TYPE CODE

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

CODE	AREA TYPE
CH	China

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.

⚠WARNING

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

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

For Your Safety

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

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

⚠WARNING

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

Follow the procedures and precautions in this manual carefully.

Important Safety Precautions

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

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

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

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

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

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

HOW TO USE THIS MANUAL

This service manual describes the service procedures for the SC125 - 5.

Follow the Maintenance Schedule (Section 3) recommendations to ensure that the vehicle is in peak operating condition.

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

Sections 1 and 3 apply to the whole scooter. Section 2 illustrates procedures for removal/installation of components that may be required to perform service described in the following sections.
Section 4 through 19 describe parts of the scooter, grouped according to location.

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

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

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

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

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

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

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

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

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

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

Honda Motor Co., Ltd.
SERVICE PUBLICATION OFFICE

CONTENTS

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SYMBOLS

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

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

1. GENERAL INFORMATION

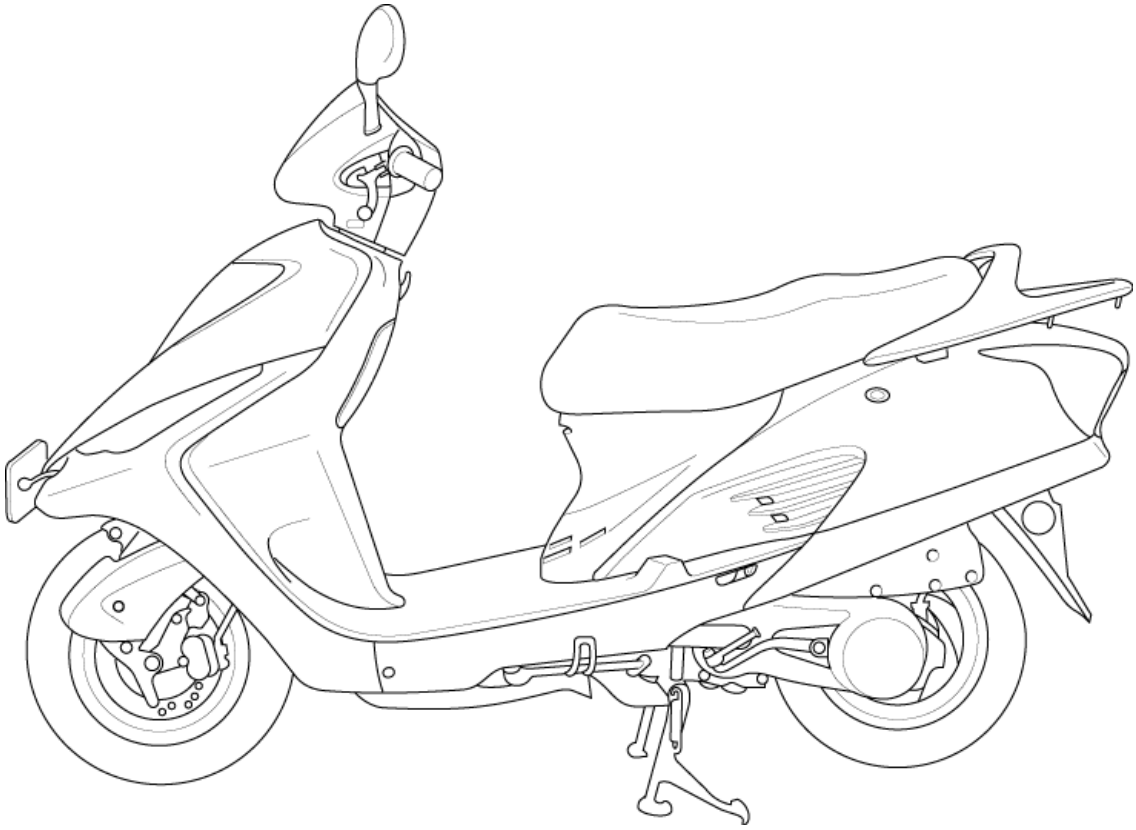
SERVICE RULES

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

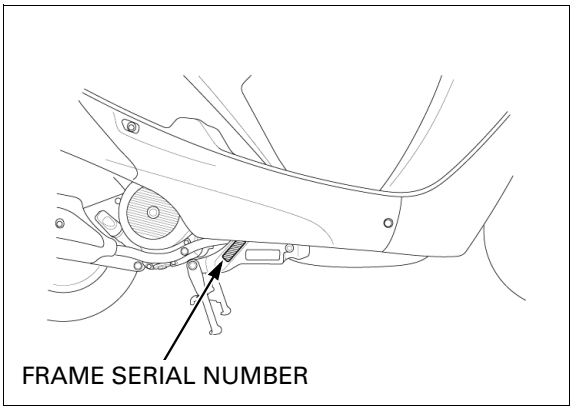
MODEL IDENTIFICATION

This manual covers 4 type of SC125 models.

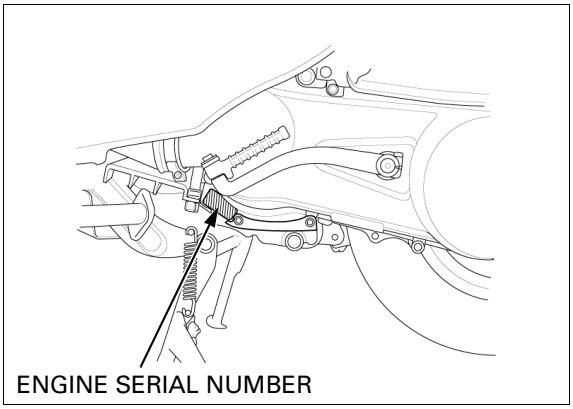
- Type I :Rear hand brake
- Type II :Rear foot brake
- Type III :Rear hand brake/Ignition switch key shutter
- Type IV :Rear foot brake/Ignition switch key shutter



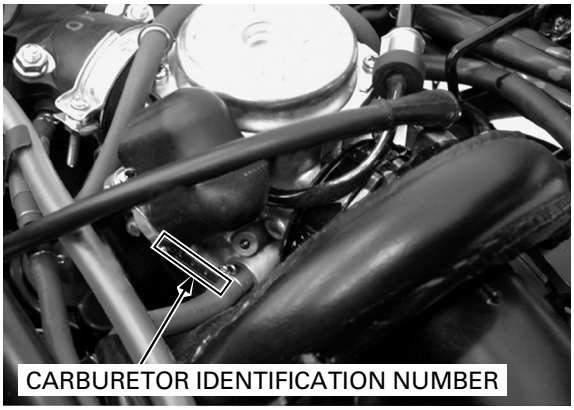
The frame serial number is stamped on the right side of the frame.



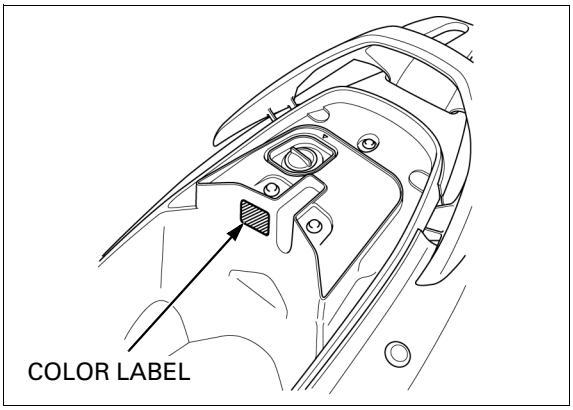
The engine serial number is stamped on the lower left side of the crankcase.



The carburetor identification number is stamped on the left side of the carburetor body.



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



GENERAL SPECIFICATIONS

ITEM			SPECIFICATION
DIMENSIONS	Overall length		1,785 mm (70.3 in)
	Overall width		694 mm (27.3 in)
	Overall height		1,139 mm (44.8 in)
	Wheelbase		1,211 mm (47.7 in)
	Seat height		752 mm (29.6 in)
	Ground clearance		121 mm (4.8 in)
	Dry weight	TYPE I, III	104 kg (229 lbs)
		TYPE II, IV	106 kg (234 lbs)
	Curb weight		109 kg (240 lbs)
	Maximum weight capacity		176 kg (388 lbs)
FRAME	Frame type		Under bone
	Front suspension		Bottom link
	Front axle travel		64 mm (2.5 in)
	Rear suspension		Unit swing
	Rear axle travel		64 mm (2.5 in)
	Front tire size		90/100 – 10 53J
	Rear tire size		90/100 – 10 53J
	Tire brand	CHENG SHIN	Front/Rear: C6027
		DURO	Front/Rear: HFC-263A
	Front brake		Hydraulic single disc
	Rear brake		Mechanical leading trailing
	Caster angle		27° 00′
	Trail length		80 mm (3.1 in)
	Fuel tank capacity		6.0 liter (1.59 US gal, 1.32 Imp gal)
ENGINE	Type		Gasoline air-cooled 4-stroke
	Cylinder arrangement		10° Include from holizontal
	Bore and stroke		52.4 x 57.8 mm (2.05 x 2.28 in)
	Displacement		124.6 cm^3 (7.60 cu-in)
	Compression ratio		9.2: 1
	Valve train		Chain driven, OHC
		Intake valve opens	0° TDC (at 1 mm lift)
		Intake valve closes	25° ABDC (at 1 mm lift)
		Exhaust valve opens	33° BBDC (at 1 mm lift)
		Exhaust valve closes	0° TDC (at 1 mm lift)
	Lubrication system		Forced pressure and wet sump
	Oil pump type		Trochoid
	Cooling system		Forced air cooled
	Air filtration		Paper filter
	Engine dry weight		25.5 kg (56.2 lbs)
CARBURETOR	Carburetor type		CV (Constant Velocity)
	Throttle bore		24 mm (0.9 in)
DRIVE TRAIN	Clutch system		Dry, automatic centrifugal clutch
	Drive belt ratio		2.640 – 0.860
	Final reduction ratio		8.615
ELECTRICAL	Ignition system		DC-CDI
	Starting system		Electric starter motor/kickstarter
	Charging system		Single phase alternator
	Regulator/rectifier		SCR shorted/single phase, half-wave rectification
	Lighting system		Alternator

LUBRICATION SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	0.8 liter (0.8 US qt, 0.7 Imp qt)	–
	After disassembly	0.9 liter (1.0 US qt, 0.8 Imp qt)	–
Recommended engine oil		Honda 4-stroke oil or equivalent motor oil API service classification: SE, SF or SG Viscosity: SAE 10W-30	–
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.21 (0.006 – 0.008)	0.25 (0.010)
	Side clearance	0.05 – 0.10 (0.002 – 0.004)	0.12 (0.005)

FUEL SYSTEM SPECIFICATIONS

ITEM	SPECIFICATIONS
Carburetor identification number	VE49E
Main jet	#102
Slow jet	#35
SE thermal valve resistance	5 Ω (20°C/68°F)
Float level	18.5 mm (0.73 in)
Pilot screw initial opening	See page 5-21
Idle speed	1,700 ± 100 min^{-1} (rpm)
PAIR control valve specified vacuum	60 kPa (450 mmHg)
SE thermal valve resistor resistance	7.6 – 9.4 Ω (20°C/68°F)
Throttle grip free play	2 – 6 mm (0.1 – 0.2 in)

CYLINDER HEAD/VALVES SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			1,275 kPa (13.0 kgf/cm^2, 185 psi) at 570 min^{-1} (rpm)	–
Cylinder head warpage			–	0.05 (0.002)
Valve clearance		IN/EX	0.14 (0.006)	–
Rocker arm	Rocker arm I.D.	IN/EX	10.000 – 10.015 (0.3937 – 0.3943)	10.10 (0.398)
	Rocker arm shaft O.D.	IN/EX	9.972 – 9.987 (0.3926 – 0.3932)	9.91 (0.390)
	Arm-to-shaft clearance	IN/EX	0.013 – 0.043 (0.0005 – 0.0017)	0.08 (0.003)
Camshaft	Cam lobe height	IN	25.885 – 26.045 (1.0191 – 1.0254)	25.815 (1.0163)
		EX	25.730 – 25.890 (1.0130 – 1.0193)	25.660 (1.0102)
Valve, valve guide	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/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 seat width	IN/EX	1.0 (0.04)	1.6 (0.06)
Valve spring free length		Inner	32.41 (1.276)	32.01 (1.260)
		Outer	35.25 (1.388)	34.85 (1.372)

CYLINDER/PISTON SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		52.40 – 52.41 (2.0630 – 2.0634)	52.50 (2.067)
	Out-of-round		–	0.05 (0.002)
	Taper		–	0.05 (0.002)
	Warpage		–	0.05 (0.002)
Piston, piston ring, piston pin	Piston O.D.		52.370 – 52.390 (2.0618 – 2.0626)	52.30 (2.059)
	Piston O.D. measurement point		10 (0.39) from bottom of skirt	–
	Piston pin bore I.D.		15.002 – 15.008 (0.5906 – 0.5909)	15.04 (0.592)
	Piston pin O.D.		14.994 – 15.000 (0.5903 – 0.5906)	14.96 (0.589)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.02 (0.001)
	Piston ring-to-ring groove clearance	Top	0.030 – 0.065 (0.0012 – 0.0026)	0.09 (0.004)
		Second	0.015 – 0.050 (0.0006 – 0.0020)	0.09 (0.004)
	Piston ring end gap	Top	0.10 – 0.25 (0.004 – 0.010)	0.50 (0.020)
		Second	0.25 – 0.40 (0.010 – 0.016)	0.60 (0.024)
		Oil (side rail)	0.20 – 0.80 (0.008 – 0.031)	–
Cylinder-to-piston clearance			0.010 – 0.040 (0.0004 – 0.0016)	0.10 (0.004)
Connecting rod small end I.D.			15.016 – 15.034 (0.5912 – 0.5919)	15.06 (0.593)
Connecting rod-to-piston pin clearance			0.016 – 0.040 (0.0006 – 0.0016)	0.06 (0.002)

KICKSTARTER/DRIVE PULLEY/DRIVEN PULLEY/CLUTCH SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Drive belt width		20.0 (0.79)	19.0 (0.75)
Movable drive face	Bushing I.D.	23.989 – 24.042 (0.9444 – 0.9465)	24.07 (0.948)
	Boss O.D.	23.960 – 23.974 (0.9433 – 0.9439)	23.93 (0.942)
	Weight roller O.D.	17.92 – 18.08 (0.706 – 0.712)	17.5 (0.69)
Clutch	Lining thickness	–	2.0 (0.08)
	Clutch outer I.D.	125.0 – 125.2 (4.92 – 4.93)	125.5 (4.94)
Driven pulley	Face spring free length	154.6 (6.09)	135 (5.3)
	Driven face O.D.	33.965 – 33.985 (1.3372 – 1.3380)	33.94 (1.336)
	Movable driven face I.D.	34.000 – 34.025 (1.3386 – 1.3396)	34.06 (1.341)

FINAL REDUCTION SPECIFICATIONS

ITEM		SPECIFICATIONS
Final reduction oil capacity	After draining	0.09 liter (0.10 US qt, 0.08 Imp qt)
	After disassembly	0.11 liter (0.12 US qt, 0.10 Imp qt)
Recommended final reduction oil		Hypoid gear oil SAE #90 or Honda 4-stroke oil or equivalent motor oil API service classification: SE, SF or SG Viscosity: SAE 10W-30

CRANKCASE/CRANKSHAFT SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod side clearance	0.10 – 0.35 (0.004 – 0.014)	0.55 (0.022)
	Connecting rod radial clearance	0 – 0.008 (0 – 0.0003)	0.05 (0.002)
	Runout	–	0.10 (0.004)

FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	To the indicator
Cold tire pressure	Driver only	175 kPa (1.75 kgf/cm^2, 25 psi)	–
	Driver and passenger	175 kPa (1.75 kgf/cm^2, 25 psi)	–
Axle runout		–	0.2 (0.01)
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)

REAR WHEEL/BRAKE/SUSPENSION SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	To the indicator
Cold tire pressure	Drive only	200 kPa (2.00 kgf/cm^2, 29 psi)	–
	Drive and passenger	250 kPa (2.50 kgf/cm^2, 36 psi)	–
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Rear brake	Brake lever free play (Type I, III)	10 – 20 (0.4 – 0.8)	–
	Brake pedal free play (Type II, IV)	20 – 30 (0.8 – 1.2)	–
	Brake drum I.D.	110.0 (4.33)	111.0 (4.4)

HYDRAULIC BRAKE SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Specified brake fluid	DOT 3 or DOT 4	–
Brake disc thickness	3.3 – 3.7 (0.13 – 0.15)	3.0 (0.12)
Brake disc warpage	–	0.2 (0.01)
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.	25.400 – 25.450 (1.0000 – 1.0020)	25.460 (1.0024)
Caliper piston O.D.	25.318 – 25.368 (0.9968 – 0.9987)	25.31 (0.996)

BATTERY/CHARGING SYSTEM SPECIFICATIONS

ITEM			SPECIFICATIONS
Battery	Capacity		12 V – 6 Ah
	Current leakage		0.5 mA max.
	Voltage	Fully charged	Above 12.8 V
		Needs charging	Below 12.3 V
	Charging current	Normal	0.6 A/5 – 10 h
		Quick	3.0 A/1.0 h
Alternator	Capacity		0.125 kW/5,000 min^{-1} (rpm)
	Charging coil resistance		0.2 – 1.0 Ω (20°C/68°F)
	Lighting coil resistance		0.1 – 0.8 Ω (20°C/68°F)
Regulator/rectifier regulated voltage (Lighting output)			12.6 – 13.6 V/5,000 min^{-1} (rpm)

IGNITION SYSTEM SPECIFICATIONS

ITEM	SPECIFICATIONS
Spark plug	CR7HSA (NGK)
Spark plug gap	0.6 – 0.7 mm (0.02 – 0.03 in)
Ignition coil peak voltage	100 V minimum
Ignition pulse generator peak voltage	0.7 V minimum
Ignition timing ("F" mark)	13° BTDC at idle speed

ELECTRIC STARTER SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	11.9 (0.47)	9.4 (0.37)

LIGHTS/METER/SWITCHES SPECIFICATIONS

ITEM			SPECIFICATIONS
Bulbs	Headlight	Hi	12V – 35 W
		Lo	12V – 35 W
	Position light		12V – 5 W
	Brake/tail light		12V – 21/5 W
	Turn signal light		12V – 21 W X 4
	Meter light		12V – 1.7 W X 2
	Turn signal indicator		12V – 3.4 W X 2
	High beam indicator		12V – 1.7 W
Fuse	Main fuse		20 A
	Sub fuse		15 A
Lighting resistor resistance			5.3 – 6.5 Ω (20°C/68°F)

STANDARD TORQUE VALUES

FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)	FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)
5 mm bolt and nut	5 (0.5, 3.6)	5 mm screw	4 (0.4, 2.9)
6 mm bolt and nut	10 (1.0, 7)	6 mm screw	9 (0.9, 6.5)
8 mm bolt and nut	22 (2.2, 16)	6 mm flange bolt (8 mm head; small head)	10 (1.0, 7)
10 mm bolt and nut	34 (3.5, 25)	6 mm flange bolt (8 mm head; large flange)	12 (1.2, 9)
12 mm bolt and nut	54 (5.5, 40)	6 mm flange bolt (10 mm head) and nut	12 (1.2, 9)
		8 mm flange bolt and nut	26 (2.7, 20)
		10 mm flange bolt and nut	39 (4.0, 29)

ENGINE & FRAME TORQUE VALUES

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

NOTE:

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

ENGINE

MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Spark plug	1	10	12 (1.2, 9)	
Air cleaner housing cover screw	7	5	1.1 (0.1, 0.7)	
Valve adjusting lock nut	2	5	9 (0.9, 6.5)	NOTE 1
Engine oil strainer screen cap	1	30	15 (1.5, 11)	
Engine oil drain bolt	1	12	24 (2.4, 17)	
Final reduction oil check bolt	1	8	12 (1.2, 9)	
Final reduction oil drain bolt	1	8	12 (1.2, 9)	
Secondary air cleaner housing cover screw	1	5	1.1 (0.1, 0.7)	

LUBRICATION SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Oil pump plate screw	1	3	2 (0.2, 1.4)	

FUEL SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Carburetor drain screw	1	–	1.5 (0.2, 1.1)	
SE thermal valve set plate screw	1	4	2.1 (0.2, 1.5)	
SE thermal valve body screw	2	5	3.5 (0.4, 2.9)	
Throttle cable holder screw	2	5	3.5 (0.4, 2.9)	
Air cut-off valve cover screw	2	4	2.1 (0.2, 1.5)	
Vacuum chamber cover screw	2	4	2.1 (0.2, 1.5)	
Float chamber screw	4	4	2.1 (0.2, 1.5)	
Slow jet	1	–	1.8 (0.2, 1.3)	
Needle jet holder	1	–	2.5 (0.3, 1.8)	
Main jet	1	–	2.1 (0.2, 1.5)	
Carburetor insulator band screw	1	4	2 (0.2, 1.4)	
PAIR pipe mounting bolt	3	6	10 (1.0, 7)	
Fuel auto valve lock nut	1	16	18 (1.8, 13)	

CYLINDER HEAD/VALVES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cam chain tensioner lifter screw	1	6	4 (0.4, 2.9)	
Cam chain tensioner lifter bolt	2	6	12 (1.2, 9)	
Camshaft holder nut	4	8	20 (2.0, 14)	NOTE 1
Intake shroud mounting screw	2	5	0.9 (0.1, 0.7)	

CYLINDER/PISTON

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder stud bolt A	2	8	9 (0.9, 6.5)	
Cylinder stud bolt B	2	8	9 (0.9, 6.5)	

KICKSTARTER/DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Kickstarter pinch bolt	1	6	14 (14, 10)	
Left crankcase cover bolt	9	6	12 (1.2, 9)	
Left crankcase cover plate screw	4	4	3 (0.3, 2.2)	
Drive pulley face nut	1	12	59 (6.0, 43)	NOTE 1
Clutch/driven pulley nut	1	28	54 (5.5, 40)	
Clutch outer nut	1	12	54 (5.5, 40)	

FINAL REDUCTION

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

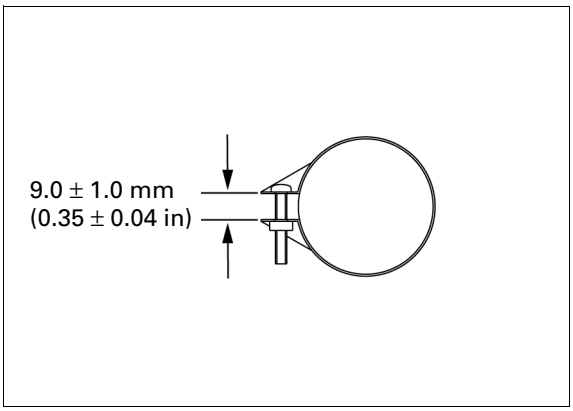
ALTERNATOR/STARTER CLUTCH

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cooling fan cover screw	2	5	0.9 (0.1, 0.7)	
Flywheel nut	1	12	54 (5.5, 40)	
Starter clutch lock nut	1	22	93 (9.5, 69)	NOTE 1, 6
Starter clutch socket bolt	3	6	12 (1.2, 9)	NOTE 3

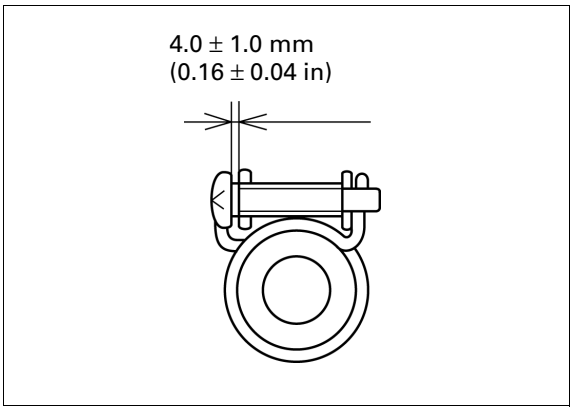
CRANKCASE/CRANKSHAFT

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cam chain tensioner slider pivot special bolt	1	6	10 (1.0, 7)	

Air cleaner connecting hose band screw:

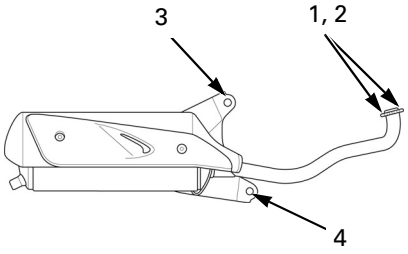


PAIR pipe band screw:



FRAME

FRAME/BODY PANELS/EXHAUST SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Fork cover bolt	2	6	6 (0.6, 4.3)	
Muffler protector cover screw	2	5	4.2 (0.4, 2.9)	
Muffler protector bolt	2	6	10 (1.0, 7)	
Exhaust pipe joint nut	2	7	29 (3.0, 22)	
Muffler mounting bolt	2	10	49 (5.0, 36)	
Exhaust pipe and muffler tightening procedure 				

ENGINE REMOVAL/INSTALLATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Engine mounting bolt (frame side)	1	10	50 (5.1, 37)	
Engine hanger link nut (engine side)	1	10	50 (5.1, 37)	

FRONT WHEEL/SUSPENSION/STEERING

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Front axle nut	1	12	56 (5.7, 41)	NOTE 5
Speedometer cable set screw	1	5	2 (0.2, 1.4)	
Front brake disc socket bolt	3	8	42 (4.3, 31)	NOTE 4
Shock absorber upper mounting nut	2	8	26 (2.6, 19)	NOTE 5
Shock absorber lower mounting screw	2	8	1 (0.1, 0.7)	
Shock absorber lower mounting nut	2	8	18 (1.8, 13)	
Shock absorber pivot arm mounting nut	2	8	36 (3.7, 27)	NOTE 5
Front brake torque link mounting nut	1	8	29 (3.0, 22)	NOTE 5
Handlebar post nut	1	10	39 (4.0, 29)	NOTE 1
Front brake hose clamp bolt	1	6	12(1.2, 9)	NOTE 4
Steering stem top cone race	1	BC1	See page 13-22	
Steering stem lock nut	1	BC1	See page 13-22	

REAR WHEEL/BRAKE/SUSPENSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear axle nut	1	16	118 (12.0, 87)	NOTE 1, 5
Rear brake arm bolt	1	6	10 (1.0, 7)	NOTE 4
Shock absorber upper mounting bolt	1	10	39 (4.0, 29)	
Shock absorber lower mounting bolt	1	8	26 (2.6, 19)	

HYDRAULIC BRAKE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Brake caliper bleed valve	1	8	6 (0.6, 4.3)	
Brake master cylinder reservoir cap screw	2	4	2 (0.2, 1.4)	
Brake pad pin plug	2	10	3 (0.3, 2.2)	
Brake pad pin	2	10	18 (1.8, 13)	
Brake master cylinder holder bolt	2	6	12 (1.2, 9)	
Brake lever pivot bolt	1	6	1 (0.1, 0.7)	
Brake lever pivot nut	1	6	6 (0.6, 4.3)	
Front brake light switch screw	2	4	1 (0.1, 0.7)	
Front brake torque link nut (brake caliper side)	1	8	29 (3.0, 22)	NOTE 5
Brake hose oil bolt	2	10	34 (3.5, 25)	

OTHERS

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Side stand pivot bolt	1	10	10 (1.0, 7)	
Side stand pivot nut	1	10	29 (3.0, 22)	
Rear brake lever pivot bolt (type II, IV only)	1	5	1 (0.1, 0.7)	
Rear brake lever pivot nut (type II, IV only)	1	5	4.5 (0.5, 3.6)	

LUBRICATION & SEAL POINTS

ENGINE

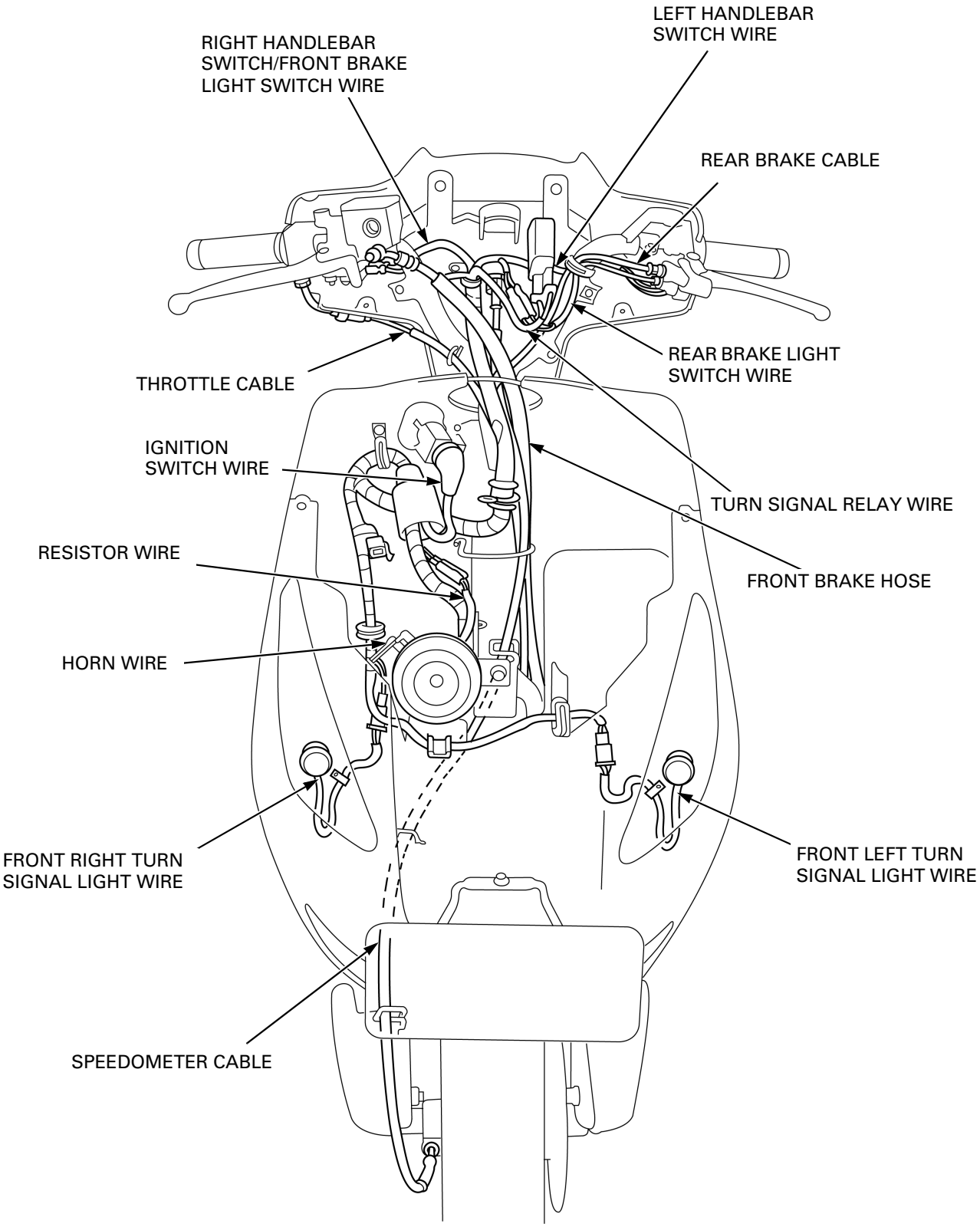
LOCATION	MATERIAL	REMARKS
Transmission case breather hose grommet Alternator wire grommet	Liquid sealant (Three bond 1207B or 1211 or equivalent)	
Starter clutch socket bolt	Locking agent	
Driven face inner surface Movable driven face cam groove Driven face needle bearing Driven face ball bearing Kickstarter spindle bearing area Kickstarter idle gear shaft both side surface Kickstarter idle gear friction spring rolling groove Kickstarter idle gear friction spring sliding area	Multi-purpose grease	7.0 – 8.0 g 2.0 – 2.5 g 1.0 – 1.5 g 0.5 g
Oil pump gear teeth Oil pump drive chain whole surface Oil pump rotor shaft whole surface Oil pump rotor whole surface Cylinder stud bolt threads (camshaft holder side) Cam shaft holder nut threads and seating surface Rocker arm shaft sliding surface Rocker arm slipper sliding surface Valve adjusting nut threads and seating surface Camshaft bearing Cam sprocket teeth Cam chain whole surface Valve stem (valve guide sliding surface) Valve stem seal inner surface Piston and cylinder sliding surfaces Piston pin hole sliding area Piston ring whole surface and ring grooves Piston pin outer surface Connecting rod small end inner surface Drive pulley face nut threads and seating surface Bearing area of drive, counter and final shaft Drive, counter and final gear teeth Starter motor idle gear teeth Starter motor idle gear shaft whole surface Starter clutch gear teeth Starter clutch lock nut threads and seating surface Starter clutch roller sliding area Crankshaft bearings Connecting rod big end bearing Each O-ring whole surface Oil seal lips and outer surfaces	Engine oil	Fill up 2 cc minimum (Each bearing) Fill up 3 cc minimum
Camshaft cam lobes	Molybdenum disulfide oil (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease)	
Crankshaft tapered area Drive/driven pulley face and drive belt	Degrease	

FRAME

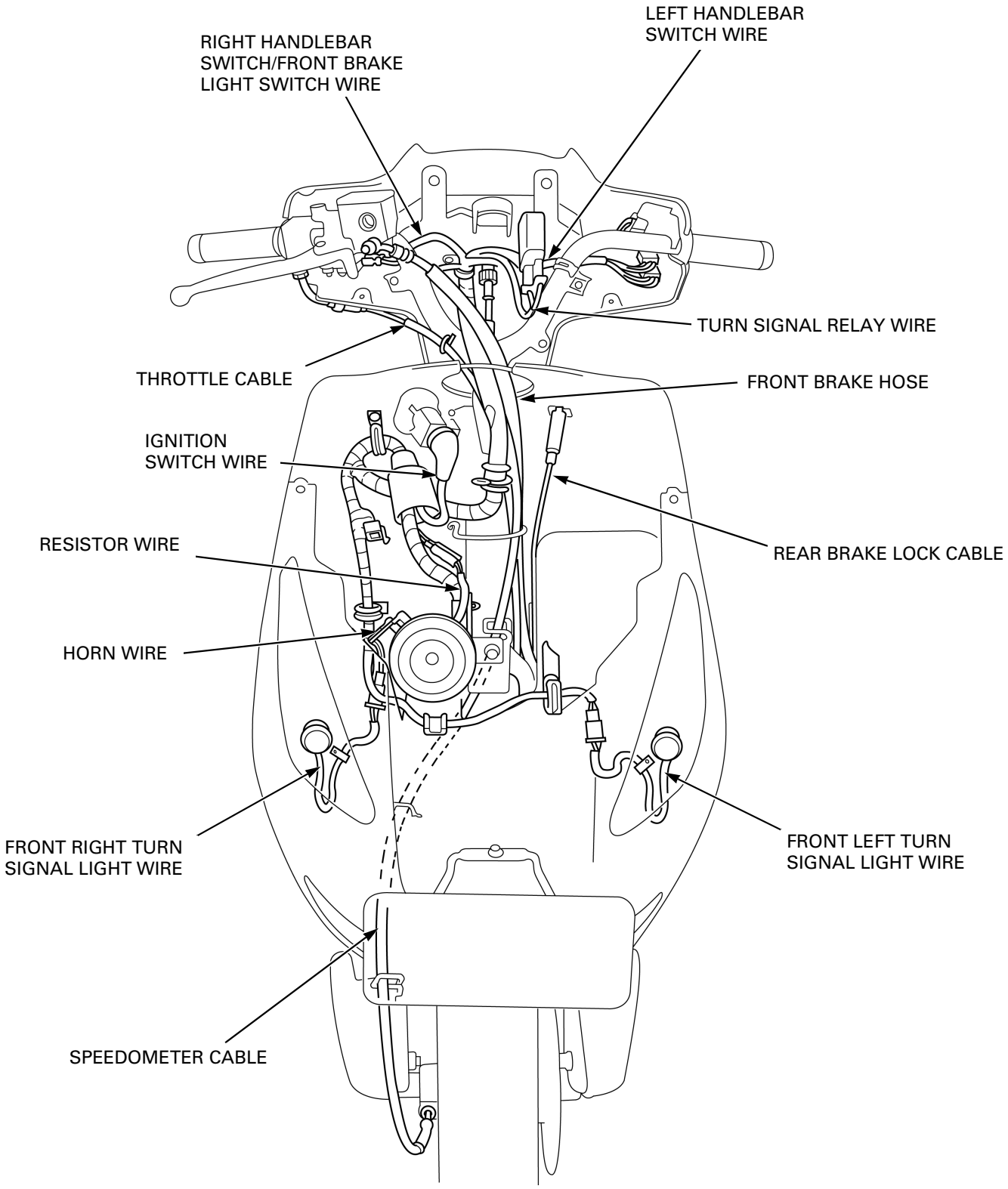
LOCATION	MATERIAL	REMARKS
Steering bearing race and bearing	Multi-purpose grease with extreme pressure (recommended: Shell ALVANIA EP2 or EXCELITE EP2 manufactured by KYODO YUSHI, japan or equivalent)	Fill up 3.0– 5.0 g to each bearing race
Front wheel dust seal lip Speedometer gear inside Speedometer gear and rolling surface Speedometer gear box seal surface Brake caliper bracket bushing outer surface Brake caliper bracket pivot dust seal lips Front brake torque link bushing outer surface Front brake torque link pivot dust seal lips Shock absorber pivot arm bushing outer surface Shock absorber pivot arm dust seal lips Shock absorber bushing outer surface Rear brake cam and shaft sliding area Rear brake cam O-ring Rear brake panel anchor pin Brake lever pivot Brake pedal pivot Brake pedal lock plate pivot Seat lock connecting area Center stand pivot	Multi-purpose grease	
Speedometer cable Throttle cable Brake master cylinder piston and lever contact area Brake caliper dust seal lips Brake caliper bracket pin outer surface	Silicone grease	
Brake master cylinder piston and cup Brake caliper piston and seal	Brake fluid (DOT 3 or DOT 4)	
Handlebar grip rubber inside Air cleaner connecting hose-to-housing mating area	Adhesive (Honda bond A or equivalent)	
Rear axle nut threads and seating surface Handlebar post nut threads	Engine oil	

CABLE & HARNESS ROUTING

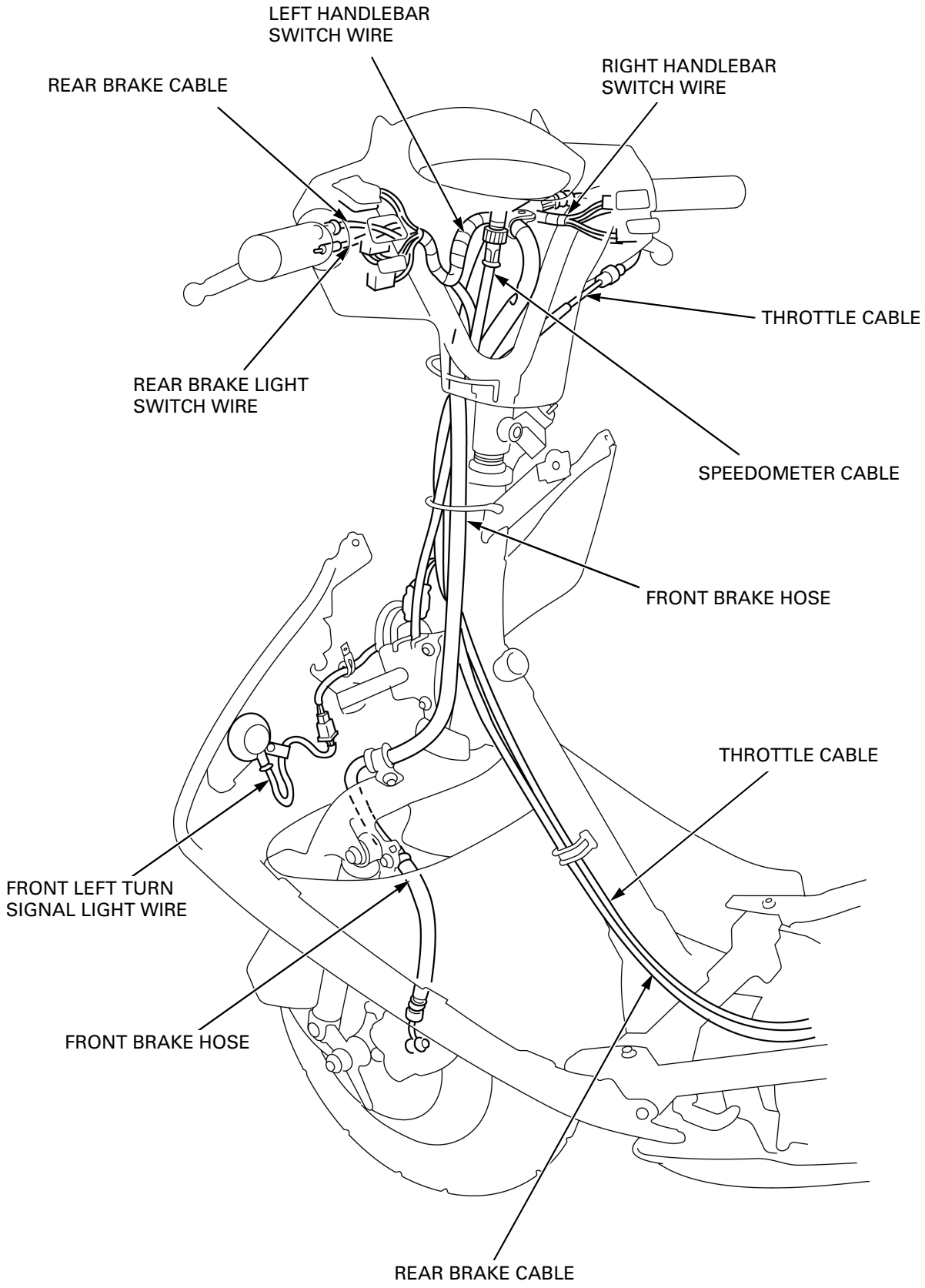
TYPE I, III (REAR HAND BRAKE TYPE):



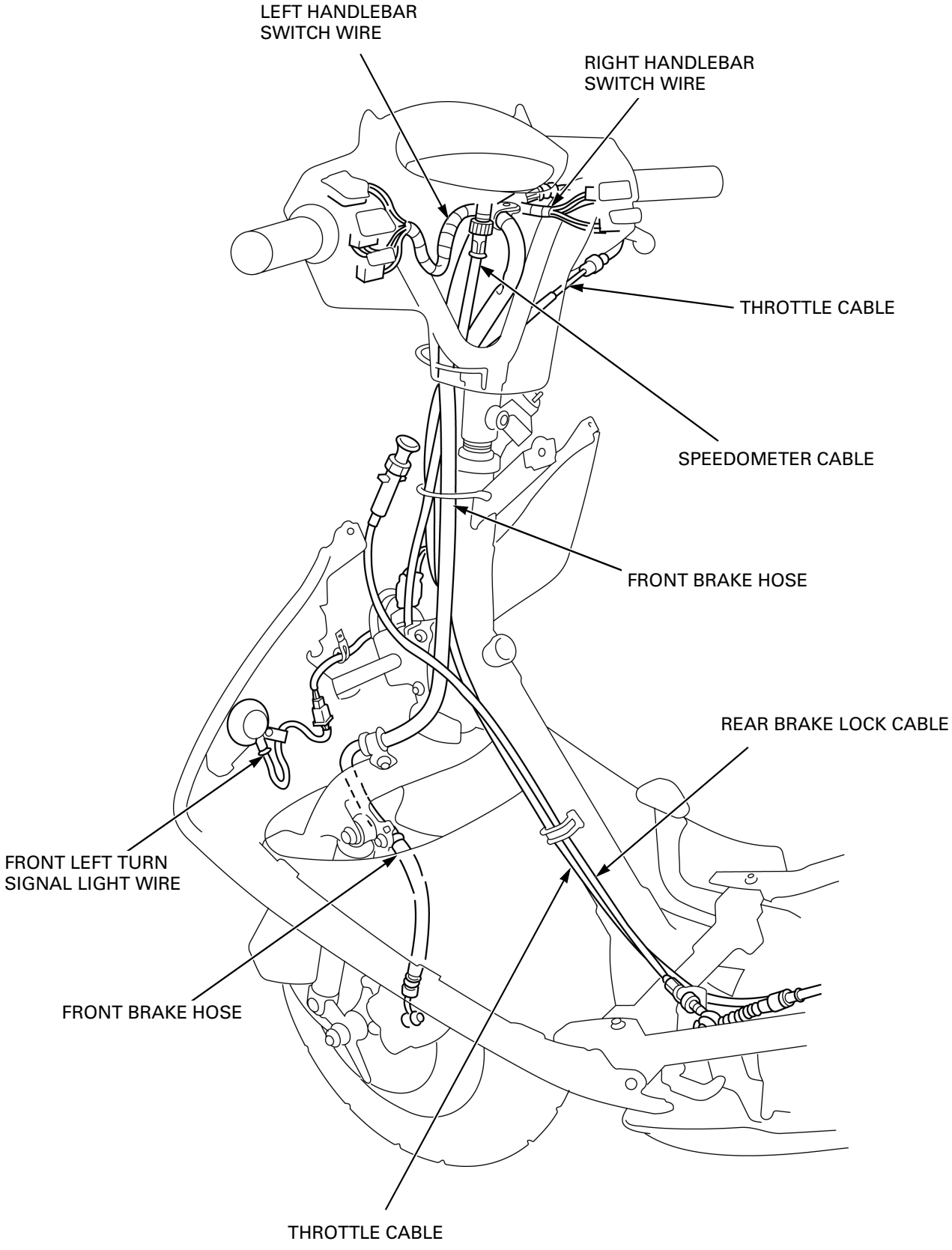
TYPE II, IV (REAR FOOT BRAKE TYPE):



TYPE I, III (REAR HAND BRAKE TYPE):



TYPE II, IV (REAR FOOT BRAKE TYPE):



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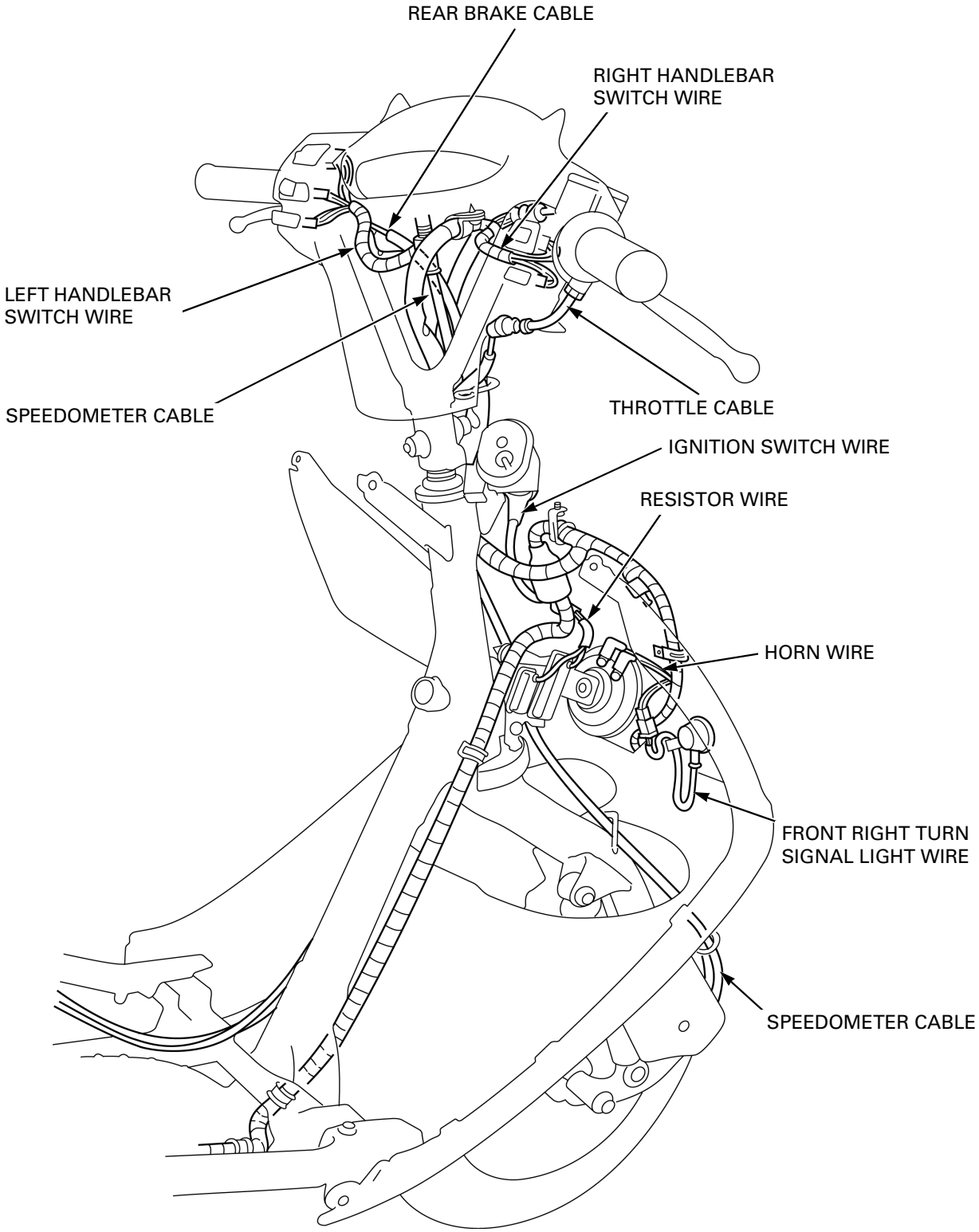
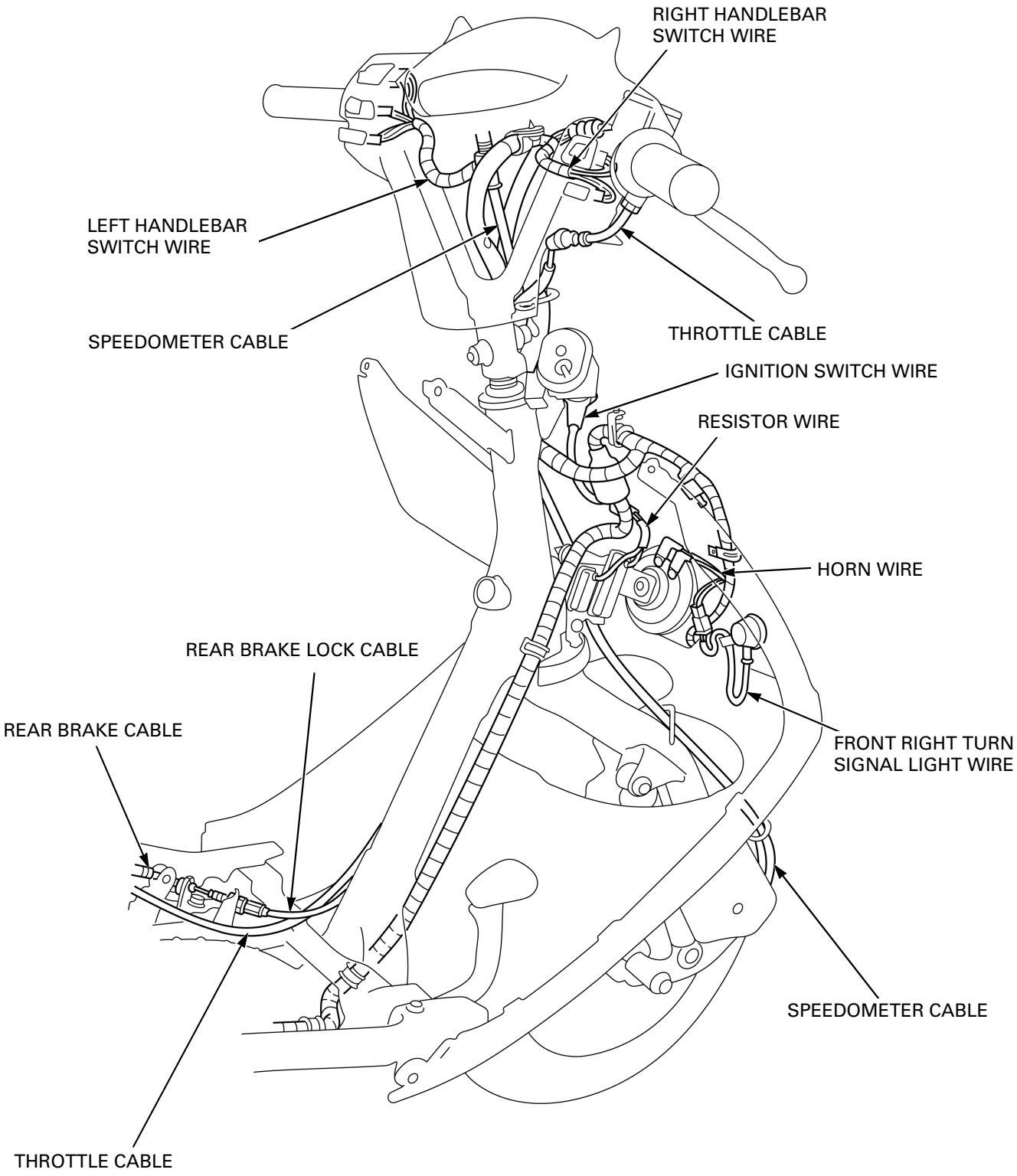
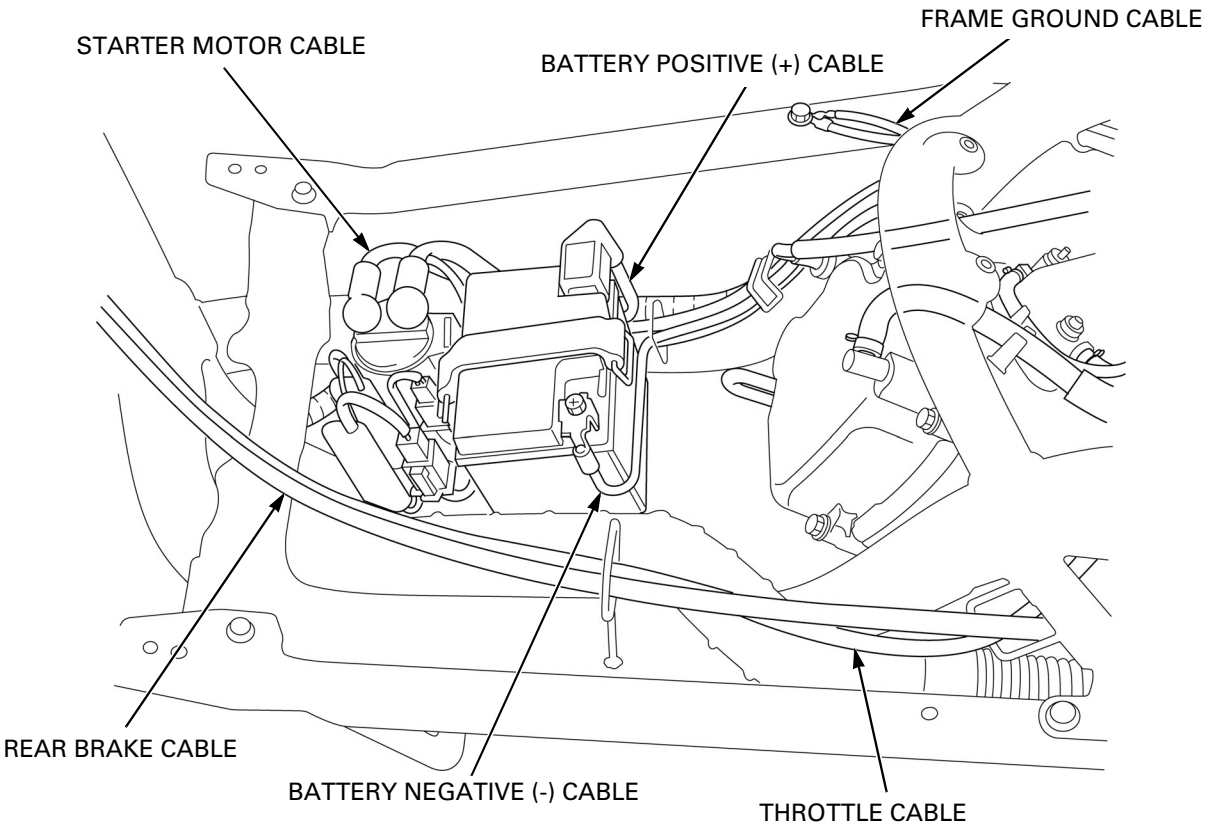
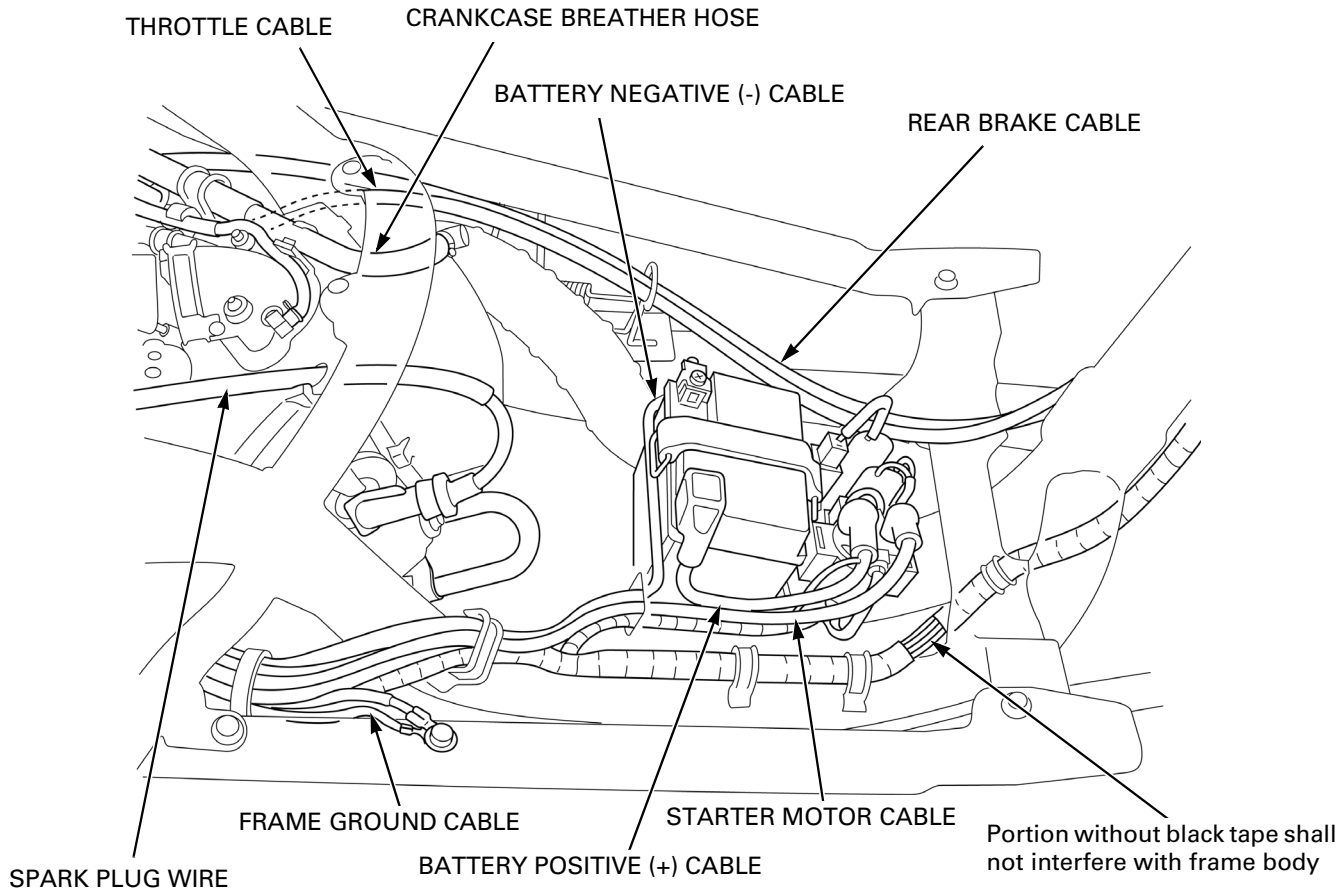


TYPE II, IV (REAR FOOT BRAKE TYPE):

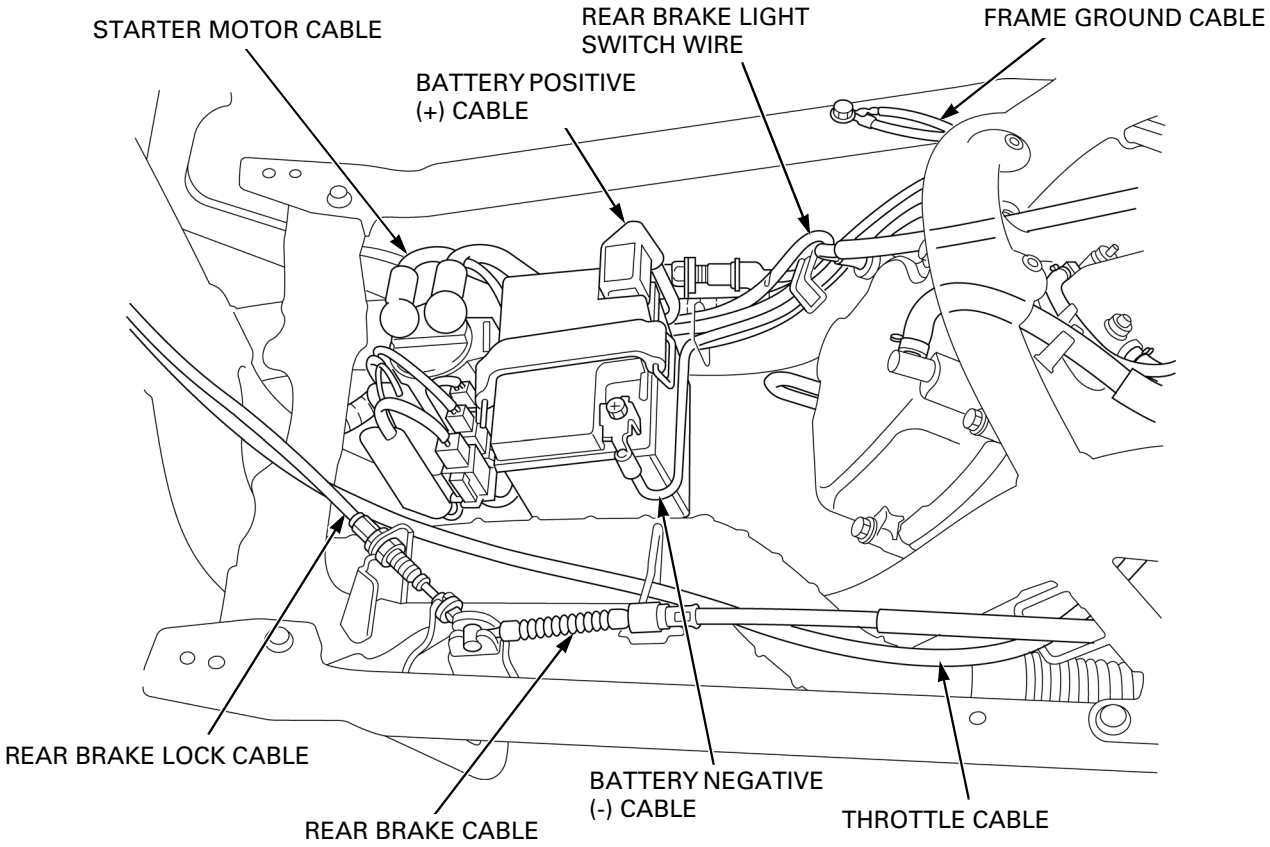


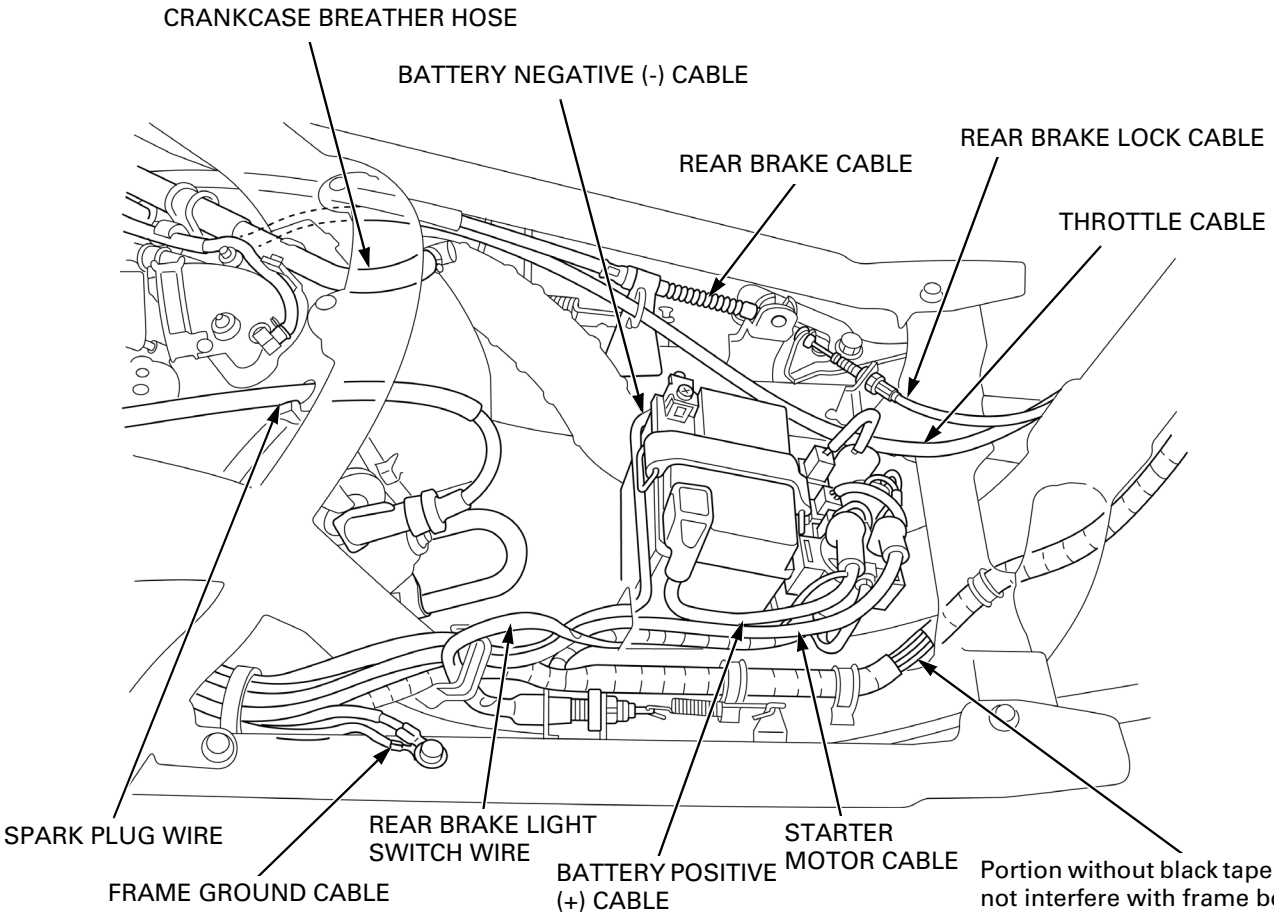
TYPE I, III (REAR HAND BRAKE TYPE):



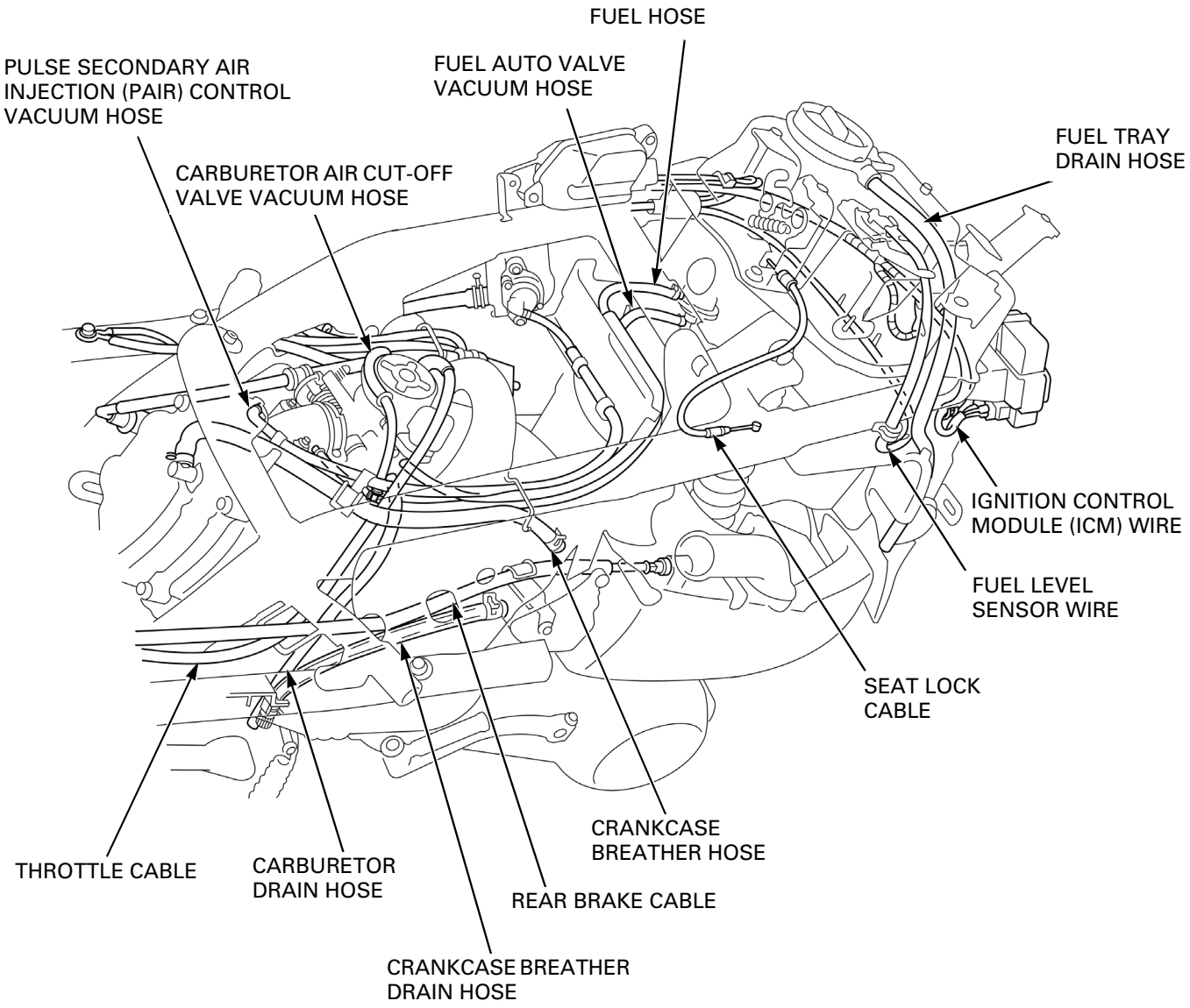


TYPE II, IV (REAR FOOT BRAKE TYPE):

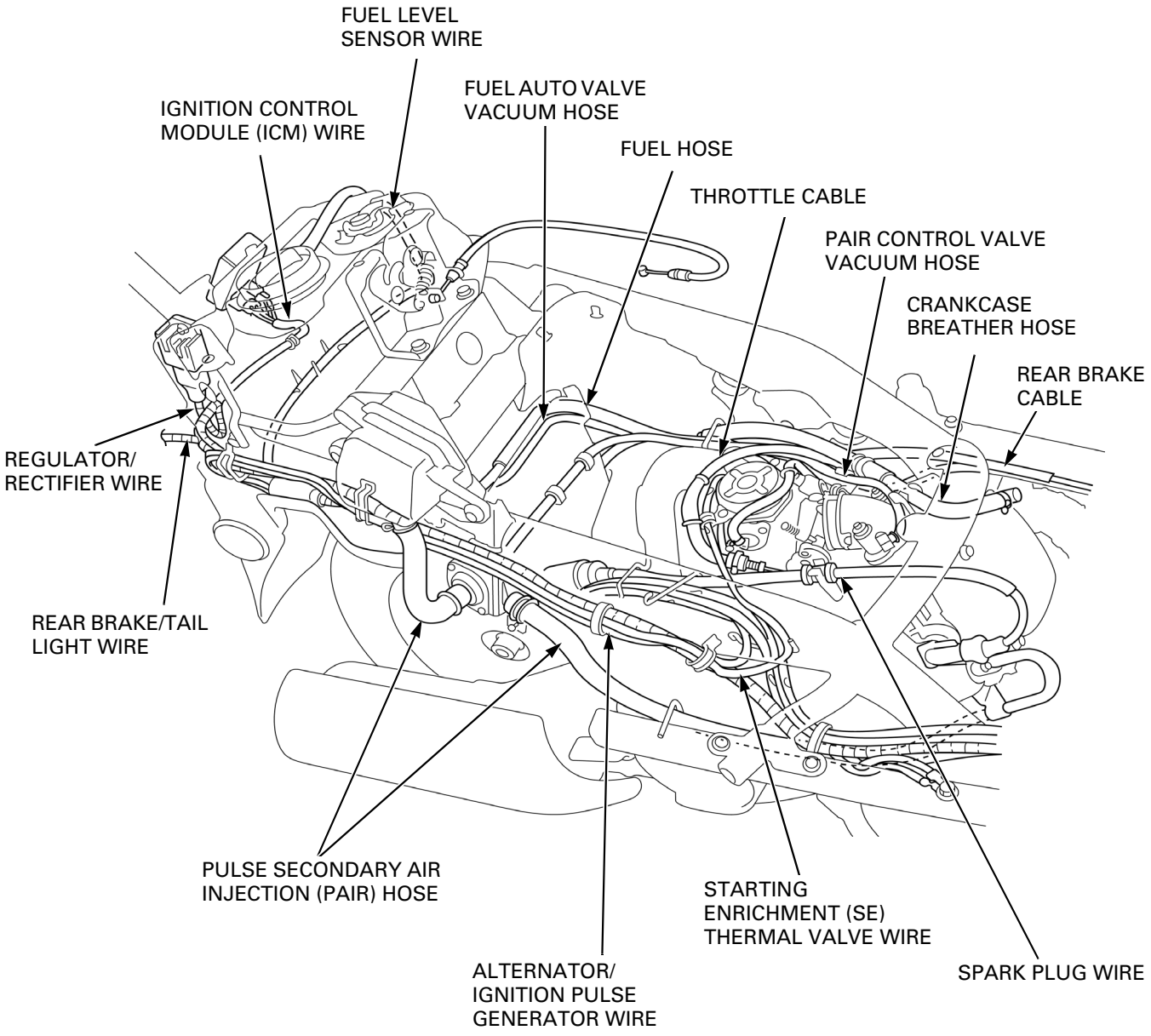




ALL TYPE:


FUEL HOSE
PULSE SECONDARY AIR INJECTION (PAIR) CONTROL VACUUM HOSE
FUEL AUTO VALVE VACUUM HOSE
FUEL TRAY DRAIN HOSE
CARBURETOR AIR CUT-OFF VALVE VACUUM HOSE
IGNITION CONTROL MODULE (ICM) WIRE
FUEL LEVEL SENSOR WIRE
SEAT LOCK CABLE
CRANKCASE BREATHER HOSE
THROTTLE CABLE
CARBURETOR DRAIN HOSE
REAR BRAKE CABLE
CRANKCASE BREATHER DRAIN HOSE

ALL TYPE:


FUEL LEVEL SENSOR WIRE
IGNITION CONTROL MODULE (ICM) WIRE
FUEL AUTO VALVE VACUUM HOSE
FUEL HOSE
THROTTLE CABLE
PAIR CONTROL VALVE VACUUM HOSE
CRANKCASE BREATHER HOSE
REAR BRAKE CABLE
REGULATOR/ RECTIFIER WIRE
REAR BRAKE/TAIL LIGHT WIRE
PULSE SECONDARY AIR INJECTION (PAIR) HOSE
ALTERNATOR/ IGNITION PULSE GENERATOR WIRE
STARTING ENRICHMENT (SE) THERMAL VALVE WIRE
SPARK PLUG WIRE

EMISSION CONTROL SYSTEMS

SOURCE OF EMISSIONS

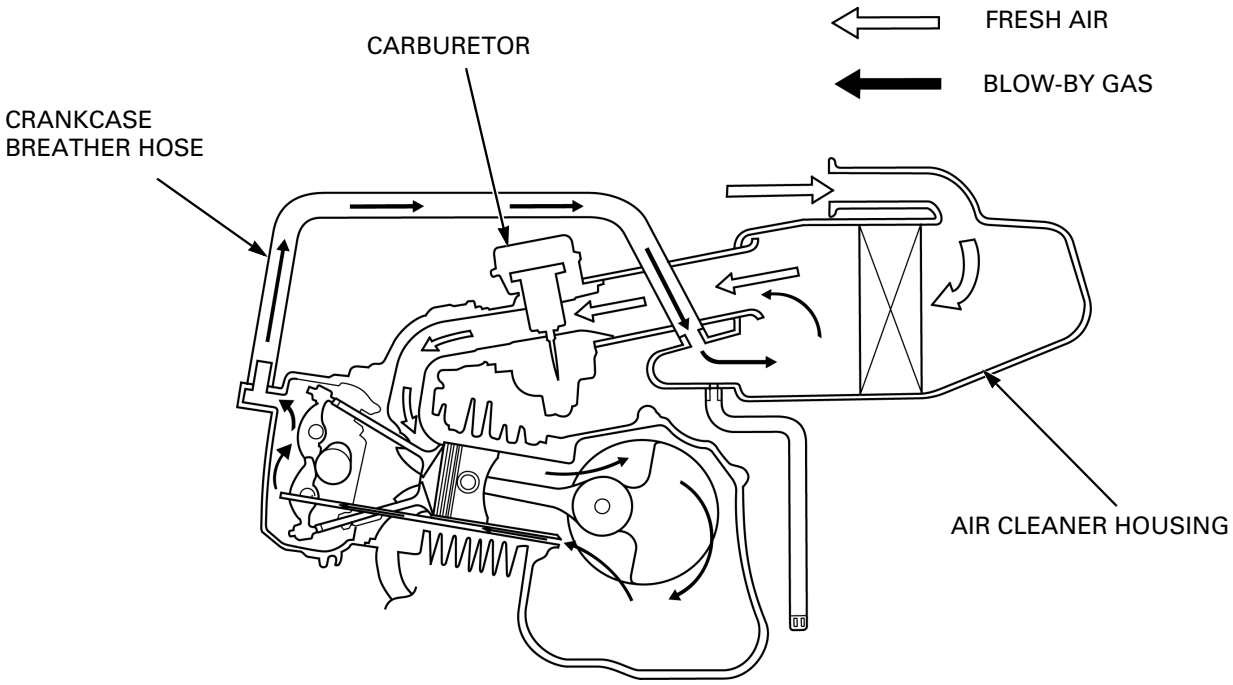
The combustion process produces carbon monoxide, oxides of nitrogen and hydrocarbons. Control of oxides of nitrogen and hydrocarbons is very important because, under certain conditions, they react to form photochemical smog when subjected to sunlight. Carbon monoxide does not react in the same way, but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

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

CRANKCASE EMISSION CONTROL SYSTEM

The engine is equipped with a closed crankcase system to prevent discharging crankcase emissions into the atmosphere.

Blow-by gas is returned to the combustion chamber through the air cleaner and carburetor.

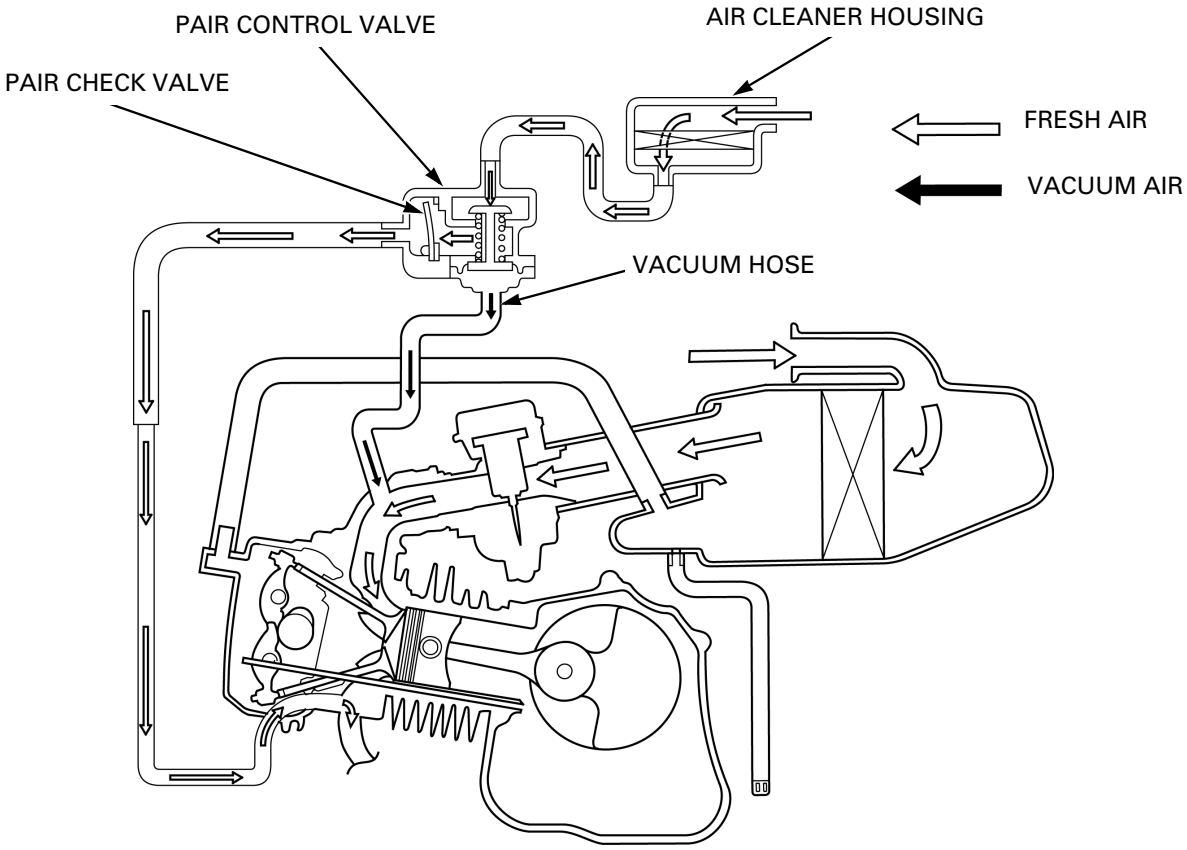


EXHAUST EMISSION CONTROL SYSTEM (PULSE SECONDARY AIR INJECTION SYSTEM)

The exhaust emission control system consists of a secondary air supply system which introduces filtered air into the exhaust gasses 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 to high intake manifold vacuum and will cut off the supply of fresh air during engine deceleration, thereby preventing afterburn in the exhaust system.

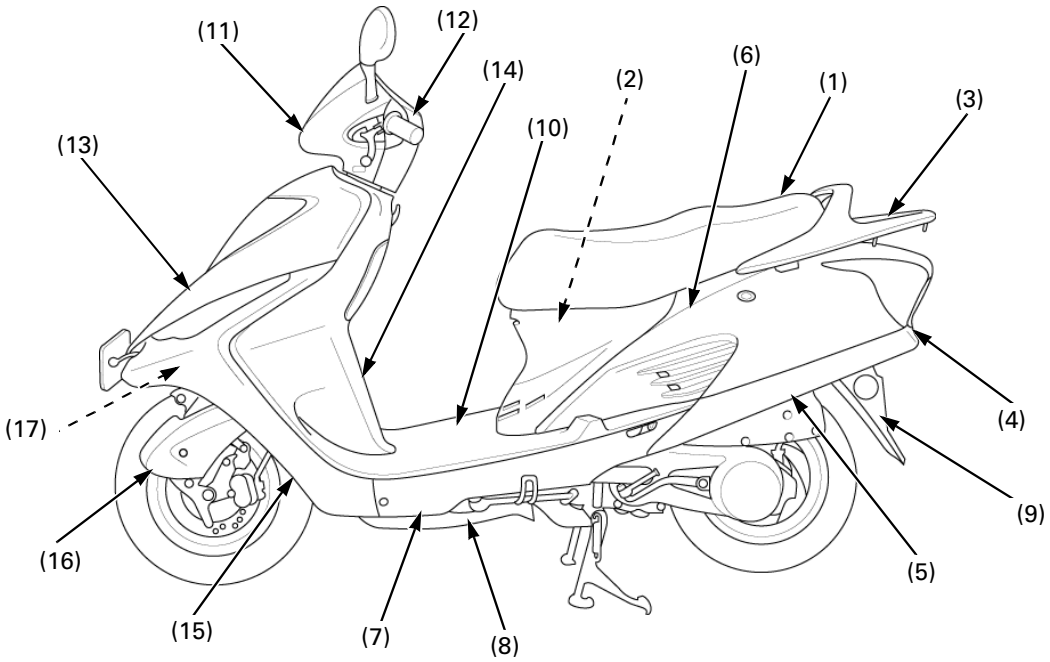
No adjustment to the pulse secondary air injection system should be made, although periodic inspection of the components recommended.



MEMO

2. FRAME/BODY PANELS/EXHAUST SYSTEM

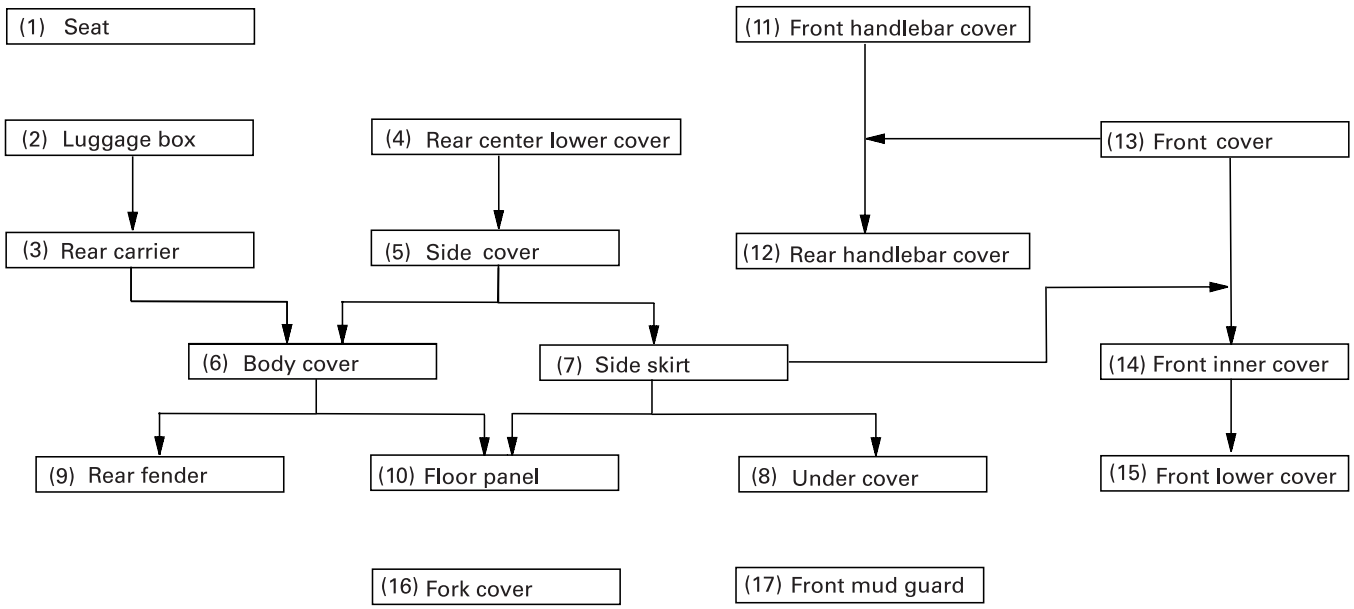
BODY PANEL LOCATIONS



(1) Seat (page 2-5)
(2) Luggage box (page 2-5)
(3) Rear carrier (page 2-6)
(4) Rear center lower cover (page 2-6)
(5) Side cover (page 2-6)
(6) Body cover (page 2-8)
(7) Side skirt (page 2-7)
(8) Under cover (page 2-7)
(9) Rear fender (page 2-9)
(10) Floor panel (page 2-9)
(11) Front handlebar cover (page 2-10)
(12) Rear handlebar cover (page 2-10)
(13) Front cover (page 2-11)
(14) Front inner cover (page 2-11)
(15) Front lower cover (page 2-12)
(16) Fork cover (page 2-12)
(17) Front mud guard (page 2-12)

BODY PANEL REMOVAL CHART

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



SERVICE INFORMATION

GENERAL

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

TORQUE VALUES

Fork cover bolt	6 N·m (0.6 kgf·m, 4.3 lbf·ft)
Muffler protector cover screw	4.2 N·m (0.4 kgf·m, 2.9 lbf·ft)
Muffler protector bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)
Exhaust pipe joint nut	29 N·m (3.0 kgf·m, 22 lbf·ft)
Muffler mounting bolt	49 N·m (5.0 kgf·m, 36 lbf·ft)

TROUBLESHOOTING

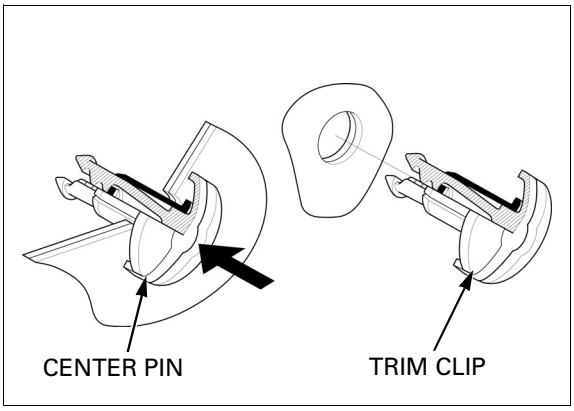
Excessive exhaust noise
- Broken exhaust system
- Exhaust gas leak

Poor performance
- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

TRIM CLIPS

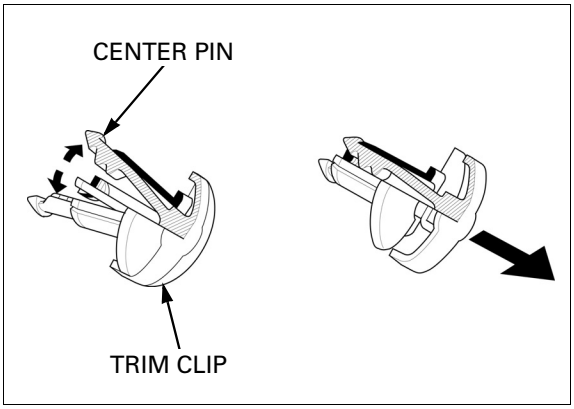
REMOVAL

Release the trim clip by pushing in the center pin and pull it out.

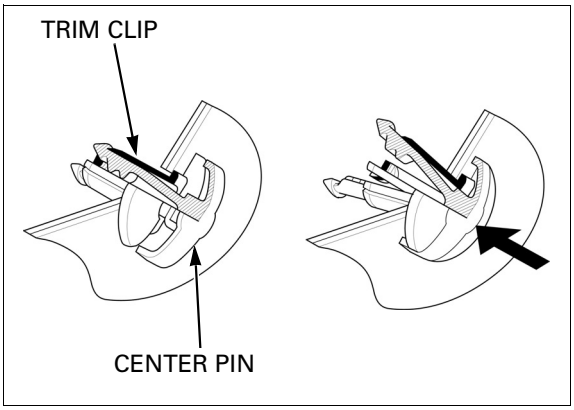


INSTALLATION

Before installing the trim clip, raise the center pin by spreading the pin tip and pushing it back.



Align the clip holes and install the trim clip fully, then lock it by pushing in the center pin until the pin head is flush with the clip head.



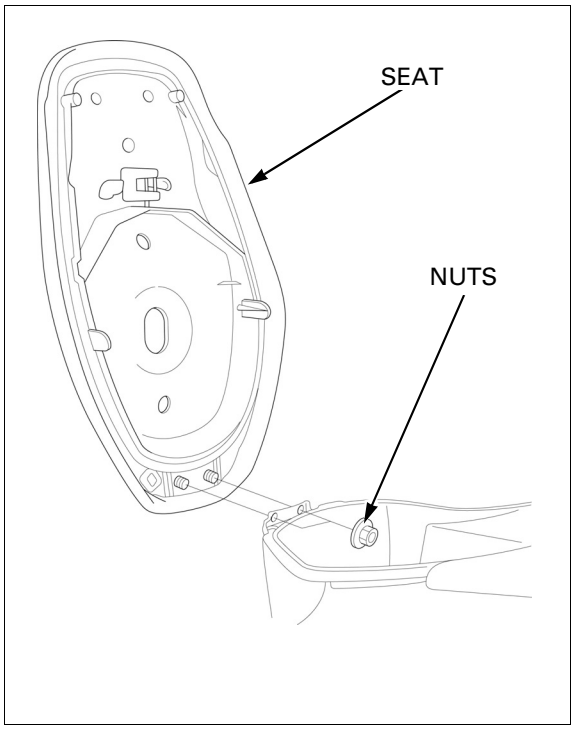
SEAT

REMOVAL/INSTALLATION

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

Remove the nuts and the seat.

Installation is in the reverse order of removal.



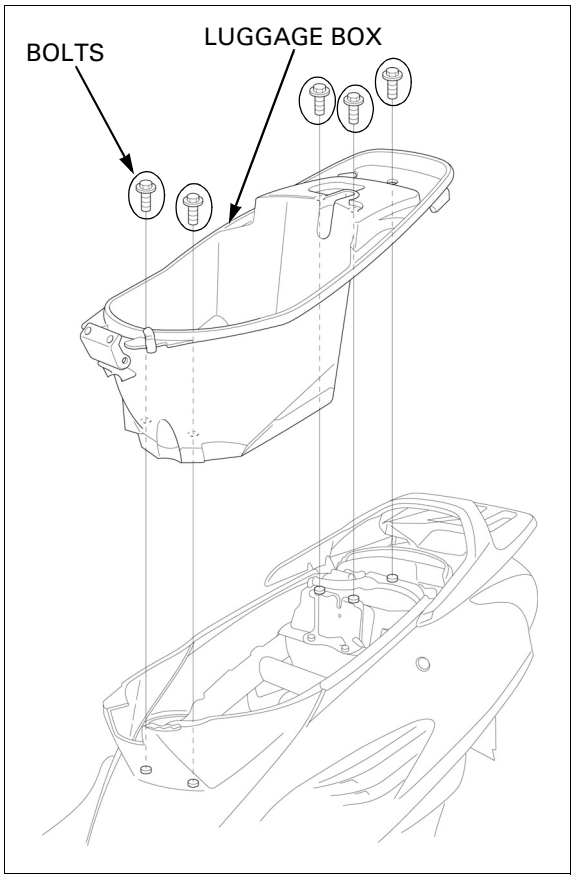
LUGGAGE BOX

REMOVAL/INSTALLATION

The luggage box can be removed with the seat installed.

Remove the five bolts and luggage box.

Installation is in the reverse order of removal.



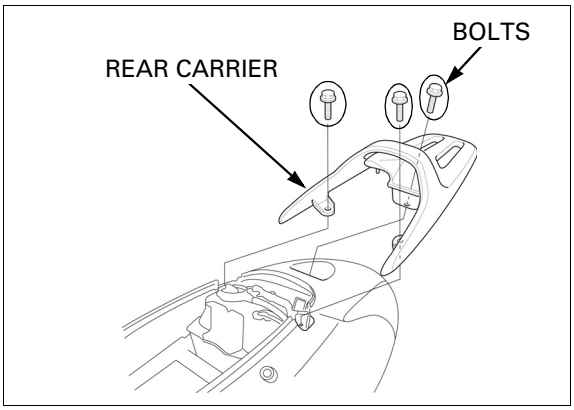
REAR CARRIER

REMOVAL/INSTALLATION

Remove the luggage box (page 2-5).

Remove the three bolts and rear carrier.

Installation is in the reverse order of removal.



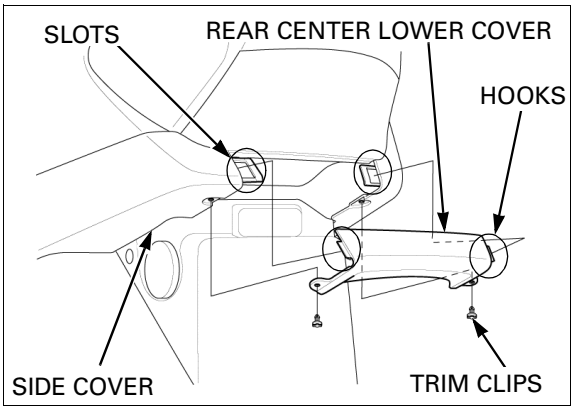
REAR CENTER LOWER COVER

REMOVAL/INSTALLATION

Remove the trim clips (page 2-4).

Release the hooks of the rear center lower cover from the slots of the side cover.

Installation is in the reverse order of removal.



SIDE COVER

REMOVAL/INSTALLATION

Remove the rear center lower cover (page 2-6).

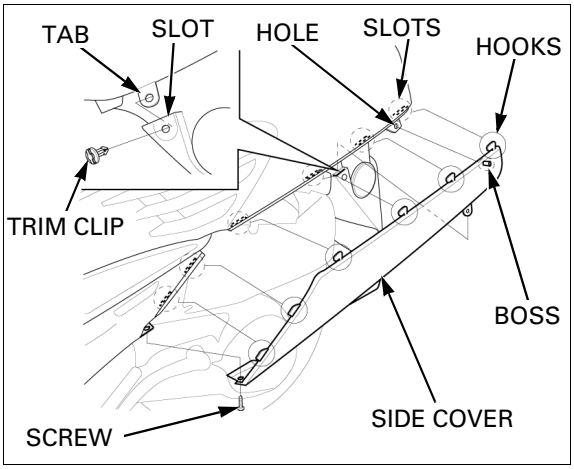
Remove the screw.

Remove the trim clip (page 2-4).

Remove the tab of the side cover from the slot.

Carefully remove the boss of the side cover out of the hole and slightly slide the side cover backward and remove the hooks out of the slots.

Installation is in the reverse order of removal.

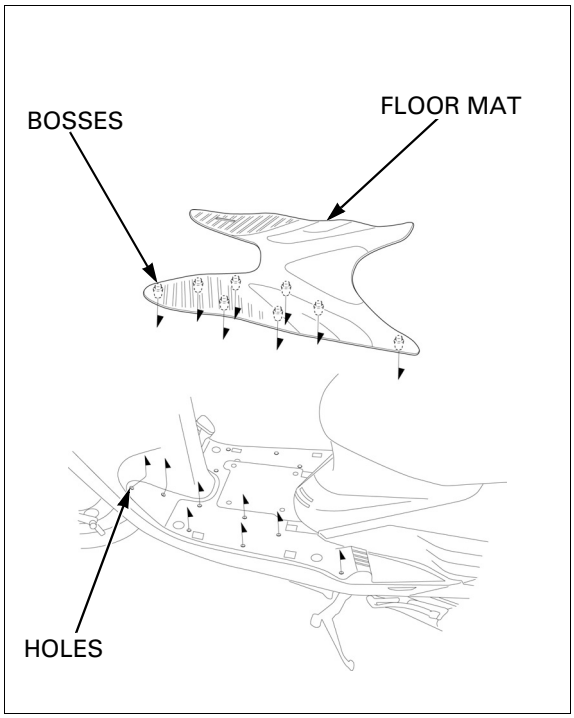


FLOOR MAT

REMOVAL/INSTALLATION

Remove the floor mat by pulling the retaining bosses out of the holes in the floor panel and front inner cover.

Installation is in the reverse order of removal.



SIDE SKIRT

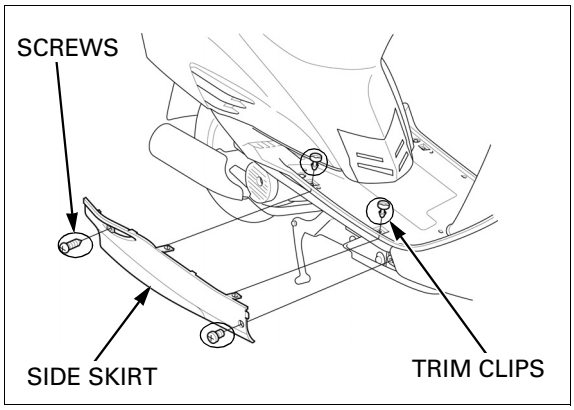
REMOVAL/INSTALLATION

Remove the following:

– Side cover (page 2-6)
– Floor mat (page 2-7)

Remove the screws and trim clips.
Pull the front of the side skirt outward lightly to remove the trim clip tabs.
Slide the side skirt backward to release the tabs from the body cover.
Remove the side skirt.

Installation is in the reverse order of removal.



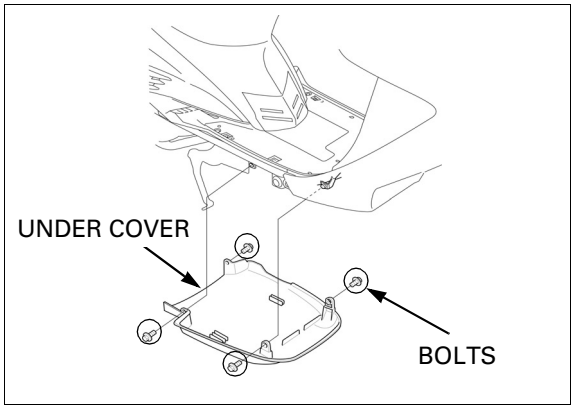
UNDER COVER

REMOVAL/INSTALLATION

Remove the side skirt (page 2-7).

Remove the bolts and under cover.

Installation is in the reverse order of removal.



BODY COVER

REMOVAL/INSTALLATION

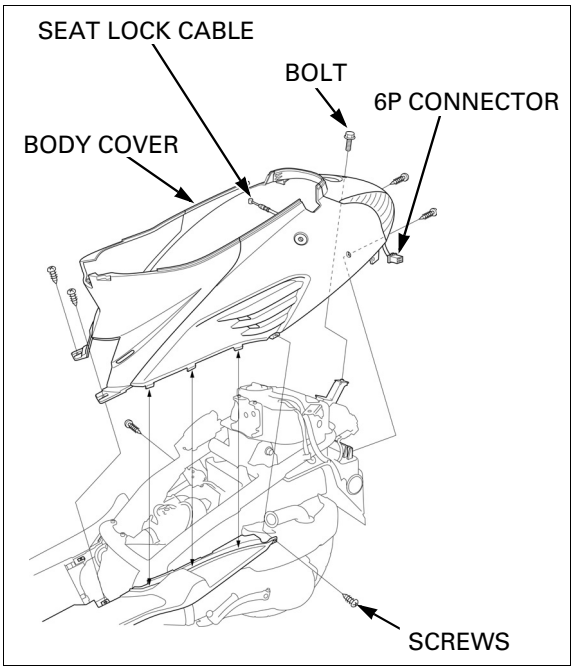
Remove the following:

- Rear center lower cover (page 2-6)
- Side cover (page 2-6).
- Luggage box (page 2-5)
- Rear carrier (page 2-6)
- Maintenance lid (page 3-8)

Remove the bolt and screws.
Slide the body cover backward to release the tabs from the floor panel.
Disconnect the seat lock cable from the seat lock bracket.
Disconnect the rear combination light 6P connector.

Remove the body cover.

Installation is in the reverse order of removal.



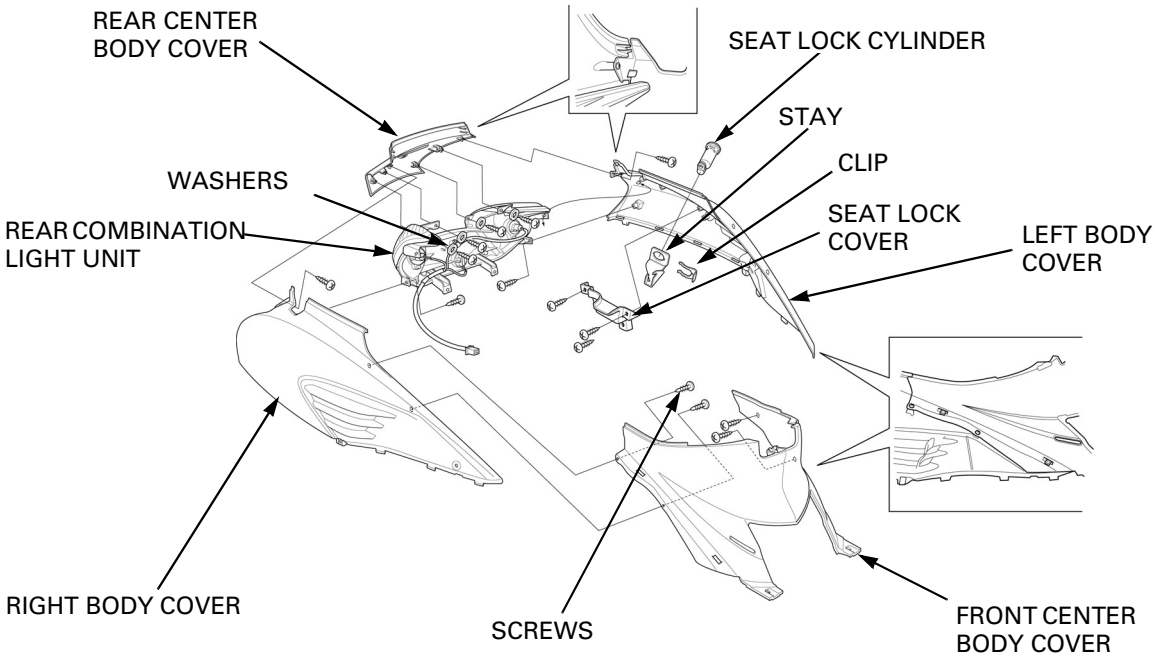
DISASSEMBLY/ASSEMBLY

Remove the screws and slide the rear center body cover/combination light unit backward to release the tabs from the right and left body cover.
Remove the screws, washers, then separate the rear center body cover and rear combination light unit.

Remove the screws, seat lock cover, clip, stay and cylinder from the left body cover.

Remove the screws and slide the front center cover downward to release the tabs from the right and left body cover.

Assembly is in the reverse order of disassembly.



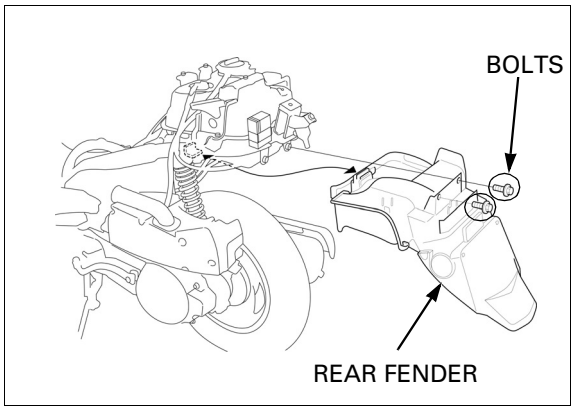
REAR FENDER

REMOVAL/INSTALLATION

Remove the body cover (page 2-8).

Remove the bolts.
Remove the rear fender by sliding it backward.

Installation is in the reverse order of removal.



FLOOR PANEL

REMOVAL/INSTALLATION

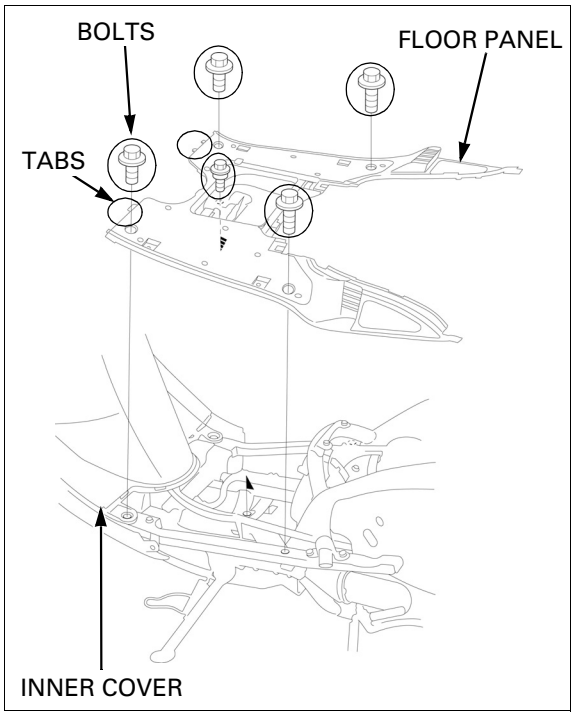
Remove the following:

- Battery (page 16-7)
- Starter relay switch (page 18-12)
- Side skirt (page 2-7)
- Body cover (page 2-8)

Remove the bolts.
Release the front tabs of the floor panel from the inner cover and remove the floor panel.

Route the wire harness properly (page 1-16).

Installation is in the reverse order of removal.



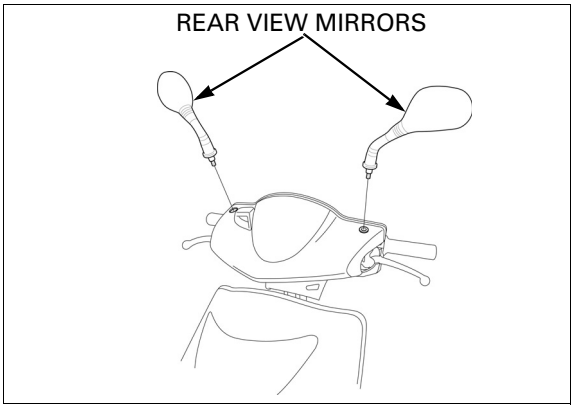
FRONT HANDLEBAR COVER

REAR VIEW MIRROR REMOVAL/ INSTALLATION

The right rear view mirror has left hand threads.

Remove the rear view mirrors.

Installation is in the reverse order of removal.



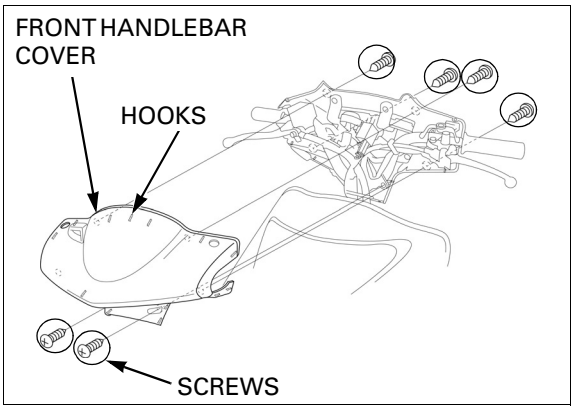
FRONT HANDLEBAR COVER REMOVAL/INSTALLATION

Remove the rear view mirrors (page 2-10).

Remove the screws and front handlebar cover by releasing the hooks.

Remove the.

Installation is in the reverse order of removal.



REAR HANDLEBAR COVER

REMOVAL/INSTALLATION

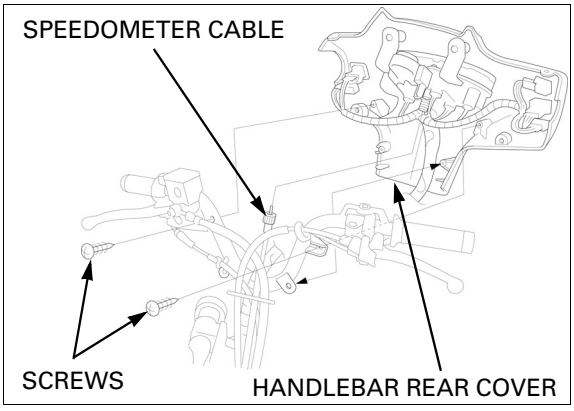
Remove the following:

– Front handlebar cover (page 2-10)
– Front cover (page 2-11)

Disconnect the main harness 9P, 2P connectors and speedometer cable.

Remove the screws and rear handlebar cover.

Installation is in the reverse order of removal.

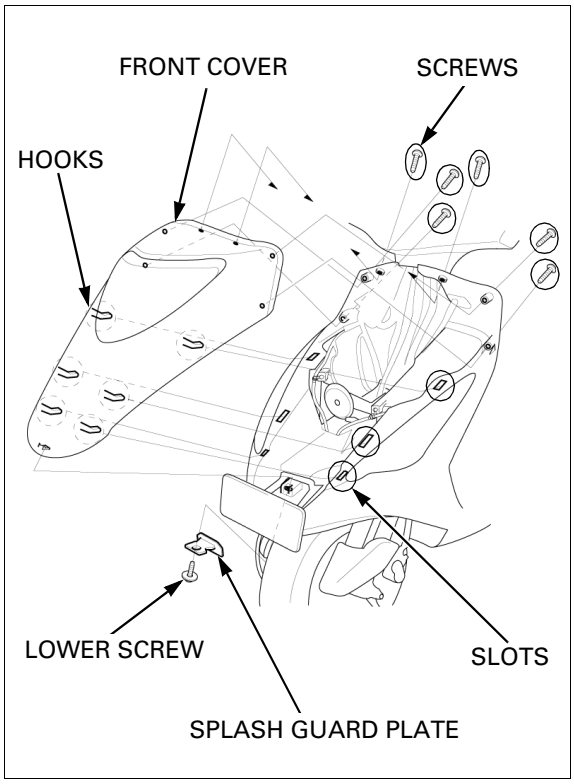


FRONT COVER

REMOVAL/INSTALLATION

Remove the lower screw and the splash guard plate.
Remove the screws.
Release the hooks from the slots of the front lower cover by sliding the front cover forward and lift up the front cover.
Disconnect the head light 4P connector and remove the front cover.

Installation is in the reverse order of removal.



FRONT INNER COVER

REMOVAL/INSTALLATION

Remove the following:

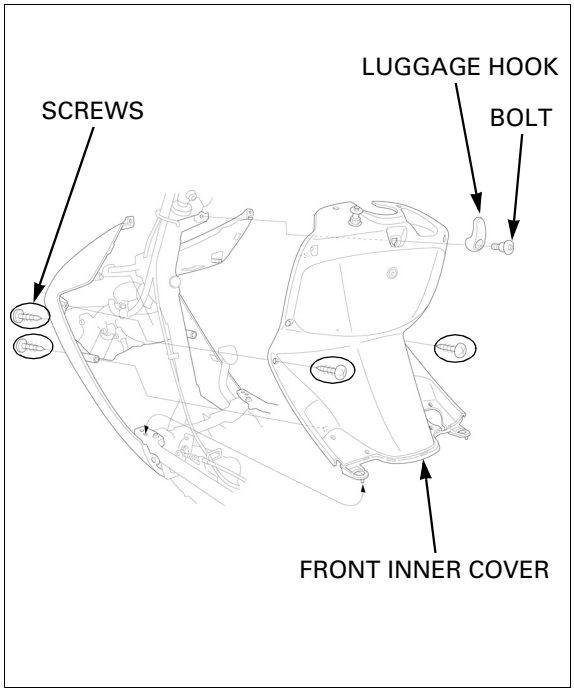
– Floor panel (page 2-9)
– Front cover (page 2-11)

Type II, IV only: Remove the brake lock cable from the cable stay and disconnect it from the lock plate (page 14-9).

Remove the screws, bolt and luggage hook.

Remove the front inner cover by releasing the bosses from the frame.

Installation is in the reverse order of removal.



FRONT LOWER COVER

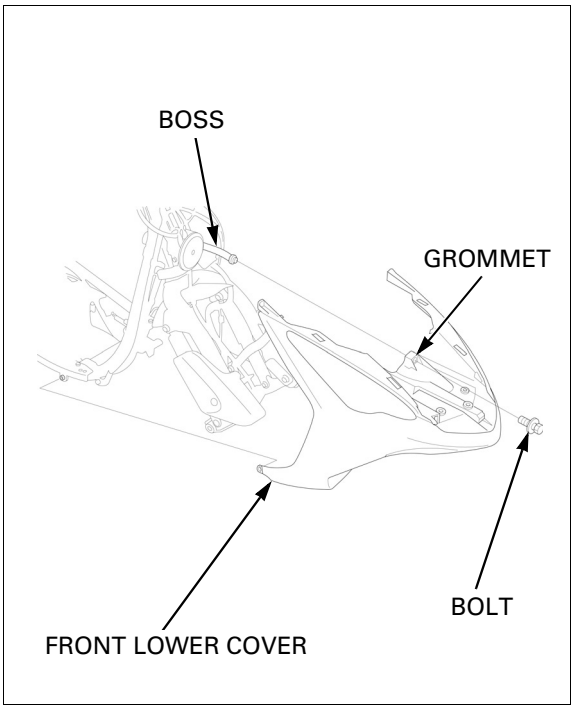
REMOVAL/INSTALLATION

Remove the front inner cover (page 2-11).

Remove the front wheel (page 13-6).

Remove the bolt.
Release the front lower cover grommet from the boss on the frame.

Installation is in the reverse order of removal.



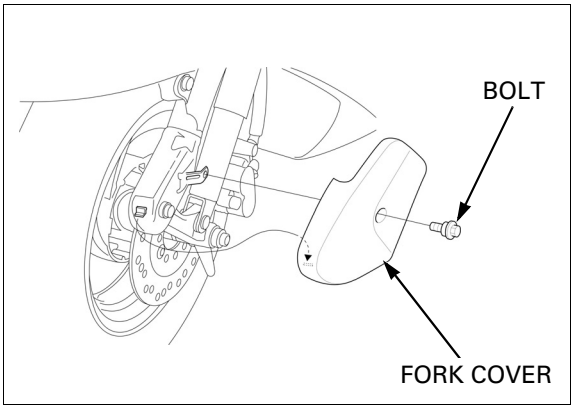
FORK COVER

REMOVAL/INSTALLATION

Remove the bolt.
Release the fork tab from the fork cover hole by sliding the fork cover downward.
Remove the fork cover.

Installation is in the reverse order of removal.

TORQUE:
FORK COVER BOLT: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)

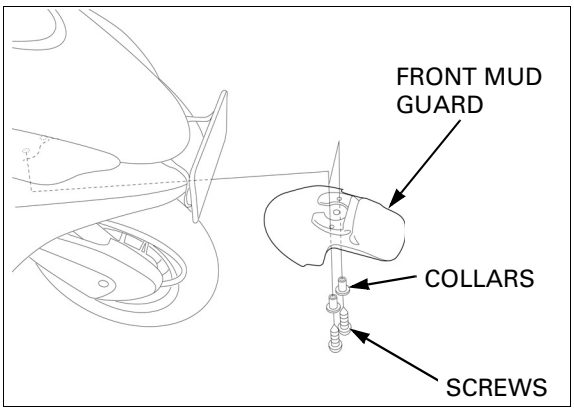


FRONT MUD GUARD

REMOVAL/INSTALLATION

Remove the two screws, collars and front mud guard.

Installation is in the reverse order of removal.



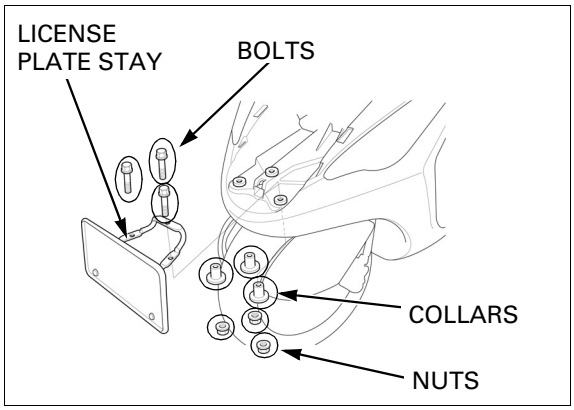
LICENSE PLATE STAY

REMOVAL/INSTALLATION

Remove the front cover (page 2-11).

Remove the three bolts, nuts and collars and remove the license plate stay.

Installation is in the reverse order of removal.



MUFFLER

MUFFLER PROTECTOR REMOVAL/ INSTALLATION

Remove the two screws and muffler protector cover.

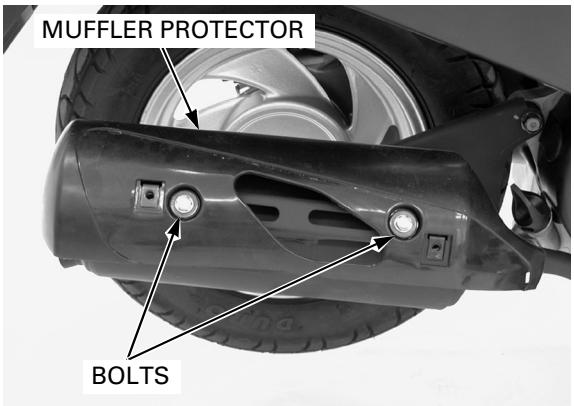
Remove the two bolts and muffler protector.

Installation is in the reverse order of removal.

TORQUE:

MUFFLER PROTECTOR BOLT:
10 N·m (1.0 kgf·m, 7 lbf·ft)

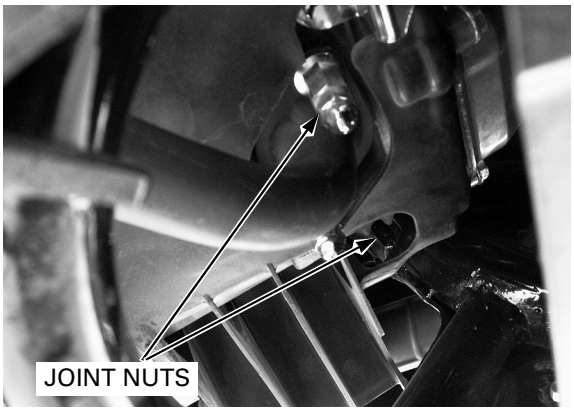
MUFFLER PROTECTOR COVER SCREW:
4.2 N·m (0.4 kgf·m, 2.9 lbf·ft)



MUFFLER REMOVAL

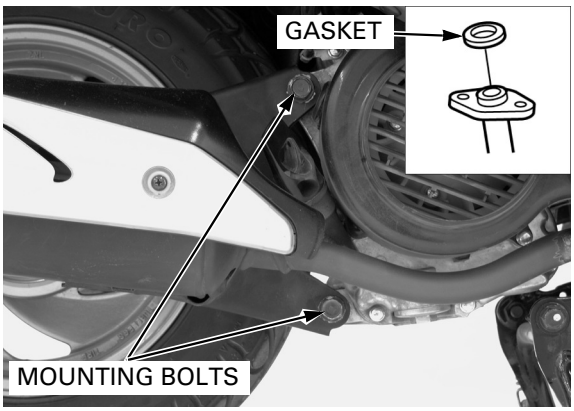
Remove the right side skirt (page 2-7).

Remove the exhaust pipe joint nuts.



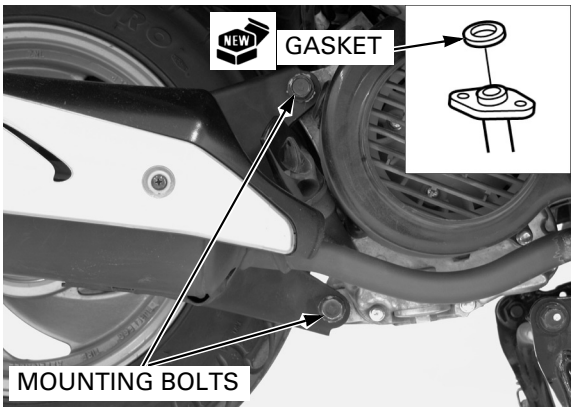
Remove the muffler mounting bolts.

Remove the muffler and gasket.



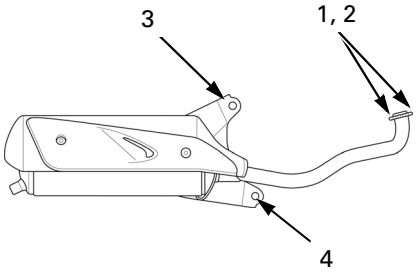
MUFFLER INSTALLATION

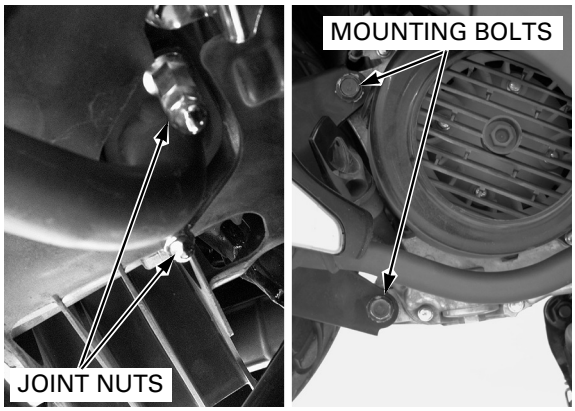
Install the new gasket.
Install the muffler to the engine.
Install the muffler mounting bolts but do not tighten yet.



Install the exhaust pipe joint nuts.
Tighten the exhaust pipe joint nuts and muffler mounting bolts in the sequence as shown.

TORQUE:
EXHAUST PIPE JOINT NUT:
29 N·m (3.0 kgf·m, 22 lbf·ft)
MUFFLER MOUNTING BOLT:
49 N·m (5.0 kgf·m, 36 lbf·ft)





After installation, inspect the exhaust system for leaks.

Install the side skirt (page 2-7).

MEMO

3. MAINTENANCE

SERVICE INFORMATION

GENERAL

- Place the scooter on a level ground before starting any work.
- The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and may lead to death. Run the engine in an open area or with an exhaust evacuation system in an enclosed area.

SPECIFICATIONS

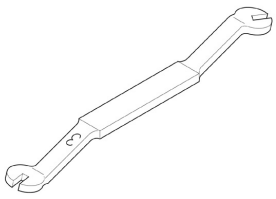
ITEM			SPECIFICATIONS
Throttle grip free play			2 – 6 mm (0.1 – 0.2 in)
Spark plug			CR7HSA (NGK)
Spark plug gap			0.6 – 0.7 mm (0.02 – 0.03 in)
Valve clearance	IN		0.14 mm (0.006 in)
	EX		0.14 mm (0.006 in)
Recommended engine oil			Honda 4-stroke oil or equivalent motor oil API service classification: SE, SF or SG Viscosity: SAE 10W-30
Engine oil capacity	After draining		0.8 liter (0.8 US qt, 0.7 Imp qt)
	After disassembly		0.9 liter (1.0 US qt, 0.8 Imp qt)
Engine idle speed			1,700 ± 100 min^{-1}(rpm)
Drive belt width			Service limit: 19.0 mm (0.75 in)
Recommended final reduction oil			Hypoid gear oil SAE #90 or Honda 4-stroke oil or equivalent motor oil API service classification: SE, SF or SG Viscosity: SAE 10W-30
Final reduction oil capacity	After draining		0.09 liter (0.10 US qt, 0.08 Imp qt)
	After disassembly		0.11 liter (0.12 US qt, 0.10 Imp qt)
Rear brake lever free play (Type I, III)			10 – 20 mm (0.4 – 0.8 in)
Rear brake pedal free play (Type II, IV)			20 – 30 mm (0.8 – 1.2 in)
Clutch lining thickness			Service limit: 2.0 mm (0.08 in)
Cold tire pressure	Drive only	Front	175 kPa (1.75 kgf/cm^2, 25 psi)
		Rear	200 kPa (2.00 kgf/cm^2, 29 psi)
	Drive 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	90/100 – 10 53J
		Rear	90/100 – 10 53J
Tire brand	CHENG SHIN	Front	C6027
		Rear	C6027
	DURO	Front	HFC-263A
		Rear	HFC-263A
Minimum tire tread depth		Front	To the indicator
		Rear	To the indicator

TORQUE VALUES

Spark plug	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Air cleaner housing cover screw	1.1 N·m (0.1 kgf·m, 0.7 lbf·ft)	
Valve adjusting lock nut	9 N·m (0.9 kgf·m, 6.5 lbf·ft)	Apply engine oil to the threads and seating surface.
Engine oil drain bolt	24 N·m (2.4 kgf·m, 17 lbf·ft)	
Engine oil strainer screen cap	15 N·m (1.5 kgf·m, 11 lbf·ft)	
Secondary air cleaner housing cover screw	1.1 N·m (0.1 kgf·m, 0.7 lbf·ft)	
Final reduction oil check bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Final reduction oil drain bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	

TOOL

Valve adjusting wrench
07908-KE90000



MAINTENANCE SCHEDULE

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

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

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

	ITEMS / FREQUENCY	WHICHEVER COMES FIRST ⇩ NOTE	⇨ ODOMETER READING (NOTE 1)					REFER TO PAGE
			X 1,000 mi	0.6	2.5	5	7.5	
			X 1,000 km	1	4	8	12	
			MONTH		6	12	18	
*	FUEL LINE				I	I	I	3-5
*	THROTTLE OPERATION				I	I	I	3-5
	AIR CLEANER	NOTE 2			C	C	R	3-6
	CRANKCASE BREATHER	NOTE 3			C	C	C	3-7
	SPARK PLUG				I	R	I	3-8
*	VALVE CLEARANCE			I	I	I	I	3-9
	ENGINE OIL			R	EVERY 3,000 km (2,000 mi) R			3-11
*	ENGINE OIL STRAINER SCREEN						C	3-12
*	ENGINE IDLE SPEED			I	I	I	I	3-13
	SECONDARY AIR SUPPLY SYSTEM	NOTE 2			C	C	C	3-13
*	DRIVE BELT			EVERY 8,000 km (5,000 mi) I, EVERY 24,000 km (15,000 mi) R				3-14
*	FINAL DRIVE OIL	NOTE 4						3-15
	BRAKE FLUID	NOTE 4			I	I	I	3-16
	BRAKE SHOES /PADS WEAR				I	I	I	3-16
	BRAKE SYSTEM			I	I	I	I	3-17
*	BRAKE LIGHT SWITCH				I	I	I	3-18
*	BRAKE LOCK OPERATION			I	I	I	I	3-19
*	HEADLIGHT AIM				I	I	I	3-20
**	CLUTCH SHOES WEAR					I		3-20
	SIDE STAND				I	I	I	3-20
*	SUSPENSION				I	I	I	3-21
*	NUTS, BOLTS, FASTENERS	NOTE 5		I		I		3-22
**	WHEELS/TIRES				I	I	I	3-22
**	STEERING HEAD BEARINGS			I			I	3-23

* SHOULD BE SERVICED BY AN AUTHORIZED Honda DEALER, UNLESS THE OWNER HAS PROPER TOOLS AND SERVICE DATA AND IS MECHANICALLY QUALIFIED.

** IN THE INTEREST OF SAFETY, WE RECOMMEND THESE ITEMS BE SERVICED ONLY BY AN AUTHORIZED Honda DEALER.

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

FUEL LINE

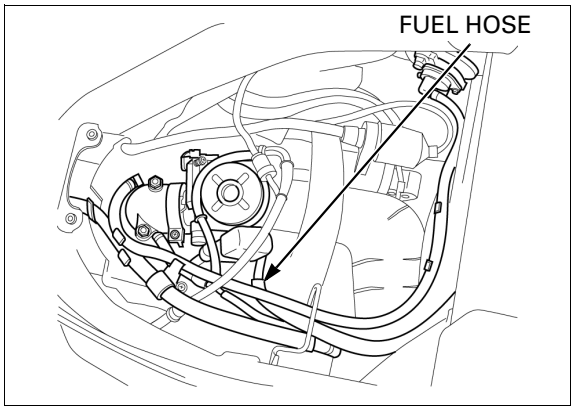
Remove the luggage box (page 2-5).

Check the fuel hose for deterioration, damage or leakage.

Replace the fuel hose if necessary.

Also, check the fuel hose fittings for leakage.

Install the luggage box (page 2-5).



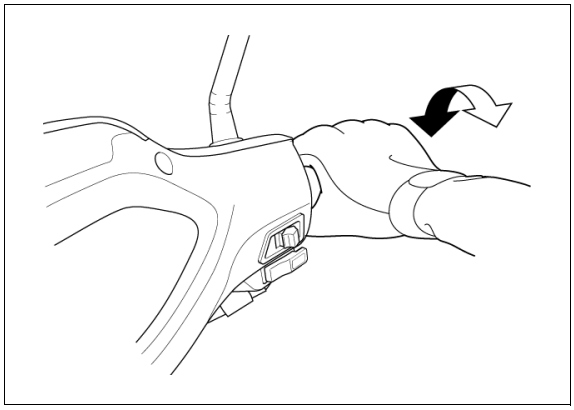
THROTTLE OPERATION

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

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

If the throttle grip does not return properly, lubricate the throttle cable and overhaul and lubricate the throttle grip housing (page 13-15).
For cable lubrication: Disconnect the throttle cable at their pivot points with a commercially available cable lubricant or a light weight oil.

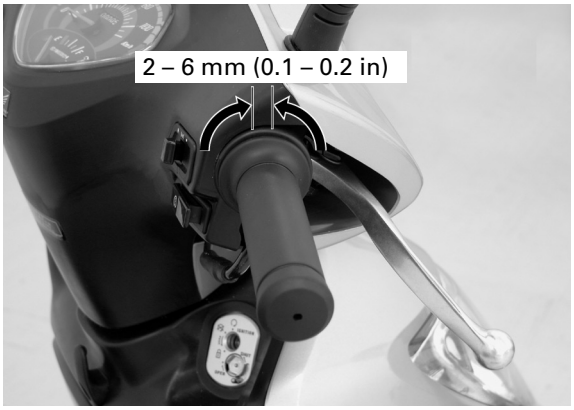
If the throttle grip still does not return properly, replace the throttle cable.



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

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

FREE PLAY: 2 – 6 mm (0.1 – 0.2 in)

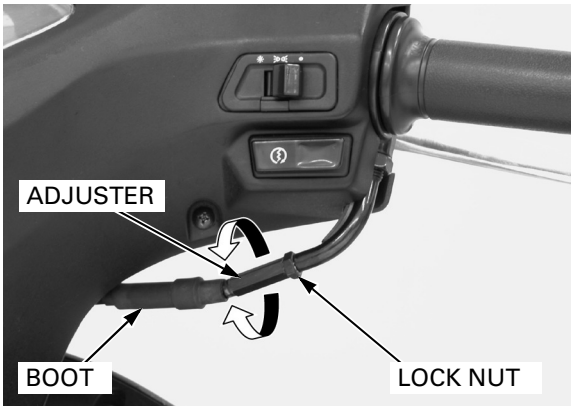


Throttle grip free play can be adjusted at either end of the throttle cable.
Minor adjustment are made with the upper adjuster.

Pull off the boot from the adjuster.

Loosen the lock nut and turn the adjuster as required.

Tighten the lock nut and put the boot back in the appropriate position.



Major adjustments are made with the lower adjusters.

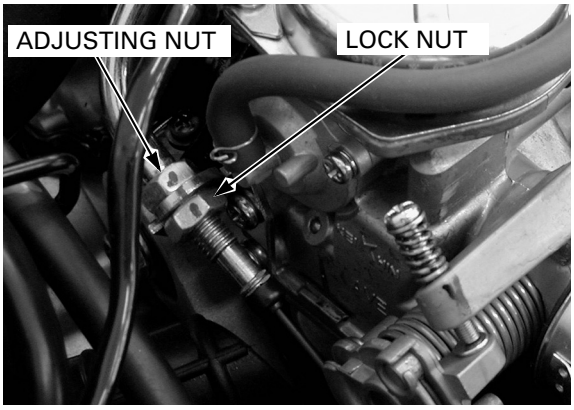
Remove the luggage box (page 2-5).

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

Tighten the lock nut.

Recheck the throttle operation.

Install the luggage box (page 2-5).

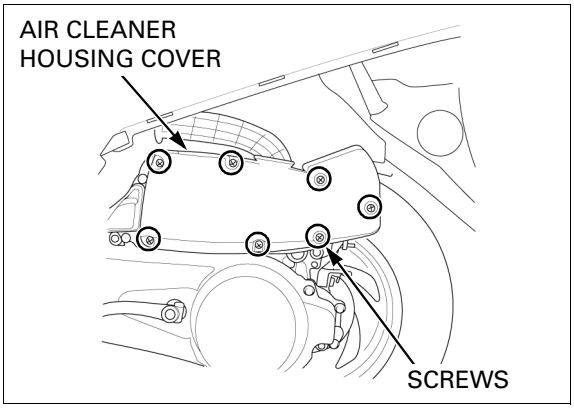


AIR CLEANER

- If the scooter is used in unusually wet or dusty areas, more frequent inspections are required.

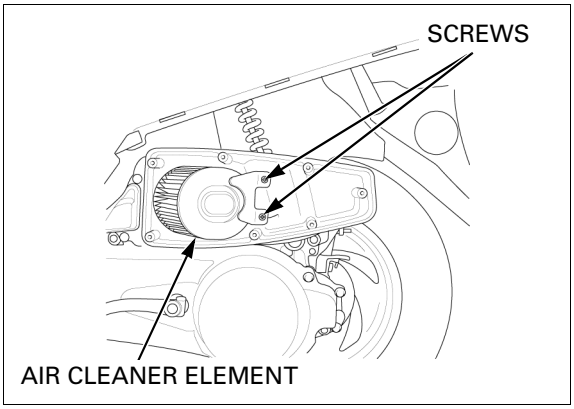
Remove the left side cover (page 2-6).

Remove the screws and air cleaner housing cover.



Remove the screws and air cleaner element.

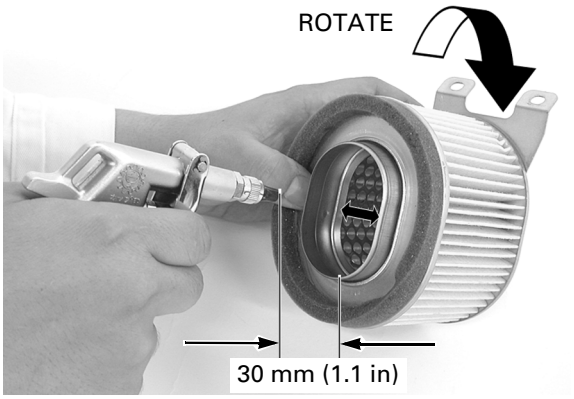
Replace the element in accordance with the maintenance schedule (page 3-4).



Inspect the element and replace if it is excessively dirty or damaged.

If reusable, clean the element using compressed air from the carburetor side from 30 mm (1.1 in) away.

Blow the element for one minute along the fold line while rotating it.

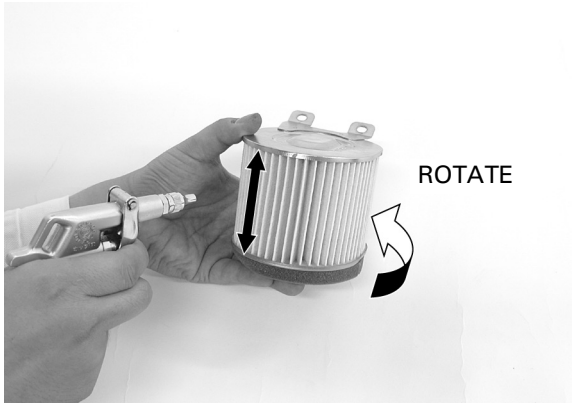


Then, blow the element for 30 seconds from the outside along the fold line while rotating it.

Blow off the remaining dust from the carburetor side from 30 mm (1.1 in) away for 30 seconds along the fold line while rotating it.

Install the removed parts in the reverse order of removal.

TORQUE: AIR CLEANER HOUSING COVER SCREW
1.1 N·m (0.1 kgf·m, 0.7 lbf·ft)

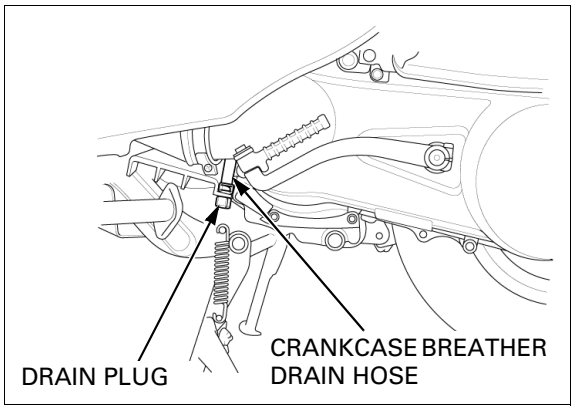


CRANKCASE BREATHER

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

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

Install the crankcase breather drain hose plug.



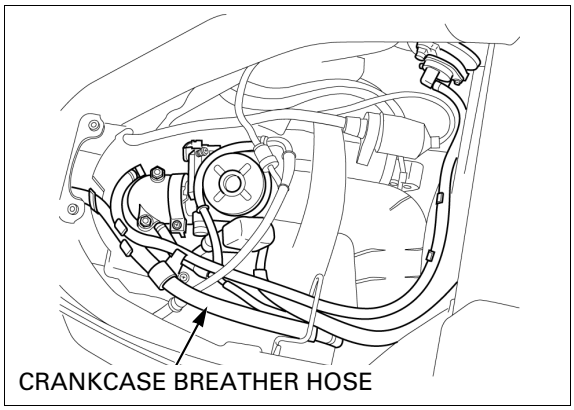
Remove the luggage box (page 2-5).

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

Replace the crankcase breather hose if necessary.

Also check the crankcase breather hose fittings for leakage.

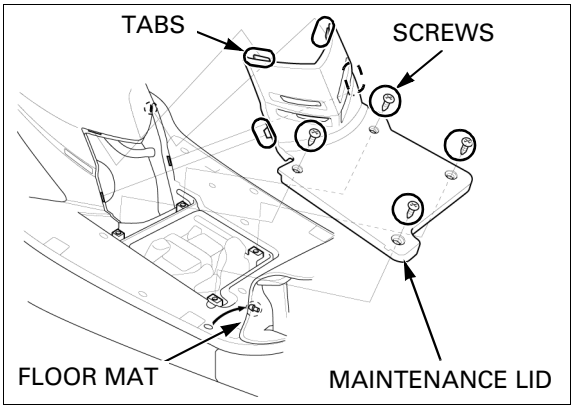
Install the luggage box (page 2-5).



SPARK PLUG

Pull the floor mat off.

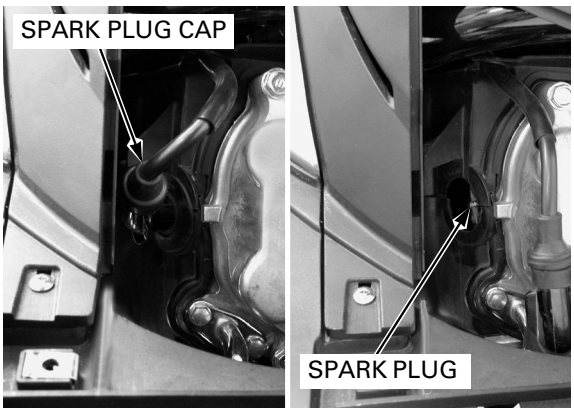
Remove the screws and maintenance lid by releasing the tabs.



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

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

Remove the spark plug.

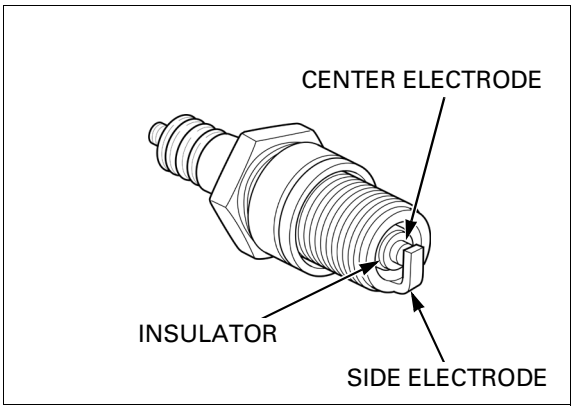


Inspect or replace as described in the maintenance schedule (page 3-4).

Check the following and replace if necessary.

- Insulator for damage
- Electrodes for wear
- Burning condition, coloration;
  - Dark to light brown indicates good condition.
  - Excessive lightness indicates malfunctioning ignition system or lean mixture.
  - Wet or black sooty deposit indicates over-rich mixture.

If the electrode is contaminated with carbon deposits, clean the electrode using a spark plug cleaner.

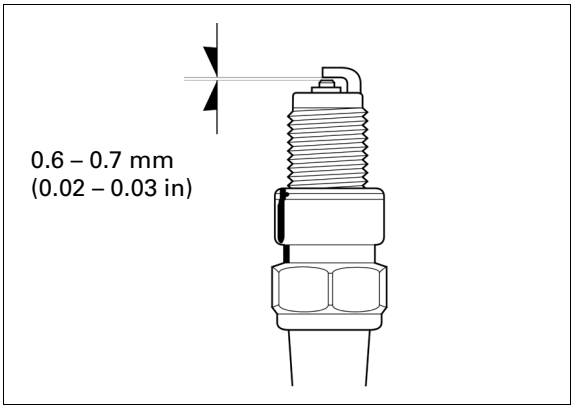


Always use the specified spark plug on this scooter.

SPECIFIED SPARK PLUG:
STANDARD: CR7HSA (NGK)

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

SPARK PLUG GAP: 0.6 – 0.7 mm (0.02 – 0.03 in)

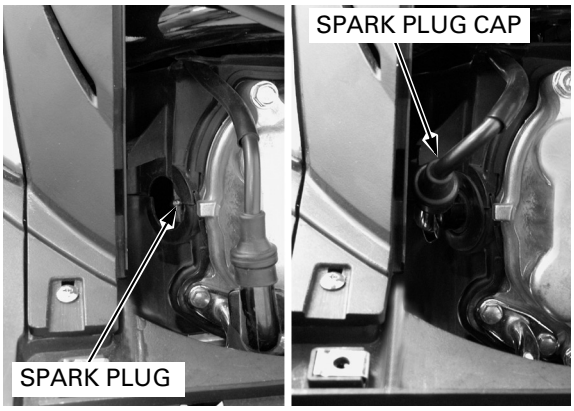


Do not overtighten the spark plug.

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

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

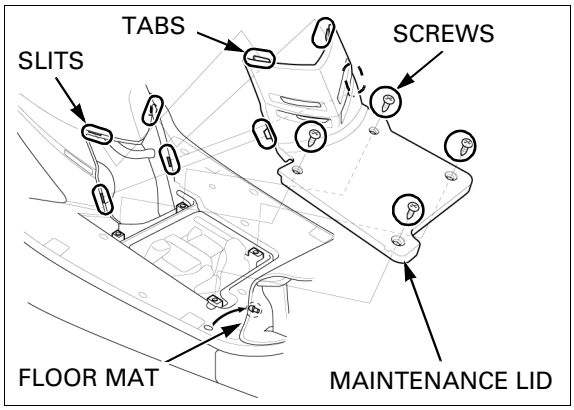
Connect the spark plug cap.



Install the maintenance lid by aligning the tabs of the lid with the slits of the body cover.

Install and tighten the four screws.

Install the floor mat.



VALVE CLEARANCE

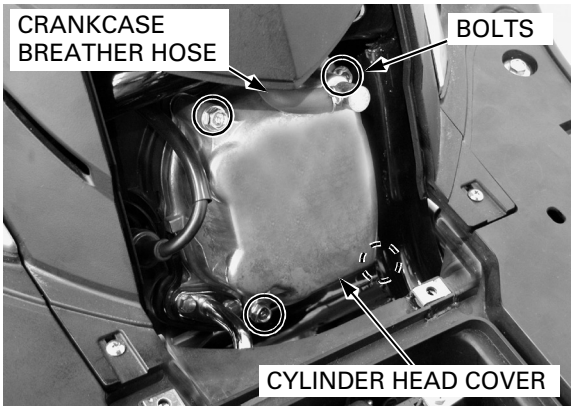
INSPECTION

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

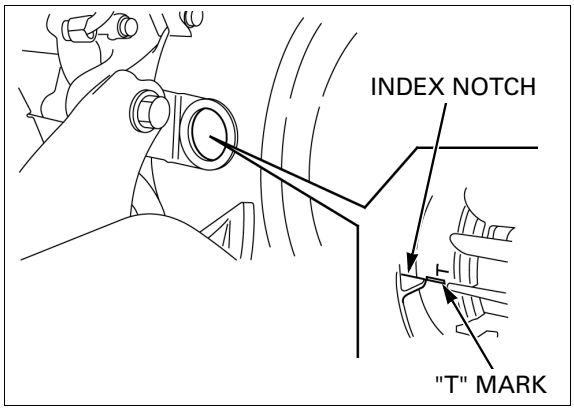
Remove the maintenance lid (page 3-8).

Disconnect the crankcase breather hose.

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

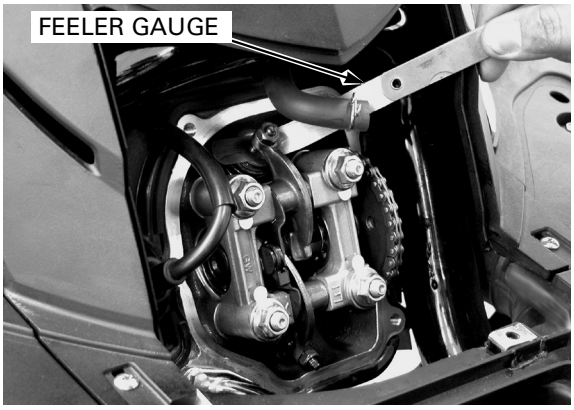


Remove the timing hole cap from the cooling fan cover.
Turn the crankshaft clockwise and align the "T" mark on the flywheel with the index notch on the right crankcase.
Make sure that the piston is at TDC (Top Dead Center) on the compression stroke.
There should be slight slack in the rocker arms, If the rocker arms are tight, turn the crankshaft clockwise 360° (one full turn) and align the "T" mark with the index notch.



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

VALVE CLEARANCE:
IN/EX: 0.14 mm (0.006 in)



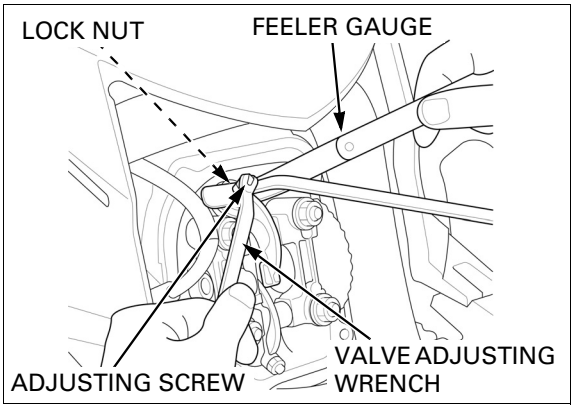
If the valve clearance is incorrect, loosen the valve adjusting screw lock nut and adjust the valve clearance by turning the adjusting screw until there is a slight drag on the feeler gauge.
Hold the adjusting screw and tighten the lock nut.

TOOL:
Valve adjusting wrench 07908-KE90000

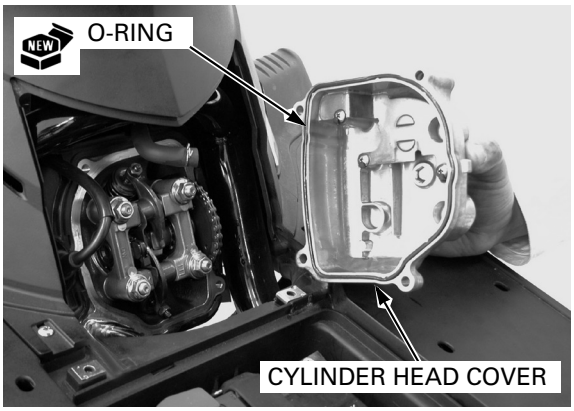
TORQUE: 9 N·m (0.9 kgf·m, 6.5 lbf·ft)

Recheck the valve clearance.

Install the timing hole cap to the cooling fan cover.

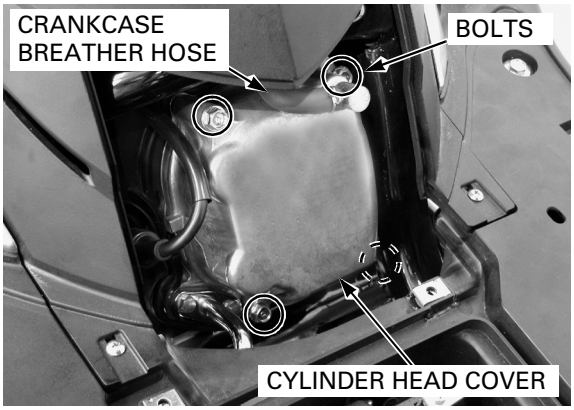


Install a new O-ring into the groove in the cylinder head cover.
Install the cylinder head cover on the cylinder head.



Install the bolts to the cylinder head cover and tighten them.
Connect the crankcase breather hose to the cylinder head cover.

Install the maintenance lid (page 3-9).



ENGINE OIL

OIL LEVEL CHECK

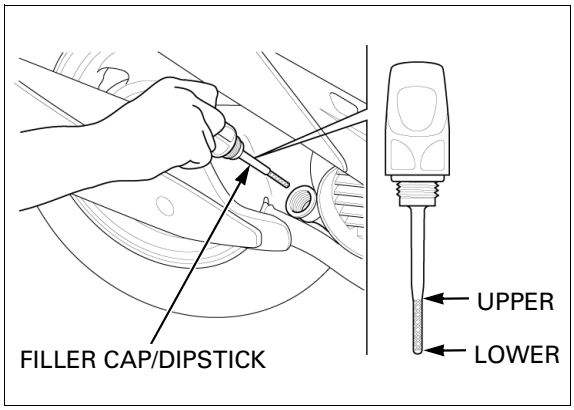
Place the scooter on its center stand on a level surface.

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

Remove the oil filler cap/dipstick and wipe off the oil from the dipstick with a clean cloth.

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

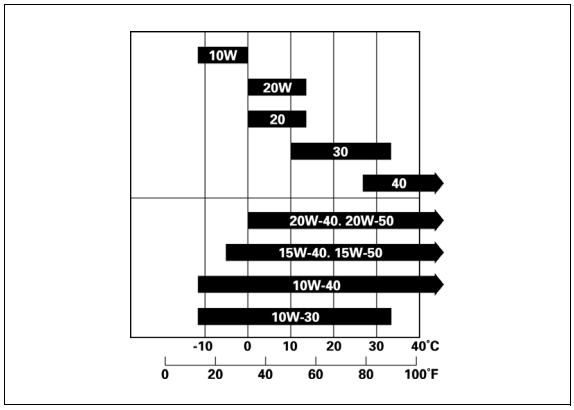
The level should be between the "UPPER" and "LOWER" level lines of the oil filler cap/dipstick.



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

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

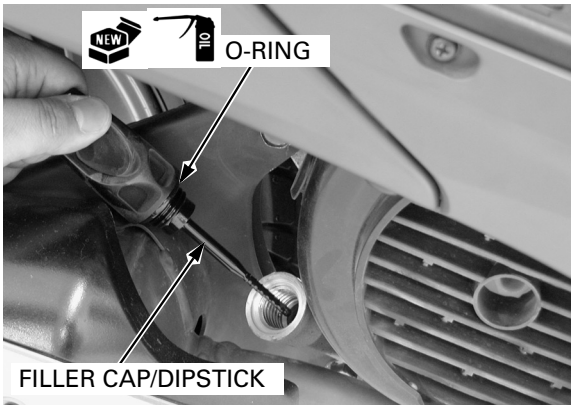
RECOMMENDED ENGINE OIL:
Honda 4-stroke oil or equivalent motor oil
API service classification: SE, SF or SG
Viscosity: SAE 10W-30



Coat a new O-ring with engine oil.

Install the oil filler cap/dipstick with a new O-ring.

For engine oil change, See page 3-12.

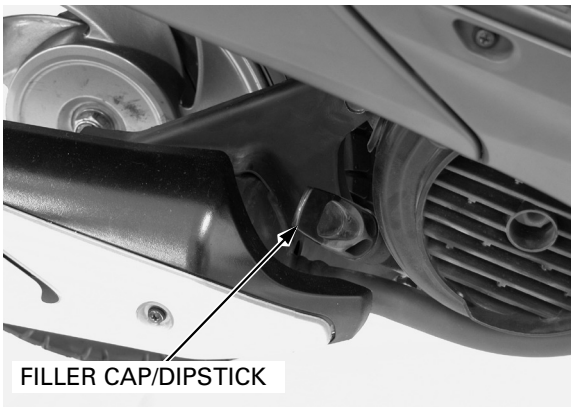


OIL CHANGE

Drain the engine oil while the engine is warm. This ensure complete and rapid draining.

Place the scooter on its center stand.

Remove the oil filler cap/dipstick.

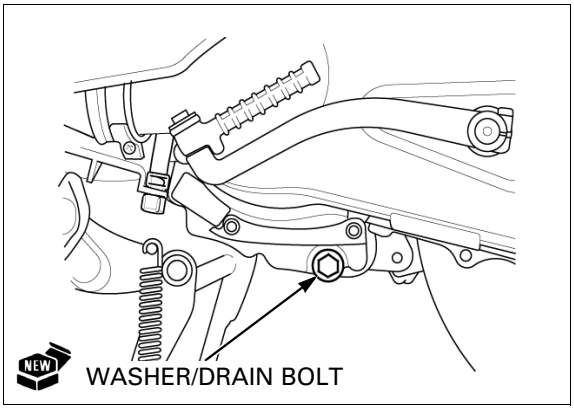


Place an oil drain pan under the engine to collect the oil, then remove the oil drain bolt and sealing washer.

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

Tighten the drain bolt to the specified torque.

TORQUE: 24 N·m (2.4 kgf·m, 17 lbf·ft)



If the maintenance for the engine oil strainer screen is scheduled, perform it before filling the crankcase with engine oil.

Fill the crankcase with the recommended engine oil.

ENGINE OIL CAPACITY:
0.8 liter (0.8 US qt, 0.7 Imp qt) after draining
0.9 liter (1.0 US qt, 0.8 Imp qt) after disassembly

Install the oil filler cap/dipstick.

Check the oil level (page 3-11).

Make sure that there are no oil leaks.

ENGINE OIL STRAINER SCREEN

Drain the engine oil (page 3-12).

Remove the oil strainer screen cap, O-ring, spring and oil strainer screen.

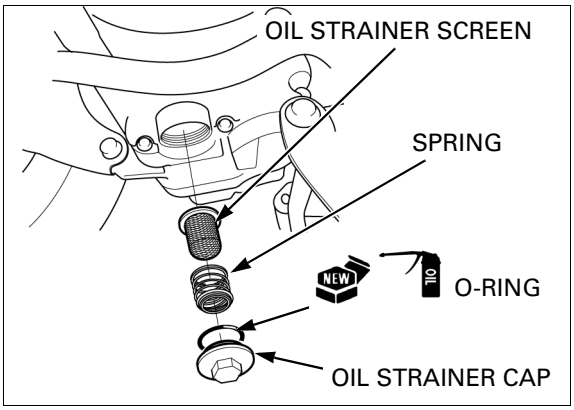
Check the oil strainer screen for clogs or damage.

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

Coat a new O-ring with clean engine oil.

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

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)



Fill the crankcase with recommended engine oil (page 3-12).

Check the engine oil level (page 3-11).

Make sure that there are no oil leaks.

ENGINE IDLE SPEED

- Inspect and adjust the idle speed after all other engine maintenance items have been performed and are within specifications.
- The engine must be warm for accurate idle speed inspection and adjustment. Ten minutes of stop-and- go riding is sufficient.

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

Remove the maintenance lid (page 3-8).

Connect a tachometer and check the idle speed.

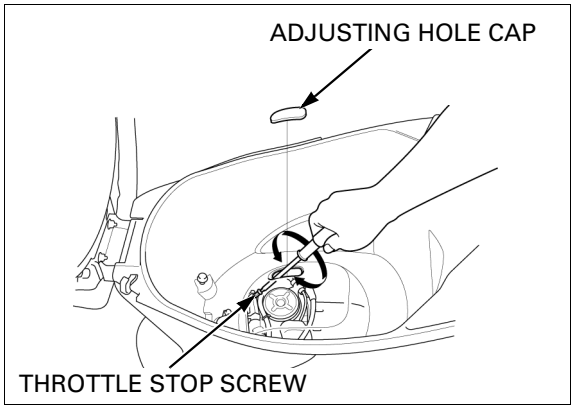
IDLE SPEED: 1,700 ± 100 min–1(rpm)

If adjustment is necessary unhook the seat with the ignition key and open the seat.

Remove the adjusting hole cap.

Adjust the engine idle speed by turning the throttle stop screw as required.

Install the removed parts in the reverse order of removal.



SECONDARY AIR SUPPLY SYSTEM

INSPECTION

Remove the luggage box (page 2-5).

Remove the screws and secondary air cleaner housing cover.

Remove the secondary air cleaner element.

Never use gasoline or low flash point solvents for cleaning the element. A fire or explosion could result.

Thoroughly wash the element in clean non flammable or high flash point cleaning solvent.

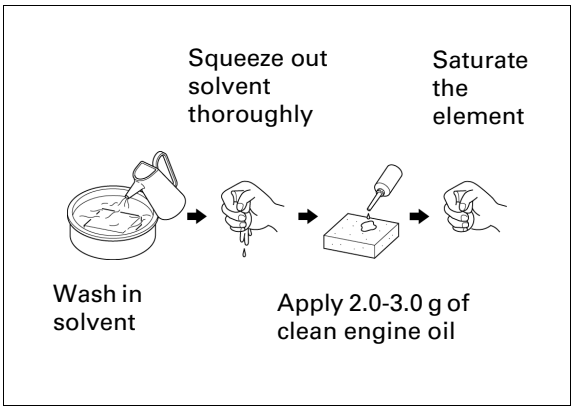
Allow the element to dry thoroughly.

After drying, apply 2.0-3.0 g of clean engine oil to the entire surface of the element and rub it with hand to saturate the element with oil.

RECOMMENDED ENGINE OIL:
Honda 4-stroke oil or equivalent motor oil
API service classification: SE, SF or SG
Viscosity: SAE 10W-30

Install the element, secondary air cleaner housing cover and tighten the screws to the specified torque.

TORQUE: 1.1 N·m (0.1 kgf·m, 0.7 lbf·ft)

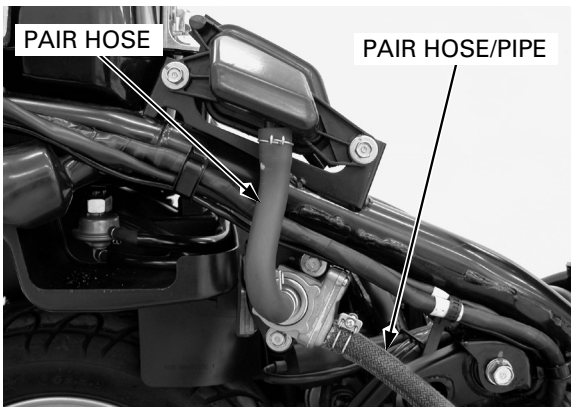


Remove the body cover (page 2-8).

Check the pulse secondary air injection (PAIR) hose, and pipe for deterioration, damage or loose connections.

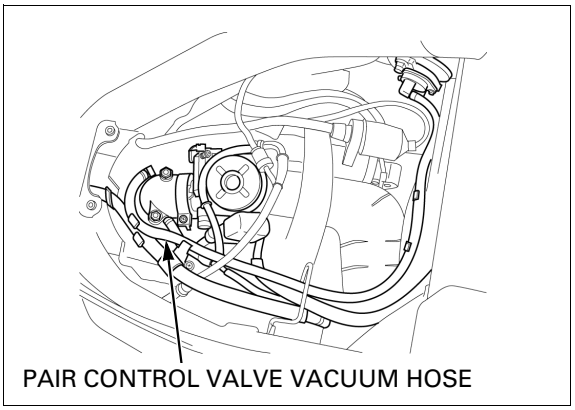
Also check that hose is not kinked or pinched.

If the hoses show any signs of heat damage, inspect the PAIR check valve (page 5-26).



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

Installation is in the reverse order of removal.



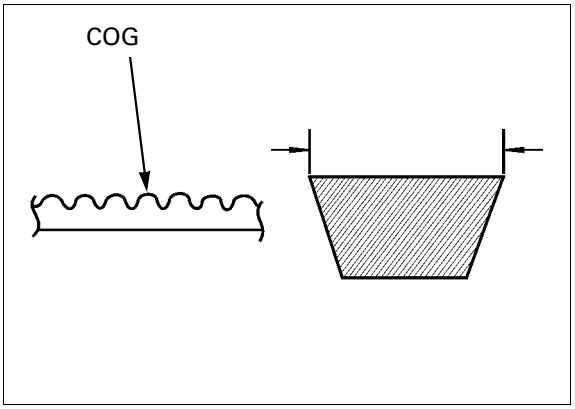
DRIVE BELT

Remove the drive belt (page 9-8).

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

SERVICE LIMIT: 19.0 mm 0.75 in)

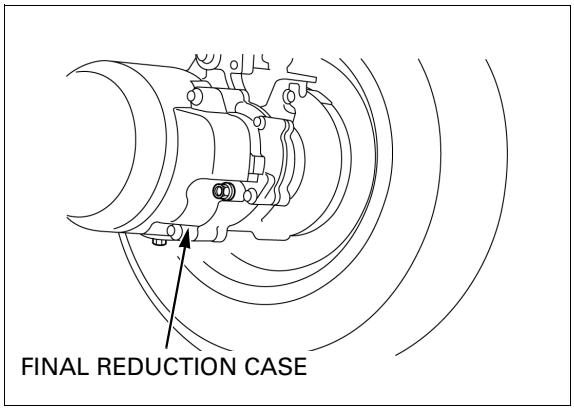
Install the drive belt (page 9-11).



FINAL DRIVE OIL

OIL LEVEL CHECK

Make sure that the final reduction case has no oil leaks.

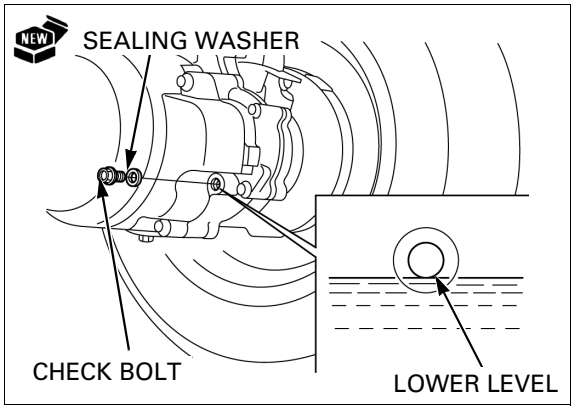


Place the scooter on its center stand.

Start the engine and let it idle for a few minutes. Stop the engine and remove the oil check bolt. Check whether the oil flows out from the check bolt hole.

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

RECOMMENDED FINAL REDUCTION OIL:
Hypoid gear oil SEA #90 or
Honda 4-stroke oil or equivalent motor oil
API service classification: SE, SF or SG
Viscosity: SAE 10W-30



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

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

OIL CHANGE

Place an oil drain pan under the final reduction case to collect the oil, then remove the oil drain bolt and sealing washer.

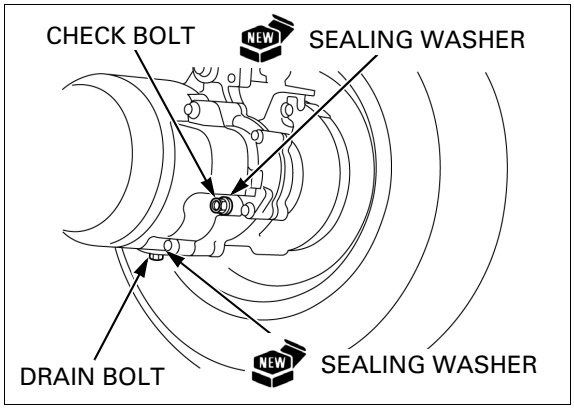
After draining the oil completely, install the new sealing washer and oil drain bolt.

Tighten the drain bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Fill the final reduction case with recommended oil up to the correct level (page 3-15).

FINAL REDUCTION OIL CAPACITY:
0.09 liter (0.10 US qt, 0.08 Imp qt) at draining
0.11 liter (0.12 US qt, 0.10 Imp qt) at disassembly



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

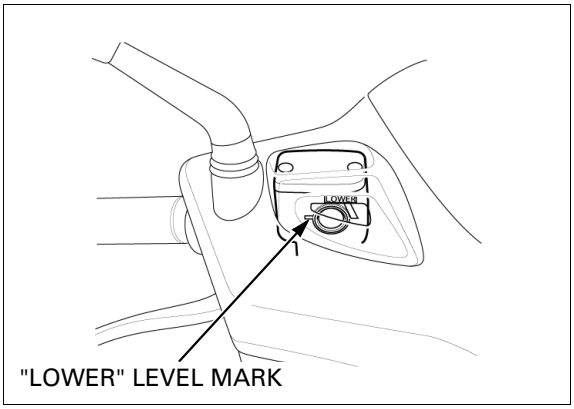
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

BRAKE FLUID

- 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.
- Spilling fluid can damage painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.
- When the fluid level is low, check the brake pads for wear (page 3-16). A low fluid level may be due to wear of the brake pads. If the brake pads are worn, the caliper piston is pushed out, and this accounts for a low reservoir level. If the brake pads are not worn and the fluid level is low, check entire system for leaks (page 3-17).

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 front brake reservoir fluid level through the sight glass.

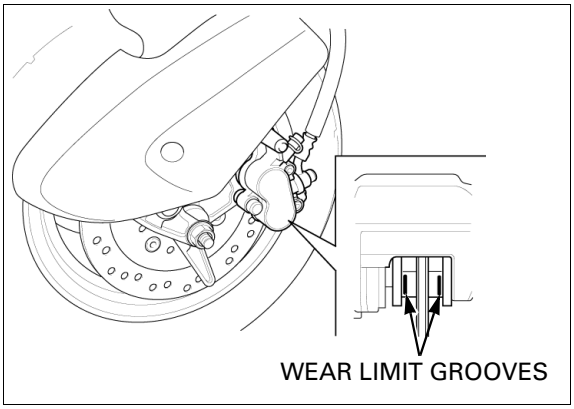
If the level is near the lower level line, check the brake pads for wear (page 3-16).



BRAKE SHOES/PADS WEAR

FRONT BRAKE

Check the brake pad for wear.
Replace the brake pads if either pad is worn to the wear limit groove.
Refer to page 15-7 for brake pad replacement.

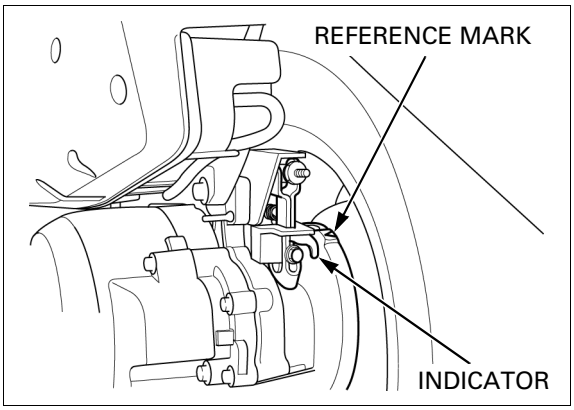


REAR BRAKE

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

If the indicator align with the reference mark, inspect the brake drum (page 14-6).

Replace the brake shoes (page 14-6) if the drum I.D. is within the service limit.



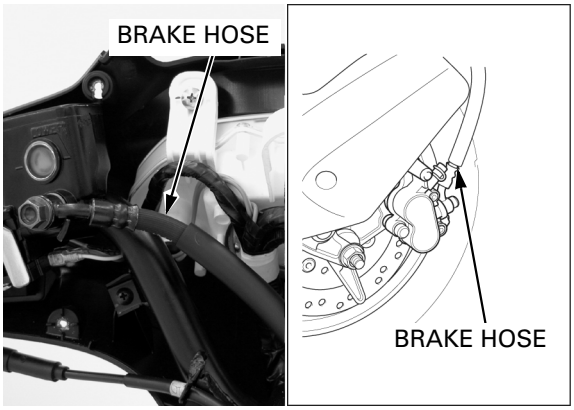
BRAKE SYSTEM

FRONT BRAKE

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

Refer to page 15-5 for air bleeding procedures.

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

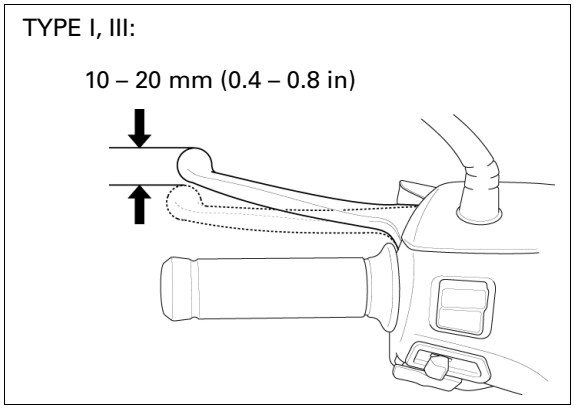


REAR BRAKE

Type I, III

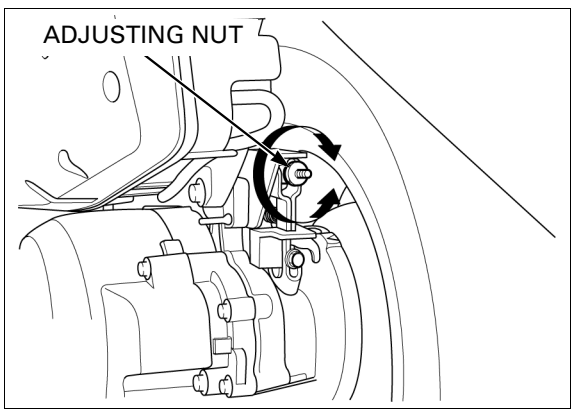
Measure the rear brake lever free play at the end of the lever.

FREE PLAY: 10 – 20 mm (0.4 – 0.8 in)



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

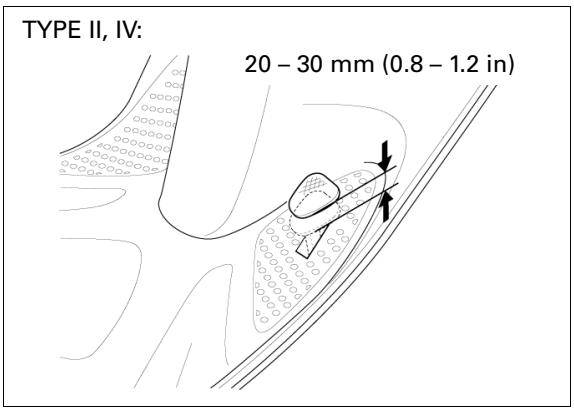
Adjust the rear brake lever free play by turning the rear brake arm adjusting nut.



Type II, IV

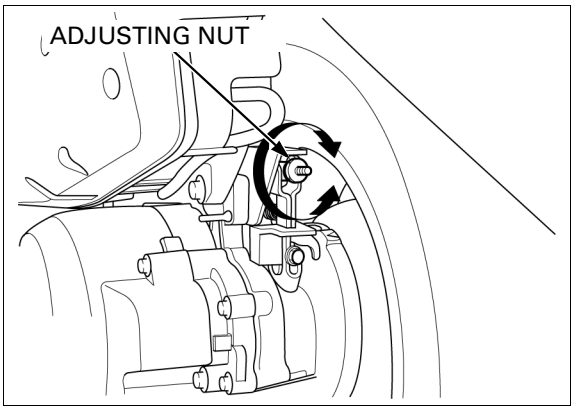
Measure the rear brake pedal free play at the tip of the brake pedal.

FREE PLAY: 20 – 30 mm (0.8 – 1.2 in)



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

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



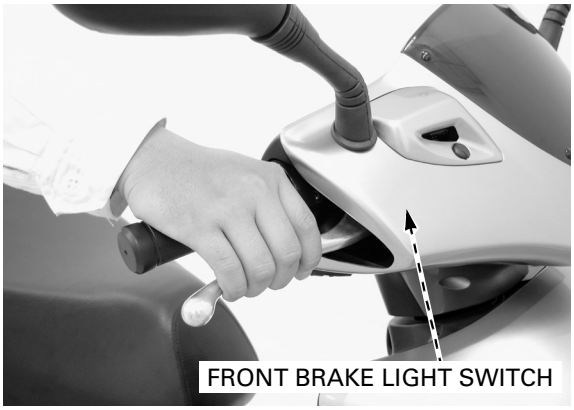
BRAKE LIGHT SWITCH

FRONT BRAKE

The brake light switch on the brake lever cannot be adjusted.

Check that the brake light comes on when the brake lever is applied.

If the brake light switch actuation and brake engagement are off, inspect the brake light switch (page 19-12).



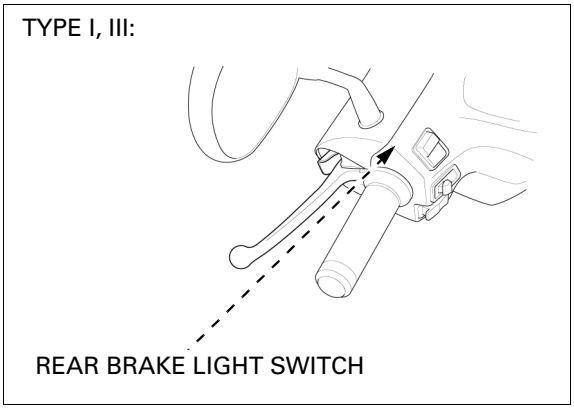
REAR BRAKE

Type I, III

The brake light switch on the brake lever cannot be adjusted.

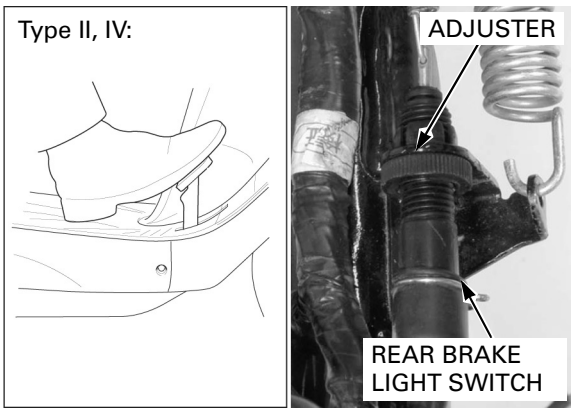
Check that the brake light comes on when the brake lever is applied.

If the brake light switch actuation and brake engagement are off, inspect the brake light switch (page 19-12).



Type II, IV

Adjust the brake light switch so that the brake light comes on just prior to the brake actually being engaged.
If the light fails to come on, adjust the switch so that the light comes on at the proper time.
Hold the switch body and turn the adjuster.
Do not turn the switch body.



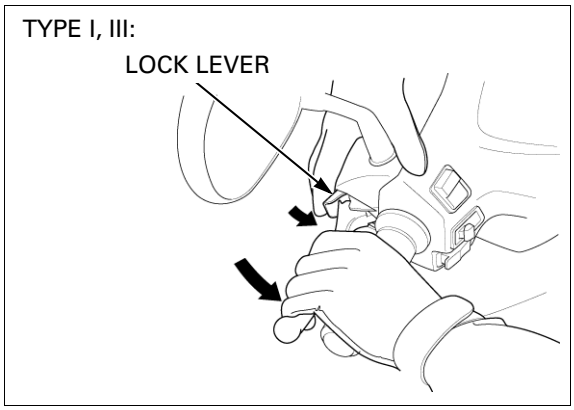
BRAKE LOCK OPERATION

TYPE I, III

Check the brake lock operation after the rear brake lever free play is checked and adjusted (page 3-17).

Squeeze the rear brake lever and set the lock lever.

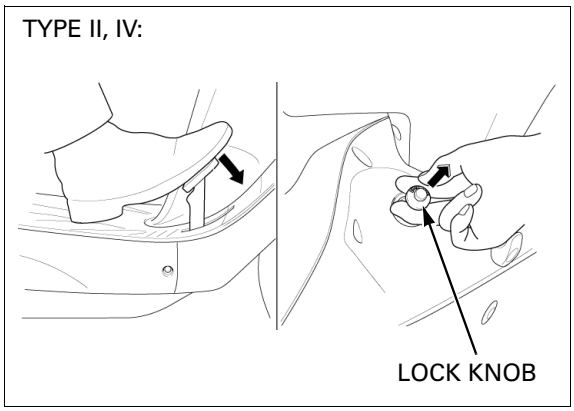
Check that the rear wheel is locked completely.



TYPE II, IV

Check the brake lock operation after the rear brake pedal free play is checked and adjusted (page 3-18).

Step on the rear brake pedal and pull the lock knob fully.
Check that the rear wheel is locked completely.



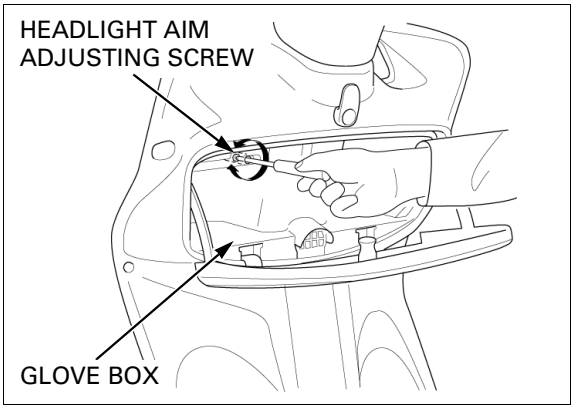
HEADLIGHT AIM

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

Place the scooter on a level ground.

Open the glove box.

Adjust the headlight beam vertically by loosening or tightening the headlight aim adjusting screw.



CLUTCH SHOES WEAR

Remove the clutch assembly (page 9-12).

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

SERVICE LIMIT: 2.0 mm (0.08 in)

Replace the clutch shoes if it is below a service limit (page 9-12).

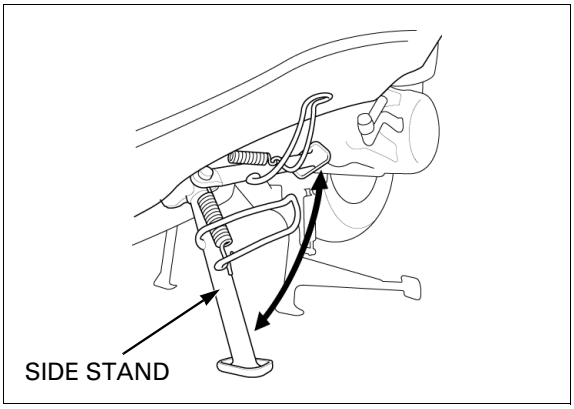
Install the removed parts in the reverse order of removal.

SIDE STAND

Support the motorcycle on its center stand.

Check the side stand spring for damage or loss of tension.

Check the side stand assembly for freedom of movement and lubricate the side stand pivot if necessary.



SUSPENSION

FRONT

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

Check the action of the forks by operating the front brakes and compressing the front suspension several times.
Check the entire assembly for damage or loose fasteners.

Replace damaged components which cannot be repaired (page 13-12).

Tighten all nuts and bolts.

Place the scooter on its center stand.
Jack up the scooter to raise the front wheel off the ground.

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

Replace the bearings if any looseness is noted (page 13-6).

REAR

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

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

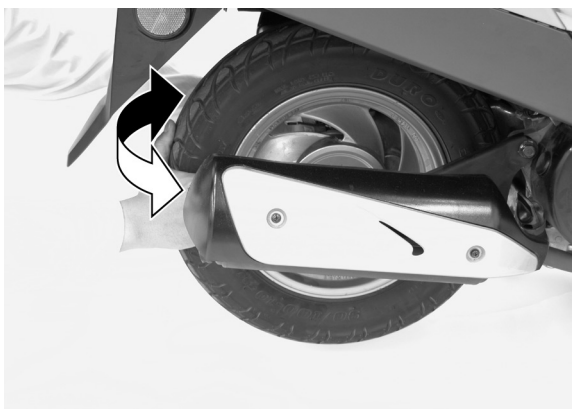
Replace damaged components which cannot be repaired (page 14-13).

Tighten all nuts and bolts.

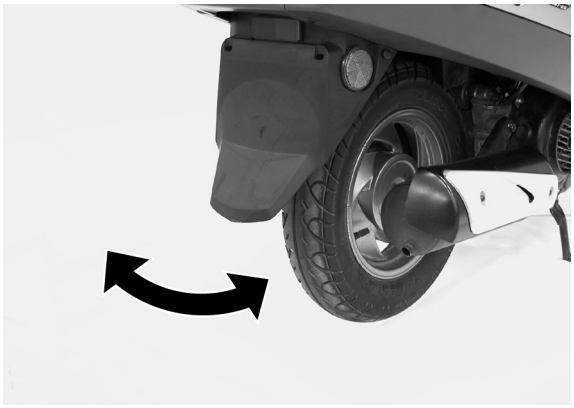
Raise the rear wheel off the ground and support the scooter securely.

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

Replace the final bearings (page 10-6) if any looseness is noted.



Check for worn engine mounting bushings by grabbing the rear wheel.
Replace the bushings if any looseness is noted (page 6-4).



NUTS, BOLTS, FASTENERS

Check that all chassis nuts and bolts are tightened to their correct torque values (page 1-9).
Check that all cotter pins, safety clips, hose clamps and cable stays are in place and properly secured.

WHEELS/TIRES

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

RECOMMENDED TIRE PRESSURE: kPa (kgf/cm^2, psi)

		FRONT	REAR
Tire pressure	Driver	175 (1.75, 25)	200 (2.00, 29)
	Driver and passenger	175 (1.75, 25)	250 (2.50, 36)

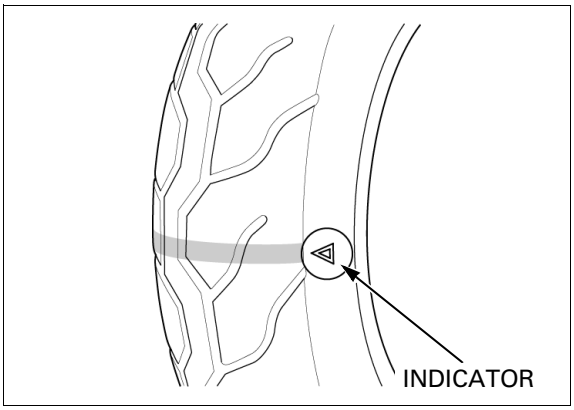
RECOMMENDED TIRE SIZE AND TIRE BLAND:

		FRONT	REAR
Tire size		90/100 – 10 53J	90/100 – 10 53J
Tire bland	CHENG SHIN	C6027	C6027
	DURO	HFC-263A	HFC-263A

Check the tires for cuts, embedded nails, or other damage.
Check the front wheel and rear wheel for trueness.

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

MINIMUM TREAD DEPTH:
FRONT/REAR: To the indicator



STEERING HEAD BEARINGS

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

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

Check that the handlebar moves freely from side-to-side.
If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (page 13-19).

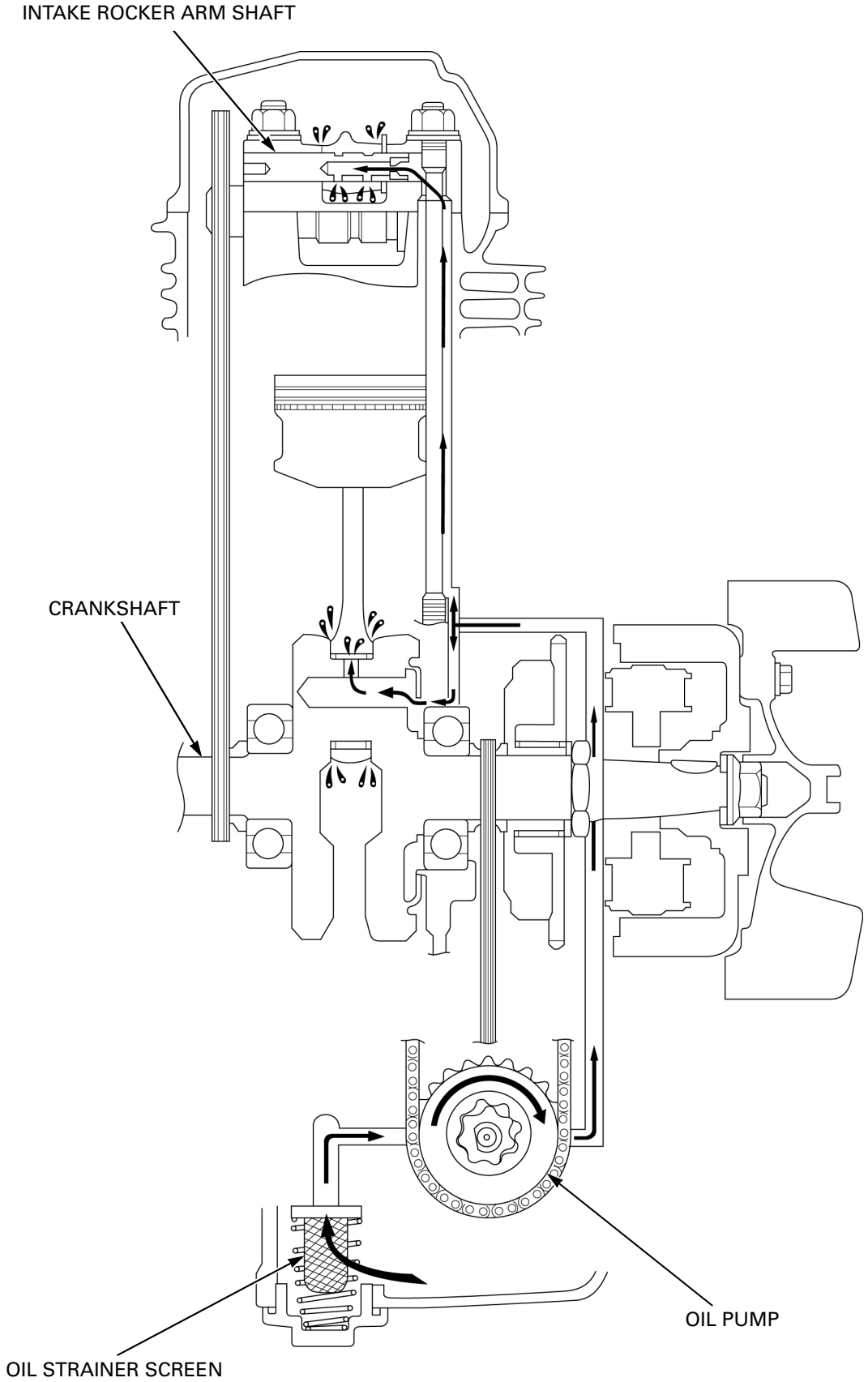
Hold the scooter and check the steering head bearings for wear by moving the fork forward and backward.

Replace the steering head bearings if any looseness is noted (page 13-19).

MEMO

4. LUBRICATION SYSTEM

LUBRICATION SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

⚠CAUTION

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

- The oil pump can be serviced with the engine installed in the frame.
- The service procedures in this section must be performed with the engine oil drained.
- When removing and installing the oil pump, use care not to allow dust or dirt to enter the engine.
- If any portion of the oil pump is worn beyond the specified service limits, replace the oil pump as an assembly.
- After the oil pump has been installed, check that there are no oil leaks.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	0.8 liter (0.8 US qt, 0.7 Imp qt)	–
	After disassembly	0.9 liter (1.0 US qt, 0.8 Imp qt)	–
Recommended engine oil		Honda 4-stroke oil or equivalent motor oil API service classification: SE, SF or SG Viscosity: SAE 10W-30	–
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.21 (0.006 – 0.008)	0.25 (0.010)
	Side clearance	0.05 – 0.10 (0.002 – 0.004)	0.12 (0.005)

TORQUE VALUES

Oil pump plate screw	2 N·m (0.2 kgf·m, 1.4 lbf·ft)

TROUBLESHOOTING

Engine oil level too low
- Oil consumption
- External oil leak
- Worn piston rings or incorrect piston ring installation (page 8-5)
- Worn cylinder (page 8-4)
- Worn valve guide or seal (page 7-12)

Oil contamination
- Oil not changed often enough
- Faulty cylinder head gasket
- Worn piston rings (page 8-5)

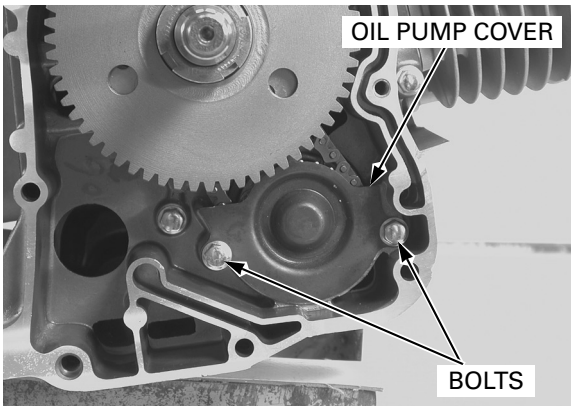
OIL PUMP

REMOVAL

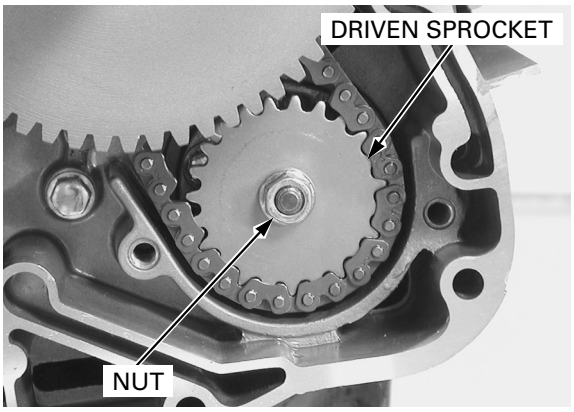
- When removing the oil pump, do not allow dust or dirt to enter the engine.

Drain the engine oil (page 3-12).
Remove the right crankcase cover (page 11-9).

Remove the bolts and oil pump cover.

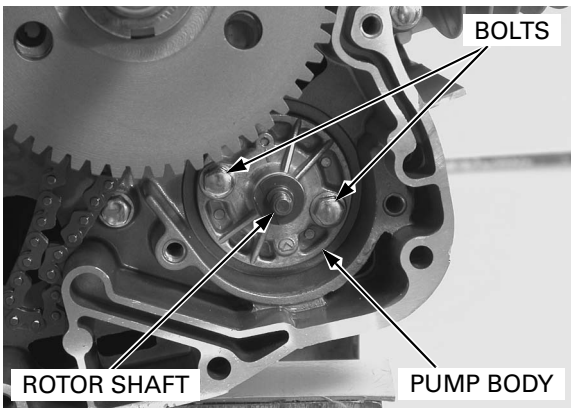


Remove the oil pump driven sprocket nut and driven sprocket.



Remove the two oil pump mounting bolts and the oil pump body.

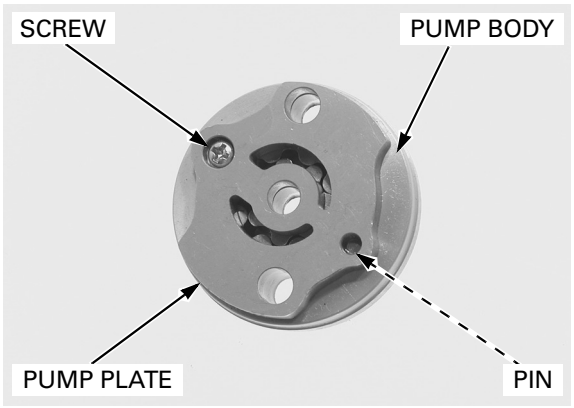
Remove the rotor shaft from the oil pump body.



DISASSEMBLY

Remove the oil pump plate attaching screw and pump plate.

Remove the pin from the oil pump body.



INSPECTION

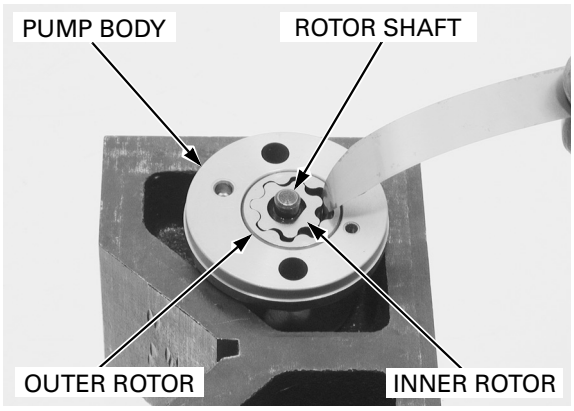
- Measure at several points and use the largest reading to compare the service limit.
- If any portion of the oil pump is worn beyond the specified service limits, replace the oil pump and oil pump cover as an assembly.

Tip clearance

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

Measure the clearance between the outer rotor and the inner rotor with a feeler gauge.

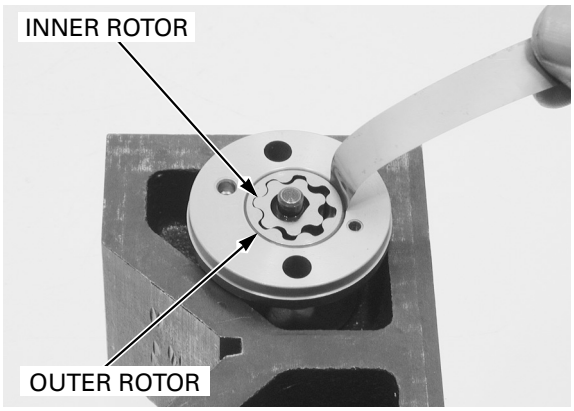
SERVICE LIMIT: 0.20 mm (0.008 in)



Body clearance

Measure the clearance between the oil pump body and the outer rotor with a feeler gauge.

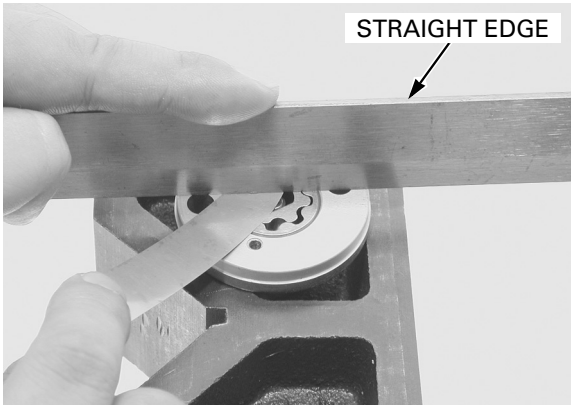
SERVICE LIMIT: 0.25 mm (0.010 in)



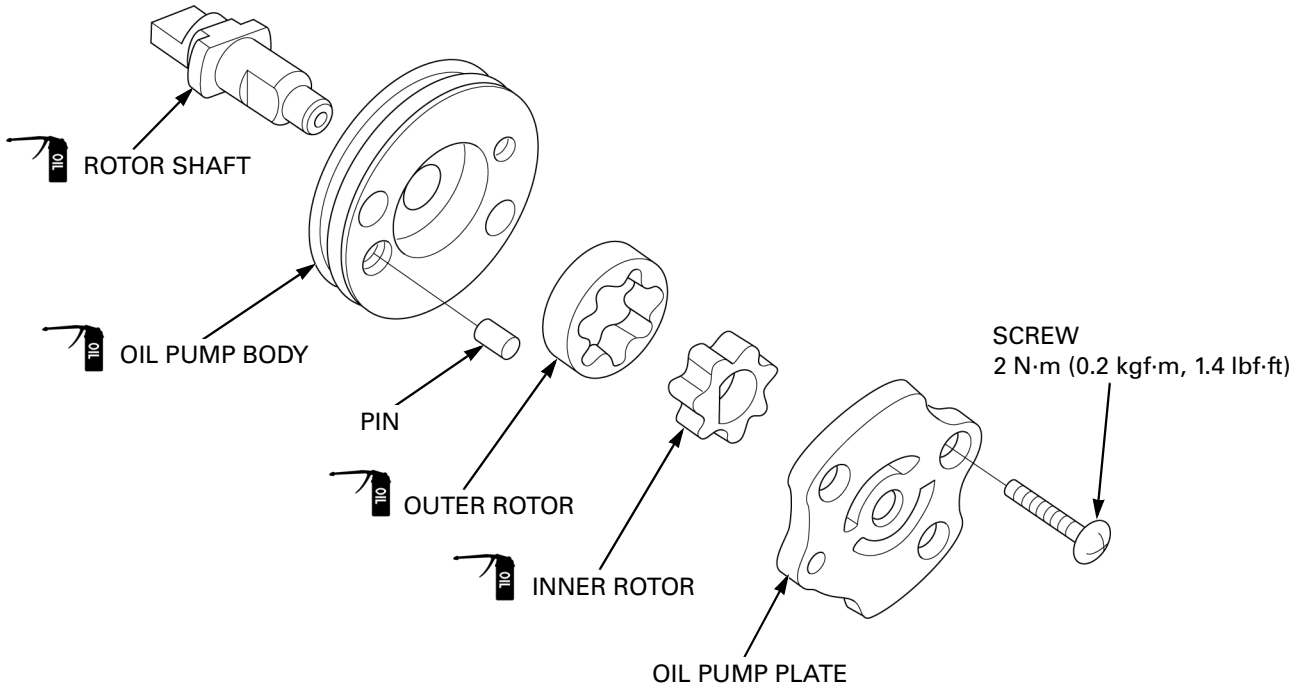
Side clearance

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

SERVICE LIMIT: 0.12 mm (0.005 in)



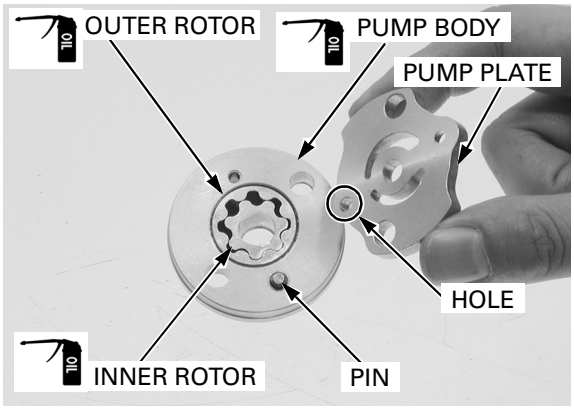
ASSEMBLY



Apply engine oil to the inner rotor, outer rotor. Install them onto the oil pump body.

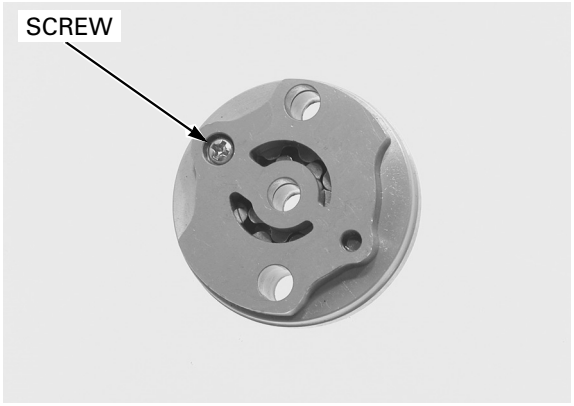
Install the pin into the oil pump body.

Install the oil pump plate to the oil pump body by aligning the pin on the oil pump body with the hole of the oil pump plate.



Install and tighten the oil pump plate screw to the specified torque.

TORQUE: 2 N·m (0.2 kgf·m, 1.4 lbf·ft)



INSTALLATION

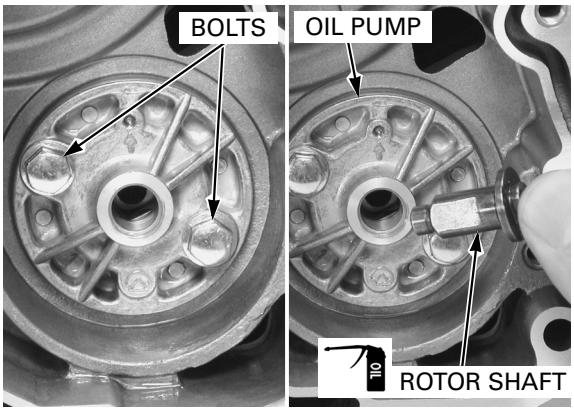
- When installing the oil pump, do not allow dust or dirt to enter the engine.

Install the oil pump onto the right crankcase and tighten the two mounting bolts.

Coat the rotor shaft with engine oil.

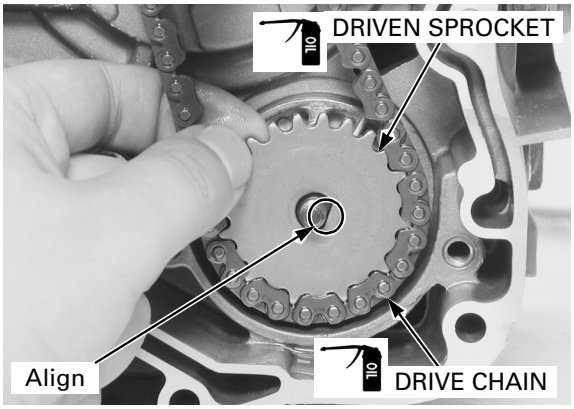
Install the rotor shaft into the oil pump.

Check that the oil pump rotates smoothly.

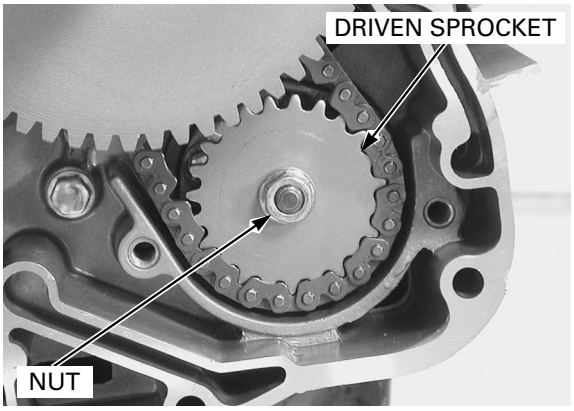


Apply engine oil to the oil pump driven sprocket and drive chain.

Install the driven sprocket to the oil pump by aligning the driven sprocket with oil pump rotor shaft cut-out.



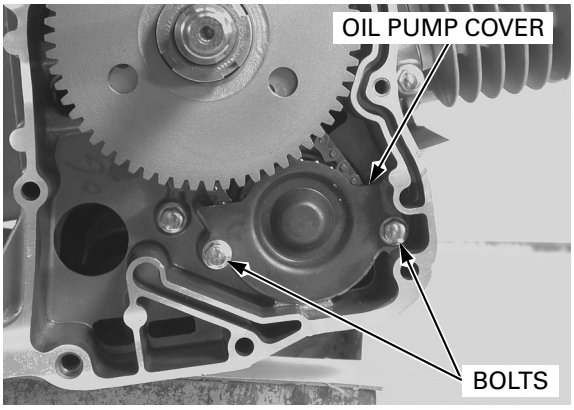
Install and tighten the oil pump driven sprocket nut.



Install the oil pump cover and tighten the two bolts.

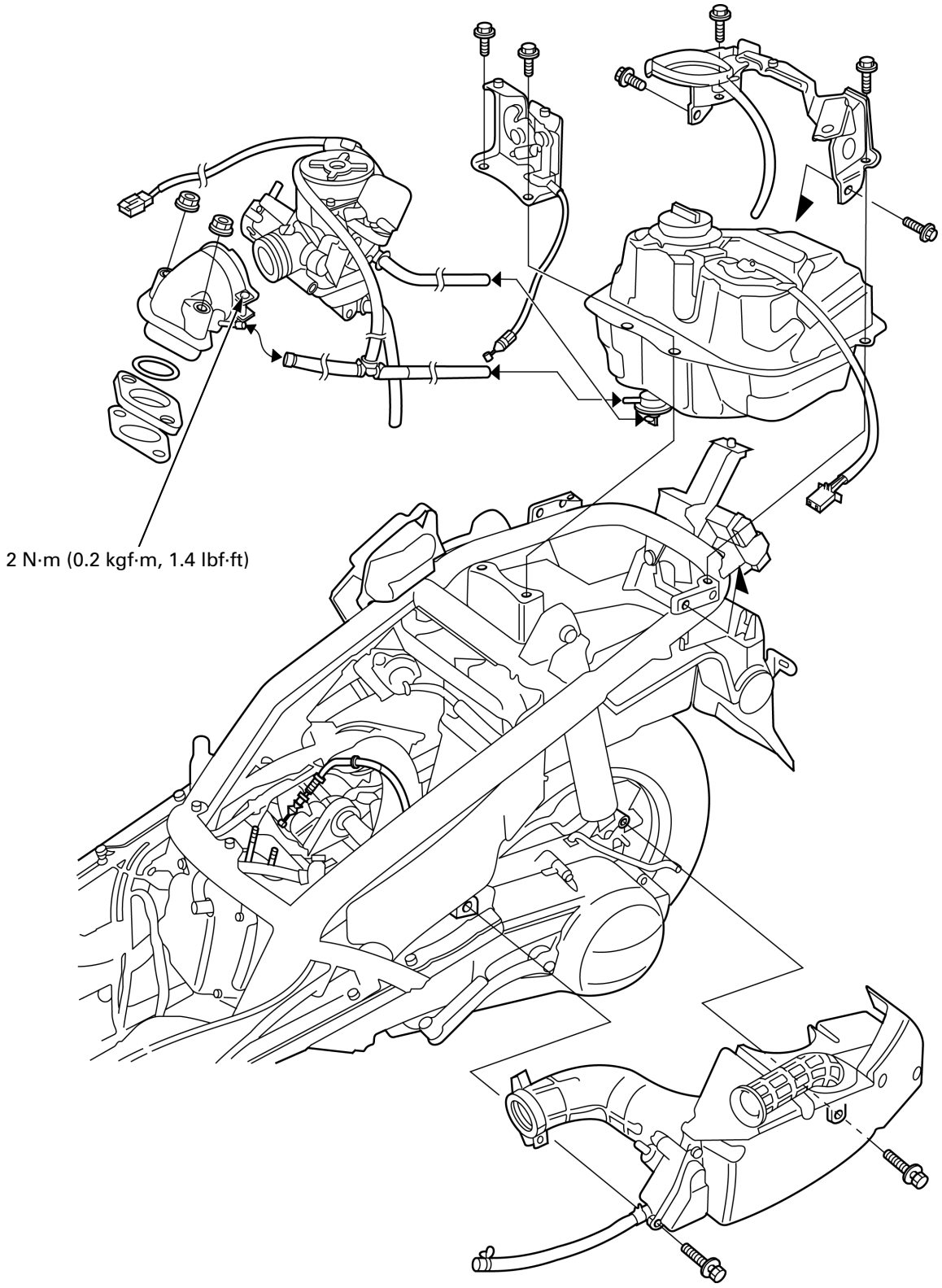
Install the right crankcase cover (page 11-10).

Fill the crankcase with recommended engine oil (page 3-12).



5. FUEL SYSTEM

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- Bending or twisting the control cable will impair smooth operation and could cause the cable to stick or bind, resulting in loss of vehicle control.
- 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.
- When disassembling fuel system parts, note the locations of the O-rings. Replace them with new ones on reassembly.
- Before disassembling the carburetor, place a suitable container under the carburetor drain hose. Loosen the drain screw and drain the carburetor.
- After removing the carburetor, wrap the intake port of the engine with a shop towel or cover it with pieces of tape to prevent any foreign material from dropping into the engine.

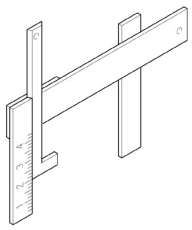
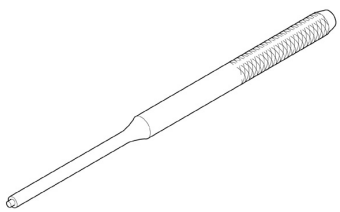
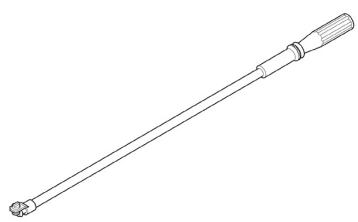
SPECIFICATIONS

ITEM	SPECIFICATIONS
Carburetor identification number	VE49E
Main jet	#102
Slow jet	#35
SE thermal valve resistance	5 Ω (20°C/68°F)
Float level	18.5 mm (0.73 in)
Pilot screw initial opening	See page 5-21
Idle speed	1,700 ± 100 min^{-1} (rpm)
PAIR control valve specified vacuum	60 kPa (450 mmHg)
SE thermal valve resistor resistance	7.6 – 9.4 Ω (20°C/68°F)
Throttle grip free play	2 – 6 mm (0.1 – 0.2 in)

TORQUE VALUES

Carburetor drain screw	1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)
SE thermal valve set plate screw	2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)
SE thermal valve body screw	3.5 N·m (0.4 kgf·m, 2.9 lbf·ft)
Throttle cable holder screw	3.5 N·m (0.4 kgf·m, 2.9 lbf·ft)
Air cut-off valve cover screw	2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)
Vacuum chamber cover screw	2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)
Float chamber screw	2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)
Slow jet	1.8 N·m (0.2 kgf·m, 1.3 lbf·ft)
Needle jet holder	2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)
Main jet	2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)
Carburetor insulator band screw	2 N·m (0.2 kgf·m, 1.4 lbf·ft)
Secondary air cleaner housing cover screw	1.1 N·m (0.1 kgf·m, 0.7 lbf·ft)
PAIR pipe mounting bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)
Fuel auto valve lock nut	18 N·m (1.8 kgf·m, 13 lbf·ft)

TOOLS

Carburetor float level gauge 07401-0010000	Pin driver 4.5 mm 07744-0010400	Pilot screw wrench 07908-4730002
		

TROUBLESHOOTING

Engine won't to start
- No fuel in tank
- No fuel to carburetor
  - Fuel strainer clogged
  - Fuel hose clogged
  - Fuel tank breather hole clogged
  - Fuel auto valve stuck
  - Fuel auto valve vacuum hose clogged
- Float level misadjusted
- Too mach fuel getting to the engine
  - Air cleaner clogged
  - Flooded carburetor
- Intake air leak
- Fuel contaminated/deteriorated
- Faulty starting enrichment (SE) thermal valve
- Clogged starting enrichment (SE) thermal valve circuit
- Clogged carburetor slow circuit
- Improper throttle operation
- No spark at plug (faulty ignition system, See page 17-5)

Engine stall, hard to start, rough idling
- Fuel line restricted
- Fuel mixture too lean/rich
- Fuel contaminated/deteriorated
- Intake air leak
- Idle speed misadjusted
- Pilot screw misadjusted
- Fuel tank breather hole clogged
- Air cleaner clogged
- Slow circuit clogged
- Clogged starting enrichment (SE) thermal valve circuit
- Faulty starting enrichment (SE) thermal valve
- Ignition system malfunction (page 17-5)

Lean mixture
- Fuel jets clogged
- Float valve faulty
- Float level too low
- Fuel line restricted
- Carburetor air vent hose clogged
- Blocked fuel tank cap air vent hole
- Intake air leak
- Vacuum piston faulty

Rich mixture
- Air jet clogged
- Float valve faulty
- Float level too high
- starting enrichment (SE) thermal valve stuck open
- Air cleaner element contaminated
- Vacuum piston faulty
- Flooded carburetor

Backfiring or misfiring during acceleration
- Fuel mixture too lean
- Ignition system malfunction (page 17-5)

Afterburn when engine braking is used
- Lean mixture in slow circuit
- Air cut-off valve malfunction
- Faulty pulse secondary air injection (PAIR) system
  - Faulty PAIR control valve
  - Faulty PAIR check valve
  - Clogged hose of the PAIR system
- Ignition system malfunction (page 17-5)

AIR CLEANER HOUSING

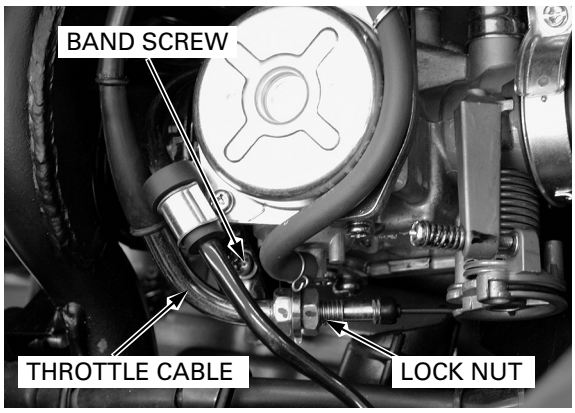
REMOVAL

Remove the following:

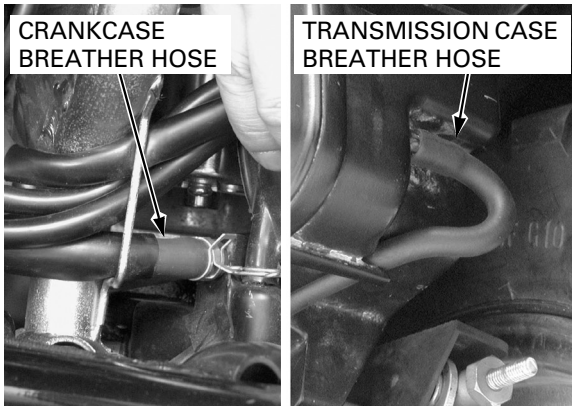
– Left side cover (page 2-6)
– Luggage box (page 2-5)

Loosen the lock nut and remove the throttle cable from the cable holder.

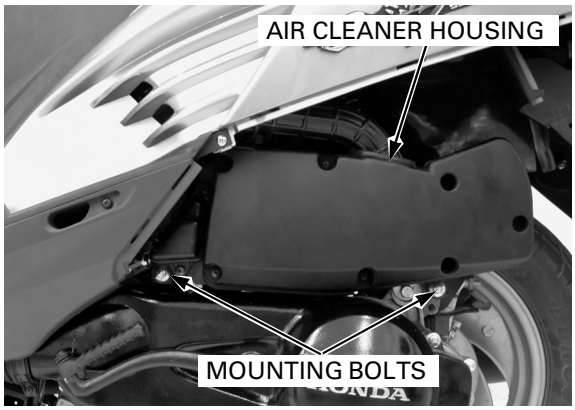
Loosen the air cleaner connecting hose band screw and disconnect the connecting hose from the carburetor.



Disconnect the crankcase breather hose and transmission case breather hose from the air cleaner housing.

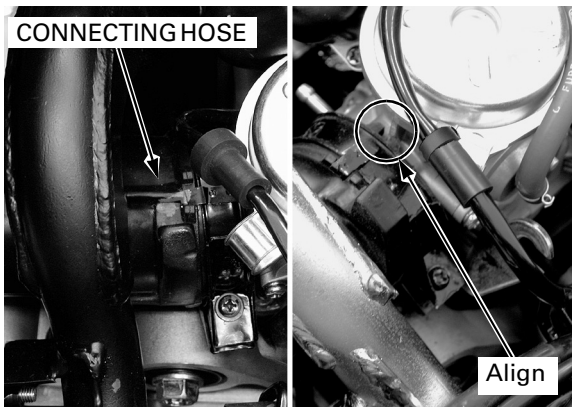


Remove the mounting bolts and air cleaner housing.

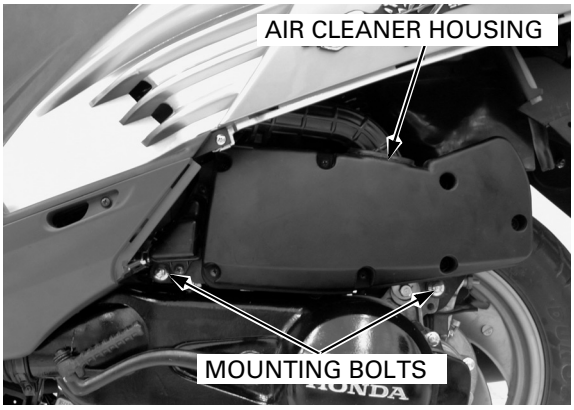


INSTALLATION

Install the air cleaner housing and connect the connecting hose to the carburetor by aligning the tabs of the air cleaner connecting hose and tab of the carburetor.

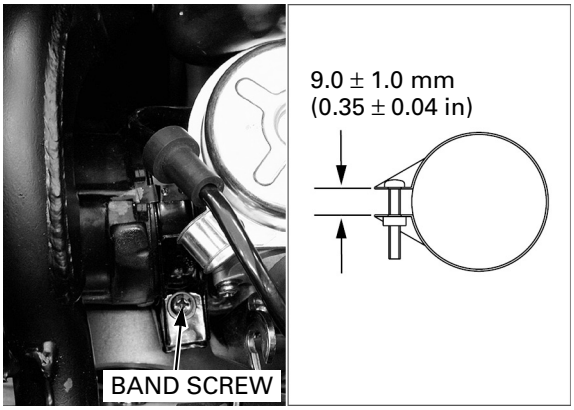


Install and tighten the air cleaner housing mounting bolts.

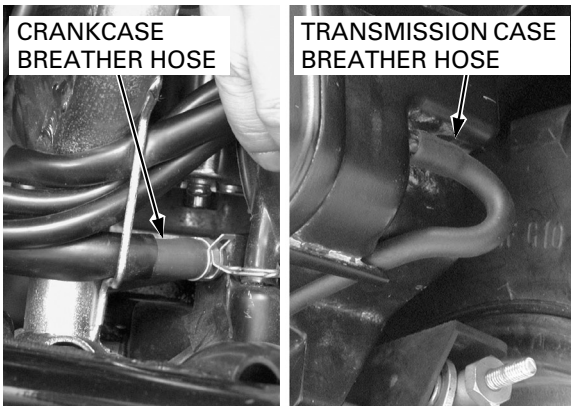


Set the connecting hose band as shown.

Tighten the connecting hose band screw so that the band ends clearance is 9.0 ± 1.0 mm (0.35 ± 0.04 in).



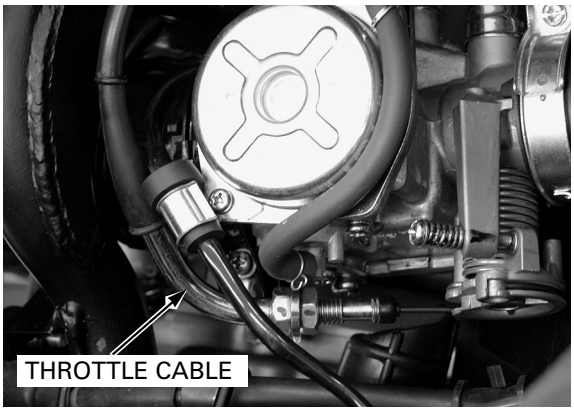
Connect the crankcase breather hose and transmission case breather hose to the air cleaner housing.



Install the throttle cable from the cable holder and adjust the throttle grip free play (page 3-5).

Install the following:

– Luggage box (page 2-5)
– Left side cover (page 2-6)



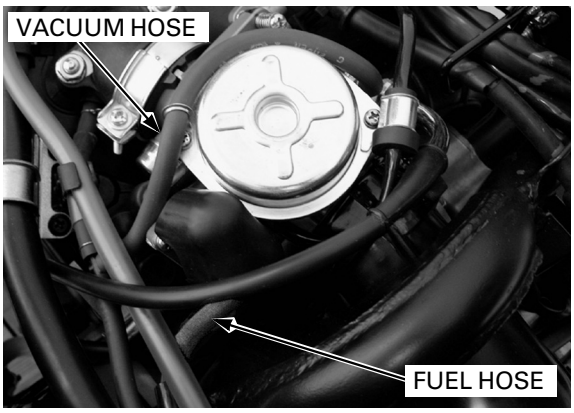
CARBURETOR

REMOVAL

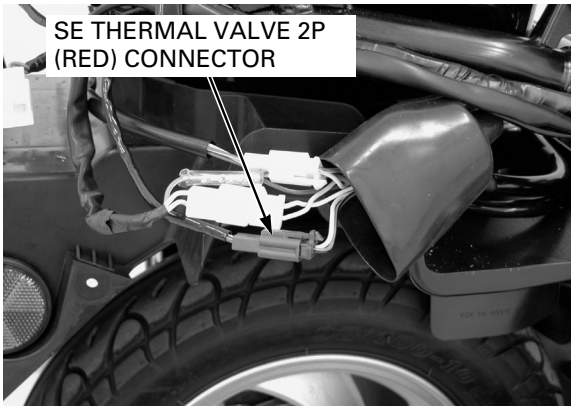
Remove the body cover (page 2-8).

Place a suitable container under the carburetor drain hose and drain fuel from the carburetor by loosening the drain screw.

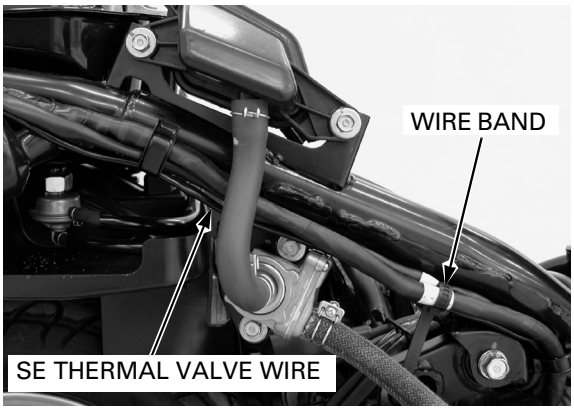
Disconnect the fuel hose from the carburetor.
Disconnect the vacuum hose from the three-way joint.



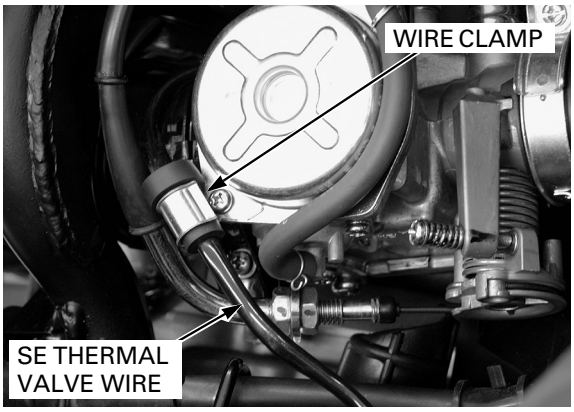
Disconnect the starting enrichment (SE) thermal valve 2P (Red) connector.



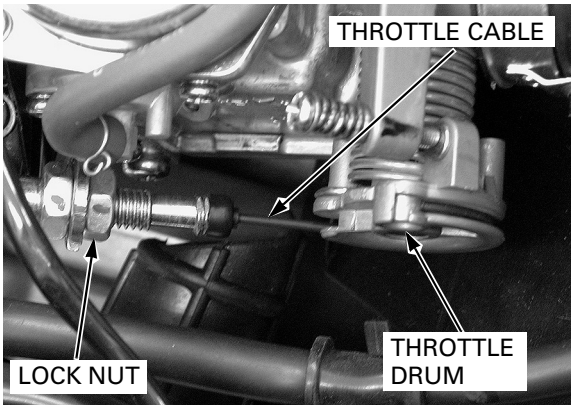
Release the SE thermal valve wire from the wire band.



Release the SE thermal valve wire from the carburetor wire clamp.



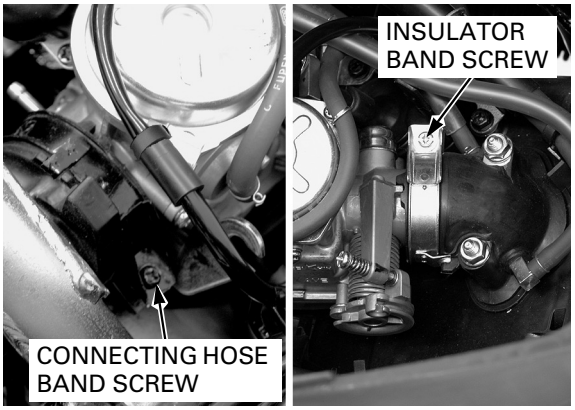
Loosen the throttle cable lock nut.
Remove the throttle cable from the cable holder and disconnect the throttle cable from the throttle drum.



Loosen the connecting hose band screw and insulator band screw.

Be careful not to damage the insulator and connecting hose.

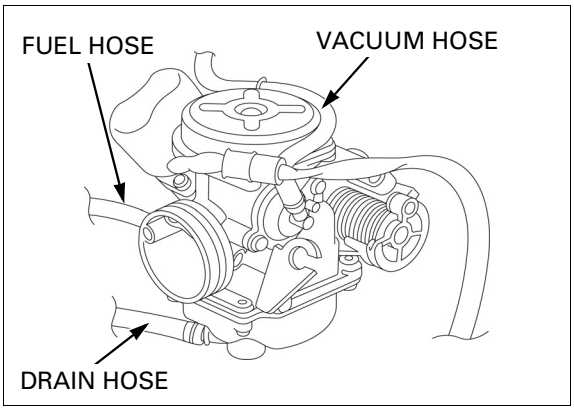
Remove the carburetor as an assembly.



DISASSEMBLY

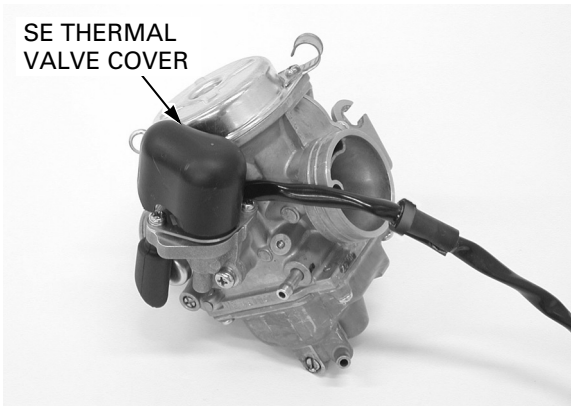
HOSES

Disconnect the air cut-off valve vacuum hose, fuel hose and drain hose.

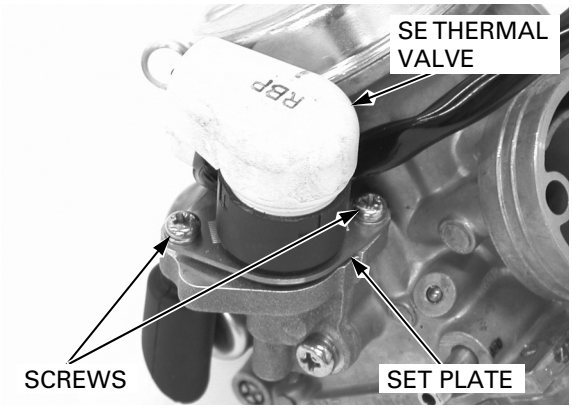


STARTING ENRICHMENT (SE) THERMAL VALVE

Remove the SE thermal valve cover.

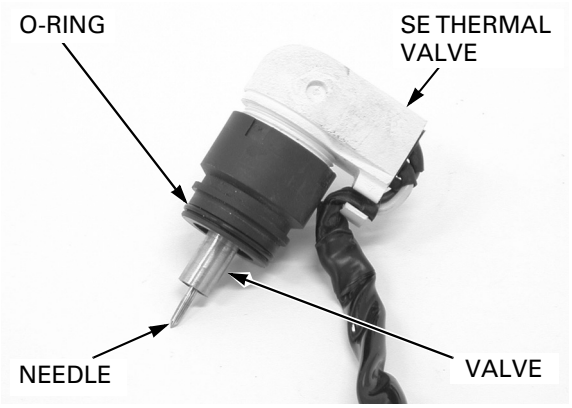


Remove the screws, set plate and SE thermal valve.

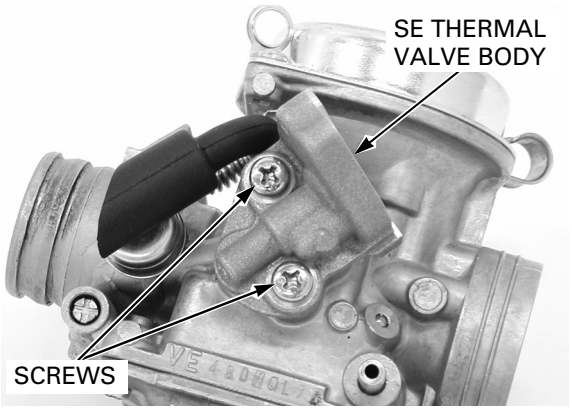


Remove the O-ring from the SE thermal valve.

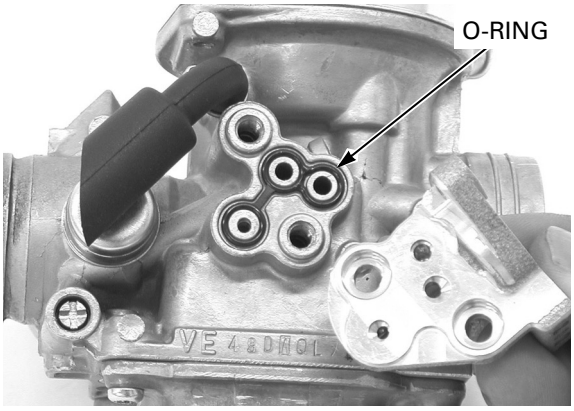
Inspect the valve and needle for stepped wear or damage.



Remove the screws and SE thermal valve body.

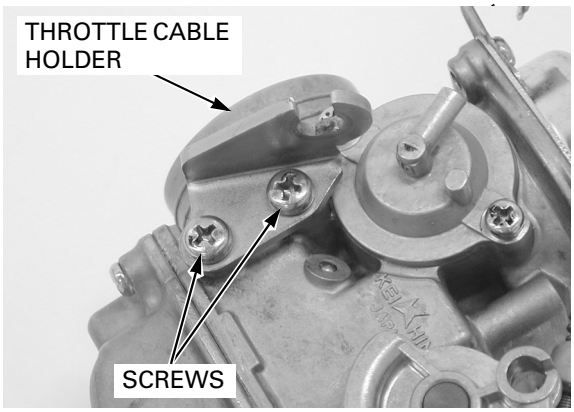


Remove the O-ring from the carburetor body.



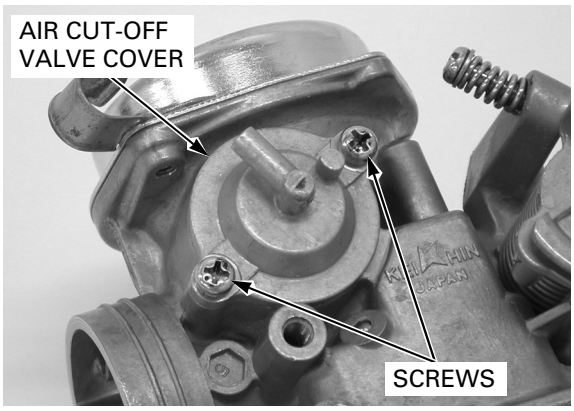
AIR CUT-OFF VALVE

Remove the screws and throttle cable holder.

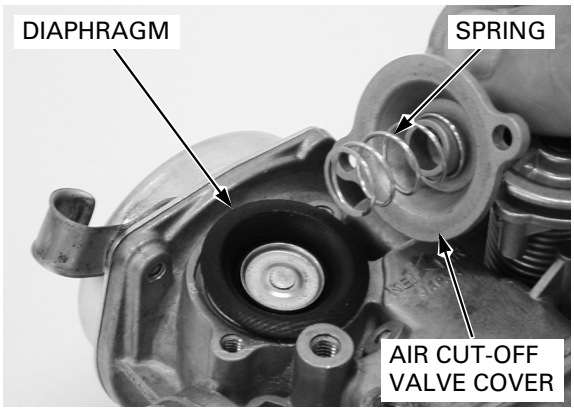


The air cut-off valve cover is under spring pressure.

Hold the air cut-off valve cover and remove the screws.

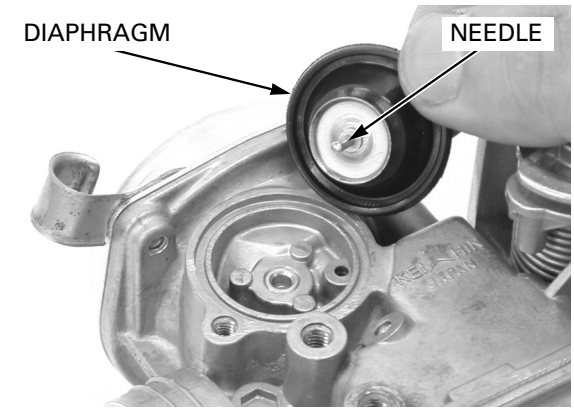


Remove the cut-off valve cover, spring and diaphragm.



Check the following:

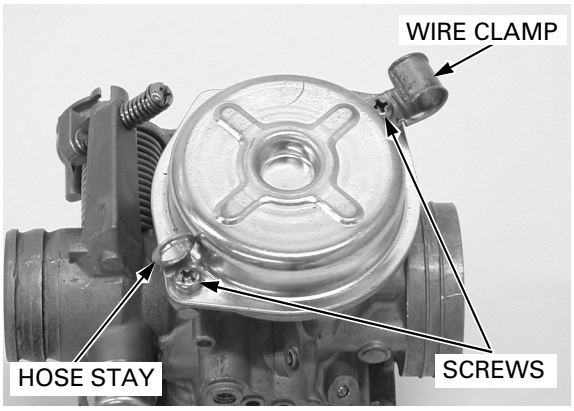
- diaphragm for pin holes, deterioration or damage
- spring for deterioration
- needle of diaphragm for wear
- air passages for clogging



VACUUM CHAMBER

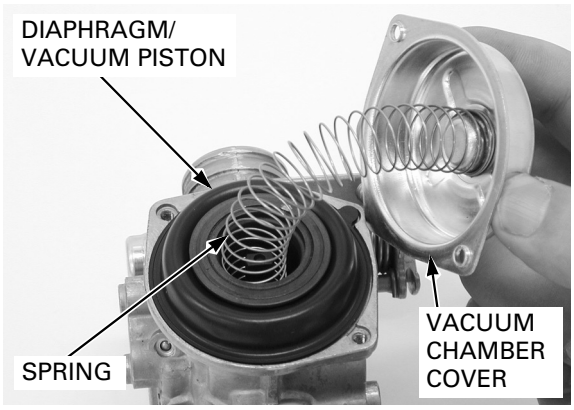
The vacuum chamber cover is under spring pressure.

Hold the vacuum chamber cover and remove the screws, hose stay and wire clamp.



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

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



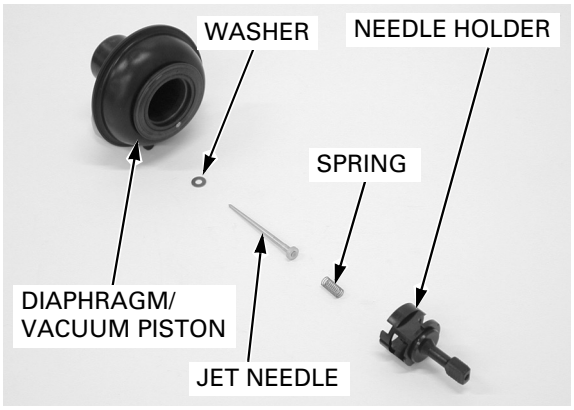
Remove the following:

- Needle holder
- Spring
- Jet needle
- Washer

Air can leak out of the vacuum chamber if the diaphragm is damaged in any way, even if only a pin hole.

Check the followings:

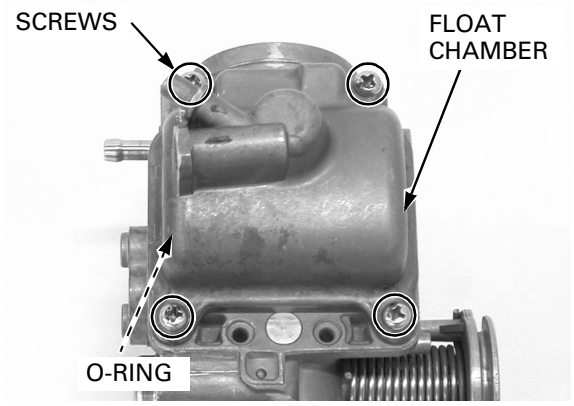
- Jet needle for stepped wear
- Vacuum piston for wear or damage
- Diaphragm for pin holes, deterioration or damage



FLOAT CHAMBER

Remove the screws and float chamber.

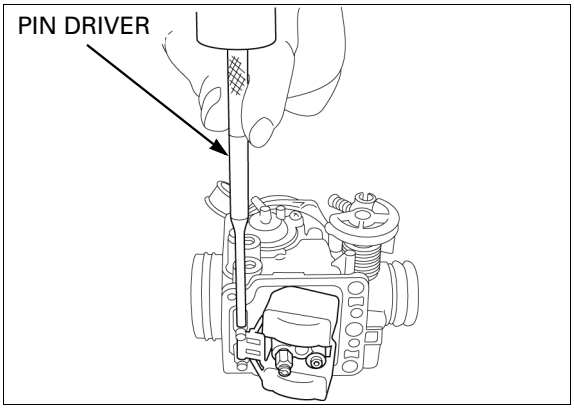
Remove the O-ring from the float chamber.



Be careful not to damage the carburetor body.

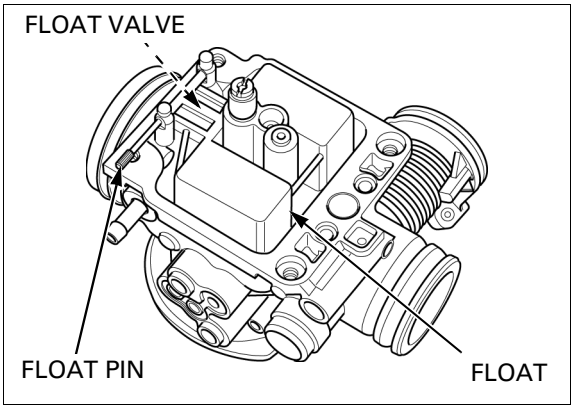
Hold the carburetor and drive the float pin lightly from the throttle drum side.

TOOL:
Pin driver, 4.5 mm **07744-0010400**



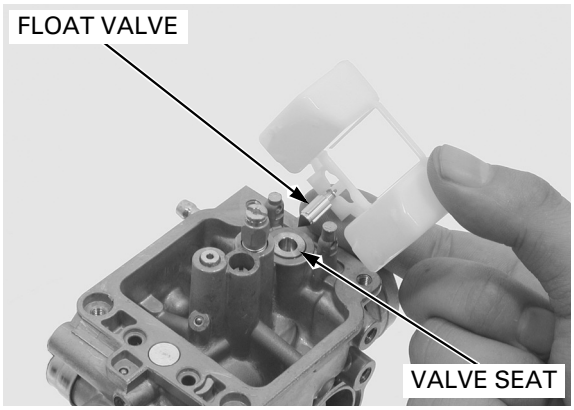
Remove the float pin, float and float valve.

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.

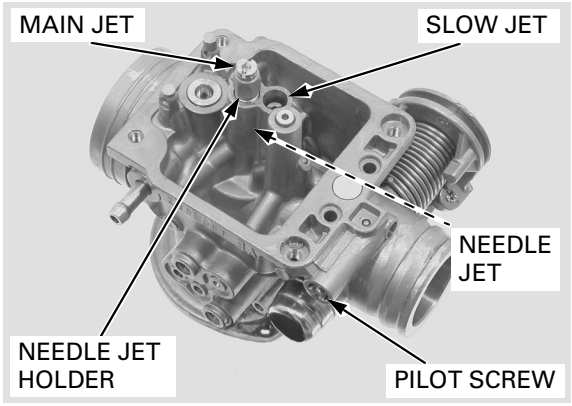
Check the operation of the float valve.



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

Remove the following:

– Main jet
– Needle jet holder
– Needle jet
– Slow jet

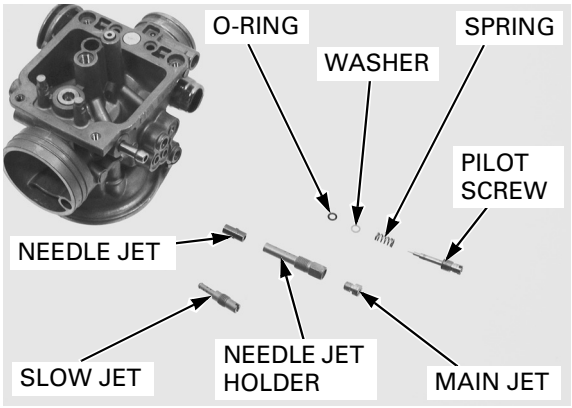


Damage to the pilot screw seat will occur if the pilot screw is tightened against the seat.

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

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

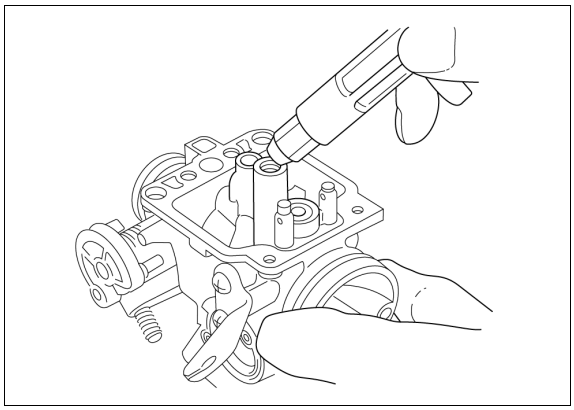
Inspect each jet for wear or damage and replace if necessary.



CARBURETOR CLEANING

Remove the following:

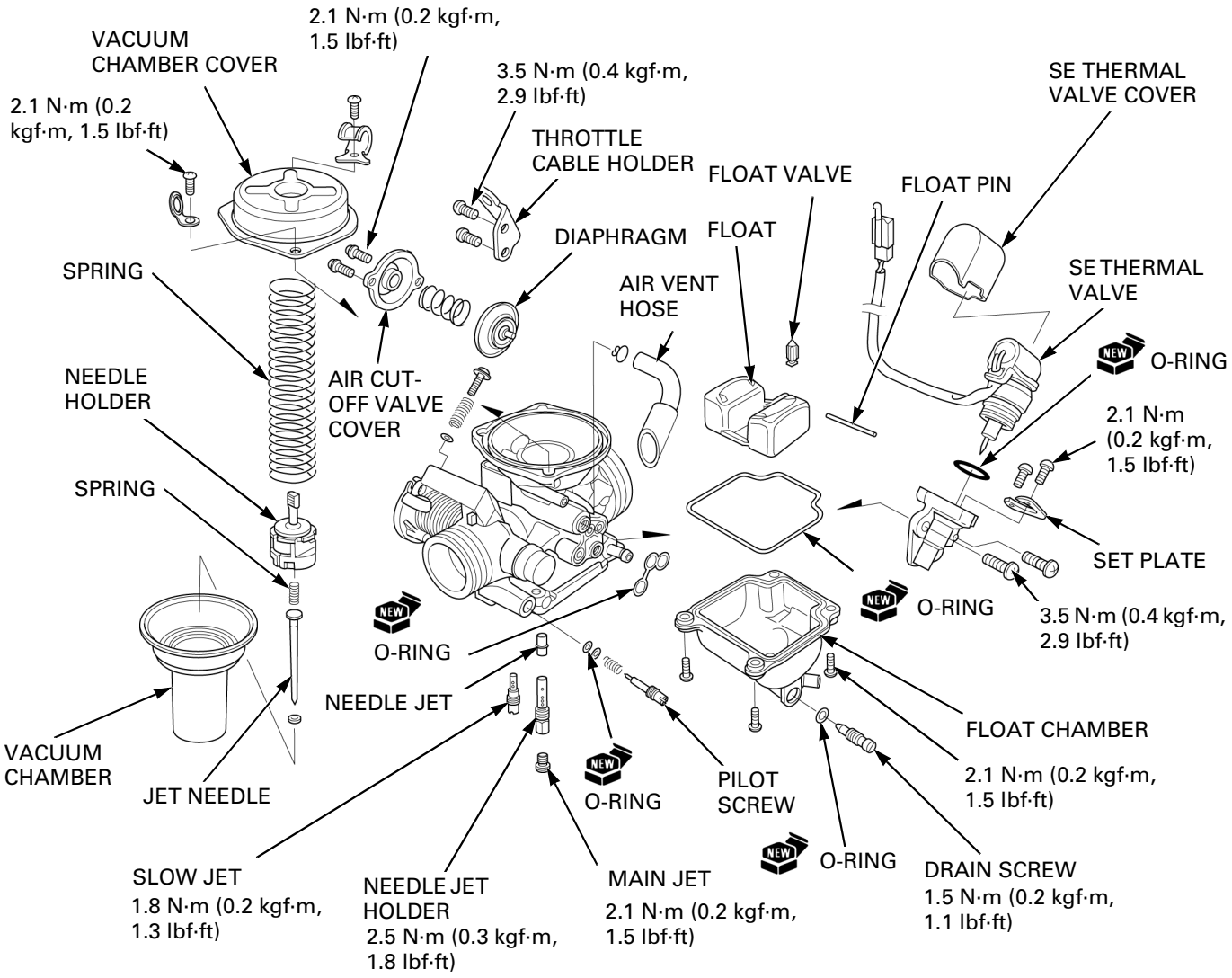
– SE thermal valve
– Air cut-off valve diaphragm
– Diaphragm/vacuum piston
– Float/float valve
– Main jet/needle jet/slow jet
– Pilot screw/spring/washer/O-ring



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

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

CARBURETOR ASSEMBLY



FLOAT CHAMBER

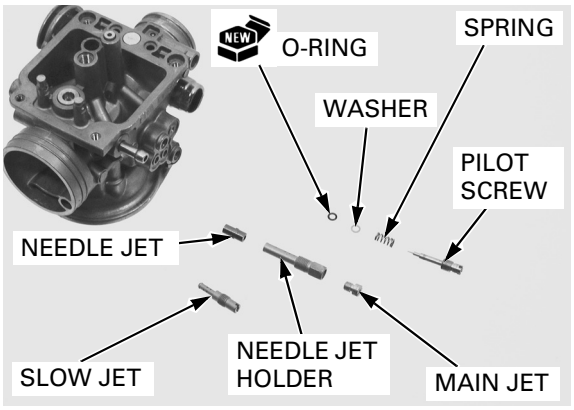
Handle the jets with care. They can easily be scored or scratched.

Install the following:

- Slow jet
- Needle jet
- Needle jet holder
- Main jet

Tighten the jets to the specified torque.

TORQUE: Slow jet:
1.8 N·m (0.2 kgf·m, 1.3 lbf·ft)
Needle jet holder:
2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)
Main jet:
2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)

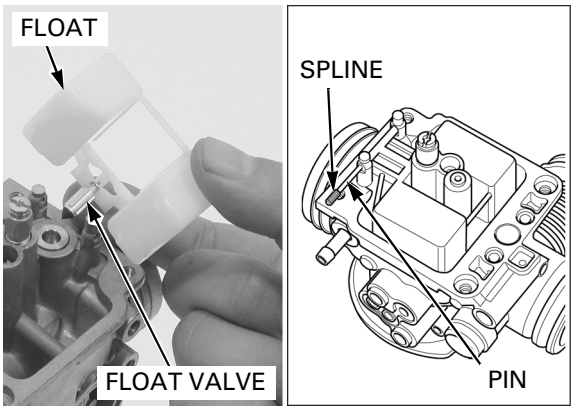


Damage to the pilot screw seat will occur if the pilot screw is tightened against the seat.

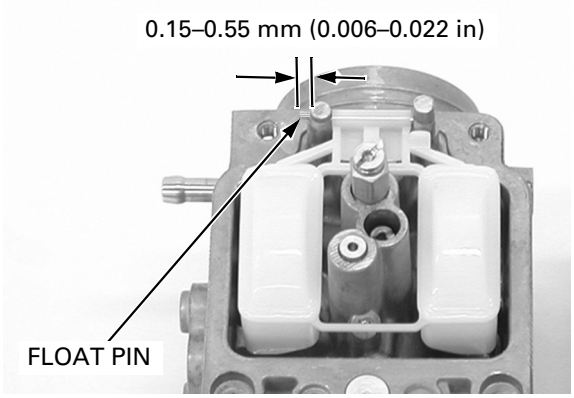
Install the pilot screw and return it to its original position as noted during removal.
Perform the pilot screw adjustment procedure if a new pilot screw is installed (page 5-21).

Drive the float pin from the shorter boss side with its spline facing the air cut-off valve side.

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



Drive the float pin lightly until the height from the float pin holder (SE thermal valve side) is 0.15–0.55 mm (0.006–0.022 in).



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

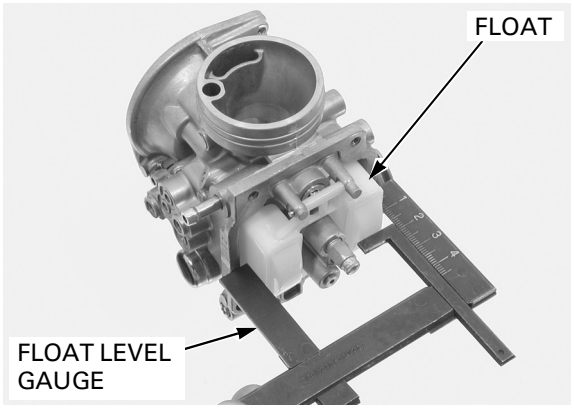
Set the float level gauge so that it is perpendicular to the float chamber face at the highest point of the float.

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

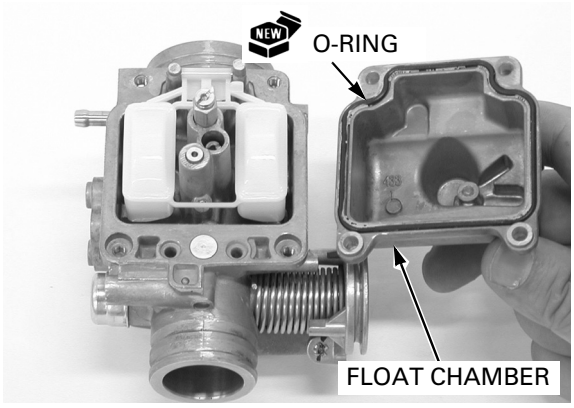
TOOL:
Carburetor float level gauge 07401-0010000

FLOAT LEVEL: 18.5 mm (0.73 in)

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

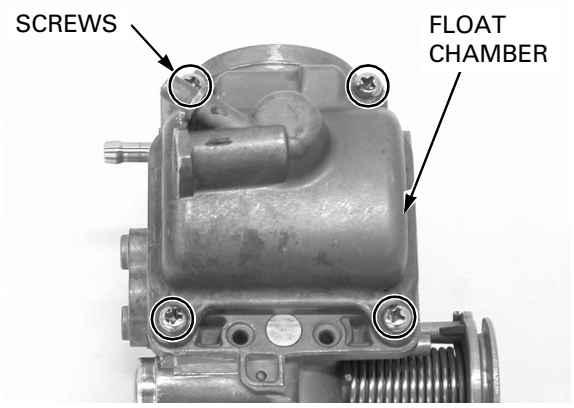


Install a new O-ring in the float chamber.
Install the float chamber.



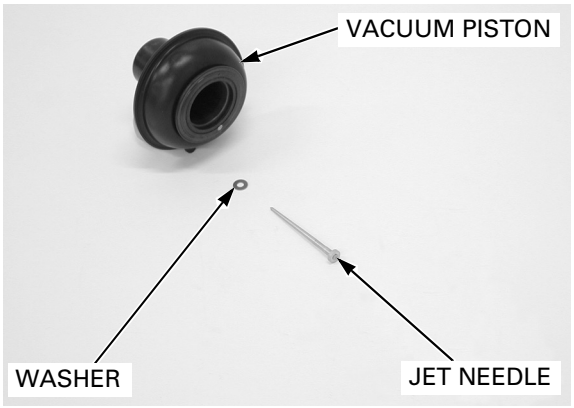
Install and tighten the float chamber screws to the specified torque.

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



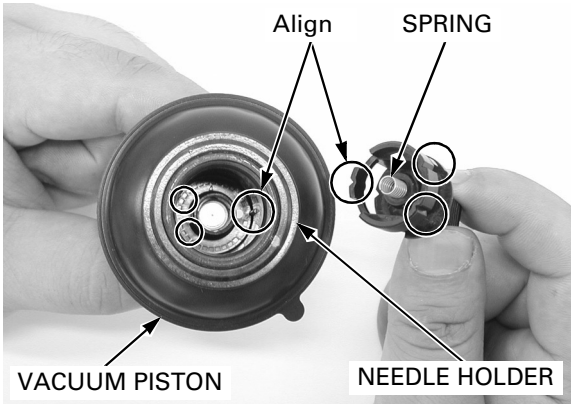
VACUUM CHAMBER

Install the washer and jet needle into the vacuum piston.



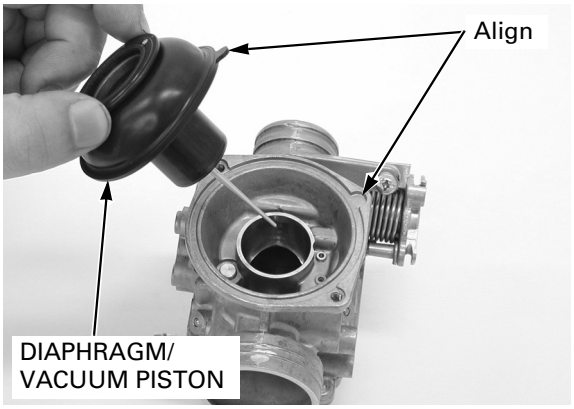
Install the spring onto the needle holder.

Install the needle holder into the vacuum piston by aligning the needle holder grooves and vacuum piston bosses.



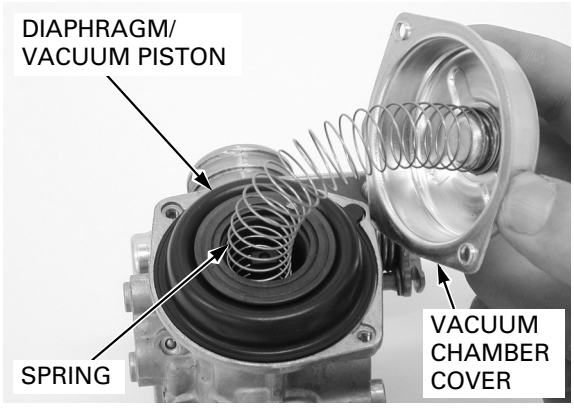
Be careful not to damage the jet needle.

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



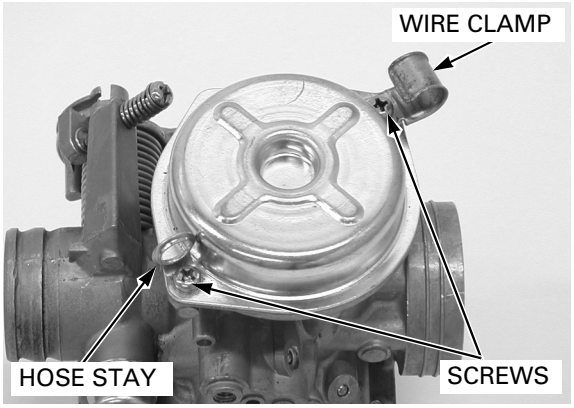
Hold the vacuum piston almost full open so the diaphragm is not pinched by the chamber cover.

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



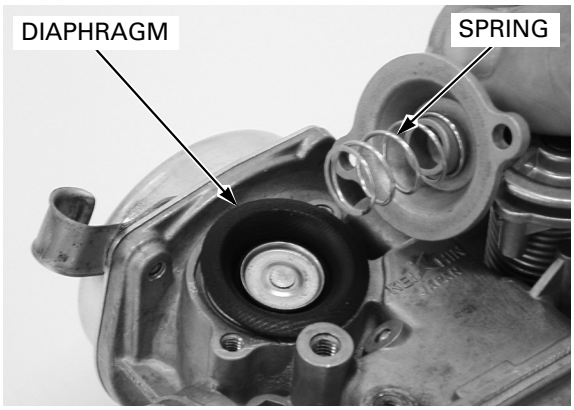
Install the wire clamp, hose stay and tighten the screws to the specified torque.

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



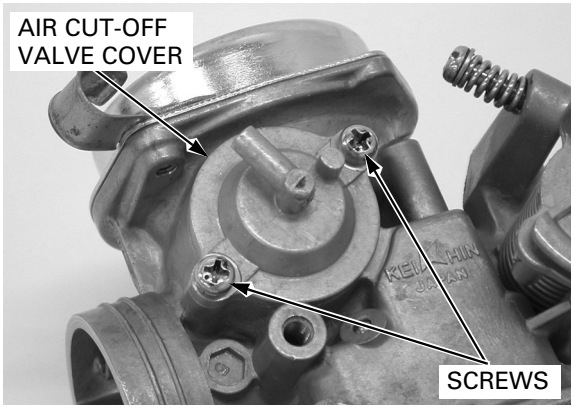
AIR CUT-OFF VALVE

Install the diaphragm and spring.



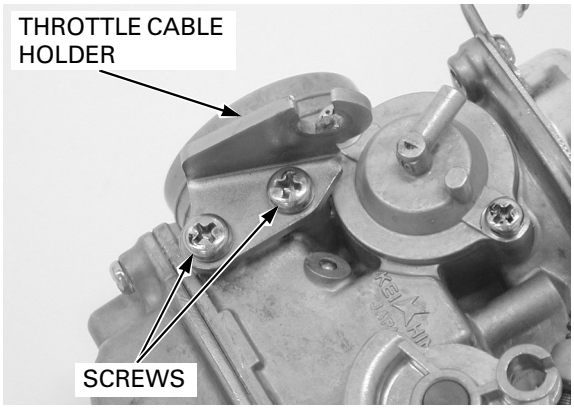
Install and hold the air cut-off valve cover, being careful not to pinch the diaphragm.
Install and tighten the screws to the specified torque.

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



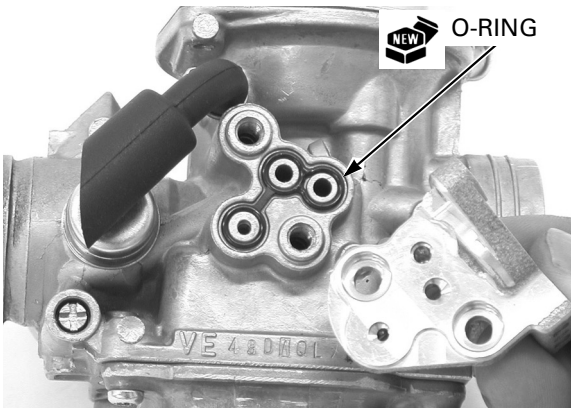
Install the throttle cable holder and tighten the screws to the specified torque.

TORQUE: 3.5 N·m (0.4 kgf·m, 2.9 lbf·ft)



STARTING ENRICHMENT (SE) THERMAL VALVE

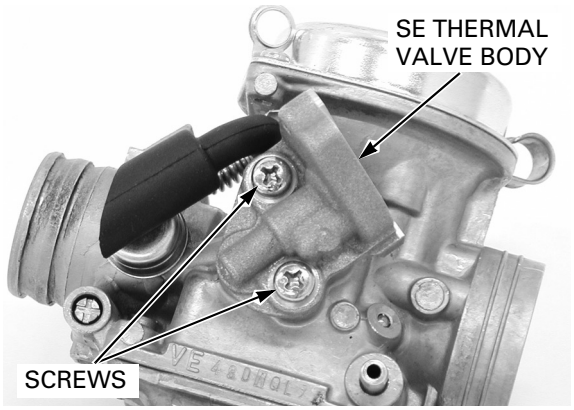
Install a new O-ring in the carburetor body groove.



Install the SE thermal valve body.

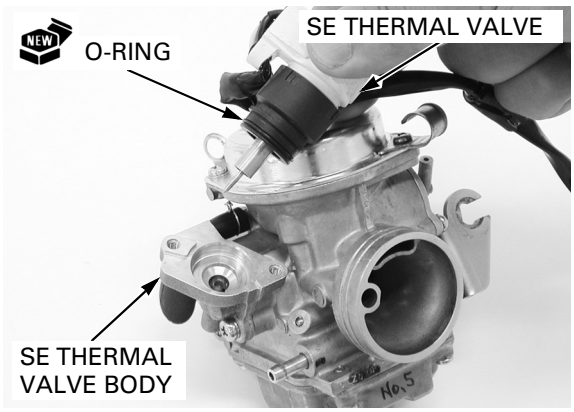
Install and tighten the screws to the specified torque.

TORQUE: 3.5 N·m (0.4 kgf·m, 2.9 lbf·ft)



Install a new O-ring to the SE thermal valve.

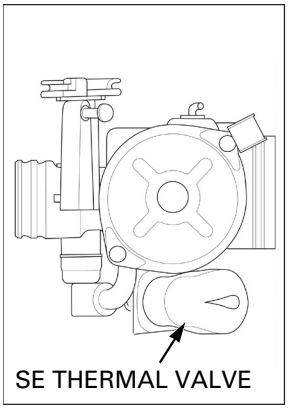
Install the SE thermal valve into the valve body until it fully seated.

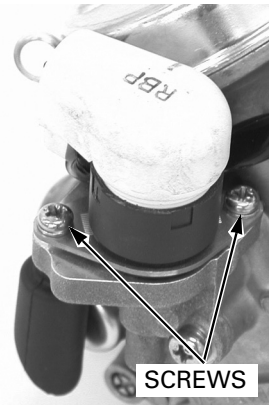


Set the SE thermal valve as shown.
Install the setting plate onto the SE thermal valve groove.
Install and tighten the screws to the specified torque.

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

Install the SE thermal valve cover onto the SE thermal valve.

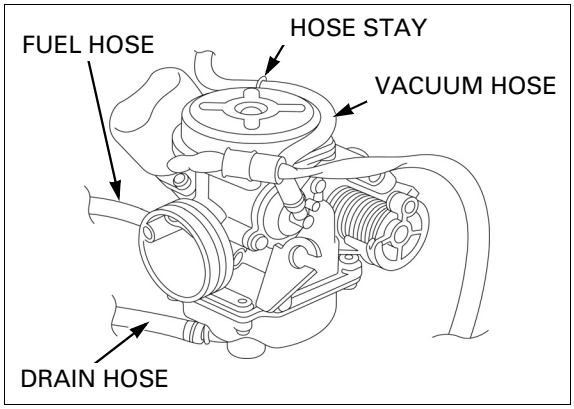




HOSES

Connect the air cut-off valve vacuum hose, fuel hose and drain hose to the carburetor.

Pass the vacuum hose though the hose stay.



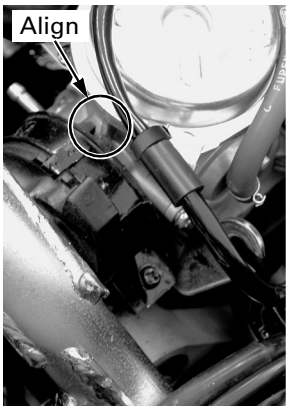
INSTALLATION

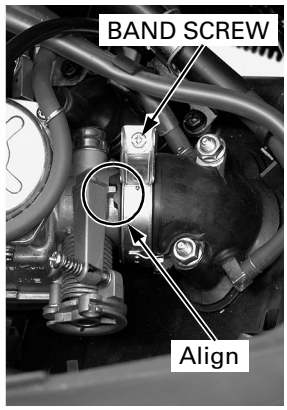
Connect the carburetor to the connecting hose by aligning the tabs of the connecting hose and tab of the carburetor.

Connect the carburetor to the insulator by aligning the tab of the carburetor and the tab of the insulator.

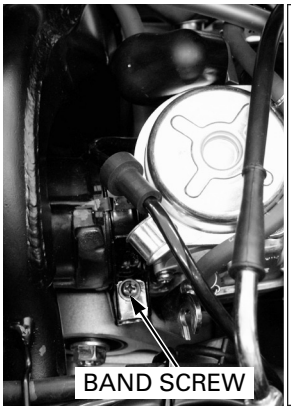
Tighten the insulator band screw.

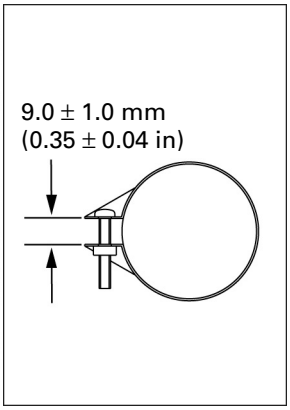
TORQUE: 2 N·m (0.2 kgf·m, 1.4 lbf·ft)



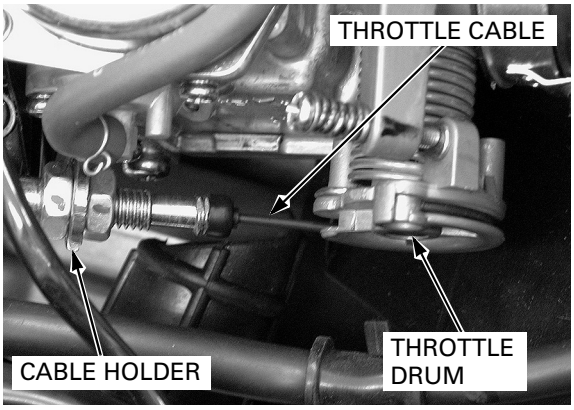


Set the connecting hose band as shown.
Tighten the connecting hose band screw so that the band ends clearance is 9.0 ± 1.0 mm (0.35 ± 0.04 in).

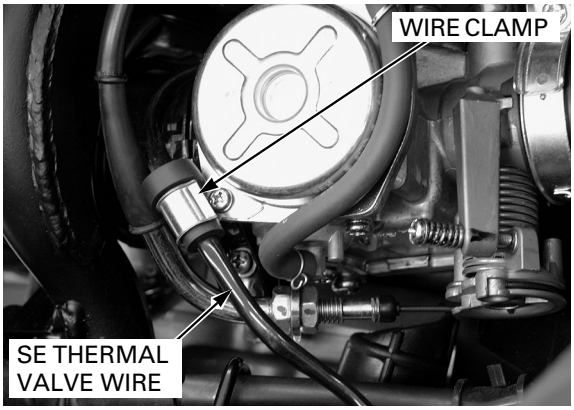




Connect the throttle cable to the throttle drum and install it to the cable holder.

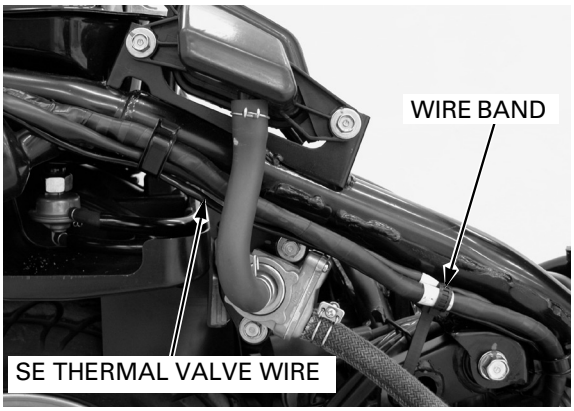


Bind the SE thermal valve wire with the carburetor wire clamp.

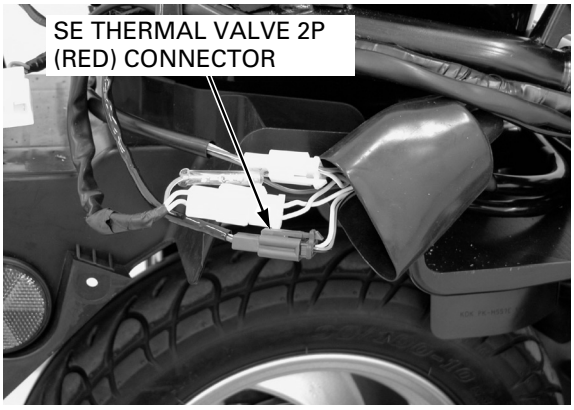


Route the wire harness properly (page 1-16).

Bind the SE thermal valve wire with the wire band.



Connect the SE thermal valve 2P (Red) connector.



Connect the vacuum hose to the three-way joint.

Connect the fuel hose to the carburetor.

Tighten the drain screw.

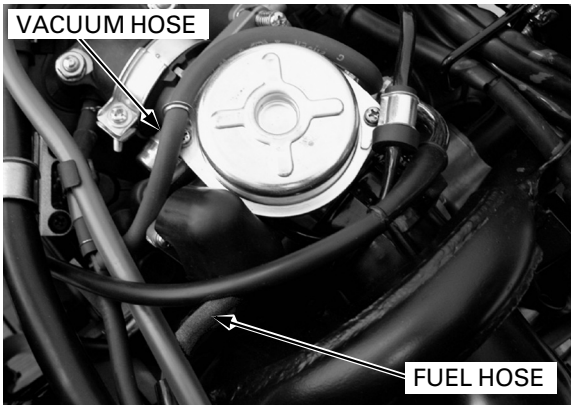
TORQUE: 1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)

After installing the carburetor, check for the following:

– Engine idle speed (page 3-13)
– Throttle grip free play (page 3-5)

Install the following:

– Body cover (page 2-8)
– Side cover (page 2-6)
– Rear center lower cover (page 2-6)
– Rear carrier (page 2-6)
– Luggage box (page 2-5)



PILOT SCREW ADJUSTMENT

- The pilot screw is factory pre-set and no adjustment is necessary unless the pilot screw is replaced.
- The engine must be warm for accurate adjustment. 10 minutes of stop-and-go riding is sufficient.
- Use a tachometer with graduations of 50 min^{-1} (rpm) or smaller that will accurately indicate a 50 min^{-1} (rpm) change.

IDLE DROP PROCEDURE

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.
   This is an initial setting prior to the final pilot screw adjustment.

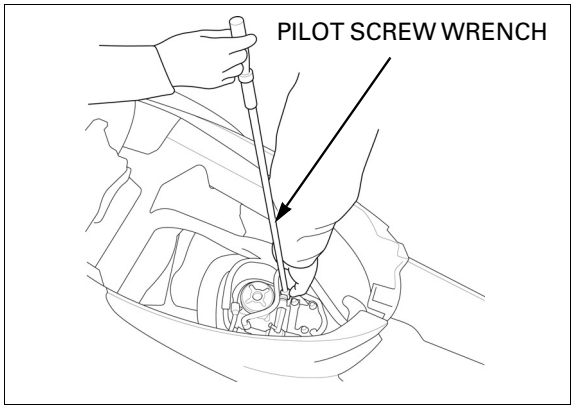
   TOOL:
   Pilot screw wrench 07908-4730002

   INITIAL OPENING: 1-3/4 turns out

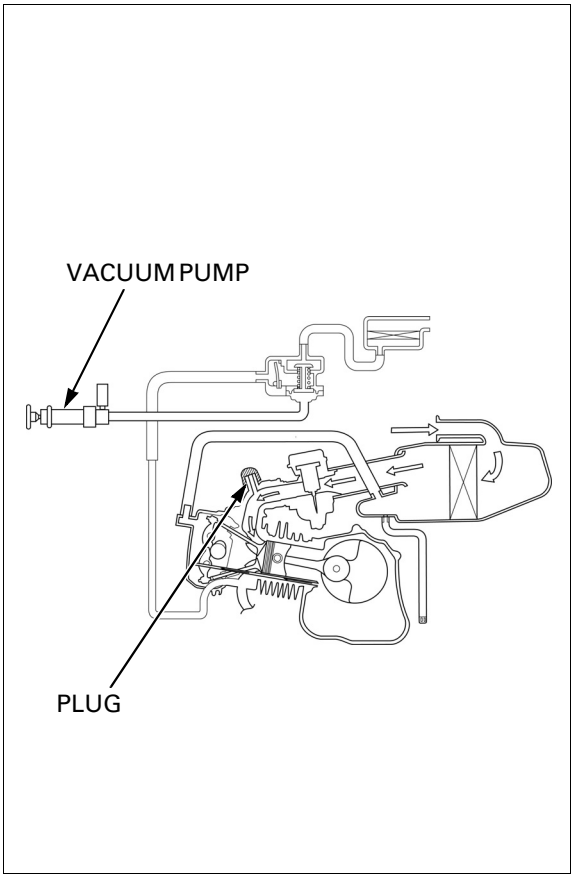
2. Warm the engine up to operating temperature.

   Stop and go riding for 10 minutes is sufficient.

3. Stop the engine and connect a tachometer according to the tachometer manufacturer's instructions.



4. Disconnect the vacuum hose of PAIR control valve, then connect it to the vacuum pump and plug the vacuum port.
5. Apply the specified vacuum to the PAIR control valve vacuum hose more than 60 kPa (450 mm Hg).



6. Start the engine and adjust the idle speed with the throttle stop screw.

   IDLE SPEED: 1,600 ± 100 min^{-1} (rpm)

7. Turn the pilot screw in or out slowly to obtain the highest engine speed.
8. Lightly open the throttle 2 or 3 times, then adjust the idle speed with the throttle stop screw.
9. Turn the pilot screw in gradually until the engine speed drops by 100 min^{-1} (rpm)
10. Turn the pilot screw outward to the final opening.

    FINAL OPENING: 1/4 turns out from the position obtained in step 9

11. Disconnect the plug from the vacuum port, then remove the vacuum pump and connect the vacuum hose of PAIR control valve.
12. Readjust the idle speed with the throttle stop screw.

    IDLE SPEED: 1,700 ± 100 min^{-1} (rpm)

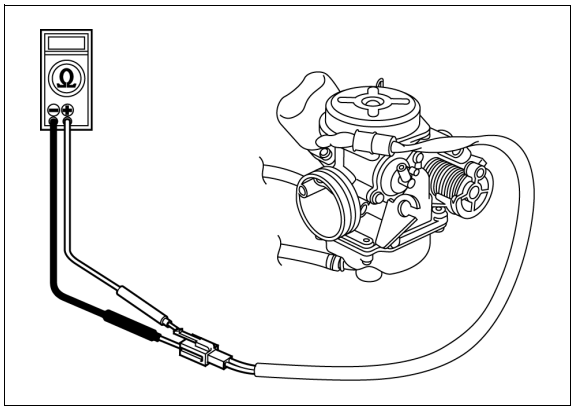
STARTING ENRICHMENT (SE) THERMAL VALVE

INSPECTION

If the engine has been running, let it cool for 10 minutes or more.

Measure the resistance between the SE thermal valve connector terminals.

Standard: 5 Ω (20°C/68°F)



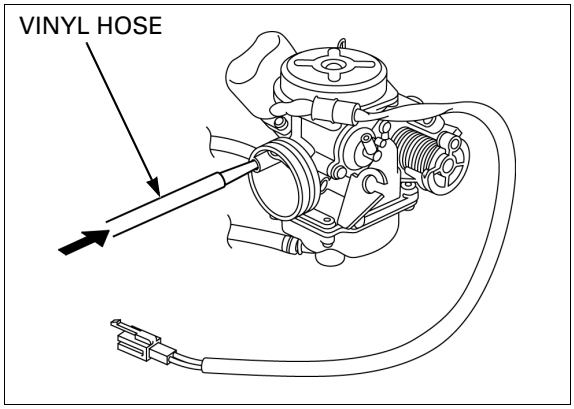
The SE thermal valve might be normal if the resistance is only slightly out of specification. However, be sure to check all related parts for trouble.

Replace the SE thermal valve with a new one if resistance is out of specification or if there is no continuity.

Let it cool down for 30 minutes.
Insert the vinyl hose into the fuel enrichment circuit and blow into the hose.

Air should flow into the circuit.

If air dose not flow into the circuit, replace the SE thermal valve.

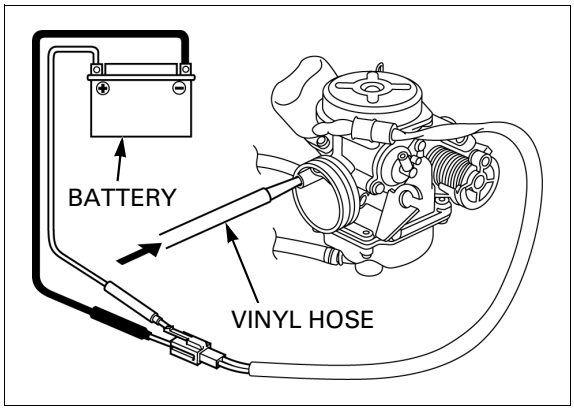


Connect the 12 V battery to the SE thermal valve connector terminals for 5 minutes.

Insert the vinyl hose into the fuel enrichment circuit and blow into the hose.

Air should not flow into the circuit.

If air flows into the circuit, replace the SE thermal valve.



SE THERMAL VALVE RESISTOR

INSPECTION

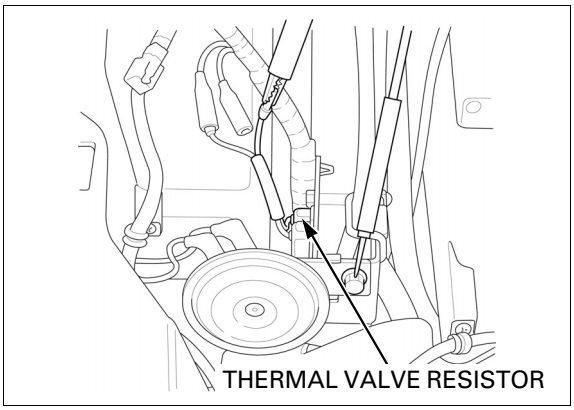
Remove the front cover (page 2-11).

Disconnect the SE thermal valve resistor.

Measure the resistance between the Green terminal of the resistor side and ground.

Standard: 7.6 – 9.4 Ω (20°C/68°F)

If there out of specification, replace the SE thermal valve resistor.



SECONDARY AIR SUPPLY SYSTEM

SYSTEM INSPECTION

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

Remove the luggage box (page 2-5).

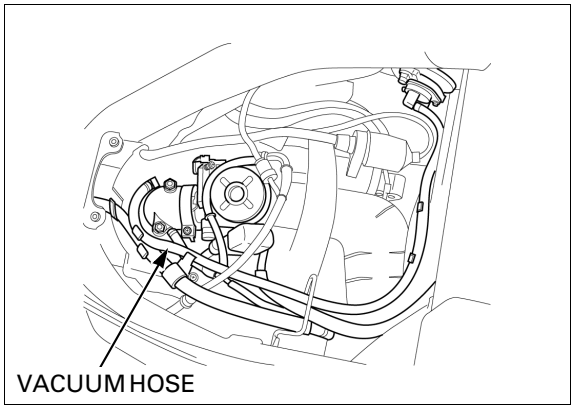
Remove the screws and secondary air cleaner housing cover.

Remove the secondary air cleaner element.

Check that the air intake port is clean and free of carbon deposits.

If the ports are carbon fouled, check the PAIR check valve.

Disconnect the PAIR control valve vacuum hose from the intake pipe 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 port.
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.

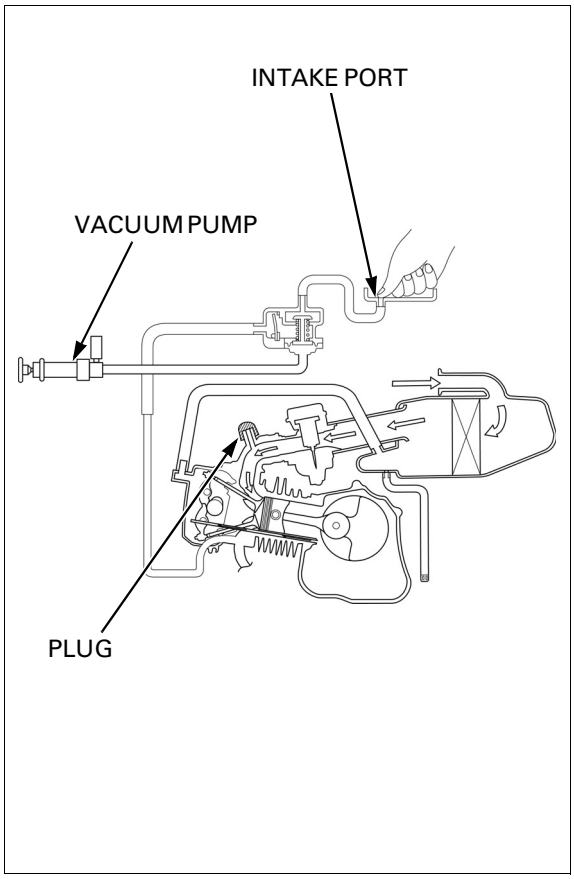
SPECIFIED VACUUM: 60 kPa (450 mm Hg)

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

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

Installation is in the reverse order of removal.

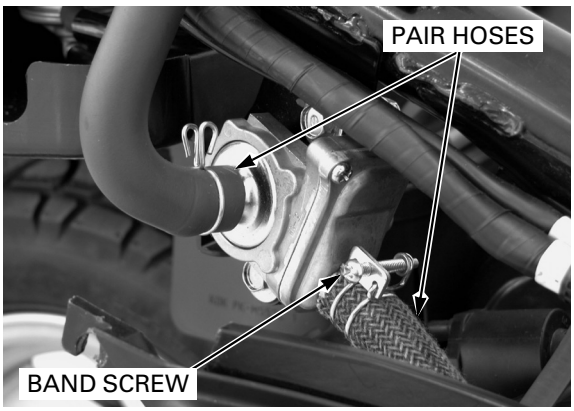
TORQUE: SECONDARY AIR CLEANER HOUSING COVER SCREW:
1.1 N·m (0.1 kgf·m, 0.7 lbf·ft)



PAIR CONTROL VALVE REMOVAL/ INSTALLATION

Remove the body cover (page 2-8).

Loosen the band screw and disconnect the PAIR hoses from PAIR control valve.

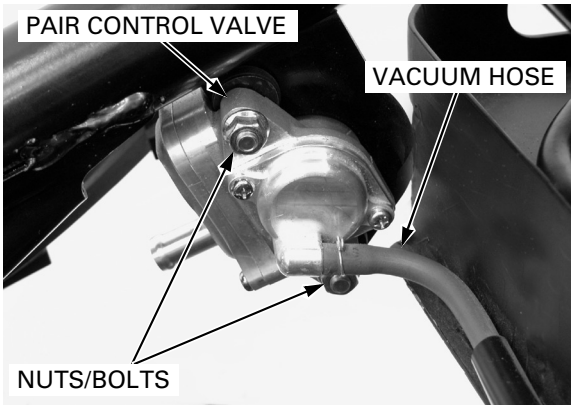


Disconnect the PAIR control valve vacuum hose.

Remove the nuts, bolts and PAIR control valve.

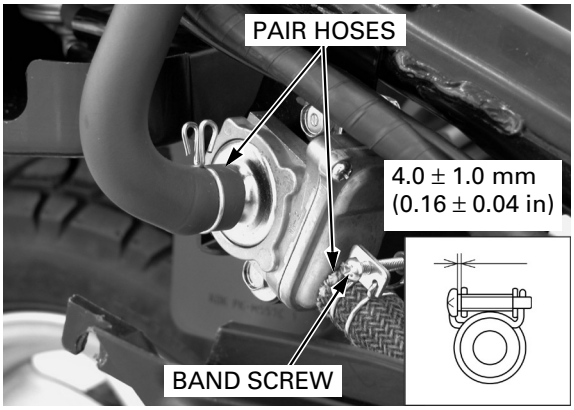
Install the PAIR control valve, bolts and tighten the nut.

Connect the PAIR control valve vacuum hose.



Connect the PAIR hoses.
Tighten the hose band screw until the clearance between the screw and the band end is 4.0 ± 1.0 mm (0.16 ± 0.04 in).

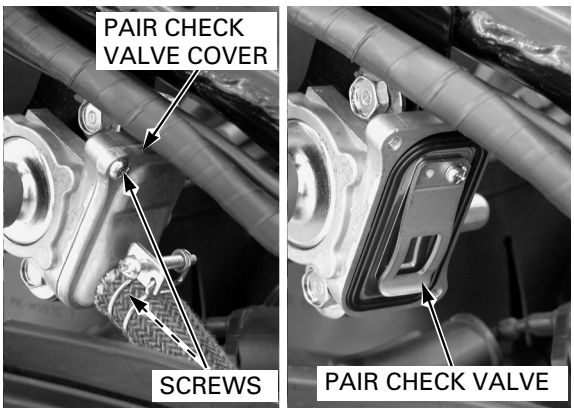
Install the body cover (page 2-8).



PAIR CHECK VALVE INSPECTION

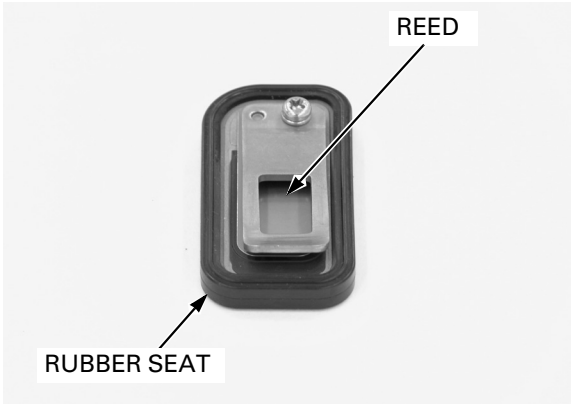
Remove the body cover (page 2-8).

Remove the screws and PAIR check valve cover.



Check the reed for damage or fatigue, and 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.



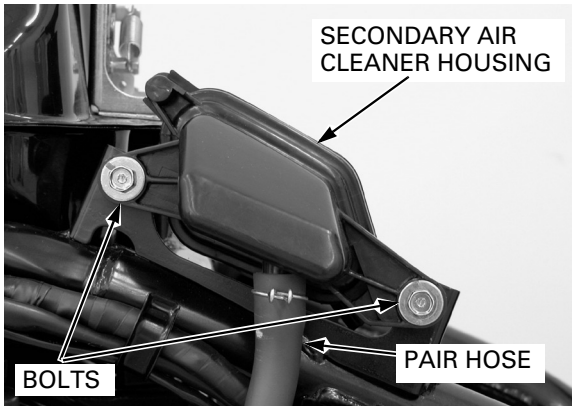
SECONDARY AIR CLEANER HOUSING REMOVAL/INSTALLATION

Remove the body cover (page 2-8).

Disconnect the PAIR hose.

Remove the bolts and secondary air cleaner housing.

Installation is in the reverse order of removal.

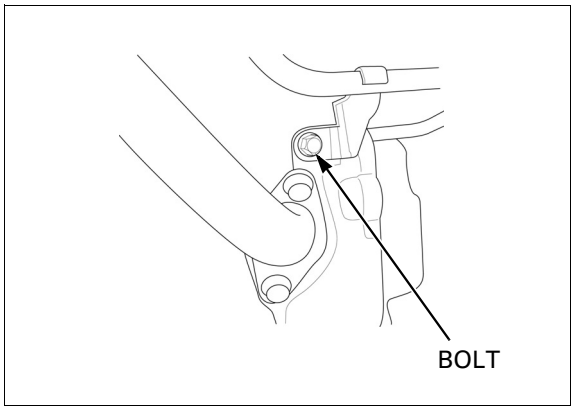


PAIR PIPE REMOVAL/INSTALLATION

Remove the following:

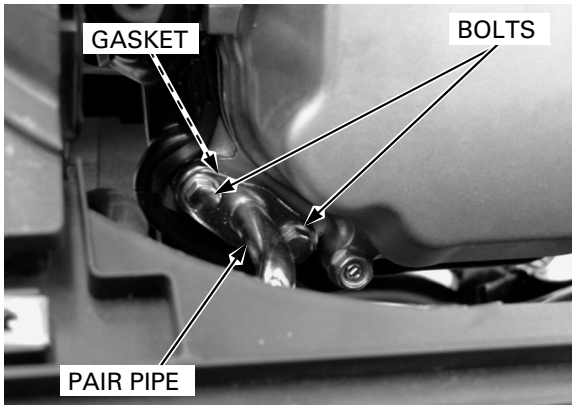
– Maintenance lid (page 3-8)
– Right side skirt (page 2-7)

Remove the bolt from the PAIR pipe stay.

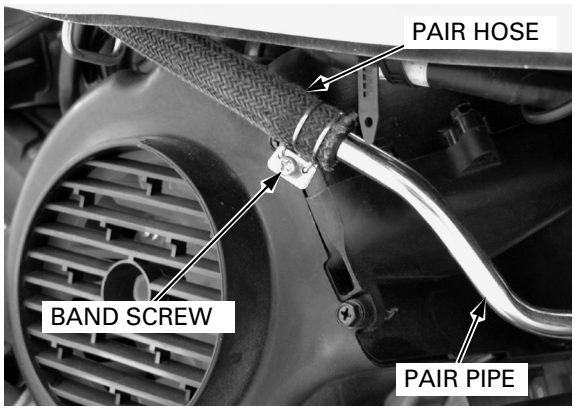


Remove the bolts from the PAIR pipe.

Remove the gasket.

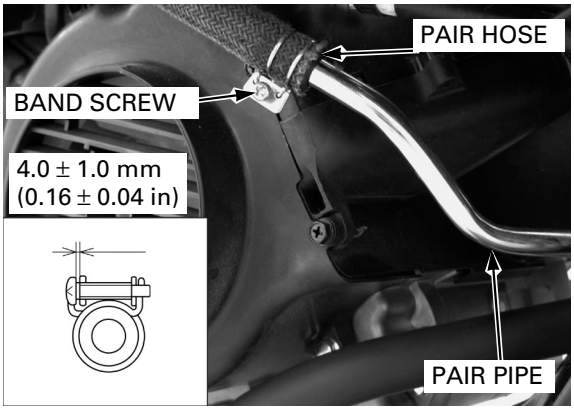


Loosen the band screw and disconnect the PAIR pipe from the PAIR hose.

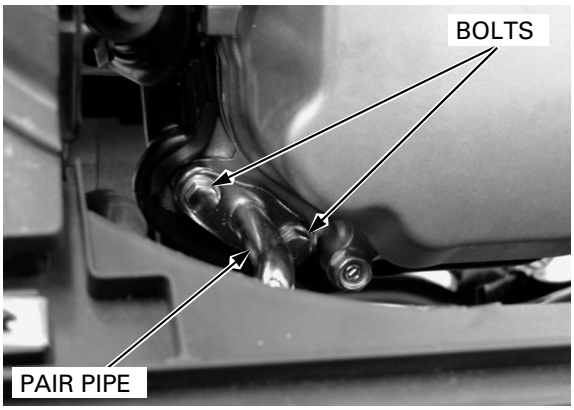


Install a new gasket to the cylinder head.

Connect the PAIR pipe to the hose and tighten the band screw.
Tighten the hose band screw until the clearance between the screw and the band end is 4.0 ± 1.0 mm (0.16 ± 0.04 in).



Install the PAIR pipe and bolts but do not tighten yet.



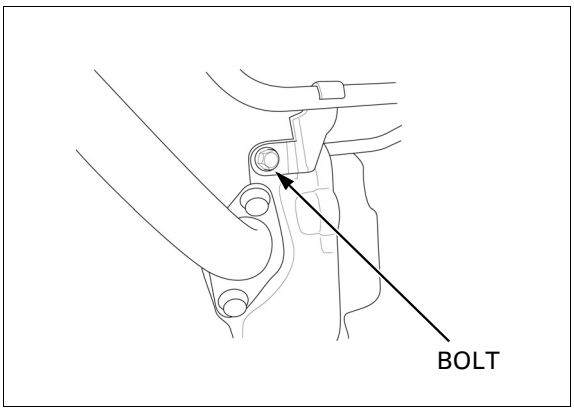
Install the bolt to the lower side.

Tighten the upper bolts first, then tighten the lower bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the following:

– Right side skirt (page 2-7)
– Maintenance lid (page 3-9)

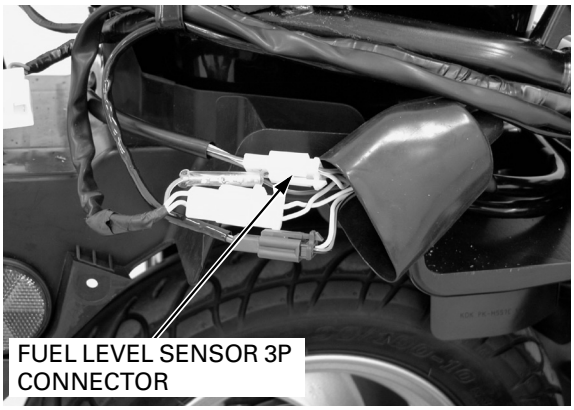


FUEL TANK

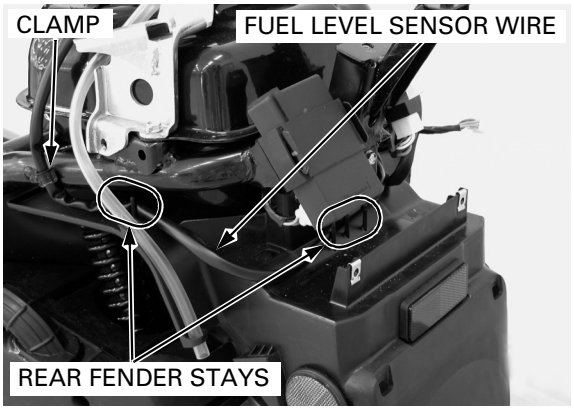
REMOVAL/INSTALLATION

Remove the body cover (page 2-8).

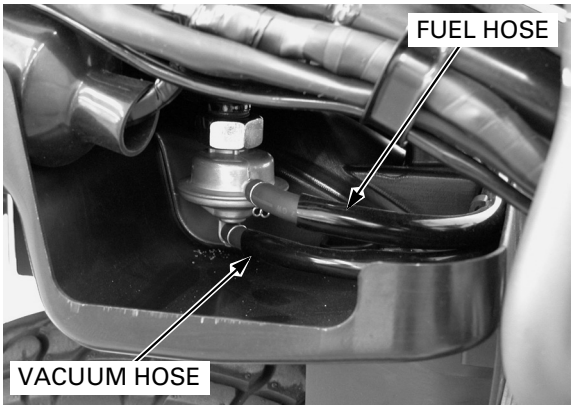
Disconnect the fuel level sensor 3P connector.



Release the fuel level sensor wire from the frame clamp and rear fender stays.



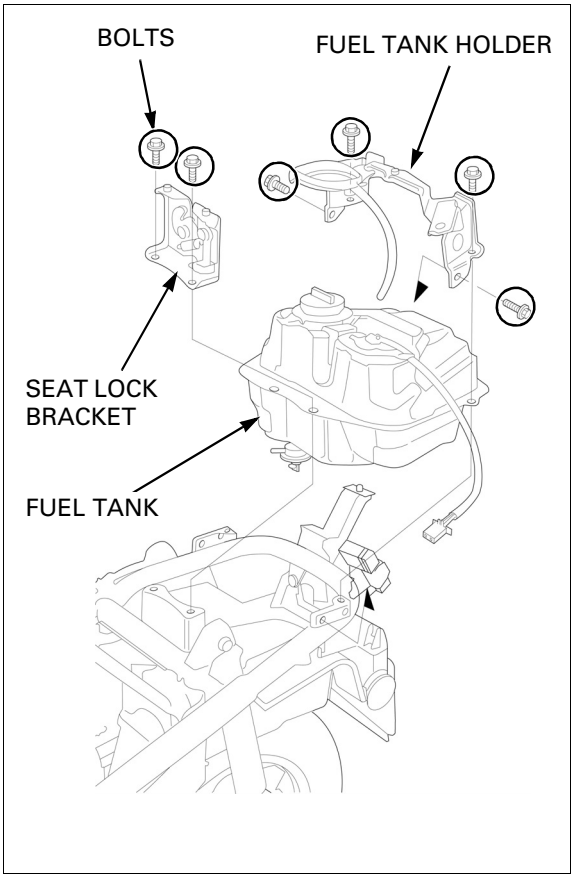
Disconnect the fuel hose and vacuum hose from the fuel auto valve.



Remove the bolts, seat lock bracket, fuel tank holder and fuel tank.

Installation is in the reverse order of removal.

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



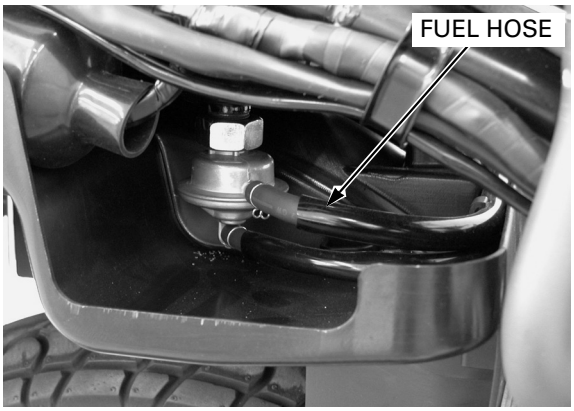
FUEL AUTO VALVE

INSPECTION

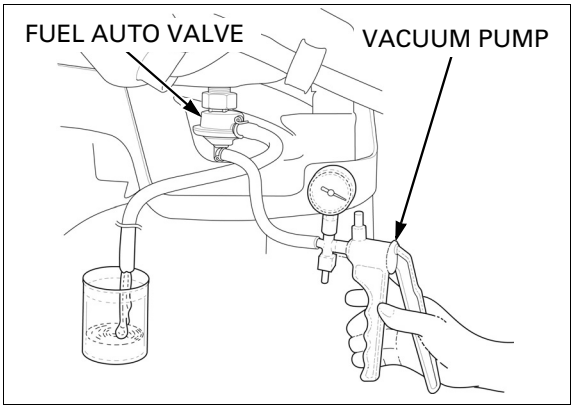
Remove the luggage box (page 2-5).

Stop the engine and disconnect the fuel hose.

Check the fuel does not come from the fuel auto valve.



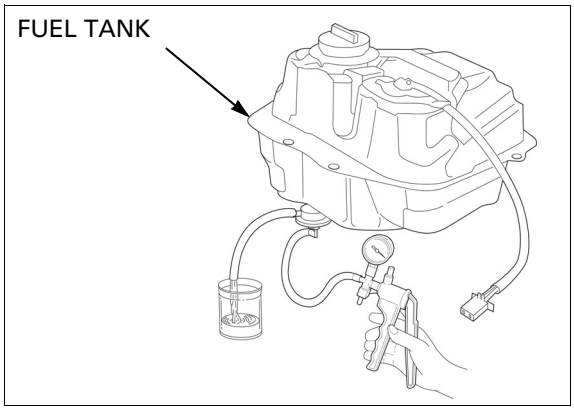
Disconnect the fuel hose from the fuel auto valve and connect a suitable fuel drain hose.
Place a suitable container under the fuel drain hose.
Disconnect the vacuum hose from the fuel auto valve and connect a commercially available vacuum pump to the diaphragm vacuum outlet.
Fuel should flow out from the fuel hose when vacuum is applied.
If fuel flow is restricted or does not flow, replace the fuel auto valve.



REMOVAL

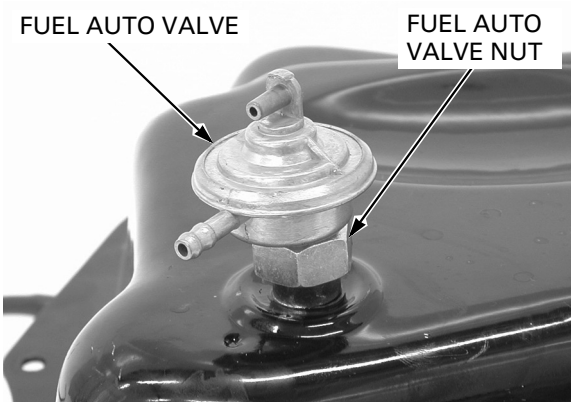
Remove the fuel tank (page 5-29).

Connect a suitable fuel drain hose.
Place a suitable container under the fuel drain hose.
Connect a commercially available vacuum pump to the diaphragm vacuum outlet.
Squeeze the vacuum pump and drain fuel from the fuel tank.

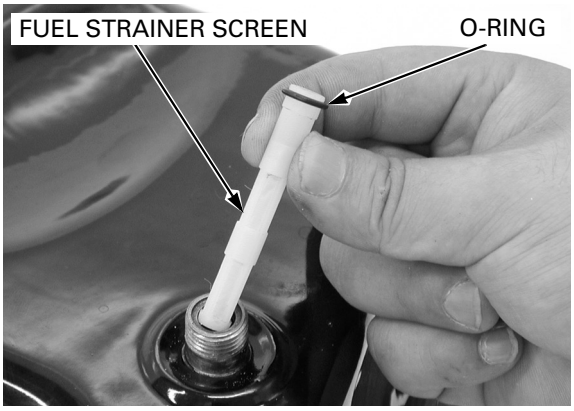


Loosen the valve nut and remove the fuel auto valve.

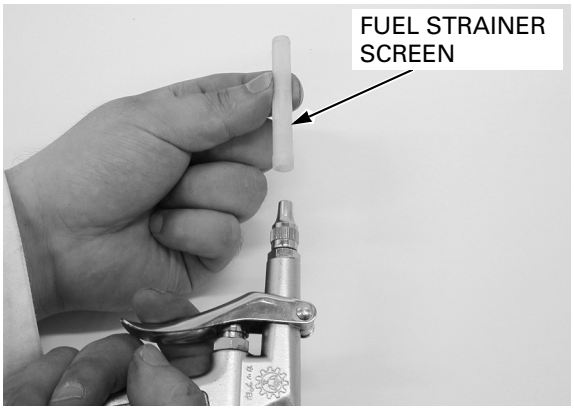
Wipe off spilled out fuel.



Remove the fuel strainer screen.
Remove the O-ring from the fuel strainer screen.

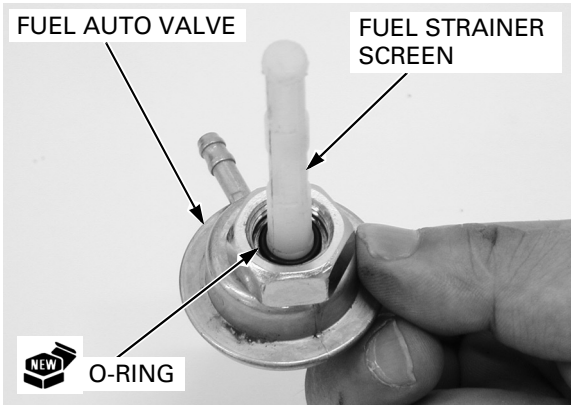


Clean the fuel strainer screen with compressed air.

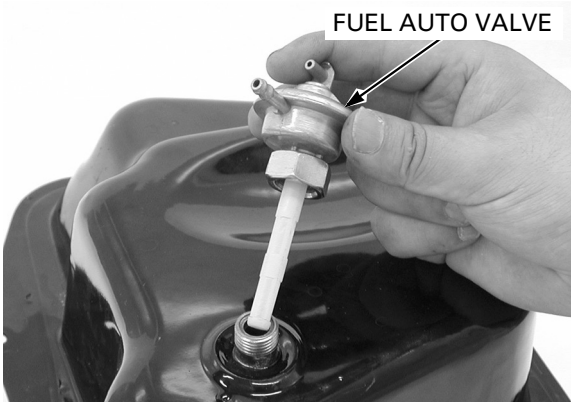


INSTALLATION

Set the fuel strainer screen and a new O-ring onto the fuel auto valve.



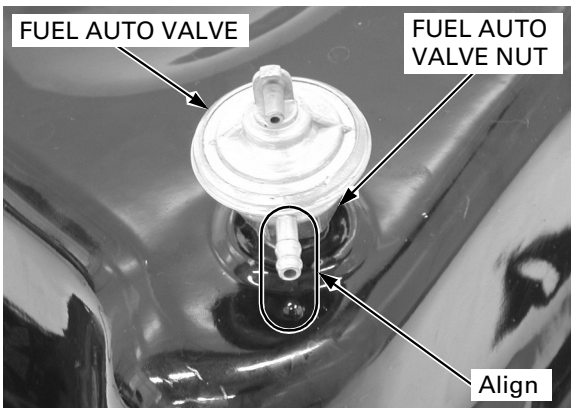
Install the fuel auto valve into the fuel tank.



Align the joint of fuel auto valve and punch mark on the fuel tank.
Tighten the fuel auto valve nut to the specified torque.

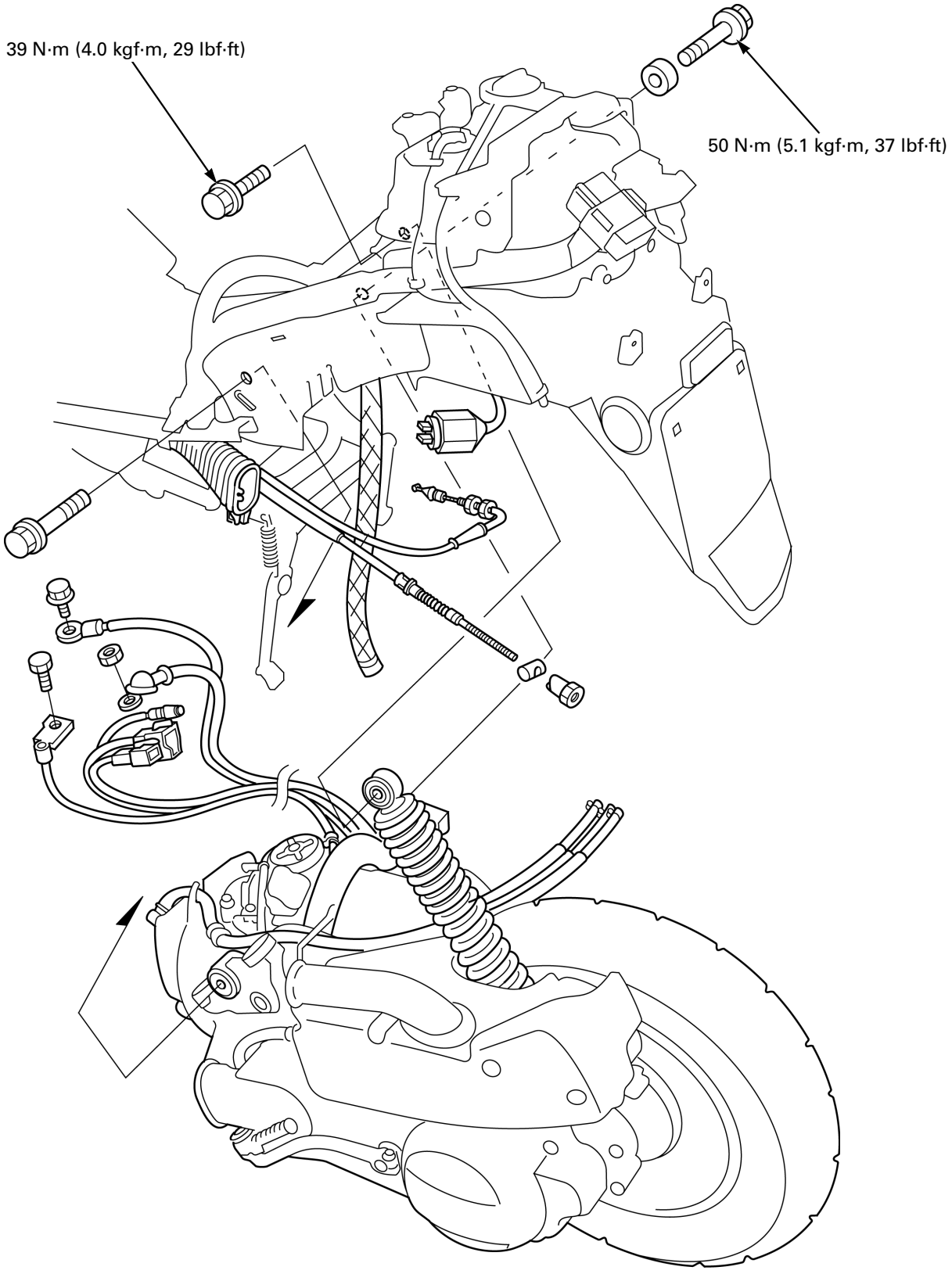
TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Installation is in the reverse order of removal.



6. ENGINE REMOVAL/INSTALLATION

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- Support the engine using a jack or other adjustable support to ease of engine mounting bolt removal.
- When removing/installing the engine, tape the frame around the engine beforehand for frame protection.
- The following components can be serviced with the engine installed in the frame.
  - Drive pulley/driven pulley/clutch
  - Final reduction
  - Alternator
  - Carburetor
  - Oil pump
- The following components require engine removal for service.
  - Cylinder head/valves
  - Cylinder/piston
  - Crankcase/crankshaft

SPECIFICATION

ITEM		SPECIFICATIONS
Engine dry weight		25.5 kg (56.2 lbs)
Engine oil capacity	After draining	0.8 liter (0.8 US qt, 0.7 Imp qt)
	After disassembly	0.9 liter (1.0 US qt, 0.8 Imp qt)

TORQUE VALUES

Engine mounting bolt (frame side)	50 N·m (5.1 kgf·m, 37 lbf·ft)
Engine hanger link nut (engine side)	50 N·m (5.1 kgf·m, 37 lbf·ft)
Rear shock absorber upper mounting bolt	39 N·m (4.0 kgf·m, 29 lbf·ft)

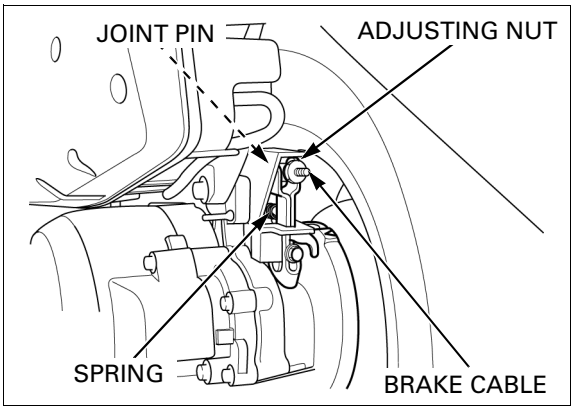
ENGINE REMOVAL

Remove the following:

– Body cover (page 2-8)
– Floor panel (page 2-9)

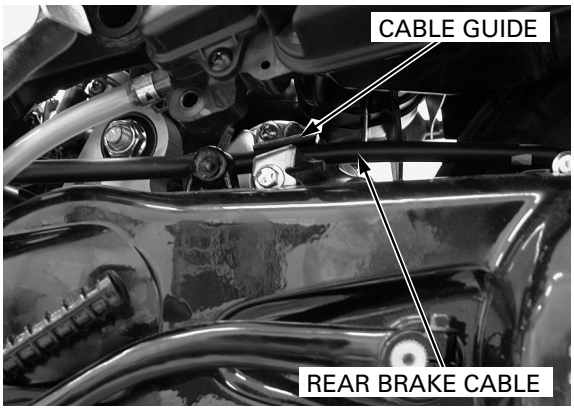
Support the scooter with its center stand.

Remove the rear brake adjusting nut, brake cable, joint pin and spring.

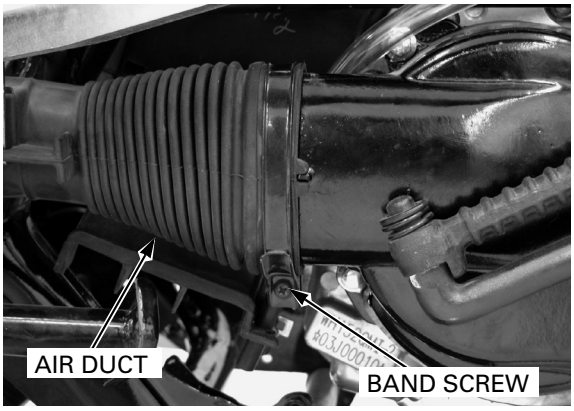


Remove the air cleaner housing mounting bolts.

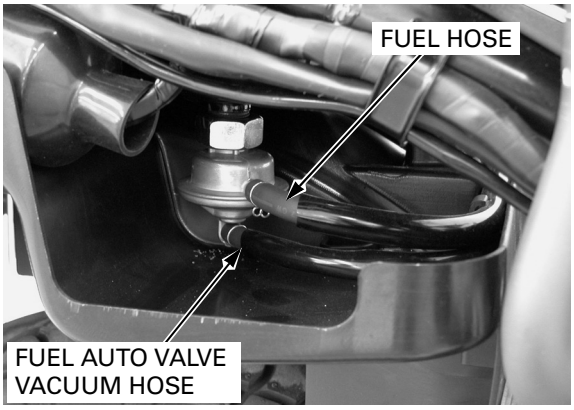
Lift up the air cleaner housing and release the rear brake cable from the cable guide.



Loosen the band screw and disconnect the air duct from the left crankcase cover.

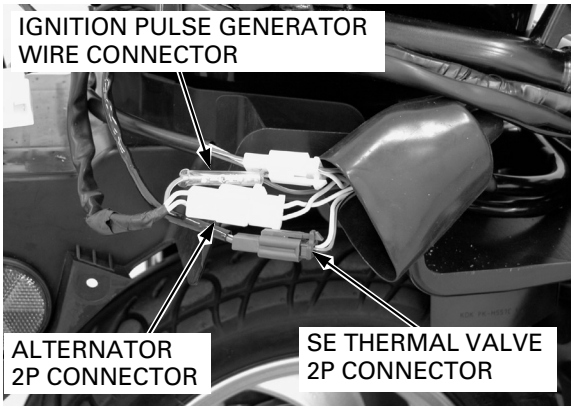


Disconnect the fuel hose and vacuum hose from the fuel auto valve.



Disconnect the following:

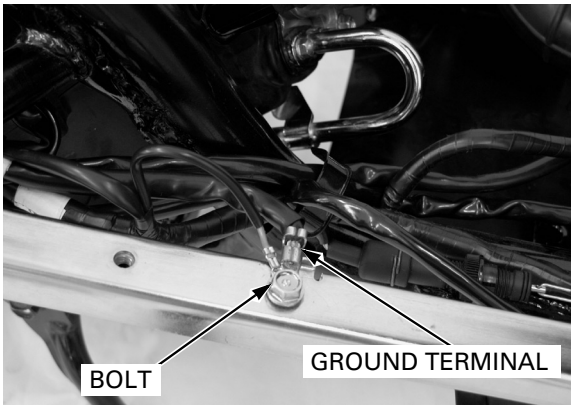
- Starting enrichment (SE) thermal valve 2P connector
- Alternator 2P connector
- Ignition pulse generator wire connector



Release the SE thermal valve wire and alternator/ ignition pulse generator wire from the wire band.

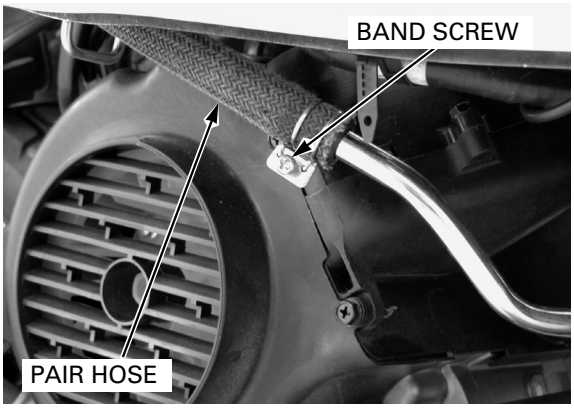
Release the starter motor cable, battery negative (–) cable, ground cable and Ignition coil primary wire from the wire band.

Remove the bolt and ground terminal.

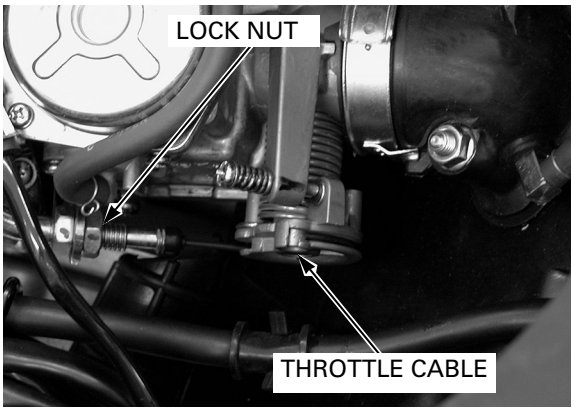


Release the starter motor cable and battery negative (–) cable from the frame clamp.

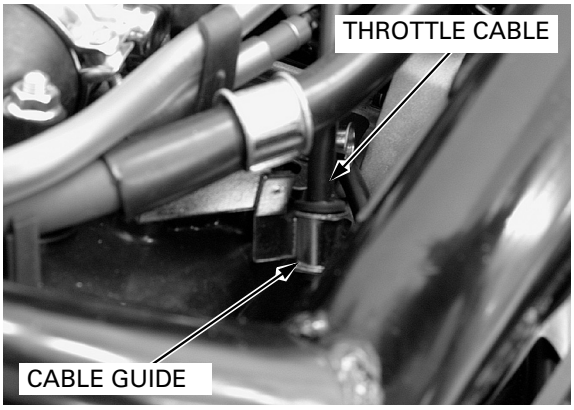
Loosen the band screw and disconnect the PAIR hose.



Loosen the throttle cable lock nut.
Remove the throttle cable from the cable holder and disconnect the throttle cable from the throttle drum.

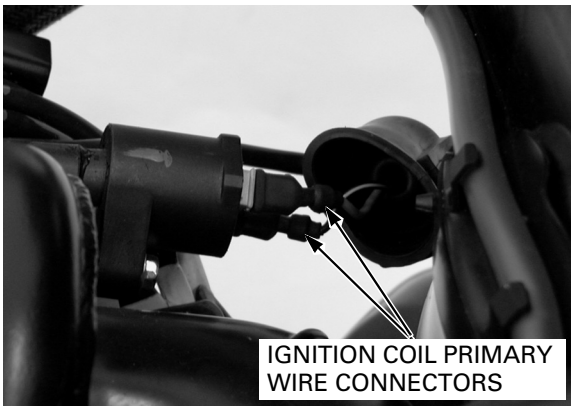


Release the throttle cable from the cable guide.



Disconnect the vacuum hose from the PAIR control valve.

Disconnect the ignition coil primary wire connectors.



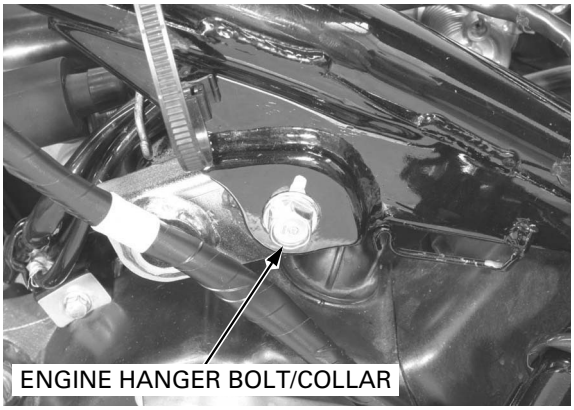
Disconnect the spark plug cap.

Pull out the following from the frame clamps:

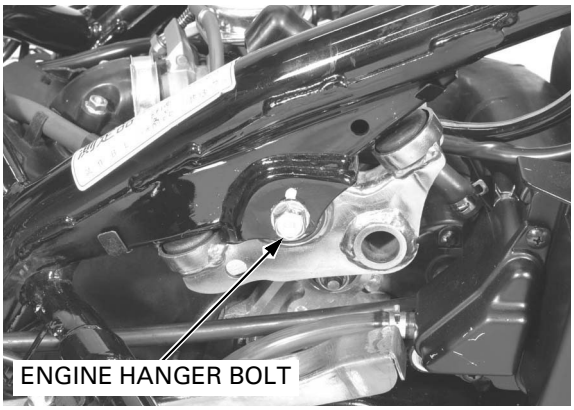
- Starter motor cable
- Ground cable
- Alternator/ignition pulse generator wire
- Battery negative (–) cable
- Ignition coil primary wire
- Spark plug wire
- SE thermal valve wire

Remove the rear shock absorber upper mounting bolt.

Remove the right side engine hunger bolt and collar.



Remove the left side engine hanger bolt.
Remove the engine from the frame.



ENGINE HANGER BRACKET REMOVAL/INSPECTION

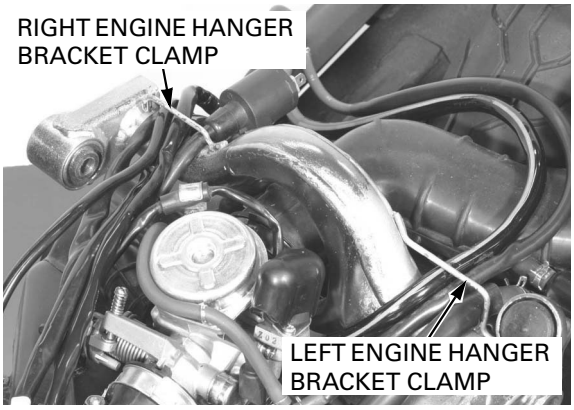
REMOVAL

Remove the engine (page 6-4).

Disconnect the crankcase breather hose from the air cleaner.

Remove the following from the right side engine hanger bracket clamp:

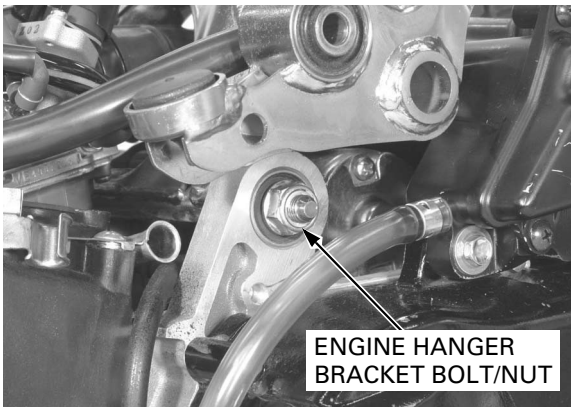
- Starter motor cable
- Ground cable
- Alternator/ignition pulse generator wire
- Battery negative (–) cable
- Ignition coil primary wire
- Spark plug wire
- SE thermal valve wire



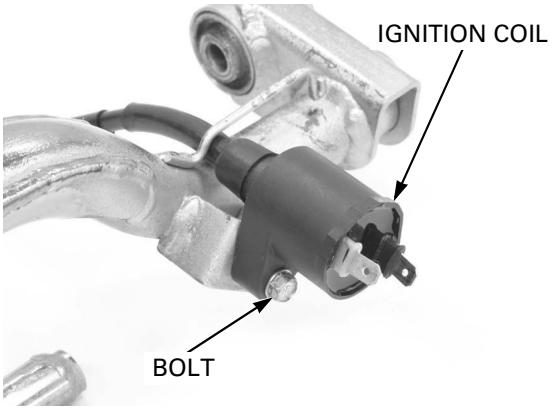
Remove the following from the left side engine hanger bracket clamp:

- Fuel hose
- Vacuum hoses
- Crankcase breather hose

Remove the engine hanger bracket bolt, nut and engine hanger bracket from the engine.

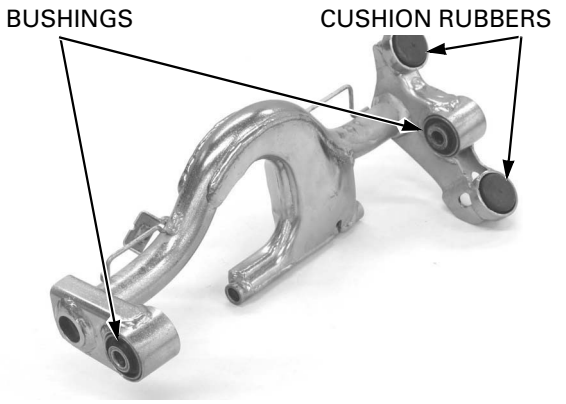


Remove the bolt and ignition coil from the engine hanger bracket.

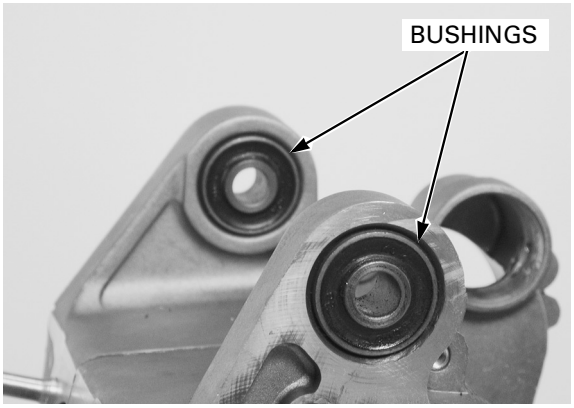


INSPECTION

Check the engine hanger bracket bushings and cushion rubbers for wear or damage.

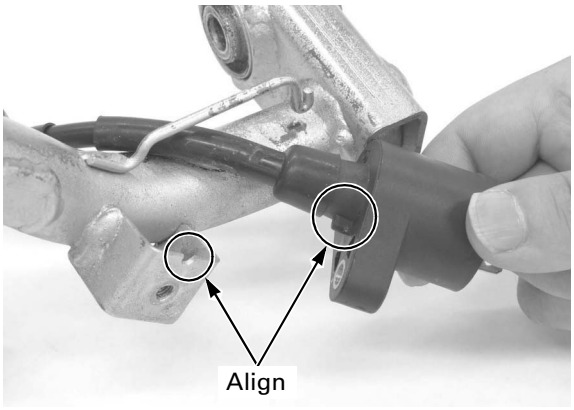


Check the engine mounting bushings wear and damage.

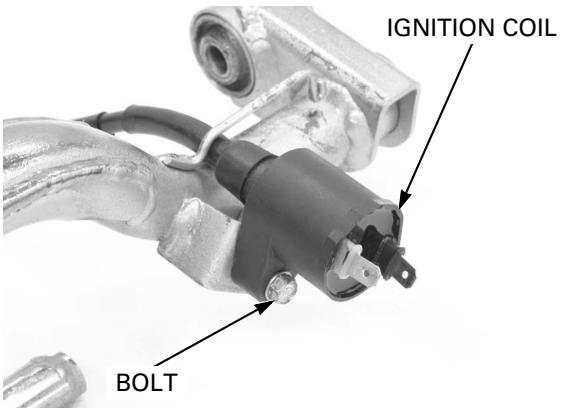


ENGINE HANGER BRACKET INSTALLATION

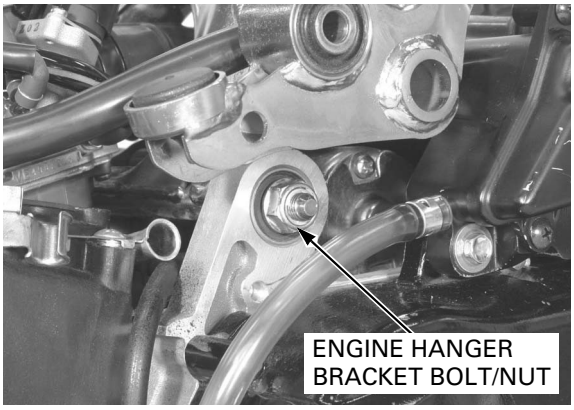
Install the ignition coil to the engine hanger bracket by aligning the boss on the ignition coil and cut-off of the engine hunger bracket.



Install and tighten the bolt.



Install the engine hanger bracket onto the engine.
Install the engine hanger bracket bolt and nut but do not tighten yet.



Route the wire harness properly (page 1-16).

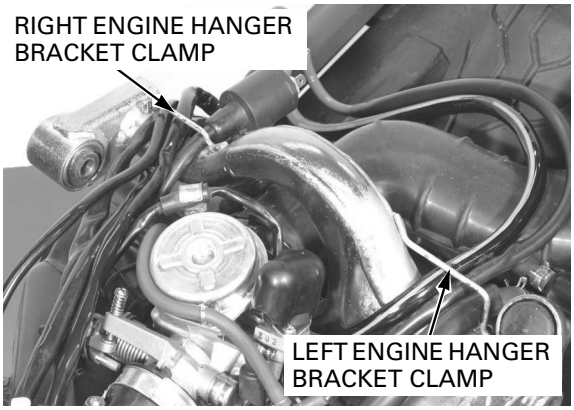
Install the following onto the left side engine hanger bracket clamp:

- Crankcase breather hose
- Vacuum hoses
- Fuel hose

Route the wire harness properly (page 1-16).

Install the following onto the right side engine hanger bracket clamp:

- Starter motor cable
- Ground cable
- Alternator/ignition pulse generator wire
- Ignition coil primary wire
- Battery negative (–) cable
- Spark plug wire
- SE thermal valve wire



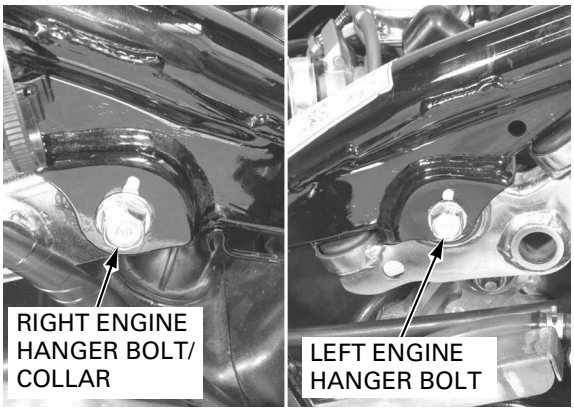
Connect the crankcase breather hose to the air cleaner.

Install the engine (page 6-11).

ENGINE INSTALLATION

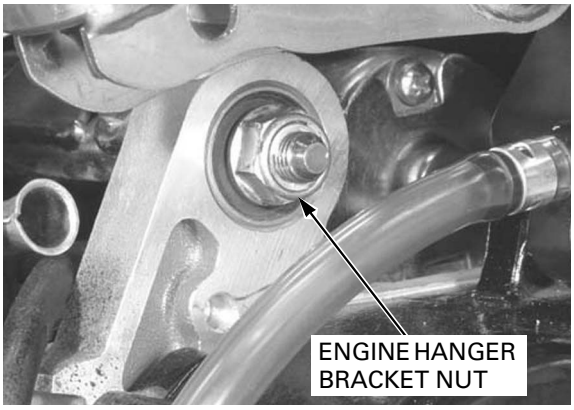
Support the scooter with its center stand.
Install the engine to the frame.
Install the right engine hanger bolt and collar.
Install the left engine hanger bolt.
Tighten the right and left engine hanger bolts.

TORQUE: 50 N·m (5.1 kgf·m, 37 lbf·ft)



Tighten the engine hanger bracket nut.

TORQUE: 50 N·m (5.1 kgf·m, 37 lbf·ft)



Install and tighten the rear shock absorber upper mounting bolt.

TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)

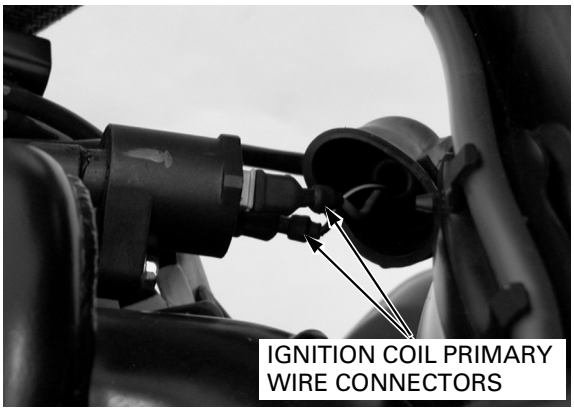
Route the wire harness properly (page 1-16).

Route the following to the frame clamps:

- SE thermal valve wire
- Spark plug wire
- Ignition coil primary wire
- Battery negative (–) cable
- Alternator/ignition pulse generator wire
- Ground cable
- Starter motor cable

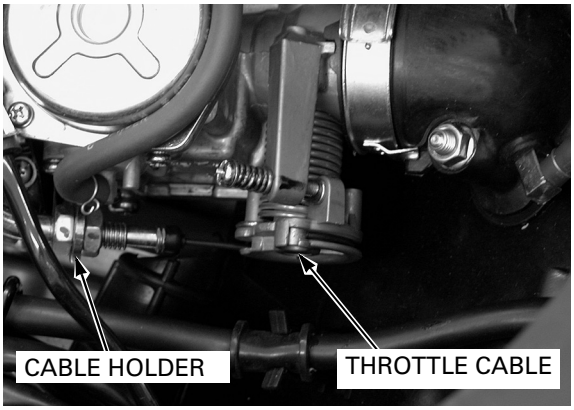
Connect the spark plug cap.

Connect the ignition coil primary wire connectors.

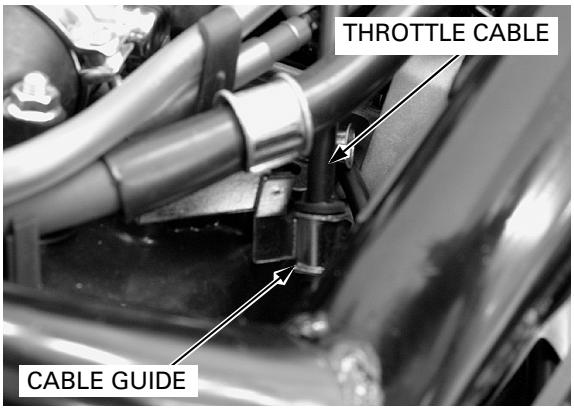


Connect the vacuum hose to the PAIR control valve.

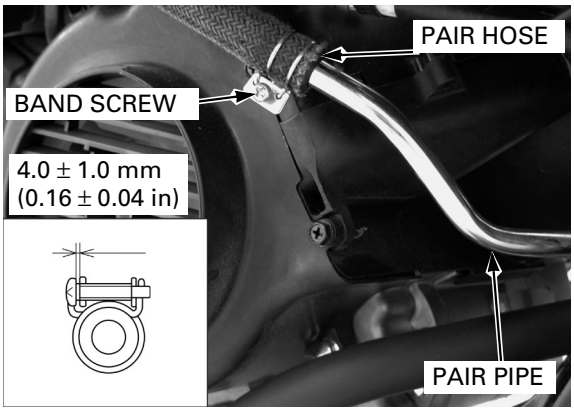
Connect the throttle cable to the throttle drum and cable holder.



Bind the throttle cable with the cable guide.



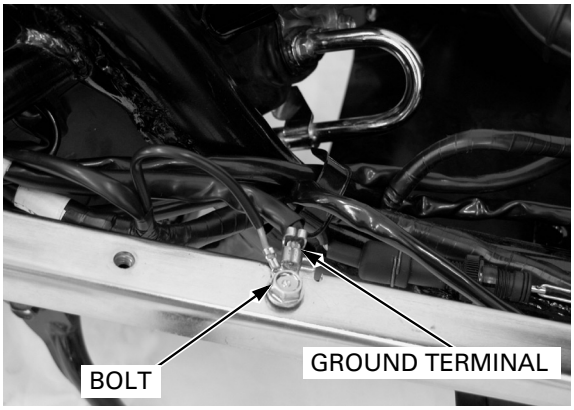
Connect the PAIR pipe to the hose and tighten the band screw.
Tighten the hose band screw until the clearance between the screw and the band end is 4.0 ± 1.0 mm (0.16 ± 0.04 in).



Route the wire harness properly (page 1-16).

Bind the starter motor cable and battery negative (-) cable with the frame clamp.

Install the ground terminal and tighten the bolt.



Route the wire harness properly (page 1-16).

Bind the following with the wire band:

- Starter motor cable
- Ground cable
- Ignition coil primary wire
- Battery negative (–) cable

Route the wire harness properly (page 1-16).

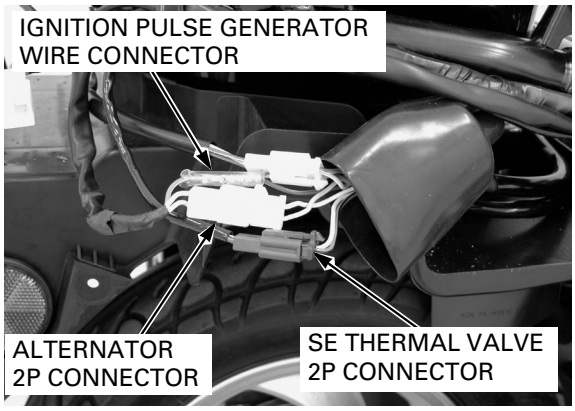
Bind the following with the wire band:

- Alternator/ignition pulse generator wire
- SE thermal valve wire

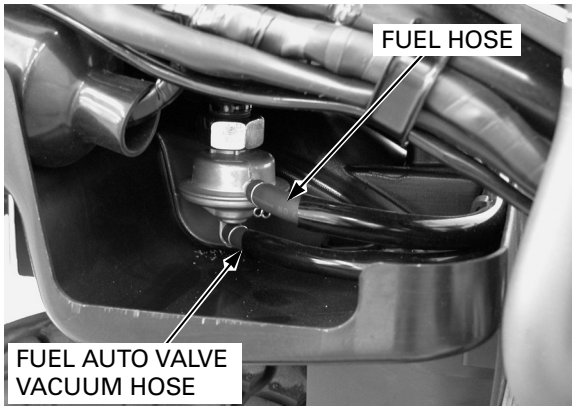
Route the wire harness properly (page 1-16).

Connect the following:

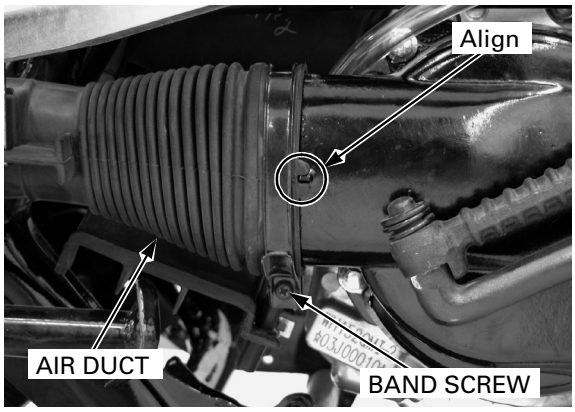
– Alternator 2P connector
– Ignition pulse generator wire connector
– SE thermal valve 2P connector



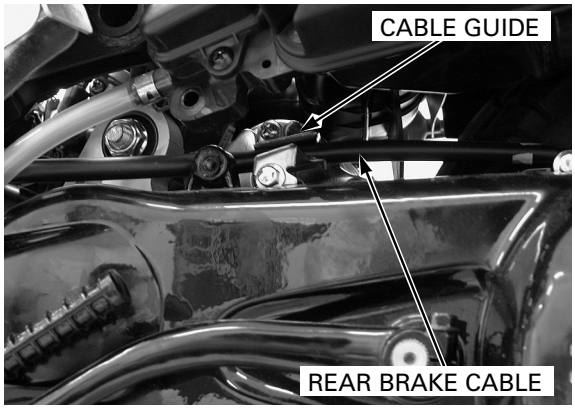
Connect the fuel hose and vacuum hose to the fuel auto valve.



Connect the air duct to the left crankcase cover by aligning the air duct cut-off with the left crankcase cover tab and tighten the band screw.



Lift up the air cleaner housing and bind the rear brake cable with the cable guide.



Install and tighten the air cleaner housing mounting bolts.

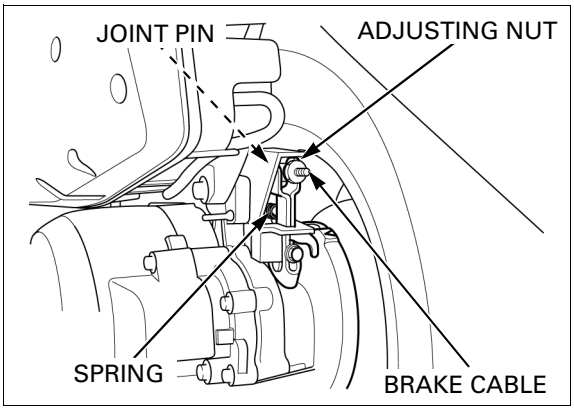
Install the spring, joint pin, brake cable and adjusting nut.

Adjust the following:

- Rear brake (page 3-17)
- Throttle grip free play (page 3-5)

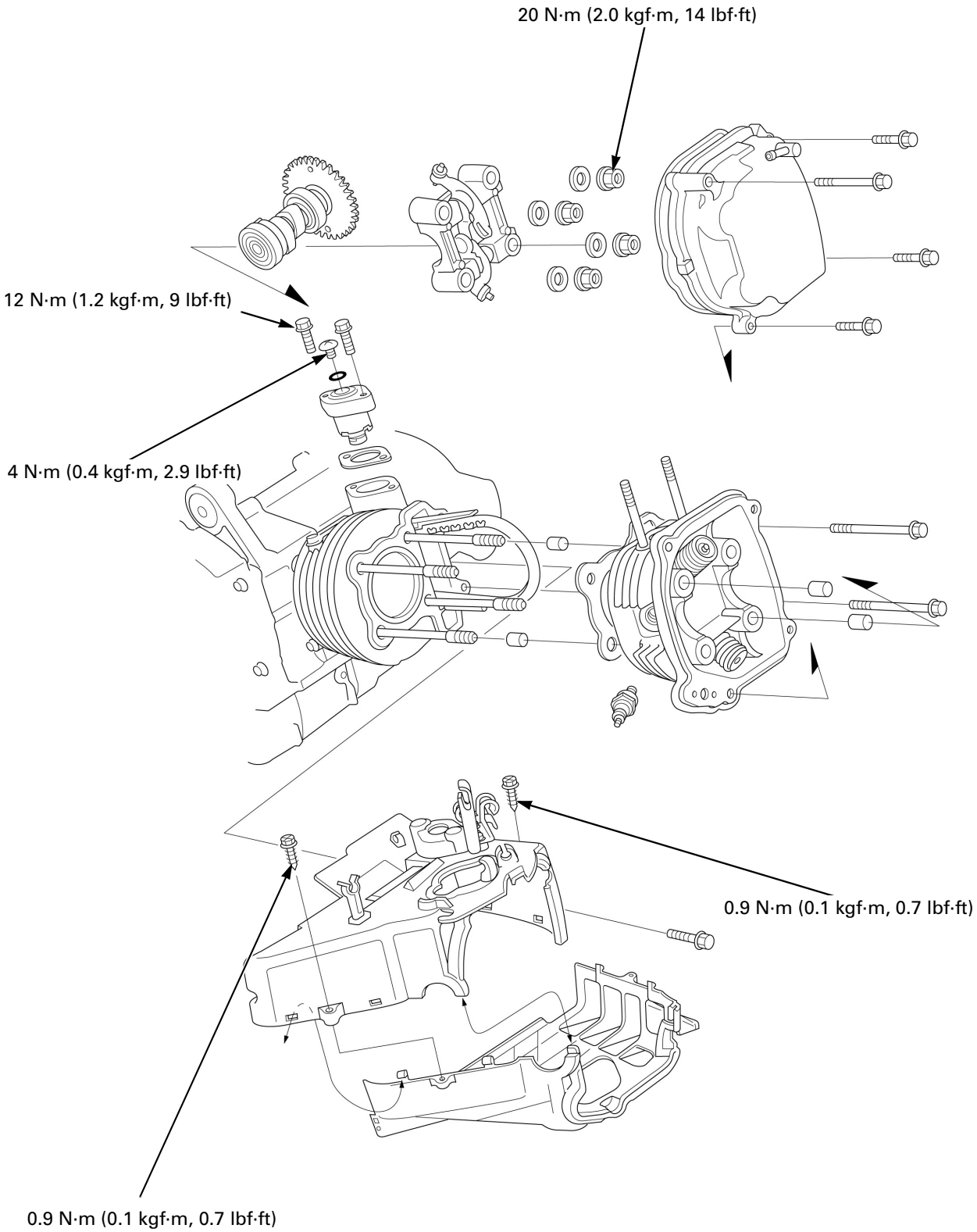
Install the following:

- Floor panel (page 2-9)
- Body cover (page 2-8)
- Side skirt (page 2-7)
- Side cover (page 2-6)
- Rear center lower cover (page 2-6)
- Rear carrier (page 2-6)
- Luggage box (page 2-5)



7. CYLINDER HEAD/VALVES

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

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

SPECIFICATIONS

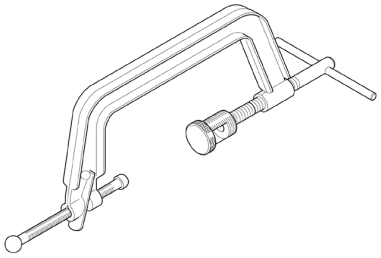
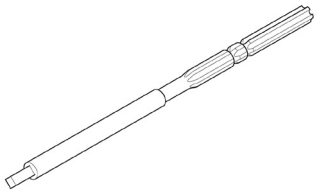
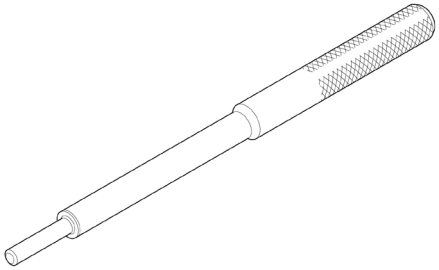
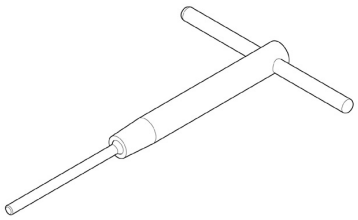
Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			1,275 kPa (13.0 kgf/cm^2, 185 psi) at 570 min^{-1} (rpm)	–
Cylinder head warpage			–	0.05 (0.002)
Valve clearance		IN/EX	0.14 (0.006)	–
Rocker arm	Rocker arm I.D.	IN/EX	10.000 – 10.015 (0.3937 – 0.3943)	10.10 (0.398)
	Rocker arm shaft O.D.	IN/EX	9.972 – 9.987 (0.3926 – 0.3932)	9.91 (0.390)
	Arm-to-shaft clearance	IN/EX	0.013 – 0.043 (0.0005 – 0.0017)	0.08 (0.003)
Camshaft	Cam lobe height	IN	25.885 – 26.045 (1.0191 – 1.0254)	25.815 (1.0163)
		EX	25.730 – 25.890 (1.0130 – 1.0193)	25.660 (1.0102)
Valve, valve guide	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/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 seat width	IN/EX	1.0 (0.04)	1.6 (0.06)
Valve spring free length		Inner	32.41 (1.276)	32.01 (1.260)
		Outer	35.25 (1.388)	34.85 (1.372)

TORQUE VALUES

Cam chain tensioner lifter screw	4 N·m (0.4 kgf·m, 2.9 lbf·ft)	
Cam chain tensioner lifter bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Camshaft holder nut	20 N·m (2.0 kgf·m, 14 lbf·ft)	Apply engine oil to the threads and seating surface.
Intake shroud mounting screw	0.9 N·m (0.1 kgf·m, 0.7 lbf·ft)	

TOOLS

Valve spring compressor 07757-0010000 	Valve guide reamer 07984-MA60001 	Valve guide driver 07942-MA60000 
Cutter holder 5.0 mm 07781-0010400 	Seat cutter, 27.5 mm (45° IN) 07780-0010200 	Seat cutter, 24 mm (45° EX) 07780-0010600 
Flat cutter, 25 mm (32° IN) 07780-0012000 	Flat cutter, 24 mm (32° EX) 07780-0012500 	Interior cutter, 26 mm (60° IN/EX) 07780-0014500 

TROUBLESHOOTING

- Engine top-end problems usually affect engine performance. These problem can be diagnosed by a compression test or by tracing engine noises to the top-end with a sounding rod or stethoscope.
- If the performance is poor at low speeds, check for white smoke in the crankcase breather hose. If the hose is smoky, check for a seized piston ring (page 8-5).

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
  - Valve stuck open
- Cylinder head:
  - Leaking or damaged head gasket
  - Warped or cracked cylinder head
  - Loose spark plug
- Worn cylinder (page 8-4)
- Worn piston or piston rings (page 8-5)

Compression too high, overheating or knocking

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

Excessive smoke

- Worn valve stem or valve guide
- Damaged stem seal
- Worn cylinder (page 8-4)
- Worn piston or piston rings (page 8-5)

Excessive noise

- Incorrect valve adjustment
- Sticking valve or broken valve spring
- Excessive worn valve seat
- Worn or damaged camshaft
- Worn or damaged cam chain
- Worn cam sprocket teeth
- Worn rocker arm and/or shaft
- Worn or damaged cam chain tensioner
- Worn cylinder (page 8-4)
- Worn piston or piston rings (page 8-5)

Rough idle

- Low cylinder compression

CYLINDER COMPRESSION TEST

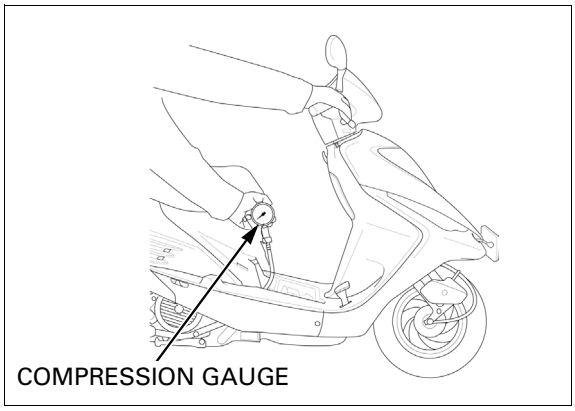
Warm up the engine to normal operating temperature.
Stop the engine and remove the spark plug cap and spark plug (page 3-8).

Install a compression gauge into the spark plug hole.

To avoid discharging the battery, do not operate the starter motor for more than 7 seconds.

Open the throttle all the way and crank the engine with the starter until the gauge reading stops rising. The maximum reading is usually reached within 4 – 7 seconds.

COMPRESSION PRESSURE:
1,275 kPa (13.0 kg/cm^2, 185 psi) at 570 min^{-1} (rpm)



If compression is high, it indicates that carbon deposits have accumulated on the combustion chamber and/or the piston crown.

If compression is low, pour 3 – 5 cc (0.1 – 0.2 oz) of clean engine oil into the cylinder through the spark plug hole and recheck the compression.

If the compression increases from the previous value, check the cylinder, piston and piston rings.
- Leaking cylinder head gasket
- Worn piston ring
- Worn cylinder and piston

If compression is the same as the previous value, check the valves for leakage.

INLET PIPE

REMOVAL/INSTALLATION

Remove the carburetor (page 5-7).

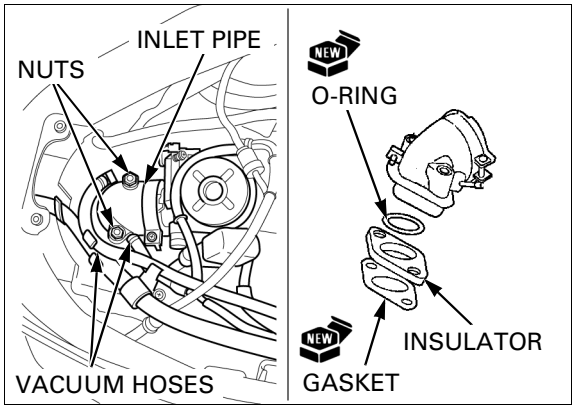
Disconnect the pulse secondary air injection (PAIR) control valve vacuum hose and fuel auto valve/air cut-off valve vacuum hose.

Remove the following:

– Nuts
– Inlet pipe
– O-ring
– Insulator
– Gasket

Replace the O-ring and gasket with new ones.

Installation is in the reverse order of removal.



INTAKE/EXHAUST SHROUDS

REMOVAL/INSTALLATION

Remove the following:

– Engine (page 6-4)
– Muffler (page 2-14)
– Inlet pipe (page 7-6)
– Cooling fan cover (page 11-5)

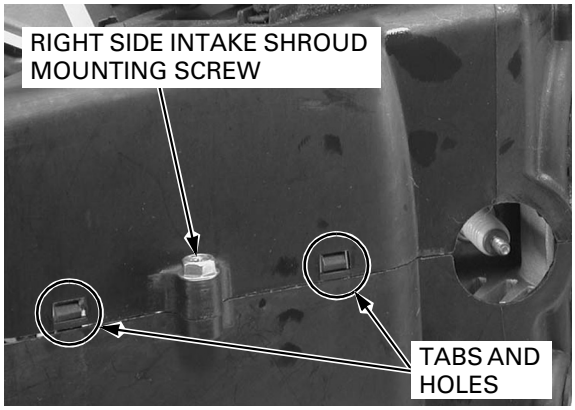
Remove the left side intake shroud attaching screw and the bolt.

Remove the right side intake shroud attaching screw.

Unhook the exhaust shroud tabs from the intake shroud holes.
Remove the intake/exhaust shrouds.

Installation is in the reverse order of removal.

TORQUE: Intake shroud mounting screw:
0.9 N·m (0.1 kgf·m, 0.7 lbf·ft)
Cooling fan cover screw:
0.9 N·m (0.1 kgf·m, 0.7 lbf·ft)



CAMSHAFT/CYLINDER HEAD REMOVAL

REMOVAL

• When removing the camshaft holder nuts, always replace the cylinder head gasket with new one.

Remove the following:

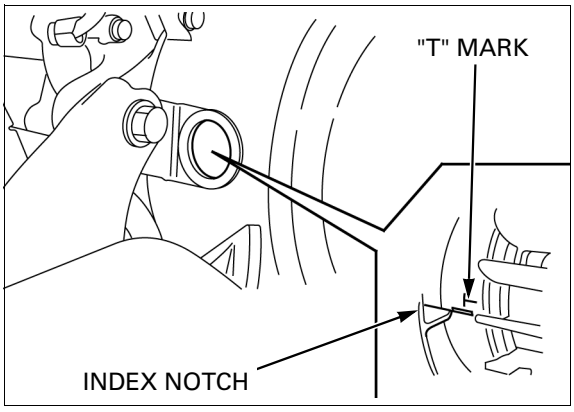
– Engine (page 6-4)
– Cylinder head cover (page 3-9)
– Muffler (page 2-14)
– Inlet pipe (page 7-6)
– Intake/exhaust shrouds (page 7-7)
– PAIR pipe (page 5-27)

Remove the timing hole cap from the cooling fan cover.

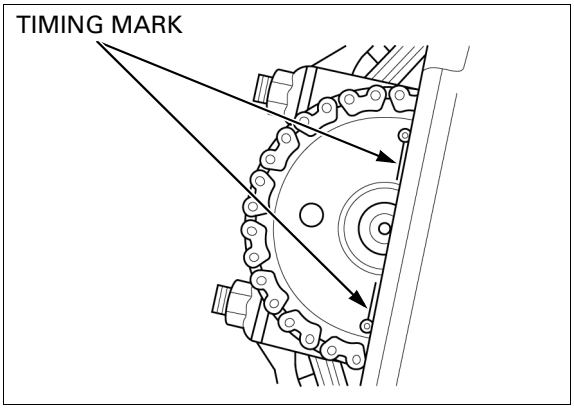
Turn the crankshaft clockwise only.

Rotate the crankshaft clockwise and align the "T" mark on the flywheel with the index notch of the right crankcase.
Make sure that the piston is at TDC (Top Dead Center) on the compression stroke.
The rocker arms should be loose.

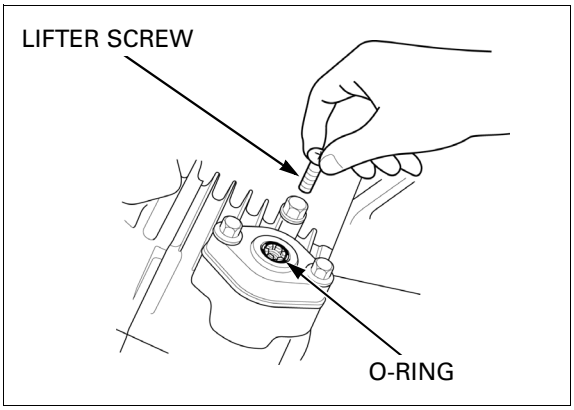
If the rocker arms are tight, rotate the crankshaft one turn and realign the "T" mark with the index notch.



Make sure that the timing mark (index line) aligns with the top surface of the cylinder head.

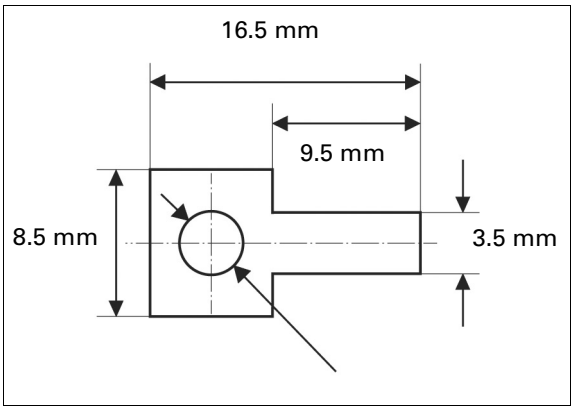


Remove the cam chain tensioner lifter screw and O-ring from the tensioner lifter.



Make a stopper tool out of a thin piece of steel (0.8 mm: 0.03 in thick) using the diagram.

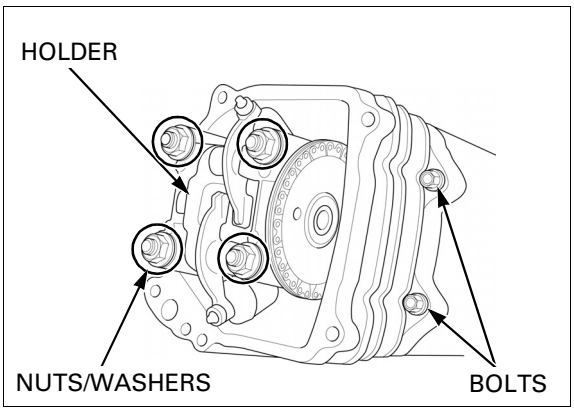
Install the stopper tool into the tensioner body and turn the tool clockwise until it stops turning.



Remove the bolts from the cylinder head.

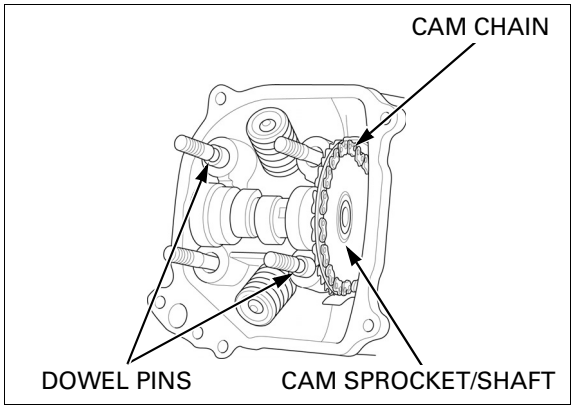
Loosen the camshaft holder nuts in a crisscross pattern in two or three steps.
Remove the nuts and washers.

Remove the camshaft holder.

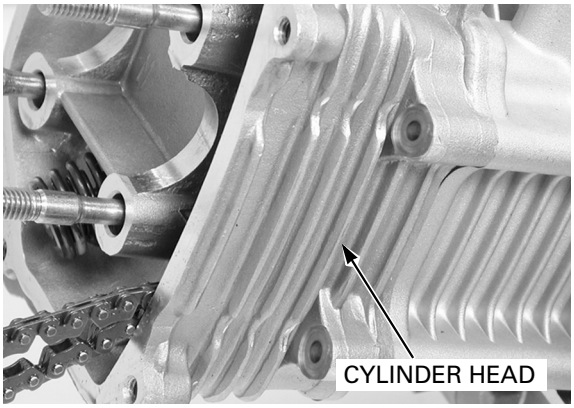


Attach a piece of wire to the cam chain to prevent it from falling into the crankcase.
Remove the cam chain from the cam sprocket.
Remove the camshaft.

Remove the dowel pins from the cylinder head.

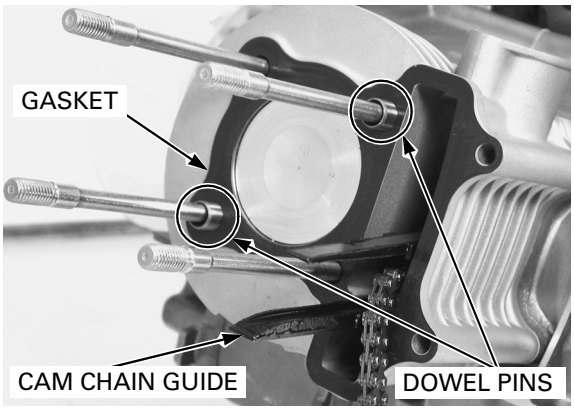


Remove the cylinder head.



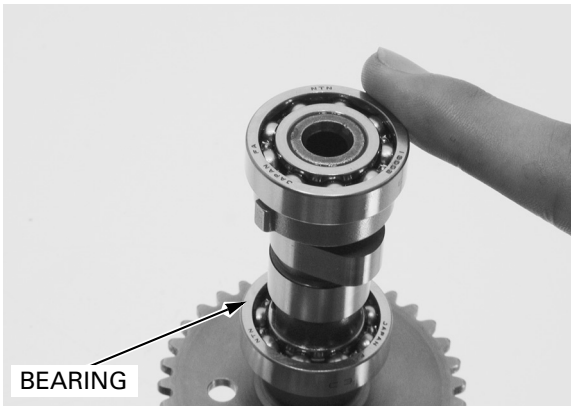
Remove the cylinder head gasket and dowel pins.

Remove the cam chain guide from the cylinder.
Check the cam chain guide for excessive wear or damage.



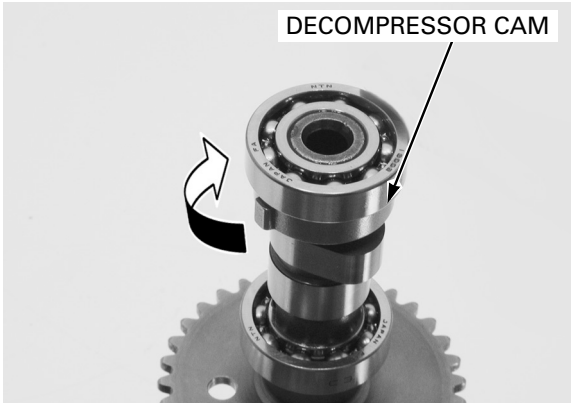
INSPECTION

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



Turn the decompressor cam with your finger. Make sure the decompressor cam only turn clockwise as shown and does not turn counterclockwise.

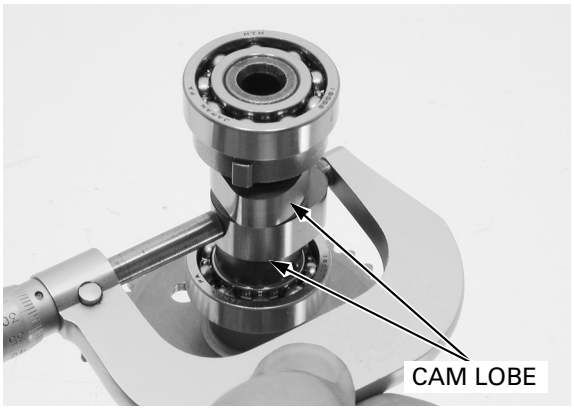
If the decompressor cam is faulty, replace the camshaft as an assembly.



Check the cam lobe for excessive wear and damage.

Measure the height of each cam lobe.

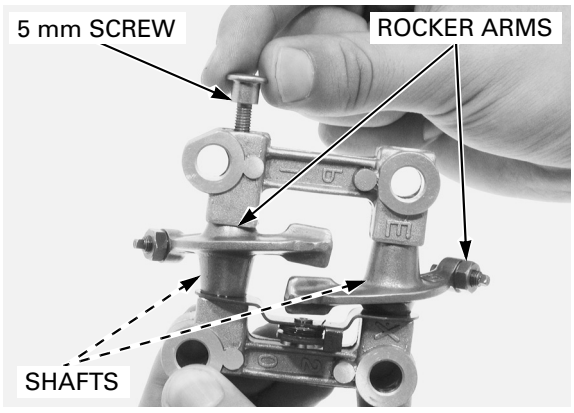
SERVICE LIMIT:
IN: 25.815 mm (1.0163 in)
EX: 25.660 mm (1.0102 in)



CAMSHAFT HOLDER DISASSEMBLY/ ASSEMBLY

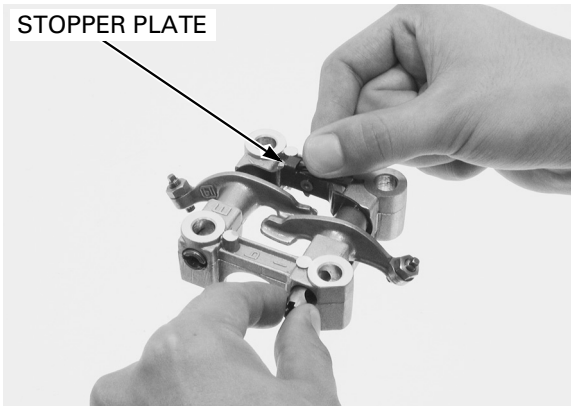
DISASSEMBLY

Screw a 5 mm screw into the threaded hole in the rocker arm shaft and pull shaft out of the camshaft holder.



Remove the rocker arm stopper plate from the camshaft holder.

Remove the rocker arms from the camshaft holder.



INSPECTION

Check the rocker arm shafts and rocker arms for wear, damage or clogged oil hole.

Measure the I.D. of each rocker arm.

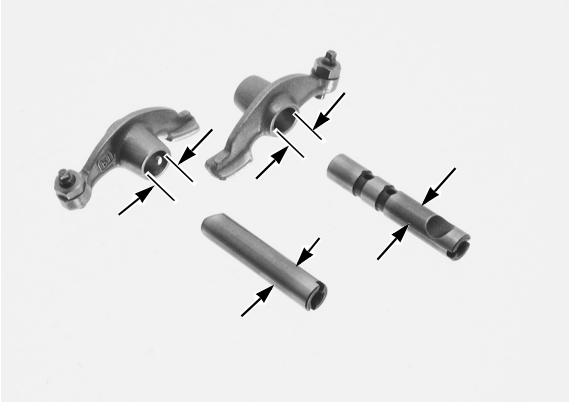
SERVICE LIMIT: IN/EX: 10.10 mm (0.398 in)

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

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

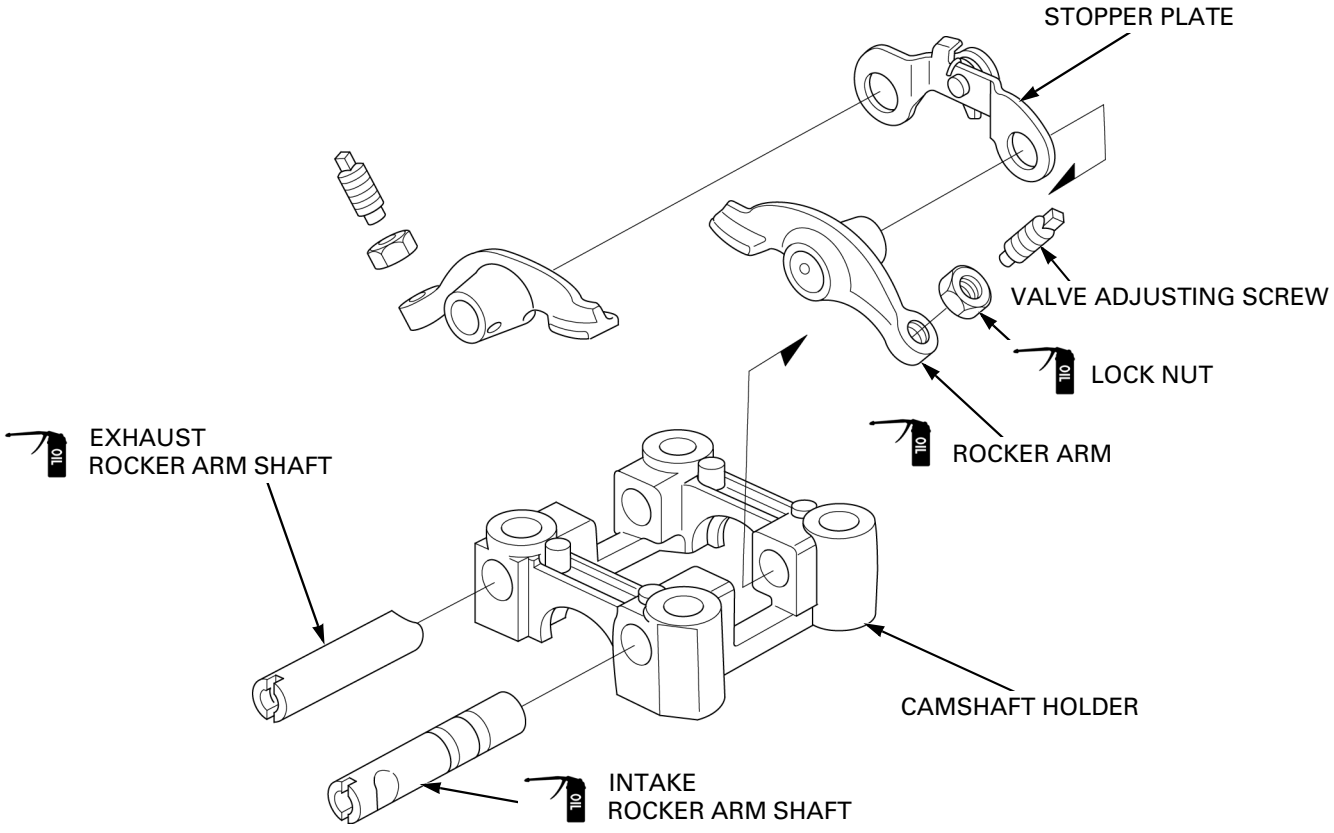
Calculate the rocker arm-to-shaft clearance.

SERVICE LIMIT: IN/EX: 0.08 mm (0.003 in)

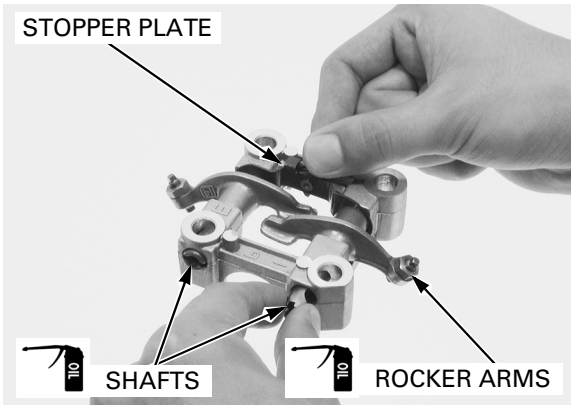


Check the stopper plate and spring for wear or damage.
Check that the stopper operates smoothly.

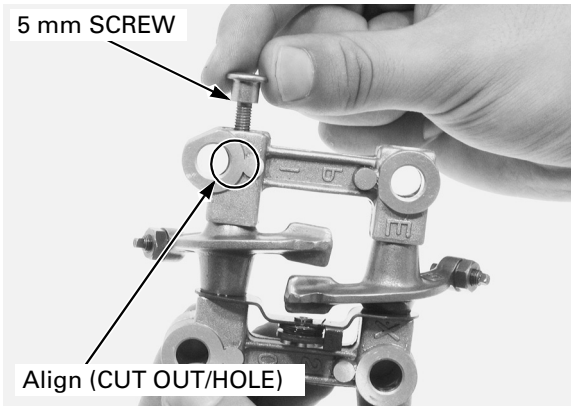
ASSEMBLY



Install the rocker arms stopper plate onto the holder as shown.
Apply engine oil to the rocker arms and shafts sliding surfaces.
Apply engine oil to the rocker arm slipper areas.
Install the rocker arms and shafts into the holder.



Install the 5 mm screw into the threaded hole in the intake rocker arm shaft.
Turn the intake rocker arm shaft using a 5 mm screw to align the cut out of the intake rocker arm shaft and hole of the cam shaft holder.



CYLINDER HEAD DISASSEMBLY/ ASSEMBLY

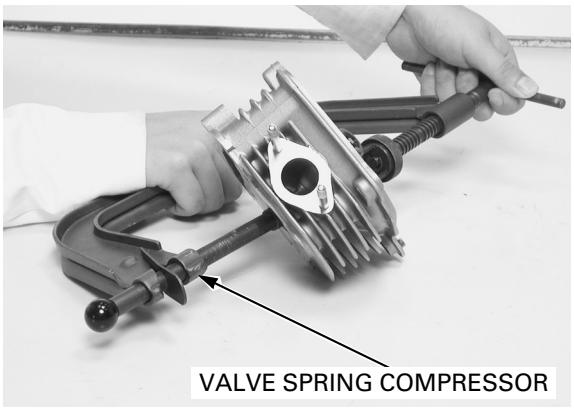
DISASSEMBLY

Remove the spark plug.

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

Remove the valve cotters using the valve spring compressor.

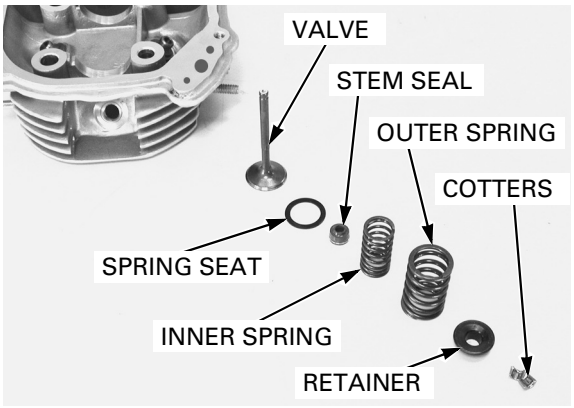
TOOL:
Valve spring compressor **07757-0010000**



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

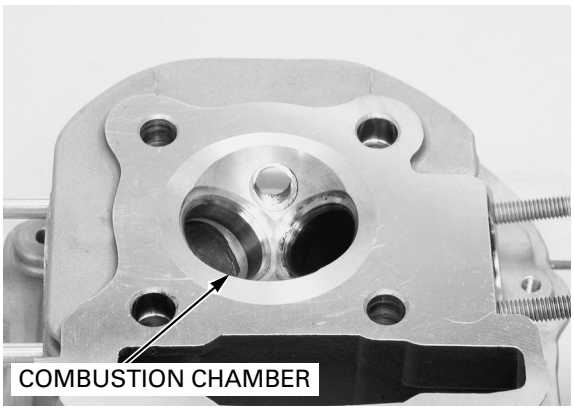
Remove the valve spring compressor, then remove the following:

- Valve spring retainers
- Valve springs (Outer)
- Valve springs (Inner)
- Valve spring seats
- Valves
- Valve 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.

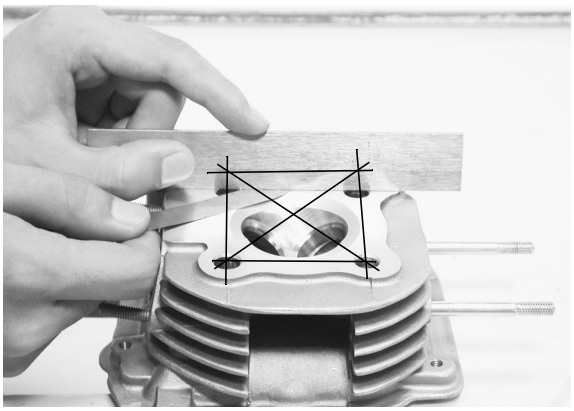


INSPECTION

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)

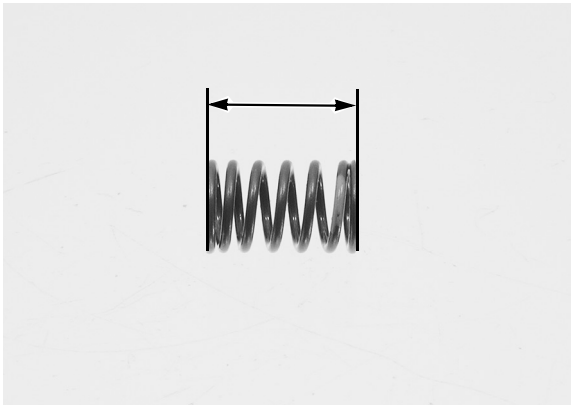


Valve spring

Measure the free length of the valve springs.

SERVICE LIMIT:
Inner: 32.01 mm (1.260 in)
Outer: 34.85 mm (1.372 in)

Replace the spring if they are shorter than the service limit.



Valve/Valve guide

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

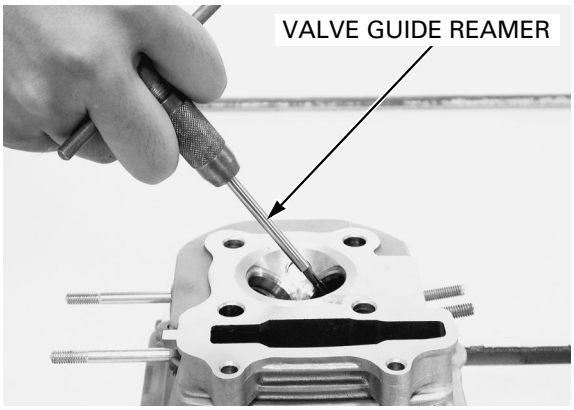
Measure each valve stem O.D. and record it.

SERVICE LIMIT:
IN/EX: 4.90 mm (0.193 in)

Always rotate the reamer clockwise, never counterclockwise when installing, removing and reaming.

Ream the valve guide to remove any carbon build up before measuring the guide.
Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise.

TOOL:
Valve guide reamer 07984-MA60001

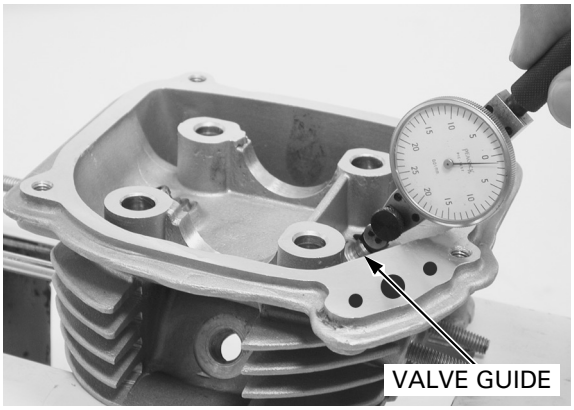


Measure each valve guide I.D. and record it.

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



Inspect and reface the valve seats whenever the valve guides are replaced (page 7-14).

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 new valve guides in a freezer for about 1 hour.

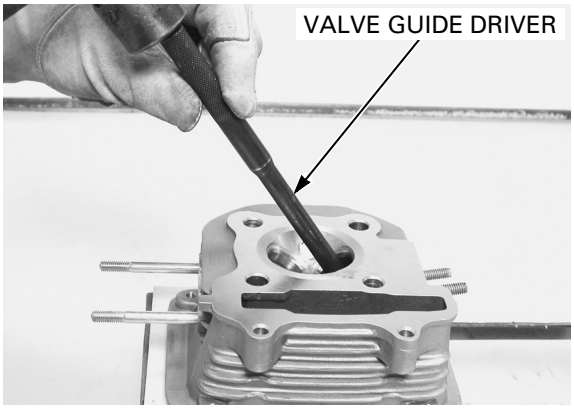
Be sure to wear heavy gloves to avoid burns when handling the heated cylinder head.

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

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

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

TOOL:
Valve guide driver 07942-MA60000



Remove the O-ring from the valve guide.

Take out the new valve guides from the freezer.

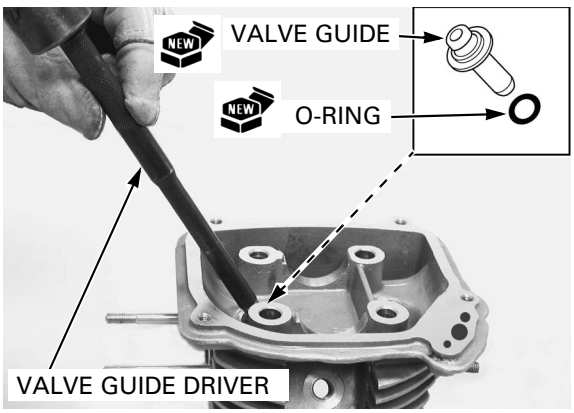
Install a new O-ring to the new valve guide.

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

Drive the new valve guides into the cylinder head.

TOOL:
Valve guide driver 07942-MA60000

Let the cylinder head cool to room temperature.

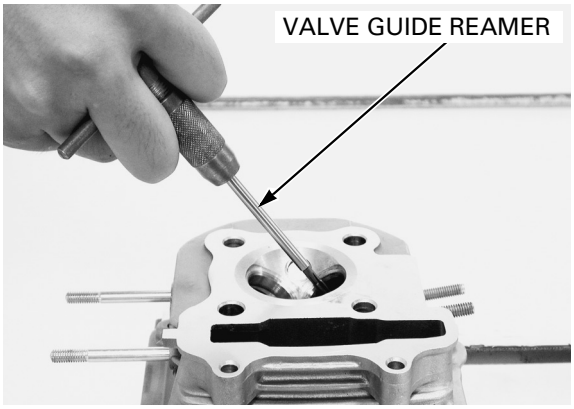


Ream the new valve guides after installation.

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

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

TOOL:
Valve guide reamer 07984-MA60001

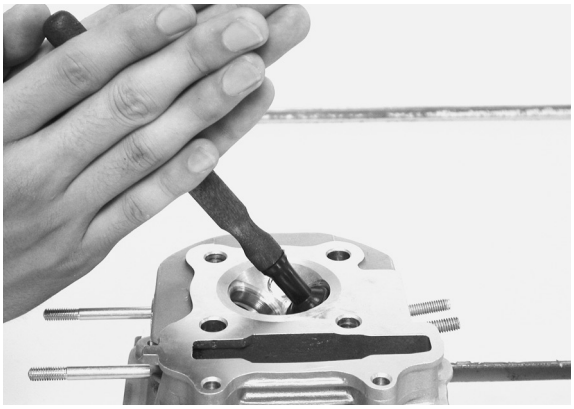


Clean the cylinder head thoroughly to remove any metal particles after reaming and reface the valve seat (page 7-16).

VALVE SEAT INSPECTION

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

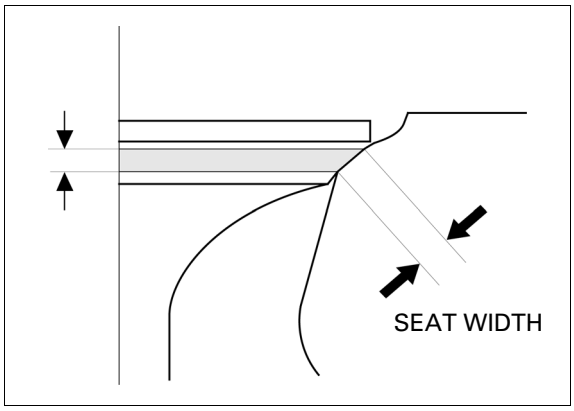
Apply a light coat of Prussian Blue to the valve seats.
Tap the valve against the valve seat several times using a hand-lapping tool, without rotating the valve, to make a clear pattern.



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

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

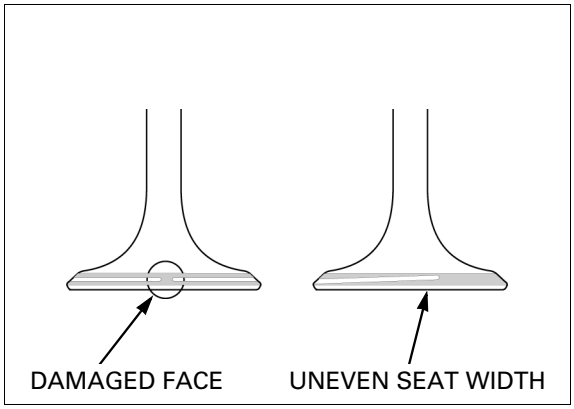
STANDARD: 1.0 mm (0.04 in)
SERVICE LIMIT: 1.6 mm (0.06 in)



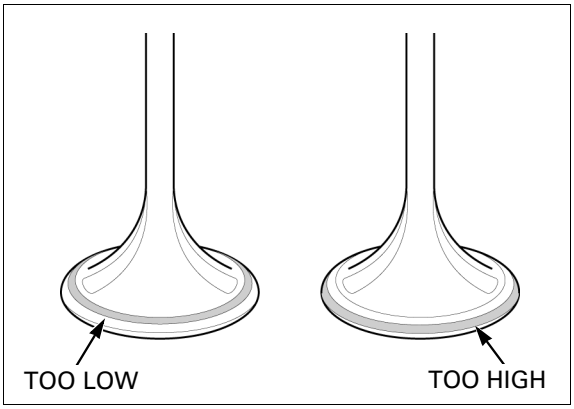
If the valve seat width is not within specification, reface the valve seat (page 7-16).

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

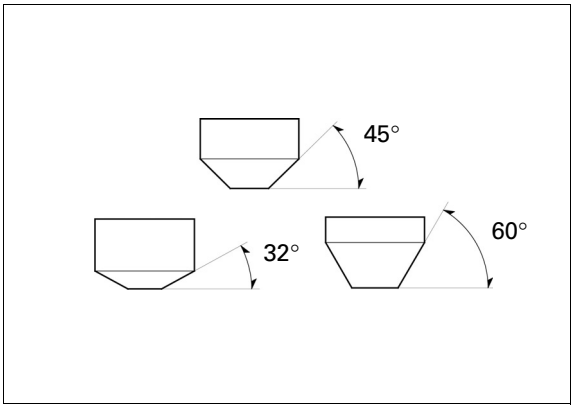


- Contact area (too low or too high area):
  – Reface the valve seat



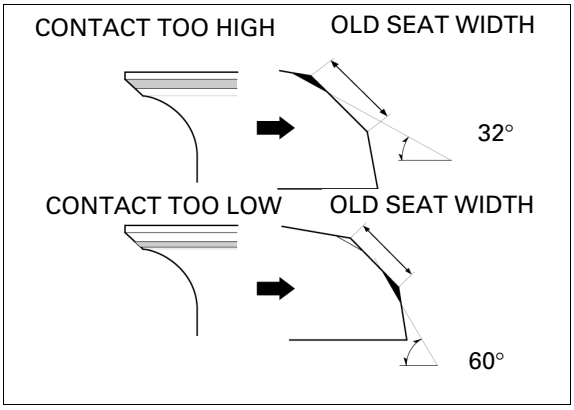
VALVE SEAT REFACING

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



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

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

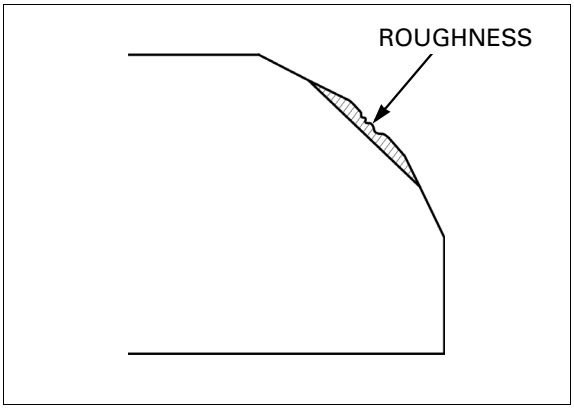


Reface the seat with a 45-degree cutter whenever a valve guide is replaced.

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

TOOLS:

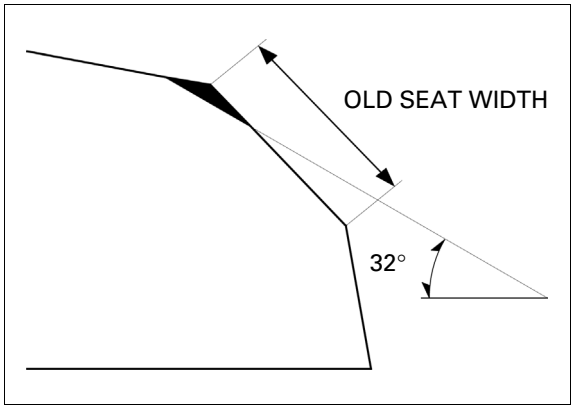
Seat cutter, 27.5 mm (45° IN)	**07780-0010200**
Seat cutter, 24 mm (45° EX)	**07780-0010600**
Cutter holder, 5.0 mm	**07781-0010400**



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

TOOLS:

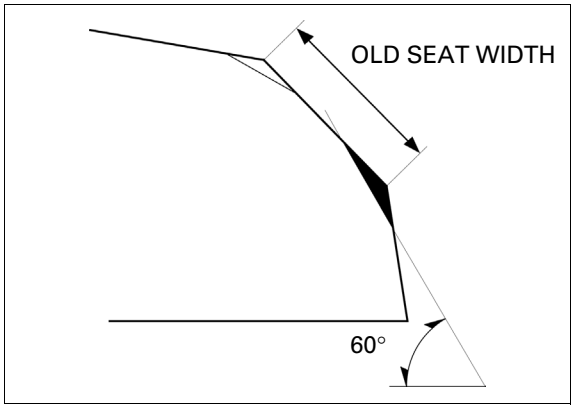
Flat cutter, 25 mm (32° IN)	**07780-0012000**
Flat cutter, 24 mm (32° EX)	**07780-0012500**
Cutter holder, 5.0 mm	**07781-0010400**



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

TOOLS:

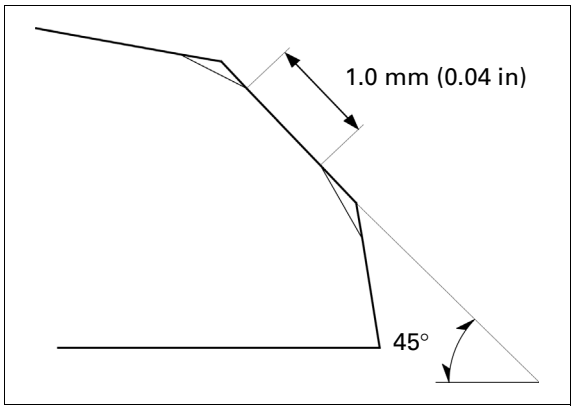
Interior cutter, 26 mm (60° IN/EX)	**07780-0014500**
Cutter holder, 5.0 mm	**07781-0010400**



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

VALVE SEAT WIDTH: 1.0 mm (0.04 in)

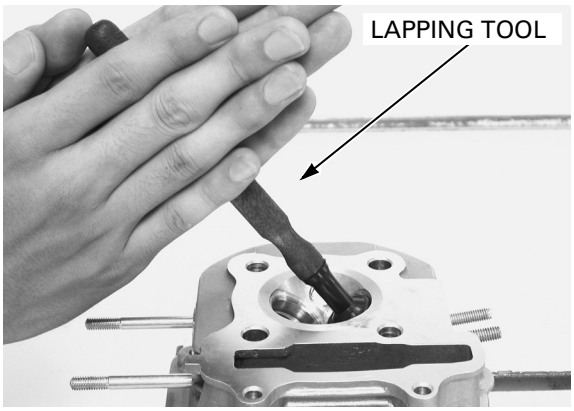
Make sure all pitting and irregularities are removed.



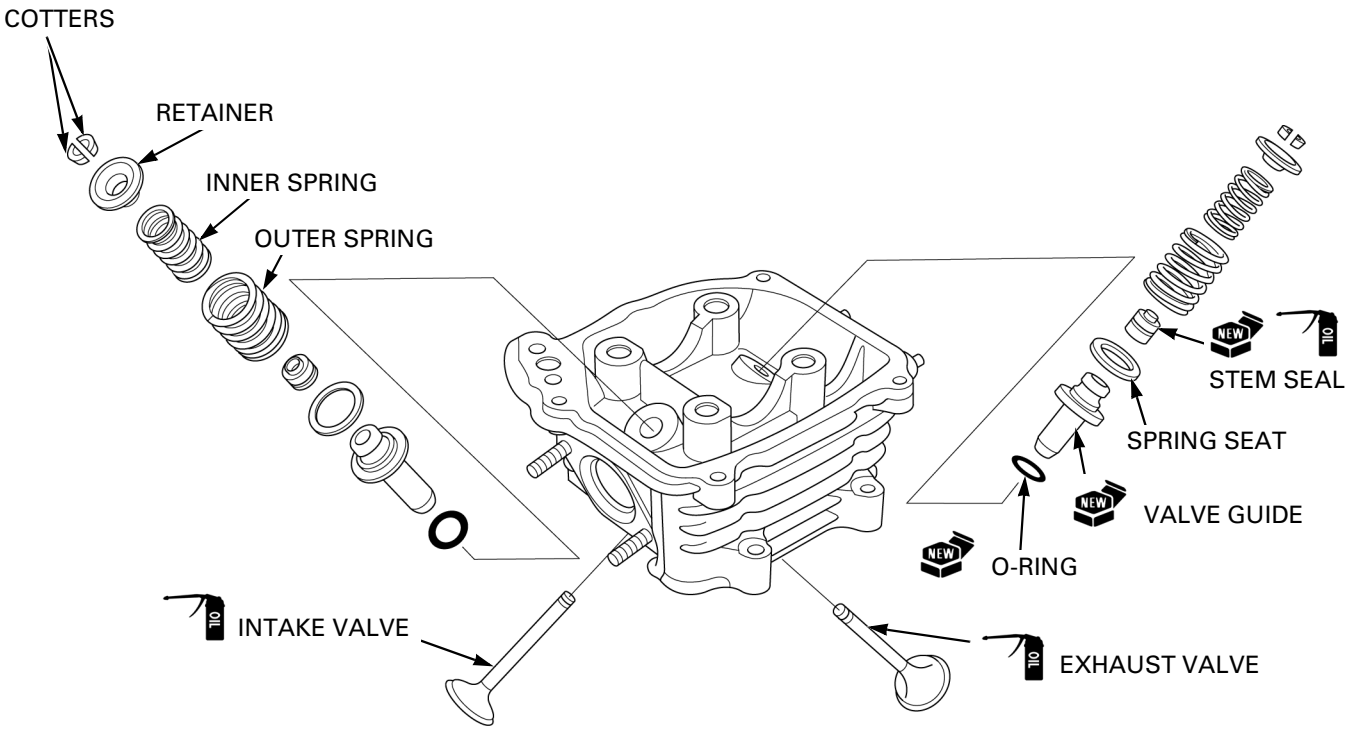
Excessive lapping pressure may deform or damage the seat.
Change the angle of the lapping tool frequently to prevent uneven seat wear.
Do not allow lapping compound to enter the guides.

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

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

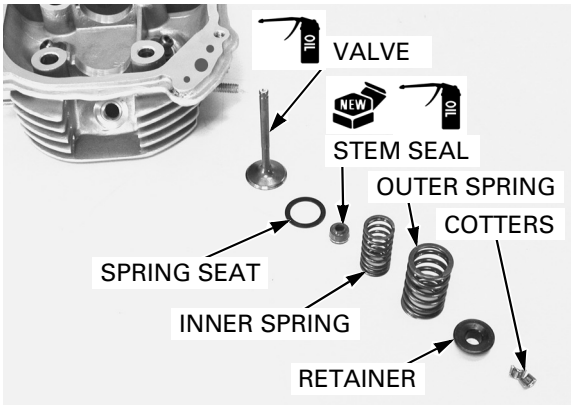


ASSEMBLY

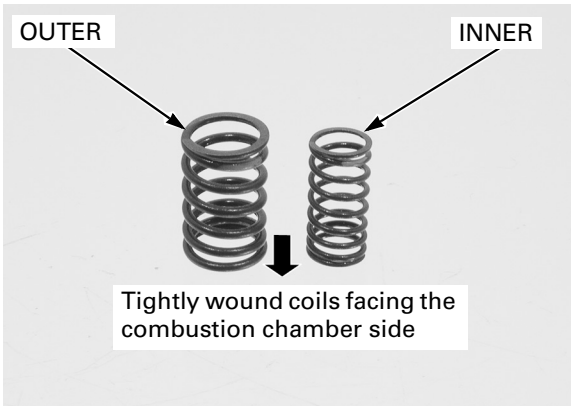


Blow through the oil passage in the cylinder head with compressed air.
Apply clean engine oil to the inner surface of new valve stem seals.
Install the valve spring seats and new valve stem seals.

Coat the valve stem sliding surface with clean engine oil.
Insert the valves into the valve guide while turning it slowly to avoid damage to the valve stem seal.



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

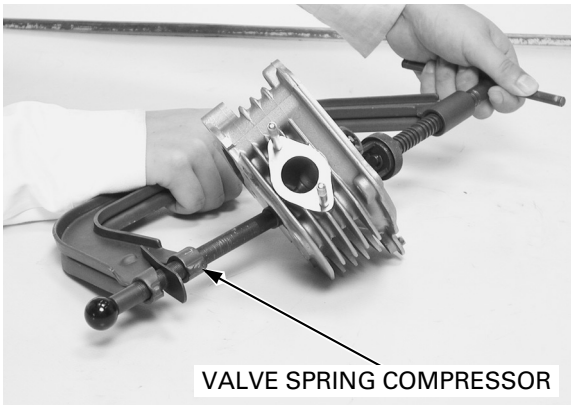


Install the valve spring retainer.

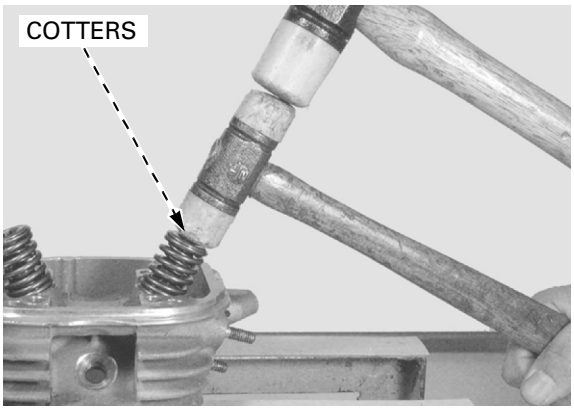
Grease the cotters to ease installation. prevent loss of tension, do not compress the valve spring more than necessary to remove the cotters.

Install the valve cotters using the valve spring compressor.

TOOL:
Valve spring compressor **07757-0010000**



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

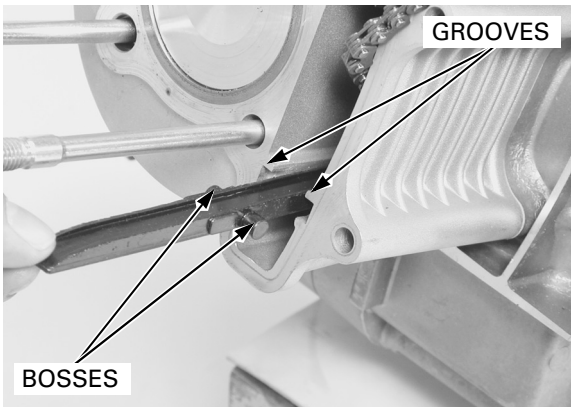


Install the spark plug (page 3-9).

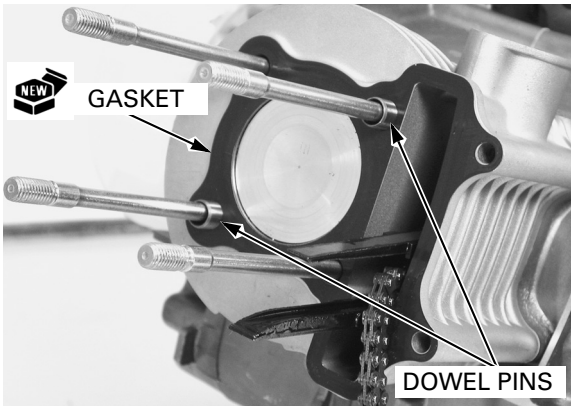
CYLINDER HEAD/CAMSHAFT INSTALLATION

Clean the mating surface of the cylinder and cylinder head.

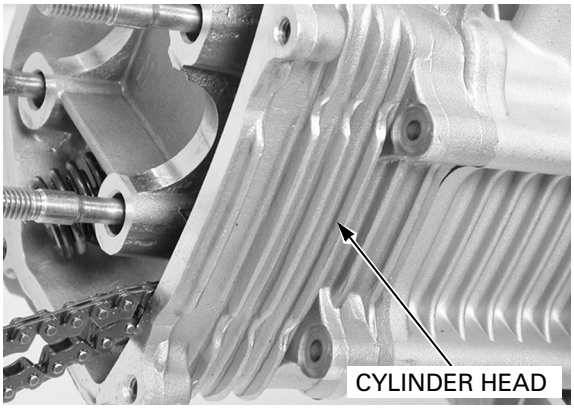
Install the cam chain guide by aligning the bosses of the cam chain guide and grooves of the cylinder.



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

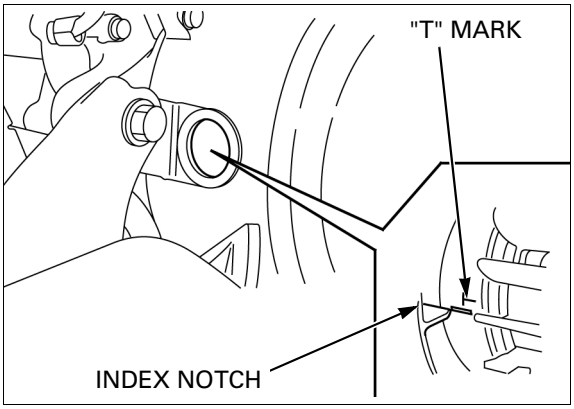


Route the cam chain through the cylinder head and install the cylinder head onto the cylinder.



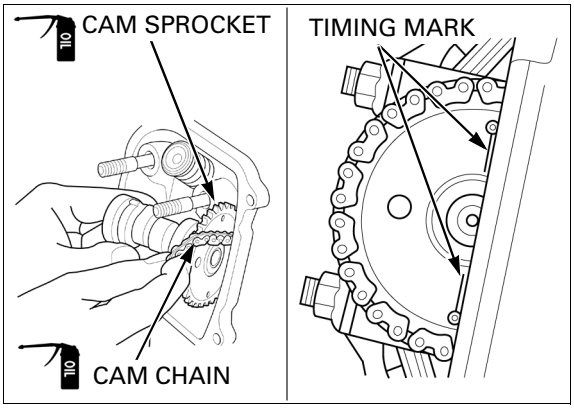
Turn the crankshaft clockwise only.

Make sure that the "T" mark of the flywheel aligns with the index notch.

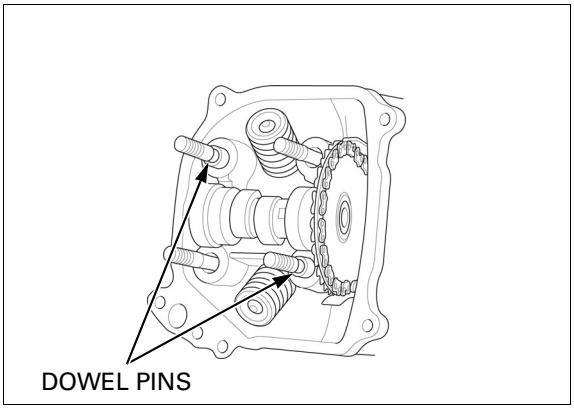


Apply engine oil to the cam chain and cam sprocket teeth.

Install the cam chain onto the cam sprocket/shaft. Align the timing mark (index line) on the cam sprocket with the top surface of the cylinder head.



Install the dowel pins.

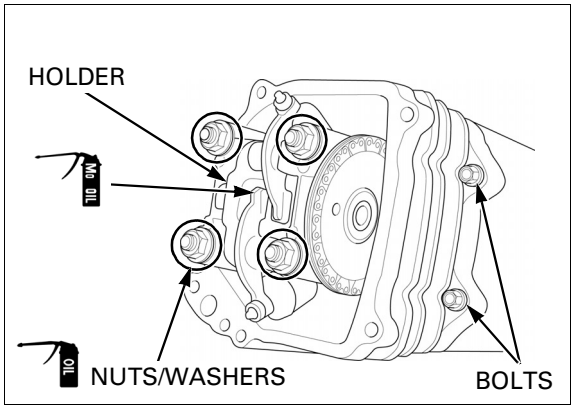


Lubricate the camshaft cam lobes with molybdenum oil solution.
Apply clean engine oil to the camshaft holder nut threads and seating surface.

Install the washers and camshaft holder nuts, then tighten the nuts and cylinder head bolts in criss-cross pattern in 2 or 3 steps.

TORQUE: 20 N·m (2.0 kgf·m, 14 lbf·ft)

Tighten the cylinder head mounting bolts.



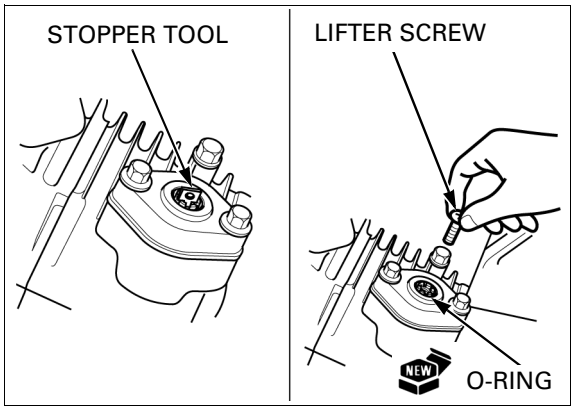
Remove the stopper tool from the cam chain tensioner lifter.

Install the cam chain tensioner lifter screw with a new O-ring and tighten it.

TORQUE: 4 N·m (0.4 kgf·m, 2.9 lbf·ft)

Install the following:

- PAIR pipe (page 5-28)
- Intake/Exhaust shrouds (page 7-7)
- Inlet pipe (page 7-6)
- Cylinder head cover (page 3-9)
- Muffler (page 2-14)
- Engine (page 6-11)



CAM CHAIN TENSIONER LIFTER

REMOVAL

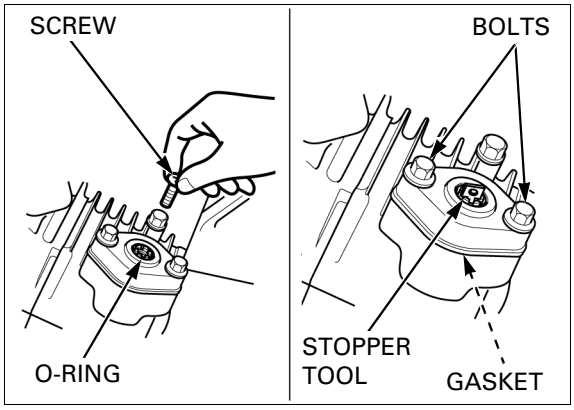
Remove the following:

- Engine (page 6-4)
- Inlet pipe (page 7-6)
- Intake/Exhaust shrouds (page 7-7)

Remove the tensioner screw and O-ring.

Retract the tensioner shaft (page 7-8)

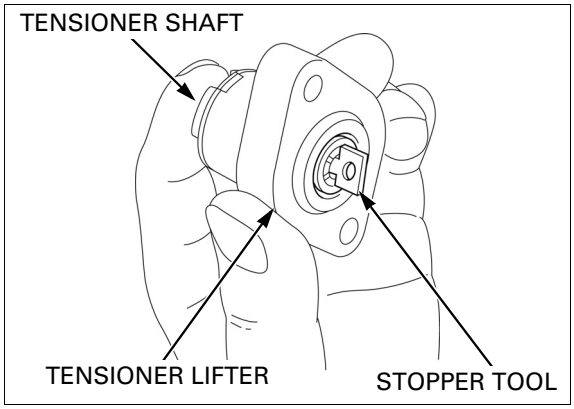
Remove the bolts, and cam chain tensioner lifter.
Remove the gasket from the tensioner lifter.



INSPECTION

Check the cam chain tensioner lifter operation:

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

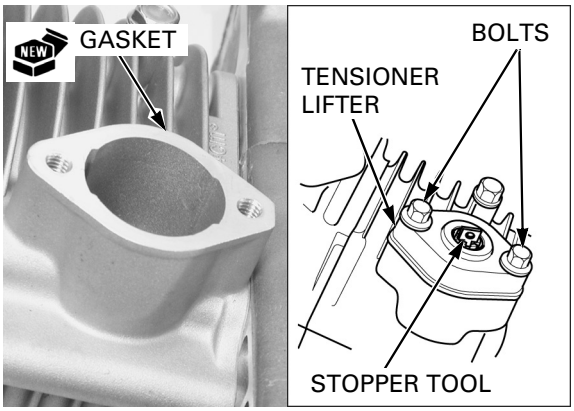


INSTALLATION

Install a stopper tool and turn the tensioner shaft clockwise with it to retract the tensioner fully.
Install a new gasket, cam chain tensioner lifter and tighten the bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Remove a stopper tool.

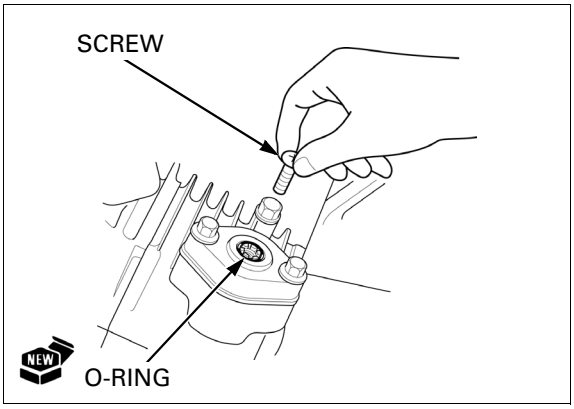


Install the new O-ring to the cam chain tensioner lifter.
Install and tighten the screw to the specified torque.

TORQUE: 4 N·m (0.4 kgf·m, 2.9 lbf·ft)

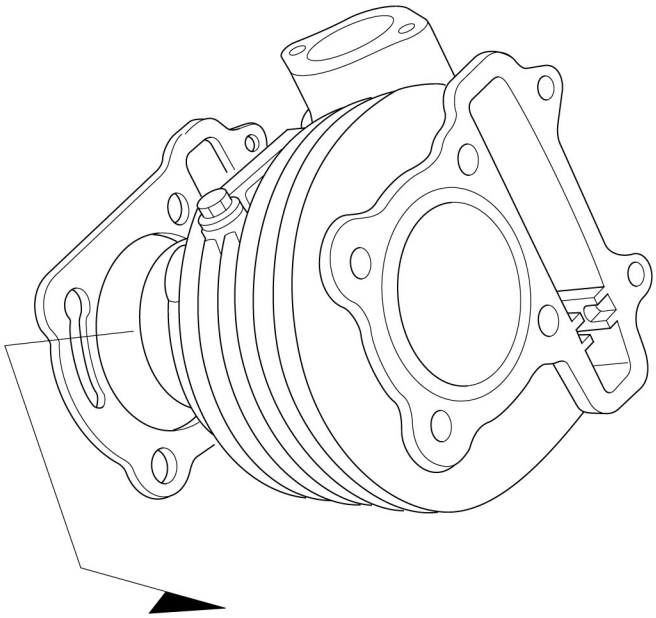
Install the following:

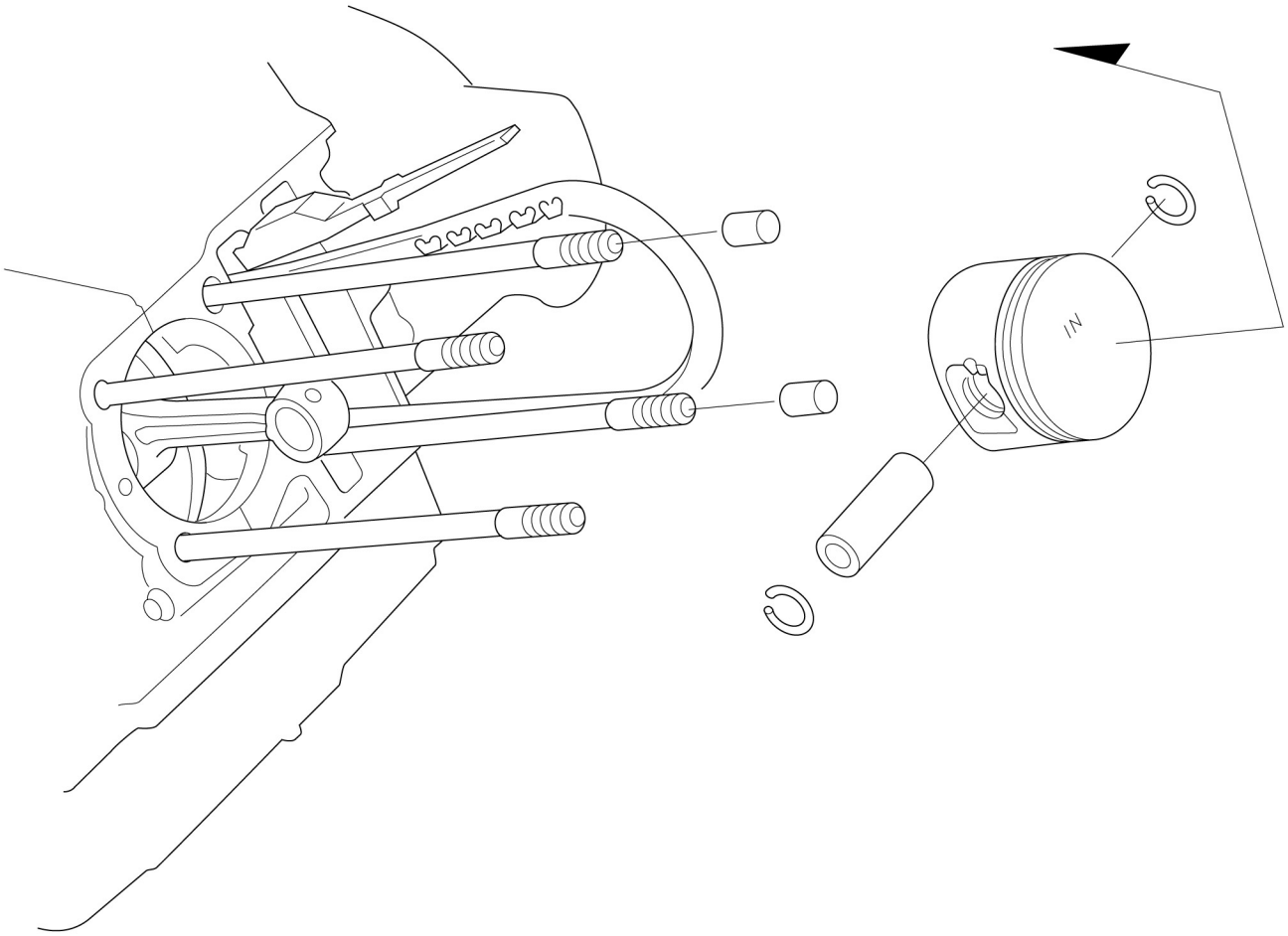
– Intake/Exhaust shrouds (page 7-7)
– Inlet pipe (page 7-6)
– Engine (page 6-11)



8. CYLINDER/PISTON

COMPONENT LOCATION





SERVICE INFORMATION

GENERAL

- This section covers maintenance of the cylinder and piston.
- To service the cylinder and piston, the engine must be removed from the frame.
- Be careful not to damage mating surfaces when removing the cylinder. Do not strike the cylinder too hard during removal.
- Take care not to damage the cylinder wall and piston.
- Clean all disassembled parts with clean solvent and dry them using compressed air before inspection.
- When removing the piston, clean carbon and sludge from the top of the cylinder.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		52.40 – 52.41 (2.0630 – 2.0634)	52.50 (2.067)
	Out-of-round		–	0.05 (0.002)
	Taper		–	0.05 (0.002)
	Warpage		–	0.05 (0.002)
Piston, piston ring, piston pin	Piston O.D.		52.370 – 52.390 (2.0618 – 2.0626)	52.30 (2.059)
	Piston O.D. measurement point		10 (0.39) from bottom of skirt	–
	Piston pin bore I.D.		15.002 – 15.008 (0.5906 – 0.5909)	15.04 (0.592)
	Piston pin O.D.		14.994 – 15.000 (0.5903 – 0.5906)	14.96 (0.589)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.02 (0.001)
	Piston ring-to-ring groove clearance	Top	0.030 – 0.065 (0.0012 – 0.0026)	0.09 (0.004)
		Second	0.015 – 0.050 (0.0006 – 0.0020)	0.09 (0.004)
	Piston ring end gap	Top	0.10 – 0.25 (0.004 – 0.010)	0.50 (0.020)
		Second	0.25 – 0.40 (0.010 – 0.016)	0.60 (0.024)
		Oil (side rail)	0.20 – 0.80 (0.008 – 0.031)	–
Cylinder-to-piston clearance			0.010 – 0.040 (0.0004 – 0.0016)	0.10 (0.004)
Connecting rod small end I.D.			15.016 – 15.034 (0.5912 – 0.5919)	15.06 (0.593)
Connecting rod-to-piston pin clearance			0.016 – 0.040 (0.0006 – 0.0016)	0.06 (0.002)

TORQUE VALUES

Cylinder stud bolt A	9 N·m (0.9 kgf·m, 6.5 lbf·ft)
Cylinder stud bolt B	9 N·m (0.9 kgf·m, 6.5 lbf·ft))

TROUBLESHOOTING

Compression too low, hard starting or poor performance at low speed
- Worn, stuck or broken piston ring
- Worn or damaged cylinder and piston
- Bent connecting rod
- Cylinder head/valve problem (page 7-13)

Compression too high, overheating or knocking
- Excessive carbon build-up on piston head or on combustion chamber

Excessive smoke
- Worn cylinder, piston or piston ring
- Improper installation of piston rings
- Scored or scratched piston or cylinder wall
- Cylinder head/valve problem (page 7-13)

Abnormal noise
- Worn piston pin or piston pin hole
- Worn connecting rod small end
- Worn cylinder, piston or piston rings

Piston ring sticking/scuffing, bearing damage
- Clogged oil gallery or oil strainer screen
- Internal oil leak
- Not using recommend engine oil

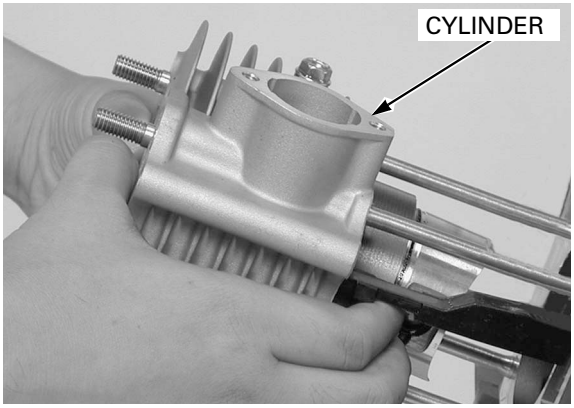
CYLINDER REMOVAL/INSPECTION

REMOVAL

Attach a piece of wire to the cam chain to prevent it from falling into the crankcase. Be careful not to damage the mating surfaces by using a screwdriver when disassembling the cylinder.

Remove the cylinder head (page 7-7).

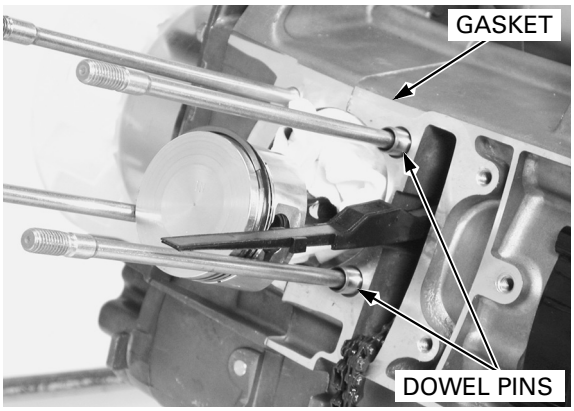
Remove the cylinder.



Remove the gasket and dowel pins.

When cleaning the cylinder mating surface, place a shop towel over the cylinder opening to prevent dust or dirt from entering the engine.

Clean any gasket material from the cylinder mating surface of the crankcase.



INSPECTION

Remove the cylinder (page 8-4).

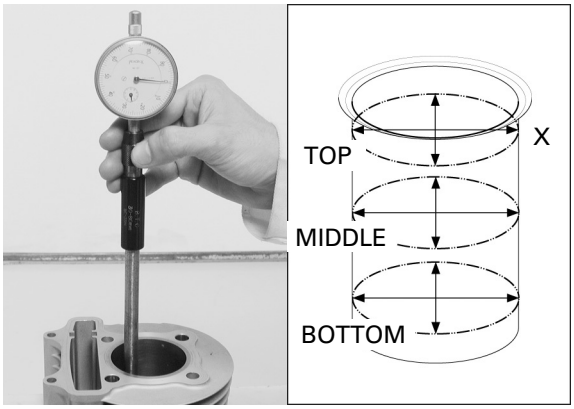
Inspect the cylinder bore for wear or damage.
Measure the cylinder I.D. in the X and Y axis at three levels.
Take the maximum reading to determine the cylinder wear.

SERVICE LIMIT: 52.50 mm (2.067 in)

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

SERVICE LIMIT:

Taper:	**0.05 mm (0.002 in)**
Out of round:	**0.05 mm (0.002 in)**



The cylinder must be rebored and an oversize piston/piston rings fitted if the service limits are exceeded.

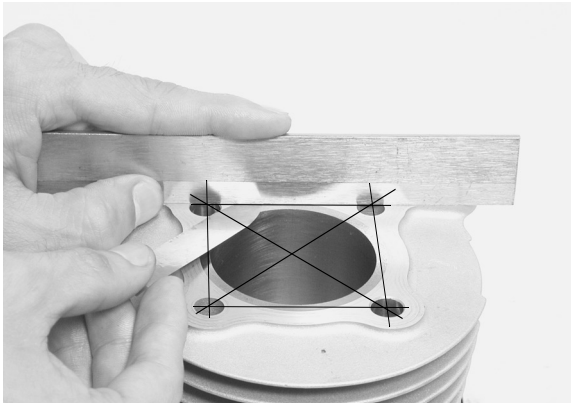
The following oversize pistons/piston rings are available:

0.25 mm (0.0098 in)
0.50 mm (0.0197 in)
0.75 mm (0.0295 in)
1.00 mm (0.0394 in)

The piston to cylinder clearance for the oversize piston must be: 0.010 – 0.040 mm (0.00040 – 0.0016 in).

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

SERVICE LIMIT: 0.05 mm (0.002 in)

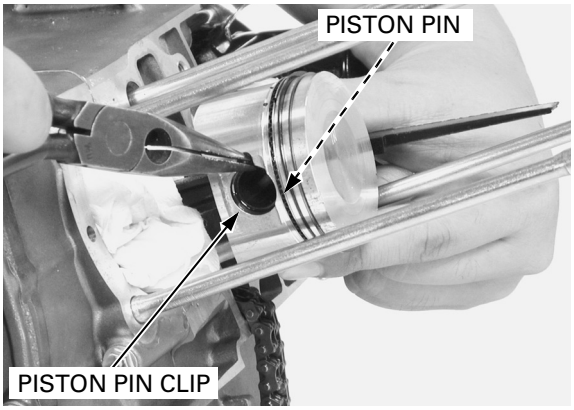


PISTON REMOVAL/INSPECTION

REMOVAL

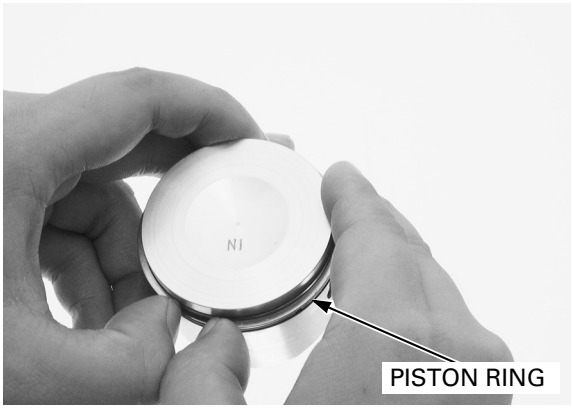
Place a shop towel at the opening of the crankcase to prevent the piston pin clips from falling into the crankcase.

Remove the piston pin clips with the pliers.
Push the piston pin out of the piston and connecting rod, and then 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.



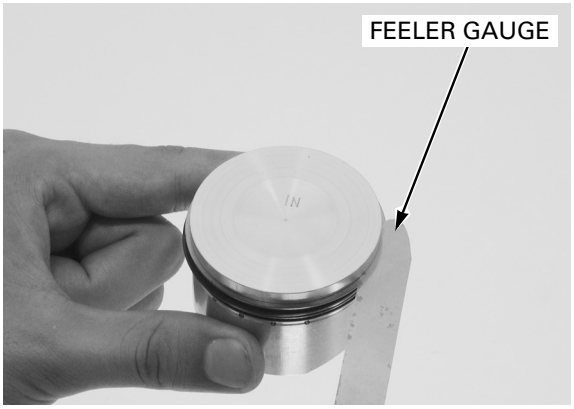
Never use a wire brush, it will scratch the groove.

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

INSPECTION

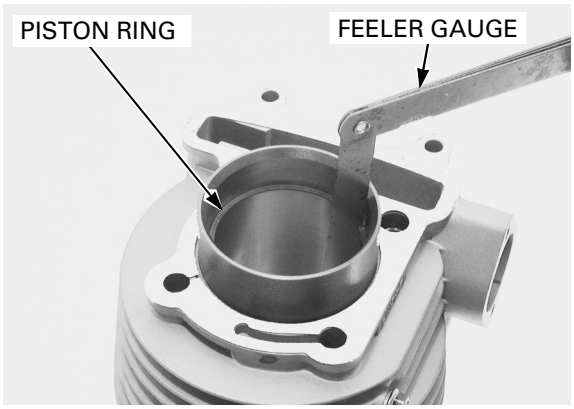
Inspect the piston rings for movement by rotating the rings. The rings should be able to move in their grooves without catching.
Push the ring until the outer surface of the piston ring is nearly flush with the piston and measure the ring-to-groove clearance.

SERVICE LIMIT:
Top/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 LIMIT:
Top: 0.50 mm (0.020 in)
Second: 0.60 mm (0.024 in)

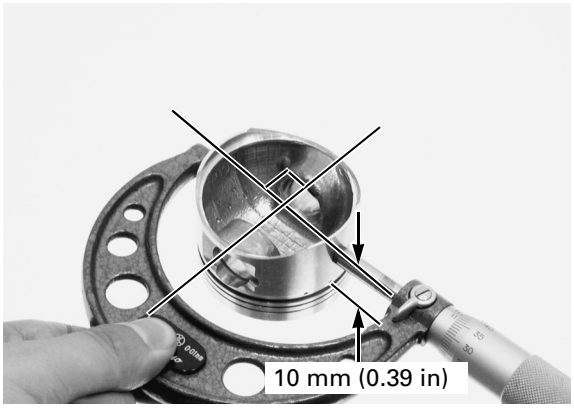


Measure the piston O.D. at the point 10 mm (0.39 in) from the bottom and 90° to the piston pin hole.

SERVICE LIMIT: 52.30 mm (2.059 in)

Calculate the cylinder-to-piston clearance (cylinder I.D.: See page 8-4).

SERVICE LIMIT: 0.10 mm (0.004 in)



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

SERVICE LIMIT: 15.04 mm (0.592 in)

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

SERVICE LIMIT: 14.96 mm (0.589 in)

Calculate the piston-to-piston pin clearance.

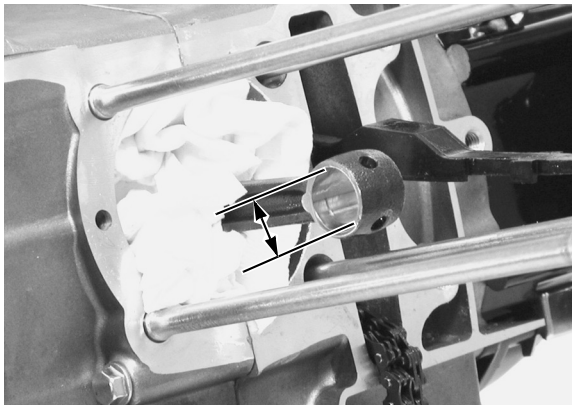
SERVICE LIMIT: 0.02 mm (0.001 in)

Measure the connecting rod small end I.D.

SERVICE LIMIT: 15.06 mm (0.593 in)

Calculate the connecting rod-to-piston pin clearance.

SERVICE LIMIT: 0.06 mm (0.002 in)

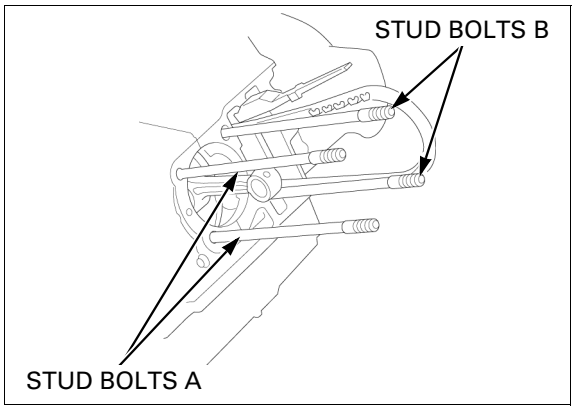


STUD BOLT REPLACEMENT

Remove the stud bolts A, B from the crankcase.

Install new stud bolts A, B into the crankcase.

TORQUE: 9 N·m (0.9 kgf·m, 6.5 lbf·ft)



PISTON INSTALLATION

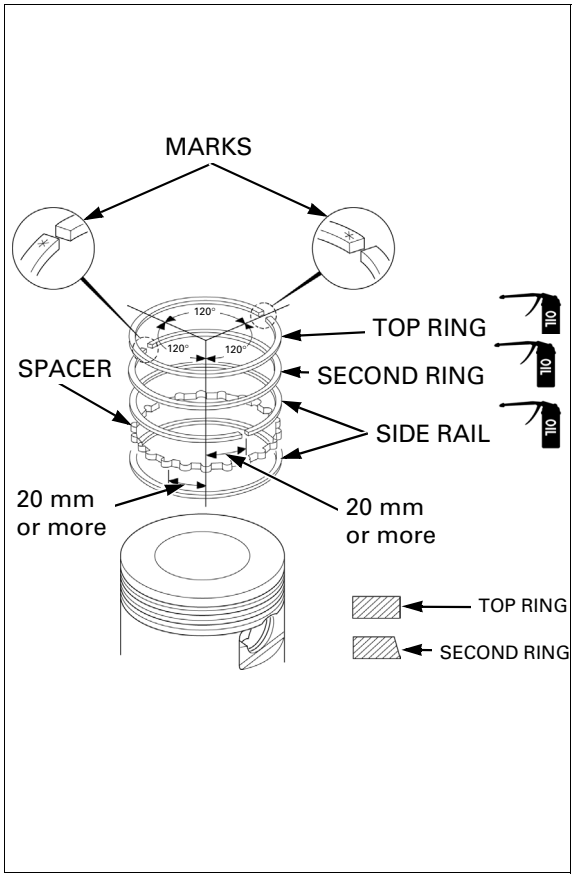
Apply clean engine oil to the each rings and ring grooves.

Be careful not to damage the piston and rings.

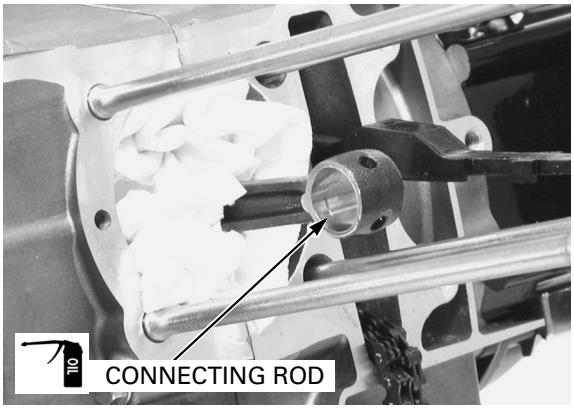
Carefully install the piston rings into the piston ring grooves with the markings facing up.

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

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

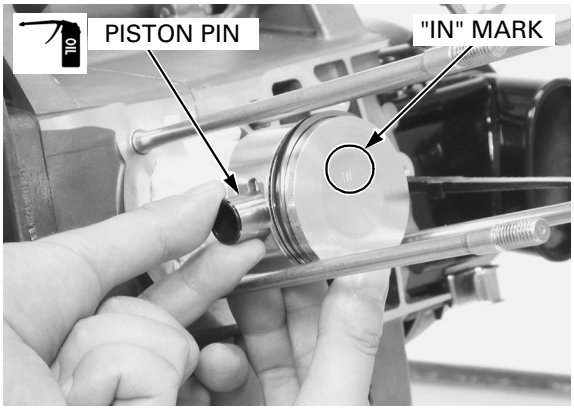


Apply clean engine oil to the connecting rod small end hole.



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

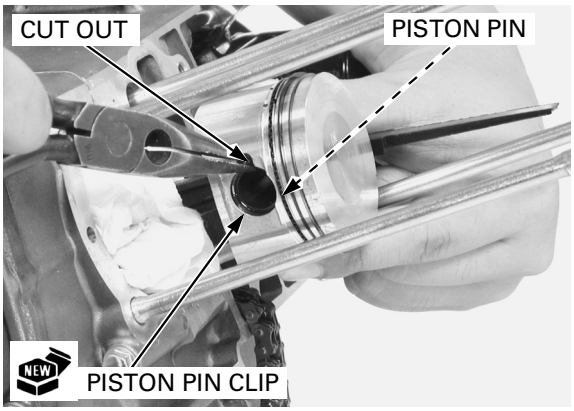
Apply clean engine oil to the piston pin and install it.



Place a shop towel at the opening of the crankcase to prevent the piston pin clips from falling into the crankcase.

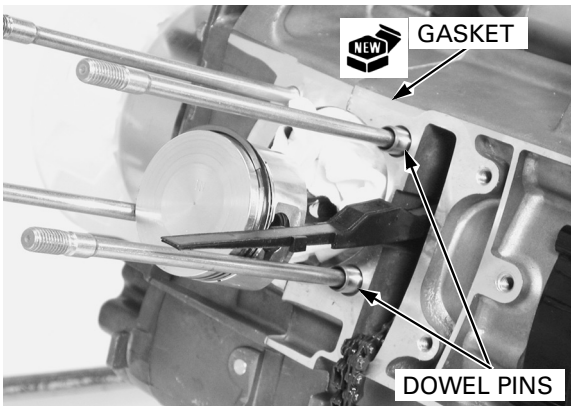
Install the new piston pin clips.

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



CYLINDER INSTALLATION

Install dowel pins and a new gasket.

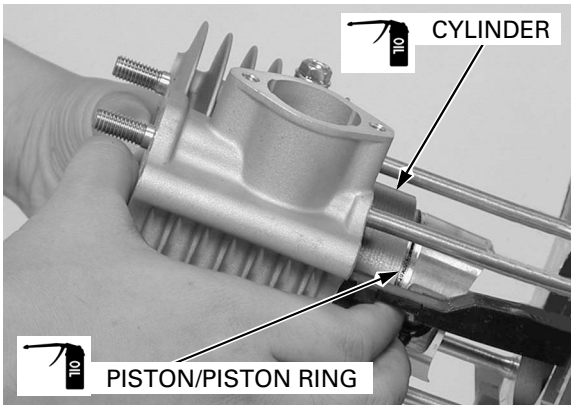


Apply clean engine oil to the cylinder inner surface and piston rings.

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

Install the cylinder over the piston while compressing the piston ring with your finger.

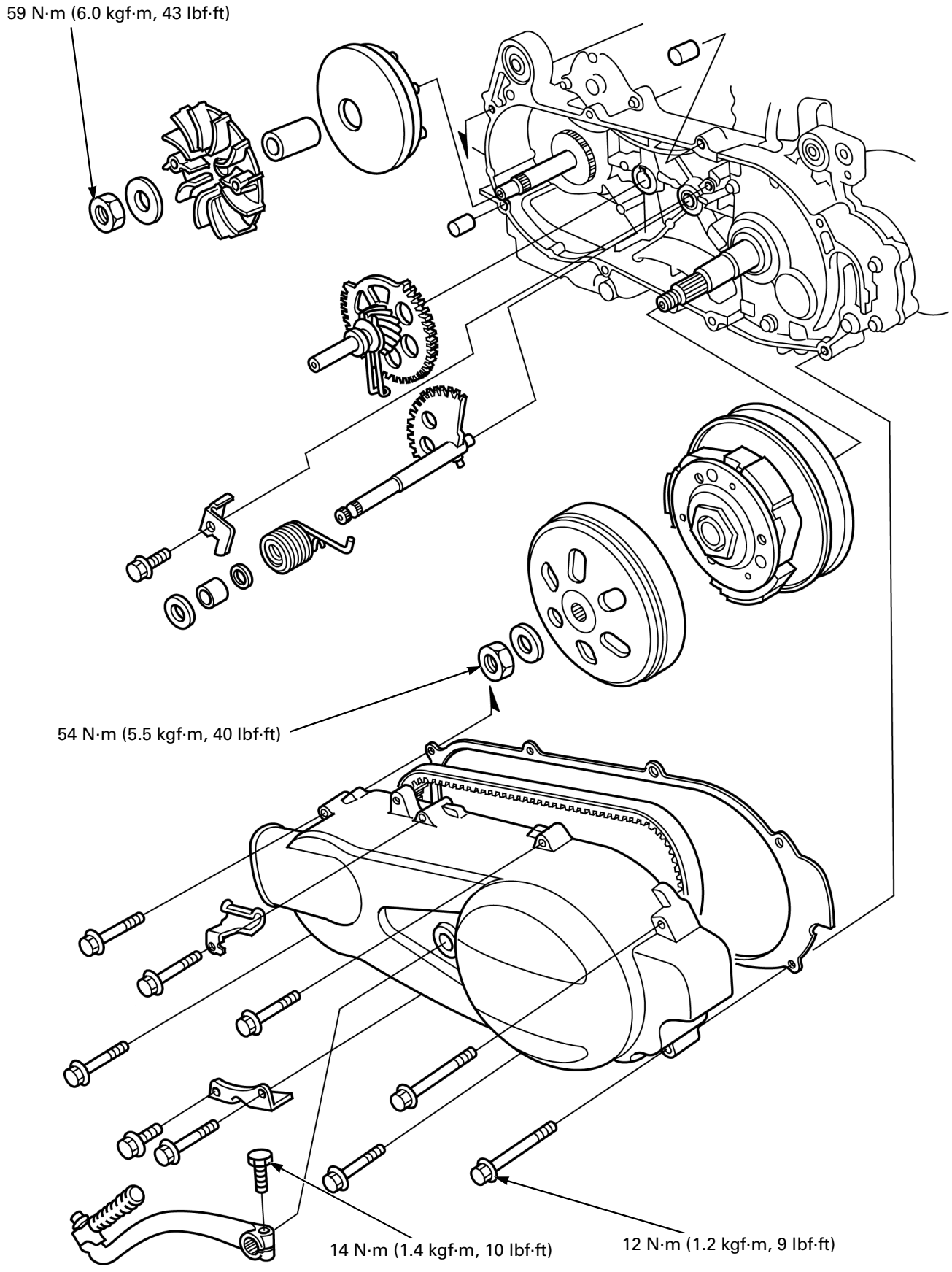
Install the cylinder head (page 7-19).



MEMO

9. KICKSTARTER/DRIVE PULLEY/DRIVEN PULLEY/CLUTCH

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

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

SPECIFICATIONS

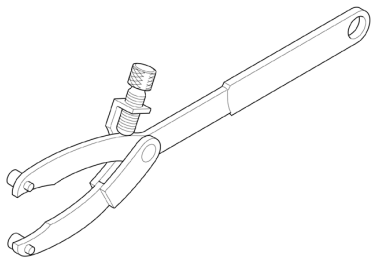
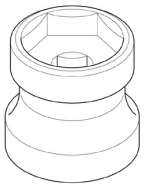
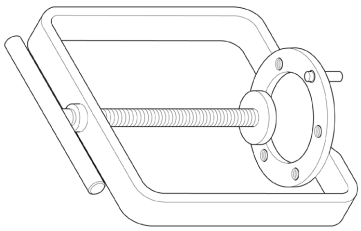
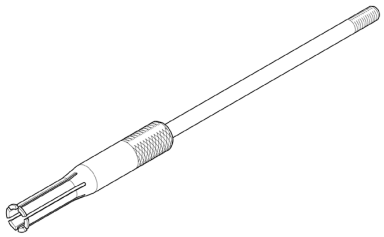
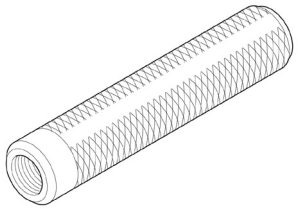
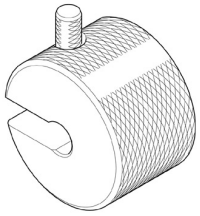
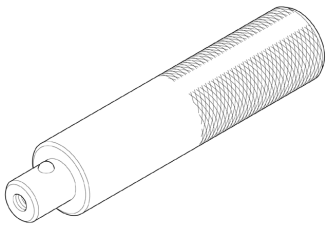
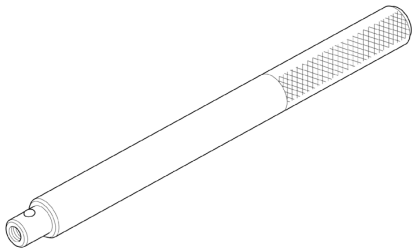
Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Drive belt width		20.0 (0.79)	19.0 (0.75)
Movable drive face	Bushing I.D.	23.989 – 24.042 (0.9444 – 0.9465)	24.07 (0.948)
	Boss O.D.	23.960 – 23.974 (0.9433 – 0.9439)	23.93 (0.942)
	Weight roller O.D.	17.92 – 18.08 (0.706 – 0.712)	17.5 (0.69)
Clutch	Lining thickness	–	2.0 (0.08)
	Clutch outer I.D.	125.0 – 125.2 (4.92 – 4.93)	125.5 (4.94)
Driven pulley	Face spring free length	154.6 (6.09)	135 (5.3)
	Driven face O.D.	33.965 – 33.985 (1.3372 – 1.3380)	33.94 (1.336)
	Movable driven face I.D.	34.000 – 34.025 (1.3386 – 1.3396)	34.06 (1.341)

TORQUE VALUES

Kickstarter pinch bolt	14 N·m (1.4 kgf·m, 10 lbf·ft)	
Left crankcase cover bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Left crankcase cover plate screw	3 N·m (0.3 kgf·m, 2.2 lbf·ft)	
Drive pulley face nut	59 N·m (6.0 kgf·m, 43 lbf·ft)	Apply engine oil to the threads and seating surface
Clutch/driven pulley nut	54 N·m (5.5 kgf·m, 40 lbt·ft)	
Clutch outer nut	54 N·m (5.5 kgf·m, 40 lbt·ft)	

TOOLS

Universal holder 07725-0030000 	Socket wrench, 39 x 41 mm 07GMA-KS40100 	Clutch spring compressor 07LME-GZ40200 
Bearing remover, 20 mm 07936-3710600 	Bearing remover handle 07936-3710100 	Remover weight 07741-0010201 
Driver 07749-0010000 	Driver handle 07949-3710001 	Attachment, 24 x 26 mm 07746-0010700 
Pilot, 20 mm 07746-0040500 	Pilot, 15 mm 07746-0040300 	

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

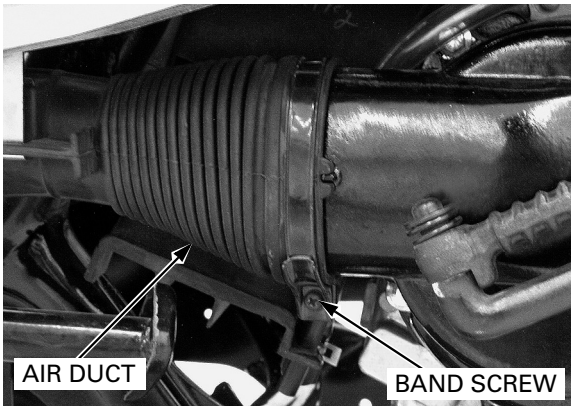
Poor performance at high speed or lack of power
- Worn drive belt
- Weak driven face spring
- Worn weight rollers
- Contaminated pulley faces

LEFT CRANKCASE COVER

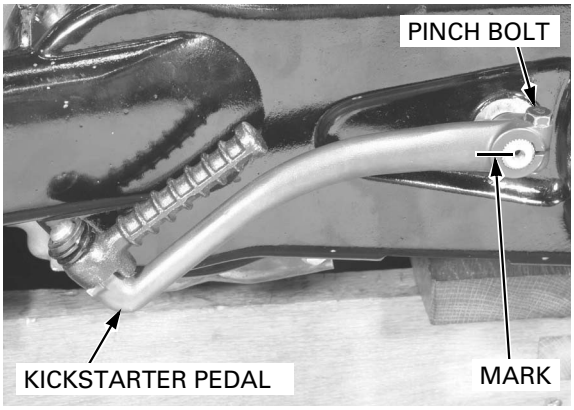
REMOVAL

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

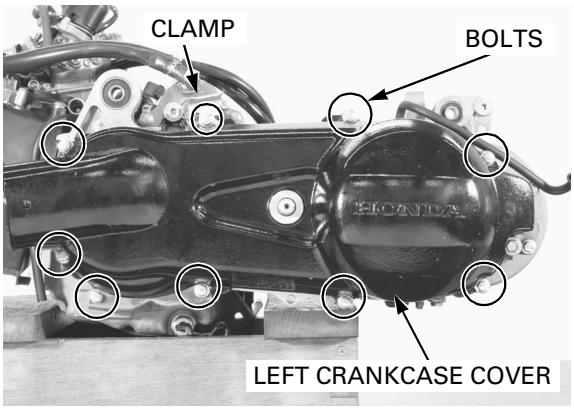
Loosen the band screw and disconnect the air duct from the left crankcase cover.



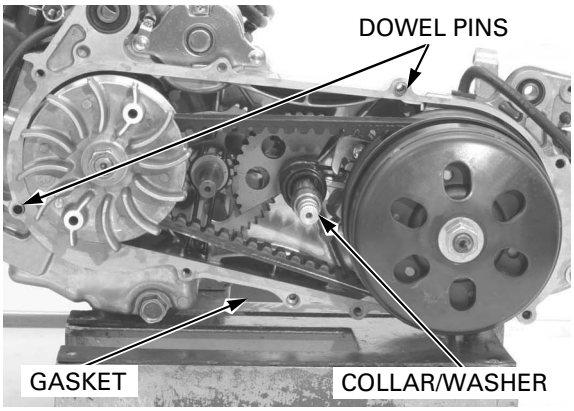
Before removing the kickstarter pedal, mark the pedal and spindle for proper installation position. Remove the kick starter pinch bolt and kick starter pedal.



Remove the bolts, clamp and left crankcase cover.

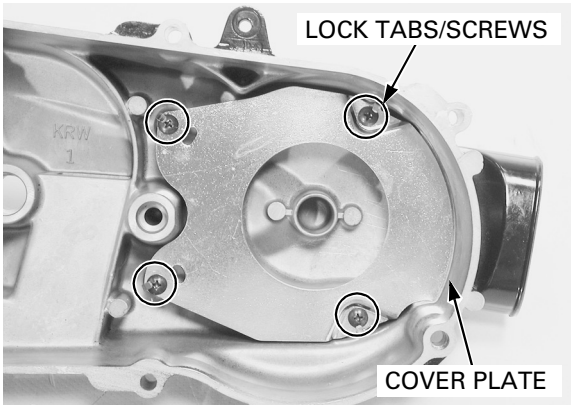


Remove the two dowel pins, gasket, collar and washer.



DISASSEMBLY

Raise the lock tabs of the left crankcase cover plate.
Remove the screws and left crankcase cover plate.

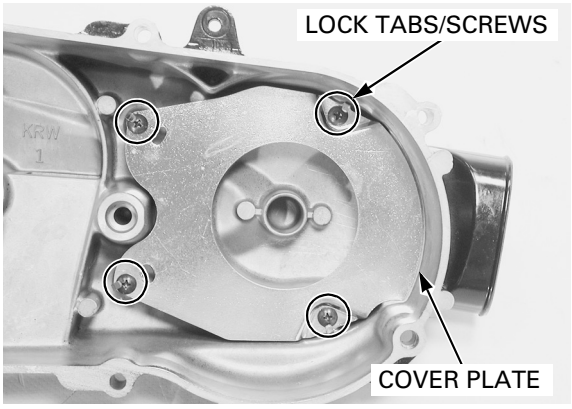


ASSEMBLY

Install the left crankcase cover plate and tighten the screws.

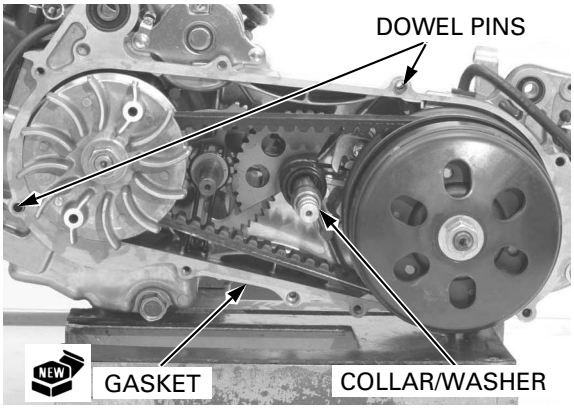
TORQUE: 3 N·m (0.3 kgf·m, 2.2 lbf·ft)

Band the lock tabs of the cover plate against the screw heads.



INSTALLATION

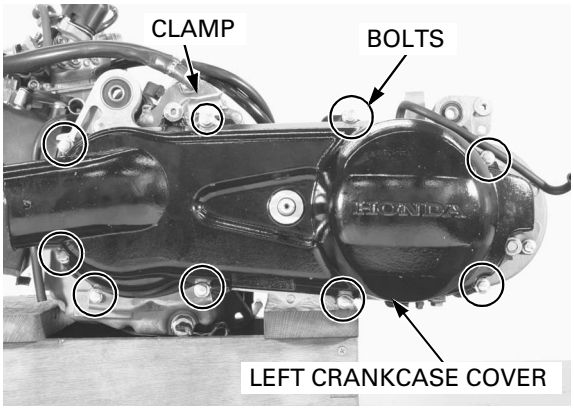
Install the two dowel pins, collar and washer.
Install a new gasket.



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

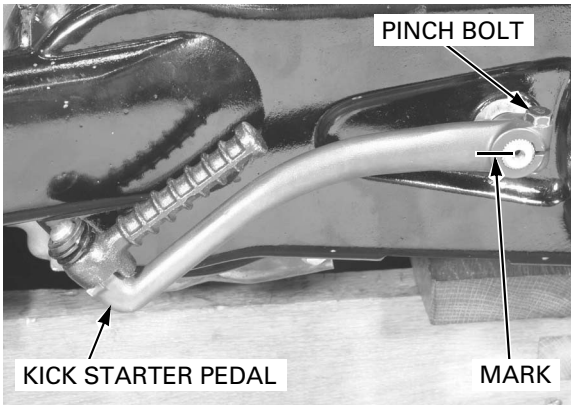
Install the clamp, left crankcase cover bolts and tighten the bolts in a crisscross pattern in two or three steps to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



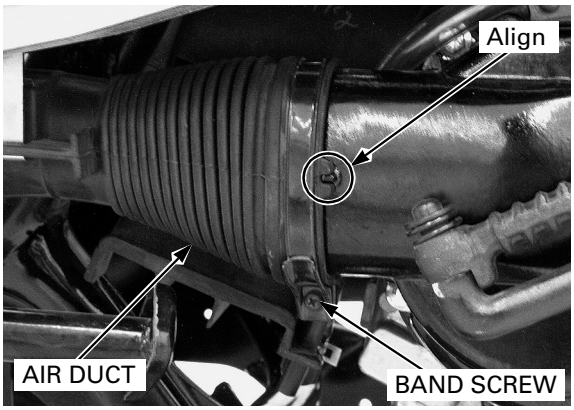
Install the kickstarter pedal in its original position as marked during removal.
Install and tighten the kickstarter pinch bolt to the specified torque:

TORQUE: 14 N·m (1.4 kgf·m, 10 lbf·ft)



Connect the air duct to the left crankcase cover by aligning the air duct cut-off with the left crankcase cover tab and tighten the band screw.

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



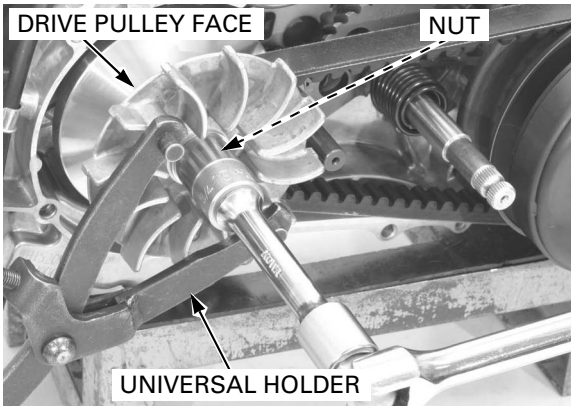
DRIVE PULLEY

REMOVAL

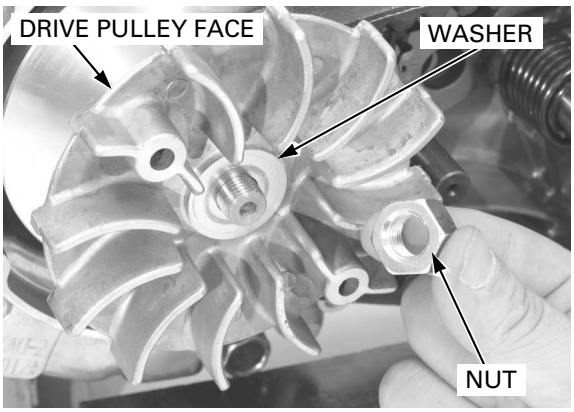
Remove the left crankcase cover (page 9-6).

Hold the drive pulley face with special tool and remove the drive pulley face nut and washer.

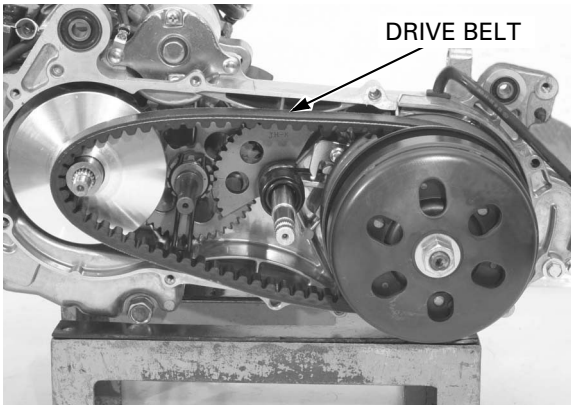
TOOL:
Universal holder **07725-0030000**



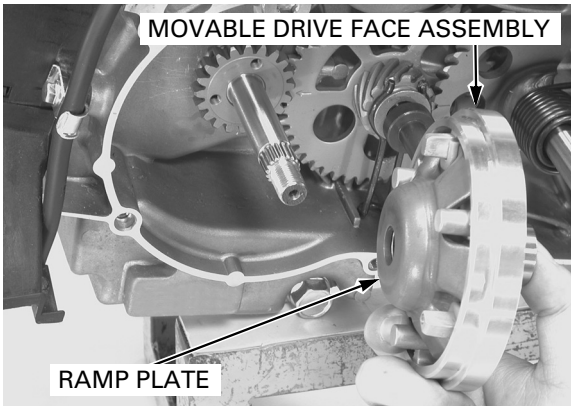
Remove the nut, washer and drive pulley face.



Remove the drive belt.



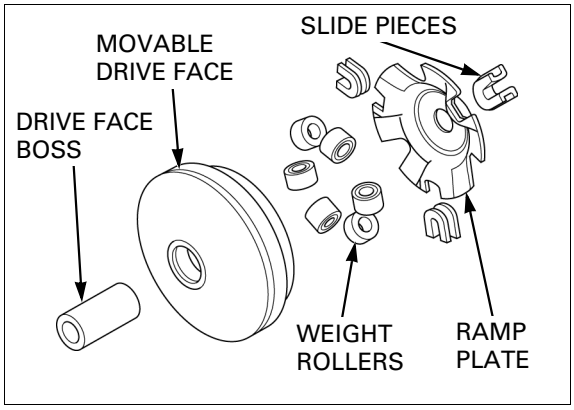
Remove the movable drive face assembly while holding the back of face (ramp plate) and drive face boss.



DISASSEMBLY

Remove the following:

- drive face boss
- ramp plate
- slide pieces
- weight rollers

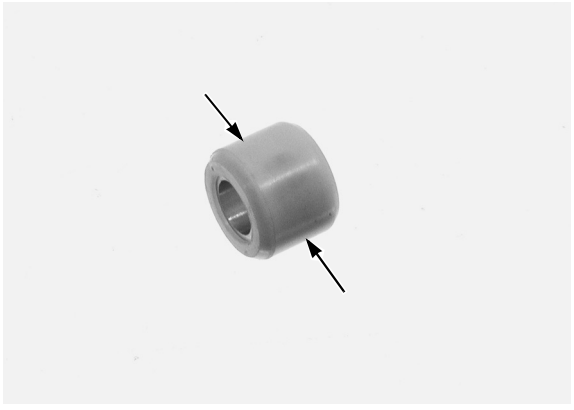


INSPECTION

Weight roller

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

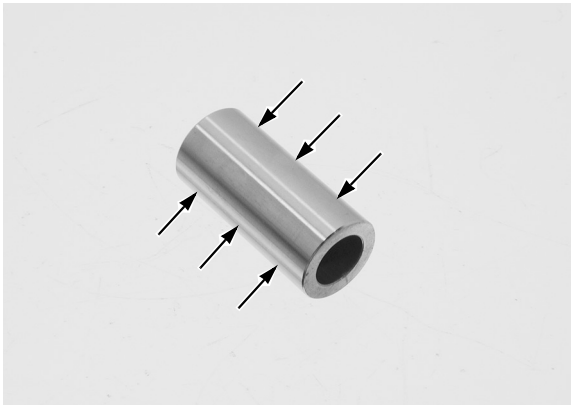
SERVICE LIMIT: 17.5 mm (0.69 in)



Movable drive face boss

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

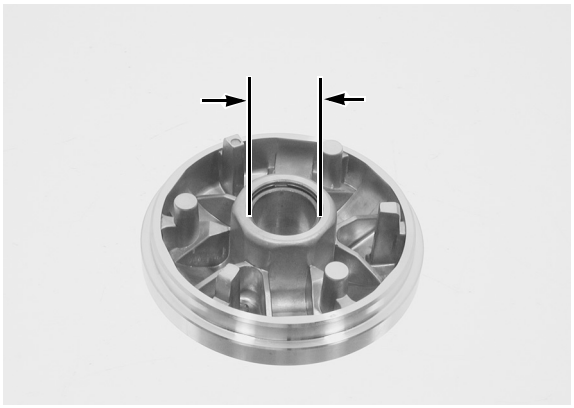
SERVICE LIMIT: 23.93 mm (0.942 in)



Movable drive face

Measure the drive face bushing I.D.

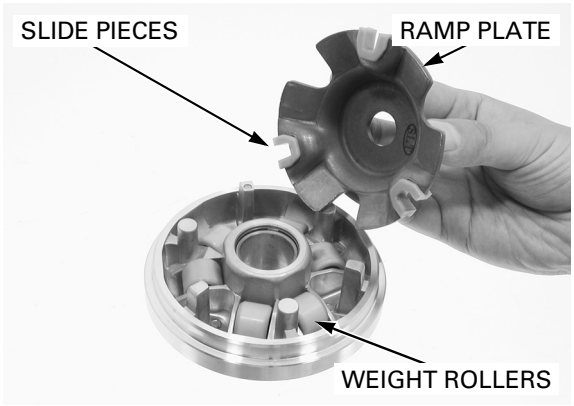
SERVICE LIMIT: 24.07 mm (0.948 in)



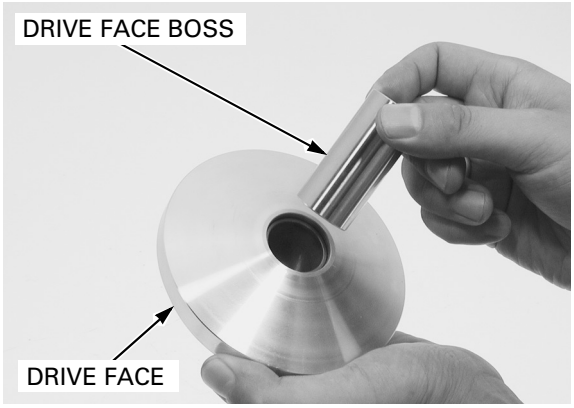
ASSEMBLY

Clean any oil and grease from the weight rollers.

Install the weight rollers on the movable drive face.
Install the slide pieces to the ramp plate.
Install the ramp plate to the movable drive face.



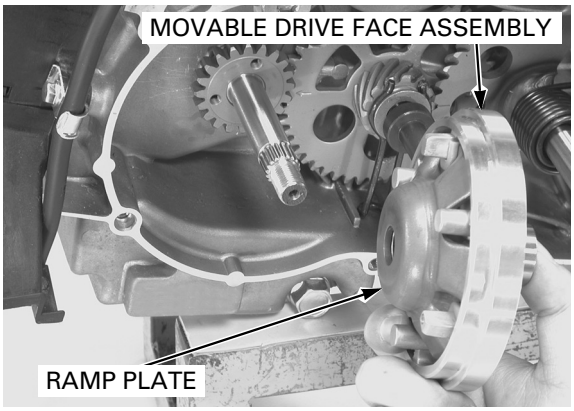
Install the drive face boss into the drive face.



INSTALLATION

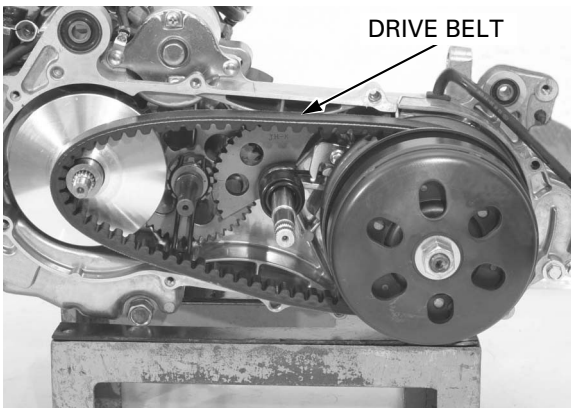
Clean any oil and grease from the drive face and the drive belt.

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



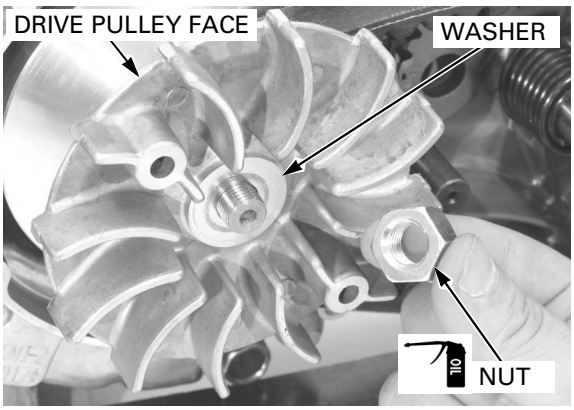
Turn the driven pulley and spread the faces apart while installing the drive belt.

Install the drive belt onto the drive face boss and clutch/driven pulley.



Install the drive pulley face and washer.

Apply clean engine oil to the drive pulley face nut threads and seating surface then install it with the washer.

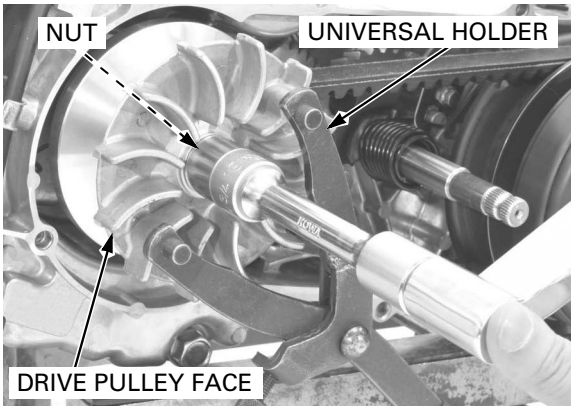


Hold the drive pulley face with the special tool and tighten the nut to the specified torque.

TOOL:
Universal holder 07725-0030000

TORQUE: 59 N·m (6.0 kgf·m, 43 lbf·ft)

Install the left crankcase cover (page 9-7).



CLUTCH/DRIVEN PULLEY

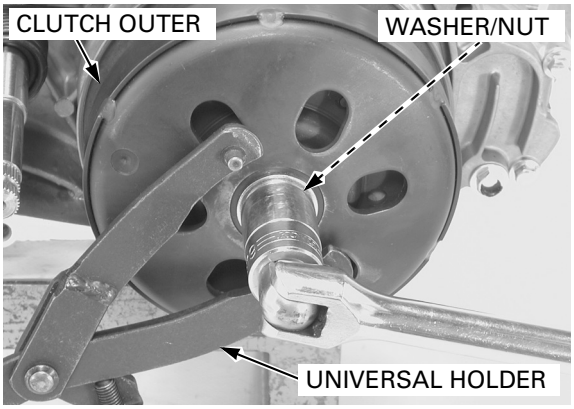
REMOVAL

Remove the drive pulley (page 9-8).

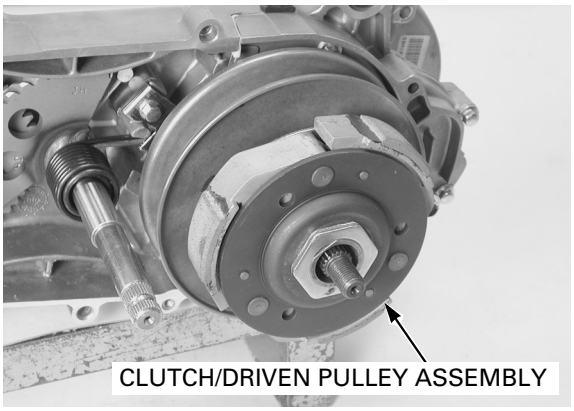
Hold the clutch outer with the special tool and remove the nut.

TOOL:
Universal holder 07725-0030000

Remove the washer and clutch outer.



Remove the clutch/driven pulley assembly.

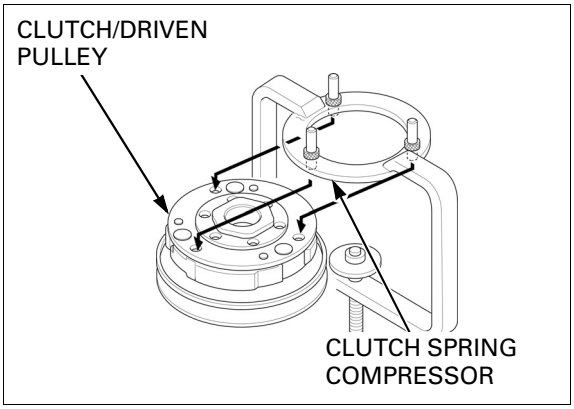


DISASSEMBLY

Clutch/driven pulley

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

TOOL:
Clutch spring compressor 07LME-GZ40200

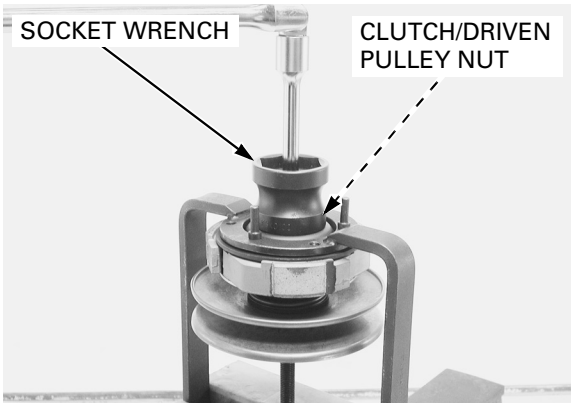


Hold the clutch spring compressor in a vise.

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

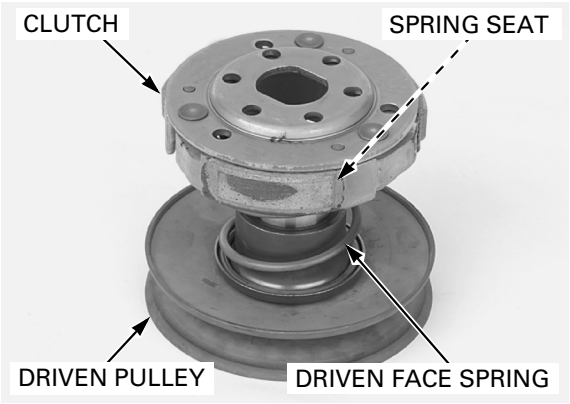
Compress the clutch/driven pulley and remove the clutch/driven pulley nut using the special tool.

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



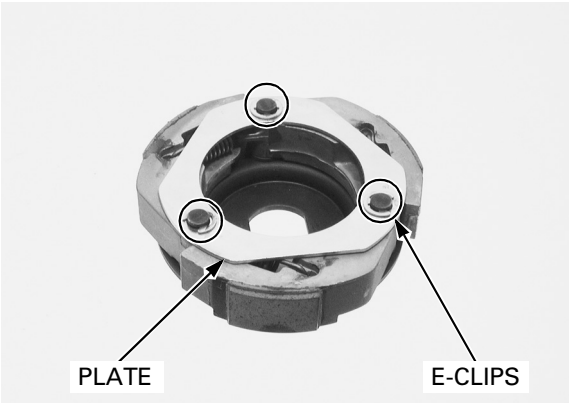
Loosen the clutch spring compressor gradually and remove the following:

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

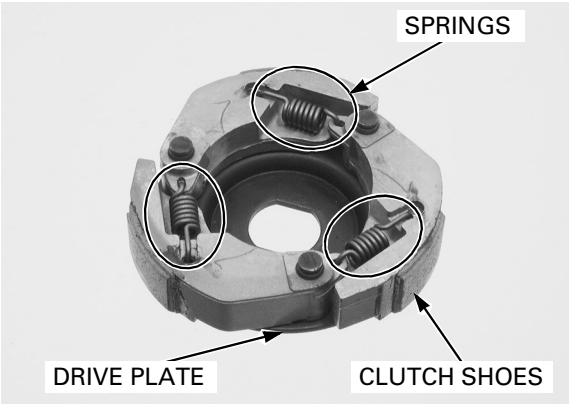


Clutch

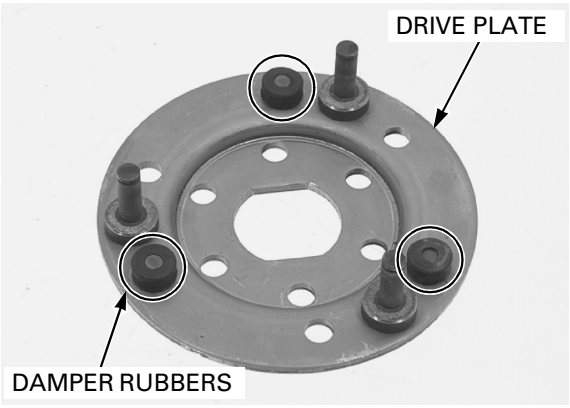
Remove the three E-clips and plate.



Remove the clutch shoe springs and clutch shoes from the clutch drive plate.

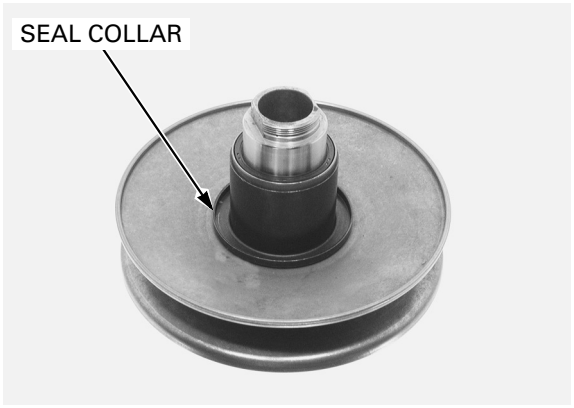


Remove the damper rubbers from the drive plate.

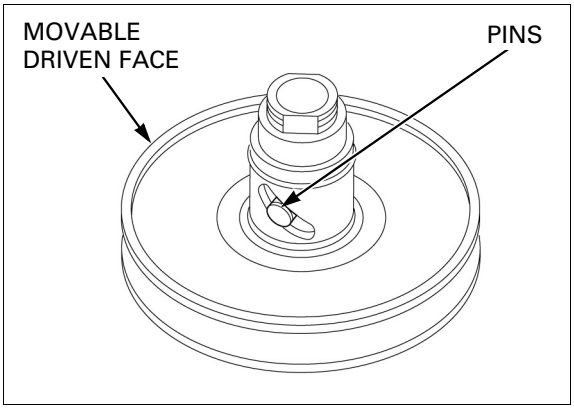


Driven pulley

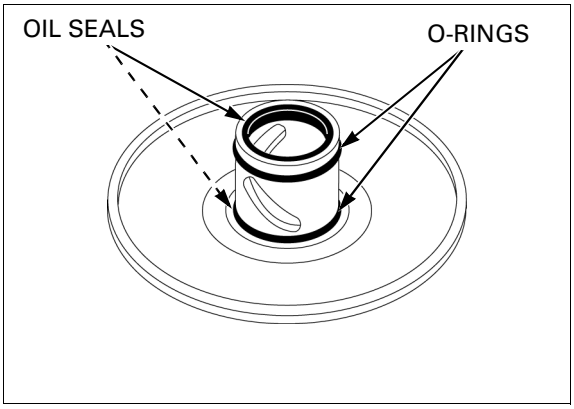
Remove the seal collar.



Remove the guide roller pins from the driven face.
Remove the movable driven face from the driven face.



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

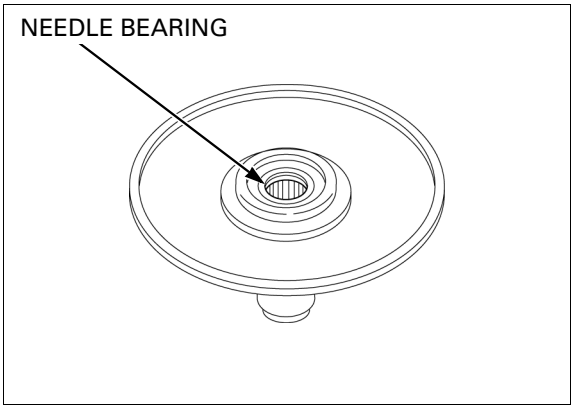


Driven face bearing replacement

Remove the driven face needle bearing using the special tools.

TOOLS:

Bearing remover, 20 mm	**07936-3710600**
Bearing remover handle	**07936-3710100**
Remover weight	**07741-0010201**



Remove the snap ring, then remove the ball bearing.

Apply grease to a new ball bearing.

The sealed side of ball bearing is facing to the driven face.

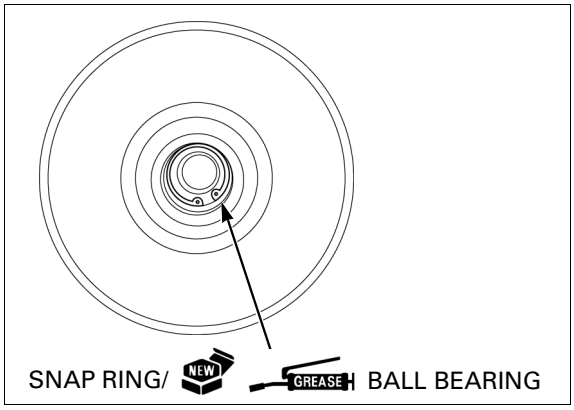
Press the ball bearing into the driven face until it is fully seated, using the special tools.

TOOLS:

Driver handle	**07949-3710001**
Attachment, 24 x 26 mm	**07746-0010700**
Pilot, 15 mm	**07746-0040300**

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

Apply 7.0 – 8.0g of grease to the driven face inner surface.



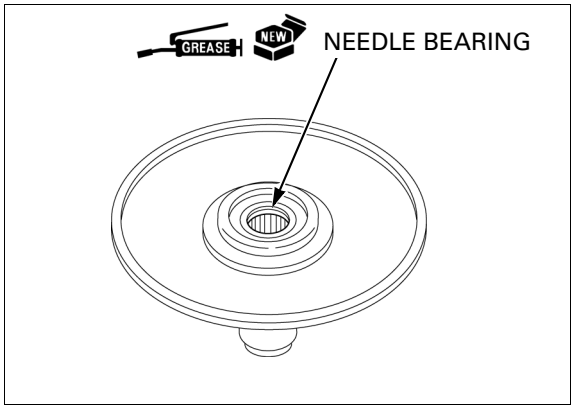
Apply 1.0 – 1.5g of grease to a new needle bearing.

The sealed side of needle bearing is facing to the special tools.

Press the needle bearing into the driven face using the special tools.

TOOLS:

Driver	**07749-0010000**
Attachment, 24 x 26 mm	**07746-0010700**
Pilot, 20 mm	**07746-0040500**



INSPECTION

clutch outer

Check the clutch outer for wear or damage.

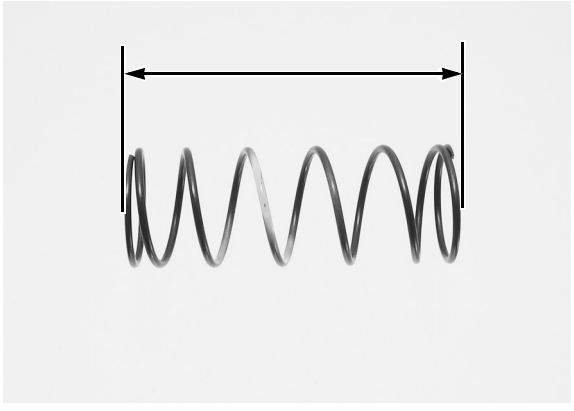
Measure the clutch outer I.D.

SERVICE LIMIT: 125.5 mm (4.94 in)

Driven face spring

Measure the driven face spring free length.

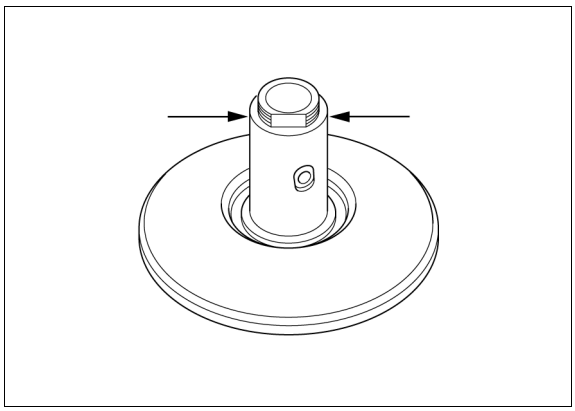
SERVICE LIMIT: 135 mm (5.3 in)



Driven face

Check the driven face for scratches, scoring or damage.
Measure the driven face boss O.D.

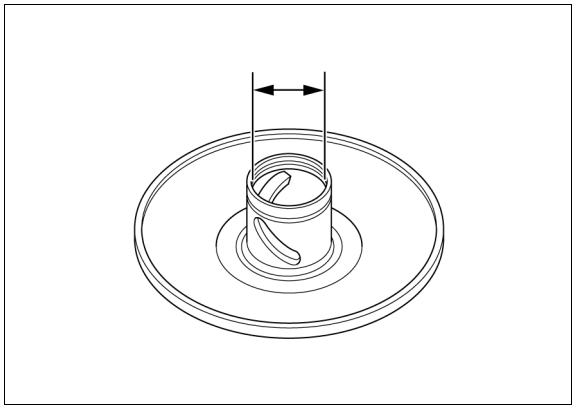
SERVICE LIMIT: 33.94 mm (1.336 in)



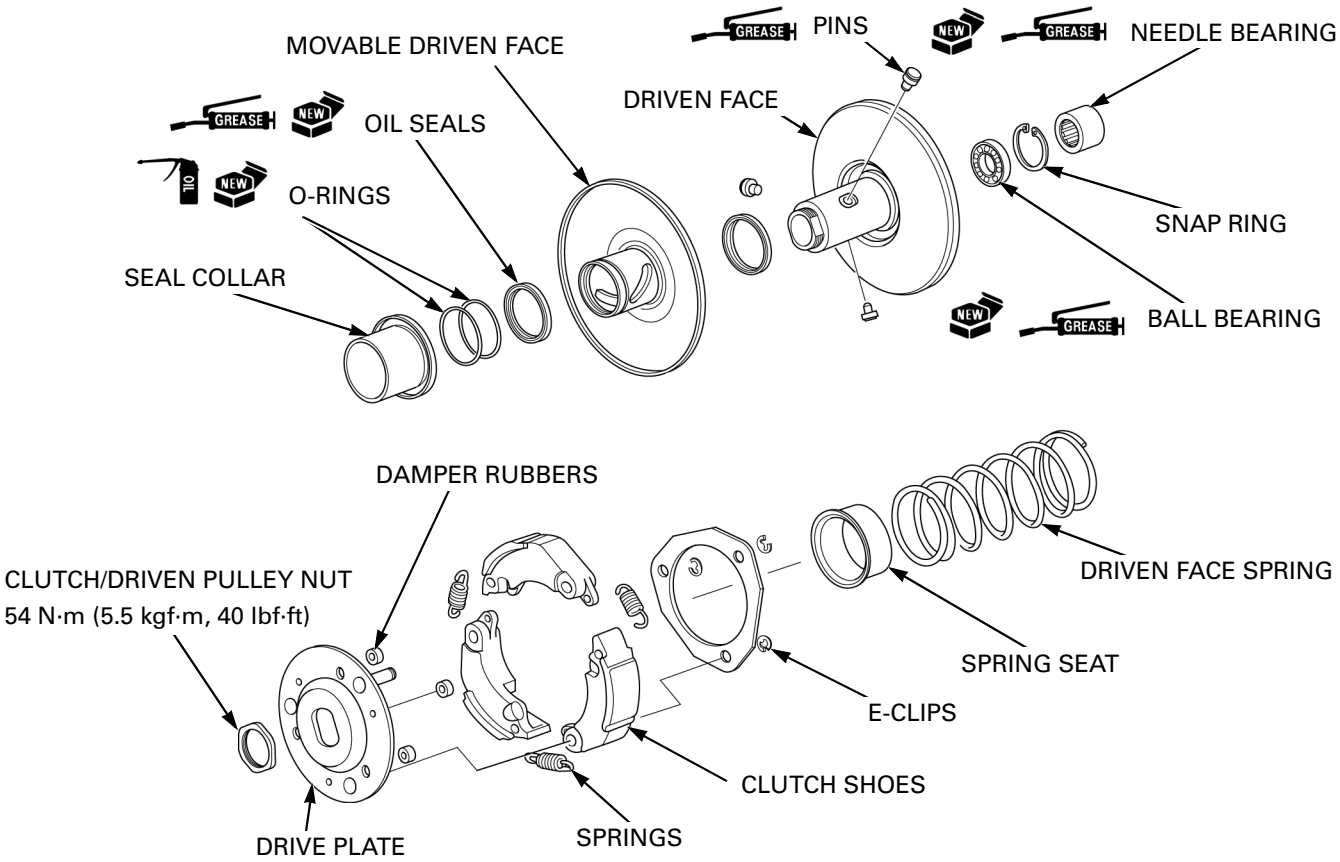
Movable driven face

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: 34.06 mm (1.341 in)



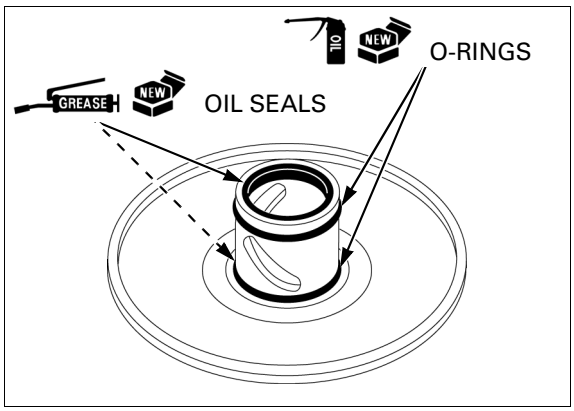
ASSEMBLY



Driven pulley

Apply grease to new oil seal lips and install them into the movable driven face.

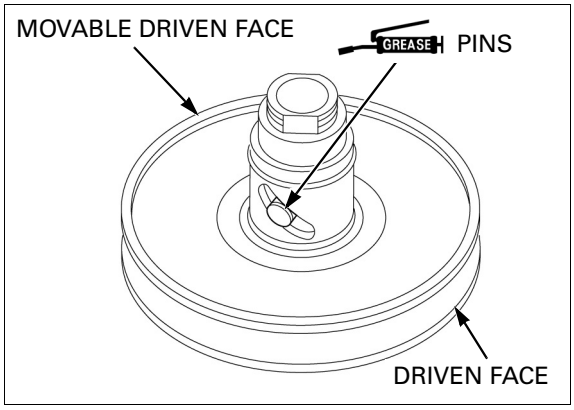
Coat new O-rings with clean engine oil and install them into the movable driven face.



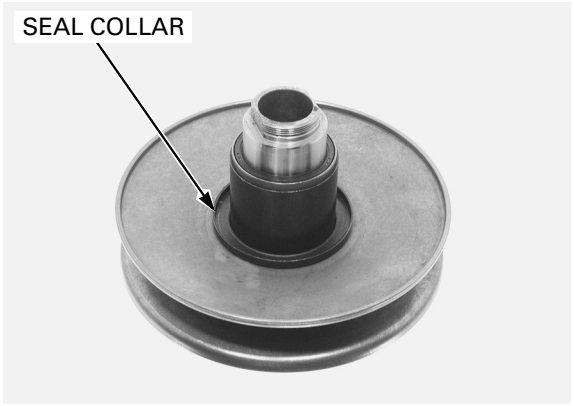
Clean any oil and grease from the pulley face.

Install the movable driven face onto the driven face. Install the guide roller pins.

Apply 2.0–2.5 g of grease to each guide groove.

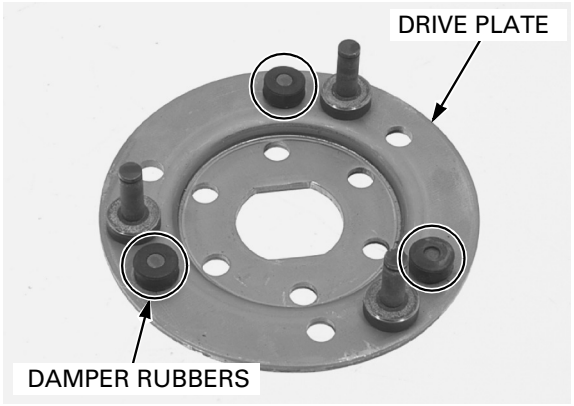


Install the seal collar to the driven pulley.



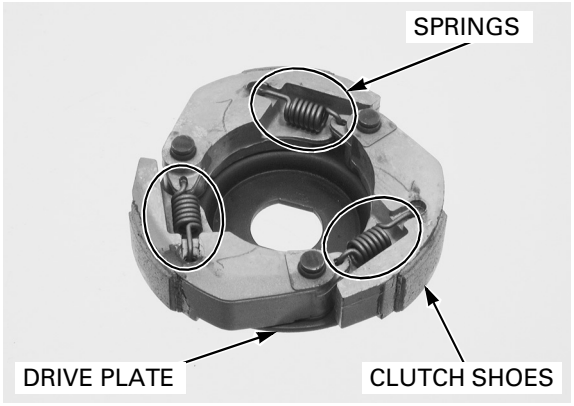
Clutch

Install the rubber dampers onto the drive plate.

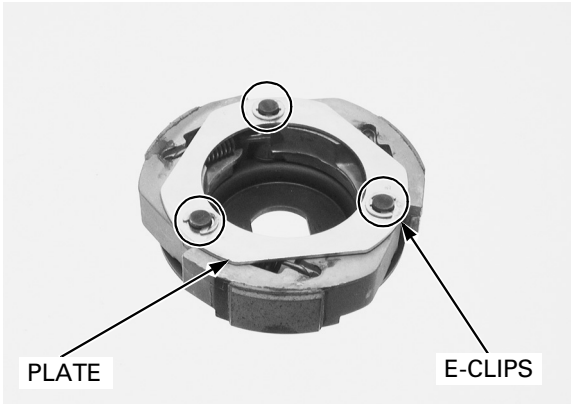


Install the shoe springs into the clutch shoes as shown.

Install the clutch shoes into the drive plate by aligning the shoe grooves and damper rubbers.



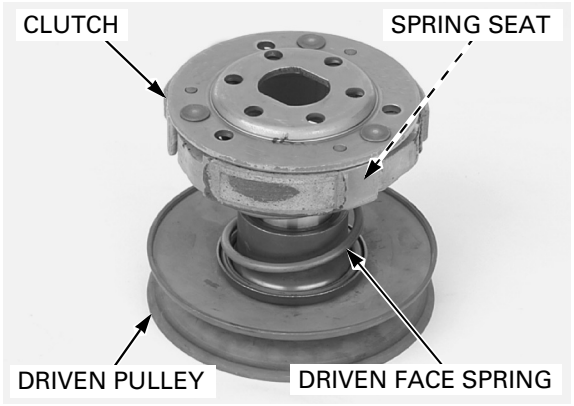
Install the plate and E-clips.



Clutch/driven pulley

Assemble the following:

- Driven pulley assembly
- Driven face spring
- Spring seat
- 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 aligning the bosses of the compressor with the holes in the clutch and compress the driven face spring.

TOOL:
Clutch spring compressor 07LME-GZ40200

Install the clutch/driven pulley nut.

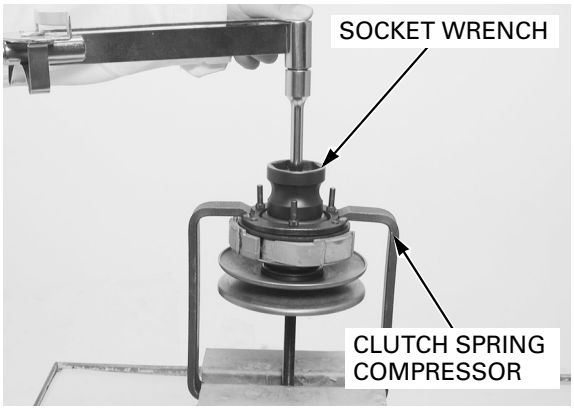
Hold the spring compressor in a vice.

Tighten the clutch/driven pulley nut using the socket wrench to the specified torque.

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

TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)

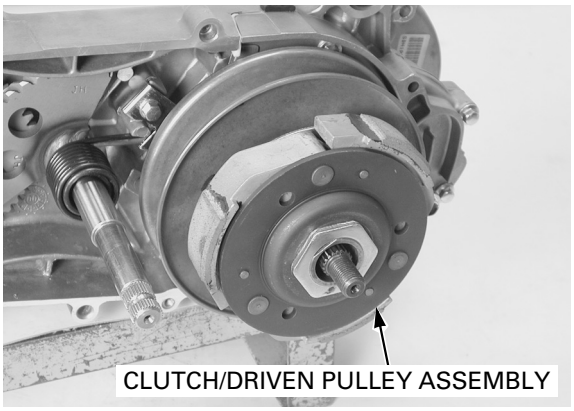
Remove the spring compressor from the clutch/driven pulley assembly.



INSTALLATION

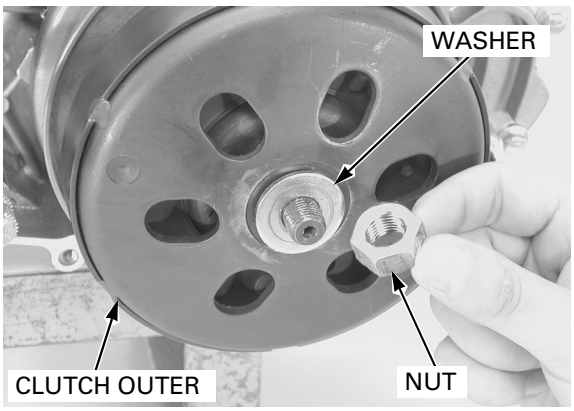
Do not get grease to the drive shaft splines from the driven face inside.

Install the clutch/driven pulley assembly onto the driveshaft.



Clean any oil and grease from the clutch outer.

Install the clutch outer, washer and clutch outer nut.

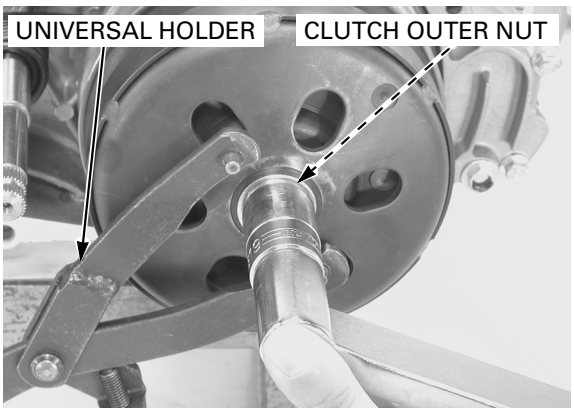


Hold the clutch outer with the special tool and tighten the clutch outer nut to the specified torque.

TOOL:
Universal holder 07725-0030000

TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)

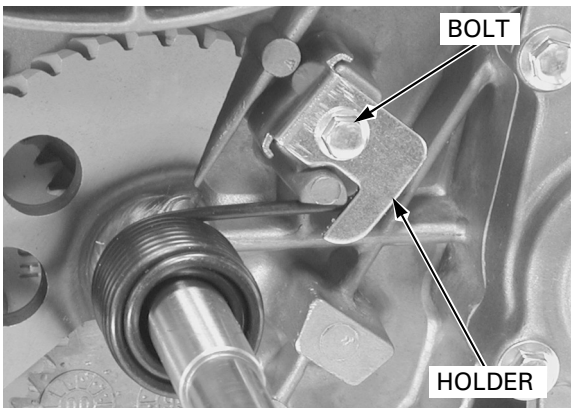
Install the drive pulley (page 9-11).



KICKSTARTER

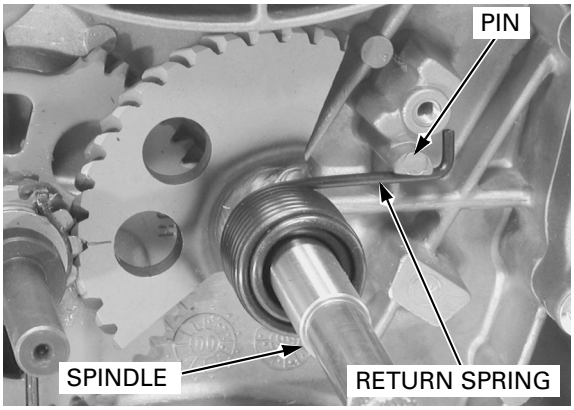
REMOVAL

Remove the clutch/driven pulley (page 9-12).
Remove the bolt and the spring holder.



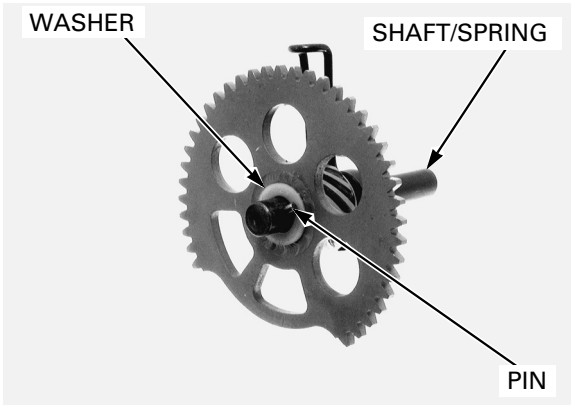
Unhook the return spring from the pin on the crankcase.

Remove the kickstarter spindle and return spring.



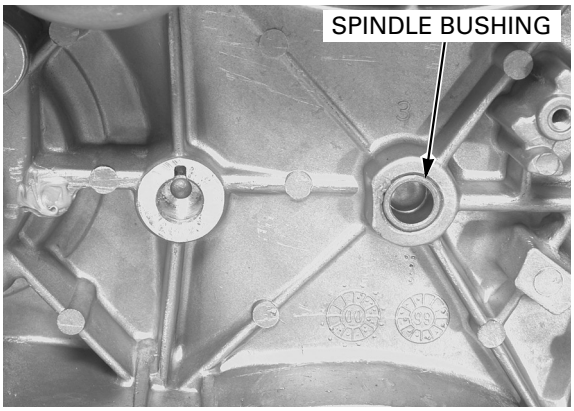
Remove the idle gear assembly.

Remove the pin, washer, shaft and spring.



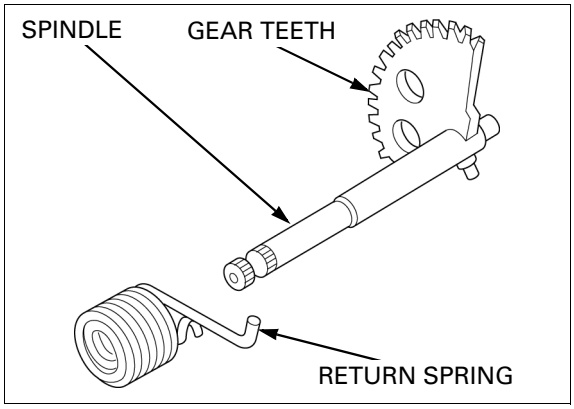
INSPECTION

Replace the kickstarter spindle bushing if it is damaged or worn.



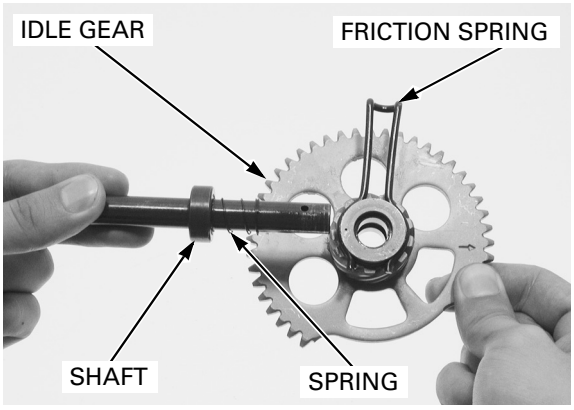
Inspect the following:

- spindle for wear, damage, or bending
- gear teeth for wear or damage
- return spring for weakness or damage



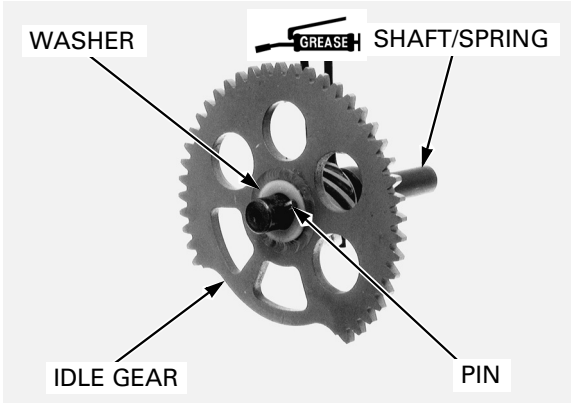
Inspect the following:

- idle gear for wear or damage
- friction spring for weakness or damage
- spring for weakness or damage
- shaft for wear or damage

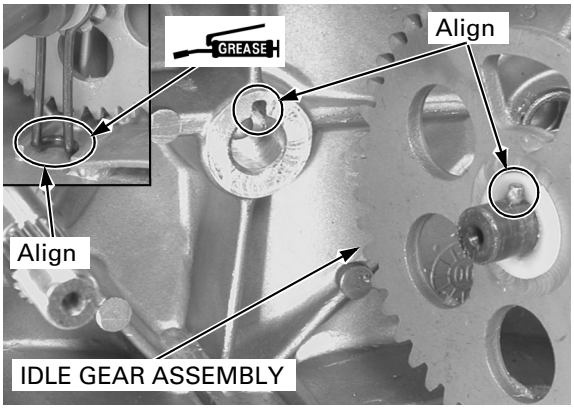


INSTALLATION

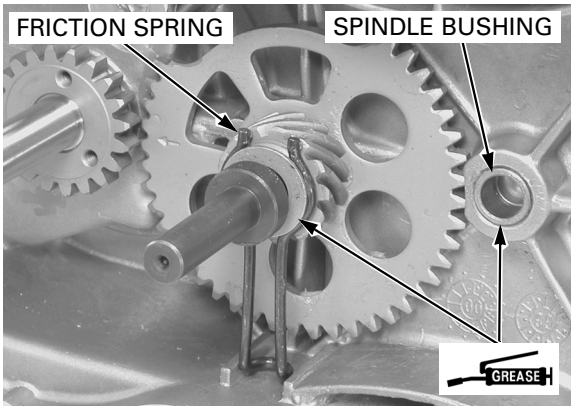
Apply grease to the sliding surface of shaft.
Install the spring and shaft to the idle gear.
Install the washer and pin to the shaft.



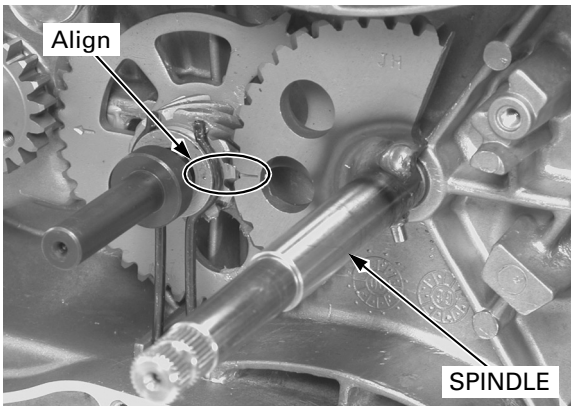
Apply grease to the friction spring sliding area.
Install the idle gear assembly into the left crankcase, aligning the boss with the groove and the friction spring with the groove.



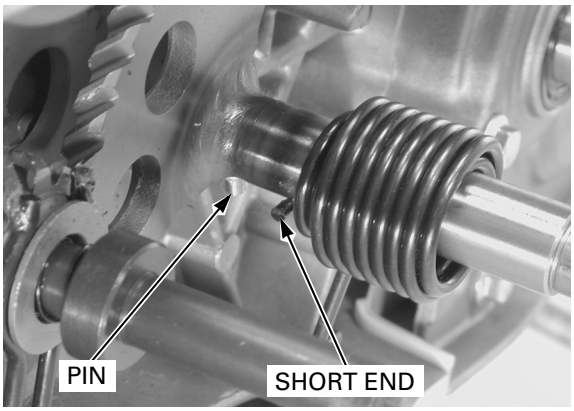
Apply grease to the kickstarter spindle bushing, and friction spring.



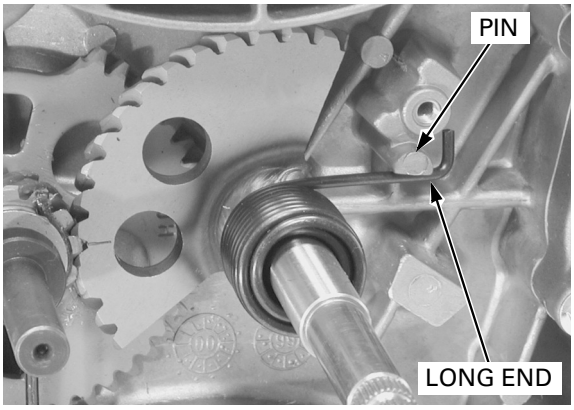
Install the spindle into the left crankcase, aligning the marks on the driven gear and spindle.



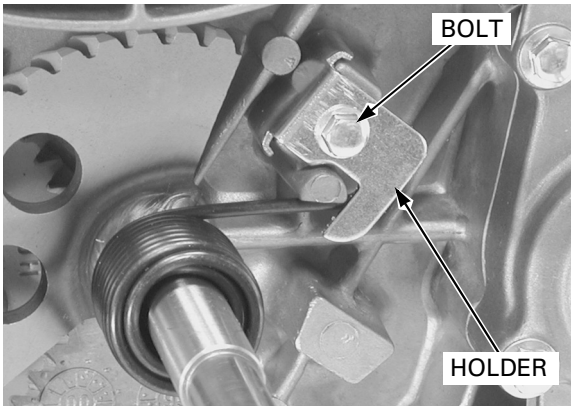
Hook the short end of the return spring to the spindle pin.



Hook the long end of the return spring to the crankcase pin.



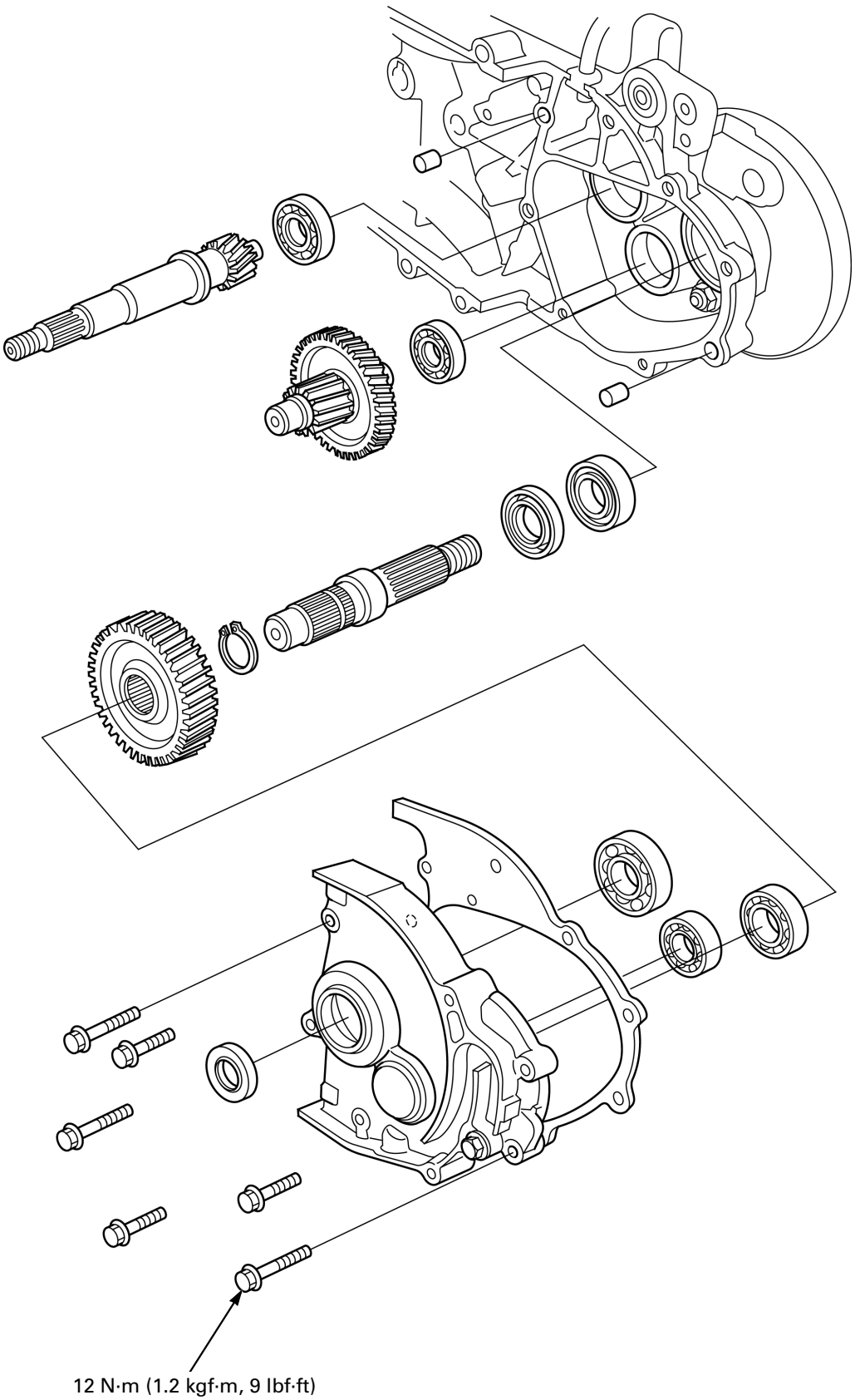
Install the bolt and spring holder and tighten it.
Install the clutch/driven pulley (page 9-19).



MEMO

10. FINAL REDUCTION

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- Refer to page 3-15 for final reduction oil inspection and change.
- These services can be done with the engine installed in the frame.
- When installing the driveshaft, be sure to use the special tools; position the special tools against the bearing inner race and pull the driveshaft into the bearing until it is fully seated.

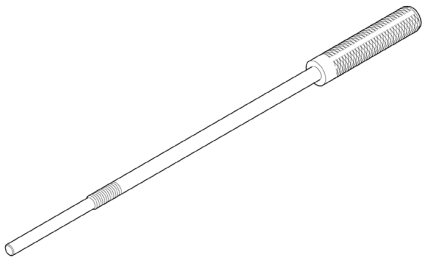
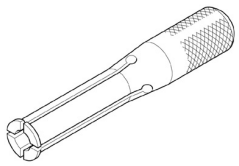
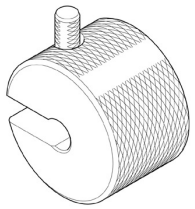
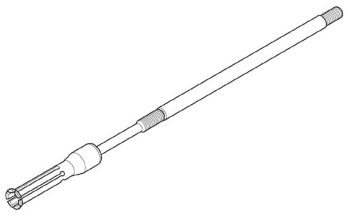
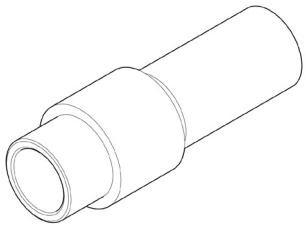
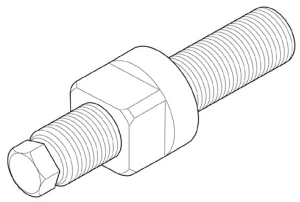
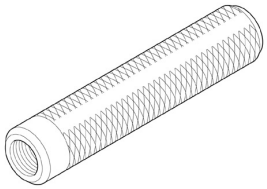
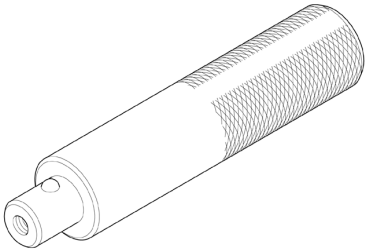
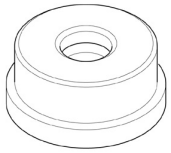
SPECIFICATIONS

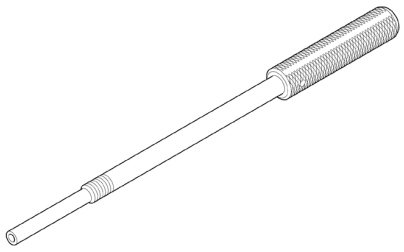
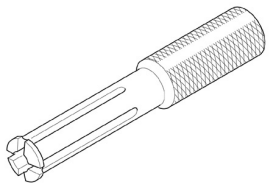
ITEM		SPECIFICATIONS
Final reduction oil capacity	After draining	0.09 liter (0.10 US qt, 0.08 Imp qt)
	After disassembly	0.11 liter (0.12 US qt, 0.10 Imp qt)
Recommended final reduction oil		Hypoid gear oil SAE #90 or Honda 4-stroke oil or equivalent motor oil API service classification: SE, SF or SG Viscosity: SAE 10W-30

TORQUE VALUES

Transmission cover bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)

TOOLS

Bearing remover shaft, 15 mm 07936-KC10100 	Bearing remover head, 15 mm 07936-KC10200 	Remover weight 07741-0010201 
Bearing remover set, 17 mm 07936-3710300 	Crankkase assembly collar 07965-GM00100 	Crankcase assembly shaft 07965-1660200 
Bearing remover handle 07936-3710100 	Driver 07749-0010000 	Assembly collar attachment 07965-GM00200 
Attachment, 37 x 40 mm 07746-0010200 	Attachment, 42 x 47 mm 07746-0010300 	Attachment, 32 x 35 mm 07746-0010100 

Pilot, 17 mm 07746-0040400 	Pilot, 12 mm 07746-0040200 	Pilot, 15 mm 07746-0040300 
Pilot, 20 mm 07746-0040500 	Bearing remover shaft, 12 mm 07936-1660120 	Bearing remover head, 12 mm 07936-1660110 

TROUBLESHOOTING

Engine does start but scooter won't move
- Damaged final reduction
- Seized final reduction
- Faulty drive pulley (page 9-8) and driven pulley/clutch (page 9-12)

Abnormal noise
- Worn, seized or chipped gears
- Worn or damaged final reduction bearing

Oil leak
- Oil level too high
- Worn or damaged oil seal
- Cracked crankcase and/or final reduction case

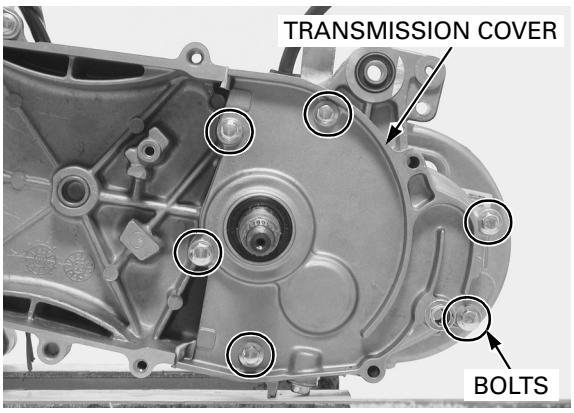
FINAL REDUCTION DISASSEMBLY

Drain the final reduction oil ((page 3-15).

Remove the following:

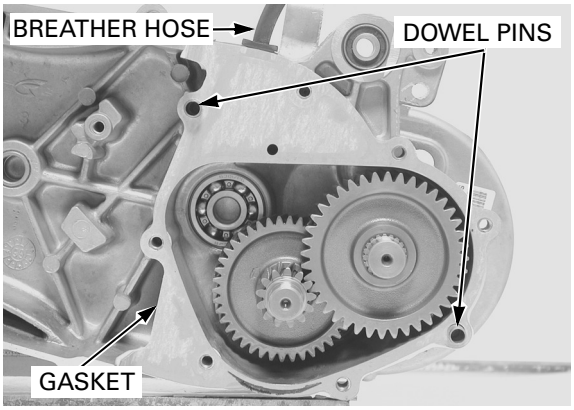
- Rear wheel (page 14-5)
- Rear brake adjusting nut and joint pin (page 14-6)
- Left crankcase cover (page 9-6)
- Clutch/driven pulley (page 9-12)

Remove the six bolts and the transmission cover.

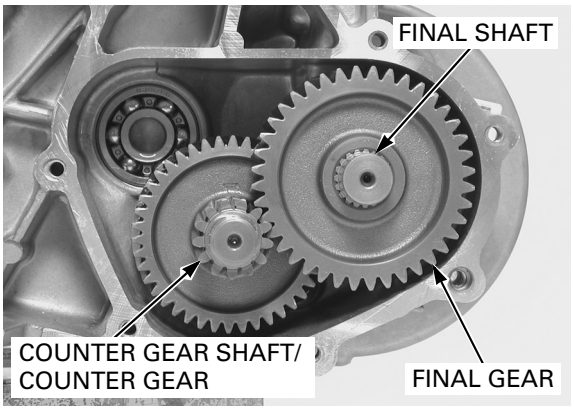


Remove the dowel pins and gasket.

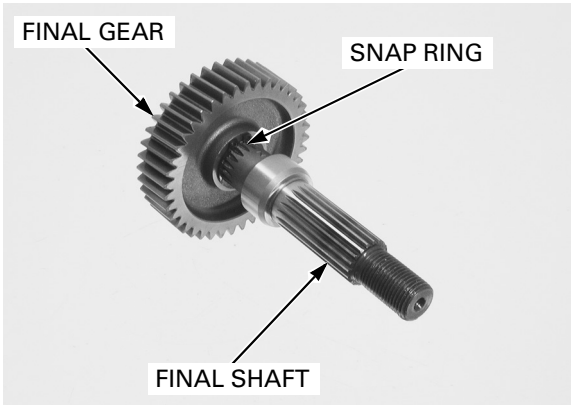
Disconnect the final reduction breather hose from the left crankcase.



Remove the final gear and final shaft.
Remove the counter gear shaft and counter gear.



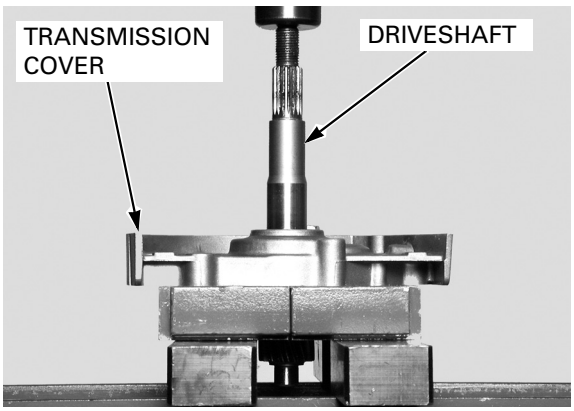
Remove the snap ring from the final shaft.
Separate the final gear and final shaft.



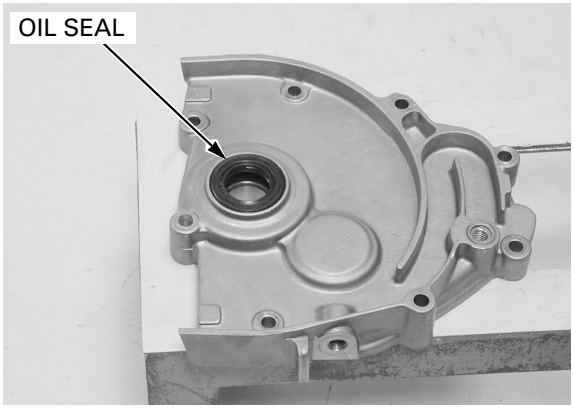
DRIVESHAFT REMOVAL

Do not damage transmission cover, bearing and driveshaft.

Remove the driveshaft from the transmission cover, using the press.



Remove the driveshaft oil seal.



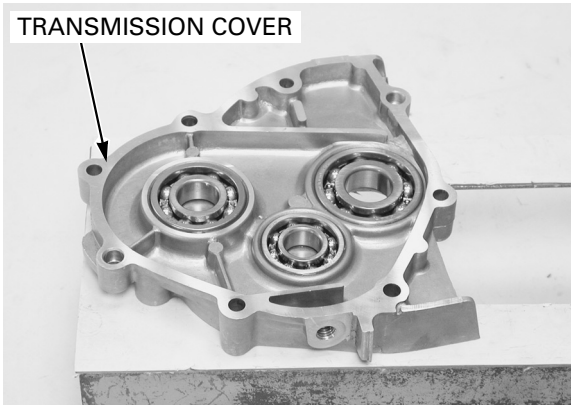
FINAL REDUCTION INSPECTION

Disassemble the final reduction (page 10-6).

Check the transmission cover bearings for wear or damage.

Turn each bearing inner race with your finger. The bearing should turn smoothly, without friction. Check that there is no clearance between the outer race and its transmission cover.

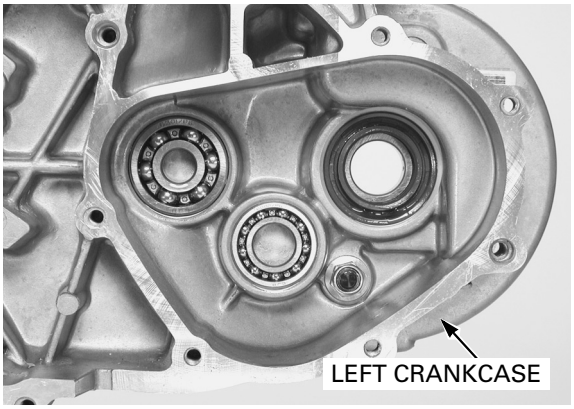
Remove and discard the bearings if the races do not turn smoothly and quietly, or if they fits loosely in the transmission cover.
Bearing replacement, See page 10-9.



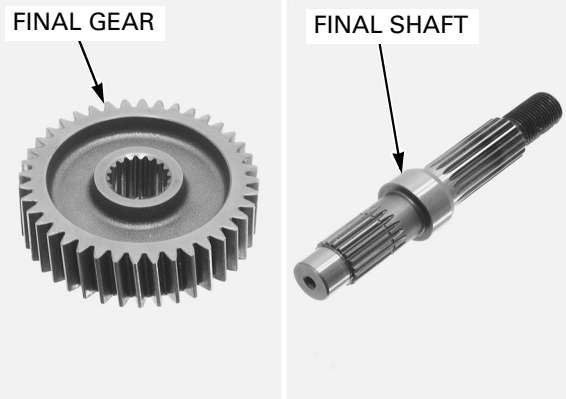
Check the left crankcase bearings and final gear shaft oil seal for wear or damage.

Turn each bearing inner race with your finger. The bearing should turn smoothly without friction. Check that there is no clearance between the outer race and the left crankcase.

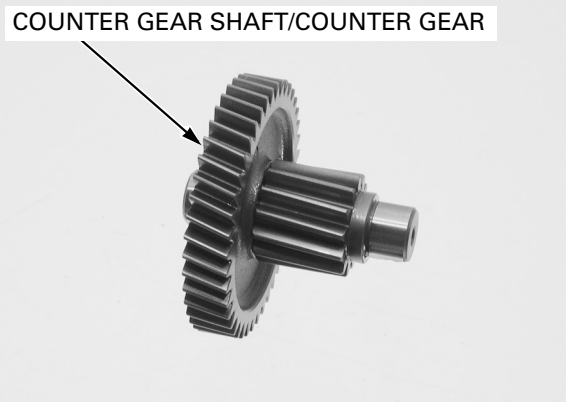
Remove and discard the bearings if the races do not turn smoothly and quietly, or if they fits loosely in the transmission cover.
Bearing replacement, See page 10-9.



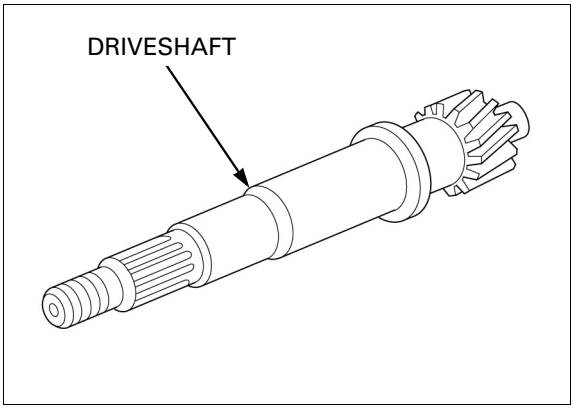
Check the final shaft and final gear for excessive wear, damage or signs of seizure.



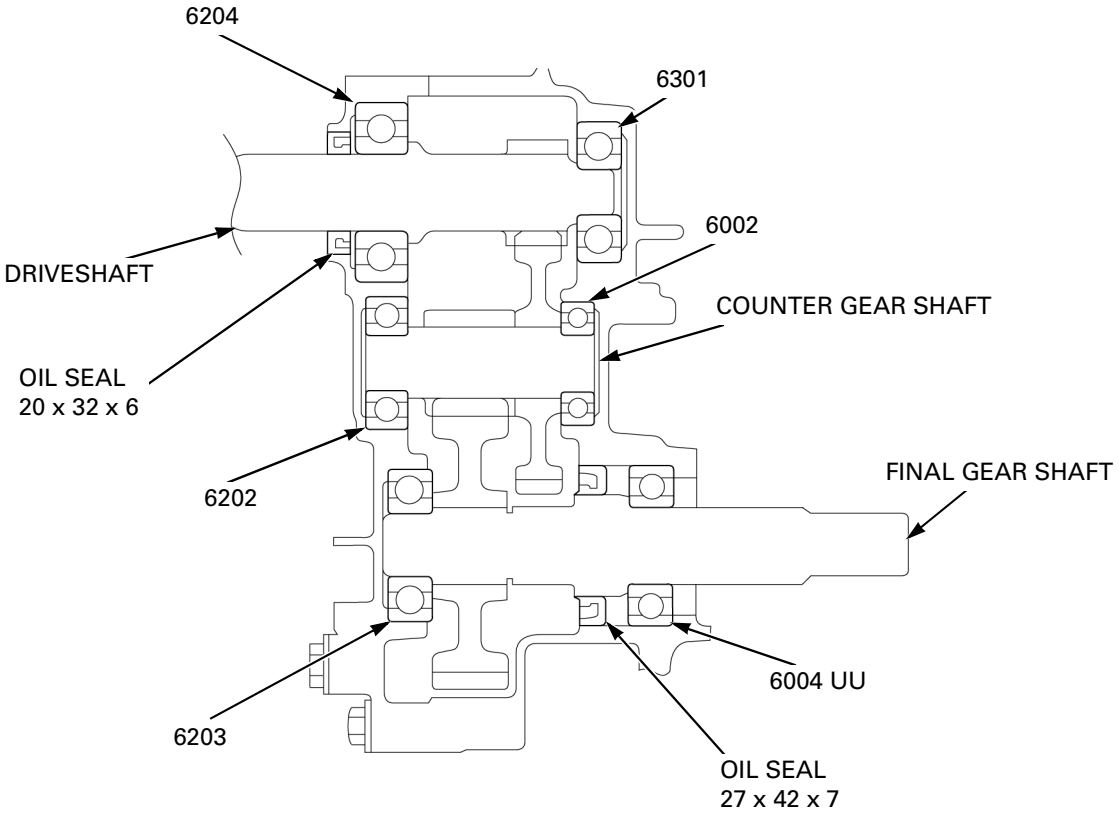
Check the counter gear shaft/counter gear for excessive wear, damage or signs of seizure.



Check the driveshaft for excessive wear, damage or sign of seizure.



BEARING REPLACEMENT



LEFT CRANKCASE

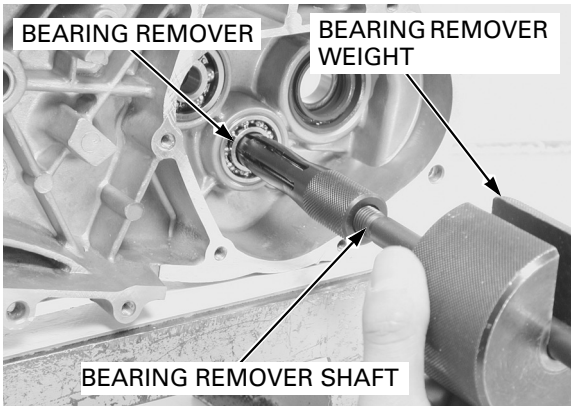
Disassemble the final reduction (page 10-6).

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

Remove the counter gear shaft bearing and driveshaft bearing using the special tools.

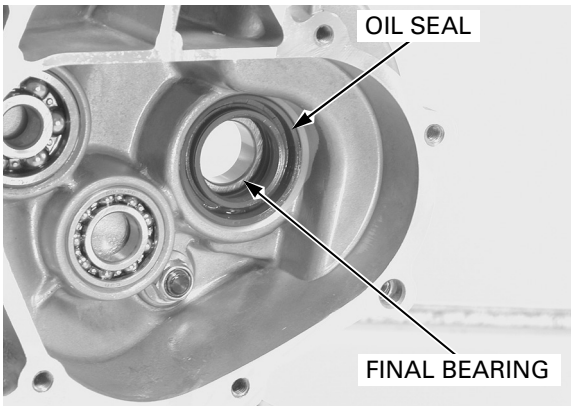
TOOLS:

Counter gear shaft bearing:	
Bearing remover head, 15 mm	**07936-KC10200**
Bearing remover shaft, 15 mm	**07936-KC10100**
Remover weight	**07741-0010201**
Driveshaft bearing:	
Bearing remover head, 12 mm	**07936-1660110**
Bearing remover shaft, 12 mm	**07936-1660120**
Remover weight	**07741-0010201**



Remove the final shaft oil seal from the left crankcase.

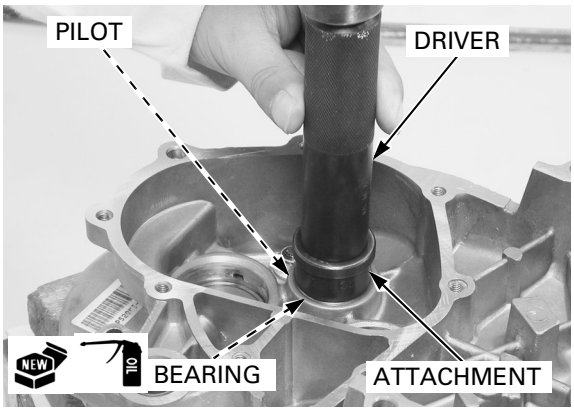
Remove the final shaft bearing from the left crankcase.



Apply engine oil to each bearing cavity.

The marked side of each bearing is facing the special tools.

Drive each new bearing into the left crankcase squarely until it is fully seated, using the special tools.

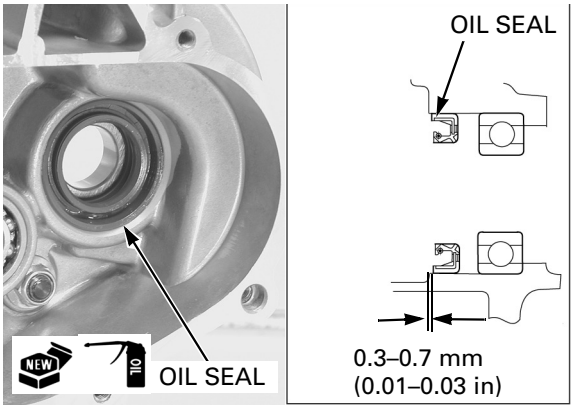


TOOLS:

Counter gear shaft bearing:	
Driver	**07749-0010000**
Attachment, 32 x 35 mm	**07746-0010100**
Pilot, 15 mm	**07746-0040300**
Driveshaft bearing:	
Driver	**07749-0010000**
Attachment, 37 x 40 mm	**07746-0010200**
Pilot, 12 mm	**07746-0040200**
Final gear shaft bearing:	
Driver	**07749-0010000**
Attachment, 42 x 47 mm	**07746-0010300**
Pilot, 20 mm	**07746-0040500**

Apply clean engine oil to a new oil seal lip.

Install a new final shaft oil seal into the left crankcase until the depth from the end surface is 0.3–0.7 mm (0.01–0.03 in).

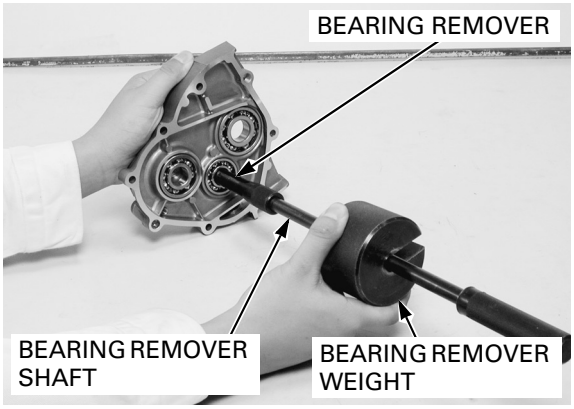


TRANSMISSION CASE

Be careful not to damage the final reduction case mating surface.

Remove the driveshaft bearing.

Remove the final gear shaft bearing and counter gear shaft bearing using the special tools.



TOOLS:

Countershaft bearing:	
Bearing remover head, 15 mm	**07936-KC10200**
Bearing remover shaft, 15 mm	**07936-KC10100**
Remover weight	**07741-0010201**
Final gear bearing:	
Bearing remover set, 17 mm	**07936-3710300**
Bearing remover handle	**07936-3710100**
Remover weight	**07741-0010201**

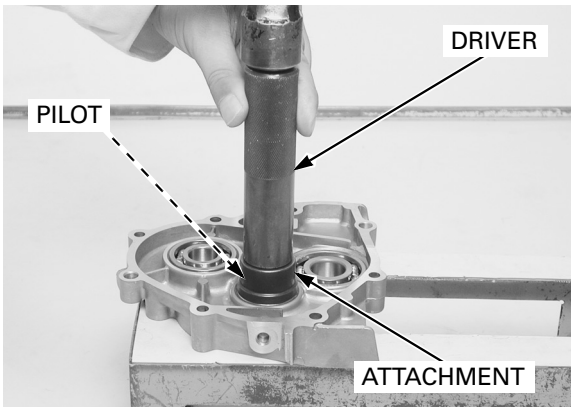
Apply engine oil to each bearing cavity.

The marked side of each bearing is facing the special tools.

Drive a new each bearing into the transmission case squarely until it is fully seated, using the special tools.

TOOLS:

Driveshaft bearing:	
Driver	**07749-0010000**
Attachment, 42 x 47 mm	**07746-0010300**
Pilot, 20 mm	**07946-0040500**
Counter gear shaft bearing:	
Driver	**07749-0010000**
Attachment, 32 x 35 mm	**07746-0010100**
Pilot, 15 mm	**07746-0040300**
Final gear shaft bearing:	
Driver	**07749-0010000**
Attachment, 37 x 40 mm	**07746-0010200**
Pilot, 17 mm	**07746-0040400**

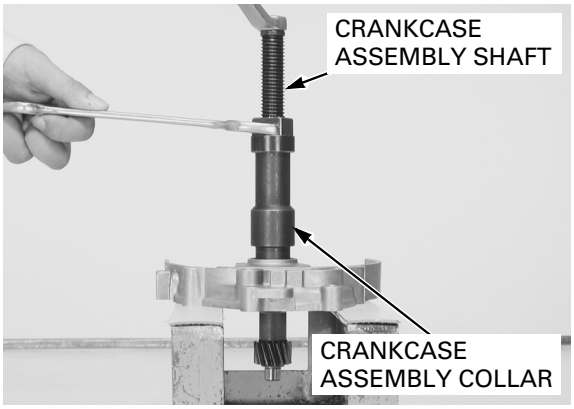


DRIVESHAFT INSTALLATION

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 shaft and draw the driveshaft into the bearing inner race, using the special tools.

TOOLS:

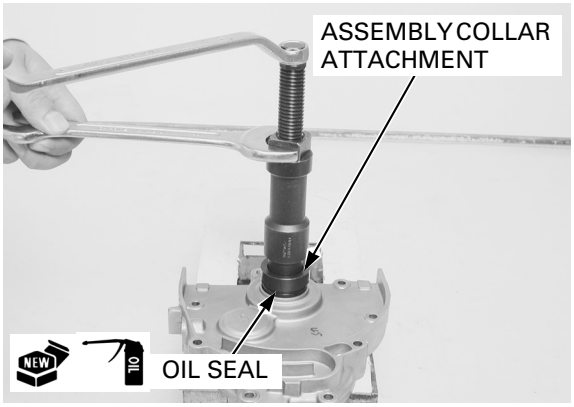
Crankcase assembly collar	**07965-GM00100**
Crankcase assembly shaft	**07965-1660200**



Apply clean engine oil to a new oil seal lips.
Install a new oil seal into the transmission cover until the depth from the transmission cover end surface is 0-0.5 mm (0-0.02 in), using the special tools.

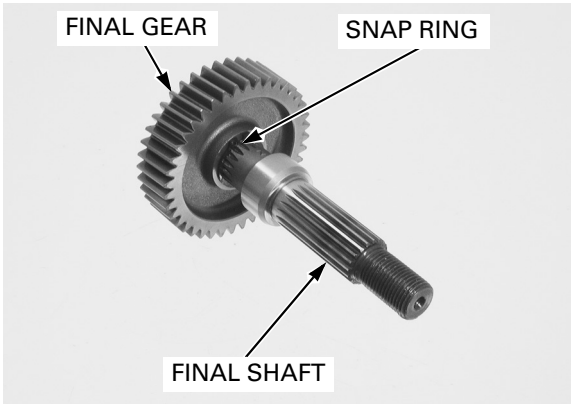
TOOLS:

Crankcase assembly collar	**07965-GM00100**
Assembly collar attachment	**07965-GM00200**
Crankcase assembly shaft	**07965-1660200**



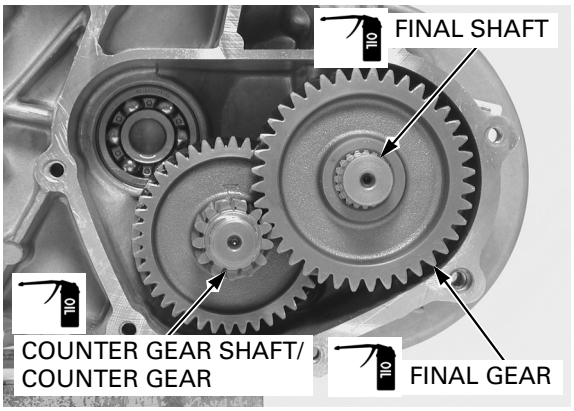
FINAL REDUCTION ASSEMBLY

Install the final gear to the final shaft then install the snap ring to the final shaft.



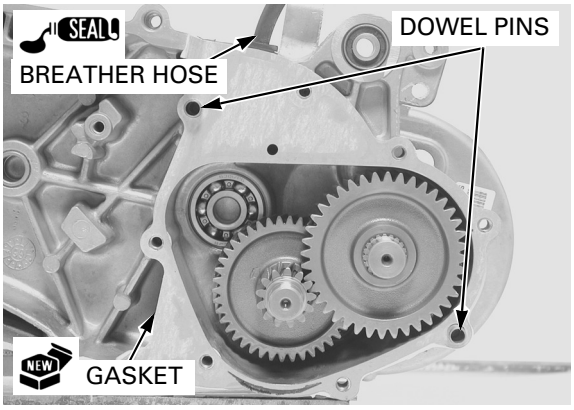
Apply engine oil to each gear teeth and each shaft of bearing sliding area.

Install the counter gear shaft/counter gear into the left crankcase.
Install the final shaft/final gear.



Apply liquid sealant to the final reduction breather hose grommet, and install it to the left crankcase.

Install a new gasket and the dowel pins.



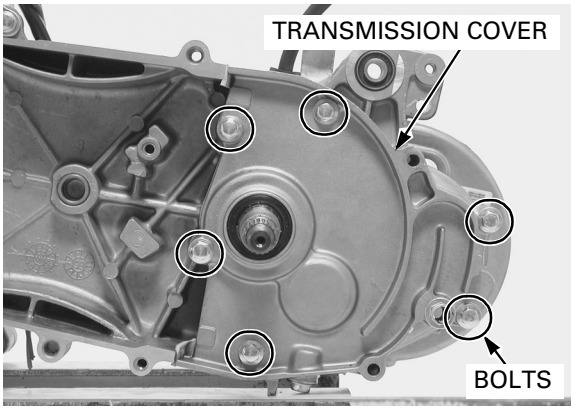
Install the transmission cover onto the left crankcase.
Tighten the six bolts to the specified torque in a crisscross pattern in 2 or 3 steps.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the following:

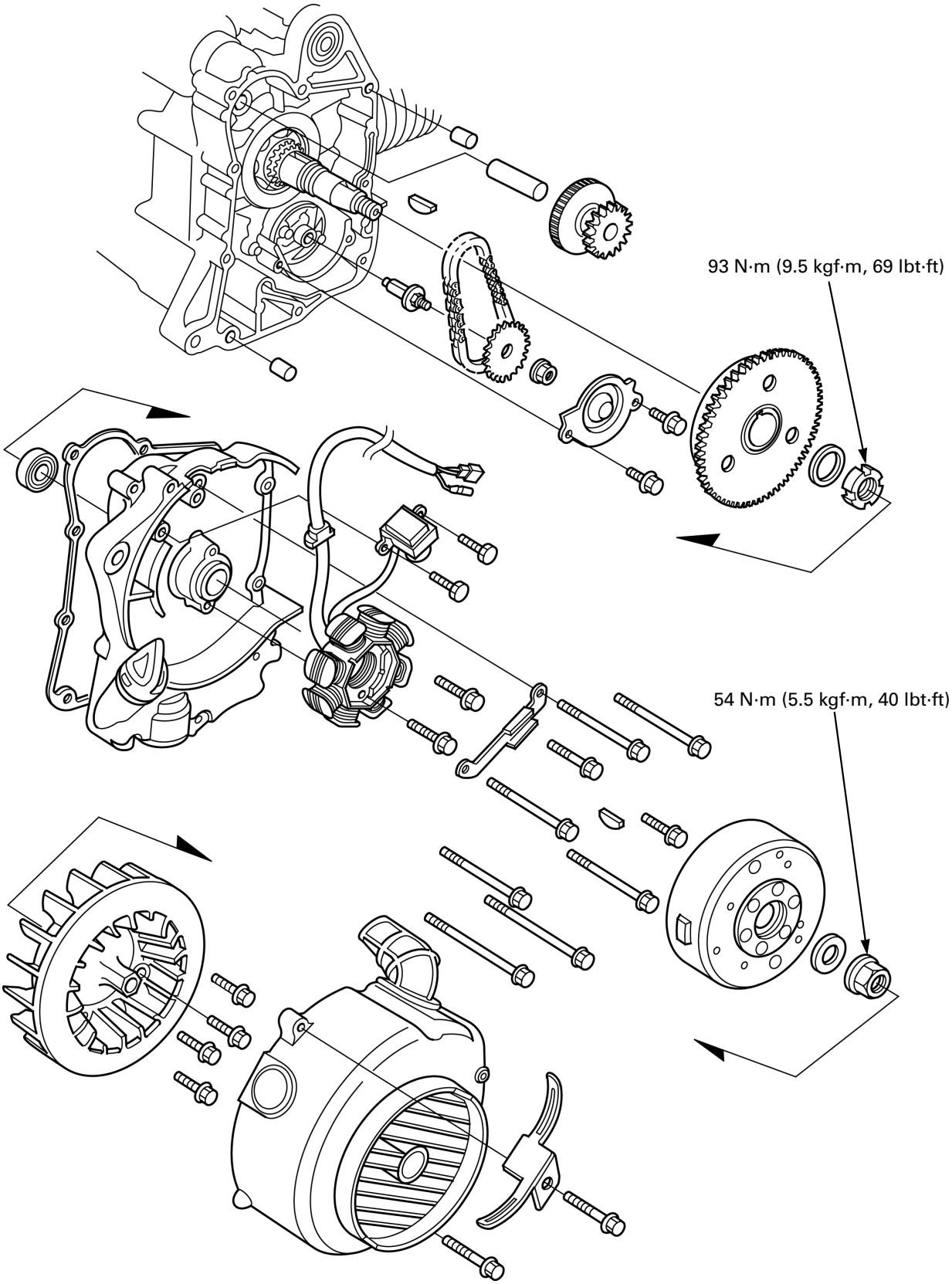
- Clutch/driven pulley (page 9-19)
- Left crankcase cover (page 9-7)
- Rear brake adjusting nut and joint pin (page 14-8)
- Rear wheel (page 14-5)

Fill the transmission case with the recommended oil (page 3-15).



11. ALTERNATOR/STARTER CLUTCH

COMPONENT LOCATION



SERVICE INFORMATION

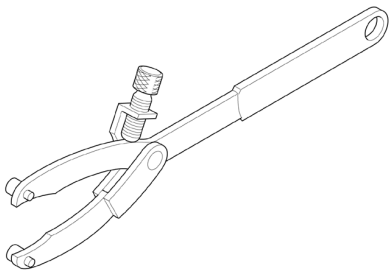
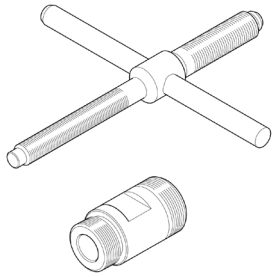
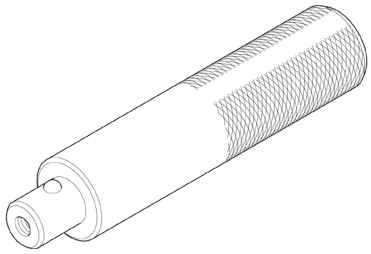
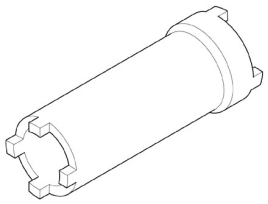
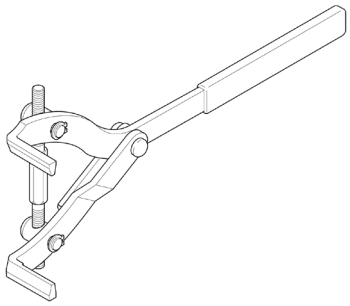
GENERAL

- This section covers the removal and installation of the flywheel, alternator/starter clutch and ignition pulse generator.
- These service can be done with the engine installed in the frame.
- Refer to page 16-10 for alternator inspection.
- Refer to page 17-6 for ignition pulse generator inspection.

TORQUE VALUES

Cooling fan cover screw	0.9 N·m (0.1 kgf·m, 0.7 lbf·ft)	
Flywheel nut	54 N·m (5.5 kgf·m, 40 lbf·ft)	
Starter clutch lock nut	93 N·m (9.5 kgf·m, 69 lbf·ft)	Apply engine oil to the threads and seating surface/Left hand threads
Starter clutch socket bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply a locking agent to the threads

TOOLS

Universal holder 07725-0030000 	Flywheel puller 07733-0010000 	Driver 07749-0010000 
Attachment, 28 x 30 mm 07946-1870100 	Pilot, 20 mm 07746-0040500 	Lock nut wrench 07HAA-SF10100 
Clutch center holder 07724-0050002 		

TROUBLESHOOTING

Starter motor turns, but engine does not start

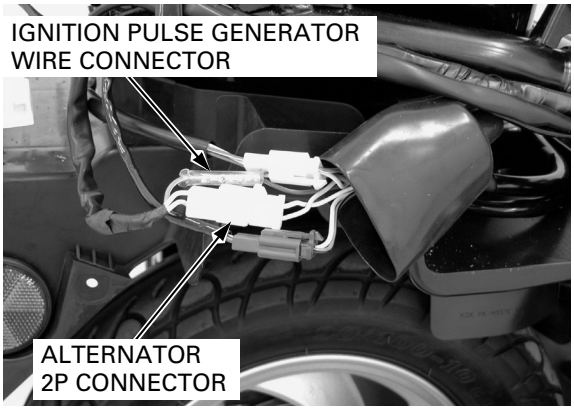
- Faulty starter one-way clutch
- Damaged starter reduction gear

FLYWHEEL/STATOR

REMOVAL

Remove the body cover (page 2-8).

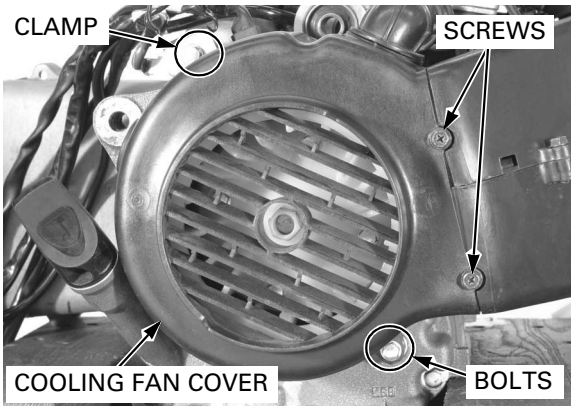
Disconnect the alternator 2P connector and ignition pulse generator wire connector.



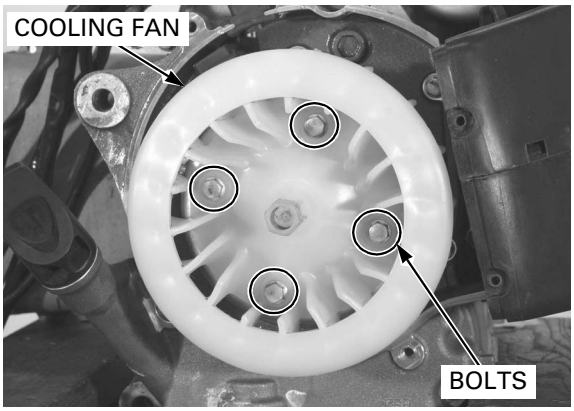
Release the alternator/ignition pulse generator wire from the wire band.

Remove the following:

- Screws
- Bolts and clamp
- Cooling fan cover



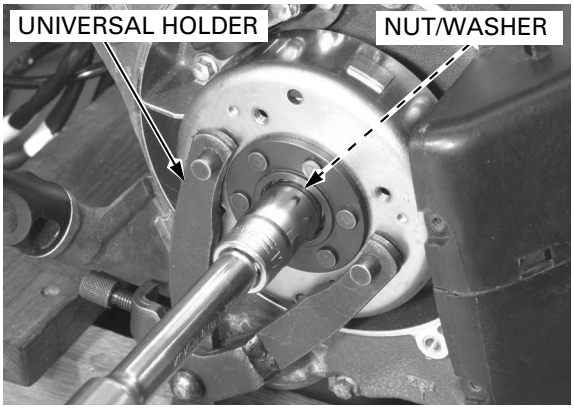
Remove the four bolts and cooling fan.



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

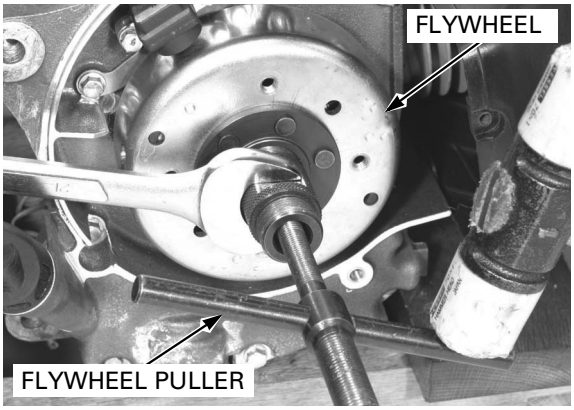
TOOL:
Universal holder **07725-0030000**

Remove the flywheel nut and washer.

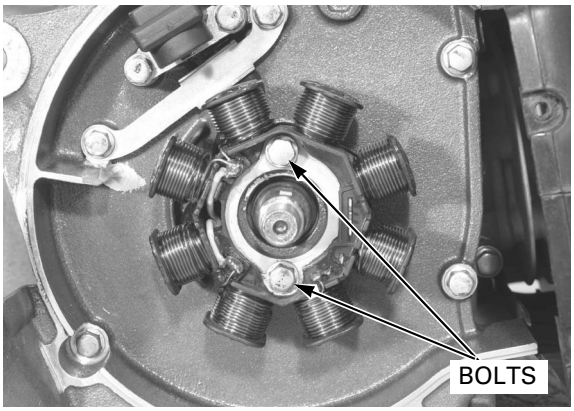


Remove the flywheel using the special tool.

TOOL:
Flywheel puller **07733-0010000**

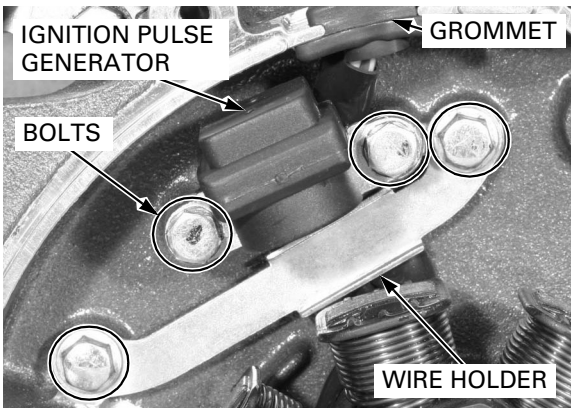


Remove the stator mount bolts.



Remove the bolts, wire holder and release the wire grommet from the right crankcase cover.

Remove the mount bolt and ignition pulse generator then remove the stator and ignition pulse generator from the left crankcase cover.



INSTALLATION

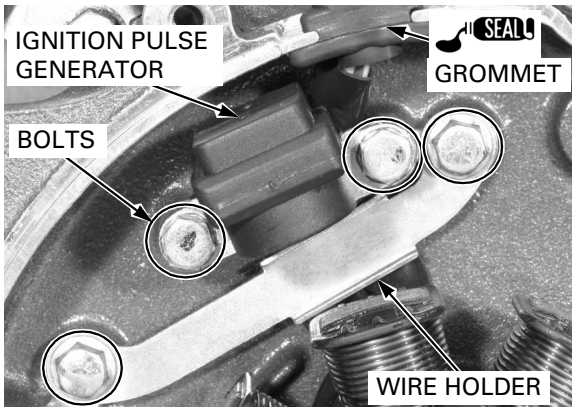
Apply liquid sealant to the alternator wire grommet.

Install the stator into the left crankcase cover.

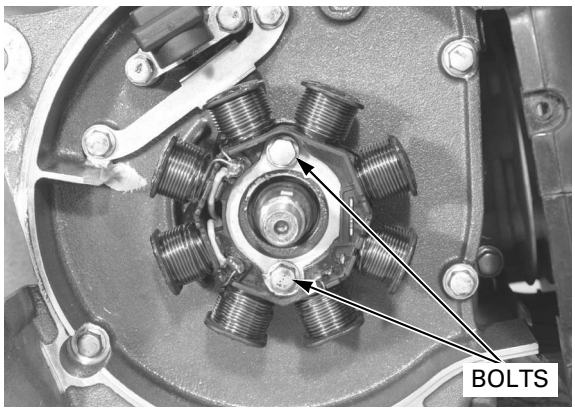
Rout the wire properly, and set the wire grommet into the left crankcase cover groove securely.

Install and tighten the ignition pulse generator mounting bolts securely.

Set the wire holder and tighten the holder bolts.



Install and tighten the stator mounting bolts.



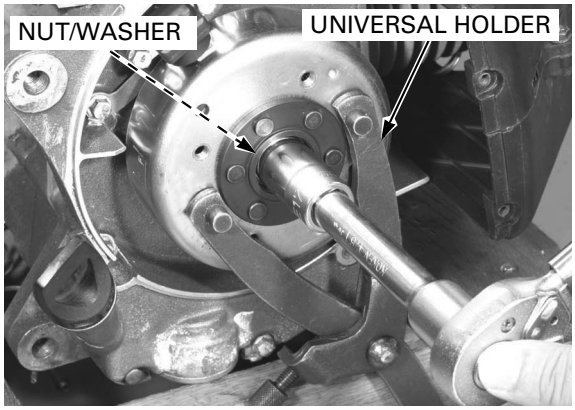
Install the flywheel onto the crankshaft by aligning the key way in the fly wheel with the key on the crankshaft.

Install the washer and flywheel nut.

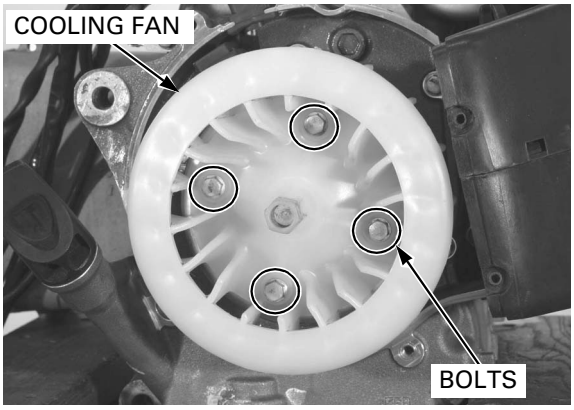
Hold the flywheel with the special tool and tighten the nut to the specified torque.

TOOL:
Universal holder **07725-0030000**

TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)



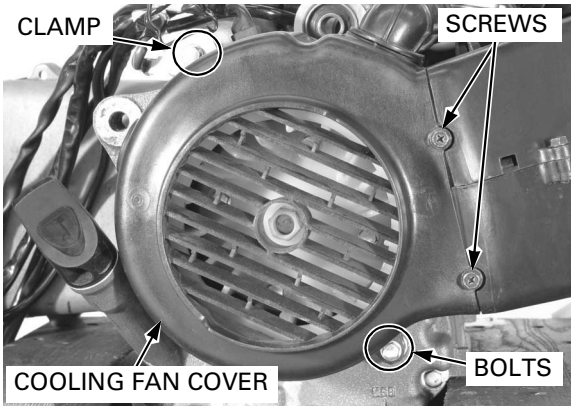
Install the cooling fan and tighten the bolts.



Install the cooling fan cover, clamp and tighten the bolts.

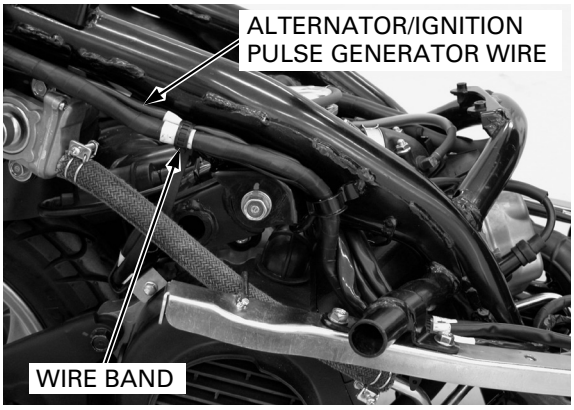
Install and tighten the screws to the specified torque.

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



Route the alternator/ignition pulse generator wire properly (page 1-16).

Bind the alternator/ignition pulse generator wire with the wire band.

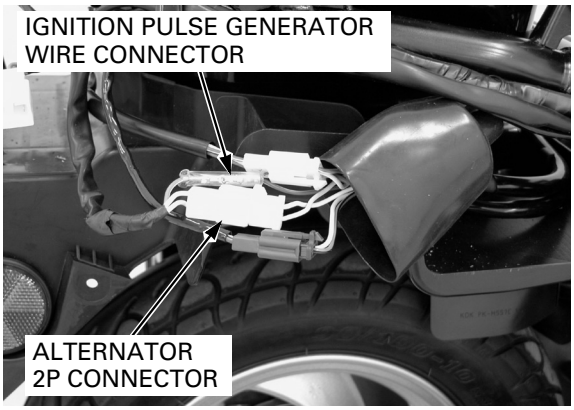


Route the alternator/ignition pulse generator wire properly (page 1-16).

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

Install the following:

- Body cover (page 2-8)
- Side cover (page 2-6)
- Rear center lower cover (page 2-6)
- Rear carrier (page 2-6)
- Luggage box (page 2-5)

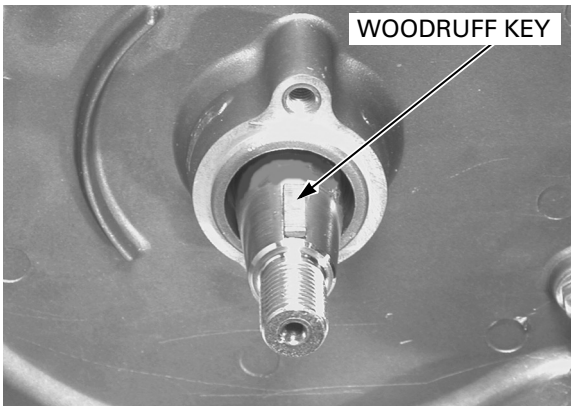


RIGHT CRANKCASE COVER

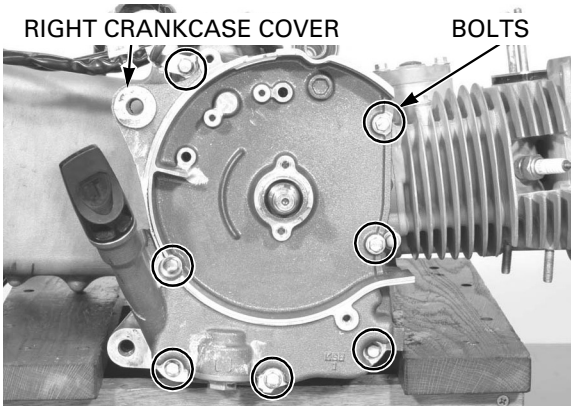
REMOVAL

Remove the muffler (page 2-14).
Remove the flywheel/stator (page 11-5).

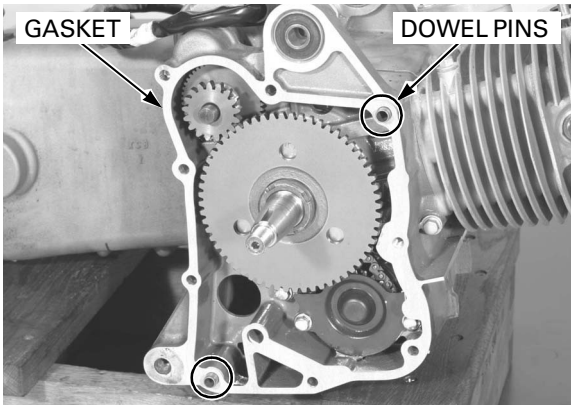
Remove the woodruff key.



Remove the bolts and right crankcase cover.

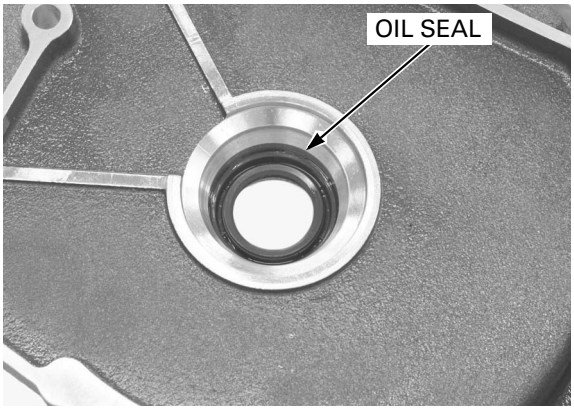


Remove the two dowel pins and gasket.



OIL SEAL REPLACEMENT

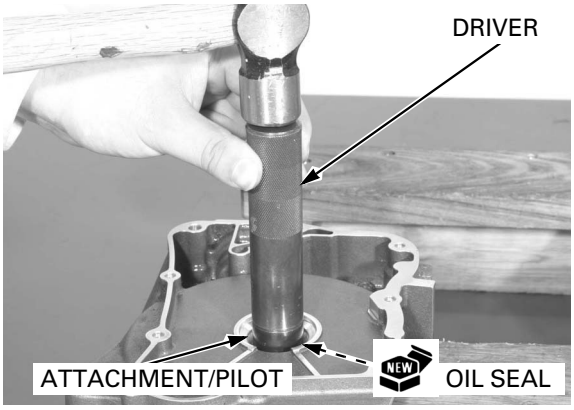
Remove the oil seal.



Install a new oil seal using the special tool.

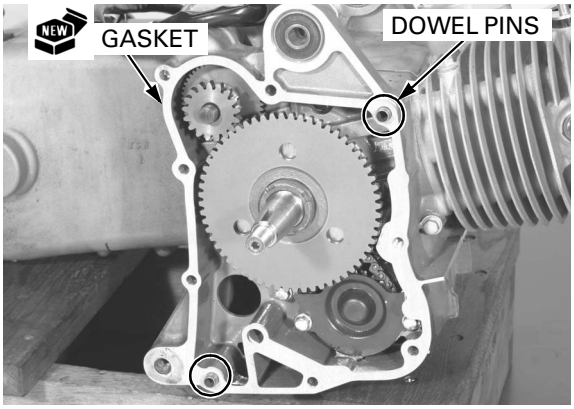
TOOLS:

Driver	**07749-0010000**
Attachment, 28 x 30 mm	**07946-1870100**
Pilot, 20 mm	**07746-0040500**

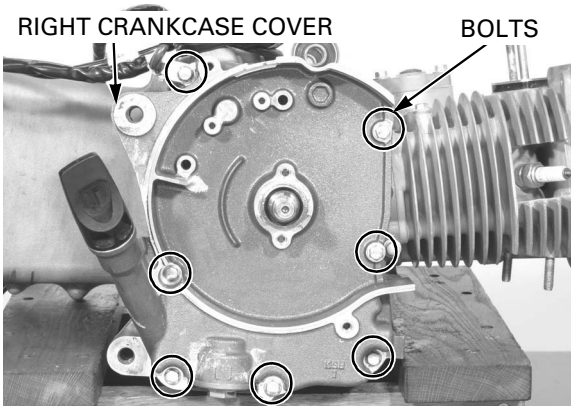


INSTALLATION

Install a new gasket and two dowel pins.

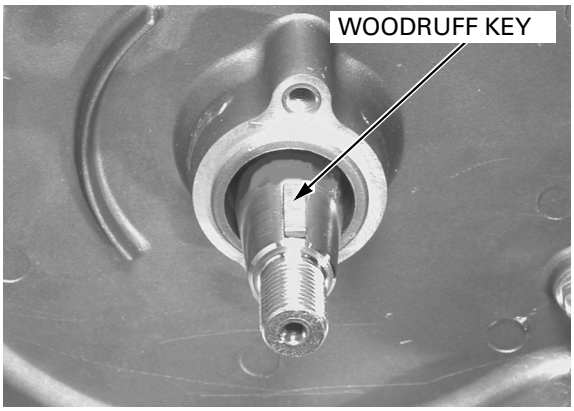


Install the right crankcase cover and tighten the bolts in a crisscross pattern in 2 or 3 steps.



Install the woodruff key into the crankshaft key groove.

Install the flywheel/stator (page 11-7).
Install the muffler (page 2-14).

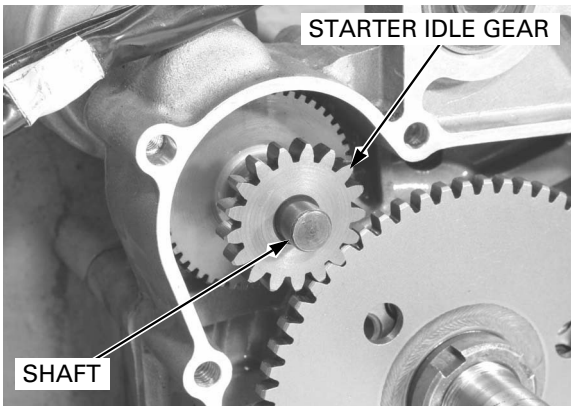


STARTER IDLE GEAR

REMOVAL

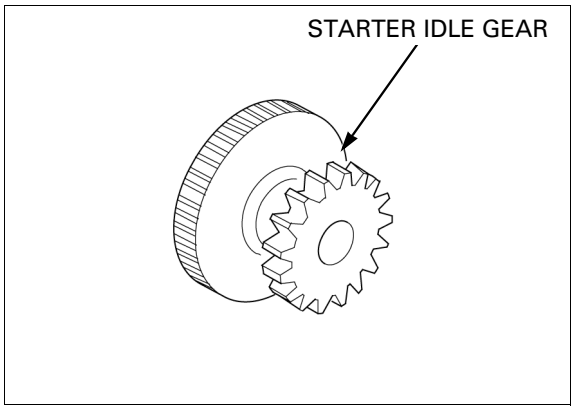
Remove the right crankcase cover (page 11-9).

Remove the shaft and starter idle gear.

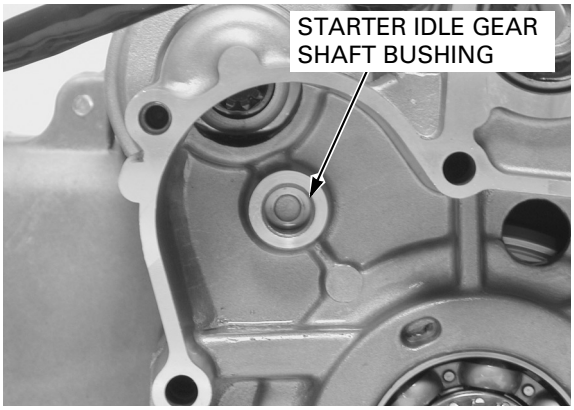


INSPECTION

Check the starter idle gear teeth for wear or damage.



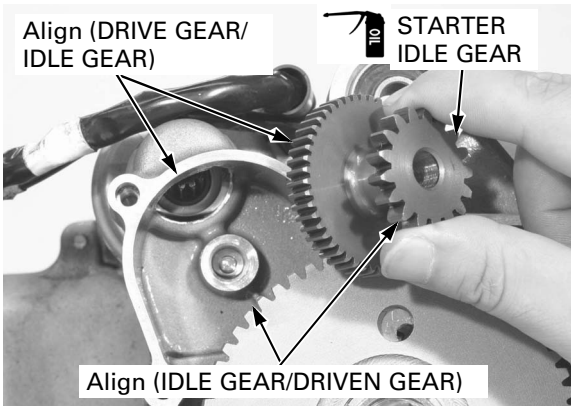
Check the starter idle gear shaft bushing for wear or damage.



INSTALLATION

Apply clean engine oil to the starter idle gear teeth.

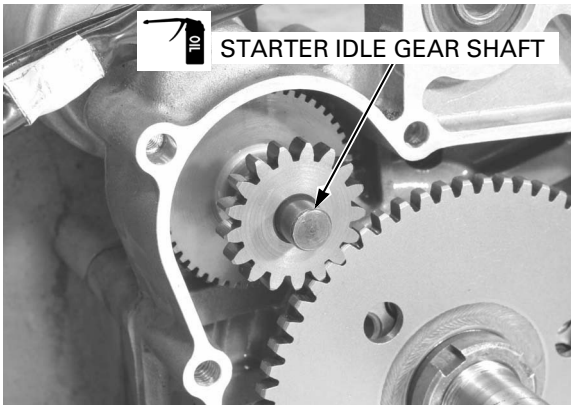
Install the starter idle gear by aligning the starter drive gear teeth and driven gear teeth.



Apply clean engine oil to the starter idle gear shaft.

Install the starter idle gear shaft into the idle gear.

Install the right crankcase cover (page 11-10).

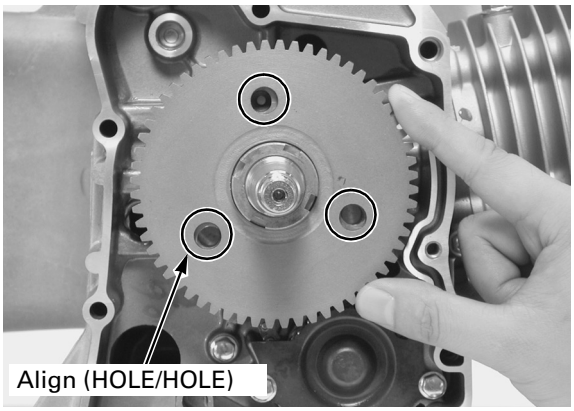


STARTER CLUTCH

REMOVAL

Remove the right crankcase cover (page 11-9).
Remove the starter idle gear (page 11-11).

Align the starter driven gear hole and starter clutch hole.



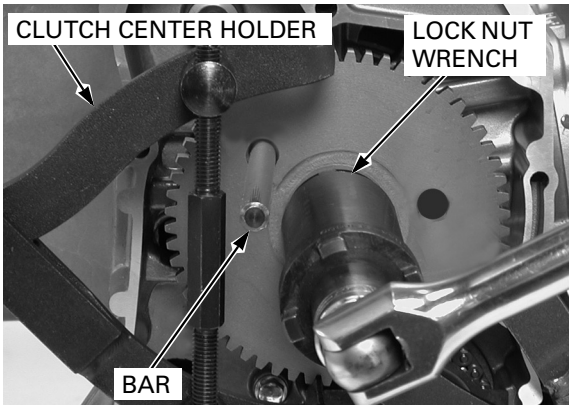
Insert the suitable bar into the starter driven gear hole and starter clutch hole.

The starter clutch lock nut has left hand threads. When using the clutch center holder, do not damage the crankcase cover mating surface by the clutch center holder.

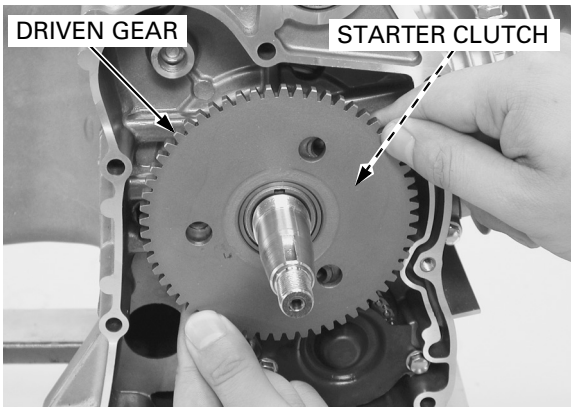
Hold the starter driven gear using the clutch center holder, then remove the starter clutch lock nut and washer using the lock nut wrench.

TOOLS:

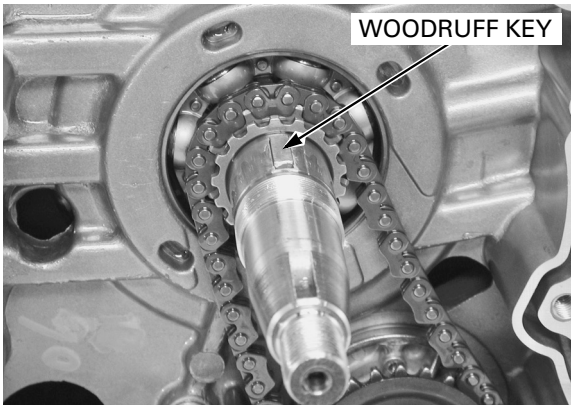
Clutch center holder	**07724-0050002**
Lock nut wrench	**07HAA-SF10100**



Remove the starter driven gear and starter clutch.

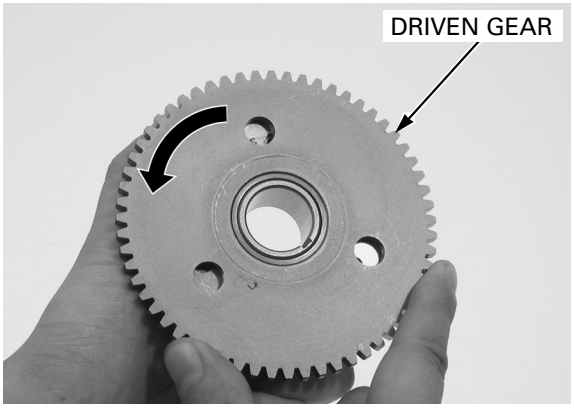


Remove the woodruff key.



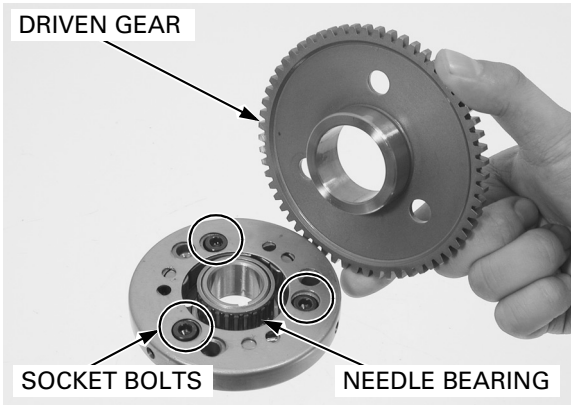
DISASSEMBLY/INSPECTION

Check the operation of the one-way clutch by turning the driven gear.
Check that the starter driven gear turns counterclockwise smoothly and does not turn clockwise.

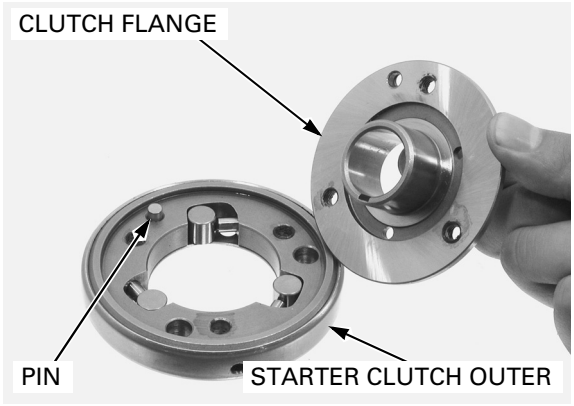


Remove the starter driven gear.
Remove the needle bearing.

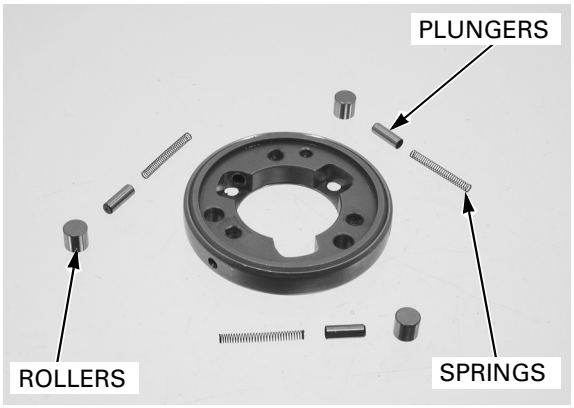
Remove the three socket bolts from the starter clutch.



Remove the starter clutch flange from the starter clutch outer.
Remove the pin.

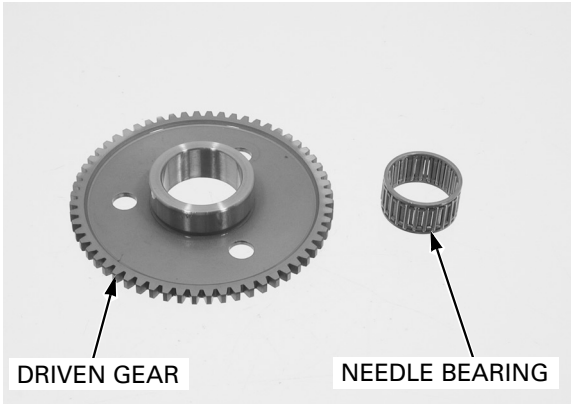


Remove the one-way clutch rollers, plungers and springs from the starter clutch outer.

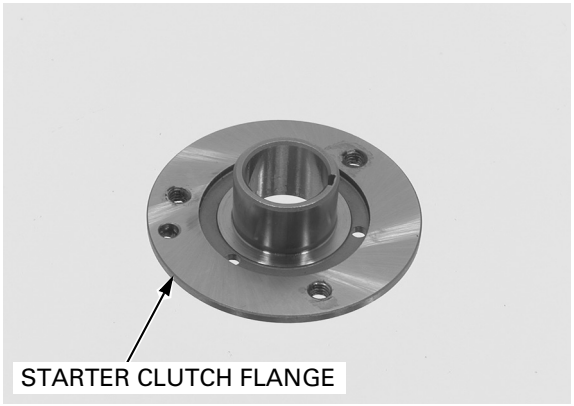


Check the starter driven gear for wear or damage.

Check the needle bearing for wear or damage.

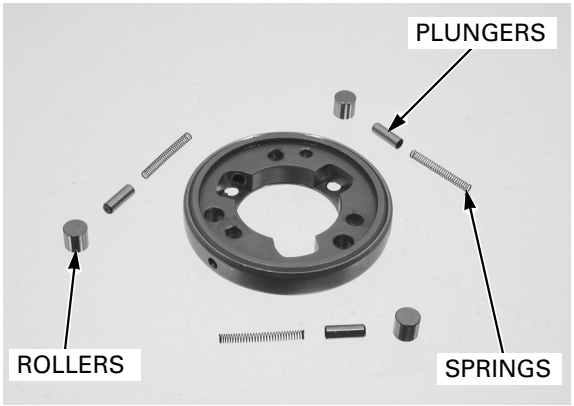


Check the starter clutch flange for wear or damage.

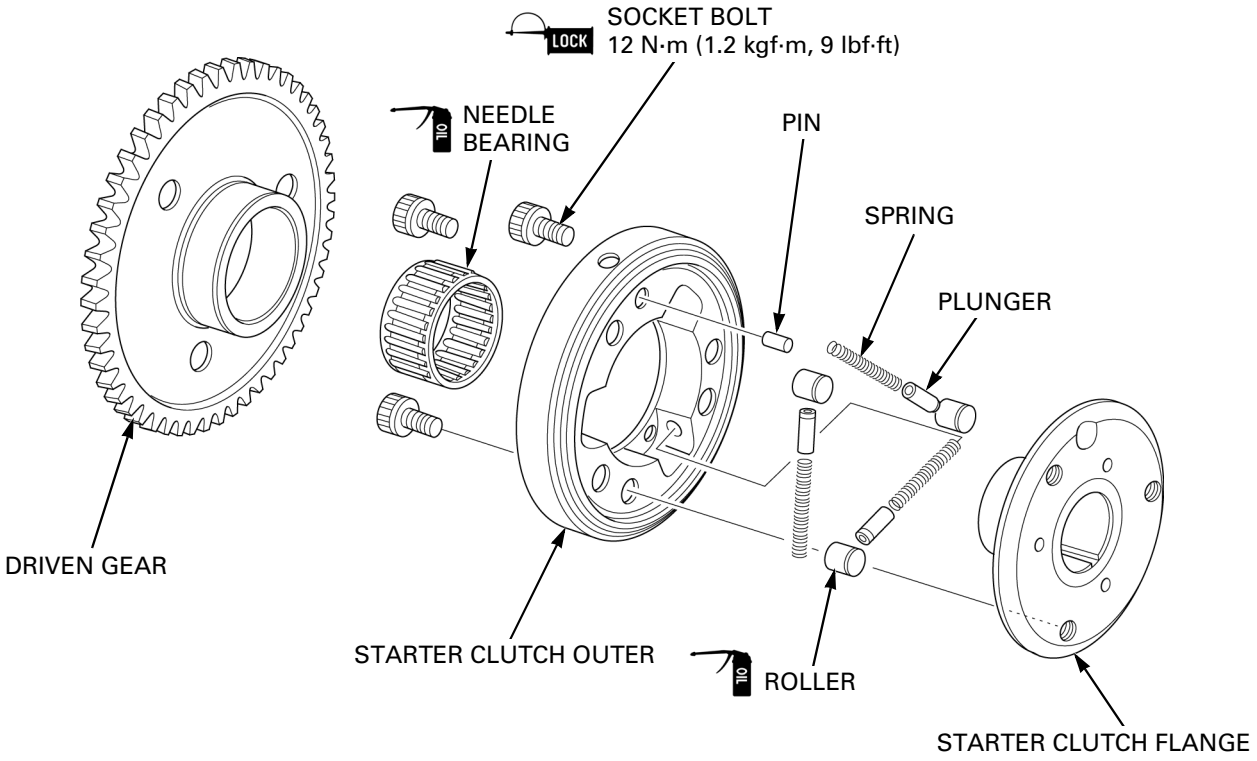


Check the starter clutch outer for wear or damage.

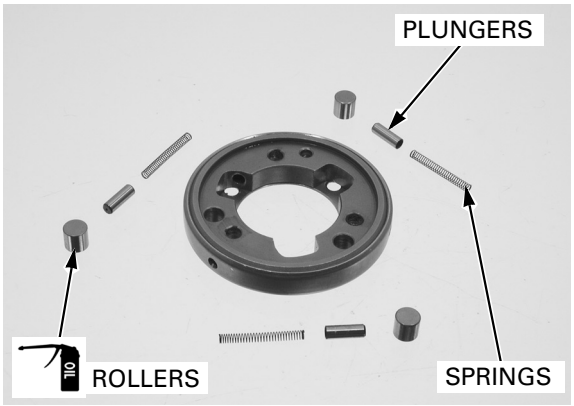
Check the one-way clutch rollers, plungers and springs for wear or damage.



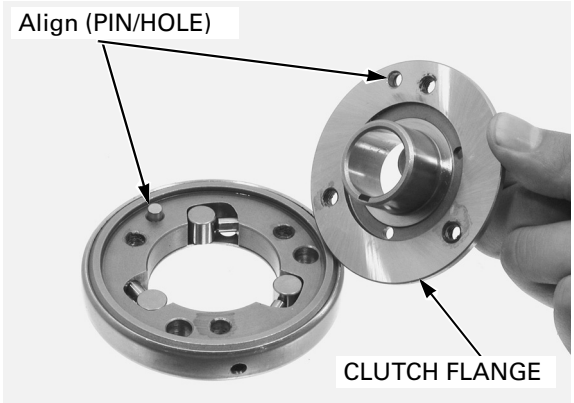
ASSEMBLY



Apply clean engine oil to the roller surface.
Install the one-way clutch rollers, plungers and springs.



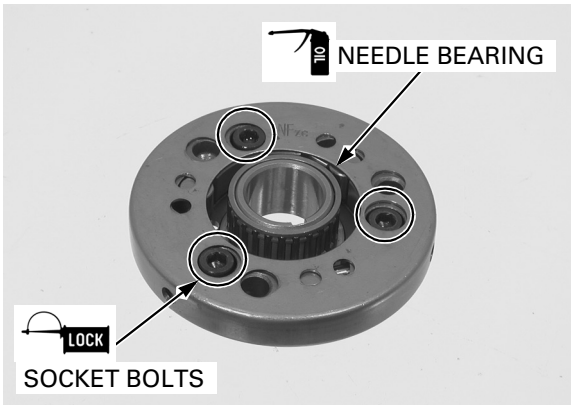
Install the pin.
Install the starter clutch flange into the starter clutch outer by aligning the hole in the clutch outer with the pin.



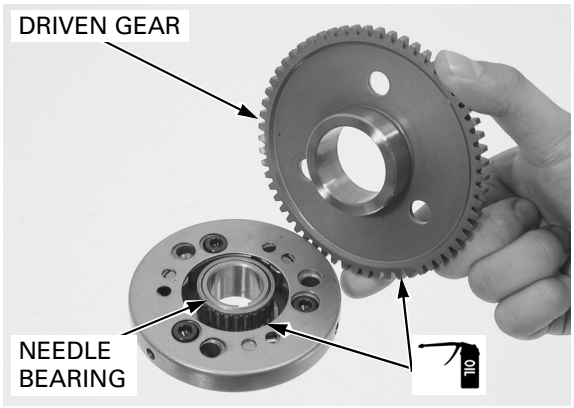
Apply locking agent to the socket bolt threads.
Install and tighten the socket bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

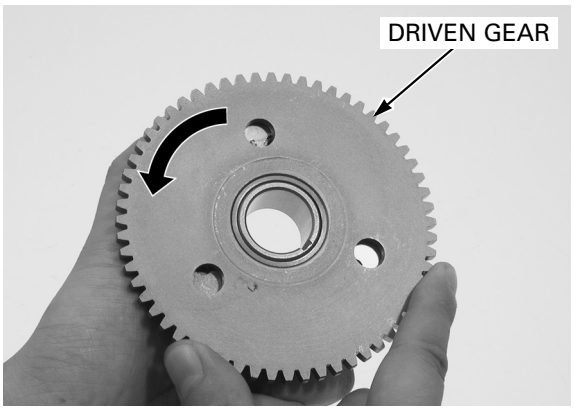
Apply clean engine oil to the needle bearing.
Install the needle bearing.



Apply clean engine oil to the starter driven gear tooth and needle bearing.
Install the needle bearing.



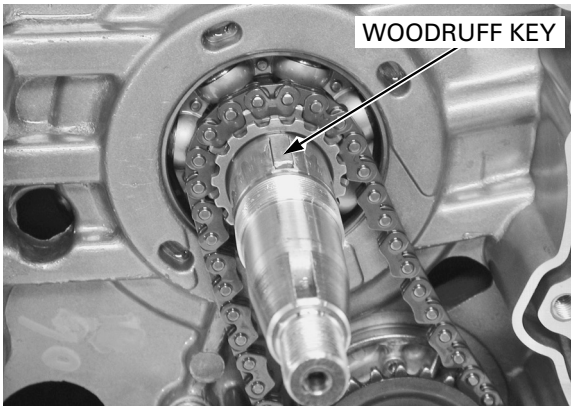
Install the starter driven gear into the starter clutch by turning it counterclockwise.
Check the proper operation of the one-way clutch by turning the starter driven gear.
The driven gear should turn counterclockwise and should not turn clockwise.



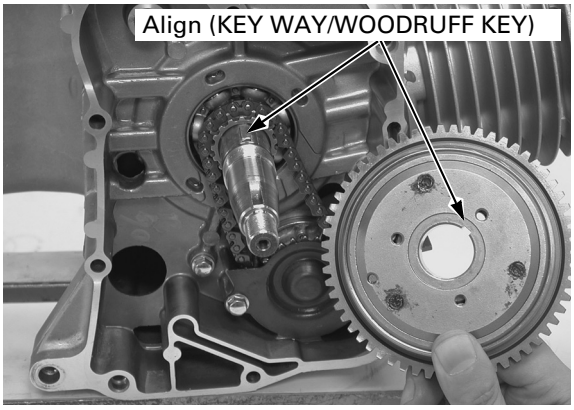
INSTALLATION

Clean any oil and grease from the crankshaft taper area.

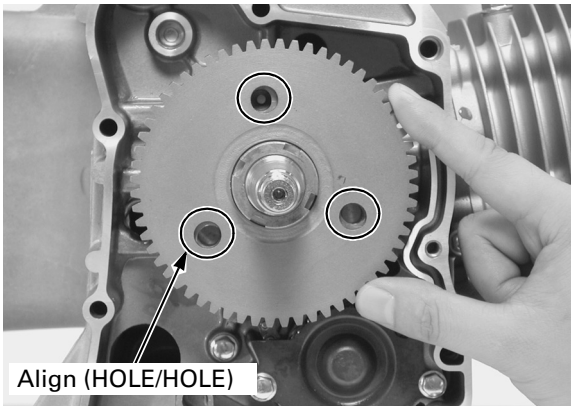
Install the woodruff key into the crankshaft key groove.



Install the starter clutch onto the crankshaft, aligning the key way in the starter clutch with the key on the crankshaft.



Align the starter driven gear hole and starter clutch hole.



Apply clean engine oil to the starter clutch lock nut threads and seating surface.

Insert the suitable bar into the starter driven gear hole and starter clutch hole.

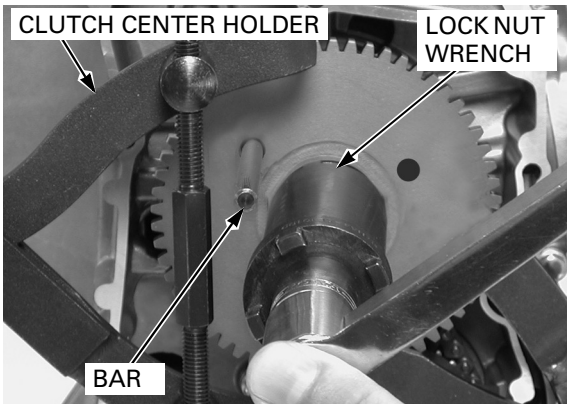
The starter clutch lock nut has left hand threads. When using the clutch center holder, do not damage the crankcase cover mating surface by the clutch center holder.

Hold the starter driven gear using the clutch center holder then tighten the starter clutch lock nut to the specified torque using the lock nut wrench.

TOOLS:

Clutch center holder	**07724-0050002**
Lock nut wrench	**07HAA-SF10100**

TORQUE: 93 N·m (9.5 kgf·m, 69 lbf·ft)



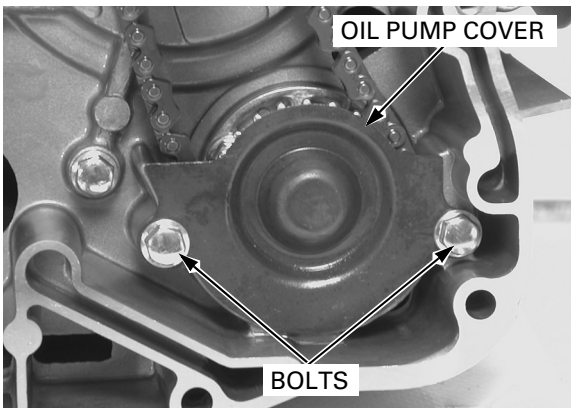
Install the starter idle gear (page 11-11).
Install the right crankcase cover (page 11-10).

OIL PUMP DRIVE CHAIN

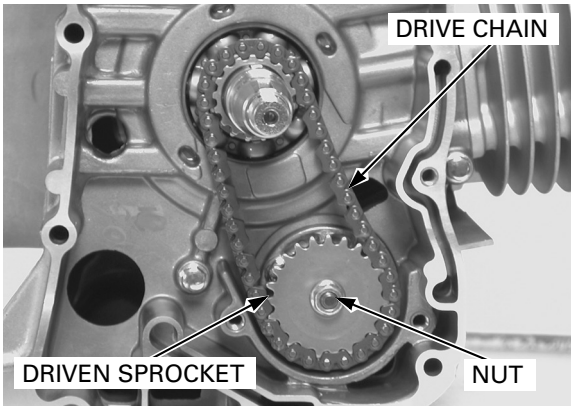
REMOVAL

Remove the starter clutch (page 11-12).

Remove the bolts and oil pump cover.

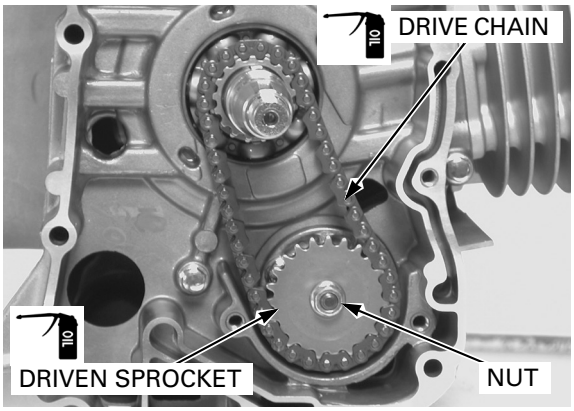


Remove the nut and driven sprocket, then remove the oil pump drive chain.



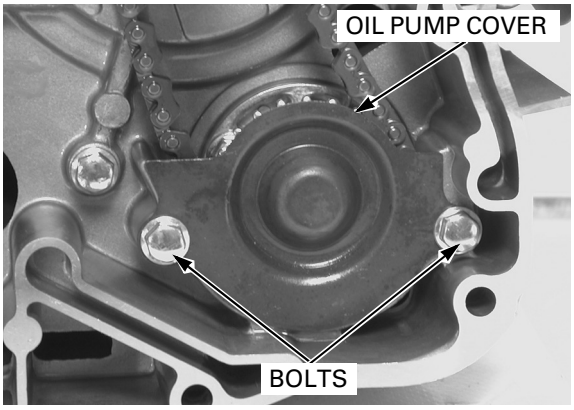
INSTALLATION

Apply clean engine oil to the oil pump drive chain and driven sprocket teeth.
Set the oil pump drive chain and install the driven sprocket, then tighten the nut.



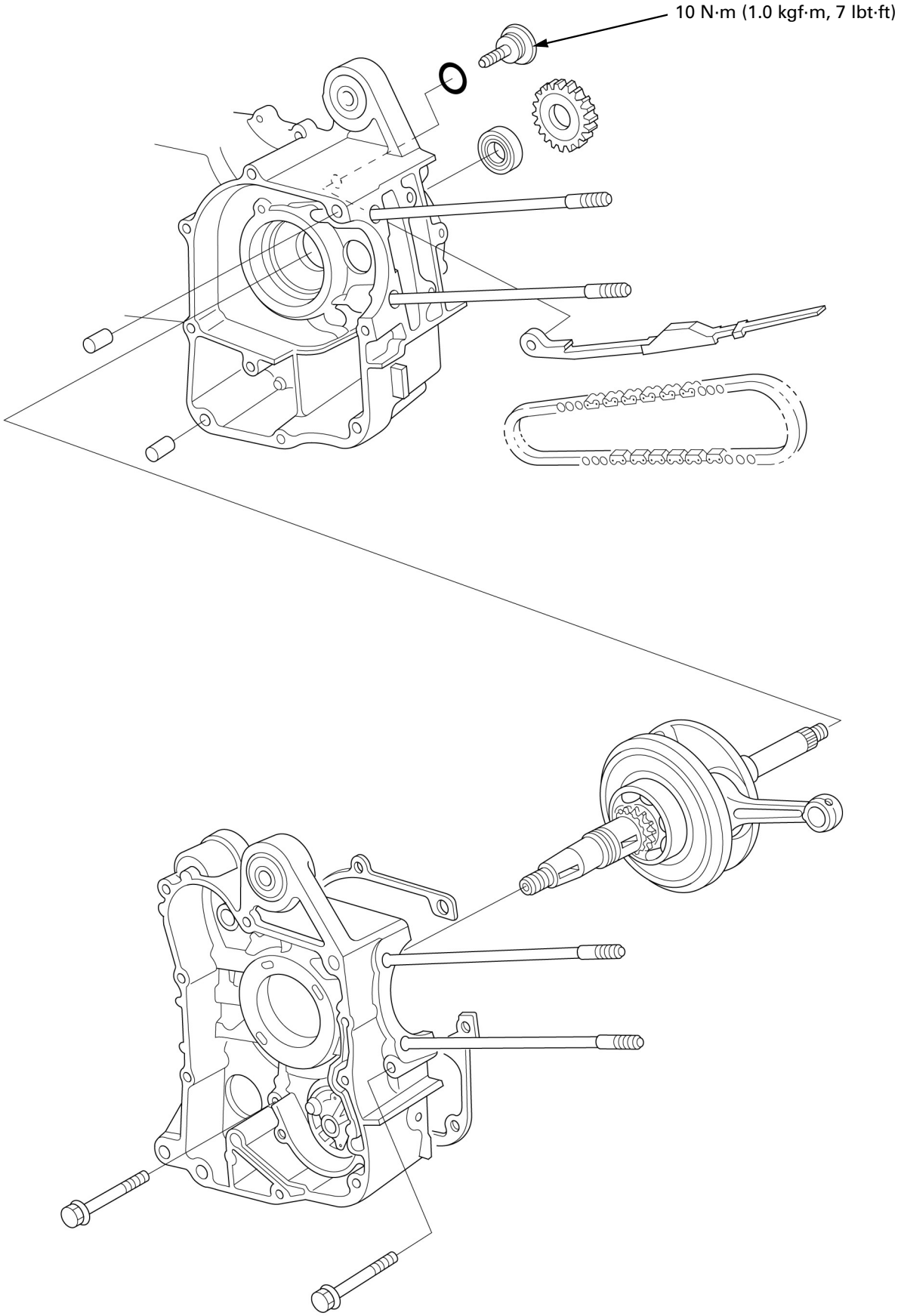
Install the oil pump cover and tighten the bolts.

Install the starter clutch (page 11-16).



12. CRANKCASE/CRANKSHAFT

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- This section covers the crankcase separation to service the crankshaft.
- The following parts must be removed before separating the crankcase.
  - Engine (page 6-4)
  - Cylinder head/Valves (page 7-7)
  - Cylinder (page 8-4)
  - Piston (page 8-5)
  - Drive pulley (page 9-8)
  - Clutch/driven pulley (page 9-12)
  - Starter motor (page 18-6)
  - Flywheel/stator (page 11-5)
  - Starter idle gear (page 11-11)
  - Starter clutch (page 11-12)
  - Oil pump drive chain (page 11-18)
- In addition to the parts listed above, remove the following parts when the left crankcase half must be replaced.
  - Final reduction (page 10-6)
- Be careful not to damage the crankcase mating surfaces when separating and assembling the crankcase halves.
- Clean all disassembled parts with clean solvent and dry them using compressed air before inspection.
- When installing the crankshaft, be sure to use the special tools; position the special tools against the bearing inner race and pull the crankshaft into the bearing until it is fully seated.

SPECIFICATIONS

Unit: mm (in)

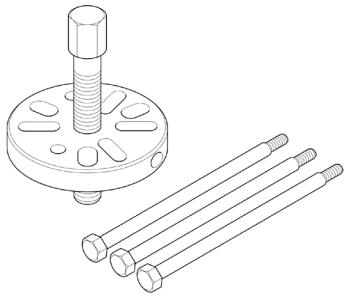
ITEM		STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod side clearance	0.10 – 0.35 (0.004 – 0.014)	0.55 (0.022)
	Connecting rod radial clearance	0 – 0.008 (0 – 0.0003)	0.05 (0.002)
	Runout	–	0.10 (0.004)

TORQUE VALUES

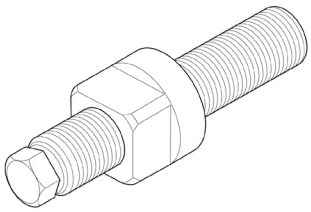
Cam chain tensioner slider pivot special bolt 10 N·m (1.0 kgf·m, 7 lbf·ft)

TOOLS

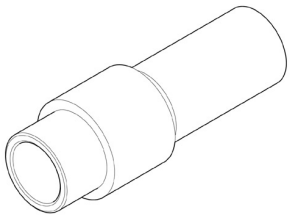
Flywheel puller set
07RMC-KCW0100



Crankcase assembly shaft
07965-1660200



Crankcase assembly collar
07965-GM00100



TROUBLESHOOTING

Abnormal noise

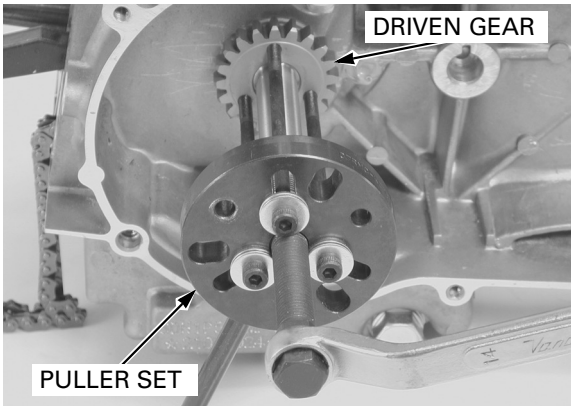
- Worn crankshaft bearing
- Worn connecting rod big end bearing
- Worn connecting rod small end (page 8-5)

CRANKCASE SEPARATION

Remove the following:

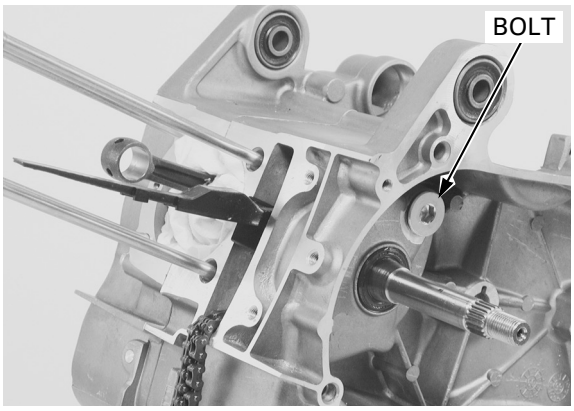
- Engine (page 6-4)
- Cylinder head/Valves (page 7-7)
- Cylinder (page 8-4)
- Piston (page 8-5)
- Drive pulley (page 9-8)
- Clutch/driven pulley (page 9-12)
- Starter motor (page 18-6)
- Flywheel/stator (page 11-5)
- Starter idle gear (page 11-11)
- Starter clutch (page 11-12)
- Oil pump drive chain (page 11-18)

Remove the kickstarter driven gear using the special tool.

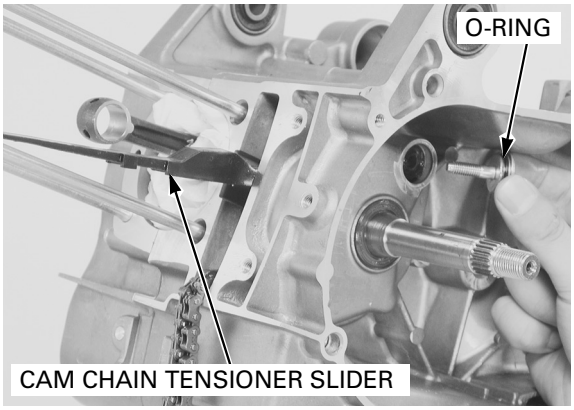


TOOL:
Flywheel puller set **07RMC-KCW0100**

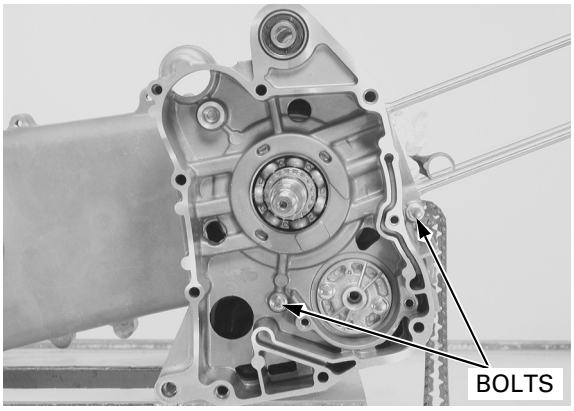
Loosen the cam chain tensioner slider pivot special bolt.



Remove the pivot special bolt, O-ring and cam chain tensioner slider.

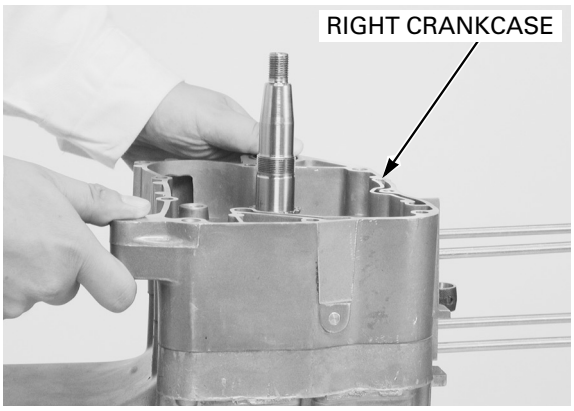


Remove the crankcase bolts from the right crankcase.



Be careful not to damage the crankcase mating surface.

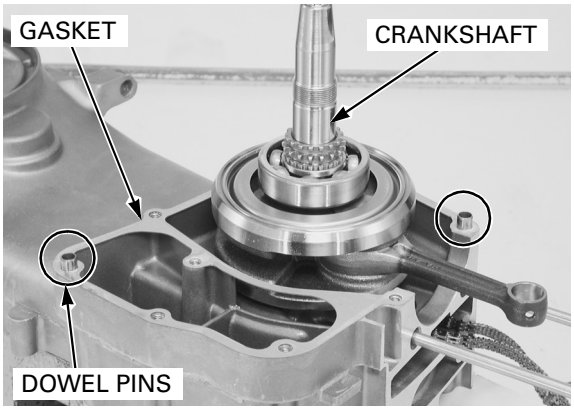
Place the crankcase with the left crankcase facing down and separate the left and right crankcase.



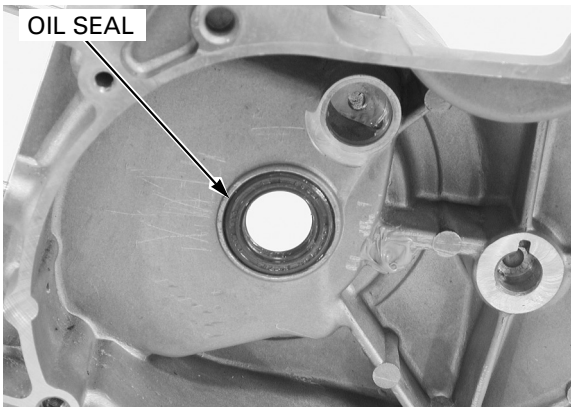
Remove the gasket and dowel pins from the left crankcase.

Remove the crankshaft.

Clean any gasket from the crankcase mating surface.



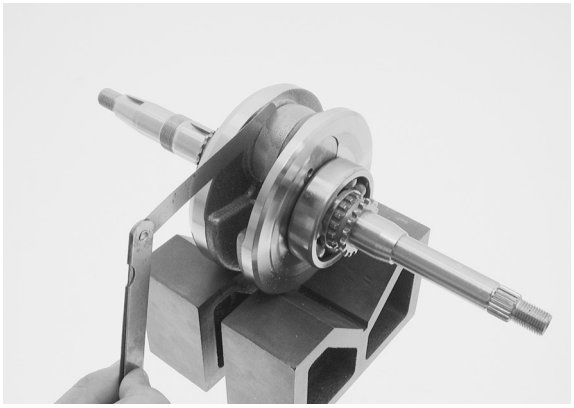
Remove the oil seal from the left crankcase.



CRANKSHAFT INSPECTION

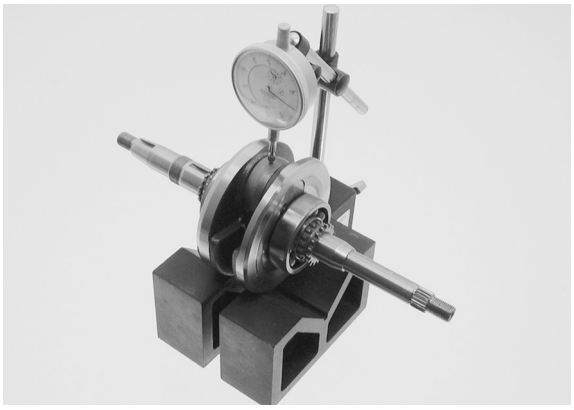
Measure the connecting rod big end side clearance with a feeler gauge.

SERVICE LIMIT: 0.55 mm (0.022 in)



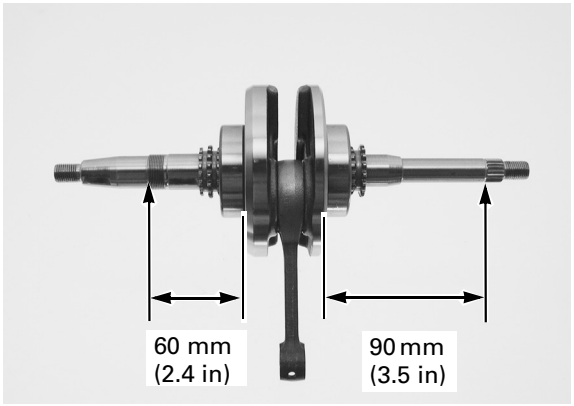
Set the crankshaft on V-blocks and measure the connecting rod big end radial clearance.

SERVICE LIMIT: 0.05 mm (0.002 in)



Set the crankshaft on a V-blocks and measure the runout using a dial indicator.
Actual runout is 1/2 of total indicator reading.

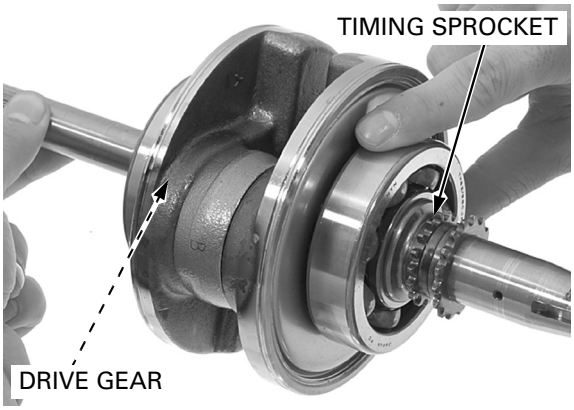
SERVICE LIMIT: 0.10 mm (0.004 in)



If the timing sprocket teeth are worn or damaged, check the cam chain, tensioner and cam sprocket.

Check the timing sprocket teeth and oil pump drive gear for wear or damage and replace them if necessary.

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 in the crankshaft.
Replace the bearings if they do not turn smoothly, quietly, or if they fit loosely on the crankshaft.



CRANKCASE ASSEMBLY

ASSEMBLY

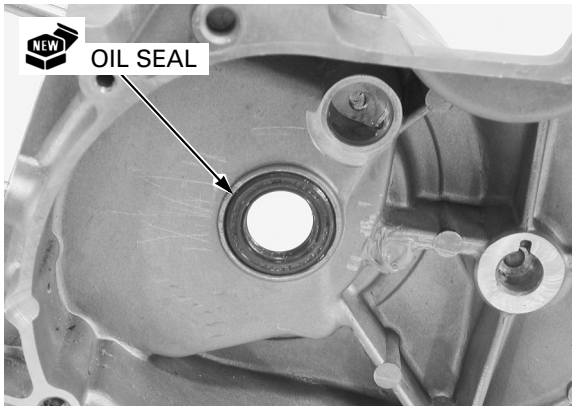
- Be careful not to damage the crankcase mating surface.

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

Apply clean engine oil to a new oil seal lip.

Install a new oil seal into the left crankcase squarely.

After oil seal installation, check that the top surface of the oil seal is flush with the crankcase halves.



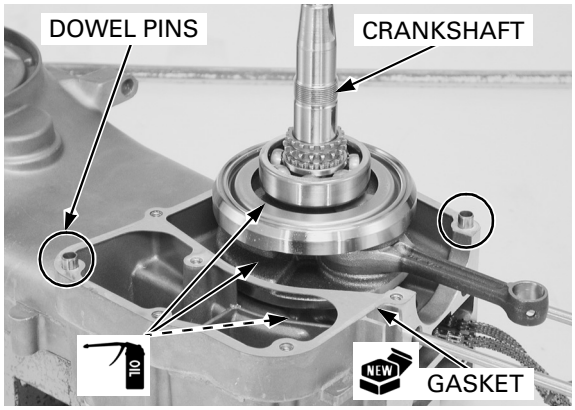
Apply 3 cc minimum of clean engine oil to the connecting rod big end bearing.

Apply 2 cc minimum of clean engine oil to each crankshaft bearing.

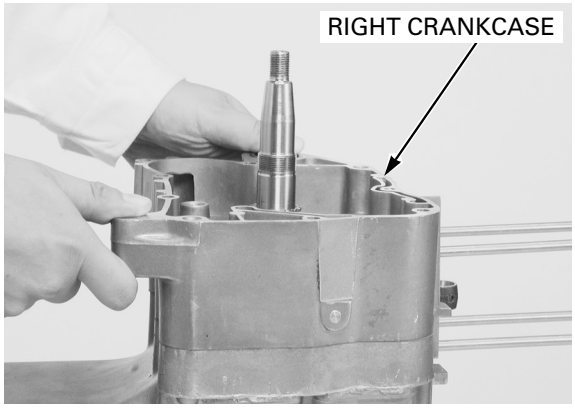
Apply clean engine oil to the cam chain and install it into the left crankcase.

Set the crankshaft through the left crankcase bearing and cam chain.

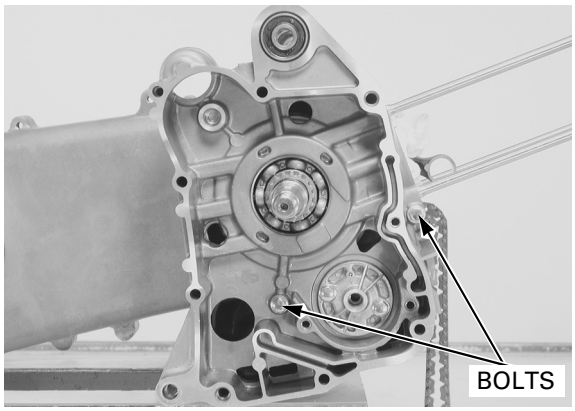
Install the dowel pins and new gasket to the left crankcase.



Assemble the left and right crankcase.



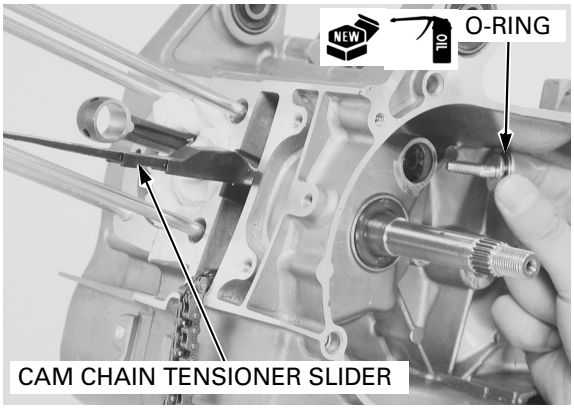
Install the crankcase bolts and tighten them.



Install the cam chain tensioner slider to the left crankcase.

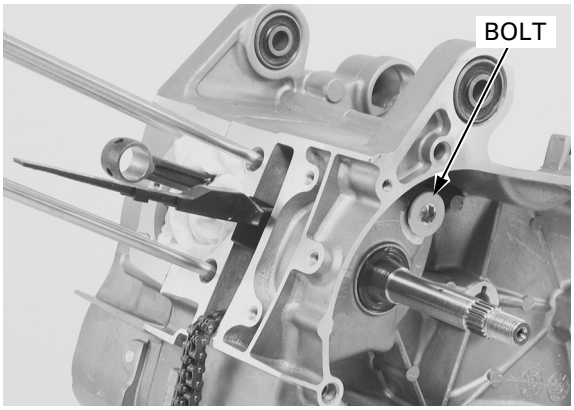
Coat a new O-ring with clean engine oil.

Install a new O-ring to the cam chain tensioner slider pivot special bolt.



Install the cam chain tensioner slider pivot special bolt.
Tighten the tensioner slider pivot special bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

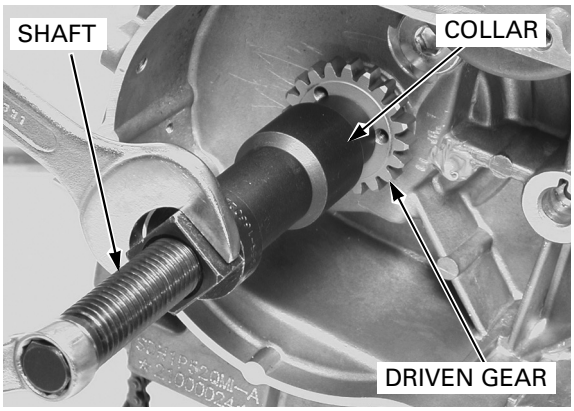


Clean any oil and grease from the crankshaft taper area.

Install the kickstarter driven gear using the special tools.

TOOLS:

Crankcase assembly shaft	**07965-1660200**
Crankcase assembly collar	**07965-GM00100**

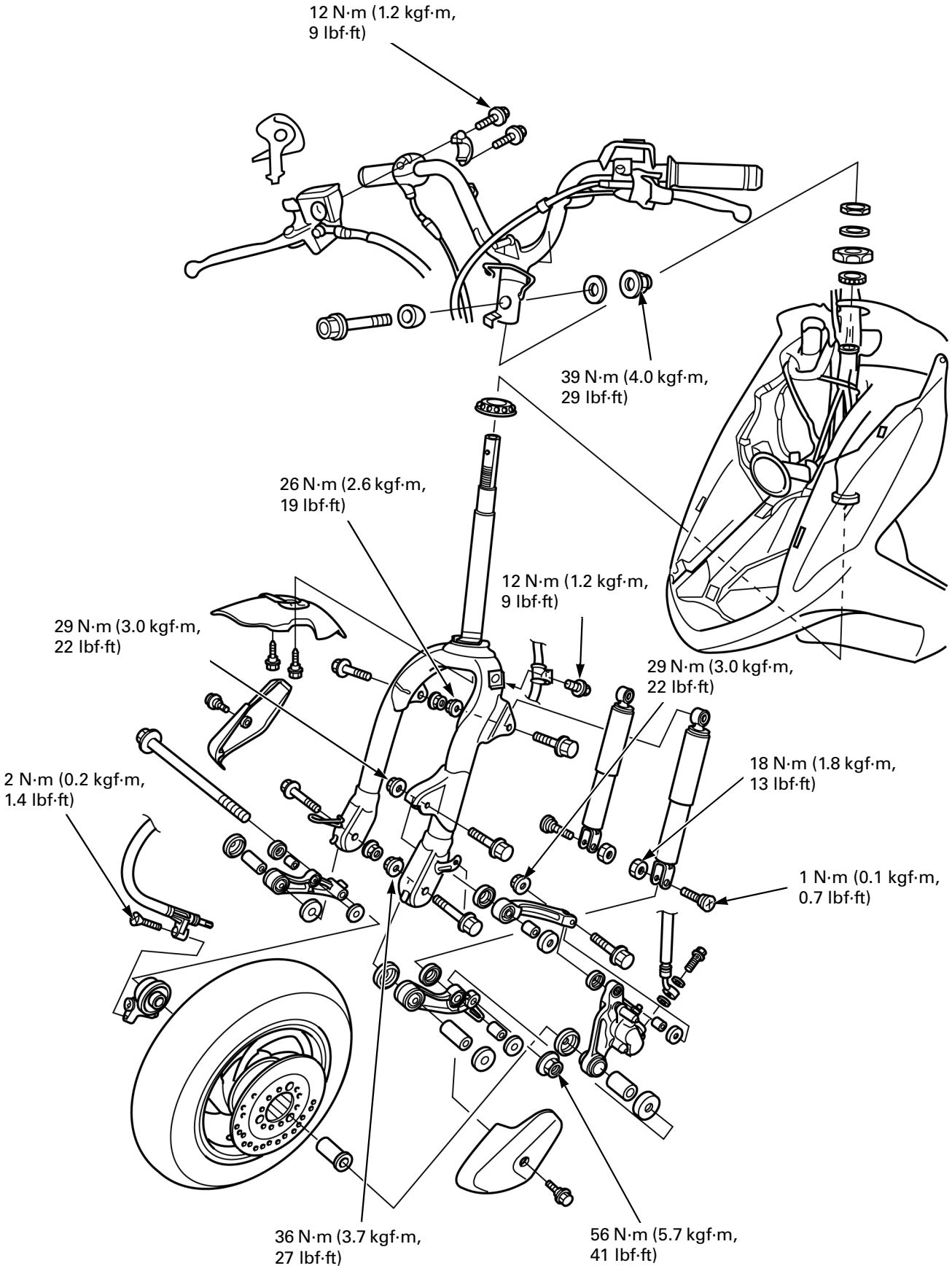


Install the following:

- Oil pump drive chain (page 11-18)
- Starter clutch (page 11-16)
- Starter idle gear (page 11-11)
- Flywheel/stator (page 11-7)
- Starter motor (page 18-9)
- Clutch/driven pulley (page 9-19)
- Drive pulley (page 9-11)
- Piston (page 8-7)
- Cylinder (page 8-8)
- Cylinder head/Valves (page 7-19)
- Engine (page 6-11)

13. FRONT WHEEL/SUSPENSION/STEERING

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- This section covers the front wheel, front suspension, handlebar and steering stem.
- When servicing the front wheel, front suspension or steering stem, support the scooter using a safety stand or hoist.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- After the front wheel installation, check the brake operation by applying the brake lever.
- Refer to the brake system information (page 15-3).
- Use only tires marked "TUBELESS" and tubeless valves on rim marked "TUBELESS TIRE APPLICABLE".
- When using the lock nut wrench, use a deflecting beam type torque wrench 25 cm (10 in) 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 top cone race. The specification given is the actual torque applied to the top cone race, not the reading on the torque wrench. Do not overtighten the top cone race. The specification later in the text gives both actual and indicated torque.

SPECIFICATIONS

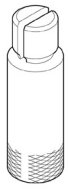
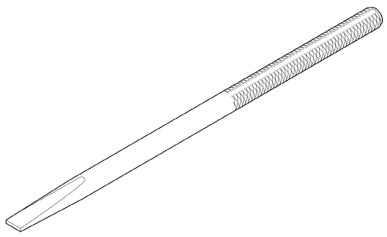
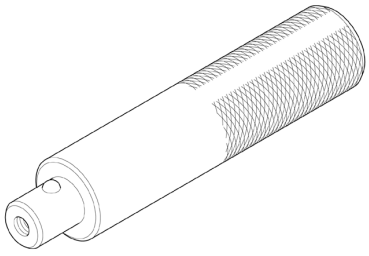
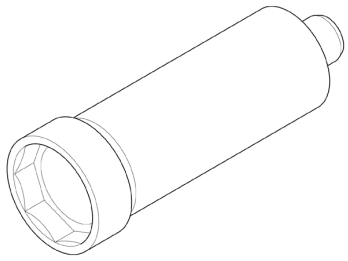
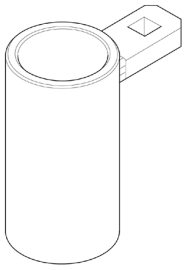
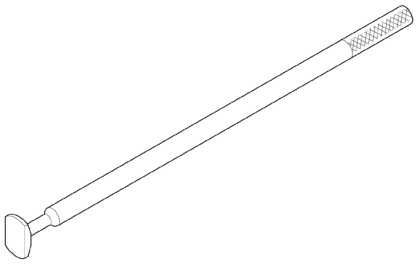
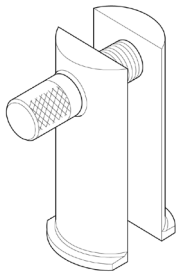
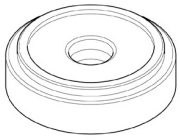
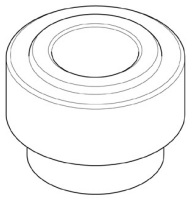
Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	To the indicator
Cold tire pressure	Driver only	175 kPa (1.75 kgf/cm^2, 25 psi)	–
	Driver and passenger	175 kPa (1.75 kgf/cm^2, 25 psi)	–
Axle runout		–	0.2 (0.01)
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)

TORQUE VALUES

Front axle nut	56 N·m (5.7 kgf·m, 41 lbf·ft)	U-nut
Speedometer cable set screw	2 N·m (0.2 kgf·m, 1.4 lbf·ft)	
Front brake disc socket bolt	42 N·m (4.3 kgf·m, 31 lbf·ft)	ALOC bolt; replace with a new one
Shock absorber upper mounting nut	26 N·m (2.6 kgf·m, 19 lbf·ft)	U-nut
Shock absorber lower mounting screw	1 N·m (0.1 kgf·m, 0.7 lbf·ft)	
Shock absorber lower mounting nut	18 N·m (1.8 kgf·m, 13 lbf·ft)	
Shock absorber pivot arm mounting nut	36 N·m (3.7 kgf·m, 27 lbf·ft)	U-nut
Front brake torque link mounting nut	29 N·m (3.0 kgf·m, 22 lbf·ft)	U-nut
Front brake master cylinder holder bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Handlebar post nut	39 N·m (4.0 kgf·m, 29 lbf·ft)	Apply engine oil to the threads and seating surface
Front brake hose clamp bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	ALOC bolt; replace with a new one
Steering stem top cone race	See page 13-22	
Steering stem lock nut	See page 13-22	

TOOLS

Bearing remover head, 12 mm 07746-0050300 	Bearing remover shaft 07746-0050100 	Driver 07749-0010000 
Attachment, 32 x 35 mm 07746-0010100 	Pilot, 12 mm 07746-0040200 	Socket wrench, 32 mm 07916-KM10000 
Lock nut wrench, 45 mm 07SMA-GBC0100 	Ball race remover 07946-GA70000 	Ball race remover 07948-4630100 
Attachment, 44 x 49.5 mm 07945-3330300 	Inner driver, 30 mm 07746-0030300 	

TROUBLESHOOTING

Hard steering
- Insufficient tire pressure
- Faulty tire
- Top cone race too tight
- Faulty steering head bearing
- Faulty steering head bearing race
- Bent steering stem

Steers to one side or does not track straight
- Bent front axle
- Wheel installed incorrectly
- Worn or damaged front wheel bearings
- Bent front shock absorber
- Worn or damaged engine mounting bushings (page 6-9)
- Bent frame
- Faulty steering head bearing

Front wheel wobbles
- Loose front axle fasteners
- Bent rim
- Worn or damaged front wheel bearings
- Unbalanced front wheel and tire

Front wheel turns hard
- Front brake drag (page 15-7)
- Bent front axle
- Faulty front wheel bearings

Soft suspension
- Low tire pressure
- Weak front shock absorber spring

Hard suspension
- High tire pressure

Suspension noisy
- Loose front suspension fasteners

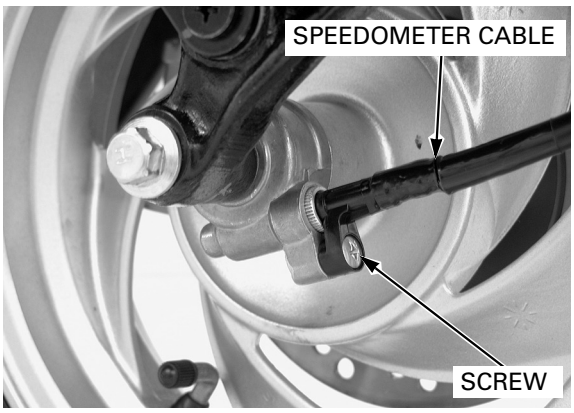
FRONT WHEEL

REMOVAL

Loosen the front axle nut.

Support the scooter securely using a hoist or equivalent and raise the front wheel off the ground.

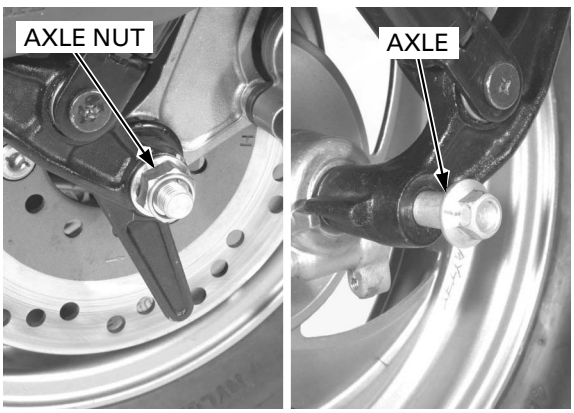
Remove the screw and disconnect the speedometer cable.



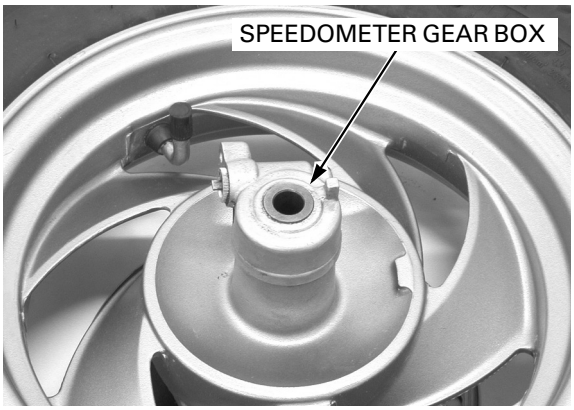
Do not operate the brake lever after removing the front wheel.

Remove the front axle nut.

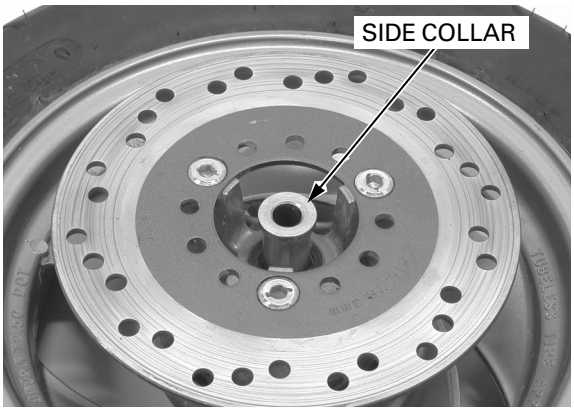
Remove the front axle out and remove the front wheel.



Remove the speedometer gear box.



Remove the side collar.

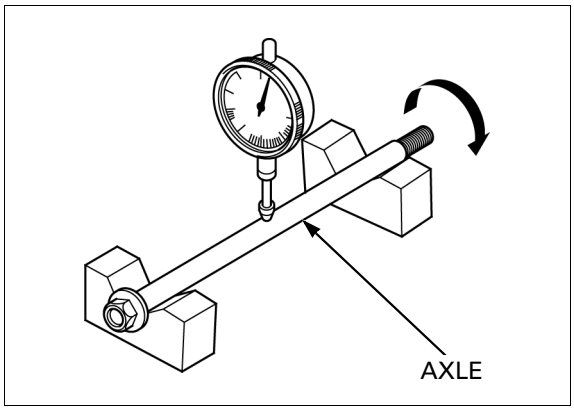


INSPECTION

Axle

Place the axle in V-blocks and measure the runout.
Actual runout is 1/2 the total indicator reading.

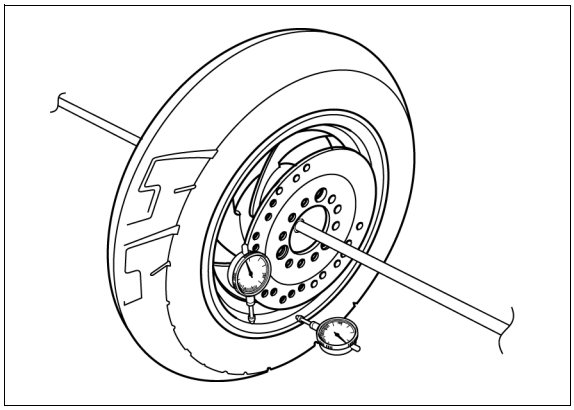
SERVICE LIMIT: 0.2 mm (0.01 in)



Wheel

Check the rim runout by placing the wheel in a turning 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)

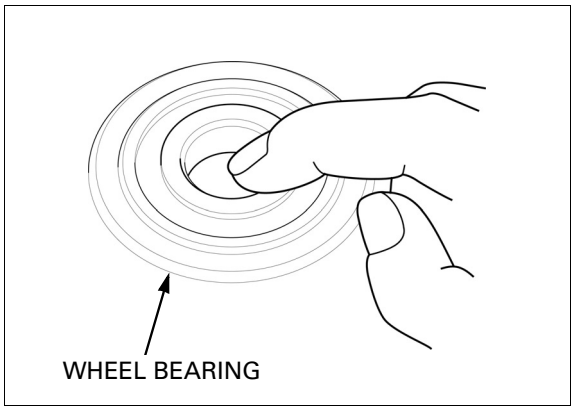


Wheel bearing

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.

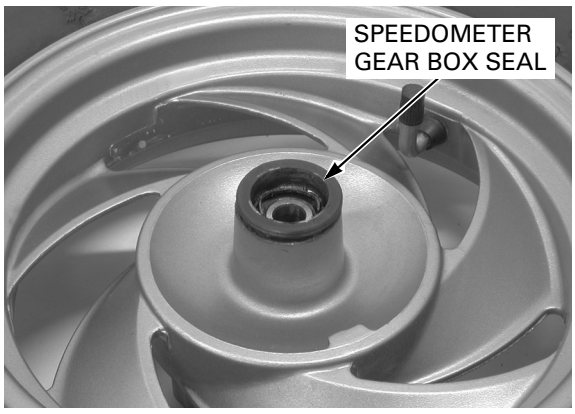
Replace the wheel bearings in pairs.

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

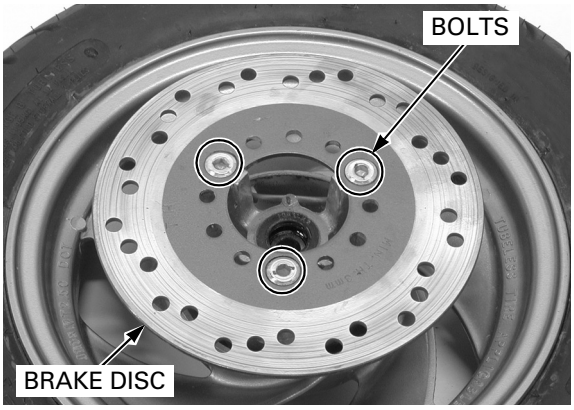


DISASSEMBLY

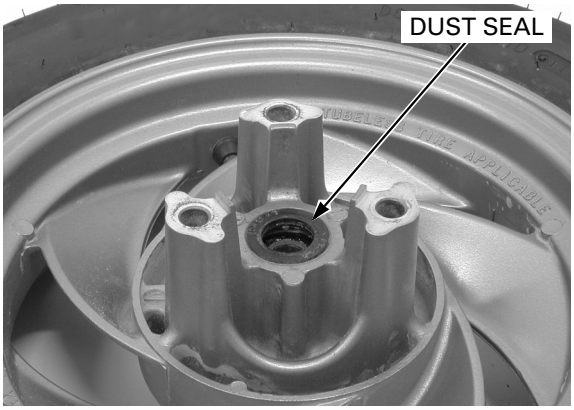
Remove the speedometer gear box seal.



Remove the socket bolts and brake disc.



Remove the dust seal.



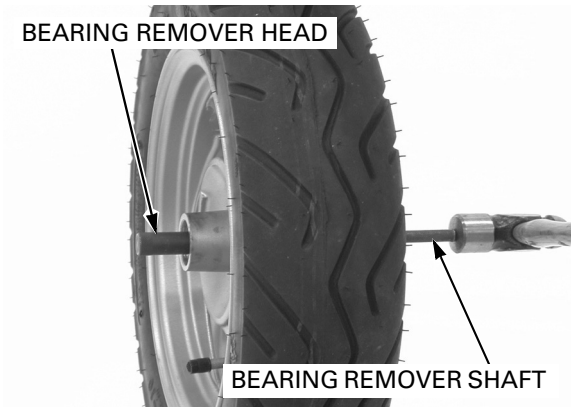
Do not reuse old bearings.

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.

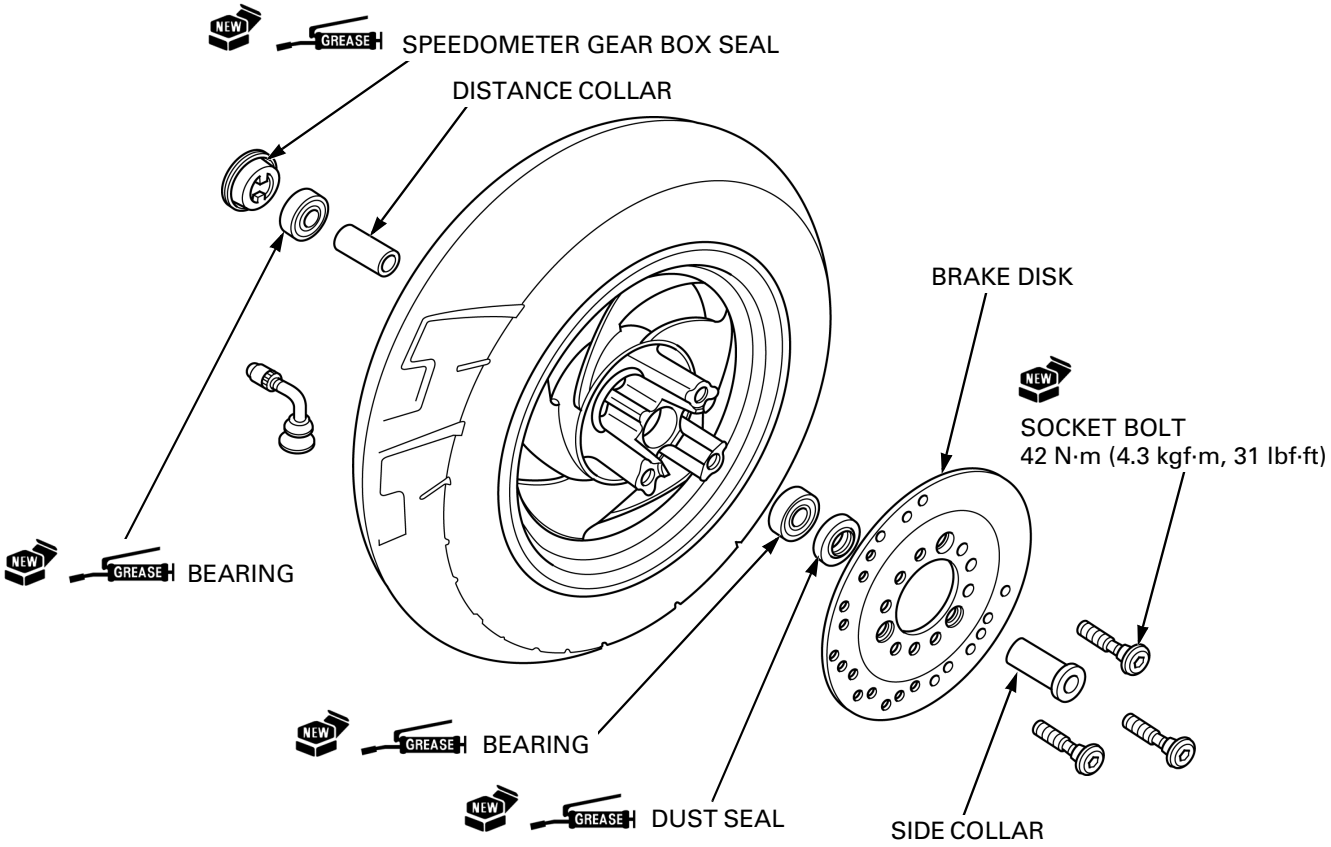
TOOLS:

Bearing remover shaft	**07746-0050100**
Bearing remover head, 12 mm	**07746-0050300**

Remove the distance collar and drive out the other bearing.



ASSEMBLY



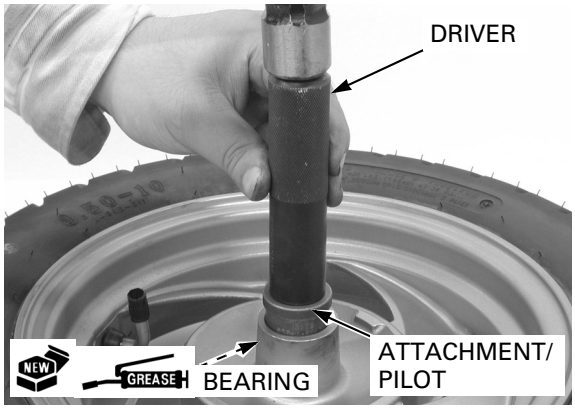
Pack the new bearing cavities with grease.

The sealed side of the bearing is facing the special tools.

Drive the new left bearing (brake disc side) squarely until it is fully seated, using the special tools.

TOOLS:

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

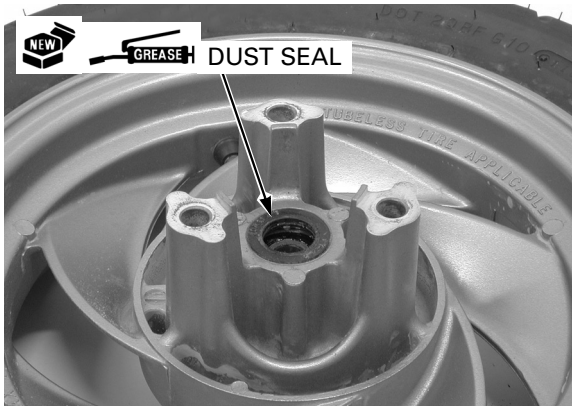


Install the distance collar.

The sealed side of the bearing is facing the special tools.

Drive the new right bearing squarely until it is fully seated, using the special tools.

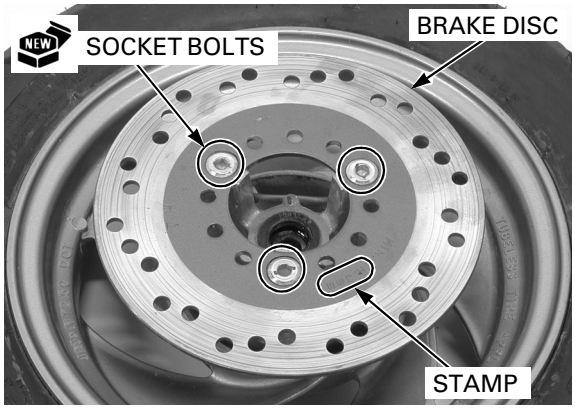
Apply grease to a new dust seal lips.
Install the new dust seal into the brake disc side of the wheel hub until it is flush with the wheel hub.



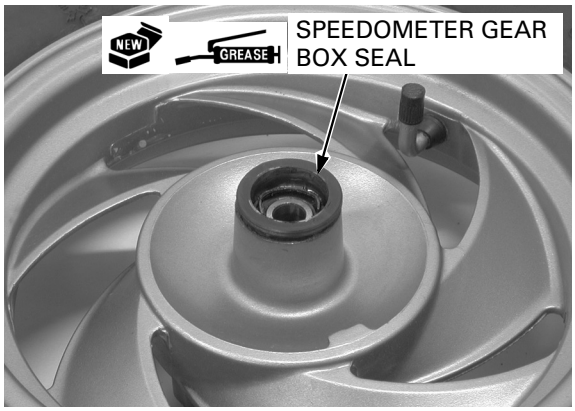
- Do not get grease on the brake disc or stopping power will be reduced.

Install the brake disc on the wheel hub with the stamp facing out.
Install and tighten the new socket bolts to the specified torque.

TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)

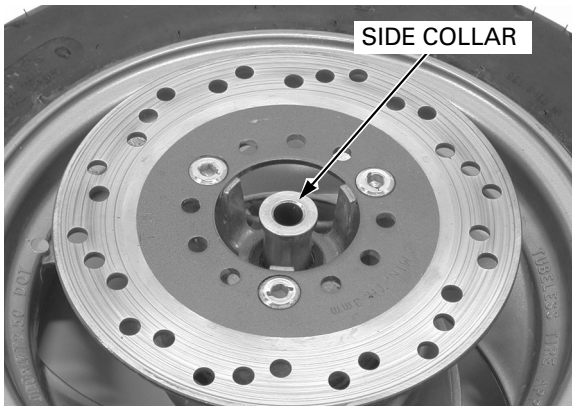


Apply grease to a new speedometer gear box seal lips.
Install the new speedometer gear box seal into the speedometer gear box side of the wheel hub until it is flush with the wheel hub.



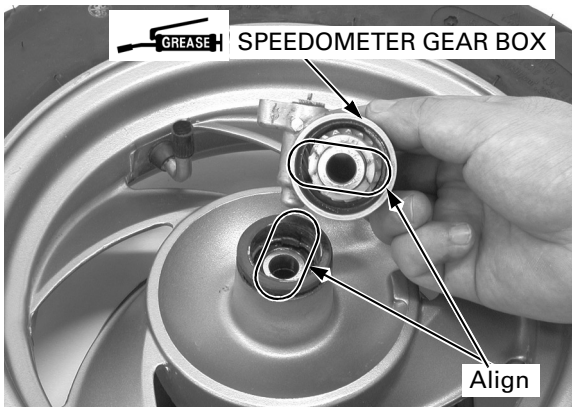
INSTALLATION

Install the side collar.



Apply grease to a speedometer gear box sliding surface.

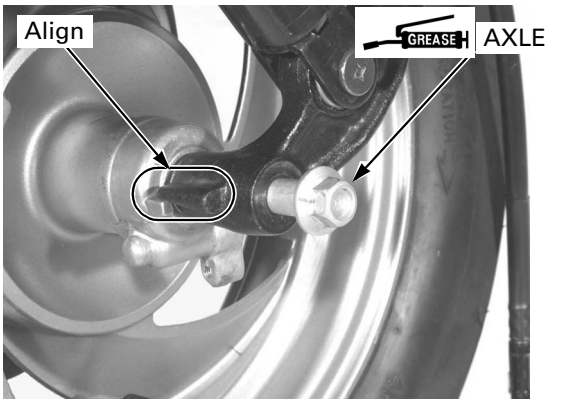
Install the speedometer gear box by aligning the tabs of the gear box with the grooves of the wheel hub.



Be careful not to damage the pads.

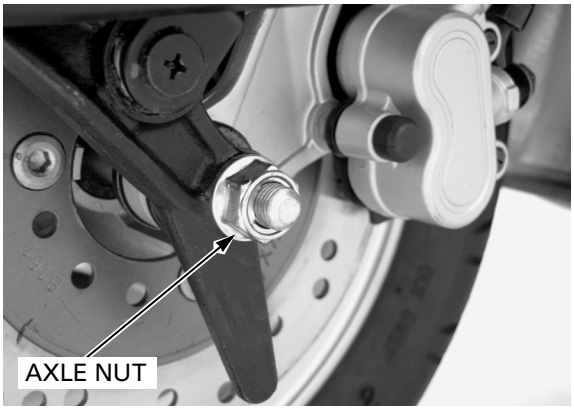
Install the front wheel between the fork legs while inserting the disc between the pads.
Align the speedometer gear box tab with the tab of the bottom of pivot arm.

Install the front axle from the right side.

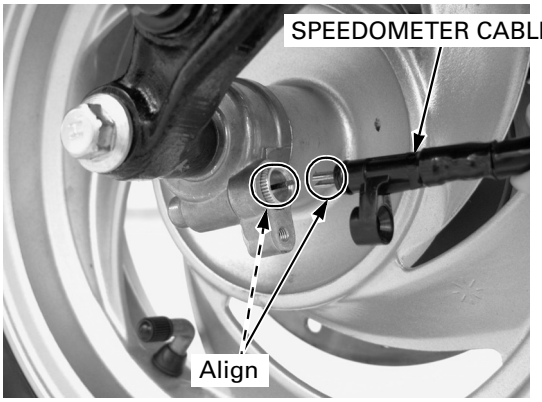


Install the axle nut and tighten it to the specified torque.

TORQUE: 56 N·m (5.7 kgf·m, 41 lbf·ft)

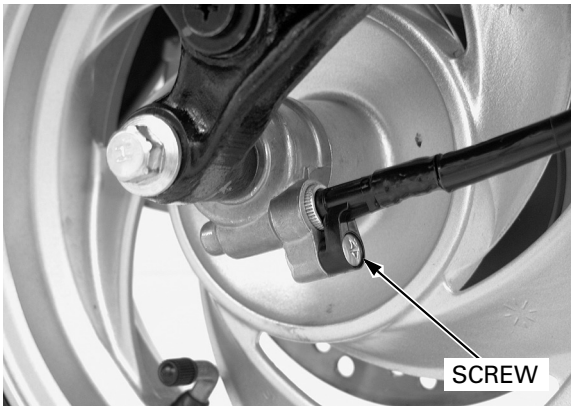


Connect the speedometer cable to the speedometer gear box by aligning the speedometer gear box tab and speedometer cable cut-off.



Install the screw and tighten it to the specified torque.

TORQUE: 2 N·m (0.2 kgf·m, 1.4 lbf·ft)



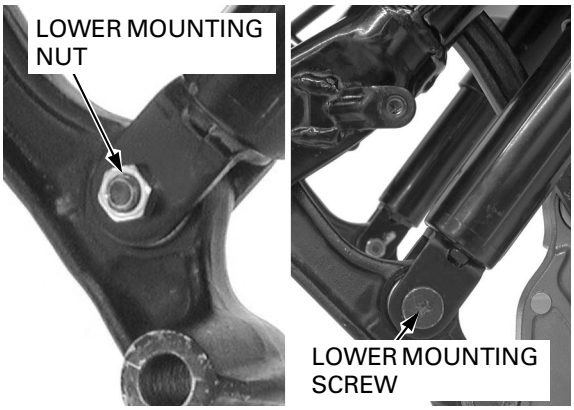
FRONT SHOCK ABSORBER

REMOVAL

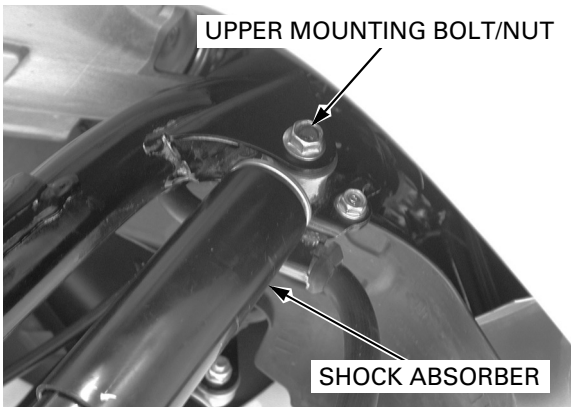
Remove the following:

– Front wheel (page 13-6)
– Fork cover (page 2-12)

Remove the lower mounting nut and screw.

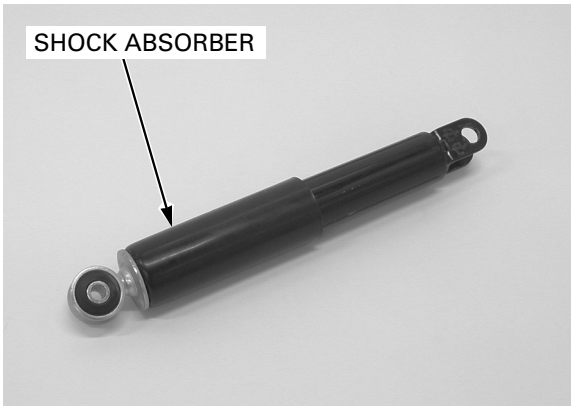


Remove the upper mounting bolt, nut and shock absorber.



INSPECTION

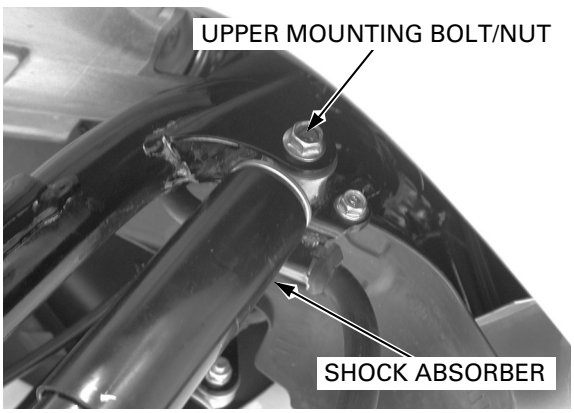
Check the damper unit for oil leaks and the bushing for deterioration or damage. Replace the shock absorber if necessary.



INSTALLATION

Install the shock absorber, upper mounting bolt and nut.
Tighten the nut to the specified torque.

TORQUE: 26 N·m (2.6 kgf·m, 19 lbf·ft)



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

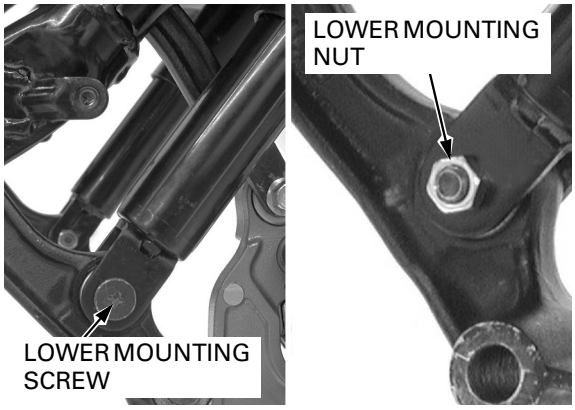
TORQUE: 1 N·m (0.1 kgf·m, 0.7 lbf·ft)

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

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Install the following:

– Fork cover (page 2-12)
– Front wheel (page 13-10)



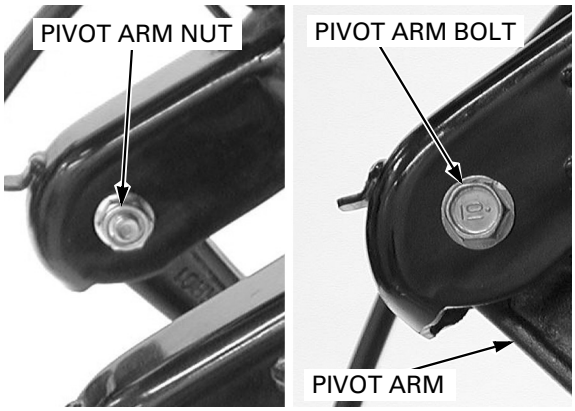
PIVOT ARM/TORQUE LINK

PIVOT ARM REMOVAL

Remove the following:

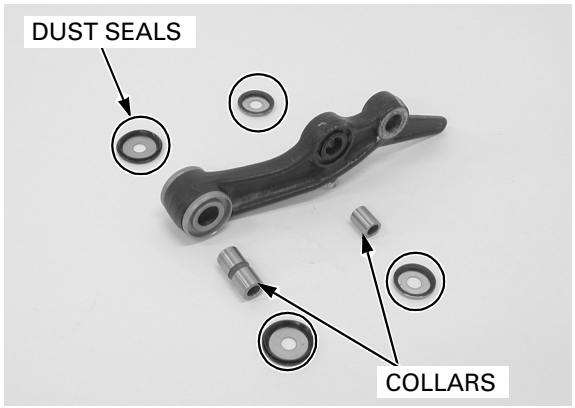
– Front wheel (page 13-6)
– Fork cover (page 2-12)
– Front shock absorber lower mounting nut and screw (page 13-12)

Remove the pivot arm nut, bolt and pivot arm.



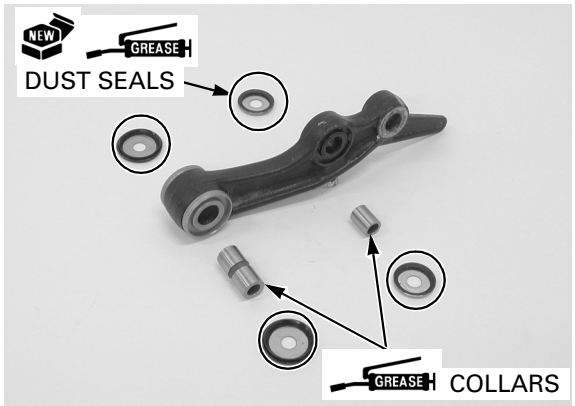
PIVOT ARM DISASSEMBLY

Remove the dust seals and collars.
Check the collar, bushing and dust seal for wear or damage.



PIVOT ARM ASSEMBLY

Apply grease to collars and new dust seal lips and install the collars and new dust seals.



PIVOT ARM INSTALLATION

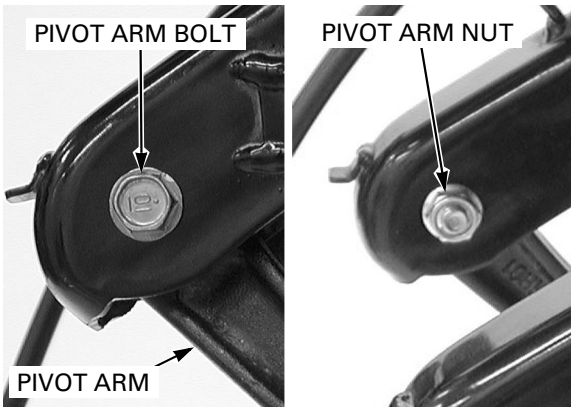
Install the pivot arm, bolt and nut.
Tighten the nut to the specified torque.

TORQUE: 36 N·m (3.7 kgf·m, 27 lbf·ft)

Install and tighten the shock absorber lower mounting screw and nut (page 13-12).

Install the following:

– Fork cover (page 2-12)
– Front wheel (page 13-10)



TORQUE LINK REMOVAL

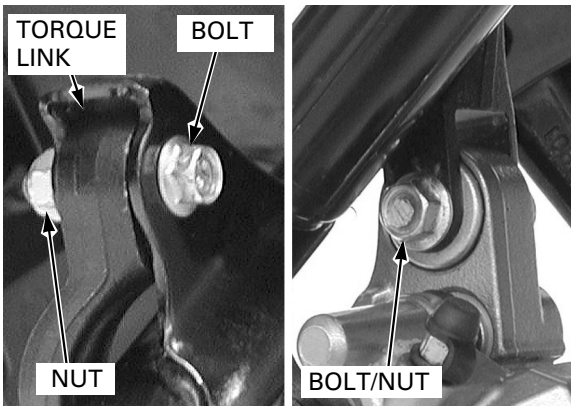
Remove the following:

– Front wheel (page 13-6)
– Fork cover (page 2-12)

Remove the torque link mounting nut and bolt from the front fork.
Remove the torque link mounting nut and bolt from the brake caliper bracket.

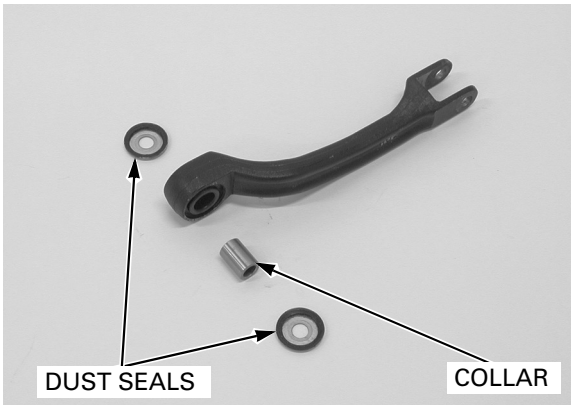
Support the caliper so it does not hang from the brake hose.
Do not twist the brake hose.

Remove the torque link.



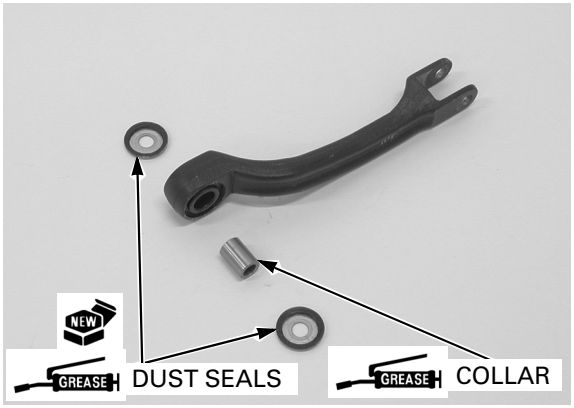
TORQUE LINK DISASSEMBLY

Remove the dust seals and collar.
Check the collar, bushing and dust seal for wear or damage.



TORQUE LINK ASSEMBLY

Apply grease to new dust seal lips and collar.
Install the collar and new dust seals.



TORQUE LINK INSTALLATION

Install the torque link, torque link mounting bolt and nut to the brake caliper bracket.
Tighten the nut to the specified torque.

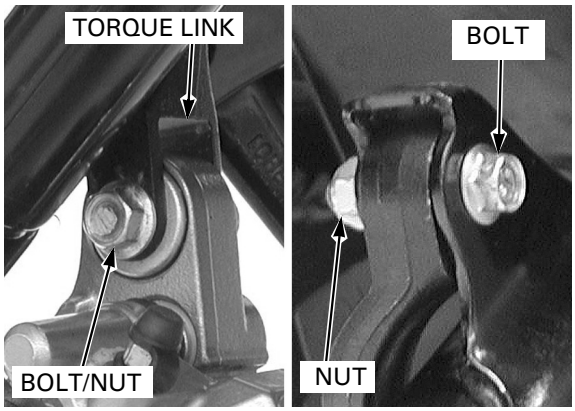
TORQUE: 29 N·m (3.0 kgf·m, 22 lbf·ft)

Install the torque link mounting bolt and nut to the front fork.
Tighten the nut to the specified torque.

TORQUE: 29 N·m (3.0 kgf·m, 22 lbf·ft)

Install the following:

– Fork cover (page 2-12)
– Front wheel (page 13-10)



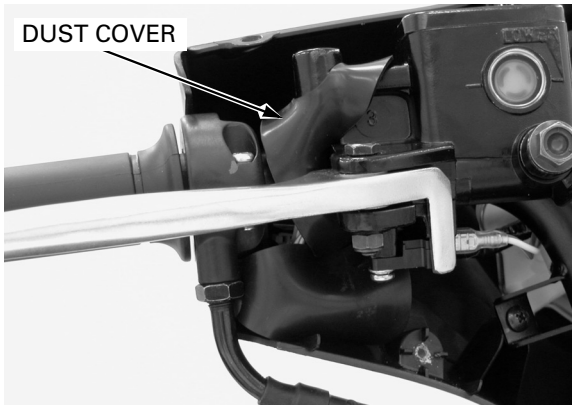
HANDLEBAR

REMOVAL

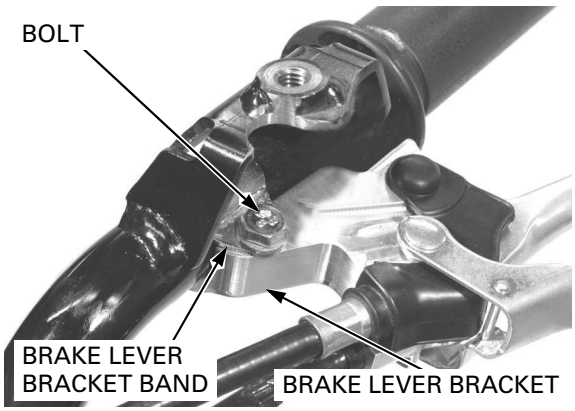
Remove the following:

– Front handlebar cover (page 2-10)
– Front cover (page 2-11)
– Rear handlebar cover (page 2-10)

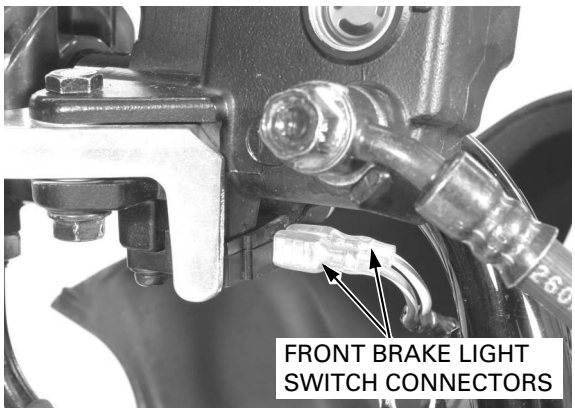
Remove the dust cover from the master cylinder.



Type I, III only. Remove the bolt and rear brake lever bracket band.
Remove the rear brake lever bracket.

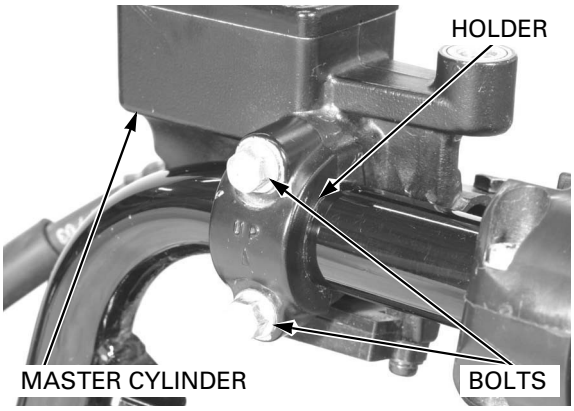


Disconnect the front brake light switch connectors from the switch.

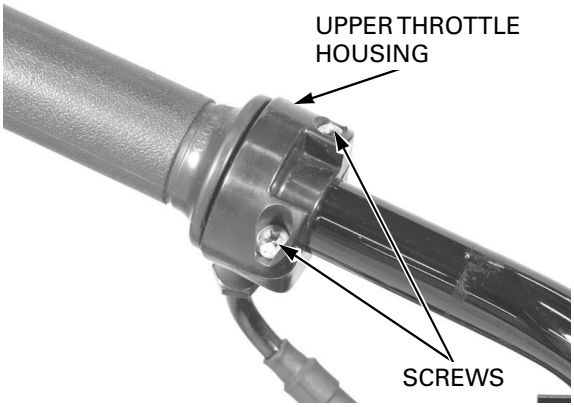


Keep the brake master cylinder upright, to prevent air from the system. Do not twist the brake hose.

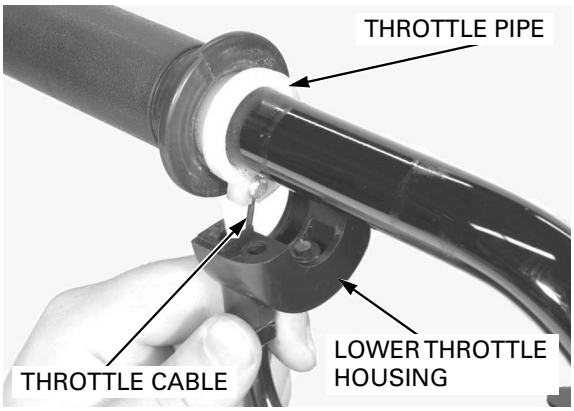
Remove the bolts, master cylinder holder and master cylinder.



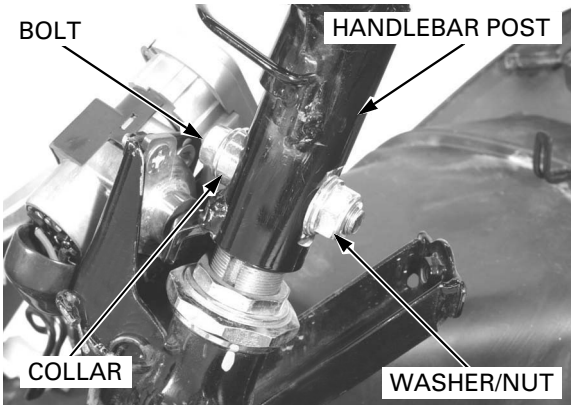
Remove the screws and upper throttle housing.



Remove the lower throttle housing.
Disconnect the throttle cable end from the throttle pipe.
Remove the throttle pipe from the handlebar.



Remove the nut, bolt, washer, collar, and handlebar post.

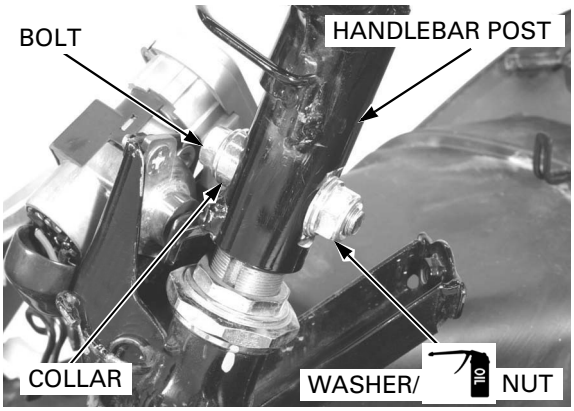


INSTALLATION

Install the handlebar post into the steering stem while aligning the holes of the steering stem and handlebar post.

Apply clean engine oil to the handlebar post nut thread and seating surface.
Install the bolt, collar, washer and nut.
Tighten the nut to the specified torque.

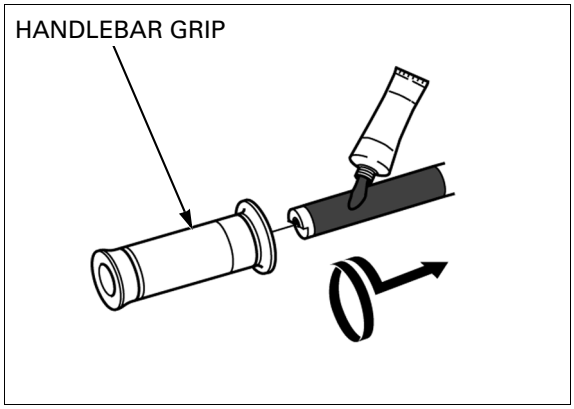
TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)



If the handlebar grips were removed, apply Honda Bond A or equivalent to the inside of the grip and to the clean surfaces of the left handlebar and throttle pipe.

Allow the adhesive to dry for 1 hour before using.

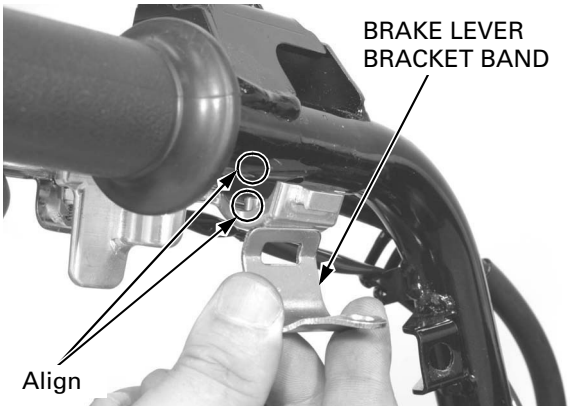
Wait 3 – 5 minutes and install the grip.
Rotate the grip for even application of the adhesive.



Type I, III only

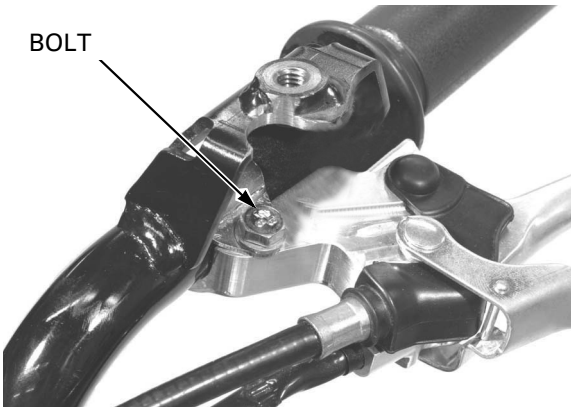
Install the rear brake lever bracket by aligning the locating pin with the hole in the handlebar.

Install the rear brake lever bracket band.



Type I, III only

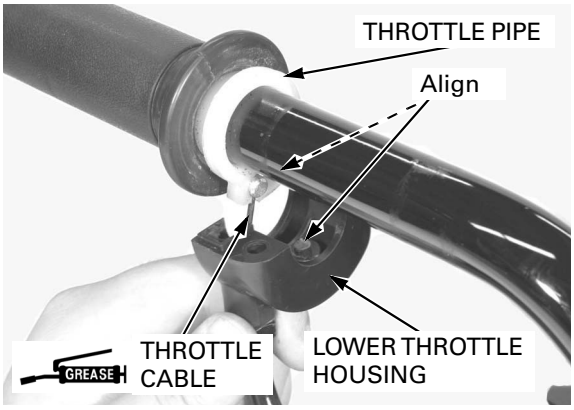
Install and tighten the bolt.



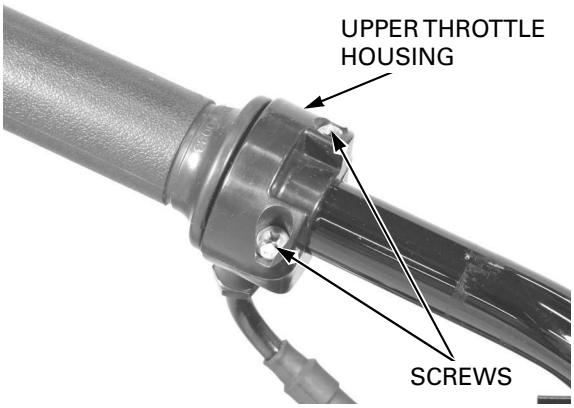
Install the throttle pipe to the handlebar.

Apply grease to the throttle cable end and connect it to the throttle pipe.

Install the lower throttle housing by aligning the hole on the handlebar with the locating pin of the lower throttle housing.

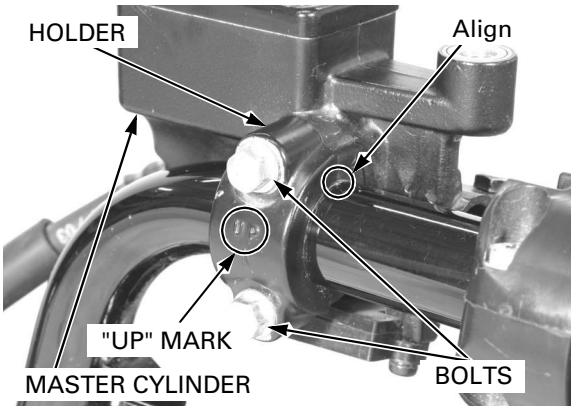


Install the upper throttle housing and tighten the screws.

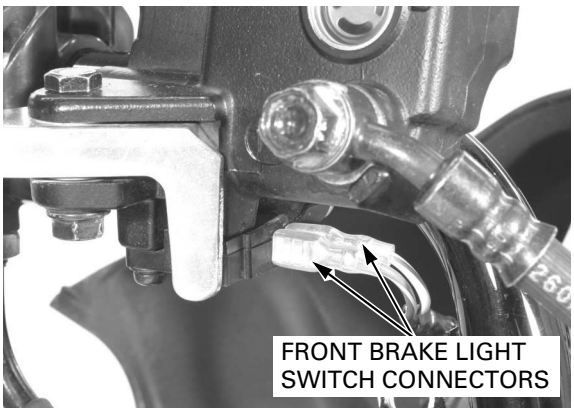


Set the master cylinder and holder with the "UP" mark facing up.
Align the end of the master cylinder with the punch mark on the handlebar and tighten the upper bolt first, then tighten the lower bolt.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



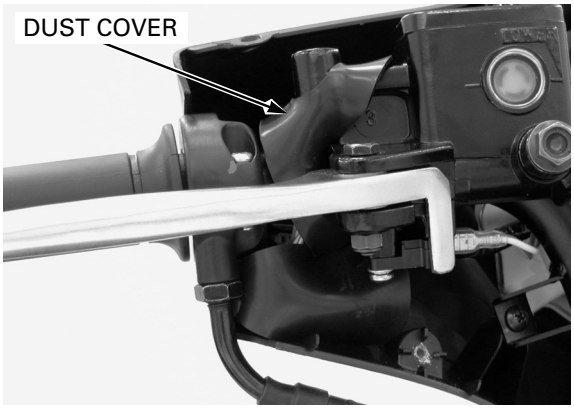
Connect the front brake light switch connectors to the front brake light switch.



Install the dust cover to the master cylinder.

Install the following:

– Rear handlebar cover (page 2-10)
– Front cover (page 2-11)
– Front handlebar cover (page 2-10)



STEERING STEM

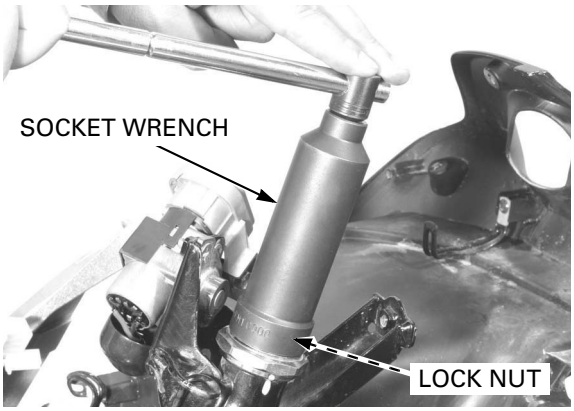
REMOVAL

Remove the following:

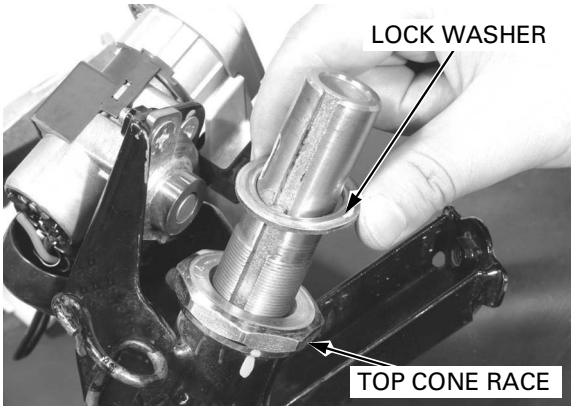
– Front wheel (page 13-6)
– Handlebar (page 13-15)
– Front shock absorber (page 13-12)
– Pivot arm (page 13-13)
– Torque link (page 13-14)

Remove the steering stem lock nut using the special tool.

TOOLS:
Socket wrench, 32 mm 07916-KM10000



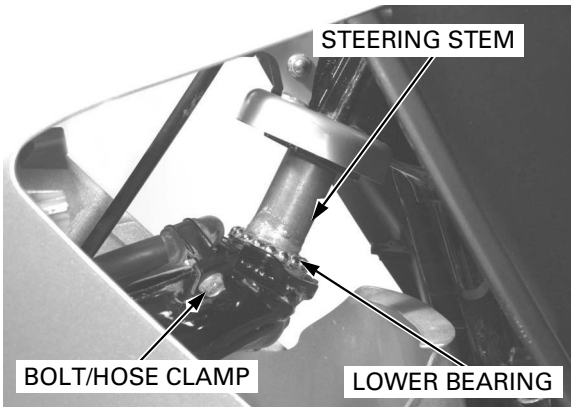
Remove the lock washer.
Remove the top cone race.



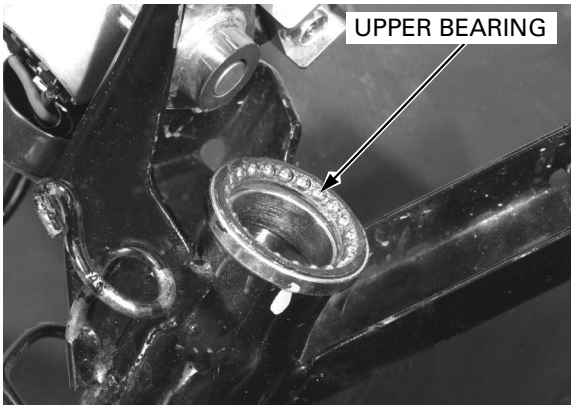
Support the brake caliper with a piece of wire so that it does not hang from the brake hose. Do not twist the brake hose.

Pull and hold the steering stem securely then remove the brake hose clamp bolt and brake hose clamp.

Remove the steering stem.
Remove the lower bearing.



Remove the upper bearing.



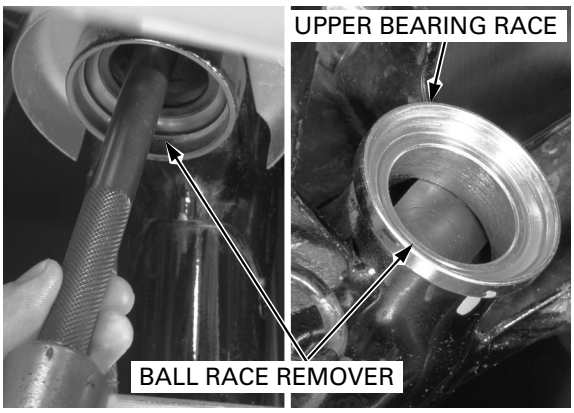
STEERING BEARING RACE REPLACEMENT

Always replace the bearings and races as a set.

Remove the upper bearing race using the following tool.

TOOL:

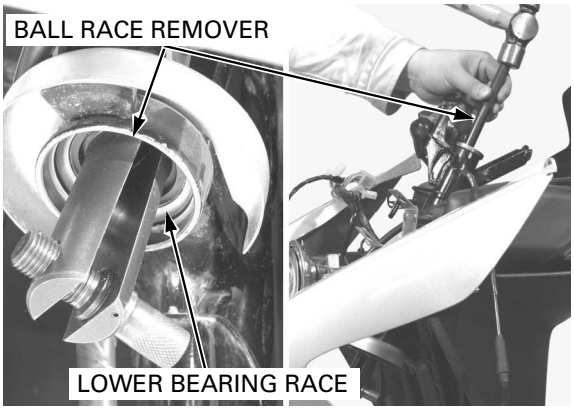
Ball race remover	**07946-GA70000**



Remove the lower bearing race using the following tools.

TOOLS:

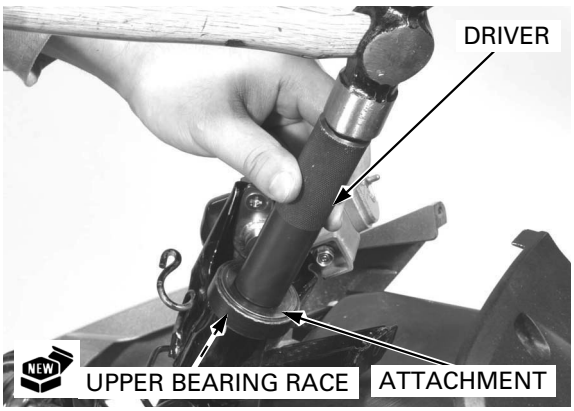
Ball race remover	**07946-GA70000**
Ball race remover	**07948-4630100**



Drive a new upper bearing race into the head pipe using the following tools.

TOOLS:

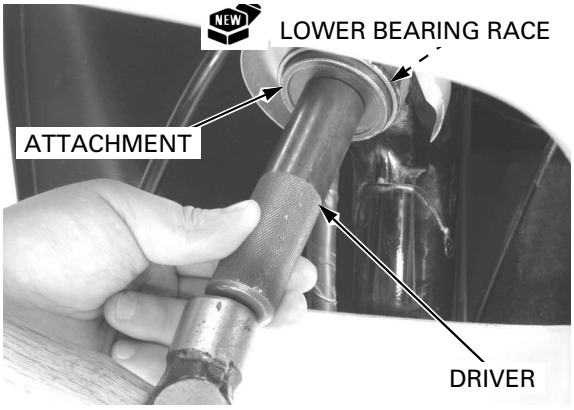
Driver	**07749-0010000**
Attachment, 44 x 49.5 mm	**07945-3330300**



Drive a new lower bearing race into the head pipe using the following tools.

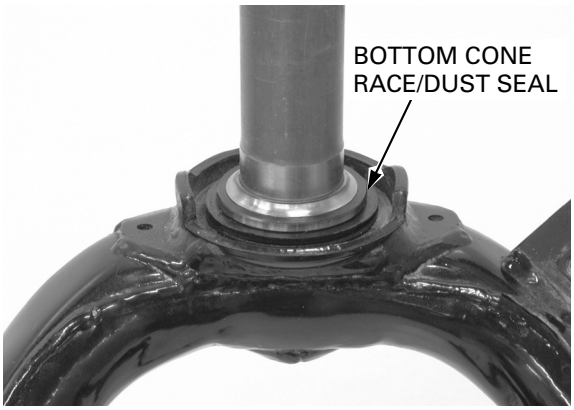
TOOLS:

Driver	**07749-0010000**
Attachment, 44 x 49.5 mm	**07945-3330300**



Remove the front mad guard (page 2-12).

Remove the bottom cone race and dust seal.



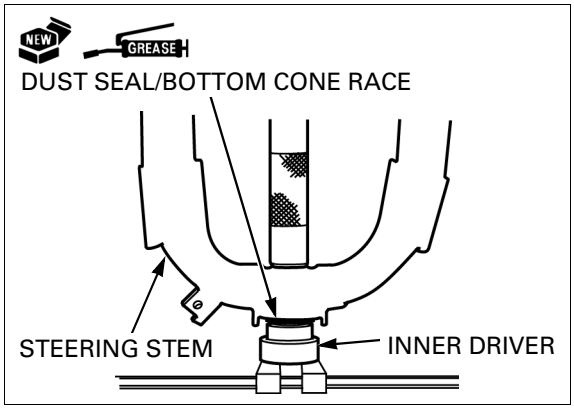
Apply grease with extreme pressure (recommended: EXCELIGHT EP2 manufactured by KYODO YUSHI, japan or Shell ALVANIA EP2 or equivalent) to a new dust seal lip then Install a new dust seal.

Install a new bottom cone race using the following tool and hydraulic press.

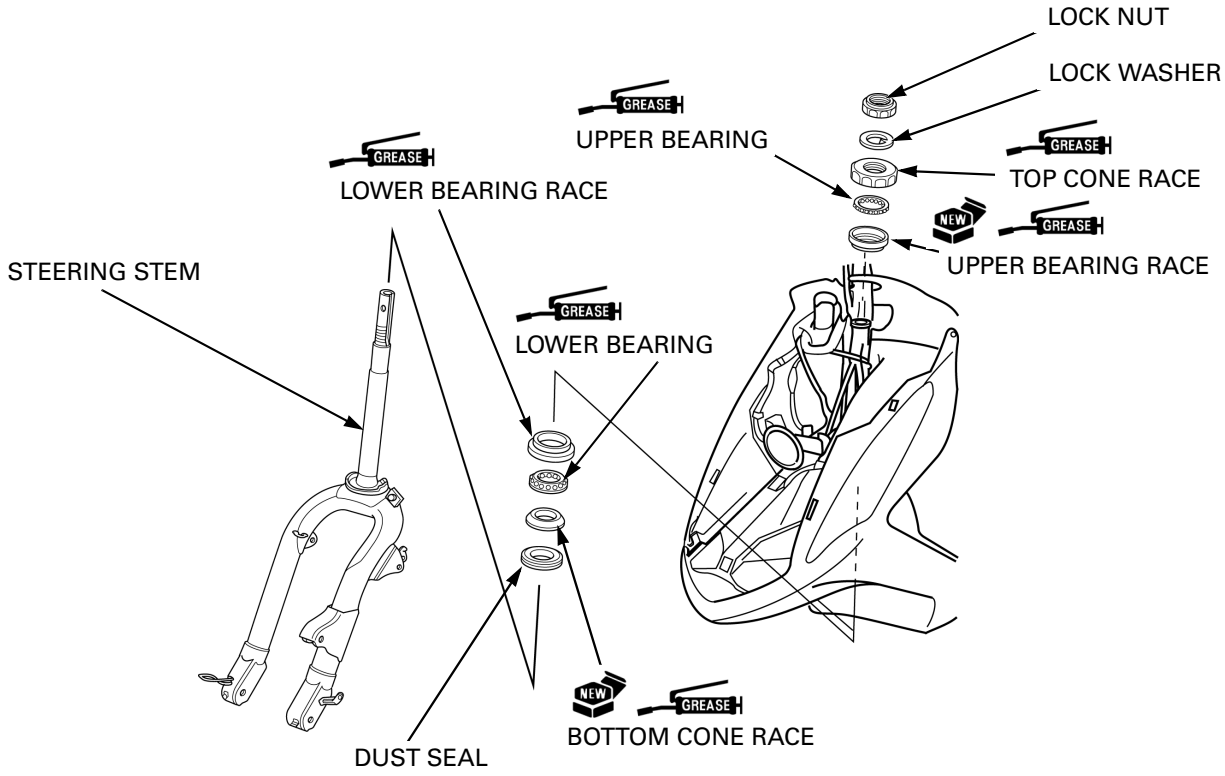
TOOL:

Inner driver, 30 mm	**07746-0030300**

Install the front mad guard (page 2-12).

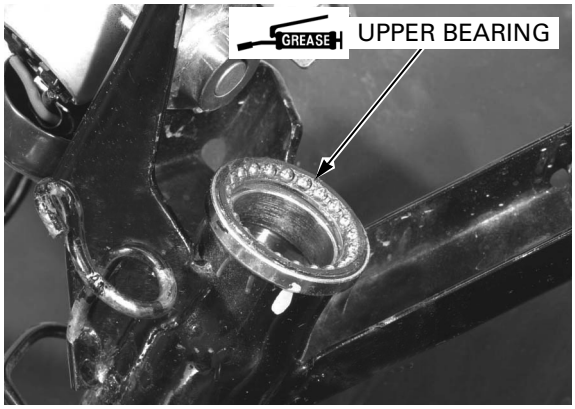


INSTALLATION



Apply grease with extreme pressure (recommended: EXCELIGHT EP2 manufactured by KYODO YUSHI, japan or Shell ALVANIA EP2 or equivalent) to the upper bearing and both side of the upper bearing race.

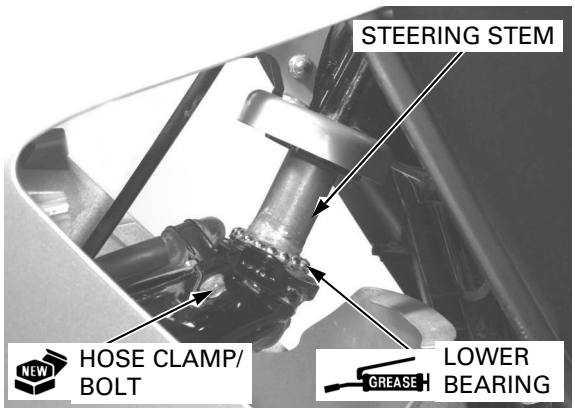
Install the upper bearing onto the upper bearing race.



Apply grease with extreme pressure (recommended: EXCELIGHT EP2 manufactured by KYODO YUSHI, japan or Shell ALVANIA EP2 or equivalent) to the lower bearing and both side of the lower bearing race.
Install the lower bearing onto the stem.

Insert the steering stem into the steering head pipe, then hold the steering stem and set the brake hose clamp.
Install and tighten the new clamp bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

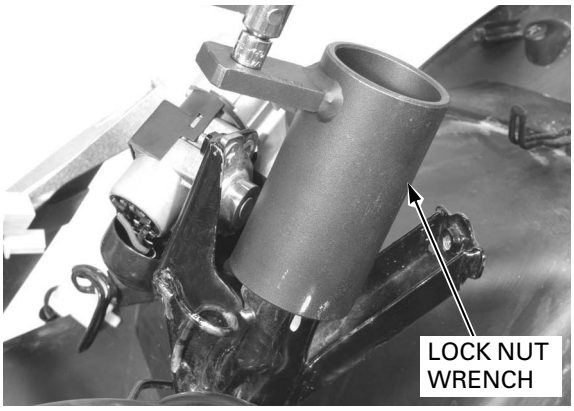


Refer to torque wrench reading information on page 13-3 ''Service Information''.

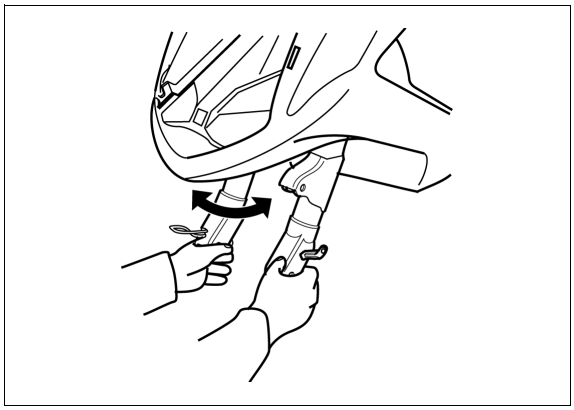
Install and tighten the top cone race to the specified torque.

TOOL:
Lock nut wrench, 45 mm 07SMA-GBC0100

TORQUE:
Actual: 16 N·m (1.6 kgf·m, 12 lbf·ft)
Indicated: 14 N·m (1.4 kgf·m, 10 lbf·ft)



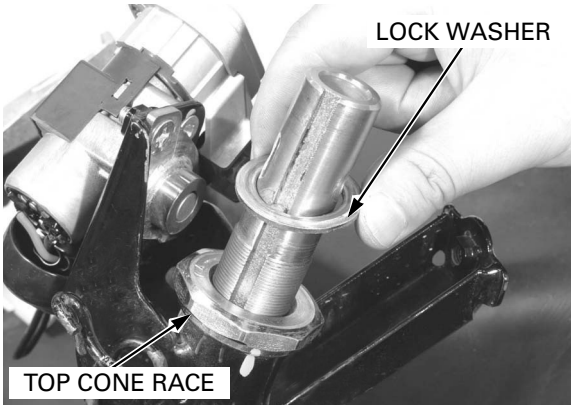
Turn the steering stem lock-to-lock several times to seat the bearing.



Temporarily loosen the top cone race.

Tighten the top cone race fully by hand, then loosen it 45 degrees.

Install the lock washer by aligning the tab of the lock washer and groove of the steering stem.

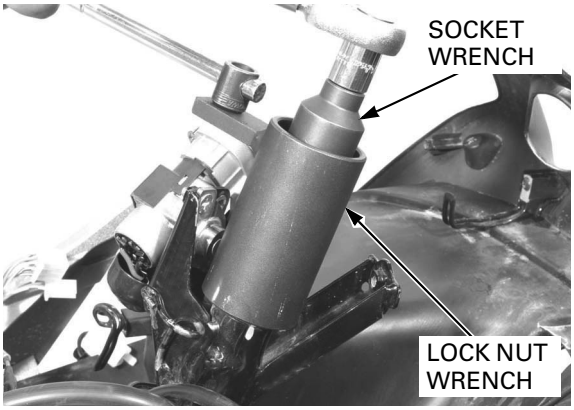


Install the steering stem lock nut.

Hold the top cone race using the lock nut wrench then tighten the steering stem lock nut to the specified torque.

TOOLS:
Socket wrench, 32 mm 07916-KM10000
Lock nut wrench, 45 mm 07SMA-GBC0100

TORQUE: 68 N·m (6.9 kgf·m, 50 lbf·ft)



Make sure the steering stem moves smoothly without play or binding.

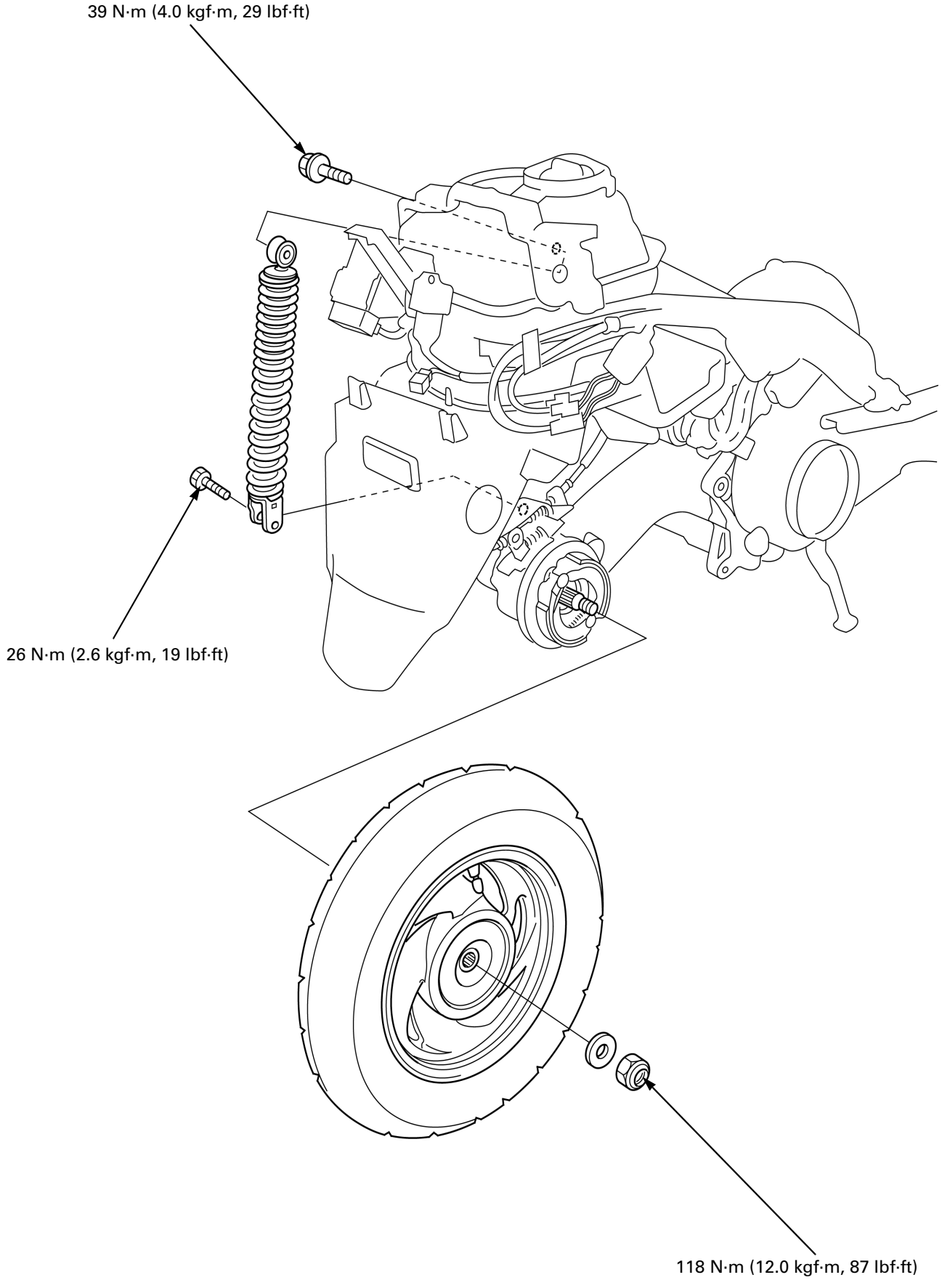
Install the following:

- Torque link (page 13-15)
- Pivot arm (page 13-14)
- Front shock absorber (page 13-12)
- Handlebar (page 13-17)
- Front wheel (page 13-10)

MEMO

14. REAR WHEEL/BRAKE/SUSPENSION

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

⚠ CAUTION

Frequent inhalation of brake shoe dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

- When servicing the rear wheel and suspension, support the scooter using a safety stand or hoist.
- A contaminated brake shoe or drum reduces stopping power. Replace the contaminated shoes and clean the contaminated drum with a high quality brake degreasing agent.
- Use only tires marked "TUBELESS" and tubeless valve stems on rims marked "TUBELESS TIRE APPLICABLE".
- Use genuine Honda replacement bolts and nuts for all suspension pivots and mounting points.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	To the indicator
Cold tire pressure	Drive only	200 kPa (2.00 kgf/cm^2, 29 psi)	–
	Drive and passenger	250 kPa (2.50 kgf/cm^2, 36 psi)	–
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Rear brake	Brake lever free play (Type I, III)	10 – 20 (0.4 – 0.8)	–
	Brake pedal free play (Type II, IV)	20 – 30 (0.8 – 1.2)	–
	Brake drum I.D.	110.0 (4.33)	111.0 (4.4)

TORQUE VALUES

Rear axle nut	118 N·m (12.0 kgf·m, 87 lbf·ft)	U-nut, Apply engine oil to the threads
Rear brake arm bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	ALOC bolt; replace with a new one
Shock absorber upper mounting bolt	39 N·m (4.0 kgf·m, 29 lbf·ft)	
Shock absorber lower mounting bolt	26 N·m (2.6 kgf·m, 19 lbf·ft)	

TROUBLESHOOTING

Rear wheel wobbles
- Bent rim
- Faulty tire
- Axle nut and/or engine mounting bolt not tightened properly
- Loose or worn final gear shaft bearing
- Insufficient tire pressure

Rear wheel turns hard
- Rear brake drag

Poor brake performance
- Improper brake adjustment
- Contaminated brake shoe lining
- Worn brake shoes
- Worn brake cam
- Contaminated brake drum
- Worn brake drum

Soft suspension
- Low tire pressure
- Oil leakage from damper unit
- Weak rear shock absorber spring

Hard suspension
- High tire pressure
- Bent damper rod

Rear suspension noisy
- Loose mounting fasteners
- Weak rear suspension bushings
- Faulty rear shock absorber

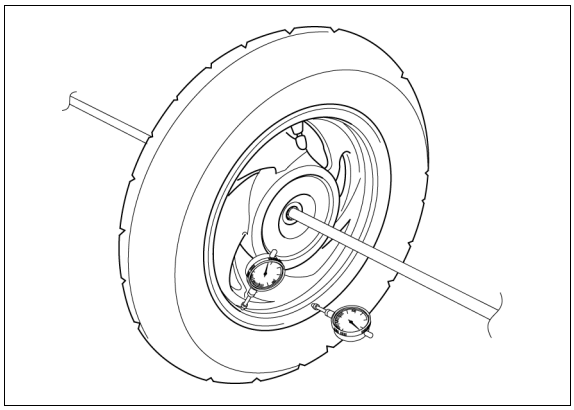
REAR WHEEL

INSPECTION

Wheel

Check the wheel rim runout using dial indicators. 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)

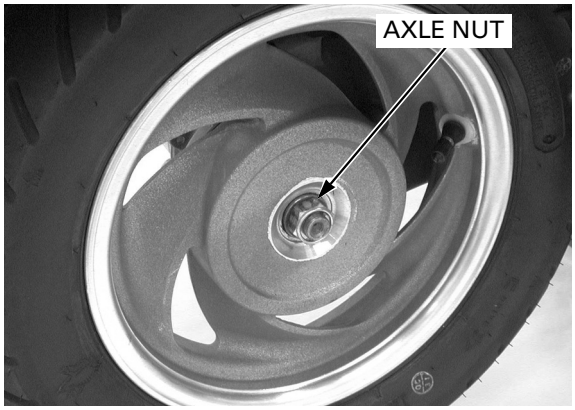


REMOVAL

Support the scooter securely on its center stand.

Remove the muffler (page 2-14).

Remove the rear axle nut and rear wheel.



INSTALLATION

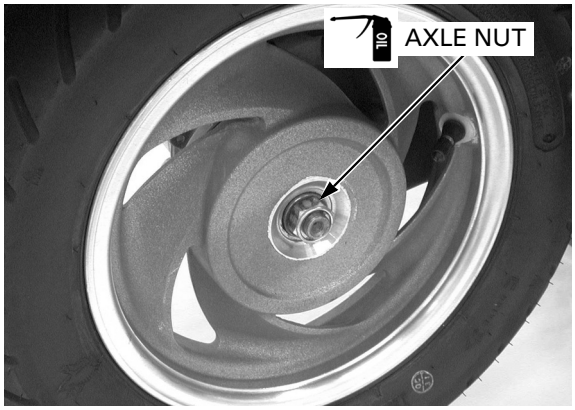
Install the rear wheel onto the final gear shaft, aligning the spline.

Apply clean engine oil to the axle nut threads and seating surface.

Install and tighten the axle nut to the specified torque.

TORQUE: 118 N·m (12.0 kgf·m, 87 lbf·ft)

Install the muffler (page 2-14).



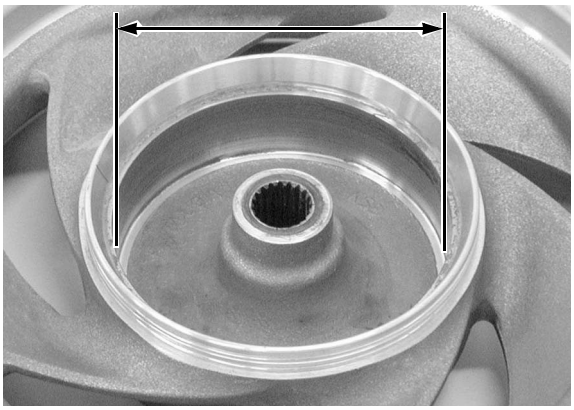
REAR BRAKE

INSPECTION

Remove the rear wheel (page 14-5).

Measure the rear brake drum I.D.

SERVICE LIMITS: 111 mm (4.4 in)



DISASSEMBLY

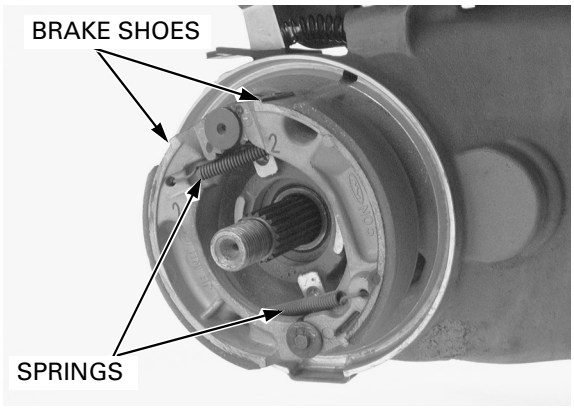
Support the scooter securely on its center stand.

Remove the rear wheel (page 14-5).

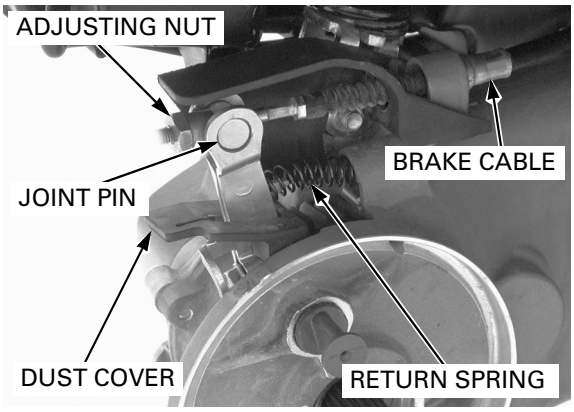
Replace the brake shoes as a set.

Mark the brake shoes to ensure that they are reinstalled on their original position.

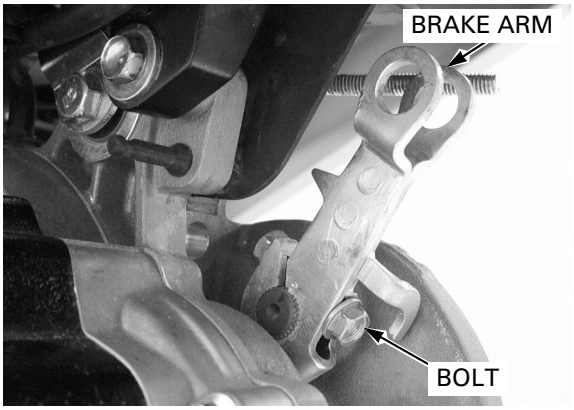
Remove the brake shoes and springs by spreading the brake shoes.



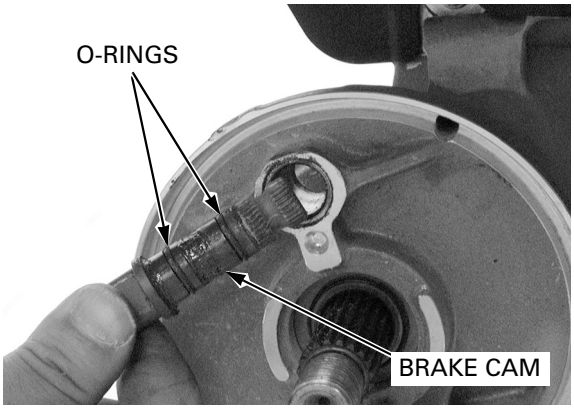
Remove the adjusting nut, brake cable, joint pin, return spring and dust cover from the brake arm.



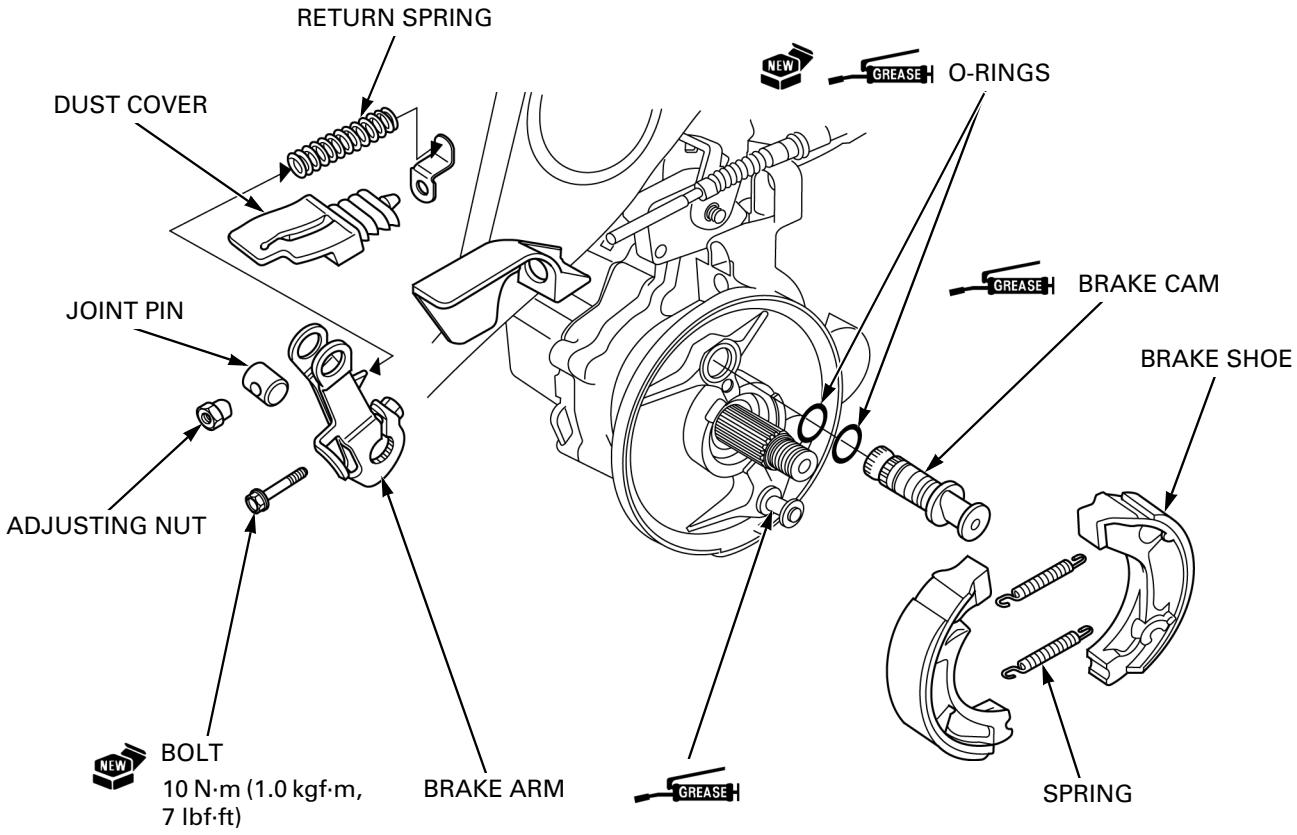
Remove the brake arm bolt and brake arm.



Remove the brake cam and O-rings.

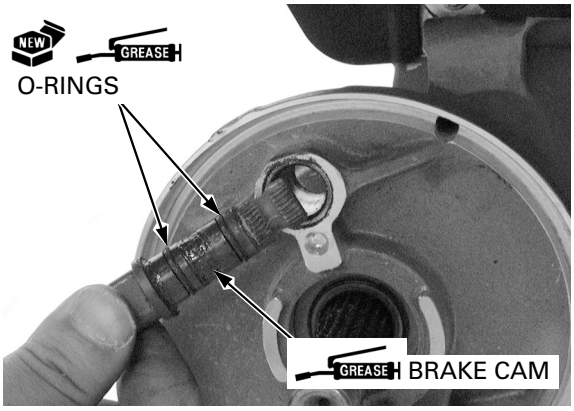


ASSEMBLY

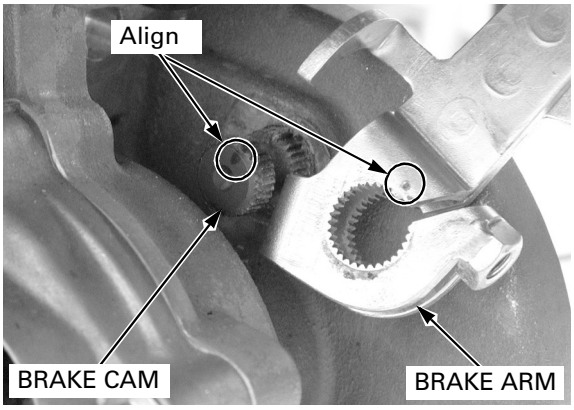


Apply grease to the brake cam sliding surface and install it to the brake panel.

Coat new O-rings with grease and install them into the brake cam.

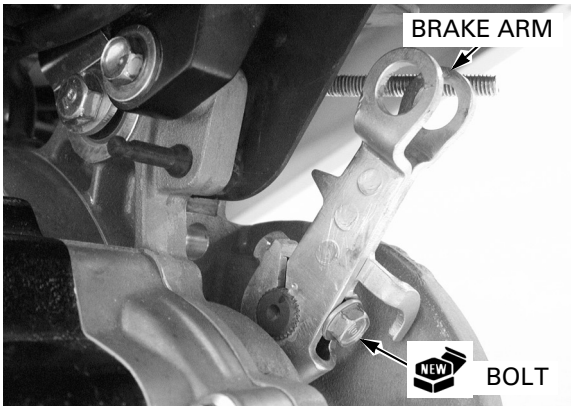


Install the brake arm to the brake cam by aligning the punch mark.

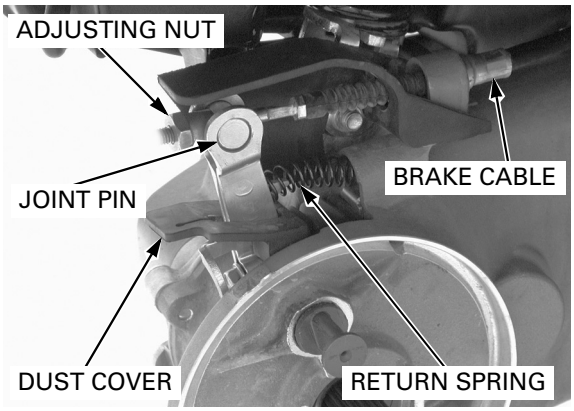


Install and tighten a new brake arm bolt.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



Install the dust cover, return spring, joint pin, brake cable, and adjusting nut to the brake arm.



Apply grease to the brake cam and anchor pin.

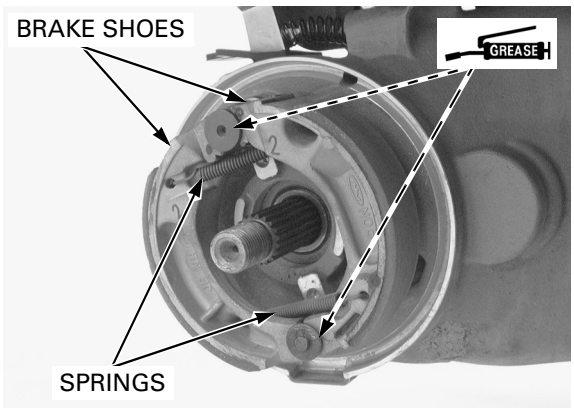
If the brake shoes are reinstalled, check the mark and make sure that each shoe is reinstalled in its original position.

Install the shoe springs onto the brake shoes.

Install the brake shoes onto the brake cam and anchor pin by spreading the brake shoes.

Install the rear wheel (page 14-5).

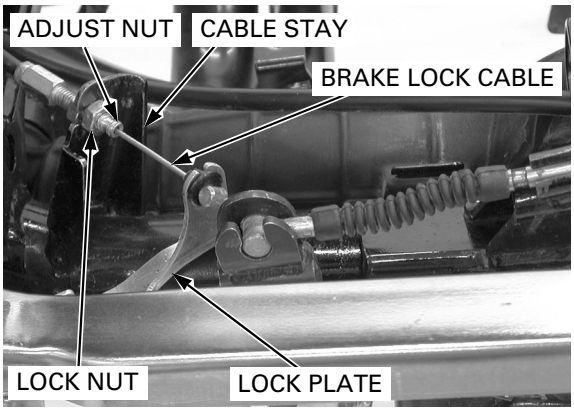
Adjust the rear brake (page 3-17).



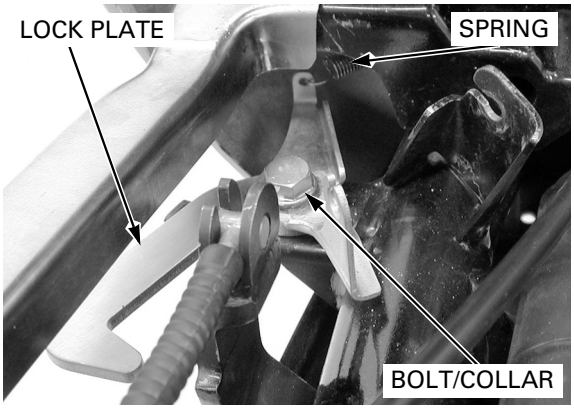
REAR BRAKE LOCK PLATE (TYPE II, IV ONLY)

REMOVAL

Remove the under cover (page 2-7).
Loosen the lock nut and adjust nut.
Remove the rear brake lock cable from the cable stay and disconnect it from the lock plate.

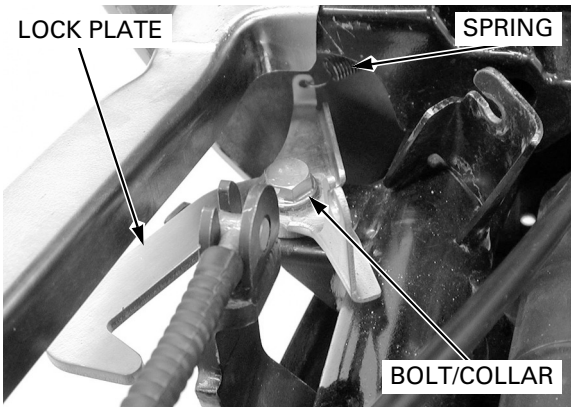


Remove the bolt, collar, spring and lock plate.
Check the lock plate for wear or damage and replace it if necessary.



INSTALLATION

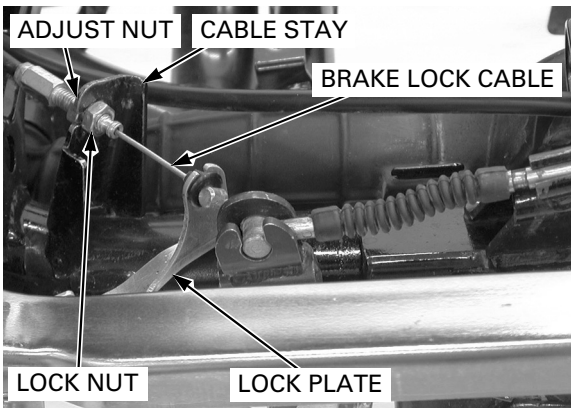
Install the lock plate, spring, collar and bolt.



Connect the rear brake lock cable to the lock plate and install it to the cable stay.

Adjust the brake lock operation (page 3-19).

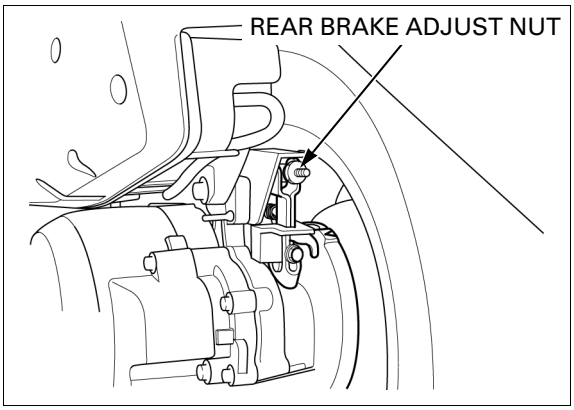
Install the under cover (page 2-7).



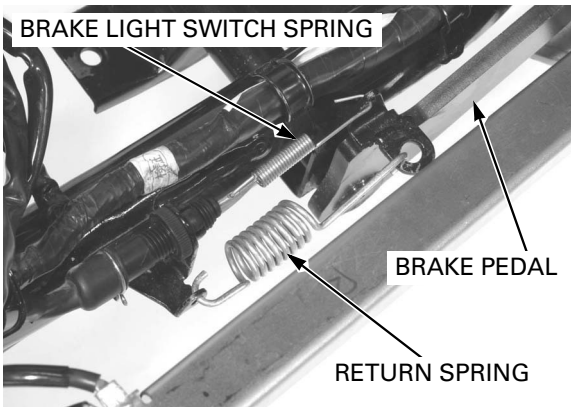
REAR BRAKE PEDAL (TYPE II, IV ONLY)

REMOVAL

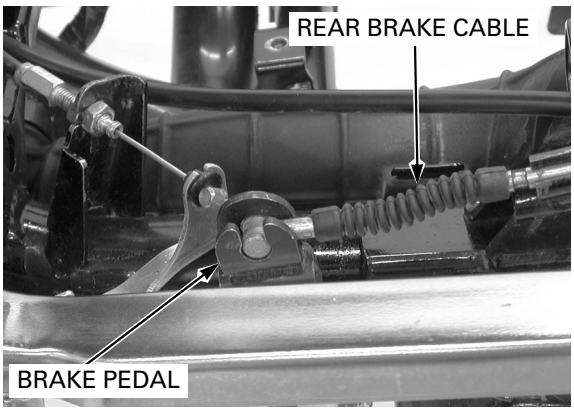
Remove the under cover (page 2-7).
Remove the rear brake adjust nut.



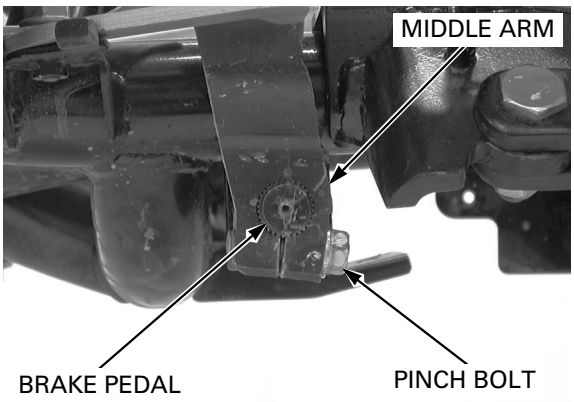
Remove the return spring and brake light switch spring from the rear brake pedal.



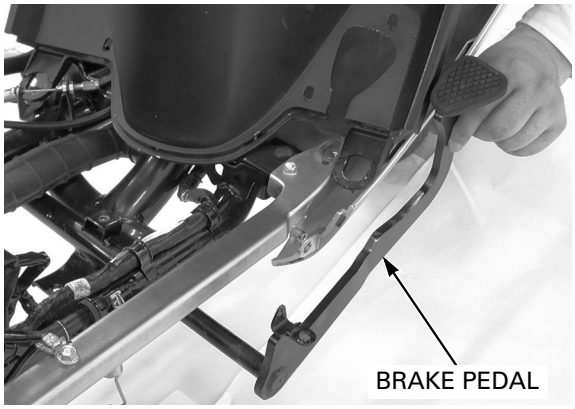
Remove the rear brake cable end from the rear brake pedal.



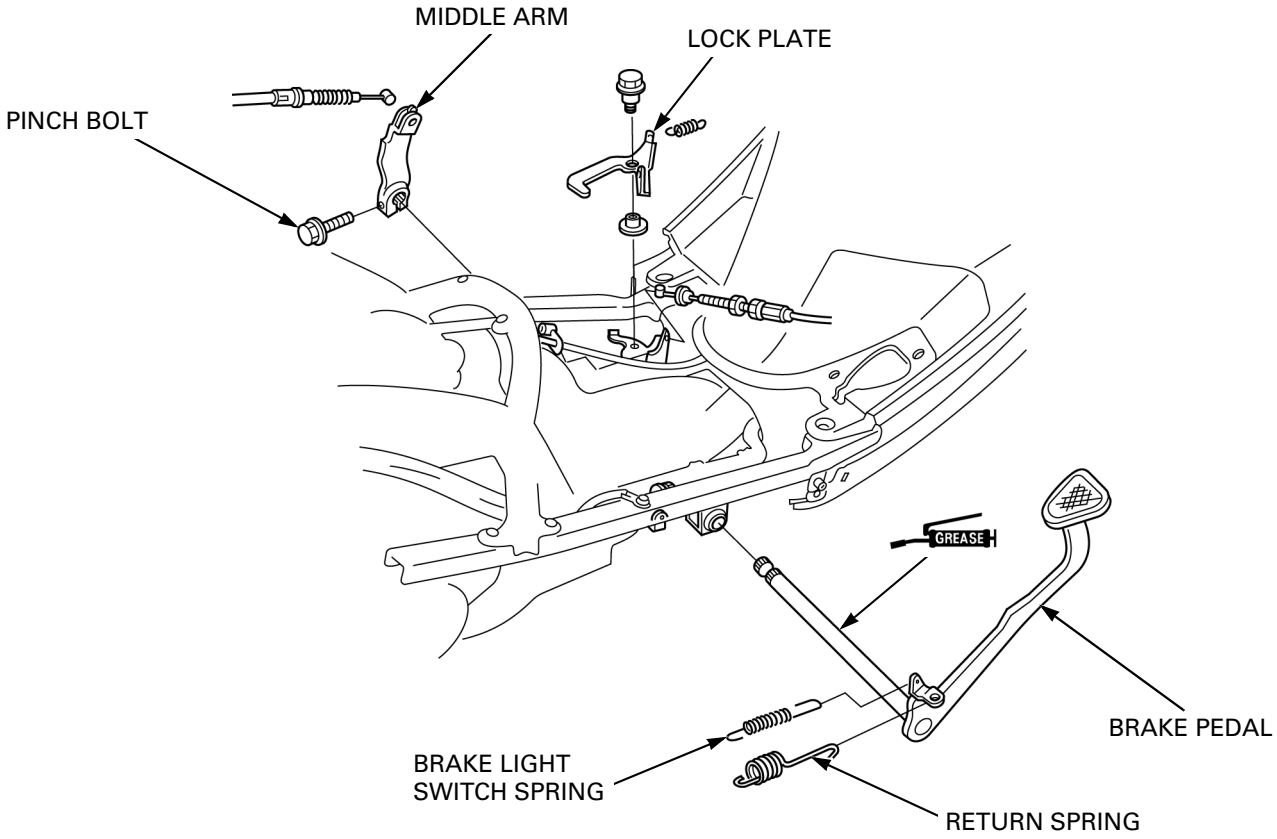
Remove the pinch bolt and middle arm from the rear brake pedal.



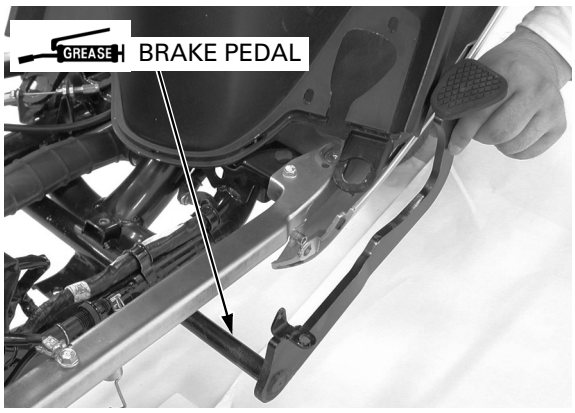
Remove the rear brake pedal from the frame.



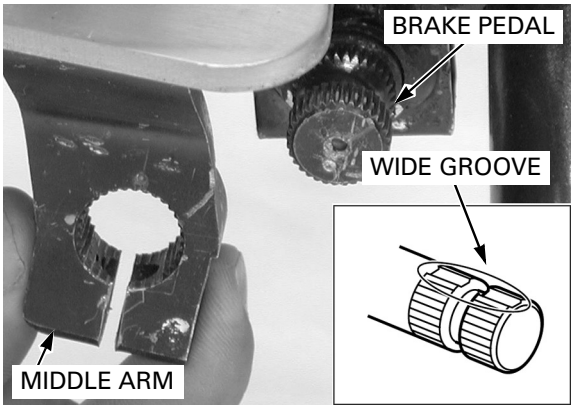
INSTALLATION



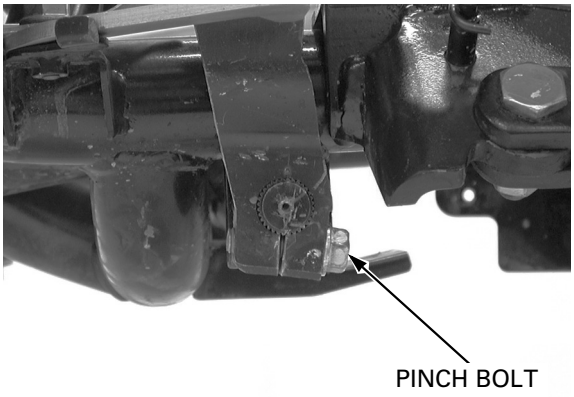
Apply grease to the brake pedal pivot and install the pedal.



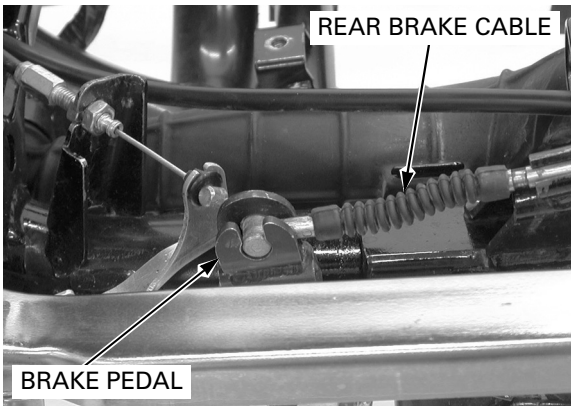
Install the middle arm onto the brake pedal by aligning its wide tooth with the wide groove on the brake pedal.



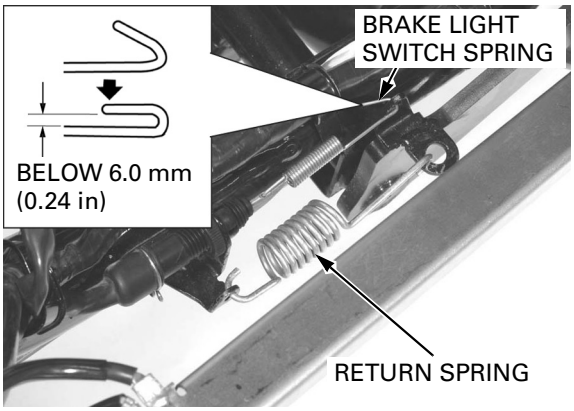
Install and tighten the middle arm pinch bolt.



Install the rear brake cable to the rear brake pedal.

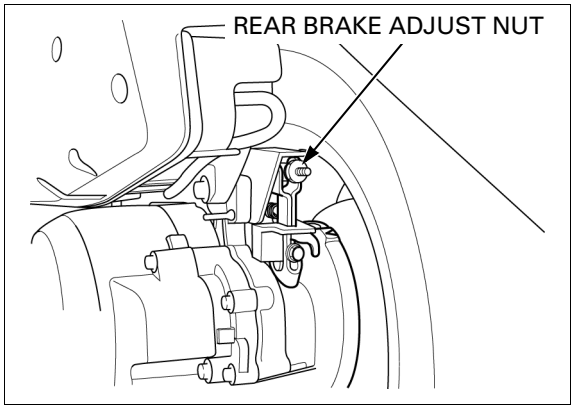


Install the return spring and brake light switch spring to the rear brake pedal.
Bend the brake light switch spring end until the clearance of the hook is below 6.0 mm (0.24 in).



Install the rear brake adjust nut.

Install the under cover (page 2-7).
Adjust the rear brake (page 3-18).



REAR SHOCK ABSORBER

REMOVAL

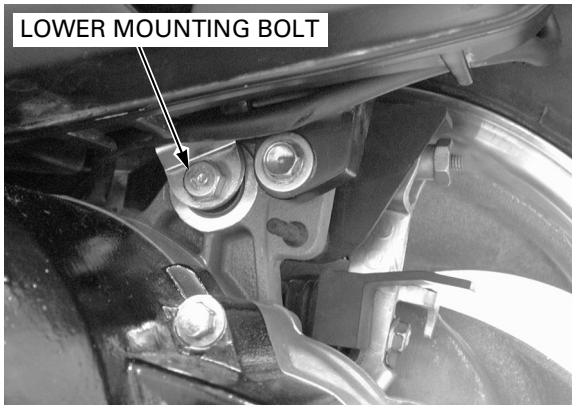
Support the scooter securely on its center stand.

Support the engine unit securely with a hoist or equivalent.

Remove the body cover (page 2-8).

Remove the air cleaner housing mounting bolts and raise the air cleaner housing.

Remove the rear shock absorber lower mounting bolt.



Remove the rear shock absorber upper mounting bolt and rear shock absorber.

INSPECTION

Check the dumper unit for leakage or other damage.
Check the upper joint bushing for wear or damage.

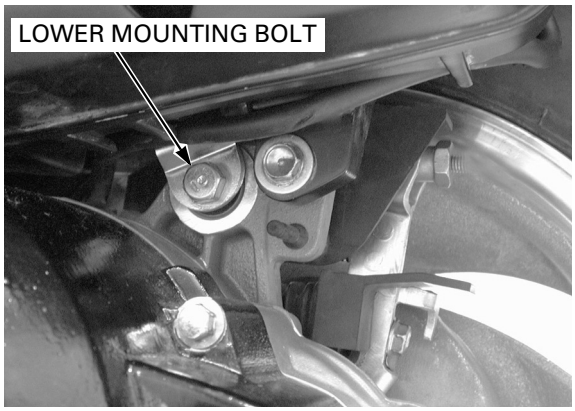
Replace the shock absorber assembly if necessary.

INSTALLATION

Install the rear shock absorber and rear shock absorber upper mounting bolt.

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

TORQUE:
UPPER: 39 N·m (4.0 kgf·m, 29 lbf·ft)
LOWER: 26 N·m (2.6 kgf·m, 19 lbf·ft)

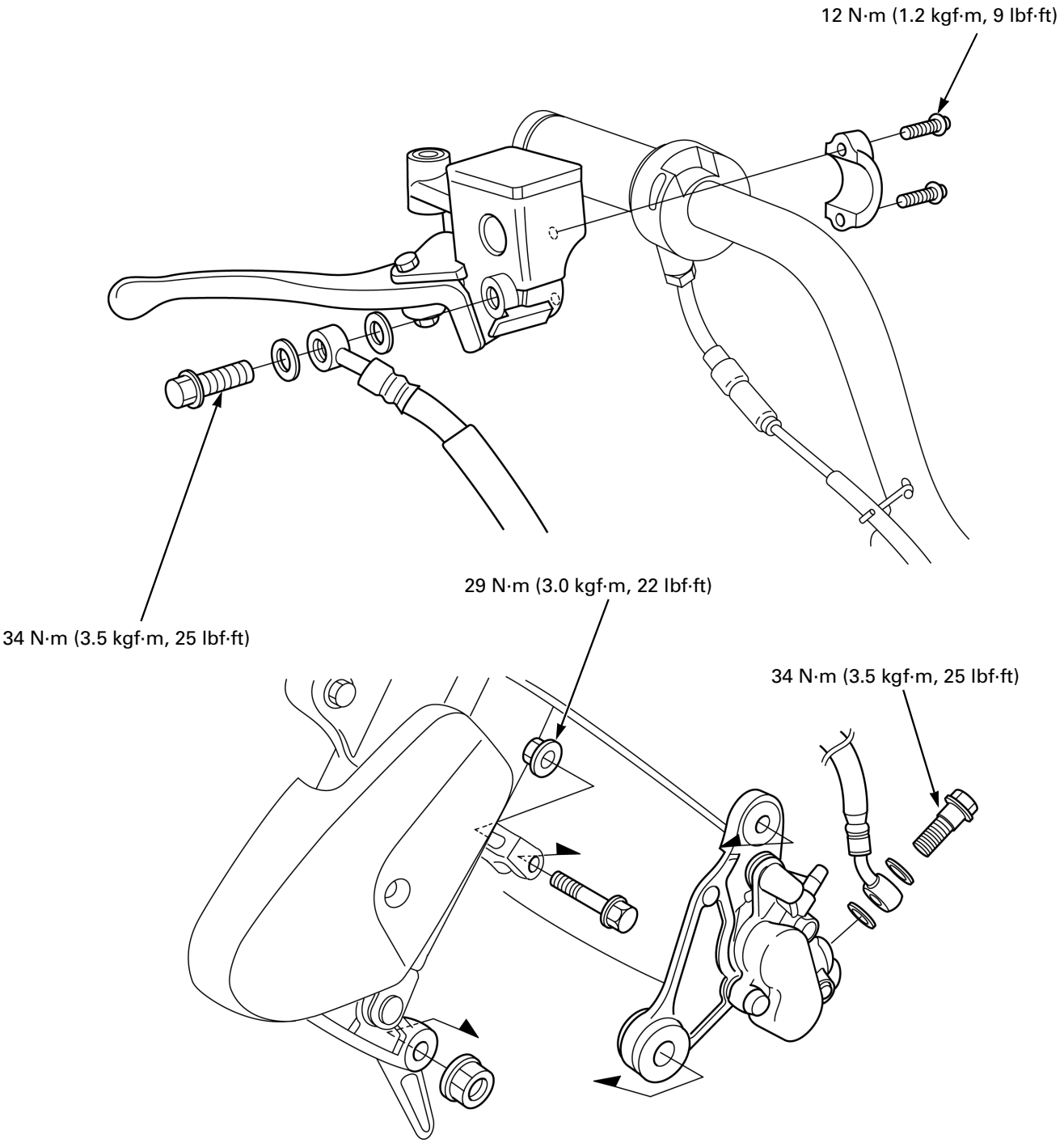


Install and tighten the air cleaner housing mounting bolts.

Install the body cover (page 2-8).

15. HYDRAULIC BRAKE

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

⚠ CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

NOTICE

Spilled brake fluid will severely damage instrument lenses and painted surfaces. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap; make sure the master cylinder reservoir is horizontal first.

- This section services hydraulic brake system.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Check the brake system by applying the brake lever after the air bleeding.
- Never allow contaminants (dirt, water, etc.) to get into an open reservoir.
- Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled.
- Always use fresh DOT 3 or DOT 4 brake fluid from a sealed container when servicing the system. Do not mix different types of fluid, they may not be compatible.
- Always check brake operation before riding the motorcycle.

SPECIFICATION

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Specified brake fluid	DOT 3 or DOT 4	–
Brake disc thickness	3.3 – 3.7 (0.13 – 0.15)	3.0 (0.12)
Brake disc warpage	–	0.2 (0.01)
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.	25.400 – 25.450 (1.0000 – 1.0020)	25.460 (1.0024)
Caliper piston O.D.	25.318 – 25.368 (0.9968 – 0.9987)	25.31 (0.996)

TORQUE VALUES

Brake caliper bleed valve	6 N·m (0.6 kgf·m, 4.3 lbf·ft)	
Brake master cylinder reservoir cap screw	2 N·m (0.2 kgf·m, 1.4 lbf·ft)	
Brake pad pin plug	3 N·m (0.3 kgf·m, 2.2 lbf·ft)	
Brake pad pin	18 N·m (1.8 kgf·m, 13 lbf·ft)	
Brake master cylinder holder bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Brake lever pivot bolt	1 N·m (0.1 kgf·m, 0.7 lbf·ft)	
Brake lever pivot nut	6 N·m (0.6 kgf·m, 4.3 lbf·ft)	
Front brake light switch screw	1 N·m (0.1 kgf·m, 0.7 lbf·ft)	
Front brake torque link nut (brake caliper side)	29 N·m (3.0 kgf·m, 22 lbf·ft)	U-nut
Brake hose oil bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)	

TROUBLESHOOTING

Brake lever soft or spongy
- Air in hydraulic system
- Leaking hydraulic system
- Contaminated brake pad/disc
- Worn caliper piston seals
- Worn master cylinder piston cups
- Worn brake pad/disc
- Contaminated caliper
- Contaminated master cylinder
- Caliper not sliding properly
- Low brake fluid level
- Clogged fluid passage
- Warped/deformed brake disc
- Sticking/worn caliper piston
- Sticking/worn master cylinder piston
- Bent brake lever

Brake lever hard
- Clogged/restricted brake system
- Sticking/worn caliper piston
- Caliper not sliding properly
- Worn caliper piston seal
- Sticking/worn master cylinder piston
- Bent brake lever

Brake drags
- Contaminated brake pad/disc
- Misaligned wheel
- Badly worn brake pad/disc
- Warped/deformed brake disc
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Sticking caliper piston

BRAKE FLUID REPLACEMENT/AIR BLEEDING

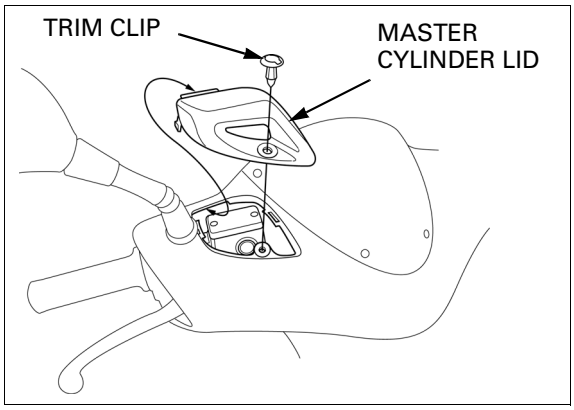
BRAKE FLUID DRAINING

Do not allow foreign material to enter the system when filling the reservoir. Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.

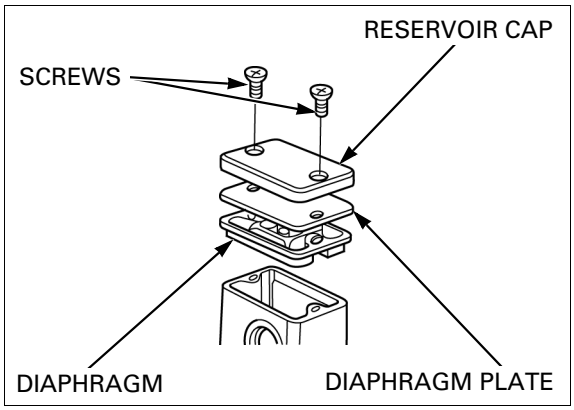
Turn the handlebar until the reservoir is parallel to the ground before removing the reservoir cap.

Remove the trim clip (page 2-4).

Remove the master cylinder lid.

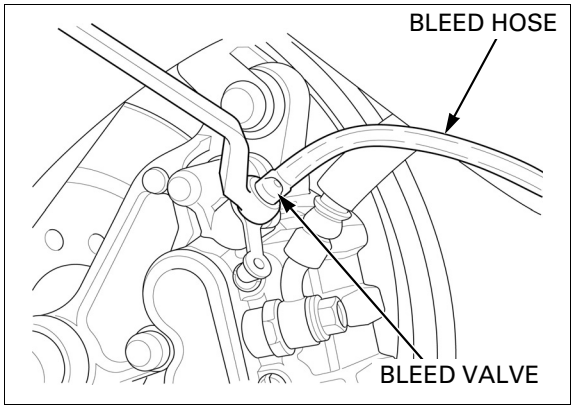


Remove the screws, reservoir cap, diaphragm plate and diaphragm.



Connect a bleed hose to the caliper bleed valve.

Loosen the bleed valve and pump the brake lever until no more fluid flows out of the bleed valve.

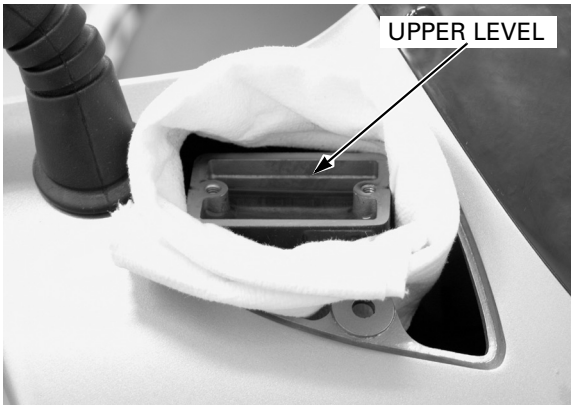


BRAKE FLUID FILLING/AIR BLEEDING

Do not mix different types of fluid. They are not compatible.

Fill the master cylinder reservoir with DOT 3 or DOT 4 brake fluid from the sealed container to the upper level.

- Check the fluid level often while bleeding the brake to prevent air from being pumped into the system.



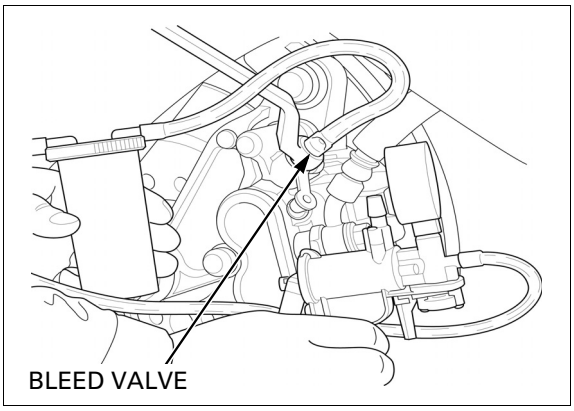
If air enters the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Connect a commercially available brake bleeder to the bleed valve.
Operate the brake bleeder and loosen the bleed valve.

Perform the bleeding procedure until the system is completely flushed/bled.
Close the bleed valve and operate the brake lever. If it still feels spongy, bleed the system again.

After bleeding the system completely, tighten the bleed valve to the specified torque.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)



If the brake bleeder is not available, perform the following procedure.

Pump up the system pressure with the brake lever until the lever resistance is felt.

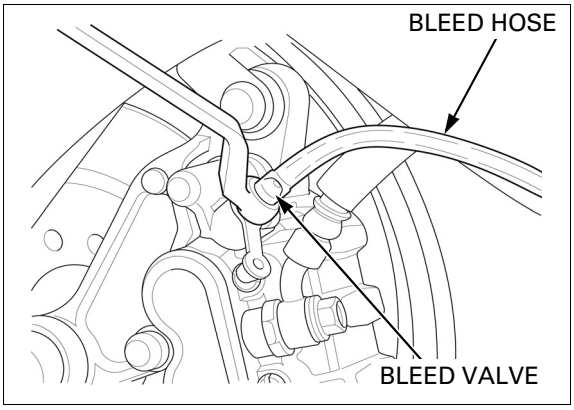
Do not release the brake lever until the bleed valve has been closed.

Connect a bleed hose to the bleed valve and bleed the system as follows:

1. Squeeze the brake lever all the way and loosen the bleed valve 1/2 of a turn. Wait several seconds and then close the bleed valve.
2. Release the brake lever slowly and wait several seconds after it reaches the end of its travel.
3. Repeat the steps 1 and 2 until there are no air bubbles in the bleed hose.

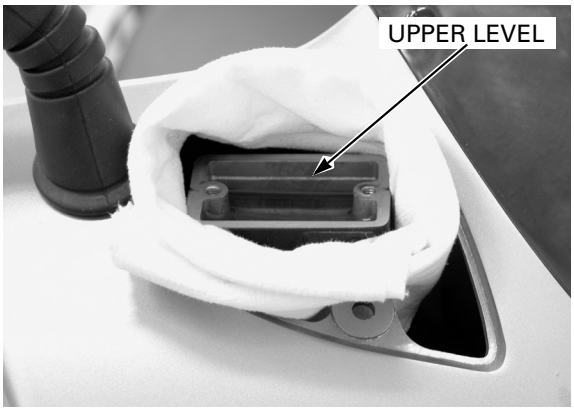
After bleeding the system completely, tighten the bleed valve.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)



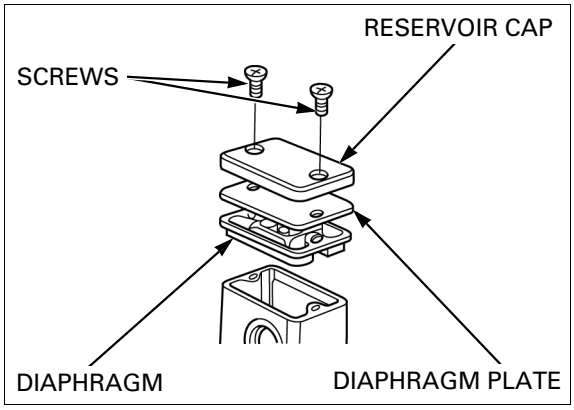
Do not mix different types of fluid. They are not compatible.

Fill the reservoir to the upper level with DOT 3 or DOT 4 brake fluid from a sealed container.



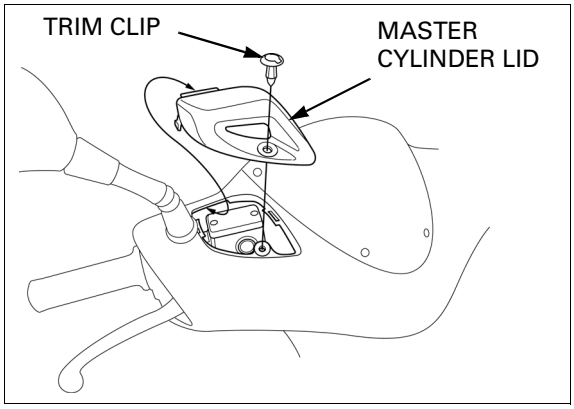
Install the diaphragm, diaphragm plate and reservoir cap, then tighten the screws to the specified torque.

TORQUE: 2 N·m (0.2 kgf·m, 1.4 lbf·ft)



Install the master cylinder lid.

Install the trim clip (page 2-4).



BRAKE PAD/DISC

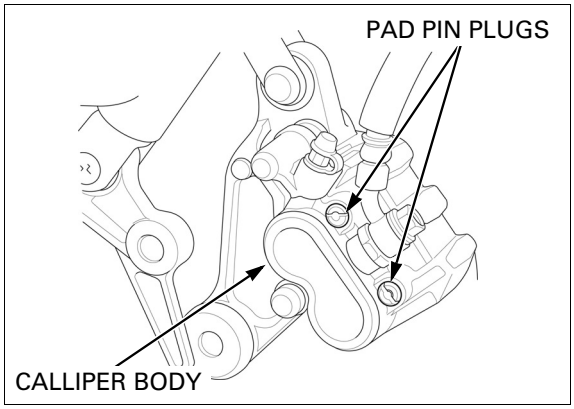
BRAKE PAD REPLACEMENT

Check the fluid level in the master cylinder reservoir as this operation causes the fluid level to rise.

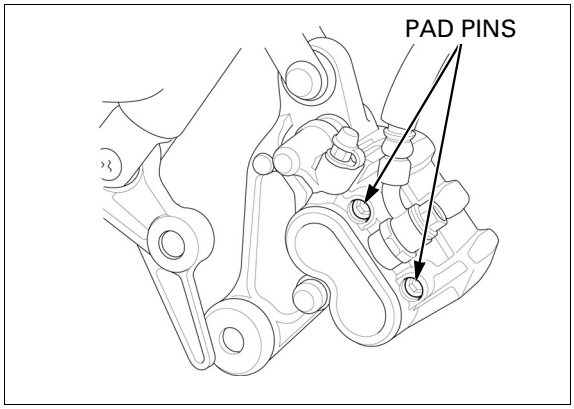
Push the caliper pistons all the way in by pushing the caliper body inward to allow installation of new brake pads.

Remove the front wheel (page 13-6).

Remove the pad pin plugs.



Remove the pad pins.

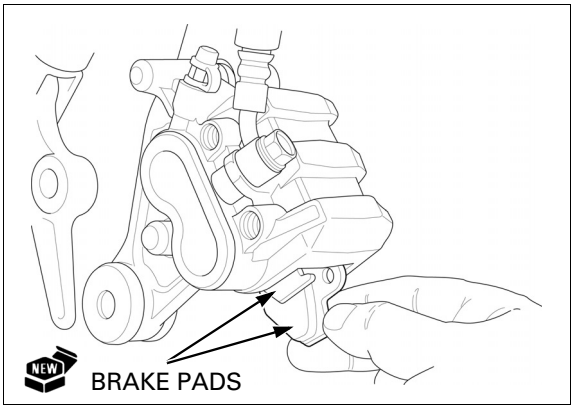


Remove the brake pads.

Make sure the pad spring is installed in position.

Always replace the brake pads in pairs to ensure even disc pressure.

Install the new brake pads so that their ends are set in the pad retainer on the caliper bracket properly.



Install the pad pins by pushing the pads against the pad spring to align the pad pin holes of the pads and caliper.
Tighten the pad pins to specified torque.

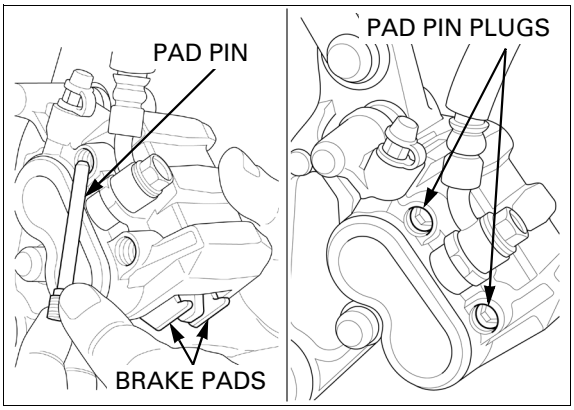
TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Install the pad pin plugs and tighten them to specified torque.

TORQUE: 3 N·m (0.3 kgf·m, 2.2 lbf·ft)

Install the front wheel (page 13-10).

Operate the brake lever to seat the caliper pistons against the pads.



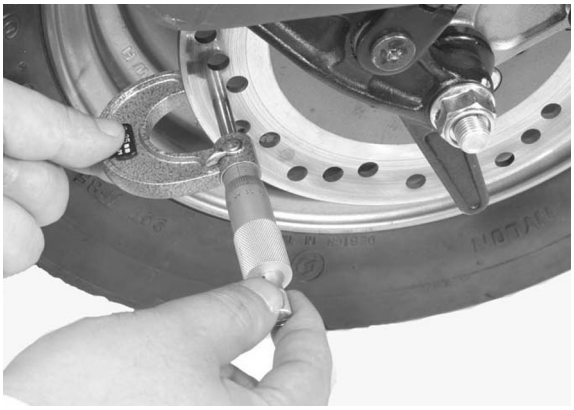
BRAKE DISC INSPECTION

Visually inspect the brake disc for damage or crack.

Measure the brake disc thickness at several points.

SERVICE LIMIT: 3.0 mm (0.12 in)

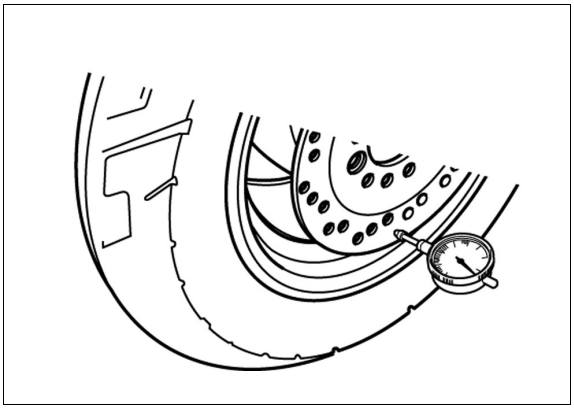
Replace the brake disc if the smallest measurement is less than service limit.



Check the brake disc for warpage.

SERVICE LIMIT: 0.2 mm (0.01 in)

Check the wheel bearings for excessive play, if the warpage exceeds the service limit.
Replace the brake disc if the wheel bearings are normal.



MASTER CYLINDER

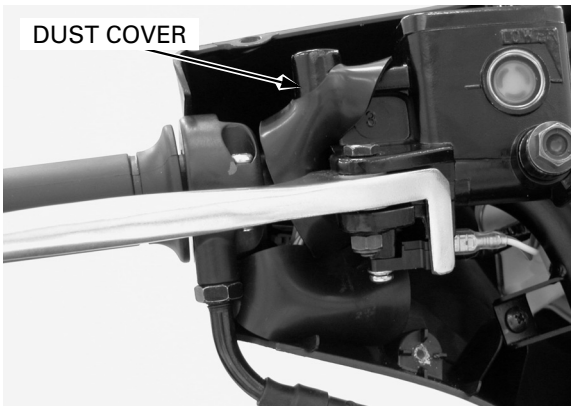
REMOVAL

Drain the brake fluid from the hydraulic system (page 15-5).

Remove the following:

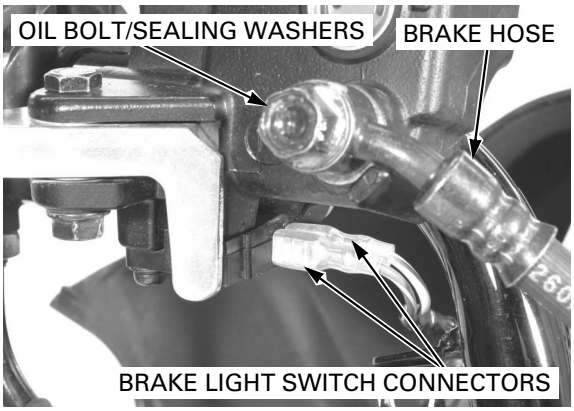
– Front handlebar cover (page 2-10)
– Front cover (page 2-11)
– Rear handlebar cover (page 2-10)

Remove the dust cover from the master cylinder.

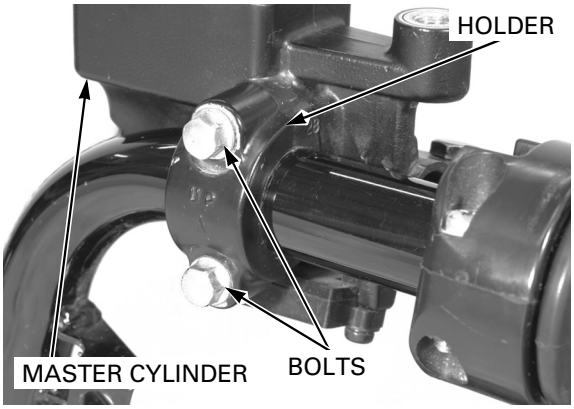


Disconnect the brake light switch connectors.

Remove the brake hose by removing the oil bolt and sealing washers.



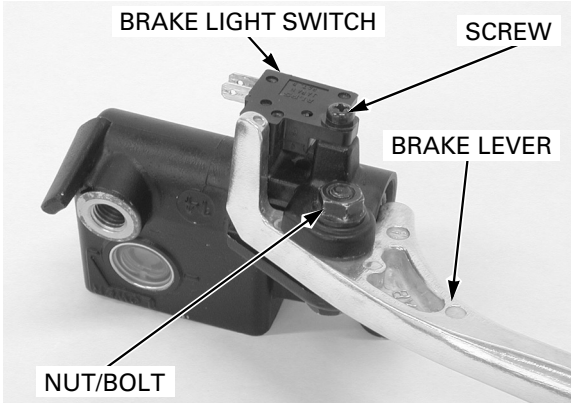
Remove the master cylinder holder bolts, holder and master cylinder.



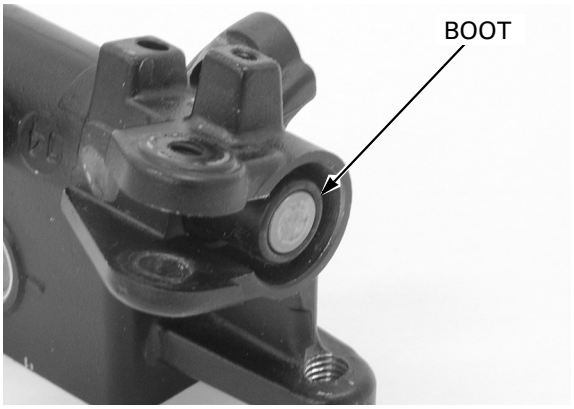
DISASSEMBLY

Remove the brake lever pivot nut, bolt and brake lever.

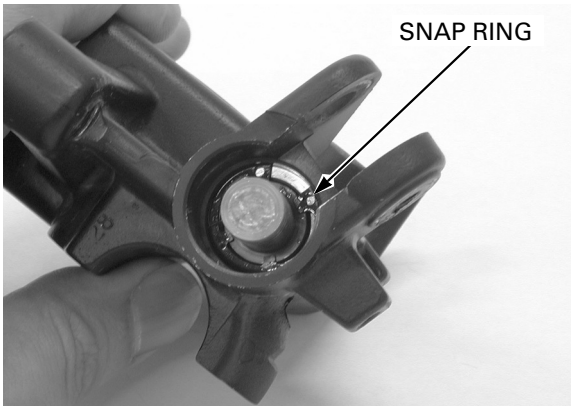
Remove the screw and brake light switch.



Remove the boot from the master piston.

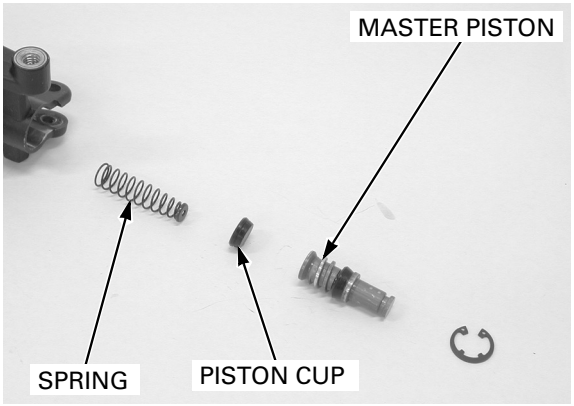


Remove the snap ring from the master piston.



Remove the master piston, piston cup and spring.

Clean the master cylinder, reservoir and master piston in clean brake fluid.



INSPECTION

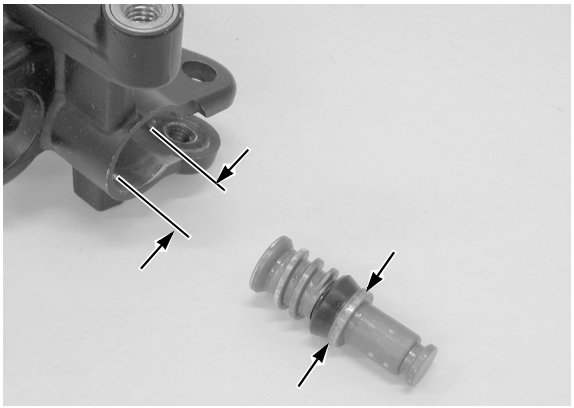
Check the master piston for scoring, scratches or damage.
Check the piston cups for wear, deterioration or damage.
Check the master cylinder for scoring, scratches or damage.

Measure the master cylinder I.D.

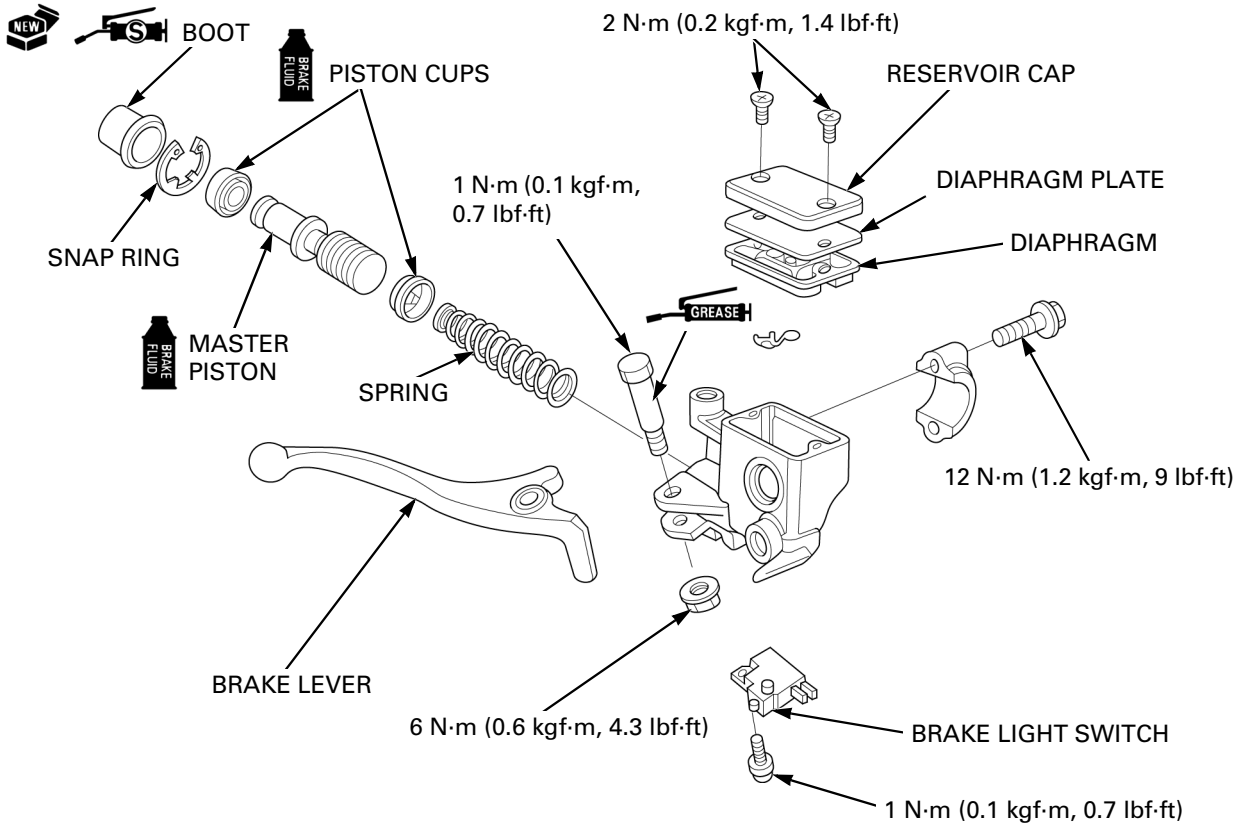
SERVICE LIMIT: 14.055 mm (0.5533 in)

Measure the master piston O.D.

SERVICE LIMIT: 13.945 mm (0.5490 in)



ASSEMBLY



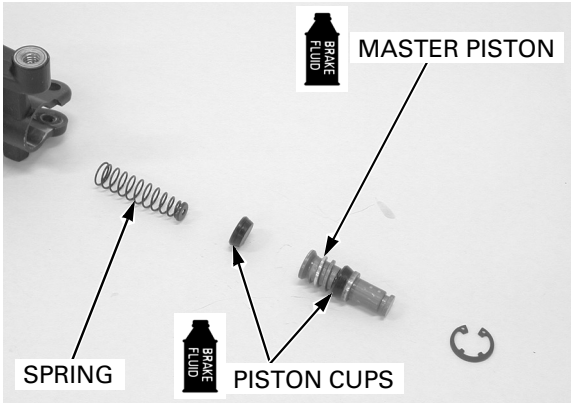
Keep the piston, cups, spring, snap ring and boot as a set; do not substitute individual part.

Coat the master piston and piston cups with clean DOT 3 or DOT 4 brake fluid.

Install the spring onto the piston cup.

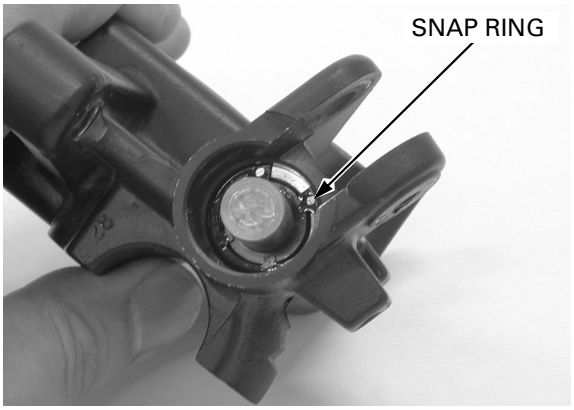
Do not allow the piston cup lips to turn inside out.

Install the spring/piston cup, master piston into the master cylinder.

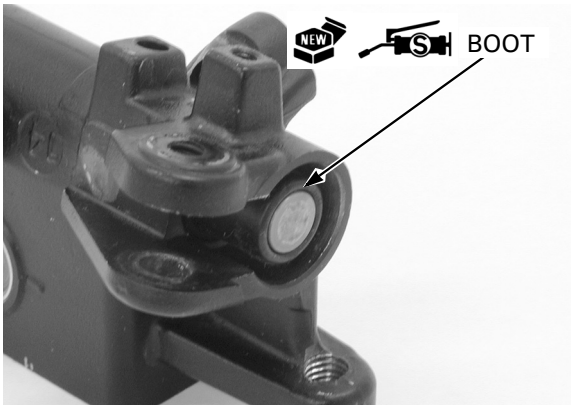


Be certain the snap ring is firmly seated in the groove.

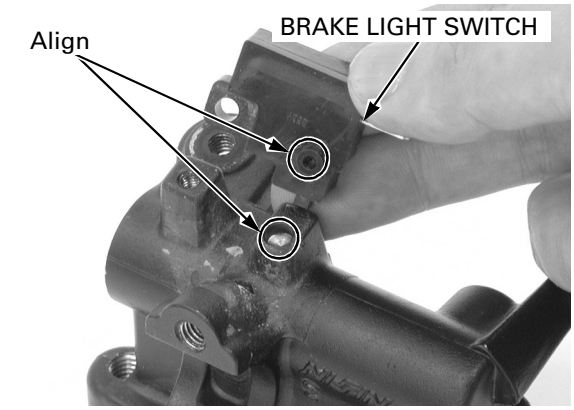
Install the snap ring into the groove in the master cylinder.



Apply silicone grease to a new boot inside.
Install the boot onto the master piston.
Apply silicone grease to the brake lever-to-master piston contact area.



Install the brake light switch to the master cylinder, aligning the brake light switch boss and master cylinder hole.



Install the brake light switch screw and tighten it.

TORQUE: 1 N·m (0.1 kgf·m, 0.7 lbf·ft)

Apply grease to the brake lever pivot bolt rotating surface.

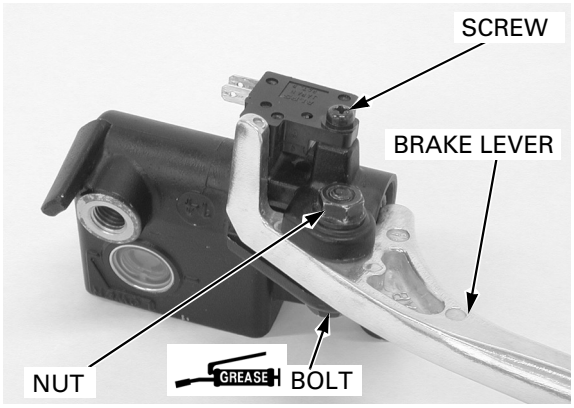
Install the brake lever to the master cylinder.

Install the pivot bolt and tighten it.

TORQUE: 1 N·m (0.1 kgf·m, 0.7 lbf·ft)

Install the pivot nut and tighten it.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)

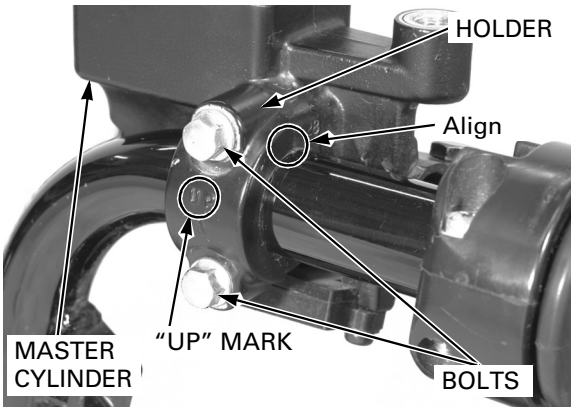


INSTALLATION

Install the master cylinder and the holder with the "UP" mark facing up.

Align the mating surface of the master cylinder with the punch mark on the handlebar, and 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)



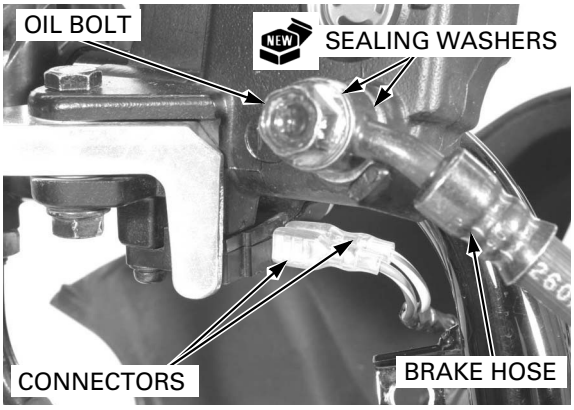
Set the brake hose joint between the stoppers on the master cylinder.

Connect the brake hose with the oil bolt and new sealing washers, and tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Connect the brake switch connectors.

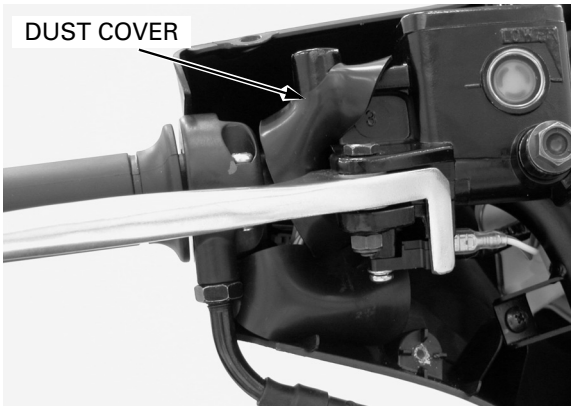
Fill the brake fluid and air bleed the hydraulic system (page 15-5).



Install the dust cover to the master cylinder.

Install the following:

– Rear handlebar cover (page 2-10)
– Front cover (page 2-11)
– Front handlebar cover (page 2-10)



BRAKE CALIPER

REMOVAL

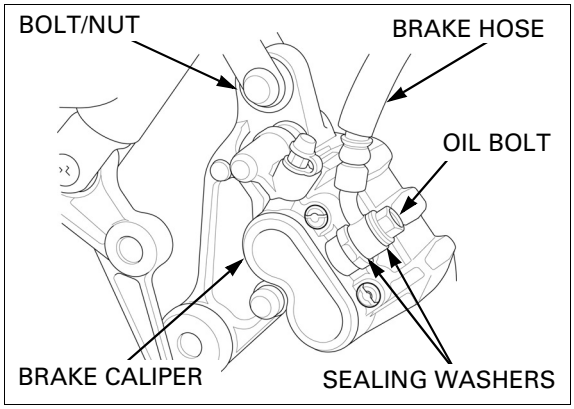
Drain the brake fluid from the hydraulic system (page 15-5).

Remove the front wheel (page 13-6).

Disconnect the brake hose from the brake caliper by removing the oil bolt and sealing washers.

Remove the brake pads (page 15-7).

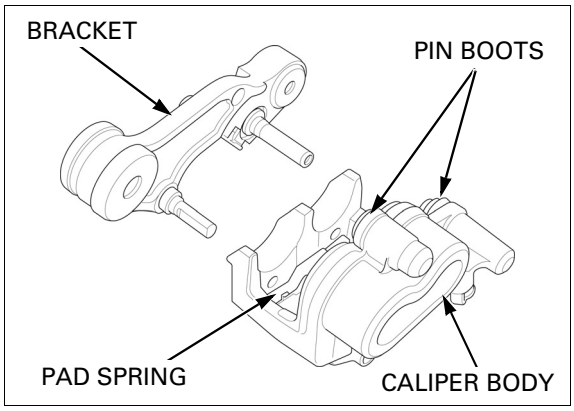
Remove the torque link bolt, nut and front brake caliper.



DISASSEMBLY

Remove the following:

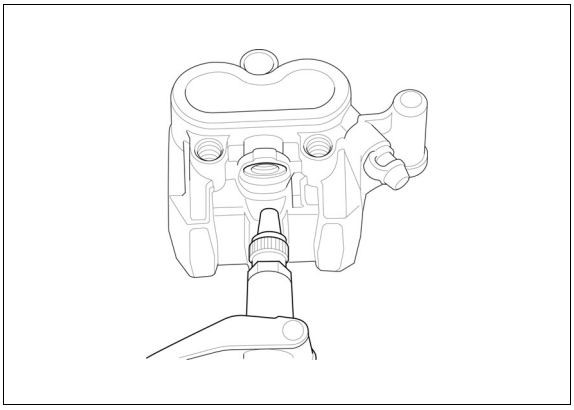
– Caliper bracket
– Pin boots
– Pad spring



Place a shop towel over the piston.

Do not use high pressure air or bring the nozzle too close to the inlet.

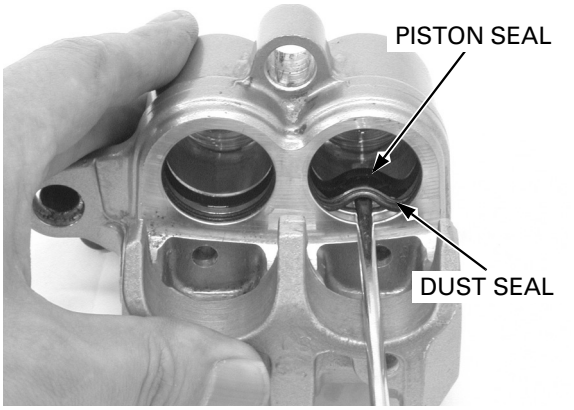
Position the caliper body with the piston down and apply small squirts of air pressure to the fluid inlet to remove the piston.



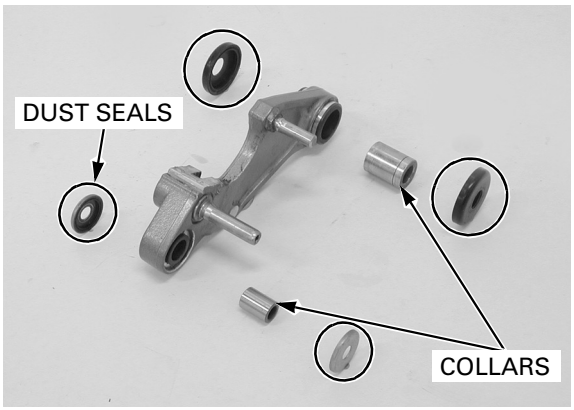
Be careful not to damage the piston sliding surface.

Push the dust seal and piston seal in and lift them out.

Clean the seal grooves, caliper cylinder and piston with clean brake fluid.



Remove the dust seals and collars from the bracket. Check the collars and bushings for wear or damage.



INSPECTION

Check the caliper cylinder for scoring, scratches or damage.

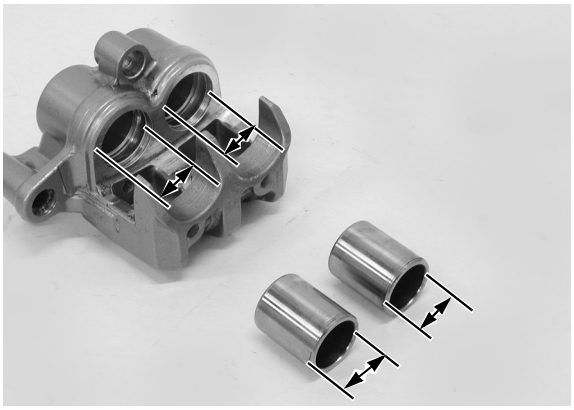
Measure the caliper cylinder I.D.

SERVICE LIMIT: 25.460 mm (1.0024 in)

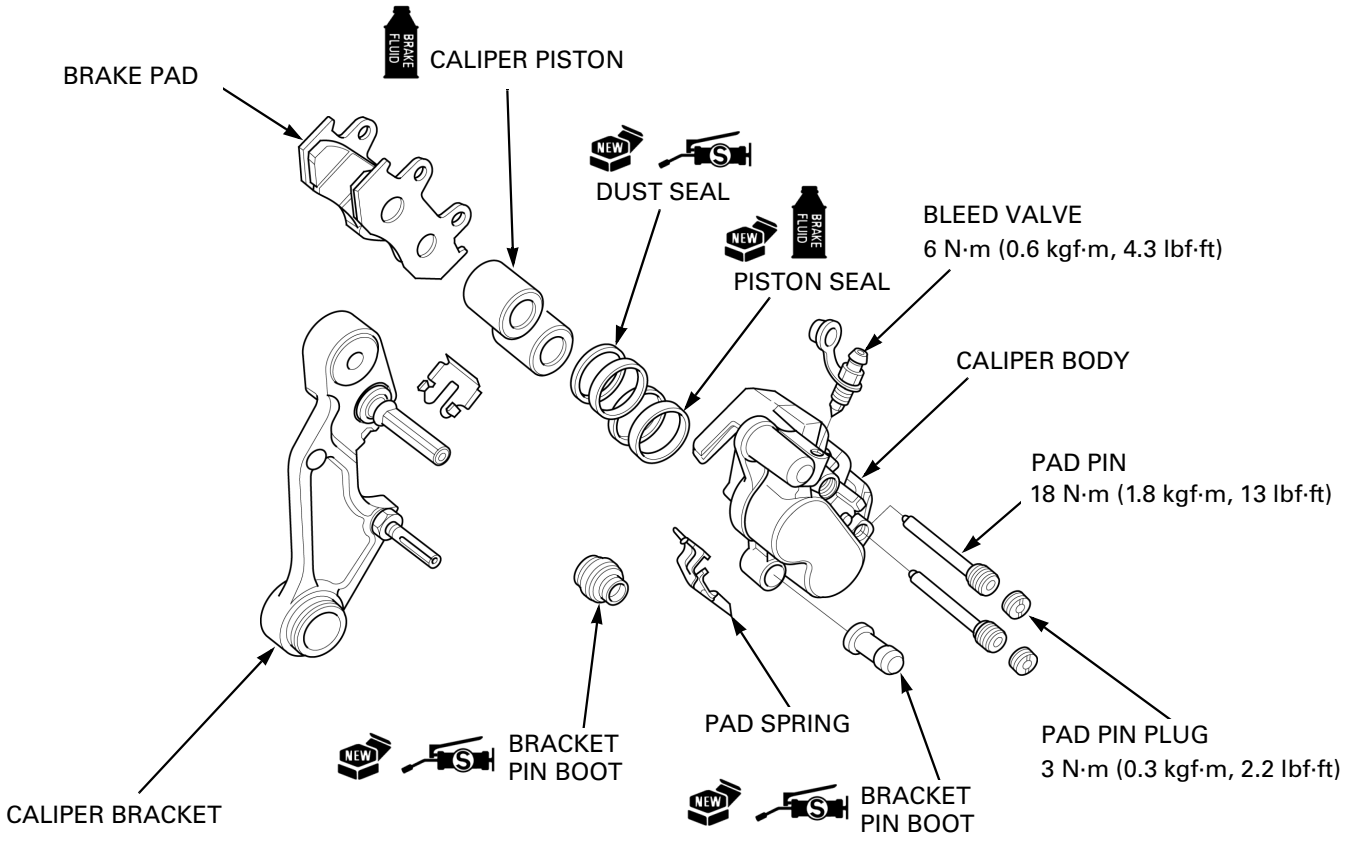
Check the caliper piston for scoring, scratches or damage.

Measure the caliper piston O.D.

SERVICE LIMIT: 25.31 mm (0.996 in)



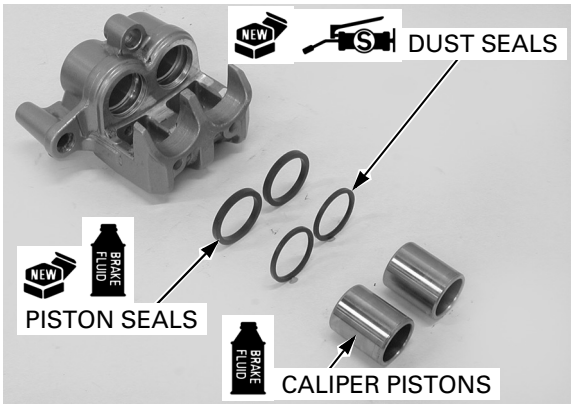
ASSEMBLY



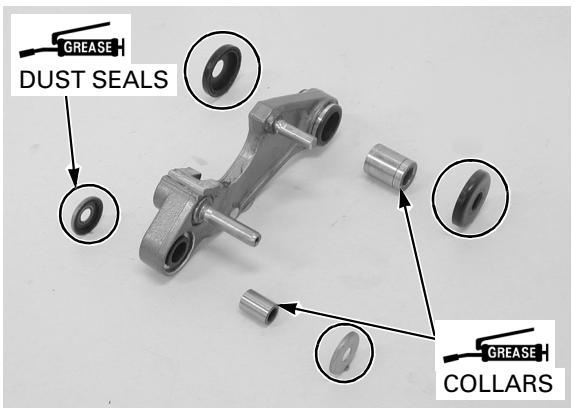
Coat a new piston seals with clean DOT 3 or DOT 4 brake fluid.
Coat a new dust seals with silicone grease.

Install the piston and dust seals into the seal grooves in the caliper cylinder.

Coat the caliper piston with clean DOT 3 or DOT 4 brake fluid and install it into the caliper cylinder with the opening side toward the pad.



Apply silicone grease to the collars.
Apply grease to the dust seal lips.
Install the pad retainer collars and dust seals to the bracket.

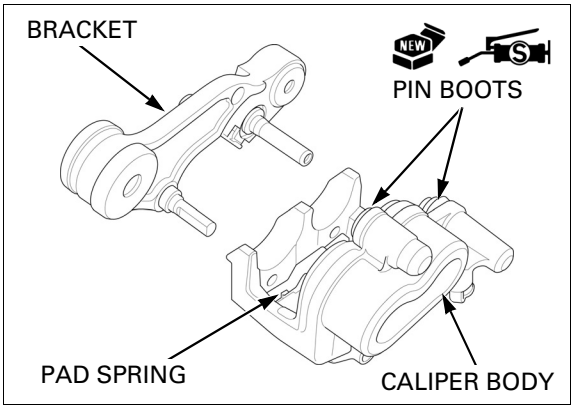


Install the pad spring onto the caliper body.

Apply silicone grease to the inside of new pin boots, and install them into the caliper body and bracket.

Install the pad spring onto the caliper body.

Install the caliper bracket over the caliper body.



INSTALLATION

Install the brake caliper to the torque link and set the bolt.
Install and tighten the torque link nut to the specified torque.

TORQUE: 29 N·m (3.0 kgf·m, 22 lbf·ft)

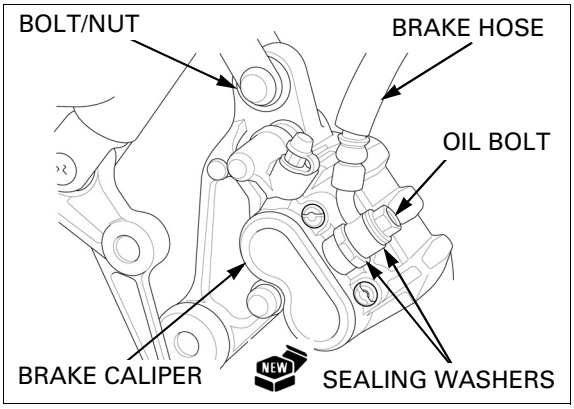
Connect the brake hose to the brake caliper with the oil bolt and new sealing washers.
Set the hose joint onto the stoppers and tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill the brake fluid and bleed the hydraulic system (page 15-5).

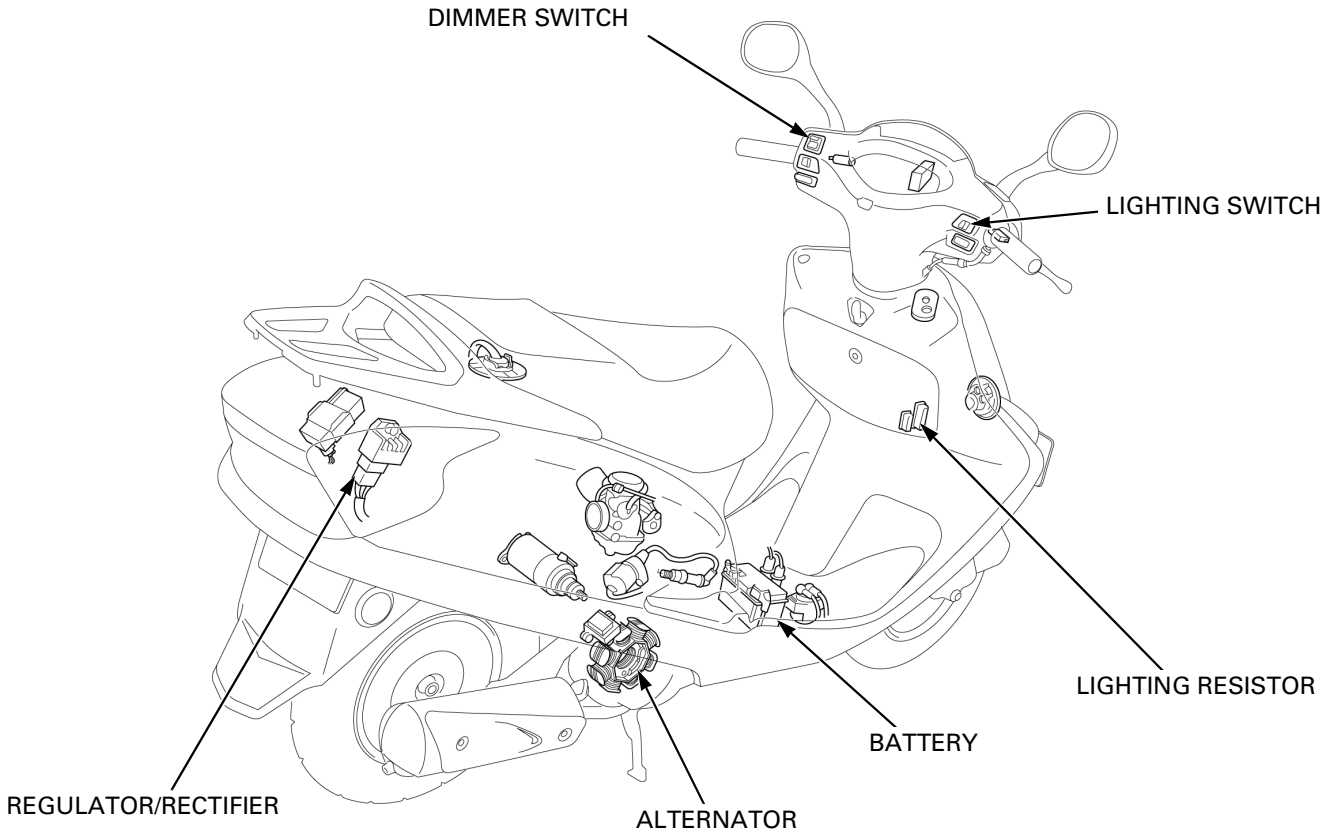
Install the following:

– Brake pads (page 15-8)
– Front wheel (page 13-10)

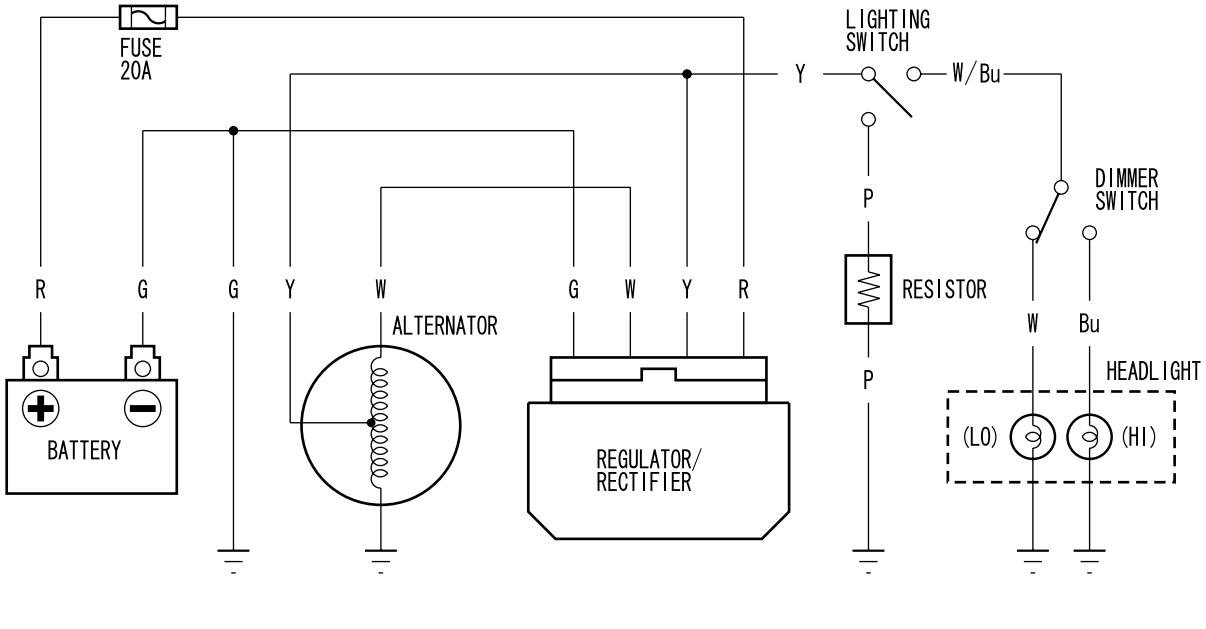


16. BATTERY/CHARGING SYSTEM

SYSTEM LOCATION



SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

⚠WARNING

- The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.
- The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.
  – If electrolyte gets on your skin, flush with water.
  – If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.
- Electrolyte is poisonous.
  – If swallowed, drink large quantities of water or milk and call your local Poison Control Center or a call a physician immediately.

NOTICE

- *Always turn off the ignition switch before disconnecting any electrical component.*
- *Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is ON and current is present.*

- For extended storage, remove the battery, give it a full charge, and store it in a cool, dry space. For maximum service life, charge the stored battery every two weeks.
- For a battery remaining in a stored motorcycle, disconnect the negative battery cable from the battery terminal.
- The maintenance free battery must be replaced when it reaches the end of its service life.
- The battery can be damaged of overcharged or undercharged, or of left to discharge for long period. These same conditions contribute to shortening the "life span" of the battery. Even under normal use, the performance of the battery deteriorates after 2–3 years.
- Battery voltage may recover after battery charging, but under heavy load, battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected as the problem. Battery 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 scooter.
- The battery will self-discharge when the motorcycle is not in use. For this reason, charge the battery every two weeks to prevent sulfation from occurring.
- When checking the charging system, always follow the steps in the troubleshooting flow chart (page 16-5).
- For battery charging, do not exceed the charging current and time specified on the battery. Use of excessive current or charging time may damage the battery.
- Refer to page 11-5 for alternator removal and disassembly.

BATTERY TESTING

Refer to the instruction of the Operation Manual for the recommended battery tester. 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 or BATTERY MATE or equivalent

SPECIFICATIONS

ITEM			SPECIFICATION
Battery	Capacity		12 V – 6 Ah
	Current leakage		0.5 mA max.
	Voltage	Fully charged	Above 12.8 V
		Needs charging	Below 12.3 V
	Charging current	Normal	0.6 A/5 – 10 h
		Quick	3.0 A/1.0 h
Alternator	Capacity		0.125 kW/5,000 min^{-1} (rpm)
	Charging coil resistance		0.2 – 1.0 Ω (20°C/68°F)
	Lighting coil resistance		0.1 – 0.8 Ω (20°C/68°F)
Regulator/rectifier regulated voltage (Lighting output)			12.6 – 13.6 V/5,000 min^{-1} (rpm)

TROUBLESHOOTING

BATTERY IS DAMAGED OR WEAK

1. BATTERY TEST

Remove the battery (page 16-7).

Check the battery condition using the recommended battery tester.

RECOMMENDED BATTERY TESTER:
BM210 or BATTERY MATE or equivalent

Is the battery good condition?

NO – Faulty battery.

YES – GO TO STEP 2.

2. CURRENT LEAKAGE TEST

Install the battery (page 16-7).

Check the battery current leakage test (Leak test; page 16-8).

Is the current leakage below 0.5 mA?

YES – GO TO STEP 4.

NO – GO TO STEP 3.

3. CURRENT LEAKAGE TEST WITHOUT REGULATOR/RECTIFIER CONNECTOR

Disconnect the regulator/rectifier 4P connector and recheck the battery current leakage.

Is the current leakage below 0.5 mA?

YES – Faulty regulator/rectifier.

NO – • Shorted wire harness.
• Faulty ignition switch.

4. CHARGING VOLTAGE INSPECTION

Measure and record the battery voltage using a digital multimeter (page 16-7).

Start the engine.

Measure the charging voltage (page 16-9).

Compare the measurement to result of the following calculation.

Standard: Measured battery voltage V < Measured Charging voltage V < 15.5 V at 5,000 min^{-1} (rpm)

Is the measured charging voltage within the standard voltage?

YES – Faulty battery.

NO – GO TO STEP 5.

5. ALTERNATOR CHARGING COIL INSPECTION

Check the alternator charging coil (page 16-10).

Is the alternator charging coil resistance within 0.2 – 1.0 Ω (20°C/68°F)

NO – Faulty charging coil.

YES – GO TO STEP 6.

6. REGULATOR/RECTIFIER SYSTEM INSPECTION

Check the voltage and resistance at the regulator/rectifier connector (page 16-9).

Are the results of checked voltage and resistance correct?

YES – Faulty regulator/rectifier.

NO – • Open circuit in related wire.
• Loose or poor contacts of related terminal.
• Shorted wire harness.

HEADLIGHT DOES NOT COME ON OR IS WEAK

1. STANDARD INSPECTION

Check the following:
– Battery condition
– Burned out the each bulb or non-specified wattage
– Burned fuse
– Loose connector
– Lighting switch (page 19-10)
– Dimmer switch (page 19-11)

Are the above items in good condition?

NO – Replace or repair the malfunction part(s)

YES – GO TO STEP 2.

2. LIGHTING OUTPUT REGULATED VOLTAGE INSPECTION

Measure the lighting voltage with the headlight connector connected (page 16-9).
REGULATED VOLTAGE: 12.6 – 13.6 V/5,000 min^{-1} (rpm)

Is the voltage within 12.6 – 13.6 V/5,000 min^{-1} (rpm)?

YES – Loose or poor contacts of the headlight connector

NO – GO TO STEP 3.

3. LIGHTING COIL INSPECTION

Measure the lighting coil resistance of the alternator side connector and ground (page 16-10).
STANDARD: 0.1 – 0.8 Ω (20°C/68°F)

Is the lighting coil resistance within 0.1 – 0.8 Ω (20°C/68°F)?

NO – Faulty lighting coil

YES – GO TO STEP 4.

4. REGULATOR/RECTIFIER SYSTEM INSPECTION

Check the voltage and resistance at the regulator/rectifier 4P connector (page 16-9).

Are the measurements correct?

YES – Faulty regulator/rectifier

NO – • Open or short circuit in related wire
• Loose or poor contacts of related terminal

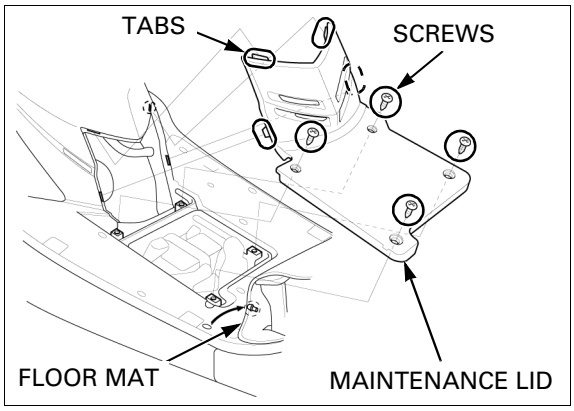
BATTERY

REMOVAL/INSTALLATION

Always turn the ignition switch "OFF" before removing the battery.

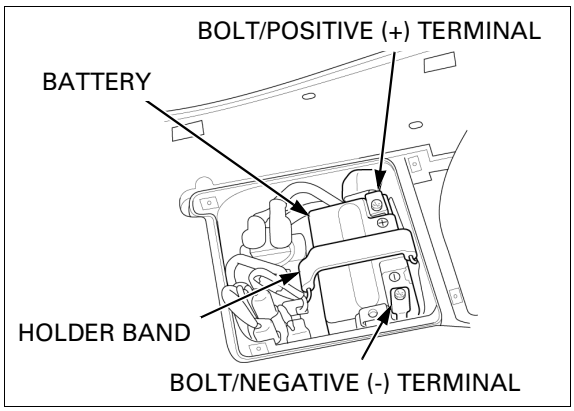
Pull the floor mat off.

Remove the four screws and maintenance lid by releasing the tabs.



Disconnect the negative terminal first and then the positive terminal.

Remove the bolt and disconnect the negative (–) cable.
Remove the bolt and disconnect the positive (+) cable.
Release the battery holder band and remove the battery.



Connect the positive terminal first and then the negative terminal.

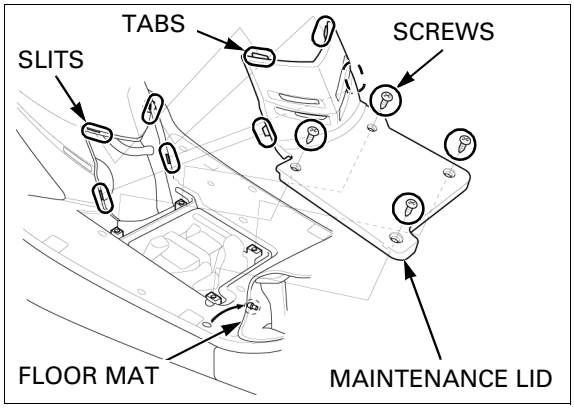
Install the battery in the reverse order of removal.

After installing the battery, coat the terminals with clean grease.

Install the maintenance lid by aligning the tabs of the lid with the slits of the body cover.

Install and tighten the four screws.

Install the floor mat.



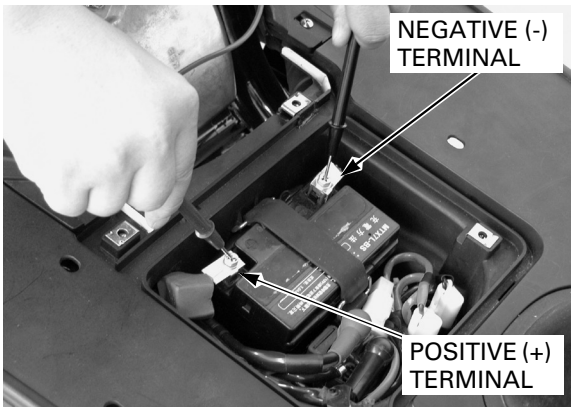
VOLTAGE INSPECTION

Remove the maintenance lid (page 16-7).

Measure the battery voltage using a digital multimeter.

VOLTAGE:
Fully charged: Above 12.8 V
Needs charging: Below 12.3 V

If the battery voltage is below 12.3 V, charge the battery (page 16-8).



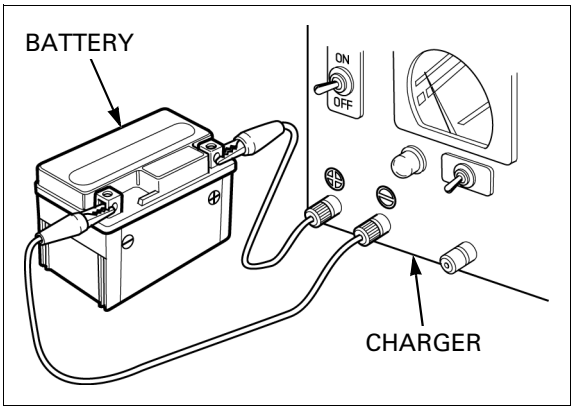
BATTERY CHARGING

Remove the battery (page 16-7).

Turn power ON/OFF at the charger, not at the battery terminal.

Connect the charger positive (+) cable to the battery positive (+) terminal.
Connect the charger negative (–) cable to the battery negative (–) terminal.

- Quick-charging should only be done in an emergency; slow charging is preferred.
- 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.



CHARGING CURRENT/TIME:

Standard:	**0.6 A/5 – 10 h**
Quick:	**3.0 A/1.0 h**

CHARGING SYSTEM INSPECTION

CURRENT LEAKAGE INSPECTION

Remove the maintenance lid (page 16-7).

Turn the ignition switch "OFF" and disconnect the negative (–) battery cable from the battery.

Connect the ammeter (+) probe to the battery (–) cable and the ammeter (–) probe to the battery (–) terminal.

With the ignition switch "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 "ON". A sudden surge of current may blow out the fuse in the tester.

SPECIFIED CURRENT LEAKAGE: 0.5 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

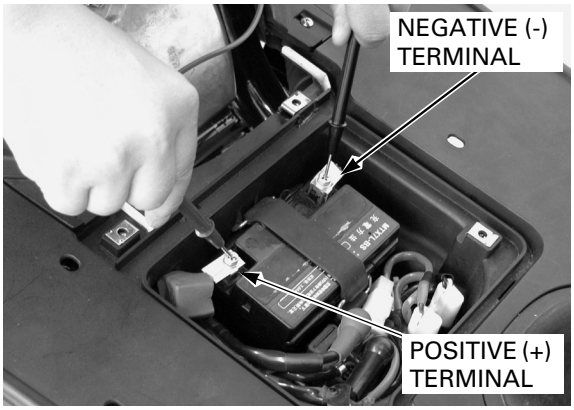
Be sure the battery is in good condition before performing this test.

Do not disconnect the battery or any cable in the charging system with out first switching off the ignition switch. Failure to follow this precaution can damage the tester or electrical components.

Warm up the engine to normal operating temperature.
Stop the engine, and connect the multimeter as shown.

- To prevent a short, make absolutely certain which are the positive and negative terminals or cable.

Restart the engine.
With the headlight on Hi beam, measure the voltage on the multimeter when the engine runs at 5,000 min^{-1} (rpm).



Standard: Measured B V < Measured C V < 15.5 V

- B V = battery voltage
- C V = Charging voltage

If the voltage is abnormal, follow the check each item in the trouble shooting flow chart (page 16-5).

LIGHTING VOLTAGE INSPECTION

Warm up the engine to normal operating temperature.

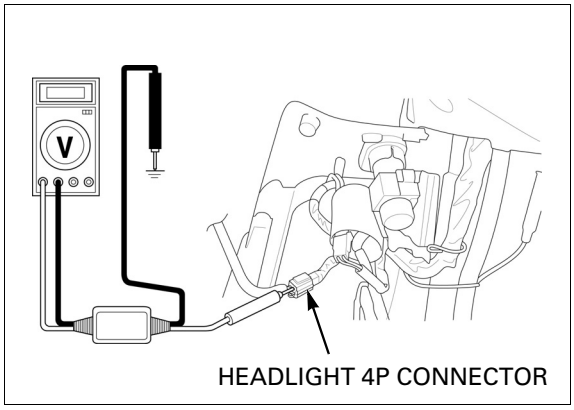
Remove the front cover (page 2-11).

Connect the multimeter (+) probe to the Blue wire terminal of the headlight connector and the (–) probe to the ground.

Measure the voltage with the headlight connector connected.

Start the engine and the lighting switch is "ON" position, dimmer switch is "Hi" position, and read the voltage.

REGULATED VOLTAGE:
12.6 – 13.6 V/5,000 min^{-1} (rpm)



If the voltage is abnormal, follow the check each item in the trouble shooting flow chart (page 16-6).

REGULATOR/RECTIFIER

SYSTEM INSPECTION

Remove the body cover (page 2-8).

Disconnect the regulator/rectifier 4P (Black) connector, and check it for loose contact or corroded terminals.

If the charging voltage (page 16-9) or lighting regulated voltage (page 16-9) reading is out of the specification, check the regulator/rectifier connector terminals (wire harness side) as follows:

Item	Terminal	Specification
Battery charging line	Red (+) and ground (–)	Battery voltage should register
Charging coil line	White and ground	0.2 – 1.0 Ω at (20° C/68° F)
Lighting coil line	Yellow and ground	0.1 – 0.8 Ω at (20° C /68° F)
Ground line	Green and ground	Continuity should exist

If all components of the charging system are normal and there are no loose connections at the regulator/rectifier connectors, replace the regulator/rectifier unit.

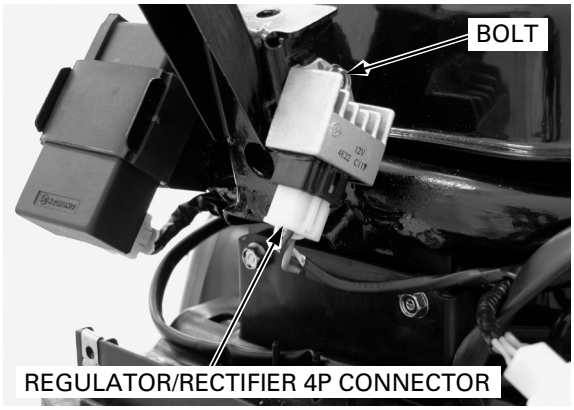
REMOVAL/INSTALLATION

Remove the body cover (page 2-8).

Disconnect the regulator/rectifier 4P (Black) connector.

Remove the mount bolt and regulator/rectifier.

Installation is in the reverse order of removal.



ALTERNATOR

INSPECTION

It is not necessary to remove the stator coil to make this test.

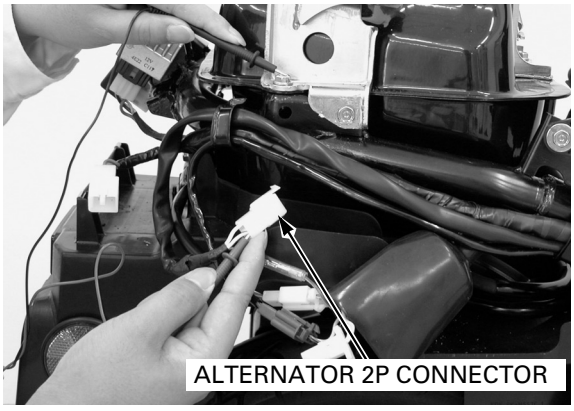
Remove the body cover (page 2-8).

Disconnect the alternator 2P connector.

Check the resistance between the following terminals of the alternator side connector and ground.

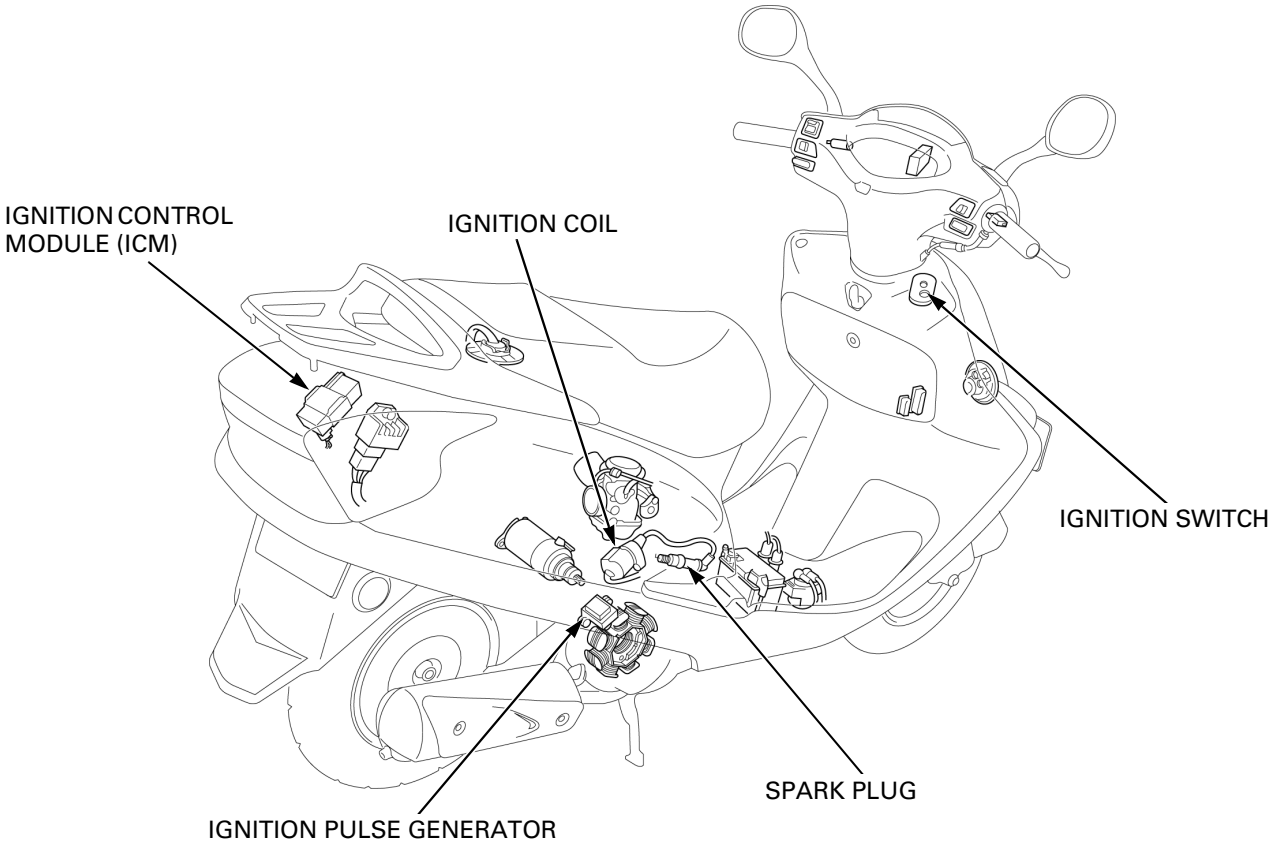
STANDARD: White – ground (Charging coil)
0.2 – 1.0 Ω (20°C/68°F)
Yellow – ground (Lighting coil)
0.1 – 0.8 Ω (20°C/68°F)

If readings are far beyond the standard, replace the alternator stator (page 11-5).

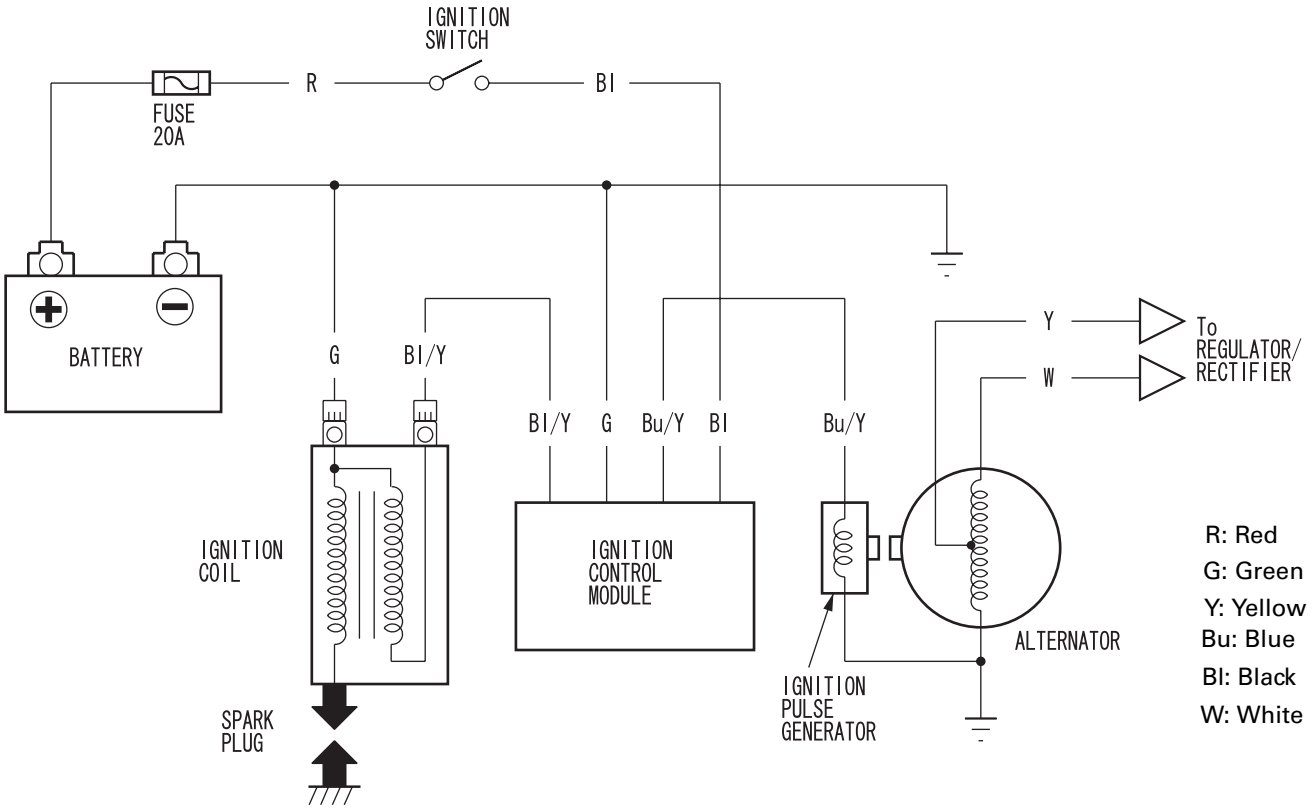


17. IGNITION SYSTEM

SYSTEM LOCATION



SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

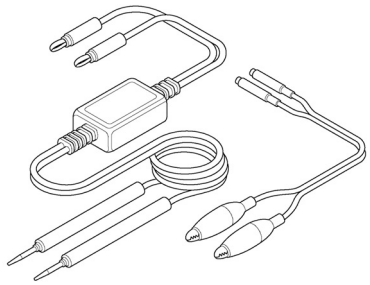
- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is turned to "ON" and current is present.
- When servicing the ignition system, always follow the steps in the troubleshooting sequence on page 17-4.
- The ignition timing cannot be adjusted since the Ignition Control Module (ICM) is factory preset.
- The Ignition Control Module (ICM) may be damaged if dropped. Also, if the connector is disconnected when current is following, the excessive voltage may damage the module. Always turn the ignition switch to "OFF" before servicing.
- A faulty ignition system is often related to poor connected or corroded connectors. Check those connections before proceeding. Make sure the battery is adequately charged. Using the starter motor with a weak battery results in a slower engine cranking speed as well as no spark at the spark plug.
- 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 inspection, see page 19-9.
- For ignition pulse generator removal/installation, see page 11-5.

SPECIFICATION

ITEM	SPECIFICATIONS
Spark plug	CR7HSA (NGK)
Spark plug gap	0.6 – 0.7 mm (0.02 – 0.03 in)
Ignition coil peak voltage	100 V minimum
Ignition pulse generator peak voltage	0.7 V minimum
Ignition timing ("F" mark)	13° BTDC at idle speed

TOOL

Imrie diagnostic tester (model 625)
or Peak voltage adaptor
07HGJ-0020100



With commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

TROUBLESHOOTING

Inspect the following before diagnosing the system.
– Faulty spark plug
– Loose spark plug cap or spark plug wire
– Water got into the spark plug cap (Leaking the ignition coil secondary voltage)

No spark at plug

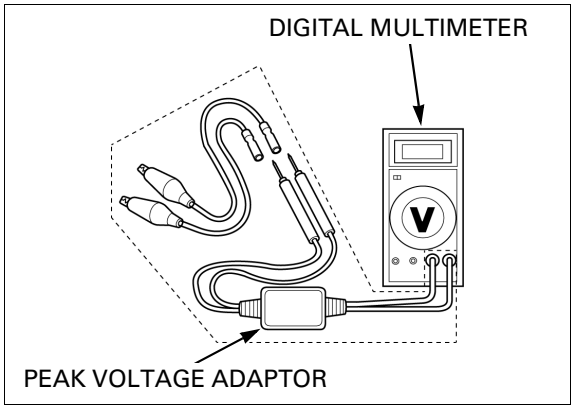
Unusual condition		Probable cause (check in numerical order)
Ignition coil primary voltage	Low peak voltage.	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too slow. (Battery is undercharged.) 3. The sampling time of the tester and measured pulse were not synchronized. (System is normal if measured voltage is over the standard voltage at least once.) 4. Poorly connected connectors or an open circuit in the ignition system. 5. Faulty ignition coil. 6. Faulty ignition control module (ICM) (in case when above No. 1 – 5 are normal).
	No peak voltage.	1. Incorrect peak voltage adapter connections. 2. Battery is undercharged. 3. Faulty ignition switch. 4. Loose or poorly connected ICM connectors. 5. Open circuit or poor connection in the Black wire of the ICM. 6. Open circuit or poor connection in the Green wire of the ICM. 7. Faulty peak voltage adapter. 8. Faulty ignition pulse generator. (Measure the peak voltage.) 9. Faulty ICM (in case when above No.1 – 8 are normal).
	Peak voltage is normal, but no spark jumps at the plug.	1. Faulty spark plug or leaking ignition coil secondary current. 2. Faulty ignition coil.
Ignition pulse generator	Low peak voltage.	1. The multimeter impedance is too low. 2. Cranking speed is too slow. (Battery is undercharged.) 3. The sampling time of the tester and measured pulse were not synchronized. (System is normal if measured voltage is over the standard voltage at least once.) 4. Faulty ignition pulse generator (in case when above No.1 – 3 are normal).
	No peak voltage.	1. Faulty peak voltage adapter. 2. Faulty ignition pulse generator.

IGNITION SYSTEM INSPECTION

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

Connect the peak voltage adapter to the digital multimeter, or use the peak voltage tester.

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



IGNITION COIL PRIMARY PEAK VOLTAGE

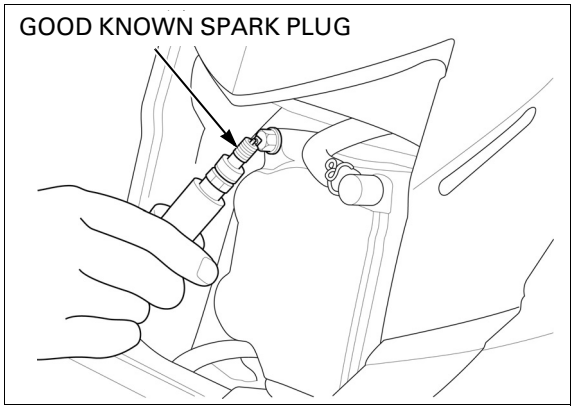
- Check all system connections before inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check cylinder compression and check that the spark plug is installed correctly.

Remove the following:

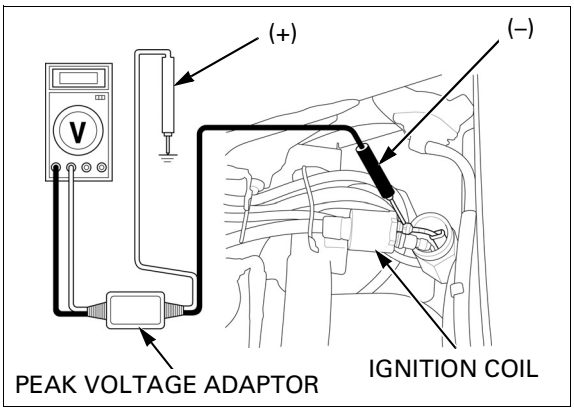
– Maintenance lid (page 16-7).
– Luggage box (page 2-5).

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 or tester probes to the ignition coil primary wire terminal and ground.



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

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

Turn the ignition switch to "ON" then squeeze the brake lever fully.

Avoid touching the tester probes to prevent electric shock.

Crank the engine with the starter switch and measure the ignition coil primary peak voltage.

PEAK VOLTAGE: 100 V minimum

If the peak voltage is abnormal, follow the check each item in the troubleshooting chart (page 17-4).

IGNITION PULSE GENERATOR PEAK VOLTAGE

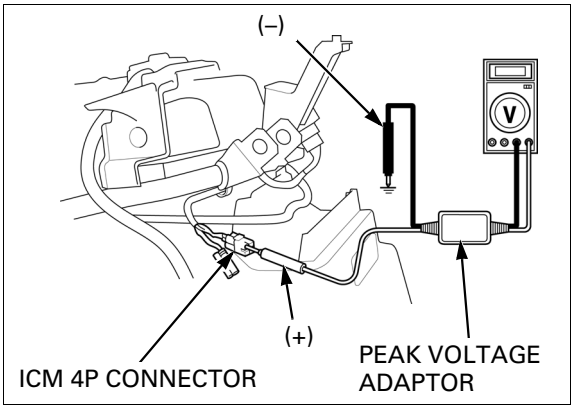
- Check cylinder compression and make sure the spark plug is installed correctly.
- Check all system connection before inspection. If the system is disconnected, incorrect peak voltage might be measured.

Turn the ignition switch to "OFF".

Disconnect the ignition control module (ICM) 4P connector.

Measure the voltage with the ICM connector connected.

Connect the peak voltage adapter or tester probes to the ICM 4P connector.



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

CONNECTION:
Blue/Yellow (+) – body ground (–)

Turn the ignition switch "ON" and squeeze the brake lever fully.

Avoid touching the tester probes to prevent electric shock.

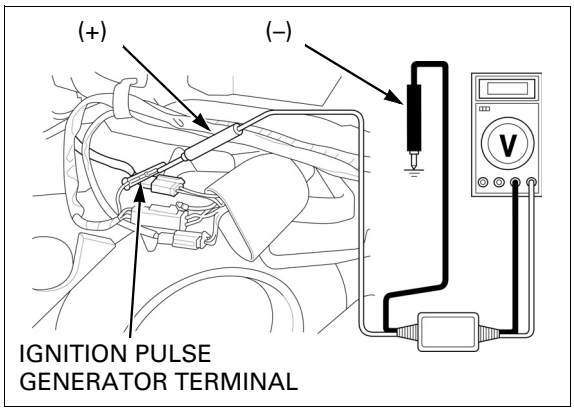
Crank the engine with the starter switch and measure the ignition pulse generator peak voltage.

PEAK VOLTAGE: 0.7 V minimum

If the peak voltage measured at the ICM connector is abnormal, measure the peak voltage at the pulse generator connector.

Connect the peak voltage tester or adaptor probes to the connector terminal of the ignition pulse generator side.
In the same manner as at the ICM connector, measure the peak voltage and compare it to the voltage measured at the ICM connector.

- If the peak voltage measured at the ICM is abnormal and the one measured at the ignition pulse generator is normal, the wire harness has an open or short circuit, or loose connection.
- If both peak voltages measure are abnormal, check each item in the troubleshooting chart (page 17-4). If all items are normal, the ignition pulse generator is faulty. See following steps for ignition pulse generator replacement (page 11-5).



IGNITION COIL

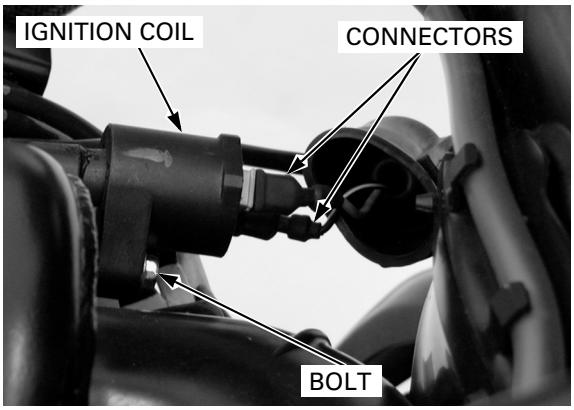
REMOVAL/INSTALLATION

Remove the luggage box (page 2-5).

Disconnect the spark plug cap.

Disconnect the ignition coil primary connectors.
Remove the mount bolt and ignition coil.

Installation is in the reverse order of removal.



IGNITION CONTROL MODULE (ICM)

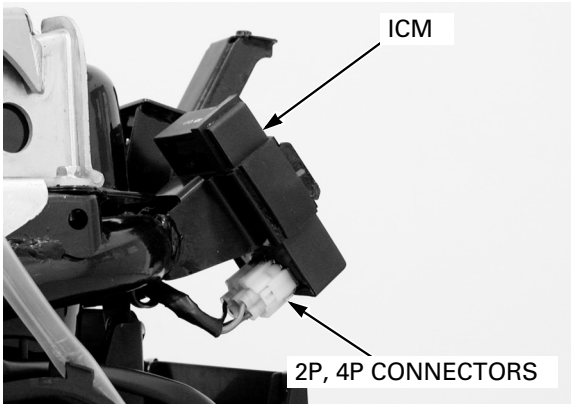
SYSTEM INSPECTION

Remove the body cover (page 2-8).

Turn the ignition switch "OFF".

Release the ICM from the stay.

Disconnect the ICM 2P, 4P connectors.



Check the following at the wire harness side connector:

Item	Terminal	Specification
Battery charging line	Black (+) and ground	Battery voltage should register
Ground line	Green and ground	Continuity should exist

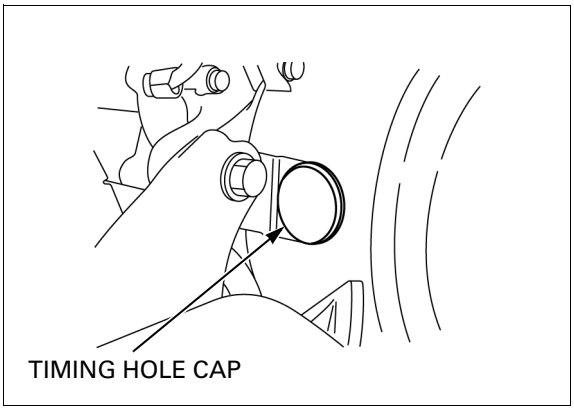
IGNITION TIMING

- The ignition timing is factory preset and need only be checked when an electrical system component is replaced.

Read the instructions for timing light operation.

Remove the maintenance lid (page 16-7) and connect the timing light to the spark plug wire.

Remove the timing hole cap.



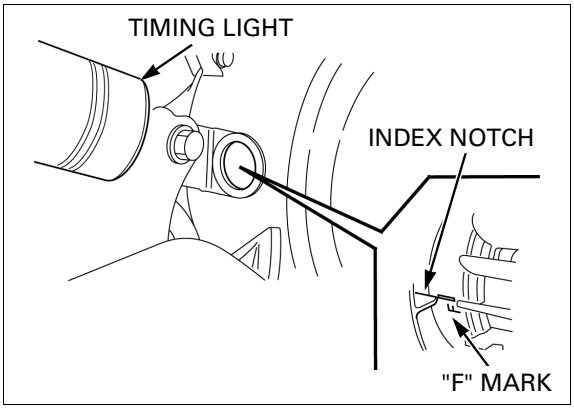
Turn the ignition switch "ON".

Start the engine and let it idle.

The ignition timing is correct if the index notch on the right crankcase aligns between the "F" mark on the flywheel as shown.

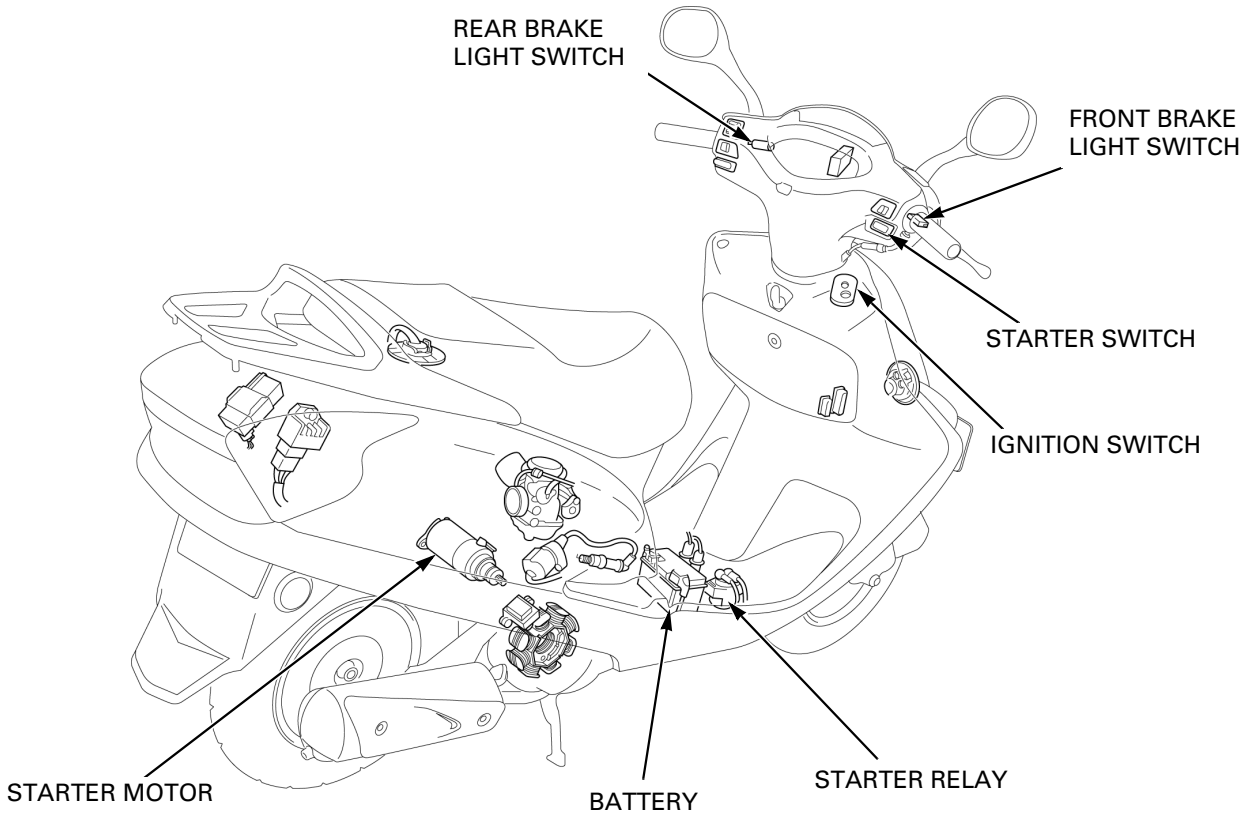
If the ignition timing is incorrect, inspect the ignition pulse generator (page 17-6).

Install the removed parts in the reverse order of removal.

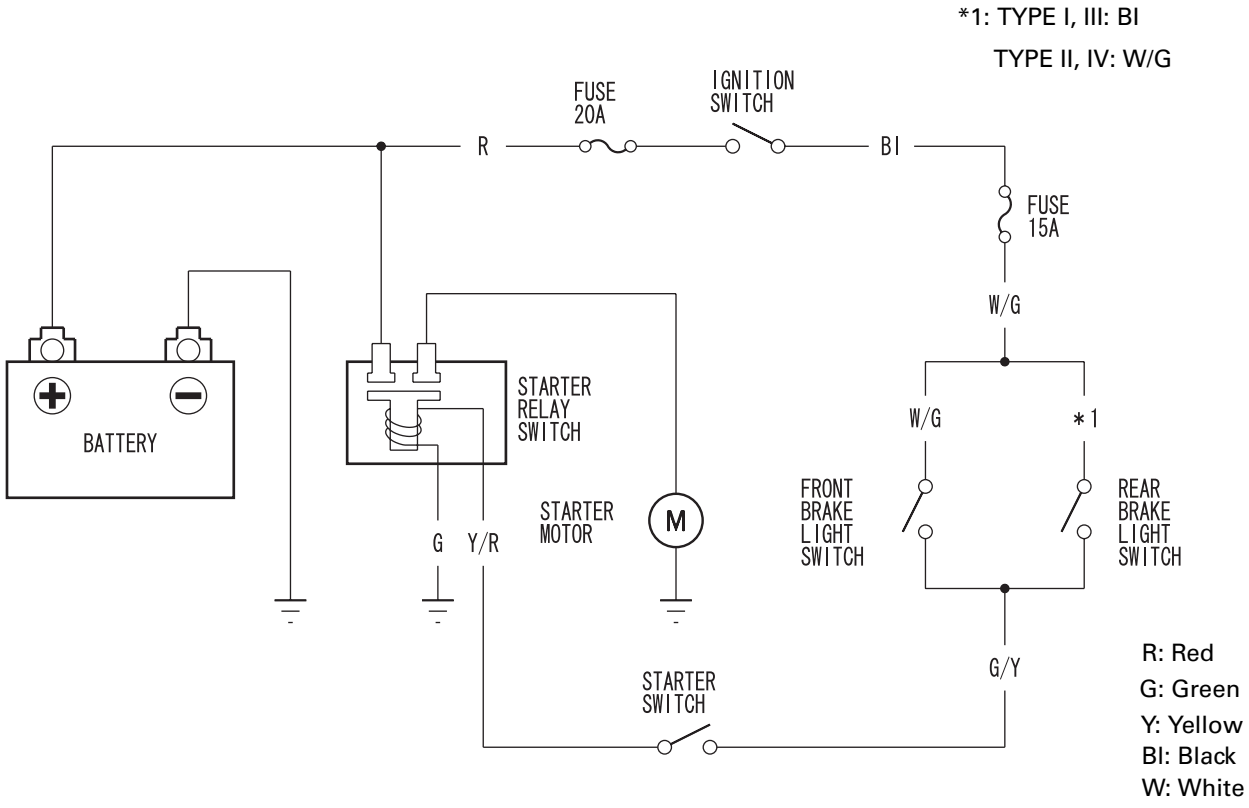


18. ELECTRIC STARTER

SYSTEM LOCATION



SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

- Always turn the ignition switch "OFF" before servicing the starter motor. The motor could suddenly start, causing serious injury.
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- The starter motor can be serviced with the engine in the frame.
- When checking the starter system, always follow the steps in the troubleshooting (page 18-4).
- If the current is kept flowing through the starter motor to turn it while the engine is not cranking over, the starter motor may be damaged.
- Refer to the following components informations.
  - Starter clutch (page 11-12)
  - Ignition switch (page 19-9)
  - Starter switch (page 19-10)
  - Brake light switch (page 19-12)

SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	11.9 (0.47)	9.4 (0.37)

TROUBLESHOOTING

Starter motor does not turn

1. **Fuse Inspection**

   Check for blown main fuse (20 A) or sub fuse (15 A).

   Is the fuse blow?

   YES – Replace the fuse.

   NO – GO TO STEP 2.

2. **Battery inspection**

   Make sure the battery is fully charged and in good condition.

   Is the battery in good condition?

   NO – Charge or replace the battery (page 16-7).

   YES – GO TO STEP 3.

3. **Starter relay operation**

   Turn the ignition switch "ON".
   Squeeze the brake lever fully and push the starter switch.
   You should hear the relay "CLICK" when the starter switch is depressed.

   Is the "CLICK" hear?

   YES – GO TO STEP 4.

   NO – GO TO STEP 6.

4. **Starter motor inspection 1**

   Check the starter motor cable for loose connection or open circuit.

   Is the starter motor cable in good condition?

   YES – GO TO STEP 5.

   NO – • Loose or poorly connected starter motor cable.
   • Open circuit in the starter motor cable.

5. **Starter motor inspection 2**

   Turn the ignition switch "OFF".
   Apply battery voltage to the starter motor directly and check the operation. (A large amount of current follows, so do not use a thin wire.)

   Dose the starter motor turn?

   YES – GO TO STEP 8.

   NO – Inspect the starter motor (page 18-7).

6. **Starter relay switch coil ground line inspection**

   Inspect the ground line of the starter relay switch coil (page 18-11).

   CONNECTION: Green – Ground

   Is there continuity?

   NO – • Loose or poor contact connector.
   • Open circuit in Green wire between the starter switch and ground.

   YES – GO TO STEP 7.

7. Starter relay switch coil power input line inspection

Inspect the power input line of the starter relay switch coil (page 18-11).

CONNECTION: Yellow/Red (+) – Ground (–)

Is there battery voltage?

NO – • Loose or poor contact connector.
• Faulty ignition switch (page 19-9).
• Faulty brake light switch (page 19-12).
• Faulty starter switch (page 19-10).
• Open or short circuit in battery cable between the battery and ignition switch.
• Open or short circuit in Black and/or White/Green wires between the ignition switch and brake light switch.
• Open or short circuit in Green/Yellow wire between the brake light switch and starter switch.
• Open or short circuit in Yellow/red wire between the starter switch and starter relay switch.

YES – GO TO STEP 8.

8. Starter relay switch continuity Inspection

Check the starter relay switch for continuity (page 18-12)

Is there continuity?

NO – Faulty starter relay switch.

YES – Loose or poor contact starter relay switch connector.

Starter motor turns engine slowly
- Low battery voltage.
- Poorly connected battery terminal cable.
- Poorly connected starter motor cable.
- Faulty starter motor.
- Poor connected battery ground cable.

Starter motor turns, but engine does not turn
- Starter motor is running backwards.
  – Case assembled improperly.
  – Terminals connected improperly.
- Faulty starter clutch.
- Faulty or damaged starter gear train.

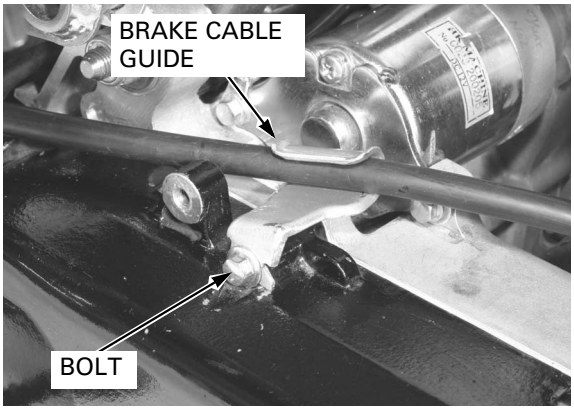
Starter relay *"CLICK"*, but engine does not turn over
- Crankshaft does not turn due to engine problems.

STARTER MOTOR

REMOVAL

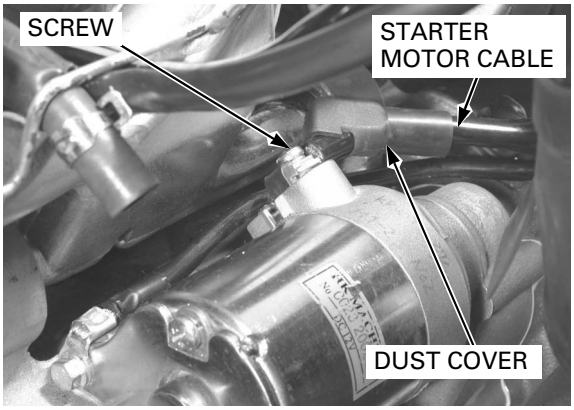
Remove the air cleaner housing (page 5-5).

Remove the bolt and rear brake cable guide.

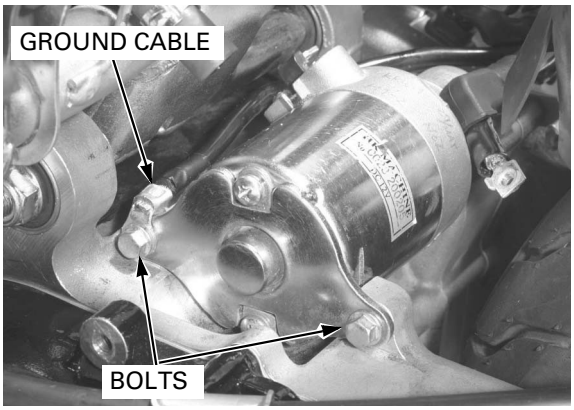


Pull off the dust cover.

Remove the screw and starter motor cable from the starter motor.

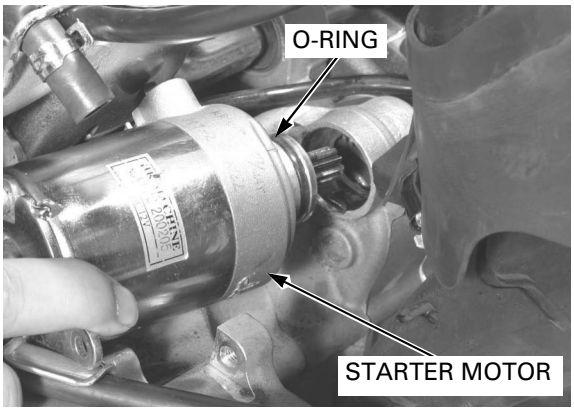


Remove the bolts and ground cable.



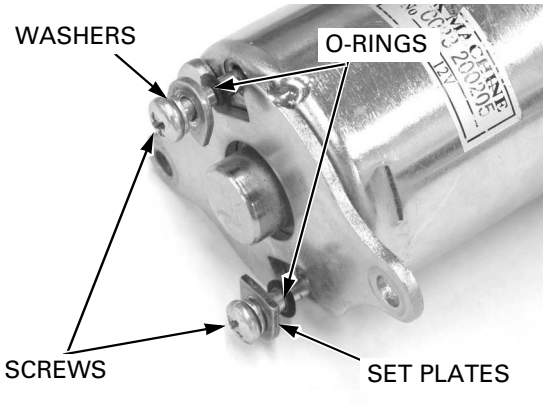
Remove the starter motor from the engine.

Remove the O-ring from the starter motor.



DISASSEMBLY

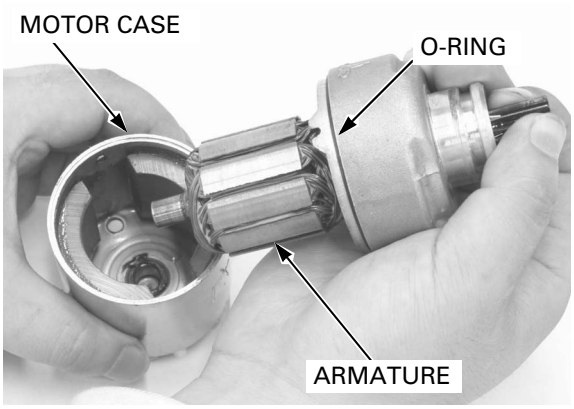
Remove the screws, washers, set plate and O-rings.



Record the location and number of shims. the number of the shims are different individually.

Divide the starter motor into the front bracket and motor case.
Remove the armature from a motor case by holding the armature tightly to keep the magnet from pulling armature against.

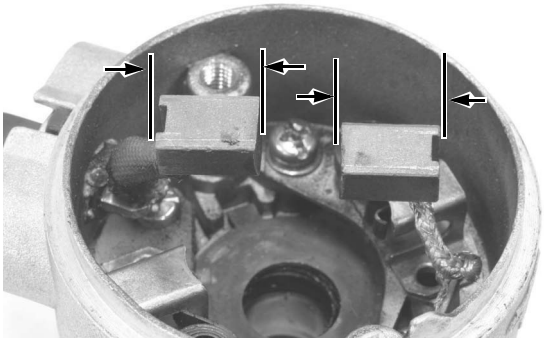
Remove the O-ring from the front bracket



INSPECTION

Inspect the brushes for damage and measure the brush length.

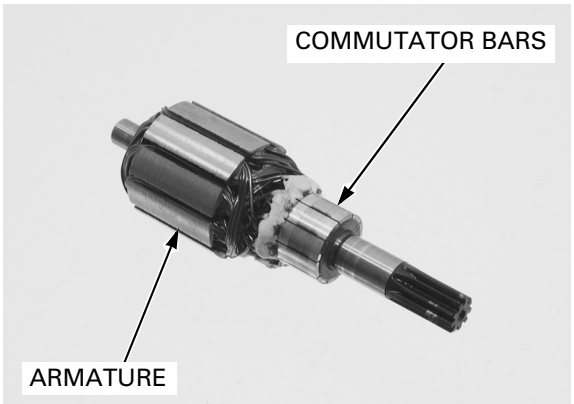
SERVICE LIMIT: 9.4 mm (0.37 in)



Do not use emery or sand paper on the commutator.

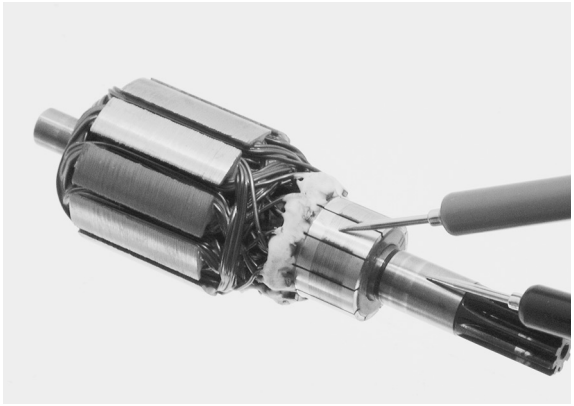
Inspect the commutator bars of the armature for discoloration.

Bars discolored in pairs indicate shorted coils.

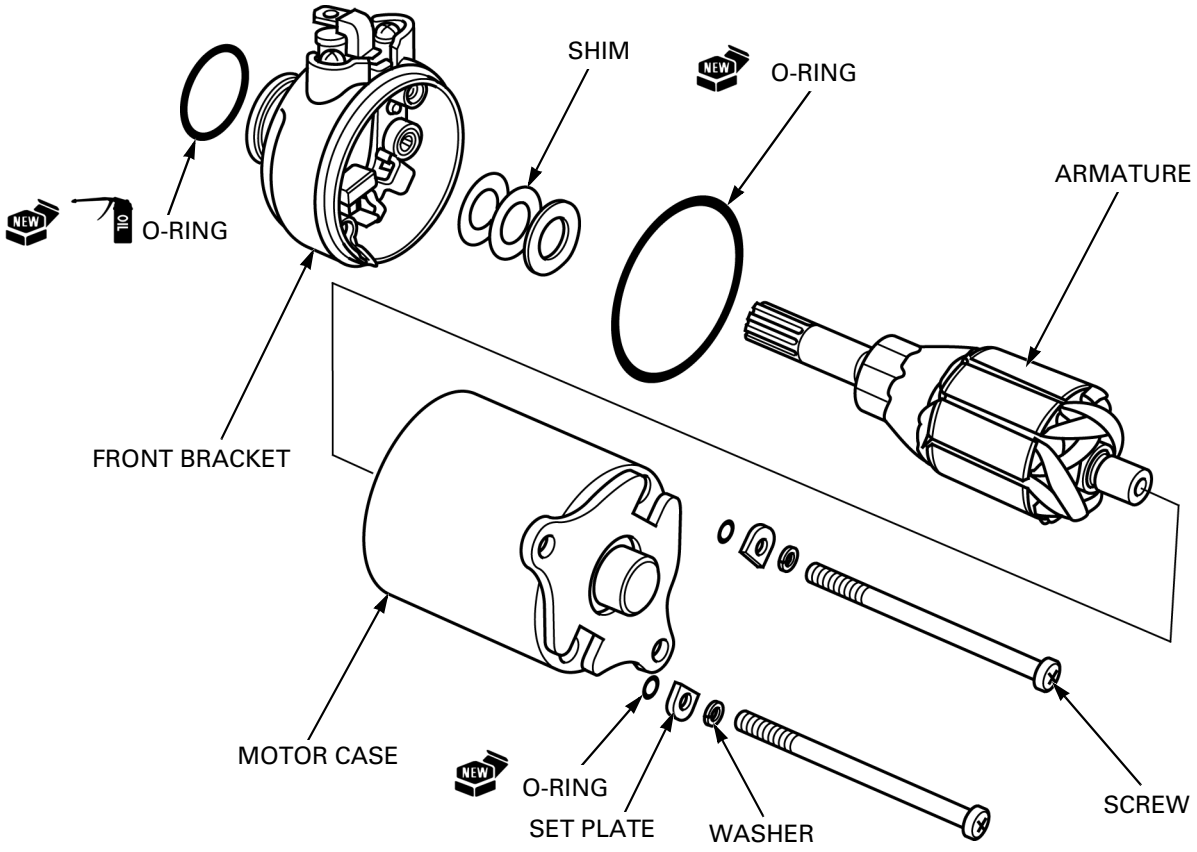


Check for continuity between pair of commutator bars.
There should be continuity.

Check for continuity between each commutator bar and the armature shaft.
These should be no continuity.

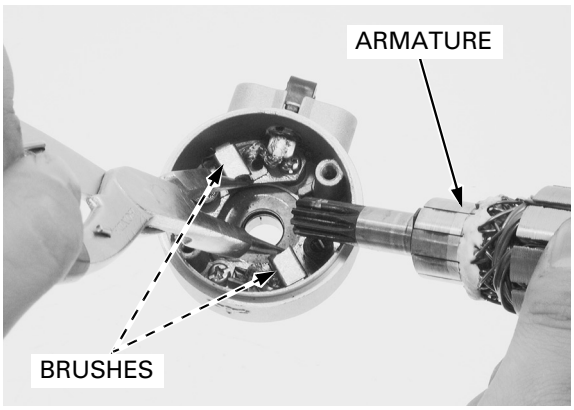


ASSEMBLY



Be careful not to damage the brush and armature.

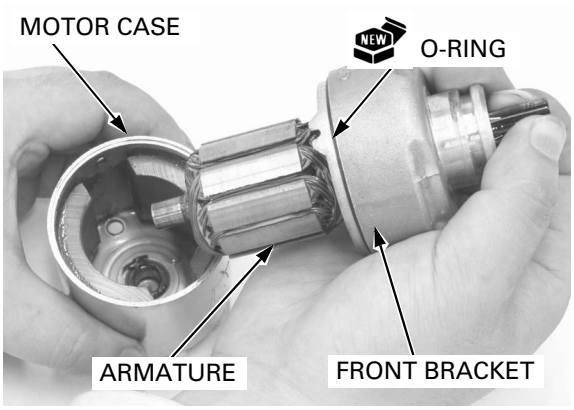
Install the armature into the front bracket while pushing and holding the brushes.



Install a new O-ring in the groove of the front bracket.

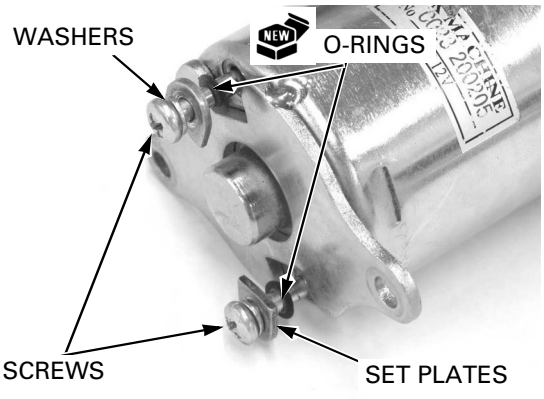
The coil may be damaged if the magnet pulls the armature against the case.

Install the front bracket and armature to the motor case by holding the bracket side armature shaft tightly.



Install the washers, set plates and new O-rings in the screws.

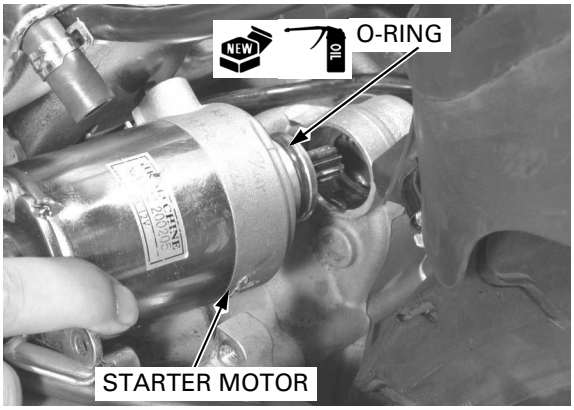
Install the motor case screws and tighten them.



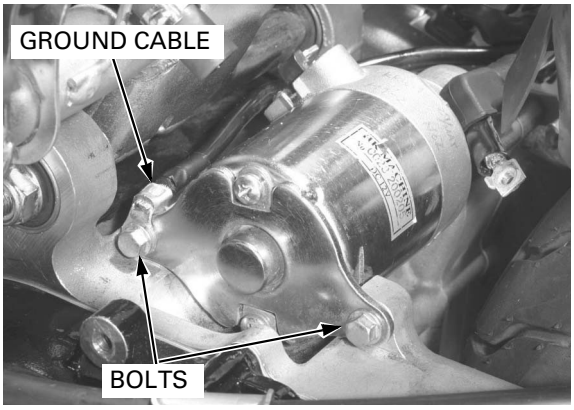
INSTALLATION

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

Install the starter motor into the engine.

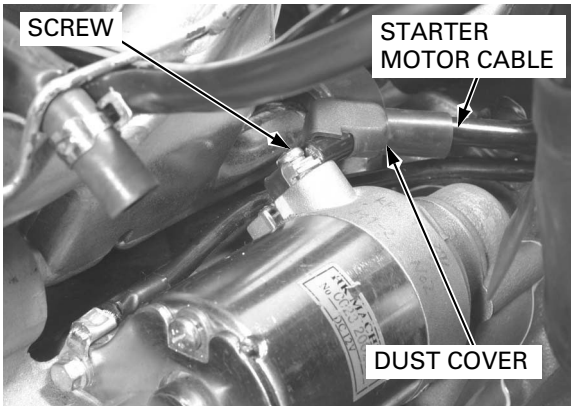


Install the mounting bolts, ground cable and tighten them.



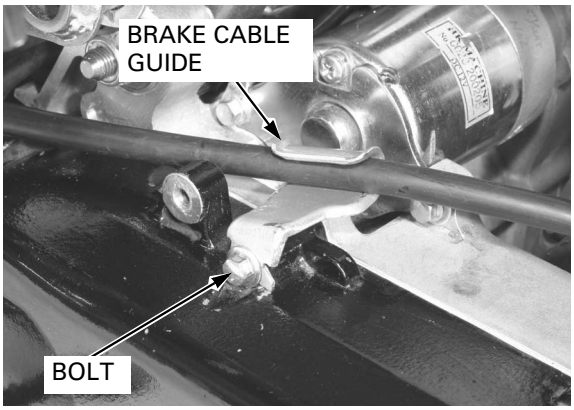
Install the starter motor cable and tighten the screw.

Put the dust cover back in the appropriate position.



Install the rear brake cable guide and tighten the bolt.

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



STARTER RELAY SWITCH

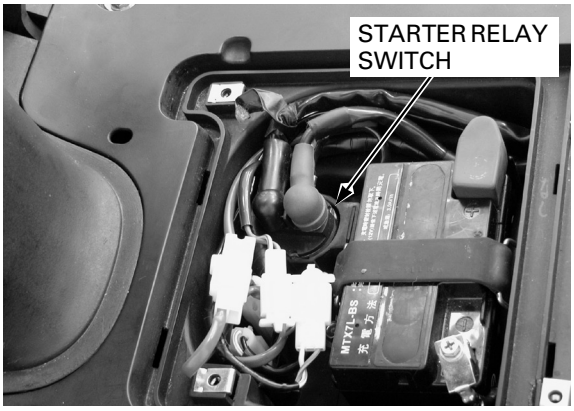
OPERATION INSPECTION

Remove the maintenance lid (page 16-7).

Turn the ignition switch "ON".
Squeeze the brake lever fully and push the starter switch.
The coil is normal if the starter relay switch clicks.

If you don't hear the relay "CLICK", inspect the starter relay coil inspection (page 18-11).

If you hear the relay "CLICK", but starter does not turn, inspect the starter relay continuity inspection (page 18-12).



STARTER RELAY COIL LINE INSPECTION

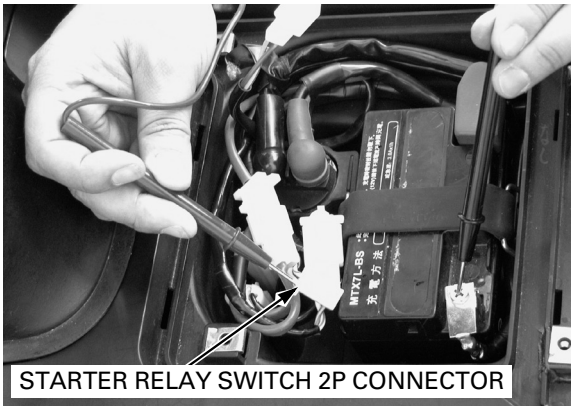
Turn the ignition switch "OFF".

Disconnect the starter relay switch 2P connector.

Check for continuity between the starter relay switch connector of the wire harness side and ground.

CONNECTION: Green – ground

If there continuity, the circuit is normal.



Connect the starter relay switch 2P connector.

Turn the ignition switch "ON".

Squeeze the brake lever fully and push the starter switch.

Check the voltage between the starter relay switch connector of the wire harness side and ground.

CONNECTION: Yellow/Red (+) – ground (–)

If the battery voltage appears only when the ignition switch "ON", the circuit is normal.

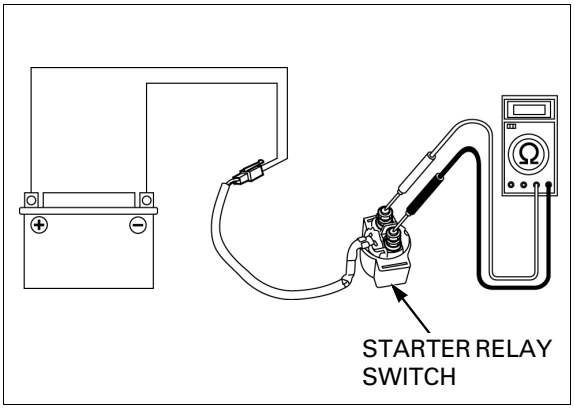
STARTER RELAY SWITCH CONTINUITY INSPECTION

Remove the starter relay switch (page 18-12).

Connect a fully charged 12V battery positive wire to the relay switch Yellow/Red terminal and negative wire to the Green wire terminal.

Check for continuity at the starter relay large terminals.

There should be continuity at the large terminals while the battery is connected, and no continuity when the battery is disconnected.



STARTER RELAY SWITCH REMOVAL/INSTALLATION

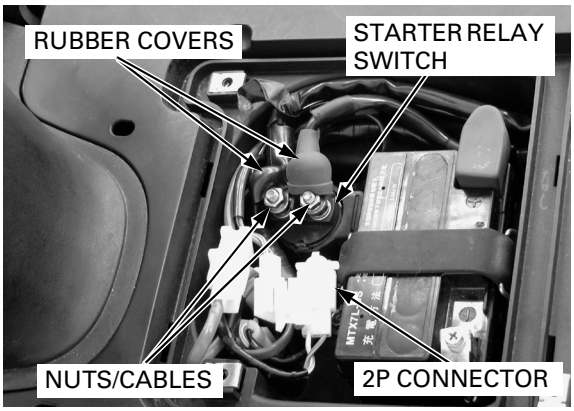
Remove the maintenance lid (page 16-7).

Disconnect the starter relay switch 2P connector.

Remove the rubber covers.
Remove the nuts and cables from the starter relay switch.
Remove the starter relay switch.

Install the starter relay switch in the reverse order of removal.

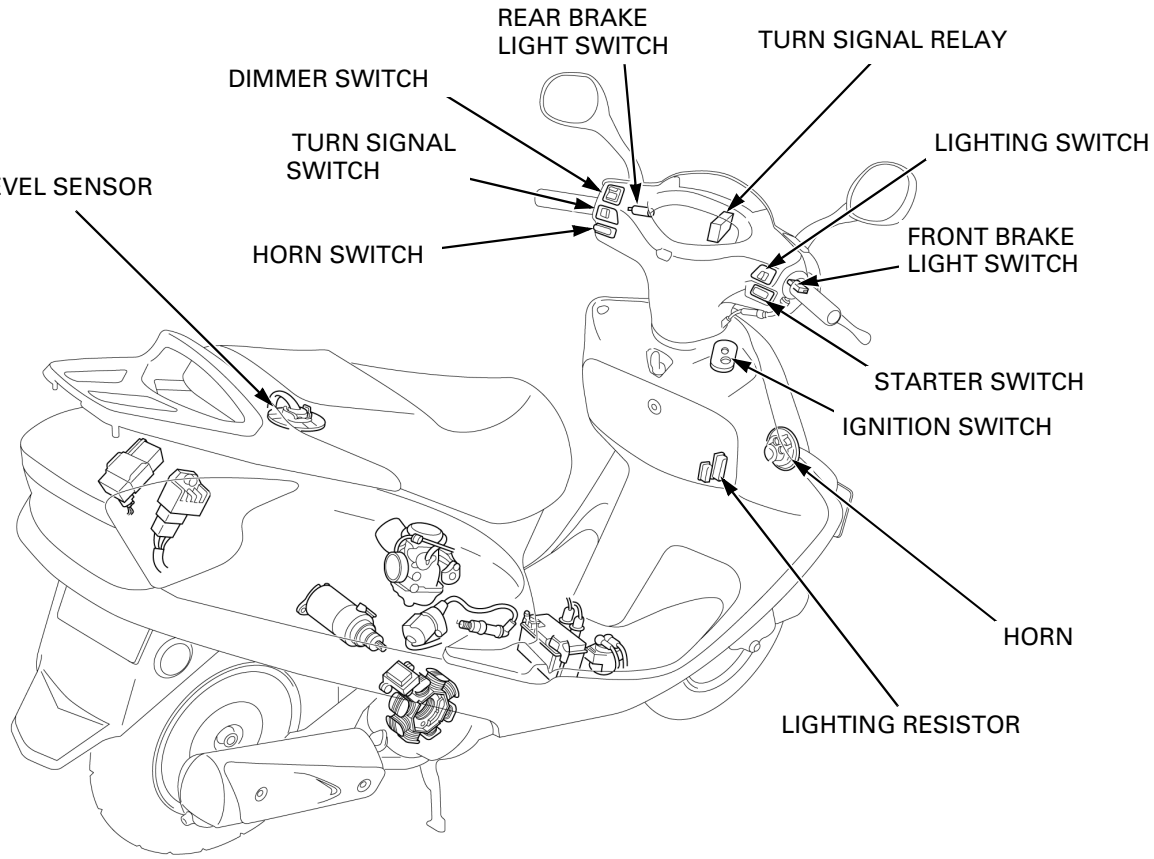
Install the maintenance lid (page 16-7).



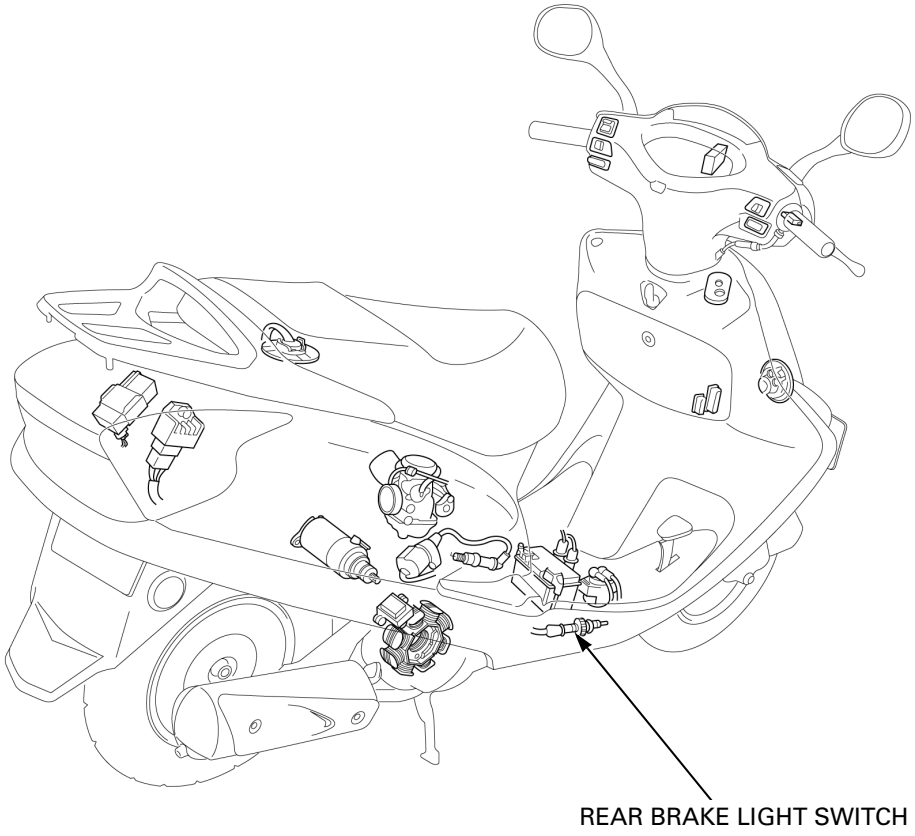
19. LIGHTS/METER/SWITCHES

SYSTEM LOCATION

TYPE I, III



TYPE II, IV



SERVICE INFORMATION

GENERAL

- A halogen headlight bulb becomes very hot while the headlight is ON, and will remain hot for a while after it is turned OFF. Be sure to let it cool down before servicing.
- Note the following when replacing the halogen headlight bulb.
  – Wear clean gloves while replacing the bulb. Do not put finger prints on the headlight bulb, as they may create hot spots on the bulb and cause is to fail.
  – If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent its early failure.
  – Be sure to install the dust cover after replacing the bulb.
- Check the battery condition before performing any inspection that requires proper battery voltage.
- A continuity test can be made with the switches installed on the scooter.
- The following color codes are used throughout this section.

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

SPECIFICATIONS

ITEM			SPECIFICATIONS
Bulbs	Headlight	Hi	12V – 35 W
		Lo	12V – 35 W
	Position light		12V – 5 W
	Brake/tail light		12V – 21/5 W
	Turn signal light		12V – 21 W X 4
	Meter light		12V – 1.7 W X 2
	Turn signal indicator		12V – 3.4 W X 2
	High beam indicator		12V – 1.7 W
Fuse	Main fuse		20 A
	Sub fuse		15 A
Lighting resistor resistance			5.3 – 6.5 Ω (20°C/68°F)

HEADLIGHT

BULB REPLACEMENT

Headlight

Remove the front cover (page 2-11).

Disconnect the headlight connector from the headlight bulb.

Remove the dust cover from the headlight unit.

Unhook the headlight bulb retainer.

Avoid touching halogen headlight bulb. Finger prints can create hot spots that cause a bulb to break.

Remove the headlight bulb from the headlight unit.

Install the new headlight bulb by aligning the bulb tabs with the grooves in the headlight unit.

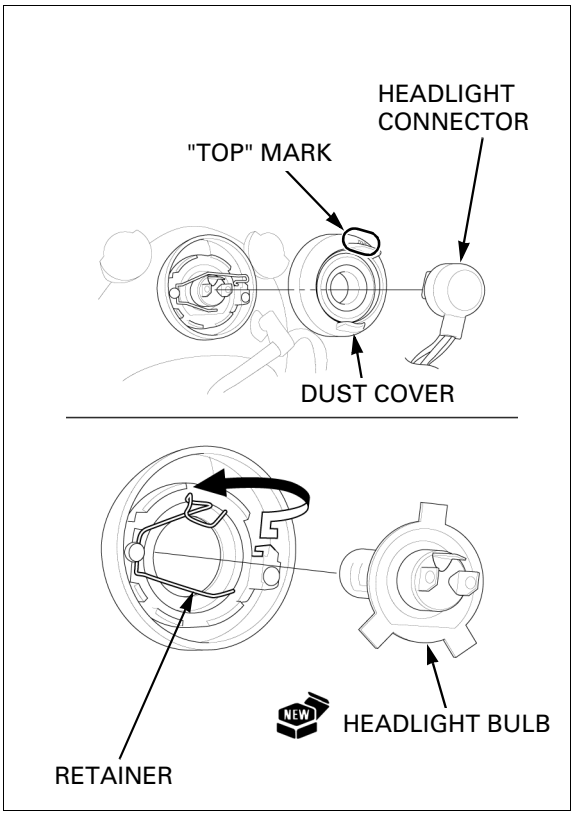
Hold the headlight bulb and hook the bulb retainer into the headlight unit groove.

When installing the dust cover, its "TOP" mark facing up.

Install the dust cover tightly against the headlight unit.

Connect the headlight connector to the headlight bulb.

Install the front cover (page 2-11).

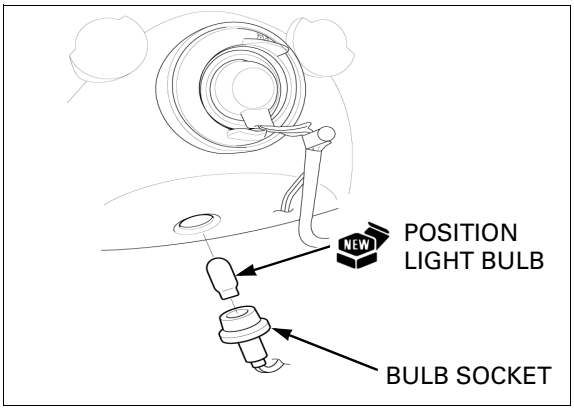


Position light

Remove the front cover (page 2-11).

Pull off the position light bulb socket.
Remove the position light bulb, replace it with a new one.

Installation is in the reverse order of removal.

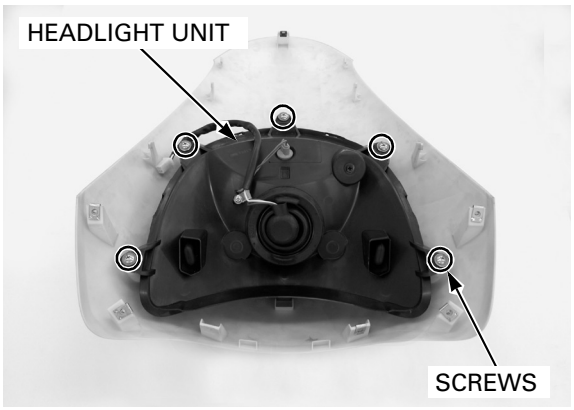


REMOVAL/INSTALLATION

Remove the front cover (page 2-11).

Remove the five screws and headlight unit.

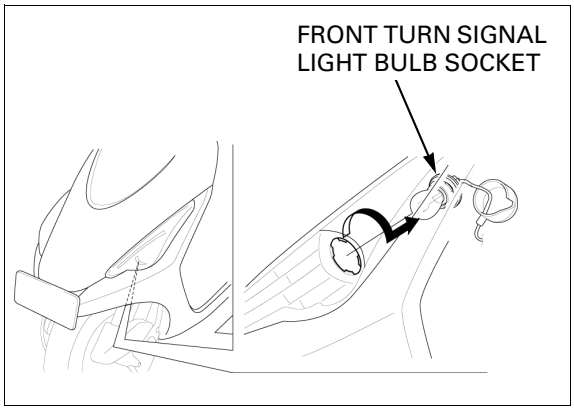
Installation is in the reverse order of removal.



TURN SIGNAL LIGHT

FRONT TURN SIGNAL LIGHT BULB REPLACEMENT

Remove the front turn signal light bulb socket by turning counterclockwise.

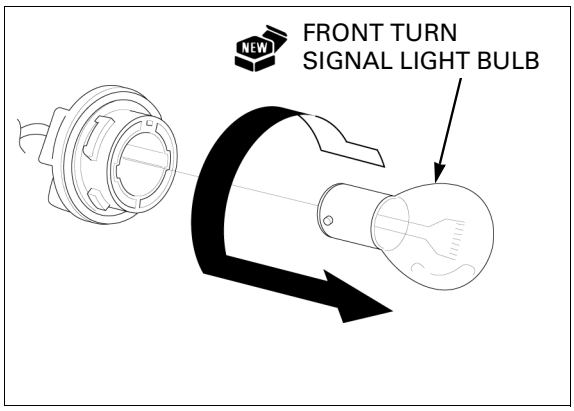


Remove the front turn signal light bulb by pressing in and turning counterclockwise.

Replace the front turn signal light bulb with a new one.

When installing the dust cover, install it tightly against the turn signal light unit.

Installation is in the reverse order of removal.

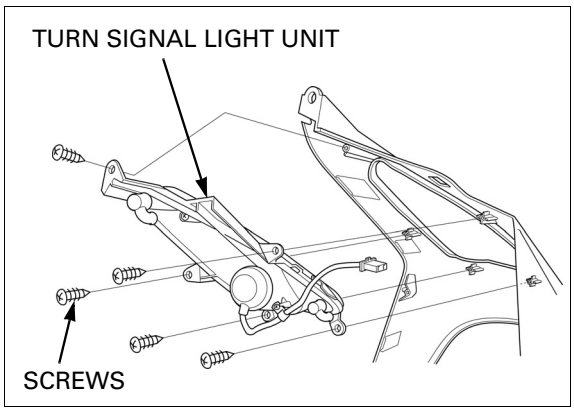


FRONT TURN SIGNAL LIGHT REMOVAL/INSTALLATION

Remove the front inner cover (page 2-11).

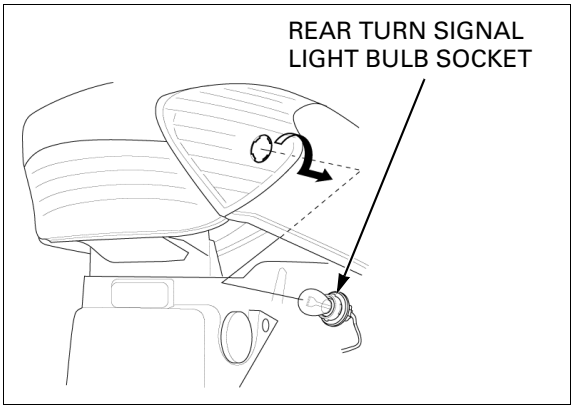
Remove the five screws and front turn signal light unit.

Installation is in the reverse order of removal.



REAR TURN SIGNAL LIGHT BULB REPLACEMENT

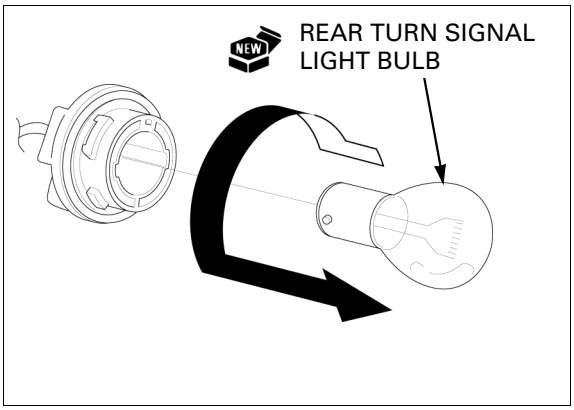
Remove the rear turn signal light bulb socket by turning counterclockwise.



Remove the rear turn signal light bulb by pressing in and turning counterclockwise.

Replace the rear turn signal light bulb with a new one.

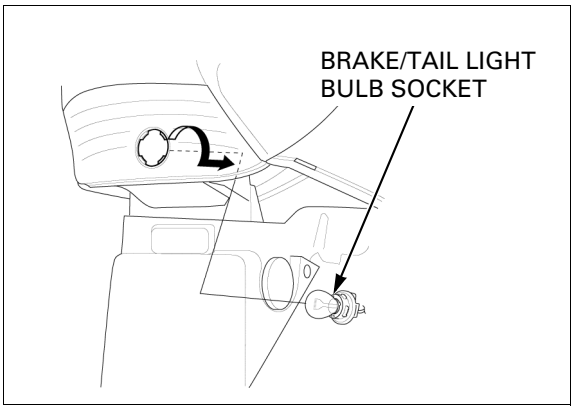
Installation is in the reverse order of removal.



BRAKE/TAIL LIGHT

BULB REPLACEMENT

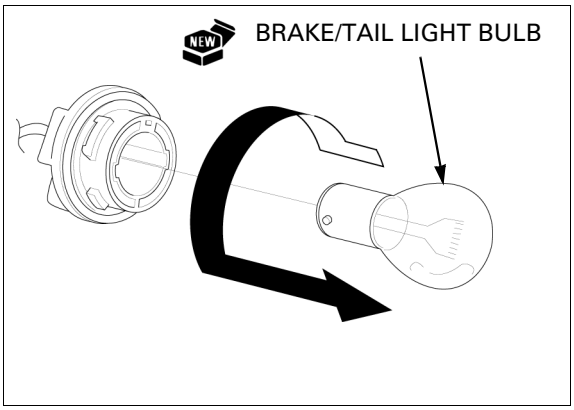
Remove the brake/tail light bulb socket by turning counterclockwise.



Remove the brake/tail light bulb by pressing in and turning counterclockwise.

Replace the brake/tail light bulb with a new one.

Installation is in the reverse order of removal.



SPEEDOMETER

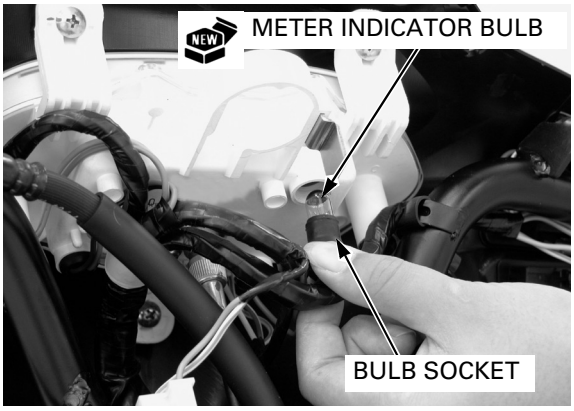
BULB REPLACEMENT

Remove the front handlebar cover (page 2-10).

Pull the indicator and meter light bulb socket out of the speedometer.

Remove the bulb from the socket and replace it with a new one.

Installation is in the reverse order of removal.



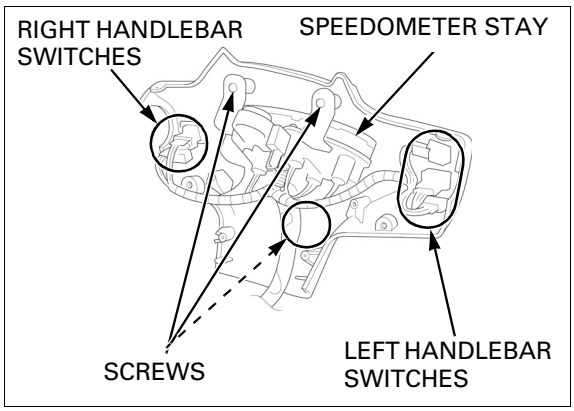
REMOVAL/INSTALLATION

Remove the rear handlebar cover (page 2-10).

Disconnect the left and right handlebar switch connectors.

Remove the three screws and speedometer.

Install the speedometer is in the reverse order of removal.

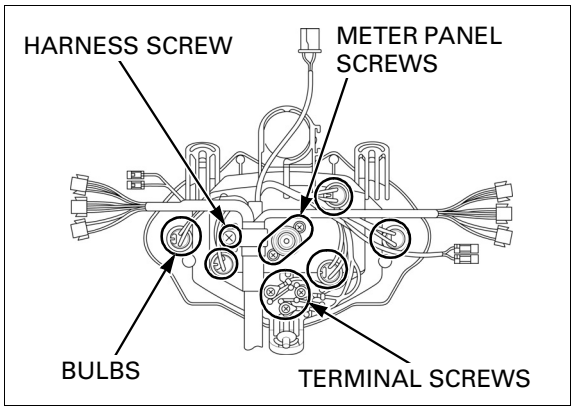


DISASSEMBLY/ASSEMBLY

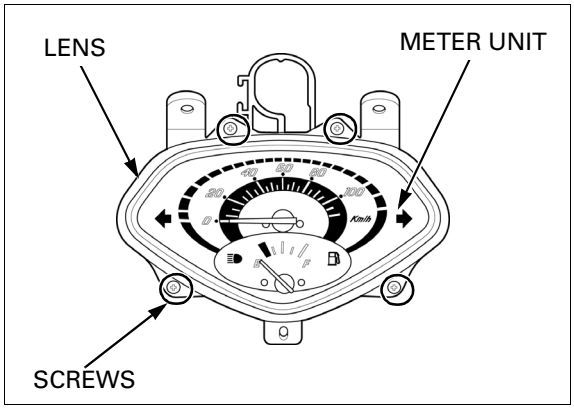
Remove the meter wire harness screw, then remove the indicator bulbs from the panel.

Remove the three screws and wire terminals.

Remove the two meter panel mounting screws from the meter case.

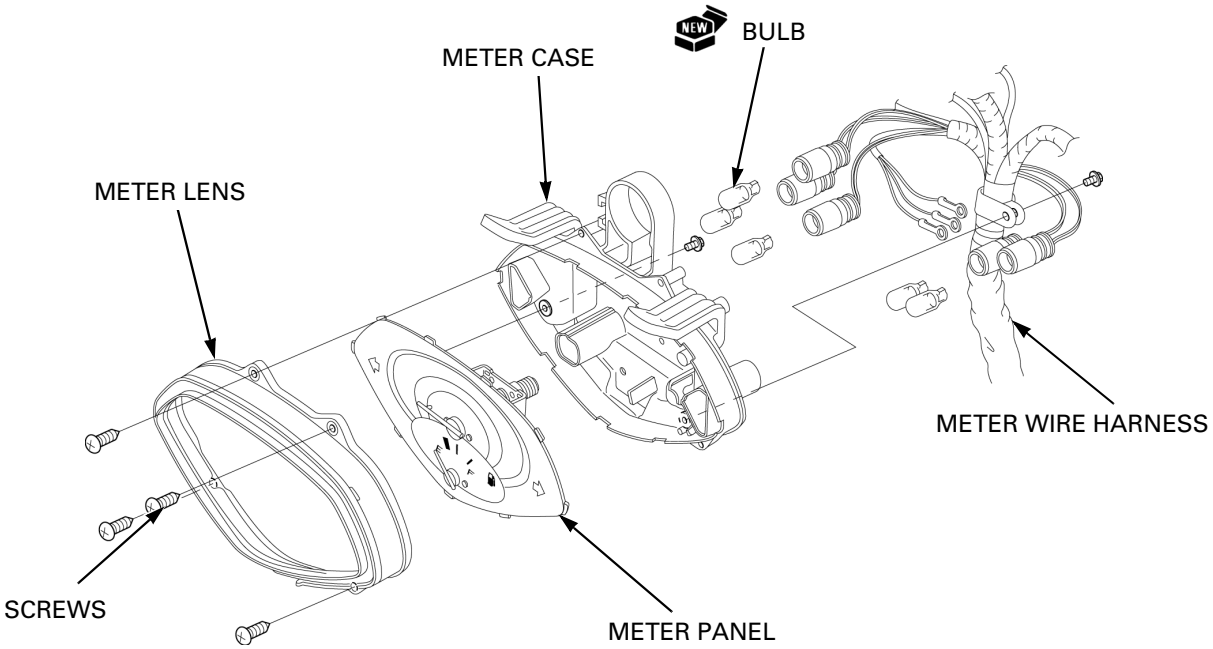


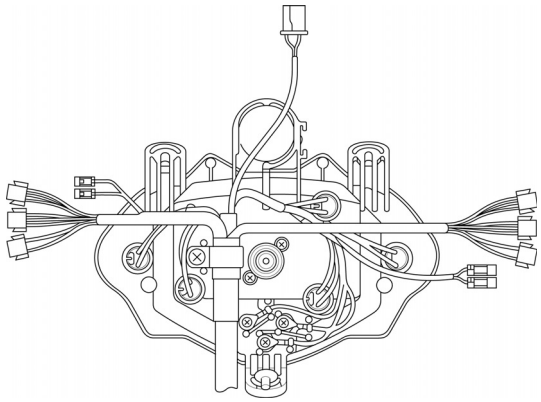
Remove the four screws, meter lens and meter unit from the meter case.



Assemble the speedometer in the reverse order of the removal.

- Connect the wire terminals and install the sockets are according to the color codes indicated on the meter case.
- Route the meter harness as shown in the illustration.



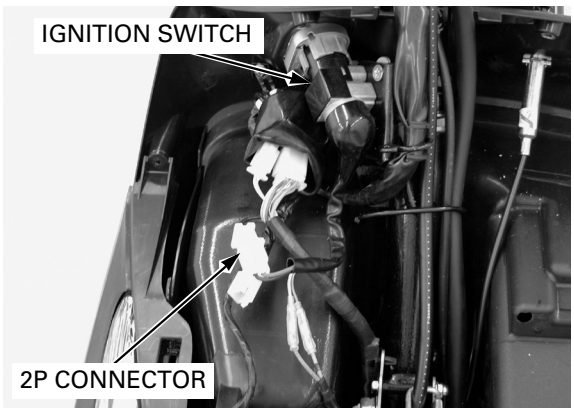


IGNITION SWITCH

INSPECTION

Remove the front cover (page 2-11).

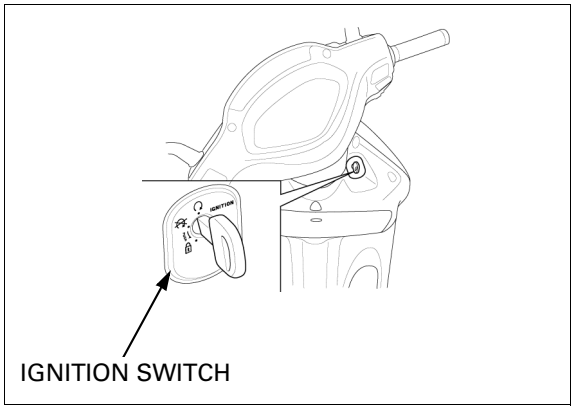
Disconnect the ignition switch 2P connector.



Check for continuity at the terminals of the switch side connector in each switch position.

Continuity should exist between the color coded wires as follows:

	BAT1	BAT2
LOCK		
OFF		
ON	○	○
COLOR	R	Bl



REMOVAL/INSTALLATION

Remove the front cover (page 2-11).

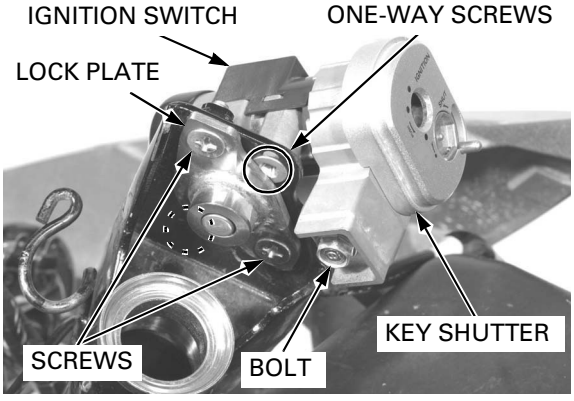
Disconnect the ignition switch 2P connector.

Remove the steering stem (page 13-19).

Remove the bolt and key shutter.

Remove the two screws and handlebar lock plate. Remove the two one-way screws and ignition switch.

Installation is in the reverse order of removal.



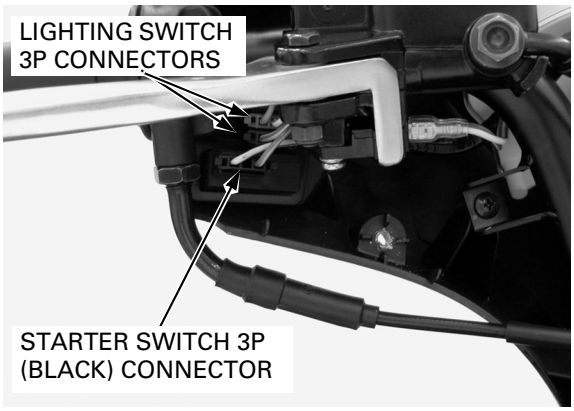
HANDLEBAR SWITCHES

RIGHT HANDLEBAR SWITCH INSPECTION

Remove the front handlebar cover (page 2-10).

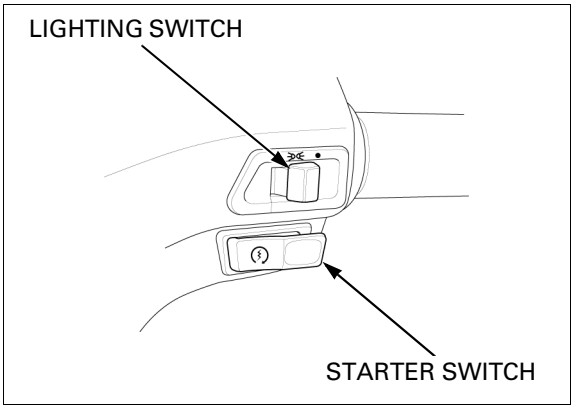
Disconnect the following:

– Lighting switch 3P connectors
– Starter switch 3P (Black) connector



Check for continuity between the terminals of the lighting switch and starter switch connector in each switch position.

Continuity should exist between the color coded wires as follows:



LIGHTING SWITCH

	C1	HL	RE	C2	TL
●	○	———	○		
(N)				○	○
≡D0≡				○	○
(N)	○	○		○	○
-☼-	○	○		○	○
COLOR	Y	W/Bu	P	W/G	Br

STARTER SWITCH

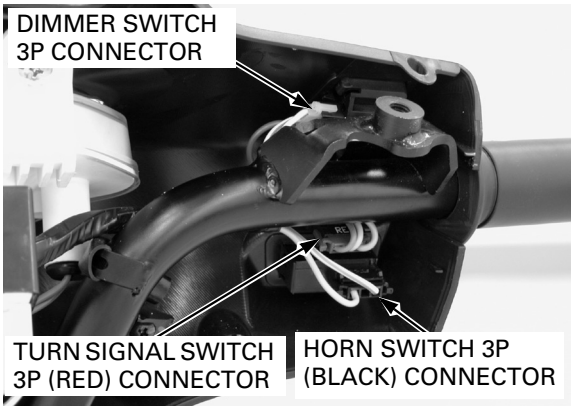
	ST	E
FREE		
PUSH	○	○
COLOR	G/Y	Y/R

LEFT HANDLEBAR SWITCH INSPECTION

Remove the front handlebar cover (page 2-10).

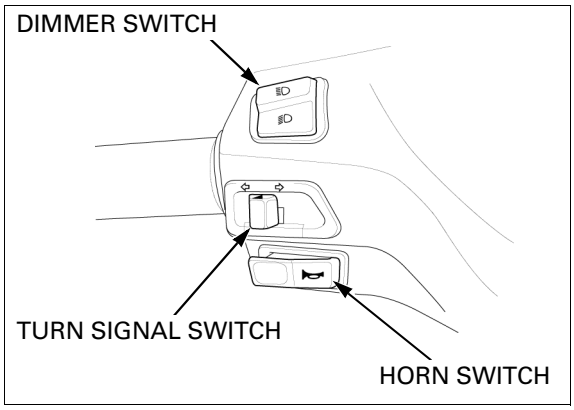
Disconnect the following:

– Dimmer switch 3P connector
– Turn signal switch 3P (Red) connector
– Horn switch 3P (Black) connector



Check for continuity between the wire terminals of the dimmer switch, turn signal switch and horn switch connector in each switch position.

Continuity should exist between the color coded wires as follows:



DIMMER SWITCH

	HL	Lo	Hi
Lo	○—○		
N	○—○	○	
Hi	○	—	○
COLOR	W/Bu	W	Bu

TURN SIGNAL SWITCH

	R	WR	L
R	○—○		
N			
L		○—○	
COLOR	Lb	Gr	O

HORN SWITCH

	HO	BAT1
FREE		
PUSH	○—○	
COLOR	Lg	W/G

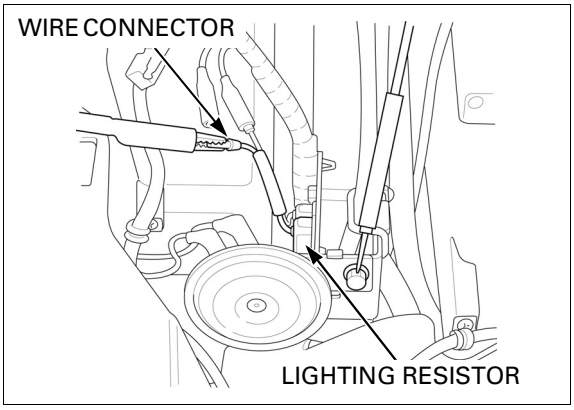
LIGHTING RESISTOR INSPECTION

Remove the front cover (page 2-11).

Disconnect the lighting resister (Pink) wire connector and check the resistance between terminal and ground.

STANDARD: 5.3 – 6.5 Ω (20°C/68°F)

If the resistance is abnormal, replace the lighting resistor.



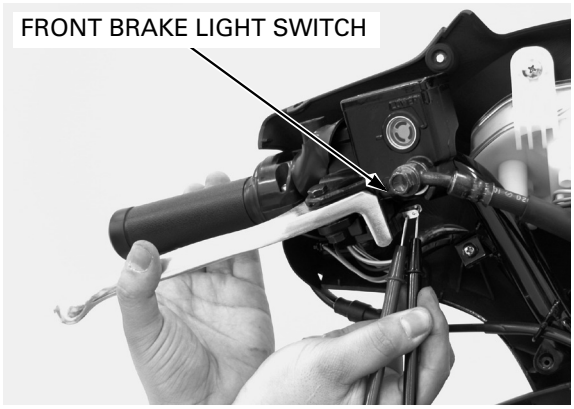
BRAKE LIGHT SWITCH

FRONT BRAKE LIGHT SWITCH

Remove the front handlebar cover (page 2-10).

Disconnect the brake light switch connectors (Green/Yellow and White/Green) and check for continuity between the switch side terminals.

There should be continuity with the front brake lever squeezed, and there should be no continuity when the front brake lever is released.



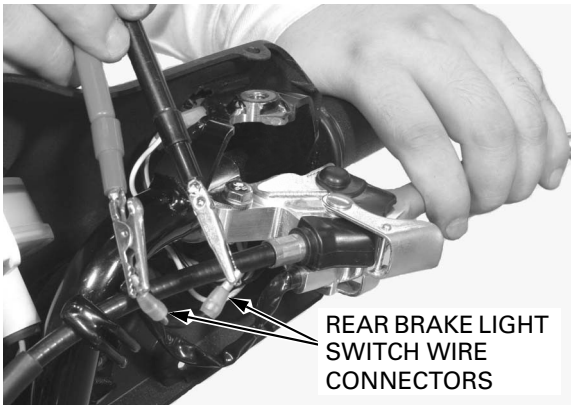
REAR BRAKE LIGHT SWITCH

Type I, III

Remove the front handlebar cover (page 2-10).

Disconnect the brake light switch wire connectors (Green/Yellow and Black) and check for continuity between the switch side terminals.

There should be continuity with the rear brake lever squeezed, and there should be no continuity when the rear brake lever is released.



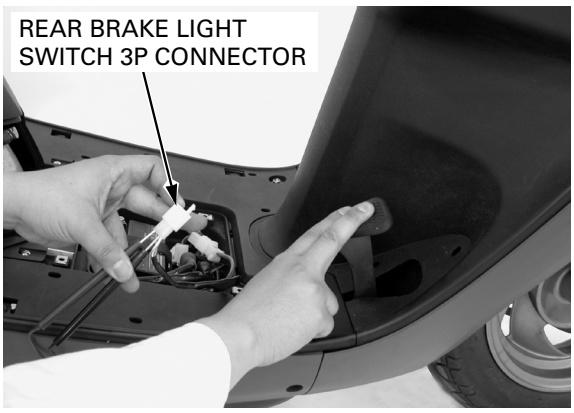
Type II, IV

Remove the maintenance lid (page 16-7).

Disconnect the brake light switch 3P connector and check for continuity between the switch side connector terminals.

There should be continuity with the rear brake pedal applied, and there should be no continuity when the rear brake pedal is released.

Install the maintenance lid (page 16-7).



FUEL GAUGE/FUEL LEVEL SENSOR

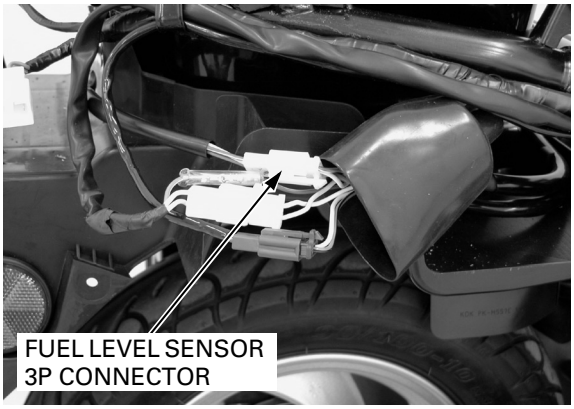
FUEL IS FULL BUT FUEL GAUGE DOES NOT MOVE

- Before starting the inspection, check the battery for charged, main and sub fuses for not blown and ignition switch for operates correctly.

Fuel gauge inspection

Turn the ignition switch "OFF".

Disconnect the fuel level sensor 3P connector.

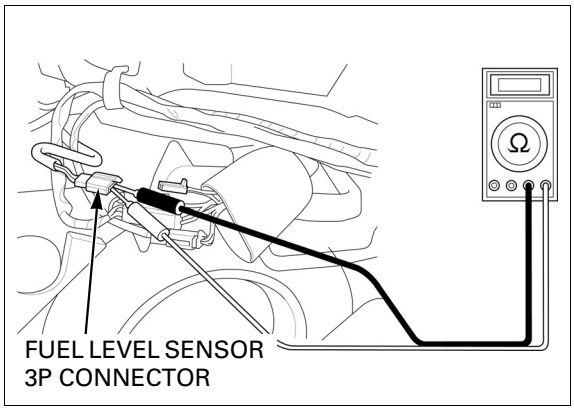


Measure the resistance at the sensor side connector terminals.

(20°C/68°F)

CONNECTION	RESISTANCE
Yellow/White – Green	25 – 700 Ω
Blue/White – Green	25 – 700 Ω
Yellow/White – Blue/White	450 – 750 Ω

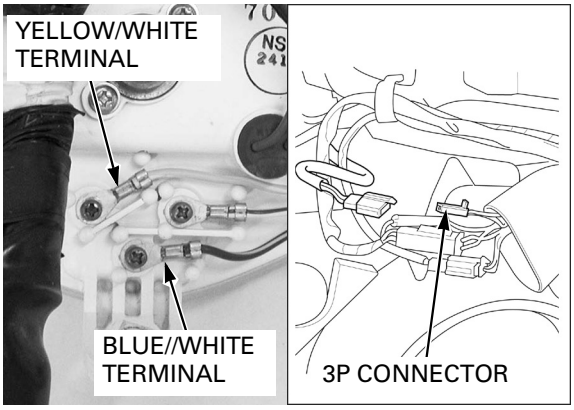
– If the resistance is out of specification value, inspect the fuel level sensor (page 19-14).



– If the resistance within the specification value, check the wires for continuity between the speedometer terminal and fuel level sensor connector terminal (wire harness side).

CONNECTION: Yellow/White – Yellow/White
Blue/White – Blue/White

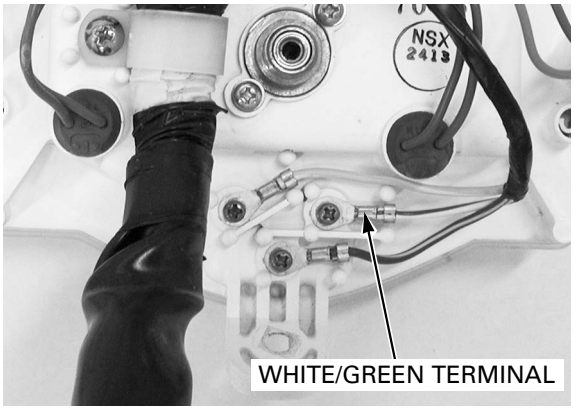
- If there is no continuity, check for broken wire harness.



– If there is continuity, measure the battery voltage at the speedometer terminal and ground.

CONNECTION: White/Green – Ground

- If there is no voltage, check for broken wire harness.
- If there is voltage, replace the meter panel with new one, and recheck.



FUEL LEVEL SENSOR INSPECTION

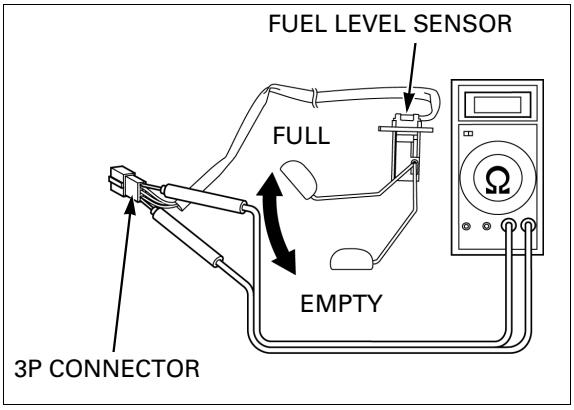
Remove the fuel level sensor (page 19-14).

Measure the resistance at the connector terminals with the float upper (full) and lower (empty) positions.

(20°C/68°F)

CONNECTION	FLOAT POSITION	
	FULL	EMPTY
Yellow/White – Green	25 – 45 Ω	400 – 700 Ω
Blue/White – Green	400 – 700 Ω	25 – 45 Ω
Yellow/White – Blue/White	450 – 750 Ω	450 – 750 Ω

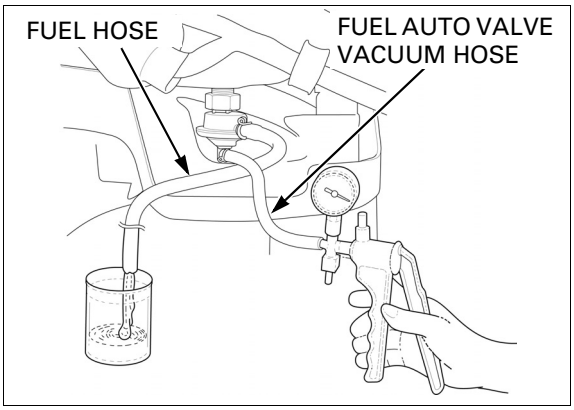
Replace the fuel level sensor if it is out of specification.



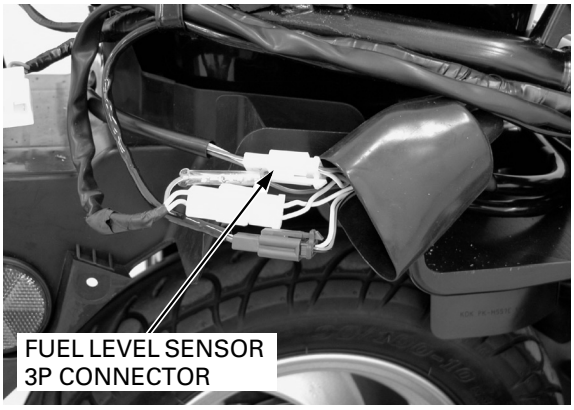
FUEL LEVEL SENSOR REMOVAL

Remove the body cover (page 2-8).

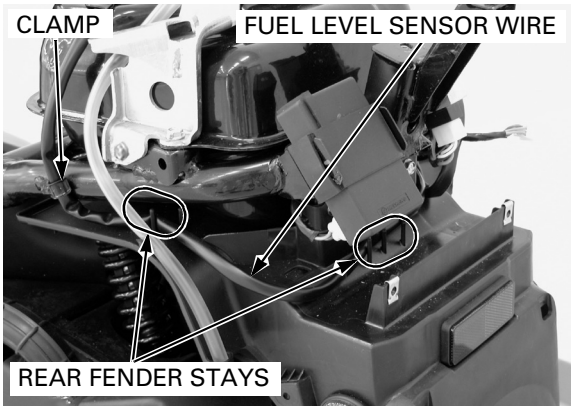
Disconnect the fuel hose from the fuel auto valve and connect a suitable fuel drain hose.
Place a suitable container under the fuel drain hose.
Disconnect the vacuum hose from the fuel auto valve and connect a commercially available vacuum pump to the diaphragm vacuum outlet.
Squeeze the vacuum pump and drain fuel from the fuel tank.



Remove the fuel level sensor 3P connector.



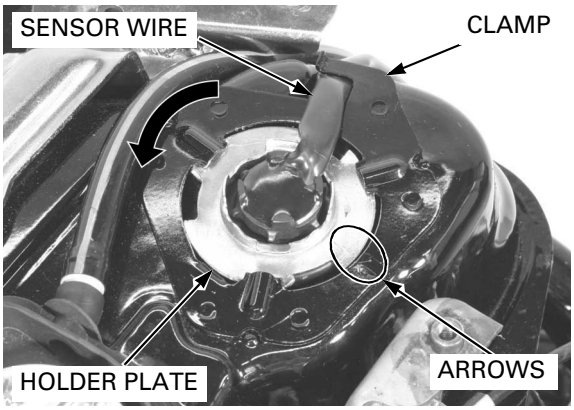
Release the fuel level sensor wire from the frame clamp and rear fender stays.



Release the fuel level sensor wire from the clamp.

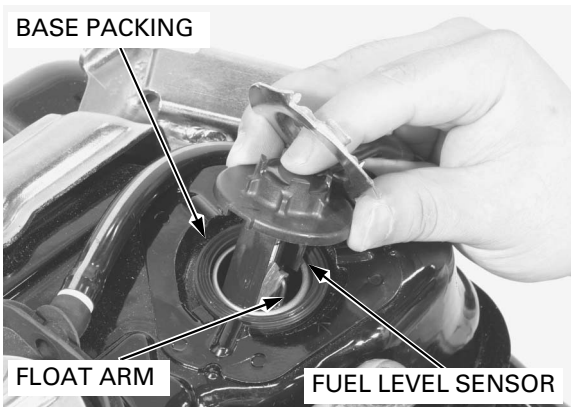
Make sure of the position of arrows before removing.

Turn the fuel level sensor holder plate counterclockwise with a pair of needle nose pliers.



Be careful not to damage the float arm so that remove the fuel level sensor.

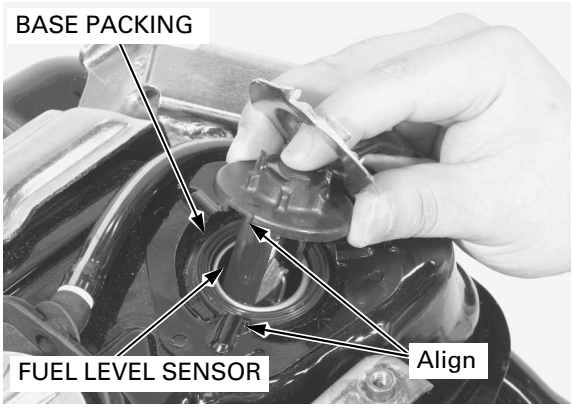
Remove the base packing.



FUEL LEVEL SENSOR INSTALLATION

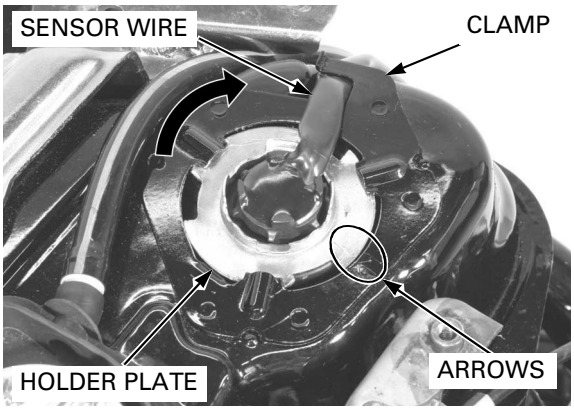
Check that the base packing is in good condition, replace if necessary.

Install the fuel level sensor by aligning the groove on the fuel level sensor with the tab on the fuel tank.



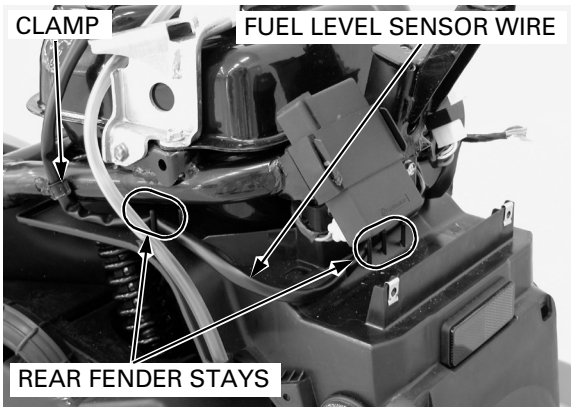
Turn the fuel level sensor holder plate to the clockwise and lock it until the arrows are aligned.

Bind the fuel level sensor wire to the clamp.



Route the wire harness properly (page 1-16).

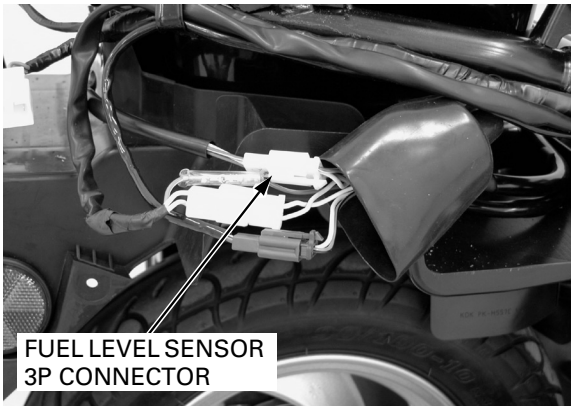
Bind the fuel level sensor wire to the frame clamp and rear fender stays.



Connect the fuel level sensor 3P connector.

Install the following:

- Body cover (page 2-8)
- Side cover (page 2-6)
- Rear center lower cover (page 2-6)
- Rear carrier (page 2-6)
- Luggage box (page 2-5)



HORN

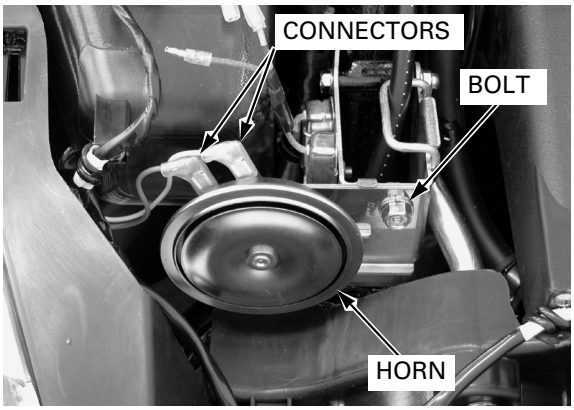
REMOVAL/INSTALLATION

Remove the front cover (page 2-11).

Disconnect the horn connectors from the horn.

Remove the bolt and horn.

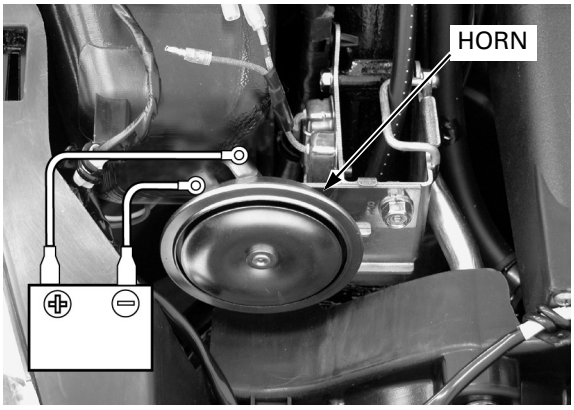
Installation is in the reverse order of removal.



INSPECTION

Remove the horn connectors.

Connect a 12 V battery to the horn terminals.
The horn is normal if it sounds when the 12 V battery is connected to the horn terminals.



TURN SIGNAL RELAY

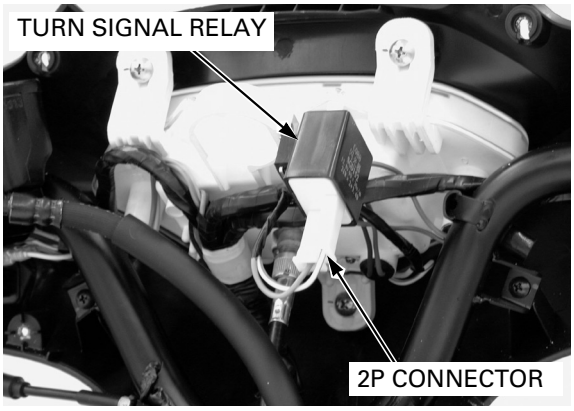
INSPECTION

Remove the front handlebar cover (page 2-10).

Check the following:

- Battery condition
- Burned out bulb or non-specified wattage
- Burned fuse
- Ignition switch and turn signal switch function
- Loose connector

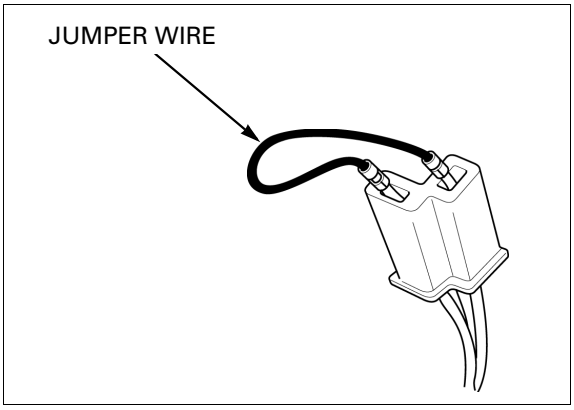
Disconnect the turn signal relay 2P connector from the relay.



Short the White/Green and Gray terminals of the turn signal relay connector with a jumper wire.
Start the engine and check the turn signal light by turning the switch ON.

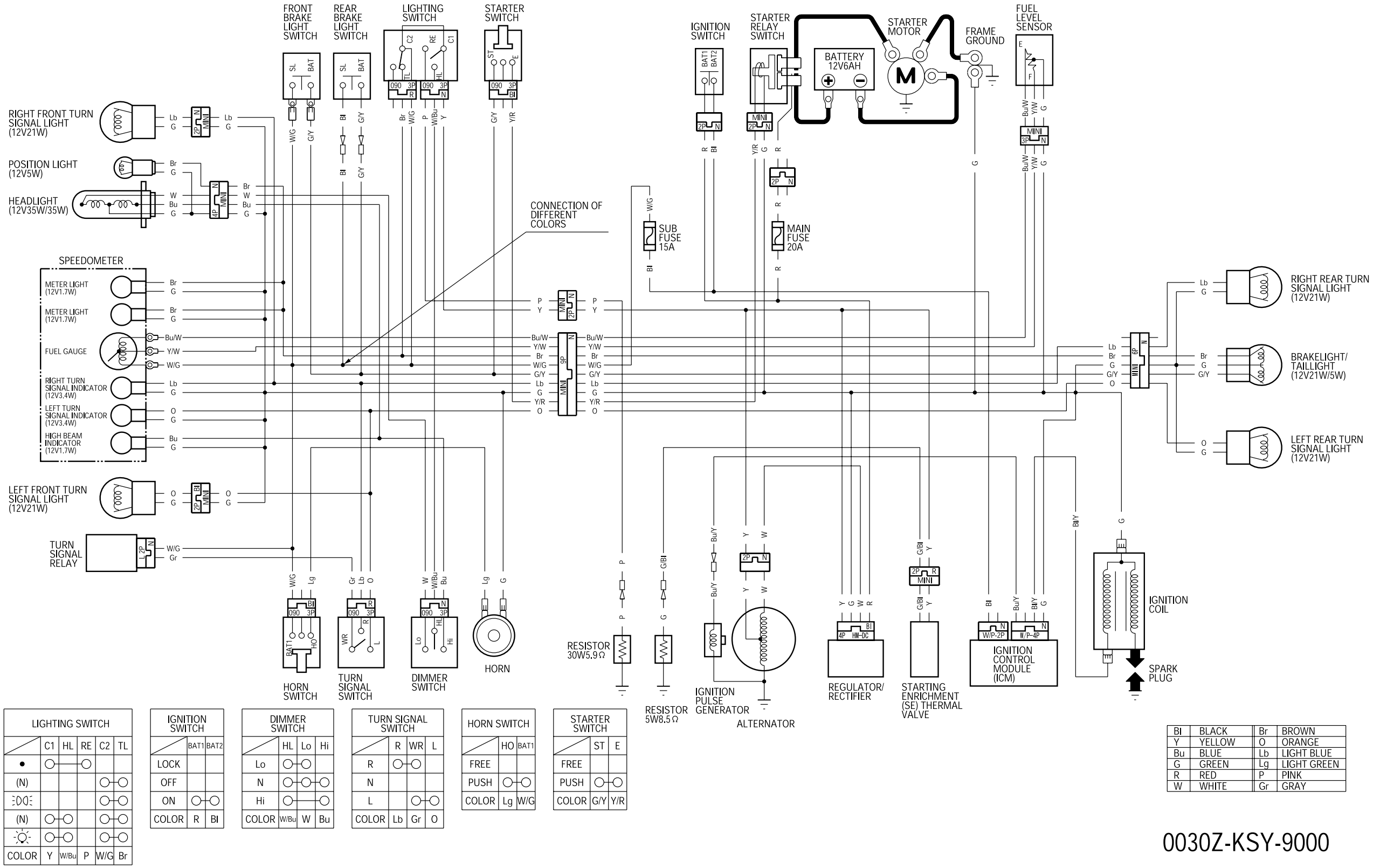
If the light comes on, the turn signal relay is faulty or the connector is poor connection.

If the light does not come on, the wire harness is broken.



20. WIRING DIAGRAMS

TYPE I, III



LIGHTING SWITCH					
	C1	HL	RE	C2	TL
•	○		○		
(N)				○	○
≡D0≡				○	○
(N)	○	○		○	○
☼	○	○		○	○
COLOR	Y	W/Bu	P	W/G	Br

IGNITION SWITCH		
	BAT1	BAT2
LOCK		
OFF		
ON	○	○
COLOR	R	Bl

DIMMER SWITCH			
	HL	Lo	Hi
Lo	○	○	
N	○	○	○
Hi	○		○
COLOR	W/Bu	W	Bu

TURN SIGNAL SWITCH			
	R	WR	L
R	○	○	
N			
L		○	○
COLOR	Lb	Gr	O

HORN SWITCH		
	HO	BAT1
FREE		
PUSH	○	○
COLOR	Lg	W/G

STARTER SWITCH		
	ST	E
FREE		
PUSH	○	○
COLOR	G/Y	Y/R

Bl	BLACK	Br	BROWN
Y	YELLOW	O	ORANGE
Bu	BLUE	Lb	LIGHT BLUE
G	GREEN	Lg	LIGHT GREEN
R	RED	P	PINK
W	WHITE	Gr	GRAY

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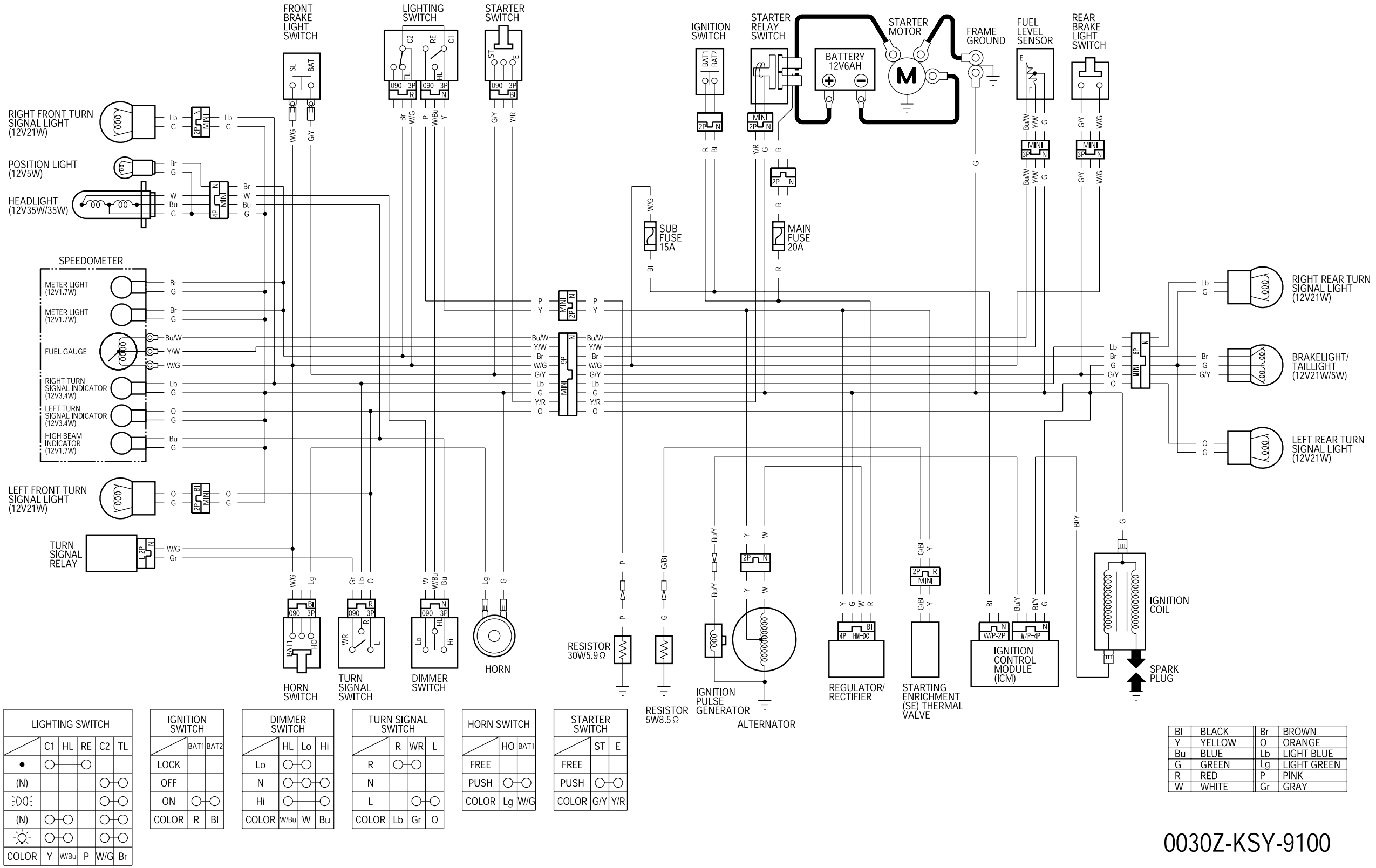
TYPE II, IV



LIGHTING SWITCH					
	C1	HL	RE	C2	TL
•	○		○		
(N)				○	○
				○	○
(N)	○	○		○	○
	○	○		○	○
COLOR	Y	W/Bu	P	W/G	Br

IGNITION SWITCH		
	BAT1	BAT2
LOCK		
OFF		
ON	○	○
COLOR	R	Bl

DIMMER SWITCH			
	HL	Lo	Hi
Lo	○	○	
N	○	○	○
Hi	○		○
COLOR	W/Bu	W	Bu

TURN SIGNAL SWITCH			
	R	WR	L
R	○	○	
N			
L		○	○
COLOR	Lb	Gr	O

HORN SWITCH		
	HO	BAT1
FREE		
PUSH	○	○
COLOR	Lg	W/G

STARTER SWITCH		
	ST	E
FREE		
PUSH	○	○
COLOR	G/Y	Y/R

Bl	BLACK	Br	BROWN
Y	YELLOW	O	ORANGE
Bu	BLUE	Lb	LIGHT BLUE
G	GREEN	Lg	LIGHT GREEN
R	RED	P	PINK
W	WHITE	Gr	GRAY

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21. TROUBLESHOOTING

ENGINE DOES NOT START OR IS HARD TO START

1. **Spark Test**

   Perform spark test.

   Is there weak or no spark?

   YES – • Faulty spark plug
   • Fouled spark plug
   • Loose or disconnected ignition system wires
   • Broken or shorted spark plug wire
   • Faulty ignition coil
   • Faulty igniting pulse generator
   • Faulty ignition switch
   • Faulty ignition control module (ICM)

   NO – GO TO STEP 2.

2. **Spark Plug Inspection**

   Remove and inspect spark plug.

   Is the spark plug wet?

   YES – • Flooded carburetor
   • Throttle valve open
   • Dirty air cleaner
   • Improperly adjusted pilot screw

   NO – GO TO STEP 3.

3. **Fuel Line Inspection**

   Check fuel flow to carburetor.

   Does fuel reach the carburetor?

   NO – • Clogged fuel hose or fuel strainer
   • Clogged fuel valve
   • Clogged fuel fill cap breather

   YES – GO TO STEP 4.

4. **Starting Enrichment (SE) Thermal Valve**

   Let the engine cool down for 30 minute or more, then insert a vinyl hose into the fuel enrichment circuit and blow into the hose.

   Does the air flow into the circuit.?

   NO – Faulty starting enrichment (SE) thermal valve

   YES – GO TO STEP 5.

5. **Cylinder Compression**

   Test cylinder compression.

   Is the compression low?

   YES – • Valve clearance too small
   • Valve stuck open
   • Worn cylinder and piston rings
   • Damaged cylinder head gasket
   • Seized valve
   • Improper valve timing

   NO – GO TO STEP 6.

6. **Engine Starting Condition**

   Start engine by following normal procedure.

   Does the engine start then stops?

   YES – • Faulty starting enrichment (SE) thermal valve
   • Incorrectly adjusted carburetor
   • Leaking carburetor insulator
   • Improper ignition timing (Faulty ICM or ignition pulse generator)
   • Contaminated fuel

ENGINE LACKS POWER

1. **Rear wheel drag Inspection**

   Raise wheel off the ground and spin by hand.

   Does the wheel spin freely?

   NO – • Brake dragging
   • Worn or damaged final reduction bearings

   YES – GO TO STEP 2.

2. **Tire Pressure Inspection**

   Check tire pressure.

   Are the tire pressures low?

   YES – • Faulty tire valve
   • Punctured tire

   NO – GO TO STEP 3.

3. **Drive Train Inspection**

   Accelerate rapidly.

   Does the engine speed change accordingly?

   NO – • Clutch slipping
   • Worn clutch shoes/outer
   • Weak driven face spring
   • Weight roller stuck
   • Additive in engine oil

   YES – GO TO STEP 4.

4. **Engine Condition Inspection**

   Accelerate lightly.

   Does the engine speed increase?

   NO – • Fuel/air mixture too rich or lean
   • Clogged air cleaner
   • Restricted fuel flow
   • Clogged muffler
   • Clogged fuel tank cap breather

   YES – GO TO STEP 5.

5. **Engine Performance Inspection**

   Accelerate or run at high speed.

   Is there knocking?

   YES – • Worn piston and cylinder
   • Use of poor quality fuel
   • Excessive carbon build-up in combustion chamber
   • Ignition timing too advance (Faulty ICM)
   • Lean fuel mixture

   NO – GO TO STEP 6.

6. **Ignition Timing Inspection**

   Check ignition timing.

   Is the ignition timing correct?

   NO – • Faulty ignition control module (ICM)
   • Faulty ignition pulse generator

   YES – GO TO STEP 7.

7. Spark Plug Inspection

Remove and inspect spark plug.

Is the spark plug fouled or discolored?

NO – • Plugs not serviced frequently enough
• Incorrect spark plug used
• Incorrect spark plug gap

YES – GO TO STEP 8.

8. Carburetor Inspection

Check carburetor for clogging.

Is the carburetor for clogged?

YES – Carburetor not serviced frequently enough

NO – GO TO STEP 9.

9. Cylinder compression Inspection

Test the cylinder compression.

Is the compression low?

YES – • Valve clearance too small
• Valve stuck open
• Worn cylinder and piston rings
• Damaged head gasket
• Improper valve timing

NO – GO TO STEP 10.

10. Engine Oil Inspection

Check oil level and condition.

Is there correct level and good condition?

NO – • Oil level too high
• Oil level too low
• Contaminated oil

YES – GO TO STEP 11.

11. Lubrication Inspection

Remove cylinder head cover and inspect lubrication.

Is the valve train lubricated properly?

NO – • Clogged oil passage
• Clogged oil strainer

POOR PERFORMANCE AT LOW AND IDLE SPEED

1. **Pilot Screw Inspection**

   Check carburetor pilot screw adjustment.

   Is the adjustment correct?

   NO – See page 5-21

   YES – GO TO STEP 2.

2. **Intake Air Leak Inspection**

   Check for leaking carburetor insulator.

   Is there leaking?

   YES – • Loose carburetor insulator bands
   • Damaged insulator

   NO – GO TO STEP 3.

3. **Starting Enrichment (SE) Thermal Valve**

   Inspect the starting enrichment (SE) thermal valve (page 5-23).

   Does the starting enrichment (SE) thermal valve operate normally?

   NO – Faulty starting enrichment (SE) thermal valve

   YES – GO TO STEP 4.

4. **Spark Test**

   Perform spark test.

   Is there weak or intermittent spark?

   YES – • Faulty spark plug
   • Fouled spark plug
   • Loose or disconnected ignition system wires
   • Broken or shorted spark plug wire
   • Faulty ignition coil
   • Faulty ignition pulse generator
   • Faulty ignition switch
   • Faulty ignition control module (ICM)

   NO – GO TO STEP 5.

5. **Ignition Timing Inspection**

   Check ignition timing.

   Is the ignition timing correct?

   NO – • Faulty ignition control module (ICM)
   • Faulty ignition pulse generator
   • Improper valve timing

POOR PERFORMANCE AT HIGH SPEED

1. **Fuel Line Inspection**

   Disconnect fuel line at carburetor and vacuum the fuel auto valve (page 5-30).

   Does fuel flow freely?

   NO – • Clogged fuel line
   • Clogged fill cap breather
   • Faulty fuel auto valve
   • Clogged fuel strainer

   YES – GO TO STEP 2.

2. **Carburetor Inspection**

   Check carburetor for clogging.

   Is the carburetor clogged?

   YES – Carburetor not serviced frequently enough

   NO – GO TO STEP 3.

3. **Ignition Timing Inspection**

   Check ignition timing.

   Is the ignition timing correct?

   NO – • Faulty ignition control module (ICM)
   • Faulty ignition pulse generator

   YES – GO TO STEP 4.

4. **Valve Timing Inspection**

   Check valve timing.

   Is the valve timing correct?

   NO – Cam sprocket not installed properly

   YES – GO TO STEP 5.

5. **Valve Spring Inspection**

   Check valve springs.

   Are the valve springs weak?

   YES – Faulty valve spring

POOR HANDLING

Steering is heavy
- Steering bearing adjustment nut too tight
- Damaged steering head bearings
- Low tire pressure

Either wheel is wobbling
- Excessive wheel bearing play
- Bent rim
- Improperly installed wheel hub
- Excessively worn engine mounting bushings
- Bent frame

Motorcycle pulled to one side
- Front and rear wheels not aligned
- Bent fork
- Faulty shock absorber
- Bent axle
- Bent frame

22. INDEX