

## How to use this manual

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# 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 to be seriously hurt or killed.

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

## For Your Safety

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

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

### **⚠ WARNING**

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

Follow the procedures and precautions in this manual carefully.

## Important Safety Precautions

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

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

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

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

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

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

## How To Use This Manual

This manual describes the service procedures for the NF100.

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

Section 4 through 17 describe parts of the motorcycle, grouped according to location.

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

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

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


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

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

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.

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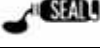


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## How to use this manual

# SYMBOLS

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

	Replace the part(s) with new one(s) before assembly.
	Use the recommend engine oil, unless otherwise specified.
	Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1:1).
	Use multi-purpose grease (lithium based multi-purpose grease NLGI #2 or equivalent).
	Use molybdenum disulfide grease (containing more than 3% molybdenum disulfide, NOGI #2 or equivalent). Example: <ul style="list-style-type: none"><li>• Molykote® BR-2 plus manufactured by Dow Corning U.S.A.</li><li>• Multi-purpose M-2 manufactured by Mitsubishi Oil, Japan</li></ul>
	Use molybdenum disulfide paste (containing more than 40% molybdenum disulfide, NOGI #2 or equivalent). Example: <ul style="list-style-type: none"><li>• Molykote® G-n Paste manufactured by Dow Corning U.S.A.</li><li>• Honda Moly 60 (U.S.A. only)</li><li>• Rocol ASP manufactured by Rocol Limited, U.K.</li><li>• Rocol Paste manufactured by Sumico Lubricant, Japan</li></ul>
	Use silicone grease.
	Apply a locking agent. Use a medium strength locking agent unless otherwise specified.
	Apply sealant.
	Use DOT3 or DOT 4 brake fluid. Use the recommended brake fluid unless otherwise specified.
	Use fork or suspension fluid.

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**MEMO**

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# 1. GENERAL INFORMATION

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## GENERAL INFORMATION

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### SERVICE RULES

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

### DESTINATION CODE

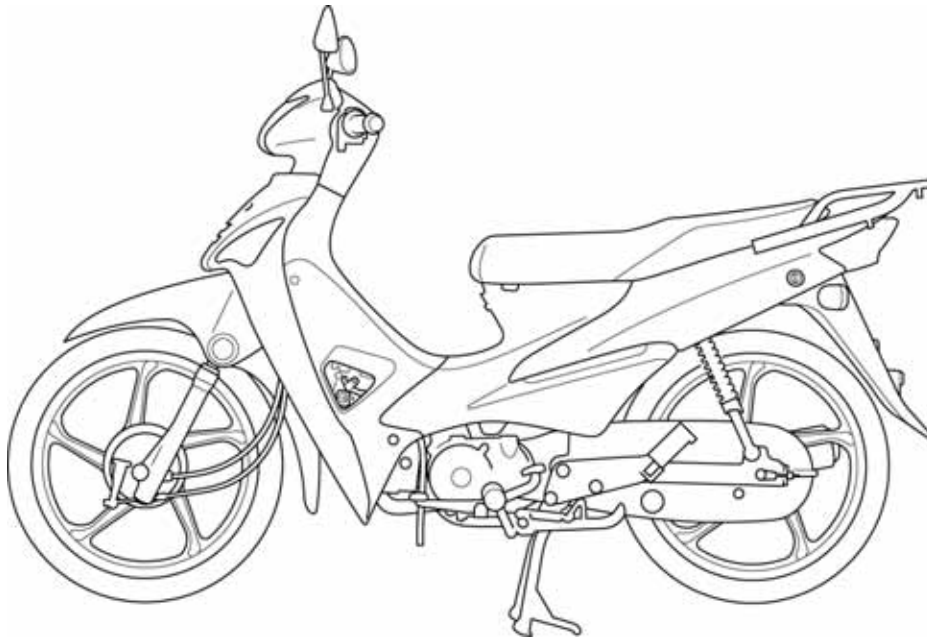
Throughout this manual, the following codes are used to identify individual types for each region.

DESTINATION CODE	REGION
3LA	Latin America 3
AG	Argentina
CO	Colombia
PE	Peru

### MODEL IDENTIFICATION

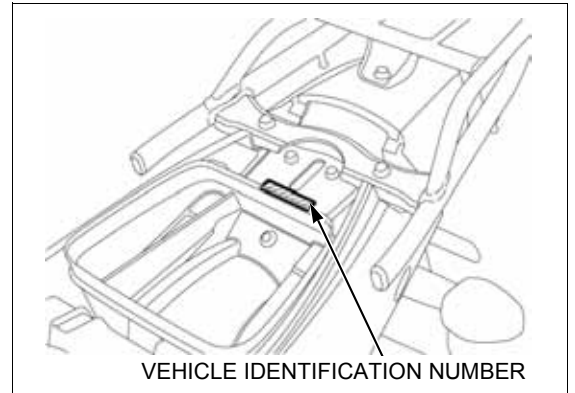
This manual covers 2 types of NF100 models.

- NF100 1SH: Spoke wheel
- NF100 3SH: Cast wheel

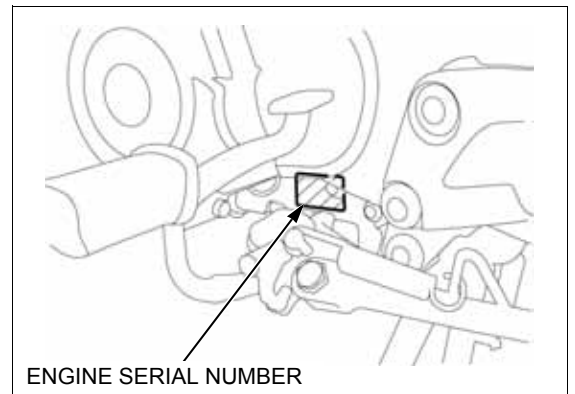


**SERIAL NUMBERS**

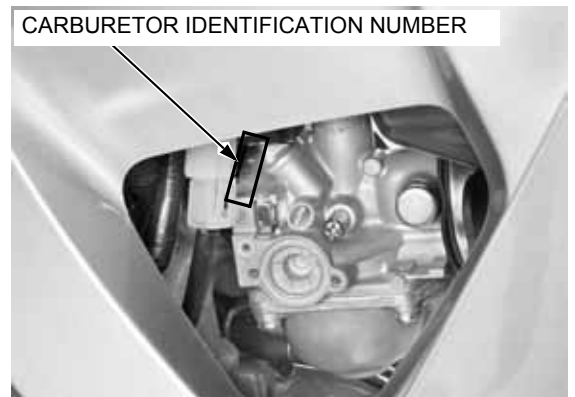
The Vehicle Identification Number (V.I.N) is stamped on the seat stay as shown.



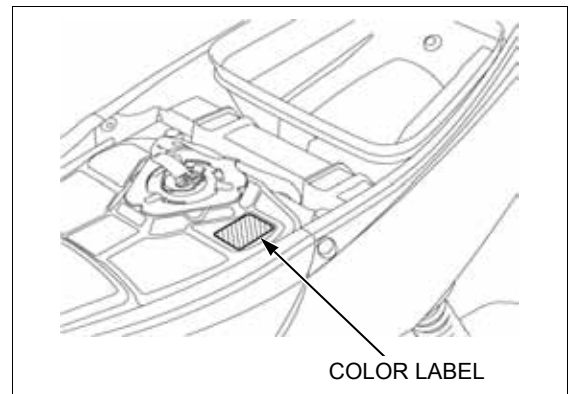
The engine serial number is stamped on the lower left side of the crankcase.



The carburetor identification number is stamped on the intake manifold side of the carburetor body as shown.



The color label is attached on the left side of the fuel tank under the seat. When ordering color-coded parts, always specify the designated color code.





## GENERAL INFORMATION

### GENERAL SPECIFICATIONS

	ITEM	SPECIFICATIONS
DIMENSIONS	Overall length Overall width Overall height Wheelbase Seat height Footpeg height Ground clearance Curb weight	1,903 mm (74.9 in) 717 mm (28.2 in) 1,084 mm (42.7 in) 1,231 mm (48.5 in) 769 mm (30.3 in) 268 mm (10.6 in) 148 mm (5.8 in) 105 kg (231 lbs)
FRAME	Frame type Front suspension Front axle travel Rear suspension Rear axle travel Front tire size Rear tire size Front brake Rear brake Caster angle Trail length Fuel tank capacity	Back bone type Telescopic fork 80 mm (3.1 in) Swingarm 81 mm (3.2 in) 2.50-17 38L 2.75-17 47P Mechanical leading trailing Mechanical leading trailing 26°30' 71 mm (2.8 in) 3.8 liter (1.00 US gal, 0.84 Imp gal)
ENGINE	Bore and stroke Displacement Compression ratio Valve train Intake valve opens at 1.1 mm (0.04 in) lift Intake valve closes at 1.1 mm (0.04 in) lift Exhaust valve opens at 1.1 mm (0.04 in) lift Exhaust valve closes at 1.1 mm (0.04 in) lift Lubrication system Oil pump type Cooling system Air filtration Crankshaft type Engine dry weight Cylinder arrangement	50.0 x 49.5 mm (1.97 x 1.95 in) 97.1 cm <sup>3</sup> (5.92 cu-in) 8.8 : 1 2 valve, single chain driven SOHC 5° BTDC 20° ABDC 35° BBDC -5° ATDC Forced pressure and wet sump Trochoid Air cooled Viscous paper filter Assembled type 23.5 kg (51.8 lbs) Single cylinder inclined 80° from vertical
CARBURETOR	Carburetor Type Venturi dia.	Piston valve type 16 mm (0.6 in) or equivalent
DRIVE TRAIN	Clutch system Clutch operation system Transmission Primary reduction Final reduction Gear ratio 1st 2nd 3rd 4th Gearshift pattern	Multi-plate, wet Automatic centrifugal type Constant mesh, 4-speed 4.058 (69/17) 2.714 (38/14) 2.833 (34/12) 1.705 (29/17) 1.238 (26/21) 0.958 (23/24) Left foot operated return system (rotary system; only when the motorcycle is not running) - N - 1 - 2 - 3 - 4 (- N)
ELECTRICAL	Ignition system Starting system Charging system Regulator/rectifier Lighting system	Condenser Discharged Ignition (CDI) Kickstarter with electric starter motor Single phase output alternator SCR opened/single phase, half wave rectification Alternator

## LUBRICATION SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	At draining	0.7 liter (0.7 US qt, 0.6 Imp qt)	–
	At disassembly	0.9 liter (1.0 US qt, 0.8 Imp qt)	–
Recommended engine oil		Honda "4-stroke motorcycle oil" or equivalent motor oil API service classification: SG or higher (except oils labeled as energy conserving on the circular API service label) JASO T 903 standard: MA Viscosity: SAE 10W-30	–
Oil pump rotor	Tip clearance	0.10 – 0.15 (0.004 – 0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.21 (0.006 – 0.008)	0.35 (0.014)
	Side clearance	0.03 – 0.09 (0.001 – 0.004)	0.15 (0.006)

## FUEL SYSTEM SPECIFICATIONS

ITEM	SPECIFICATIONS
Carburetor identification number	VM16G
Main jet	#72.5
Slow jet	#12.5 x $\Phi$ 0.4
Air screw initial opening	See page 5-16
Float level	18.2 mm (0.72 in)
Engine idle speed	1,400 $\pm$ 100 min <sup>-1</sup> (rpm)
Throttle grip freeplay	2 – 6 mm (0.1 – 0.2 in)
PAIR control valve specified vacuum	60 kPa (450 mmHg)

## CYLINDER HEAD/VALVES SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			1,177 kPa (12.0 kgf/cm <sup>2</sup> , 171 psi) at 600 min <sup>-1</sup> (rpm)	–
Cylinder head warpage			–	0.05 (0.002)
Valve, valve guide	Valve clearance	IN/EX	0.10 (0.004)	–
	Valve stem O.D.	IN	4.975 – 4.990 (0.1959 – 0.1965)	4.92 (0.194)
		EX	4.955 – 4.970 (0.1951 – 0.1957)	4.92 (0.194)
	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 – 0.0017)	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	IN/EX	32.41 (1.276)	30.9 (1.22)
	Outer	IN/EX	35.25 (1.388)	34.0 (1.34)
Rocker arm/ shaft	Rocker arm I.D.	IN/EX	10.200 – 10.260 (0.4016 – 0.4039)	10.10 (0.398)
	Rocker arm shaft O.D.	IN/EX	9.972 – 9.987 (0.3926 – 0.3932)	9.91 (0.390)
Camshaft	Cam lobe height	IN	26.003 – 26.243 (1.0237 – 1.0332)	26.26 (1.034)
		EX	25.815 – 26.055 (1.0163 – 1.0258)	26.00 (1.024)
Cam chain tensioner	Push rod O.D.		11.985 – 12.000 (0.4718 – 0.4724)	11.94 (0.470)
	Spring free length		111.3 (4.38)	109 (4.3)

## GENERAL INFORMATION

### CYLINDER/PISTON SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Cylinder	I.D.	50.005 – 50.015 (1.9687 – 1.9691)	50.05 (1.970)	
	Out-of-round	–	0.10 (0.004)	
	Taper	–	0.10 (0.004)	
	Warpage	–	0.05 (0.002)	
Piston, piston rings	Piston mark direction	"IN" mark facing toward the intake side	–	
	Piston O.D.	49.980 – 49.995 (1.9677 – 1.9683)	49.90 (1.965)	
	Piston O.D. measurement point	15 mm (0.6 in) from bottom of skirt	–	
	Piston pin bore I.D.	13.002 – 13.008 (0.5119 – 0.5121)	13.055 (0.5140)	
	Piston pin O.D.	12.994 – 13.000 (0.5116 – 0.5118)	12.98 (0.511)	
	Piston-to-piston pin clearance	0.002 – 0.014 (0.0001 – 0.0006)	0.020 (0.0008)	
	Piston ring-to-ring groove clearance	Top	0.015 – 0.045 (0.0006 – 0.0018)	0.12 (0.005)
		Second	0.015 – 0.045 (0.0006 – 0.0018)	0.12 (0.005)
	Piston ring end gap	Top	0.10 – 0.25 (0.004 – 0.010)	0.5 (0.02)
		Second	0.10 – 0.25 (0.004 – 0.010)	0.5 (0.02)
Oil (side rail)		0.20 – 0.70 (0.008 – 0.028)	1.1 (0.04)	
Cylinder-to-piston clearance		0.010 – 0.035 (0.0004 – 0.0014)	0.15 (0.006)	
Connecting rod small end I.D.		13.016 – 13.028 (0.5124 – 0.5129)	13.10 (0.516)	
Connecting rod-to-piston pin clearance		0.016 – 0.034 (0.0006 – 0.0013)	0.08 (0.003)	

### CLUTCH/GEARSHIFT LINKAGE SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Manual clutch	Disc thickness	2.80 – 2.90 (0.110 – 0.114)	2.6 (0.10)
	Plate warpage	–	0.20 (0.008)
	Clutch spring free length	25.7 (1.01)	25.2 (0.99)
	Clutch outer guide O.D.	20.959 – 20.980 (0.8252 – 0.8260)	20.91 (0.832)
	Clutch outer I.D.	21.020 – 21.041 (0.8276 – 0.8284)	21.09 (0.830)
Centrifugal clutch	Clutch drum I.D.	104.0 – 104.2 (4.09 – 4.10)	104.3 (4.11)
	Clutch weight lining thickness	1.5 (0.06)	1.0 (0.04)
	One-way clutch drum I.D.	42.000 – 42.020 (1.6535 – 1.6543)	42.04 (1.655)
	One-way clutch roller O.D.	4.990 – 5.000 (0.1965 – 0.1969)	4.97 (0.196)
	Primary drive gear I.D.	19.030 – 19.058 (0.7492 – 0.7503)	19.11 (0.752)
	Crankshaft O.D. at primary drive gear	18.967 – 18.980 (0.7467 – 0.7472)	18.92 (0.745)

**CRANKSHAFT/TRANSMISSION/KICKSTARTER SPECIFICATIONS**

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod side clearance	0.10 – 0.35 (0.004 – 0.014)	0.60 (0.024)
	Connecting rod radial clearance	0 – 0.008 (0 – 0.0003)	0.05 (0.002)
	Runout	–	0.10 (0.004)
Transmission	Gear I.D.	M2, M4	17.016 – 17.043 (0.6699 – 0.6710)
		C1	23.020 – 23.041 (0.9063 – 0.9071)
		C3	20.020 – 20.041 (0.7882 – 0.7890)
	Bushing O.D.	C1	22.979 – 23.000 (0.9047 – 0.9055)
	Bushing I.D.	C1	20.000 – 20.021 (0.7874 – 0.7882)
	Gear-to-bushing clearance	C1	0.020 – 0.062 (0.0008 – 0.0024)
	Mainshaft O.D.	M2, M4	16.966 – 16.984 (0.6680 – 0.6687)
	Countershaft O.D.	C1, C3	19.959 – 19.980 (0.7858 – 0.7866)
	Gear-to-shaft clearance	M2, M4	0.032 – 0.077 (0.0013 – 0.0030)
		C3	0.040 – 0.082 (0.0016 – 0.0032)
Bushing-to-shaft clearance at C1 gear		0.020 – 0.062 (0.0008 – 0.0024)	
Shift fork/ Shift drum	Shift fork I.D.	34.075 – 34.100 (1.3415 – 1.3425)	
	Claw thickness	4.86 – 4.94 (0.191 – 0.194)	
	Shift drum O.D.	33.950 – 33.975 (1.3366 – 1.3376)	
Kickstarter	Pinion I.D.	20.000 – 20.021 (0.7874 – 0.7882)	
	Spindle O.D.	19.959 – 19.980 (0.7858 – 0.7866)	

**FRONT WHEEL/BRAKE/SUSPENSION/STEERING SPECIFICATIONS**

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	To indicator
Cold tire pressure	Driver only	200 kPa (2.00 kgf/cm <sup>2</sup> , 29 psi)	–
	Driver and passenger	200 kPa (2.00 kgf/cm <sup>2</sup> , 29 psi)	–
Axle runout		–	0.20 (0.008)
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Wheel hub-to-rim distance (Spoke wheel type)		8.0 ± 1.0 (0.31 ± 0.04)	–
Brake	Brake drum I.D.	110.0 – 110.2 (4.33 – 4.34)	111.0 (4.37)
	Brake lever freeplay	10 – 20 (0.4 – 0.8)	–
Fork	Spring free length	343.5 (13.52)	–
	Spring direction	With the tightly wound side facing down	–
	Pipe runout	–	0.20 (0.008)
	Recommended fork fluid	Fork fluid	–
	Fluid level	68.5 (2.70)	–
	Fluid capacity	64 ± 1 cm <sup>3</sup> (2.16 ± 0.03 US oz, 2.25 ± 0.04 Imp oz)	–

**REAR WHEEL/BRAKE/SUSPENSION SPECIFICATIONS**

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	To indicator
Cold tire pressure	Driver only	225 kPa (2.25 kgf/cm <sup>2</sup> , 33 psi)	–
	Driver and passenger	280 kPa (2.80 kgf/cm <sup>2</sup> , 41 psi)	–
Axle runout		–	0.20 (0.008)
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Wheel hub-to-rim distance (Spoke wheel type)		6.0 ± 1.0 (0.24 ± 0.04)	–
Drive chain	Size – link	428 – 104	–
	Slack	30 – 40 (1.2 – 1.6)	–
Brake drum I.D.		110.0 – 110.2 (4.33 – 4.34)	111.0 (4.37)
Brake pedal freeplay		20 – 30 (0.8 – 1.2)	–

## GENERAL INFORMATION

### BATTERY/CHARGING SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS	
Battery	Capacity	12 V – 5.0 Ah	
	Current leakage	0.1 mA max.	
	Voltage (20°C/68°F)	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.3 V
	Charging current (20°C/68°F)	Normal	0.5 A/5 – 10 h
Quick		5.0 A/0.5 h	
Alternator	Capacity	0.085 kW/5,000 min <sup>-1</sup> (rpm)	
	Charging coil resistance (20°C/68°F)	0.2 – 2.0 Ω	

### IGNITION SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS
Spark plug	Standard	CR6HSA (NGK)
	Optional	CR7HSA (NGK)
Spark plug gap		0.60 – 0.70 mm (0.024 – 0.028 in)
Ignition coil primary peak voltage		100 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Alternator exciter coil peak voltage		100 V minimum
Ignition timing ("F" mark)		15° BTDC at idle

### ELECTRIC STARTER SYSTEM SPECIFICATIONS

ITEM	STANDARD	Unit: mm (in)
		SERVICE LIMIT
Starter motor brush length	12.0 (0.47)	4.0 (0.16)

### LIGHTS/METERS/SWITCHES SPECIFICATIONS

ITEM		SPECIFICATIONS
Bulbs	Headlight (High/Low)	12 V – 35/35 W
	Position light	12 V – 5 W
	Brake/tail light	12 V – 21/5 W
	Front turn signal light	12 V – 21 W x 2
	Rear turn signal light	12 V – 21 W x 2
	Meter light	12 V – 1.7 W x 2
	Turn signal indicator	12 V – 3.4 W x 2
	High beam indicator	12 V – 1.7 W
	Gear position indicator	12 V – 1.7 W x 4
	Neutral indicator	12 V – 1.7 W
Main fuse		10 A
Alternator lighting coil resistance (20°C/68°F)		0.1 – 1.0 Ω

## STANDARD TORQUE VALUES

FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)	FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)
5 mm hex bolt and nut	5 (0.51, 3.7)	5 mm screw	4 (0.41, 3.0)
6 mm bolt and nut	10 (1.0, 7)	6 mm screw	9 (0.92, 6.6)
8 mm bolt and nut	22 (2.2, 16)	6 mm flange bolt (8 mm head)	10 (1.0, 7)
10 mm bolt and nut	34 (3.5, 25)	6 mm flange bolt (10 mm head) and nut	12 (1.2, 9)
12 mm bolt and nut	54 (5.5, 40)	8 mm flange bolt and nut	26 (2.7, 20)
		10 mm flange bolt and nut	39 (4.0, 29)

## ENGINE & FRAME TORQUE VALUES

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

### FRAME/BODY PANELS/EXHAUST SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Front turn signal light mounting screw	4	4	1.5 (0.15, 1.1)	
Headlight mounting screw	2	4	1.5 (0.15, 1.1)	
Footpeg bar mounting bolt	4	8	22 (2.2, 16)	
Chain case mounting bolt	3	6	7 (0.71, 5.2)	

### MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Air cleaner housing cover screw	4	5	1.1 (0.11, 0.8)	
Spark plug	1	10	16 (1.6, 12)	
Valve adjuster lock nut	2	5	9 (0.92, 6.6)	
Valve adjuster hole cap	2	30	12 (1.2, 9)	Apply engine oil to the threads and seating surface.
Crankshaft hole cap	1	30	3 (0.31, 2.2)	Apply engine oil to the threads and seating surface.
Timing hole cap	1	14	1.5 (0.15, 1.1)	Apply engine oil to the threads and seating surface.
Oil drain bolt	1	12	24 (2.4, 18)	
Oil centrifugal filter cover screw	3	5	4 (0.41, 3.0)	
Headlight aim bolt	1	4	3 (0.31, 2.2)	
Clutch adjuster lock nut	1	8	12 (1.2, 9)	

### LUBRICATION SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Oil pump cover screw	3	5	5 (0.51, 3.7)	

### FUEL SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Carburetor drain screw	1	–	2.0 (0.20, 1.5)	
Choke lever holder mounting screw	1	5	3.5 (0.36, 2.6)	
Float chamber screw	4	4	2.0 (0.20, 1.5)	
Slow jet	1	–	1.0 (0.10, 0.7)	
Main jet	1	–	1.8 (0.18, 1.3)	
Needle jet holder	1	–	1.8 (0.18, 1.3)	
Fuel valve mounting screw	2	3	1.0 (0.10, 0.7)	
Fuel strainer screen cup	1	22	5.0 (0.51, 3.7)	
PAIR check valve cover screw	2	4	2.0 (0.20, 1.5)	

## GENERAL INFORMATION

### ENGINE REMOVAL/INSTALLATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Drive sprocket fixing plate bolt	2	6	12 (1.2, 9)	
Engine hanger upper nut	1	8	40 (4.1, 30)	
Engine hanger lower nut	1	8	40 (4.1, 30)	

### CYLINDER HEAD/VALVES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder head cover cap nut	4	7	14 (1.4, 10)	
Cylinder head mounting socket bolt	1	6	9 (0.92, 6.6)	
Cylinder head right side cover bolt	2	6	10 (1.0, 7)	
Cam sprocket bolt	2	5	9 (0.92, 6.6)	
Cam chain tensioner sealing bolt	1	14	22 (2.2, 16)	
Cam chain tensioner arm pivot bolt	1	8	16 (1.6, 12)	

### CYLINDER/PISTON

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cam chain guide roller pin bolt	1	8	10 (1.0, 7)	
Cylinder mounting socket bolt	1	6	9 (0.92, 6.6)	

### CLUTCH/GEARSHIFT LINKAGE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Shift drum stopper arm bolt	1	6	10 (1.0, 7)	
Shift return spring pin	1	8	30 (3.1, 22)	
Gearshift cam plate bolt	1	6	17 (1.7, 13)	
Centrifugal clutch lock nut	1	14	42 (4.3, 31)	
Clutch lifter plate flange bolt	4	6	12 (1.2, 9)	
Manual clutch center lock nut	1	14	42 (4.3, 31)	

### ALTERNATOR/STARTER CLUTCH

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Ignition pulse generator mounting bolt	2	5	5 (0.51, 3.7)	
Ignition pulse generator wire holder bolt	1	5	5 (0.51, 3.7)	
Flywheel flange nut	1	10	40 (4.1, 30)	
Starter clutch outer mounting screw	3	6	10 (1.0, 7)	Replace with new ones.

### CRANKSHAFT/TRANSMISSION/KICKSTARTER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Shift drum socket bolt	1	6	10 (1.0, 7)	

## GENERAL INFORMATION

### FRONT WHEEL/BRAKE/SUSPENSION/STEERING

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Steering stem nut	1	26	–	See page 12-27
Steering stem top thread	1	26	–	See page 12-27
Bottom bridge pinch bolt	4	10	74 (7.5, 55)	
Handlebar mounting nut	1	10	59 (6.0, 44)	U-nut
Front axle nut	1	12	49 (5.0, 36)	U-nut
Front spoke (Spoke wheel type)	36	BC 2.9	3.2 (0.33, 2.4)	
Brake lever pivot bolt	1	6	1 (0.10, 0.7)	
Brake lever pivot nut	1	6	6 (0.61, 4.4)	
Front brake arm nut	1	6	10 (1.0, 7)	
Fork cap bolt	2	20	22 (2.2, 16)	
Fork socket bolt	2	8	20 (2.0, 15)	Apply locking agent to the threads.

### REAR WHEEL/BRAKE/SUSPENSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear axle nut	1	12	49 (5.0, 36)	U-nut
Rear axle sleeve nut	1	17	44 (4.5, 32)	
Rear spoke (Spoke wheel type)	36	BC 3.2	3.7 (0.38, 2.7)	
Driven sprocket nut	4	8	32 (3.3, 24)	Apply engine oil to the threads and seating surface.
Driven flange stud bolt	4	8	–	See page 13-13 Apply locking agent to the threads.
Rear brake arm nut	1	6	10 (1.0, 7)	U-nut
Shock absorber upper mounting bolt	2	10	24 (2.4, 18)	
Shock absorber lower mounting cap nut	2	10	24 (2.4, 18)	
Swingarm pivot nut	1	10	39 (4.0, 29)	

### ELECTRIC STARTER SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Starter motor case screw	4	5	4.2 (0.43, 3.1)	



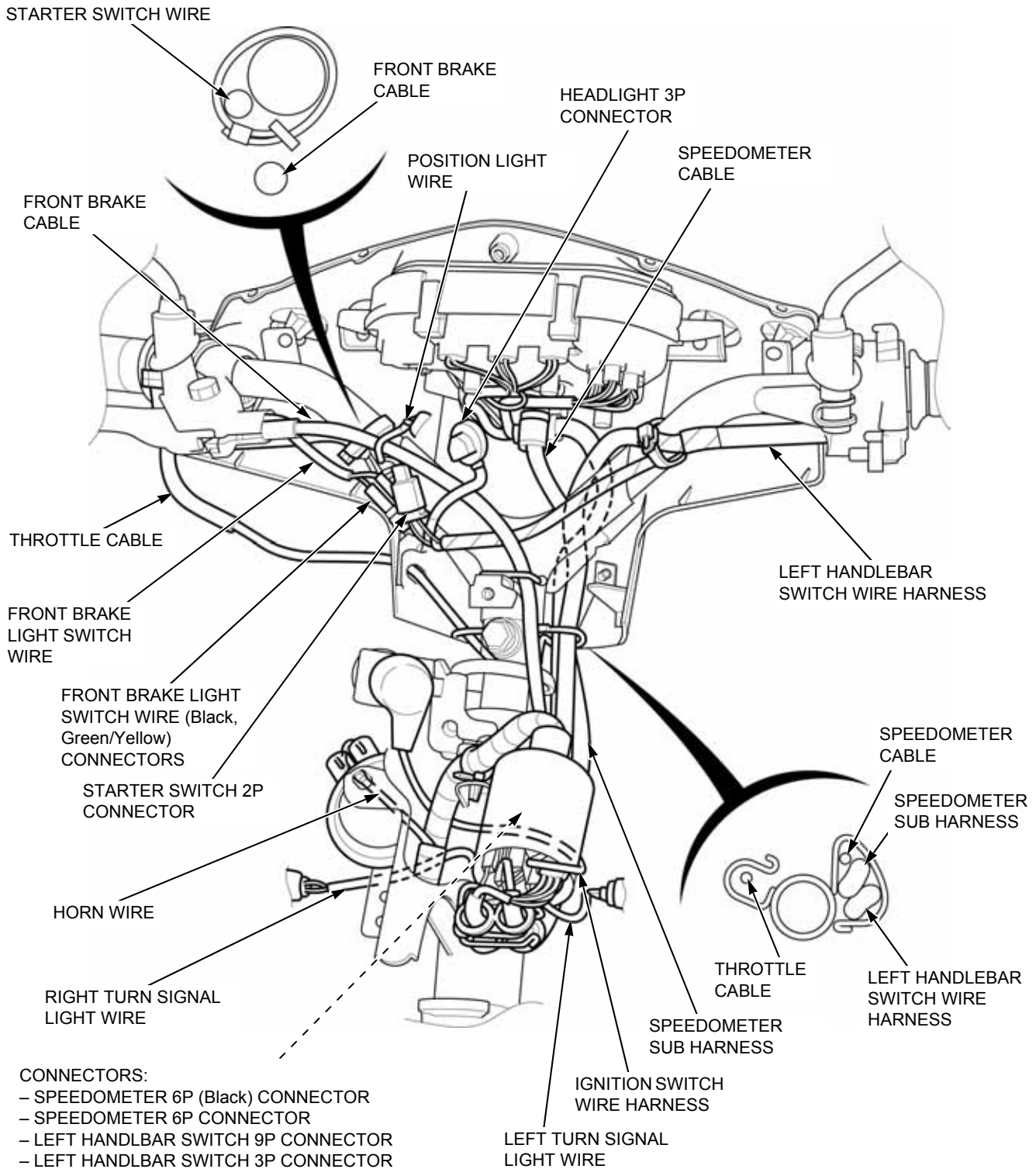


FRAME

MATERIAL	LOCATION	REMARKS
Urea based multi-purpose grease with extreme pressure agent (SHELL ALVANIA EP2 or EXCELITE EP2 manufactured by KYODO YUSHI, Japan.), or equivalent	Steering stem dust seal lips surface Upper inner and outer bearing race Lower inner and outer bearing race	Fill 3 – 5 g Fill 3 – 5 g
Multi-purpose grease	Front/rear axle surface Each wheel bearing Front wheel dust seal lips Rear wheel driven flange dust seal lips Rear wheel hub O-ring all around Front brake panel anchor pin  Front brake cam and shaft rotating area  Front brake panel dust seal lips surface Rear brake cam and shaft rotating area  Rear brake panel anchor pin  Front brake lever pivot sliding surface Rear brake pedal pivot sliding surface Speedometer gear teeth Speedometer gear inner surface Speedometer pinion shaft Speedometer pinion dust seal lips surface Sidestand pivot surface Kickstarter arm sliding area and steel ball Throttle pipe flange groove Throttle pipe slot Steering lock sliding surface Seat lock component sliding portion	No grease and oil on lining surface 0.2 – 0.3 g No grease and oil on lining surface Each 0.2 – 0.3 g  No grease and oil on lining surface Each 0.2 – 0.3g No grease and oil on lining surface 0.2 – 0.3g  Inject 3g 0.2 – 0.3g 0.2 – 0.3g
Silicone grease	Speedometer cable inside of casing	
Gear oil	Front brake cam felt seal  Rear brake cam felt seal	No grease and oil on lining surface No grease and oil on lining surface
Honda bond A or equivalent	Handlebar grip rubber inside Air cleaner housing-to-connecting hose mating surface	Left side only
Fork fluid	Fork oil seal lip Fork dust seal lip Fork cap O-ring	
Molybdenum oil (mixture of the engine oil and Molybdenum grease in a ratio 1 : 1)	Throttle cable surface	
Locking agent	Ignition switch screw threads	

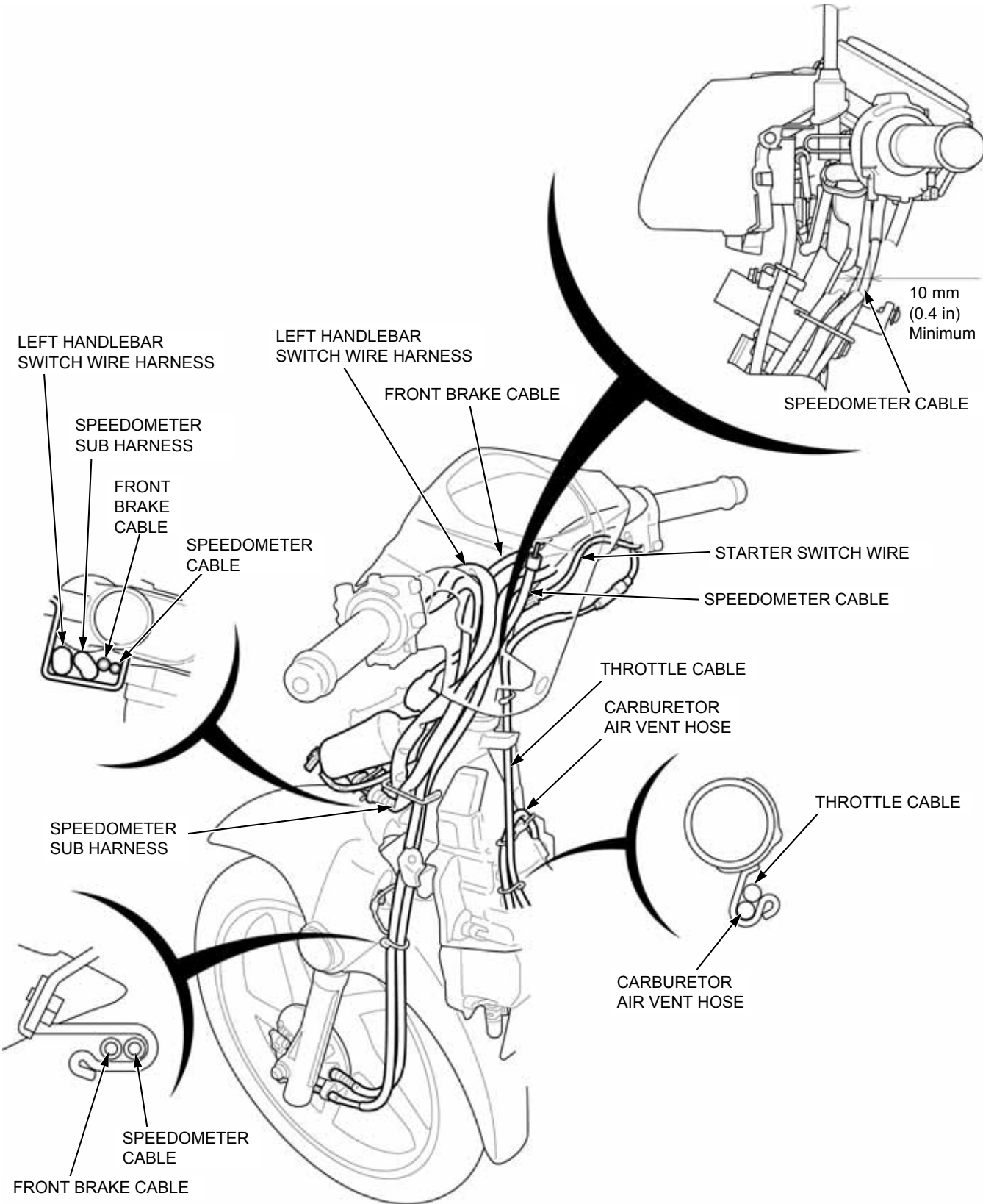
## GENERAL INFORMATION

# CABLE & HARNESS ROUTING

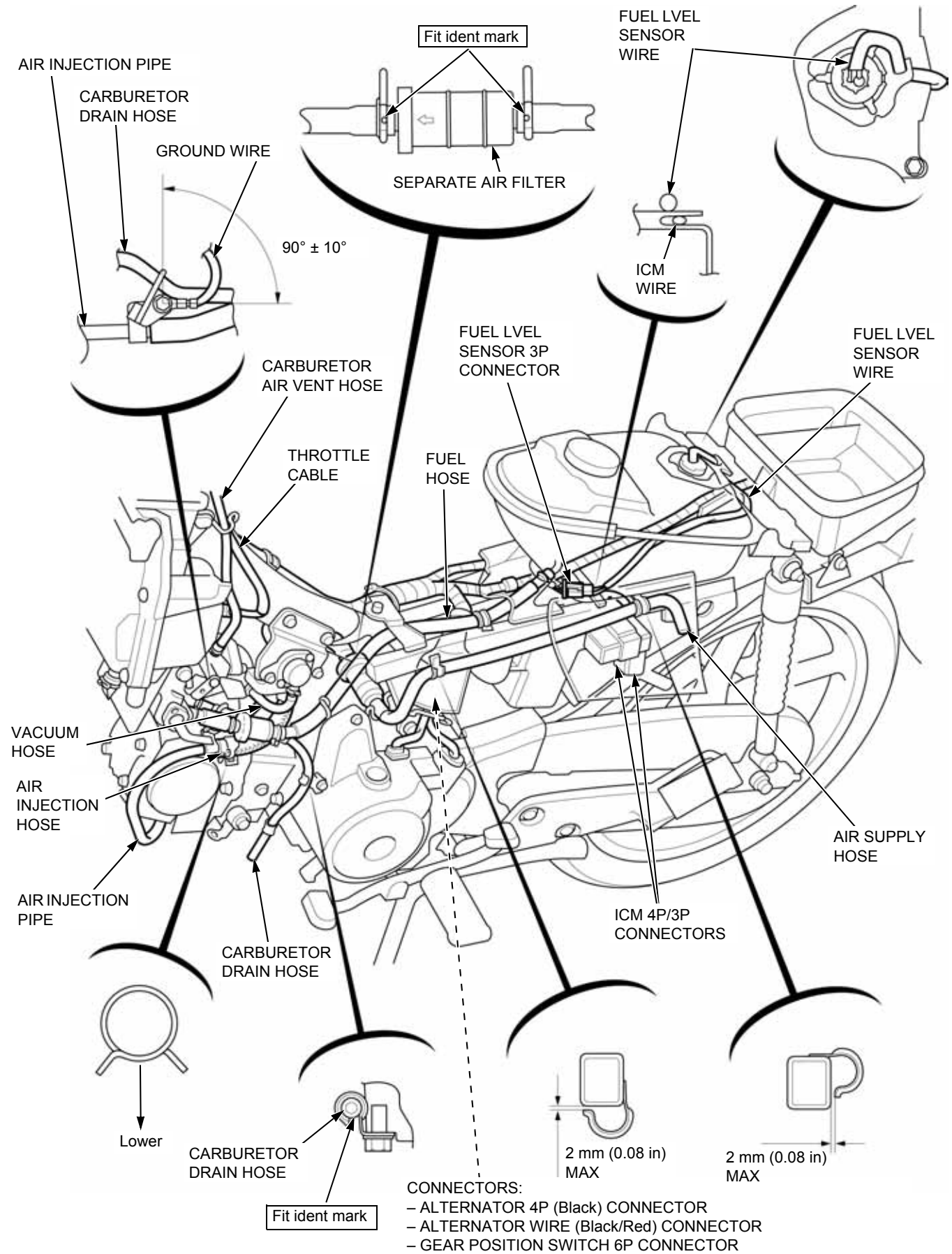


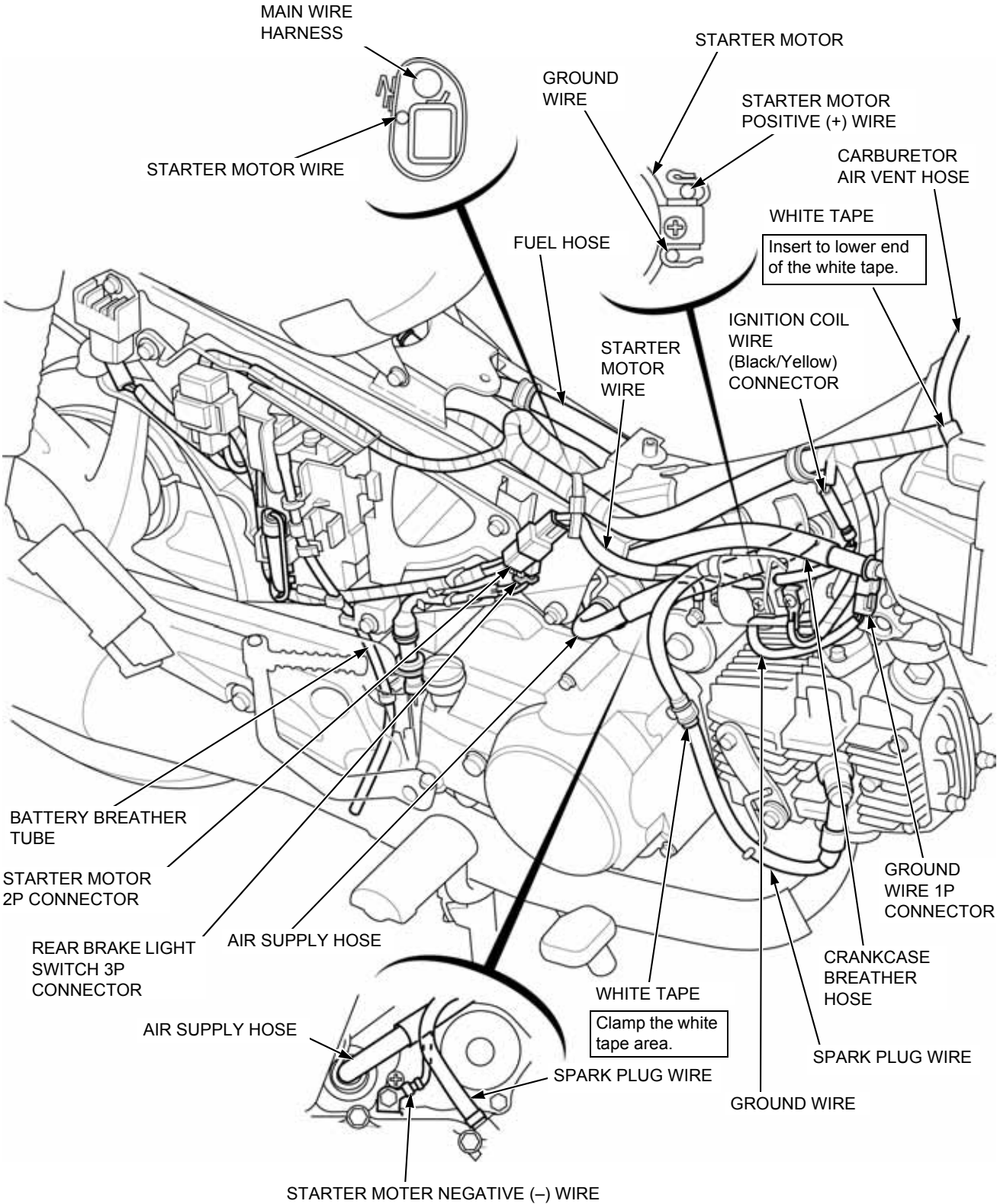
### CONNECTORS:

- SPEEDOMETER 6P (Black) CONNECTOR
- SPEEDOMETER 6P CONNECTOR
- LEFT HANDLEBAR SWITCH 9P CONNECTOR
- LEFT HANDLEBAR SWITCH 3P CONNECTOR
- IGNITION SWITCH 2P CONNECTOR
- IGNITION SWITCH WIRE (Black/White, Green) CONNECTOR
- LEFT FRONT TURN SIGNAL LIGHT 2P (Brown) CONNECTOR
- RIGHT FRONT TURN SIGNAL LIGHT 2P (Black) CONNECTOR

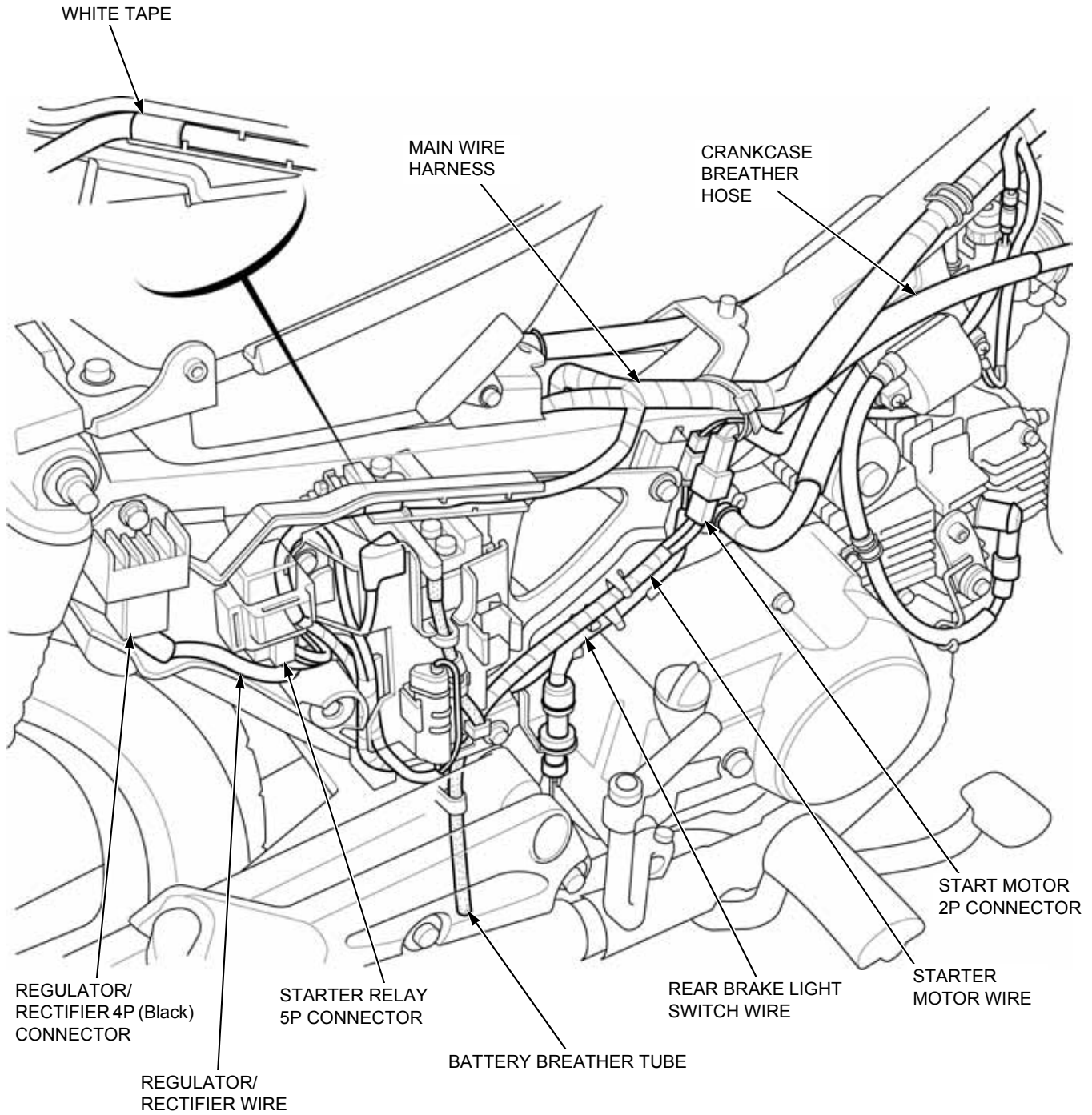


# GENERAL INFORMATION



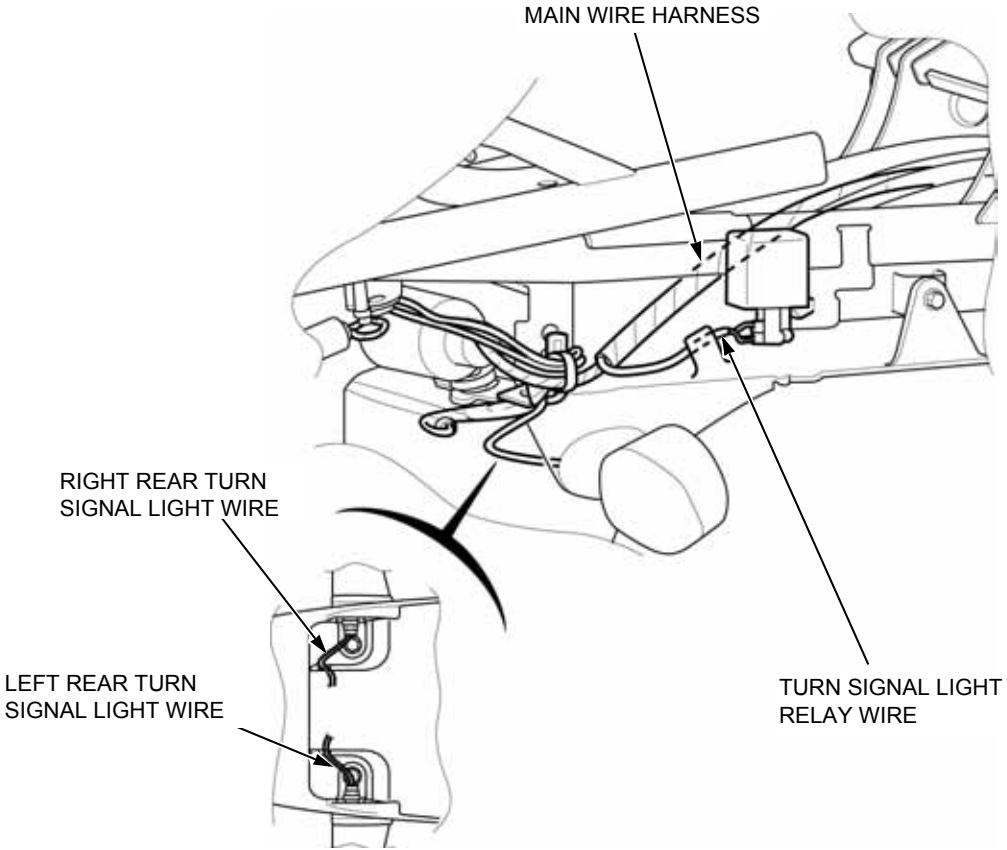
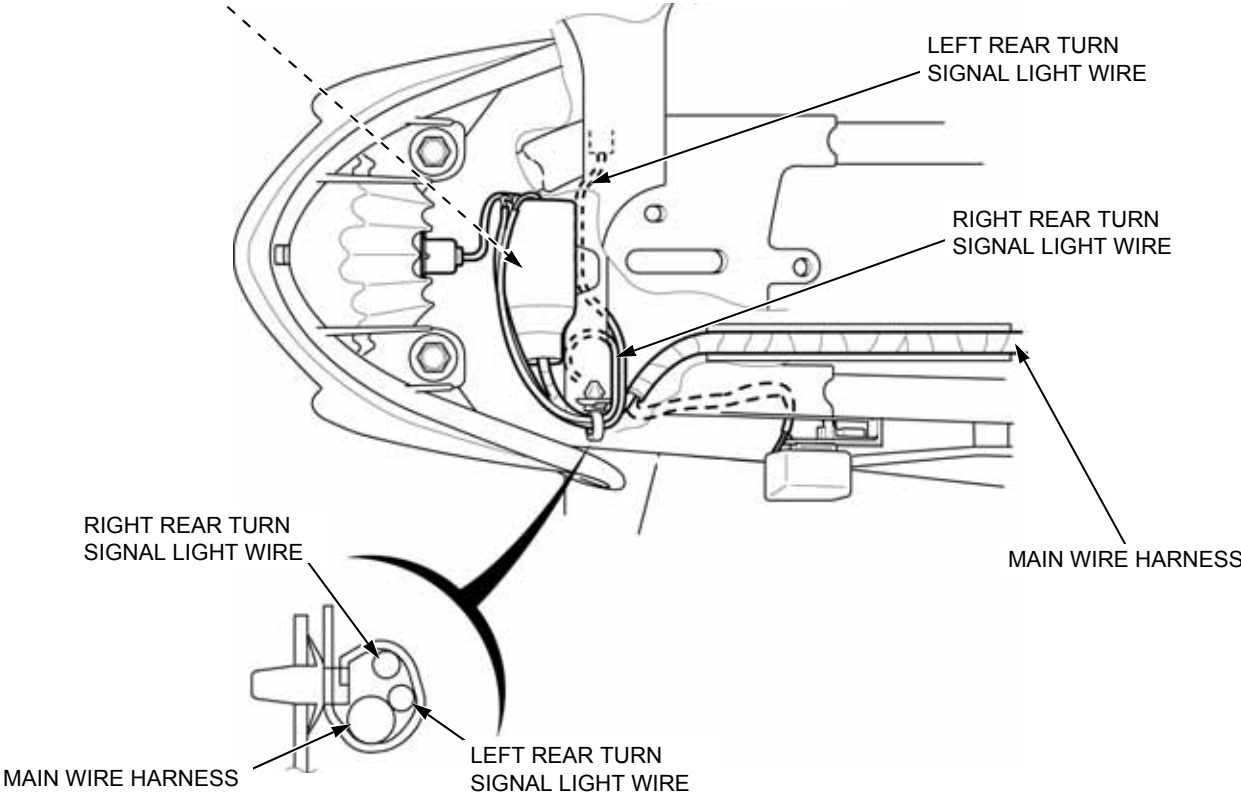


# GENERAL INFORMATION



CONNECTORS:

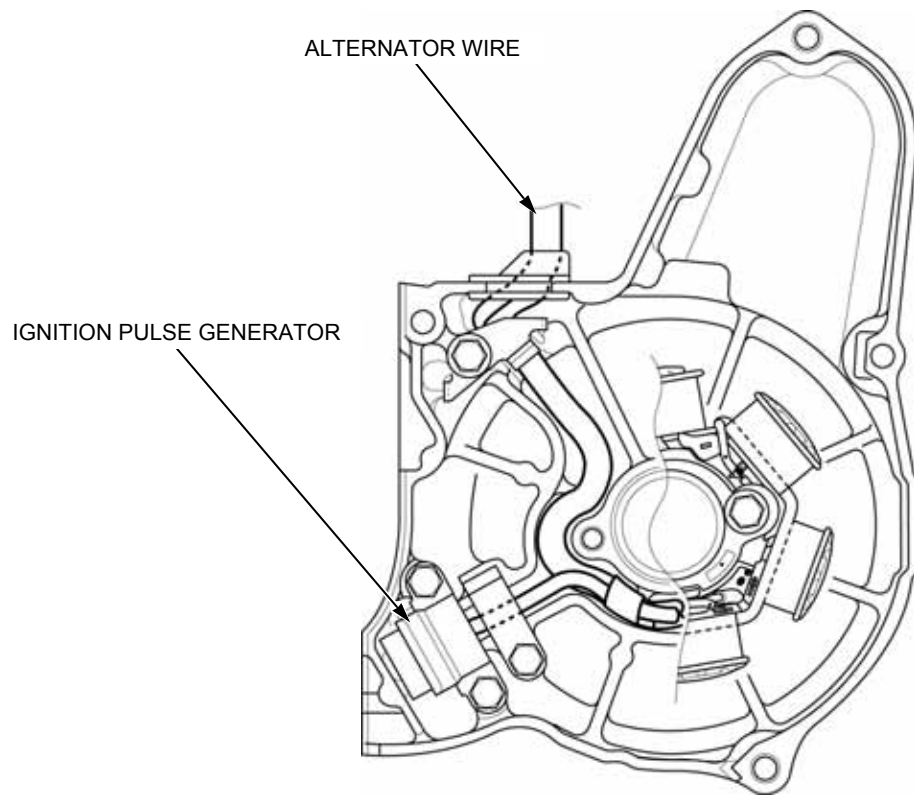
- BRAKE/TAIL LIGHT 3P CONNECTOR
- LEFT REAR TURN SIGNAL LIGHT WIRE (Orange, Green) CONNECTORS
- RIGHT REAR TURN SIGNAL LIGHT WIRE (Light blue, Green) CONNECTORS





## GENERAL INFORMATION

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# EMISSION CONTROL SYSTEMS

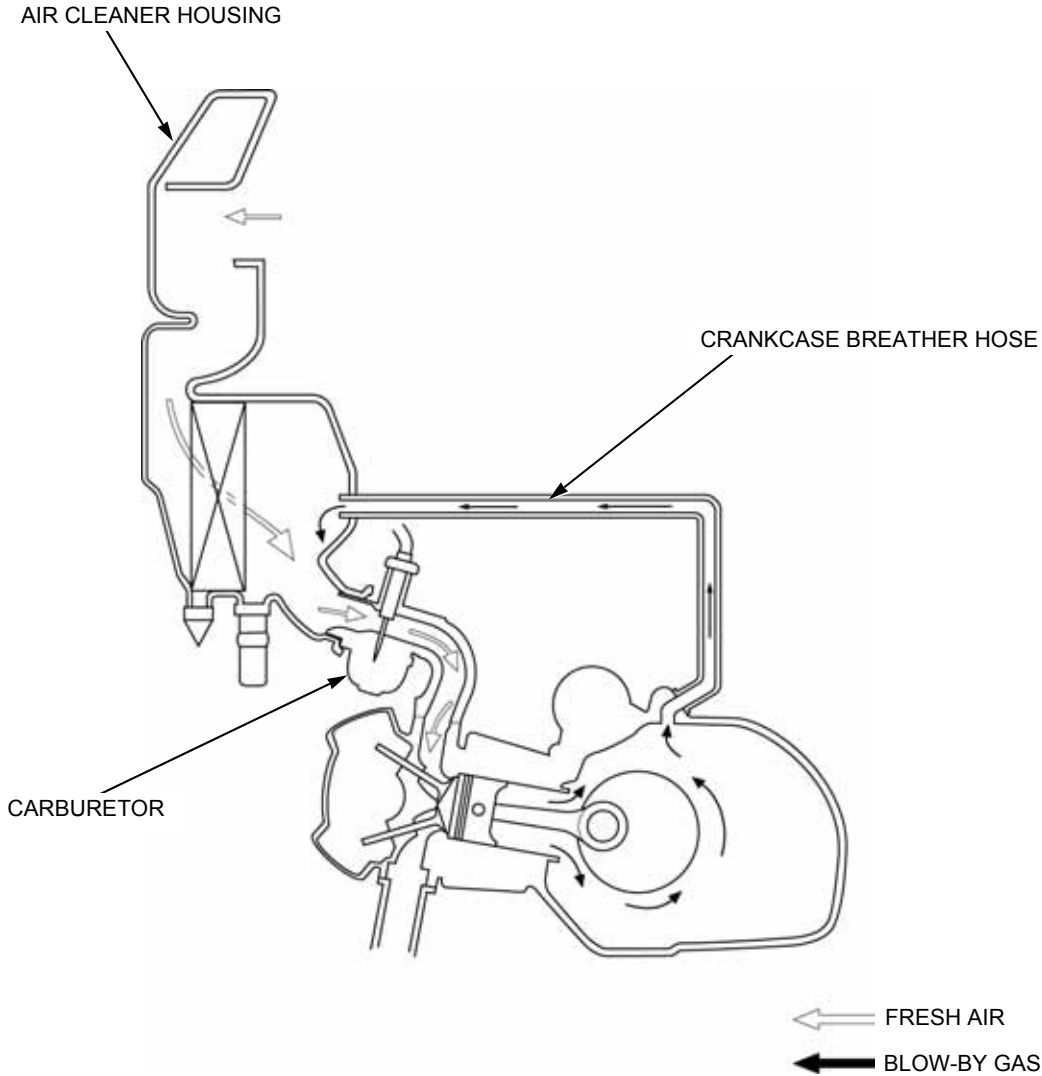
## SOURCE OF EMISSIONS

The combustion process produces carbon monoxide and hydrocarbons (HC). Controlling hydrocarbon emission is very important because, under certain conditions, they react to form photochemical smog when subject 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, oxides of nitrogen and hydrocarbons.

## CRANKCASE EMISSION CONTROL SYSTEM

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



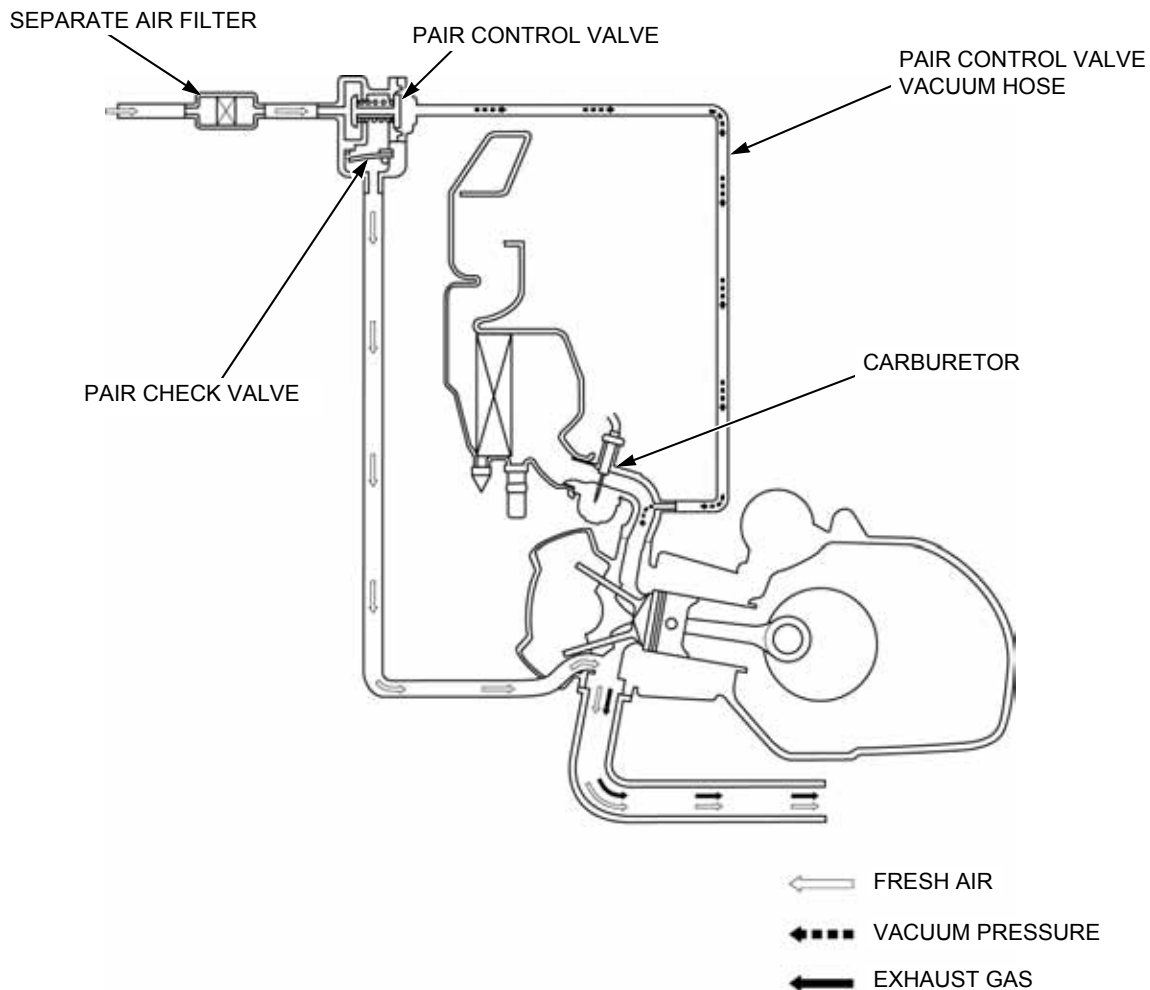
## GENERAL INFORMATION

### EXHAUST EMISSION CONTROL SYSTEM (PULSE SECONDARY AIR INJECTION SYSTEM)

The exhaust emission control system consists of a secondary air supply system which introduces filtered air into the exhaust gases in the exhaust port. Fresh air is drawn into the exhaust port whenever there is a negative pressure pulse in the exhaust system. This change 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 PAIR (pulse secondary air injection) control valve and PAIR check valve. PAIR check valve prevents reverse air flow through the system. The PAIR control valve reacts to high inlet pipe vacuum and will cut off the supply of the 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 is recommended.



### NOISE EMISSION CONTROL SYSTEM

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

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

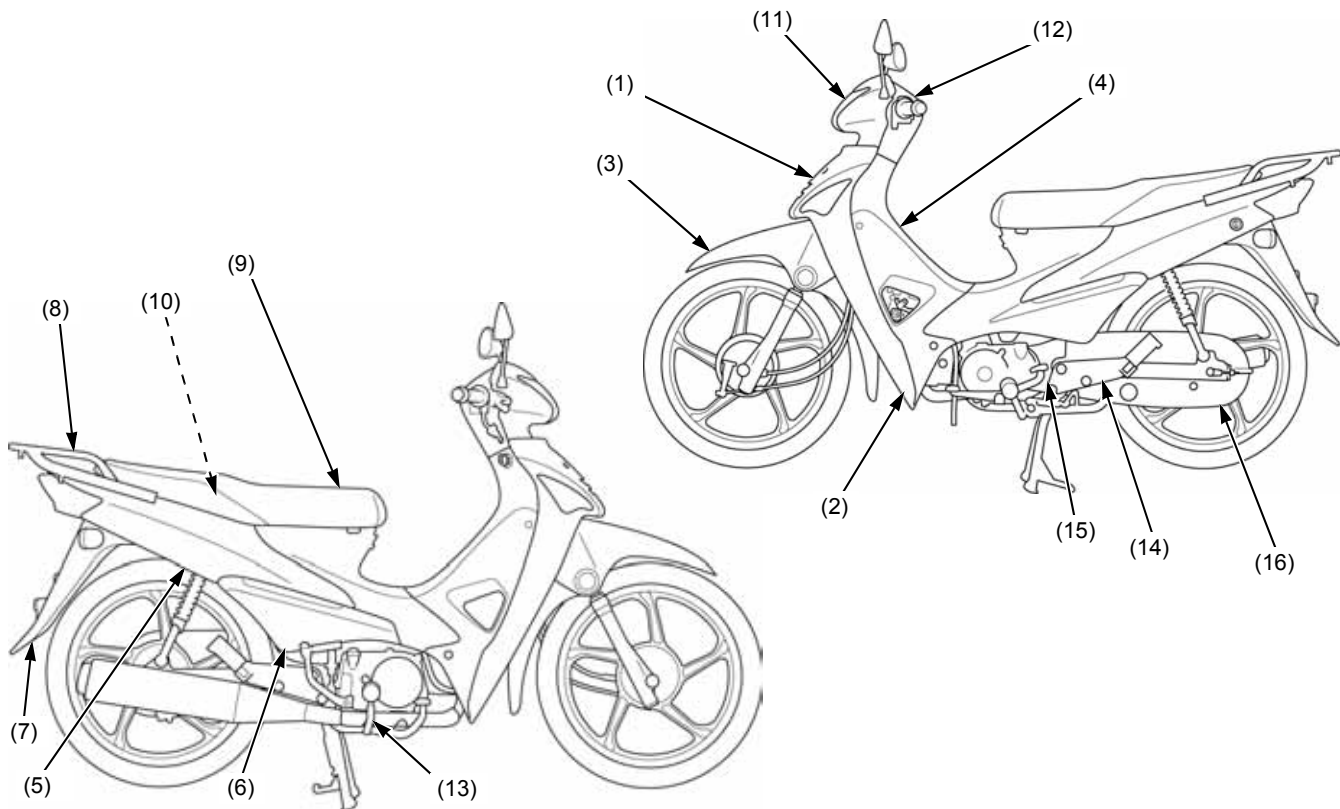
1. Removal of, or puncturing of the muffler, baffles, header pipes or any other component which conducts exhaust gases.
2. Removal of, or puncturing of any part of the intake system.
3. Lack of proper maintenance.
4. Replacing any moving parts of the vehicle, or parts of the exhaust or intake system,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

# 2. FRAME/BODY PANELS/EXHAUST SYSTEM

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MAIN PIPE COVER .....	2-10		

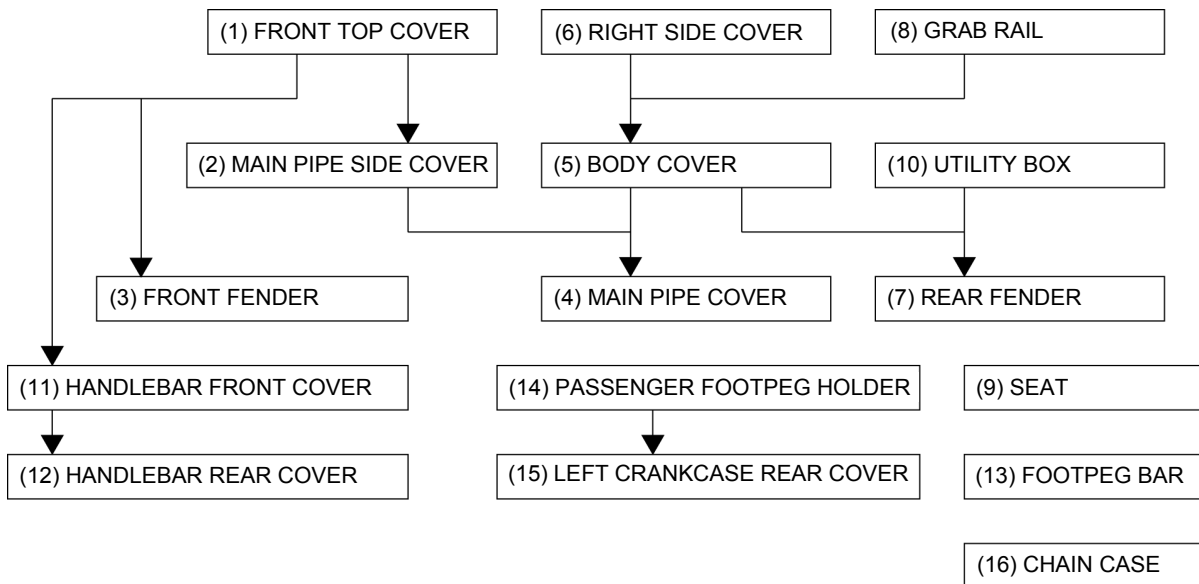
**BODY PANEL LOCATIONS**



- (1) Front top cover (page 2-4)
- (2) Main pipe side cover (page 2-6)
- (3) Front fender (page 2-5)
- (4) Main pipe cover (page 2-10)
- (5) Body cover (page 2-8)
- (6) Right side cover (page 2-7)
- (7) Rear fender (page 2-12)
- (8) Grab rail (page 2-10)
- (9) Seat (page 2-11)
- (10) Utility box (page 2-11)
- (11) Handlebar front cover (page 2-13)
- (12) Handlebar rear cover (page 2-15)
- (13) Footpeg bar (page 2-18)
- (14) Passenger footpeg holder (page 2-19)
- (15) Left crankcase rear cover (page 2-19)
- (16) Chain case (page 2-20)

**BODY PANEL REMOVAL CHART**

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



## **SERVICE INFORMATION**

### **GENERAL**

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.
- This section covers removal and installation of the body panels and exhaust system.
- When installing the body panels, make sure the mating areas are aligned properly before tightening the fasteners.
- Serious burns may result if the exhaust system is not allowed to cool before components are removed or serviced.
- Always replace the exhaust pipe gaskets after removing the exhaust pipe from the engine.
- When installing the exhaust system, loosely install all of the fasteners. Always tighten the exhaust pipe joint nuts 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**

Front turn signal light mounting screw	1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)
Headlight mounting screw	1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)
Footpeg bar mounting bolt	22 N·m (2.2 kgf·m, 16 lbf·ft)
Chain case mounting bolt	7 N·m (0.71 kgf·m, 5.2 lbf·ft)

## **TROUBLESHOOTING**

### **Excessive exhaust noise**

- Broken exhaust system
- Exhaust gas leak

### **Poor performance**

- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

**FRONT TOP COVER**

**REMOVAL/INSTALLATION**

Remove the following:

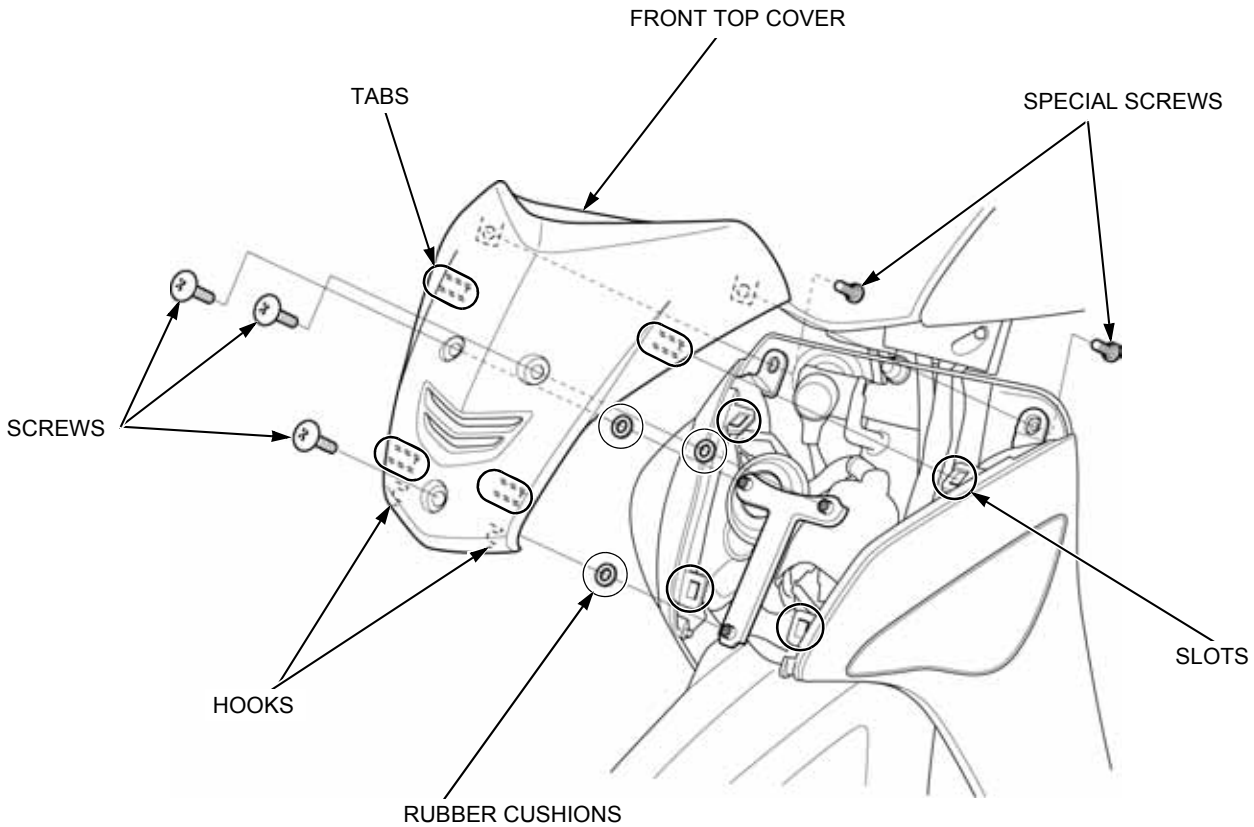
- Three screws from the front side
- Two special screws from the rear side

*Be careful not to damage the tabs.* Release the front top cover tabs from the slots on the leg shield.

Remove the front top cover by releasing the hooks.

Installation is in the reverse order of removal.

- If the three rubber cushions were dropped, clean the rubber cushions and frame surfaces. Apply Honda Bond A or equivalent to the rubber cushions on the frame side.  
Wait 3 - 5 minutes and install the rubber cushions.



## FRONT FENDER

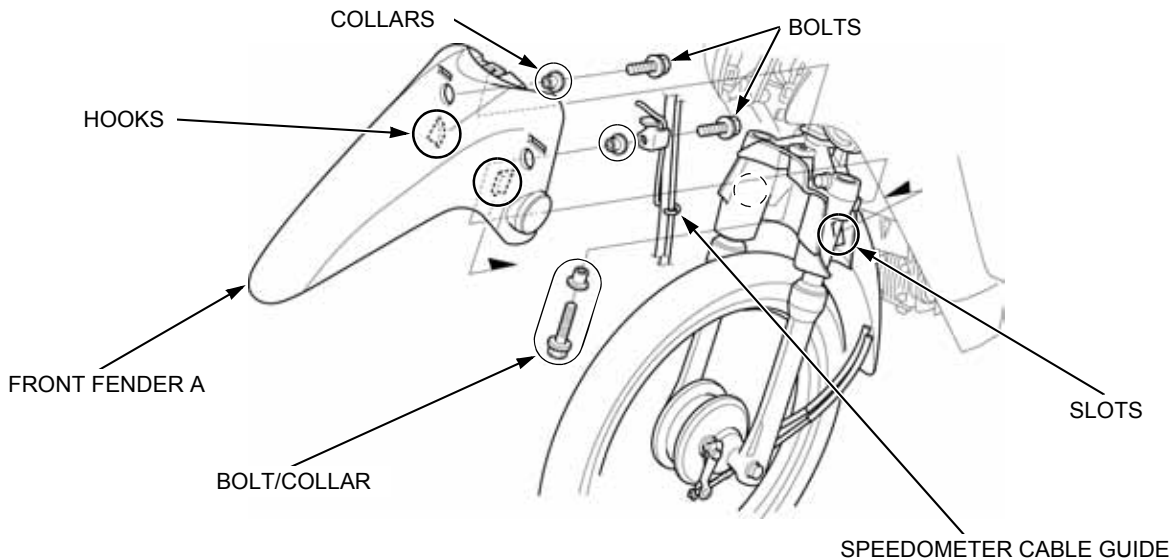
### FRONT FENDER A REMOVAL/INSTALLATION

Remove the following:

- Front top cover (page 2-4)
- Bolt, speedometer cable guide and collar
- Bolt, and collar
- Bolt/collar

Remove the front fender A by releasing the two hooks from slots of the front fender B.

Installation is in the reverse order of removal.

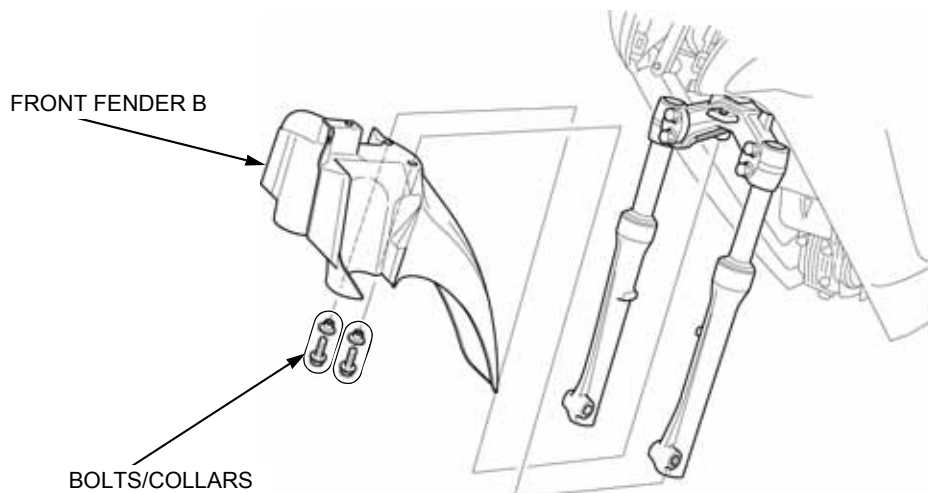


### FRONT FENDER B REMOVAL/INSTALLATION

Remove the following:

- Front wheel (page 12-7)
- Front fender A (page 2-5)
- Two bolts/collars
- Front fender B

Installation is in the reverse order of removal.





## MAIN PIPE SIDE COVER

### REMOVAL/INSTALLATION

Remove the front top cover (page 2-4).

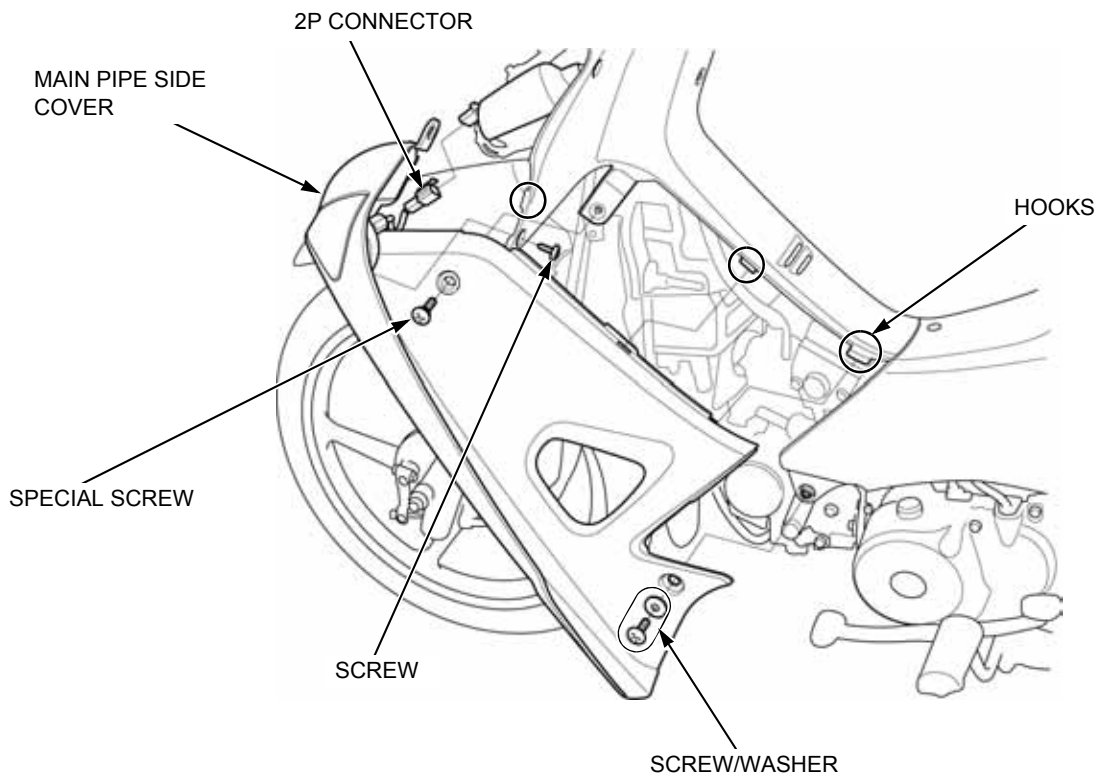
Disconnect the front turn signal light 2P (Black, Brown) connectors.

Remove the following:

- Screw and washer
- Special screw
- Screw

*Be careful not to damage the hooks.* Release the main pipe side cover from the hooks on the main pipe cover, then carefully remove the main pipe side cover.

Left side shown:

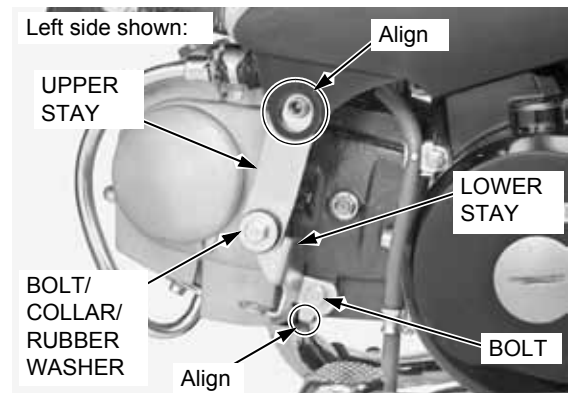


Remove the following:

- Bolt, collar and rubber washer
- Upper stay
- Bolt
- Lower stay

Installation is in the reverse order of removal.

- Install the lower stay while aligning its tab with the stopper on the cylinder, then tighten the bolt.
- Install the upper stay while aligning its boss with the hole on the body cover, then tighten the bolt.



**DISASSEMBLY/ASSEMBLY**

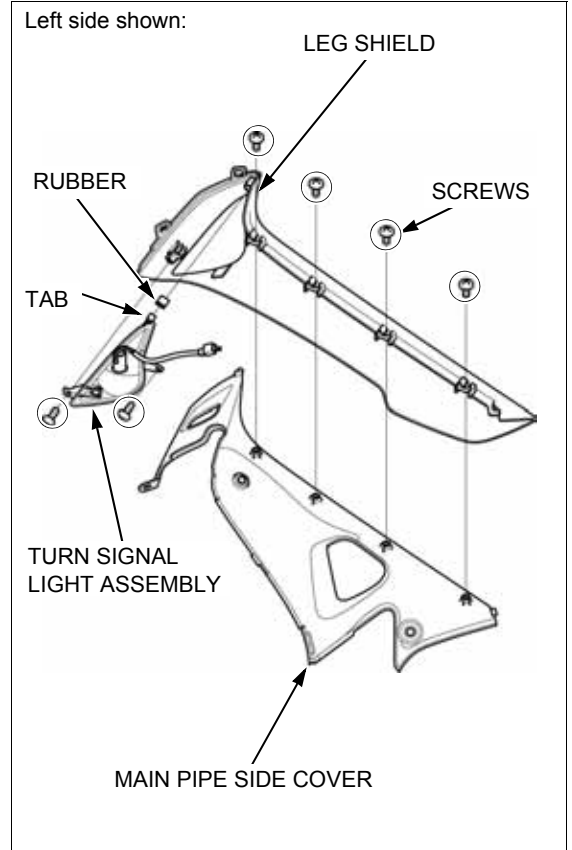
Remove the four screws and separate the leg shield from the main pipe side cover.

Remove the two screws and turn signal light assembly by releasing the its tab from the rubber.

Assembly is in the reverse order of disassembly.

**TORQUE:**

**FRONT TURN SIGNAL LIGHT MOUNTING SCREW**      **1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)**



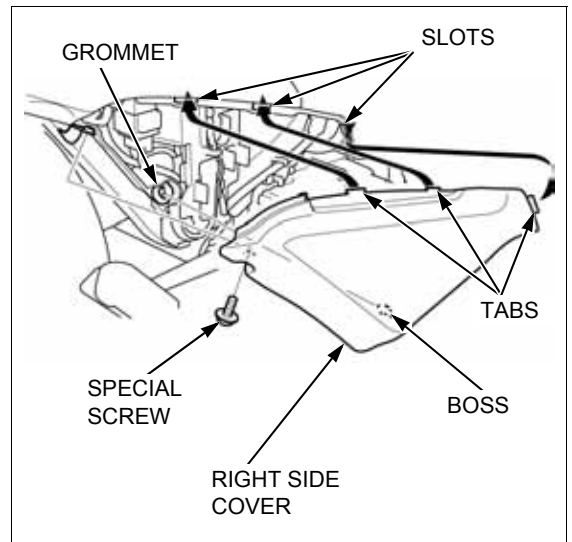
**RIGHT SIDE COVER**

**REMOVAL/INSTALLATION**

Remove the special screw.

Releasing the boss from the grommet on the frame and the three tabs from the slots on the body cover, then remove the right side cover.

Installation is in the reverse order of removal.



**BODY COVER**

**REMOVAL/INSTALLATION**

Remove the following:

- Grab rail (page 2-10)
- Right side cover (page 2-7)

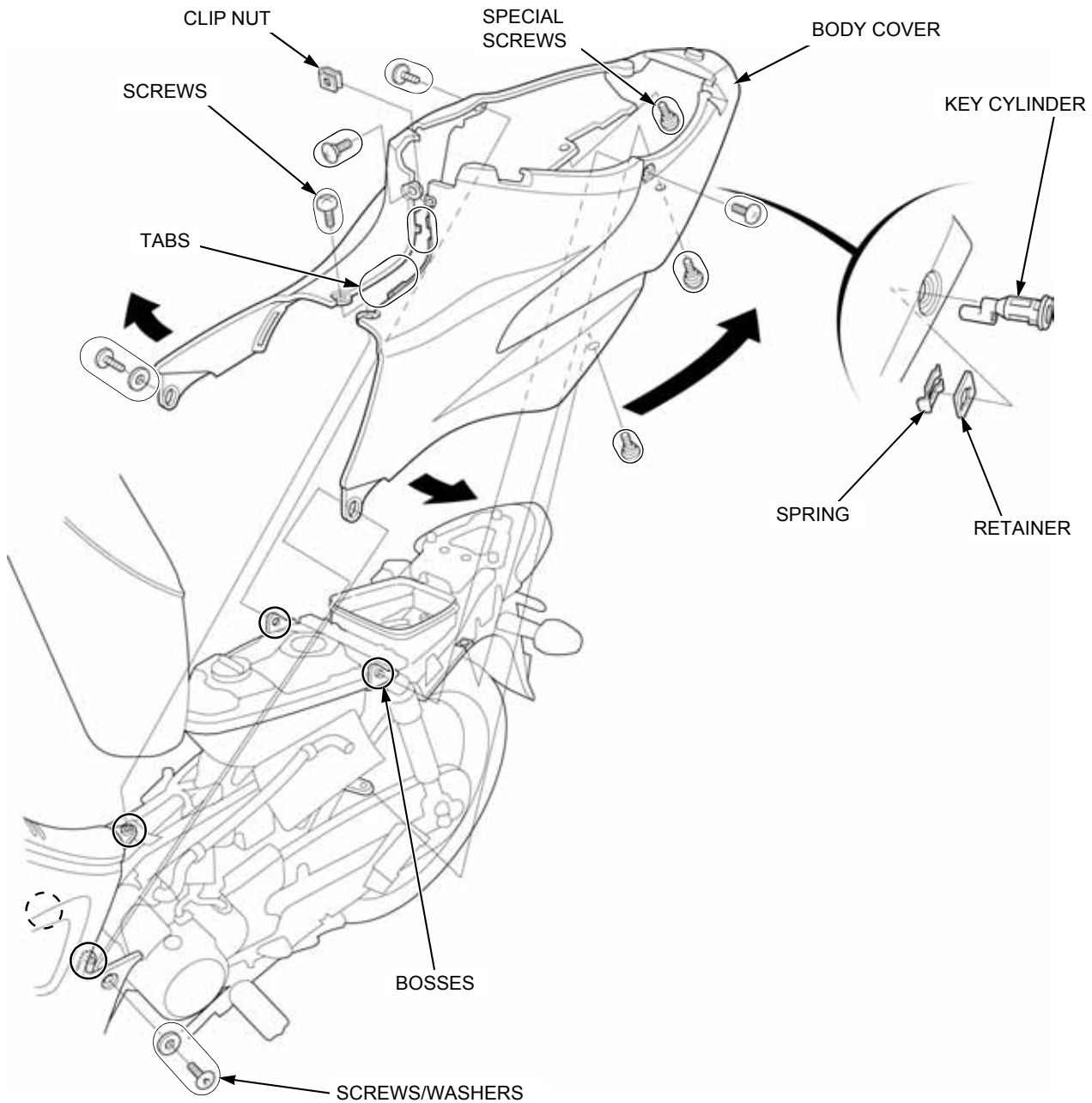
Remove the three special screws from the bottom.  
Remove the two screws, two screws and washers from the each side.  
Remove the special screw and screw.

Release the bosses and tabs, then spread the body cover slightly and remove the body cover backward.

Remove the clip nut from the left body cover.

Remove the spring, retainer and key cylinder.

Installation is in the reverse order of removal.



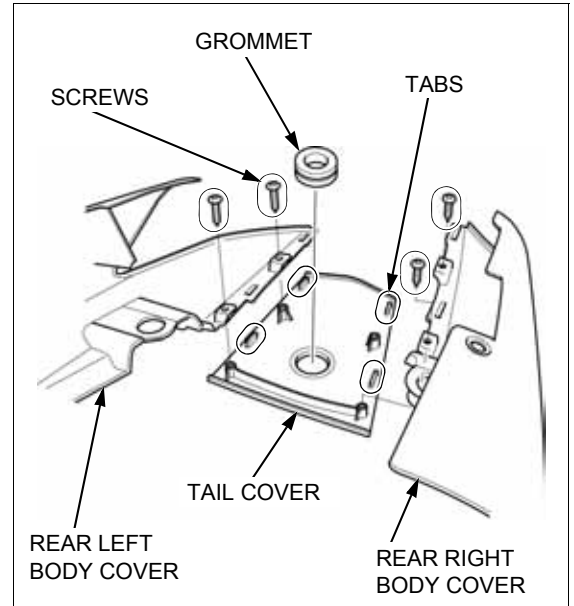
**DISASSEMBLY/ASSEMBLY**

Remove the four screws.

*Be careful not to damage the tabs.*

Release the tabs from the slots and separate the rear left body cover, rear right body cover and tail cover.

Remove the grommet from the tail cover.

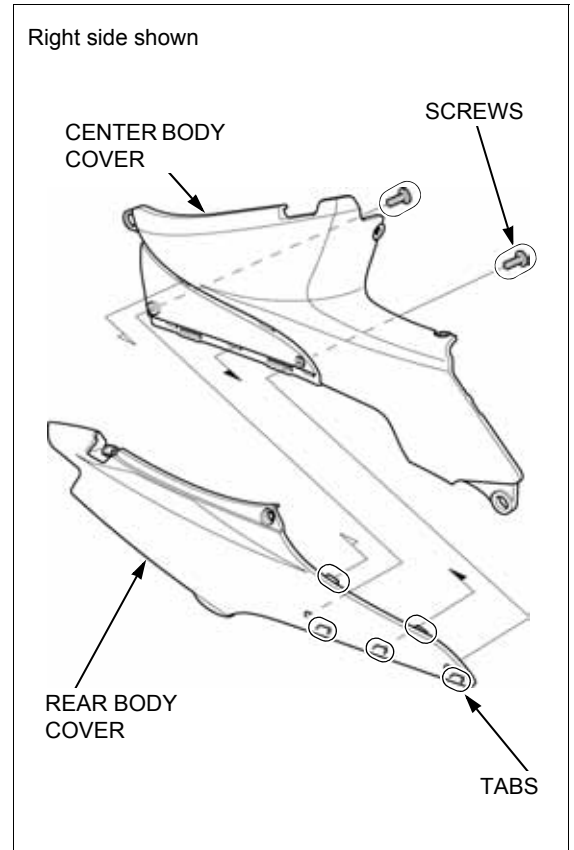


Remove the two screws.

*Be careful not to damage the tabs.*

Remove the rear body cover from the center body cover by releasing the tabs.

Assembly is in the reverse order of disassembly.



## **MAIN PIPE COVER**

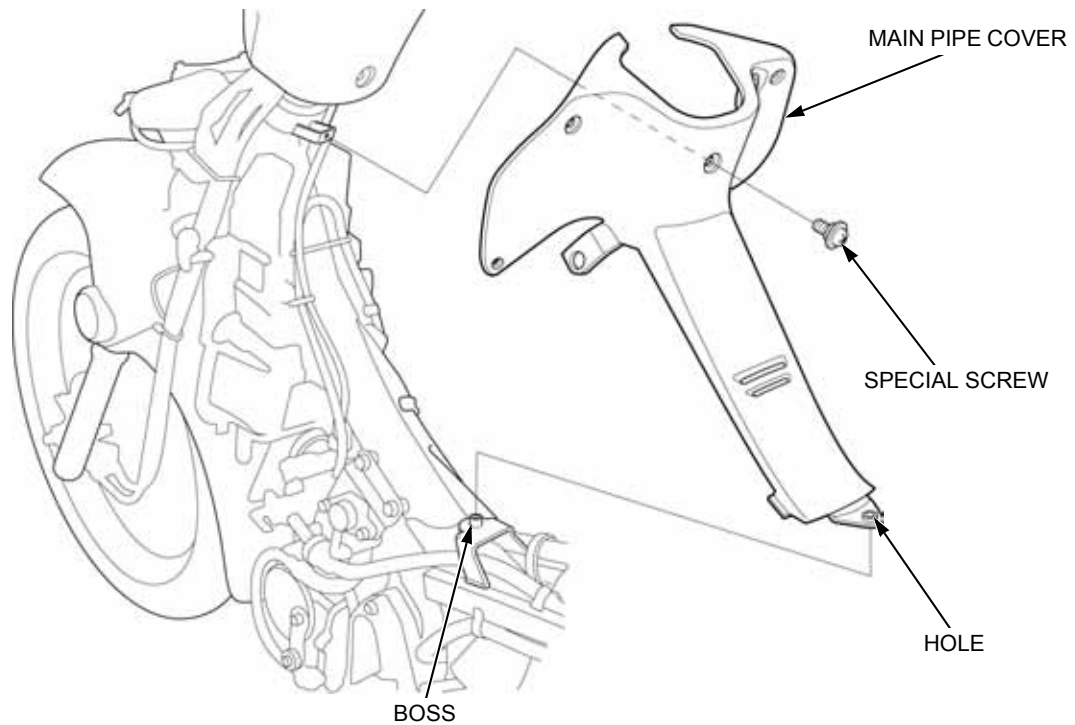
### **REMOVAL/INSTALLATION**

Remove the following:

- Main pipe side covers (page 2-6)
- Body cover (page 2-8)

Remove the special screw and main pipe cover by releasing the hole from the boss on the frame.

Installation is in the reverse order of removal.



## **GRAB RAIL**

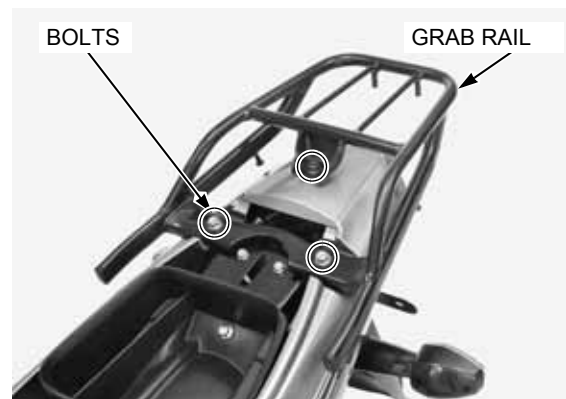
### **REMOVAL/INSTALLATION**

Open the seat using the ignition key.

*Support the grab rail while removing the bolts.*

Remove the three mounting bolts and grab rail.

Installation is in the reverse order of removal.



## SEAT

### REMOVAL/INSTALLATION

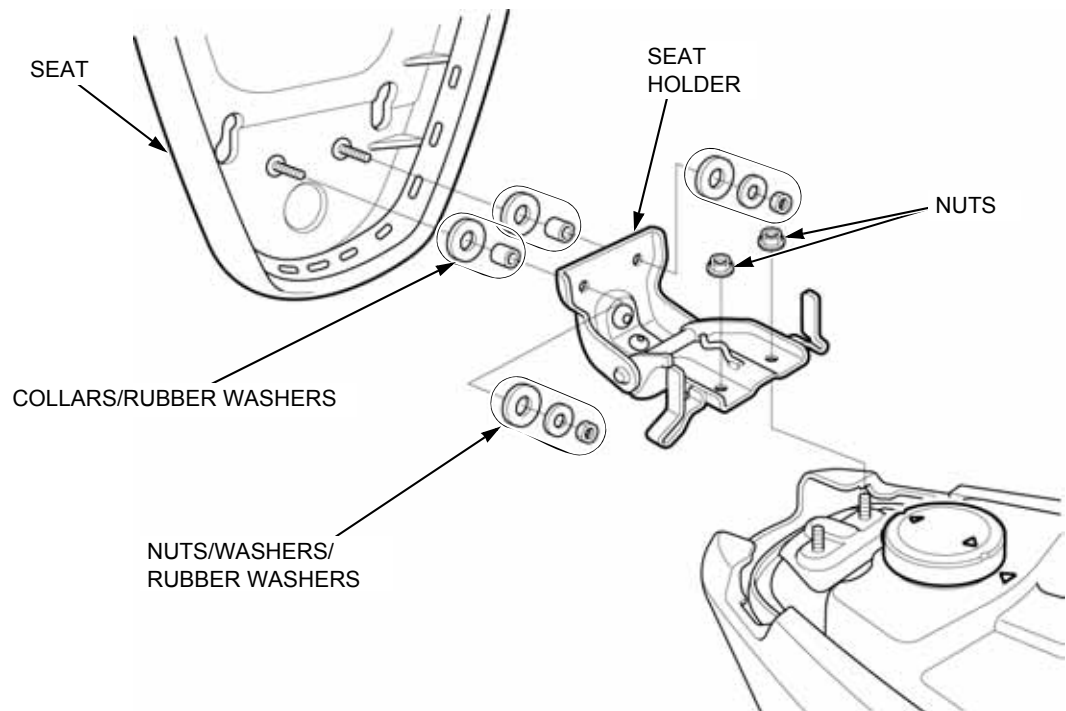
Open the seat using the ignition key.

*Support the seat while removing the nuts.*

Remove the following:

- Two nuts, two washers and two rubber washers
- Two collars and two rubber washers
- Seat
- Two nuts
- Seat holder

Installation is in the reverse order of removal.



## UTILITY BOX

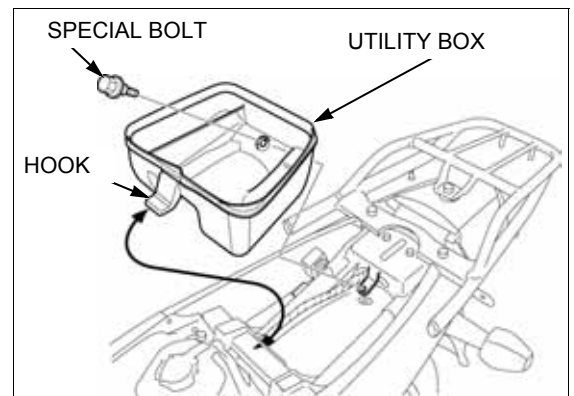
### REMOVAL/INSTALLATION

Open the seat using the ignition key.

Remove the special bolt.

Remove the utility box by releasing the its hook from the frame.

Installation is in the reverse order of removal.



**REAR FENDER**

**REMOVAL/INSTALLATION**

Support the motorcycle with its centerstand.

Remove the following:

- Body cover (page 2-8)
- Utility box (page 2-11)

Disconnect the rear turn signal light wire connectors. Loosen the wire band and pull the wire connectors out from it.

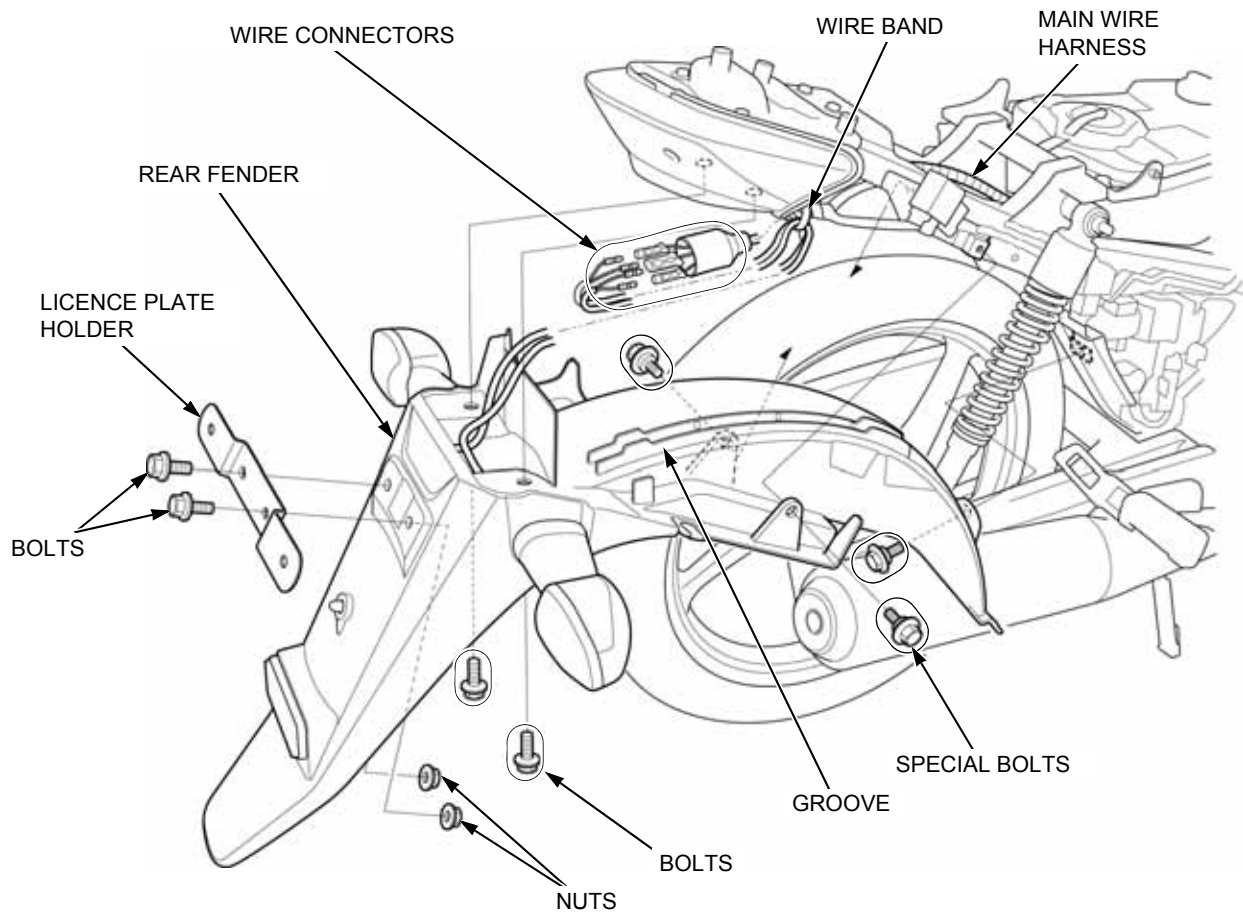
Remove the following:

- Two nuts, two bolts and licence plate holder
- Two bolts from the bottom
- Three special bolts
- Rear fender

Installation is in the reverse order of removal.

- Route the main wire harness into the rear fender groove.

*Route the wire harnesses properly (page 1-14).*

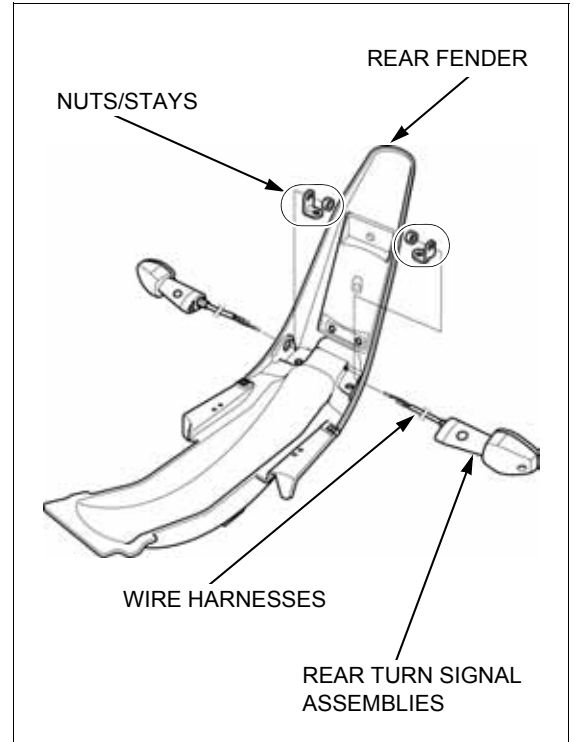


**DISASSEMBLY/ASSEMBLY**

Remove the two nuts and two stays by pulling the wire harnesses and rear turn signal light assemblies from the rear fender.

*Route the wire harnesses properly (page 1-14).*

Assembly is in the reverse order of disassembly.



**HANDLEBAR COVER**

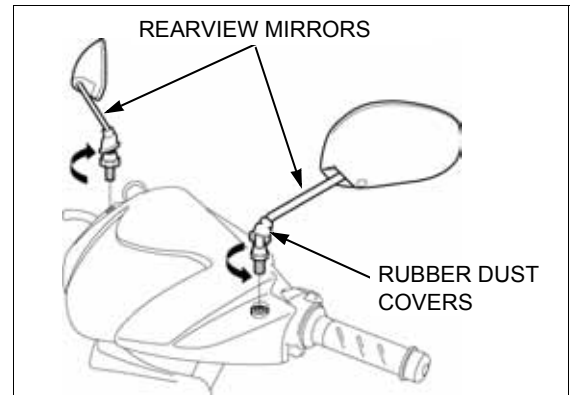
**HANDLEBAR FRONT COVER REMOVAL/INSTALLATION**

Remove the front top cover (page 2-4).

Pull back the rubber dust covers.

*Left side:* Loosen the lock nuts by turning it counterclockwise and remove the left rearview mirror.

*Right side:* Loosen the lock nuts by turning it clockwise and remove the right rearview mirror.



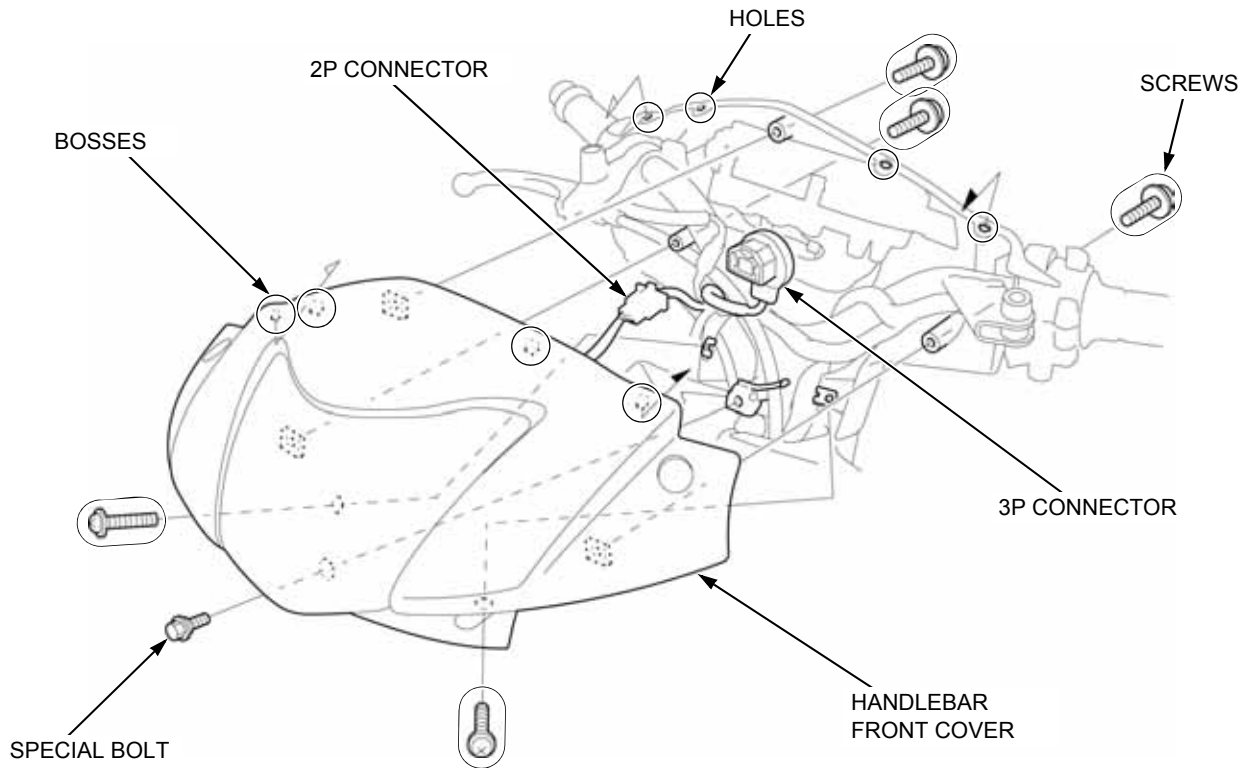


## FRAME/BODY PANELS/EXHAUST SYSTEM

Remove the special bolt, two mounting screws from the front side and three mounting screws from the rear side.

*Be careful not to damage the bosses.* Release the bosses from the holes on the handlebar rear cover and separate the handlebar front cover from the handlebar rear cover.

*Be careful not to damage the headlight and position light wires.* Disconnect the headlight 3P and position light 2P connectors while holding the handlebar front cover. Remove the handlebar front cover. Installation is in the reverse order of removal.



### HANDLEBAR FRONT COVER DISASSEMBLY/ASSEMBLY

Remove the handlebar front cover (page 2-13).

Remove the special bolt and washer.  
Remove the two screws and two headlight holders.

Remove the headlight assembly from the handlebar front cover.

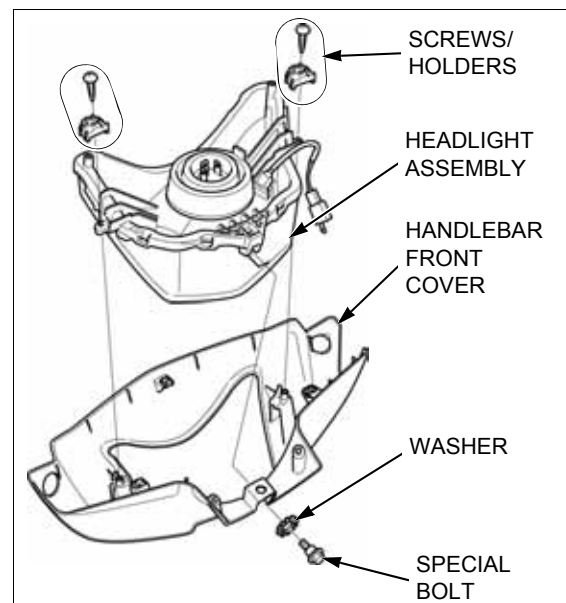
Assembly is in the reverse order of disassembly.

#### TORQUE:

**HEADLIGHT MOUNTING SCREW** 1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)

Install the handlebar front cover (page 2-13).

Adjust the headlight aim (page 3-19).



**HANDLEBAR REAR COVER  
REMOVAL**

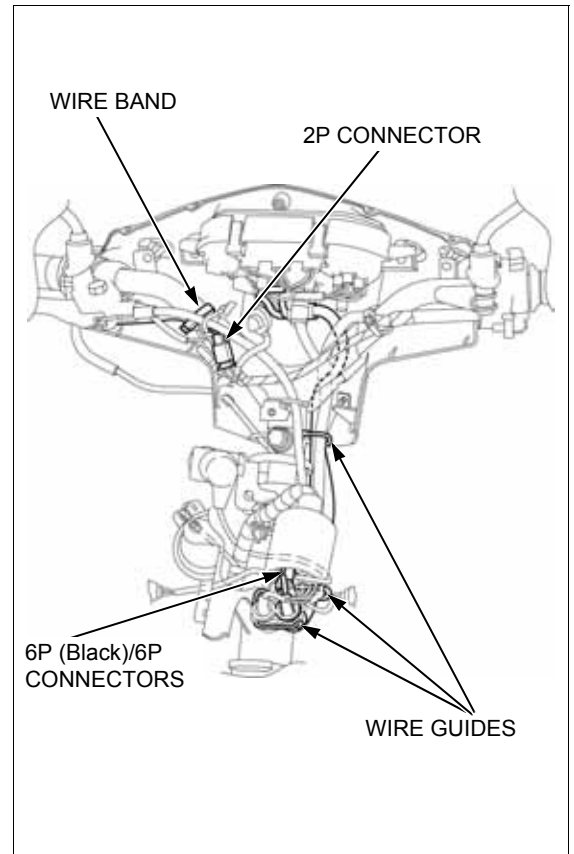
Remove the handlebar front cover (page 2-13).

Loosen the wire band.

Disconnect the following:

- Starter switch 2P connector
- Speedometer 6P (Black) and 6P connectors

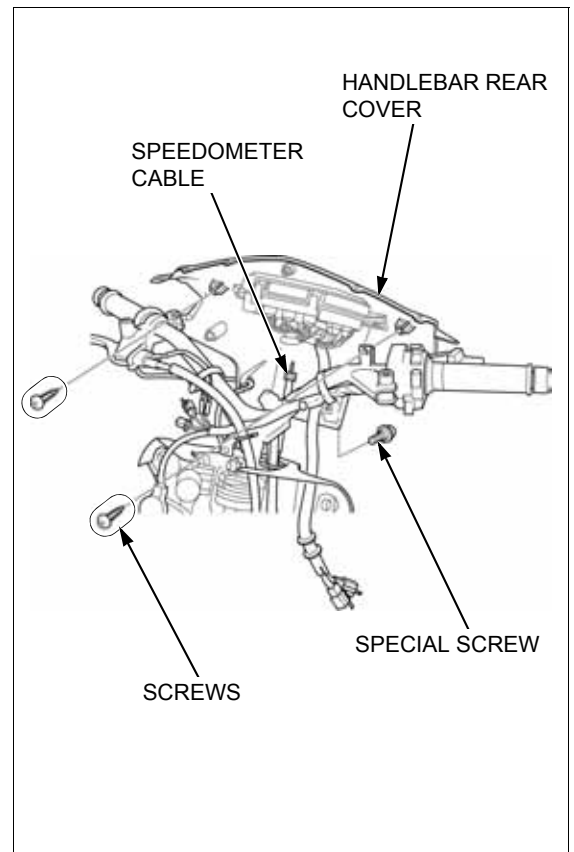
Release the speedometer sub harness from the wire guides.



Remove the following:

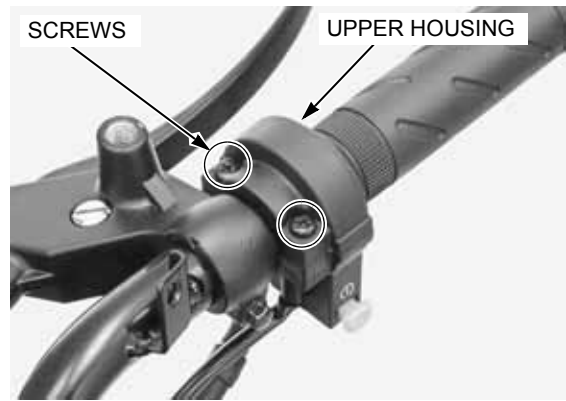
- Two screws from the front side
- Special screw from the rear side

Disconnect the speedometer cable from the speedometer while holding the handlebar rear cover.

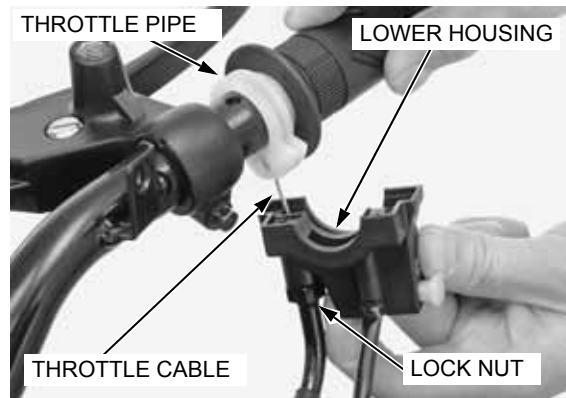


## FRAME/BODY PANELS/EXHAUST SYSTEM

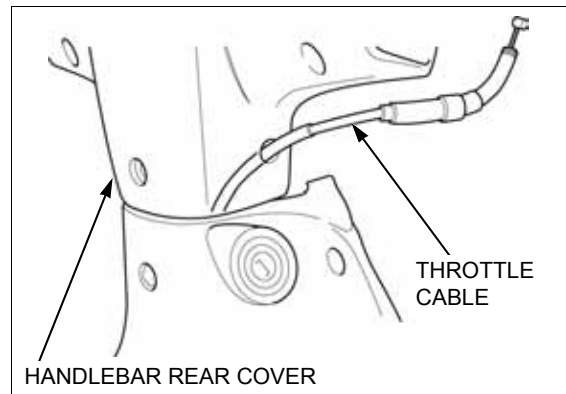
Remove the two screws and throttle upper housing.



Disconnect the throttle cable from the throttle pipe. Loosen the throttle cable lock nut and pull the cable out from the throttle lower housing.

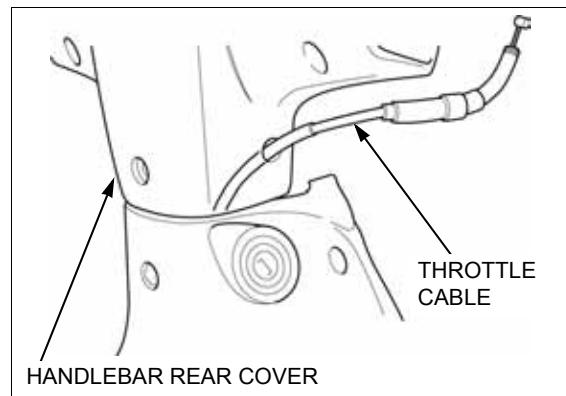


Remove the handlebar rear cover by pulling the throttle cable out of its hole.



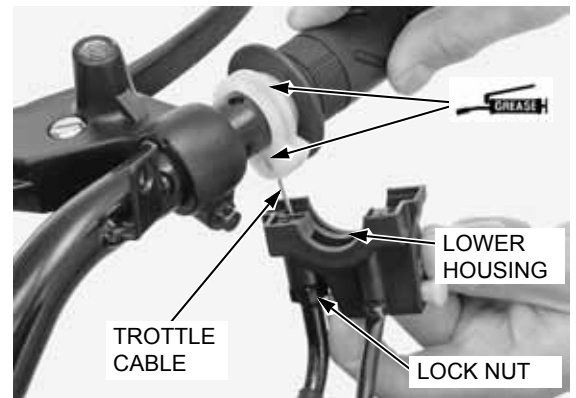
### HANDLEBAR REAR COVER INSTALLATION

Route the throttle cable through the hole on the handlebar rear cover.



## FRAME/BODY PANELS/EXHAUST SYSTEM

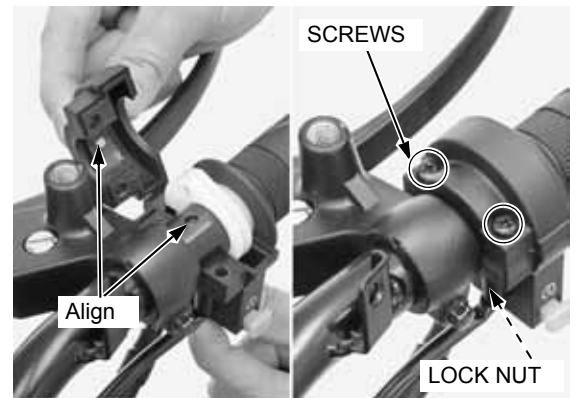
Route the throttle cable through the throttle lower housing and temporarily tighten the lock nut. Apply grease to the throttle pipe flange groove and throttle pipe slot. Connect the throttle cable to the throttle pipe.



Install the throttle lower housing in position. Install the throttle upper housing by aligning its pin with the hole on the handlebar.

Install and tighten the screws.

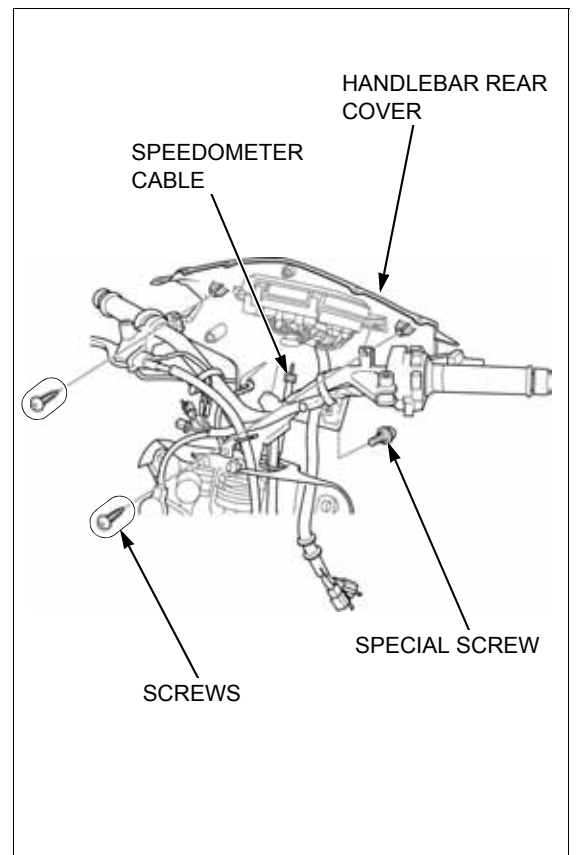
Tighten the lock nut.



Connect the speedometer cable to the speedometer while holding the handlebar rear cover.

Set the handlebar rear cover in position, then install and tighten the following:

- Special screw from the rear side
- Two screws from the front side



## FRAME/BODY PANELS/EXHAUST SYSTEM

*Route the wire harnesses properly (page 1-14).*

Install the speedometer sub harness into the wire guides.

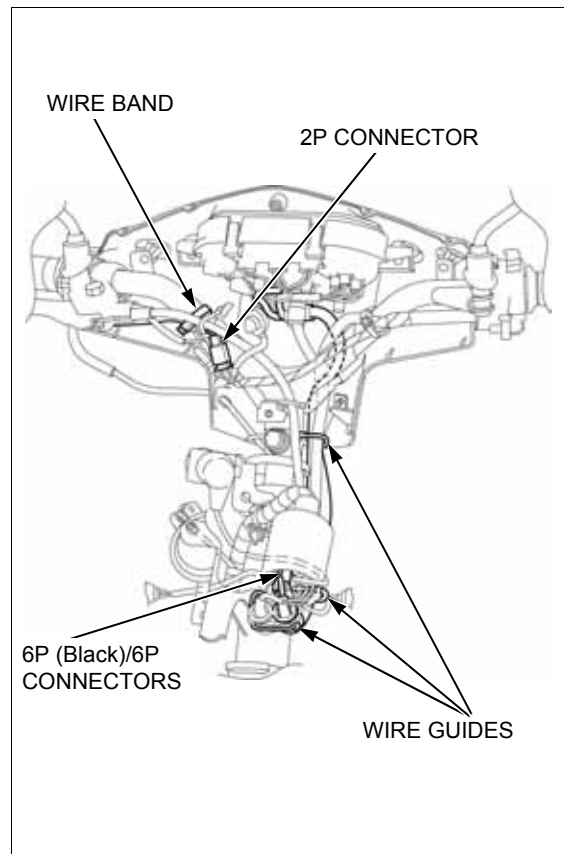
- Speedometer sub harness must not bite into the handle stopper.

Connect the following:

- Speedometer 6P (Black) and 6P connectors
- Starter switch 2P connector

Tighten the wire band.

Install the handlebar front cover (page 2-13).



## FOOTPEG

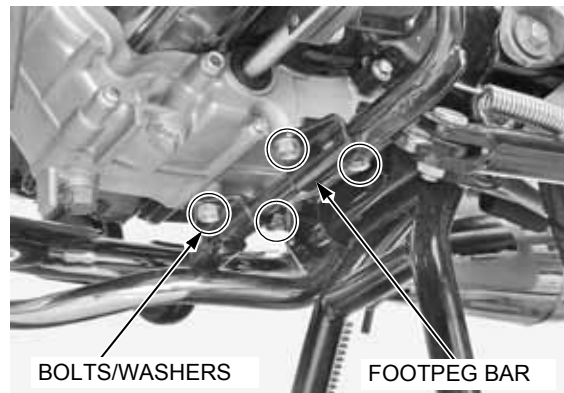
### FOOTPEG BAR REMOVAL/ INSTALLATION

Remove the four bolts and washers, then remove the footpeg bar while depressing the rear brake pedal.

Installation is in the reverse order of removal.

#### TORQUE:

**FOOTPEG BAR MOUNTING BOLT**    22 N·m (2.2 kgf·m, 16 lbf·ft)

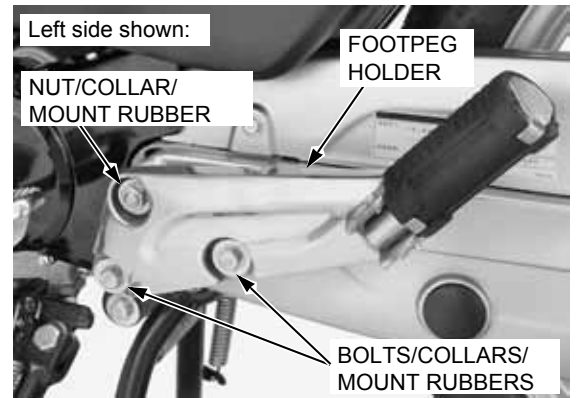


### PASSENGER FOOTPEG HOLDER REMOVAL/INSTALLATION

*Left side:* Remove the two bolts, nut and left passenger footpeg holder.  
Remove three collars and three mount rubbers from the left passenger footpeg holder.

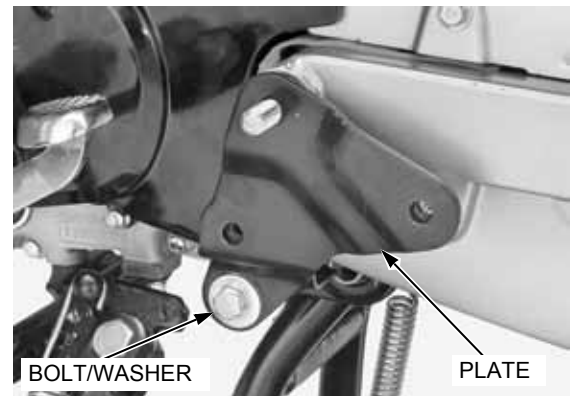
*Right side:* Remove the two bolts, two washers, nut and right passenger footpeg holder.  
Remove the three collars and three mount rubbers from the right passenger footpeg holder.

Installation is in the reverse order of removal.

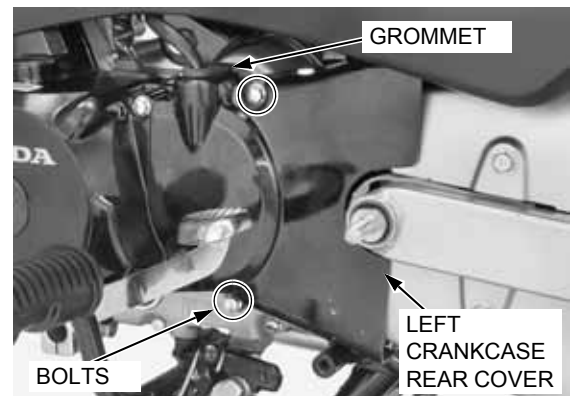


### LEFT CRANKCASE REAR COVER REMOVAL/INSTALLATION

Remove the left passenger footpeg holder (page 2-19).  
Remove the bolt, washer and plate.



*Be careful not to damage the left crankcase rear cover surface.* Remove the two bolts and left crankcase rear cover by releasing the gear position switch wire grommet.  
Installation is in the reverse order of removal.



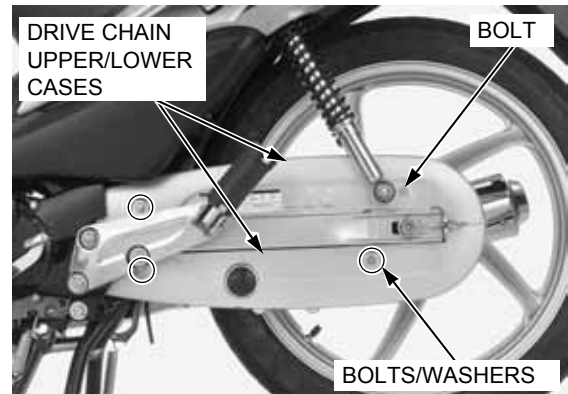
### CHAIN CASE

#### REMOVAL

*Hold the lower case while removing the lower case bolts.*

Remove the following:

- Mounting bolt
- Three mounting bolts and washers
- Drive chain upper/lower cases



#### INSTALLATION

Install the drive chain upper/lower cases by aligning its tab with slot as shown.

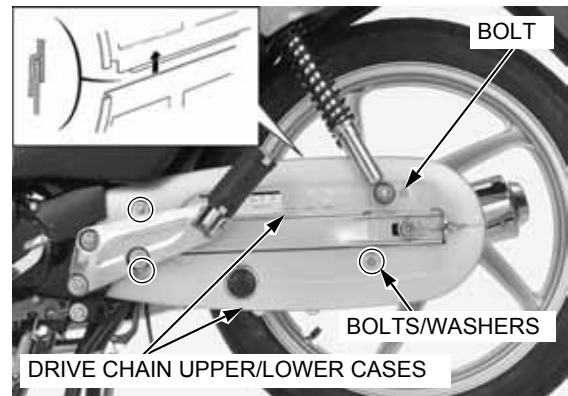
Install the following:

- Three mounting bolts three washers
- Mounting bolt

Tighten the three mounting bolts and washers to the specified torque.

**TORQUE: 7 N·m (0.71 kgf·m, 5.2 lbf·ft)**

Tighten the mounting bolt.

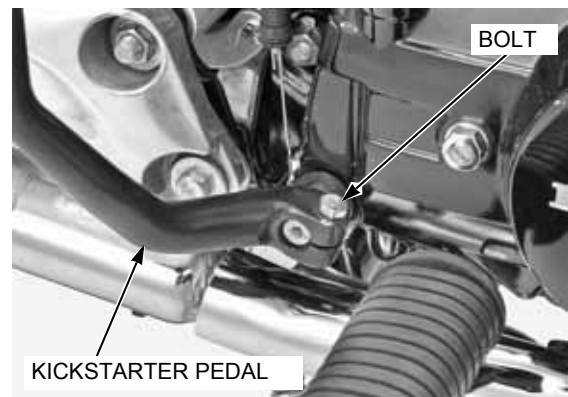


### EXHAUST PIPE/MUFFLER

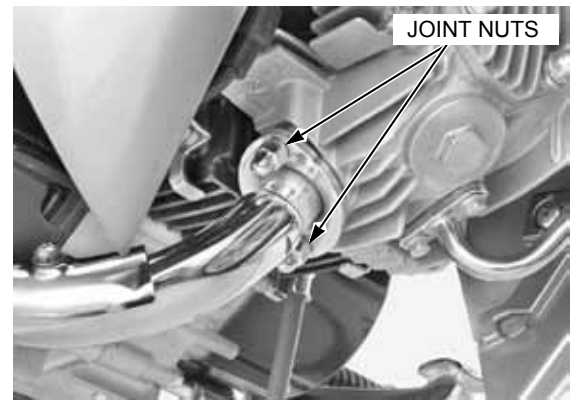
#### REMOVAL

*When removing the kickstarter pedal, mark the pedal position to ensure the original position.*

Remove the bolt and kickstarter pedal.



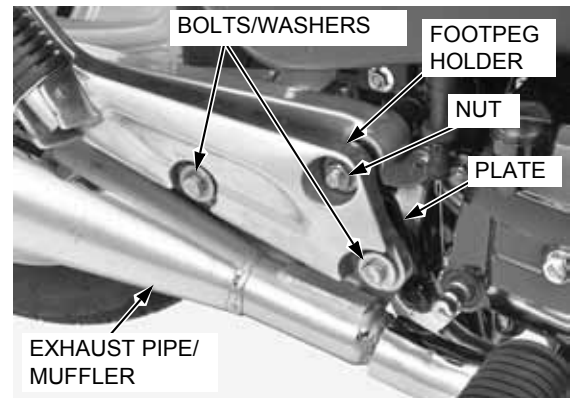
Remove the exhaust pipe joint nuts.



Remove the two bolts, two washers, nut and right passenger footpeg holder.

Remove the plate by turning it.

Remove the exhaust pipe/muffler while pushing down the rear brake pedal.



Remove the exhaust pipe gasket from the exhaust port of the engine.



### INSTALLATION

Install a new exhaust pipe gasket to the exhaust port of the engine.



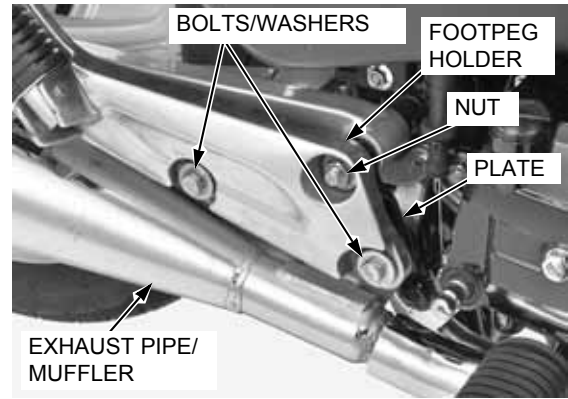


## FRAME/BODY PANELS/EXHAUST SYSTEM

Set the exhaust pipe/muffler in position.

Install the plate by turning it.

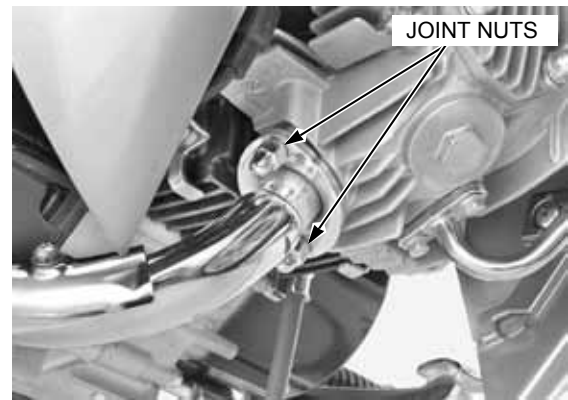
Install the right passenger footpeg holder, nut, two washers, and two bolts but do not tighten them yet.



*Make sure that the exhaust pipe is seated when tightening the joint nuts.*

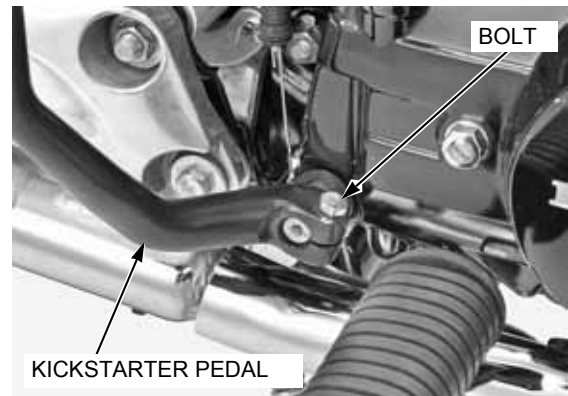
Install and tighten the exhaust pipe joint nuts.

Tighten the right passenger footpeg holder mounting nut and bolts.



Install the kickstarter pedal to its original position as marked during removal.

Install and tighten the bolt.



SERVICE INFORMATION .....	3-2	DRIVE CHAIN .....	3-14
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## MAINTENANCE

# SERVICE INFORMATION

## GENERAL

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






## SPECIFICATIONS

ITEM		SPECIFICATIONS	
Throttle grip freeplay		2 – 6 mm (0.1 – 0.2 in)	
Spark plug	Standard	CR6HSA (NGK)	
	Optional	CR7HSA (NGK)	
Spark plug gap		0.60 – 0.70 mm (0.024 – 0.028 in)	
Engine oil capacity	At draining	0.7 liter (0.7 US qt, 0.6 Imp qt)	
	At disassembly	0.9 liter (1.0 US qt, 0.8 Imp qt)	
Recommended engine oil		Honda "4-stroke motorcycle oil" or equivalent motor oil API service classification: SG or higher (except oils labeled as energy conserving on the circular API service label) JASO T 903 standard: MA Viscosity: SAE 10W-30	
Engine idle speed		1,400 ± 100 min <sup>-1</sup> (rpm)	
Valve clearance	IN/EX	0.10 mm (0.004 in)	
Drive chain	Size – link	428 – 104	
	Slack	30 – 40 mm (1.2 – 1.6 in)	
Brake lever freeplay		10 – 20 mm (0.4 – 0.8 in)	
Brake pedal freeplay		20 – 30 mm (0.8 – 1.2 in)	
Tire size	Front	2.50-17 38L	
	Rear	2.75-17 47P	
Cold tire pressure	Driver only	Front	200 kPa (2.00 kgf/cm <sup>2</sup> , 29 psi)
		Rear	225 kPa (2.25 kgf/cm <sup>2</sup> , 33 psi)
	Driver and passenger	Front	200 kPa (2.00 kgf/cm <sup>2</sup> , 29 psi)
		Rear	280 kPa (2.80 kgf/cm <sup>2</sup> , 41 psi)
Minimum tire tread depth	Front	To indicator	
	Rear	To indicator	

## TORQUE VALUES

Air cleaner housing cover screw	1.1 N·m (0.11 kgf·m, 0.8 lbf·ft)	
Spark plug	16 N·m (1.6 kgf·m, 12 lbf·ft)	
Valve adjuster lock nut	9 N·m (0.92 kgf·m, 6.6 lbf·ft)	
Valve adjuster hole cap	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply engine oil to the threads and seating surface.
Crankshaft hole cap	3 N·m (0.31 kgf·m, 2.2 lbf·ft)	Apply engine oil to the threads and seating surface.
Timing hole cap	1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)	Apply engine oil to the threads and seating surface.
Oil drain bolt	24 N·m (2.4 kgf·m, 18 lbf·ft)	
Oil centrifugal filter cover screw	4 N·m (0.41 kgf·m, 3.0 lbf·ft)	
Rear axle sleeve nut	44 N·m (4.5 kgf·m, 32 lbf·ft)	
Rear axle nut	49 N·m (5.0 kgf·m, 36 lbf·ft)	U-nut
Headlight aim bolt	3 N·m (0.31 kgf·m, 2.2 lbf·ft)	
Clutch adjuster lock nut	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Front spoke	3.2 N·m (0.33 kgf·m, 2.4 lbf·ft)	
Rear spoke	3.7 N·m (0.38 kgf·m, 2.7 lbf·ft)	

TOOLS

<p>Spoke wrench, 4.5 × 5.1 mm 07701-0020200</p>  A line drawing of a spoke wrench with a long handle and a curved, notched end.	<p>Spoke wrench, 5.8 × 6.1 mm 07701-0020300</p>  A line drawing of a spoke wrench, similar to the first one but with a different handle length and notch shape.	<p>Lock nut wrench, 8 × 9 mm 07708-0030100</p>  A line drawing of a long, thin wrench with a hook-shaped end and a circular opening at the other end.
<p>Timing cap wrench 07709-0010001</p>  A line drawing of a Y-shaped wrench with a central handle and two angled arms.	<p>Valve adjusting wrench 07908-KE90000</p>  A line drawing of a long, thin wrench with a hook-shaped end and a circular opening at the other end.	

## MAINTENANCE

# MAINTENANCE SCHEDULE

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

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

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

ITEMS	FREQUENCY	WHICHEVER COMES FIRST ↓      →	ODOMETER READING (NOTE 1)				REFER TO PAGE	
			X1,000 km	1	4	8		12
			X1,000 mi	0.6	2.5	5		7.5
		Months		6	12	18		
* FUEL LINE				I	I	I	3-5	
* THROTTLE OPERATION				I	I	I	3-5	
AIR CLEANER	NOTE 2		EVERY 16,000 km (10,000 mi) R				3-6	
CRANKCASE BREATHER	NOTE 3			C	C	C	3-6	
SPARK PLUG				I	R	I	3-7	
* VALVE CLEARANCE			I	I	I	I	3-8	
ENGINE OIL	NOTE 4		R	R	R	R	3-10	
** ENGINE OIL STRAINER SCREEN						C	3-11	
** ENGINE OIL CENTRIFUGAL FILTER						C	3-11	
* ENGINE IDLE SPEED			I	I	I	I	3-12	
* SECONDARY AIR SUPPLY SYSTEM	NOTE 5					I	3-13	
DRIVE CHAIN			EVERY 1,000 km (600 mi) I, L				3-14	
BATTERY			EVERY 2,000 km (1,250 mi) L				3-16	
BRAKE SHOES WEAR				I	I	I	3-17	
BRAKE SYSTEM			I	I	I	I	3-18	
* BRAKE LIGHT SWITCH				I	I	I	3-19	
* HEADLIGHT AIM				I	I	I	3-19	
CLUTCH SYSTEM			I	I	I	I	3-19	
SIDESTAND				I	I	I	3-20	
* SUSPENSION				I	I	I	3-20	
* NUTS, BOLTS, FASTENERS	NOTE 4		I		I		3-21	
** WHEELS/TIRES (Cast wheel type)				I	I	I	3-21	
** WHEELS/TIRES (Spoke wheel type)	NOTE 4		I	I	I	I	3-21	
** STEERING HEAD BEARINGS			I			I	3-22	

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

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

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

### NOTES:

- At higher odometer readings, repeat at the frequency interval established here.
- Service more frequently when riding in unusually wet or dusty areas.
- Service more frequently when riding in rain or at full throttle.
- Service more frequently when riding OFF-ROAD.
- Replace the PAIR air filter every 3 years or 24,000 km (15,000 mile). Replacement requires mechanical skill.

## FUEL LINE

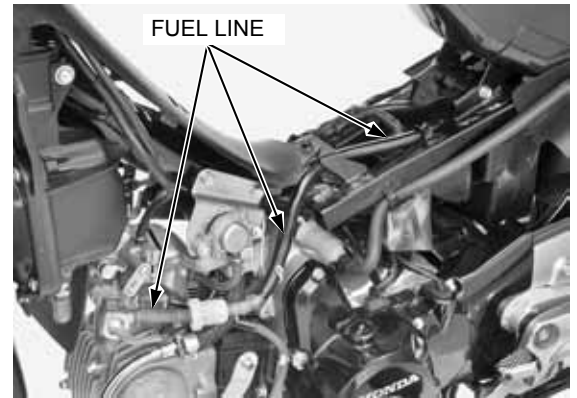
Remove the following:

- Left main pipe side cover (page 2-6)
- Body cover (page 2-8)

Check the fuel line for deterioration, damage or leakage.

Replace the fuel line if necessary.

Installation is in the reverse order of removal.



## THROTTLE OPERATION

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

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

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

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

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

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

Measure the throttle grip freeplay at the throttle grip flange.

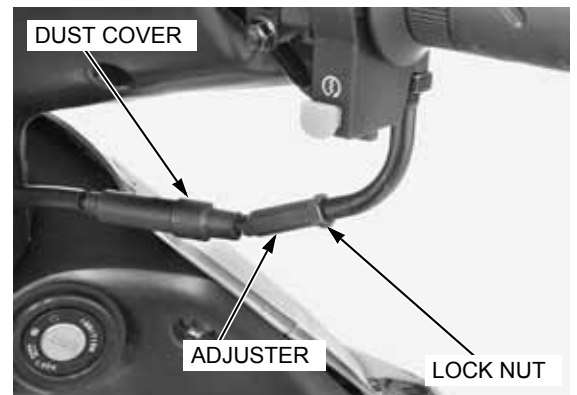
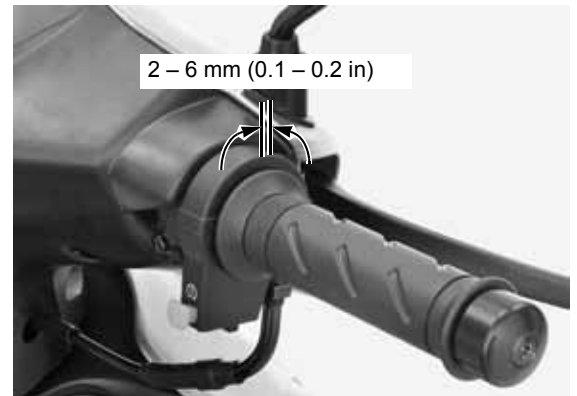
**FREEPLAY: 2 – 6 mm (0.1 – 0.2 in)**

Throttle grip freeplay can be adjusted at throttle cable adjuster.

Remove the dust cover from the adjuster.  
Loosen the lock nut.  
Adjust the freeplay by turning the adjuster.  
Tighten the lock nut while holding the adjuster.

Install the dust cover to the adjuster.

Recheck the throttle operation.  
Replace any damaged parts, if necessary.



## MAINTENANCE

### AIR CLEANER

**NOTE:**

- The viscous paper element connect be cleaned because the element contains a dust adhesive.
- If the motorcycle is used in unusually wet or dusty areas, more frequent inspections are required.

Remove the screws, air cleaner housing cover and seals.

Remove and discard the air cleaner element in accordance with the maintenance schedule (page 3-4).

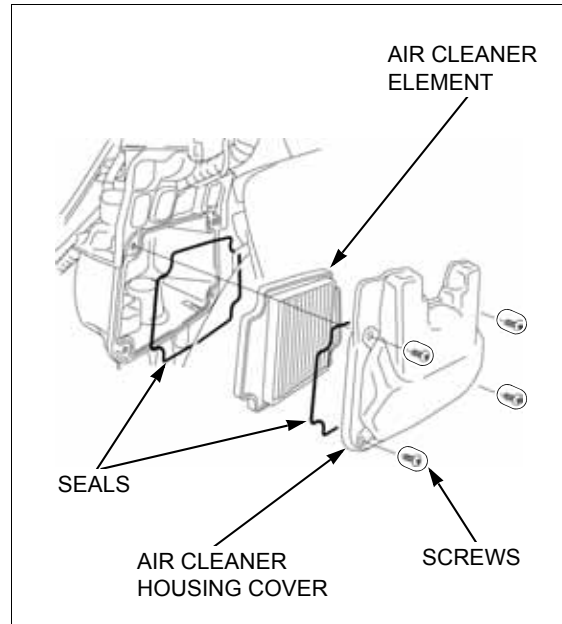
Replace the element any time if it is excessively dirty or damaged.

Install the removed parts in the reverse order of removal.

**TORQUE:**

**AIR CLEANER HOUSING COVER SCREW** 1.1 N·m (0.11 kgf·m, 0.8 lbf·ft)

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



### CRANKCASE BREATHER

**NOTE:**

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

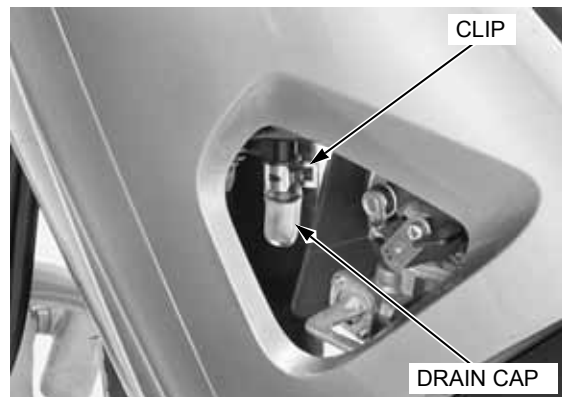
Check the crankcase breather drain cap. If deposits has collected, remove the clip and crankcase breather drain cap. Drain deposits into the suitable container. Install the crankcase breather drain cap and clip.

Remove the following:

- Right main pipe side cover (page 2-6)
- Body cover (page 2-8)

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

Install the removed parts in the reverse order of removal.



# SPARK PLUG

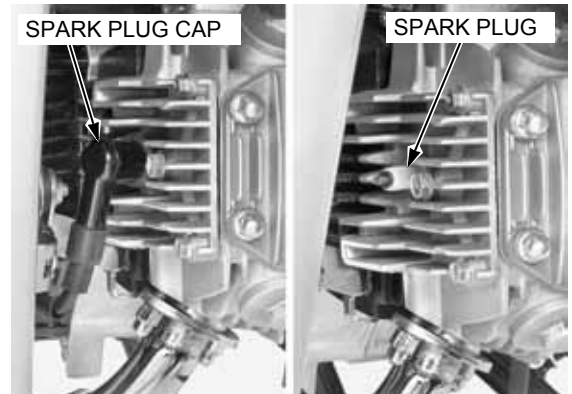
## REMOVAL

Disconnect the spark plug cap.

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

Remove the spark plug.

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



## INSPECTION

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

Check the insulator for cracks or damage, and the electrodes for wear, fouling or discoloration.

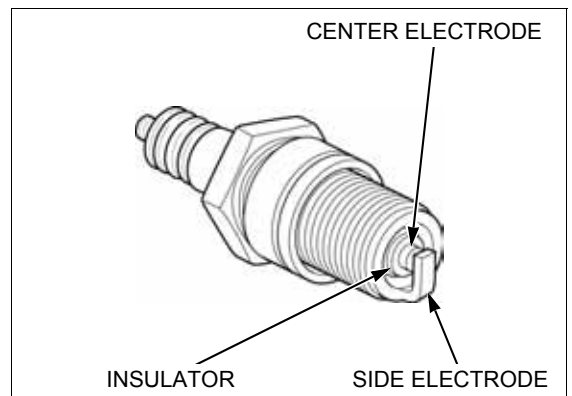
Replace the plug if necessary.

*Always use the specified spark plug on this motorcycle.*

### RECOMMENDED SPARK PLUG (OR EQUIVALENT):

**Standard: CR6HSA (NGK)**

**Optional: CR7HSA (NGK)**

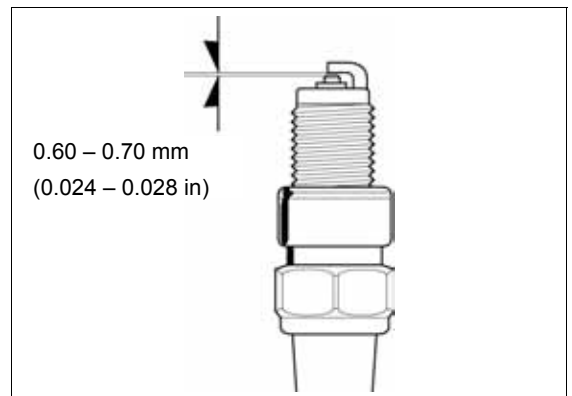


Measure the spark gap between the center and side electrodes with a feeler gauge.

### SPARK PLUG GAP:

**0.60 – 0.70 mm (0.024 – 0.028 in)**

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

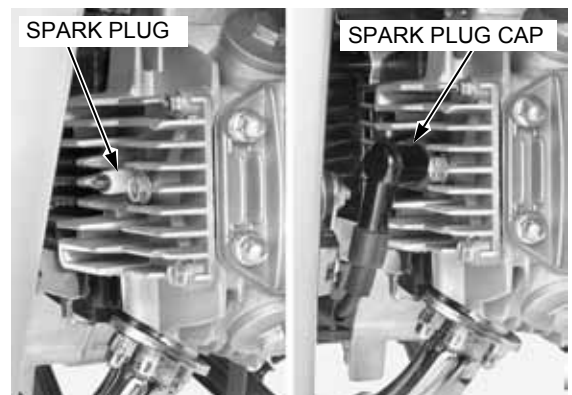


## INSTALLATION

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

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

Connect the spark plug cap.





## MAINTENANCE

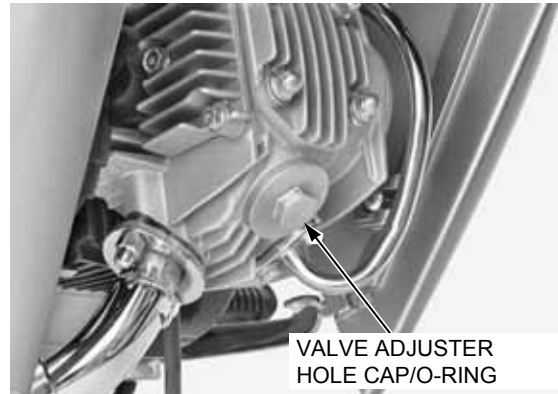
# VALVE CLEARANCE

### INSPECTION

#### NOTE:

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

Remove the valve adjuster hole caps and O-rings.

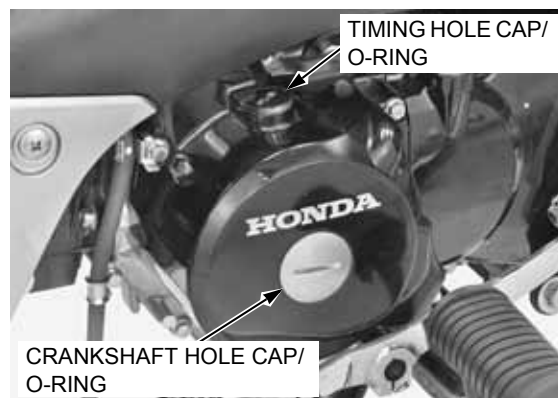


Remove the following using the special tool.

- Crankshaft hole cap /O-ring
- Timing hole cap/O-ring

#### TOOL:

Timing cap wrench                      07709-0010001



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

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

This position can be obtained by confirming that there is slack in the rocker arm.

If there is no slack, it is because the piston is moving through the exhaust stroke to TDC.

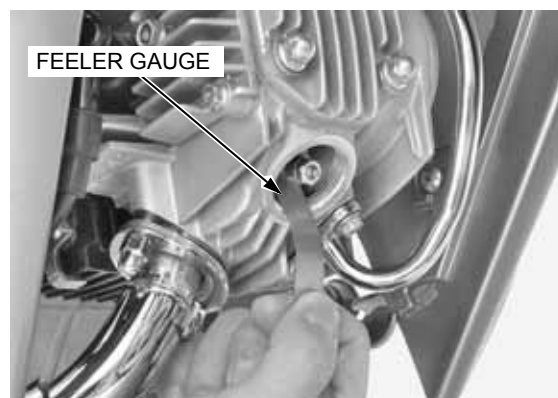
Rotate the crankshaft counterclockwise one full turn and match up the "T" mark again.



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

#### VALVE CLEARANCE:

IN/EX: 0.10 mm (0.004 in)



**ADJUSTMENT**

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

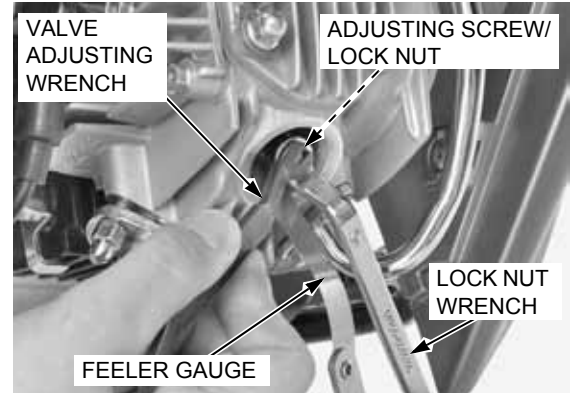
Hold the adjusting screw and tighten the lock nut.

**TOOL:**

Valve adjusting wrench                    **07908-KE90000**  
 Lock nut wrench, 8 × 9 mm            **07708-0030100**

**TORQUE: 9 N·m (0.92 kgf·m, 6.6 lbf·ft)**

Recheck the valve clearance.

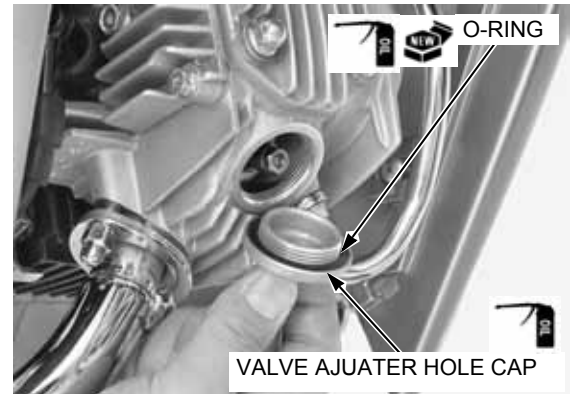


Apply engine oil to new O-rings and the valve adjuster hole cap threads.

Install the O-rings to the valve adjuster hole caps.

Install and tighten the valve adjuster hole caps to the specified torque.

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



Apply engine oil to new O-rings.

Install the O-rings to the timing hole cap and crankshaft hole cap.

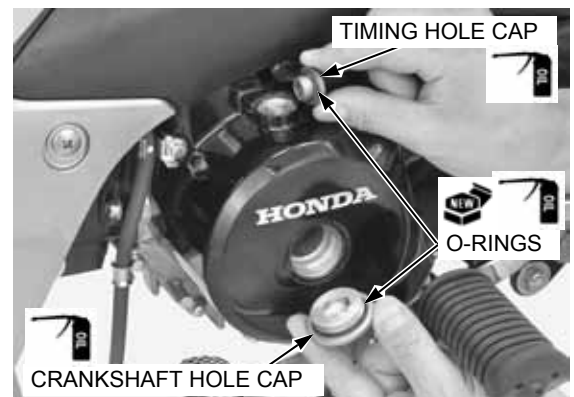
Apply engine oil to the timing hole cap and crankshaft hole cap threads.

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

**TORQUE: 3 N·m (0.31 kgf·m, 2.2 lbf·ft)**

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

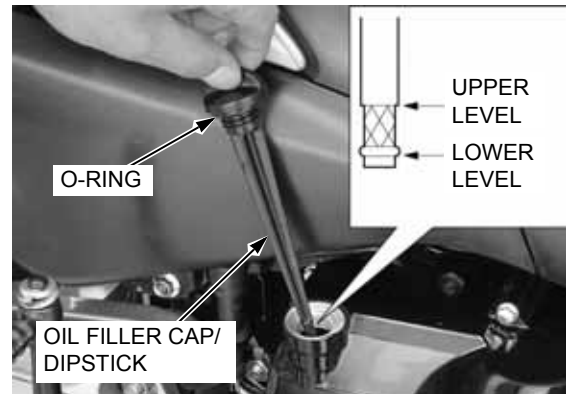
**TORQUE: 1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)**



## ENGINE OIL

### OIL LEVEL INSPECTION

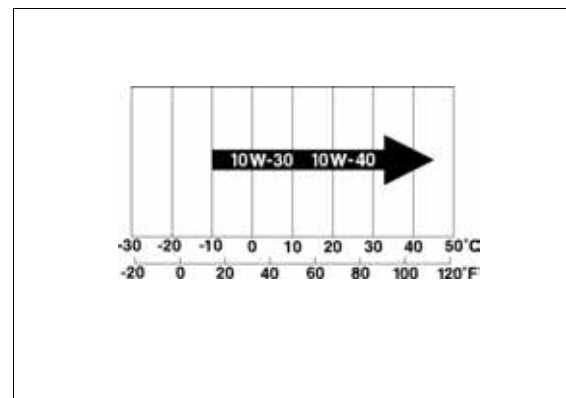
Start the engine and let it idle for 3 – 5 minutes.  
Stop the engine and wait 2 – 3 minutes.  
Hold the motorcycle in an upright position.  
Remove the oil filler cap/dipstick and wipe oil from the dipstick with a clean cloth.  
Insert the oil filler cap/dipstick without screwing it in, remove it and check the oil level.



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

### RECOMMENDED ENGINE OIL:

**Honda "4-stroke motorcycle oil" or equivalent motor oil**  
**API service classification: SG or higher (except oils labeled as energy conserving on the circular API service label)**  
**JASO T 903 standard: MA**  
**Viscosity: SAE 10W-30**

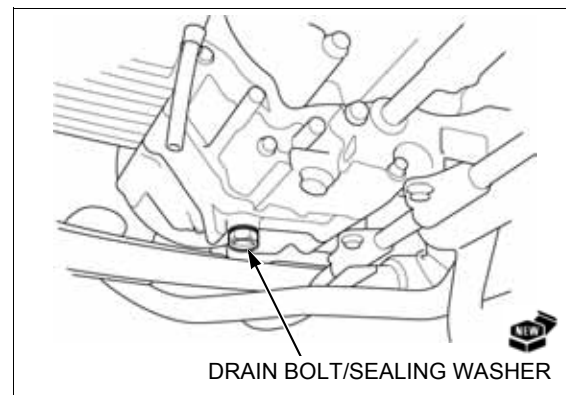


Check that the O-ring on the oil filler cap is in good condition, and replace it if necessary.  
Install the oil filler cap/dipstick.

### ENGINE OIL CHANGE

Warm up the engine.  
Stop the engine, remove the oil filler cap/dipstick and wipe oil from the dipstick with a clean cloth.  
Remove the drain bolt and sealing washer.  
Drain oil completely.  
Install the oil drain bolt with a new sealing washer and tighten it to the specified torque.

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



Fill the engine with recommended engine oil.

### ENGINE OIL CAPACITY:

**0.7 liter (0.7 US qt, 0.6 Imp qt) at draining**  
**0.9 liter (1.0 US qt, 0.8 Imp qt) at disassembly**

Check that the O-ring on the oil filler cap is in good condition, and replace it if necessary.  
Install the oil filler cap/dipstick.

Make sure there are no oil leaks.

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



## ENGINE OIL STRAINER SCREEN

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

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

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

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

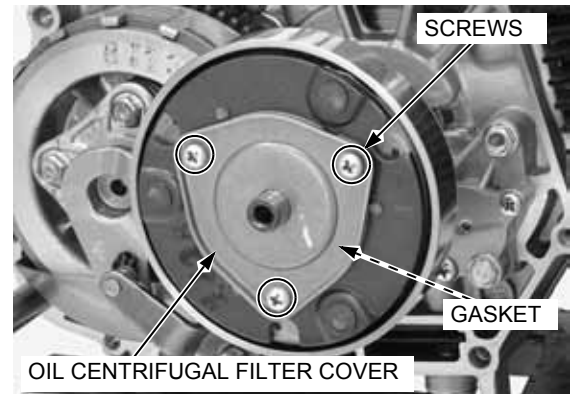


## ENGINE OIL CENTRIFUGAL FILTER

### CLEANING

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

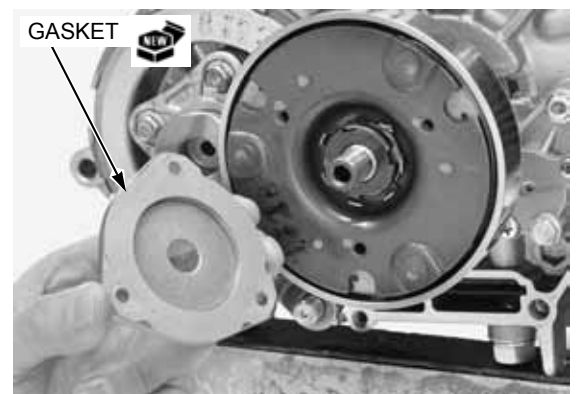
Remove the screws, oil centrifugal filter cover and gasket.



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



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

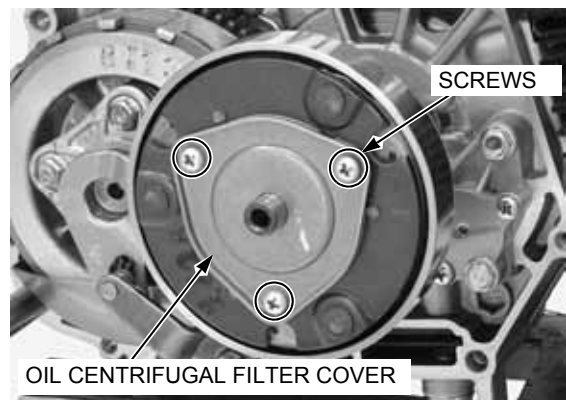


## MAINTENANCE

Install the oil centrifugal filter cover and screws.  
Tighten the screws to the specified torque.

**TORQUE: 4 N·m (0.41 kgf·m, 3.0 lbf·ft)**

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



## ENGINE IDLE SPEED

NOTE:

- Inspect and adjust the engine idle speed after all other engine maintenance items have been performed and are within specifications.
- The engine must be warm for accurate engine idle speed inspection and adjustment.
- Use a tachometer with graduations of  $50 \text{ min}^{-1}$  (rpm) or smaller that will accurately indicate a  $50 \text{ min}^{-1}$  (rpm) change.

Warm up the engine for about 10 minutes.

Connect a tachometer according to the tachometer manufacturer's operating instructions.

Check the engine idle speed.

**IDLE SPEED:  $1,400 \pm 100 \text{ min}^{-1}$  (rpm)**

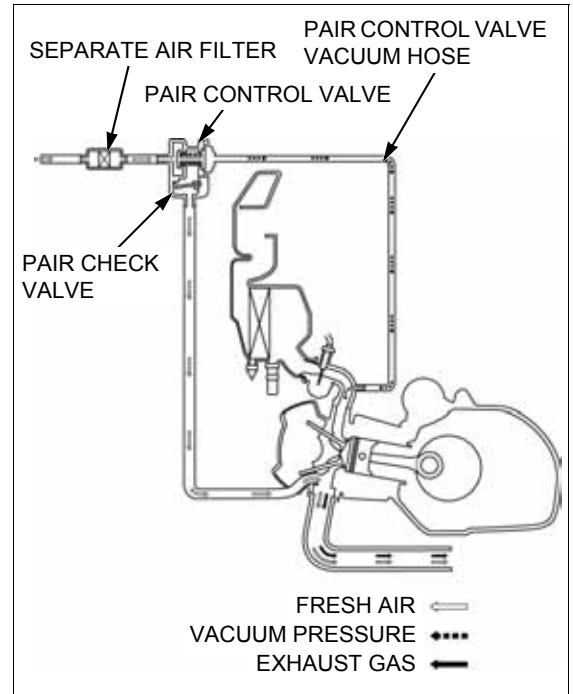
Turn the throttle stop screw as required to obtain the specified engine idle speed.



## SECONDARY AIR SUPPLY SYSTEM

**NOTE:**

- This model is equipped with a secondary air supply system. The pulse secondary air supply system is located above the cylinder.
- The secondary air supply system introduces filtered air into exhaust gases in the exhaust port. The secondary air is drawn into the exhaust port whenever there is negative pressure pulse in the exhaust system. This charged secondary 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.



Remove the following.

- Main pipe side covers (page 2-6)
- Body cover (page 2-8)

Check the air injection hose and pipe between the PAIR (pulse secondary air injection) control valve and exhaust port for cracks, deterioration, damage or loose connections.

Check the air supply hoses for cracks, deterioration, damage or loose connections.

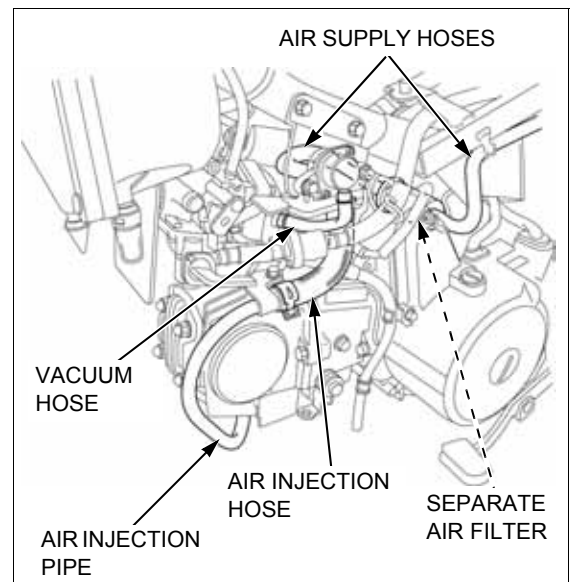
Check the vacuum hose between the PAIR control valve and inlet pipe hose joint for cracks, deterioration, damage or loose connections.

Make sure that hoses and pipe are in good condition and replace if necessary.

Disconnect and check the air supply hoses. If the inside of the air supply hoses are carbon fouled, check the PAIR check valve (page 5-20).

Install the removed parts in the reverse order of removal.

*Route the hoses properly (page 1-14).*



## MAINTENANCE

# DRIVE CHAIN

### NOTE:

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

### DRIVE CHAIN SLACK INSPECTION

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

Remove the chain inspection hole cap.

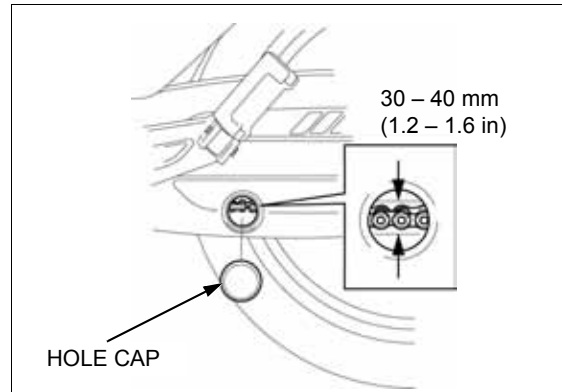
Measure the drive chain slack, on the chain run midway between the sprockets.

**CHAIN SLACK: 30 – 40 mm (1.2 – 1.6 in)**

### NOTICE

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

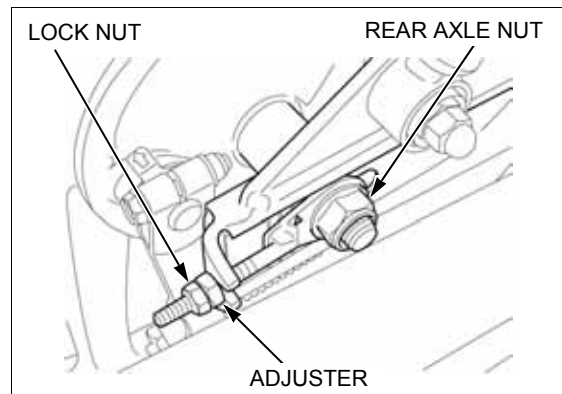
*Install the chain inspection hole cap.*



### ADJUSTMENT

Loosen the rear axle nut, rear axle sleeve nut and both lock nuts.

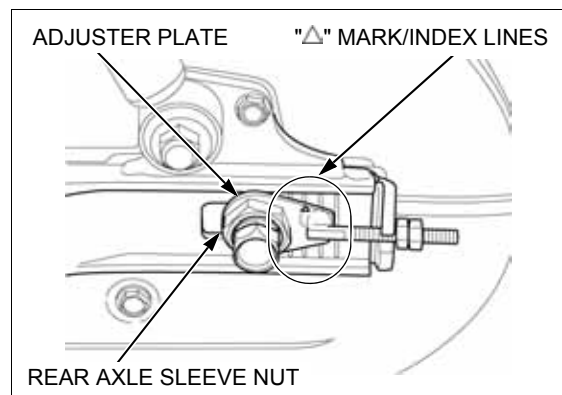
Turn both drive chain adjusters until the correct drive chain slack is obtained.



Make sure the "Δ" marks on both adjuster plates are aligned with the same index lines on the swingarm.

Tighten the rear axle sleeve nut to the specified torque.

**TORQUE: 44 N·m (4.5 kgf·m, 32 lbf·ft)**



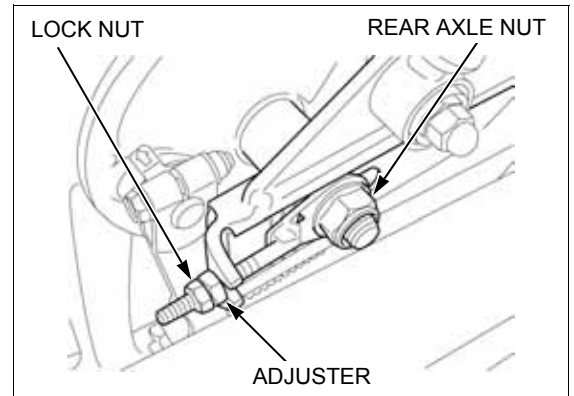
Tighten the rear axle nut to the specified torque.

**TORQUE: 49 N·m (5.0 kgf·m, 36 lbf·ft)**

Tighten the both drive chain adjusters and lock nuts securely.

Recheck the drive chain slack and free wheel rotation.

Check the rear brake pedal freeplay (page 3-18) and adjust it if necessary.



**CLEANING, LUBRICATION AND INSPECTION**

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

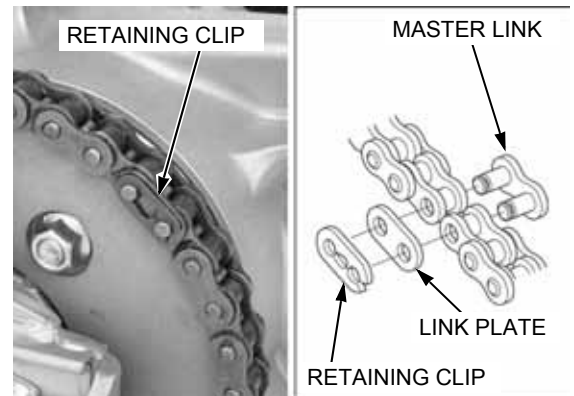
If the drive chain becomes extremely dirty, it should be removed and cleaned prior to lubrication.

Remove the chain cases (page 2-20).

Carefully remove the retaining clip with pliers.

Remove the master link and link plate, and disconnect the drive chain.

Remove the drive chain.



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

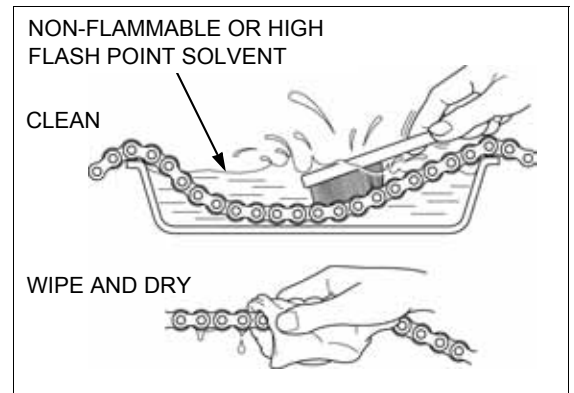
Be sure the chain has dried completely before lubricating.

Inspect the drive chain for possible damage or wear.

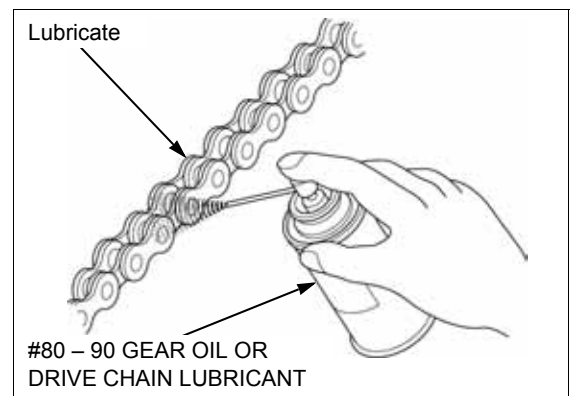
Replace any chain that has damaged rollers, loose fitting links, or otherwise appears unserviceable.

Installing a new chain on badly worn sprockets will cause a new chain to wear quickly.

Inspect and replace the sprocket as necessary.



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





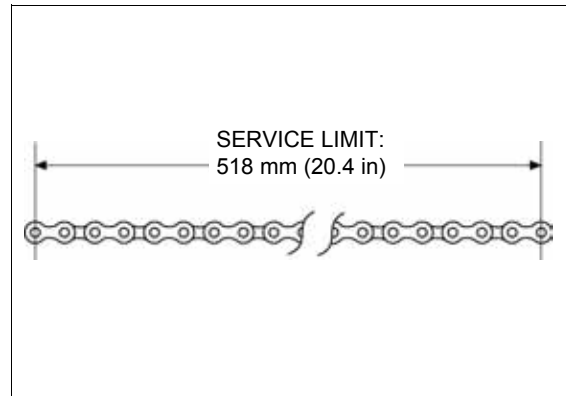
## MAINTENANCE

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

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

**STANDARD: 508 mm (20.0 in)**

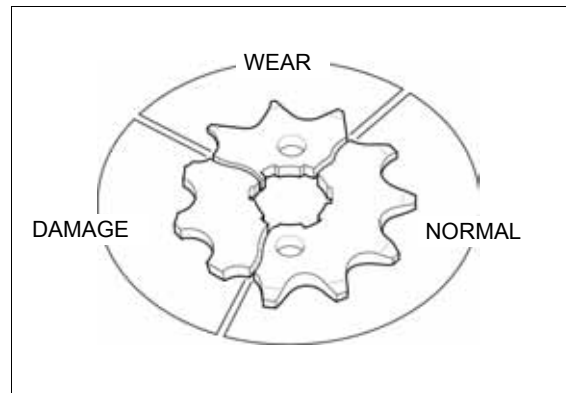
**SERVICE LIMIT: 518 mm (20.4 in)**



### SPROCKET INSPECTION

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

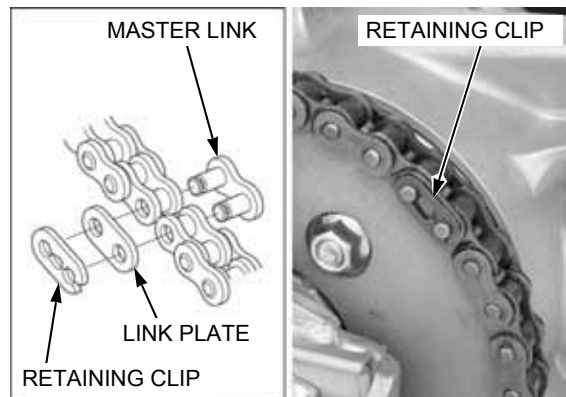
Never use a new drive chain on worn sprockets. Both chain and sprockets must be in good condition, or a new replacement chain will wear rapidly.



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

Install the chain cases (page 2-20).

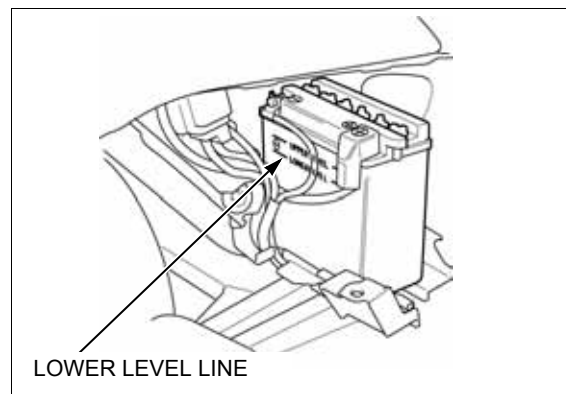
Adjust the drive chain slack (page 3-14).



## BATTERY

Remove the bolt and open the battery case cover, then pull out the battery (page 14-5).

Inspect the electrolyte level.



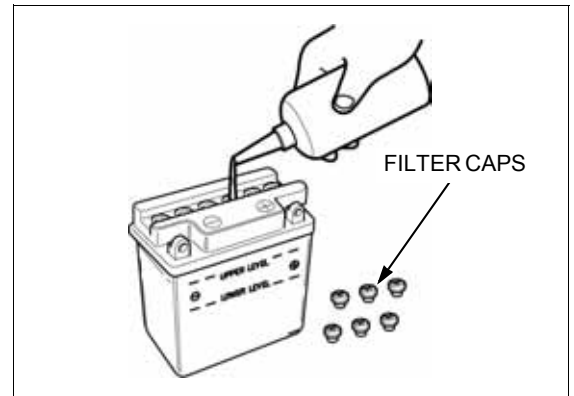
When the electrolyte level nears the lower level, remove the filler cap.

*Add only distilled water. Tap water contains that will shorten the life of the battery.*

Add distilled water to the upper level line.

After filling, install each filler cap firmly.

For the battery charging and specific gravity (page 14-5).



Make sure that the battery breather tube is correctly positioned, and not kinked, trapped or bent in such away as to obstruct the passage of the air.

- If the battery breather tube is blocked, the battery's internal pressure will not be relieved, the breather may come off, or the battery crack as a result.

Install the removed parts in the reverse order of removal.



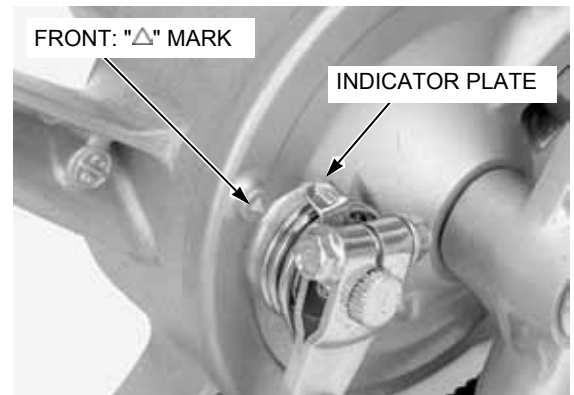
## **BRAKE SHOES WEAR**

### **FRONT BRAKE SHOES**

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

If the indicator plate aligns with the "△" mark, inspect the brake drum (page 12-11).

Replace the brake shoes if the drum I.D. is within service limit (page 12-12).

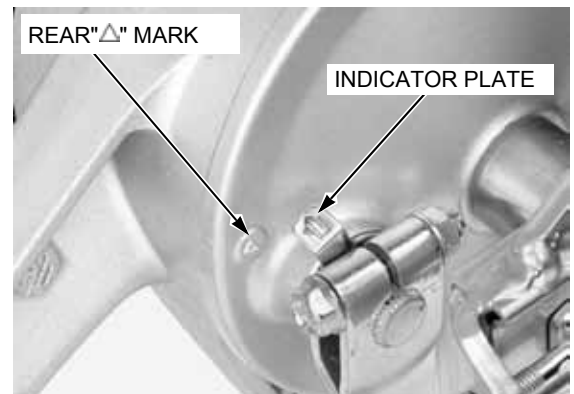


### **REAR BRAKE SHOES**

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

If the indicator plate aligns with the "△" mark on the brake panel, inspect the brake drum (page 13-14).

If the brake drum I.D. is within the service limit, replace the brake shoes (page 13-14).



## MAINTENANCE

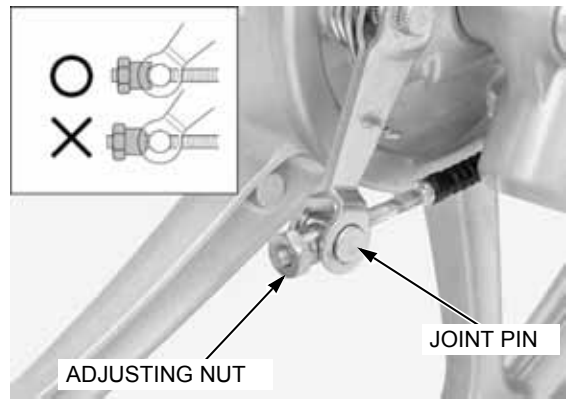
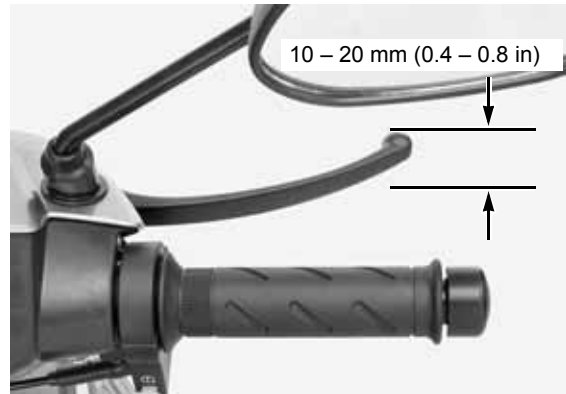
# BRAKE SYSTEM

### FRONT BRAKE LEVER FREEPLAY

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

Measure the front brake lever freeplay at the end of the lever.

**FREEPLAY: 10 – 20 mm (0.4 – 0.8 in)**



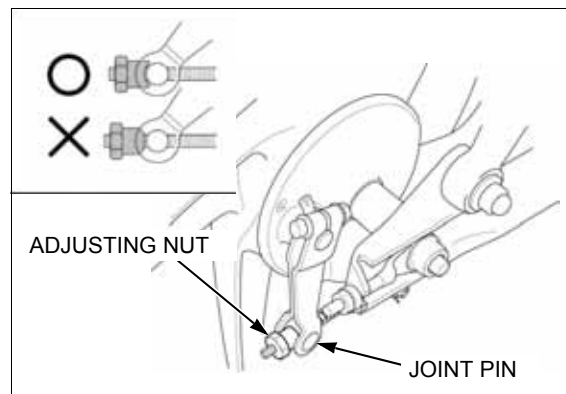
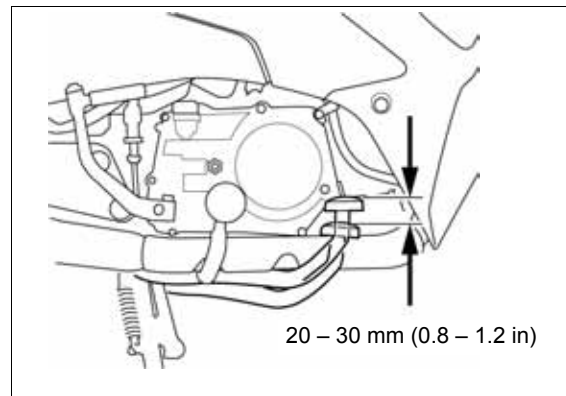
*Make sure the cut-out of the adjusting nut is seated on the joint pin.*

Adjust the front brake lever freeplay by turning the front brake arm adjusting nut.

### BRAKE PEDAL FREEPLAY

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

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



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

Adjust the brake pedal freeplay by turning the adjusting nut.

Recheck the freeplay, then check and adjust the rear brake light switch (page 3-19).

## BRAKE LIGHT SWITCH

**NOTE:**

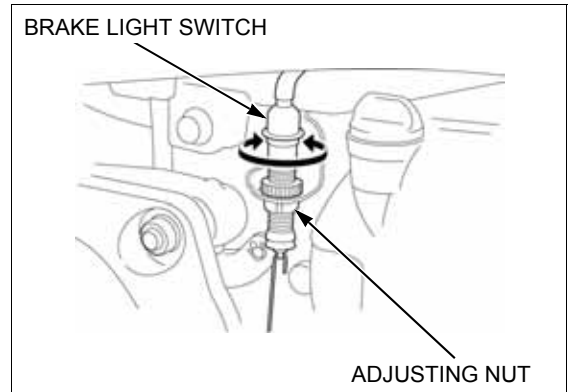
- The front brake light switch cannot be adjusted. If the front brake light switch actuation and brake engagement are not synchronized, either replace the switch unit or the malfunctioning parts of the system.
- Adjust the rear brake light switch after the brake pedal freeplay adjustment.

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

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

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

Recheck the brake light switch operation.



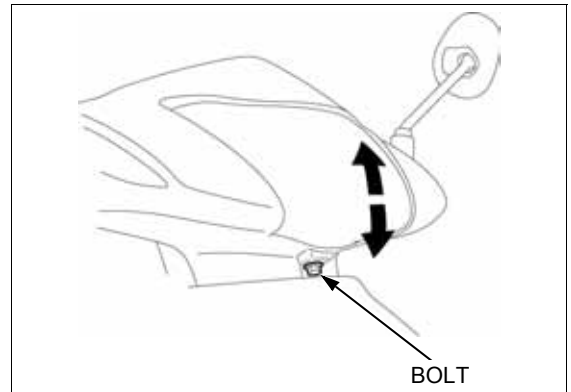
## HEADLIGHT AIM

Place the motorcycle on the level ground using the centerstand.

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

Adjust the headlight beam vertically by loosening the bolt and moving the headlight unit, then tighten the bolt to the specified torque.

**TORQUE: 3 N·m (0.31 kgf·m, 2.2 lbf·ft)**



## CLUTCH SYSTEM

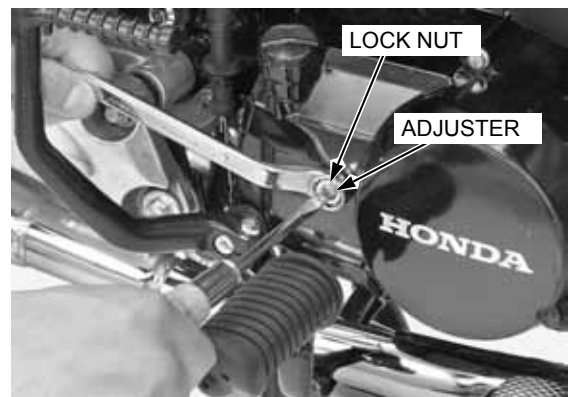
Loosen the clutch adjuster lock nut and turn the clutch adjuster clockwise one full turn; do not turn excessively. Slowly turn the adjuster counterclockwise until resistance is felt.

*Hold the adjuster while tightening the lock nut.*

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

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

- Check for clutch operation after adjustment.



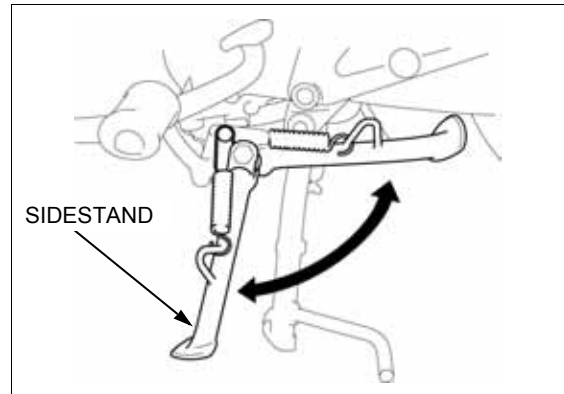
## MAINTENANCE

### SIDESTAND

Support the motorcycle with its centerstand.

Check the sidestand springs for damage or loss of tension.

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



### SUSPENSION

#### FRONT SUSPENSION INSPECTION

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

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

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

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

For fork service (page 12-13).



#### REAR SUSPENSION INSPECTION

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

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

Tighten all nuts and bolts.

For rear shock absorber service (page 13-21).



Support the motorcycle with its centerstand.

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

Replace the swingarm bushings if any looseness is noted (page 13-17).



## NUTS, BOLTS, FASTENERS

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

## WHEELS/TIRES

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

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

Replace the wheel bearings if any looseness is noted (page 12-10).



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

Replace the wheel bearings if any looseness is noted (page 13-8).



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

### RECOMMENDED TIRE PRESSURE AND SIZE:

Unit: kPa (kgf/cm<sup>2</sup>, psi)

		FRONT	REAR
Cold tire pressure	Driver only	200 (2.00, 29)	225 (2.25, 33)
	Driver and Passenger	200 (2.00, 29)	280 (2.80, 41)
Tire size		2.50-17 38L	2.75-17 47P



## MAINTENANCE

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

Check the front and rear wheels for trueness.

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

**MINIMUM TIRE TREAD DEPTH: To indicator**



*Spoke wheel type:* Inspect the wheel rims and spokes for damage.

Tighten any loose spokes to the specified torque using the special tool.

**TOOL:**

**FRONT:** Spoke wrench, 07701-0020200  
4.5 x 5.1 mm

**REAR:** Spoke wrench, 07701-0020300  
5.8 x 6.1 mm

**TORQUE:**

**FRONT SPOKE** 3.2 N·m (0.33 kgf·m, 2.4 lbf·ft)

**REAR SPOKE** 3.7 N·m (0.38 kgf·m, 2.7 lbf·ft)



## STEERING HEAD BEARINGS

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

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



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

If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (page 12-24).



# 4. LUBRICATION SYSTEM

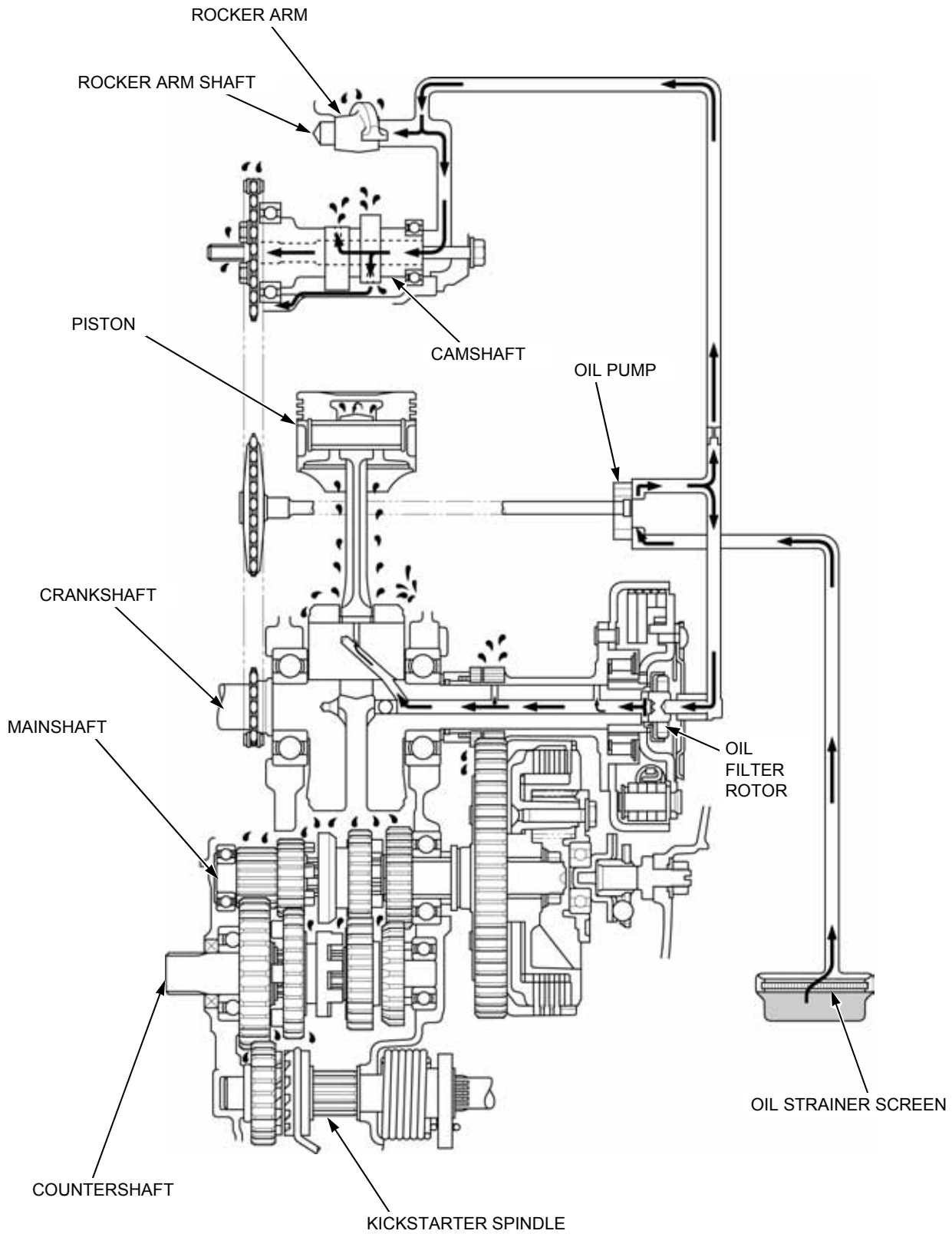
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LUBRICATION SYSTEM DIAGRAM .....	4-2	TROUBLESHOOTING .....	4-3
SERVICE INFORMATION .....	4-3	OIL PUMP .....	4-4



**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

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	At draining	0.7 liter (0.7 US qt, 0.6 Imp qt)	–
	At disassembly	0.9 liter (1.0 US qt, 0.8 Imp qt)	–
Recommended engine oil		Honda "4-stroke motorcycle oil" or equivalent motor oil API service classification: SG or higher (except oils labeled as energy conserving on the circular API service label) JASO T 903 standard: MA Viscosity: SAE 10W-30	–
Oil pump rotor	Tip clearance	0.10 – 0.15 (0.004 – 0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.21 (0.006 – 0.008)	0.35 (0.014)
	Side clearance	0.03 – 0.09 (0.001 – 0.004)	0.15 (0.006)

Unit: mm (in)

### TORQUE VALUE

Oil pump cover screw 5 N·m (0.51 kgf·m, 3.7 lbf·ft)

## TROUBLESHOOTING

#### Engine oil level too low

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

#### Oil contamination

- Worn piston ring or incorrect piston ring installation
- Oil not changed frequently enough

## LUBRICATION SYSTEM

### OIL PUMP

#### REMOVAL

Drain the engine oil (page 3-10).

Remove the following:

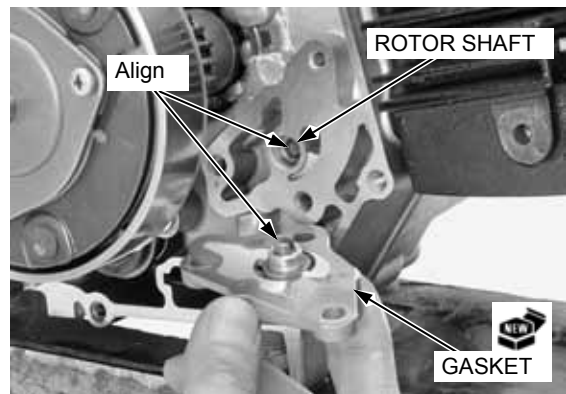
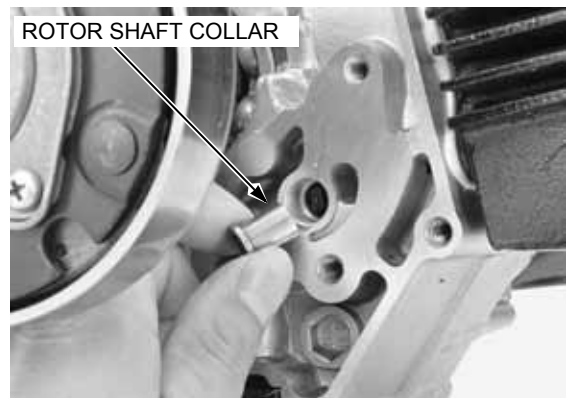
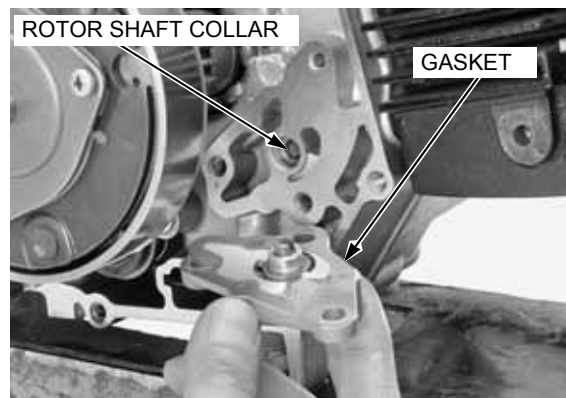
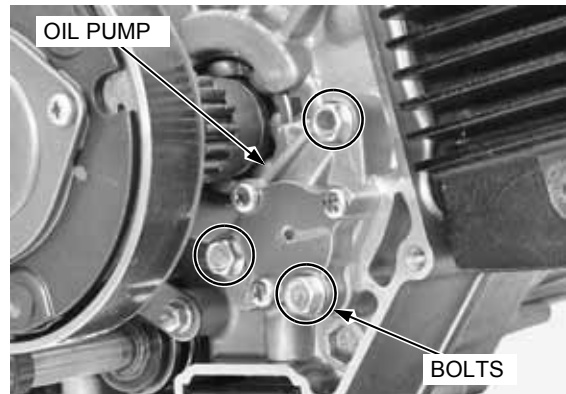
- Right crankcase cover (page 9-6)
- Three bolts
- Oil pump

Remove the rotor shaft collar from the crankcase.  
Remove the gasket from the oil pump body.

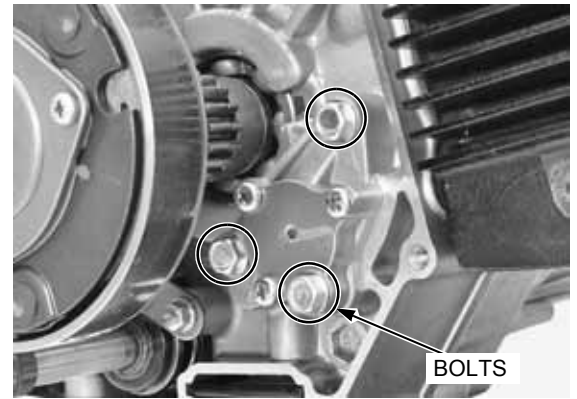
#### INSTALLATION

Install the rotor shaft collar to the crankcase.

Install a new gasket to the oil pump body.  
Install the oil pump to the crankcase by aligning the oil pump shaft groove with the rotor shaft.

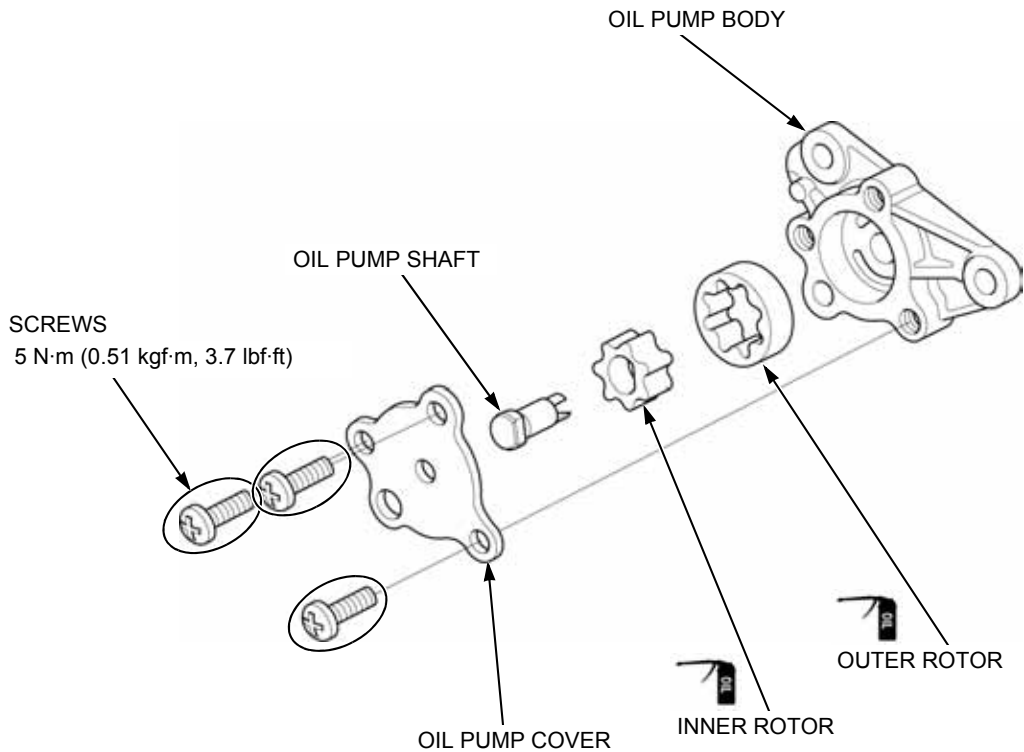


Install and tighten the three mounting bolts.  
 Clean the oil strainer screen (page 3-11).  
 Install the right crankcase cover (page 9-8).  
 After installation, fill the crankcase with recommended engine oil (page 3-10).  
 Start the engine and check that there are no oil leaks.



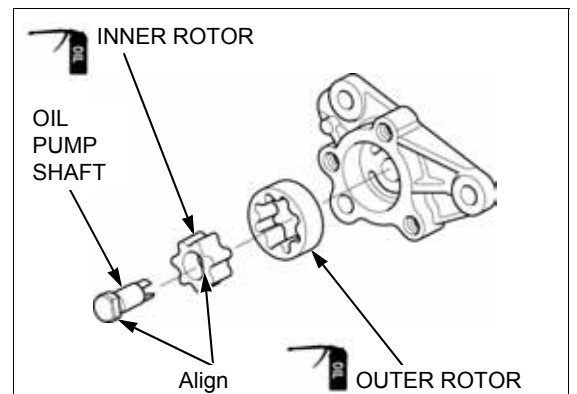
**DISASSEMBLY/ASSEMBLY**

Remove the oil pump (page 4-4).  
 Disassemble the oil pump.



Apply engine oil to the inner rotor and outer rotor sliding surfaces.

Install the inner and outer rotors to the oil pump body.  
 Install the oil pump shaft aligning the flat surfaces of the oil pump shaft and inner rotor.



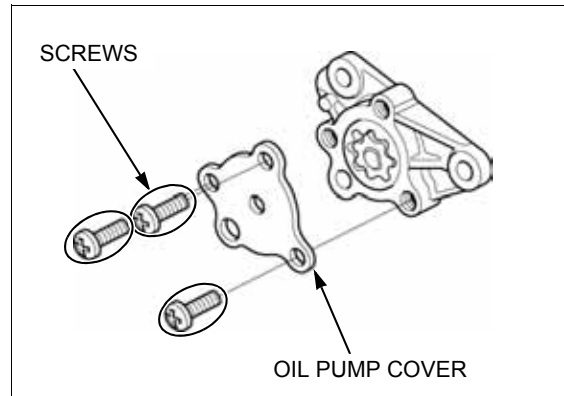
## LUBRICATION SYSTEM

Install the oil pump cover.

Install and tighten the three screws to the specified torque.

**TORQUE: 5 N·m (0.51 kgf·m, 3.7 lbf·ft)**

Install the oil pump (page 4-4).



### INSPECTION

*If any portion of the oil pump is worn beyond the service limit, replace the oil pump as an assembly.*

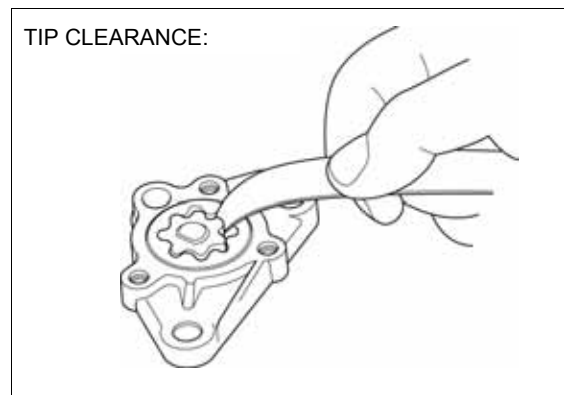
Disassemble the oil pump (page 4-5).

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

Install the oil pump shaft.

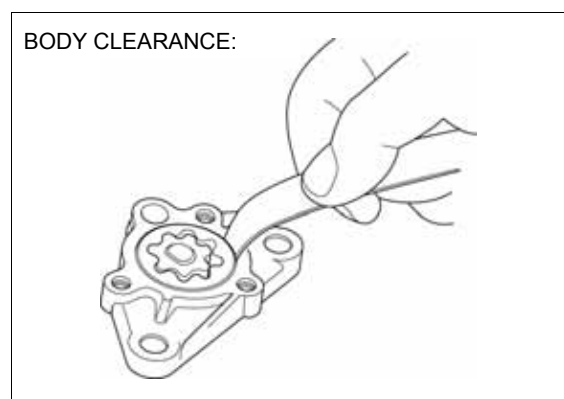
Measure the tip clearance between the inner and outer rotors.

**SERVICE LIMIT: 0.20 mm (0.008 in)**



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

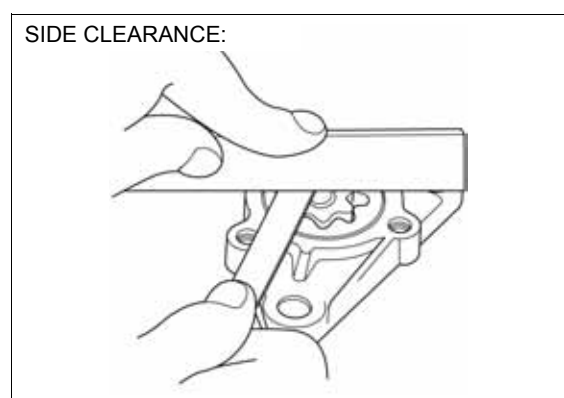
**SERVICE LIMIT: 0.35 mm (0.014 in)**



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

**SERVICE LIMIT: 0.15 mm (0.006 in)**

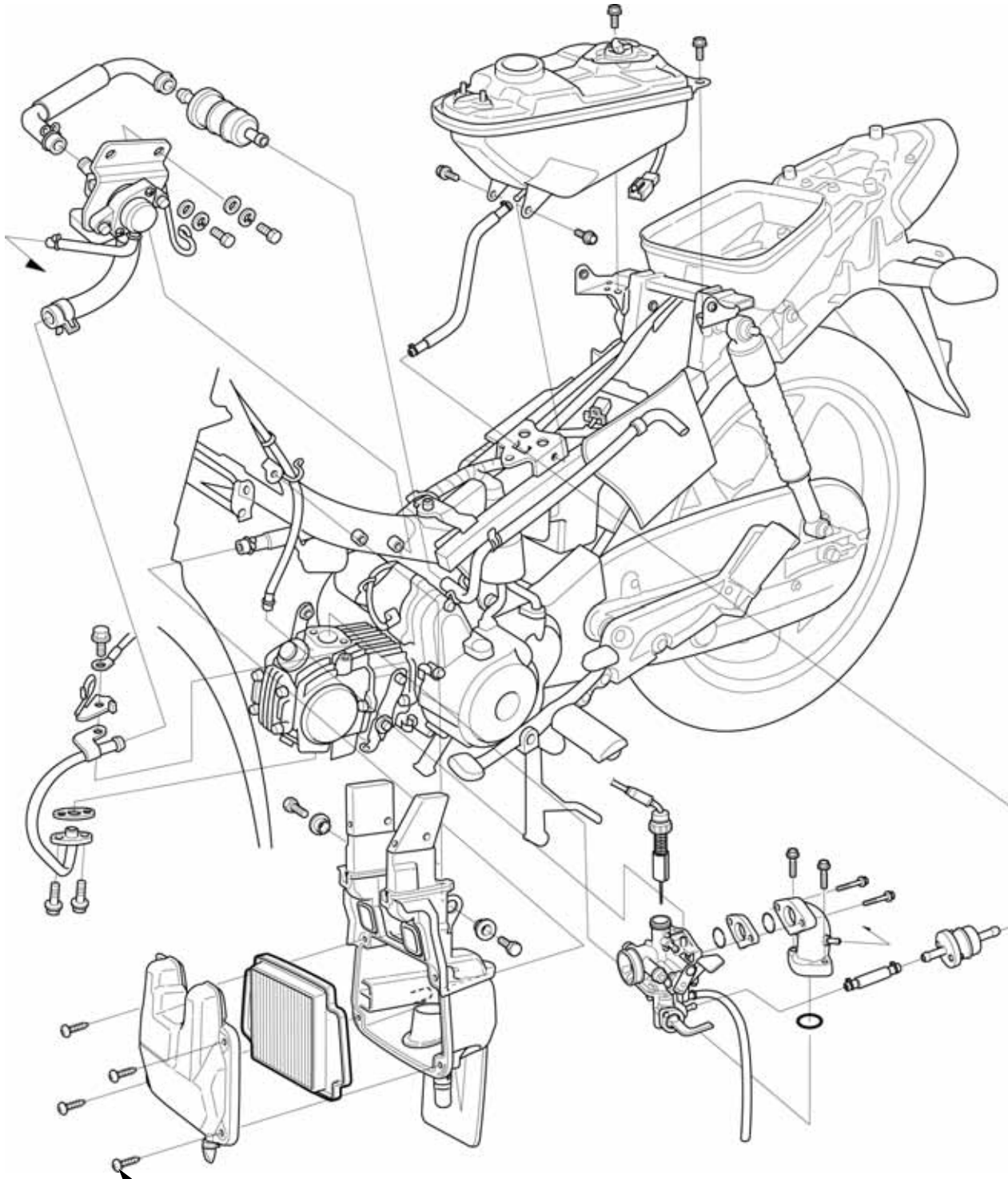
Assemble the oil pump (page 4-5).



COMPONENT LOCATION .....	5-2	CARBURETOR INSTALLATION .....	5-13
SERVICE INFORMATION .....	5-3	FUEL VALVE .....	5-15
TROUBLESHOOTING .....	5-4	AIR SCREW ADJUSTMENT .....	5-16
AIR CLEANER HOUSING .....	5-5	FUEL TANK .....	5-17
CARBURETOR REMOVAL .....	5-6	FUEL FILTER .....	5-18
CARBURETOR DISASSEMBLY/INSPECTION .....	5-8	FUEL STRAINER SCREEN .....	5-18
CARBURETOR ASSEMBLY .....	5-10	SECONDARY AIR SUPPLY SYSTEM .....	5-19
		INLET PIPE .....	5-22

## FUEL SYSTEM

### COMPONENT LOCATION



1.1 N·m (0.11 kgf·m, 0.8 lbf·ft)

## SERVICE INFORMATION

### GENERAL

- Bending or twisting the throttle 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.
- If the vehicle is to be stored for more than one month, drain the float chamber. Fuel left in the float chamber may cause clogged jets, resulting in hard starting or poor driveability.
- Before disassembling the carburetor, place an approved fuel container under the carburetor, loosen the drain screw and drain the carburetor.
- When disassembling the fuel system parts, note the locations of the O-rings. Replace them with new ones on reassembly.
- After removing the carburetor, wrap the intake port of the engine with a shop towel or cover it with a piece of tape to prevent any foreign material from dropping into the engine. Be sure to remove the cover when reinstalling the carburetor.

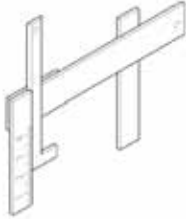

### SPECIFICATIONS

ITEM	SPECIFICATIONS
Carburetor identification number	VM16G
Main jet	#72.5
Slow jet	#12.5 x $\Phi$ 0.4
Air screw initial opening	See page 5-16
Float level	18.2 mm (0.72 in)
Engine idle speed	1,400 $\pm$ 100 min <sup>-1</sup> (rpm)
Throttle grip freeplay	2 – 6 mm (0.1 – 0.2 in)
PAIR control valve specified vacuum	60 kPa (450 mmHg)

### TORQUE VALUE

Carburetor drain screw	2.0 N·m (0.20 kgf·m, 1.5 lbf·ft)
Choke lever holder mounting screw	3.5 N·m (0.36 kgf·m, 2.6 lbf·ft)
Float chamber screw	2.0 N·m (0.20 kgf·m, 1.5 lbf·ft)
Slow jet	1.0 N·m (0.10 kgf·m, 0.7 lbf·ft)
Main jet	1.8 N·m (0.18 kgf·m, 1.3 lbf·ft)
Needle jet holder	1.8 N·m (0.18 kgf·m, 1.3 lbf·ft)
Fuel valve mounting screw	1.0 N·m (0.10 kgf·m, 0.7 lbf·ft)
Fuel strainer screen cup	5.0 N·m (0.51 kgf·m, 3.7 lbf·ft)
PAIR check valve cover screw	2.0 N·m (0.20 kgf·m, 1.5 lbf·ft)

### TOOLS

Carburetor float level gauge 07401-0010000 	Pin driver 07744-0010400 
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## FUEL SYSTEM

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# TROUBLESHOOTING

### Engine won't start

- Too much fuel getting to the engine
  - Air cleaner clogged
  - Flooded carburetor
- Intake air leak
- Fuel contaminated/deteriorated
- No fuel to carburetor
  - Fuel filter clogged
  - Fuel strainer clogged
  - Fuel line clogged/bent
  - No fuel in tank

### Lean mixture

- Fuel jets clogged
- Float valve faulty
- Float level too low
- Fuel line restricted
- Carburetor air vent hose clogged
- Intake air leak
- Throttle valve faulty

### Rich mixture

- Carburetor choke stuck
- Float valve faulty
- Float level too high
- Air jets clogged
- Air cleaner element contaminated
- Flooded carburetor

### Engine stall, hard to start, rough idling

- Fuel line restricted
- Ignition system malfunction
- Fuel mixture too lean/rich
- Fuel contaminated/deteriorated
- Intake air leak
- Idle speed misadjusted
- Air screw misadjusted
- Slow circuit clogged
- Improper choke operation
- Low cylinder compression
- Air cleaner clogged

### Afterburn when engine braking is used

- Lean mixture in slow circuit
- Faulty PAIR (pulse secondary air injection) system
  - Faulty PAIR control valve
  - Clogged hose of the PAIR system
- Ignition system malfunction

### Backfiring or misfiring during acceleration

- Ignition system malfunction
- Fuel mixture too lean

### Poor performance (driveability) and poor fuel economy

- Fuel system clogged
- Ignition system malfunction
- Air cleaner clogged

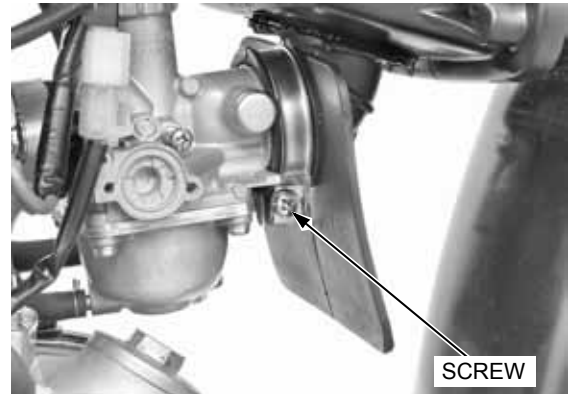
## AIR CLEANER HOUSING

### REMOVAL/INSTALLATION

Remove the following:

- Main pipe cover (page 2-10)
- Air cleaner element (page 3-6)

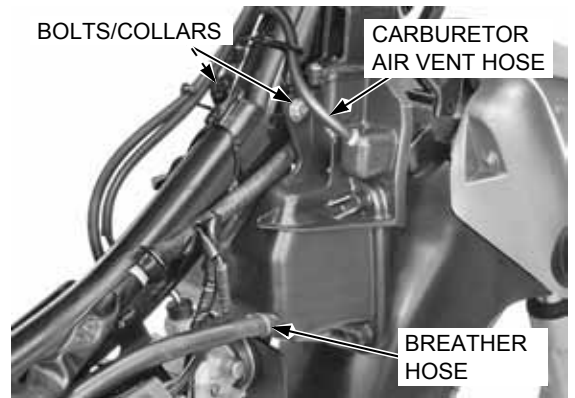
Loosen the connecting hose band screw.



Disconnect the following:

- Crankcase breather hose
- Carburetor air vent hose

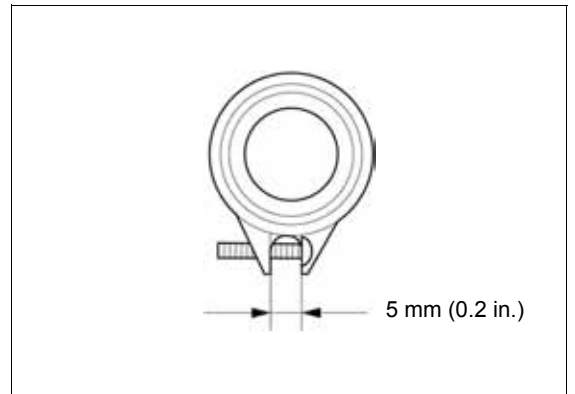
Remove the bolts/collars and air cleaner housing assembly.



*Route the hoses properly (page 1-14).*

Installation is in the reverse order of removal.

- Tighten the connecting hose band screw so that the gap between the band ends is 5 mm (0.2 in.).



# CARBURETOR REMOVAL

### THROTTLE VALVE

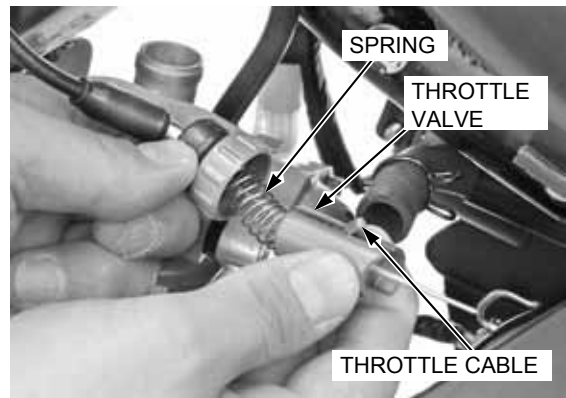
Remove the following:

- Main pipe side covers (page 2-6)
- PAIR (pulse secondary air injection) control valve (page 5-20)

Remove the carburetor top and throttle valve from the carburetor.



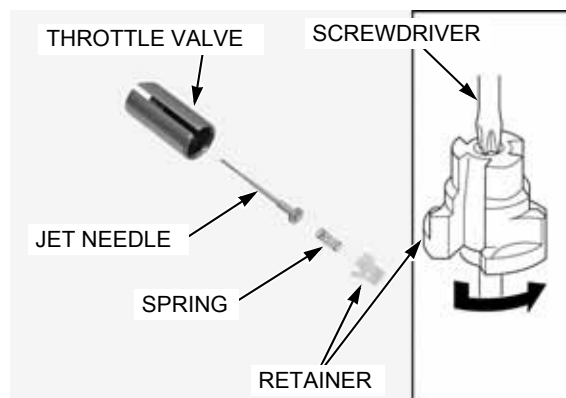
Remove the throttle cable from the throttle valve while compressing the throttle valve spring.



Remove the retainer, spring and jet needle while pushing the retainer with a screwdriver slightly and turning it counterclockwise.

Check the throttle valve and jet needle for scratches, wear or damage.

Replace them if necessary.



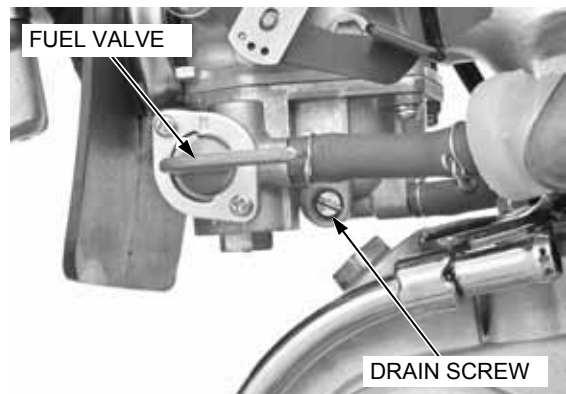
### CARBURETOR BODY

Turn the fuel valve "OFF".

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

Tighten the carburetor drain screw.

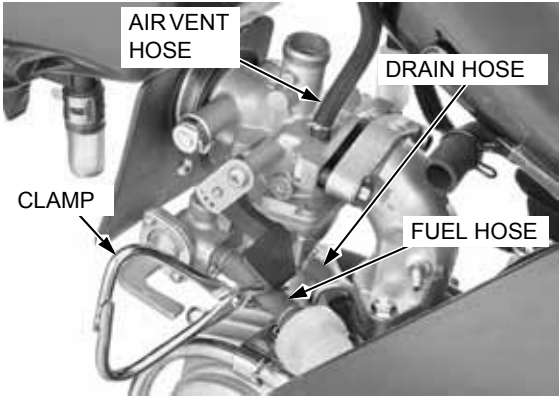
**TORQUE: 2.0 N·m (0.20 kgf·m, 1.5 lbf·ft)**



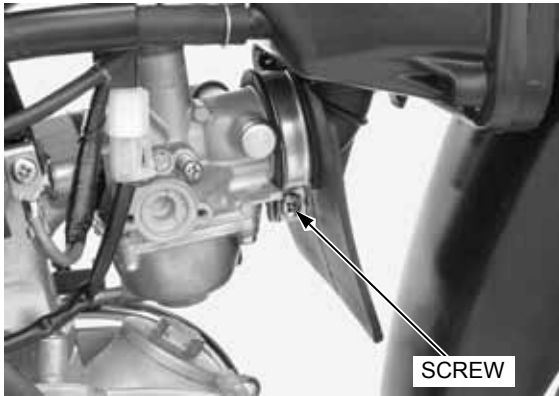
Pinch the fuel hose with the hose clamp.

Disconnect the following:

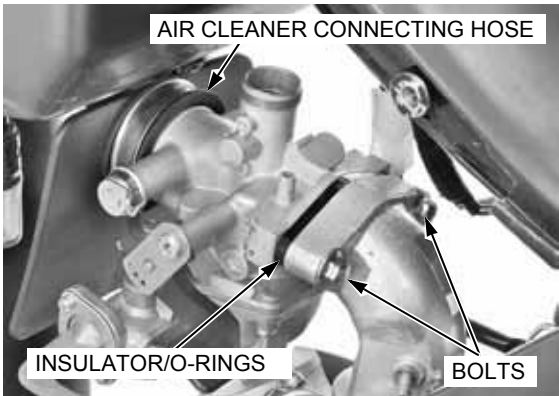
- Fuel hose
- Drain hose
- Carburetor air vent hose



Loosen the air cleaner connecting hose band screw.



Remove the carburetor mounting bolts, insulator and O-rings.  
Remove the carburetor from the inlet pipe and air cleaner connecting hose.

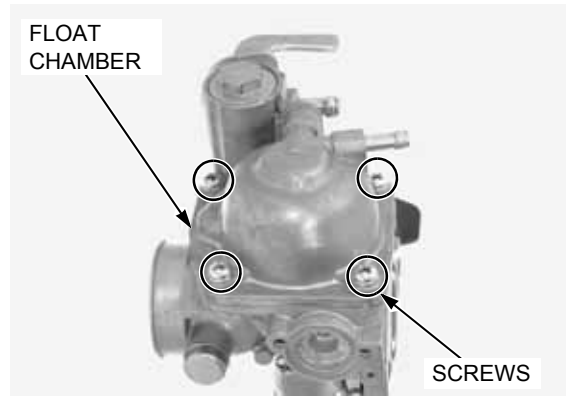


## FUEL SYSTEM

# CARBURETOR DISASSEMBLY/ INSPECTION

### FLOAT CHAMBER

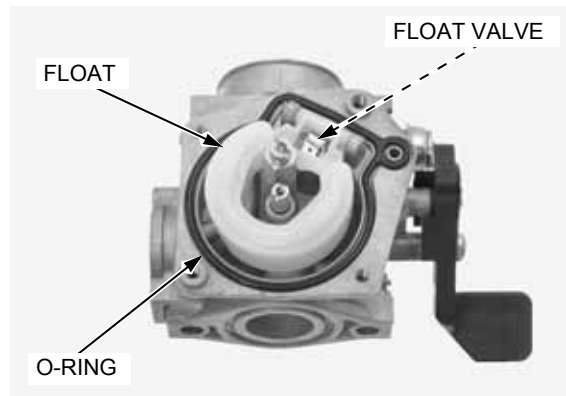
Remove the screws and float chamber.



Remove the O-ring from the carburetor body.

Check the operation of the float valve.

Inspect the float for deformation or damage.

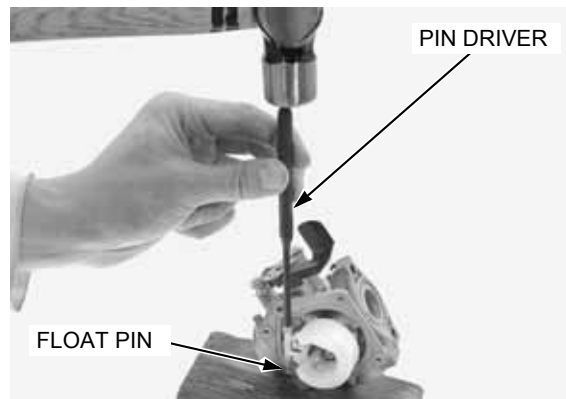


*Be careful not to damage the carburetor body.*

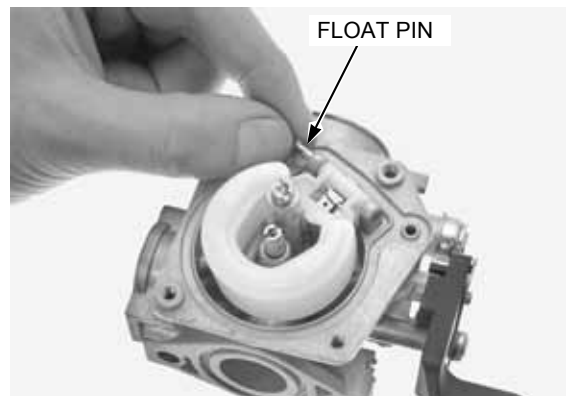
Hold the carburetor body and lightly drive the float pin from the choke lever side.

**TOOL:**  
Pin driver

**07744-0010400**



Remove the float pin.



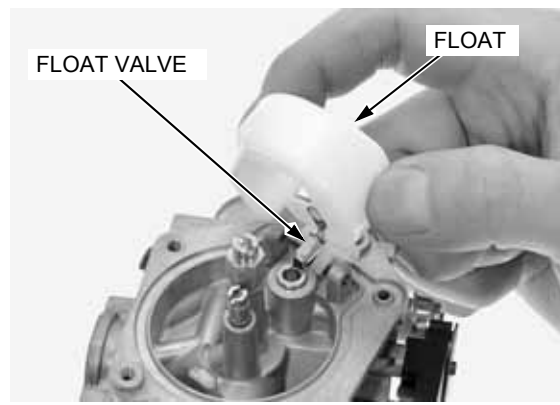
Remove the float and float valve.

Inspect the float valve seat for scratches, clogging and damage.

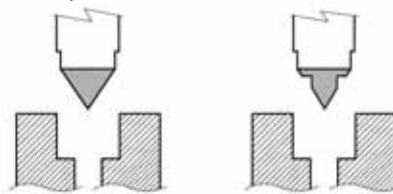
Check the tip of the float valve where it contacts the valve seat for stepped wear or contamination.

Check the float valve operation by pushing its end pin. The pin should return smoothly.

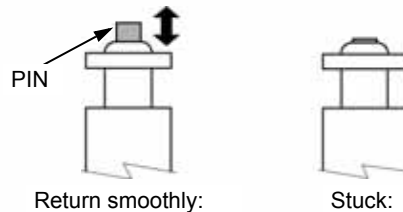
Replace the valve if the tip is worn or contaminated.



Float valve tip check:



Float valve operation check:



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

Remove the following:

- Main jet
- Needle jet holder
- Needle jet
- Slow jet
- Throttle stop screw/spring

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

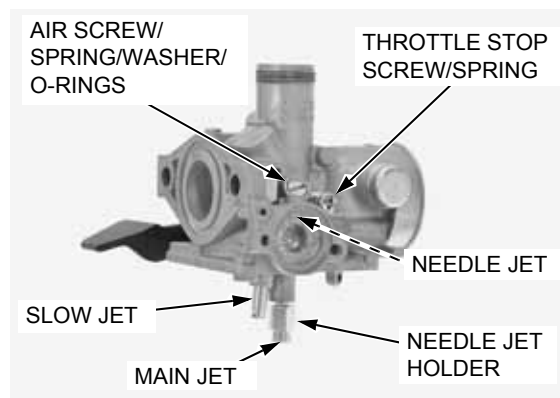
Turn the air screw in and record the number of turns until it seats lightly.

Make a note of the number to use as a reference when reinstalling the air screw.

Remove the air screw, spring, washer and O-rings.

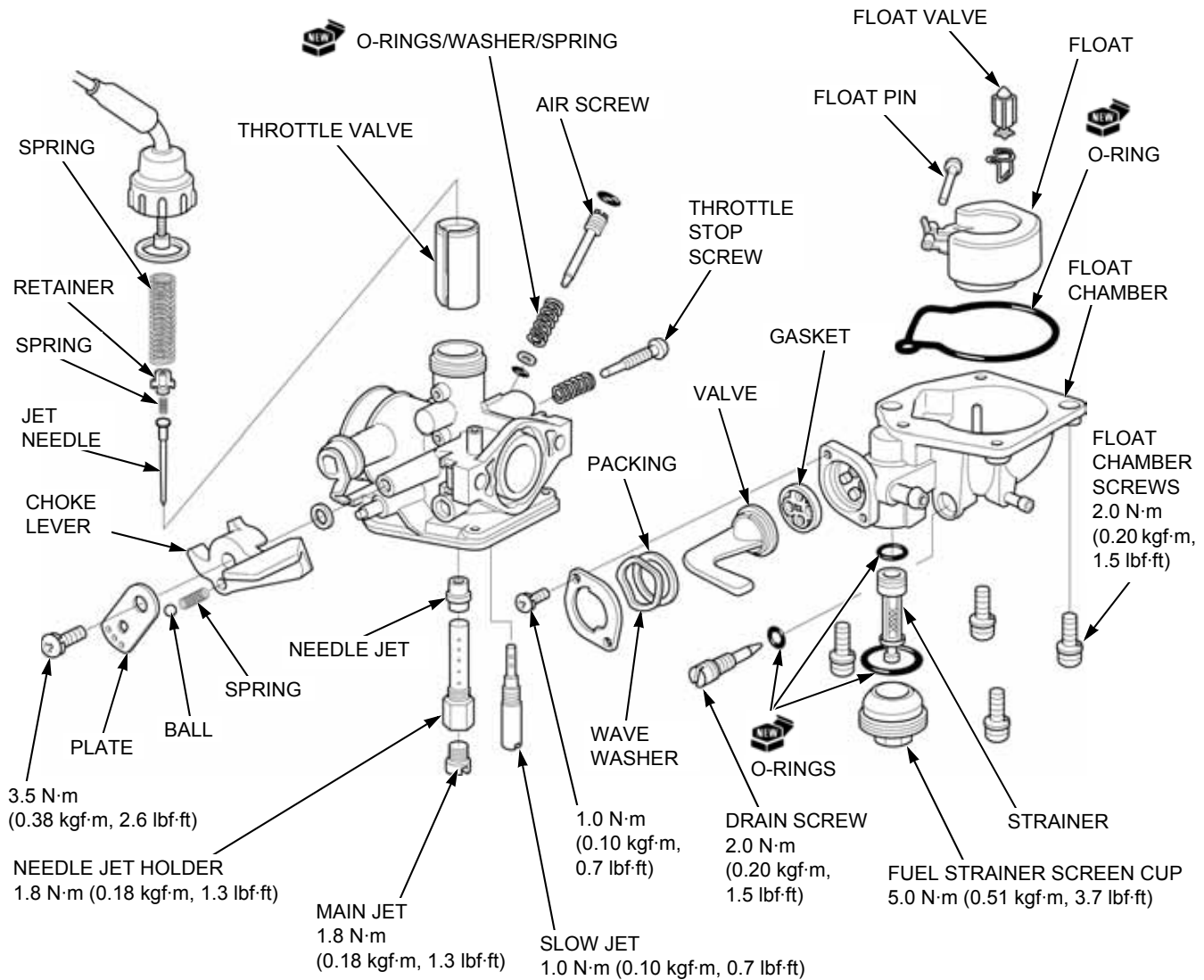
Inspect each jet for wear or damage and replace them if necessary.

Blow open each air and fuel passage in the carburetor body with compressed air.



# FUEL SYSTEM

## CARBURETOR ASSEMBLY



### FLOAT CHAMBER

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

Install the following:

- Throttle stop screw/spring
- Slow jet
- Needle jet
- Needle jet holder
- Main jet

Tighten them to the specified torque.

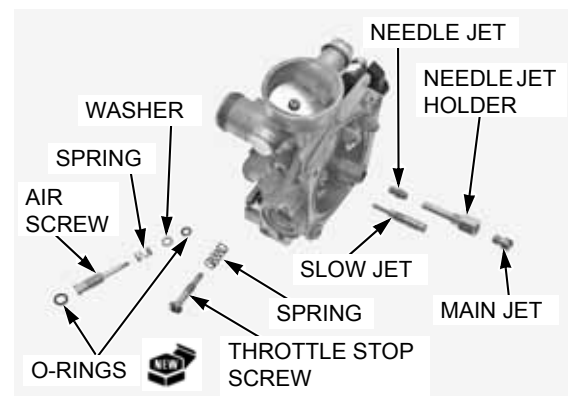
#### TORQUE:

<b>Slow jet</b>	<b>1.0 N·m (0.10 kgf·m, 0.7 lbf·ft)</b>
<b>Needle jet holder</b>	<b>1.8 N·m (0.18 kgf·m, 1.3 lbf·ft)</b>
<b>Main jet</b>	<b>1.8 N·m (0.18 kgf·m, 1.3 lbf·ft)</b>

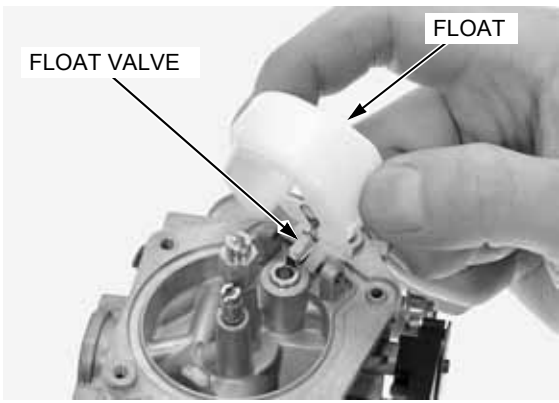
Install the following:

- Spring
- Washer
- New O-rings

Install the air screw and return it to its original position as noted during removal.

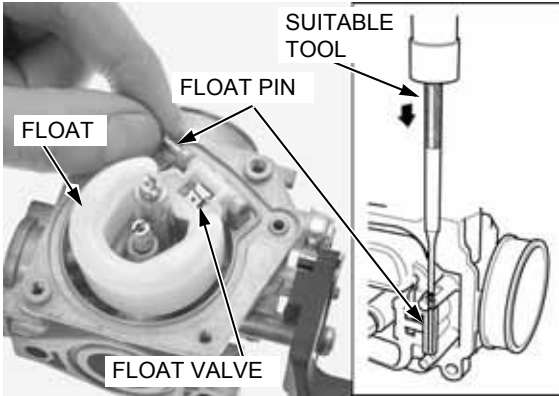


Install the float valve onto the float.  
Install the float and float valve in the carburetor body.



Install the float pin through the body and float.  
Hold the carburetor body and lightly drive the float pin until it is fully seated.

*Be careful not to damage the carburetor body.*

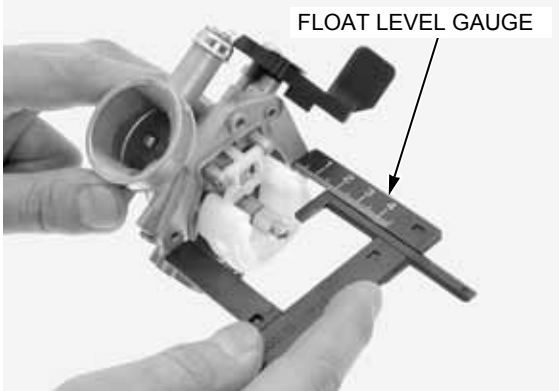


With the float valve seated and the float arm just touching the valve, measure the float level with the float level gauge as shown.

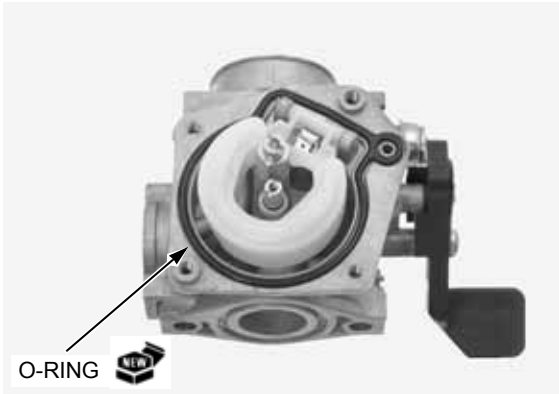
**FLOAT LEVEL: 18.2 mm (0.72 in)**

**TOOL:**  
**Carburetor float level gauge 07401-0010000**

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



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

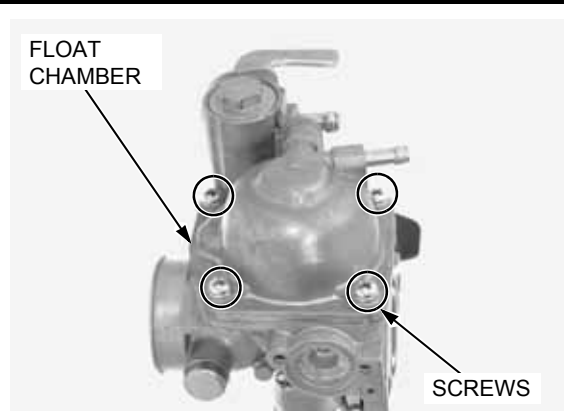




## FUEL SYSTEM

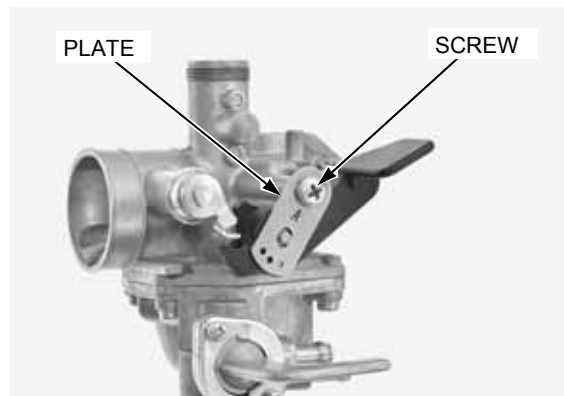
Install the float chamber.  
Install and tighten the float chamber screws to the specified torque.

**TORQUE: 2.0 N·m (0.20 kgf·m, 1.5 lbf·ft)**

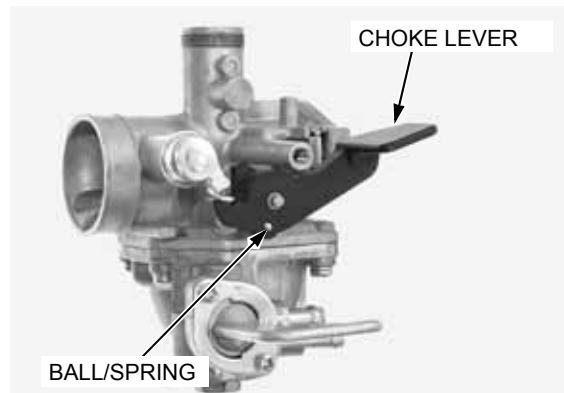


### CHOKE LEVER DISASSEMBLY/ ASSEMBLY

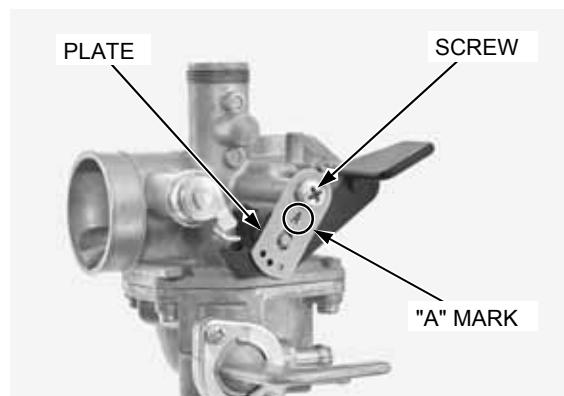
Remove the screw and plate.



Remove the ball, spring and choke lever.  
Install the choke lever, spring and ball.



Install the plate with its "A" mark facing out.  
Install and tighten the screw to the specified torque.  
**TORQUE: 3.5 N·m (0.36 kgf·m, 2.6 lbf·ft)**



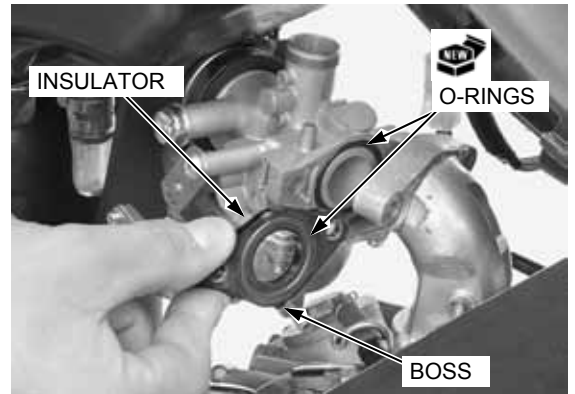
# CARBURETOR INSTALLATION

## CARBURETOR BODY

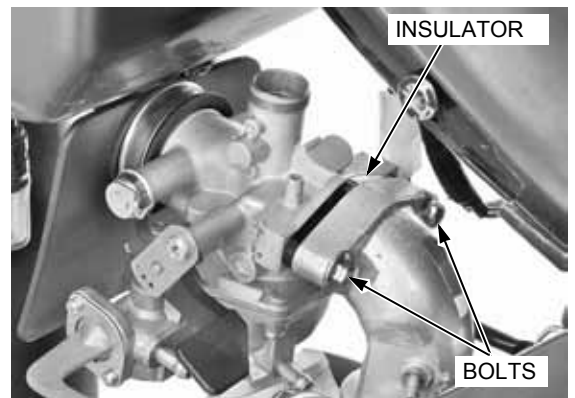
Install the carburetor body to the air cleaner connecting hose.

*Install the insulator with the boss facing down.*

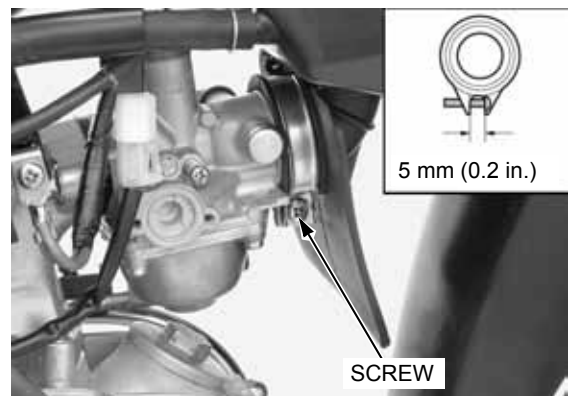
Install new O-rings into the insulator and carburetor body grooves.



Install the carburetor body and insulator to the inlet pipe and tighten the bolts.



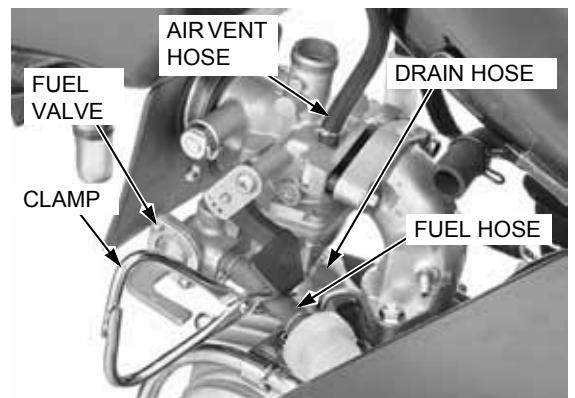
Tighten the connecting hose band screw so that the gap between the band ends is 5 mm (0.2 in.).



Connect the following:

- Carburetor air vent hose
- Drain hose
- Fuel hose

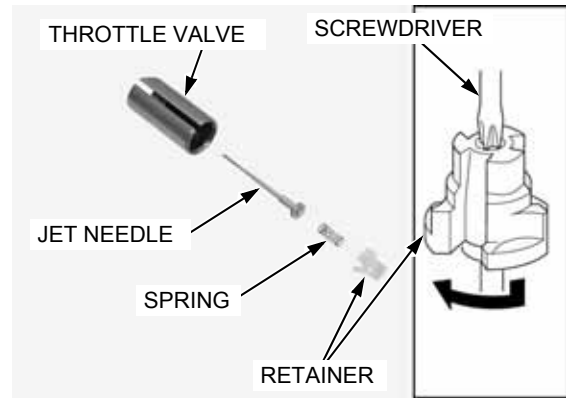
Remove the hose clamp.  
Turn the fuel valve "ON".



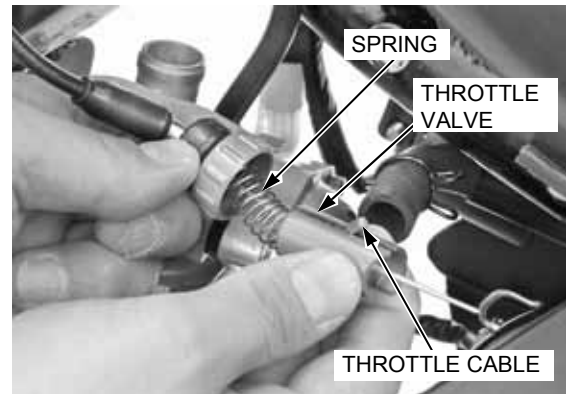
## FUEL SYSTEM

### THROTTLE VALVE

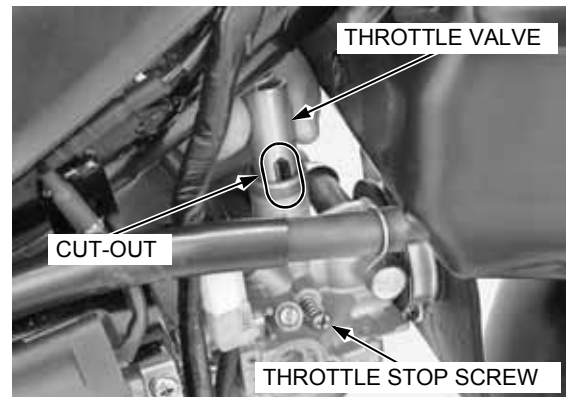
Install the jet needle into the throttle valve. Secure the jet needle with retainer and spring while pushing the retainer with a screwdriver slightly and turning it clockwise.



Install the throttle valve spring onto the throttle cable. Connect the throttle cable to the throttle valve while compressing the throttle valve spring.



Install the throttle valve into the carburetor body by aligning its cut-out with the throttle stop screw.



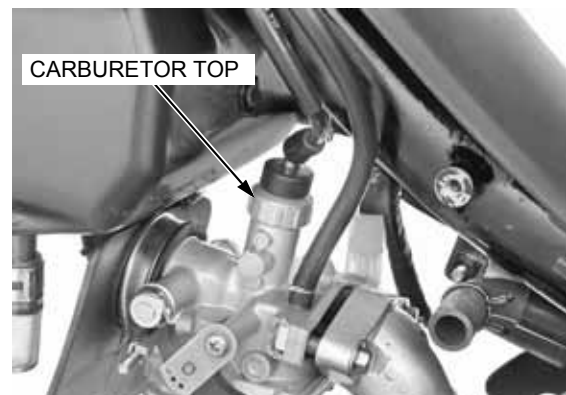
Tighten the carburetor top.

Install the PAIR (pulse secondary air injection) control valve (page 5-20).

After installing the carburetor and PAIR control valve, check for the following:

- Throttle grip freeplay (page 3-5)
- Engine idle speed (page 3-12)
- Air screw adjustment (page 5-16)

Install the main pipe side covers (page 2-6).



## FUEL VALVE

### REMOVAL

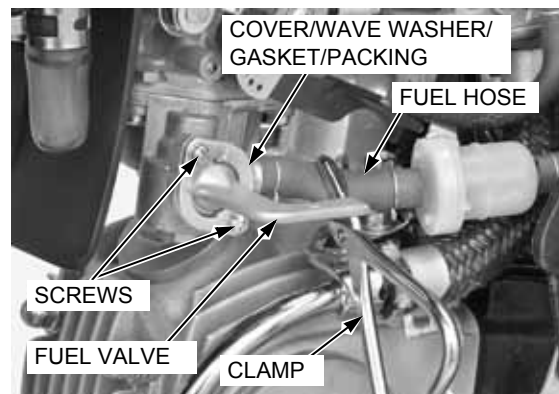
Remove the main pipe side covers (page 2-6).

Turn the fuel valve "OFF".

Pinch the fuel hose with the hose clamp.

Remove the following:

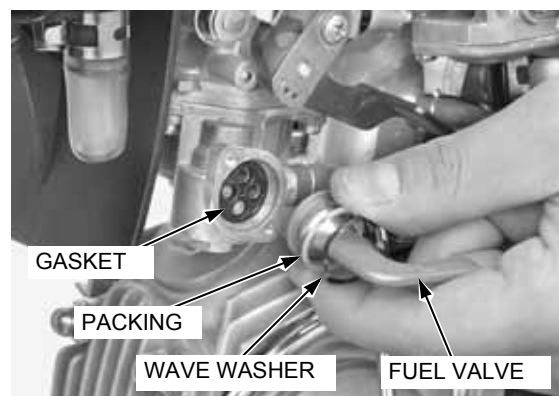
- Two screws
- Cover
- Wave washer
- Packing
- Fuel valve
- Gasket



### INSTALLATION

Install the following:

- Gasket
- Fuel valve
- Packing
- Wave washer



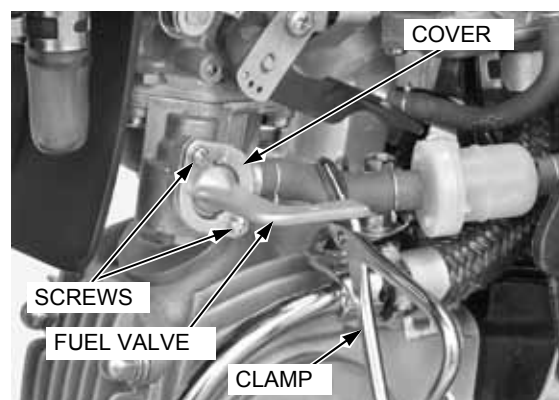
Install the cover and tighten two screws to the specified torque.

**TORQUE: 1.0 N·m (0.10 kgf·m, 0.7 lbf·ft)**

Remove the hose clamp.

Turn the fuel valve "ON".

Install the main pipe side cover (page 2-6).



## FUEL SYSTEM

# AIR SCREW ADJUSTMENT

### IDLE DROP PROCEDURE

- The air screw is factory pre-set and no adjustment is necessary unless the carburetor is overhauled or the air screw is replaced.
- Use a tachometer with graduations of  $50 \text{ min}^{-1}$  (rpm) or smaller that will accurately indicate a  $50 \text{ min}^{-1}$  (rpm) change.

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

Remove the left main pipe side cover (page 2-6)

1. Turn the air screw clockwise until it seats lightly, then back it out to specification given. This is an initial setting prior to the final air screw adjustment.

**INITIAL OPENING: 2 – 1/8 turns out**

2. Warm up the engine to operating temperature. Stop and go riding for 10 minutes is sufficient.
3. Stop the engine and connect the tachometer according to its manufacturer's instructions.

4. Disconnect the PAIR (pulse secondary air injection) control valve vacuum hose from the PAIR control valve, then plug the vacuum hose and connect the vacuum pump to PAIR control valve joint with a suitable hose.

5. Apply the specified vacuum to the PAIR control valve more than 60 kPa (450 mmHg).
6. Start the engine and adjust the idle speed with the throttle stop screw.

**IDLE SPEED:  $1,300 \pm 100 \text{ min}^{-1}$  (rpm)**

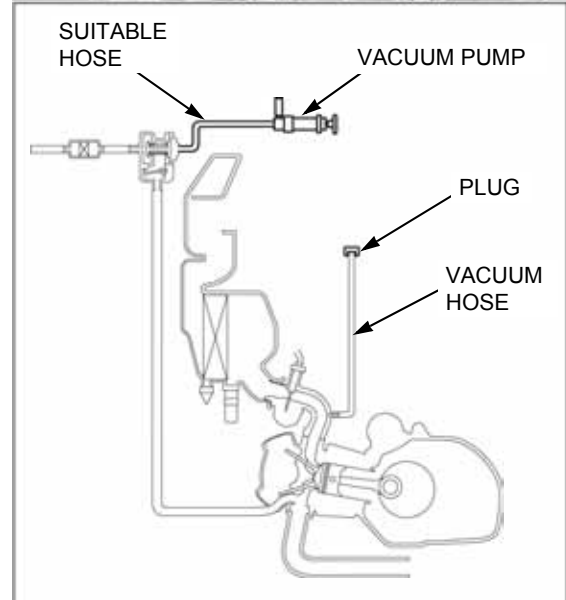
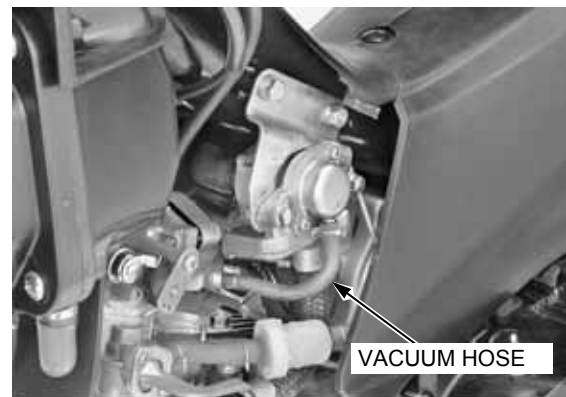
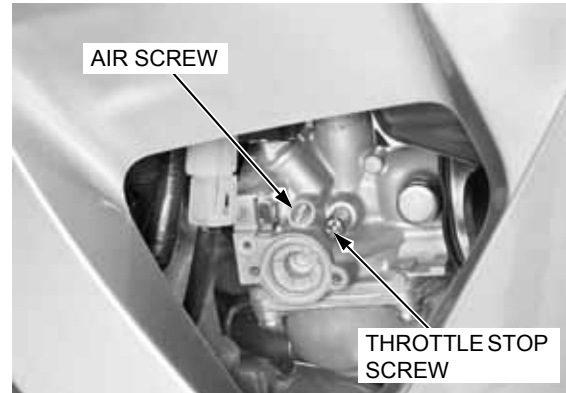
7. Turn the air screw in or out slowly to obtain the highest engine speed.
8. Lightly open the throttle 2 or 3 times, then adjust the idle speed with the throttle stop screw.
9. Turn the air screw out until the engine speed drops by  $100 \text{ min}^{-1}$  (rpm).
10. Turn the air screw clockwise to the final opening from the position obtained step 9.

**FINAL OPENING: 3/8 turns in**

11. Disconnect the plug from the inlet pipe hose joint, then disconnect the PAIR control valve vacuum hose from the vacuum pump and connect it to the inlet pipe hose joint.

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

**IDLE SPEED:  $1,400 \pm 100 \text{ min}^{-1}$  (rpm)**



# FUEL TANK

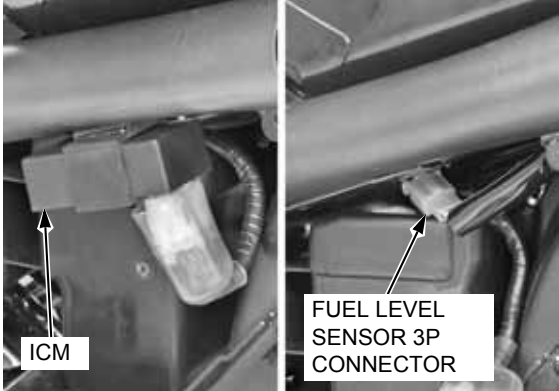
## REMOVAL/INSTALLATION

Remove the following:

- Seat (page 2-11)
- Body cover (page 2-8)

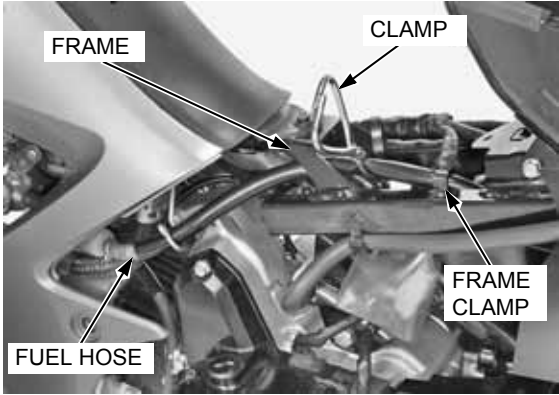
Remove the ICM from the frame.

Disconnect the fuel level sensor 3P connector.



Clamp and disconnect the fuel hose.

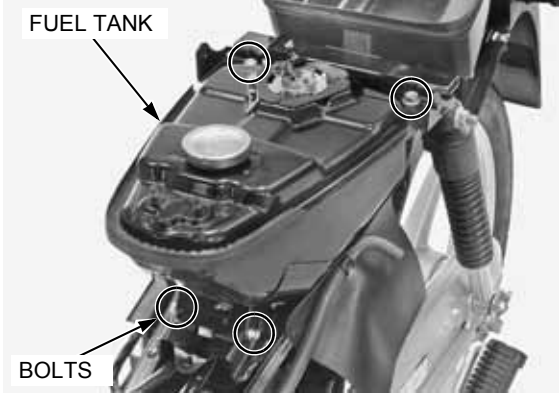
Release the fuel hose from the frame clamp and pull it out of the frame.



Remove the mounting bolts and fuel tank.

*Route the hoses properly (page 1-14).*

Installation is in the reverse order of removal.



## FUEL SYSTEM

### FUEL FILTER

#### REMOVAL/INSTALLATION

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

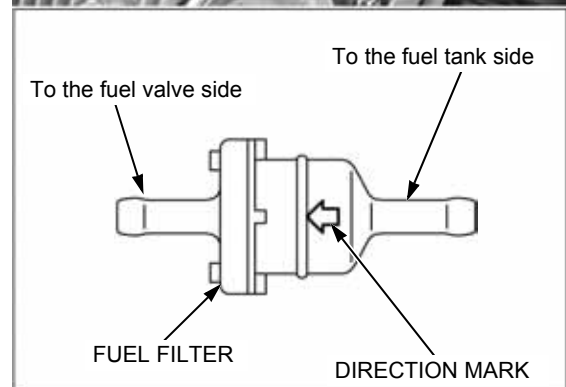
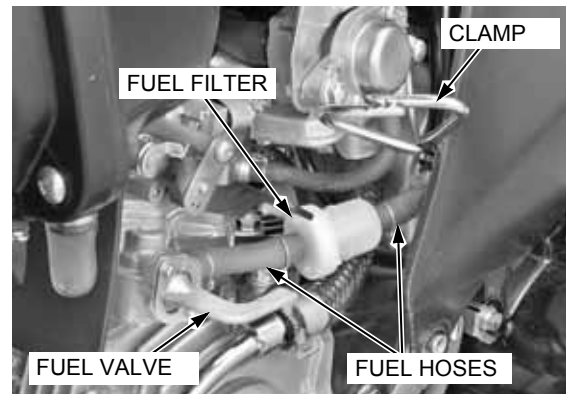
Turn the fuel valve "OFF".

Clamp the fuel hose of the fuel tank side.  
Disconnect the fuel hoses and remove the fuel filter.

*Wipe off spilled out fuel.* Place an approved fuel container and drain the fuel.

Check the fuel filter for damage or contamination.  
Replace the fuel filter if necessary.

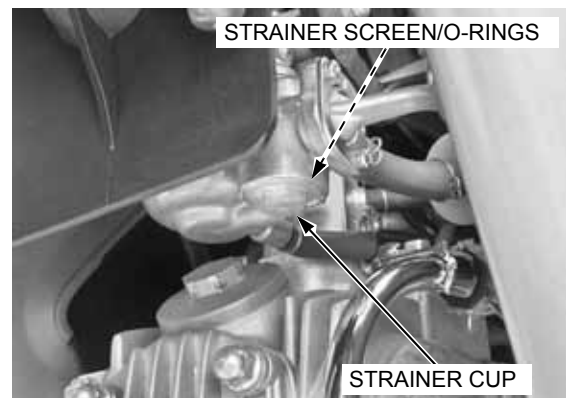
Installation is in the reverse order of removal.



### FUEL STRAINER SCREEN

Turn the fuel valve "OFF".  
Remove the fuel strainer cup, strainer screen and O-rings.

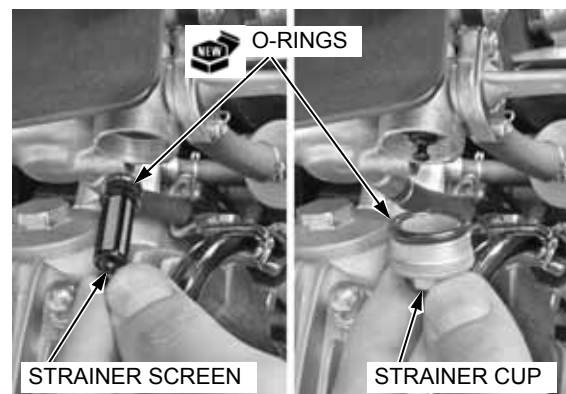
Clean the strainer screen and strainer cup in non-flammable or high flash point solvent.  
Replace the strainer screen if necessary.



Install new O-rings, strainer screen and strainer cup.  
Tighten the strainer cup to the specified torque.

**TORQUE: 5.0 N·m (0.51 kgf·m, 3.7 lbf·ft)**

Turn the fuel valve "ON" and make sure that there are no fuel leakage.



## SECONDARY AIR SUPPLY SYSTEM

### SYSTEM INSPECTION

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

Disconnect the air supply hose from the separate air filter (page 5-19).

Disconnect the PAIR (pulse secondary air injection) control valve vacuum hose from the PAIR control valve, then plug the vacuum hose and connect the vacuum pump to PAIR control valve joint with a suitable hose.

Start the engine and open the throttle slightly to be certain that air is sucked in through the air supply hose. If the air is not drawn in, check the air supply hose for clogging.

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

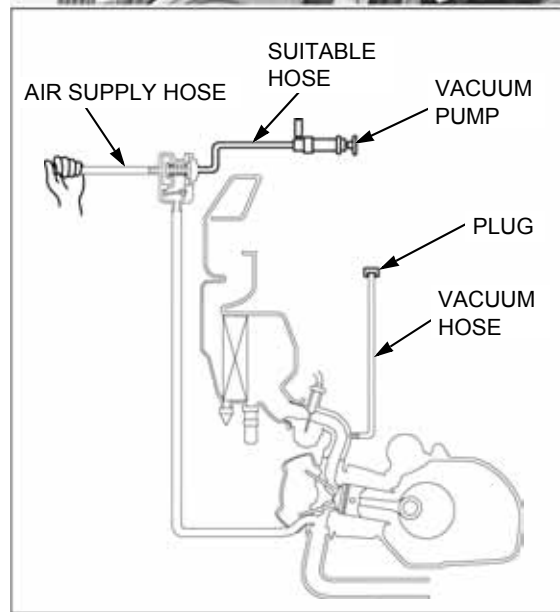
Check that the air supply hose stops drawing air, and that the vacuum does not bleed.

#### SPECIFIED VACUUM: 60 kPa (450 mmHg)

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

*Route the hoses properly (page 1-14).*

Install the removed parts in the reverse order of removal.



### SEPARATE AIR FILTER REMOVAL/INSTALLATION

Remove the following:

- Main pipe side covers (page 2-6)
- Body cover (page 2-8)

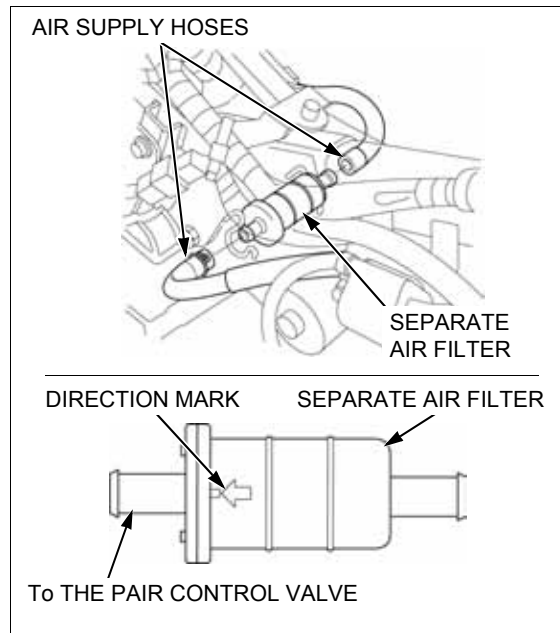
Release the separate air filter from the frame clamps.

Disconnect the air supply hoses from the separate air filter and remove the separate air filter.

Check the separate air filter.

*Route the hoses properly (page 1-14).*

Installation is in the reverse order of removal.





## FUEL SYSTEM

### PAIR (PULSE SECONDARY AIR INJECTION) CONTROL VALVE REMOVAL/INSTALLATION

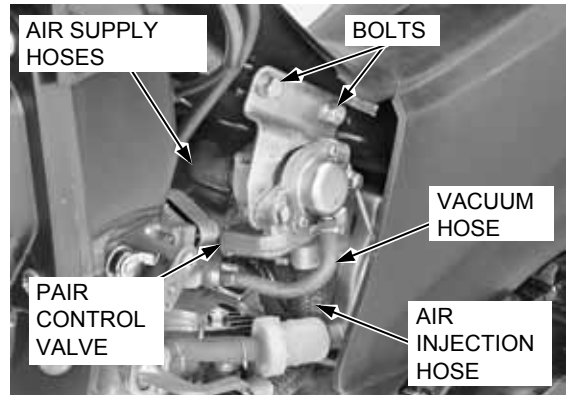
Remove the left main pipe side cover (page 2-6).

Disconnect the vacuum hose and air injection hose.

Remove the bolts and disconnect the air supply hose, then remove the PAIR control valve body.

*Route the hoses properly (page 1-14).*

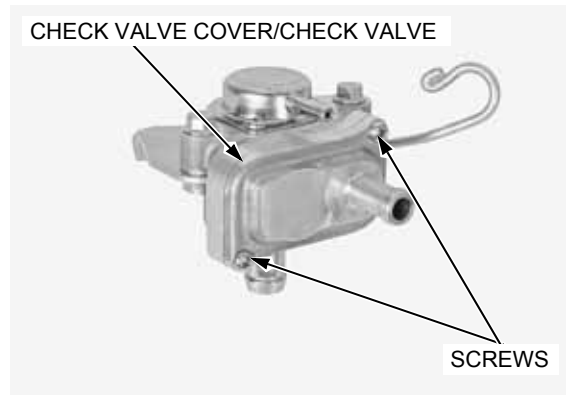
Installation is in the reverse order of removal.



### PAIR (PULSE SECONDARY AIR INJECTION) CHECK VALVE REMOVAL/INSTALLATION

Remove the PAIR control valve (page 5-20).

Remove the screws, check valve cover and check valve from the PAIR control valve body.



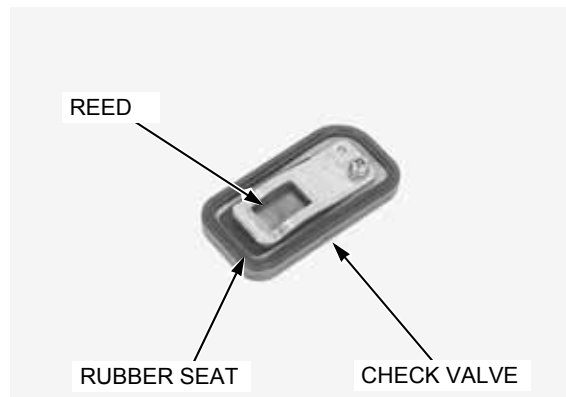
Check the reed for damage or fatigue, replace if necessary.

Replace the PAIR control 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.

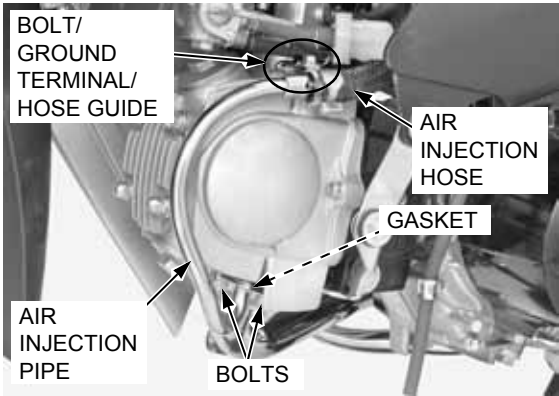
#### TORQUE:

**PAIR CHECK VALVE COVER SCREW**      **2.0 N·m (0.20 kgf·m, 1.5 lbf·ft)**



### AIR INJECTION PIPE REMOVAL/ INSTALLATION

- Remove the left main pipe side cover (page 2-6).
- Disconnect the air injection hose.
- Remove the bolt, ground terminal, carburetor drain hose guide.
- Remove the bolts and air injection pipe.
- Remove the gasket and clean the both mating surfaces.



Check the injection pipe for crack or damage.

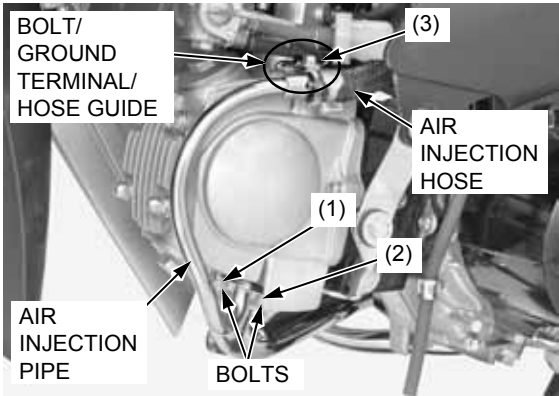


Install a new gasket to the air injection pipe.



*Route the wire harness properly (page 1-14).* Set the air injection pipe, carburetor drain hose guide and ground terminal in position and loosely install the bolts.

- Tighten the bolts in the specified sequence as shown.
- Connect the air injection hose to the air injection pipe.
- Install the left main pipe side cover (page 2-6).



## FUEL SYSTEM

### INLET PIPE

#### REMOVAL

Remove the following:

- Main pipe side covers (page 2-6)
- PAIR (pulse secondary air injection) control valve (page 5-20)

Remove the following:

- Bolts
- Insulator
- O-rings

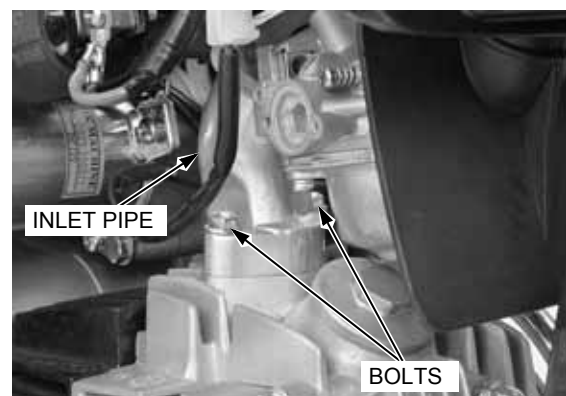
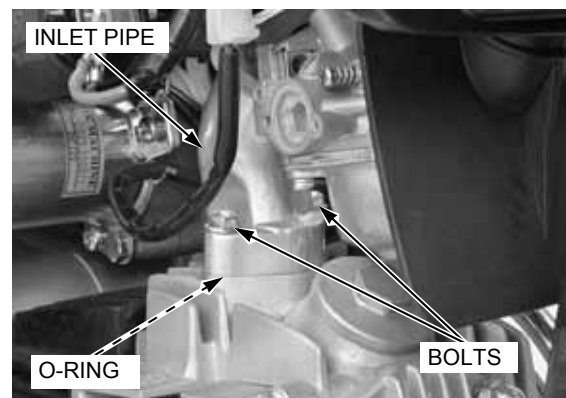
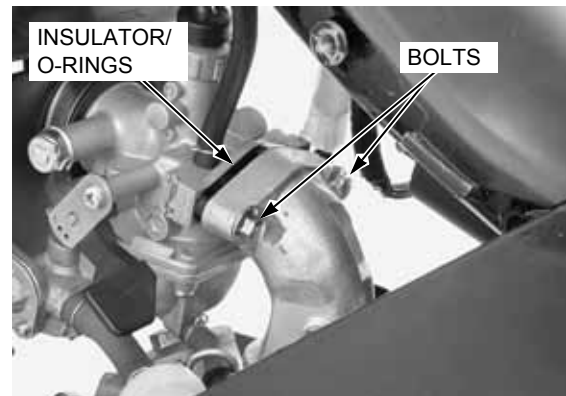
Remove the following:

- Bolts
- Inlet pipe
- O-ring

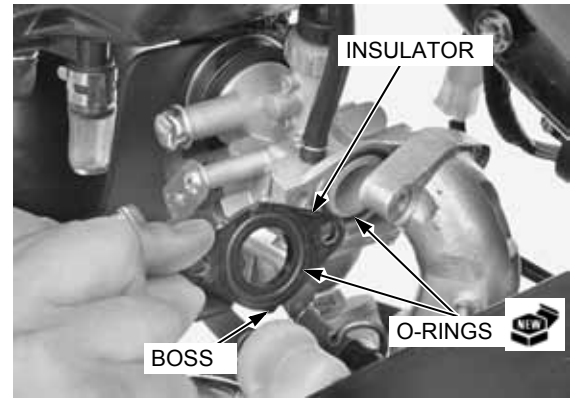
#### INSTALLATION

Install a new O-ring to the inlet pipe.

Install the inlet pipe and bolts to the cylinder head. Tighten the bolts.



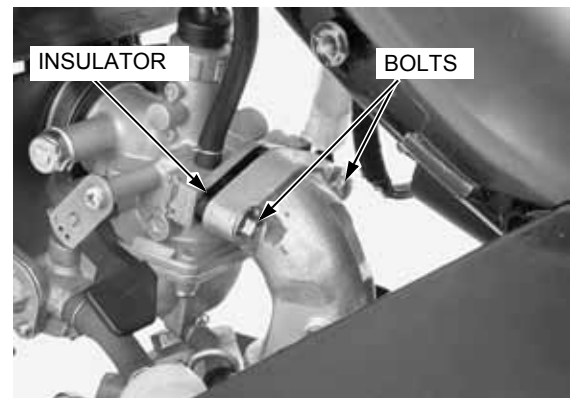
*Install the insulator with the boss facing down.* Install new O-rings into the insulator and carburetor body grooves.



Install the insulator and bolts to the carburetor body and tighten the bolts.

Install the following:

- PAIR (pulse secondary air injection) control valve (page 5-20)
- Main pipe side covers (page 2-6)



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**MEMO**

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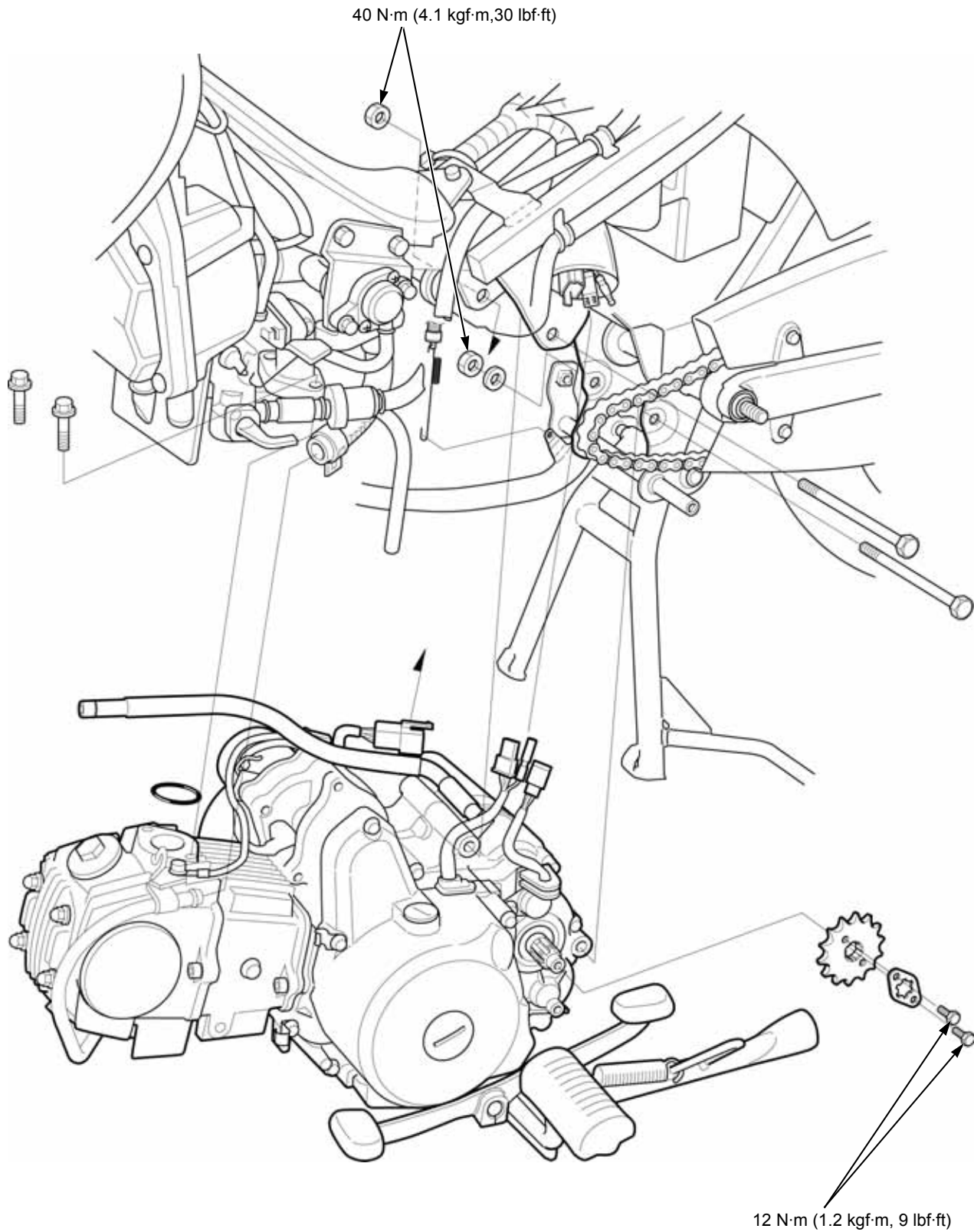
# 6. ENGINE REMOVAL/INSTALLATION

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COMPONENT LOCATION .....6-2      ENGINE REMOVAL ..... 6-4  
SERVICE INFORMATION .....6-3      ENGINE INSTALLATION..... 6-7

# ENGINE REMOVAL/INSTALLATION

## COMPONENT LOCATION



## **SERVICE INFORMATION**

### **GENERAL**

- During engine removal and installation, support the motorcycle with its centerstand.
- Support the engine using a jack or other adjustable support to ease of engine hanger bolts removal.
- The following components can be serviced with the engine installed in the frame.
  - Alternator (page 10-6)
  - Manual clutch (page 9-9)
  - Centrifugal clutch (page 9-9)
  - Gearshift linkage (page 9-26)
  - Cylinder head (page 7-10)
  - Cylinder/piston (page 8-4)
  - Oil pump (page 4-4)
  - Starter motor (page 16-6)
- The following components require engine removal for service.
  - Crankshaft/transmission/kickstarter (page 11-7)
  - Shift forks/shift drum (page 11-13)
  - Cam chain guide sprocket (page 11-22)

### **SPECIFICATIONS**

<b>ITEM</b>		<b>SPECIFICATIONS</b>
Engine dry weight		23.5 kg (51.8 lbs)
Engine oil capacity	At draining	0.7 liter (0.7 US qt, 0.6 Imp qt)
	At disassembly	0.9 liter (1.0 US qt, 0.8 Imp qt)
Recommended engine oil		Honda "4-stroke motorcycle oil" or equivalent motor oil API service classification: SG or higher (except oils labeled as energy conserving on the circular API service label) JASO T 903 standard: MA Viscosity: SAE 10W-30

### **TORQUE VALUES**

Drive sprocket fixing plate bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Engine hanger upper nut	40 N·m (4.1 kgf·m, 30 lbf·ft)
Engine hanger lower nut	40 N·m (4.1 kgf·m, 30 lbf·ft)



## ENGINE REMOVAL/INSTALLATION

### ENGINE REMOVAL

Support the motorcycle with its centerstand.

Drain the engine oil (page 3-10).

Remove the following:

- Body cover (page 2-8)
- Main pipe side covers (page 2-6)
- Left crankcase rear cover (page 10-4)
- Exhaust pipe/muffler (page 2-20)

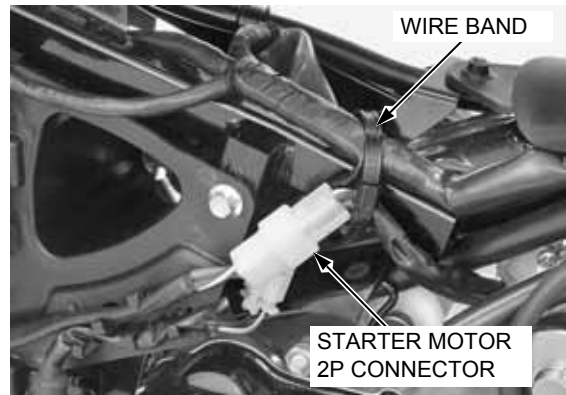
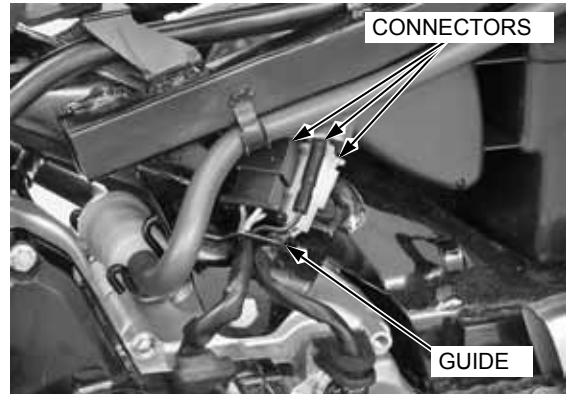
Release the wires from the guide.

Disconnect the following:

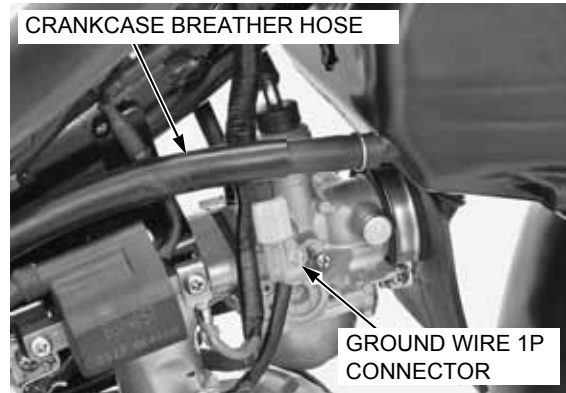
- Alternator 4P (Black) connector
- Alternator wire (Black/Red) connector
- Gear position switch 6P connector

Disconnect the starter motor 2P connector.

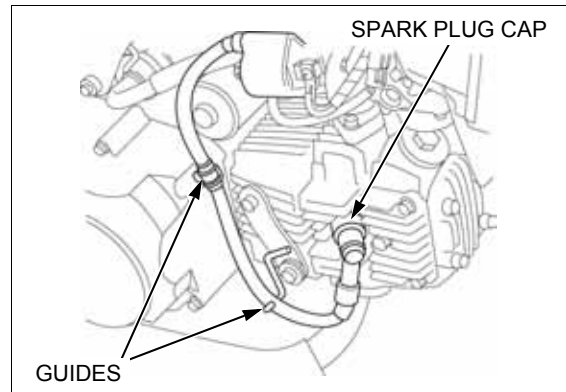
Loosen the wire band and pull the starter motor wire out from it.



Disconnect the crankcase breather hose and ground wire 1P connector.

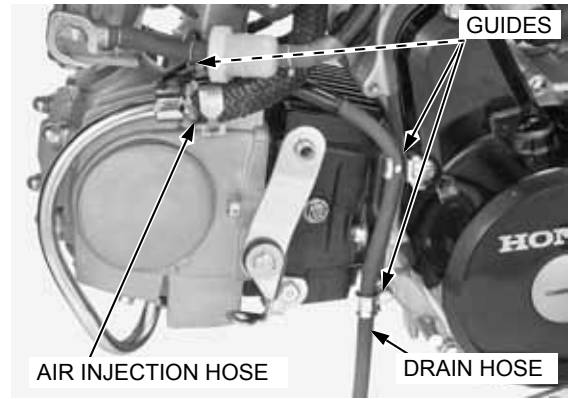


Disconnect the spark plug cap and release the spark plug wire from the guides.

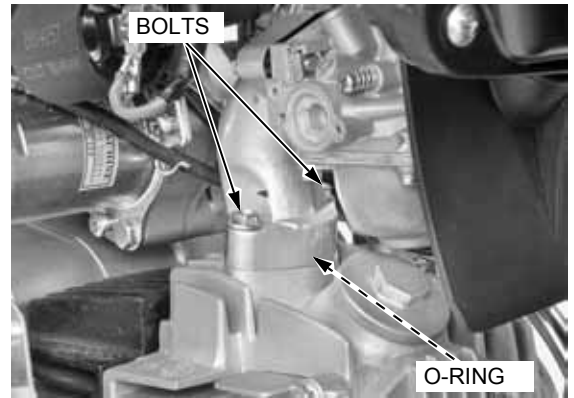


## ENGINE REMOVAL/INSTALLATION

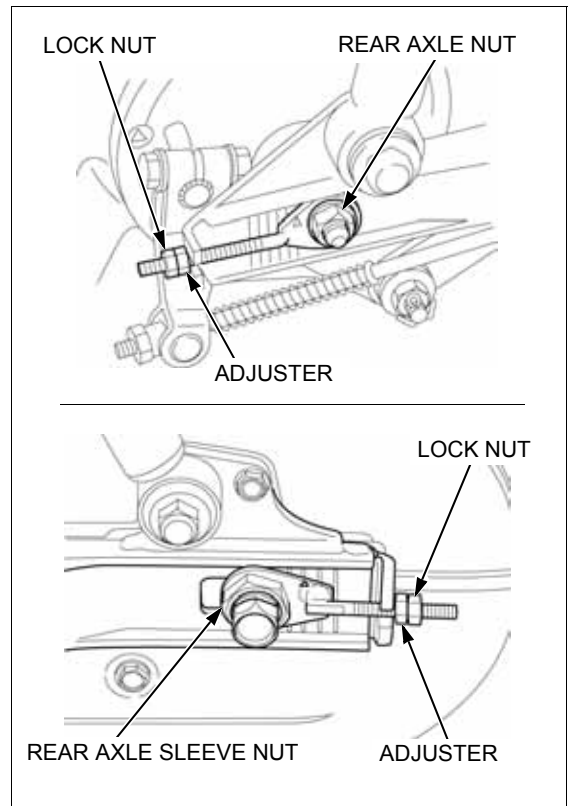
Release the carburetor drain hose from the guides.  
Disconnect the air injection hose.



Remove the inlet pipe mounting bolts and O-ring.

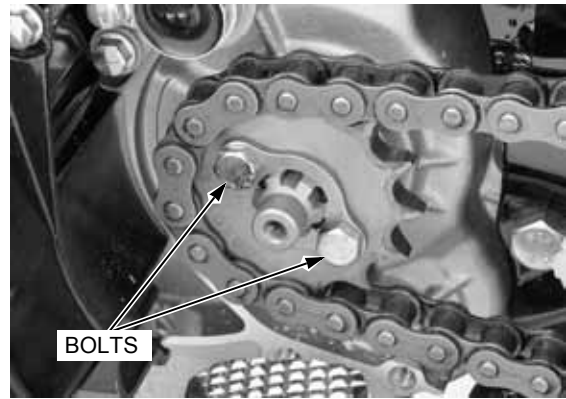


Loosen the rear axle nut, rear axle sleeve nut, both lock nuts and drive chain adjusters.  
Push the rear wheel forward.



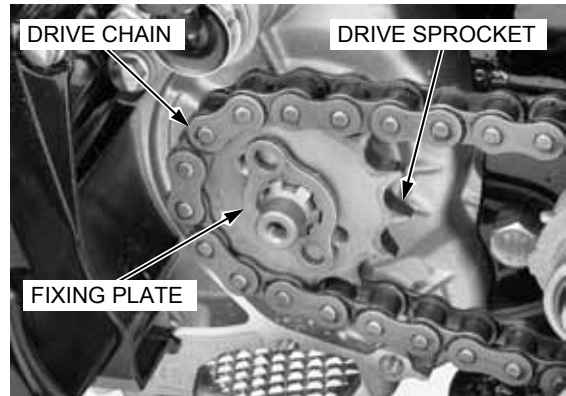
## ENGINE REMOVAL/INSTALLATION

Remove the drive sprocket fixing plate bolts.



Turn and remove the fixing plate.

Remove the drive sprocket from the countershaft and drive chain.



Remove the rear brake switch return spring.

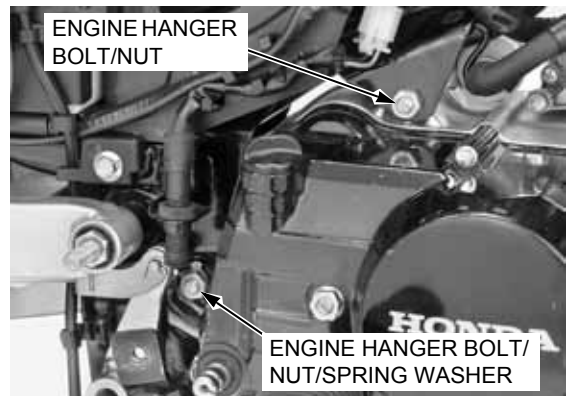


Support the engine using a jack or other adjustable support.

Remove the rear upper engine hanger nut and rear lower engine hanger nut/spring washer.

Remove the engine hanger bolts and engine from the frame.

- Wrap the inlet pipe port with a shop towel or cover it with a piece of tape to prevent any foreign material from dropping into the engine.



ENGINE INSTALLATION

NOTE:

- Note the direction of the hanger bolts.
- Use a floor jack or other adjustable support, carefully place the engine into the frame and maneuver it into place.
- Route the wires and hoses properly (page 1-14).

*During engine installation, hold the engine securely and be careful not to damage the frame and engine.*

Place the engine into the frame and support the engine using a jack or other adjustable support.

Install the engine hanger bolts, spring washer and nuts. Tighten the upper engine hanger nut to the specified torque.

**TORQUE: 40 N·m (4.1 kgf·m, 30 lbf·ft)**

Tighten the lower engine hanger nut to the specified torque.

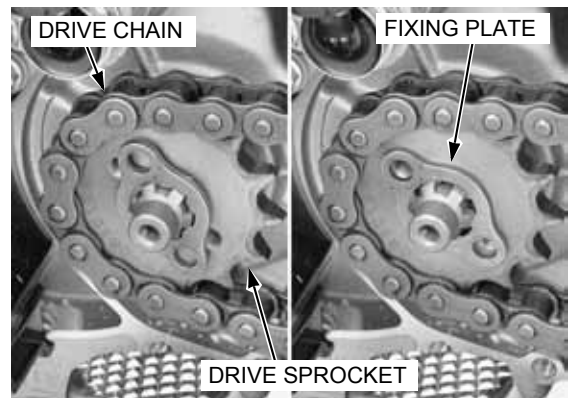
**TORQUE: 40 N·m (4.1 kgf·m, 30 lbf·ft)**

Hook the rear brake switch return spring.

Install the drive chain onto the drive sprocket. Install the drive sprocket onto the countershaft.

Install the fixing plate to the countershaft while aligning their teeth.

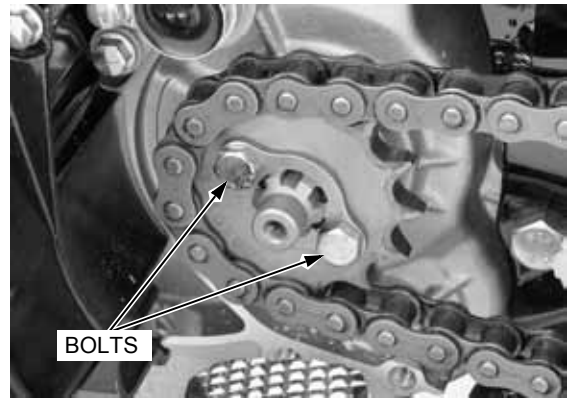
Rotate the fixing plate and align their bolt holes.



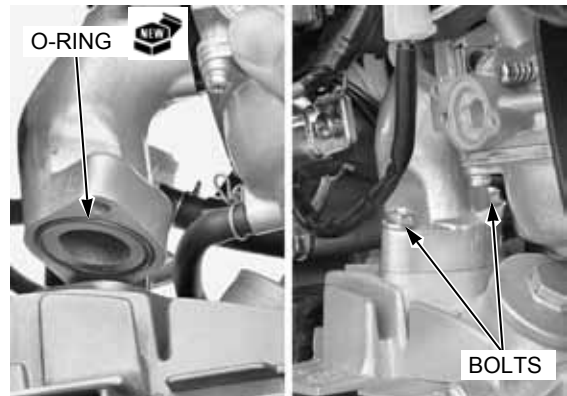
## ENGINE REMOVAL/INSTALLATION

Install and tighten the drive sprocket fixing plate bolts alternately to the specified torque.

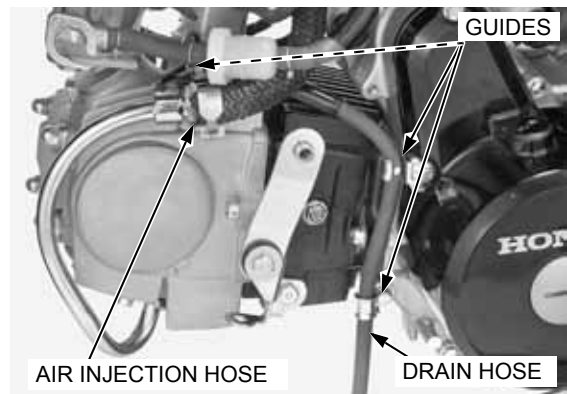
**TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)**



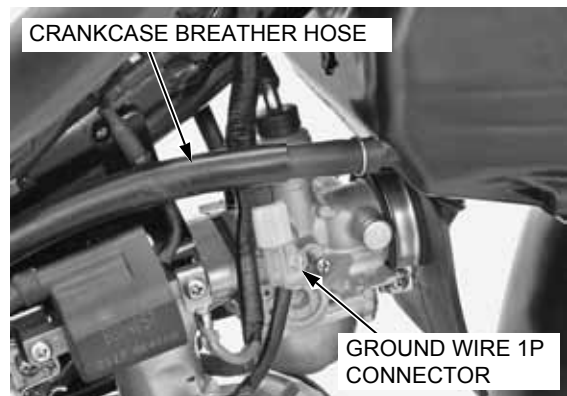
Install a new O-ring to the inlet pipe.  
Install and tighten the mounting bolts.



Connect the air injection hose.  
Install the carburetor drain hose to the guides.

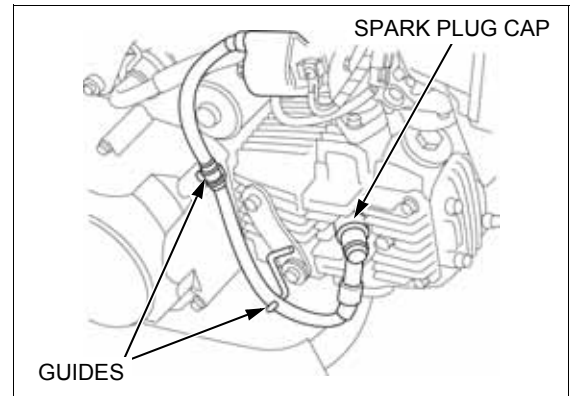


Connect the crankcase breather hose and ground wire 1P connector.

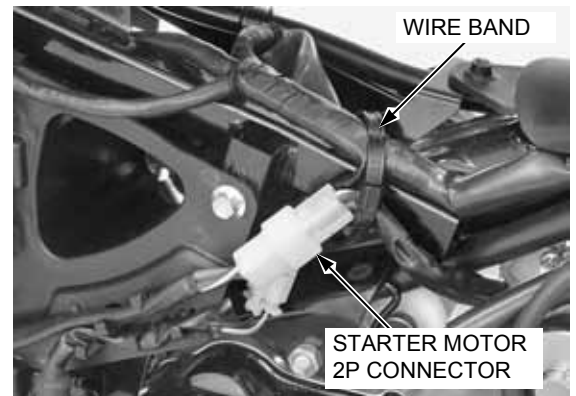


## ENGINE REMOVAL/INSTALLATION

Install the spark plug wire to the guides and connect the spark plug cap.



Put the starter motor wire through the wire band and tighten it.  
Connect the starter motor 2P connector.



Connect the following:

- Alternator 4P (Black) connector
- Alternator wire (Black/Red) connector
- Gear position switch 6P connector

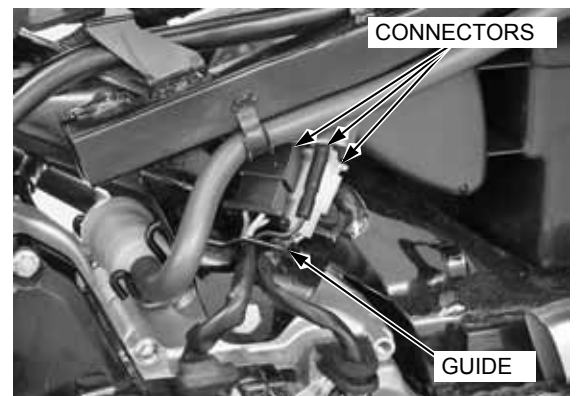
Install the wires to the guide.

Fill the recommended engine oil up to the proper level (page 3-10).

Adjust the drive chain slack (page 3-14).

Install the following:

- Exhaust pipe/muffler (page 2-21)
- Left crankcase rear cover (page 10-5)
- Main pipe side covers (page 2-6)
- Body cover (page 2-8)



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**MEMO**

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# 7. CYLINDER HEAD/VALVES

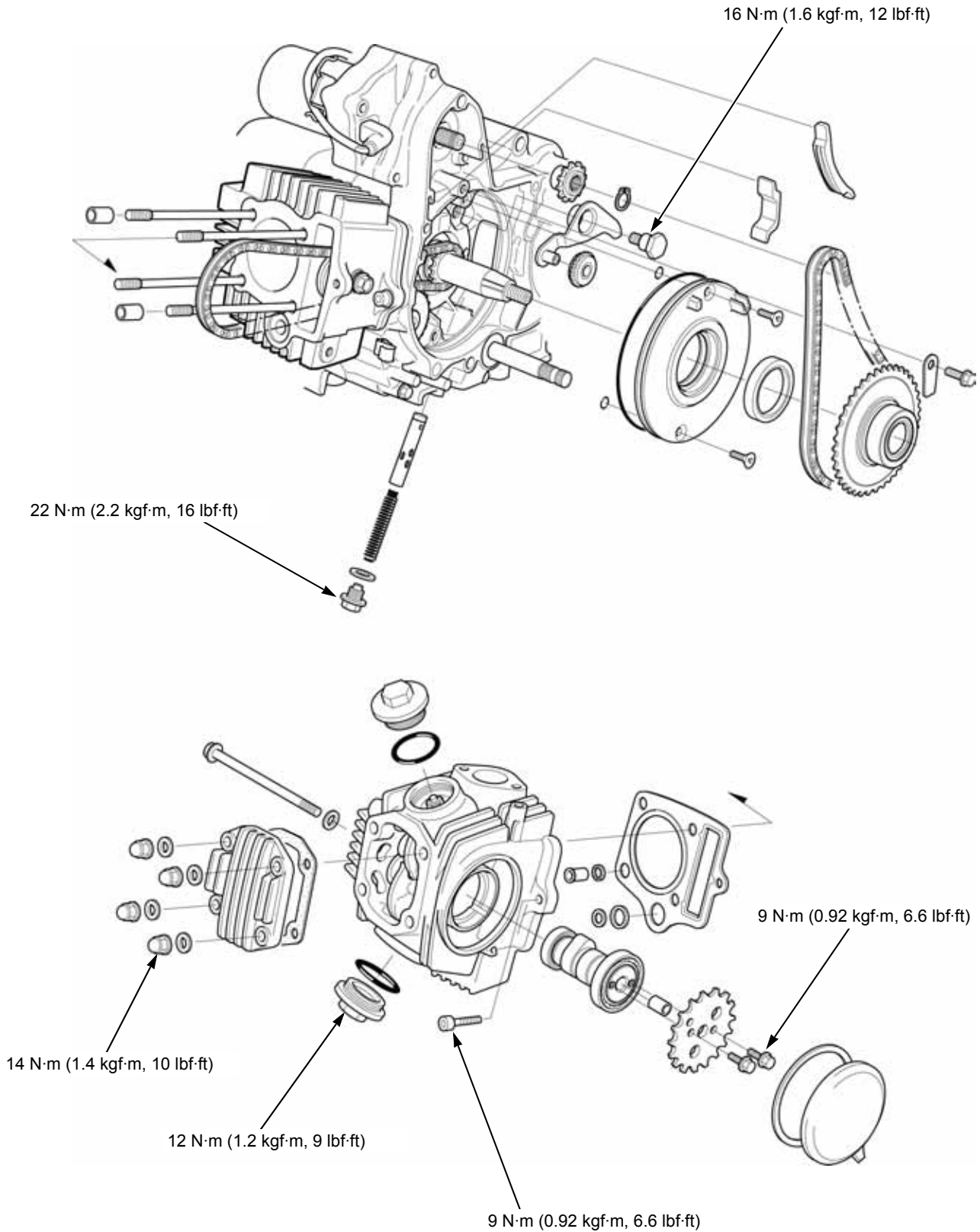
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COMPONENT LOCATION .....	7-2	CYLINDER HEAD DISASSEMBLY .....	7-13
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# CYLINDER HEAD/VALVES

## COMPONENT LOCATION



## SERVICE INFORMATION

### GENERAL

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

### SPECIFICATIONS

Unit: mm (in)










ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			1,177 kPa (12.0 kgf/cm <sup>2</sup> , 171 psi) at 600 min <sup>-1</sup> (rpm)	–
Cylinder head warpage			–	0.05 (0.002)
Valve, valve guide	Valve clearance	IN/EX	0.10 (0.004)	–
	Valve stem O.D.	IN	4.975 – 4.990 (0.1959 – 0.1965)	4.92 (0.194)
		EX	4.955 – 4.970 (0.1951 – 0.1957)	4.92 (0.194)
	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 – 0.0017)	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)	
	Inner	IN/EX	32.41 (1.276)	30.9 (1.22)
Valve spring free length	Outer	IN/EX	35.25 (1.388)	34.0 (1.34)
	Rocker arm I.D.	IN/EX	10.200 – 10.260 (0.4016 – 0.4039)	10.10 (0.398)
Rocker arm/ shaft	Rocker arm shaft O.D.	IN/EX	9.972 – 9.987 (0.3926 – 0.3932)	9.91 (0.390)
	Camshaft	Cam lobe height	IN	26.003 – 26.243 (1.0237 – 1.0332)
EX			25.815 – 26.055 (1.0163 – 1.0258)	26.00 (1.024)
Cam chain tensioner	Push rod O.D.		11.985 – 12.000 (0.4718 – 0.4724)	11.94 (0.470)
	Spring free length		111.3 (4.38)	109 (4.3)

### TORQUE VALUES

Cylinder head cover cap nut	14 N·m (1.4 kgf·m, 10 lbf·ft)
Cylinder head mounting socket bolt	9 N·m (0.92 kgf·m, 6.6 lbf·ft)
Cylinder head right side cover bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)
Cam sprocket bolt	9 N·m (0.92 kgf·m, 6.6 lbf·ft)
Cam chain tensioner sealing bolt	22 N·m (2.2 kgf·m, 16 lbf·ft)
Cam chain tensioner arm pivot bolt	16 N·m (1.6 kgf·m, 12 lbf·ft)

## CYLINDER HEAD/VALVES

### TOOLS

<p>Valve spring compressor 07757-0010000</p> 	<p>Seat cutter, 24.5 mm (45° EX) 07780-0010100</p> 	<p>Seat cutter, 24 mm (45° IN) 07780-0010600</p> 
<p>Flat cutter, 25 mm (32° IN/EX) 07780-0012000</p> 	<p>Interior cutter, 22 mm (60° IN/EX) 07780-0014202</p> 	<p>Cutter holder, 5.0 mm 07781-0010400</p> 
<p>Valve guide driver, 4.8 mm 07942-MA60000</p> 	<p>Valve spring compressor attachment 07959-KM30101</p> 	<p>Valve guide reamer, 5.0 mm 07984-MA60001</p> 

## **TROUBLESHOOTING**

- Engine top-end problems usually affect engine performance. These problem can be diagnosed by a compression test or by tracing engine noises to the top-end with a sounding rod 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 8-9).

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

- Valves:
  - Incorrect valve clearance
  - Burned or bent valves
  - Incorrect valve timing
  - Broken valve spring
  - Valve stuck open
  - Weak valve spring
- Cylinder head:
  - Uneven valve seating
  - Leaking or damaged cylinder head gasket
  - Warped or cracked cylinder head
- Worn cylinder, piston or piston rings (page 8-8)

### **Compression too high, overheating or knocking**

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

### **Excessive smoke**

- Cylinder head:
  - Worn valve stem or valve guide
  - Damaged stem seal
- Worn cylinder, piston or piston rings (page 8-8)

### **Excessive noise**

- Cylinder head:
  - Incorrect valve clearance
  - Sticking valve or broken valve spring
  - Damaged or worn camshaft
  - Loose or worn cam chain
  - Worn or damaged cam chain guide roller/sprocket
  - Worn or damaged cam chain tensioner
  - Worn cam sprocket teeth
  - Worn rocker arm and/or shaft
- Worn cylinder, piston or piston rings (page 8-8)

### **Rough idle**

- Low cylinder compression
- Faulty fuel system

## CYLINDER HEAD/VALVES

### CYLINDER COMPRESSION TEST

Warm up the engine to normal operating temperature.

Stop the engine and remove the spark plug (page 3-7).

*Make sure that the compression gauge connection does not leak.*

Install the compression gauge attachment to the spark plug hole.

Connect the compression gauge to the attachment.

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

Open the throttle all the way and crank the engine with the starter motor until the gauge reading stops rising.

#### STANDARD:

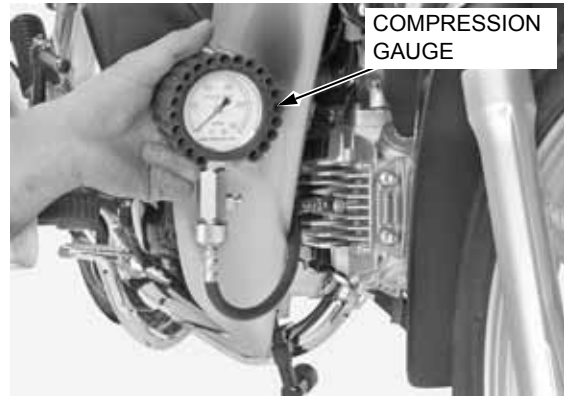
**1,177 kPa (12.0 kgf/cm<sup>2</sup>, 171 psi) at 600 min<sup>-1</sup>(rpm)**

High compression can be caused by:

- Carbon deposits accumulated on the combustion chamber and/or the piston head.

Low compression can be caused by:

- Leaking cylinder head gasket
- Improper valve adjustment
- Valve leakage
- Worn piston ring, piston and/or cylinder
- Warped or cracked cylinder head



### CAMSHAFT

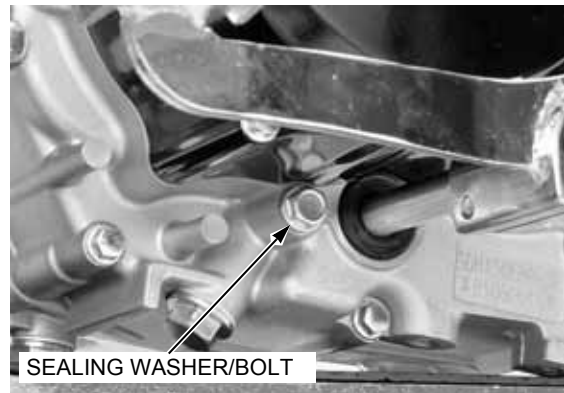
#### REMOVAL

##### NOTE:

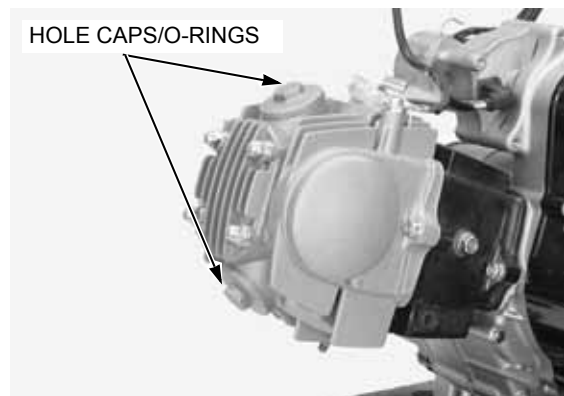
- Camshaft can be serviced with the engine installed on the frame.

Remove the main pipe side covers (page 2-6).

Remove the cam chain tensioner sealing washer/bolt.



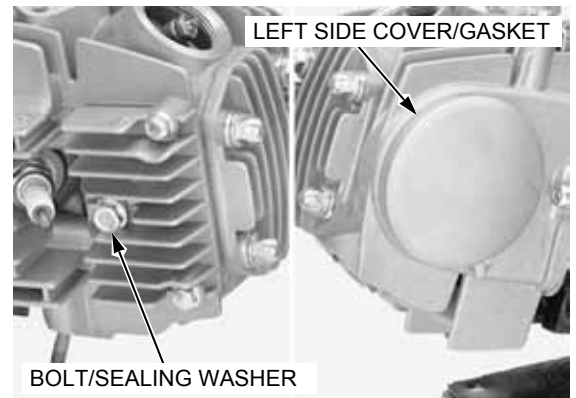
Remove the two valve adjuster hole caps and O-rings.



Loosen the cylinder head side cover bolt.

Tap the head of the cylinder head side cover bolt and release the cylinder head left side cover from the cylinder head.

Remove the cylinder head side cover bolt, sealing washer, cylinder head left side cover and gasket.



Remove the following:

- Crankshaft hole cap /O-ring
- Timing hole cap/O-ring



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

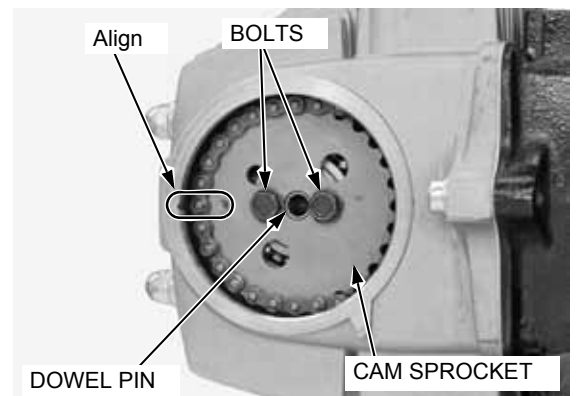


Make sure that the stamp mark on the cam sprocket is aligned with the index notch on the cylinder head.

Check that the piston is at TDC (Top Dead Center) on the compression stroke by moving the rocker arms.

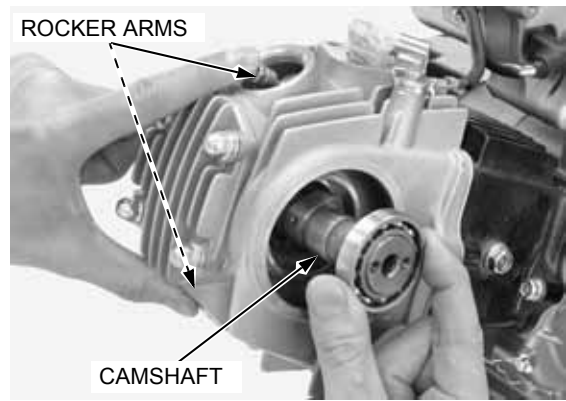
Remove the two bolts, cam sprocket and dowel pin.

*Secure the cam chain with a piece of wire to prevent the cam chain from falling into the cylinder.*



## CYLINDER HEAD/VALVES

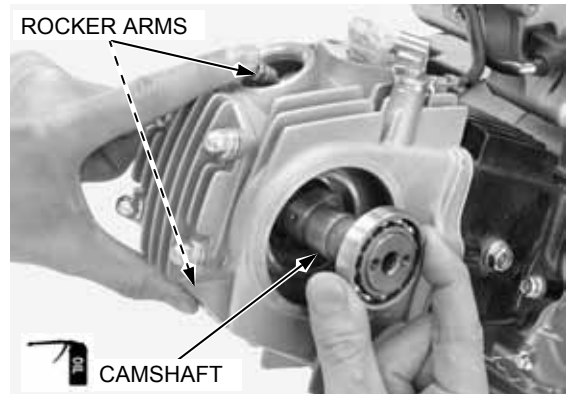
Remove the camshaft from the cylinder head while holding the rocker arms to ease removal.



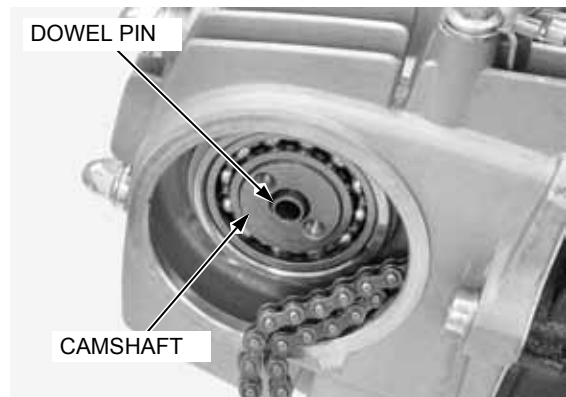
### INSTALLATION

Apply engine oil to the camshaft whole surface.

Install the camshaft into the cylinder head while holding the rocker arms to ease installation.



Install the dowel pin to the camshaft.



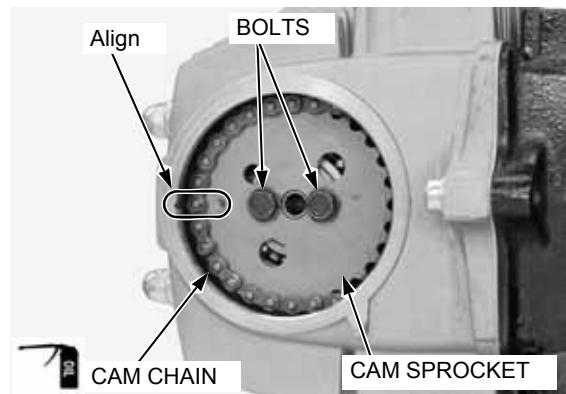
Apply engine oil to the cam chain and install it to the cam sprocket.

*Be careful not to let the cam sprocket bolts fall into the crankcase.*

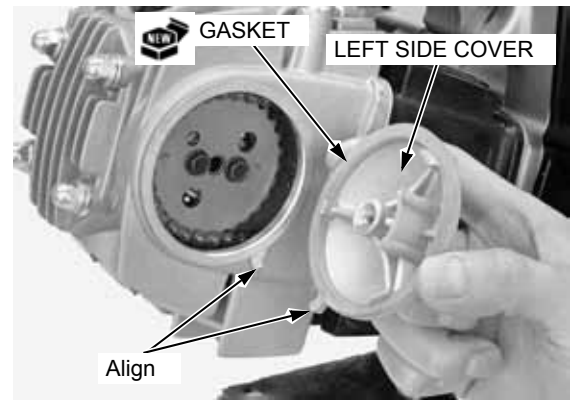
Install the cam sprocket to the camshaft aligning the stamp mark of the cam sprocket with the index notch of the cylinder head.

Install and tighten the cam sprocket bolts to the specified torque.

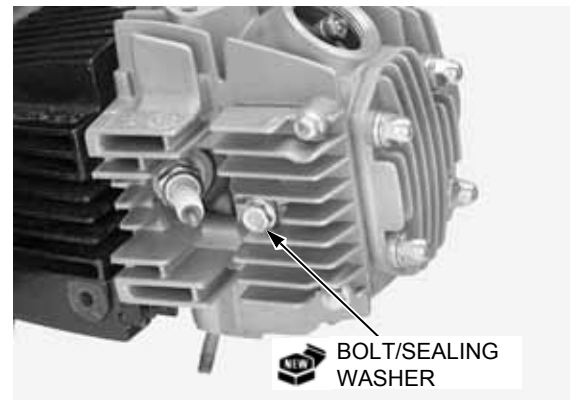
**TORQUE: 9 N·m (0.92 kgf·m, 6.6 lbf·ft)**



Install a new gasket and cylinder head left side cover to the cylinder head while aligning the tab on the side cover with the stopper on the cylinder head.



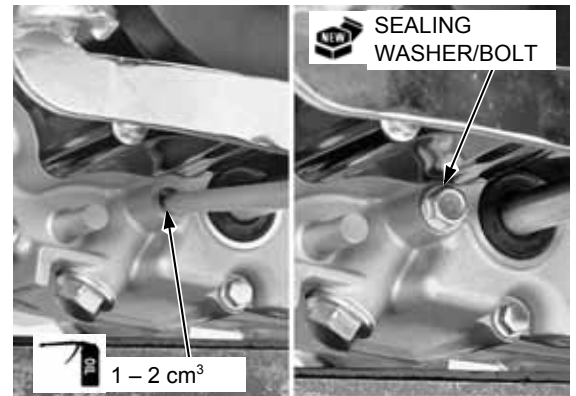
Install the cylinder head left side cover mounting bolt with a new sealing washer to the cylinder head and tighten it.



Pour 1 – 2 cm<sup>3</sup> of engine oil into the cam chain tensioner push rod as shown.

Install a new sealing washer and bolt, then tighten it.

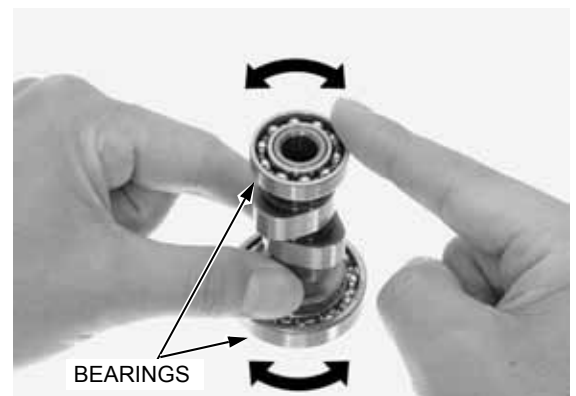
Install the main pipe side covers (page 2-6).



### 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 on the camshaft.

Replace the camshaft assembly if the bearing does not turn smoothly, quietly, or if they fit loosely on the camshaft.





## CYLINDER HEAD/VALVES

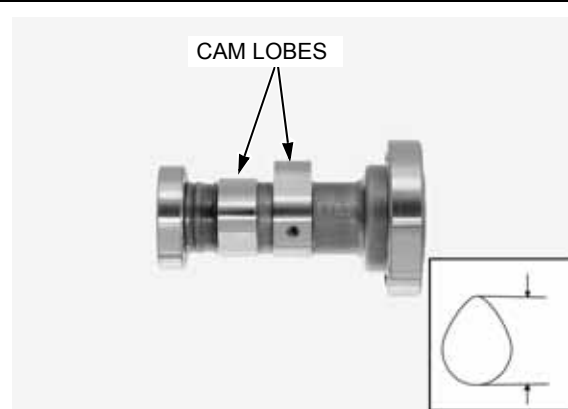
Check the cam lobes for excessive wear and damage.

Measure the height of each cam lobe.

### SERVICE LIMIT:

IN: 26.26 mm(1.034 in)

EX: 26.00 mm(1.024 in)



## CYLINDER HEAD REMOVAL

### NOTE:

- Cylinder head can be serviced with the engine installed on the frame.

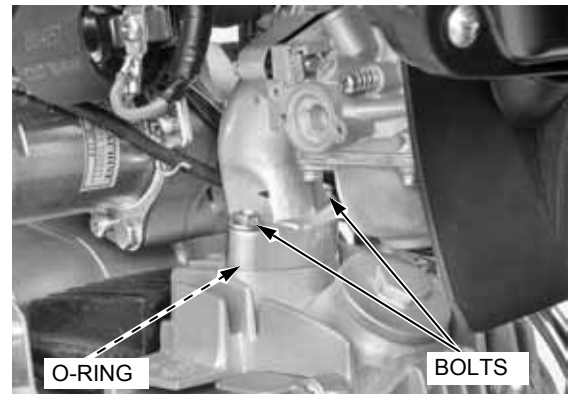
Remove the following:

- Main pipe side covers (page 2-6)
- Camshaft (page 7-6)

Disconnect the air injection hose from the air injection pipe and remove the bolt, ground terminal, carburetor drain hose guide (page 5-21).

Remove the following:

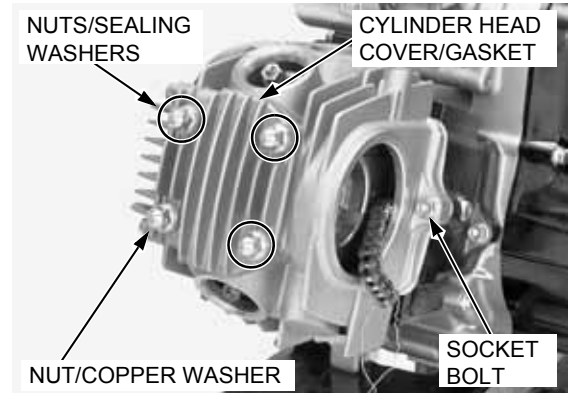
- Two inlet pipe mounting bolts
- O-ring



*Note the position of the copper washer.*

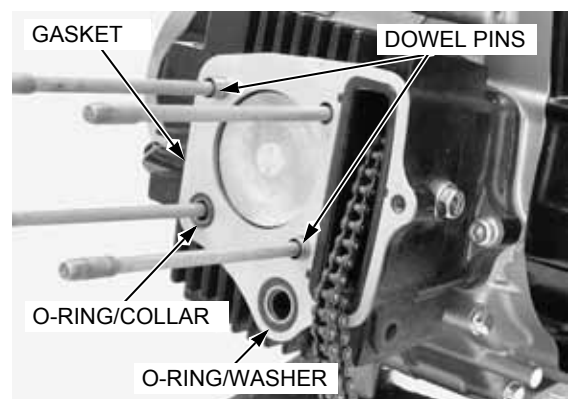
Remove the following:

- Three cap nuts/sealing washers
- Cap nut/copper washer
- Cylinder head cover
- Gasket
- Cylinder head mounting socket bolt
- Cylinder head



Remove the following

- Cylinder head gasket
- O-ring/collar
- O-ring/washer
- Two dowel pins



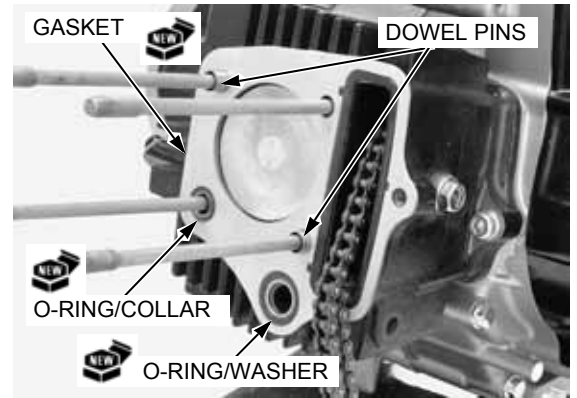
## CYLINDER HEAD INSTALLATION

*Be careful not to damage the mating surface when cleaning the cylinder head.*

Clean off any gasket material from the cylinder surface.

Install the following:

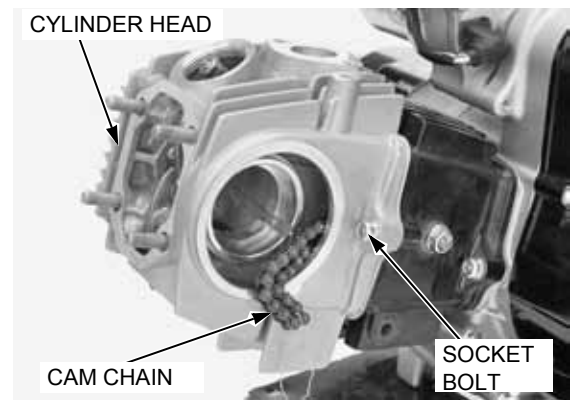
- Two dowel pins
- New cylinder head gasket
- New O-ring/collar
- New O-ring/washer



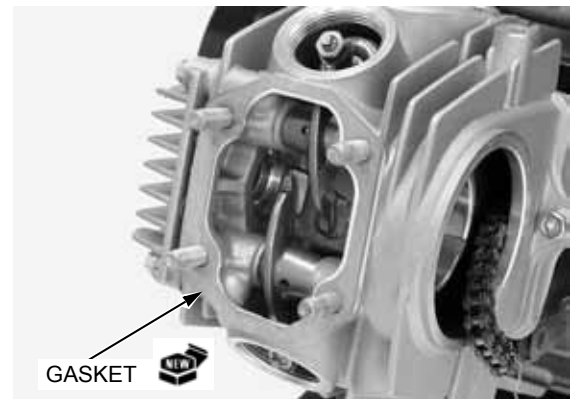
*Be careful not to let the cam chain fall into the crankcase.*

Install the cylinder head while routing the cam chain through the cylinder head.

Install the cylinder head mounting socket bolt but do not tighten yet.



Install a new gasket.



## CYLINDER HEAD/VALVES

Install the cylinder head cover with its arrow mark facing down.

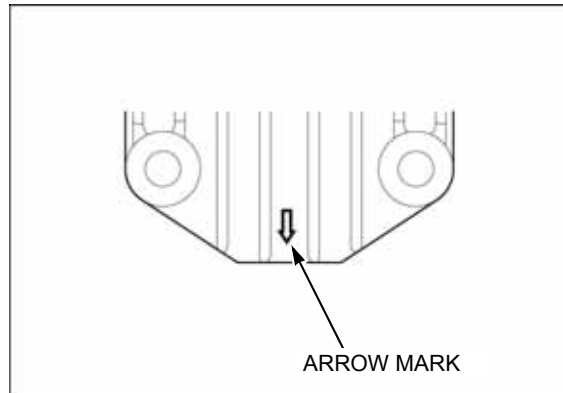
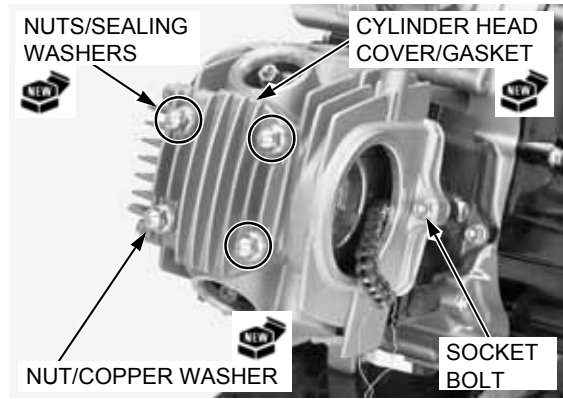
Install the three new sealing washers and cap nuts. Install a new copper washer and cap nut.

Tighten the cylinder head cap nuts to the specified torque in a crisscross pattern in 2 – 3 steps.

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

Tighten the cylinder head mounting socket bolt to the specified torque.

**TORQUE: 9 N·m (0.92 kgf·m, 6.6 lbf·ft)**



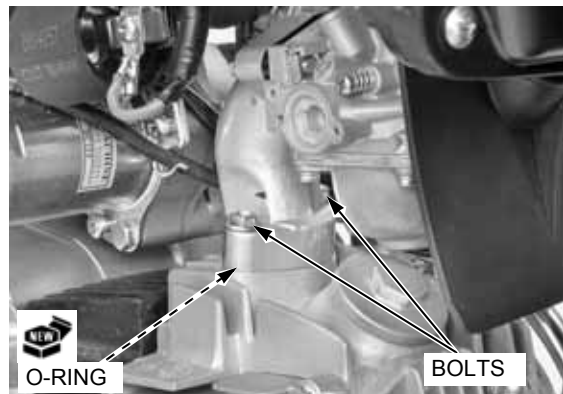
Install the O-ring to the inlet pipe. Install the two mounting bolts, then tighten them.

Tighten the carburetor drain hose guide, ground terminal, air injection pipe by the bolt and connect the air injection hose to the air injection pipe (page 5-21).

Install the following:

- Camshaft (page 7-8)
- Main pipe side covers (page 2-6)

Adjust the valve clearance (page 3-9).

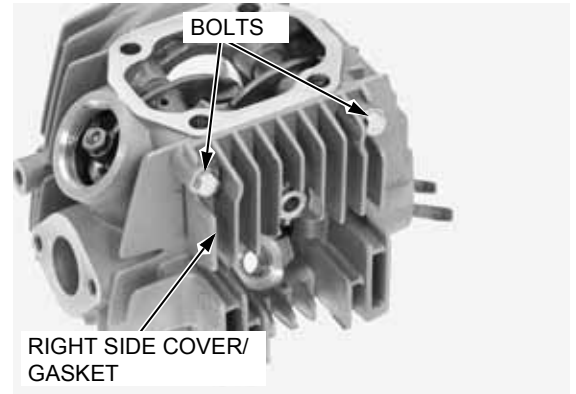


## CYLINDER HEAD DISASSEMBLY

Remove the following:

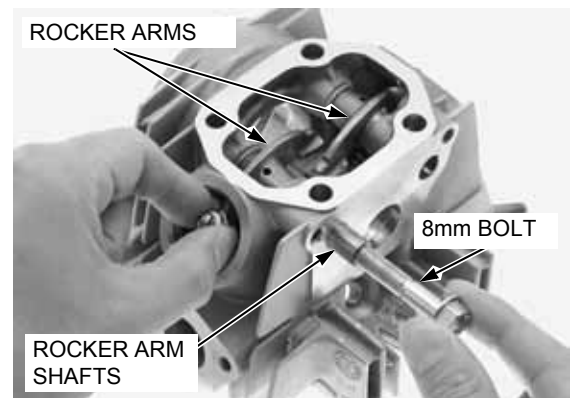
- Air injection pipe (page 5-21)
- Spark plug (page 3-7)
- Cylinder head (page 7-10)

Remove the two bolts, cylinder head right side cover and gasket.



Temporarily install a 8 mm bolt to the rocker arm shaft and pull out the rocker arm shafts.

Remove the rocker arms.



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

Remove the valve spring cotters using the special tools as shown.

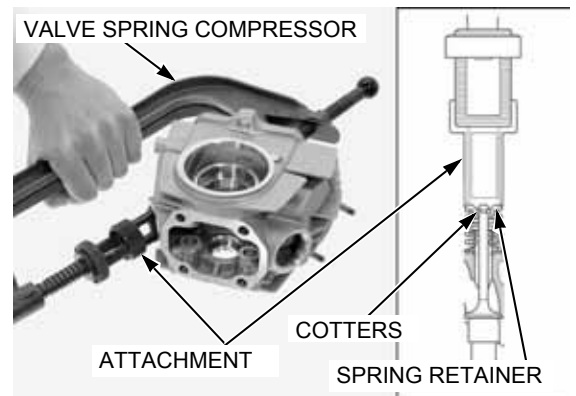
**TOOLS:**

- Valve spring compressor**
- Valve spring compressor attachment**

07757-0010000

07959-KM30101

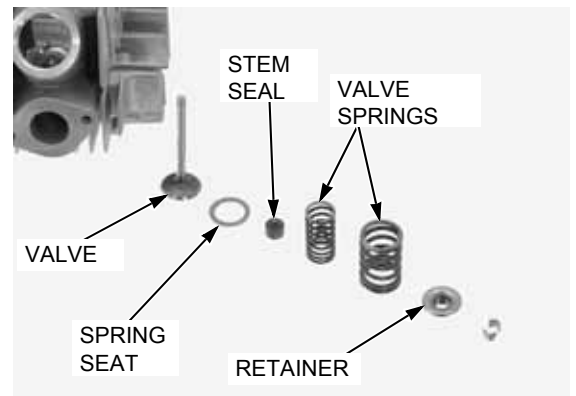
If it is difficult to remove the valve cotters, use the magnet catch tool.



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

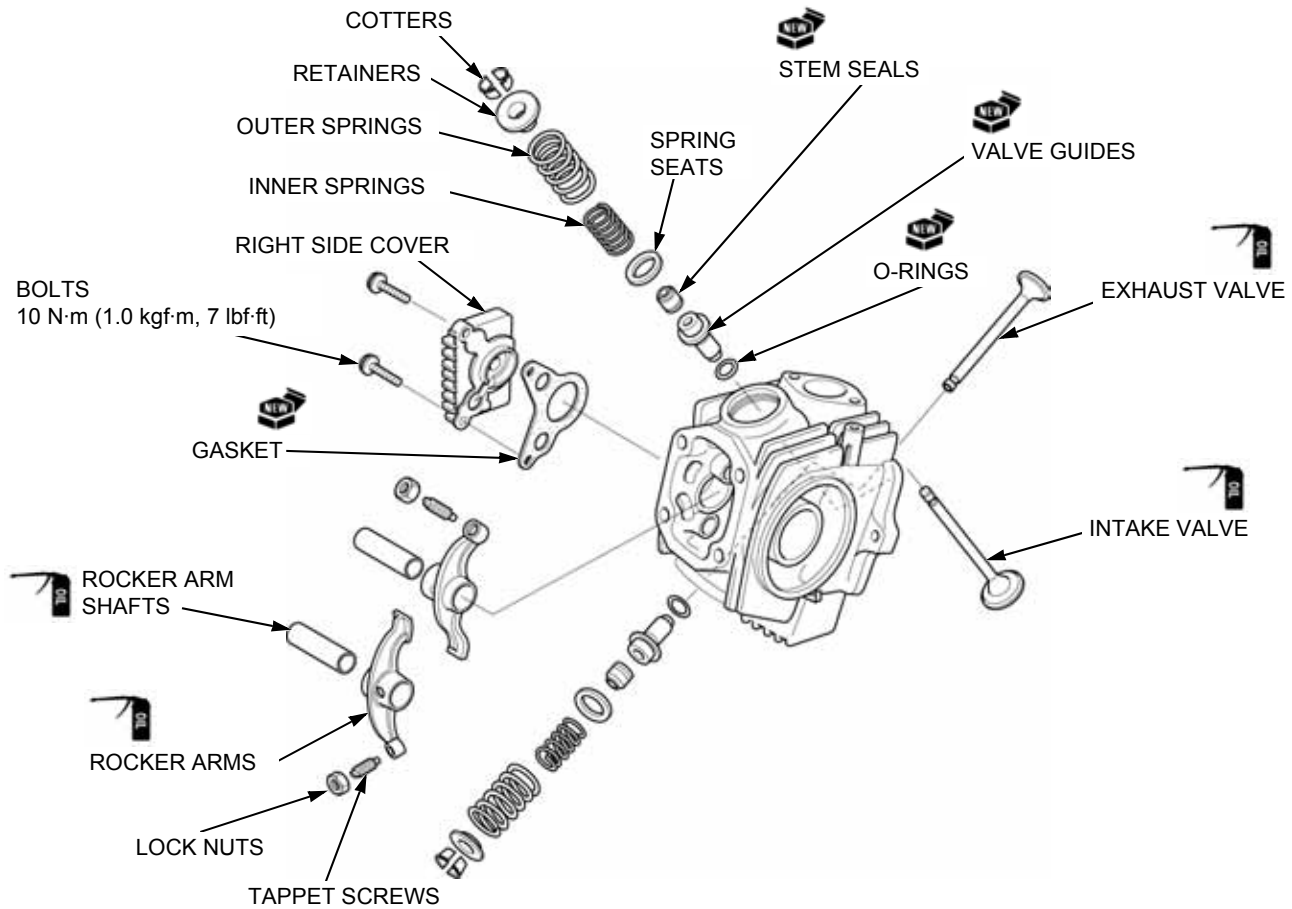
Remove the following:

- Spring retainers
- Outer and inner valve springs
- Valves
- Stem seals
- Valve spring seats



## CYLINDER HEAD/VALVES

# CYLINDER HEAD ASSEMBLY



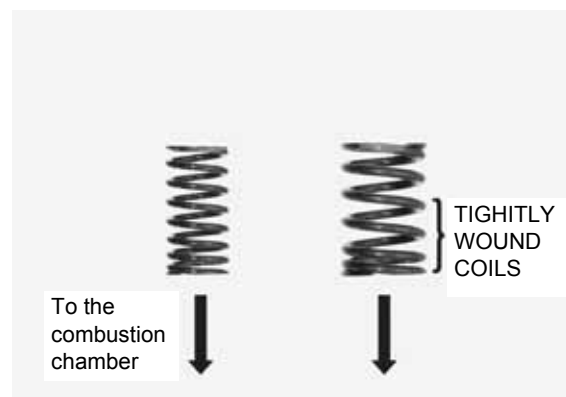
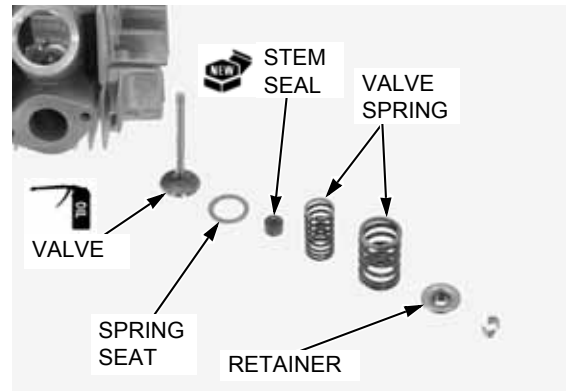
Clean the cylinder head assembly with solvent and blow through all of the oil passages with compressed air.

Install the valve spring seats and new valve stem seals. Lubricate the valve stems with engine oil and insert the valve into the valve guide.

**NOTE:**

- To avoid damage to the stem seal, turn the valve slowly when installing the valve.

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



## CYLINDER HEAD/VALVES

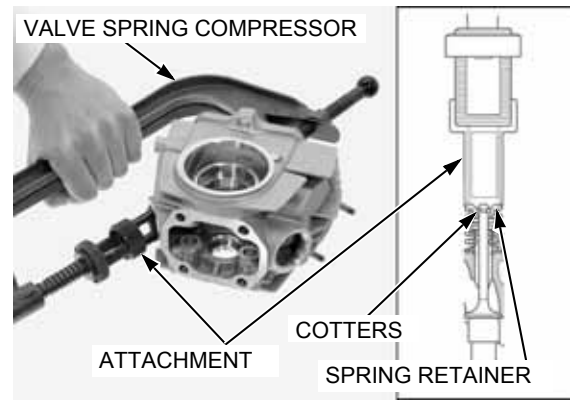
*To prevent loss of tension, do not compress the valve spring more than necessary.*

Install the valve cotters using the special tool as shown.

### TOOLS:

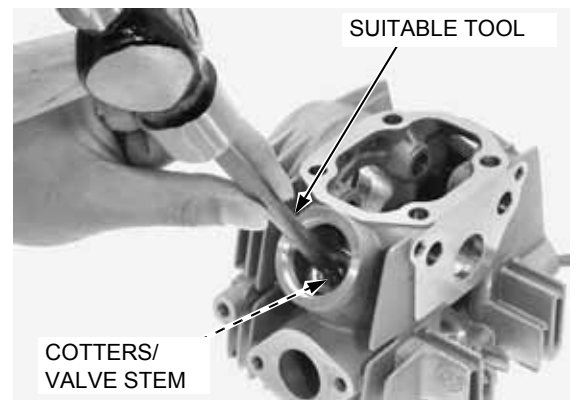
**Valve spring compressor**  
**Valve spring compressor attachment**

**07757-0010000**  
**07959-KM30101**



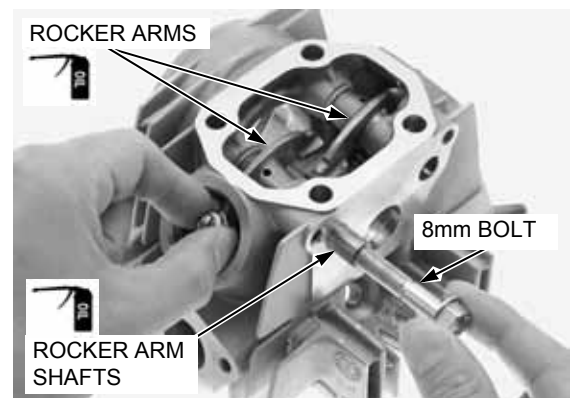
*Support the cylinder head above the work bench surface to prevent valve damage.*

Place a suitable tool onto the valve stem. Tap the tool gently to seat the cotters firmly using a hammer.

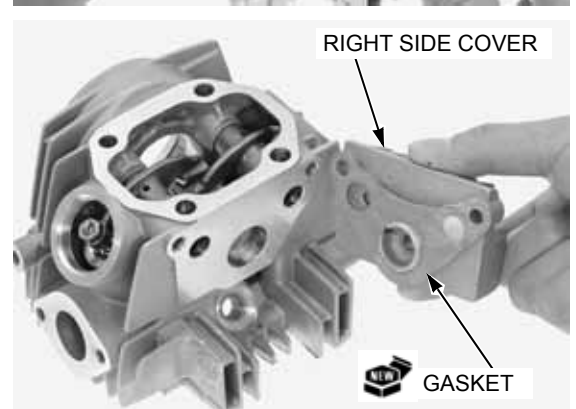


Apply engine oil to the slipper surfaces of the rocker arms.  
Apply engine oil to the sliding surfaces of the rocker arm shafts.

Install the rocker arms and rocker arm shafts with their threaded ends facing out using a 8 mm bolt.



Set a new gasket to the cylinder head right side cover.  
Install the right side cover to the cylinder head.



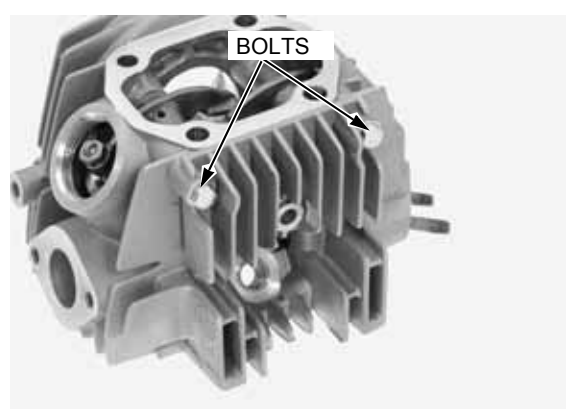
## CYLINDER HEAD/VALVES

Install and tighten the right side cover mounting bolts to the specified torque.

**TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)**

Install the following:

- Cylinder head (page 7-11)
- Spark plug (page 3-7)
- Air injection pipe (page 5-21)



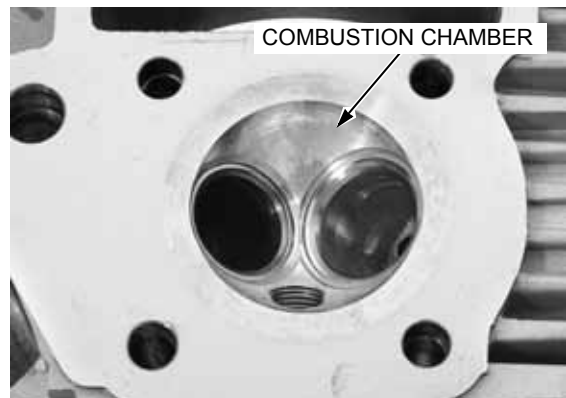
## CYLINDER HEAD INSPECTION

### CYLINDER HEAD

*Be careful not to damage the valve seat surface and cylinder head mating surface.*

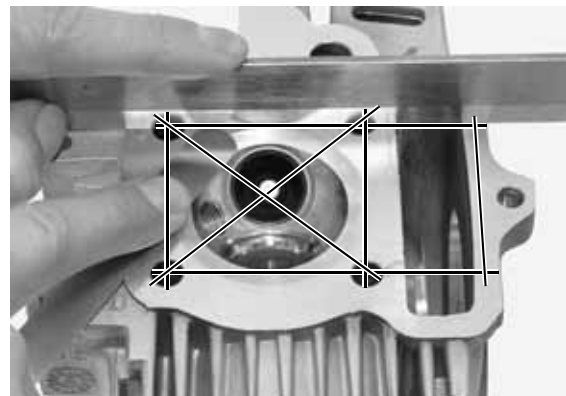
Remove carbon deposits from the combustion chamber.

Check the spark plug hole and valve areas for cracks.



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

**SERVICE LIMIT: 0.05 mm (0.002 in)**



### ROCKER ARM

*If either rocker arm require service or replacement, inspect the cam lobes for scoring, chipping or flat spots.*

Inspect the rocker arm slipper surfaces for wear or damage.

Check the oil holes for clog.

Measure the rocker arm I.D.

**SERVICE LIMIT: 10.10 mm (0.398 in)**

Inspect the rocker arm shafts for wear or damage.

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

**SERVICE LIMIT: 9.91 mm (0.390 in)**



**VALVE SPRING**

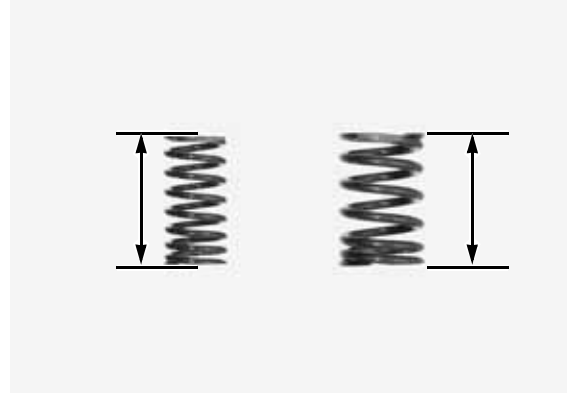
Measure the free length of inner and outer valve springs.

**SERVICE LIMITS:**

**INNER: 30.9 mm (1.22 in)**

**OUTER: 34.0 mm (1.34 in)**

Replace the springs if less than the service limits.



**VALVE**

Check each valve for bending, burning, scratches or abnormal wear.

Insert the valves in their original positions in the cylinder head.

Check that each valve moves up and down smoothly, without binding.

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

**SERVICE LIMIT: IN/EX: 4.92 mm (0.194 in)**

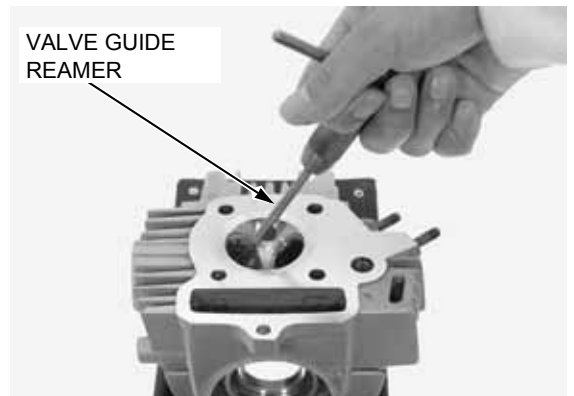


Ream the guides to remove any carbon deposits before measuring the guide I.D.

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

**TOOL:**

**Valve guide reamer, 5.0 mm      07984-MA60001**



Measure and record each valve guide I.D. each valve for bending, burning, scratches or abnormal wear.

**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 LIMITS:**

**I N:      0.08 mm (0.003 in)**

**EX:      0.10 mm (0.004 in)**



*Reface the valve seats whenever the valve guides are replaced (page 7-20).*

If the stem-to-guide clearance is out of standard, 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 is out of standard with a new guide, replace the valve and guide.



## CYLINDER HEAD/VALVES

### VALVE GUIDE REPLACEMENT

Chill new valve guides in the freezer section of a refrigerator for about an hour.

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.

To avoid burns, wear insulated gloves when handling the heated cylinder head.

#### NOTICE

*Do not use a torch to heat the cylinder head; it may cause warping.*

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

#### TOOL:

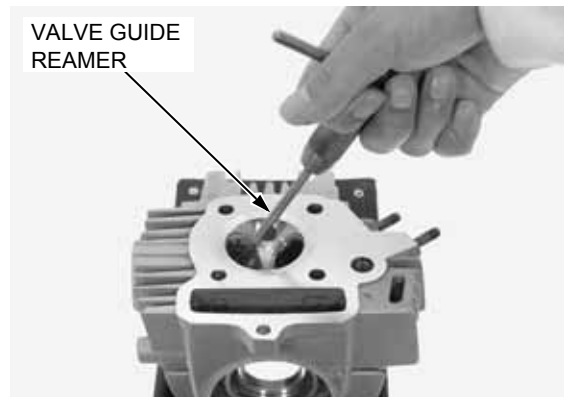
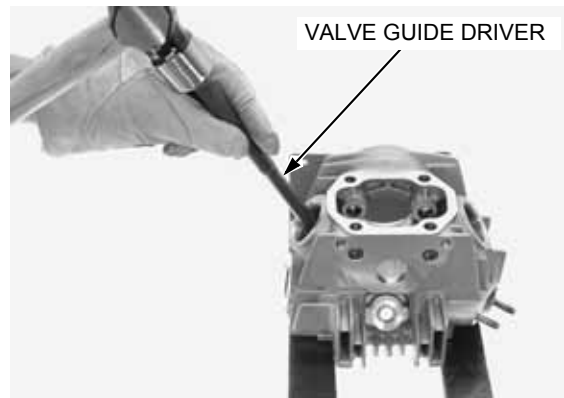
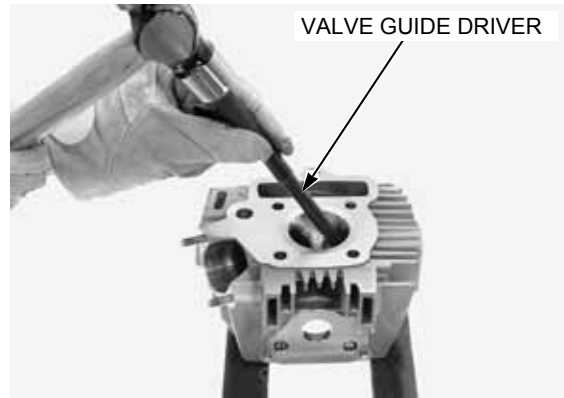
**Valve guide driver, 4.8 mm      07942-MA60000**

Install a new guide clip to each guide.

Drive in the guides into the cylinder head from camshaft side until the exposed height is specified value.

#### TOOL:

**Valve guide driver, 4.8 mm      07942-MA60000**



*Use cutting oil on the reamer during this operation.*

Ream new valve guides.

#### TOOL:

**Valve guide reamer, 5.0 mm      07984-MA60001**

#### NOTE:

- Be careful not to tilt or lean the reamer in the guide while reaming, otherwise the valves may be installed slanted, causing oil leakage from the stem seal and improper valve seat contact. This may prevent valve seat refacing.
- Insert the reamer from the combustion chamber side of the cylinder head and always rotate the reamer clockwise.

Clean the cylinder head thoroughly to remove any metal particles after reaming and reface the valve seat (page 7-20).

## VALVE SEAT INSPECTION

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

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

Tap the valve against the valve seat several times without rotating it to check for proper valve seat contact.



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

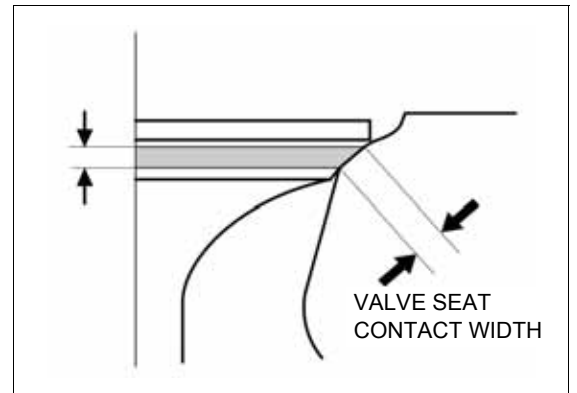
Remove the valve and inspect the valve seat face.

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

**STANDARD: 1.0 mm (0.04 in)**

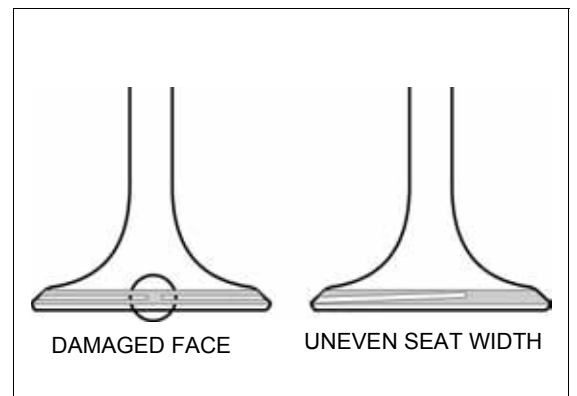
**SERVICE LIMIT: 1.6 mm (0.06 in)**

If the valve seat width is not within specification, reface the valve seat (page 7-20).

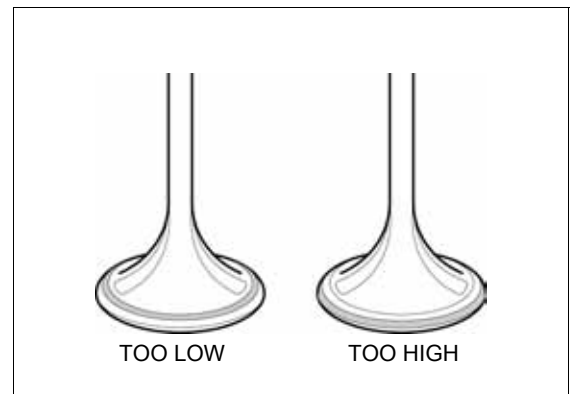


Inspect the valve seat face for:

- 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):
  - Reface the valve seat

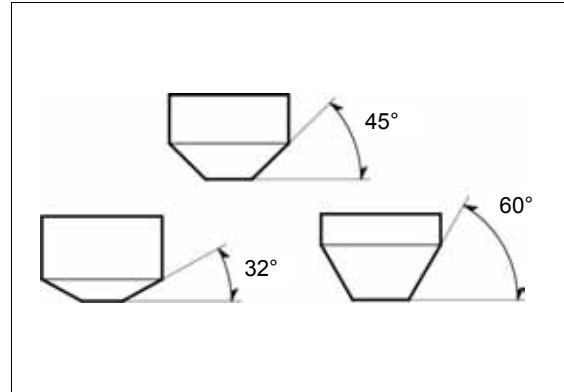


## CYLINDER HEAD/VALVES

### VALVE SEAT REFACING

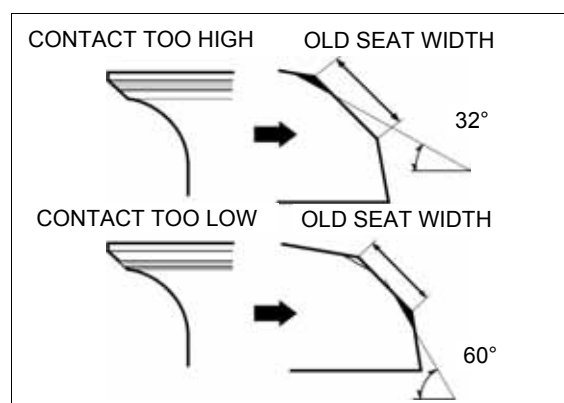
**NOTE:**

- Follow the refacer manufacturer's operating instructions.
- Reface the valve seat whenever the valve guide has been replaced.
- Be careful not to grind the seat more than necessary.

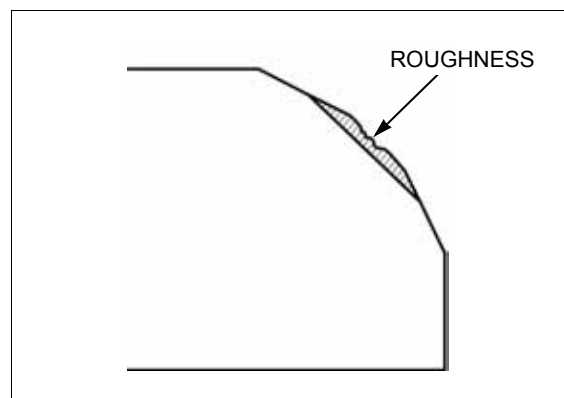


If the contact area is too high on the valve, the seat must be lowered using a 32° flat cutter.

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



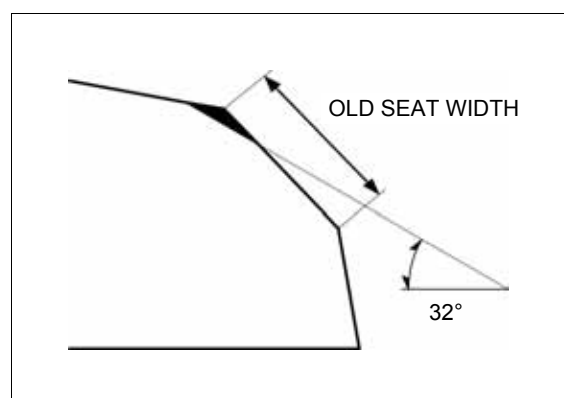
*Reface the seat with a 45° cutter whenever a valve guide is replaced.* Use a 45° seat cutter, remove any roughness or irregularities from the seat.



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

**TOOLS:**

**Flat cutter, 25 mm (32° IN/EX) 07780-001200**  
**Cutter holder, 5.0 mm 07781-0010400**



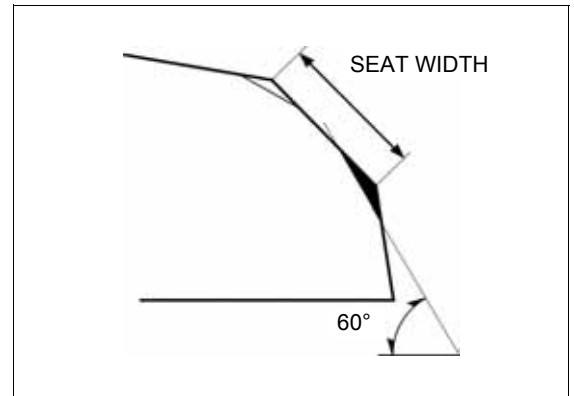
Use a 60° interior cutter, cut the seat to the proper width.

**TOOLS:**

Interior cutter, 22 mm (60° IN/EX) 07780-0014202  
 Cutter holder, 5.0 mm 07781-0010400

**STANDARD:** 1.0 mm (0.04 in)

Make sure that all pitting and irregularities are removed.



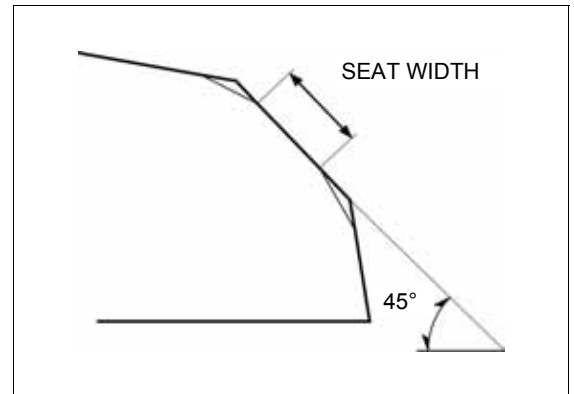
Using a 45° finish cutter, cut the seat to the proper width.

**TOOLS:**

Seat cutter, 24 mm (45° IN) 07780-0010600  
 Seat cutter, 24.5 mm (45° EX) 07780-0010100  
 Cutter holder, 5.0 mm 07781-0010400

**STANDARD:** 1.0 mm (0.04 in)

Make sure that all pitting and irregularities are removed.



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

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

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

After lapping, wash any residual compound off the cylinder head and valves.

Recheck the seat contact after lapping.



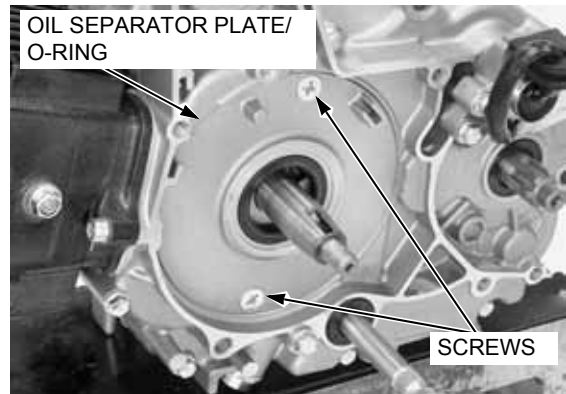
## CAM CHAIN TENSIONER

### REMOVAL

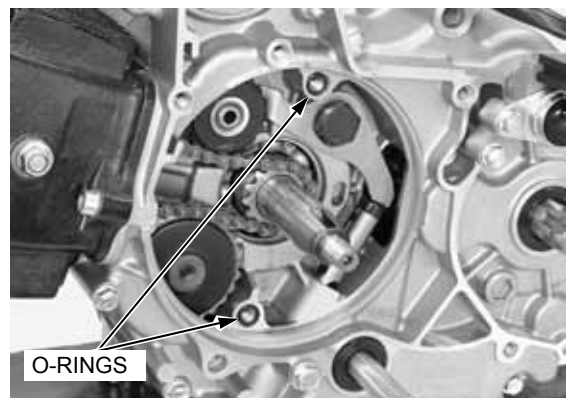
Remove the starter clutch (page 10-9).

Remove the following:

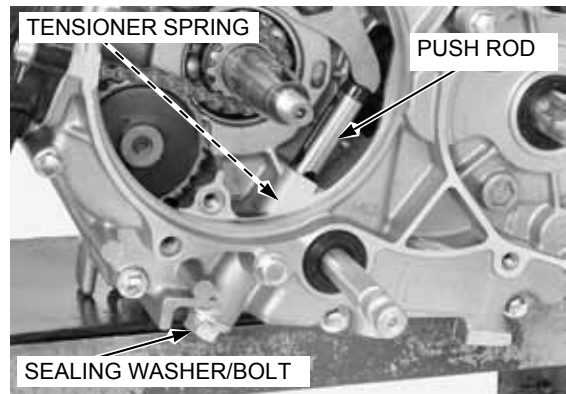
- Two screws
- Oil separator plate
- O-ring



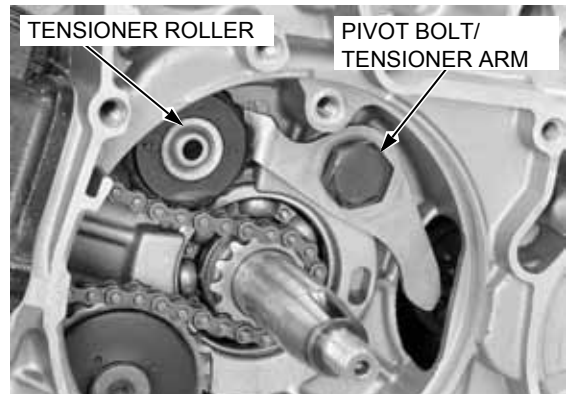
Remove the two O-rings.



Remove the sealing washer/bolt, tensioner spring and push rod.



Remove the pivot bolt, tensioner arm and tensioner roller.

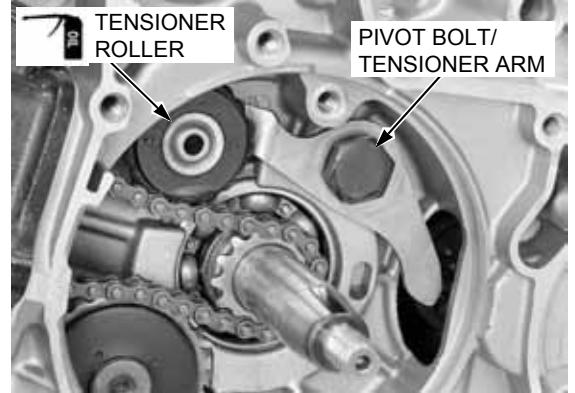


**INSTALLATION**

Apply engine oil to the tensioner roller inner surface.

Install the cam chain tensioner roller, tensioner arm and pivot bolt, then tighten it to the specified torque.

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



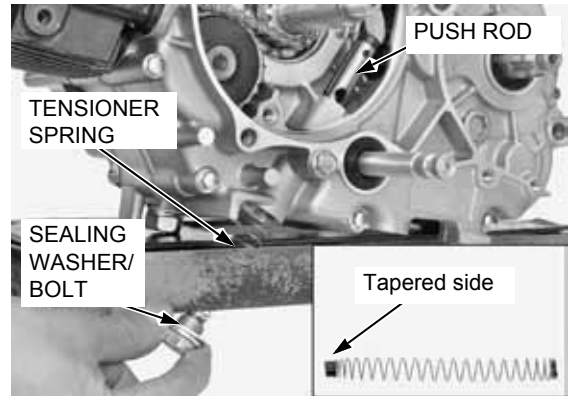
Check that the sealing washer is in good condition, replace if necessary.

Install the push rod.

Install the tensioner spring with its tapered side facing down.

Install the sealing washer/bolt and tighten it to the specified torque.

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

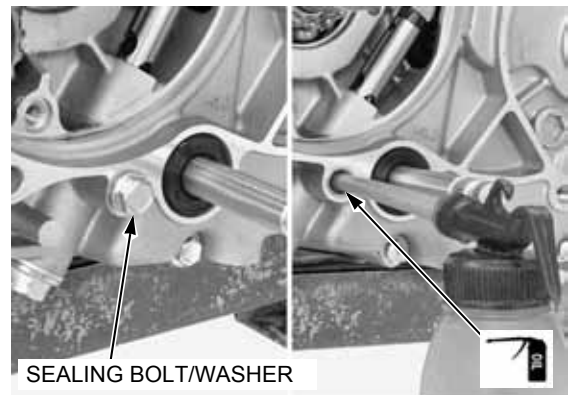


Remove the crankcase sealing bolt and washer.

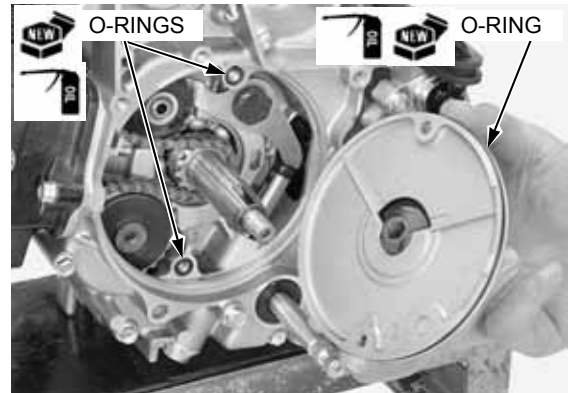
Pour 1 – 2 cm<sup>3</sup> of engine oil into the push rod.

Check that the sealing washer is in good condition, replace if necessary.

Install the sealing washer and sealing bolt, then tighten it.



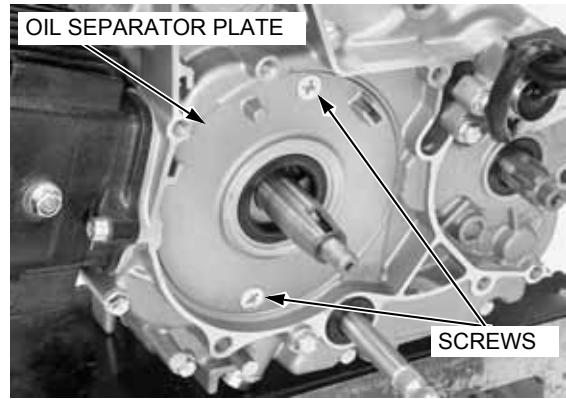
Apply engine oil to new O-rings and install them to the crankcase groove and oil separator plate groove.



## CYLINDER HEAD/VALVES

Install the oil separator plate and screws, then tighten them.

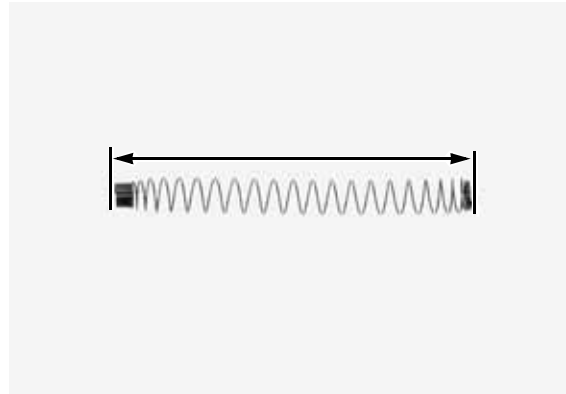
Install the starter clutch (page 10-13).



### INSPECTION

Measure the tensioner spring free length.

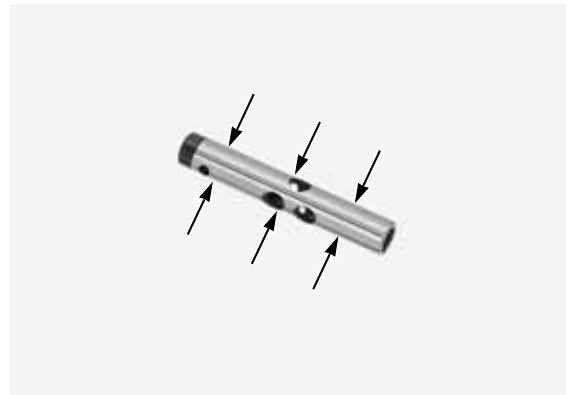
**SERVICE LIMIT: 109 mm (4.3 in)**



Check the push rod for wear or damage.

Measure the push rod O.D.

**SERVICE LIMIT: 11.94 mm (0.470 in)**



Check the oil separator plate oil seal for damage.

Replace if necessary.



# 8. CYLINDER/PISTON

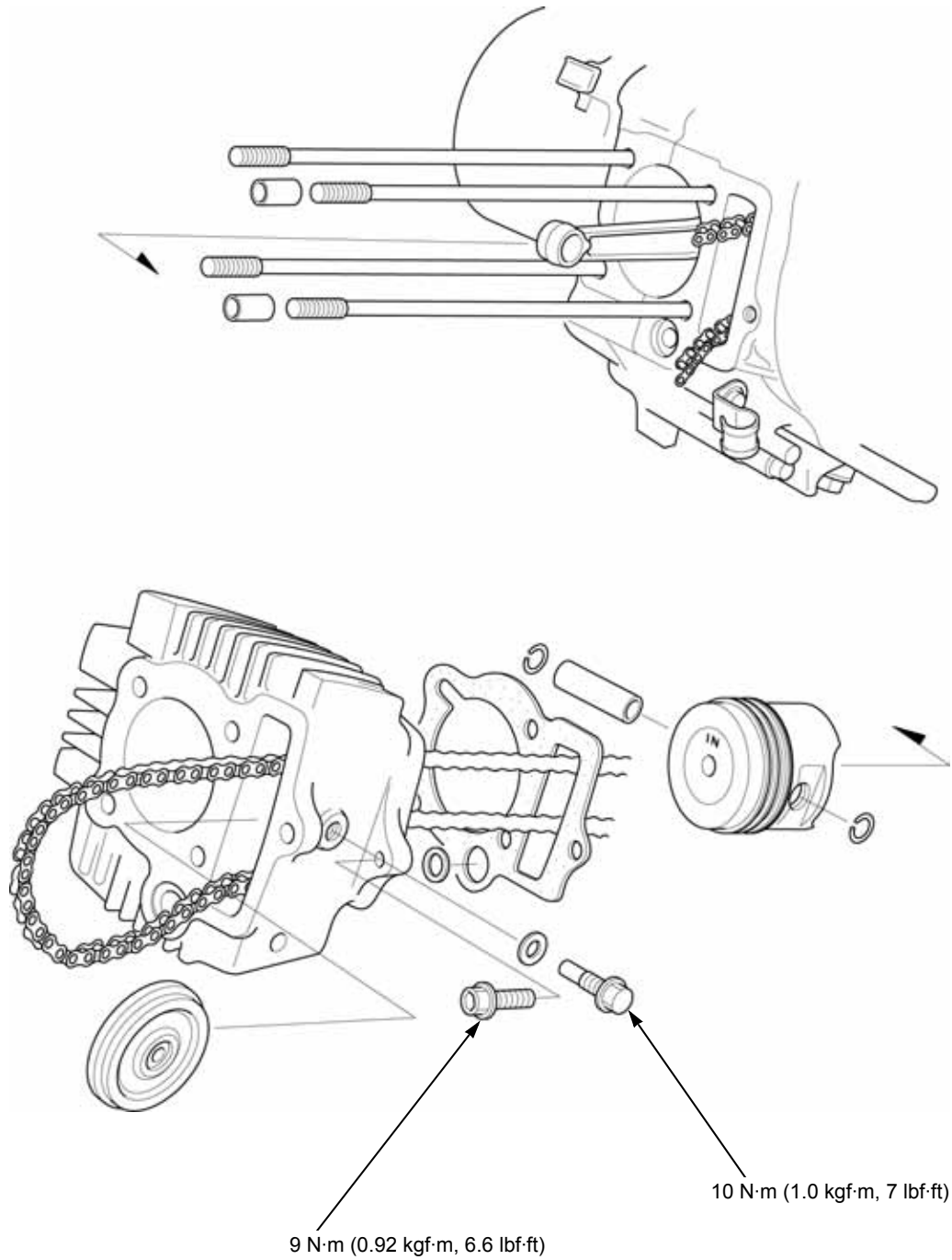
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COMPONENT LOCATION .....	8-2	CYLINDER/PISTON REMOVAL .....	8-4
SERVICE INFORMATION .....	8-3	PISTON/CYLINDER INSTALLATION .....	8-6
TROUBLESHOOTING .....	8-3	CYLINDER/PISTON INSPECTION .....	8-8



## CYLINDER/PISTON

### COMPONENT LOCATION



## SERVICE INFORMATION

### GENERAL

- The cylinder/piston can be serviced with the engine installed in the frame.
- Take care not to damage the cylinder wall and piston.
- Be careful not to damage the mating surfaces when removing the cylinder. Do not strike the cylinder too hard during removal.
- 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. Clean the oil passages before installing the cylinder.

### SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Cylinder	I.D.	50.005 – 50.015 (1.9687 – 1.9691)	50.05 (1.970)	
	Out-of-round	–	0.10 (0.004)	
	Taper	–	0.10 (0.004)	
	Warpage	–	0.05 (0.002)	
Piston, piston rings	Piston mark direction	"IN" mark facing toward the intake side	–	
	Piston O.D.	49.980 – 49.995 (1.9677 – 1.9683)	49.90 (1.965)	
	Piston O.D. measurement point	15 mm (0.6 in) from bottom of skirt	–	
	Piston pin bore I.D.	13.002 – 13.008 (0.5119 – 0.5121)	13.055 (0.5140)	
	Piston pin O.D.	12.994 – 13.000 (0.5116 – 0.5118)	12.98 (0.511)	
	Piston-to-piston pin clearance	0.002 – 0.014 (0.0001 – 0.0006)	0.020 (0.0008)	
	Piston ring-to-ring groove clearance	Top	0.015 – 0.045 (0.0006 – 0.0018)	0.12 (0.005)
		Second	0.015 – 0.045 (0.0006 – 0.0018)	0.12 (0.005)
	Piston ring end gap	Top	0.10 – 0.25 (0.004 – 0.010)	0.5 (0.02)
		Second	0.10 – 0.25 (0.004 – 0.010)	0.5 (0.02)
Oil (side rail)		0.20 – 0.70 (0.008 – 0.028)	1.1 (0.04)	
Cylinder-to-piston clearance		0.010 – 0.035 (0.0004 – 0.0014)	0.15 (0.006)	
Connecting rod small end I.D.		13.016 – 13.028 (0.5124 – 0.5129)	13.10 (0.516)	
Connecting rod-to-piston pin clearance		0.016 – 0.034 (0.0006 – 0.0013)	0.08 (0.003)	

### TORQUE VALUES

Cam chain guide roller pin bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)
Cylinder mounting socket bolt	9 N·m (0.92 kgf·m, 6.6 lbf·ft)

## TROUBLESHOOTING

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

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

#### Compression too high, overheating or knocking

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

#### Excessive smoke

- Worn cylinder, piston or piston rings
- Improper installation of piston rings
- Scored or scratched piston or cylinder wall

#### Abnormal noise

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

## CYLINDER/PISTON

### CYLINDER/PISTON REMOVAL

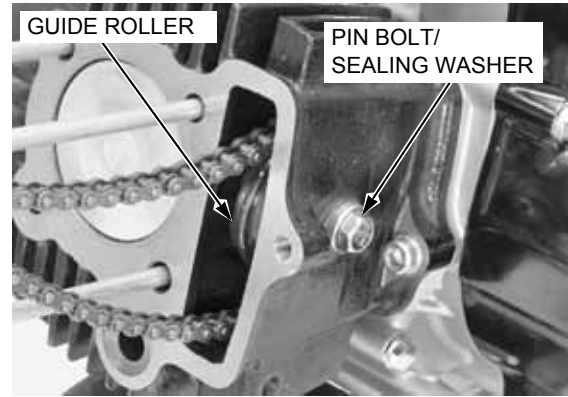
**NOTE:**

- The cylinder/piston can be serviced with the engine installed on the frame.

*Be careful not to drop the guide roller into the crankcase.*

Remove the following:

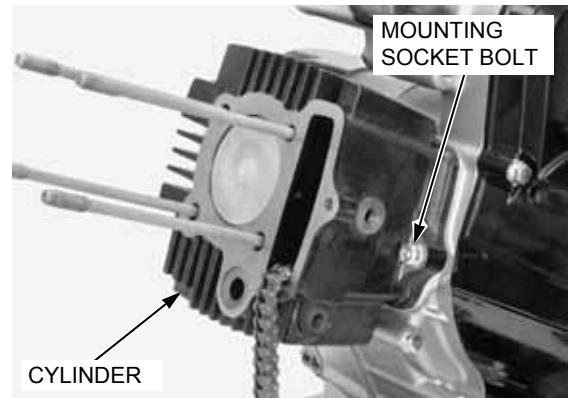
- Cylinder head (page 7-10)
- Cam chain guide pin bolt/sealing washer
- Guide roller



*Be careful not to damage the mating surface.*

Remove the following:

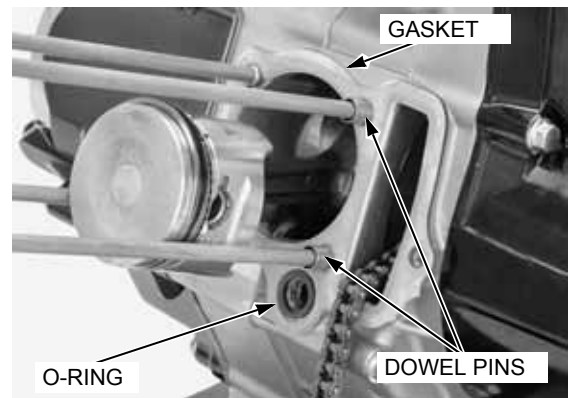
- Cylinder mounting socket bolt
- Cylinder



*Be careful not to damage the gasket mating surface and not to let the dust or dirt fall into the crankcase.*

Remove the following:

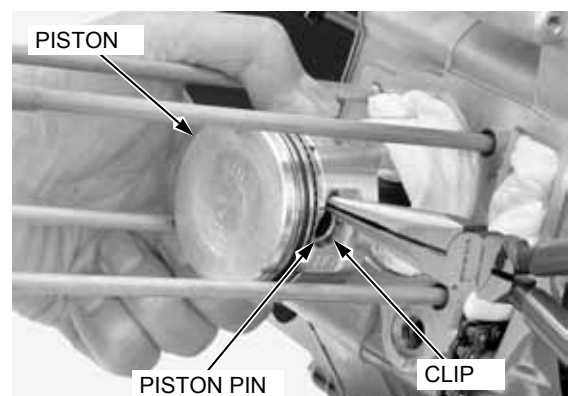
- Gasket
- Two dowel pins
- O-ring



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

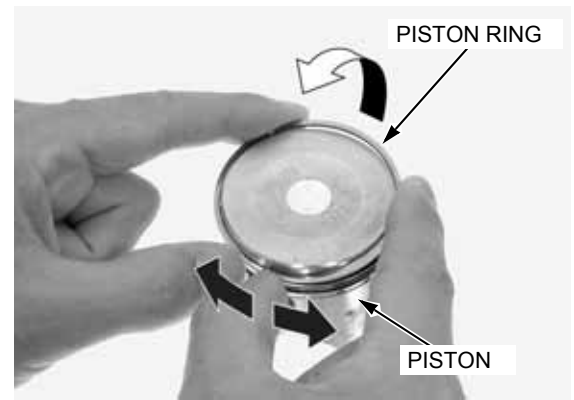
Remove the piston pin clip with pliers.

Push the piston pin out of the piston and connecting rod, then remove the piston.



*Do not damage the piston rings by spreading the ends too far. Be careful not to scratch the piston.*

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



*Never use a wire brush; it will damage the groove.*

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



### CYLINDER STUD BOLT INSTALLATION

Check the stud bolts for looseness.

If replacing the cylinder stud bolts, be sure to install them as shown.

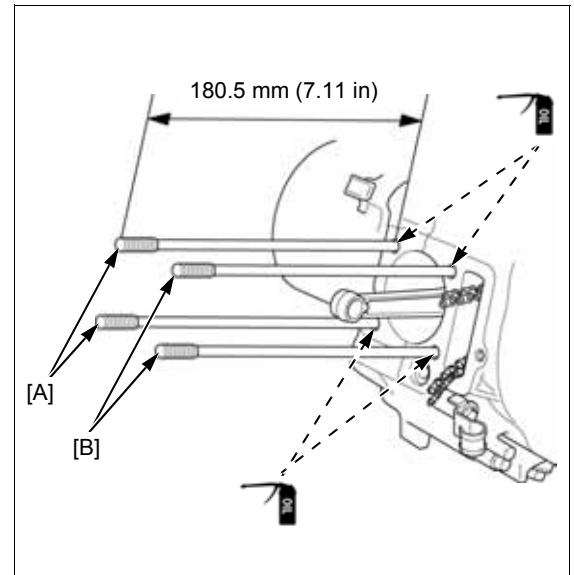
These parts A and B may be changed without written permission.

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

Apply engine oil to the lower threads of new stud bolts and install them.

After installation, be sure to measure the length from the top of each stud to the crankcase surface.

**STANDARD LENGTH: 180.5 mm (7.11 in)**



## CYLINDER/PISTON

# PISTON/CYLINDER INSTALLATION

### PISTON RING INSTALLATION

Clean the piston heads, ring lands and skirts.

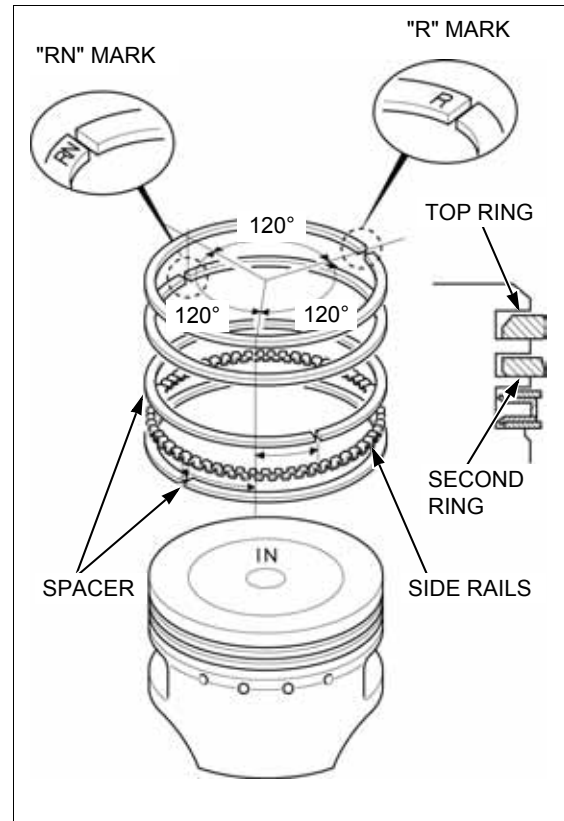
*Be careful not to damage the piston and piston rings during installation.*

Carefully install the piston rings onto the piston with their markings facing up.

#### NOTE:

- Do not confuse the top and second rings as they are not interchangeable.
- When installing the oil ring, install the spacer first and then the side rails.
- Stagger the piston ring end gaps 120 degrees apart from each other.
- Stagger the side rails as shown.

Check that the piston rings can be rotated smoothly in their grooves.



*Be careful not to damage the mating surface. When cleaning the surface, place a shop towel into the crankcase opening to prevent the dust or dirt to enter the engine.*

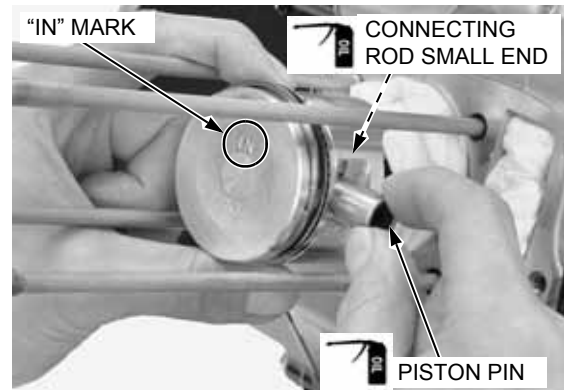
Clean any gasket material from the cylinder mating surface of the crankcase.



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

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

Insert the piston pin through the piston and connecting rod.



Install new piston pin clips into the grooves on the piston pin bore.

**NOTE:**

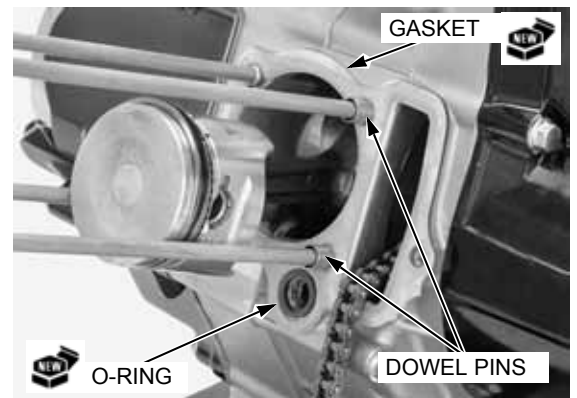
- Make sure that the piston pin clips are seated in the groove securely.
- Do not align the clip end gaps with the piston cutout.



*Do not reuse the gasket and O-ring, replace with new one.*

Install the following:

- Two dowel pins
- New gasket
- New O-ring

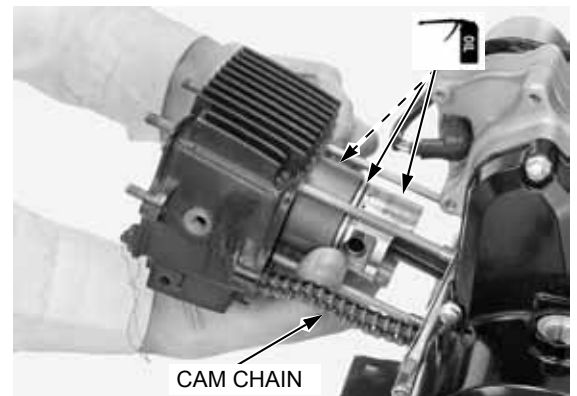


*Be careful not to damage the piston rings and cylinder wall.*

Apply engine oil to the cylinder bore, piston outer surface and piston ring grooves.

*Be careful not to let the cam chain fall into the crankcase.*

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

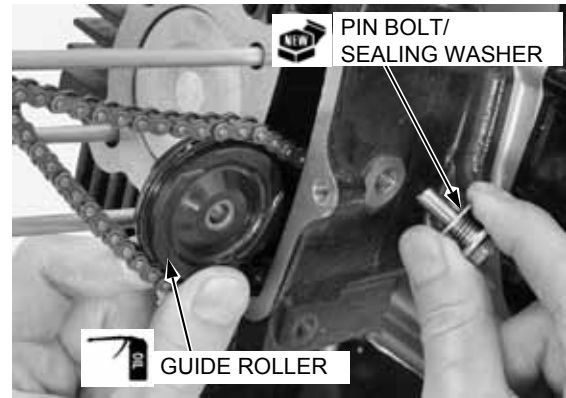


Install the cylinder mounting socket bolt but do not tighten yet.

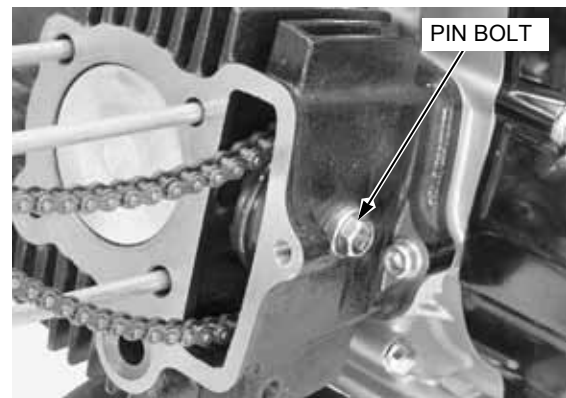


## CYLINDER/PISTON

*Be careful not to drop the guide roller into the crankcase.* Apply engine oil to the cam chain guide roller inner surface.  
Install the cam chain guide roller, new sealing washer and pin bolt.



*Be careful not to drop the guide roller into the crankcase.* Tighten the cam chain guide roller pin bolt to the specified torque.  
**TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)**

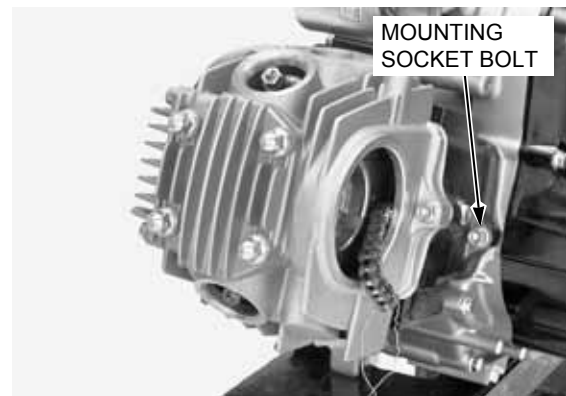


Install the cylinder head and tighten the bolt and nuts to the specified torque (page 7-11).  
Tighten the cylinder mounting socket bolt to the specified torque.

**TORQUE: 9 N·m (0.92 kgf·m, 6.6 lbf·ft)**

Install the removed parts.

After installation, adjust the valve clearance (page 3-9).



## CYLINDER/PISTON INSPECTION

### CYLINDER

Inspect the cylinder wall for scratches and wear.  
Measure and record the cylinder I.D. at three levels in both the X and Y axis. Take the maximum reading to determine the cylinder wear.

**SERVICE LIMIT: 50.05 mm (1.970 in)**

Calculate the out of round at the three levels in an X and Y axis. Take the maximum reading to determine the out of round.

**SERVICE LIMIT: 0.10 mm (0.004 in)**



Calculate the cylinder for taper at three levels in an X and Y axis. Take the maximum reading to determine the taper.

**SERVICE LIMIT: 0.10 mm (0.004 in)**

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

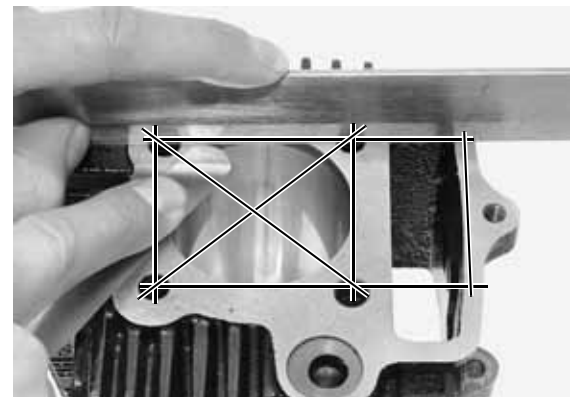
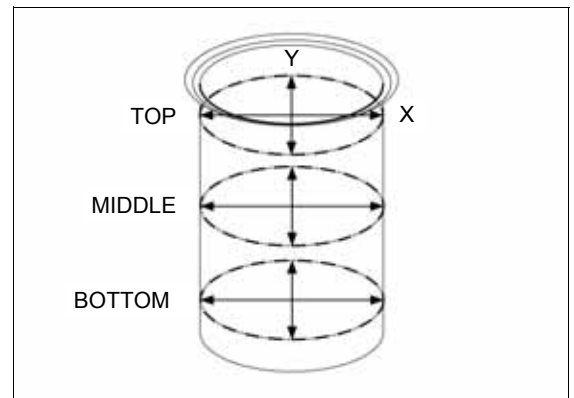
**The following oversize pistons are available:**

- 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 cylinder must be rebored so that the clearance for an oversize piston is 0.010 – 0.035 mm (0.0004 – 0.0014 in).

Check the cylinder for warpage by placing a straight edge and a feeler gauge across the stud holes as shown.

**SERVICE LIMIT: 0.05 mm (0.002 in)**



**PISTON**

Inspect the piston ring, and replace them if they are worn.

*Always replace the piston rings as a set.*

Reinstall the piston rings into the piston grooves.

Inspect the piston rings for smooth movement by rotating them.

The rings should be able to move in their grooves without catching.

Push the ring until the outer surface of the piston ring is nearly flush with the piston and measure the clearance using a feeler gauge.

**SERVICE LIMITS:**

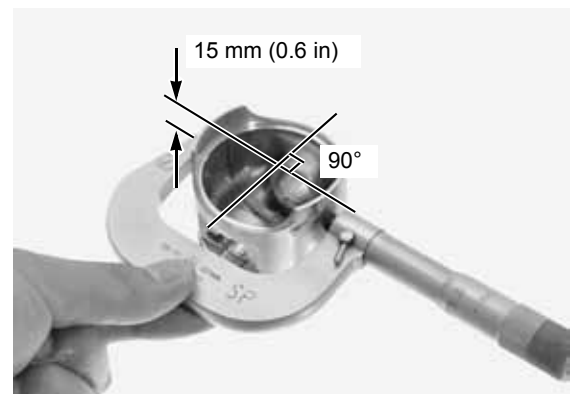
- Top: 0.12 mm (0.005 in)**
- Second: 0.12 mm (0.005 in)**

Inspect the piston for cracks, wear or other damage. Measure the outer diameter of the piston at 15 mm (0.6 in) from the bottom of the piston and 90 degrees to the piston pin hole.

**SERVICE LIMIT: 49.90 mm (1.965 in)**

Calculate the piston-to-cylinder clearance. Take the maximum reading to determine the clearance (Cylinder I.D.: (page 8-8))

**SERVICE LIMIT: 0.15 mm (0.006 in)**





## CYLINDER/PISTON

Measure piston pin bore I.D. in an X and Y axis.  
Take the maximum reading to determine I.D.

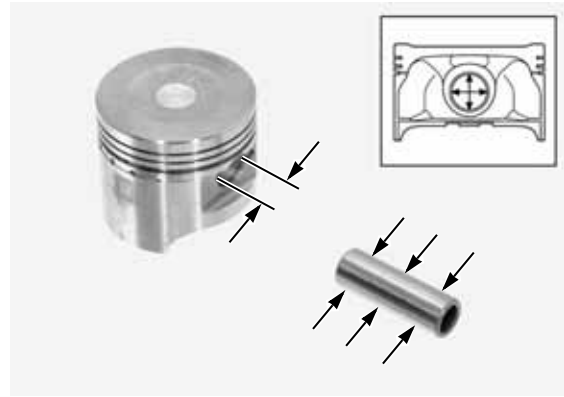
**SERVICE LIMIT: 13.055 mm (0.5140 in)**

Measure the piston pin O.D. at three points as shown in a figure.

**SERVICE LIMIT: 12.98 mm (0.511 in)**

Calculate the piston-to-piston pin clearance.

**SERVICE LIMIT: 0.020 mm (0.0008 in)**

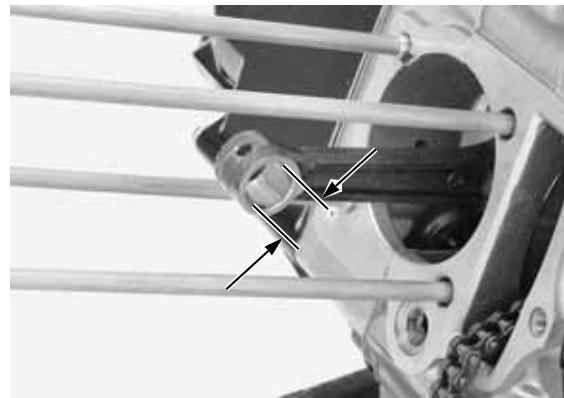


Measure the connecting rod small end I.D.

**SERVICE LIMIT: 13.10 mm (0.516 in)**

Calculate the connecting rod small end-to-piston pin clearance.

**SERVICE LIMIT: 0.08 mm (0.003 in)**



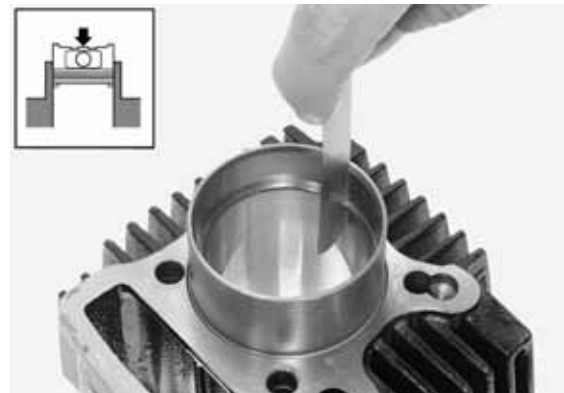
Using a piston, push the ring squarely into the bottom of the cylinder and measure the end gap using a feeler gauge.

**SERVICE LIMITS:**

**Top: 0.5 mm (0.02 in)**

**Second: 0.5 mm (0.02 in)**

**Oil (side rail): 1.1 mm (0.04 in)**

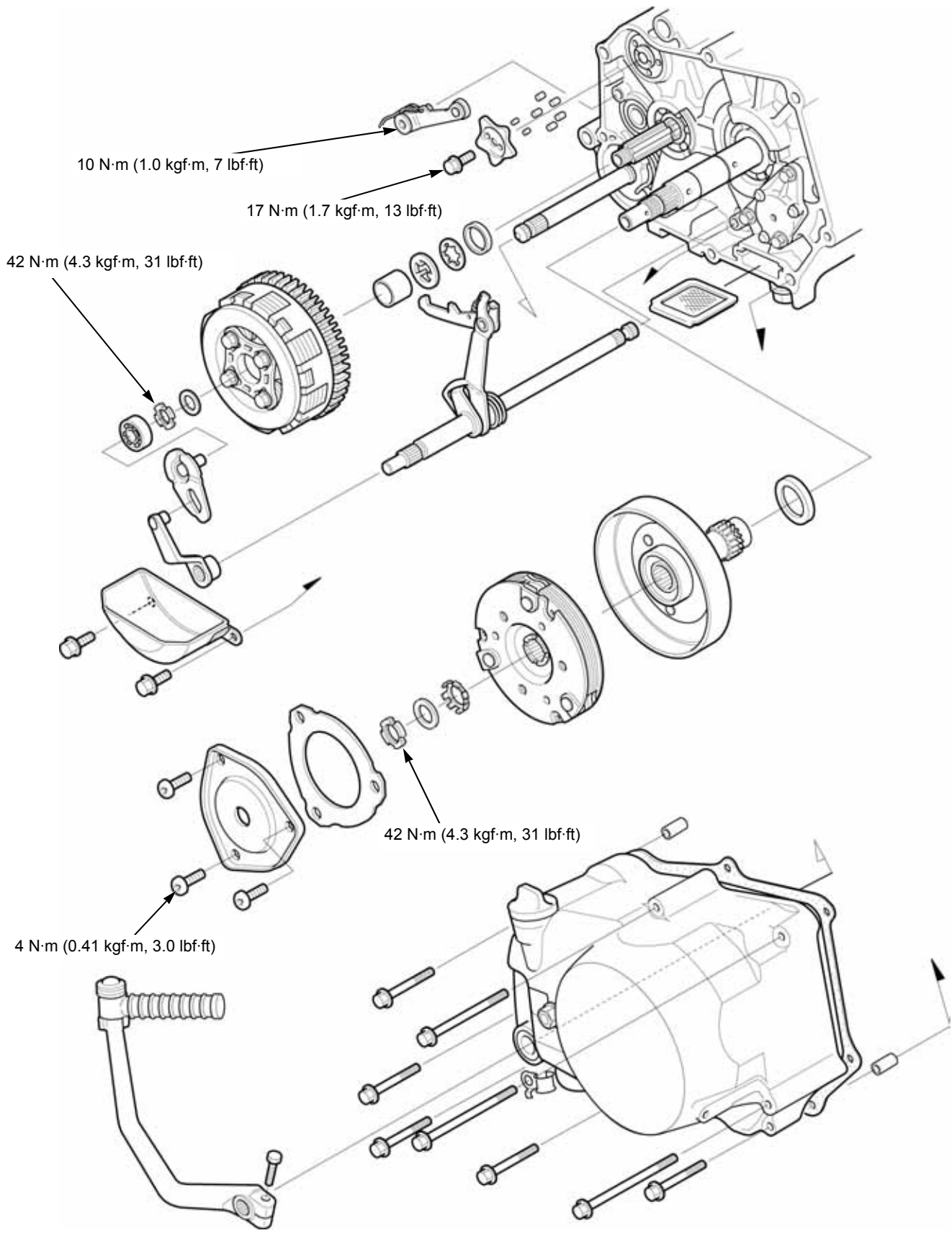


# 9. CLUTCH/GEARSHIFT LINKAGE

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COMPONENT LOCATION .....	9-2	CLUTCH INSTALLATION .....	9-12
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CLUTCH REMOVAL .....	9-9		

# CLUTCH/GEARSHIFT LINKAGE COMPONENT LOCATION



## SERVICE INFORMATION

### GENERAL

- This section covers service of the clutch (centrifugal clutch/manual clutch) and gearshift linkage. These service can be performed with the engine installed in the frame.
- Engine oil viscosity and level and the use of oil additives have an effect on clutch operation. Oil additives of any kind are specifically not recommended. When the clutch does not disengage or the motorcycle creeps with clutch disengaged, inspect the engine oil and oil level before servicing the clutch system.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.

### SPECIFICATIONS

Unit: mm (in)


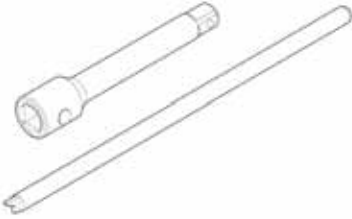

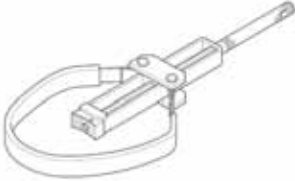
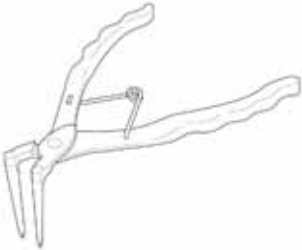


	ITEM	STANDARD	SERVICE LIMIT
Manual clutch	Disc thickness	2.80 – 2.90 (0.110 – 0.114)	2.6 (0.10)
	Plate warpage	–	0.20 (0.008)
	Clutch spring free length	25.7 (1.01)	25.2 (0.99)
	Clutch outer guide O.D.	20.959 – 20.980 (0.8252 – 0.8260)	20.91 (0.832)
	Clutch outer I.D.	21.020 – 21.041 (0.8276 – 0.8284)	21.09 (0.830)
Centrifugal clutch	Clutch drum I.D.	104.0 – 104.2 (4.09 – 4.10)	104.3 (4.11)
	Clutch weight lining thickness	1.5 (0.06)	1.0 (0.04)
	One-way clutch drum I.D.	42.000 – 42.020 (1.6535 – 1.6543)	42.04 (1.655)
	One-way clutch roller O.D.	4.990 – 5.000 (0.1965 – 0.1969)	4.97 (0.196)
	Primary drive gear I.D.	19.030 – 19.058 (0.7492 – 0.7503)	19.11 (0.752)
	Crankshaft O.D. at primary drive gear	18.967 – 18.980 (0.7467 – 0.7472)	18.92 (0.745)

### TORQUE VALUES

Shift drum stopper arm bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)
Shift return spring pin	30 N·m (3.1 kgf·m, 22 lbf·ft)
Gearshift cam plate bolt	17 N·m (1.7 kgf·m, 13 lbf·ft)
Centrifugal clutch lock nut	42 N·m (4.3 kgf·m, 31 lbf·ft)
Clutch lifter plate flange bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Manual clutch center lock nut	42 N·m (4.3 kgf·m, 31 lbf·ft)

## CLUTCH/GEARSHIFT LINKAGE

### TOOLS

<p>Lock nut wrench, 20 x 24 mm 07716-0020100</p> 	<p>Extension bar 07716-0020500</p> 	<p>Gear holder 07724-0010200</p> 
<p>Flywheel holder 07725-0040001</p> 	<p>Snap ring pliers 07914-SA50001</p> 	<p>Lock nut wrench 18 mm 07HMA-GN80101</p> 
<p>Clutch center holder 07HMB-HB70100</p> 		

## **TROUBLESHOOTING**

Faulty clutch operation can usually be corrected by adjusting the clutch system.

### **Clutch slips when accelerating**

- Incorrect clutch adjustment
- Worn clutch disc
- Weak clutch spring
- Faulty clutch weight
- Additive in engine oil

### **Motorcycle creeps with clutch disengaged**

- Incorrect clutch adjustment
- Clutch plate warped
- Faulty clutch lifter
- Faulty clutch weight

### **Hard to shift**

- Damaged gearshift spindle
- Damaged stopper plate and pin
- Loose stopper plate bolt
- Incorrect clutch adjustment
- Loose gearshift cam plate bolt

### **Transmission jumps out of gear**

- Damaged stopper arm
- Damaged gearshift cam plate
- Loose gearshift cam plate bolt
- Loose stopper plate bolt

### **Gearshift pedal will not return**

- Weak or broken gearshift spindle return spring
- Bent gearshift spindle

## CLUTCH/GEARSHIFT LINKAGE

### RIGHT CRANKCASE COVER

#### REMOVAL

Drain the engine oil (page 3-10).

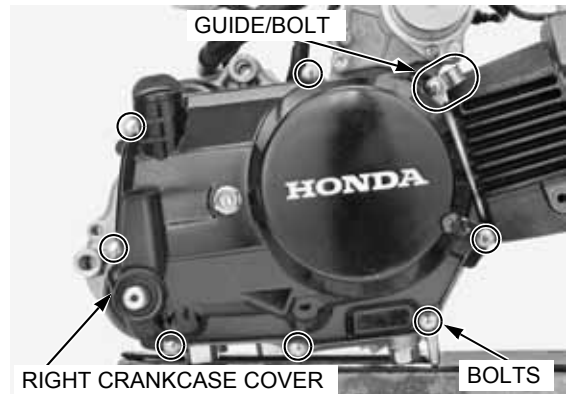
Remove the following:

- Footpeg bar (page 2-18)
- Exhaust pipe/muffler (page 2-20)

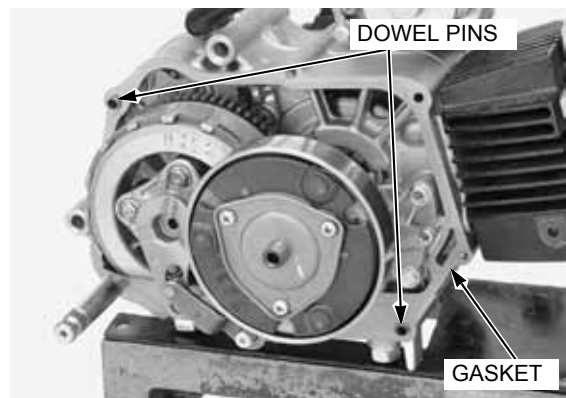
Loosen the bolts in a crisscross pattern in several steps and remove them and guide.

Remove the right crankcase cover.

*Be careful not to damage the mating surface.*



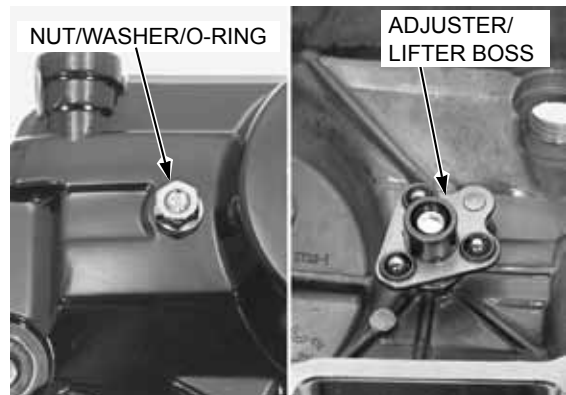
Remove the gasket and dowel pins.



#### DISASSEMBLY

Remove the following:

- Clutch adjuster lock nut
- Washer
- O-ring
- Clutch adjuster/lifter boss



Remove the clutch adjuster bolt.



### KICKSTARTER SPINDLE OIL SEAL

Check that the kickstarter spindle oil seal is in good condition, replace it if necessary.

If replacing the oil seal, install it until it is fully seated.



### OIL PASSAGES

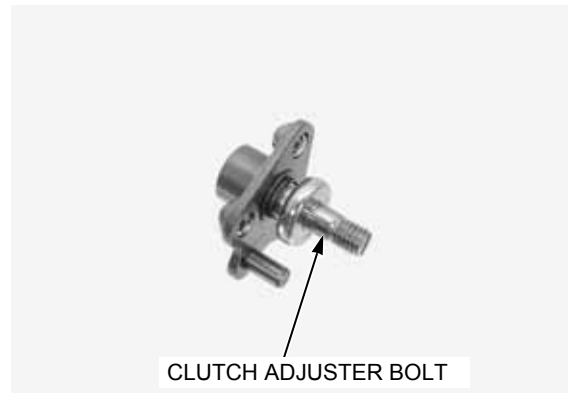
Blow open the oil passage of the right crankcase cover with compressed air.

Check the oil passage for clog.



### ASSEMBLY

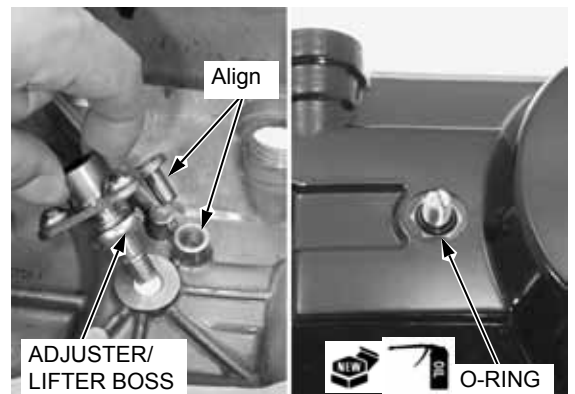
Install the clutch adjuster bolt.



Install the clutch adjuster/lifter boss into the right crankcase cover aligning its boss with the hole in the crankcase cover.

Apply engine oil to a new O-ring.

Install the O-ring onto the clutch adjuster/lifter boss.

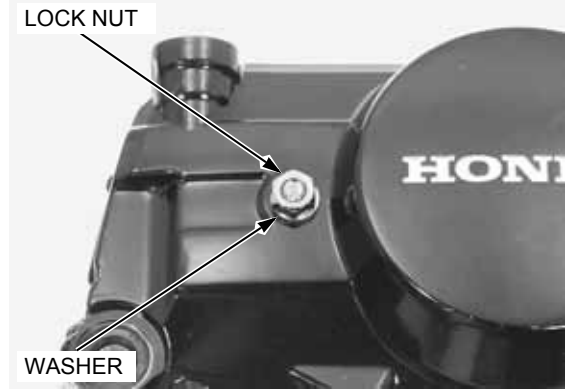




## CLUTCH/GEARSHIFT LINKAGE

Install the washer and clutch adjuster lock nut.

After installing the right crankcase cover, adjust the clutch system (page 3-19).



## INSTALLATION

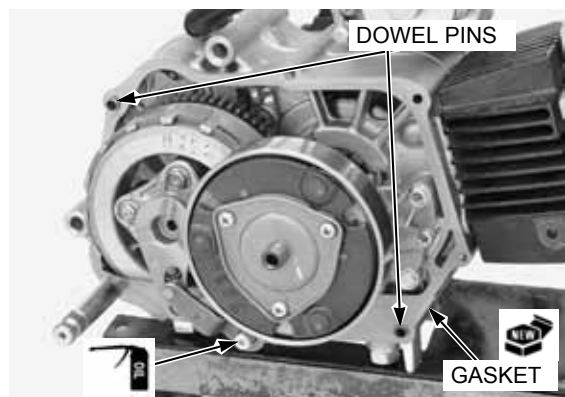
Apply engine oil to the kickstarter spindle oil seal lips.



*Be careful not to drop any foreign materials into the engine.* Clean the gasket mating surface of the crankcase and right crankcase cover, being careful not to damage them.

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

Apply engine oil to the gearshift spindle journal area.



*Be careful not to damage the kickstarter oil seal lips.* Install the right crankcase cover. Install the right crankcase cover bolts and guide, then tighten the bolts in a crisscross pattern in several steps.

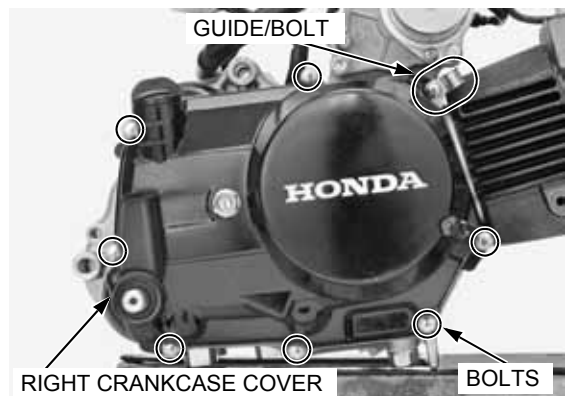
Install the following:

- Exhaust pipe/muffler (page 2-21)
- Footpeg bar (page 2-18)

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

Make sure there are no oil leaks.

Check the clutch system adjustment (page 3-19).



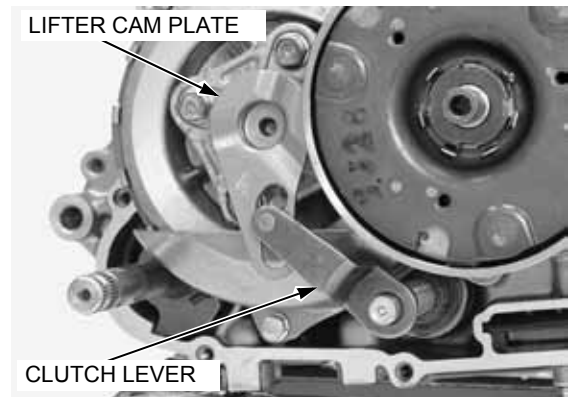
## CLUTCH REMOVAL

**NOTE:**

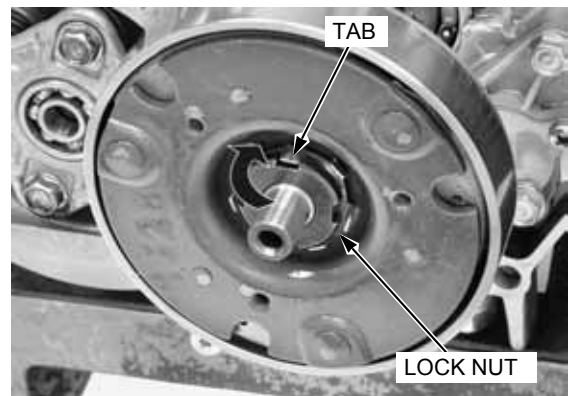
- Clutch system can be serviced with the engine installed on the frame.

Remove the following:

- Right crankcase cover (page 9-6)
- Engine oil centrifugal filter cover (page 3-11)
- Clutch lever
- Clutch lifter cam plate



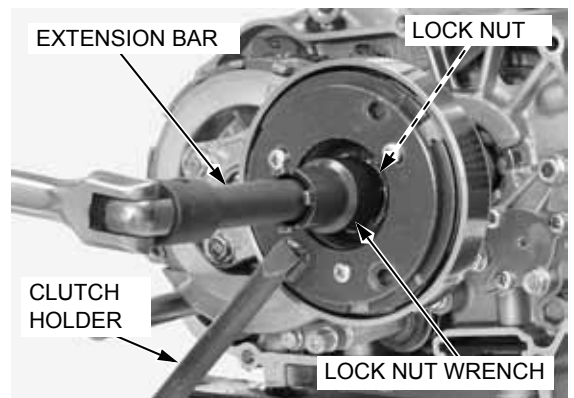
Bend up the tab of the lock washer to clear the lock nut groove.



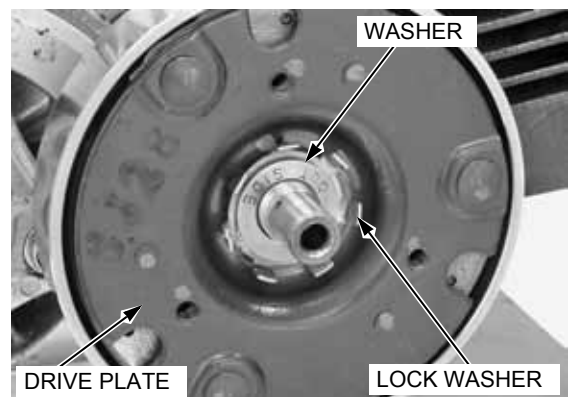
Remove the lock nut using the special tools.

**TOOLS:**

- |                             |               |
|-----------------------------|---------------|
| Lock nut wrench, 20 x 24 mm | 07716-0020100 |
| Extension bar               | 07716-0020500 |
| Clutch center holder        | 07HMB-HB70100 |

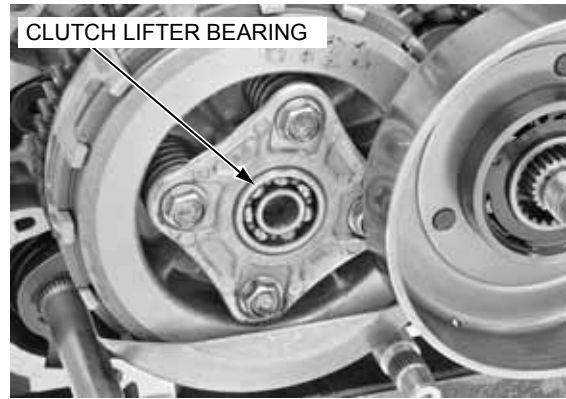


Remove the washer, lock washer and primary drive plate/clutch weight assembly.



## CLUTCH/GEARSHIFT LINKAGE

Remove the manual clutch lifter bearing.

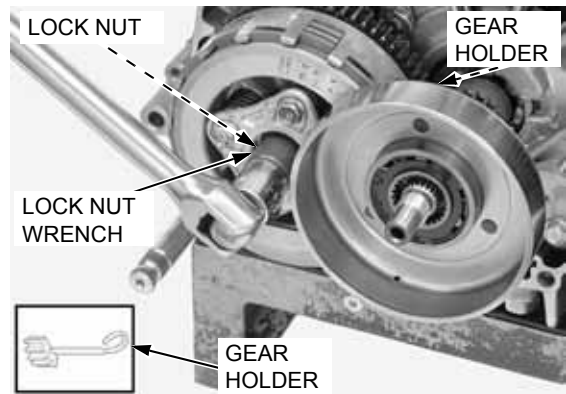


Hold the primary drive and driven gear with gear holder, remove the manual clutch lock nut using the special tool.

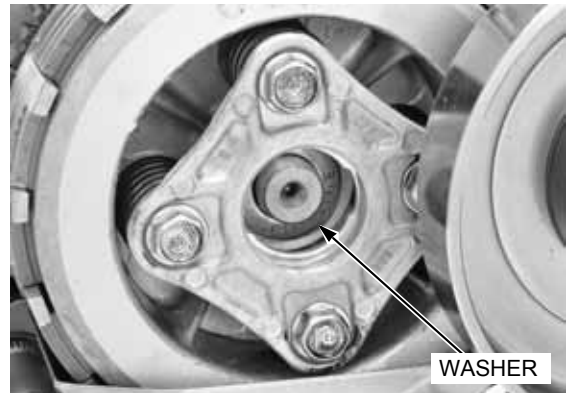
**TOOLS:**

Lock nut wrench, 18 mm  
Gear holder

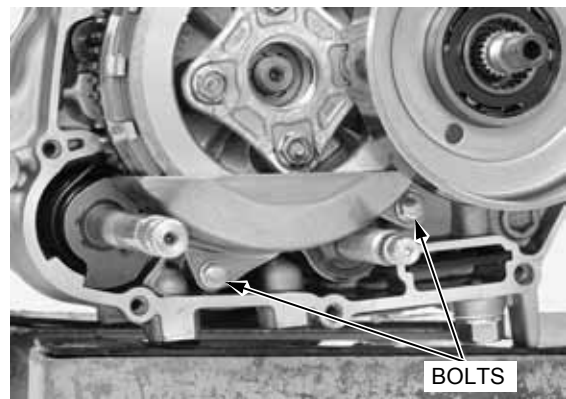
07HMA-GN80101  
07724-0010200



Remove the washer.

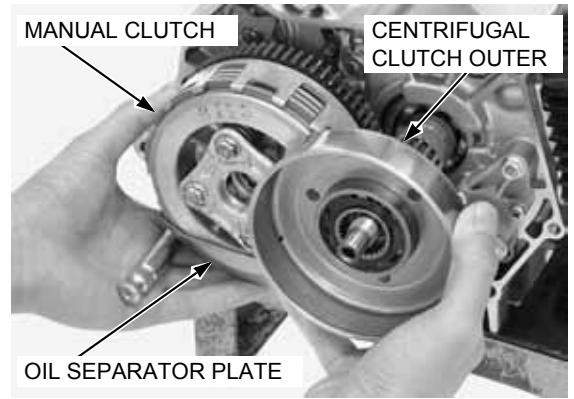


Remove the two oil separator plate mounting bolts.

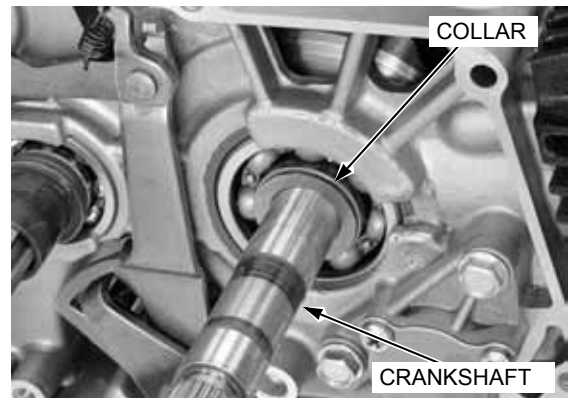


## CLUTCH/GEARSHIFT LINKAGE

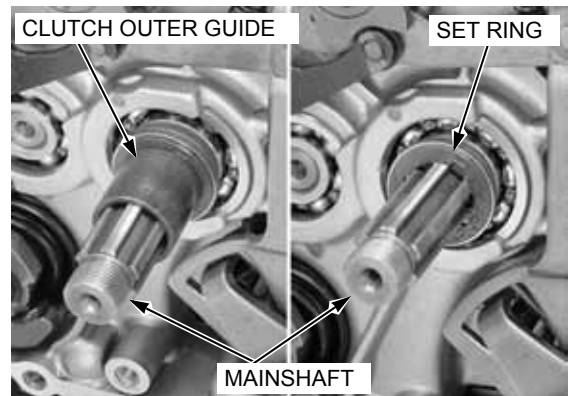
Remove the centrifugal clutch outer, manual clutch and oil separator plate as an assembly.



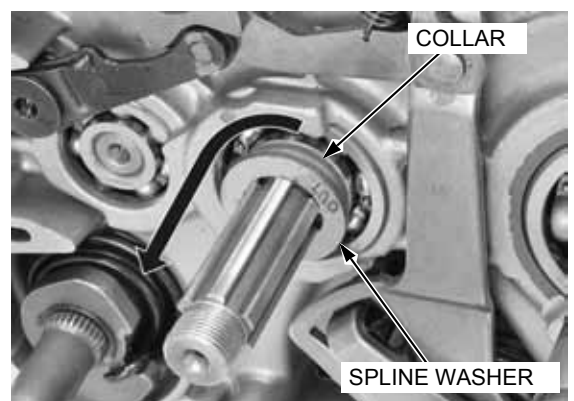
Remove the collar from the crankshaft.



Remove the clutch outer guide and set ring from the mainshaft.



Rotate and unlock the spline washer, then remove it and collar.



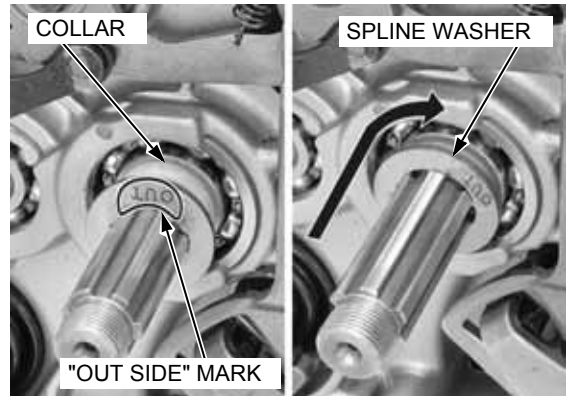
## CLUTCH/GEARSHIFT LINKAGE

### CLUTCH INSTALLATION

Install the collar to the mainshaft.

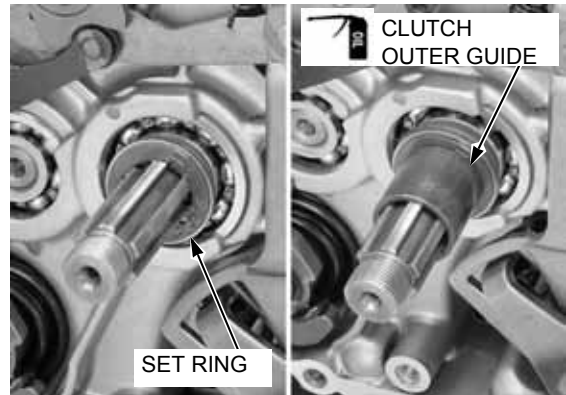
Install the spline washer to the mainshaft with its "OUT SIDE" mark facing out.

Rotate and lock the spline washer.

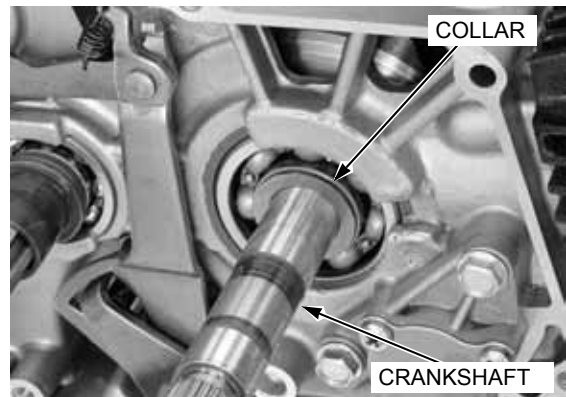


Install and lock the set ring while aligning its tabs with the spline slots.

Apply engine oil to the clutch outer guide sliding surface and install it to the mainshaft.

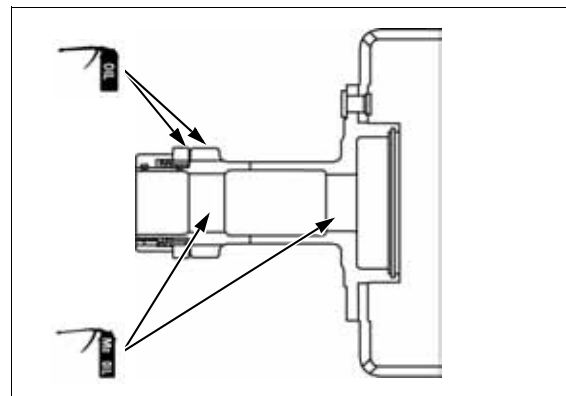


Install the collar to the crankshaft.



Apply molybdenum disulfide oil to the centrifugal clutch outer inner surface.

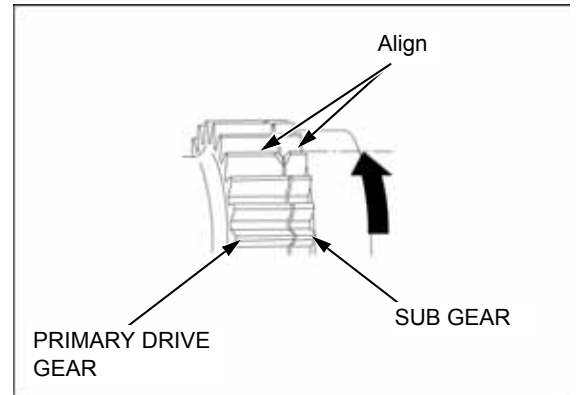
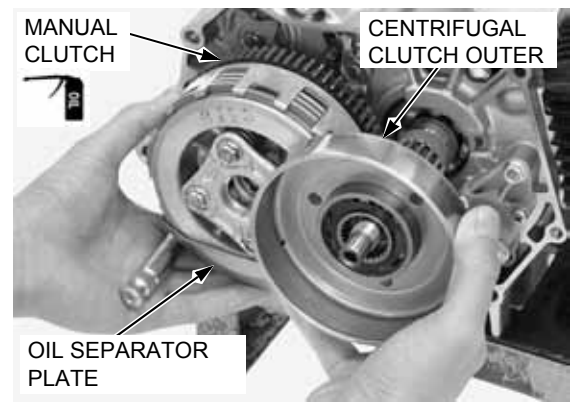
Apply engine oil to the primary drive gear and sub gear teeth.



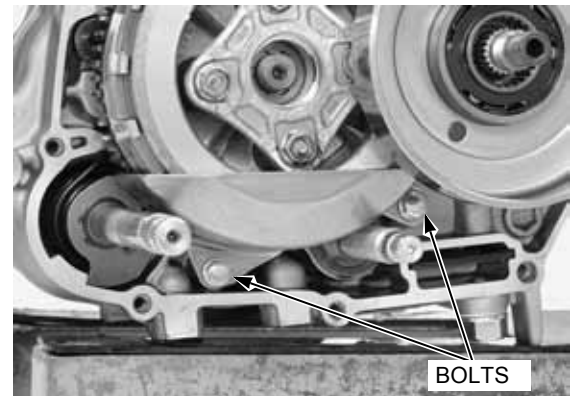
## CLUTCH/GEARSHIFT LINKAGE

Apply engine oil to the manual clutch outer teeth and rotating area.

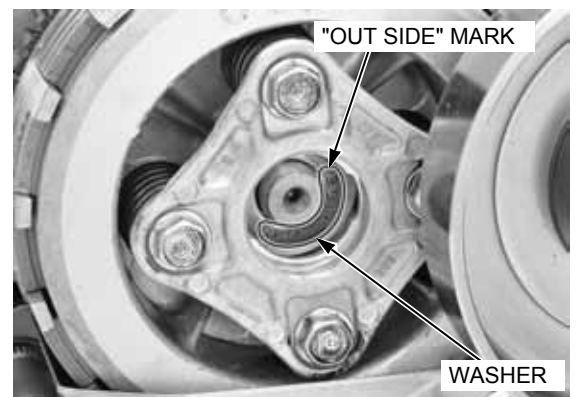
Set the oil separator plate to the manual clutch outer. Align the primary drive gear and sub gear as shown, then install the manual clutch, centrifugal clutch outer and oil separator plate as an assembly.



Install and tighten the two oil separator plate mounting bolts.



Install the washer to the mainshaft with its "OUT SIDE" mark facing out.



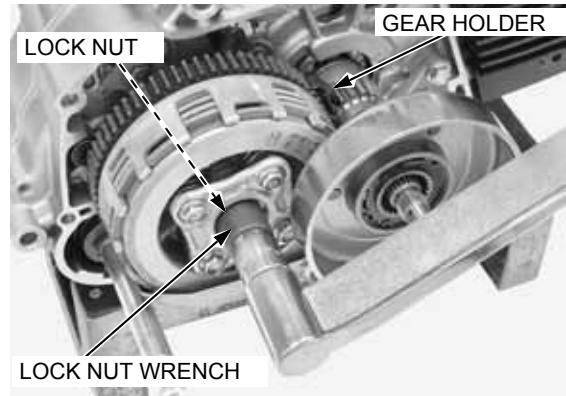
## CLUTCH/GEARSHIFT LINKAGE

Install the clutch center lock nut.  
Hold the primary drive and driven gear with the gear holder, tighten the clutch center lock nut to the specified torque.

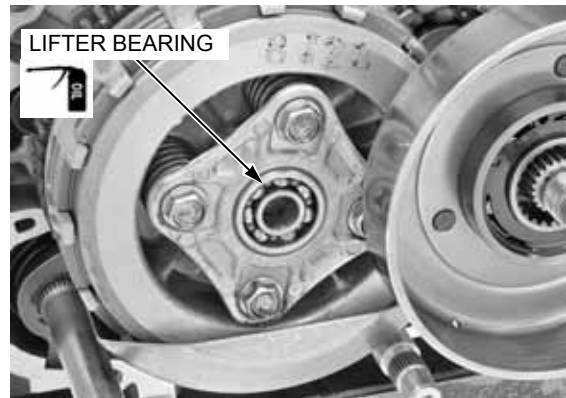
**TOOLS:**

Lock nut wrench, 18 mm                    07HMA-GN80101  
Gear holder                                    07724-0010200

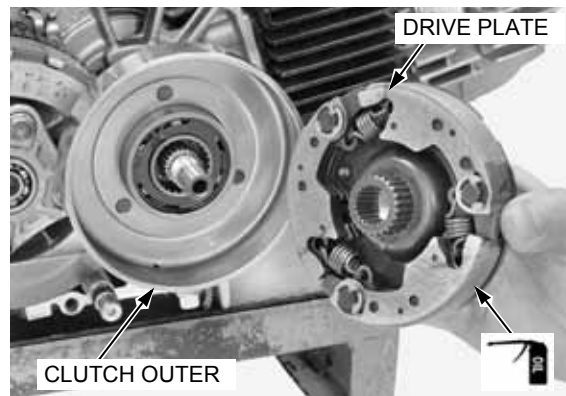
**TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)**



Apply engine oil to the clutch lifter bearing and install it to the clutch lifter plate.

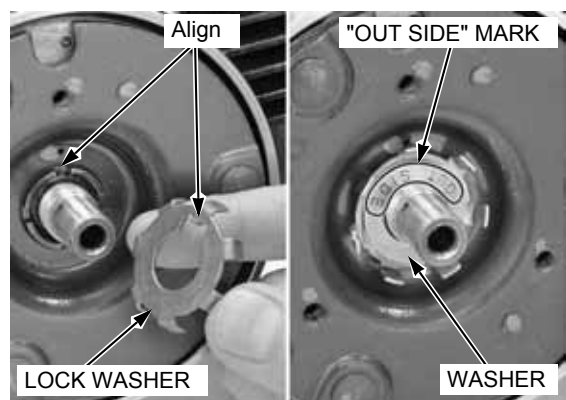


Apply engine oil to the primary drive plate shoe lining surfaces.  
Install the primary drive plate/clutch weight assembly to the primary clutch outer.



Set the lock washer to the crankshaft aligning its inner tab with the groove on the drive plate.

Install the washer with its "OUT SIDE" mark facing out.



## CLUTCH/GEARSHIFT LINKAGE

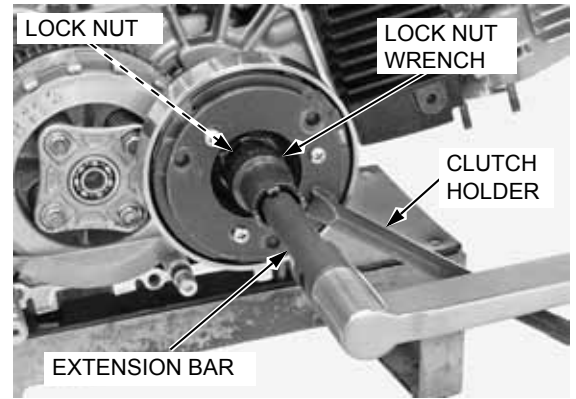
Install the centrifugal clutch lock nut to the crankshaft.

Hold the clutch weight assembly with the clutch holder, tighten the lock nut to the specified torque.

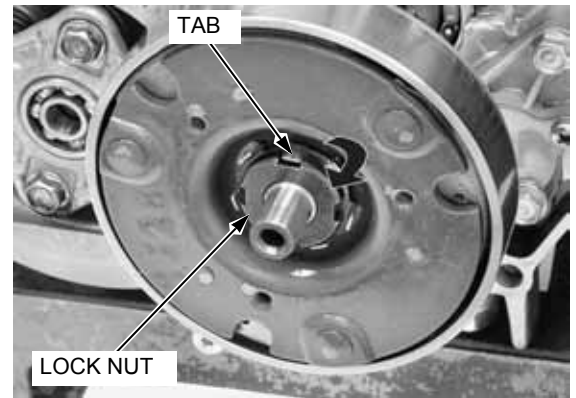
### TOOLS:

Lock nut wrench, 20 x 24 mm      07716-0020100  
 Extension bar                              07716-0020500  
 Clutch holder                                07HMB-HB70100

**TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)**



If none of the lock nut groove is aligned with the lock washer tab, further tighten the lock nut and align the lock nut groove with the lock washer tab. Bend down the lock washer tab against the lock nut groove.

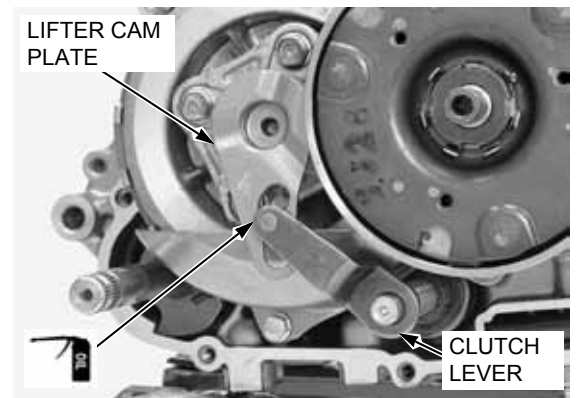


Install the clutch lever while aligning the punch mark on the clutch lever and gearshift spindle as shown.

Install the clutch lifter cam plate onto the clutch lifter bearing.

Apply engine oil to the clutch lever roller rotating area.

Shift pedal does not operate if the clutch lever is installed incorrectly to the gearshift spindle.

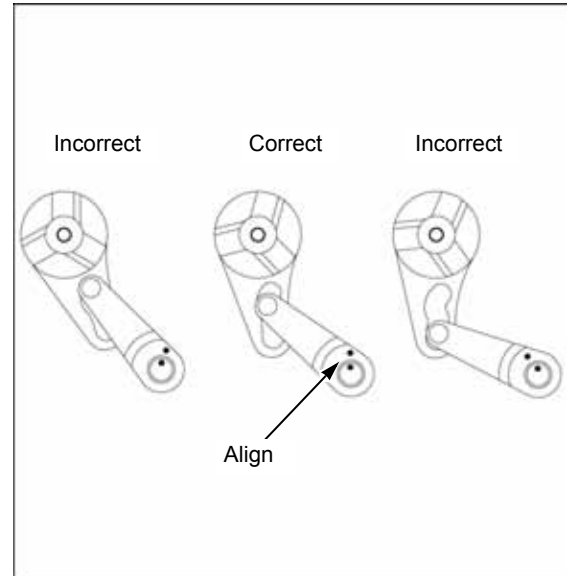


*Before installing the right crankcase cover, operate the shift pedal while holding the center of the lifter plate and confirm that the gear shifts properly.*

Install the following:

- Engine oil centrifugal filter cover (page 3-11)
- Right crankcase cover (page 9-8)

Adjust the clutch system (page 3-19).





**CENTRIFUGAL CLUTCH**

**DISASSEMBLY/INSPECTION**

Remove the clutch (page 9-9).

**ONE-WAY CLUTCH**

Temporarily install the primary drive plate/clutch weight assembly into the clutch outer.

Turn the drive plate/clutch weight assembly and check the one-way clutch operation.

Make sure that the drive plate/clutch weight assembly only turn clockwise and does not turn counterclockwise.

Remove the clutch weight assembly from the clutch outer.

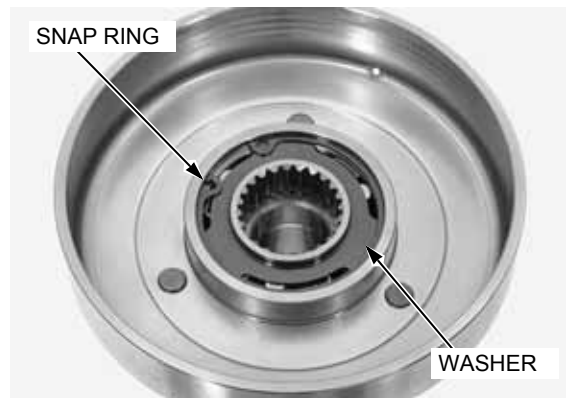


Remove the snap ring and washer.

**TOOL:**

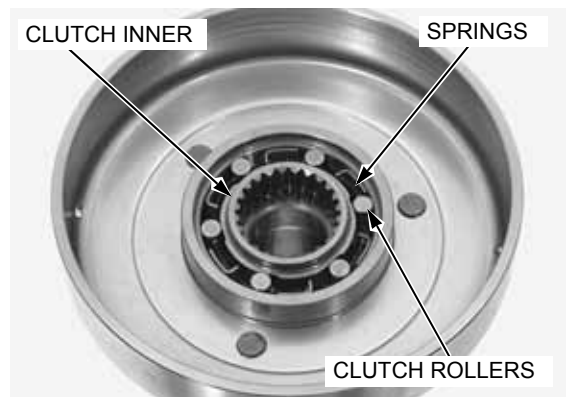
**Snap ring pliers**

**07914-SA50001**



*Be careful not to lose the clutch rollers and springs.*

Remove the one-way clutch rollers and springs.  
Remove the one-way clutch inner.

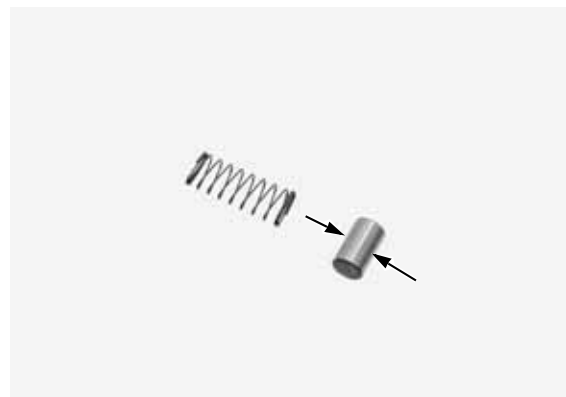


Check the rollers and springs for excessive wear or damage.

Replace if necessary.

Measure the one-way clutch roller O.D.

**SERVICE LIMIT: 4.97 mm (0.196 in)**



Check the clutch inner for wear or damage.



### CLUTCH OUTER/SUB GEAR

Check the sliding surfaces of the one-way clutch outer and inner for excessive wear or damage.

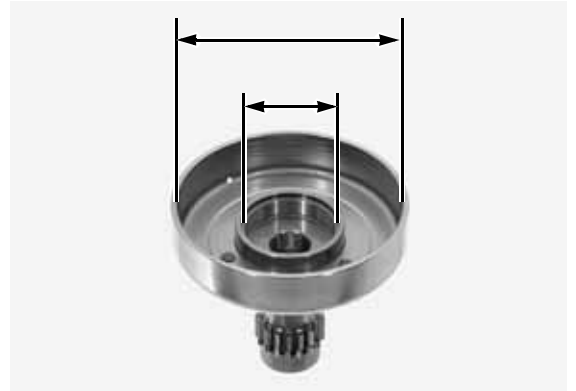
Measure the one-way clutch drum I.D.

**SERVICE LIMIT: 42.04 mm (1.655 in)**

Check the inside of the centrifugal clutch drum and inner for excessive wear or damage.

**SERVICE LIMIT: 104.3 mm (4.11 in)**

If necessary, replace them as a set.



Check the sub gear for wear or damage.



Check the sub gear operation by moving it and make sure that it returns without binding.

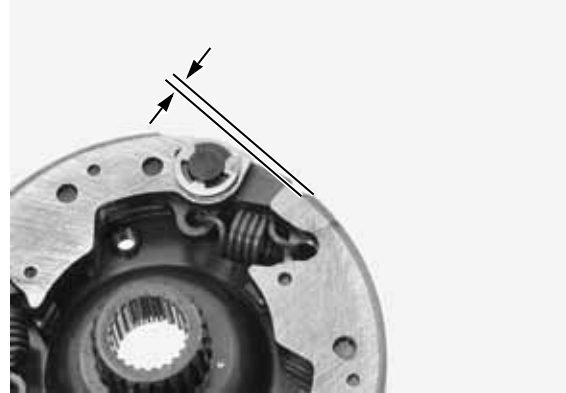


## CLUTCH/GEARSHIFT LINKAGE

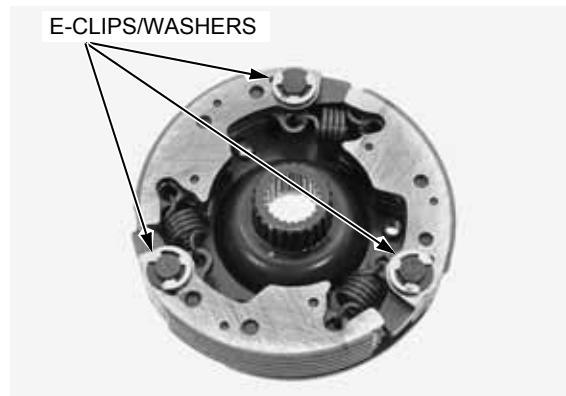
### CLUTCH WEIGHT

Check the clutch weight assembly for damage.  
Measure the clutch weight lining thickness.

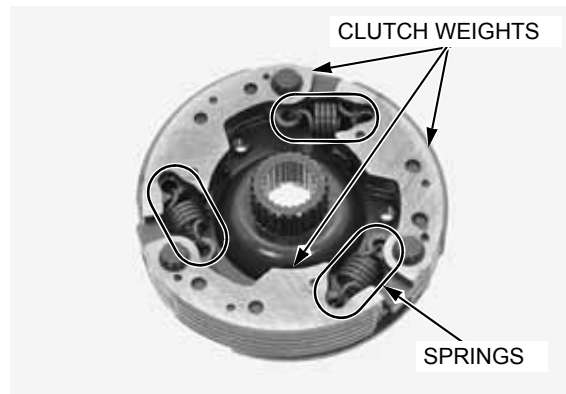
**SERVICE LIMIT: 1.0 mm (0.04 in)**



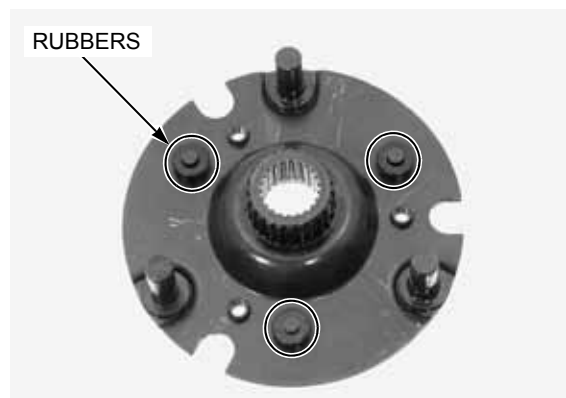
Remove the three E-clips and washers.



*Mark all parts during disassembly so they can be placed back in their original locations.* Alternately lift the clutch weights, then remove the weights and springs.

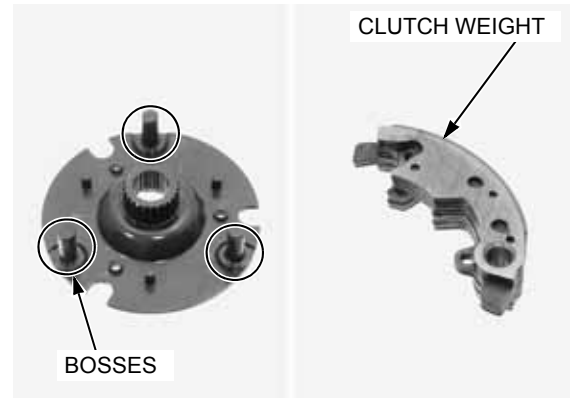


Remove the damper rubbers.



## CLUTCH/GEARSHIFT LINKAGE

*If necessary, replace the clutch weights as a set.* Check the drive plate bosses for wear or damage.  
Check each clutch weight for wear or damage.

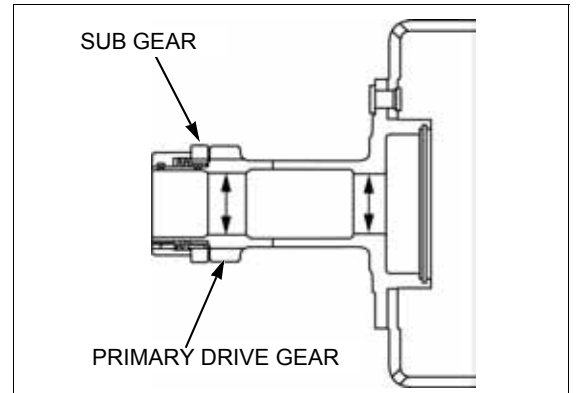


### PRIMARY DRIVE GEAR

Check the sub gear spring function by turning the sub gear.

Measure the primary drive gear I.D.

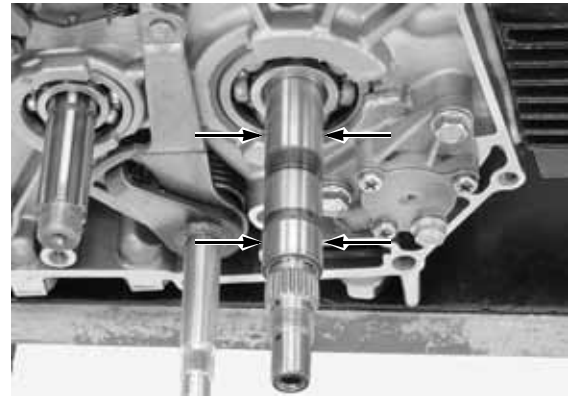
**SERVICE LIMIT: 19.11 mm (0.752 in)**



### CRANKSHAFT

Measure the crankshaft O.D.

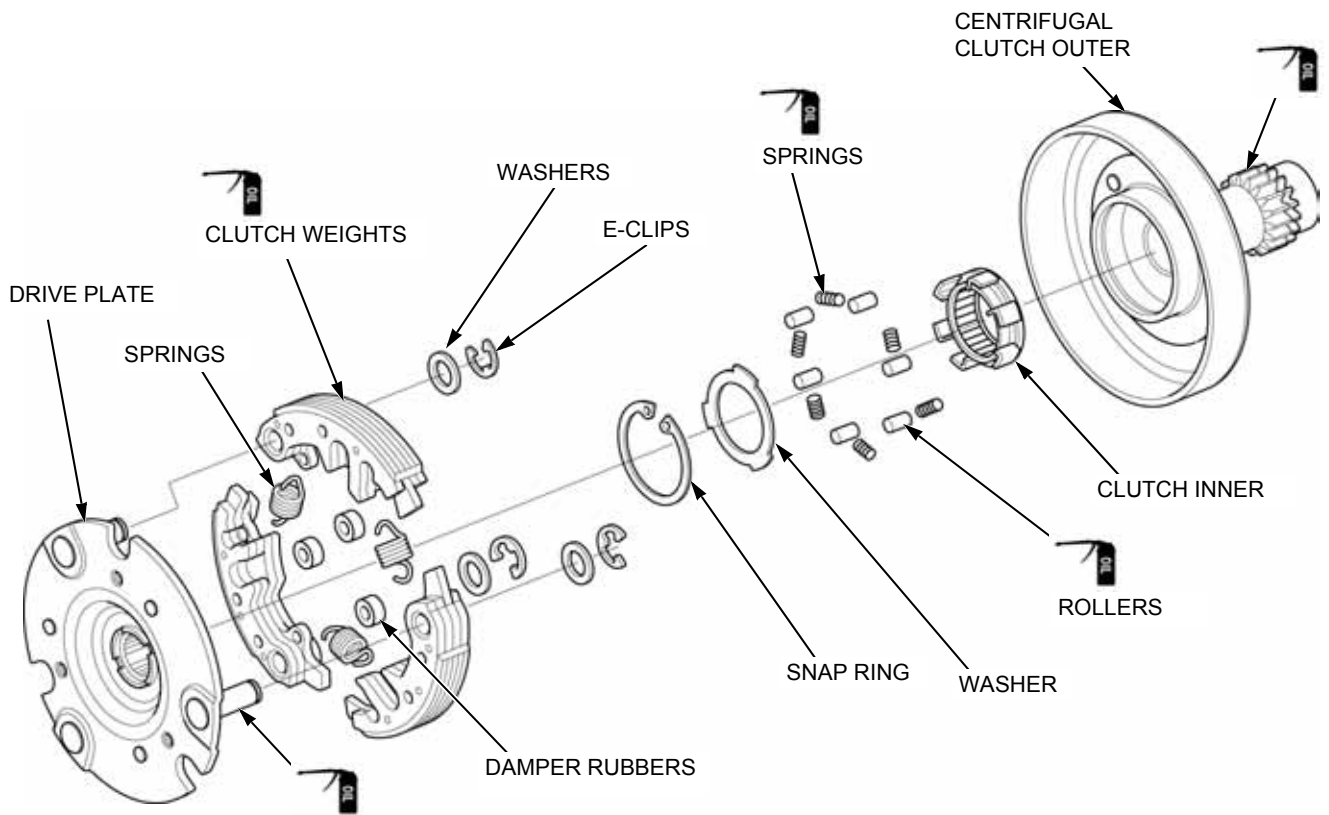
**SERVICE LIMIT: 18.92 mm (0.745 in)**



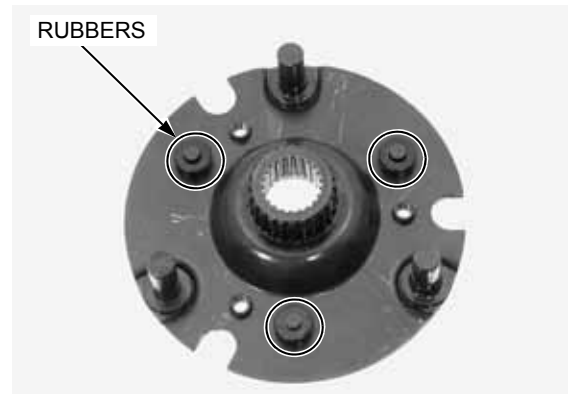
# CLUTCH/GEARSHIFT LINKAGE

## ASSEMBLY

### CLUTCH WEIGHT



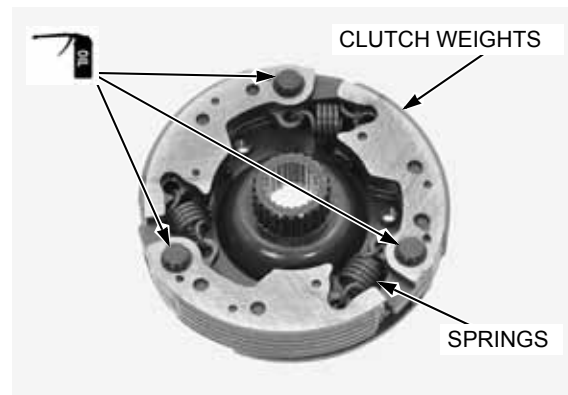
Install the damper rubbers.



Apply engine oil to the drive plate pivots.

*Clutch weights and springs must be placed back in the original locations.*

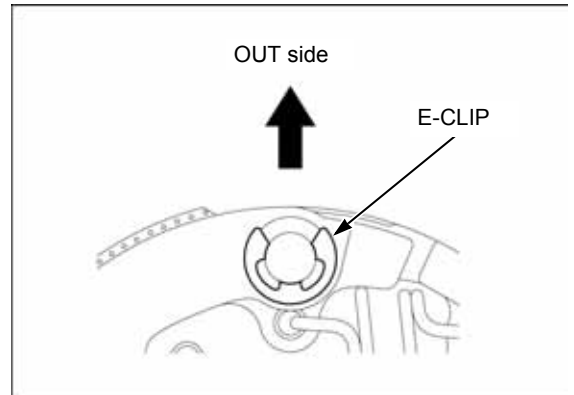
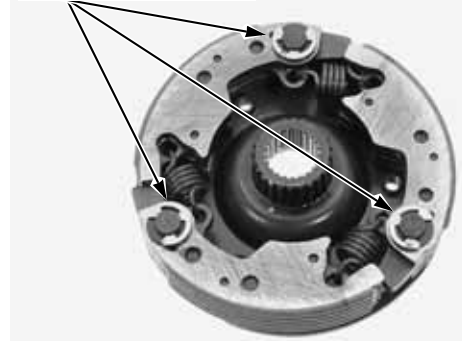
Install the clutch weights and springs to the drive plate as shown.



## CLUTCH/GEARSHIFT LINKAGE

*Make sure that the E-clips are seated in the grooves.* Install the three washers and E-clips while compressing its open end to out side.

WASHERS/E-CLIPS

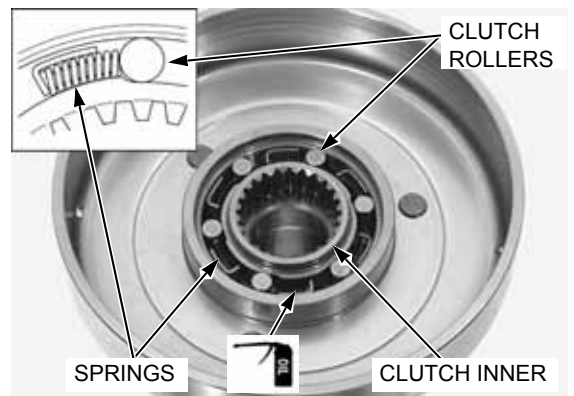


### ONE-WAY CLUTCH

Apply engine oil to the one-way clutch sliding surfaces.  
Install the one-way clutch inner.

*Be careful not to lose the springs and clutch rollers.*

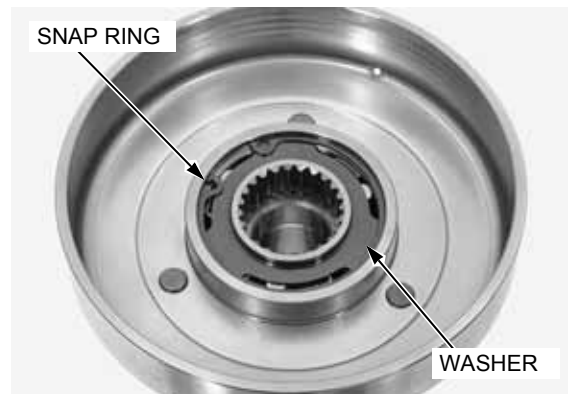
Install the springs and one-way clutch rollers as shown.



*Do not align the open end of the snap ring with the cut-out on the washer.* Install the washer.  
Install the snap ring into the groove of the one-way clutch outer.

**TOOL:**  
Snap ring pliers

07914-SA50001



## CLUTCH/GEARSHIFT LINKAGE

Temporarily install the drive plate/clutch weight assembly and check the one-way clutch function. Make sure that the drive plate/clutch weight only turn clockwise and does not turn counterclockwise.



## MANUAL CLUTCH

### DISASSEMBLY

Remove the clutch (page 9-9).

*Loosen the clutch lifter plate bolts in a crisscross pattern in 2-3 steps.*

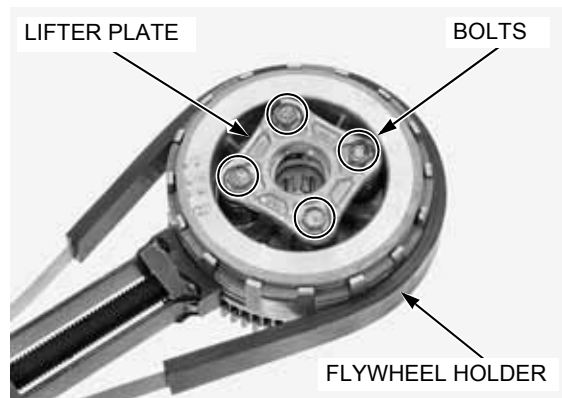
Hold the clutch outer using the special tool, then loosen and remove the lifter plate bolts.

**TOOL:**

**Flywheel holder**

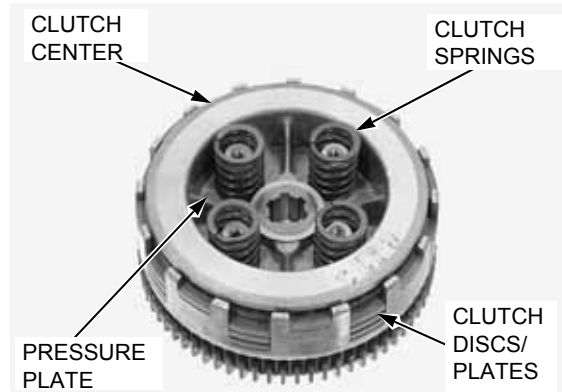
**07725-0040001**

Remove the clutch lifter plate.

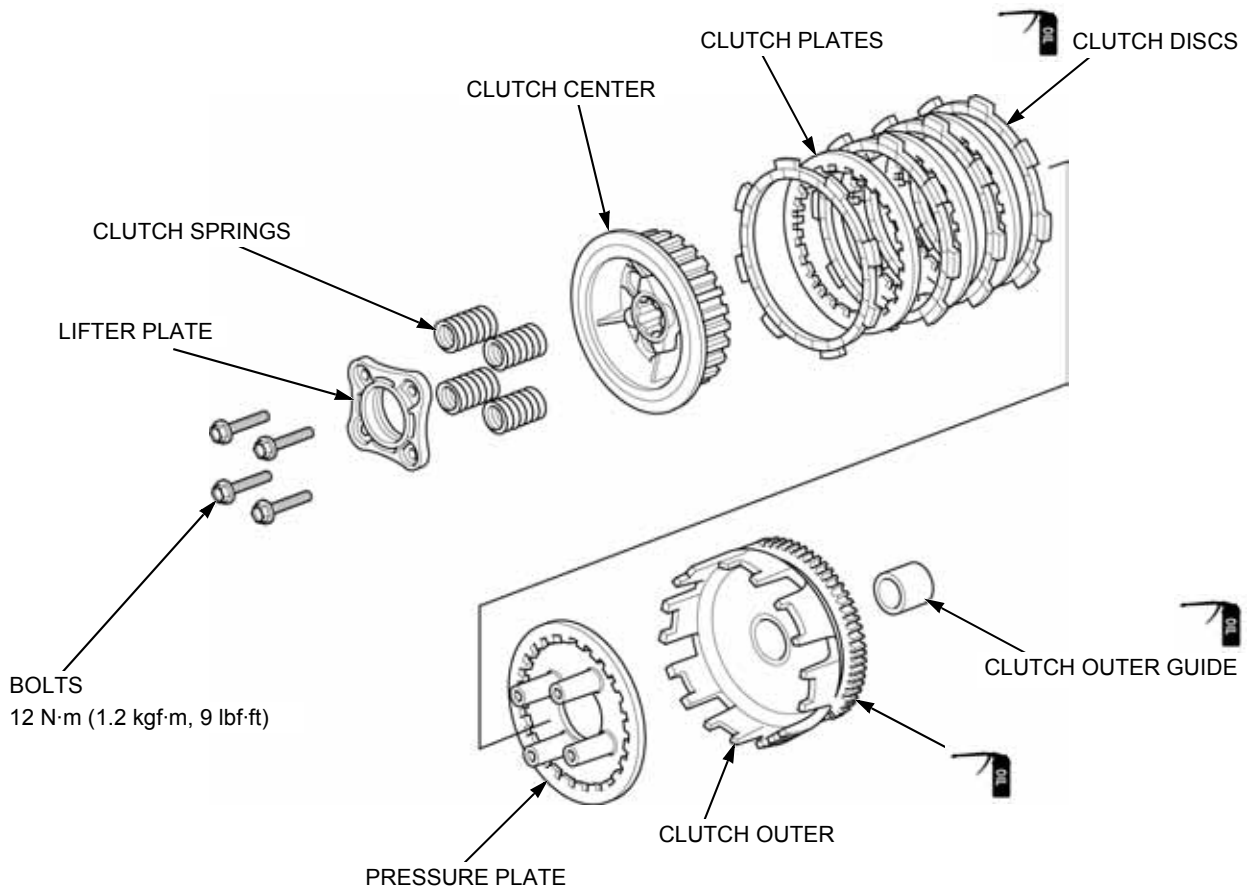


Remove the following:

- Four clutch springs
- Clutch center
- Four clutch discs
- Three clutch plates
- Pressure plate



**ASSEMBLY**

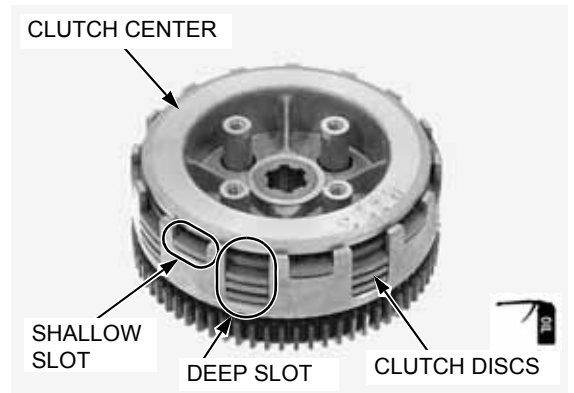


Coat the clutch discs with recommended engine oil.

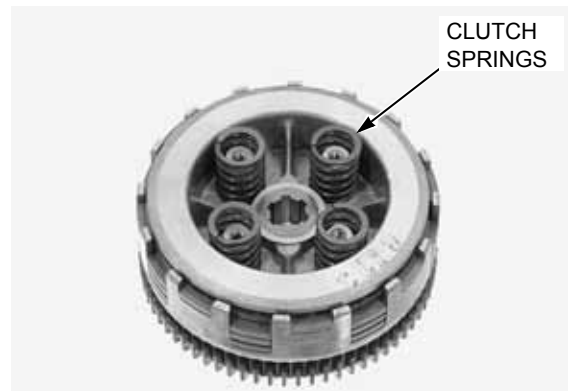
Install the four clutch discs and three plates alternately onto the clutch center.

Install the pressure plate onto the clutch center.

Install the clutch center assembly to the clutch outer while aligning three bottom clutch disc tabs with the deep slots and top clutch disc tabs with the shallow slots.



Install the four clutch springs to the pressure plate.





## CLUTCH/GEARSHIFT LINKAGE

Install the lifter plate and four lifter plate bolts.

*Tighten the clutch lifter plate bolts in a crisscross pattern in 2-3 steps.*

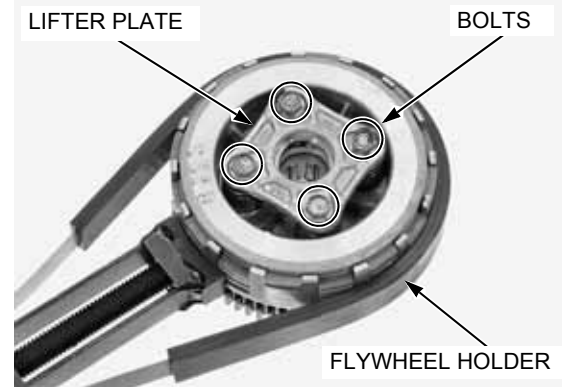
Hold the clutch outer using the flywheel holder, then tighten the clutch lifter bolts to the specified torque.

### TOOL:

Flywheel holder

07725-0040001

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



## INSPECTION

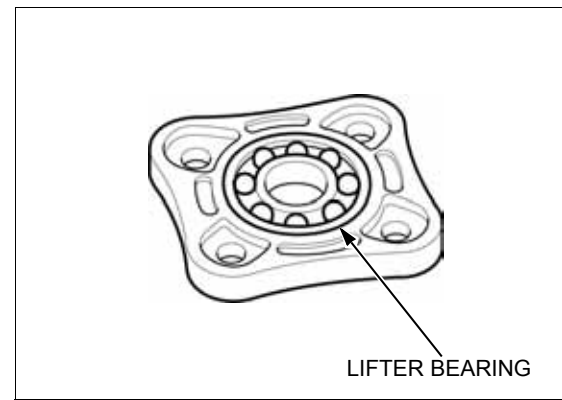
### CLUTCH LIFTER BEARING

Temporarily install the manual clutch lifter bearing on the lifter plate.

Turn the inner race of the lifter bearing with your finger. The bearing should turn smoothly and freely without excessive play.

Replace the bearing if necessary.

Check the clutch lifter plate for wear or damage. Replace the plate if necessary.



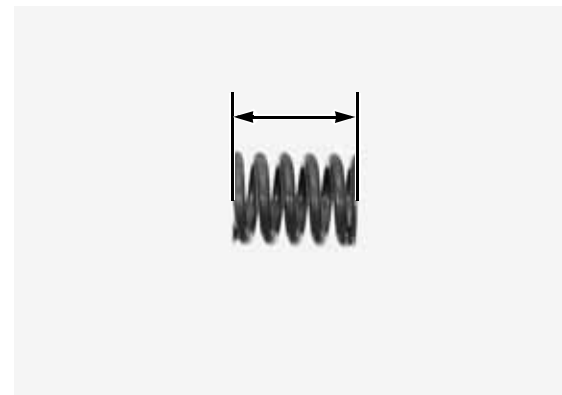
### CLUTCH SPRING

Check the clutch spring for fatigue or other damage.

Measure the clutch spring free length.

**SERVICE LIMIT: 25.2 mm (0.99 in)**

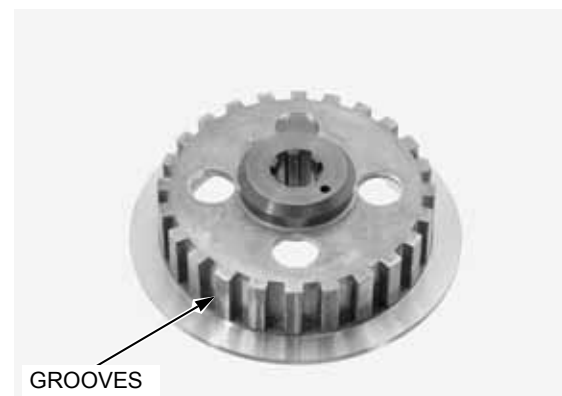
*Clutch springs should be replaced as a set if one or more of them is less than the service limit.*



### CLUTCH CENTER

Check the grooves of the clutch center for damage or wear caused by the clutch plates. Replace if necessary.

Replace if necessary.



### CLUTCH DISC

*Clutch discs should be replaced as a set if one or more is below service limit.*

Replace the clutch discs if they show signs of scoring or discoloration.

Measure the thickness of each clutch disc.

**SERVICE LIMIT: 2.6 mm (0.10 in)**

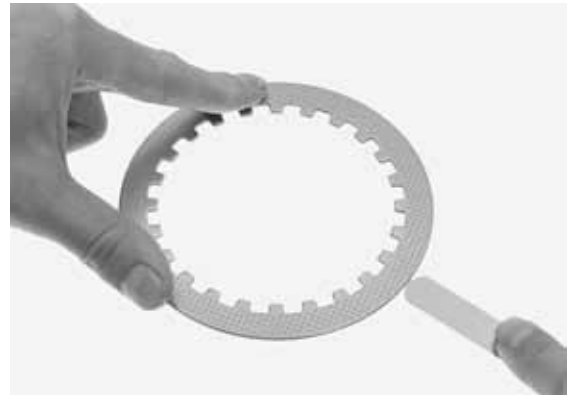


### CLUTCH PLATE

*Clutch plates should be replaced as a set if one or more is below service limit.*

Check each clutch plate for warpage on a surface plate using a feeler gauge.

**SERVICE LIMIT: 0.20 mm (0.008 in)**



### CLUTCH OUTER/CLUTCH OUTER GUIDE

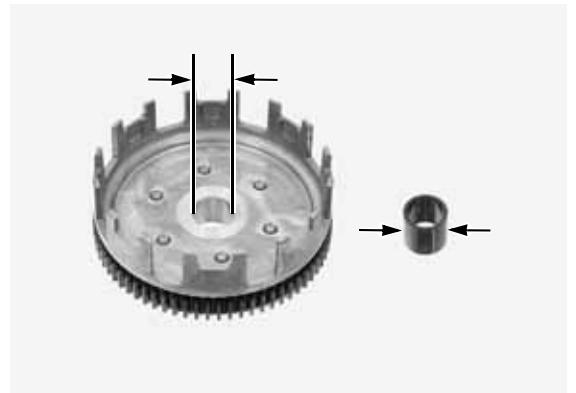
Check the slots of the clutch outer for damage or wear caused by the clutch discs.

Measure the clutch outer I.D.

**SERVICE LIMIT: 21.09 mm (0.830 in)**

Measure the clutch outer guide O.D.

**SERVICE LIMIT: 20.91 mm (0.832 in)**



## CLUTCH/GEARSHIFT LINKAGE

### GEARSHIFT LINKAGE

#### REMOVAL

Remove the clutch (page 9-9).

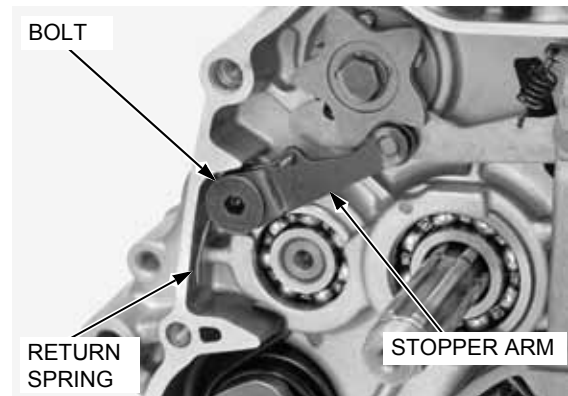
*When removing the gearshift pedal, mark the pedal position to ensure the original setting.*

Remove the bolt and gearshift pedal.



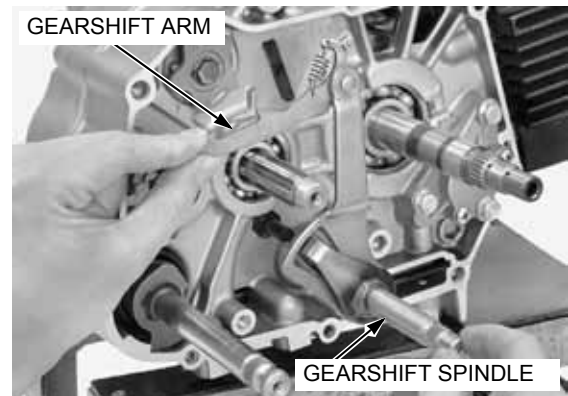
Remove the following:

- Shift drum stopper arm bolt
- Stopper arm
- Return spring



*To prevent the dust and dirt from entering the crankcase, clean the gearshift spindle thoroughly before removing it.*

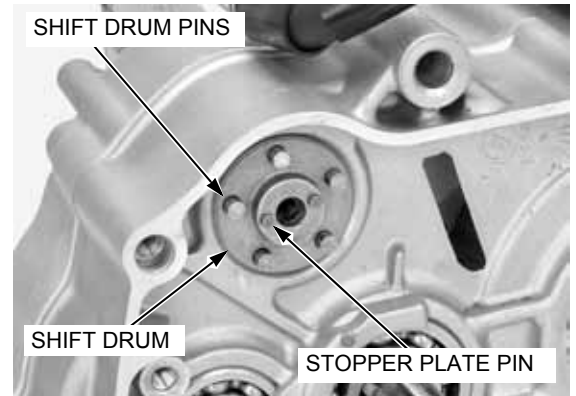
Remove the gearshift spindle by holding down the gearshift arm as shown.



Remove the bolt and gearshift cam plate.



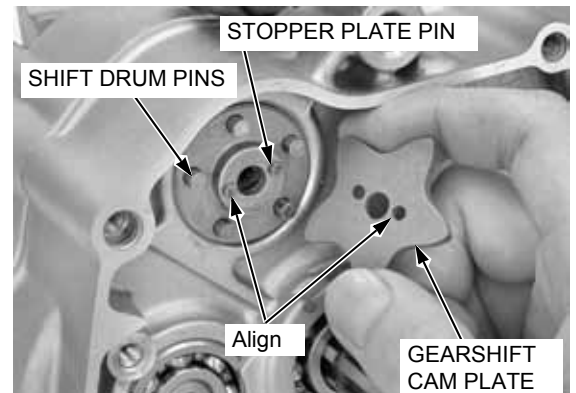
Remove the shift drum pins and stopper plate pins from the shift drum.



### INSTALLATION

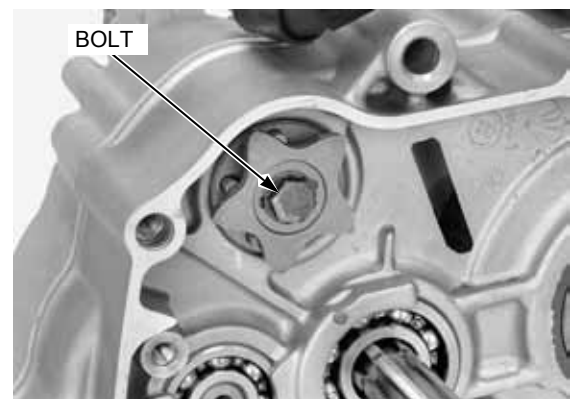
Install the five shift drum pins and two stopper plate pins to the holes on the shift drum.

Install the gearshift cam plate while aligning the holes on the plate with the stopper plate pins.

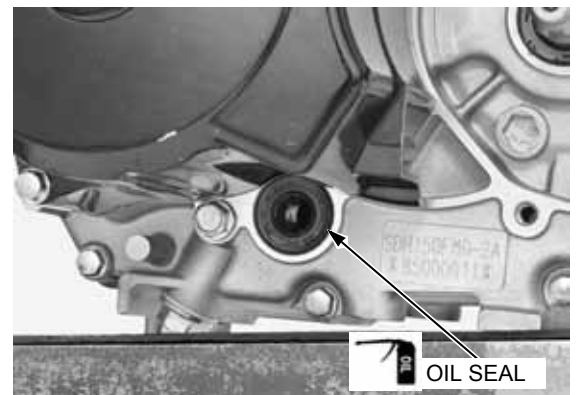


Install the gearshift cam plate bolt and tighten it to the specified torque.

**TORQUE: 17 N·m (1.7 kgf·m, 13 lbf·ft)**



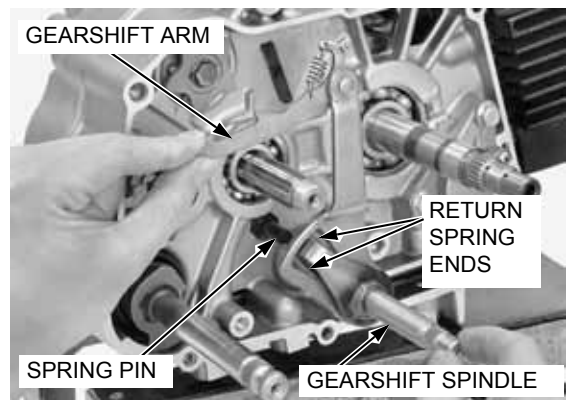
Apply engine oil to the gearshift spindle oil seal lips.



## CLUTCH/GEARSHIFT LINKAGE

Install the gearshift spindle so that the shift return spring pin is located between both ends of the return spring as shown.

Insert the gearshift spindle while holding down the gearshift arm as shown.

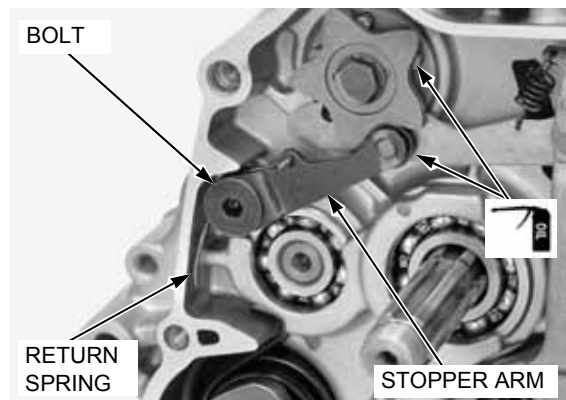


Apply engine oil to the stopper arm roller and meeting surface on gearshift cam plate.

Set the return spring end along the crankcase wall as shown.

Install the stopper arm and bolt, then tighten it to the specified torque.

**TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)**



Install the gearshift pedal to its original position as marked during removal.

Install and tighten the bolt.

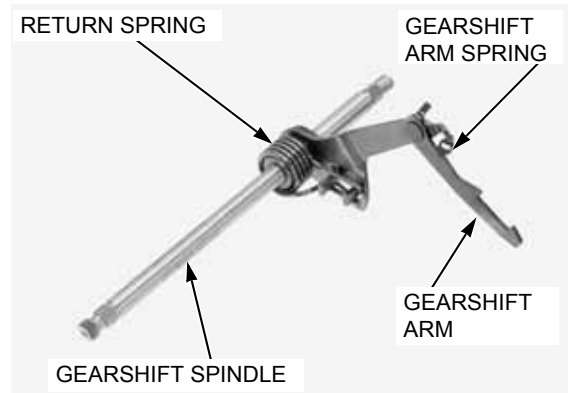
Install the clutch (page 9-12).



### INSPECTION

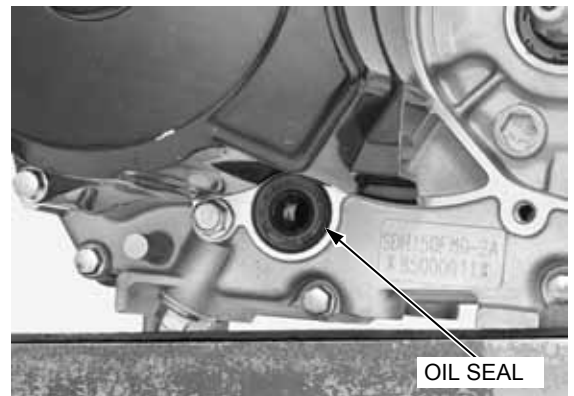
Check the gearshift spindle and gearshift arm for bend, wear or damage.

Check the gearshift arm spring and return spring for damage or fatigue.



Check that the gearshift spindle oil seal is in good condition, replace it if necessary.

If replacing the oil seal, install it until it is fully seated.



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**MEMO**

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# 10. ALTERNATOR/STARTER CLUTCH

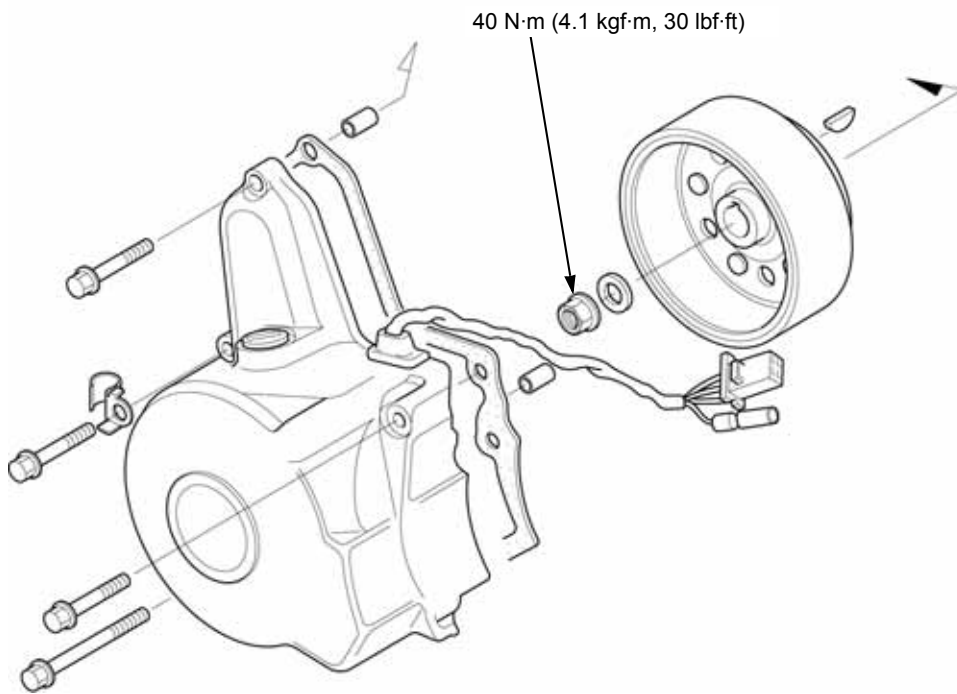
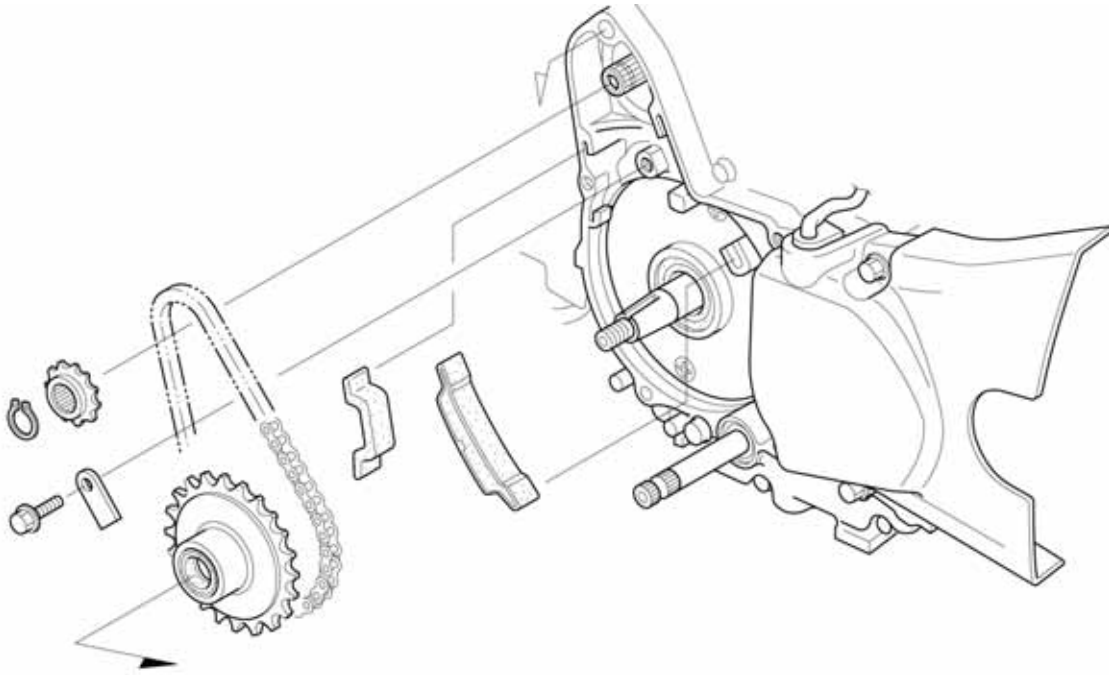
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COMPONENT LOCATION .....	10-2	STATOR .....	10-6
SERVICE INFORMATION .....	10-3	FLYWHEEL .....	10-7
TROUBLESHOOTING .....	10-3	STARTER CLUTCH .....	10-9
LEFT CRANKCASE COVER .....	10-4		



**ALTERNATOR/STARTER CLUTCH  
COMPONENT LOCATION**

---



## SERVICE INFORMATION

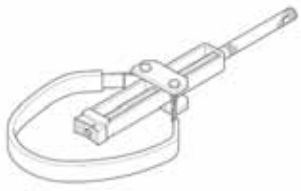

### GENERAL

- This section covers service of the alternator and starter clutch. All service can be done with the engine installed in the frame.
- Refer to page 14-8 for alternator stator inspection.
- Refer to page 15-7 for ignition pulse generator inspection.

### TORQUE VALUES

Ignition pulse generator mounting bolt	5 N·m (0.51 kgf·m, 3.7 lbf·ft)	
Ignition pulse generator wire holder bolt	5 N·m (0.51 kgf·m, 3.7 lbf·ft)	
Flywheel flange nut	40 N·m (4.1 kgf·m, 30 lbf·ft)	
Starter clutch outer mounting screw	10 N·m (1.0 kgf·m, 7 lbf·ft)	Replace with new ones.

### TOOLS

<p>Flywheel holder 07725-0040001</p> 	<p>Rotor puller 07933-KG20000</p> 
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## TROUBLESHOOTING

### Starter motor turns, but engine does not start

- Faulty starter clutch
- Faulty starter drive/driven gear or starter drive chain

## ALTERNATOR/STARTER CLUTCH

### LEFT CRANKCASE COVER

#### REMOVAL

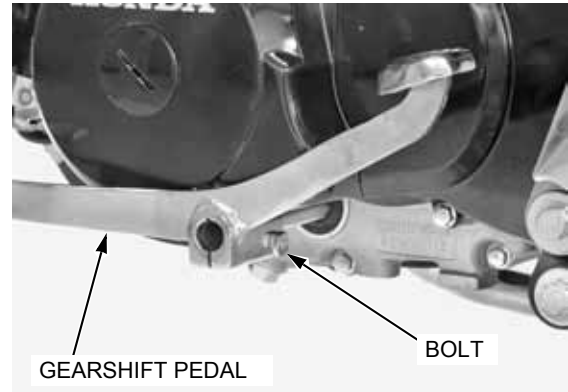
Drain the engine oil (page 3-10).

Remove the following:

- Body cover (page 2-8)
- Footpeg bar (page 2-18)

*When removing the gearshift pedal, mark the pedal position to ensure the original position.*

Remove the bolt and gearshift pedal.

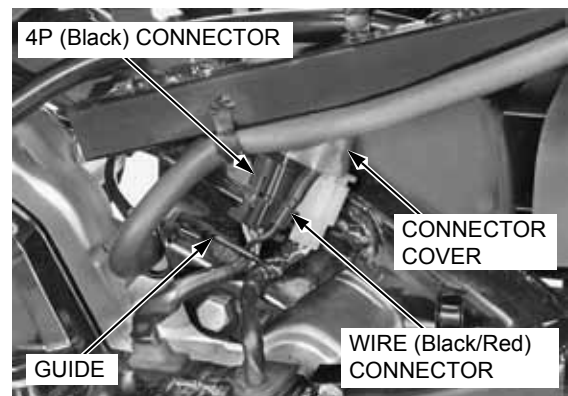


Release the wire harnesses from the guide.

Pull back the connector cover.

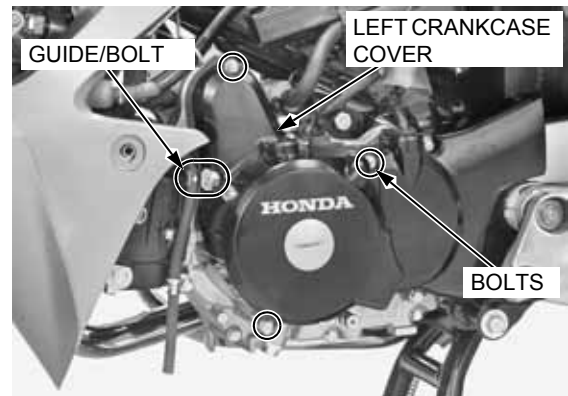
Disconnect the following:

- Alternator 4P (Black) connector
- Alternator wire (Black/Red) connector



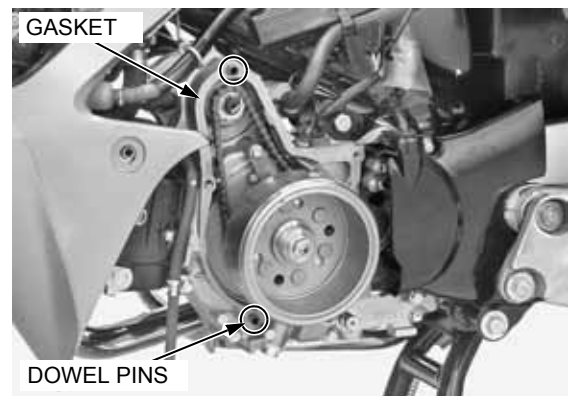
Release the carburetor drain hose from the guide.

Loosen the bolts in a crisscross pattern in several steps and remove them and guide.



*The left crankcase cover (stator) is magnetically attached to the flywheel, be careful during removal.*

Remove the left crankcase cover.



*Be careful not to damage the mating surface.*

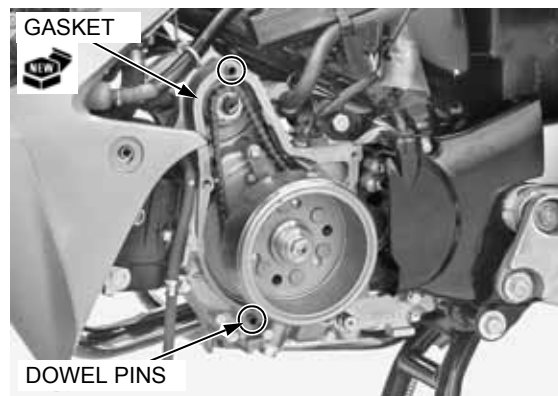
Remove the gasket and dowel pins.

**INSTALLATION**

*Be careful not to damage the mating surface.*

Clean any gasket material from the left crankcase cover mating surface.

Install the dowel pins and a new gasket.



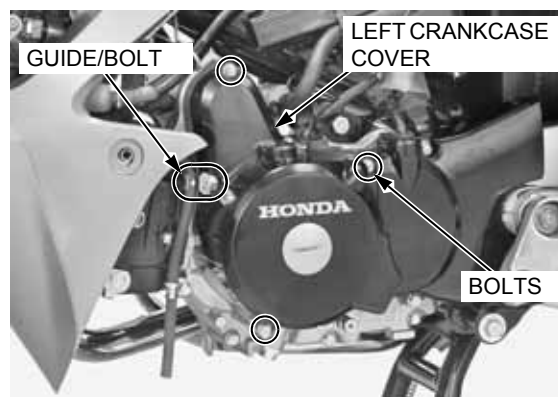
Install the left crankcase cover.

Install the guide and bolts, then tighten them in a crisscross pattern in 2 – 3 steps.

Install the carburetor drain hose to the guide.

**NOTE:**

- The left crankcase cover (stator) is magnetically attached to the flywheel, be careful during installation.



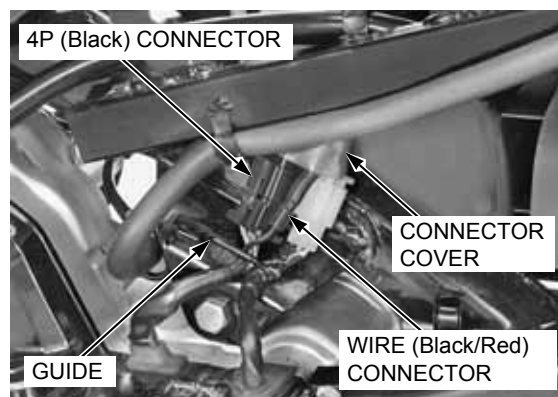
*Route the wire harness properly (page 1-14).*

Connect the following:

- Alternator 4P (Black) connector
- Alternator wire (Black/Red) connector

Set the connector cover in position.

Route the wire harnesses into the guide.



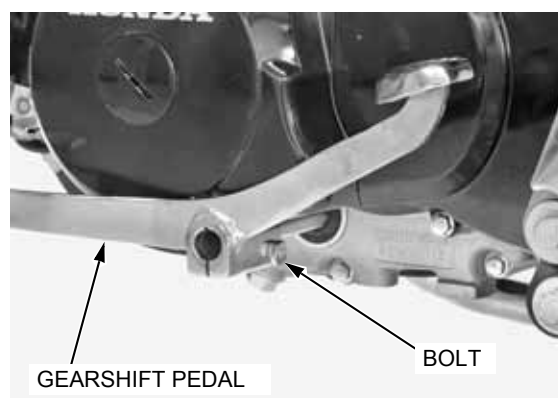
Install the gearshift pedal in its original position as marked during removal.

Install and tighten the bolt.

Install the following:

- Body cover (page 2-8)
- Footpeg bar (page 2-18)

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



## ALTERNATOR/STARTER CLUTCH

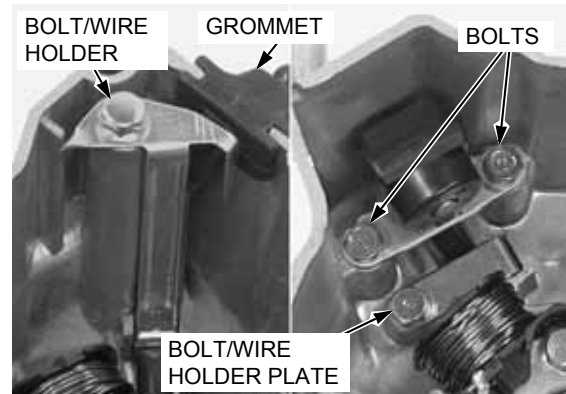
### STATOR

#### REMOVAL

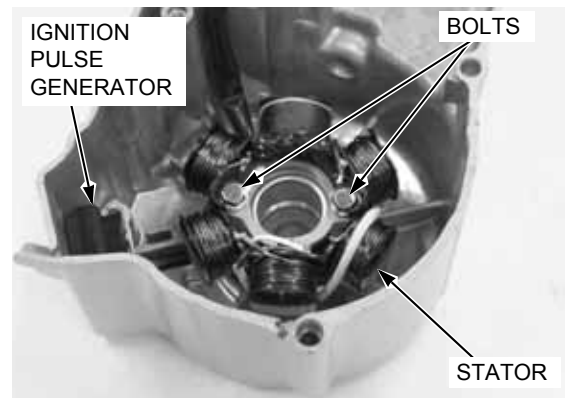
Remove the left crankcase cover (page 10-4).

Remove the bolt and wire holder, then release the wire grommet from the left crankcase cover.

Remove the two pulse generator mounting bolts, wire holder plate bolt and wire holder plate.



Remove the two stator mounting bolts, then remove the stator and ignition pulse generator from the left crankcase cover.

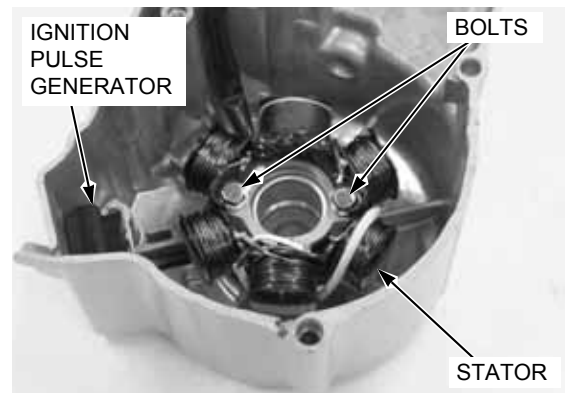


#### INSTALLATION

*Route the wire harness properly (page 1-14).*

Set the stator to the left crankcase cover, then install and tighten the two stator mounting bolts.

Set the ignition pulse generator in position.



Install and tighten two ignition pulse generator mounting bolts to the specified torque.

**TORQUE: 5 N·m (0.51 kgf·m, 3.7 lbf·ft)**

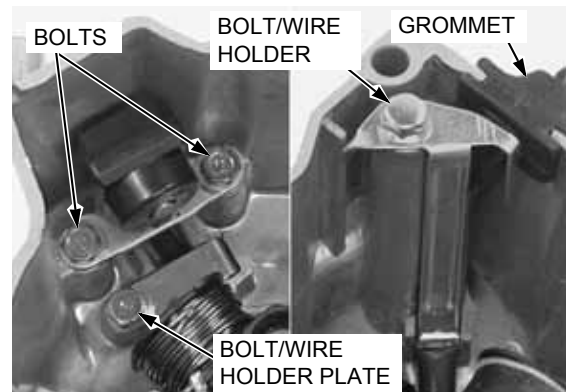
Set the wire holder plate in position, then install and tighten the wire holder plate bolt to the specified torque.

**TORQUE: 5 N·m (0.51 kgf·m, 3.7 lbf·ft)**

Set the wire grommet to the left crankcase cover.

Install the wire holder and bolt, then tighten it.

Install the left crankcase cover (page 10-5).



## FLYWHEEL

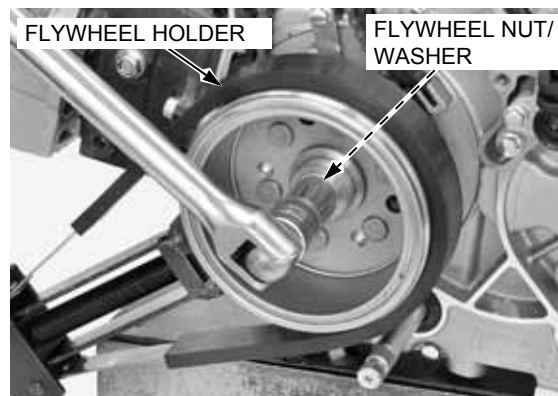
### REMOVAL

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

Remove the flywheel nut and washer using the special tool.

**TOOL:**

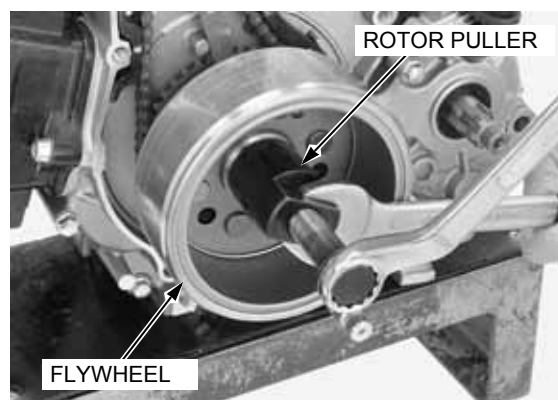
Flywheel holder **07725-0040001**



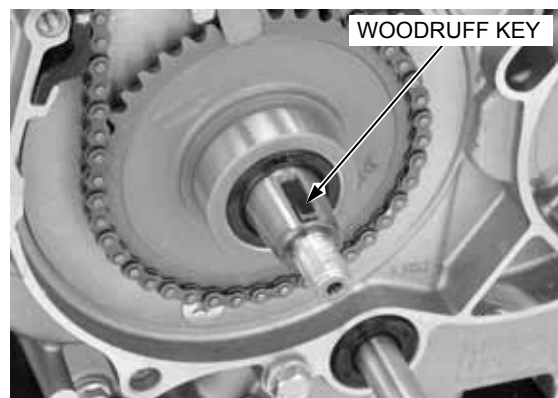
Remove the flywheel using the special tool.

**TOOL:**

Rotor puller **07933-KG20000**

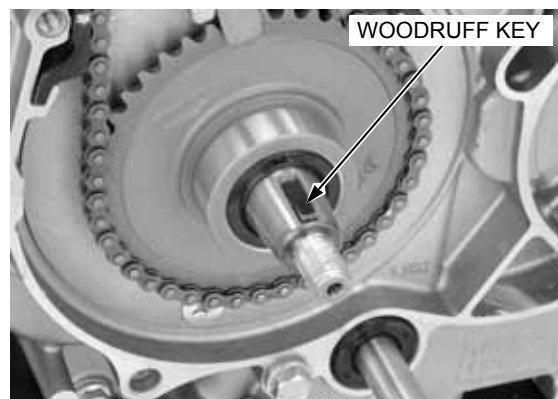


*When removing the woodruff key, be careful not to damage the key groove and crankshaft.* Remove the woodruff key from the crankshaft.



### INSTALLATION

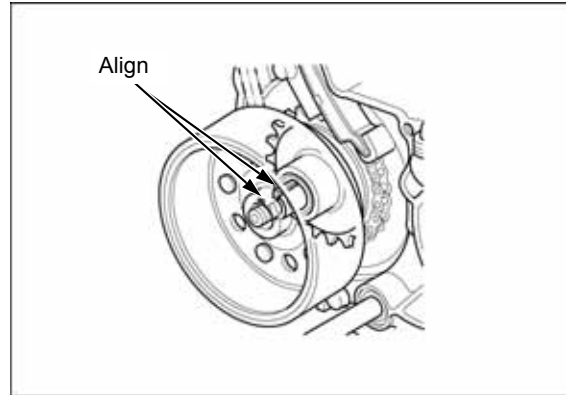
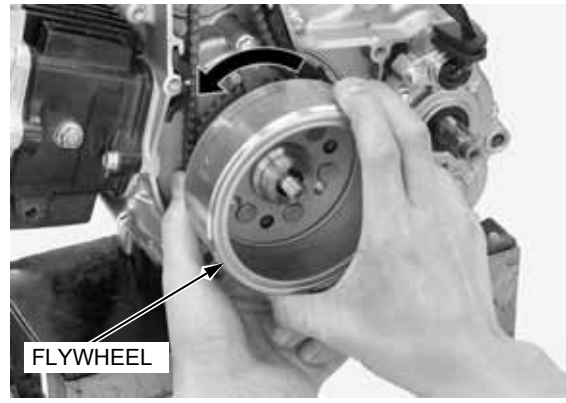
*During woodruff key installation, be careful not to damage the key groove or crankshaft.* Install the woodruff key to the crankshaft key groove.



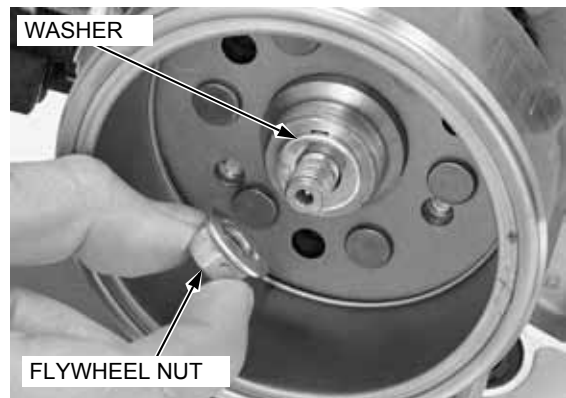
## ALTERNATOR/STARTER CLUTCH

*If the key is not positioned in the groove, remove the flywheel and install it correctly.*

Install the flywheel while turning it counterclockwise until it is fully seated, making sure that the woodruff key is positioned in the key groove on the flywheel.



Install the washer and flywheel nut.

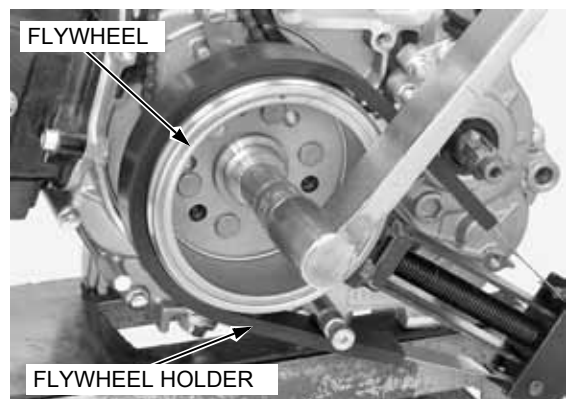


Hold the flywheel using the special tool and tighten the flywheel nut to the specified torque.

**TOOL:**  
Flywheel holder **07725-0040001**

**TORQUE: 40 N·m (4.1 kgf·m, 30 lbf·ft)**

Install the left crankcase cover (page 10-5).



## STARTER CLUTCH

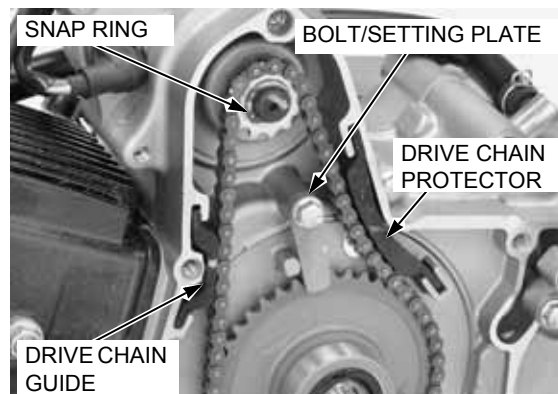
### REMOVAL

Remove the flywheel (page 10-7).

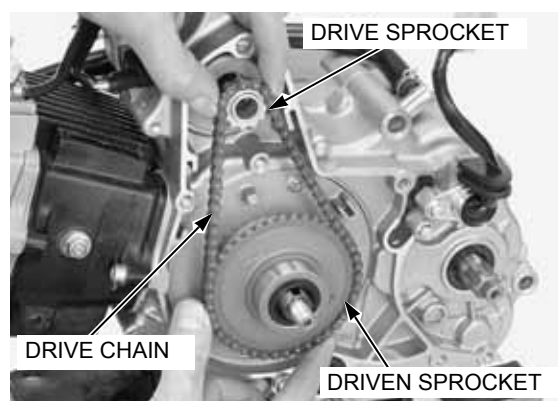
Remove the starter drive chain guide and drive chain protector.

Remove the bolt and driven sprocket setting plate.

Remove the snap ring from the starter motor shaft.



Remove the starter drive/driven sprocket and drive chain as an assembly.



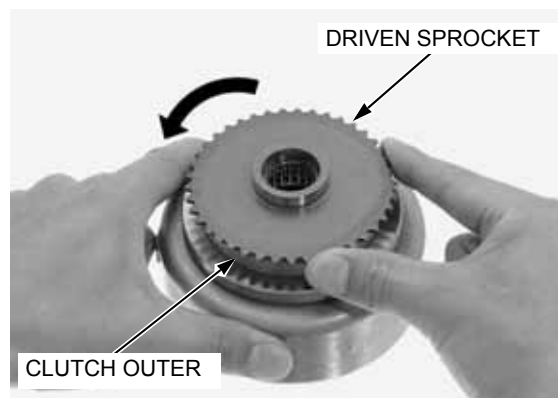
### DISASSEMBLY

Temporarily install the starter driven sprocket to the one-way/starter clutch outer.

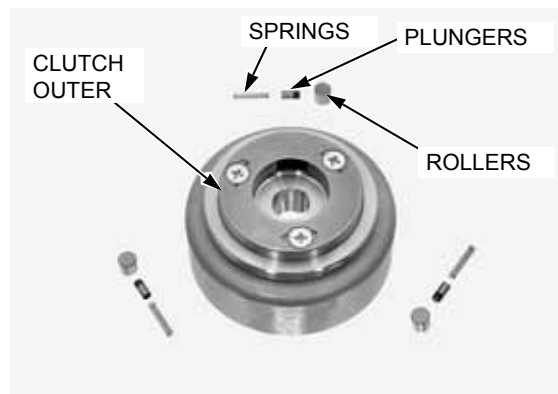
Check the operation of the one-way clutch by turning the starter driven sprocket.

The driven sprocket should turn counterclockwise smoothly, but should not turn clockwise.

Remove the starter driven sprocket from the one-way/starter clutch outer while turning the driven sprocket counterclockwise.



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

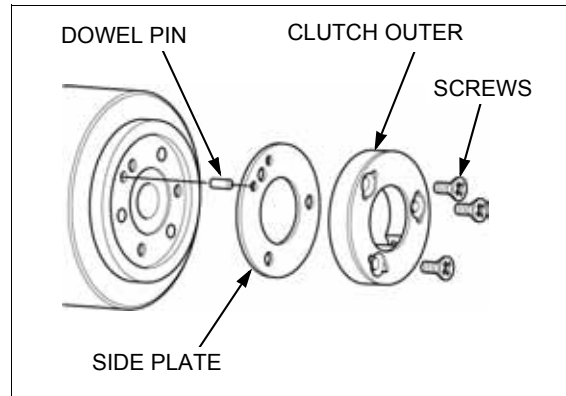




## ALTERNATOR/STARTER CLUTCH

Remove the three screws.

Remove the one-way/starter clutch outer, side plate and dowel pin.

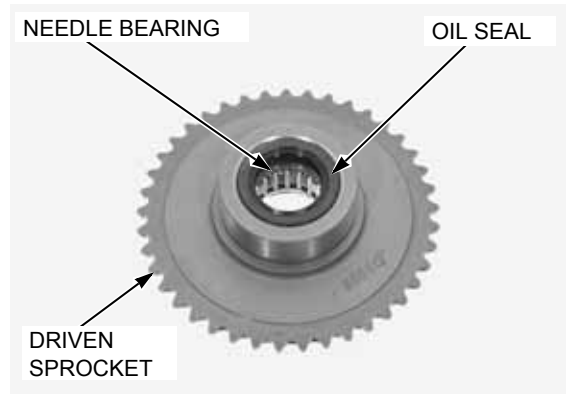


### INSPECTION

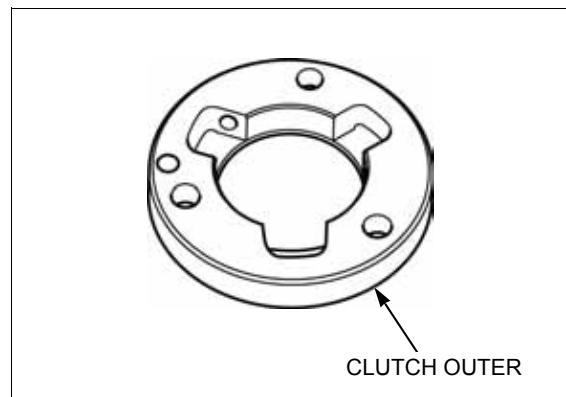
Check the starter driven sprocket for wear or damage.

Inspect the starter driven sprocket boss for excessive wear or damage.

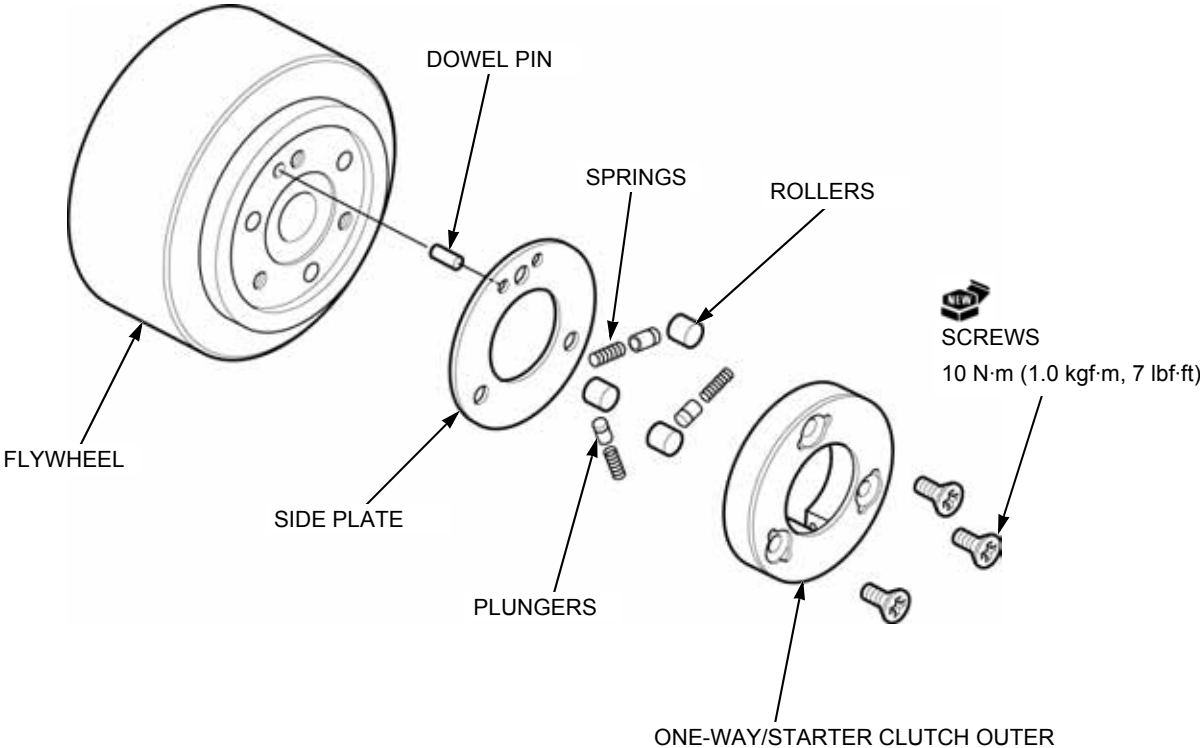
Check the oil seal and needle bearing for wear or damage.



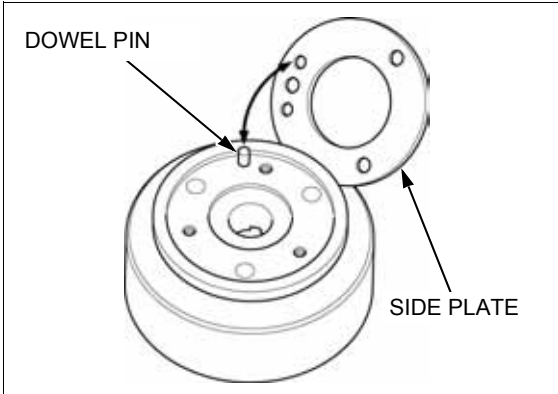
Inspect the one-way/starter clutch outer for wear or damage.



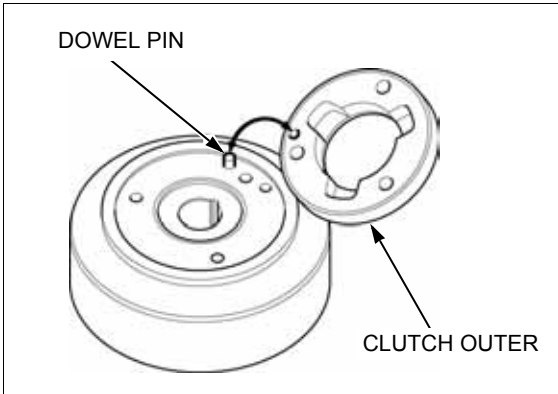
ASSEMBLY



Install the dowel pin to the flywheel.  
Install the side plate aligning its hole with the dowel pin.



Install the one-way/starter clutch outer to the flywheel aligning its hole with the dowel pin.

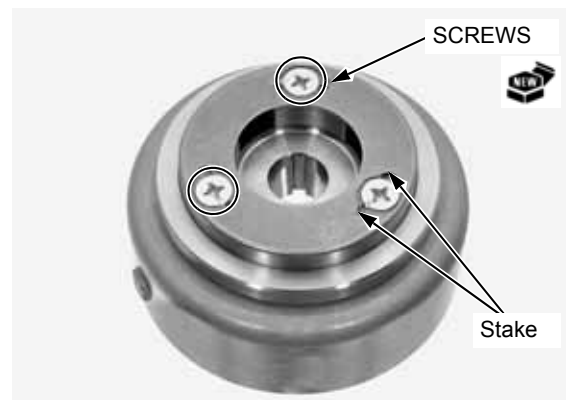


## ALTERNATOR/STARTER CLUTCH

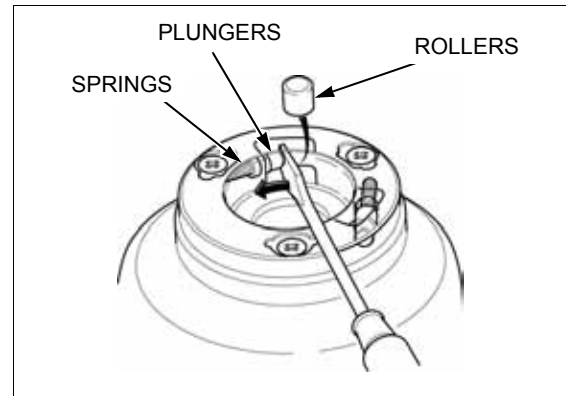
Install and tighten the three new screws to the specified torque.

**TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)**

Stake the screws as shown.



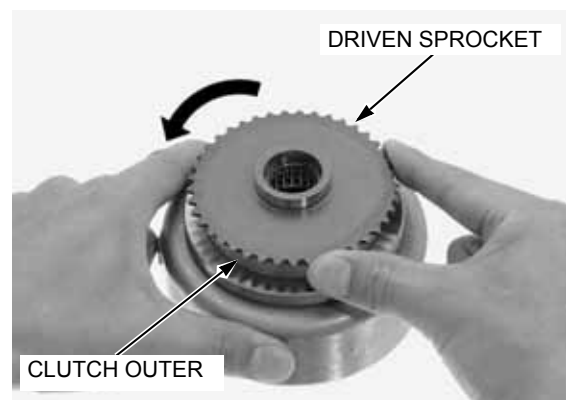
Set the three one-way clutch roller springs, plungers and rollers as shown.



Temporarily install the starter driven sprocket to the one-way/starter clutch outer while turning it counterclockwise.

Make sure that the starter driven sprocket turns counterclockwise smoothly and does not turn clockwise.

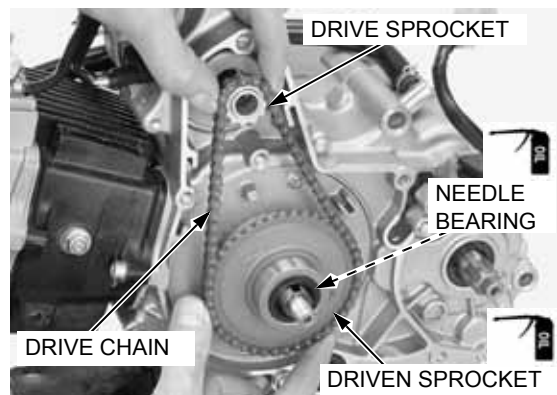
Remove the starter driven sprocket from the one-way/starter clutch outer while turning the driven sprocket counterclockwise.



### INSTALLATION

Apply engine oil to the starter driven sprocket surface and needle bearing.

Install the starter drive/driven sprocket and drive chain as an assembly.



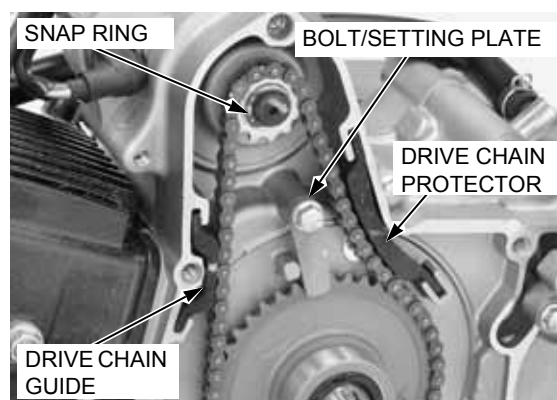
*Make sure that the snap ring is seated in the groove.*

Install the snap ring to the starter motor shaft.

Install the driven sprocket setting plate and bolt.

Install the starter drive chain guide and drive chain protector.

Install the flywheel (page 10-7).



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**MEMO**

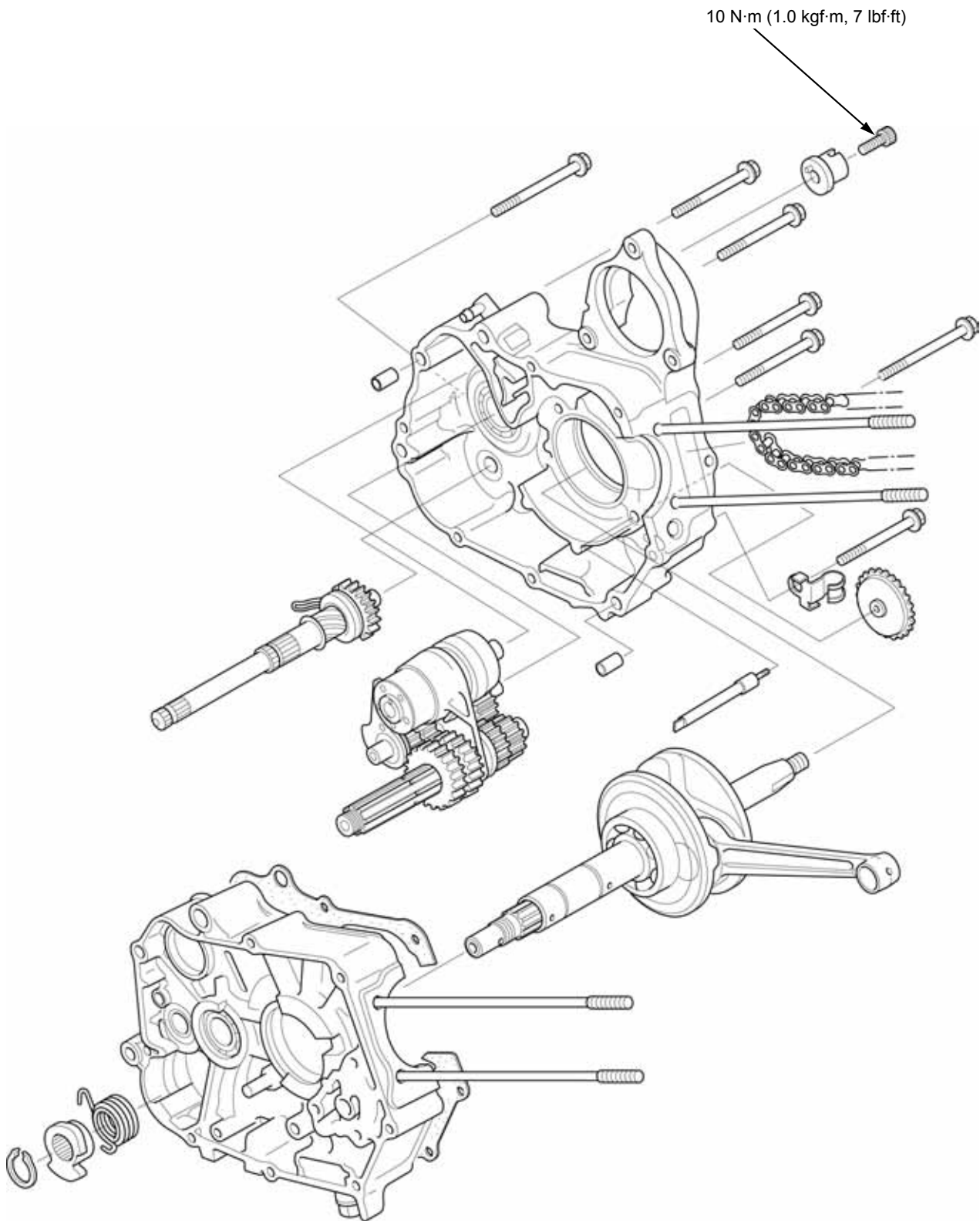
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# 11. CRANKSHAFT/TRANSMISSION/KICKSTARTER

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COMPONENT LOCATION .....	11-2	TRANSMISSION .....	11-9
SERVICE INFORMATION .....	11-3	KICKSTARTER .....	11-15
TROUBLESHOOTING.....	11-5	BEARING REPLACEMENT .....	11-18
CRANKCASE SEPARATION.....	11-6	CRANKCASE ASSEMBLY .....	11-20
CRANKSHAFT .....	11-7	CAM CHAIN GUIDE SPROCKET .....	11-22

COMPONENT LOCATION



# SERVICE INFORMATION

## GENERAL

- The crankcase must be separated to service the crankshaft, transmission and kickstarter.
- The following parts must be removed before separating the crankcase.
  - Engine (page 6-4)
  - Alternator/flywheel (page 10-7)
  - Starter clutch (page 10-9)
  - Starter motor (page 16-6)
  - Clutch/gearshift linkage (page 9-26)
  - Cylinder head (page 7-10)
  - Cylinder/piston (page 8-4)
  - Oil pump (page 4-4)
  - Gear position switch (page 17-18)
  - Cam chain tensioner (page 7-22)
- Be careful not to damage the crankcase mating surfaces when servicing.

## SPECIFICATIONS

				Unit: mm (in)	
ITEM			STANDARD	SERVICE LIMIT	
Crankshaft	Connecting rod side clearance		0.10 – 0.35 (0.004 – 0.014)	0.60 (0.024)	
	Connecting rod radial clearance		0 – 0.008 (0 – 0.0003)	0.05 (0.002)	
	Runout		–	0.10 (0.004)	
Transmission	Gear I.D.	M2, M4	17.016 – 17.043 (0.6699 – 0.6710)	17.10 (0.673)	
		C1	23.020 – 23.041 (0.9063 – 0.9071)	23.10 (0.909)	
		C3	20.020 – 20.041 (0.7882 – 0.7890)	20.10 (0.791)	
	Bushing O.D.	C1	22.979 – 23.000 (0.9047 – 0.9055)	22.93 (0.903)	
	Bushing I.D.	C1	20.000 – 20.021 (0.7874 – 0.7882)	20.08 (0.791)	
	Gear-to-bushing clearance	C1	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)	
	Mainshaft O.D.	M2, M4	16.966 – 16.984 (0.6680 – 0.6687)	16.95 (0.667)	
	Countershaft O.D.	C1, C3	19.959 – 19.980 (0.7858 – 0.7866)	19.94 (0.785)	
	Gear-to-shaft clearance	M2, M4	0.032 – 0.077 (0.0013 – 0.0030)	0.10 (0.004)	
		C3	0.040 – 0.082 (0.0016 – 0.0032)	0.10 (0.004)	
Bushing-to-shaft clearance at C1 gear			0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)	
Shift fork/ Shift drum	Shift fork I.D.		34.075 – 34.100 (1.3415 – 1.3425)	34.14 (1.344)	
	Claw thickness		4.86 – 4.94 (0.191 – 0.194)	4.60 (0.181)	
	Shift drum O.D.		33.950 – 33.975 (1.3366 – 1.3376)	33.93 (1.336)	
Kickstarter	Pinion I.D.		20.000 – 20.021 (0.7874 – 0.7882)	20.08 (0.791)	
	Spindle O.D.		19.959 – 19.980 (0.7858 – 0.7866)	19.94 (0.785)	











## TORQUE VALUE

Shift drum socket bolt                                  10 N·m (1.0 kgf·m, 7 lbf·ft)



# CRANKSHAFT/TRANSMISSION/KICKSTARTER

## TOOLS

<p>Remover weight 07741-0010201</p> 	<p>Attachment, 32 × 35 mm 07746-0010100</p> 	<p>Attachment, 37 × 40 mm 07746-0010200</p> 
<p>Pilot, 12 mm 07746-0040200</p> 	<p>Pilot, 17 mm 07746-0040400</p> 	<p>Driver 07749-0010000</p> 
<p>Bearing remover set, 12 mm 07936-1660101</p> 	<p>Bearing remover head, 12 mm 07936-1660110</p> 	<p>Bearing remover shaft, 12 mm 07936-1660120</p> 
<p>Attachment, 28 × 30 mm 07946-1870100</p> 		

## TROUBLESHOOTING

### Hard to shift

- Incorrect clutch adjustment
- Bent shift forks
- Bent shift fork claw
- Damaged shift drum cam groove
- Incorrect engine oil viscosity

### Transmission jumps out of gear

- Worn gear dogs and slots
- Broken shift drum stopper arm
- Bent shift fork
- Worn shifter gear groove

### Excessive noise

- Worn connecting rod big end bearing
- Worn crankshaft bearing
- Worn transmission bearing
- Worn or damaged transmission gears

## CRANKSHAFT/TRANSMISSION/KICKSTARTER

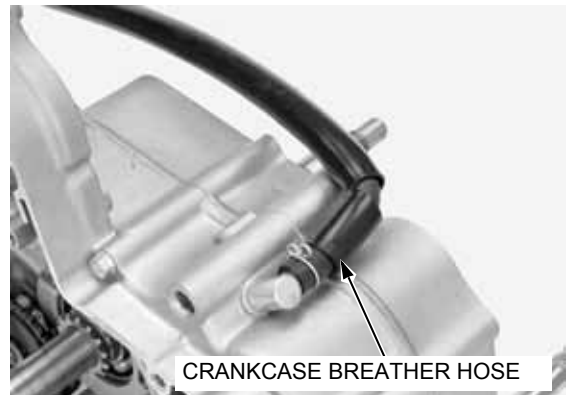
### CRANKCASE SEPARATION

Refer to Service Information (page 11-3) for removal of necessary parts before separating the crankcase.

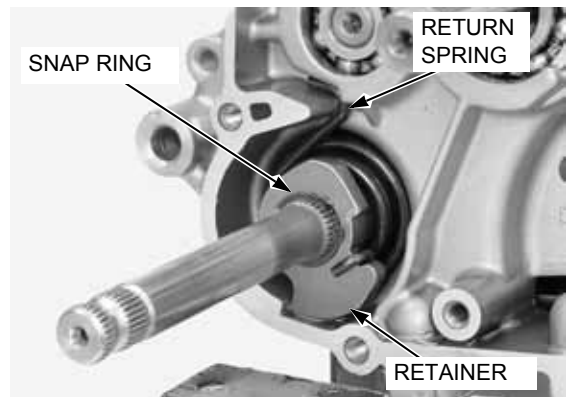
Remove the cam chain.



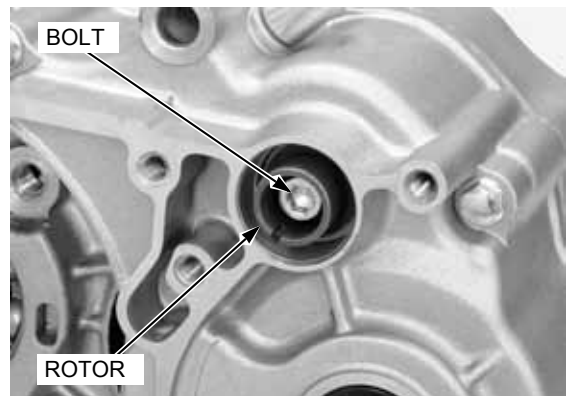
Disconnect the crankcase breather hose.



Remove the snap ring from the kickstarter spindle. Unhook the kickstarter return spring, then remove the retainer and return spring.

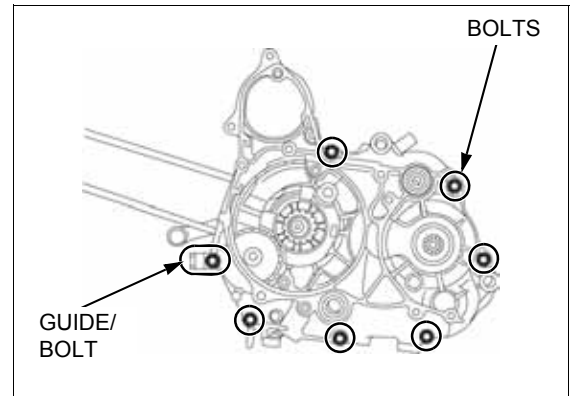


Remove the bolt and gear position switch rotor.



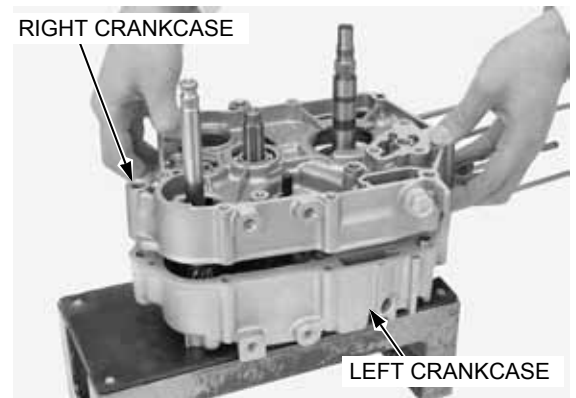
## CRANKSHAFT/TRANSMISSION/KICKSTARTER

Loosen the crankcase bolts in a crisscross pattern in 2 – 3 steps.  
Remove the crankcase bolts and guide.

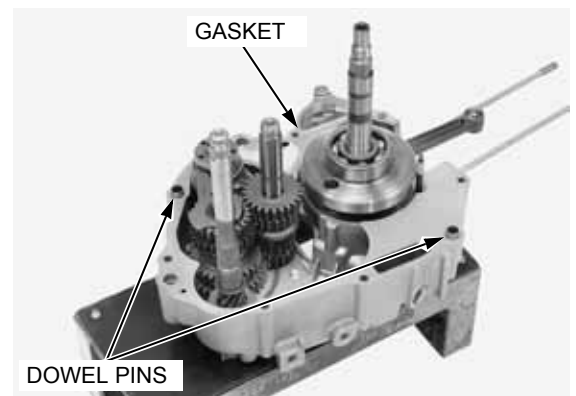


Place the left crankcase down.

*Be careful not to damage the mating surface. Do not pry the crankcase halves.* Carefully separate the right crankcase from the left crankcase.



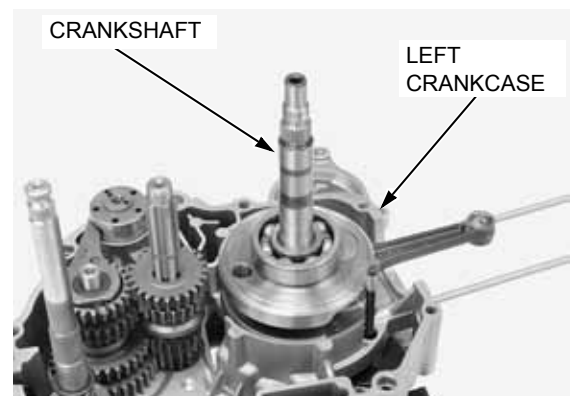
Remove the gasket and dowel pins.



## CRANKSHAFT

### REMOVAL

Separate the crankcase halves (page 11-6).  
Remove the crankshaft from the left crankcase.

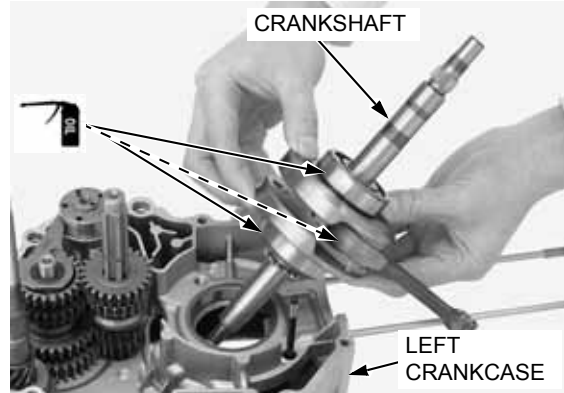


## CRANKSHAFT/TRANSMISSION/KICKSTARTER

### INSTALLATION

Apply 1 – 2 cm<sup>3</sup> of engine oil to the connecting rod big end inner surface and crankshaft bearings.  
Install the crankshaft to the left crankcase.

Assemble the crankcase (page 11-20).



### INSPECTION

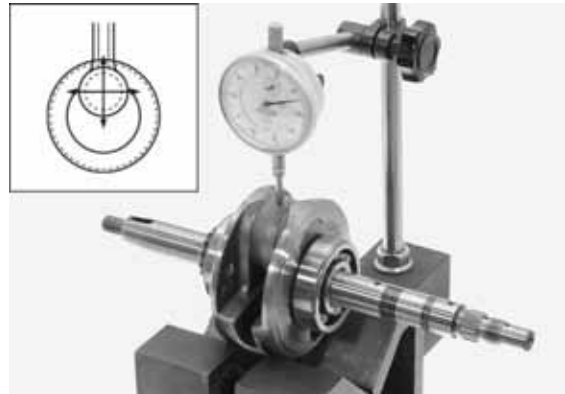
Measure the connecting rod big end side clearance with a feeler gauge.

**SERVICE LIMIT: 0.60 mm (0.024 in)**



Measure the connecting rod big end radial clearance at symmetrical points as shown.

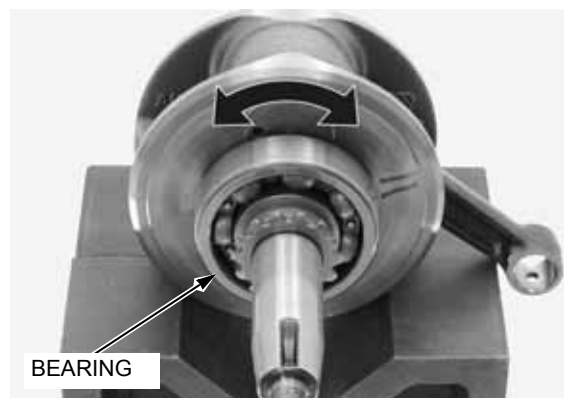
**SERVICE LIMIT: 0.05 mm (0.002 in)**



Turn the outer race of the left crankshaft bearing with your finger.

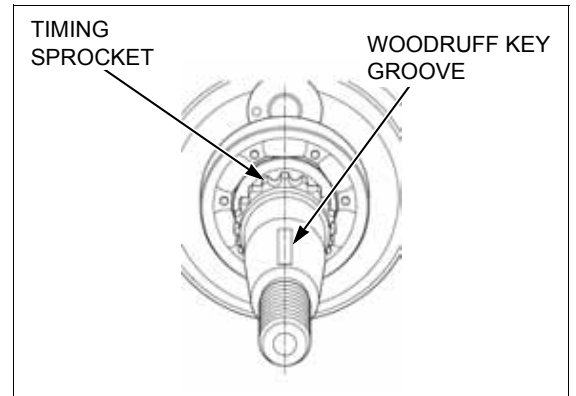
The bearing should turn smoothly and quietly.

Also check that the bearing inner race fits tightly on the crankshaft.



Check the timing sprocket for wear or damage.

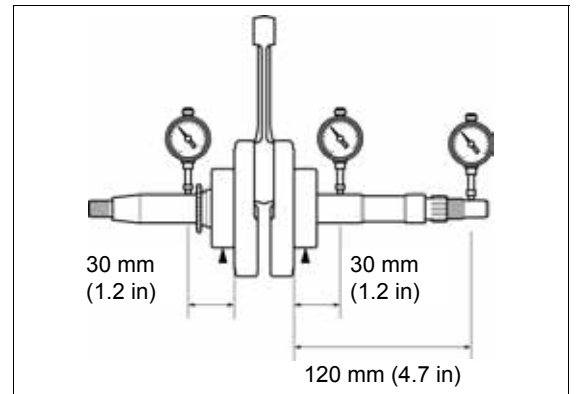
If replacing the timing sprocket, align the center of the sprocket teeth with the center of the woodruff key groove as shown.



Place the crankshaft on a stand or V-blocks and measure the runout using a dial gauge.

The measuring locations are shown in the illustration.

**SERVICE LIMIT: 0.10 mm (0.004 in)**



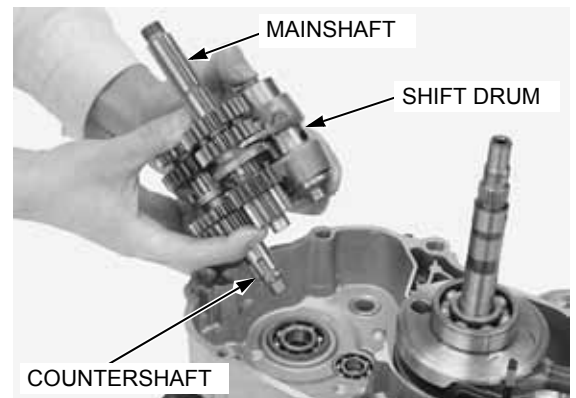
## TRANSMISSION

### REMOVAL

Separate the crankcase halves (page 11-6).

Remove the kickstarter spindle (page 11-15).

Remove the mainshaft, countershaft and shift drum as an assembly.

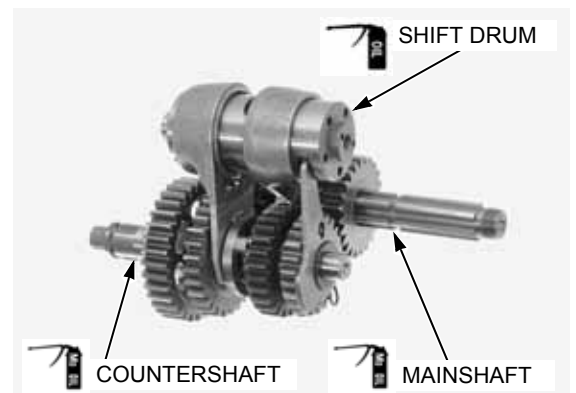


### INSTALLATION

Apply molybdenum oil solution to the transmission gear sliding surface, mainshaft/countershaft rotating and sliding area.

Apply engine oil to the shift drum outer and sliding surface.

Engage the mainshaft, countershaft, shift drum as assembly.



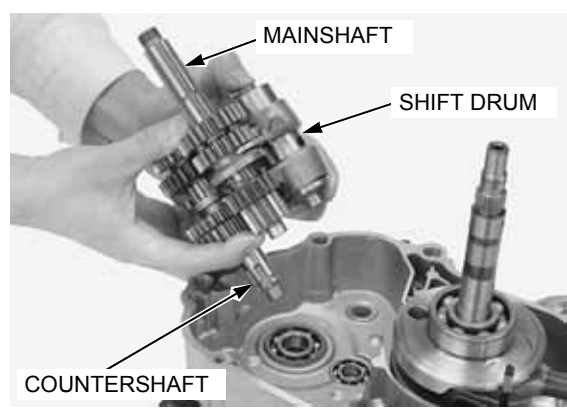
## CRANKSHAFT/TRANSMISSION/KICKSTARTER

Install the mainshaft, countershaft and shift drum as an assembly into the left crankcase.

Rotate the shift drum to check the transmission operation.

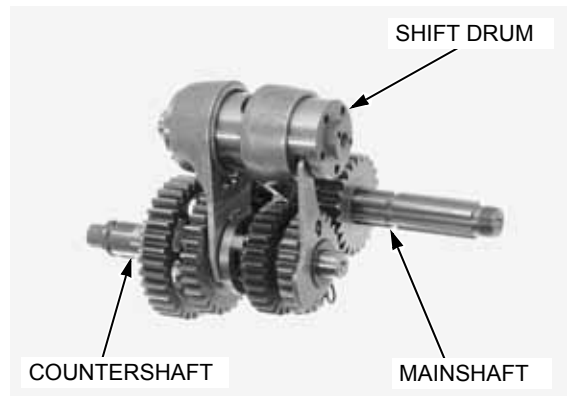
Install the kickstarter spindle (page 11-15).

Assemble the crankcase halves (page 11-20).



### DISASSEMBLY

Disassemble the mainshaft, countershaft and shift drum.



### ASSEMBLY

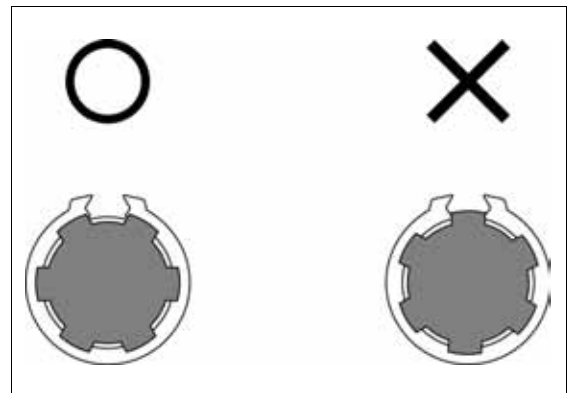
Clean all parts in solvent.

Apply molybdenum disulfide oil to the gear and bushing sliding surface and shift fork grooves to ensure initial lubrication.

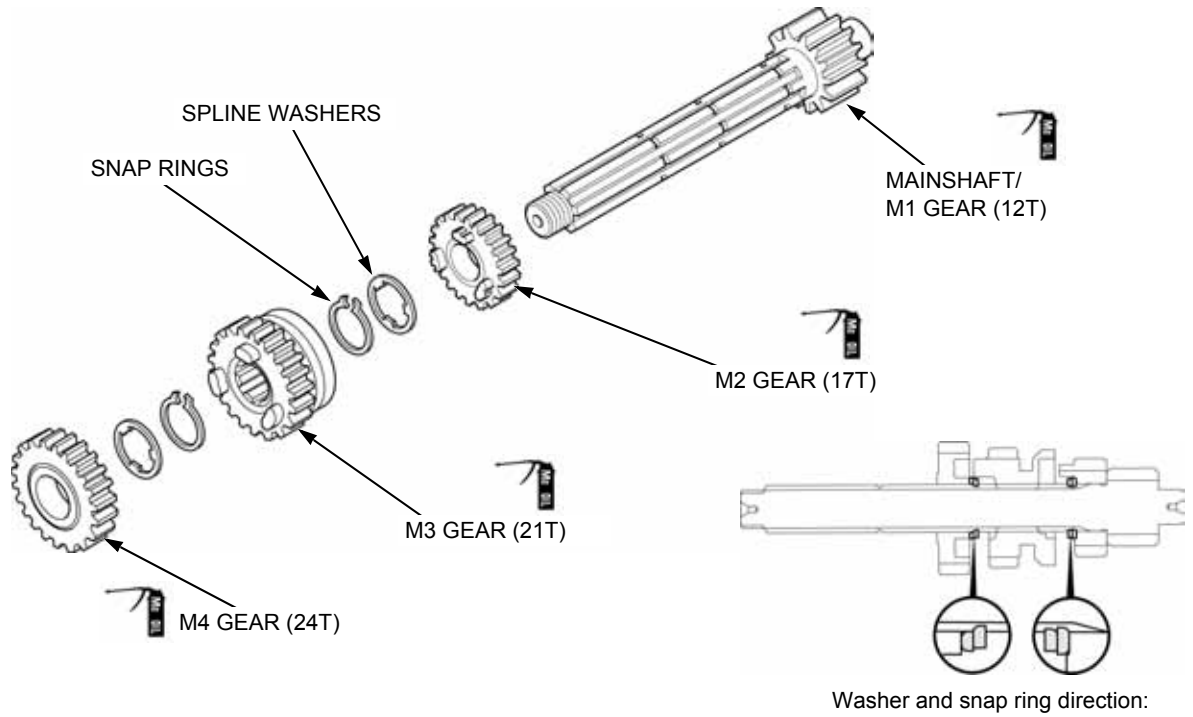
Assemble all parts into their original positions.

#### NOTE:

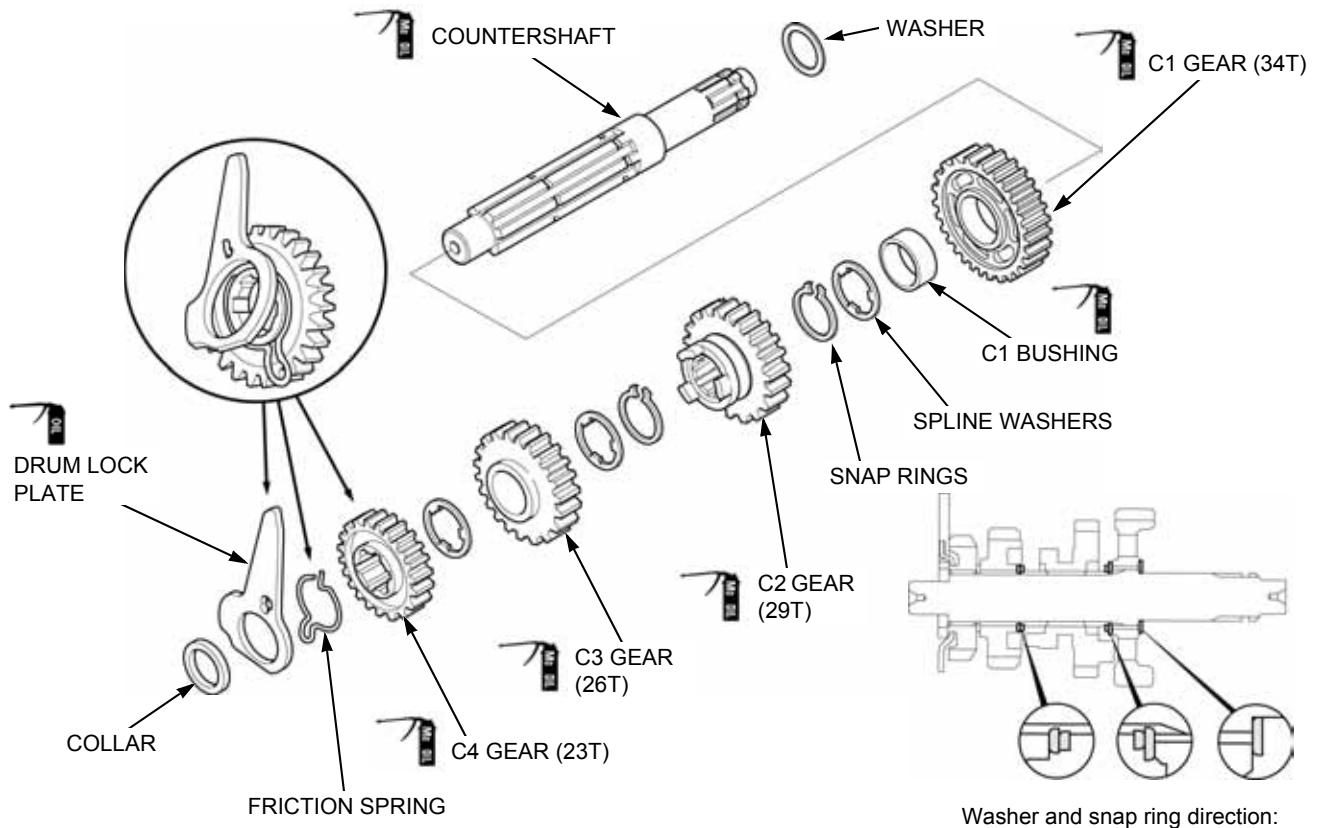
- Check the gears for smooth movement and rotation on the shaft.
- Install the washers and snap rings with the chamfered edges facing the thrust load side.
- Do not reuse a worn snap ring which could easily spin in the groove.
- Check that the snap rings are seated in the grooves and align their end gaps with the grooves of the spline.



MAINSHAFT:



COUNTERSHAFT:



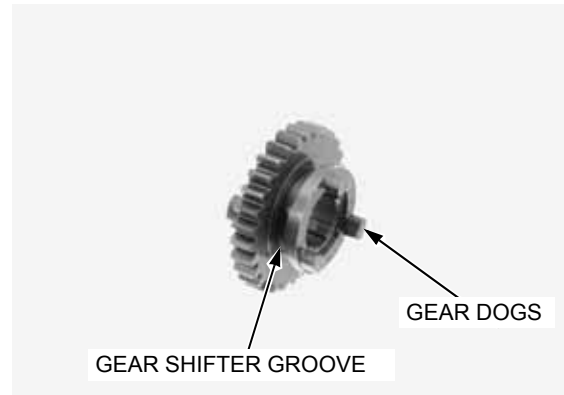


## CRANKSHAFT/TRANSMISSION/KICKSTARTER

### INSPECTION

Check the gear shifter groove for abnormal wear or damage.

Check the gear dogs and teeth for abnormal wear or lack of lubrication.



Check the dog holes for abnormal wear or lack of lubrication.

Measure the I.D. of each gear.

#### SERVICE LIMIT:

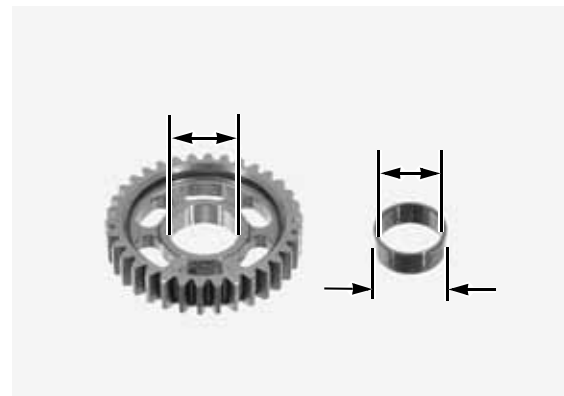
**M2, M4:** 17.10 mm (0.673 in)

**C1:** 23.10 mm (0.909 in)

**C3:** 20.10 mm (0.791 in)

Check the C1 gear bushing for wear or damage.

Measure the O.D. and I.D. of C1 gear bushing.



#### SERVICE LIMITS:

**O.D.:** 22.93 mm (0.903 in)

**I.D.:** 20.08 mm (0.791 in)

Calculate the gear to bushing clearance.

#### SERVICE LIMIT:

**C1:** 0.10 mm (0.004 in)

Measure the O.D. of the mainshaft and countershaft.

#### SERVICE LIMITS:

**At M2, M4 gear:** 16.95 mm (0.667 in)

**At C1, C3 gear:** 19.94 mm (0.785 in)

Calculate the gear to shaft clearance.

#### SERVICE LIMITS:

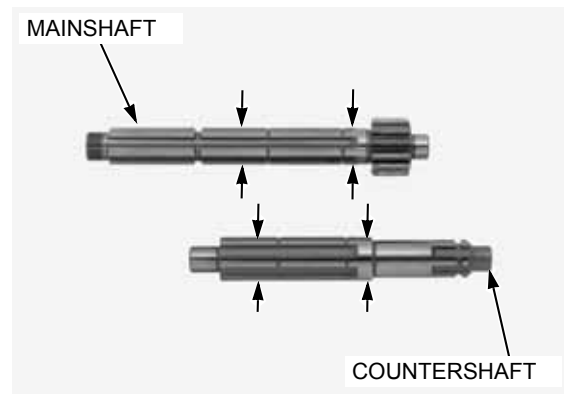
**M2, M4:** 0.10 mm (0.004 in)

**C3:** 0.10 mm (0.004 in)

Calculate the bushing to shaft clearance.

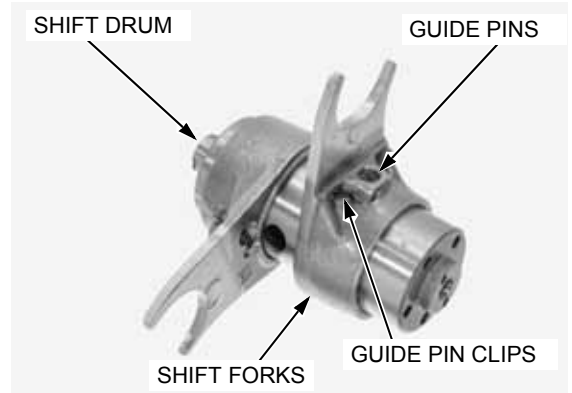
#### SERVICE LIMIT:

**C1:** 0.10 mm (0.004 in)

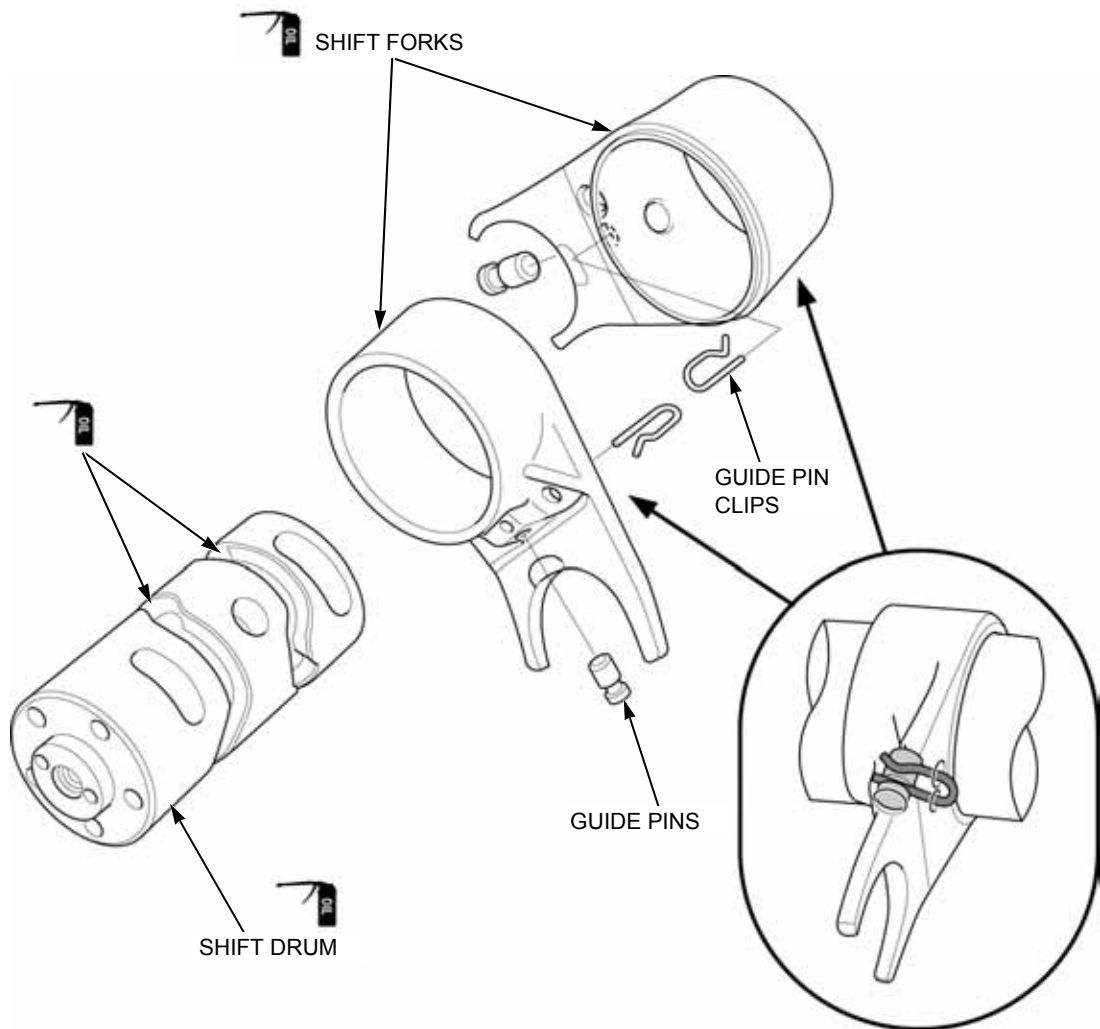


**SHIFT DRUM DISASSEMBLY**

Remove the guide pin clips.  
Remove the guide pins and shift forks from the shift drum.



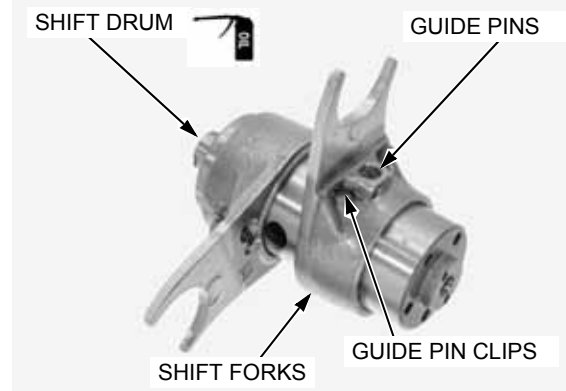
**SHIFT DRUM ASSEMBLY**



## CRANKSHAFT/TRANSMISSION/KICKSTARTER

Apply engine oil to the shift drum surface and groove of the shift fork bosses.

Install the shift forks to the shift drum.  
Install the guide pins and secure them with clips.



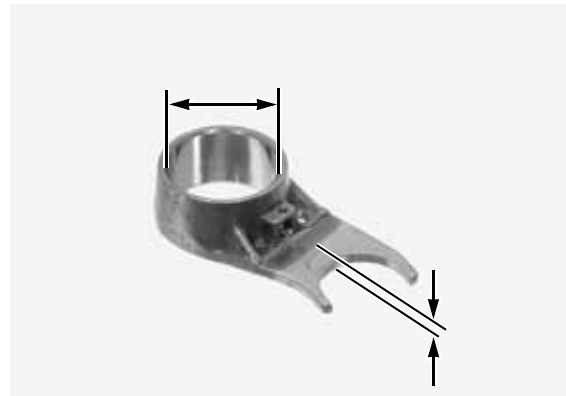
### SHIFT DRUM INSPECTION

Check the shift fork for deformation or abnormal wear.  
Measure the shift fork claw thickness.

**SERVICE LIMIT: 4.60 mm (0.181 in)**

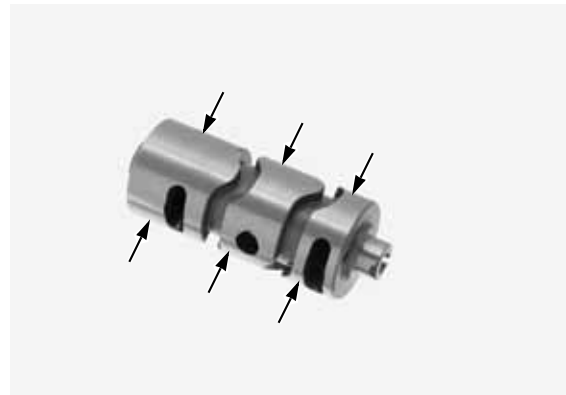
Measure the shift fork I.D.

**SERVICE LIMIT: 34.14 mm (1.344 in)**



Check the shift drum grooves for wear or damage.  
Measure the shift drum O.D.

**SERVICE LIMIT: 33.93 mm (1.336 in)**

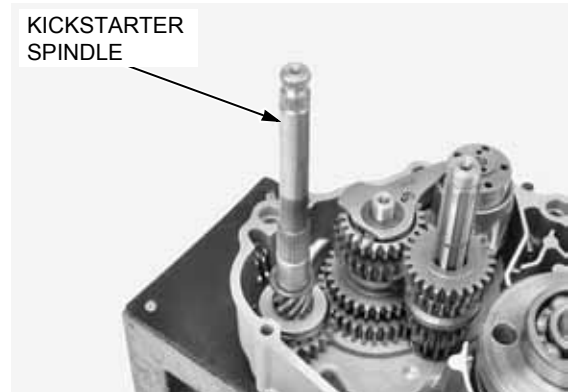


## KICKSTARTER

### REMOVAL

Separate the crankcase halves (page 11-6).

Remove the kickstarter spindle from the left crankcase.

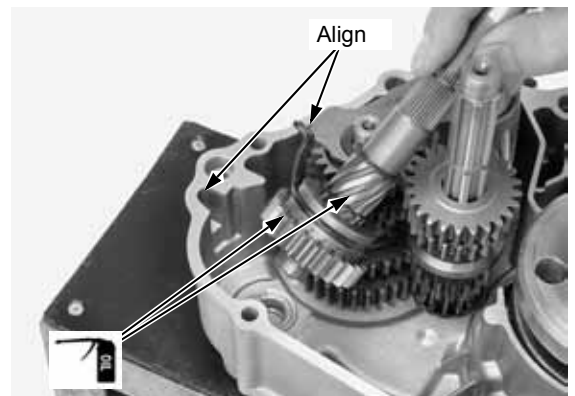


### INSTALLATION

Apply engine oil to the rotating and sliding area of kickstarter spindle.

Install the kickstarter spindle aligning its ratchet spring with the groove on the left crankcase as shown.

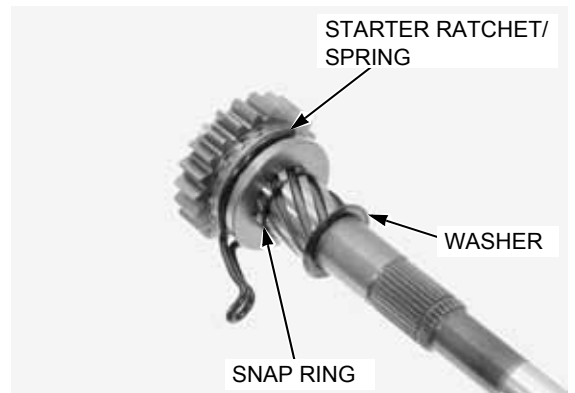
Assemble the crankcase (page 11-20).



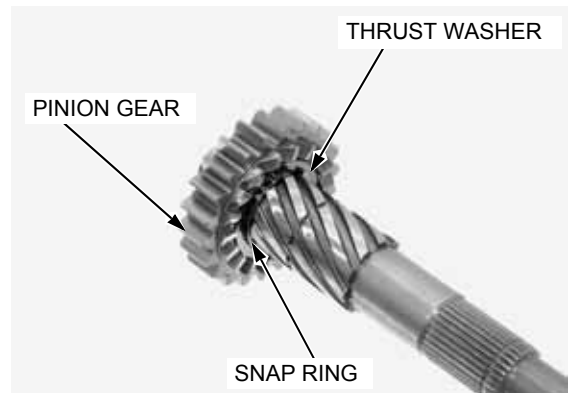
### DISASSEMBLY

Remove the washer.

Remove the snap ring, starter ratchet and ratchet spring.



Remove the snap ring, thrust washer and starter pinion gear.



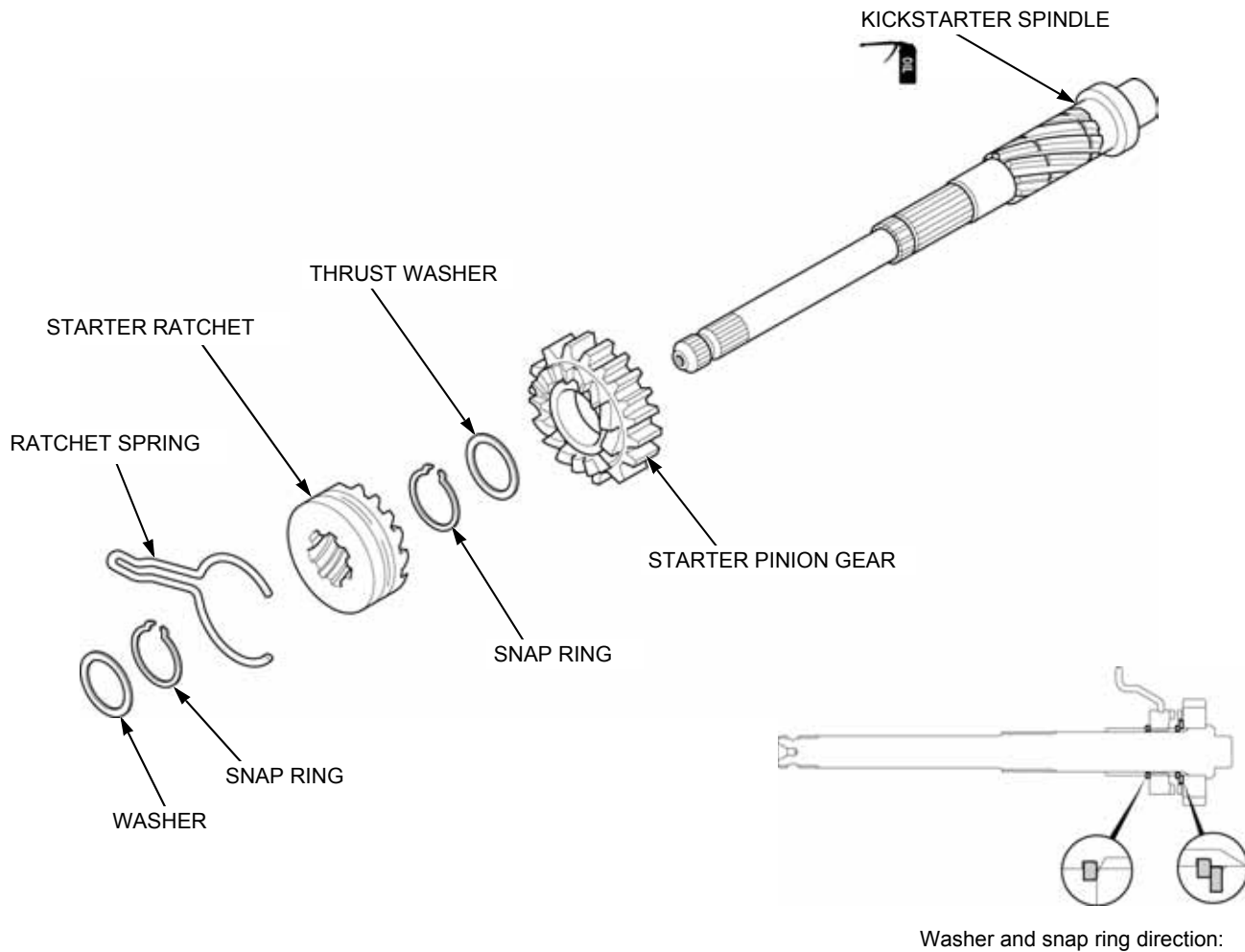
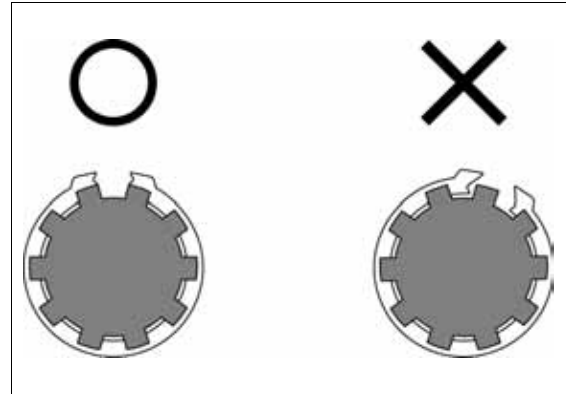
# CRANKSHAFT/TRANSMISSION/KICKSTARTER

## ASSEMBLY

Clean all parts in solvent and dry them thoroughly.

### NOTE:

- Install the washers and snap rings with the chamfered edges facing the thrust load side.
- Do not reuse a worn snap ring which could easily spin in the groove.
- Check that the snap rings are seated in the grooves and align their end gaps with the grooves of the spline.
- Check that the special washer is seated in the groove.

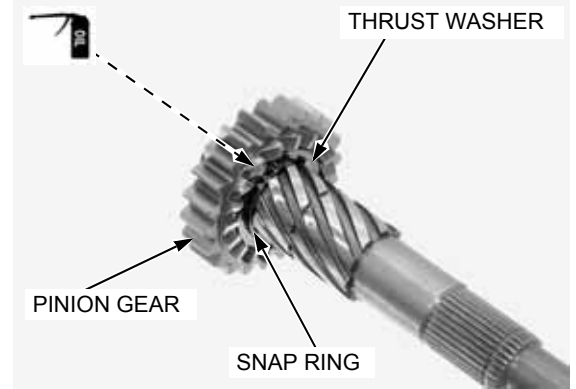


## CRANKSHAFT/TRANSMISSION/KICKSTARTER

*Make sure that the snap ring is seated in the groove.*

Apply engine oil to the kickstarter spindle sliding surface.

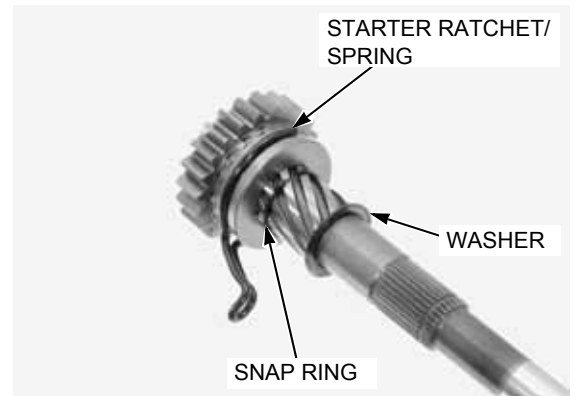
Install the starter pinion gear, thrust washer and snap ring to the kickstarter spindle.



*Make sure that the snap ring is seated in the groove.*

Install the ratchet spring, starter ratchet and snap ring.

Install the washer.



### INSPECTION

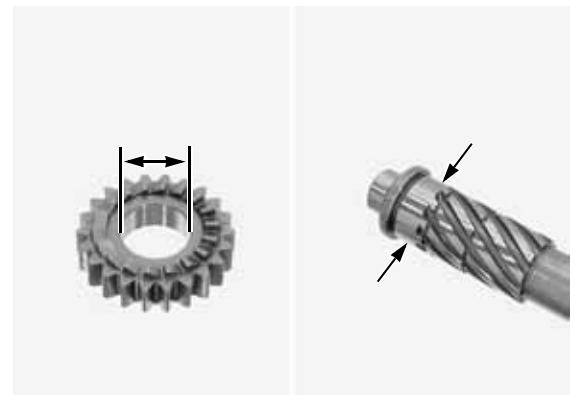
Check the kickstarter spindle for bent.  
Check each part for wear or damage, replace them if necessary.

Measure the starter pinion gear I.D.

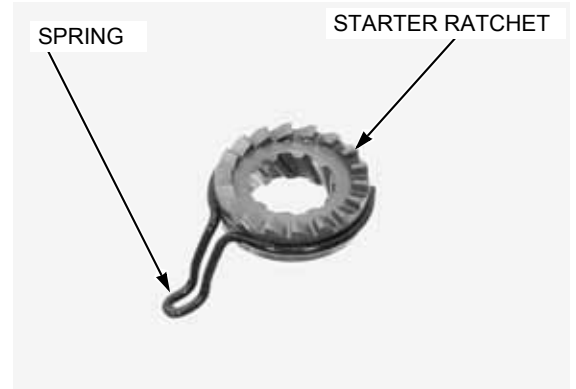
**SERVICE LIMIT: 20.08 mm (0.791 in)**

Measure the kickstarter spindle O.D.

**SERVICE LIMIT: 19.94 mm (0.785 in)**



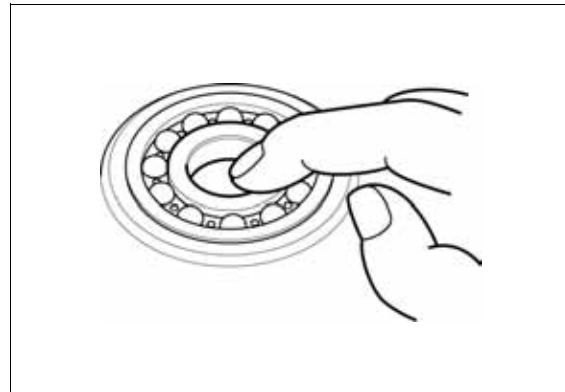
Check the starter ratchet for wear or damage.  
Check the ratchet spring for fatigue.  
Replace them if necessary.



**BEARING REPLACEMENT**

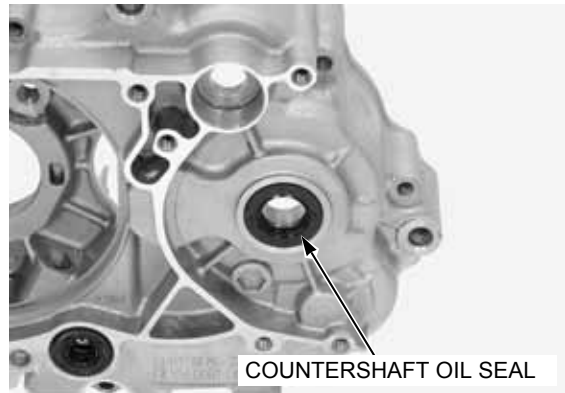
**BEARING INSPECTION**

Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that each bearing outer race fits tightly in the crankcase. Remove and discard the bearing, if the race does not turn smoothly, quietly, or fits loosely in the crankcase.

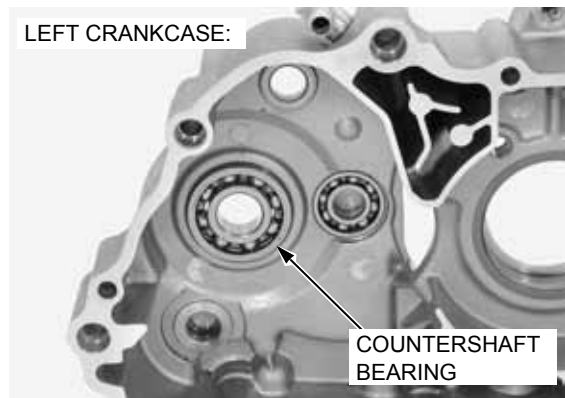


**BEARING REMOVAL**

Remove the countershaft oil seal from the left crankcase.



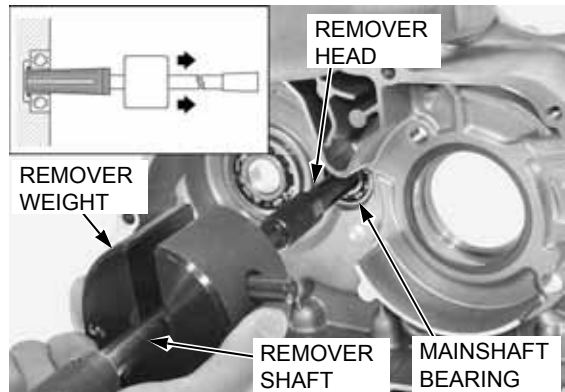
Drive out the countershaft bearing from the left crankcase.



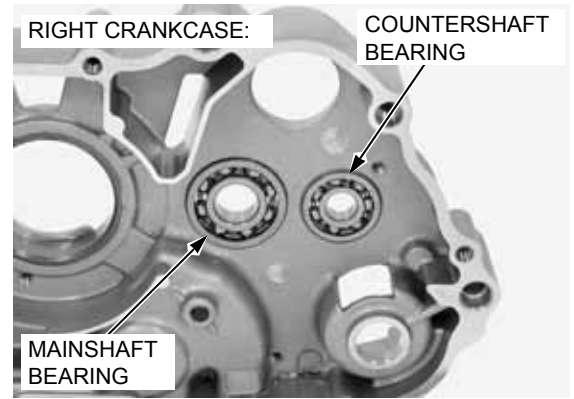
Remove the mainshaft bearing from the left crankcase using the special tools as shown.

**TOOLS:**

- Bearing remover set, 12 mm**      07936-1660101
- Bearing remover shaft, 12 mm**    07936-1660120
- Bearing remover head, 12 mm**    07936-1660110
- Remover weight**                      07741-0010201



Drive out the mainshaft and countershaft bearings from the right crankcase.



## BEARING INSTALLATION

Drive new bearings into the crankcase using the special tools.

### TOOLS:

#### Left crankcase mainshaft bearing:

Driver	07749-0010000
Attachment, 28 x 30 mm	07946-1870100
Pilot, 12 mm	07746-0040200

#### Left crankcase countershaft bearing:

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

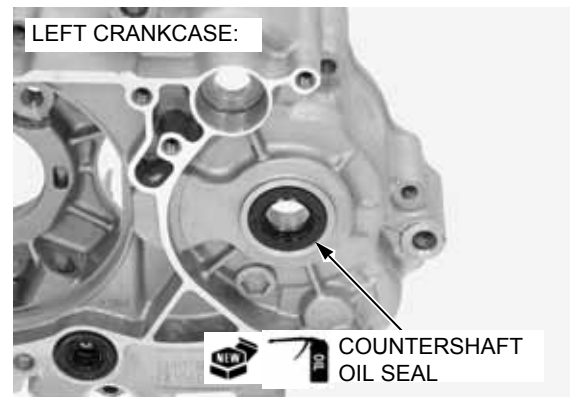
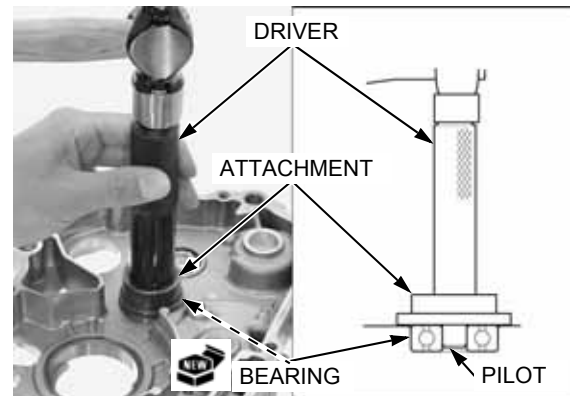
#### Right crankcase mainshaft bearing:

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

#### Right crankcase countershaft bearing:

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

Apply engine oil to a new countershaft oil seal lip. Install a new countershaft oil seal.





## CRANKSHAFT/TRANSMISSION/KICKSTARTER

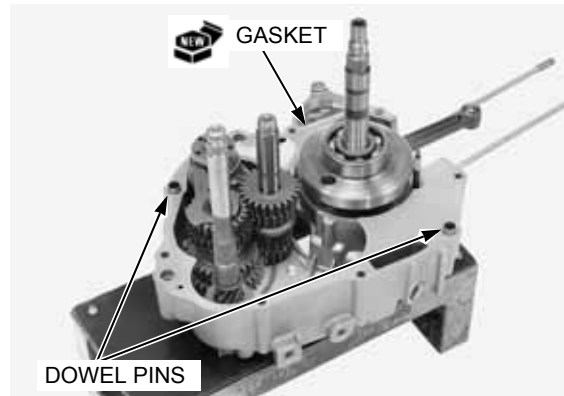
### CRANKCASE ASSEMBLY

*Be careful not to damage the mating surface.* Clean the crankcase mating surfaces before assembly.

**NOTE:**

- Correct any minor roughness or irregularities with an oil stone if necessary.
- After cleaning, lubricate the crankshaft bearings and other sliding surfaces with engine oil.
- Make sure that all the components inside the crankcase are installed correctly.

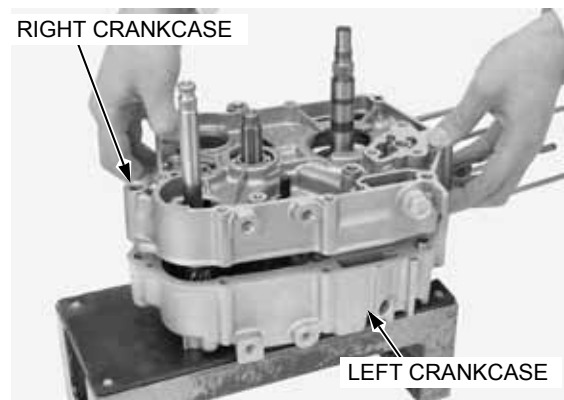
Install the dowel pins and new gasket to the left crankcase.



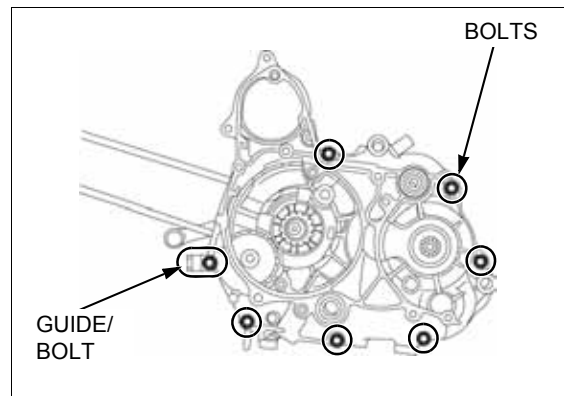
*Make sure that the gasket stays in correct position.* Install the right crankcase over the left crankcase.

**NOTICE**

- Do not apply excessive force to the crankcase halves. If it is difficult to mate the halves, separate them and check for misaligned parts.

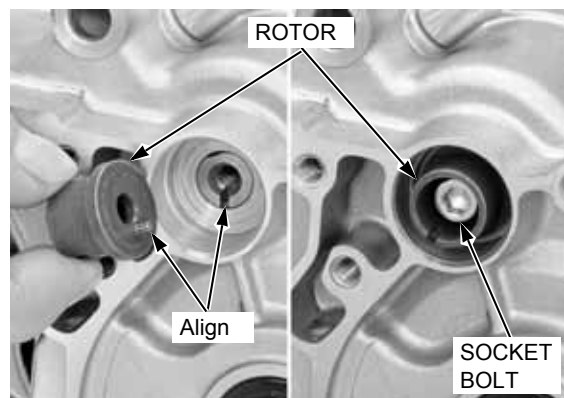


Install the crankcase bolts and guide, then tighten them in a crisscross pattern in 2 – 3 steps.



Install the gear position switch rotor aligning its boss with the groove on the shift drum. Install and tighten the socket bolt to the specified torque.

**TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)**



Install the return spring and retainer to the kickstarter spindle while aligning the stoppers on the crankcase and retainer.  
Hook the end of the return spring to the crankcase as shown.

*Make sure that the snap ring is seated in the groove.* Install the snap ring to the groove on the kickstarter spindle.

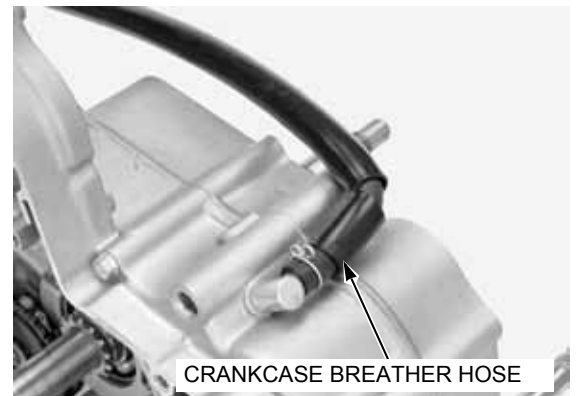
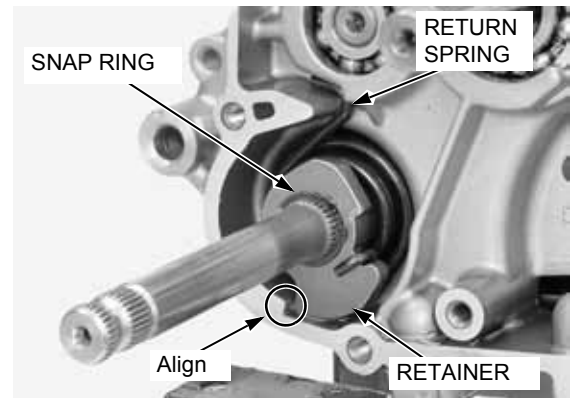
**NOTE:**

- Make sure that the mainshaft rotates smoothly. If not, temporarily set the kickstarter pedal to the spindle and operate the kickstarter to release the starter pinion/ratchet gear.

Connect the crankcase breather hose.

Install the cam chain.

Install the removed parts (page 11-3).

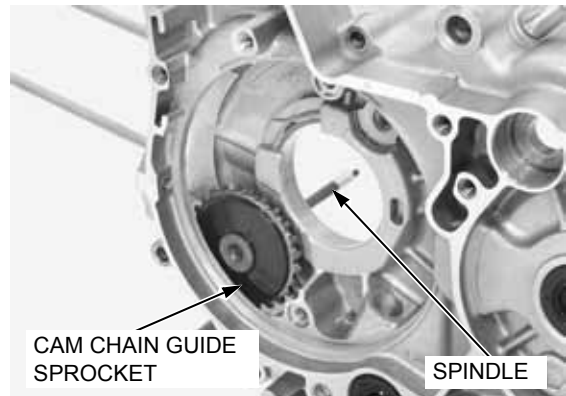


**CAM CHAIN GUIDE SPROCKET**

**REMOVAL**

Separate the crankcase (page 11-6).

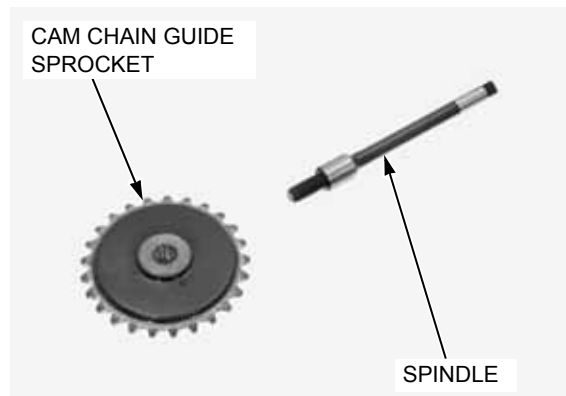
Hold the cam chain guide sprocket, turn the cam chain guide sprocket spindle counterclockwise and remove them from the left crankcase.



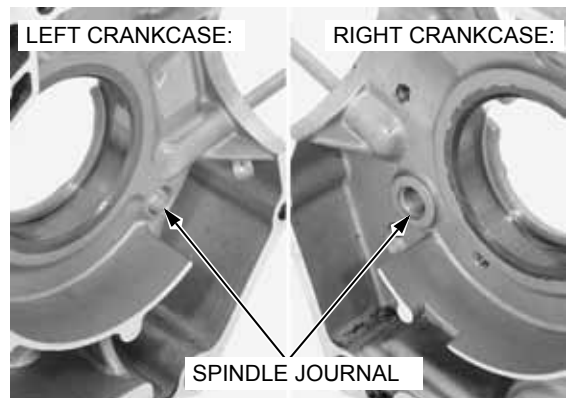
**INSPECTION**

Inspect the following:

- Cam chain guide sprocket for wear or damage
- Cam chain guide sprocket spindle for wear or damage



- Spindle journal for abnormal wear or damage

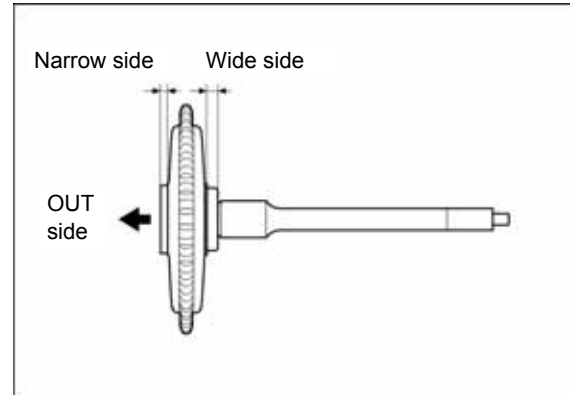
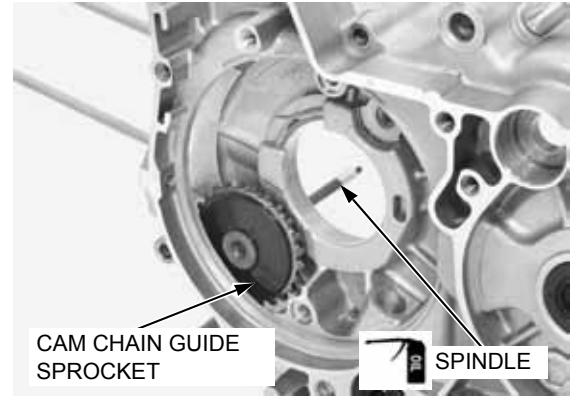


**INSTALLATION**

Apply engine oil to the cam chain guide sprocket spindle sliding surface.

Install the spindle and sprocket to the left crankcase as shown, hold the sprocket and tighten the spindle.

Assemble the crankcase (page 11-20).



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**MEMO**

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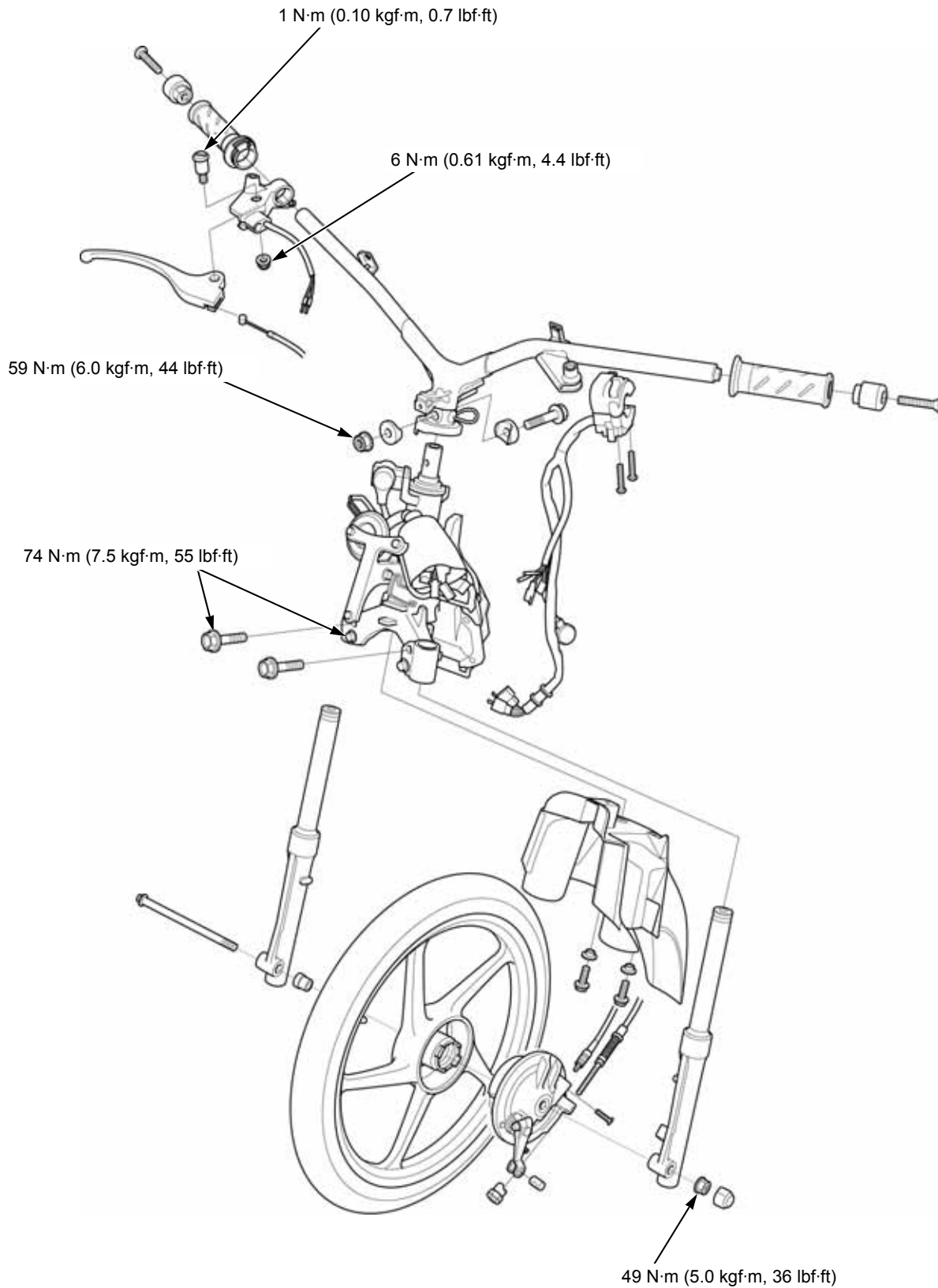
# 12. FRONT WHEEL/BRAKE/SUSPENSION/STEERING

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COMPONENT LOCATION .....	12-2	FRONT BRAKE .....	12-11
SERVICE INFORMATION .....	12-3	FORK .....	12-13
TROUBLESHOOTING .....	12-6	HANDLEBAR .....	12-19
FRONT WHEEL .....	12-7	STEERING STEM .....	12-24

# FRONT WHEEL/BRAKE/SUSPENSION/STEERING

## COMPONENT LOCATION



## SERVICE INFORMATION

### GENERAL

#### ⚠ WARNING

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.

- This section covers the front wheel, fork, handlebar and steering stem.
- When servicing the front wheel, fork or steering stem, support the motorcycle using a jack or other support.
- A contaminated brake drum or shoe reduces stopping power. Discard contaminated shoes and clean a contaminated drum with a high quality brake degreasing agent.
- After the front wheel installation, check the brake operation by applying the brake lever.

### SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	To indicator
Cold tire pressure	Driver only	200 kPa (2.00 kgf/cm <sup>2</sup> , 29 psi)	–
	Driver and passenger	200 kPa (2.00 kgf/cm <sup>2</sup> , 29 psi)	–
Axle runout		–	0.20 (0.008)
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Wheel hub-to-rim distance		8.0 ± 1.0 (0.31 ± 0.04)	–
Brake	Brake drum I.D.	110.0 – 110.2 (4.33 – 4.34)	111.0 (4.37)
	Brake lever freeplay	10 – 20 (0.4 – 0.8)	–
Fork	Spring free length	343.5 (13.52)	–
	Spring direction	With the tightly wound side facing down	–
	Pipe runout	–	0.20 (0.008)
	Recommended fork fluid	Fork fluid	–
	Fluid level	68.5 (2.70)	–
	Fluid capacity	64 ± 1 cm <sup>3</sup> (2.16 ± 0.03 US oz, 2.25 ± 0.04 Imp oz)	–









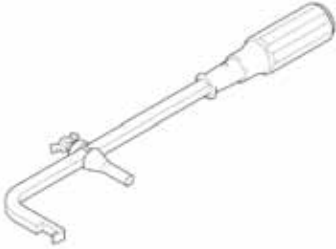
### TORQUE VALUES

Steering stem nut	–	See page 12-27
Steering stem top thread	–	See page 12-27
Bottom bridge pinch bolt	74 N·m (7.5 kgf·m, 55 lbf·ft)	
Handlebar mounting nut	59 N·m (6.0 kgf·m, 44 lbf·ft)	U-nut
Front axle nut	49 N·m (5.0 kgf·m, 36 lbf·ft)	U-nut
Front spoke (Spoke wheel type)	3.2 N·m (0.33 kgf·m, 2.4 lbf·ft)	
Brake lever pivot bolt	1 N·m (0.10 kgf·m, 0.7 lbf·ft)	
Brake lever pivot nut	6 N·m (0.61 kgf·m, 4.4 lbf·ft)	
Front brake arm nut	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Fork cap bolt	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Fork socket bolt	20 N·m (2.0 kgf·m, 15 lbf·ft)	Apply locking agent to the threads.



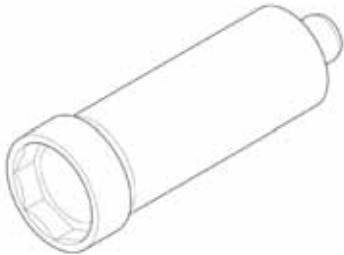






## FRONT WHEEL/BRAKE/SUSPENSION/STEERING

### TOOLS

<p>Spoke wrench, 4.5 × 5.1 mm 07701-0020200</p> 	<p>Attachment, 37 × 40 mm 07746-0010200</p> 	<p>Pilot, 12 mm 07746-0040200</p> 
<p>Bearing remover shaft 07746-0050100</p> 	<p>Bearing remover head, 12 mm 07746-0050300</p> 	<p>Fork seal driver body 07747-0010100</p> 
<p>Fork seal driver attachment, 27.2 mm 07747-0010300</p> 	<p>Fork seal driver attachment, 33.2 mm 07747-0010501</p> 	<p>Oil seal remover 07748-0010001 or equivalent</p> 

## FRONT WHEEL/BRAKE/SUSPENSION/STEERING

<p>Driver 07749-0010000</p> 	<p>Steering stem socket 07916-3710101</p> 	<p>Socket wrench 07916-KM10000</p> 
<p>Bearing driver attachment 07946-3710701</p> 	<p>Oil seal driver, 53.5 mm 07947-SB00200</p> 	<p>Ball race remover, 34.5 mm 07948-4630100</p> 
<p>Ball race remover shaft 07GMD-KS40100</p> 		

# TROUBLESHOOTING

### Hard steering

- Insufficient tire pressure
- Faulty tire
- Loose or distorted spokes (spoke wheel type)
- Steering stem lock nut too tight
- Faulty steering head bearing
- Faulty steering head bearing race
- Bent steering stem

### Steers to one side or does not track straight

- Bent front axle
- Wheel installed incorrectly
- Worn or damaged front wheel bearings
- Bent fork
- Bent frame
- Faulty steering head bearing

### Front wheel wobbles

- Loose front axle fasteners
- Bent rim
- Worn or damaged front wheel bearings

### Front wheel turns hard

- Front brake drag
- Bent front axle
- Faulty front wheel bearings

### Soft suspension

- Low tire pressure
- Deteriorated fork fluid
- Incorrect fork fluid weight
- Insufficient fluid in fork
- Weak fork spring

### Hard suspension

- High tire pressure
- Too much fluid in fork
- Incorrect fork fluid weight
- Bent fork pipes
- Clogged fork fluid passage

### Suspension noisy

- Bent fork slider
- Insufficient fluid in fork
- Loose fork fasteners

## FRONT WHEEL

### REMOVAL/INSTALLATION

Support the motorcycle using a jack or other adjustable support.

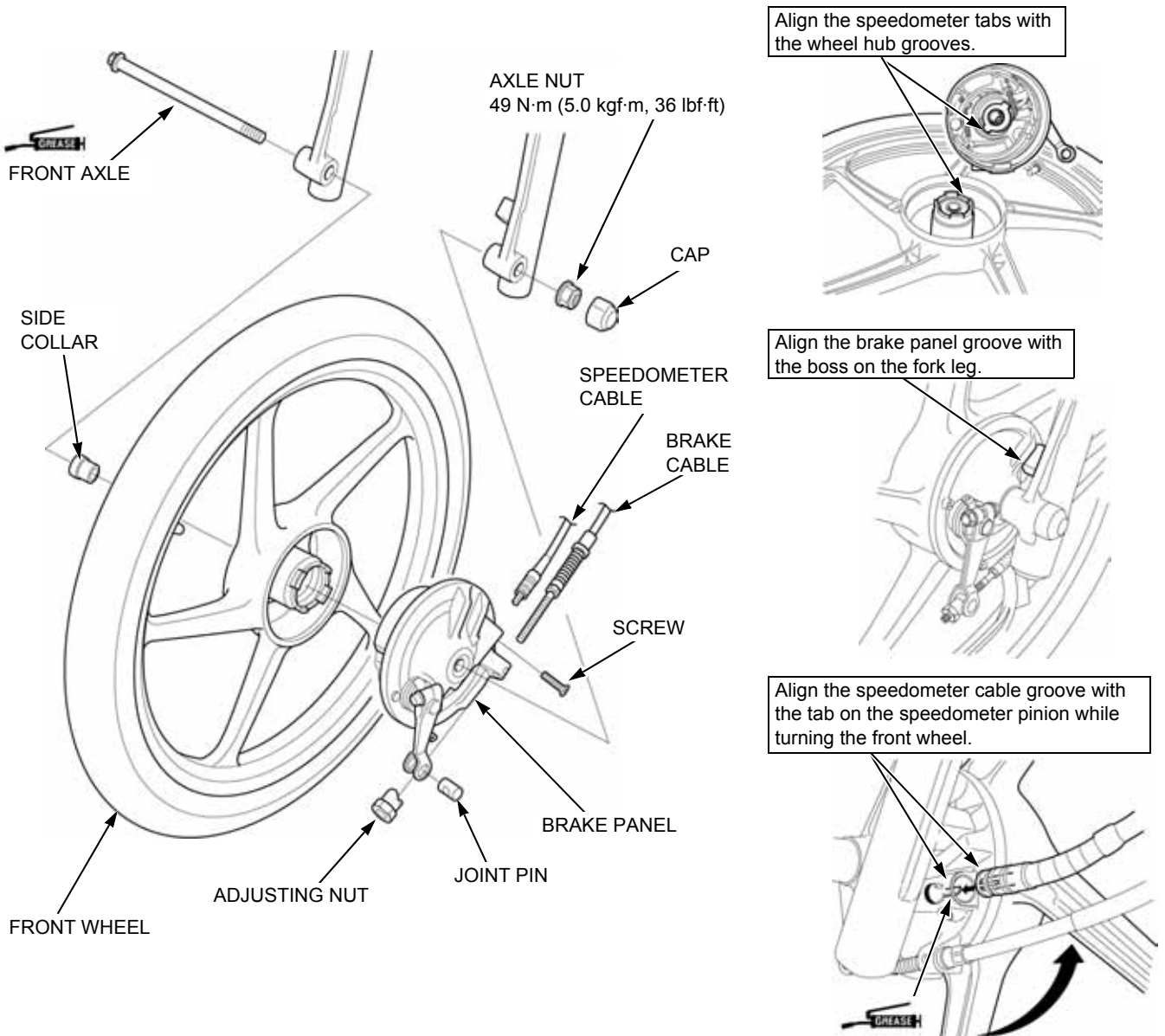
Remove/install the following:

- Front brake adjusting nut/brake arm joint pin
- Brake cable
- Screw/Speedometer cable
- Axle nut cap/axle nut
- Front axle
- Front wheel
- Side collar
- Brake panel

### TORQUE:

**AXLE NUT**                      **49 N·m (5.0 kgf·m, 36 lbf·ft)**

- Apply grease to the front axle and speedometer pinion shaft.
- Adjust the front brake lever freeplay (page 3-18).
- Check the brake operation after installation.



# FRONT WHEEL/BRAKE/SUSPENSION/STEERING

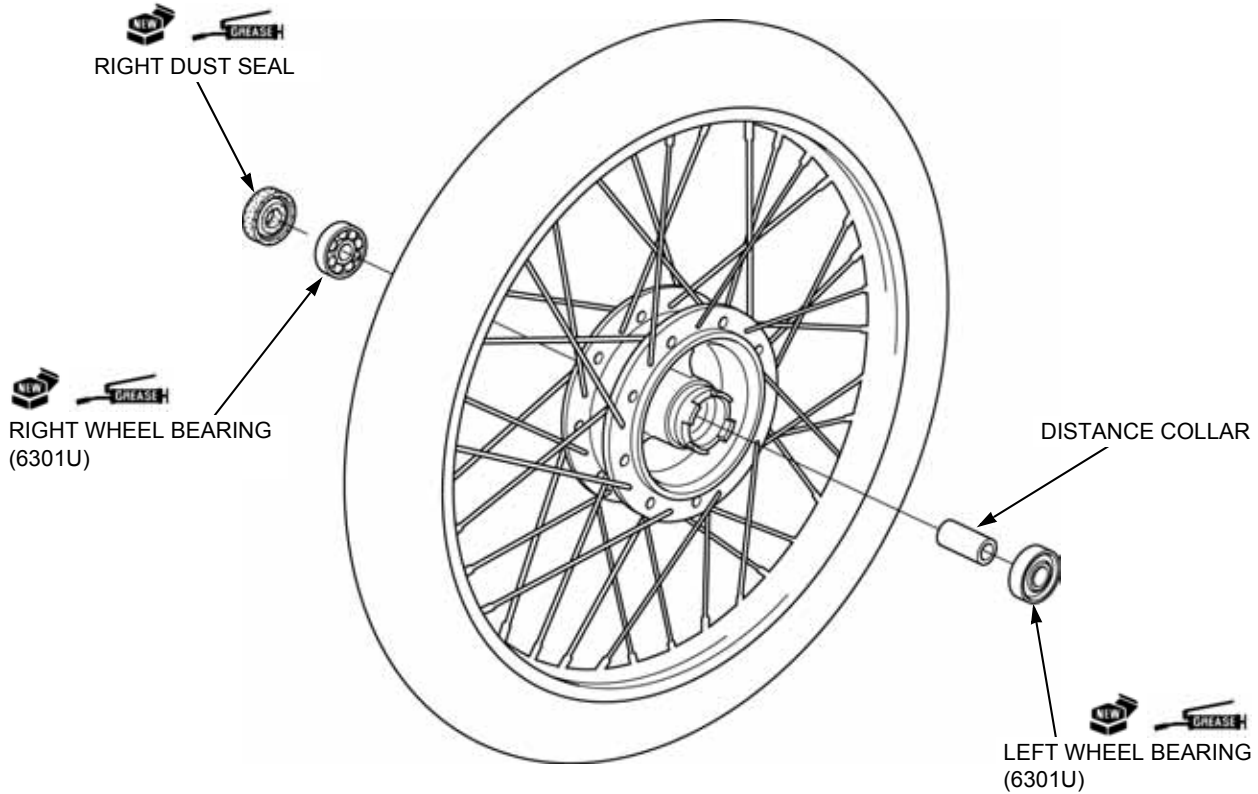
## DISASSEMBLY/ASSEMBLY

Remove/install the following:

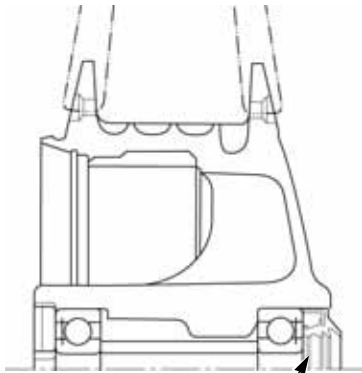
- Right dust seals
- Wheel bearings
- Distance collar
- Replace the bearings and dust seal with new ones.
- Apply grease to the dust seal lips and bearing cavities.

For wheel bearing replacement (page 12-10).

Spoke wheel type shown:



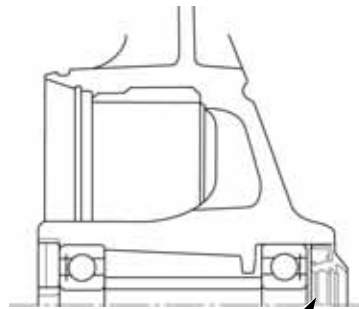
Spoke wheel type:



RIGHT DUST SEAL

Install the right dust seal until it is fully seated.

Cast wheel type:



RIGHT DUST SEAL

Install the right dust seal until it is flush with the wheel end surface.

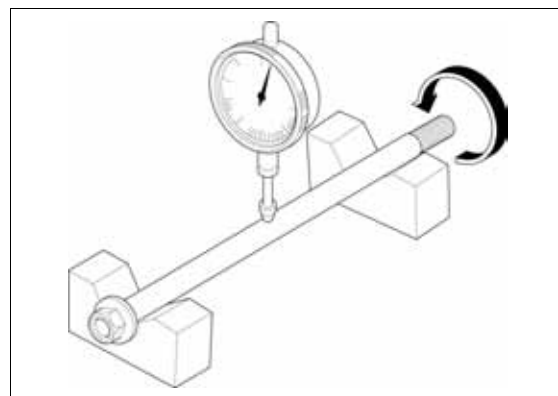
## INSPECTION

### AXLE

Place the axle on V-blocks and measure the runout with a dial indicator.

**SERVICE LIMIT: 0.20 mm (0.008 in)**

Actual runout is 1/2 of the total indicator reading.

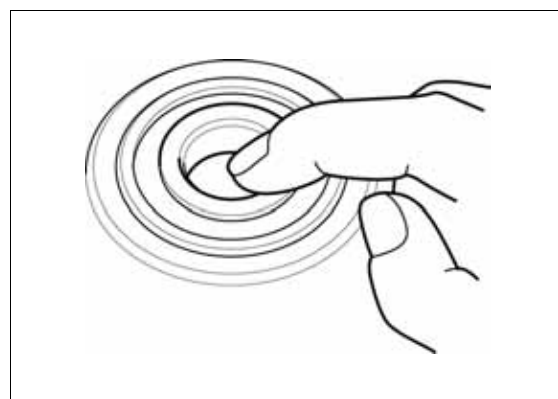


### WHEEL BEARING

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

*Replace the bearings in pairs.*

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



### WHEEL RIM

Check the wheel rim runout by placing the wheel on a turning stand.

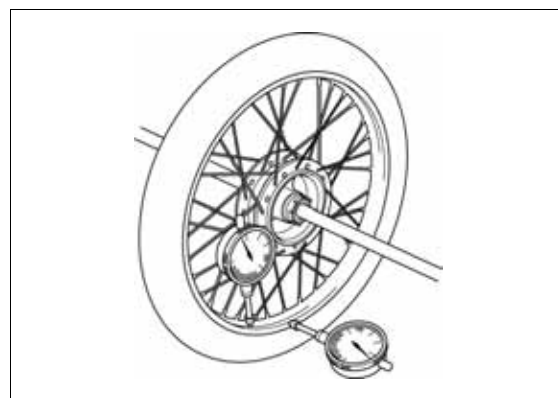
Spin the wheel by hand and read the runout using a dial indicator.

Actual runout is 1/2 the total indicator reading.

#### SERVICE LIMIT:

**Axial: 2.0 mm (0.08 in)**

**Radial: 2.0 mm (0.08 in)**



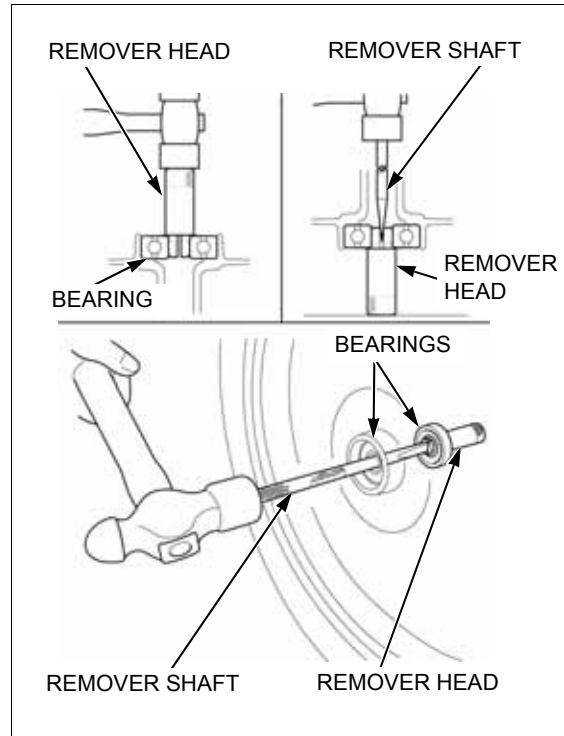
## FRONT WHEEL/BRAKE/SUSPENSION/STEERING

### WHEEL BEARING REPLACEMENT

Install the bearing remover head into the bearing.  
From the opposite side, install the bearing remover shaft and drive the bearing out of the wheel hub.  
Remove the distance collar and drive out the other bearing.

#### TOOLS:

**Bearing remover head, 12 mm** 07746-0050300  
**Bearing remover shaft** 07746-0050100



Pack all bearing cavities with grease.

*Never install the old bearings. Once the bearings have been removed, the bearings must be replaced with new ones.*

Spoke wheel type:

Drive in a new right bearing (opposite side of the brake panel) squarely with its sealed side facing up until it is fully seated.

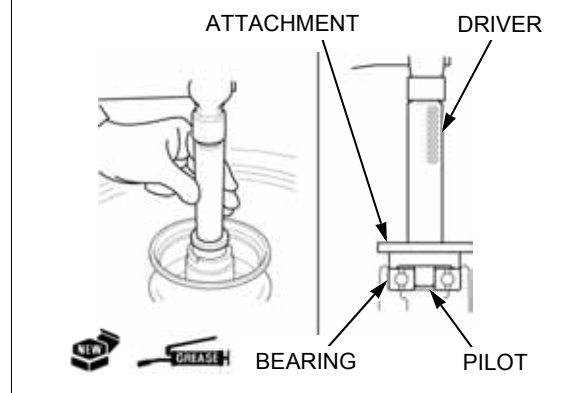
Cast wheel type:

Drive in a new left bearing (brake panel side) squarely with its sealed side facing up until it is fully seated.

#### TOOLS:

**Driver** 07749-0010000  
**Attachment, 37×40 mm** 07746-0010200  
**Pilot, 12 mm** 07746-0040200

Cast wheel type shown:



Install the distance collar.

Spoke wheel type:

Drive in a new left bearing squarely with its sealed side facing up.

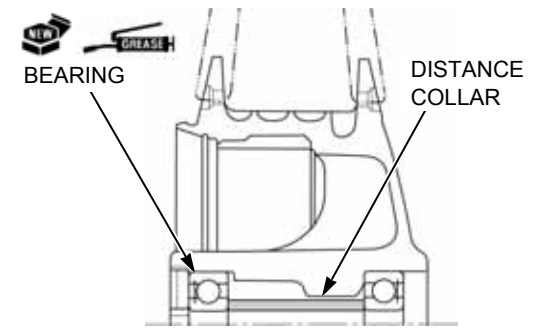
Cast wheel type:

Drive in a new right bearing squarely with its sealed side facing up.

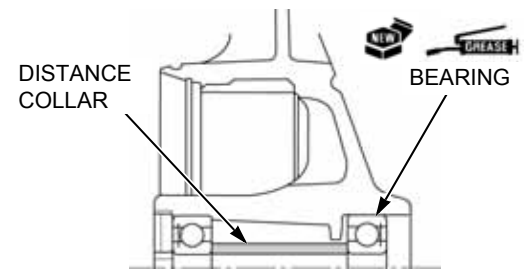
**TOOLS:**

- |                             |                      |
|-----------------------------|----------------------|
| <b>Driver</b>               | <b>07749-0010000</b> |
| <b>Attachment, 37×40 mm</b> | <b>07746-0010200</b> |
| <b>Pilot, 12 mm</b>         | <b>07746-0040200</b> |

Spoke wheel type:



Cast wheel type:



## WHEEL CENTER ADJUSTMENT (Spoke wheel type)

Place the rim on the work bench.

Place the wheel hub in the center of the rim and begin lacing with new spokes.

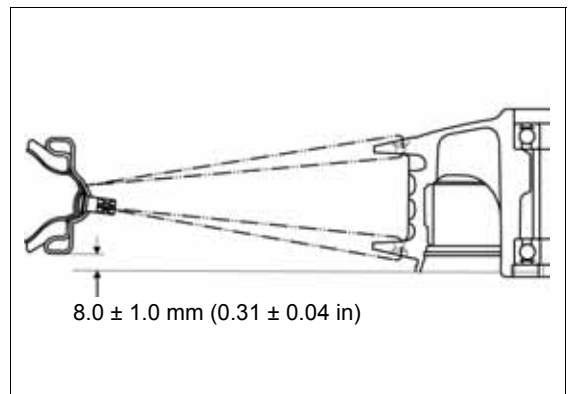
Adjust the wheel hub position so that the distance from the wheel hub left end surface to the side of rim is  $8.0 \pm 1.0$  mm ( $0.31 \pm 0.04$  in) as shown.

**TOOL:**

- Spoke wrench, 4.5 x 5.1 mm      07701-0020200**

**TORQUE: 3.2 N·m (0.33 kgf·m, 2.4 lbf·ft)**

Check the rim runout (page 12-9).



## FRONT BRAKE

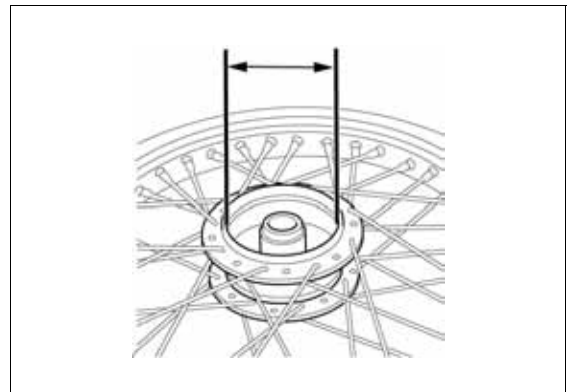
### INSPECTION

Remove the front wheel and brake panel (page 12-7).

Measure the front brake drum I.D.

**SERVICE LIMIT: 111.0 mm (4.37 in)**

Install the brake panel and front wheel (page 12-7).





# FRONT WHEEL/BRAKE/SUSPENSION/STEERING

## DISASSEMBLY/ASSEMBLY

- Always replace the brake shoes as a set.
- When the brake shoes are reused, mark all parts before disassembly so they can be installed in their original locations.

Remove the front drum brake panel assembly (page 12-7).

Expand the brake shoes and remove them from the brake panel.

Remove the brake shoe springs from the brake shoes.

Remove the following:

- Nut/bolt/brake arm/indicator plate/return spring
- Brake cam/felt seal
- Dust seal/speedometer gear/shim

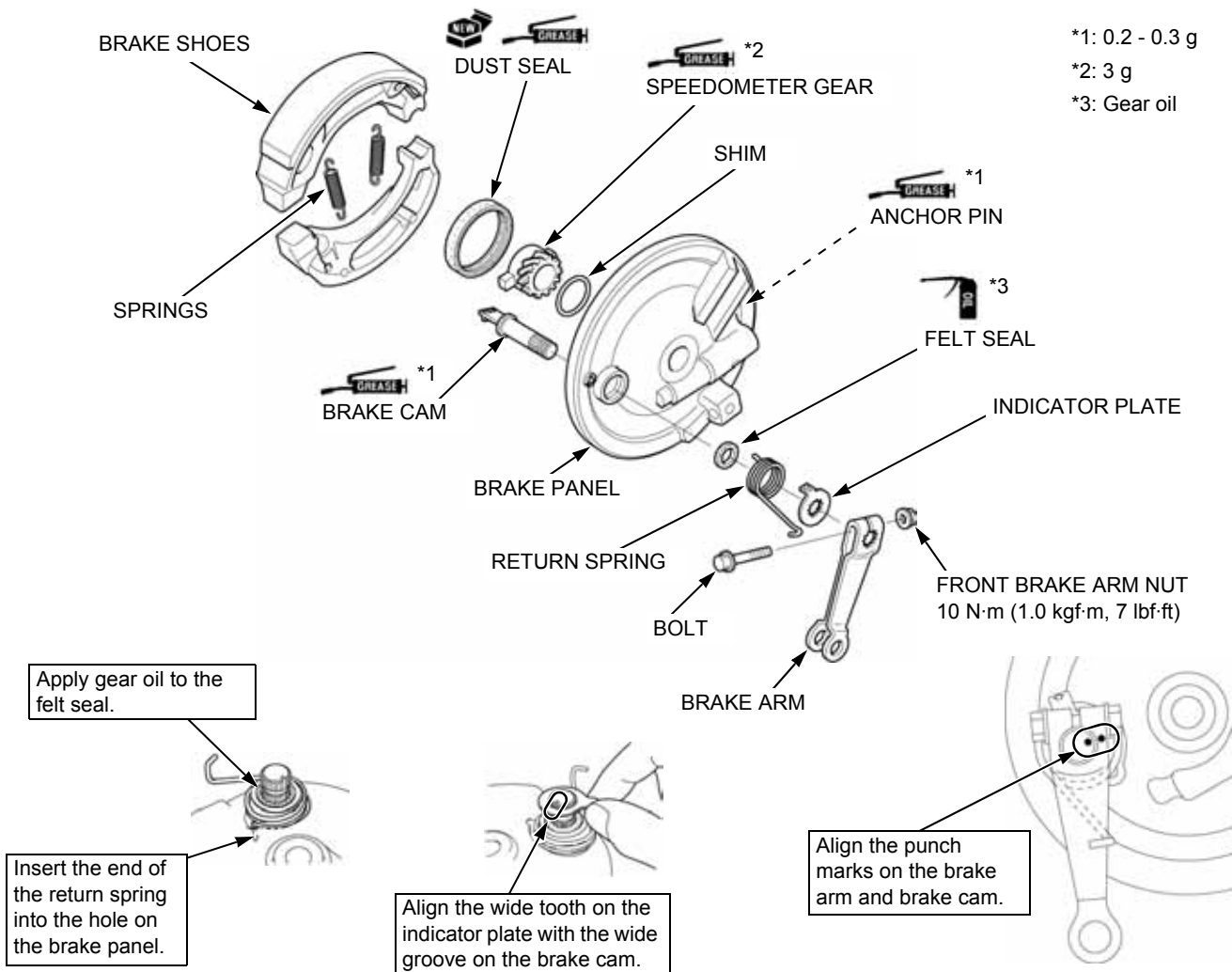
Installation is in the reverse order of removal.

### TORQUE:

**FRONT BRAKE ARM NUT** 10 N·m (1.0 kgf·m, 7 lbf·ft)

- Apply gear oil to the felt seal
- Apply grease to the anchor pin, brake cam, dust seal and speedometer gear

Adjust the front brake lever freeplay (page 3-18).

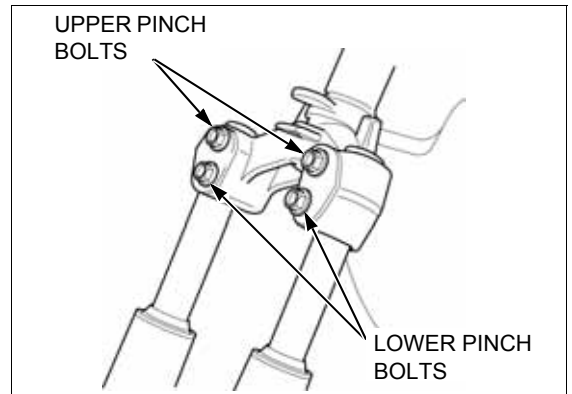


# FORK

## REMOVAL

Remove the front fender B (page 2-5).

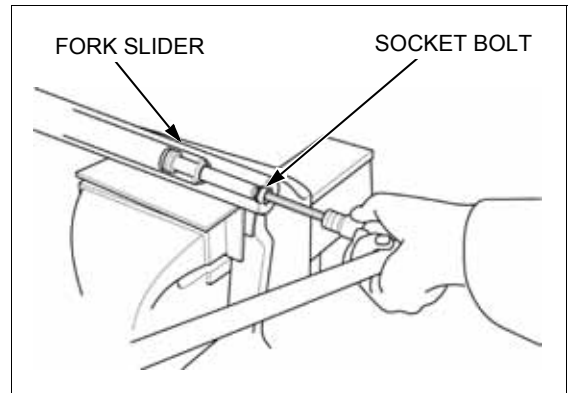
Remove the bottom bridge upper pinch bolts.  
Loosen the bottom bridge lower pinch bolts and remove the fork legs.



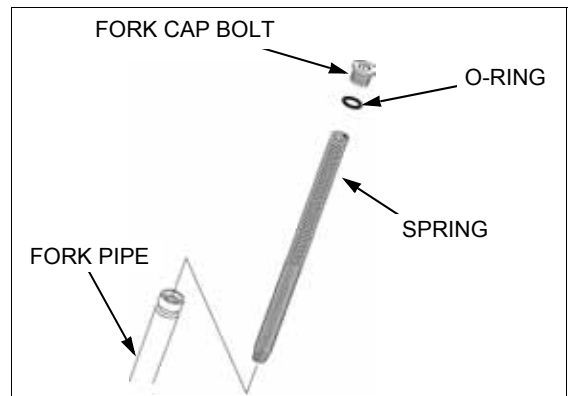
## DISASSEMBLY

Hold the fork slider in a vice with soft jaws or a shop towel.

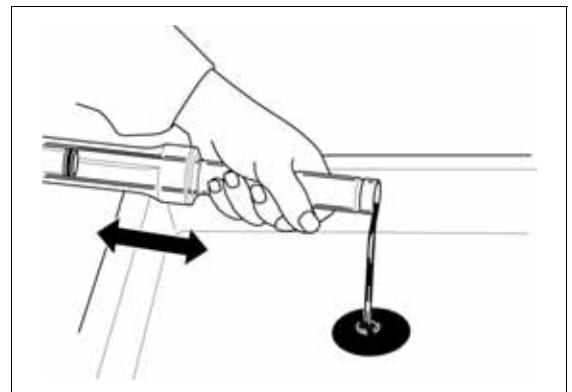
Loosen the fork socket bolt but do not remove yet.



Remove the fork cap bolt and O-ring.  
Remove the fork spring from the fork pipe.

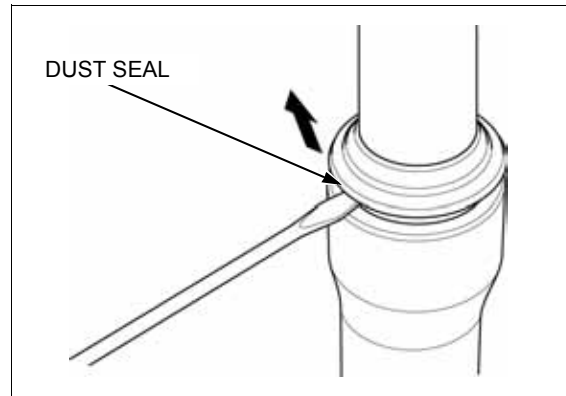


Pour out the fork fluid by pumping the fork pipe several times.

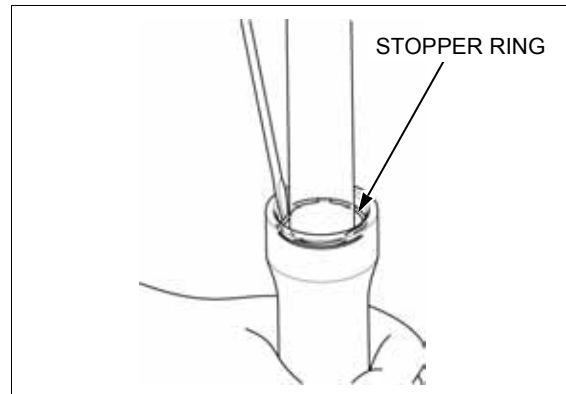


## FRONT WHEEL/BRAKE/SUSPENSION/STEERING

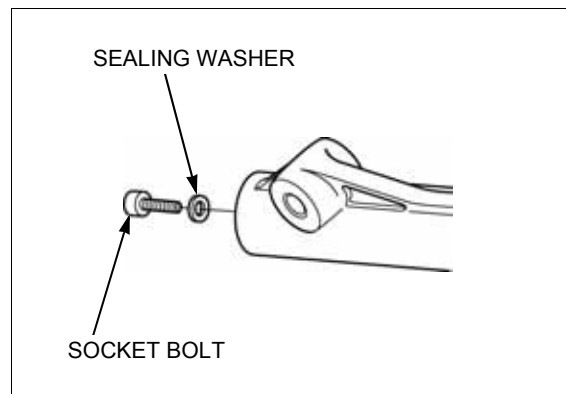
Remove the dust seal.



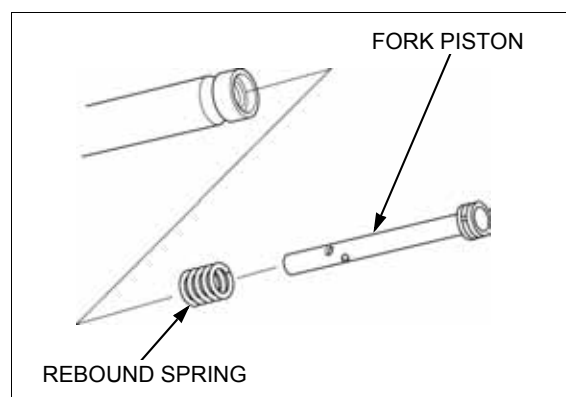
Remove the oil seal stopper ring.



Remove the socket bolt and sealing washer.

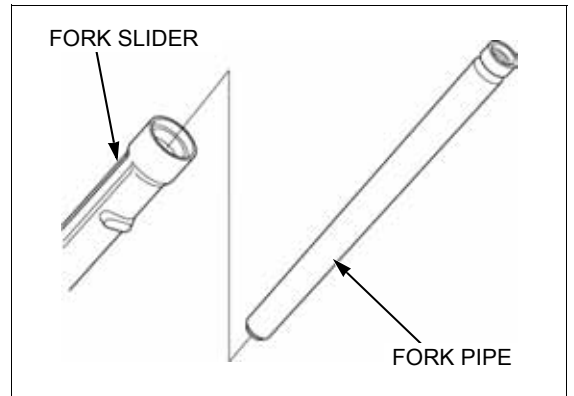


Remove the fork piston and rebound spring from the fork pipe.



# FRONT WHEEL/BRAKE/SUSPENSION/STEERING

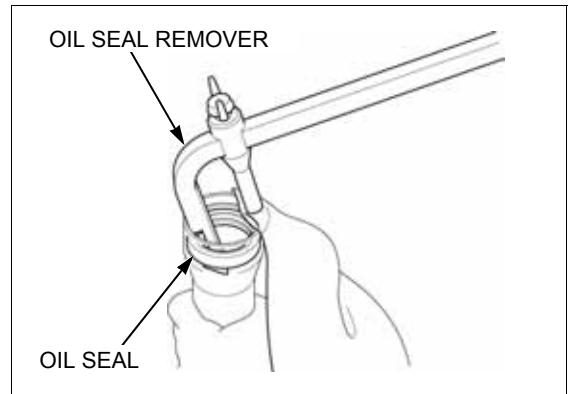
Pull the fork pipe out from the fork slider.



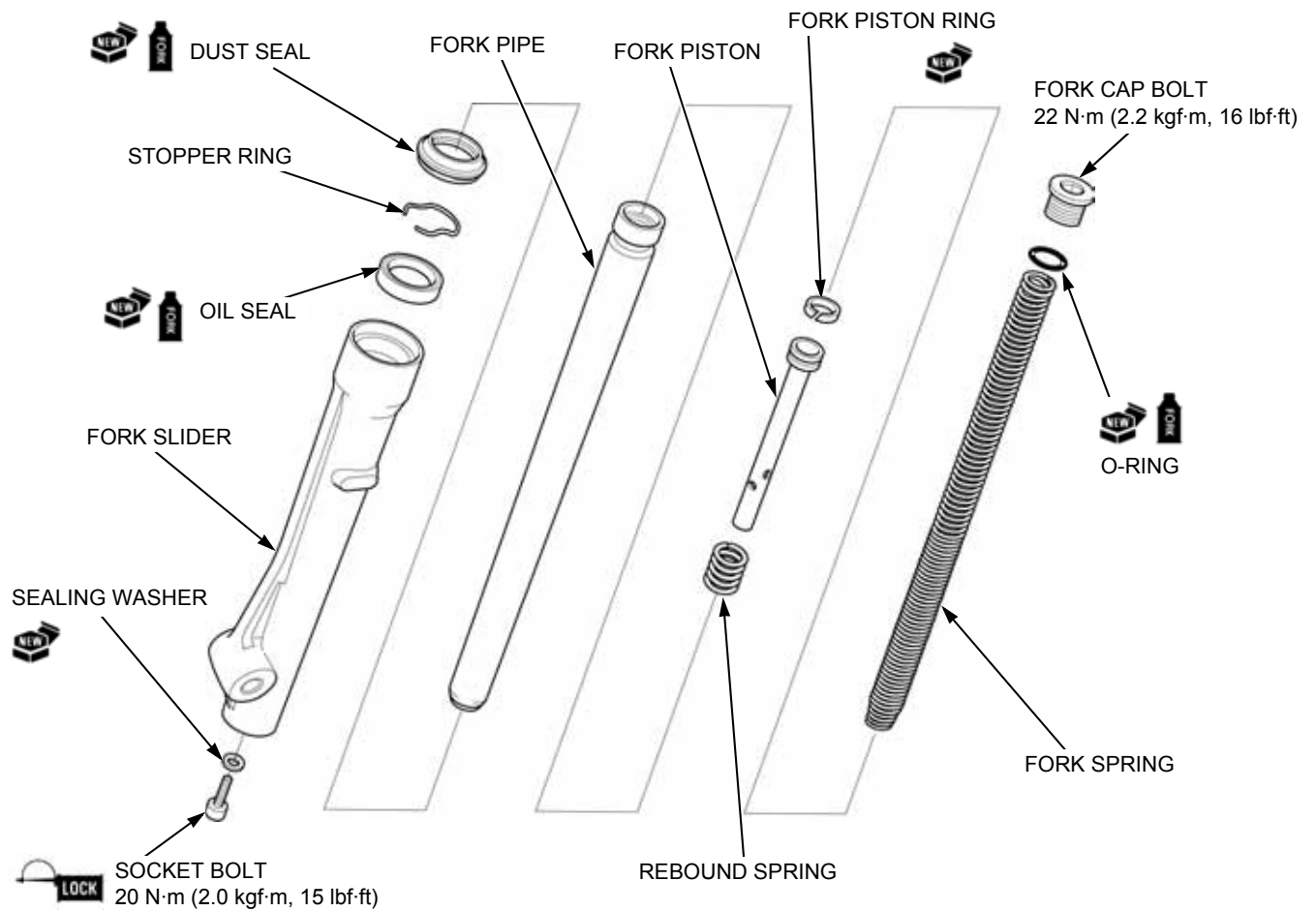
Remove the oil seal using the special tool.

**TOOL:**

Oil seal remover 07748-0010001 or equivalent



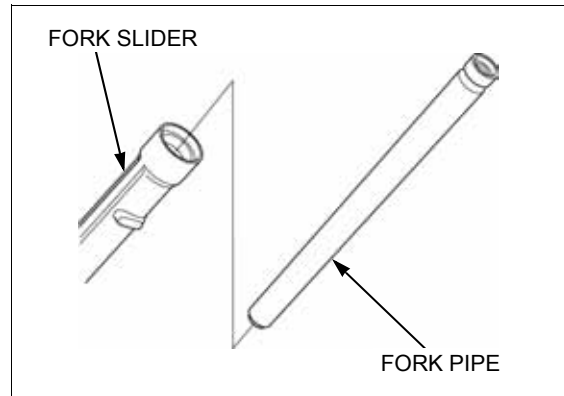
## ASSEMBLY



## FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Before assembly, wash all parts with high flash point or non-flammable solvent and wipe them dry.

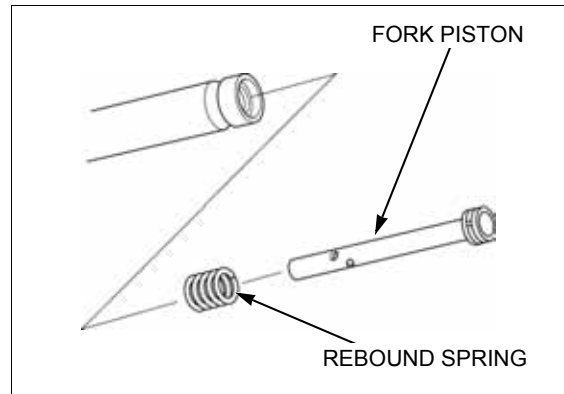
Install the fork pipe into the fork slider.



If removing the fork piston ring from the fork piston, install a new fork piston ring to the fork piston groove.

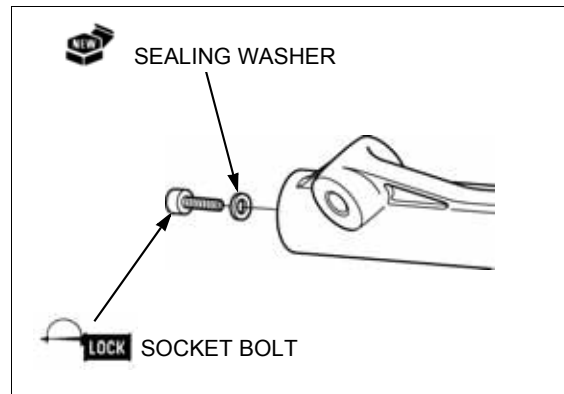
*Make sure that the fork piston ring is seated in the groove.*

Install the rebound spring and fork piston into the fork pipe.



Clean the socket bolt threads and apply locking agent to the bolt threads.

Install and tighten the socket bolt with a new sealing washer to the fork piston.



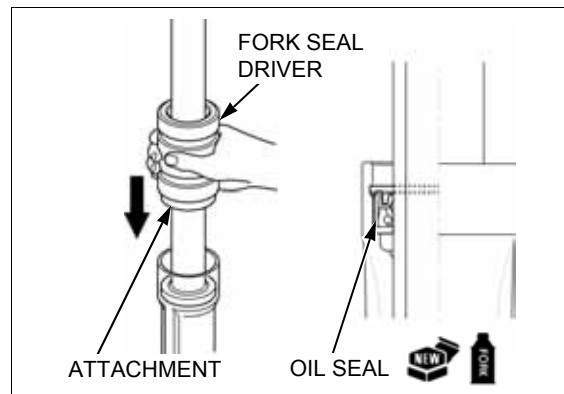
Apply fork fluid to the lip of a new oil seal.

*Install the oil seal with its marked side facing up.*

Drive the oil seal into the fork slider using the special tools until it is fully seated.

### TOOLS:

**Fork seal driver body**                      **07747-0010100**  
**Fork seal driver attachment,**        **07747-0010300**  
**27.2 mm**



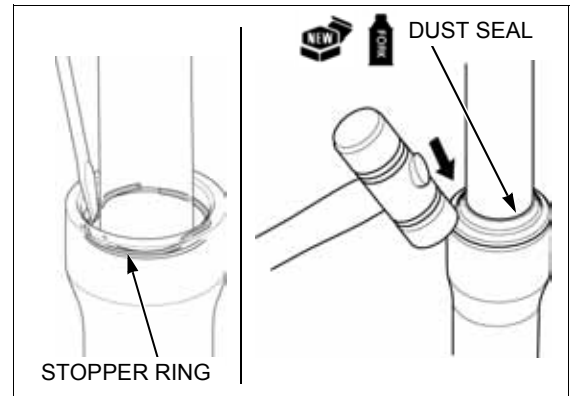
## FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Install the oil seal stopper ring into the stopper ring groove on the fork slider.

Apply fork fluid to a new dust seal lip.

*Do not tap the dust seal lip too hard.*

Install the dust seal until it is fully seated.

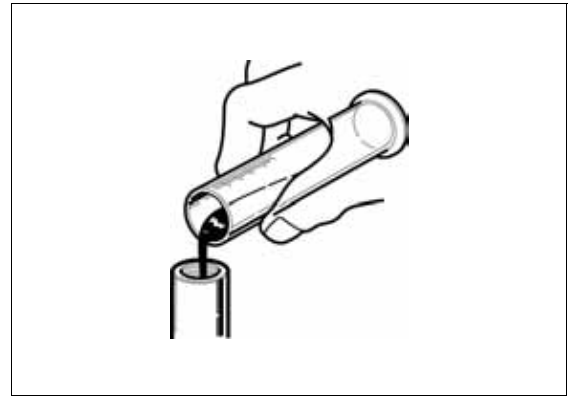


Pour the specified amount of recommended fork fluid into the fork pipe.

### FORK FLUID CAPACITY:

**$64 \pm 1 \text{ cm}^3$  (2.16  $\pm$  0.03 US oz, 2.25  $\pm$  0.04 Imp oz)**

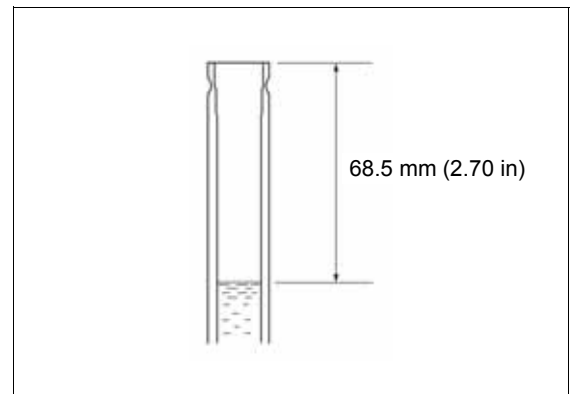
Pump the fork pipe several times to remove trapped air from the lower portion of the fork pipe.



*Be sure the oil level is same in the both forks.*

Compress the fork leg fully and measure the fluid level from the top of the fork pipe.

**FORK FLUID LEVEL: 68.5 mm (2.70 in)**

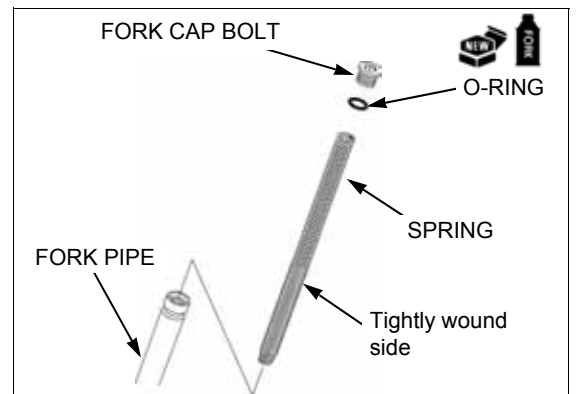


Pull the fork pipe up and install the fork spring with its tightly wound side facing down.

Coat a new O-ring with fork fluid and install it into the groove in the fork cap bolt.

Install the fork cap bolt and tighten it to the specified torque.

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

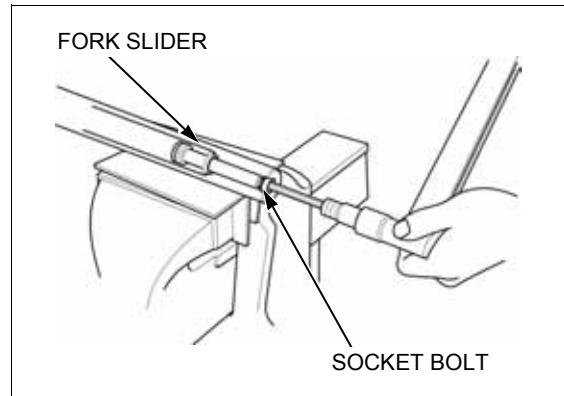


## FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Hold the fork slider in a vise with soft jaws or a shop towel.

Tighten the fork socket bolt to the specified torque.

**TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)**

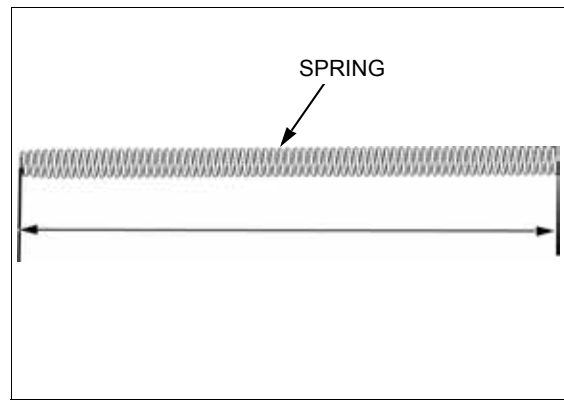


### INSPECTION

#### FORK SPRING

Measure the fork spring free length.

**STANDERD: 343.5 mm (13.52 in)**

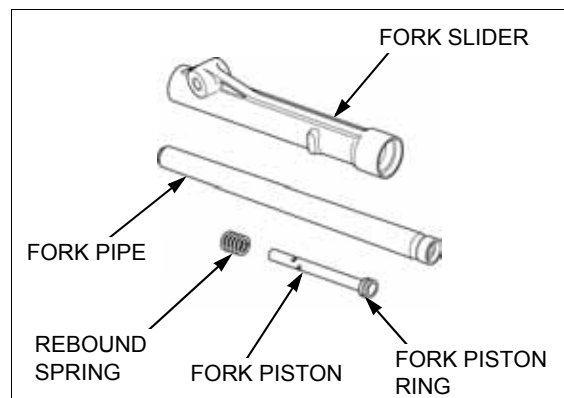


#### FORK PIPE/SLIDER/PISTON

Check the fork pipe, fork slider and fork piston for score mark, and excessive or abnormal wear.

Check the fork piston ring for wear or damage.  
Check the rebound spring for fatigue or damage.

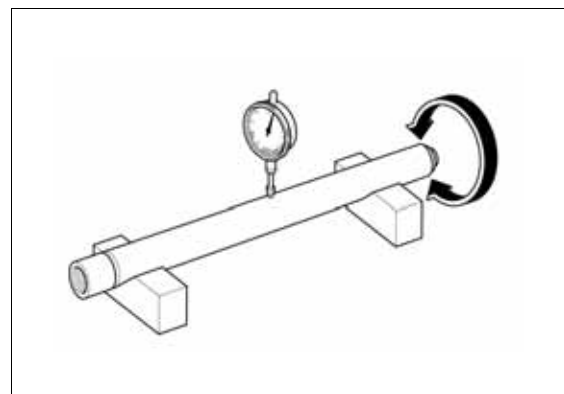
Replace the components if necessary.



Place the fork pipe on V-block and measure the runout.

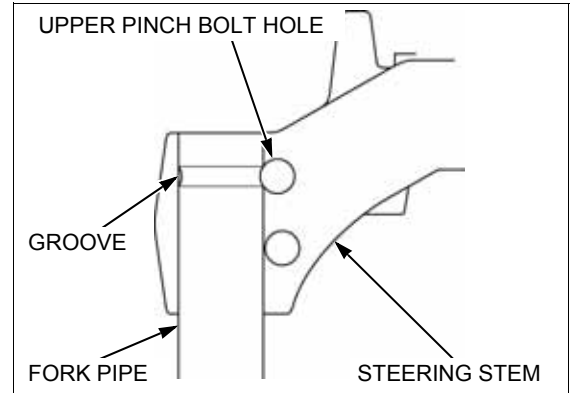
Actual runout is 1/2 the total indicator reading.

**SERVICE LIMIT: 0.20 mm (0.008 in)**



## INSTALLATION

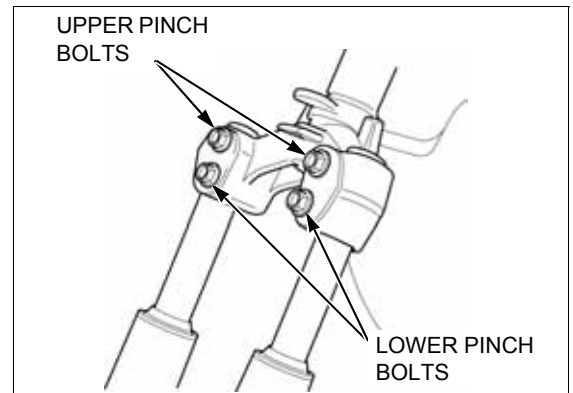
Install the fork pipe into the steering stem.  
Align the upper pinch bolt hole with the groove of the fork pipe as shown.



Install the bottom bridge upper pinch bolts.  
Tighten the bottom bridge upper/lower pinch bolts to the specified torque.

**TORQUE: 74 N·m (7.5 kgf·m, 55 lbf·ft)**

Install the front fender B (page 2-5).

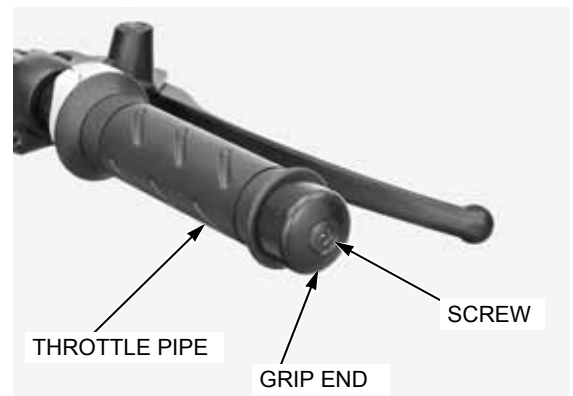


## HANDLEBAR

### REMOVAL

Remove the following:

- Handlebar rear cover (page 2-15)
- Main pipe cover (page 2-10)
- Screw
- Grip end
- Throttle pipe



Release the front brake switch wire (Black, Green/Yellow) connectors.

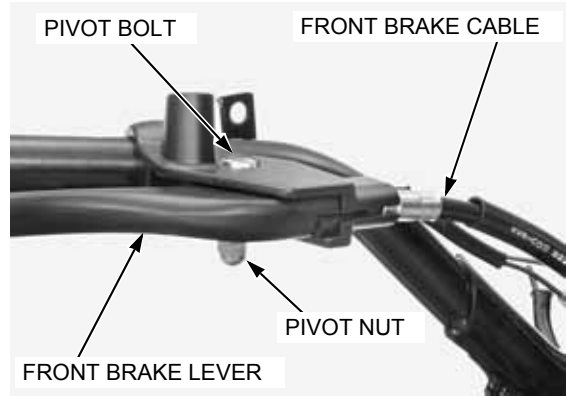




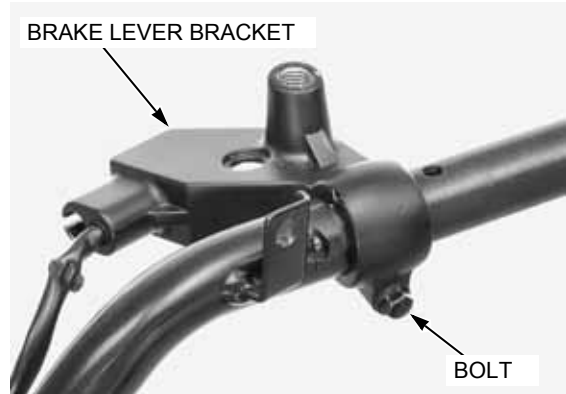
## FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Remove the following:

- Brake lever pivot nut
- Brake lever pivot bolt
- Brake cable
- Brake lever

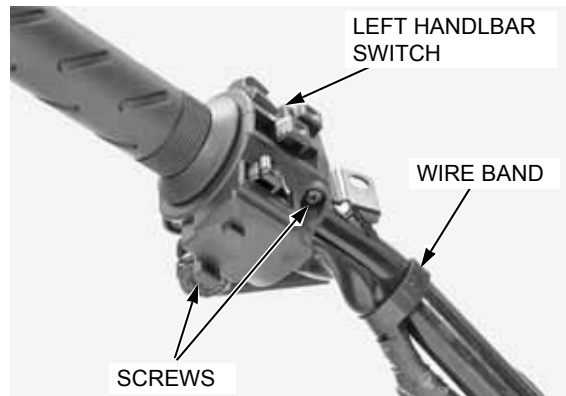


Remove the bolt and brake lever bracket.



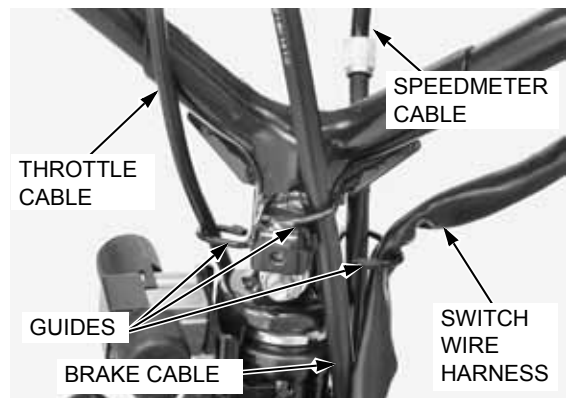
Remove the following:

- Wire band
- Two screws
- Left handlebar switch



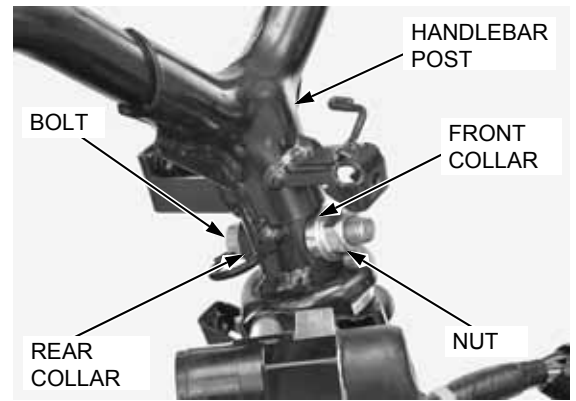
Release the following from the handlebar guides:

- Brake cable
- Throttle cable
- Speedometer cable
- Left handlebar switch wire harness



Remove the following:

- Nut
- Front/rear collars
- Bolt
- Handlebar post

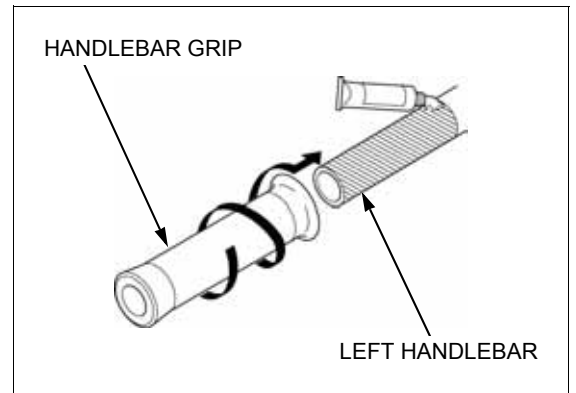


**HANDLEBAR GRIP INSTALLATION**

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.

Wait 3 – 5 minutes and install the grip.

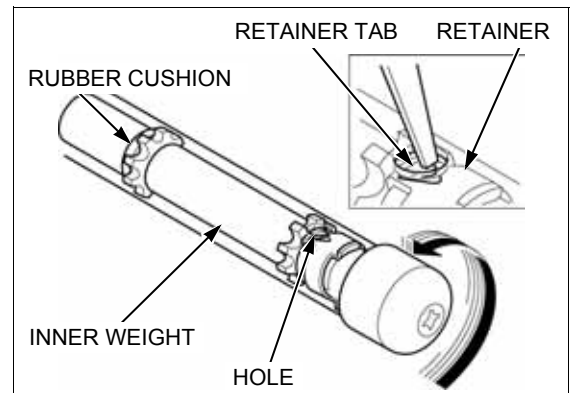
*Allow the adhesive to dry for 1 hour before using.* Rotate the grip for even application of the adhesive.



**HANDLEBAR INNER WEIGHT REPLACEMENT**

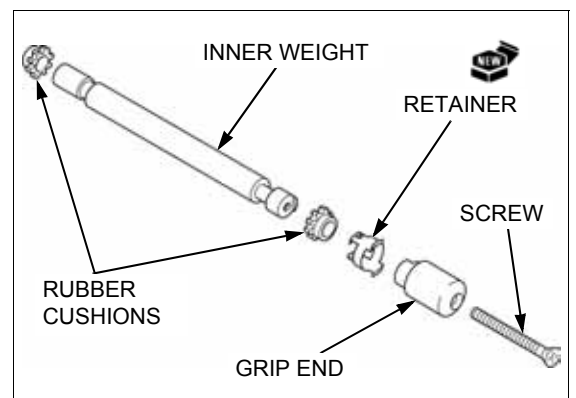
Push the retainer tab through the handlebar hole with a screwdriver or punch.

*Apply lubricant spray through the handlebar hole to the rubber for easy removal.* Temporarily install the grip end and screw, then remove the inner weight assembly by turning the grip end.



Remove the screw, grip end and rubber cushions from the inner weight. Discard the retainer. Check that the condition of the rubber cushions, replace them if necessary.

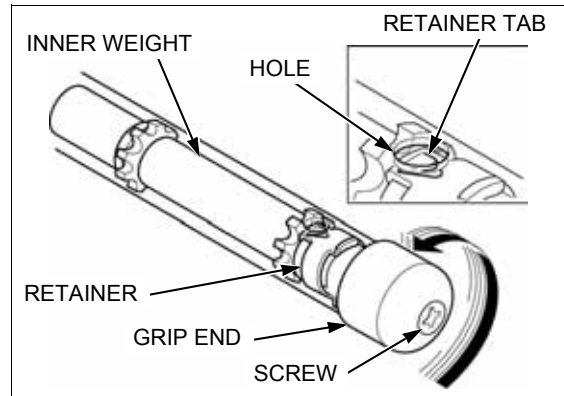
Install the rubber cushions and a new retainer onto the inner weight. Install the grip end onto the inner weight aligning its boss with groove each other. Install the grip end screw.



## FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Insert the inner weight assembly into the handlebar.  
Turn the inner weight and hook the retainer tab with the hole in the handlebar.

Remove the grip end screw and grip end.



### INSTALLATION

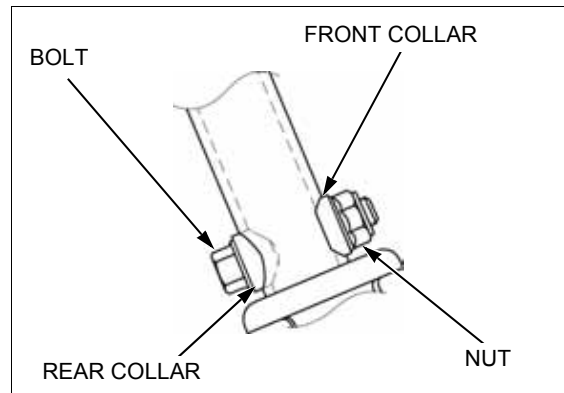
Install the handlebar post onto the steering stem while aligning the bolt holes.

*Rear collar is taller than the front collar.*

Install the front/rear collars, bolt and nut.

Tighten the nut to the specified torque.

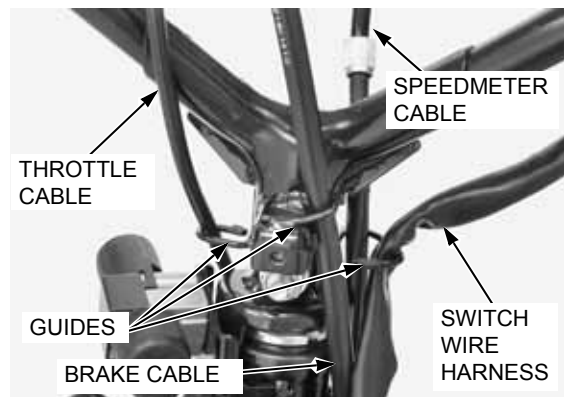
**TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)**



*Route the cable and wire harness properly (page 1-14).*

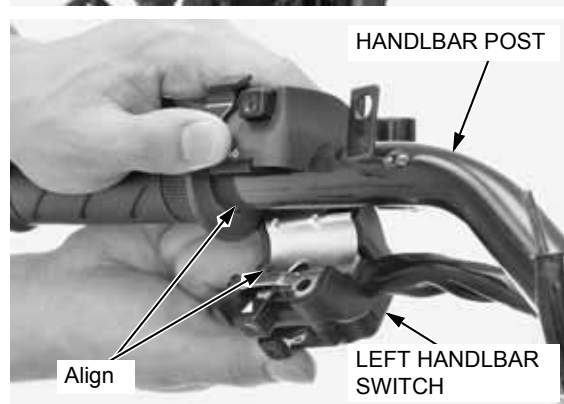
Install the following into the handlebar guides:

- Left handlebar switch wire harness
  - Speedometer cable
  - Throttle cable
  - Brake cable
- Left handlebar switch wire harness must not bite into the handle stopper.



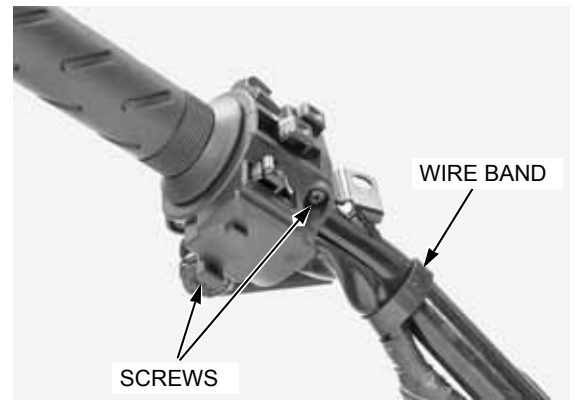
*Route the wire harness properly (page 1-14).*

Install the left handlebar switch by aligning its boss with the hole on the handlebar post.

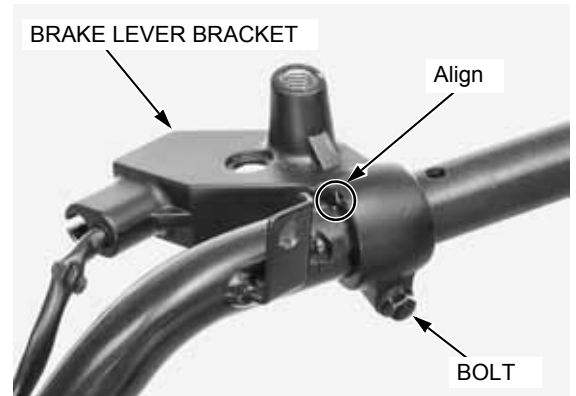


## FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Install and tighten the screws.  
Install the wire band.



Install the brake lever bracket by aligning its cut off with the punch mark on the handlebar post.  
Install and tighten the bolt.



Install the brake cable to the brake lever, then install it to the brake lever bracket.

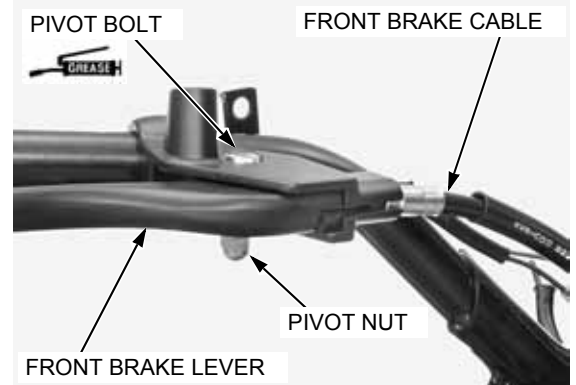
Apply grease to the brake lever pivot bolt.

Install and tighten the brake lever pivot bolt to the specified torque.

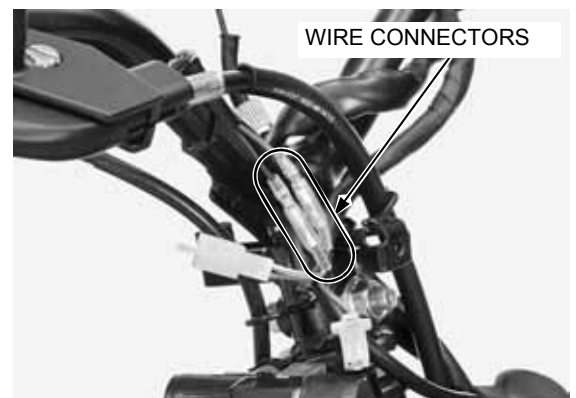
**TORQUE: 1 N·m (0.10 kgf·m, 0.7 lbf·ft)**

Install and tighten the brake lever pivot nut to the specified torque.

**TORQUE: 6 N·m (0.61 kgf·m, 4.4 lbf·ft)**

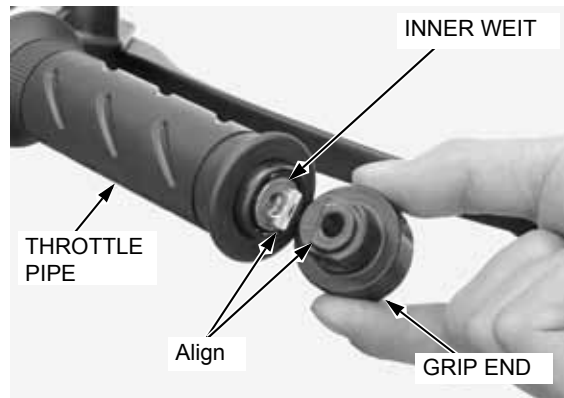


Connect the front brake switch wire (Black, Green/Yellow) connectors.



## FRONT WHEEL/BRAKE/SUSPENSION/STEERING

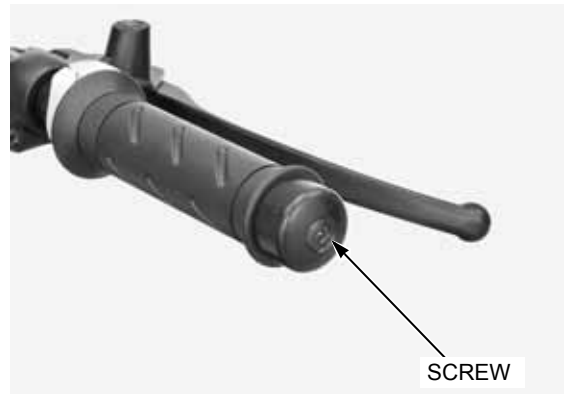
Install the throttle pipe.  
Install the grip end by aligning its boss off with the cut off on the inner weight.



Install and tighten the screw.

Install the following:

- Main pipe cover (page 2-10)
- Handlebar rear cover (page 2-15)



## STEERING STEM

### REMOVAL

Remove the following:

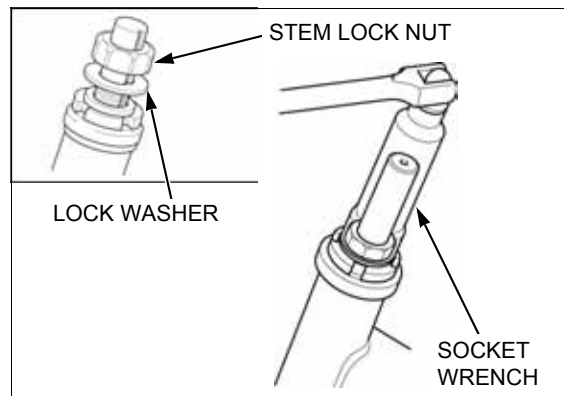
- Fork (page 12-13)
- Handlebar (page 12-19)

Loosen the steering stem lock nut using the socket wrench.

#### TOOL:

**Socket wrench** **07916-KM10000**

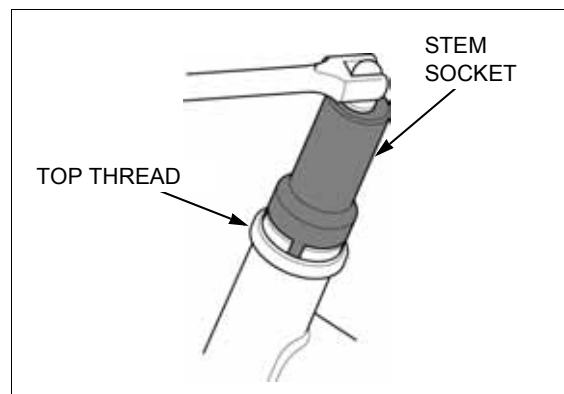
Remove the steering stem lock nut and lock washer.



*Be careful not to drop the steering stem.* Hold the steering stem and remove the top thread using the stem socket.

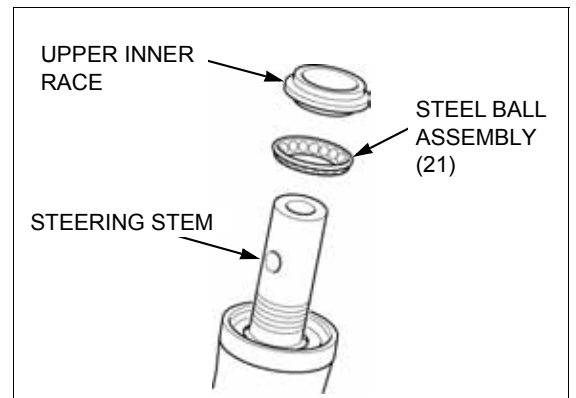
#### TOOL:

**Steering stem socket** **07916-3710101**

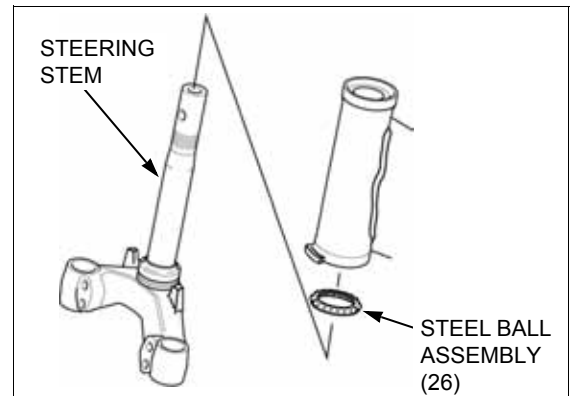


## FRONT WHEEL/BRAKE/SUSPENSION/STEERING

*Be careful not to drop the steering stem and upper steel balls assembly* Remove the upper bearing inner race and upper steel ball assembly (21 balls) while holding the steering stem.



*Be careful not to drop the steering stem and lower steel ball assembly.* Remove the steering stem and lower steel ball assembly (26 balls).

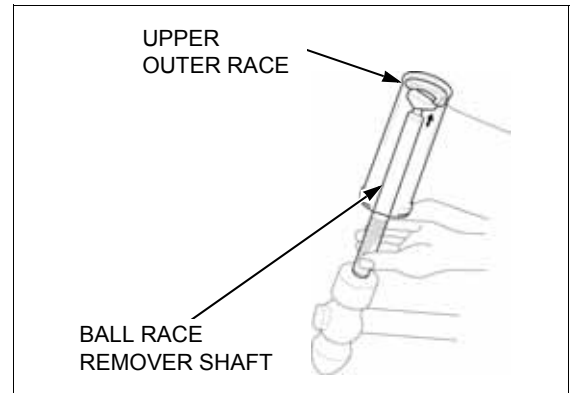


### STEERING STEM BEARINGS REPLACEMENT

- Always replace the steel balls and races as a set.

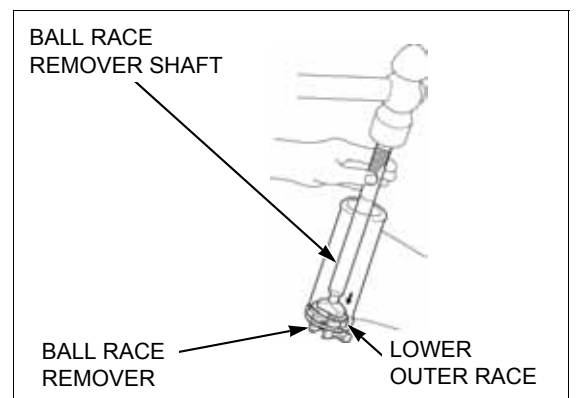
Remove the steering stem (page 12-24).  
Remove the upper bearing outer race using the following tool.

**TOOL:**  
**Ball race remover shaft 07GMD-KS40100**



Remove the lower bearing outer race using the following tools.

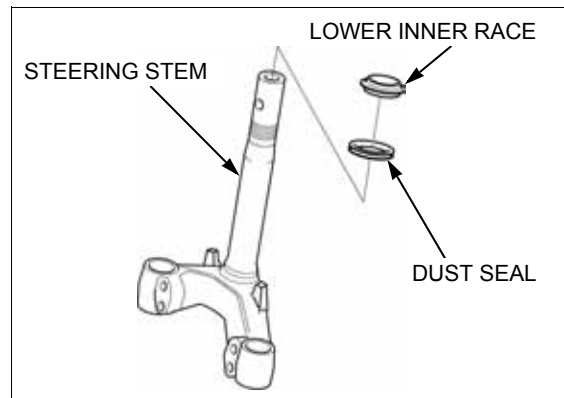
**TOOLS:**  
**Ball race remover, 34.5 mm 07948-4630100**  
**Ball race remover shaft 07GMD-KS40100**



## FRONT WHEEL/BRAKE/SUSPENSION/STEERING

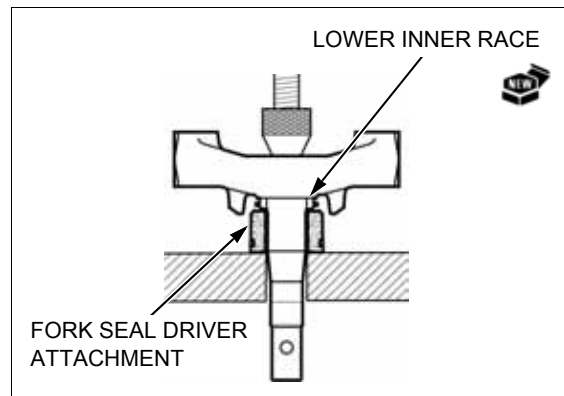
Remove the dust seal from the steering stem lower bearing inner race.

Remove the lower bearing inner race with a chisel or equivalent tool being careful not to damage the stem.

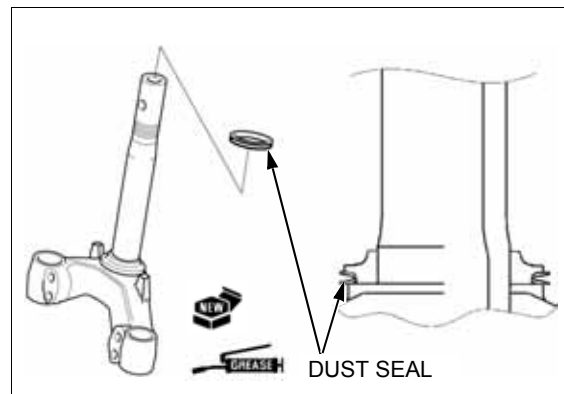


Install a new lower bearing inner race using the following tool and hydraulic press.

**TOOL:**  
**Fork seal driver attachment, 07747-0010501**  
**33.2 mm**

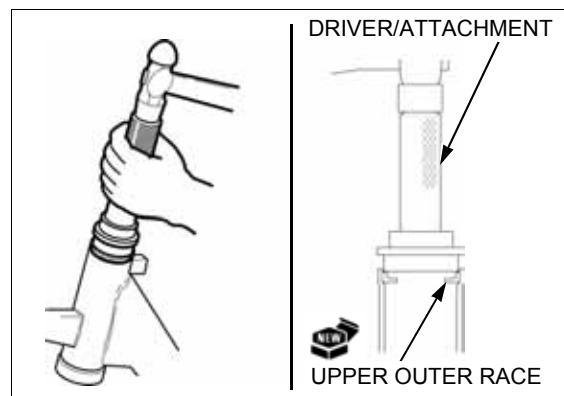


Apply grease with extreme pressure agent (recommended: EXCELIGHT EP2 manufactured by KYODO YUSHI, Japan or Shell ALVANIA EP2 or equivalent) to a new dust seal lip then install it to the lower bearing inner race.



Drive a new upper bearing outer race into the head pipe using the following tools.

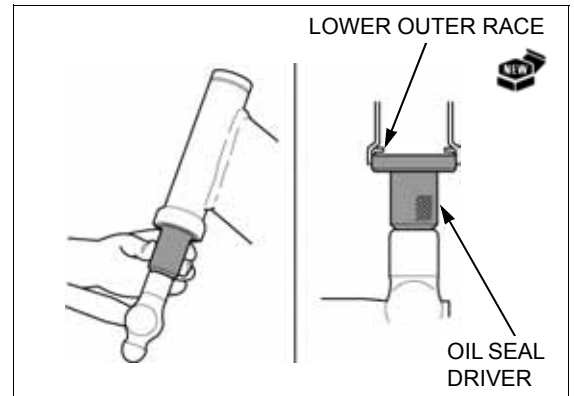
**TOOLS:**  
**Driver 07749-0010000**  
**Bearing driver attachment 07946-3710701**



Drive a new lower bearing outer race into the head pipe using the following tools.

**TOOL:**  
**Oil seal driver 53.5 mm                      07947-SB00200**

Install the steering stem (page 12-27).

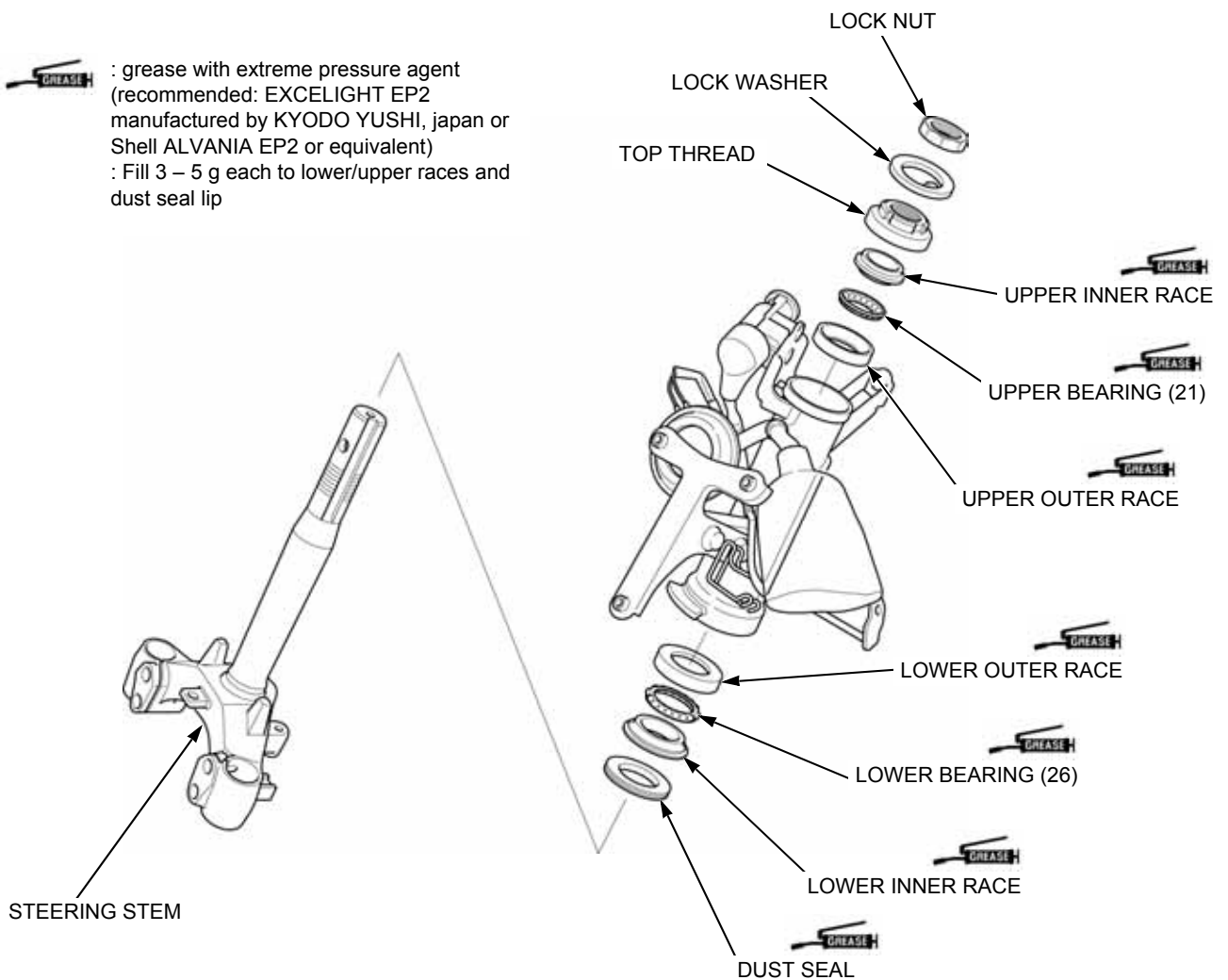


**INSTALLATION**

For steering stem bearing replacement (page 12-25).



: grease with extreme pressure agent (recommended: EXCELIGHT EP2 manufactured by KYODO YUSHI, japan or Shell ALVANIA EP2 or equivalent)  
 : Fill 3 – 5 g each to lower/upper races and dust seal lip





## FRONT WHEEL/BRAKE/SUSPENSION/STEERING

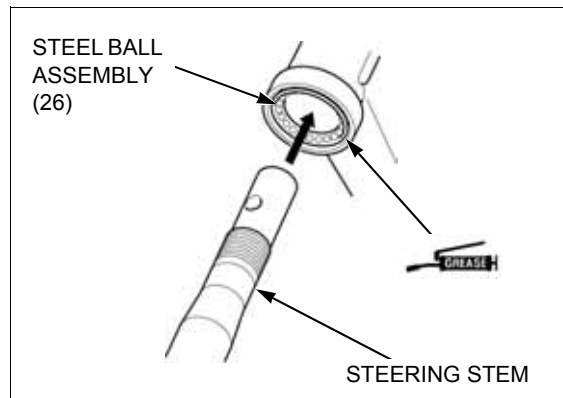
Fill 3 – 5 g of grease with extreme pressure agent (recommended: EXCELIGHT EP2 manufactured by KYODO YUSHI, japan or Shell ALVANIA EP2 or equivalent) to the lower bearing races.

*Replace the bearing races and balls as a set.*

Attach the steel ball assembly (26 balls) to the lower bearing outer race.

*Be careful not to drop the steering stem and lower steel balls assembly.*

Insert the steering stem into the steering head pipe, being careful not to drop the steel balls assembly.



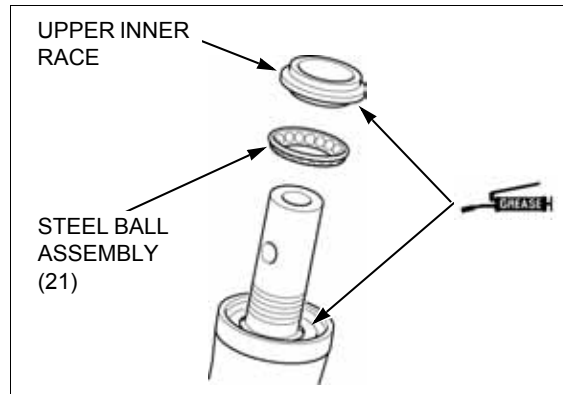
Fill 3 – 5 g of grease with extreme pressure agent (recommended: EXCELIGHT EP2 manufactured by KYODO YUSHI, japan or Shell ALVANIA EP2 or equivalent) to the upper bearing races.

*Replace the bearing races and balls as a set.*

Install the steel ball assembly (21 balls) onto the upper bearing outer race.

*Be careful not to drop the steering stem and upper steel balls assembly.*

Install the upper bearing inner race onto the stem.

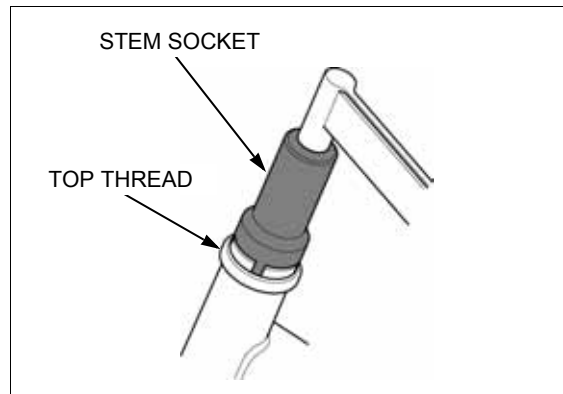


Install the top thread.  
Hold the steering stem and tighten the stem top thread to the initial torque using the special tool.

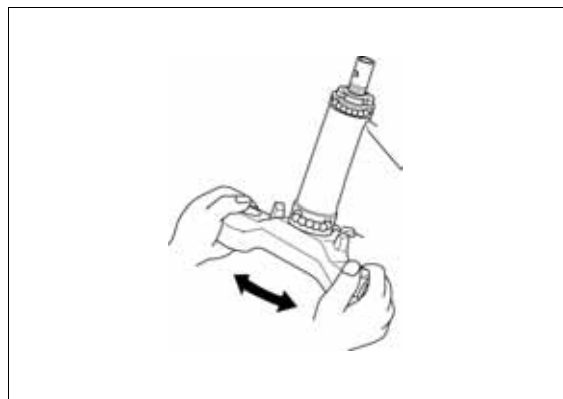
### TOOL:

**Steering stem socket**                      **07916-3710101**

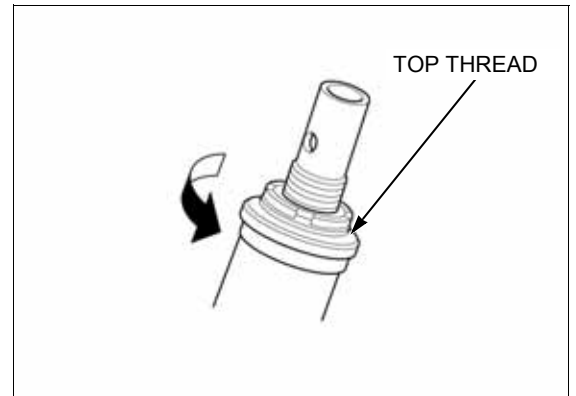
**TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)**



Turn the steering stem lock-to-lock several times to seat the bearing.



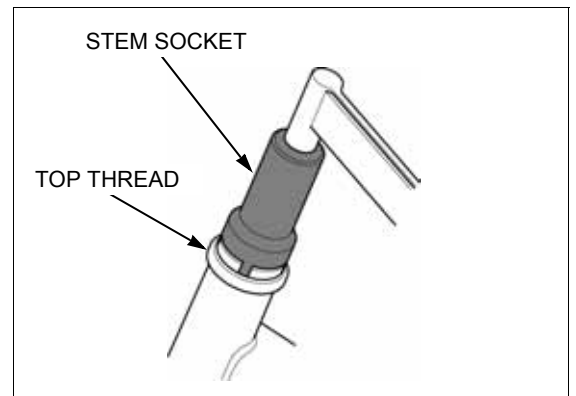
Completely loosen the top thread.



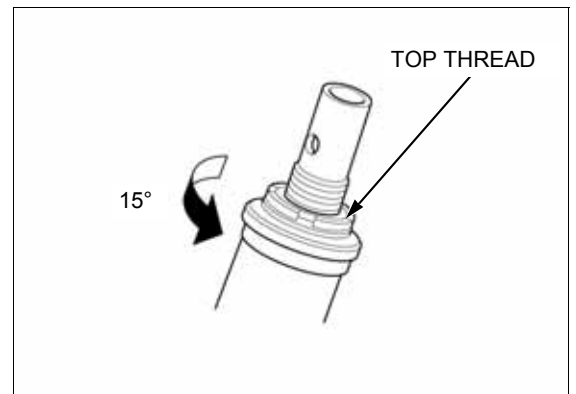
Hold the steering stem and tighten the stem top thread to the specified torque using the special tool.

**TOOL:**  
**Steering stem socket**                      **07916-3710101**

**TORQUE: 2.5 N·m (0.25 kgf·m, 1.8 lbf·ft)**



Turn the top thread counterclockwise about 15 degrees.



Install the lock washer by aligning its tab with the groove of the steering stem.

Tighten the steering stem lock nut to the specified torque.

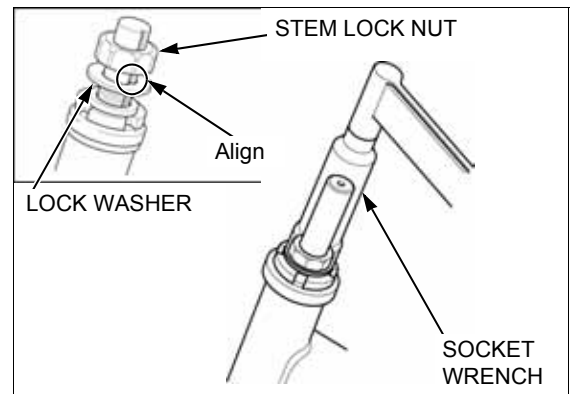
**TOOL:**  
**Socket wrench**                                      **07916-KM10000**

**TORQUE: 74 N·m (7.5 kgf·m, 55 lbf·ft)**

Turn the steering stem lock-to-lock several times.  
Make sure the steering stem moves smoothly without play or binding.

Install the following:

- Fork (page 12-19)
- Handlebar (page 12-22)



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**MEMO**

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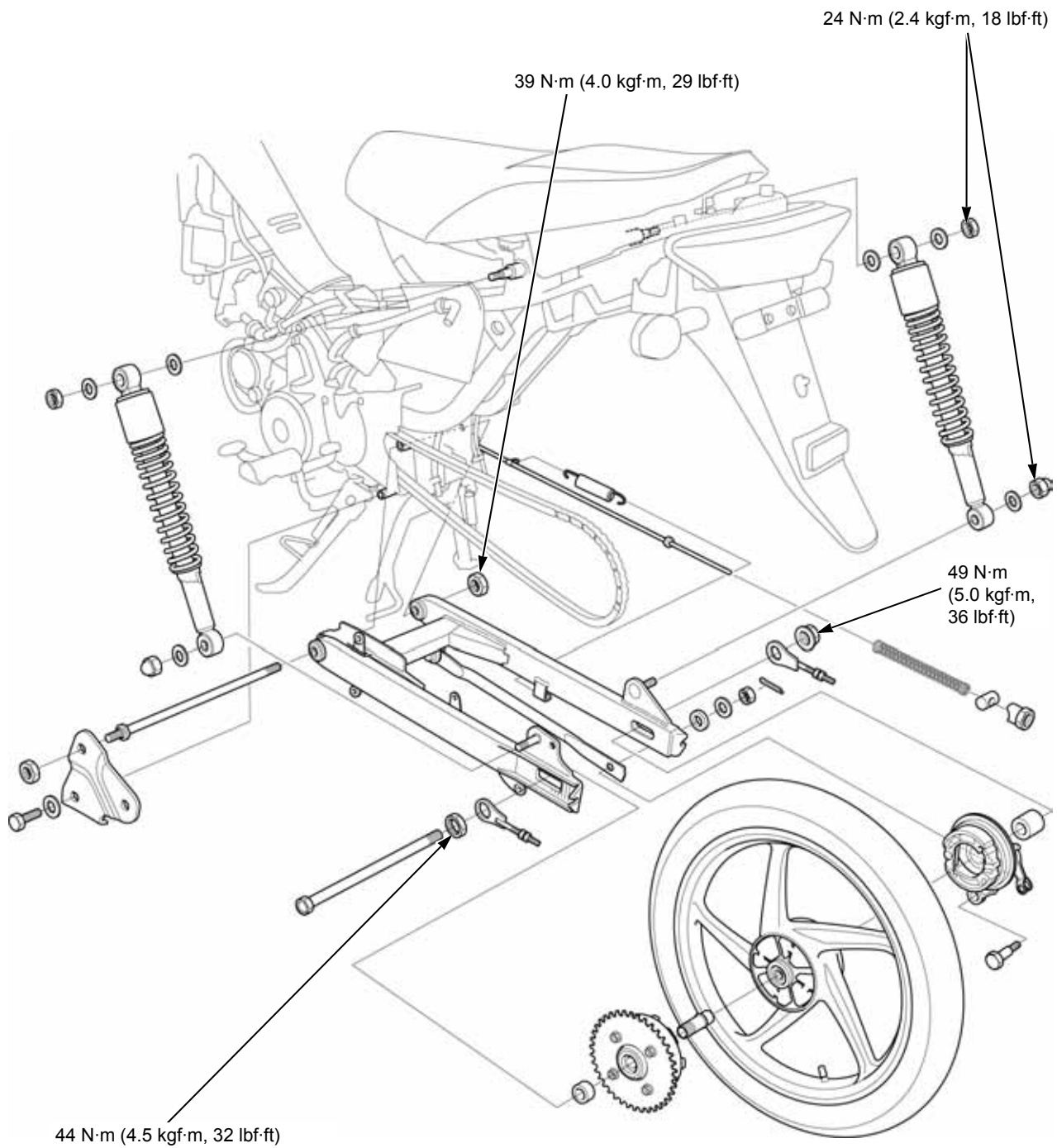
# 13. REAR WHEEL/BRAKE/SUSPENSION

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COMPONENT LOCATION .....	13-2	REAR BRAKE .....	13-14
SERVICE INFORMATION .....	13-3	SWINGARM .....	13-17
TROUBLESHOOTING.....	13-5	SHOCK ABSORBER .....	13-21
REAR WHEEL .....	13-6	BRAKE PEDAL .....	13-22
DRIVEN FLANGE.....	13-11		

## 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.

- This section covers service of the rear wheel, rear brake, swingarm, shock absorber and brake pedal.
- A contaminated brake drum or shoe reduces stopping power. Discard contaminated shoes and clean a contaminated drum with a high quality brake degreasing agent.
- When servicing the rear wheel and suspension, support the motorcycle with its centerstand.
- Use only 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 indicator
Cold tire pressure	Driver only	225 kPa (2.25 kgf/cm <sup>2</sup> , 33 psi)	–
	Driver and passenger	280 kPa (2.80 kgf/cm <sup>2</sup> , 41 psi)	–
Axle runout		–	0.20 (0.008)
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Wheel hub-to-rim distance		6.0 ± 1.0 (0.24 ± 0.04)	–
Drive chain	Size – link	428 – 104	–
	Slack	30 – 40 (1.2 – 1.6)	–
Brake drum I.D.		110.0 – 110.2 (4.33 – 4.34)	111.0 (4.37)
Brake pedal freeplay		20 – 30 (0.8 – 1.2)	–

### TORQUE VALUES

Rear axle nut	49 N·m (5.0 kgf·m, 36 lbf·ft)	U-nut
Rear axle sleeve nut	44 N·m (4.5 kgf·m, 32 lbf·ft)	
Rear spoke (Spoke wheel type)	3.7 N·m (0.38 kgf·m, 2.7 lbf·ft)	
Driven sprocket nut	32 N·m (3.3 kgf·m, 24 lbf·ft)	Apply engine oil to the threads and seating surface.
Driven flange stud bolt	–	See page 13-13
		Apply locking agent to the threads.
Rear brake arm nut	10 N·m (1.0 kgf·m, 7 lbf·ft)	U-nut
Shock absorber upper mounting bolt	24 N·m (2.4 kgf·m, 18 lbf·ft)	
Shock absorber lower mounting cap nut	24 N·m (2.4 kgf·m, 18 lbf·ft)	
Swingarm pivot nut	39 N·m (4.0 kgf·m, 29 lbf·ft)	

## REAR WHEEL/BRAKE/SUSPENSION

### TOOLS

<p>Spoke wrench, 5.8 × 6.1 mm 07701-0020300</p>  A long, thin metal spoke wrench with a curved handle and a small hook at the end.	<p>Attachment, 32 × 35 mm 07746-0010100</p>  A cylindrical metal attachment with a central hole and a flange at the top.	<p>Attachment, 37 × 40 mm 07746-0010200</p>  A cylindrical metal attachment with a central hole and a flange at the top, similar to the previous one but larger.
<p>Pilot, 12 mm 07746-0040200</p>  A small cylindrical metal pilot with a central hole.	<p>Pilot, 17 mm 07746-0040400</p>  A small cylindrical metal pilot with a central hole, larger than the 12 mm one.	<p>Bearing remover shaft 07746-0050100</p>  A long, thin metal shaft with a tapered end and a textured grip section.
<p>Bearing remover head, 12 mm 07746-0050300</p>  A small cylindrical metal bearing remover head with a central hole.	<p>Driver 07749-0010000</p>  A long, cylindrical metal driver with a textured grip section and a central hole.	

## **TROUBLESHOOTING**

### **Rear wheel wobbles**

- Bent rim
- Worn wheel bearings
- Loose or distorted spokes (spoke wheel type)
- Faulty tire
- Improperly tightened axle fasteners
- Faulty swingarm pivot bushings
- Insufficient tire pressure

### **Soft suspension**

- Weak shock absorber springs
- Oil leakage from damper unit
- Low tire pressure

### **Stiff suspension**

- Bent shock absorber damper rod
- Damaged swingarm pivot bushings
- Bent swingarm pivot
- High tire pressure
- Damaged shock absorber bushings

### **Steers to one side or does not track straight**

- Bent rear axle
- Bent frame
- Damaged swingarm pivot bushing
- Axle alignment/chain adjustment not equal on both sides

### **Poor brake performance**

- Improper brake adjustment
- Worn brake linings
- Contaminated brake linings
- Worn brake cam
- Worn brake drum
- Brake arm serrations improperly engaged
- Worn brake shoes at cam contact faces



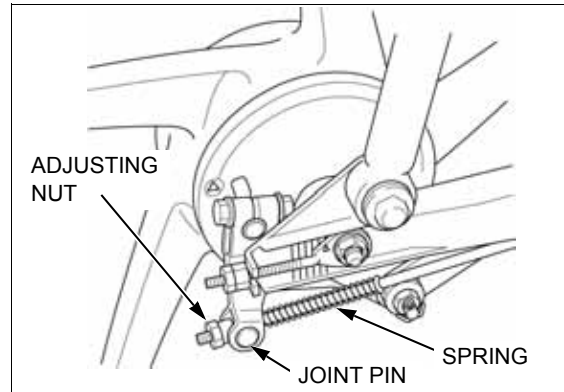
## REAR WHEEL/BRAKE/SUSPENSION

### REAR WHEEL

#### REMOVAL

Support the motorcycle with its centerstand.

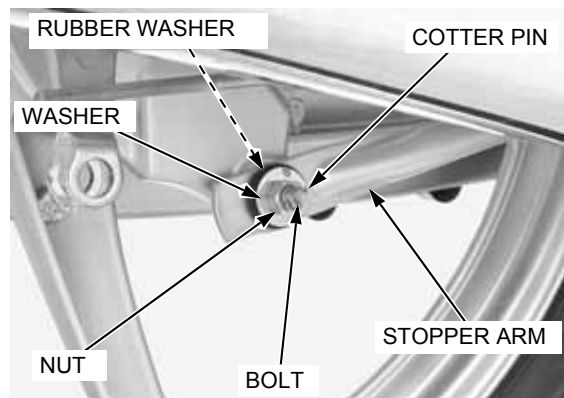
Remove the brake adjusting nut, spring and joint pin.



Remove the following:

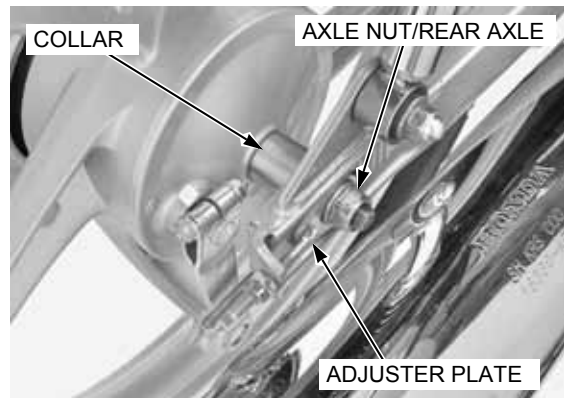
- Cotter pin
- Nut
- Washer
- Rubber washer

Remove the bolt and release the stopper arm from the brake panel.

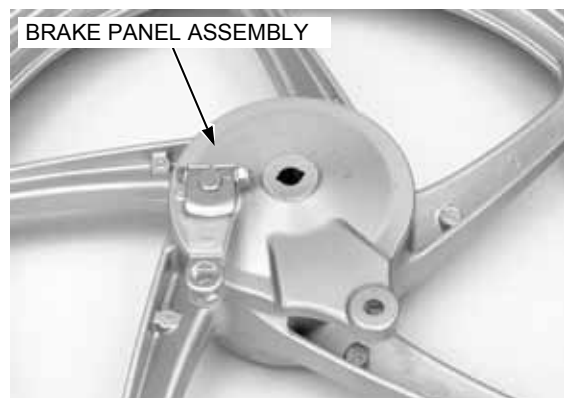


Remove the following:

- Rear axle nut
- Rear axle
- Right adjuster plate
- Rear wheel
- Right side collar



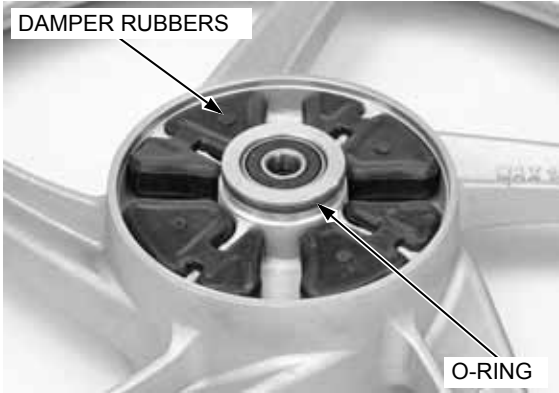
Remove the brake panel assembly from the right wheel hub.



**DISASSEMBLY**

*Replace the damper rubbers as a set.*

Remove the damper rubbers and O-ring.

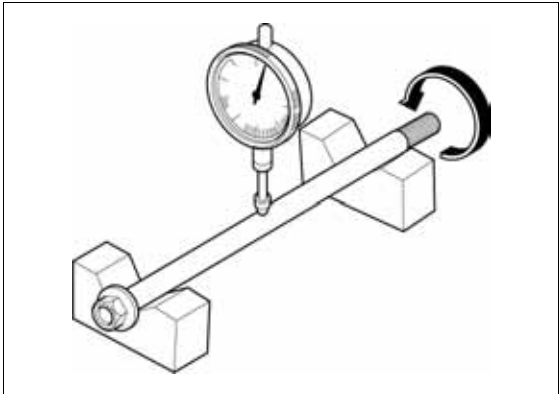


**INSPECTION**

**AXLE**

Set the rear axle in V-blocks.  
Turn the rear axle and measure the runout using a dial indicator.  
Actual runout is 1/2 the total indicator reading.

**SERVICE LIMIT: 0.20 mm (0.008 in)**

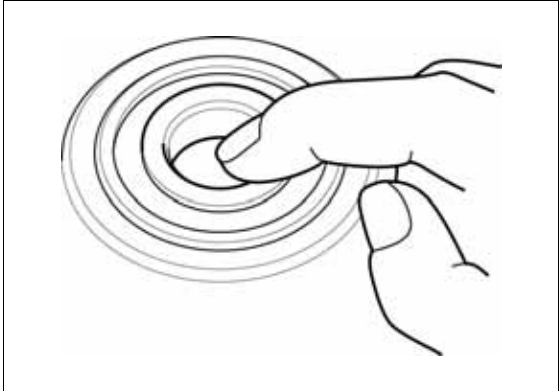


**WHEEL BEARING**

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 wheel hub.

*Replace the bearings in pairs.*

Replace the bearings if the inner race does not turn smoothly and quietly, or if the outer race fit loosely in the wheel hub.



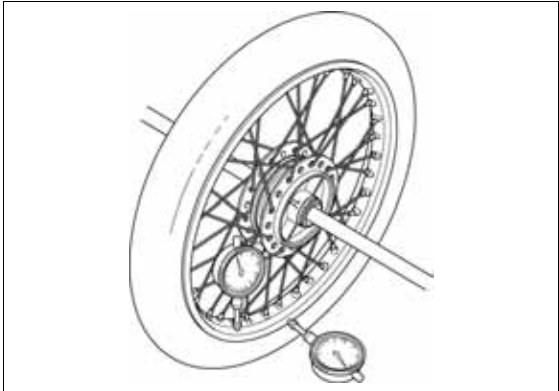
**WHEEL RIM**

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)**



## REAR WHEEL/BRAKE/SUSPENSION

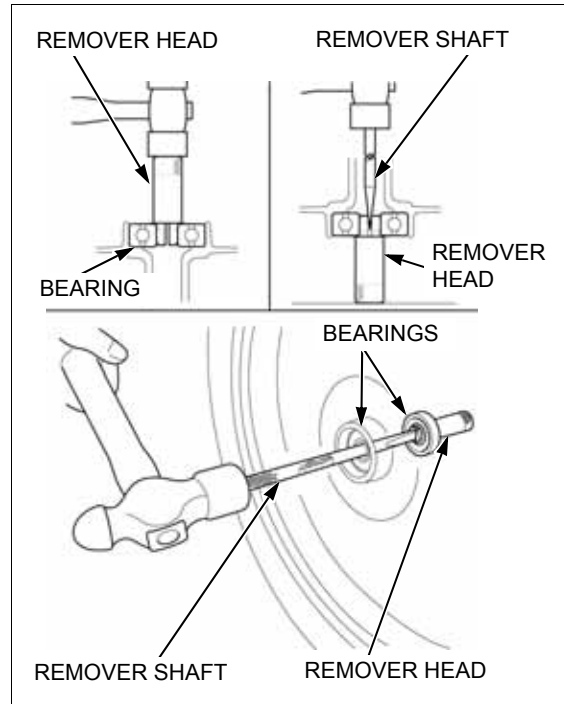
### WHEEL BEARING REPLACEMENT

*Replace the wheel bearings in pairs. Do not reuse the old bearings.*

Install the bearing remover head into the wheel bearing. From opposite side install the bearing remover shaft and drive the bearing out of the wheel hub. Remove the distance collar and drive out the other bearing.

**TOOLS:**

**Bearing remover head, 12 mm** 07746-0050300  
**Bearing remover shaft** 07746-0050100

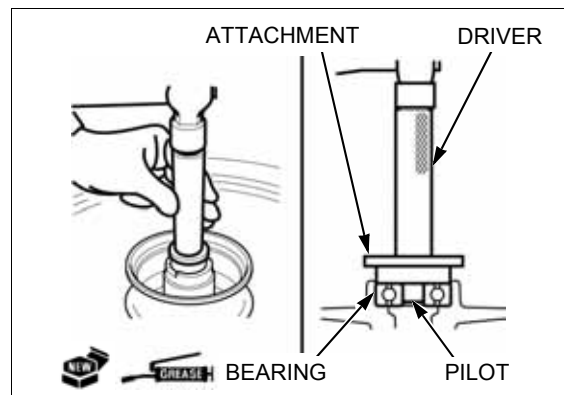


Pack all bearing cavities with grease.

Drive in a new right bearing squarely with its sealed side facing up until it is fully seated.

**TOOLS:**

**Driver** 07749-0010000  
**Attachment, 37 x 40 mm** 07746-0010200  
**Pilot, 12 mm** 07746-0040200

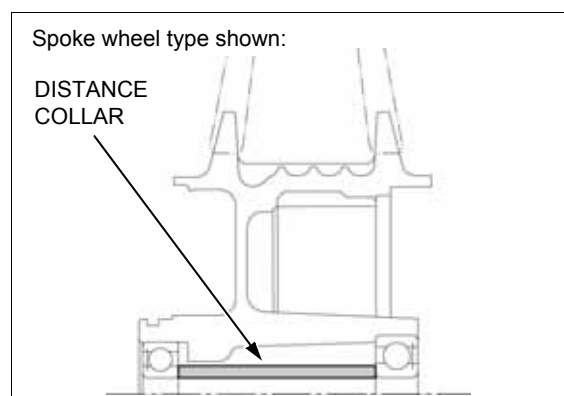


Install the distance collar.

Drive in a new left bearing squarely with its sealed side facing up.

**TOOLS:**

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



**WHEEL CENTER ADJUSTMENT  
(Spoke wheel type)**

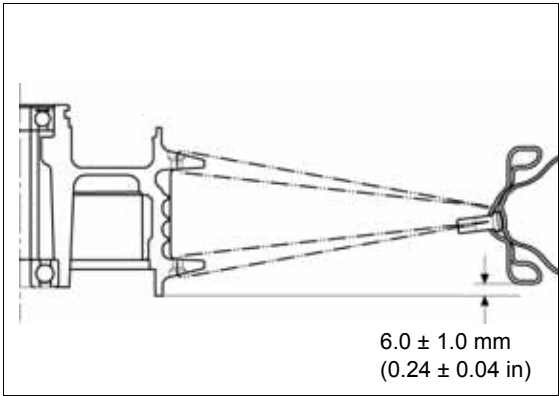
Place the wheel rim on the work bench.  
Place the wheel hub in the center of the rim and begin lacing with new spokes.

Adjust the wheel hub position so that the distance from the wheel hub right end surface to the side of rim is  $6.0 \pm 1.0$  mm ( $0.24 \pm 0.04$  in) as shown.

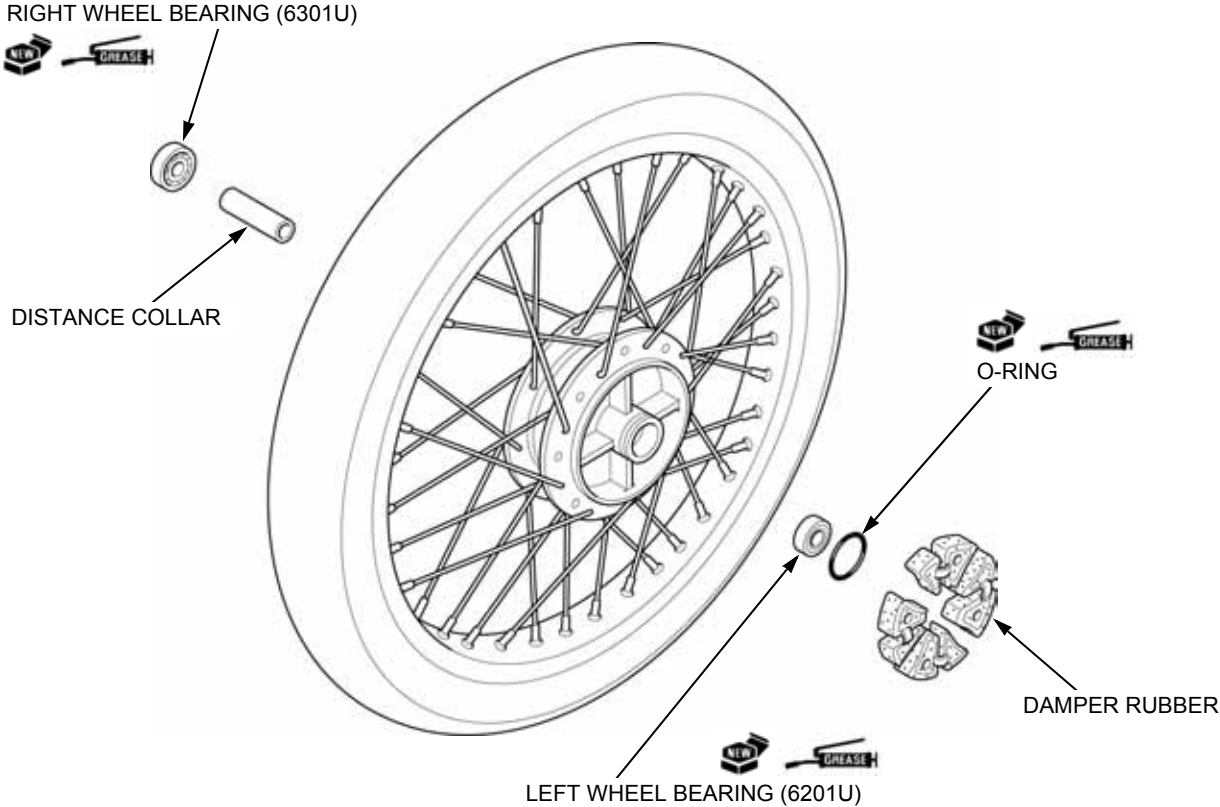
**TOOL:**  
Spoke wrench, 4.5 x 5.1 mm    07701-0020200

**TORQUE:** 3.7 N·m (0.38 kgf·m, 2.7 lbf·ft)

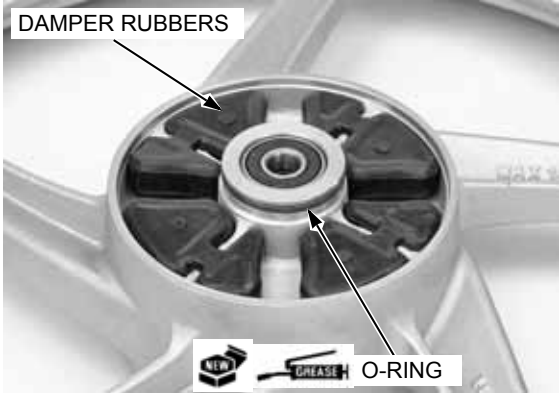
Check the rim runout (page 13-7).



**ASSEMBLY**



Install the damper rubbers into the wheel hub.  
Apply grease to a new O-ring and install it into the groove of the wheel hub.

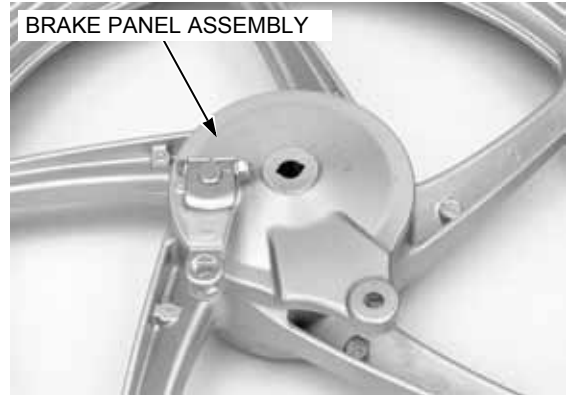


## REAR WHEEL/BRAKE/SUSPENSION

### INSTALLATION

*Do not get grease on the brake drum or stopping power will be reduced.*

Install the brake panel assembly into the wheel hub.



Place the rear wheel between the driven flange and swingarm.

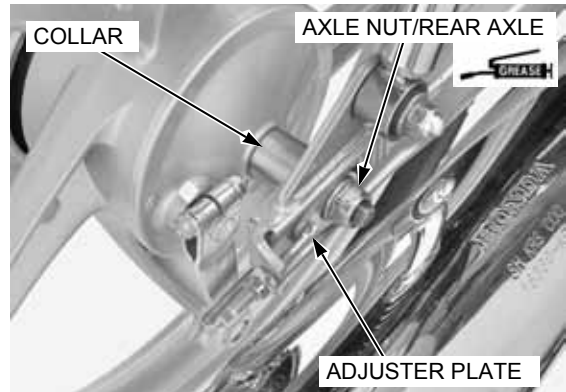
Apply grease to the rear axle surface.

Install the following:

- Rear axle
- Right side collar
- Right adjuster plate
- Rear axle nut

Tighten the rear axle nut to the specified torque.

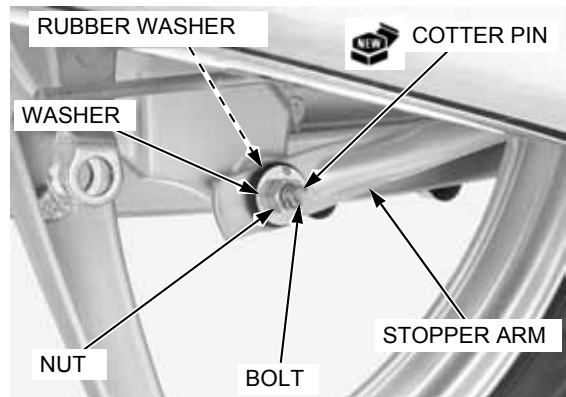
**TORQUE: 49 N·m (5.0 kgf·m, 36 lbf·ft)**



Install the stopper arm to the brake panel with bolt, rubber washer, washer and nut.

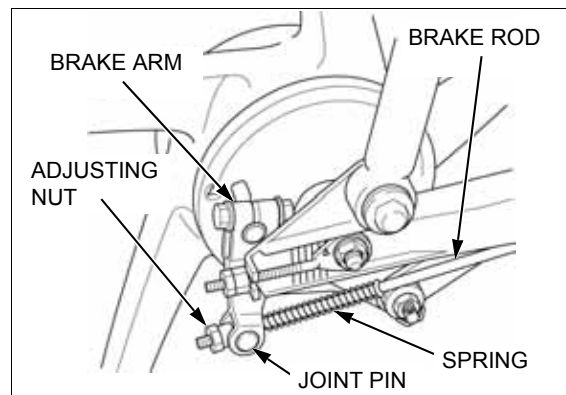
Tighten the nut.

Install a new cotter pin.



Install the joint pin into the brake arm, then install the spring, brake rod and adjusting nut.

Adjust the brake pedal freeplay (page 3-18).



## DRIVEN FLANGE

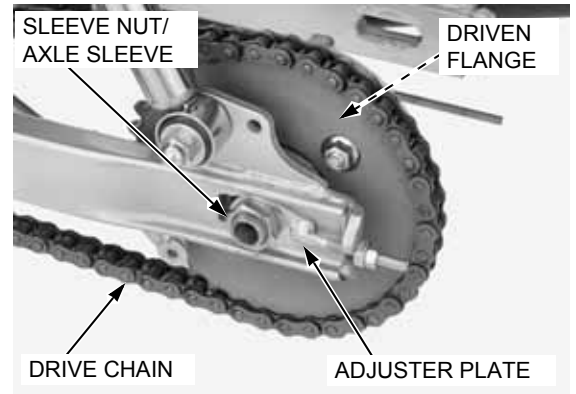
### REMOVAL

Remove the following:

- Chain cases (page 2-20)
- Rear wheel (page 13-6)

Loosen the sleeve nut and derail the drive chain from the driven sprocket.

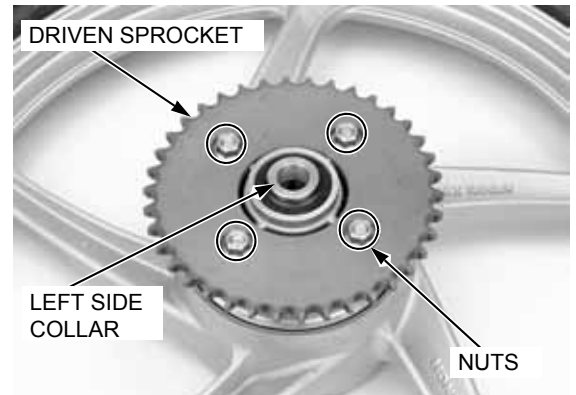
Remove the sleeve nut, axle sleeve, left adjuster plate and driven flange.



### DISASSEMBLY

Remove the left side collar.

Temporarily install the driven flange into the wheel hub. Remove the driven sprocket nuts and driven sprocket.



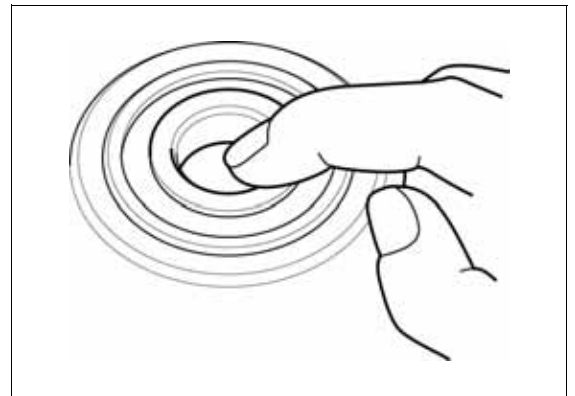
### INSPECTION

#### Driven flange bearing

Turn the inner race of bearing with your finger.

Bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the driven flange.

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



## REAR WHEEL/BRAKE/SUSPENSION

### DRIVEN FLANGE BEARING REPLACEMENT

Remove the dust seal.



Drive out the driven flange bearing.



Install a new driven flange bearing squarely until it is fully seated.

#### TOOLS:

**Driver**

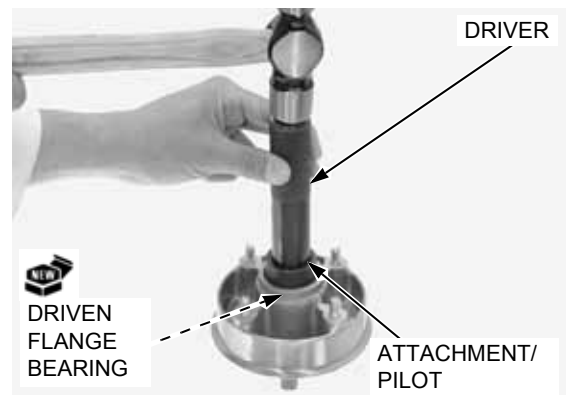
**07749-0010000**

**Attachment, 37 x 40 mm**

**07746-0010200**

**Pilot, 17 mm**

**07746-0040400**



Apply grease to new dust seal lips, then install it into the driven flange until it is flush with the driven flange end surface.



**DRIVEN FLANGE STUD BOLT REPLACEMENT**

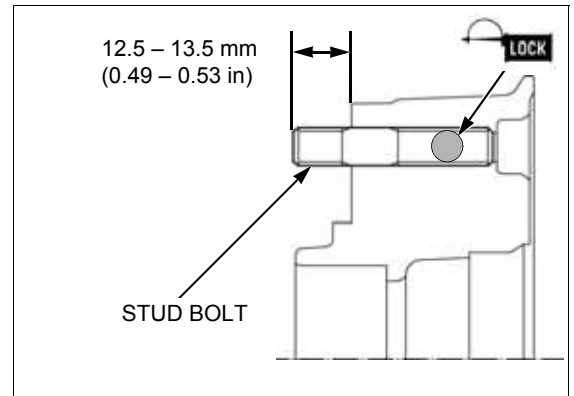
Apply locking agent to the driven flange stud bolt threads.

Install and tighten the driven flange stud bolt to specified torque.

**TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)**

After installing the stud bolts, check that the height from the bolt head to the driven flange surface is within specification.

**STANDARD: 12.5 – 13.5 mm (0.49 – 0.53 in)**

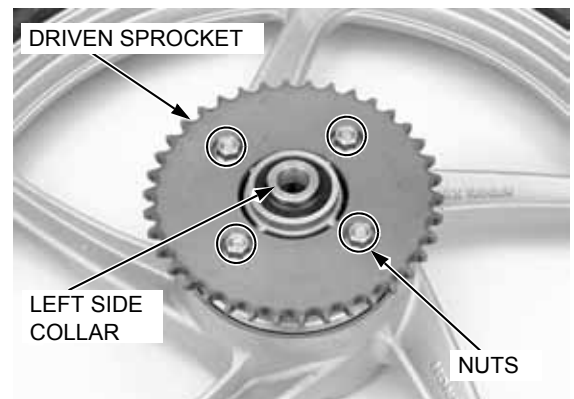


**ASSEMBLY**

Temporarily install the driven flange into the wheel hub. Install the driven sprocket and tighten the nuts to the specified torque.

**TORQUE: 32 N·m (3.3 kgf·m, 24 lbf·ft)**

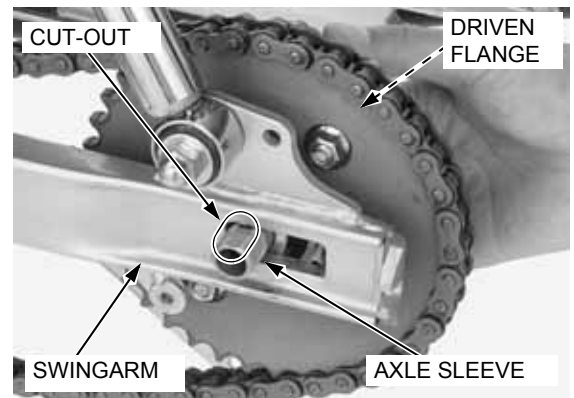
Install the left side collar.



**INSTALLATION**

Install the axle sleeve into the driven flange.

Install the driven flange onto the swingarm, while aligning the cut-out of the axle sleeve with the swingarm.



Install the left adjuster plate and sleeve nut but do not tighten it yet.

Install the drive chain to the driven sprocket.

Install the following:

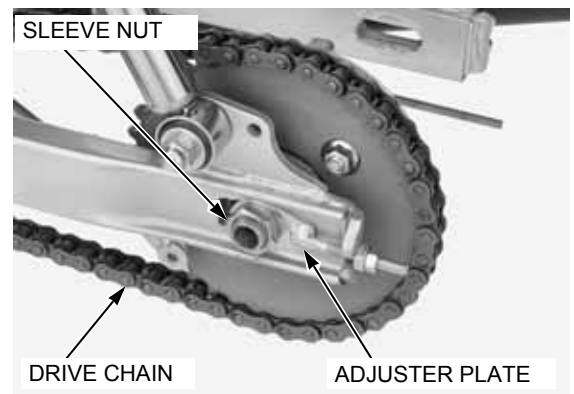
- Rear wheel (page 13-10)
- Chain cases (page 2-20)

Adjust the drive chain slack (page 3-14).

After adjusting the drive chain, tighten the rear axle sleeve nut and rear axle nut to the specified torque.

**TORQUE:**

- REAR AXLE SLEEVE NUT**      **44 N·m (4.5 kgf·m, 32 lbf·ft)**
- REAR AXLE NUT**      **49 N·m (5.0 kgf·m, 36 lbf·ft)**





### REAR BRAKE

#### INSPECTION

Remove the rear wheel and brake panel (page 13-6).

Measure the rear brake drum I.D.

**SERVICE LIMIT: 111.0 mm (4.37 in)**

Install the brake panel and rear wheel (page 13-10).

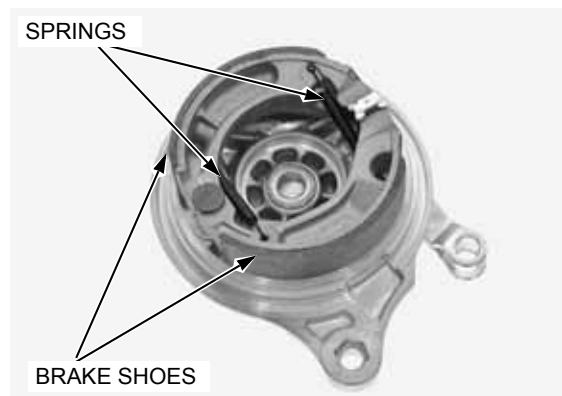


#### DISASSEMBLY

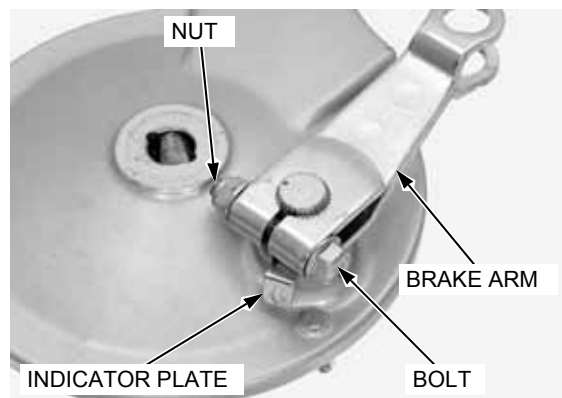
Remove the rear wheel and brake panel (page 13-6).

Remove the brake shoes and springs.

- Always replace the brake shoes as a set.
- When the brake shoes are reused, mark all parts before disassembly so they can be installed in their original locations.

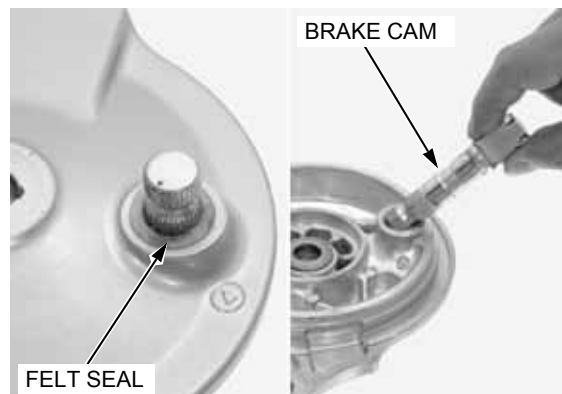


Remove the nut, bolt and brake arm.  
Remove the indicator plate.

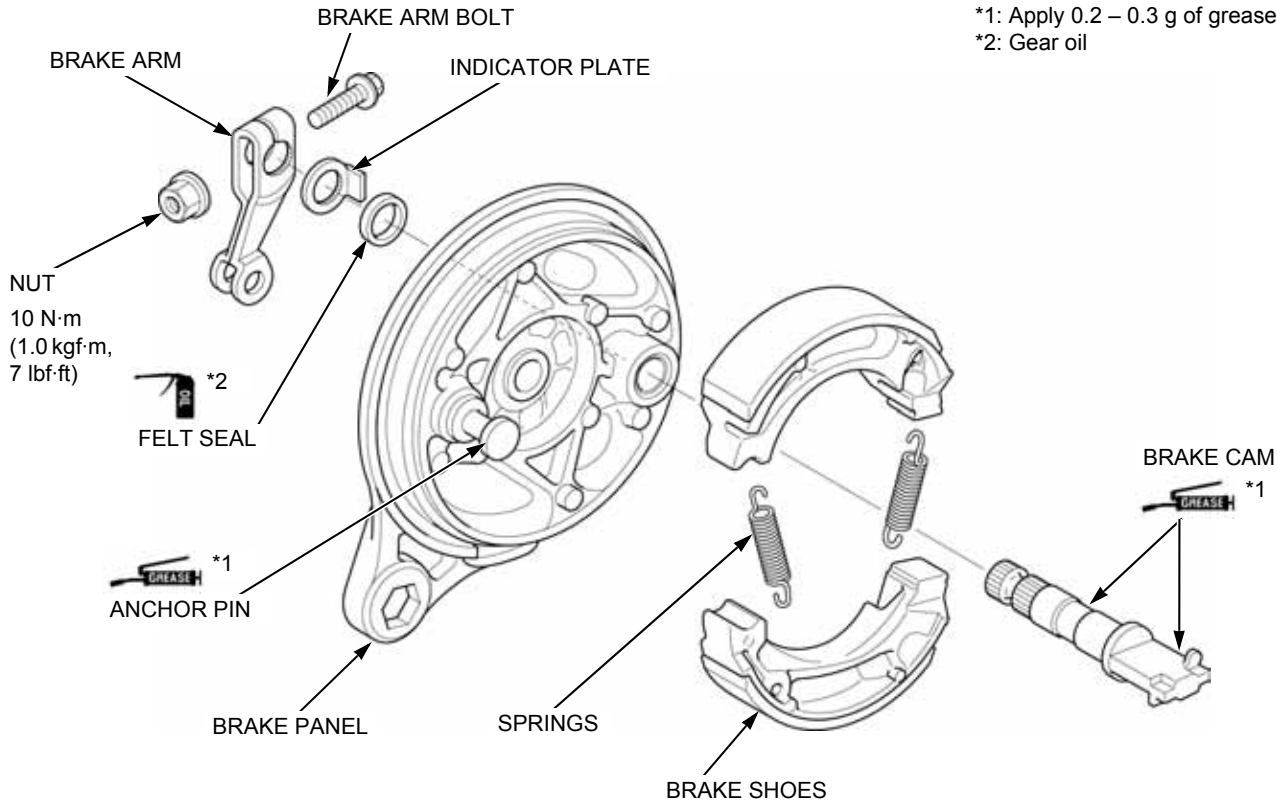


Remove the felt seal and brake cam from the brake panel.

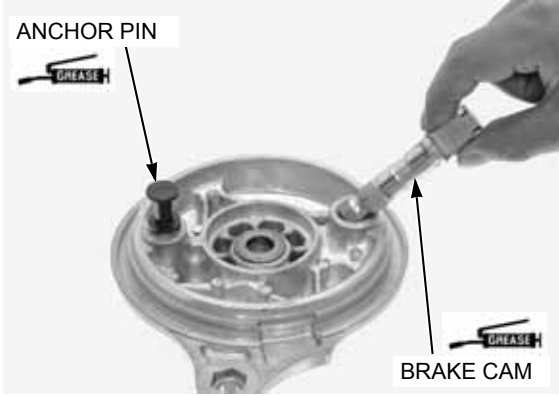
Check the condition of the felt seal, replace it if necessary.



ASSEMBLY



Apply 0.2 – 0.3 g of grease to the brake panel anchor pin.  
Apply 0.2 – 0.3 g of grease to the brake cam sliding surface and brake shoes contact area.  
Install the brake cam into the brake panel.

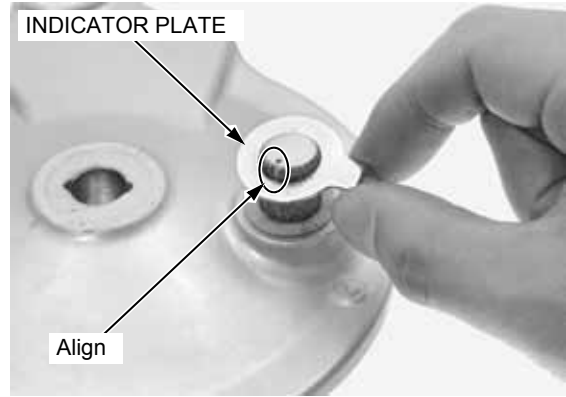


Apply gear oil to the felt seal and install it onto the brake panel.



## REAR WHEEL/BRAKE/SUSPENSION

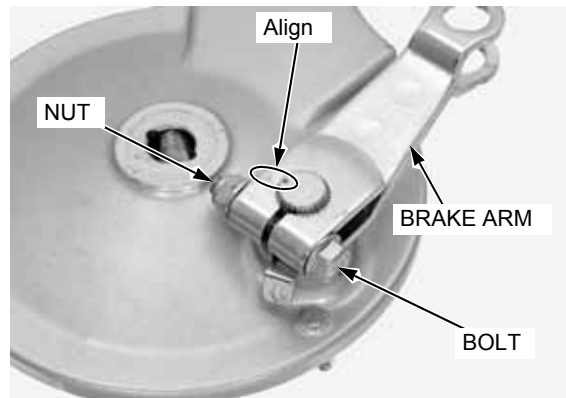
Install the indicator plate on the brake cam by aligning its wide tooth with the wide groove on the brake cam.



Install the brake arm by aligning the punch marks of the brake arm and brake cam.

Install the brake arm bolt and nut.  
Tighten the nut to the specified torque.

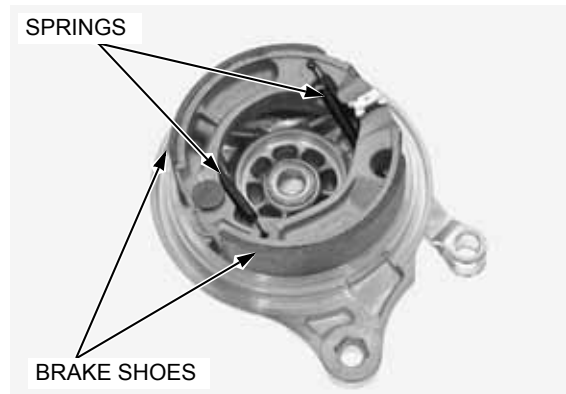
**TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)**



*If the brake shoes are reused, the shoes and springs must be placed back in their original locations.*

Install the brake shoes and springs.

Install the brake panel and rear wheel (page 13-10).



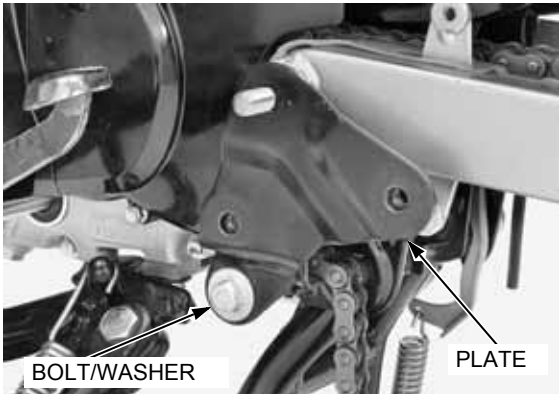
# SWINGARM

## REMOVAL

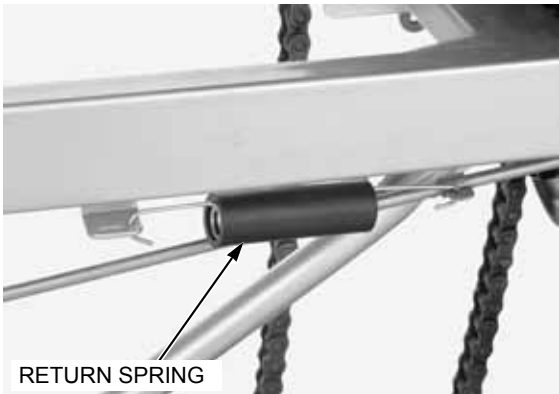
Support the motorcycle with its centerstand.

Remove the following:

- Exhaust pipe/muffler (page 2-20)
- Passenger footpeg holder (page 2-19)
- Driven flange (page 13-11)
- Bolt/washer
- Plate

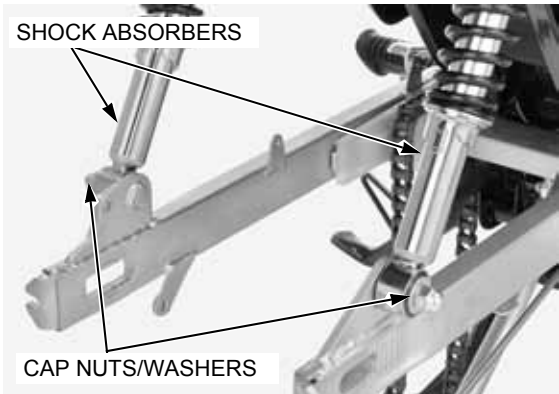


Remove the brake pedal return spring.

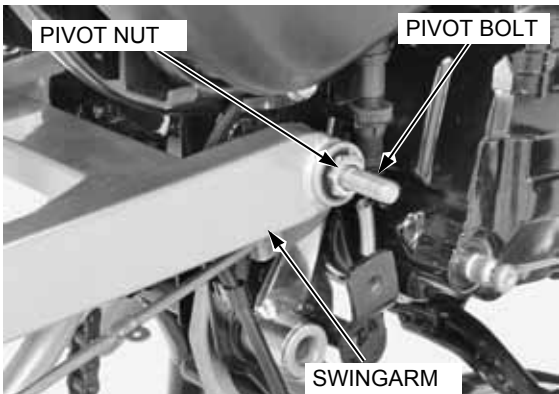


Remove the rear shock absorber lower mounting cap nuts and washers.

Release both shock absorber lower mounts from the swingarm studs.



Remove the swingarm pivot nut, pivot bolt and swingarm.



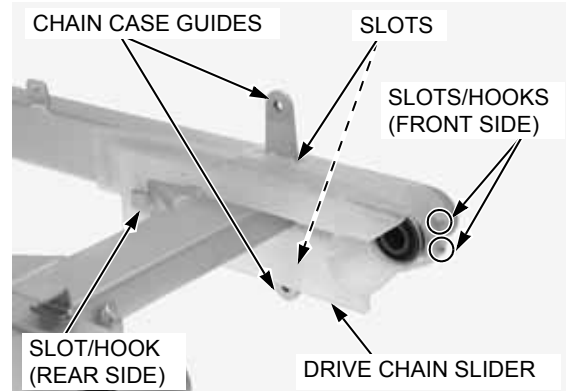
## REAR WHEEL/BRAKE/SUSPENSION

### DISASSEMBLY/INSPECTION

Check the drive chain slider for wear or damage.

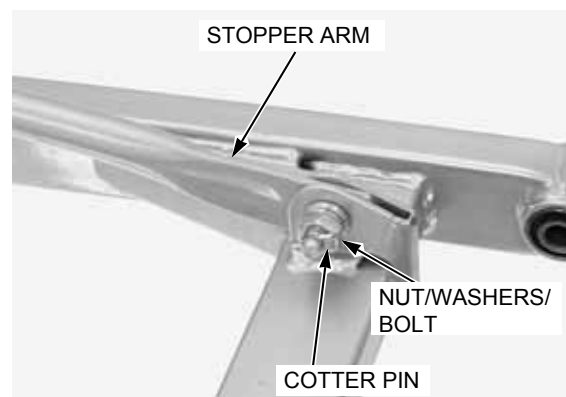
Release the drive chain slider front side slots from the hooks on the swingarm.

Remove the drive chain slider by releasing its slots from the chain case guides and rear side slot from the hook on the swingarm.

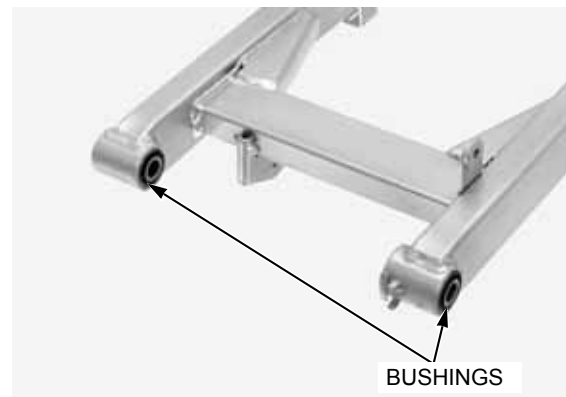


Remove the following:

- Cotter pin
- Nut
- Washer
- Spring washer
- Bolt
- Stopper arm



Check the pivot bushings for wear or damage.  
Check the swingarm for cracks or damage.



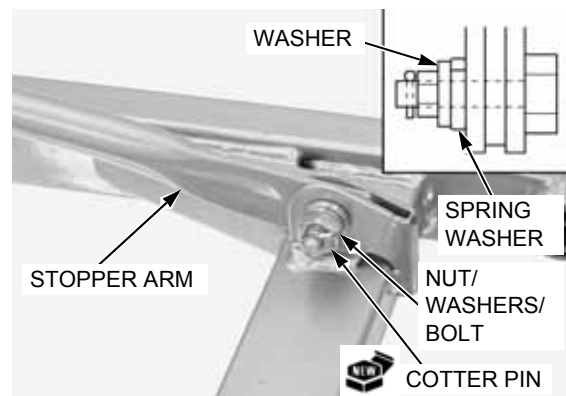
### ASSEMBLY

Install the following:

- Stopper arm
- Bolt
- Spring washer
- Washer
- Nut

Tighten the nut.

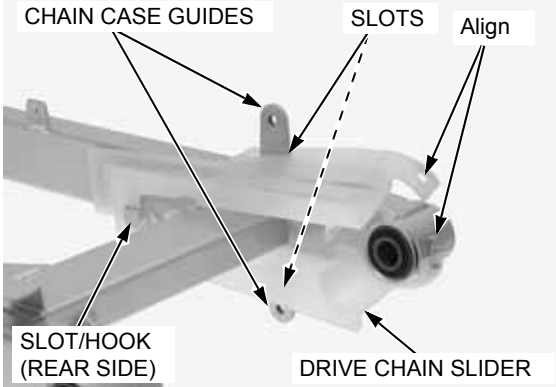
Install a new cotter pin.



**REAR WHEEL/BRAKE/SUSPENSION**

Install the drive chain slider while aligning its rear side slot to the hook on swingarm and slots to the chain case guides.

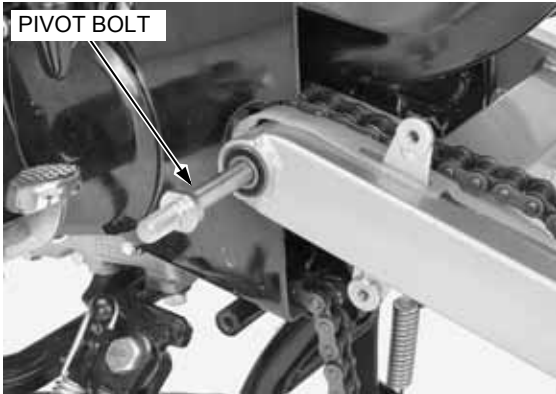
Hook the front side slots on drive chain slider to the hooks on the swingarm.



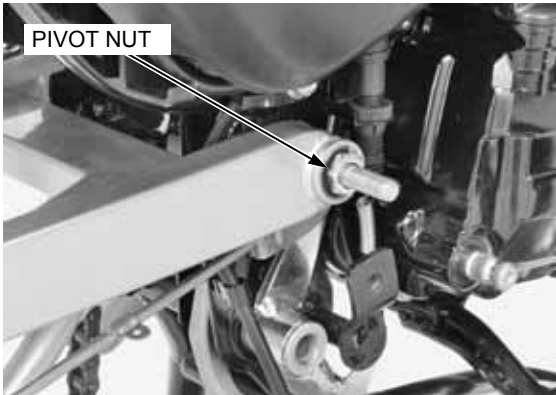
**INSTALLATION**

Route the drive chain and install the swingarm into the frame.

Insert the pivot bolt from the left side.

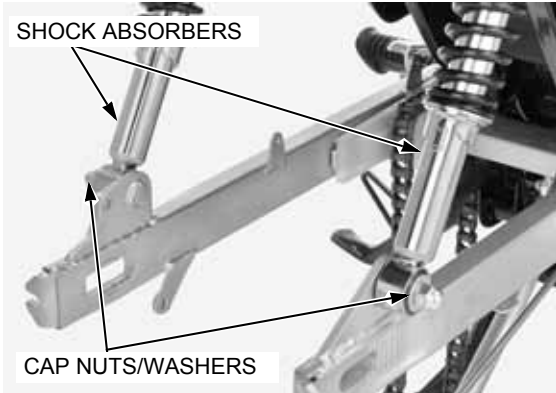


Install the pivot nut to the pivot bolt and temporarily tighten it.



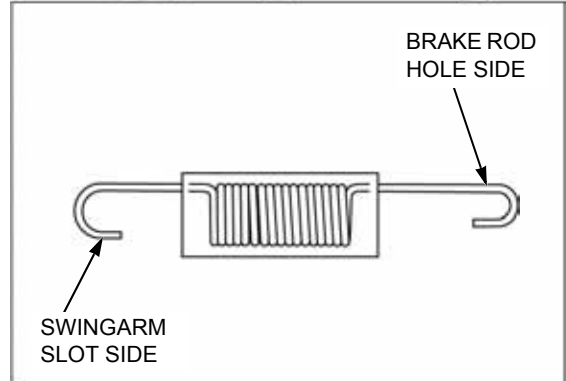
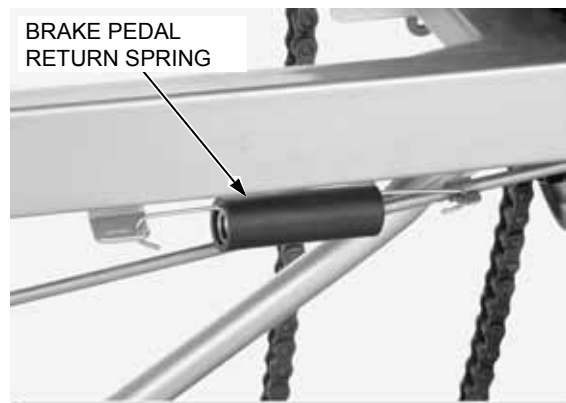
Hook the rear shock absorber lower mounts onto the swingarm studs, then install the washers and lower mounting cap nuts.

Temporarily tighten the rear shock absorber lower mounting cap nuts.



## REAR WHEEL/BRAKE/SUSPENSION

Hook the narrow end of brake pedal return spring to the hole on the brake rod, then hook the wide end to the swingarm slot

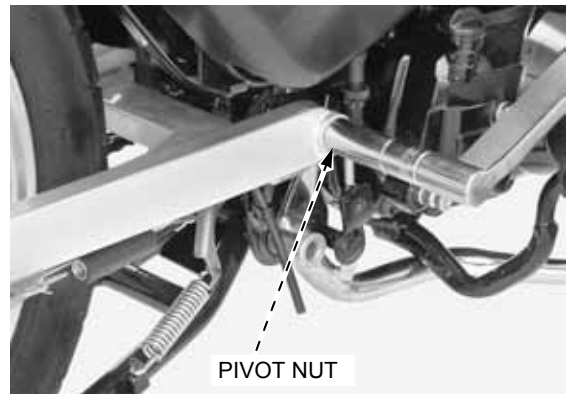


Install the following:

- Driven flange (page 13-13)
- Rear wheel (page 13-10)

Retract the centerstand carefully and support the motorcycle securely, then tighten the swingarm pivot nut to the specified torque.

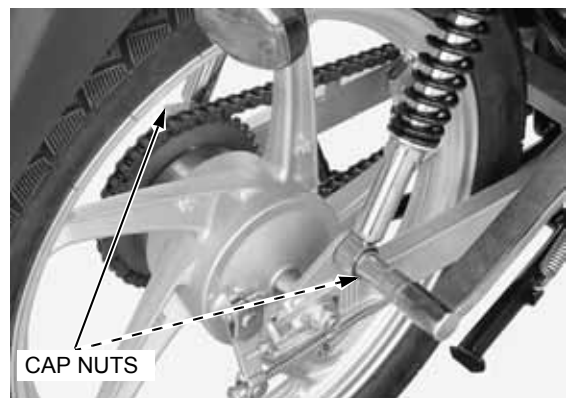
**TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)**



Tighten the rear shock absorber lower mounting cap nuts to the specified torque.

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

Support the motorcycle with its centerstand.



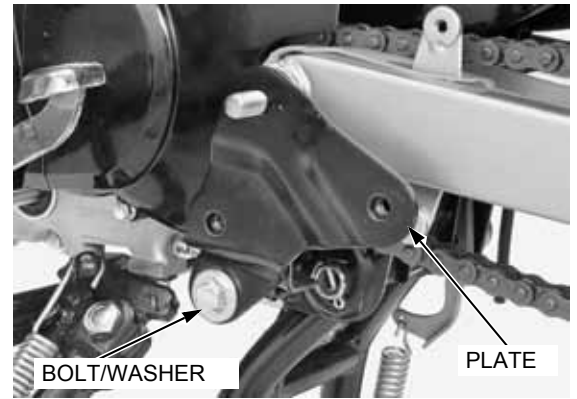
Install the plate, bolt and washer and tighten it.

Adjust the following:

- Drive chain slack (page 3-14)
- Brake pedal freeplay (page 3-18)

Install the following:

- Exhaust pipe/muffler (page 2-21)
- Passenger footpeg holder (page 2-19)
- Chain cases (page 2-20)



## SHOCK ABSORBER

### REMOVAL

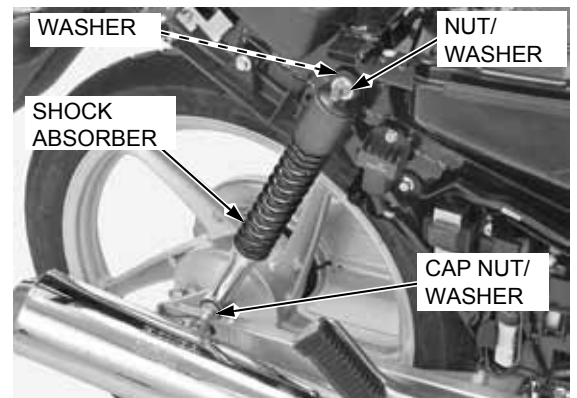
Support the motorcycle with its centerstand.

Remove the body cover (page 2-8).

Remove the shock absorber upper mounting nut and washer.

Remove the shock absorber lower mounting cap nut and washer, then remove the shock absorber.

If necessary, remove the shock absorber upper mounting washer.



### INSPECTION

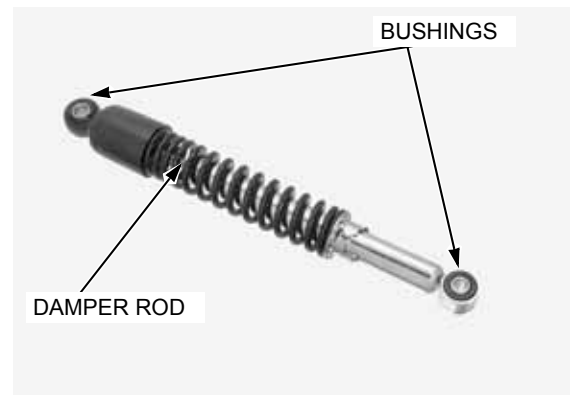
*Do not disassemble the shock absorber. Replace the shock absorbers as a set.*

Visually inspect the shock absorber for wear or damage.

Check the following:

- Deformation or oil leakage
- Bushings for wear or damage
- Damper rod for bend or damage

Check the smooth damper operation.



### INSTALLATION

*Be sure to set the upper side washer before install the shock absorber.*

Install the washer and shock absorber onto the frame.

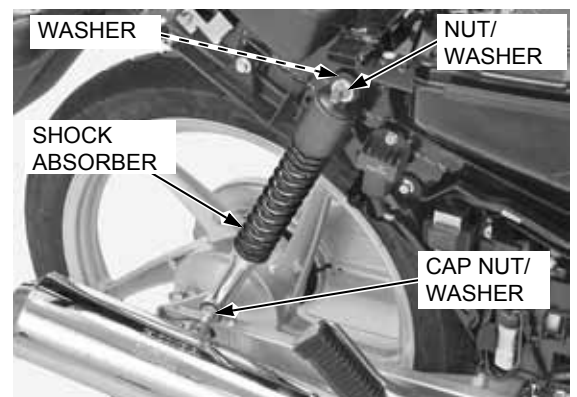
Install the washer and upper mounting nut. Tighten the upper mounting nut to the specified torque.

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

Install the washer and lower mounting cap nut. Tighten the lower mounting cap nut to the specified torque.

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

Install the body cover (page 2-8).





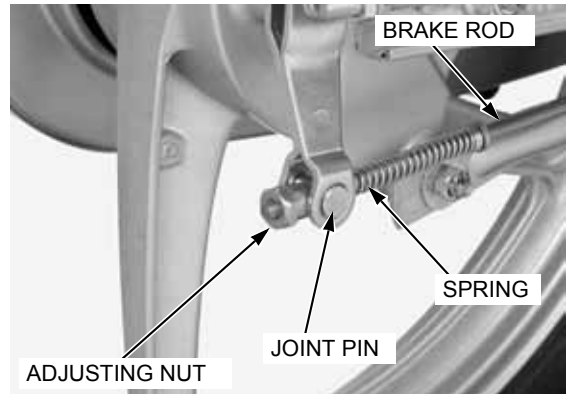
**BRAKE PEDAL**

**REMOVAL**

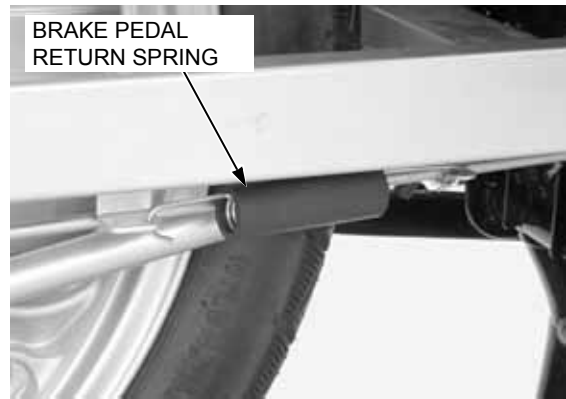
Support the motorcycle using a safety stand or hoist.

Remove the exhaust pipe/muffler (page 2-20).

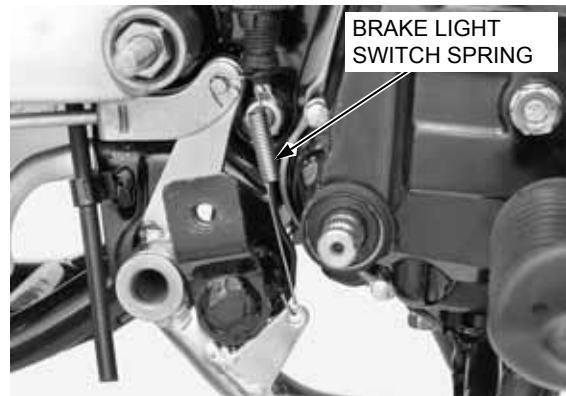
Remove the brake pedal adjusting nut, brake rod, spring and joint pin from the brake arm.



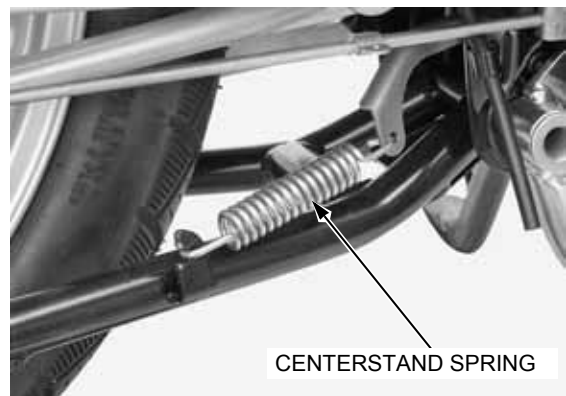
Remove the brake pedal return spring.



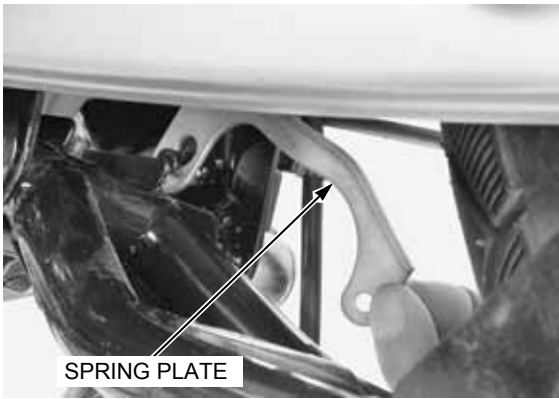
Unhook the brake light switch spring.



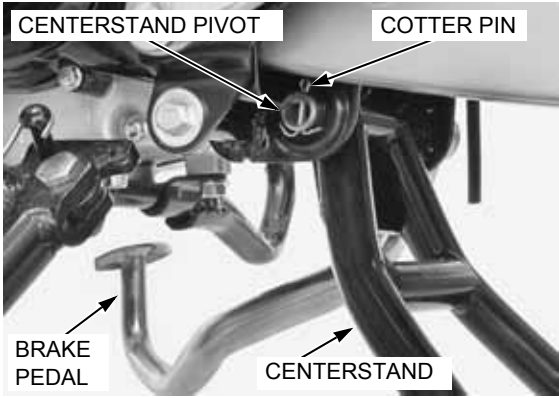
Remove the centerstand spring.



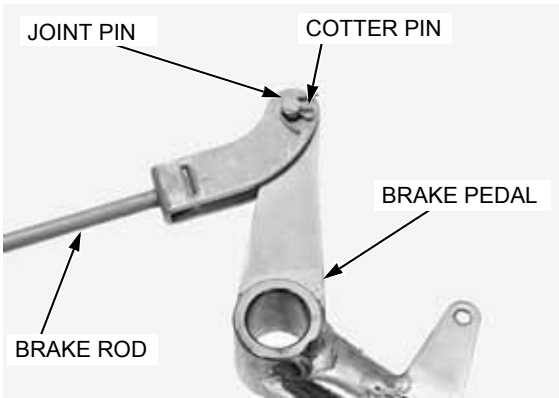
Remove the centerstand spring plate.



Remove the cotter pin, then remove the centerstand pivot.  
Remove the centerstand and brake pedal.



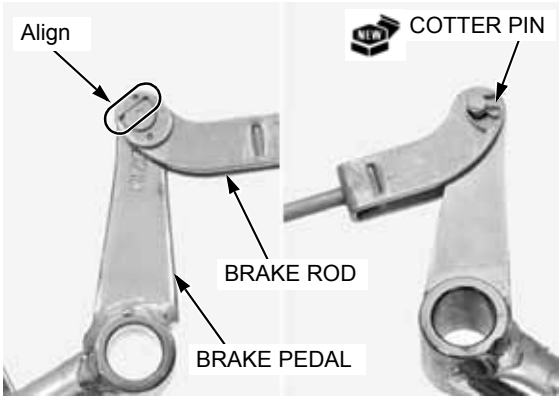
Remove the cotter pin, joint pin, and separate the brake rod from the brake pedal.



**INSTALLATION**

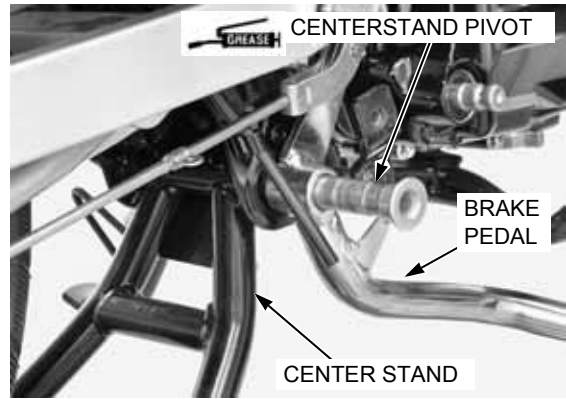
Connect the brake rod to the brake pedal, then install the joint pin while aligning the its cut-out with the brake rod cut-out.

Install a new cotter pin.

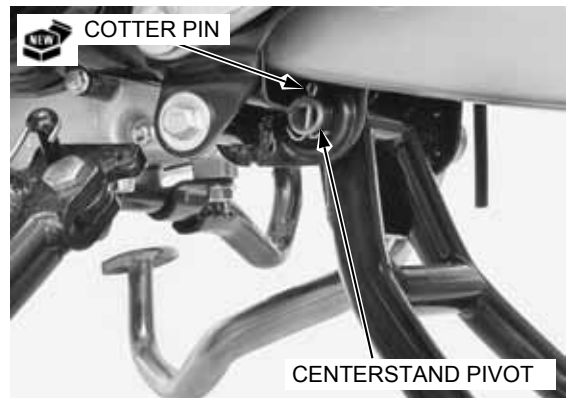


## REAR WHEEL/BRAKE/SUSPENSION

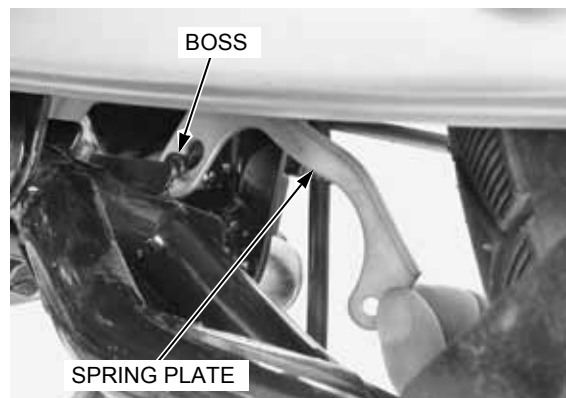
Apply grease to the centerstand pivot sliding surface.  
Install the brake pedal, centerstand and centerstand pivot to the frame.



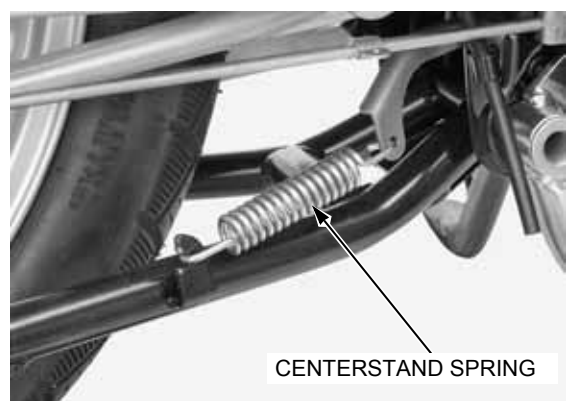
Insert the centerstand pivot.  
Secure the centerstand pivot with a new cotter pin.



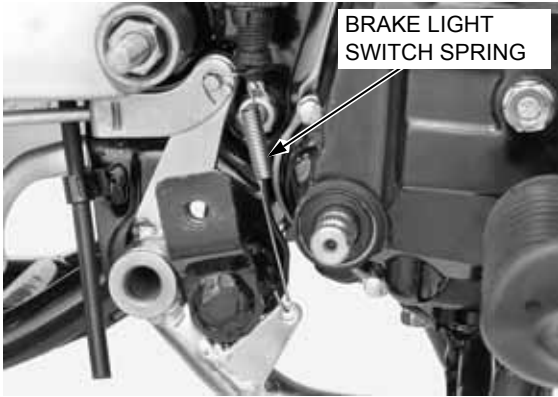
Install the centerstand spring plate to the boss on the frame.



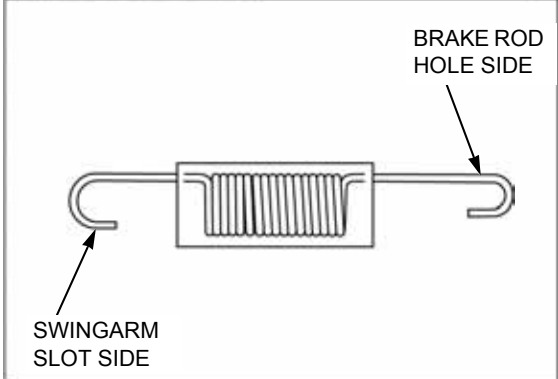
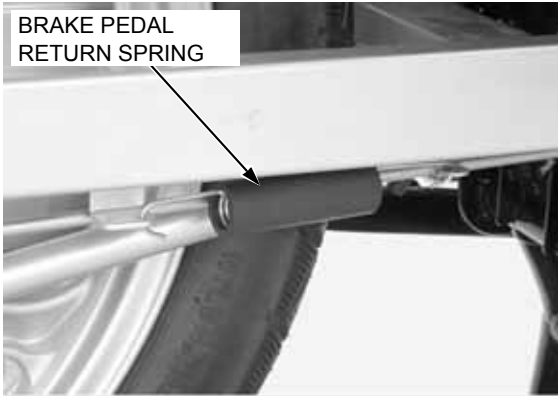
Hook the centerstand spring to the centerstand spring plate and centerstand.



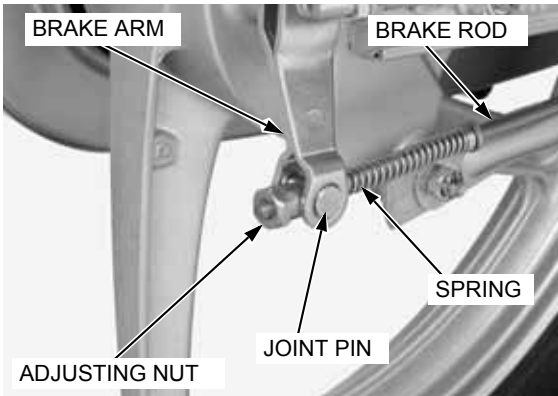
Hook the brake light switch spring.



Hook the narrow end of brake pedal return spring to the hole on the brake rod, then hook the wide end to the swingarm slot



Install the joint pin into the brake arm, then install the spring, brake rod and adjusting nut.  
Adjust the brake pedal freeplay (page 3-18).  
Install the exhaust pipe/muffler (page 2-21).



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**MEMO**

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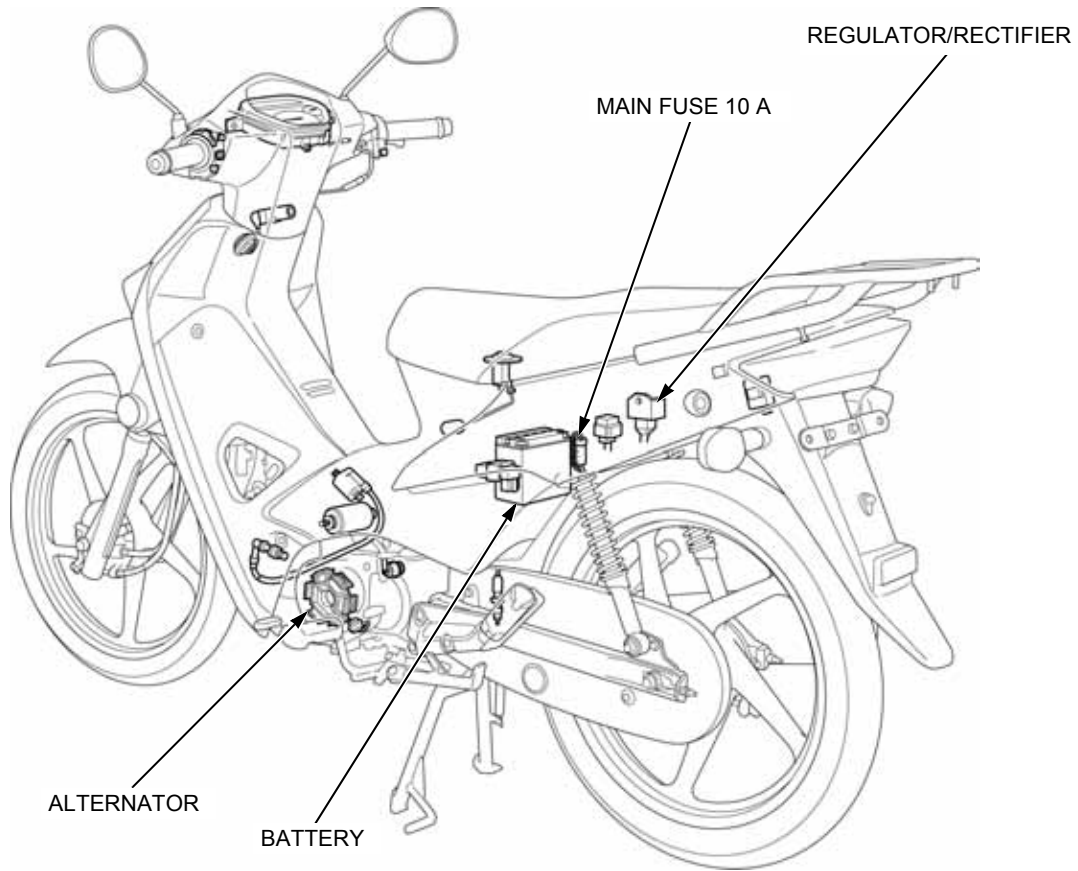
# 14. BATTERY/CHARGING SYSTEM

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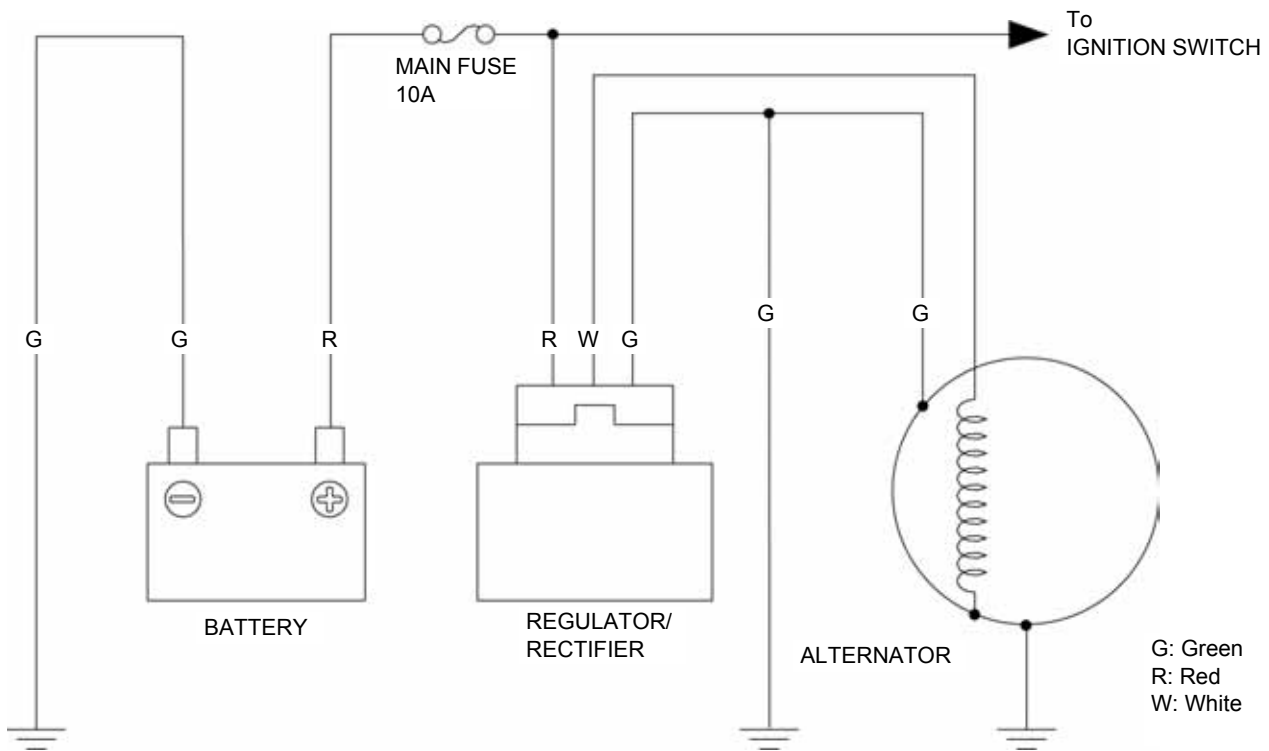
SYSTEM LOCATION.....	14-2	BATTERY.....	14-5
SYSTEM DIAGRAM .....	14-2	CHARGING SYSTEM INSPECTION .....	14-7
SERVICE INFORMATION .....	14-3	ALTERNATOR INSPECTION .....	14-8
TROUBLESHOOTING.....	14-4	REGULATOR/RECTIFIER .....	14-8

# 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 physician immediately.
- KEEP OUT OF REACH OF CHILDREN.

#### 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 battery can be damaged if overcharged or undercharged, or if left to discharge for long period. These same conditions contribute to shortening the "life span" of the battery. Even under normal use, the performance of the battery deteriorates after 2 – 3 years.
- Battery voltage may recover after battery charging, but under heavy load, the battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected as the problem. Battery overcharge often results from problems in the battery itself, which may appear to be an overcharging symptom. If one of the battery cells is shorted and battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level goes down quickly.
- Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under heavy load, such as having the headlight and taillight ON for long periods of time without riding the motorcycle.
- The battery will self-discharge when the motorcycle is not in use. For this reason, charge the battery every two weeks to prevent sulfation from occurring.
- Filling a new battery with electrolyte will produce some voltage, but in order to achieve its maximum performance, always charge the battery. Also, the battery life is lengthened when it is initially charged.
- When checking the charging system, always follow the steps in the troubleshooting (page 14-4).
- Alternator stator removal/installation (page 10-6).
- Ignition switch servicing (page 17-14).

#### BATTERY TESTING

Refer to the instruction of the Operation Manual for the recommended battery tester for details about battery testing. The recommended battery tester puts a "load" on the battery so that the actual battery condition can be measured.

**Recommended battery tester: BM210 or BATTERY MATE or equivalent**

#### SPECIFICATIONS

ITEM		SPECIFICATIONS	
Battery	Capacity	12 V – 5.0 Ah	
	Current leakage	0.1 mA max.	
	Voltage (20°C/68°F)	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.3 V
	Charging current (20°C/68°F)	Normal	0.5 A/5 – 10 h
Quick		5.0 A/0.5 h	
Alternator	Capacity	0.085 kW/5,000 min <sup>-1</sup> (rpm)	
	Charging coil resistance (20°C/68°F)	0.2 – 2.0 Ω	



# TROUBLESHOOTING

### BATTERY IS DAMAGED OR WEAK

#### 1. BATTERY TEST

Remove the battery (page 14-5).

Check the battery condition using the recommended battery tester.

**RECOMMENDED BATTERY TESTER: BM-210 or BATTERY MATE or equivalent**

*Is the battery in good condition?*

**YES** – GO TO STEP 2.

**NO** – Faulty battery

#### 2. CURRENT LEAKAGE TEST

Install the battery (page 14-5).

Check the battery current leakage (page 14-7).

*Is the current leakage below 0.1 mA?*

**YES** – GO TO STEP 4.

**NO** – GO TO STEP 3.

#### 3. CURRENT LEAKAGE TEST WITHOUT REGULATOR/RECTIFIER CONNECTED

Disconnect the regulator/rectifier connector and recheck the battery current leakage.

*Is the current leakage below 0.1 mA?*

**YES** – Faulty regulator/rectifier

**NO** – • Shorted wire harness  
• Faulty ignition switch

#### 4. ALTERNATOR CHARGING COIL INSPECTION

Check the alternator charging coil (page 14-8).

*Is the alternator charging coil resistance within 0.2 – 2.0  $\Omega$  (20°C/68°F)?*

**YES** – GO TO STEP 5.

**NO** – Faulty charging coil

#### 5. CHARGING VOLTAGE INSPECTION

Measure and record the battery voltage (page 14-6).

Start the engine.

Measure and record the charging voltage (page 14-7).

Compare the measurements to result of the following calculation.

**STANDARD: Measured BV < Measured CV < 15.5 V**

- **BV = Battery Voltage**
- **CV = Charging Voltage**

*Is the measured charging voltage within the standard voltage?*

**YES** – Faulty battery

**NO** – GO TO STEP 6.

#### 6. REGULATOR/RECTIFIER SYSTEM INSPECTION

Check the voltage and resistance at the regulator/rectifier connectors (page 14-8).

*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

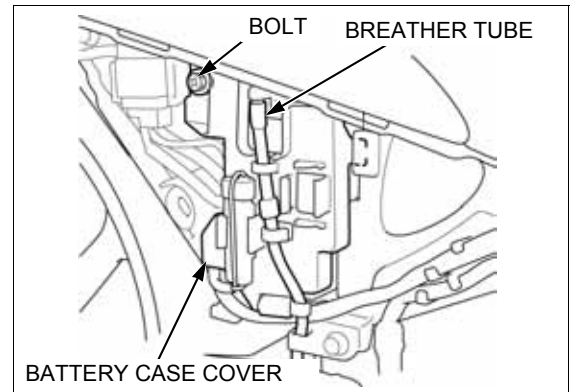
## BATTERY

### REMOVAL/INSTALLATION

- Always turn the ignition switch "OFF" before removing the battery.

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

Remove the battery breather tube from the battery.  
Remove the bolt and open the battery case cover.



Pull out the battery.

*Always disconnect the negative terminal first.*

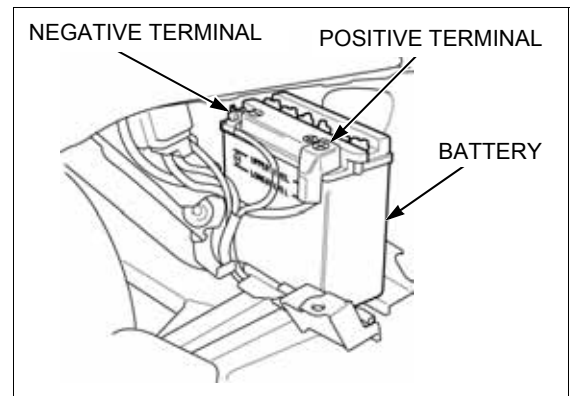
Remove the bolt and disconnect the negative (-) cable.  
Pull back the positive terminal cover.

Remove the bolt and disconnect the positive (+) cable.

Remove the battery.

Install the battery in the reverse order of removal with the proper wiring as shown.

- Connect the positive (+) cable to the battery first, then connect the negative (-) cable.



Make sure that the battery breather tube is correctly positioned, and not kinked, trapped or bent in such away as to obstruct the passage of the air.

- If the battery breather tube is blocked, the battery's internal pressure will not be relieved, the breather may come off, or the battery crack as a result.



### BATTERY INSPECTION

Remove the battery (page 14-5).

Check for cracked or broken case or plates.

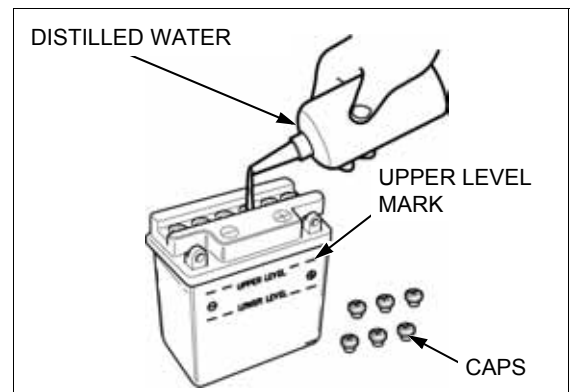
Check the plates for sulfation.

Replace the battery if damaged or sulfated.

If low, remove the caps and add distilled water to bring the level to the upper level line.

Replace the battery if damaged or sulfated.

- In order to obtain an accurate test reading when checking the charging system, the battery must be fully charged and in good condition. Perform the following inspections and tests before attempting to troubleshooting charging system problems.



## BATTERY/CHARGING SYSTEM

### SPECIFIC GRAVITY

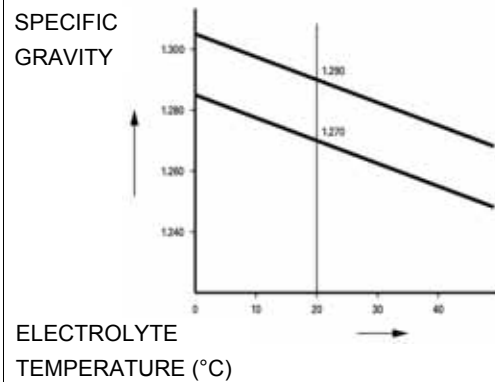
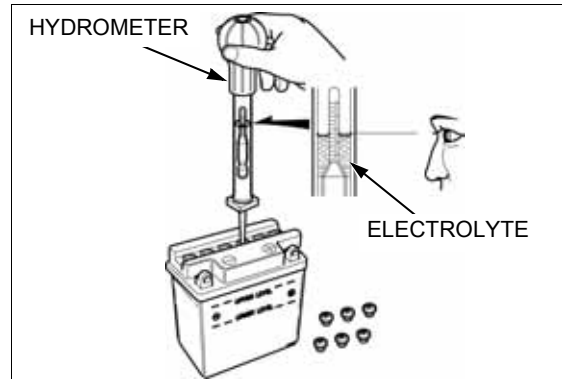
- The battery electrolyte contains sulfuric acid. Avoid contact with skin, eyes or clothing.

The specific gravity must be checked with a hydrometer.

Test each cell by drawing electrolyte into the hydrometer.

**SPECIFIC GRAVITY** Fully charged: 1.270 – 1.290  
(20°C/68°F): Under charged: Below 1.230

- If the difference in specific gravity between cells exceeds 0.01, re-charge the battery. If the difference in specific gravity is excessive, replace the battery.
- There is a change in specific gravity of approximately 0.007 per 10°C change in temperature. Be sure to consider this when taking measurements.
- Reading of the hydrometer's fluid level should be taken horizontally.



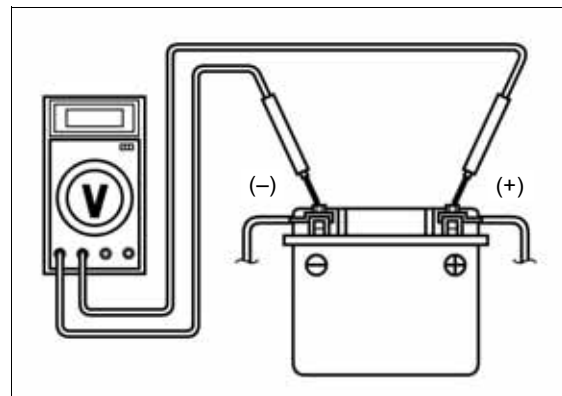
### VOLTAGE INSPECTION

Measure the battery voltage using a commercially available digital multimeter.

**VOLTAGE (20°C/68°F):** Fully charged: 13.0 – 13.2 V  
Under charged: Below 12.3 V

NOTE:

- When measuring the battery voltage after charging, leave it for least 30 minutes, or the accurate results cannot be obtained because the battery voltage fluctuates just after charging.



### BATTERY CHARGING

Remove the battery (page 14-5).

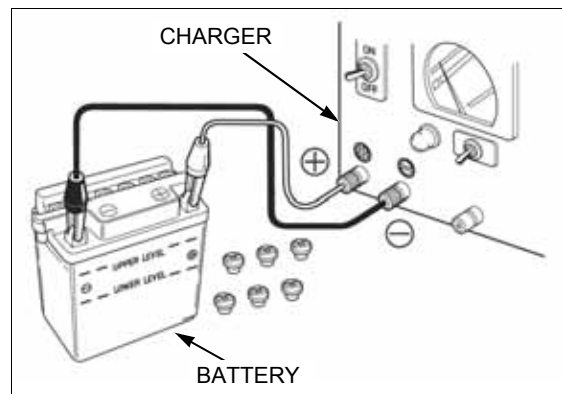
*Turn power ON/  
OFF at the charger,  
not at the battery  
terminals to prevent  
sparks.*

Connect the charger positive (+) cable to the battery positive (+) terminal.  
Connect the charger negative (-) cable to the battery negative (-) terminal.

**CHARGING CURRENT/TIME:** Normal: 0.5 A/5 – 10 h  
Quick: 5.0 A/0.5 h

NOTE:

- 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 SYSTEM INSPECTION

### CURRENT LEAKAGE TEST

Open the battery case cover and pull out the battery (page 14-5).

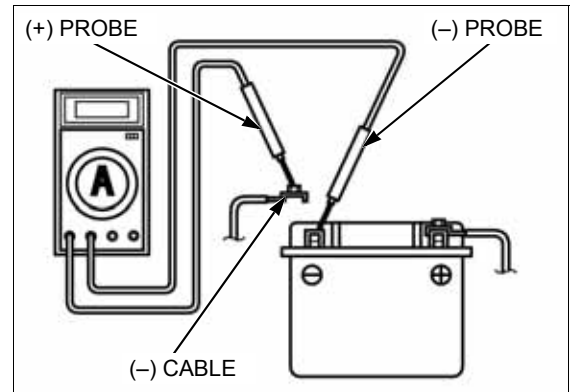
Turn the ignition switch OFF and disconnect the negative (-) cable from the battery.

Connect the ammeter (+) probe to the negative (-) cable and the ammeter (-) probe to the battery (-) terminal.

With the ignition switch OFF, check for current leakage.

**NOTE:**

- When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher than the range selected may blow the fuse in the tester.
- While measuring current, do not turn the ignition switch ON. A sudden surge of current may blow the fuse in the tester.



**CURRENT LEAKAGE: 0.1 mA max.**

If current leakage exceeds the specified value, a shorted circuit is the probable cause.

Locate the short by disconnecting connections one by one and measuring the current.

### CHARGING VOLTAGE INSPECTION

Be sure the battery is in good condition before performing this test.

Open the battery case cover and pull out the battery (page 14-5).

Warm up the engine to normal operating temperature and stop it.

Connect the multimeter between the battery positive (+) and negative (-) terminals.

**NOTE:**

- To prevent a short, make absolutely certain which are the positive (+) and negative (-) terminals or cables.
- Do not disconnect the battery or any cable in the charging system without first switching off the ignition switch. Failure to follow this precaution can damage the tester or electrical components.

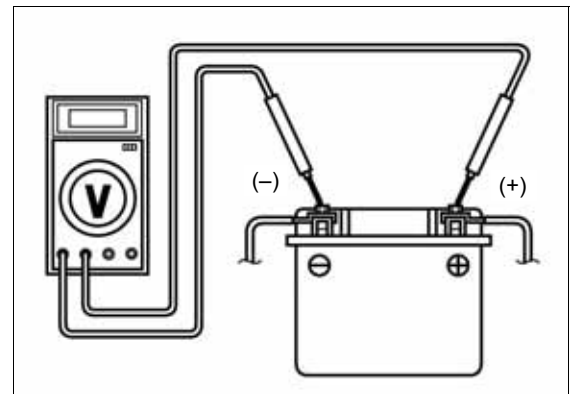
Restart the engine and turn the headlight on.

Measure the voltage on the multimeter when the engine runs at 5,000 min<sup>-1</sup> (rpm).

**STANDARD: Measured BV < Measured CV < 15.5 V**

**BV = Battery voltage (page 14-6)**

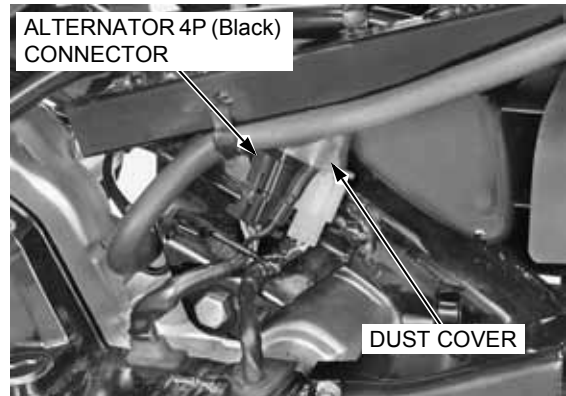
**CV = Charging voltage**



## BATTERY/CHARGING SYSTEM

### ALTERNATOR INSPECTION

Remove the body cover (page 2-8).  
Pull back the dust cover.  
Disconnect the alternator 4P (Black) connector.

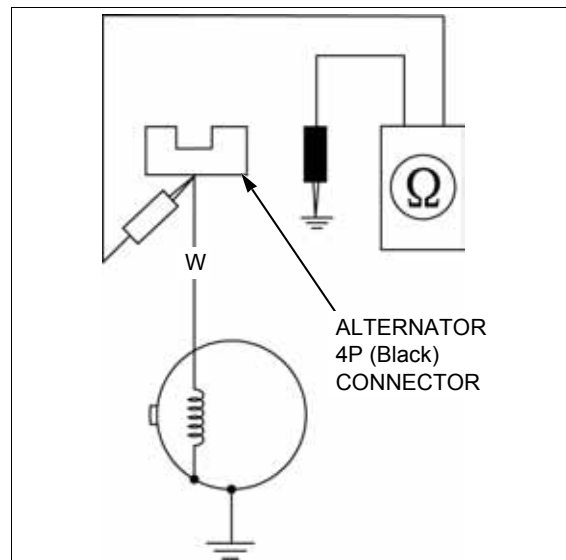


Check the resistance between the following terminals of the alternator side.

**STANDARD:**  
**Charging coil (White – Ground):**  
**0.2 – 2.0  $\Omega$  (at 20°C/68°F)**

Replace the stator if the resistance is out of specification.

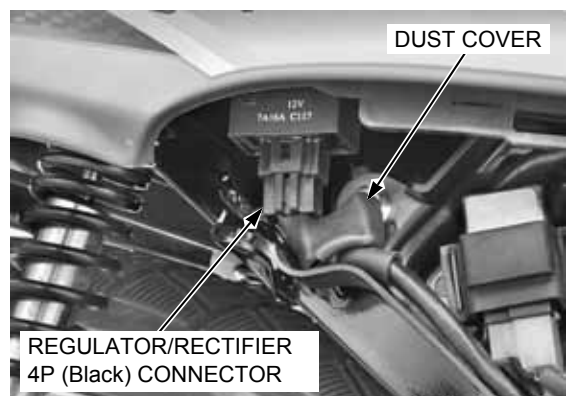
For stator removal (page 10-6).  
Install the removed parts in the reverse order of removal.



### REGULATOR/RECTIFIER

#### SYSTEM INSPECTION

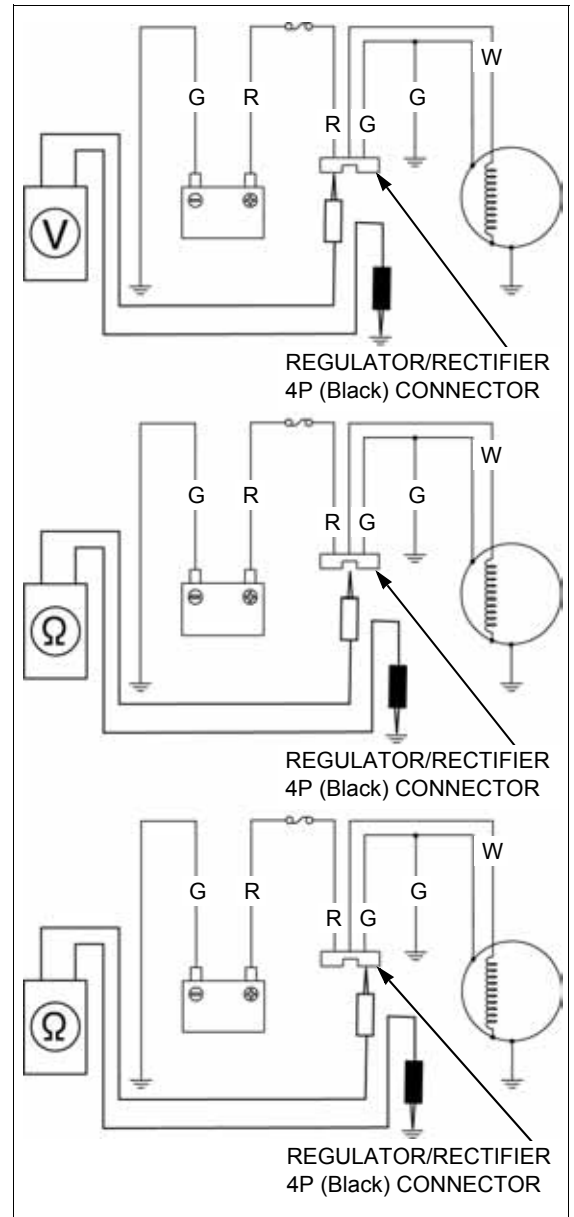
Remove the right side cover (page 2-7).  
Pull back the dust cover.  
Disconnect the regulator/rectifier 4P (Black) connector,  
and check it for loose contact or corroded terminals.



If the charging voltage reading (page 14-7) is out of the specification, inspect the regulator/rectifier 4P (Black) connector terminals (wire harness side) as follows:

Item	Terminal	Specification
Battery charging line	Red (+) and Ground (-)	Battery voltage should appear
Charging coil line	White and Ground	0.2 – 2.0 Ω (at 20°C/68°F)
Ground line	Green and Ground	Continuity should exist

If all components of the charging system is normal and there are no loose connections at the regulator/rectifier 4P (Black) connector, replace the regulator/rectifier unit.



## REMOVAL/INSTALLATION

Remove the body cover (page 2-8).

Turn the ignition switch OFF.

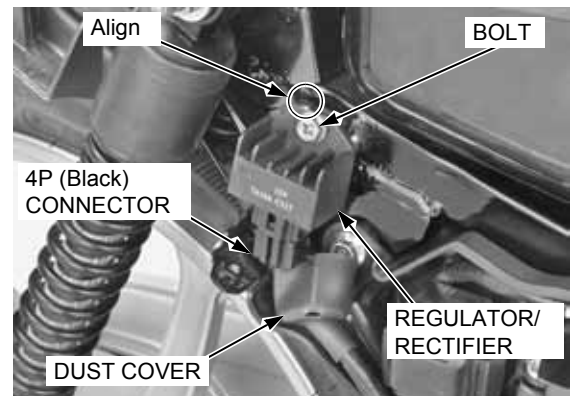
Remove the bolt and regulator/rectifier from the frame.

Pull back the dust cover.

Disconnect the regulator/rectifier 4P (Black) connector.

Installation is in the reverse order of removal.

- Position the regulator/rectifier so that its upper left side is aligned with the stopper on the frame.



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**MEMO**

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# 15. IGNITION SYSTEM

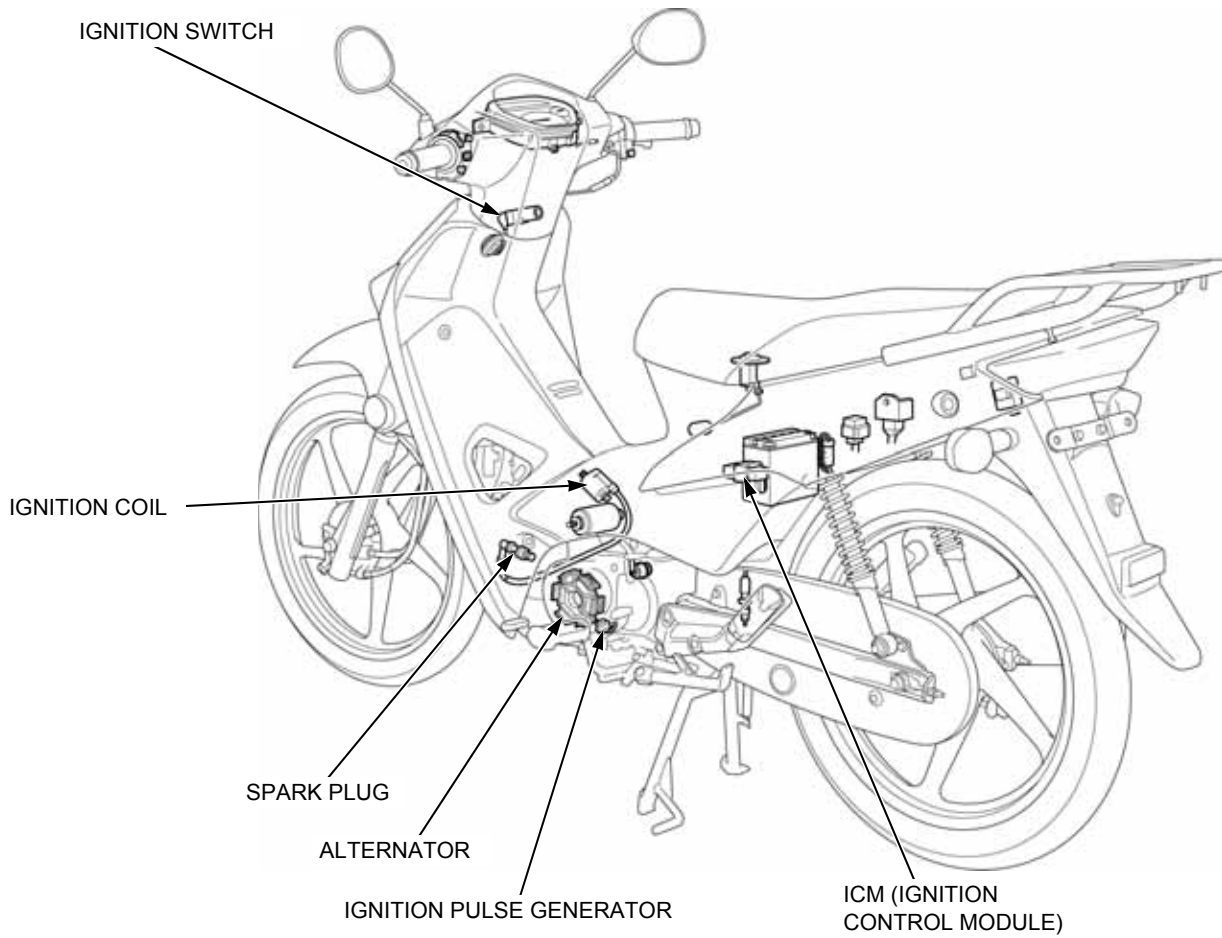
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SYSTEM LOCATION.....	15-2	IGNITION SYSTEM INSPECTION .....	15-5
SYSTEM DIAGRAM .....	15-2	IGNITION COIL .....	15-9
SERVICE INFORMATION .....	15-3	ICM (IGNITION CONTROL MODULE).....	15-9
TROUBLESHOOTING.....	15-4	IGNITION TIMING .....	15-10

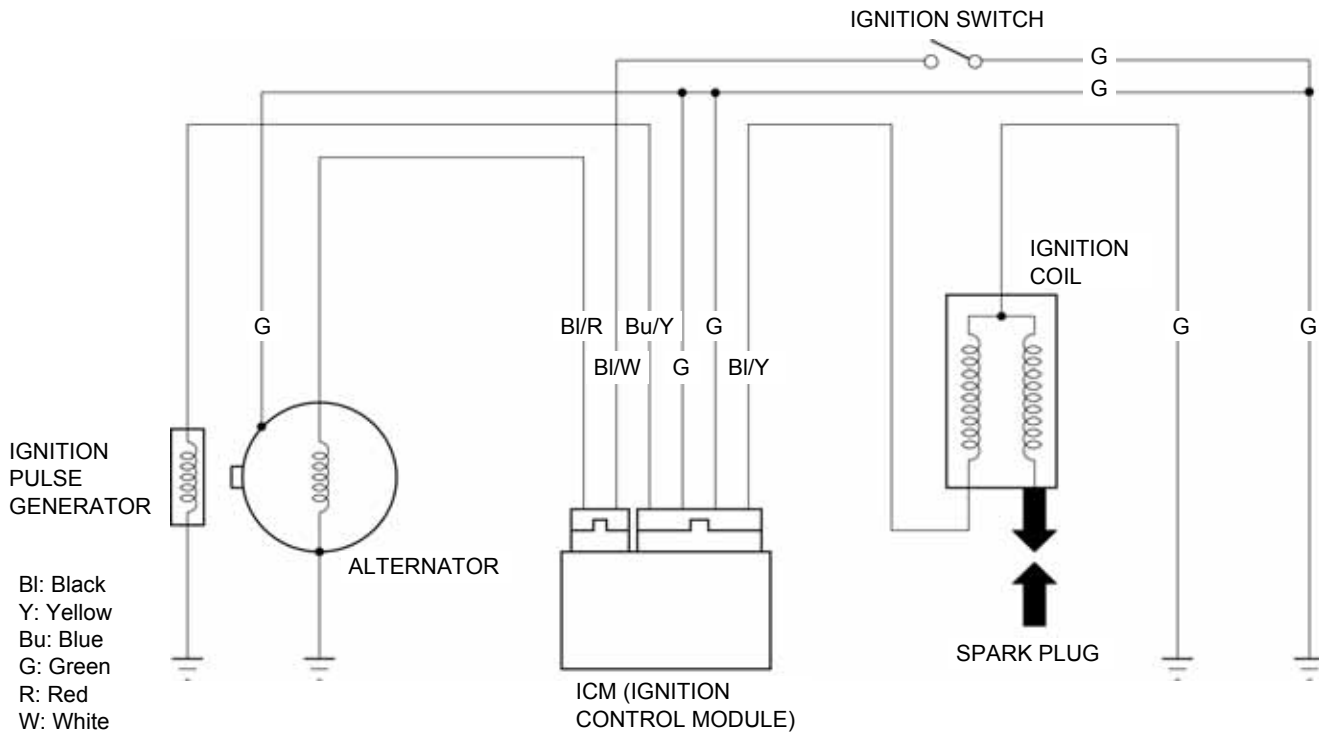


# IGNITION SYSTEM

## SYSTEM LOCATION



## SYSTEM DIAGRAM



## SERVICE INFORMATION

### GENERAL

#### NOTICE

- The ICM (Ignition Control Module) may be damaged if dropped. Also if the connector is disconnected when current is flowing, the excessive voltage may damage the ICM. Always turn the ignition switch to OFF before servicing.
- Use spark plug with the correct heat range. Using spark plug with an incorrect heat range can damage the engine.
- When servicing the ignition system, always follow the steps in the troubleshooting chart (page 15-4).
- The ignition timing cannot be adjusted since the ICM is factory preset.
- A faulty ignition system is often related to poor connections. 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.
- Ignition pulse generator removal/installation (page 10-6).
- Ignition switch servicing (page 17-14).

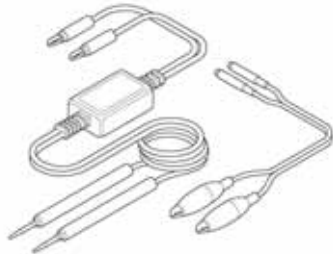

### SPECIFICATIONS

ITEM		SPECIFICATIONS
Spark plug	Standard	CR6HSA (NGK)
	Optional	CR7HSA (NGK)
Spark plug gap		0.60 – 0.70 mm (0.024 – 0.028 in)
Ignition coil primary peak voltage		100 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Alternator exciter coil peak voltage		100 V minimum
Ignition timing ("F" mark)		15° BTDC at idle

### TORQUE VALUE

Timing hole cap                      1.5 N·m (0.15 kgf·m, 1.1 lbf·ft.)                      Apply engine oil to the threads and seating surface.

### TOOLS

<p>Imrie diagnostic tester (model 625) or Peak voltage adaptor 07HGJ-0020100</p>  <p>with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)</p>	<p>Timing cap wrench 07709-0010001</p> 
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## IGNITION SYSTEM

### TROUBLESHOOTING

- Inspect the following before diagnosing the system.
  - Faulty spark plug
  - Loose spark plug cap or spark plug wire connection
  - Water got into the spark plug cap (Leaking the ignition coil secondary voltage)

#### No spark at plug

Unusual condition		Probable cause (check in numerical order)
Ignition coil primary voltage	Low peak voltage.	<ol style="list-style-type: none"> <li>1. The multimeter impedance is too low; below 10 MΩ/DCV.</li> <li>2. Cranking speed is too slow. (Battery is undercharged.)</li> <li>3. The sampling time of the tester and measured pulse were not synchronized. (System is normal if measured voltage is over the standard voltage at least once.)</li> <li>4. Poorly connected connectors or an open circuit in the ignition system.</li> <li>5. Faulty exciter coil (measure the peak voltage).</li> <li>6. Faulty ignition coil.</li> <li>7. Faulty ICM (in case when above No. 1 through 6 are normal).</li> </ol>
	No peak voltage.	<ol style="list-style-type: none"> <li>1. Incorrect peak voltage adaptor connections. (System is normal if measured voltage is over the specifications with reverse connections.)</li> <li>2. Short circuit in the ignition switch Black/white wire.</li> <li>3. Faulty ignition switch.</li> <li>4. Loose or poorly connected ICM connector.</li> <li>5. Open circuit or poor connection in the Green wire of the ICM.</li> <li>6. Faulty peak voltage adapter.</li> <li>7. Faulty exciter coil (measure the peak voltage).</li> <li>8. Faulty ignition pulse generator. (Measure the peak voltage.)</li> <li>9. Faulty ICM (in case when above No. 1 through 8 are normal).</li> </ol>
	Peak voltage is normal, but no spark at the plug.	<ol style="list-style-type: none"> <li>1. Faulty spark plug or leaking ignition coil secondary current.</li> <li>2. Faulty ignition coil.</li> </ol>
Exciter coil	low peak voltage.	<ol style="list-style-type: none"> <li>1. The multimeter impedance is too low; below 10 MΩ/DCV.</li> <li>2. Cranking speed is too slow. (Battery is undercharged.)</li> <li>3. The sampling time of the tester and measured pulse were not synchronized. (System is normal if measured voltage is over the standard voltage at least once.)</li> <li>4. Faulty exciter coil (in case when above No. 1 through 3 are normal).</li> </ol>
	No peak voltage.	<ol style="list-style-type: none"> <li>1. Faulty peak voltage adapter.</li> <li>2. Faulty exciter coil.</li> </ol>
Ignition pulse generator	Low peak voltage.	<ol style="list-style-type: none"> <li>1. The multimeter impedance is too low; below 10 MΩ/DCV.</li> <li>2. Cranking speed is too slow. (Battery is undercharged.)</li> <li>3. The sampling time of the tester and measured pulse were not synchronized. (System is normal if measured voltage is over the standard voltage at least once.)</li> <li>4. Faulty ignition pulse generator (in case when above No. 1 through 3 are normal).</li> </ol>
	No peak voltage.	<ol style="list-style-type: none"> <li>1. Faulty peak voltage adapter.</li> <li>2. Faulty ignition pulse generator.</li> </ol>

## IGNITION SYSTEM INSPECTION

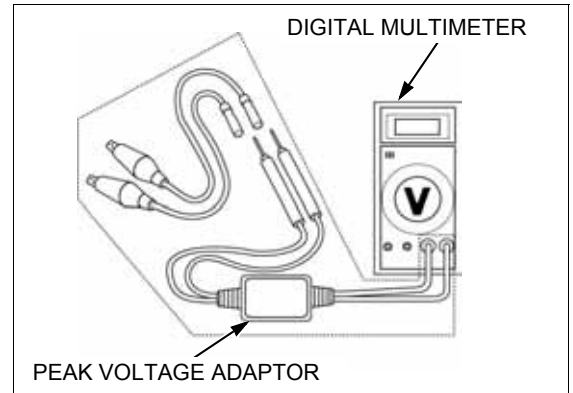
**NOTE:**

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

Connect the peak voltage adaptor to the digital multimeter, or use the Imrie diagnostic tester.

**TOOLS:**

**Imrie diagnostic tester (model 625) or  
Peak voltage adaptor 07HGJ-0020100  
with Commercially available digital multimeter  
(impedance 10 MΩ/DCV minimum)**



### PEAK VOLTAGE ADAPTOR INSPECTION

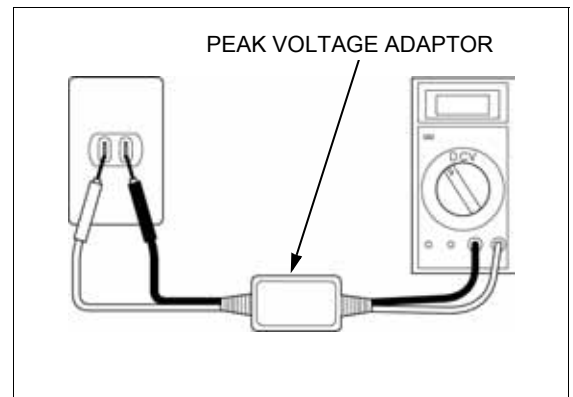
When testing the high tension on the ignition coil secondary side using the peak voltage adaptor, the inner diode may be damaged. As a damaged adaptor will cause incorrect peak voltage readings, always consider a defective adaptor if the peak voltage readings are all abnormal.

The adaptor diode can be easily checked by the following procedure. Therefore, be sure to check the adaptor before replacing the parts that display an abnormal testing value.

*If you touch the adaptor jack immediately after disconnecting the adaptor, you may get electrical shock.*

Set the multimeter to the AC voltage range and measure the local line voltage. Then, connect the peak voltage adaptor to the multimeter, measure the same AC voltage with DC voltage range and compare it to AC voltage measured previously.

- The adaptor is normal if the DC voltage measured via the adaptor is 1.4 times of AC voltage.
  - The adaptor is defective if the DC voltage measured via the adaptor is 0 V.
- Be sure to disconnect the adaptor after allowing the voltage to decrease sufficiently.*



## IGNITION SYSTEM

### IGNITION COIL PRIMARY PEAK VOLTAGE

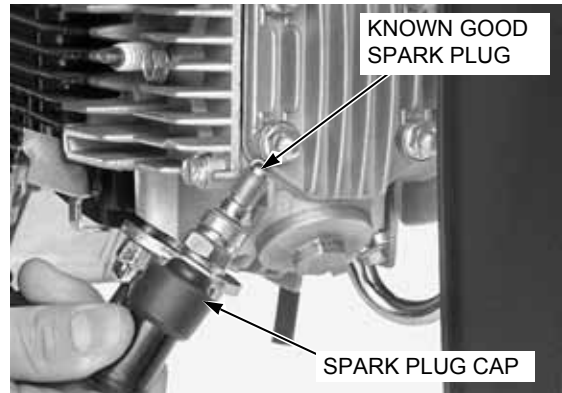
#### NOTE:

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

Remove the right main pipe side cover (page 2-6).

Support the motorcycle with its centerstand.

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 head as done in a spark test.



With the ignition coil wire connected, connect the peak voltage adaptor or tester probes to the ignition coil wire connector and ground.

#### TOOLS:

Imrie diagnostic tester (model 625) or  
Peak voltage adaptor 07HGJ-0020100  
with commercially available digital multimeter  
(impedance 10 M $\Omega$ /DCV minimum)

#### CONNECTION:

Black/Yellow (+) – Body ground (–)

Turn the ignition switch ON.



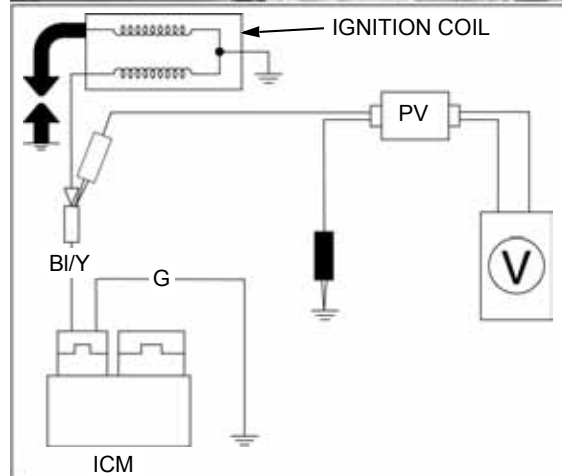
*Avoid touching the tester probes to prevent electric shock.*

Crank the engine with the starter motor and measure the ignition coil primary peak voltage.

**PEAK VOLTAGE: 100 V minimum**

If the peak voltage is abnormal, check each item following the troubleshooting chart (page 15-4).

Connect the spark plug cap to the spark plug.



## IGNITION PULSE GENERATOR PEAK VOLTAGE

**NOTE:**

- Check all system connection before inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check cylinder compression and make sure the spark plug is installed correctly.

Turn the ignition switch to "OFF".

Remove the body cover (page 2-8).

Pull back the dust cover.

Disconnect the ICM 4P connector.

Connect the peak voltage adaptor or tester probes to the ICM 4P connector.

**TOOLS:**

**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".

*Avoid touching the tester probes to prevent electric shock.*

Crank the engine with the starter motor 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 alternator 4P (Black) connector.

Pull back the dust cover.

Disconnect the alternator 4P (Black) connector.

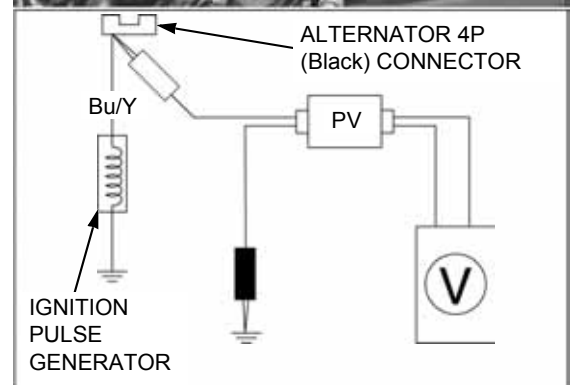
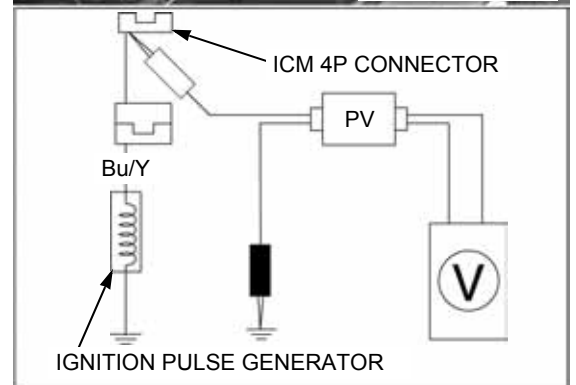
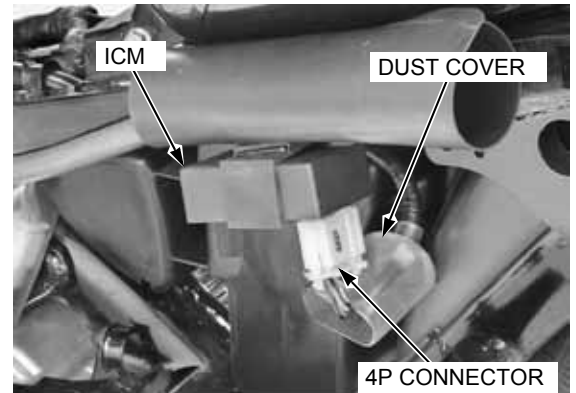
Connect the peak voltage tester or adaptor probes to the alternator 4P (Black) connector of the ignition pulse generator side.

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 15-4). If all items are normal, the ignition pulse generator is faulty. Refer to ignition pulse generator replacement (page 10-6).

*Route the wire harness properly (page 1-14).*

Install the removed parts in the reverse order of removal.



## IGNITION SYSTEM

### ALTERNATOR EXCITER COIL PEAK VOLTAGE

#### NOTE:

- Check all system connection before inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check cylinder compression and make sure the spark plug is installed correctly.

Turn the ignition switch to "OFF".

Remove the body cover (page 2-8).

Pull back the dust cover.

Disconnect the ICM 3P connector.

Connect the peak voltage adaptor or tester probes to the ICM 3P connector.

#### TOOLS:

Imrie diagnostic tester (model 625) or  
Peak voltage adaptor 07HGJ-0020100  
with commercially available digital multimeter (impedance 10 M $\Omega$ /DCV minimum)

#### CONNECTION: Black/Red (+) – Body ground (-)

Turn the ignition switch "ON".

Crank the engine with the starter motor and measure the ignition pulse generator peak voltage.

**PEAK VOLTAGE: 100 V minimum**

If the peak voltage measured at the ICM connector is abnormal, measure the peak voltage at the alternator wire (Black/Red) connector.

*Avoid touching the tester probes to prevent electric shock.*

Pull back the dust cover.

Disconnect the alternator wire (Black/Red) connector.

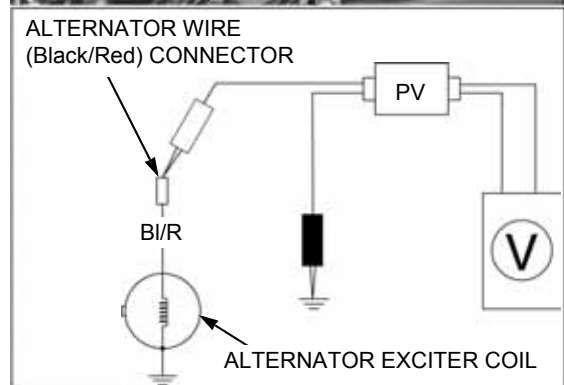
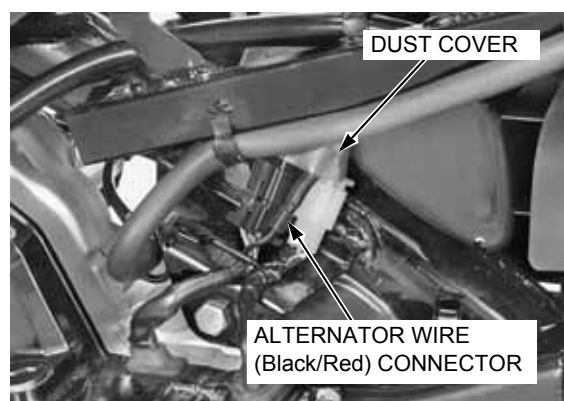
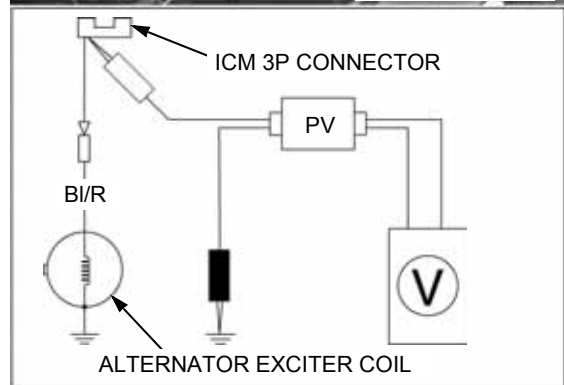
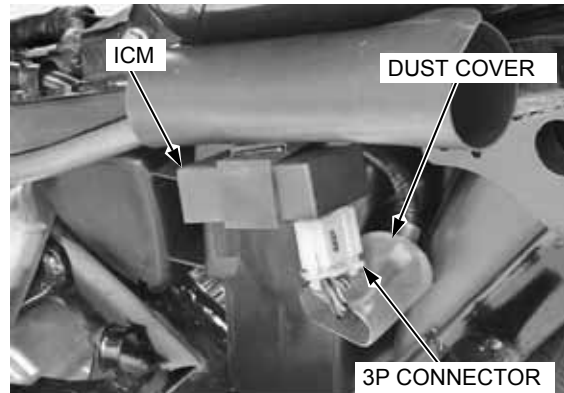
Connect the peak voltage tester or adaptor probes to the alternator wire (Black/Red) connector of the alternator side.

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 alternator exciter coil 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 15-4). If all items are normal, the exciter coil is faulty. Refer to exciter coil replacement (page 10-6).

Install the removed parts in the reverse order of removal.

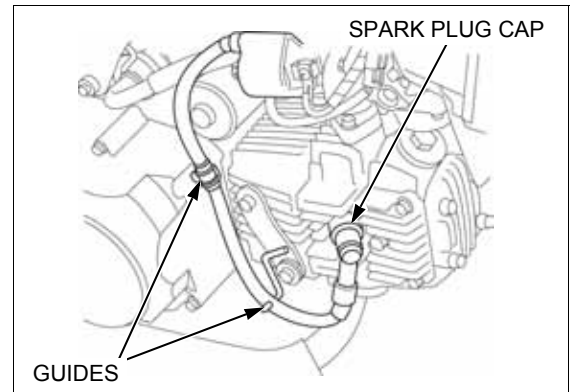
*Route the wire harness properly (page 1-14).*



## IGNITION COIL

### REMOVAL/INSTALLATION

Remove the left main pipe side cover (page 2-6).  
 Disconnect the spark plug cap from the spark plug.  
 Release the spark plug wire from the guides.

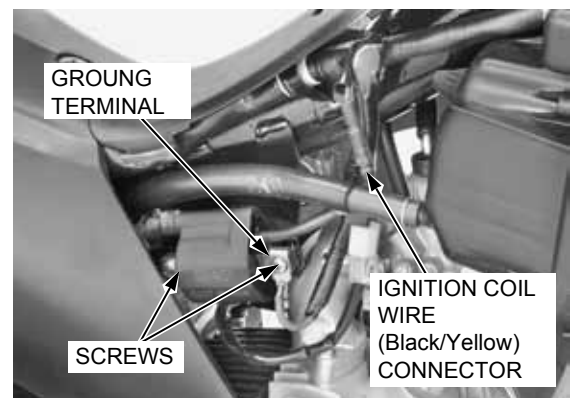


Disconnect the ignition coil wire (Black/Yellow) connector.

Remove the screws, ground terminal and ignition coil from the frame.

Installation is in the reverse order of removal.

*Route the wire harness properly (page 1-14).*



## ICM (IGNITION CONTROL MODULE)

### REMOVAL/INSTALLATION

Remove the body cover (page 2-8).

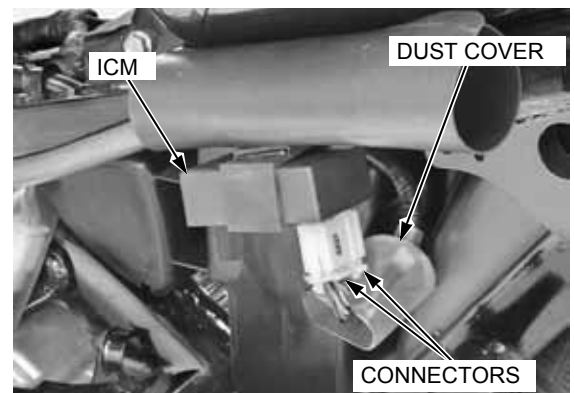
Turn the ignition switch "OFF".

Pull back the dust cover.

Disconnect the ICM connectors.

Remove the ICM from the frame.

Installation is in the reverse order of removal.





## IGNITION SYSTEM

### IGNITION TIMING

Warm up the engine.  
Stop the engine and remove the timing hole cap using the special tool.

**TOOL:**  
Timing cap wrench                      **07709-0010001**

Connect a tachometer.

*Read the manufacturer's instructions for timing light operation.*

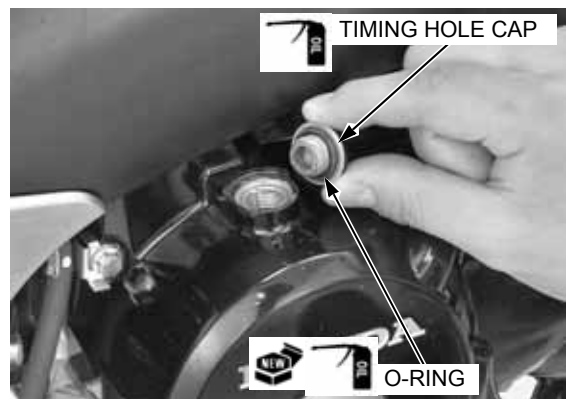
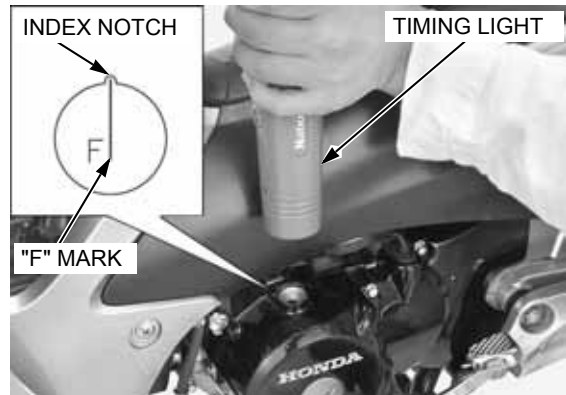
Connect the timing light to the spark plug wire.  
Start the engine and let it idle.

**IDLE SPEED:  $1,400 \pm 100 \text{ min}^{-1}$  (rpm)**

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

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

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



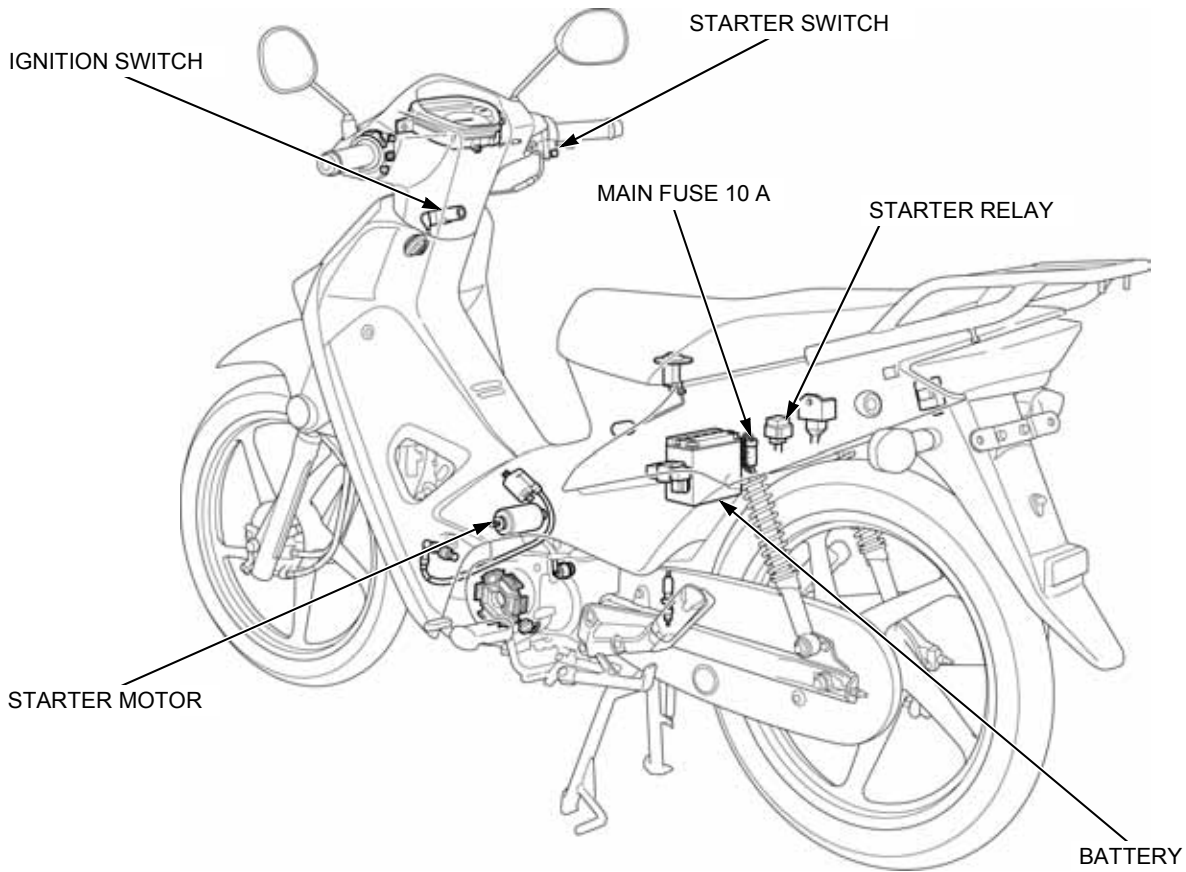
# 16. ELECTRIC STARTER SYSTEM

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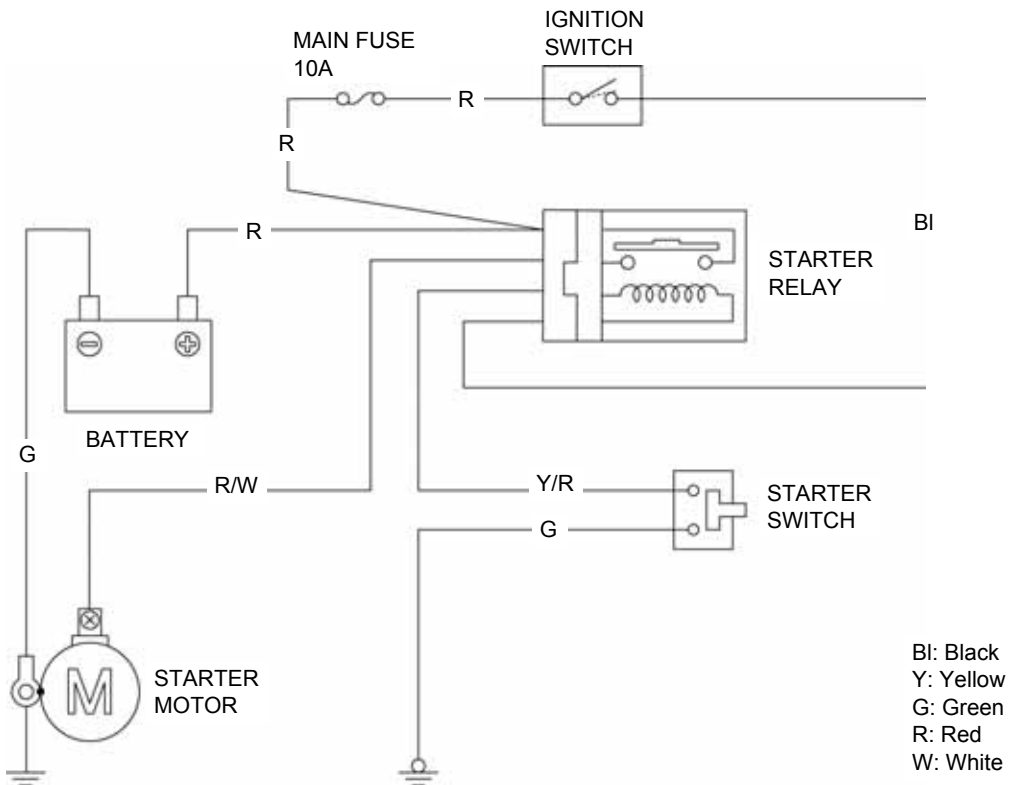
SYSTEM LOCATION.....	16-2	TROUBLESHOOTING .....	16-4
SYSTEM DIAGRAM .....	16-2	STARTER MOTOR .....	16-6
SERVICE INFORMATION .....	16-3	STARTER RELAY.....	16-13

# ELECTRIC STARTER SYSTEM

## 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 16-4).
- 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 component information.
  - Ignition switch (page 17-14)
  - Starter switch (page 17-16)

**SPECIFICATION**

Unit: mm (in)

<b>ITEM</b>	<b>STANDARD</b>	<b>SERVICE LIMIT</b>
Starter motor brush length	12.0 (0.47)	4.0 (0.16)

**TORQUE VALUE**

Starter motor case screw 4.2 N·m (0.43 kgf·m, 3.1 lbf·ft)

# TROUBLESHOOTING

### Starter motor does not turn

#### 1. Standard Inspection

Check for following:

- Battery condition
- Burned fuse(s)

**Are the above items in good condition?**

**YES** - GO TO STEP 2.

**NO** - Replace or repair the malfunction part(s).

#### 2. Starter Relay Operation

Turn the ignition switch "ON".

Push the starter switch.

You should hear the relay "CLICK" when the starter switch is depressed.

**Is the "CLICK" heard?**

**YES** - GO TO STEP 3.

**NO** - GO TO STEP 5.

#### 3. Starter Motor Cable Inspection

Turn the ignition switch "OFF".

Check for open circuit in starter motor cable.

**Is the above cable in good condition?**

**YES** - GO TO STEP 4.

- NO** -
- Loose or poorly connected starter motor cable and starter motor
  - Open circuit in battery negative terminal.
  - Open circuit in starter motor Red/White cable between the starter relay and starter motor.

#### 4. Starter Motor Inspection

Apply battery voltage to the starter motor directly and check the operation.

**Does the starter motor turn?**

- YES** -
- Open circuit in Red wire between the starter relay and battery.
  - Faulty starter relay.

**NO** - Faulty starter motor.

#### 5. Starter Relay Coil Circuit Inspection

Check the following:

- Ground line inspection (page 16-14)
- Input voltage inspection (page 16-14)

**Are the above inspections normal?**

**YES** - GO TO STEP 6.

- NO** -
- Loose or poorly connected connector.
  - Open circuit in battery cable between the battery and ignition switch.
  - Open circuit in Black wire between the ignition switch and starter relay.
  - Open circuit in starter relay Yellow/Red wire between the starter switch and starter relay.
  - Open circuit in Green wire between the starter switch and ground.
  - Faulty ignition switch (page 17-14).
  - Faulty starter switch (page 17-15).

#### 6. Starter Relay Continuity Inspection

Check the starter relay for continuity (page 16-14).

**Is there continuity?**

**YES** - Intermittent failure.

**NO** - Faulty starter relay.

**Starter motor turns engine slowly**

- Low battery voltage.
- Poorly connected battery terminal cable.
- Poorly connected starter motor cable.
- Faulty starter motor.
- Poorly 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.

**Starter relay "CLICK", but engine does not turn**

- Crankshaft does not turn due to engine problems.
- Faulty starter clutch.

## ELECTRIC STARTER SYSTEM

### STARTER MOTOR

#### REMOVAL

With the ignition switch turned to OFF, disconnect the negative (-) cable at the battery before servicing the starter motor.

Remove the following:

- Body cover (page 2-8)
- Left crankcase cover (page 10-4)

Disconnect the starter motor 2P connector. Loosen the wire band and pull the starter motor wire out from it.

Remove the following:

- Snap ring
- Starter motor drive sprocket
- Starter motor drive chain

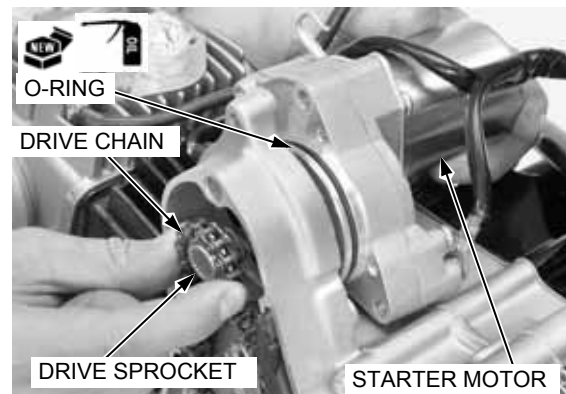
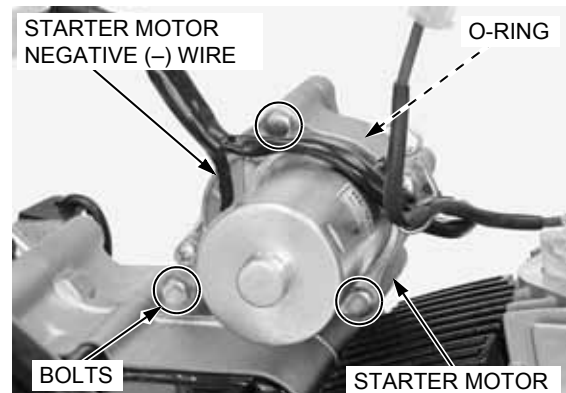
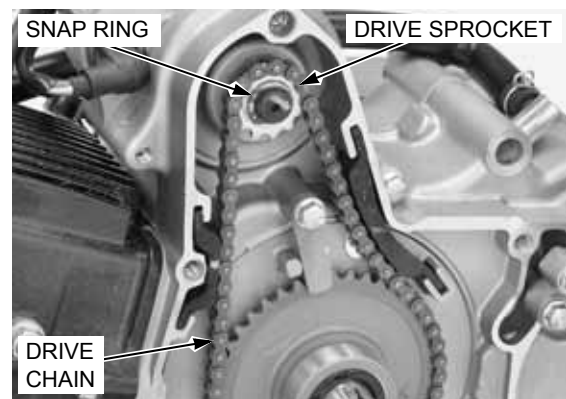
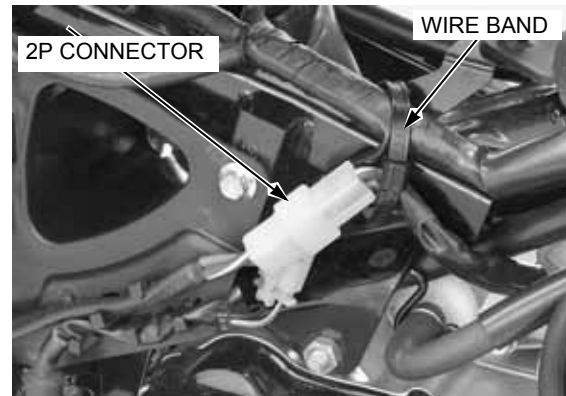
Remove the three mounting bolts and starter motor negative (-) wire.

Remove the starter motor from the left crankcase and O-ring.

#### INSTALLATION

Coat a new O-ring with engine oil and install it to the starter motor, then install them to the left crankcase.

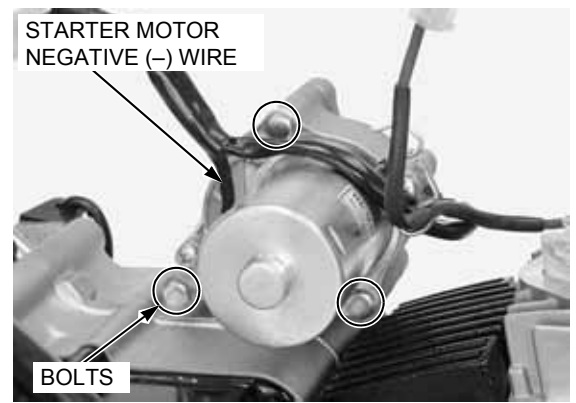
Set the starter drive chain to the drive sprocket, then install the sprocket to the starter motor.



## ELECTRIC STARTER SYSTEM

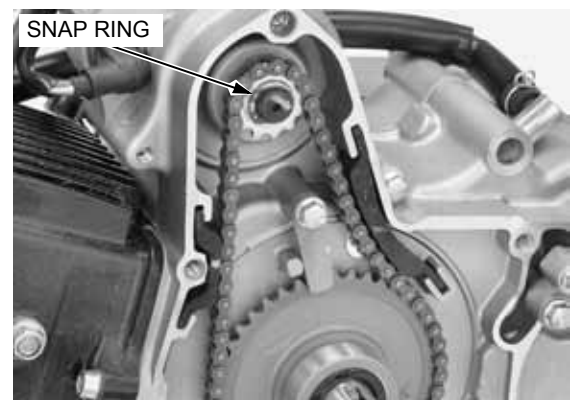
*Route the wire harness properly (page 1-14).*

Install the starter motor negative (-) wire/mounting bolts and tighten them.



*Make sure that the snap ring is seated in the groove.*

Install the following snap ring.



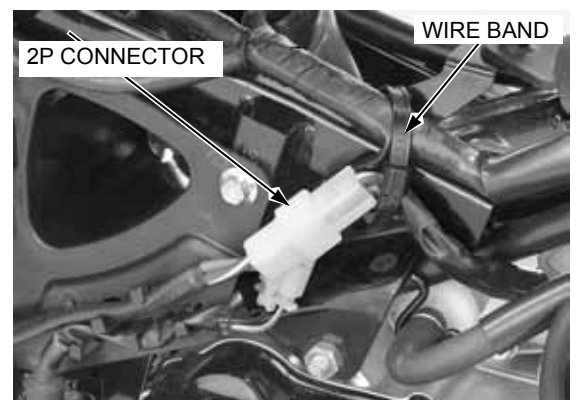
*Route the wire harness properly (page 1-14).*

Put the starter motor wire through the wire band and tighten it.

Connect the starter motor 2P connector.

Install the following:

- Left crankcase cover (page 10-5)
- Body cover (page 2-8)

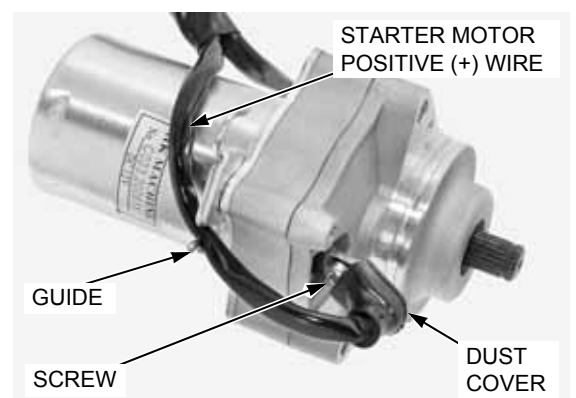


### DISASSEMBLY

Release the starter motor positive (+) wire from the guide.

Pull back the dust cover.

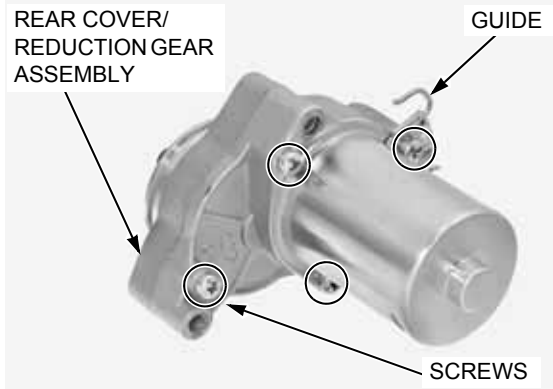
Remove the screw and disconnect the starter motor positive (+) wire.



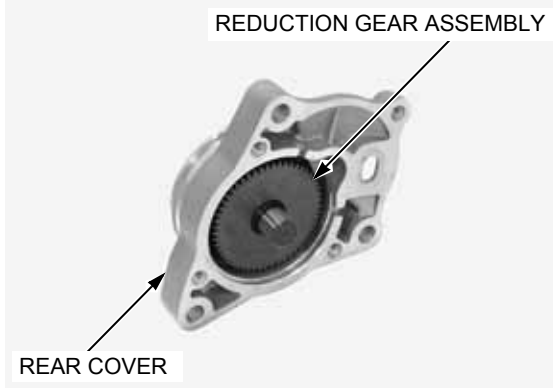


## ELECTRIC STARTER SYSTEM

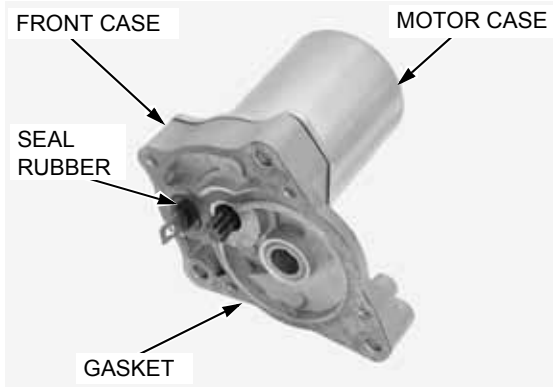
Remove the four screws, guide and rear cover/reduction gear assembly.



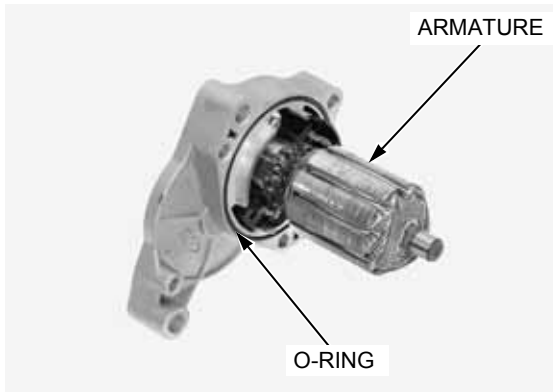
Remove the starter reduction gear assembly from the rear cover.



Remove the gasket, motor case and seal rubber from the front case.

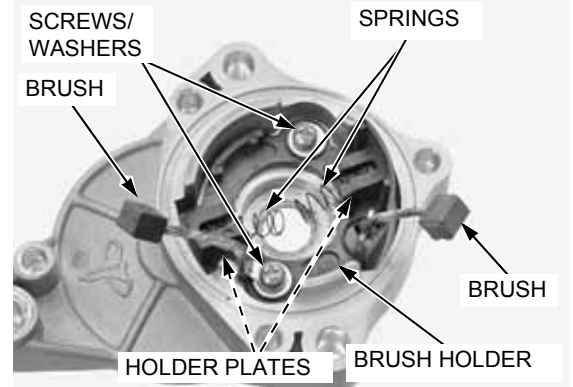


Remove the armature and O-ring.



Remove the following:

- Be careful not to lose the brush springs.*
- Two brush springs
  - Two screws/washers
  - Brush holder
  - Two holder plates
  - Two brushes

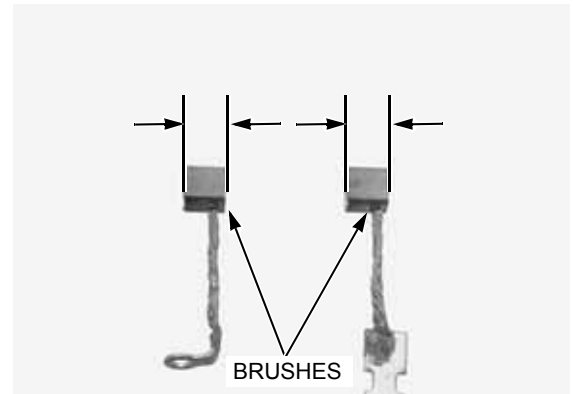


## INSPECTION

Inspect the brushes for damage and measure the brush length.

**SERVICE LIMIT: 4.0 mm (0.16 in)**

Replace if necessary.



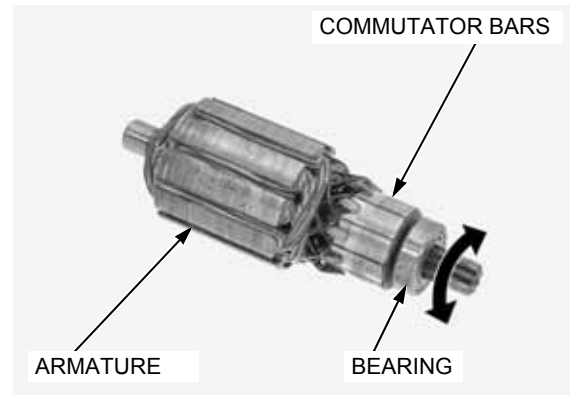
Check that the bearing on the armature shaft turns smoothly.

Check the commutator bars of the armature for discoloration, wear or damage.

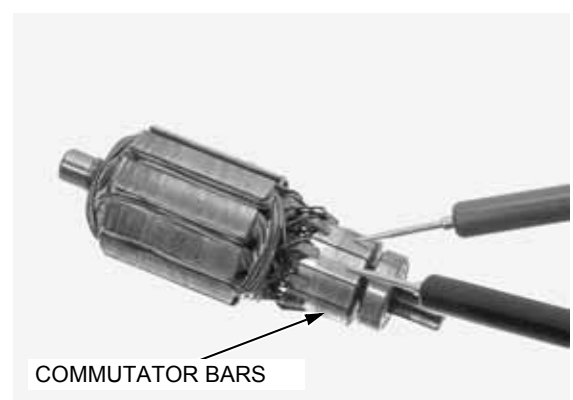
*Do not use emery or sand paper on the commutator.*

Clean the metallic debris off between commutator bars.

Replace the armature with a new one if necessary.

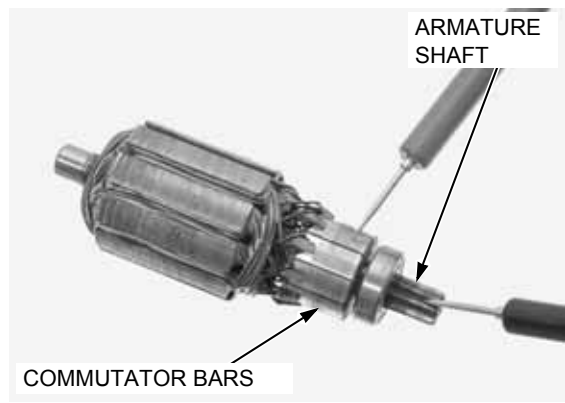


Check for continuity between pair of commutator bars. There should be continuity.

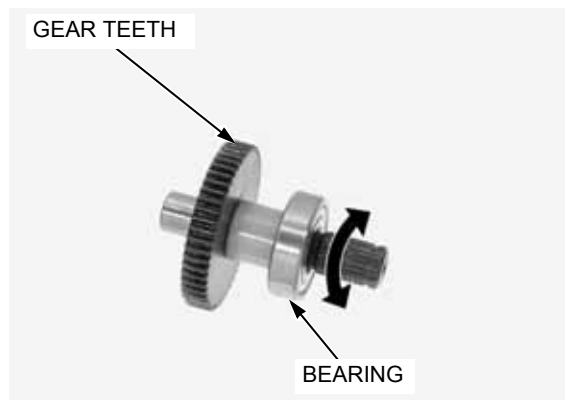


## ELECTRIC STARTER SYSTEM

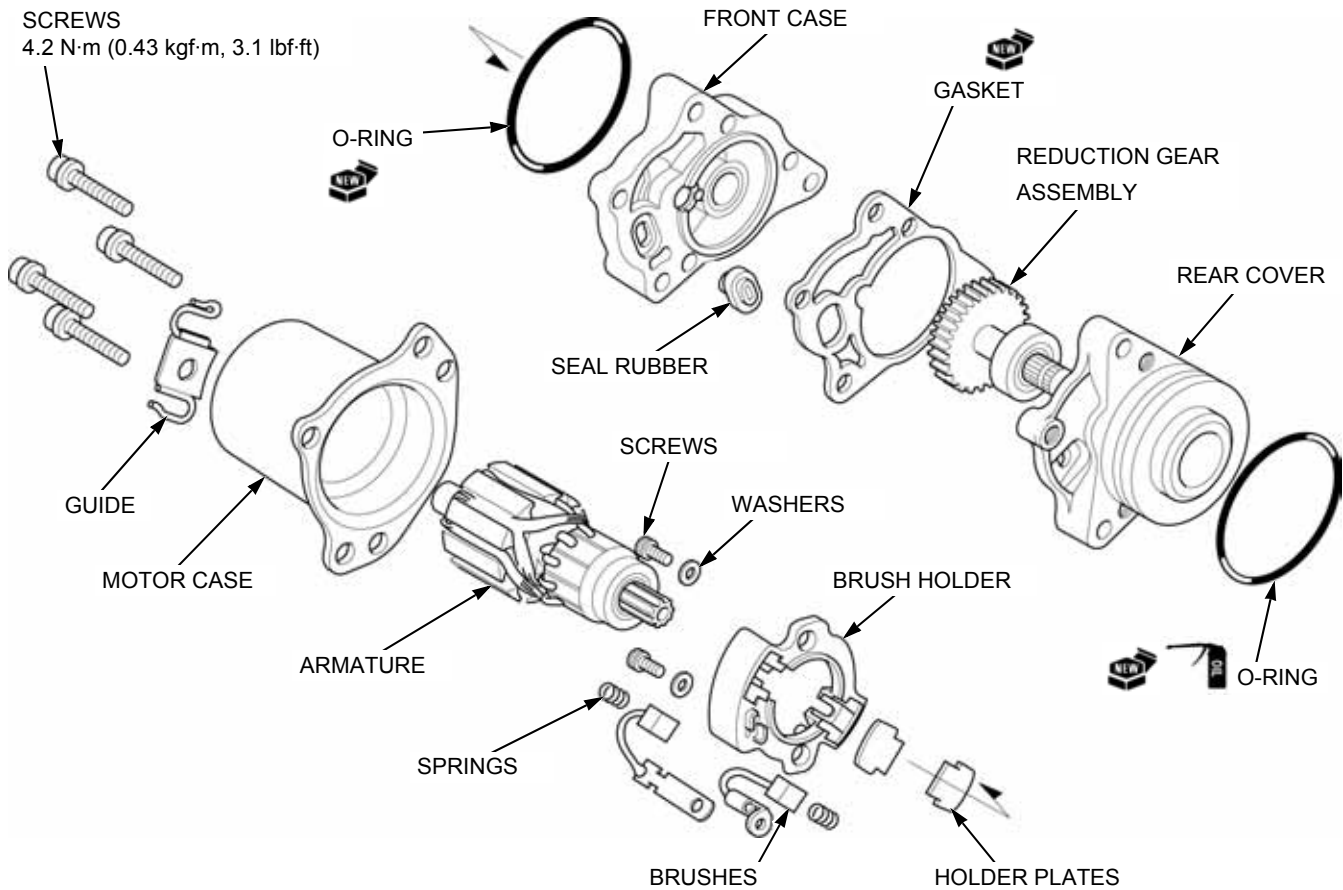
Check for continuity between each commutator bar and armature shaft.  
There should be no continuity.



Check that the bearing on the reduction gear turns smoothly.  
Check the reduction gear teeth for wear or damage.  
Replace the reduction gear assembly with a new one if necessary.



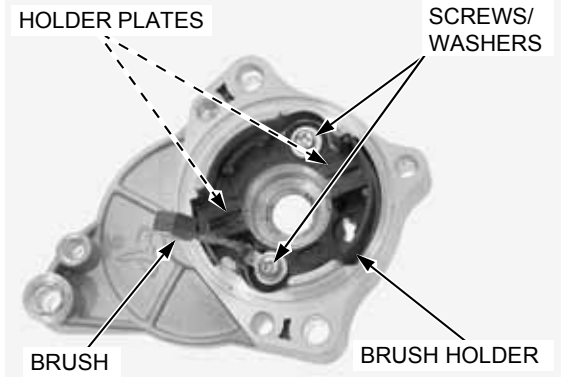
## ASSEMBLY



## ELECTRIC STARTER SYSTEM

Install the two holder plates to the brush holder, then install the plates, brush, washers and screws.

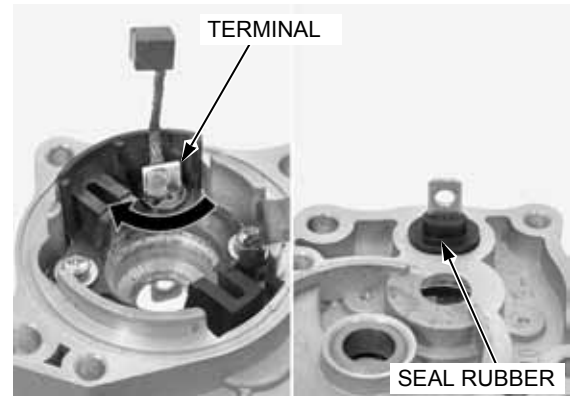
Tighten the screws.



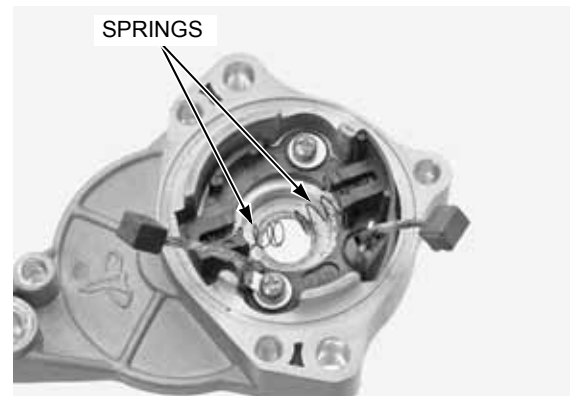
Insert the terminal of the brush into the brush holder, then rotate and secure it.

*The sliding surfaces of the brushes can be damaged if they are not installed properly.*

Install the seal rubber to the terminal.



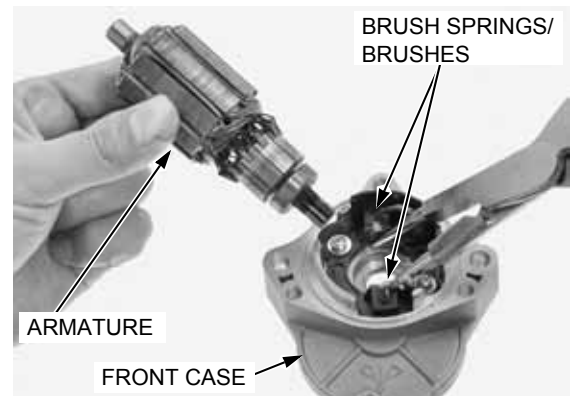
Install the springs into the brush holder.



Set the brush springs/brushes to the brush holder and hold them in position.

*The sliding surfaces of the brushes can be damaged if they are not installed properly.*

Install the armature to the front case.

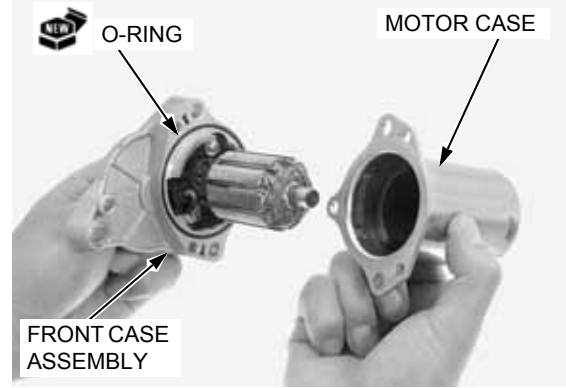


## ELECTRIC STARTER SYSTEM

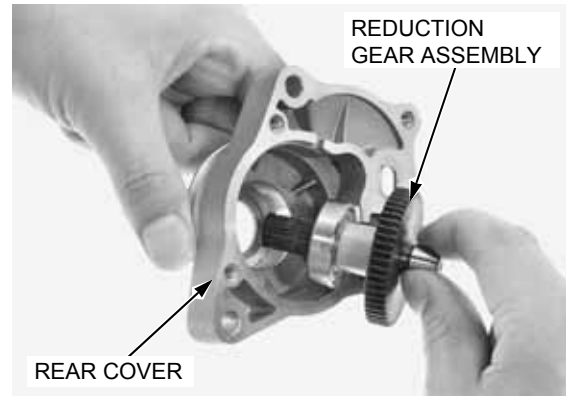
Install a new O-ring to the front case.

*The armature will be magnetically attached to the motor case, be careful during installation.*

Install the motor case to the front case assembly.

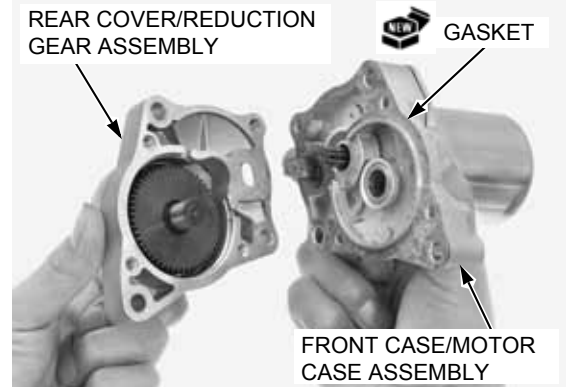


Install the reduction gear assembly to the rear cover.



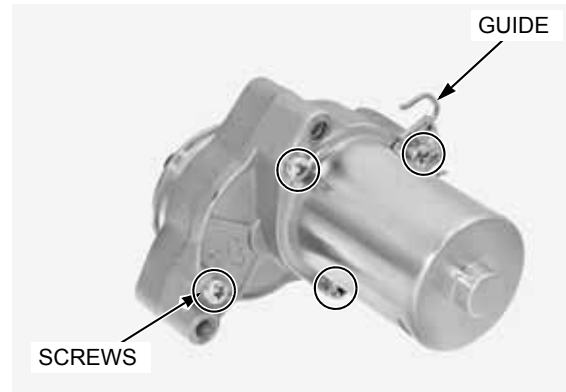
Install a new gasket to the front case/motor case assembly.

Install the rear cover/reduction gear assembly to the front case/motor case assembly.



Install the guide and four screws and tighten it to the specified torque.

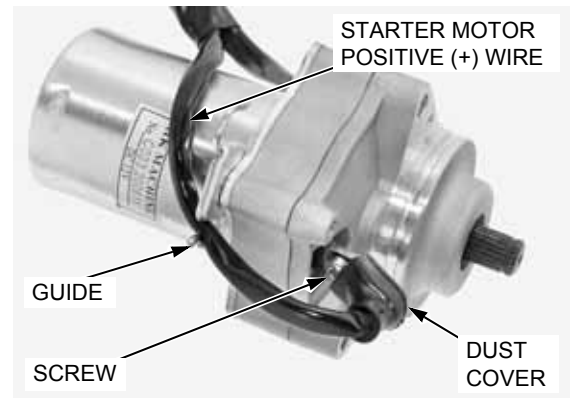
**TORQUE: 4.2 N·m (0.43 kgf·m, 3.1 lbf·ft)**



Connect the starter motor positive (+) wire and tighten the screw.

Set the dust cover in position.

Set the starter motor positive (+) wire to the guide.



## STARTER RELAY

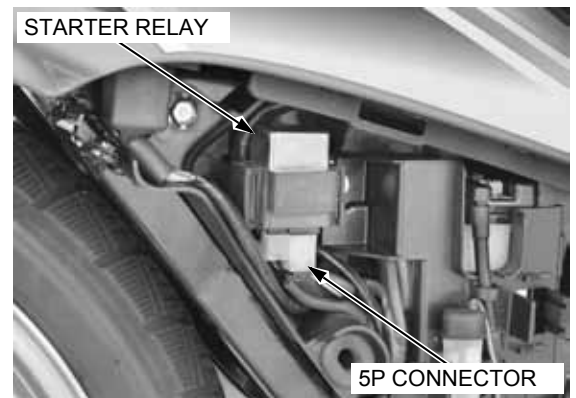
### REMOVAL/INSTALLATION

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

Remove the starter relay, then disconnect the starter relay 5P connector.

*Route the wire harness properly (page 1-14).*

Installation is in the reverse order of removal.



### INSPECTION

#### OPERATION CHECK

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

Shift the transmission into neutral.

Turn the ignition switch to ON.  
Push the starter switch button.

The coil is normal if the starter relay clicks.

If you don't hear the starter relay "CLICK", inspect the starter relay using the procedure below.



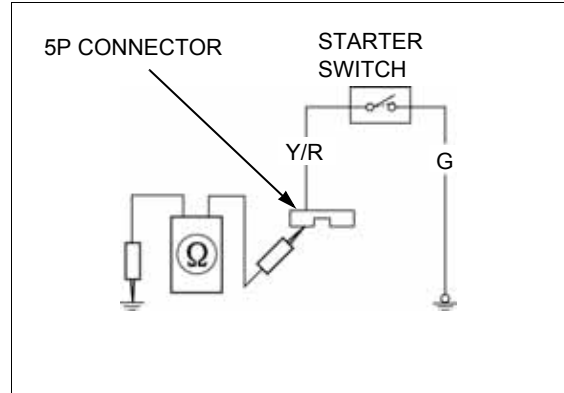
# ELECTRIC STARTER SYSTEM

## GROUND LINE INSPECTION

Disconnect the starter relay 5P connector.

Check for continuity between the Yellow/Red wire of the wire harness side (ground line) and ground when the starter switch is pushed.

If there is continuity when the starter switch button is pushed, the ground line is normal.



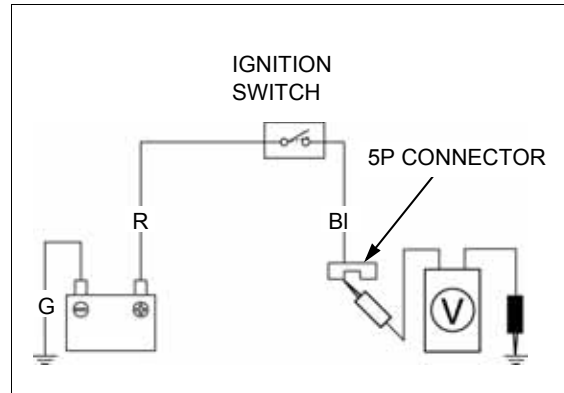
## INPUT VOLTAGE INSPECTION

Disconnect the starter relay 5P connector.

Turn the ignition switch to ON.

Measure the voltage between the Black (+) wire and ground at the starter relay 5P connector of the wire harness side.

If the battery voltage appears only when the ignition switch is ON position, the starter relay input voltage is normal.



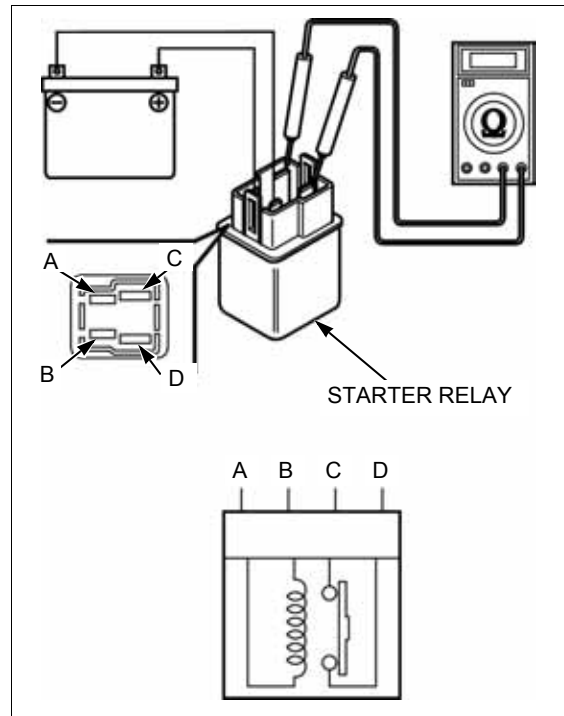
## CONTINUITY INSPECTION

Remove the starter relay (page 16-13).

Connect a fully charged 12V battery positive wire to the relay switch terminal A and negative wire to the terminal B.

Check for continuity at the terminal C and terminal D.

There should be continuity between the cable terminals while the battery is connected, and no continuity when the battery is disconnected.



# 17. LIGHTS/METERS/SWITCHES

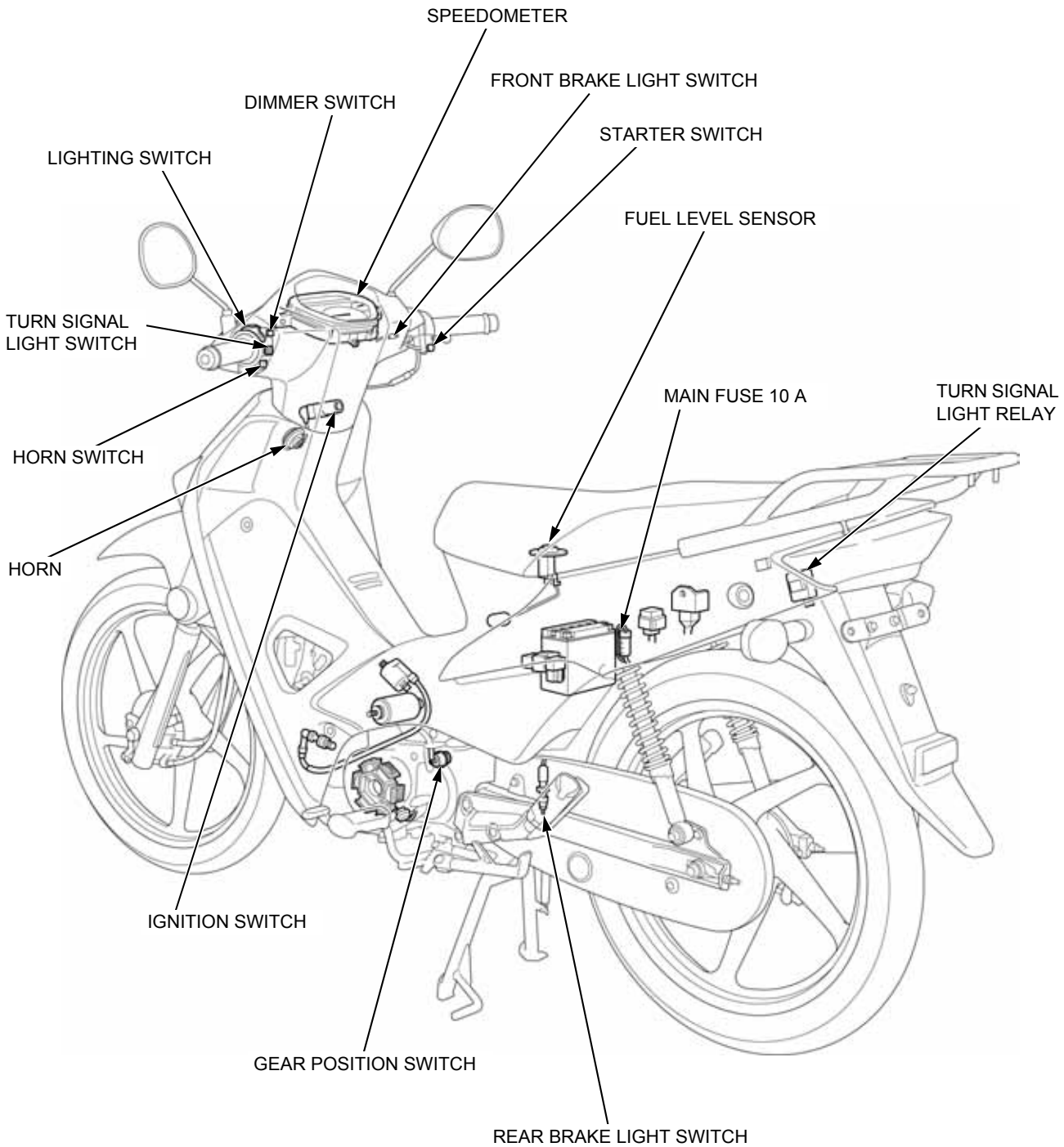
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SYSTEM LOCATION.....	17-2	FUEL METER.....	17-13
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LIGHTING SYSTEM INSPECTION .....	17-4	HANDLEBAR SWITCHES .....	17-15
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BRAKE/TAIL LIGHT.....	17-8	HORN .....	17-19
SPEEDOMETER.....	17-9	TURN SIGNAL LIGHT RELAY .....	17-20
FUEL LEVEL SENSOR .....	17-11		



# LIGHTS/METERS/SWITCHES

## SYSTEM LOCATION



## SERVICE INFORMATION

### GENERAL

- Be sure to install the dust cover after replacing the bulb.
- Check the battery condition before performing any inspection that requires proper battery voltage.
- Route the wires and cables properly after servicing each component (page 1-14).
- The following color codes are used throughout this section.

Bl = Black	G = Green	Br = Brown	Lg = Light green
Y = Yellow	R = Red	O = Orange	P = Pink
Bu = Blue	W = White	Lb = Light blue	Gr = Gray

### SPECIFICATIONS

ITEM		SPECIFICATIONS
Bulbs	Headlight (High/Low)	12 V – 35/35 W
	Position light	12 V – 5 W
	Brake/tail light	12 V – 21/5 W
	Front turn signal light	12 V – 21 W x 2
	Rear turn signal light	12 V – 21 W x 2
	Meter light	12 V – 1.7 W x 2
	Turn signal indicator	12 V – 3.4 W x 2
	High beam indicator	12 V – 1.7 W
	Gear position indicator	12 V – 1.7 W x 4
	Neutral indicator	12 V – 1.7 W
Main fuse		10 A
Alternator lighting coil resistance (20°C/68°F)		0.1 – 1.0 Ω

## LIGHTING SYSTEM INSPECTION

### HEADLIGHT DOES NOT COME ON OR IS WEAK

#### Standard Inspection

Check the following:

- Burned out bulb or bulb with unspecified wattage
- Loose connector
- Lighting switch
- Dimmer switch

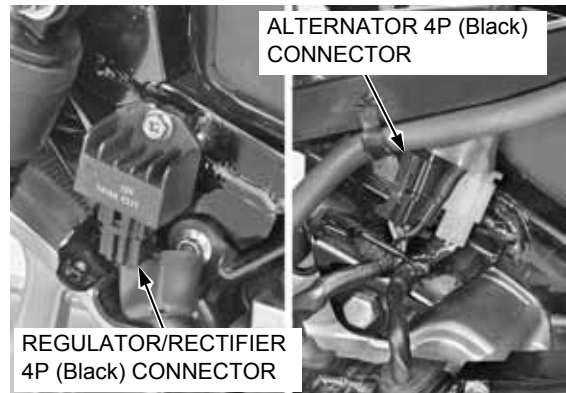
If the above items are normal, check as follows:

#### Lighting Circuit Inspection

Remove the following:

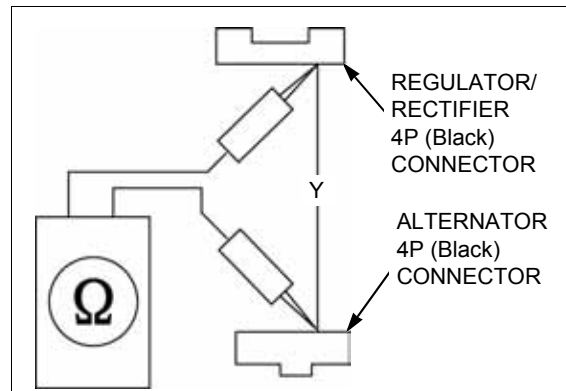
- Handlebar front cover (page 2-13)
- Body cover (page 2-8)

Disconnect the regulator/rectifier 4P (Black) connector and alternator 4P (Black) connector.



Check the continuity between the Yellow terminals of the Regulator/rectifier 4P connector and alternator 4P connector.

if there is continuity, check the following:



Turn the lighting switch to ON position.

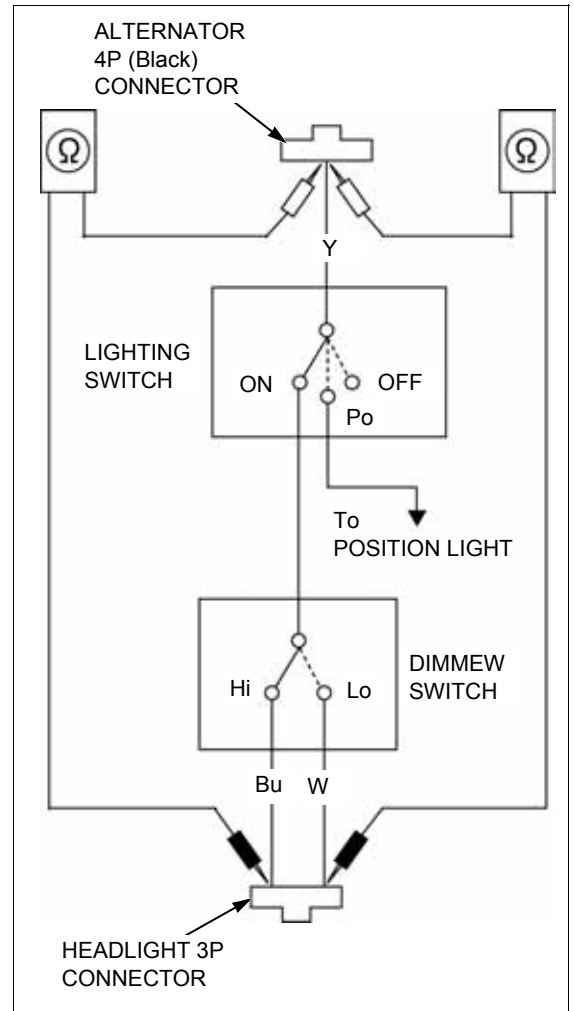
Turn the dimmer switch to Lo position.

Check the continuity between the White terminal of the headlight 3P connector and Yellow terminal of the alternator 4P (Black) connector.

Turn the dimmer switch to Hi position.

Check the continuity between the Blue terminal of the headlight 3P connector and Yellow terminal of the alternator 4P (Black) connector.

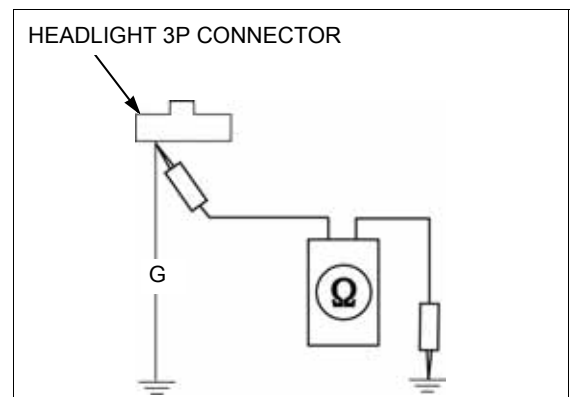
If there is continuity, check the following:



**Ground Inspection**

Check the continuity between the Green terminal of the headlight 3P connector and ground.

If there is continuity, check the following:



## LIGHTS/METERS/SWITCHES

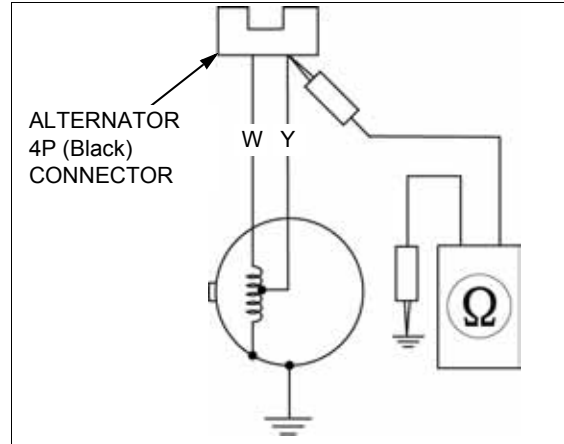
### Lighting Coil Inspection

Check the resistance between the following terminals of the alternator 4P (Black) connector (alternator side).

#### STANDARD:

**Lighting coil (Yellow – Ground):**  
**0.1 – 1.0  $\Omega$  (at 20°C/68°F)**

If there is continuity, check the following:



### Regulator/rectifier Inspection

Remove the front top cover (page 2-4).

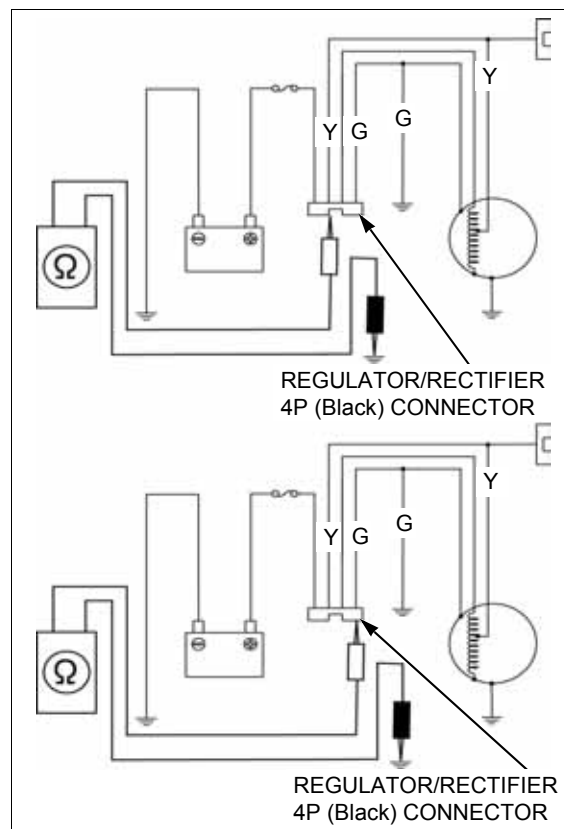
Disconnect the left handle bar switch 9P connector.



Check the regulator/rectifier 4P (Black) connector terminals (wire harness side) as follows:

Item	Terminal	Specification
Lighting coil line	Yellow and Ground	0.1 – 1.0 $\Omega$ (at 20°C/68°F)
Ground line	Green and Ground	Continuity should exist

If all components of the charging system is normal and there are no loose connections at the regulator/rectifier 4P (Black) connector, replace the regulator/rectifier unit.



## HEADLIGHT

### HEADLIGHT BULB REPLACEMENT

Remove the handlebar front cover (page 2-13).

Remove the dust cover.

Press and release the pin, then remove the headlight bulb.

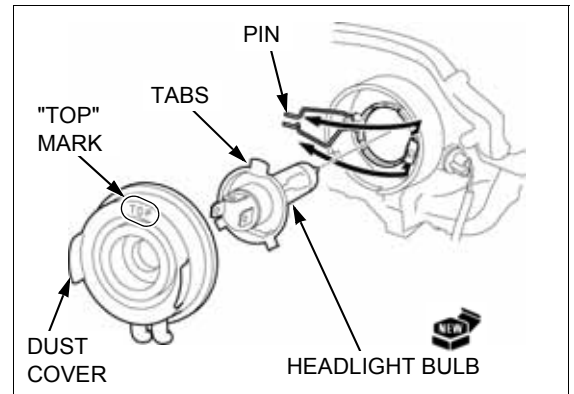
If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent early bulb failure.

Install a new headlight bulb aligning its tabs with the groove on the headlight unit.

Install the headlight bulb, then press and hook the pin.

Install the dust cover with the "TOP" mark facing up.

Install the handlebar front cover (page 2-13).  
For headlight assembly removal/installation (page 2-14).



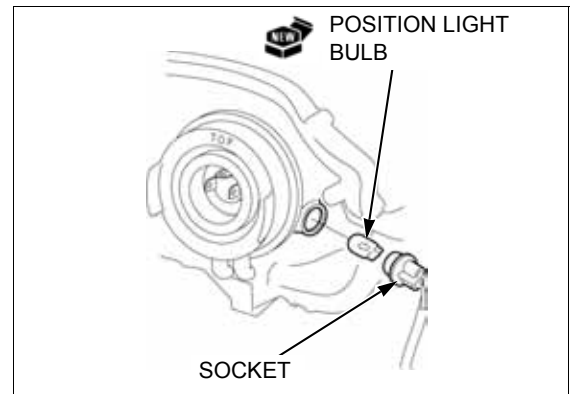
### POSITION LIGHT BULB REPLACEMENT

Remove the handlebar front cover (page 2-13).

Remove socket, then pull out the position light bulb from the socket.

Install a new bulb in the reverse order of removal.

Install the handlebar front cover (page 2-13).



## TURN SIGNAL LIGHT

### BULB REPLACEMENT

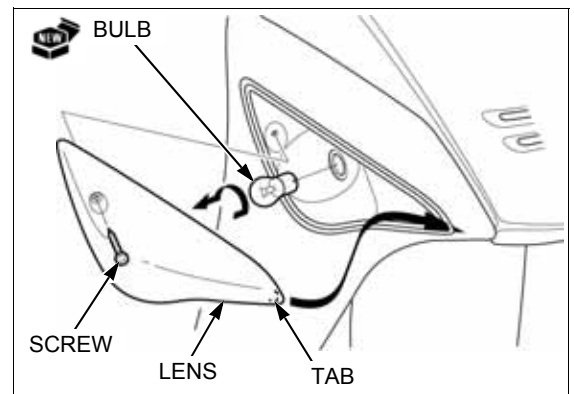
#### FRONT TURN SIGNAL LIGHT

*Be careful not to damage the lens.* Remove the screw and front turn signal lens by releasing the tab.

While pushing the bulb in, turn it counterclockwise and remove it.

Install a new bulb in the reverse order of removal.

- Use only the amber bulbs.



## LIGHTS/METERS/SWITCHES

### REAR TURN SIGNAL LIGHT

*Be careful not to damage the lens.*

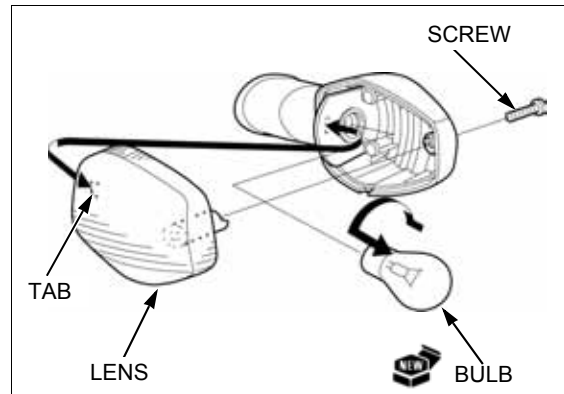
Remove the screw and rear turn signal lens by releasing the tab.

While pushing the bulb in, turn it counterclockwise and remove it.

Install a new bulb in the reverse order of removal.

- Use only the amber bulbs.

For rear turn signal light removal/installation (page 2-13).



## BRAKE/TAIL LIGHT

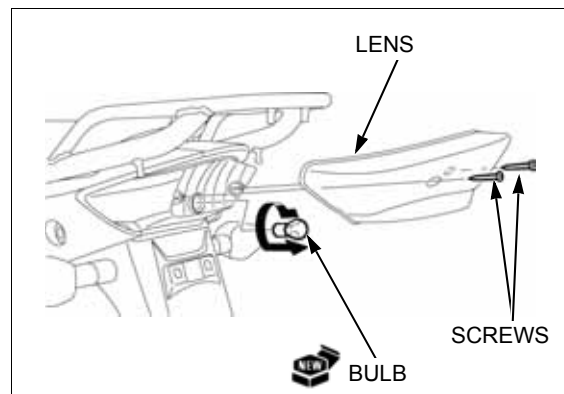
### BULB REPLACEMENT

*Be careful not to damage the lens.*

Remove the two screws and brake/tail light lens.

While pushing the bulb in, turn it counterclockwise and remove it.

Install a new bulb in the reverse order of removal.



### BRAKE/TAIL LIGHT UNIT REMOVAL/INSTALLATION

Remove the body cover (page 2-8).

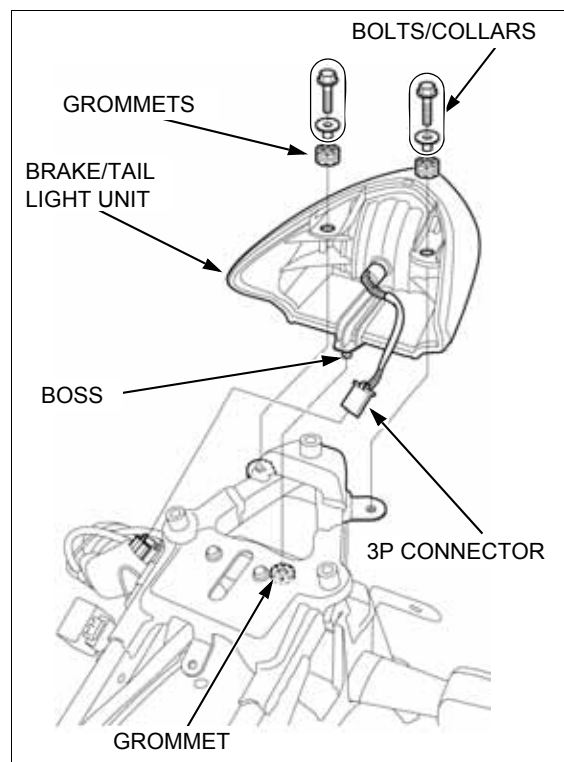
Remove the two bolts and collars.

Pull the brake/tail light unit upward and release its boss from the grommet on the frame.

Disconnect the brake/tail light 3P connector.

Remove the two grommets from the brake/tail light unit.

Installation is in the reverse order of removal.



## SPEEDOMETER

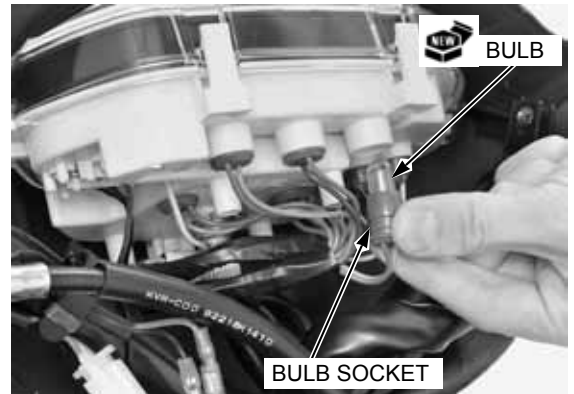
### BULB REPLACEMENT

Remove the handlebar front cover (page 2-13).

Pull out the bulb socket from the speedometer assembly.

Remove the bulb from the socket and replace it with a new one.

Installation is in the reverse order of removal.

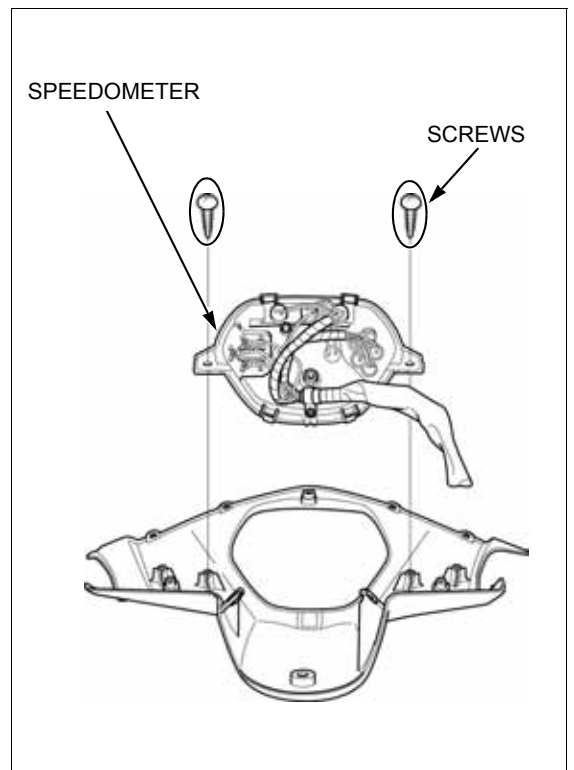


### REMOVAL/INSTALLATION

Remove the handlebar rear cover (page 2-15).

Remove the screws and speedometer assembly.

Install the removed parts in the reverse order of removal.





# LIGHTS/METERS/SWITCHES

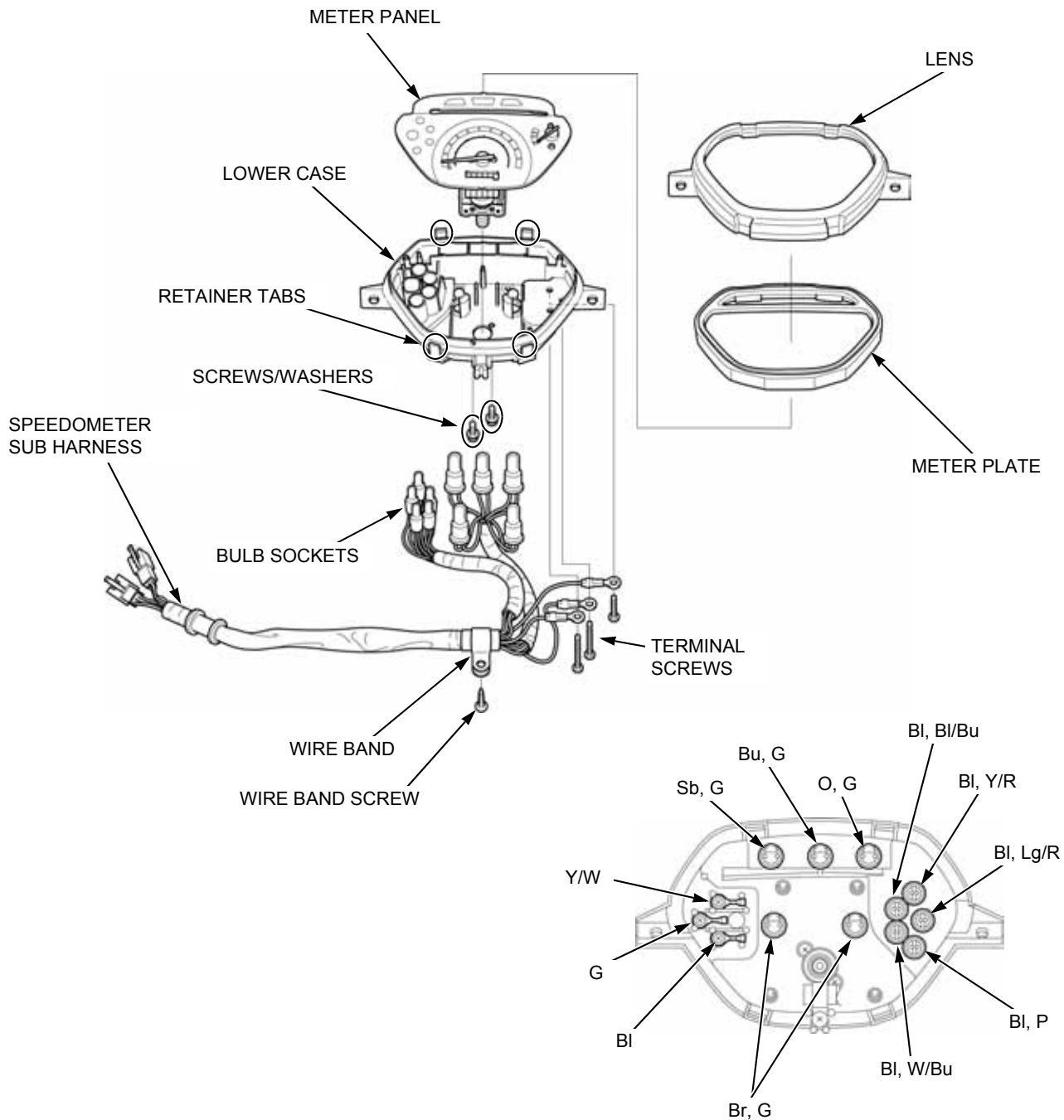
## DISASSEMBLY/ASSEMBLY

- Be careful not to put fingerprints on the meter panel.
- Be careful not to damage the retainer tabs when removing the lens.
- Route the speedometer sub harness properly.

Remove the following:

- Wire band screw/wire band
- Three terminal screws
- Bulb sockets/speedometer sub harness
- Lens/meter plate
- Two screws/washers
- Speedometer panel

Assembly is in the reverse order of disassembly.



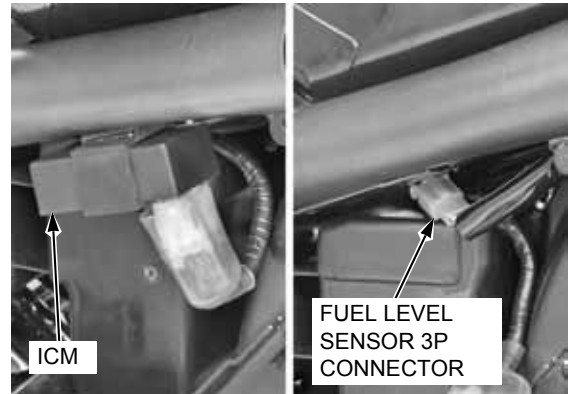
## FUEL LEVEL SENSOR

### REMOVAL

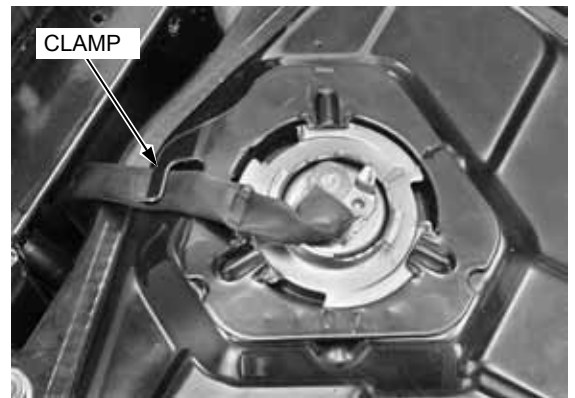
Remove the body cover (page 2-8).

Remove the ICM from the frame.

Disconnect the fuel level sensor 3P connector.



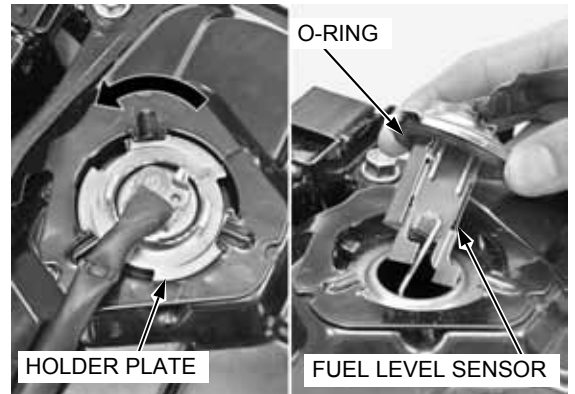
Release the harness from the clamp.



Turn the holder plate counterclockwise with a pair of needle nose pliers and remove the fuel unit holder plate.

*Be careful not to damage the float arm.*

Remove the fuel level sensor and O-ring.

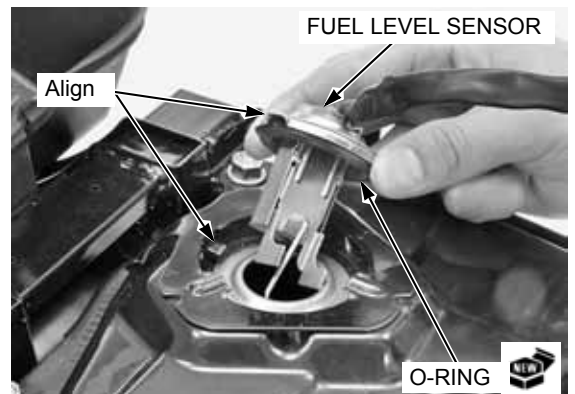


### INSTALLATION

Install a new O-ring to the fuel level sensor.

*Be careful not to damage the float arm.*

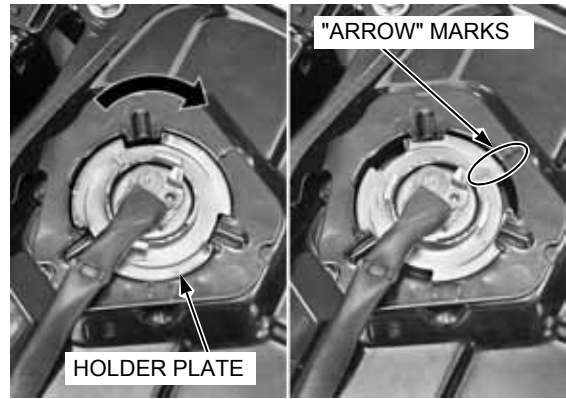
Install the fuel level sensor while aligning its groove with the tab on the fuel tank.



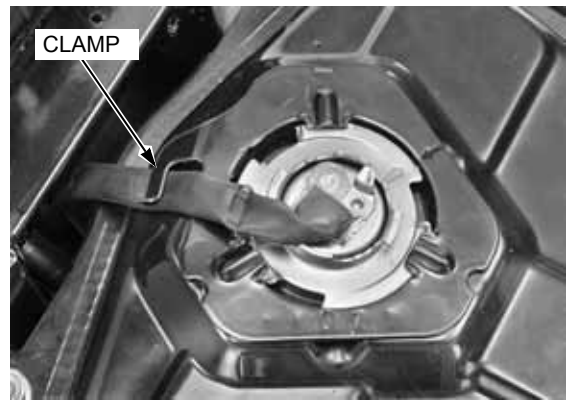
## LIGHTS/METERS/SWITCHES

Set the holder plate as shown.

Turn the holder plate clockwise until the arrow marks on the holder plate and fuel tank are aligned.

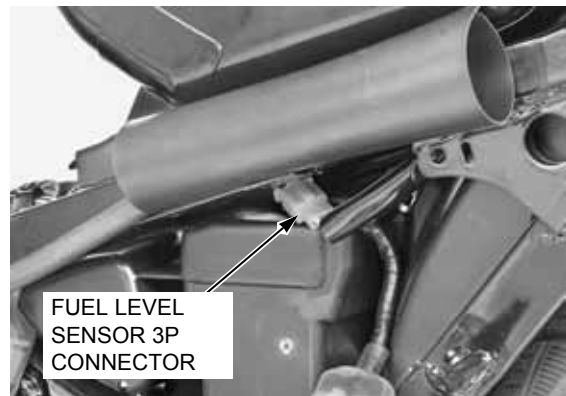


Secure the harness with the clamp.



Connect the fuel level sensor 3P connector.

*Route the wire harness properly (page 1-14).* install the removed parts in the reverse order of removal.



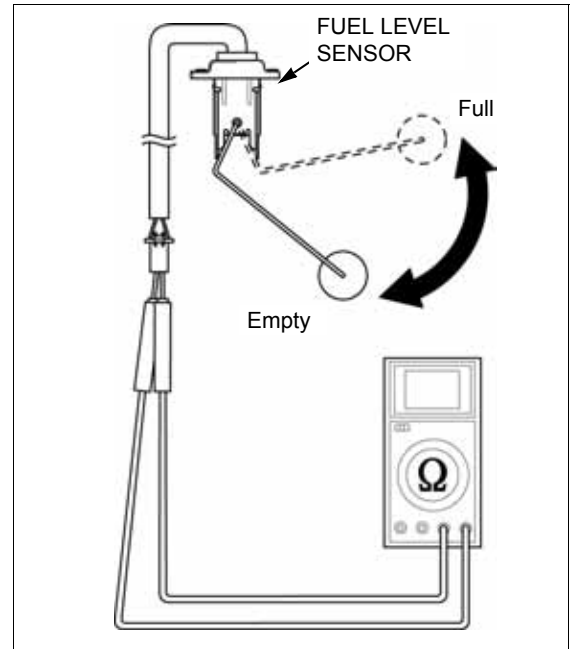
**INSPECTION**

Measure the resistance between the 3P connector terminals with the float at upper (full) and lower (empty) positions.

(20°C/68°F)

CONNECTION	FLOAT POSITION	
	FULL	EMPTY
Yellow/White - Green	4 – 10 Ω	97.5 – 107.5 Ω

Replace the fuel level sensor if it is out of specification.



**FUEL METER**

**METER CIRCUIT INSPECTION**

**WHEN FUEL IS ABOUT FULL BUT NEEDLE DOES NOT MOVE**

- Before performing the system inspection, make sure that the following items are normal.
  - Battery condition
  - Fuses
  - Meter indicators

Remove the body cover (page 2-8)

Remove the ICM from the frame.

Disconnect the fuel level sensor 3P connector.

Short the connector terminals of the wire harness side with the jumper wire.

**CONNECTION: Yellow/White – Green**

*Do not leave the terminals connected with jumper wire for a long time, as it causes damage to the fuel meter.*

Turn the ignition switch "ON", check if the fuel meter needle moves to "F".

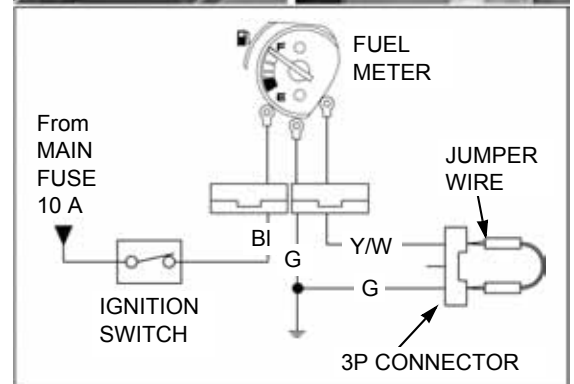
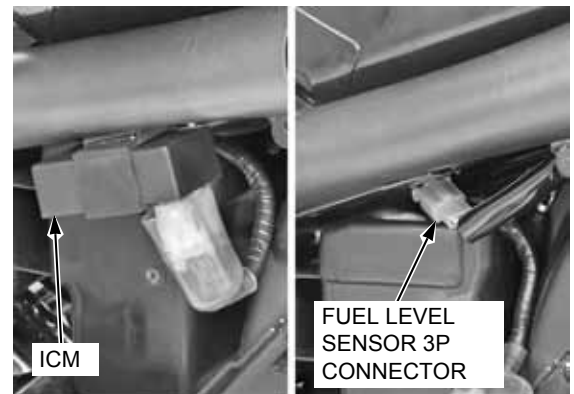
The needle moves if the system circuit is normal. In that case, check the fuel level sensor (page 17-13).

If the needle does not move, check the following:

- Yellow/White wire between the fuel level sensor and fuel meter for open or short circuit
- Black wire between the ignition switch and fuel meter for open circuit
- Green wire between the fuel level sensor and ground for open circuit
- Green wire between the fuel meter and ground for open circuit

If the wire is normal, replace the speedometer panel with a new one, and recheck.

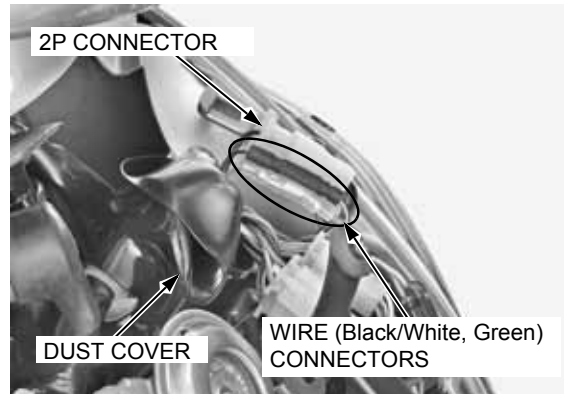
Install the removed parts in the reverse order of removal.



# IGNITION SWITCH


## INSPECTION

Remove the front top cover (page 2-4).  
 Turn the ignition switch "OFF".  
 Pull back the dust cover.  
 Disconnect the ignition switch 2P connector and wire (Black/White, Green) connectors.



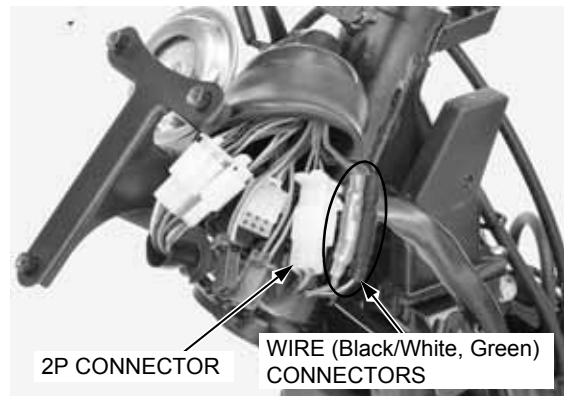
Check for continuity between the switch side of the connector terminals in each switch position. Continuity should exist between the color coded wires as shown.

IGNITION SWITCH

	IG	E	BAT1	BAT2
LOCK	○	○		
	○	○		
○			○	○
COLOR	BI/W	G	R	BI

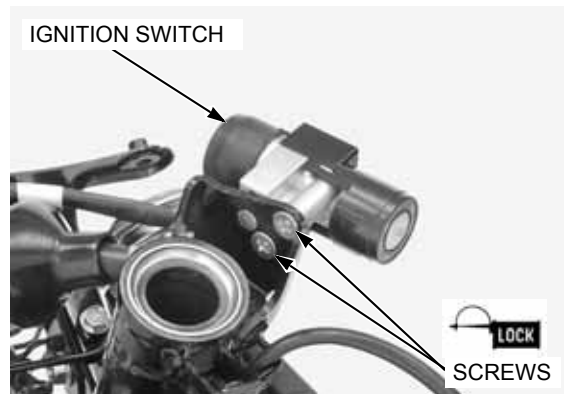
## REMOVAL/INSTALLATION

Remove the steering stem (page 12-24)  
 Disconnect the ignition switch 2P connector and wire (Black/White, Green) connectors.



Remove the two screws and ignition switch.  
 Installation is in the reverse order of removal.

- Apply locking agent to the ignition switch screw threads.



# HANDLEBAR SWITCHES

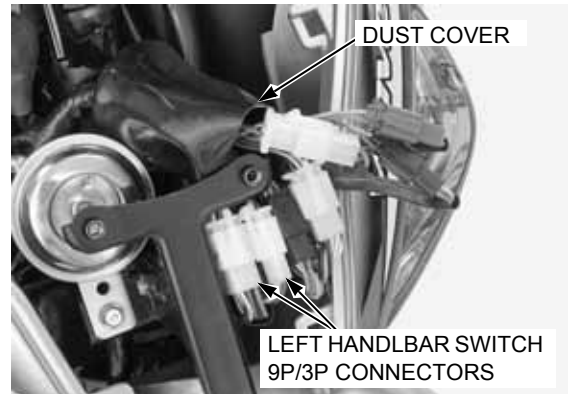
## LEFT HANDLEBAR SWITCH INSPECTION

Remove the front top cover (page 2-4).

Turn the ignition switch "OFF".

Pull back the dust cover.

Disconnect the left handlebar switch 9P/3P connectors.



Check for continuity between the connector terminals in each switch position.

Continuity should exist between the color coded wire terminals as shown in the charts.

LIGHTING SWITCH

	C1	HL	TL
	○	○	○
	○	○	○
COLOR	Y	●	Br

DIMMER SWITCH

	HL	Lo	Hi
	○	○	
(N)	○	○	○
	○		○
COLOR	●	W	Bu

TURN SIGNAL LIGHT SWITCH

	R	WR	L
	○	○	
N			
		○	○
COLOR	Lb	Gr	O

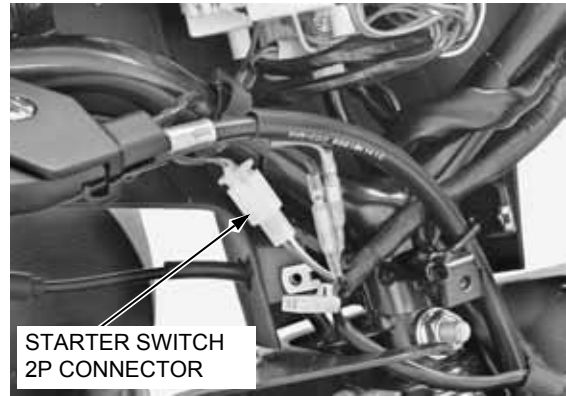
HORN SWITCH

	Ho	BAT1
FREE		
PUSH	○	○
COLOR	Lg	Bl

## LIGHTS/METERS/SWITCHES

### RIGHT HANDLEBAR SWITCH INSPECTION

Remove the handlebar front cover (page 2-13).  
Turn the ignition switch "OFF".  
Disconnect the starter switch 2P connector.



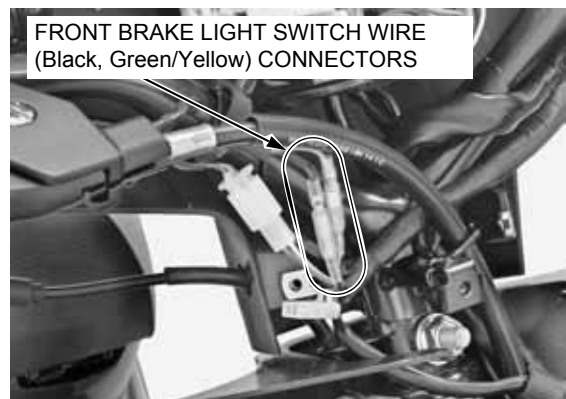
Check for continuity between the connector terminals in each switch position.  
Continuity should exist between the color coded wire terminals as shown in the charts.

STARTER SWITCH		
	ST	E
FREE		
PUSH	○	○
COLOR	Y/R	G

## BRAKE LIGHT SWITCH

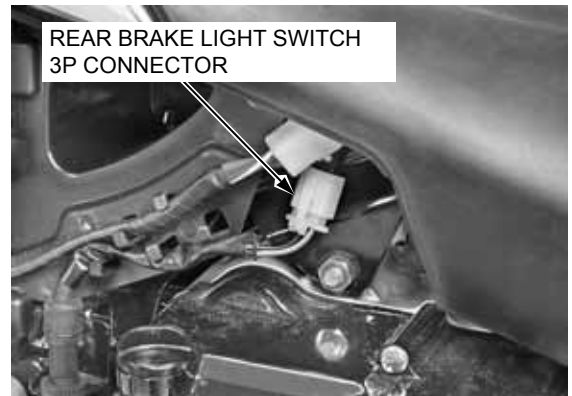
### FRONT BRAKE LIGHT SWITCH INSPECTION

Remove the handlebar front cover (page 2-13).  
Disconnect the front brake light switch wire (Black, Green/Yellow) connectors and check for continuity between the switch terminals.  
There should be continuity with the brake lever squeezed and no continuity with the lever released.



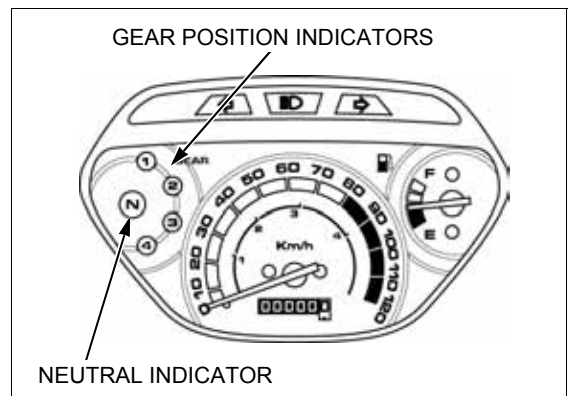
### REAR BRAKE LIGHT SWITCH INSPECTION

Remove the right side cover (page 2-7).  
 Disconnect the rear brake light switch 3P connector.  
 Check for continuity between the switch side connector terminals.  
 There should be continuity with the brake pedal applied and no continuity with the pedal released.

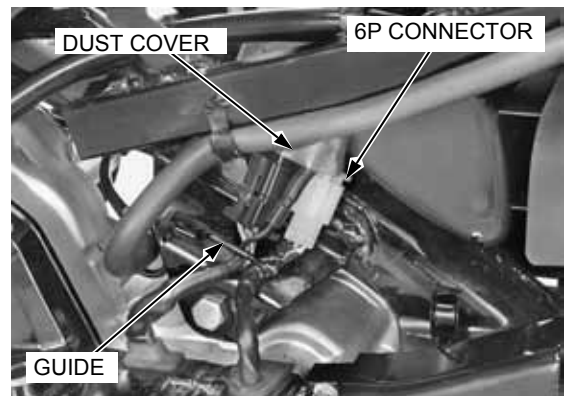


### GEAR POSITION SWITCH INSPECTION

Turn the ignition switch ON, and shift the transmission into each gear position.  
 Check the operation of gear position and neutral indicator lights at each gear position.  
 If all the indicator bulbs are normal but the gear position indicator does not light, check as follows:



Remove the body cover (page 2-8).  
 Release the wire harnesses from the guide.  
 Pull back the dust cover.  
 Disconnect the gear position switch 6P connector.  
 Check for continuity between the terminals at each gear position.  
 The gear position switch is normal if the continuity exist between the color coded wires as shown in the chart.



Check for continuity between the terminals at each gear position.  
 The gear position switch is normal if the continuity exist between the color coded wires as shown in the chart.

GEAR	GROUND	Lg/R	Y/R	Bl/Bu	W/Bu	P
N	○	○				
1	○		○			
2	○			○		
3	○				○	
4	○					○



## LIGHTS/METERS/SWITCHES

### REMOVAL

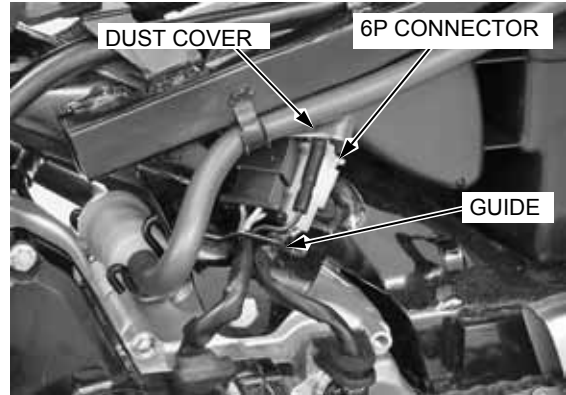
Remove the following:

- Body cover (page 2-8)
- Left crankcase rear cover (page 10-4)

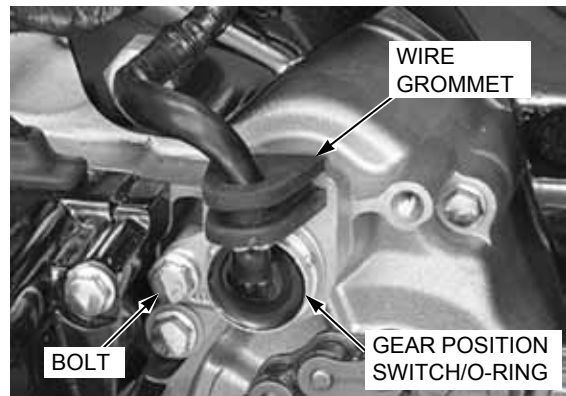
Release the wire harnesses from the guide.

Pull back the dust cover.

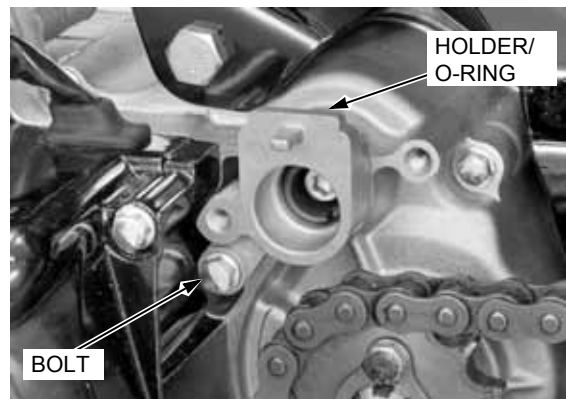
Disconnect the gear position switch 6P connector.



Remove the bolt, gear position switch, and O-ring by releasing the gear position switch wire grommet.



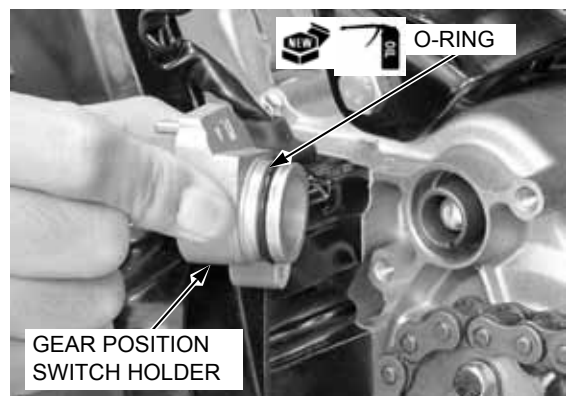
Remove the bolt, gear position switch holder and O-ring from the left crankcase.



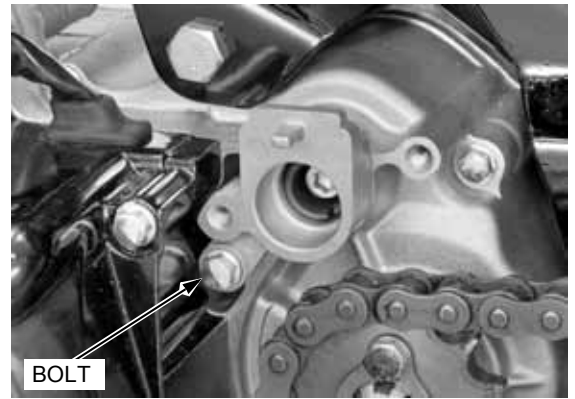
### INSTALLATION

Apply engine oil to a new O-ring and install it to the gear position switch holder.

Install the gear position switch holder to the left crankcase.



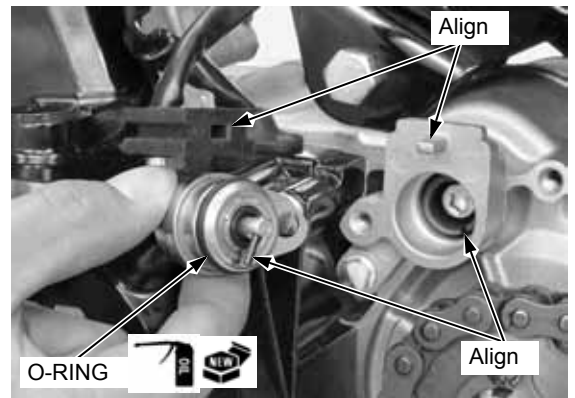
Install and tighten the bolt.



Apply engine oil to a new O-ring and install it to the gear position switch.

Install the gear position switch while aligning its pin with the groove on the rotor.

Install the gear position switch wire grommet while aligning its groove with the boss on the gear position switch holder.

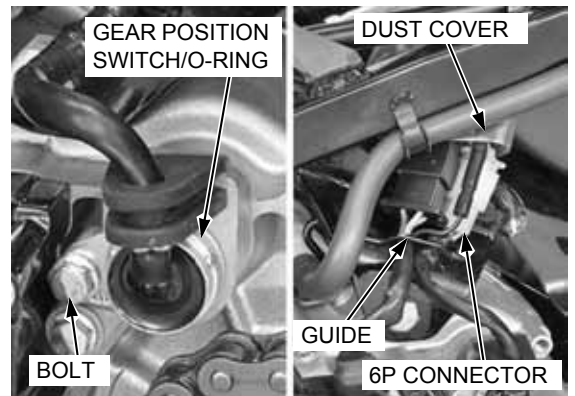


Install and tighten the bolt.

Connect the gear position switch 6P connector. Secure the wire harnesses with the guide. Set the dust cover in position.

Install the following:

- Left crankcase rear cover (page 10-5)
- Body cover (page 2-8)



## HORN

### INSPECTION

Remove the front top cover (page 2-4).

Disconnect the horn wire connectors. Connect the 12 V battery to the horn terminals.

The horn is normal if it sounds when the 12 V battery is connected to the horn terminals.



## LIGHTS/METERS/SWITCHES

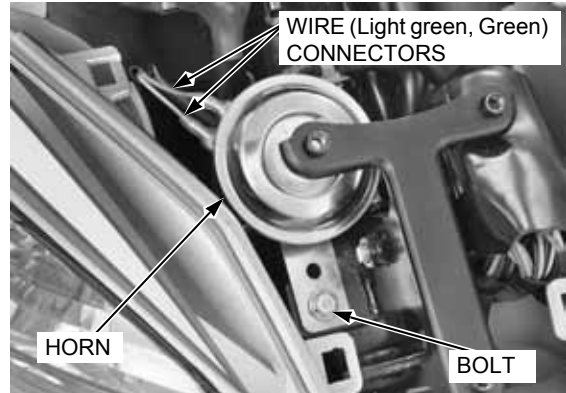
### REMOVAL/INSTALLATION

Remove the front top cover (page 2-4).

Disconnect the horn wire (Light green, Green) connectors.

Remove the bolt and horn.

Installation is in the reverse order of removal.

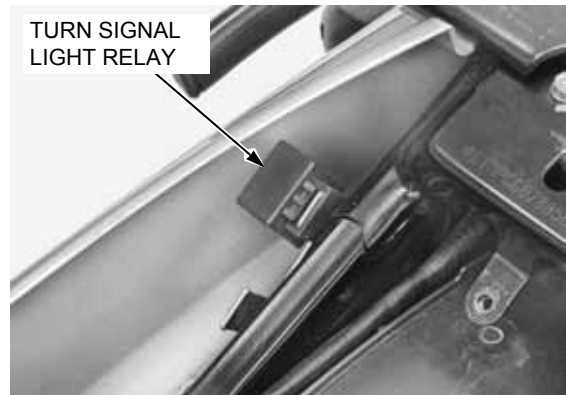


## TURN SIGNAL LIGHT RELAY

### REMOVAL/INSTALLATION

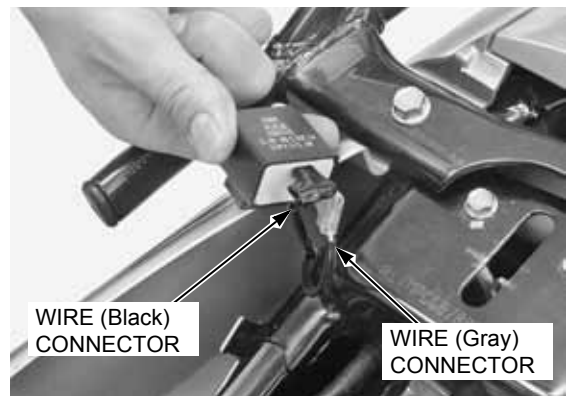
Remove the utility box (page 2-11).

Release the turn signal light relay from the relay holder.



Disconnect the turn signal light relay wire (Black, Gray) connectors and remove the turn signal light relay.

Installation is in the reverse order of removal.



**INSPECTION**

Check the following:

- Battery condition
- Ignition switch and turn signal light switch function
- Loose connectors
- Main fuse (10 A)

If above items are all normal, check the following:

Remove the turn signal light relay (page 17-20).

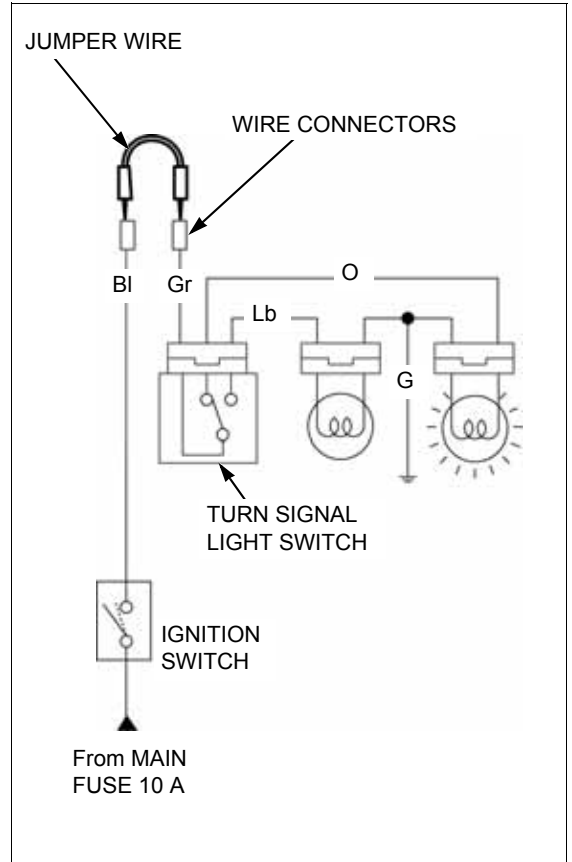
Short the Black and Gray terminals of the harness side connector with the jumper wire.

Turn the ignition switch ON.

Check the turn signal light by moving the turn signal switch to the right and left.

- If the turn signal light does not come on, there is open circuit in wire harness.
- If the lights come on, the circuit is normal.  
Replace the turn signal relay.

Install the removed parts in the reverse order of removal.



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**MEMO**

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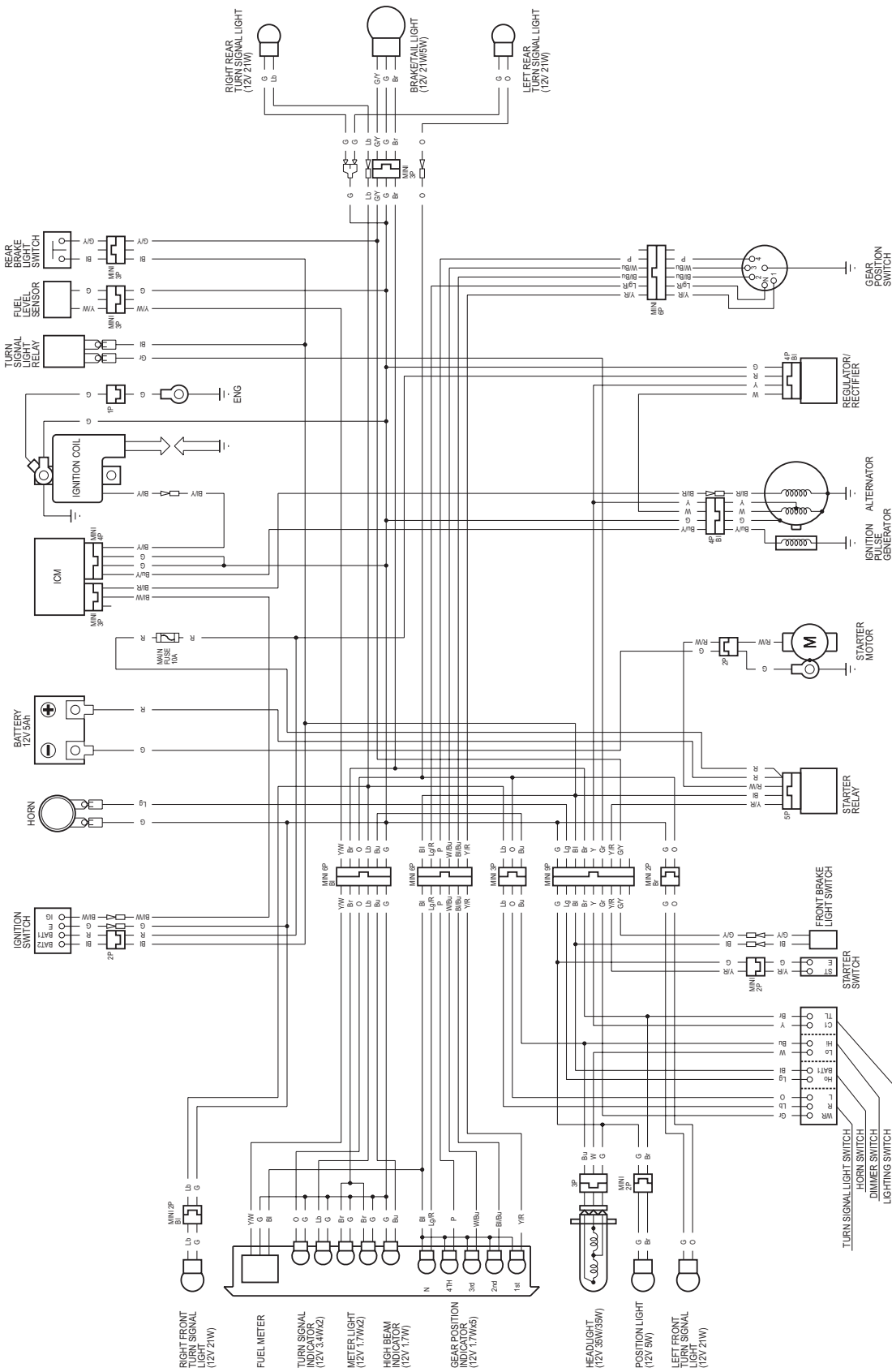
# 18. WIRING DIAGRAM

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WIRING DIAGRAM.....18-2

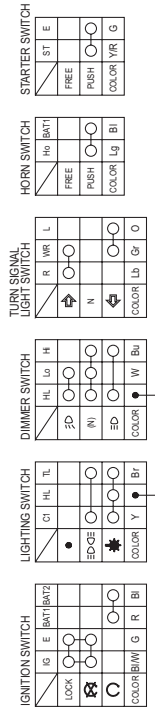
# WIRING DIAGRAM

## WIRING DIAGRAM



BI	BLACK	Br	BROWN
Y	YELLOW	O	ORANGE
Bu	BLUE	Lg	LIGHT BLUE
G	GREEN	Lg	LIGHT GREEN
W	WHITE	Gr	GRAY
		Lc	LEAD

COLOR COMB : GROUND MARKING



# 19. TROUBLESHOOTING

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ENGINE DOES NOT START  
OR IS HARD TO START .....19-2

ENGINE LACKS POWER .....19-3

POOR PERFORMANCE  
AT LOW AND IDLE SPEED .....19-5

POOR PERFORMANCE  
AT HIGH SPEED ..... 19-6

POOR HANDLING ..... 19-7



# ENGINE DOES NOT START OR IS HARD TO START

### 1. Fuel Line Inspection

Check fuel flow to carburetor.

**Does fuel reach the carburetor?**

**YES** – GO TO STEP 2.

**NO** –

- Clogged fuel line or strainer
- Clogged fuel tank cap
- Sticking float valve
- Clogged fuel filter

### 2. Spark Plug Inspection

Remove and inspect spark plug.

**Is the spark plug wet?**

**YES** –

- Flooded carburetor
- Throttle valve open
- Dirty air cleaner

**NO** – GO TO STEP 3.

### 3. Spark Test

Perform spark test.

**Is there weak or no spark?**

**YES** –

- Faulty spark plug
- Fouled spark plug
- Loose or disconnected ignition system wires
- Faulty ignition pulse generator
- Faulty ignition coil
- Faulty ICM (ignition control module)

**NO** – GO TO STEP 4.

### 4. Cylinder Compression

Test cylinder compression.

**Is the compression low?**

**YES** –

- Valve stuck open
- Worn cylinder and piston rings
- Damaged cylinder head gasket
- Seized valve
- Improper valve timing
- Valve clearance too small

**NO** – GO TO STEP 5.

### 5. Engine Starting Condition

Start by following normal procedure.

**Does the engine start then stops?**

**YES** –

- Improper choke operation
- Incorrectly adjusted carburetor
- Leaking carburetor insulator or inlet pipe
- Improper ignition timing (Faulty ICM or ignition pulse generator)
- Contaminated fuel

---

## ENGINE LACKS POWER

### 1. Drive Train Inspection

Raise wheel off the ground and spin it by hand.

**Does the wheel spin freely?**

**YES** – GO TO STEP 2.

**NO** – • Brake dragging  
• Worn or damaged wheel bearings

### 2. Tire Pressure Inspection

Check tire pressure.

**Are the tire pressures low?**

**YES** – • Faulty tire valve  
• Punctured tire

**NO** – GO TO STEP 3.

### 3. Clutch Inspection

Accelerate rapidly from low to second.

**Does the engine speed change accordingly when the gearshift pedal is applied?**

**YES** – GO TO STEP 4.

**NO** – • Clutch slipping  
• Worn clutch discs/plates  
• Warped clutch discs/plates  
• Weak clutch spring  
• Additive in engine oil  
• Faulty clutch weight  
• Faulty clutch lining  
• Incorrect clutch adjustment

### 4. Engine Performance Inspection

Accelerate lightly.

**Does the engine speed increase?**

**YES** – GO TO STEP 5.

**NO** – • Improper choke operation  
• Dirty air cleaner  
• Restricted fuel flow  
• Clogged exhaust system  
• Clogged fuel tank cap

### 5. Spark Plug Inspection

Remove and inspect spark plug.

**Is the spark plug fouled or discolored?**

**YES** – GO TO STEP 6.

**NO** – • Plugs not serviced frequently enough  
• Incorrect spark plug heat range  
• Incorrect spark plug gap

### 6. Engine Oil Inspection

Check oil level and condition.

**Is there correct level and good condition?**

**YES** – GO TO STEP 7.

**NO** – • Oil level too high  
• Oil level too low  
• Contaminated oil

## TROUBLESHOOTING

---

### 7. Ignition Timing Inspection

Check ignition timing.

***Is the ignition timing correct?***

**YES** – GO TO STEP 8.

**NO** – • Faulty ICM (ignition control module)  
• Faulty ignition pulse generator

### 8. Cylinder Compression Inspection

Test cylinder compression.

***Is the compression low?***

**YES** – • Valve clearance too small  
• Valve stuck open  
• Worn cylinder and piston rings  
• Damaged cylinder head gasket  
• Improper valve timing  
• Seized valve

**NO** – GO TO STEP 9.

### 9. Carburetor Inspection

Check carburetor for clogging.

***Is the carburetor for clogged?***

**YES** – Carburetor not serviced frequently enough

**NO** – GO TO STEP 10.

### 10. Lubrication Inspection

Remove cylinder head cover and inspect lubrication.

***Is the valve train lubricated properly?***

**YES** – GO TO STEP 11.

**NO** – • Clogged oil passage  
• Clogged oil orifice  
• Oil strainer screen not serviced frequently enough  
• Oil centrifugal filter not serviced frequently enough

### 11. Overheating Inspection

Check for engine overheating.

***Is the engine overheating?***

**YES** – • Excessive carbon build-up in combustion chamber  
• Use of poor quality fuel  
• Wrong type of fuel  
• Clutch slipping  
• Lean fuel mixture

**NO** – GO TO STEP 12.

### 12. Engine Knocking Inspection

Accelerate or run at high speed.

***Is there knocking?***

**YES** – • Worn piston and cylinder  
• Wrong type of fuel  
• Excessive carbon build-up in combustion chamber  
• Ignition timing too advance (Faulty ICM or ignition pulse generator)  
• Lean fuel mixture.

---

## POOR PERFORMANCE AT LOW AND IDLE SPEED

### 1. Idle Adjustment Inspection

Check the idle speed.

***Is the idle speed correct?***

**YES** – GO TO STEP 2.

**NO** – Adjust the idle speed

### 2. Intake Air Leak Inspection

Check for leaking carburetor insulator and inlet pipe.

***Is there leaking?***

**YES** – • Damaged insulator  
• Faulty O-ring  
• Loose inlet pipe

**NO** – GO TO STEP 3.

### 3. Spark Test

Perform spark test.

***Is there weak or intermittent spark?***

**YES** – • Faulty spark plug  
• Fouled spark plug  
• Loose or disconnected ignition system wires  
• Faulty ignition coil  
• Faulty ICM (ignition control module)

**NO** – GO TO STEP 4.

### 4. Ignition Timing Inspection

Check ignition timing.

***Is the ignition timing correct?***

**YES** – GO TO STEP 5.

**NO** – • Faulty ICM  
• Faulty ignition pulse generator

### 5. Air Screw Inspection

Check carburetor air screw adjustment.

***Is the adjustment correct?***

**NO** – See page 5-16

# POOR PERFORMANCE AT HIGH SPEED

### 1. Fuel Line Inspection

Disconnect fuel line at carburetor.

***Does fuel flow freely?***

**YES** – GO TO STEP 2.

**NO** –

- Restricted fuel line and strainer
- Restricted fuel tank cap
- Restricted fuel filter

### 2. Spark Plug Inspection

Remove and inspect the spark plug.

***In the spark plug in good condition?***

**YES** – GO TO STEP 3.

**NO** –

- Plug not serviced frequently enough
- Incorrect spark plug heat range
- Incorrect spark plug gap
- Air cleaner dirty
- Improper choke operation

### 3. Carburetor Inspection

Check carburetor for clogging.

***Is the carburetor clogged?***

**YES** – Carburetor not serviced frequently enough

**NO** – GO TO STEP 4.

### 4. Ignition Timing Inspection

Check ignition timing.

***Is the ignition timing correct?***

**YES** – GO TO STEP 5.

**NO** –

- Faulty ICM (ignition control module)
- Faulty ignition pulse generator

### 5. Valve Timing Inspection

Check valve timing.

***Is the valve timing correct?***

**YES** – GO TO STEP 6.

**NO** – Cam sprocket not installed properly

### 6. Valve Spring Inspection

Check valve springs.

***Is the valve spring free length within specification?***

**YES** – GO TO STEP 7.

**NO** – Faulty valve spring

### 7. Camshaft Inspection

Remove and inspect the camshaft.

***Is the cam lobe height within specification?***

**NO** – Faulty camshaft

---

## POOR HANDLING

### **Steering is heavy**

- Steering top thread too tight
- Damaged steering head bearings
- Low tire pressure

### **Either wheel is wobbling**

- Excessive wheel bearing play
- Bent rim
- Loose or distorted spokes (spoke wheel type)
- Excessively worn swingarm pivot bushings
- Bent frame

### **Motorcycle pulled to one side**

- Front and rear wheels not aligned
- Bent fork
- Bent swingarm
- Bent axle
- Bent frame
- Axle alignment (chain adjustment not equal on both sides)

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**MEMO**

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