

TYPE CODE

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

CODE	AREA TYPE
CH	China

A Few Words About Safety

Service Information

The service and repair information contained in this manual is intended for use by qualified, professional technicians.

Attempting service or repairs without the proper training, tools, and equipment could cause injury to you or others. It could also damage the vehicle or create an unsafe condition.

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

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

For Your Customer's Safety

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

For Your Safety

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

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

Important Safety Precautions

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

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

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

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

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

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

⚠ WARNING

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

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

⚠ WARNING

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

Follow the procedures and precautions in this manual carefully.

HOW TO USE THIS MANUAL

This service manual describes the service procedures for the GLH125SH-6.

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

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

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

Section 4 through 18 describe parts of the motorcycle, grouped according to location.

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


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

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

Your safety, and the safety of others, is very important. To help you make informed decisions we have provided safety messages and other information throughout this manual. Of course, it is not practical or possible to warn you about all the hazards associated with servicing this vehicle.

You must use your own good judgement.

You will find important safety information in a variety of forms including:

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

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

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

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

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

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

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Honda Motor Co., Ltd.
SERVICE PUBLICATION OFFICE

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SYMBOLS

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

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

1. GENERAL INFORMATION

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GENERAL INFORMATION

SERVICE RULES

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

ABBREVIATION

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

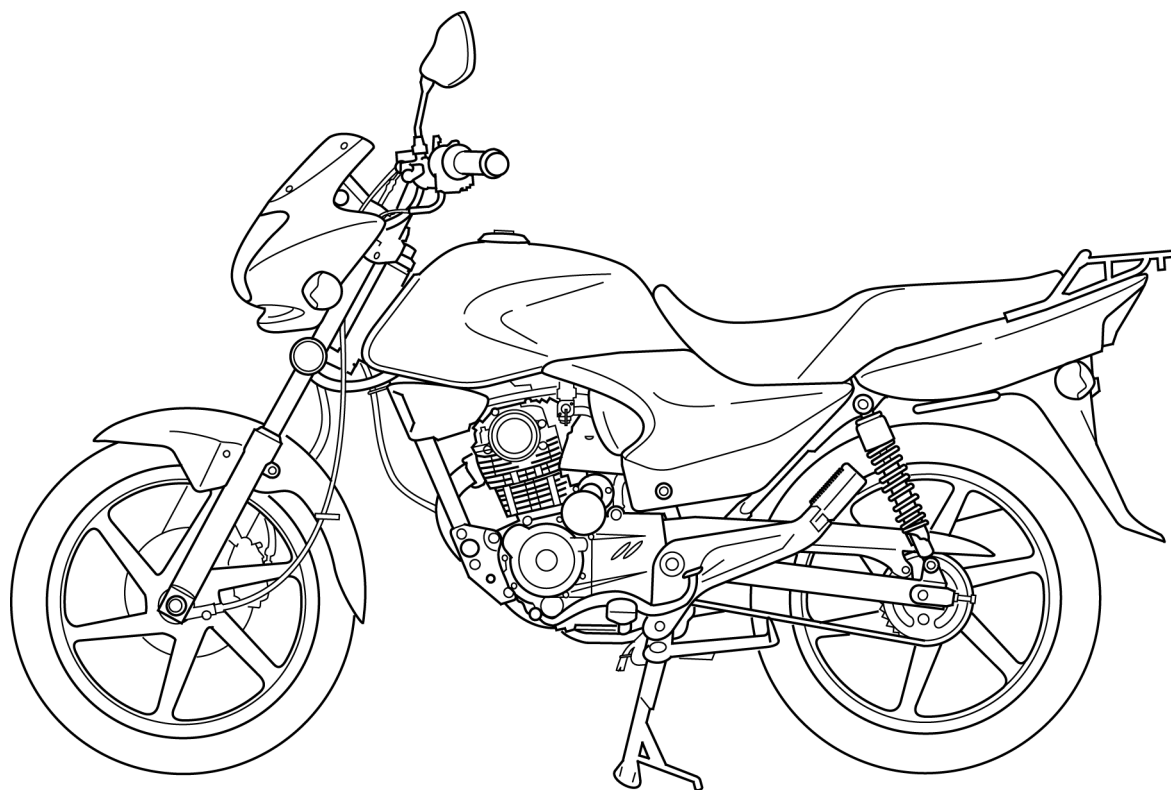
Abbrev. term	Full term
ICM	Ignition Control Module
PAIR	Pulsed Secondary Air Injection

MODEL IDENTIFICATION

This manual covers 2 type of GLH125SH models.

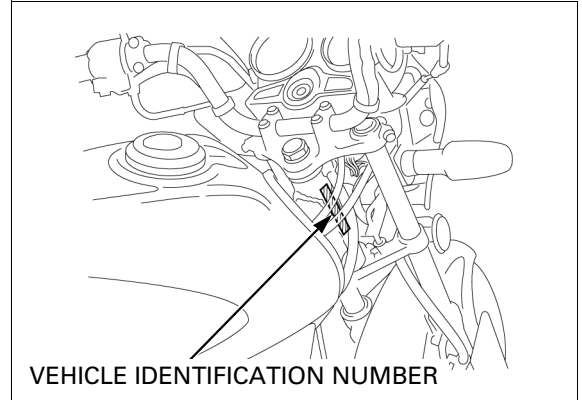
- Disc brake type
- Drum brake type

DISC BRAKE TYPE shown:

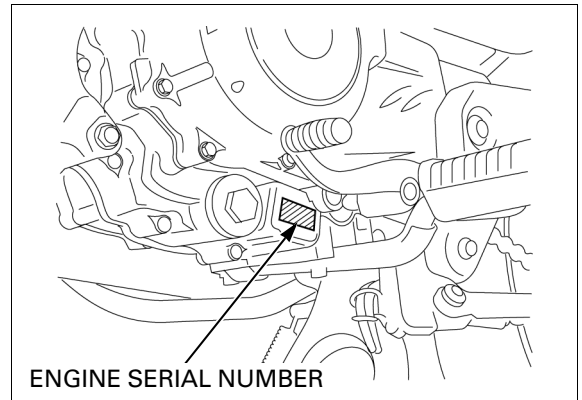


SERIAL NUMBERS

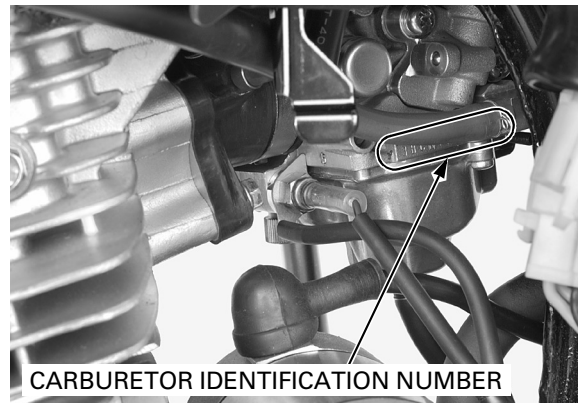
The Vehicle Identification Number (VIN) is stamped on the right side of the steering head.



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

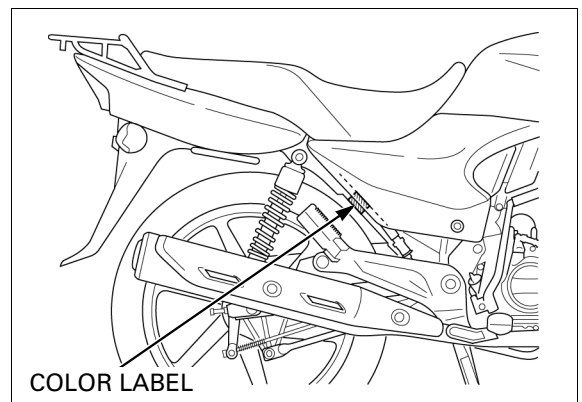


The carburetor identification number is stamped on the left side of the carburetor body.



LABEL

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



GENERAL INFORMATION

GENERAL SPECIFICATIONS

ITEM		SPECIFICATION
DIMENSIONS	Overall length	2,026 mm (79.8 in)
	Overall width	765 mm (30.1 in)
	Overall height	1,094 mm (43.1 in)
	Wheelbase	1,286 mm (50.6 in)
	Seat height	767 mm (30.2 in)
	Footpeg height	287 mm (11.3 in)
	Ground clearance	145mm (5.7 in)
	Curb weight	137 kg (302 lbs)
	Disc brake type	136 kg (300 lbs)
	Drum brake type	153 kg (337 lbs)
	Maximum weight capacity	
FRAME	Frame type	Backbone
	Front suspension	Telescopic fork
	Front axle travel	118 mm (4.6 in)
	Rear suspension	Swingarm
	Rear axle travel	70 mm (2.8 in)
	Front tire size	80/100 – 18 M/C 47P
	Rear tire size	90/90 – 18 M/C 51P
	Front brake	Hydraulic single disc
	Disc brake type	Internal expanding shoe
	Drum brake type	Internal expanding shoe
	Rear brake	29°00'
	Caster angle	103.6 mm (4.08 in)
	Trail length	14.0 liter (3.70 US gal, 3.08 Imp gal)
	Fuel tank capacity	2.0 liter (0.53 US gal, 0.44 Imp gal)
	Fuel tank reserve capacity	
ENGINE	Cylinder arrangement	Single cylinder inclined 15° from vertical
	Bore and stroke	56.5 x 49.5 mm (2.22 x 1.95 in)
	Displacement	124.1 cm ³ (7.57 cu-in)
	Compression ratio	9.0: 1
	Valve train	Chain driven OHC
	Intake valve	15° BTDC
	opens	at 1.1 mm (0.04 in) lift
	closes	at 1.1 mm (0.04 in) lift
	Exhaust valve	20° ABDC
	opens	at 1.1 mm (0.04 in) lift
	closes	at 1.1 mm (0.04 in) lift
	Lubrication system	35° BBDC
	Oil pump type	0° ATDC
	Cooling system	Forced pressure and wet sump
	Air filtration	Trochoid
	Engine dry weight	Air cooled
CARBURETOR	Carburetor type	Paper filter
	Throttle bore	30.5 kg (67.2 lbs)
DRIVE TRAIN	Clutch system	Constant velocity
	Clutch operation system	24 mm (0.9 in)
	Transmission	Multi-plate, wet
	Primary reduction	Mechanical type
	Final reduction	5 speeds
	Gear ratio	4.055 (73/18)
	1st	2.643 (37/14)
	2nd	3.083 (37/12)
	3rd	1.882 (32/17)
	4th	1.400 (28/20)
	5th	1.130 (26/23)
	Gearshift pattern	0.960 (24/25)
ELECTRICAL	Ignition system	Left foot operated return system
	Starting system	1 - N - 2 - 3 - 4 - 5
	Charging system	AC-CDI
	Regulator/rectifier	Electric starter motor and kickstarter
	Lighting system	Single phase alternator
		SCR shorted/single phase, full-wave rec-tification
		Battery

LUBRICATION SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	0.9 liter (1.0 US qt, 0.8 Imp qt)	–
	After disassembly	1.1 liter (1.2 US qt, 1.0 Imp qt)	–
Recommended engine oil		Honda 4-stroke oil or equivalent motor oil API service classification: SF or SG Viscosity: SAE 10W-30	–
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.12 – 0.18 (0.005 – 0.007)	0.25 (0.010)
	Side clearance	0.09 – 0.16 (0.004 – 0.006)	0.25 (0.010)

FUEL SYSTEM SPECIFICATIONS

ITEM	SPECIFICATIONS
Carburetor identification number	AVK3BC
Main jet	#100
Slow jet	#38
Pilot screw initial/final opening	See page 5-20
Float level	13.0 mm (0.51 in)
Idle speed	1,400 ± 100 min ⁻¹ (rpm)
Throttle grip free play	2.0 – 6.0 mm (1/16 – 1/4 in)
PAIR control valve specified vacuum	52.0 kPa (390 mmHg)
Carburetor heater resistance (20°C /68°F)	13 – 15 Ω

CYLINDER HEAD/VALVES SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression at 450 min ⁻¹ (rpm)			1,294 kPa (13.2 kgf/cm ² , 188 psi)	–
Valve clearance		IN/EX	0.10 ± 0.02 (0.004 ± 0.001)	–
Valve, valve guide	Valve stem O.D.	IN	5.450 – 5.465 (0.2146 – 0.2152)	5.42 (0.213)
		EX	5.430 – 5.445 (0.2138 – 0.2144)	5.40 (0.213)
	Valve guide I.D.	IN/EX	5.475 – 5.485 (0.2156 – 0.2159)	5.50 (0.217)
		IN	0.010 – 0.035 (0.0004 – 0.0014)	0.12 (0.005)
	Stem-to-guide clearance	EX	0.030 – 0.055 (0.0012 – 0.0022)	0.14 (0.006)
		IN/EX	1.2 – 1.6 (0.05 – 0.06)	2.0 (0.08)
Valve spring free length	Inner	IN/EX	39.2 (1.54)	38.0 (1.50)
	Outer	IN/EX	44.85 (1.77)	43.5 (1.71)
Rocker arm	Arm I.D.	IN/EX	12.000 – 12.018 (0.4724 – 0.4731)	12.05 (0.474)
	Shaft O.D.	IN/EX	11.977 – 11.995 (0.4715 – 0.4722)	11.95 (0.470)
	Arm-to-shaft clearance	IN/EX	0.005 – 0.041 (0.0002 – 0.0016)	0.10 (0.004)
Cylinder head warpage			–	0.05 (0.002)
Camshaft	Cam lobe height	IN	31.452 – 31.532 (1.2383 – 1.2414)	31.1 (1.22)
		EX	31.132 – 31.212 (1.2257 – 1.2288)	31.0 (1.22)

GENERAL INFORMATION

CYLINDER/PISTON SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		56.50 – 56.51 (2.224 – 2.225)	56.60 (2.228)
	Out-of-round		–	0.10 (0.004)
	Taper		–	0.10 (0.004)
	Warpage		–	0.05 (0.002)
Piston, piston pin, piston ring	Piston mark direction		"IN" mark facing toward the intake side	–
	Piston O.D. at 11.5 (0.45) from bottom		56.45 – 56.48 (2.222 – 2.224)	56.40 (2.220)
	Piston pin hole I.D.		15.002 – 15.008 (0.5906 – 0.5909)	15.04 (0.592)
	Piston pin O.D.		14.994 – 15.000 (0.5903 – 0.5906)	14.96 (0.589)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.02 (0.001)
	Piston ring end gap	Top	0.05 – 0.20 (0.002 – 0.008)	0.40 (0.012)
		Second	0.05 – 0.20 (0.002 – 0.008)	0.40 (0.012)
		Oil (side rail)	0.20 – 0.70 (0.008 – 0.028)	0.85 (0.033)
	Piston ring-to-ring groove clearance	Top	0.015 – 0.045 (0.0006 – 0.0018)	0.09 (0.004)
Second		0.015 – 0.045 (0.0006 – 0.0018)	0.09 (0.004)	
Cylinder-to-piston clearance			0.02 – 0.06 (0.0008 – 0.0024)	0.10 (0.004)
Connecting rod small end I.D.			15.010 – 15.028 (0.5909 – 0.5917)	15.06 (0.593)
Connecting rod-to-piston pin clearance			0.010 – 0.034 (0.0004 – 0.0013)	0.10 (0.004)

CLUTCH/GEARSHIFT LINKAGE SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Clutch lever free play		10 – 20 (3/8 – 13/16)	–
Clutch	Spring free length	35.50 (1.398)	34.20 (1.346)
	Disc thickness	2.80 – 2.90 (0.110 – 0.114)	2.6 (0.10)
	Plate warpage	–	0.20 (0.008)

ALTERNATOR/STARTER CLUTCH SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Starter driven gear	O.D.	45.660 – 45.673 (1.7976 – 1.7981)	45.60 (1.795)
	I.D.	22.010 – 22.031 (0.8665 – 0.8674)	22.08 (0.869)
Crankshaft left side shaft O.D.		21.947 – 21.980 (0.8641 – 0.8654)	21.91 (0.863)
Starter driven gear-to-crankshaft left side shaft clearance		0.030 – 0.084 (0.0012 – 0.0033)	0.23 (0.009)

CRANKCASE/TRANSMISSION/CRANKSHAFT/KICKSTARTER SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod big end side clearance		0.05 – 0.30 (0.002 – 0.012)	0.80 (0.031)
	Connecting rod big end radial clearance		0 – 0.008 (0 – 0.0003)	0.05 (0.002)
	Runout		–	0.02 (0.001)
Transmission	Gear I.D.	M3, M5, C4, Starter idle gear	20.020 – 20.041 (0.7882 – 0.7890)	20.07 (0.790)
		Starter gear	20.000 – 20.021 (0.7874 – 0.7882)	20.05 (0.789)
		C1	19.520 – 19.541 (0.7685 – 0.7693)	19.57 (0.770)
		C2	23.020 – 23.041 (0.9063 – 0.9071)	23.07 (0.908)
	Bushing O.D.	C1	19.479 – 19.500 (0.7669 – 0.7677)	19.43 (0.765)
		C2	22.979 – 23.000 (0.9047 – 0.9055)	22.93 (0.903)
		Starter idle gear	19.979 – 20.000 (0.7866 – 0.7874)	19.94 (0.785)
	Bushing I.D.	C1, Starter idle gear	16.516 – 16.534 (0.6502 – 0.6509)	16.60 (0.654)
		C2	20.000 – 20.021 (0.7874 – 0.7882)	20.05 (0.789)
	Gear-to-bushing clearance	C1, C2, Starter idle gear	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
	Mainshaft O.D.	M3, Starter gear	19.959 – 19.980 (0.7858 – 0.7866)	19.91 (0.784)
	Countershaft O.D.	C1, Starter idle gear	16.466 – 16.484 (0.6483 – 0.6490)	16.41 (0.646)
		C2, C4	19.974 – 19.987 (0.7864 – 0.7869)	19.94 (0.785)
	Gear-to-shaft clearance	M3	0.040 – 0.082 (0.0016 – 0.0032)	0.10 (0.004)
		Starter gear	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
		C4	0.023 – 0.067 (0.0009 – 0.0026)	0.10 (0.004)
	Bushing-to-shaft clearance	C1, Starter idle gear	0.032 – 0.068 (0.0013 – 0.0027)	0.10 (0.004)
		C2	0.020 – 0.047 (0.0008 – 0.0019)	0.10 (0.004)
Shift fork	I.D.		12.000 – 12.018 (0.4724 – 0.4731)	12.05 (0.474)
	Claw thickness		4.93 – 5.00 (0.194 – 0.197)	4.50 (0.177)
	Shaft O.D.		11.976 – 11.994 (0.4715 – 0.4722)	11.96 (0.471)
Kickstarter	Pinion gear I.D.		20.000 – 20.021 (0.7874 – 0.7882)	20.05 (0.789)
	Spindle O.D.		19.959 – 19.980 (0.7878 – 0.7866)	19.90 (0.783)
Shift drum	Journal O.D.	Right side	20.959 – 20.980 (0.8252 – 0.8260)	20.90 (0.823)
		Left side	13.948 – 13.970 (0.5137 – 0.5146)	13.96 (0.550)
	Journal I.D.	Right crank-case	21.000 – 21.033 (0.8268 – 0.8281)	21.05 (0.829)
		Left crank-case	14.000 – 14.027 (0.5512 – 0.5522)	14.04 (0.553)
	Shift drum journal-to-crankcase journal clearance	Right side	0.020 – 0.074 (0.0008 – 0.0029)	0.10 (0.004)
		Left side	0.030 – 0.079 (0.0012 – 0.0031)	0.10 (0.004)

GENERAL INFORMATION

FRONT WHEEL/BRAKE/SUSPENSION/STEERING SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	To wear indicator
Cold tire pressure	Driver only	200 kPa (2.00 kgf/cm ² , 29 psi)	–
	Driver and passenger	200 kPa (2.00 kgf/cm ² , 29 psi)	–
Axle runout		–	0.2 (0.01)
Wheel rim runout	Radial	–	1.0 (0.04)
	Axial	–	1.0 (0.04)
Drum brake (Drum brake type)	Brake lever free play	10 – 20 (3/8 – 13/16)	–
	Drum I.D.	130.0 – 130.2 (5.12 – 5.13)	131.0 (5.16)
Fork	Spring free length	484.5 ± 2 (19.1 ± 0.08)	472 (18.6)
	Pipe runout	–	0.20 (0.008)
	Recommended fluid	Fork fluid	–
	Fluid level	140 (5.5)	–
	Fluid capacity	159.0 ± 2.5 cm ³ (5.38 ± 0.08 US oz, 5.60 ± 0.09 Imp oz)	–
Steering head bearing pre-load		13 – 19 N (1.3 – 1.9 kgf)	–

REAR WHEEL/BRAKE/SUSPENSION SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	To wear indicator
Cold tire pressure	Driver only	225 kPa (2.25 kgf/cm ² , 33 psi)	–
	Driver and passenger	225 kPa (2.25 kgf/cm ² , 33 psi)	–
Axle runout		–	0.2 (0.01)
Wheel rim runout	Radial	–	1.0 (0.04)
	Axial	–	1.0 (0.04)
Drive chain	Size/link	428/108	–
	Slack	10 – 20 (3/8 – 13/16)	–
Brake	Pedal free play	20 – 30 (13/16 – 1-3/16)	–
	Drum I.D.	130.0 – 130.2 (5.12 – 5.13)	131.0 (5.16)

HYDRAULIC BRAKE SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Recommended brake fluid	DOT 3 or DOT 4	–
Brake disc thickness	3.8 – 4.2 (0.15 – 0.17)	3.5 (0.14)
Brake disc runout	–	0.25 (0.010)
Master cylinder I.D.	12.700 – 12.743 (0.5000 – 0.5017)	12.755 (0.5022)
Master piston O.D.	12.657 – 12.684 (0.4983 – 0.4994)	12.645 (0.4978)
Caliper cylinder I.D.	25.400 – 25.450 (1.0000 – 1.0020)	25.460 (1.0024)
Caliper piston O.D.	25.318 – 25.368 (0.9968 – 0.9987)	25.31 (0.996)

BATTERY/CHARGING SYSTEM SPECIFICATIONS

ITEM			SPECIFICATION
Battery	Capacity		12 V – 7 Ah
	Current leakage		0.1 mA max.
	Specific gravity (20°C/68°F)	Fully charged	1.270 – 1.290
		Needs charging	Below 1.230
	Voltage	Fully charged	Above 12.8 V
		Needs charging	Below 12.3 V
Alternator	Charging current	Normal	0.8 A/5 – 10 h
		Quick	8 A/1 h
	Capacity		0.135 kW/5,000 min ⁻¹ (rpm)
	Charging coil resistance (20°C/68°F)		0.3 – 1.2 Ω

IGNITION SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS
Spark plug	Standard	DPR8EA-9 (NGK), X24EPR-U9 (DENSO)
	For extended high speed riding	DPR9EA-9 (NGK), X27EPR-U9 (DENSO)
	For cold climate	DPR7EA-9 (NGK), X22EPR-U9 (DENSO)
Spark plug gap		0.80 – 0.90 mm (0.031 – 0.035 in)
Ignition coil primary peak voltage		100 V minimum
Exciter coil peak voltage		100 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Ignition timing ("F" mark)		15° BTDC at idle

ELECTRIC STARTER SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	11 (0.43)	7 (0.28)

LIGHTS/METERS/SWITCHES SPECIFICATIONS

ITEM			SPECIFICATION
Bulbs	Headlight (Hi/low beam)		12 V - 35/35 W
	Brake/tail light		12 V - 21/5 W
	Turn signal light		12 V - 10 W x 4
	Position light		12 V - 4 W
	Speedometer instrument light		LED x 3
	Tachometer instrument light		LED x 3
	Turn signal indicator		12 V - 3.4 W x 2
	High-beam indicator		12 V - 3.4 W
	Neutral indicator		12 V - 3.4 W
Fuse			15 A
Tachometer peak voltage			10.5 V minimum
Fuel level sensor resistance (20°C/68°F)	Full	4 – 10 Ω	
	Empty	97 – 108 Ω	

GENERAL INFORMATION

STANDARD TORQUE VALUES

FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)	FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)
5 mm bolt and nut	5.2 (0.5, 3.8)	5 mm screw	4 (0.4, 3.1)
6 mm bolt and nut	10 (1.0, 7)	6 mm screw	9 (0.9, 6.6)
(Include SH flange bolt)		6 mm flange bolt and nut	12 (1.2, 9)
8 mm bolt and nut	22 (2.2, 16)	(Include NSHF)	
10 mm bolt and nut	34 (3.5, 25)	8 mm flange bolt and nut	27 (2.8, 20)
12 mm bolt and nut	54 (5.5, 40)	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.

ENGINE

MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Air cleaner housing cover screw	4	5	1.8 (0.2, 1.3)	Apply engine oil to the threads
Air cleaner element mounting screw	1	5	4.2 (0.4, 3.1)	
Spark plug	1	12	18 (1.8, 13)	
Oil strainer screen cap	1	36	15 (1.5, 11)	
Oil centrifugal filter cover screw	3	5	5 (0.5, 3.7)	
Valve adjusting lock nut	2	6	14 (1.4, 10)	
Valve adjusting hole cap	2	36	15 (1.5, 11)	
Timing hole cap	1	14	6 (0.6, 4.4)	
Crankshaft hole cap	1	30	8 (0.8, 5.9)	

LUBRICATION SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Oil centrifugal filter lock nut	1	16	54 (5.5, 40)	Apply engine oil to the threads and seating surface
Oil pump mounting screw	2	6	10 (1.0, 7)	
Oil pump rotor cover screw	2	4	2 (0.2, 1.5)	
Oil pump gear cover bolt	2	5	4.4 (0.4, 3.2)	

FUEL SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
SE (starting enrichment) valve lock nut	1	12	2.3 (0.2, 1.7)	
SE (starting enrichment) valve cover screw	2	5	3.4 (0.3, 2.5)	
Carburetor drain screw	1	6	1.5 (0.2, 1.1)	
Slow jet	1	6	1.5 (0.2, 1.1)	
Needle jet holder	1	7	2.5 (0.3, 1.8)	
Main jet	1	5	2.1 (0.2, 1.5)	
Float chamber screw	3	4	2.1 (0.2, 1.5)	
Air cut-off valve cover screw	2	4	2.1 (0.2, 1.5)	
PAIR check valve cover screw	2	4	2.1 (0.2, 1.5)	
Carburetor heater	1	—	4.9 (0.5, 3.6)	
Vacuum chamber cover screw	2	4	2.1 (0.2, 1.5)	
Tool box bolt	2	5	1.8 (0.2, 1.3)	

CYLINDER HEAD/VALVES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder head cover cap nut	4	8	28 (2.9, 21)	Apply engine oil to the threads and seating surface
Cylinder head cover bolt	1	6	10 (1.0, 7)	
Cam sprocket bolt	2	6	12 (1.2, 9)	
Cam chain tensioner lifter sealing plug	1	6	4 (0.4, 3.0)	
Cam chain tensioner pivot bolt	1	8	10 (1.0, 7)	

CYLINDER/PISTON

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cam chain tensioner lifter bolt	2	6	12 (1.2, 9)	

CLUTCH/GEARSHIFT LINKAGE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Clutch lifter plate bolt	4	6	12 (1.2, 9)	Apply engine oil to the threads and seating surface
Shift drum stopper arm bolt	1	6	12 (1.2, 9)	
Clutch center lock nut	1	16	44 (4.5, 32)	
Kickstarter pedal pinch bolt	1	8	27 (2.8, 20)	
Footpeg bar mounting bolt	4	8	27 (2.8, 20)	

ALTERNATOR/STARTER CLUTCH

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Gearshift pedal pinch bolt	1	6	12 (1.2, 9)	Apply locking agent Apply engine oil to the threads and seating surface
Starter clutch socket bolt	3	6	16 (1.6, 12)	
Flywheel bolt	1	10	74 (7.5, 55)	
Ignition pulse generator mounting bolt	2	5	5 (0.5, 3.7)	Apply locking agent to the threads
Stator mounting bolt	3	6	12 (1.2, 9)	

CRANKCASE/TRANSMISSION/CRANKSHAFT/KICKSTARTER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Kickstarter spindle lock bolt	1	12	35 (3.6, 26)	

GENERAL INFORMATION

FRAME

FRAME/BODY PANELS/EXHAUST SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Exhaust pipe joint nut	2	7	20 (2.0, 15)	

ENGINE REMOVAL/INSTALLATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Upper engine hanger plate mounting nut	3	8	27 (2.8, 20)	
Front engine hanger bracket mounting nut	4	8	27 (2.8, 20)	
Rear upper/lower engine mounting nut	2	10	54 (5.5, 40)	

FRONT WHEEL/BRAKE/SUSPENSION/STEERING

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Handlebar holder bolt	4	6	11.8 (1.2, 9)	
Front brake disc bolt (Disc brake type)	4	8	42 (4.3, 31)	ALOC bolt: replace with a new one
Front axle nut	1	12	52 (5.3, 38)	
Front brake arm nut (Drum brake type)	1	6	10 (1.0, 7)	U-nut
Fork cap	2	26	22 (2.2, 16)	
Fork socket bolt	2	8	20 (2.0, 15)	Apply locking agent
Top bridge pinch bolt	2	8	23 (2.3, 17)	
Bottom bridge pinch bolt	2	8	34 (3.5, 25)	
Steering bearing adjusting nut	1	22	–	See page 12-33
Steering stem nut	1	22	74 (7.5, 55)	

REAR WHEEL/BRAKE/SUSPENSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Driven sprocket bolt	4	8	34 (3.5, 25)	
Rear axle nut	1	14	59 (6.0, 44)	
Rear brake arm nut	1	6	10 (1.0, 7)	U-nut
Shock absorber upper mounting nut	2	10	29 (3.0, 21)	
Shock absorber lower mounting bolt	2	10	34 (3.5, 25)	
Pillion step bracket bolt	2	10	45 (4.6, 33)	
Swingarm pivot nut	1	12	59 (6.0, 44)	

HYDRAULIC BRAKE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Caliper bleed valve	1	8	8.0 (0.8, 5.9)	
Master cylinder reservoir cap screw	2	4	1.5 (0.2, 1.1)	
Pad pin	2	10	18 (1.8, 13)	
Pad pin plug	2	10	2.5 (0.3, 1.8)	
Brake caliper mounting bolt	2	8	26 (2.7, 19)	ALOC bolt: replace with a new one
Front brake light switch screw	1	4	1.0 (0.1, 0.7)	
Brake lever pivot bolt	1	6	1.0 (0.1, 0.7)	
Brake lever pivot nut	1	6	6.0 (0.6, 4.4)	
Brake hose oil bolt	2	10	34 (3.5, 25)	

BATTERY/CHARGING SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Battery holder bolt	2	6	1.8 (0.2, 1.3)	

ELECTRIC STARTER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Starter motor terminal nut	1	6	10 (1.0, 7)	
Starter motor case bolt	2	6	5 (0.5, 3.7)	

LIGHTS/METERS/SWITCHES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Ignition switch mounting bolt	2	8	24 (2.4, 18)	

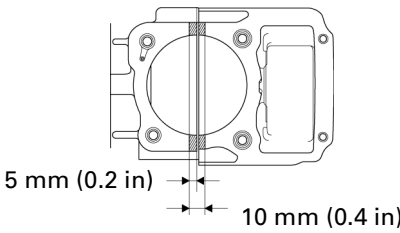
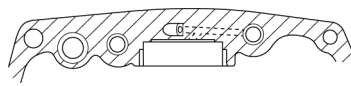
OTHERS

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Clutch lever pivot nut	1	6	5.9 (0.6, 4.4)	
Clutch lever pivot bolt	1	6	1 (0.1, 0.7)	
Brake lever pivot bolt (Drum brake type)	1	6	1 (0.1, 0.7)	
Brake lever pivot nut (Drum brake type)	1	6	5.9 (0.6, 4.4)	
Side stand pivot lock nut	1	10	45(4.6, 33)	

GENERAL INFORMATION

LUBRICATION & SEAL POINTS

ENGINE

MATERIAL	LOCATION	REMARKS
Engine oil	Oil through sliding area Cylinder head oil pocket Cylinder wall Clutch center lock nut threads and seating surface Cylinder head cap nut threads and seating surface Piston whole surface and piston rings Crankshaft connecting rod big end bearing Flywheel bolt threads and seating surface Oil centrifugal filter lock nut threads and seating surface Oil pump rotors Valve adjusting lock nut threads and seating surface Starter reduction gear shaft whole surface Starter idle gear shaft whole surface Sprag clutch rolling surface Cam chain whole surface Crankshaft (Starter driven gear inner surface contacting area) Clutch disc surface Shift fork inner surface and guide pin Shift fork shaft whole surface Shift drum guide groove Each O-rings Each ball bearing and needle bearing Each oil seal lips	
Molybdenum disulfide oil (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease)	Piston pin whole surface Cam lobes and bearing Each valve stem outer surface Rocker arm shaft whole surface Transmission gear and gear shifter groove surface Kickstarter pinion gear teeth and inner surface Kickstarter idle gear teeth and inner surface	
Locking agent	Ignition pulse generator mounting bolt Starter clutch socket bolt	
Liquid sealant (THREE BOND #1141 or equivalent)	Cylinder-to-crankcase hatched area  Alternator wire grommet	
Degrease	Flywheel mating surface with crankshaft	
Liquid sealant (THREE BOND #1215 or equivalent)	Cylinder head cover mating surface (cylinder head side) 	

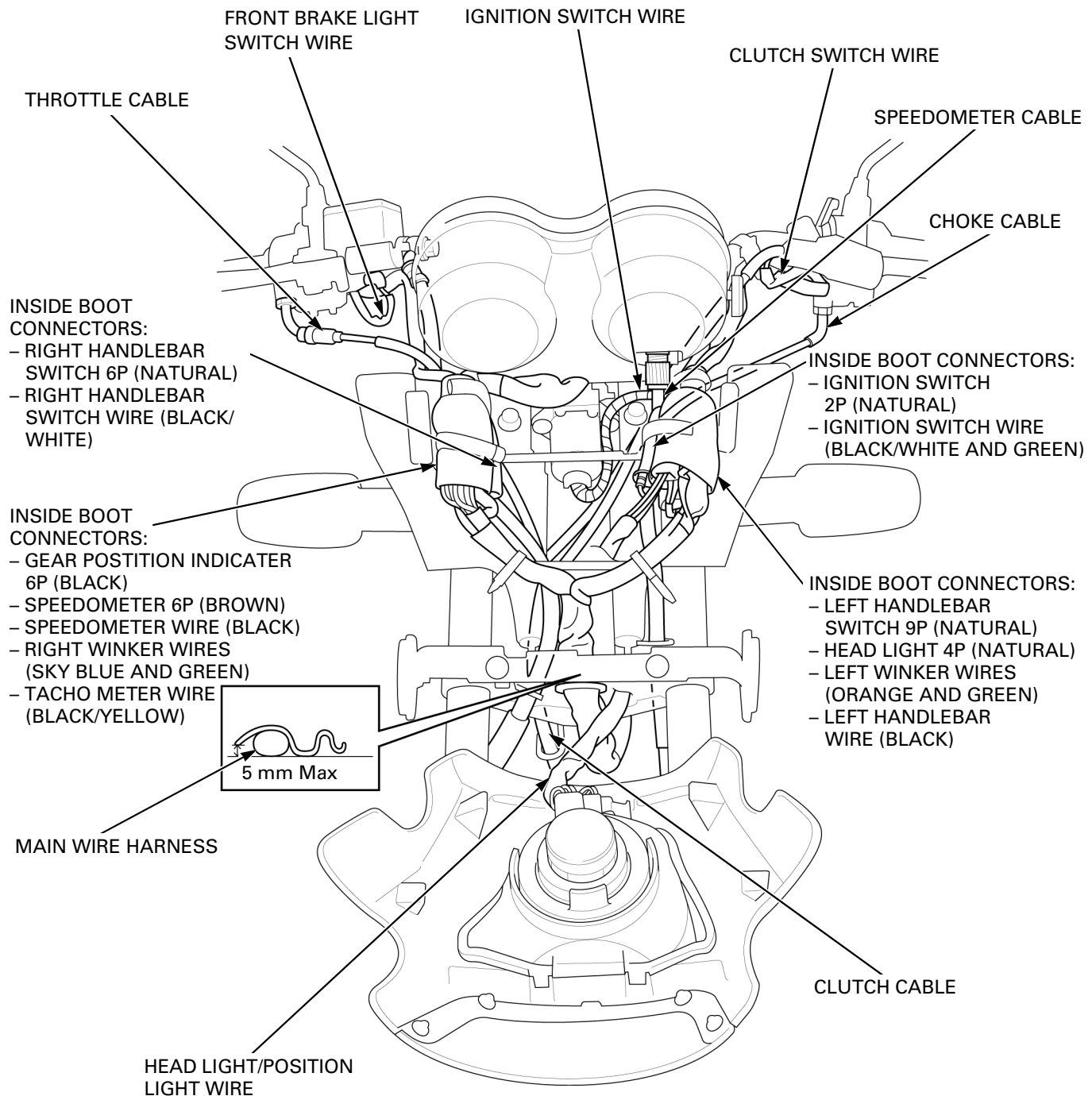
FRAME

MATERIAL	LOCATION	REMARKS
Multi-purpose grease	Steering bearing races and steel ball Steering stem dust seal lips Front wheel dust seal lip Speedometer gear teeth Speedometer gear inner surface Speedometer pinion shaft Speedometer cable (Inside of casing) Front brake cam and shaft sliding surface (Drum brake type) Front brake panel anchor pin sliding surface (Drum brake type) Front brake panel dust seal lip (Drum brake type) Rear wheel driven flange dust seal lip Rear wheel O-ring whole surface Rear brake cam and shaft surface Rear brake panel anchor pin sliding area Side stand pivot sliding area Center stand pivot shaft sliding area Throttle pipe cable contacting area Front brake lever pivot bolt sliding surface (Drum brake type) Clutch lever pivot bolt sliding surface Each bearing rotating area	Inject 3.0 - 5.0 g No grease on lining surface No grease on lining surface No grease on lining surface No grease on lining surface
Gear oil (IDEMITSU AUTOLUB 30 or MECHANIC 44 or equivalent)	Front brake cam felt seal whole surface (Drum brake type) Rear brake cam felt seal whole surface	
DOT 3 or DOT 4 brake fluid	Brake master piston cups (Disc brake type) Brake master piston sliding surface (Disc brake type) Brake caliper piston seal lips (Disc brake type) Brake caliper piston sliding surface (Disc brake type)	
Silicone grease	Throttle cable inside Clutch cable inside Brake cable inside (Drum brake type) Brake lever pivot bolt sliding surface (Disc brake type) Brake caliper dust seal lips (Disc brake type) Brake lever-to-master piston contact surface (Disc brake type) Caliper pin boot inside (Disc brake type)	
Fork fluid	Fork cap O-ring Fork slider bushing surface Fork oil seal lips and dust seal lips	
Honda Bond A or equivalent	Handlebar grip inner surface	
Locking agent	Fork socket bolt	

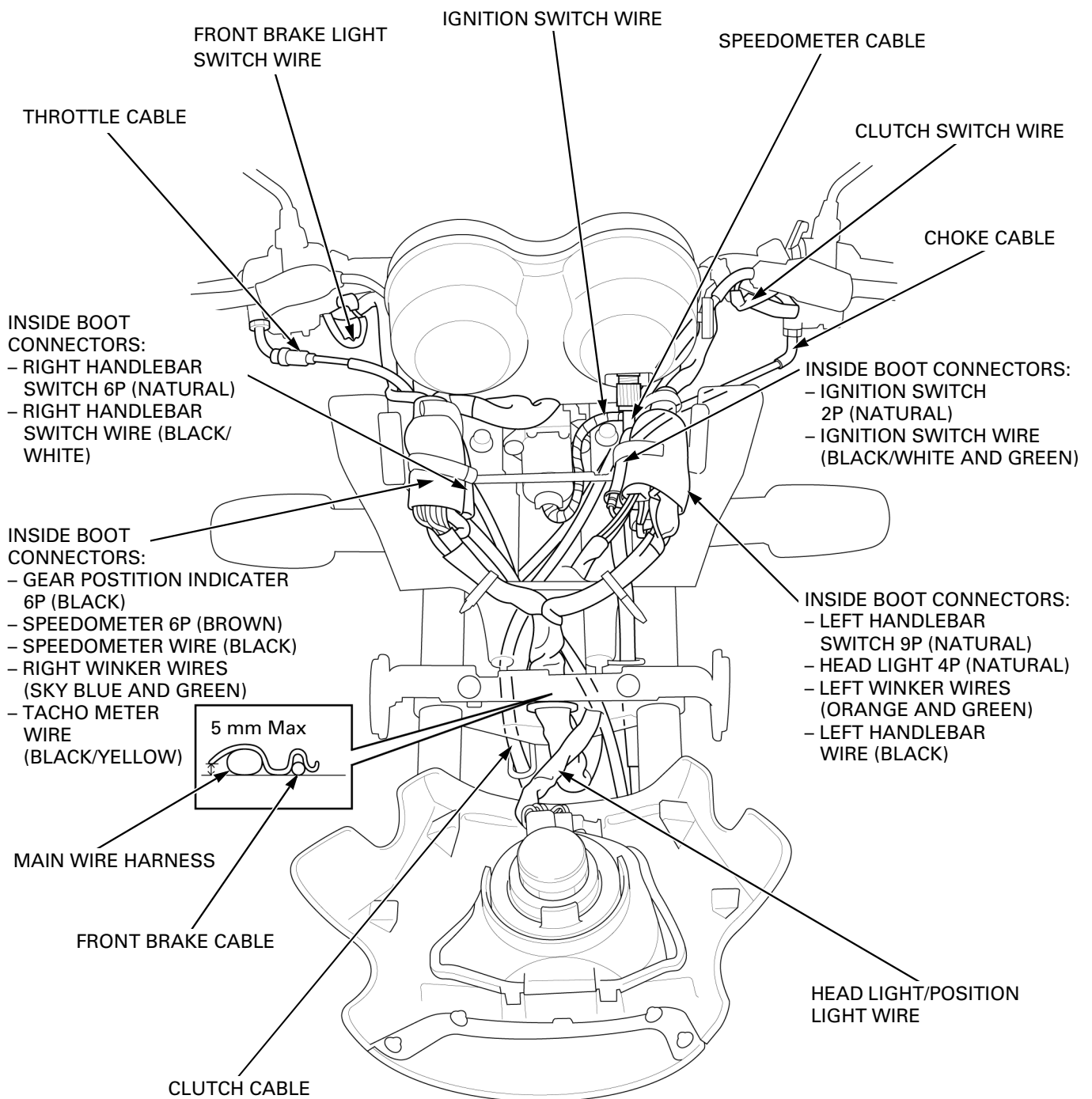
GENERAL INFORMATION

CABLE & HARNESS ROUTING

DISC BRAKE TYPE:

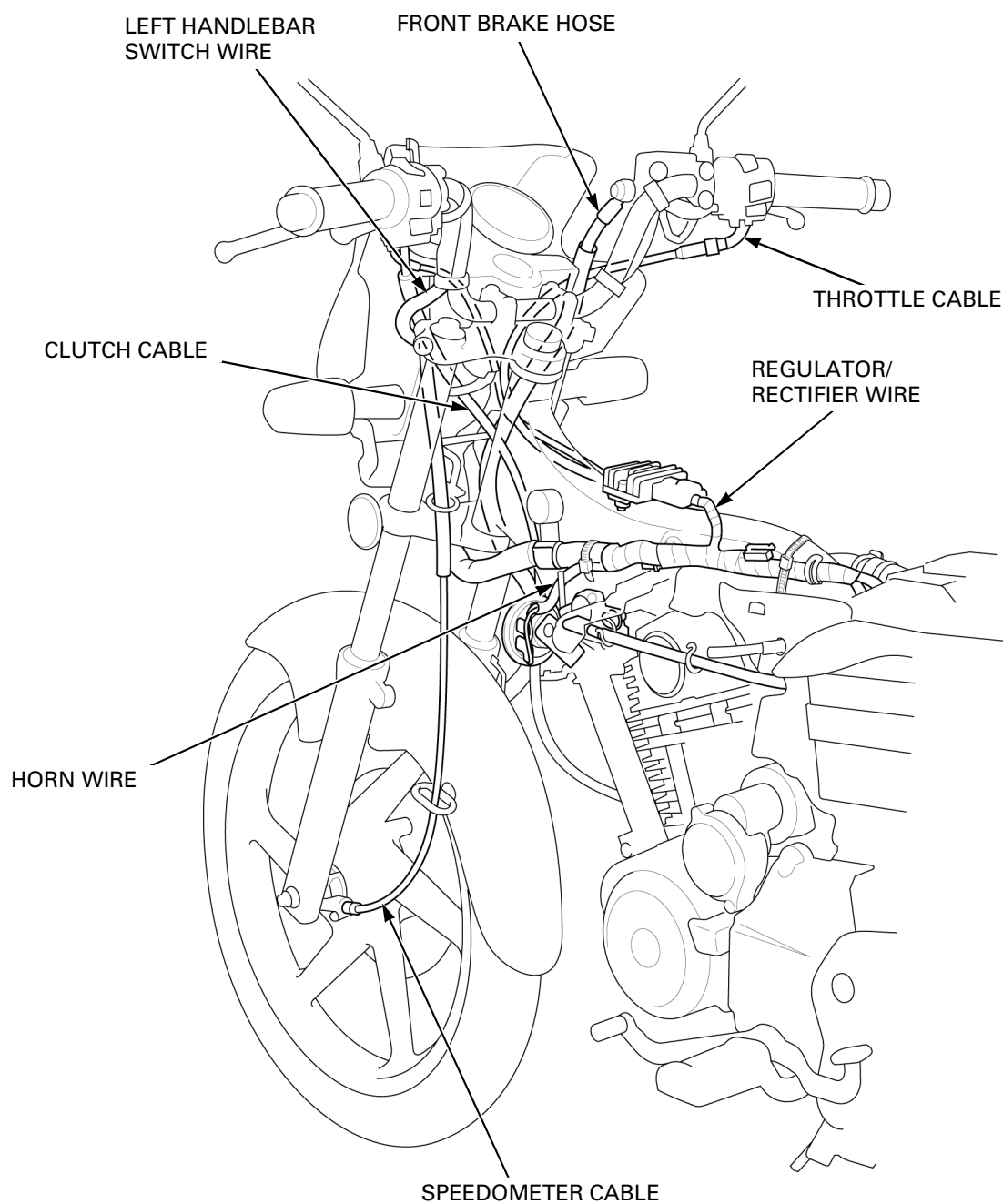


DRUM BRAKE TYPE:

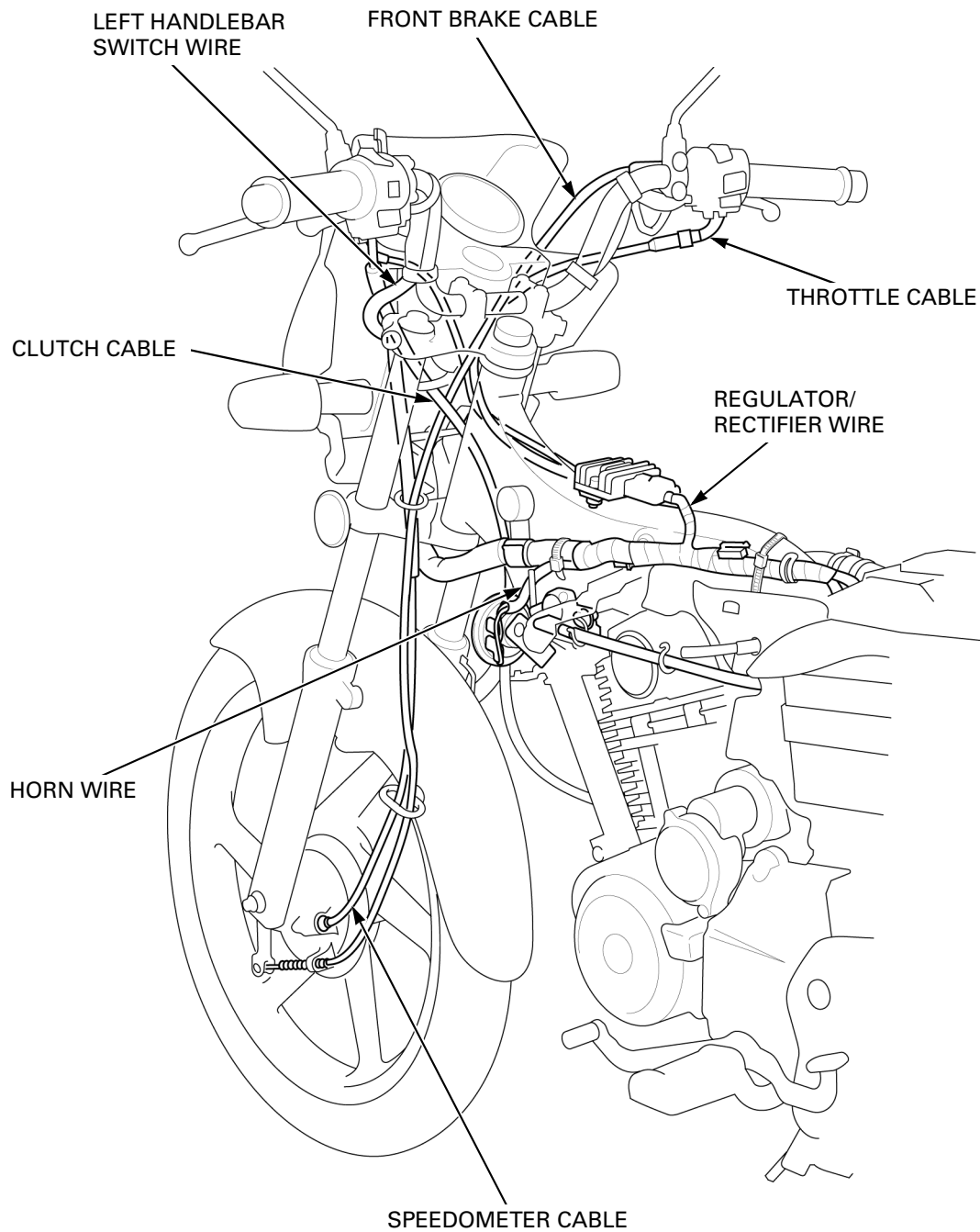


GENERAL INFORMATION

DISC BRAKE TYPE:

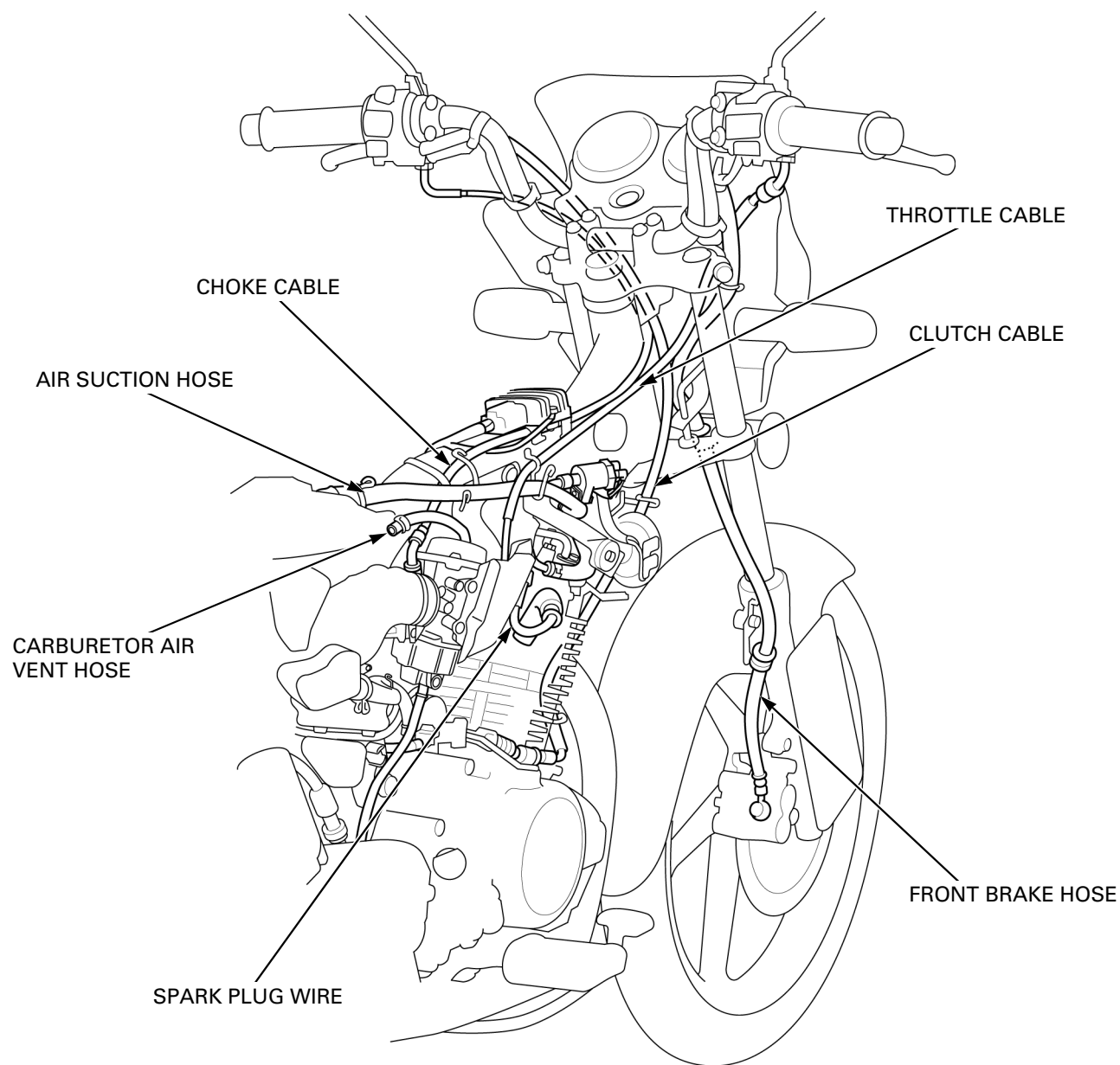


DRUM BRAKE TYPE:

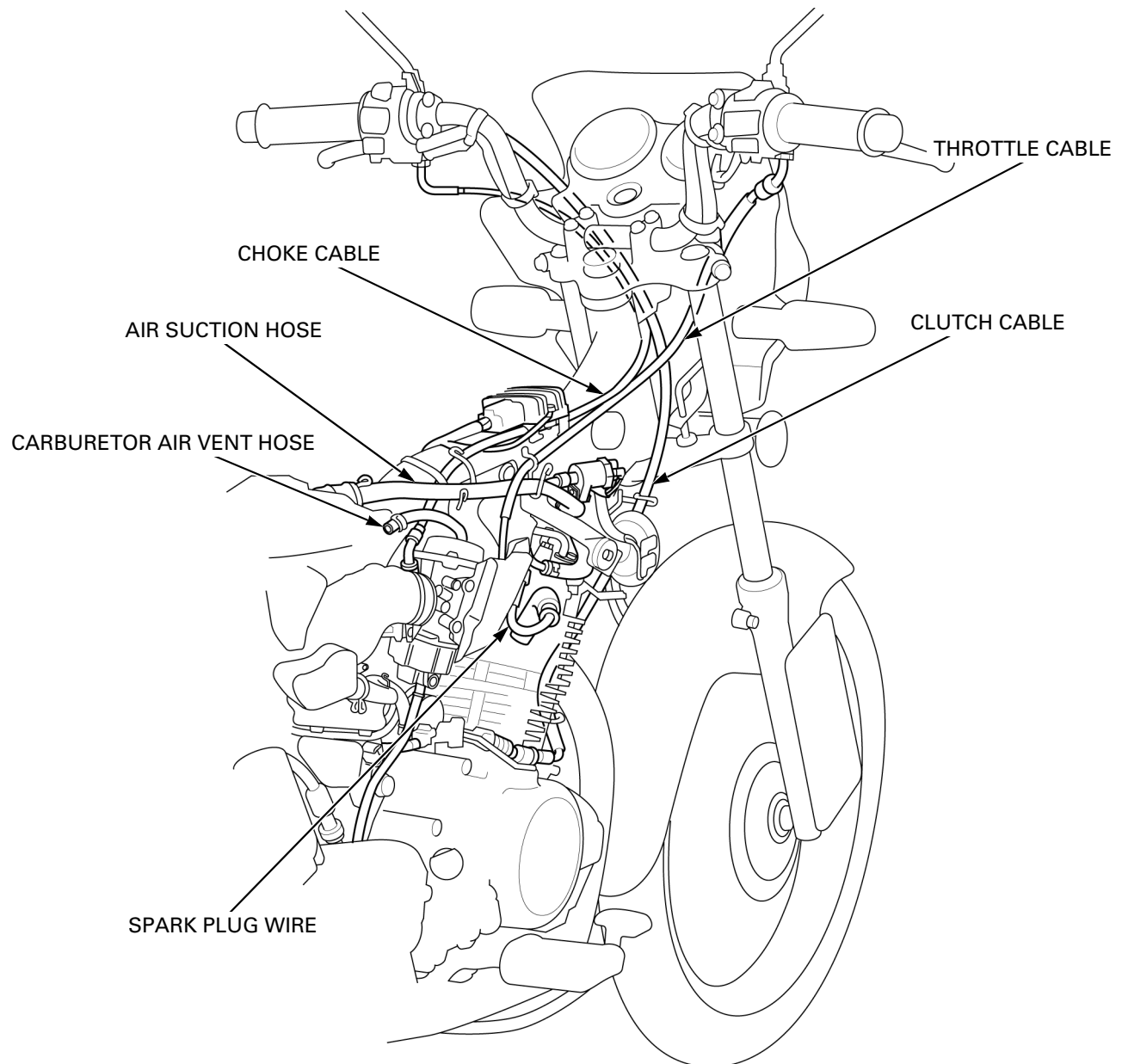


GENERAL INFORMATION

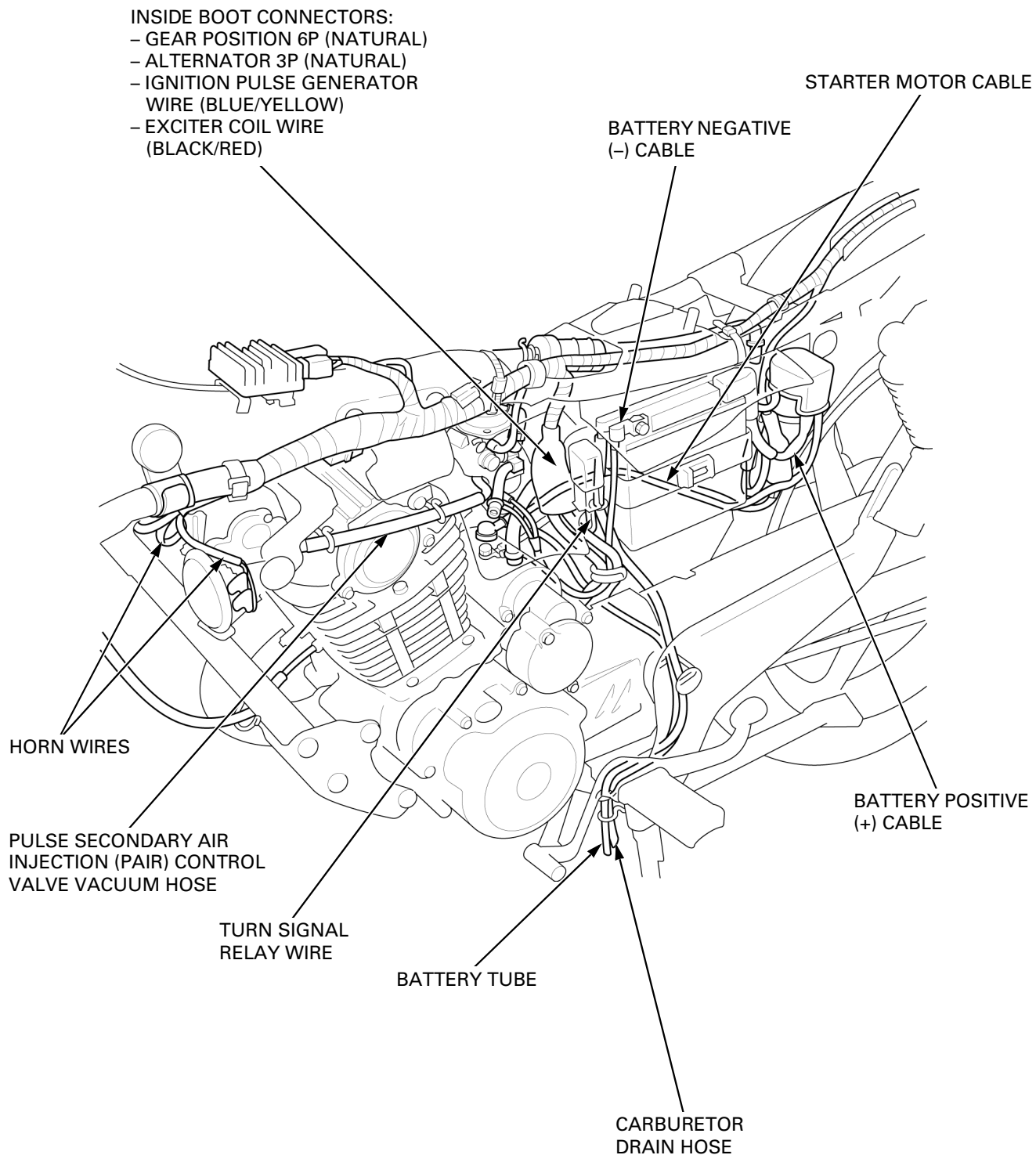
DISC BRAKE TYPE:

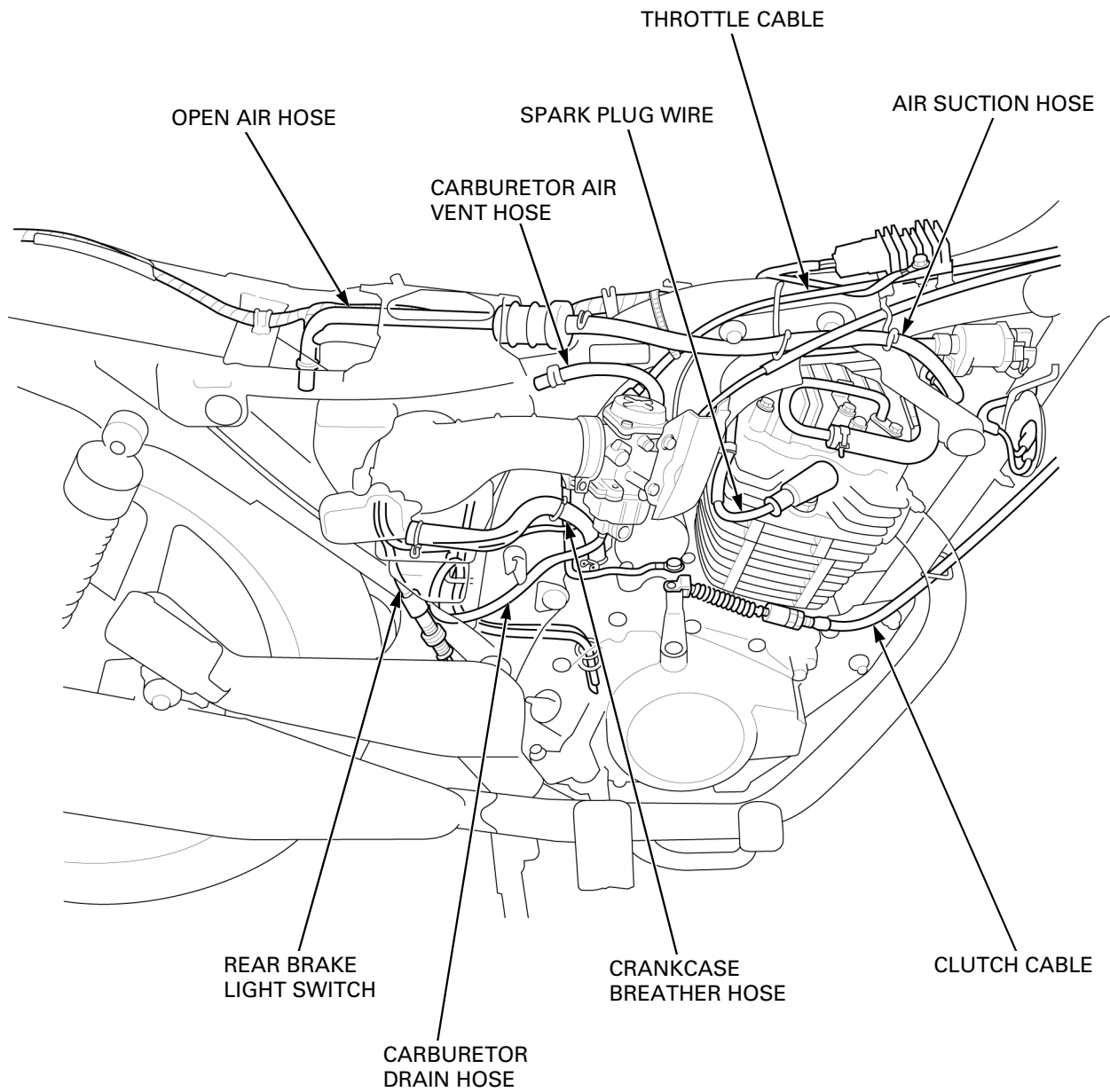


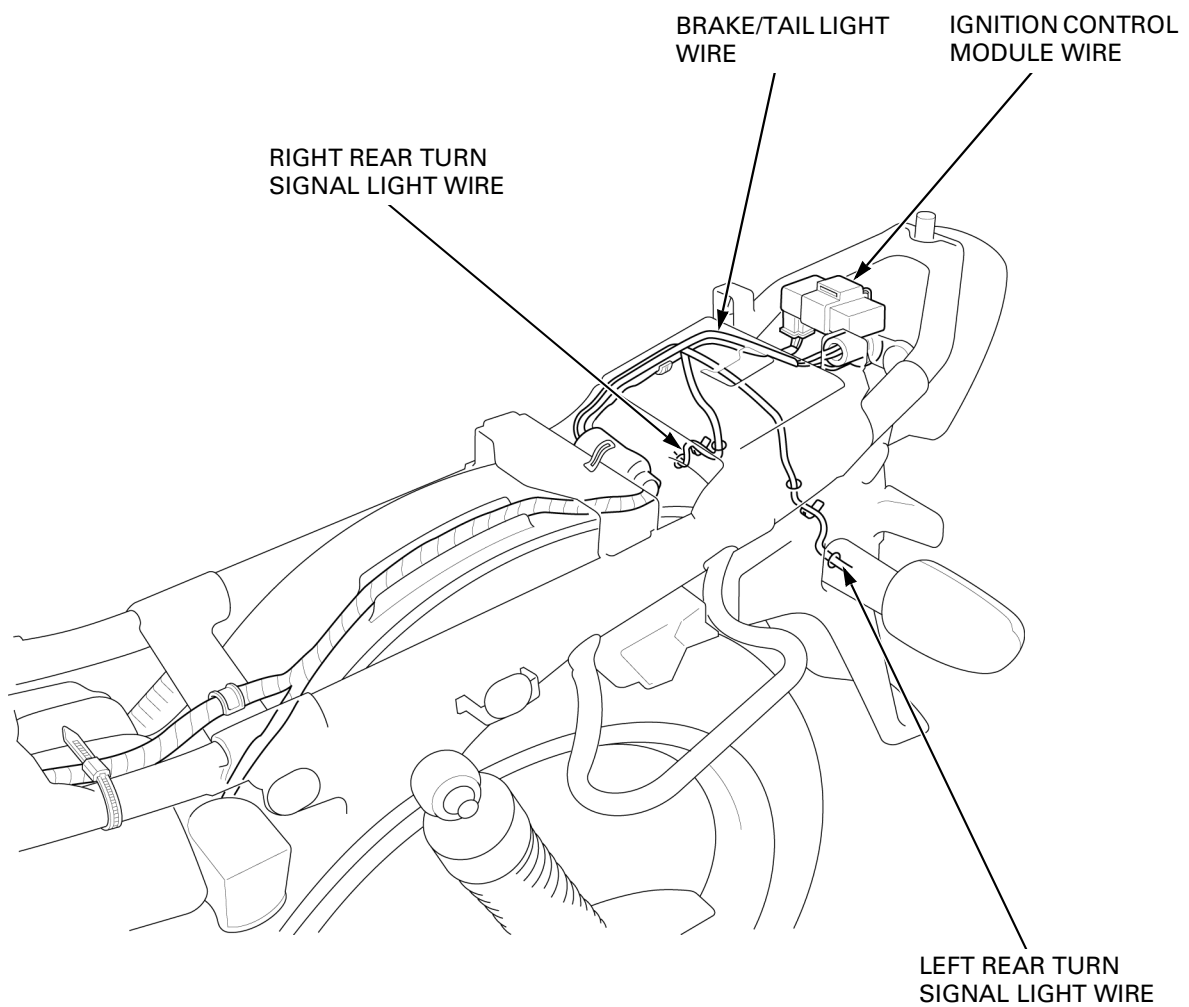
DRUM BRAKE TYPE:



GENERAL INFORMATION







EMISSION CONTROL SYSTEMS

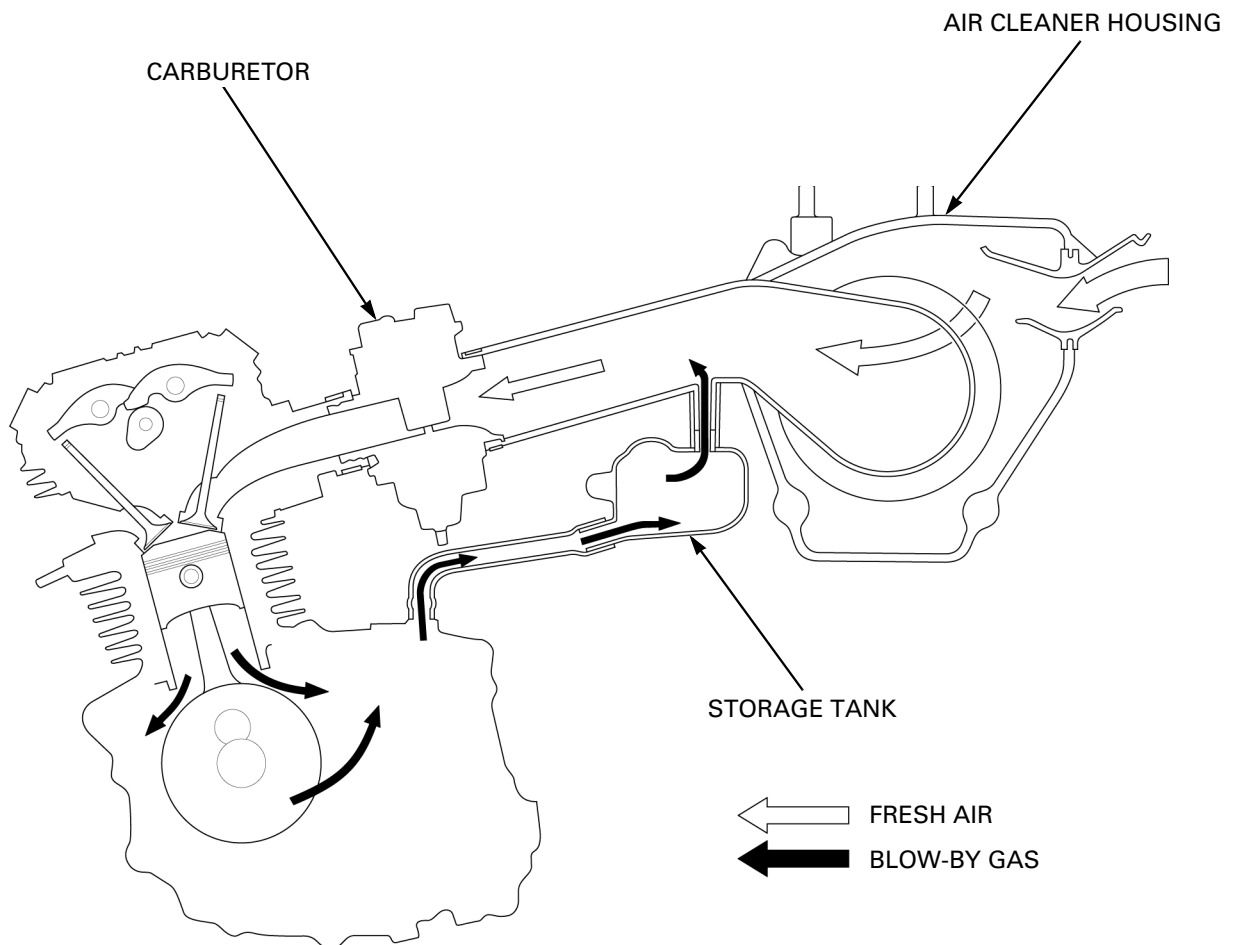
SOURCE OF EMISSIONS

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

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

CRANKCASE EMISSION CONTROL SYSTEM

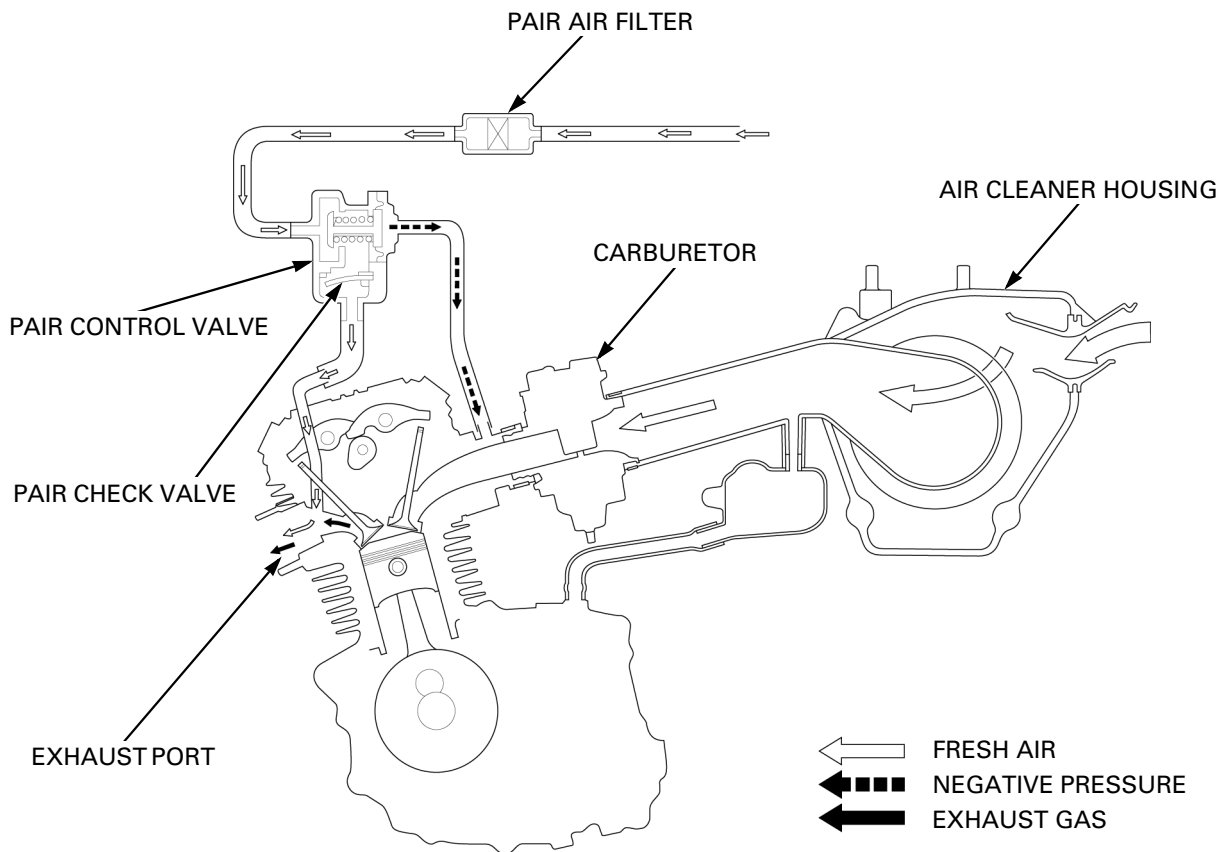
The engine is equipped with a closed crankcase system to prevent discharging crankcase emissions into the atmosphere. Blow-by gas is returned to the combustion chamber through the air cleaner and carburetor.



EXHAUST EMISSION CONTROL SYSTEM

SECONDARY AIR SUPPLY SYSTEM

No adjustments to the secondary air supply system should be made, although periodic inspection of the components is recommended.



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

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

2. FRAME/BODY PANELS/EXHAUST SYSTEM

SERVICE INFORMATION	2-2	REAR FENDER	2-7
TROUBLESHOOTING	2-2	FRONT FENDER	2-8
SIDE COVERS	2-3	FRONT COWL	2-8
SEAT	2-4	HORN COVER	2-9
FUEL TANK	2-4	LICENSE PLATE HOLDER	2-10
REAR CARRIER	2-5	EXHAUST PIPE/MUFFLER	2-10
REAR COWL	2-6		

SERVICE INFORMATION

GENERAL

- This section covers removal and installation of the body panels, fuel tank and exhaust system.
- Place the motorcycle on level ground before starting any work.
- Always replace the exhaust pipe gasket with a new one 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 nut 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 VALUE

Exhaust pipe joint nut	20 N·m (2.0 kgf·m, 15 lbf·ft)
------------------------	-------------------------------

TROUBLESHOOTING

Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leak

Poor performance

- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

SIDE COVERS

REMOVAL/INSTALLATION

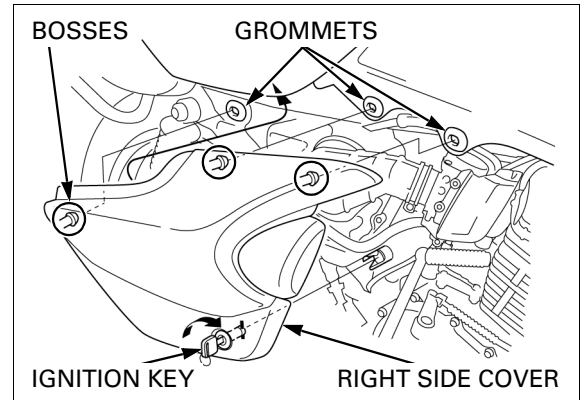
RIGHT SIDE COVER

Unlock the right side cover with the ignition key by turning it clockwise.

Be careful not to damage the side cover bosses.

Release side cover bosses from the grommets of the frame and fuel tank, then remove the right side cover.

Installation is in the reverse order of removal.



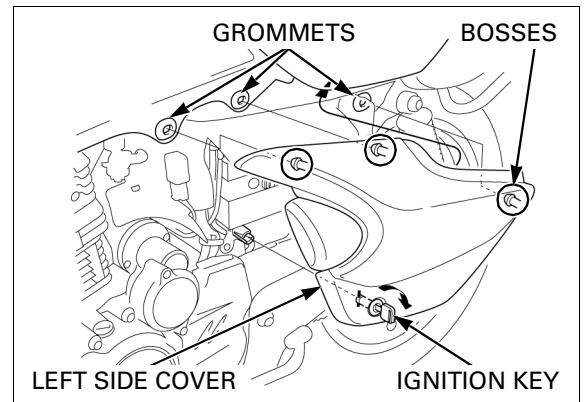
LEFT SIDE COVER

Unlock the left side cover with the ignition key by turning it clockwise.

Be careful not to damage the side cover bosses.

Release side cover bosses from the grommets of the frame and fuel tank, then remove the left side cover.

Installation is in the reverse order of removal.



DISASSEMBLY/ASSEMBLY

Be careful not to damage the bosses when removing the carburetor cover.

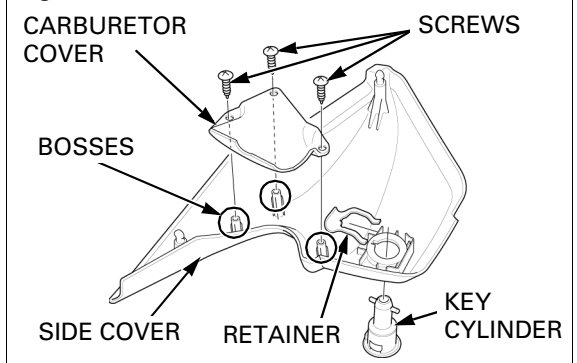
Remove screws and the carburetor cover from the side cover.

Remove the retainer spring and the key cylinder from the side cover.

Insert the key cylinder to the side cover by aligning the tab and boss of the key cylinder and side cover. Install the retainer spring by aligning the slots on the side of the key cylinder with the spring.

Install the carburetor cover by aligning bosses with the holes of carburetor cover and tighten three screws.

Right side shown:



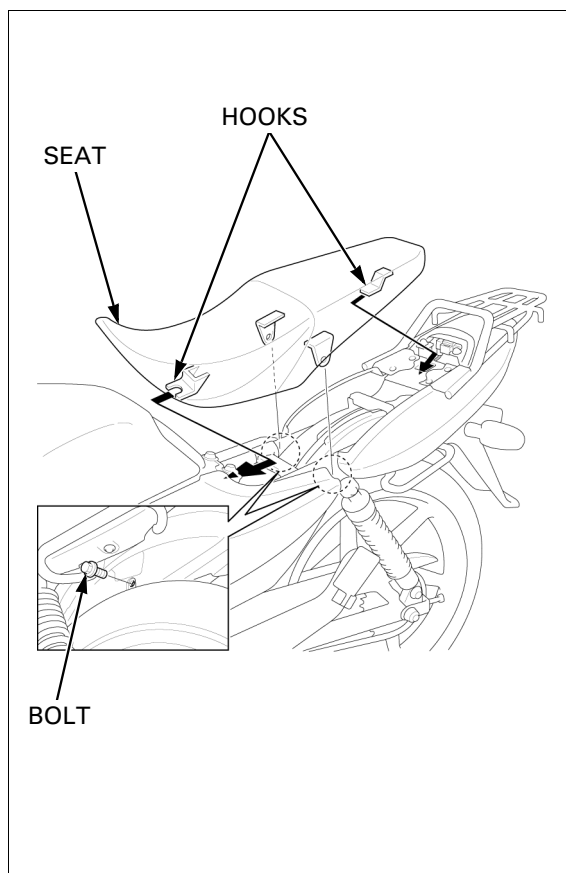
SEAT

REMOVAL/INSTALLATION

Remove the seat mounting bolts.
Slide the seat backward, release the hooks from the holes and remove it.

Install the seat by aligning the hooks with the holes of the frame, press down the seat and slide it forward.

Install and tighten the seat mounting bolts.



FUEL TANK

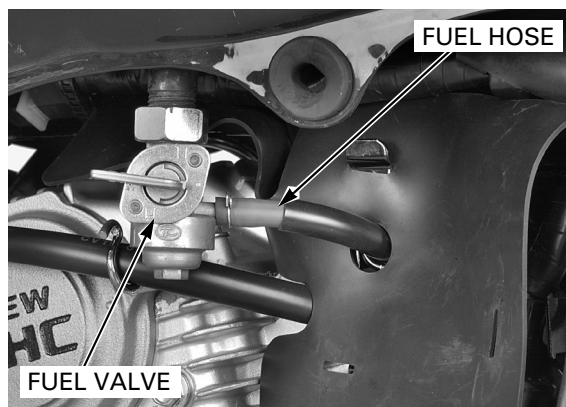
REMOVAL/INSTALLATION

Remove the following:

- Right and left side covers (page 2-3)
- Seat (page 2-4)

Wipe the spilled gasoline off immediately.

Turn the fuel valve "●" (OFF) and disconnect the fuel hose from the fuel valve.



Remove the fuel tank mounting bolts and washer.

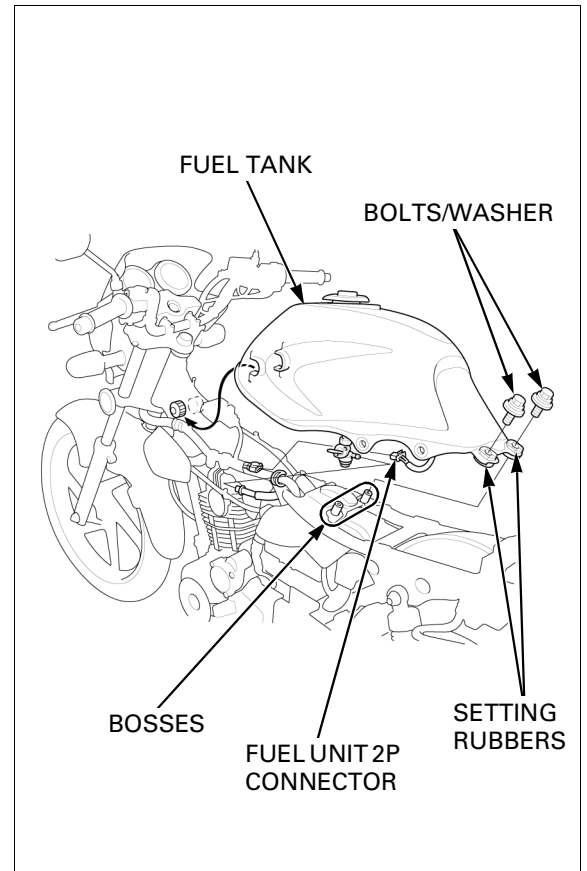
Release the setting rubbers of the fuel tank from the bosses of the frame.

Lift up the fuel tank rear end and disconnect the fuel level sensor 2P (Black) connector.

Pull the fuel tank backward, then remove the fuel tank.

Installation is in the reverse order of removal.

*After installation,
turn the fuel valve
"I" (ON) and make
sure that there are
no fuel leaks.*



REAR CARRIER

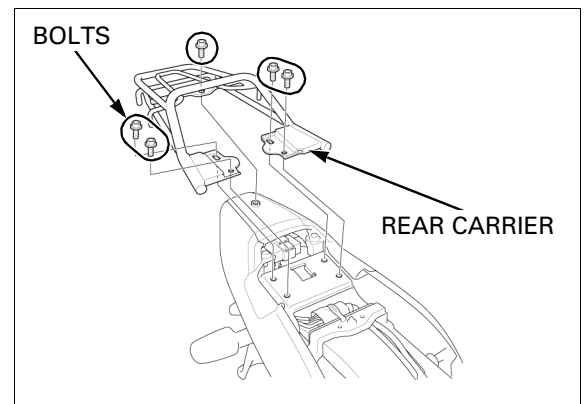
REMOVAL/INSTALLATION

Remove the seat (page 2-4).

Remove the bolts and the rear carrier.

Installation is in the reverse order of removal.

Install the seat (page 2-4).



REAR COWL

REMOVAL

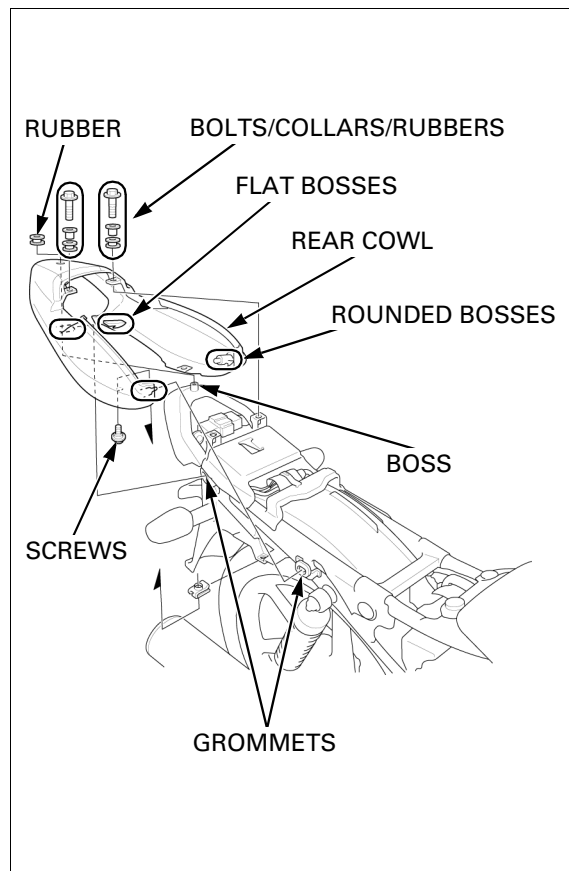
Remove the rear carrier (page 2-5).

Remove the rear cowl mounting screws, bolts, collars and setting rubbers from the rear cowl.

Be careful not to damage the bosses when removing the rear cowl.

Release the rounded bosses of the right/left rear cowl from the grommets of the frame first, then release the flat bosses from the grommets of the rear fender.

Release the boss of the frame from the rear center cowl grommet and remove the rear cowl.



DISASSEMBLY/ASSEMBLY

Remove the screws from the rear cowl.

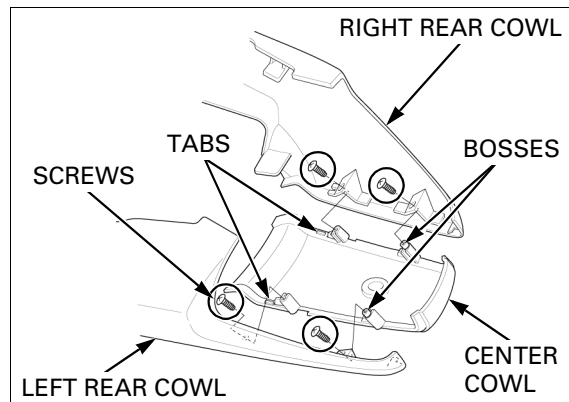
Be careful not to damage the bosses and the tabs when separating the cowls.

Separate the rear cowl by releasing the bosses and the tabs of the center cowl from the right and left rear cowls.

Assembly is in the reverse order of disassembly.

INSTALLATION

Installation is in the reverse order of removal.



REAR FENDER

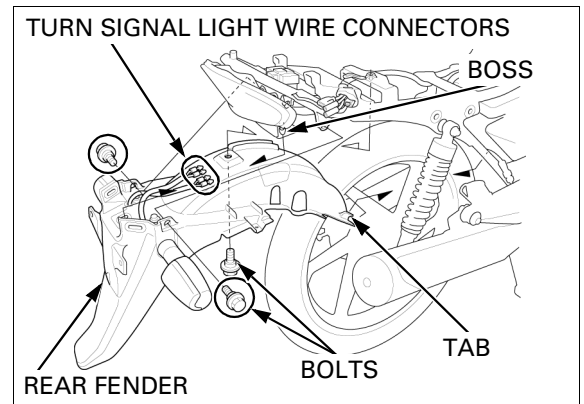
REMOVAL

Remove the rear cowl (page 2-6).

Disconnect the turn signal light wire connectors. Remove bolts and release the boss of the taillight unit from the grommet of the rear fender by slightly pulling the rear fender down.

Be careful not to damage the tabs when removing the rear fender.

Release the tabs of the rear fender from the frame and remove the rear fender by pulling it backward.



DISASSEMBLY/ASSEMBLY

Release the turn signal light wires from the clamps.

Remove the turn signal unit mounting nuts from the rear turn signal mounting bracket and rear fender.

Pull out the rear turn signal light wires from the upper holes of the rear fender, nuts, rear turn signal mounting bracket and the lower holes of the rear fender and remove the rear turn signal units.

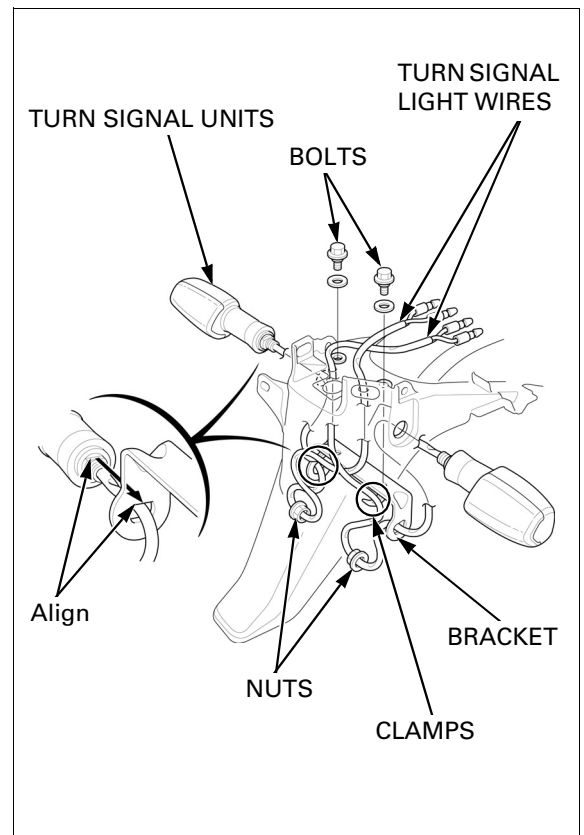
Remove the bolts and turn signal unit mounting bracket.

Route the turn signal light wires properly (page 1-16).

Assembly is in the reverse order of disassembly.

NOTE:

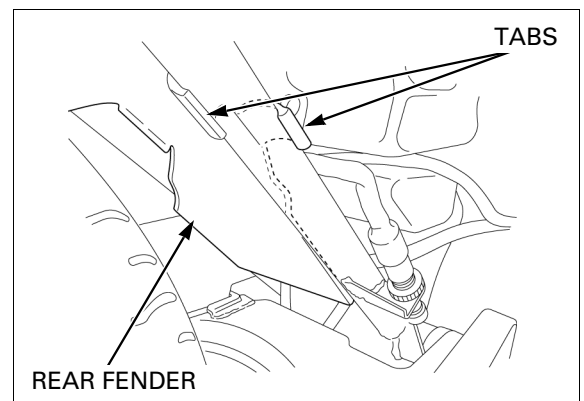
- When installing turn signal units to the rear fender with turn signal mounting bracket, aligning to cut-out of them.



INSTALLATION

Install the rear fender by hooking the tabs onto the frame as shown.

Installation is in the reverse order of removal.



FRONT FENDER

REMOVAL/INSTALLATION

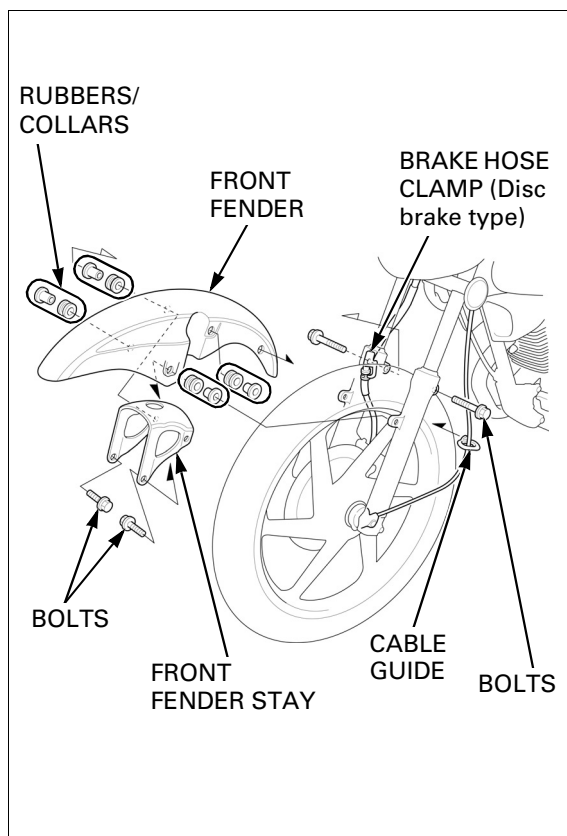
Remove the cable guide from the front fender.

Remove the bolts, collars and setting rubbers.

Disc brake type: Remove the brake hose clamp.

Pull up and remove the front fender and front fender stay.

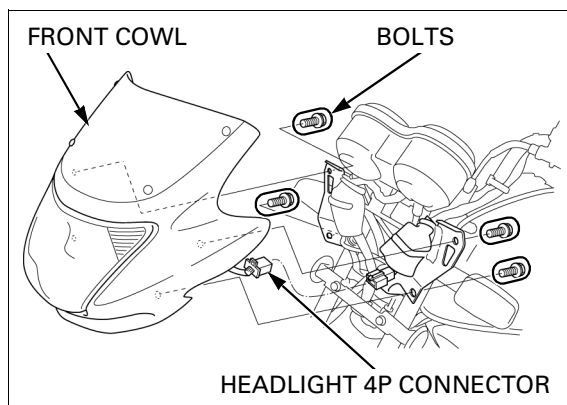
Installation is in the reverse order of removal.



FRONT COWL

REMOVAL

Hold the front cowl when removing the bolts. Remove the bolts.
Disconnect the headlight 4P (Natural) connector and remove the front cowl.



DISASSEMBLY/ASSEMBLY

Remove the headlight aim adjusting bolt/washer and retainer springs.

Remove the headlight unit by releasing the tabs of the headlight unit from the slots of the front cowl.

Be careful not to damage the front visor surface.

Remove the set screws, plastic washers, and front visor.

Remove the setting nuts from the front cowl.

Install the setting nuts to the front cowl.

Install the front visor by aligning its tab with the slot of the front cowl and tighten the set screws until the setting nuts are squeezed as shown.

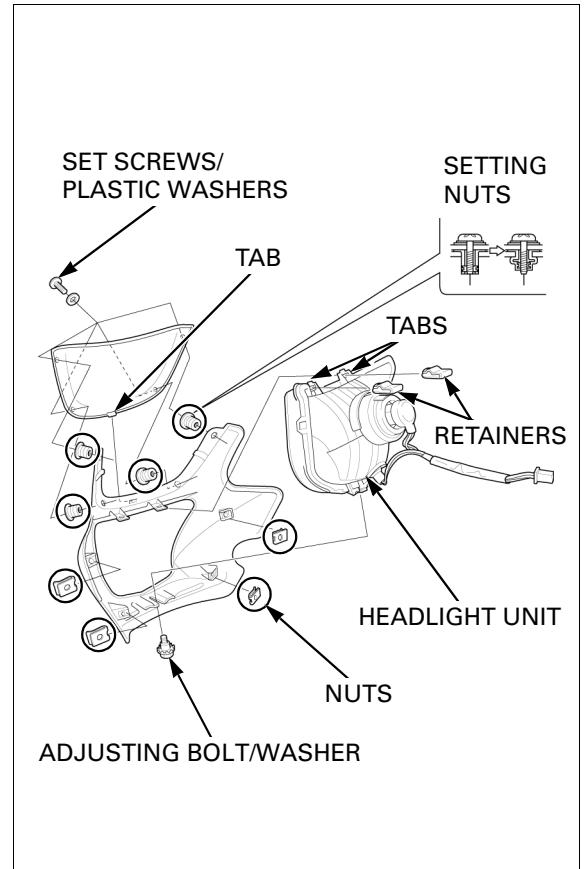
Install the headlight unit by aligning its tabs with the slots of the front cowl, then install the retainer springs.

Install the headlight aim adjusting bolt/washer.

INSTALLATION

Installation is in the reverse order of removal.

Adjust the headlight aim (page 3-21).



HORN COVER

REMOVAL/INSTALLATION

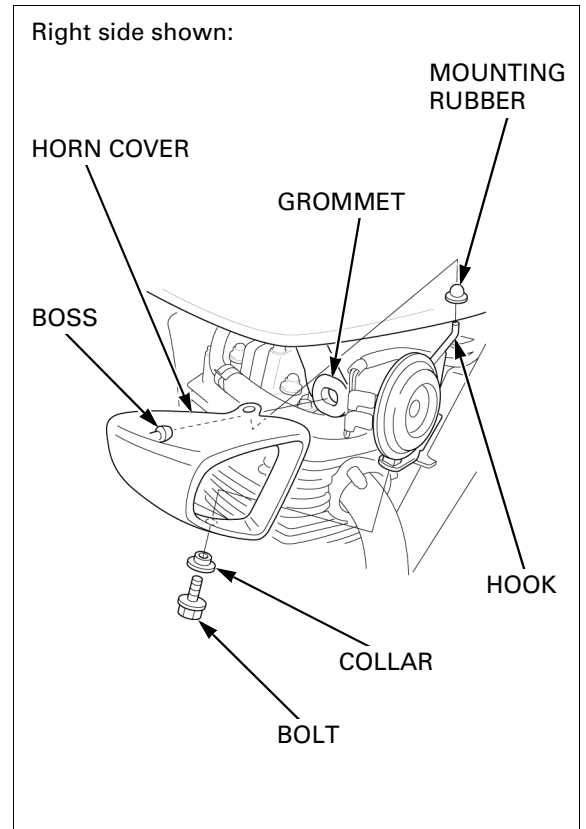
Remove the horn cover mounting bolt and collar.

Be careful not to damage the horn cover boss.

Release the horn cover boss from the grommet of the horn cover stay.

Unhook the horn cover mounting rubber from the hook and remove the horn cover.

Installation is in the reverse order of removal.

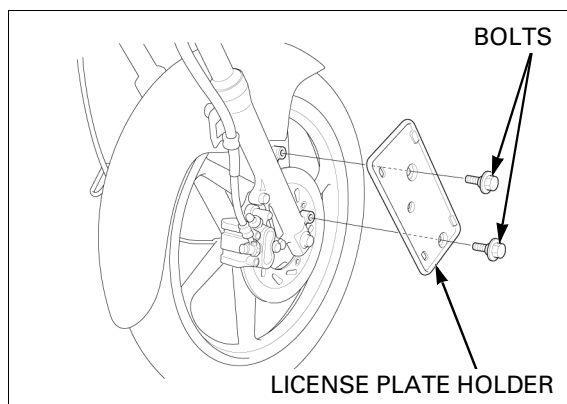


LICENSE PLATE HOLDER

REMOVAL/INSTALLATION

Remove the bolts and the license plate holder.

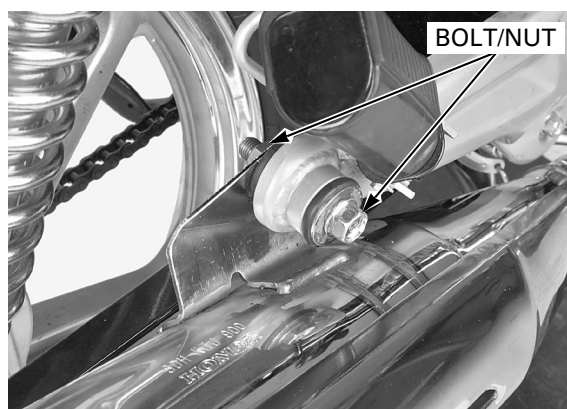
Installation is in the reverse order of removal.



EXHAUST PIPE/MUFFLER

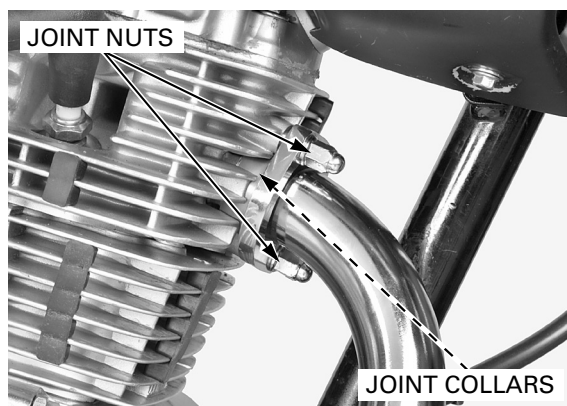
REMOVAL

Loosen the muffler mounting bolt and nut.

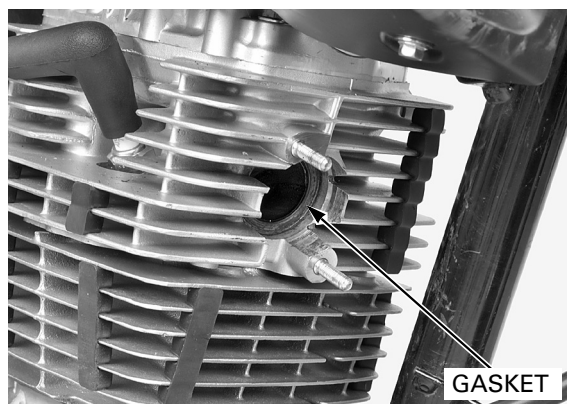


Remove the exhaust pipe joint nuts and joint collars.

Remove the muffler mounting bolt, nut and exhaust pipe/muffler.

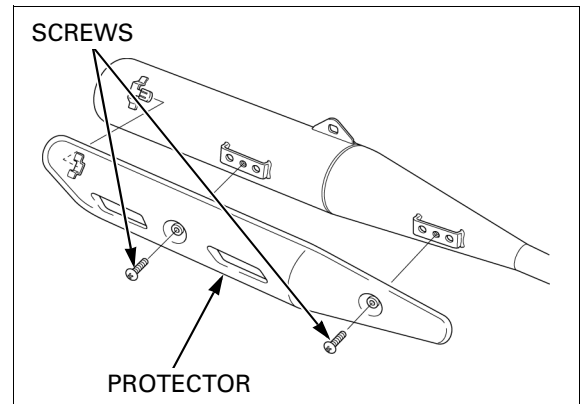


Remove the gasket from the exhaust port.

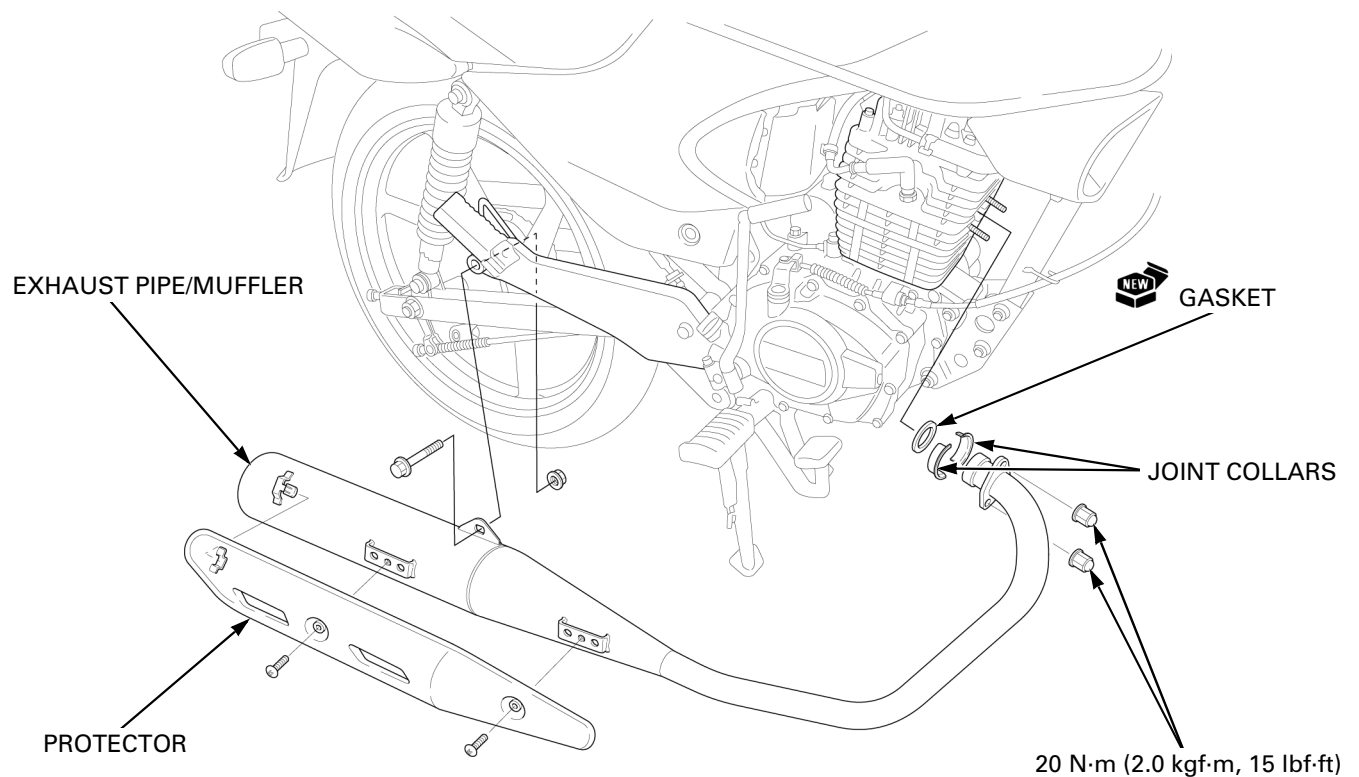


DISASSEMBLY/ASSEMBLY

Remove the screws and protector.
Assemble is in the reverse order of disassembly.



INSTALLATION



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

Install a new gasket into the exhaust port.

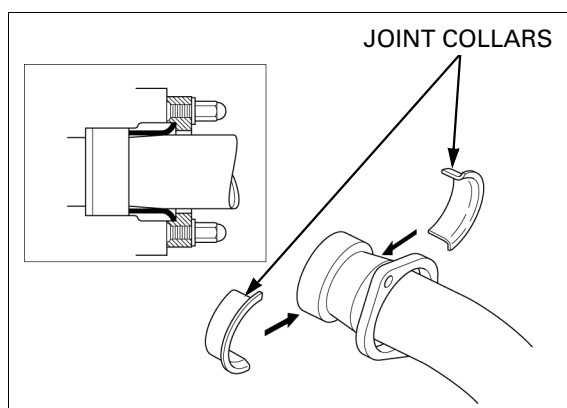


FRAME/BODY PANELS/EXHAUST SYSTEM

Install the exhaust pipe/muffler.

Set the joint collars to the exhaust pipe by aligning its flange with the groove of exhaust pipe flange.

Temporarily install the exhaust pipe joint nuts, muffler mounting bolt and nut.



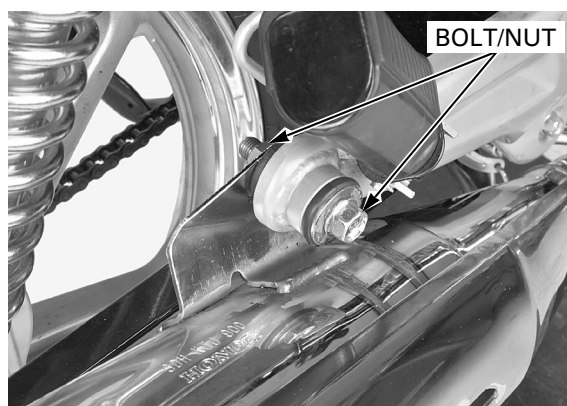
Tighten the exhaust pipe joint nuts to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)



Always inspect the exhaust system for leak after installation.

Tighten the muffler mounting nut securely.



SERVICE INFORMATION	3-2	DRIVE CHAIN.....	3-15
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ENGINE OIL.....	3-11	SIDE STAND	3-22
ENGINE OIL STRAINER SCREEN	3-12	SUSPENSION	3-23
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MAINTENANCE

SERVICE INFORMATION

GENERAL

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

SPECIFICATIONS

ITEM			SPECIFICATIONS
Throttle grip free play			2.0 – 6.0 mm (1/16 – 1/4 in)
Spark plug	Standard		DPR8EA-9 (NGK), X24EPR-U9 (DENSO)
	For extended high speed riding		DPR9EA-9 (NGK), X27EPR-U9 (DENSO)
	For cold climate		DPR7EA-9 (NGK), X22EPR-U9 (DENSO)
Spark plug gap			0.80 – 0.90 mm (0.031 – 0.035 in)
Valve clearance		IN/EX	0.10 ± 0.02 mm (0.004 ± 0.001 in)
Engine oil capacity	After draining		0.9 liter (1.0 US qt, 0.8 Imp qt)
	After disassembly		1.1 liter (1.2 US qt, 1.0 Imp qt)
Recommended engine oil			Honda 4-stroke oil or equivalent motor oil API service classification: SF or SG Viscosity: SAE 10W-30
Idle speed			1,400 ± 100 min ⁻¹ (rpm)
Drive chain	Chain slack		10 – 20 mm (3/8 – 13/16 in)
	Size/link		428/108
Recommended brake fluid (Disc brake type)			DOT 3 or DOT 4
Brake lever free play (Drum brake type)			10 – 20 mm (3/8 – 13/16 in)
Brake pedal free play			20 – 30 mm (13/16 – 1-3/16 in)
Clutch lever free play			10 – 20 mm (3/8 – 13/16 in)
Tire size		Front	80/100 – 18 M/C 47P
		Rear	90/90 – 18 M/C 51P
Cold tire pressure	Driver only	Front	200 kPa (2.00 kgf/cm ² , 29 psi)
		Rear	225 kPa (2.25 kgf/cm ² , 33 psi)
	Driver and passen- ger	Front	200 kPa (2.00 kgf/cm ² , 29 psi)
		Rear	225 kPa (2.25 kgf/cm ² , 33 psi)
Minimum tire tread depth (front/rear)			To wear indicator

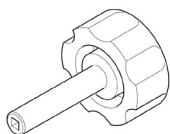
TORQUE VALUES

Air cleaner housing cover screw	1.8 N·m (0.2 kgf·m, 1.3 lbf·ft)
Air cleaner element mounting screw	4.2 N·m (0.4 kgf·m, 3.1 lbf·ft)
Spark plug	18 N·m (1.8 kgf·m, 13 lbf·ft)
Oil strainer screen cap	15 N·m (1.5 kgf·m, 11 lbf·ft)
Oil centrifugal filter screw	5 N·m (0.5 kgf·m, 3.7 lbf·ft)
Valve adjusting lock nut	14 N·m (1.4 kgf·m, 10 lbf·ft)
Valve adjusting hole cap	15 N·m (1.5 kgf·m, 11 lbf·ft)
Timing hole cap	6 N·m (0.6 kgf·m, 4.4 lbf·ft)
Crankshaft hole cap	8 N·m (0.8 kgf·m, 5.9 lbf·ft)
Master cylinder reservoir cap screw (Disc brake type)	1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)
Rear axle nut	59 N·m (6.0 kgf·m, 44 lbf·ft)
Side stand pivot lock nut	45 N·m (4.6 kgf·m, 33 lbf·ft)

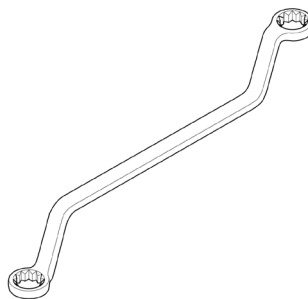
Apply engine oil to the threads and seating surface.

TOOLS

Valve adjusting wrench B
07708-0030400



Wrench, 10 x 12 mm
07708-0030200



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 your Honda dealer.

ITEMS	FREQUENCY	WHICHEVER COMES FIRST ↓ NOTE	ODOMETER READING (NOTE 1)					REFER TO PAGE
			x 1,000 km	1	4	8	12	
			x 1,000 mi	0.6	2.5	5	7.5	
			MONTHS		6	12	18	
* FUEL LINE					I	I	I	3-5
* FUEL STRAINER SCREEN					C	C	C	3-5
* THROTTLE OPERATION					I	I	I	3-6
* CHOKE OPERATION					I	I	I	3-7
AIR CLEANER		NOTE 2			C	C	R	3-7
SPARK PLUG					I	R	I	3-8
* VALVE CLEARANCE				I	I	I	I	3-9
ENGINE OIL				R	EVERY 3,000 km (2,000 mi) R			3-11
* ENGINE OIL STRAINER SCREEN							C	3-12
** ENGINE OIL CENTRIFUGAL FILTER							C	3-13
* ENGINE IDLE SPEED				I	I	I	I	3-14
* SECONDARY AIR SUPPLY SYSTEM		NOTE 5					I	3-14
DRIVE CHAIN		NOTE 3			EVERY 1,000 km (600 mi) I, L			3-15
BATTERY					EVERY 2,000 km (1,250 mi) I			3-17
BRAKE FLUID		NOTE 4			I	I	I	3-18
BRAKE SHOES WEAR		NOTE 6			I	I	I	3-19
BRAKE SHOES/PADS WEAR		NOTE 7			I	I	I	3-19
BRAKE SYSTEM				I	I	I	I	3-20
* BRAKE LIGHT SWITCH					I	I	I	3-21
* HEADLIGHT AIM					I	I	I	3-21
CLUTCH SYSTEM				I	I	I	I	3-22
SIDE STAND					I	I	I	3-22
* SUSPENSION					I	I	I	3-23
* NUTS, BOLTS, FASTENERS		NOTE 3		I		I		3-23
** WHEELS/TIRES					I	I	I	3-24
** STEERING HEAD BEARINGS				I			I	3-25

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

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

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

NOTES:

1. At higher odometer reading, repeat at the frequency interval established here.
2. Service more frequently when riding in unusually wet or dusty areas.
3. Service more frequently when riding OFF-ROAD.
4. Replace every 2 years. Replacement requires mechanical skill.
5. Replace the PAIR air filter every 3 years or 24,000 km (15,000 mi). Replacement requires mechanical skill.
6. Drum brake type only.
7. Disc brake type only.

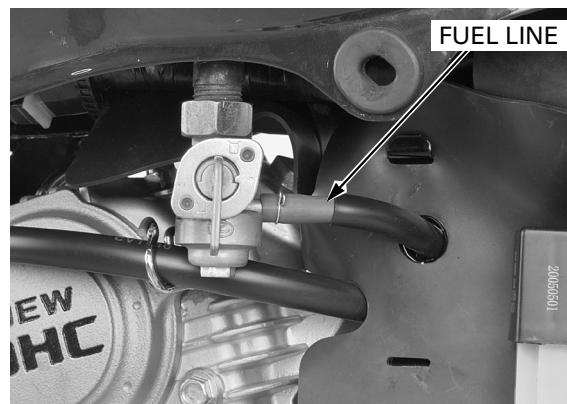
FUEL LINE

Remove the left side cover (page 2-3).

Check the fuel line between the fuel tank and carburetor for deterioration, damage or leak.

Clean or replace it if necessary.

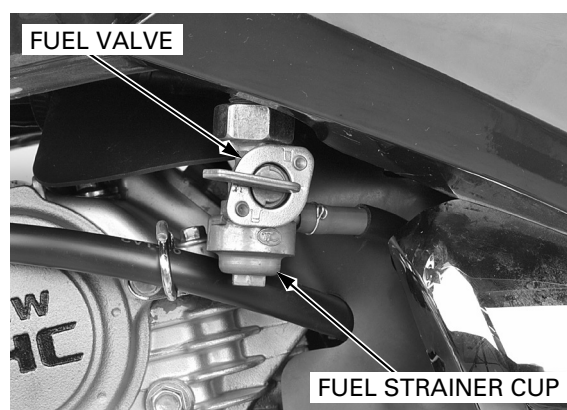
If the fuel flow is restricted, inspect the fuel line and fuel strainer for blockage.



FUEL STRAINER SCREEN

Turn the fuel valve "●" (OFF).

Remove the fuel strainer cup and drain the contents of the fuel cup into a suitable container.



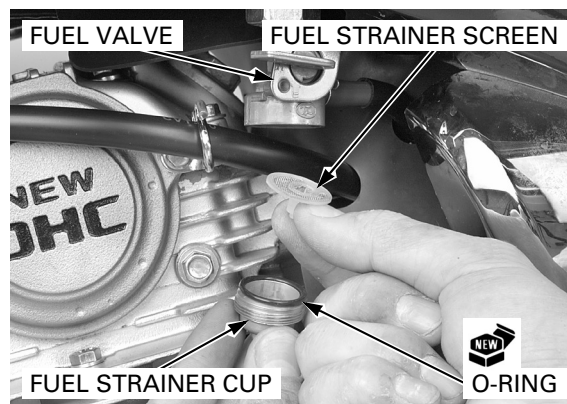
Remove the O-ring and fuel strainer screen.

Wash the fuel strainer screen and cup in clean non-flammable or high flash point solvent.

Install the fuel strainer screen, new O-ring and fuel strainer cup to the fuel valve body, making sure that the O-ring is in place.

Tighten the fuel strainer cup securely.

Turn the fuel valve "□" (ON) and be sure there are no fuel leaks.



THROTTLE OPERATION

Check the throttle grip for smooth operation.
Check that the throttle grip full opens and automatically closes in all steering positions.

If the throttle grip does not return properly, check the throttle cable routing.

Check for any deterioration or damage to the throttle cable.

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

With the engine idling, turn the handlebar all the way to the right and left to ensure that the idle speed does not change.

If idle speed increase, check the throttle grip free play and the throttle cable connection.

Measure the free play at the throttle grip flange.

FREE PLAY: 2.0 – 6.0 mm (1/16 – 1/4 in)

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

Minor adjustment is made with the upper adjuster.

Slide the dust cover.

Loosen the lock nut and turn the adjuster as required.

After adjustment, tighten the lock nut and reposition the dust cover.

Recheck the throttle operation in all steering positions.

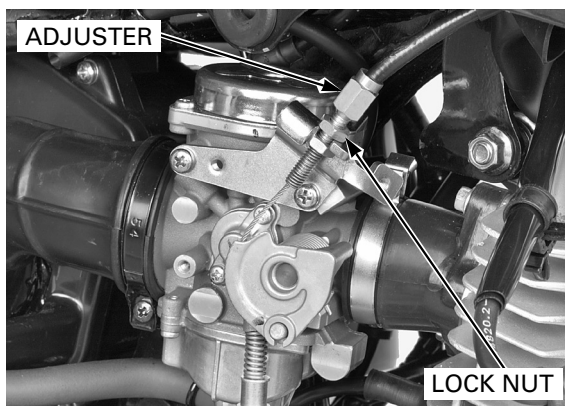
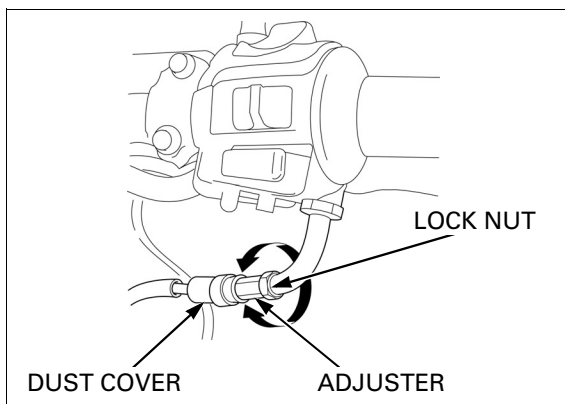
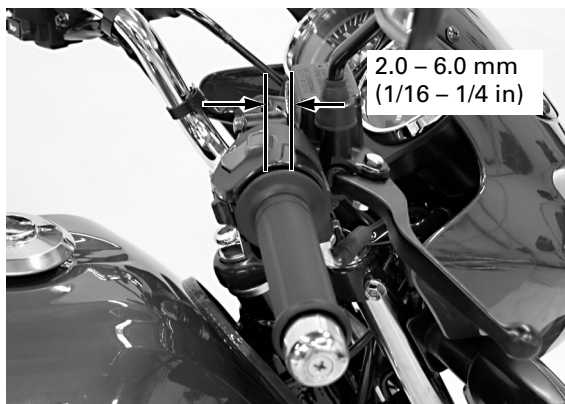
Remove the carburetor guard (page 5-8).

Major adjustments are made with the lower adjuster.

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

Recheck the throttle operation.

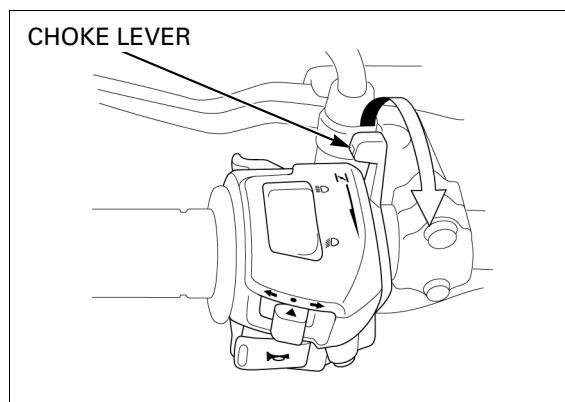
Install the carburetor guard (page 5-17).



CHOKE OPERATION

The SE valve opens the enriching circuit via a cable when the choke lever on the handlebar is pulled back.

Check for smooth operation of the choke lever.
Lubricate the choke cable if the operation is not smooth.

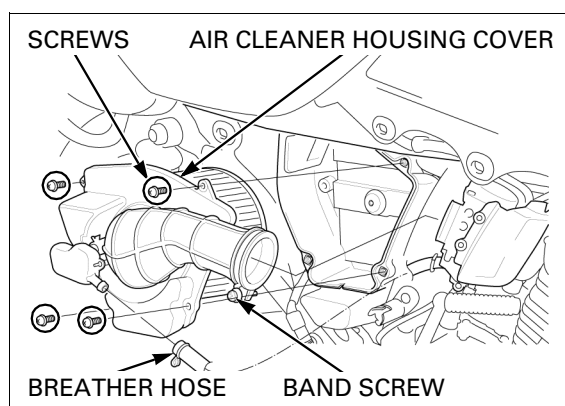


AIR CLEANER

Remove the right side cover (page 2-3).

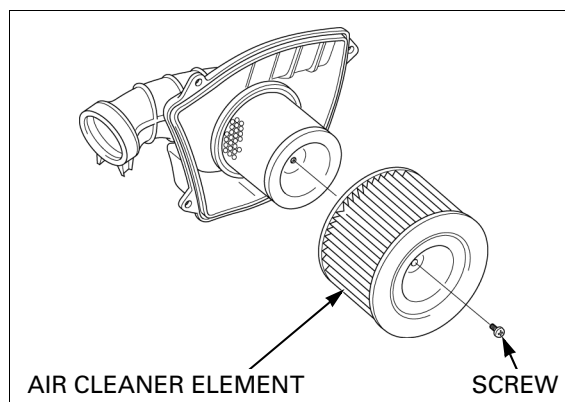
Disconnect the crankcase breather hose.

Loosen the air cleaner connecting tube band screw.
Remove the screws and the air cleaner housing cover.



Remove the screw and the air cleaner element.

Clean or replace the air cleaner element as described in the maintenance schedule (page 3-4).

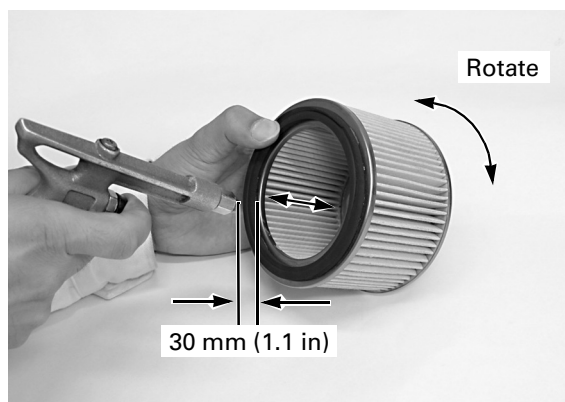


Check the element for clogged.

Replace the element if it is excessively dirty or damaged.

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

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



MAINTENANCE

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

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

Install the removed parts in the reverse order of removal.

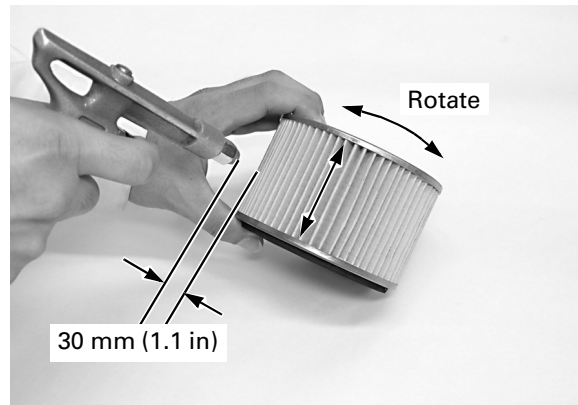
TORQUE:

AIR CLEANER ELEMENT MOUNTING SCREW

4.2 N·m (0.4 kgf·m, 3.1 lbf·ft)

AIR CLEANER HOUSING COVER SCREW

1.8 N·m (0.2 kgf·m, 1.3 lbf·ft)



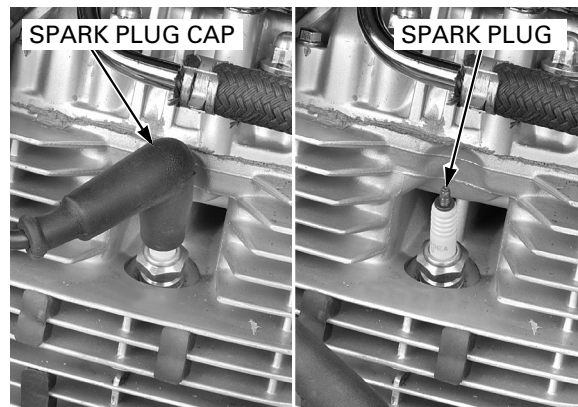
SPARK PLUG

REMOVAL/INSTALLATION

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

Disconnect the spark plug cap and remove the spark plug.

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



Do not overtighten the spark plug.

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

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Connect the spark plug cap.

INSPECTION

Check the following and replace the spark plug if necessary.

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

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

RECOMMENDED SPARK PLUG:

Standard:

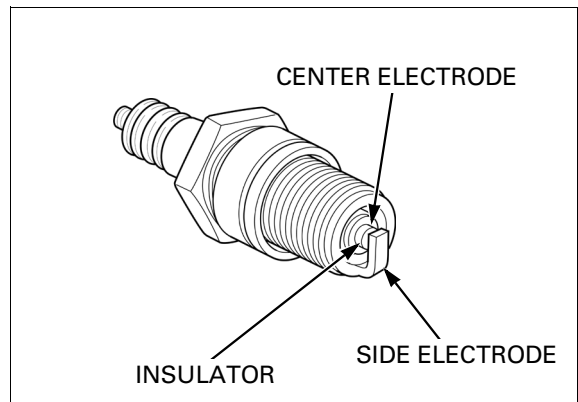
DPR8EA-9 (NGK),
X24EPR-U9 (DENSO)

For extended high speed riding:

DPR9EA-9 (NGK),
X27EPR-U9 (DENSO)

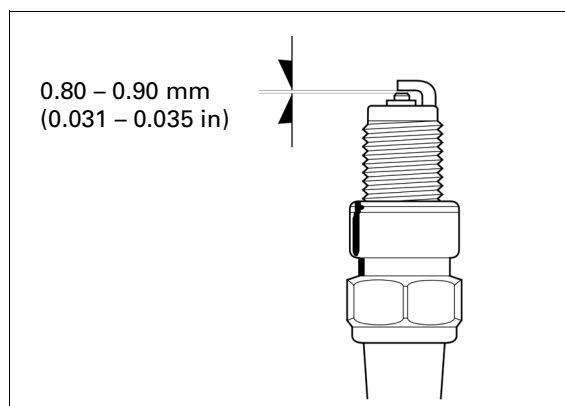
For cold climate:

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



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

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



VALVE CLEARANCE

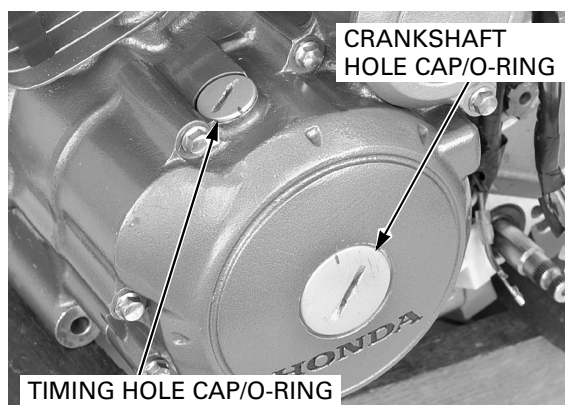
INSPECTION

Remove the following:

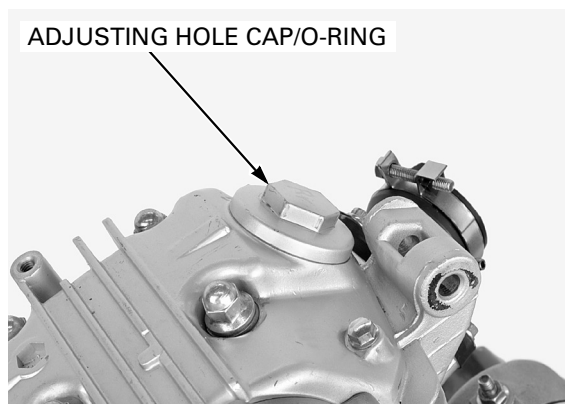
- Fuel tank (page 2-4)
- Horn cover (page 2-9)

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

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



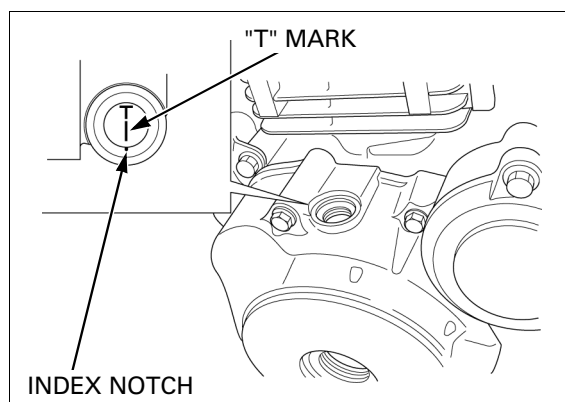
Remove the valve adjusting hole caps and O-rings.



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

Make sure that the piston is at TDC (Top Dead Center) on the compression stroke (The rocker arms should be loose).

If the rocker arms are tight, rotate the crankshaft counterclockwise 360° (1 full turn) and realign the "T" mark with the index notch.



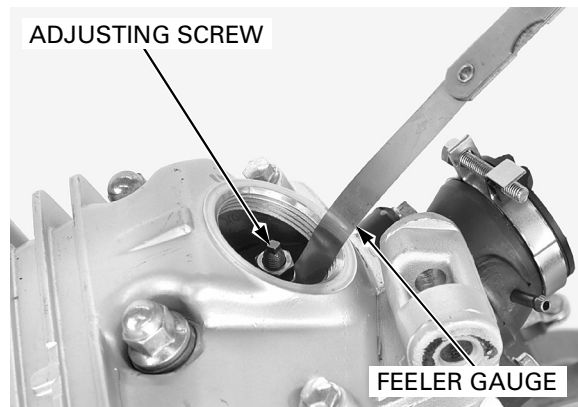
MAINTENANCE

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

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

VALVE CLEARANCE:

IN/EX: 0.10 ± 0.02 mm (0.004 ± 0.001 in)



ADJUSTMENT

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

TOOLS:

Valve adjusting wrench B **07708-0030400**
Wrench, 10 x 12 mm **07708-0030200**

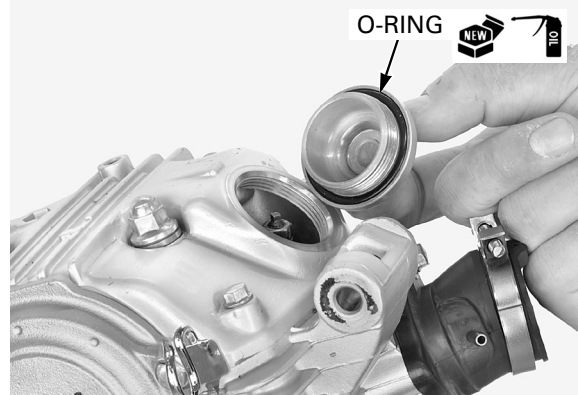
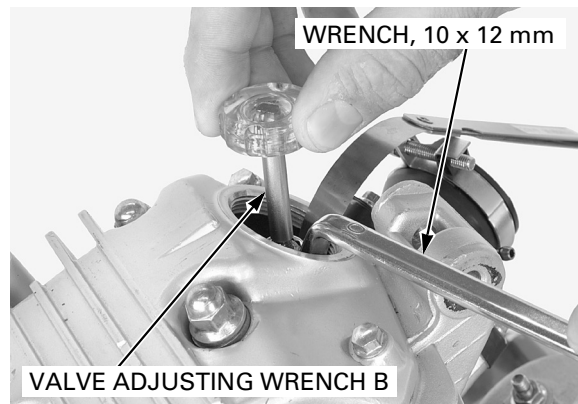
Apply engine oil to the lock nut.
Hold the adjusting screw and tighten the lock nut to the specified torque.

TORQUE: 14 N·m (1.4 kgf·m, 10 lbf·ft)

Recheck the valve clearance.

Apply engine oil to new O-rings and install them onto the valve adjusting hole caps.
Install and tighten the valve adjusting hole caps.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)



Apply engine oil to new O-rings.
Install the O-rings to the crankshaft hole cap and timing hole cap.

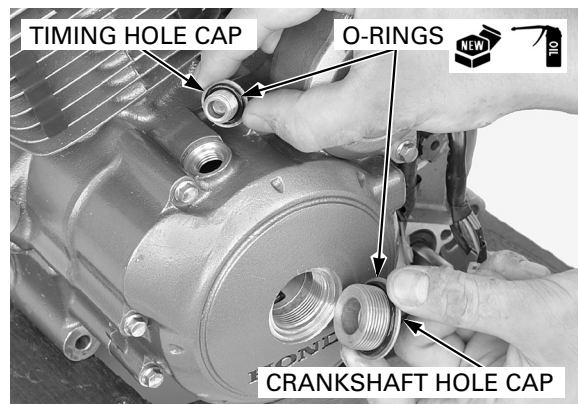
Install and tighten the crankshaft hole cap and timing hole cap to the specified torque.

TORQUE:

Timing hole cap: 6 N·m (0.6 kgf·m, 4.4 lbf·ft)
Crankshaft hole cap: 8 N·m (0.8 kgf·m, 5.9 lbf·ft)

Install the following:

- Horn cover (page 2-9)
- Fuel tank (page 2-4)



ENGINE OIL

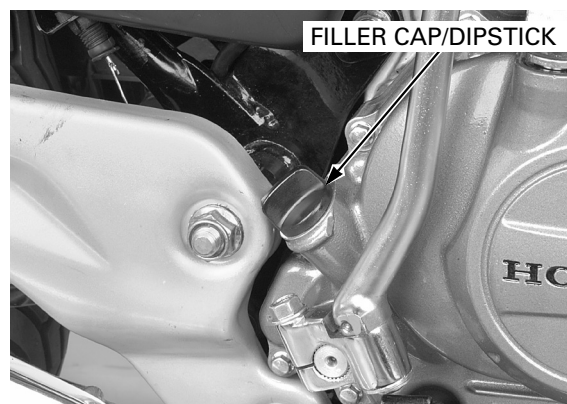
OIL LEVEL CHECK

Clean around the oil filler cap/dipstick and nearby surface.

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.

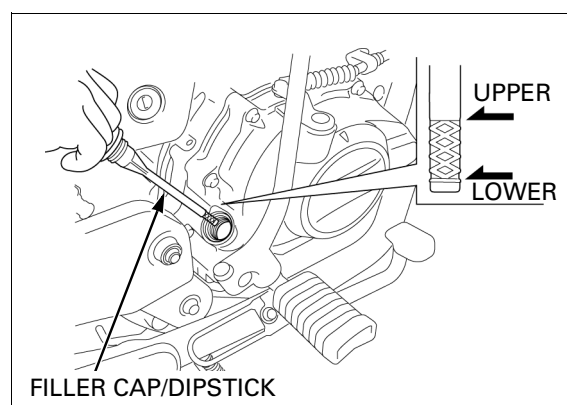


Remove the filler cap/dipstick and wipe the oil with a clean cloth.

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

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

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



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

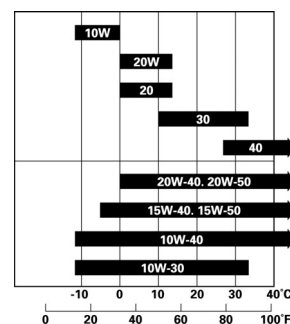
RECOMMENDED ENGINE OIL:

Honda 4-stroke oil or equivalent motor oil

API service classification: SF or SG

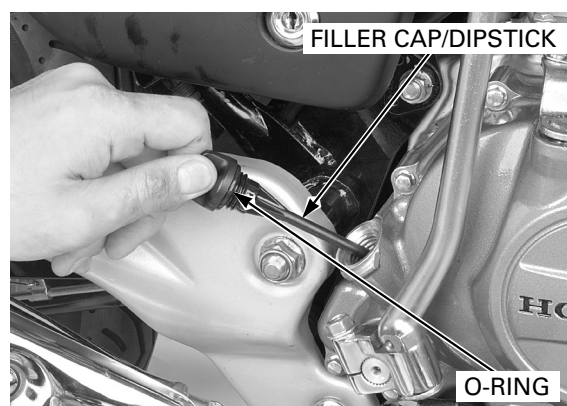
Viscosity: SAE 10W-30

OIL VISCOSITIES



Check that the O-ring is in good condition, replace it if necessary.

Install the oil filler cap/dipstick.



MAINTENANCE

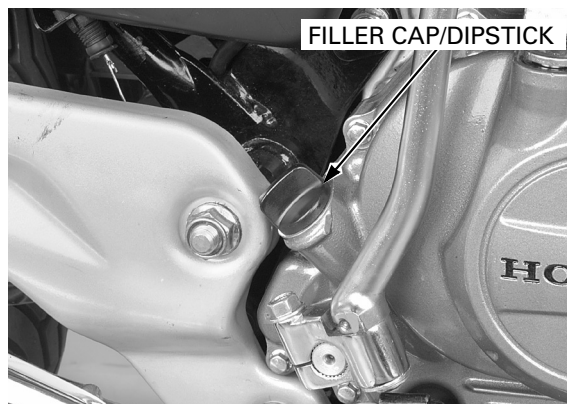
ENGINE OIL STRAINER SCREEN

OIL CHANGE/STRAINER CLEANING

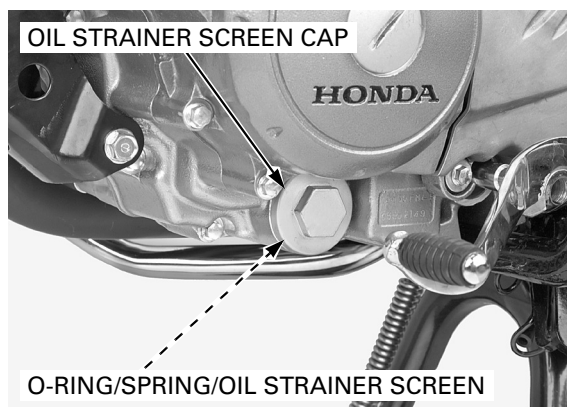
Drain the engine oil while the engine is warm and motorcycle on its side stand. This ensure complete and rapid draining.

Start the engine, warm it up and stop it.

Remove the oil filler cap/dipstick.



Place an oil pan under the engine to collect the oil, then remove the oil strainer screen cap, O-ring, spring and oil strainer screen, and drain the oil.



Check the oil strainer screen for clogs or damage.

Wash the strainer screen thoroughly in non-flammable or high flash point solvent until all accumulated dirt has been removed.

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

Coat a new O-ring with engine oil and install it into strainer cap groove.

Install and tighten the oil strainer screen cap.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)

Fill the crankcase with recommended engine oil.

ENGINE OIL CAPACITY:

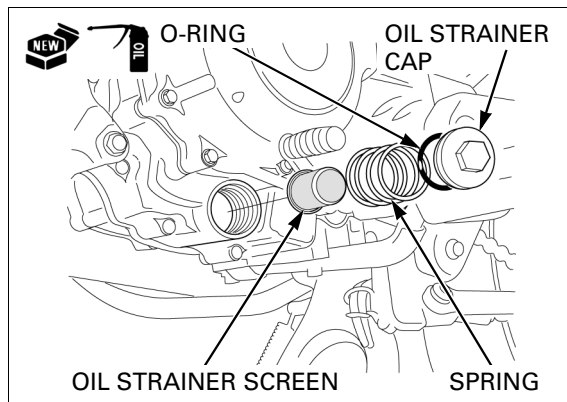
After draining: 0.9 liter (1.0 US qt, 0.8 Imp qt)

After disassembly: 1.1 liter (1.2 US qt, 1.0 Imp qt)

Install the oil filler cap/dipstick.

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

Make sure that there are no oil leaks.

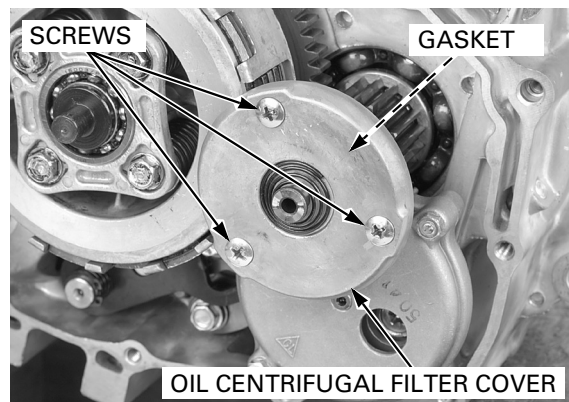


ENGINE OIL CENTRIFUGAL FILTER

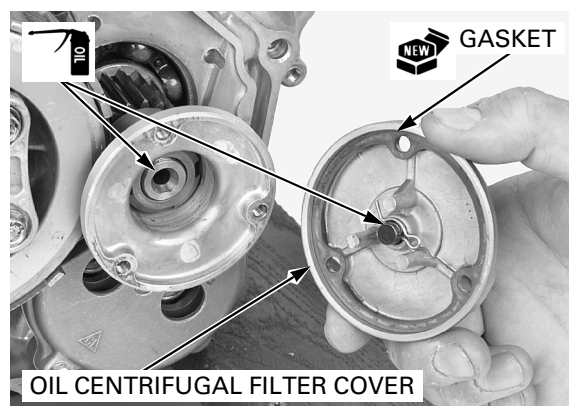
Remove the right crankcase cover (page 9-5).
Remove the screws, oil filter cover and gasket.

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

Cleaning the inside of the oil centrifugal filter and cover.



Install a new gasket onto the oil centrifugal filter cover.
Apply engine oil to the oil through sliding area.



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

TORQUE: 5 N·m (0.5 kgf·m, 3.7 lbf·ft)

Install the right crankcase cover (page 9-14).



ENGINE IDLE SPEED

NOTE:

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

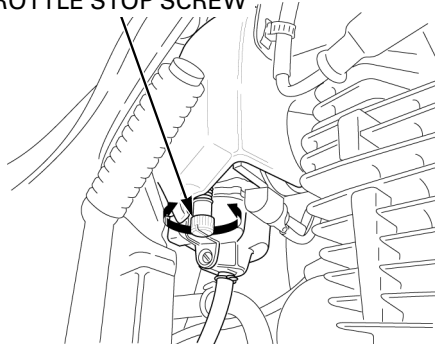
Warm the engine, shift the transmission into neutral and support the motorcycle with its center stand on a level surface.

Check the idle speed.

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

If the adjustment is necessary, turn the throttle stop screw as required.

THROTTLE STOP SCREW



SECONDARY AIR SUPPLY SYSTEM

NOTE:

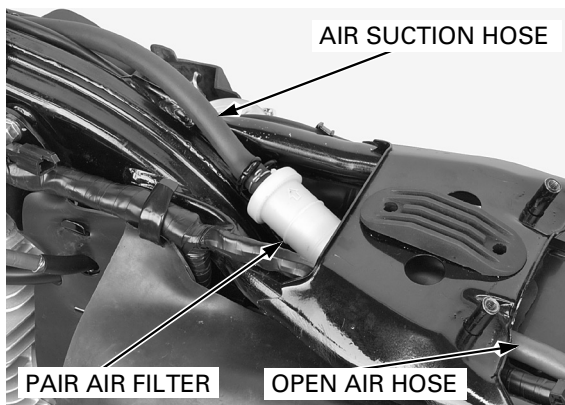
- This model is equipped with the pulse secondary air injection (PAIR) control valve and the PAIR check valve.
- The secondary air supply system introduces filtered air into exhaust gases in the exhaust port. The secondary air is drawn into the exhaust port whenever there is negative pressure pulse in 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 fuel tank (page 2-4).

If the hoses show any signs of heat damage, inspect the PAIR check valve.

Check the PAIR air filter for damage and replace it if necessary (page 5-22).

Check the open air hose for deterioration, damage or loose connections.



Check the air supply hose for deterioration, damage or loose connections. Make sure that the hoses is not cracked.

Check the air suction hose for deterioration, damage or loose connections.
Make sure that the hoses is not kinked, pinched or cracked.

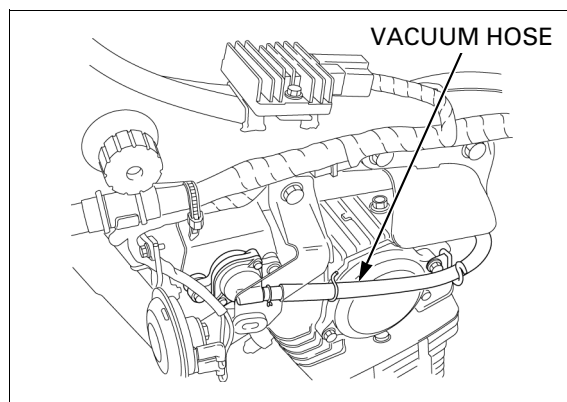
If the air supply hose show any signs of heat damage, inspect the PAIR check valve (page 5-23).



Check the vacuum hose for deterioration, damage or loose connections.
Make sure that the hose is not kinked, pinched or cracked.

Install the fuel tank (page 2-4).

For secondary air supply system inspection (page 5-22).



DRIVE CHAIN

DRIVE CHAIN SLACK INSPECTION

NOTICE

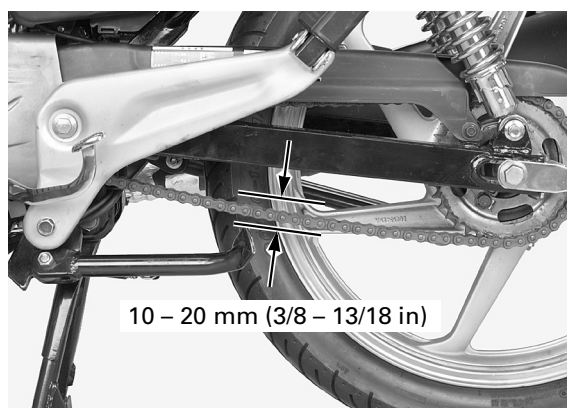
Excessive chain slack, 50 mm (2.0 in) or more, may damage the frame.

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

Turn off the ignition switch, place the motorcycle on its center stand and shift the transmission into neutral.

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

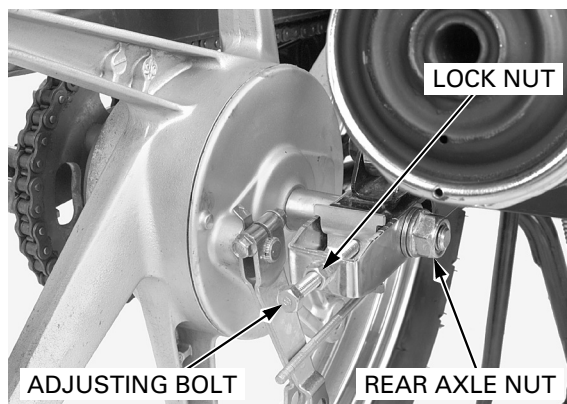
CHAIN SLACK: 10 – 20 mm (3/8 – 13/18 in)



MAINTENANCE

ADJUSTMENT

Loosen the rear axle nut.
Loosen the both drive chain adjuster lock nuts.
Turn both adjusting bolts until the correct drive chain slack is obtained.



Make sure that the index lines on the both adjusters are aligned with the rear edge of the swingarm (same position).

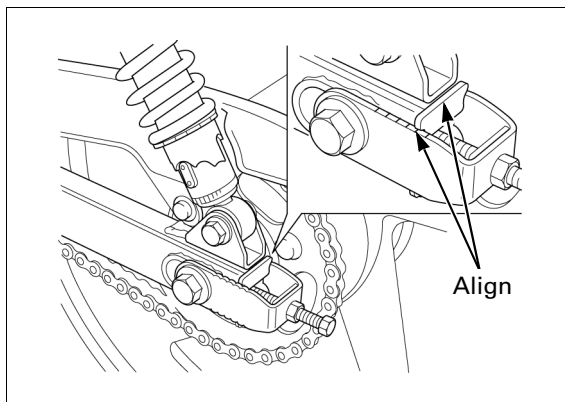
Tighten the rear axle nut to the specified torque.

TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)

Tighten the both drive chain adjuster lock nuts while holding the adjusting bolt.

Recheck the drive chain slack and free wheel rotation.

Check the rear brake pedal free play (page 3-21).



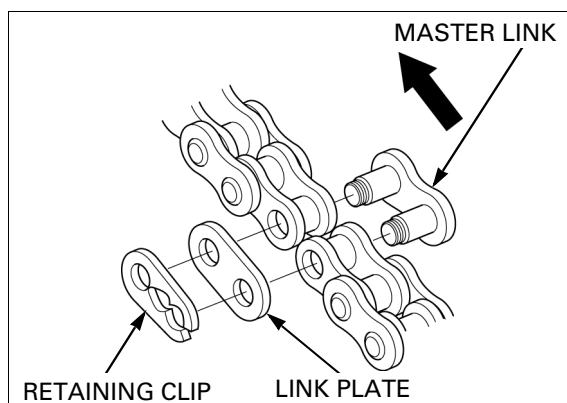
REMOVAL/INSTALLATION

Remove the left crankcase rear cover (page 10-4).

Carefully remove the retaining clip with pliers.
Remove the master link, link plate and drive chain.

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

Install the left crankcase rear cover (page 10-13).

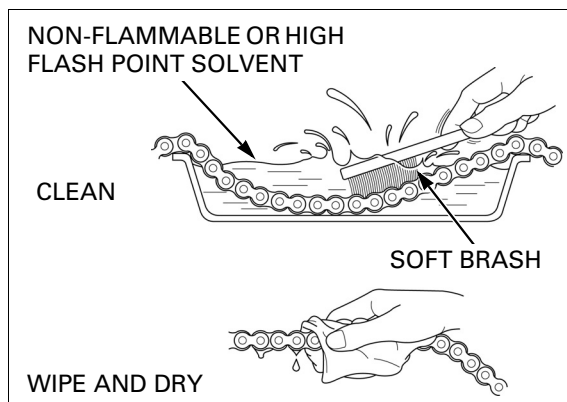


CLEANING AND LUBRICATION

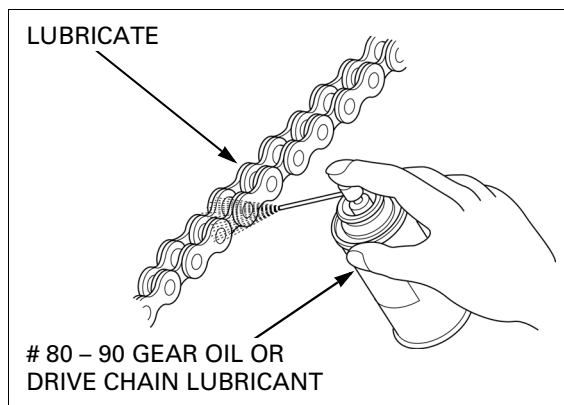
If the drive chain is extremely dirty, it should be removed and cleaned prior to lubrication.

Remove the drive chain (page 3-16).

Clean the chain with non-flammable or high flash point solvent and wipe it dry.
Make sure that the chain is completely dry before lubricating.



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

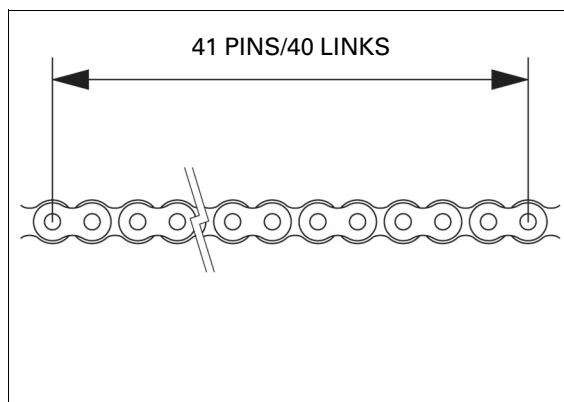


Inspect the drive chain for possible damage or wear. Replace any chain that has damaged rollers, loose fitting links, or otherwise appears unserviceable. Measure the drive chain length with the chain held so that all the links are straight.

DRIVE CHAIN LENGTH (41 pins/40 links)

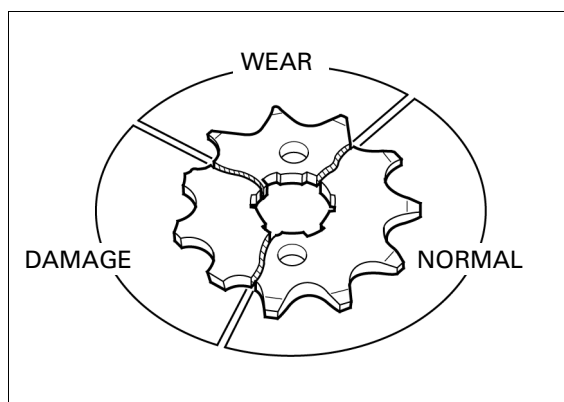
STANDARD: 508 mm (20.0 in)

SERVICE LIMIT: 518 mm (20.4 in)



Inspect the drive and driven sprocket teeth for wear or damage, replace them if necessary. Never use a new drive chain on worn sprockets. Both chain and sprockets must be in good condition, or the new replacement chain will wear rapidly.

Install the drive chain (page 3-16).



BATTERY

Remove the battery (page 15-6).

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

Inspect the electrolyte level.

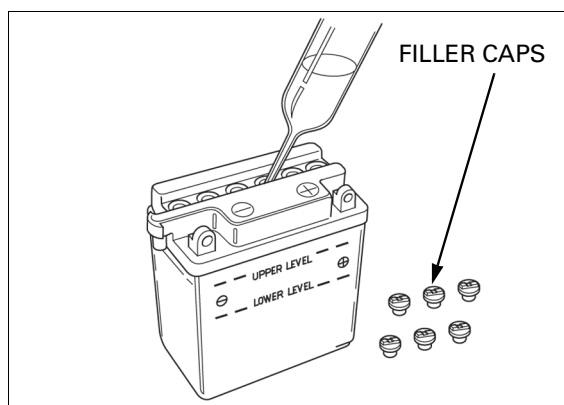
When the electrolyte level nears the lower level, remove the filler caps and add distilled water to the upper level line.

After filling, install each filler cap firmly.

After connecting the battery terminals, lightly coat the terminals with clean grease.

Install the battery (page 15-6).

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



BRAKE FLUID

NOTICE

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

NOTE:

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

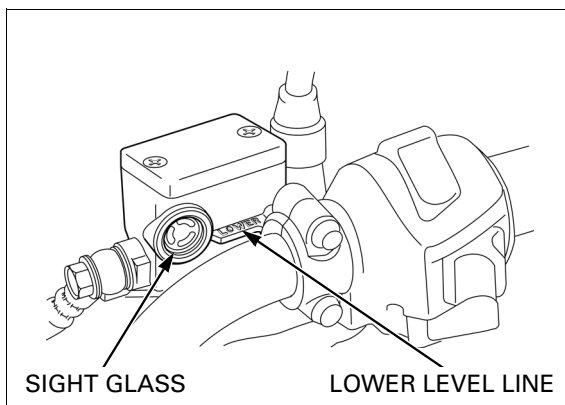
Turn the handlebar so the reservoir is level and check the front brake fluid reservoir level through the sight glass.

When the fluid level is low, check the brake pads for wear (page 3-19).

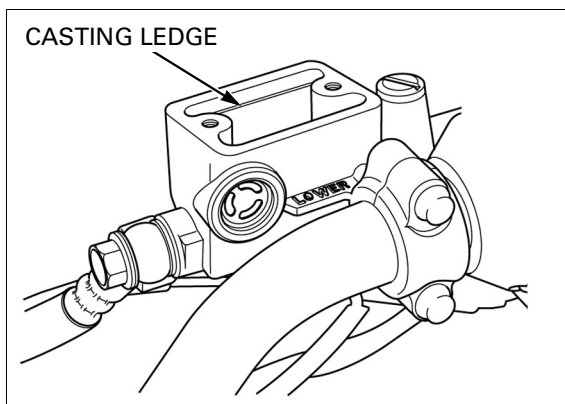
A low fluid level may be due to worn brake pads.

If the brake pads are worn, the caliper pistons are pushed out, and this causes a low reservoir level.

If the brake pads are not worn and the fluid level is low, check entire system for leaks (page 3-20).

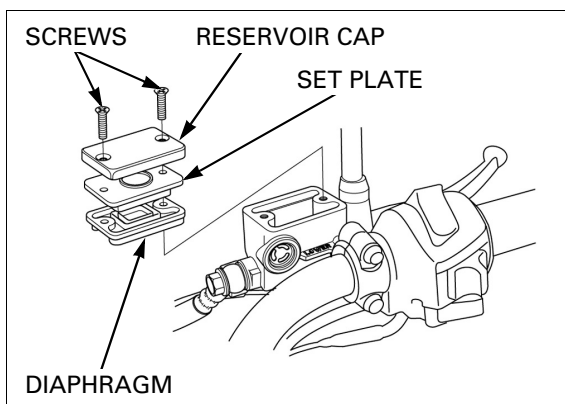


If the level is near the lower level line, remove the cap screws, reservoir cap, set plate and diaphragm, then fill the reservoir DOT 3 or DOT 4 brake fluid from a sealed container to the casting ledge.



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

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



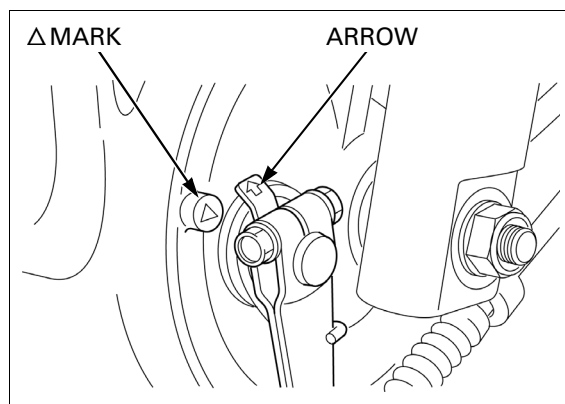
BRAKE SHOES WEAR

FRONT BRAKE SHOES

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

If the arrow on the brake arm aligns with the "Δ" mark on the brake panel, inspect the brake drum (page 12-19).

Replace the brake shoes (page 12-19) if the drum I.D. is within the service limit.

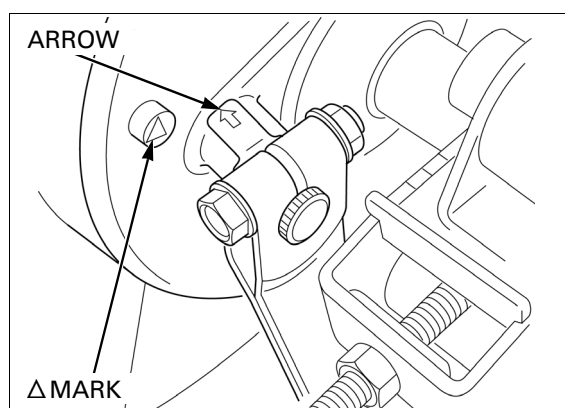


REAR BRAKE SHOES

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

If the arrow on the brake arm aligns with the "Δ" mark on the brake panel, inspect the brake drum (page 13-13).

Replace the brake shoes (page 13-13) if the drum I.D. is within the service limit.



BRAKE SHOES/PADS WEAR

FRONT BRAKE PADS

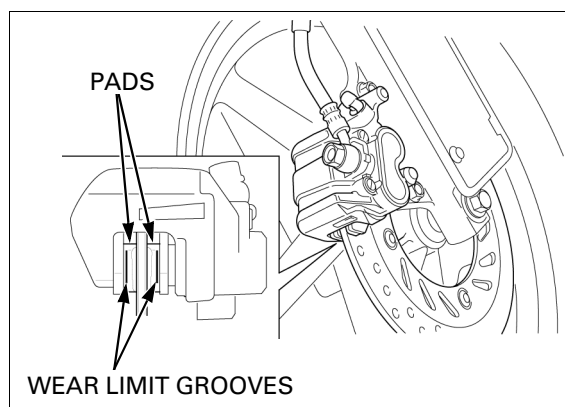
Check the brake pads for wear.

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

Refer to page 14-7 for brake pad replacement.

REAR BRAKE SHOES

The service procedure is in the same method with the drum brake type (page 3-19).



BRAKE SYSTEM

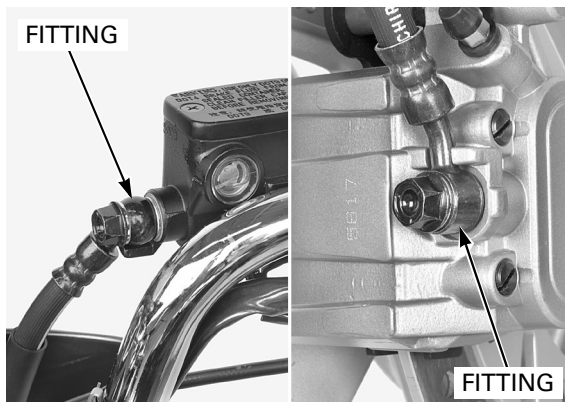
FRONT BRAKE

DISC BRAKE TYPE

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

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

Refer to page 14-5 for air bleeding procedures.



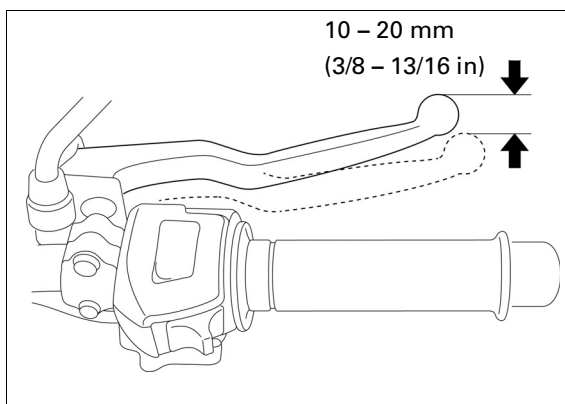
DRUM BRAKE TYPE

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

Inspect the brake cable for kinks or damage, and lubricate the cable if necessary.

Measure the front brake lever free play at the tip of the brake lever.

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



Minor adjustments are made with the upper adjuster.

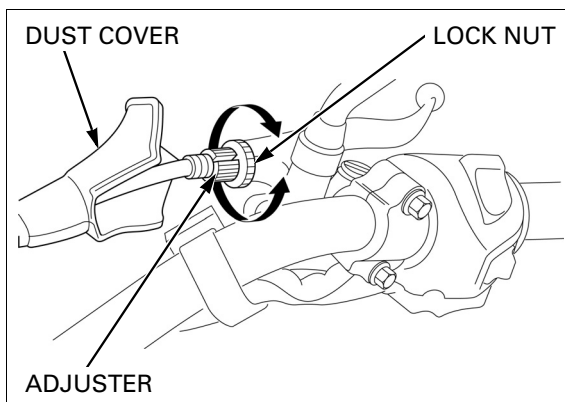
Slide the dust cover.

Loosen the adjuster lock nut and turn the adjuster to obtain correct free play.

Tighten the adjuster lock nut and reposition the dust cover.

If the adjuster is threaded out near the limit and correct free play cannot be obtained, turn the adjuster all the way in and back out one turn.

Tighten the lock nut and make major adjustments as follows.

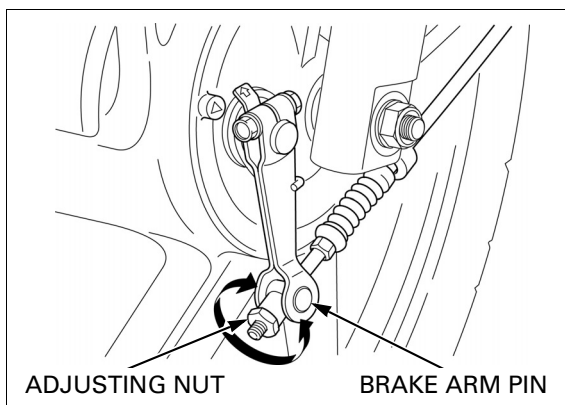


Make sure the cut-out of the adjusting nut is seated on the brake arm pin.

Major adjustments are made with the lower adjuster.

Turn the adjusting nut to obtain correct free play.

Recheck the brake lever free play (page 3-20).

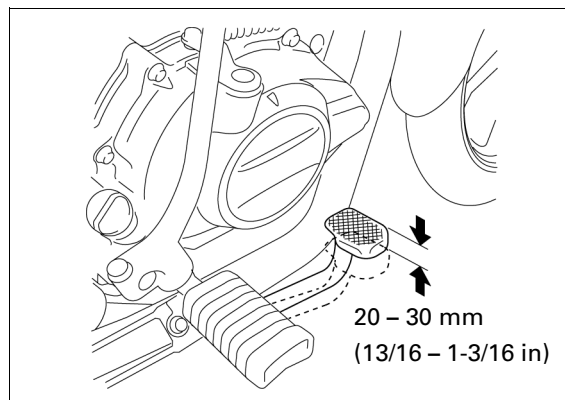


REAR BRAKE

Check the brake pedal and brake rod for loose connections, excessive play, or other damage. Replace or repair them if necessary.

Measure the rear brake pedal free play.

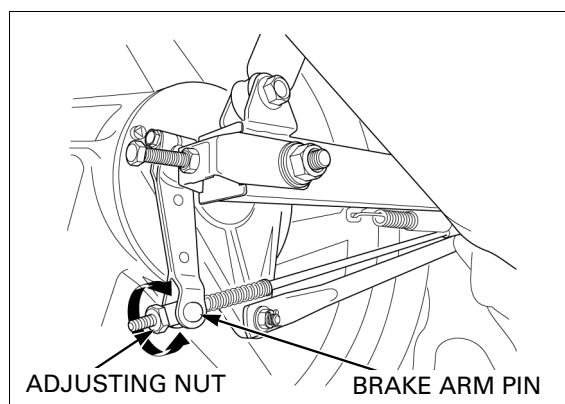
FREE PLAY: 20 – 30 mm (13/16 – 1-3/16 in)



Make sure the cut-out of the adjusting nut is seated on the brake arm pin.

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

Recheck the free play, then check and adjust the brake light switch (page 3-21).



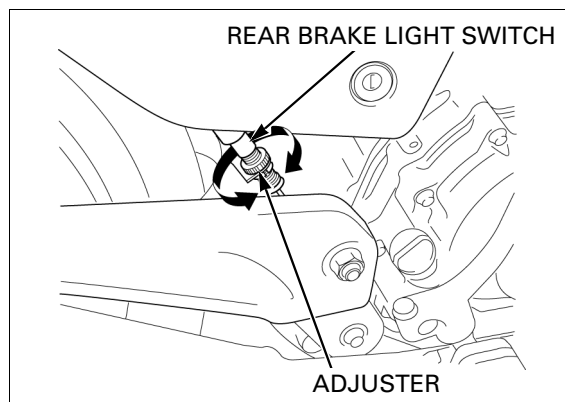
BRAKE LIGHT SWITCH

The front brake light switch does not require adjustment.

Adjust the rear brake light switch so that the brake light comes on just prior to the brake actually being engaged.

Perform the rear brake light switch adjustment after adjusting the brake pedal free play.

If the light fails to come on properly, adjust the brake light switch by holding the switch body and turning the adjuster. Do not turn the switch body.



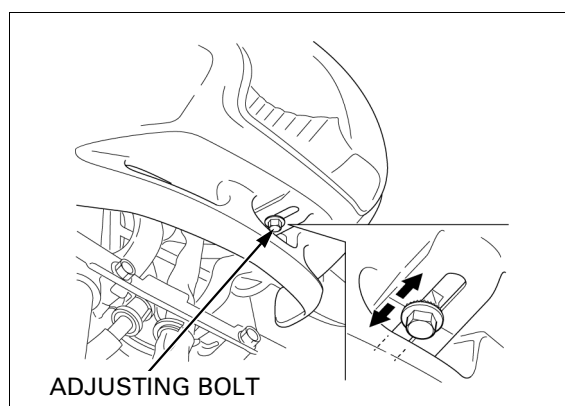
HEADLIGHT AIM

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

Place the motorcycle with its center stand on a level surface.

Adjust the headlight beam vertically by loosening the adjusting bolt and moving the headlight unit.

Tighten the adjusting bolt after adjustment.



MAINTENANCE

CLUTCH SYSTEM

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

Measure the clutch lever free play at the tip of the clutch lever.

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

The adjuster may be damaged if it is positioned too far out, leaving minimal thread engagement.

Minor adjustments are made with the upper adjuster at the clutch lever.

Slide the dust cover, loosen the adjuster lock nut and turn the adjuster to obtain the correct free play.

Tighten the adjuster lock nut and reposition the dust cover.

If the adjuster is threaded out near the limit and the correct free play cannot be obtained, turn the adjuster all the way in and back out one turn.

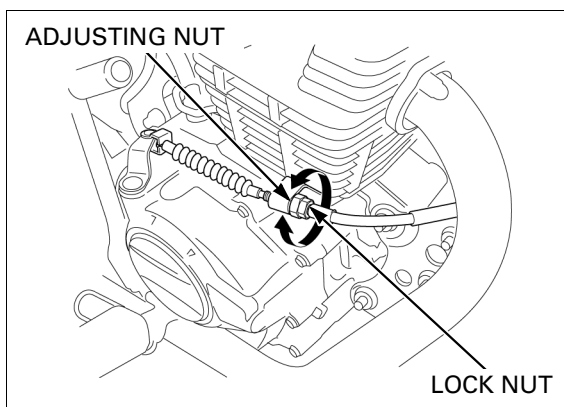
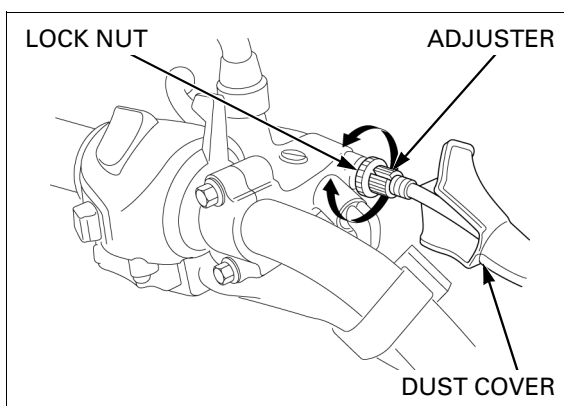
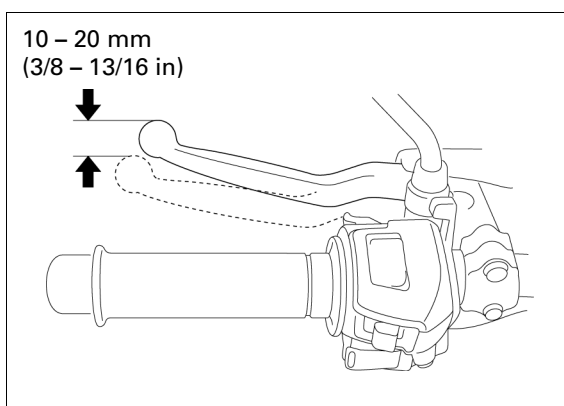
Tighten the lock nut and make major adjustments as follows.

Major adjustment is made with the lower adjusting nut at the engine.

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

Check the clutch operation.

If the correct free play cannot be obtained, or the clutch slips during the test ride, disassemble and inspect the clutch (page 9-7).



SIDE STAND

Place the motorcycle on its center stand.

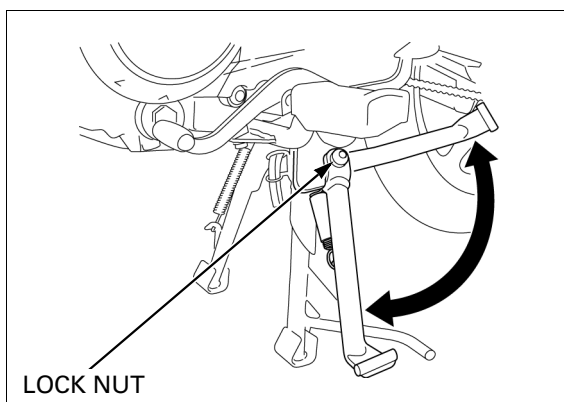
Check the side stand spring for damage or loss of tension.

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

Check that the side stand pivot bolt and lock nut are tightened.

If loosened the side stand pivot lock nut, tighten it to the specified torque.

TORQUE: 45 N·m (4.6 kgf·m, 33 lbf·ft)



SUSPENSION

FRONT SUSPENSION INSPECTION

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

Check the entire fork 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.

Refer to fork service (page 12-22).



REAR SUSPENSION INSPECTION

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

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

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

Refer to shock absorber service (page 13-19).



Raise the rear wheel off the ground using the center stand and support the motorcycle securely.

Check for worn swingarm bushing by grabbing end of the swingarm and attempting to move the swingarm side to side.



NUTS, BOLTS, FASTENERS

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

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

WHEELS/TIRES

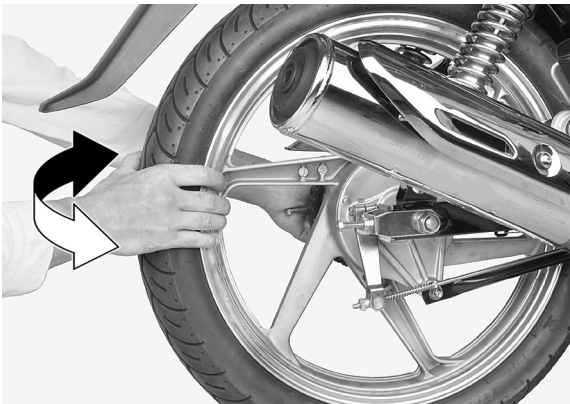
Support the motorcycle securely and raise the front wheel off the ground.
Hold the fork leg and move the front wheel side-ways with force to see if the wheel bearings are worn

Refer to front wheel service (page 12-11).



Support the motorcycle with its center stand.
Hold the swingarm and move the rear wheel side-ways with force to see if the wheel bearings are worn

Refer to rear wheel service (page 13-6).



Check the tire pressure when the tires are cold.

RECOMMENDED TIRE PRESSURE AND TIRE SIZE:

		FRONT	REAR
Tire pressure kPa (kgf/cm ² , psi)	Driver only	200 (2.00, 29)	225 (2.25, 33)
	Driver and passenger	200 (2.00, 29)	225 (2.25, 33)
Tire size		80/100-18 M/C 47P	90/90-18 M/C 51P



Check the tires for cuts, embedded nails, or other damage.
Check the front wheel (page 12-11) and rear wheel (page 13-6) for trueness.

Replace the tires when the wear indicator appears on the tire.

MINIMUM TIRE TREAD DEPTH:

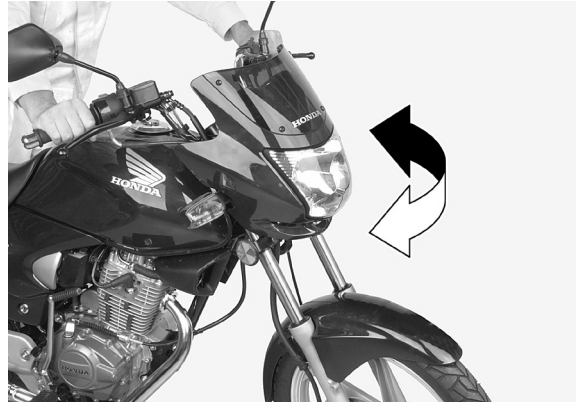
FRONT: To wear indicator
REAR: To wear indicator



STEERING HEAD BEARINGS

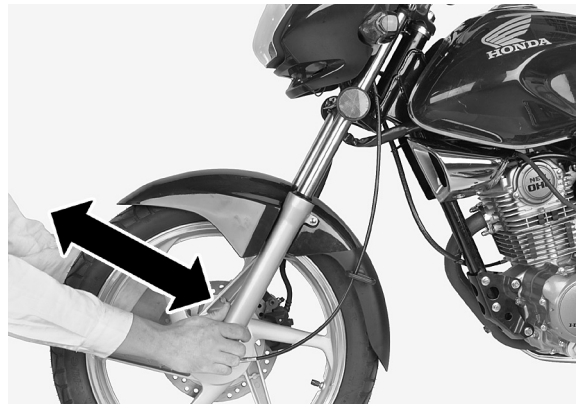
Raise the front wheel off the ground and support the motorcycle using safety stand or a box.

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



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

If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (page 12-29).

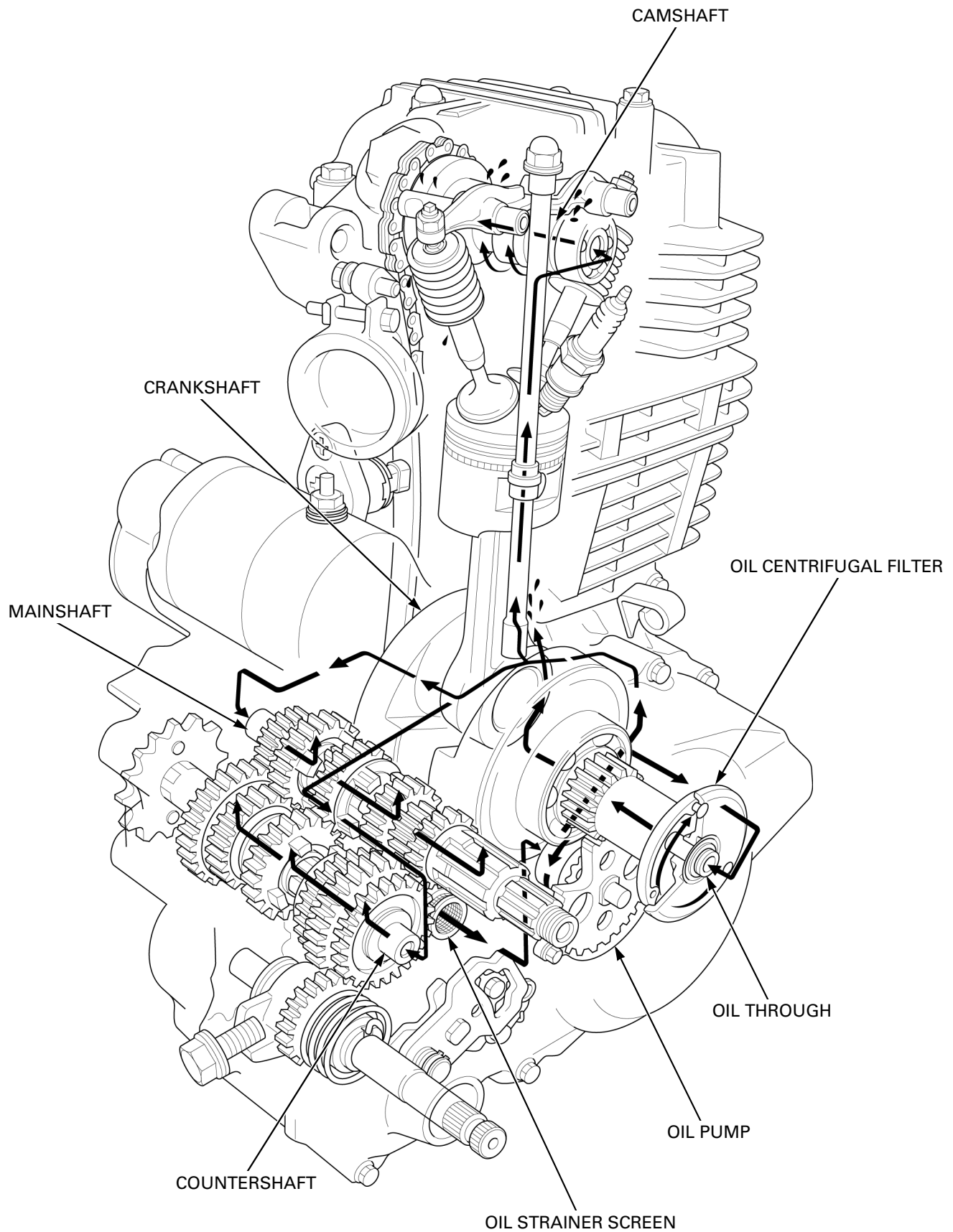


MEMO

4. LUBRICATION SYSTEM

LUBRICATION SYSTEM DIAGRAM	4-2	OIL PUMP	4-5
SERVICE INFORMATION	4-3	OIL CENTRIFUGAL FILTER	4-9
TROUBLESHOOTING	4-4		

LUBRICATION SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

⚠ CAUTION

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

- The oil pump can be serviced with the engine installed in the frame.
- 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.
- For engine oil level check (page 3-11).
- For engine oil change and strainer cleaning (page 3-12).
- For engine oil centrifugal filter cleaning (page 3-13).

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	0.9 liter (1.0 US qt, 0.8 Imp qt)	—
	After disassembly	1.1 liter (1.2 US qt, 1.0 Imp qt)	—
Recommended engine oil		Honda 4-stroke oil or equivalent motor oil API service classification: SF or SG Viscosity: SAE 10W-30	—
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.12 – 0.18 (0.005 – 0.007)	0.25 (0.010)
	Side clearance	0.09 – 0.16 (0.004 – 0.006)	0.25 (0.010)

TORQUE VALUES

Oil pump rotor cover screw
Oil pump mounting screw
Oil centrifugal filter lock nut

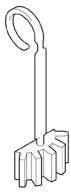
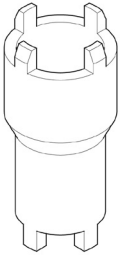
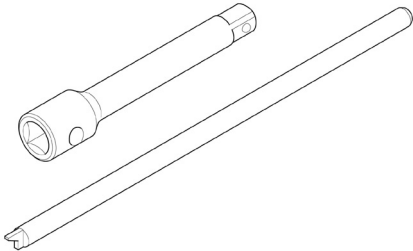
2 N·m (0.2 kgf·m, 1.5 lbf·ft)
10 N·m (1.0 kgf·m, 7 lbf·ft)
54 N·m (5.5 kgf·m, 40 lbf·ft)

Apply engine oil to the threads and seating surface.

Oil centrifugal filter cover screw
Oil pump gear cover bolt

5 N·m (0.5 kgf·m, 3.7 lbf·ft)
4.4 N·m (0.4 kgf·m, 3.2 lbf·ft)

TOOLS

Gear holder 07724-0010200 	Lock nut wrench, 20 x 24 mm 07716-0020100 	Extension bar 07716-0020500 
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LUBRICATION SYSTEM

TROUBLESHOOTING

Engine oil level too low, high oil consumption

- External oil leaks
- Worn valve guide or seal
- Worn piston rings or incorrect piston ring installation
- Worn cylinder

Engine oil contamination

- Oil not changed often enough
- Worn piston rings
- Clogged oil strainer screen
- Oil centrifugal filter not serviced often enough

OIL PUMP

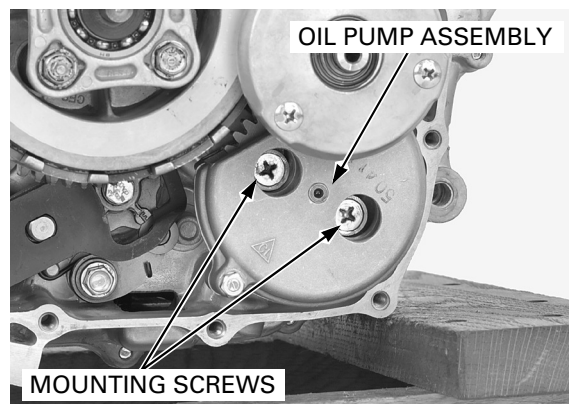
REMOVAL

Drain the engine oil (page 3-12).

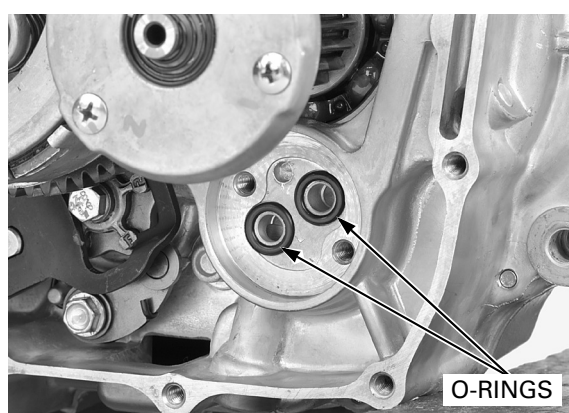
Remove the right crankcase cover (page 9-5).

Turn the crankshaft clockwise and align the holes in the oil pump driven gear with oil pump mounting screws.

Remove the mounting screws and oil pump assembly.

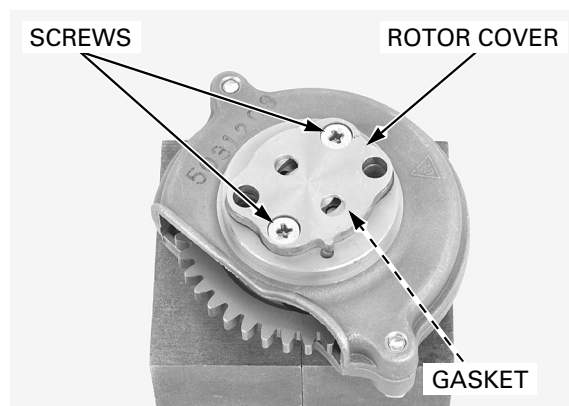


Remove the O-rings from the right crankcase grooves.

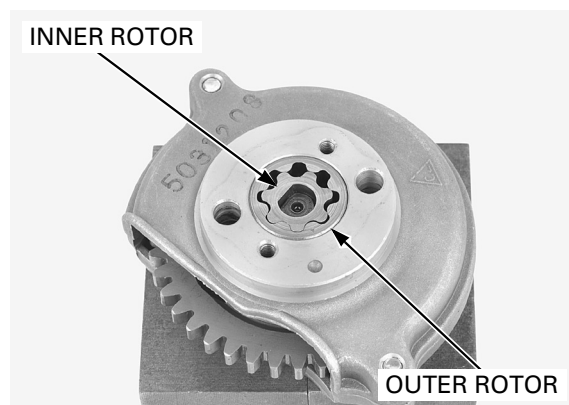


DISASSEMBLY

Remove the screws, rotor cover and gasket.



Remove the inner and outer rotors.



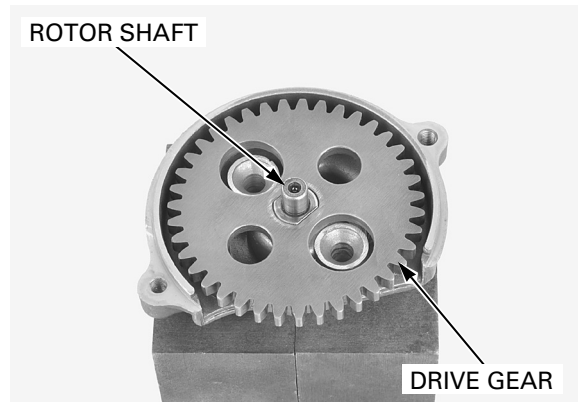
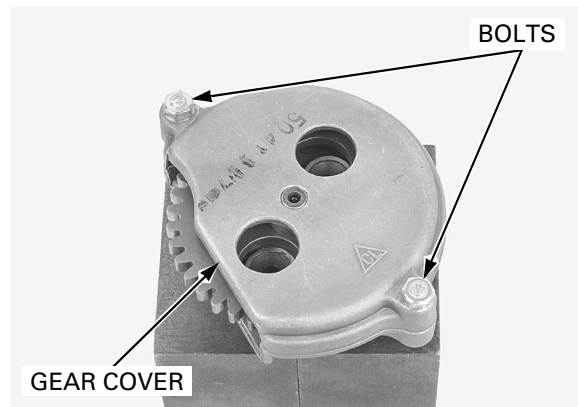
LUBRICATION SYSTEM

Remove the following:

- Oil pump gear cover bolts
- Oil pump gear cover

- Rotor shaft
- Oil pump driven gear

Check the oil pump driven gear and rotor shaft for wear or damage.



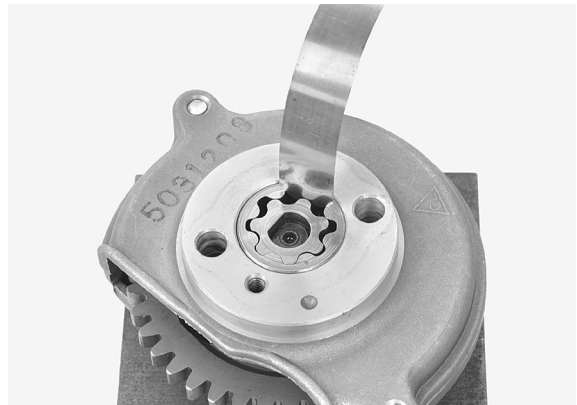
INSPECTION

Assemble the oil pump assembly.

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

Measure the tip clearance between the inner and outer rotors.

SERVICE LIMIT: 0.20 mm (0.008 in)



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

SERVICE LIMIT: 0.25 mm (0.010 in)



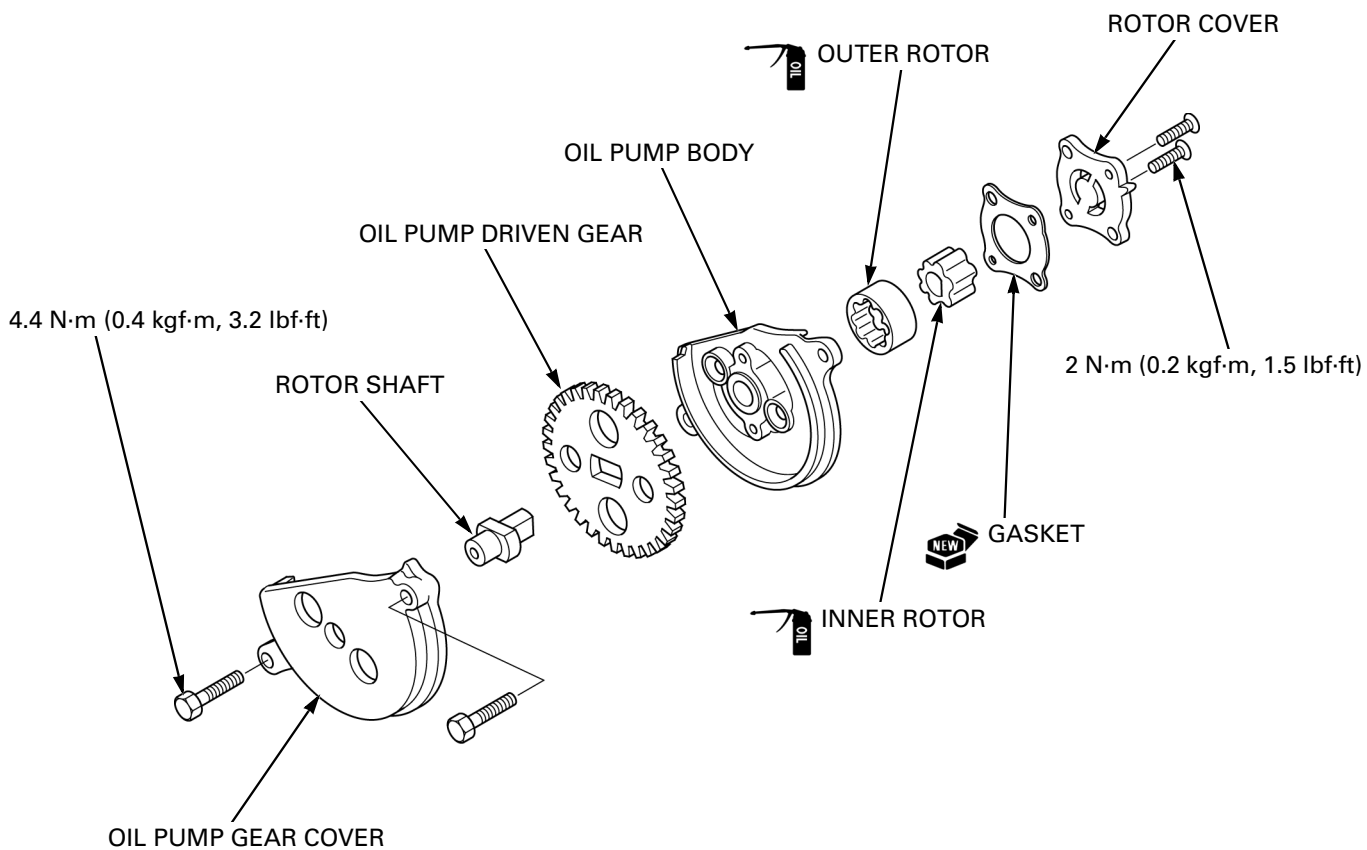
Measure the clearance with the gasket installed.

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

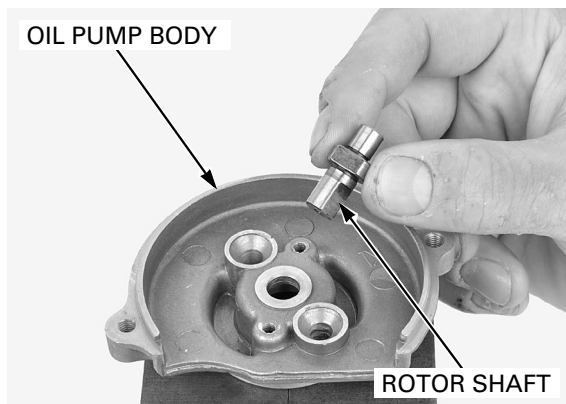
SERVICE LIMIT: 0.25 mm (0.010 in)



ASSEMBLY

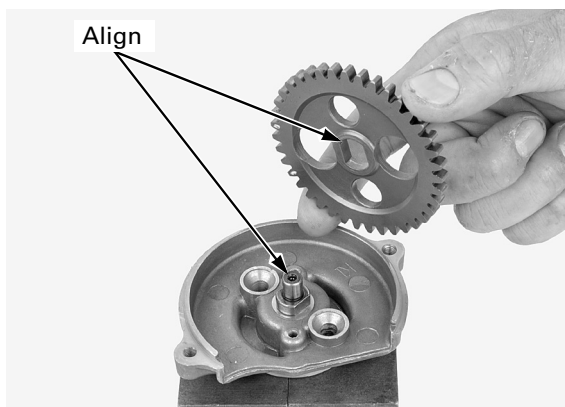


Install the rotor shaft with the long side facing toward the oil pump body.



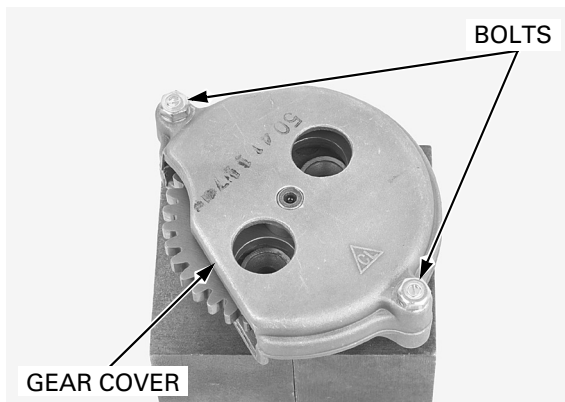
LUBRICATION SYSTEM

Install the oil pump driven gear by aligning its cut-outs rotor shaft as shown.

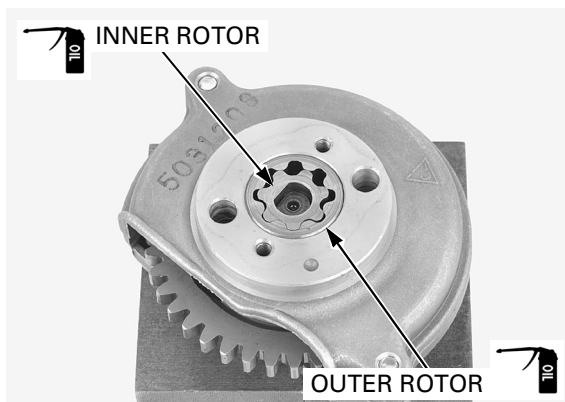


Install the oil pump gear cover and tighten the bolts to the specified torque.

TORQUE: 4.4 N·m (0.4 kgf·m, 3.2 lbf·ft)



Apply engine oil to the inner and outer rotors and install them into the oil pump body.



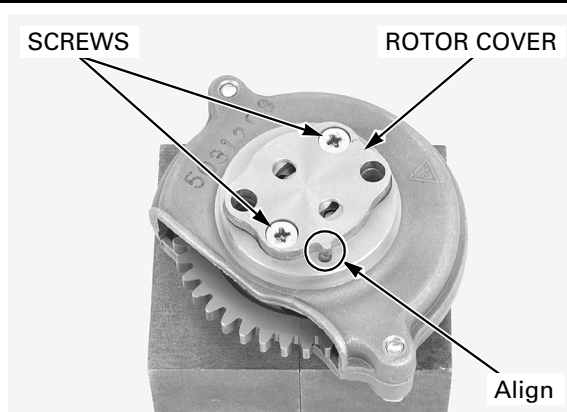
Install a new gasket.



Install the rotor cover by aligning its boss with the dent of the pump body.
Install the rotor cover screws and tighten them to the specified torque.

TORQUE: 2 N·m (0.2 kgf·m, 1.5 lbf·ft)

Check the oil pump operation by rotating the oil pump driven gear by hand.



INSTALLATION

Apply engine oil to new O-rings and install them into the right crankcase grooves.

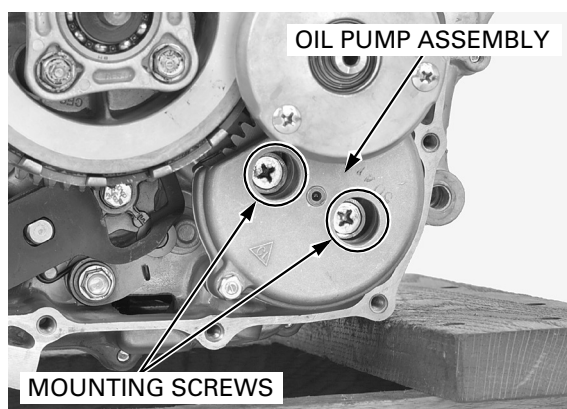


Install the oil pump assembly to the right crankcase. Turn the crankshaft clockwise and align the holes of the oil pump driven gear and gear cover. Install and tighten the mounting screws to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the right crankcase cover (page 9-14).

Fill the crankcase with recommended engine oil (page 3-11).

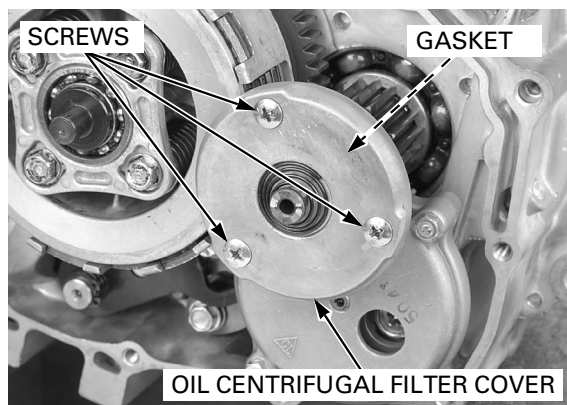


OIL CENTRIFUGAL FILTER

REMOVAL

Remove the right crankcase cover (page 9-5).

Remove the screws, oil centrifugal filter cover and gasket.



LUBRICATION SYSTEM

Remove the oil pump (page 4-5).

Insert the gear holder between the primary drive and driven gears.

Remove the oil centrifugal filter lock nut using the special tools.

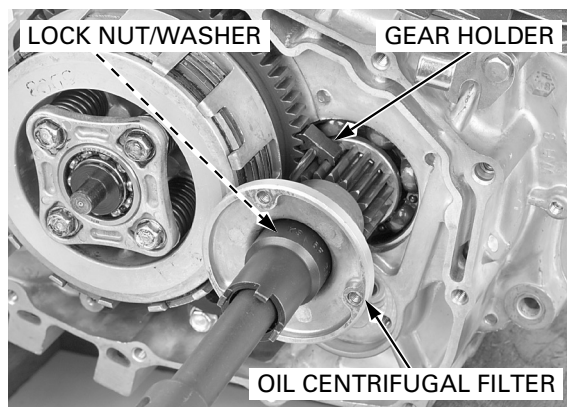
TOOLS:

Gear holder 07724-0010200

Lock nut wrench, 20 x 24 mm 07716-0020100

Extension bar 07716-0020500

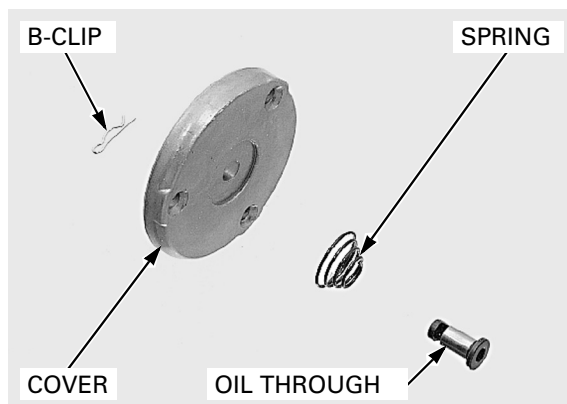
Remove the lock washer and oil centrifugal filter.



DISASSEMBLY/ASSEMBLY

Check the oil through operates freely, without binding.

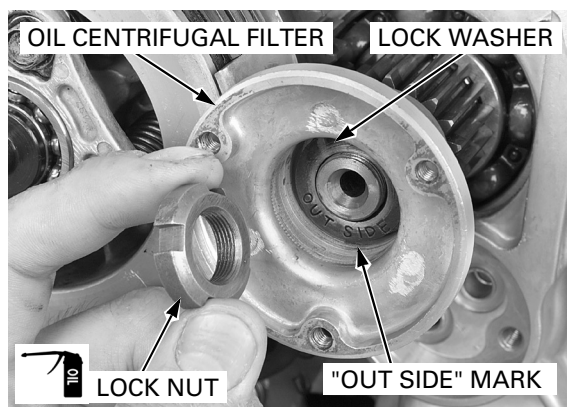
If necessary, remove the B-clip and replace the faulty part.



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

Install the oil centrifugal filter and lock washer onto the crankshaft.

Apply engine oil to the threads and seating surface of the lock nut and install it with the chamfered side facing in.



Insert the gear holder between the primary drive and driven gears.

Tighten the oil filter rotor lock nut using the special tools.

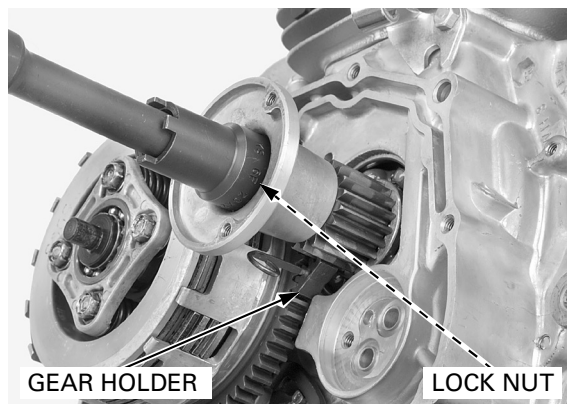
TOOLS:

Gear holder 07724-0010200

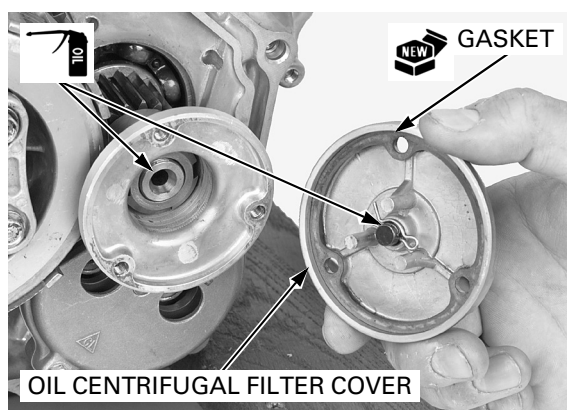
Lock nut wrench, 20 x 24 mm 07716-0020100

Extension bar 07716-0020500

TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)



Install a new gasket onto the oil centrifugal filter cover.
Apply engine oil to the oil through sliding area.
Install the oil pump (page 4-9).



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

TORQUE: 5 N·m (0.5 kgf·m, 3.7 lbf·ft)

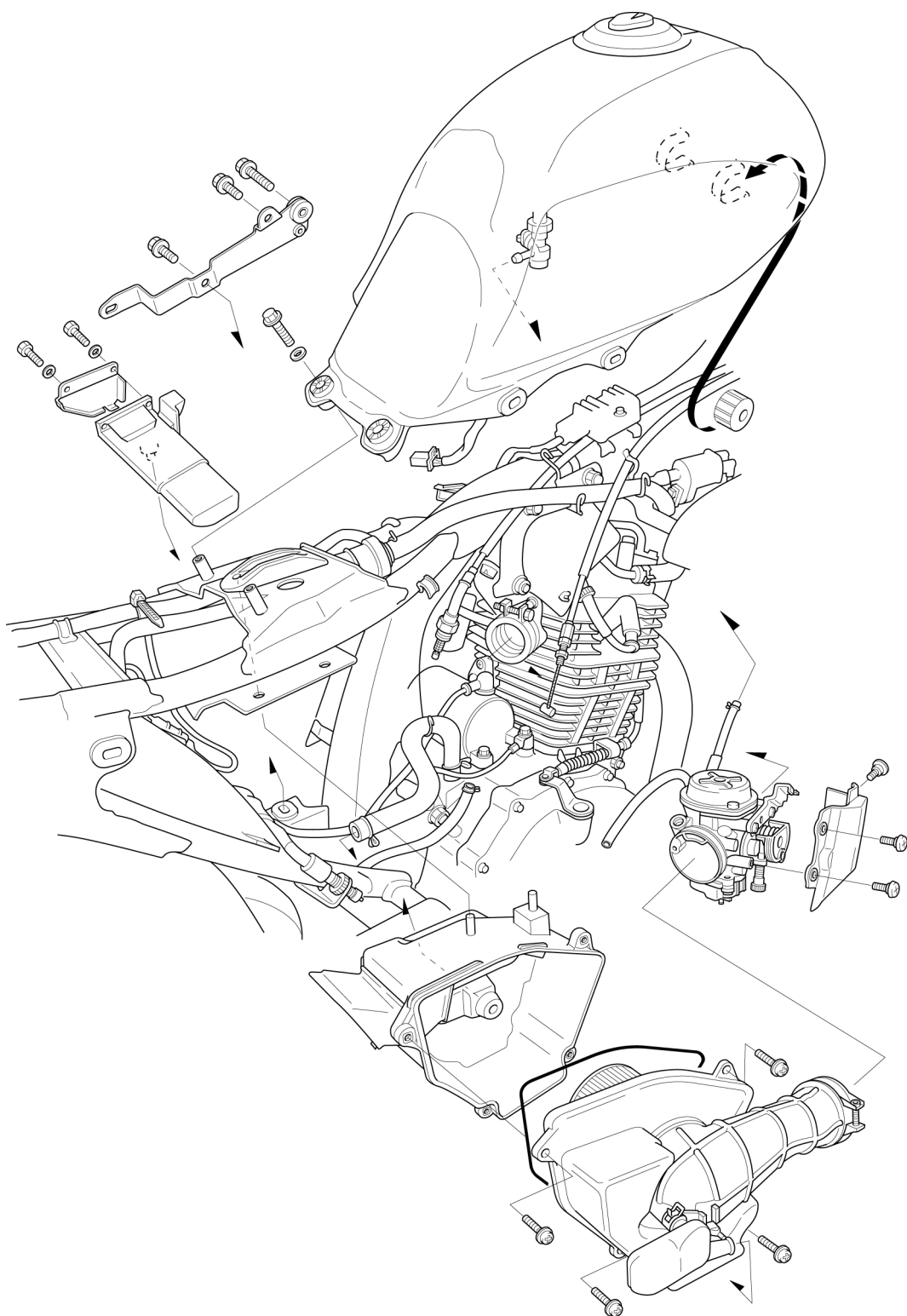
Install the right crankcase cover (page 9-14).



MEMO

COMPONENT LOCATION	5-2	CARBURETOR	5-9
SERVICE INFORMATION	5-3	PILOT SCREW ADJUSTMENT	5-23
TROUBLESHOOTING	5-4	SECONDARY AIR SUPPLY SYSTEM	5-25
STORAGE TANK	5-5	FUEL STRAINER	5-28
AIR CLEANER HOUSING	5-6	CARBURETOR HEATER	5-29
STARTING ENRICHMENT (SE) VALVE	5-8		

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- Bending or twisting the control cable will impair smooth operation and could cause the cable to stick or bind, resulting in loss of vehicle control.
- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.
- When disassembling the fuel system parts, note the locations of the O-rings. Replace them with new ones on reassembly.
- Before removing the carburetor, place an approved gasoline container under the carburetor drain hose, loosen the drain screw and drain the carburetor.
- After removing the carburetor, wrap the intake port of the engine with a shop towel or cover it with pieces of tape to prevent any foreign material from dropping into the engine.
- 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.

SPECIFICATIONS

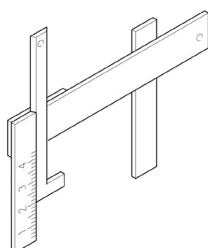
ITEM	SPECIFICATIONS
Carburetor identification number	AVK3BC
Main jet	#100
Slow jet	#38
Pilot screw initial/final opening	See page 5-20
Float level	13.0 mm (0.51 in)
Idle speed	1,400 ± 100 min ⁻¹ (rpm)
Throttle grip free play	2.0 – 6.0 mm (1/16 – 1/4 in)
PAIR control valve specified vacuum	52.0 kPa (390 mmHg)
Carburetor heater resistance (20°C/68°F)	13 – 15 Ω

TORQUE VALUES

SE (starting enrichment) valve lock nut	2.3 N·m (0.2 kgf·m, 1.7 lbf·ft)
Carburetor drain screw	1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)
Slow jet	1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)
Needle jet holder	2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)
Main jet	2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)
Float chamber screw	2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)
SE (starting enrichment) valve cover screw	3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)
Vacuum chamber cover screw	2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)
Air cut-off valve cover screw	2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)
Carburetor heater	4.9 N·m (0.5 kgf·m, 3.6 lbf·ft)
PAIR check valve cover screw	2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)
Tool box bolt	1.8 N·m (0.2 kgf·m, 1.3 lbf·ft)

TOOL

Carburetor float level gauge
07401-0010000



FUEL SYSTEM

TROUBLESHOOTING

Engine will not start

- Too much fuel getting to the engine
 - Air cleaner clogged
 - Flooded carburetor
- Intake air leak
- Fuel contaminated/deteriorated
- No fuel to carburetor
 - Fuel strainer clogged
 - Fuel line clogged
 - Fuel valve stuck

Lean mixture

- Fuel jet clogged
- Fuel strainer clogged
- Float valve faulty
- Float level too low
- Fuel line restricted
- Intake air leak
- Clogged carburetor air vent hose
- Vacuum piston faulty

Rich mixture

- SE valve open
- Float valve faulty
- Float level too high
- Air jets clogged
- Flooded carburetor
- Vacuum piston faulty

Engine stall, hard to start, rough idling

- Fuel line restricted
- Ignition system malfunction (page 16-4)
- Fuel mixture too lean/rich (pilot screw misadjustment)
- Fuel contaminated/deteriorated
- Intake air leak
- Idle speed misadjusted
- SE valve open

Afterburn when engine braking is used

- Lean mixture in slow circuit
- Faulty PAIR control valve
- Faulty PAIR check valve
- Clogged hose of the secondary air supply system
- Ignition system malfunction (page 16-4)
- Faulty air cut-off valve

Backfiring or misfiring during acceleration

- Ignition system malfunction (page 16-4)
- Fuel mixture too lean

Poor performance (driveability) and poor fuel economy

- Fuel system clogged
- Ignition system malfunction (page 16-4)

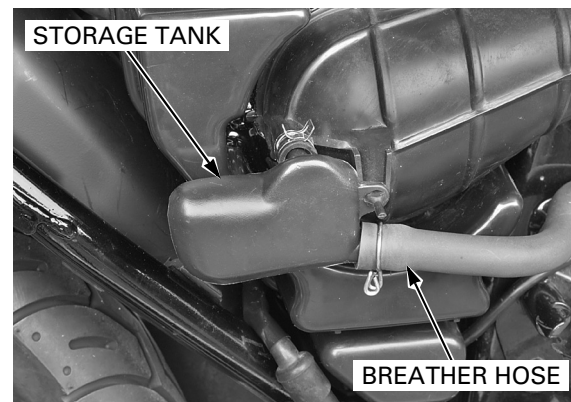
STORAGE TANK

Disconnect the crankcase breather hose.
Remove the storage tank from the air cleaner connecting tube.

Check the breather hose for deterioration, damage or loose connection. Make sure that the hose is not cracked.

Check the storage tank for clogging, damage or fatigue.

Installation is in the reverse order of removal.



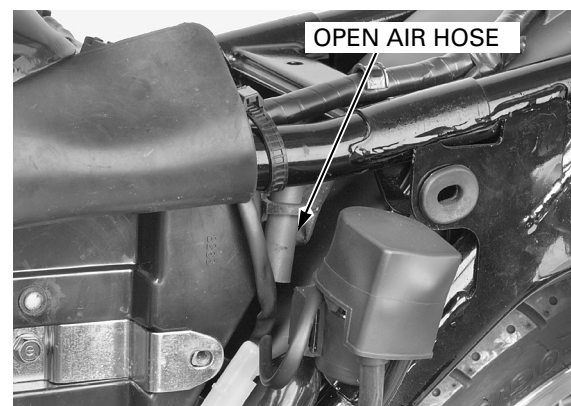
AIR CLEANER HOUSING

REMOVAL

Remove the following:

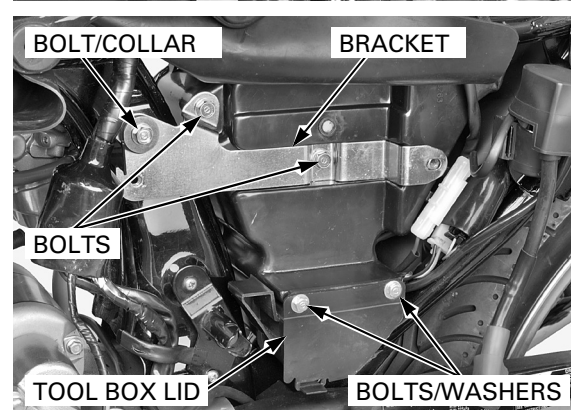
- Air cleaner element (page 3-7)
- Battery (page 15-6)

Pull out the open air hose from the air cleaner housing.

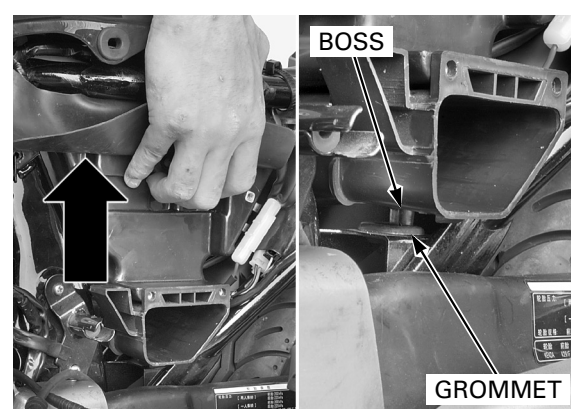


Remove the bolts, collar and air cleaner housing bracket.

Remove the bolts, washers and tool box lid.

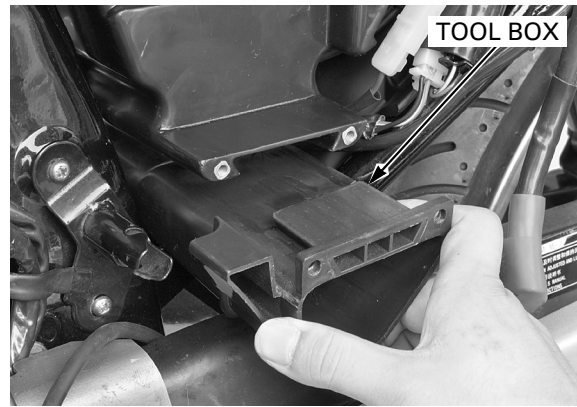


Release the boss of the tool box from the frame grommet by slightly pulling up the air cleaner housing.



FUEL SYSTEM

Pull out the tool box from the left side of the frame.

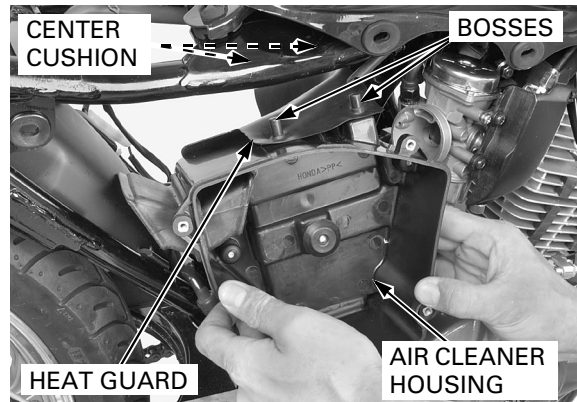


Release the bosses of the air cleaner housing from the fuel tank center cushion by pulling down the air cleaner housing.
Release the heat guard from the air cleaner housing and remove the air cleaner housing.

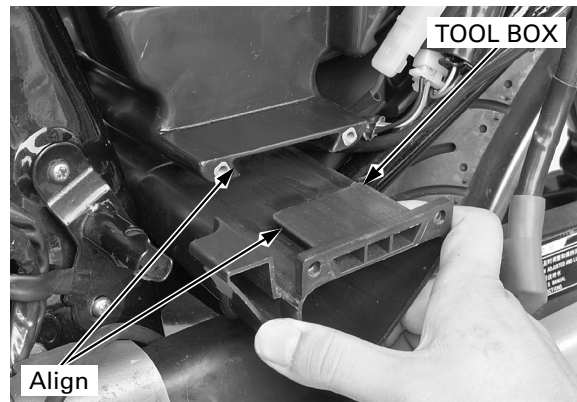
INSTALLATION

Set the heat guard to the air cleaner housing as shown.

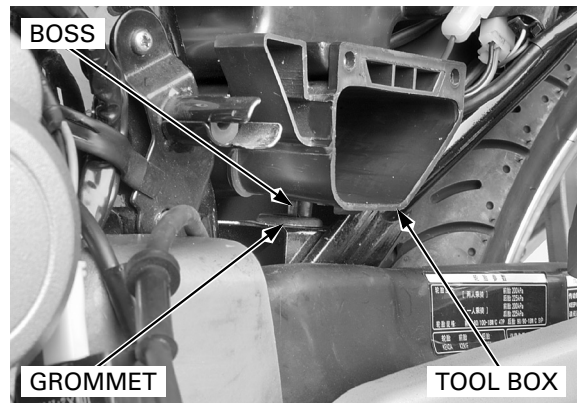
Install the air cleaner housing by aligning its bosses with the holes of the fuel tank center cushion.



Install the tool box while aligning the slots of the tool box and air cleaner housing.



Set the boss of the tool box to the grommet of the frame by pushing down the air cleaner housing.

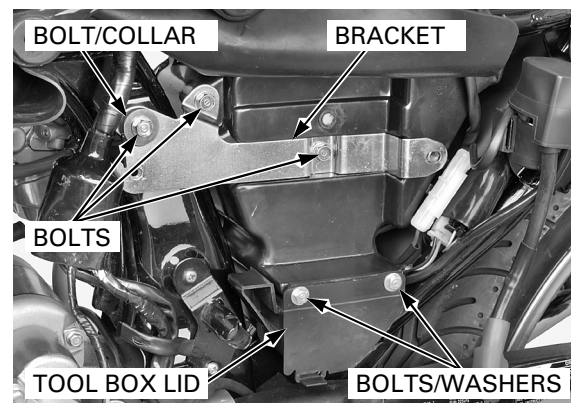


Install the air cleaner housing bracket, collar and bolts.

Tighten the bolts securely.

Install the tool box lid, bolts/washers and tighten the bolts to the specified torque.

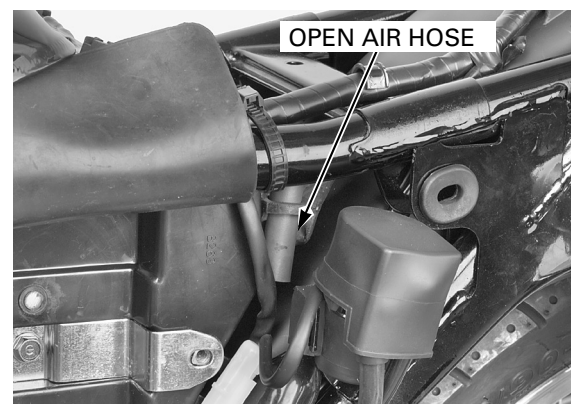
TORQUE: 1.8 N·m (0.2 kgf·m, 1.3 lbf·ft)



Install the open air hose to the air cleaner housing.

Install the following:

- Battery (page 15-6)
- Air cleaner element (page 3-7)



STARTING ENRICHMENT (SE) VALVE

REMOVAL/INSTALLATION

Remove the SE valve (page 5-8).

Check the SE valve for scoring, scratches or wear. Check the seat at the tip of the SE valve for stepped wear.

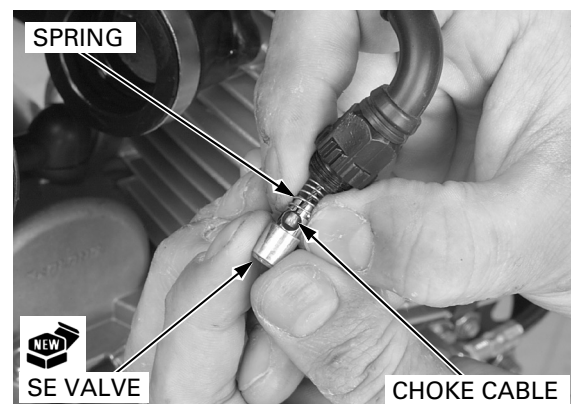
Replace the SE valve as a set if necessary.



When replacing the SE valve, compress the spring and release the choke cable from the SE valve.

Install a new SE valve in the reverse order of removal.

Install the SE valve (page 5-17).



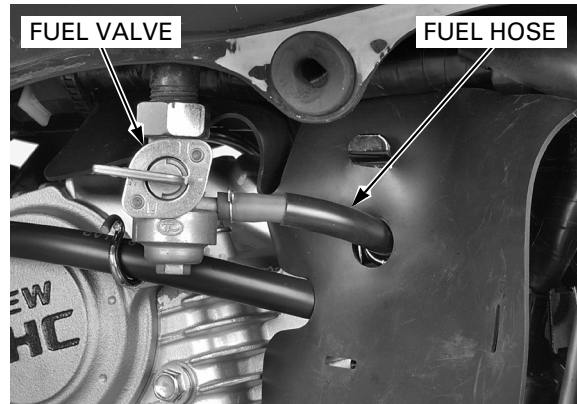
CARBURETOR

REMOVAL

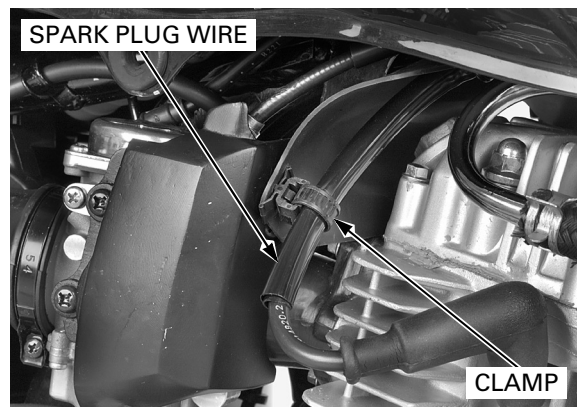
Remove the following:

- Side covers (page 2-3)
- Carburetor heater (page 5-26)

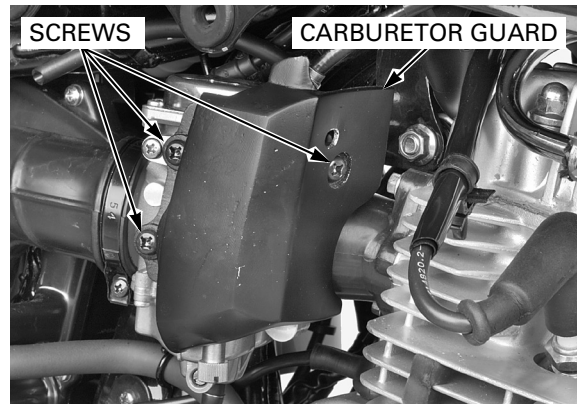
Turn the fuel valve "●"(OFF) and disconnect the fuel hose from fuel valve.



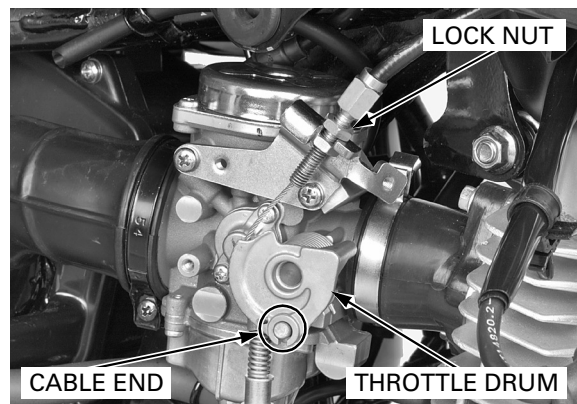
Remove the spark plug wire clamp from the carburetor guard.



Remove the screws and carburetor guard.



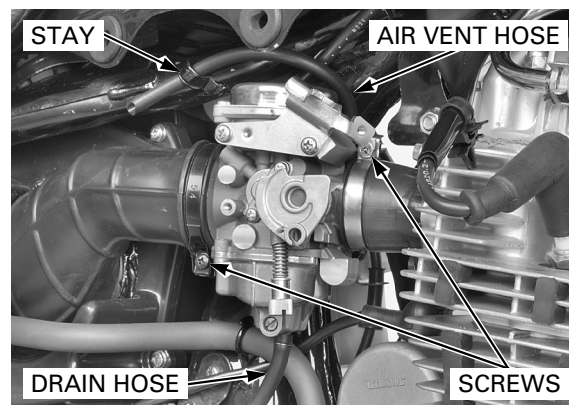
Loosen the throttle cable lock nut and disconnect the throttle cable end from the throttle drum.



Release the carburetor air vent hose from the stay.
Disconnect carburetor drain hose from the carburetor.

Loosen the insulator band screw and air cleaner connecting tube band screw.

Remove the carburetor from the right side of the frame.



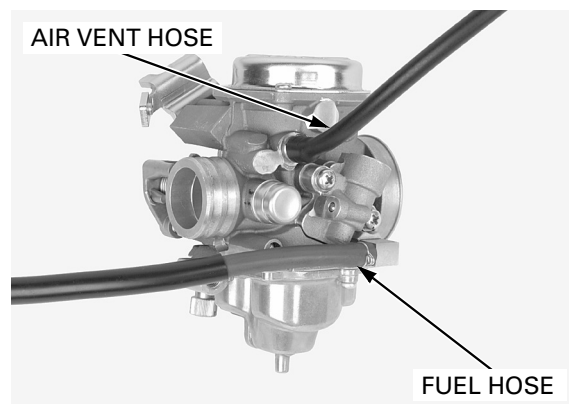
Loosen the SE valve lock nut and remove the SE valve from the carburetor.



DISASSEMBLY

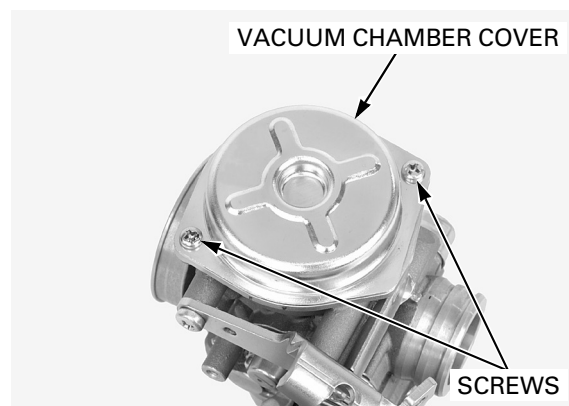
VACUUM CHAMBER

Remove the fuel hose and carburetor air vent hose.



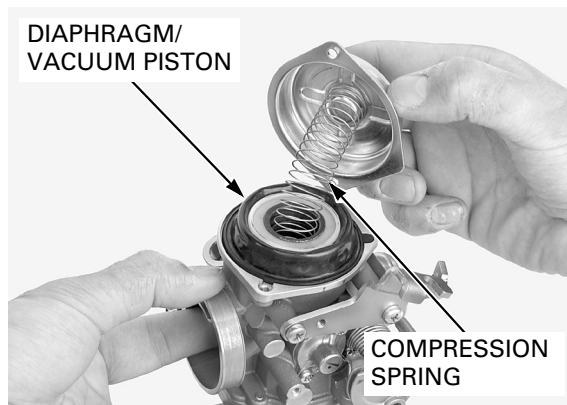
As the compression spring is very long, it will jump out of the carburetor when the cover is removed.

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

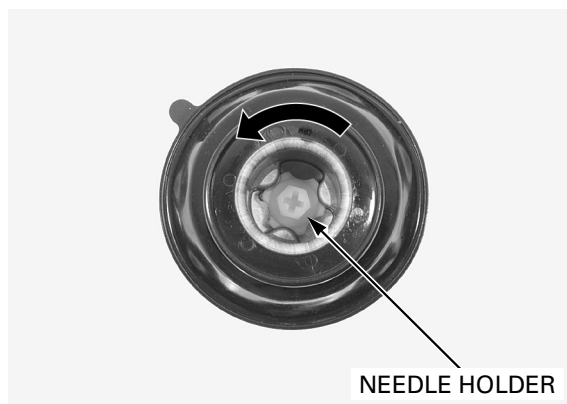


FUEL SYSTEM

Remove the compression spring and diaphragm/vacuum piston from the carburetor body.



Turn the needle holder counterclockwise and remove it.



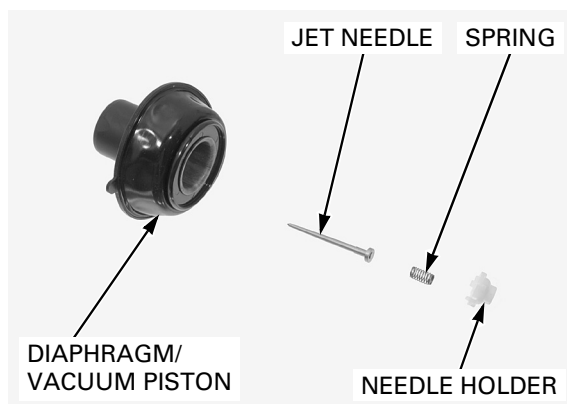
Be careful not to damage the diaphragm.

Remove the spring and jet needle from the diaphragm/vacuum piston.

Check the following:

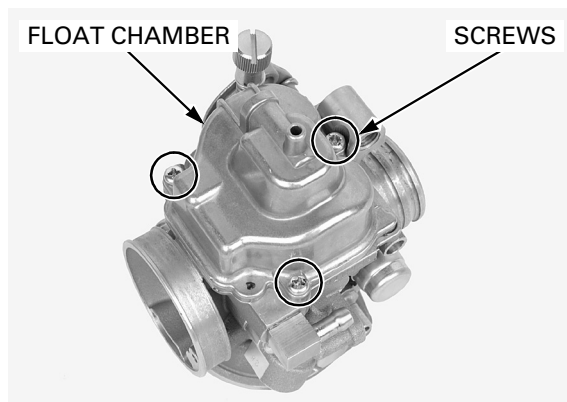
- Jet needle for stepped wear
- Vacuum piston for wear or damage
- Diaphragm for pin holes, deterioration or damage
- Spring for damage
- Needle holder for damage

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

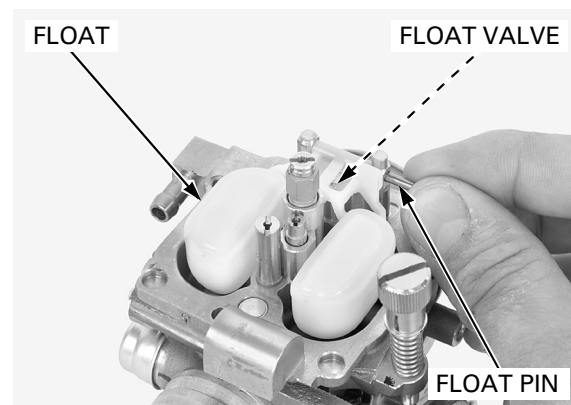


FLOAT

Remove the screws and float chamber.



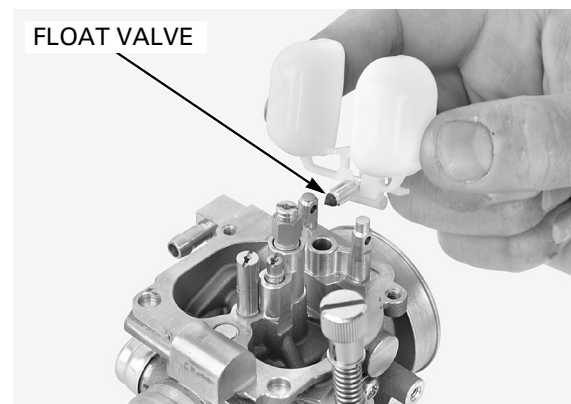
Remove the float pin, float and float valve.
Check the float for damage or fuel in the float.



Check the tip of the float valve where it contacts the valve seat for stepped wear or contamination.
Replace the float valve if the tip is worn or contaminated.

Check the operation of the float valve.

Inspect the float valve seat for scores, scratches, clogging and damage.
If the seat is damaged, replace the carburetor body.



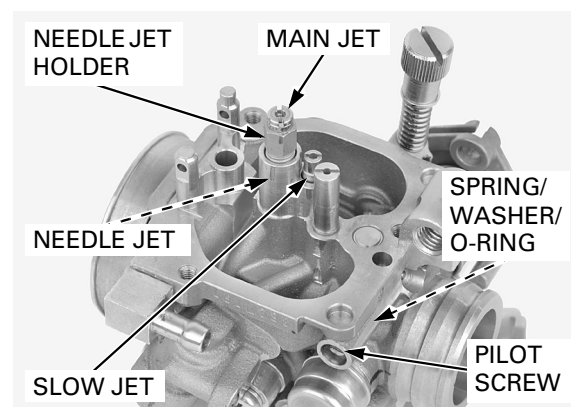
JETS

Remove the following:

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

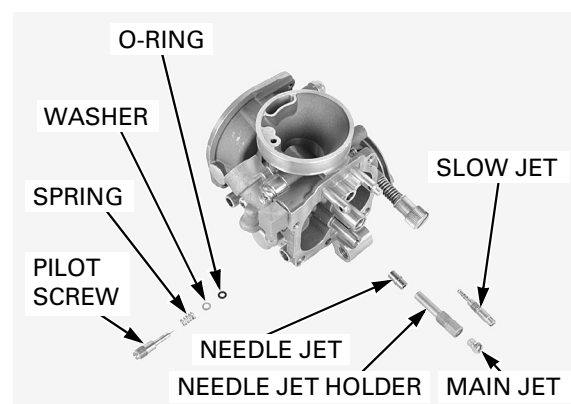
Damaged the pilot screw seat will occur if the screw is tightened against the seat.

Before removing the pilot screw, record the number of turns until it seats lightly, then remove the pilot screw, spring, washer and O-ring.



Check each jet for wear or damage.
Check the pilot screw and spring for wear or damage.

Replace the damaged parts, if necessary.



FUEL SYSTEM

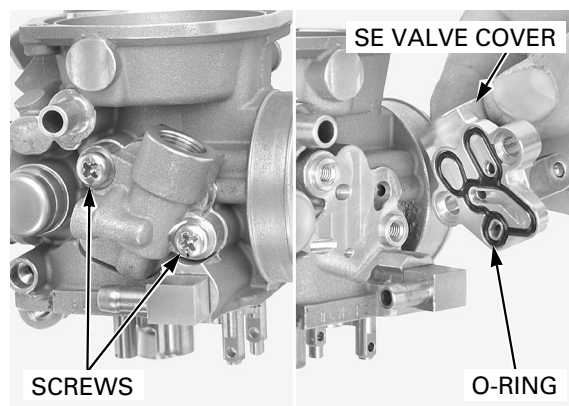
SE VALVE COVER

Remove the screws.

Remove the SE valve cover and O-ring.

Check the O-ring for deteriorated or damage.

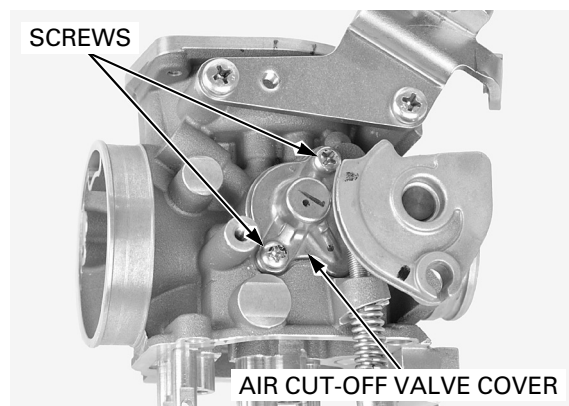
Check the SE valve cover and SE valve air passage. If air passage is clogged, blow open with compressed air (page 5-12).



AIR CUT-OFF VALVE

The air cut-off valve cover is under spring pressure. Do not lose the spring and screws.

Remove the screws while holding the air cut-off valve cover.



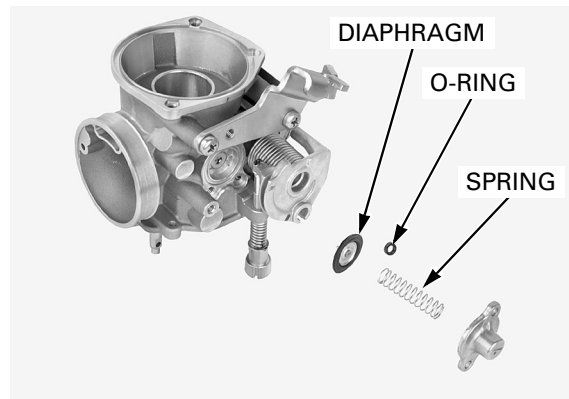
Remove the O-ring, spring and diaphragm.

Check the diaphragm for pin holes, deterioration or other damage.

Check the diaphragm rod for wear or damage at the tip.

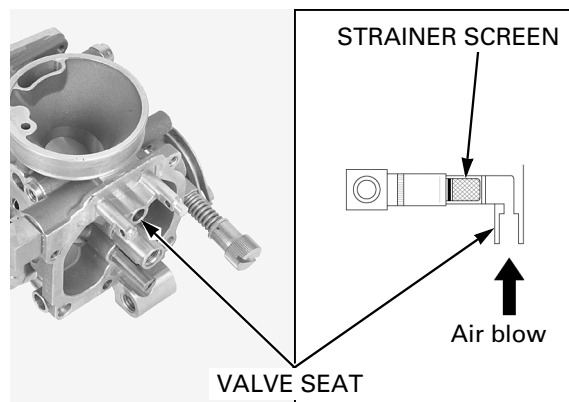
Check the orifice in the valve cover and valve body for clogs or restriction.

Blow open the air passage in the valve cover.



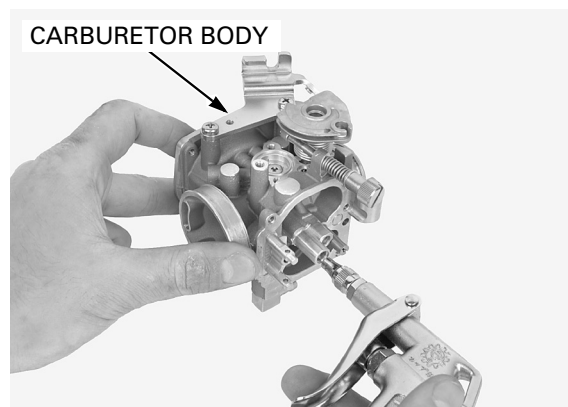
CARBURETOR CLEANING

Blow open the fuel passage from the valve seat side with compressed air and clean the strainer screen.

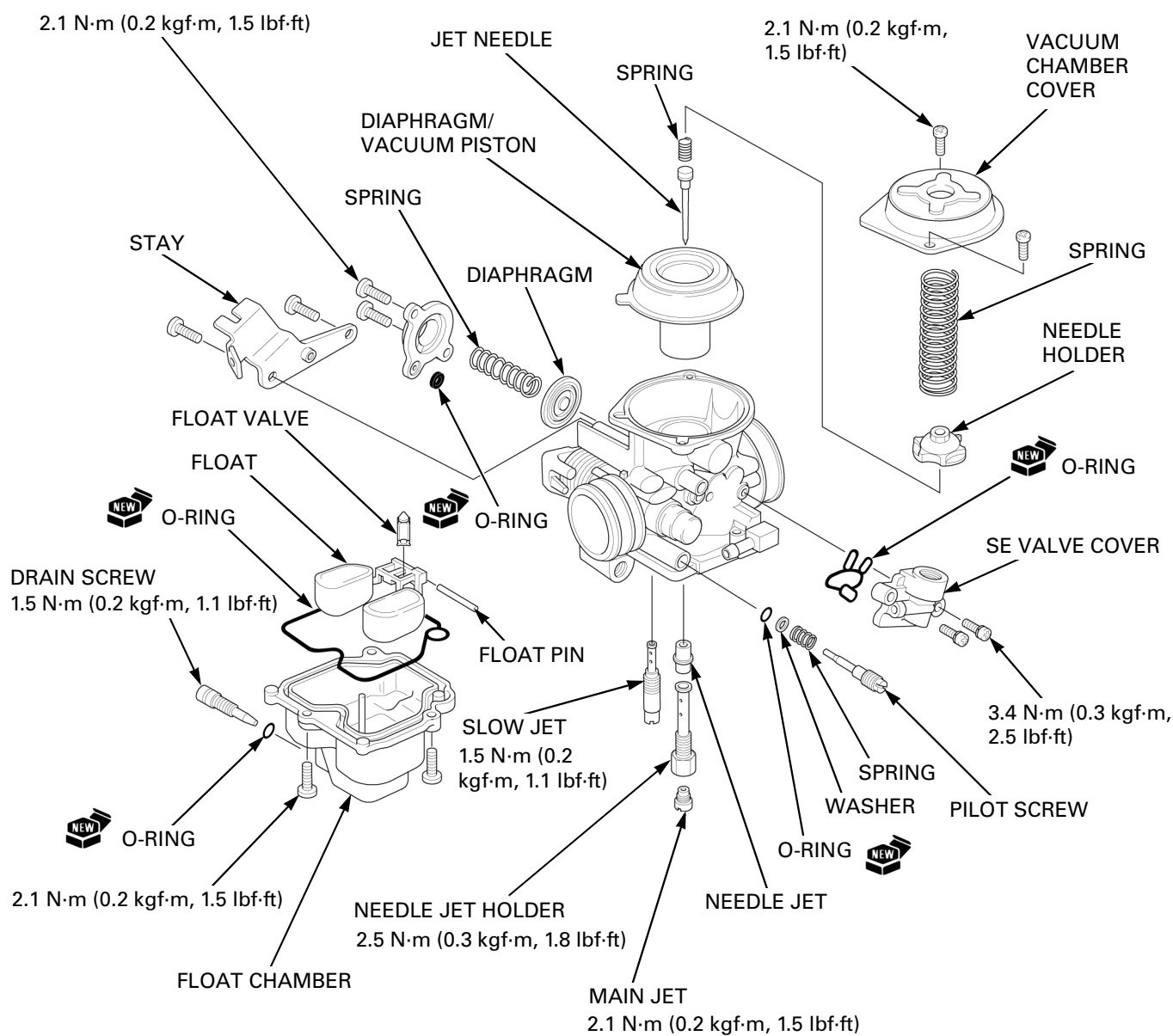


Blow open each air and fuel passages in the carburetor body with compressed air.

Check each part for wear or damage and replace them if necessary.



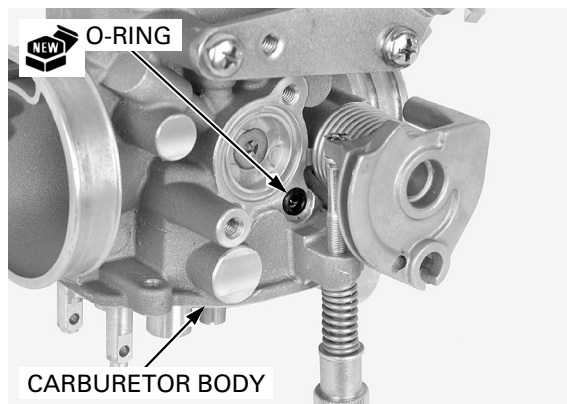
ASSEMBLY



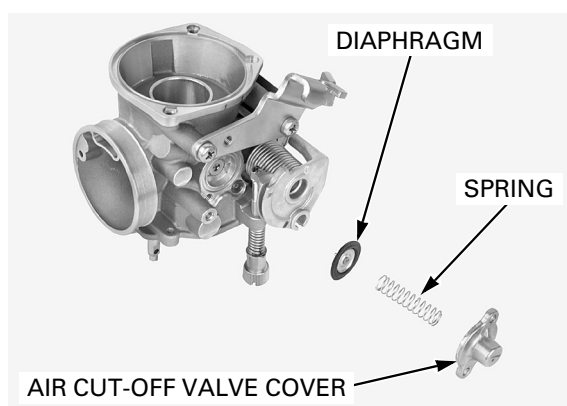
FUEL SYSTEM

AIR CUT-OFF VALVE

Install a new O-ring onto the carburetor body with the flat side facing toward the carburetor body.

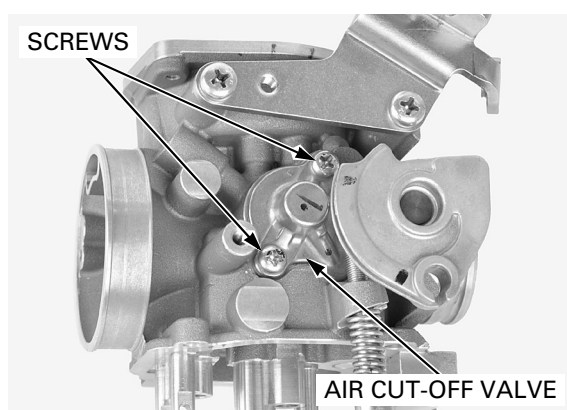


Be careful not to pinch the diaphragm. Install the diaphragm, spring and air cut-off valve cover.



Install and tighten the screws while holding the air cut-off valve to the specified torque

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

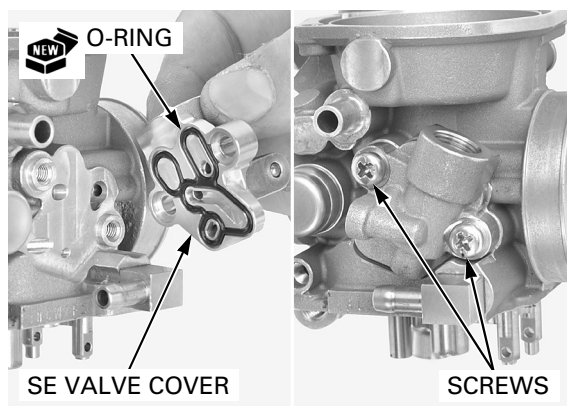


SE VALVE COVER

Install the SE valve cover and new O-ring.

Install and tighten the screws to the specified torque.

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



JETS

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

Install the pilot screw with the spring, washer and new O-ring.

Perform the pilot screw adjustment if a new pilot screw is installed (page 5-20).

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

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

Install the following:

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

TORQUE:

Needle jet holder: 2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)

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

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

FLOAT

Install the float valve to the float.

Install the float to the carburetor body.

Install the float pin through the body and float.

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

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

FLOAT LEVEL: 13.0 mm (0.51 in)

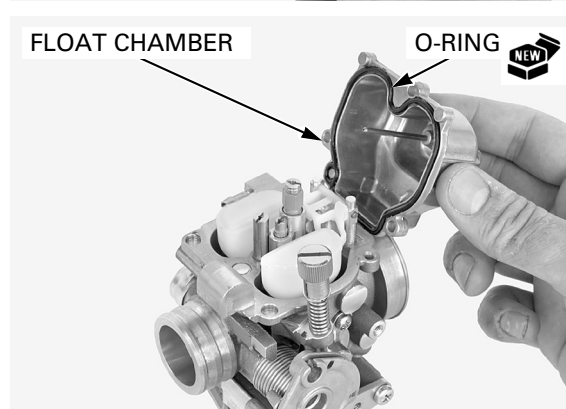
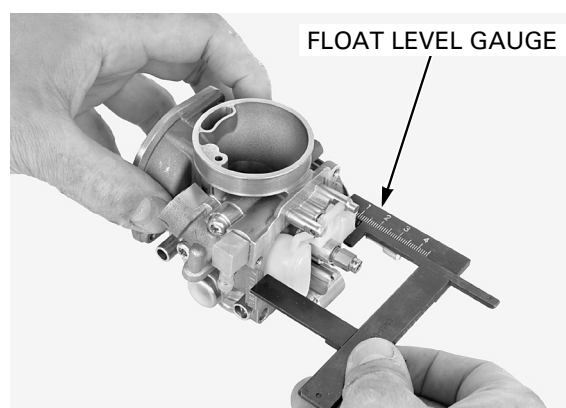
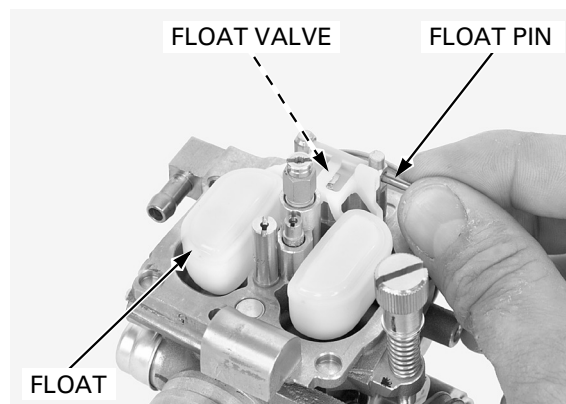
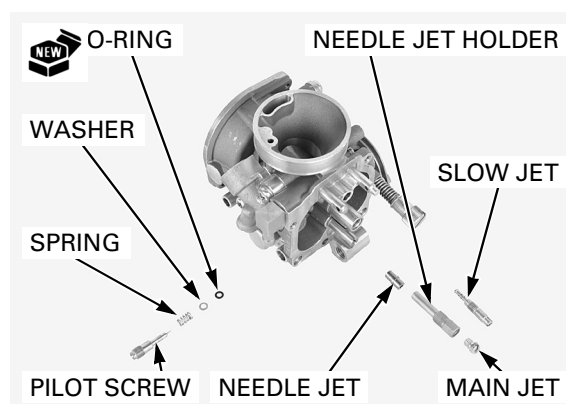
TOOL:

Carburetor float level gauge 07401-0010000

The float cannot be adjusted.

Replace the float assembly if the float level is out of specification.

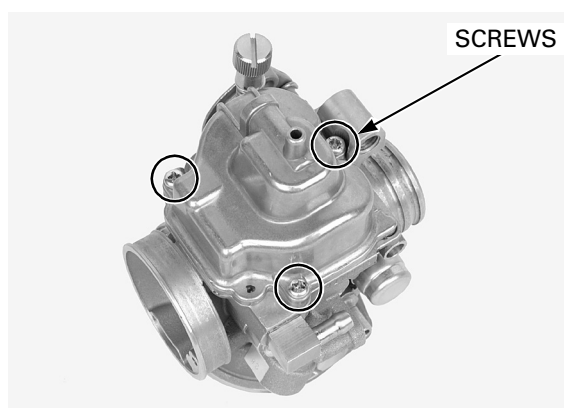
Install a new O-ring into the float chamber groove.
Install the float chamber.



FUEL SYSTEM

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

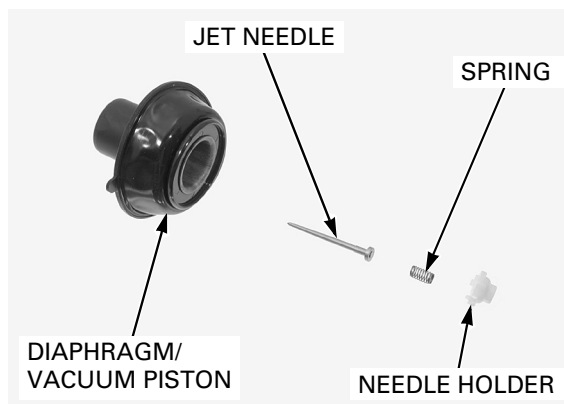
TORQUE: 2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)



VACUUM CHAMBER

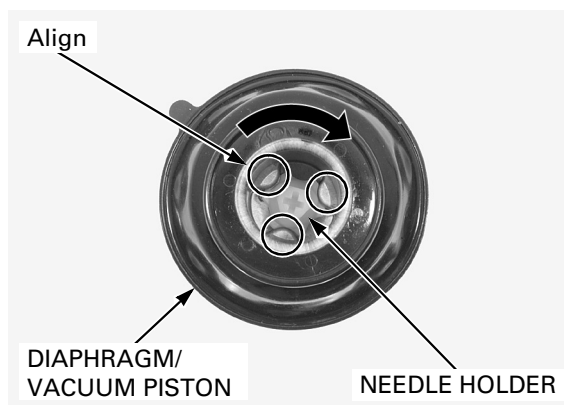
Install the jet needle into the diaphragm/vacuum piston.

Install the spring onto the needle holder and set the needle holder into the vacuum piston.



Turn the needle holder clockwise while pressing it until it locks.

Holder flanges and piston grooves should be fitted after turning.



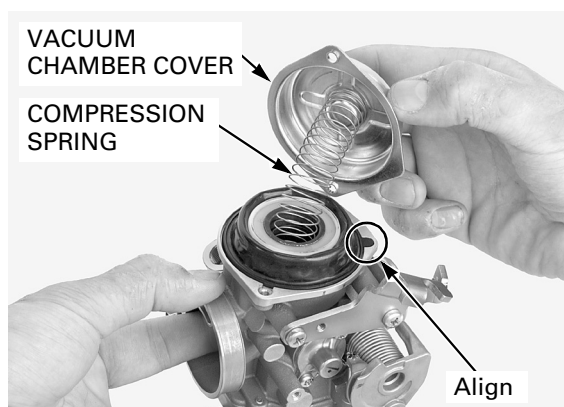
Be careful not to damage the jet needle.

Install the diaphragm/vacuum piston into the carburetor body by aligning the tab of the diaphragm with the groove of carburetor body.

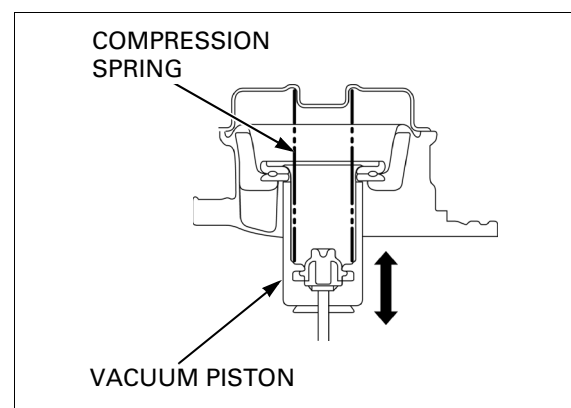
Lift the bottom of the piston with your finger to set the diaphragm rib into the groove in the carburetor body.

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

Install the compression spring and vacuum chamber cover while lifting the piston in place. Install the screws before releasing the vacuum piston.

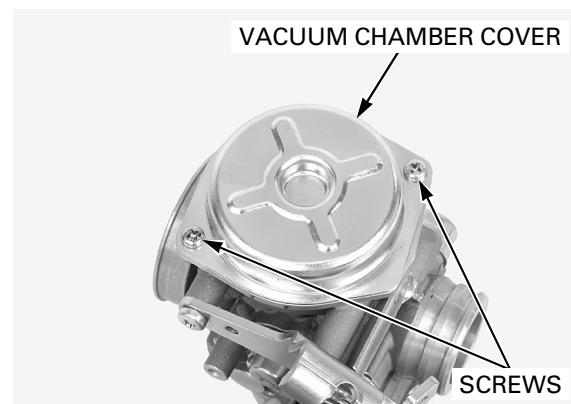


Check that the spring installed correctly by pushing the bottom of the piston with your finger and make sure that the piston returns back in place smoothly.

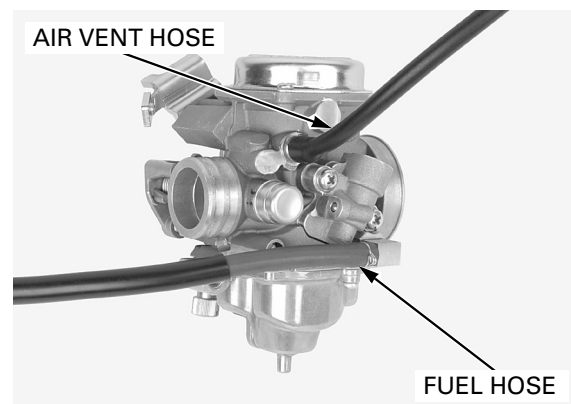


Tighten the screws while holding the vacuum chamber cover to the specified torque.

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



Install the fuel hose and carburetor air vent hose to the carburetor.

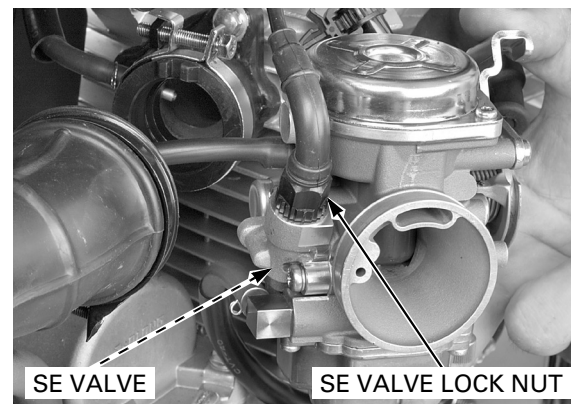


INSTALLATION

Install the SE valve and tighten the lock nut to the specified torque.

TORQUE: 2.3 N·m (0.2 kgf·m, 1.7 lbf·ft)

Check the carburetor choke operation (page 3-7).

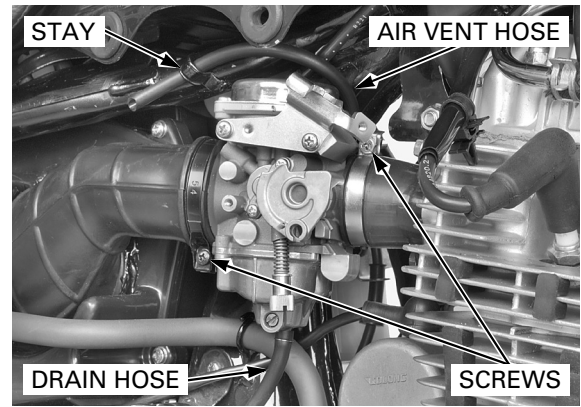


FUEL SYSTEM

Install the carburetor to the air cleaner connecting tube, insulator and tighten them.

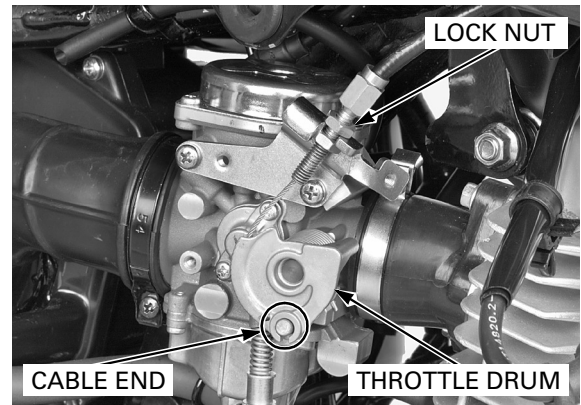
Install carburetor drain hose to the carburetor.

Install carburetor air vent hose to the stay.



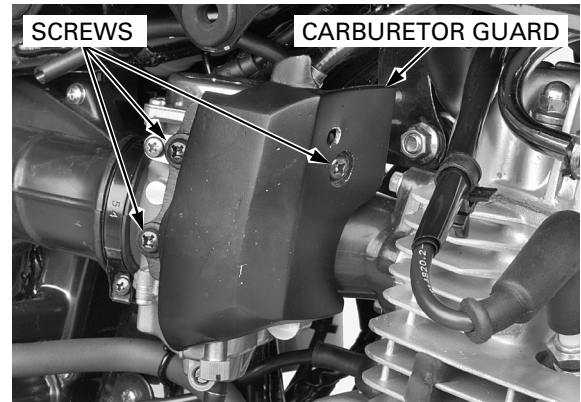
Connect the throttle cable end to the throttle drum and tighten the lock nut.

Check the throttle operation (page 3-6).

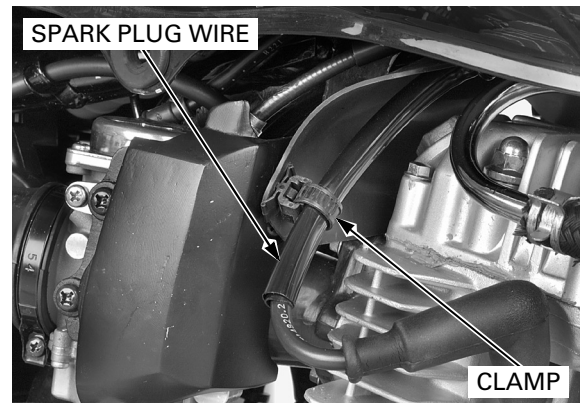


Install the carburetor guard and screws.

Tighten the screws securely.



Install the spark plug wire clamp to the carburetor guard.



Route the fuel hose to the heat guard properly (page 1-16).

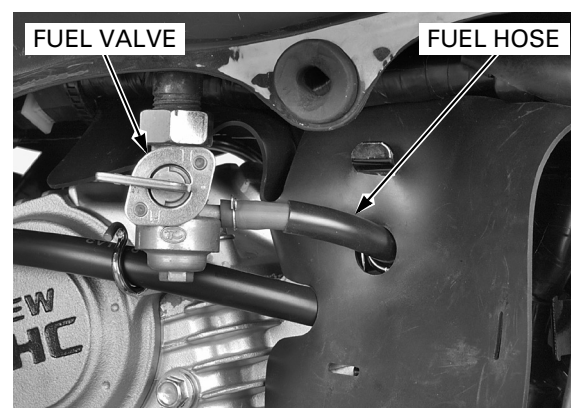
Connect the fuel hose to the fuel valve.

Install the following:

- Carburetor heater (page 5-26)
- Side covers (page 2-3)

After installation, check the following:

- Turn the fuel valve "☐" (ON) and make sure these are no fuel leaks
- Secondary air leak around the insulator and connecting tube
- Pilot screw (page 5-20)



PILOT SCREW ADJUSTMENT

- The pilot screw is factory pre-set and no adjustment is necessary unless the pilot screw is replaced.
- Place the motorcycle on its center stand on a level surface.
- Use a tachometer with graduations of 50 min^{-1} (rpm) or smaller that will accurately indicate a 50 min^{-1} (rpm) change.

IDLE DROP PROCEDURE

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

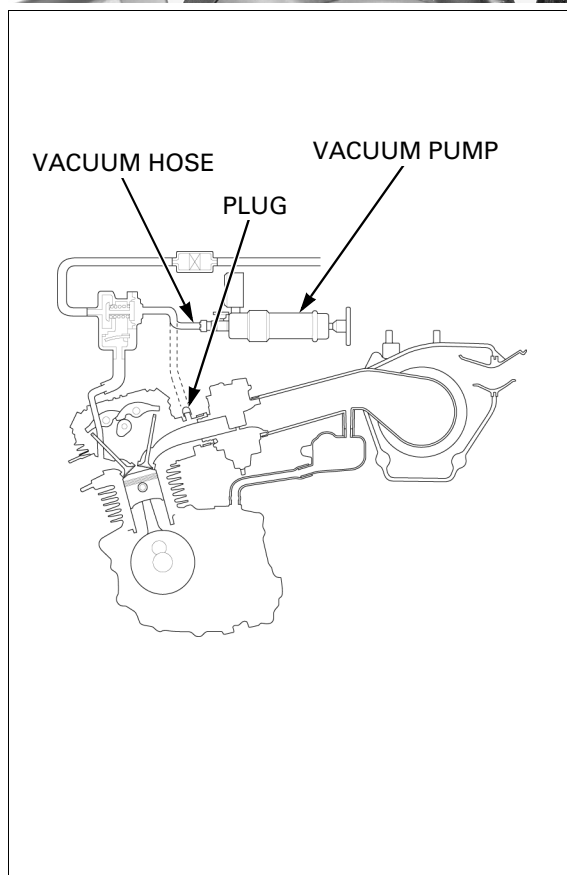
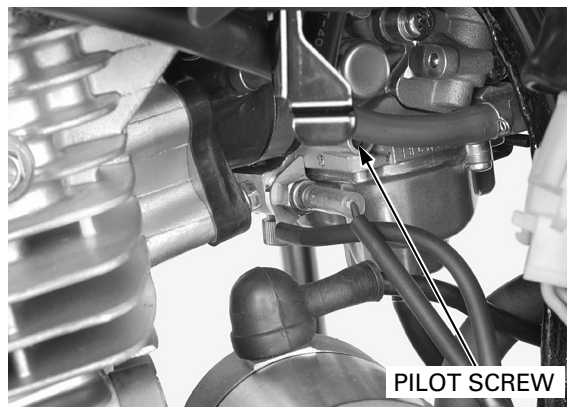
1. Remove the left side cover (page 2-3).

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

INITIAL OPENING: 2 turns out

2. Warm up the engine to normal operating temperature.
Ride the motorcycle for approximately 10 minutes.
3. Stop the engine and connect the tachometer, according to the manufacturer's instructions.
4. Disconnect the vacuum hose of PAIR control valve, then it connect the vacuum pump and plug the vacuum port.

Apply the specified vacuum to the PAIR control valve vacuum hose more than 52.0 kPa (390 mmHg) (make sure the secondary air does not supply).



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

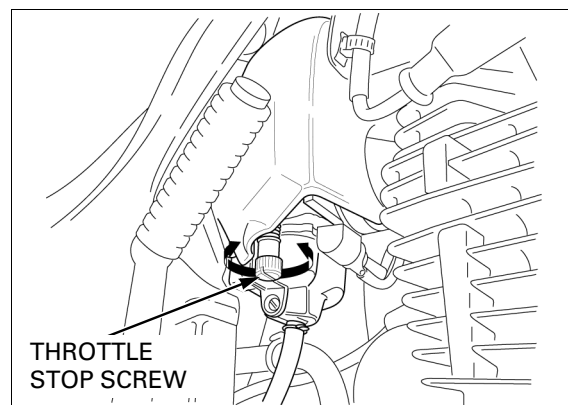
IDLE SPEED: $1,400 \pm 100 \text{ min}^{-1} \text{ (rpm)}$

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

FINAL OPENING: 1/2 turns out from the position obtained in step 8

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

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



SECONDARY AIR SUPPLY SYSTEM

SYSTEM INSPECTION

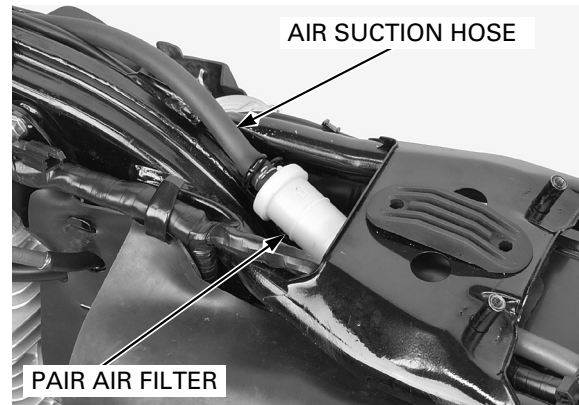
Warm up to the engine to normal operating temperature.

Remove the fuel tank (page 2-4).

Disconnect the air suction hose from the PAIR air filter.

Check the air suction hose port is clean and free carbon deposits.

If the port is carbon fouled, check the PAIR check valve.



Disconnect the vacuum hose of PAIR control valve, then it connect the vacuum pump and plug the vacuum port.

Temporarily install the fuel tank (page 2-4).

Start the engine and open the throttle slightly to be certain that air is sucked in through the air suction hose.

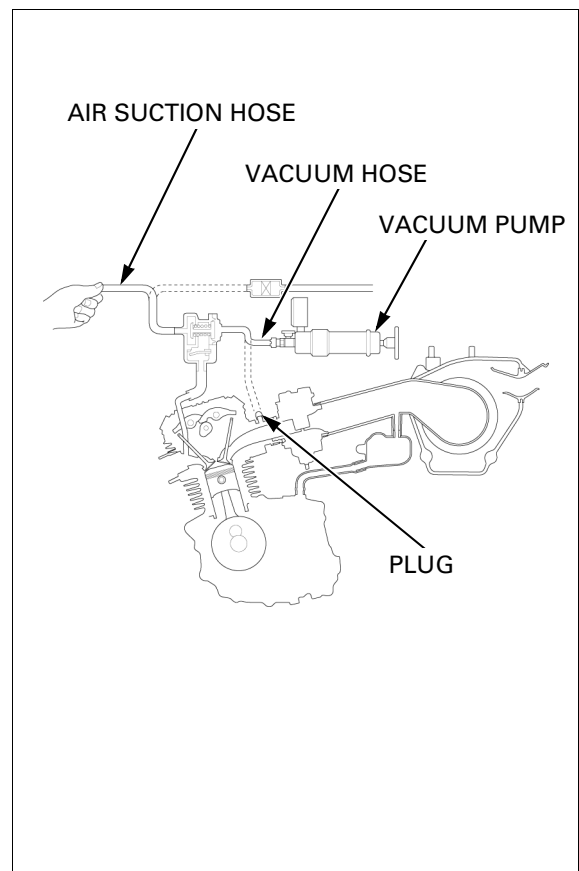
If the air is not drawn in, check the air suction hose for clogging.

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

Check that the air suction hose stop drawing air, and that the vacuum dose not bleed.

SPECIFIED VACUUM: 52.0 kPa (390 mmHg)

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



PAIR CHECK VALVE INSPECTION

Remove the following:

- Fuel tank (page 2-4)
- Left horn cover (page 2-9)
- Screws
- Valve cover
- PAIR check valve

Check the reed for fatigue or damage.

Check the seat rubber for cracks, deterioration or damage.

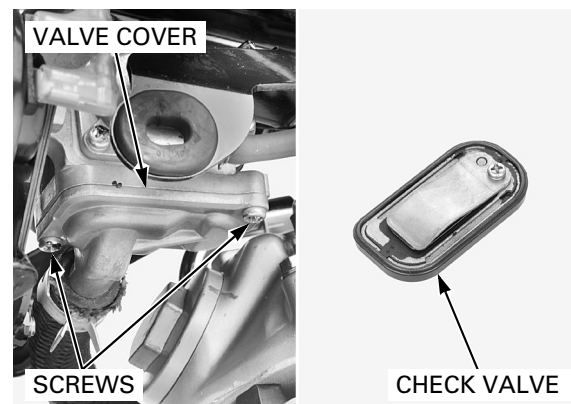
Replace the PAIR check valve if the seat rubber is cracked, deteriorated or damaged, or if there is clearance between the reed and seat.

Installation is in the reverse order of removal.

TORQUE:

PAIR check valve cover screw:

2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)

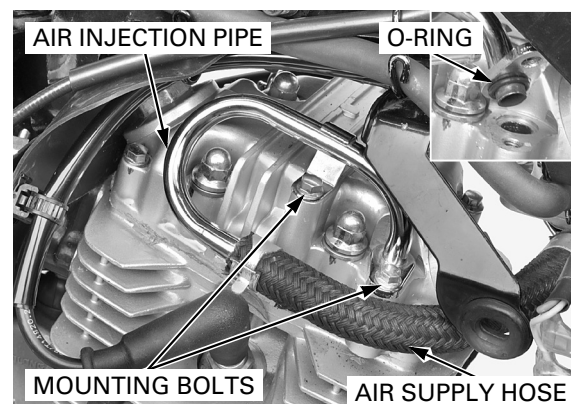


AIR INJECTION PIPE REMOVAL/INSTALLATION

Remove the right horn cover (page 2-9).

Disconnect the air supply hose from the air injection pipe.

Remove the two mounting bolts, air injection pipe and O-ring.



Check the air injection pipe for bent, cracked or damaged.

Installation is in the reverse order of removal.

NOTE:

Always replace the O-ring with a new one, when removing the air injection pipe.



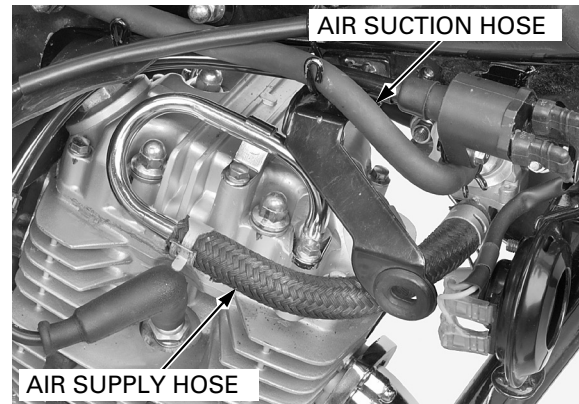
FUEL SYSTEM

PAIR CONTROL VALVE REMOVAL/INSTALLATION

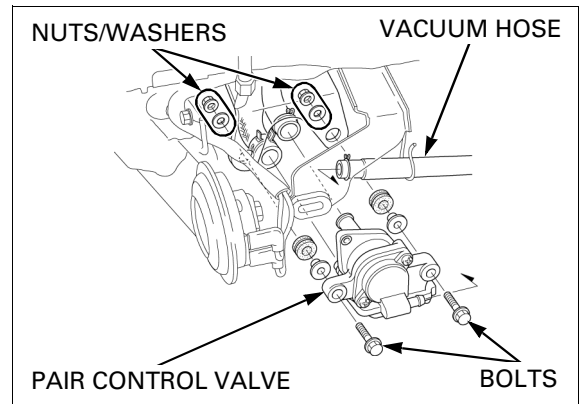
Remove the following:

- Fuel tank (page 2-4)
- Horn covers (page 2-9)

Disconnect the air supply hose and air suction hose.



Disconnect the vacuum hose.
Remove the bolts, nuts, washers and PAIR control valve.



Route the hoses properly (page 1-16).

Installation is in the reverse order of removal.

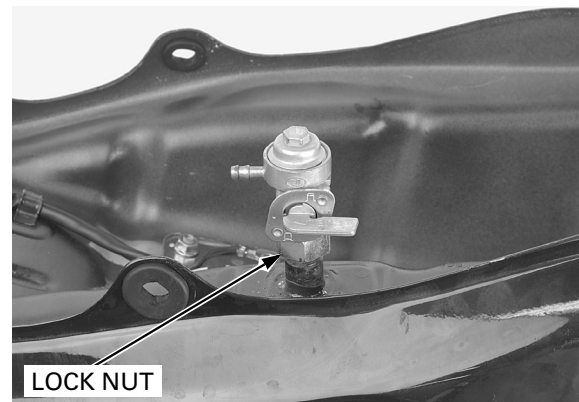
FUEL STRAINER

REMOVAL

Drain the fuel from the fuel tank into the approved gasoline container.

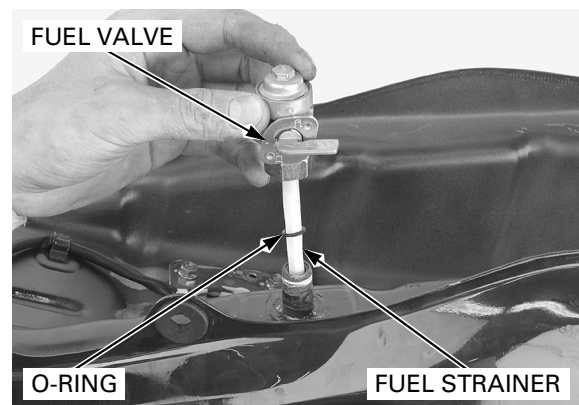
Remove the fuel tank (page 2-4).

Loosen the fuel valve lock nut.



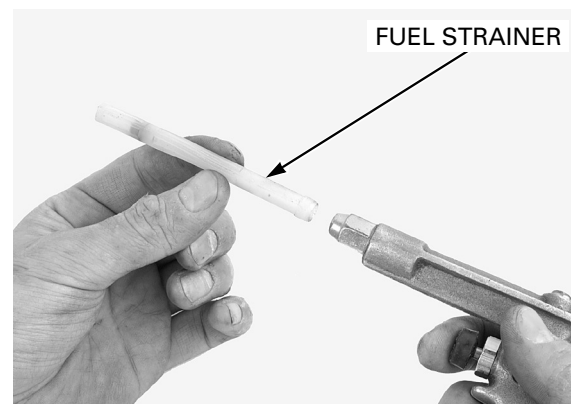
Remove the fuel strainer and fuel valve assembly from the fuel tank.

Remove the fuel strainer and O-ring from the fuel valve.



CLEANING

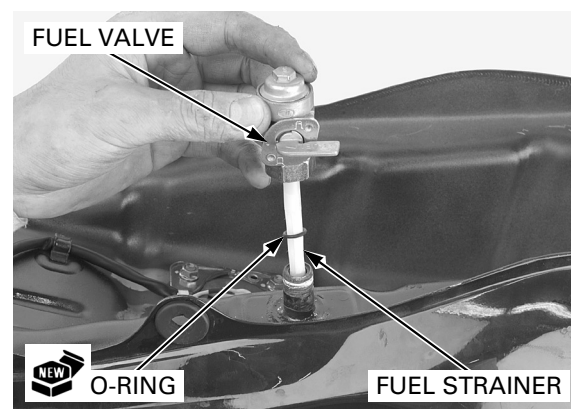
Clean the fuel strainer with compressed air.



INSTALLATION

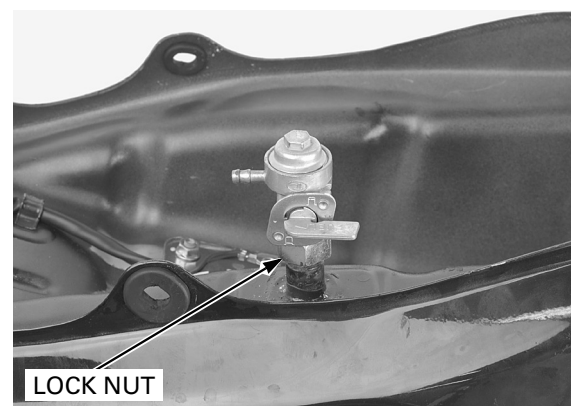
Install a new O-ring onto the fuel strainer, and install the fuel strainer into the fuel valve.

Install the fuel strainer and fuel valve assembly into the fuel tank.



Tighten the fuel valve lock nut securely.

Install the fuel tank (page 2-4).

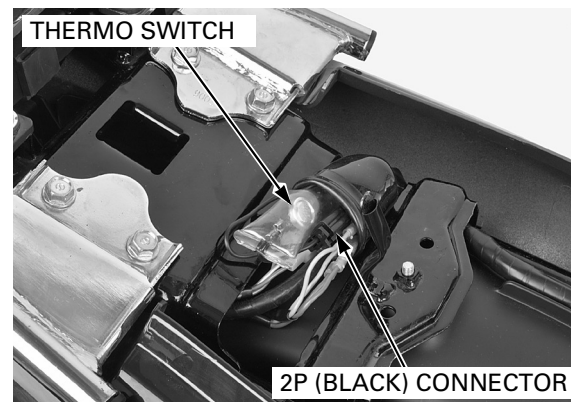


CARBURETOR HEATER

THERMO SWITCH INSPECTION

Remove the seat (page 2-4).

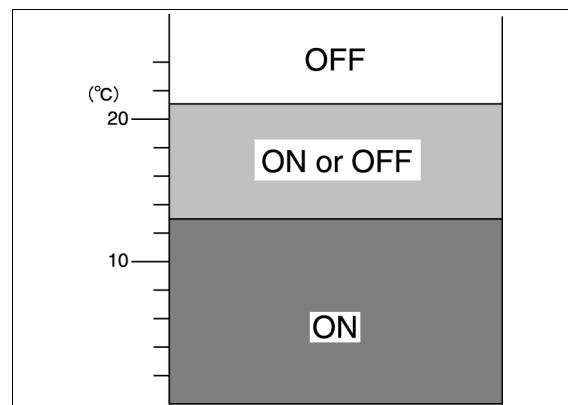
Disconnect the thermo switch 2P (Black) connector and remove the thermo switch.



FUEL SYSTEM

Check for continuity between the switch side connector terminals of the thermo switch.

Above 21°C (70°F) ± 3°C (5.4°F): No continuity
Below 13°C (55°F) ± 3°C (5.4°F): Continuity



CARBURETOR HEATER INSPECTION

Remove the following:

- Left side cover (page 2-3)
- Turn signal relay (page 18-18)

Disconnect the carburetor heater 2P (Natural) connector.

Measure the resistance between the carburetor heater terminals.

STANDARD: 13 – 15 Ω at 20°C (68°F)

If the resistance is out of specification, replace the carburetor heater with a new one (page 5-26).

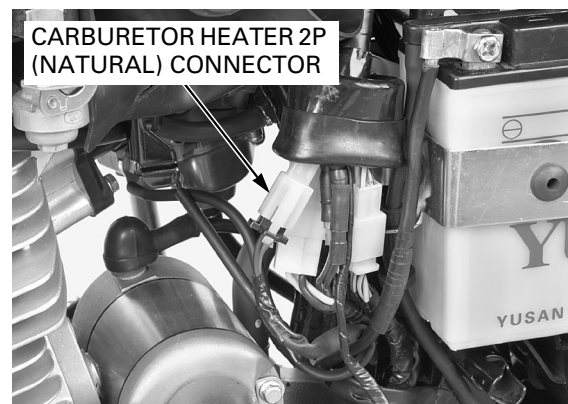


REMOVAL/INSTALLATION

Remove the following:

- Left side cover (page 2-3)
- Turn signal relay (page 18-18)

Disconnect the carburetor heater 2P (Natural) connector.

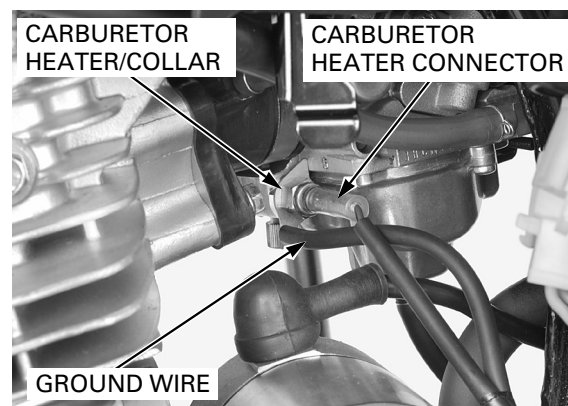


Disconnect the carburetor heater connector from the carburetor heater.
Remove the carburetor heater, ground wire and collar.

Installation is in the reverse order of removal.

TORQUE:

Carburetor heater: 4.9 N·m (0.5 kgf·m, 3.6 lbf·ft)



6. ENGINE REMOVAL/INSTALLATION

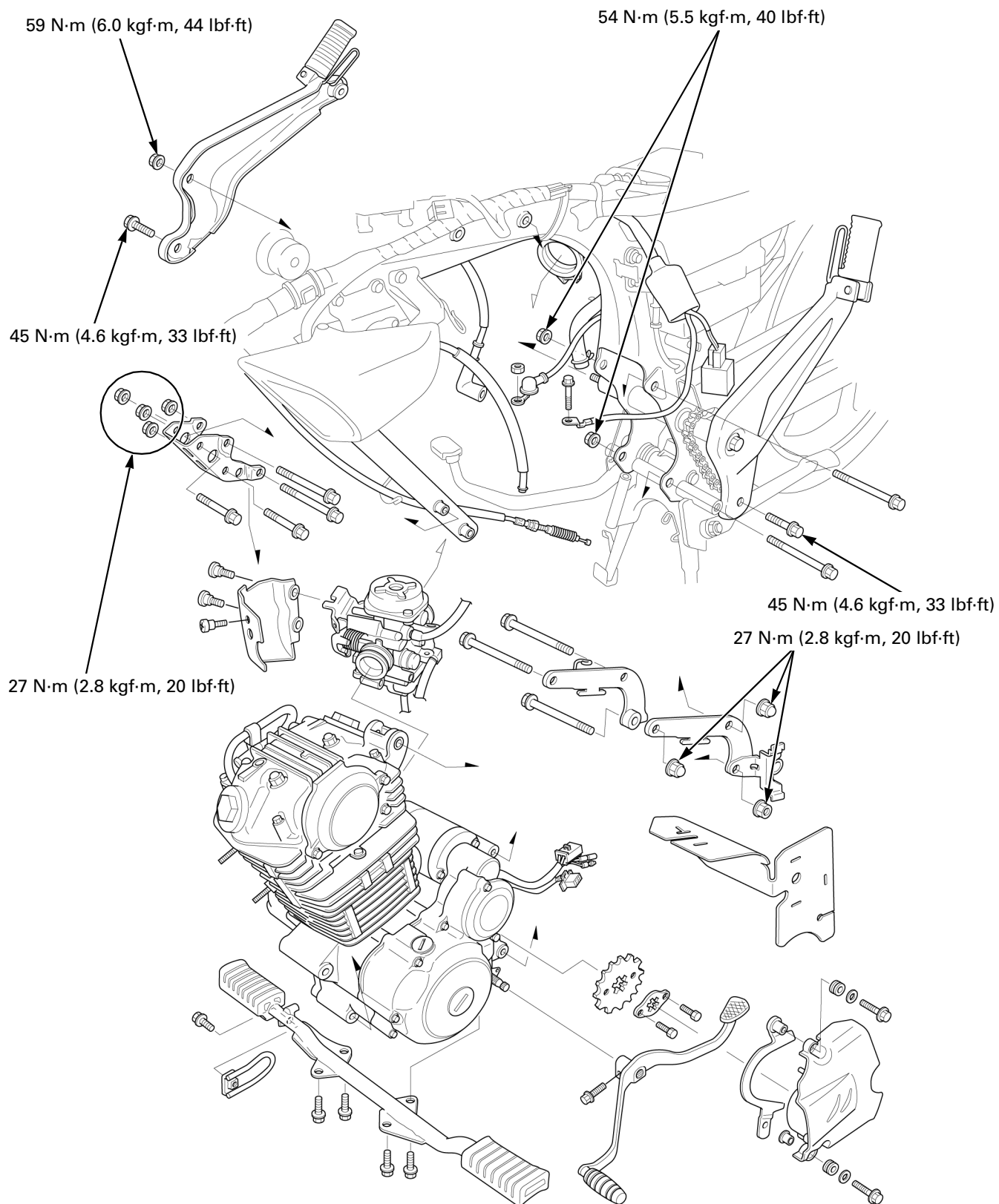
COMPONENT LOCATION 6-2

ENGINE REMOVAL 6-4

SERVICE INFORMATION 6-3

ENGINE INSTALLATION..... 6-7

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- Place the motorcycle with its center stand on level ground before starting any work.
- When removing/installing the engine, tape the frame around the engine beforehand for frame protection.
- Support the engine using a floor jack or other adjustable support to ease engine hanger bolt stresses.
- The following components require engine removal for service.
 - Cylinder head/valves (page 7-10)
 - Cylinder/piston (page 8-4)
 - Crankshaft (page 11-18)
 - Transmission (page 11-7)
 - Kickstarter (page 11-14)

SPECIFICATIONS

ITEM		SPECIFICATIONS
Engine oil capacity	After draining	0.9 liter (1.0 US qt, 0.8 Imp qt)
	After disassembly	1.1 liter (1.2 US qt, 1.0 Imp qt)
Engine dry weight		30.5 kg (67.2 lbs)

TORQUE VALUES

Upper engine hanger plate mounting nut	27 N·m (2.8 kgf·m, 20 lbf·ft)
Front engine hanger bracket mounting nut	27 N·m (2.8 kgf·m, 20 lbf·ft)
Swingarm pivot nut	59 N·m (6.0 kgf·m, 44 lbf·ft)
Rear upper/lower engine mounting nut	54 N·m (5.5 kgf·m, 40 lbf·ft)
Pillion step bracket bolt	45 N·m (4.6 kgf·m, 33 lbf·ft)

ENGINE REMOVAL

Drain the engine oil (page 3-12).

Remove the following:

- Fuel tank (page 2-4)
- Turn signal relay (page 18-18)
- Right and left horn covers (page 2-9)
- Exhaust pipe/muffler (page 2-10)
- Carburetor (page 5-8)
- Footpeg bar (page 9-5)
- Kickstarter pedal (page 9-5)
- Left crankcase rear cover (page 10-4)

Release the heat guard from the heat guard stay.

Remove the heat guard.

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

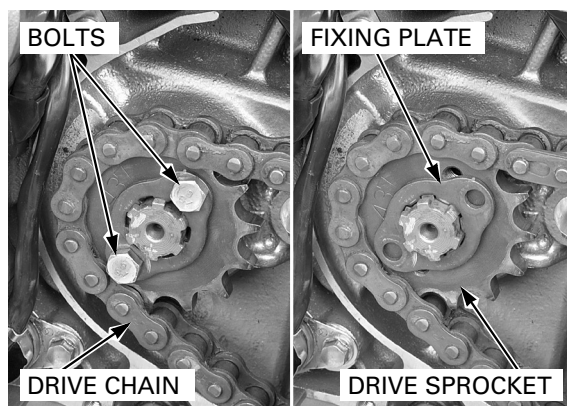
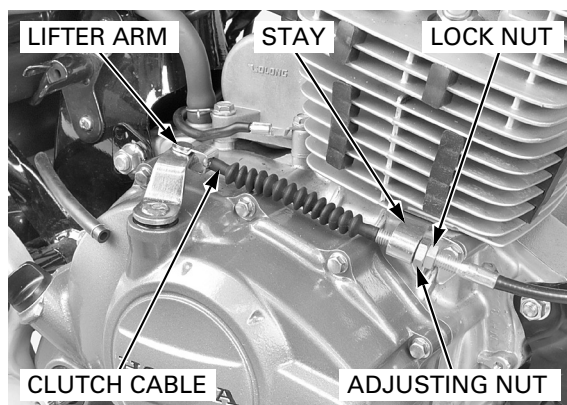
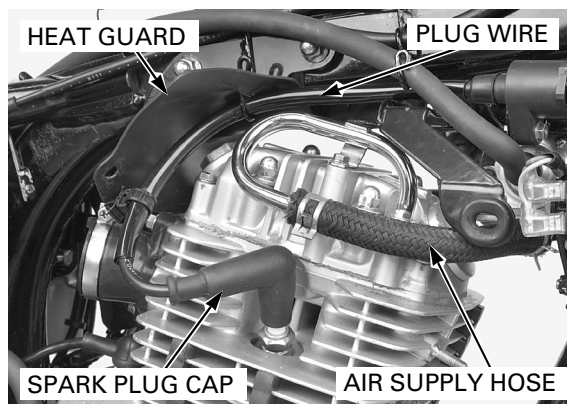
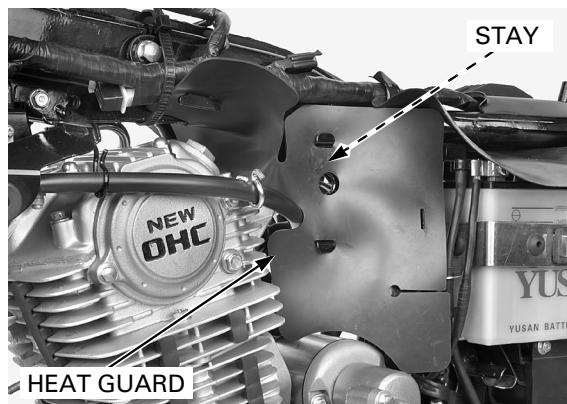
Disconnect the air supply hose from the air injection pipe.

Loosen the clutch cable lock nut and clutch cable adjusting nut.

Release the clutch cable from the stay and disconnect the clutch cable end from the lifter arm.

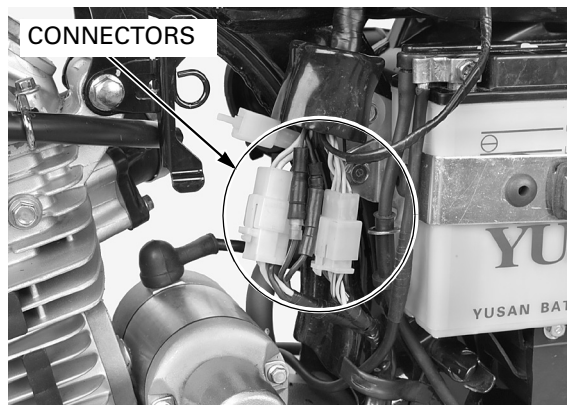
Remove the fixing plate mounting bolts.

Turn the fixing plate until the slots of the fixing plate and the spline of the countershaft are aligned. Remove the fixing plate, drive chain and the drive sprocket.

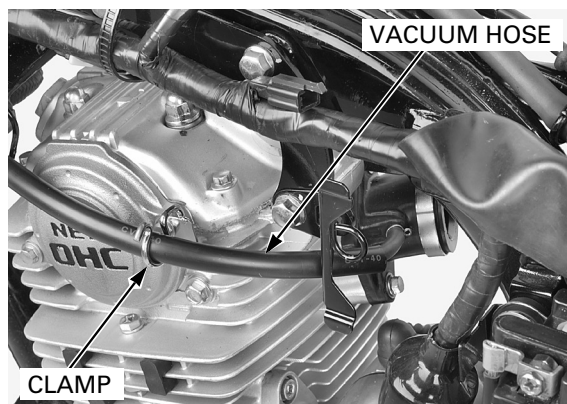


Disconnect the following:

- Gear position switch 6P (Natural) connector
- Alternator 3P (Natural) connector
- Black/Red exciter coil wire connector
- Blue/Yellow ignition pulse generator wire connector



Disconnect the PAIR control valve vacuum hose from the insulator and release the vacuum hose from the clamp.

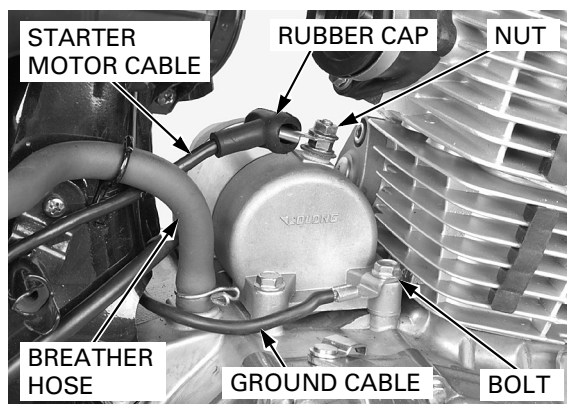


Pull back the rubber cap.

Remove the starter motor cable nut and disconnect the starter motor cable from the starter motor terminal.

Remove the starter motor front mounting bolt and ground cable from the starter motor.

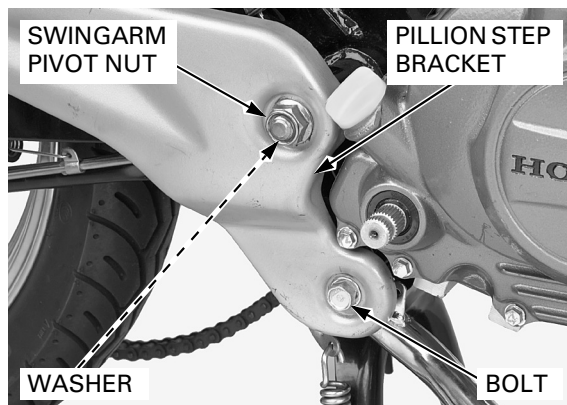
Disconnect the crankcase breather hose from the crankcase.



Remove the right pillion step bracket bolt.

Do not remove the swingarm pivot bolt.

Remove the swingarm pivot nut, right pillion step bracket and the washer.

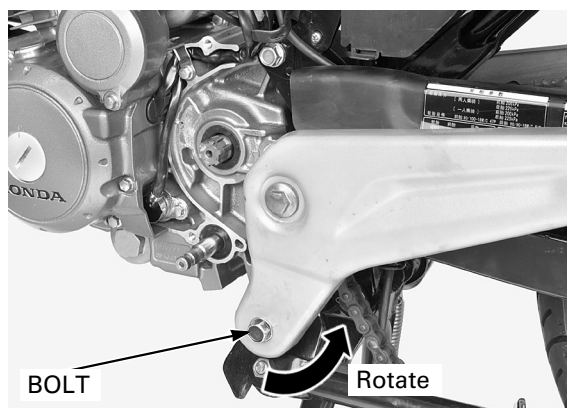


ENGINE REMOVAL/INSTALLATION

Do not remove the swingarm pivot bolt.

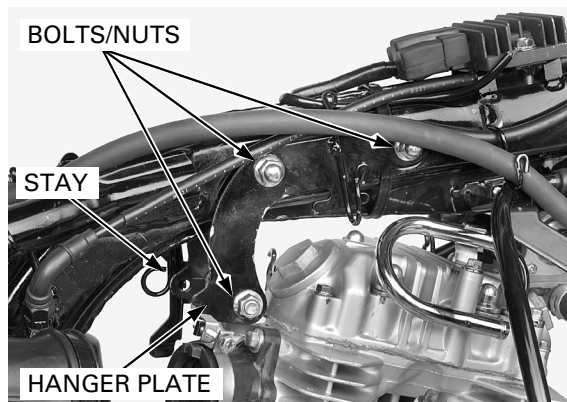
Remove the left pillion step bracket bolt.

Rotate the left pillion step bracket so that the engine rear upper/lower mounting bolts are accessible.

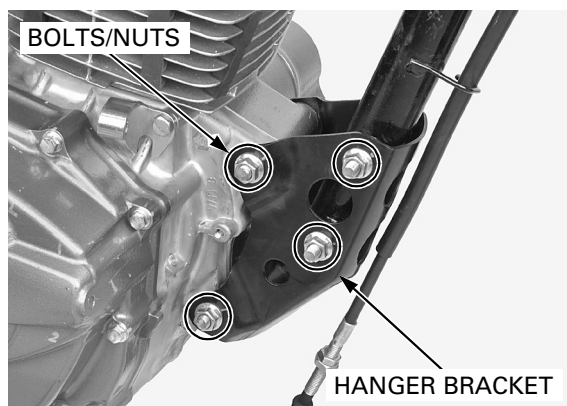


Place the floor jack or other adjustable support under the engine.

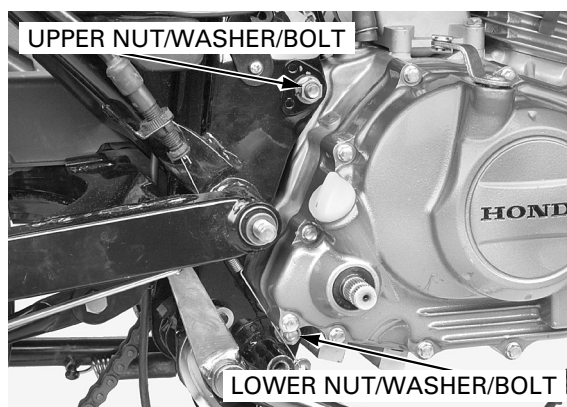
Remove the upper engine hanger mounting bolts/nuts, heat guard stay and the engine hanger plates.



Remove the front engine hanger bracket bolts/nuts and engine hanger bracket.



Remove the rear upper engine mounting nut, washer and bolt.
Remove the rear lower engine mounting nut, washer and bolt.



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

Carefully maneuver the engine and remove it out of the frame.

Note the direction of the engine hanger plates and hanger bolts.



ENGINE INSTALLATION

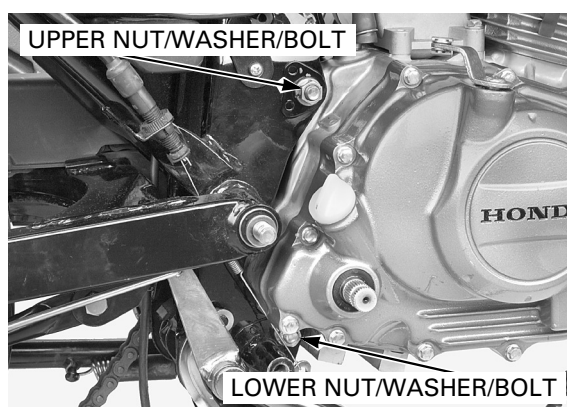
- Use the correct bolts in their proper positions.
- Route the wires and cables properly (page 1-16).

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

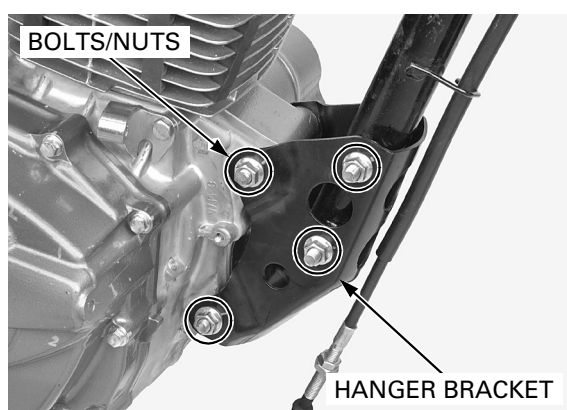
Using the floor jack or other adjustable support, carefully place the engine into the frame and maneuver it into place.

Align the mounting bolt holes and install the following fasteners but do not tighten yet:

- Rear lower engine mounting bolt, washer and nut
- Rear upper engine mounting bolt, washer and nut



- Front engine hanger bracket mounting bolts and nuts



Install the heat guard stay, upper engine hanger plates, engine hanger plate mounting bolts/nuts.

After installing all the engine mounting nuts, tighten them to the specified torque.

TORQUE:

Rear upper/lower engine mounting nut:

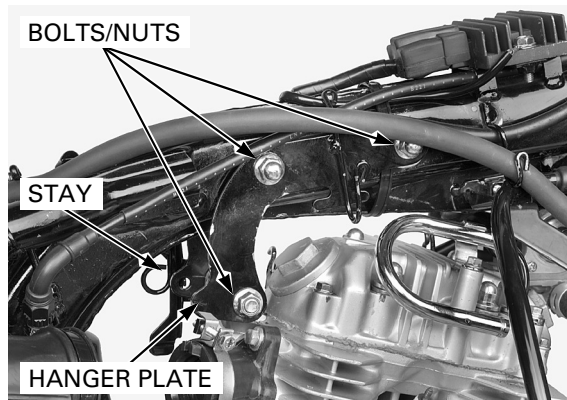
54 N·m (5.5 kgf·m, 40 lbf·ft)

Front engine hanger bracket mounting nut:

27 N·m (2.8 kgf·m, 20 lbf·ft)

Upper engine hanger plate mounting nut:

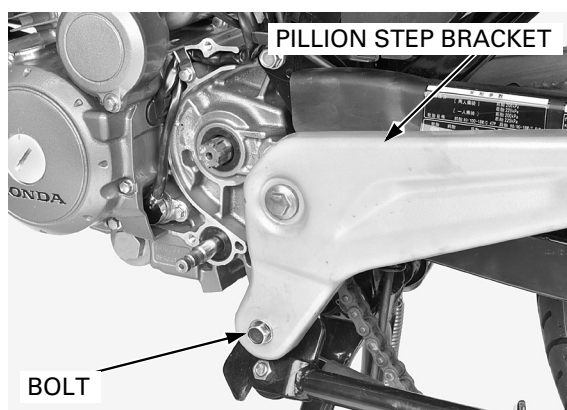
27 N·m (2.8 kgf·m, 20 lbf·ft)



ENGINE REMOVAL/INSTALLATION

Set the left pillion step bracket in its original position and install the left pillion step bracket bolt and tighten it to the specified torque.

TORQUE: 45 N·m (4.6 kgf·m, 33 lbf·ft)

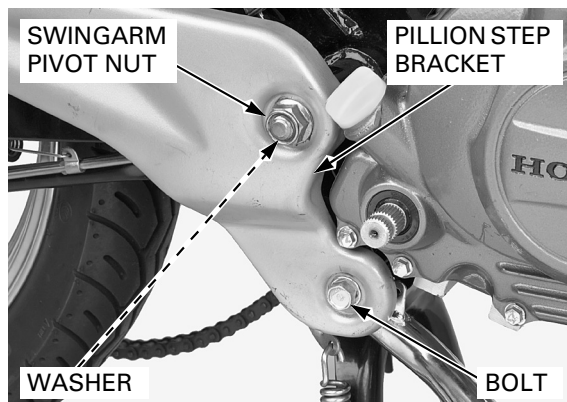


Install the washer to the swingarm pivot bolt. Install the right pillion step bracket, swingarm pivot nut and right pillion step bracket bolt. Tighten the swingarm pivot nut to the specified torque.

TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)

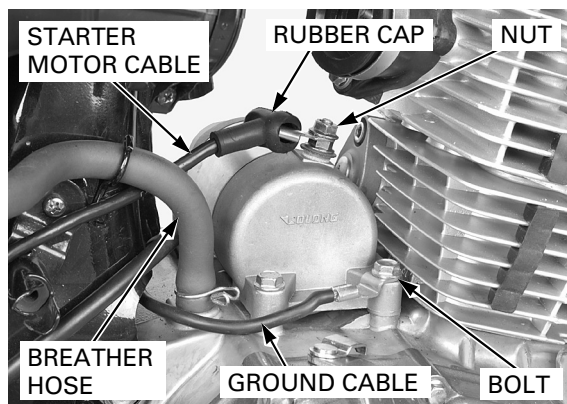
Tighten the right pillion step bracket bolt to the specified torque.

TORQUE: 45 N·m (4.6 kgf·m, 33 lbf·ft)

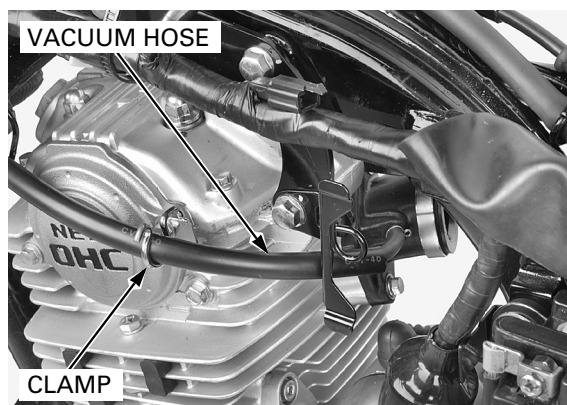


Connect the crankcase breather hose.

Install the starter motor front mounting bolt with the ground cable, and tighten the bolt securely. Install the starter motor cable and cable nut onto the starter motor terminal. Tighten the starter motor cable nut securely. Install the rubber cap over the starter motor terminal properly.

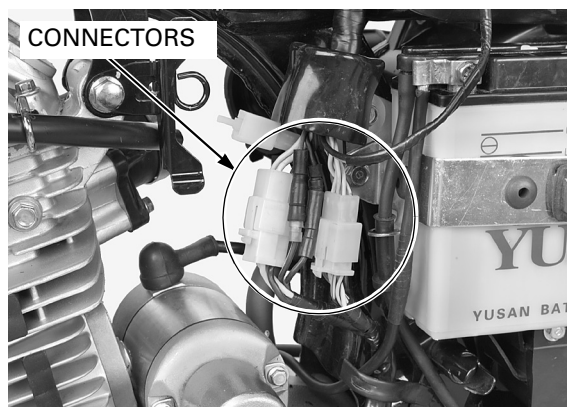


Set the PAIR control valve vacuum hose to the clamp. Connect the PAIR control valve vacuum hose to the insulator.



Connect the following:

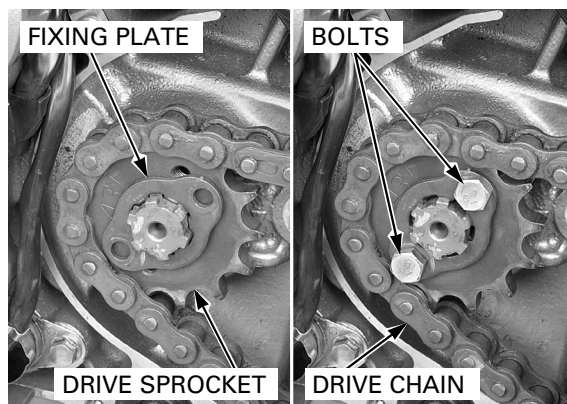
- Gear position switch 6P (Natural) connector
- Alternator 3P (Natural) connector
- Black/Red exciter coil wire connector
- Blue/Yellow ignition pulse generator wire connector



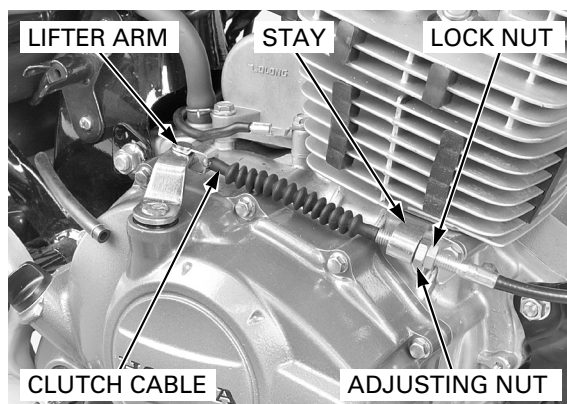
Install the drive chain onto the drive sprocket.
Install the drive sprocket to the countershaft.

Install the fixing plate and turn it until its bolt holes and the bolt holes of the drive sprocket are aligned.

Install and tighten fixing plate mounting bolts securely.



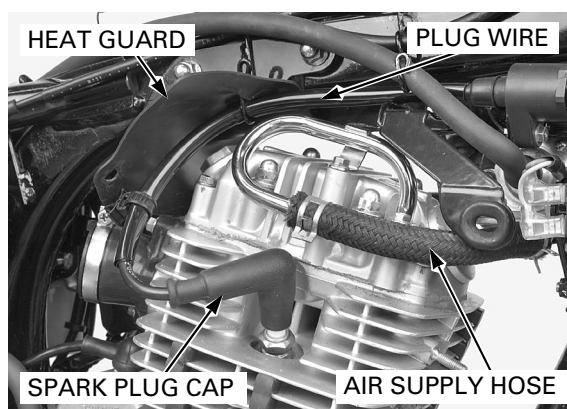
Connect the clutch cable end to the lifter arm and set the clutch cable to the stay.



Set the spark plug wire to the stay and connect the spark plug cap.

Install the heat guard.

Connect the air supply hose to the air injection pipe.



ENGINE REMOVAL/INSTALLATION

Set the heat guard by hooking the tabs of the heat guard stay, right and left upper engine hanger plates as shown.

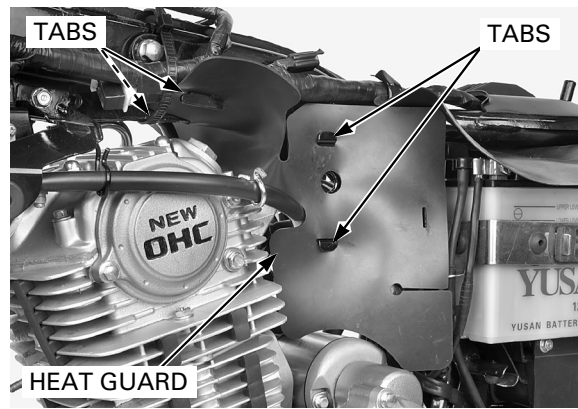
Install the following:

- Fuel tank (page 2-4)
- Footpeg bar (page 9-14)
- Kickstarter pedal (page 9-14)
- Left crankcase rear cover (page 10-13)
- Carburetor (page 5-17)
- Muffler (page 2-11)
- Right and left horn covers (page 2-9)
- Turn signal relay (page 18-18)

Fill the crankcase with the recommended engine oil (page 3-11).

Adjust the following:

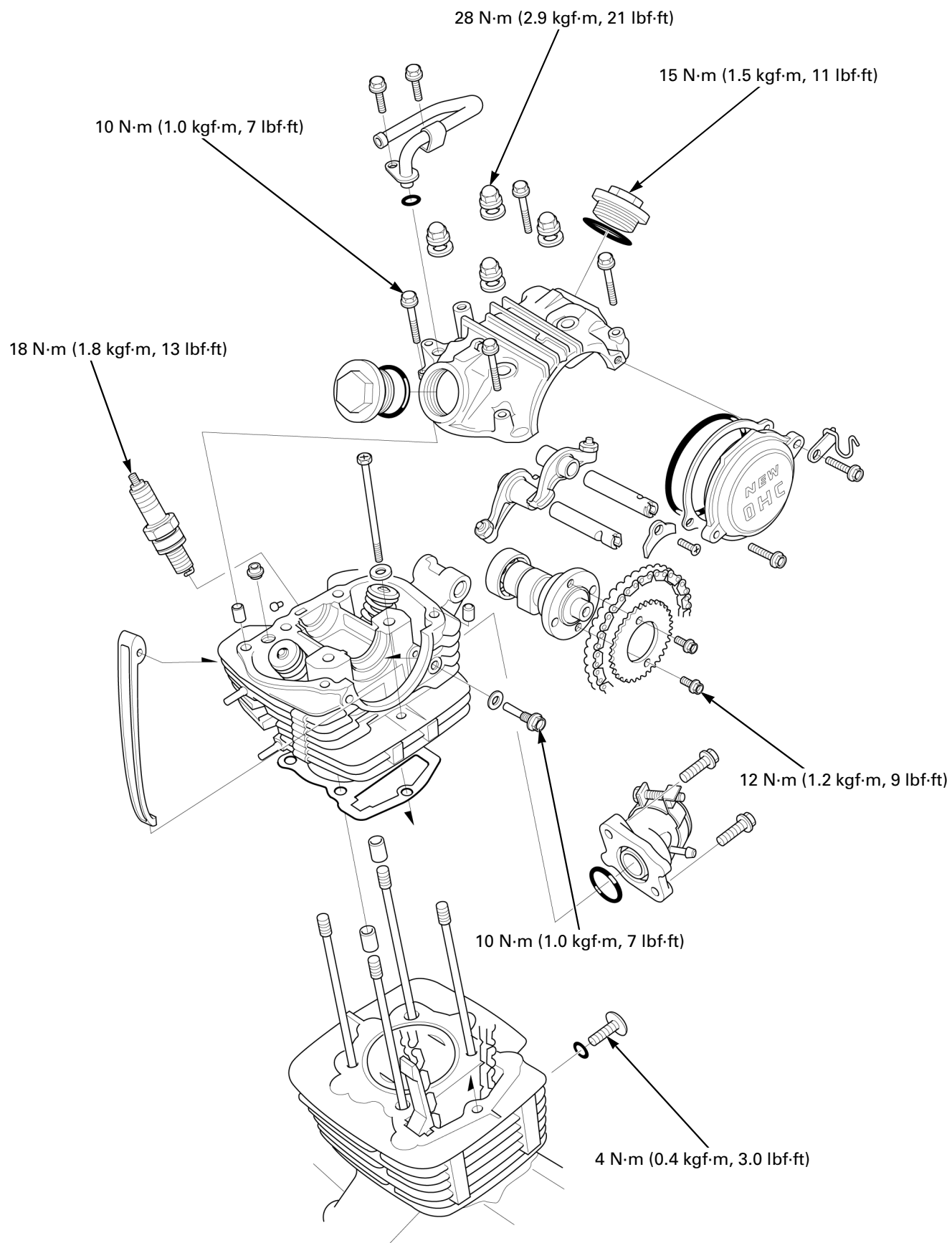
- Clutch cable (page 3-22)
- Drive chain (page 3-15)
- Rear brake (page 3-21)



7. CYLINDER HEAD/VALVES

COMPONENT LOCATION	7-2	CYLINDER HEAD DISASSEMBLY	7-11
SERVICE INFORMATION	7-3	VALVE GUIDE REPLACEMENT	7-13
TROUBLESHOOTING	7-5	VALVE SEAT INSPECTION/ REFACING	7-14
CYLINDER COMPRESSION	7-6	CYLINDER HEAD ASSEMBLY	7-17
CYLINDER HEAD COVER/CAMSHAFT REMOVAL	7-6	CYLINDER HEAD INSTALLATION	7-19
CYLINDER HEAD REMOVAL	7-10	CAMSHAFT/CYLINDER HEAD COVER INSTALLATION	7-20

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

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

SPECIFICATIONS

Unit: mm (in)

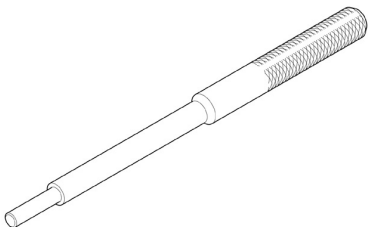
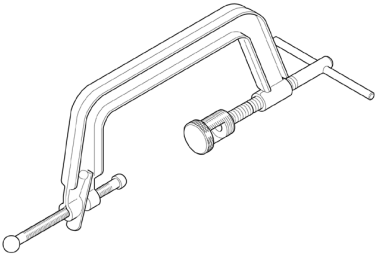

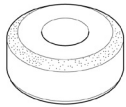

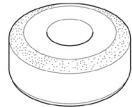

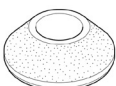
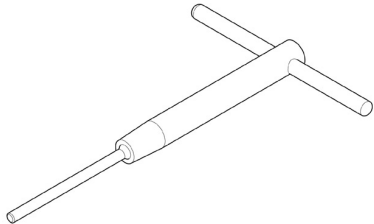
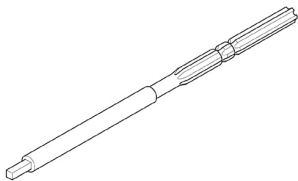
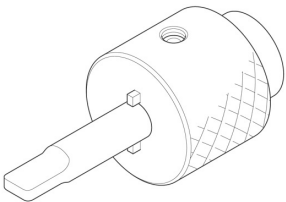
ITEM			STANDARD	SERVICE LIMIT
Cylinder compression at 450 min ⁻¹ (rpm)			1,294 kPa (13.2 kgf/cm ² , 188 psi)	–
Valve clearance		IN/EX	0.10 ± 0.02 (0.004 ± 0.001)	–
Valve, valve guide	Valve stem O.D.	IN	5.450 – 5.465 (0.2146 – 0.2152)	5.42 (0.213)
		EX	5.430 – 5.445 (0.2138 – 0.2144)	5.40 (0.213)
	Valve guide I.D.	IN/EX	5.475 – 5.485 (0.2156 – 0.2159)	5.50 (0.217)
		IN	0.010 – 0.035 (0.0004 – 0.0014)	0.12 (0.005)
	Stem-to-guide clearance	EX	0.030 – 0.055 (0.0012 – 0.0022)	0.14 (0.006)
Valve seat width		IN/EX	1.2 – 1.6 (0.05 – 0.06)	2.0 (0.08)
Valve spring free length	Inner	IN/EX	39.2 (1.54)	38.0 (1.50)
	Outer	IN/EX	44.85 (1.77)	43.5 (1.71)
Rocker arm	Arm I.D.	IN/EX	12.000 – 12.018 (0.4724 – 0.4731)	12.05 (0.474)
	Shaft O.D.	IN/EX	11.977 – 11.995 (0.4715 – 0.4722)	11.95 (0.470)
	Arm-to-shaft clearance	IN/EX	0.005 – 0.041 (0.0002 – 0.0016)	0.10 (0.004)
Cylinder head warpage			–	0.05 (0.002)
Camshaft	Cam lobe height	IN	31.452 – 31.532 (1.2383 – 1.2414)	31.1 (1.22)
		EX	31.132 – 31.212 (1.2257 – 1.2288)	31.0 (1.22)

TORQUE VALUES

Cylinder head cover cap nut	28 N·m (2.9 kgf·m, 21 lbf·ft)	Apply engine oil to the threads and seating surface.
Cylinder head cover bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Cam sprocket bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Cam chain tensioner lifter sealing plug	4 N·m (0.4 kgf·m, 3.0 lbf·ft)	
Cam chain tensioner pivot bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Timing hole cap	6 N·m (0.6 kgf·m, 4.4 lbf·ft)	
Crankshaft hole cap	8 N·m (0.8 kgf·m, 5.9 lbf·ft)	
Valve adjusting hole cap	15 N·m (1.5 kgf·m, 11 lbf·ft)	
Spark plug	18 N·m (1.8 kgf·m, 13 lbf·ft)	

CYLINDER HEAD/VALVES

TOOLS

<p>Valve guide driver, 5.5 mm 07742-0010100</p> 	<p>Valve spring compressor 07757-0010000</p> 	<p>Valve seat cutter, 27.5 mm (45° EX) 07780-0010200</p> 
<p>Valve seat cutter, 33 mm (45° IN) 07780-0010800</p> 	<p>Flat cutter, 29 mm (32° EX) 07780-0013400</p> 	<p>Flat cutter, 33 mm (32° IN) 07780-0012900</p> 
<p>Interior cutter, 26 mm (60° EX) 07780-0014500</p> 	<p>Interior cutter, 30 mm (60° IN) 07780-0014000</p> 	<p>Cutter holder, 5.5 mm 07781-0010101</p> 
<p>Valve guide reamer, 5.47 mm 07984-0980001</p> 	<p>Tensioner stopper 070MG-0010100</p> 	

TROUBLESHOOTING

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

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

- Valves
 - Incorrect valve adjustment
 - Burned or bent valve
 - Incorrect valve timing
 - Weak valve spring
 - Uneven valve seating
 - Valve stuck open
- Cylinder head
 - Leaking or damaged cylinder head gasket
 - Warped or cracked cylinder head
 - Loose spark plug
- Cylinder/piston problem (page 8-5)

Compression too high

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

Excessive smoke

- Worn valve stem or valve guide
- Damaged stem seal
- Cylinder/piston problem (page 8-5)

Excessive noise

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

Rough idle

- Low cylinder compression

CYLINDER HEAD/VALVES

CYLINDER COMPRESSION

Warm the engine to normal operating temperature.

Stop the engine and remove the spark plug (page 3-8).

Install the compression gauge into the spark plug hole.

Shift the transmission in neutral.

Operate the choke lever fully (open).

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

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

COMPRESSION PRESSURE:

1,294 kPa (13.2 kgf/cm², 188 psi) at 450 min⁻¹ (rpm)

Low compression can be caused by:

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

High compression can be caused by:

- Carbon deposits in combustion chamber or on piston head



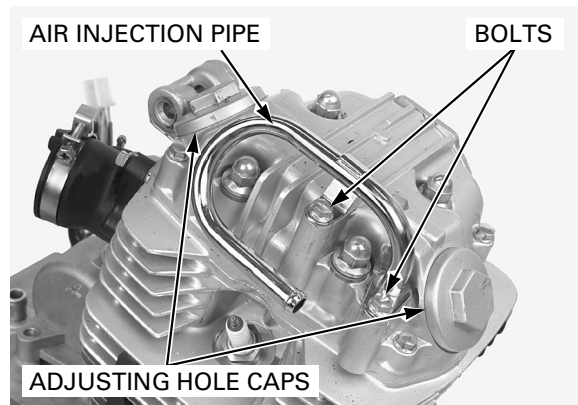
CYLINDER HEAD COVER/CAMSHAFT REMOVAL

Remove the following:

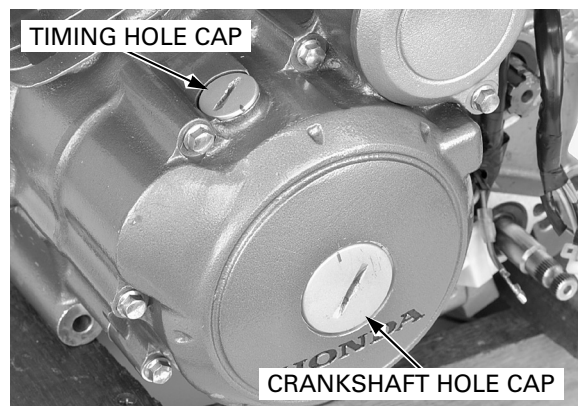
- Engine (page 6-4)
- Starter motor (page 17-6)

Remove the valve adjusting hole caps.

Remove the bolts, air injection pipe and O-ring.



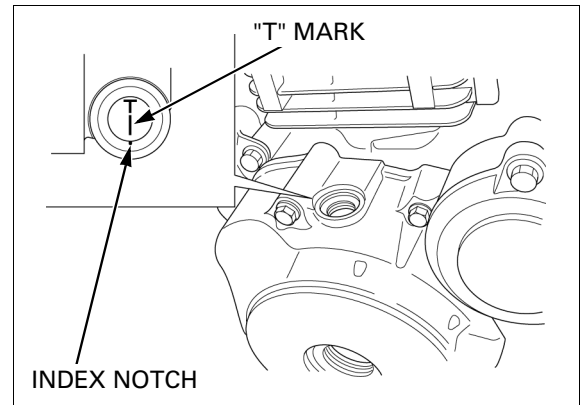
Remove the timing hole cap, crankshaft hole cap and O-rings.



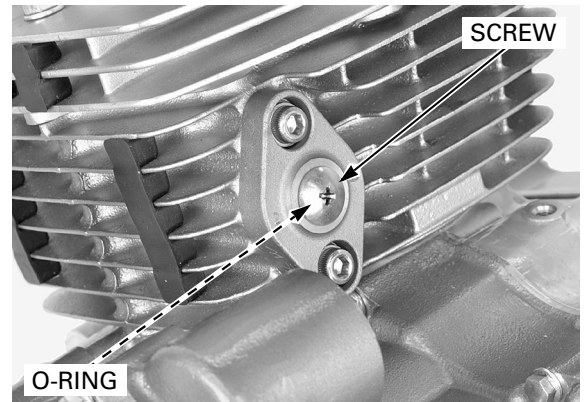
Rotate the crankshaft counterclockwise and align the "T" mark on the flywheel with the index notch on the left crankcase cover.

Make sure that the piston is at TDC (Top Dead Center) on the compression stroke (The rocker arms should be loose).

If the rocker arms are tight, rotate the crankshaft counterclockwise 360° (1 full turn) and realign the the "T" mark with the index notch.



Remove the screw and O-ring.

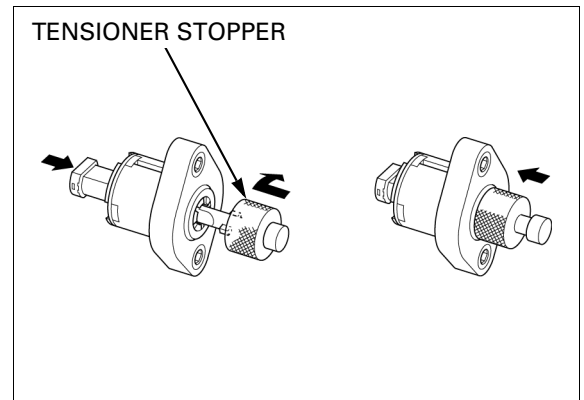


Turn the tensioner lifter shaft clockwise fully and secure it using the special tool.

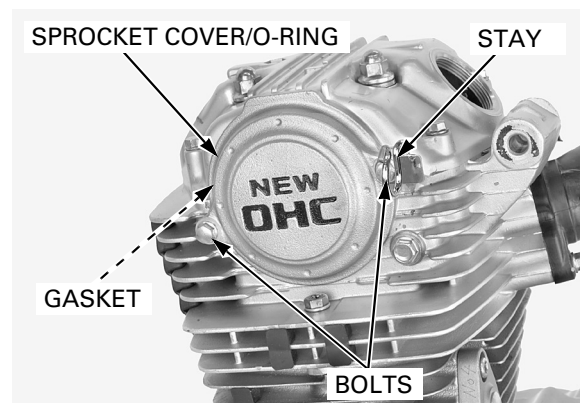
TOOL:

Tensioner stopper

070MG-0010100



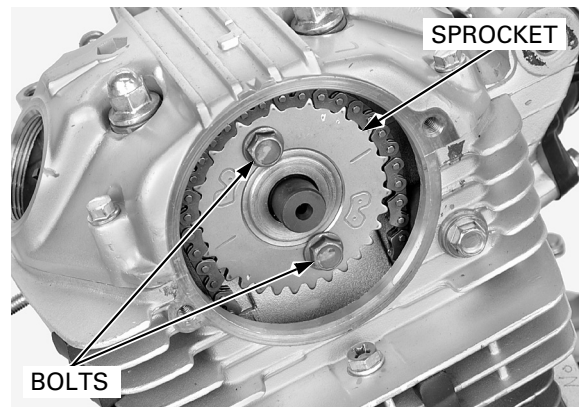
Remove the bolts, stay, cam sprocket cover, O-ring and gasket.



CYLINDER HEAD/VALVES

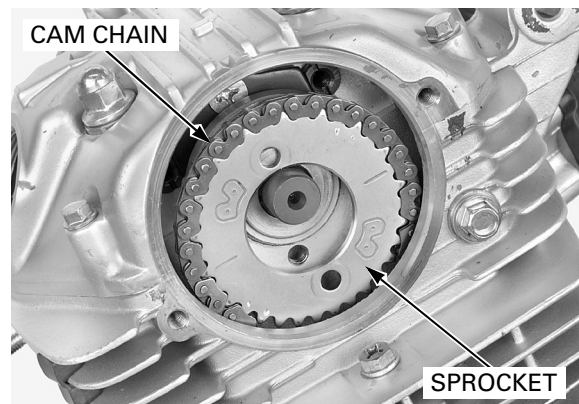
Be careful not to let the bolts fall into the crankcase.

Remove the cam sprocket bolts and then release the cam sprocket with the cam chain from the camshaft.



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

Remove the cam sprocket from the cam chain.



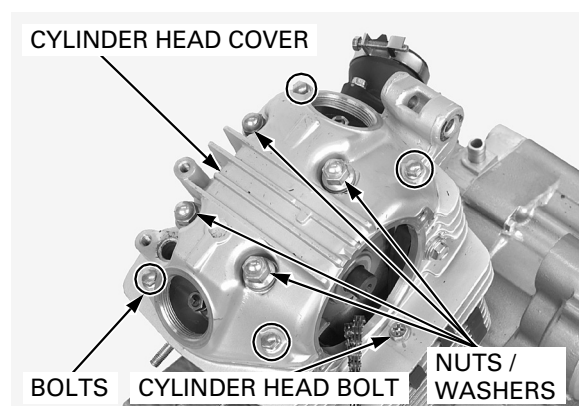
Loosen the cylinder head bolt.

Remove the following:

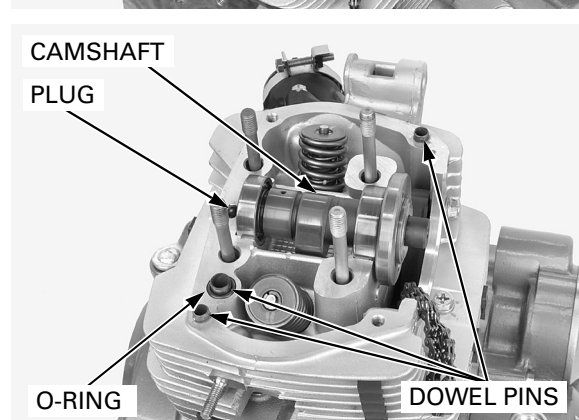
- Cylinder head cover 6-mm bolts
- Cap nuts and washers
- Cylinder head cover

NOTE:

- Do not strike the head cover too hard and do not damage the mating surfaces with a screwdriver during head cover removal.
- Remove the bolts and nuts in a crisscross pattern in several steps.

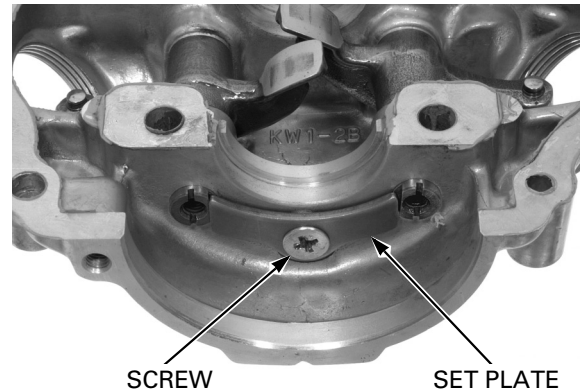


- Camshaft
- Dowel pins
- Oil hole plug
- O-ring

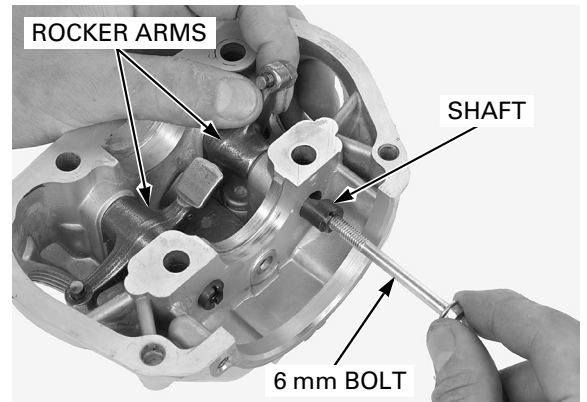


CYLINDER HEAD COVER DISASSEMBLY

Remove the screw and set plate.



Pull out the rocker arm shafts using a 6 mm bolt.
Remove the rocker arms.

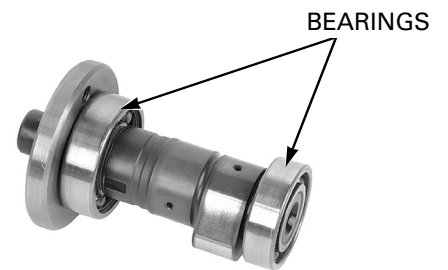


INSPECTION

CAMSHAFT

Turn the camshaft bearings with your finger.
The bearings should turn smoothly and quietly.
Also check that the inner races fit tightly on the camshaft.

Check the cam surfaces for scoring, scratches or evidence of insufficient lubrication.
Check the oil holes in the camshaft for debris.



Measure each cam lobe height.

SERVICE LIMITS:

IN: 31.1 mm (1.22 in)

EX: 31.0 mm (1.22 in)

If the cam lobe is damaged or excessively worn,
inspect the oil passages and rocker arms.



CYLINDER HEAD/VALVES

ROCKER ARM/SHAFT

Inspect the sliding surfaces of the rocker arms and shafts for wear or damage.

If the rocker arm slipper surface is excessive worn or damaged, inspect the cam lobe and oil passage.

Measure the I.D. of each rocker arm

SERVICE LIMIT:

IN/EX: 12.05 mm (0.474 in)

Measure the O.D. of each shaft at the rocker arm sliding area.

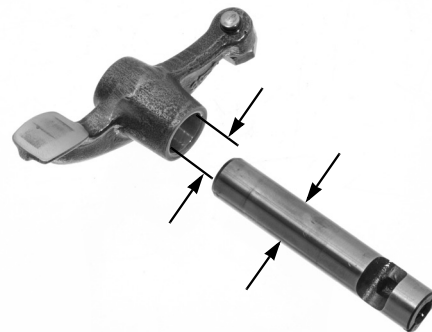
SERVICE LIMIT:

IN/EX: 11.95 mm (0.470 in)

Calculate the rocker arm-to-shaft clearance.

SERVICE LIMIT:

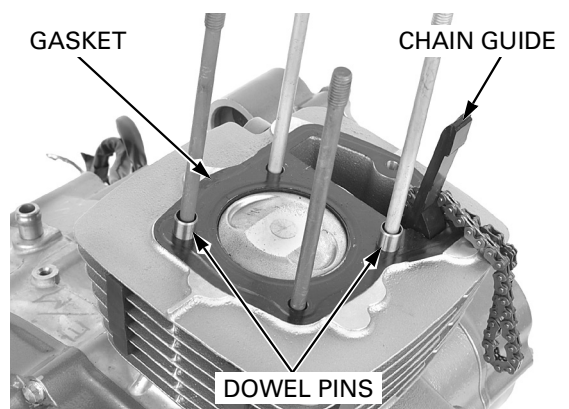
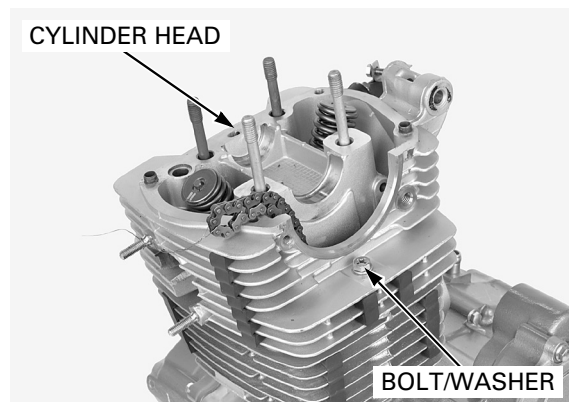
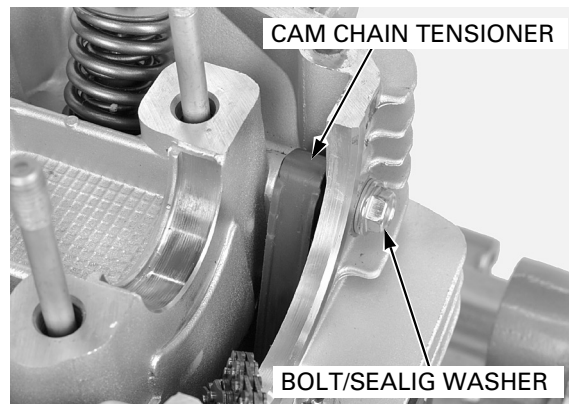
IN/EX: 0.10 mm (0.004 in)



CYLINDER HEAD REMOVAL

Remove the following:

- Spark plug (page 3-8)
- Cylinder head cover and camshaft (page 7-6)
- Pivot bolt and sealing washer
- Cam chain tensioner



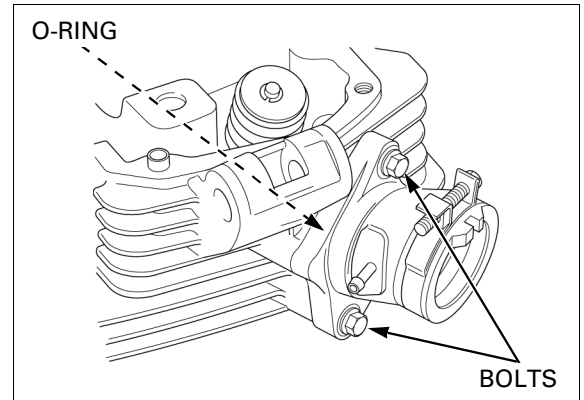
Do not strike the cylinder head too hard and do not damage the mating surface with a screwdriver.

- Cylinder head bolt and washer
- Cylinder head

- Gasket
- Dowel pins
- Cam chain guide

CYLINDER HEAD DISASSEMBLY

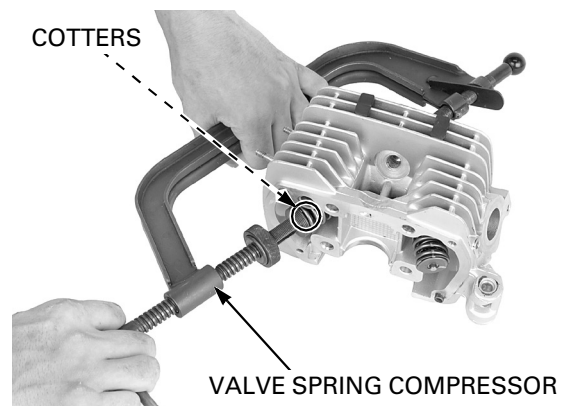
Remove the bolts, insulator and O-ring.



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

Remove the valve spring cotters using the special tool.

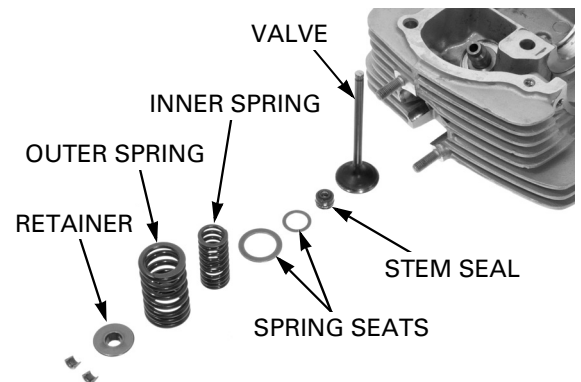
TOOL:
Valve spring compressor **07757-0010000**



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

Remove the following:

- Spring retainers
- Inner and outer valve springs
- Intake and exhaust valves
- Stem seals
- Spring seats



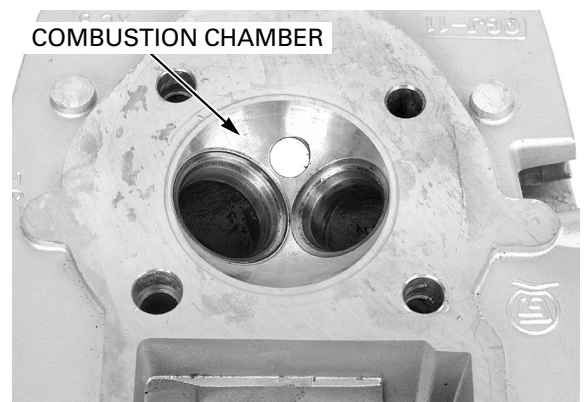
INSPECTION

CYLINDER HEAD

Be careful not to damage the valve seat and gasket surfaces.

Remove the carbon deposits from the combustion chamber.

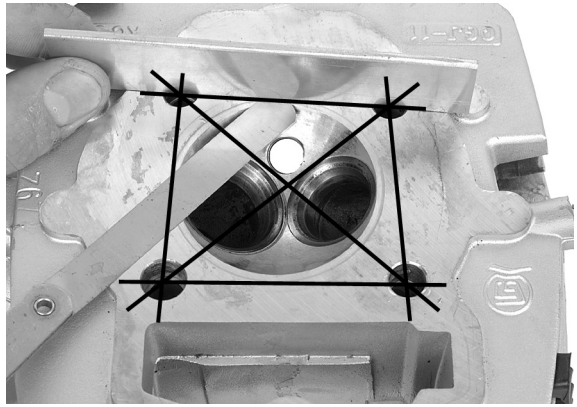
Check the spark plug hole and valve areas for cracks.



CYLINDER HEAD/VALVES

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

SERVICE LIMIT: 0.05 mm (0.002 in)



VALVE SPRING

Check the valve springs for fatigue or damage. Measure the valve spring free length.

SERVICE LIMITS:

Inner: 38.0 mm (1.50 in)

Outer: 43.5 mm (1.71 in)



VALVE/VALVE GUIDE

Check that the valve moves smoothly in the guide. Check the valve for bending, burning or abnormal wear.

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

SERVICE LIMITS:

IN: 5.42 mm (0.213 in)

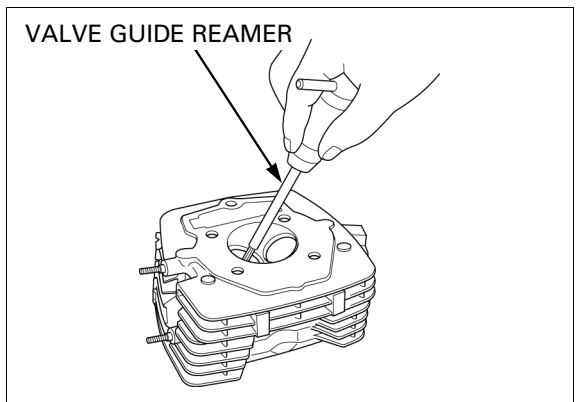
EX: 5.40 mm (0.213 in)



Ream the guides to remove any carbon build-up before measuring the valve guide I.D. Insert the reamer from the combustion chamber side and always rotate the reamer clockwise.

TOOL:

Valve guide reamer, 5.47 mm 07984-0980001



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

SERVICE LIMIT:

IN/EX: 5.50 mm (0.217 in)

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

SERVICE LIMITS:

IN: 0.12 mm (0.005 in)

EX: 0.14 mm (0.006 in)

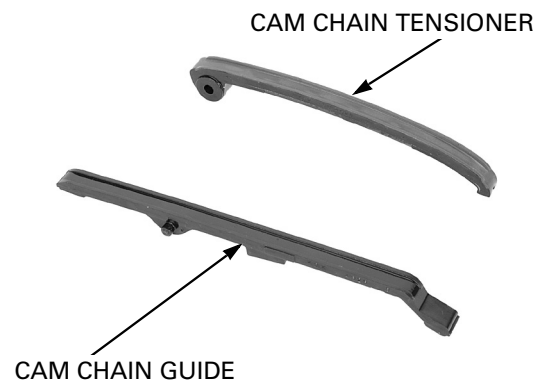
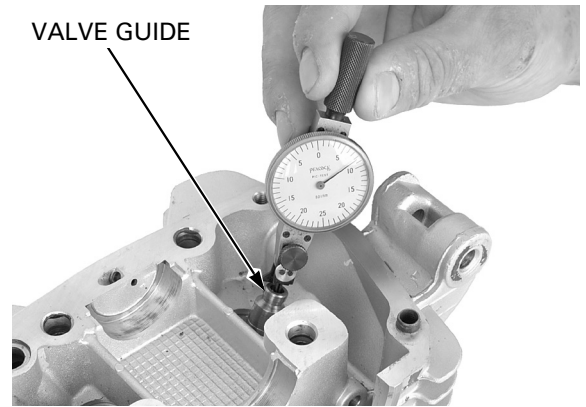
Inspect and reface the valve seats whenever the valve guides are replaced (page 7-13).

If the stem-to-guide clearance exceeds the service limit, determine if a new guide with standard dimensions would bring the clearance within tolerance. If so, replace any guides as necessary and ream to fit.

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

CAM CHAIN TENSIONER AND CAM CHAIN GUIDE

Check the cam chain tensioner and guide for excessive wear or damage.



VALVE GUIDE REPLACEMENT

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

Be sure to wear heavy gloves to avoid burns when handling the heated cylinder head. Using a torch to heat the cylinder head may cause warpage.

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

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

TOOL:

Valve guide driver, 5.5 mm

07742-0010100



CYLINDER HEAD/VALVES

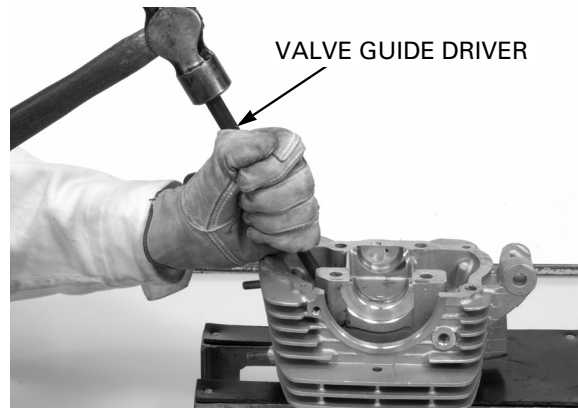
Remove the newly valve guide from the freezer. Coat new O-rings with the engine oil and install them onto the valve guide.

While the cylinder head is still heated, drive each valve guide into the cylinder head from the cam-shaft side until it is fully seated.

TOOL:

Valve guide driver, 5.5 mm 07742-0010100

Let the cylinder head cool to room temperature.



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

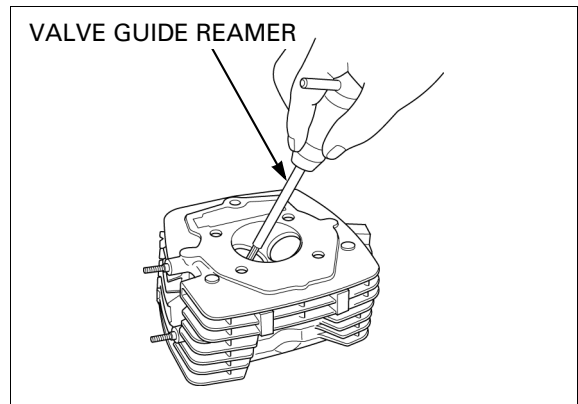
Ream the new valve guides.

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

TOOL:

Valve guide reamer, 5.47mm 07984-0980001

Clean the cylinder head thoroughly to remove any metal particles after reaming and reface the valve seat (page 7-14).

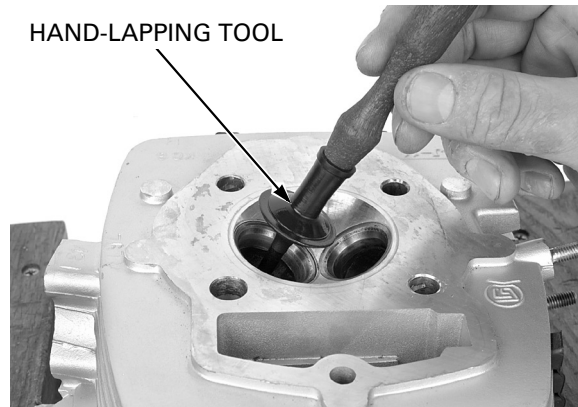


VALVE SEAT INSPECTION/REFACING

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 the valve, to check for proper valve seat contact.



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

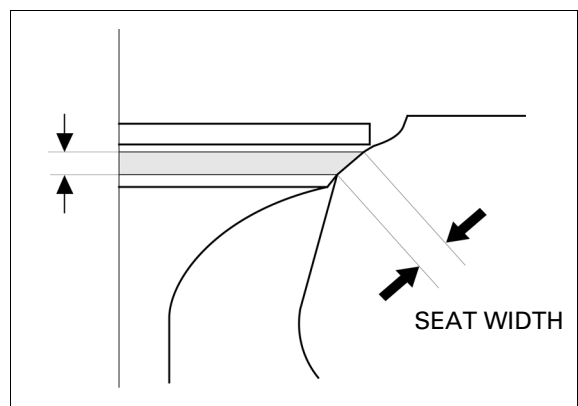
Remove the valve and inspect the valve seat face.

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

STANDARD: 1.2 – 1.6 mm (0.05 – 0.06 in)

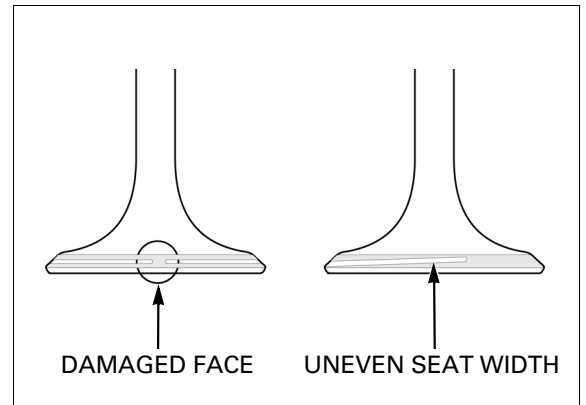
SERVICE LIMIT: 2.0 mm (0.08 in)

If the seat width is not within specification, reface the valve seat.

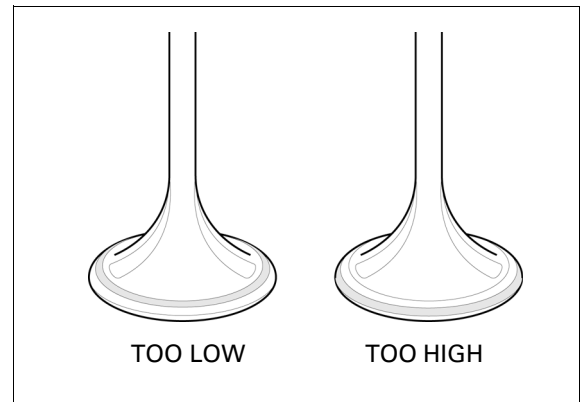


Inspect the valve seat face for:

- Damaged face:
 - Replace the valve and reface the valve seat.
- Uneven seat width:
 - Replace the valve and reface the valve seat.



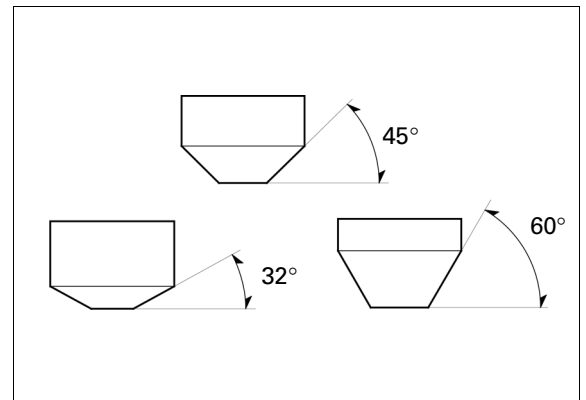
- Contact area (too high or too low)
 - Reface the valve seat.



REFACING

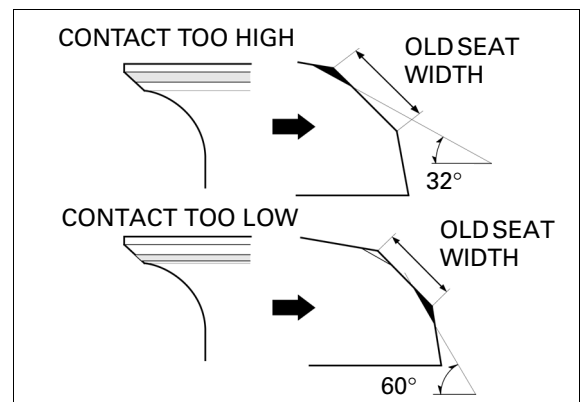
NOTE:

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



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

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

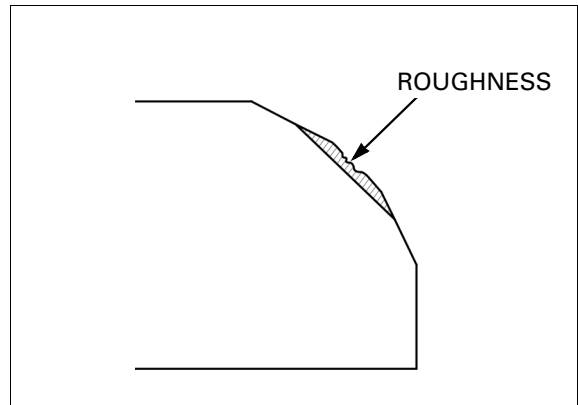


CYLINDER HEAD/VALVES

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

TOOLS:

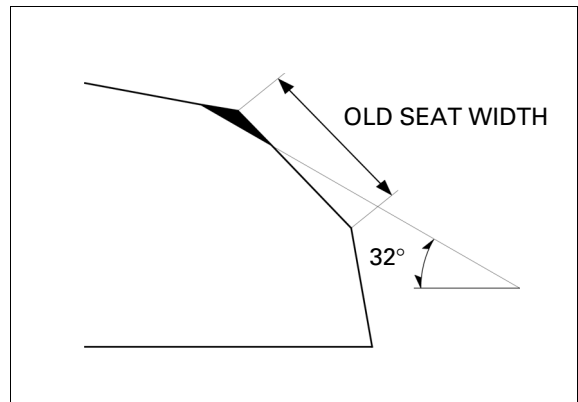
Seat cutter, 33 mm (45° IN)	07780-0010800
Seat cutter, 27.5 mm (45° EX)	07780-0010200
Cutter holder, 5.5 mm	07781-0010101



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

TOOLS:

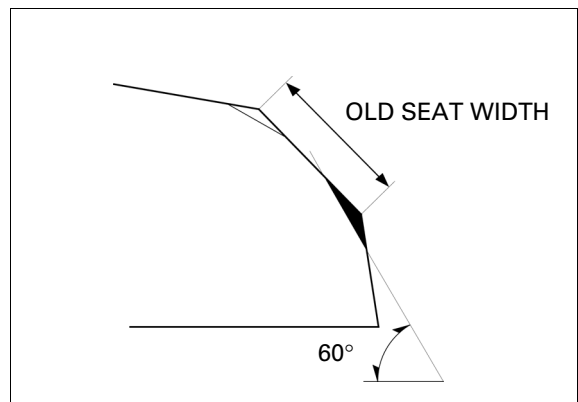
Flat cutter, 33 mm (32° IN)	07780-0012900
Flat cutter, 29 mm (32° EX)	07780-0013400
Cutter holder, 5.5 mm	07781-0010101



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

TOOLS:

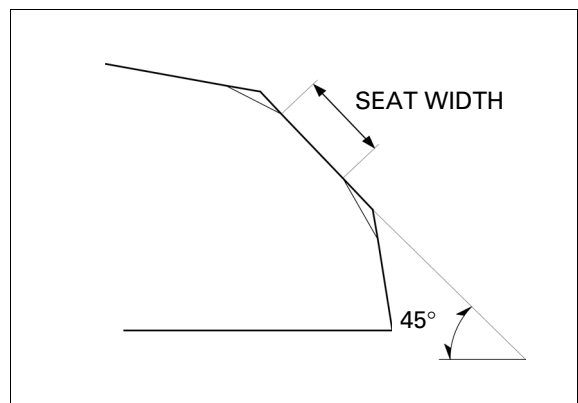
Interior cutter, 30 mm (60° IN)	07780-0014000
Interior cutter, 26 mm (60° EX)	07780-0014500
Cutter holder, 5.5 mm	07781-0010101



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

VALVE SEAT WIDTH: 1.2 – 1.6 mm (0.05 – 0.06 in)

Make sure that all pitting and irregularities are removed.

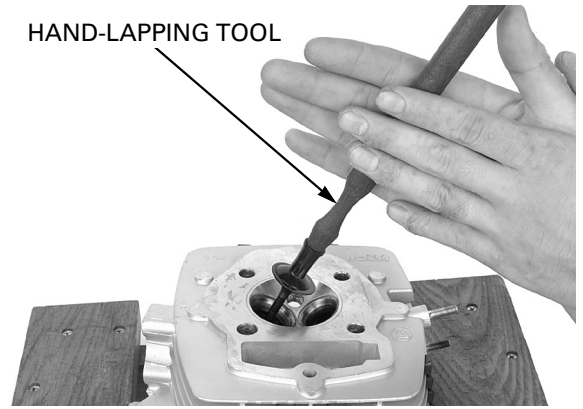


Excessive lapping pressure may deform or damage the seat. Do not allow lapping compound to enter the guides.

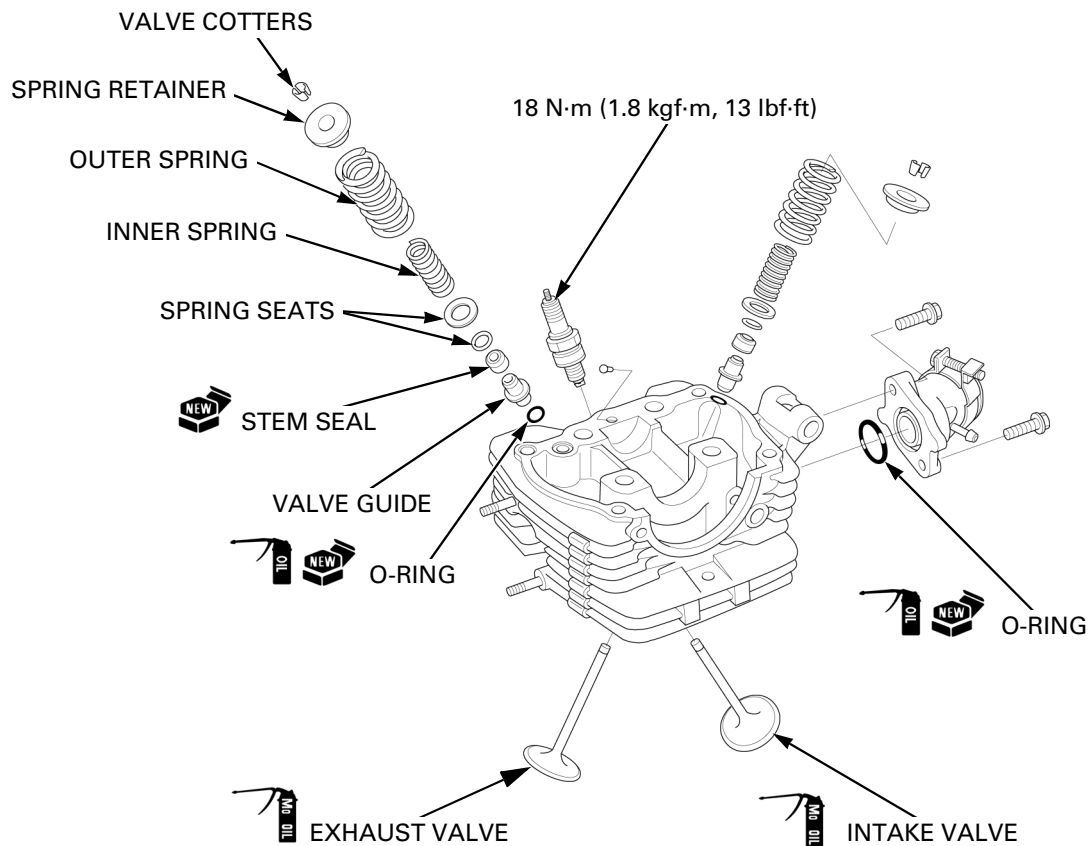
After cutting the seat, apply lapping compound and engine oil to the valve face, and lap the valve using light pressure. Change the angle of lapping tool frequently to prevent uneven seat wear.

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

HAND-LAPPING TOOL



CYLINDER HEAD ASSEMBLY

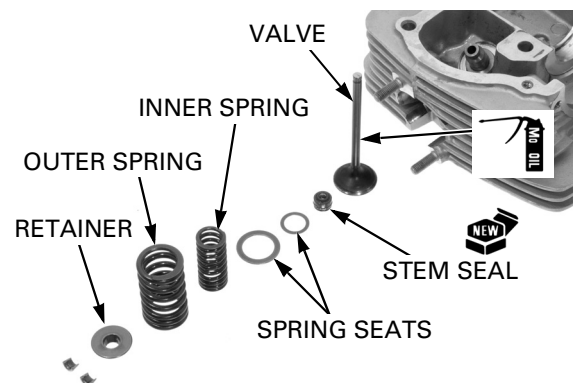


Blow through the oil passage in the cylinder head with compressed air.

Install the spring seats and new stem seals.

Lubricate the valve stem outer surface with molybdenum oil solution.

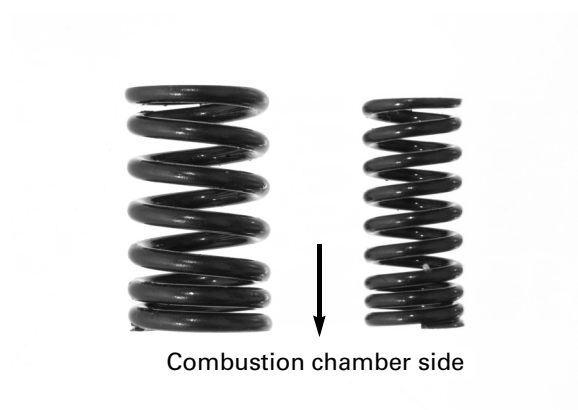
Insert the valve into the guide while turning it slowly to avoid damaging to the stem seal.



CYLINDER HEAD/VALVES

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

Install the spring retainer.



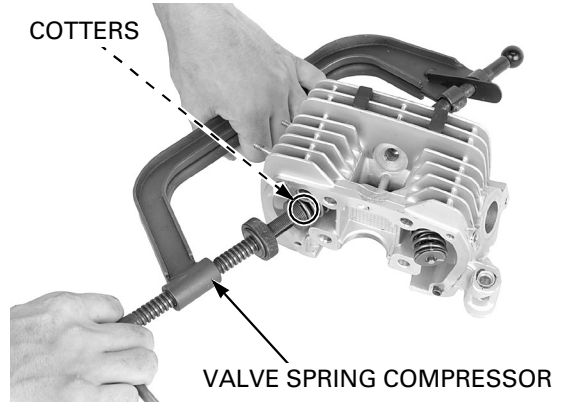
To prevent loss of tension, do not compress the valve springs more than necessary.

Install the valve cotters using the special tool.

TOOL:

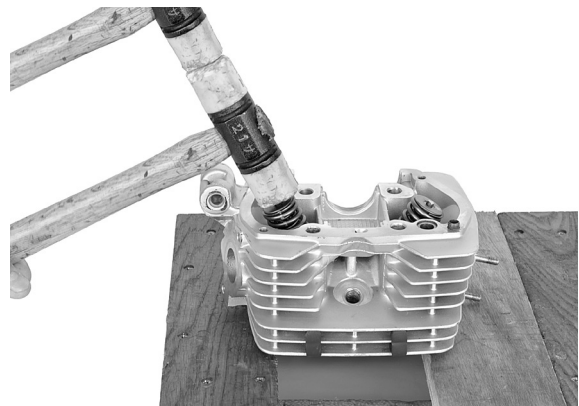
Valve spring compressor

07757-0010000



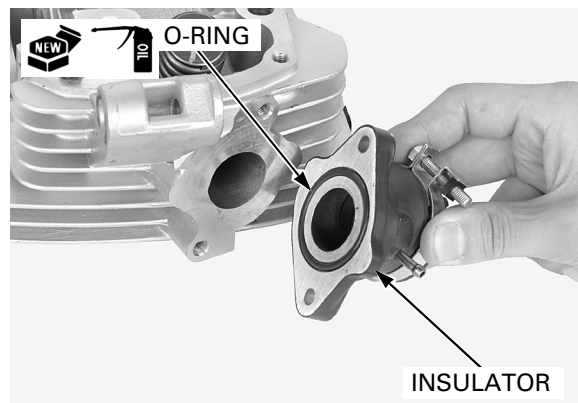
Support the cylinder head so the valve heads will not contact anything that cause damage.

Tap the valve stems gently with two plastic hammers to seat the cotters firmly.



Coat a new O-ring with engine oil and install it to the insulator groove.

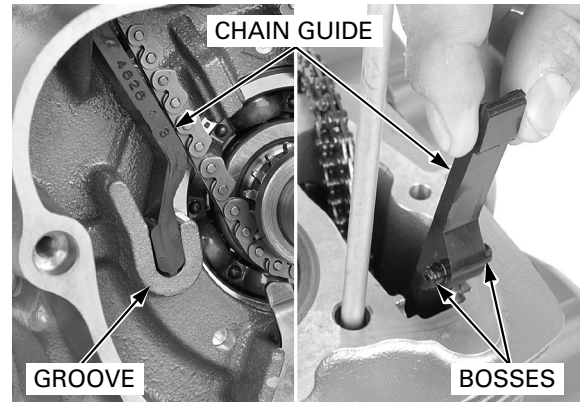
Install the insulator and tighten the bolts securely.



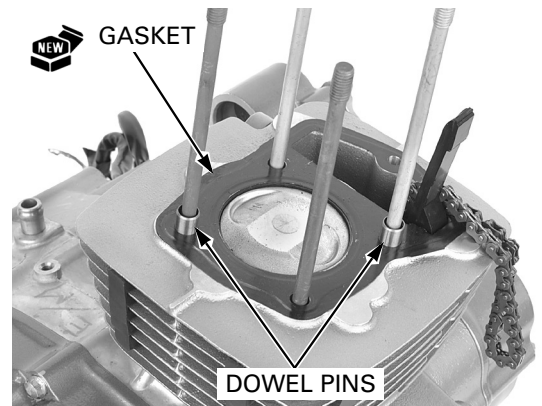
CYLINDER HEAD INSTALLATION

Clean the gasket mating surfaces of the cylinder and cylinder head, being careful not to damage them.

Install the cam chain guide by aligning the guide end with the groove in the crankcase and the bosses with the grooves in the cylinder.



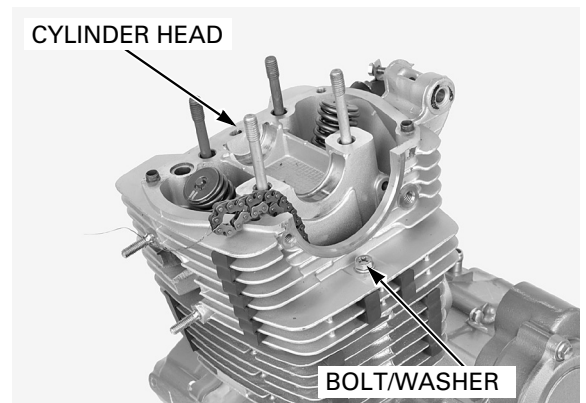
Install the dowel pins and a new gasket.



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

Tighten the cylinder head bolt after installing the cylinder head cover.

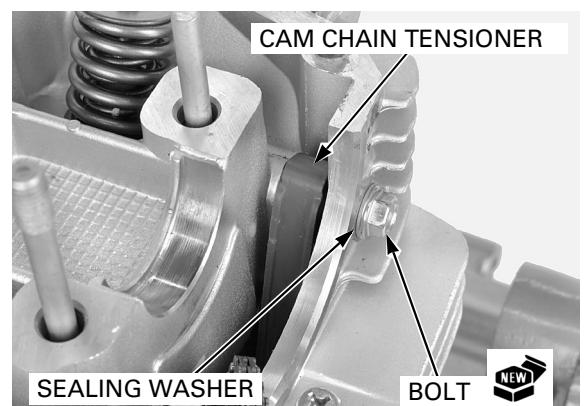
Install the cylinder head bolt with the washer and temporarily tighten it.



Insert the cam chain tensioner into the cylinder. Align the bolt holes and install the pivot bolt with a new sealing washer. Tighten the pivot bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the spark plug (page 3-8).

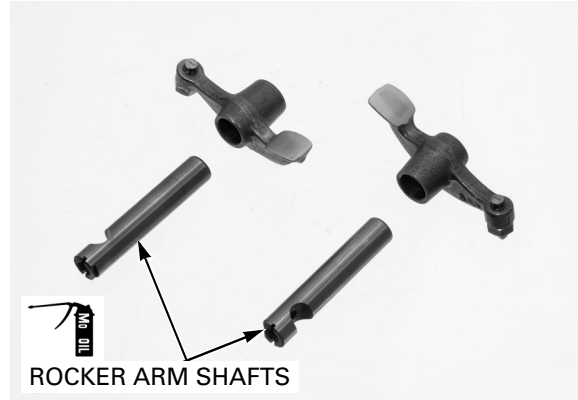


CAMSHAFT/CYLINDER HEAD COVER INSTALLATION

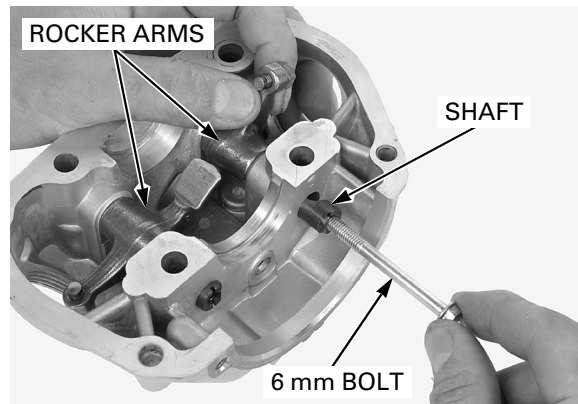
Clean the mating surface of the cylinder head and cover thoroughly, being careful not to damage them.

CYLINDER HEAD COVER ASSEMBLY

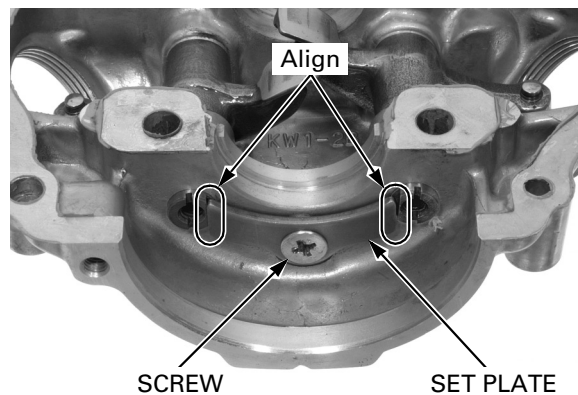
Apply molybdenum oil solution to the whole surface of the rocker arm shafts.



Place the rocker arms into the head cover. Install the rocker arm shafts through the head cover and rocker arms using the 6 mm bolt.



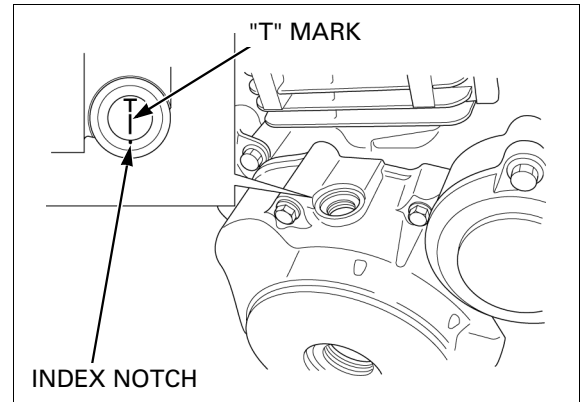
Install the set plate by aligning the plate ends with each cut-out of the shaft. Tighten the set plate screw securely.



INSTALLATION

Carefully rotate the crankshaft while holding the cam chain to avoid jamming the cam chain against the timing sprocket of the crankshaft.

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



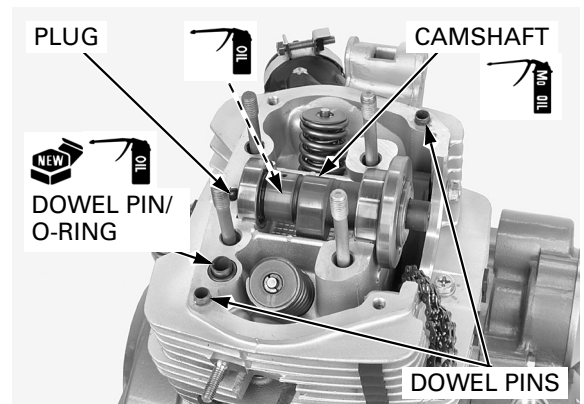
Pour engine oil into the oil pocket in the cylinder head.

Apply molybdenum oil solution to the cam lobes and bearings.

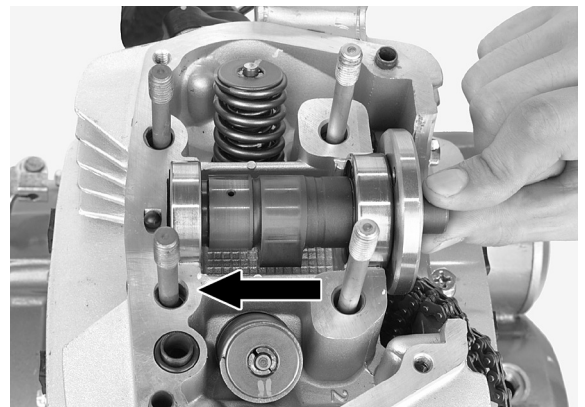
Place the camshaft onto the cylinder head with the cam lobes facing down.

Apply engine oil to a new O-ring.

Install a new O-ring, dowel pins and the oil hole plug.

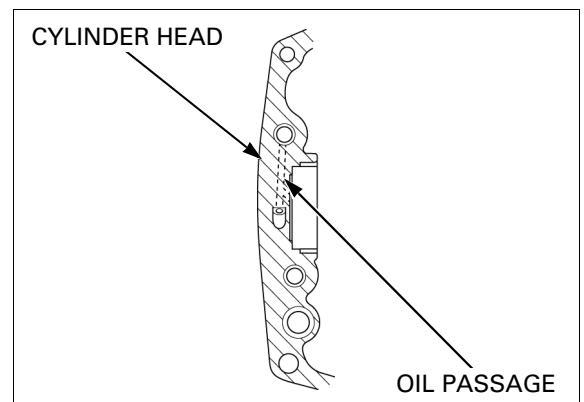


Make sure the camshaft is installed firmly onto the cylinder head by pushing the camshaft toward the right side fully.



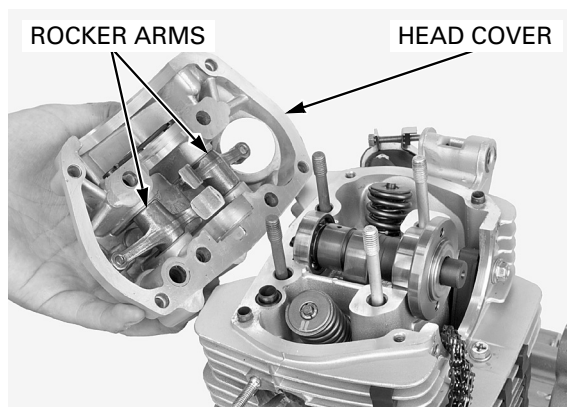
Do not get sealant to the oil passage in the cylinder head.

Apply liquid sealant (THREE BOND #1215 or equivalent) to the mating surfaces of the cylinder head cover.

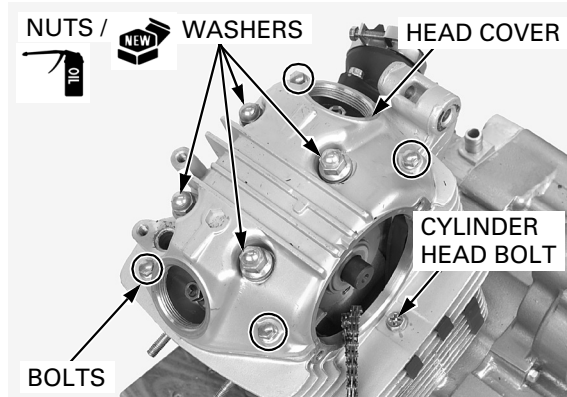


CYLINDER HEAD/VALVES

Carefully install the cylinder head cover while holding the rocker arms to avoid interfering the arms with the camshaft.



Apply engine oil to the cap nut threads and seating surfaces.
Install the cylinder head cover cap nuts and new sealing washers.
Install the cylinder head cover bolts.



Tighten the nuts and bolts in a criss-cross pattern in several steps.

Tighten the cylinder head cover cap nuts, then tighten the cylinder head cover bolts to the specified torque.

TORQUE:

Cylinder head cover cap nut:
28 N·m (2.9 kgf·m, 21 lbf·ft)

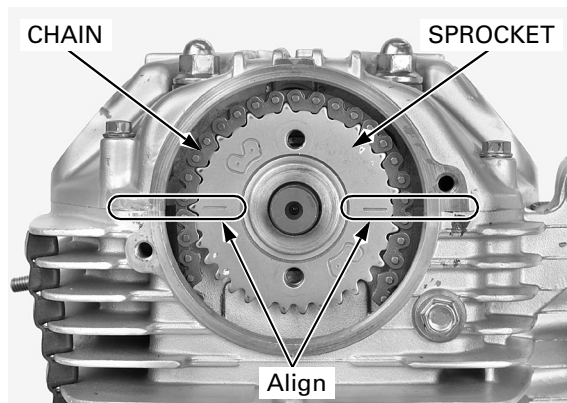
Cylinder head cover bolt:
10 N·m (1.0 kgf·m, 7 lbf·ft)

Tighten the cylinder head bolt securely.

Be sure to align the "T" mark on the flywheel with the index notch (page 3-9).

Set the cam sprocket onto the cam chain carefully so the timing marks on the sprocket are aligned with the mating lines.

Install the cam sprocket onto the camshaft.



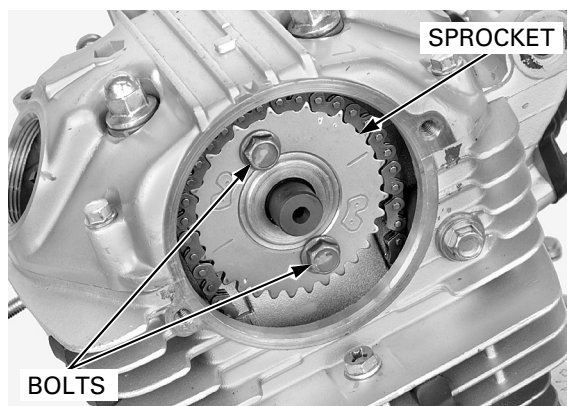
Make sure the timing marks on the sprocket aligns with the mating lines when the "T" mark is aligned with the index notch.

Align the bolt holes in the sprocket and camshaft flange.

Install the sprocket bolts, being careful not to let them fall into the crankcase.

Tighten the sprocket bolts alternately to the specified torque while holding the crankshaft.

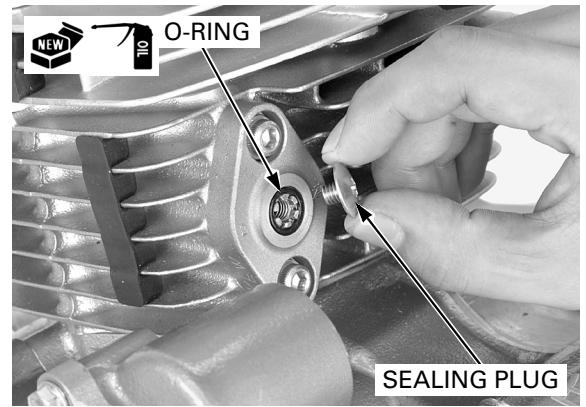
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Remove the tensioner stopper.

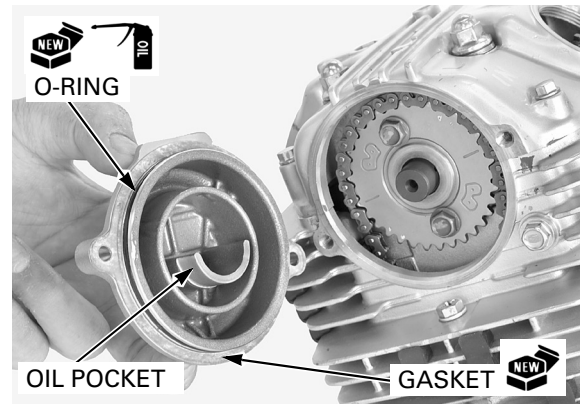
Coat a new O-ring with engine oil and install it into the tensioner lifter groove.
Install the sealing plug and tighten it to the specified torque.

TORQUE: 4 N·m (0.4 kgf·m, 3.0 lbf·ft)

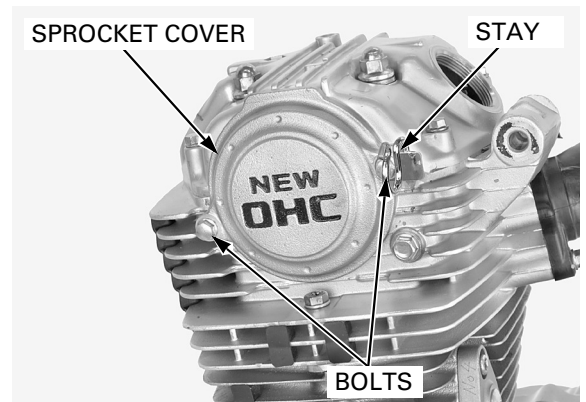


Install a new gasket onto the cam sprocket cover.
Coat a new O-ring with engine oil and install it into the cover groove.

Install the sprocket cover with the oil pocket facing down.



Install the cam sprocket cover bolts and stay.
Tighten the cam sprocket cover bolts securely.



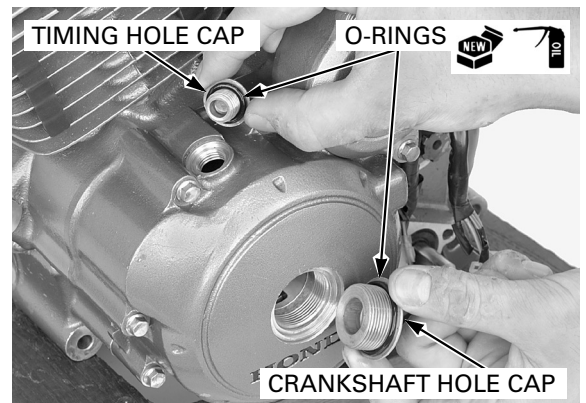
Apply engine oil to new O-rings.
Install the O-rings to the crankshaft hole cap and timing hole cap.

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

TORQUE:

Timing hole cap: 6 N·m (0.6 kgf·m, 4.4 lbf·ft)

Crankshaft hole cap: 8 N·m (0.8 kgf·m, 5.9 lbf·ft)



CYLINDER HEAD/VALVES

Apply engine oil to new O-rings.
Install and tighten the valve adjusting hole caps.

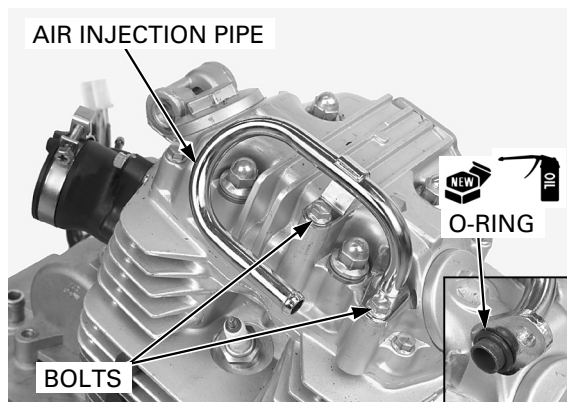
TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)



Apply oil to a new O-ring and install it onto the air injection pipe.
Install the air injection pipe.
Install and tighten the bolts securely.

Install the following:

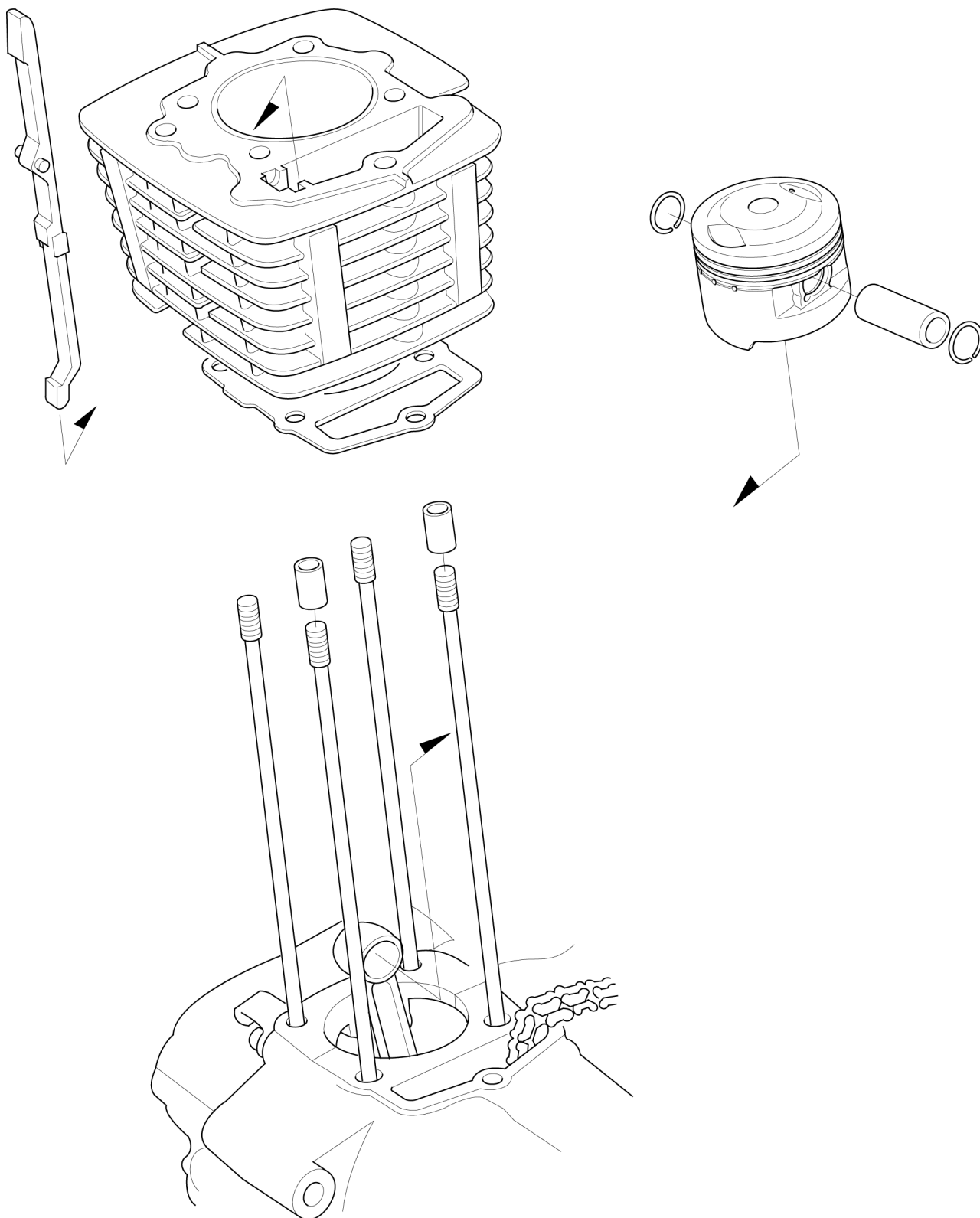
- Starter motor (page 17-12)
- Engine (page 6-7)



8. CYLINDER/PISTON

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

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- The engine must be removed from the frame to service the cylinder and piston.
- 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.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		56.50 – 56.51 (2.224 – 2.225)	56.60 (2.228)
	Out-of-round		–	0.10 (0.004)
	Taper		–	0.10 (0.004)
	Warpage		–	0.05 (0.002)
Piston, piston pin, piston ring	Piston mark direction		"IN" mark facing toward the intake side	–
	Piston O.D. at 11.5 (0.45) from bottom		56.45 – 56.48 (2.222 – 2.224)	56.40 (2.220)
	Piston pin hole I.D.		15.002 – 15.008 (0.5906 – 0.5909)	15.04 (0.592)
	Piston pin O.D.		14.994 – 15.000 (0.5903 – 0.5906)	14.96 (0.589)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.02 (0.001)
	Piston ring end gap	Top	0.05 – 0.20 (0.002 – 0.008)	0.40 (0.012)
		Second	0.05 – 0.20 (0.002 – 0.008)	0.40 (0.012)
		Oil (side rail)	0.20 – 0.70 (0.008 – 0.028)	0.85 (0.033)
	Piston ring-to-ring groove clearance	Top	0.015 – 0.045 (0.0006 – 0.0018)	0.09 (0.004)
Second		0.015 – 0.045 (0.0006 – 0.0018)	0.09 (0.004)	
Cylinder-to-piston clearance			0.02 – 0.06 (0.0008 – 0.0024)	0.10 (0.004)
Connecting rod small end I.D.			15.010 – 15.028 (0.5909 – 0.5917)	15.06 (0.593)
Connecting rod-to-piston pin clearance			0.010 – 0.034 (0.0004 – 0.0013)	0.10 (0.004)

TORQUE VALUE

Cam chain tensioner lifter bolt 12 N·m (1.2 kgf·m, 9 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 connecting rod small end
- Worn cylinder, piston or piston rings

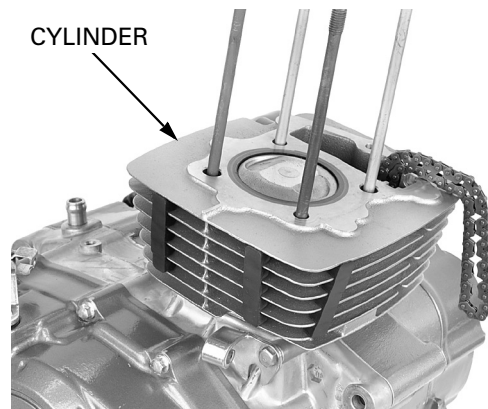
CYLINDER/PISTON REMOVAL

CYLINDER REMOVAL

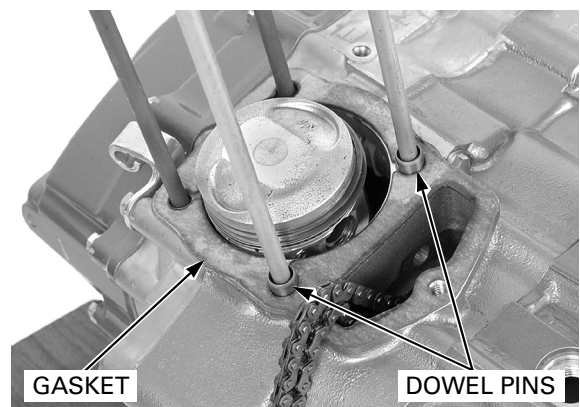
Remove the cylinder head (page 7-10).

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

Lift the cylinder and remove it, being careful not to damage the piston with the stud bolts.

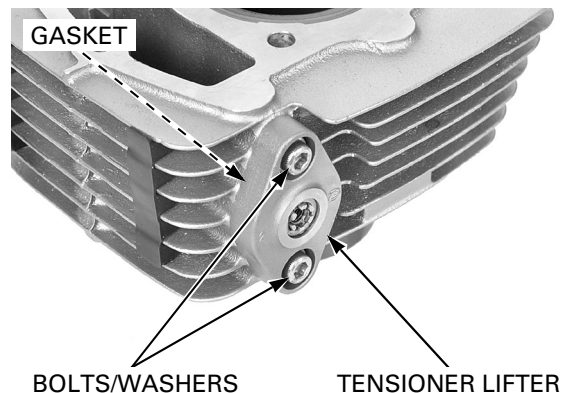


Remove the gasket and dowel pins.



Remove the following:

- Bolts
- Washers
- Cam chain tensioner lifter
- Gasket

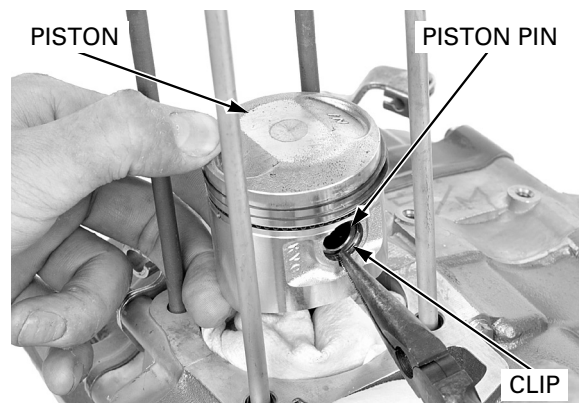


PISTON REMOVAL

Remove the piston pin clips with pliers.

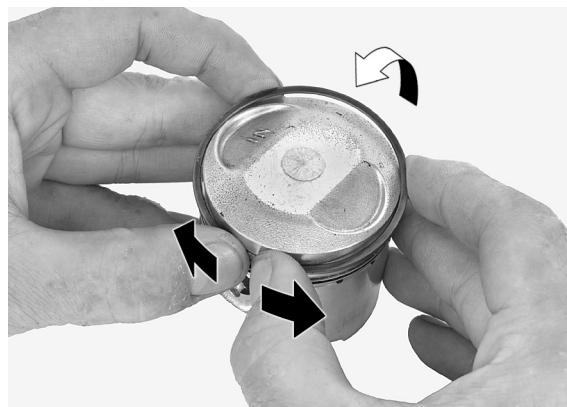
Place a clean shop towel over the crankcase to prevent the clips from falling into the crankcase.

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



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

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



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

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



INSPECTION

CYLINDER

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

SERVICE LIMIT: 56.60 mm (2.228 in)

Calculate the cylinder-to-piston clearance. Refer to page 8-6 for measurement of the piston O.D.

SERVICE LIMIT: 0.10 mm (0.004 in)



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

SERVICE LIMITS:

Taper: 0.10 mm (0.004 in)

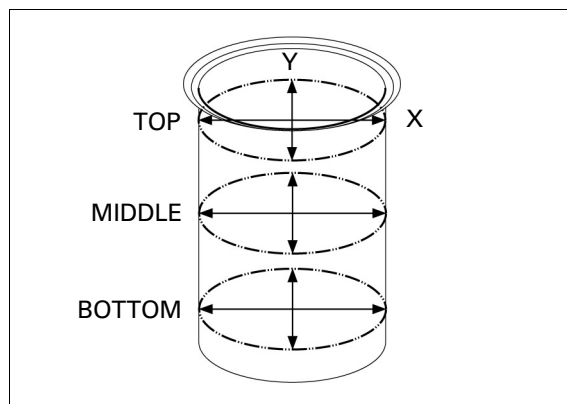
Out-of-round: 0.10 mm (0.004 in)

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

The following oversize pistons are available:

- 0.25 mm (0.010 in)
- 0.50 mm (0.020 in)
- 0.75 mm (0.030 in)
- 1.0 mm (0.04 in)

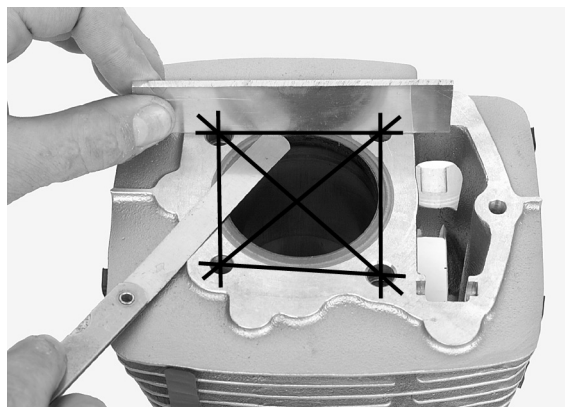
The cylinder must be rebored so the clearance for an oversize piston is 0.02 – 0.06 mm (0.0008 – 0.0024 in).



CYLINDER/PISTON

Check the top of the cylinder for warpage with a straight edge and feeler gauge across the stud holes.

SERVICE LIMIT: 0.05 mm (0.002 in)



PISTON/PISTON RING

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

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

SERVICE LIMITS:

Top: 0.09 mm (0.004 in)

Second: 0.09 mm (0.004 in)



Insert the piston ring into the bottom of the cylinder squarely using the piston crown.

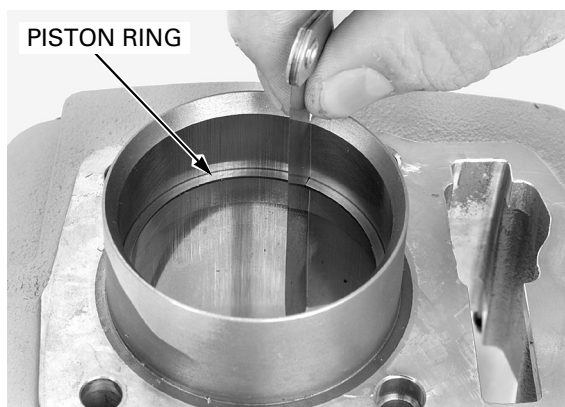
Measure the ring end gap.

SERVICE LIMITS:

Top: 0.40 mm (0.012 in)

Second: 0.40 mm (0.012 in)

Oil (side rail): 0.85 mm (0.033 in)



Measure the piston O.D. at a point 11.5 mm (0.45 in) from the bottom and 90° to the piston pin hole.

SERVICE LIMIT: 56.40 mm (2.220 in)

Compare this measurement against the maximum cylinder I.D. measurement and calculate the cylinder-to-piston clearance (page 8-5).



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

SERVICE LIMIT: 15.04 mm (0.592 in)

Measure the piston pin O.D. at three points.

SERVICE LIMIT: 14.96 mm (0.589 in)

Calculate the piston-to-piston pin clearance.

SERVICE LIMIT: 0.02 mm (0.001 in)



CONNECTING ROD

Measure the connecting rod small end I.D.

SERVICE LIMIT: 15.06 mm (0.593 in)

Calculate the connecting rod-to-piston pin clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)



CYLINDER/PISTON INSTALLATION

PISTON RING INSTALLATION

Be careful not to damage the piston and rings.

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

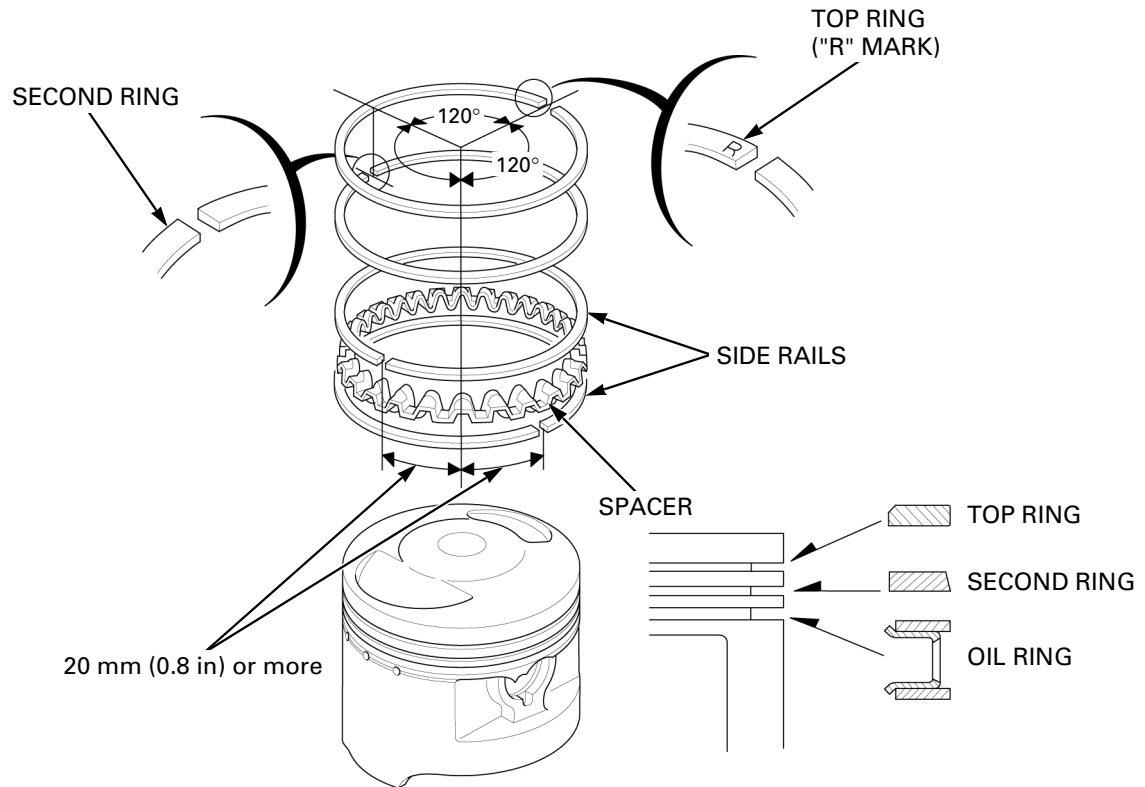
NOTE:

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

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

Stagger the side rail end gaps as shown.

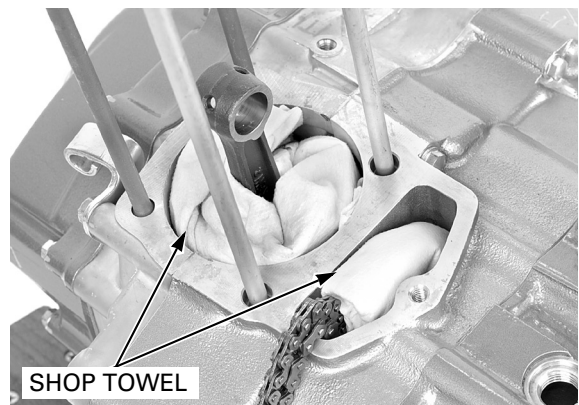
After installation, the rings should rotate freely in the ring groove.



PISTON INSTALLATION

Place a clean shop towel over the crankcase to prevent the gasket material, piston pin clip or other parts falling into the crankcase.

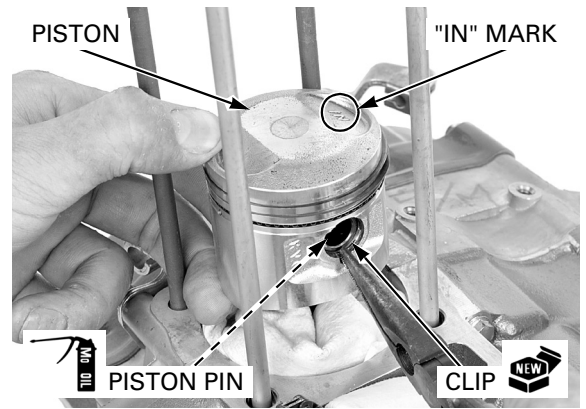
Clean the gasket surface of the crankcase thoroughly, being careful not to damage them.



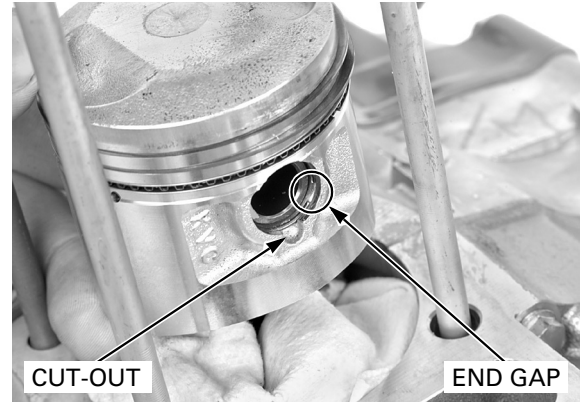
Apply molybdenum oil solution to the piston pin whole surface.

Install the piston with the "IN" mark facing toward the intake side.
Insert the piston pin through the piston and connecting rod.

Install new piston pin clips.

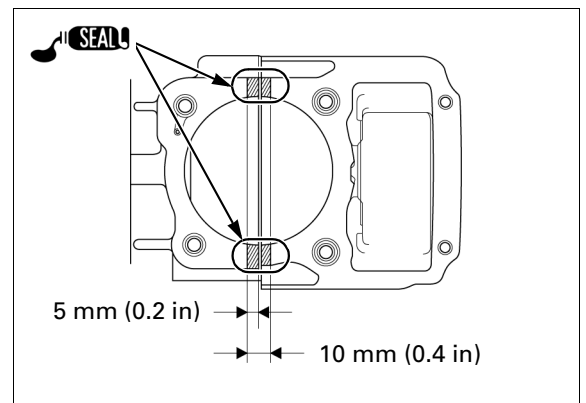


Make sure the piston pin clips are seated securely.
Do not align the clip end gap with the piston cut-out.



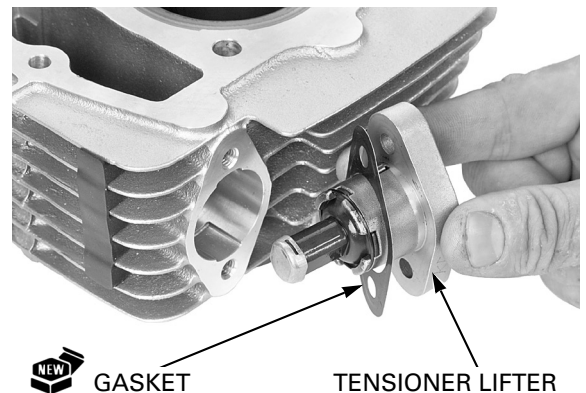
CYLINDER INSTALLATION

Apply liquid sealant (THREE BOND #1141 or equivalent) to the crankcase mating areas as shown.



Install a new gasket onto the cam chain tensioner lifter.

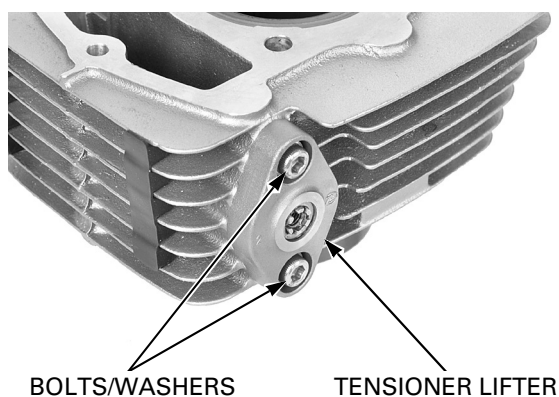
Install the cam chain tensioner lifter.



CYLINDER/PISTON

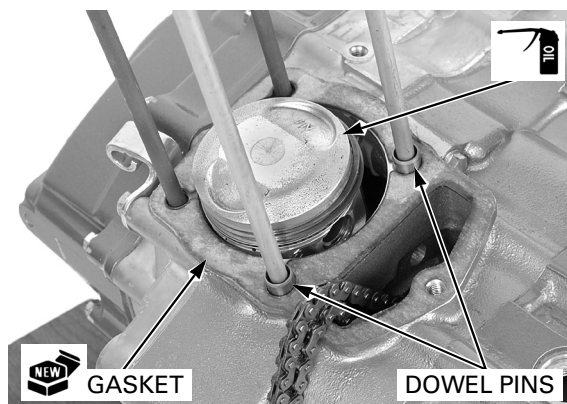
Install the cam chain tensioner lifter bolts with washers and tighten them to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Install the dowel pins and a new gasket.

Apply engine oil to the piston whole surface and piston rings.



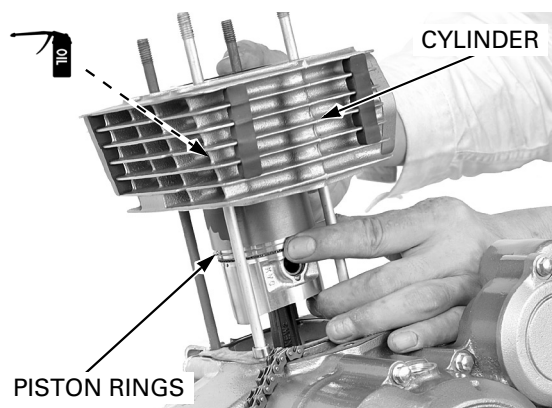
Apply engine oil to the cylinder wall.

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

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

Make sure that the cylinder touches the crankcase evenly.

Install the cylinder head (page 7-19).

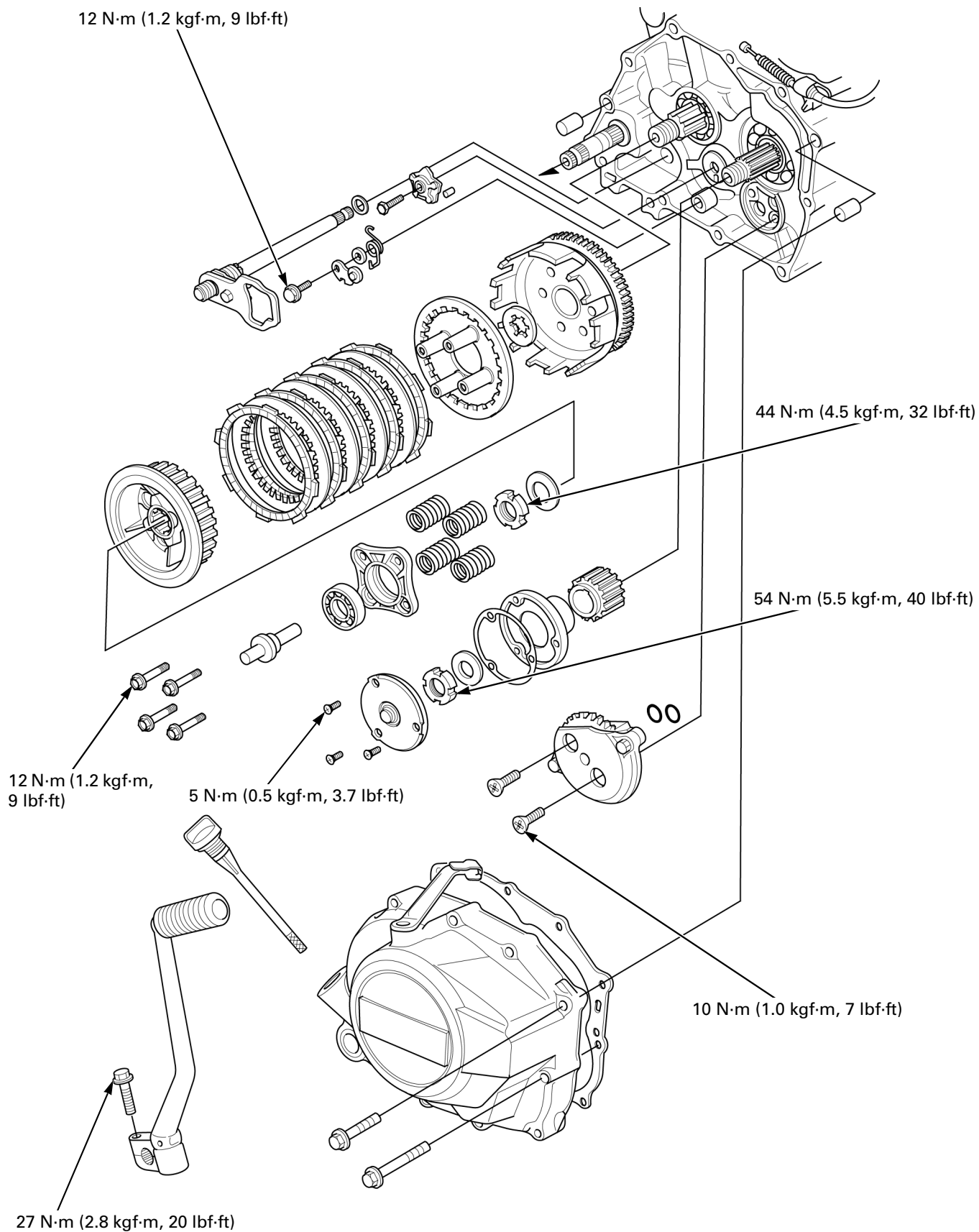


9. CLUTCH/GEARSHIFT LINKAGE

COMPONENT LOCATION	9-2	CLUTCH LIFTER ARM	9-6
SERVICE INFORMATION	9-3	CLUTCH	9-7
TROUBLESHOOTING	9-4	GEARSHIFT LINKAGE	9-12
RIGHT CRANKCASE COVER REMOVAL...	9-5	RIGHT CRANKCASE COVER INSTALLATION	9-14

CLUTCH/GEARSHIFT LINKAGE

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- This section covers maintenance of the clutch, gearshift linkage and right crankcase cover. These services can be performed with the engine installed in the frame.
- Engine oil viscosity and level have an effect on clutch disengagement. When the clutch does not disengage or the motorcycle creeps with clutch disengaged, inspect the engine oil and oil level before servicing the clutch system.

SPECIFICATIONS

Unit: mm (in)

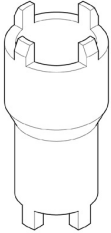
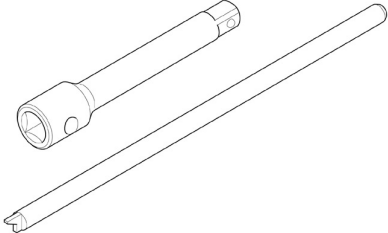
ITEM		STANDARD	SERVICE LIMIT
Clutch lever free play		10 – 20 (3/8 – 13/16)	–
Clutch	Spring free length	35.50 (1.398)	34.20 (1.346)
	Disc thickness	2.80 – 2.90 (0.110 – 0.114)	2.6 (0.10)
	Plate warpage	–	0.20 (0.008)

TORQUE VALUES

Clutch lifter plate bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Shift drum stopper arm bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Clutch center lock nut	44 N·m (4.5 kgf·m, 32 lbf·ft)
Kickstarter pedal pinch bolt	27 N·m (2.8 kgf·m, 20 lbf·ft)
Footpeg bar mounting bolt	27 N·m (2.8 kgf·m, 20 lbf·ft)

Apply engine oil to the threads and seating surface.

TOOLS

Lock nut wrench, 20 x 24 mm 07716-0020100 	Extension bar 07716-0020500 	Clutch center holder 07GMB-KT70101 
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CLUTCH/GEARSHIFT LINKAGE

TROUBLESHOOTING

Faulty clutch operation can usually be corrected by adjusting the free play.

Clutch lever difficult to pull in

- Damaged, kinked or dirty clutch cable
- Improperly routed clutch cable
- Damaged clutch lifter mechanism
- Faulty clutch lifter plate bearing

Clutch will not disengage or motorcycle creeps with clutch disengaged

- Excessive clutch lever free play
- Clutch plate warped
- Oil level too high, improper oil viscosity, or additive used
- Check for oil additive

Clutch slips

- Clutch lifter sticking
- Worn clutch discs
- Weak clutch springs
- Incorrect clutch adjustment
- Check for oil additive

Hard to shift

- Misadjusted clutch lever free play
- Damaged or bent shift fork (page 11-10)
- Bent shift fork shaft (page 11-10)
- Incorrect engine oil viscosity
- Incorrect gearshift spindle assembly
- Damaged shift drum guide grooves (page 11-10)

Transmission jumps out of gear

- Worn shift drum stopper arm
- Worn or broken gearshift spindle return spring
- Bent shift fork shaft (page 11-10)
- Damaged shift drum guide grooves (page 11-10)
- Worn gear dogs or dog holes (page 11-8)

Gearshift pedal will not return

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

RIGHT CRANKCASE COVER REMOVAL

Drain engine oil (page 3-12).

Remove the exhaust pipe/muffler (page 2-10).

Remove the footpeg bar mounting bolts, washers and footpeg bar.

When removing the kickstarter pedal, mark the pedal position to ensure correct reassembly in its original position.

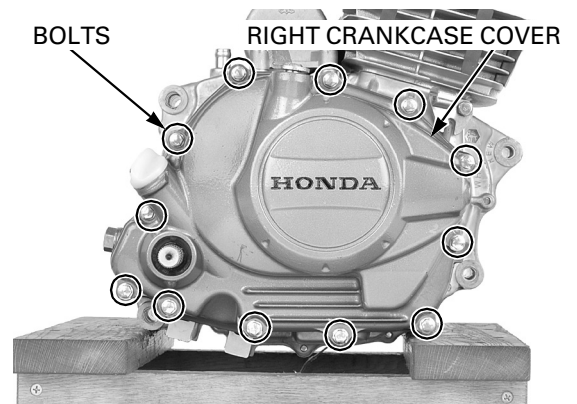
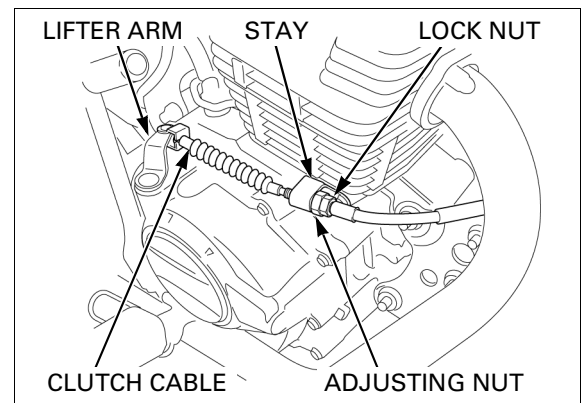
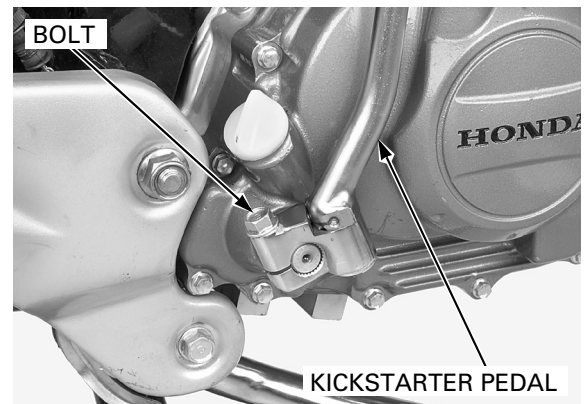
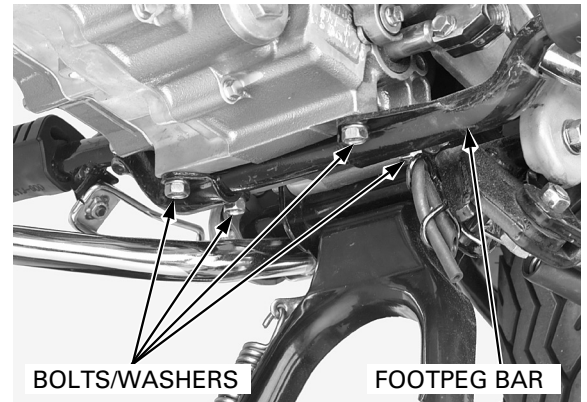
Remove the pinch bolt and kickstarter pedal.

Loosen the clutch cable lock nut and clutch cable adjusting nut.

Release the clutch cable from the stay and disconnect the clutch cable end from the lifter arm.

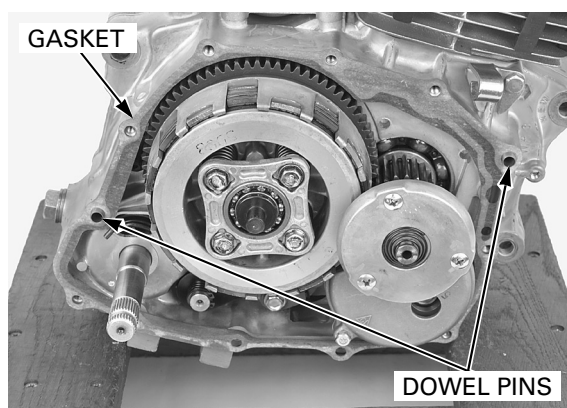
Loosen the bolts in a crisscross pattern in several steps.

Remove the bolts and right crankcase cover.



CLUTCH/GEARSHIFT LINKAGE

Remove the gasket and dowel pins.

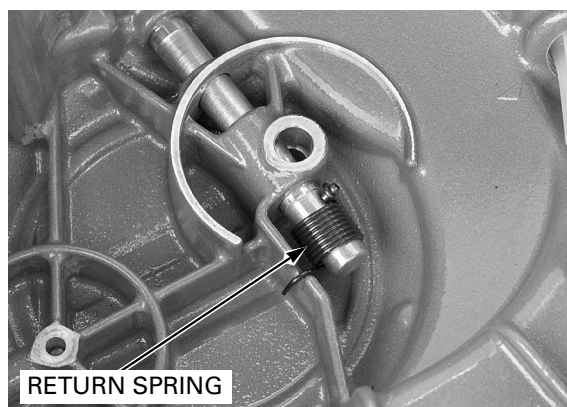


CLUTCH LIFTER ARM

REMOVAL

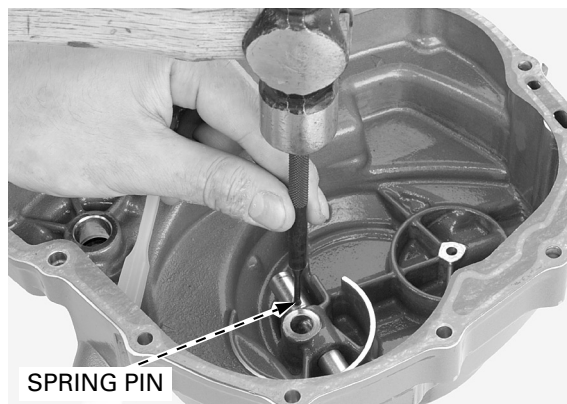
Remove the right crankcase cover (page 9-5).

Remove the return spring.



Measure and record the length of spring pin protrusion.

Drive the spring pin into the clutch lifter arm until the pin end is flush with the lifter arm surface, using the commercially available 3 mm pin driver.



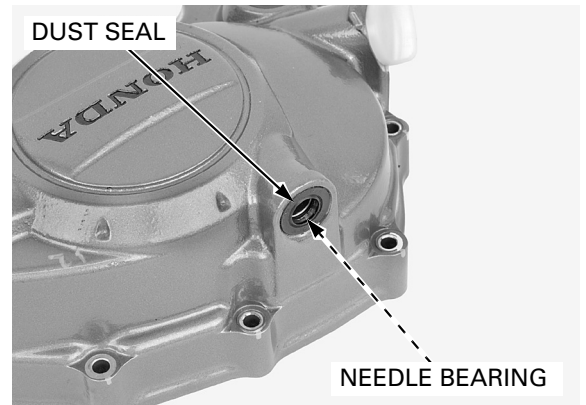
INSPECTION

Check the lifter arm for wear or damage.

Check the return spring for fatigue or damage.



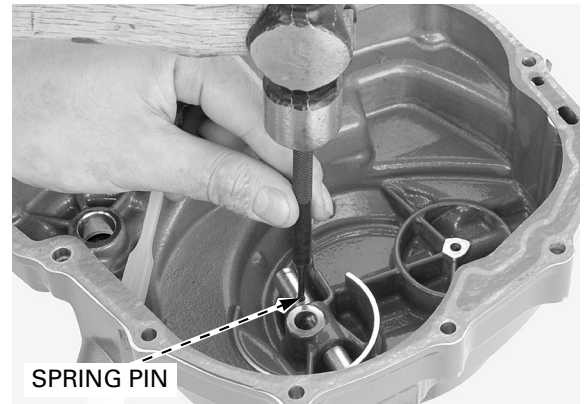
Check the dust seal for fatigue or damage and replace it if necessary.
Check the needle bearing for wear or damage and replace it if necessary.



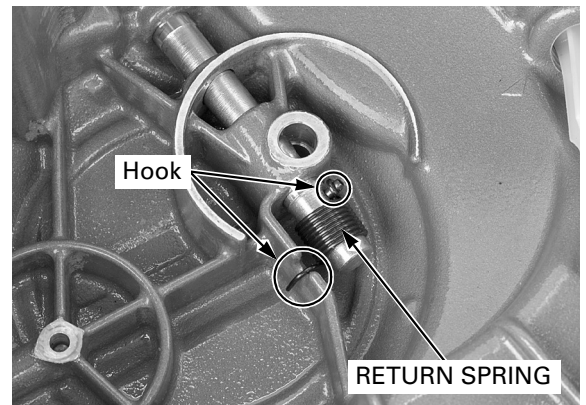
INSTALLATION

Install the clutch lifter arm.

Drive the spring pin until it projects the same amount as recorded at removal, using the commercially available 3 mm pin driver.



Install the return spring and hook its ends as shown.
Install the right crankcase cover (page 9-14).



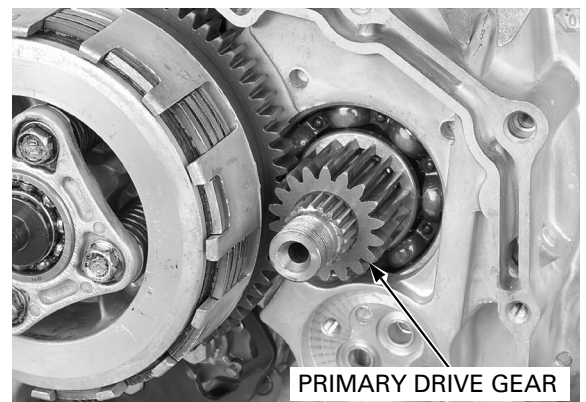
CLUTCH

REMOVAL

Remove the following:

- Right crankcase cover (page 9-5)
- Oil centrifugal filter (page 4-9)

Remove the primary drive gear.

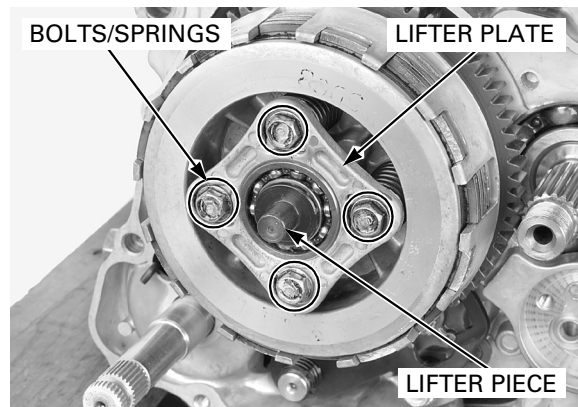


CLUTCH/GEARSHIFT LINKAGE

Remove the clutch lifter piece.

*Loosen the bolts in
a crisscross pattern
in several steps.*

Remove the clutch bolts, clutch lifter plate and clutch spring.

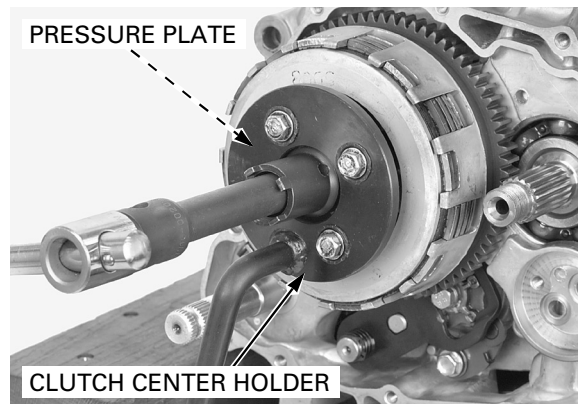


Attach the clutch center holder to the pressure plate using four clutch bolts to hold the clutch center. Loosen the clutch center lock nut using the special tools.

TOOLS:

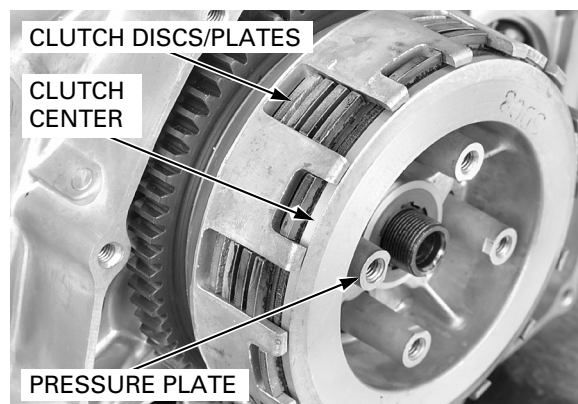
Lock nut wrench, 20 x 24 mm	07716-0020100
Extension bar	07716-0020500
Clutch center holder	07GMB-KT70101

Remove the special tools, lock nut and lock washer.



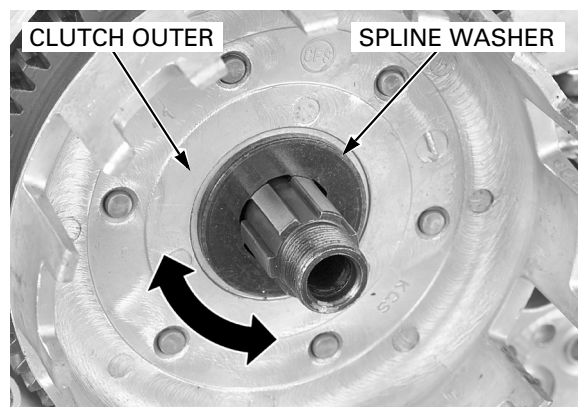
Remove the following:

- Clutch center
- Clutch discs
- Clutch plates
- Pressure plate



Rotate and align the spline washer teeth with main-shaft grooves.

Remove the spline washer and clutch outer.



INSPECTION

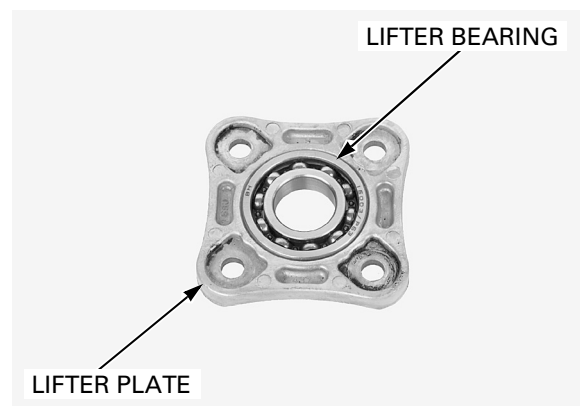
Clutch lifter piece

Visually inspect the clutch lifter piece for wear or damage.



Clutch lifter bearing

Turn the inner race of the lifter bearing with your finger. The bearing should turn smoothly and quietly. Also check that the outer race of the bearing fits tightly in the lifter plate. Replace the bearing if the inner race does not turn smoothly, quietly, or if the outer race fits loosely in the lifter plate.

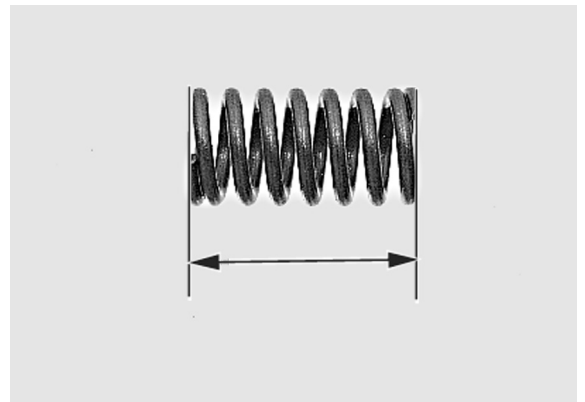


Clutch spring

Replace the clutch springs as a set.

Measure the clutch spring free length.

SERVICE LIMIT: 34.20 mm (1.346 in)



Clutch disc

Replace the clutch discs and plates as a set.

Check the clutch discs for signs of scoring or discoloration.

Measure the thickness of each disc.

SERVICE LIMIT: 2.6 mm (0.10 in)



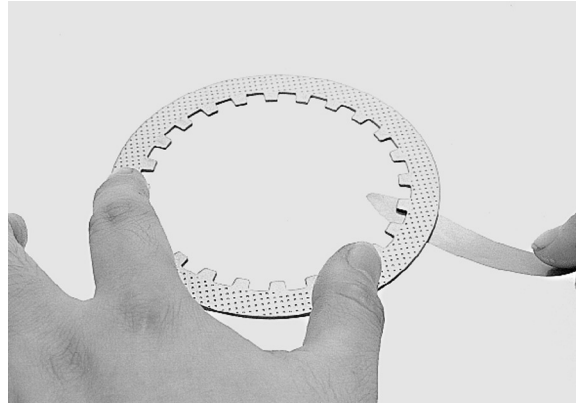
CLUTCH/GEARSHIFT LINKAGE

Clutch plate

Replace the clutch discs and plates as a set.

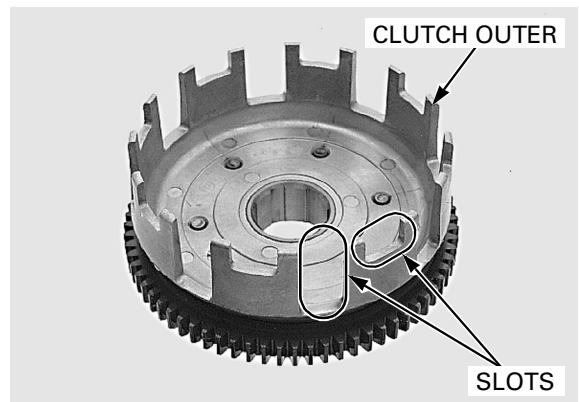
Check the plate for discoloration.
Check the clutch plate for warpage on a surface plate by using a feeler gauge.

SERVICE LIMIT: 0.20 mm (0.008 in)



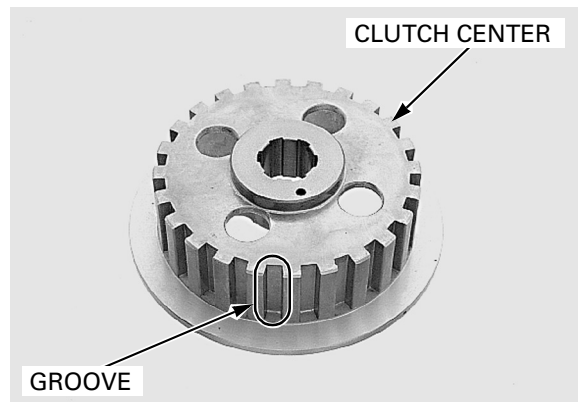
Clutch outer

Check the slots in the clutch outer for nicks, cuts or indentations made by the clutch discs.



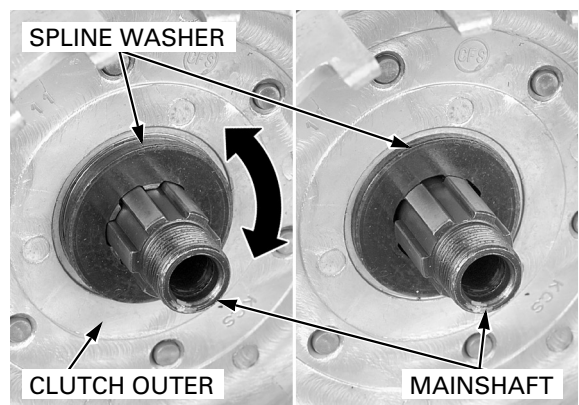
Clutch center

Check the grooves of the clutch center for damage or wear caused by the clutch plates.



INSTALLATION

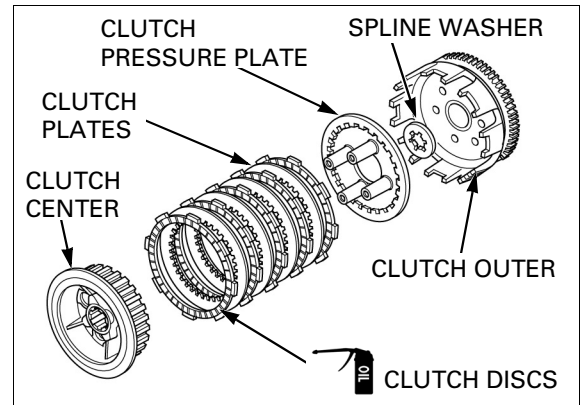
Install the clutch outer and spline washer.
Rotate and align the spline washer teeth with main-shaft spline teeth.



CLUTCH/GEARSHIFT LINKAGE

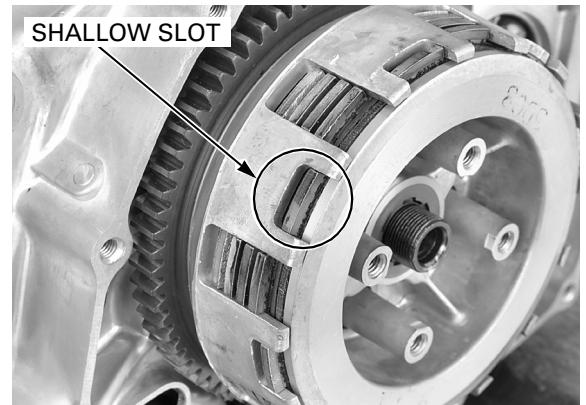
Coat the clutch discs with engine oil.

Assemble the clutch discs, clutch plates and pressure plates onto clutch center.

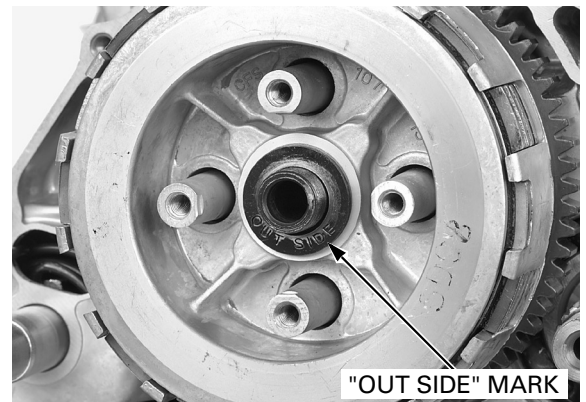


Install the clutch center assembly into the clutch outer.

Install the outside clutch disc tabs into the shallow slots of the clutch outer.



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



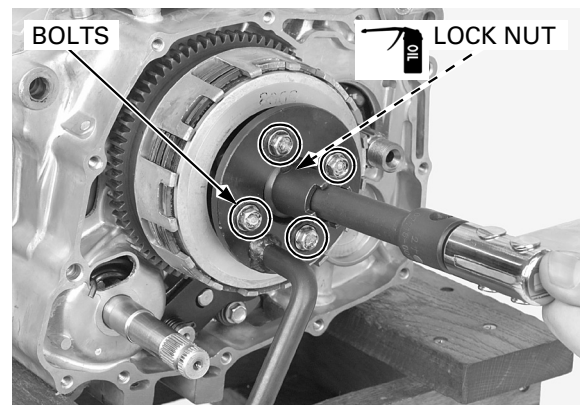
Apply engine oil to the threads and seating surface of the lock nut and install it with the chamfered side facing in.

Attach the clutch center holder to the pressure plate using the clutch bolts to hold the clutch center. Tighten the clutch center lock nut using the special tools.

TOOLS:

Lock nut wrench, 20 x 24 mm	07716-0020100
Extension bar	07716-0020500
Clutch center holder	07GMB-KT70101

TORQUE: 44 N·m (4.5 kgf·m, 32 lbf·ft)



CLUTCH/GEARSHIFT LINKAGE

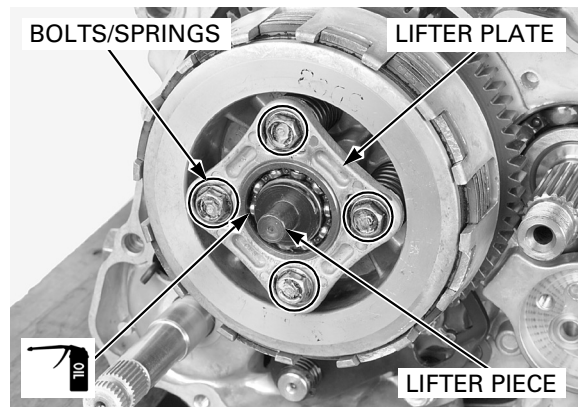
Apply engine oil to the clutch lifter plate bearing.

Install the clutch springs, lifter plate and bolts.

Tighten the lifter plate bolts in a crisscross pattern in several steps.

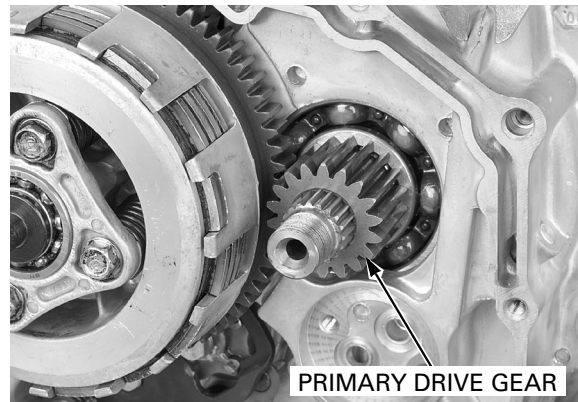
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the clutch lifter piece.



Install the following:

- Primary drive gear
- Oil centrifugal filter (page 4-10)
- Right crankcase cover (page 9-14)



GEARSHIFT LINKAGE

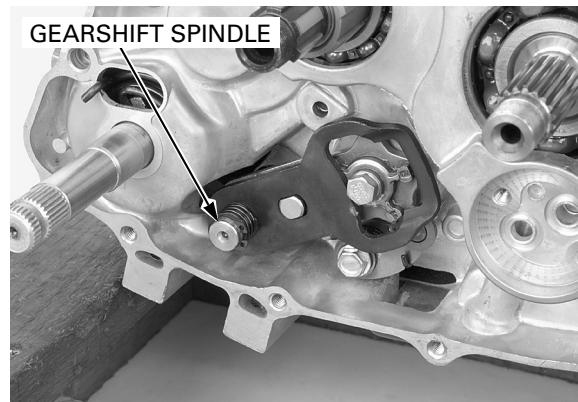
REMOVAL

Remove the following:

- Oil centrifugal filter (page 4-9)
- Clutch (page 9-7)
- Oil pump (page 4-5)
- Gearshift pedal (page 10-4)

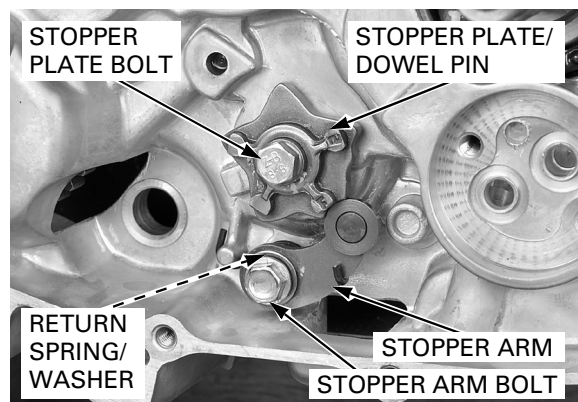
Clean the gearshift spindle and gearshift pedal contact area.

Pull the gearshift spindle out of the crankcase.



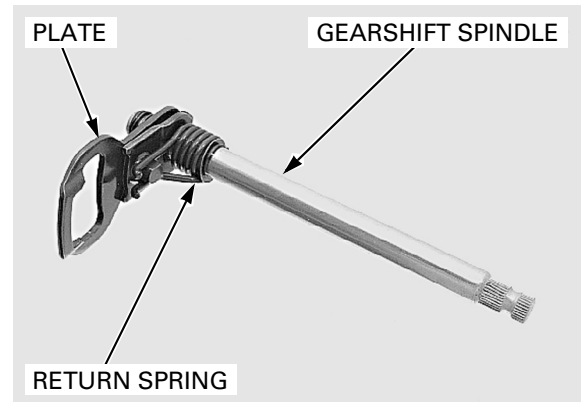
Remove the following:

- Stopper plate bolt
- Shift drum stopper plate
- Dowel pin from the shift drum
- Stopper arm bolt
- Stopper arm
- Washer
- Return spring



INSPECTION

Check the gearshift spindle for wear or bend.
Check the spindle plate for wear, damage or deformation.
Check the return spring for fatigue or damage.

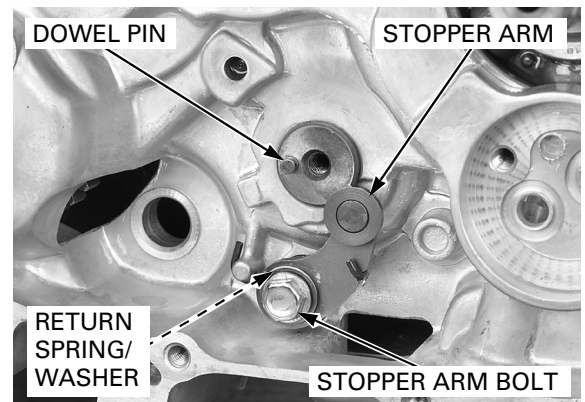


INSTALLATION

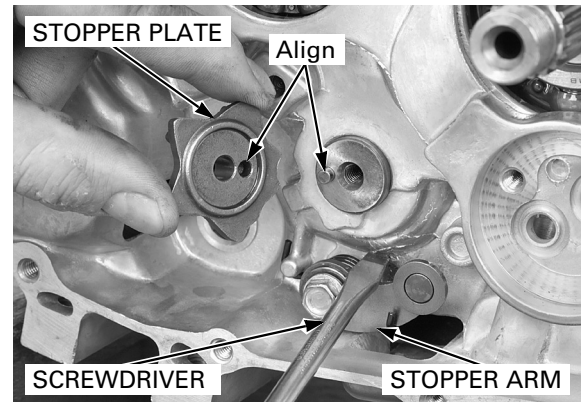
Install the dowel pin into the hole of the shift drum.

Install the return spring, washer, stopper arm and bolt, then tighten the bolt to the specified torque.

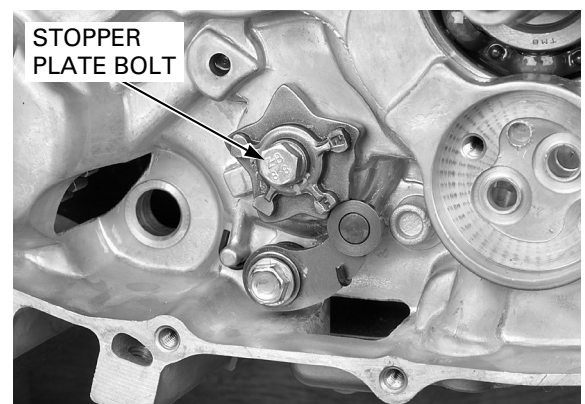
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Hold the stopper arm using a screwdriver and install the stopper plate by aligning its hole with the dowel pin.



Install and tighten the stopper plate bolt.



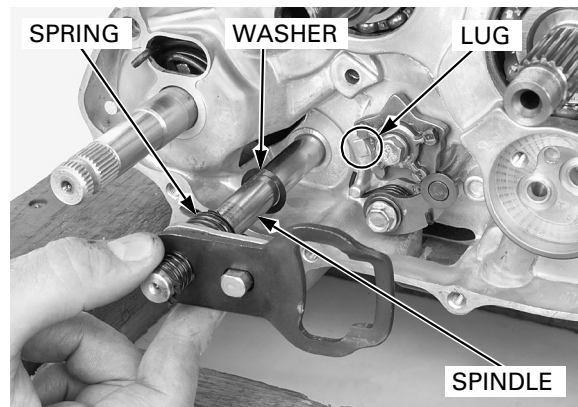
CLUTCH/GEARSHIFT LINKAGE

Install the washer onto the gearshift spindle.

Install the gearshift spindle with the return spring attached to the lug on the crankcase.

Install the following:

- Oil pump (page 4-9)
- Clutch (page 9-10)
- Oil centrifugal filter (page 4-10)
- Gearshift pedal (page 10-13)

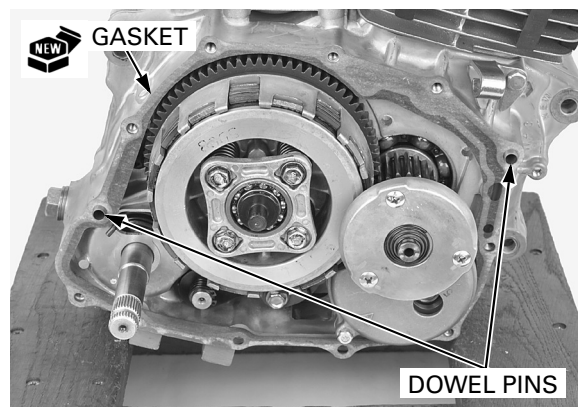


RIGHT CRANKCASE COVER INSTALLATION

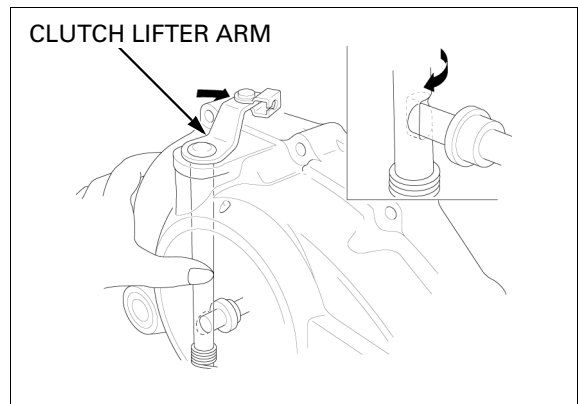
Be careful not to damage the mating surfaces.

Clean off any gasket material from the mating surfaces of the right crankcase and cover.

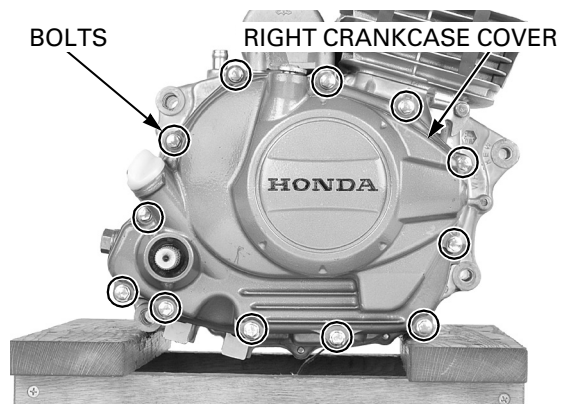
Install the dowel pins and new gasket.



Install the right crankcase cover while turning the clutch lifter arm clockwise to engage the lifter arm spindle groove with the lifter piece flanges as shown.

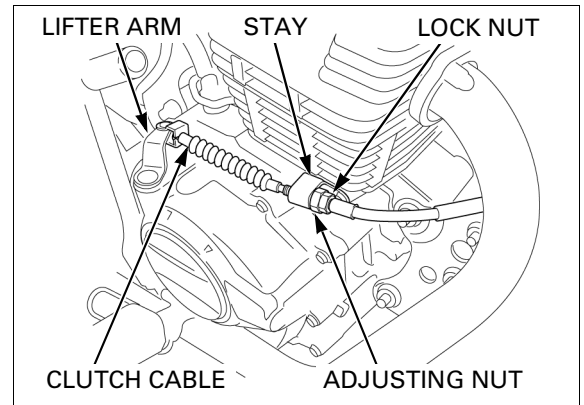


Install and tighten the bolts in a crisscross pattern in several steps.



CLUTCH/GEARSHIFT LINKAGE

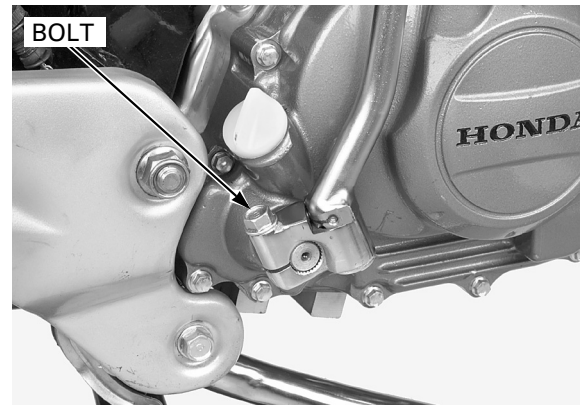
Connect the clutch cable end to the lifter arm and set the clutch cable to the stay.



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

Install and tighten the pinch bolt to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)



Install the footpeg bar mounting bolts and washers.

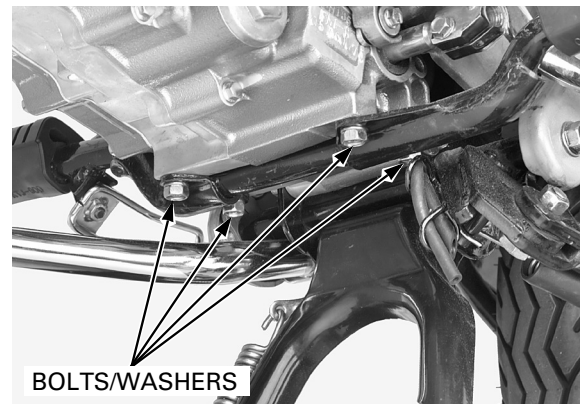
Tighten the footpeg bar mounting bolts to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

Install the exhaust pipe/muffler (page 2-11).

Adjust the clutch lever free play (page 3-22).

Fill the crankcase with the recommended engine oil (page 3-11).

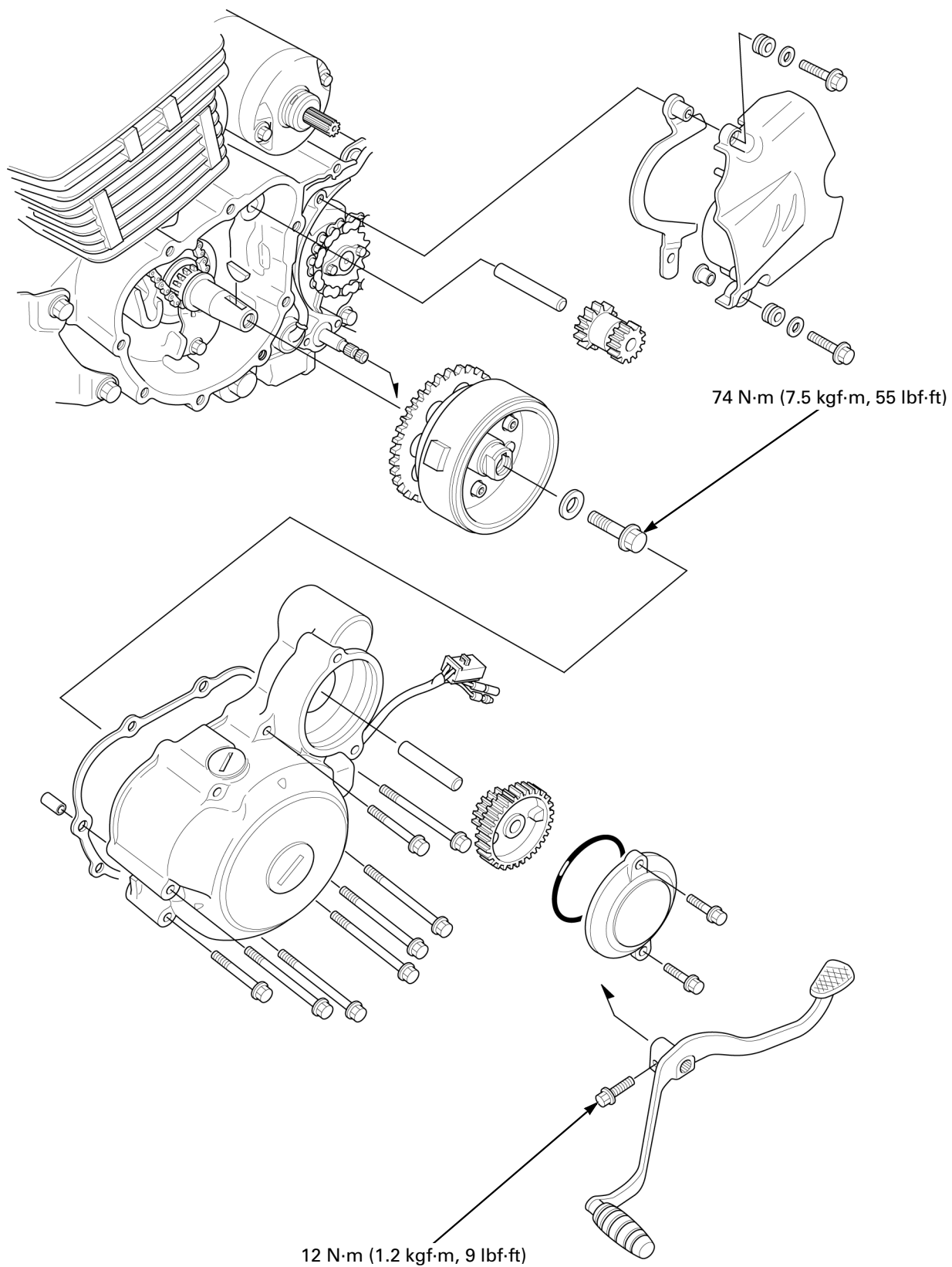


MEMO

10. ALTERNATOR/STARTER CLUTCH

COMPONENT LOCATION	10-2	FLYWHEEL REMOVAL	10-7
SERVICE INFORMATION	10-3	STARTER CLUTCH	10-8
TROUBLESHOOTING	10-3	FLYWHEEL INSTALLATION	10-12
LEFT CRANKCASE COVER REMOVAL ...	10-4	LEFT CRANKCASE COVER INSTALLATION	10-13
STATOR/IGNITION PULSE GENERATOR	10-5		

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- This section covers the removal and installation of the alternator stator, flywheel and starter clutch. These services can be done with the engine installed in the frame.
- For alternator inspection (page 15-11).
- For starter motor servicing (page 17-6).

SPECIFICATION

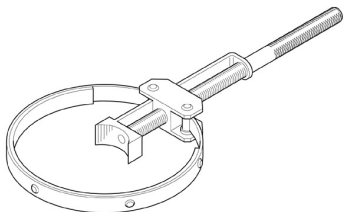
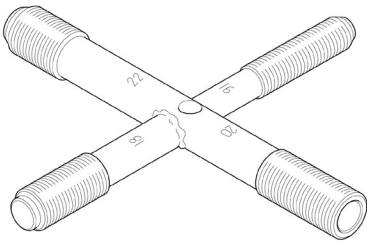
Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Starter driven gear	O.D.	45.660 – 45.673 (1.7976 – 1.7981)	45.60 (1.795)
	I.D.	22.010 – 22.031 (0.8665 – 0.8674)	22.08 (0.869)
Crankshaft left side shaft O.D.		21.947 – 21.980 (0.8641 – 0.8654)	21.91 (0.863)
Starter driven gear-to-crankshaft left side shaft clearance		0.030 – 0.084 (0.0012 – 0.0033)	0.23 (0.009)

TORQUE VALUES

Starter clutch socket bolt	16 N·m (1.6 kgf·m, 12 lbf·ft)	Apply a locking agent to the threads.
Flywheel bolt	74 N·m (7.5 kgf·m, 55 lbf·ft)	Apply engine oil to the threads and seating surface.
Ignition pulse generator mounting bolt	5 N·m (0.5 kgf·m, 3.7 lbf·ft)	Apply a locking agent to the threads.
Stator mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Gearshift pedal pinch bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	

TOOLS

<p>Flywheel holder 07725-0040000</p> 	<p>Flywheel puller 07733-0020001</p> 
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TROUBLESHOOTING

Starter motor turns, but engine does not start

- Faulty starter clutch
- Damaged reduction gear, starter idle gear and driven gear

ALTERNATOR/STARTER CLUTCH

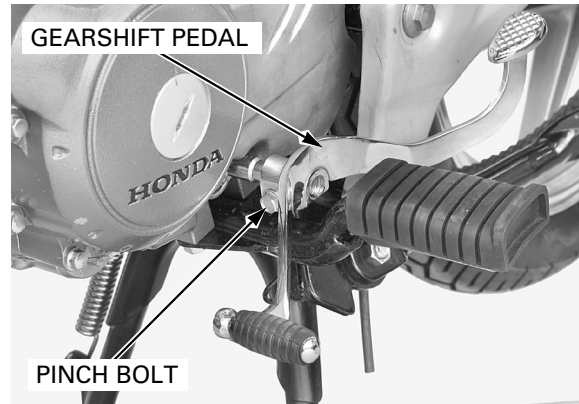
LEFT CRANKCASE COVER REMOVAL

Remove the following:

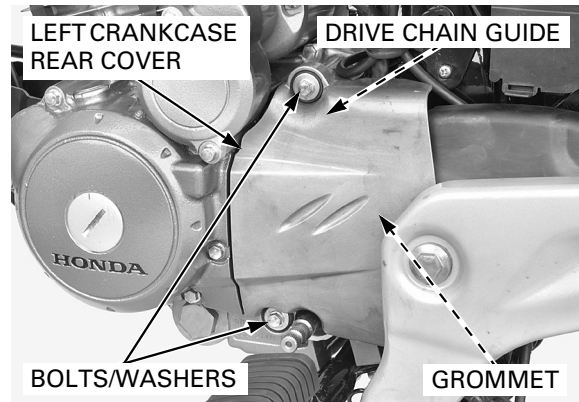
- Left side cover (page 2-3)
- Turn signal relay (page 18-18)

When removing the gearshift pedal, mark the pedal position to ensure correct reassembly in its original position.

Remove the pinch bolt and gearshift pedal.

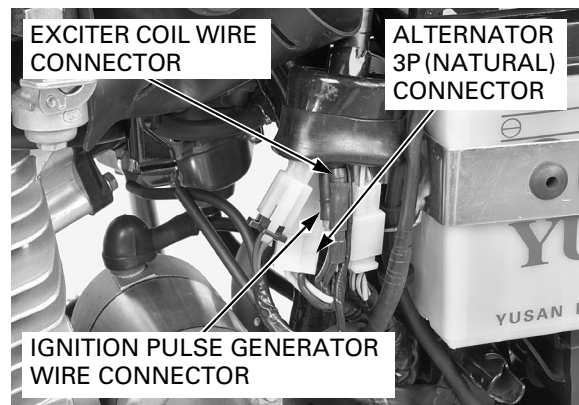


Remove the bolts, washers, left crankcase rear cover, grommet, collar and the drive chain guide.



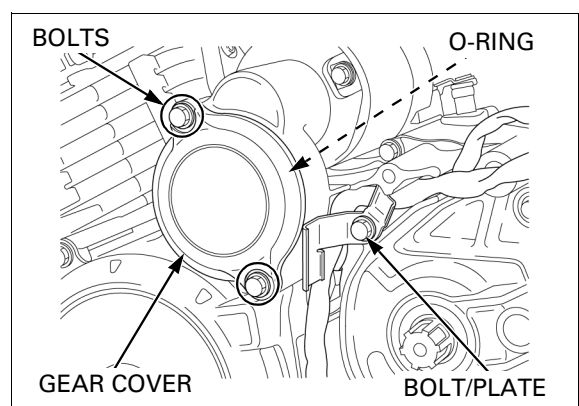
Disconnect the following:

- Alternator 3P (Natural) connector
- Black/red exciter coil wire connector
- Blue/yellow ignition pulse generator wire connector

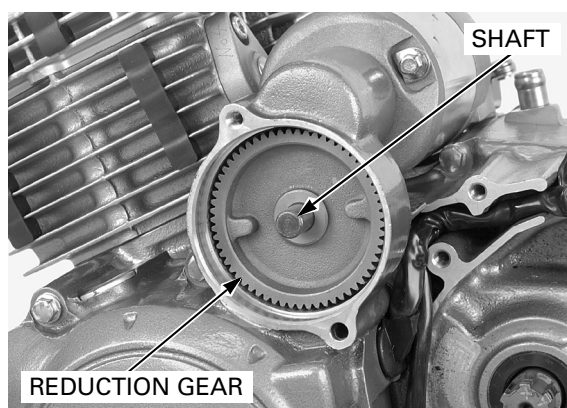


Remove the bolts, starter reduction gear cover and O-ring.

Remove the bolt and wire guide plate.



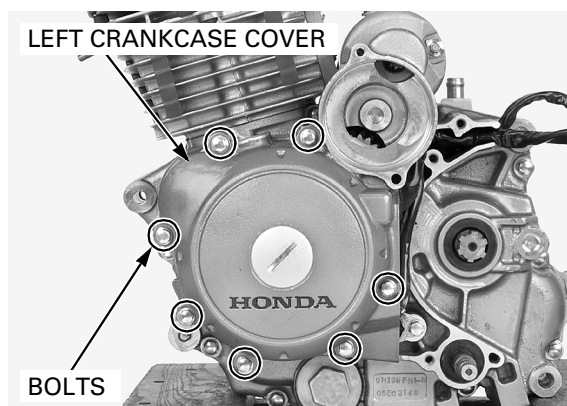
Remove the reduction gear shaft and starter reduction gear.



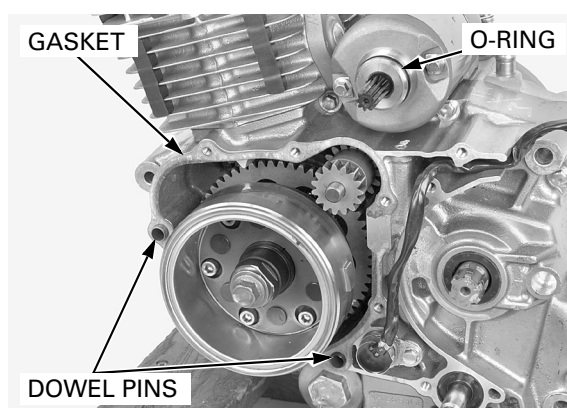
Loosen the left crankcase cover bolts in a crisscross pattern in several steps.

The left crankcase cover (stator) is magnetically attached to the fly-wheel, be careful when removing the cover.

Remove the left crankcase cover bolts and cover.



Remove the dowel pins and gasket.
Remove the O-ring from the starter motor.

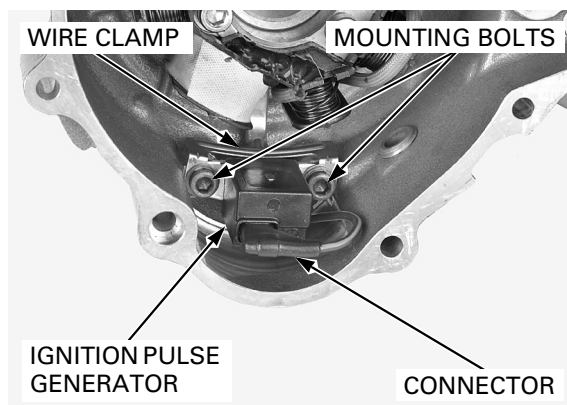


STATOR/IGNITION PULSE GENERATOR

REMOVAL

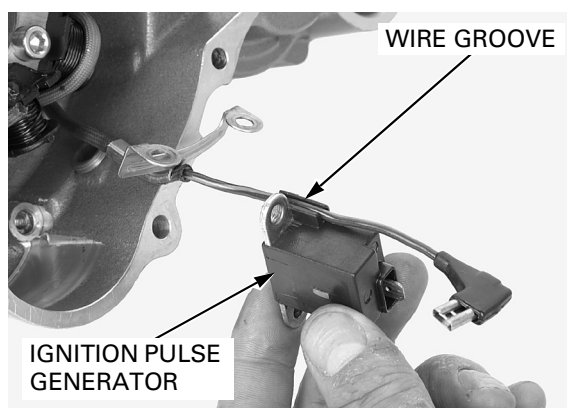
Remove the left crankcase cover (page 10-4).

Disconnect the ignition pulse generator connector.
Remove the mounting bolts, wire clamp and ignition pulse generator.



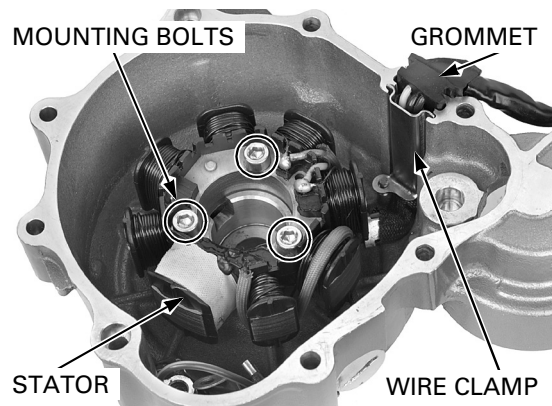
ALTERNATOR/STARTER CLUTCH

Remove the ignition pulse generator wire from the groove.

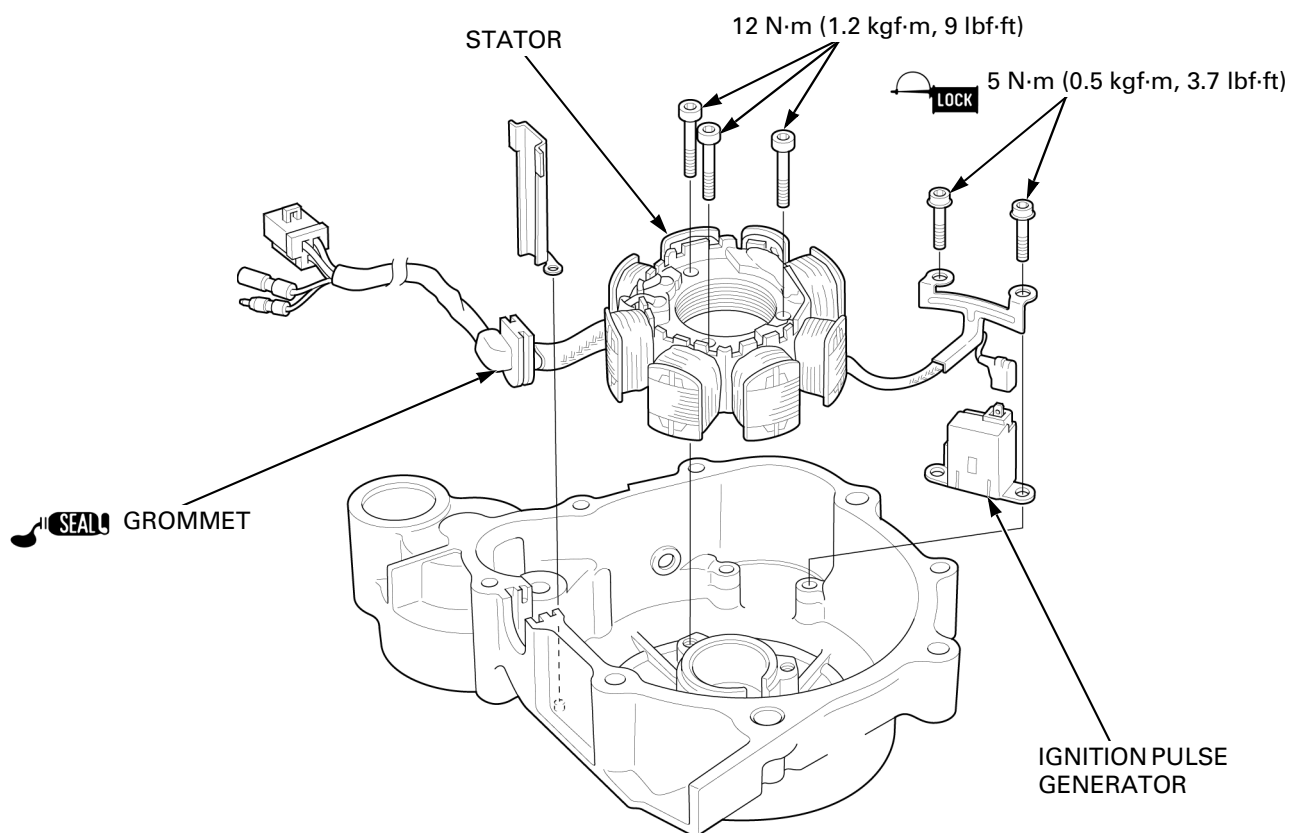


Remove the following:

- Wire clamp
- Grommet
- Mounting bolts
- Stator



INSTALLATION



Place the stator into the left crankcase cover.
Apply liquid sealant (THREE BOND #1141 or equivalent) to the wire grommet seating surface and install the grommet into the groove of the left crankcase cover.
Tighten the stator mounting bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

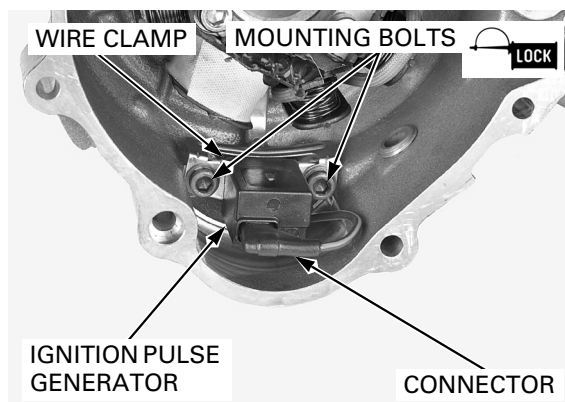
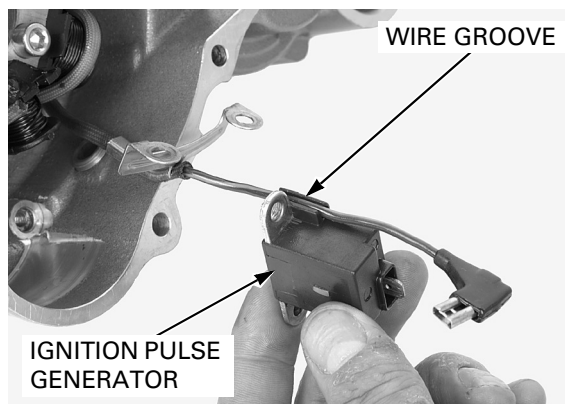
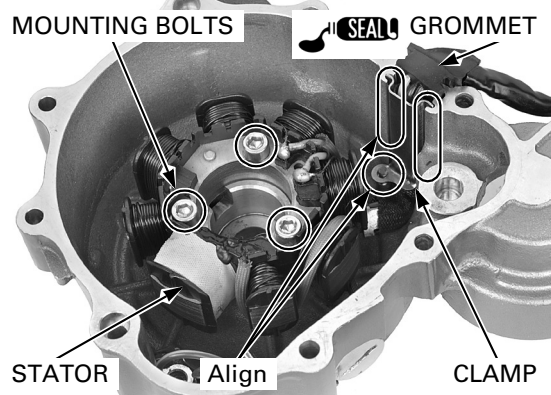
Install the wire clamp while aligning its tabs with the grooves of the left crankcase and hole of the wire clamp with the tab of the left crankcase.

Route the ignition pulse generator wire into the wire groove as shown.

Apply locking agent to the ignition pulse generator mounting bolt threads.
Install the ignition pulse generator, wire clamp and mounting bolts into the left crankcase cover.
Tighten the ignition pulse generator mounting bolts to the specified torque.

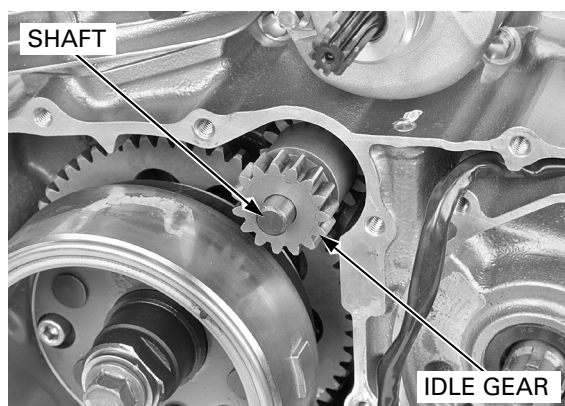
TORQUE: 5 N·m (0.5 kgf·m, 3.7 lbf·ft)

Connect the ignition pulse generator connector.
Install the left crankcase cover (page 10-13).



FLYWHEEL REMOVAL

Remove the left crankcase cover (page 10-4).
Remove the starter idle gear and shaft.



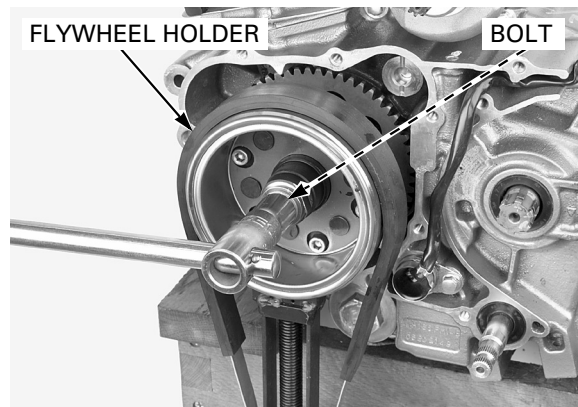
ALTERNATOR/STARTER CLUTCH

Remove the flywheel bolt while holding the flywheel using the special tool.

TOOL:

Flywheel holder

07725-0040000

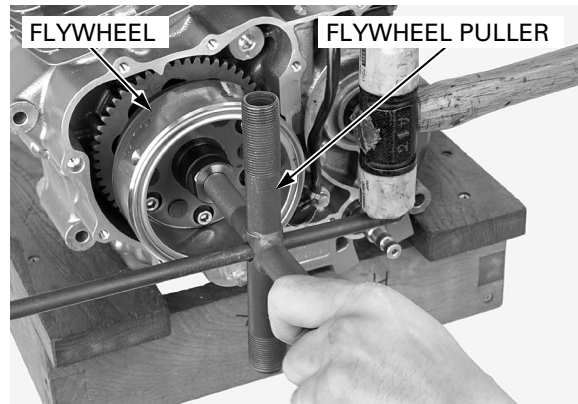


Remove the flywheel using the special tool.

TOOL:

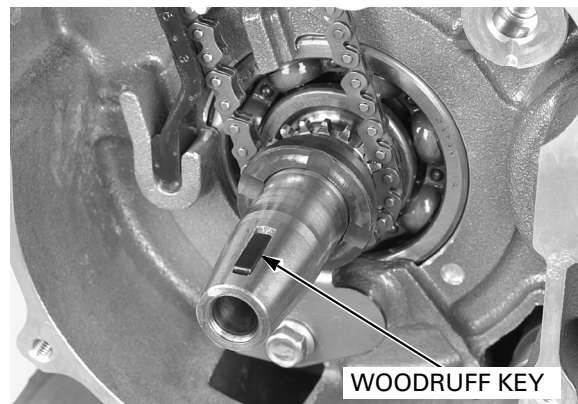
Flywheel puller

07733-0020001



When removing the woodruff key, be careful not to damage the key groove and crankshaft.

Remove the woodruff key.

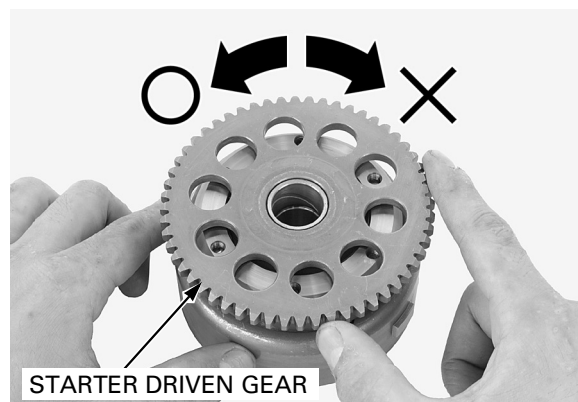


STARTER CLUTCH

REMOVAL

Remove the flywheel (page 10-7).

Remove the starter driven gear from the flywheel while turning the driven gear counterclockwise.

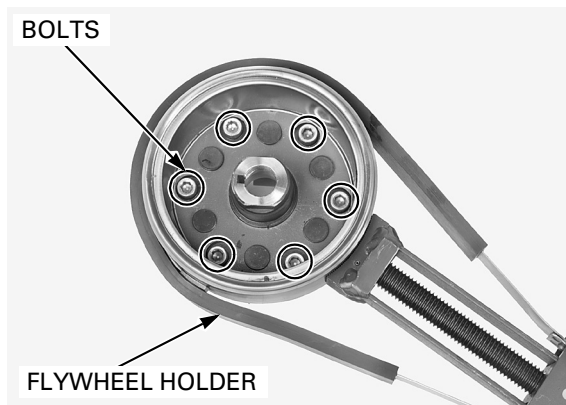


Remove the starter clutch socket bolts while holding the flywheel using the special tool.

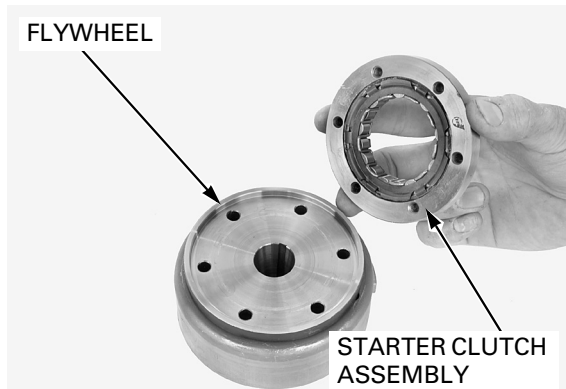
TOOL:

Flywheel holder

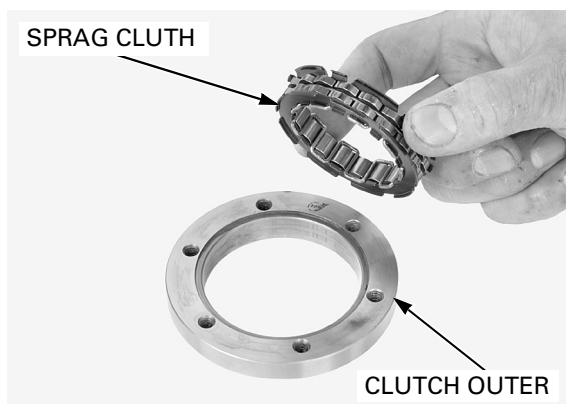
07725-0040000



Remove the starter clutch assembly from the flywheel.



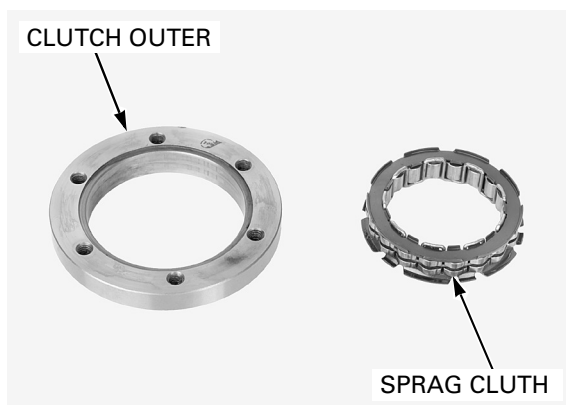
Remove the sprag clutch from the clutch outer.



INSPECTION

Check the sprag clutch for abnormal wear, damage or irregular movement.

Check the sprag contacting surface of the clutch outer for abnormal wear or damage.



ALTERNATOR/STARTER CLUTCH

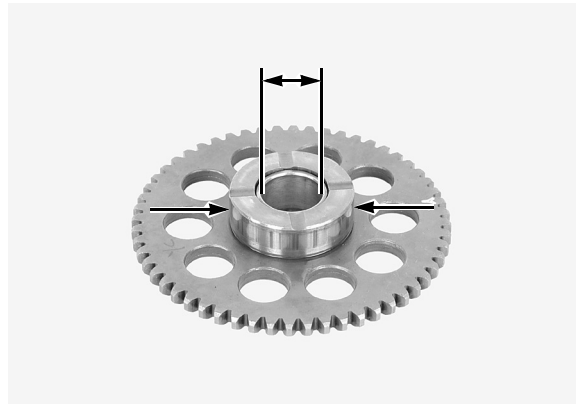
Check the sprag contacting surface and crankshaft contacting surface of the stator driven gear for abnormal wear or damage.

Measure the starter driven gear boss O.D. and I.D.

SERVICE LIMITS:

O.D. : 45.60 mm (1.795 in)

I.D. : 22.08 mm (0.869 in)



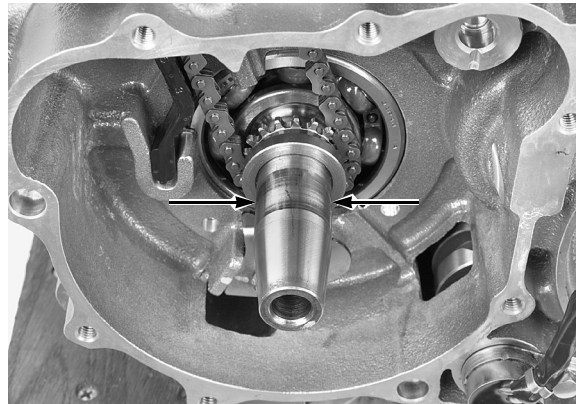
Check the starter driven gear contacting surface of the crankshaft for abnormal wear or damage.

Measure the left side crankshaft O.D.

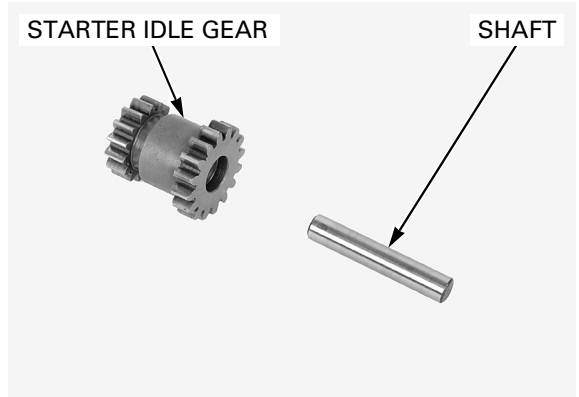
SERVICE LIMIT: 21.91 mm (0.863 in)

Calculate the starter driven gear-to-crankshaft clearance.

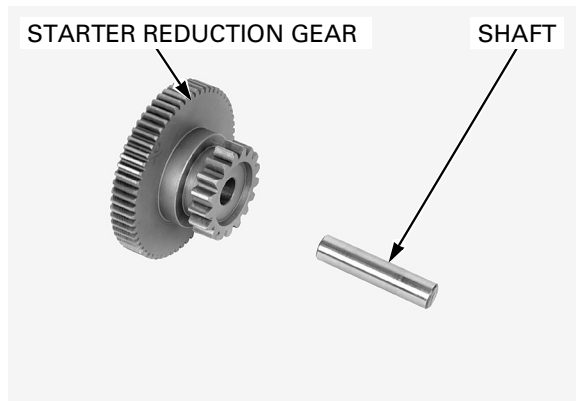
SERVICE LIMIT: 0.23 mm (0.009 in)



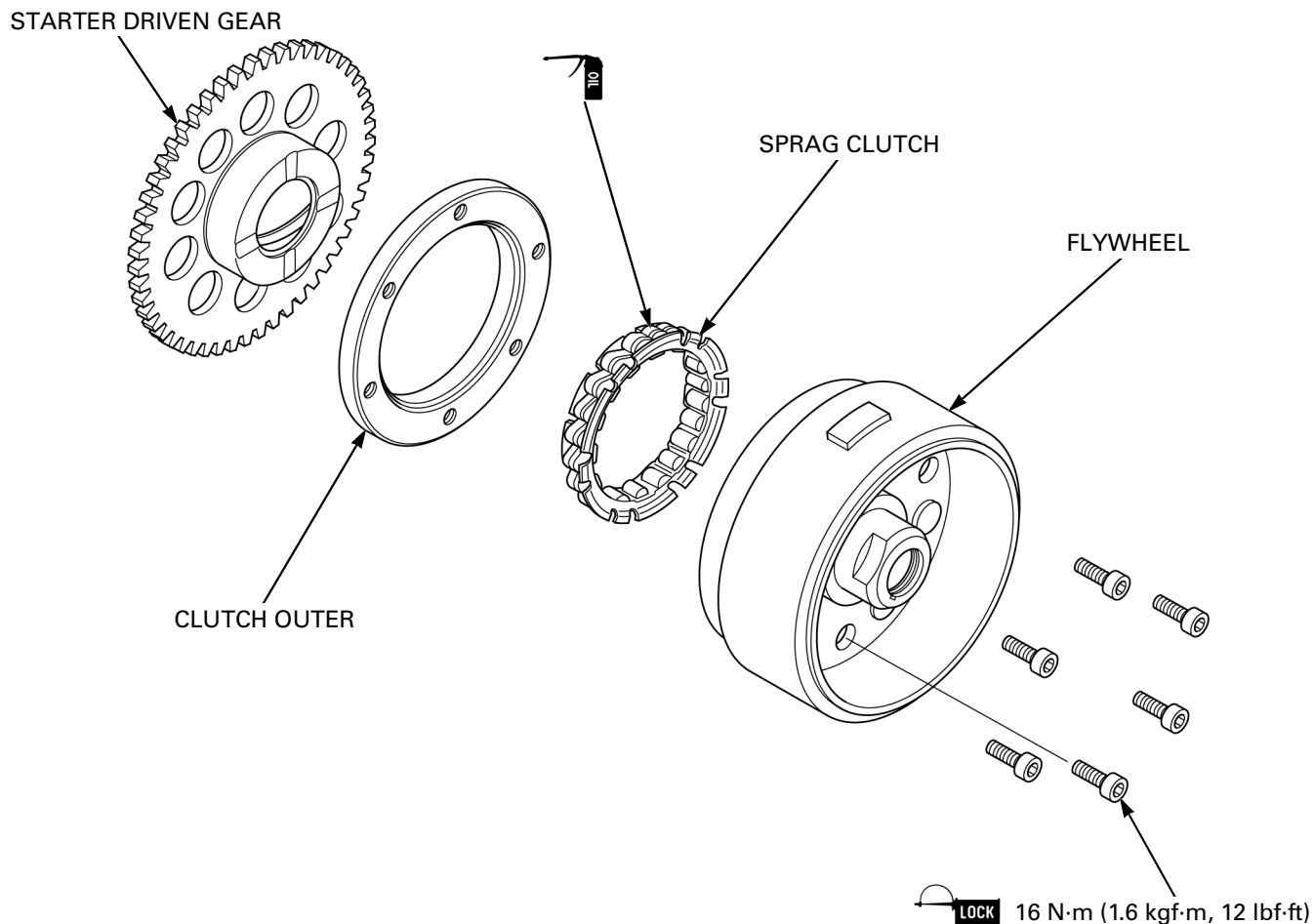
Check the starter idle gear teeth and shaft contacting surface for abnormal wear or damage.



Check the starter reduction gear teeth and shaft contacting surface for abnormal wear or damage.



INSTALLATION



Apply engine oil to the sprag clutch rolling surface.
Install the sprag clutch into the clutch outer with the flange side facing the flywheel side.



Clean and apply a locking agent to the starter clutch socket bolt threads.
Install the flywheel onto the starter clutch assembly and install the socket bolt.

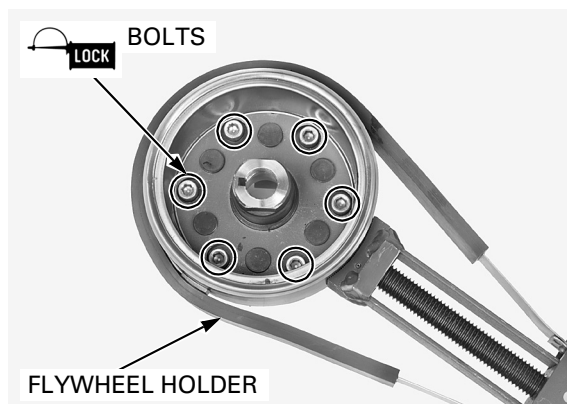
Tighten the starter clutch socket bolts to the specified torque while holding the flywheel using the special tool.

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)

TOOL:

Flywheel holder

07725-0040000



ALTERNATOR/STARTER CLUTCH

Install the starter driven gear to the flywheel while turning the driven gear counterclockwise.

Make sure that the starter driven gear turns counterclockwise smoothly and does not turn clockwise.

Install the flywheel (page 10-12).

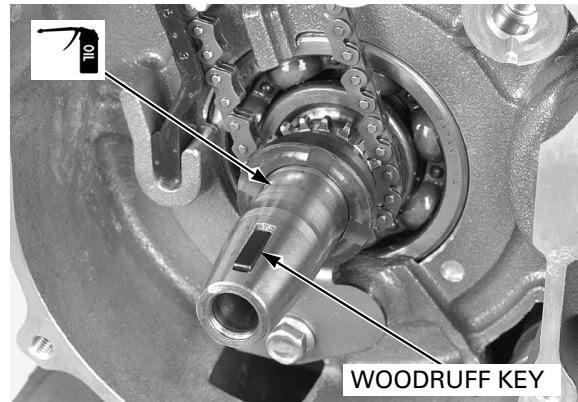


FLYWHEEL INSTALLATION

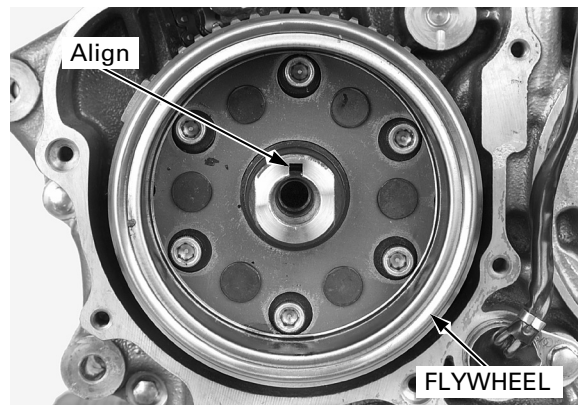
Apply engine oil to the crankshaft of the starter driven gear inner surface contacting area.
Clean any oil from the crankshaft taper.

When installing the woodruff key, be careful not to damage the key groove and crankshaft.

Install the woodruff key.



Install the flywheel, aligning the woodruff key on the crankshaft with flywheel keyway.



Apply engine oil to the flywheel bolt threads and seating surface.

Install the washer and bolt.

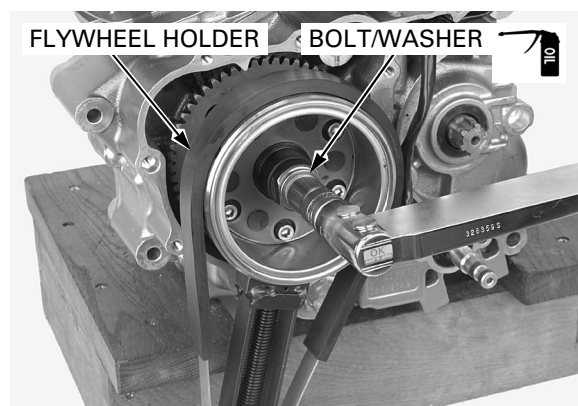
Tighten the flywheel bolt to the specified torque while holding the flywheel using the special tool.

TOOL:

Flywheel holder

07725-0040000

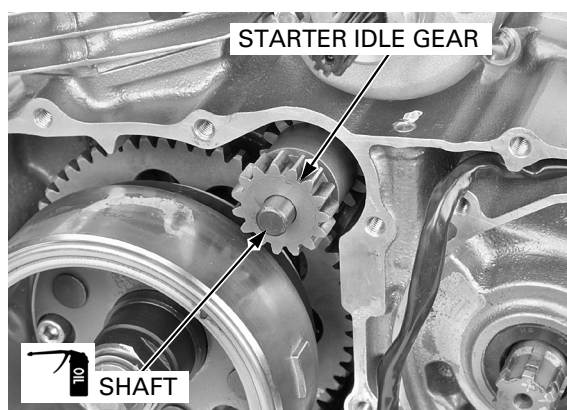
TORQUE: 74 N·m (7.5 kgf·m, 55 lbf·ft)



Apply engine oil to the starter idle gear shaft whole surface.

Install the starter idle gear and shaft.

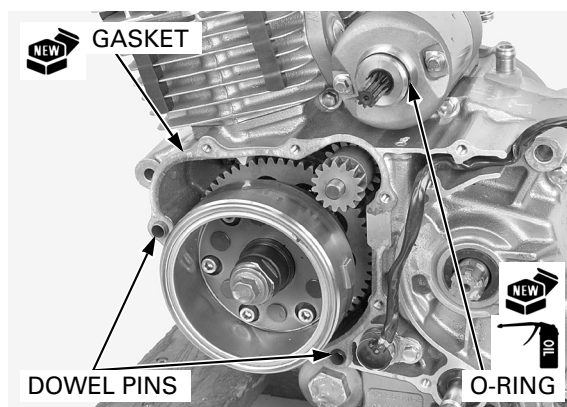
Install the left crankcase cover (page 10-13).



LEFT CRANKCASE COVER INSTALLATION

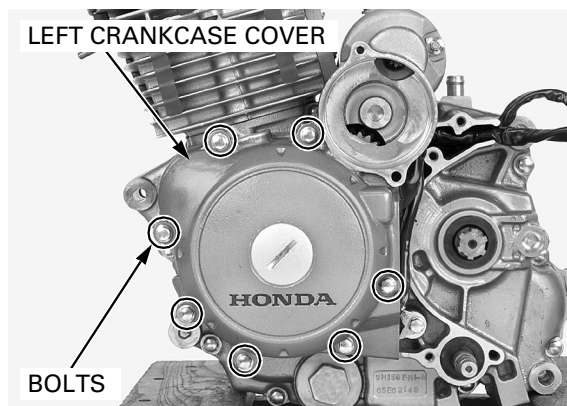
Apply engine oil to a new O-ring and install it to the starter motor.

Install a new gasket and dowel pins.



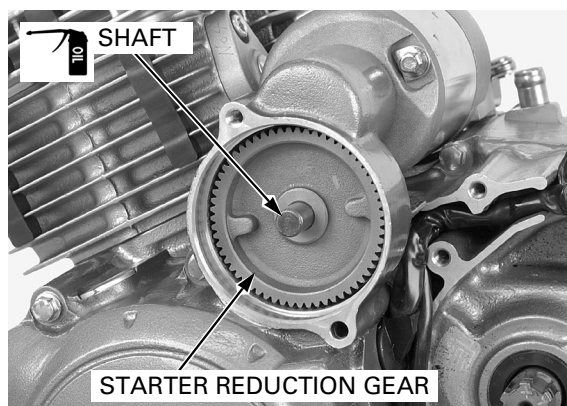
The left crankcase cover (stator) is magnetically attached to the fly-wheel, be careful when installing.

Install the left crankcase cover and tighten them in a crisscross pattern in several steps.



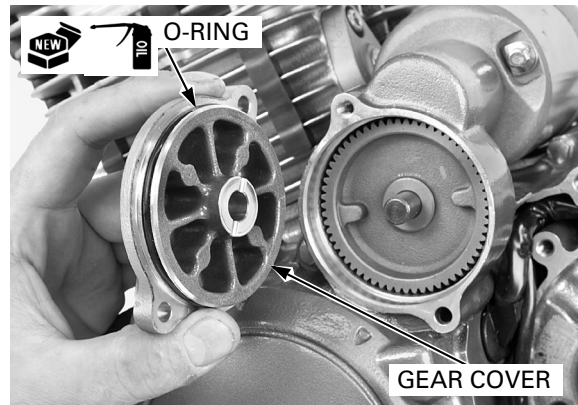
Apply engine oil to the starter reduction gear shaft whole surface.

Install the reduction gear shaft and starter reduction gear.



ALTERNATOR/STARTER CLUTCH

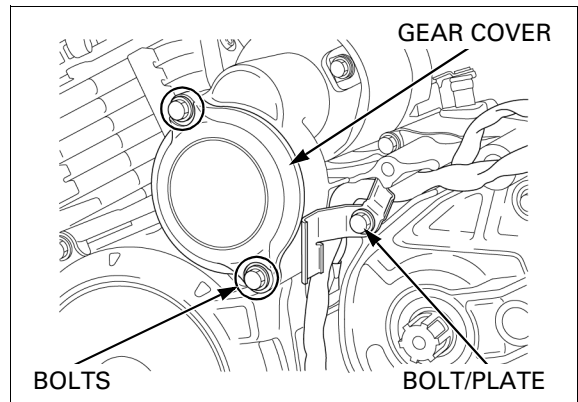
Apply engine oil to the new O-ring and install it to the starter reduction gear cover.



Install and tighten the starter reduction gear cover bolts.

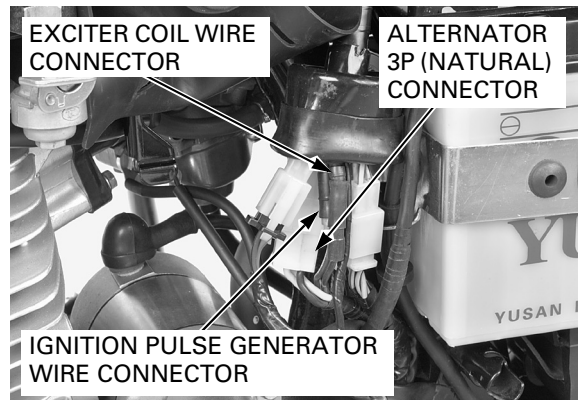
Route the alternator/ignition pulse generator wire properly (page 1-16).

Route the alternator/ignition pulse generator wire in the left crankcase groove. Install the wire guide plate and tighten the bolt securely.

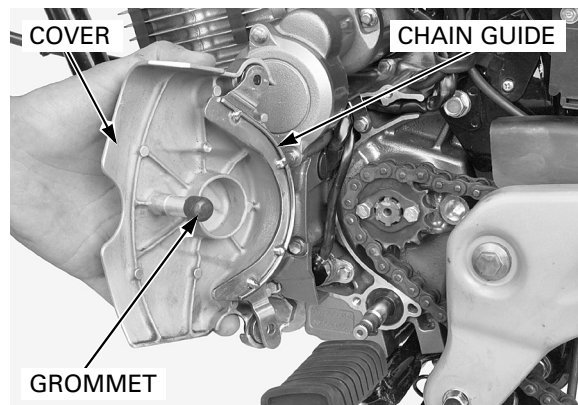


Connect the following:

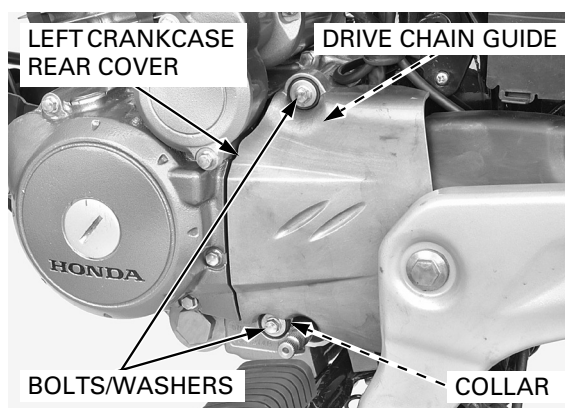
- Alternator 3P (Natural) connector
- Black/red exciter coil wire connector
- Blue/yellow ignition pulse generator wire connector



Set the grommet and drive chain guide to the left crankcase rear cover as shown.



Install the left crankcase rear cover, collar, washers and bolts.
Tighten the bolts securely.



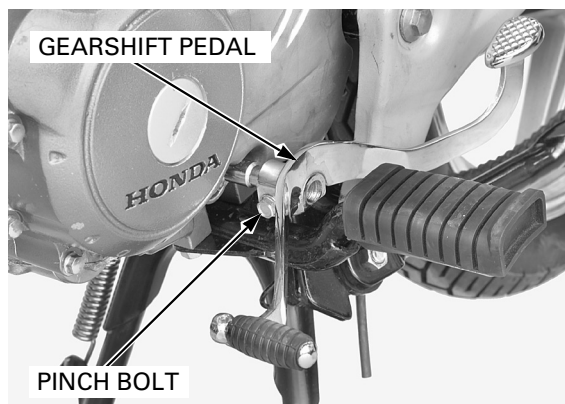
Install the gearshift pedal on its original position as marked during removal.

Install and tighten the pinch bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the following:

- Turn signal relay (page 18-18)
- Left side cover (page 2-3)

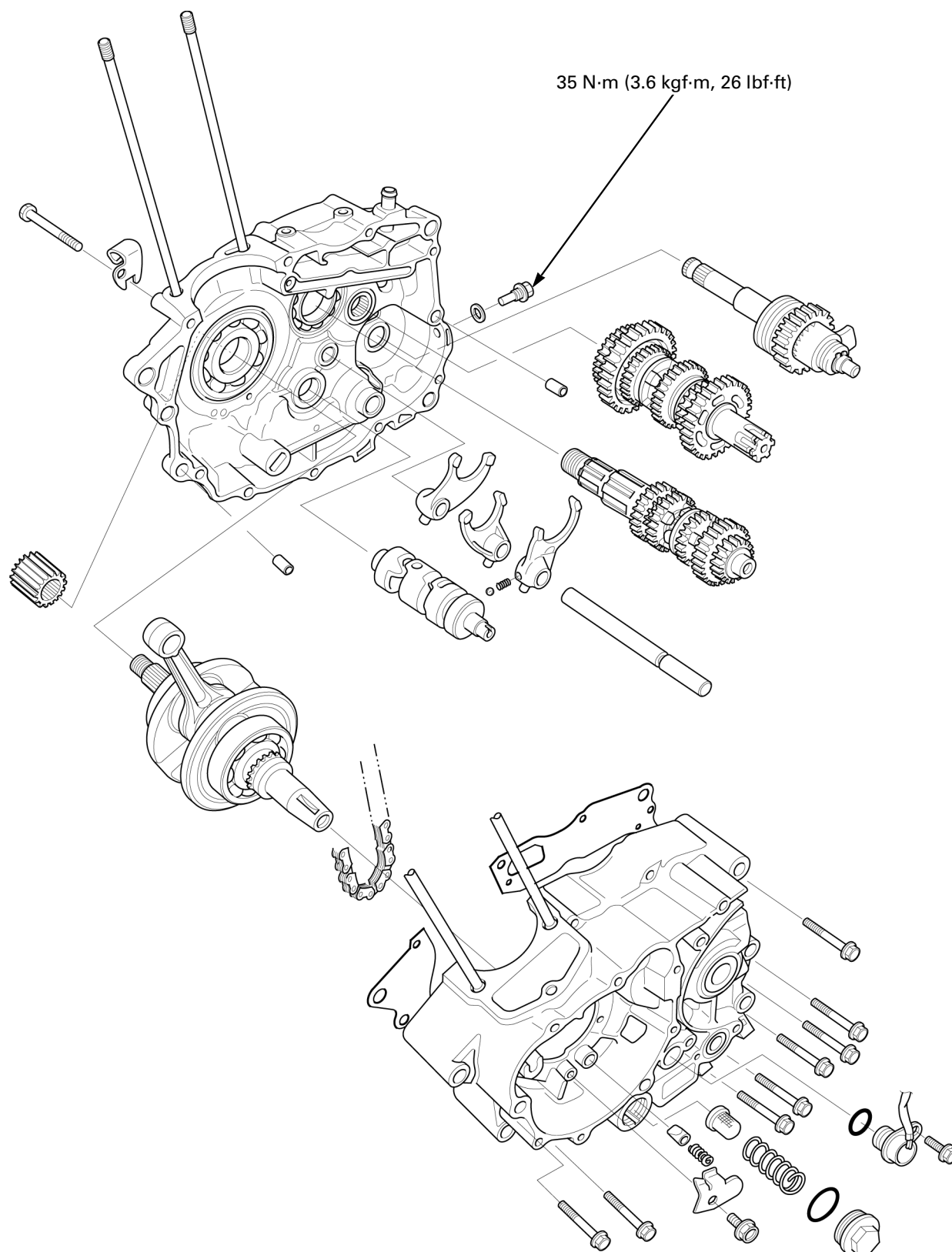


MEMO

11. CRANKCASE/TRANSMISSION/CRANKSHAFT/KICKSTARTER

COMPONENT LOCATION	11-2	KICKSTARTER	11-14
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COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- The crankcase halves must be separated to service the following:
 - Crankshaft (page 11-18)
 - Transmission (page 11-7)
 - Kickstarter spindle (page 11-14)
- The following components must be removed before separating the crankcase:
 - Engine (page 6-4)
 - Starter motor (page 17-6)
 - Cylinder head (page 7-10)
 - Cylinder/piston (page 8-4)
 - Oil pump (page 4-5)
 - Oil centrifugal filter (page 4-9)
 - Clutch (page 9-7)
 - Gearshift linkage (page 9-12)
 - Flywheel (page 10-7)
- Be careful not to damage the crankcase mating surfaces when servicing.

SPECIFICATIONS

Unit: mm (in)

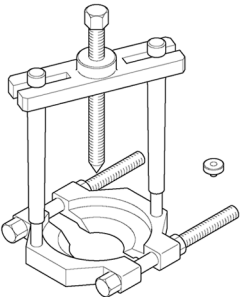
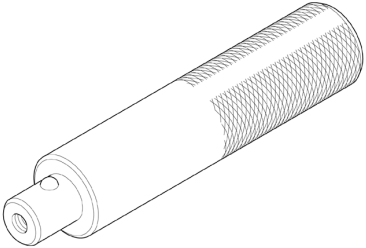
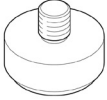
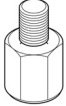
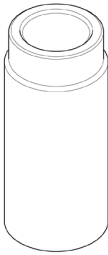
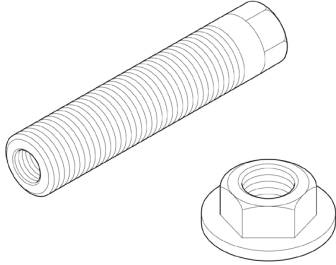
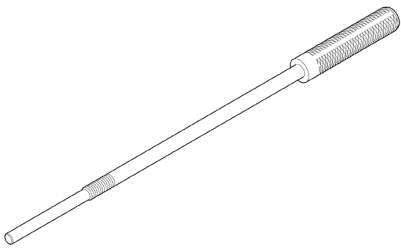
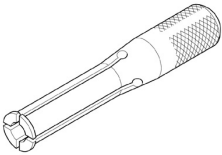
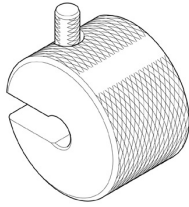
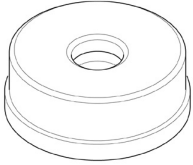


ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod big end side clearance		0.05 – 0.30 (0.002 – 0.012)	0.80 (0.031)
	Connecting rod big end radial clearance		0 – 0.008 (0 – 0.0003)	0.05 (0.002)
	Runout		–	0.02 (0.001)
Transmission	Gear I.D.	M3, M5, C4, Starter idle gear	20.020 – 20.041 (0.7882 – 0.7890)	20.07 (0.790)
		Starter gear	20.000 – 20.021 (0.7874 – 0.7882)	20.05 (0.789)
		C1	19.520 – 19.541 (0.7685 – 0.7693)	19.57 (0.770)
		C2	23.020 – 23.041 (0.9063 – 0.9071)	23.07 (0.908)
	Bushing O.D.	C1	19.479 – 19.500 (0.7669 – 0.7677)	19.43 (0.765)
		C2	22.979 – 23.000 (0.9047 – 0.9055)	22.93 (0.903)
		Starter idle gear	19.979 – 20.000 (0.7866 – 0.7874)	19.94 (0.785)
	Bushing I.D.	C1, Starter idle gear	16.516 – 16.534 (0.6502 – 0.6509)	16.60 (0.654)
		C2	20.000 – 20.021 (0.7874 – 0.7882)	20.05 (0.789)
	Gear-to-bushing clearance	C1, C2, Starter idle gear	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
	Mainshaft O.D.	M3, Starter gear	19.959 – 19.980 (0.7858 – 0.7866)	19.91 (0.784)
	Countershaft O.D.	C1, Starter idle gear	16.466 – 16.484 (0.6483 – 0.6490)	16.41 (0.646)
		C2, C4	19.974 – 19.987 (0.7864 – 0.7869)	19.94 (0.785)
	Gear-to-shaft clearance	M3	0.040 – 0.082 (0.0016 – 0.0032)	0.10 (0.004)
		Starter gear	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
		C4	0.023 – 0.067 (0.0009 – 0.0026)	0.10 (0.004)
Shift fork	Bushing-to-shaft clearance	C1, Starter idle gear	0.032 – 0.068 (0.0013 – 0.0027)	0.10 (0.004)
		C2	0.020 – 0.047 (0.0008 – 0.0019)	0.10 (0.004)
	I.D.		12.000 – 12.018 (0.4724 – 0.4731)	12.05 (0.474)
	Claw thickness		4.93 – 5.00 (0.194 – 0.197)	4.50 (0.177)
Kickstarter	Shaft O.D.		11.976 – 11.994 (0.4715 – 0.4722)	11.96 (0.471)
	Pinion gear I.D.		20.000 – 20.021 (0.7874 – 0.7882)	20.05 (0.789)
Shift drum	Spindle O.D.		19.959 – 19.980 (0.7878 – 0.7866)	19.90 (0.783)
	Journal O.D.	Right side	20.959 – 20.980 (0.8252 – 0.8260)	20.90 (0.823)
		Left side	13.948 – 13.970 (0.5137 – 0.5146)	13.96 (0.550)
	Journal I.D.	Right crankcase	21.000 – 21.033 (0.8268 – 0.8281)	21.05 (0.829)
		Left crankcase	14.000 – 14.027 (0.5512 – 0.5522)	14.04 (0.553)
	Shift drum journal-to-crankcase journal clearance	Right side	0.020 – 0.074 (0.0008 – 0.0029)	0.10 (0.004)
		Left side	0.030 – 0.079 (0.0012 – 0.0031)	0.10 (0.004)

CRANKCASE/TRANSMISSION/CRANKSHAFT/KICKSTARTER

TORQUE VALUE

Kickstarter spindle lock bolt 35 N·m (3.6 kgf·m, 26 lbf·ft)

TOOLS

<p>Universal bearing puller 07631-0010000</p> 	<p>Driver 07749-0010000</p> 	<p>Pilot, 30 mm 07746-0040700</p> 
<p>Thread adapter 07YMF-KFG0300</p> 	<p>Assembly collar 07965-VM00100</p> 	<p>Thread shaft 07965-VM00200</p> 
<p>Remover shaft 07936-KC10100</p> 	<p>Remover head, 15 mm 07936-KC10200</p> 	<p>Remover weight 07741-0010201</p> 
<p>Attachment, 52 x 55 mm 07746-0010400</p> 	<p>Pilot, 20 mm 07746-0040500</p> 	<p>Attachment, 22 x 24 mm 07746-0010800</p> 

<p>Pilot, 15 mm 07746-0040300</p> 	<p>Attachment, 32 x 35 mm 07746-0010100</p> 	<p>Attachment, 42 x 47 mm 07746-0010300</p> 
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TROUBLESHOOTING

Excessive engine noise

- Worn connecting rod big end bearing
- Worn crankshaft main journal bearing
- Worn transmission gears
- Worn transmission bearings

Transmission jumps out of gear

- Worn or broken gearshift spindle return spring
- Worn gear dogs or dog holes
- Worn shift drum guide groove
- Worn shift fork guide pin
- Worn gear shifter groove
- Worn shift fork
- Bent shift fork shaft
- Faulty gearshift linkage (page 9-13)

Hard to shift

- Incorrect clutch adjustment
- Bent or damaged gearshift spindle (page 9-13)
- Bent shift fork
- Bent shift fork shaft
- Bent shift fork claw
- Damaged shift drum guide grooves
- Damaged shift fork guide pin
- Faulty gearshift linkage (page 9-13)

Gearshift pedal will not return

- Weak or broken gearshift spindle return spring (page 9-13)
- Bent gearshift spindle (page 9-13)

Engine vibration

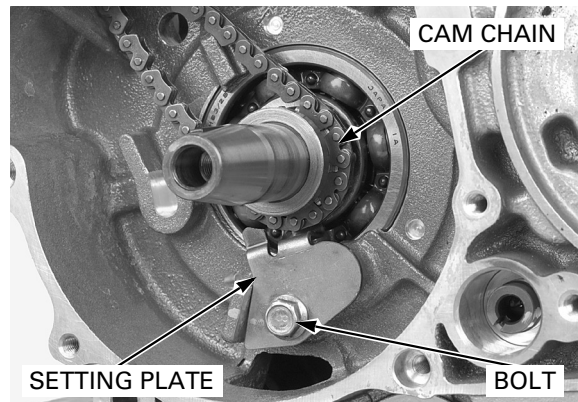
- Excessive crankshaft runout

CRANKCASE SEPARATION

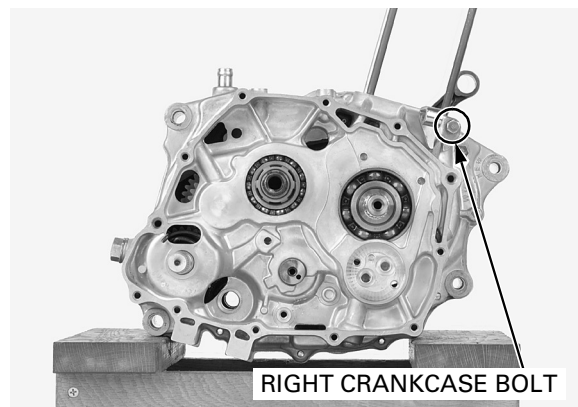
Refer to service information (page 11-3) for removal of necessary parts before separating the crankcase.

Remove the bolt, cam chain setting plate and cam chain.

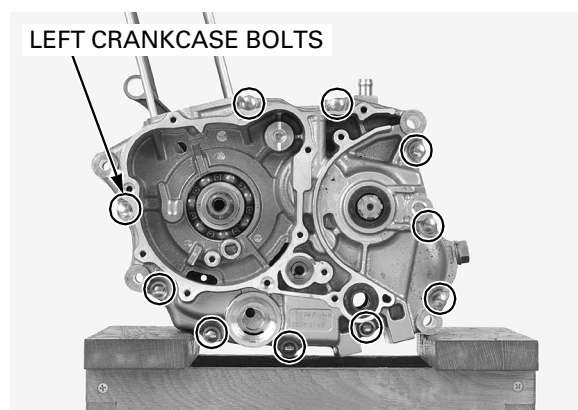
Check the cam chain for excessive wear or damage.
Check the timing sprocket for wear or damage.



Remove the right crankcase bolt.



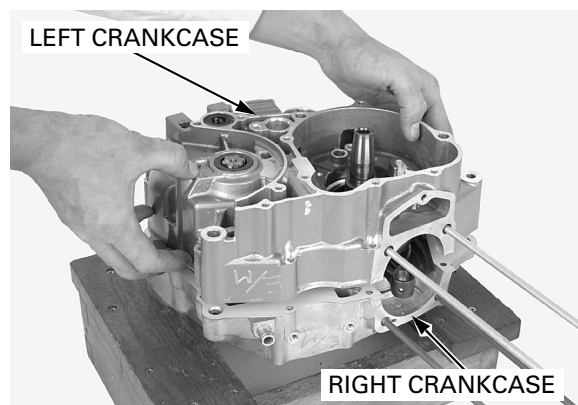
Loosen the left crankcase bolts in a crisscross pattern in several steps, and remove them.



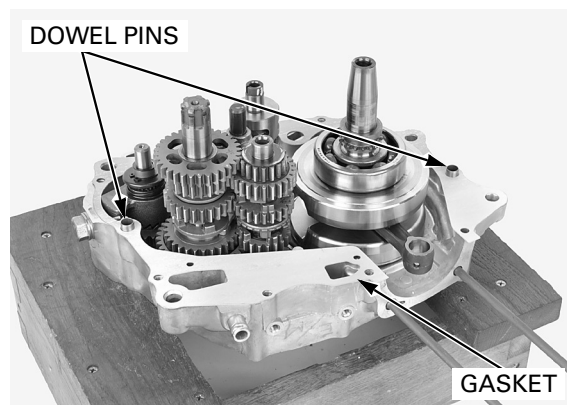
Place the right crankcase down.

Do not pry the crankcase apart with a screwdriver.

Separate the left crankcase from the right crankcase by tapping them at several locations with a soft hammer.



Remove the gasket and dowel pins.



TRANSMISSION

DISASSEMBLY

Separate the crankcase halves (page 11-6).

Pull out the shift fork shaft from right shift fork and center shift fork.

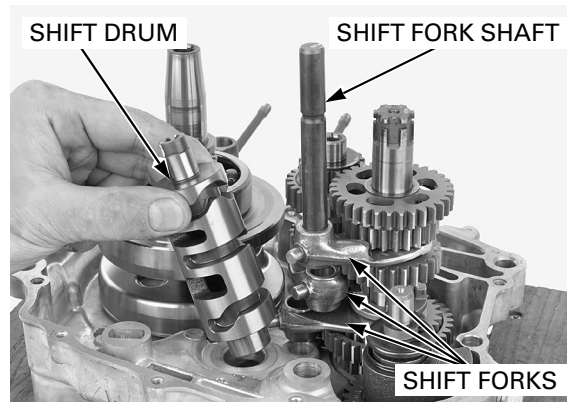
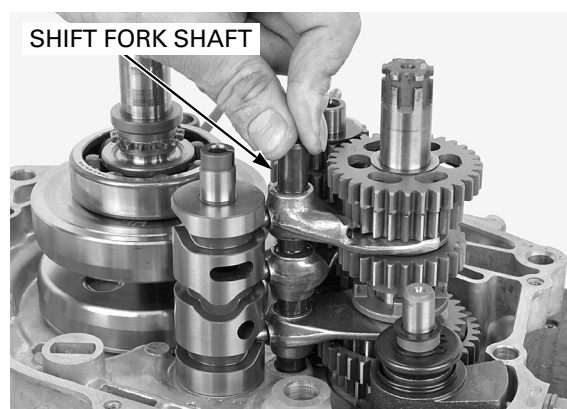
NOTE:

- Left shift fork has spring and ball. If the shift fork shaft was removed from the left shift fork; them could be lost.

Release the shift fork guide pins from the shift drum grooves by sliding the each shift forks.

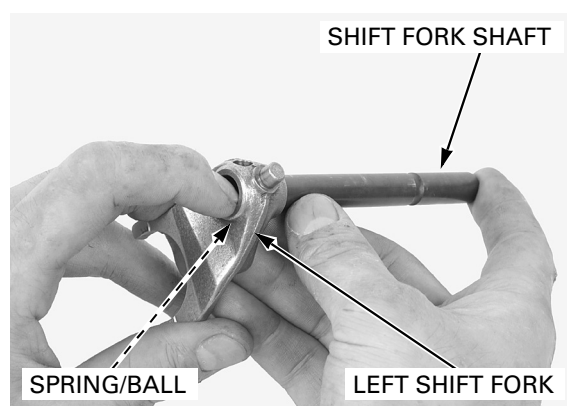
Remove the shift drum.

Remove the shift fork shaft with the left shift fork.
Remove the center and right shift forks.



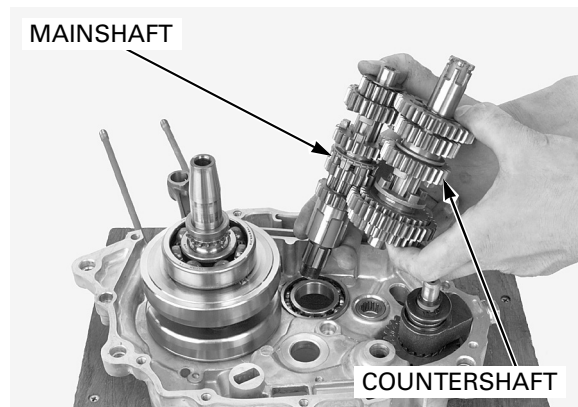
*Be careful not to
loose the spring
and boll.*

Remove the shift fork shaft from the left shift fork.



CRANKCASE/TRANSMISSION/CRANKSHAFT/KICKSTARTER

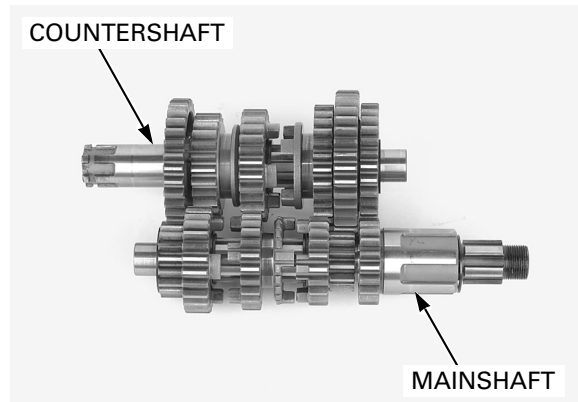
Remove the mainshaft and countershaft as an assembly from the right crankcase.



Do not expand the snap ring more than necessary for removal.

Disassemble the mainshaft and countershaft.

- Keep track of the disassembled parts (gears, bushings, washers, and rings) by sliding them onto a tool or piece of wire.
- Do not remove the snap rings over the shafts. Expand the snap ring ends and slide the snap ring off the shaft, along with the gear behind it.



INSPECTION

GEARS

Check the gear shifter groove for abnormal wear or damage.



Check the gear dogs, dog holes and teeth for abnormal wear or damage.

Measure the I.D. of each gear.

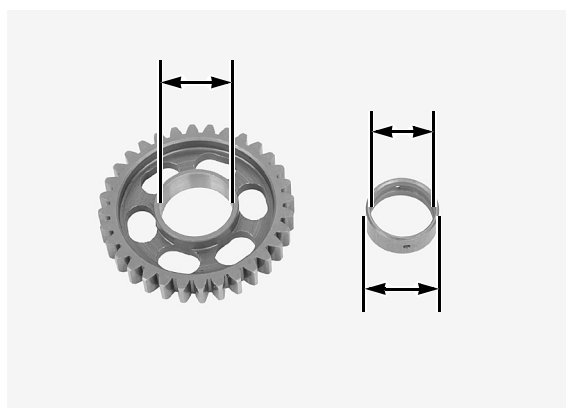
SERVICE LIMITS:

M3, M5, C4, Starter idle gear: 20.07 mm (0.790 in)

Starter gear: 20.05 mm (0.789 in)

C1: 19.57 mm (0.770 in)

C2: 23.07 mm (0.908 in)



BUSHING

Check the bushings for abnormal wear or damage.

Measure the I.D. and O.D. of the gear bushing.

SERVICE LIMITS:

C1 bushing: O.D. : 19.43 mm (0.765 in)

I.D. : 16.60 mm (0.654 in)

C2 bushing: O.D. : 22.93 mm (0.903 in)

I.D. : 20.05 mm (0.789 in)

Starter idle gear: O.D. : 19.94 mm (0.785 in)

I.D. : 16.60 mm (0.654 in)

Calculate the gear-to-bushing clearance.

SERVICE LIMITS:

C1, C2, Starter idle gear: 0.10 mm (0.004 in)

MAINSHAFT/COUNTERSHAFT

Check the spline grooves and sliding surfaces of the mainshaft and countershaft for abnormal wear or damage.

Measure the O.D. of the mainshaft and countershaft.

SERVICE LIMITS:

At M3, Starter gear: 19.91 mm (0.784 in)

At C1, Starter idle gear: 16.41 mm (0.646 in)

At C2, C4: 19.94 mm (0.785 in)

Calculate the gear-to-shaft clearance.

SERVICE LIMITS:

M3, C4: 0.10 mm (0.004 in)

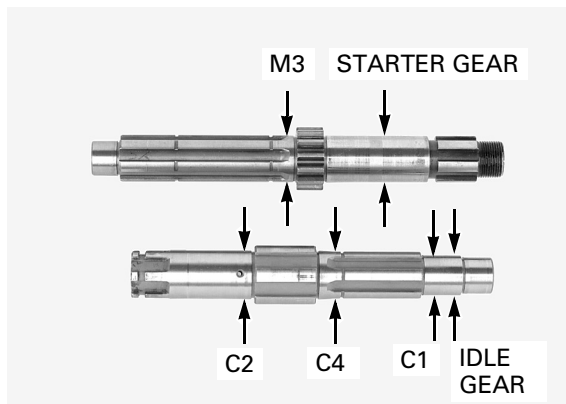
Starter gear: 0.10 mm (0.004 in)

Calculate the bushing-to-shaft clearance.

SERVICE LIMITS:

C1, Starter idle gear: 0.10 mm (0.004 in)

C2: 0.10 mm (0.004 in)



CRANKCASE/TRANSMISSION/CRANKSHAFT/KICKSTARTER

SHIFT DRUM

Inspect the shift drum end for scoring, scratches or evidence of insufficient lubrication.

Check the shift drum guide grooves for abnormal wear or damage.

Measure the O.D. of the shift drum right and left journal.

SERVICE LIMITS:

Right side: 20.90 mm (0.823 in)

Left side: 13.96 mm (0.550 in)



Check the shift drum journal in the right and left crankcase for excessive wear or damage.

Measure the shift drum journal I.D.

SERVICE LIMITS:

Right crankcase journal: 21.05 mm (0.829 in)

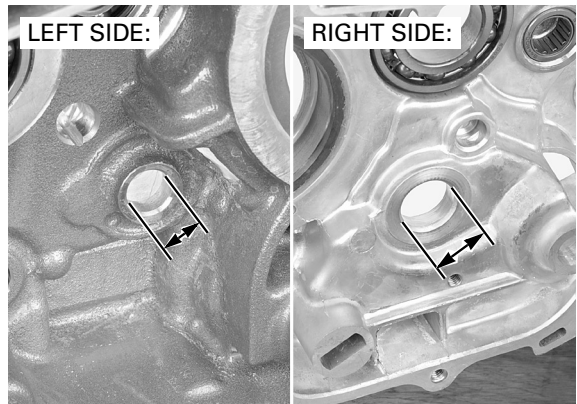
Left crankcase journal: 14.04 mm (0.553 in)

Calculate the journal end-to-journal clearance.

SERVICE LIMITS:

Right side: 0.10 mm (0.004 in)

Left side: 0.10 mm (0.004 in)

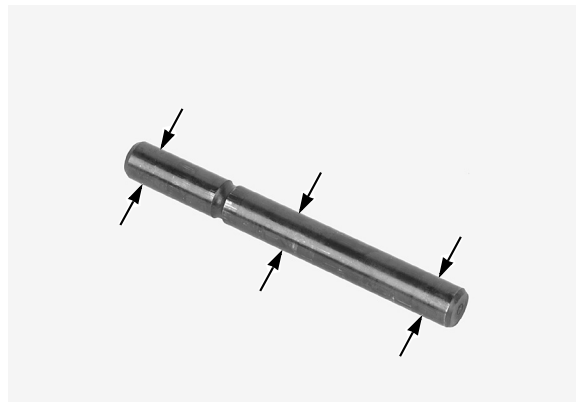


SHIFT FORK SHAFT

Check the shift fork shaft for abnormal wear or damage.

Measure the shift fork shaft O.D.

SERVICE LIMIT: 11.96 mm (0.471 in)



SHIFT FORK

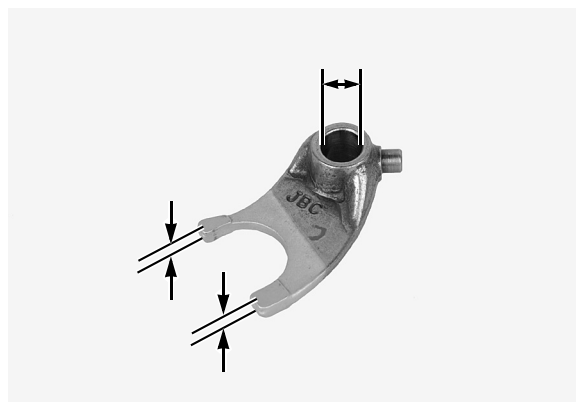
Check the shift forks for abnormal wear or damage.

Measure the I.D. of the shift fork.

SERVICE LIMIT: 12.05 mm (0.474 in)

Measure the shift fork claw thickness.

SERVICE LIMIT: 4.50 mm (0.177 in)



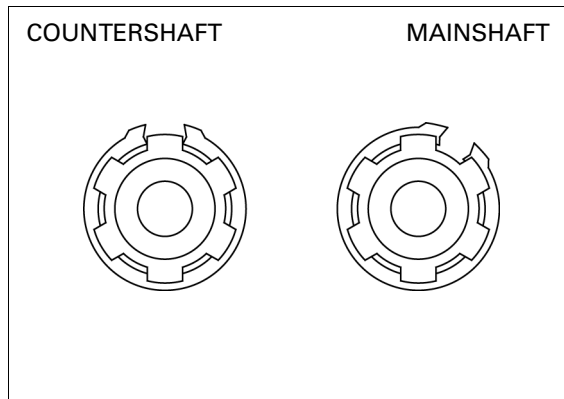
ASSEMBLY/INSTALLATION

Apply molybdenum oil solution to the transmission gears rotating surfaces and gear teeth.

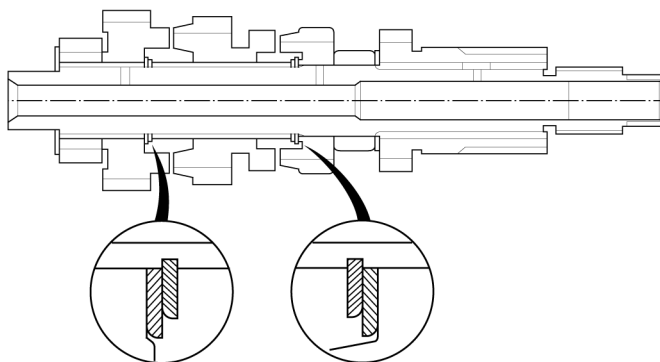
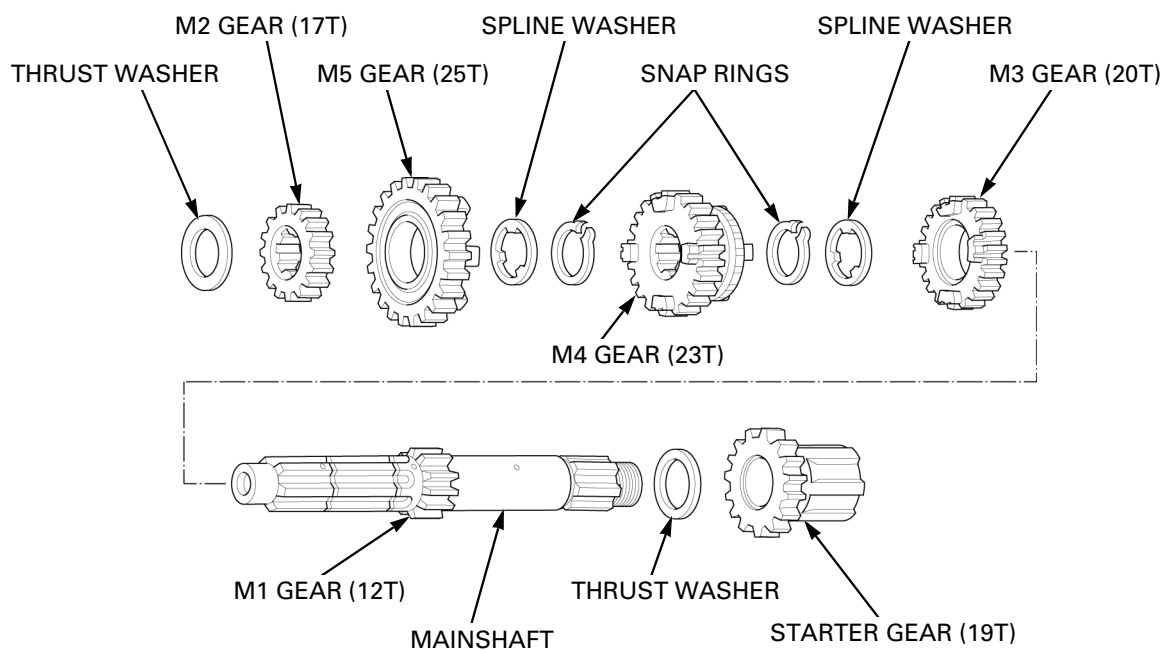
Assemble the mainshaft and countershaft.

NOTE:

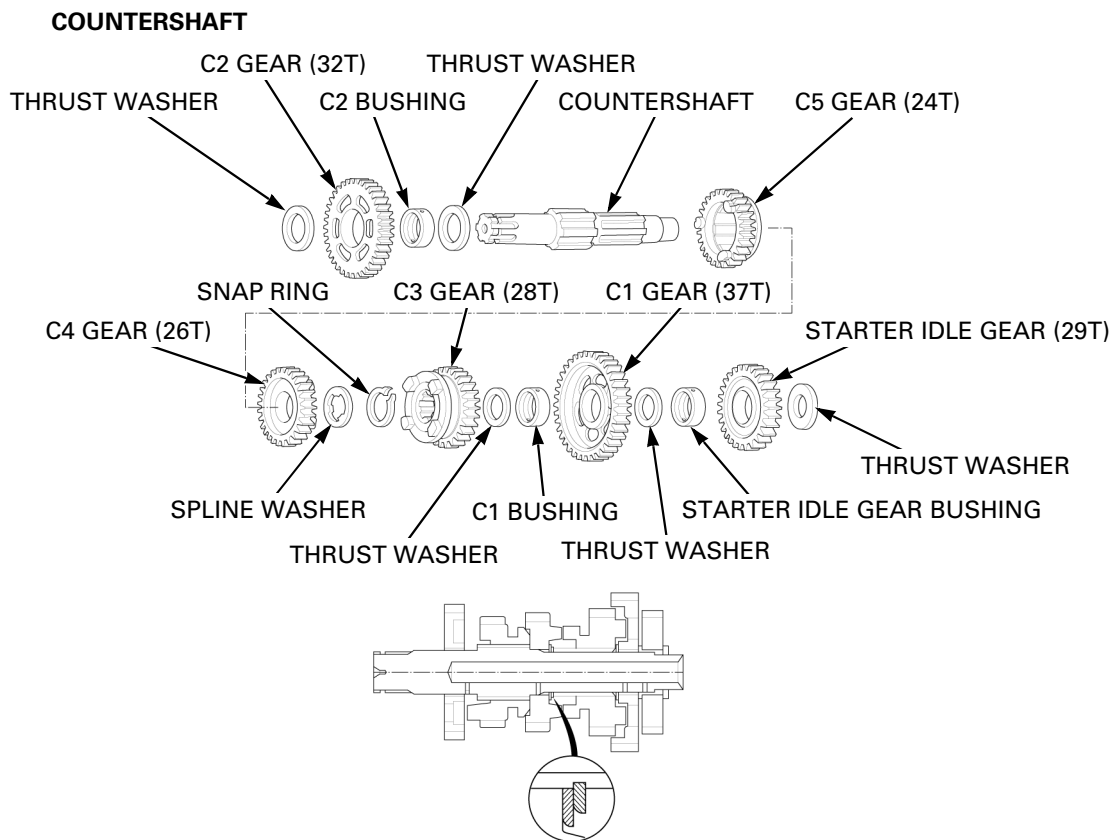
- Always instal the washer and snap ring with the chamfered (rolled) edge facing away from the thrust load.
- Do not reuse worn snap ring which could easily spin in the groove.
- Install the snap ring so that its end gap aligns with the groove in the splines.
- Make sure that the snap ring is fully seated in the shaft groove after installing it.



MAINSHAFT



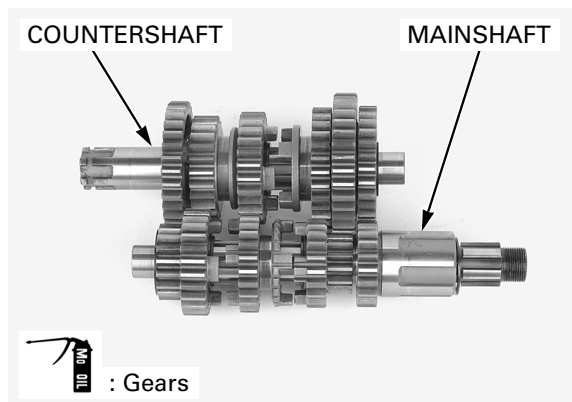
CRANKCASE/TRANSMISSION/CRANKSHAFT/KICKSTARTER



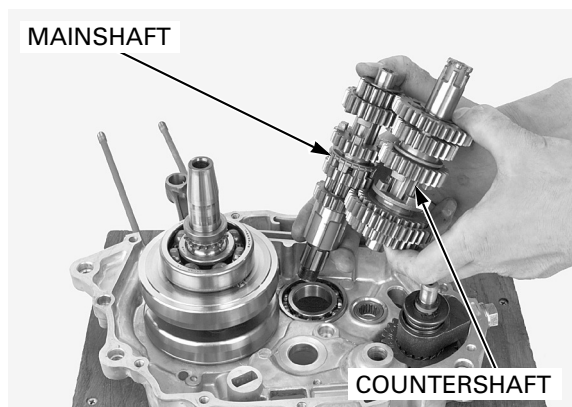
Check the transmission gears for freedom of movement and rotation on the shaft.

Apply molybdenum oil solution to the gear teeth and gear shifter groove (M4, C3, and C5).

Engage the mainshaft and countershaft gears.



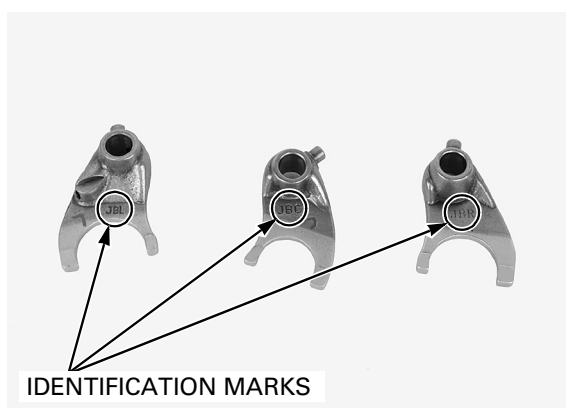
Install the mainshaft and countershaft as an assembly into the right crankcase.



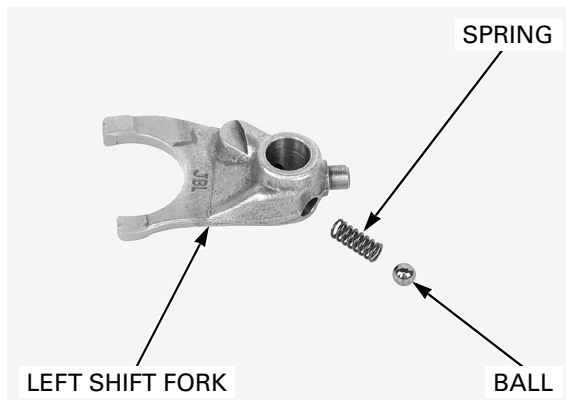
Each shift fork has an identification marks; "JBL" (Left), "JBC" (Center), "JBR" (Right).

Apply engine oil to the inner surface and guide pin of each shift fork.

Install the right shift fork into the shifter gear groove with the mark facing down (right crankcase side).
Install the center shift fork into the shifter gear groove with the mark facing up (left crankcase side).

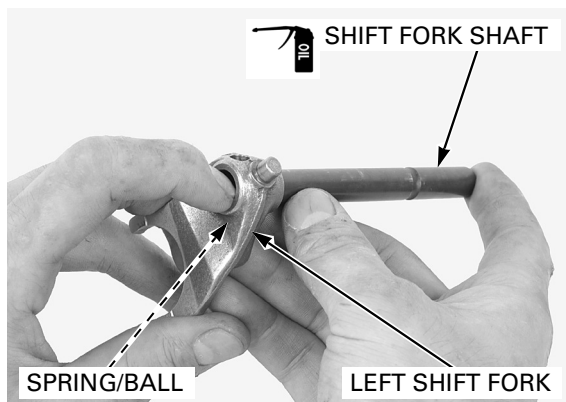


Install the spring and ball into the left shift fork.

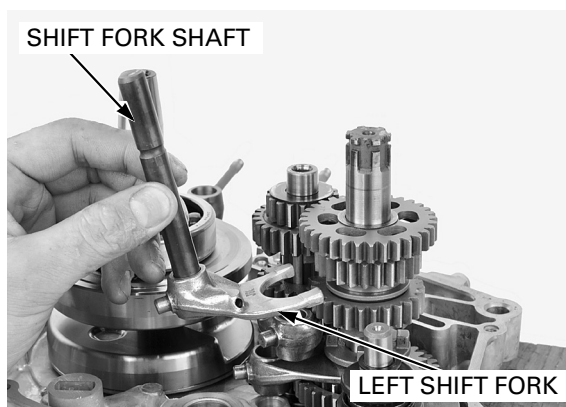


Apply engine oil to the shift fork shaft whole surface.

Install the shift fork shaft into the left shift fork, while pushing the ball.



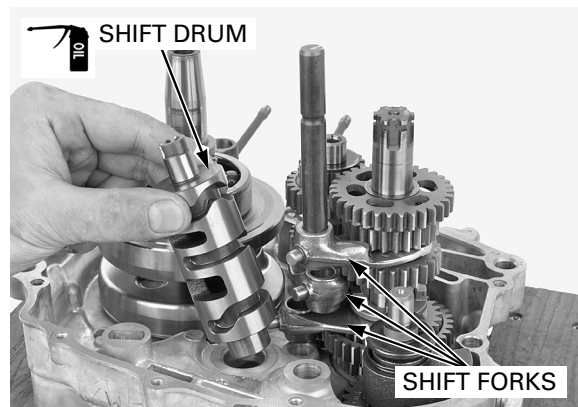
Install the left shift fork and shift fork shaft with the mark side facing up (right crankcase).



CRANKCASE/TRANSMISSION/CRANKSHAFT/KICKSTARTER

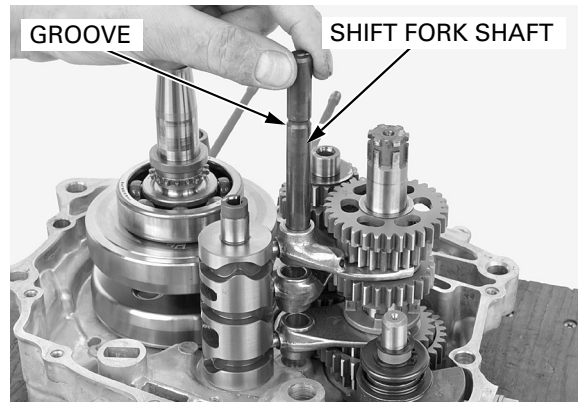
Apply engine oil to the shift drum guide grooves and install it onto the right crankcase.

Set the guide pin of each fork into the shift drum guide grooves carefully.



Install the shift fork shaft while pushing down the shift fork shaft until the ball seated into the shift fork shaft groove.

Assemble the crankcase (page 11-22).



KICKSTARTER

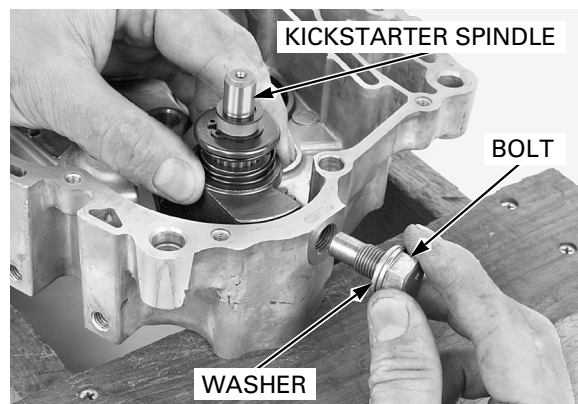
REMOVAL/DISASSEMBLY

Separate the crankcase (page 11-6).

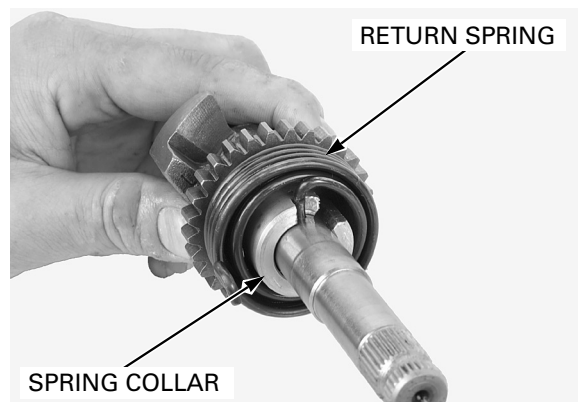
Remove the transmission (page 11-7).

Hold the kickstarter spindle, then remove the bolt and sealing washer.

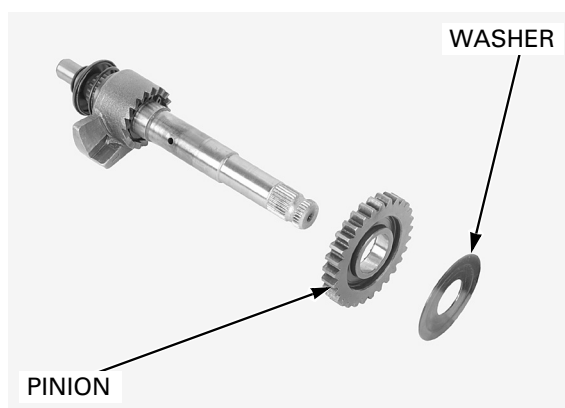
Remove the kickstarter spindle.



Rotate the spring collar counterclockwise and remove the spring collar and return spring.

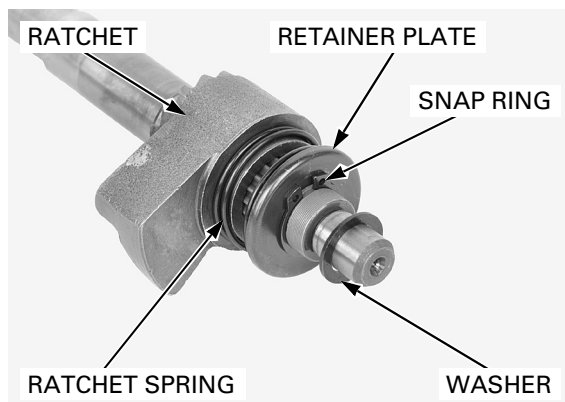


Remove the washer and kickstarter pinion.

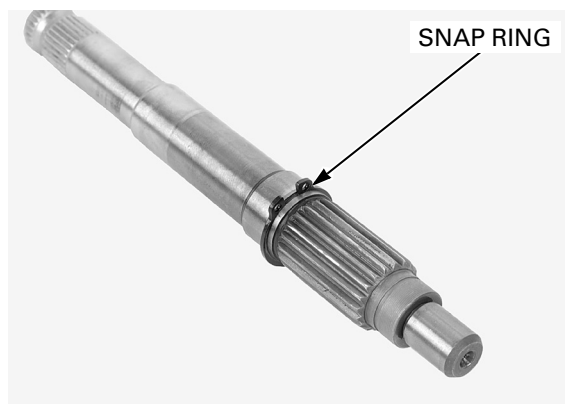


Remove the following:

- Washer
- Snap ring
- Retainer plate
- Ratchet spring
- Kickstarter ratchet



Remove the snap ring.



INSPECTION

Check the kickstarter spindle for straightness.
Check the return spring for fatigue.

Measure the kickstarter spindle O.D. at the kickstarter pinion gear.

SERVICE LIMIT: 19.90 mm (0.783 in)

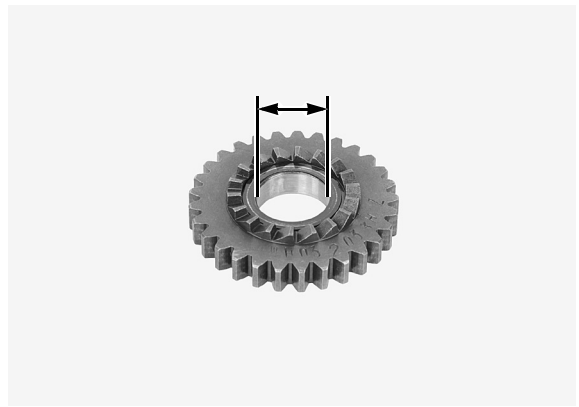


CRANKCASE/TRANSMISSION/CRANKSHAFT/KICKSTARTER

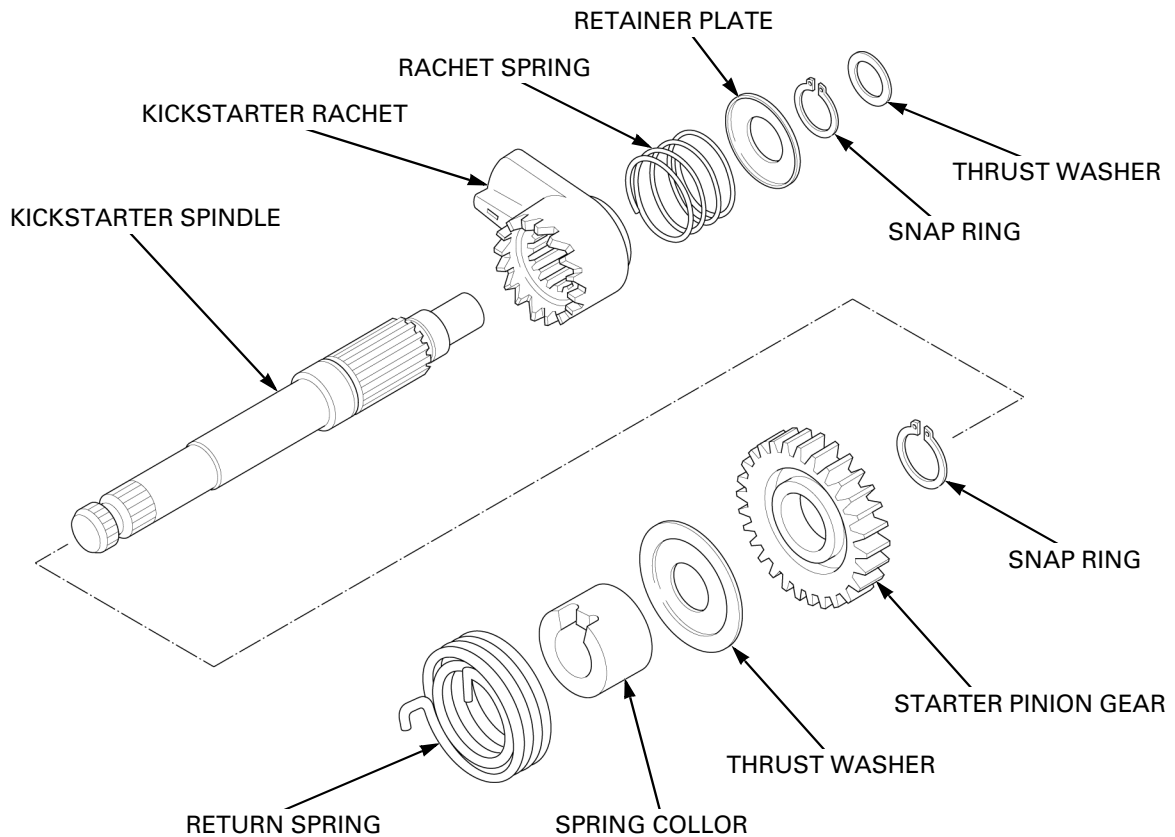
Check the kickstarter pinion gear teeth for abnormal.

Measure the kickstarter pinion gear I.D.

SERVICE LIMIT: 20.05 mm (0.789 in)



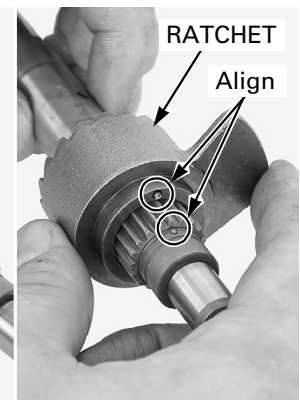
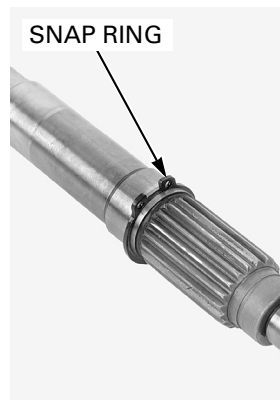
ASSEMBLY/INSTALLATION



Make sure the snap ring is fully seated in the kickstarter spindle groove after installing it.

Install the snap ring.

Install the starter ratchet align the punch marks of the starter ratchet and kickstarter spindle.

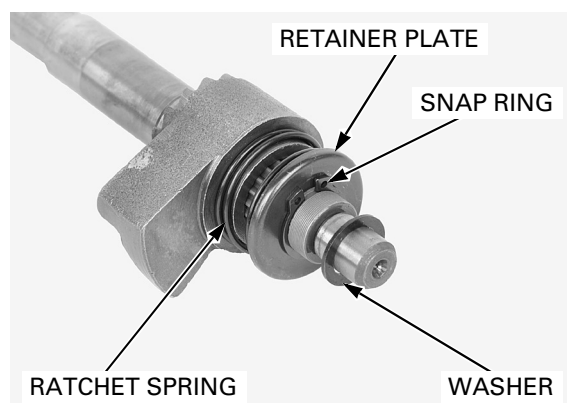


Install the following:

- Ratchet spring
- Retainer plate
- Snap ring
- Washer

NOTE:

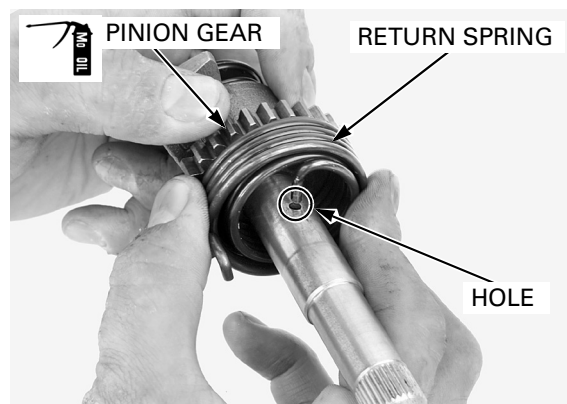
- Make sure the snap ring is fully seated in the kickstarter spindle groove after installing it.



Apply molybdenum oil solution to the starter pinion gear teeth and inner surface.

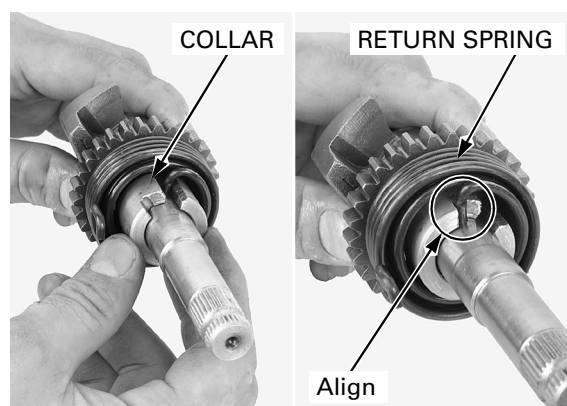
Install the starter pinion gear onto the kickstarter spindle.

Install the return spring onto the kickstarter spindle by inserting the return spring end into the hole on the kickstarter spindle.

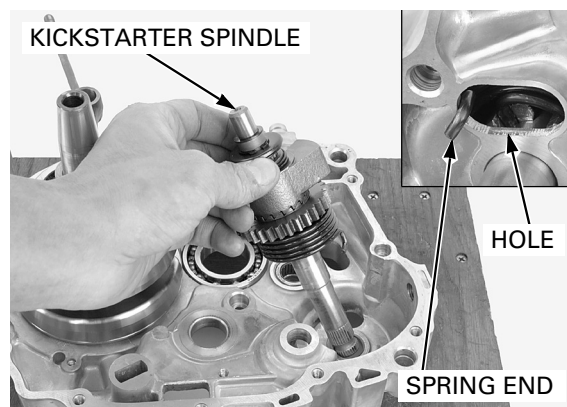


Install the spring collar align its cut-out with the return spring end.

Turn the spring collar clockwise and set the return spring end onto the groove of the spring collar.



Install the kickstarter spindle to the right crankcase and hook the spring end to the right crankcase cover hole.



CRANKCASE/TRANSMISSION/CRANKSHAFT/KICKSTARTER

Install a new sealing washer to the kickstarter spindle lock bolt.

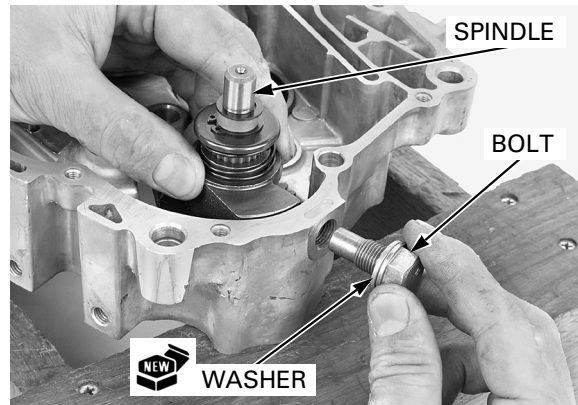
Install the kickstarter spindle lock bolt while rotating the kickstarter spindle clockwise.

Tighten the kickstarter spindle lock bolt to the specified torque.

TORQUE: 35 N·m (3.6 kgf·m, 26 lbf·ft)

Install the transmission (page 11-11).

Assemble the crankcase halves (page 11-22).

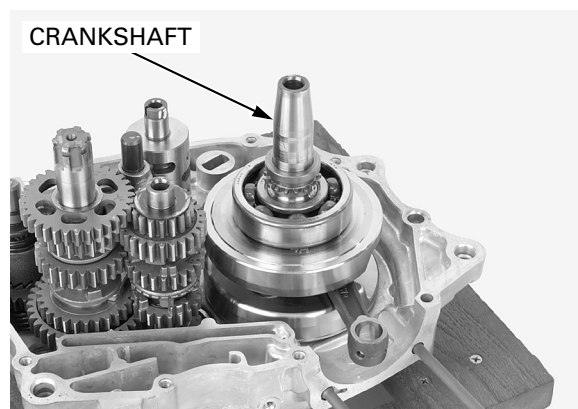


CRANKSHAFT

REMOVAL

Separate the crankcase halves (page 11-6).

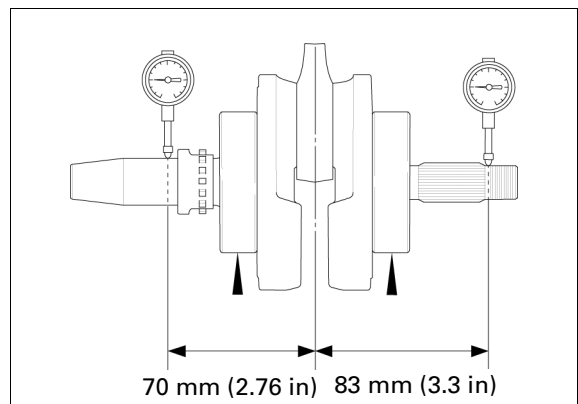
Remove the crankshaft from the right crankcase.



INSPECTION

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

SERVICE LIMIT: 0.02 mm (0.001 in)



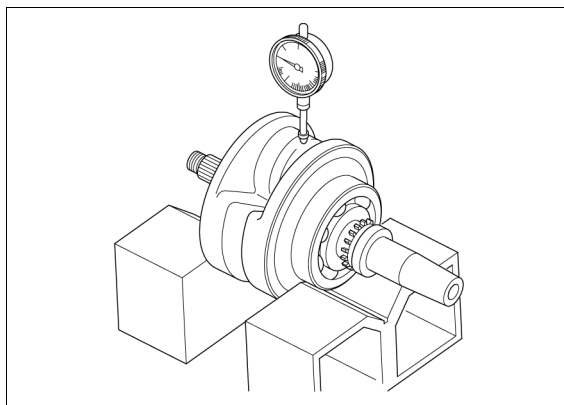
Measure the connecting rod big end side clearance.

SERVICE LIMIT: 0.80 mm (0.031 in)



Measure the connecting rod big end radial clearance.

SERVICE LIMIT: 0.05 mm (0.002 in)



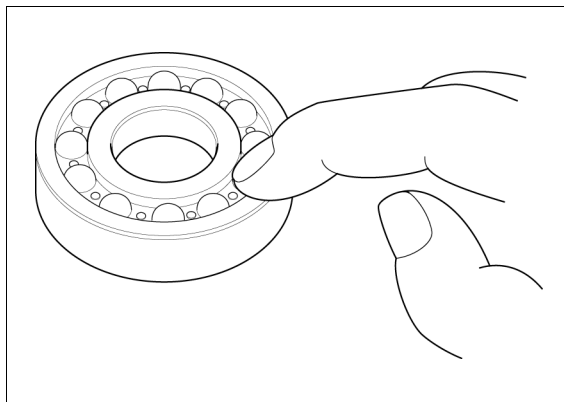
Turn the outer race of the crankshaft bearing with your finger.

The bearing should turn smoothly and quietly.

Also check that the inner race of the bearing fits tightly on the crankshaft.

Replace right crankshaft bearing if the race does not turn smoothly and quietly, or if the bearing fits loosely on the crankshaft (page 11-19).

If left crankshaft bearing is worn, replace the crankshaft assembly.

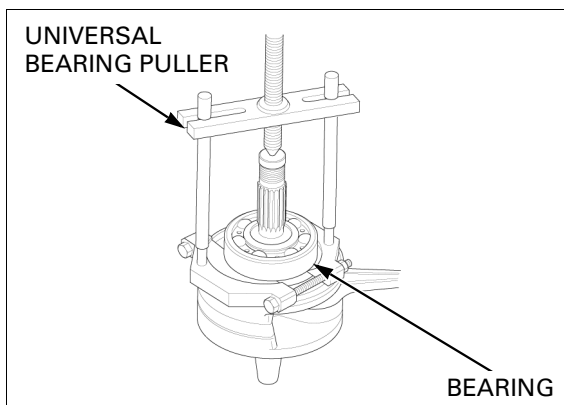


BEARING REPLACEMENT

Remove the right crankshaft bearing using the special tool.

TOOL:

Universal bearing puller **07631-0010000**



Apply new right crankshaft bearing with engine oil.

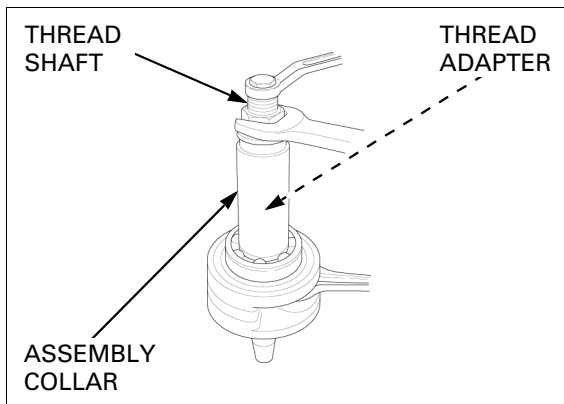
Install the right crankshaft bearing marked side facing up.

Install a new right crankshaft bearing using the special tools.

TOOLS:

Thread adapter
Assembly collar
Thread shaft

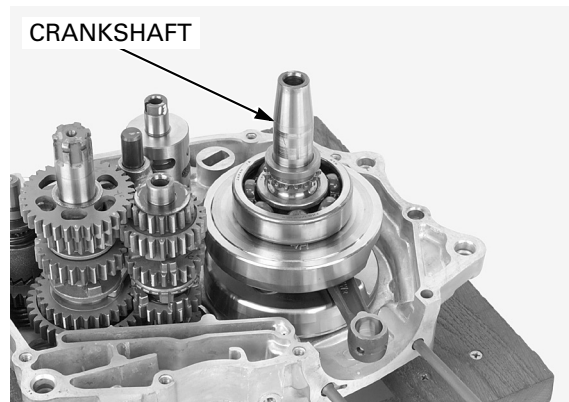
07YMF-KFG0300
07965-VM00100
07965-VM00200



INSTALLTION

Install the crankshaft to right crankcase.

Assemble the crankcase (page 11-22).



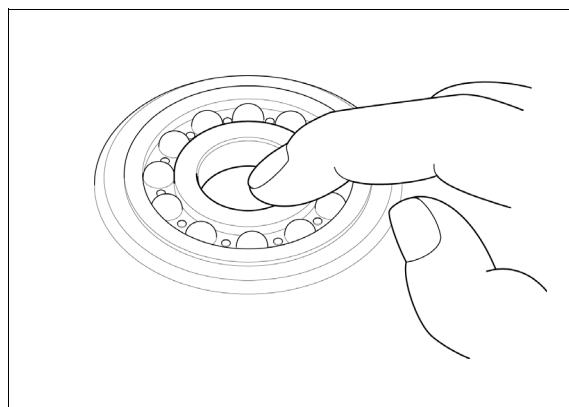
CRANKCASE BEARING REPLACEMENT

Remove the following:

- Transmission (page 11-7)
- Crankshaft (page 11-18)
- Kickstarter spindle (page 11-14)

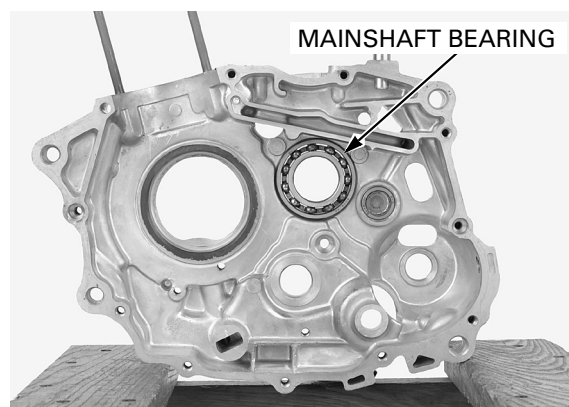
Turn the inner race of each crankcase bearing with your finger and check the needle bearing for damage. The bearing should turn smoothly and quietly. Also check that the bearing outer race and needle bearing fits tightly in the crankcase.

Replace the bearing if the inner race does not turn smoothly, quietly or if the outer race fits loosely in the crankcase.



RIGHT CRANKCASE BEARINGS

Drive the mainshaft bearing out of the right crankcase.

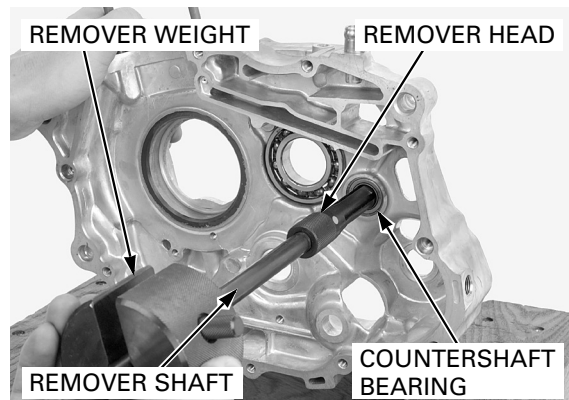


Remove the countershaft bearing using the special tools.

TOOLS:

Remover shaft
Remover head, 15 mm
Remover weight

07936-KC10100
07936-KC10200
07741-0010201



Apply new right crankcase bearings with engine oil.

Drive new mainshaft bearing with the marked side facing up using the special tools.

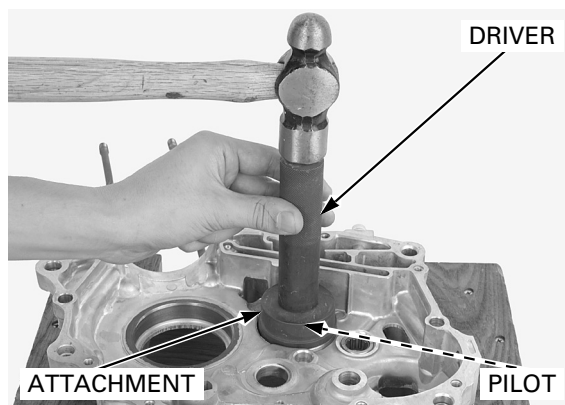
TOOLS:

Driver	07749-0010000
Attachment, 52 x 55 mm	07746-0010400
Pilot, 30 mm	07746-0040700

Drive new countershaft needle bearing with the marked side facing up using the special tools.

TOOLS:

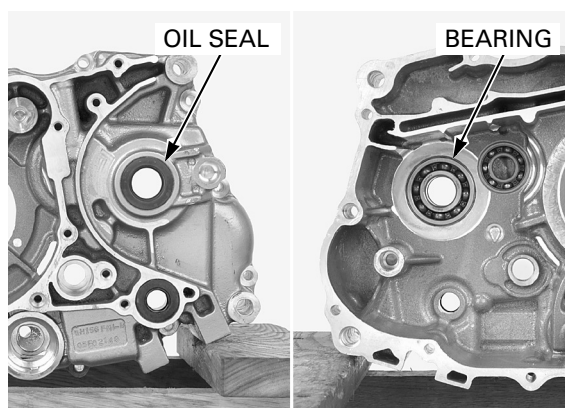
Driver	07749-0010000
Attachment, 22 x 24 mm	07746-0010800
Pilot, 15 mm	07746-0040300



LEFT CRANKCASE BEARINGS

Remove the countershaft oil seal.

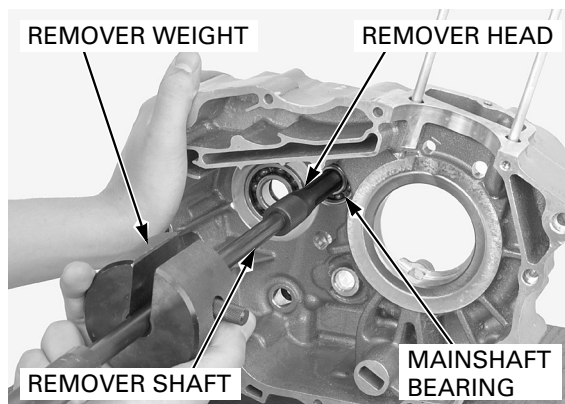
Drive the countershaft bearing out of the left crankcase.



Remove the mainshaft bearing using the special tools.

TOOLS:

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



Apply new left crankcase bearings with engine oil.

Drive new bearings with the marked side facing up using the special tools.

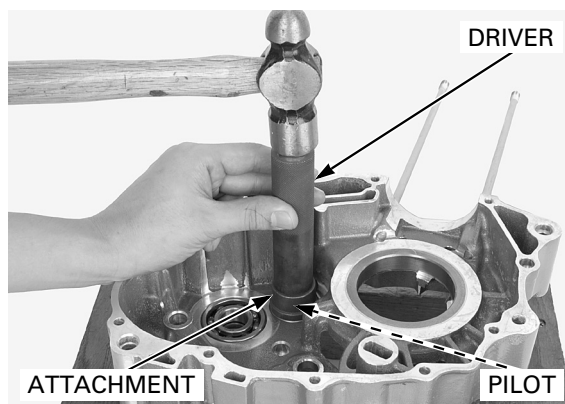
TOOLS:

Mainshaft bearing:

Driver	07749-0010000
Attachment, 32 x 35 mm	07746-0010100
Pilot, 15 mm	07746-0040300

Countershaft bearing:

Driver	07749-0010000
Attachment, 42 X 47 mm	07746-0010300
Pilot, 20 mm	07746-0040500



CRANKCASE/TRANSMISSION/CRANKSHAFT/KICKSTARTER

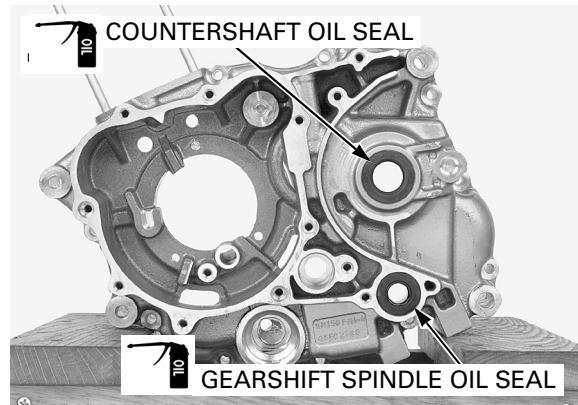
Apply engine oil to the each oil seal lip.

Install a new countershaft oil seal into the left crankcase.

Check the gearshift spindle oil seal for damage and replace it if necessary.

Install the following:

- Kickstarter (page 11-16)
- Crankshaft (page 11-20)
- Transmission (page 11-11)

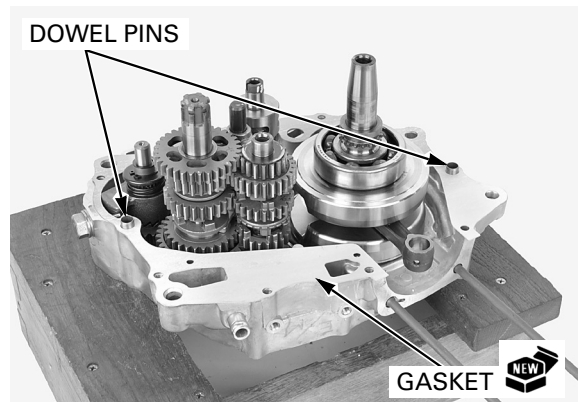


CRANKCASE ASSEMBLY

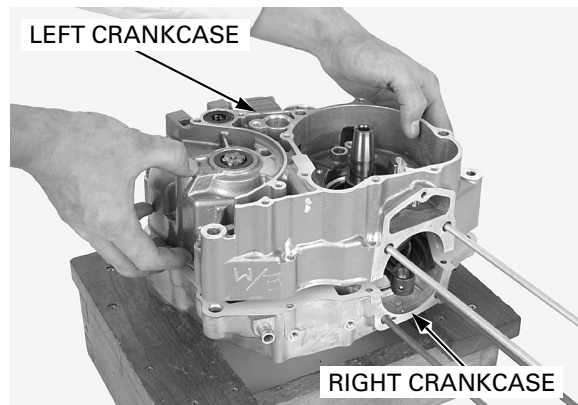
Be careful not to damage the crankcase mating surface.

Clean the crankcase mating surfaces thoroughly.

Install the dowel pins and a new gasket.



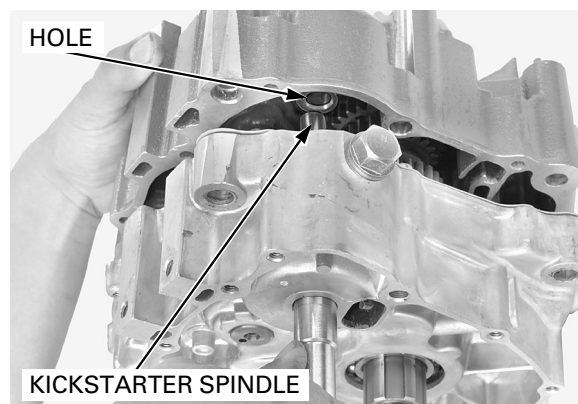
Place the left crankcase over the right crankcase.



Assemble the crankcase halves while aligning the kickstarter spindle with the hole of the left crankcase as shown.

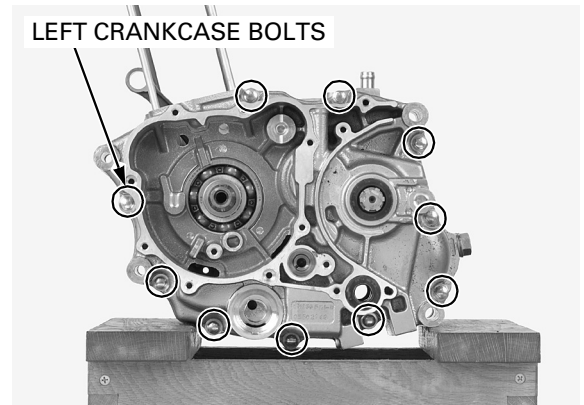
NOTE:

Do not force the crankcase halves together; if there is excessive force required, something is wrong. Remove the crankcase and check for misaligned parts.

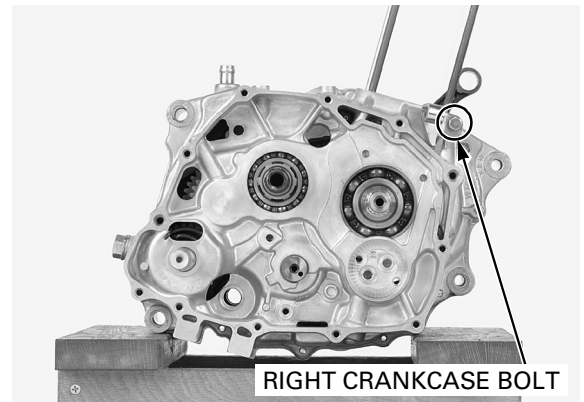


CRANKCASE/TRANSMISSION/CRANKSHAFT/KICKSTARTER

Install the left crankcase bolts and tighten them in a crisscross pattern in several steps.



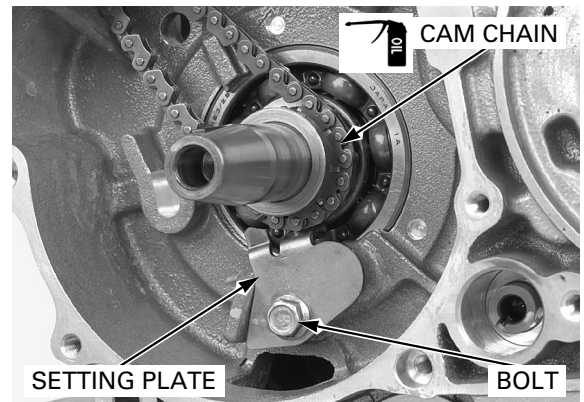
Install the right crankcase bolt and tighten it.



Apply engine oil to the cam chain whole surface.

Install the cam chain over the timing sprocket.
Install the cam chain set plate and tighten the bolt securely.

Install the removed parts in the reverse order of removal.



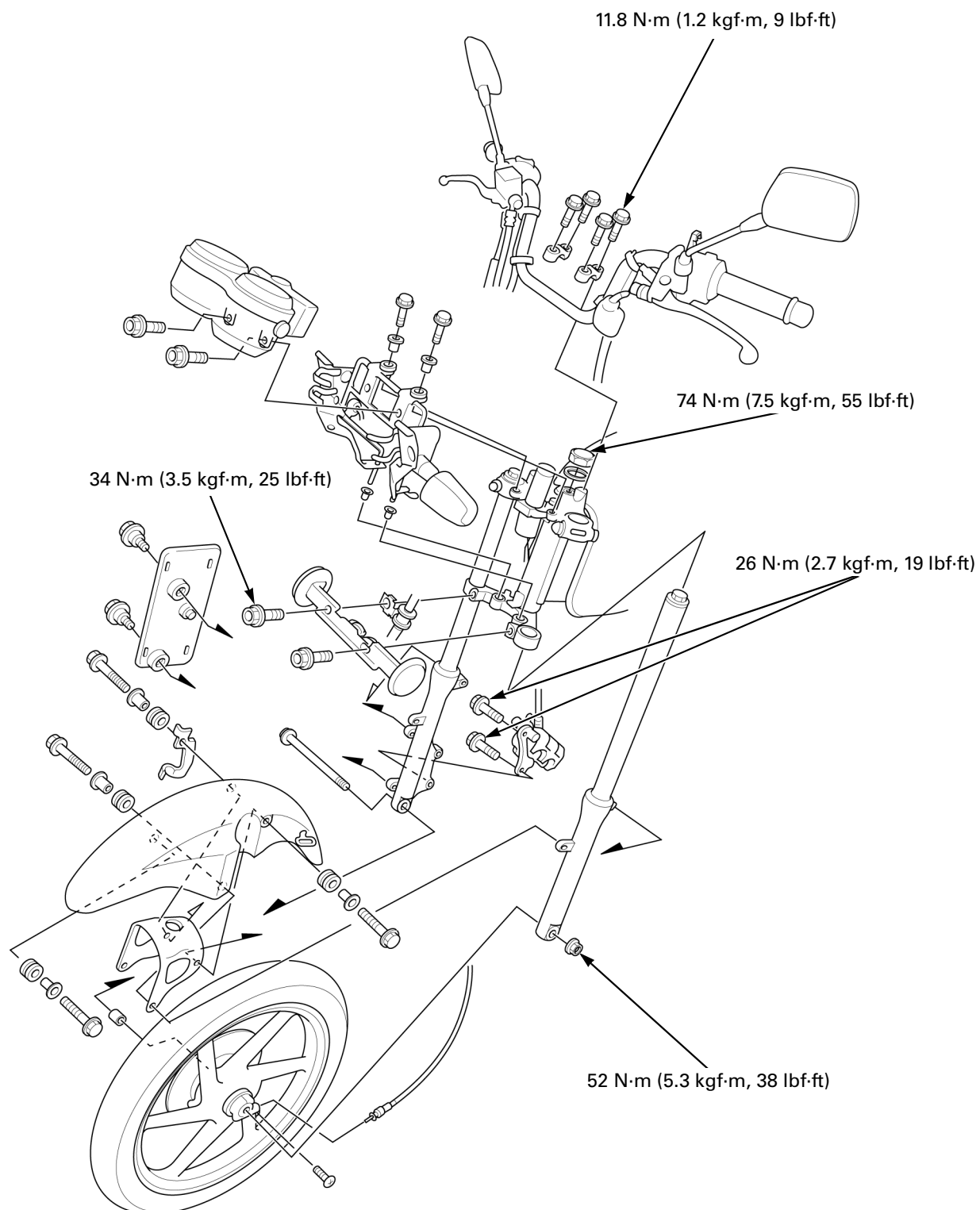
MEMO

12. FRONT WHEEL/BRAKE/SUSPENSION/STEERING

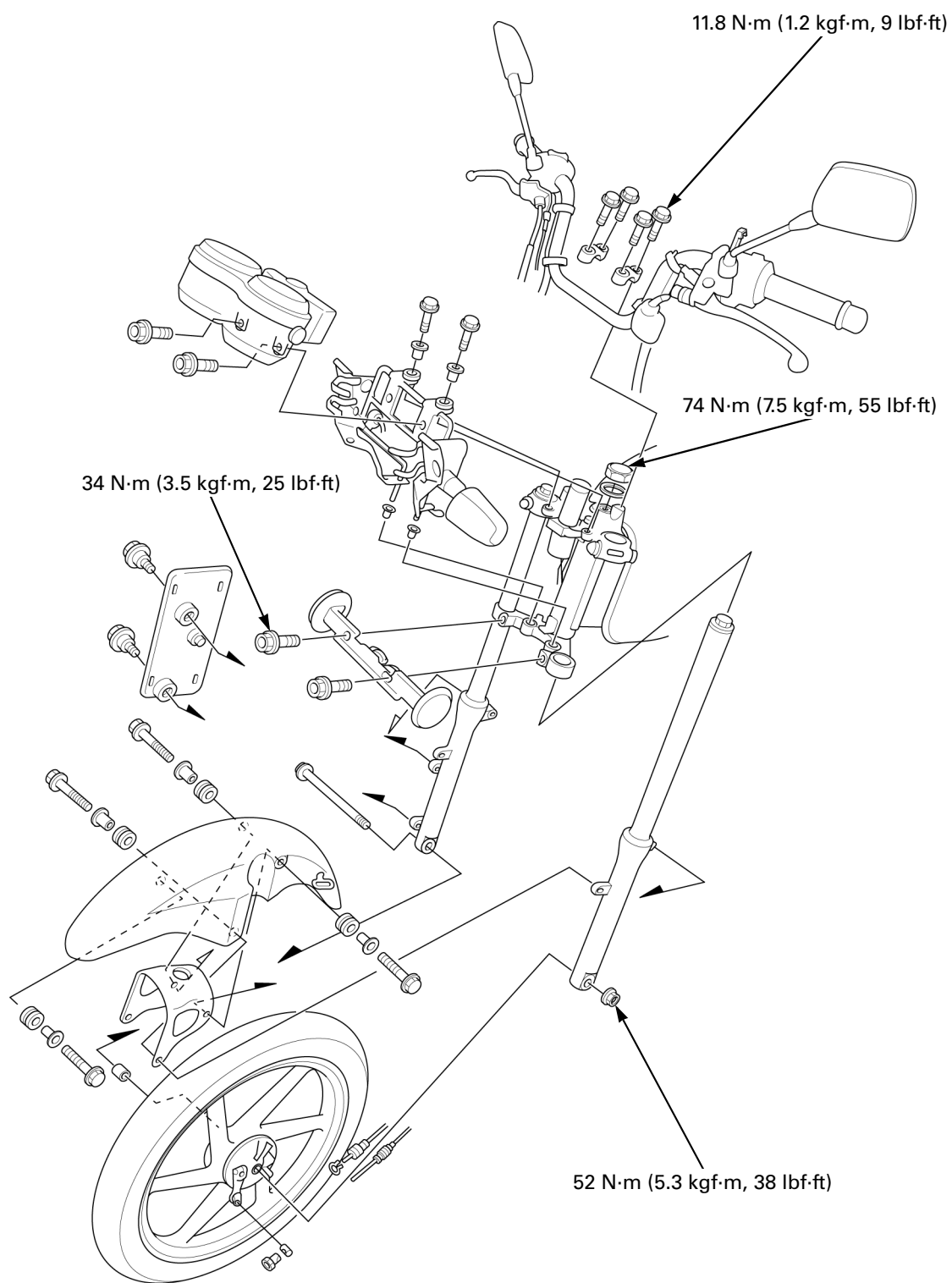
COMPONENT LOCATION	12-2	FRONT WHEEL	12-11
SERVICE INFORMATION	12-4	FRONT DRUM BRAKE	12-19
TROUBLESHOOTING	12-6	FORK	12-22
HANDLEBAR	12-7	STEERING STEM.....	12-29

COMPONENT LOCATION

DISC BRAKE TYPE:



DRUM BRAKE TYPE:



SERVICE INFORMATION

GENERAL

⚠ CAUTION

Frequent inhalation of brake shoe dust, regardless of material composition could be hazardous to your health.

- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

- When servicing the front wheel, fork or steering stem, support the motorcycle using a safety stand or hoist.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- After the front wheel installation, check the brake operation by applying the brake lever.
- Refer to hydraulic brake system information (page 14-3).

SPECIFICATIONS


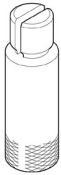

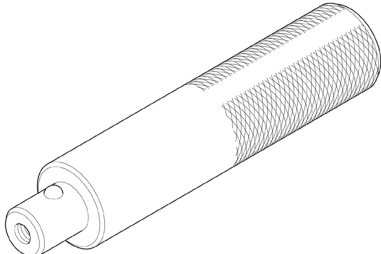
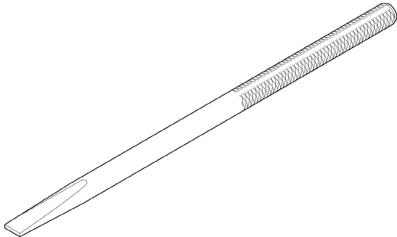
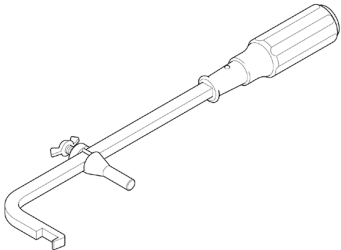
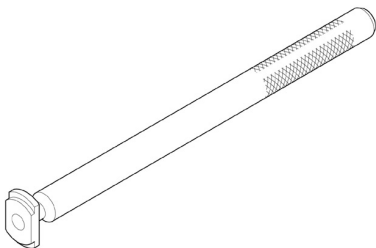
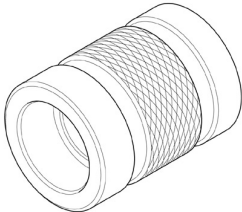
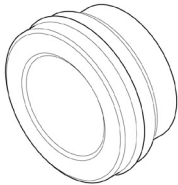
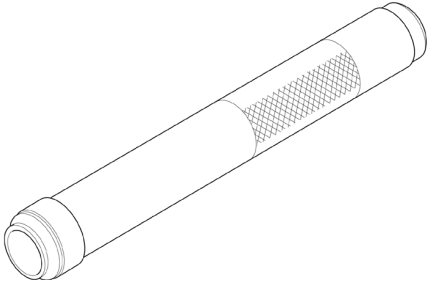
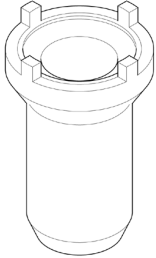
Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	To wear indicator
Cold tire pressure	Driver only	200 kPa (2.00 kgf/cm ² , 29 psi)	–
	Driver and passenger	200 kPa (2.00 kgf/cm ² , 29 psi)	–
Axle runout		–	0.2 (0.01)
Wheel rim runout	Radial	–	1.0 (0.04)
	Axial	–	1.0 (0.04)
Drum brake (Drum brake type)	Brake lever free play	10 – 20 (3/8 – 13/16)	–
	Drum I.D.	130.0 – 130.2 (5.12 – 5.13)	131.0 (5.16)
Fork	Spring free length	484.5 ± 2 (19.1 ± 0.08)	472 (18.6)
	Pipe runout	–	0.20 (0.008)
	Recommended fluid	Fork fluid	–
	Fluid level	140 (5.5)	–
	Fluid capacity	159.0 ± 2.5 cm ³ (5.38 ± 0.08 US oz, 5.60 ± 0.09 Imp oz)	–
Steering head bearing pre-load		13 – 19 N (1.3 – 1.9 kgf)	–

TORQUE VALUES

Handlebar holder bolt	11.8 N·m (1.2 kgf·m, 9 lbf·ft)	
Front brake disc bolt (Disc brake type)	42 N·m (4.3 kgf·m, 31 lbf·ft)	ALOC bolt: replace with a new one.
Front axle nut	52 N·m (5.3 kgf·m, 38 lbf·ft)	
Front brake arm nut (Drum brake type)	10 N·m (1.0 kgf·m, 7 lbf·ft)	U-nut
Fork cap	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.
Top bridge pinch bolt/nut	23 N·m (2.3 kgf·m, 17 lbf·ft)	
Bottom bridge pinch bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)	
Steering bearing adjusting nut	See page 12-33	
Steering stem nut	74 N·m (7.5 kgf·m, 55 lbf·ft)	
Brake caliper mounting bolt	26 N·m (2.7 kgf·m, 19 lbf·ft)	ALOC bolt: replace with a new one.

TOOLS

<p>Attachment, 37 x 40 mm 07746-0010200</p> 	<p>Remover head, 12 mm 07746-0050300</p> 	<p>Pilot, 12 mm 07746-0040200</p> 
<p>Driver 07749-0010000</p> 	<p>Bearing remover shaft 07746-0050100</p> 	<p>Oil seal remover 07748-0010001</p> 
<p>Ball race remover 07944-1150001</p> 	<p>Fork seal driver 07747-0010100</p> 	<p>Fork seal driver attachment 07747-0010400</p> 
<p>Steering stem driver 07946-GC40000</p> 	<p>Stem socket wrench 07916-3710101</p> 	

TROUBLESHOOTING

Hard steering

- Steering bearing adjusting nut too tight
- Damaged steering head bearing/race
- Insufficient tire pressure
- Faulty tire

Steers to one side or does not track straight

- Bent fork
- Bent front axle
- Wheel installed incorrectly
- Faulty steering head bearing
- Bent frame
- Faulty wheel bearing
- Worn swingarm pivot components (page 13-21)

Front wheel wobbling

- Bent rim
- Worn wheel bearings
- Faulty tire

Wheel hard to turn

- Faulty wheel bearing
- Faulty speedometer gear
- Bent front axle
- Brake drag

Soft suspension

- Weak fork spring
- Insufficient fork fluid
- Tire pressure too low

Hard suspension

- Incorrect fork fluid viscosity
- Bent fork pipes
- Clogged fluid passage
- Damaged fork pipe and/or fork slider

Front suspension noisy

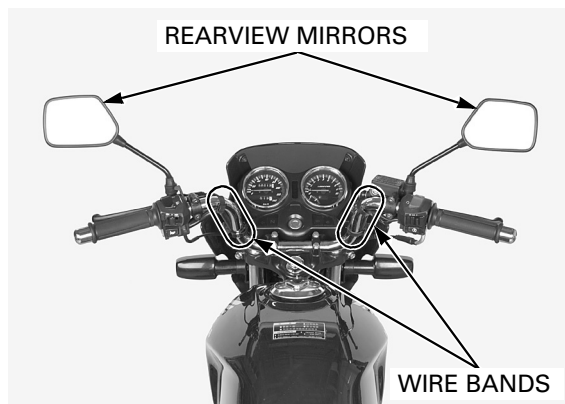
- Insufficient fluid in fork
- Loose fork fasteners
- Lack of grease in speedometer gear

HANDLEBAR

REMOVAL

Right rearview mirror lock nut has left hand threads.

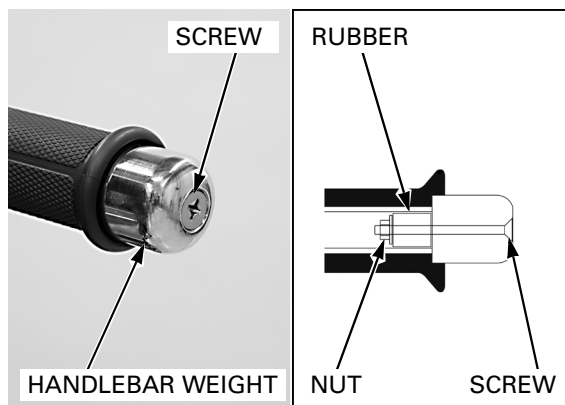
Remove the wire bands and rearview mirrors.



When removing the weight, do not remove the screw from the nut.

Hold the handlebar weight and loosen the screw.

Remove the handlebar weight, rubber and nut assembly.



Disconnect the front brake light switch connectors.

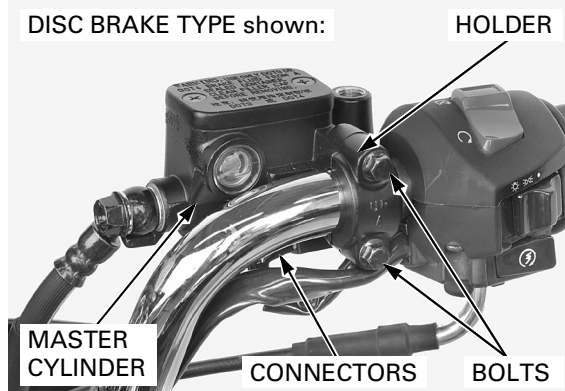
Remove the bolts and holder.

Disc brake type:

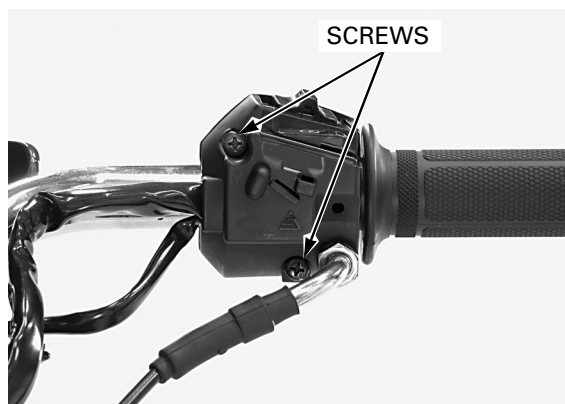
Remove the master cylinder.

Drum brake type:

Remove the brake lever bracket.



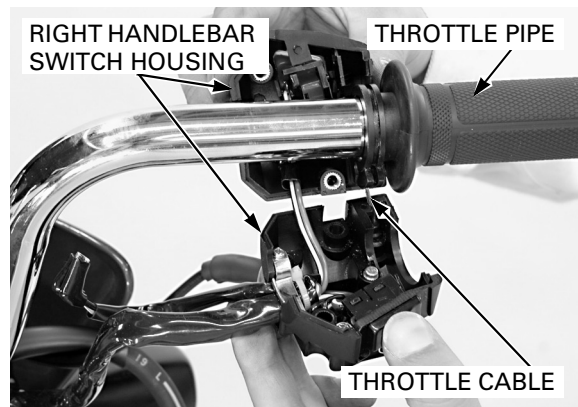
Remove the right handlebar switch housing screws.



FRONT WHEEL/BRAKE/SUSPENSION/STEERING

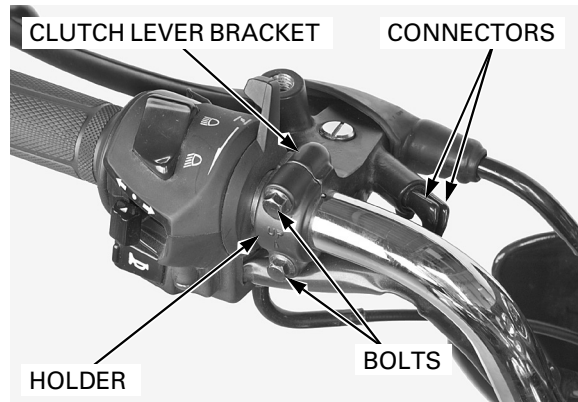
Separate the right handlebar switch housing.

Disconnect the throttle cable from the throttle pipe, then remove the throttle pipe.

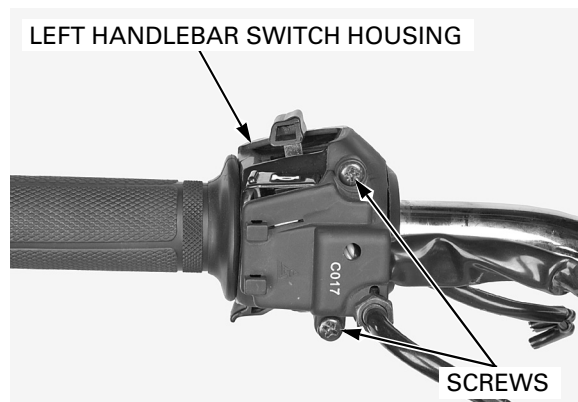


Disconnect the clutch switch connectors.

Remove the bolts, clutch lever bracket and holder.



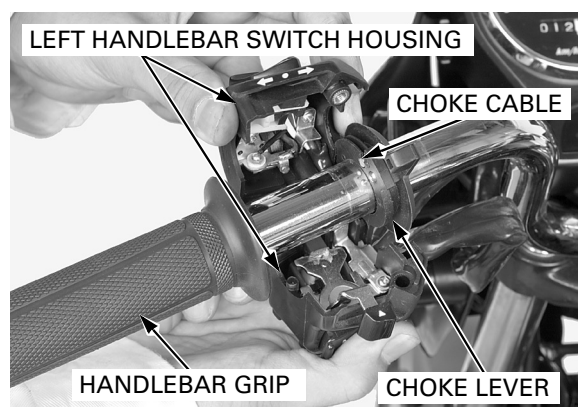
Remove the screws and left handlebar switch housing.



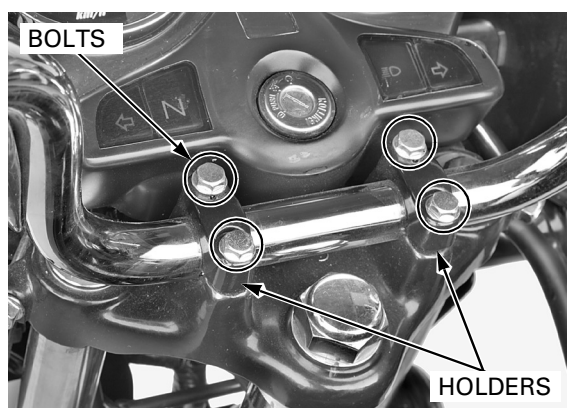
Separate the left handlebar switch housing.

Disconnect the choke cable from the choke lever and remove the left handlebar switch housing.

Remove the handlebar grip.



Remove the bolts, handlebar holders and handlebar from the top bridge.

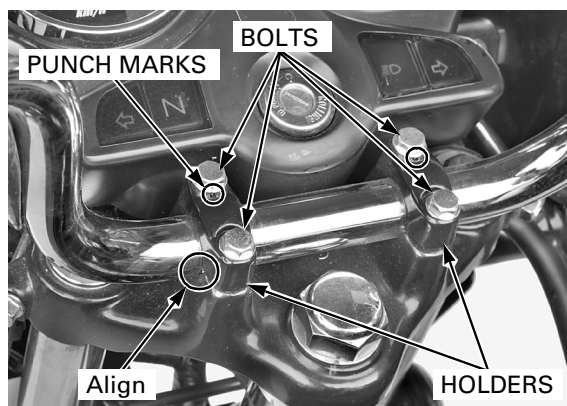


INSTALLATION

Place the handlebar to the top bridge.
Place the handlebar upper holders with the punch marks facing forward and install the holder bolts.

Align the punch mark on the handlebar with the top surface of the lower holder.
Tighten the front bolts first, then the rear bolts.

TORQUE: 11.8 N·m (1.2 kgf·m, 9 lbf·ft)

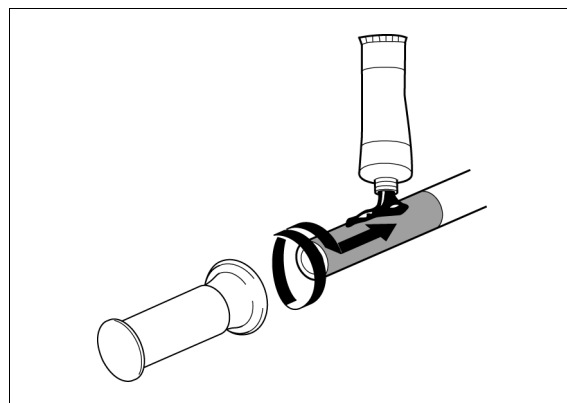


Apply Honda Bond A or equivalent to the inside surface of the grip and to the clean surface of the left handlebar.

Wait 3 – 5 minutes and install the grip.

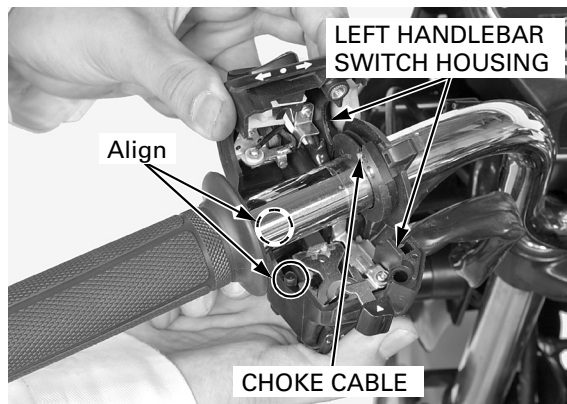
Allow the adhesive to dry for 1 hour before using.

Rotate the grips for even application of the adhesive.



Connect the choke cable to the choke lever.

Install the left handlebar switch housing, aligning the locating pin in the housing with the hole in the handlebar.



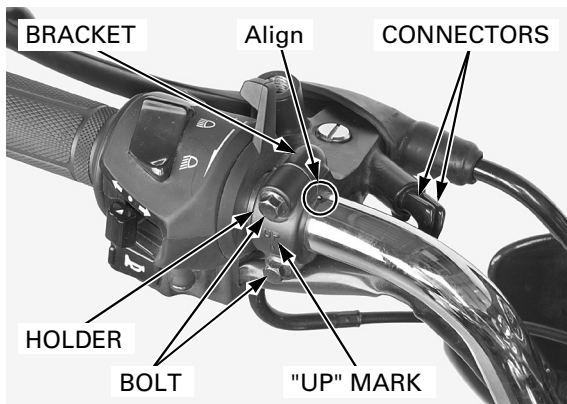
FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Install the screws and tighten the front screw first, then the rear screw.



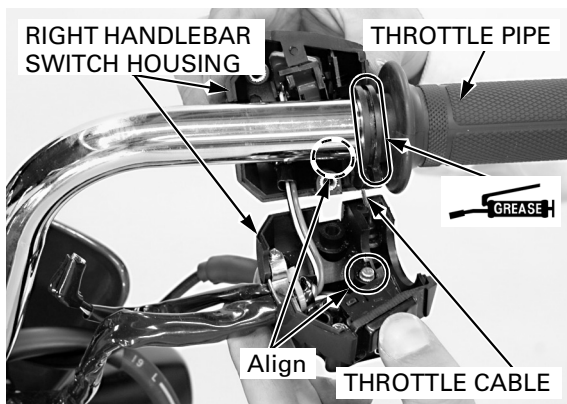
Install the clutch lever bracket onto the left side of the handlebar aligning the end of bracket with the punch mark on the handlebar.
Install the holder with the "UP" mark facing up.
Install the bolts and tighten the upper bolt first, then the lower bolt.

Connect the clutch switch connectors.

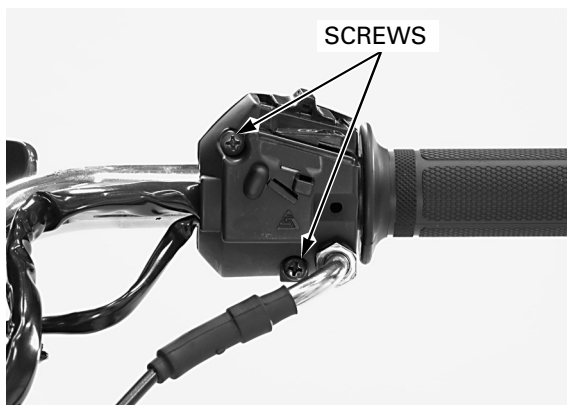


Install the throttle pipe on the handlebar.
Apply grease to the throttle cable contacting area of the throttle pipe and throttle cable end.
Connect the throttle cable end to the throttle pipe.

Install the right handlebar switch housing, aligning its locating pin with the hole on the handlebar.



Install the screws and tighten the front screw first, then the rear screw.

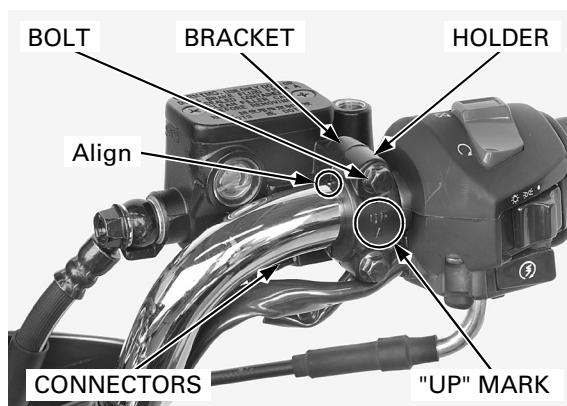


Disc brake type: Install the master cylinder aligning the end of master cylinder with the punch mark on the handlebar.

Drum brake type: Install the brake lever bracket aligning the end of bracket with the punch mark on the handlebar.

Install the holder with the "UP" mark facing up.
Install the bolts and tighten the upper bolt first, then the lower bolt.

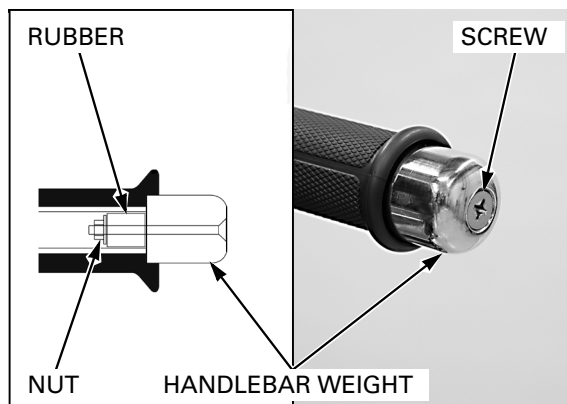
Connect the brake light switch connectors.



Temporarily assemble the handlebar weight, rubber and nut.

Install the handlebar weight assembly to the handlebar.

Hold the handlebar weight and tighten the screw until the handlebar weight is installed securely.



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

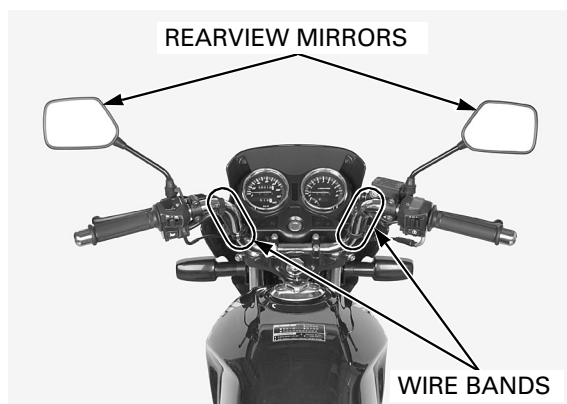
Install the wire bands and rearview mirrors.

NOTE:

- Right rearview mirror lock nut has left hand threads.

Adjust the following:

- Throttle grip (page 3-6)
- Clutch lever (page 3-22)



FRONT WHEEL

REMOVAL (DISC BRAKE TYPE)

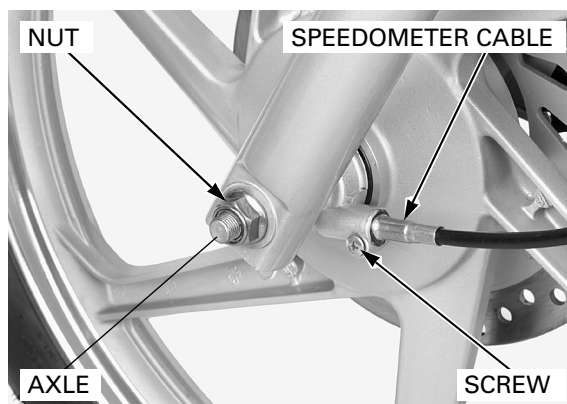
Raise the front wheel off the ground and support the motorcycle using safety stand or a box.

Remove the screw and disconnect the speedometer cable.

Remove the axle nut.

Remove the axle and front wheel.

Do not operate the brake lever after removing the wheel, to do so will cause difficulty in fitting the brake disc between the brake pads.

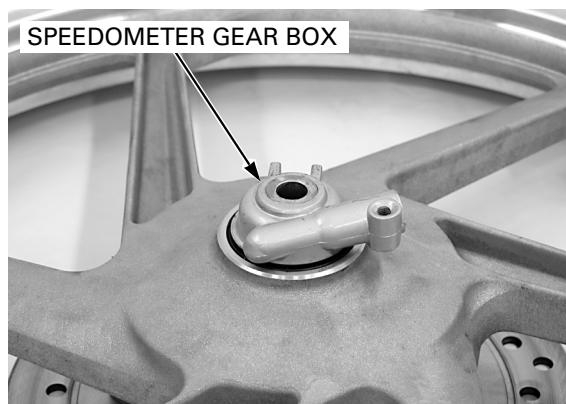


FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Remove the right side collar.



Remove the speedometer gear box from the left side wheel hub.



REMOVAL (DRUM BRAKE TYPE)

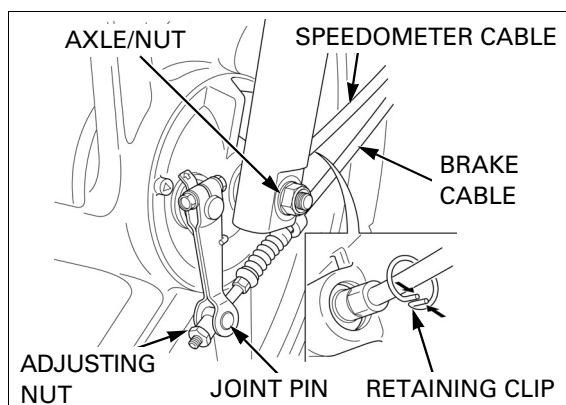
Raise the front wheel off the ground and support the motorcycle using safety stand or a box.

Remove the retaining clip and disconnect the speedometer cable.

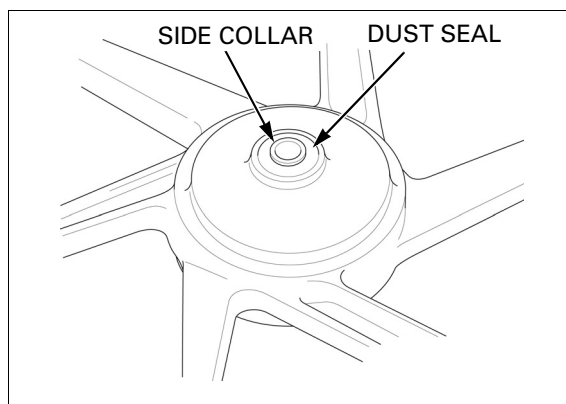
Remove the front brake adjusting nut, brake cable and brake arm joint pin.

Remove the axle nut.

Remove the axle and front wheel.

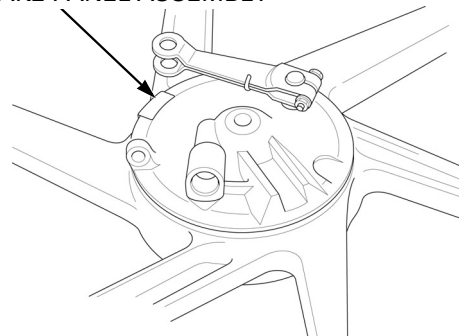


Remove the right side collar and dust seal.



Remove the brake panel assembly from left wheel hub.

BRAKE PANEL ASSEMBLY



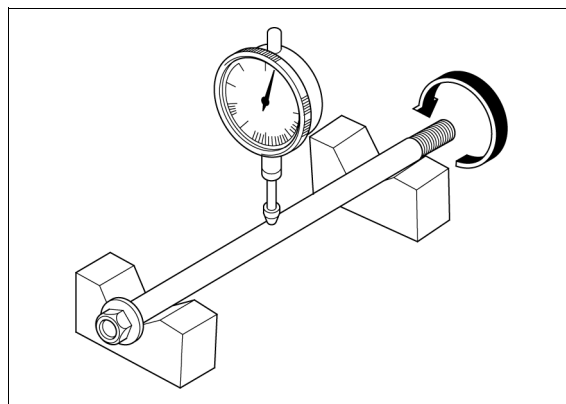
INSPECTION

AXLE

Set the axle in V-blocks. Turn the axle and measure the runout with a dial indicator.

Actual runout is 1/2 of the total indicator reading.

SERVICE LIMIT: 0.2 mm (0.01 in)



WHEEL RIM RUNOUT

Check the wheel rim runout by placing the wheel in a turning stand.

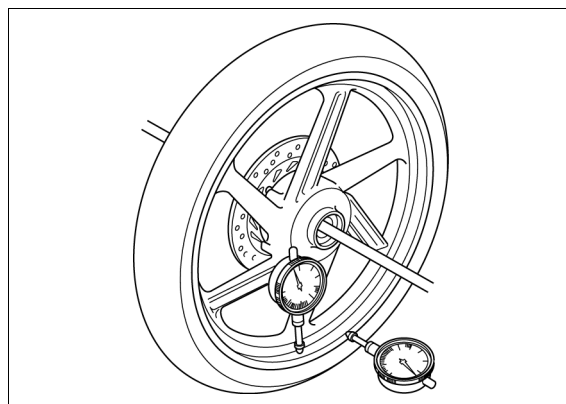
Spin the wheel slowly by hand and, read the runout using a dial indicator.

Actual runout is 1/2 of the total indicator reading.

SERVICE LIMITS:

Axial: 1.0 mm (0.04 in)

Radial: 1.0 mm (0.04 in)

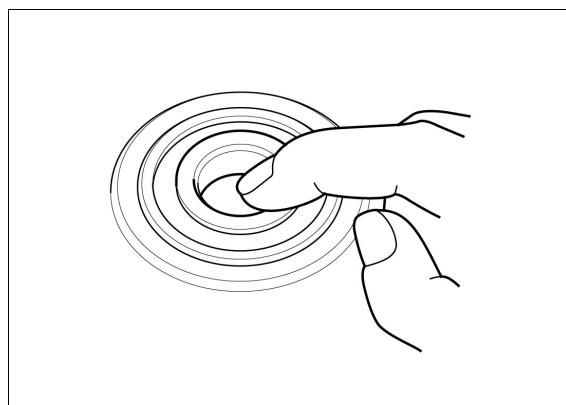


WHEEL BEARING

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

Replace the bearings in pairs.

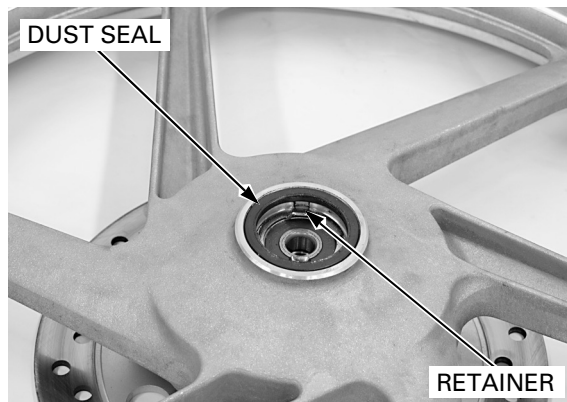
Remove and discard the bearings if they do not turn smoothly, quietly, or if they fit loosely in the hub.



FRONT WHEEL/BRAKE/SUSPENSION/STEERING

DISASSEMBLY (DISC BRAKE TYPE)

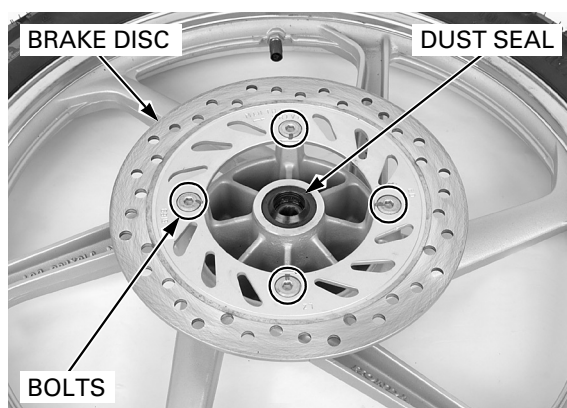
Remove the dust seal and speedometer gear retainer from the left side of the front wheel.



Never install the old brake disc mounting bolts.

Remove the brake disc mounting bolts and brake disc.

Remove the dust seal.



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.

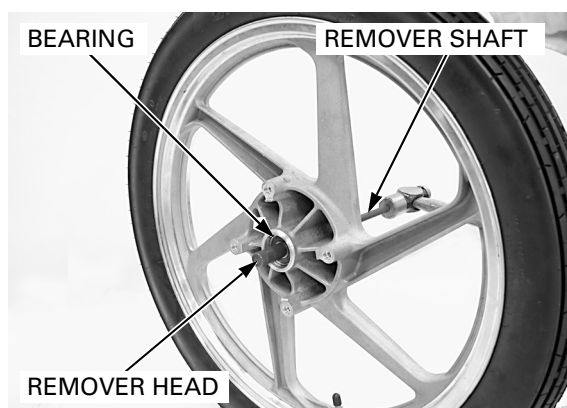
TOOLS:

Remover head, 12 mm

07746-0050300

Bearing remover shaft

07746-0050100



DISASSEMBLY (DRUM BRAKE TYPE)

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.

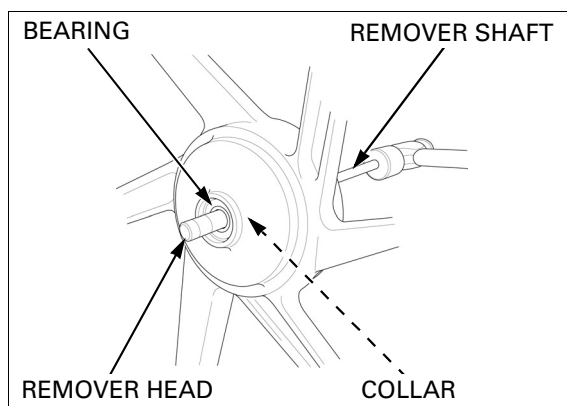
TOOLS:

Remover head, 12 mm

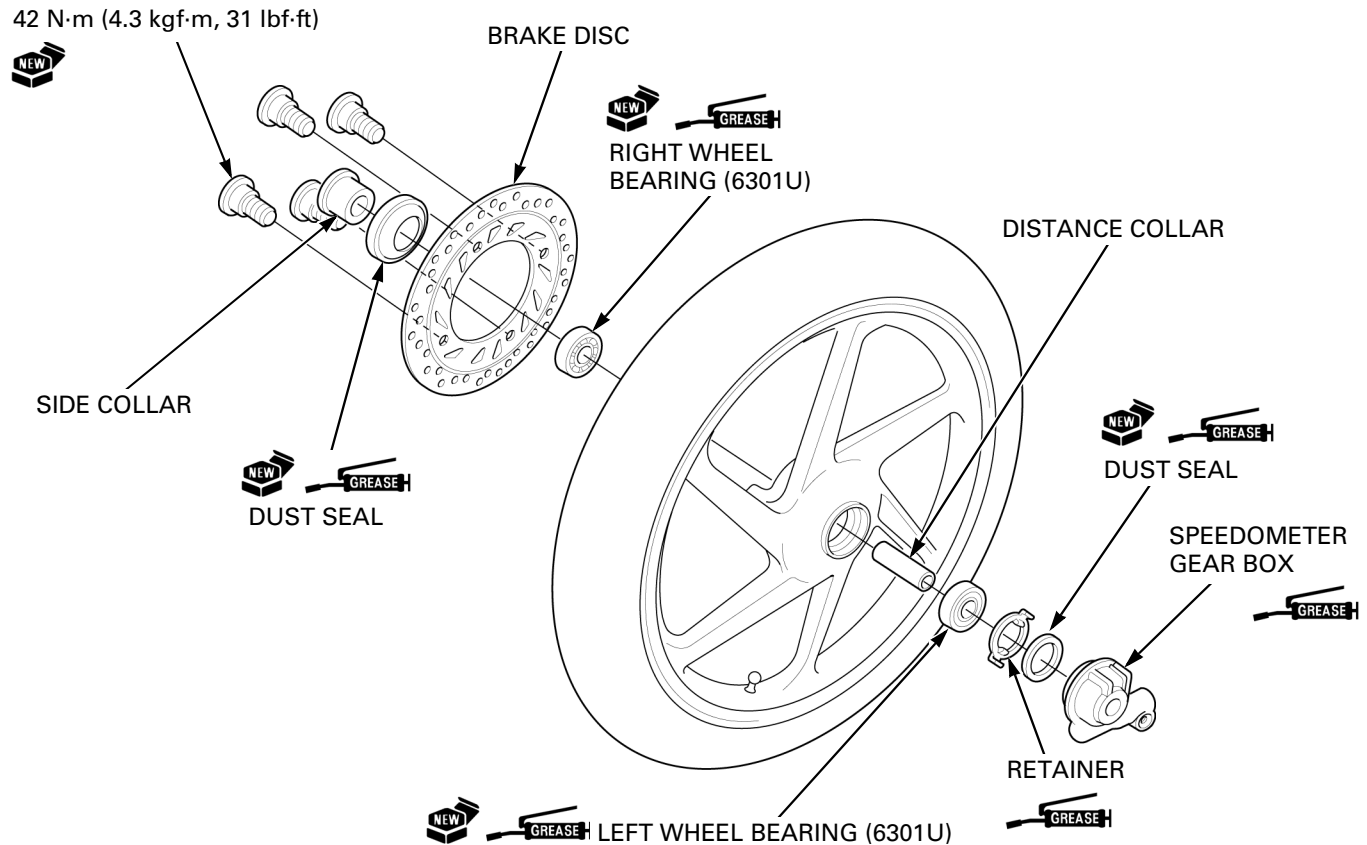
07746-0050300

Bearing remover shaft

07746-0050100



ASSEMBLY (DISC BRAKE TYPE)



WHEEL ASSEMBLY

Pack new bearing cavities with grease.

Never install the old bearing, once the bearing has been removed, the bearing must be replaced with new ones.

Drive in a new right (brake disc side) bearing squarely with the sealed side facing up until it is fully seated.

Install the distance collar.

Drive in a new left side bearing squarely with the sealed side facing up until it is fully seated.

TOOLS:

Driver

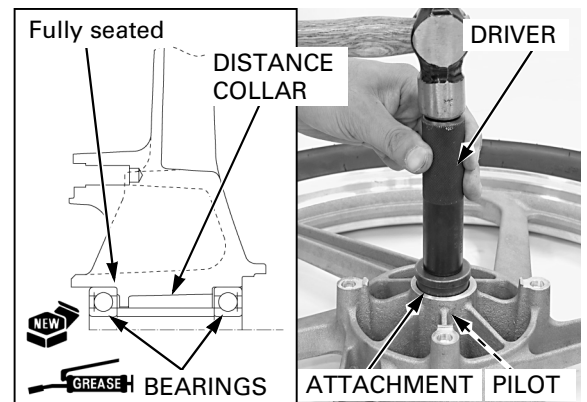
Attachment, 37 x 40 mm

Pilot, 12 mm

07749-0010000

07746-0010200

07746-0040200



Do not get grease on the brake disc or stopping power will be reduced.

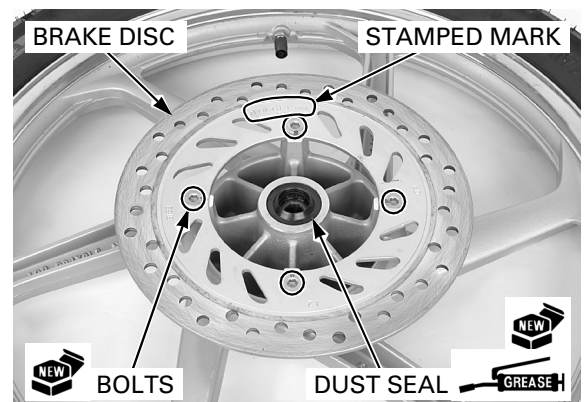
Install the brake disc with the stamped mark facing out.

Install and tighten the new brake disc bolts in a crisscross pattern in several steps.

TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)

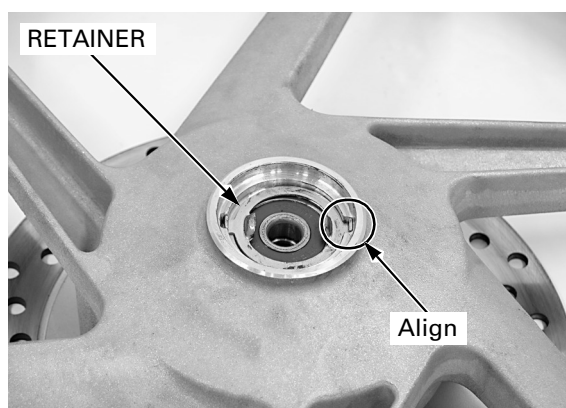
Apply grease to a new dust seal lip.

Install the dust seal until it is flush with the right wheel hub.

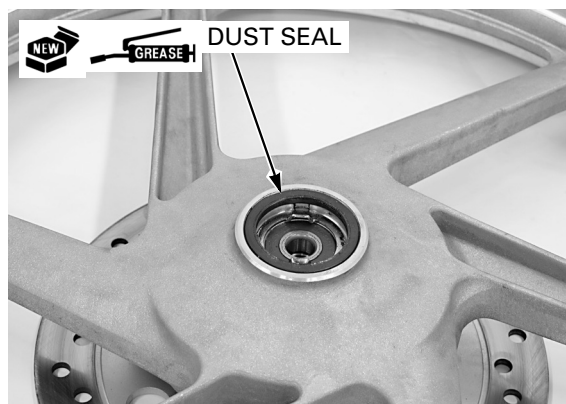


FRONT WHEEL/BRAKE/SUSPENSION/STEERING

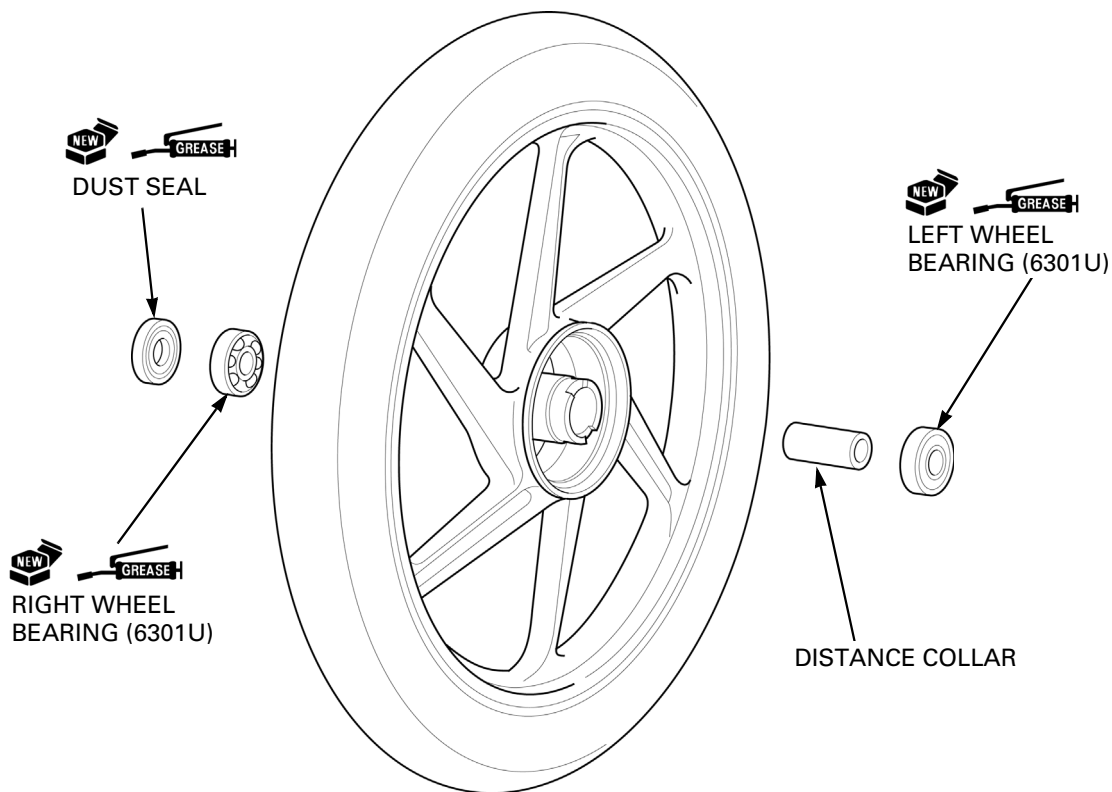
Install the speedometer gear retainer to the wheel hub, aligning the tabs on the retainer with the slots on the hub.



Apply grease to a new dust seal lip.
Install the dust seal to the left wheel hub.



ASSEMBLY (DRUM BRAKE TYPE)



WHEEL ASSEMBLY

Pack new bearing cavities with grease.

Never install the old bearing, once the bearing has been removed, the bearing must be replaced with new ones.

Drive in a new left (brake drum side) bearing squarely with the sealed side facing up until it is fully seated.

Install the distance collar.

Drive in a new right side bearing squarely with the sealed side facing up until it is fully seated.

TOOLS:

Driver

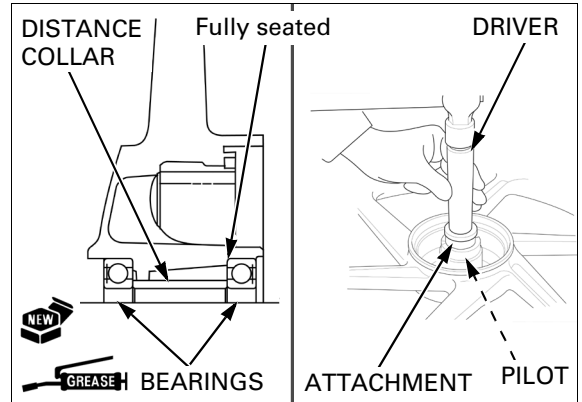
07749-0010000

Attachment, 37 x 40 mm

07746-0010200

Pilot, 12 mm

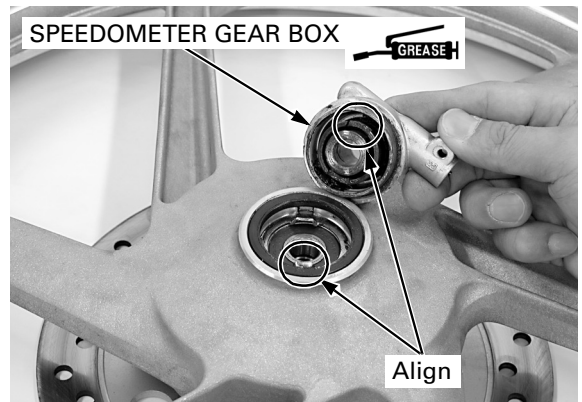
07746-0040200



INSTALLATION (DISC BRAKE TYPE)

Apply grease to the inside of the speedometer gear box and retainer tabs.

Install the speedometer gear box into the left wheel hub, aligning the tabs of the retainer with the slots of the gear box.



Install the side collar.



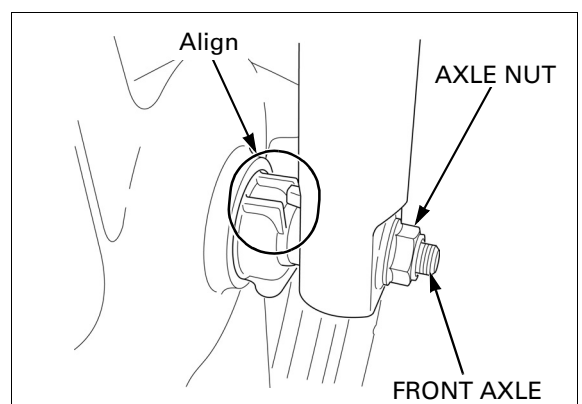
Be careful not to damage the pads.

Install the front wheel between the fork legs, aligning the speedometer gear box groove with the boss on the fork leg so that the brake disc is positioned between the pads.

Insert the front axle from right side.

Install and tighten the axle nut to the specified torque.

TORQUE: 52 N·m (5.3 kgf·m, 38 lbf·ft)

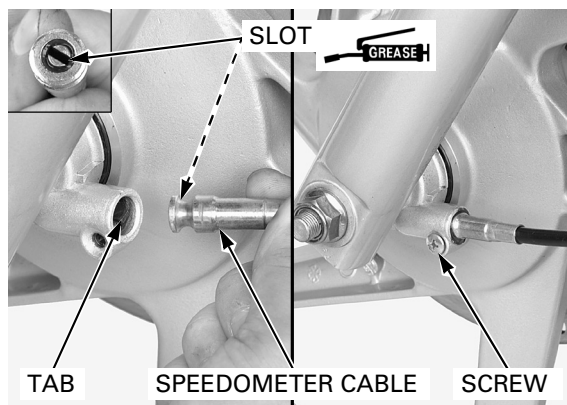


FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Apply grease to the slot of the speedometer cable.

Install the speedometer cable to the speedometer gear box aligning slot of the cable and the tab of the gear box.

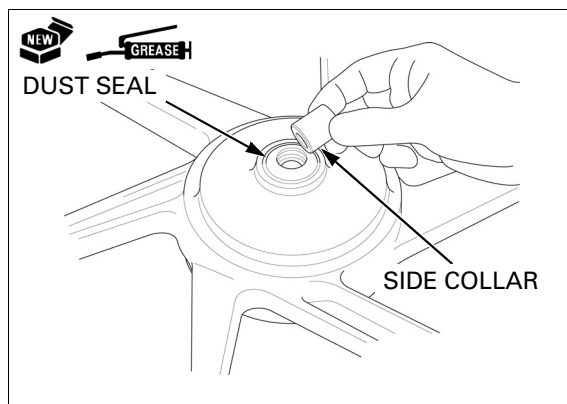
Install and tighten the screw.



INSTALLATION (DRUM BRAKE TYPE)

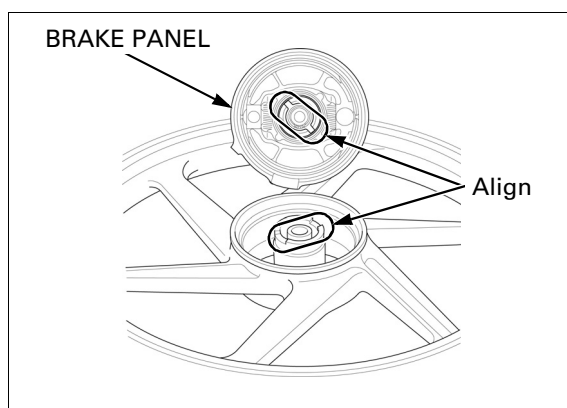
Apply grease to a new dust seal lip.

Install the dust seal until it is flush with the right wheel hub, and side collar to the right wheel hub.



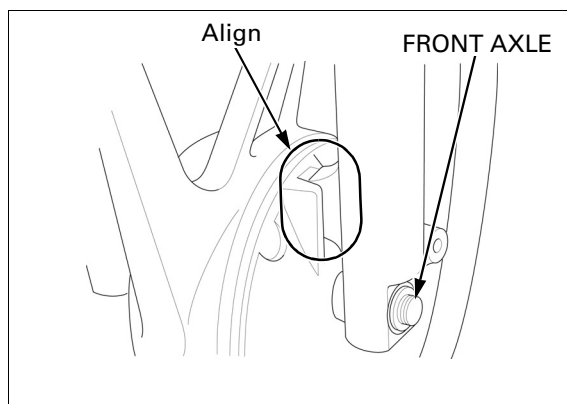
Do not get grease on the brake drum and shoe linings.

Install the brake panel assembly into the left wheel hub, aligning the speedometer tab with the wheel hub slot.



Install the front wheel between the fork legs, aligning the brake panel groove with the boss on the left fork leg.

Install the front axle from right side.



Install and tighten the axle nut to the specified torque.

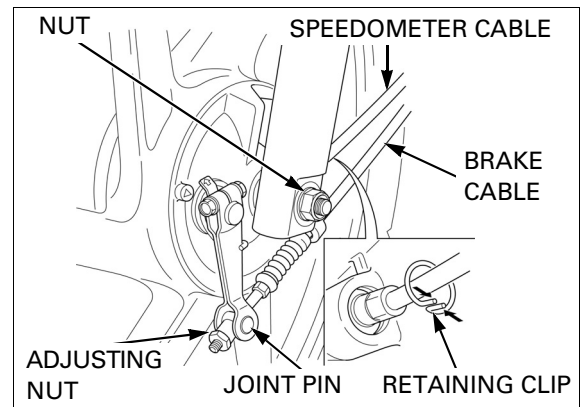
TORQUE: 52 N·m (5.3 kgf·m, 38 lbf·ft)

Apply grease to the speedometer cable of inside area.

Install the speedometer cable and retaining clip.

Install the brake arm joint pin, brake cable and front brake adjusting nut.

Adjust the brake lever free play and check the brake operation (page 3-20).



FRONT DRUM BRAKE

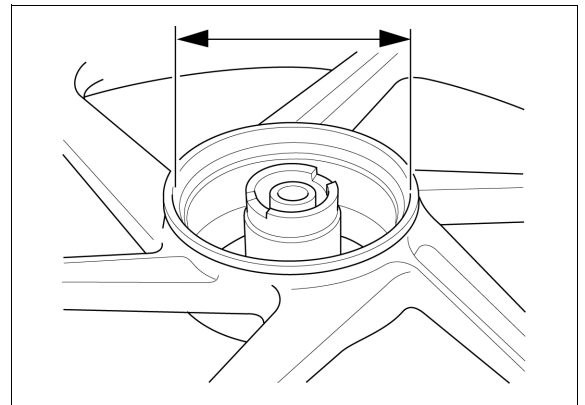
REMOVAL

Remove the brake panel from the front wheel (page 12-12).

INSPECTION

Measure the front brake drum I.D.

SERVICE LIMIT: 131.0 mm (5.16 in)



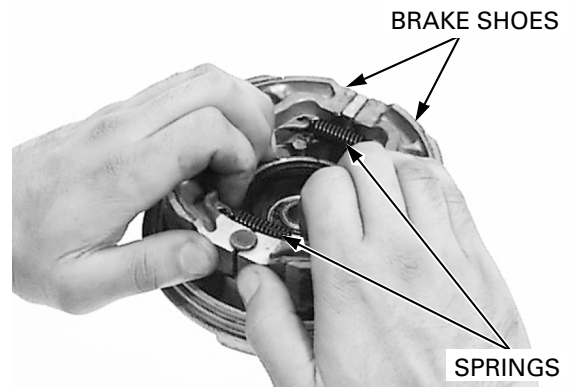
DISASSEMBLY

Always replace the brake shoes in pairs.

Expand the brake shoes and remove them from the brake panel.

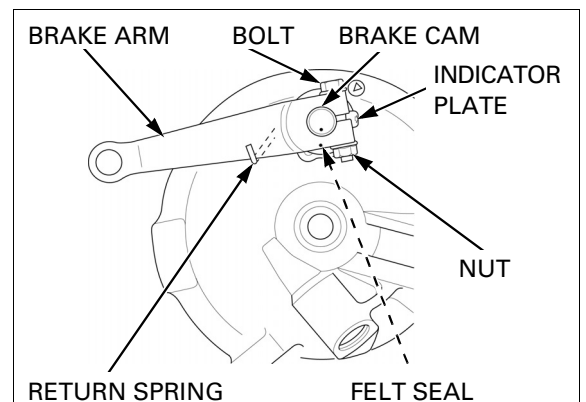
If the brake shoes are to be reused, mark them so they can be reassembled in their original positions.

Remove the shoe springs from the brake shoes.



Remove the brake arm pinch bolt, nut and brake arm.

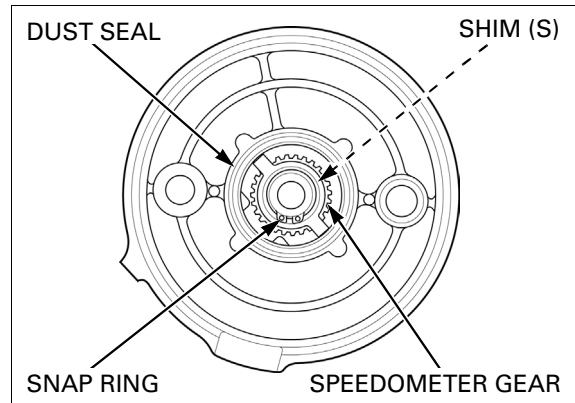
Remove the indicator plate, return spring, felt seal and brake cam.



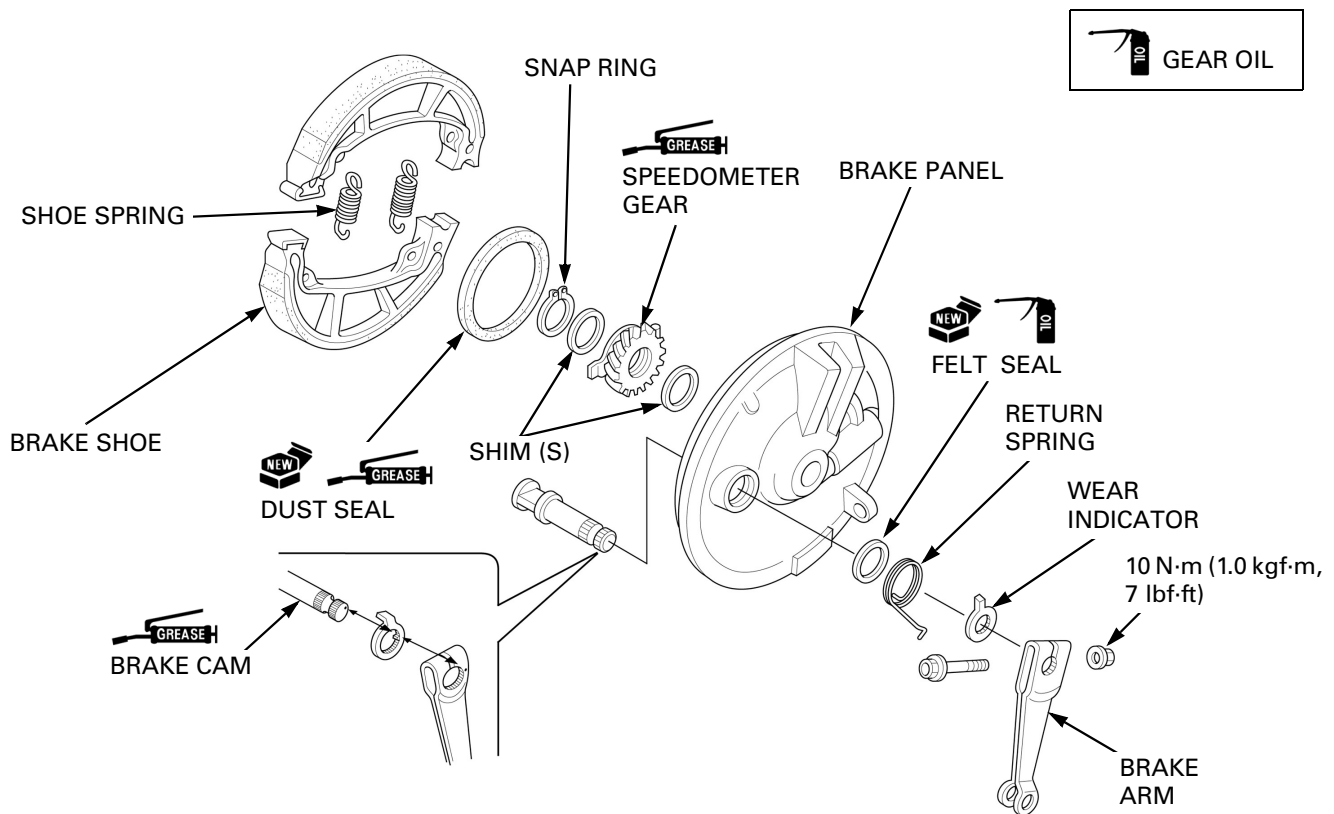
FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Remove the following:

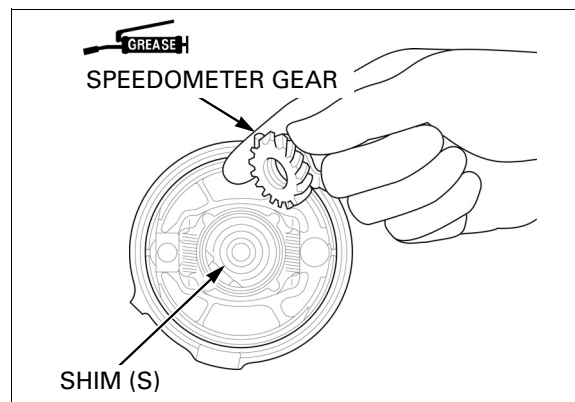
- Dust seal
- Snap ring
- Speedometer gear
- Shim (s)



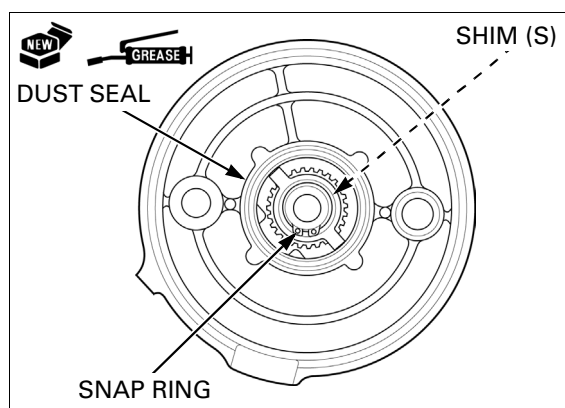
ASSEMBLY



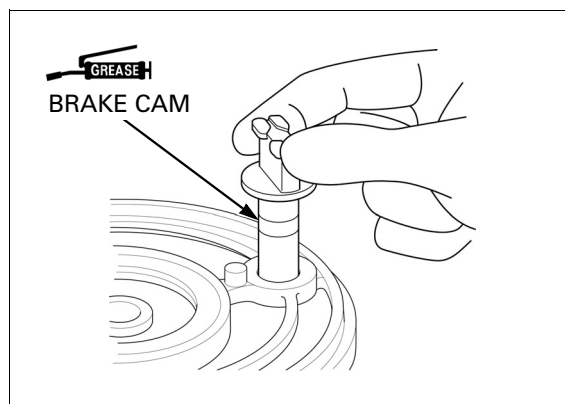
Apply 3.0 – 5.0 g (0.1 – 0.2 oz) of grease to the speedometer gear teeth.
Apply grease to the speedometer gear inner surface.
Install the shim (s) and speedometer gear.



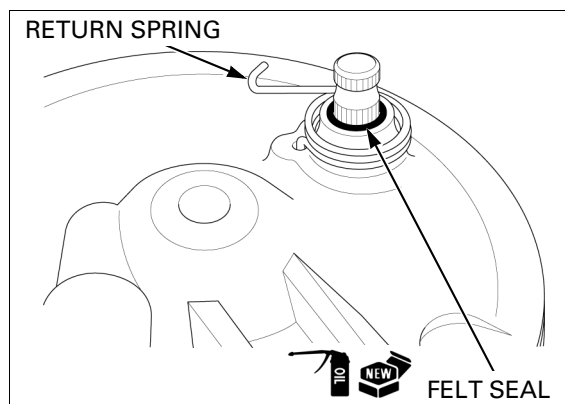
Install the shim (s) and snap ring.
 Apply grease to a new dust seal lip.
 Install the dust seal to the brake panel.



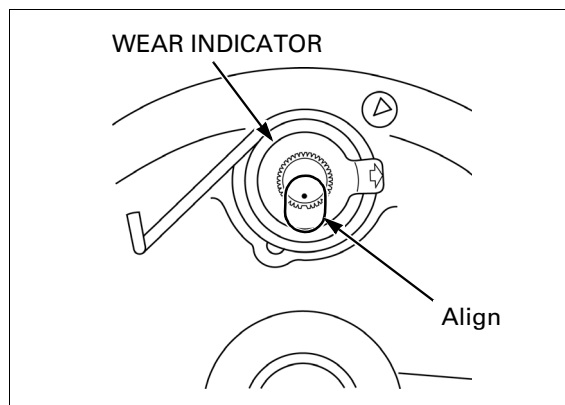
Apply grease to the spindle groove in the brake cam.
 Install the brake cam to the brake panel.



Apply gear oil to a new felt seal and install it.
 Install the return spring to the brake panel.



Install the wear indicator, aligning the wide tooth with the wide groove of the brake cam.



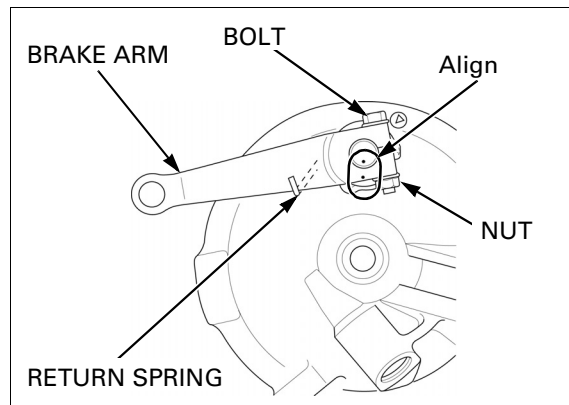
FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Install the brake arm, aligning the punch marks.

Hook the return spring to the brake arm as shown.

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

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



Apply grease to the anchor pin and brake cam sliding surfaces.

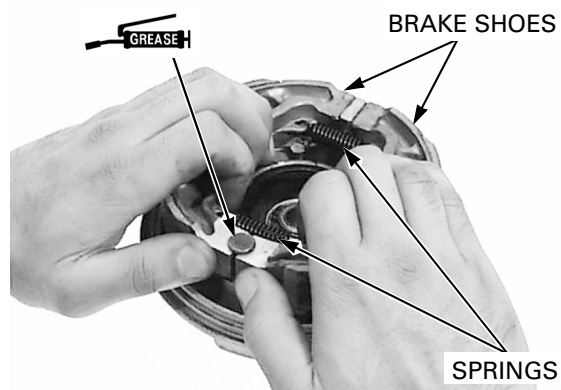
If the brake shoes are reused, the shoes and springs must be placed back in their original location.

Assemble the brake shoes and springs as shown. Install the shoe assembly onto the brake panel.

Wipe any excess grease from the brake cam and anchor pin.

INSTALLATION

Install the brake panel assembly (page 12-18).



FORK

REMOVAL

Disc brake type: support the caliper so it does not hang from the brake hose. Do not twist the brake hose.

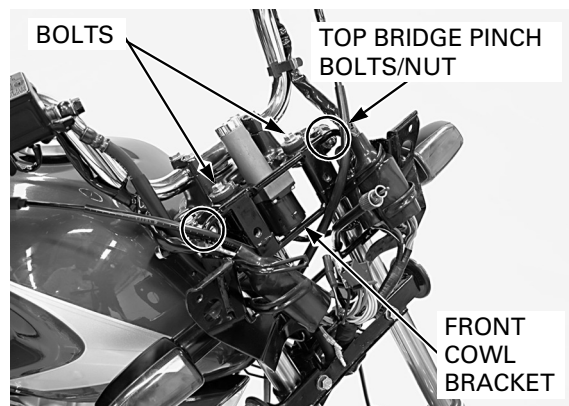
Remove the brake caliper (page 14-15).

Remove the following:

- Front cowl (page 2-8)
- Front wheel (Disc brake type: page 12-11 or Drum brake type: page 12-12)
- Front fender (page 2-8)
- License plate holder (page 2-10)
- Combination meter unit (page 18-6)

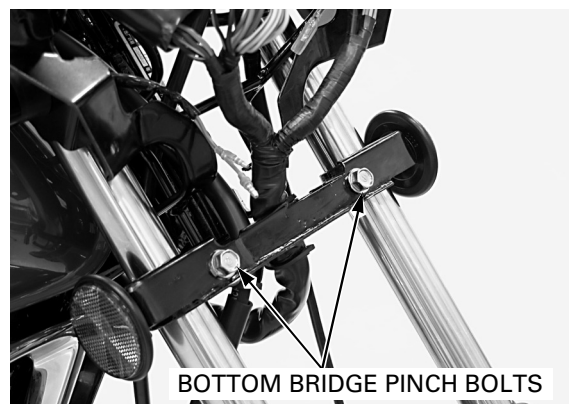
Loosen the front cowl bracket bolts and slightly pull up the bracket.

Loosen the top bridge pinch bolts and nuts.



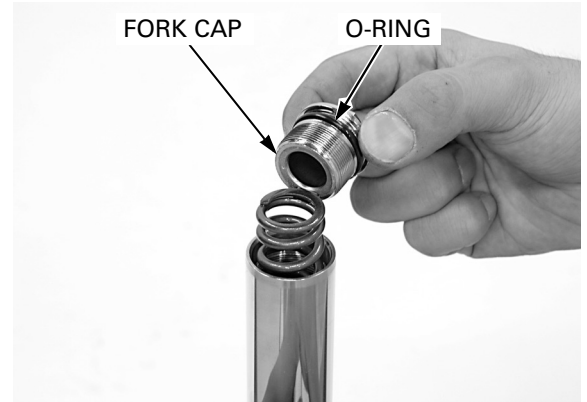
If the fork will be disassembled, loosen the fork cap by tightening the bottom bridge pinch bolts temporarily.

Loosen the fork bottom bridge pinch bolts and pull out the fork.

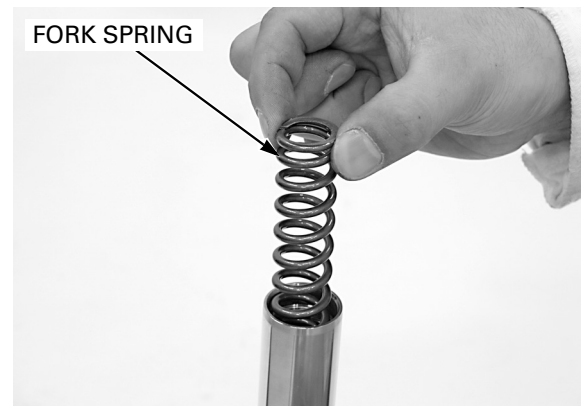


DISASSEMBLY

Remove the fork cap and O-ring.



Remove the fork spring.



Drain the fork fluid by pumping the fork pipe several times.



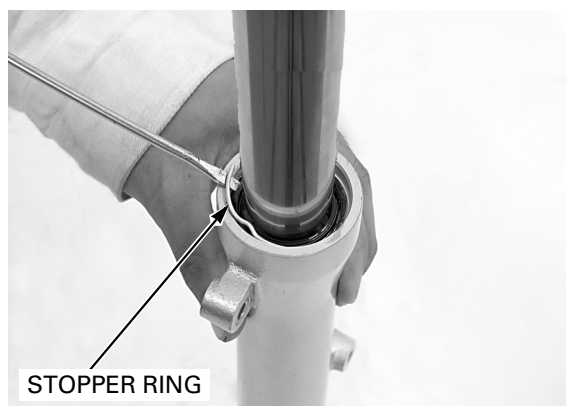
Remove the dust seal.



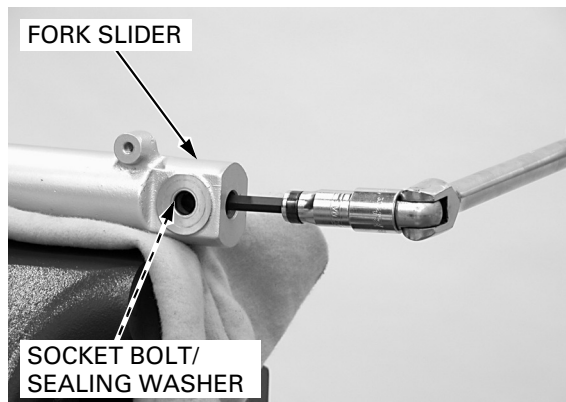
FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Be careful not to scratch the fork pipe.

Remove the oil seal stopper ring.



Hold the fork slider in a vise with soft jaws or shop towel.

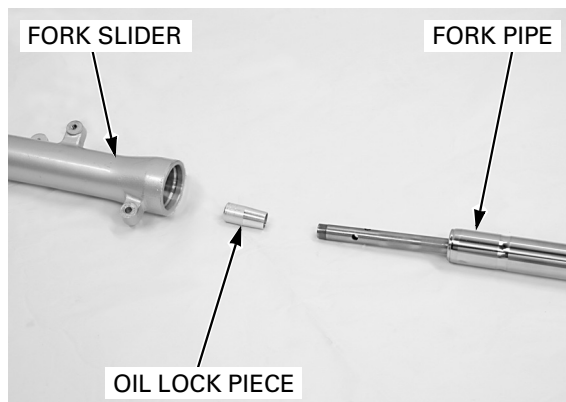


If the fork piston turns with the socket bolt, temporarily install the fork spring and fork cap.

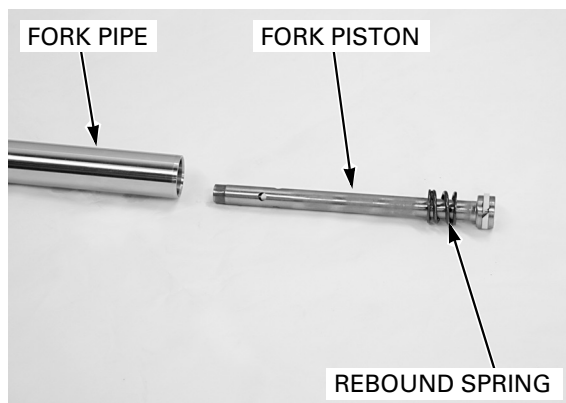
Remove the fork socket bolt and sealing washer.

Remove the fork pipe from the fork slider.

Remove the oil lock piece from the fork slider.



Remove the fork piston and rebound spring from the fork pipe.

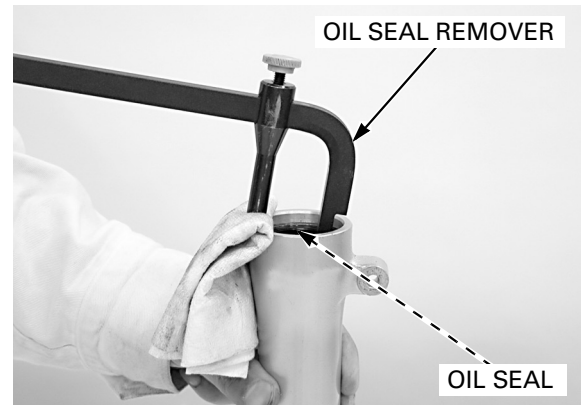


Remove the oil seal using the special tool.

TOOL:

Oil seal remover

07748-0010001



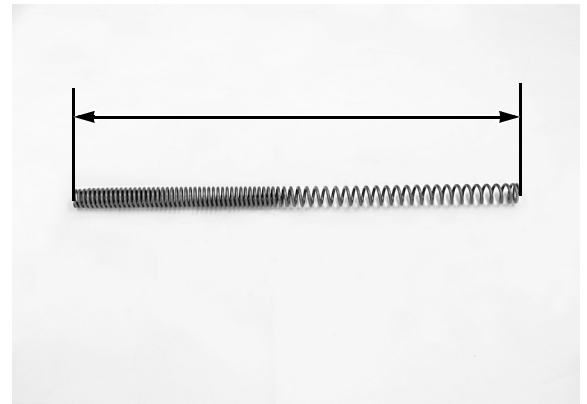
INSPECTION

FORK SPRING

Check the fork spring for fatigue or damage.

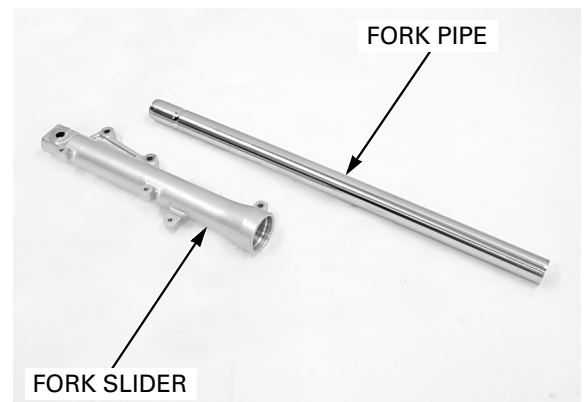
Measure the fork spring free length.

SERVICE LIMIT: 472 mm (18.6 in)



FORK PIPE/SLIDER

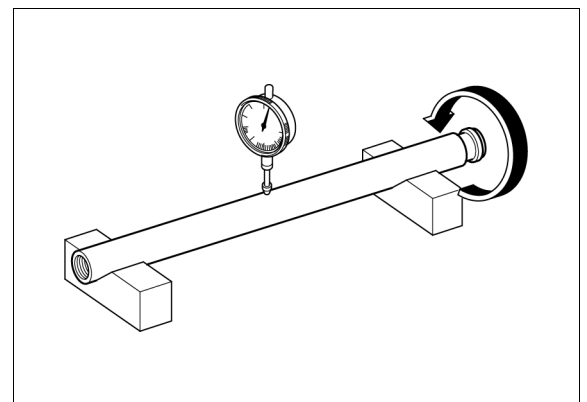
Check the fork pipe and slider for score marks, scratches, or excessive or abnormal wear.



Set the fork pipe in V-blocks and read the runout with a dial indicator.

The actual runout is 1/2 of the total indicator reading.

SERVICE LIMIT: 0.20 mm (0.008 in)



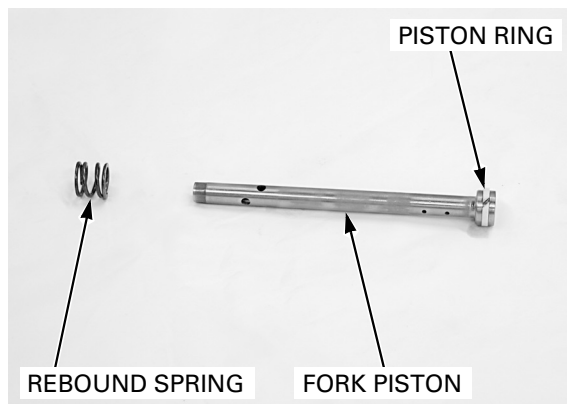
FRONT WHEEL/BRAKE/SUSPENSION/STEERING

FORK PISTON

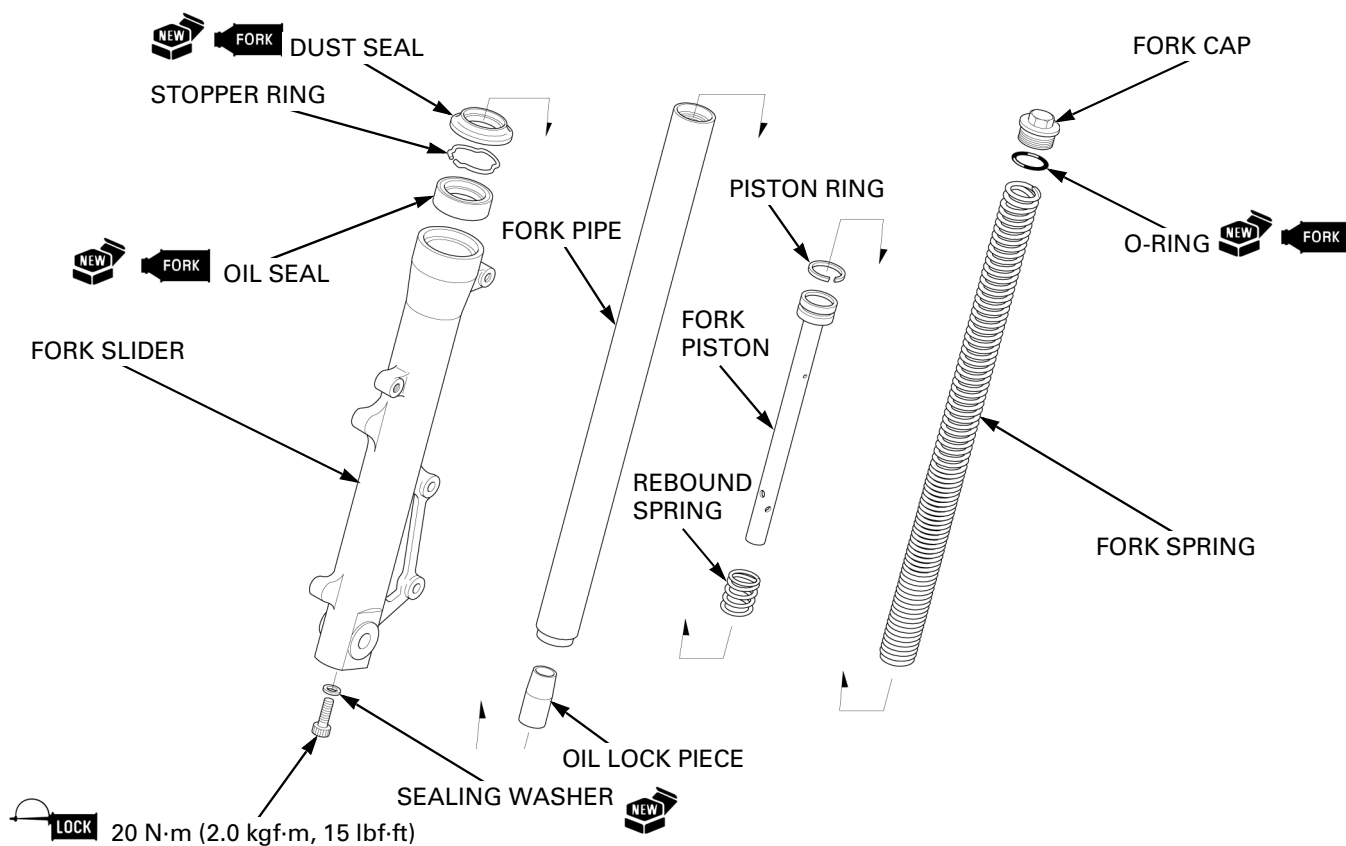
Check the fork piston for score marks, scratches, or excessive or abnormal wear.

Check the rebound spring for fatigue or damage.

Check the piston ring for wear or damage.

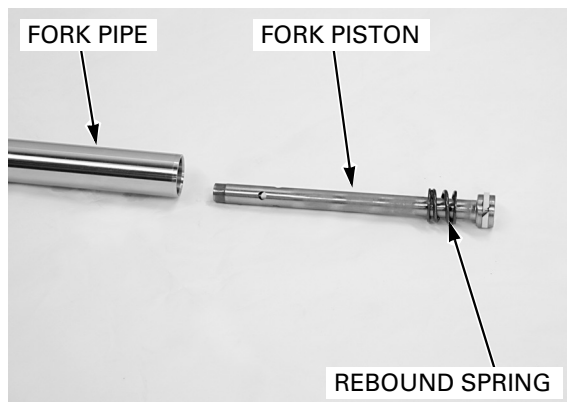


ASSEMBLY

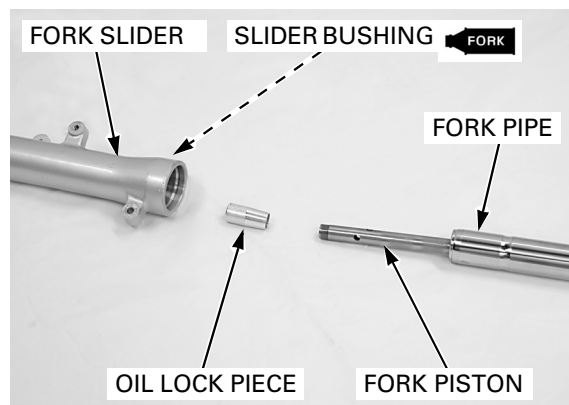


Before assembly, wash all parts with a high flash point or non-flammable solvent and wipe them dry.

Install the rebound spring and fork piston into the fork pipe.

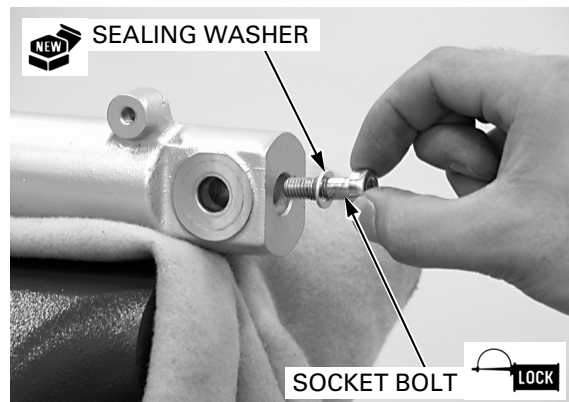


Install the oil lock piece onto the fork piston end.
Apply fork fluid to the slider bushing.
Install the fork pipe into the fork slider.



Clean and apply a locking agent to the socket bolt thread.

Install the socket bolt with a new sealing washer.

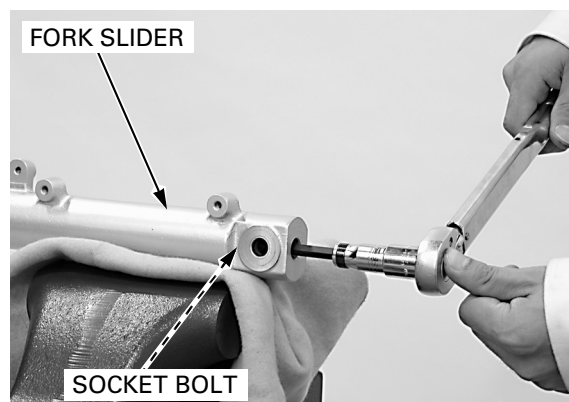


Hold the fork slider in a vise with soft jaws or a shop towel.

Tighten the socket bolt to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)

If the fork piston turns with the socket bolt, temporarily install the fork spring and fork cap.



Install the oil seal with its marked side facing up.

Apply fork fluid to a new oil seal lips, then install it into the fork slider.

Drive the oil seal into the fork slider using the special tools.

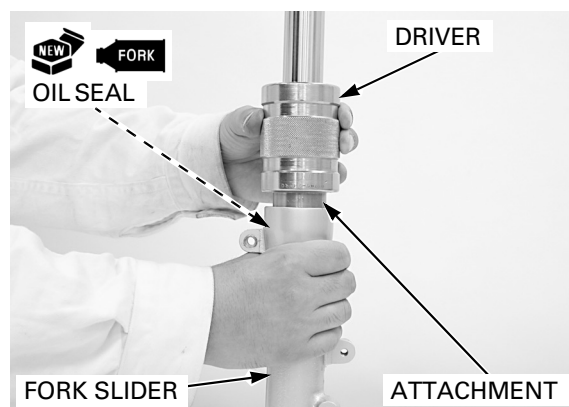
TOOLS:

Fork seal driver

07747-0010100

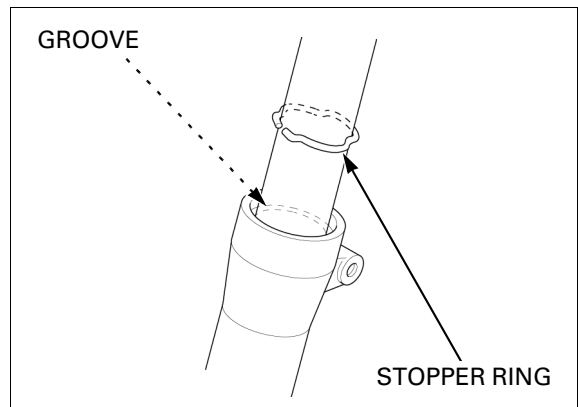
Fork seal driver attachment

07747-0010400



FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Install the oil seal stopper ring into the groove of the fork slider.



Apply fork fluid to new dust seal lips.

Install a new dust seal.



Pour the specified amount of recommended fork fluid into the fork.

RECOMMENDED FLUID: Fork fluid

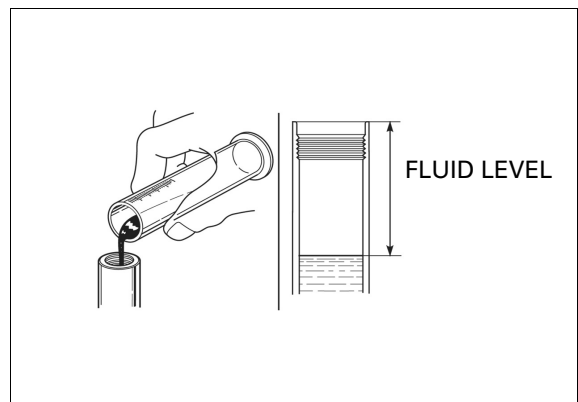
FORK FLUID CAPACITY:

$159 \pm 2.5 \text{ cm}^3$ ($5.38 \pm 0.08 \text{ US oz}$, $5.60 \pm 0.09 \text{ Imp oz}$)

Pump the fork pipe several times to remove trapped air from the lower portion of the fork.

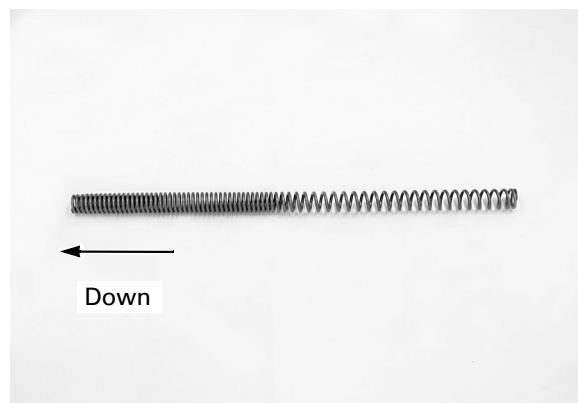
Compress the fork fully and measure the oil level from the top of the fork pipe.

FLUID LEVEL: 140 mm (5.5 in)



Blow out the oil completely off the fork spring using the compressed air.

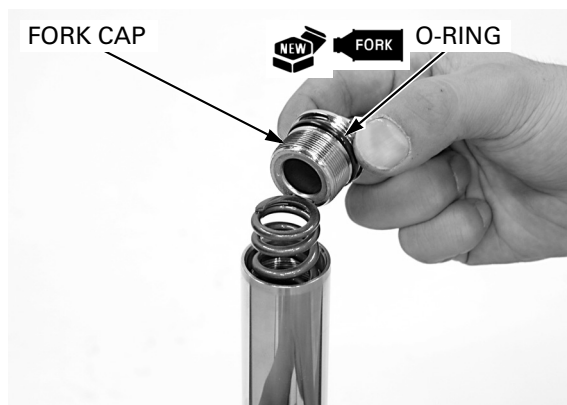
Pull the fork pipe up and install the fork spring with its narrow pitched end facing down.



Apply fork fluid to a new O-ring and install it onto the fork cap.

Tighten the fork cap after installing the fork into the fork bridges.

Install the fork cap onto the fork pipe.



INSTALLATION

Insert the fork into the bottom bridge.

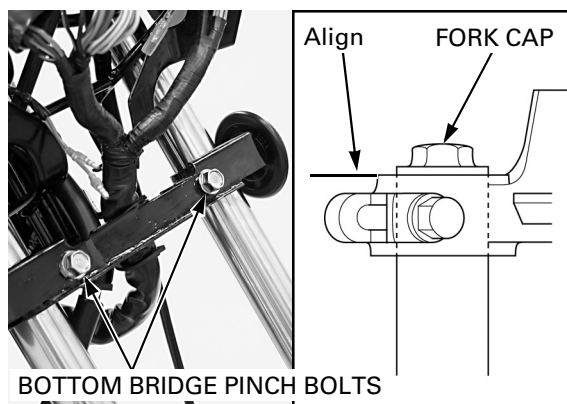
Align the top end of the fork pipe with the upper surface of the top bridge as shown.

Tighten the bottom bridge pinch bolts to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Tighten the fork caps to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)



Tighten the top bridge pinch bolt and nut to the specified torque.

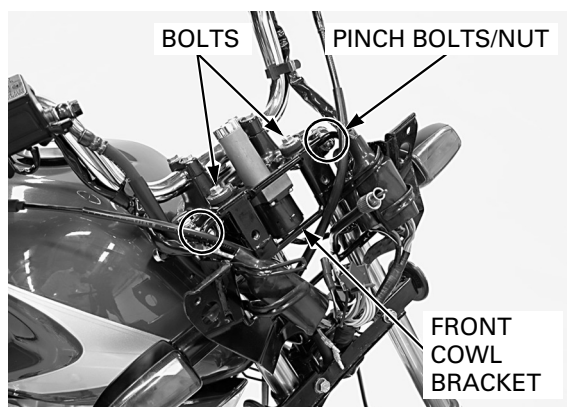
TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)

Install the front cowl bracket and tighten the bolts securely.

Install the following:

- Combination meter unit (page 18-8)
- License plate holder (page 2-10)
- Front fender (page 2-8)
- Front wheel (Disc brake type: page 12-17, Drum brake type: page 12-18)
- Front cowl (page 2-9)

Disc brake type Install the brake caliper (page 14-18).



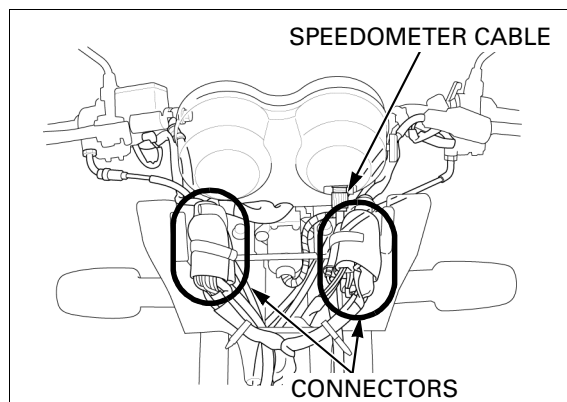
STEERING STEM

REMOVAL

Remove the front cowl (page 2-8).

Disconnect the following:

- Ignition switch connectors
- Turn signal connectors
- Speedometer cable
- Handlebar switch connectors
- Clutch switch connector

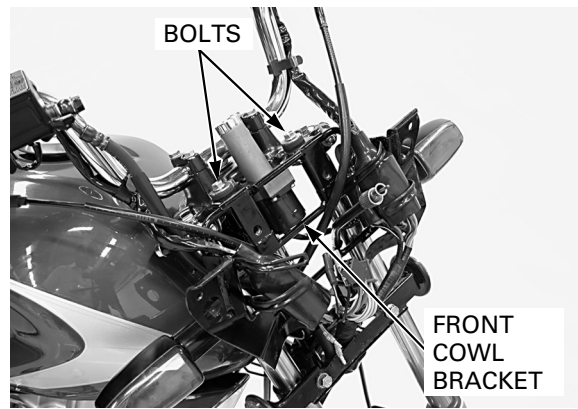


FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Remove the following:

- Front wheel (Disc brake type: page 12-11, Drum brake type: page 12-12)
- Combination meter (page 18-6)

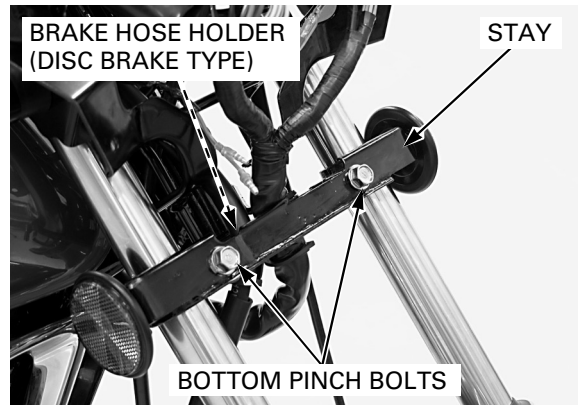
Remove the bolts and front cowl bracket.



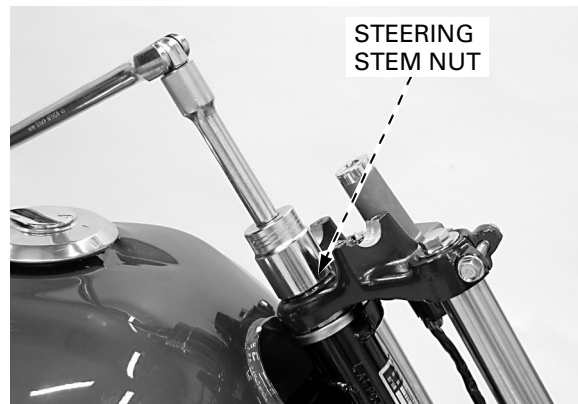
Remove the bottom bridge pinch bolts and side reflector stay.

Disc brake type: Remove the brake hose holder from the bottom bridge.

Remove the handlebar (page 12-7).

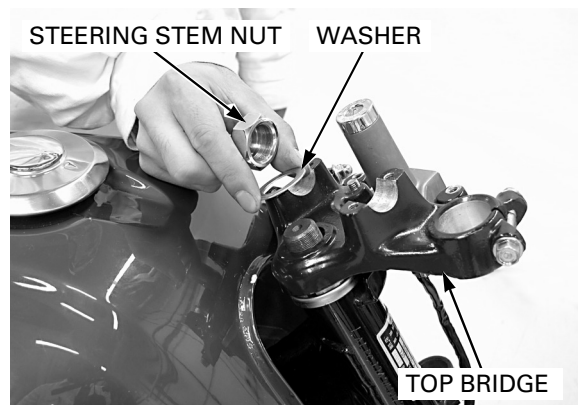


Loosen the steering stem nut.



Remove the fork (page 12-22).

Remove the steering stem nut, washer and top bridge.



FRONT WHEEL/BRAKE/SUSPENSION/STEERING

When removing the adjusting nut, hold the steering stem.

Remove the adjusting nut using the special tool.

TOOL:

Stem socket wrench

07916-3710101



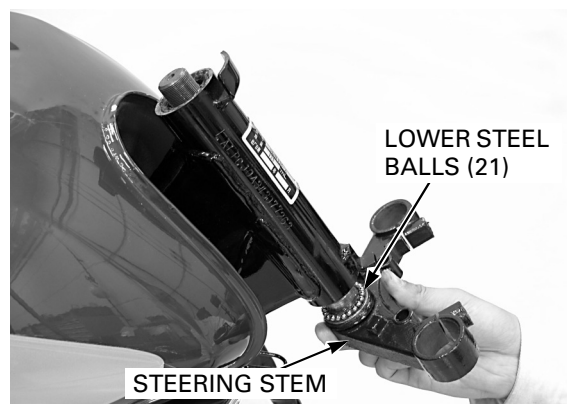
Be careful not to loose the steel balls.

Remove the following:

- Top cone race
- Upper steel balls (21)



- Steering stem
- Lower steel balls (21)



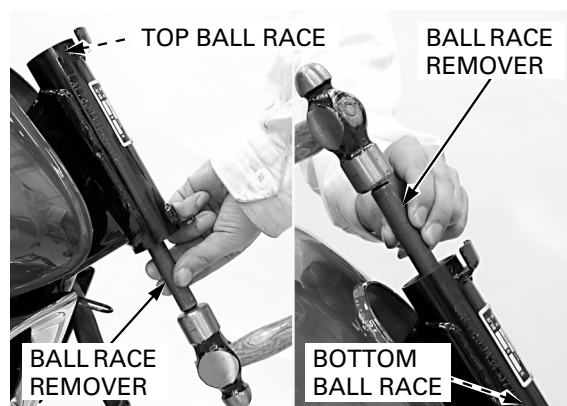
BALL RACE REPLACEMENT

Remove the ball races using the special tool.

TOOL:

Ball race remover

07944-1150001

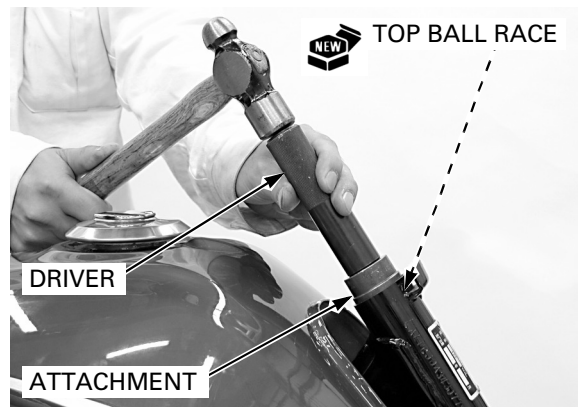


FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Install a new top ball race using the special tools.

TOOLS:

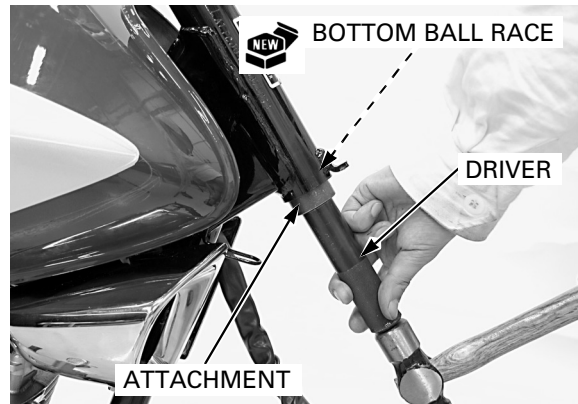
Driver	07749-0010000
Attachment, 37 x 40 mm	07746-0010200



Install a new bottom ball race using the special tools.

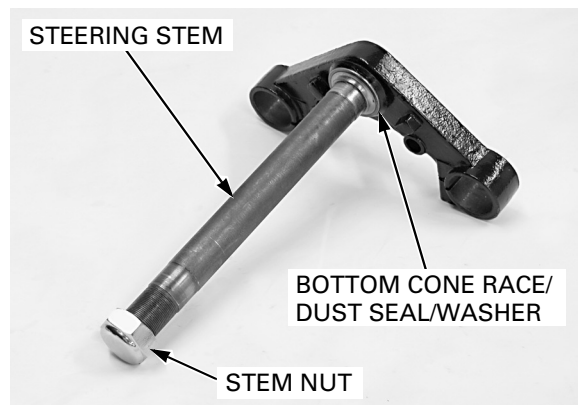
TOOLS:

Driver	07749-0010000
Attachment, 37 x 40 mm	07746-0010200



BOTTOM CONE RACE REPLACEMENT

To avoid damaging the steering stem threads, temporarily install the stem nut. Remove the bottom cone race, washer and dust seal.



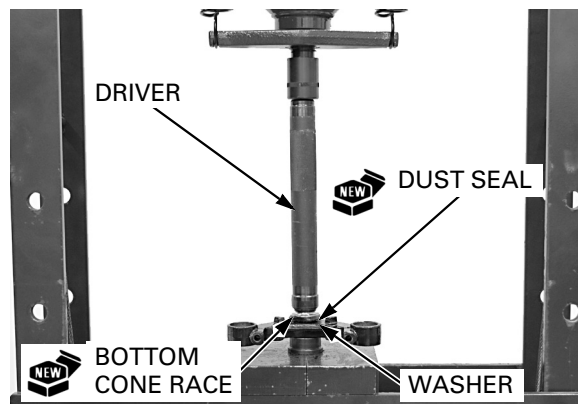
Apply grease to new dust seal lips.

Install the washer and a new dust seal.

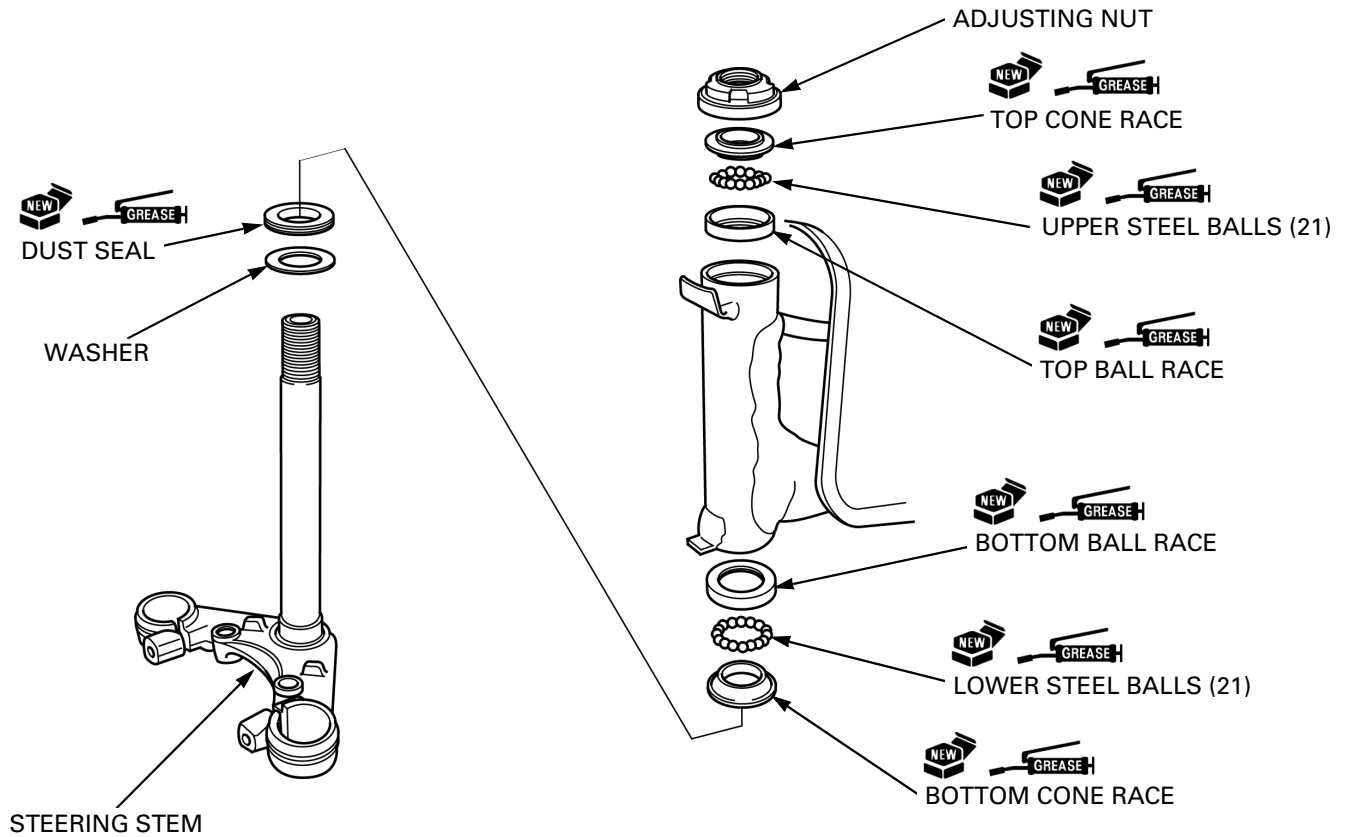
Press a new bottom cone race onto the steering stem using the special tool.

TOOL:

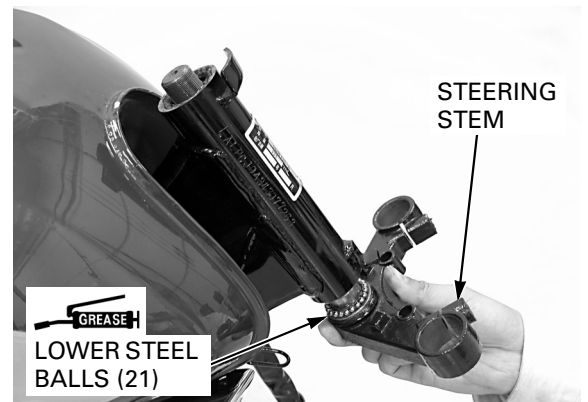
Steering stem driver	07946-GC40000
-----------------------------	----------------------



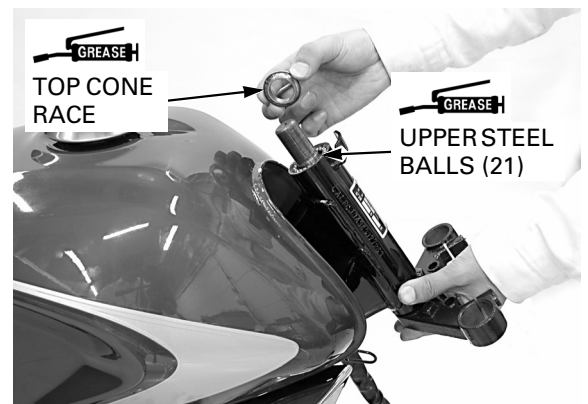
INSTALLATION



Apply grease to the bottom races.
Install the lower steel balls (21) in the bottom cone race.
Install the steering stem.



Apply grease to the top races.
Install the upper steel balls (21) in the top ball race.
Install the top cone race.



FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Install the adjusting nut.

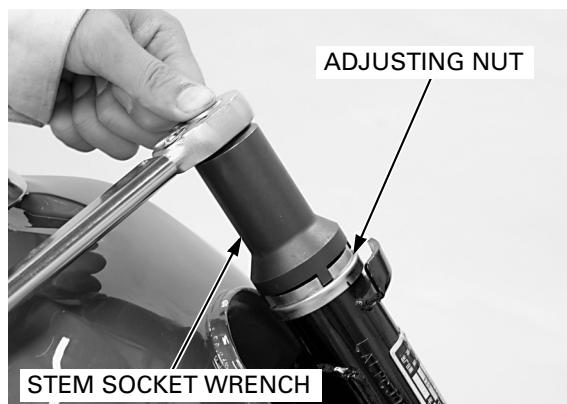


Tighten the adjusting nut to the specified torque.

TOOL:

Stem socket wrench 07916-3710101

TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)



Turn the steering stem comp right and left, lock-to-lock enough times for races and balls to get to fit. Make sure that the steering stem moves smoothly, without play or binding.



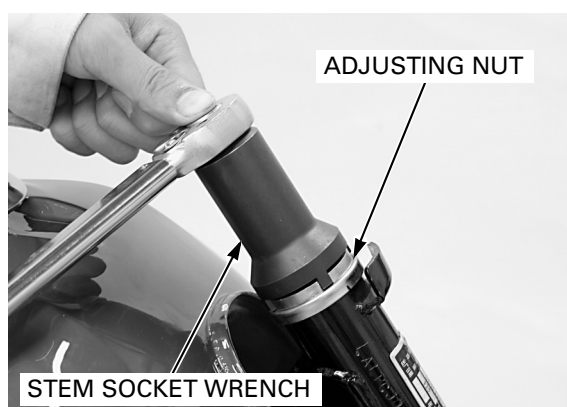
Loosen the adjusting nut completely, then retighten the adjusting nut to the specified torque.

TOOL:

Stem socket wrench 07916-3710101

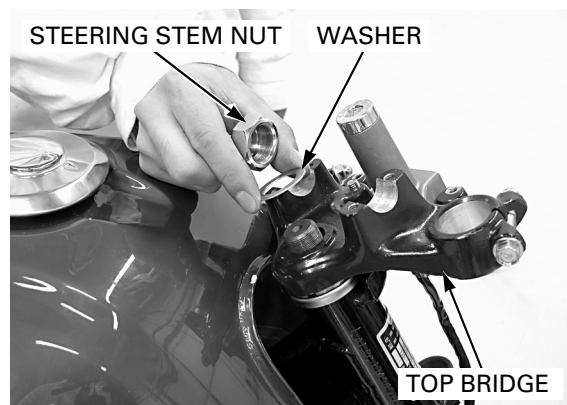
TORQUE: 3.0 N·m (0.3 kgf·m, 2.2 lbf·ft)

Check that there is no vertical play and that the steering stem rotates smoothly.



Install the top bridge.

Temporarily install the washer and steering stem nut.

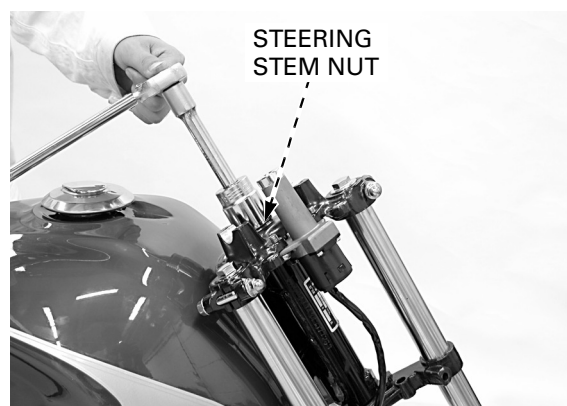


Loosen the bottom bridge pinch bolts when tightening the stem nut.

Install the fork (page 12-29).

Tighten the steering stem nut to the specified torque.

TORQUE: 74 N·m (7.5 kgf·m, 55 lbf·ft)

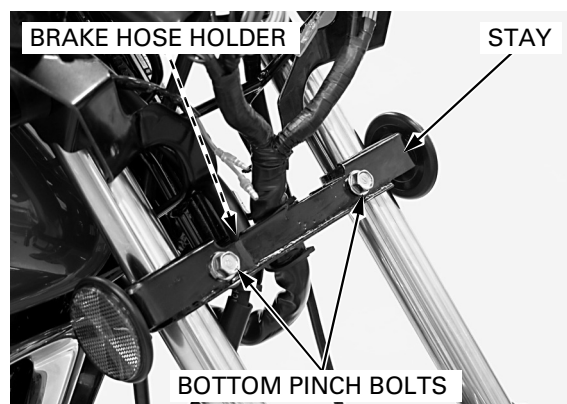


Install the handlebar (page 12-9).

Disc brake type: Install the brake hose holder to the bottom bridge.

Install the side reflector stay and tighten the bottom bridge pinch bolts.

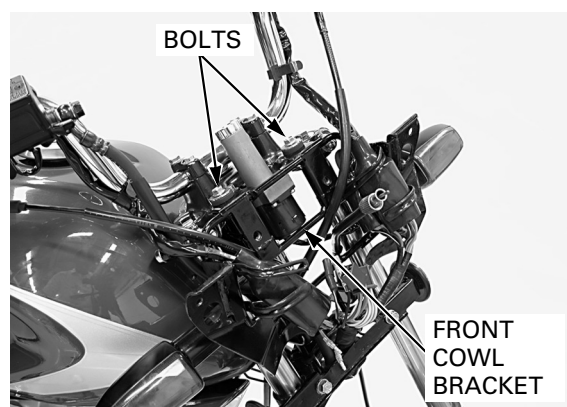
TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)



Install the front cowl bracket and tighten the bolts.

Install the following:

- Combination meter (page 18-8)
- Front wheel (Disc brake type: page 12-17, Drum brake type: page 12-18)

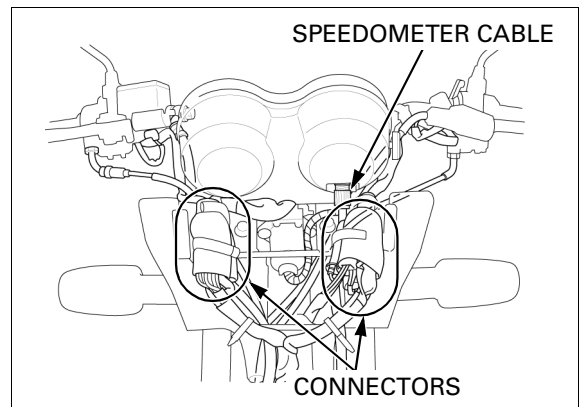


FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Connect the following:

- Clutch switch connector
- Handlebar switch connectors
- Speedometer cable
- Turn signal connectors
- Ignition switch connectors

Install the front cowl (page 2-8).



STEERING BEARING PRELOAD

Raise the front wheel off the ground.

Position the steering stem to the straight ahead position.

Hook a spring scale to the fork pipe between the fork top and bottom bridges.

Make sure that there is no cable or wire harness interference.

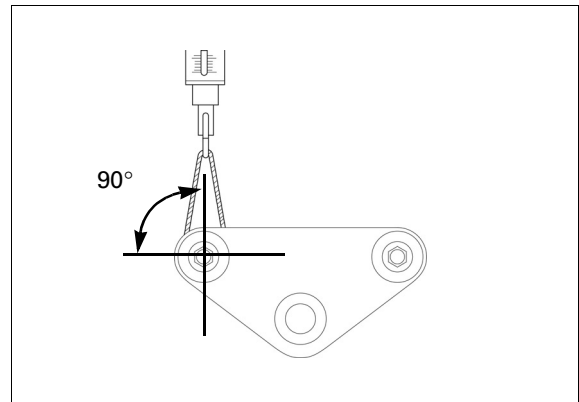
Pull the spring scale keeping the scale at a right angle to the steering stem.

Read the scale at the point where the steering stem just starts to move.

STEERING BEARING PRE-LOAD:

13 – 19 N (1.3 – 1.9 kgf)

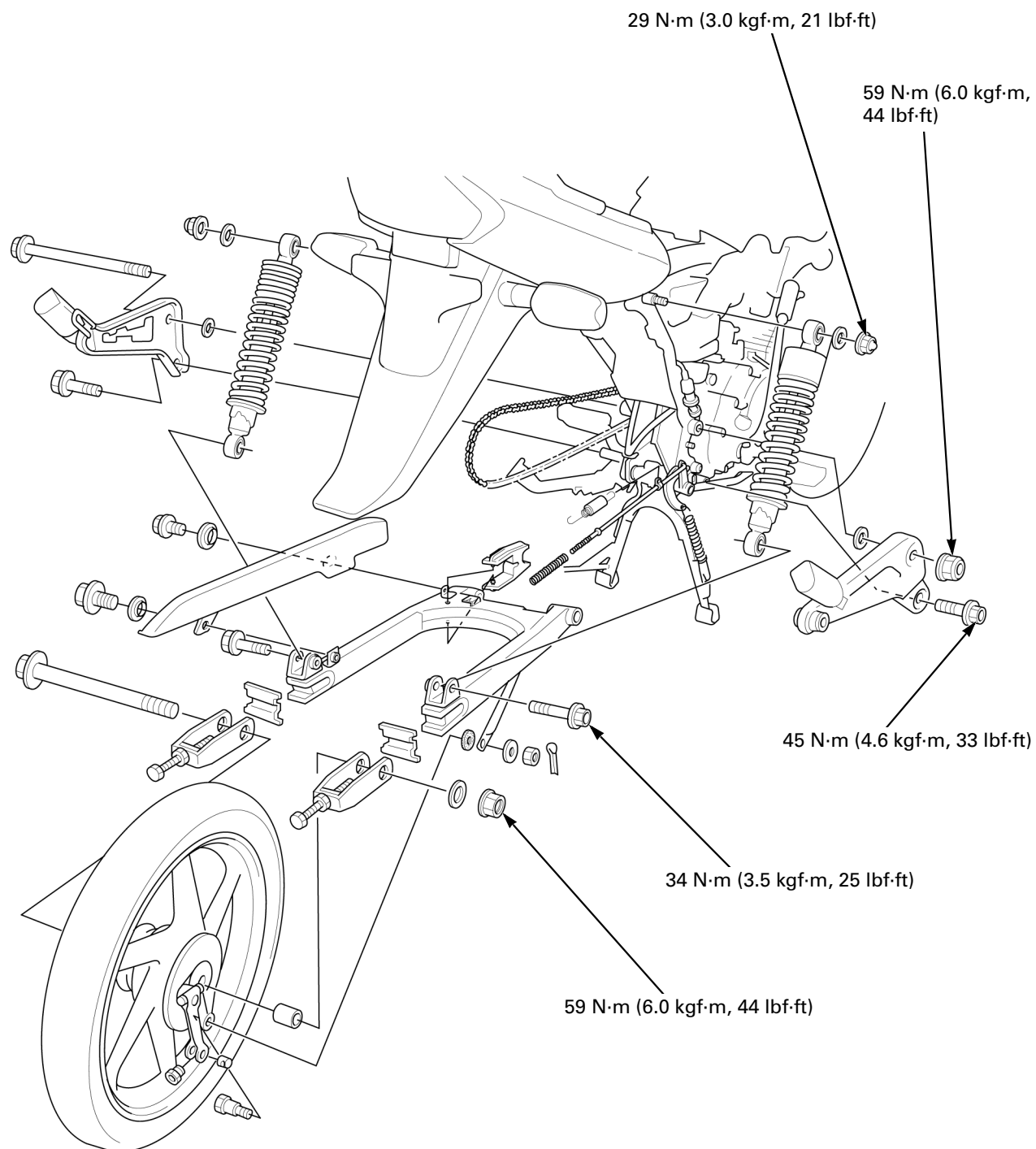
If the readings do not fall within the limits, readjust the steering bearing adjusting nut.



13. REAR WHEEL/BRAKE/SUSPENSION

COMPONENT LOCATION	13-2	REAR DRUM BRAKE	13-13
SERVICE INFORMATION	13-3	BRAKE PEDAL	13-16
TROUBLESHOOTING	13-5	SHOCK ABSORBER.....	13-19
REAR WHEEL	13-6	SWINGARM	13-20

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

⚠ CAUTION

Frequent inhalation of brake shoe dust, regardless of material composition could be hazardous to your health.

- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

- Use genuine Honda replacement bolts and nuts for all suspension pivots and mounting points.

SPECIFICATIONS

Unit: mm (in)






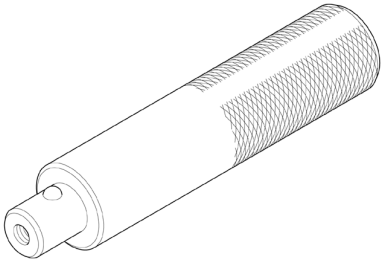
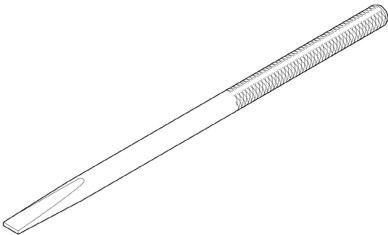
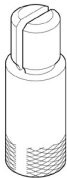
ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	To wear indicator
Cold tire pressure	Driver only	225 kPa (2.25 kgf/cm ² , 33 psi)	–
	Driver and passenger	225 kPa (2.25 kgf/cm ² , 33 psi)	–
Axle runout		–	0.2 (0.01)
Wheel rim runout	Radial	–	1.0 (0.04)
	Axial	–	1.0 (0.04)
Drive chain	Size/link	428/108	–
	Slack	10 – 20 (3/8 – 13/16)	–
Brake	Pedal free play	20 – 30 (13/16 – 1-3/16)	–
	Drum I.D.	130.0 – 130.2 (5.12 – 5.13)	131.0 (5.16)

TORQUE VALUES

Driven sprocket bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)	
Rear axle nut	59 N·m (6.0 kgf·m, 44 lbf·ft)	
Rear brake arm nut	10 N·m (1.0 kgf·m, 7 lbf·ft)	U-nut
Shock absorber upper mounting nut	29 N·m (3.0 kgf·m, 21 lbf·ft)	
Shock absorber lower mounting bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)	
Pillion step bracket bolt	45 N·m (4.6 kgf·m, 33 lbf·ft)	
Swingarm pivot nut	59 N·m (6.0 kgf·m, 44 lbf·ft)	

REAR WHEEL/BRAKE/SUSPENSION

TOOLS

<div>Pilot, 15 mm 07746-0040300</div> <div></div>	<div>Pilot, 20 mm 07746-0040500</div> <div></div>	<div>Attachment, 22 x 24 mm 07746-0010800</div> <div></div>
<div>Attachment, 32 x 35 mm 07746-0010100</div> <div></div>	<div>Attachment, 42 x 47 mm 07746-0010300</div> <div></div>	<div>Driver 07749-0010000</div> <div></div>
<div>Bearing remover shaft 07746-0050100</div> <div></div>	<div>Bearing remover head, 15 mm 07746-0050400</div> <div></div>	

TROUBLESHOOTING

Rear wheel wobbling

- Bent rim
- Worn or damaged rear wheel bearings
- Faulty rear tire
- Worn or damaged swingarm bushings
- Bent frame or swingarm
- Axle fastener not tightened properly
- Tire pressure too low

Wheel to turn hard

- Brake drag
- Faulty wheel bearings
- Bent axle
- Drive chain too tight (page 3-15)

Soft suspension

- Incorrect suspension adjustment
- Weak shock absorber springs
- Oil leakage from damper unit
- Low tire pressure

Hard suspension

- Incorrect suspension adjustment
- Bent shock absorber damper rod
- Damaged suspension or swingarm pivot bushings
- Bent swingarm pivot or frame
- High tire pressure

Steers to one side or does not track straight

- Drive chain adjusters not adjusted equally
- Bent axle
- Bent frame
- Worn swingarm pivot components

Rear suspension noise

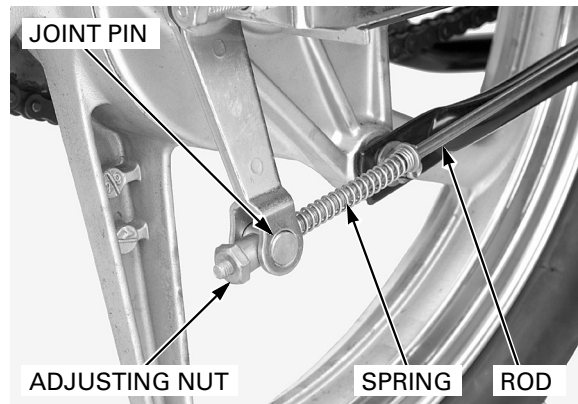
- Loose suspension fasteners
- Worn or damaged suspension pivot bushings
- Faulty shock absorber

REAR WHEEL

REMOVAL

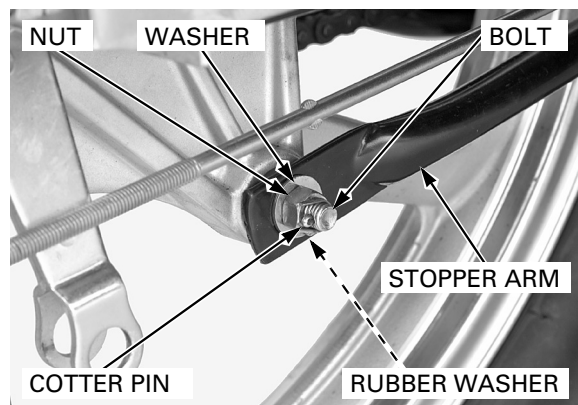
Support the motorcycle with its center stand.

Disconnect the brake rod by removing the adjusting nut, and remove the spring and joint pin.



Remove the following:

- Cotter pin
- Nut
- Washer
- Joint bolt
- Brake panel stopper arm
- Rubber washer



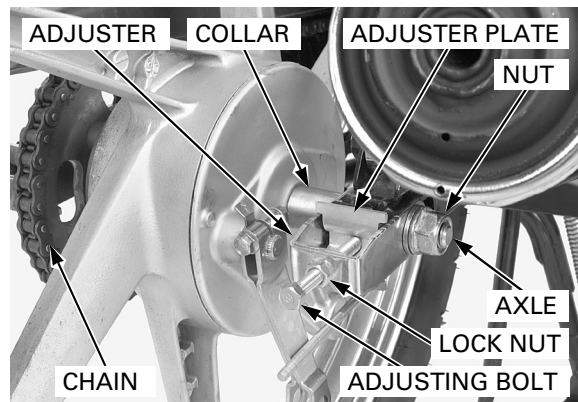
Loosen the axle nut.

Loosen the both drive chain adjuster lock nuts and adjusting bolts so the wheel can be moved all the way forward. Move the wheel forward for maximum chain slack.

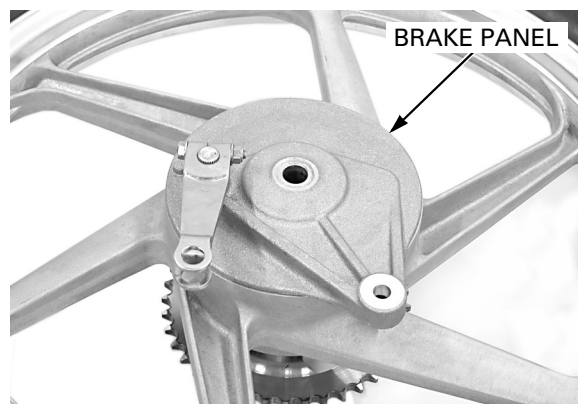
Derail the drive chain from the driven sprocket.

Remove the following:

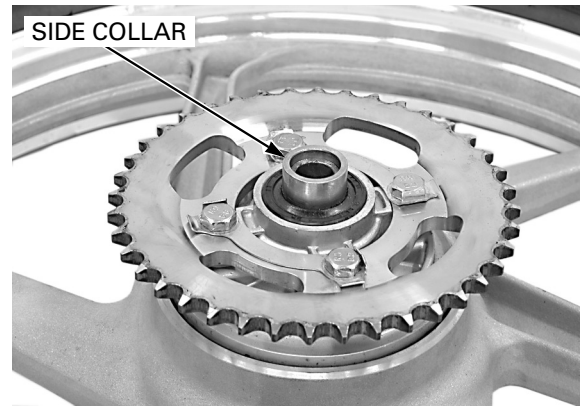
- Axle nut
- Axle
- Both adjusters and adjuster plates
- Right side collar
- Rear wheel



Remove the brake panel assembly from the right side wheel hub.



Remove the side collar from the driven flange.

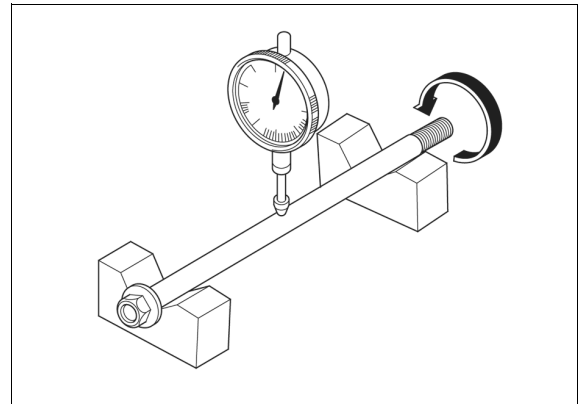


INSPECTION

AXLE

Set the axle in V-blocks. Turn the axle and measure the runout using a dial indicator. Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.2 mm (0.01 in)



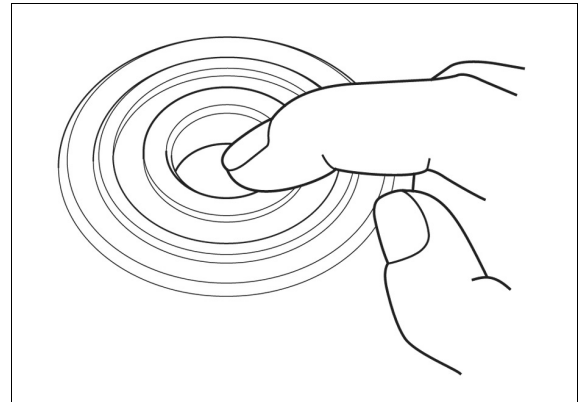
WHEEL BEARING

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

Replace the bearings in pairs.

Remove and discard the bearings if they do not turn smoothly, quietly, or if they fit loosely in the hub or driven flange.

Replace the bearings if necessary (page 13-8).



WHEEL RIM

Check the wheel rim runout by placing the wheel in a turning stand.

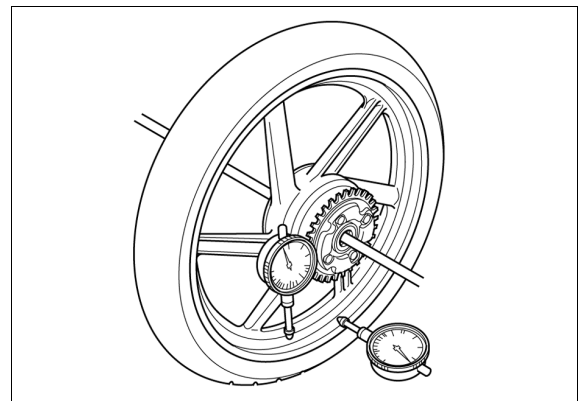
Spin the wheel slowly by hand, and read the runout using a dial indicator.

Actual runout is 1/2 of the total indicator reading.

SERVICE LIMITS:

Radial: 1.0 mm (0.04 in)

Axial: 1.0 mm (0.04 in)



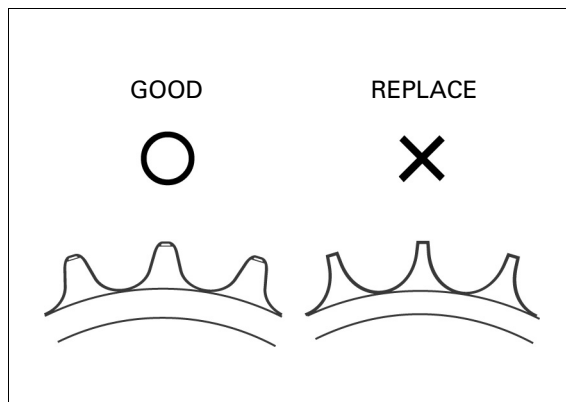
REAR WHEEL/BRAKE/SUSPENSION

DRIVEN SPROCKET

Check the condition of the driven sprocket teeth. Replace the sprocket if it is worn or damaged.

NOTE:

- If the driven sprocket requires replacement, inspect the drive chain and drive sprocket.
- Never install a new drive chain on a worn sprocket or a worn chain on new sprockets. Both chain and sprocket must be in good condition, or the replacement chain or sprocket will wear rapidly.

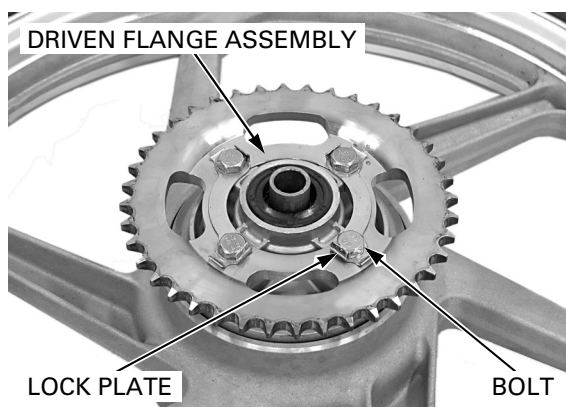


DISASSEMBLY

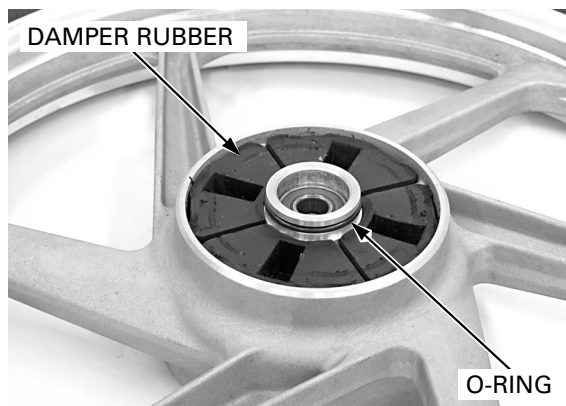
DRIVEN SPROCKET

If you will disassemble the driven flange, bend down the lock plate and loosen the driven sprocket bolts before removing the driven flange from the wheel hub.

Remove the driven flange assembly from the left side rear wheel hub.

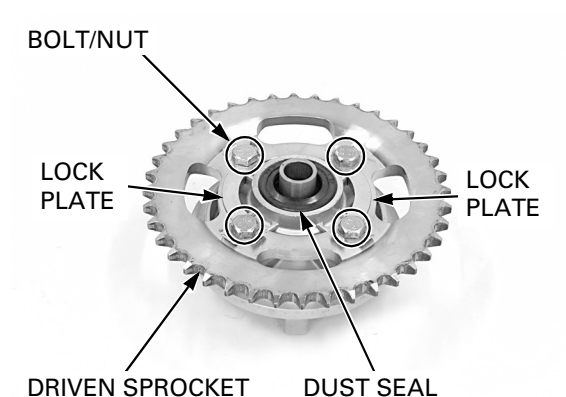


Remove the damper rubbers and O-ring.



Remove the following:

- Bolts
- Lock plates
- Nuts
- Driven sprocket
- Dust seal

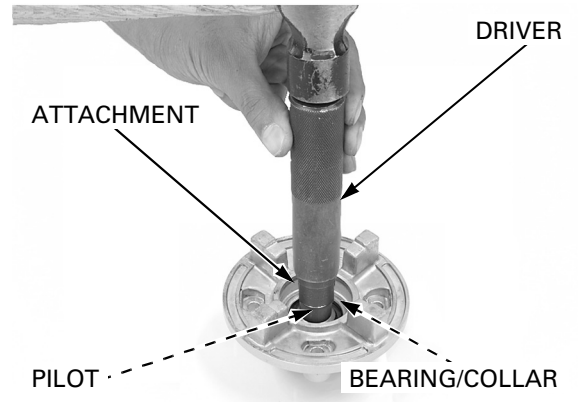


DRIVEN FLANGE BEARING

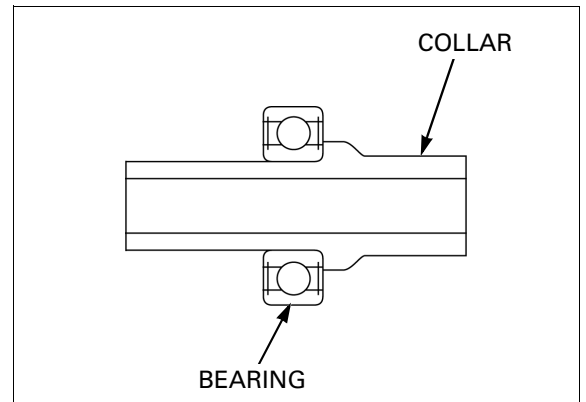
Drive out the driven flange bearing and collar.

TOOLS:

Driver	07749-0010000
Attachment, 22 x 24 mm	07746-0010800
Pilot, 15 mm	07746-0040300



Remove the collar from the driven flange bearing.



WHEEL BEARING

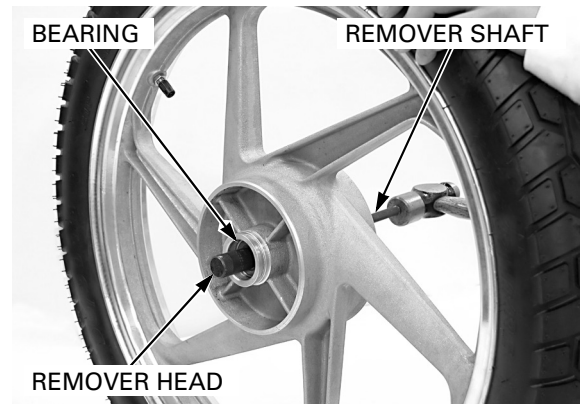
Install the bearing remover head into the wheel bearing.

From the opposite side of the wheel, install the bearing remover shaft and drive the bearing out of the wheel hub.

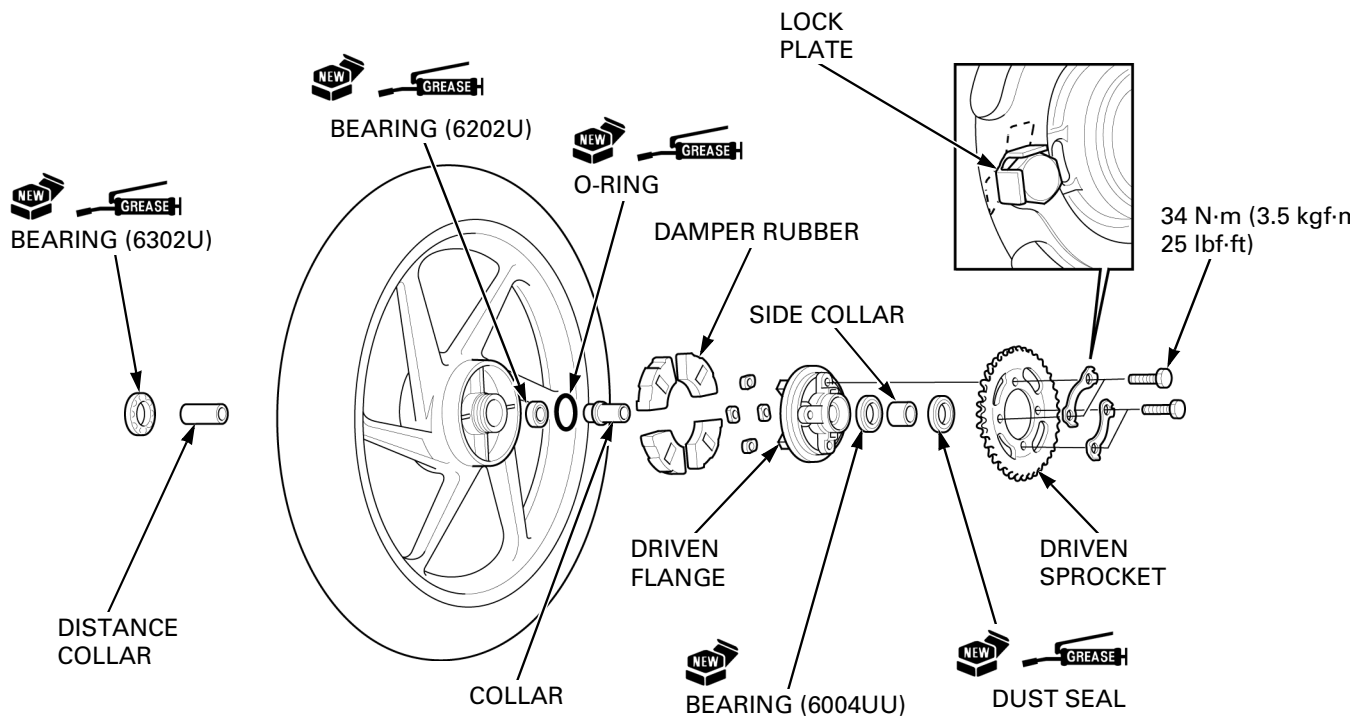
Remove the distance collar and drive out the other bearing.

TOOLS:

Bearing remover head, 15 mm	07746-0050400
Bearing remover shaft	07746-0050100



REAR WHEEL/BRAKE/SUSPENSION ASSEMBLY



WHEEL BEARING

Pack new bearing cavities with grease.

Never install the old bearing, once the bearing has been removed, the bearing must be replaced with new ones.

Drive in a new right side (brake drum side) bearing squarely with the sealed side facing up until it is fully seated.

TOOLS:

Driver

Attachment, 42 x 47 mm

Pilot, 15 mm

07749-0010000

07746-0010300

07746-0040300

Install the distance collar.

Drive in a new left side bearing with the sealed side facing up until it is fully seated.

TOOLS:

Driver

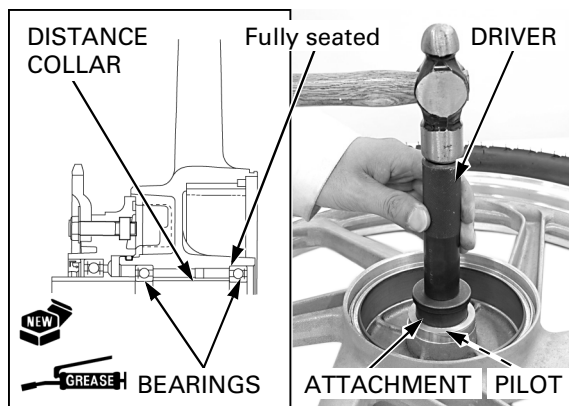
Attachment, 32 x 35 mm

Pilot, 15 mm

07749-0010000

07746-0010100

07746-0040300



DRIVEN FLANGE

Drive in the driven flange bearing to the driven flange.

TOOLS:

Driver

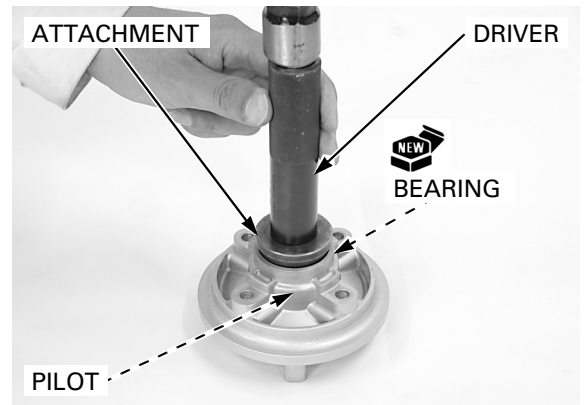
07749-0010000

Attachment, 42 x 47 mm

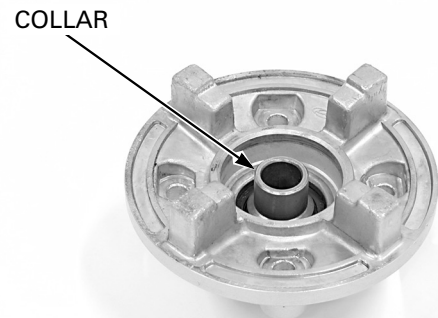
07746-0010300

Pilot, 20 mm

07746-0040500



Install the collar to a new driven flange bearing.



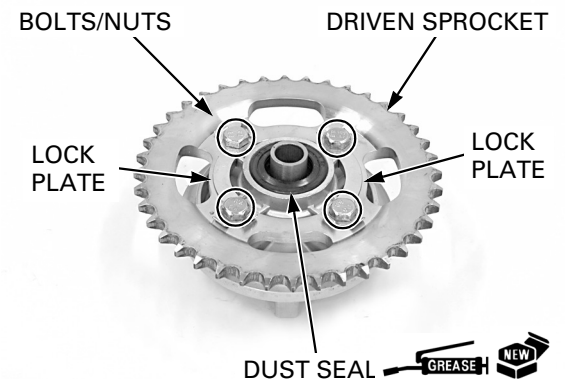
DRIVEN SPROCKET

Install the following:

- Driven sprocket
- Lock plates

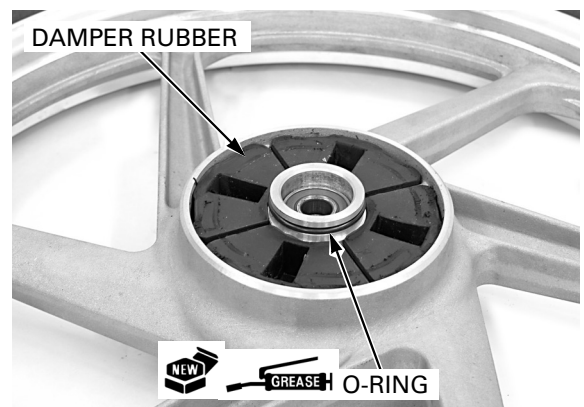
Temporarily install the driven sprocket bolts and nuts.

Apply grease to the lip of a new dust seal. Install the dust seal until it is flush with the driven flange.



Apply grease to a new O-ring.

Install the damper rubbers and O-ring to the left wheel hub.



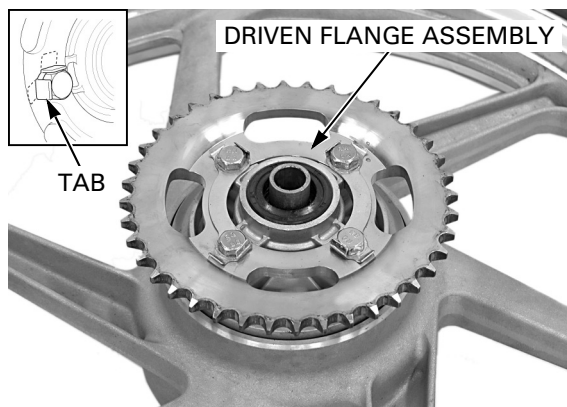
REAR WHEEL/BRAKE/SUSPENSION

Install the driven flange assembly to the left wheel hub.

If the driven sprocket is removed, tighten the sprocket bolts to the specified torque.

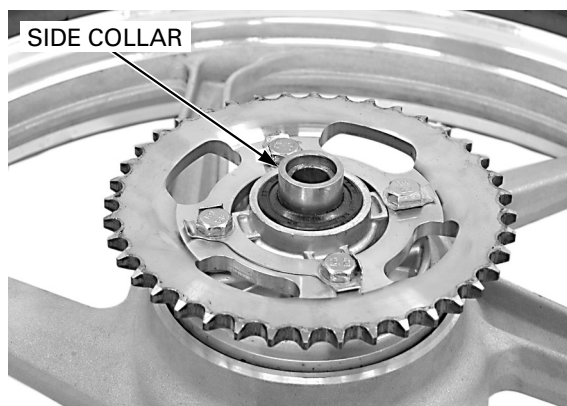
TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Bend the tab of the lock plates against the bolts.



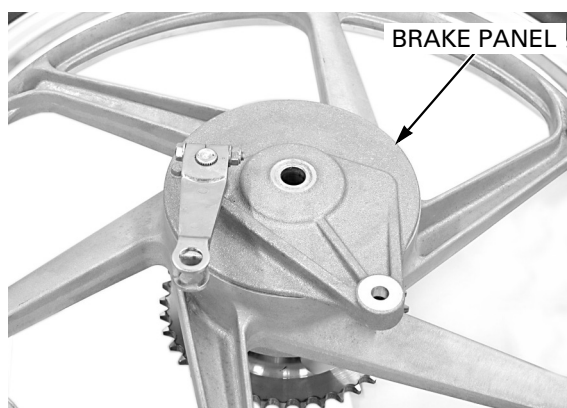
INSTALLATION

Install the left side collar.



Do not get grease on the brake drum and shoe linings.

Install the brake panel assembly into the right wheel hub.



Place the rear wheel and collar in the swingarm. Install both chain adjusters and adjuster plates to the swingarm.

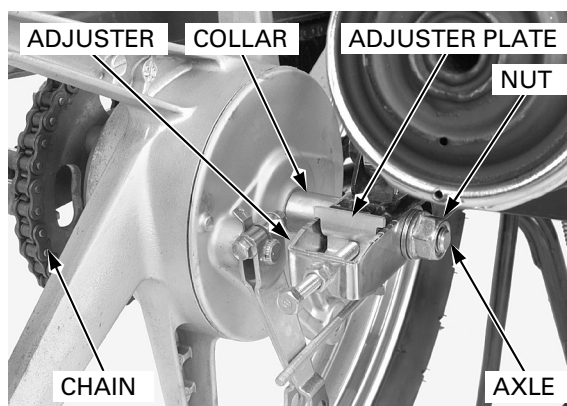
Insert the axle from the left side through the swingarm, rear wheel and right side collar. Temporarily install the axle nut.

Install the drive chain over the driven sprocket.

Adjust the drive chain slack (page 3-15).

Tighten the axle nut to the specified torque.

TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)

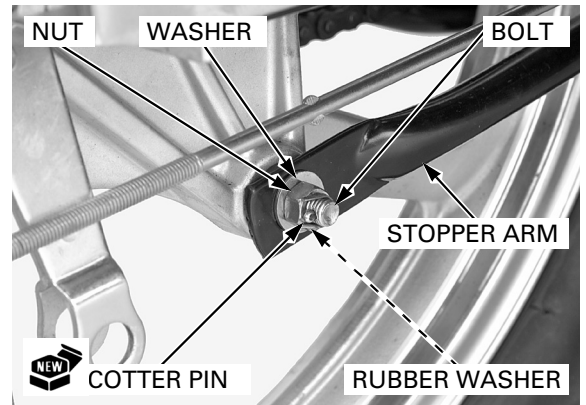


Install the following:

- Rubber washer
- Brake panel stopper arm
- Joint bolt
- Washer

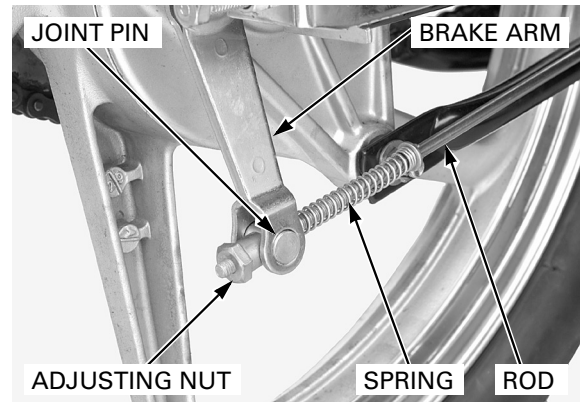
Install and tighten the nut securely.

Install a new cotter pin and secure it.



Install the joint pin to the brake arm.
Install the spring onto the brake rod.
Push down the brake pedal, and install the brake rod into the joint pin.
Connect the brake rod to the brake arm with the adjusting nut.

Adjust the brake pedal free play (page 3-21).



REAR DRUM BRAKE

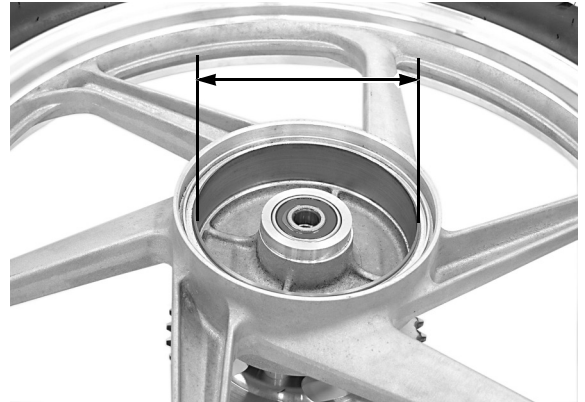
REMOVAL

Remove the rear brake panel assembly from the rear wheel (page 13-6).

INSPECTION

Measure the rear brake drum I.D.

SERVICE LIMIT: 131.0 mm (5.16 in)



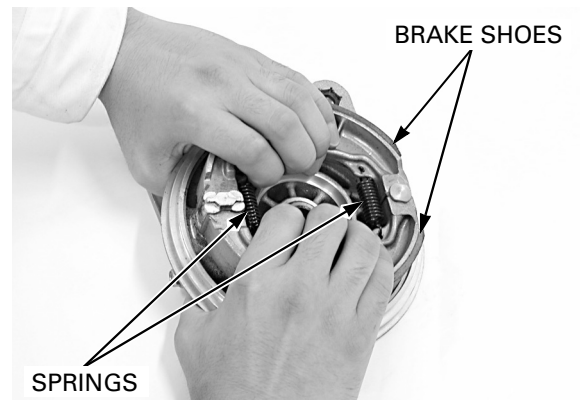
DISASSEMBLY

Always replace the brake shoes in pairs.

Expand the brake shoes and remove them from the brake panel.

If the brake shoes are to be reused, mark them so that they can be reassembled in their original positions.

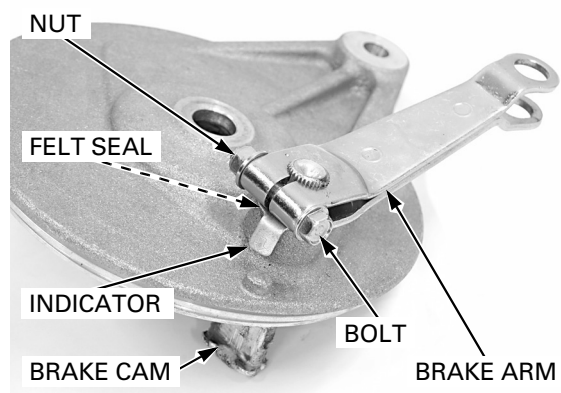
Remove the shoe springs from the brake shoes.



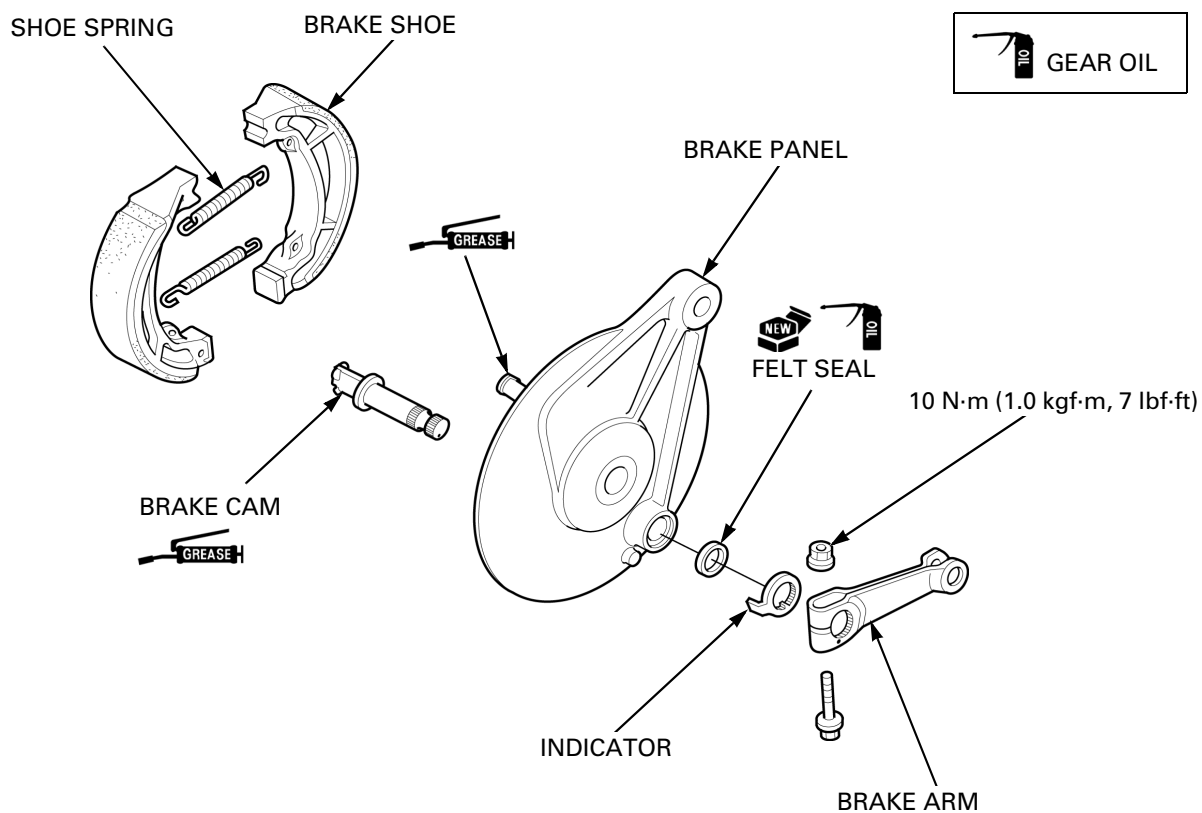
REAR WHEEL/BRAKE/SUSPENSION

Remove the following:

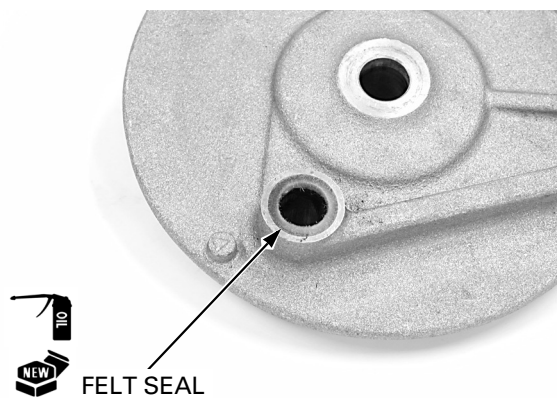
- Nut and bolt
- Brake arm
- Wear indicator
- Brake cam
- Felt seal



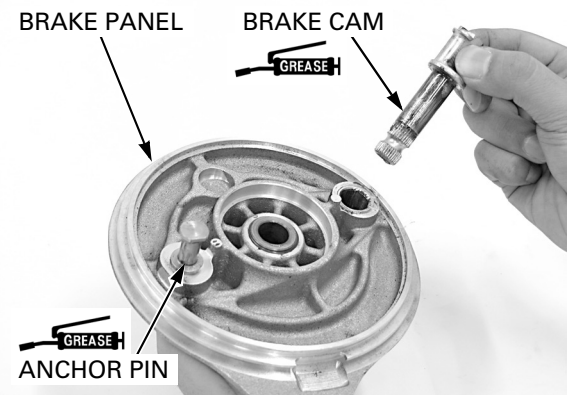
ASSEMBLY



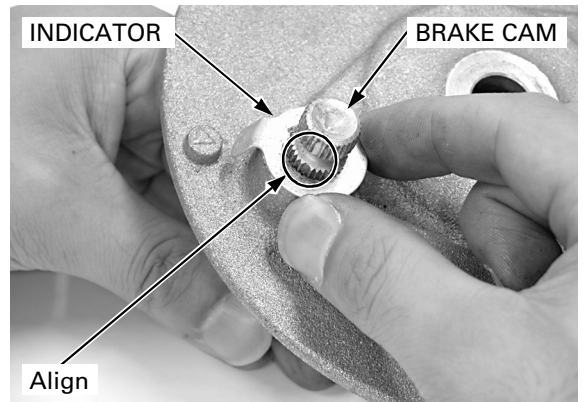
Apply gear oil to a new felt seal and install it to the brake panel.



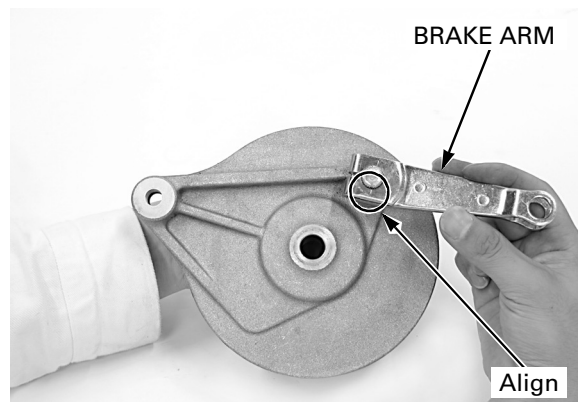
Apply grease to the sliding surface of the brake cam and anchor pin sliding surface.
Install the brake cam to the brake panel.



Install the wear indicator plate onto brake cam, aligning its wide tooth with the wide groove in the brake cam.

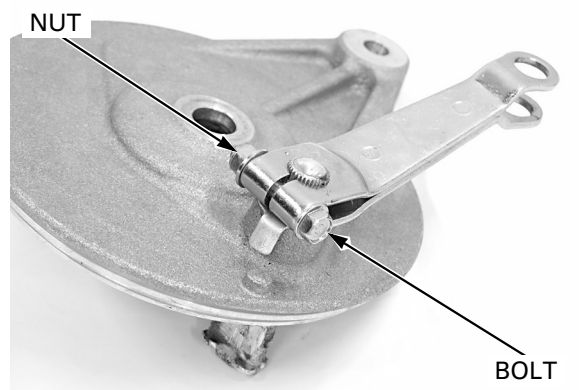


Install the brake arm, aligning the punch marks of the brake cam and brake arm.



Install the brake arm bolt and tighten the nut to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



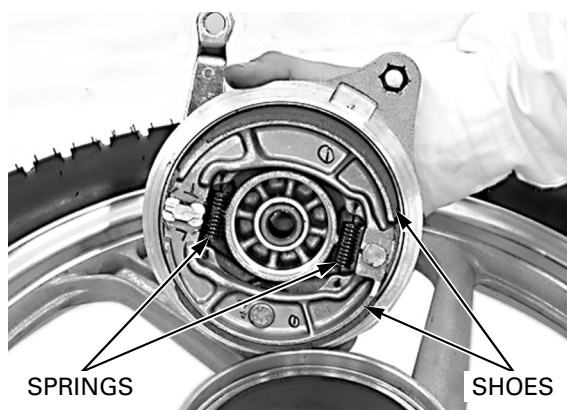
REAR WHEEL/BRAKE/SUSPENSION

If the brake shoes are reused, be sure to reassemble them in their original positions.

Assemble the brake shoes and springs as shown. Install the shoe assembly onto the brake panel.

Wipe any excess grease from the brake cam and anchor pin.

Install the brake panel (page 13-12).



BRAKE PEDAL

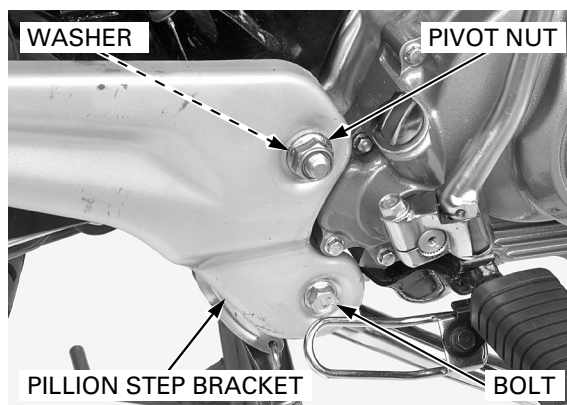
REMOVAL

Raise and support the motorcycle using safety stand or a box.

Do not remove the swingarm pivot.

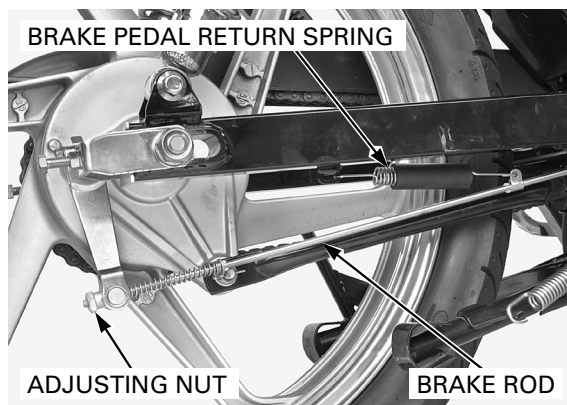
Remove the following:

- Exhaust pipe/muffler (page 2-10)
- Right pillion step bracket bolt
- Swingarm pivot nut
- Right pillion step bracket
- Washer

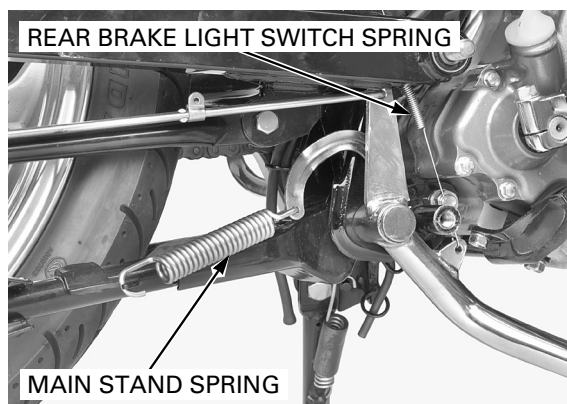


Disconnect the brake rod by removing the adjusting nut, spring and joint pin.

Remove the brake pedal return spring from the swing arm side.



Remove the center stand spring and rear brake light switch spring from rear brake pedal.

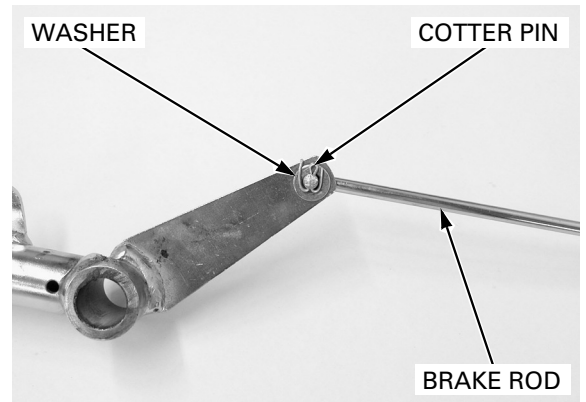
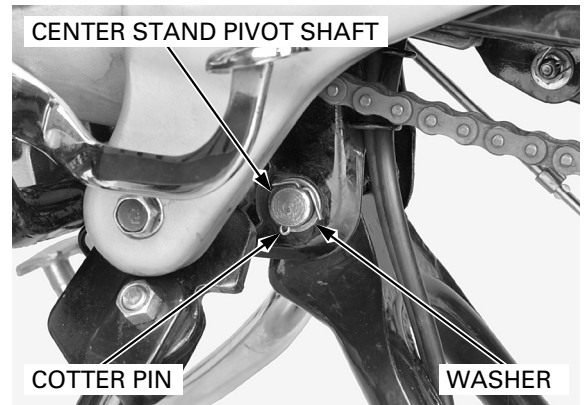


Remove the cotter pin and washer from the center stand pivot shaft.

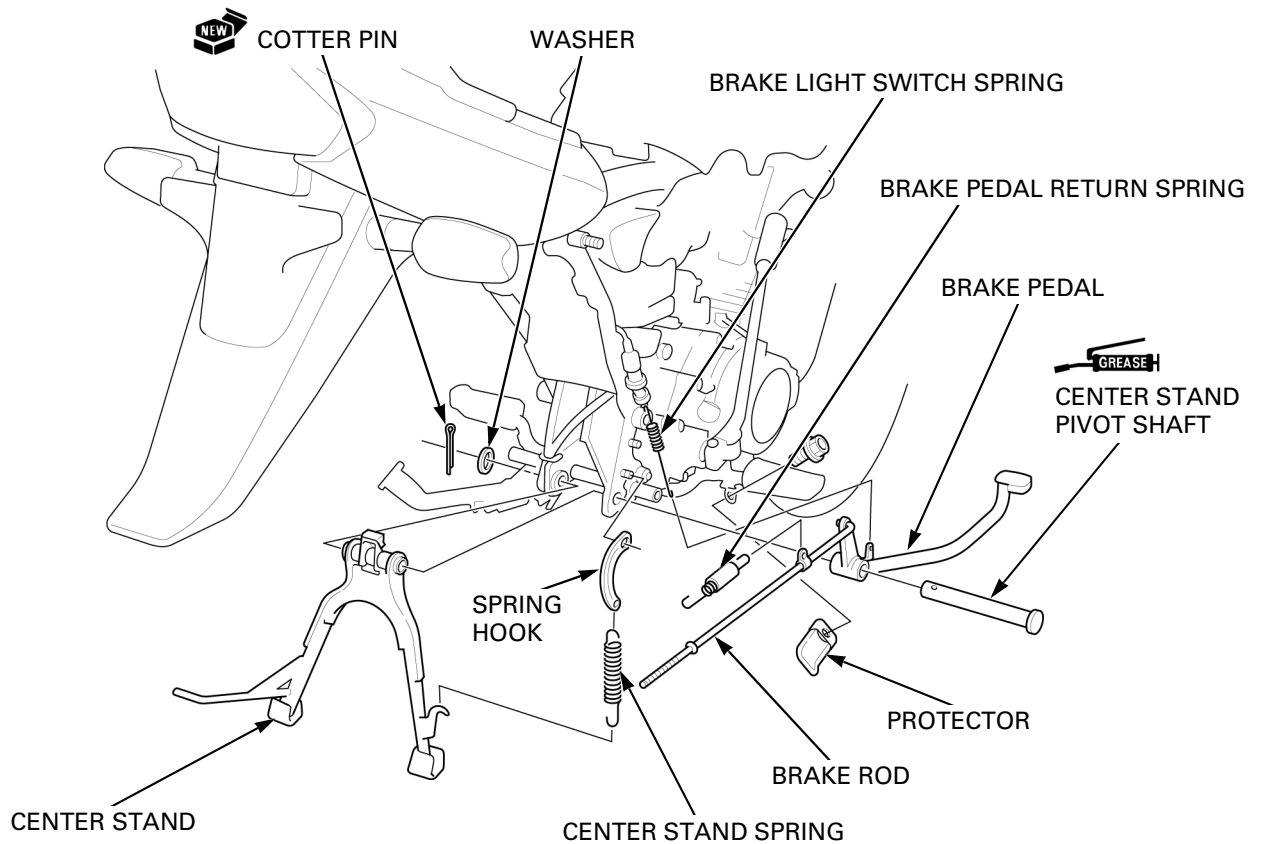
Pull out the pivot shaft from left side, then remove the center stand and rear brake pedal.

Remove the following:

- Cotter pin
- Washer
- Brake rod

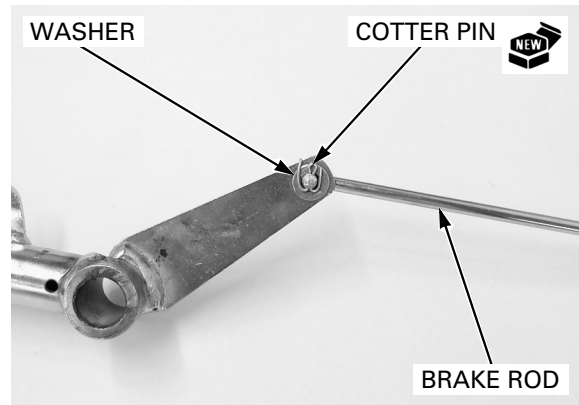


INSTALLATION



REAR WHEEL/BRAKE/SUSPENSION

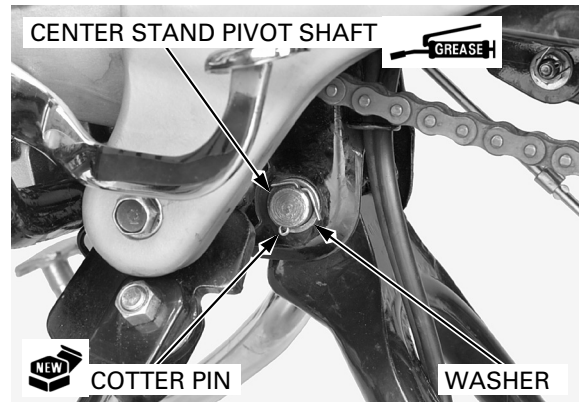
Connect the brake rod to the pedal with a washer and a new cotter pin.



Apply grease to the center stand pivot shaft outer surface.

Set the brake pedal and center stand into the frame, then install the pivot shaft into the frame from right side.

Install the washer and new cotter pin.



Install the rear brake pedal return spring.

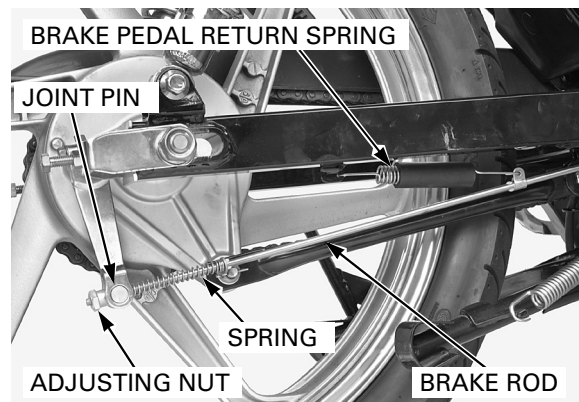
Install the joint pin to the brake arm.

Install the spring onto the brake rod.

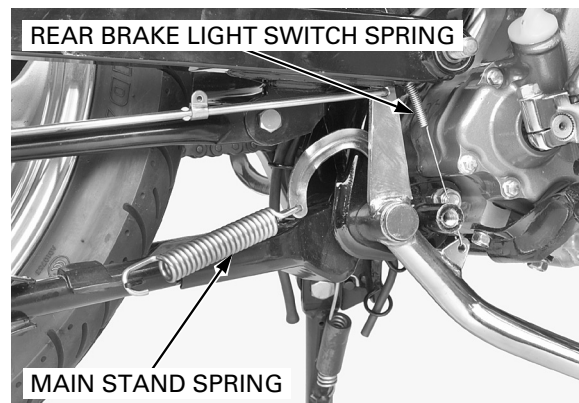
Push down the brake pedal, and install the brake rod into the joint pin.

Connect the brake rod to the brake arm with the adjusting nut.

Adjust the brake pedal free play (page 3-21).



Install the center stand spring and rear brake light switch spring to the rear brake pedal.



Set the washer to the swingarm pivot and install the right pillion step bracket and bolt.

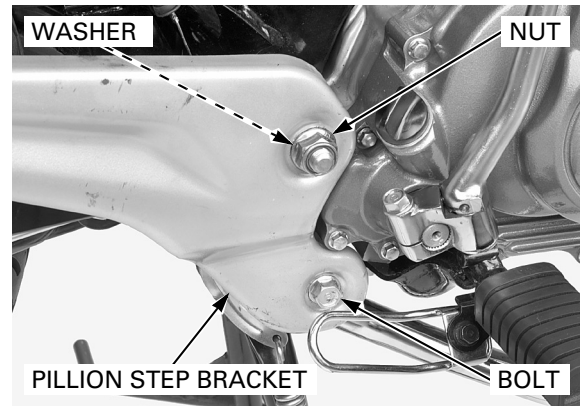
Install and tighten the swingarm pivot nut to the specified torque.

TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)

Tighten the right pillion step bracket bolt to the specified torque.

TORQUE: 45 N·m (4.6 kgf·m, 33 lbf·ft)

Install the exhaust pipe/muffler (page 2-11).



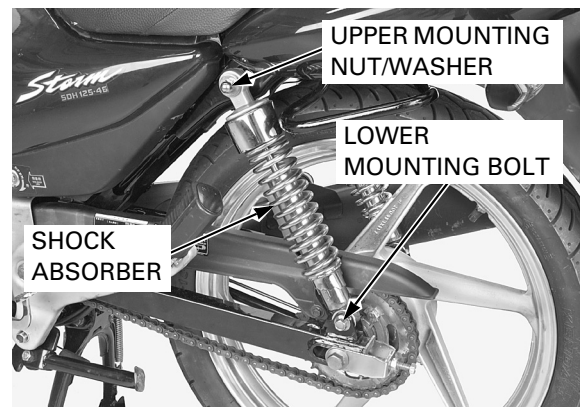
SHOCK ABSORBER

REMOVAL

Support the motorcycle on its center stand.

Remove the upper mounting nut and washer.

Remove the lower mounting bolt and shock absorber.



INSPECTION

Do not disassemble the shock absorber. Replace the shock absorber as an assembly.

Visually inspect the shock absorber for wear or damage.

Check the following:

- Damper rod for bending or damage
- Damper unit for leakage or other damage
- Bushing for wear or damage

Check for smooth damper operation.



INSTALLATION

Install the shock absorber and lower mounting bolt.

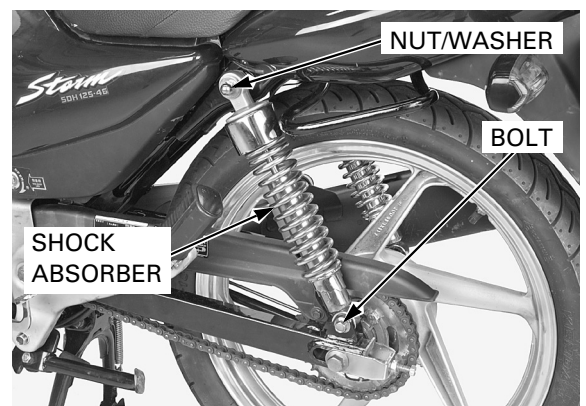
Install the washer and upper mounting nut.

Tighten the upper mounting nut/washer and lower mounting bolt to the specified torque.

TORQUE:

Shock absorber upper mounting nut:
29 N·m (3.0 kgf·m, 21 lbf·ft)

Shock absorber lower mounting bolt:
34 N·m (3.5 kgf·m, 25 lbf·ft)

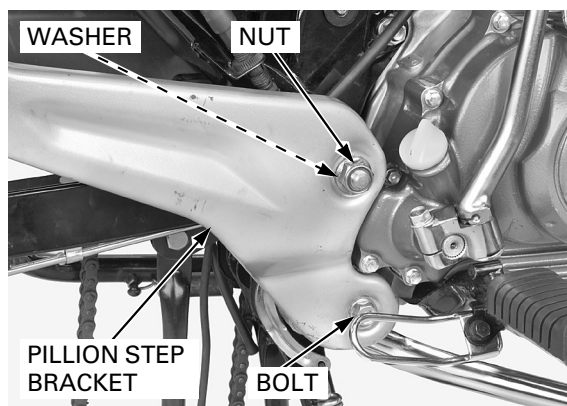


SWINGARM

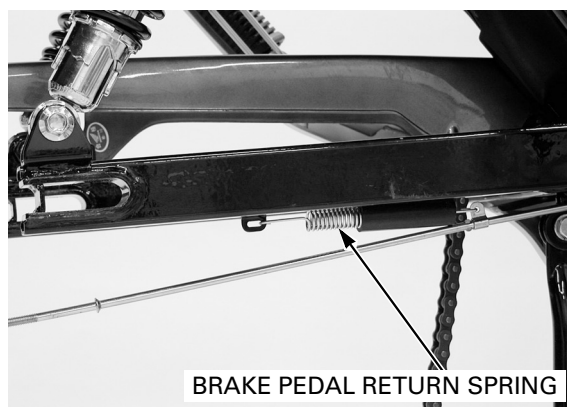
REMOVAL

Remove the following:

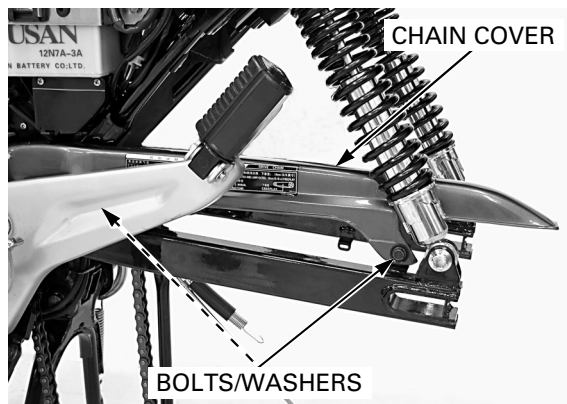
- Exhaust pipe/muffler (page 2-10)
- Rear wheel (page 13-6)
- Swingarm pivot nut
- Right pillion step bracket bolt
- Right pillion step bracket
- Washer



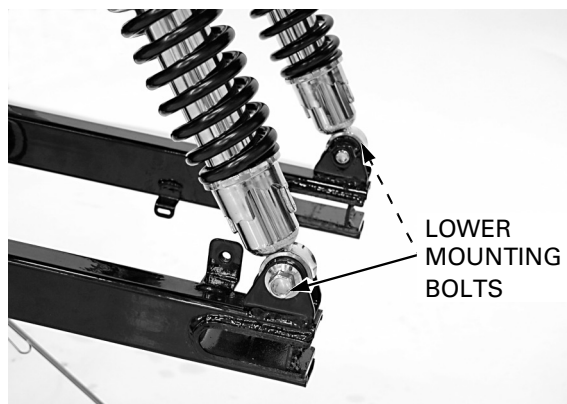
Remove the brake pedal return spring.



Remove the bolts, washers and chain cover.



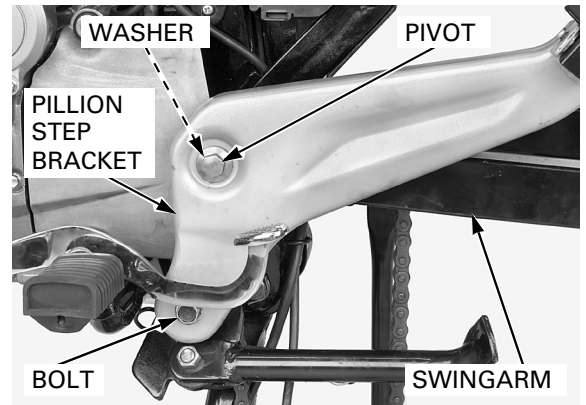
Remove the shock absorber lower mounting bolts.



When removing the swingarm pivot shaft, hold the swingarm.

Remove the following:

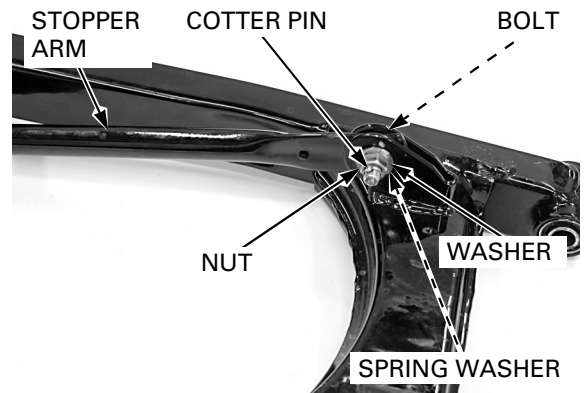
- Left pillion step bracket bolt
- Swingarm pivot shaft
- Pillion step bracket
- Washer
- Swingarm



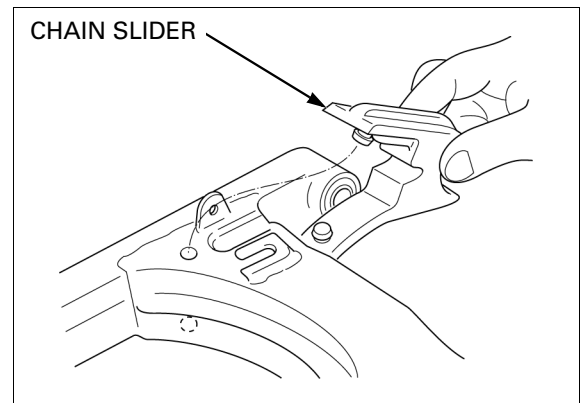
DISASSEMBLY

Remove the following:

- Cotter pin
- Nut
- Washer
- Spring washer
- Joint bolt
- Brake panel stopper arm



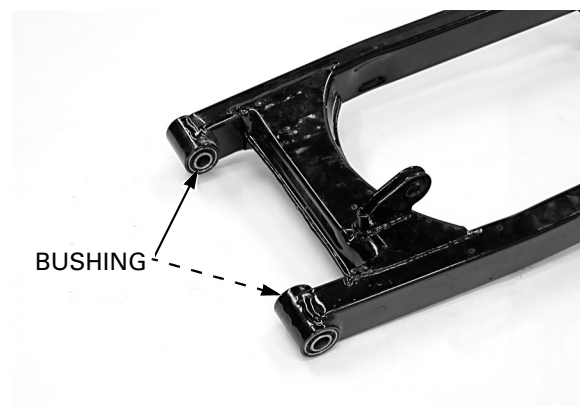
Remove the chain slider.



INSPECTION

Check the chain slider for wear or damage.

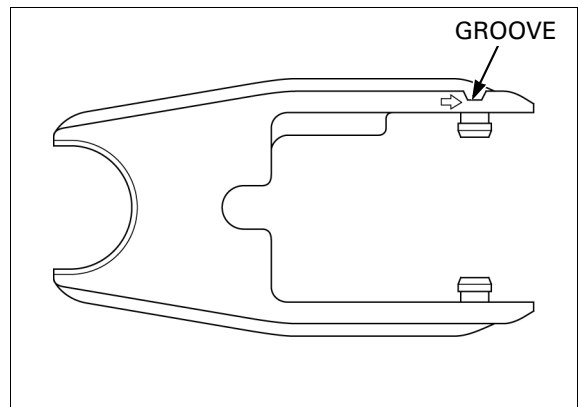
The chain slider must be replaced if it is worn to the wear limit groove.



REAR WHEEL/BRAKE/SUSPENSION

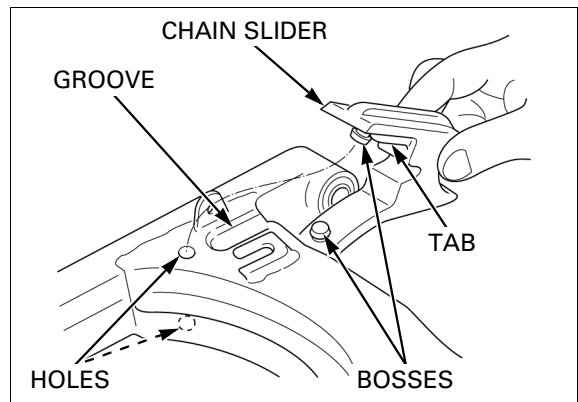
Check the chain slider for wear or damage.

The chain slider must be replaced if it is worn to the wear limit groove.



ASSEMBLY

Install the chain slider aligning the tab and the swingarm groove, and set the bosses into the holes in the swingarm securely.

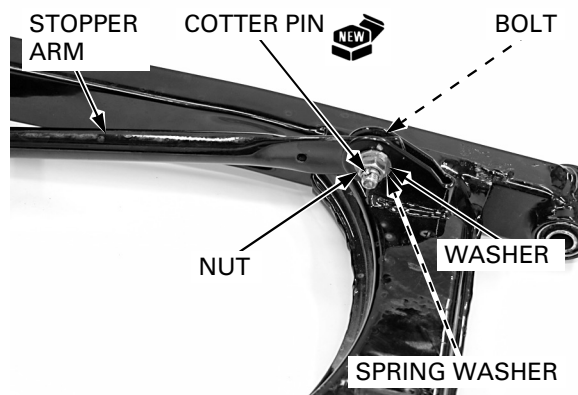


Install the following:

- Brake panel stopper arm
- Joint bolt
- Spring washer
- Washer

Install and tighten the nut securely.

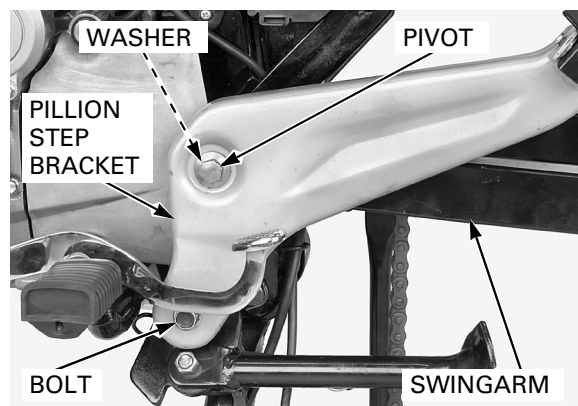
Install a new cotter pin and secure it.



INSTALLATION

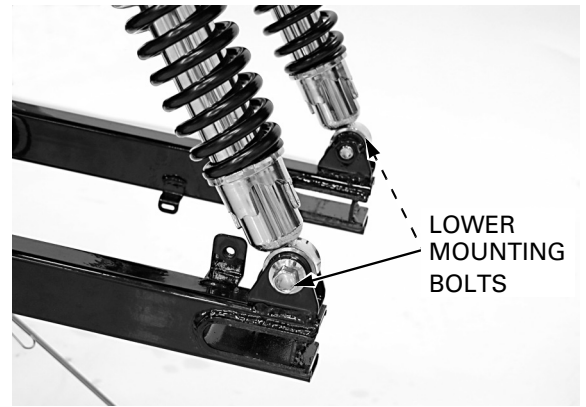
Install the swingarm, washer and left pillion step bracket, then install the swingarm pivot shaft from the left side.

Install the left pillion step bracket bolt.

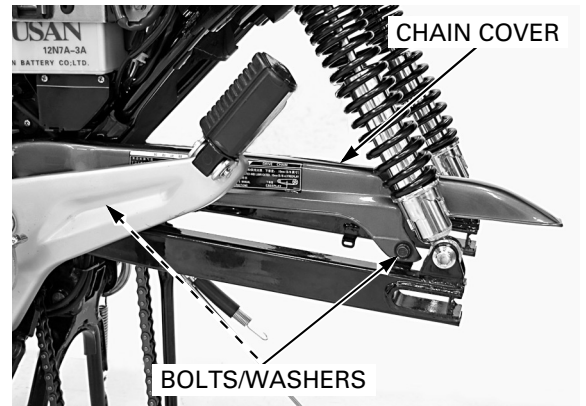


Install and tighten the shock absorber lower mounting bolts to the specified torque.

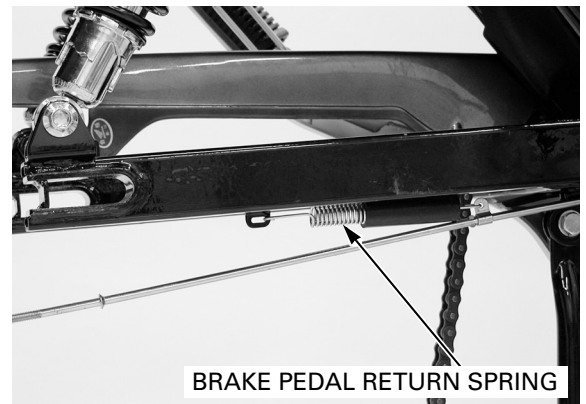
TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)



Install the chain cover, mounting bolts and washers. Tighten the bolts securely.



Install the brake pedal return spring.



Set the washer to the swingarm pivot shaft, then install the right pillion step bracket. Temporarily install the right pillion step bracket bolt and swingarm pivot nut.

Install the rear wheel (page 13-12).

Retract the center stand and support the motorcycle.

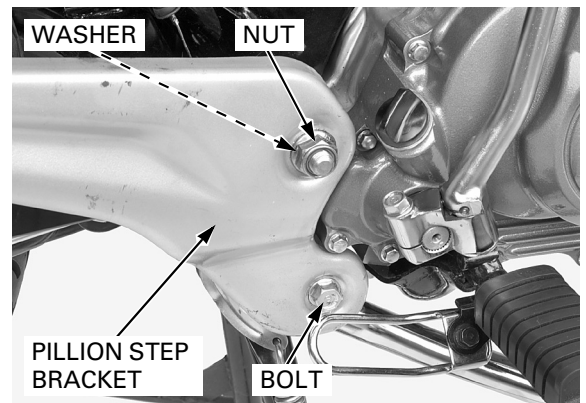
Tighten the swingarm pivot nut to the specified torque.

TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)

Tighten the right and left pillion step bracket bolts to the specified torque.

TORQUE: 45 N·m (4.6 kgf·m, 33 lbf·ft)

Install the exhaust pipe/muffler (page 2-11).

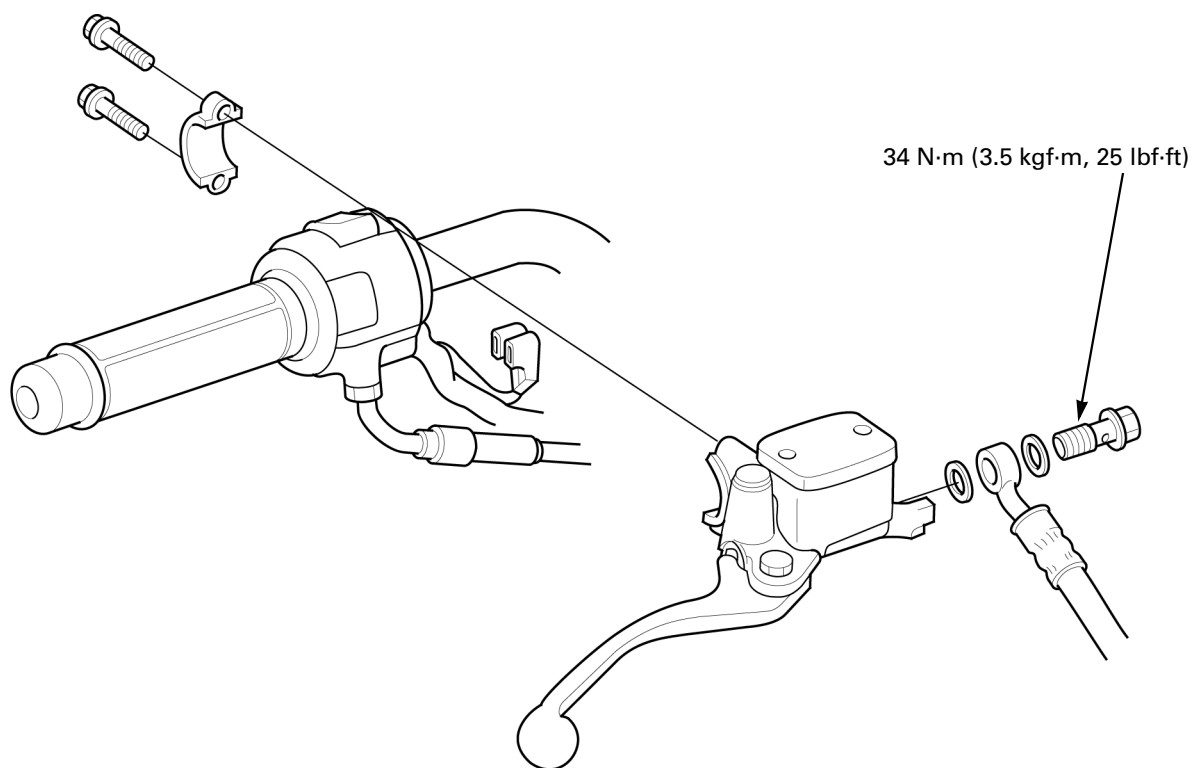


MEMO

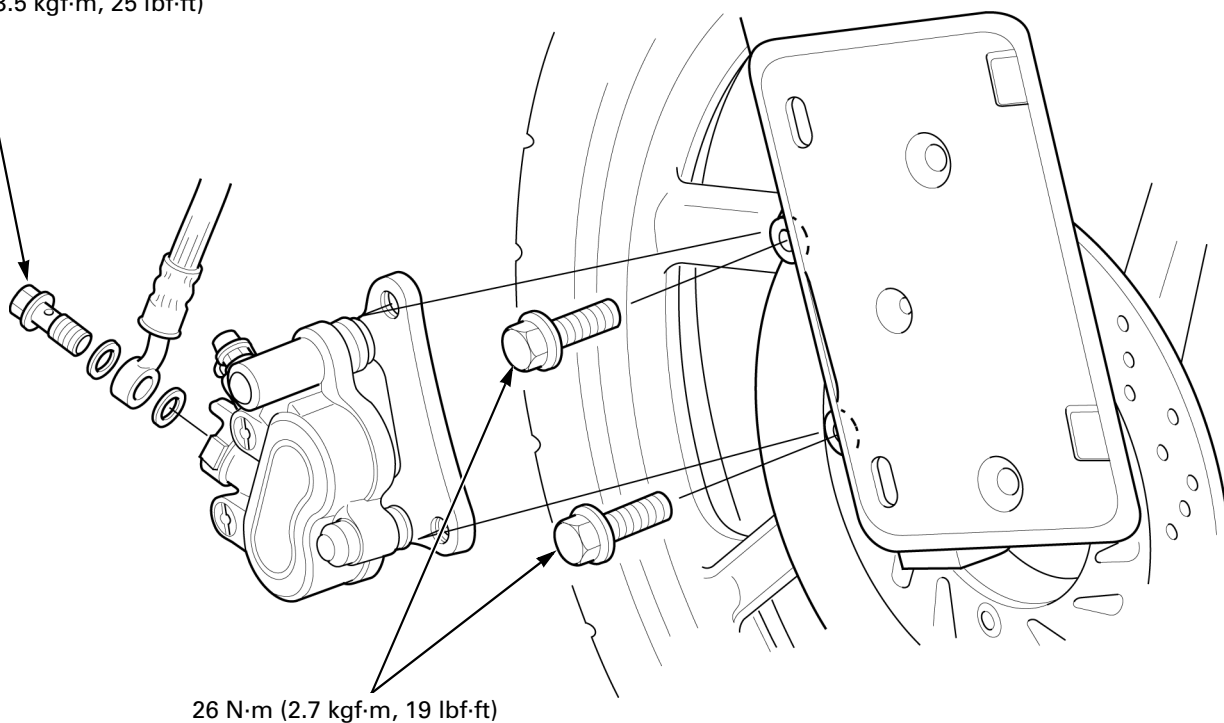
14. HYDRAULIC BRAKE

COMPONENT LOCATION	14-2	BRAKE PAD/DISC	14-7
SERVICE INFORMATION	14-3	MASTER CYLINDER.....	14-10
TROUBLESHOOTING	14-4	BRAKE CALIPER	14-15
BRAKE FLUID REPLACEMENT/ AIR BLEEDING	14-5		

COMPONENT LOCATION



34 N·m (3.5 kgf·m, 25 lbf·ft)



SERVICE INFORMATION

GENERAL

⚠ CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.

- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

NOTICE

Spilling brake fluid will severely damage instrument lenses and painted surface. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap; make sure the front reservoir is horizontal first.

- This section covers the services for disc brake type only.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Check the brake system by applying the brake lever after the air bleeding.
- Never allow contaminants (dirt, water, etc.) to get into an open reservoir.
- Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled.
- Always use fresh DOT 3 or DOT 4 brake fluid from a sealed container when servicing the system. Do not mix different types of fluid, they may not be compatible.
- Always check brake operation before riding the motorcycle.

SPECIFICATION

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Recommended brake fluid	DOT 3 or DOT 4	–
Brake disc thickness	3.8 – 4.2 (0.15 – 0.17)	3.5 (0.14)
Brake disc runout	–	0.25 (0.010)
Master cylinder I.D.	12.700 – 12.743 (0.5000 – 0.5017)	12.755 (0.5022)
Master piston O.D.	12.657 – 12.684 (0.4983 – 0.4994)	12.645 (0.4978)
Caliper cylinder I.D.	25.400 – 25.450 (1.0000 – 1.0020)	25.460 (1.0024)
Caliper piston O.D.	25.318 – 25.368 (0.9968 – 0.9987)	25.31 (0.996)

TORQUE VALUES

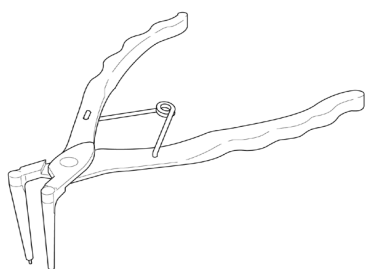
Caliper bleed valve	8.0 N·m (0.8 kgf·m, 5.9 lbf·ft)
Master cylinder reservoir cap screw	1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)
Pad pin	18 N·m (1.8 kgf·m, 13 lbf·ft)
Pad pin plug	2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)
Brake caliper mounting bolt	26 N·m (2.7 kgf·m, 19 lbf·ft)
Front brake light switch screw	1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)
Brake lever pivot bolt	1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)
Brake lever pivot nut	6.0 N·m (0.6 kgf·m, 4.4 lbf·ft)
Brake hose oil bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)

ALOC bolt: replace with a new one.

Apply grease to the sliding surface.

TOOL

Snap ring pliers
07914-SA50001



TROUBLESHOOTING

Brake lever soft or spongy

- Air in hydraulic system
- Leaking hydraulic system
- Contaminated brake pad/disc
- Worn caliper piston seal
- Worn master cylinder piston cups
- Worn brake pad/disc
- Contaminated caliper
- Contaminated master cylinder
- Caliper not sliding properly
- Low brake fluid level
- Clogged fluid passage
- Warped/deformed brake disc
- Sticking/worn caliper piston
- Sticking/worn master cylinder piston
- Bent brake lever

Brake lever hard

- Clogged/restricted brake system
- Sticking/worn caliper piston
- Caliper not sliding properly
- Worn caliper piston seal
- Sticking/worn master cylinder piston
- Bent brake lever

Brake drags

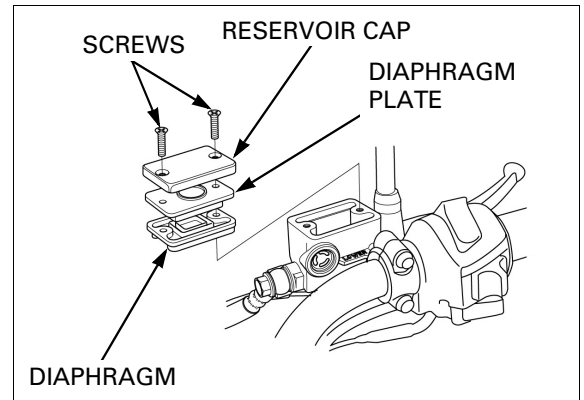
- Contaminated brake pad/disc
- Misaligned wheel
- Badly worn brake pad/disc
- Warped/deformed brake disc
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Sticking caliper piston

BRAKE FLUID REPLACEMENT/AIR BLEEDING

BRAKE FLUID DRAINING

Turn the handlebar so the reservoir is level before removing the reservoir cap.

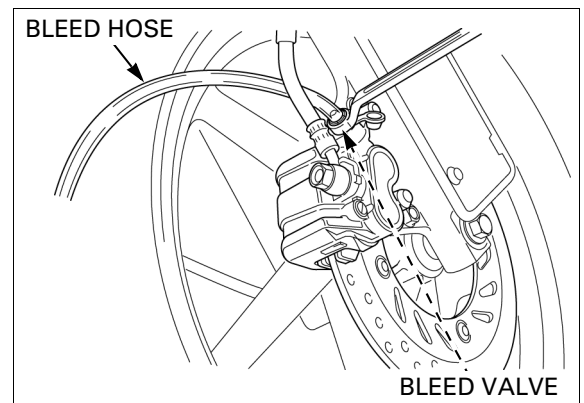
Remove the screws, reservoir cap, diaphragm plate and diaphragm.



Connect a bleed hose to the caliper bleed valve.

Loosen the bleed valve and pump the brake lever until no more fluid flows out of the bleed valve.

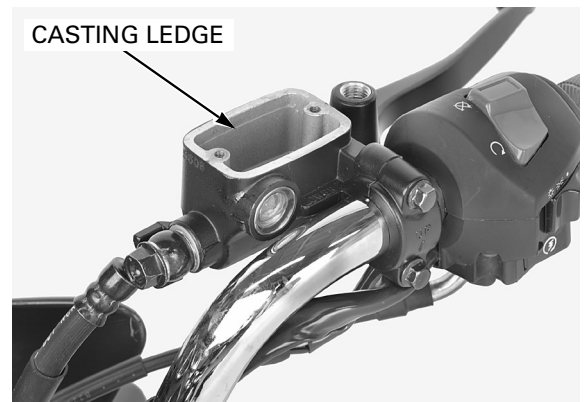
Close the bleed valve.



BRAKE FLUID FILLING/AIR BLEEDING

Do not mix different types of fluid. They are not compatible.

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



HYDRAULIC BRAKE

If air enters the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Connect a commercially available brake bleeder to the bleed valve.

Operate the brake bleeder and loosen the bleed valve.

- Check the fluid level often while bleeding the brake to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.

Add brake fluid when the fluid level in the reservoir is low.

Perform the bleeding procedure until the system is completely flushed/bled.

Close the bleed valve and operate the brake lever. If it still feels spongy, bleed the system again.

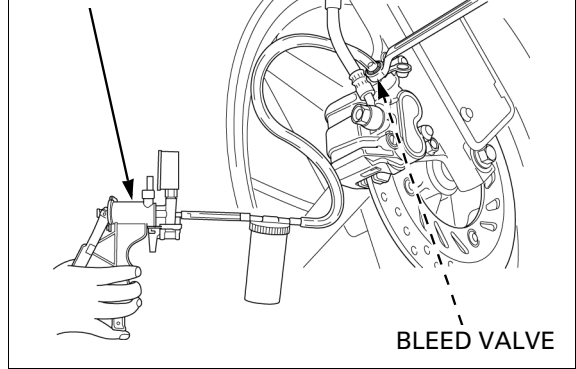
After bleeding the system completely, tighten the bleed valve to the specified torque.

TORQUE: 8.0 N·m (0.8 kgf·m, 5.9 lbf·ft)

If the brake bleeder is not available, perform the following procedure.

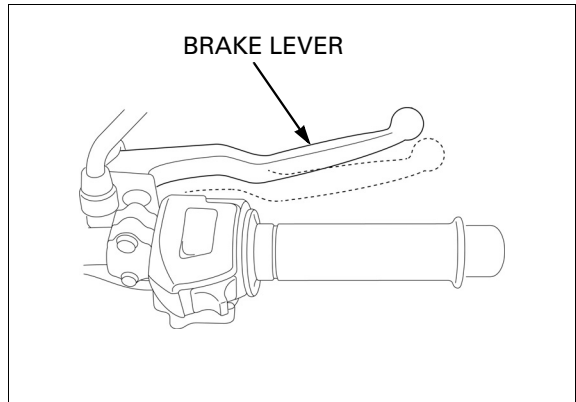
Pump up the system pressure with the brake lever until the lever resistance is felt.

BRAKE BLEEDER

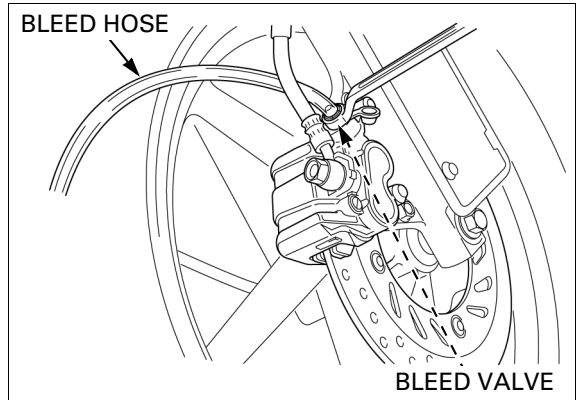


BLEED VALVE

BRAKE LEVER



BLEED HOSE



BLEED VALVE

Connect a bleed hose to the bleed valve and bleed the system as follows:

Do not release the brake lever until the bleed valve is closed.

1. Squeeze the brake lever all the way and loosen the bleed valve 1/2 turn and then close the bleed valve.
2. Release the brake lever slowly and wait several seconds after it reaches the end of its travel.
3. Repeat the steps 1 and 2 until there are no air bubbles in the bleed hose.

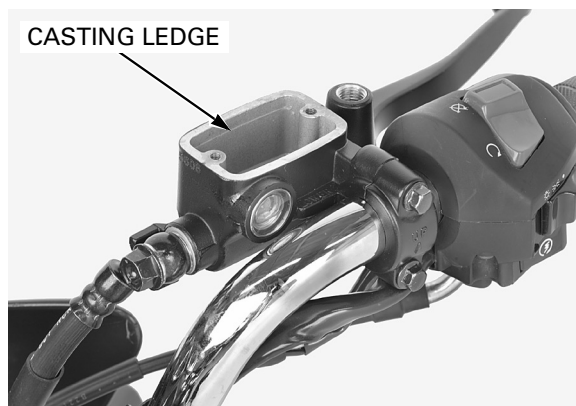
After bleeding the system completely, tighten the bleed valve to the specified torque.

TORQUE: 8.0 N·m (0.8 kgf·m, 5.9 lbf·ft)

Do not mix different types of fluid. They are not compatible.

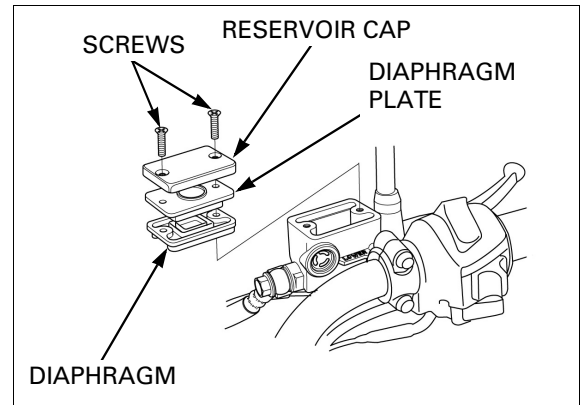
Fill the reservoir with DOT 3 or DOT 4 brake fluid to the casting ledge from a sealed container.

CASTING LEDGE



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

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

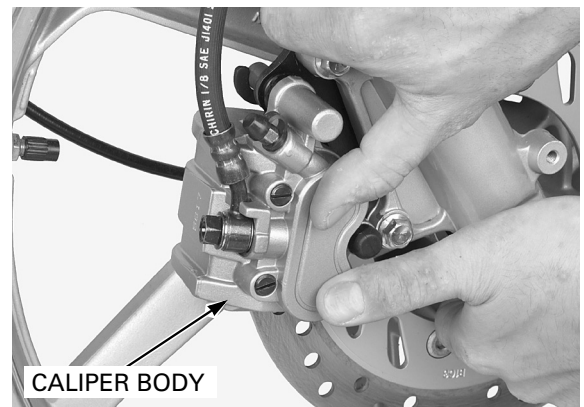


BRAKE PAD/DISC

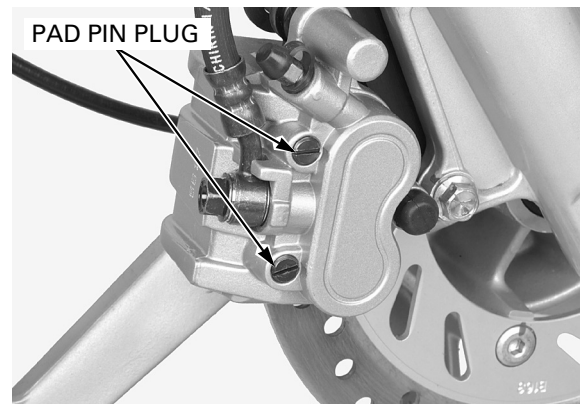
BRAKE PAD REPLACEMENT

Check the brake fluid level in the master cylinder reservoir as this operation causes the fluid level to rise.

Push the caliper pistons all the way in by pushing the caliper body inward to allow installation of new brake pads.



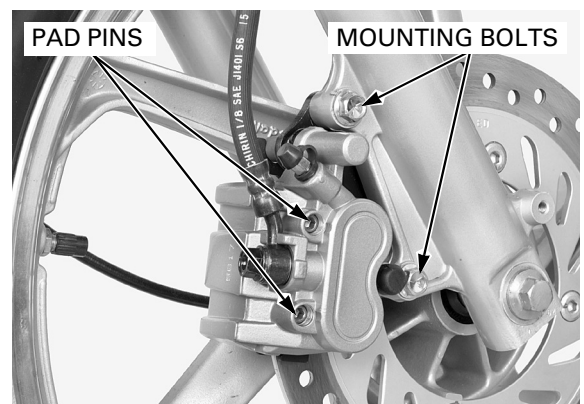
Remove the pad pin plug.



Loosen the pad pins.

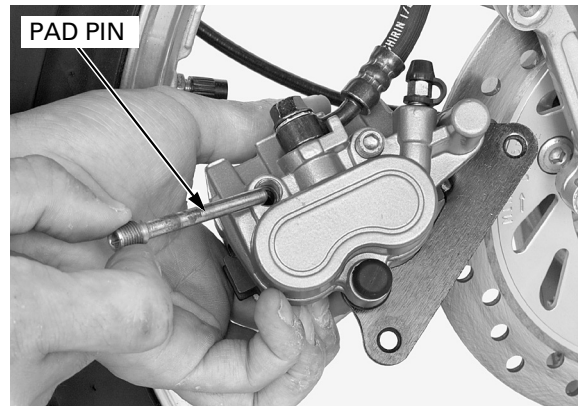
Never install the old brake disc mounting bolts.

Remove the caliper mounting bolts and brake caliper.



HYDRAULIC BRAKE

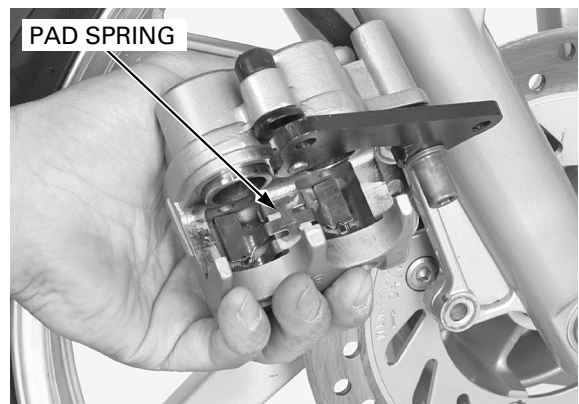
Remove the pad pins.



Remove the brake pads.



Make sure the pad spring is installed in position.

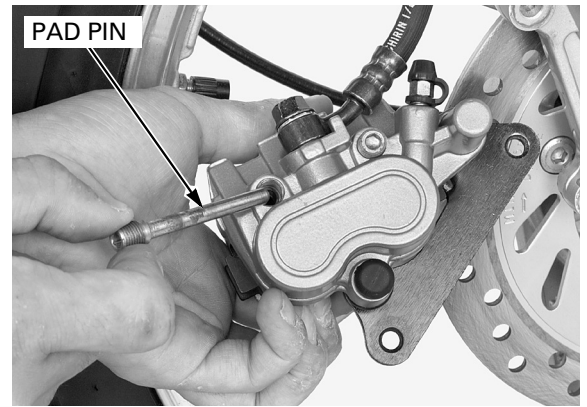


*Always replace the
brake pads in pairs.*

Install new brake pads.



Install the pad pin by pushing the pads against the pad spring to align the pad pin holes of the pads and caliper.



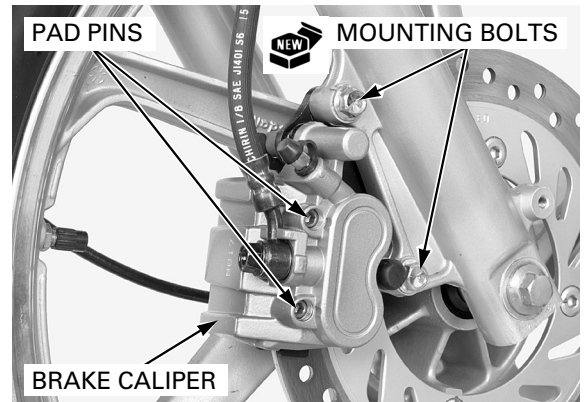
Install the brake caliper and new mounting bolts. Tighten the brake caliper mounting bolts to the specified torque.

TORQUE: 26 N·m (2.7 kgf·m, 19 lbf·ft)

Tighten the pad pins to the specified torque.

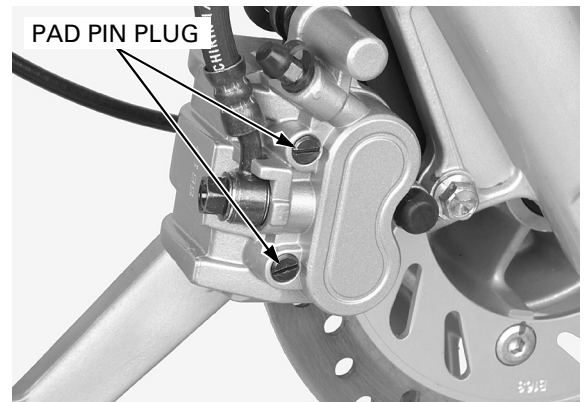
TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Operate the brake lever to seat the caliper pistons against the pads.



Install and tighten the pad pin plugs to the specified torque.

TORQUE: 2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)

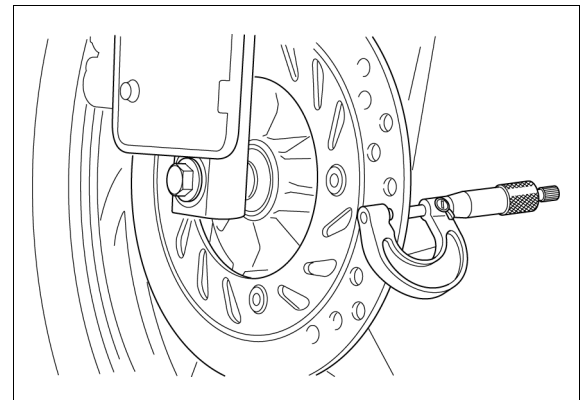


BRAKE DISC INSPECTION

Visually inspect the brake disc for damage or crack.

Measure the brake disc thickness at several points.

SERVICE LIMIT: 3.5 mm (0.14 in)

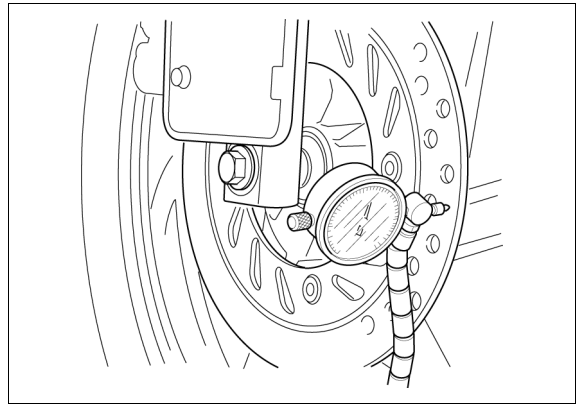


HYDRAULIC BRAKE

Measure the brake disc runout with a dial indicator.

SERVICE LIMIT: 0.25 mm (0.010 in)

Check the wheel bearings for excessive play (page 12-13), if the warpage exceeds the service limit.
Replace the brake disc (page 12-15) if the wheel bearings are normal.



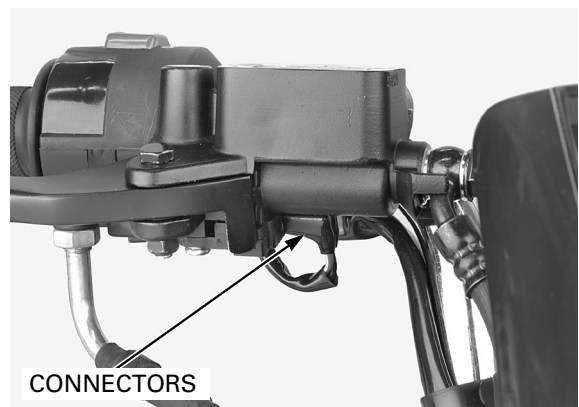
MASTER CYLINDER

REMOVAL

Drain the brake fluid from the hydraulic system (page 14-5).

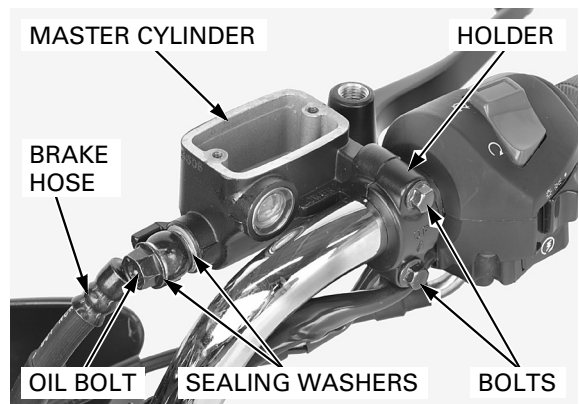
Remove the right rearview mirror (page 12-7).

Disconnect the brake light switch connectors.



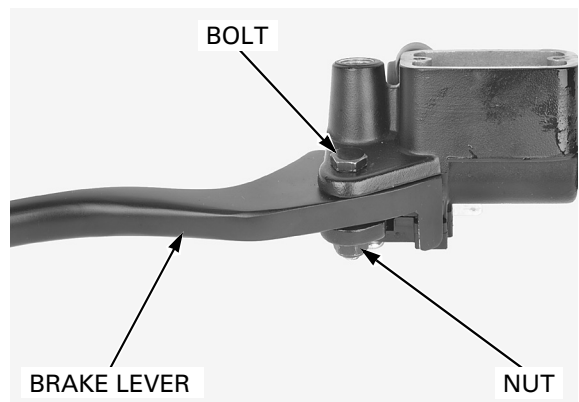
Disconnect the brake hose from the master cylinder by removing the oil bolt and sealing washers.

Remove the bolts, holder and master cylinder.

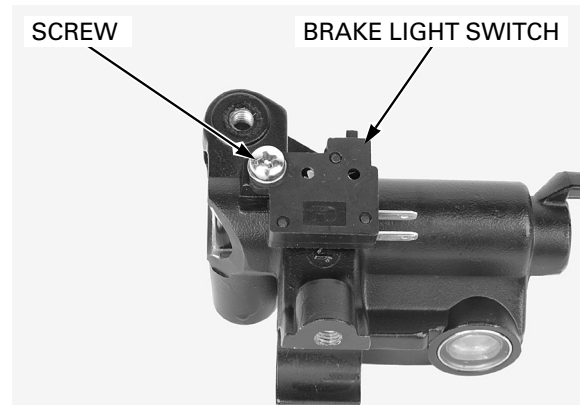


DISASSEMBLY

Remove the brake lever pivot nut, bolt and brake lever.

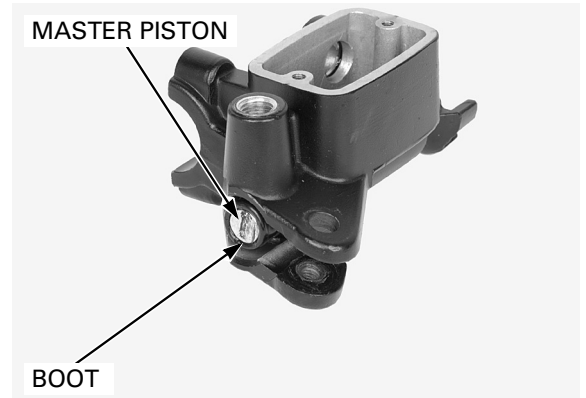


Remove the screw and brake light switch.



Be careful not to damage the boot.

Remove the boot from the master piston.

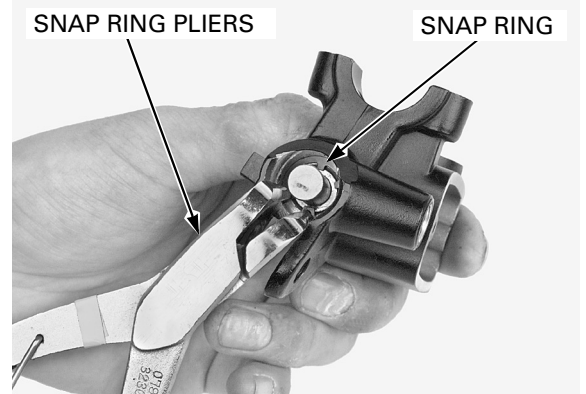


Remove the snap ring using the special tool.

TOOL:

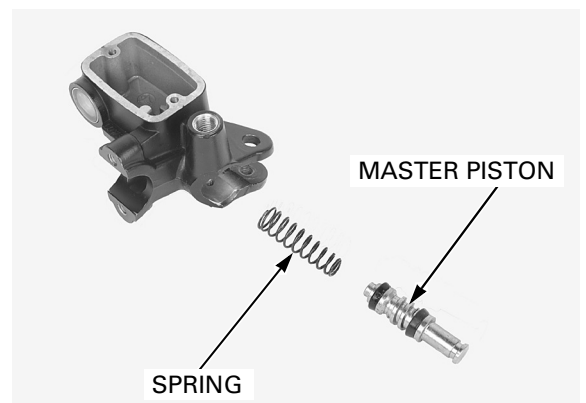
Snap ring pliers

07914-SA50001



Remove the master piston and spring.

Clean the master cylinder, reservoir and master piston with clean brake fluid.



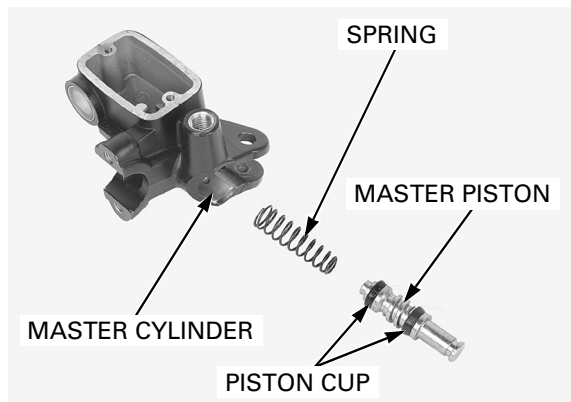
HYDRAULIC BRAKE

INSPECTION

Check the master cylinder and piston for scoring, scratches or damage.

Check the piston cups and boot for wear, deterioration or damage.

Check the spring for fatigue or damage.



Measure the master cylinder I.D.

SERVICE LIMIT: 12.755 mm (0.5022 in)

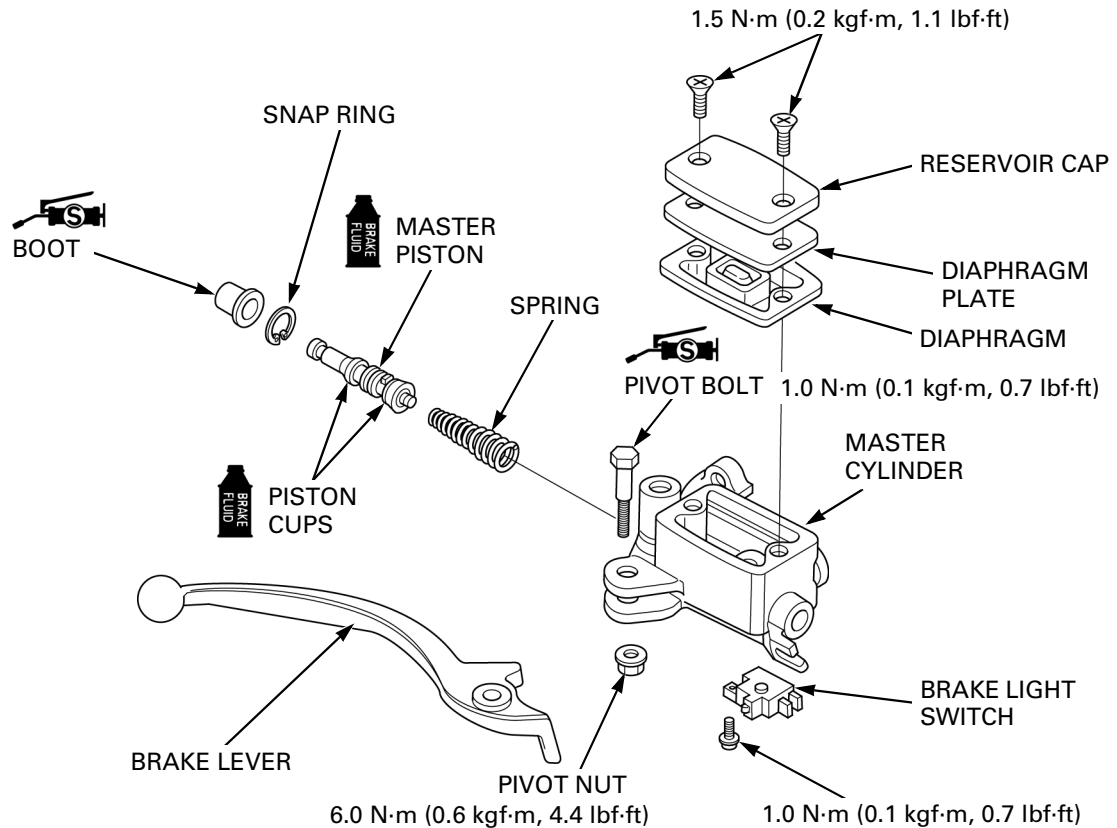


Measure the master piston O.D.

SERVICE LIMIT: 12.645 mm (0.4978 in)



ASSEMBLY



Replace the piston, cups, spring, snap ring and boot as a set; do not substitute individual part.

Do not allow the piston cup lips to turn inside out.

Coat the piston cups and piston with clean DOT 3 or DOT 4 brake fluid.

Install the spring onto the master piston end.

Install the master piston assembly into the master cylinder.

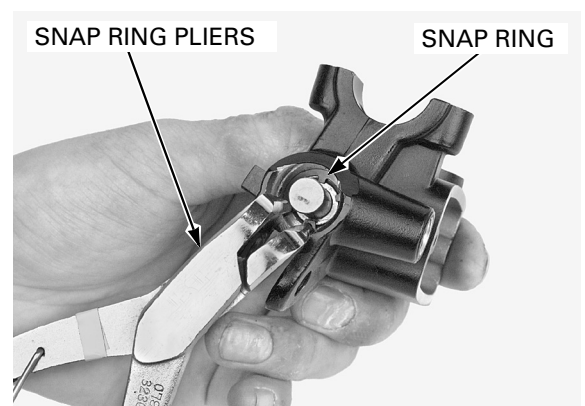
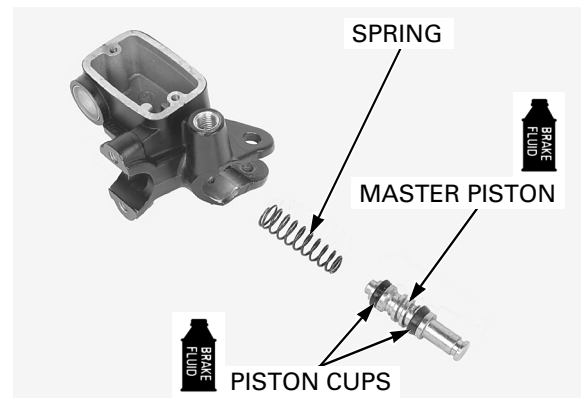
Be certain the snap ring is firmly seated in the groove.

Install the snap ring into the groove in the master cylinder.

TOOL:

Snap ring pliers

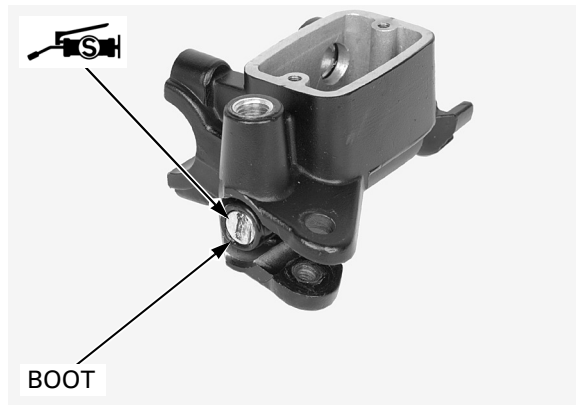
07914-SA50001



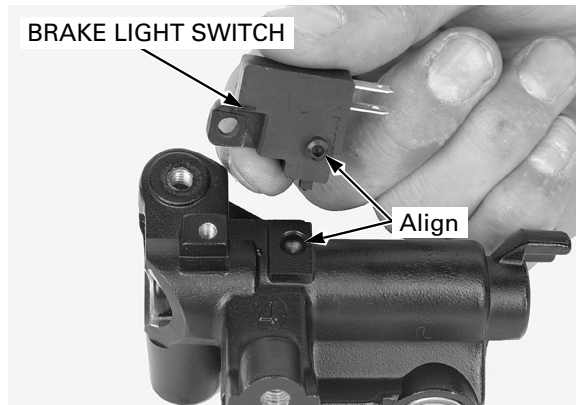
HYDRAULIC BRAKE

Install the boot into the master cylinder and piston groove.

Apply silicone grease to the brake lever-to-master piston contact area.

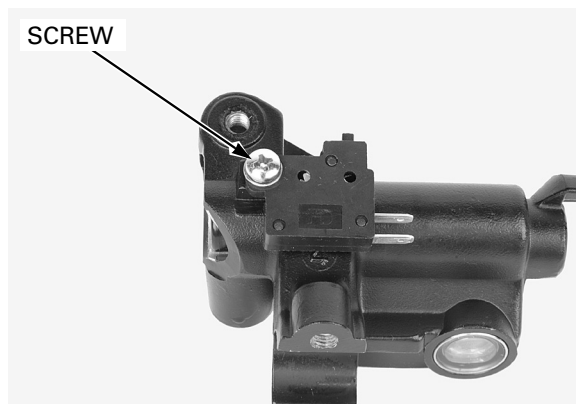


Install the brake light switch to the master cylinder, aligning the brake light switch boss and master cylinder hole.



Install and tighten the screw to the specified torque.

TORQUE: 1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)



Apply silicone grease to the brake lever pivot bolt sliding surface.

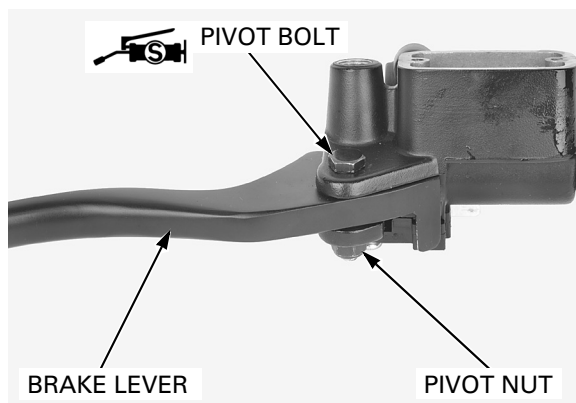
Install the brake lever to the master cylinder.

Install the pivot bolt and tighten it to the specified torque.

TORQUE: 1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)

Install the pivot nut and tighten it to the specified torque.

TORQUE: 6.0 N·m (0.6 kgf·m, 4.4 lbf·ft)



INSTALLATION

Set the master cylinder and the holder to the handlebar with its "UP" mark facing up.

Align the mating surface of the master cylinder with the punch mark on the handlebar, and tighten the upper bolt first, then tighten the lower bolt.

Set the brake hose eyelet joint between the stoppers on the master cylinder.

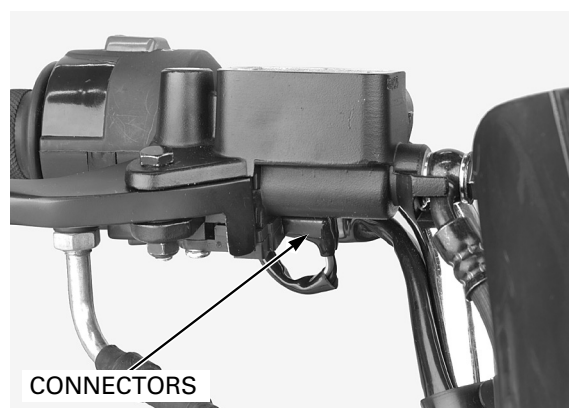
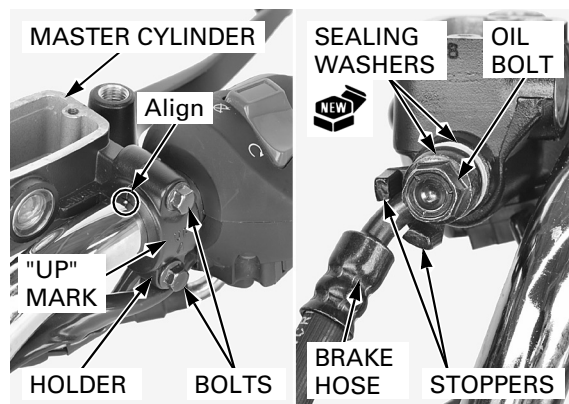
Connect the brake hose with the oil bolt and new sealing washers, and tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Connect the brake light switch connectors.

Fill the brake fluid and bleed the air from the hydraulic system (page 14-5).

Install the right rearview mirror (page 12-9).



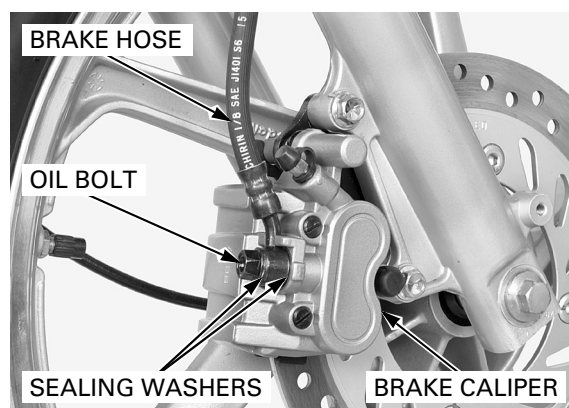
BRAKE CALIPER

REMOVAL

Drain the brake fluid from the hydraulic system (page 14-5).

Disconnect the brake hose from the brake caliper by removing the oil bolt and sealing washers.

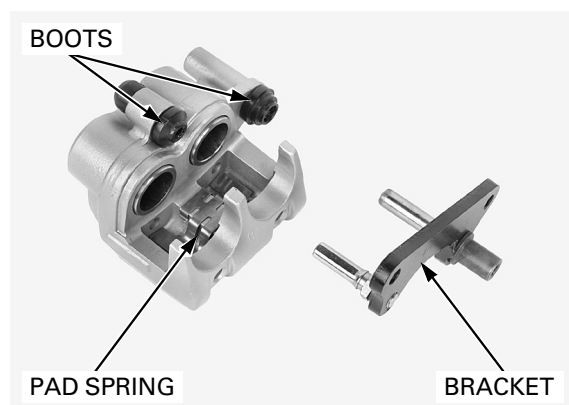
Remove the brake pads and brake caliper (page 14-7).



DISASSEMBLY

Remove the following:

- Caliper bracket
- Pad spring
- Caliper pin boots

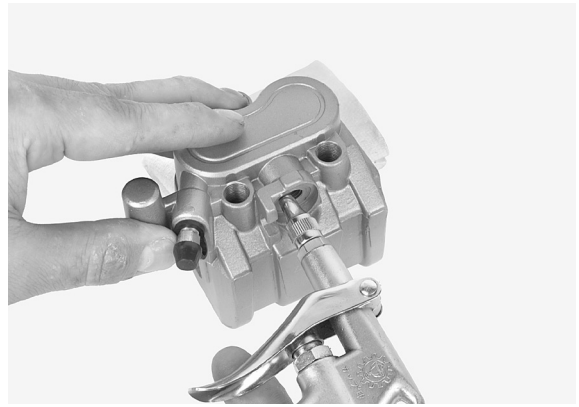


HYDRAULIC BRAKE

Place a shop towel over the piston.

Do not use high pressure air or bring the nozzle too close to the inlet.

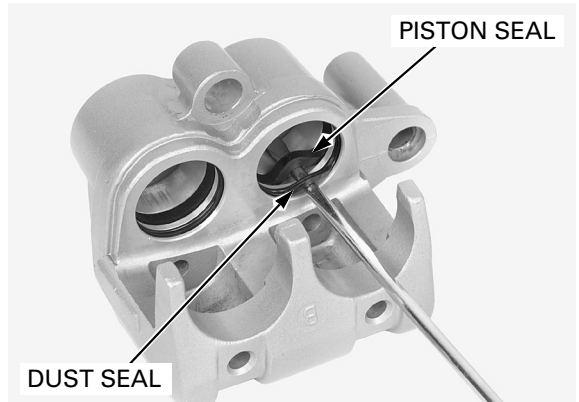
Position the caliper body with the piston facing down and apply small squirts of air pressure to the fluid inlet to remove the piston.



Be careful not to damage the piston sliding surface.

Push the dust seal and piston seal in and lift them out.

Clean the seal grooves, caliper cylinder and piston with clean brake fluid.

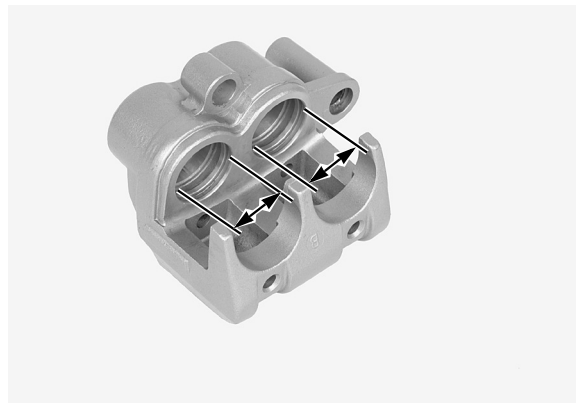


INSPECTION

Check the caliper cylinder for scoring, scratches or damage.

Measure the caliper cylinder I.D.

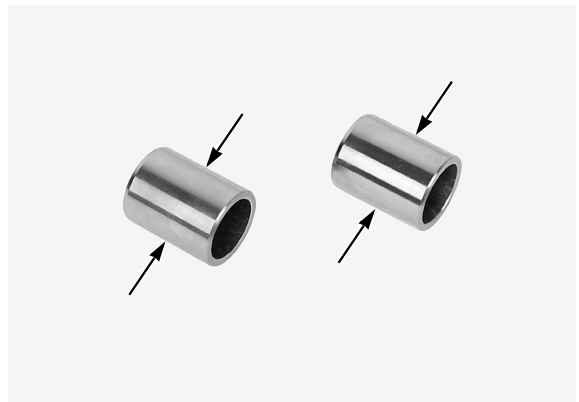
SERVICE LIMIT: 25.460 mm (1.0024 in)



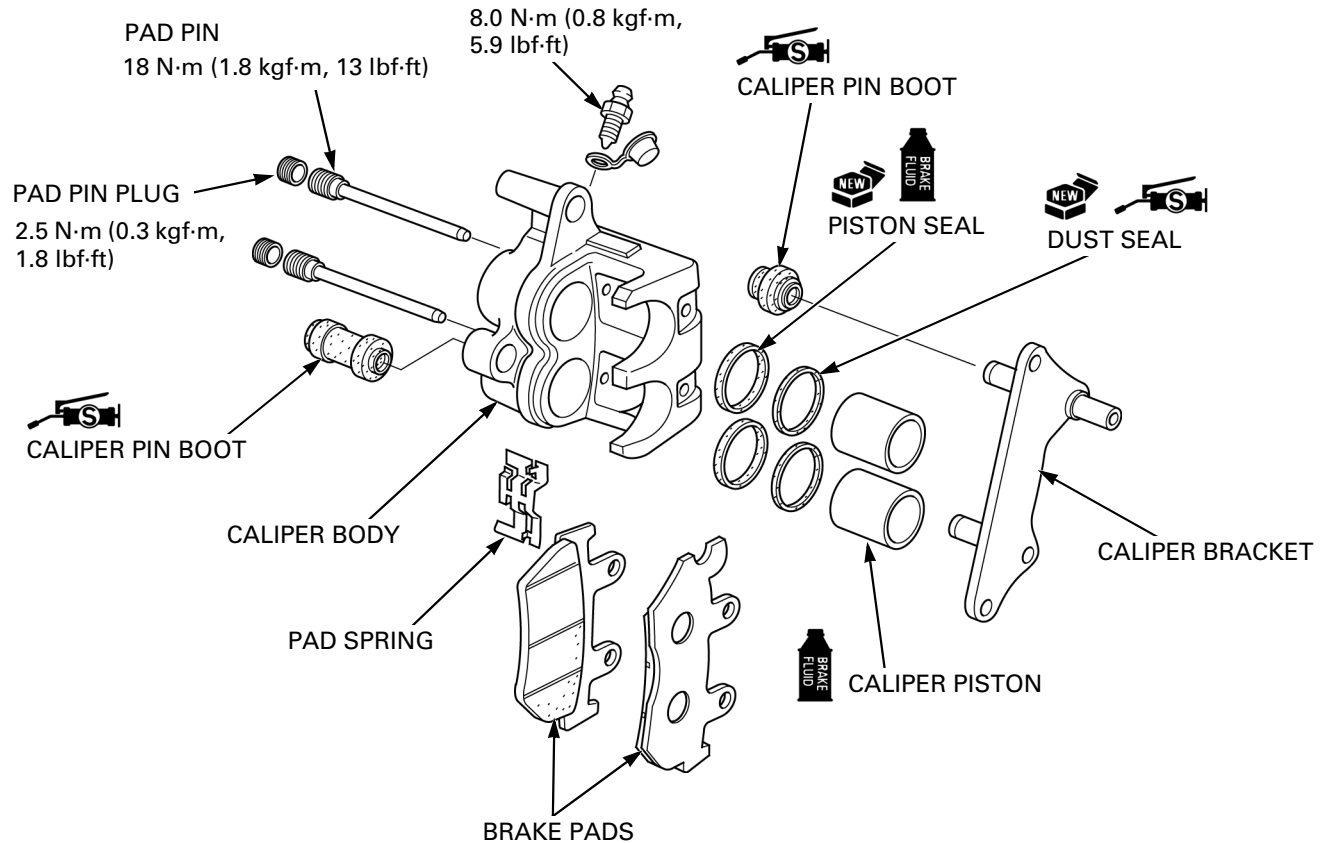
Check the caliper piston for scoring, scratches or damage.

Measure the caliper piston O.D.

SERVICE LIMIT: 25.31 mm (0.996 in)



ASSEMBLY



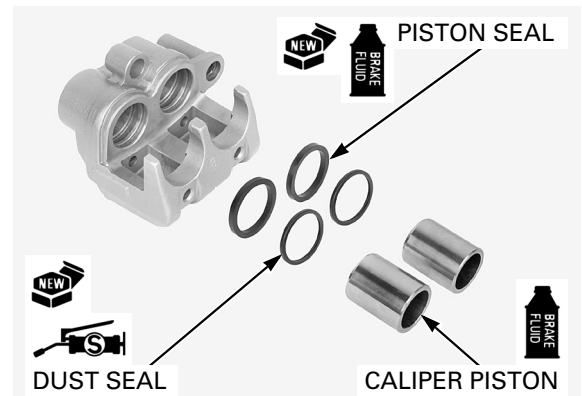
Coat a new piston seal with clean brake fluid.

Apply silicone grease to the new dust seals.

Install each piston seal, dust seal and caliper piston in their proper locations.

Install the new piston seals and new dust seals into the seal grooves in the caliper cylinder.

Coat the caliper pistons with clean brake fluid and install them into the caliper cylinders with the opening side facing the pad.

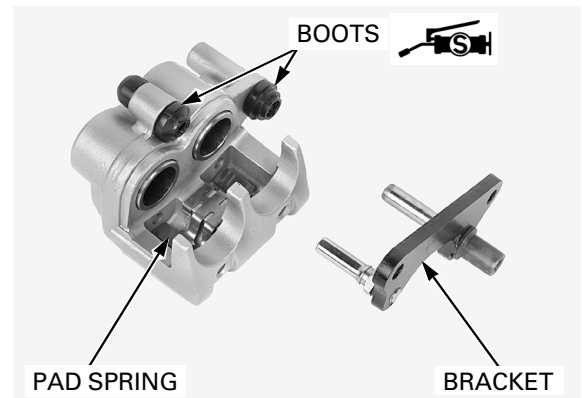


Install the pad spring onto the caliper body.

Apply silicone grease to the inside of the boots, and install them into the caliper body.

- If the boots are hard or deteriorated, replace them with new ones.

Install the caliper bracket.



HYDRAULIC BRAKE

INSTALLATION

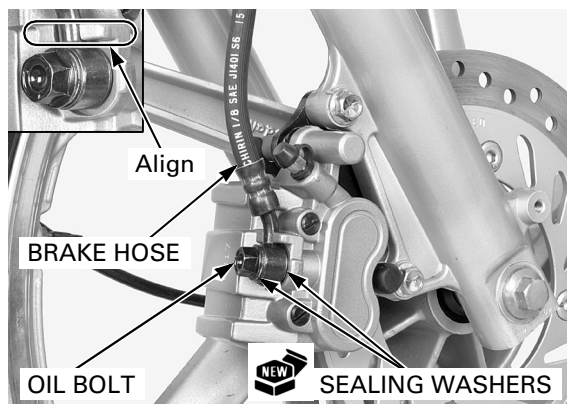
Install the brake pads (page 14-7).

Connect the brake hose to the brake caliper with the oil bolt and new sealing washers.

Set the hose eyelet joint between the stoppers and tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill the brake fluid and bleed the air from the hydraulic system (page 14-5).

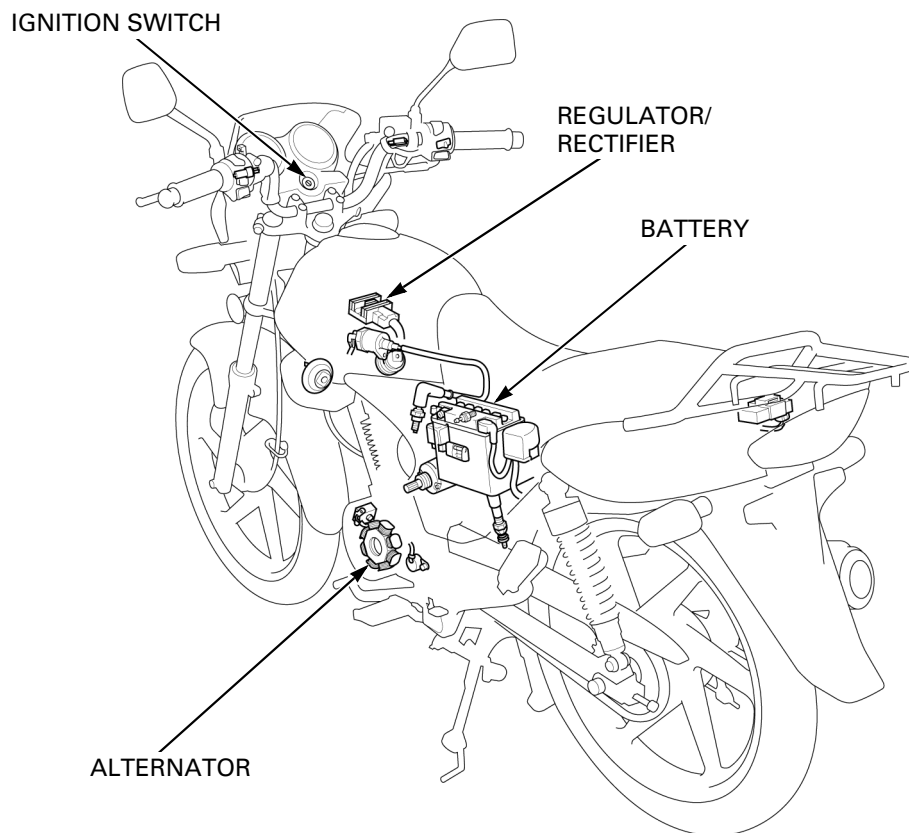


15. BATTERY/CHARGING SYSTEM

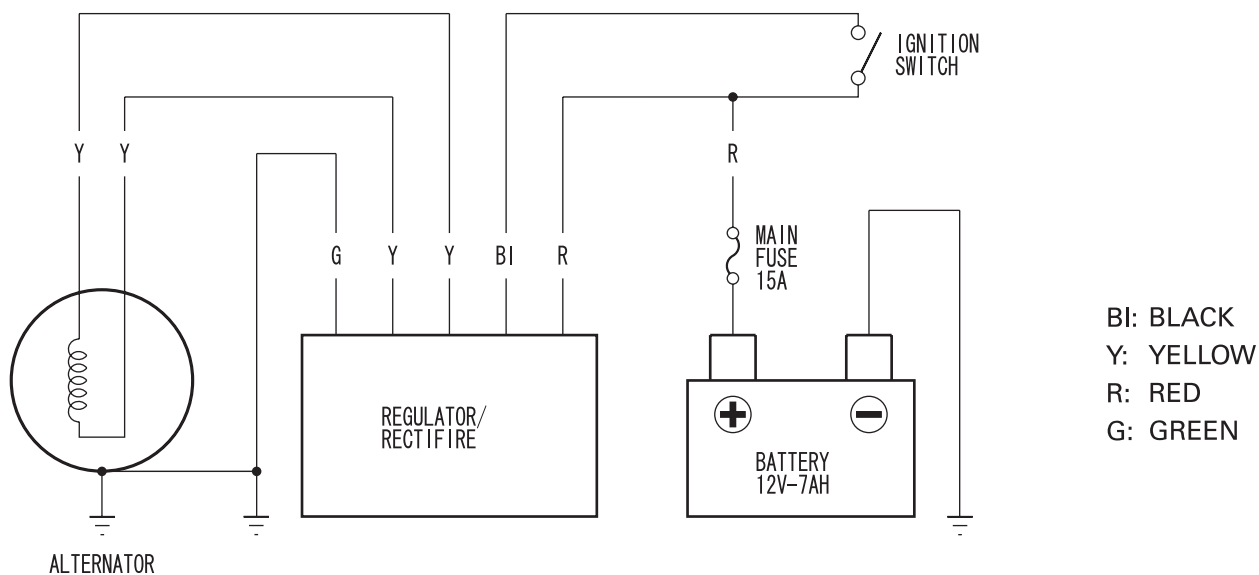
SYSTEM LOCATION.....	15-2	BATTERY	15-6
SYSTEM DIAGRAM.....	15-2	CHARGING SYSTEM INSPECTION.....	15-9
SERVICE INFORMATION	15-3	REGULATOR/RECTIFIER	15-10
TROUBLESHOOTING	15-5	ALTERNATOR CHARGING COIL	15-11

BATTERY/CHARGING SYSTEM

SYSTEM LOCATION



SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

⚠ WARNING

- The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.
- The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.
 - If electrolyte gets on your skin, flush with water.
 - If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.
- Electrolyte is poisonous.
 - If swallowed, drink large quantities of water or milk and call your local Poison Control Center or a call a physician immediately.

NOTICE

- *Always turn the ignition switch "OFF" before disconnecting any electrical component.*
- *Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is ON "ON" position and current is present.*
- If the battery tube is blocked, the battery's internal pressure will not be relieved and the breather may come off, or the battery may crack as a result.
- 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.
- Tap water will shorten the service life of the battery.
- Immediately wash off any spilled electrolyte.
- The battery can be damaged if overcharged or undercharged, or of left to discharge for long period. These same conditions contribute to shortening the "life span" of the battery. Even under normal use, the performance of the battery deteriorates after 2–3 years.
- Battery voltage may recover after battery charging, but under heavy load, battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected as the problem. Battery overcharging often results from problems in the battery itself, which may appear to be an overcharging symptom. If one of the battery cells is shorted and battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level goes down quickly.
- Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under heavy load, such as having the headlight and tail light "ON" for long periods of time without riding the motorcycle.
- The battery will self-discharge when the motorcycle is not in use. For this reason, charge the battery every 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 flow chart (page 15-5).
- For alternator service, page 10-4.

BATTERY CHARGING

For battery charging, do not exceed the charging current and time specified on the battery. Using excessive current or extending the charging time may damage the battery.

BATTERY TESTING

Refer to the battery instruction of the Operation Manual for the recommended battery tester. The recommended battery tester puts a "load" on the battery so the actual battery condition of the load can be measured.

Recommended battery tester **BM210 or BATTERY MATE or equivalent**

BATTERY/CHARGING SYSTEM

SPECIFICATIONS

ITEM			SPECIFICATION
Battery	Capacity		12 V – 7 Ah
	Current leakage		0.1 mA max.
	Specific gravity (20°C/68°F)	Fully charged	1.270 – 1.290
		Needs charging	Below 1.230
	Voltage	Fully charged	Above 12.8 V
		Needs charging	Below 12.3 V
	Charging current	Normal	0.8 A/5 – 10 h
		Quick	8 A/1 h
Alternator	Capacity		0.135 kW/5,000 min ⁻¹ (rpm)
	Charging coil resistance (20°C/68°F)		0.3 – 1.2 Ω

TORQUE VALUE

Battery holder bolt 1.8 N·m (0.2 kgf·m, 1.3 lbf·ft)

TROUBLESHOOTING

BATTERY IS DAMAGED OR WEAK

1. BATTERY TEST

Remove the battery (page 15-6).

Check the battery condition using the recommended battery tester.

RECOMMENDED BATTERY TESTER: BM210 or BATTERY MATE or equivalent

Is the battery in good condition?

NO – Faulty battery.

YES – GO TO STEP 2.

2. CURRENT LEAKAGE TEST

Install the battery (page 15-6).

Check the battery current leakage test (Leak test; page 15-9).

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 stop switch

4. CHARGING VOLTAGE INSPECTION

Measure and record the battery voltage using a digital multimeter.

Start the engine.

Measure the charging voltage (page 15-9).

Compare the measurements to the results 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 5.

5. ALTERNATOR CHARGING COIL INSPECTION

Check the alternator charging coil (page 15-11).

Is the alternator charging coil resistance within 0.3 – 1.2 Ω (20°C/68°F)?

NO – Faulty charging coil.

YES – GO TO STEP 6.

6. REGULATOR/RECTIFIER SYSTEM INSPECTION

Check the voltage and resistance at the regulator/rectifier connector (page 15-10).

Are the measurements 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 or installing the battery.

Remove the left side cover (page 2-3).

Remove the bolt and disconnect the battery negative (-) cable first from the battery.

Remove the bolt and disconnect the battery positive (+) cable from the battery.

Disconnect the battery tube.

Remove the bolts, battery holder and battery.

Install the battery in the reverse order of removal.

TORQUE:

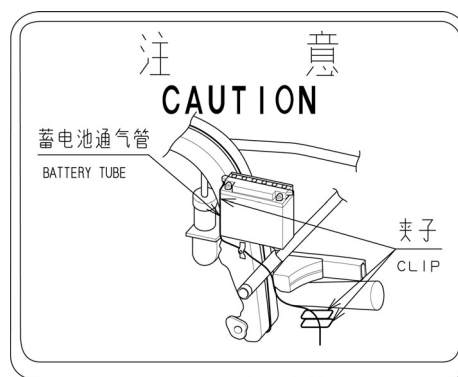
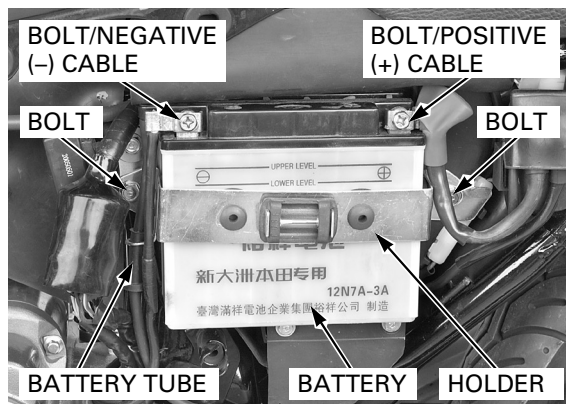
Battery holder bolt:

1.8 N·m (0.2 kgf·m, 1.3 lbf·ft)

NOTE:

- Route the battery tube properly as shown in the battery level.
- Make sure that the battery tube is correctly positioned, and not kinked, trapped or bent in such a way as to obstruct the passage of the air.

Install the left side cover (page 2-3).



BATTERY INSPECTION

Remove the battery (page 15-6).

Check for cracked or broken case or plates.

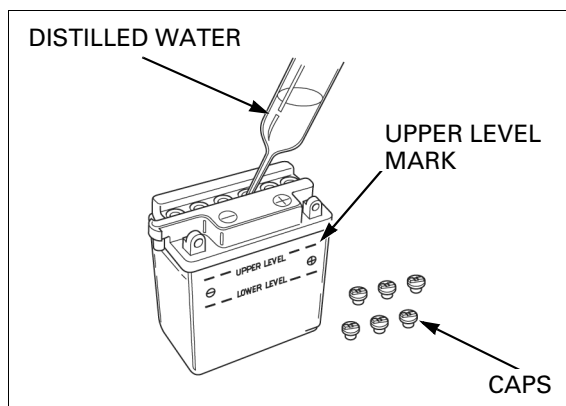
Check the plates for sulfation.

Replace the battery if damaged or sulfated.

Check each cell's electrolyte level by the UPPER and LOWER level lines inscribed on the side of battery. If levels are approaching the LOWER level line, remove the cell caps and add distilled water to bring the level to the upper level mark.

NOTE:

- 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 troubleshoot charging system problems.



SPECIFIC GRAVITY

NOTE:

- The battery electrolyte contains sulfuric acid. Avoid contact with skin, eyes or clothing.

The specific gravity must be checked with a hydrometer.

Remove the cell caps.

Test each cell by drawing electrolyte into the hydrometer.

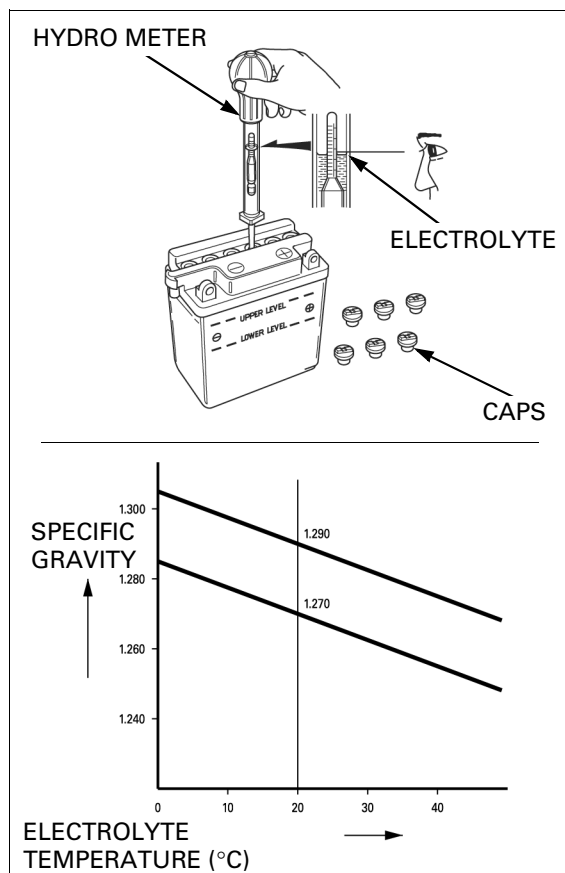
SPECIFIC GRAVITY:

Fully charged: 1.270 – 1.290 (20°C/68°F)

Needs charging: Below 1.230 (20°C/68°F)

NOTE:

- 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

Remove the left side cover (page 2-3).

Measure the battery voltage using a digital multimeter.

VOLTAGE:

Fully charged: Above 12.8 V

Needs charging: Below 12.3 V

If the battery voltage is below 12.3 V, charge the battery (page 15-8).



BATTERY/CHARGING SYSTEM

BATTERY CHARGING

NOTE:

- Keep flames and sparks away from a charging battery.

Remove the battery (page 15-6).

Before charging a battery, remove the cap from each cell.

Turn power ON/OFF at the charger, not at the battery terminal to prevent sparks.

Remove the cell caps.

Fill the cells with distilled water to the upper level line, if necessary.

Connect the charger positive (+) cable to the battery positive (+) terminal.

Connect the charger negative (-) cable to the battery negative (-) terminal.

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.
- Discontinue charging if the electrolyte temperature exceeds 45°C (113°F).

CHARGING CURRENT/TIME:

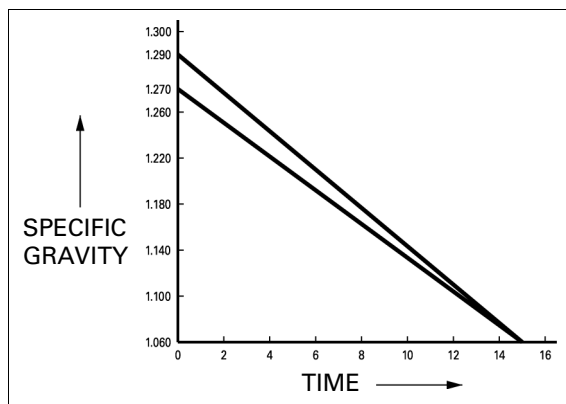
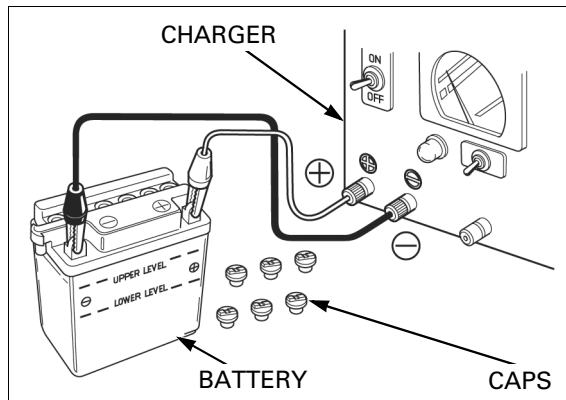
Normal: 0.8 A/5 – 10 h

Quick: 8 A/1 h

After charging, recheck the battery gravity.

Measure the specific gravity of each cell with hydrometer.

Fully charged: 1.270 – 1.290 (20°C/68°F)



CHARGING SYSTEM INSPECTION

CURRENT LEAKAGE INSPECTION

Remove the left side cover (page 2-3).

Turn the ignition switch "⌂" and disconnect the battery negative (–) cable from the battery.

Connect the ammeter (+) probe to the battery negative (–) cable and the ammeter (–) probe to the battery negative (–) terminal.

With the ignition switch "⌂", check for current leakage.

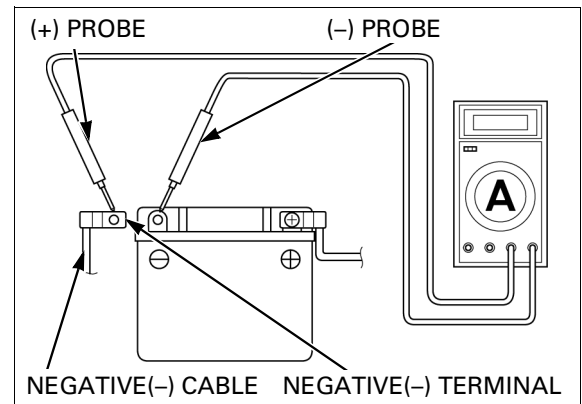
NOTE:

- 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 "O". A sudden surge of current may blow the fuse in the tester.

CURRENT LEAKAGE: 0.1 mA max.

If the current leakage exceeds the specified value, a shorted circuit is likely.

Locate the short by disconnecting connections one by one and measuring the current.



CHARGING VOLTAGE INSPECTION

Before performing this test, be sure that the battery is fully charged and that the specific gravity is above 1.270.

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.

Be careful not to short any tester probes.

Remove the left side cover (page 2-3).

Warm up the engine to normal operating temperature.

Stop the engine, and connect the multimeter as shown.

NOTE:

- To prevent a short, be absolutely certain which are the positive and negative terminals or cable.

Restart the engine.

With the headlight on Hi beam, measure the voltage on the multimeter when the engine runs at 5,000 min⁻¹ (rpm).

Standard:

Measured BV < Measured CV < 15.5 V

- BV = Battery voltage
- CV = Charging voltage



REGULATOR/RECTIFIER

SYSTEM INSPECTION

Remove the fuel tank (page 2-4).
Pull back the dust cover and disconnect the regulator/rectifier 6P (Black) connector, and check it for loose contact or corroded terminals.

If the charging voltage reading (page 15-9) is out of the specification, turn the ignition switch "⊗", then check the voltage and resistance at the wire harness side of the regulator/rectifier 6P (Black) connector.

Item	Terminal	Specification
Battery charging line	Red (+) and Green (-)	Battery voltage should exist
Charging coil line	Yellow and Yellow	0.3 – 1.2 Ω at (20°C/68°F)
Ground line	Green and ground	Continuity should exist

Connect the regulator/rectifier 6P (Black) connector and turn the ignition switch "⊘".

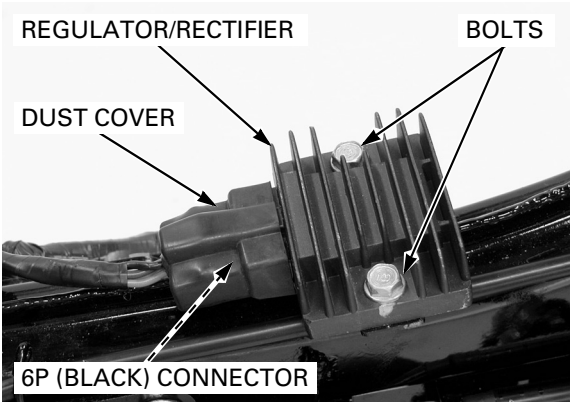
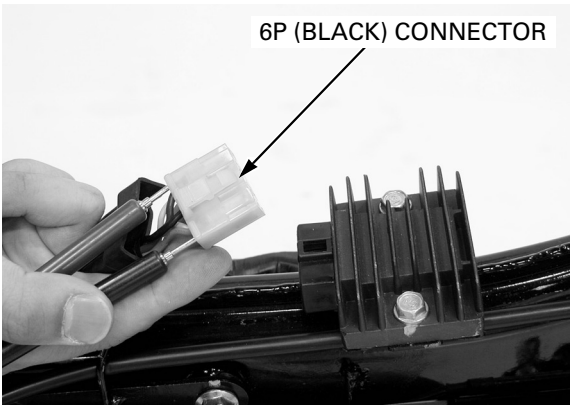
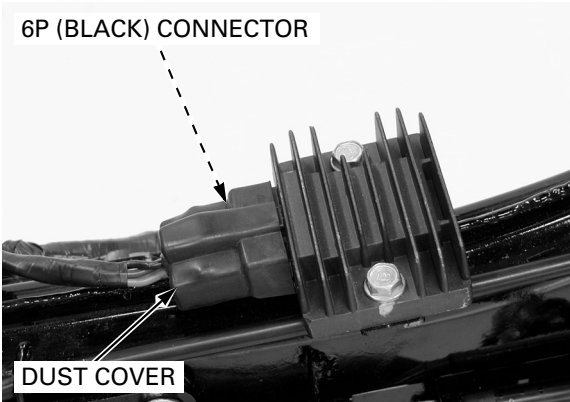
Measure the voltage at the regulator/rectifier 6P (Black) connector from the wire harness side.

Item	Terminal	Specification
Voltage detection line	Black (+) and Green (-)	Battery voltage should exist

If all components of the charging system are normal and there are no loose connections at the regulator/rectifier 6P (Black) connector, replace the regulator/rectifier unit.

REMOVAL/INSTALLATION

Remove the fuel tank (page 2-4).
Pull back the dust cover and disconnect the regulator/rectifier 6P (Black) connector.
Remove the mounting bolts and regulator/rectifier.
Installation is in the reverse order of removal.



ALTERNATOR CHARGING COIL

INSPECTION

It is not necessary to remove the stator coil to perform this test.

Remove the following:

- Left side cover (page 2-3)
- Turn signal relay (page 18-18)

Disconnect the alternator 3P(Natural) connector.

Check the resistance between the following terminals of the alternator side 3P (Natural) connector.

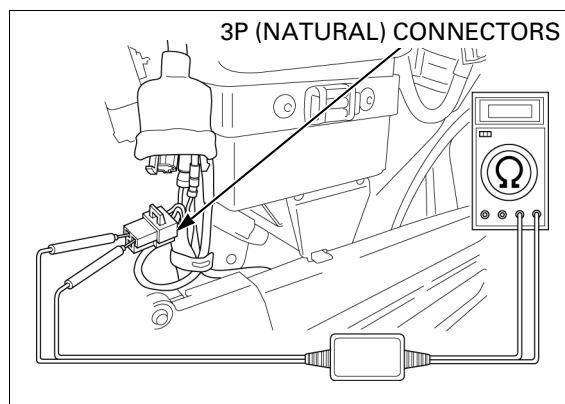
CONNECTION: Yellow – Yellow (Charging coil)

STANDARD: 0.3 – 1.2 Ω (20°C/68°F)

Check for continuity between each terminals and ground.

There should be no continuity.

If reading is far beyond the standard, or if any wire has continuity to ground, replace the alternator stator (page 10-5).



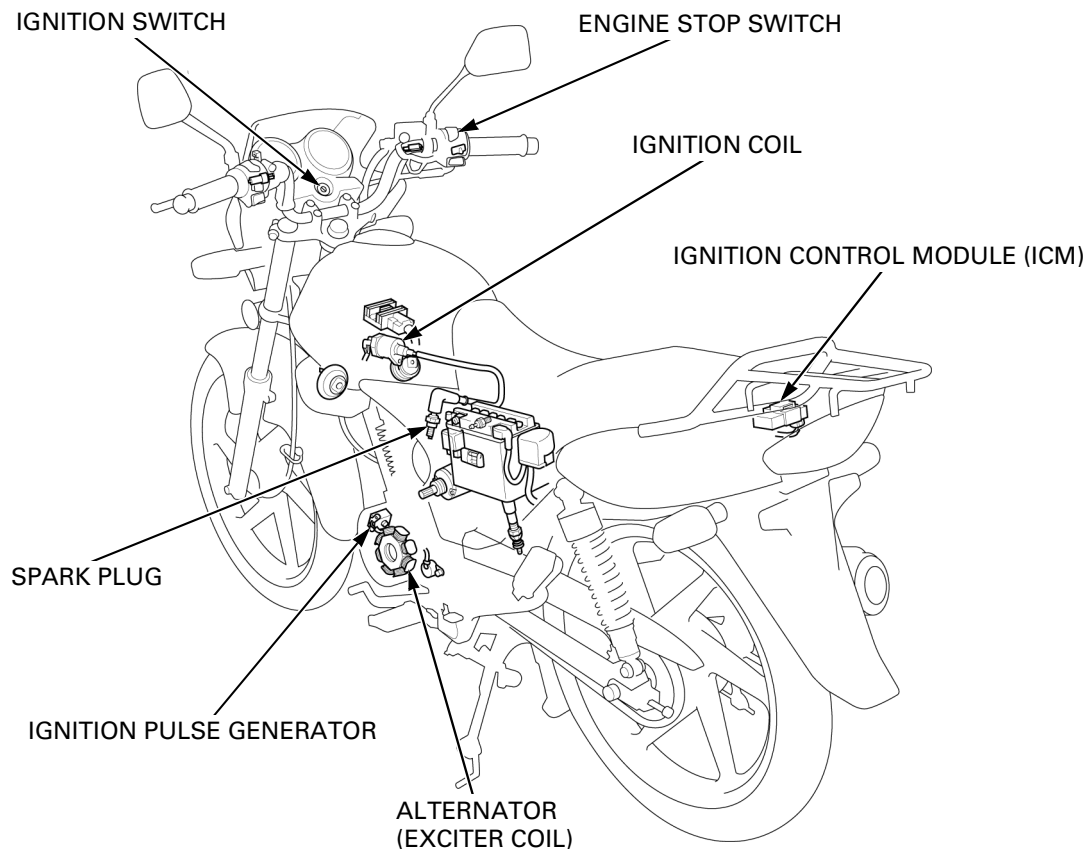
MEMO

16. IGNITION SYSTEM

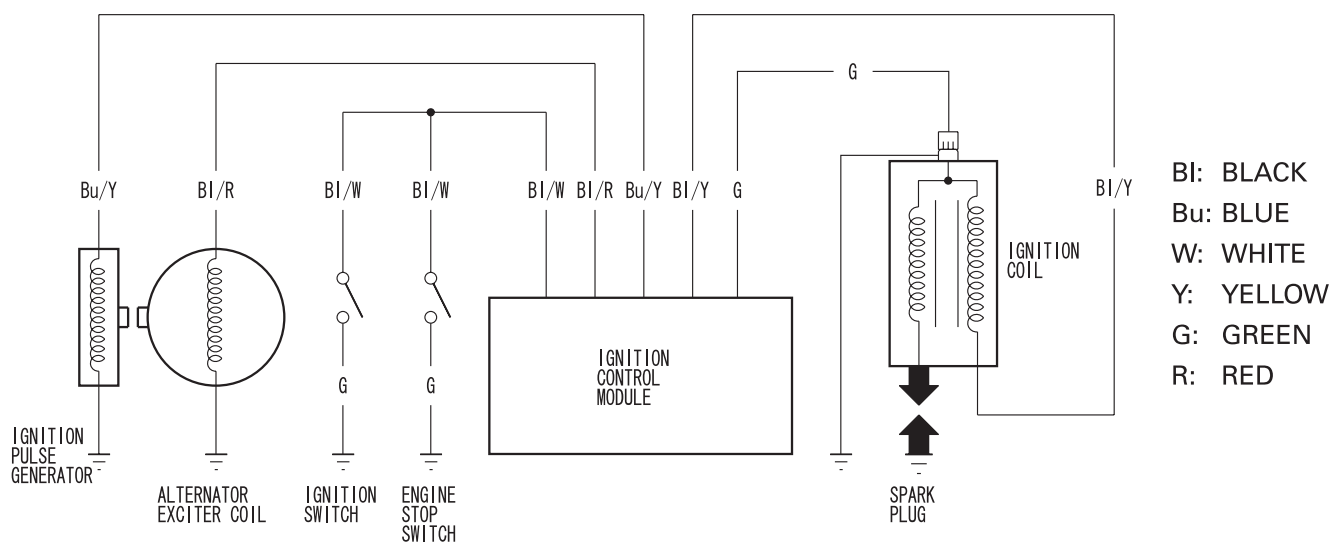
SYSTEM LOCATION.....	16-2	IGNITION SYSTEM INSPECTION.....	16-5
SYSTEM DIAGRAM.....	16-2	IGNITION TIMING	16-8
SERVICE INFORMATION	16-3	IGNITION COIL	16-9
TROUBLESHOOTING	16-4	ICM (IGNITION CONTROL MODULE)	16-9

IGNITION SYSTEM

SYSTEM LOCATION



SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

NOTICE

- The Ignition Control Module (ICM) may be damaged if dropped. Also if the connector is disconnected when current is flowing, the excessive voltage may damage the module. Always turn the ignition switch "OFF" before servicing.
- Use spark plug of 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 sequence on page 16-4.
- The ignition timing cannot be adjusted since the Ignition Control Module (ICM) is factory preset.
- A faulty ignition system is often related to poor connections. Check those connections before proceeding.

SPECIFICATION

ITEM		SPECIFICATIONS
Spark plug	Standard	DPR8EA-9 (NGK), X24EPR-U9 (DENSO)
	For extended high speed riding	DPR9EA-9 (NGK), X27EPR-U9 (DENSO)
	For cold climate	DPR7EA-9 (NGK), X22EPR-U9 (DENSO)
Spark plug gap		0.80 – 0.90 mm (0.031 – 0.035 in)
Ignition coil primary peak voltage		100 V minimum
Exciter coil peak voltage		100 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Ignition timing ("F" mark)		15° BTDC at idle

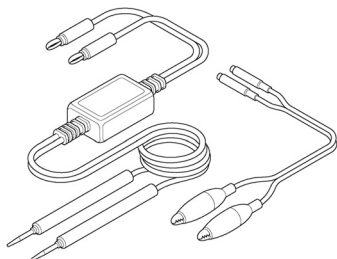
TORQUE VALUE

Timing hole cap

6 N·m (0.6 kgf·m, 4.4 lbf·ft)

TOOL

Peak voltage adaptor
07HGJ-0020100



with commercially available digital
multimeter (impedance 10 M Ω /DCV
minimum)
or Imrie diagnostic tester (model
625)

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.	1. The multimeter impedance is too low; below 10 M Ω /DCV. 2. Cranking speed is too slow. 3. The sampling time of the tester and measured pulse were not synchronized. (System is normal if measured voltage is over the standard voltage at least once.) 4. Poorly connected connectors or an open circuit in the ignition system. 5. Faulty exciter coil. (Measure the peak voltage.) 6. Faulty ignition coil. 7. Faulty ignition control module (ICM) (in case when above No.1 – 6 are normal).
	No peak voltage.	1. Incorrect peak voltage adapter connections. 2. Short circuit in the engine stop switch or ignition switch Black/white wire. 3. Faulty ignition switch or engine stop switch. 4. Loose or poorly connected ICM connectors. 5. Open circuit or poor connection in the green wire of the ICM. 6. Faulty peak voltage adapter. 7. Faulty exciter coil. (Measure the peak voltage.) 8. Faulty ignition pulse generator. (Measure the peak voltage.) 9. Faulty ICM (in case when above No.1 – 8 are normal).
	Peak voltage is normal, but no spark at the plug.	1. Faulty spark plug or leaking ignition coil secondary current. 2. Faulty ignition coil.
Exciter coil	Low peak voltage.	1. The multimeter impedance is too low; below 10 M Ω /DCV. 2. Cranking speed is too slow. 3. The sampling time of the tester and measured pulse were not synchronized. (System is normal if measured voltage is over the standard voltage at least once.) 4. Faulty exciter coil (in case when above No.1 – 3 are normal).
	No peak voltage.	1. Faulty peak voltage adapter. 2. Faulty exciter coil.
Ignition pulse generator	Low peak voltage.	1. The multimeter impedance is too low; below 10 M Ω /DCV. 2. Cranking speed is too slow. 3. The sampling time of the tester and measured pulse were not synchronized. (System is normal if measured voltage is over the standard voltage at least once.) 4. Faulty ignition pulse generator (in case when above No.1 – 3 are normal).
	No peak voltage.	1. Faulty peak voltage adapter. 2. Faulty ignition pulse generator.

IGNITION SYSTEM INSPECTION

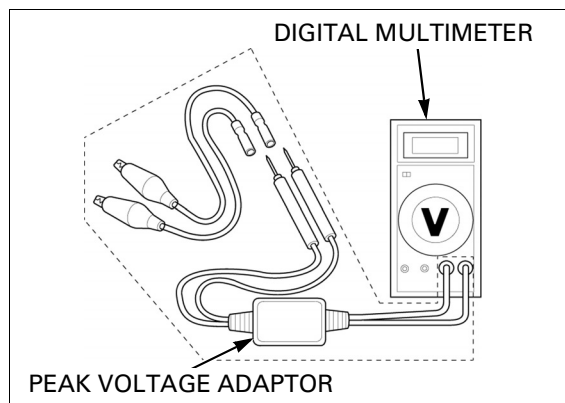
NOTE:

- If there is no spark at the plug, check all connections for loose or poor contact before measuring the peak voltage.
- Use a commercially available digital multimeter with an impedance of 10 M Ω /DCV minimum.
- The display value differs depending upon the internal impedance of the multimeter.
- If using the 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.

TOOL:

Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100
with commercially available digital multimeter
(impedance 10 M Ω /DCV minimum)

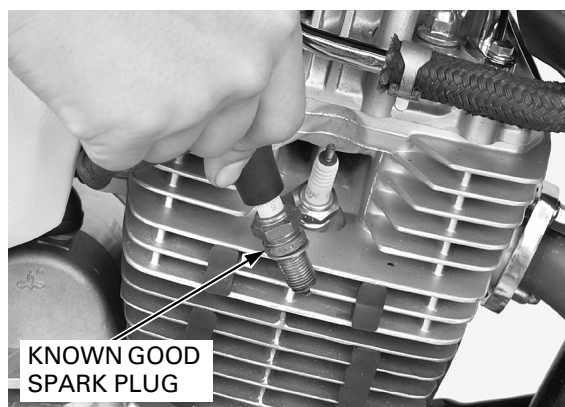


IGNITION COIL PRIMARY PEAK VOLTAGE INSPECTION

NOTE:

- Check all system connections before this inspection. Poor connected connectors can cause incorrect readings.
- Check the cylinder compression and check that the spark plug is installed correctly in the cylinder head.

Disconnect the spark plug cap from the spark plug. Connect a known good spark plug to the spark plug cap and ground it to the cylinder head as done in a spark test.



IGNITION SYSTEM

Remove the fuel tank (page 2-4).

With the ignition coil primary wire connected, connect the peak voltage tester or adaptor probes to the ignition coil primary wire terminal (Black/yellow) and body ground.

TOOL:

**Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100
with commercially available digital multimeter
(impedance 10 M Ω /DCV minimum)**

CONNECTION:

Black/Yellow wire terminal (-) – Body ground (+)

Shift the transmission into neutral.

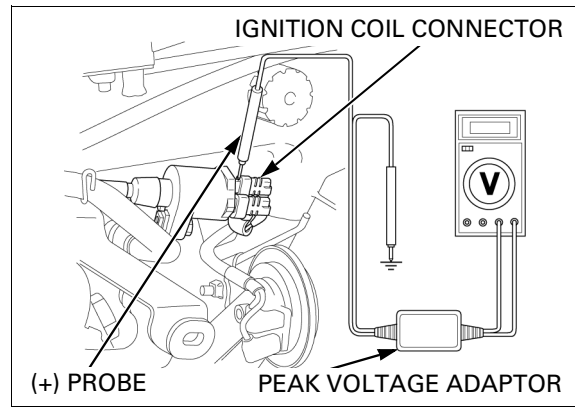
Turn the engine stop switch to "O" and ignition switch to "O".

Crank the engine with the starter motor and read ignition coil primary peak voltage.

PEAK VOLTAGE: 100 V minimum

If the peak voltage is lower than the standard value, follow the checks described in the troubleshooting chart (page 16-4).

If the peak voltage is normal, follow the checks described in the troubleshooting chart (page 16-4).



*Avoid touching the
spark plug and/or
tester probes to
prevent electric
shock.*

EXCITER COIL PEAK VOLTAGE

- Check the cylinder compression and check that the spark plug is installed correctly in the cylinder head.

Remove the rear cowl (page 2-6).

Disconnect the ICM 3P (Black) connector.

Connect the peak voltage tester or adaptor probes to the exciter coil wire terminal at the wire harness side of the ICM 3P (Black) connector and body ground.

TOOL:

**Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100
with commercially available digital multimeter
(impedance 10 M Ω /DCV minimum)**

CONNECTION:

Black/red wire terminal (+) – Body ground (-)

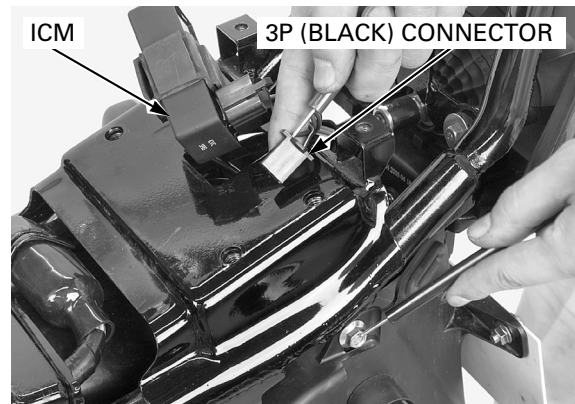
Shift the transmission into neutral.

Turn the engine stop switch to "O" and ignition switch to "O".

Crank the engine with the starter motor and read exciter coil peak voltage.

PEAK VOLTAGE: 100 V minimum

If the peak voltage measured at the ICM 3P (Black) connector is abnormal, measure the peak voltage at the exciter coil wire connector.



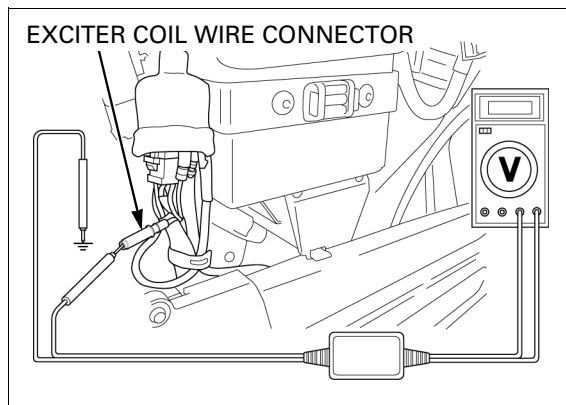
Remove the following:

- Left side cover (page 2-3)
- Turn signal relay (page 18-18)

Disconnect the exciter coil Black/red wire connector and connect the tester probes to the exciter coil side wire connector terminal and body ground.

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 exciter coil is normal, the wire harness has an open or short circuit, or loose connection.
- If both peak voltages are abnormal, follow the checks described in the troubleshooting chart (page 16-4).



IGNITION PULSE GENERATOR PEAK VOLTAGE

- Check the cylinder compression and check that the spark plug is installed correctly in the cylinder head.

Remove the rear cowl (page 2-6).

Disconnect the ICM 4P (Black) connector. Connect the peak voltage tester or adaptor probes to the ignition pulse generator Blue/yellow wire terminal at the wire harness of the ICM 4P (Black) connector side and body ground.

TOOL:

Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100
with commercially available digital multimeter
(impedance 10 M Ω /DCV minimum)

CONNECTION:

Blue/Yellow wire terminal (+) – Body ground (–)

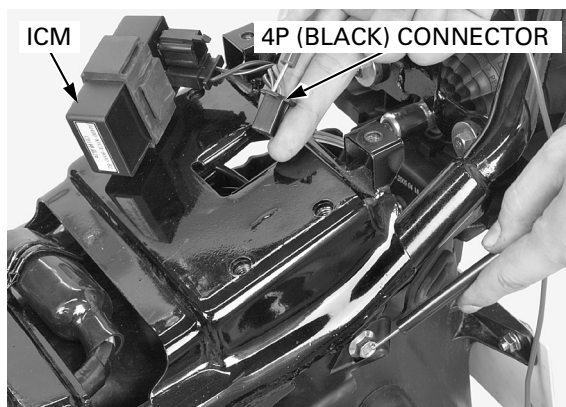
Shift the transmission into neutral.

Turn the engine stop switch to "O" and ignition switch to "O".

Crank the engine with the starter motor and read the ignition pulse generator peak voltage.

PEAK VOLTAGE: 0.7 V minimum

If the peak voltage measured at the ICM 4P (Black) connector is abnormal, measure the peak voltage at the ignition pulse generator wire connector.



IGNITION SYSTEM

Remove the following:

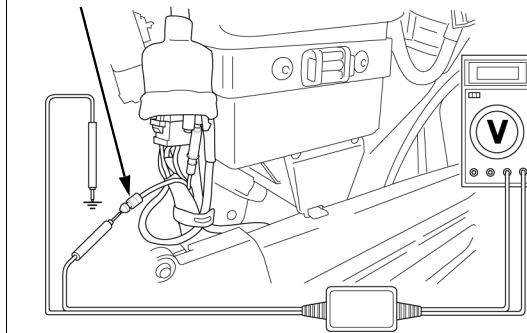
- Left side cover (page 2-3)
- Turn signal relay (page 18-18)

Disconnect the ignition pulse generator wire (Blue/yellow) connector and connect the tester probes to the Ignition pulse generator side Blue/yellow wire connector terminal and body ground.

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 are abnormal, follow the checks described in the troubleshooting chart (page 16-4).

IGNITION PULSE GENERATOR
WIRE CONNECTOR



IGNITION TIMING

Warm up the engine.

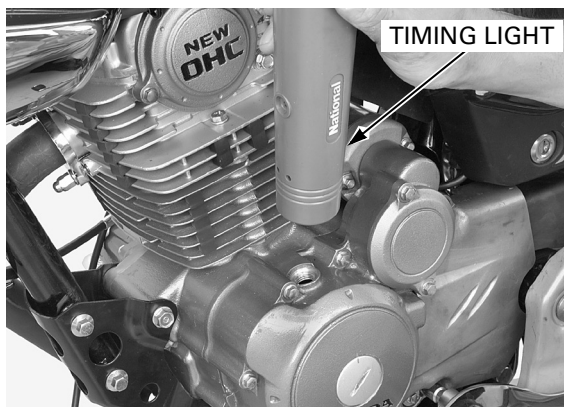
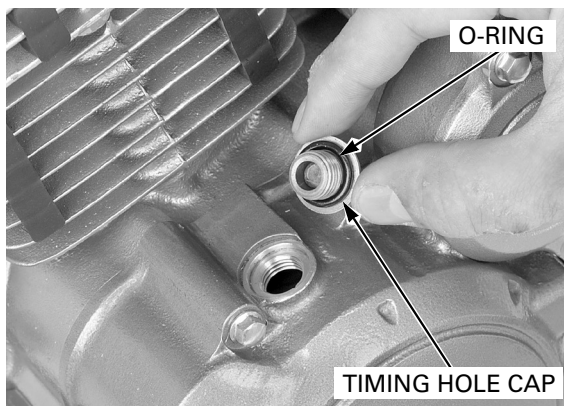
Stop the engine and remove the timing hole cap and O-ring.

Read the instructions for timing light operation.

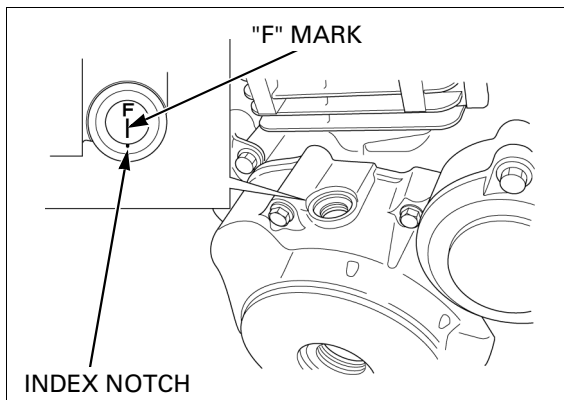
Connect a timing light to the spark plug wire.

Start the engine and let it idle.

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



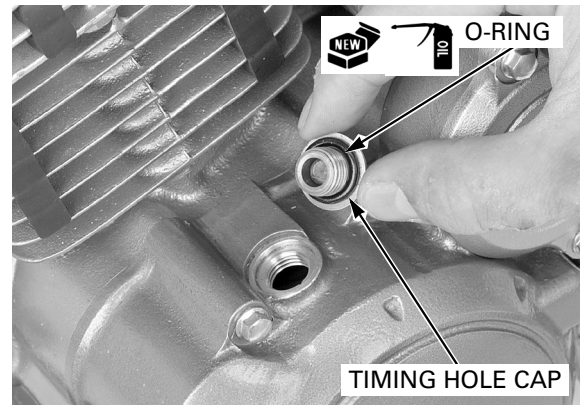
The ignition timing is correct if the "F" mark on the flywheel aligns with the index notch on the left crankcase cover.



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

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

TORQUE: 6 N·m (0.6 kgf·m, 4.4 lbf·ft)



IGNITION COIL

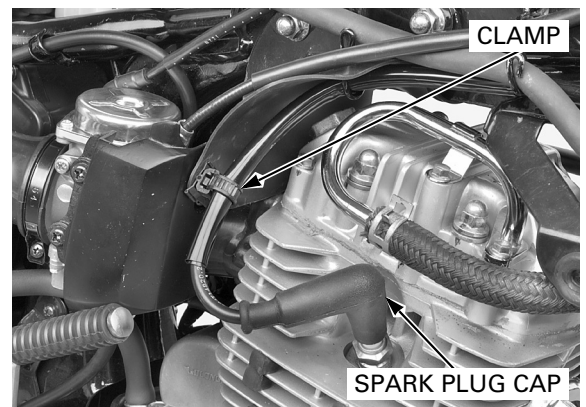
REMOVAL/INSTALLATION

Remove the following:

- Fuel tank (page 2-4)
- Right horn cover (page 2-9)

Disconnect the spark plug cap from the spark plug.

Release the spark plug wire clamp from the carburetor guard.

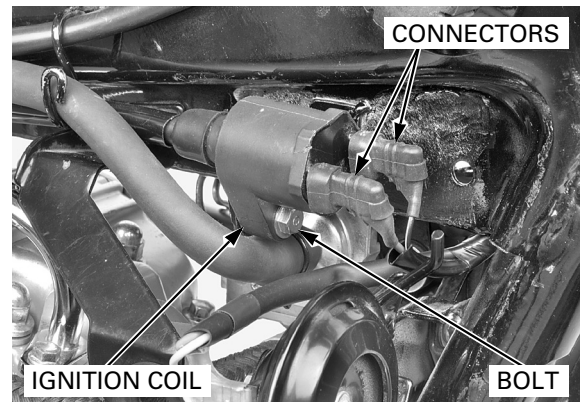


Disconnect the wire connectors from the ignition coil.

Remove the bolt and ignition coil.

Route the wires properly (page 1-16).

Installation is in the reverse order of removal.



ICM (IGNITION CONTROL MODULE)

REMOVAL/INSTALLATION

Remove the rear cowl (page 2-6).

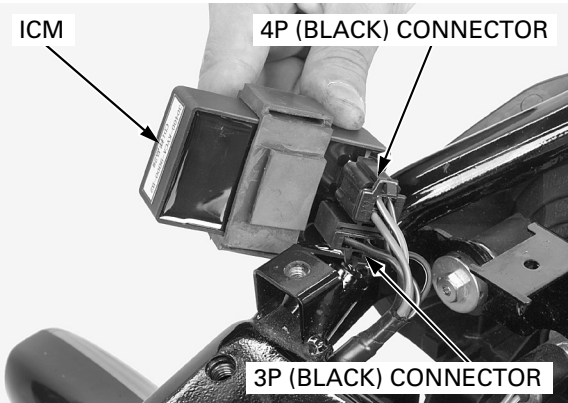
Remove the ICM from the stay of the rear frame.



IGNITION SYSTEM

Disconnect the ICM 4P (Black) and 3P (Black) connectors.

Installation is in the reverse order of removal.



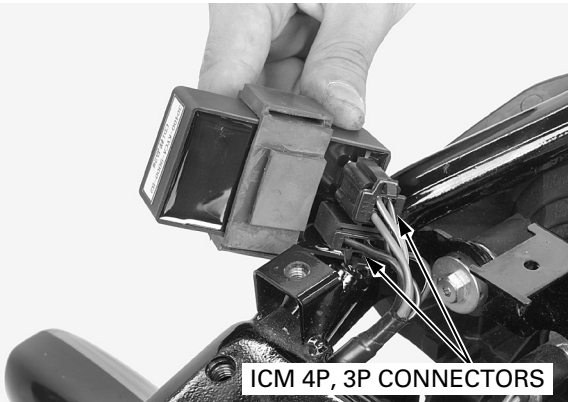
SYSTEM INSPECTION

Remove the ICM from the stay of the rear frame (page 16-9).

Disconnect the ICM 4P (Black) and 3P (Black) connectors, and check for loose contact or corroded terminals.

If the ignition system inspection (page 16-5) is normal, but no spark at plug, turn the ignition switch "⊗" and engine stop switch "⊗", then check the resistance at the wire harness side of the ICM connector.

Item	Terminal	Specification
Ignition switch and engine stop switch line	Black/White and Green	Continuity should exist
Ground line	Green and ground	Continuity should exist



Turn the ignition switch "○" and engine stop switch "○".

Check for continuity at the ICM connector from the wire harness side.

Item	Terminal	Specification
Ignition switch and engine stop switch line	Black/White and Green	No continuity

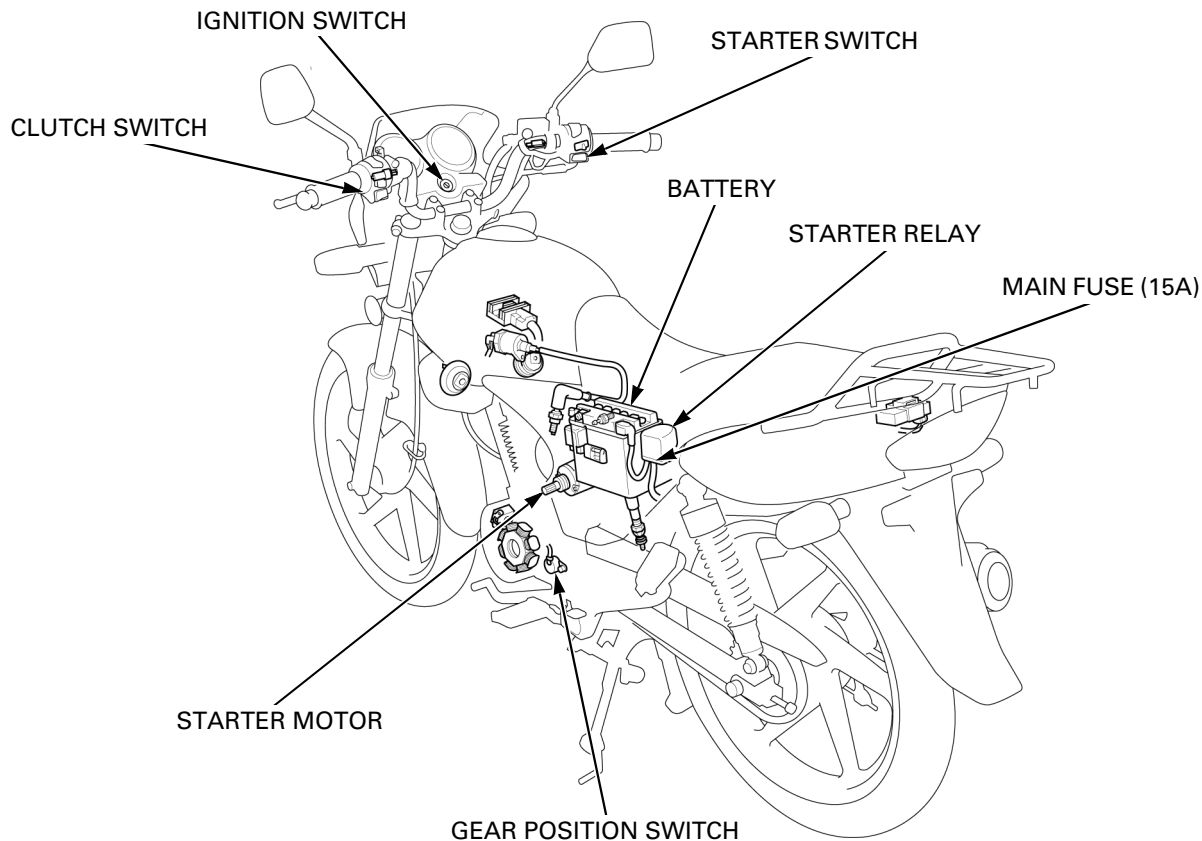
If all components of the ignition system are normal and there are no loose connections at the ICM connectors, replace the ICM with a new one and recheck.

17. ELECTRIC STARTER

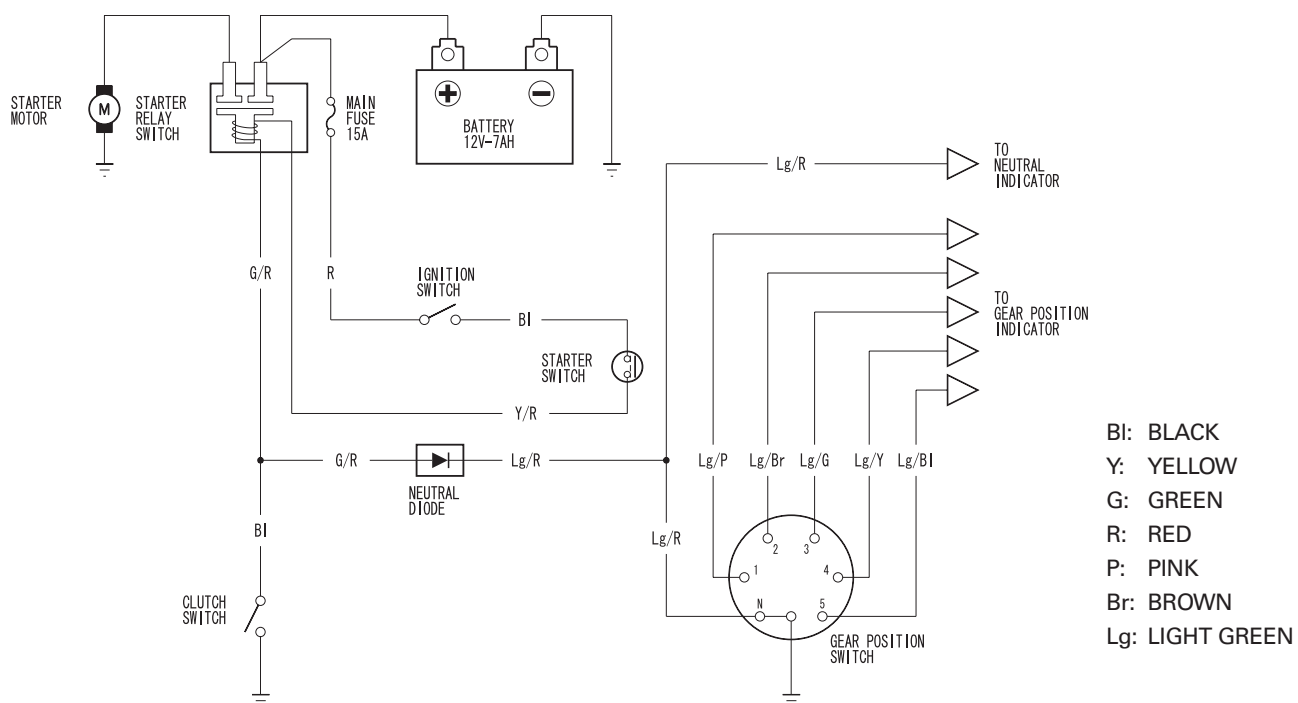
SYSTEM LOCATION.....	17-2	STARTER MOTOR.....	17-6
SYSTEM DIAGRAM.....	17-2	STARTER RELAY SWITCH.....	17-13
SERVICE INFORMATION	17-3	NEUTRAL DIODE.....	17-14
TROUBLESHOOTING	17-4		

ELECTRIC STARTER

SYSTEM LOCATION



SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

NOTICE

If the current is kept flowing through the starter motor to turn it while the engine is not cranking over, the starter motor may be damaged.

- Always turn the ignition switch "OFF" before servicing the starter motor. The motor could suddenly start, causing serious injury.
- The starter motor can be serviced with the engine in the frame.
- When checking the starter system, always follow the steps in the troubleshooting (page 17-4).
- A weak battery may be unable to turn the starter motor quick enough, or supply adequate ignition current.
- Refer to the following components informations:
 - Starter clutch (page 10-8)
 - Ignition switch (page 18-10)
 - Starter switch (page 18-10)
 - Gear position switch (page 18-14)
 - Clutch switch (page 18-13)

SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	11 (0.43)	7 (0.28)

TORQUE VALUES

Starter motor terminal nut	10 N·m (1.0 kgf·m, 7 lbf·ft)
Starter motor case bolt	5 N·m (0.5 kgf·m, 3.7 lbf·ft)

TROUBLESHOOTING

NOTE:

- The starter motor should operate when the transmission is in neutral and when the clutch lever is squeezed.

Starter motor does not turn

1. Fuse Inspection

Check for blown fuse.

Is the fuse blown?

YES – Replace the fuse.

NO – GO TO STEP 2.

2. Battery Inspection

Make sure the battery is fully charged and in good condition (page 15-6).

Is the battery in good condition?

YES – GO TO STEP 3.

NO – Charge or replace the battery (page 15-6).

3. Battery Cable Inspection

Check the battery cables for loose or poorly connected terminal, and for an open circuit.

Is the terminal loose or poorly connected?

YES – • Loose or poorly connected battery cables.
• Open circuit in the battery cable.

NO – GO TO STEP 4.

4. Starter Motor Cable Inspection

Check the starter motor cable for loose or poorly connected terminal, and for an open circuit.

Is the terminal loose or poorly connected?

YES – • Loose or poorly connected starter motor cable.
• Open circuit in the starter motor cable.

NO – GO TO STEP 5.

5. Starter Relay Switch Operation Inspection

Check the operation of the starter relay switch (page 17-13).

Does the starter relay switch click?

YES – GO TO STEP 6.

NO – GO TO STEP 7.

6. Starter Motor Inspection

Connect the starter motor terminal to the battery positive (+) terminal directly. (A large amount of current flows, so do not use a thin wire.)

Does the starter motor turn?

YES – Faulty starter relay switch.

NO – Faulty starter motor.

7. Relay Coil Ground Line Inspection

Check the ground line of the starter relay switch (page 17-13).

Is the ground line normal?

YES – GO TO STEP 8.

NO – • Faulty gear position switch (page 18-14).
• Faulty neutral diode (page 17-14).
• Faulty clutch switch (page 18-13).
• Loose or poor contact of the related connector terminal.
• Open circuit in the wire harness.

8. Relay Coil Power Input Line Inspection

Check the power input line of the starter relay switch (page 17-13).

Is the power input line normal?

YES – GO TO STEP 9.

NO –

- Faulty ignition switch (page 18-10).
- Faulty starter switch (page 18-10).
- Loose or poor contact of the related connector terminal.
- Open circuit in the wire harness.

9. Starter Relay Switch Inspection

Check the function of the starter relay switch (page 17-13).

Does the starter relay switch function properly?

NO – Faulty starter relay switch.

YES – Loose or poor contact of the starter relay switch connector.

Starter motor turns, but the engine turns slowly

- Low battery voltage
- Poorly connected battery cable
- Poorly connected starter motor cable
- Faulty starter motor
- Poorly connected ground cable terminal

Starter motor turns, but engine does not turn

- Starter motor is running backwards
 - Case assembled improperly
 - Terminals connected improperly
- Faulty starter clutch
- Damaged or faulty starter gear train

Starter relay switch clicks, but engine does not turn

- Crankshaft does not turn due to engine problems

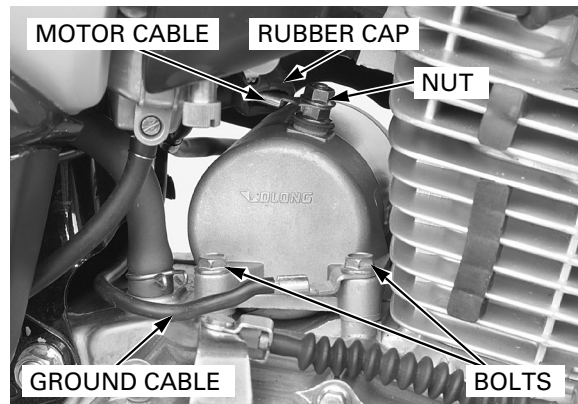
STARTER MOTOR

REMOVAL

Remove the negative cable from the battery.

Slide the rubber cap off the starter motor terminal, and remove the starter motor terminal nut and starter motor cable.

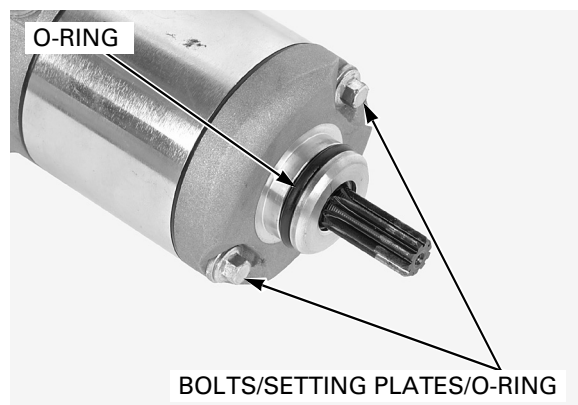
Remove the mounting bolts, ground cable and starter motor from the crankcase.



DISASSEMBLY/INSPECTION

Remove the O-ring from the starter motor.

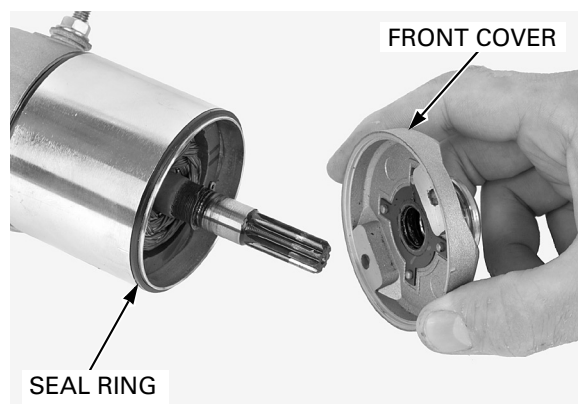
Remove the starter motor case bolts, setting plates and O-rings.



If the shim is installed, then record the location and number of it.

Remove the following:

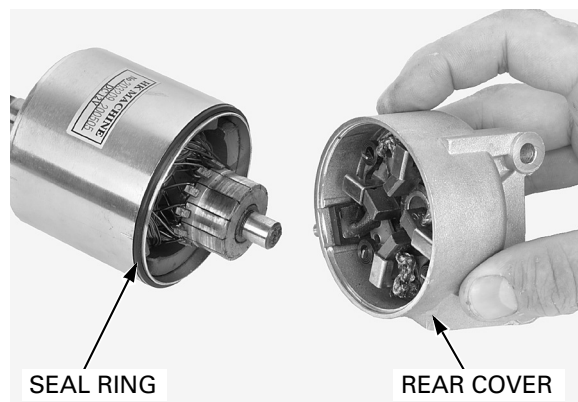
- Front cover
- Seal ring



If the shim is installed, then record the location and number of it.

Remove the following:

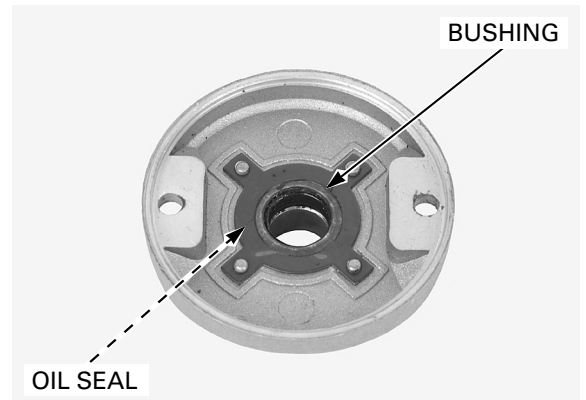
- Rear cover
- Seal ring



Remove the armature from the starter motor case.

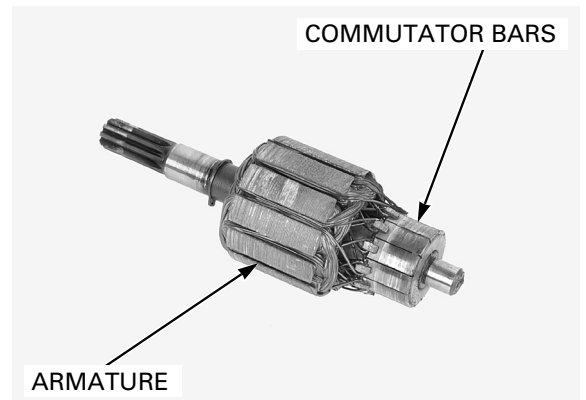


Check the oil seal and bushing in the front cover for deterioration, wear or damage.



Do not use emery or sand paper on the commutator.

Check the commutator bars of the armature for discoloration.



Check for continuity between pairs of commutator bars.
There should be continuity.

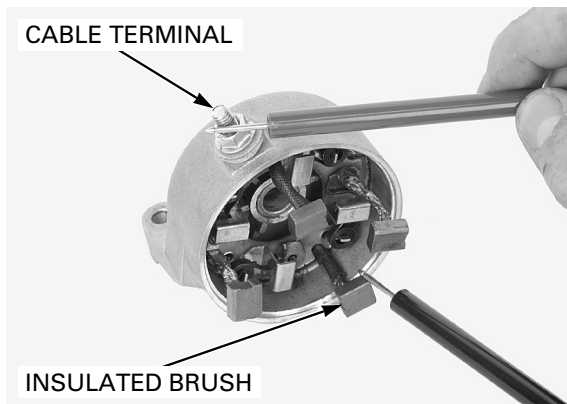


ELECTRIC STARTER

Check for continuity between each commutator bar and the armature shaft.
There should be no continuity.

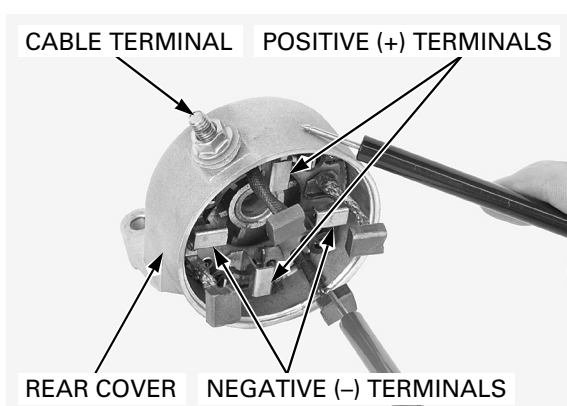


Check for continuity between the insulated brush and cable terminal as shown.
There should be continuity.



Check for continuity between the insulated brush and rear cover as shown.
There should be no continuity.

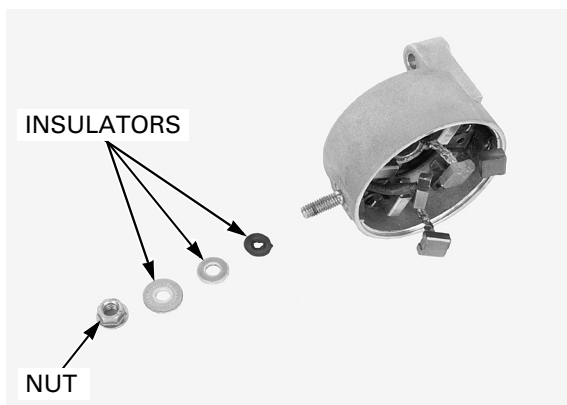
Check for continuity between the positive (+) and negative (-) terminals of the brush holder.
There should be no continuity.



*Record the location
and number of insu-
lators.*

Remove the following:

- Nut
- Insulators



Remove the following:

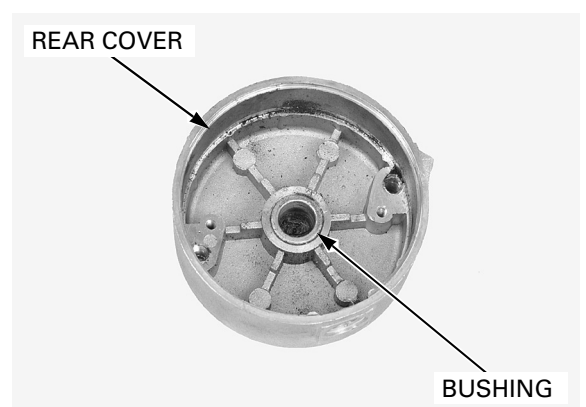
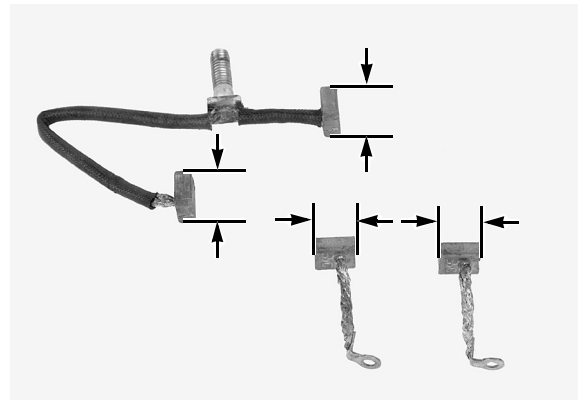
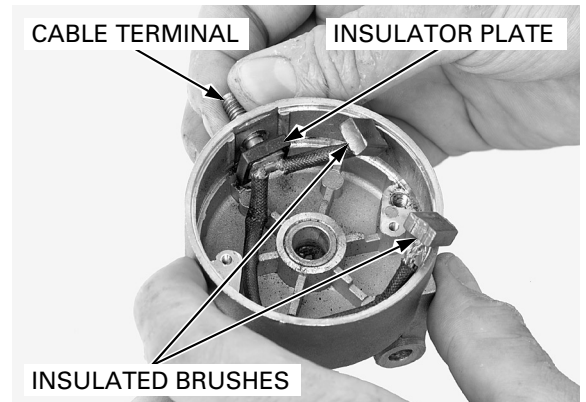
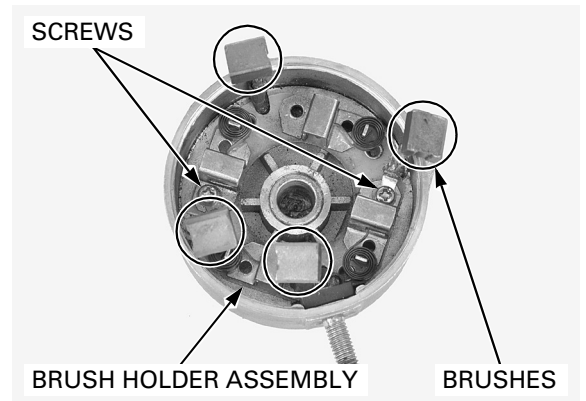
- Screws
- Brushes
- Brush holder assembly

- Cable terminal
- Insulator plate
- Insulated brushes

Inspect the brush for wear or damage and measure the brush length.

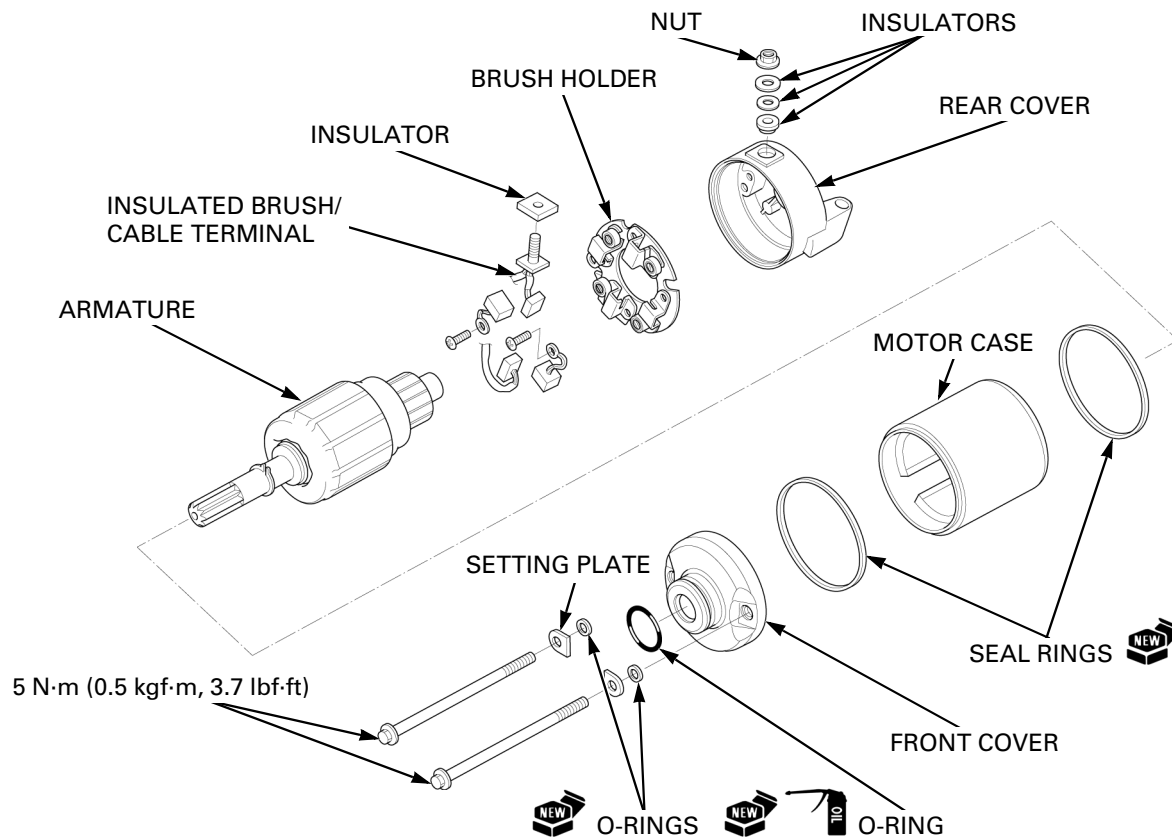
SERVICE LIMIT: 7 mm (0.28 in)

Check the bushing in the rear cover for wear or damage.

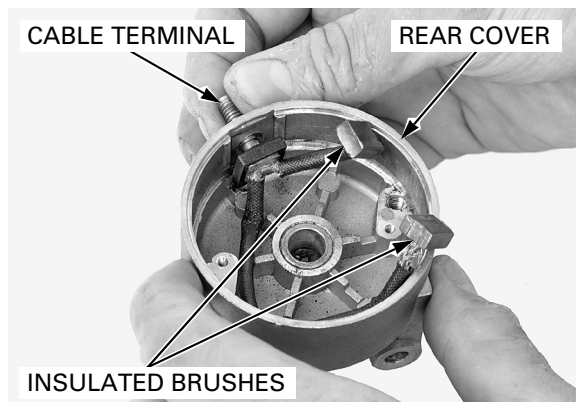


ELECTRIC STARTER

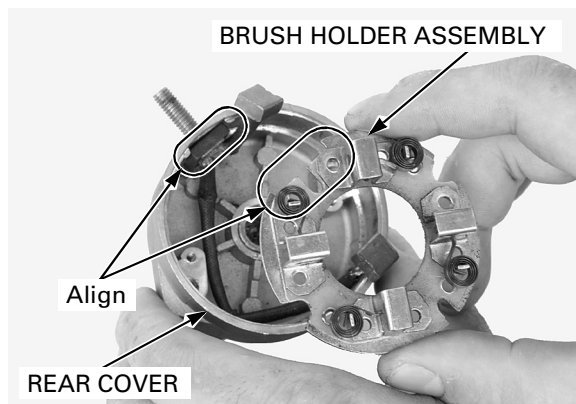
ASSEMBLY



Install the insulated brush/cable terminal into the rear cover.



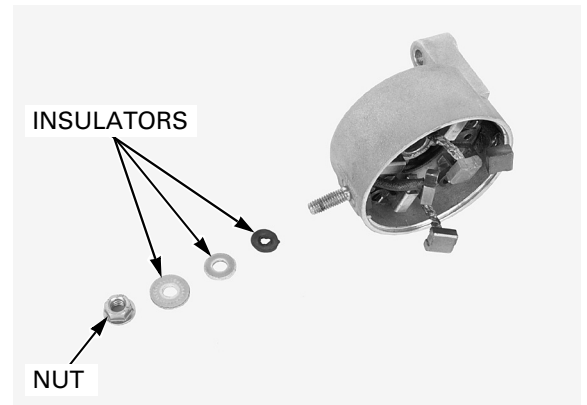
Install the brush holder assembly into the rear cover by aligning its wide cut-out with the insulator plate.



Install the insulators properly as noted during removal.

Install the following:

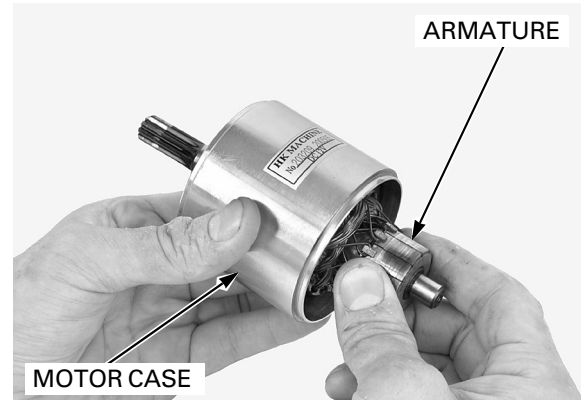
- Insulators
- Terminal nut



Install the armature in the motor case.

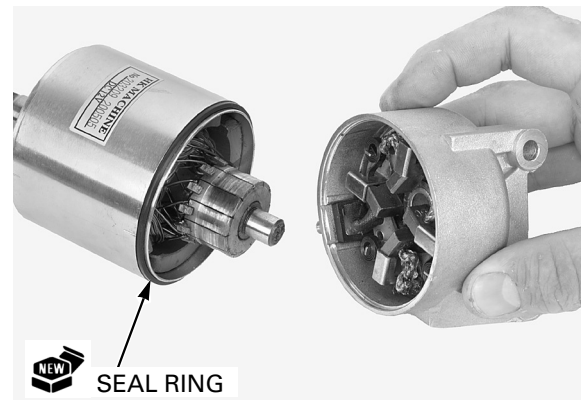
NOTICE

The coil may be damaged if the magnet pulls the armature and hits the case.



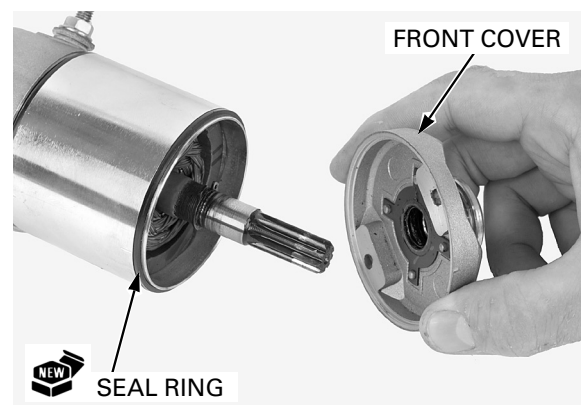
Install a new seal ring onto the motor case.

When installing the rear cover onto the motor case, insert the brushes into the brush holder and hold them.



Install a new seal ring onto the motor case.

Install the front cover.



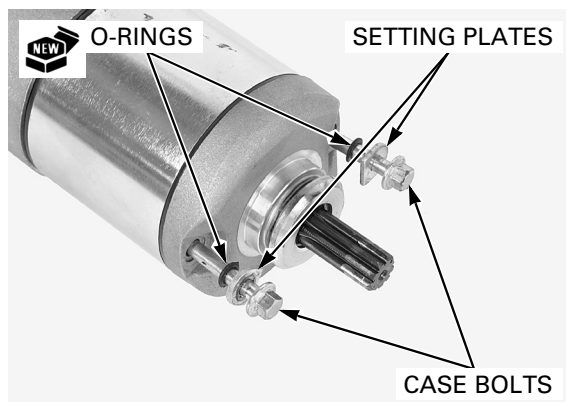
ELECTRIC STARTER

Align the lines with motor case, rear cover and front cover.



Install the motor case bolts with the setting plates and new O-rings and tighten them to the specified torque.

TORQUE: 5 N·m (0.5 kgf·m, 3.7 lbf·ft)



Coat a new O-ring with clean engine oil and install it into the starter motor groove.



INSTALLATION

- Rotate the cables properly (page 1-16).

Install the starter motor into the left crankcase cover and onto the crankcase.

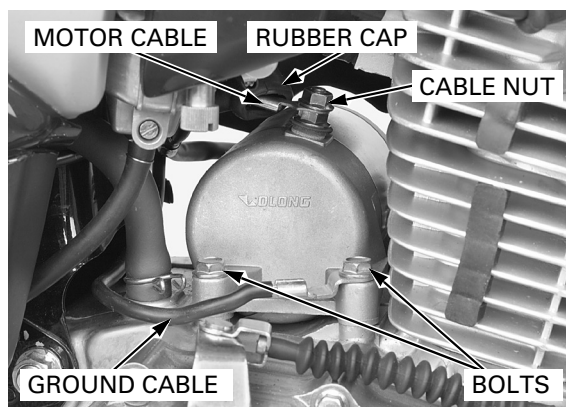
Install the mounting bolts with the ground cable, and tighten the bolts.

Install the starter motor cable and terminal nut onto the motor terminal and tighten the nut to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the rubber cap over the motor terminal properly.

Connect the battery negative cable.



STARTER RELAY SWITCH

OPERATION INSPECTION

Remove the left side cover (page 2-3).

Shift the transmission into neutral.

Turn the ignition switch "O" and push the starter switch.

The coil is normal if the starter relay switch clicks.

If you don't hear the switch click, inspect the relay switch circuits (page 17-13).

If you hear the switch "CLICK", but starter motor does not turn, inspect the relay switch (page 17-13).

Install the left side cover (page 2-3).



CIRCUIT INSPECTION

Remove the left side cover (page 2-3).

GROUND LINE

Turn the ignition switch to "OFF".

Disconnect the starter relay switch 2P (Natural) connector.

Check for continuity between the Green/red wire terminal of the wire harness side connector and ground.

If there is continuity when the transmission is in neutral and when the clutch lever is squeezed, the ground circuit is normal.



POWER INPUT LINE

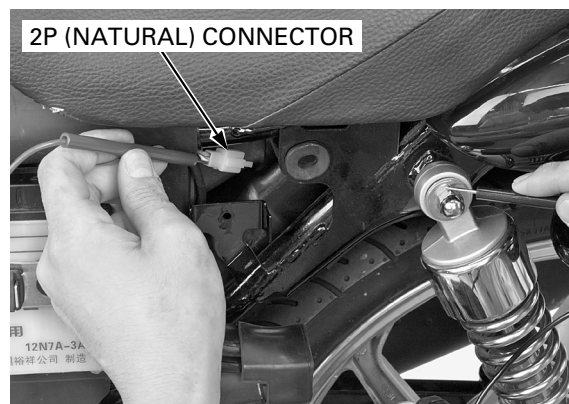
Disconnect the starter relay switch 2P (Natural) connector.

Turn the ignition switch to "O".

Measure the voltage between the Yellow/red wire terminal (+) and ground (-).

If the battery voltage appears only when the starter switch is pushed, the circuit is normal.

Install the left side cover (page 2-3).



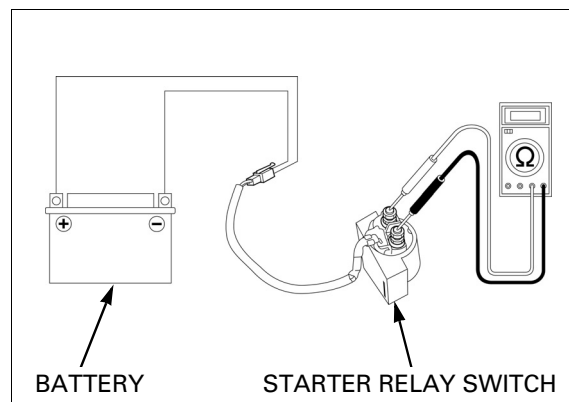
FUNCTION INSPECTION

Remove the starter relay switch (page 17-14).

Connect an ohmmeter to the starter relay switch cable terminals.

Connect the fully charged 12 V battery positive terminal to the Yellow/red wire terminal and negative terminal to the Green/red wire terminal of the starter relay switch.

There should be continuity between the cable terminals while the battery is connected, and no continuity when the battery is disconnected.



ELECTRIC STARTER

REMOVAL/INSTALLATION

Remove the left side cover (page 2-3).

Disconnect the battery negative (–) cable from the battery (page 15-6).

Disconnect the starter relay switch 2P (Natural) connector.

Turn over the rubber covers.

Remove the nuts, battery cable and starter motor cable from the starter relay switch.

Remove the starter relay switch from the stays of the frame.

Installation is in the reverse order of removal.

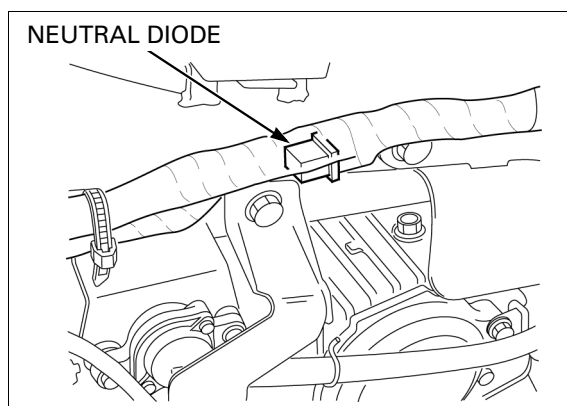


NEUTRAL DIODE

INSPECTION

Remove the fuel tank (page 2-4).

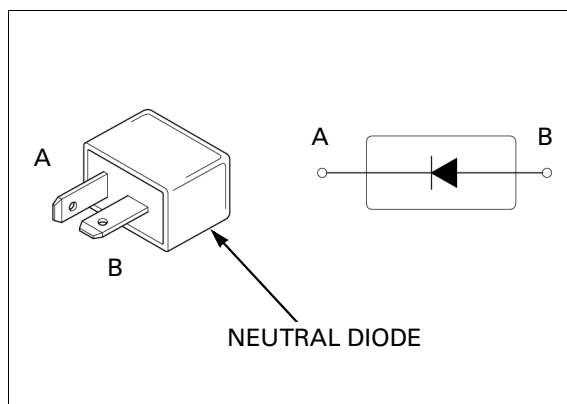
Remove the neutral diode.



Check for continuity between the diode terminals. When there is continuity, a small resistance value will register.

If there is continuity in one direction, the neutral diode is normal.

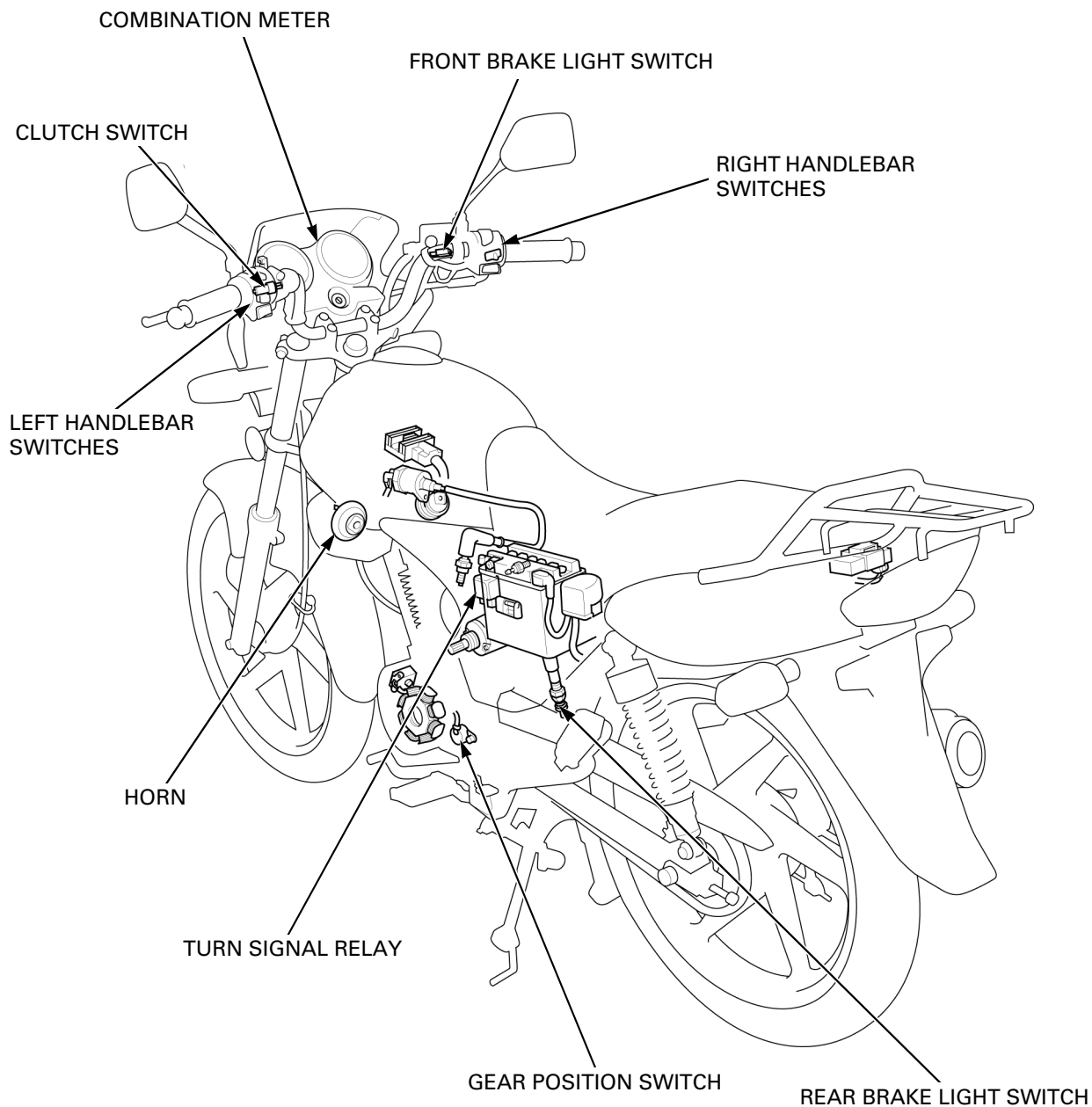
Installation is in the reverse order of removal.



18. LIGHTS/METERS/SWITCHES

SYSTEM LOCATION.....	18-2	IGNITION SWITCH	18-10
SERVICE INFORMATION	18-3	HANDLEBAR SWITCHES.....	18-10
HEADLIGHT.....	18-4	BRAKE LIGHT SWITCH	18-12
POSITION LIGHT	18-4	CLUTCH SWITCH	18-13
BRAKE/TAIL LIGHT	18-4	GEAR POSITION SWITCH	18-14
TURN SIGNAL LIGHT.....	18-5	FUEL LEVEL SENSOR.....	18-16
COMBINATION METER.....	18-6	HORN	18-17
TACHOMETER	18-8	TURN SIGNAL RELAY	18-18

SYSTEM LOCATION



SERVICE INFORMATION

GENERAL

NOTICE

- A halogen headlight bulb becomes very hot while the headlight is ON, and remain hot for a while after it is turned OFF. Be sure to let it cool down before servicing.
- Note the following when replacing the halogen headlight bulb.
 - Wear clean gloves while replacing the bulb. Do not put finger prints on the headlight bulb, as they may create hot spots on the bulb and cause it to fail.
 - If you touch the bulb with your bare hands, clean it with a cloth moistened with denatured alcohol to prevent its early failure.
 - Be sure to install the dust cover after replacing the bulb.
- Check the battery condition before performing any inspection that requires proper battery voltage.
- A continuity test can be made with the switches installed on the motorcycle.
- The following color codes are used throughout this section.

Bu = Blue	G = Green	Lg = Light Green	R = Red
Bl = Black	Gr = Gray	O = Orange	W = White
Br = Brown	Lb = Light Blue	P = Pink	Y = Yellow

SPECIFICATIONS

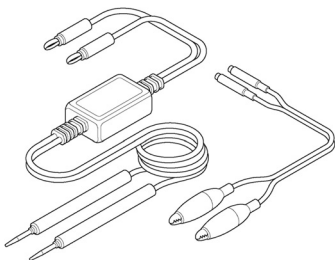
ITEM		SPECIFICATION
Bulbs	Headlight (Hi/low beam)	12 V - 35/35 W
	Brake/tail light	12 V - 21/5 W
	Turn signal light	12 V - 10 W x 4
	Position light	12 V - 4 W
	Speedometer instrument light	LED x 3
	Tachometer instrument light	LED x 3
	Turn signal indicator	12 V - 3.4 W x 2
	High-beam indicator	12 V - 3.4 W
	Neutral indicator	12 V - 3.4 W
Fuse		15 A
Tachometer peak voltage		10.5 V minimum
Fuel level sensor resistance (20°C/68°F)	Full	4 – 10 Ω
	Empty	97 – 108 Ω

TORQUE VALUE

Ignition switch mounting bolt 24 N·m (2.4 kgf·m, 18 lbf·ft)

TOOL

Peak voltage adaptor
07HGJ-0020100



with commercially available digital
multimeter (impedance 10 M Ω /DCV
minimum)
or Imrie diagnostic tester (model
625)

HEADLIGHT

BULB REPLACEMENT

Remove the following:

- Front cowl (page 2-8)
- 3P connector
- Dust cover

Remove the dust cover.

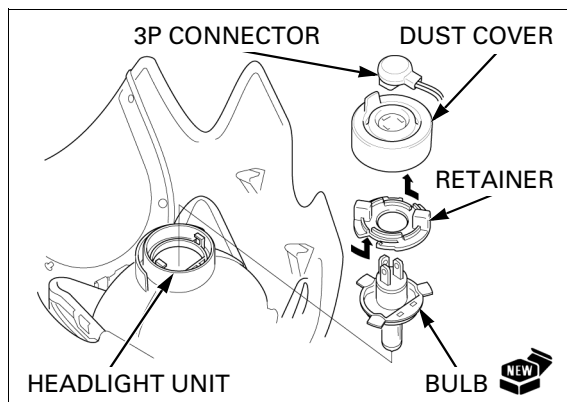
Turn the headlight bulb retainer counterclockwise and remove it from the headlight unit.

Replace the bulb with a new one.

Installation is in the reverse order of removal.

NOTICE

Avoid touching halogen headlight bulb. Finger prints can create not spots that cause a bulb to break.



POSITION LIGHT

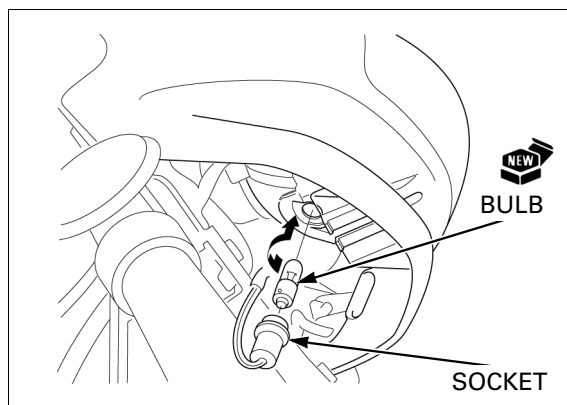
BULB REPLACEMENT

Pull out the position light bulb socket from the headlight unit.

Push the position light bulb in, turn it counterclockwise and remove it.

Replace the bulb with a new one.

Install the bulb socket.



BRAKE/TAIL LIGHT

BULB REPLACEMENT

Remove the screws, brake/tail light lens and rubber packing.

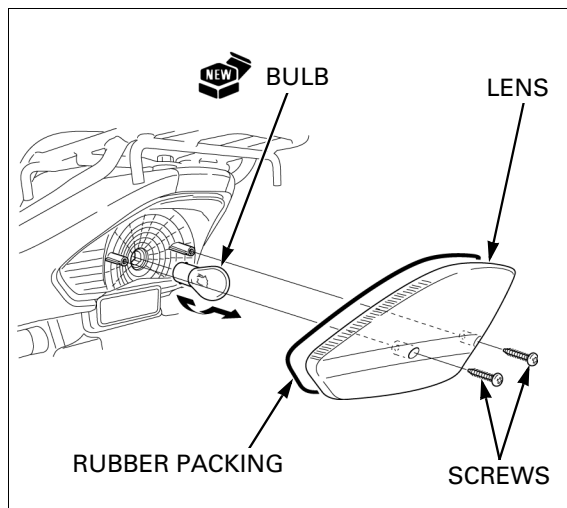
Push the bulb in, turn it counterclockwise and remove it.

Replace the bulb with a new one.

Make sure the rubber packing is installed in position and is in good condition.

Replace the packing with a new one if necessary.

Installation is in the reverse order of removal.



REMOVAL/INSTALLATION

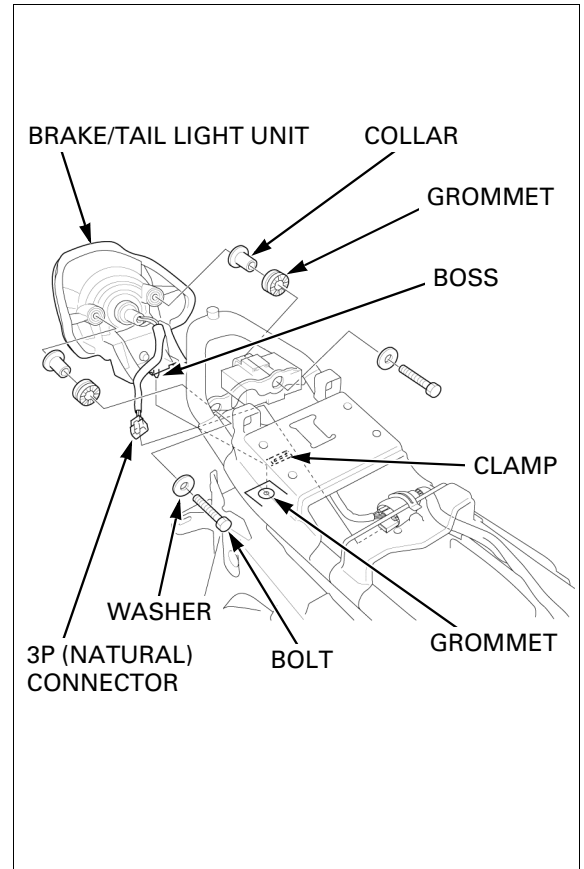
Remove the rear cowl (page 2-6).

Release the brake/tail light wire from the clamp under the rear carrier stay and disconnect the brake/tail light 3P (Natural) connector.

Remove the brake/tail light unit mounting bolts and washers.

Release the boss of the tail light unit from the grommet of the rear fender and remove the brake/tail light unit, collars and grommets.

Installation is in the reverse order of removal.



TURN SIGNAL LIGHT

BULB REPLACEMENT

Remove the lower screw and the turn signal light reflector/lens from the turn signal base.

Remove the screws, rubber packing and turn signal lens from the reflector.

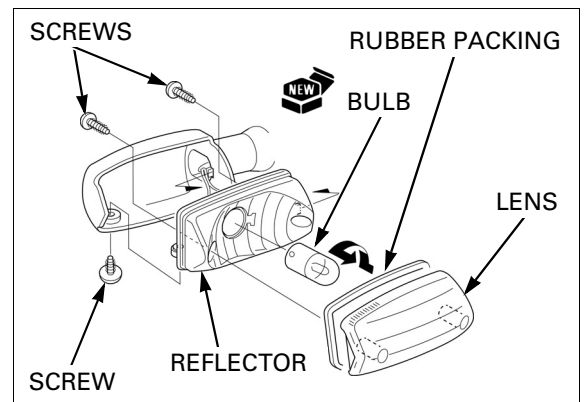
Push the bulb in, turn it counterclockwise and remove it.

Replace the bulb with a new one.

Make sure the rubber packing is installed in position and is in good condition.

Replace the packing if necessary.

Installation is in the reverse order of removal.



COMBINATION METER

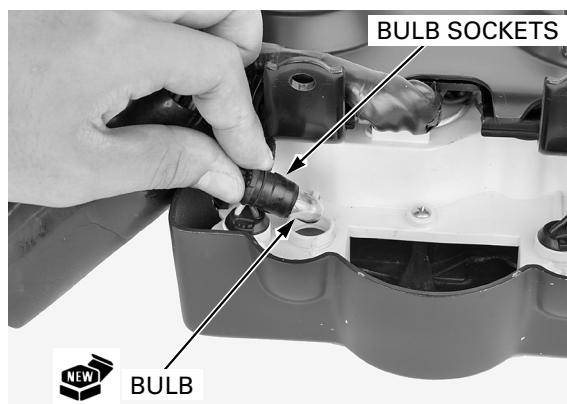
BULB REPLACEMENT

Remove the combination meter (page 18-6).

Pull out the combination meter light bulb socket.

Replace the bulb with new one.

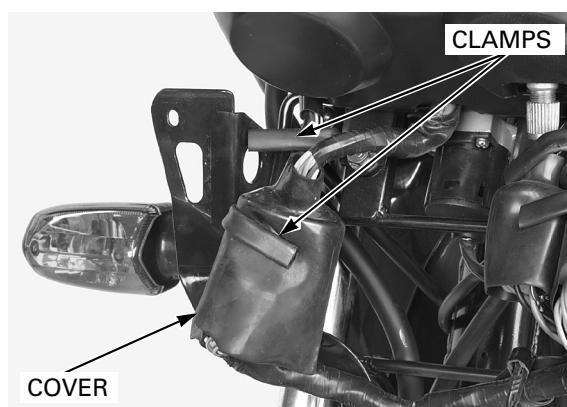
Install the removed parts in the reverse order of removal.



REMOVAL

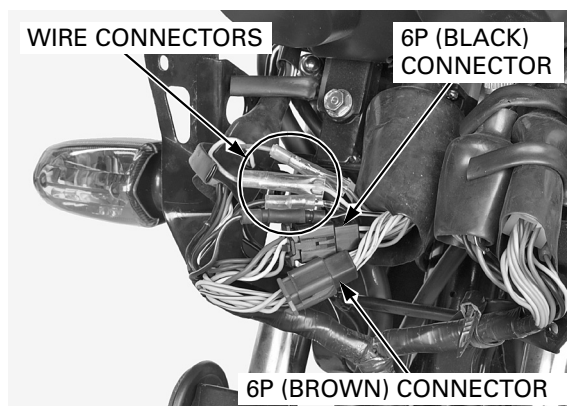
Remove the front cowl (page 2-8).

Release the dust cover from the clamps.



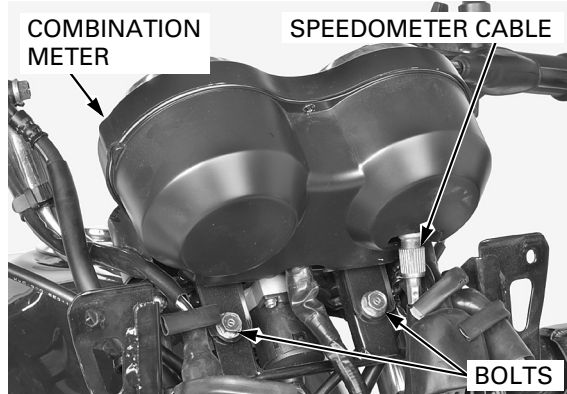
Disconnect the following connectors:

- Gear position indicator 6P (Brown)
- Combination meter 6P (Black)
- Black/yellow wire
- Black wire
- Light blue wire
- Green wire



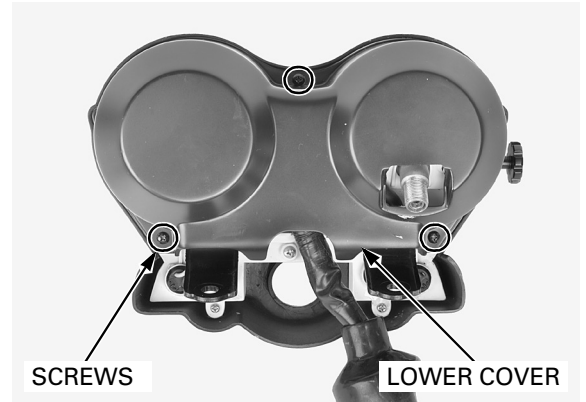
Disconnect the speedometer cable.

Remove the bolts and the combination meter.

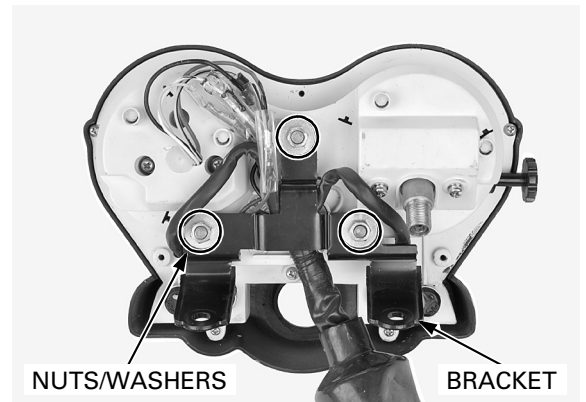


DISASSEMBLY

Remove the screws and combination meter lower cover.

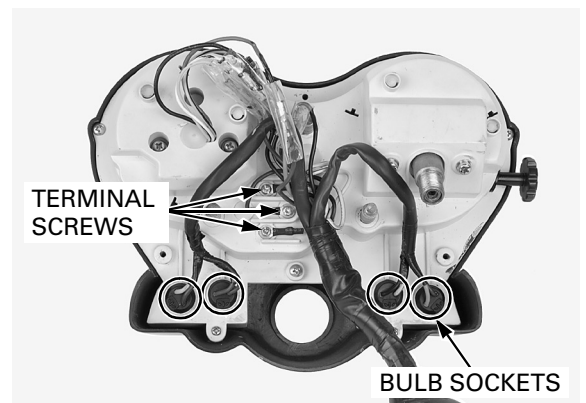


Remove the nuts/washers and combination meter mounting bracket.



Pull out the combination meter light bulb sockets.

Remove the fuel level sensor terminal screws and disconnect the terminals.

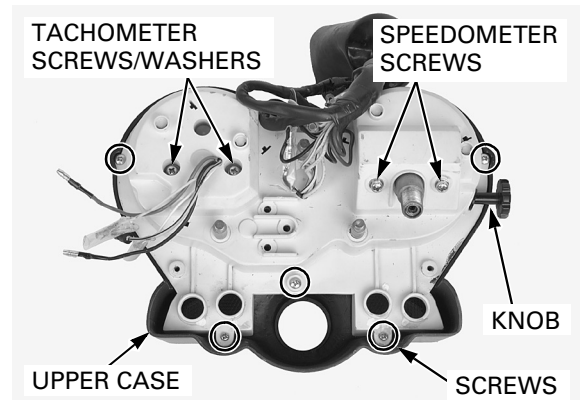


Remove the screws, trip meter knob and combination meter upper case from the combination meter unit.

Do not touch the speedometer and tachometer panel surfaces.

Remove the speedometer mounting screws, washers and speedometer unit from the combination meter case.

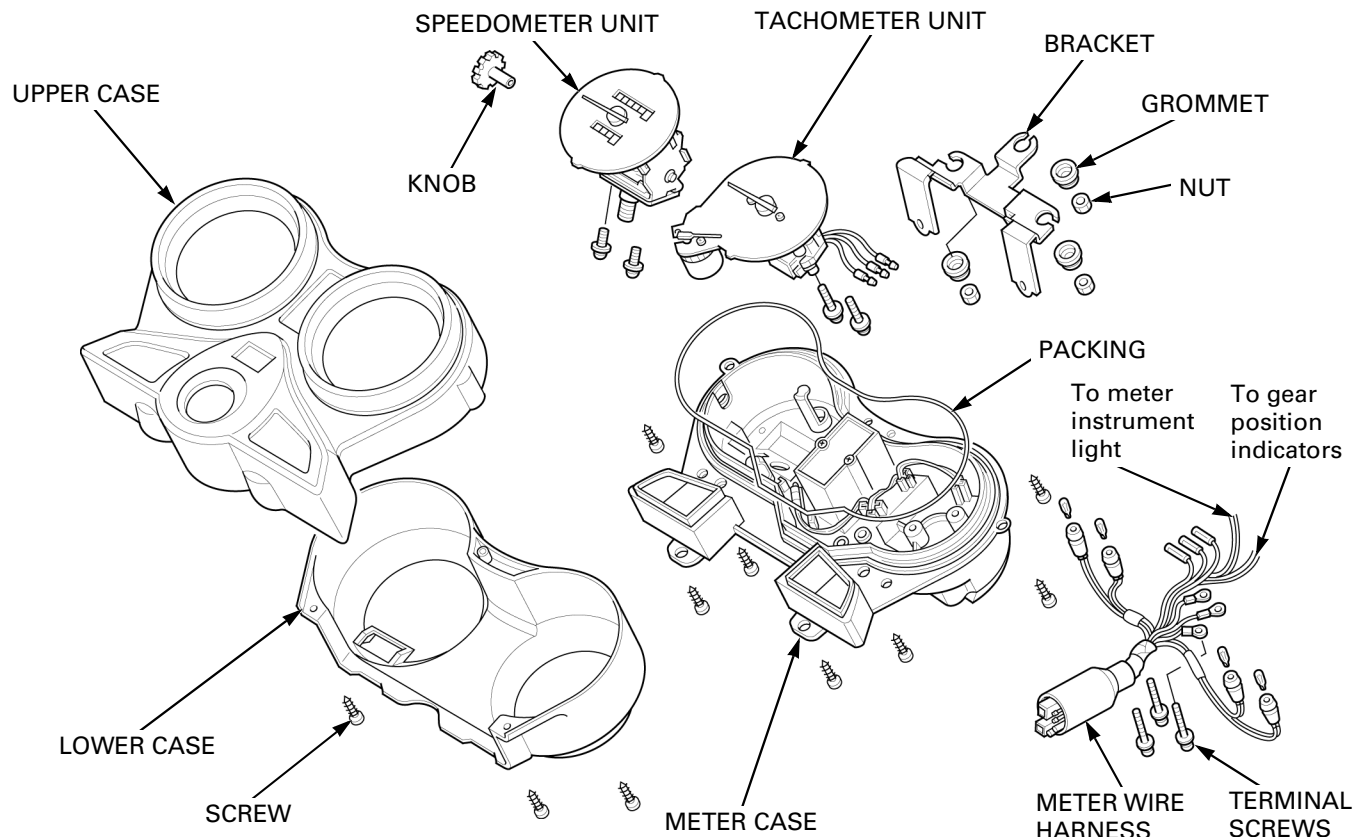
Remove the tachometer mounting screws, washers and tachometer unit from the combination meter case.



LIGHTS/METERS/SWITCHES

ASSEMBLY/INSTALLATION

Installation is in the reverse order of removal.



TACHOMETER

GROUND LINE INSPECTION

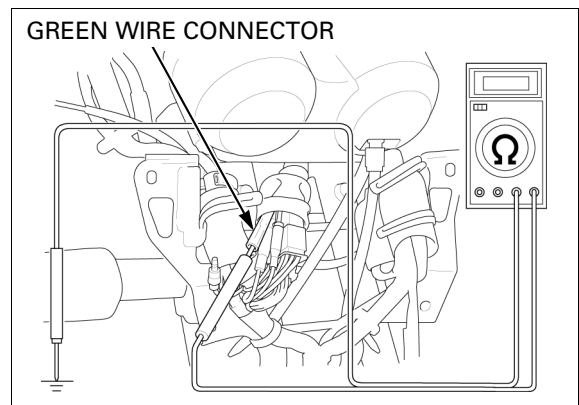
Remove the front cowl (page 2-8).

Disconnect the green wire connector.

Check for continuity between the Green wire terminal of the meter side and body ground.

There should be continuity.

If there is no continuity, check for open circuit in the Green wire.

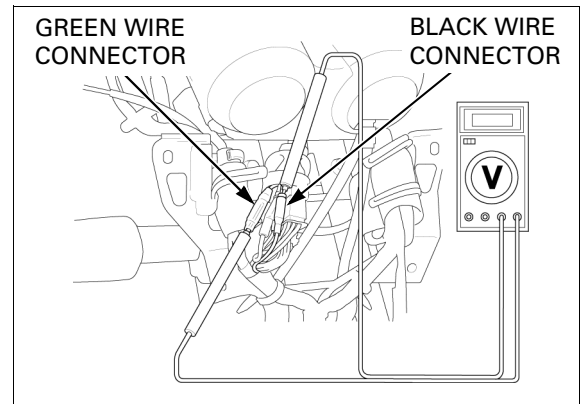


POWER VOLTAGE LINE INSPECTION

Turn the ignition switch "O" and measure the voltage between the Black (+) and Green (-) wire terminals.

There should be battery voltage.

If there is no battery voltage, check for open circuit in the Black and/or Green wire.



INPUT LINE INSPECTION

Connect the peak voltage adaptor to the tachometer Black/yellow (+) and Green (-) wire terminals.

- Use a commercially available digital multimeter with an impedance of 10 M Ω /DCV minimum.
- The display value differs depending upon the internal impedance of the multimeter.
- If using the Imrie diagnostic tester (model 625), follow the manufacturer's instructions.

TOOL:

Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100
with commercially available digital multimeter
(impedance 10 M Ω /DCV minimum)

Start the engine and measure the tachometer input line peak voltage.

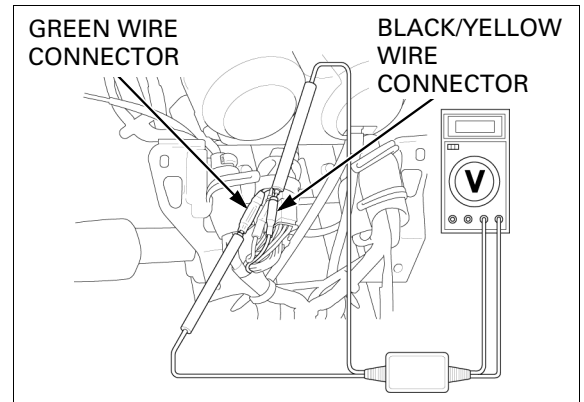
PEAK VOLTAGE: 10.5 V minimum

- If the value is normal, replace the tachometer (page 18-6).
- If the measured value is below 10.5 V, check the ignition control module (ICM) (page 16-10).
- If the value is 0 V, check for continuity between the combination meter wire terminal and ICM 4P (Black) connector Black/yellow terminals.

If there is no continuity, check the wire harness for open circuit.

If there is continuity, replace the ICM (page 16-9).

Install the front cowl (page 2-8).







IGNITION SWITCH

INSPECTION

Remove the front cowl (page 2-8).

Disconnect the ignition switch 2P (Natural) connector and Black/white and Green wire connectors. Check for continuity at the terminals in each switch position according to the table.

IGNITION SWITCH

	IG	E	BAT1	BAT2
				
				
COLOR	BI/W	G	R	BI

REMOVAL/INSTALLATION

Remove the top bridge (page 12-29).

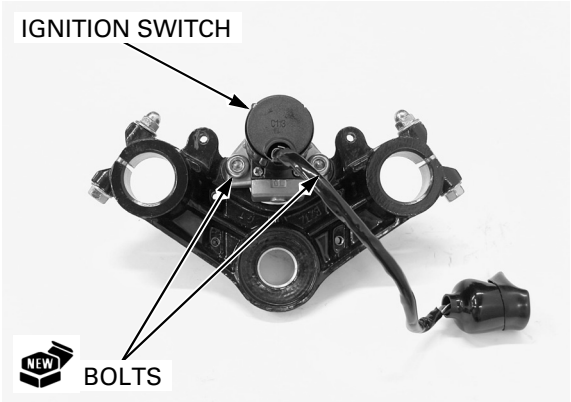
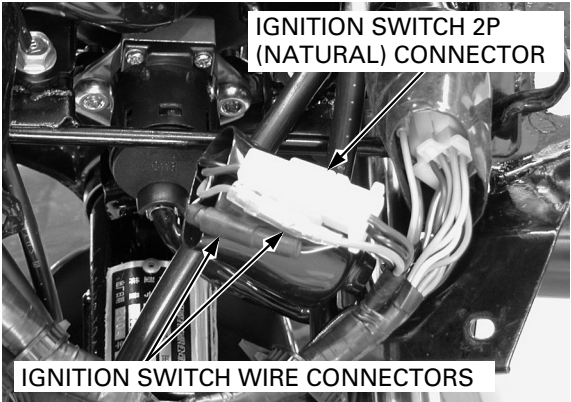
Remove the ignition switch mounting bolts and ignition switch.

Install the ignition switch in the reverse order of removal.

- NOTE:
- Always replace the ignition switch mounting bolts with new ones.

TORQUE:

Ignition switch mounting bolt:
24 N·m (2.4 kgf·m, 18 lbf·ft)

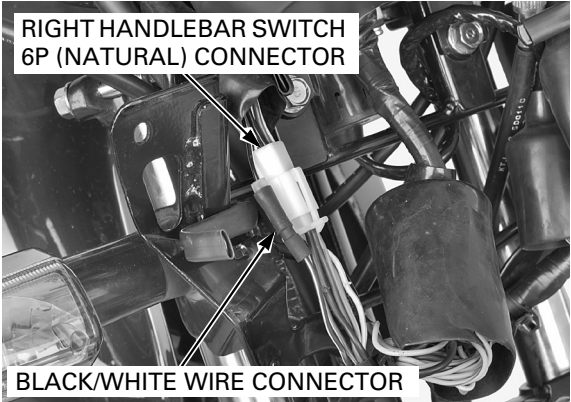


HANDLEBAR SWITCHES

RIGHT HANDLEBAR SWITCH

Remove the front cowl (page 2-8).

Disconnect the right handlebar switch 6P (Natural) connector and Black/white wire connector.





Check for continuity between the terminals in each switch position according to the tables.




STARTER SWITCH

	ST	BAT
FREE		
PUSH	○—○	
COLOR	Y/R	BI

ENGINE STOP SWITCH

	E	IG
		
	○—○	
COLOR	G	BI/W

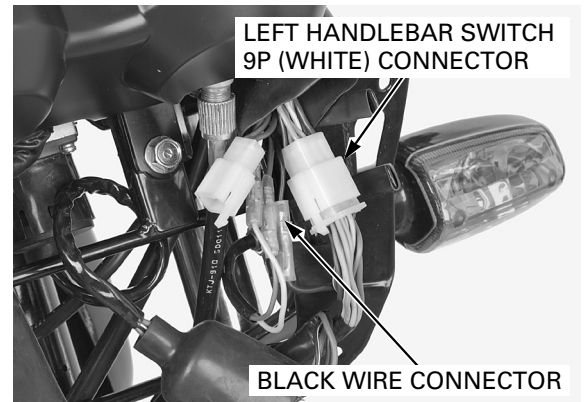
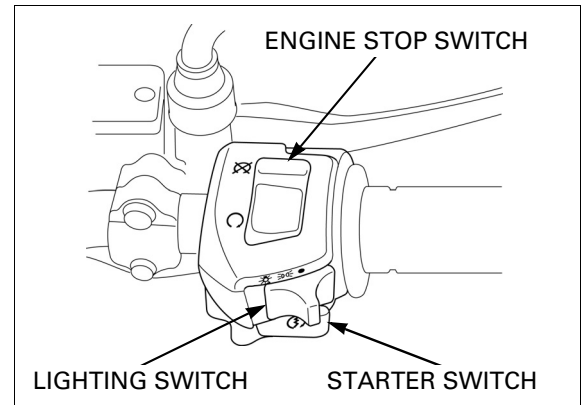
LIGHTING SWITCH

	BAT	TL	HL
			
	○—○		
	○—○—○		
COLOR	BI	Br	Bu/W

LEFT HANDLEBAR SWITCH



Remove the front cowl (page 2-8).

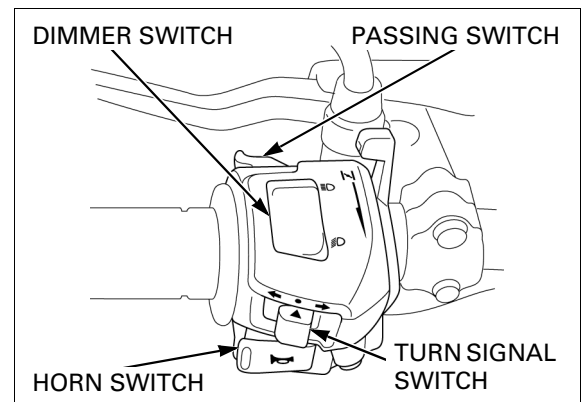
Disconnect the left handlebar switch 9P (White) connector and Black wire connector.



Check for continuity between the terminals in each switch position according to the table.





DIMMER SWITCH

	HL	HI	LO
	○—○—○		
(N)	○—○—○		
	○—○		
COLOR	Bu/W	Bu	W




LIGHTS/METERS/SWITCHES


TURN SIGNAL SWITCH

	R	WR	L
			
N			
			
COLOR	Lb	Gr	O

HORN SWITCH

	BAT	HO
FREE		
PUSH		
COLOR	Bl	Lg

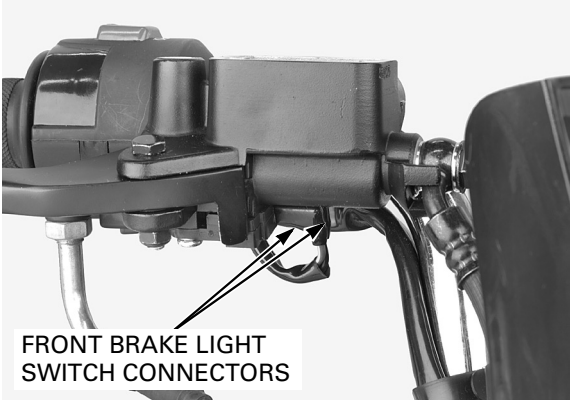
PASSING SWITCH

	BAT	HI
FREE		
PUSH		
COLOR	Bl	Bu

BRAKE LIGHT SWITCH

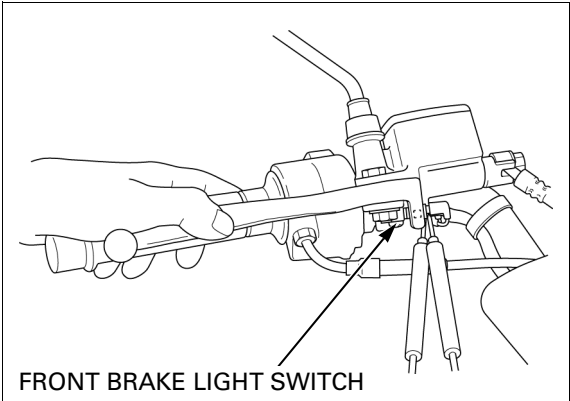
FRONT

Disconnect the front brake light switch connectors.



Check the continuity between the switch connectors.

There should be continuity with the brake lever applied, and there should be no continuity when the brake lever is released.

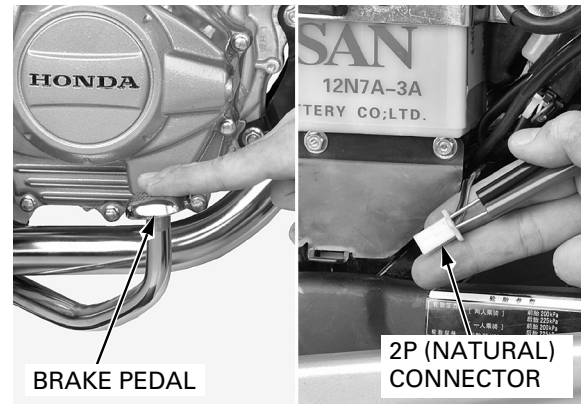


REAR

Remove the left side cover (page 2-3).

Disconnect the rear brake light switch 2P (Natural) connector and check for continuity between the terminals.

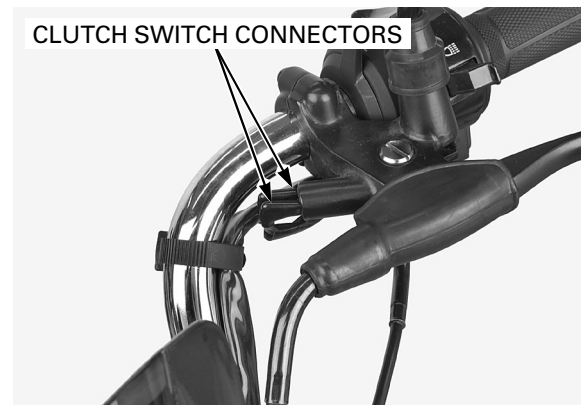
There should be continuity with the brake pedal applied, and there should be no continuity when the brake pedal is released.



CLUTCH SWITCH

INSPECTION

Disconnect the clutch switch connectors.



There should be continuity with the clutch lever applied, and there should be no continuity when the clutch lever is released.



GEAR POSITION SWITCH

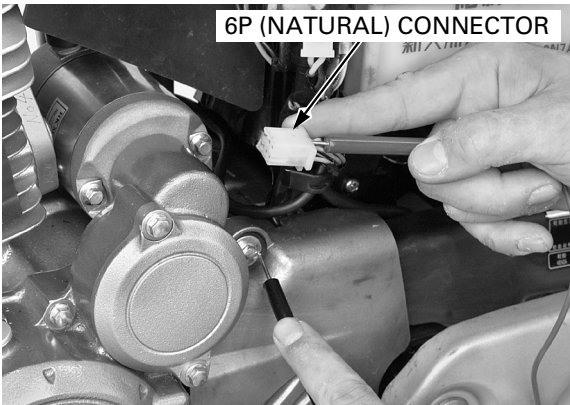
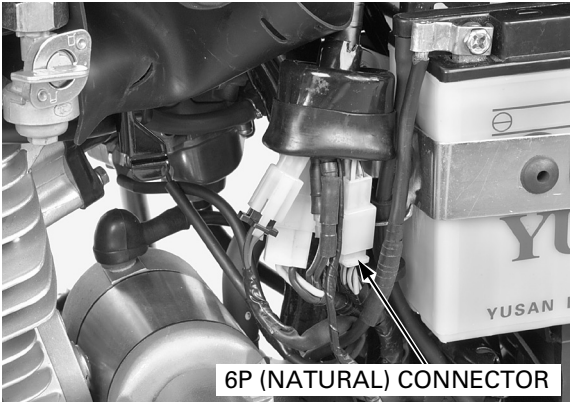
INSPECTION

Remove the left side cover (page 2-3).
Disconnect the gear position switch 6P (Natural) connector.

Check for continuity between the terminals at each gear position.
There should be no continuity with other terminals at each gear position.

GEAR POSITION SWITCH

GEAR	GROUND	Lg/R	Lg/P	Lg/Br	Lg/G	Lg/Y	Lg/Bl
N	○	○					
1	○		○				
2	○			○			
3	○				○		
4	○					○	
5	○						○

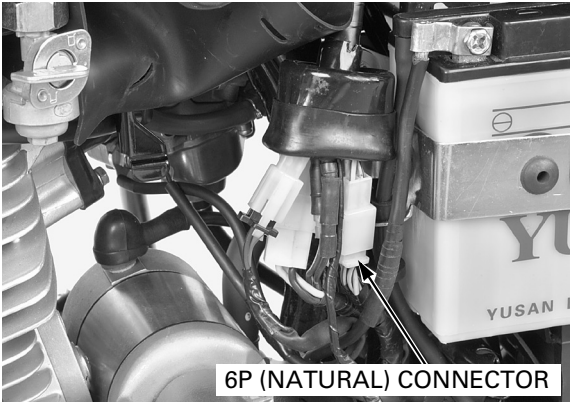


REMOVAL

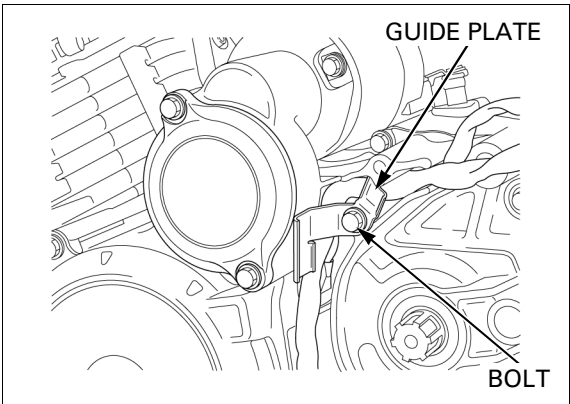
Remove the following:

- Left crankcase rear cover (page 10-4)
- Left crankcase cover (page 10-4)

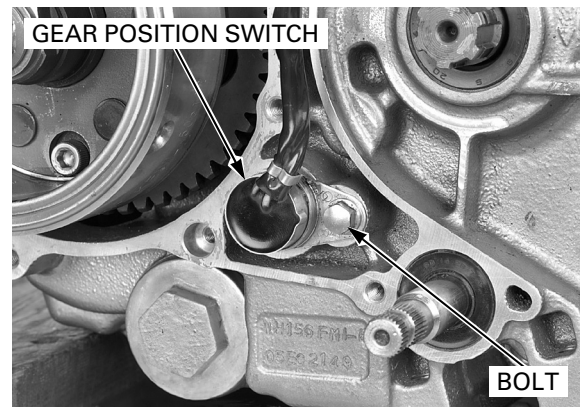
Disconnect the gear position switch 6P (Natural) connector.



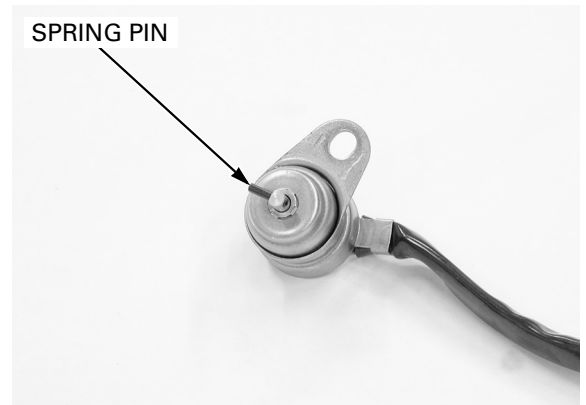
Remove the bolt and the alternator/gear position switch wire guide plate.
Release the gear position switch wire from the clamp.



Remove the gear position switch mounting bolt and the gear position switch.



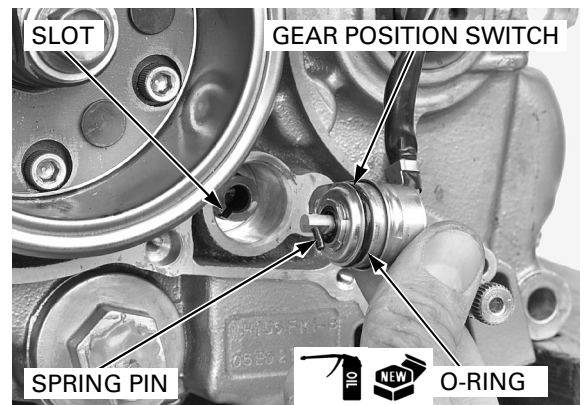
Check the condition of the spring pin.



INSTALLATION

Coat a new O-ring with engine oil and install it into the groove of the gear position switch.

Install the gear position switch while aligning the spring pin with the slot of the shift drum.



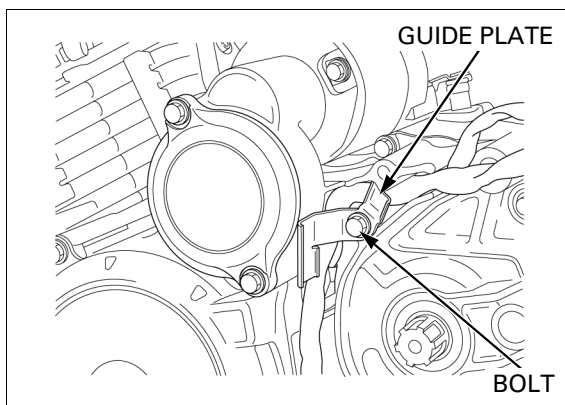
Install and tighten the gear position switch mounting bolt.



LIGHTS/METERS/SWITCHES

Route the gear position switch wire in the left crankcase cover groove properly.

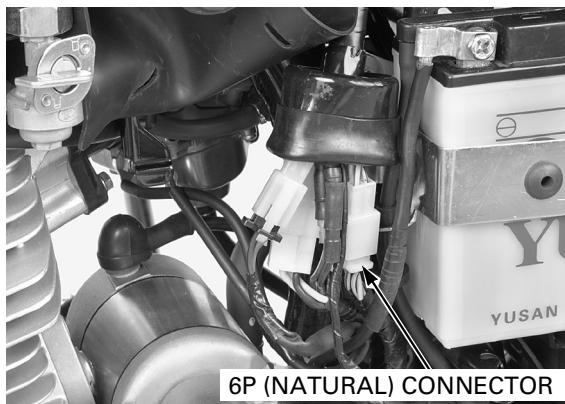
Install the alternator/gear position switch wire guide plate and tighten the bolt.



Connect the gear position switch 6P (Natural) connector.

Install the following:

- Left crankcase cover (page 10-13)
- Left crankcase rear cover (page 10-13)



FUEL LEVEL SENSOR

REMOVAL/INSTALLATION

Remove the fuel tank (page 2-4).

Release the fuel level sensor wire from the wire clamp.

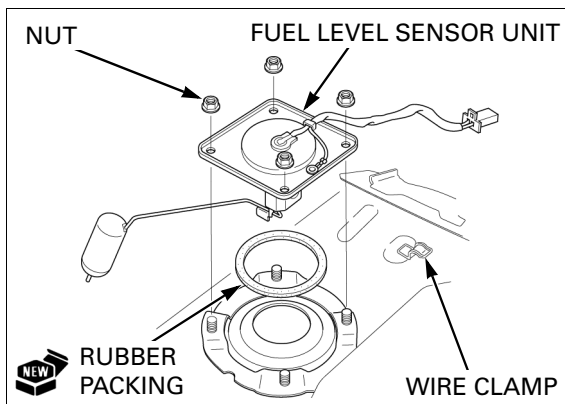
Remove nuts, rubber packing and fuel level sensor unit.

Installation is in the reverse order of removal.

NOTE:

Always replace the rubber packing with a new one.

Be careful not to damage the float arm.



INSPECTION

Inspect the following before fuel level sensor inspection.

- Ground line inspection (page 18-8)
- Power voltage inspection (page 18-9)

FUEL METER

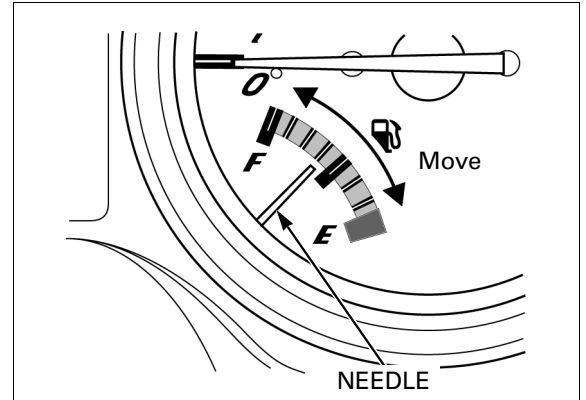
Remove the fuel level sensor unit (page 18-16).

Connect the fuel level sensor unit 2P (Black) connector to the wire harness.

Turn the ignition switch "ON" and remove the float from bottom (empty) to top (full).

Check the fuel meter needle.

If the fuel meter needle does not move properly, check for the fuel sensor unit.



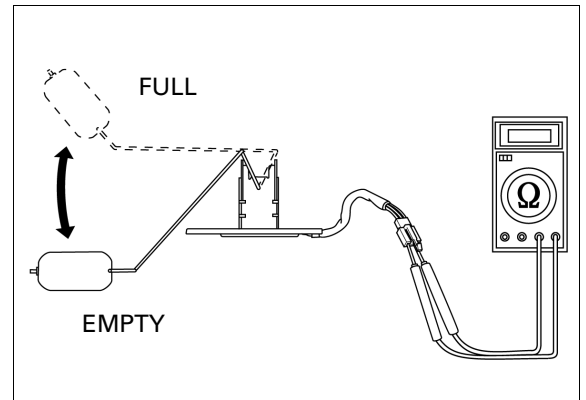
FUEL LEVEL SENSOR

Remove the fuel level sensor unit (page 18-16).

Connect the ohmmeter to the fuel level sensor terminals.

Inspect the resistance of the float at the top (FULL) and bottom (EMPTY) positions.

	FULL	EMPTY
Resistance (20°C/68°F)	4 – 10 Ω	97 – 108 Ω



HORN

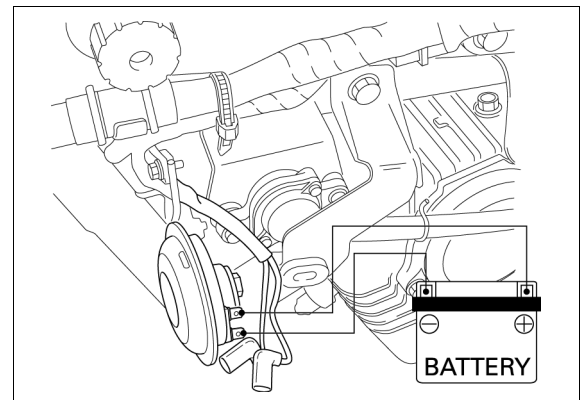
INSPECTION

Remove the right and left horn covers (page 2-9).

Disconnect the wire connectors from the horn.

Connect the battery voltage to the horn terminals.

The horn is normal if it sounds when the battery voltage is connected across the horn terminals.



LIGHTS/METERS/SWITCHES

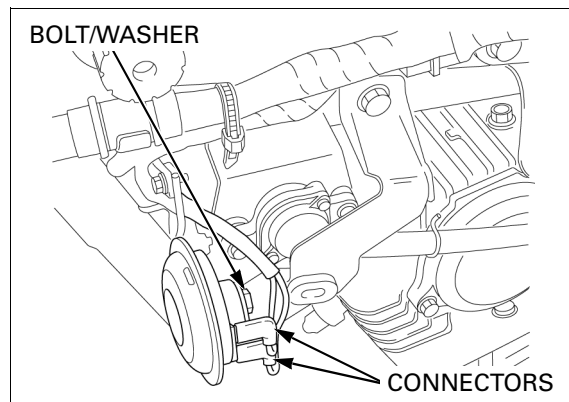
REMOVAL/INSTALLATION

Remove the horn covers (page 2-9).

Disconnect the wire connectors from the horn.

Remove the mounting bolt and washer.

Installation is in the reverse order of removal.



TURN SIGNAL RELAY

INSPECTION

1. Recommended Inspection

Check the following

- Battery condition
- Burned out bulb or non-specified wattage
- Blown fuse
- Ignition switch (page 18-10) and turn signal switch function (page 18-11)
- Loose connector

Are the above items in good condition?

NO - Replace or repair the malfunction part(s)

YES - GO TO STEP 2.

2. Turn Signal Circuit Inspection

Remove the left side cover (page 2-3).

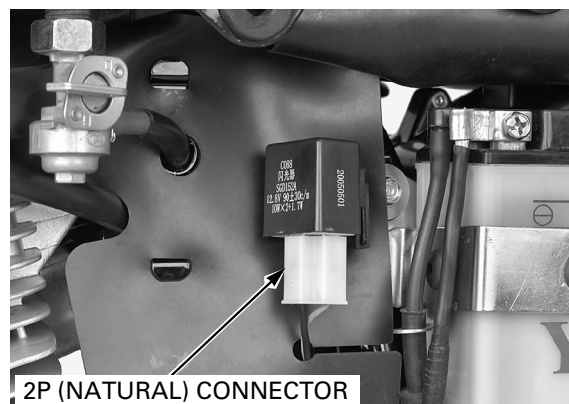
Disconnect the turn signal relay 2P (Natural) connector from the relay.

Short the turn signal relay connector with a jumper wire. Turn the ignition switch "O" and check the turn signal light by turning the switch "←" and "→".

Does the light come on?

YES - • Faulty turn signal relay
• Poor connection of the connector.

NO - Open or short circuit in wire harness

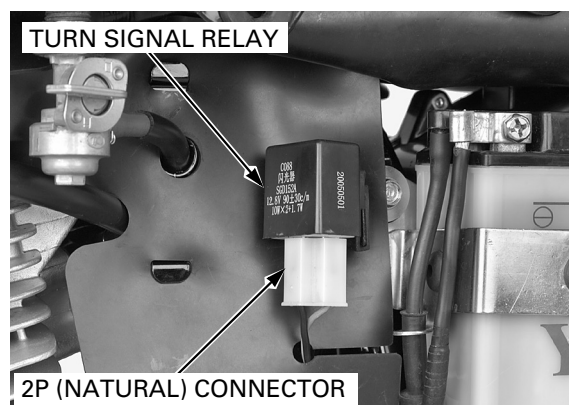


REMOVAL/INSTALLATION

Remove the left side cover (page 2-3).

Disconnect the turn signal relay 2P (Natural) connector and remove the turn signal relay from the stay.

Installation is in the reverse order of removal.

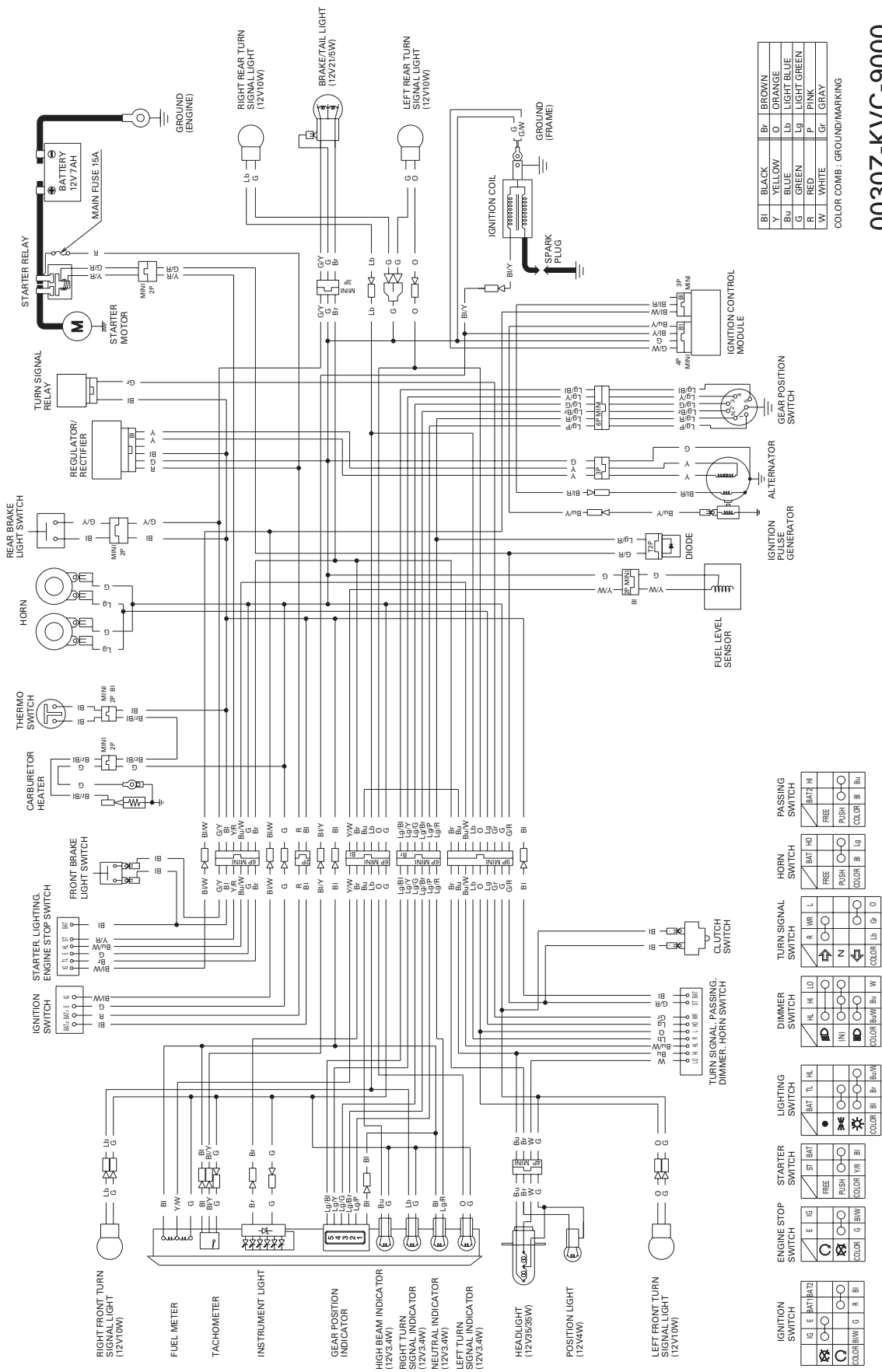


19. WIRING DIAGRAM

WIRING DIAGRAM 19-2

WIRING DIAGRAM

WIRING DIAGRAM



0030Z-KVC-9000

20. TROUBLESHOOTING

ENGINE DOES NOT START OR IS HARD TO START	20-2	POOR PERFORMANCE AT HIGH SPEED	20-6
ENGINE LACKS POWER	20-3	POOR HANDLING	20-6
POOR PERFORMANCE AT LOW AND IDLE SPEED	20-5		

ENGINE DOES NOT START OR IS HARD TO START

1. Fuel Line Inspection

Check fuel flow to the carburetor.

Does fuel reach the carburetor?

- NO** – • Clogged fuel hose or fuel strainer
• Clogged fuel valve
• Clogged fuel cap breather
• Sticking float valve

YES – GO TO STEP 2.

2. Spark Plug Inspection

Remove and inspect the spark plug.

Is the spark plug wet?

- YES** – • Flooded carburetor
• Throttle valve open
• Dirty air cleaner
• Improperly adjusted pilot screw

NO – GO TO STEP 3.

3. Spark Test

Perform spark test.

Is there weak or no spark?

- YES** – • Faulty spark plug
• Fouled spark plug
• Loose or disconnected ignition system wires
• Broken or shorted spark plug wire
• Broken or shorted ignition coil
• Faulty exciter coil
• Faulty ignition pulse generator
• Faulty ignition switch
• Faulty engine stop switch
• Faulty ignition control module (ICM)

NO – GO TO STEP 4.

4. Engine Starting Condition

Start engine by following normal procedure.

Does the engine start then stops?

- YES** – • Improper choke operation
• Incorrectly adjusted carburetor
• Leaking carburetor insulator
• Improper ignition timing (Faulty ICM or ignition pulse generator)
• Contaminated fuel

NO – GO TO STEP 5.

5. Cylinder Compression

Test cylinder compression.

Is the compression low?

- YES** – • Valve clearance too small
• Valve stuck open
• Worn cylinder and piston rings
• Damaged cylinder head gasket
• Seized valve
• Improper valve timing

ENGINE LACKS POWER

1. Drive Train Inspection

Raise the rear wheel off the ground and spin it by hand.

Does the wheel spin freely?

- NO** – • Brake dragging
• Worn or damaged wheel bearings
• Bent axle
• Drive chain too tight

YES – GO TO STEP 2.

2. Tire Pressure Inspection

Check tire pressure.

Is the tire pressure 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 clutch is engaged?

- NO** – • Worn clutch discs/plates
• Warped clutch discs/plates
• Weak clutch spring
• Sticking clutch lifter
• Additive in engine oil

YES – GO TO STEP 4.

4. Engine Condition Inspection

Accelerate lightly.

Does the engine speed increase?

- NO** – • Fuel/air mixture too rich or lean
• Clogged air cleaner
• Restricted fuel flow
• Clogged muffler
• Clogged fuel cap breather
• Carburetor choke is on
• Excessive carbon build-up in combustion chamber

YES – GO TO STEP 5.

5. Engine Knocking Inspection

Accelerate or run at high speed.

Is there knocking?

- YES** – • Worn piston and cylinder
• Use of poor quality fuel
• Excessive carbon build-up in combustion chamber
• Ignition timing too advanced (Faulty ICM or ignition pulse generator)
• Lean fuel mixture

NO – GO TO STEP 6.

6. Ignition Timing Inspection

Check ignition timing.

Is the ignition timing correct?

- NO** – • Faulty ignition control module (ICM)
• Faulty ignition pulse generator

YES – GO TO STEP 7.

TROUBLESHOOTING

7. Engine Oil Inspection

Check the oil level and condition.

Is the oil level correct and the oil in good condition?

- NO** – • Oil level too high
• Oil level too low
• Contaminated oil

YES – GO TO STEP 8.

8. Spark Plug Inspection

Remove and inspect the spark plug.

Is the spark plug fouled or discolored?

- YES** – • Plugs not serviced frequently enough
• Incorrect spark plug heat range
• Incorrect spark plug gap

NO – GO TO STEP 9.

9. Cylinder compression Inspection

Test the cylinder compression.

Is the compression low?

- YES** – • Valve clearance too small
• Valve stuck open
• Worn cylinder and piston rings
• Damaged cylinder head gasket
• Improper valve timing

NO – GO TO STEP 10.

10. Carburetor Inspection

Check the carburetor for clogs.

Is the carburetor clogged?

- YES** – • Carburetor not serviced frequently enough
• Dirt getting passed the air cleaner

NO – GO TO STEP 11.

11. Lubrication Inspection

Remove cylinder head cover and inspect lubrication.

Is the valve train lubricated properly?

- NO** – • Faulty oil pump
• Clogged oil passage
• Clogged oil strainer

POOR PERFORMANCE AT LOW AND IDLE SPEED

1. Pilot Screw Inspection

Check carburetor pilot screw adjustment.

Is the adjustment correct?

NO – See page 5-20

YES – GO TO STEP 2.

2. Intake Air Leak Inspection

Check for leaking carburetor insulator.

Is there leaking?

YES – • Loose carburetor insulator bands
• Damaged insulator

NO – GO TO STEP 3.

3. Spark Test

Perform spark test.

Is there weak or intermittent spark?

YES – • Faulty spark plug
• Fouled spark plug
• Loose or disconnected ignition system wires
• Broken or shorted spark plug wire
• Faulty ignition coil
• Faulty ignition pulse generator
• Faulty ignition switch
• Faulty engine stop switch
• Faulty ignition control module (ICM)

NO – GO TO STEP 4.

4. Ignition Timing Inspection

Check ignition timing.

Is the ignition timing correct?

NO – • Faulty ignition control module (ICM)
• Faulty ignition pulse generator

POOR PERFORMANCE AT HIGH SPEED

1. Fuel Line Inspection

Disconnect fuel line at carburetor.

Does fuel flow freely?

- NO** – • Clogged fuel line
• Clogged fuel cap breather
• Faulty fuel valve
• Clogged fuel strainer

YES – GO TO STEP 2.

2. Carburetor Inspection

Check carburetor for clogs.

Is the carburetor clogged?

- YES** – • Carburetor not serviced frequently enough
• Dirt getting passed the air cleaner

NO – GO TO STEP 3.

3. Ignition Timing Inspection

Check ignition timing.

Is the ignition timing correct?

- NO** – • Faulty ignition control module (ICM)
• Faulty ignition pulse generator

YES – GO TO STEP 4.

4. Valve Timing Inspection

Check valve timing.

Is the valve timing correct?

- NO** – Cam sprocket not installed properly.

YES – GO TO STEP 5.

5. Valve Spring Inspection

Check valve springs.

Are the valve springs weak?

- YES** – Faulty valve spring.

POOR HANDLING

Steering is heavy

- Steering bearing adjusting nut too tight
- Damaged steering head bearings
- Low tire pressure

Either wheel is wobbling

- Excessive wheel bearing play
- Bent rim
- Improperly installed wheel hub
- Damaged swingarm pivot bushing
- Bent frame

Motorcycle pulls to one side

- Front and rear wheels not aligned
- Bent fork
- Bent swingarm
- Bent axle
- Bent frame
- Faulty shock absorber

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