

SHOP MANUAL

INVICTA

TYPE CODE

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

CODE	AREA TYPE
LA	Latin America

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 recommended 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 CBF150ME.

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

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

Sections 1 and 3 apply to the whole scooter. Section 2 illustrates procedures for removal/installation of components that may be required to perform service described in the following sections. Section 4 through 18 describe parts of the scooter, grouped according to location.


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

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

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.

Some information provided in this manual is applicable for ID type model only.

ALL INFORMATION, ILLUSTRATIONS, DIRECTIONS AND SPECIFICATIONS INCLUDED IN THIS PUBLICATION ARE BASED ON THE LATEST PRODUCT INFORMATION AVAILABLE AT THE TIME OF APPROVAL FOR PRINTING. HONDA MOTOR CO., LTD. RESERVES THE RIGHT TO MAKE CHANGES AT ANY TIME WITHOUT NOTICE AND WITHOUT INCURRING ANY OBLIGATION WHATEVER. NO PART OF THIS PUBLICATION MAY BE REPRODUCED WITHOUT WRITTEN PERMISSION. THIS MANUAL IS WRITTEN FOR PERSONS WHO HAVE ACQUIRED BASIC KNOWLEDGE OF MAINTENANCE ON HONDA MOTORCYCLES, MOTOR SCOOTERS OR ATVS.













Honda Motor Co., Ltd.
SERVICE PUBLICATION OFFICE

CONTENTS

	GENERAL INFORMATION	1
	FRAME/BODY PANELS/EXHAUST SYSTEM	2
	MAINTENANCE	3
ENGINE	LUBRICATION SYSTEM	4
	FUEL SYSTEM	5
	ENGINE REMOVAL/INSTALLATION	6
	CYLINDER HEAD/VALVES	7
	CYLINDER/PISTON	8
	CLUTCH/GEARSHIFT LINKAGE	9
	ALTERNATOR	10
	CRANKCASE/CRANKSHAFT/TRANSMISSION	11
CHASSIS	FRONT WHEEL/SUSPENSION/STEERING	12
	REAR WHEEL/SUSPENSION	13
	BRAKE SYSTEM	14
ELECTRICAL	BATTERY/CHARGING SYSTEM	15
	IGNITION SYSTEM	16
	LIGHTS/METERS/SWITCHES	17
	ELECTRIC STARTER SYSTEM	18
	WIRING DIAGRAM	19
	TROUBLESHOOTING	20
	INDEX	21

SYMBOLS

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

	Replace the part(s) with new one(s) before assembly.
	Use recommended engine oil, unless otherwise specified.
	Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1:1).
	Use multi-purpose grease (Lithium based multi-purpose grease NLGI #2 or equivalent).
	Use water resistant multi-purpose grease (Shell Alvania EP2 or Excelite EP2 (KYODO YUSHI CO. LTD) or equivalent).
	Use molybdenum disulfide grease (containing more than 3% molybdenum disulfide, NLGI #2 or equivalent). Example: Molykote® BR-2 plus manufactured by Dow corning U.S.A. Multi-purpose M-2 manufactured by Mitsubishi Oil, Japan
	Use molybdenum disulfide paste (containing more than 40% molybdenum disulfide, NLGI #2 or equivalent). Example: Molykote® G-n paste manufactured by Dow Corning, U.S.A. Honda Moly 60 (U.S.A. only) Rocol ASP manufactured by Rocol Limited, U.K. Rocol Paste manufactured by Sumico Lubricant, Japan
	Use silicone grease.
	Apply a locking agent. Use a middle strength locking agent unless otherwise specified.
	Apply sealant.
	Use DOT 3 or DOT 4 brake fluid. Use the recommended brake fluid unless otherwise specified.
	Use Fork or Suspension Fluid.

1. GENERAL INFORMATION

1

SERVICE RULES	1-1	REAR WHEEL/BRAKE/SUSPENSION SPECIFICATIONS	1-8
MODEL IDENTIFICATION	1-2	HYDRAULIC BRAKE SPECIFICATIONS	1-8
GENERAL SPECIFICATION	1-4	BATTERY/CHARGING SYSTEM SPECIFICATIONS	1-9
LUBRICATION SYSTEM SPECIFICATIONS	1-5	ELECTRIC STARTER SPECIFICATION	1-9
FUEL SYSTEM SPECIFICATIONS	1-5	IGNITION SYSTEM SPECIFICATIONS	1-9
CYLINDER HEAD/VALVE SPECIFICATIONS	1-5	LIGHTS/METER/SWITCHES SPECIFICATION	1-9
CYLINDER/PISTON SPECIFICATIONS	1-6	STANDARD TORQUE VALUES	1-10
CLUTCH/GEARSHIFT LINKAGE/ KICKSTARTER SPECIFICATIONS	1-6	ENGINE & FRAME TORQUE VALUES	1-10
ALTERNATOR/STARTER CLUTCH SPECIFICATIONS	1-6	LUBRICATION & SEAL POINTS	1-15
CRANKCASE CRANKSHAFT/ TRANSMISSION SPECIFICATION	1-7	CABLE & HARNESS ROUTING	1-18
FRONT WHEEL/SUSPENSION/ STEERING SPECIFICATIONS	1-7	EMISSION CONTROL SYSTEMS	1-25

SERVICE RULES

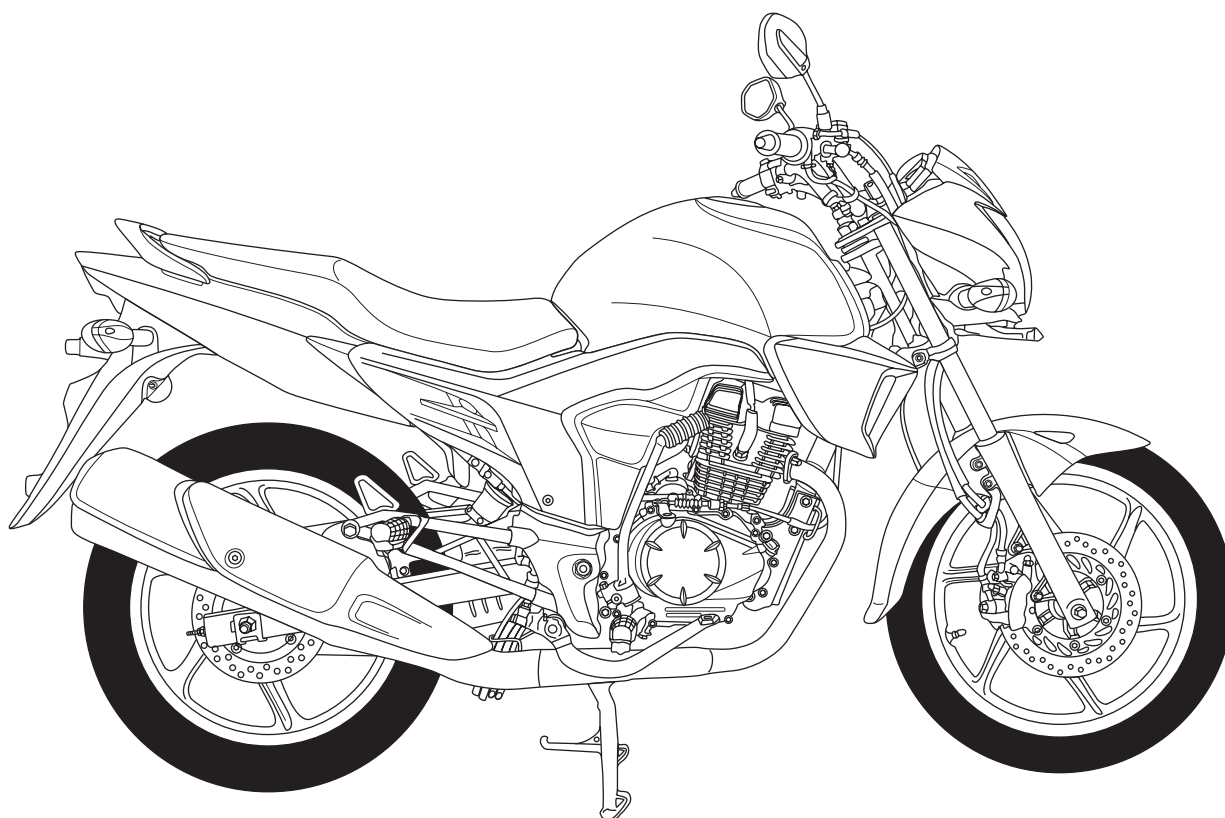
1. Use genuine Honda or Honda-recommended parts and lubricants or their equivalents. Parts that do not meet Honda's design specifications may cause damage to the motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing 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 1-18).

ABBREVIATION

Abbrev. term	Full term
PAIR	Pulse Secondary Air Injection

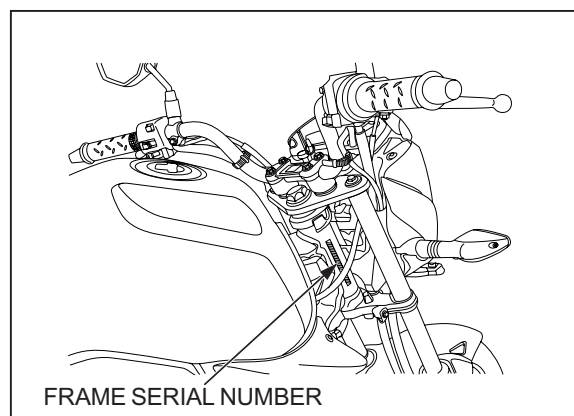
MODEL IDENTIFICATION

This manual covers 3 type of CBF 150 models.

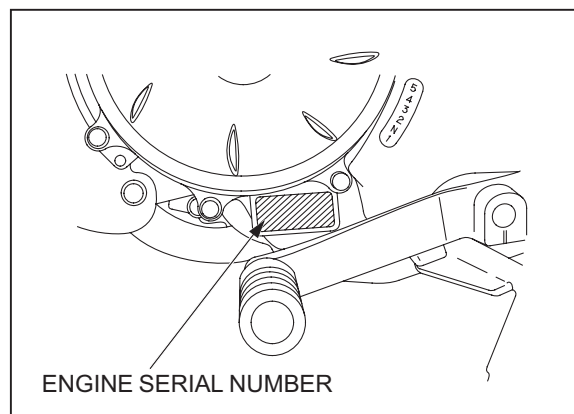


SERIAL NUMBERS

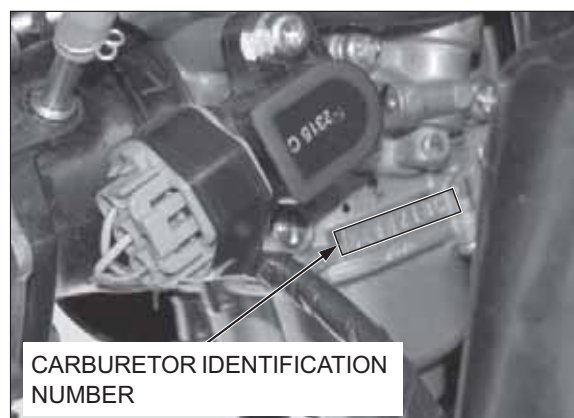
The Vehicle identification Number (V.I.N.) is stamped on the other right side of the steering head.



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

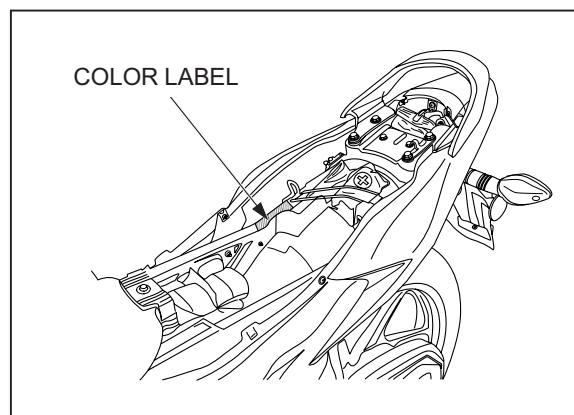


The carburetor identification number is stamped on the left side of the carburetor body.



LABEL

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



	ITEM	SPECIFICATION
DIMENSIONS	Overall length Overall width Overall height Wheelbase Seat height Footpeg height Ground clearance Dry weight (STD / DLX / CBS) Curb weight CBF150MD - ID (STD) CBF150MD - 2ID (DLX) CBF150MD - 3ID (CBS) Maximum weight capacity	2045 mm (80.5 in) 757 mm (29.8 in) 1060 mm (41.7 in) 1325 mm (52.1 in) 785 mm (30.9 in) 299 mm (11.7 in) 175 mm (6.8 in) 126 kg (280 lbs) / 127kg (279 lbs) / 128 kg (283 lbs) 136 kg (299.8 lbs) 137 kg (302 lbs) 138 kg (306.4 lbs) 170 kg (374.7 lbs)
FRAME	Frame type Front suspension Front wheel travel Rear suspension Rear wheel travel Rear damper Front tire size Rear tire size Front tire brand Rear tire brand Front brake Rear brake Drum type Disc type Caster angle Trail length Fuel tank capacity Fuel tank reserve capacity	Diamond type Telescopic fork 117 mm (4.6 in) Swingarm 113 mm (4.4 in) Both side operation 80/100-17 M/C 46P 110/80-17 M/C 57P MRF MRF Hydraulic Single Disc Mechanical Leading Trailing Hydraulic Single Disc 26° 94 mm (3.7 in) 12.0 liter (3.17 US gal, 2.63 Imp gal) 2 liter (0.52 US gal, 0.44 Imp gal)
ENGINE	Cylinder arrangement Bore and stroke Displacement Compression ratio Valve train Intake valve opens at 1 mm (0.04 in) lift closes at 1 mm (0.04 in) lift Exhaust valve opens at 1 mm (0.04 in) lift closes at 1 mm (0.04 in) lift Lubrication system Oil pump type Cooling system Air filtration Engine dry weight	Single cylinder inclined 15° from vertical 57.3 x 57.8 mm (2.26 x 2.28 in) 149.15 cm³ (5.87 in) 9.5:1 Chain driven OHC with rocker arm 5° BTDC 40° ABDC 30° BBDC 10° ATDC Forced pressure and wet sump Trochoid Air cooled Viscous paper filter 29.5 kg (65.03 lbs)
CARBURETOR	Carburetor type Throttle bore	CV (constant velocity) type 28 mm (1.10 in)
DRIVE TRAIN	Clutch system Clutch operation system Transmission Primary reduction Final reduction Gear ratio 1st 2nd 3rd 4th 5th Gearshift pattern	Multi-plate, wet Cable operating 5 Speed, Manual 3.350 (67/20) 2.800 (42/15) 3.076 (40/13) 1.789 (34/19) 1.304 (30/23) 1.090 (24/22) 0.937 (30/32) Left foot operated return system 1-N-2-3-4-5
ELECTRICAL	Ignition system Starting system Charging system Regulator/rectifier	DIGITAL DC - C.D.I. Electric starter motor and Kick starter Single phase output alternator Semi conductor type

LUBRICATION SYSTEM SPECIFICATION

	ITEM	STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	1.0 liter (1.1 US qt, 0.9 Imp qt)	–
	After disassembly	1.2 liter (1.3 US qt, 1.1 Imp qt)	–
Recommended engine oil		Honda 4-stroke oil or equivalent motor oil API service classification: MA Viscosity: SAE 10W-30	–
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.20 (0.006 – 0.008)	0.25 (0.010)
	Side clearance	0.05 – 0.11 (0.002 – 0.004)	0.15 (0.006)

FUEL SYSTEM SPECIFICATION

ITEM	SPECIFICATIONS
Carburetor identification number	AVK6AY
Main jet	#115
Slow jet	#35
Pilot screw initial opening	2 & 7/8 Turn out
Float level	13.0 mm (0.51in)
Engine Idle speed	1,400 ± 100 min-1 (rpm)
Throttle grip free play	2 ~ 6 mm (0.08 - 0.24 in)
PAIR control valve specified vacuum	58.7 kPa (440 mm Hg)

CYLINDER HEAD/VALVES SPECIFICATIONS

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression at 1,000 min-1 (rpm)			1100 kPa (11.2 kgf/cm ² , 159.3 psi)	–
Valve clearance		IN	0.08 (0.003)	–
		EX	0.12 (0.005)	–
Valve, valve guide	Valve stem O.D.	IN	4.975 – 4.990 (0.1959 – 0.1965)	4.92 (0.194)
		EX	4.955 – 4.970 (0.1951 – 0.1957)	4.90 (0.193)
	Valve guide I.D.	IN/EX	5.000 – 5.012 (0.1969 – 0.1973)	5.04 (0.198)
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)	0.07 (0.003)
		EX	0.030 – 0.057 (0.0012 – 0.0022)	0.09 (0.004)
	Valve guide height	IN/EX	16.8 – 17.0 (0.66 – 0.67)	–
	Valve seat width	IN/EX	0.9 – 1.1 (0.035 – 0.043)	1.5 (0.06)
Valve spring	Free length	INNER	38.76 (1.526)	37.89 (1.492)
		OUTER	35.95 (1.415)	35.14 (1.383)
Rocker arm	Arm I.D.	IN/EX	10.000 – 10.015 (0.3937 – 0.3943)	10.10 (0.398)
	Shaft O.D.	IN/EX	9.972 – 9.987 (0.3926 – 0.3932)	9.91 (0.390)
	Arm-to-shaft clearance	IN/EX	0.013 – 0.043 (0.0005 – 0.0017)	0.10 (0.004)
Camshaft	Cam lobe height	IN	32.994 – 33.234 (1.2990 – 1.3084)	32.96 (1.298)
		EX	32.880 – 33.120 (1.2945 – 1.3039)	32.85 (1.293)
Cylinder head warpage			–	0.05 (0.002)

GENERAL INFORMATION

CYLINDER/PISTON SPECIFICATIONS

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		57.300 – 57.310 (2.2559 – 2.2563)	57.40 (2.260)
	Out-of-round		–	0.10 (0.004)
	Taper		–	0.10 (0.004)
	Warpage		–	0.10 (0.004)
Piston, piston pin, piston ring	Piston O.D. at 10 (0.4) from bottom		57.280 – 57.295 (2.2551 – 2.2557)	57.20 (2.252)
	Piston pin hole I.D.		14.002 – 14.008 (0.5513 – 0.5515)	14.04 (0.553)
	Piston pin O.D.		13.994 – 14.000 (0.5509 – 0.5512)	13.96 (0.550)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.04 (0.002)
	Piston ring end gap	Top	0.10 – 0.25 (0.004 – 0.010)	0.40 (0.016)
		Second	0.10 – 0.25 (0.004 – 0.010)	0.40 (0.016)
		Oil (side rail)	0.20 – 0.70 (0.008 – 0.028)	0.85 (0.033)
	Piston ring-to-ring groove clearance	Top	0.030 – 0.060 (0.0012 – 0.0024)	0.10 (0.004)
Second		0.030 – 0.060 (0.0012 – 0.0024)	0.10 (0.004)	
Cylinder-to-piston clearance			0.005 – 0.030 (0.0002 – 0.0012)	0.09 (0.004)
Connecting rod small end I.D.			14.010 – 14.028 (0.5516 – 0.5523)	14.06 (0.554)
Connecting rod-to-piston pin clearance			0.010 – 0.034 (0.0004 – 0.0013)	0.10 (0.004)

CLUTCH/GEARSHIFT LINKAGE KICKSTARTER SPECIFICATIONS

ITEM		STANDARD	SERVICE LIMIT
Clutch lever free play		10 – 20 (0.4 – 0.8)	–
Clutch	Spring free length	40.5 (1.59)	39.6 (1.56)
	Disc thickness	2.92 – 3.08 (0.115 – 0.121)	2.6 (0.10)
	Plate warpage	–	0.20 (0.008)
Clutch outer I.D.		23.000 – 23.021 (0.9055 – 0.9063)	23.08 (0.909)
Clutch outer guide	O.D.	22.959 – 22.980 (0.9039 – 0.9047)	22.93 (0.903)
	I.D.	16.991 – 17.009 (0.6689 – 0.6696)	17.04 (0.671)
Mainshaft O.D. at clutch outer guide		16.966 – 16.984 (0.6680 – 0.6687)	16.95 (0.667)
Kickstarter idle gear I.D.		20.500 – 20.521 (0.8071 – 0.8079)	20.58 (0.810)
Kickstarter idle gear Guide	O.D.	20.459 – 20.480 (0.8055 – 0.8063)	20.43 (0.804)
	I.D.	17.000 – 17.018 (0.6693 – 0.6700)	17.04 (0.671)
Countershaft O.D. at Kickstarter idle gear guide		16.966 – 16.984 (0.6680 – 0.6687)	16.94 (0.667)
Kickstarter drive gear I.D.		16.016 – 16.034 (0.6305 – 0.6313)	16.06 (0.632)
Kickstarter spindle O.D. at Kickstarter drive gear		15.966 – 15.984 (0.6286 – 0.6293)	15.94 (0.628)

ALTERNATOR/STARTER CLUTCH SPECIFICATIONS

ITEM	STANDARD	SERVICE LIMIT
Starter driven gear boss O.D.	45.660 – 45.673 (1.7976 – 1.7981)	45.60 (1.795)

CRANKCASE CRANKSHAFT/TRANSMISSION SPECIFICATIONS

ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Runout		-	0.03 (0.001)
	Connecting rod big end radial clearance		0 – 0.008 (0 – 0.0003)	0.05 (0.002)
	Connecting rod big end side clearance		0.10 – 0.35 (0.004 – 0.014)	0.80 (0.032)
Transmission	Gear I.D.	M4, M5	20.000 – 20.021 (0.7874 – 0.7882)	20.05 (0.789)
		C1	20.500 – 20.521 (0.8071 – 0.8079)	20.55 (0.809)
		C2	23.020 – 23.041 (0.9063 – 0.9071)	23.07 (0.908)
		C3	23.025 – 23.046 (0.9065 – 0.9073)	23.07 (0.908)
	Bushing O.D.	M4, M5	19.959 – 19.980 (0.7858 – 0.7866)	19.91 (0.784)
		C1	20.459 – 20.480 (0.8055 – 0.8063)	20.41 (0.804)
		C2, C3	22.984 – 23.005 (0.9049 – 0.9057)	22.95 (0.904)
	Gear-to-bushing clearance	M4, M5, C1	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
		C2	0.015 – 0.057 (0.0006 – 0.0022)	0.10 (0.004)
		C3	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
	Bushing I.D.	M4, C1	17.000 – 17.018 (0.6693 – 0.6700)	17.04 (0.671)
		C2, C3	20.020 – 20.041 (0.7882 – 0.7890)	20.07 (0.790)
	Mainshaft / countershaft O.D.	M4, C1	16.966 – 16.984 (0.6680 – 0.6687)	16.93 (0.667)
		C2	19.978 – 19.989 (0.7865 – 0.7870)	19.94 (0.785)
		C3	19.979 – 20.000 (0.7866 – 0.7874)	19.94 (0.785)
	Bushing-to-shaft clearance	M4, C1	0.016 – 0.052 (0.0006 – 0.0020)	0.10 (0.004)
		C2	0.031 – 0.063 (0.0012 – 0.0025)	0.10 (0.004)
		C3	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
Shift fork, shift fork shaft	Shift fork shaft O.D.		9.986 – 9.995 (0.3931 – 0.3935)	9.93 (0.391)
	Shift fork I.D.		10.000 – 10.018 (0.3937 – 0.3944)	10.05 (0.396)
	Shift fork claw thickness		4.93 – 5.00 (0.194 – 0.197)	4.50 (0.177)

FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS

ITEM		STANDARD	SERVICE LIMIT
Minimum tire thread depth		–	1.5 (0.06)
Cold tire pressure	Driver only	175 kPa (1.75 kgf/cm², 25 psi)	–
	Driver and passenger	175 kPa (1.75 kgf/cm², 25 psi)	–
Axle runout		–	0.2 (0.01)
Wheel rim runout	Radial	–	1.0 (0.04)
	Axial	–	1.0 (0.04)
Fork	Spring free length	481 (18.93)	458 (18.03)
	Pipe runout	–	0.20 (0.008)
	Recommended fluid	Honda Ultra Cushion Oil No.10 (BHARAT SS-8)	–
	Fluid level	175 mm (6.88 in)	–
	Fluid capacity	156 cm³ ± 1.0 cm³ (5.27 ± 0.03 USoz, 5.49 ± 0.04 UKoz)	–
Steering head bearing pre-load		0.7 – 1.3 kgf (1.64 – 2.81 lbf)	–

GENERAL INFORMATION

REAR WHEEL/BRAKE/SUSPENSION SPECIFICATIONS

ITEM		STANDARD	SERVICE LIMIT
Minimum tire thread depth		–	2.0 (0.08)
Cold tire pressure	Driver only	200 kpa (2.00 kgf/cm ² , 29 psi)	–
	Driver and passenger	225 kpa (2.29 kgf/cm ² , 32 psi)	–
Axle runout		–	0.2 (0.01)
Wheel rim runout	Radial	–	1.0 (0.04)
	Axial	–	1.0 (0.04)
Drive chain	Size/link	428/126	–
	Slack	30 – 40 (1.1 – 1.5)	–
Brake	Pedal free play	20 – 30 (0.8 – 1.2)	–
	Drum I.D.	130.0 – 130.2 (5.12 – 5.13)	131.0 (5.16)

HYDRAULIC BRAKE SPECIFICATION

	ITEM		STANDARD	SERVICE LIMIT
Front	Specified brake fluid		DOT 3 or DOT 4	–
	Brake disc thickness		4 mm (0.15 in)	3.5 mm (0.13 in)
	Brake disc Runout		–	0.10 (0.004)
	Master cylinder I.D.	STD & DLX	12.700 - 12.743 (0.4999 - 0.5017)	12.775 (0.5029)
		CBS	11.000 - 11.043 (0.4331 - 0.4348)	11.055 (0.4352)
	Master Piston O.D.	STD & DLX	12.657 - 12.684 (0.4983 - 0.4994)	12.645 (0.4978)
		CBS	10.057 - 10.084 (0.4314 - 0.4324)	10.945 (0.4309)
	Caliper cylinder I.D. (STD & DLX)		25.400 - 25.450 (1.0000 - 1.0020)	25.460 (1.0024)
	Caliper cylinder I.D.(CBS)	Cylinder A	25.400 - 25.450 (1.0000 - 1.0020)	25.460 (1.0024)
		Cylinder B	22.650 - 22.700 (0.8917 - 0.8937)	22.710 (0.8941)
	Caliper piston O.D. (STD & DLX)		25.318 - 25.368 (0.9968 - 0.9987)	25.31 (0.996)
	Caliper piston O.D. (CBS)	Piston A	25.318 - 25.368 (0.9968 - 0.9987)	25.31 (0.996)
		Piston B	22.585 - 22.618 (0.8892 - 0.8905)	22.56 (0.888)
Rear	Specified brake fluid		DOT 3 or DOT 4	–
	Brake disc thickness		4 mm (0.15 in)	3.5 mm (0.13 in)
	Brake disc warpage		–	0.10 (0.004)
	Master cylinder I.D.	DLX	12.700 - 12.743 (0.4999 - 0.5017)	12.775 (0.5029)
		CBS	14.000 - 14.043 (0.5512 - 0.5529)	14.055 (0.5533)
	Master cylinder O.D.	DLX	12.657 - 12.684 (0.4983 - 0.4994)	12.645 (0.4978)
		CBS	13.957 - 13.984 (0.5495 - 0.5529)	13.945 (0.5490)
	Caliper cylinder I.D.		32.030 - 32.080 (1.2610 - 1.2629)	32.090 (1.2634)
	Caliper piston O.D.		31.948 - 31.998 (1.2578 - 1.2598)	31.94 (1.2575)
	Brake Pedal Height		66.0 - 68.0 (2.60 - 2.67)	–

BATTERY/CHARGING SYSTEM SPECIFICATIONS

ITEM			SPECIFICATIONS
Battery	Capacity		12 V – 4 Ah
	Current leakage		0.096 mA max.
	Voltage	Fully charged	12.5 – 13.0 V
		Needs charging	Below 12.4 V
Alternator	Capacity		0.14 kW/5,000 min-1 (rpm)
	Charging coil resistance(20° C/68° F)		0.2 – 1.0 Ω

ELECTRIC STARTER SPECIFICATIONS

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	10.00 – 10.05 (0.394 – 0.396)	6.5 (0.26)

IGNITION SYSTEM SPECIFICATIONS

ITEM		SPECIFICATION
Spark plug	Standard	CPR8EA-9 (NGK)
Spark plug gap		0.8 – 0.9 mm (0.03 – 0.04 in)
Ignition coil primary peak voltage		100 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Ignition timing ("F" mark)		8° BTDC at idle
Throttle position sensor	Input voltage	4.75 – 5.25 V
	Resistance (20×C/68×F)	4.0 – 6.0 Ω

LIGHTS/METER/SWITCHES SPECIFICATIONS

ITEM			SPECIFICATION
Bulbs	Headlight (Hi/low beam)		12 V - 35/35 W
	Position Light		12V - 5W
	Brake/tail light (LED)		12 V - 3.5/0.7 W
	Turn signal light		12 V - 10 W x 4
	Instrument light		LED
	Turn signal indicator		LED
	High-beam indicator		LED
	Neutral indicator		LED
Fuse	Main		20A
	Sub		15A & 10A
Fuel level sensor resistance (20°C/68°F)	Full		6 - 9 Ω
	Empty		266 - 274 Ω
Resistor comp (20°C/68°F)	Resistance		150 ± 7.5 Ω
	Power		5W

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 (0.5, 3.6)	5 mm screw	4 (0.4, 2.9)
6 mm bolt and nut (Include SH flange bolt)	10 (1.0, 7)	6 mm screw	9 (0.9, 6.5)
8 mm bolt and nut	22 (2.2, 16)	6 mm flange bolt (Include NSHF) and nut	12 (1.2, 9)
10 mm bolt and nut	34 (3.5, 25)	8 mm flange bolt and nut	26 (2.7, 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.

NOTE

1. Apply engine oil to the threads and seating surface.
2. Apply locking agent to the threads.
3. U-nut
4. Apply grease to the threads.

ENGINE

MAINTENANCE

ITEM	QTY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Spark plug	1	10	16 (1.6, 12)	NOTE 1
Valve adjusting lock nut	2	6	14 (1.4, 10)	
Timing hole cap	1	14	10 (1.0, 7)	
Crankshaft hole cap	1	32	15 (1.5, 11)	NOTE 4
Oil drain bolt	1	12	30 (3.1, 22)	
Oil filter rotor cover screw	3	5	4 (0.4, 3.0)	

LUBRICATION

ITEM	QTY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Oil pump plate screw	1	4	3 (0.3, 2.2)	
Oil pump mounting bolt	2	6	12 (1.2, 9)	

FUEL SYSTEM

ITEM	QTY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
SE valve lock nut	1	10	2.3 (0.2, 1.7)	Page 1-12
Carburetor drain screw	1	6	1.5 (0.2, 1.1)	
Slow jet	1	5	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, 1.6)	
Float chamber screw	3	4	2.1 (0.2, 1.6)	
SE valve cover screw	2	5	3.4 (0.4, 2.5)	
Vacuum chamber cover screw	2	4	2.1 (0.2, 1.6)	
Throttle cable stay screw	2	5	3.4 (0.4, 2.5)	
Insulator band screw	1	5	1 (0.1, 0.7)	
Fuel valve lock nut	1	16	27 (2.8, 20)	

CYLINDER HEAD/VALVES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder head cover bolt	2	6	10 (1.0, 7)	NOTE 1
Rocker arm shaft bolt	2	5	5 (0.5, 3.7)	
Cam sprocket bolt	2	5	9 (0.9, 6.6)	
Cam shaft holder bolt	4	8	32 (3.3, 24)	
Carburetor insulator bolt	2	6	12 (1.2, 9)	
Cam chain tensioner lifter plug	1	6	4 (0.4, 3.0)	

CYLINDER/PISTON

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder stud bolt	4	8	11 (1.1, 8)	page no. 1-12

CLUTCH/GEARSHIFT LINKAGE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Clutch center lock nut	1	14	74 (7.5, 55)	NOTE 1
Clutch lifter plate bolt	4	6	12 (1.2, 9)	
Oil filter rotor lock nut	1	14	64 (6.5, 47)	NOTE 1
Gear shift cam bolt	1	6	12 (1.2, 9)	NOTE 2
Shift drum stopper arm bolt	1	6	12 (1.2, 9)	NOTE 2

ALTERNATOR/STARTER CLUTCH

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Flywheel lock nut	1	14	74 (7.5, 55)	NOTE 1
Starter clutch bolt	6	6	16 (1.6, 12)	NOTE 2
Ignition pulse generator mounting bolt	2	6	12 (1.2, 9)	NOTE 2
Wire guide bolt	1	6	12 (1.2, 9)	NOTE 2

CRANKSHAFT/TRANSMISSION

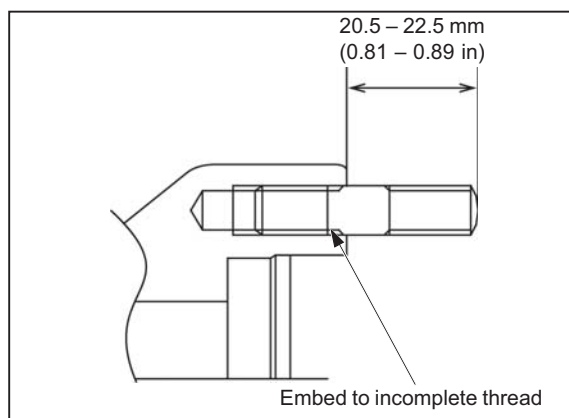
ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Mainshaft bearing setting plate bolt	2	6	12 (1.2, 9)	NOTE 2
Crankshaft bearing retainer plate bolt	3	6	12 (1.2, 9)	
Push plug bolt	1	6	10 (1.0, 7)	NOTE 2

OTHERS

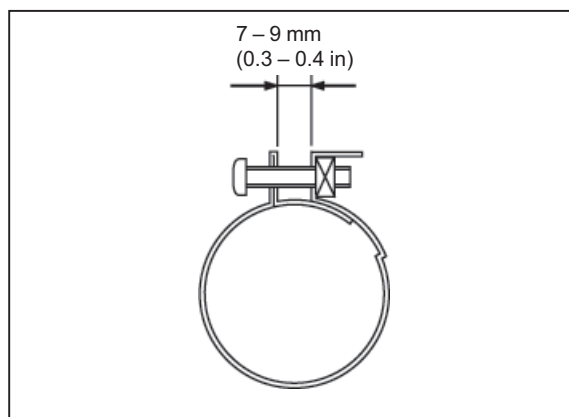
ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Clutch lever pivot bolt	1	6	1 (0.1, 0.7)	
Clutch lever pivot nut	1	6	5.9 (0.6, 4.4)	

GENERAL INFORMATION

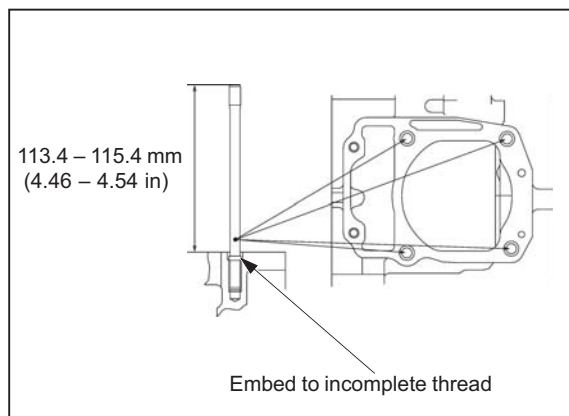
EXHAUST PIPE STUD BOLT:



INSULATOR BAND SCREW:



CYLINDER STUD BOLT:



FRAME**FRAME/BODY PANELS/EXHAUST SYSTEM**

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Exhaust pipe stud bolt	2	8	11 (1.1, 8)	

ENGINE REMOVAL/INSTALLATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Front engine hanger nut	2	8	26 (2.7, 19)	
Rear engine hanger nut	2	10	54 (5.5, 40)	
Drive sprocket fixing plate bolt	2	6	12 (1.2, 9)	

FRONT WHEEL/BRAKE/SUSPENSION/STEERING

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Front brake disc bolt	6	8	42 (4.3, 32)	NOTE 2
Front axle nut	1	12	59 (6.0, 44)	NOTE 3
Handlebar lower holder nut	2	8	26 (2.7, 19)	NOTE 3
Handlebar upper holder bolt	4	8	22 (2.2, 16)	
Master cylinder holder bolt	2	6	9 (0.9, 7)	
Rear view mirror lock nut	2	10	34 (3.5, 25)	
Fork socket bolt	2	8	20 (2.0, 15)	NOTE 2
Fork cap	2	26	22 (2.2, 16)	
Bottom bridge pinch bolt	2	8	32 (3.3, 24)	
Top bridge bolt	2	8	44 (4.5, 33)	
Steering bearing adjustment nut	1	26	3.4	
Steering stem nut	1	24	74 (7.5, 55)	

REAR WHEEL/BRAKE/SUSPENSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear brake disc bolt	6	8	42 (4.3, 32)	
Driven sprocket nut	4	10	64 (6.5, 47)	NOTE 3
Rear axle nut	1	14	88 (8.9, 65)	NOTE 3
Shock absorber mounting nut	2	10	44 (4.5, 33)	NOTE 3
Swingarm pivot nut	1	14	54 (5.5, 40)	NOTE 3

HYDRAULIC BRAKE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Caliper bleeder valve	1	10	5.4 (0.55, 3.9)	
Master cylinder reservoir cap screw	2	4	1.5 (0.2, 1.1)	
Brake caliper mounting bolt	2	8	30 (3.1, 22)	
Front brake light switch screw	1	4	1.2 (0.1, 0.9)	
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)	
Front brake caliper pin	2	8	17 (1.7, 12)	
Rear brake caliper hangar pin	1	10	17 (1.7, 12)	
Rear M/C (Step holder fitting use)	1	6	12 (1.2, 9)	
Rear brake caliper main nut	1	12	22 (2.2, 16)	NOTE 2

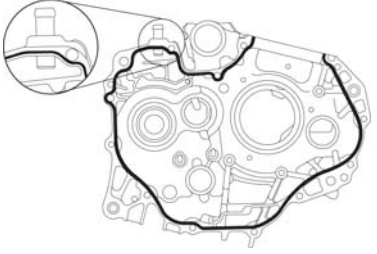
GENERAL INFORMATION

CARBURETOR				
ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Throttle position sensor screw	1	5	3.4 (0.4, 2.5)	

LIGHTS/METER/SWITCHES				
ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Fuel level sensor mounting nut	4	6	10 (1.0, 7)	

LUBRICATION & SEAL POINTS

ENGINE

LOCATION	MATERIAL	REMARKS
Crankcase mating area 	Liquid sealant	
Alternator wire grommet seating surface Oil pump rotors Oil through sliding area Oil pump drive gear teeth Rocker arm shaft entire surface Rocker arm inner surface and roller surface Camshaft lobes Cam chain entire surface Cylinder inner surface Piston outer surface and piston rings Clutch disc entire surface Primary drive gear teeth Primary driven gear teeth Clutch lifter rod sliding surface Gearshift spindle journal rotating area Electric starter idle gear shaft entire surface Electric starter idle gear teeth Electric starter driven gear teeth Transmission gear teeth Shift fork shaft sliding area Shift drum journal rotating area Each bearing rotating area Each O-ring	Engine oil	
Each dust seal lip Each oil seal lip Crankshaft hole cap threads	Multi-purpose grease	
Valve stem sliding surface Piston pin entire surface Clutch outer guide entire surface Clutch outer rotating area Starter clutch rolling surfaces Crankshaft connecting rod big end needle bearing Crankshaft connecting rod small end inner surface Crankshaft bearing push plug entire surface M4, M5, C1, C2, C3 gear rotating surface M4, M5, C1, C2, C3 gear bushing entire surface M3, C4, C5 gear shift fork grooves	Molybdenum oil solution (a mixture of engine oil and molybdenum disulfide grease in a ratio of 1:1)	

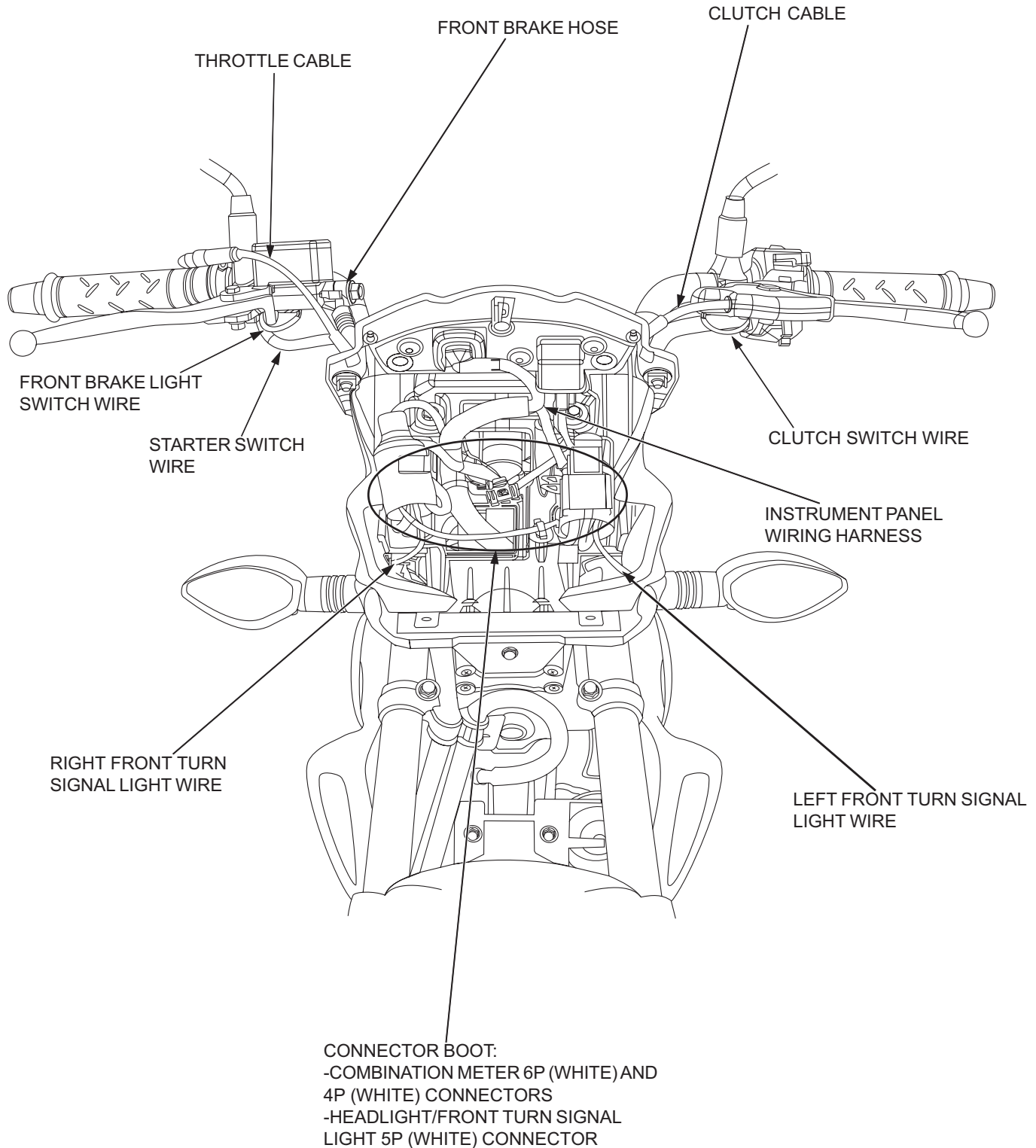
GENERAL INFORMATION

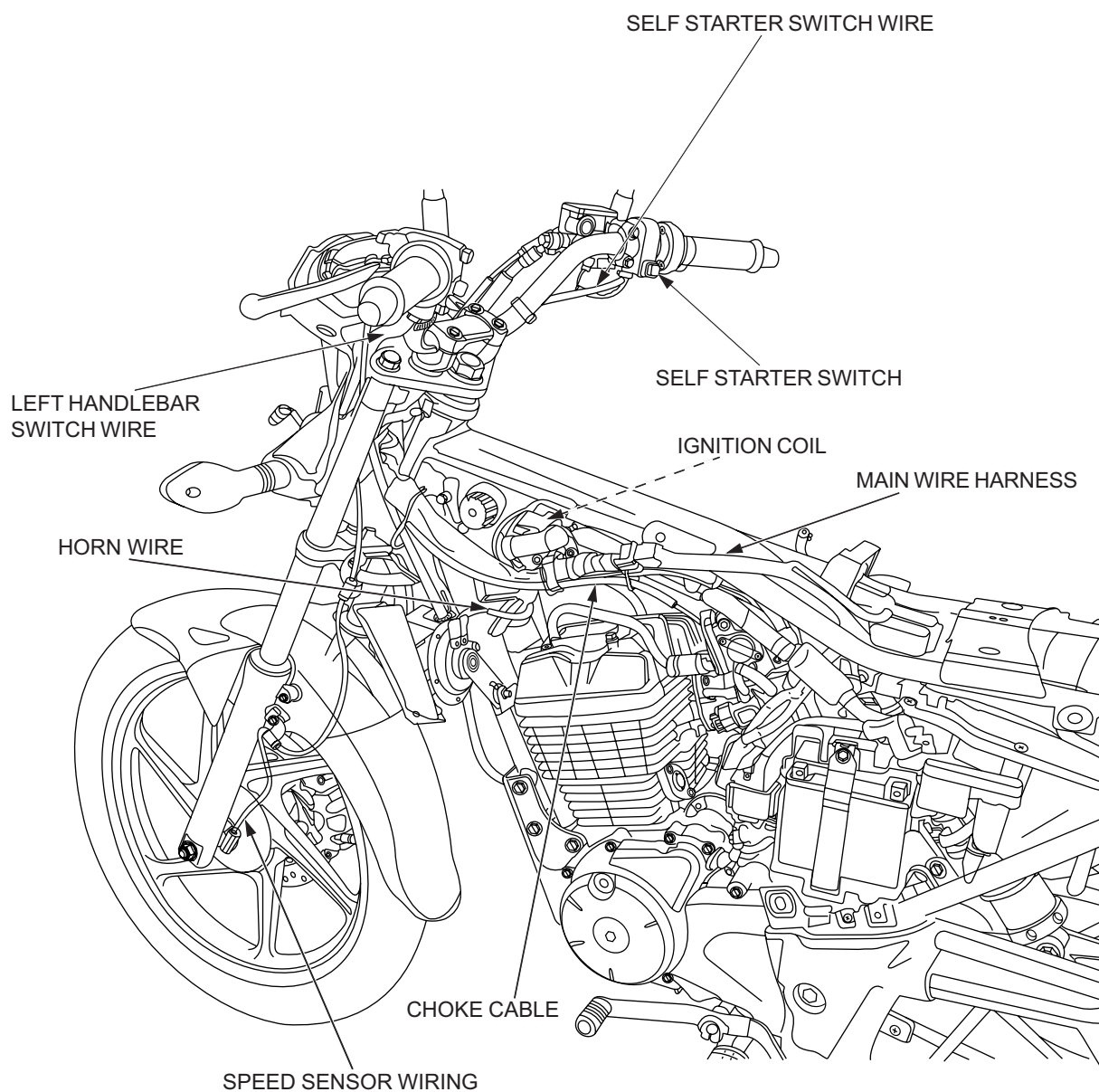
LOCATION	MATERIAL	REMARKS
Shift drum stopper arm bolt threads	Locking agent	Coating width: 6.5 ± 1.0 mm from tip
Gear shift cam bolt threads		Coating width: 6.5 ± 1.0 mm from tip
Starter clutch bolt threads		Coating width: 6.5 ± 1.0 mm from tip
Ignition pulse generator mounting bolt threads		Coating width: 6.5 ± 1.0 mm from tip
Mainshaft bearing setting plate bolt threads		Coating width: 6.5 ± 1.0 mm from tip
Alternator stator wire guide bolt threads		Coating width: 6.5 ± 1.0 mm from tip
Crankshaft bearing push plug bolt threads		Coating width: 6.5 ± 1.0 mm from tip

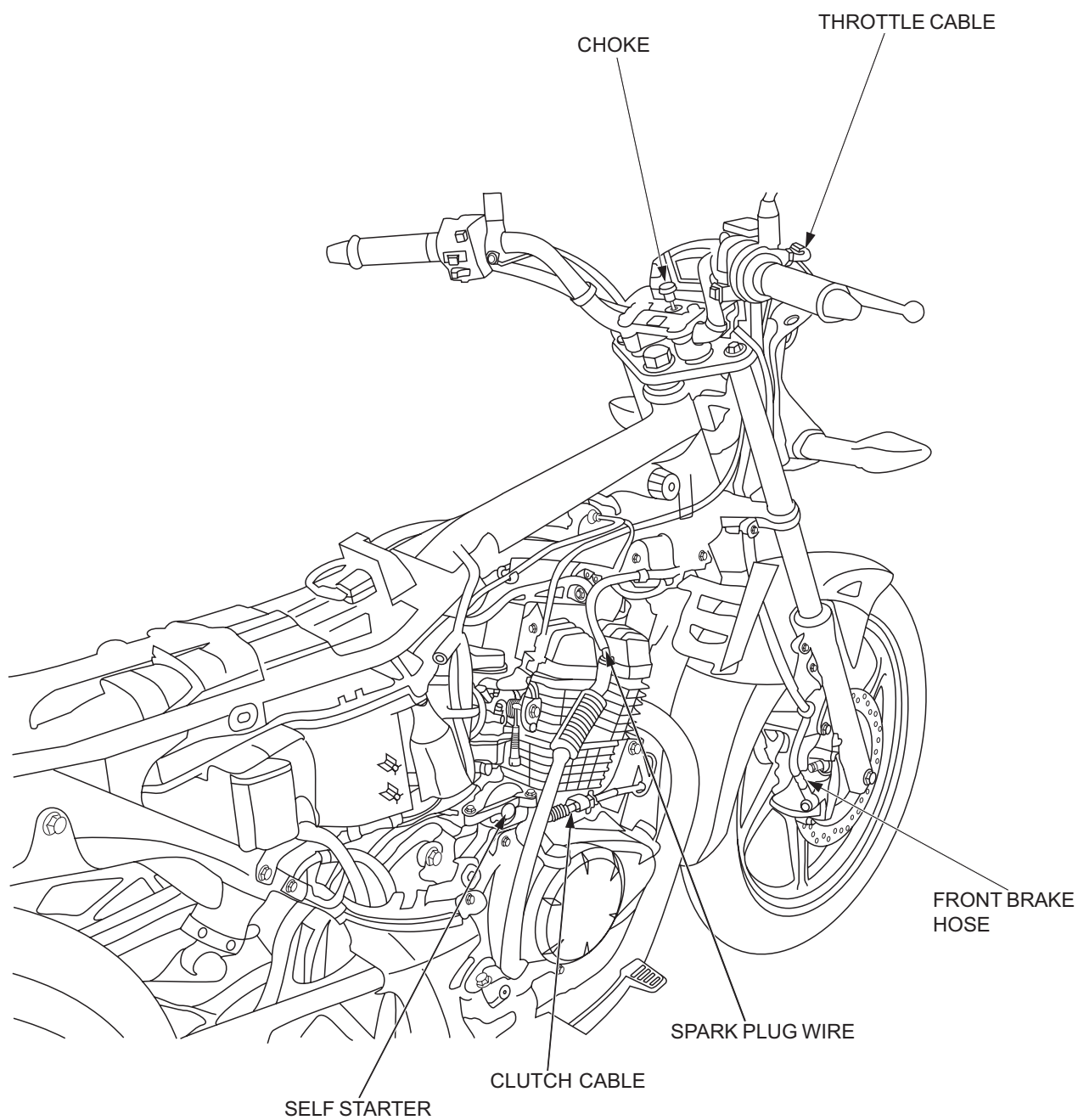
FRAME

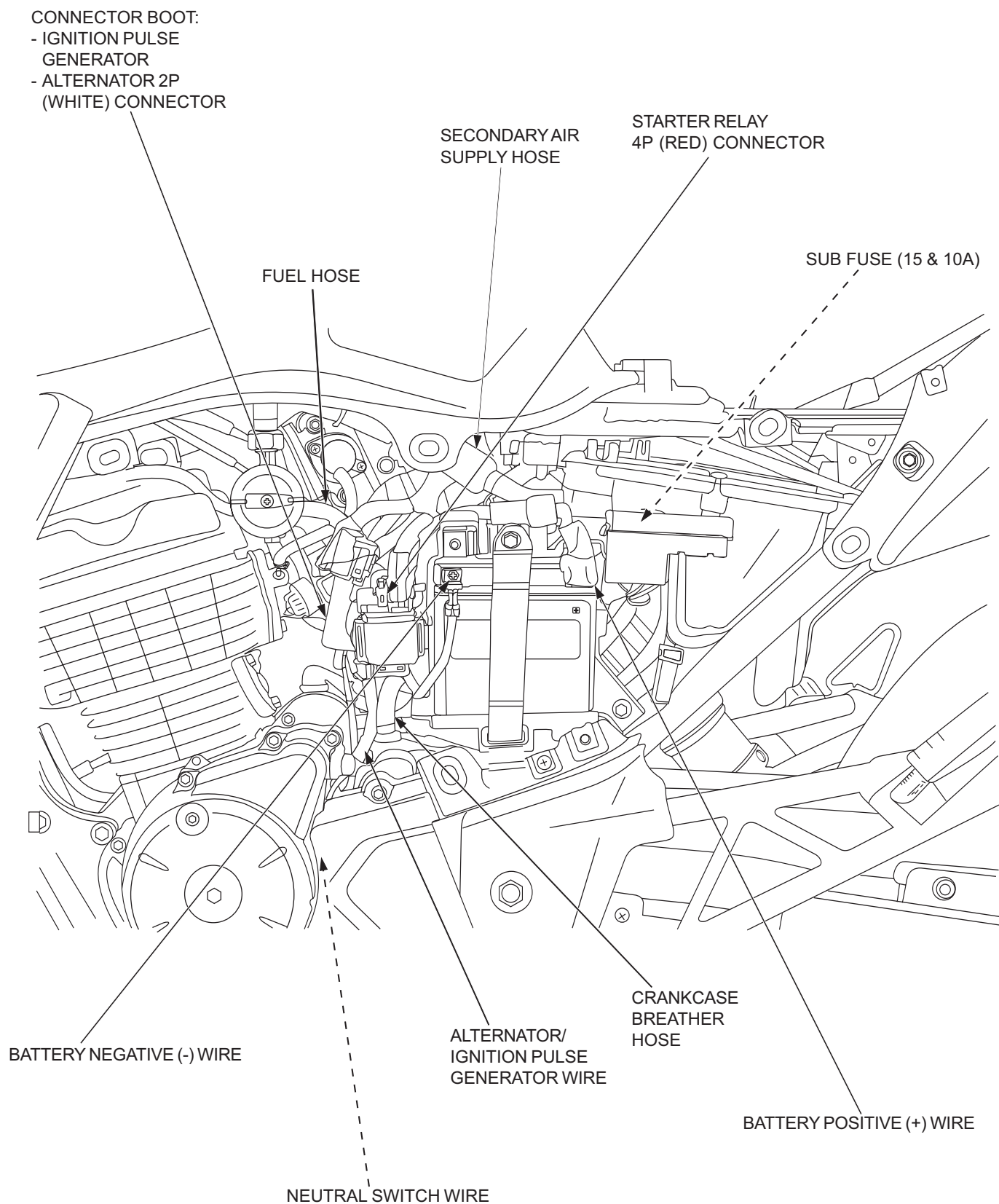
LOCATION	MATERIAL	REMARKS
Steering head bearings Steering head cone race Steering head bearing dust seal lips Speed sensor dust seal lip Speed sensor magnet	Use Water resistant multi-purpose grease (Shell Alvania EP2 or Excelite EP2 (KYODO YUSHI CO. LTD) or equivalent)	Apply Min 3g Apply Min 3g Apply Min 3g Spreading Spreading
Axle bolt surface Wheel distance collar surface Front wheel dust seal lips Driven flange dust seal lip Rear wheel hub O-ring Rear brake cam rotating surface and shoe contacting area Rear brake panel anchor pin Swingarm needle bearings Swingarm pivot collar surface Swingarm pivot dust seal cap lips Swingarm pivot bolt and nut threads Center stand pivot Rear brake pedal pivot rotating area Throttle grip pipe rotating area Clutch lever pivot Brake lever pivot Brake master cylinder push rod contacting area Brake caliper pin boot inner surface Brake caliper pin sliding surface Each dust seal lips Each bearing rotating area Each O-ring	Multi-purpose grease	
Rear brake cam felt seal	Gear oil (IDEMITSU AUTOLUB 30 or MECHANIC OIL 44 or equivalent)	
Drive chain	Gear oil (SAE #80 – 90)/Molten grease	
Throttle cable boot inside and connecting area Clutch cable boot inside and connecting area	Silicone grease	
Brake master cylinder piston cups	DOT3 or DOT4 brake fluid	
Throttle cable case inside Clutch cable case inside	Molybdenum oil solution (a mixture of engine oil and molybdenum disulfide grease in a ratio of 1:1)	
Fork socket bolt threads Ignition switch mounting bolt threads	Locking agent	
Fork cap O-ring Fork oil seal lips	Fork fluid	
Handlebar grip inner surface	Honda Bond A or equivalent	

CABLE & HARNESS ROUTING

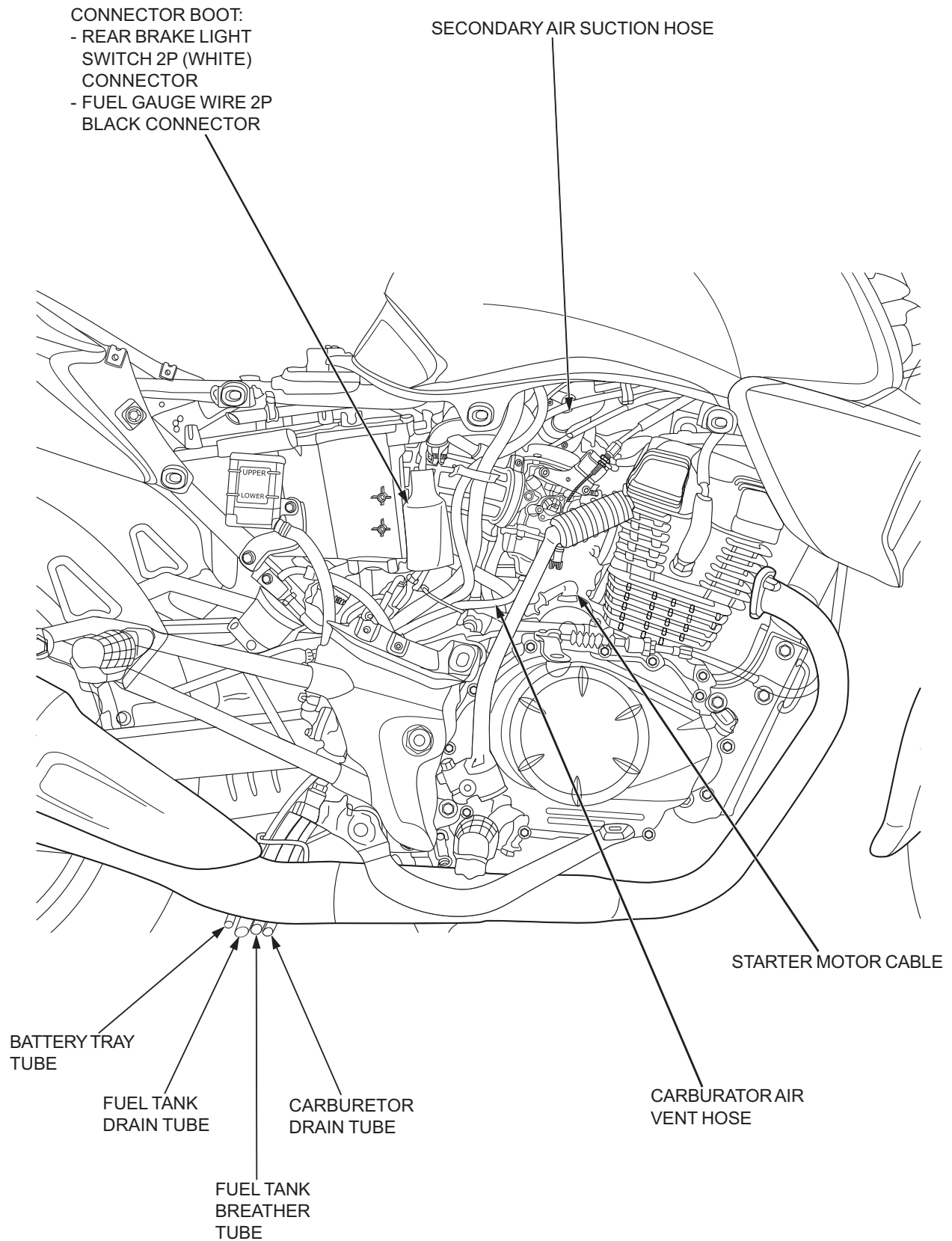


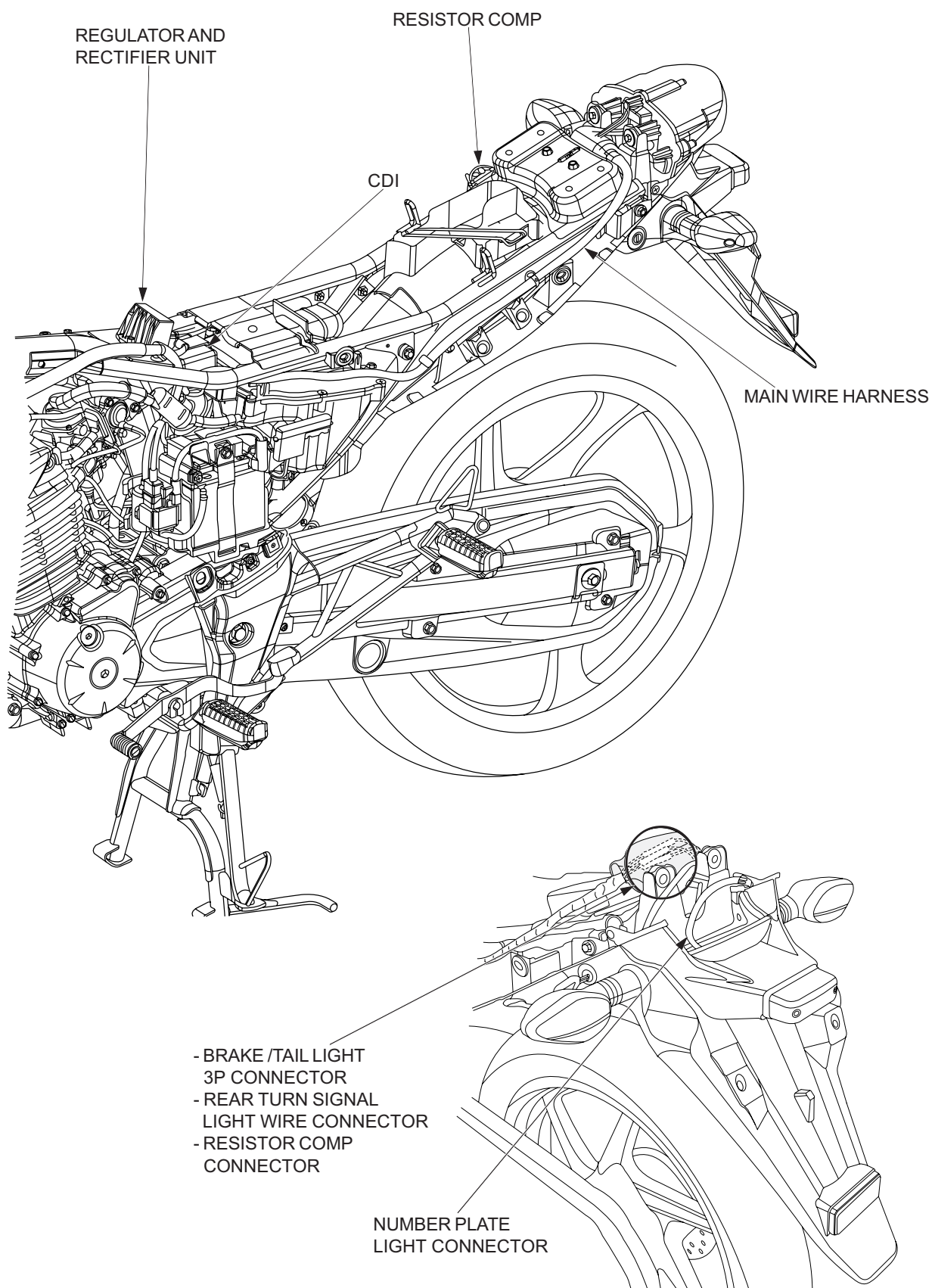






GENERAL INFORMATION





EMISSION CONTROL SYSTEMS

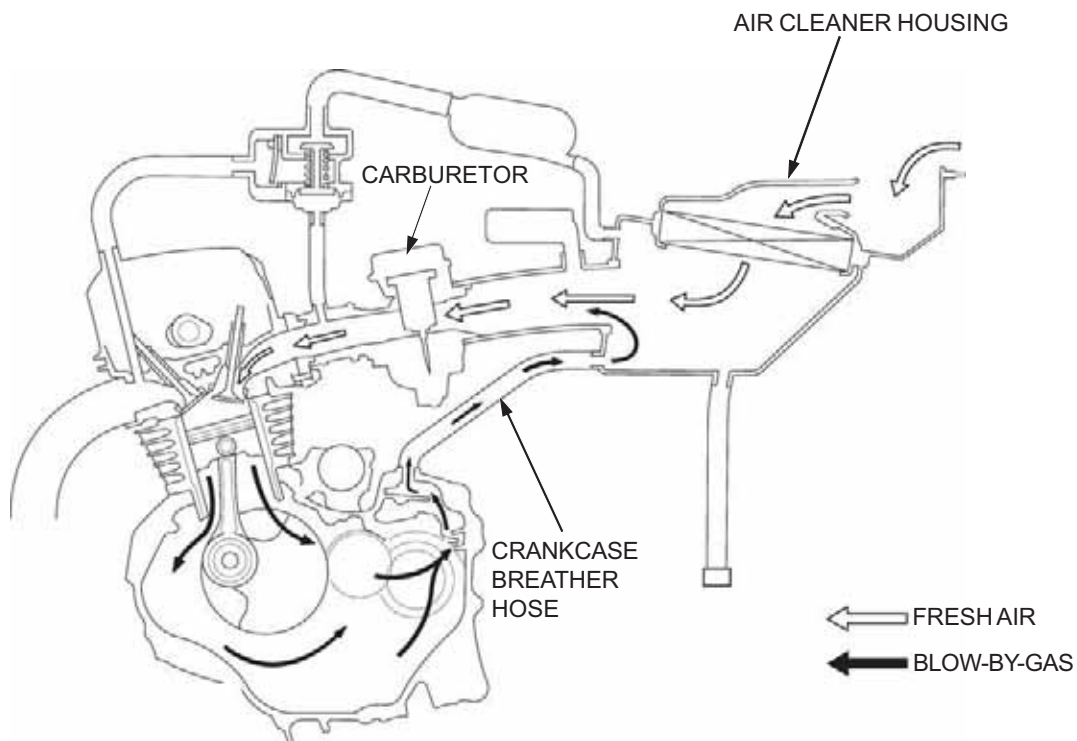
SOURCE OF EMISSIONS

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

Honda Motor Co., Ltd. utilizes 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

The exhaust emission control system is composed of a pulse secondary air injection system and lean carburetor settings.

No adjustment should be made except idle speed adjustment with the throttle stop screw. The exhaust emission control system is separate from the crankcase emission control system.

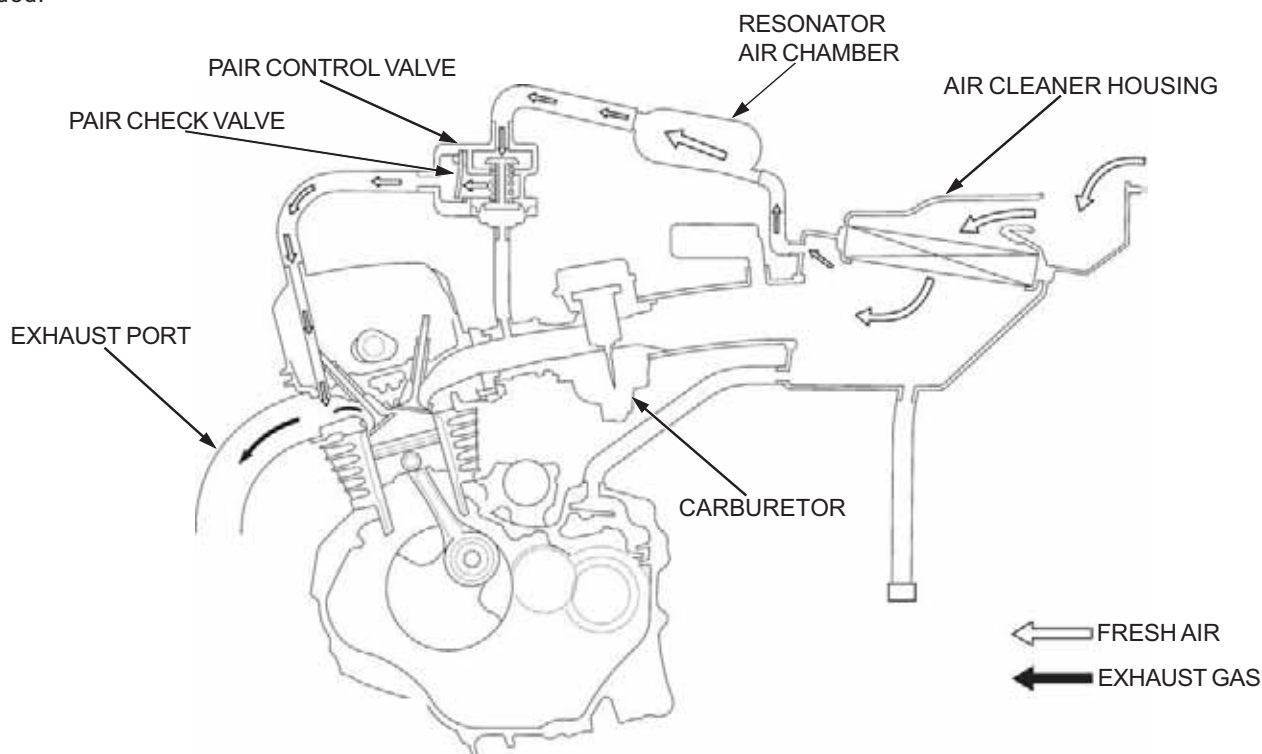
SECONDARY AIR SUPPLY SYSTEM

The secondary air supply system introduces filtered air into the exhaust gases in the exhaust port. Fresh air is drawn into the exhaust port by the function of the PAIR control valve.

This charge of fresh air promotes burning of the unburned exhaust gases and changes a considerable amount of hydrocarbons and carbon monoxide into relatively harmless carbon dioxide and water vapor.

The reed valve prevents reverse air flow through the system. The PAIR control valve reacts to high intake manifold vacuum and will cut off the supply of fresh air during engine deceleration, thereby preventing afterburn in the exhaust system.

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



OXIDATION CATALYTIC CONVERTER

This motorcycle is equipped with an oxidation catalytic converter.

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

NOISE EMISSION CONTROL SYSTEM

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

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

1. Removal of or puncturing of the muffler, 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

2

SERVICE INFORMATION	2-1	FUEL TANK	2-3
TROUBLESHOOTING	2-1	FRONT FENDER	2-4
FRONT COWL	2-2	REAR GRIP	2-4
COVER HEADLIGHT RR	2-2	REAR COWL	2-5
FRONT COWL DISASSEMBLY	2-2	REAR FENDER	2-6
SEAT	2-2	SAREE GUARD	2-6
RIGHT SIDE COVER	2-3	EXHAUST PIPE/MUFFLER	2-7
LEFT SIDE COVER	2-3	MUFFLER PROTECTOR	2-7
RIGHT / LEFT SHROUD	2-3		

SERVICE INFORMATION

GENERAL

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where the gasoline is stored can cause a fire or explosion.
- This section covers removal and installation of the body panels, fuel tank and exhaust system.
- Serious burns may result if the exhaust system is not allowed to cool before components are removed or serviced.
- Always replace the exhaust pipe gasket with a new one after loosening or removing the exhaust pipe joint nuts.
- When installing the exhaust system, loosely install all of the exhaust pipe/muffler fasteners, always tighten the exhaust pipe joint nuts first, then tighten the mounting bolt and nut, if you tighten the mounting bolt and nut first, the exhaust pipe may not seat properly.
- Always inspect the exhaust system for leaks after installation.

TORQUE VALUES

Stud bolt	11 N·m (1.1 kgf·m, 8 lbf·ft)	See page 2-7
Muffler mounting bolt	26 N·m (2.6 kgf·m, 19.18 lbf·ft)	

TROUBLESHOOTING

Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leak

Poor performance

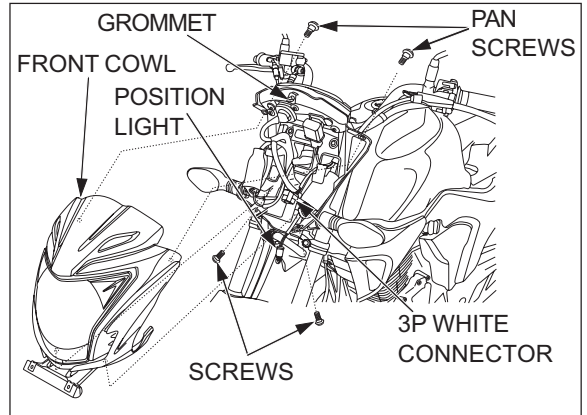
- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

FRONT COWL

Align the grommet with front cowl

REMOVAL/INSTALLATION

- Remove the front cowl pan screws (2 nos.).
- Remove screws (2 nos.) from the bottom side.
- Disconnect 3P white connector (Headlight).
- Carefully remove the position light 2P connector from the wire harness.
- Remove the front cowl.
- Installation is in the reverse order of removal.



COVER HEADLIGHT RR

REMOVAL / INSTALLATION

- Remove the 12 P grey connector from combination meter.
- Remove screws (3 nos.) from the bottom side of combination meter to disassemble it from the RR comp.

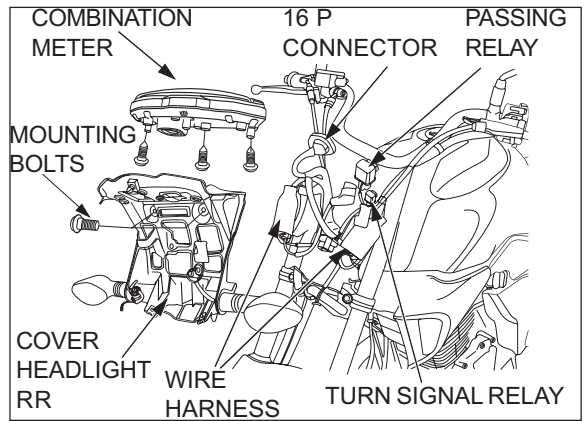
NOTICE

The process of combination meter disassembly is given (page 17-5).

Disconnect 2 wires of both the wipers and all the couplers in both the wiring harness.

Remove passing relay and turn signal relay from cover headlight and remove mounting bolts (2 nos) from cover head light.

Installation is in the reverse order of removal.

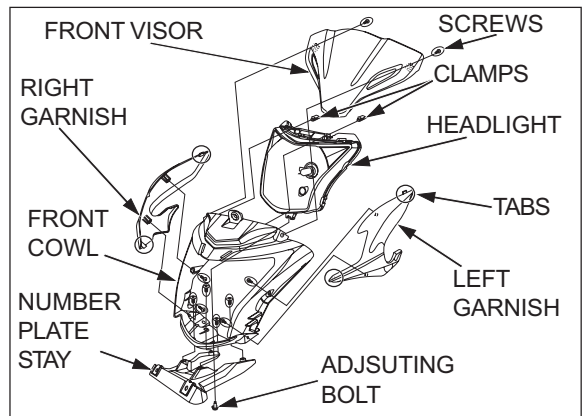


FRONT COWL DISASSEMBLY

REMOVAL/INSTALLATION

- Remove the front visor screw (2 nos.) to take it out carefully.
- Remove the headlight adjusting bolt (1 no.).
- Remove the overhead clamps (2 nos.) and release the headlight from the tabs carefully.
- Remove the right and left garnish by removing screws (4 nos.) and tabs carefully.
- Remove the number plate stay by removing screws (4 nos.)

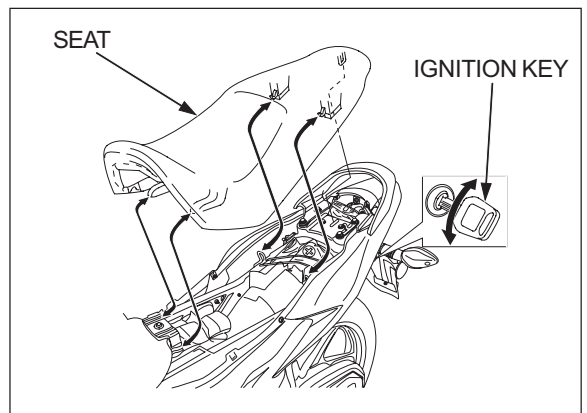
Installation is in the reverse order of removal.



SEAT

REMOVAL/INSTALLATION

- Insert the ignition key into the seat lock and turn it clockwise.
- Slide seat backward and remove the seat.
- Install the seat, while aligning its hook with the bracket on the frame and press it to lock and remove the ignition key.



RIGHT SIDE COVER

Be careful not to damage the side cover boss.

REMOVAL/INSTALLATION

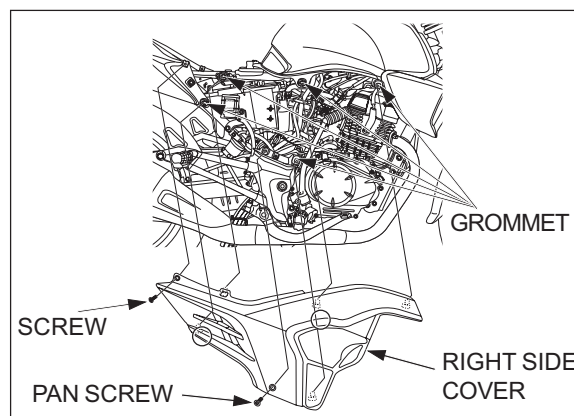
Remove the seat (page 2-2).

Remove the right side cover pan screw (1 nos.) and screw (1 no.) from the rear cowl.

Carefully release the right side cover boss (5 nos.) from the grommet.

Remove the right side cover.

Installation is in the reverse order of removal.



LEFT SIDE COVER

Be careful not to damage the side cover boss.

REMOVAL/INSTALLATION

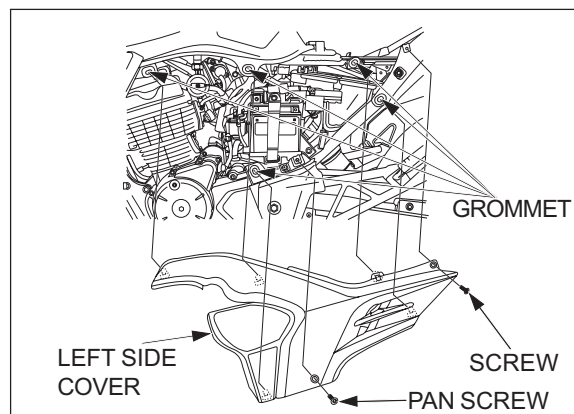
Remove the seat (page 2-2).

Remove the left side cover pan screw (1 nos.) and screw (1 no.) from the rear cowl.

Release the left side cover boss (5 nos.) from the grommet.

Remove the left side cover.

Installation is in the reverse order of removal.



RIGHT/LEFT SHROUD

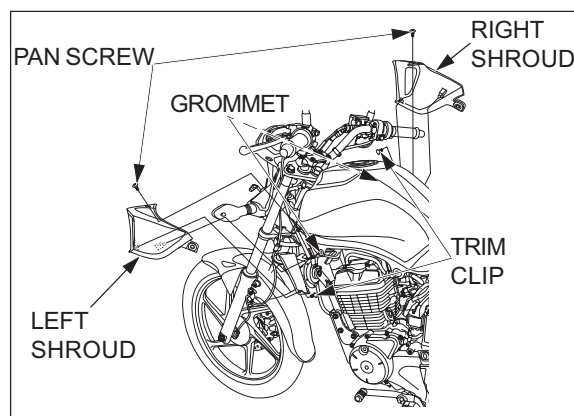
REMOVAL/INSTALLATION

Remove both side shroud pan screw (1 no.).

Remove both side shroud trim clip (1 no.) each side.

Carefully remove the shroud from fuel tank grommet / side cover.

Installation is in the reverse order of removal.



FUEL TANK

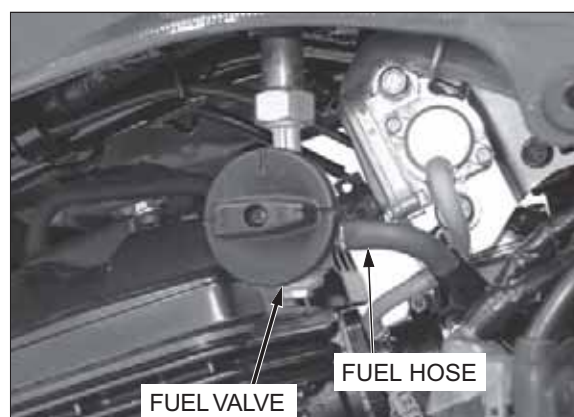
Wipe the spilled gasoline off at once.

REMOVAL/INSTALLATION

Remove the following :

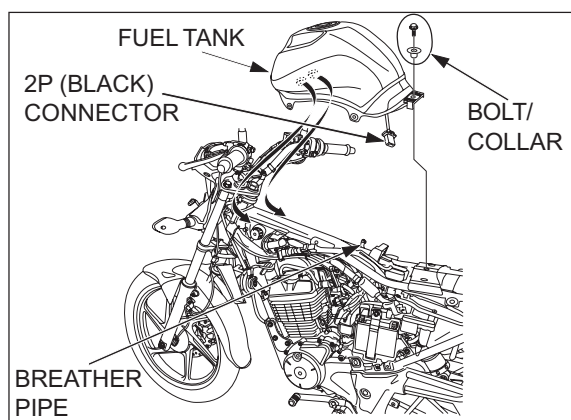
- remove the seat (page 2-2).
- right side cover (page 2-3).
- left side cover (page 2-3).
- remove the shroud (page 2-3).

Turn the fuel valve to "OFF" position, and disconnect the fuel hose from the fuel valve.



FRAME/BODY PANELS/EXHAUST SYSTEM

- After installation, turn the fuel valve "ON", and make sure that there are no fuel leaks.*
- Remove the fuel tank mounting bolt and collar.
 - While raising the fuel tank disconnect the fuel unit 2P (Black) connector.
 - Disconnect the breather pipe from fuel tank.
 - Pull back and remove the fuel tank.
 - Installation is in the reverse order of removal.



FRONT FENDER

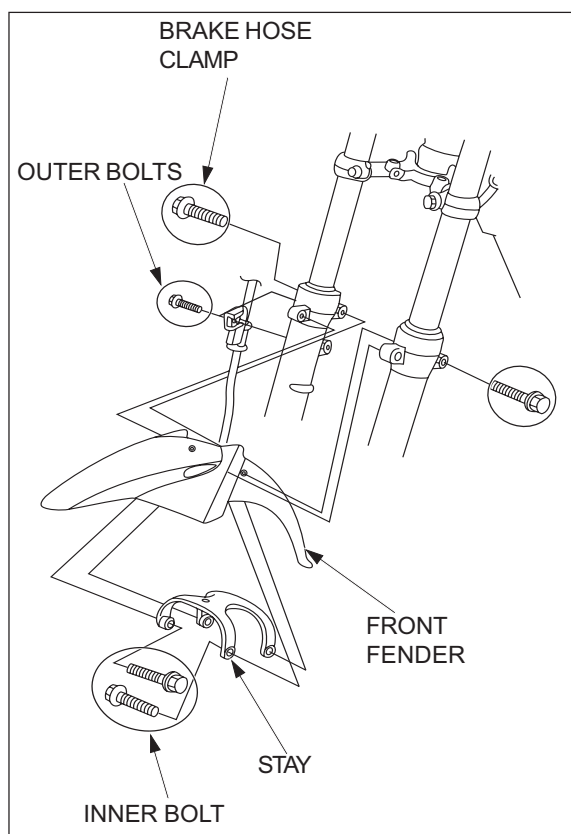
REMOVAL/INSTALLATION

Remove the front wheel (page 12-10).

Remove the following :

- Inner bolts (2 nos.)
- Outer bolts (2 nos.)
- Front fender and stay.

Installation is in the reverse order of removal.



REAR GRIP

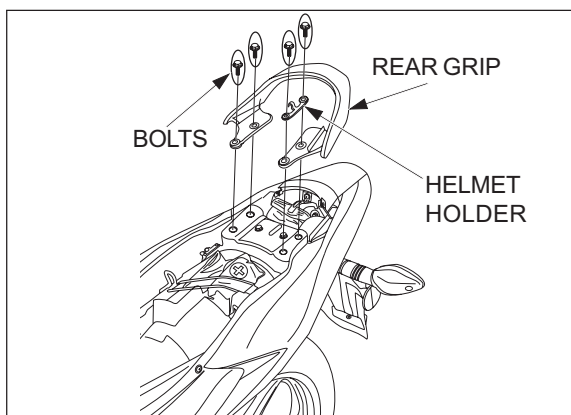
REMOVAL/INSTALLATION

Remove the seat (page 2-2).

Remove the mounting bolts (4 nos.).

Remove helmet holder stay and the rear grip.

Installation is in the reverse order of removal.



REAR COWL

REMOVAL/INSTALLATION

Remove the following :

- Remove the seat (page 2-2).
- Right side cover (page 2-3).
- Left side cover (page 2-3).
- Rear grip (page 2-4).

Remove the mounting bolts (2 nos.) from the rear cowl.

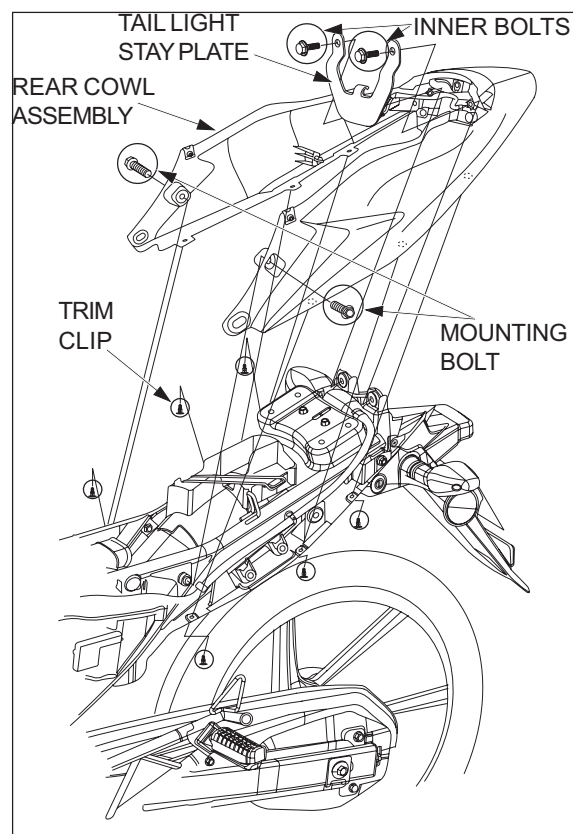
Remove the trim clips (6 nos.) from the bottom side of both rear cowl.

Remove inner bolts (2 nos.) and tail light stay plate situated on the tail light unit.

Carefully disconnect the brake /tail unit connecting wires (3 nos.).

Remove the rear cowl assembly.

Installation is in the reverse order of removal.



DISASSEMBLY/ASSEMBLY

Remove mounting screws (3 nos.) from rear cowl assembly to disassemble tail light.

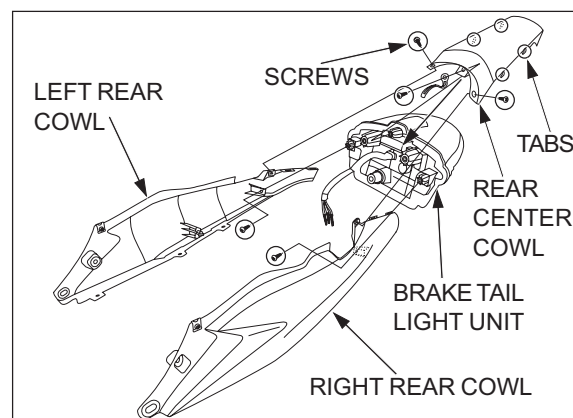
Separate tail light carefully from the rear cowl assembly.

Remove screws (2 nos) from left and right side rear cowl. Invert the cowl and slide the center rear cowl downward to unlock tabs (4 no.)

Separate the rear center cowl from the left and right cowl.

Assembly is in the reverse order of disassembly.

While installing the rear cowl route the wire harness properly 1-18.



REAR FENDER

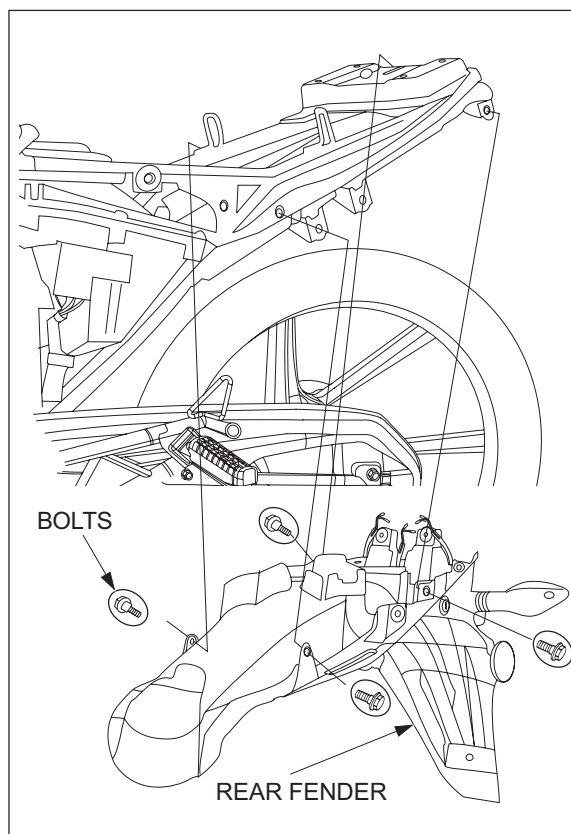
REMOVAL/INSTALLATION

Remove the rear cowl (page 2-5).

Disconnect the turn signal and number plate light wire connectors.

Remove the bolts (4 nos.) and rear fender.

Installation is in the reverse order of removal.



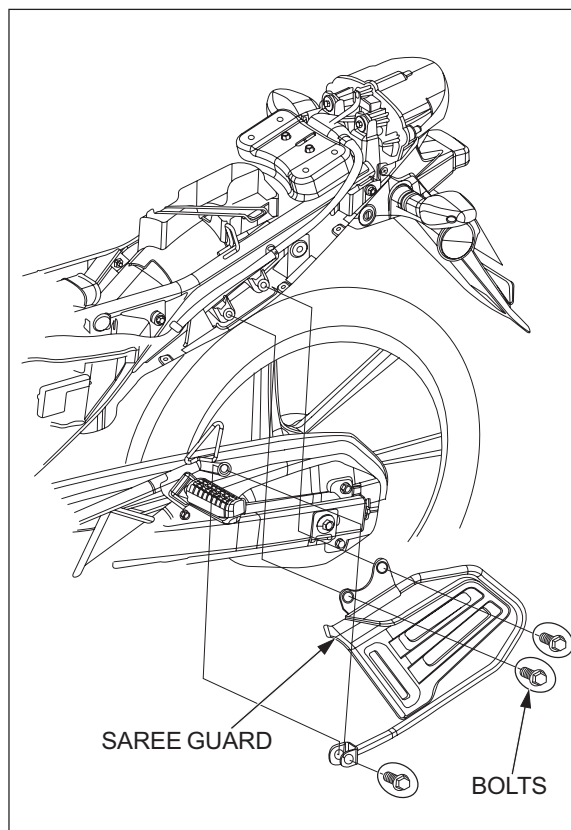
SAREE GUARD

REMOVAL/INSTALLATION

Remove the rear cowl (page 2-5).

Remove the mounting bolts (3 nos.) and saree guard.

Installation is in the reverse order of removal.



EXHAUST PIPE /MUFFLER

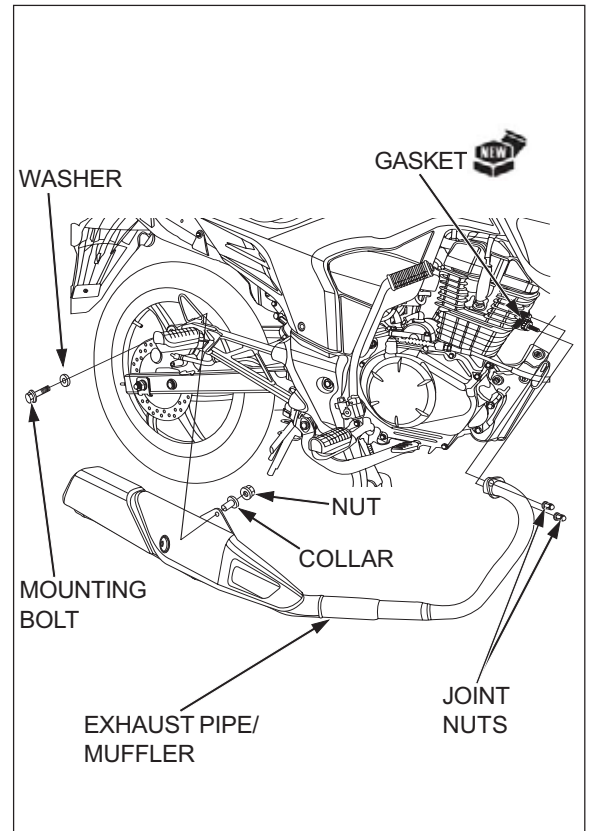
Remove the following:

- Exhaust pipe joint nuts.
 - Muffler mounting bolt, washer, collar and nut
 - Exhaust pipe/muffler
 - Gasket
- Install a new gasket into the exhaust port.

Install the exhaust pipe/muffler, then temporarily install the exhaust pipe joint nuts, muffler mounting bolt, washer, collar and nut.

Tighten the exhaust pipe joint nuts securely, then tighten the muffler mounting bolt to the specified torque.

TORQUE: 26 N·m (2.6 kgf·m, 19.18 lbf·ft)



MUFFLER PROTECTOR

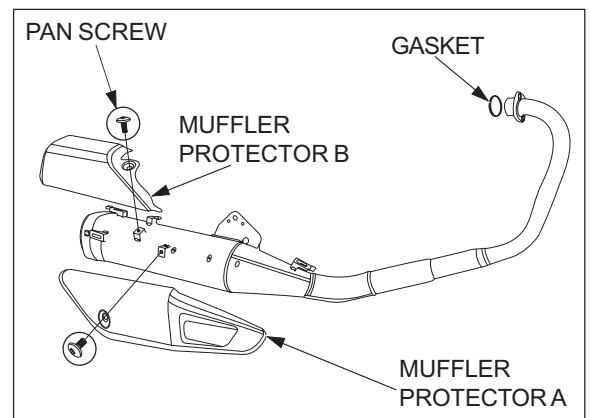
REMOVAL/INSTALLATION

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

Remove the pan screw (1 no.) of muffler protector A and slide towards engine to take it out.

Remove the pan screw (1 no.) of muffler protector B and slide away from the engine to take it out.

Installation is in the reverse order of removal.



STUD BOLT REPLACEMENT

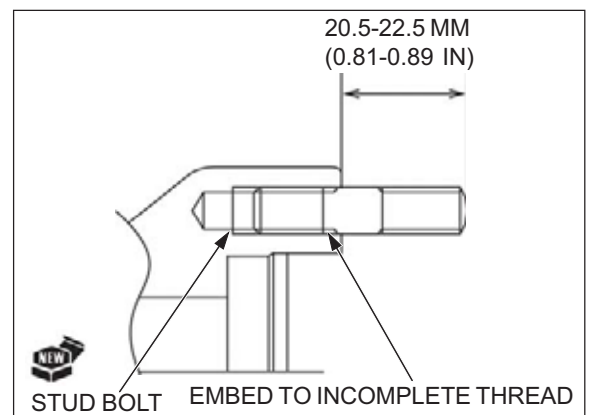
Always check for the condition of the rubber grommets on the muffler protector.

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

Install new stud bolts into the cylinder head as shown.

TORQUE: 11 N·m (1.1 kgf·m, 8 lbf·ft)

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



MEMO

3. MAINTENANCE

SERVICE INFORMATION	3-1	SECONDARY AIR SUPPLY SYSTEM	3-14
MAINTENANCE SCHEDULE	3-3	DRIVE CHAIN	3-15
FUEL LINE	3-4	BATTERY	3-18
FUEL STRAINER SCREEN	3-4	BRAKE FLUID	3-18
THROTTLE OPERATION	3-5	BRAKE PADS WEAR	3-20
CHOKE OPERATION	3-5	BRAKE SYSTEM	3-20
AIR CLEANER	3-6	BRAKE LIGHT SWITCH	3-21
CRANKCASE BREATHER	3-7	HEADLIGHT AIM	3-21
SPARK PLUG	3-7	CLUTCH SYSTEM	3-21
VALVE CLEARANCE	3-8	SIDE STAND	3-22
ENGINE OIL	3-10	SUSPENSION	3-22
ENGINE OIL STRAINER SCREEN	3-12	NUTS, BOLTS, FASTENERS	3-23
ENGINE OIL CENTRIFUGAL FILTER	3-12	WHEELS/TIRES	3-23
ENGINE IDLE SPEED	3-14	STEERING HEAD BEARINGS	3-24

SERVICE INFORMATION

GENERAL

- Support the motorcycle on a level surface before starting any work.
- Gasoline is extremely flammable and is explosive under certain conditions.
- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where the gasoline is stored can cause a fire or explosion.
- If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in an enclosed area.
- 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.

MAINTENANCE

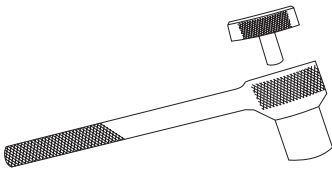

SPECIFICATIONS

ITEM			SPECIFICATIONS
Throttle grip free play			2-6 mm (0.08-0.24 in)
Spark plug Standard			CPR8EA-9 (NGK)
Spark plug gap			0.8 – 0.9 mm (0.03 – 0.04 in)
Valve clearance	IN		0.08 mm (0.003 in)
	EX		0.12 mm (0.005 in)
Engine oil capacity	After draining		1.0 liter (1.1 US qt, 0.9 Imp qt)
	After disassembly		1.2 liter (1.3 US qt, 1.1 Imp qt)
Recommended engine oil			Honda 4-stroke oil or equivalent motor oil API service classification: SJ Viscosity: SAE 10W-30 MA
Engine idle speed			1,400 ± 100 min ⁻¹ (rpm)
Drive chain size/link			428/126
Drive chain slack			30 – 40 mm (1.1 – 1.5 in)
Recommended brake fluid			DOT 3 or DOT 4
Clutch lever free play			10 – 20 mm (0.4 – 0.8 in)
Cold tire pressure	Front	Driver only	175 kPa (1.75 kgf/cm ² , 25 psi)
		Driver and passenger	175 kPa (1.75 kgf/cm ² , 25 psi)
	Rear	Driver only	200 kPa (2.00 kgf/cm ² , 29 psi)
		Driver and passenger	225 kPa (2.25 kgf/cm ² , 32 psi)
Tire size	Front		80/100-17M/C 46P
	Rear		110/80-17M/C 57P
Minimum tire tread depth	Front		1.5 mm (0.06 in)
	Rear		2.0 mm (0.08 in)

TORQUE VALUES

Spark plug	16 N·m (1.6 kgf·m, 12 lbf·ft)	
Tappet adjuster lock nut	14 N·m (1.4 kgf·m, 10 lbf·ft)	Apply engine oil to the threads and seating surface
Crankshaft hole cap	15 N·m (1.5 kgf·m, 11 lbf·ft)	Apply grease to the threads
Timing hole cap	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Oil drain bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	
Oil filter rotor cover screw	4 N·m (0.4 kgf·m, 3.0 lbf·ft)	
Rear axle nut	88 N·m (8.9 kgf·m, 65 lbf·ft)	U-nut
Headlight adjusting bolt	0.6 N·m (0.06 kgf·m, 0.4 lbf·ft)	
Air cleaner cover screw	1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)	
Drive sprocket fixing plate bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Driven sprocket nut	64 N·m (6.4 kgf·m, 47 lbf·ft)	U-nut
Side stand pivot bolt	18 N·m (1.8 kgf·m, 13.3 lbf·ft)	
Side stand lock nut	44 N·m (4.4 kgf·m, 32.5 lbf·ft)	U-nut
Head cover bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	

TOOLS

Valve Adjustment, 10 mm 070SR-TKS-PO18 	Gear Holder 0706-KRB-T7900 
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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.

WHICH EVER COMES FIRST

ITEM	FREQUENCY	PRE-RIDE CHECK	ODOMETER READING (NOTE 1)								ANNUAL CHECK	REGULAR REPLACE	Refer to Page
			X1000Km	1	4	8	12	16	20	24			
			X1000mi	0.6	2.5	5	7.5	10	12.5	15			
			MONTHS	1	4	8	12	16	20	24			
* FUEL LINE					I	I	I	I					3-4
FUEL LEVEL		I											-
* FUEL STRAINER SCREEN					C	C	C	C	C	C			3-4
* THROTTLE OPERATION		I			I	I	I	I	I	I	I		3-5
* CHOKE OPERATION		I			I	I	I	I	I	I	I		3-5
* AIR CLEANER	(NOTE 2)		EVERY 16000Km (10000mil) R										3-6
CRANKCASE BREATHER	(NOTE 3)				C	C	C	C	C	C	C		3-7
SPARK PLUG					I	R	I	R	I	R			3-7
* VALVE CLEARANCE				I	I	I	I	I	I	I			3-8
ENGINE OIL		I		R	R	R	R	R	R	R	R		3-10
** ENGINE OIL STRAINER SCREEN							C			C			3-12
** ENGINE OIL CENTRIFUGAL FILTER							C			C			3-12
* ENGINE IDLE SPEED				I	I	I	I	I	I	I	I		3-14
* SECONDARY AIR SUPPLY SYSTEM							I			I	I		3-14
DRIVE CHAIN		I	EVERY 1000Km (600mil) I, L										3-15
BATTERY		I		I	I	I	I	I	I	I	I		3-18
BRAKE FLUID	(NOTE 4)	I			I	I	I	I	I	I	I	2 years	3-18
BRAKE PADS WEAR		I			I	I	I	I	I	I	I		3-20
BRAKE SYSTEM				I	I	I	I	I	I	I	I		3-20
BRAKE LIGHT SWITCH					I	I	I	I	I	I	I		3-21
HEAD LIGHT AIM					I	I	I	I	I	I	I		3-21
LIGHTS/HORN		I											-
CLUTCH SYSTEM		I		I	I	I	I	I	I	I	I		3-21
SIDE STAND					I	I	I	I	I	I	I		3-22
* SUSPENSION					I	I	I	I	I	I	I		3-22
* NUTS, BOLTS, FASTENERS				I		I		I		I	I		3-23
** WHEELS/TYRES		I			I	I	I	I	I	I	I		3-23
** STEERING HEAD BEARINGS				I			I			I	I		3-24

* Should be serviced by an authorized Honda dealer, unless the owner has proper tools and service data and is mechanically qualified. Refer to the official Honda Shop Manual

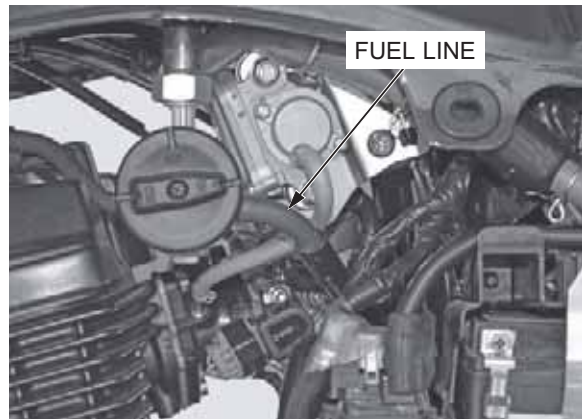
** In the interest of safety, we recommended these items be serviced only by your Honda dealer.

NOTES:

- At higher odometer readings, repeat at the frequency interval established here.
- Service more frequently if the motorcycle is ridden in unusually wet or dusty areas.
- Service more frequently when riding in rain or at full throttle.
- Replacement requires mechanical skills.

FUEL LINE

Replace the fuel line if it is cracked, damaged or leaking. Inspect the fuel line routing, kinks and bends which can restrict the fuel flow. Also inspect the position of clips used for locking. Check fuel line and fuel strainer for blockage.



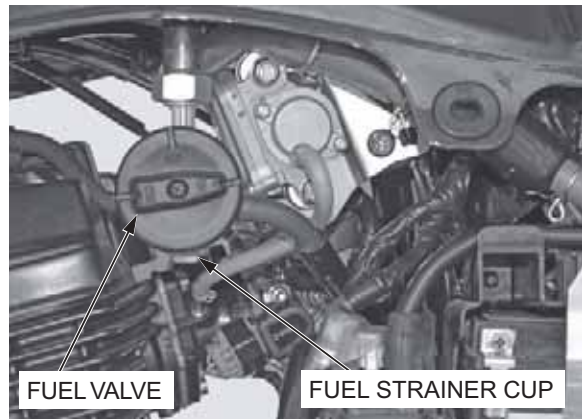
FUEL STRAINER SCREEN

Remove Left side cover (Page 2-3)

Turn the fuel valve "OFF".

Wipe the spilled gasoline off at once.

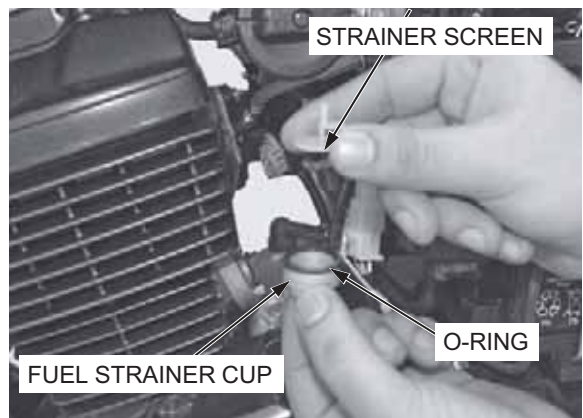
Remove the fuel strainer cup and drain the contents of the cup into a suitable container.



Remove the O-ring and strainer screen.

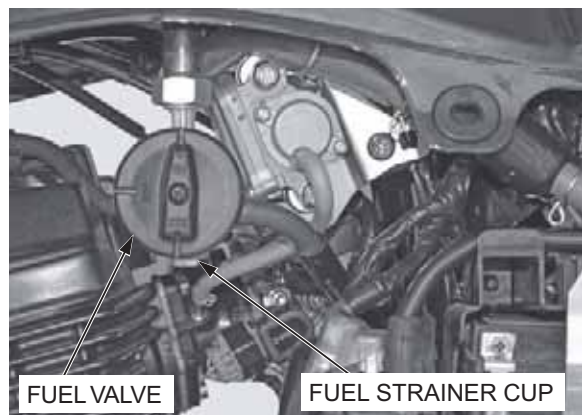
Wash the strainer screen and cup in clean non-flammable high flash point solvent.

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



Tighten the fuel strainer cup.

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



THROTTLE OPERATION

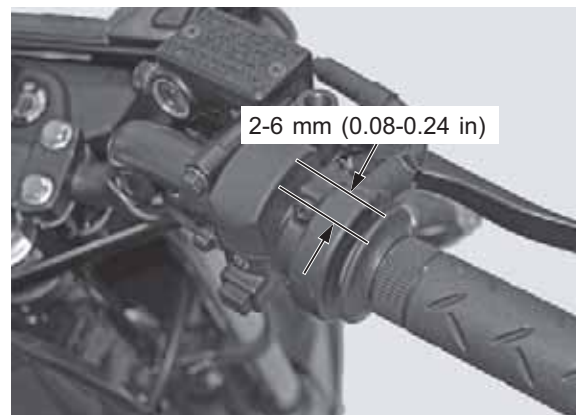
Check for smooth throttle grip full opening and automatic full closing in all steering positions.

Check the throttle cable and replace it if it is deteriorated, kinked or damaged.

Lubricate the throttle cable, if throttle operation is not smooth.

Measure the free play at the throttle grip flange.

FREE PLAY: 2 – 6 mm (0.08 – 0.24 in)



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

Minor Adjustment:

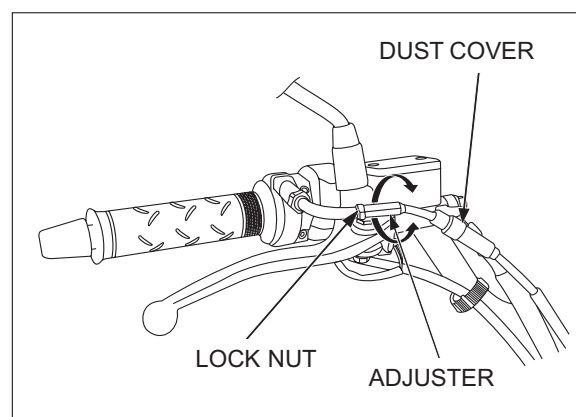
Minor adjustments are made with the upper adjuster at throttle housing adjuster.

Slide the dust cover from the adjuster.

Adjust the free play by loosening the lock nut and turning the adjuster.

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

Recheck the throttle operation.



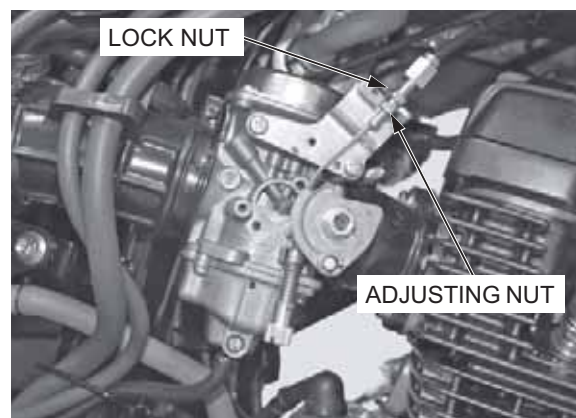
Major Adjustment:

Major adjustment are made with the lower adjusting nut at the carburetor end.

Remove the right side cover (page 2-3)

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

Recheck the throttle operation.



CHOKE OPERATION

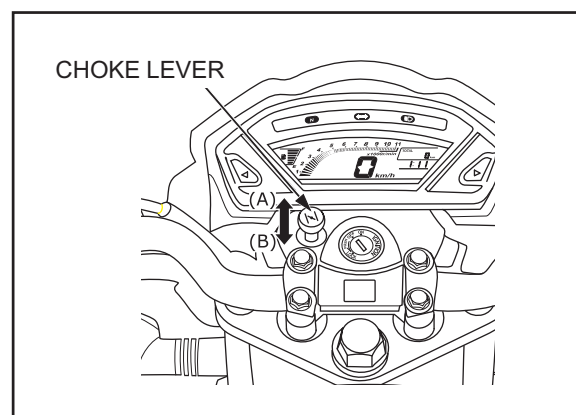
- This motorcycle is equipped with a fuel enriching circuit controlled by a starting enrichment (SE) valve.
- The SE valve opens the enriching circuit via a choke cable when the choke lever is pulled.

Check for smooth operation of the choke lever.

Lubricate the choke cable if the operation is not smooth.

Inspect the cable casing for cracks which could allow moisture to enter.

Replace the cable if necessary.



AIR CLEANER

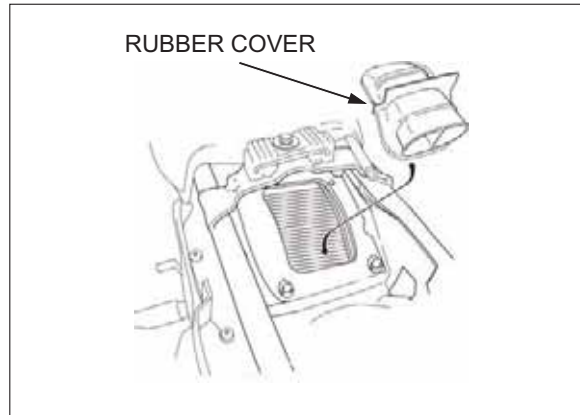
AIR CLEANER ELEMENT

Remove the seat (page 2-2).

Inspection:

Rubber cover can be removed to do the visual inspection of air cleaner element.

Clean the surrounding area of air filter with high pressure air.

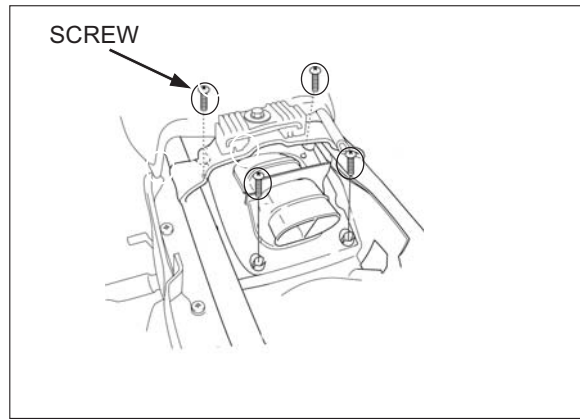


Replacement:

If found dirty, damaged or according to maintenance schedule (page 3-3) replace air cleaner element by removing the air cleaner cover screws (4 nos.).

Remove the air cleaner element and packing.

Check the packing are in good condition, and replace it if necessary.

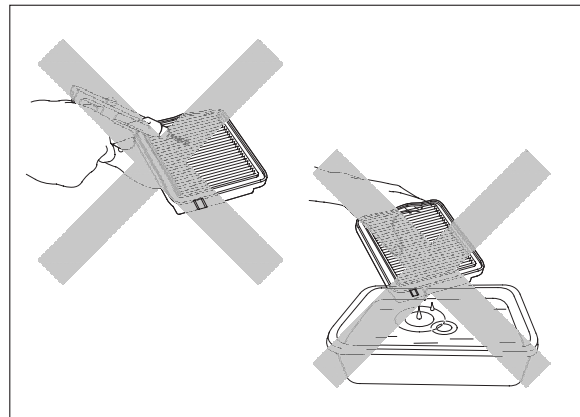


NOTICE

Do not clean with solvent to remove dust and also do not use forced air on it. The viscous oil will be lost and filter becomes dry. As the base filter paper is coarse, it cannot block fine dust when it becomes dry.

Replace the air cleaner if it is excessively dirty, torn or damage.

Do not place filter horizontally on any surface as dust can stick to the filter due to oil present. If necessary place vertically. Install immediately after inspection.

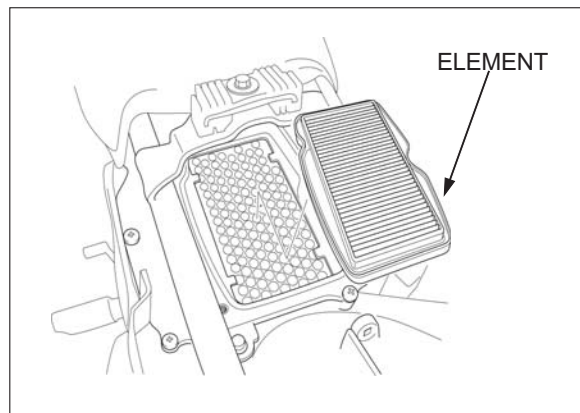


Install the packing to the groove of the air cleaner element, then install them by alligning its tab with the hole of the air cleaner element holder.

Install the removed parts in the reverse order of removal.

TORQUE

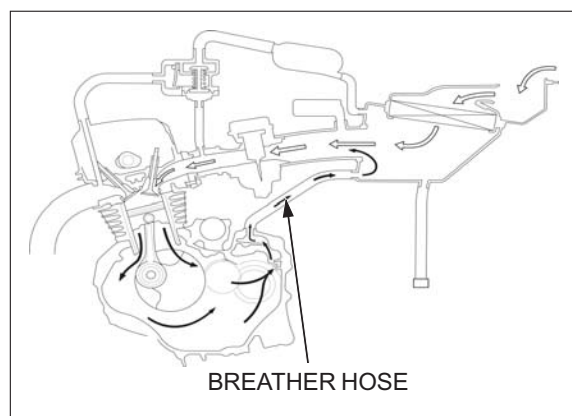
Air cleaner cover screw: 1.2 N.m (0.1 kgf.m, 0.9 lbf.ft)



CRANKCASE BREATHER

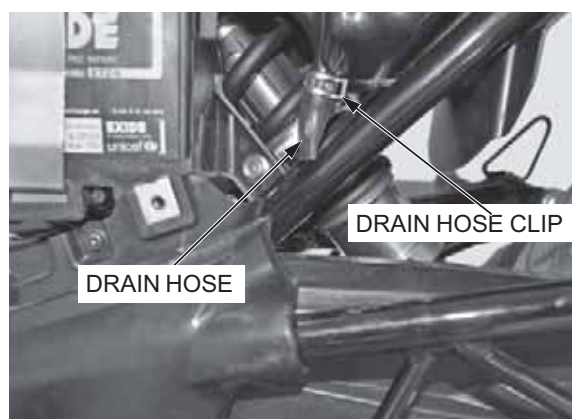
Service more frequently when ridden in rain, at full throttle, or after the motorcycle is washed or overturned.

Check the crankcase breather hose for deterioration, damage or loose connection. Make sure that the hoses are not kinked, pinched or cracked.



Loosen the drain hose clip and remove the drain hose from the air cleaner housing and drain deposits into a suitable container.

Reinstall the drain hose.

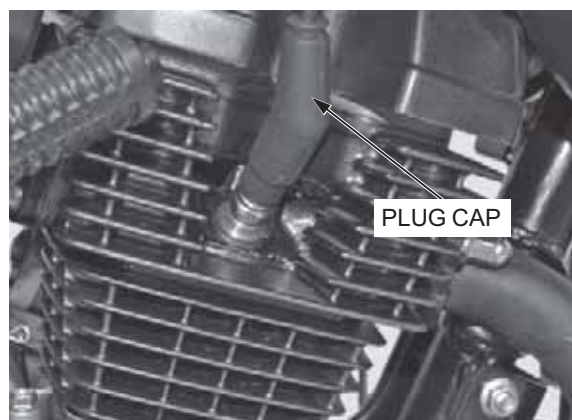


SPARK PLUG

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

REMOVAL

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



Remove the spark plug using a equipped spark plug wrench or an equivalent.

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

Replace it if necessary.

RECOMMENDED SPARK PLUG:

Standard:

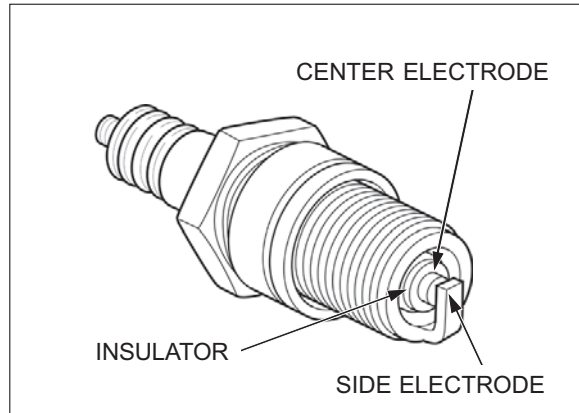
CPR8EA-9 (NGK)



INSPECTION

Check the following and replace if necessary (recommended spark plug : page 3-2)

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

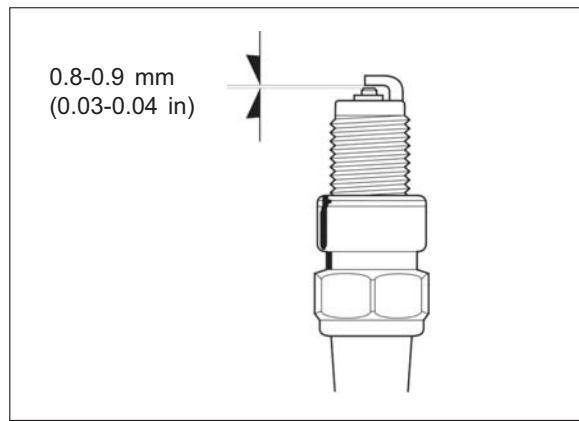


Clean the spark plug electrodes with a wire brush or special plug cleaner.

Check the gap between the center and side electrodes with a wire-type feeler gauge (wire gauge).

SPARK PLUG GAP: 0.8 – 0.9 mm (0.03 – 0.04 in)

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

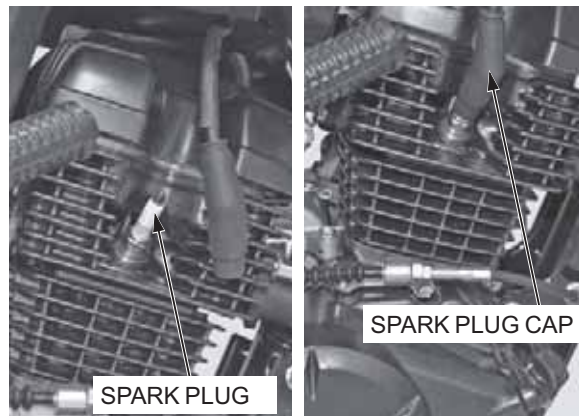


INSTALLATION

Install and hand tighten the spark plug to the cylinder head, then tighten the spark plug to the specified torque using a equipped spark plug wrench or an equivalent.

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)

Connect the spark plug cap securely.



VALVE CLEARANCE

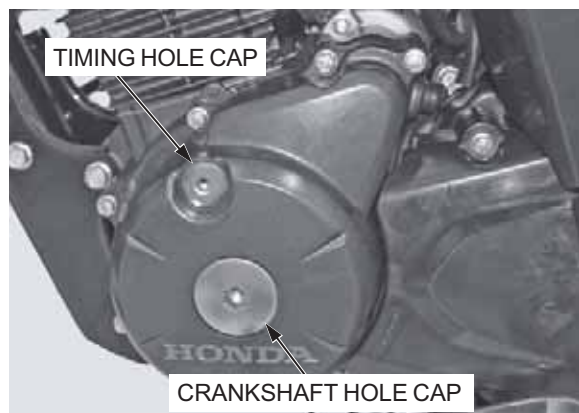
INSPECTION

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

Remove the following:

- left side shroud (page 2-3).
- left side cover (page 2-3).
- cylinder head cover (page 7-4).
- spark plug (page 3-7).

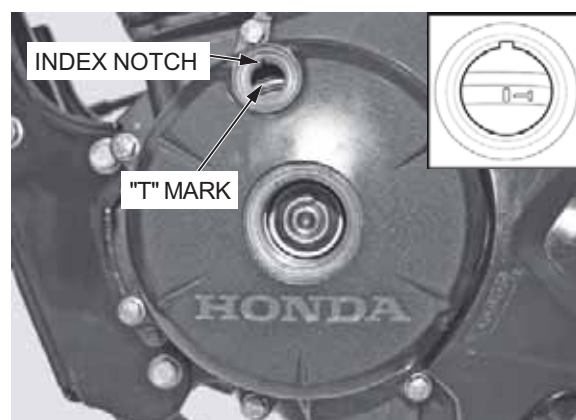
Remove the timing hole cap and crankshaft hole cap and O-rings.



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

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

This position can be obtained by confirming that there is slack in the rocker arm. If there is no slack, it is because the piston is moving through the exhaust stroke to TDC. Rotate the crankshaft one full turn counter clockwise and match up to the "T" mark again.



Clean the feeler gauge with a soft cloth before usage. 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 adjusting screw and valve stem.

VALVE CLEARANCE:

IN: 0.08 ± 0.02 mm (0.003 ± 0.001 in)

EX: 0.12 ± 0.02 mm (0.005 ± 0.001 in)

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

TOOL:

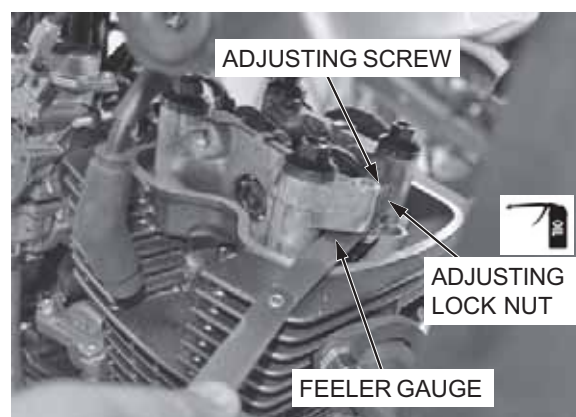
Valve adjusting 10mm (070SR-TKS-PO18)

Apply clean engine oil to the valve adjusting lock nut threads and seating surface.

Hold the adjusting screw, and tighten the valve adjusting lock nut to the specified torque.

TORQUE: 14 N·m (1.4 kgf·m, 10 lbf·ft)

Recheck the valve clearance.

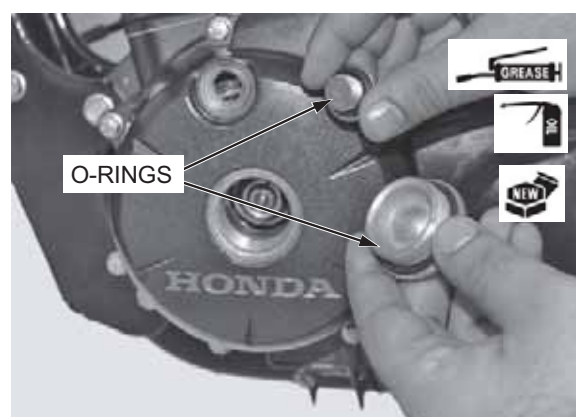


Install the cylinder head cover (page 7-4) and apply the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Apply clean engine oil to new O-rings, and install them to each hole cap.

Apply grease to the crankshaft hole cap threads.



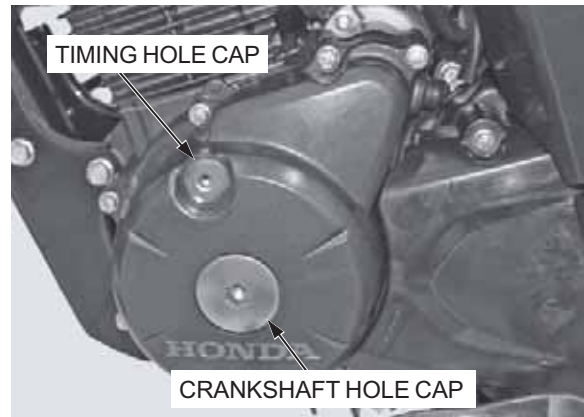
MAINTENANCE

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

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)

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

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



ENGINE OIL

OIL LEVEL INSPECTION

While checking oil level take into consideration not to screw dipstick.

Support the motorcycle on its center stand.

Start the engine and let it idle for 3 – 5 minutes.

Stop the engine and wait 2 – 3 minutes.

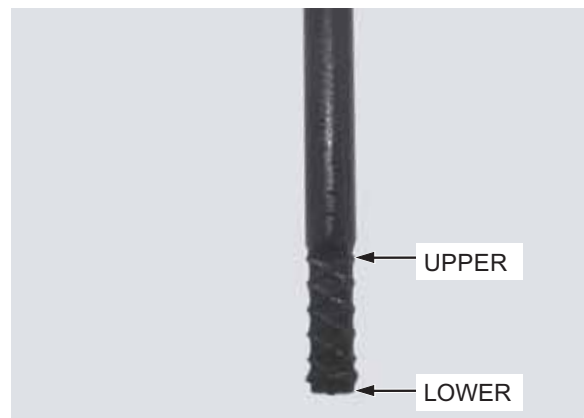
Remove the oil filler cap/dipstick, and wipe the oil from the dipstick with a clean shop towel.

Reinstall the oil filler cap/dipstick, but do not screw it.

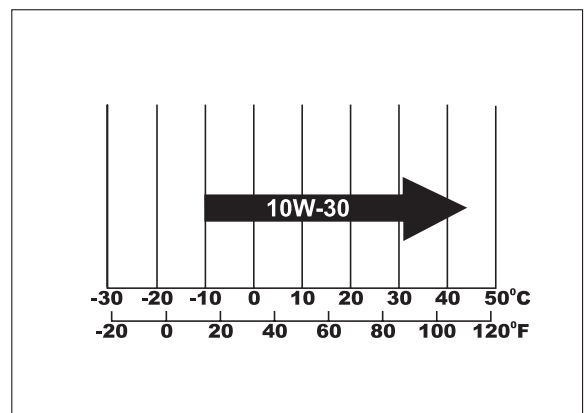
Remove the oil filler cap/dipstick.

Check the oil level.

If the oil level is below or near the lower level line on the dipstick, fill the recommended engine oil to the upper level line through the oil filler hole.



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



Apply clean engine oil to a new O-ring, and install it on oil filler cap/dipstick.

Reinstall and tighten the oil filler cap/dipstick securely.



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

ENGINE OIL CHANGE

Warm up the engine to normal operating temperature.

Stop the engine, and remove the oil filler cap/dipstick.



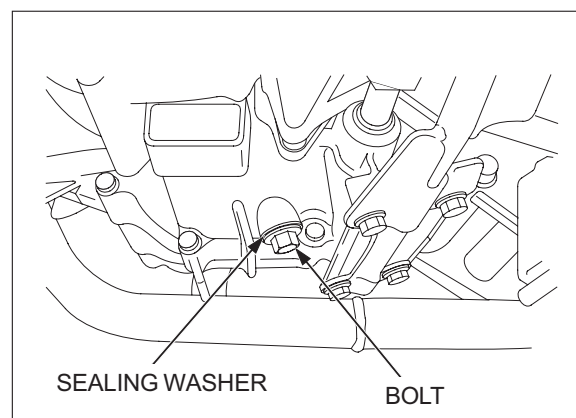
Place a clean container under the engine.

Remove the oil drain bolt and sealing washer.

Drain the engine oil completely.

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

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)



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

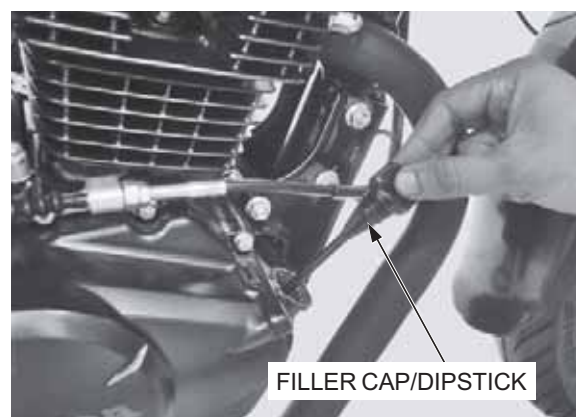
ENGINE OIL CAPACITY:

1.0 liters (1.1 US qt, 0.9 Imp qt) at draining

1.2 liters (1.3 US qt, 1.1 Imp qt) at disassembly

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

Start the vehicle and check for no oil leaks.



ENGINE OIL STRAINER SCREEN

REMOVAL/INSTALLATION

Be careful not to damage the Oil strainer screen.

Remove the right crankcase cover (page 9-3).

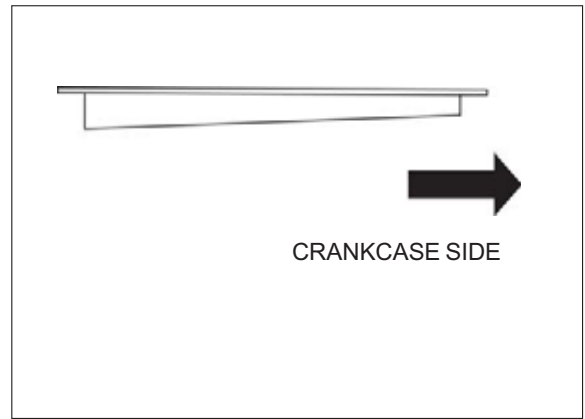
Pull the oil strainer screen out of the crankcase.

Wash the oil strainer screen thoroughly in nonflammable or high flash point solvent until all accumulated dirt has been removed.

Blow dry it with compressed air to clean completely. Before installing the strainer, it should be examined closely for damage, and make sure the sealing rubber is in good condition.

Install the oil strainer screen with the thin edge facing in and flange side facing up as shown.

Install the right crankcase cover (page 9-3)



ENGINE OIL CENTRIFUGAL FILTER

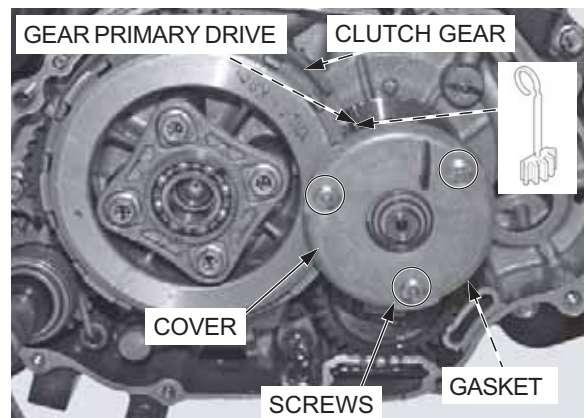
Remove the right crankcase cover (page 9-3).

Remove the screws of oil filter by using gear holder between clutch gear and Gear Primary Drive. Also remove oil filter rotor cover and gasket.

TOOL:

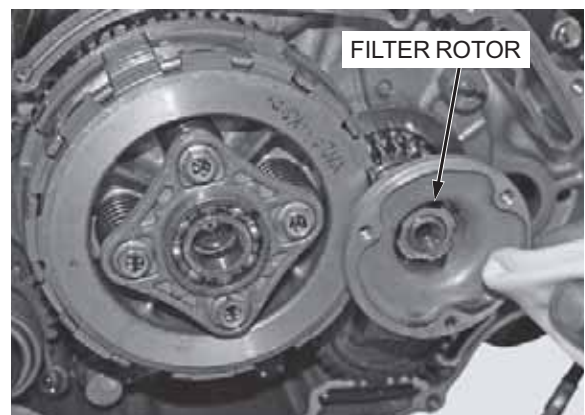
Gear Holder

07006-KRBT900

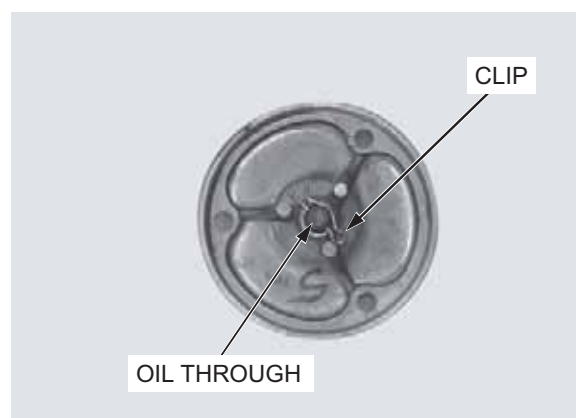


*Do not allow dust and dirt to enter the oil passage in the crankshaft.
Never use compressed air for cleaning.*

Clean the oil filter rotor cover and inside of the oil filter rotor using a clean shop towel.



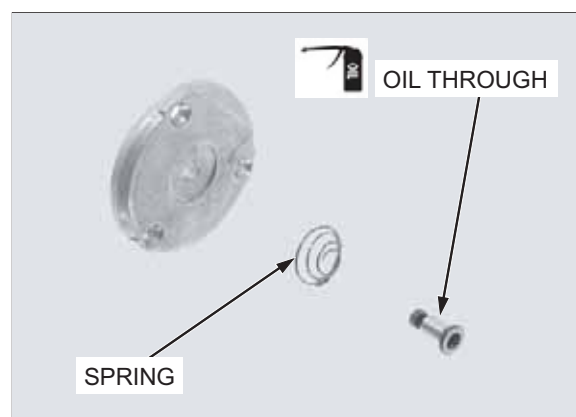
While pressing the oil through from the reverse side, then remove the clip.



Remove the oil through and spring from the oil filter rotor cover.

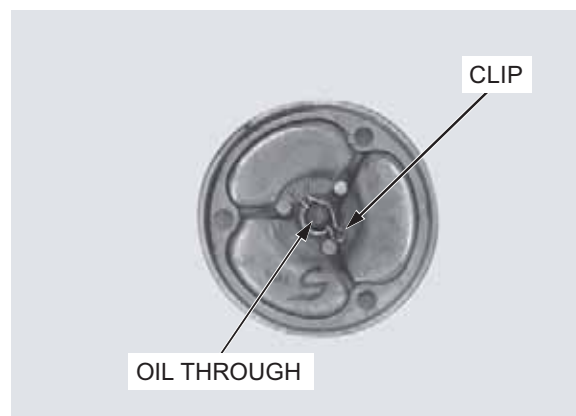
Blow and clean the oil through using compressed air.

Apply clean engine oil to the oil through surface, and install the spring and oil through to the oil filter rotor cover.



While pressing the oil through from the reverse side, install the clip.

Check the oil through operates freely, without binding.

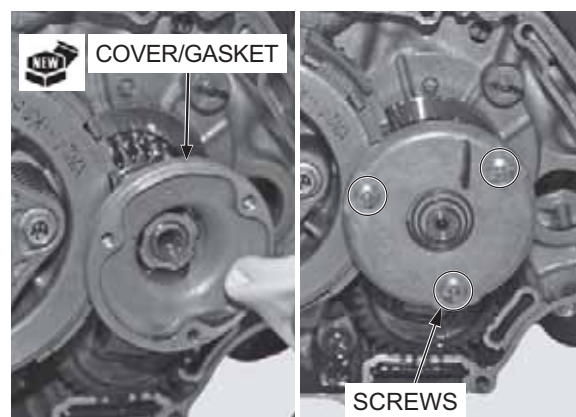


Install a new gasket on to the oil rotor cover.

Install and tighten the oil filter rotor cover screws by using gear holder between clutch gear and Gear Primary Drive.

TORQUE: 4 N·m (0.4 kgf·m, 3.0 lbf·ft)

Install the right crankcase cover (page 9-3).



ENGINE IDLE SPEED

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

Warm up the engine to normal operating temperature, shift the transmission into neutral and place the motorcycle on a level surface.

Connect a tachometer according to its manufacturer's instructions.

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

IDLE SPEED: 1,400 ± 100 min⁻¹ (rpm)



SECONDARY AIR SUPPLY SYSTEM

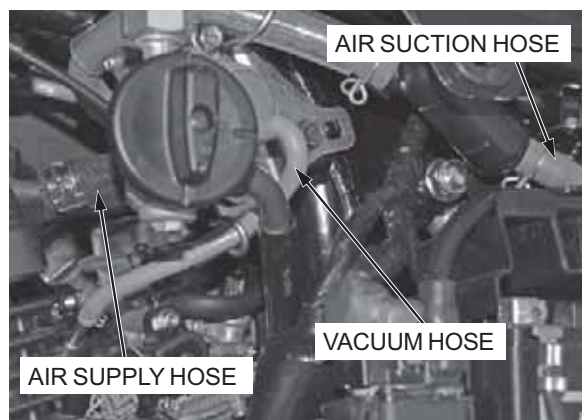
- The secondary air supply system introduces filtered air into the exhaust gases in the exhaust port. Fresh air is drawn into the exhaust port by the function of the PAIR control valve.
- This charged of fresh air promotes burning of the unburned exhaust gases, and changes a considerable amount of hydrocarbons and carbon monoxide into relatively harmless carbon dioxide and water vapor.

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

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

Check the air supply hose and vacuum hose for deterioration, damage or loose connections.

Make sure that the hoses are not cracked.



Check the air suction hose between the PAIR control valve and air cleaner housing for deterioration, damage or loose connections.

Make sure that the hose is not cracked.

Remove and check the air suction hose.

If the carbon deposits in the air suction hose, check the PAIR check valve.

Installation is in the reverse order of removal.



DRIVE CHAIN

DRIVE CHAIN SLACK INSPECTION

Never inspect the drive chain while the engine is running

Turn the ignition switch "OFF". Place the motorcycle on its center stand and shift the transmission into neutral.

Remove the chain slack inspection cover.

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

CHAIN SLACKNESS: 30 – 40 mm (1.2 – 1.5 in)

NOTICE

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

ADJUSTMENT

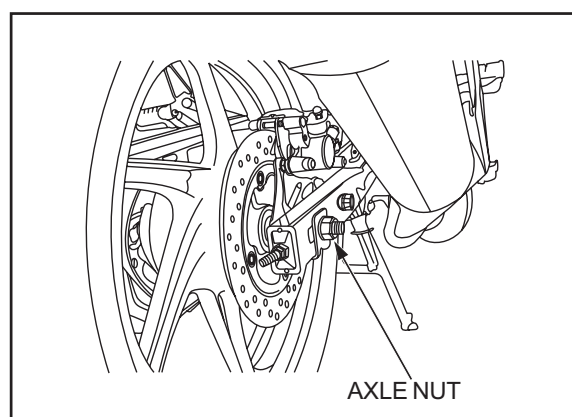
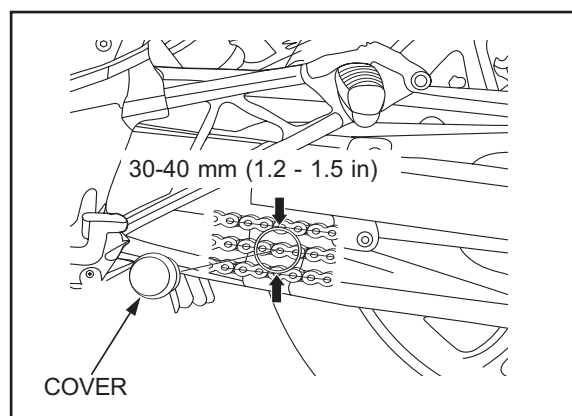
Never adjust the drivechain while the engine is running.

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

Loosen the rear axle nut.

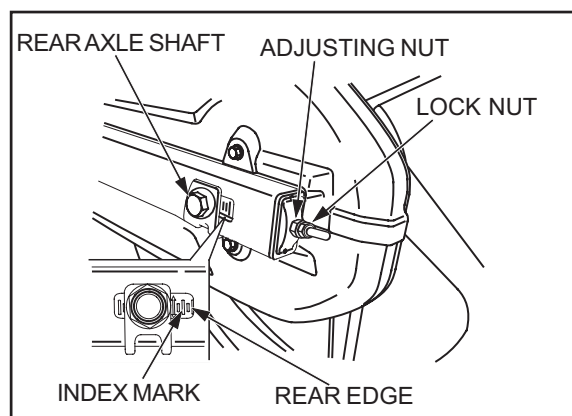
NOTICE

Adjust the drive chain at minimum slack point.



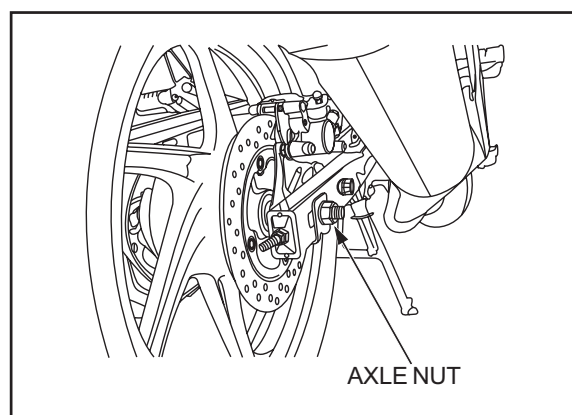
Loosen the lock nut and then the adjusting nut until the correct drive chain slack is obtained.

Align the chain adjuster index marks with the rearedge of the adjusting slots.



Tighten the rear axle nut to the specified torque.

TORQUE: 88 N·m (8.9 kgf·m, 65 lbf·ft)



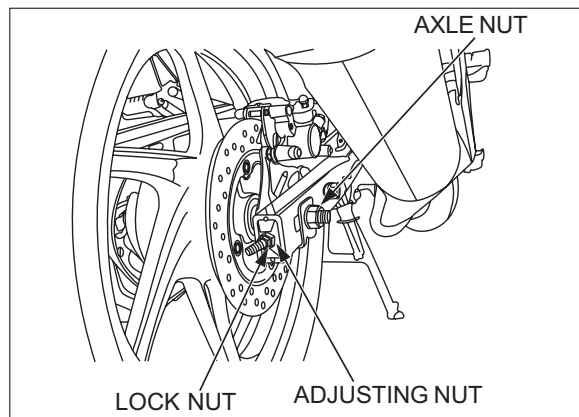
MAINTENANCE

In case of rear disk brake no need to check freeplay.

Tighten the both sides of adjusting nuts and lock nuts.

Recheck the drive chain slack and free wheel rotation.

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

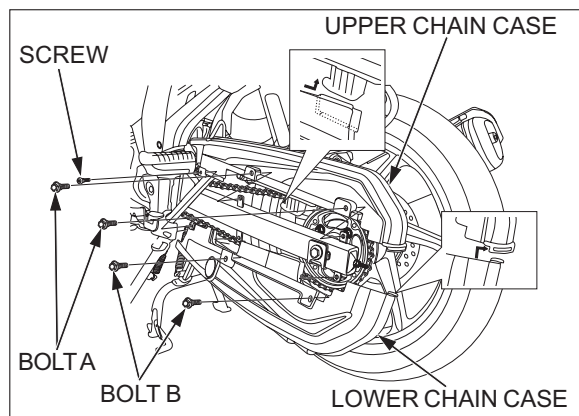


CLEANING INSPECTION AND LUBRICATION

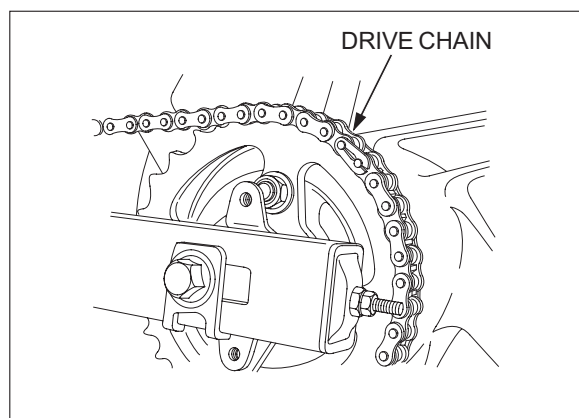
Turn off the ignition switch, place the motorcycle on its center stand on a level ground and shift the transmission into neutral.

Remove the bolt A and screw from the upper chain case. Pull the upper chain case away from the engine carefully and take it out.

Remove the bolt B from lower chain case and remove it carefully.



Lubricate the drive chain with SAE #80–90 gear oil. Wipeoff the excess oil.

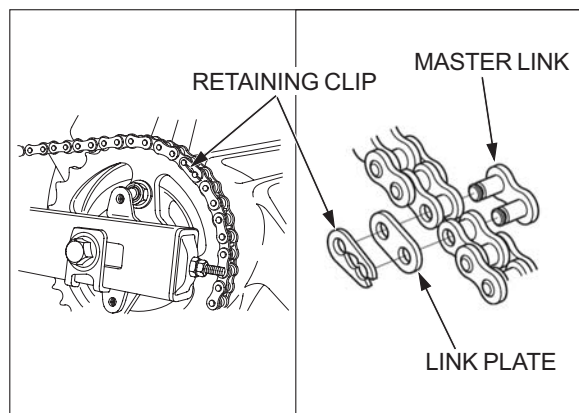


If the drive chain becomes extremely dirty, it should be removed and cleaned prior to lubrication.

Remove the drive chain case (page 3-16).

Carefully remove the retaining clip with pliers.

Remove the master link, link plate and drive chain.

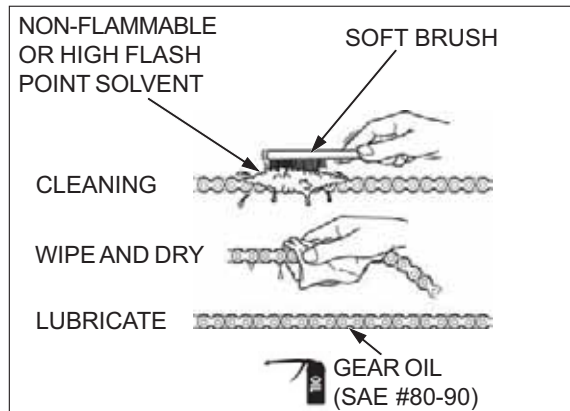


Clean the chain with non-flammable or high flashpoint solvent and wipe it dry.

Be sure the chain has dried completely before lubricating.

Lubricate the drive chain with SAE #80–90 gear oil.

Wipe off the excess gear oil.



Inspect the drive chain for possible damage or wear.

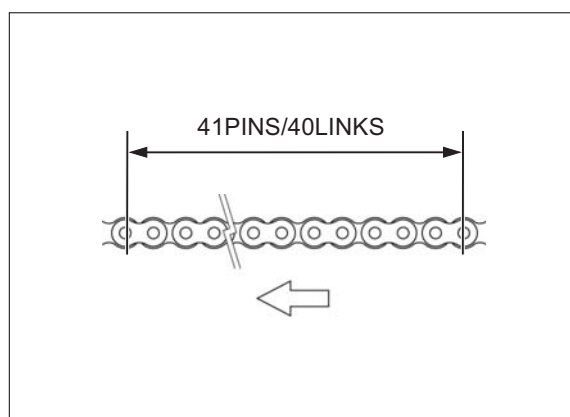
Replace any chain that has damaged rollers, loose fitting links, or otherwise appears unserviceable.

Measure the drive chain length with the chain held so that all links are straight.

DRIVE CHAIN LENGTH (41 pins/40 links)

STANDARD: 428 mm (16.9 in)

SERVICE LIMIT: 511 mm (20.1 in)



Sprocket Inspection

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

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

Check the attaching bolts and nuts on the drive and driven sprockets.

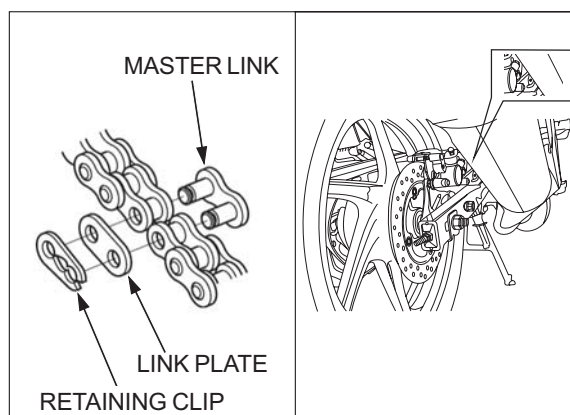
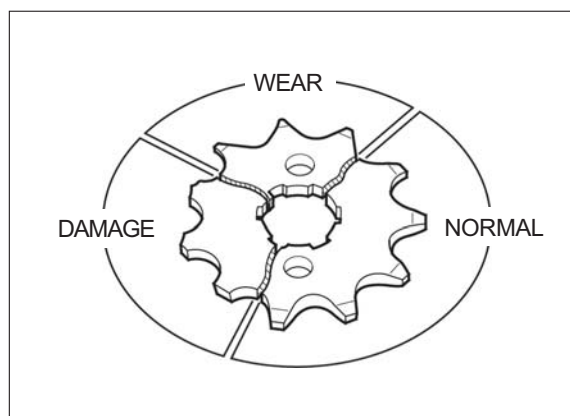
If any are loose, torque them.

TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)

Install the drive chain onto the sprockets.

Install the master link and link plate.

Install the retaining clip with its open end opposite to the direction of chain travel.



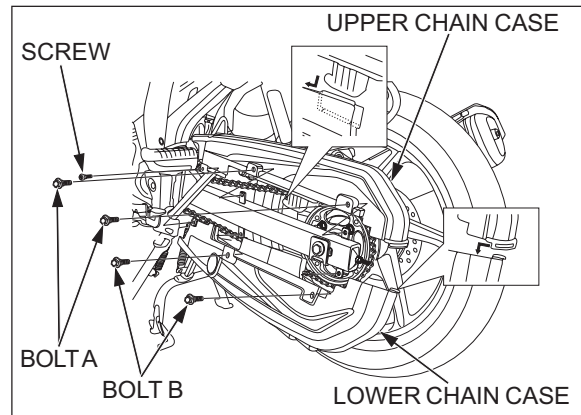
MAINTENANCE

Install the left crankcase rear cover (page 6-6).

Install the lower drive chain case and tighten bolt B.

Place the tabs of upper chain case carefully into the grooves of lower chain case and push it towards the engine to lock both the case.

Tighten bolt A and screw of upper chain case



BATTERY

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

It is not necessary to check the battery electrolyte level or add distilled water as the battery is a maintenance free sealed type.

Check the voltage of battery with FBT 50 tester.

Charging the battery (page 15-5).

Install the battery (page 15-3).



BRAKE FLUID

NOTICE

Spilled fluid can damage painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced. Keep a spray water bottle while working with brake fluid.

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

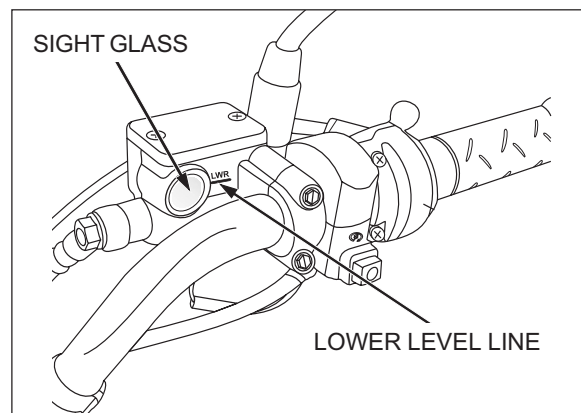
FRONT BRAKE

Support the motorcycle on its center stand.

Turn the handlebar to the left until the reservoir is parallel to the ground.

Check the brake reservoir level through the sight glass.

- When the fluid level is near the lower level line, check the brake pads for wear (page 3-20). 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 fluid level is near the lower level line, check entire system for leaks.

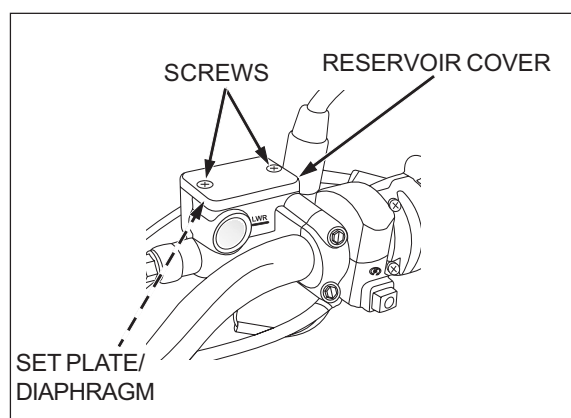


- As per maintenance schedule or if level found low re-fill DOT 3 or DOT 4 brake fluid in to the reservoir. For re-filling remove the following:

- Screws
- Reservoir cover
- Set plate
- Diaphragm

Install in the reverse order of removal and tighten the cover screws to the specified torque.

TORQUE: 1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)



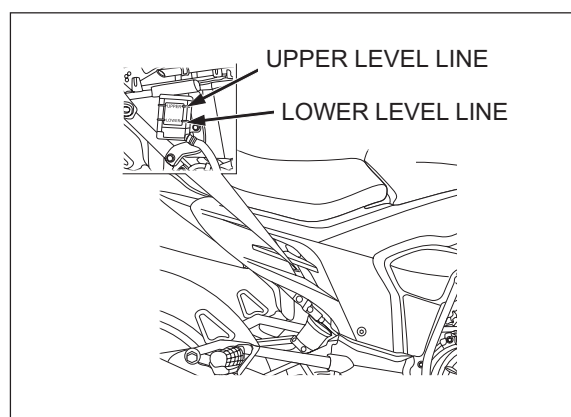
REAR BRAKE

Disk Type

Support the motorcycle on its center stand.

Check the rear brake fluid level through the hole provided in right side cover.

- When the fluid level is near the lower level line, check the brake pads for wear (page 3-20). 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 fluid level is near the lower level line, check entire system for leaks.

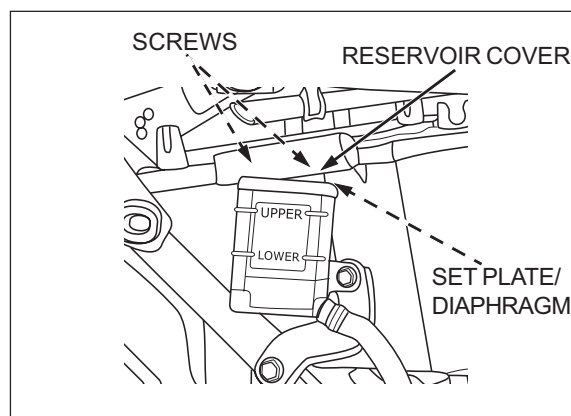


- As per maintenance schedule or if level found low re-fill DOT 3 or DOT 4 brake fluid in to the reservoir. For re-filling remove the following:

- right side cover (page 2-3)
- Screws
- Reservoir cover
- Set plate
- Diaphragm

Install in the reverse order of removal and tighten the cover screws to the specified torque.

TORQUE: 1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)

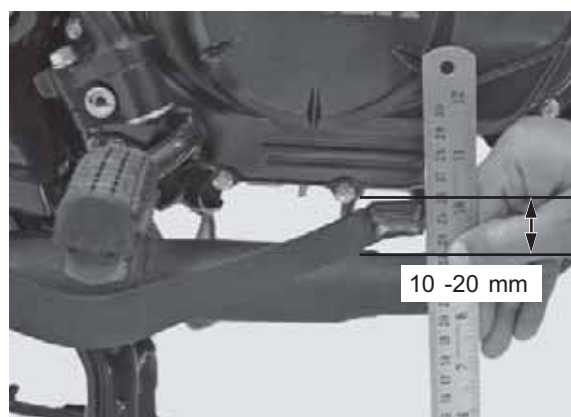


Drum Type

Check the brake pedal and brake rod for loose connections, excessive play, or other damage. Repair or replace if necessary.

Measure the rear brake pedal free play.

Free Play: 20 - 30 mm (0.8 - 1.2 in)

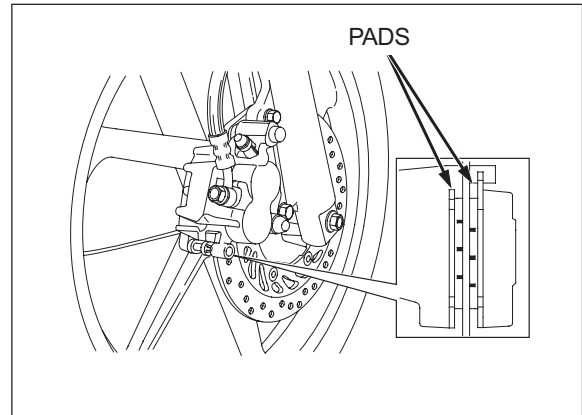


BRAKE PADS WEAR

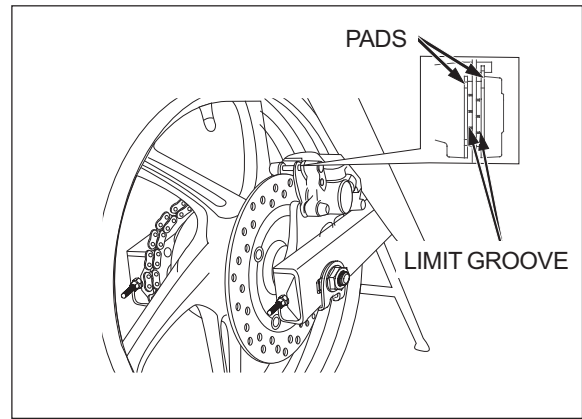
FRONT / REAR BRAKE PADS (Disc)

Check the brake pads for wear by locking from the front side of the brake caliper.

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



Refer to the brake pad replacement (page 14-9).

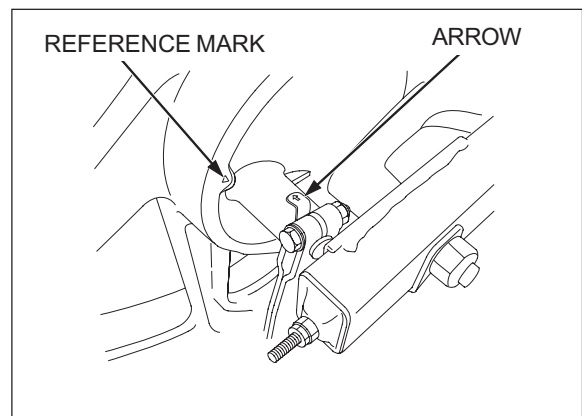


REAR BRAKE PADS (Drum)

Check the wear indicator position when the brake is applied.

If the arrow on the indicator plate aligns with the reference mark on the brake panel, inspect the brake drum (page 14-32)

Replace the brake shoes (page 14-32) if the drum I.D. is within the service limit.



BRAKE SYSTEM

FRONT BRAKE

Inspect the brake hose and fittings for deterioration, cracks and signs of leakage.

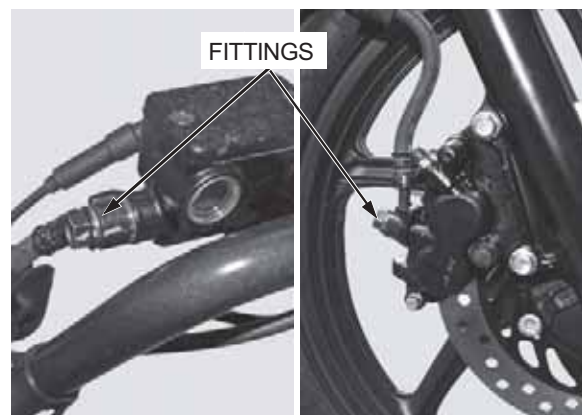
Tighten any loose fittings.

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 the brake bleeding procedures (page 14-4).



REAR BRAKE

DISC TYPE:

Inspect the brake hose and fittings for deterioration, cracks and signs of leakage.

Tighten any loose fittings.

Replace or repair if necessary.

Remove the muffler (page 2-7).

Replace hoses and fittings as required.

Check the brake pedal excessive play or other damage.

Refer to the brake bleeding procedures (page 14-4).



BRAKE LIGHT SWITCH

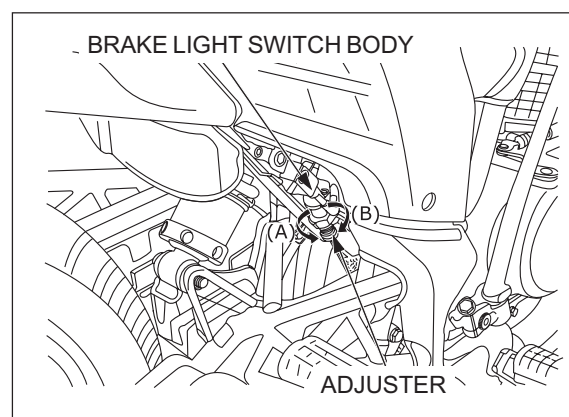
- The front brake light switch does not require adjustment.

Hold the brake light switch body and turn the adjuster. Do not turn the brake light switch body.

- Adjust the rear brake light switch.

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

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



HEADLIGHT AIM

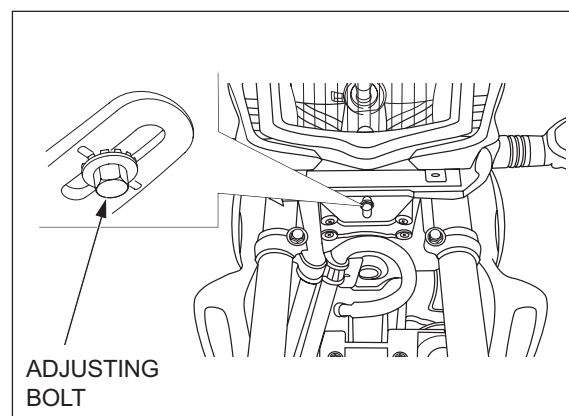
Place the motorcycle on a level ground.

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

Adjust the headlight beam vertically by loosening the headlight adjusting bolt.

After adjusting the headlight aim, tighten the headlight adjusting bolt to the specified torque.

TORQUE: 0.6 N·m (0.06 kgf·m, 0.4 lbf·ft)



CLUTCH SYSTEM

Inspection

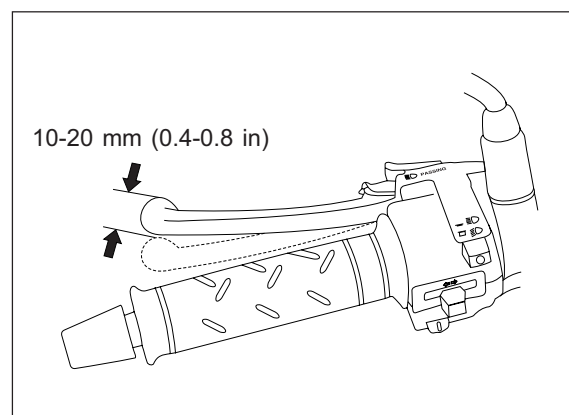
Check the cable and clutch lever for any looseness, excessive play, or other damage.

Replace or repair them if necessary.

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

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

FREE PLAY: 10 – 20 mm (0.4 – 0.8 in)



Adjustment

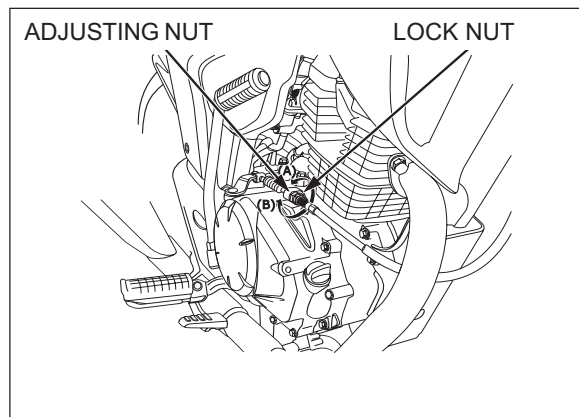
Adjustments are performed at the clutch lifter arm.

Loosen the lock nut, and turn the adjusting nut.

After adjustment, tighten the lock nut by holding adjusting nut.

Check the clutch operation.

If the proper free play cannot be obtained, or the clutch slips during the test ride, disassemble and inspect the clutch (page 9-8).



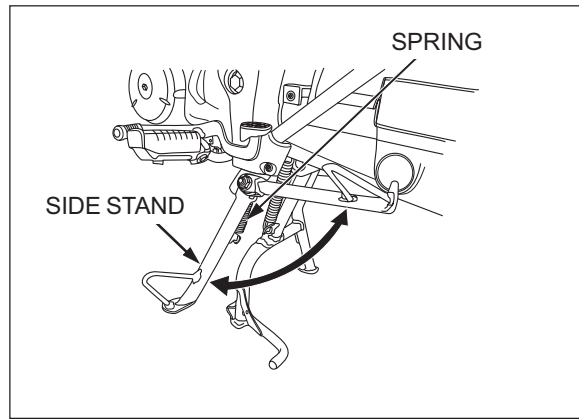
SIDE STAND

Support 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.

Make sure the side stand is not bent.



SUSPENSION

FRONT SUSPENSION INSPECTION

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

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

Replace the damaged components which cannot be repaired.

Tighten all nuts and bolts.

Refer to (page 12-14) for fork service.

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



REAR SUSPENSION INSPECTION

Check the action of the rear shock absorber by pressing the rear end several times.

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

Replace the damaged components which can not be repaired.

Tighten all nuts and bolts.

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

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



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

Check for worn swingarm bearings by grabbing the rear wheel and attempting to move the wheel and attempting to move the wheel side to side.

Replace the bearings if any looseness is noted.

Refer to (page 13-15) for swingarm service.



NUTS, BOLTS, FASTENERS

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

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

WHEELS/TIRES

FRONT WHEEL

Support the motorcycle on its center stand, and raise the front wheel off the ground.

Check for worn wheel bearings by holding the fork leg, and attempting to move the wheel side to side.

Replace the bearings if any looseness is noted.

Refer to the front wheel bearings replacement (page 12 -10).



REAR WHEEL

Support the motorcycle on its center stand.

Check for worn wheel and driven flange bearings by holding the swingarm, and attempting to move the wheel side to side.

Replace the bearings if any looseness is noted.

Refer to each bearing replacement:

- Rear wheel bearings (page 13-5)
- Driven flange bearing (page 13-10)



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

RECOMMENDED TIRE PRESSURE AND TIRE SIZE:

		FRONT	REAR
Tire pressure kPa(kgf/cm ² , psi)	Driver only	175 (1.75,25)	200 (2.00,29)
	Driver and passenger	175 (1.75,25)	225 (2.29,32)
Tire size		80/100- 17M/C 46P	110/80 17M/C 57P
Tire brand	MRF	NYLOGRIP ZAPPER-FQ	NYLOGRIP ZAPPER - C



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

Check the trueness of each wheel:

- Front wheel (page 12-10)
- Rear wheel (page 13-4)

Replace the tires when the tread depth (TWI) reaches the following limits.

MINIMUM TREAD DEPTH:

FRONT: 1.5 mm (0.06 in)

REAR: 2.0 mm (0.08 in)

Measure the tread depth at the center of the tires.



STEERING HEAD BEARINGS

Support the motorcycle on its center stand, and raise the front wheel off the ground.

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

Check that the handlebar moves freely from side to side.

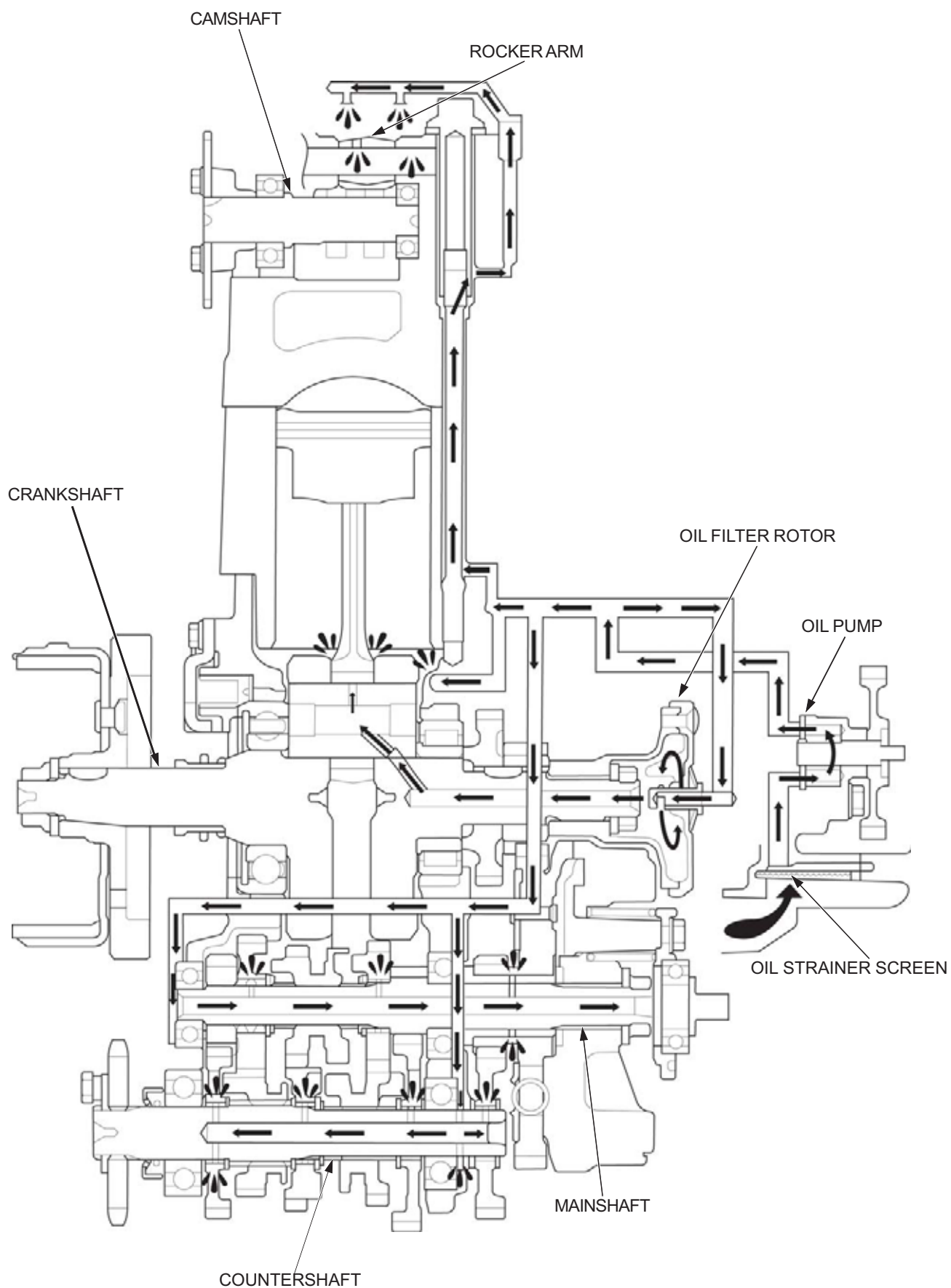


Check that the fork leg moves freely from forward to backward.

If the handlebar or fork moves unevenly, binds, or has vertical movement, inspect the steering head bearings (page 12- 22).



LUBRICATION SYSTEM DIAGRAM



4. LUBRICATION SYSTEM

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

SERVICE INFORMATION

GENERAL

CAUTION

4

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

- The oil pump can be serviced with the engine installed in the frame.
- The service procedures in this section must be performed with the engine oil drained.
- When removing and installing the oil pump, use care not to allow dust or dirt to enter the engine.
- If any portion of the oil pump is worn beyond the specified service limits, replace the oil pump as an assembly.
- After the oil pump has been installed, check that there are no oil leaks.
- Refer to the following:
 - engine oil level check (page 3-10)
 - engine oil change (page 3-11)
 - engine oil strainer screen cleaning (page 3-12)
 - engine oil centrifugal filter cleaning (page 3-12)

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	1.0 liter (1.1 US qt, 0.9 Imp qt)	–
	After disassembly	1.2 liter (1.3 US qt, 1.1 Imp qt)	–
Recommended engine oil		Honda 4-stroke oil or equivalent motor Oil API service classification: MA Viscosity: SAE 10W-30	–
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.20 (0.006 – 0.008)	0.25 (0.010)
	Side clearance	0.05 – 0.11 (0.002 – 0.004)	0.15 (0.006)

TORQUE VALUES

Oil pump cover screw	3 N·m (0.3 kgf·m, 2.2 lbf·ft)
Oil pump mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)

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
- Clogged oil strainer
- Faulty cylinder head gasket
- Worn piston rings

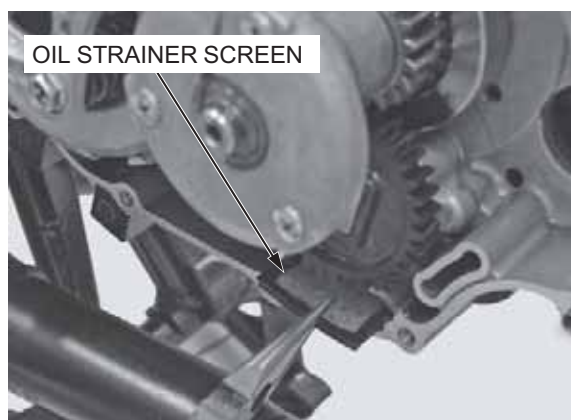
ENGINE OIL STRAINER SCREEN

REMOVAL

Remove the right crankcase cover (page 9-3).

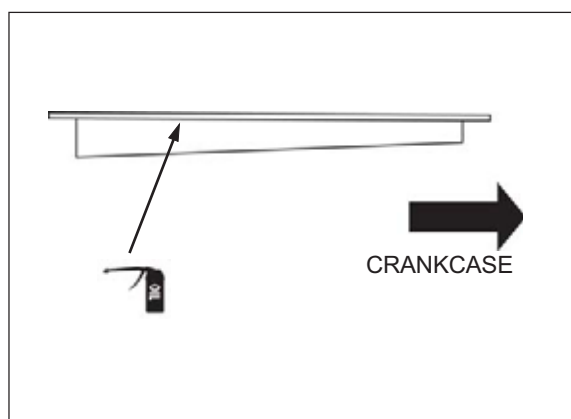
Remove the oil pump driven gear.

Remove the oil pump mounting bolts (2 nos.) and oil pump assembly.



Coat the screen rubber with engine oil and install it at original direction.

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



OIL PUMP

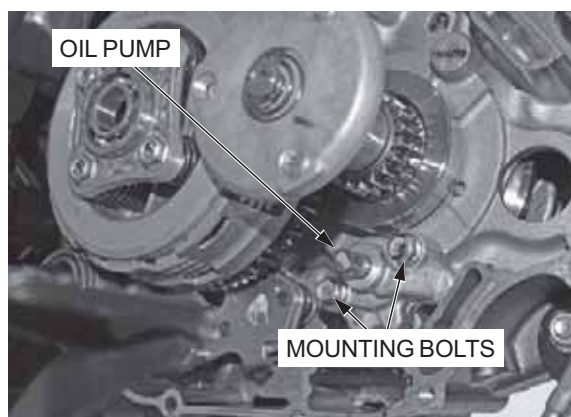
REMOVAL

Remove the right crankcase cover (page 9-3).

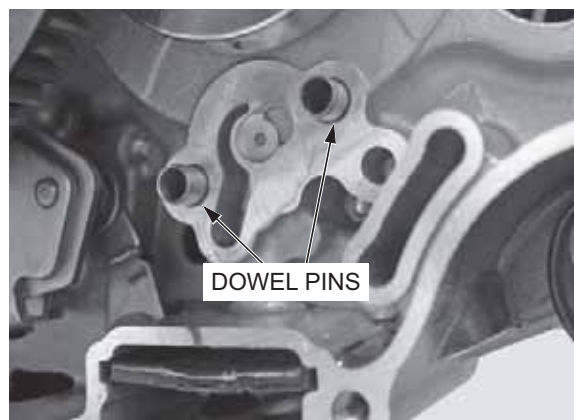
Remove the oil pump drive gear.



Remove the oil pump mounting bolts (2 nos.) and oil pump assembly.

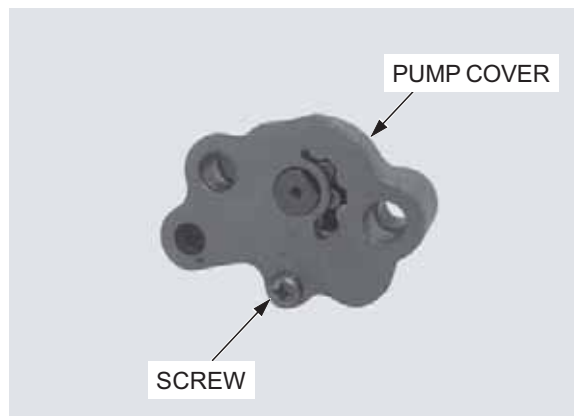


Remove the dowel pins (2 nos.).

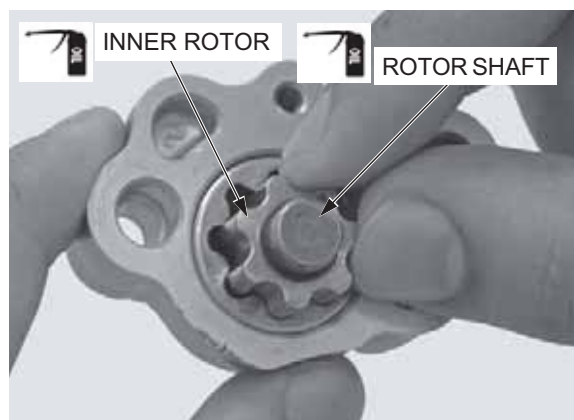


DISASSEMBLY

Remove the oil pump cover screw (1 no.) and oil pump cover.



Remove the rotor shaft and inner rotor.



Remove the outer rotor from the oil pump body.



INSPECTION

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

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

Measure the oil pump body clearance.

SERVICE LIMIT: 0.25 mm (0.010 in)

BODY CLEARANCE :



Measure the rotor tip clearance between the inner and outer rotors.

SERVICE LIMIT: 0.20 mm (0.008 in)

TIP CLEARANCE :



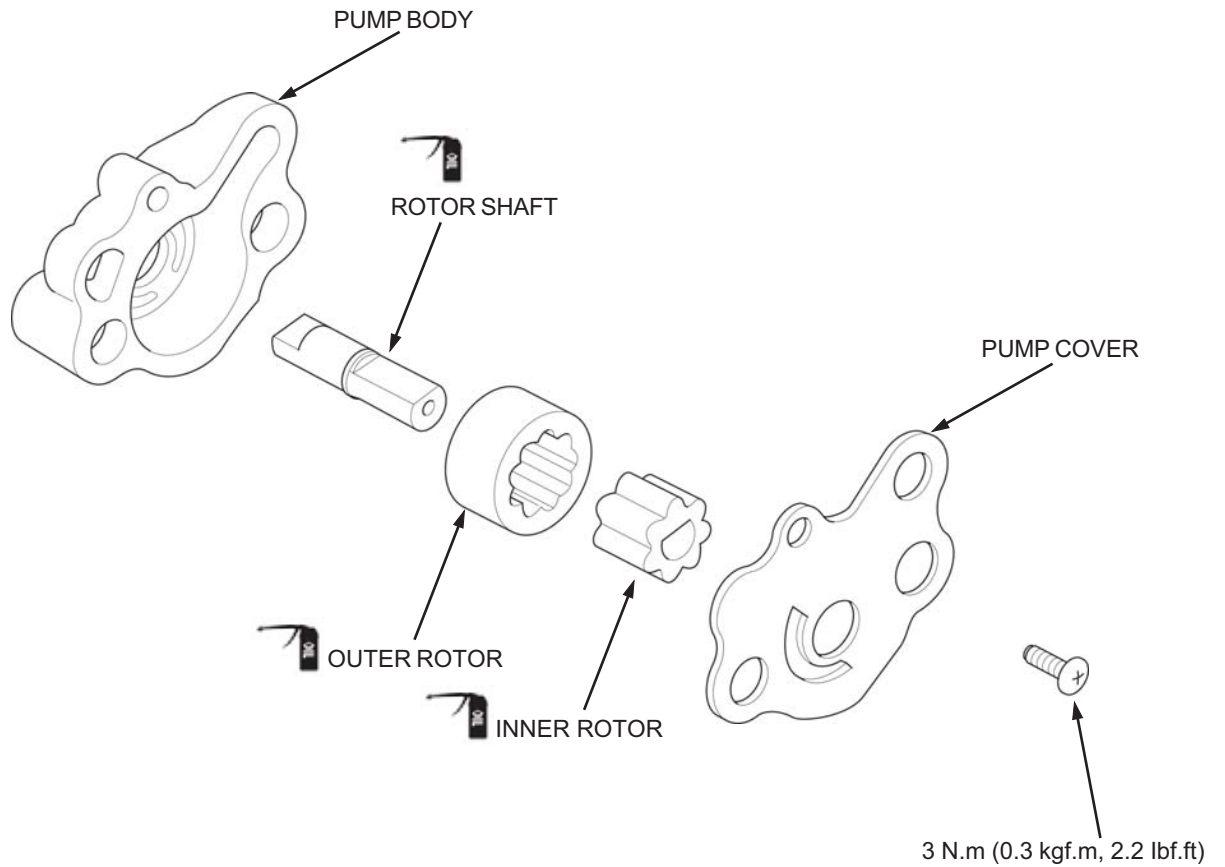
Remove the rotor shaft.

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

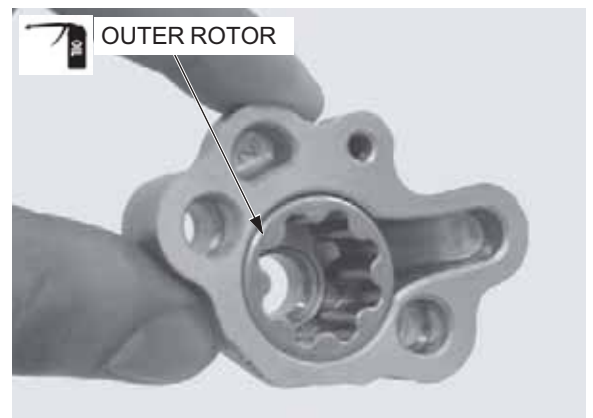
SERVICE LIMIT: 0.15 mm (0.006 in)

SIDE CLEARANCE :

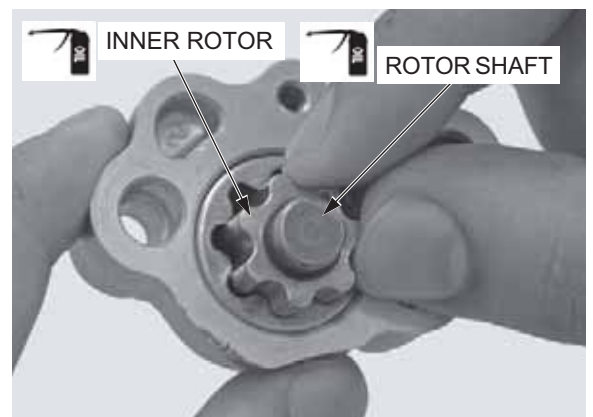




Apply clean engine oil to the outer rotor and install it into the oil pump body.



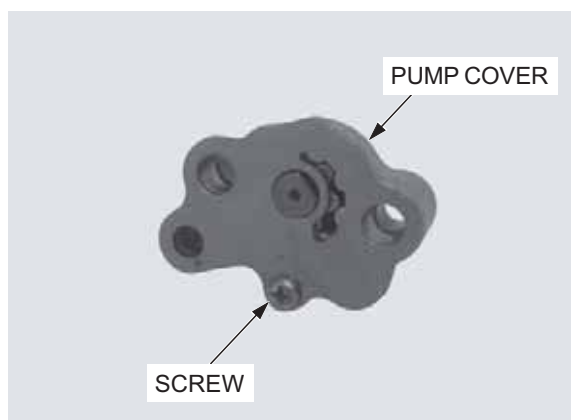
Apply clean engine oil to the inner rotor and rotor shaft and install them.



LUBRICATION SYSTEM

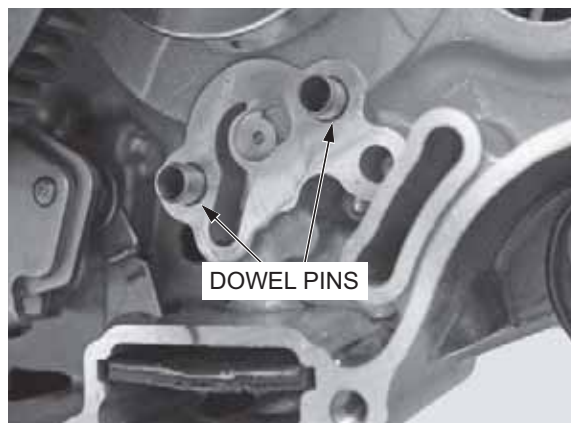
Install the oil pump cover and tighten the screw.

TORQUE: 3 N·m (0.3 kgf·m, 2.2 lbf·ft)



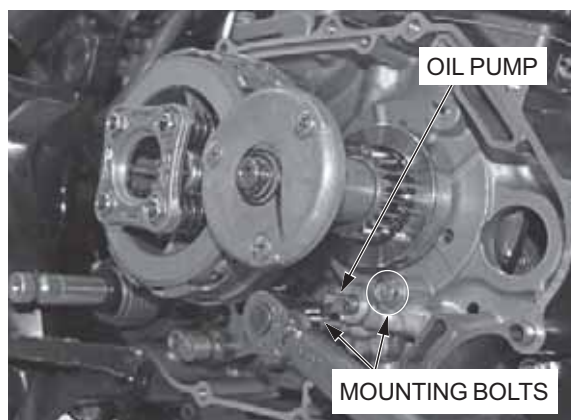
INSTALLATION

Install two dowel pins into the crankcase.



Install the oil pump and tighten the mounting bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

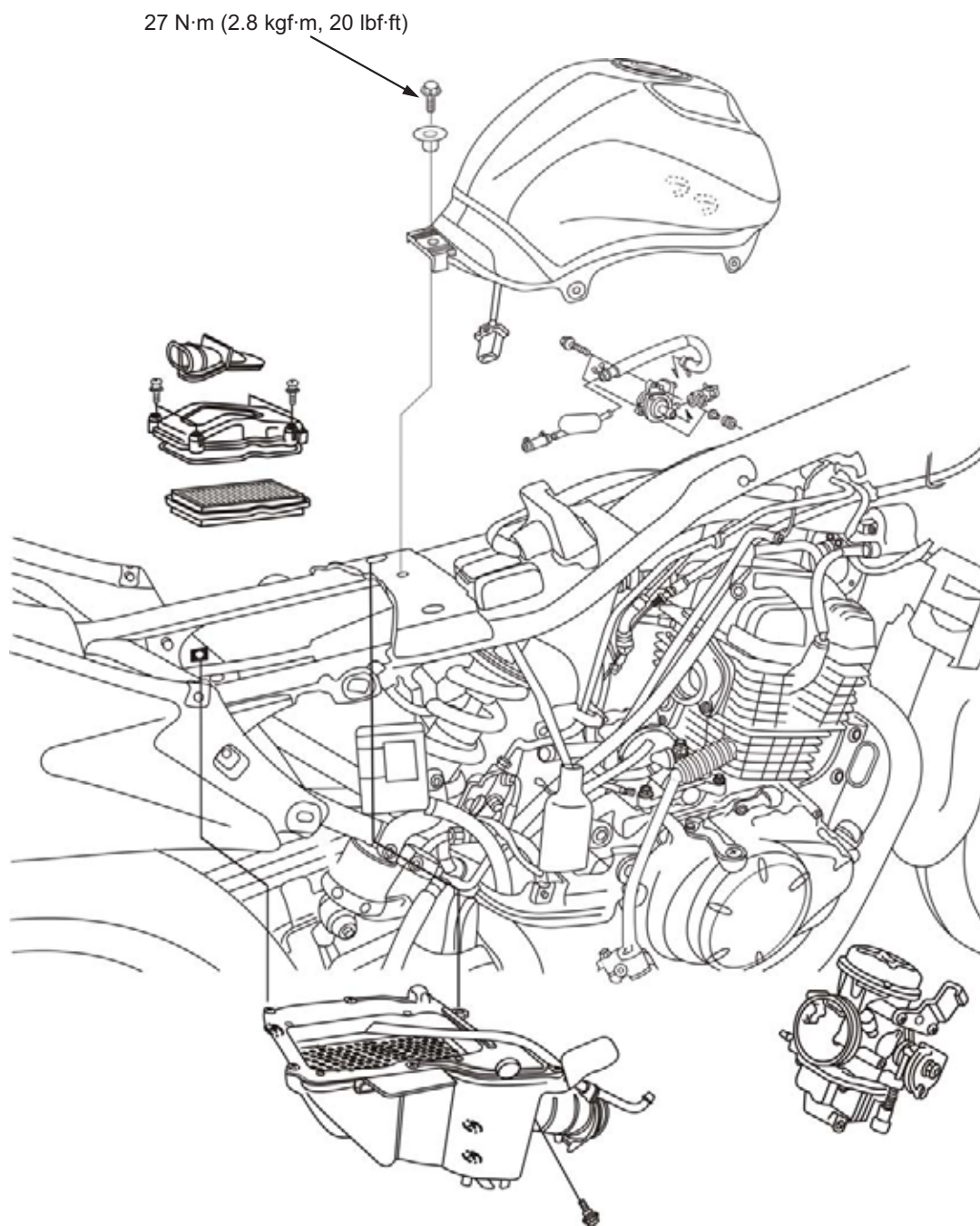


Apply clean engine oil to the oil pump drive gear teeth, and install it.

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



SYSTEM LOCATION



SYSTEM LOCATION	5-0	CARBURETOR	5-6
SERVICE INFORMATION	5-1	PILOT SCREW ADJUSTMENT	5-16
TROUBLESHOOTING	5-2	SECONDARY AIR SUPPLY SYSTEM	5-20
AIR CLEANER HOUSING	5-3	FUEL STRAINER	5-21
STARTING ENRICHMENT(SE) VALVE	5-5		

SERVICE INFORMATION

5

GENERAL

- Bending or twisting the control cable will impair smooth operation of secondary air supply system, 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 tube, loosen the drain screw, and drain the fuel from 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 motorcycle 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

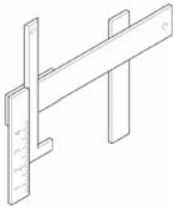
ITEM	SPECIFICATIONS
Carburetor identification number	AVK6AY
Main jet	#115
Slow jet	#35
Pilot screw initial/final opening	2 & 7/8 Turn out
Float level	13.0 mm (0.51 in)
Engine idle speed	1,400 ± 100 min ⁻¹ (rpm)
Throttle grip free play	2 – 6 mm (0.08 – 0.24 in)
PAIR control valve specified vacuum	58.7 kPa (440 mm Hg)

TORQUE VALUES

Fuel tank mounting bolt	27 N·m (2.8 kgf·m, 20 lbf·ft)
SE 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, 1.6 lbf·ft)
Float chamber screw	2.1 N·m (0.2 kgf·m, 1.6 lbf·ft)
SE valve cover screw	3.4 N·m (0.4 kgf·m, 2.5 lbf·ft)
Vacuum chamber cover screw	2.1 N·m (0.2 kgf·m, 1.6 lbf·ft)
Throttle cable stay screw	3.4 N·m (0.4 kgf·m, 2.5 lbf·ft)
Insulator band screw	1 N·m (0.1 kgf·m, 0.7 lbf·ft)
Fuel valve lock nut	27 N·m (2.8 kgf·m, 20 lbf·ft)

TOOL

Carburetor float level gauge
070MJ-001-I110



TROUBLESHOOTING

Engine won't start

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

Lean mixture

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

Rich mixture

- SE valve in open position
- Float valve faulty
- Float level too high
- Air jets clogged
- Air cleaner element contaminated
- Flooded carburetor

Engine stall, hard to start, rough idling

- Fuel line restricted
- Ignition system malfunction (page 16-3)
- Fuel mixture too lean/rich (pilot screw adjustment)
- Fuel contaminated/deteriorated
- Intake air leak
- Idle speed misadjusted
- Float level faulty
- Pilot screw misadjusted

After burn 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 16-3)

Backfiring or misfiring during acceleration

- Ignition system malfunction
- Fuel mixture too lean

Poor performance (driveability) and poor fuel economy

- Fuel system clogged
- Ignition system malfunction

AIR CLEANER HOUSING

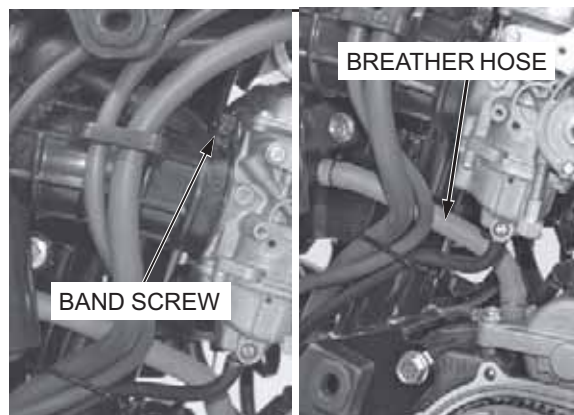
REMOVAL

Remove the following:

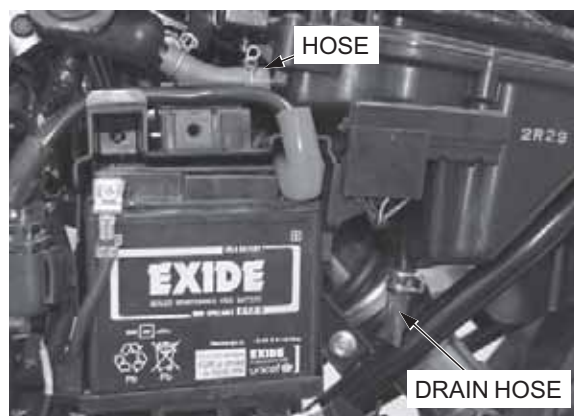
- right side cover (page 2-3)
- left side cover (page 2-3)
- air cleaner element (page 3-6)
- Fuel tank (page 2-3)

Loosen the air cleaner connecting boot band screw.

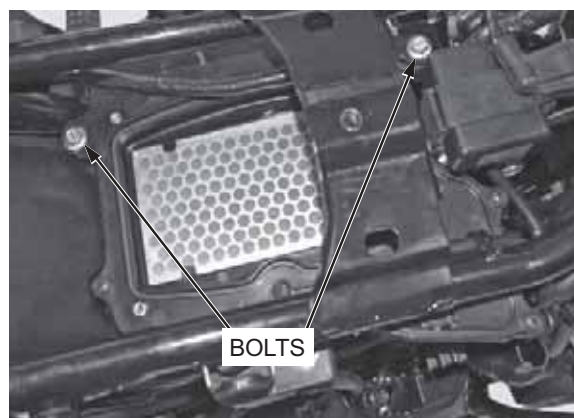
Disconnect the crank case breather hose.



Disconnect the resonator air chamber hose and air cleaner housing drain hose.



Remove the mounting bolts.

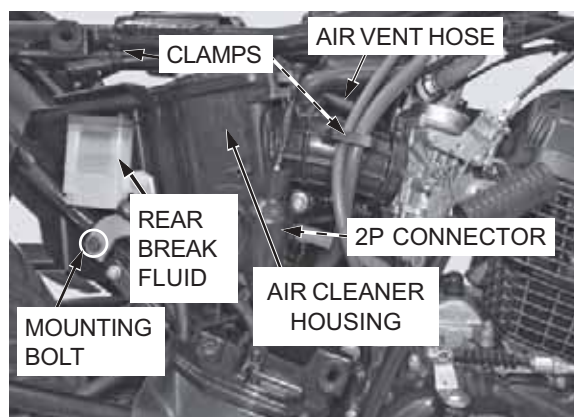


Disconnect the air vent hose (page 5-5) from the carburetor and remove the hose from the frame clamps. Disconnect the routing of 2P connector as well as 2P connector to rear brake light switch.

Remove the mounting bolt (1 no.) from air cleaner housing.

Remove the rear break fluid reservoir by loosening mounting bolt (1 nos).

Remove the air cleaner housing from right side.



INSTALLATION

Install the air cleaner housing to the frame.

Install and tighten the mounting bolt (1 no).

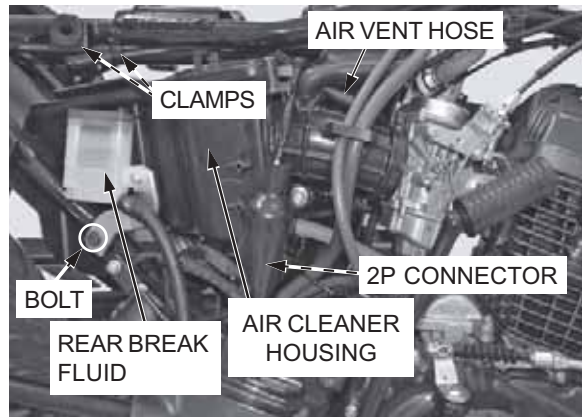
Install the rear break fluid reservoir.

Install the rear brake reservoir mounting bolt.

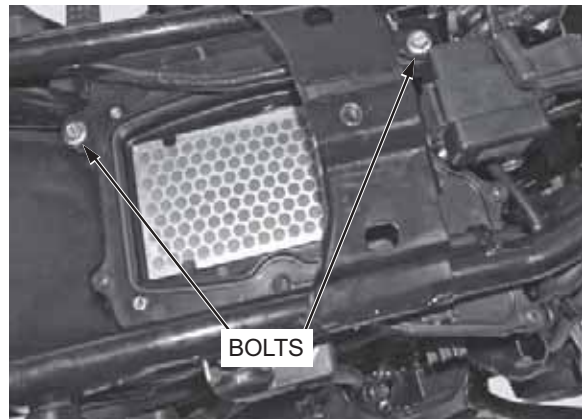
Connect the air vent hose to the carburetor (page 5-16) and clamp the hose to the frame carefully.

Connect the rear brake light switch 2P connector and clamp the routing on the air cleaner housing.

Route all hoses as shown on page (1-18 to 1-24)

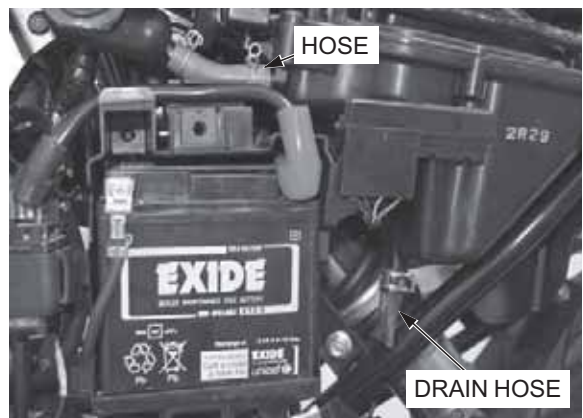


Install and tighten the mounting bolts (2 nos).



Connect the resonator air chamber hose and air cleaner housing drain hose.

While installing the drain hose route the wire harness properly page (1-18)



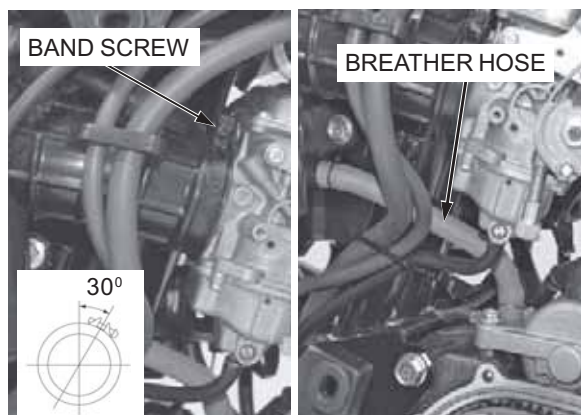
Connect the air cleaner connecting boot and tighten the band screw.

Connect the crank case breather hose.

Install the following:

- air cleaner element (page 3-6)
- fuel tank (page 2-3)
- left side cover (page 2-3)
- right side cover (page 2-3)

Take care of the direction of the band screw while installing as shown.



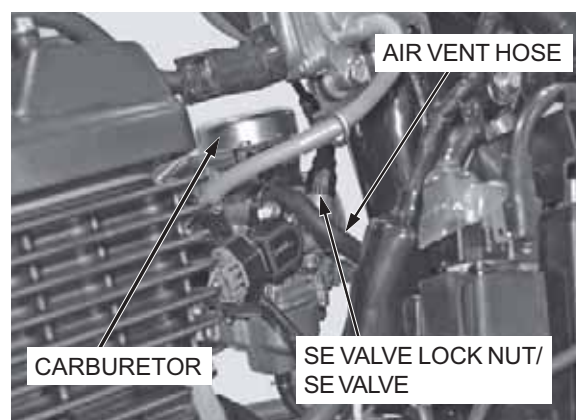
STARTING ENRICHMENT (SE) VALVE

REMOVAL/INSTALLATION

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

Disconnect the air vent hose.

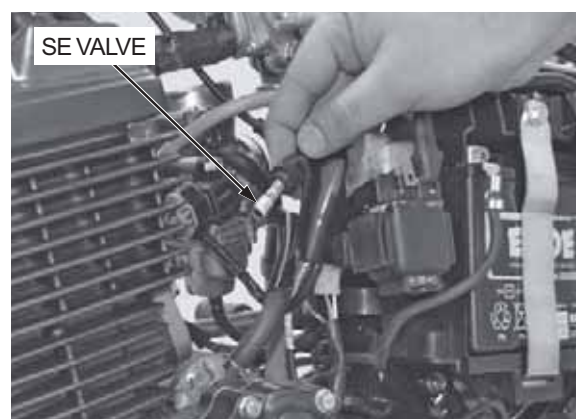
Loosen the starting enrichment (SE) valve lock nut and remove the SE valve from the carburetor body.



Check the SE valve for scoring, scratches or wear.

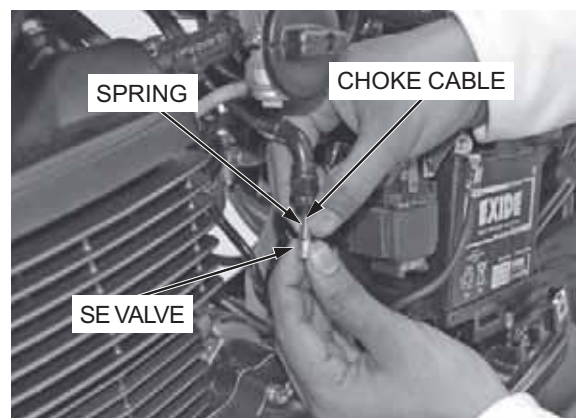
Check the seat at the tip of the SE valve for stepped wear.

Replace the SE valve set if necessary.



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

Install the SE valve to the choke cable.



Handle the SE valve lock nut with care that can easily be damaged.

Install the SE valve to the carburetor body.

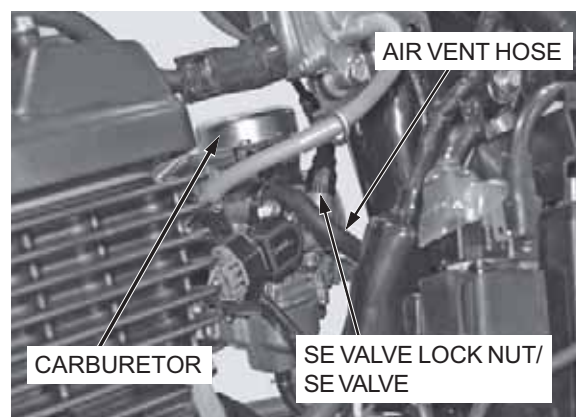
Tighten the SE valve lock nut.

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

After the installation, check for the smooth operation of the choke lever.

Connect the air vent hose.

Install the left side cover (page 2-3)



CARBURETOR

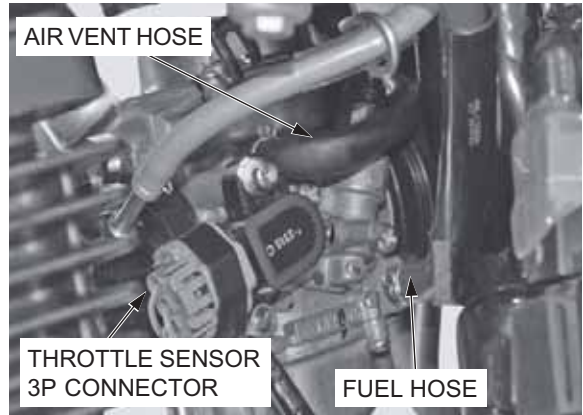
REMOVAL

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

Remove the SE valve (page 5-5).

Disconnect the air vent hose and the throttle sensor 3P connector

Turn the fuel valve "OFF", and disconnect the fuel hose from the carburetor.

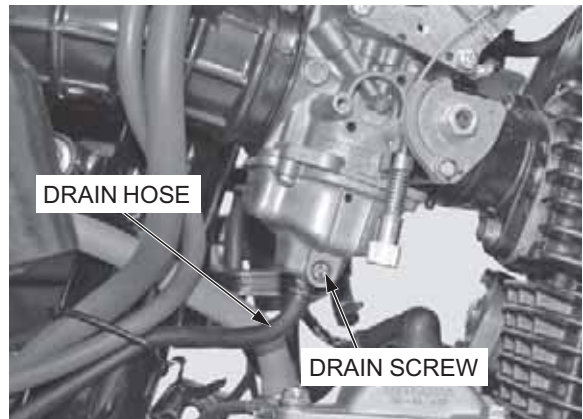


Loosen the drain screw and drain the fuel from the float chamber into the approved gasoline container.

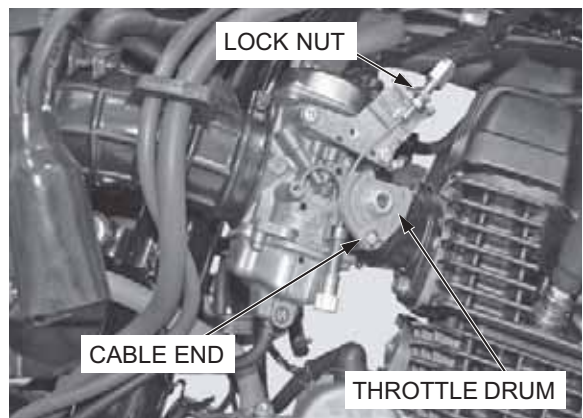
Completely drain any residual fuel, tighten the drain screw to the specified torque.

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

Disconnect the drain hose from the carburetor

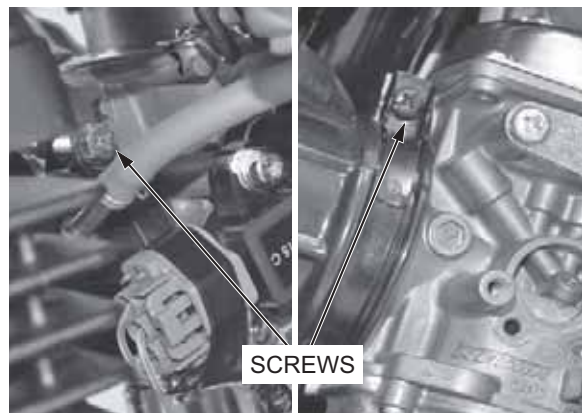


Loosen the throttle cable lock nut and disconnect the throttle cable end from the throttle drum.



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

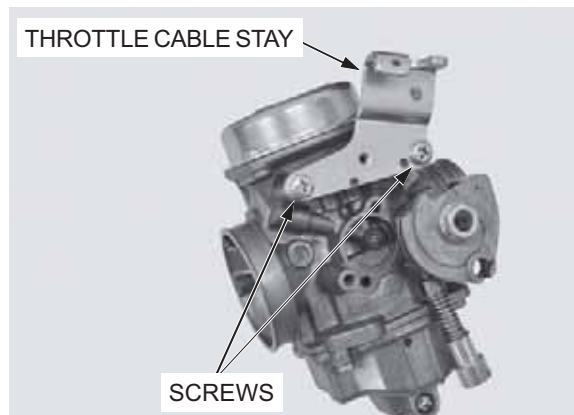
Remove the carburetor.



DISASSEMBLY

THROTTLE CABLE STAY

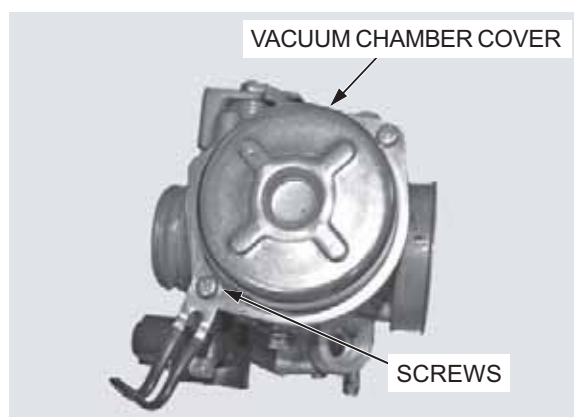
Remove the two screws and throttle cable stay.



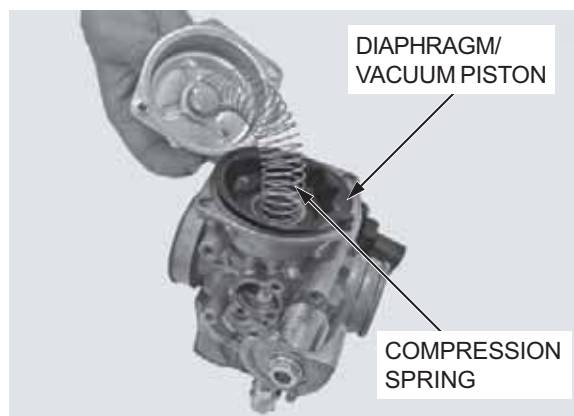
Take care of the spring as the compression spring is very long, it will jump out of the carburetor when the cover is removed.

VACUUM CHAMBER

Remove the two screws and vacuum chamber cover.



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



FUEL SYSTEM

Turn the needle holder counterclockwise and remove it.



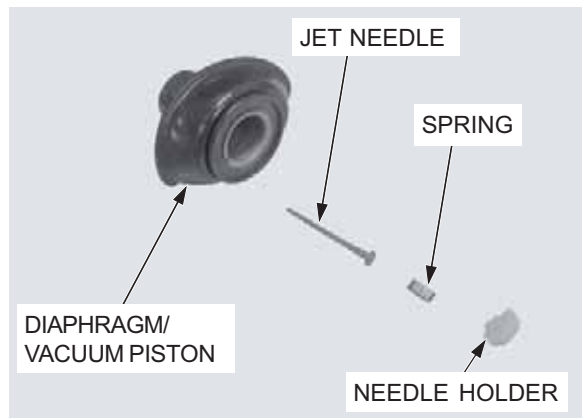
Be careful not to damage the diaphragm.

Remove the spring and jet needle from the vacuum piston.

Check the following:

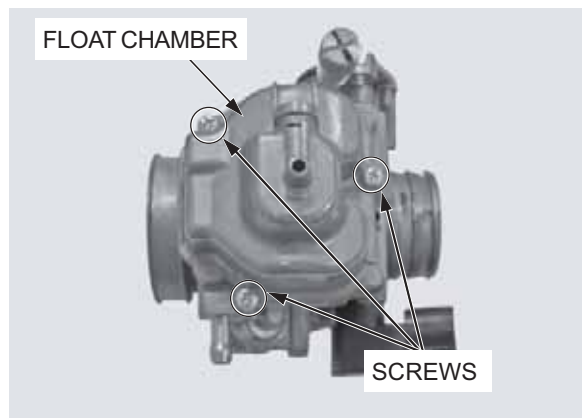
- Jet needle for stepped wear
- Vacuum piston for wear or damage
- Diaphragm for pin holes, deterioration or damage
- Spring for wear or damage
- Needle holder for damage

Replace the damage parts, if necessary.



FLOAT

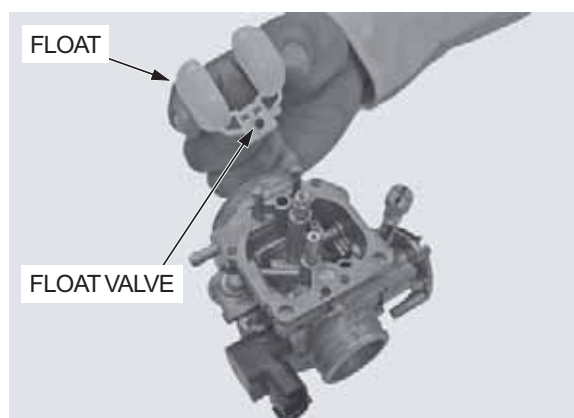
Remove the screws (3 nos) float chamber.



Pull out the float pin.



Remove the float and float valve.



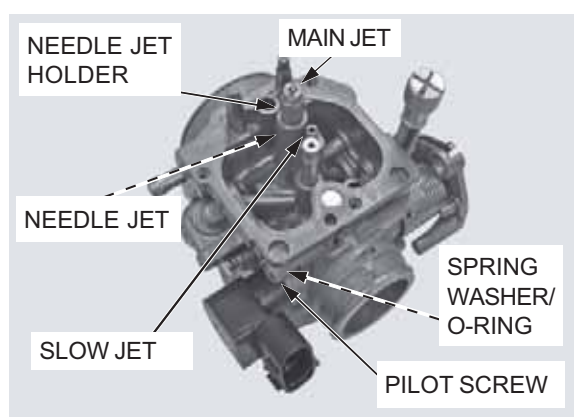
JETS

Remove the followings:

- main jet
- slow jet
- needle jet holder
- needle jet

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

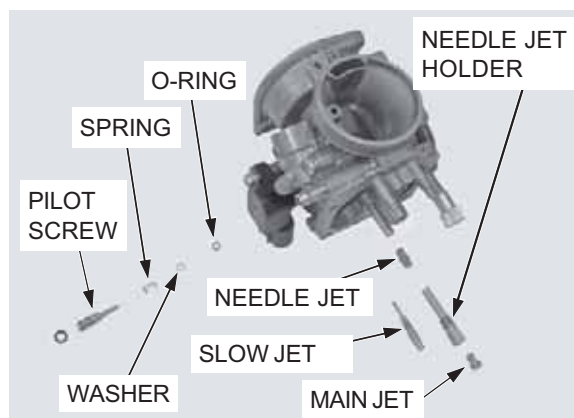
Before removing the pilot screw, record the number of turns until it seats lightly, then remove the pilot screw, spring, washer and O-ring



Check the each jet for wear or damage.

Check the pilot screw, spring washer and O-ring for wear or damage.

Replace the damaged parts, if necessary.



STARTING ENRICHMENT (SE) VALVE COVER

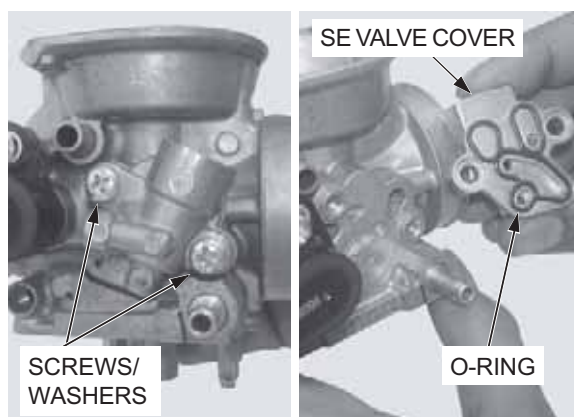
Remove the two screws/washers.

Remove the valve cover and O-ring.

Check the O-ring for deteriorated or damage.

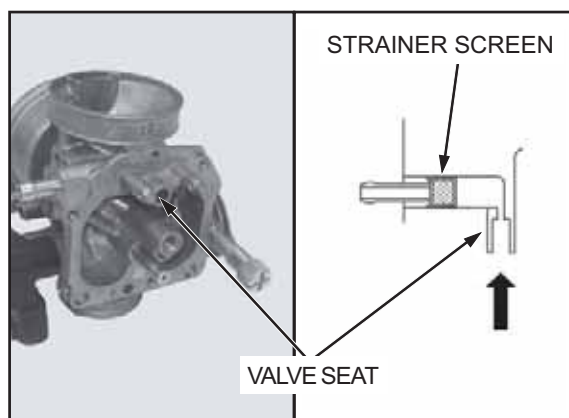
Check the starting enrichment (SE) valve cover and SE valve air passage.

If air passage is clogged, blow open with compressed air.



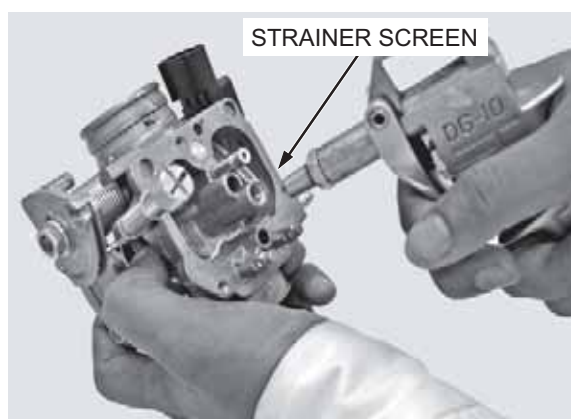
CARBURETOR CLEANING

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

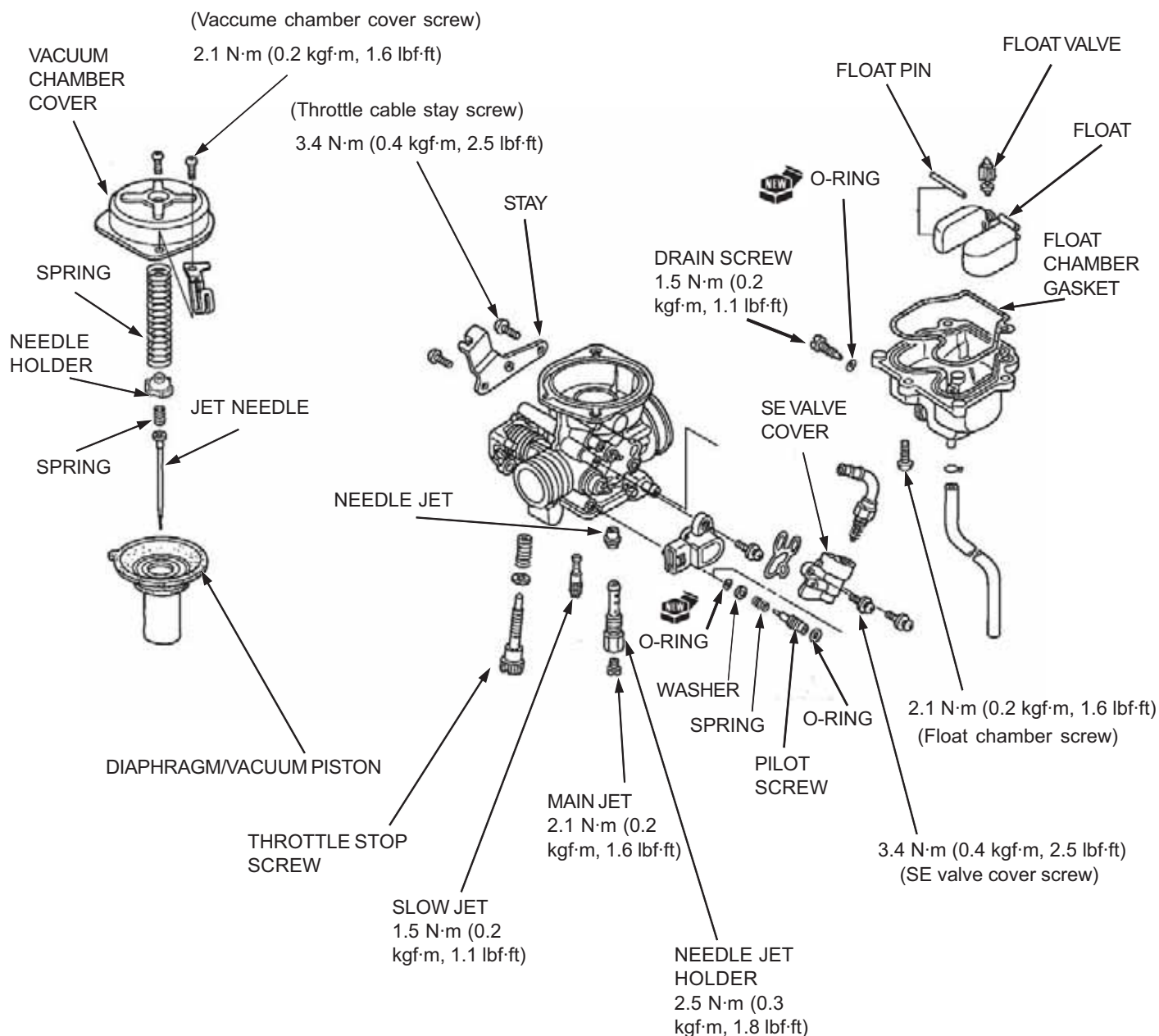


Blow open each air and fuel passages in the carburetor body using compressed air.

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



ASSEMBLY

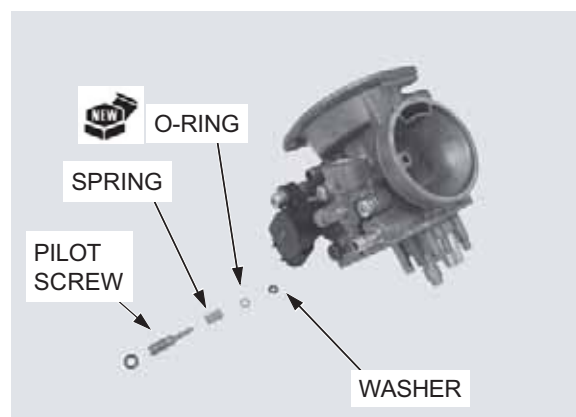


JETS

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, and return it to its original position as noted during removal.

Perform the pilot screw adjustment if a new pilot screw is installed (page 5-16).



FUEL SYSTEM

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

Install the following:

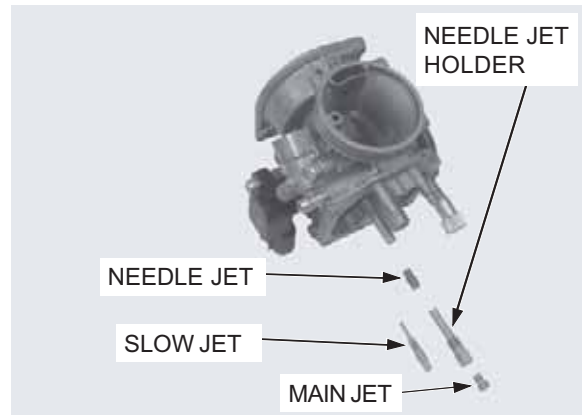
- Needle jet
- Needle jet holder
- Main jet
- Slow jet

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, 1.6 lbf·ft)

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



FLOAT

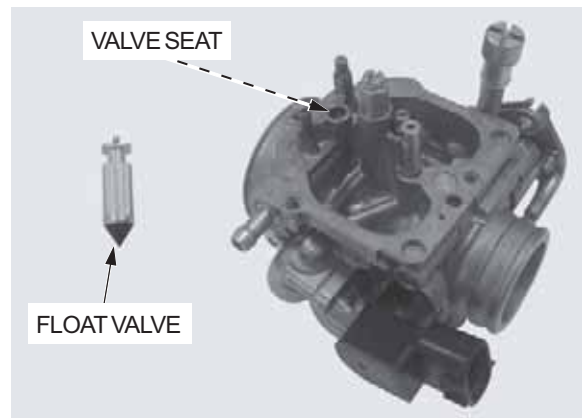
Check the tip of the float valve where it contacts the valve seat for stepped wear or contaminated.

Replace the valve if the tip is worn or contaminated.

Check the operation of the float valve.

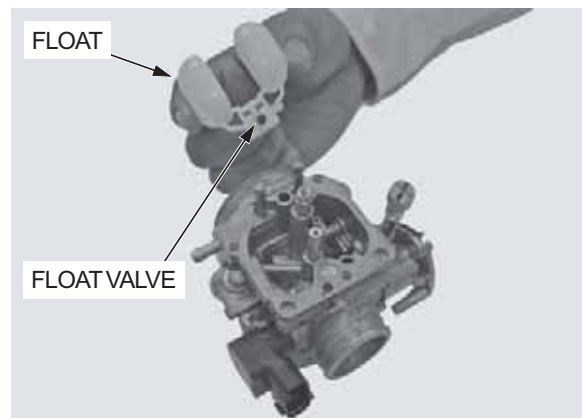
Inspect the float valve seat for scores, scratches clogging and damage.

If the seat is damaged, replace the carburetor body.



Install the float valve to the float.

Install the float to the carburetor body.



Install the float pin through the carburetor body and float.



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

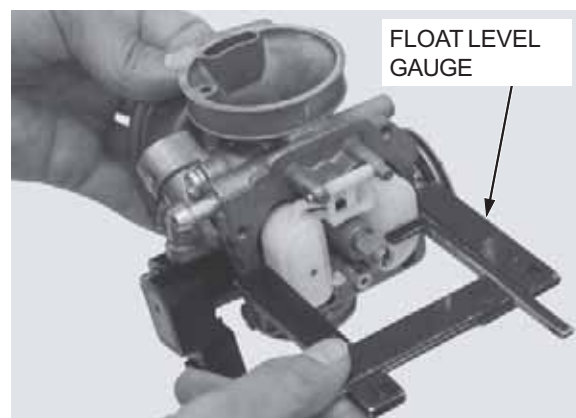
FLOAT LEVEL: 13.0 mm (0.51 in)

TOOL:

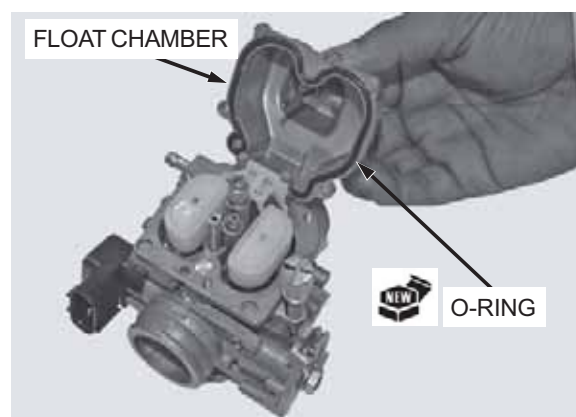
Carburetor float level gauge 070MJ-001-I110

The float cannot be adjusted.

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

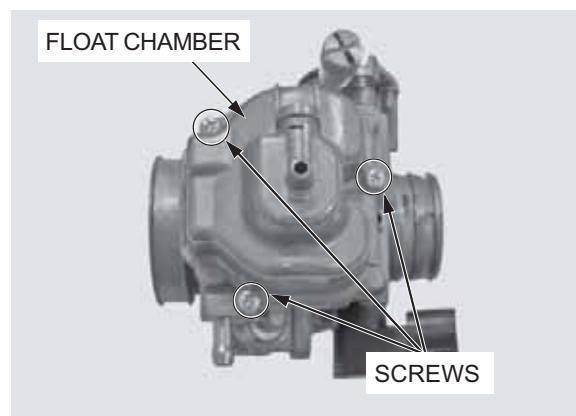


Install a new O-ring into the float chamber groove. Install the float chamber.



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

TORQUE: 2.1 N·m (0.2 kgf·m, 1.6 lbf·ft)



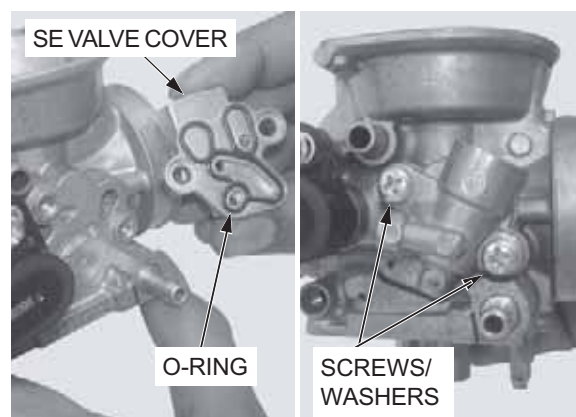
STARTING ENRICHMENT (SE) VALVE COVER

Install the the new O-ring and SE valve cover.

Install the two screws/washers.

Tighten the screws.

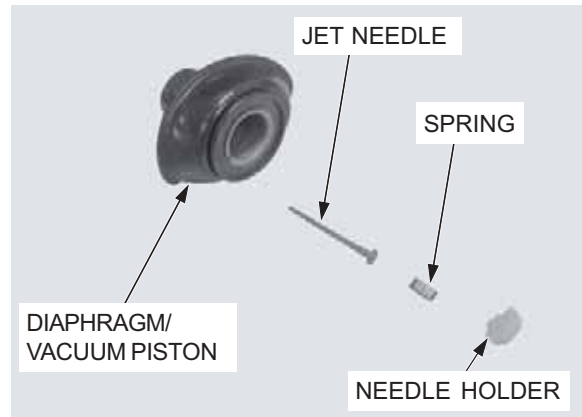
TORQUE: 3.4 N·m (0.4 kgf·m, 2.5 lbf·ft)



VACUUM CHAMBER

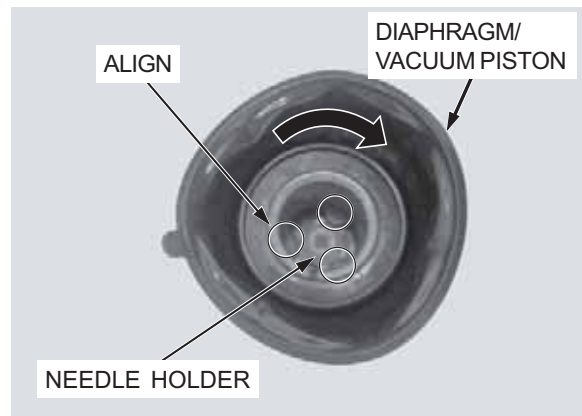
Install the jet needle into the diaphragm/vacuum piston.

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.

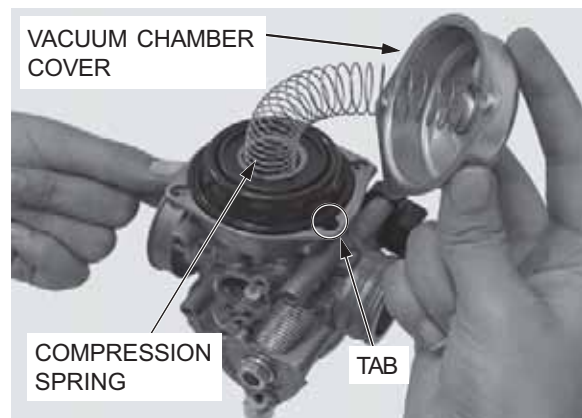


Be careful not to damage the jet needle.

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

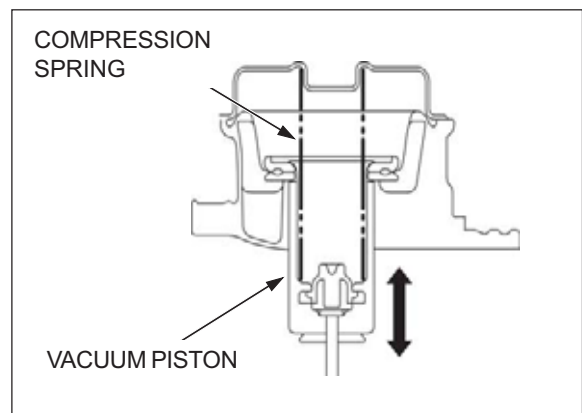
Lift the bottom of the piston with your finger to set the diaphragm tab into the groove of the carburetor body.

Install the compression spring and vacuum chamber over by lifting the piston in place.



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

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



Install the 2 screws of the vacuum chamber cover before releasing the vacuum piston.

Tighten the two screws.

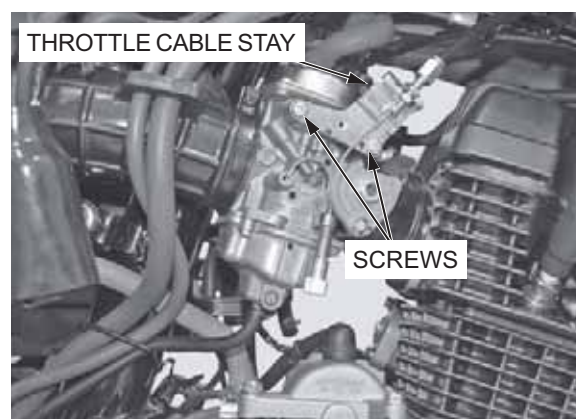
TORQUE: 2.1 N·m (0.2 kgf·m, 1.6 lbf·ft)



Install the two screws and throttle cable stay.

Tighten the two screws.

TORQUE: 3.4 N·m (0.4 kgf·m, 2.5 lbf·ft)



INSTALLATION

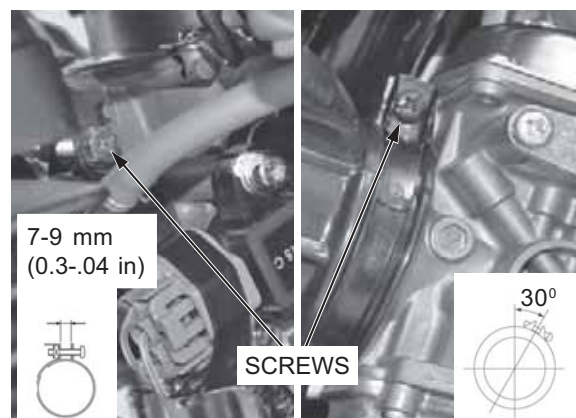
Take care of the direction of the band screw while installing as shown.

Install the carburetor to the connecting hose and insulator.

Tighten the insulator band screw so that the band ends clearance is 7 - 9 mm (0.3 - 0.4 in)

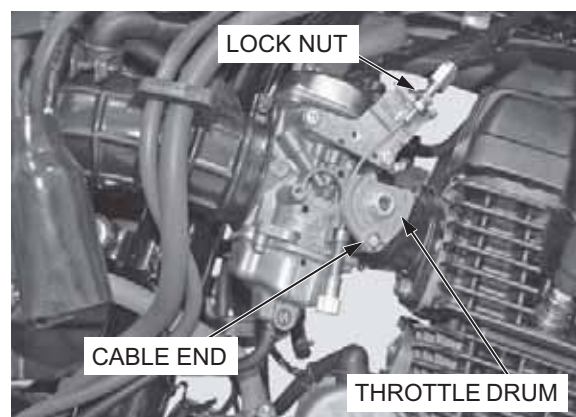
TORQUE: 1 N·m (0.1 kgf·m, 0.7 lbf·ft)

Tighten the connecting boot band screw.



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

Check the throttle operation (page 3-5)



FUEL SYSTEM

Connect the drain hose to the carburetor.

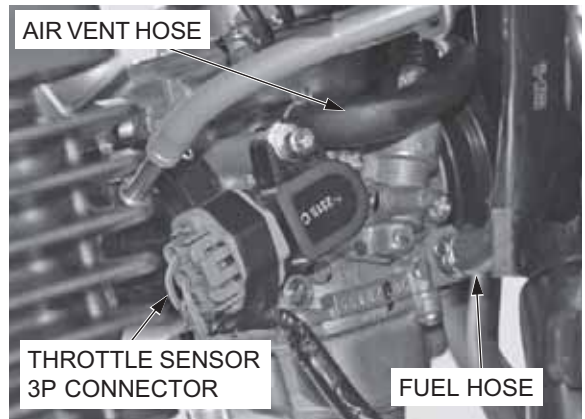


*After installation
turn the fuel
valve "ON" and
make sure
these are no
fuel leaks.*

Connect the air vent hose and throttle sensor 3P connector to the carburetor.

Connect the fuel hose to the carburetor.

Install the SE valve (page 5-5)



PILOT SCREW ADJUSTMENT

- The pilot screw is correctly adjusted at the factory. As the adjustment of the pilot screw is very critical for the emission of CO and HC gases, such an adjustment shall be carried out very carefully.
- Place the motorcycle on its center stand on a level surface.
- Use a tachometer with graduations of 50 min^{-1} (rpm) or smaller with graduations of 50 min^{-3} (rpm) change.
- If the CO measurement tool is available, perform the adjustment by co concentration measurement procedure.

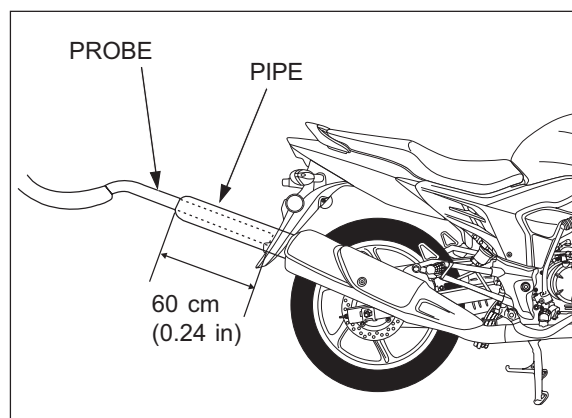
ADJUSTMENT BY CO CONCENTRATION MEASUREMENT

- Check the following items before inspection.
 - air cleaner (page 3-6)
 - spark plug (page 3-7)
 - crankcase breather (page 3-7)
 - secondary air supply system (page 5-20)
 - ignition timing (page 16-5)
- 1. Connect an appropriate pipe or hose (heat-resistant, chemical-resistant) to the muffler so that the probe can be inserted by more than 60cm (0.24 in)
- 2. Connect a tachometer according to the tachometer manufacturer's instructions.
- 3. Remove the left side cover (page 2-3).

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

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

INITIAL OPENING: 2 & 7/8 turns out.

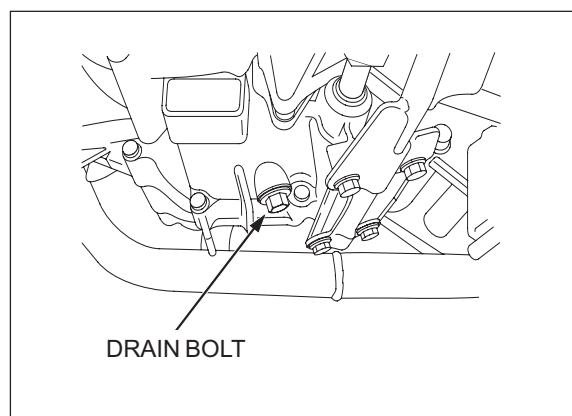


- 4. Warm up the engine for 10 minutes at idle speed.
 - Do not warm up the engine by running the motorcycle. The catalytic converter will act and affect the measurement.

Measure the engine oil drain bolt temperature.

DRAIN BOLT TEMPERATURE: 60 - 65 °C

Be careful if using water thermometer, the measurement may be affected by the atmospheric temperature.



- 5. Adjust the idle speed with the throttle stop screw.

IDLE SPEED: 1,400 ± 100min-1(rpm)

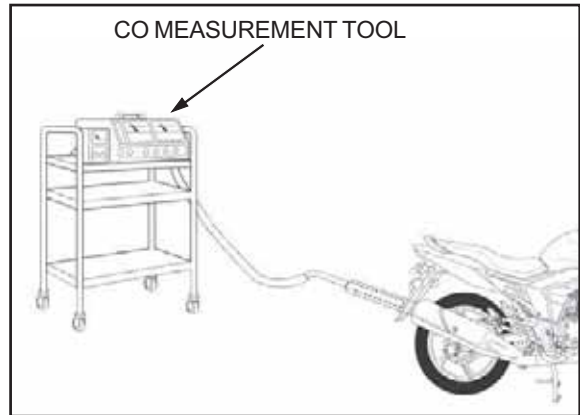


FUEL SYSTEM

6. Insert the probe into the muffler and measure the carbon-mono-oxide (CO%) concentration.

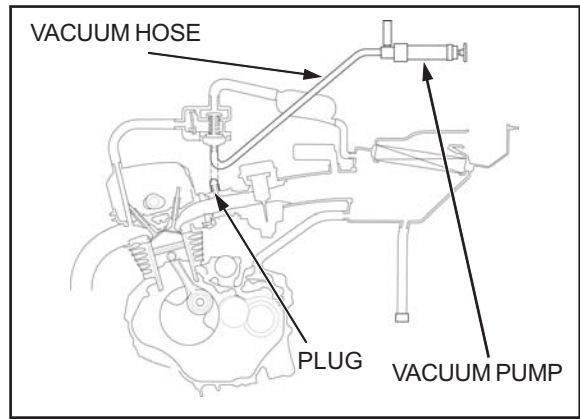
CO measurement at idle: 0.7 - 0.8%

If the CO concentration is exist, adjust the pilot screw as following.



7. 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 58.7 kPa (440 mm Hg) (make sure the secondary air does not supply).



When PAIR system stop, idle speed will change.

8. Start the engine and check the idle speed.

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

If the idle speed is out of specification, adjust the idle speed by turning the throttle stop screw with the PAIR system stopped.



9. Turn the pilot screw and adjust the CO concentration.

CO measurement at idle:
(secondary air does not supply) 3.5 - 4.5 %

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

Start the engine.

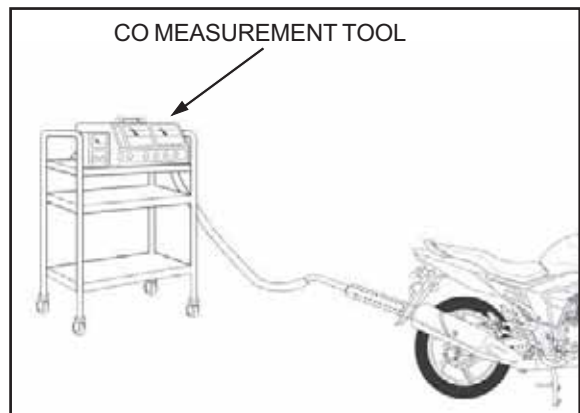
Adjust the idle speed with the throttle stop screw if necessary.

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

Measure the CO concentration again.

CO measurement at idle: 0.7 - 0.8%

If the CO concentration is exist, check the secondary air supply system (page 5-20).



IDLE DROP PROCEDURE

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

Reference engine oil temperature: 60 - 65°C

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 & 7/8 Turns out

2. Warm up the engine to normal operating temperature.
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 58.7 kPa (440 mm Hg) (make sure the secondary air does not supply).

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

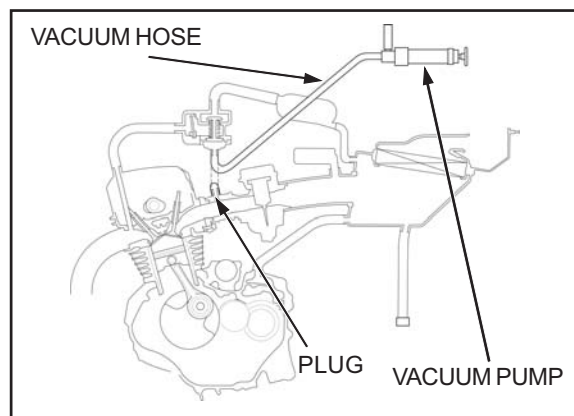
IDLE SPEED: 1,400 ± 100 min⁻¹ (rpm)

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 min⁻¹ (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 ± 100 min⁻¹ (rpm)



SECONDARY AIR SUPPLY SYSTEM

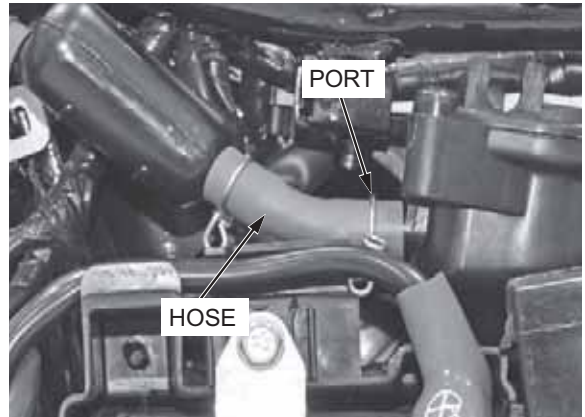
SYSTEM INSPECTION

Warm up to the engine to normal operating temperature.

Disconnect the air suction hose from the air cleaner housing.

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

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



Disconnect the air suction hose from the resonator air chamber.

Then check the air suction hose is clean and free of carbon deposits.

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

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

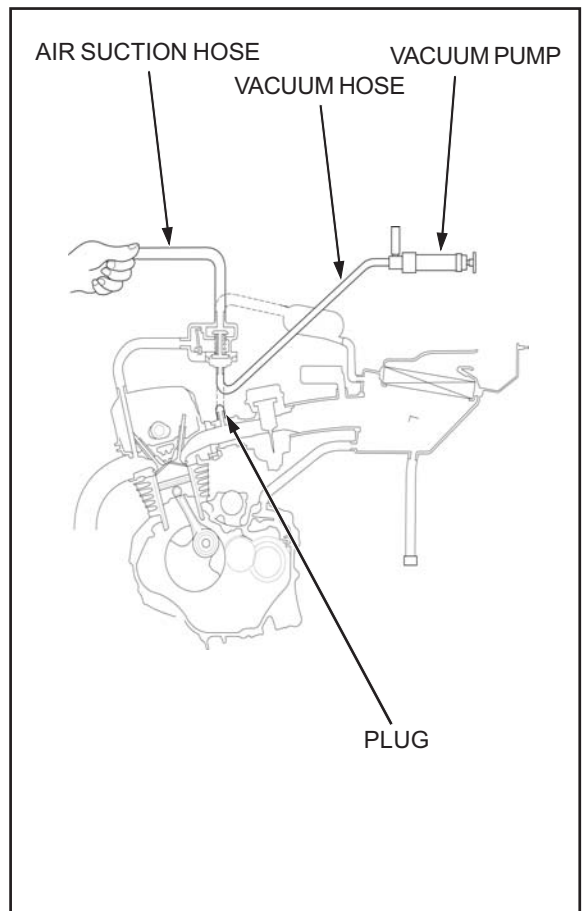
If the air is not drawn in, check the air suction hose for clogging.

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

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

SPECIFIED VACUUM: 58.7 kPa (440 mm Hg)

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



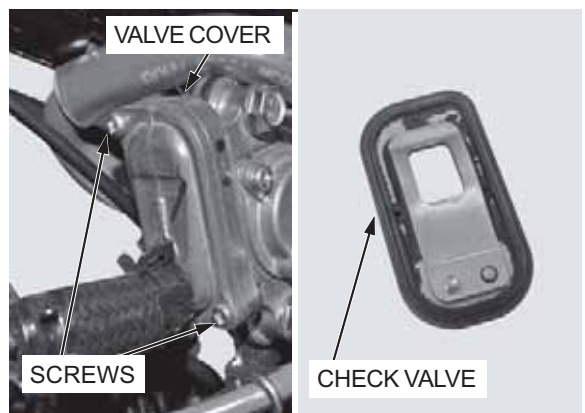
PAIR CHECK VALVE INSPECTION

- Remove the following:
 - PAIR control valve (page 5-21)
 - Two screws
 - Valve cover
 - Pair check valve.

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

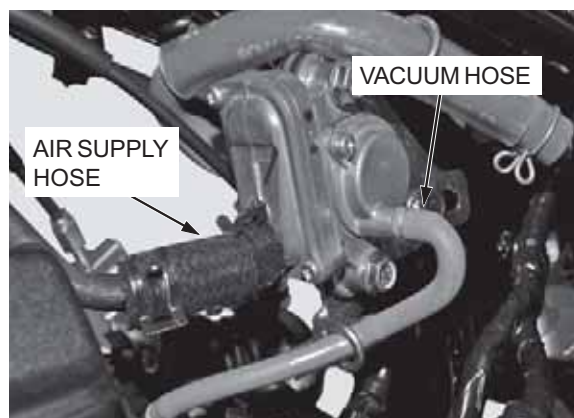
Replace the PAIR control valve if the seat rubber is cracked, deteriorated or damaged, or if there is clearance between the reed and seat.

Installation is in the reverse order of removal.

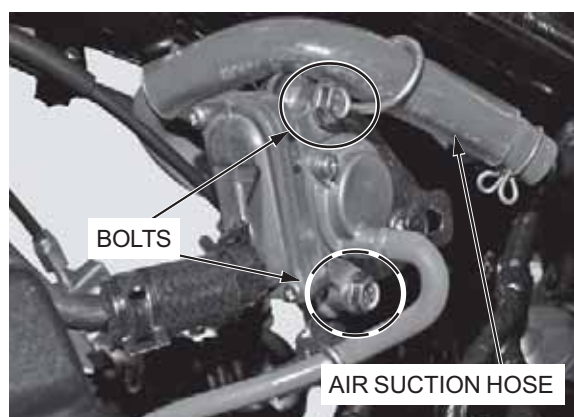


PAIR CONTROL VALVE REMOVAL /INSTALLATION

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



Disconnect the air suction hose.
Remove the bolts, nuts (2 nos) and PAIR control valve.
Installation is in the reverse order of removal.



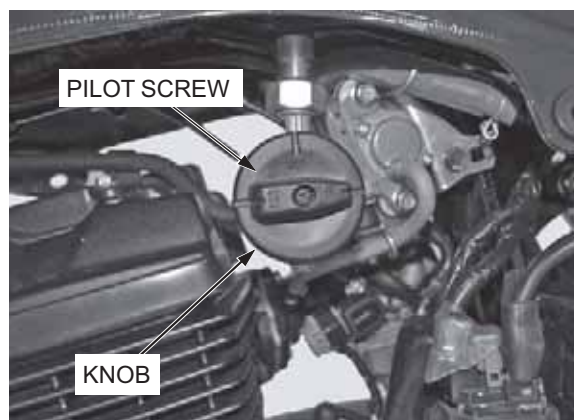
FUEL STRAINER

REMOVAL

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

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

Remove the screw and plastic fuel valve knob.



*Make sure not
to damage
painted surface
of fuel tank*

Remove the fuel tank (page 2-3)

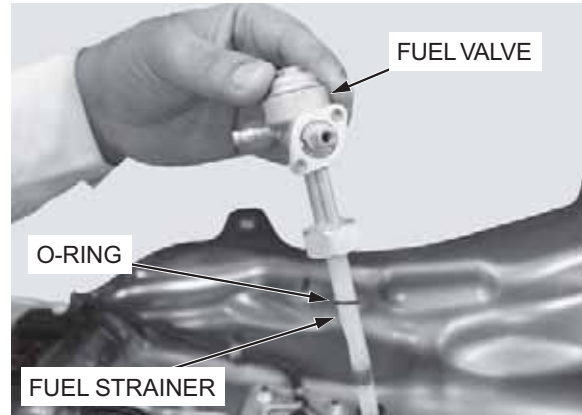
Loosen the fuel valve lock nut.



FUEL SYSTEM

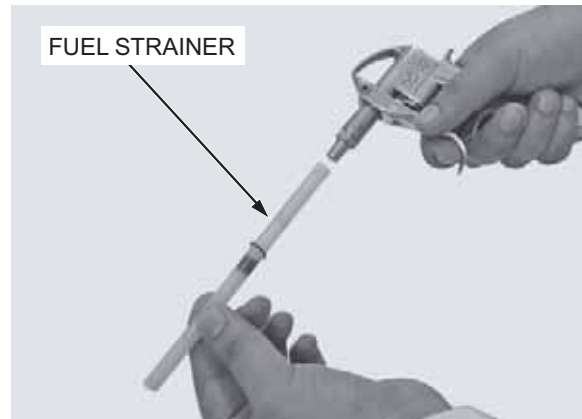
Remove the fuel strainer and fuel valve assembly from the fuel tank.

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



CLEANING

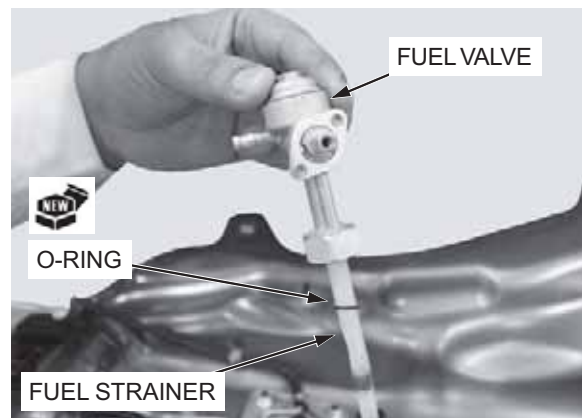
Clean the fuel strainer with compressed air.



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.



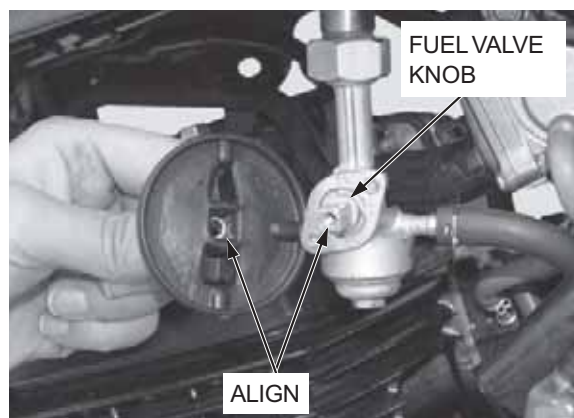
Tighten the fuel valve lock nut and apply the specified Torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

Install the fuel tank (page 2-3).

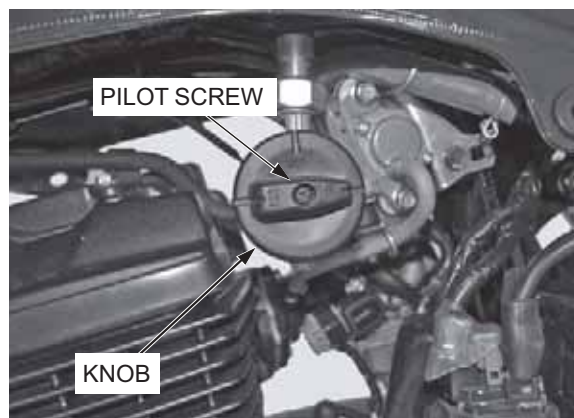


Install the fuel valve knob while aligning the fuel valve tab with the knob hole.

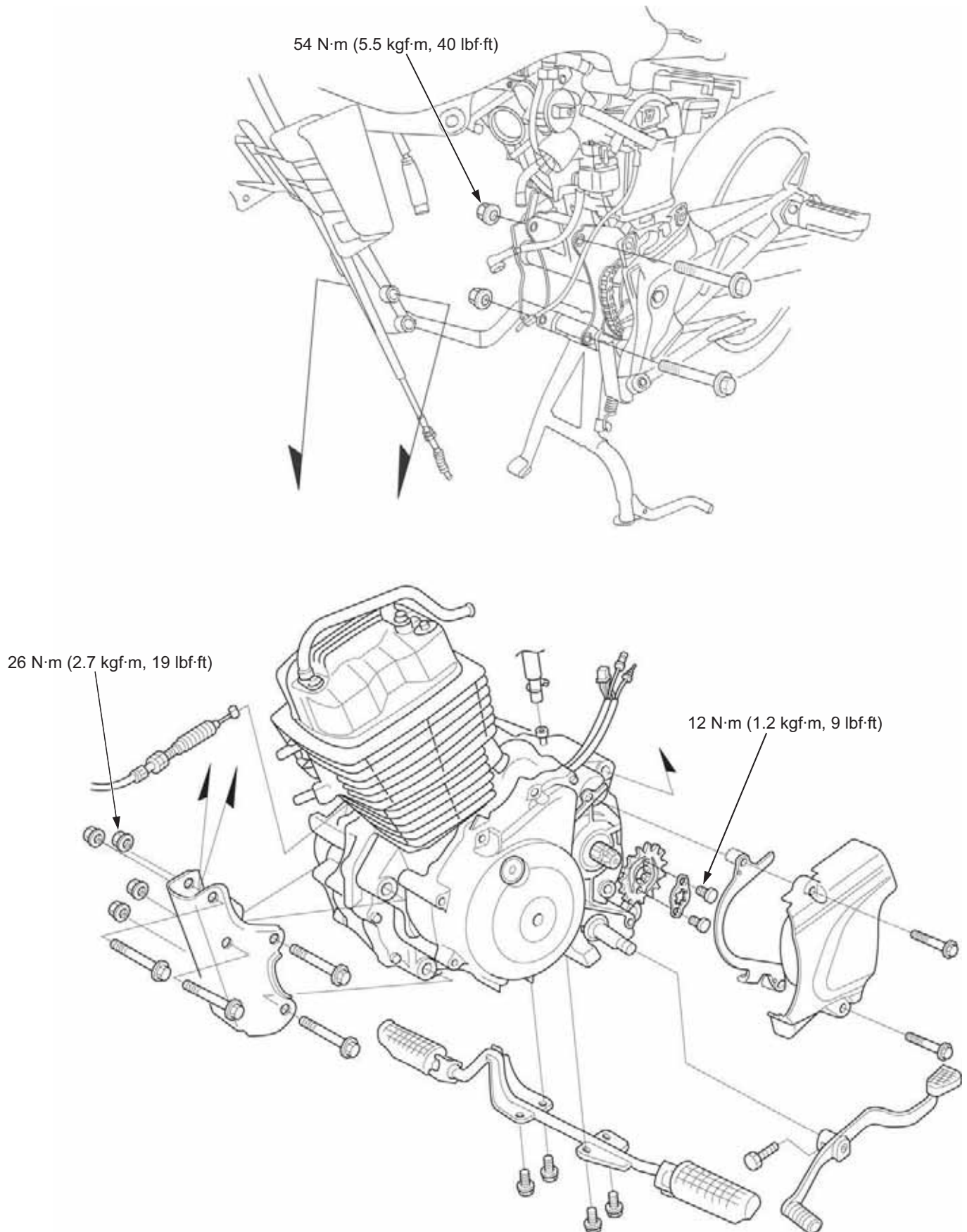


Install and tighten the screw.

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



COMPONENT LOCATION



6. ENGINE REMOVAL/INSTALLATION

COMPONENT LOCATION	6-0	ENGINE REMOVAL	6-2
SERVICE INFORMATION	6-1	ENGINE INSTALLATION	6-4

SERVICE INFORMATION

GENERAL

- When removing/installing the engine, tape the frame around the engine beforehand for frame protection.
- The following components can be serviced with the engine installed in the frame.
 - Oil pump (page 4-2)
 - Cylinder head / valves (page 7-1)
 - Cylinder / piston (page 8-2)
 - Clutch (page 9-6)
 - Gearshift linkage (page 9-13)
 - Alternator (page 10-1)
- The following components require engine removal for service.
 - Crankcase/crankshaft/transmission (page 11-1)

6

SPECIFICATIONS

ITEM		SPECIFICATIONS
Engine oil capacity	After draining	1.0 liter (1.1 US qt, 0.9 Imp qt)
	After disassembly	1.2liter (1.3 US qt, 1.1 Imp qt)
Engine dry weight		29.5 kg (65.03 lbs)

TORQUE VALUES

Front engine hanger nut	26 N·m (2.7 kgf·m, 19 lbf·ft)
Rear engine hanger nut	54 N·m (5.5 kgf·m, 40 lbf·ft)
Drive sprocket fixing plate bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)

ENGINE REMOVAL

Support the motorcycle on its center stand.

Drain the engine oil (page 3-11).

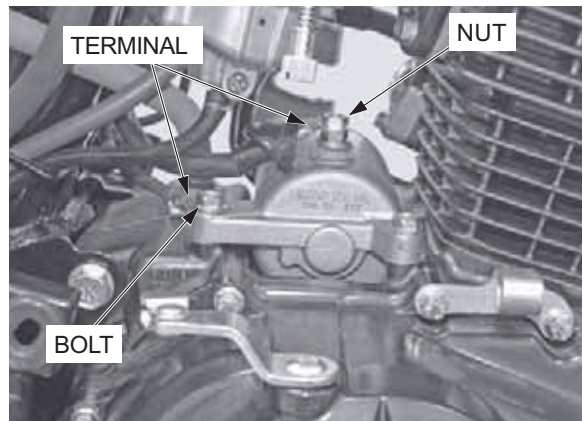
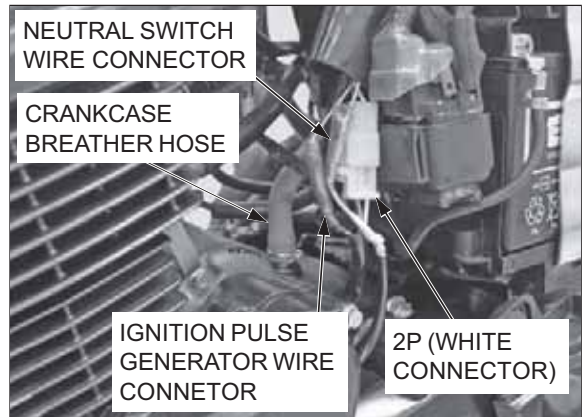
Remove the following:

- Spark plug cap (page 3-7)
- Clutch cable (page 9-5)
- Carburetor (page 5-6)
- Exhaust pipe/muffler (page 2-7)
- PAIR air supply hose (page 5-20)

Disconnect the neutral switch wire connector, ignition pulse generator wire connector and alternator 2P (white) connector. Disconnect the crankcase breather hose.

Disconnect the 2 terminals of the starter motor by removing nut and bolt.

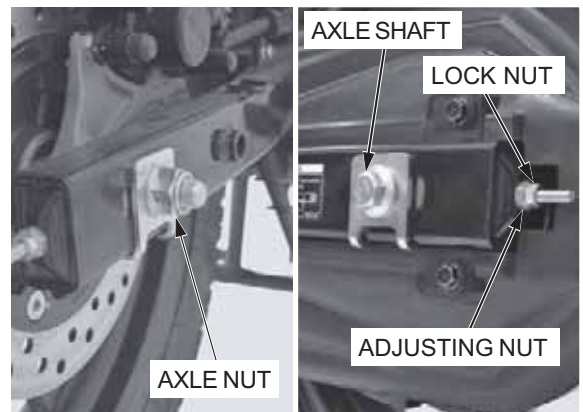
Replace the bolt and nut after disconnecting the terminal



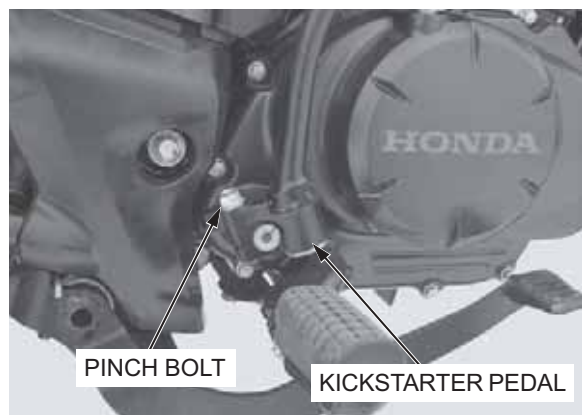
Loosen the rear axle nut.

Loosen the both side drive chain adjusting lock nut and adjusting nut.

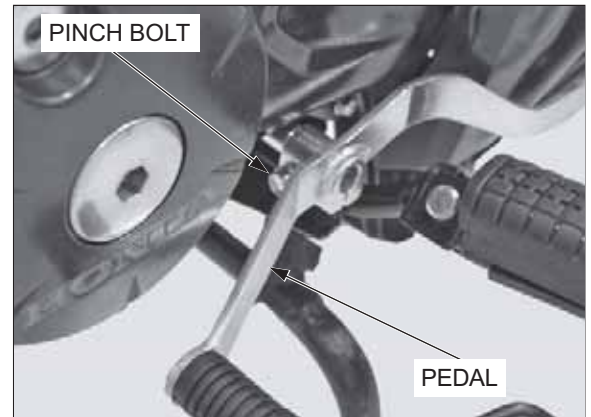
Push the rear wheel forward and make a drive chain slack fully



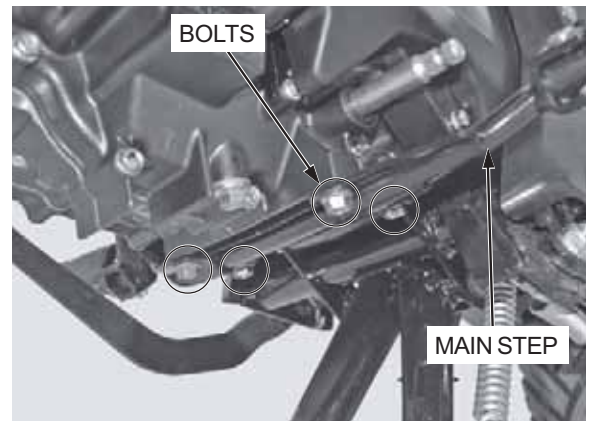
Remove the kickstarter pedal pinch bolt and kickstarter pedal.



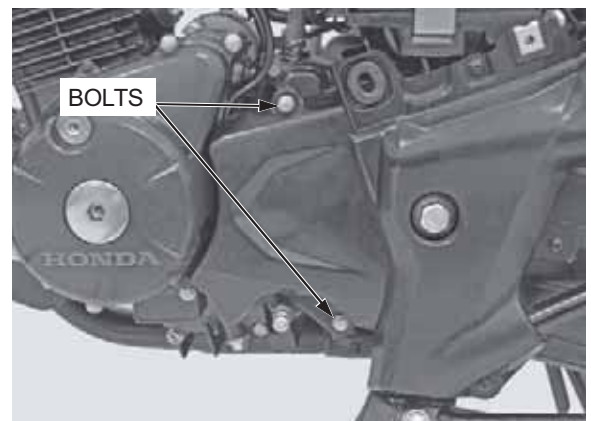
Remove the gear shift pedal pinch bolt and gear shift pedal.



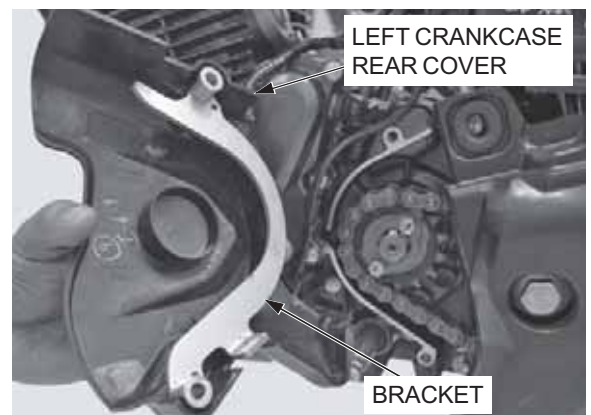
Remove the main step mounting bolts and main step.



Remove the two bolts of left crankcase rear cover.

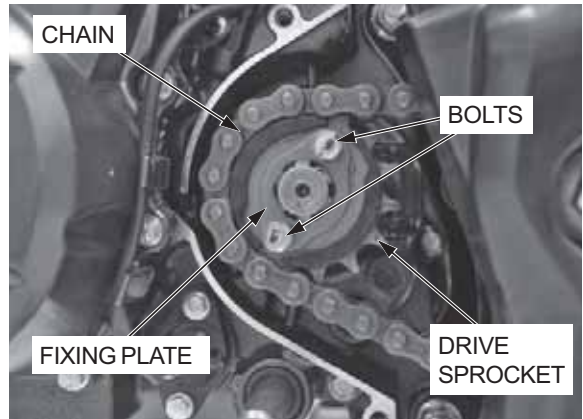


Remove the left crankcase rear cover and bracket.



ENGINE REMOVAL/INSTALLATION

Remove the fixing plate bolts, fixing plate and drive sprocket with chain.

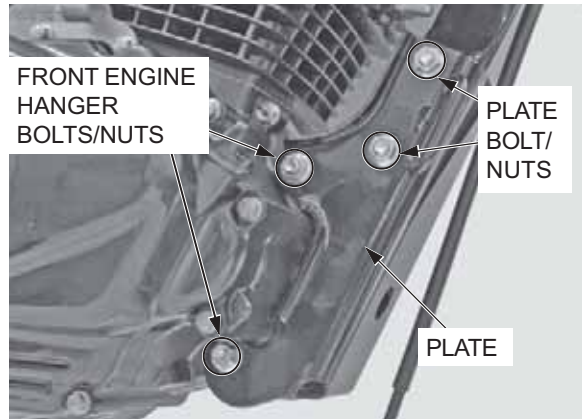


The jack height must be continually adjusted to relieve stress for ease of bolt removal.

Support the engine using a jack or other adjustable support to ease of engine hanger bolts removal.

Remove the following:

- front engine hanger bolts and nuts.
- plate bolts and nuts.
- front engine hanger plate.



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

Remove the rear engine hanger bolts and nuts.

Remove the engine from the frame.



ENGINE INSTALLATION

- Place the jack or other adjustable support under the engine.
- The jack height must be continually adjusted to relieve stress for ease bolt installation.
- Carefully align the mounting points with the jack to prevent damage to engine, frame, wires and cables.
- All the engine mounting bolts and nuts loosely install, then tighten the bolts and nuts to the specified torque.
- Route the wires and cables properly.



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

Place the engine in the frame.

Install the rear engine hanger bolts and nuts, but do not tighten it yet.



Install the plate, plate bolts and nuts.

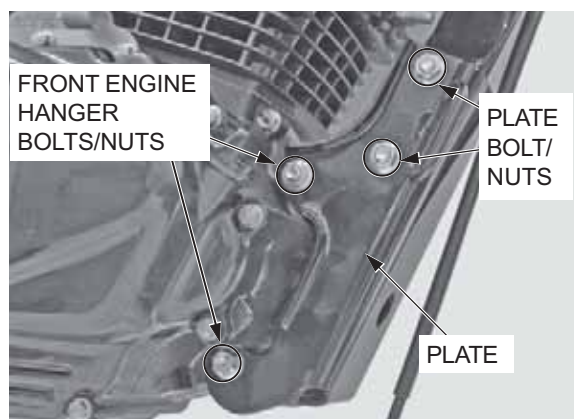
Install the front engine hanger bolts and nuts.

Tighten the front and rear engine hanger nuts to the specified torque.

TORQUE:

Front engine hanger nut : 26 N·m (2.7 kgf·m, 19 lbf·ft)

Rear engine hanger nut : 54 N·m (5.5 kgf·m, 40 lbf·ft)

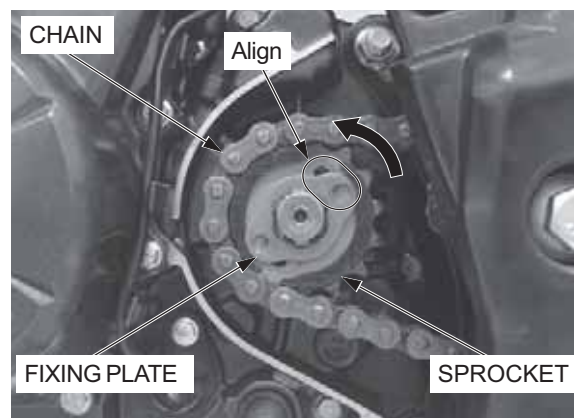


Install the drive chain onto the drive sprocket.

Install the drive sprocket to the counter shaft.

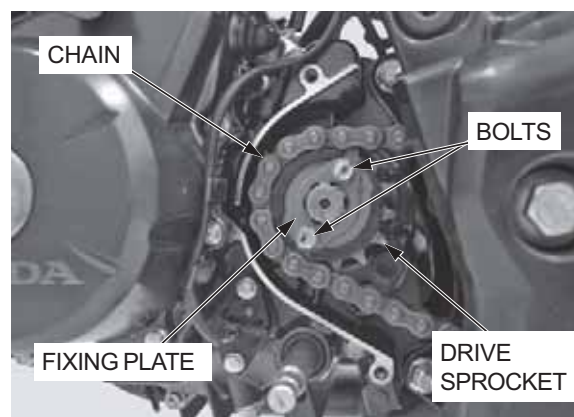
Install the fixing plate.

Rotate the fixing plate, and align the holes in the fixing plate with the bolts hole in the drive sprocket.



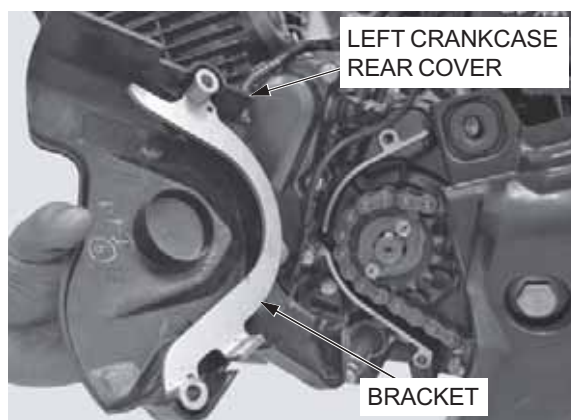
Tighten the drive sprocket fixing plate bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

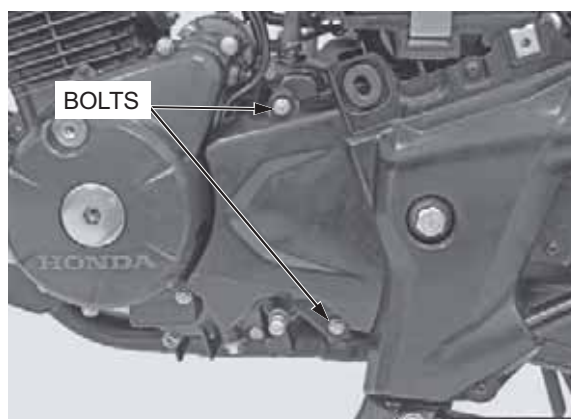


ENGINE REMOVAL/INSTALLATION

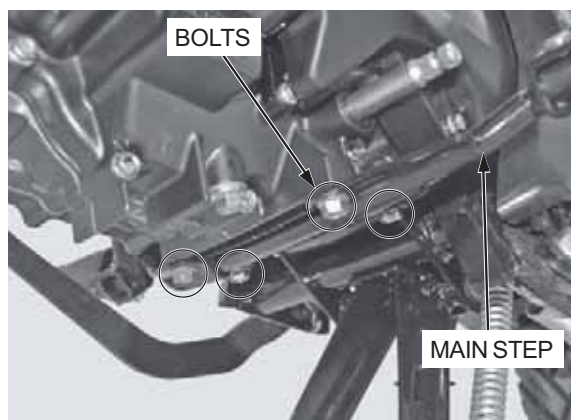
Install the left crankcase rear cover and bracket.



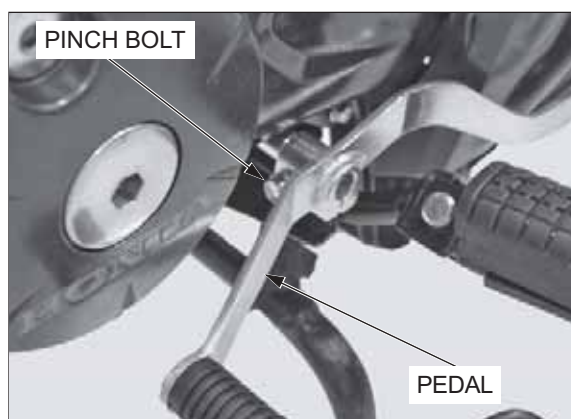
Install and tighten the two bolts of left crankcase rear cover.



Install the main step and tighten the mounting bolts.

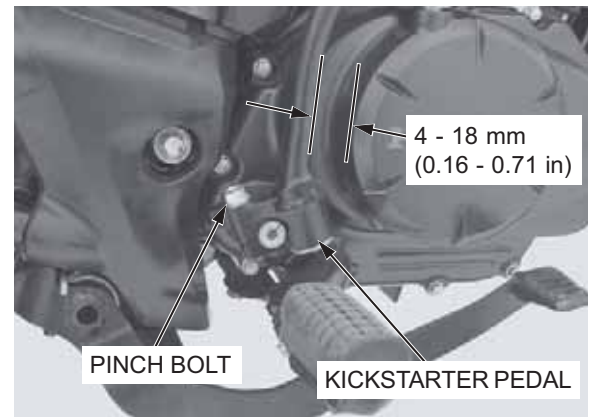


Install the gear shift pedal and tighten the pinch bolt.

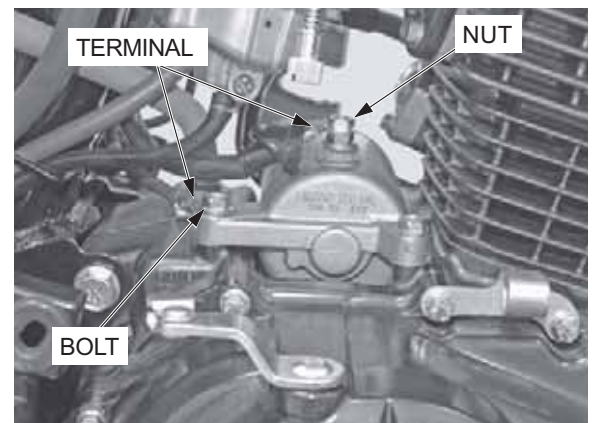


Install the kickstarter pedal so the distance between the left crankcase cover and kickstarter pedal is 4 - 18 mm (0.16 - 0.71 in)

Install and tighten the pinch bolt.



Connect the 2 terminals of the starter motor.



Connect the crank case breather hose.

Connect the neutral switch wire connector, pulse generator wire connector and alternator 2P (white) connector.

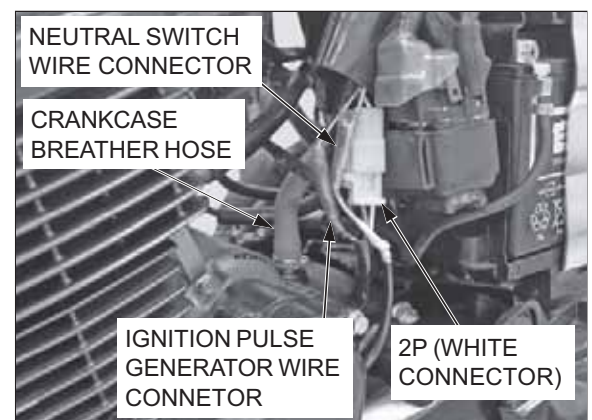
Install the following:

- PAIR air supply hose (page 5-20)
- Exhaust pipe/muffler (page 2-7)
- Carburetor (page 5-6)
- Spark plug cap (page 3-7)
- Fuel tank (page 2-3)

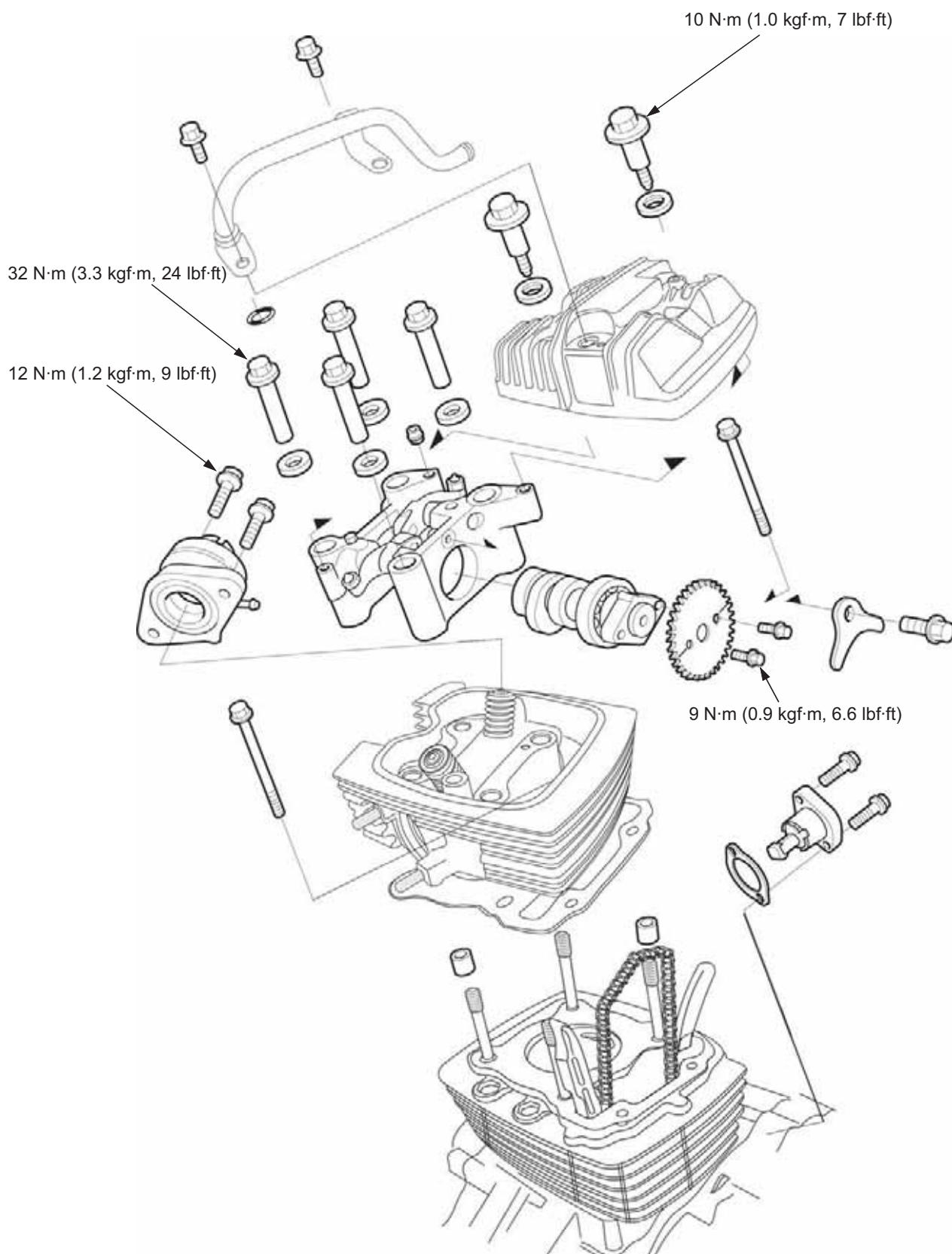
Inspect the following:

- drive chain slack (page 3-15)
- clutch lever free play (page 3-21)

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



COMPONENT LOCATION



7. CYLINDER HEAD/VALVES

COMPONENT LOCATION	7-0	CAMSHAFT HOLDER	
SERVICE INFORMATION	7-1	DISASSEMBLY/ASSEMBLY	7-9
TROUBLESHOOTING	7-2	CYLINDER HEAD	
CYLINDER COMPRESSION	7-4	DISASSEMBLY/ASSEMBLY	7-12
CYLINDER HEAD COVER	7-4	CAMSHAFT HOLDER /	
CAMSHAFT HOLDER/ CYLINDER HEAD		CYLINDER HEAD INSTALLATION	7-16
REMOVAL	7-7	CAM CHAIN TENSIONER LIFTER	7-18

SERVICE INFORMATION

GENERAL

- This section covers service of the cylinder head, valves, rocker arms and camshaft. These services can be done with the engine installed in 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 passages in the cylinder head (stud bolt hole), camshaft holder and cylinder head cover. Clean the oil passages before assembling them.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression at 1,000 min-1 (rpm)			1100 kPa (11.2 kgf/cm² , 159.3 psi)	–
Valve clearance		IN	0.08 (0.003)	–
		EX	0.12 (0.005)	–
Valve, valve guide	Valve stem O.D.	IN	4.975 – 4.990 (0.1959 – 0.1965)	4.92 (0.194)
		EX	4.955 – 4.970 (0.1951 – 0.1957)	4.90 (0.193)
	Valve guide I.D.	IN/EX	5.000 – 5.012 (0.1969 – 0.1973)	5.04 (0.198)
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)	0.07 (0.003)
		EX	0.030 – 0.057 (0.0012 – 0.0022)	0.09 (0.004)
	Valve guide height	IN/EX	16.8 – 17.0 (0.66 – 0.67)	–
	Valve seat width	IN/EX	0.9 – 1.1 (0.035 – 0.043)	1.5 (0.06)
Valve spring	Free length	INNER	38.76 (1.526)	37.89 (1.492)
		OUTER	35.95 (1.415)	35.14 (1.383)
Rocker arm	Arm I.D.	IN/EX	10.000 – 10.015 (0.3937 – 0.3943)	10.10 (0.398)
	Shaft O.D.	IN/EX	9.972 – 9.987 (0.3926 – 0.3932)	9.91 (0.390)
	Arm-to-shaft clearance	IN/EX	0.013 – 0.043 (0.0005 – 0.0017)	0.10 (0.004)
Camshaft	Cam lobe height	IN	32.994 – 33.234 (1.2990 – 1.3084)	32.96 (1.298)
		EX	32.880 – 33.120 (1.2945 – 1.3039)	32.85 (1.293)
Cylinder head warpage			–	0.05 (0.002)

TORQUE VALUES

Spark plug	16 N·m (1.6 kgf·m, 12 lbf·ft)	
Cylinder head cover bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Rocker arm shaft bolt	5 N·m (0.5 kgf·m, 3.7 lbf·ft)	
Cam sprocket bolt	9 N·m (0.9 kgf·m, 6.6 lbf·ft)	
Camshaft holder bolt	32 N·m (3.3 kgf·m, 24 lbf·ft)	Apply engine oil to the threads and seating surface
Cam chain tensioner lifter plug	4 N·m (0.4 kgf·m, 3.0 lbf·ft)	
Crankshaft hole cap	15 N·m (1.5 kgf·m, 11 lbf·ft)	Apply grease to the threads
Timing hole cap	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Carburetor insulator bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	

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 8-3).

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

Compression too high

- Excessive carbon buildup on piston head or combustion chamber

Excessive smoke

- Worn valve stem or valve guide
- Damaged stem seal
- Cylinder/piston problem


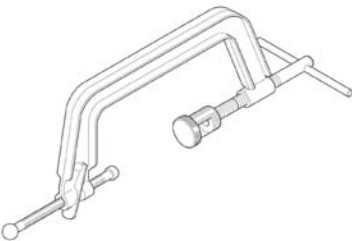






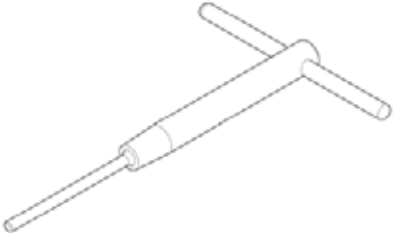

Excessive noise

- Incorrect valve adjustment
- Sticking valve or broken valve spring
- Excessive worn valve seat
- Worn or damaged camshaft
- Worn rocker arm and/or shaft
- Worn rocker arm roller and valve stem end
- Worn cam sprocket teeth
- Worn cam chain
- Worn or damaged cam chain tensioner
- Cylinder/piston problem

Rough idle

- Low cylinder compression

TOOLS

<p>Valve guide driver 070-GD-0061150</p> 	<p>Valve spring compressor 070-GE-001-I100</p> 	<p>Valve seat cutter, 27.5 mm (45° EX) 070GH-0031180</p> 
<p>Valve seat cutter, 29 mm (45° IN) 07780-0010300</p> 	<p>Flat cutter, 27 mm (32° EX) 07780-0013300</p> 	<p>Flat cutter, 30 mm (32° IN) 07780-0012200</p> 
<p>Interior cutter, 26 mm (60° EX) 07780-0014500</p> 	<p>Interior cutter, 30 mm (60° IN) 07780-0014000</p> 	<p>Cutter holder 070GH-0051150</p> 
<p>Valve guide reamer 070GH-0011160</p> 		

CYLINDER COMPRESSION

Reference engine oil temperature: 60 – 65°C (140 – 149°F)

Warm up the engine to normal operating temperature.
Stop the engine, disconnect the spark plug cap, and remove the spark plug (Page 3-7).

To avoid discharging the battery, do not operate the starter motor for more than 5 seconds. Ensure battery in fully charge state incase done by self start method.

Install a compression gauge attachment into the spark plug hole.

Connect a compression gauge to the attachment.

TOOL:

Compression gauge attachment 07RMJ-MY50100 or equivalent commercially available

Turn the ignition switch ON.

Shift the transmission into neutral.

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

COMPRESSION PRESSURE:

1,100 kPa (11.2 kgf/cm², 159 psi) at 1,000 min-1(rpm)

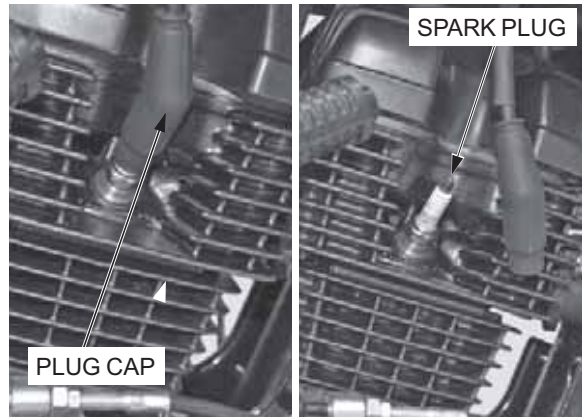
If compression is high, it indicates that carbon deposits have accumulated on the combustion chamber and/or the piston crown.

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

If the compression increases from the previous value, check the cylinder, piston and piston rings.

- Blown cylinder head gasket
- Improper valve clearance adjustment
- Worn piston ring
- Worn cylinder and piston

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

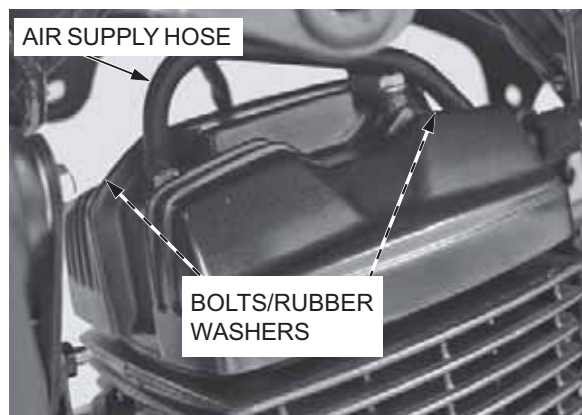


CYLINDER HEAD COVER

REMOVAL

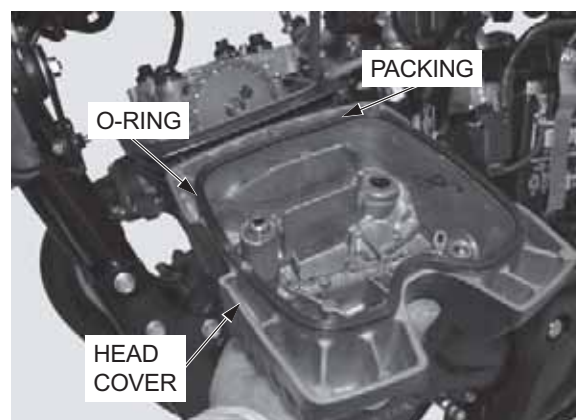
Disconnect the air supply hose.

Remove the two bolts and rubber washers.

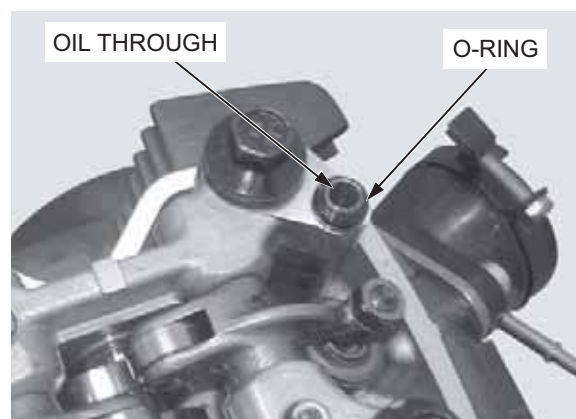


Remove the cylinder head cover and cover packing.

Remove the PAIR passage O-ring from the cylinder head cover.

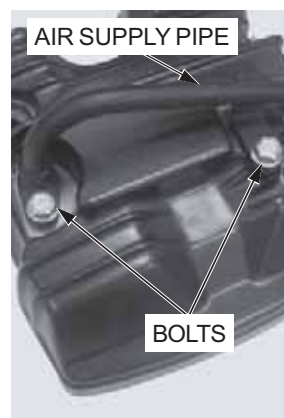


Remove the oil through and O-ring from the camshaft holder.



Remove the two bolts.

Remove the air supply pipe and O-ring.



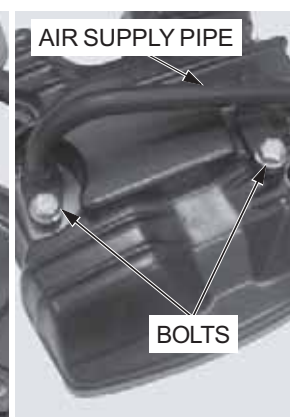
INSTALLATION

Apply clean engine oil to a new O-ring.

Install the new O-ring to the air supply pipe.

Install the air supply pipe to the cylinder head cover.

Install and tighten the two bolts.



CYLINDER HEAD/VALVES

Apply clean engine oil to a new O-ring.

Install the oil through and O-ring to the camshaft holder.

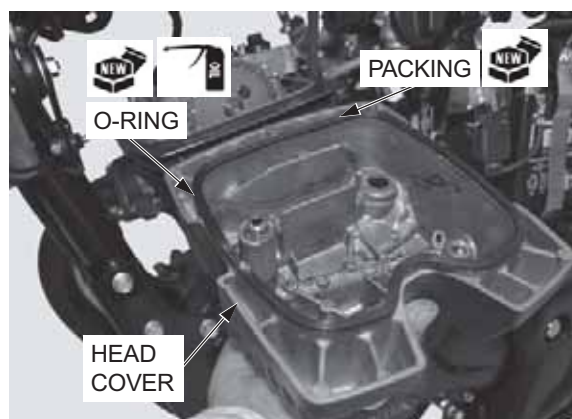


Apply clean engine oil to a new O-ring.

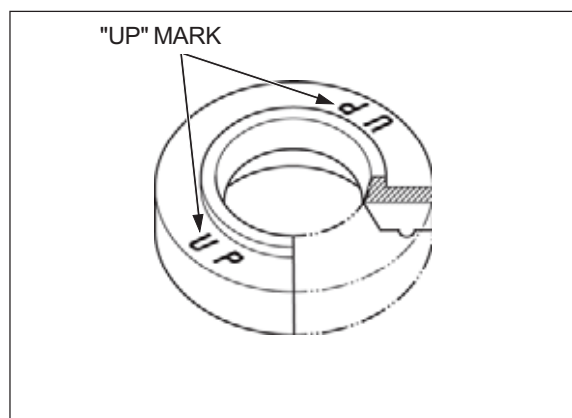
Install the PAIR passage O-ring to the cylinder head cover.

Install a new cover packing into the cylinder head cover groove.

Install the cylinder head cover onto the cylinder head.



Install and tighten the Install the rubber washer to the cylinder head cover with their "UP" mark facing up.



Install and tighten the head cover bolts to the specified torque.

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



CAMSHAFT HOLDER/ CYLINDER HEAD REMOVAL

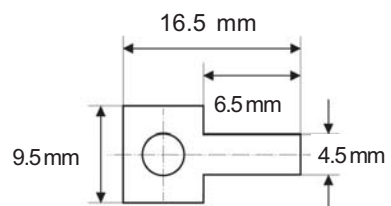
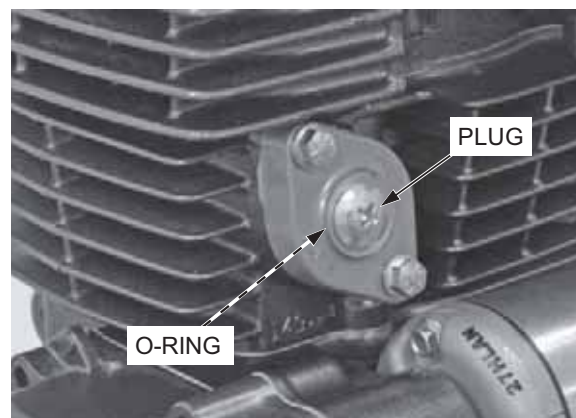
Remove the following:

- Spark plug cap (page 3-7)
- exhaust pipe/muffler (page 2-7)
- carburetor (page 5-6)
- cylinder head cover (page 7-4)

Make sure the piston is at TDC (Top Dead Center) on the compression stroke (page 3-9).

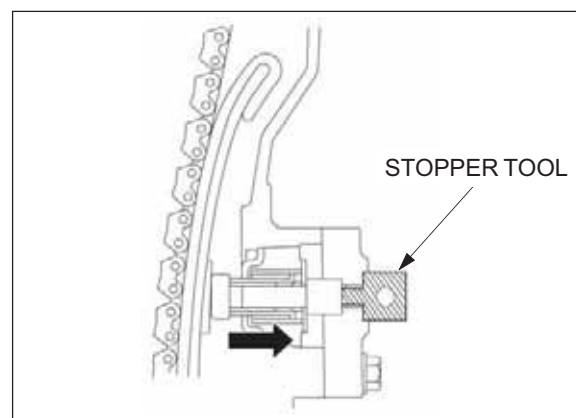
Remove the tensioner lifter plug and O-ring

Make a tensioner shaft stopper tool out of a thin piece of steel (0.8 mm thickness) using the diagram.



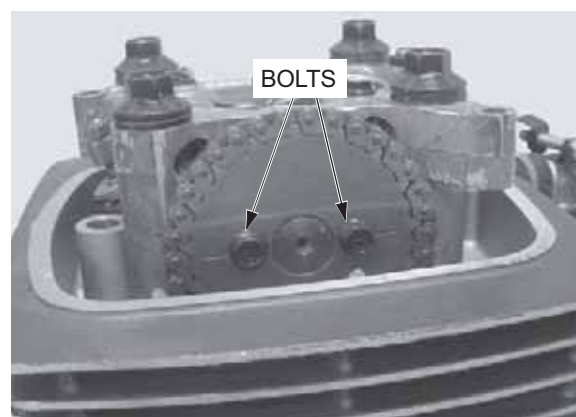
MATERIAL THICKNESS: 0.8 mm

Turn the tensioner shaft clockwise with the stopper tool to retract the tensioner, then insert the stopper fully to hold the tensioner in the fully retracted position.



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

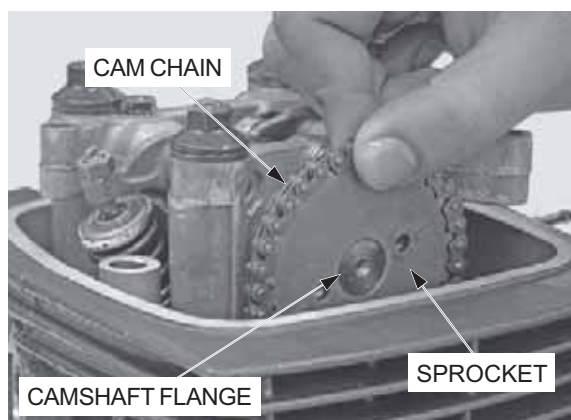
Remove the cam sprocket bolts.



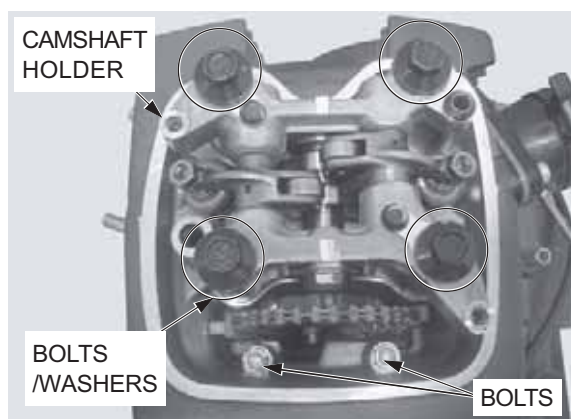
CYLINDER HEAD/VALVES

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

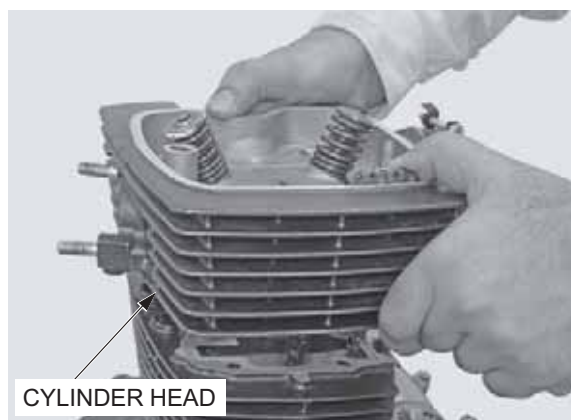
Attach a piece of wire to the cam chain to prevent it from falling into the crankcase.



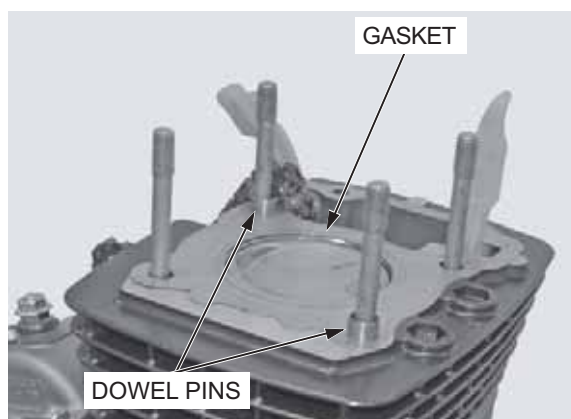
Remove the two cylinder head bolts.
Remove the four bolts, washer and camshaft holder.



Remove the cylinder head.



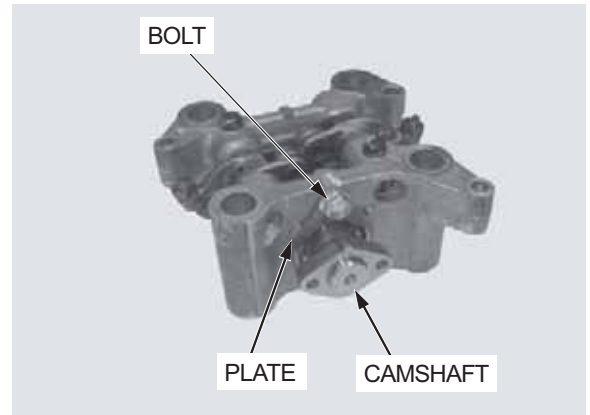
Remove the gasket and dowel pins.



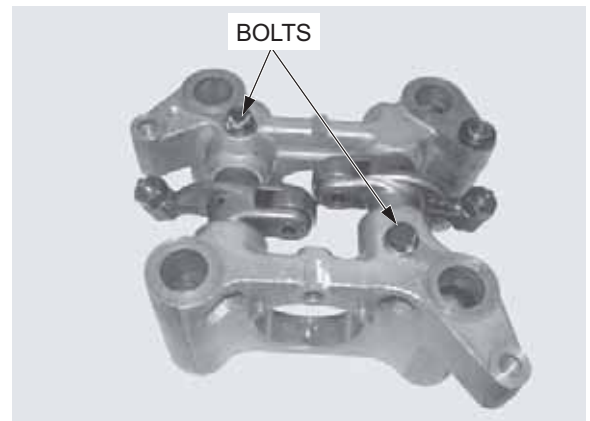
CAMSHAFT HOLDER DISASSEMBLY/ASSEMBLY

DISASSEMBLY

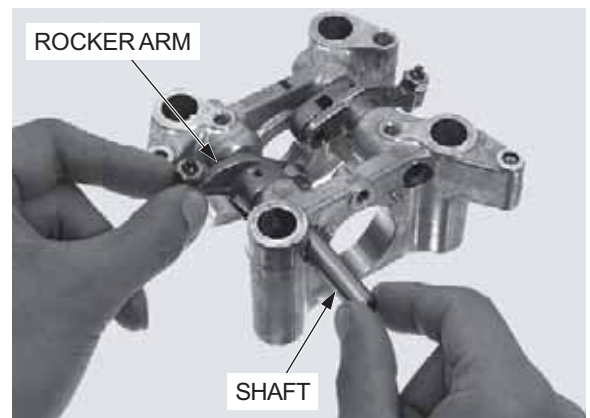
Remove the bolt and camshaft retainer plate.
Remove the camshaft from the camshaft holder.



Remove the rocker arm shaft bolts.



Remove the rocker arm shafts and rocker arms from the camshaft holder.



INSPECTION

CAMSHAFT BEARING

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



CYLINDER HEAD/VALVES

CAM LOBE

Measure the height of each cam lobe.

SERVICE LIMITS:

IN: 32.96 mm (1.298 in)

EX: 33.85 mm (1.293 in)

Inspect the cam lobe for damage or excessively worn.

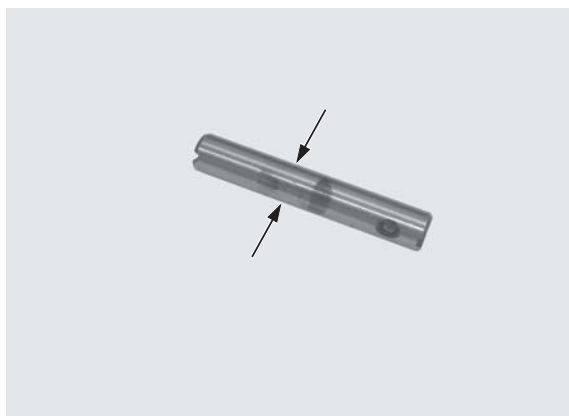
Inspect the oil passages and rocker arms for wear or damage if necessary.



ROCKER ARM SHAFT

Measure the rocker arm shaft O.D.

SERVICE LIMIT: 9.91 mm (0.390 in)



ROCKER ARM

Turn the rocker arm roller with your finger.

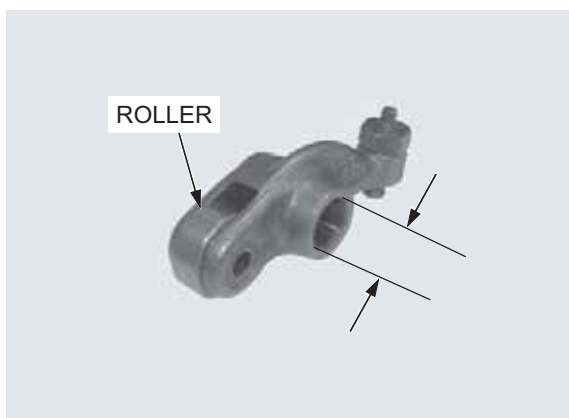
The roller should turn smoothly and quietly.

Measure each rocker arm shaft I.D.

SERVICE LIMIT: 10.10 mm (0.398 in)

Calculate the rocker arm-to-shaft clearance.

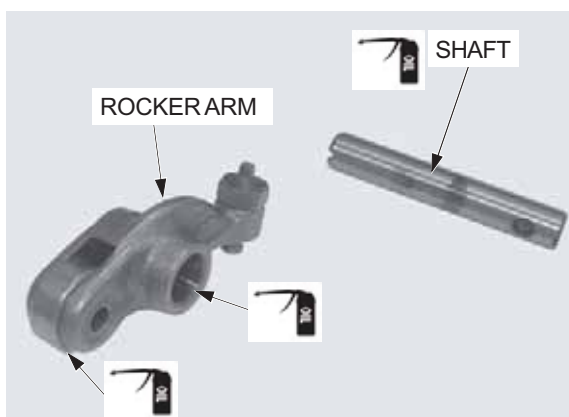
SERVICE LIMIT: 0.10 mm (0.004 in)



ASSEMBLY

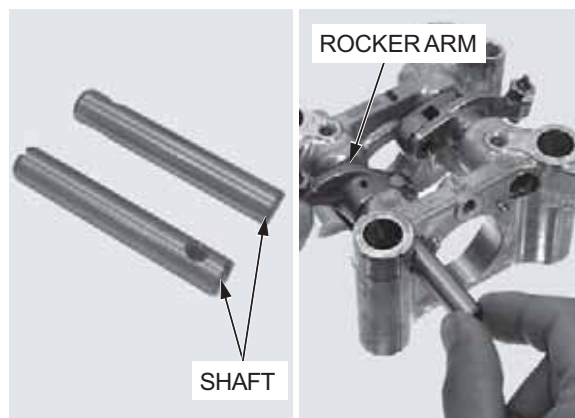
Clean the threads of each rocker arm shaft thoroughly.

Apply clean engine oil to each rocker arm inner, roller surface and rocker arm shaft rotating surface.



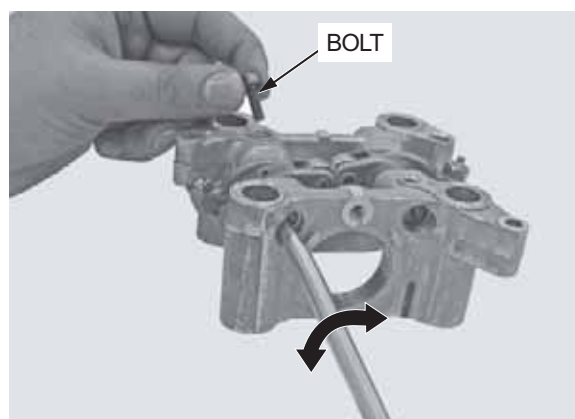
Carrying out as shown that the direction of a rocker arm shafts.

Set the rocker arm into the camshaft holder then install the rocker arm shaft into the camshaft holder through the rocker arm.



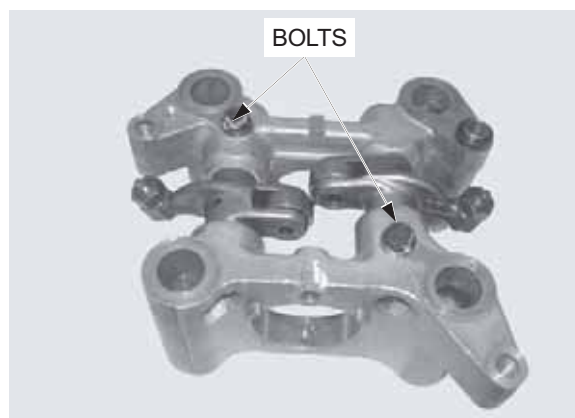
Align the hole of the rocker arm shaft with the hole of the camshaft holder.

Install the rocker arm shaft bolts.

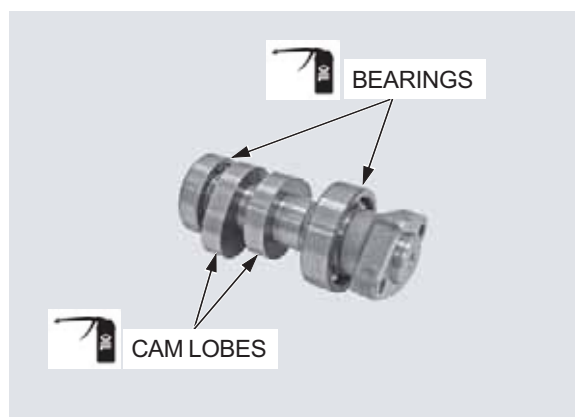


Tighten the rocker arm shaft bolts to the specified torque.

TORQUE: 5 N·m (0.5 kgf·m, 3.7 lbf·ft)



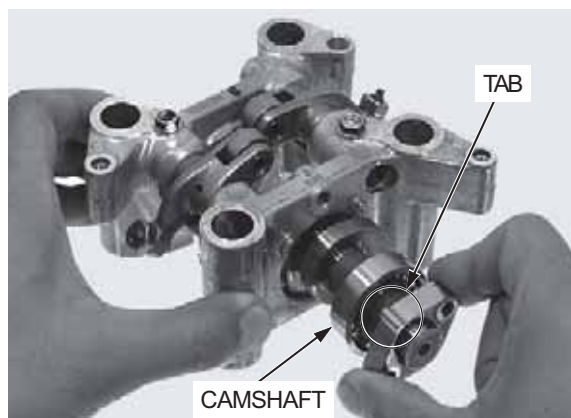
Lubricate the camshaft bearings with clean engine oil.
Apply clean engine oil to the cam lobes.



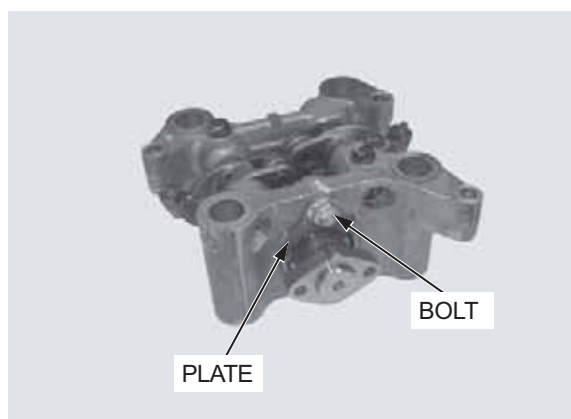
CYLINDER HEAD/VALVES

Make sure the tab of camshaft is turning the upward.

Install the camshaft into the camshaft holder.



Install the camshaft retainer plate and tighten the bolt.

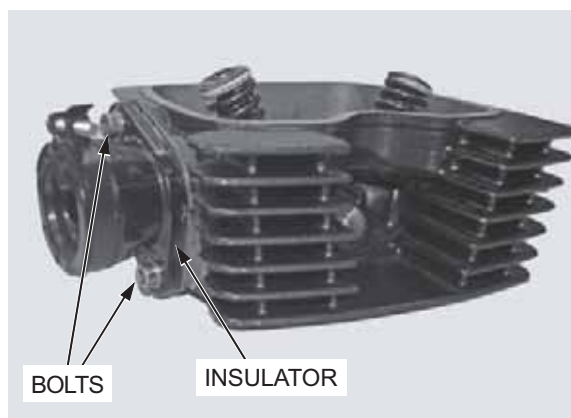


CYLINDER HEAD DISASSEMBLY/ ASSEMBLY

DISASSEMBLY

Remove the spark plug (page 3-7).

Remove the two bolts and carburetor insulator.



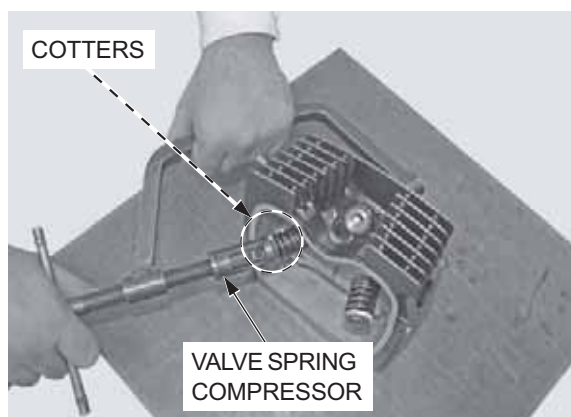
*To prevent loss
of tension,
do not
compress
the valve spring
more than
necessary
to remove the
cotters.*

While compressing the valve spring using the special tool, remove the valve cotters.

TOOL:

Valve spring compressor

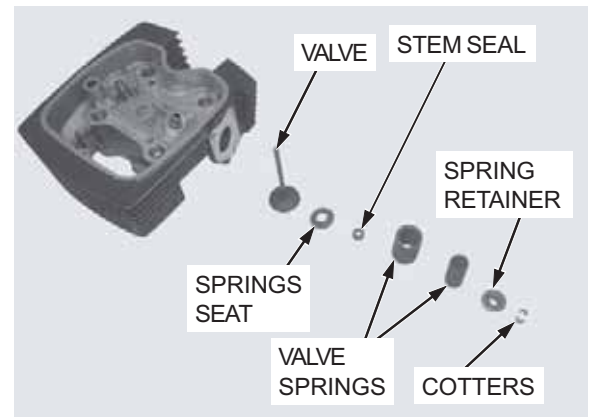
070GE-001-I100



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

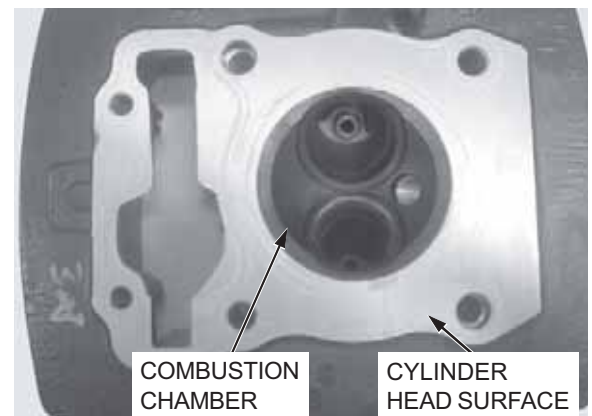
Loosen the valve spring compressor and remove the following:

- Spring retainers
- Valve spring
- Intake and exhaust valve
- Stem seals
- Spring seats



Remove the carbon deposits from the combustion chamber.

Clean off any gasket material from the cylinder head surface.



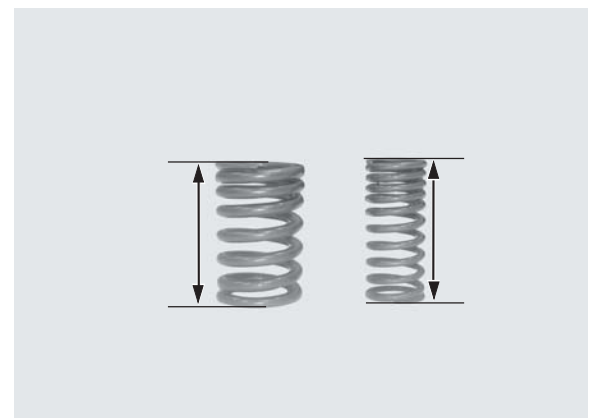
INSPECTION

VALVE SPRING

Measure the valve spring free length.

SERVICE LIMIT :

INNER	37.89 mm (1.492 in)
OUTER	35.14 mm (1.383 in)

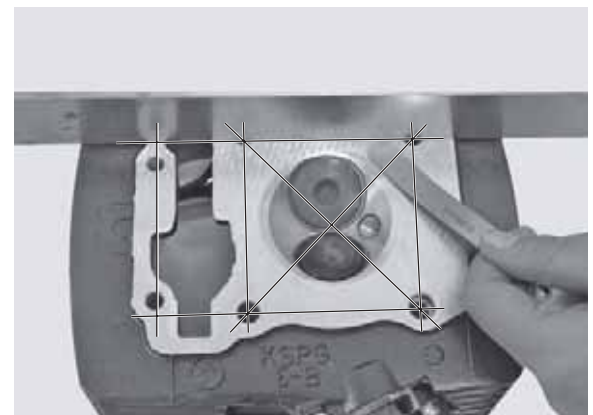


Be careful not to damage the gasket surface.

CYLINDER HEAD

Check the spark plug hole and valve area for cracks. Check the cylinder head for warpage with a straight edge and a feeler gauge.

SERVICE LIMIT: 0.05 mm (0.002 in)



VALVE

Inspect the valve for trueness, burning scratches or abnormal stem wear.

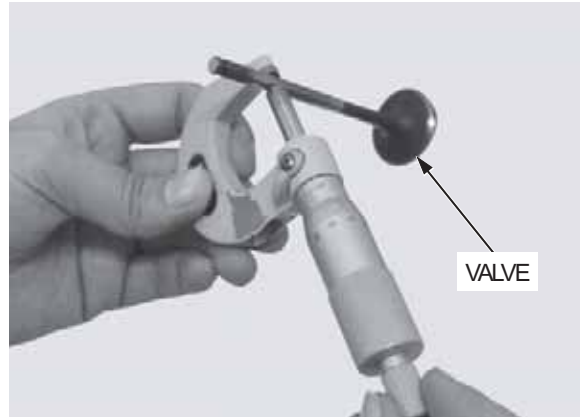
Measure the valve stem O.D.

SERVICE LIMITS:

IN: 4.92 mm (0.194 in)

EX: 4.90 mm (0.193 in)

Insert each valve into the valve guide and check the valve movement in the guide.



VALVE GUIDE

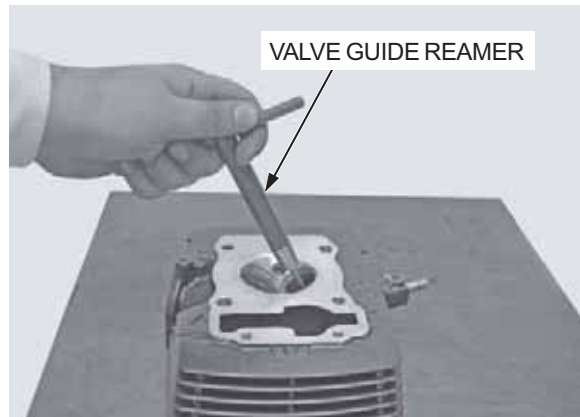
Always rotate the reamer clockwise, never counterclockwise when installing, removing and reaming.

Ream the valve guide to remove the carbon build-up before checking the valve guide.

TOOL:

Valve guide reamer

07984-MA60001



Measure and record each valve guide I.D. with a ball gauge or inside micrometer.

SERVICE LIMIT: IN/EX: 5.04 mm (0.198 in)

Calculate the stem-to-guide clearance.

SERVICE LIMIT: IN:0.07 mm (0.003 in)

EX:0.09 mm (0.004 in)

- 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 the guides as necessary and ream to fit.
- If the stem-to-guide clearance still exceeds the service limit with new guides, replace the valve and guide.
- Reface the valve seat whenever new valve guides are installed.

VALVE GUIDE REPLACEMENT

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

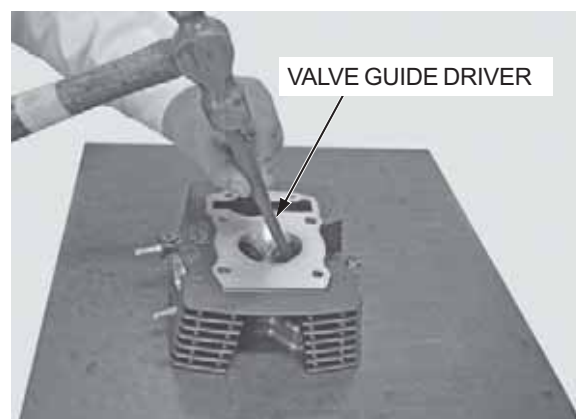
Heat the cylinder head to 130°C – 140°C (275°F – 290°F) with a hot plate or oven. Do not heat the cylinder head beyond 150°C (300°F). Use temperature indicator sticks, available from welding supply stores, to be sure the cylinder head is heated to the proper temperature.

- Wear insulated gloves to avoid burns when handling the heated cylinder head.
- Using a torch to heat the cylinder head may cause warping.
- Be careful not to damage the mating surface.

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

TOOL:

Valve guide driver 07942-8920000



While the cylinder head is still heated, take off the new valve guides from the freezer and install the new clips to the new guides.

Drive new guides in the cylinder head from the camshaft side.

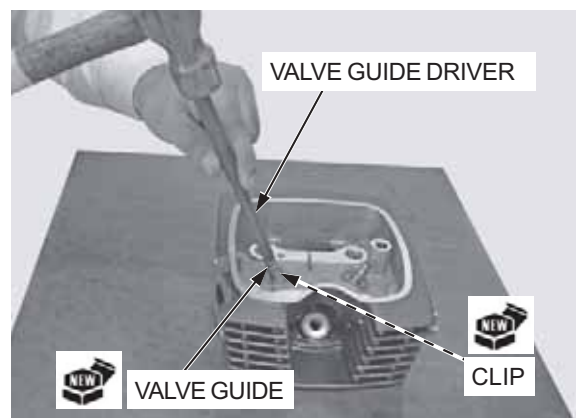
TOOL:

Valve guide driver 07942-8920000

After installing the valve guides, measure the valve guide height from the cylinder head.

SPECIFIED HEIGHT: 16.8 – 17.0 mm (0.66 – 0.67 in)

Let the cylinder head cool to room temperature.



Ream the new valve guides.

TOOL:

Valve guide reamer 07984-MA60001

- Take care not to tilt or lean the reamer in the guide while reaming. Otherwise, the valve is installed slanted, that causes oil leaks from the stem seal and improper valve seat contact and results in the valve seat refacing not able to be performed.
- Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise.
- Use cutting oil on the reamer during this operation.

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

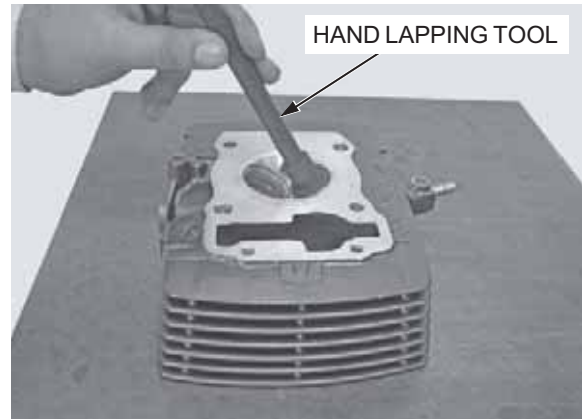


VALVE SEAT INSPECTION

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

Apply light coating of Prussian Blue to the valve seats.

Tap the valves and seats using a rubber hose or other hand lapping tool.



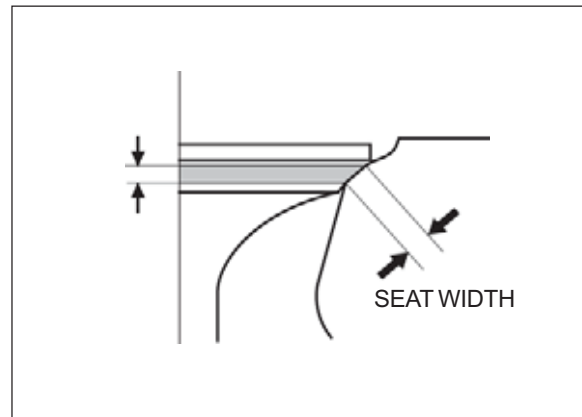
Remove the valve and inspect the width of each valve seat.

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

STANDARD: 0.9 – 1.1 mm (0.035 – 0.043 in)

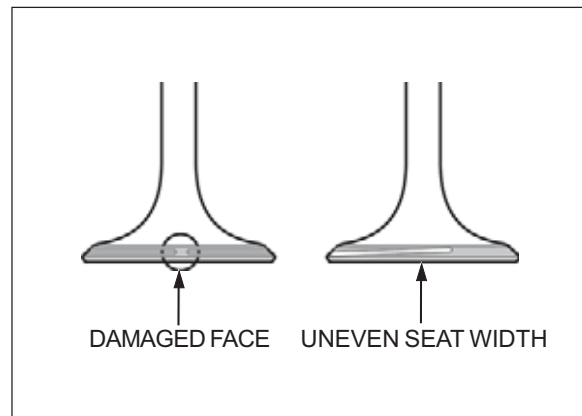
SERVICE LIMIT: 1.5 mm (0.06 in)

Valve seat width is not within specification, reface the valve seat (page 7-19).



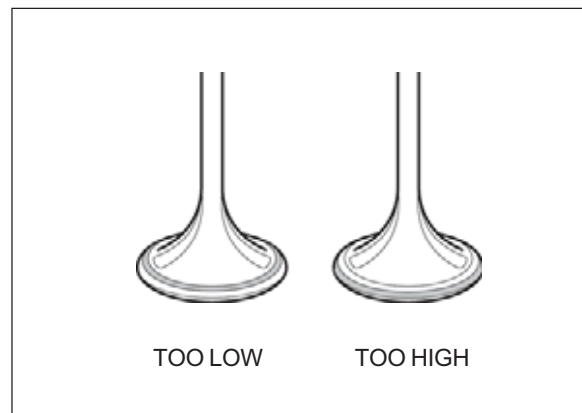
Inspect the valve seat face for:

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



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

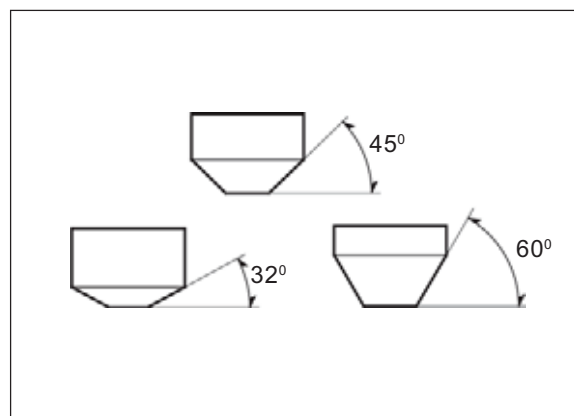
- Contact area (too high or too low area)
 - Reface the valve seat.



VALVE SEAT REFACING

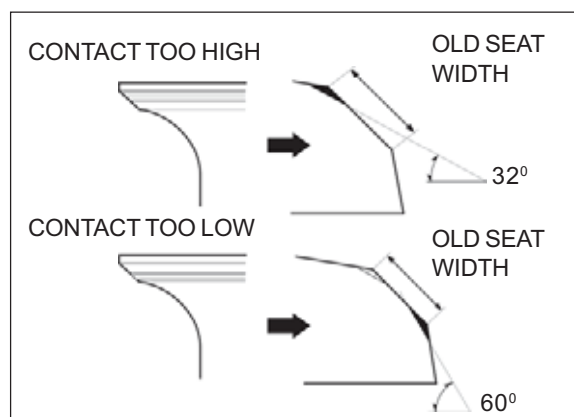
Follow the refacing manufacture's operating instructions.

Valve Seat Cutters, a grinder or equivalent valve seat refacing equipment are recommended to correct a worn valve seat.



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

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



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

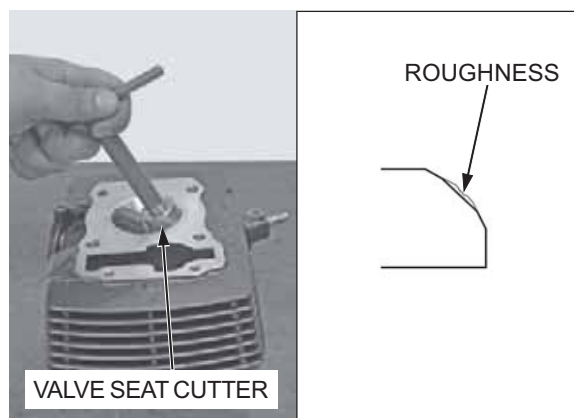
Use a 45 degree cutter to remove the roughness or irregularities from the seat.

TOOLS:

Seat cutter, 27.5 mm (EX) 07780-0010200

Seat cutter, 29 mm (IN) 07780-0010300

Cutter holder 07781-0010400



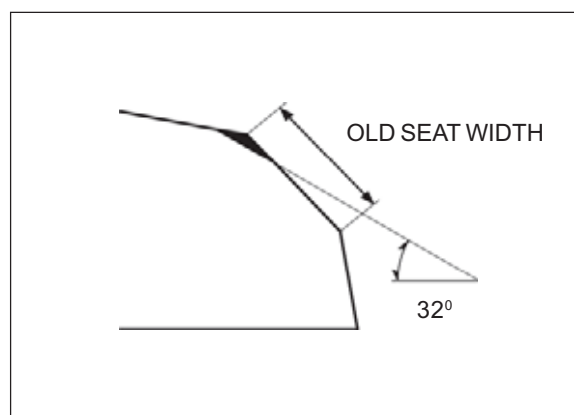
Using 32 degree cutter, remove top 1/4 of the existing valve seat material.

TOOLS:

Flat cutter, 27 mm (EX) 07780-0013300

Flat cutter, 30 mm (IN) 07780-0012200

Cutter holder 07781-001040



CYLINDER HEAD/VALVES

Using 60 degree cutter, remove the bottom 1/4 of the old seat.

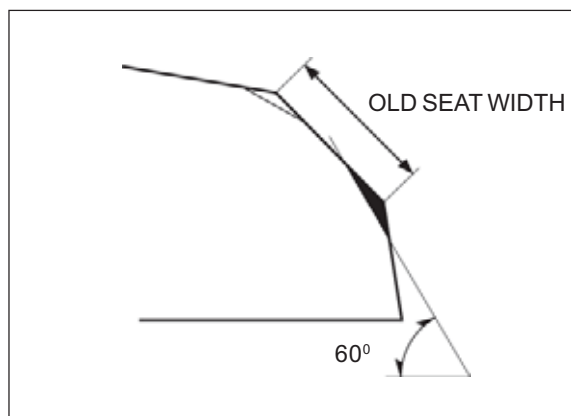
Remove the cutter and inspect the area you have just removed.

TOOLS:

Interior cutter, 26 mm (EX) 07780-0014500

Interior cutter, 30 mm (IN) 07780-0014000

Cutter holder 07781-0010400



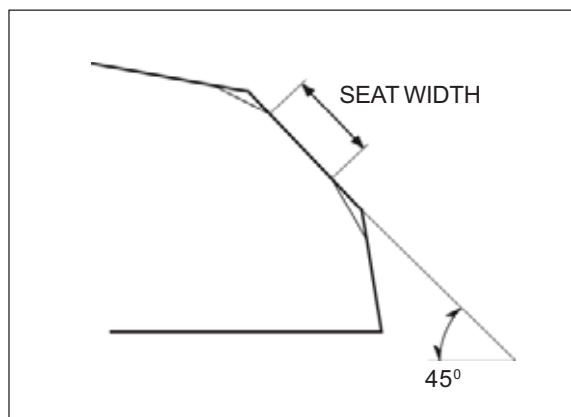
Install a 45 degree finish cutter and cut the seat to proper width.

Make sure that all pitting and irregularities are removed.

Refinish if necessary.

STANDARD SEAT WIDTH:

0.9 – 1.1 mm (0.035 – 0.043 in)

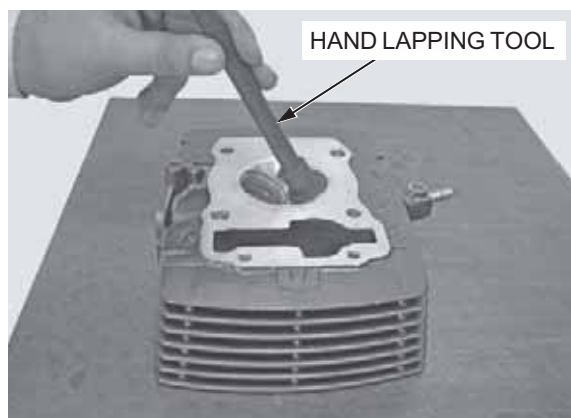


After cutting the seat, apply lapping compound to the valve face and lap the valve using light pressure.

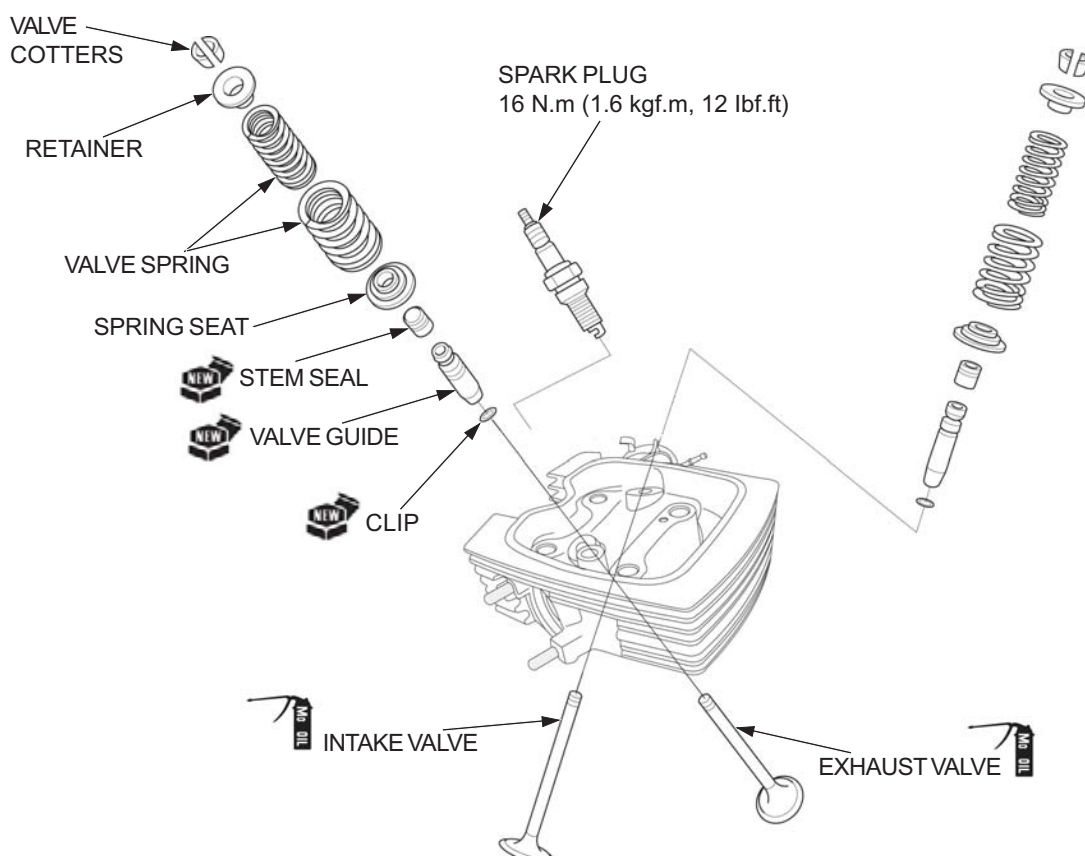
- Excessive lapping pressure may deform or damage the seat.
- Change the angle of lapping tool frequently to prevent uneven seat wear.
- Lapping compound can cause damage if it enters between the valve stem and guide.

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

Recheck the seat contact after lapping.



ASSEMBLY



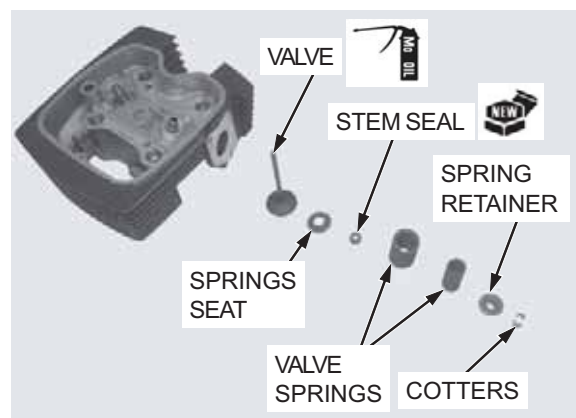
To avoid damage to the seal, turn the valve slowly when inserting.

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

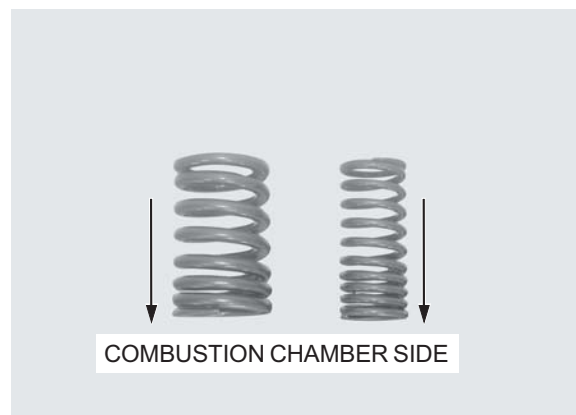
Install the valve seats and new valve stem seals.

Lubricate each valve stem with molybdenum oil solution.

Insert the intake and exhaust valve into the valve guides.



Install the valve springs and retainers. The springs tightly wound coils should face toward the combustion chamber.



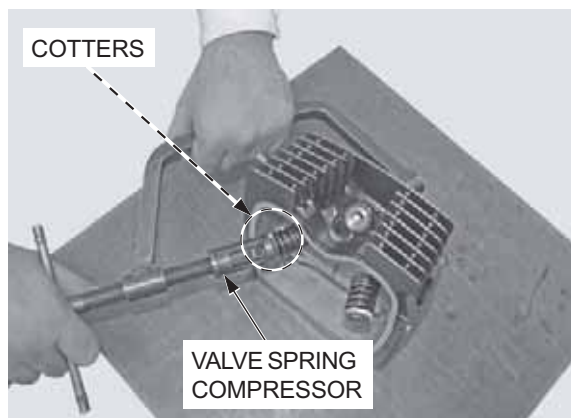
CYLINDER HEAD/VALVES

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

Compress the valve spring and install the valve cotteners.

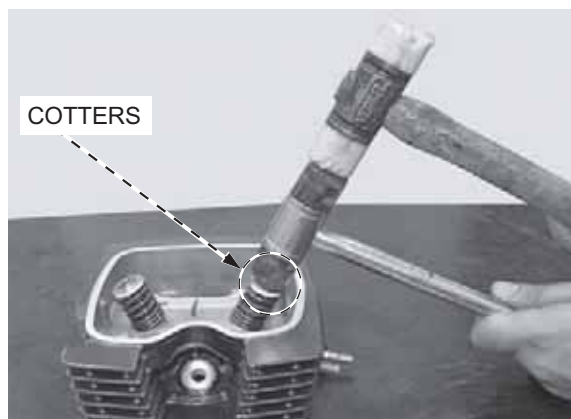
TOOL:

Valve spring compressor 070-GE-001-I100

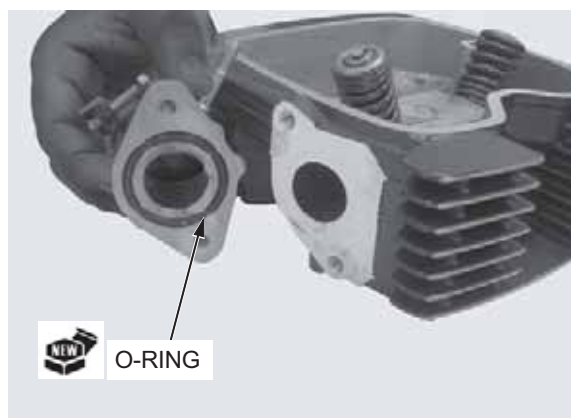


Support the cylinder head above the work bench surface to prevent valve damage.

Tap the stems gently with two plastic hammer to firmly seat the cotteners.



Install a new O-ring to the carburetor insulator.

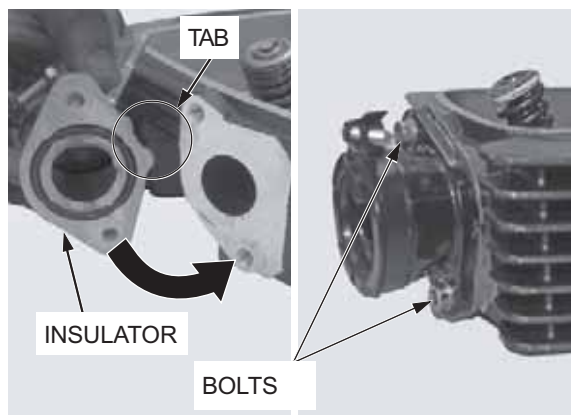


Carrying out as shown that the direction of the insulator tab.

Install the carburetor insulator to the cylinder head and tighten the bolts to the specified torque.

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

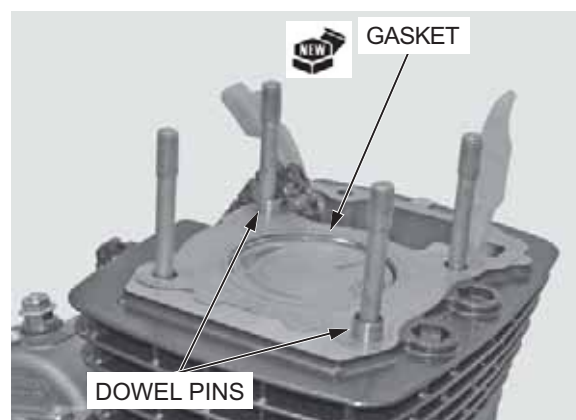
Install the spark plug (page 3-7).



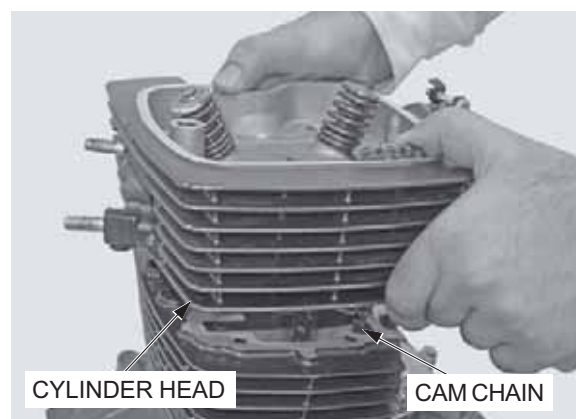
CAMSHAFT HOLDER/ CYLINDER HEAD INSTALLATION

*Do not allow
dust and dirt to
enter the
engine.*

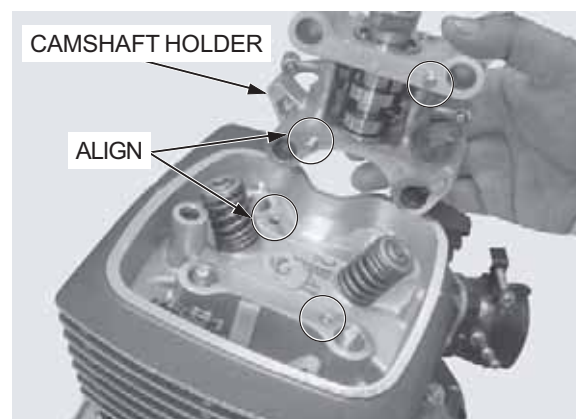
Clean any gasket material from the cylinder mating surfaces.
Install the dowel pins and new gasket.



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



Install the camshaft holder to the cylinder head while aligning the holes in the cylinder head with dowel pins in the camshaft holder.



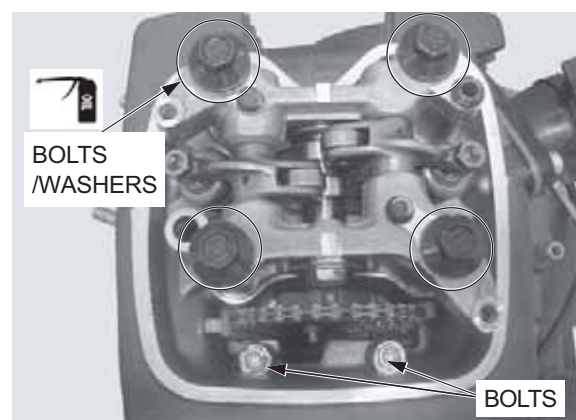
Apply clean engine oil to the threads and seating surfaces of the camshaft holder bolts.

Install the washers onto the camshaft holder bolts.

Install and tighten the bolts to the specified torque.

TORQUE: 32 N.m (3.3 kgf.m, 24 lbf.ft)

Install and tighten the cylinder head bolts.

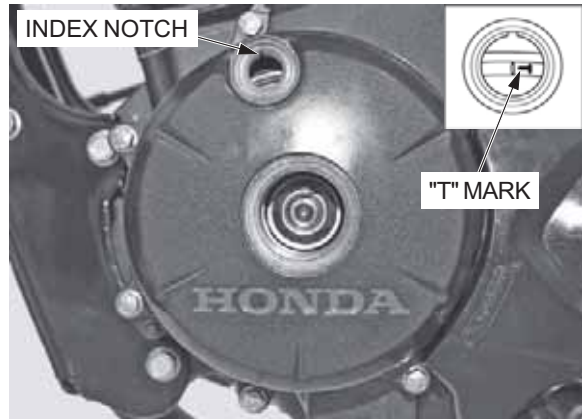


CYLINDER HEAD/VALVES

Remove the timing hole cap and crankshaft hole cap (page 3-9).

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

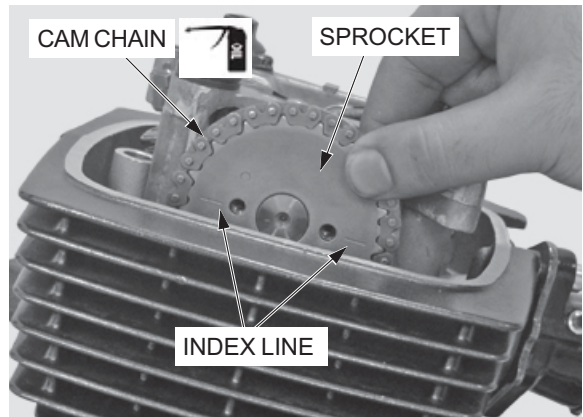
Make sure the piston is at TDC (Top Dead Center).



Apply clean engine oil to the cam chain.

Attach the cam sprocket to the cam chain with the index line facing outside.

Temporarily align the index line on the sprocket with the upper surface of the cylinder head without moving the cam chain.



Install the cam sprocket onto the camshaft flange.

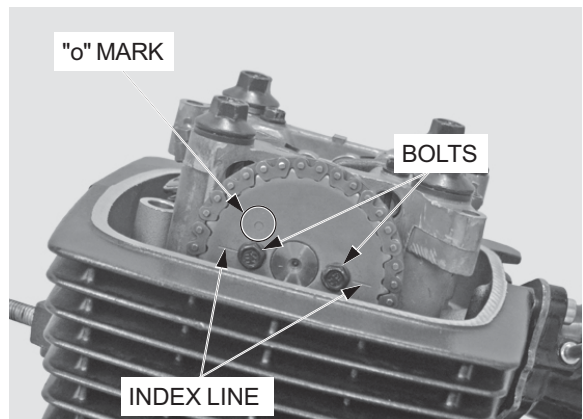
Be sure that the index lines on the cam sprocket align with the upper surface of the cylinder head when the index line of the "T" mark on the flywheel is aligned with the index notch on the crankcase cover.

"o" mark side is fastened previously

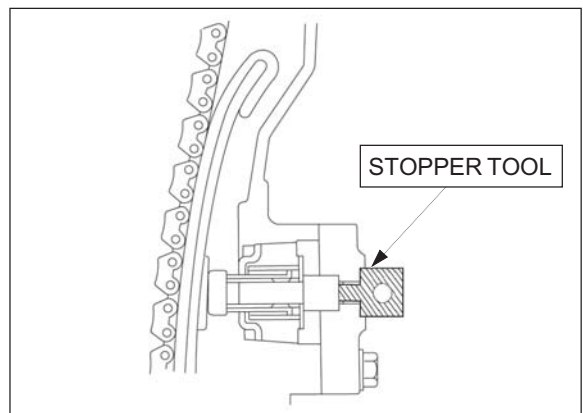
Apply locking agent to the cam sprocket bolt threads.

Install and tighten the cam sprocket bolts.

TORQUE: 9.N.m (0.9 kgf.m, 6.6 lbf.ft)



Remove the stopper tool from the cam chain tensioner lifter.



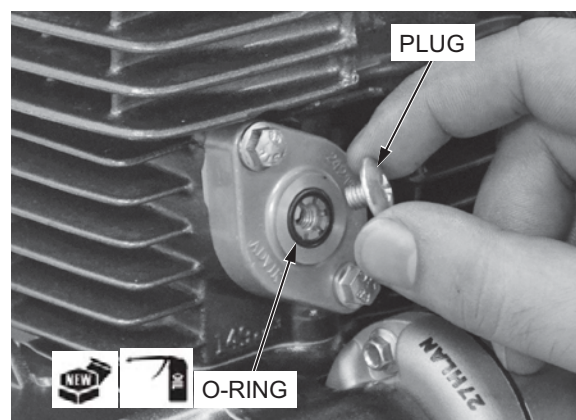
Apply clean engine oil to a new O-ring and install it to the lifter.

Install the plug and tighten it.

TORQUE: 4 N.m (0.4 kgf.m, 3.0 lbf.ft.)

Install the following:

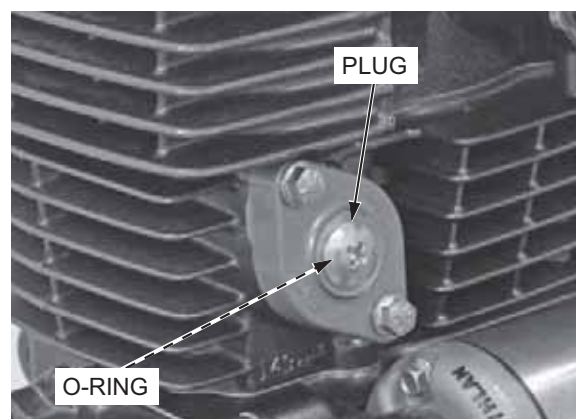
- cylinder head cover (page 7-5)
- carburetor (page 5-11)
- exhaust pipe/muffler (page 2-7)
- spark plug cap (page 3-8)



CAM CHAIN TENSIONER LIFTER

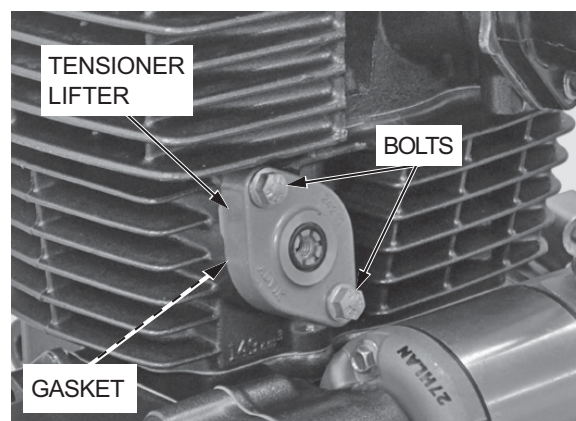
REMOVAL

Remove the tensioner lifter plug and O-ring.



Remove the two mounting bolts.

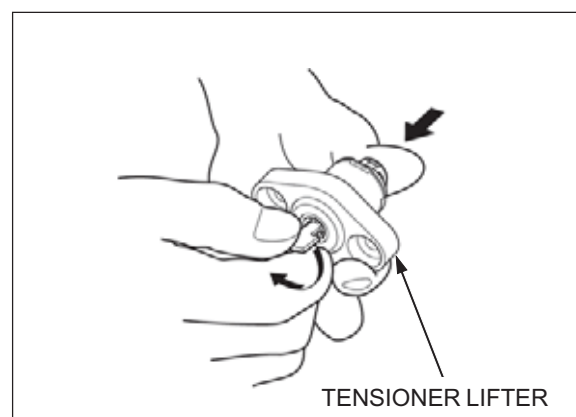
Remove the cam chain tensioner lifter and gasket.



INSPECTION

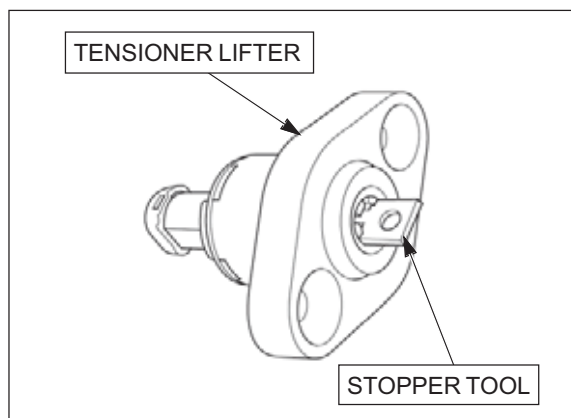
Check the lifter operation:

- The tensioner shaft should not go into the body when it is pushed.
- When it is turned clockwise with a stopper tool (page 7-7), the tensioner lifter shaft should be pulled into the body. The shaft spring out of the body as soon as the stopper tool is released.

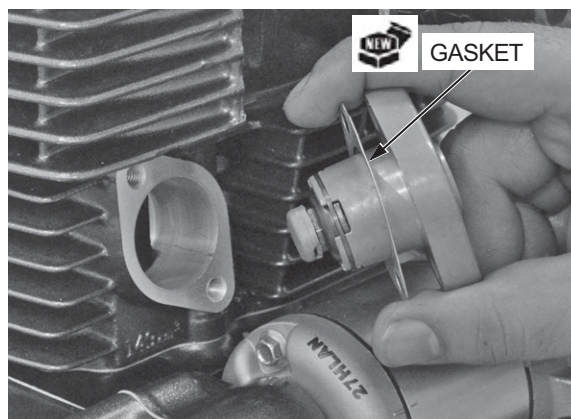


INSTALLATION

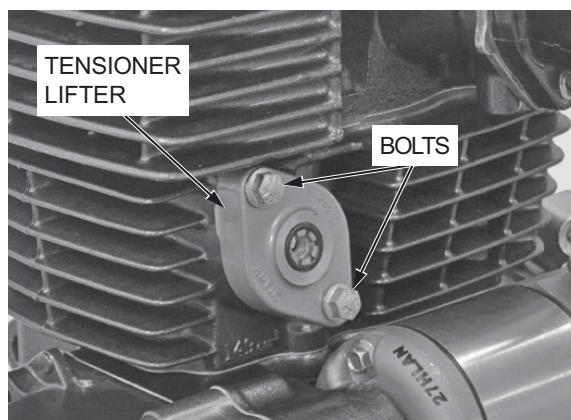
Turn the tensioner lifter shaft clockwise with the stopper tool to retract the tensioner lifter, then insert the stopper fully to hold the tensioner lifter in the fully retracted position.



Install a new gasket on the cam chain tensioner lifter.



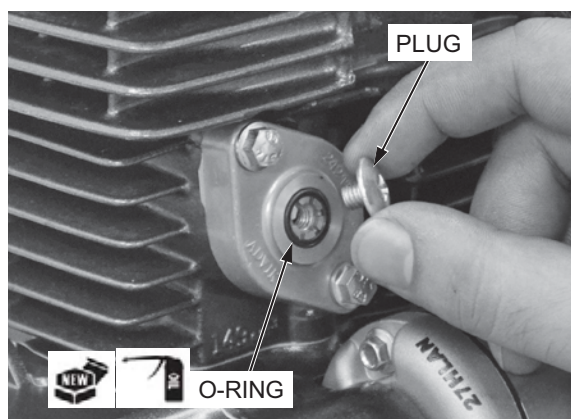
Install the cam chain tensioner lifter.
Install the two mounting bolts and tighten them.
Remove the stopper tool from the tensioner lifter.



Apply clean engine oil to a new O-ring and install it to the lifter.

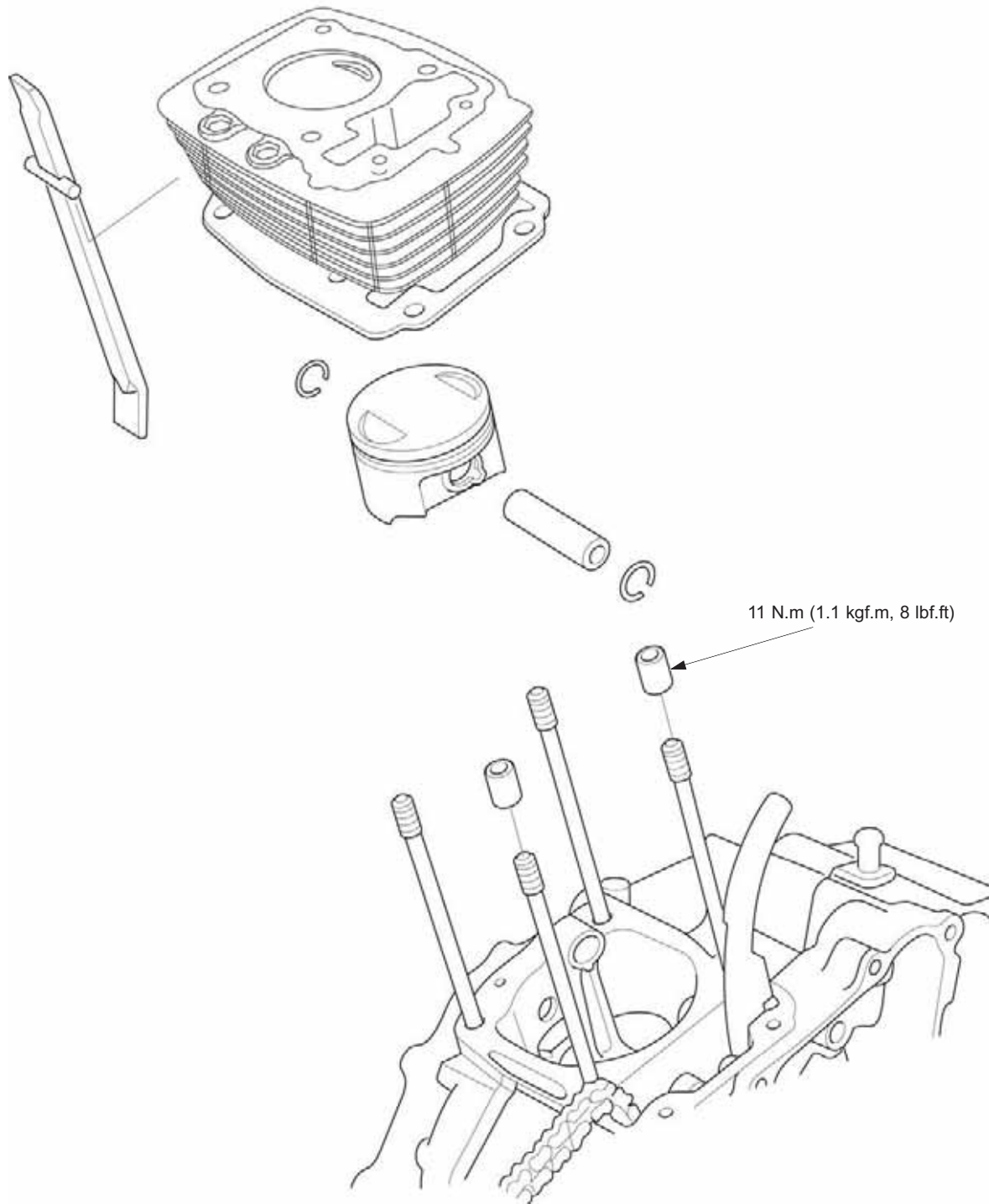
Install the tensioner lifter plug and tighten it.

TORQUE: 4 N·m (0.4 kgf·m, 3.0 lbf·ft)



MEMO

COMPONENT LOCATION



8. CYLINDER/PISTON

COMPONENT LOCATION

8-0

TROUBLESHOOTING

8-1

SERVICE INFORMATION

8-1

CYLINDER/PISTON

8-2

SERVICE INFORMATION

GENERAL

- The cylinder and piston services can be done with the engine installed in the frame.
- Take care not to damage the cylinder wall and piston.
- Be careful not to damage the mating surfaces when removing the cylinder. Do not strike the cylinder too hard during removal.
- Camshaft and rocker arm lubricating oil is fed through an oil passage in the cylinder. Clean the oil passage before installing cylinder.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		57.300 – 57.310 (2.2559 – 2.2563)	57.40 (2.260)
	Out-of-round		–	0.10 (0.004)
	Taper		–	0.10 (0.004)
	Warpage		–	0.10 (0.004)
Piston, piston pin, piston ring	Piston O.D. at 5 (0.2) from bottom		57.280 – 57.295 (2.2551 – 2.2557)	57.20 (2.252)
	Piston pin hole I.D.		14.002 – 14.008 (0.5513 – 0.5515)	14.04 (0.553)
	Piston pin O.D.		13.994 – 14.000 (0.5509 – 0.5512)	13.96 (0.550)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.04 (0.002)
	Piston ring end gap	Top	0.10 – 0.25 (0.004 – 0.010)	0.40 (0.016)
		Second	0.10 – 0.25 (0.004 – 0.010)	0.40 (0.016)
		Oil (side rail)	0.20 – 0.70 (0.008 – 0.028)	0.85 (0.033)
	Piston ring-to-ring groove clearance	Top	0.030 – 0.060 (0.0012 – 0.0026)	0.10 (0.004)
		Second	0.030 – 0.060 (0.0012 – 0.0026)	0.10 (0.004)
Cylinder-to-piston clearance			0.005 – 0.030 (0.0002 – 0.0012)	0.09 (0.004)
Connecting rod small end I.D.			14.010 – 14.028 (0.5516 – 0.5523)	14.06 (0.554)
Connecting rod-to-piston pin clearance			0.010 – 0.034 (0.0004 – 0.0013)	0.10 (0.004)

TORQUE VALUES

Cylinder stud bolt

11 N·m (1.1 kgf·m, 8 lbf·ft)

See page 8-2

TROUBLESHOOTING

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

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

Compression too high, overheating or knocking

- Excessive carbon built-up on top of piston or combustion chamber

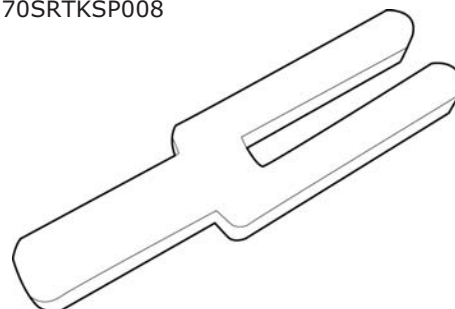
Excessive smoke

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

Abnormal noise (piston)

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

Slider base piston
070SRTKSP008



CYLINDER/PISTON

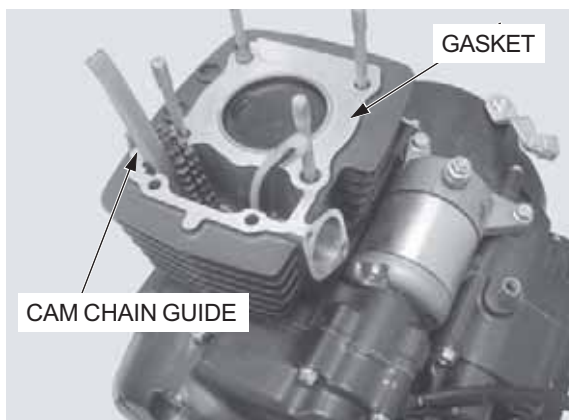
CYLINDER REMOVAL

The cylinder can be serviced with the engine installed in the frame

Remove the cylinder head (page 7-7).

Remove the gasket

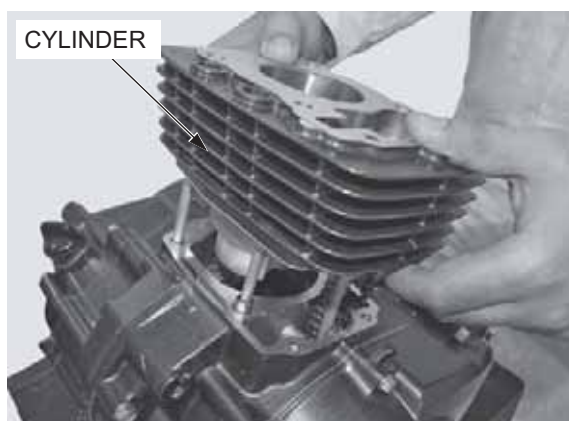
Remove the cam chain guide.



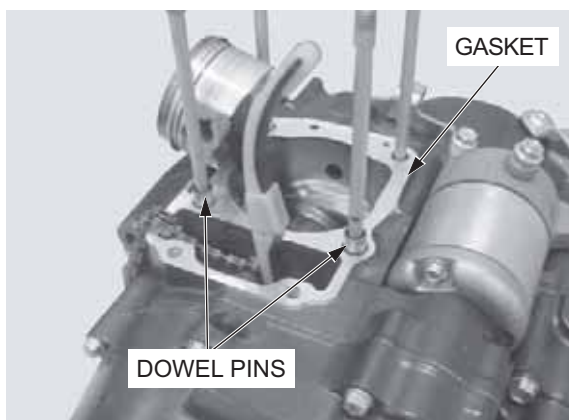
Do not strike the cylinder too hard and do not damage the mating surface with a screwdriver.

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

Clean the top of the cylinder thoroughly



Remove the dowel pins and gasket.



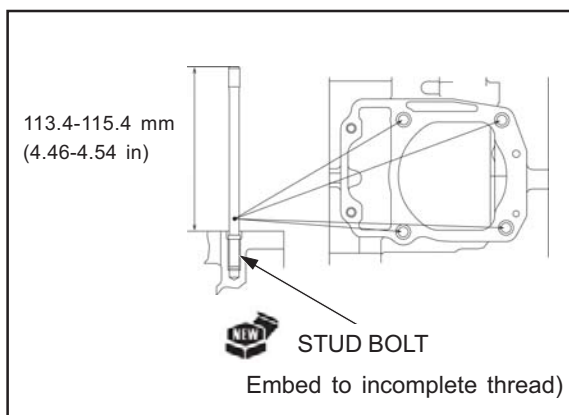
STUD BOLT REPLACEMENT

Remove the stud bolts from the crankcase.

Install the new stud bolts into the crankcase embed to incomplete threads.

TORQUE: 11 N·m (1.1 kgf·m, 8 lbf·ft)

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



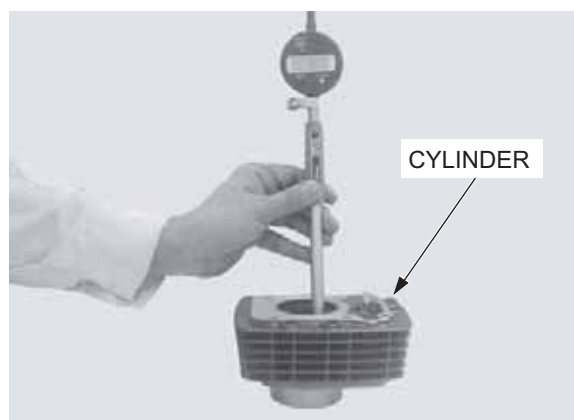
CYLINDER INSPECTION

Inspect the cylinder wall for scratches and wear.

Measure and record the cylinder I.D. at three levels in both the X and Y axes. Take the maximum reading to determine the cylinder wear.

SERVICE LIMIT: 57.40 mm (2.260 in)

Calculate the cylinder-to-piston clearance (page 8-4).



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

SERVICE LIMITS:

Taper: 0.10 mm (0.004 in)

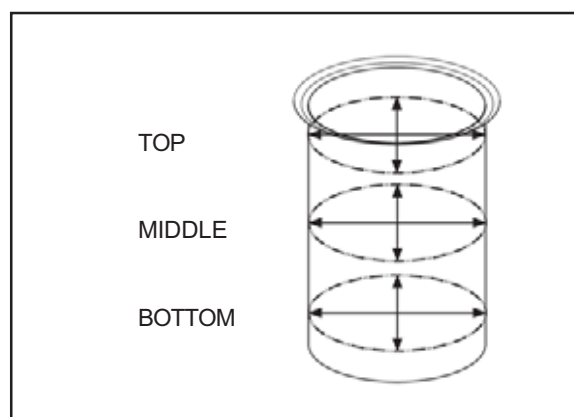
Out of round: 0.10 mm (0.004 in)

The cylinder must be rebored and an oversize piston fitted if the service limit is exceeded.

The following oversize pistons are available:

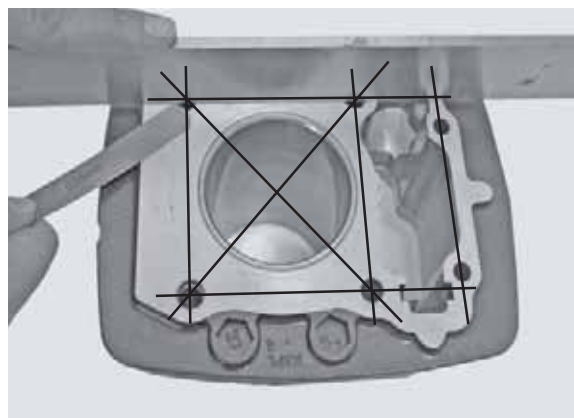
0.25 mm (0.010 in) - 1.00 mm (0.0394 in)

The cylinder must be rebored so that the clearance for an oversize piston is 0.005 – 0.030 mm (0.0002 – 0.0012 in).



Check the cylinder for warpage with a straight edge and feeler gauge across the studs and bolt holes as shown.

SERVICE LIMIT: 0.10 mm (0.004 in)



Place a clean shop towel in the crankcase opening to prevent the possibility of the piston pin clip falling into the crankcase.

PISTON REMOVAL

Remove the piston pin clips using the pliers.

TOOL:

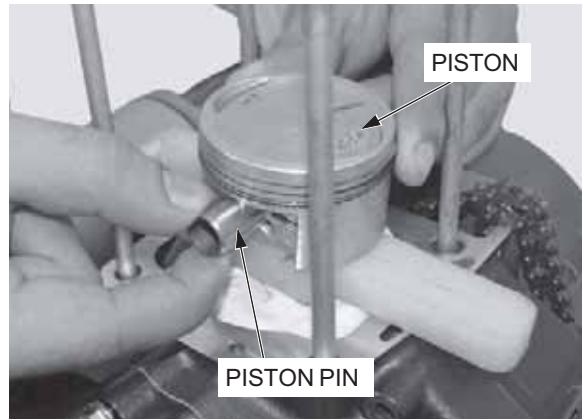
Slider base piston 070SRTKSP008



CYLINDER/PISTON

Remove the piston pin and remove the piston.

Inspect the piston rings for movement by pressing the rings. The rings should be able to move in its groove without catching.



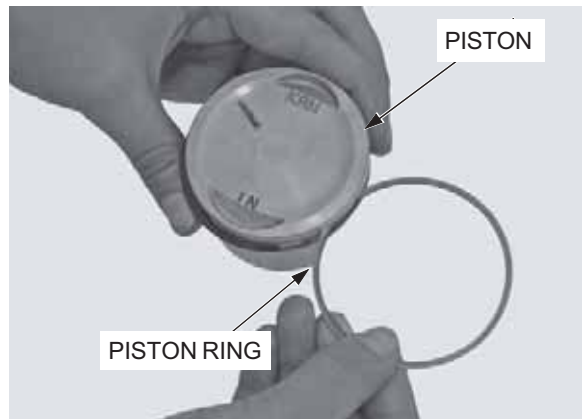
Spread each piston ring and remove it by lifting it up at a point just opposite and gap.

- Do not damage the piston ring by spreading the ends too far.
- Be careful not to damage the piston when the piston ring removal.



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

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



PISTON INSPECTION

Inspect the piston for cracks or other damage.

Inspect the ring grooves for excessive wear and carbon buildup.

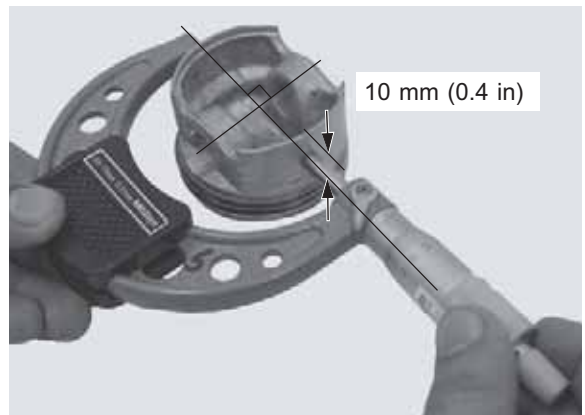
Measure the piston O.D. at a point 10 mm (0.4 in) from the bottom and 90° to the piston pin hole.

SERVICE LIMIT: 57.20 mm (2.252 in)

Calculate the cylinder-to-piston clearance.

Take the maximum reading to determine the clearance (Cylinder I.D.:page 8-3).

SERVICE LIMIT: 0.09 mm (0.004 in)



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

SERVICE LIMIT: 14.04 mm (0.553 in)

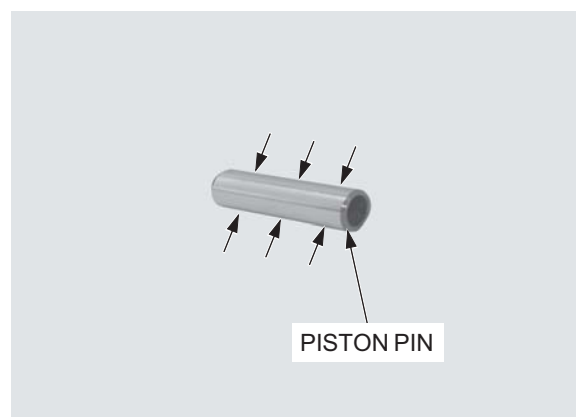


Measure the piston pin O.D. at three points.

SERVICE LIMIT: 13.96 mm (0.550 in)

Calculate the piston-to-piston pin clearance.

SERVICE LIMIT: 0.04 mm (0.002 in)



Measure the connecting rod small end I.D.

SERVICE LIMIT: 14.06 mm (0.554 in)

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

SERVICE LIMIT: 0.10 mm (0.004 in)



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

SERVICE LIMITS:

Top: 0.40 mm (0.016 in)

Second: 0.40 mm (0.016 in)

Oil: 0.85 mm (0.033 in)



CYLINDER/PISTON

Always replace the piston rings as a set.

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

Reinstall the piston rings into the piston grooves.

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

SERVICE LIMITS:

Top: 0.10 mm (0.004 in)

Second: 0.10 mm (0.004 in)

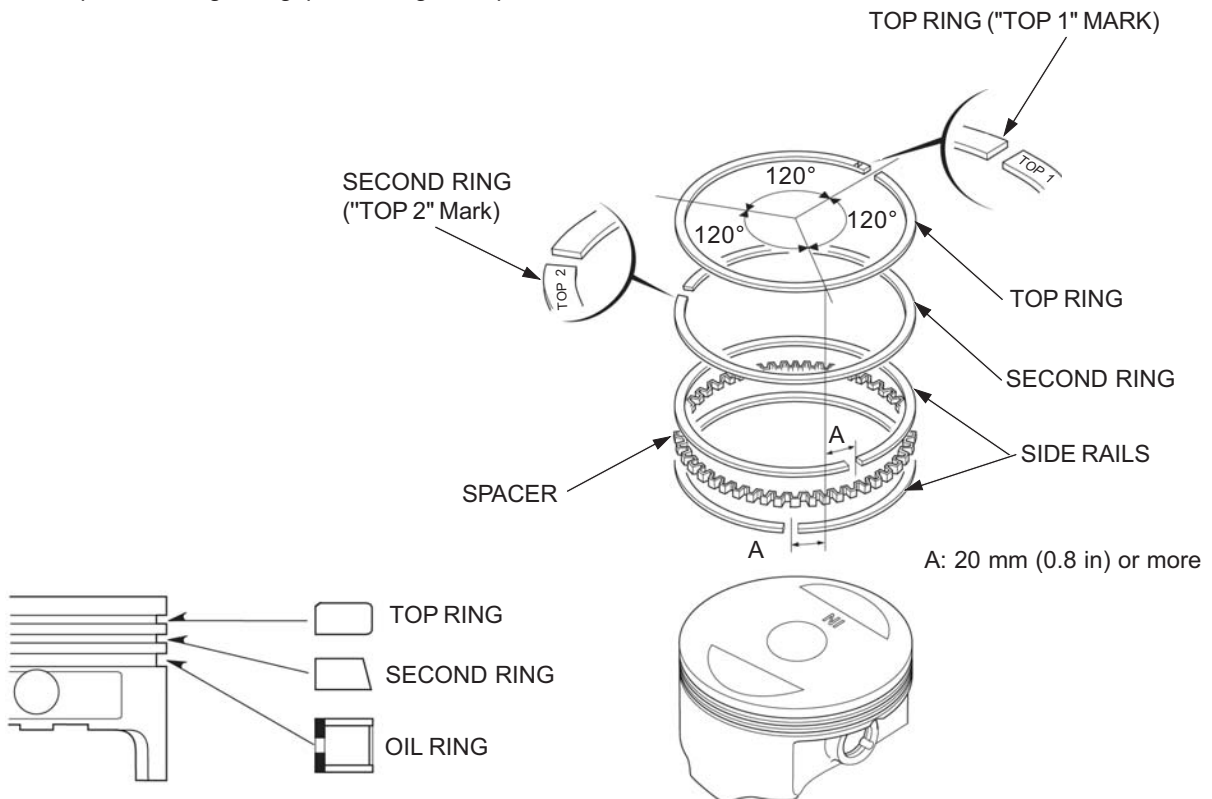


PISTON INSTALLATION

Clean the piston heads, ring lands and skirts.

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

- Do not damage the piston ring by spreading the ends too far.
- Be careful not to damage the piston when the piston ring installation.
- Do not confuse the top and second rings.
- After installing the rings they should rotate freely, without sticking.
- Space the ring end gaps 120 degrees apart.



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

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



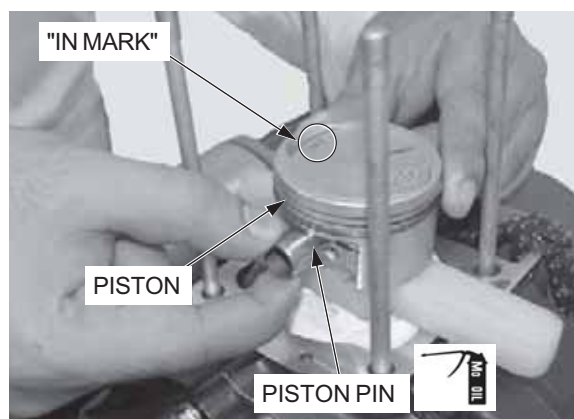
Apply molybdenum oil solution to the piston pin outer surface.

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

Install the piston pin.

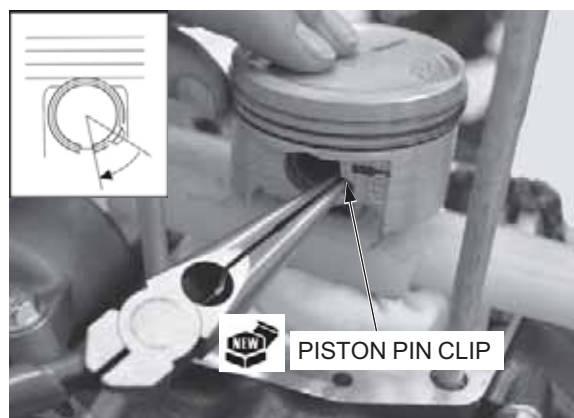
TOOL:

Slider base piston 070SRTKSP008



Install the new piston pin clips.

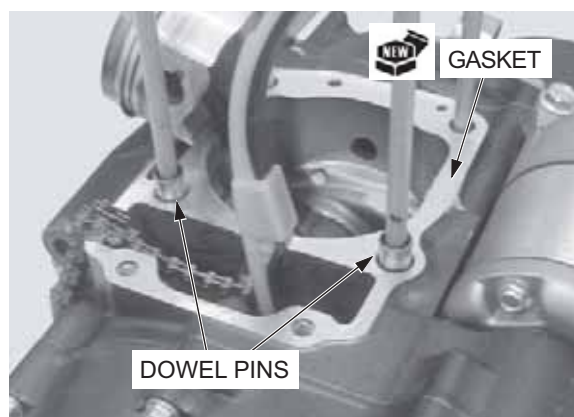
- Place a shop towel over the crankcase opening to prevent piston pin clips from falling into the crankcase.
- Always use new piston pin clips. Reinstalling used piston pin clips may lead to serious engine damage.
- Set the piston pin clip in the groove properly.
- Do not align the clip's end gap with the piston cutout.



Do not reuse the gasket, replace with a new one.

CYLINDER INSTALLATION

Install the dowel pins and new gasket.



CYLINDER/PISTON

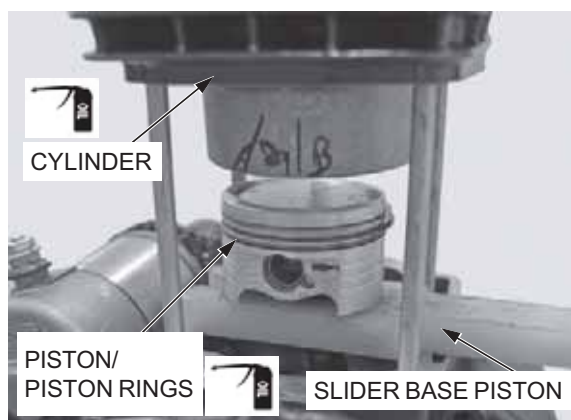
Be careful not to damage the piston rings and cylinder wall

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

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

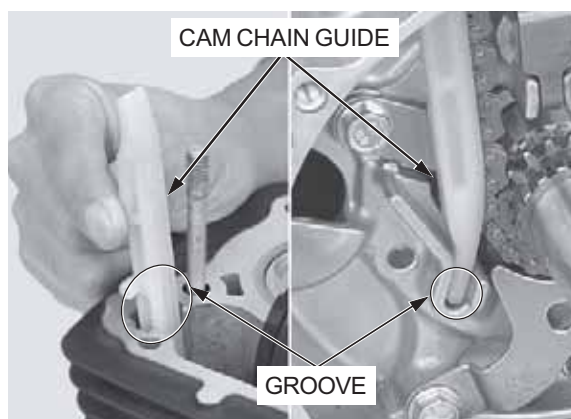
TOOL:

Slider base piston 070SRTKSP008



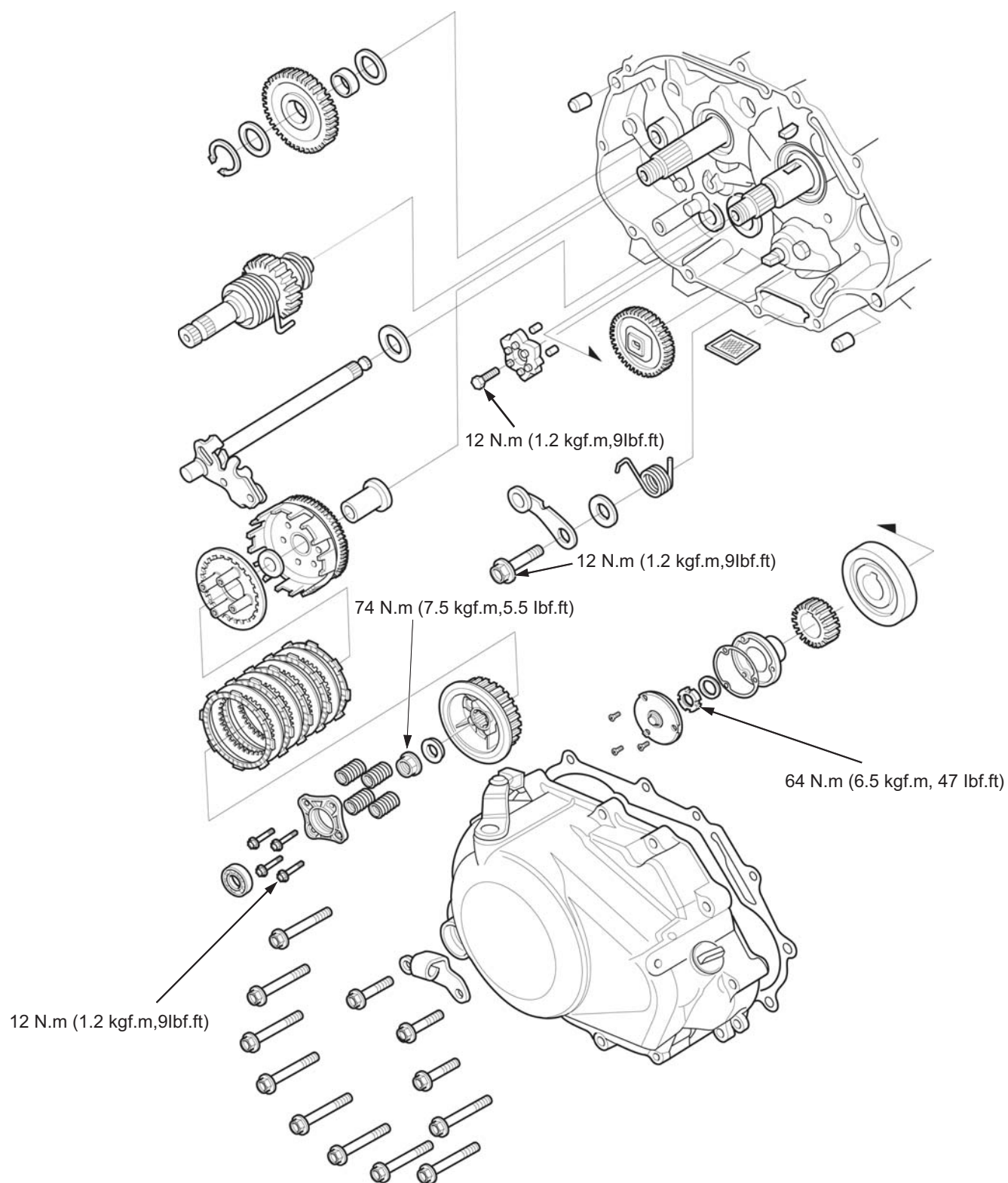
Insert the cam chain guide into the cylinder and crankcase groove.

Install the cylinder head (page 7-19)



MEMO

COMPONENT LOCATION



9. CLUTCH/GEARSHIFT LINKAGE/KICKSTARTER

COMPONENT LOCATION	9-0	GEAR SHIFT LINKAGE	9-13
SERVICE INFORMATION	9-1	KICKSTARTER IDLE GEAR	9-15
TROUBLESHOOTING	9-2	KICKSTARTER	9-16
RIGHT CRANKCASE COVER	9-3	PRIMARY DRIVE GEAR/ CRANKSHAFT COLLAR	9-19
CLUTCH	9-6		

SERVICE INFORMATION

GENERAL

- This section covers service of the clutch, gearshift linkage, kickstarter. All services can be done 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 motorcycle creeps with clutch disengaged, inspect the engine oil level before servicing the clutch system.

SPECIFICATIONS

Unit: mm (in)

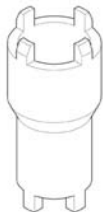
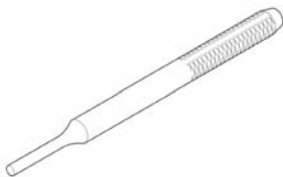
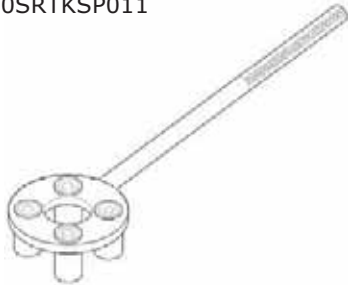

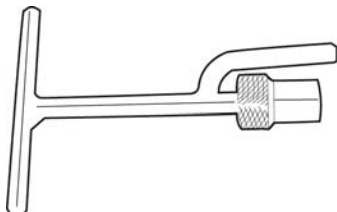
ITEM		STANDARD	SERVICE LIMIT
Clutch lever free play		10 – 20 (0.4 – 0.8)	–
Clutch	Spring free length	40.5 (1.59)	39.6 (1.56)
	Disc thickness	2.92 – 3.08 (0.115 – 0.121)	2.6 (0.10)
	Plate warpage	–	0.20 (0.008)
Clutch outer I.D.		23.000 – 23.021 (0.9055 – 0.9063)	23.08 (0.909)
Clutch outer guide	O.D.	22.959 – 22.980 (0.9039 – 0.9047)	22.93 (0.903)
	I.D.	16.991 – 17.009 (0.6689 – 0.6696)	17.04 (0.671)
Mainshaft O.D. at clutch outer guide		16.966 – 16.984 (0.6680 – 0.6687)	16.95 (0.667)
Kickstarter idle gear I.D.		20.500 - 20.521 (0.8071 - 0.8079)	20.58 (0.810)
Kickstarter idle gear Guide	O.D.	20.459 - 20.480 (0.8055 - 0.8063)	20.43 (0.804)
	I.D.	17.000 - 17.018 (0.6693 - 0.6700)	17.04 (0.671)
Countershaft O.D. at Kickstarter idle gear guide		16.966 -16.984 (0.6680 - 0.6687)	16.94 (0.667)
Kickstarter drive gear I.D.		16.016 - 16.034 (0.6305 - 0.6313)	16.06 (0.632)
Kickstarter spindle O.D. at Kickstarter drive gear		15.966 - 15.984 (0.6286 - 0.6293)	15.94 (0.628)

TORQUE VALUES

Clutch center lock nut	74 N·m (7.5 kgf·m, 55 lbf·ft)	Apply engine oil to the threads and seating surface
Clutch lifter plate bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Oil filter rotor lock nut	64 N·m (6.5 kgf·m, 47 lbf·ft)	Apply engine oil to the threads and seating surface
Gearshift cam bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply locking agent to the threads
Shift drum stopper arm bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply locking agent to the threads

CLUTCH/GEARSHIFT LINKAGE/KICKSTARTER

TOOLS

Lock nut wrench 07001-KRB-T900 	Pin driver 07744-0010200 	Clutch center holder 070SRTKSP011 
Gear holder 0706-KRB-T7900 	Holder gear drum stopper arm 070SRTKSP010 	

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
- No clutch lever free play
- Check for oil additive

Hard to shift

- Misadjusted clutch cable
- Damaged or bent shift fork
- Bent shift fork shaft
- Incorrect engine oil viscosity
- Incorrect gearshift spindle assembly
- Damaged shift drum guide grooves

Transmission jumps out of gear

- Worn shift drum stopper arm
- Worn or broken gearshift spindle return spring
- Bent shift fork shaft
- Damaged shift drum guide grooves
- Worn gear dogs or dog holes

Gearshift pedal will not return

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

RIGHT CRANKCASE COVER

REMOVAL

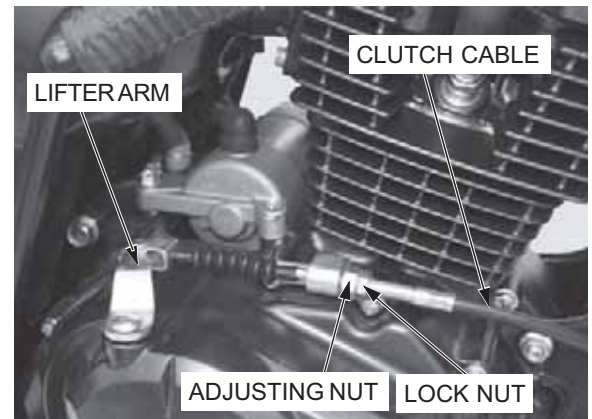
The right crankcase cover can be serviced with the engine installed in the frame.

Drain the engine oil (page 3-11).

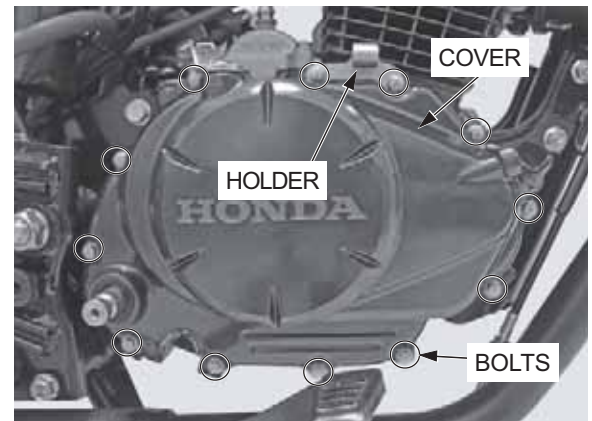
Remove the following:

- Kickstarter pedal (page 6-2)
- Exhaust pipe/ muffler (page 2-7)
- Main step

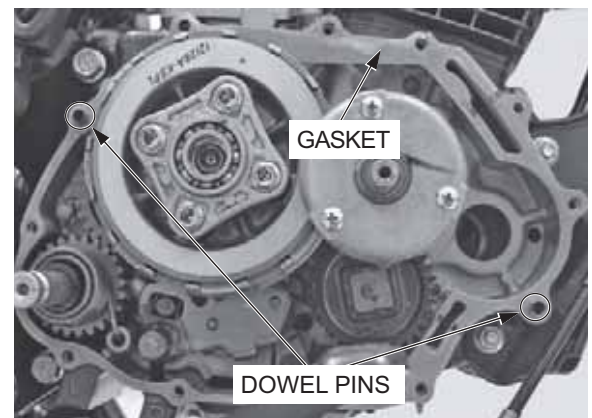
Loosen the lock nut and adjusting nut, then disconnect the clutch cable from the clutch lifter arm.



Loosen the right crankcase cover bolts (12 nos.) in a crisscross pattern in 2 or 3 steps, and remove the right crankcase cover bolts, clutch cable holder and right crankcase cover.



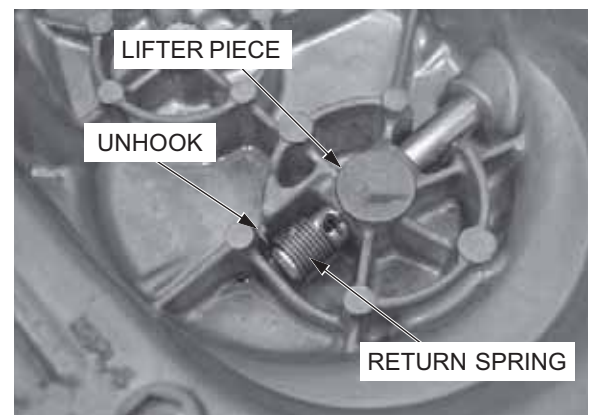
Remove the dowel pins (2 nos.) and gasket.



DISASSEMBLY

Remove the clutch lifter piece.

Unhook the return spring from right crankcase cover.



CLUTCH/GEARSHIFT LINKAGE/KICKSTARTER

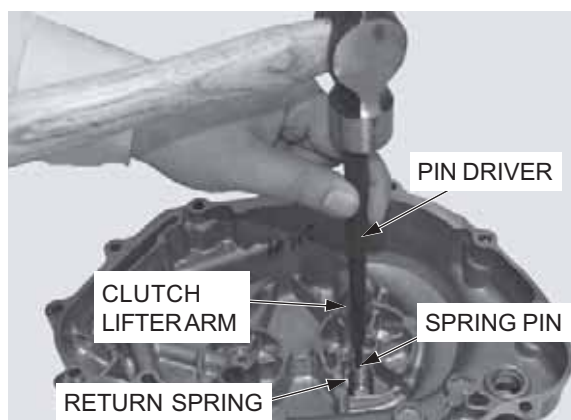
Measure and record the length of drive pin protrusion.

Drive the spring pin into the clutch lifter arm until the pin end is flush with the lifter arm surface using the Pin Driver.

TOOL:

Pin driver **07744-0010200**

Pull out the clutch lifter arm from the right crankcase cover, and remove the return spring.



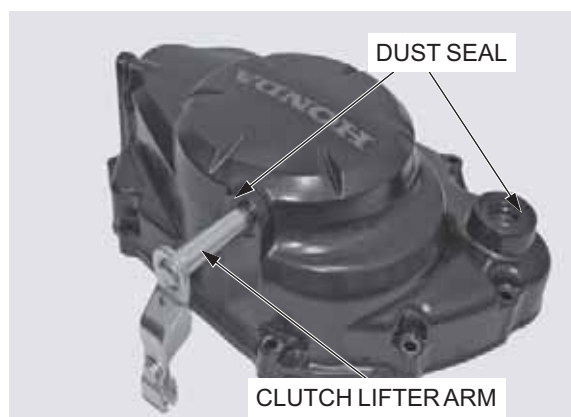
Remove the kickstarter spindle dust seal

Remove the clutch lifter arm and dust seal.

Check the clutch lifter arm for wear or damage.

Check the return spring for fatigue or damage.

Replace them if necessary.

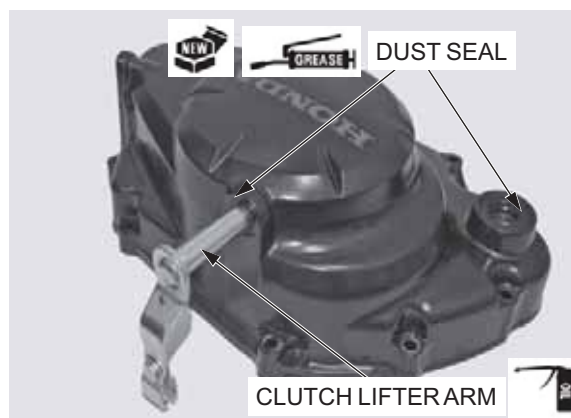


ASSEMBLY

Apply grease to a new kickstarter spindle dust seal lip and install it into the right crankcase cover.

Apply grease to a new clutch lifter arm dust seal lip and install it into the right crankcase cover.

Apply clean engine oil to the clutch lifter arm sliding surface, and install it into the right crankcase cover.

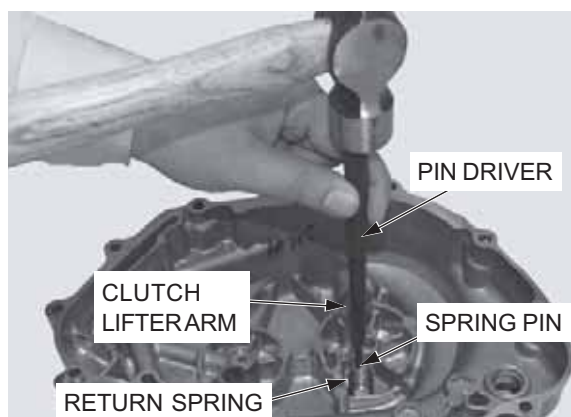


Install the return spring onto the lifter arm end.

From the opposite side, drive the spring pin until it projects the same amount as recorded at disassembly using the pin driver.

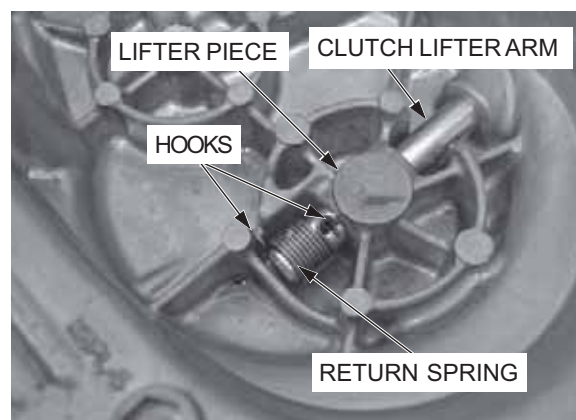
TOOL:

Pin driver **07744-0010200**



Hook the return spring ends as shown.

Install the clutch lifter piece into the clutch lifter arm groove by aligning the groove with the lifter piece hole.

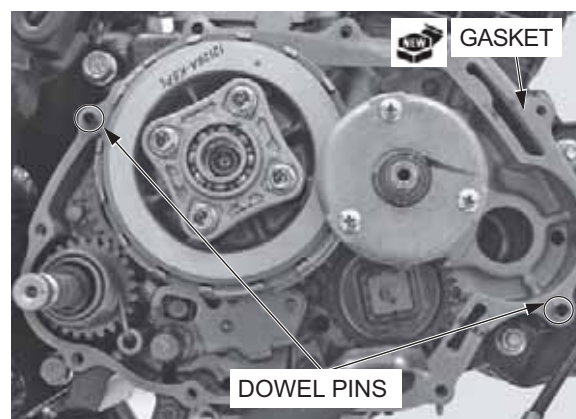


INSTALLATION

Be careful not to damage the mating surfaces.

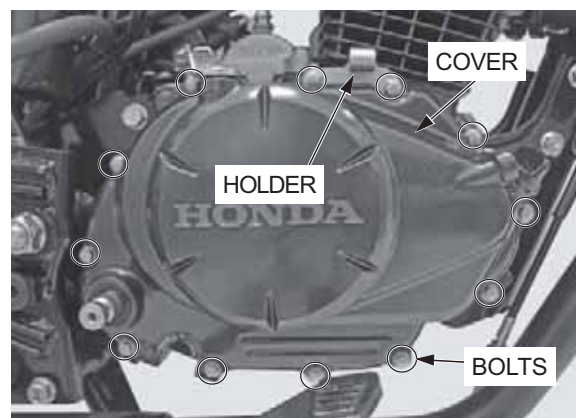
Clean off any gasket material from the mating surfaces of the right crankcase and cover.

Install the dowel pins and new gasket.



Install the right crankcase cover, clutch cable holder and right crankcase cover bolts.

Tighten the right crankcase cover bolts in a crisscross pattern in 2 or 3 steps.



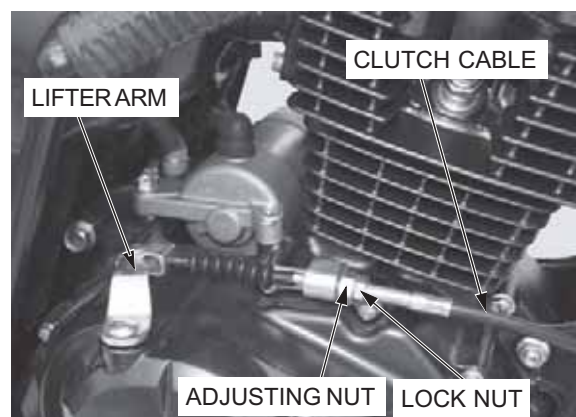
Connect the clutch cable to the clutch lifter arm.

Adjust the clutch lever free play (page 3-21).

Install the following:

- Main step (page 2-6)
- Exhaust pipe/muffler (page 2-6)
- Kickstarter pedal (page 6-6)

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



CLUTCH

REMOVAL

The clutch can be serviced with the engine installed in the frame.

Remove the following:

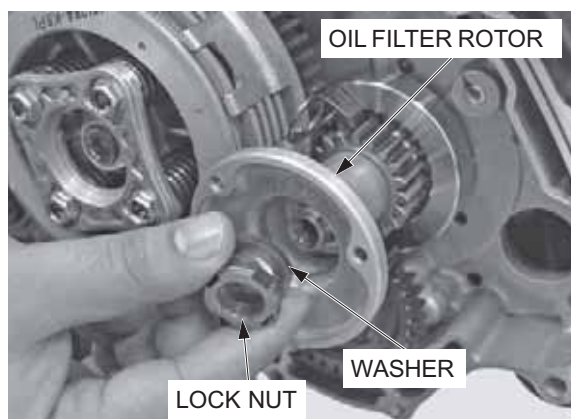
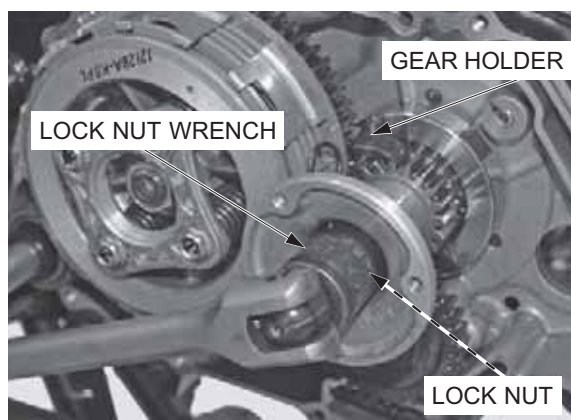
- right crankcase cover (page 9-3)
- Oil filter rotor cover (page 3-12)
- Oil pump drive gear (page 4-2)

Install the gear holder between the primary drive and driven gears as shown, and loosen the oil filter rotor lock nut using lock nut wrench.

TOOLS:

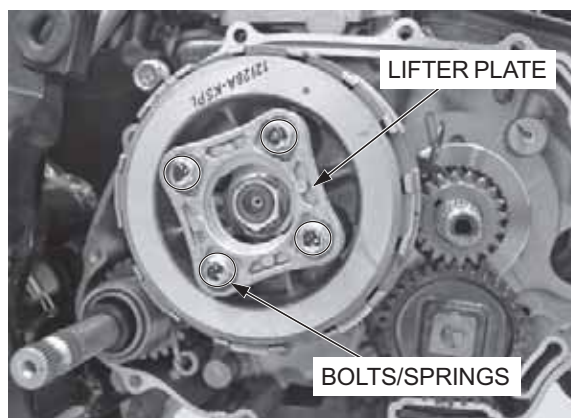
Gear holder	07006-KRBT900
Lock nut wrench	07001-KRBT900

Remove the lock nut, lock washer and oil filter rotor.



Loosen the clutch lifter plate bolts (4 nos.) in a crisscross pattern in several steps.

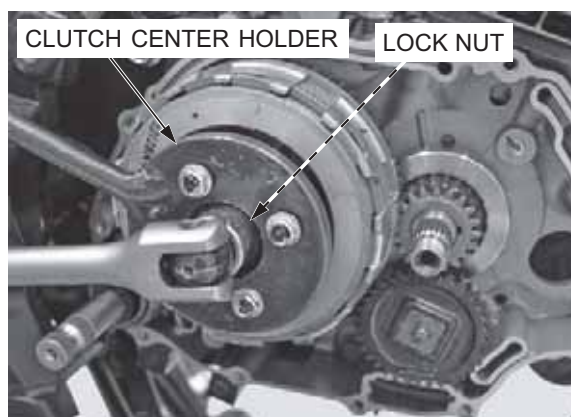
Remove the bolts, clutch lifter plate and clutch springs.



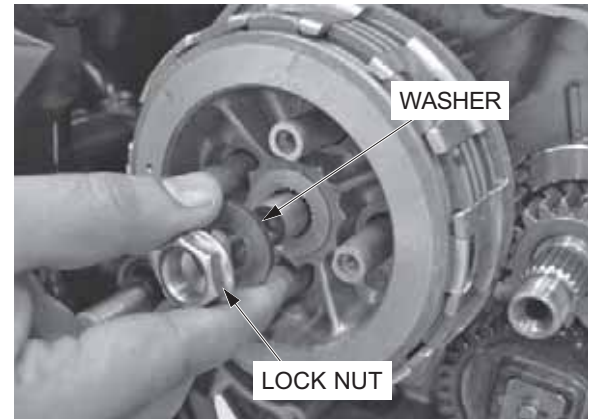
Attach the clutch center holder to the pressure plate using four clutch lifter plate bolts to hold the clutch center, then loosen the clutch center lock nut using the special tool.

TOOL:

Clutch center holder	070SRTKSP011
-----------------------------	---------------------

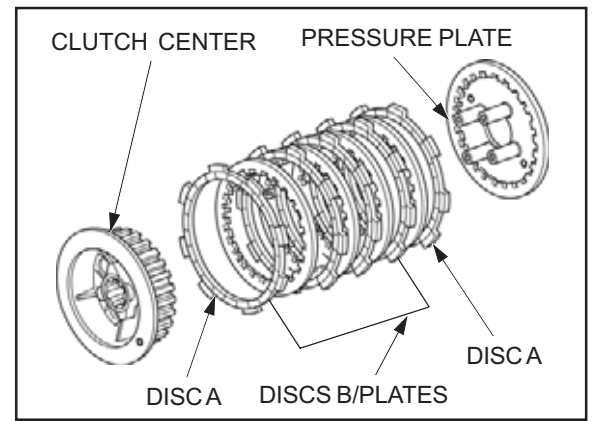


Remove the special tools, lock nut and lock washer.



Remove the following:

- Clutch center
- Clutch disc A
- Clutch plates and discs B
- Pressure plate

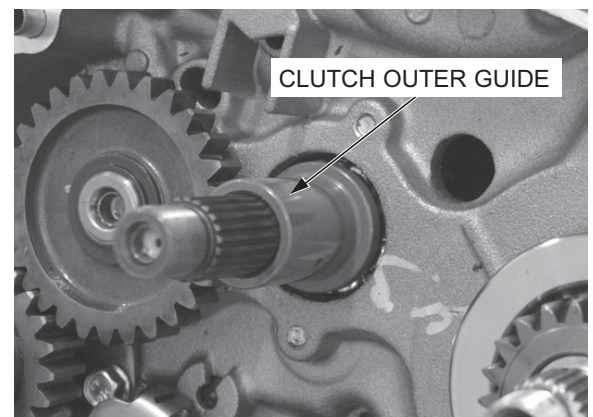


Remove the following.

- Washer
- Clutch outer



Remove the clutch outer guide.



INSPECTION

CLUTCH LIFTER BEARING

Turn the inner race of the clutch lifter bearing with your finger.

The bearing should turn smoothly and quietly.

Also check that the bearing outer race fits tightly in the clutch lifter plate.

Replace the bearing if the inner race does not turn smoothly, quietly, or if the outer race fits loosely in the clutch lifter plate.



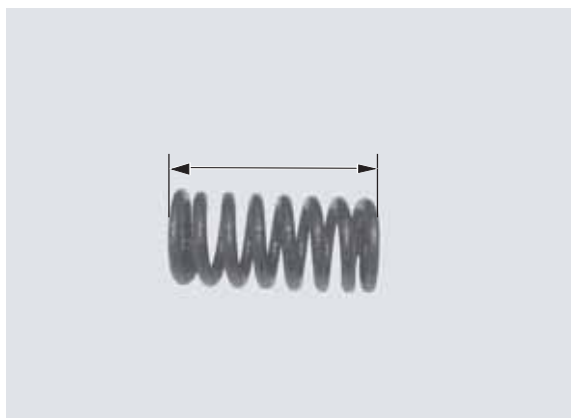
Replace the clutch springs as a set.

CLUTCH SPRING

Check the clutch spring for fatigue or damage.

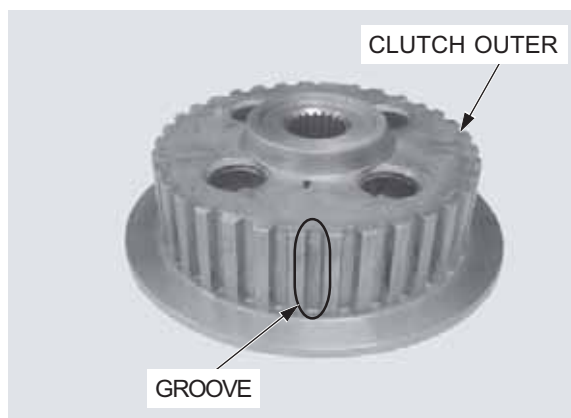
Measure the clutch spring free length.

SERVICE LIMIT: 39.6 mm (1.56 in)



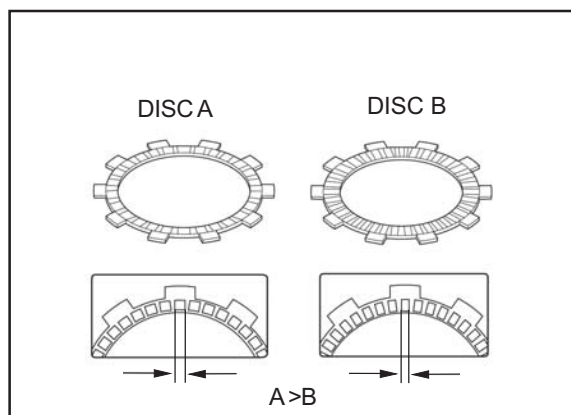
CLUTCH CENTER

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



CLUTCH DISC

Check the clutch discs for signs of scoring or discoloration.

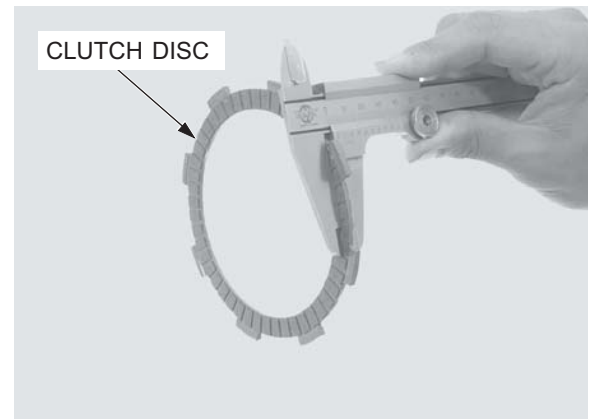


Replace the clutch discs and plates as a set.

Measure the clutch disc thickness of each clutch disc.

SERVICE LIMIT:

Disc A, B: 2.6 mm (0.10 in)



Replace the clutch discs and plates as a set.

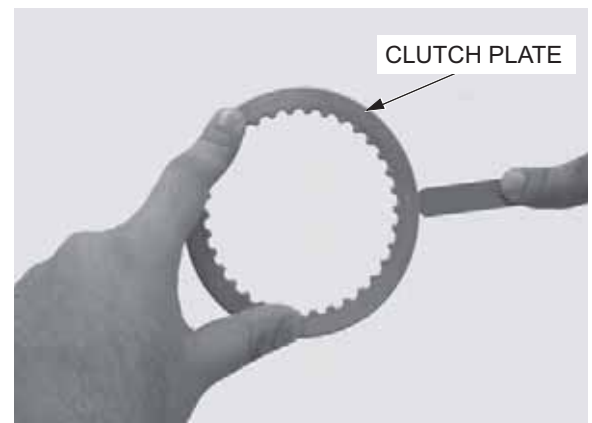
CLUTCH PLATE

Check the plate for discoloration.

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

SERVICE LIMIT: 0.20 mm (0.008 in)

Warped clutch plates prevent the clutch from disengaging properly.



CLUTCH OUTER/OUTER GUIDE

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

Check the primary driven gear teeth for wear or damage.

Measure the clutch outer I.D.

SERVICE LIMIT: 23.08 mm (0.909 in)

Check the clutch outer guide for damage or abnormal wear.

Measure the clutch outer guide I.D. and O.D.

SERVICE LIMITS:

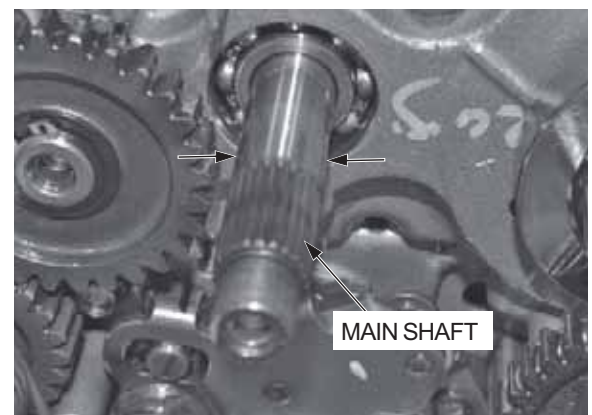
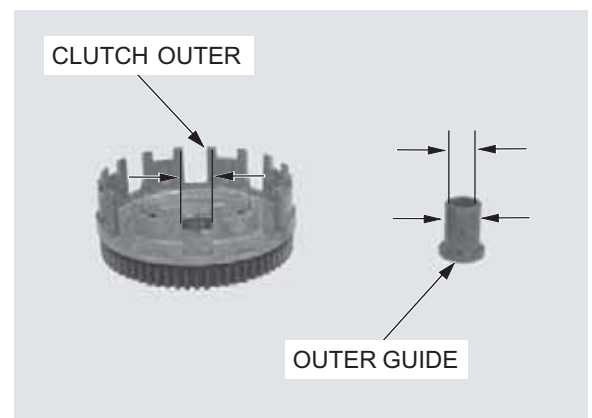
I.D.: 17.04 mm (0.671 in)

O.D.: 22.93 mm (0.903 in)

MAINSHAFT

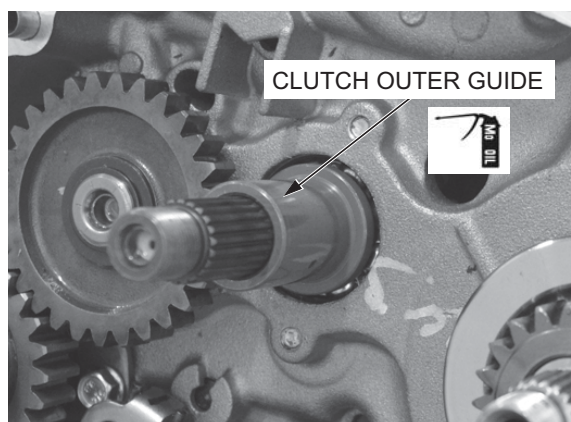
Measure the mainshaft O.D. at the clutch outer guide.

SERVICE LIMIT : 16.95 mm (0.667 in).

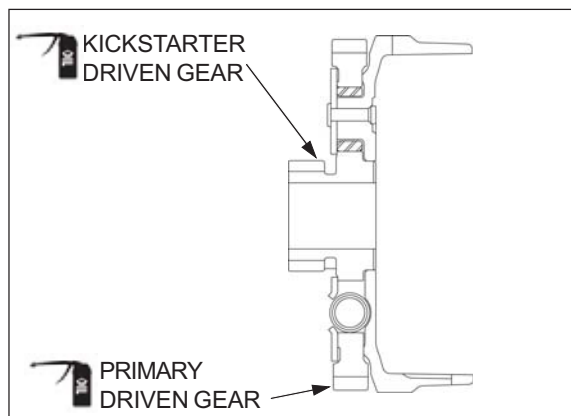


INSTALLATION

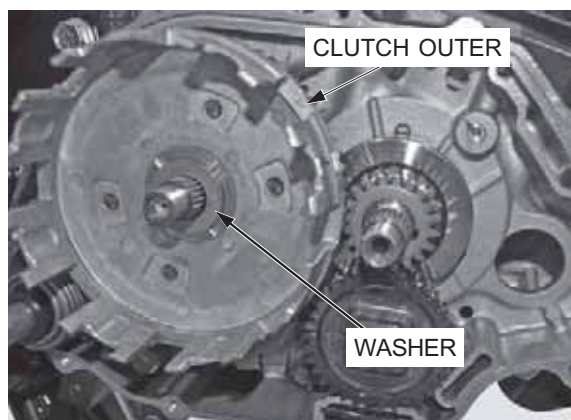
Apply molybdenum oil solution to the entire surface of the clutch outer guide, and install it onto the mainshaft .



Apply clean engine oil to the primary driven gear & kickstarter driven gear.

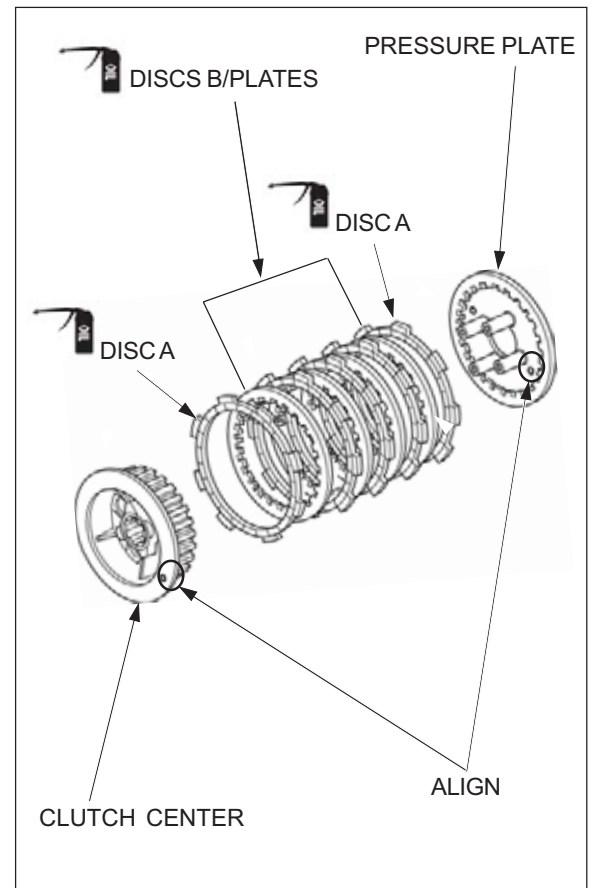


Install the clutch outer and washer.



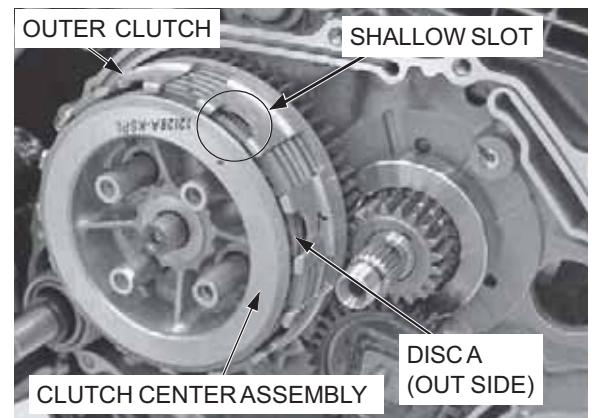
Coat the clutch discs with clean engine oil.

Assemble clutch discs A, B, clutch plates and pressure plate onto clutch center by aligning "o" mark of clutch center and pressure plate.



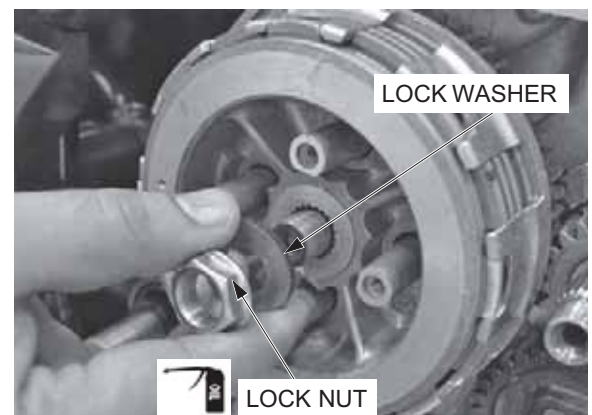
Install the tabs of clutch disc A (out side) to the shallow slots of the clutch outer.

Install the clutch center assembly into the clutch outer.



Install the lock washer.

Apply clean engine oil to the threads and seating surface of the clutch center lock nut, and install it.



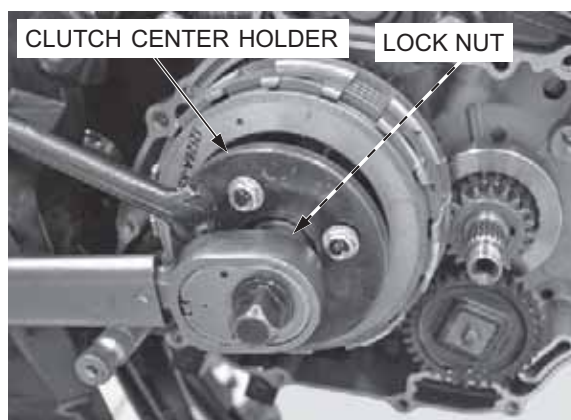
CLUTCH/GEARSHIFT LINKAGE/KICKSTARTER

Attach the clutch center holder to the pressure plate using clutch lifter plate bolts to hold the clutch center, then tighten the clutch center lock nut to the specified torque using special tool.

TOOL:

Clutch center holder 070SRTKSP011

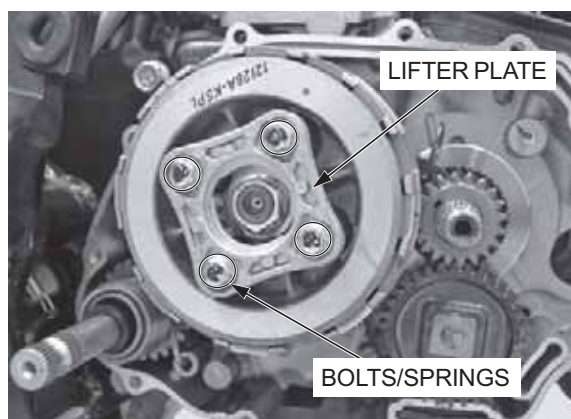
TORQUE: 74 N·m (7.5 kgf·m, 55 lbf·ft)



Install the clutch springs, clutch lifter plate and clutch lifter plate bolts.

Tighten the clutch lifter plate bolts to the specified torque in a crisscross pattern in several steps.

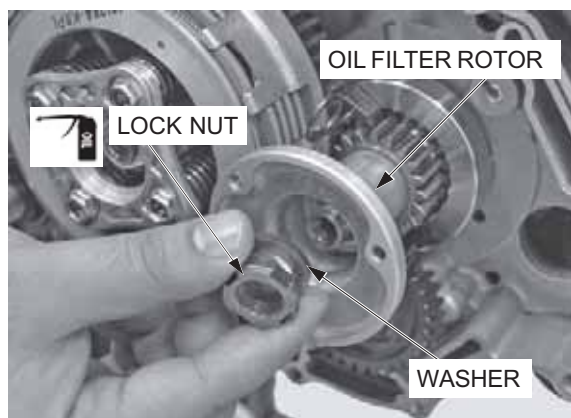
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Clean the inside of the oil filter rotor.

Install the oil filter rotor and washer onto the crankshaft.

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



Install the gear holder between the primary drive and driven gears as shown, and tighten the oil filter rotor lock nut to the specified torque using the special tools.

TOOLS:

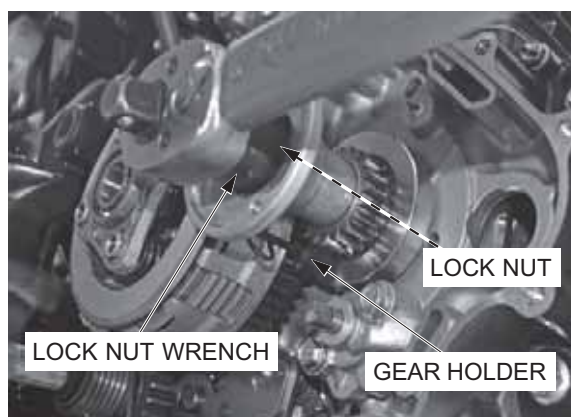
Gear holder 07006-KRBT900

Lock nut wrench 07001-KRBT900

TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)

Install the following:

- oil pump driven gear (page 4-6)
- oil filter rotor cover (page 3-13)
- right crankcase cover (page 9-5)



GEARSHIFT LINKAGE

REMOVAL

Remove the following:

- gearshift pedal (page 6-3)
- right crankcase cover (page 9-3)
- clutch assembly (page 9-6)

Pull out the gearshift spindle from the crankcase.

Remove the thrust washer.

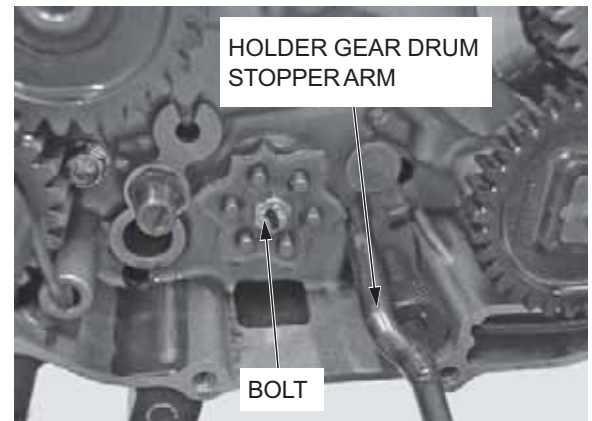


Remove the following:

- Gearshift cam bolt
- Gearshift cam

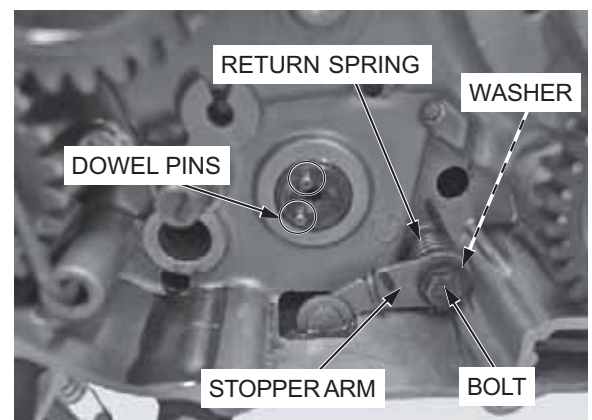
TOOL:

Holder gear drum stopper arm 070SRTKSP010



Remove the following:

- dowel pins from the shift drum
- stopper arm bolt
- stopper arm
- washer
- return spring

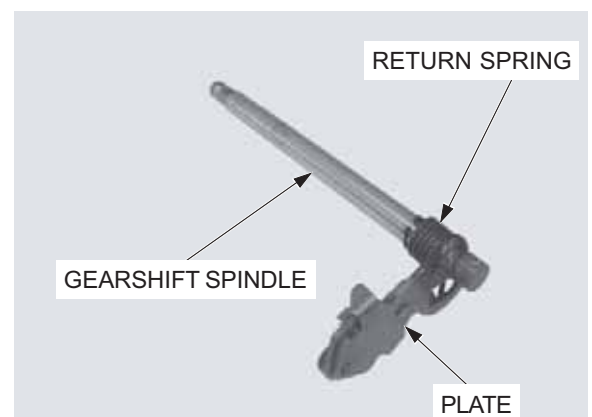


INSPECTION

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.



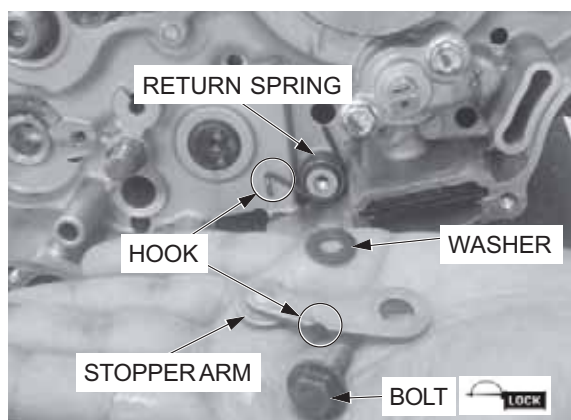
INSTALLATION

Apply locking agent to the stopper arm bolt threads.

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

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Hook the return spring to the stopper arm groove.

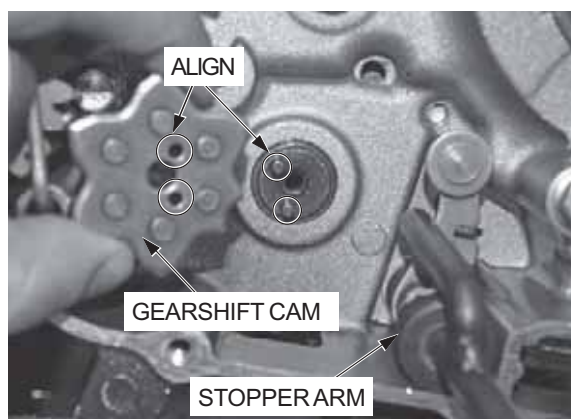


Install the dowel pins into the shift drum hole.

Hold the stopper arm using a special tool and install the gearshift cam, while aligning the pins hole with the dowel pins.

TOOL:

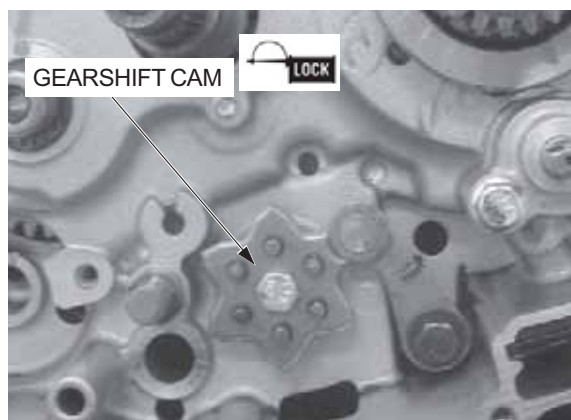
Holder gear drum stopper arm: 070SRTKSP010



Apply a locking agent to the gearshift cam bolt threads.

Install and tighten the gearshift cam bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Apply clean engine oil to the gearshift spindle journal rotating area.

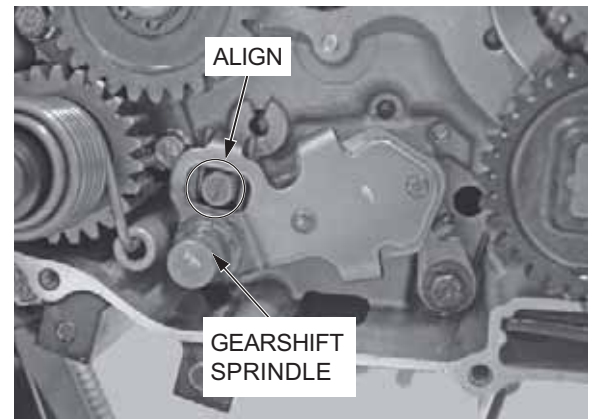
Install the thrust washer to the gearshift spindle, and insert the spindle into the crankcase.



Install the gearshift spindle by aligning the return spring ends with the stopper pin.

Install the following:

- clutch assembly (page 9-10)
- right crankcase cover (page 9-5)
- gearshift pedal (page 6-6)

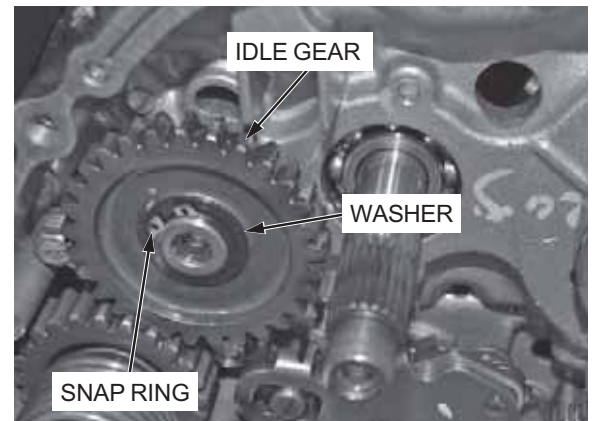


KICKSTARTER IDLE GEAR

REMOVAL

Remove the clutch assembly (page 9-6).

Remove the snap ring, washer and kickstarter idle gear.



Remove the bushing and washer



INSPECTION

Measure the kickstarter idle gear I.D.

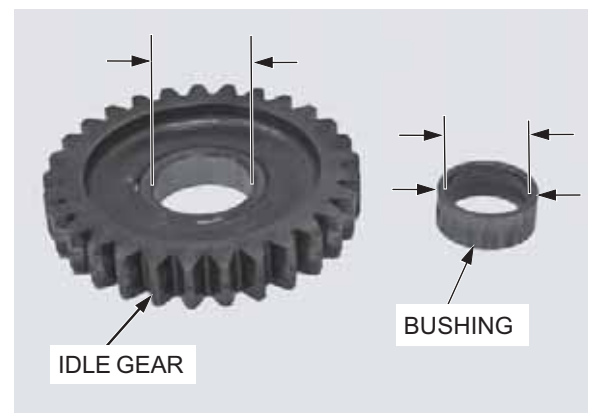
SERVICE LIMIT: 20.58 mm (0.810 in)

Measure the bushing I.D. and O.D.

SERVICE LIMIT:

I.D.: 17.04 mm (0.671 in)

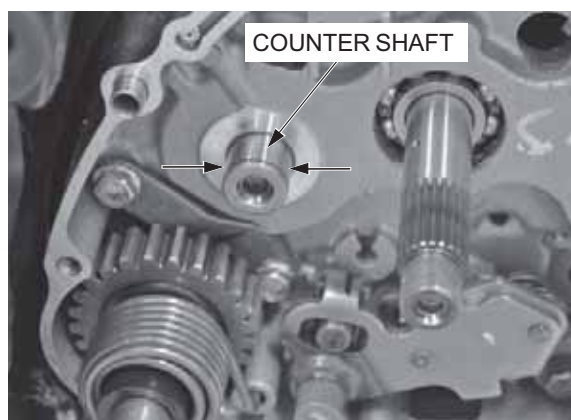
O.D.: 20.43 mm (0.804 in)



CLUTCH/GEARSHIFT LINKAGE/KICKSTARTER

Measure the countershaft O.D. at the kickstarter idle gear.

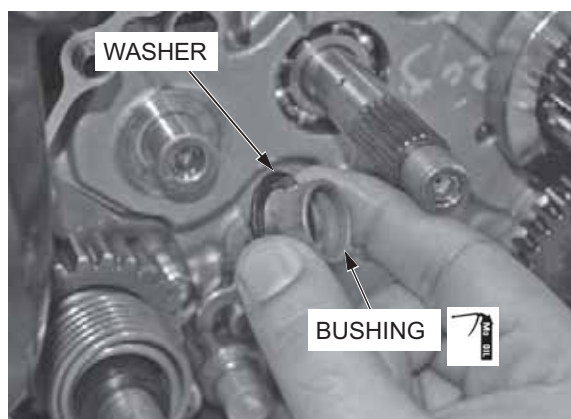
SERVICE LIMIT: 16.94 mm (0.667 in)



INSTALLATION

Apply molybdenum oil solution to the bushing.

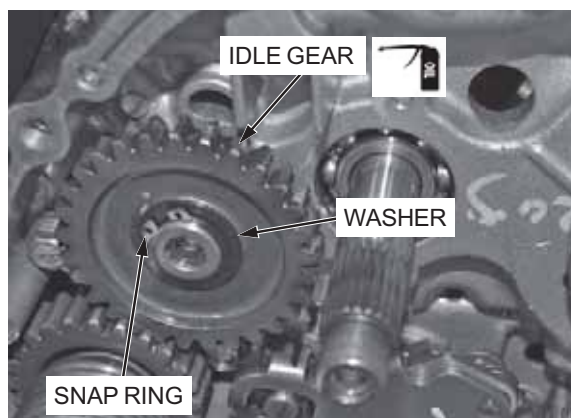
Install the washer and bushing.



Apply clean engine oil to the kickstarter idle gear teeth.

Install the idle gear, washer and snap ring.

Install the clutch assembly (page 9-11).



KICKSTARTER

REMOVAL

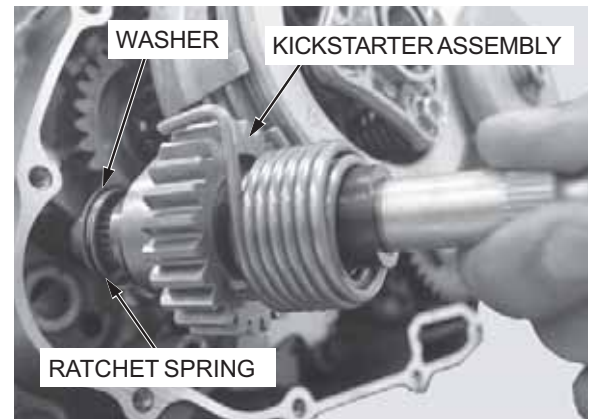
Remove the right crankcase cover (page 9-3).

Unhook the return spring from the crankcase.



Remove the following:

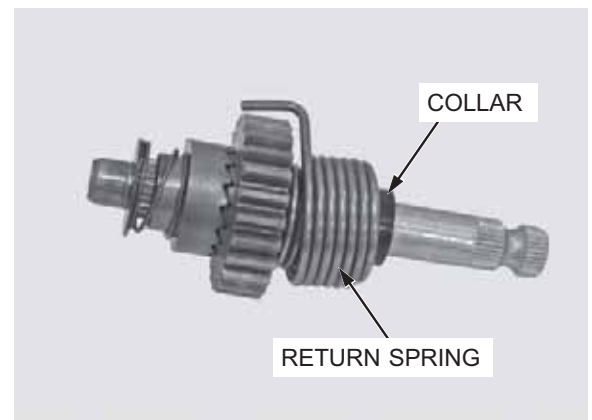
- kickstarter assembly
- ratchet spring
- washer



DISASSEMBLY

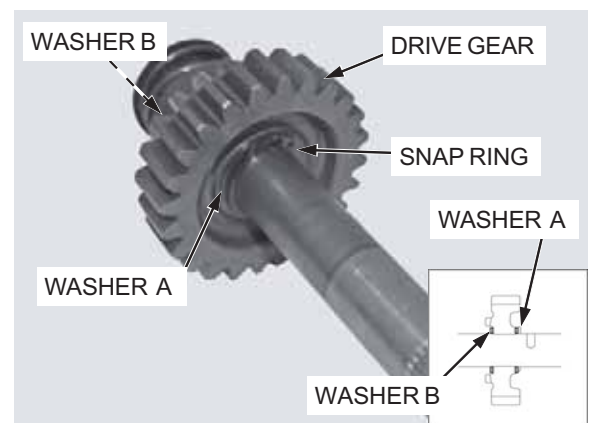
Remove the following:

- Collar
- Return spring



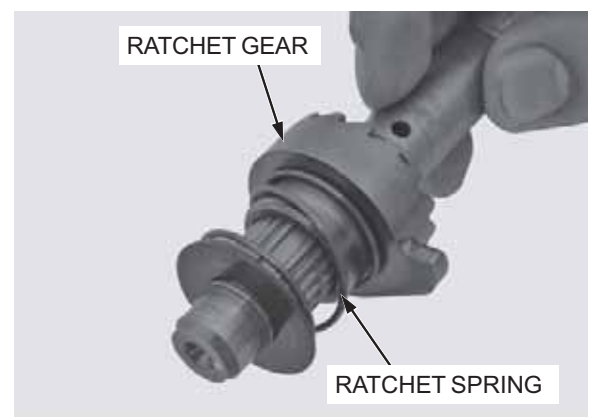
Remove the following:

- Snap ring
- Washer A
- Kickstarter drive gear
- Washer B



Remove the following:

- Starter ratchet gear
- Ratchet spring



INSPECTION

Check the following:

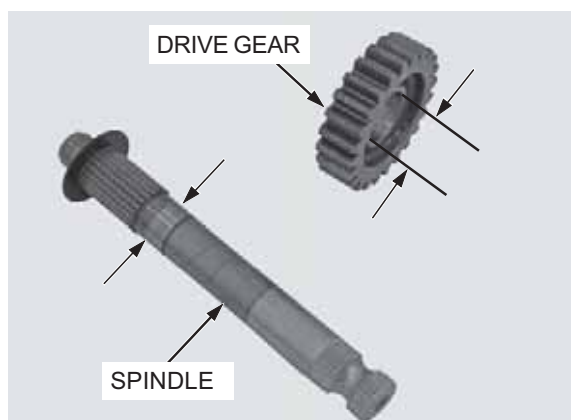
- Ratchet gear and drive gear for excessive wear or damage.
- Spindle for vent or damage.

Measure the drive gear I.D. and spindle O.D. at the drive gear.

SERVICE LIMIT:

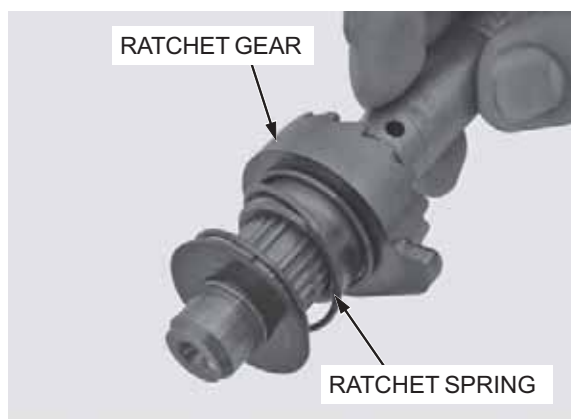
Drive gear I.D.: 16.06 mm (0.632 in)

Spindle O.D.: 15.94 mm (0.628 in)



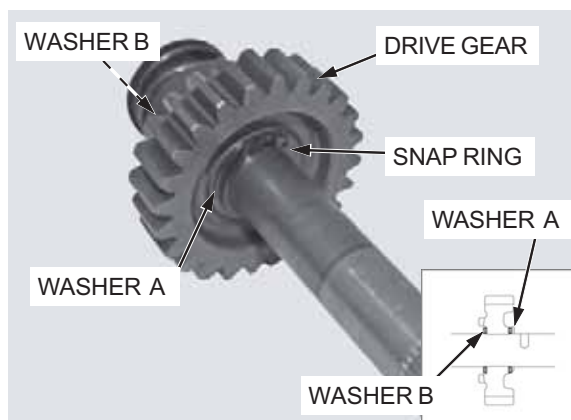
ASSEMBLY

Install the ratchet spring & ratchet gear on to the kickstarter spindle.

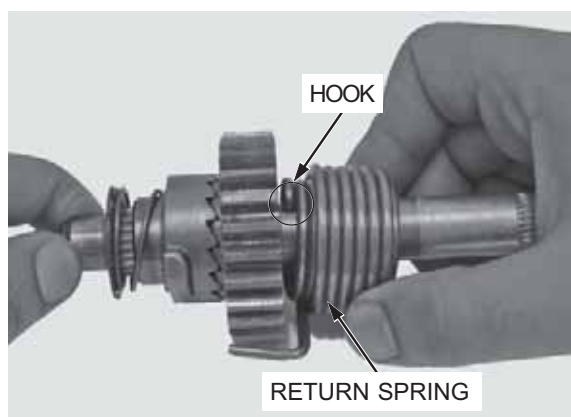


Install the following:

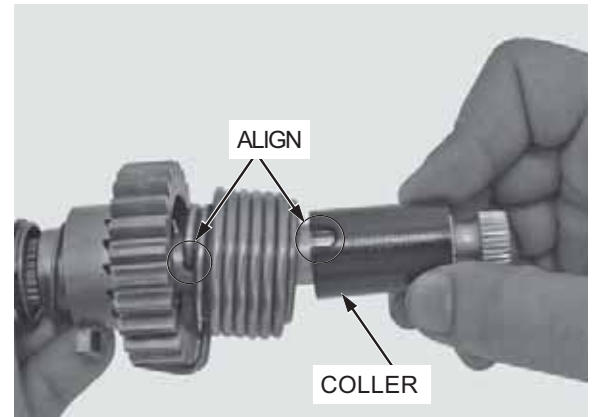
- washer B
- kickstarter drive gear
- washer A
- snap ring



Hook the return spring to the hole of the spindle.

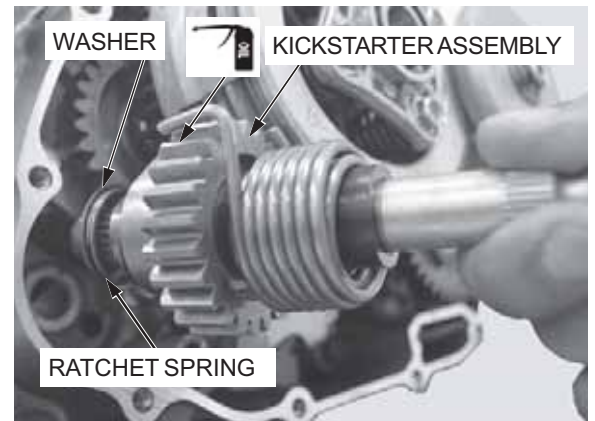


Install the collar to the return spring, while aligning the cut-out of the collar with the spring.

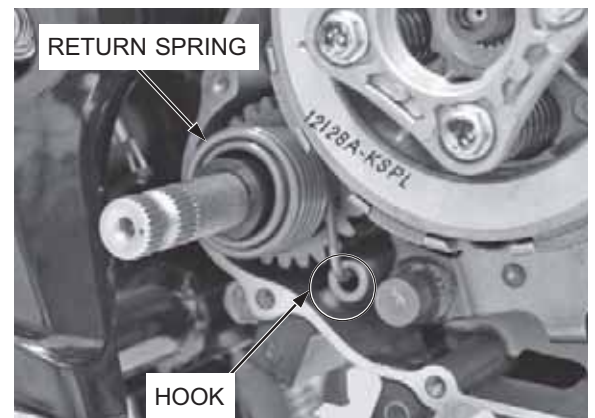


INSTALLATION

Apply clean engine oil to the kickstarter drive gear teeth.
Install the kickstarter assembly.



Hook the return spring to the crankcase.
Install the right crankcase cover (page 9-5).



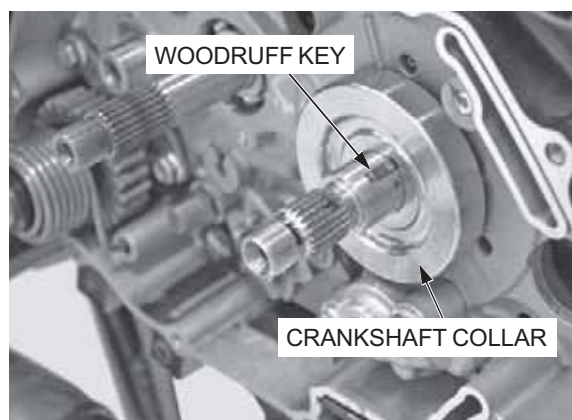
PRIMARY DRIVE GEAR/ CRANKSHAFT COLLAR

REMOVAL

Remove the clutch assembly (page 9-6).
Remove the primary drive gear.



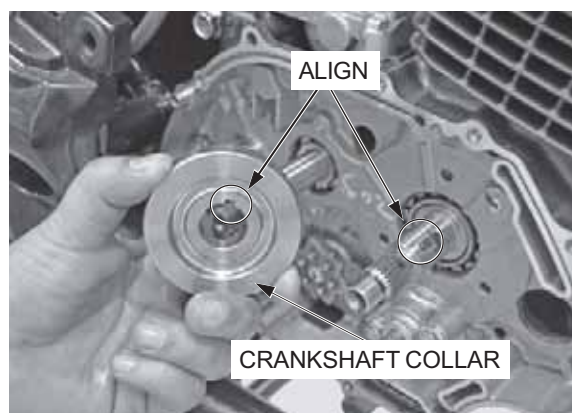
Remove the crankshaft collar and woodruff key.



INSTALLATION

Install the woodruff key onto the crankshaft.

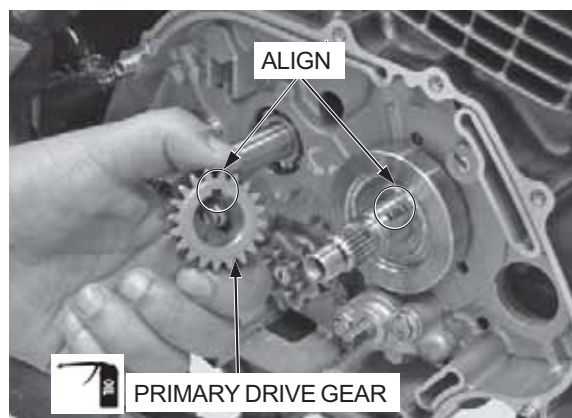
Install the crankshaft collar, while aligning the groove with the woodruff key.



Apply clean engine oil to the primary drive gear.

Install the primary drive gear, while aligning the groove with the woodruff key.

Install the clutch assembly (page 9-10).



MEMO



10. ALTERNATOR

COMPONENT LOCATION	10-0	STARTER CLUTCH	10-6
SERVICE INFORMATION	10-1	STARTER MOTOR	10-8
LEFT CRANKCASE COVER	10-2	STATOR/IGNITION PULSE	
FLYWHEEL	10-4	GENERATOR	10-16

SERVICE INFORMATION

GENERAL

- This section covers the removal and installation of the flywheel and alternator stator. These services can be done with the engine installed in the frame.
- Refer to the alternator stator inspection (page 15-8).

SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter driven gear boss O.D.	45.660 – 45.673 (1.7976 – 1.7981)	45.60 (1.795)

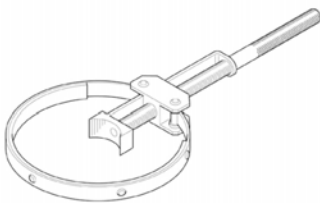
TORQUE VALUES

Flywheel lock nut	74 N·m (7.5 kgf·m, 55 lbf·ft)	Apply engine oil to the threads and seating surface
Starter clutch bolt	16 (1.6 kgf·m, 12 lbf·ft)	
Ignition pulse generator mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply locking agent to the threads
Wire guide bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply locking agent to the threads

10

TOOLS

Flywheel holder
070SRTKSP015



Flywheel puller
070SRTKSP014

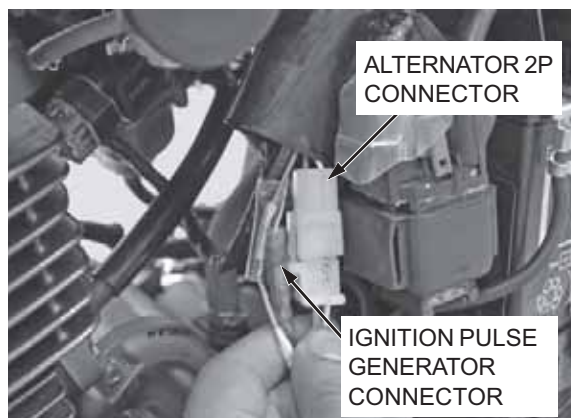


LEFT CRANKCASE COVER

REMOVAL

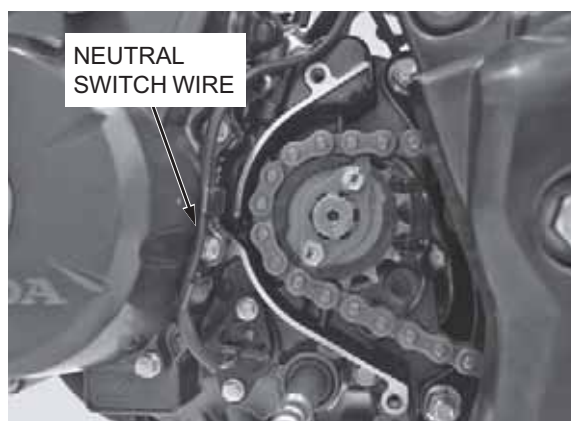
Remove the side cover (page 2-3).

Disconnect the alternator 2P (White) connector and ignition pulse generator connector.



Remove the left crankcase rear cover (page 6-3).

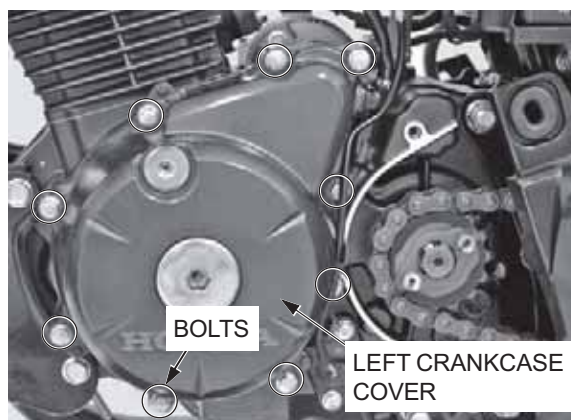
Remove the neutral switch wire from the left crankcase grooves.



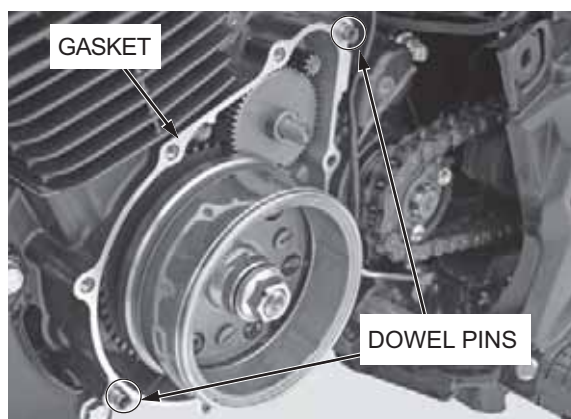
The left crankcase cover is magnetically attached to the flywheel, be careful to remove.

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

Remove the left crankcase cover bolts and cover.

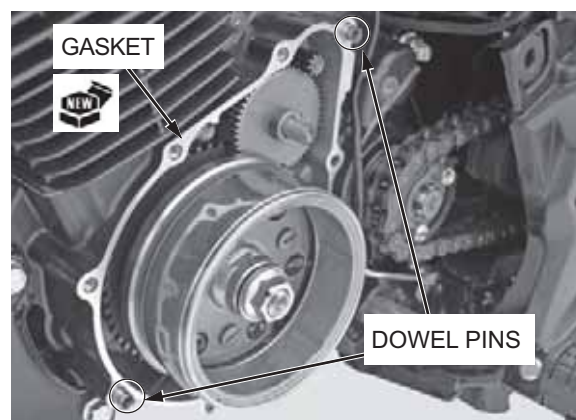


Remove the dowel pins (2 nos.) and gasket.

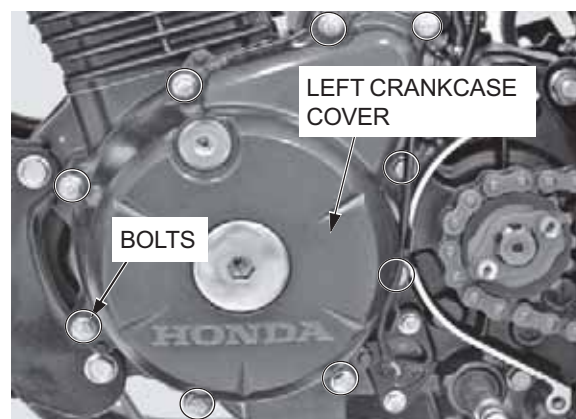


INSTALLATION

Install the new gasket and dowel pins.

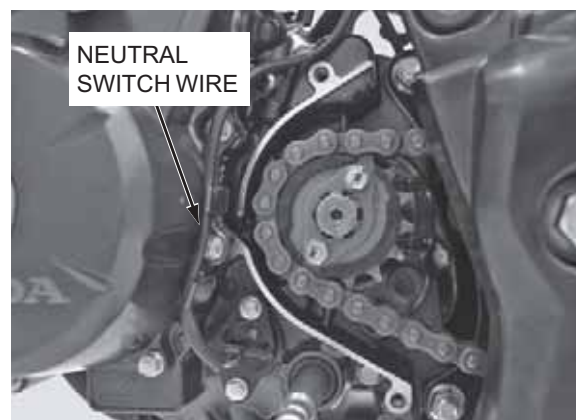


Install the left crankcase cover and tighten the bolt in a crisscross pattern in several steps.



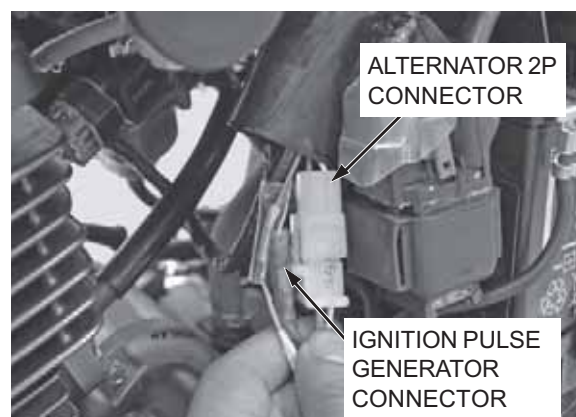
Route the neutral switch wire to the left crankcase grooves.

Install the left crankcase rear cover (page 6-6).



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

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

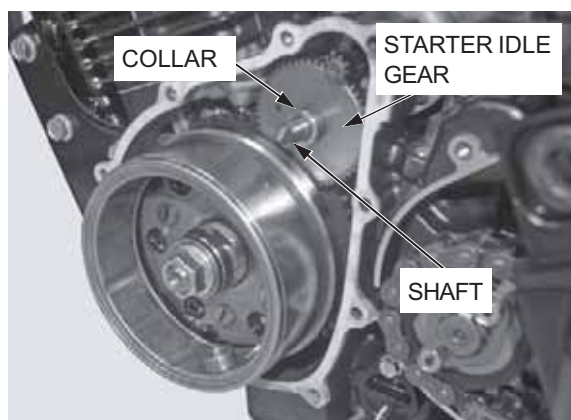


FLYWHEEL

REMOVAL

Remove the left crankcase cover (page 6-3)

Remove the collar, shaft and starter idle gear.

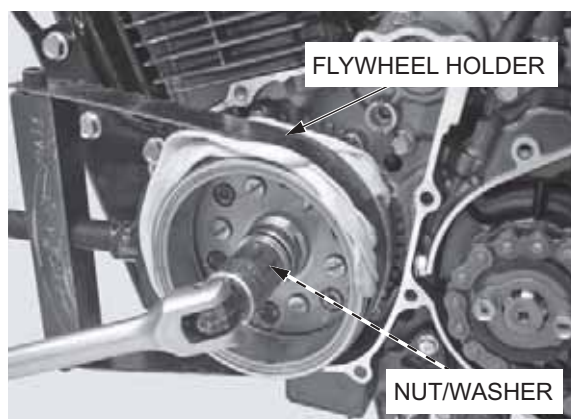


Hold the flywheel with the flywheel holder and remove the flywheel lock nut and washer.

TOOL:

Flywheel holder

070SRTKSP015

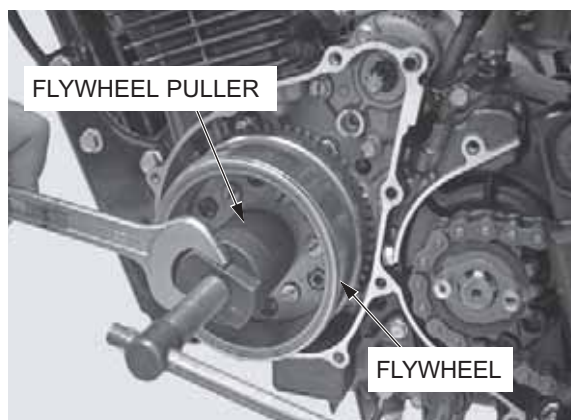


Remove the flywheel using the flywheel puller.

TOOL:

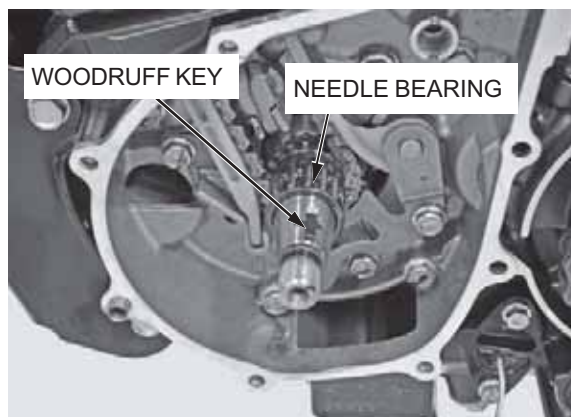
Flywheel puller

070SRTKSP014



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

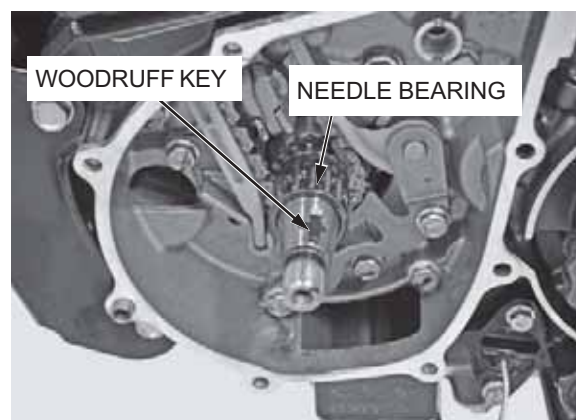
Remove the woodruff key and needle bearing.



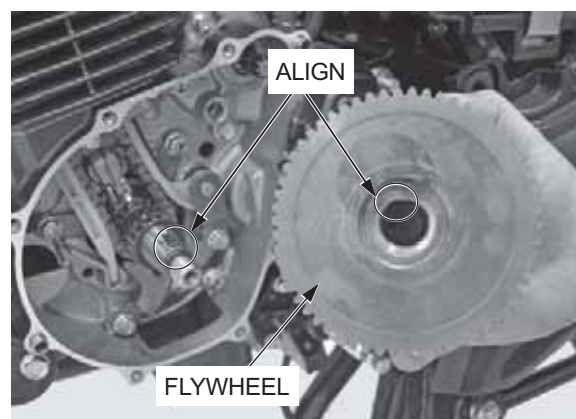
INSTALLATION

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

Clean any oil from the crankshaft taper.
Install the needle bearing and woodruff key.



Install the flywheel, while aligning the woodruff key on the crankshaft with flywheel keyway.



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

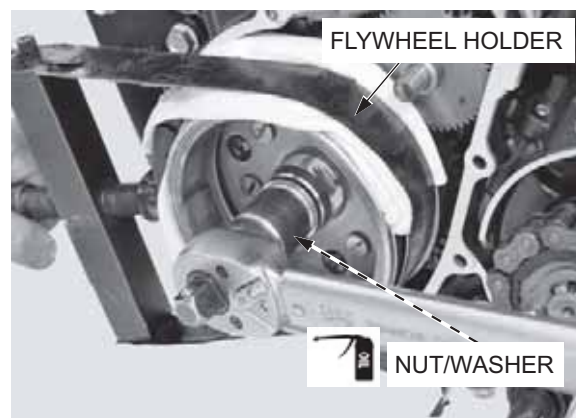
Install the washer and lock nut.

Hold the flywheel with the flywheel holder, tighten the lock nut to the specified torque.

TOOL:

Flywheel holder **070SRTKSP015**

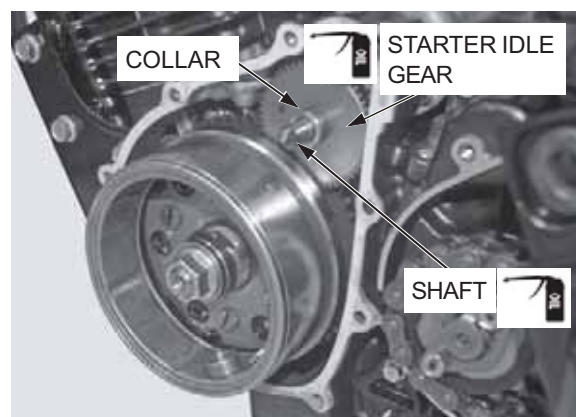
TORQUE: 74 N.m (7.5 kgf.m, 55 lbf.ft)



Apply clean engine oil to the starter idle gear and shaft.

Install the starter idle gear, shaft and collar.

Install the left crankcase cover (page 6-5).

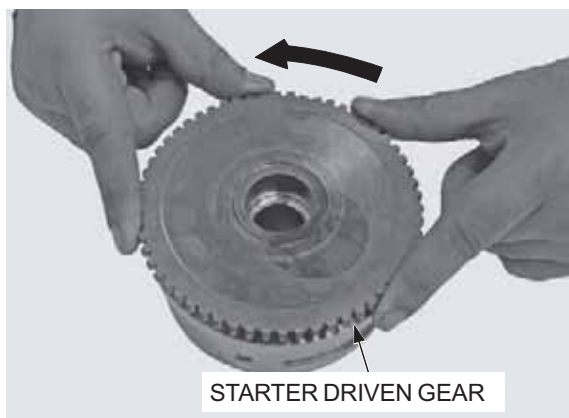


STARTER CLUTCH

DISASSEMBLY

Remove the flywheel (page 10-6).

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

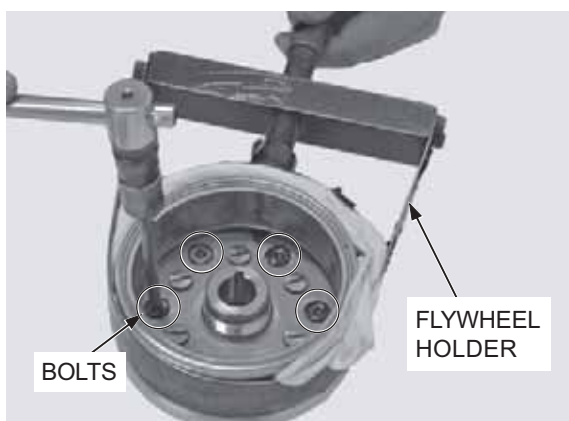


Remove the starter clutch bolts while holding the flywheel with a flywheel holder.

Tool:

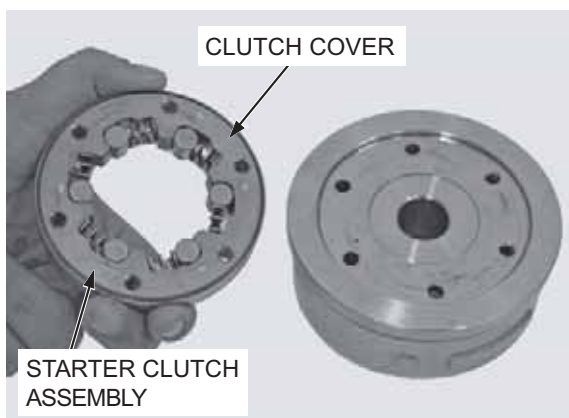
Flywheel holder

070SRTKSP015



Remove the starter clutch assembly from the flywheel.

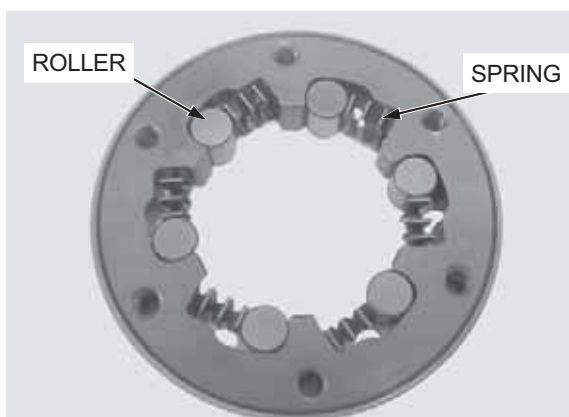
Remove the stater clutch cover.



Do not bend or tap the plate when installing the spring guides.

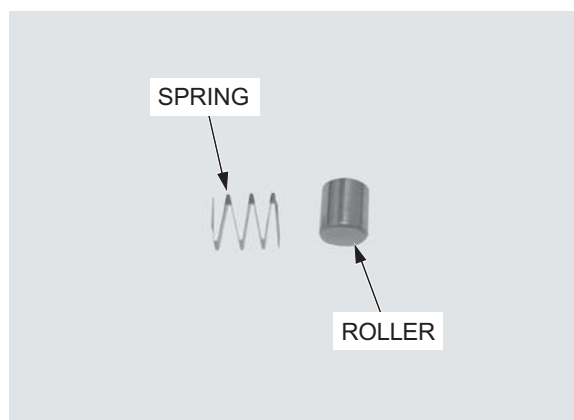
Remove the following:

- rollers
- spring



Check the spring for bend or damage.

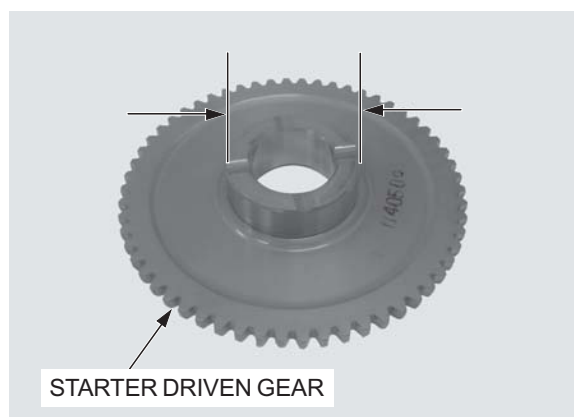
Check the roller for wear or damage.



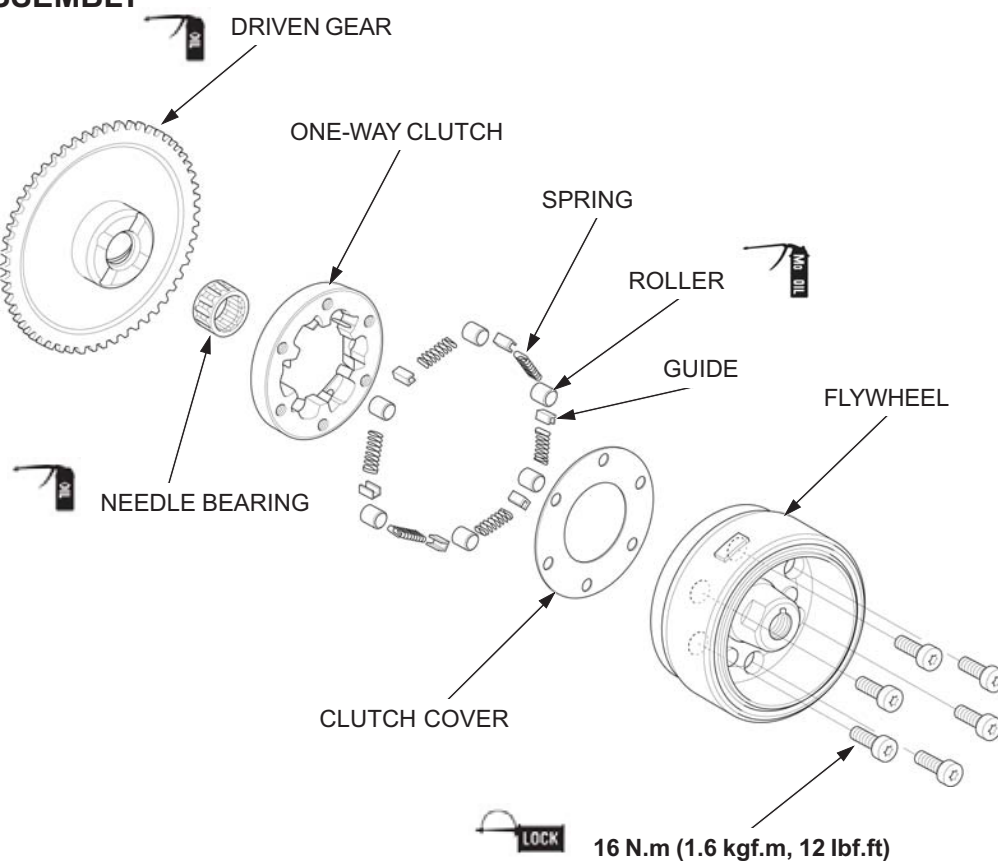
Check the roller contacting surface of the starter driven gear for abnormal wear or damage.

Measure the starter driven gear boss O.D.

SERVICE LIMIT: 45.60 mm (1.795 in)

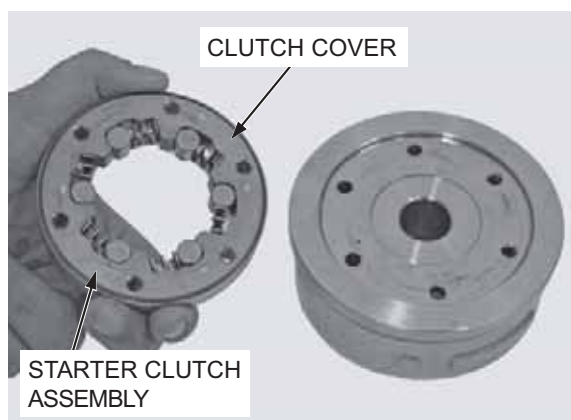


ASSEMBLY



ALTERNATOR

Install the clutch cover and stater clutch assembly to the flywheel, aligning the bolt hole of cover, starter clutch and flywheel.



Hold the flywheel using the flywheel holder.

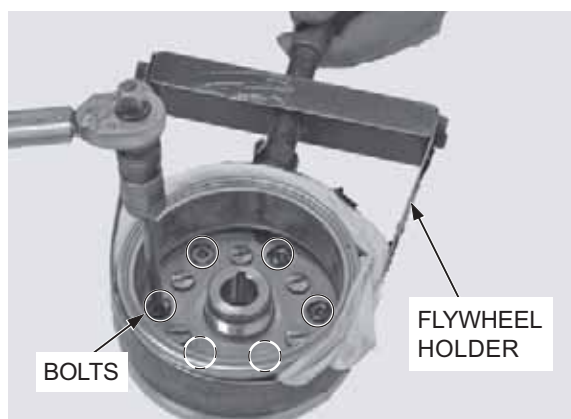
TOOL:

Flywheel holder 070SRTKSP015

Clean and apply a locking agent to the stater clutch bolts threads.

Install and tighten the starter clutch bolts to the specified torque.

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

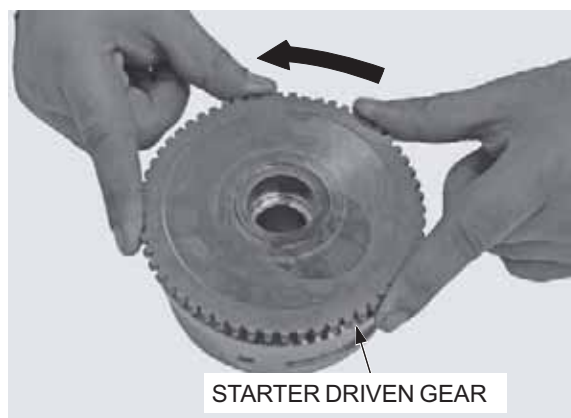


Apply clean engine oil to the starter driven gear teeth.

Install the starter driven gear to the flywheel while turning the driven gear counterclockwise.

Make sure that the starter driven gear turns counter clockwise smoothly and does not turn clockwise.

Install the flywheel (page10-5)

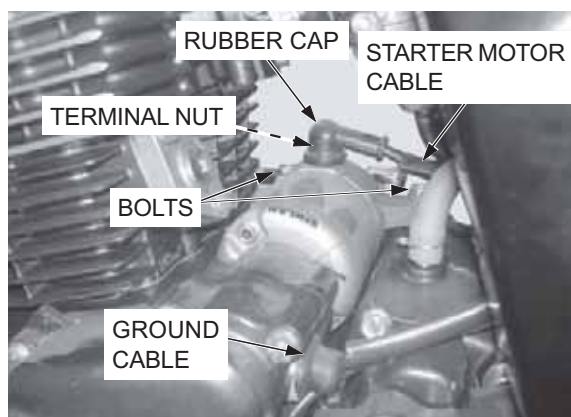


STARTER MOTOR

REMOVAL

Slide the rubber cap off the starter motor terminal, and remove the terminal nut and starter motor cable.

Remove the two mounting bolts, ground cable and starter motor from the crankcase.



Remove the O-ring from the starter motor.



DISASSEMBLY/INSPECTION

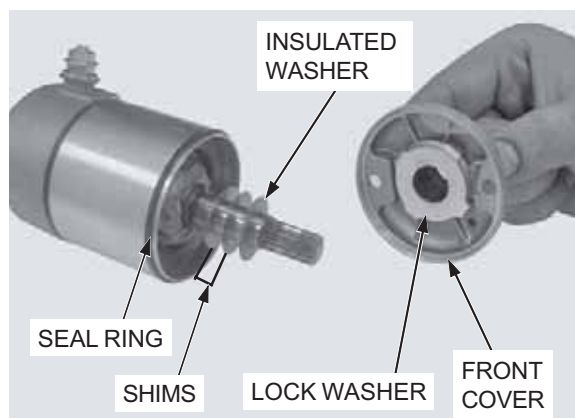
Remove the starter motor case bolts and O-rings.



Remove the following:

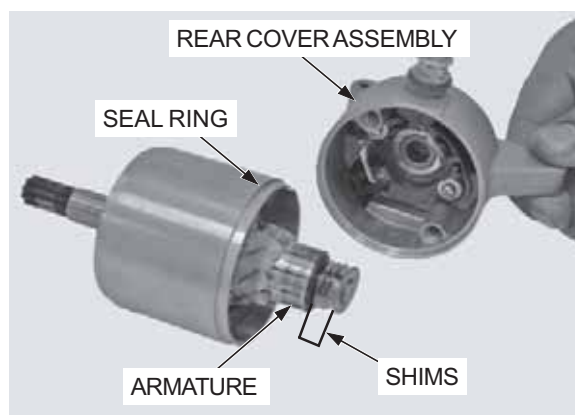
- front cover assembly
- seal ring
- lock washer
- insulated washer
- shims

Remove the following:



Record the location and number of shims. The number of the shims are different individually.

- rear cover assembly
- seal ring
- shims
- armature



ALTERNATOR

Check the dust seal and needle bearing in the front cover for deterioration, wear or damage.



Check for continuity between the cable terminal and the insulated brush.

There should be continuity.



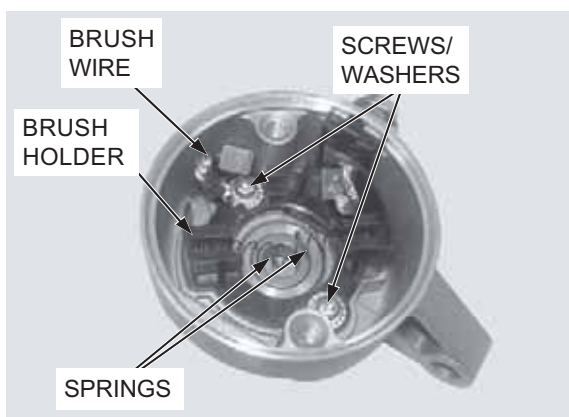
Check for continuity between the cable terminal and rear cover.

There should be no continuity.

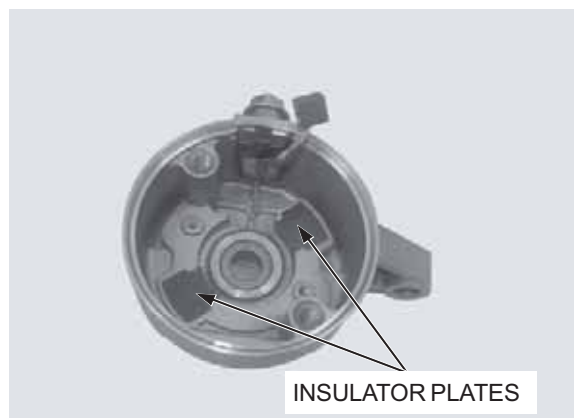


Remove the following

- springs
- screw/washers
- brush wire
- brush holder

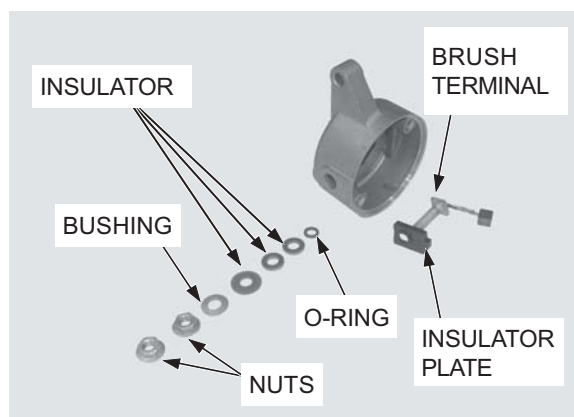


Remove the insulator plates.



Remove the following:

- nut
- washer
- insulators
- O-ring
- insulator plate
- brush terminal

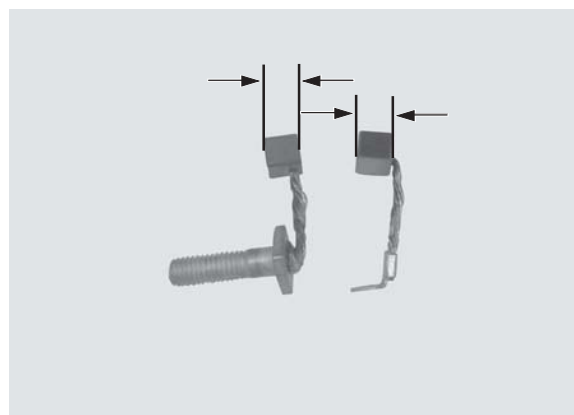


Check the bushing in the rear cover for wear or damage.



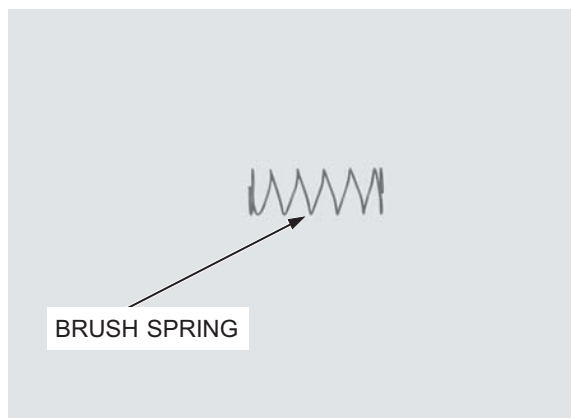
Measure the brush length.

SERVICE LIMIT: 6.5 mm (0.26 in)



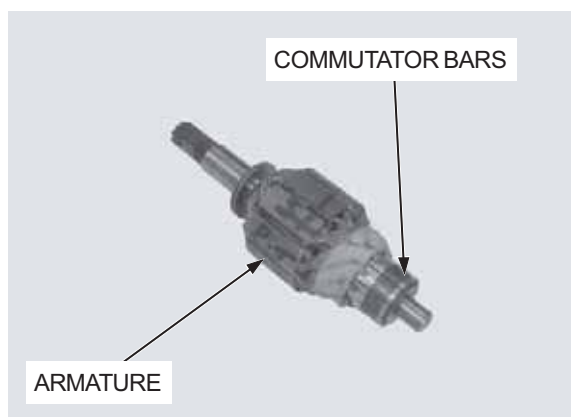
ALTERNATOR

Inspect the brush spring for excessive wear, fatigue or damage, replace if necessary.



*Do not use
emery or sand
paper on the
commutator*

Inspects the commutator bars of the armature for discoloration.



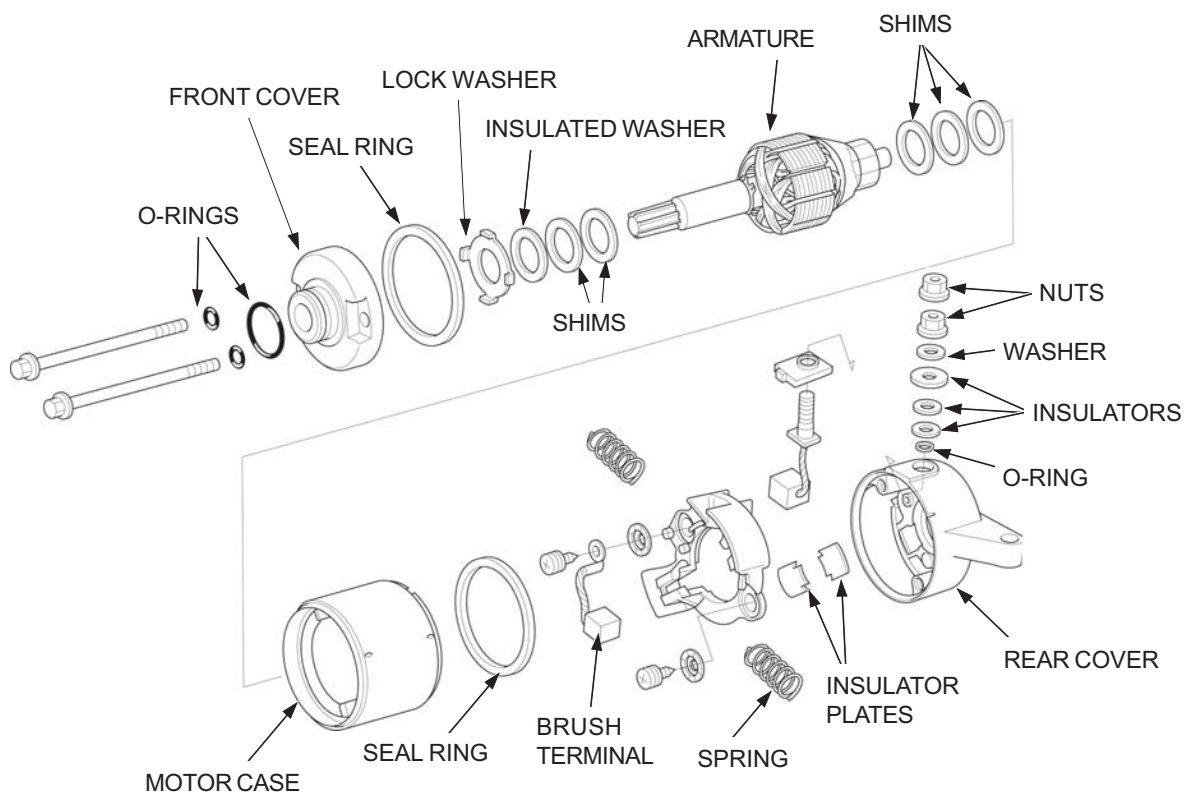
Check for continuity between pair of commutator bars.
These should be continuity



Check for continuity between each commutator bar and
the armature shaft.
There should be no continuity.

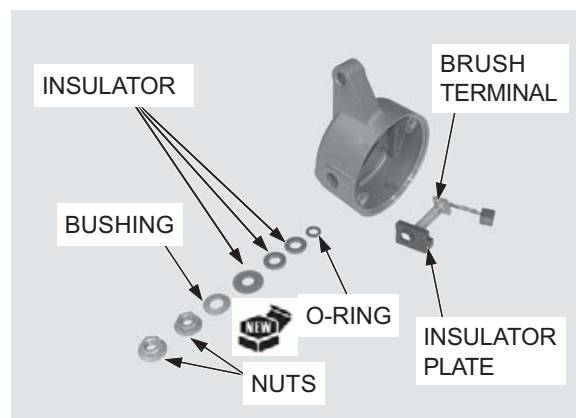


ASSEMBLY



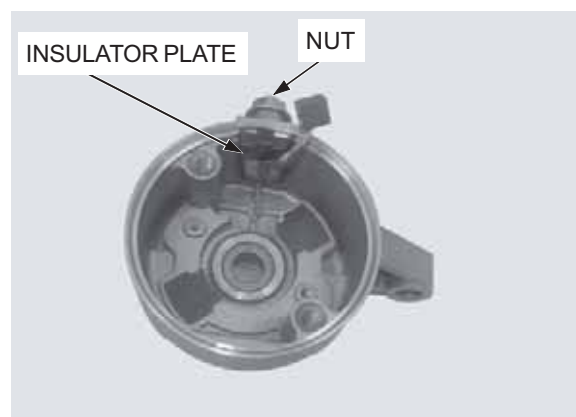
Install the following:

- insulator plate
- brush terminal
- new O-ring
- insulators
- washer
- nut



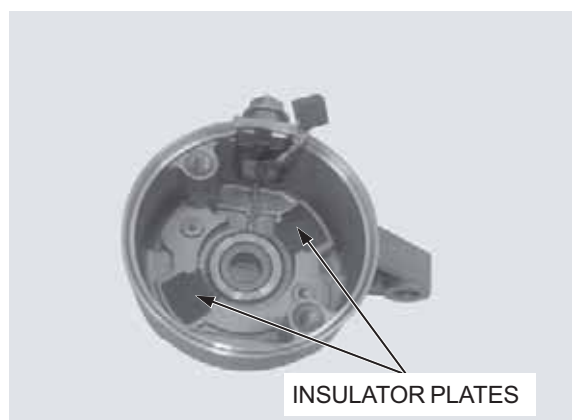
The insulators plate will be damaged easily. Be careful not to over tighten the nut.

Tighten the nut.



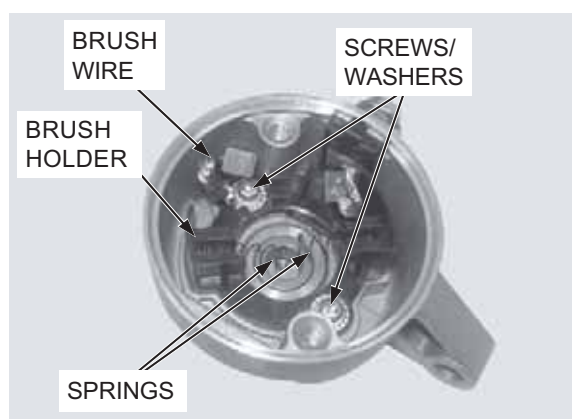
ALTERNATOR

Install the insulator plates.



Install the brush holder, washer and tighten the screws with brush wire.

Install the springs into the brush holder.



Install the shims properly as noted during removal.

Install the shims onto the armature shaft.



Be careful not to damage the brush and armature.

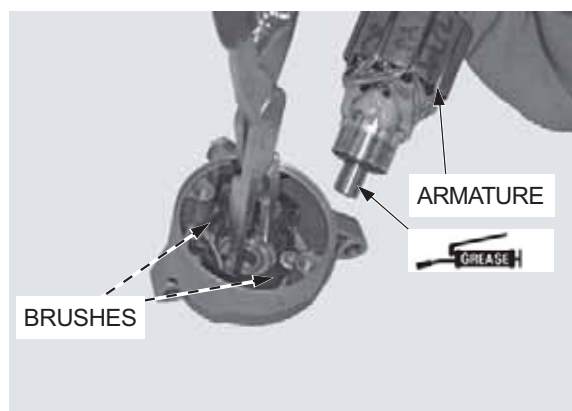
Apply a thin coat of grease to the armature shaft end.

Install the brushes into the brush holder.

Spread the brushes.

Install the armature into the rear cover assembly.

Install a new seal ring to the motor case.

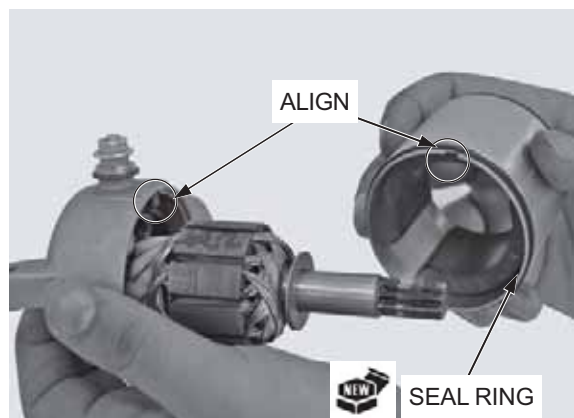


NOTICE

The coil may be damaged if the magnet pulls the armature against the case.

Align the rear cover tab with the motor case groove.

Install the armature/rear cover into the motor case while holding the armature tightly to keep the magnet of the case from pulling the armature against it.



Install the shims properly as noted during removal.

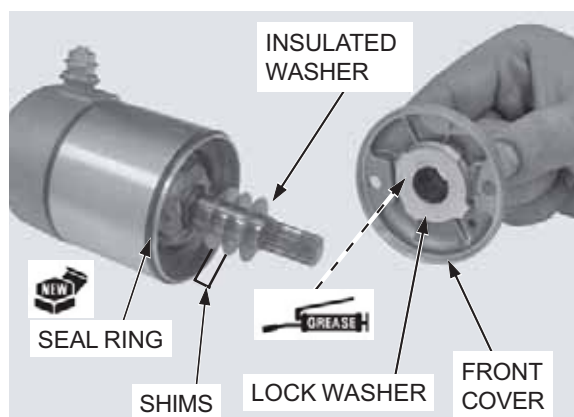
Install the shims and insulated washer onto the armature shaft.

Install the new seal ring onto the motor case.

Apply grease to the dust seal lip and needle bearing in the front cover.

Install the lock washer onto the front cover.

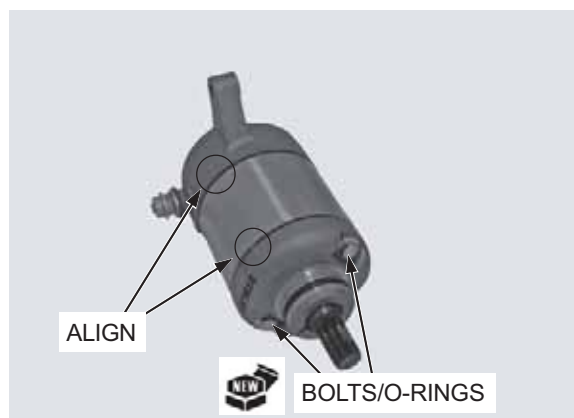
Install the front cover being careful not to damage the dust seal lip.



Align the index lines on the front cover and motor case.

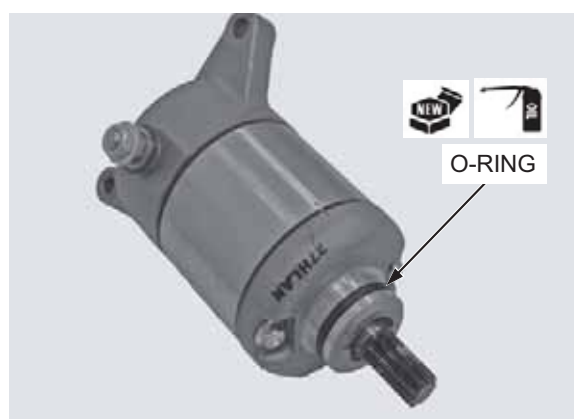
Install the new O-rings onto the motor case bolts.

Install the motor case bolts and tighten them.



INSTALLATION

Coat a new O-ring with clean engine oil and install it into the starter motor groove.



ALTERNATOR

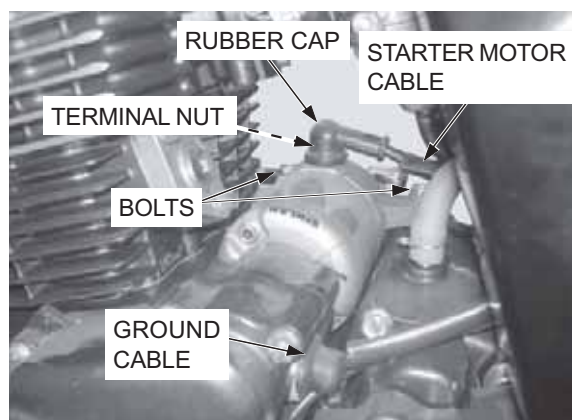
While installing the starter motor cable, route the wire harness properly (page)

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 stator motor cable and terminal nut onto the motor terminal and tighten the nut.

Install the rubber cap over the motor terminal properly.

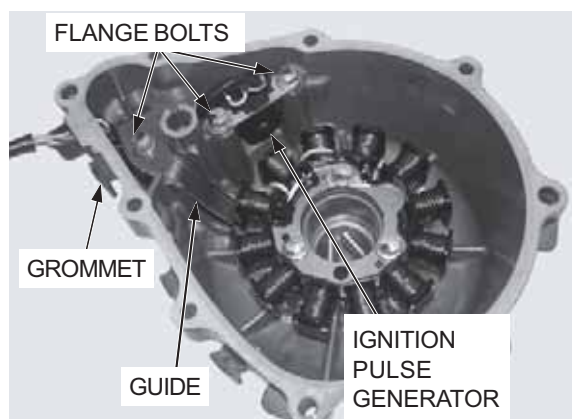


STATOR/IGNITION PULSE GENERATOR

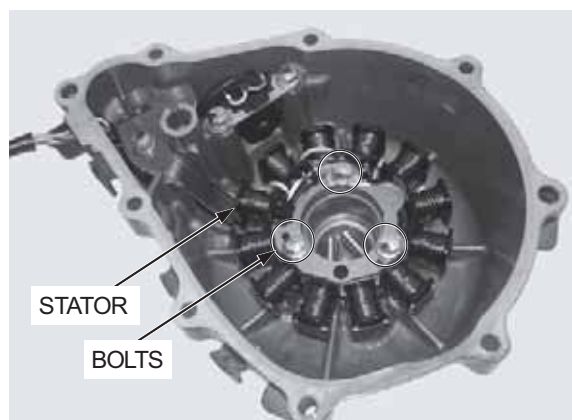
Remove the left crankcase cover (page 6-3).

Remove the grommet.

Remove the three flange bolts, wire guide and ignition pulse generator.



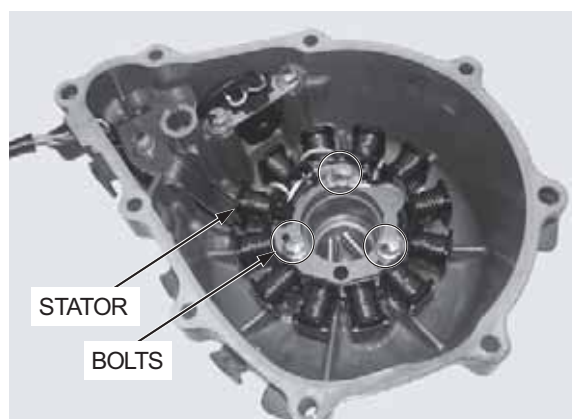
Remove the three flange bolts and stator from the left crankcase cover.



INSTALLATION

Install the stator.

Install the three bolts and tighten it.



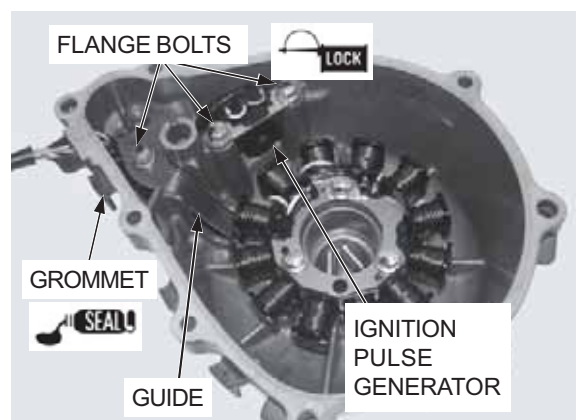
Apply liquid sealant to the wire grommet seating surface, and install the wire grommet into the groove.

Install the wire guide and ignition pulse generator.

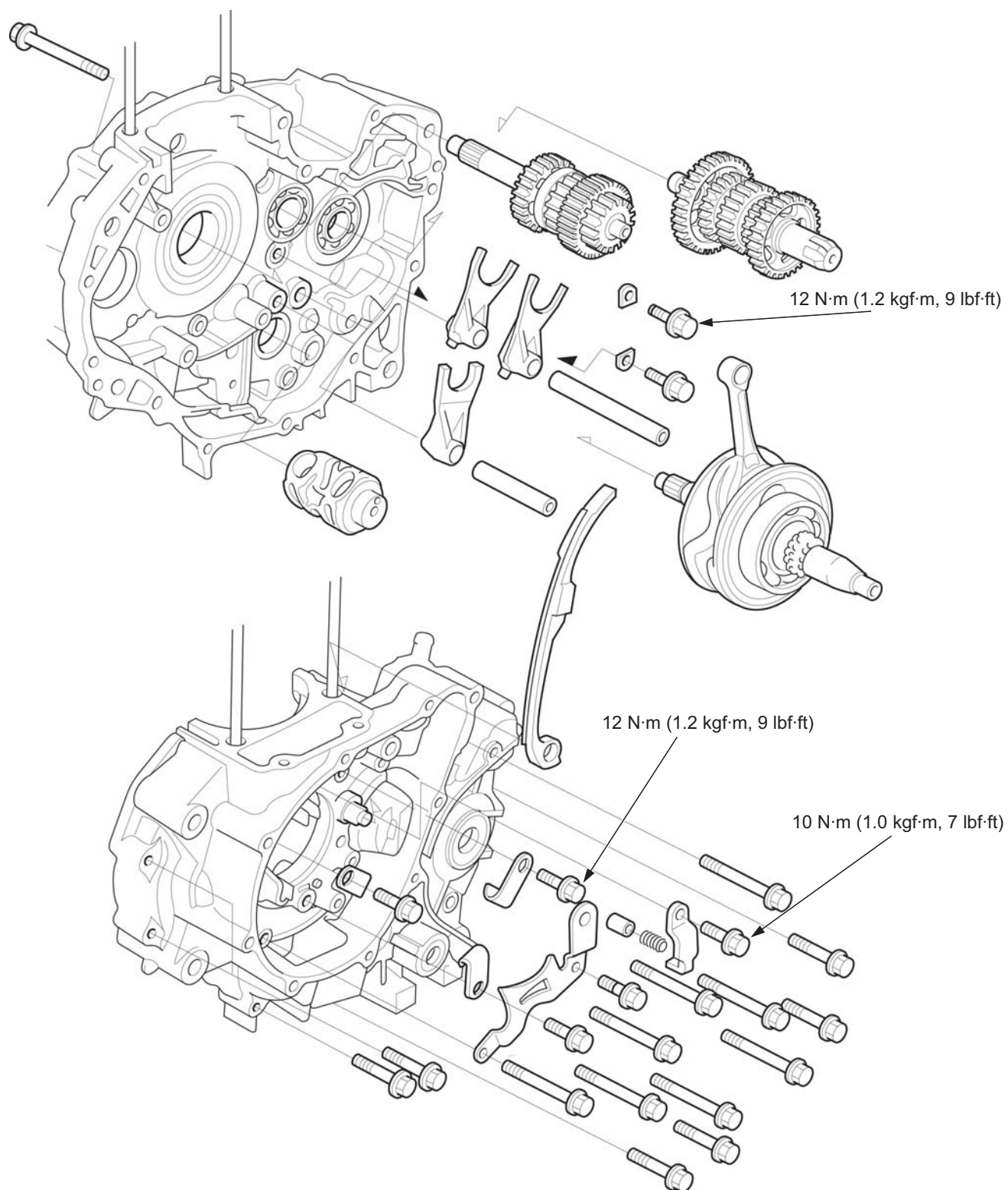
Apply a locking agent to the three bolt threads.

Install the bolts and tighten it to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



COMPONENT LOCATION



11. CRANKCASE/CRANKSHAFT/TRANSMISSION

COMPONENT LOCATION	11-0	BEARING REPLACEMENT OF CRANKCASE	11-9
SERVICE INFORMATION	11-1	BEARING REPLACEMENT OF CRANKSHAFT	11-12
TROUBLESHOOTING	11-3	CRANKCASE ASSEMBLY	11-17
CRANKCASE SEPARATION	11-4		
TRANSMISSION	11-5		
CRANKSHAFT	11-8		

SERVICE INFORMATION

GENERAL

- The following components must be removed before separating the crankcase:
 - Cylinder head cover (page 7-4)
 - Cylinder head (page 7-12)
 - Cylinder/piston (page 8-2)
 - Oil pump (page 4-2)
 - Clutch (page 9-6)
 - Gearshift linkage (page 9-13)
 - Primary drive gear/crankshaft collar (page 9-19)
 - Flywheel (page 10-4)
 - Neutral switch (page 17-11)
 - Engine (page 6-2)
- Be careful not to damage the crankcase mating surfaces when servicing.
- Clean the oil passages before assembling the crankcase halves.

SPECIFICATIONS



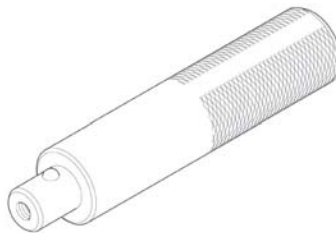








Unit: mm (in)

	ITEM		STANDARD	SERVICE LIMIT
Crankshaft	Runout		-	0.03 (0.001)
	Connecting rod big end radial clearance		0 – 0.008 (0 – 0.0003)	0.05 (0.002)
	Connecting rod big end side clearance		0.10 – 0.35 (0.004 – 0.014)	0.80 (0.032)
Transmission	Gear I.D.	M4, M5	20.000 – 20.021 (0.7874 – 0.7882)	20.05 (0.789)
		C1	20.500 – 20.521 (0.8071 – 0.8079)	20.55 (0.809)
		C2	23.020 – 23.041 (0.9063 – 0.9071)	23.07 (0.908)
		C3	23.025 – 23.046 (0.9065 – 0.9073)	23.07 (0.908)
	Bushing O.D.	M4, M5	19.959 – 19.980 (0.7858 – 0.7866)	19.91 (0.784)
		C1	20.459 – 20.480 (0.8055 – 0.8063)	20.41 (0.804)
		C2, C3	22.984 – 23.005 (0.9049 – 0.9057)	22.95 (0.904)
	Gear-to-bushing clearance	M4, M5, C1	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
		C2	0.015 – 0.057 (0.0006 – 0.0022)	0.10 (0.004)
		C3	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
	Bushing I.D.	M4, C1	17.000 – 17.018 (0.6693 – 0.6700)	17.04 (0.671)
		C2, C3	20.020 – 20.041 (0.7882 – 0.7890)	20.07 (0.790)
	Mainshaft / countershaft O.D.	M4, C1	16.966 – 16.984 (0.6680 – 0.6687)	16.93 (0.667)
		C2	19.978 – 19.989 (0.7865 – 0.7870)	19.94 (0.785)
		C3	19.979 – 20.000 (0.7866 – 0.7874)	19.94 (0.785)
	Bushing-to-shaft clearance	M4, C1	0.016 – 0.052 (0.0006 – 0.0020)	0.10 (0.004)
		C2	0.031 – 0.063 (0.0012 – 0.0025)	0.10 (0.004)
		C3	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
Shift fork, shift fork shaft	Shift fork shaft O.D.		9.986 – 9.995 (0.3931 – 0.3935)	9.93 (0.391)
	Shift fork I.D.		10.000 – 10.018 (0.3937 – 0.3944)	10.05 (0.396)
	Shift fork claw thickness		4.93 – 5.00 (0.194 – 0.197)	4.50 (0.177)

TORQUE VALUES

Mainshaft bearing setting plate bolt	12 N.m (1.2 kgf. m, 9 lbf.ft)	Apply locking agent to the threads
Crankshaft bearing retainer plate bolt	12 N.m (1.2 kgf. m, 9 lbf.ft)	
Push plug bolt	10 N.m (1.0 kgf. m, 7 lbf.ft)	Apply locking agent to the threads

TOOLS

<p>Remover shaft, 12 mm 070MCKPLI410</p>  <p>Remover head, 12 mm 070MCKPLI400</p>	<p>Remover weight 070MCKPLI300</p> 	<p>Driver 070GD001I100</p> 
<p>Pilot, 12 mm 070GD004I130</p> 	<p>Pilot, 17 mm 070GD004I150</p> 	<p>Pilot, 20 mm 070GD004I160</p> 
<p>Attachment, 32 x 35 mm 070GD002I140</p> 	<p>Attachment, 37 x 40 mm 070GD002I150</p> 	<p>Attachment, 42 x 47 mm 007GD002I160</p> 
<p>Assembly collar 070MFKPLI110</p> 	<p>Remover head, 17 mm 070MCKPLI520</p> 	

TROUBLESHOOTING

Excessive engine noise

- Worn, seized or chipped transmission gears
- Worn or damaged transmission bearings
- Worn or damaged connecting rod big end bearing
- Worn crankshaft bearing

Hard to shift

- Improper clutch operation
- Bent shift fork
- Bent shift fork shaft
- Damaged shift drum guide grooves
- Damaged shift fork guide pin

Transmission jumps out of gear

- Worn gear dogs or slots
- Worn shift drum guide groove
- Worn shift fork guide pin
- Worn shift fork groove in gear
- Worn shift fork shaft
- Bent shift fork shaft

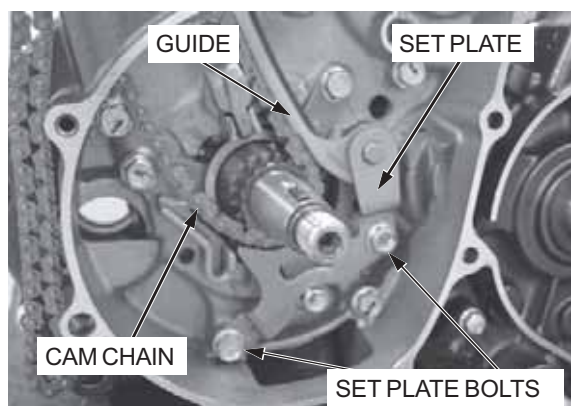
CRANKCASE SEPARATION

Refer to service information (page 11-1) for removal of necessary parts before disassembling the crankcase.

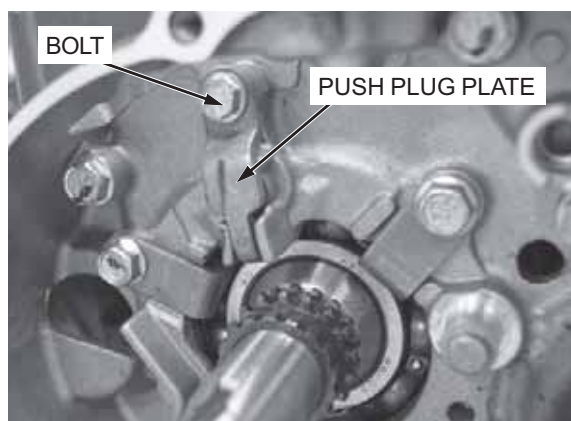
Remove the cam chain tensioner set plate bolts (2 nos.) and tensioner set plate.

Remove cam chain tensioner guide.

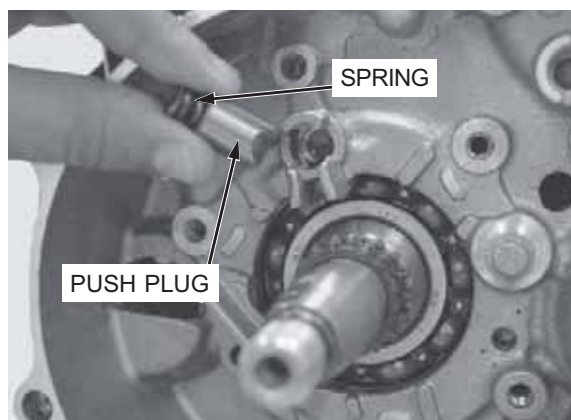
Remove the cam chain.



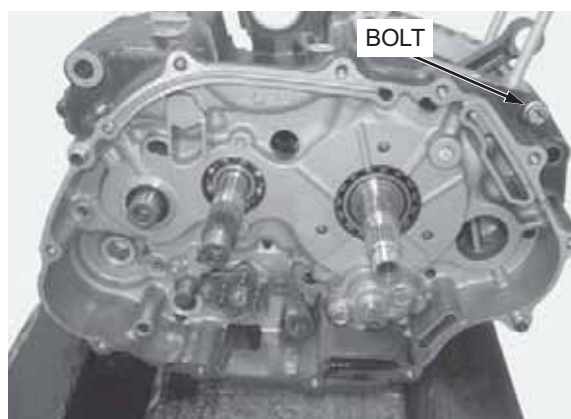
Remove the bolt and push plug plate.



Remove the push plug and spring.

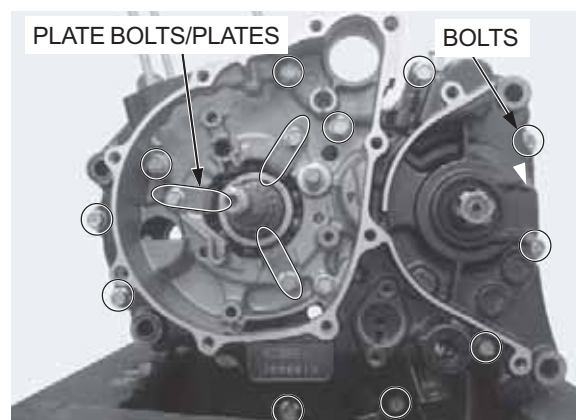


Remove the right crankcase bolt.



Remove the three bolts and bearing retainer plates.

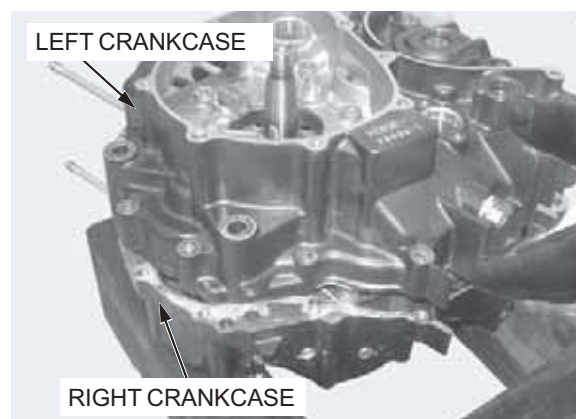
Remove the left crankcase bolts in a criss cross pattern in two or three step and remove them.



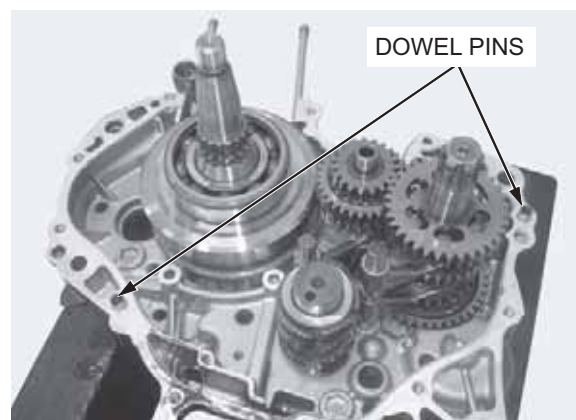
Place the crankcase assembly with the right side down.

Do not ply the crankcase halves with a screw driver.

Carefully separate the left crankcase from the right crankcase by tapping them at several locations with a soft hammer.



Remove the dowel pins (2 nos.).

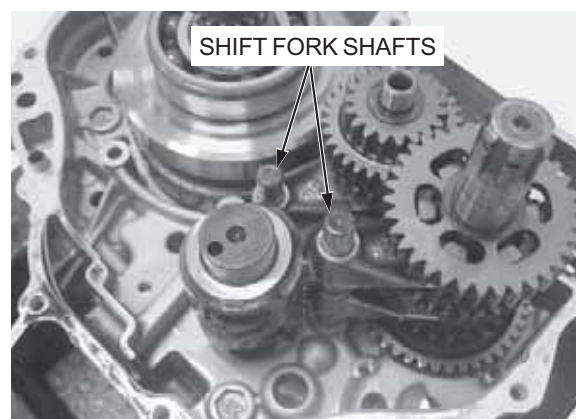


TRANSMISSION

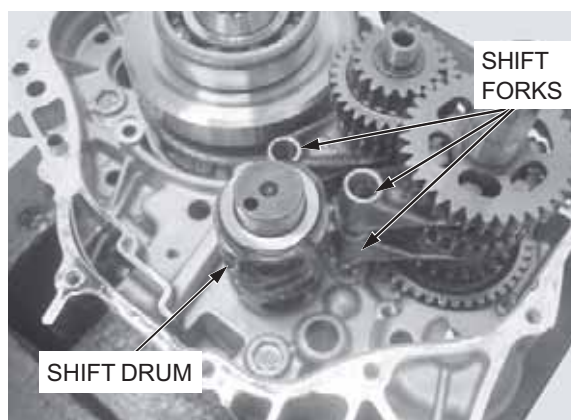
DISASSEMBLY

Separate the crankcase halves (page 11-4).

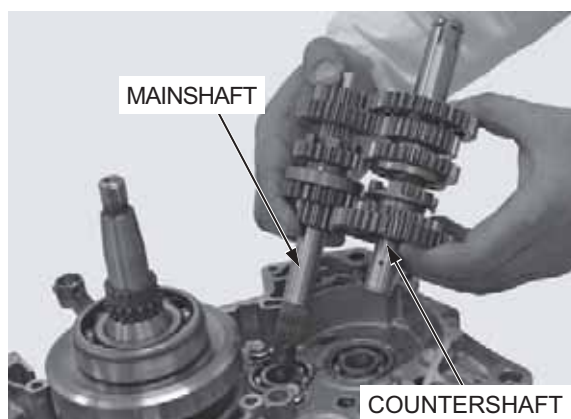
Pull out the shift fork shafts.



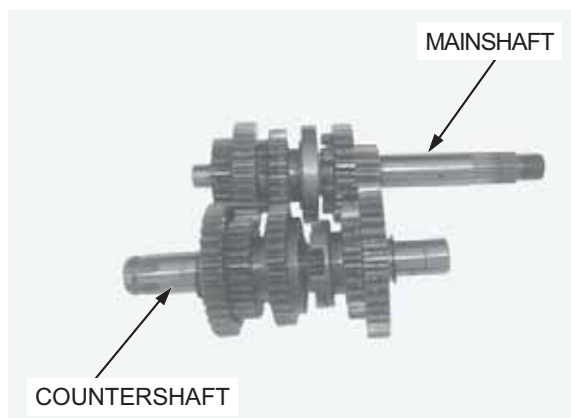
Remove the shift forks and shift drum.



Remove the mainshaft and countershaft together.



Disassemble the mainshaft and countershaft.



INSPECTION

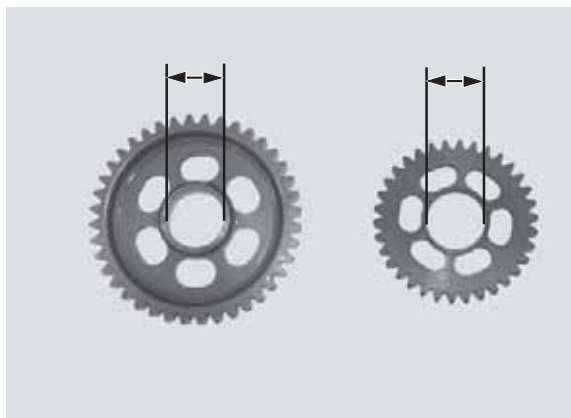
GEARS

Check the gear dogs, dog holes and teeth for damage of excessive wear.

Measure the I.D. of each gear.

SERVICE LIMIT:

M4, M5:	20.05 mm (0.789 in)
C1:	20.55 mm (0.809 in)
C2:	23.07 mm (0.908 in)
C3:	23.07 mm (0.908 in)



BUSHING

Check the bushings for wear or damage.
Measure O.D. of each bushing.

SERVICE LIMIT:

M4, M5: 19.91 mm (0.784 in)

C1: 20.41 mm (0.804 in)

C2, C3: 22.95 mm (0.904 in)

Calculate the gear-to-bushing clearance.

SERVICE LIMIT:

M4, M5, C1: 0.10 mm (0.004 in)

C2: 0.10 mm (0.004 in)

C3: 0.10 mm (0.004 in)

Measure I.D of each bushing.

M4, C1: 17.04 mm (0.671 in)

C2, C3: 20.07 mm (0.790 in)

MAINSHAFT/COUNTERSHAFT

Check the spine grooves and sliding surfaces for abnormal wear or damage.

Measure the O.D of the mainshaft and countershaft at gear and bushing sliding areas.

SERVICE LIMIT:

Mainshaft (at M4 gear bushing):

16.93 mm (0.667 in)

Countershaft (at C1 gear bushing):

16.93 mm (0.667 in)

(at C2 gear bushing):

19.94 mm (0.785 in)

(at C3 gear bushing):

19.94 mm (0.785 in)

Calculate the bushing-to-shaft clearance.

SERVICE LIMIT:

M4, C1: 0.10 mm (0.004 in)

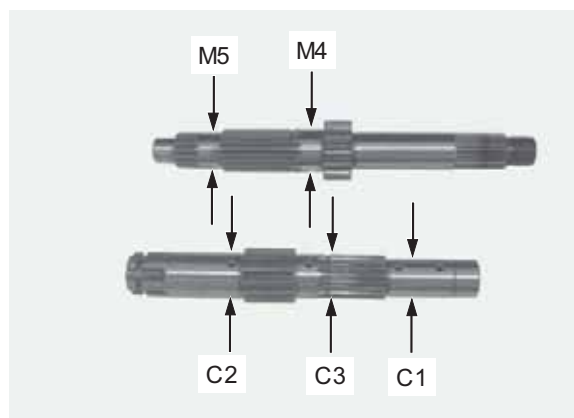
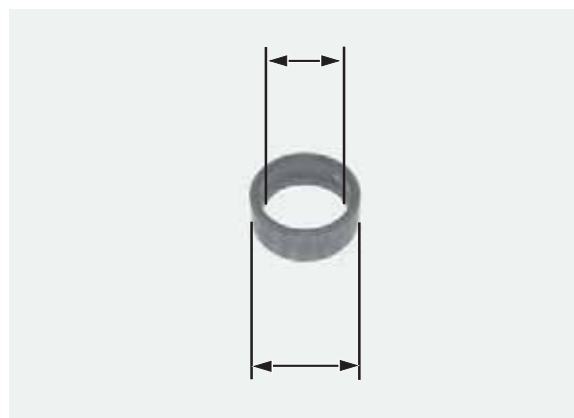
C2: 0.10 mm (0.004 in)

C3: 0.10 mm (0.004 in)

SHIFT DRUM

Inspect the shift drum end for scoring, scratches, or evidence of sufficient lubrication.

Check the shift drum grooves for abnormal wear or damage.



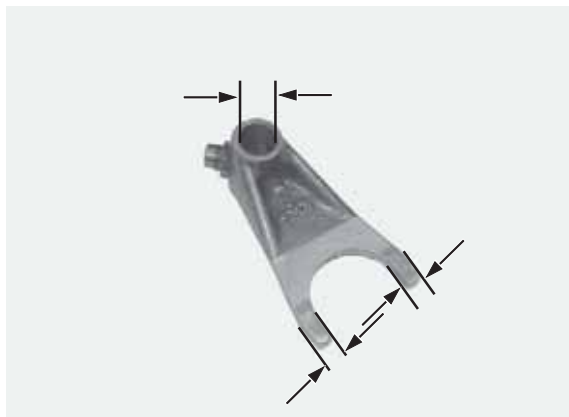
SHIFT FORK

Check the shift forks for deformation or abnormal wear.
Measure each shift fork claw thickness.

SERVICE LIMITS: 4.50 mm (0.177 in)

Measure I.D. of each fork.

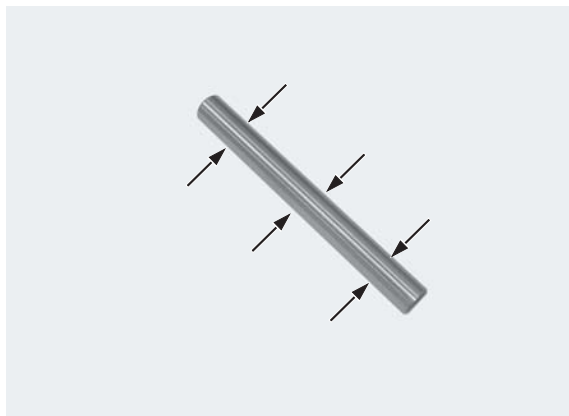
SERVICE LIMITS: 10.05 mm (0.396 in)



SHIFT FORK SHAFT

Check the shift fork shafts for damage and straightness.
Measure the shift fork shaft for O.D.

SERVICE LIMITS: 9.93 mm (0.391 in)



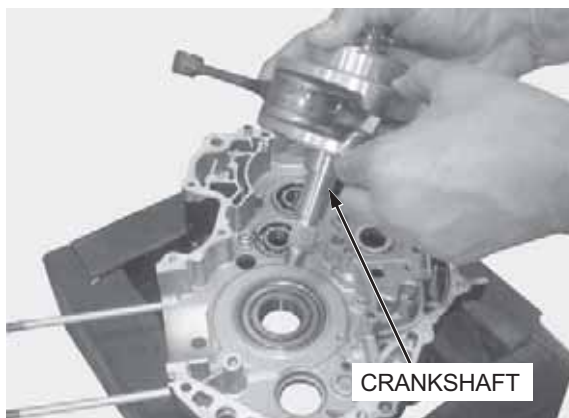
CRANKSHAFT

REMOVAL

Remove both crankcase (page 11-5)

Remove the transmission (page 11-6)

Remove the crankshaft from the right crankcase.



INSPECTION

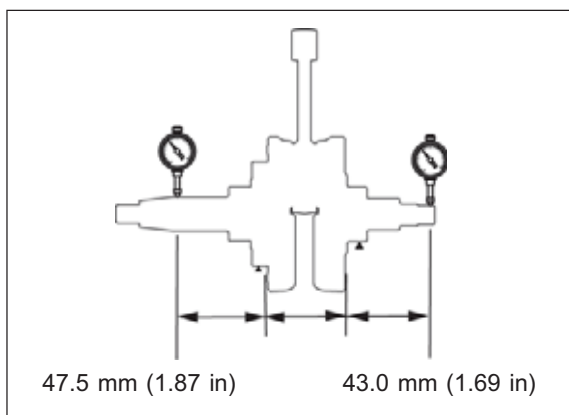
CRANKSHAFT RUNOUT

Place the crankshaft on a stand or V-blocks.

Set the dial indicator on the shafts.

Rotate the crankshaft two revolutions and read the runout.

SERVICE LIMIT: 0.03mm (0.001 in)



BIG END SIDE CLEARANCE

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

SERVICE LIMIT: 0.80 mm (0.032 in)



BIG END RADIAL CLEARANCE

Measure the radial clearance of the connecting rod big end.

SERVICE LIMIT: 0.05 mm (0.002 in)



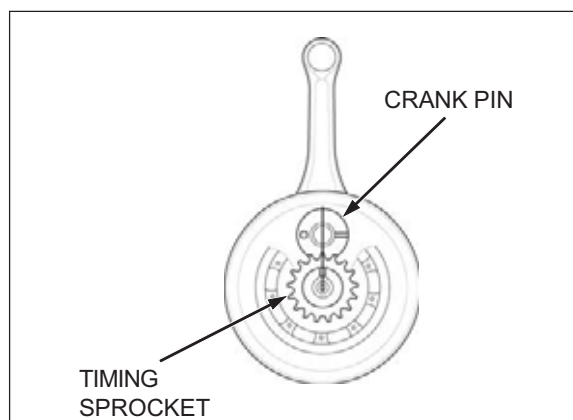
If the timing sprocket teeth are worn or damaged, check the cam chain tensioner and cam sprocket

TIMING SPROCKET

Check the timing sprocket teeth for wear or damage.

Remove the timing sprocket if necessary.

When installing the timing sprocket, while align the center of the timing sprocket teeth with the center of the crank pin.



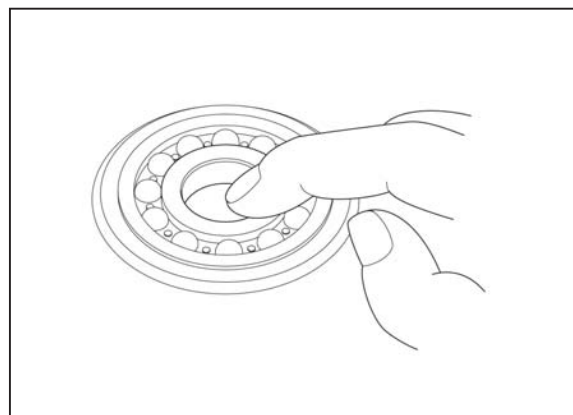
BEARING REPLACEMENT OF CRANKCASE

INSPECTION

Turn the inner of each bearing with your finger. The bearings should turn smoothly and quietly.

Also check that bearing outer races fit tightly in the crankcase.

Replace bearing if the inner race do not turn smoothly , quietly or if they fit loose in crankcase (page 11-10).



CRANKCASE/CRANKSHAFT/TRANSMISSION

REMOVAL

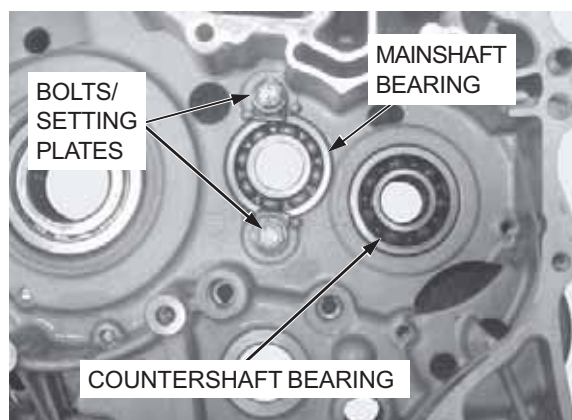
Remove the setting plate bolts and mainshaft bearing setting plates from the right crankcase.

Drive out the mainshaft bearing from the right crankcase.

Drive out the countershaft bearing from the right crankcase with following tools.

TOOLS:

Remover shaft, 17mm	07936-3710330
Remover handle	07936-3710100
Remover weight	070MC-KPL1300



Remove the countershaft dust seal and gear shift spindle dust seal from the left crankcase.



Drive out the countershaft bearing from the left crankcase.

Tools

Remover shaft, 17 mm	07936-3710330
Remover handle	07936-3710100
Remover weight	070MC-KPLI300



Drive out the mainshaft bearing from the left crankcase with following tools.

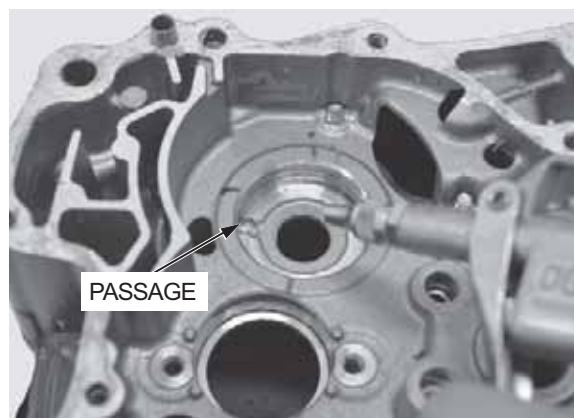
Tools

Remover head, 12mm	070MC-kPLI410
Remover shaft, 12mm	070MC-KPLI420
Remover weight	070MC-KPLI300



OIL PASSAGES INSPECTION

Clean the oil passages of each crankcase using the compressed air.



INSTALLATION

Lubricate the all bearing with engine oil.

Drive new bearings into the left crankcase with following tools:

TOOLS:

RIGHT CRANKCASE

Mainshaft bearing:

Driver	070GD-001I100
Attachment, 37x40 mm	070GD-002I150
Pilot, 17mm	070GD-004I150

Mainshaft bearing:

Driver	070GD-001I100
Attachment, 37x40 mm	070GD-002I150
Pilot, 17mm	070GD-004I150

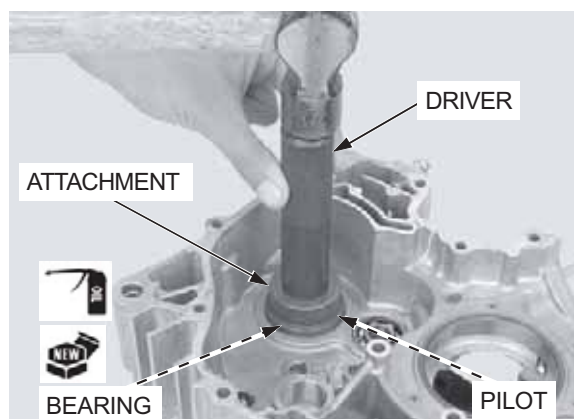
LEFT CRANKCASE

Mainshaft bearing:

Driver	070GD-001I100
Attachment, 32x35 mm	070GD-002I140
Pilot, 12mm	070GD-004I130

Countershaft bearing:

Driver	070GD-001I100
Attachment, 42x47 mm	070GD-002I160
Pilot, 20mm	070GD-004I160



Apply grease to the new dust seal lips.

Install the countershaft and gearshift spindle dust seals with following tools as shown.

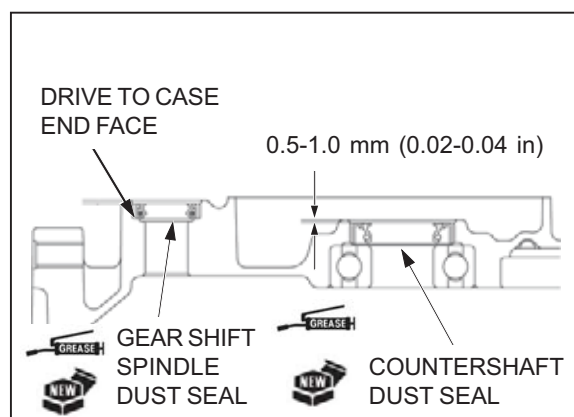
TOOLS:

Countershaft dust seal:

Driver	070GD-001I100
Attachment, 34mm	07JAD-PL60100
Pilot, 20mm	070GD-004I160

Gearshift spindle dust seal:

Driver	070GD-001I100
Attachment, 22 x 24 mm	07746-0010800
Pilot, 20mm	07746-0041200



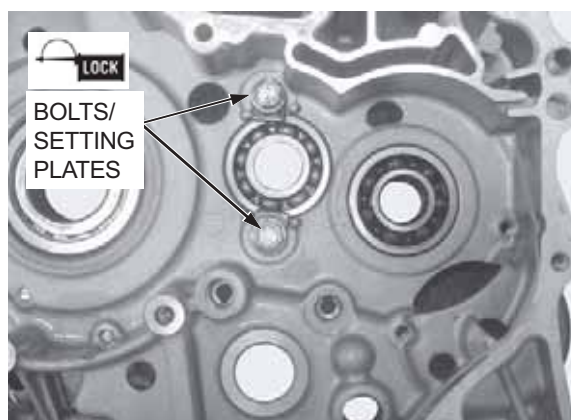
CRANKCASE/CRANKSHAFT/TRANSMISSION

Apply locking agent to the threads of the setting plate bolt.
Install the setting plates and bolts.

Install the setting plates and bolts.

Tighten the bolts to the specified torque.

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



BEARING REPLACEMENT OF CRANKSHAFT

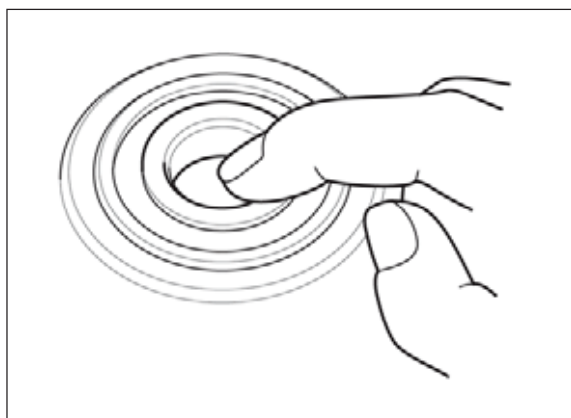
INSPECTION

Turn the inner race of bearing with your finger.

The bearing should turn smoothly and quietly.

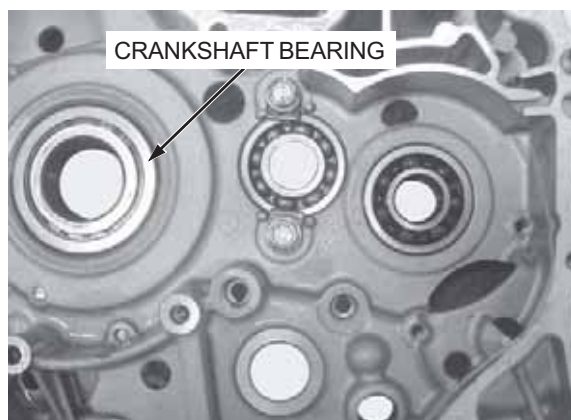
Also check that bearing outer races fit tightly in the crankcase.

Replace bearing if the inner race do not turn smoothly, quietly or if they fit loose in crankcase (page 11-13).



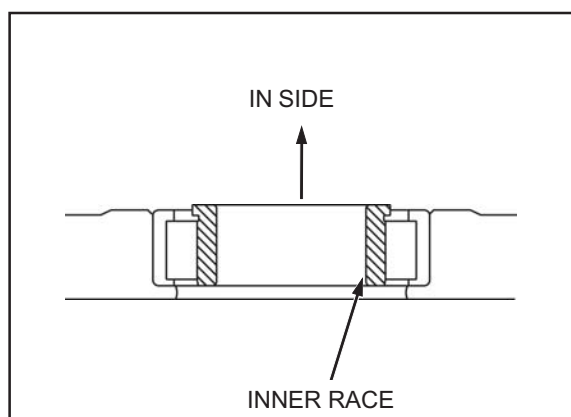
REMOVAL

Drive out the crankshaft bearing from the right crankcase.



INSTALLATION

If the crankshaft bearing inner race is removed install it as shown.



Lubricate the all bearings with engine oil.

Drive new bearings into the right crankcase with following tools.

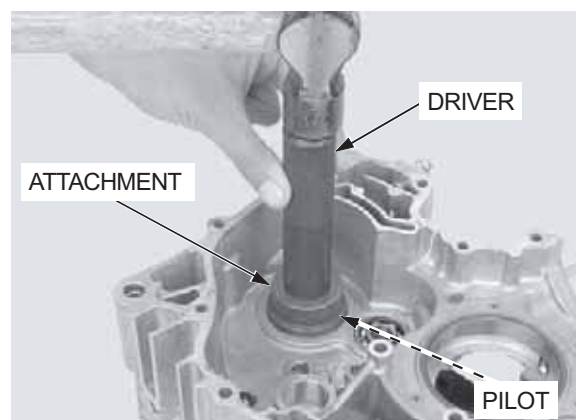
TOOLS:

Crankshaft bearing:

Driver 070GD-0011100

Attachment, 52 x55mm 07NAD-P200100

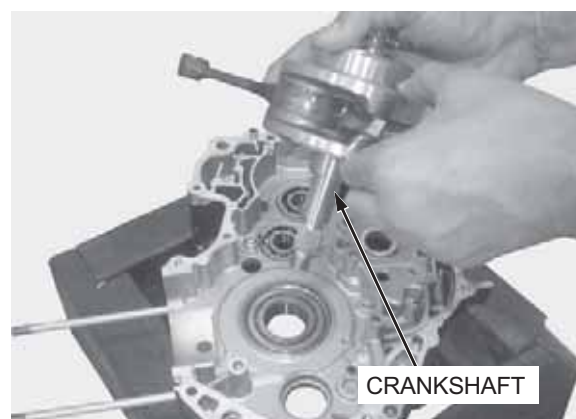
Pilot, 30 mm 07746-0040700



INSTALLATION

Install the crankshaft into the right crankcase.

Install the transmission.



INSTALLATION

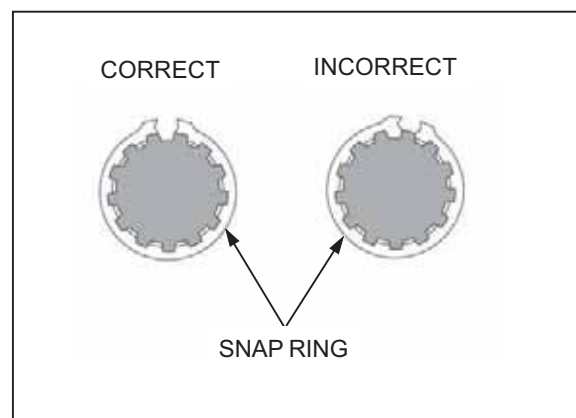
Clean all parts in solvent and dry them thoroughly.

Apply clean engine oil to each gear teeth.

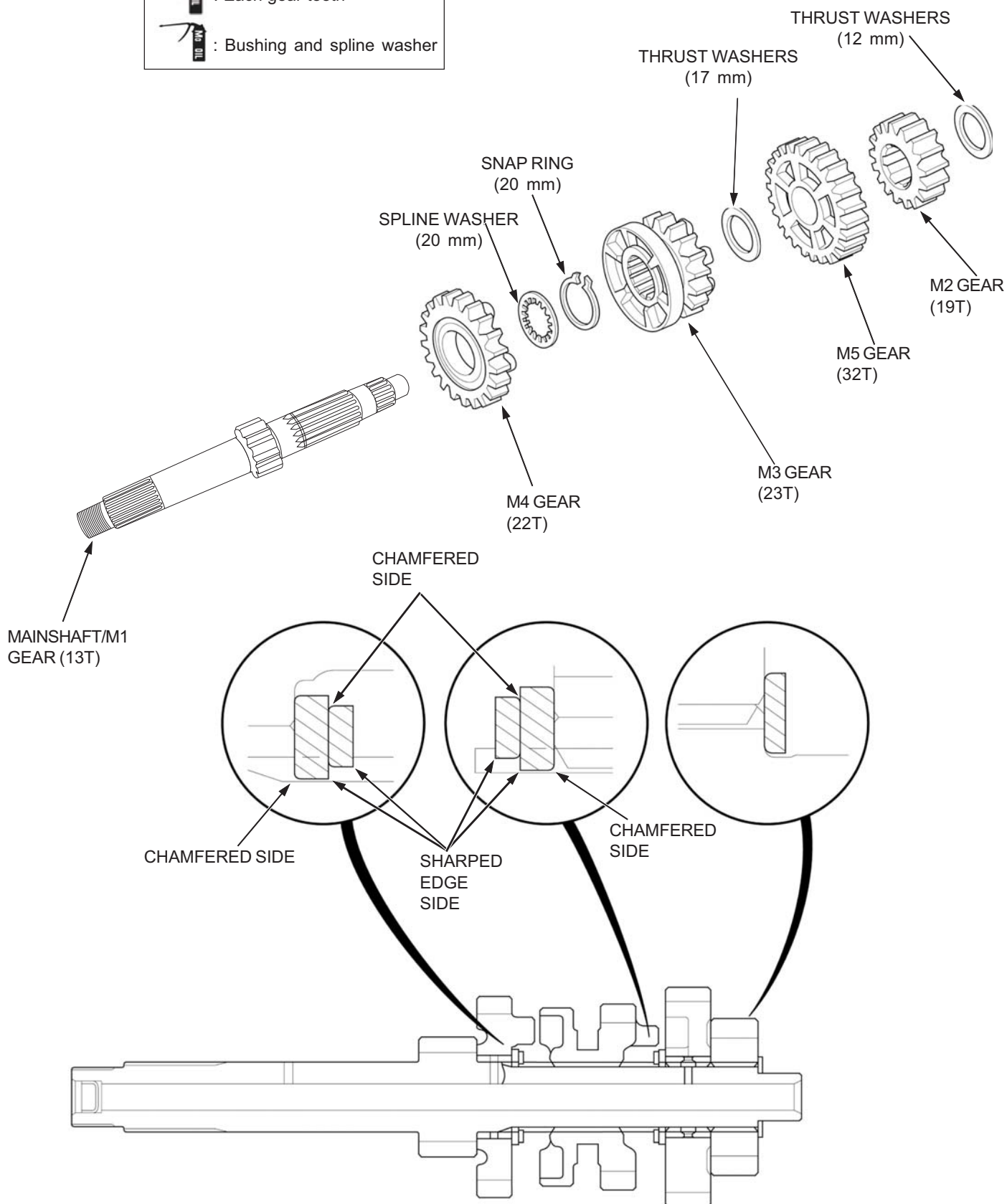
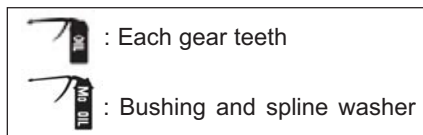
Apply molybdenum oil solution to the bushing sliding surface to ensure initial lubrication.

Assemble all parts into their original positions.

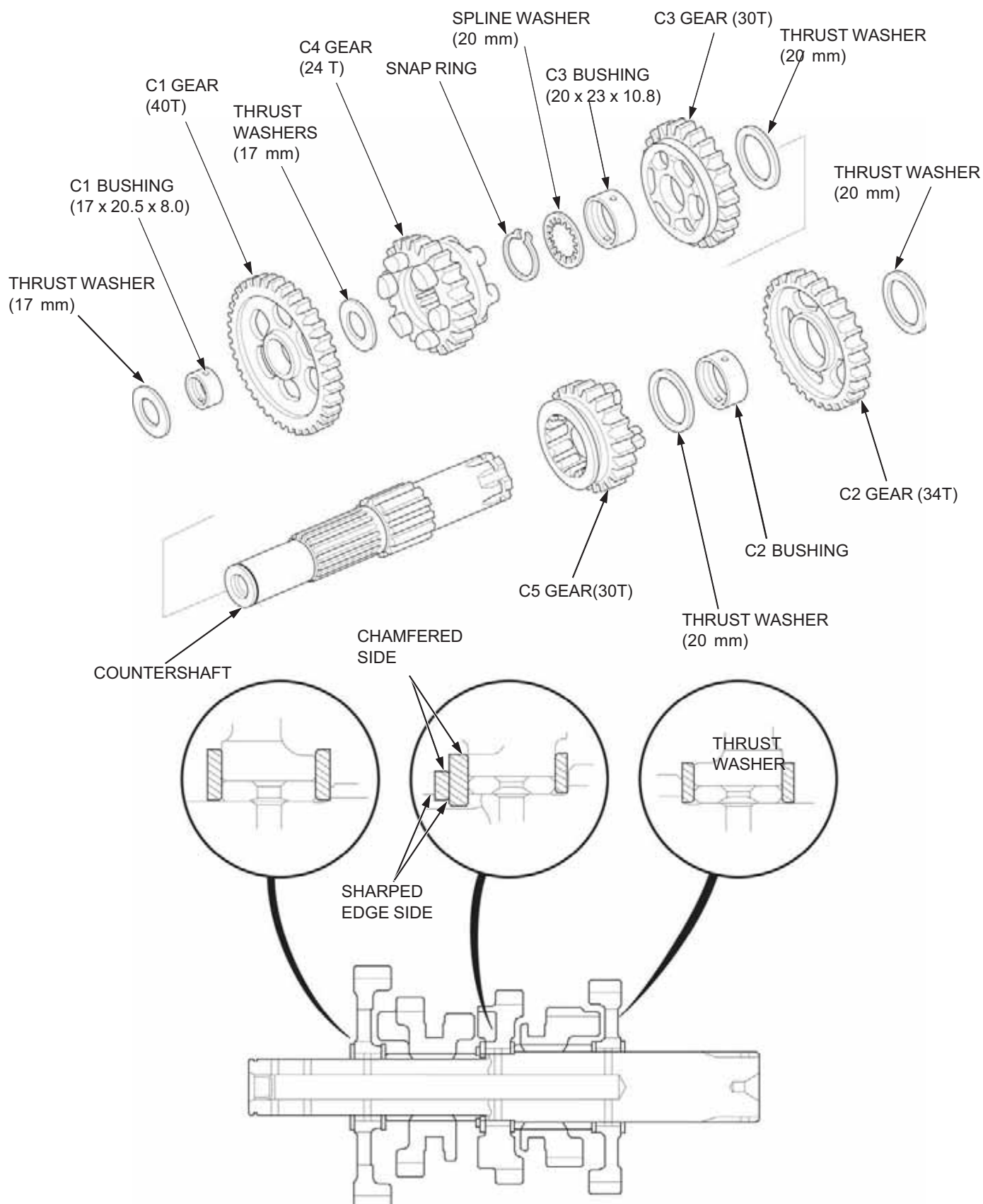
- Check the gears for freedom of movement or rotation on the shaft.
- Install the washers and snap rings with the chamfered edge facing the thrust load side. Confirm the inner side of snap rings and washer when you detect the chamfered side.
- Do not reuse worn snap ring which could easily spin in the groove.
- Check that the snap rings are seated in the shaft grooves, and align their end gaps with the grooves of the spline.



MAINSHAFT



COUNTERSHAFT

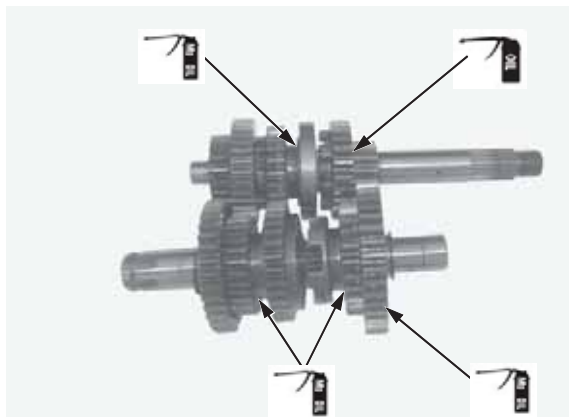


CRANKCASE/CRANKSHAFT/TRANSMISSION

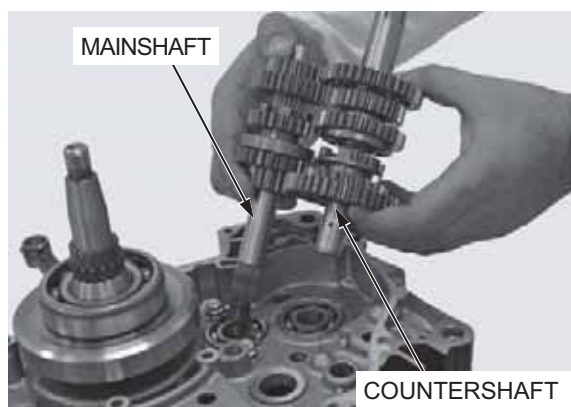
If the crankshaft removed, install the crankshaft first (page 11-13)

Apply molybdenum oil solution to the shift fork grooves.

Apply clean engine oil to the transmission gear teeth.

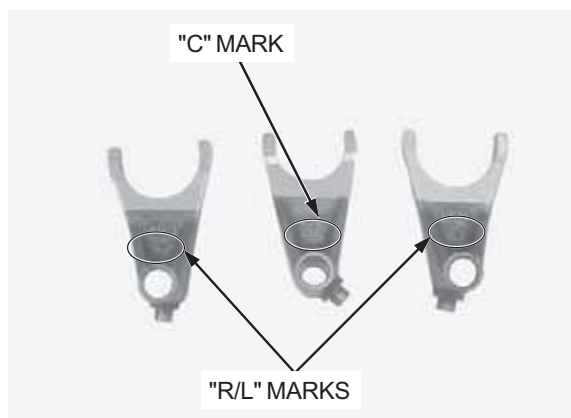


Install the mainshaft and countershaft together into the right crankcase. Be sure to install the three end washers (mainshaft; left only countershaft; both ends.)



Each shift fork has an identification marks; " R/L" (right and left), "C" (center).

Install the shift forks into the shifter gear grooves with the marks facing up (left crankcase side).



Apply clean engine oil to the guide grooves in the shift drum and install it, while aligning the shift fork guide pins with the guide grooves.



Apply clean engine oil to the shift fork shafts, and insert them through the shift forks into the right crankcase.

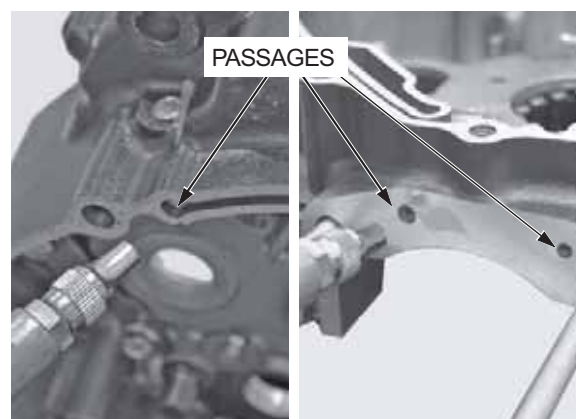
Rotate the mainshaft by hand to see the gears rotate freely.

Assemble the crankcase (page 11-18).



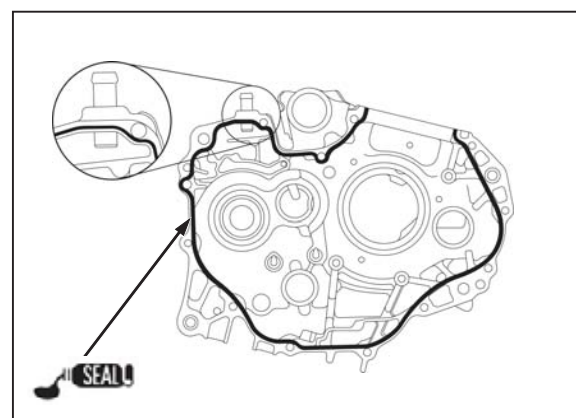
CRANKCASE ASSEMBLY

Clean the oil passages of crankcase using the compressed air.

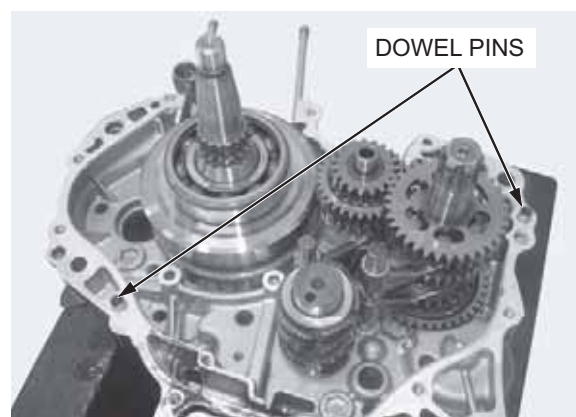


Clean the left and right crankcase mating surface thoroughly, being careful not to damage them and check for damage.

Apply a light but thorough coating of sealant to all crankcase mating surface except the oil passage area.



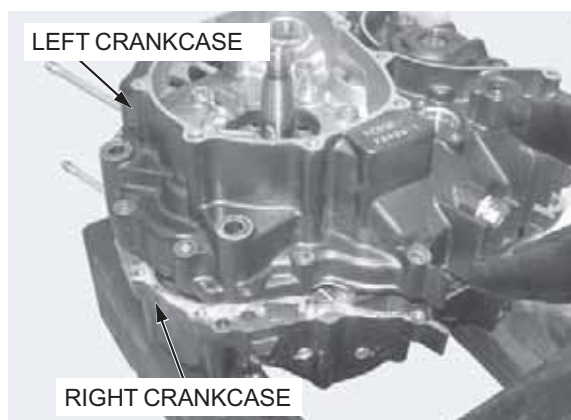
Install the dowel pins.



CRANKCASE/CRANKSHAFT/TRANSMISSION

Do not force the crankcase halves together, if there is excessive force required, something is wrong. Remove the left crankcase and check for misaligned parts.

Install the left crankcase over the right crankcase.

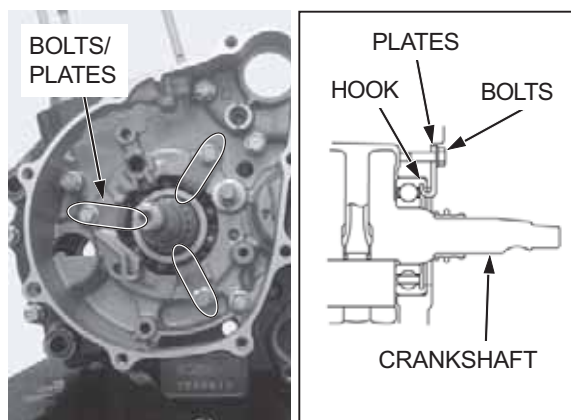


Install the crankcase bolts, and tighten the bolts in a crisscross pattern in 2-3 steps.

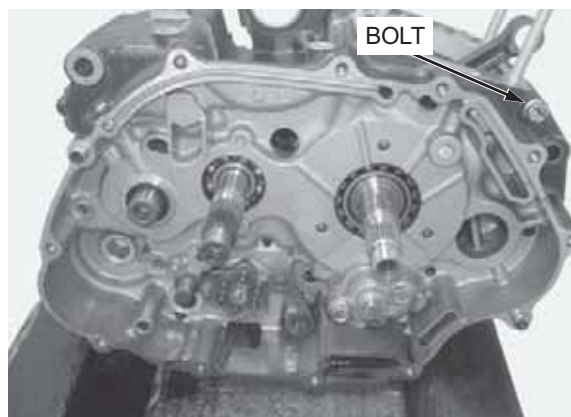


When the installing the retainer plate, pulling the crankshaft and hook the plate tab to the crankshaft bearing groove.

Install the bearing retainer plates and bolts to the specified torque.

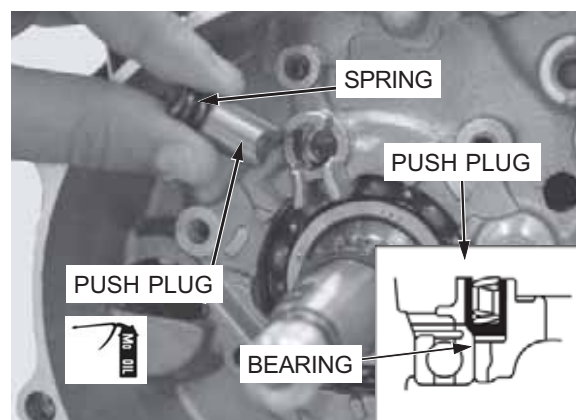


Install the tighten the right crankcase bolt.

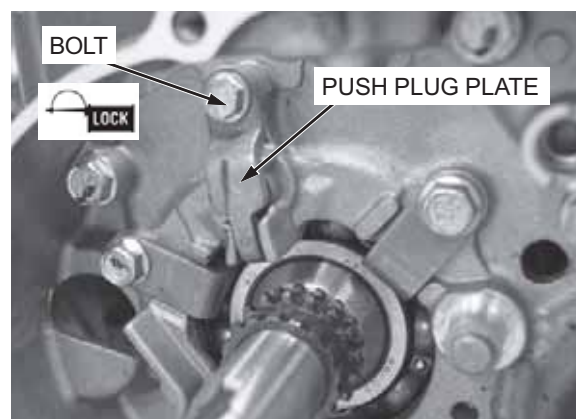


When installing the push plug, make sure the crankshaft bearing outer touches the taper part of push plug.

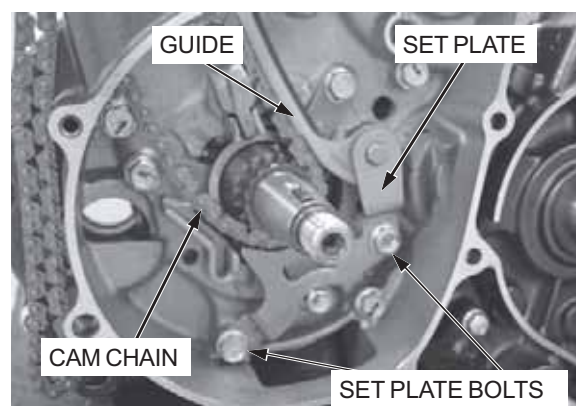
Apply molybdenum oil solution to the push plug.
Install the push plug and spring.



Apply locking agent to the threads of the push plug bolt.
Install the push plug plate and bolt.
Tighten the bolt to the specified torque.
TORQUE: 10 N.m (1.0 kgf.m, 7 lbf.ft)

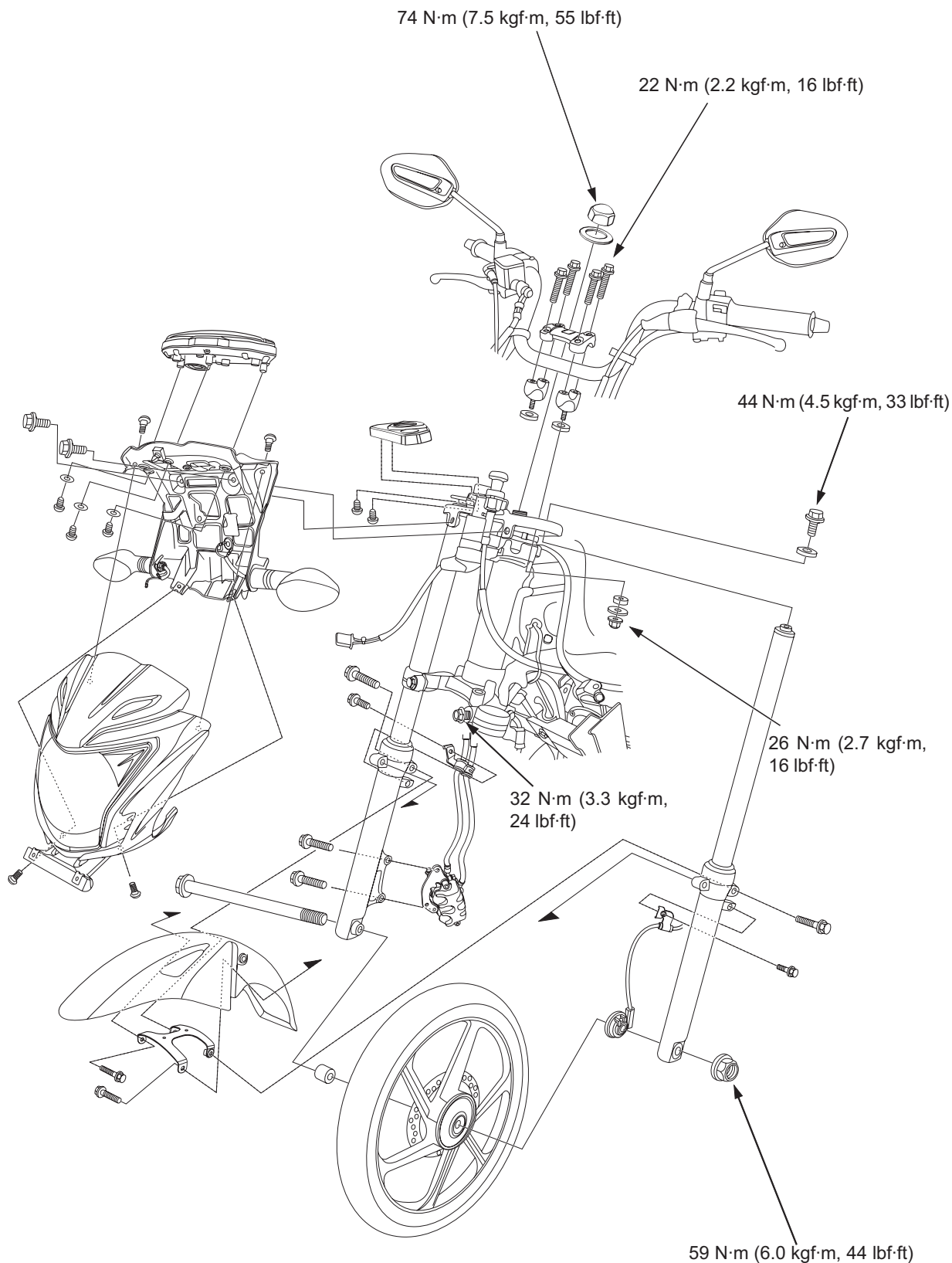


Install the cam chain through the crankcase.
Install the cam chain to the sprocket.
Install the tensioner guide and tensioner guide plate.
Install and tighten the tensioner guide plate bolts (2 nos).
Install the removed parts in the reverse order of removal.



COMPONENT LOCATION

DISC TYPE:



12. FRONT WHEEL/SUSPENSION/STEERING

COMPONENT LOCATION	12-0	FRONT WHEEL	12-10
SERVICE INFORMATION	12-1	FORK	12-14
TROUBLESHOOTING	12-3	STEERING STEM	12-22
HANDLEBAR	12-4		

⚠ CAUTION

Frequent inhalation of brake pad (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.

SERVICE INFORMATION

GENERAL

- Riding on damaged rims impairs safe operation of the motorcycle.
- When servicing the front wheel, fork or steering stem, support the motorcycle using a center stand and hoist.
- A contaminated brake disc or pad (drum or shoe) reduces stopping power. Discard contaminated pads (shoes), and clean a contaminated disc (drum) with a high quality brake degreasing agent.
- After the front wheel installation, check the brake operation by applying the brake lever.
- Refer to the brake system information (page 14-1).
- This motorcycle is equipped with the tubeless tyre.
- Refer to the tubeless tyre repair (page 13-1).

SPECIFICATIONS




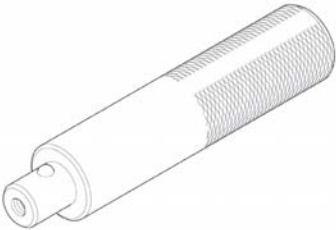



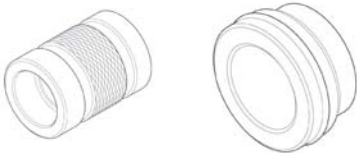




Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire thread depth		—	1.5 (0.06)
Cold tire pressure	Driver only	175 kPa (1.75 kgf/cm ² , 25 psi)	—
	Driver and passenger	175 kPa (1.75 kgf/cm ² , 25 psi)	—
Wheel rim runout	Axle runout	—	0.2 (0.01)
	Radial	—	1.0 (0.04)
	Axial	—	1.0 (0.04)
Fork	Spring free length	481 (18.94)	
	Pipe runout	—	0.20 (0.008)
	Recommended fluid	Fork fluid (honda ultra cushion oil)	—
	Fluid level	175 (6.89)	—
	Fluid capacity	156.0 ± 1.0 cm ³ (5.27 ± 0.03 US oz, 5.49 ± 0.04 Imp oz)	—
Brake	Disc thickness	4 (0.15)	3.5 (0.13)
Steering Head Pipe Bearing Pre-load		0.7 - 1.3 kgf (1.64 - 2.81 lbf)	—

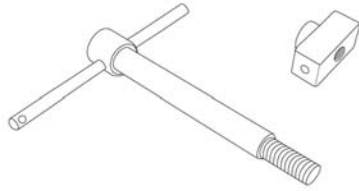
TORQUE VALUES

Front brake disc bolt	42 (4.3 kgf·m, 32 lbf·ft)	ALOC bolt: replace with a new one
Front axle nut	59 (6.0 kgf·m, 44 lbf·ft)	U-nut
Handlebar lower holder nut	26 (2.7 kgf·m, 19 lbf·ft)	U-nut
Handlebar upper holder bolt	22 (2.2 kgf·m, 19 lbf·ft)	
Master cylinder holder bolt	9 (0.9 kgf·m, 7 lbf·ft)	
Rear view mirror lock nut	34 (3.5 kgf·m, 25 lbf·ft)	
Fork socket bolt	20 (2.0 kgf·m, 15 lbf·ft)	Apply locking agent to the threads
Fork cap	22 (2.2 kgf·m, 16 lbf·ft)	
Bottom bridge pinch bolt	32 (3.3 kgf·m, 24 lbf·ft)	
Top bridge bolt	44 (4.5 kgf·m, 33 lbf·ft)	
Steering bearing adjustment nut	3.4 (0.34 kgf·m, 2.5 lbf·ft)	
Steering stem nut	74 (7.5 kgf·m, 55 lbf·ft)	

TOOLS

<p>Attachment, 37 x 40 mm 070GD002I150</p> 	<p>Attachment, 42 x 47 mm 007GD002I160</p> 	<p>Pilot, 12 mm 070GD004I130</p> 
<p>Driver 070GD001I100</p> 	<p>Bearing remover shaft 070GD005I100</p> 	<p>Bearing remover head, 12 mm 070GD005I130</p> 
<p>Oil seal remover 070SRTKSP002</p> 	<p>Fork seal driver 070SRTKSP001</p> 	<p>Socket wrench steering 070SRTKSP004</p> 
<p>Ball race remover 070SRTKSP005</p> 	<p>Steering cone installer(Frame) 070SRTKSP007</p> 	<p>T-stem cone remover 07000TCR900</p> 

Steering cone installer
070SRTKSP006



TROUBLESHOOTING

Hard steering

- Steering stem 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 bearings
- Bent frame
- Faulty wheel bearing
- Worn swingarm pivot components
- Unevenly assembled left and right fork legs
- Unequal oil quantity in each fork leg

Front wheel wobbling

- Bent rim
- Worn or damaged wheel bearings
- Faulty tire
- Axle not tightened properly

Wheel turns hard

- Faulty wheel bearings
- Bent axle
- Brake drag

Soft suspension

- Weak fork spring
- Insufficient fluid in fork
- Insufficient tire pressure

Hard suspension

- Incorrect fork fluid viscosity
- Bent or damaged fork tubes
- Clogged fluid passage
- Damaged fork tube and/or fork slider

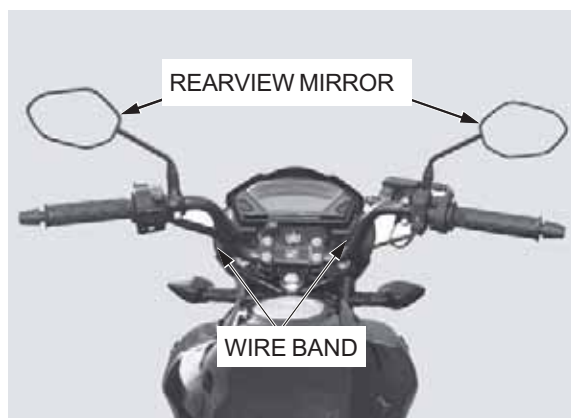
Front suspension noisy

- Insufficient fluid in fork
- Loose fork fasteners

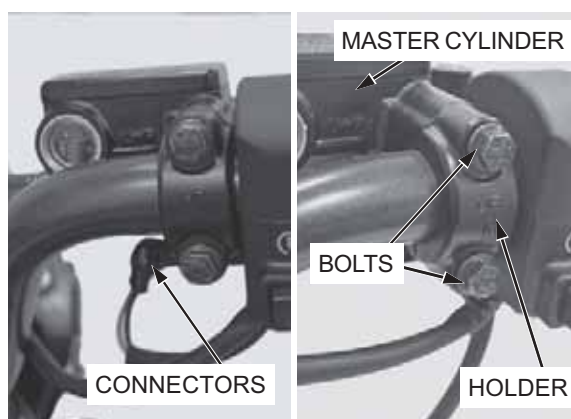
HANDLEBAR

REMOVAL

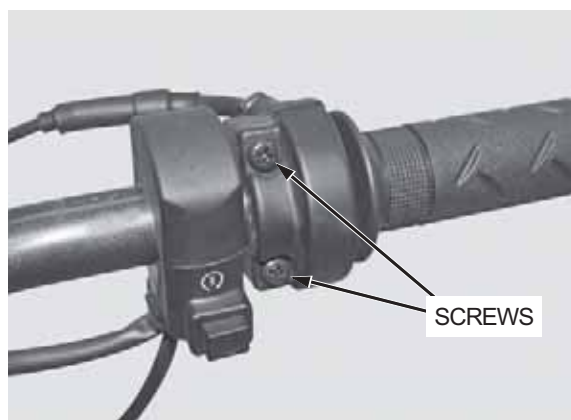
Remove the wire bands and rearview mirrors.



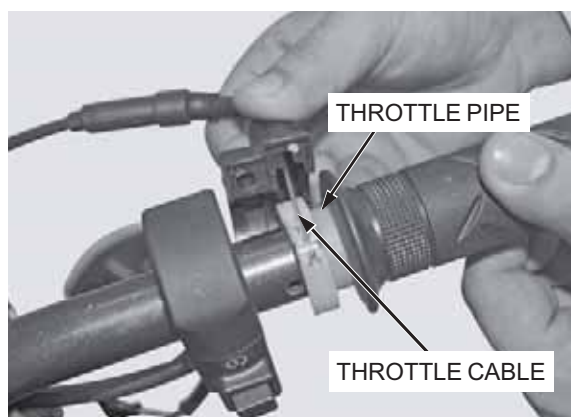
Disconnect the front brake light switch connectors.
Remove the bolts, holder and brake master cylinder.



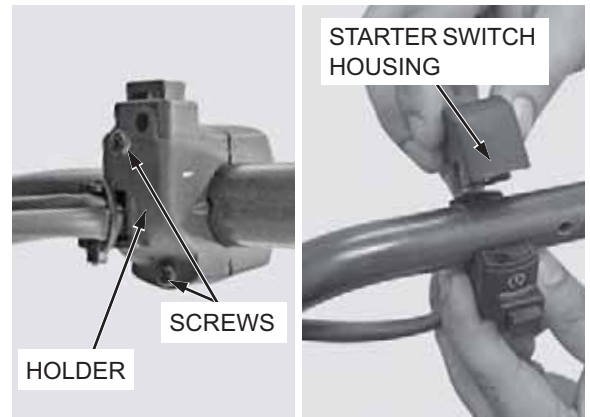
Remove handlebar throttle housing screws (2 nos.) on right hand side



Disconnect the throttle cable from the throttle pipe, then remove the throttle pipe.



Remove the starter switch housing screws and remove the housing from the handle bar.



Remove the clutch wire connector.



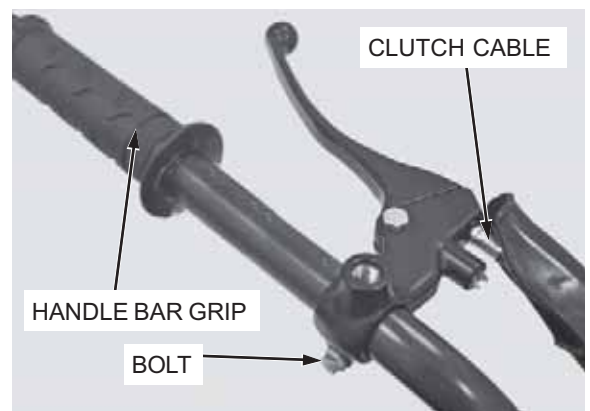
Remove the screws and separate the left handlebar switch housing.



Pull out the handle bar grip with twisting movement in outward direction

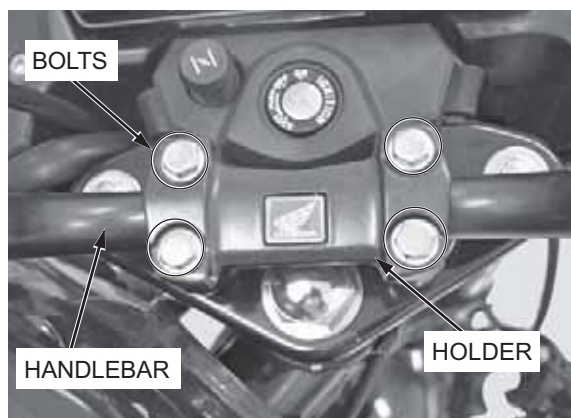
Remove the clutch cable

Remove the clutch lever bracket bolt and slide the bracket out of the handle bar.

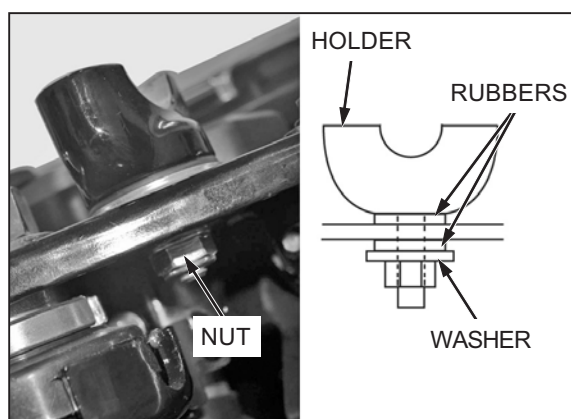


FRONT WHEEL/SUSPENSION/STEERING

Remove the bolts, handlebar upper holders and handlebar from the top bridge.



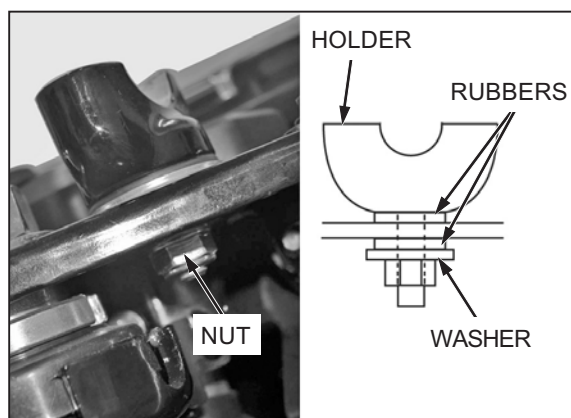
Remove the nuts, washers, cushion rubbers and handlebar lower holders



INSTALLATION

Install the handlebar lower holders, cushion rubbers, washers and nuts.

Temporarily tighten the handlebar lower holder nuts.



Place the handlebar to the top bridge.

Place the handlebar holders with the punch marks facing forward and install the holder bolts.

Align the punch mark on the handlebar with the mating surface of the lower holder.

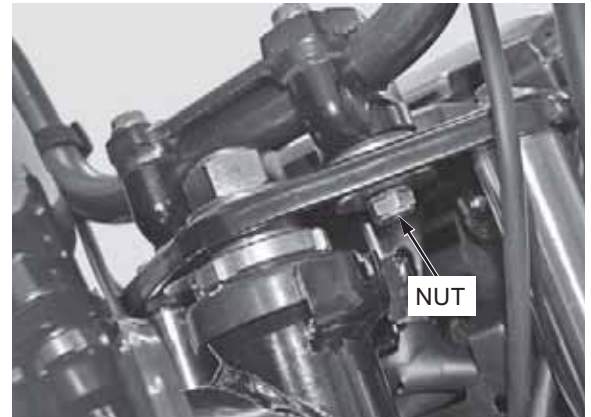
Tighten the forward bolts first, then the rear bolts

TORQUE: 26 N.m (2.7 kgf.m, 19 lbf.ft)



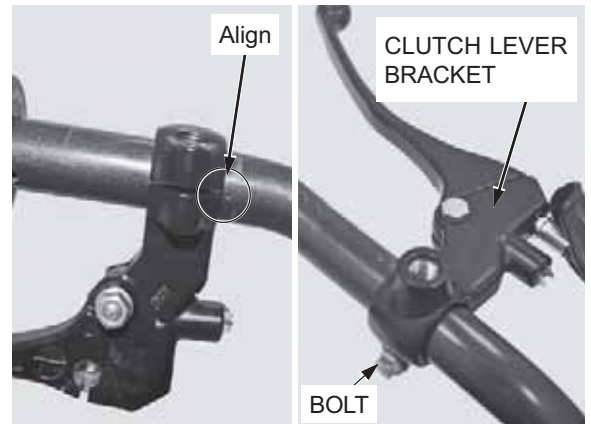
Tighten the handlebar lower holder nuts.

TORQUE: 26 N·m (2.7 kgf·m, 19 lbf·ft)



slide and Install the clutch lever bracket by aligning the meeting surface of the bracket with the punch mark on the handle bar.

Tighten the clutch lever bracket bolt.

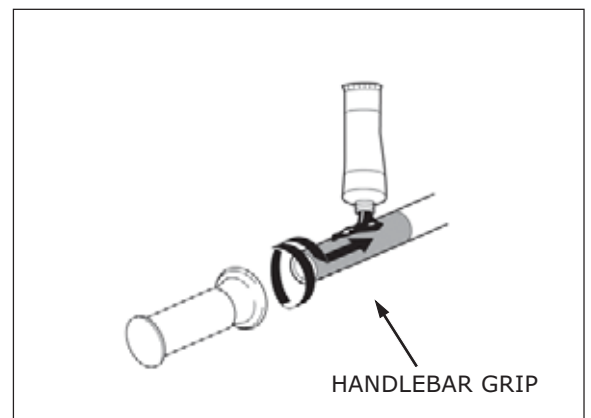


Allow the adhesive to dry for 1 hour before using.

Apply Honda Bond A or its equivalent to the inside surface of the grips and to the clean surface of the left handlebar.

Wait 3-5 minutes and install the grip.

Rotate the grips for even application of the adhesive.



Install the left handlebar switch housing while aligning the locating pin in the housing with the hole in the handlebar.



FRONT WHEEL/SUSPENSION/STEERING

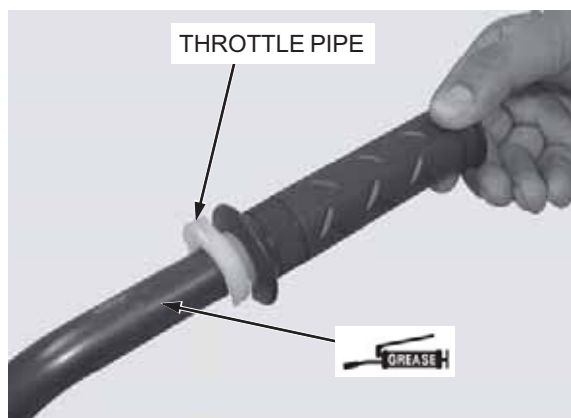
Install the screw and tighten the forward screw first, then the rear screw.



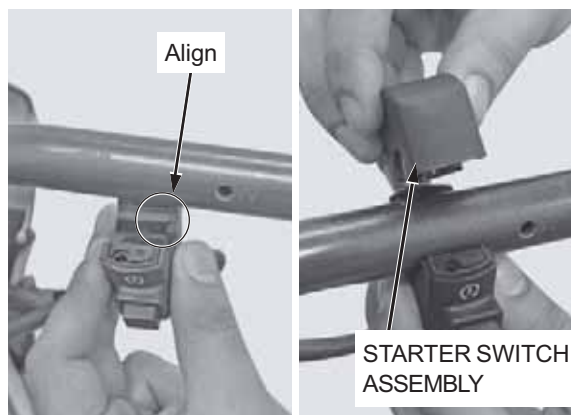
Connect the clutch wire connector



Apply grease to the throttle pipe rotating area of the handlebar and install the throttle grip on the handle bar.



Install the starter switch housing on the handlebar while aligning it's locating pin.



Install the starter switch housing screws

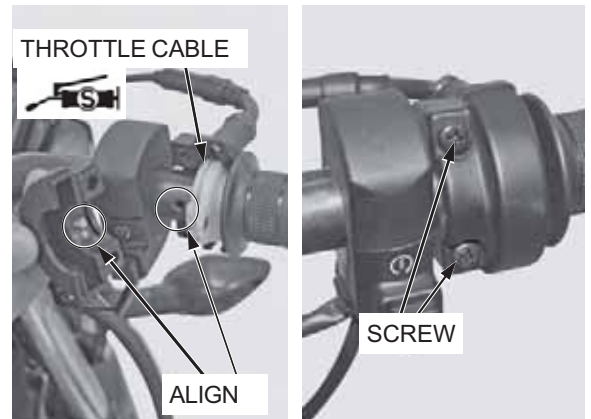


Apply silicon grease to the throttle cable end.

Connect the throttle cable end to the throttle pipe.

Install the right handlebar switch housing, while aligning its locating pin with the hole on the handlebar.

Install the throttle housing screws.



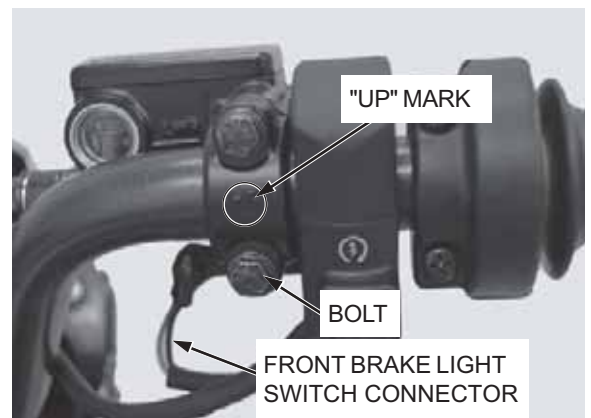
Install the master cylinder bracket & holder with "UP" mark facing up.

Aligning the mating surface of the bracket holder with the punch mark on the handle bar.

Tighten the holder bolt to the specified torque.

TORQUE: 9 N.m (0.9 kgf.m, 6.6 lbf.ft)

Also connect the front brake light switch connector.



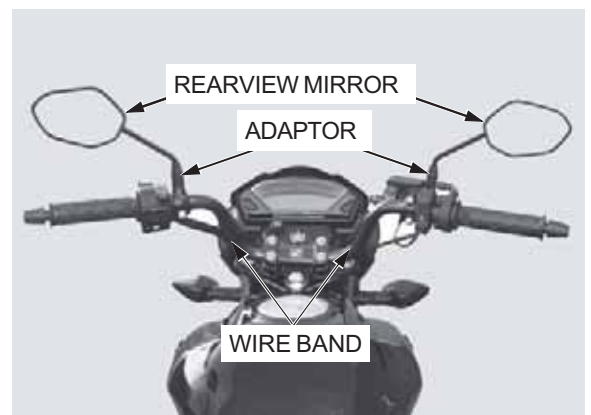
Install the wire bands and rear view mirrors.

Tighten the mirror mounting nuts to the specified torque

TORQUE: 34 N.m (3.5 kgf.m, 25 lbf.ft)

Check & adjust the throttle grip free play (Page 3-5)

Adjust the clutch lever free play (Page 3-21)



FRONT WHEEL

REMOVAL

Raise and support the motorcycle using safety stand or a box.

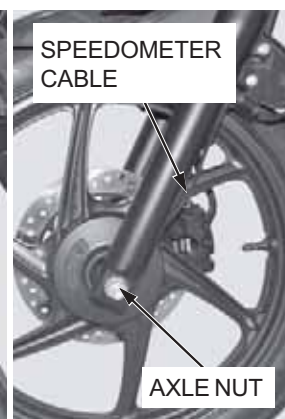
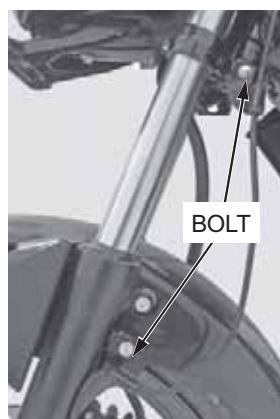
Remove the sensor wire two bolts.

Disconnect the speedometer sensor wire from front cowl.

Remove the axle nut.

Remove the wheel.

Do not operate the front brake lever after the front wheel is removed.



Remove the side collar.

Remove the speedometer gear box.



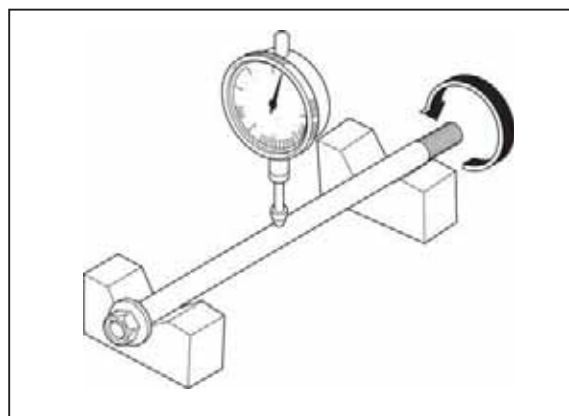
INSPECTION

AXLE

Place the axle on V-blocks. Turn the axle and measure the runout using a dial indicator.

Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.2mm (0.01in)

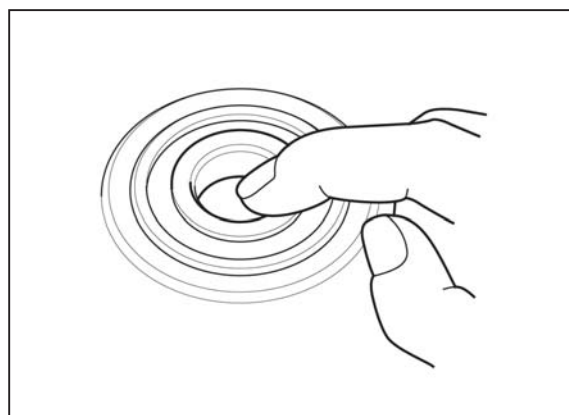


WHEEL BEARING

Turn the inner race of each bearing with your finger.

Also check that the bearing outer race fits tightly in the hub.

Remove and discard the bearings if the inner races do not turn smoothly, quietly, or if they fit loosely in the hub.



WHEEL RIM

Check the wheel rim runout by placing the wheel in a turning stand.

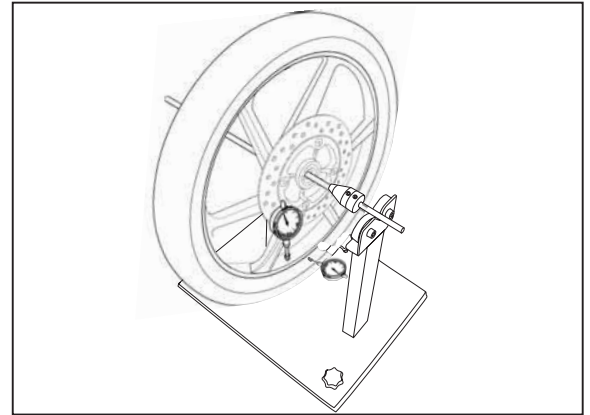
Turn the wheel by hand and read the runout using a dial indicator.

Actual runout is 1/2 the total indicator reading.

SERVICE LIMITS:

Axial: 1.0 mm (0.04 in)

Radial: 1.0 mm (0.04 in)



DISASSEMBLY

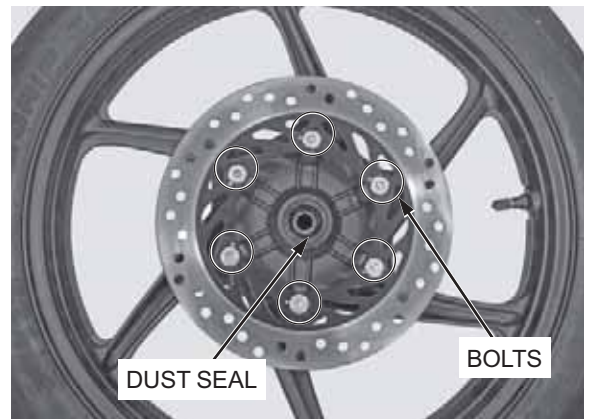
Remove the speedometer gear retainer from the left side of the wheel hub.



Do not reuse the bolts.

Remove the dust seal from the right wheel hub.

Loosen the brake disc mounting bolts in a crisscross pattern in 2 or 3 steps, and remove the brake disc mounting bolts and brake disc.



Never install the old bearing, once the bearing has been removed, the bearing must be replaced with new one.

Install the bearing remover head into the bearing.

From the opposite side, install the bearing remover shaft, and drive the bearing out of the wheel hub.

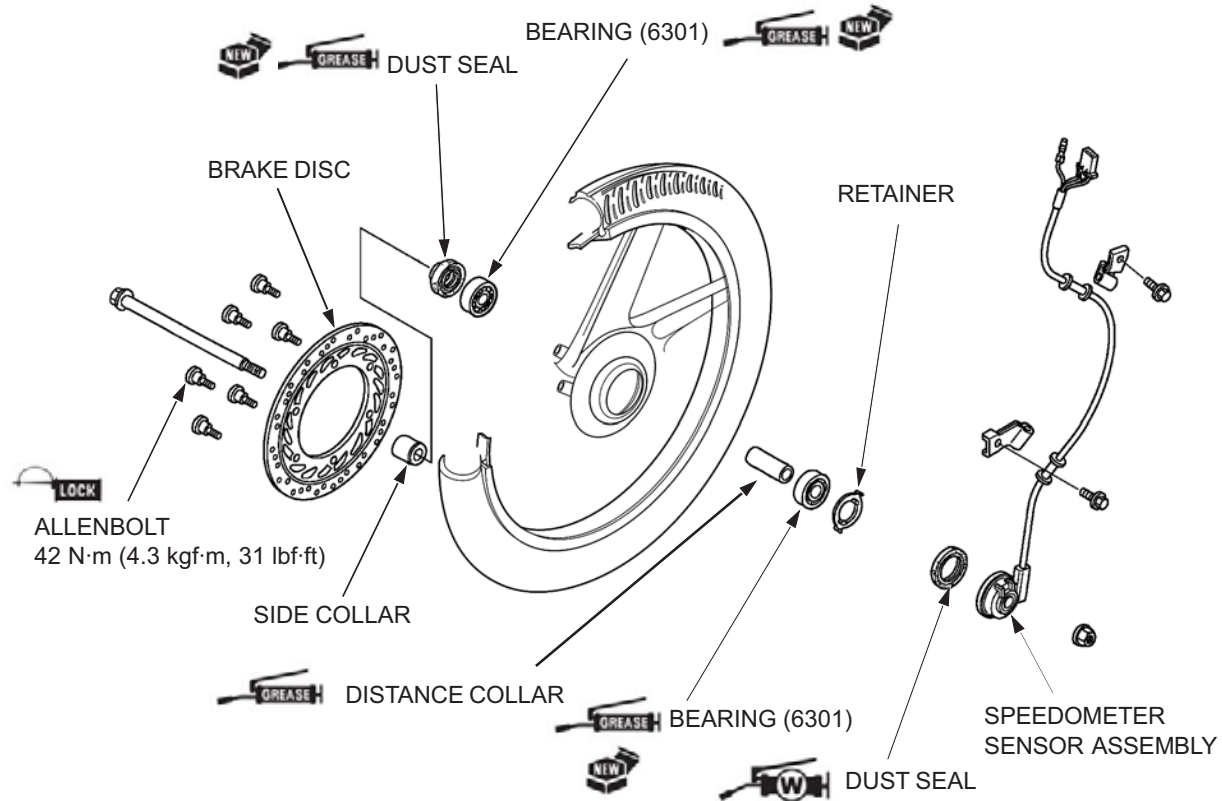
Remove the distance collar, and drive out the other bearing.

TOOLS:

Bearing remover head, 12 mm 070GD0051130

Bearing remover shaft 070GD0051100





Never install the old bearing once the bearing has been removed, the bearing must be replaced with new ones.

Pack all bearing cavities with grease.

Drive in a new right bearing squarely with its sealed side facing up until it is fully seated.

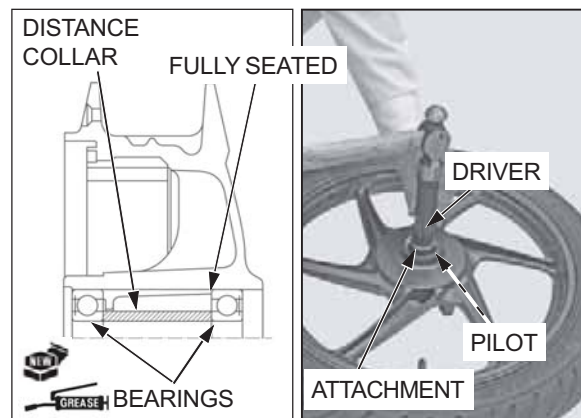
Install the distance collar, then drive in a new left bearing squarely with its sealed side facing up.

TOOLS: 070GD001I100

Driver 070GD002I150

Attachment, 37 x 40 mm 070GD004I130

Pilot, 12 mm



Do not get grease on the brake disc or stopping power will be reduced

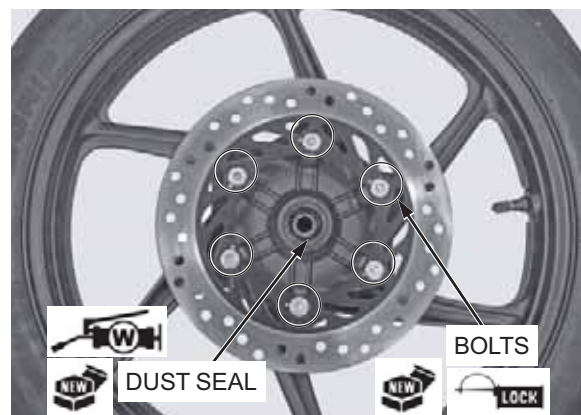
Install the brake disc onto the brake hub with the arrow mark facing out.

Install and tighten new brake disc mounting bolts to the specified torque in a crisscross pattern in 2 or 3 steps.

TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)

Apply grease to a new right dust seal lip.

Install the dust seal until it is flat surface with the right wheel hub.



Install the speedometer gear retainer onto the left wheel hub by aligning the tabs of the retainer with the slots of the hub.



Apply grease to the new left dust seal lip.

Install the dust seal until it is fully seated with the left wheel hub.



INSTALLATION

Apply grease to the speedometer sensor assembly inside area and retainer tabs.

Install the speedometer sensor assembly onto the left wheel hub by aligning the retainer tabs with the slots.



Install the side collar onto the right wheel hub.



FRONT WHEEL/SUSPENSION/STEERING

Connect the speedometer sensor wire by aligning its tab with the groove of the speedometer gear box.

Check the brake operation.



Be careful not to damage the pads.

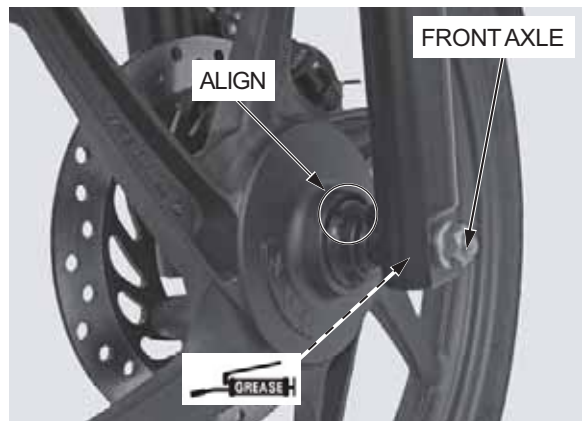
Install the front wheel between the fork legs by aligning the speedometer sensor assembly groove with the boss of the left fork leg so that the brake disc is positioned between the pads.

Apply a thin coat of grease to the front axle surface.

Install the front axle from right side.

Install and tighten the axle nut to the specified torque.

TORQUE: 59 N.m (6.0 kgf.m, 44 lbf.ft)



FORK

REMOVAL

Remove the following:

- front fender (page 2-4)
- brake caliper (page 14-16)

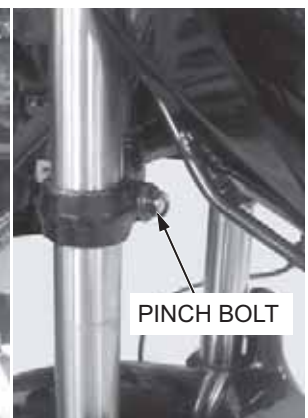
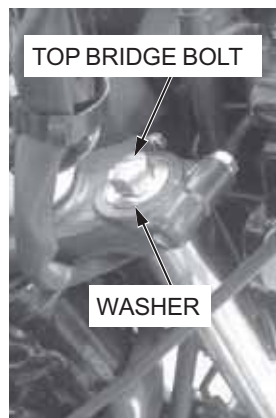
Remove the top bridge bolt and washer.

Loosen the bottom pinch bolt and lower the fork leg.

If the fork will be disassembled loosen the fork cap when bottom pinch bolts fastened by having removed fork downward.

After lowering the fork leg tighten the pinch bolt again and loosen the fork cap as shown.

Remove the fork cap.



Remove the fork spring.



Drain the fork fluid by pumping the fork pipe several times in a clean tray.

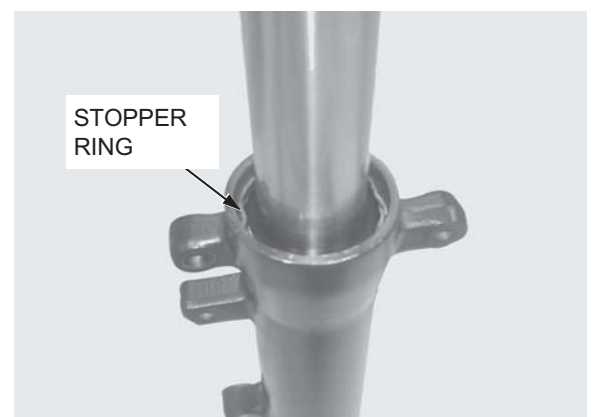


Remove the dust seal.



*Be care full not
to scratch the
fork pipe.*

Remove the oil seal stopper ring.

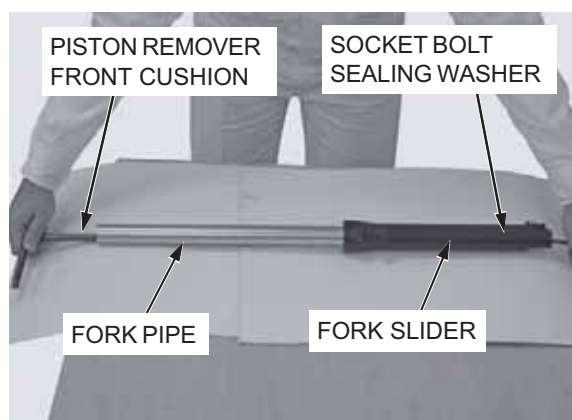


FRONT WHEEL/SUSPENSION/STEERING

Remove the fork socket bolt and sealing washer.

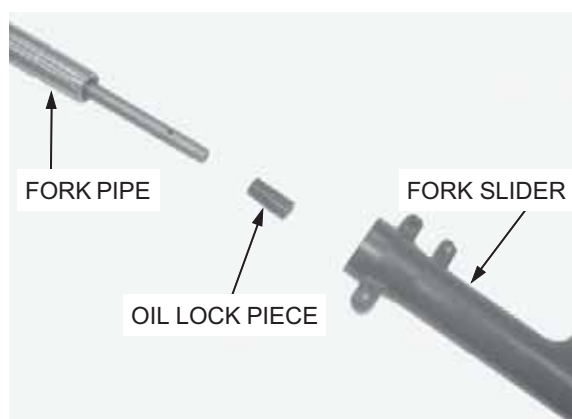
TOOL:

Piston remover front cushion: 070SRTKSP003

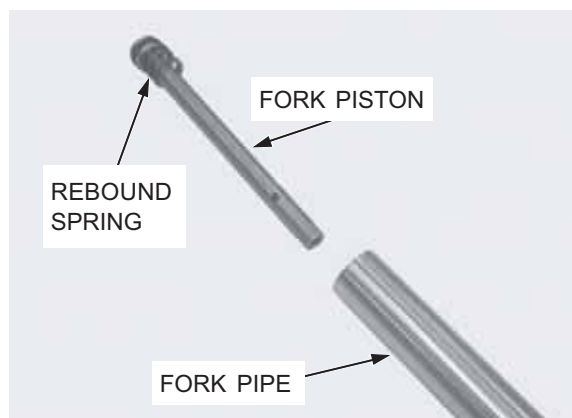


Remove the fork pipe from the fork slider.

Remove the oil lock piece from the fork slider.



Remove the fork piston and rebound spring from the fork pipe.



Be careful not to damage the fork slider.

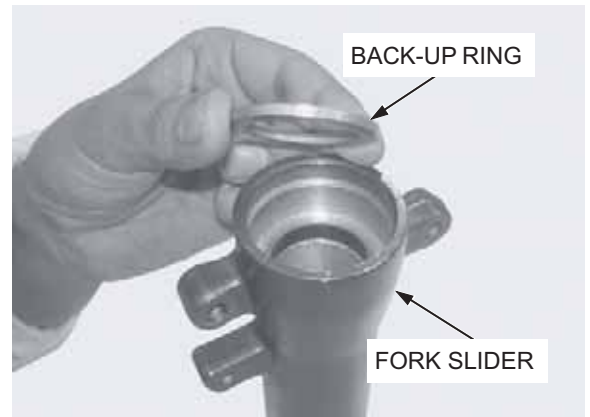
Remove the oil seal using the special tool.

TOOL:

Oil seal remover 070SRTKSP002



Remove the backup ring from the fork slider.



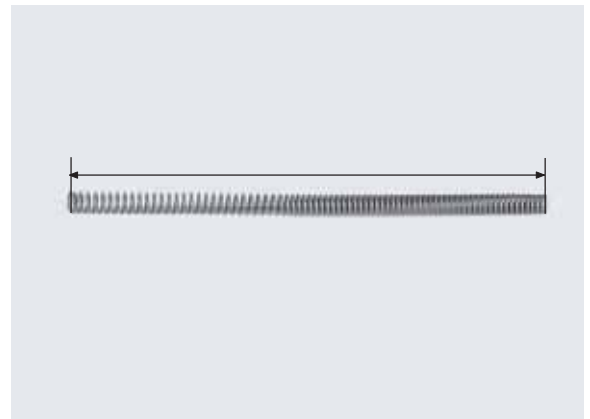
INSPECTION

FORK SPRING

Check the fork spring for fatigue or damage.

Measure the fork spring free length.

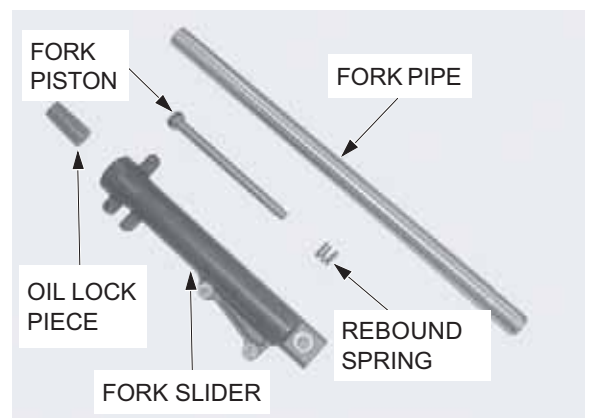
SERVICE LIMIT: 470 mm (18.5in)



FORK PIPE/SLIDER/PISTON

Check the fork tube and slider for score marks and excessive or abnormal wear.

Check the fork piston for score marks and excessive or abnormal wear.



Check the fork piston ring for wear or damage.

Replace any components that are worn or damaged.

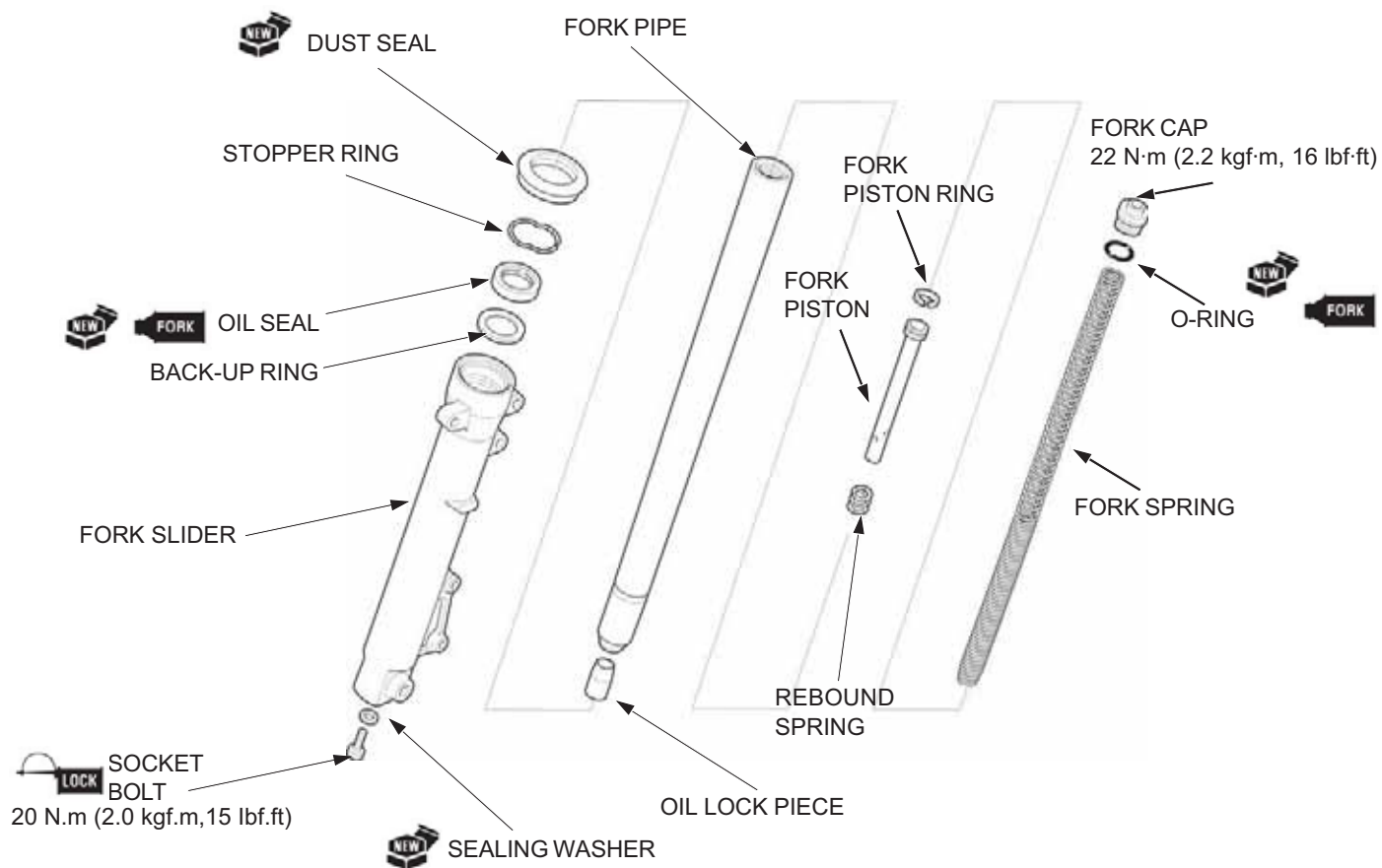
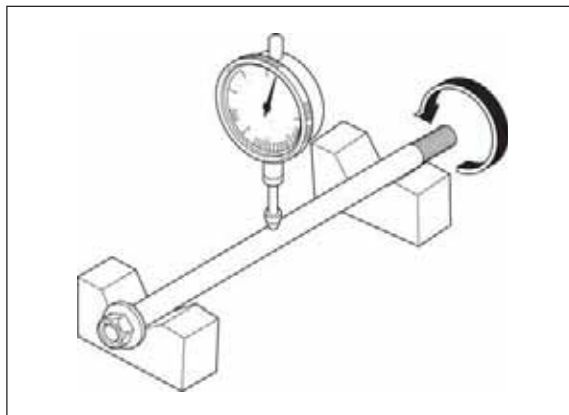


FRONT WHEEL/SUSPENSION/STEERING

Set the the fork tube on V-block. Turn fork tube 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)

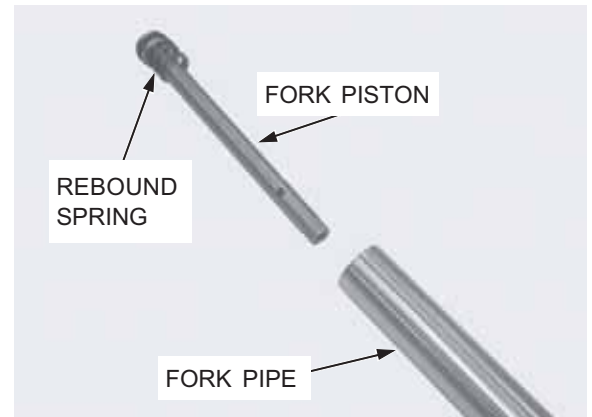


Before assembly, wash all parts with a high flash or nonflammable solvent, and wipe them dry.

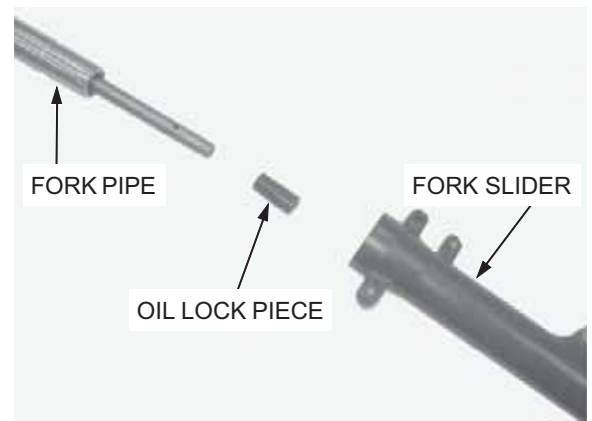
Install the rebound spring to the fork piston, then install them into the fork pipe.

TOOL:

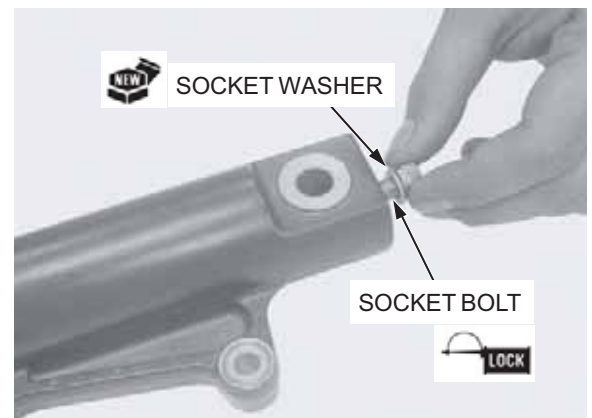
Piston Remover Front cushion: 070SRTKSP003



Install the oil lock piece to the fork piston end, then install the fork pipe into the fork slider.



Apply a locking agent to the fork socket bolt threads and install it with a new sealing washer.

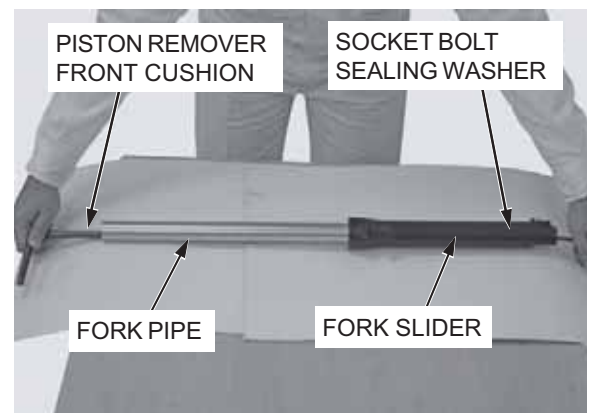


Tighten the socket bolt.

TOOL:

Piston Remover Front Cushion: 070SRTKSP003

TORQUE: 20 N.m (2.0 kgf.m, 15 lbf.ft)



FRONT WHEEL/SUSPENSION/STEERING

Install the back-up ring into the fork slider.



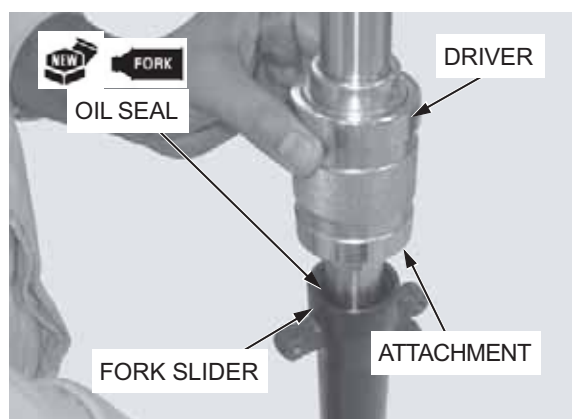
Apply fork fluid to a new oil seal lip, then install it into the fork slider with its marking facing up.

Drive the into the fork slider using the special tools.

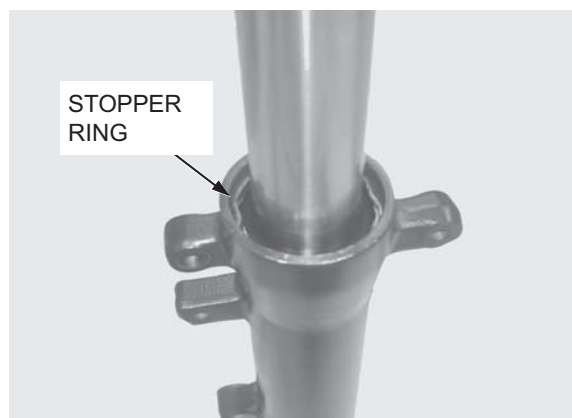
TOOLS

Fork seal driver

070SRTKSP001



Install the oil seal stopper ring into the groove of the fork slider.



Install a new dust seal.



Pour the specified amount of recommended fork fluid into the fork tube.

RECOMMENDED FLUID:Fork fluid

FORK FLUID CAPACITY:

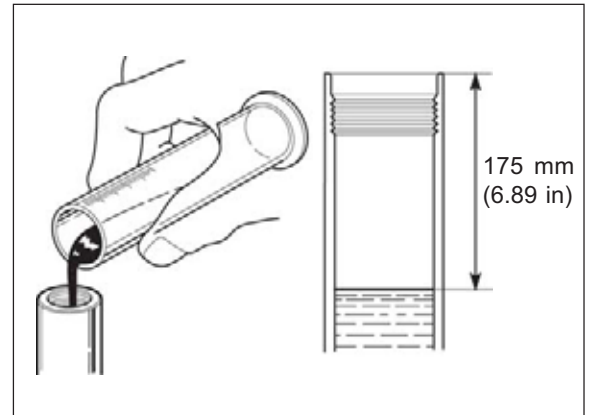
$156 \pm 1.0 \text{ cm}^3$

($5.27 \pm 0.03 \text{ US oz}$, $5.49 \pm 0.04 \text{ Imp oz}$)

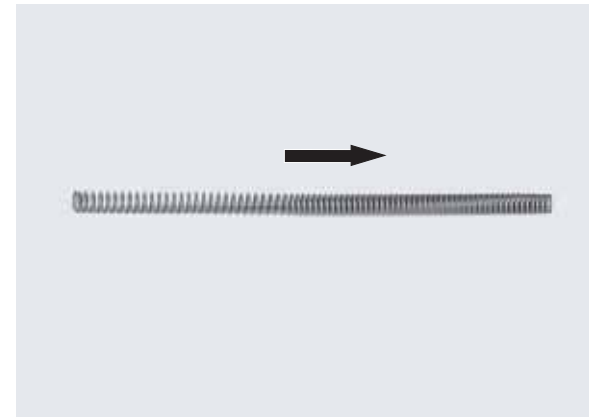
Pump the fork tube several times to remove trapped air from the lower portion of the fork tube.

Compress the fork leg fully, and measure the oil level from the top of the fork tube.

OIL LEVEL: 175 mm (6.89 in)



Pull the fork tube up, and install the fork spring with its tapered (narrow coil pitch) end facing down.



Tighten the fork cap after installing the fork tube into the fork bridge.

Apply fork fluid to a new O-ring, and install it to the fork cap groove.

Install the fork cap onto the fork pipe.



INSTALLATION

Temporarily install the fork leg up through the bottom bridge, and temporarily tighten the bottom bridge pinch bolt.

Tighten the fork cap to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)



FRONT WHEEL/SUSPENSION/STEERING

Loosen the bottom pinch bolt, and install the fork leg up through the top bridge.

Install the washer and top bridge bolt.

Tighten the top bridge bolt to the specified torque.

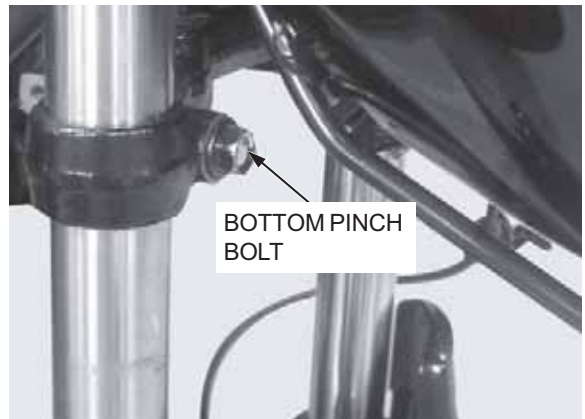
TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)



Tighten the bottom bridge pinch bolt to the specified torque.

TORQUE: 32 N·m (3.3 kgf·m, 24 lbf·ft)

- Install the brake caliper (page 14-19).
- install the front fender (page 2-4)



STEERING STEM

REMOVAL

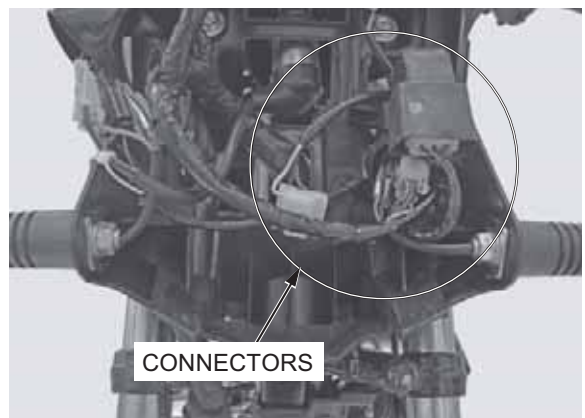
Remove the following:

- front cowl (page 2-2)
- combination meter (page 17-4)

Disconnect the following:

- left handlebar switch 5P (White) connector 2P White winker relay connector.
- right handlebar starter switch 2P Connector and wire (Black) connector.
- ignition switch 2P (White) connector.
- tachometer wire connector.

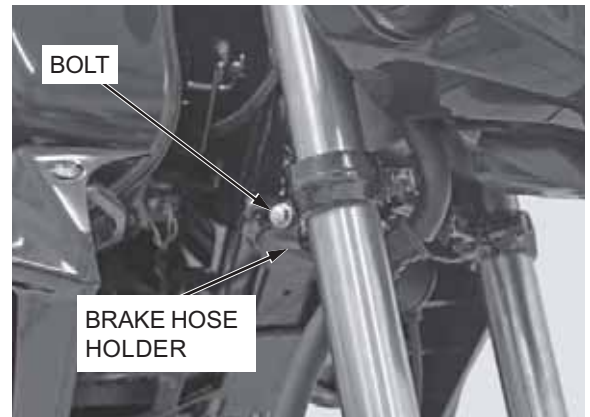
Remove the bolt and meter stay.



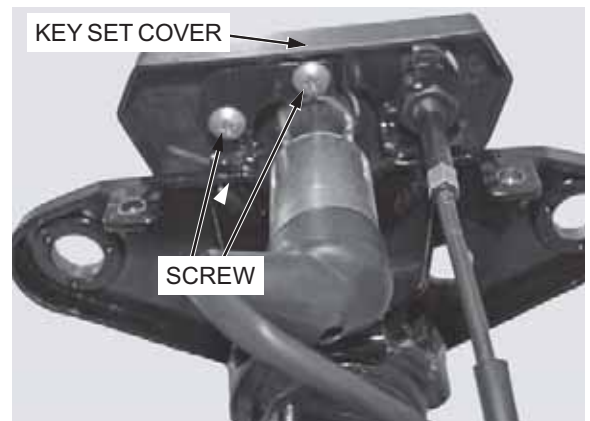
Remove the following:

- handlebar (page 12-4)
- fork (page 12-15)
- front fender

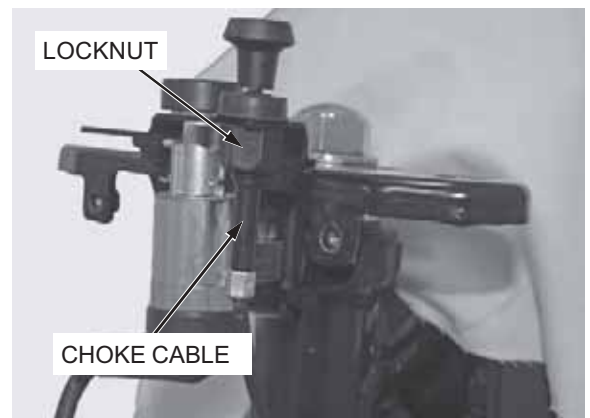
Remove the bolt and brake hose holder from the bottom bridge.



Remove the key set cover by removing the mounting screws



Remove the choke cable from its stay by loosening the locknut.



Remove the steering stem nut, washer and top bridge.



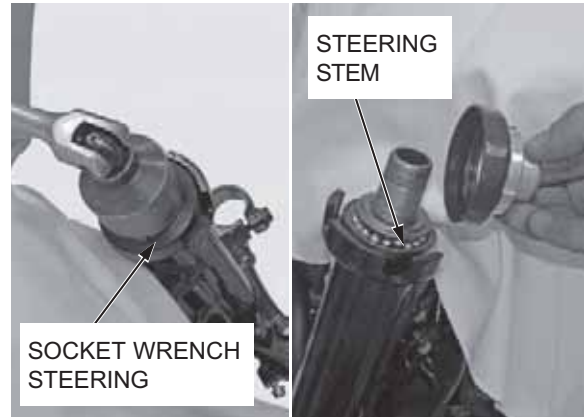
FRONT WHEEL/SUSPENSION/STEERING

Loosen the adjusting nut using the special tool.

TOOL:

Socket wrench steering 070SRTKSP004

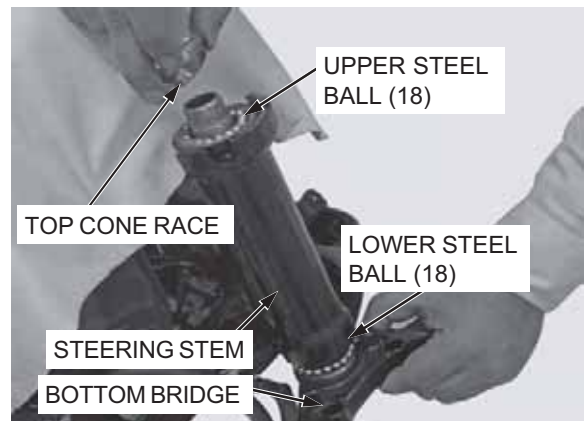
Hold the steering stem and remove the adjusting nut.



Be careful not to loose the steel balls.

Remove the following:

- top cone race
- upper steel ball (18)
- lower steel ball (18)
- Bottom bridge



BALL RACE REPLACEMENT

Remove the ball races using the special tool

TOOL:

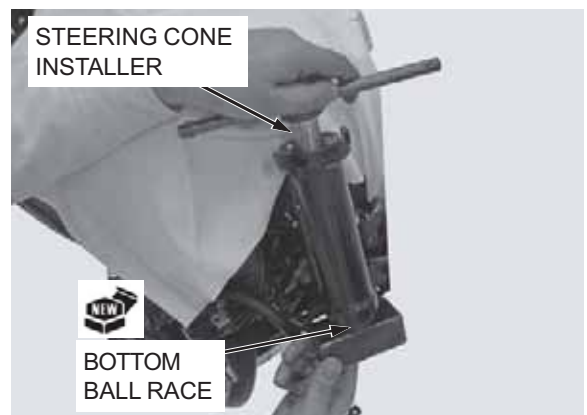
Ball race remover 070SRTKSP005

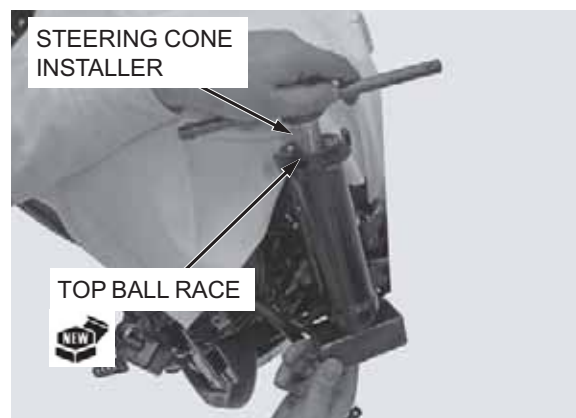


Install a new top ball race and new bottom ball race using the special tool.

TOOLS:

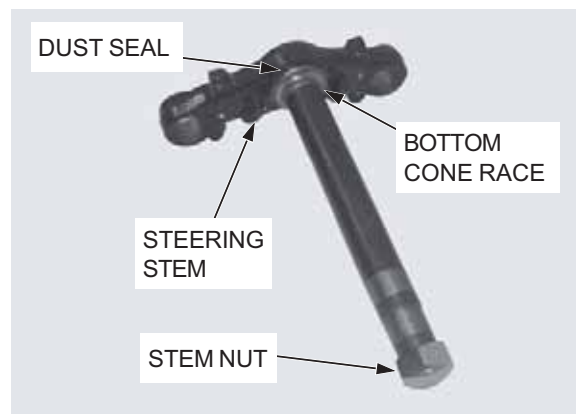
Steering cone installer 070SRTKSP006





BOTTOM CONE RACE REPLACEMENT

Avoid damaging the steering stem thread, temporarily install the stem nut.



Remove the dust seal.

Remove the bottom cone race with a T-stem cone remover MC tool, being careful not to damage the stem.

TOOL:

T-stem cone remover MC 07000TCR900



Press a new bottom cone race onto the steering stem using the special tool.

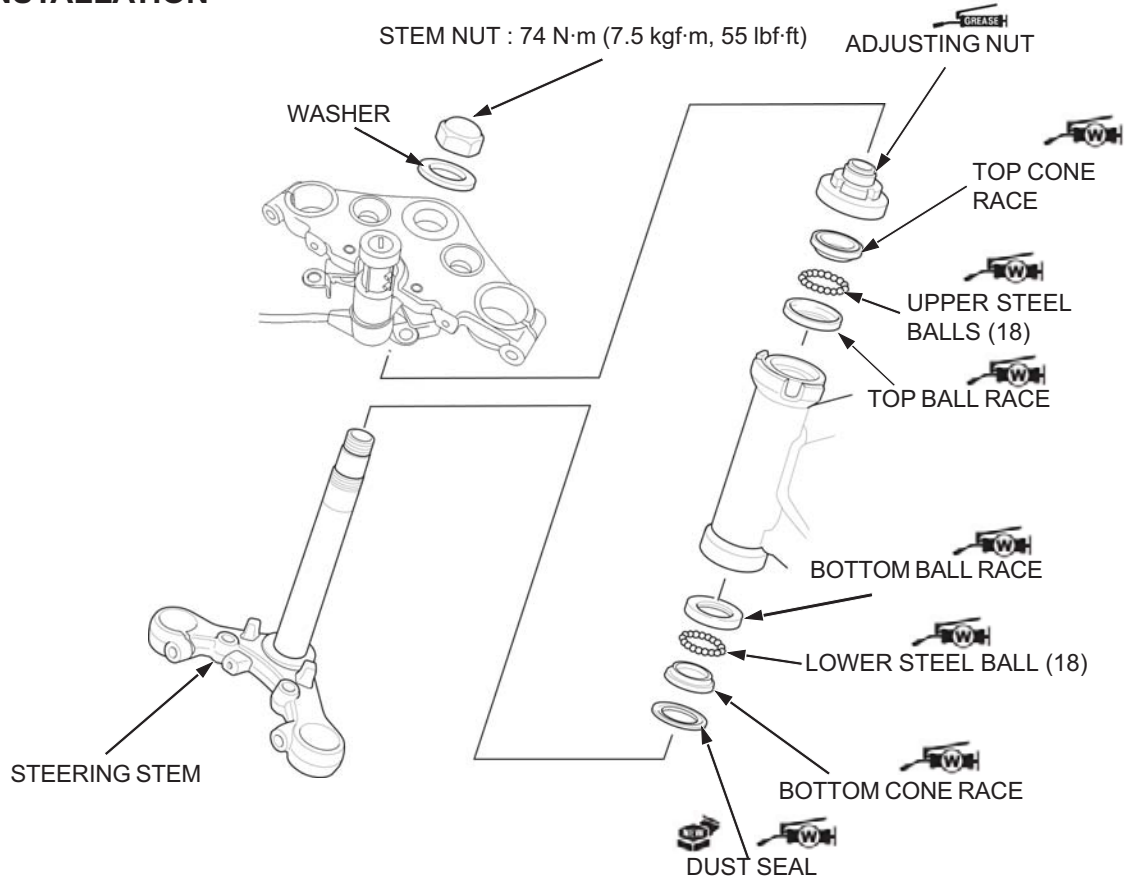
TOOL:

Steering cone installer 070SRTKSP007

Install the dust seal.



INSTALLATION



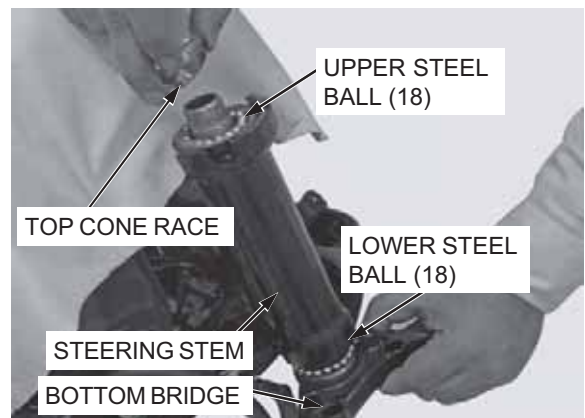
Apply grease with extreme pressure to all bearing area.

Install the steel balls in the bottom cone race and top ball race.

Upper steel ball: 18

Lower steel ball: 18

Install the steering stem and top cone race.

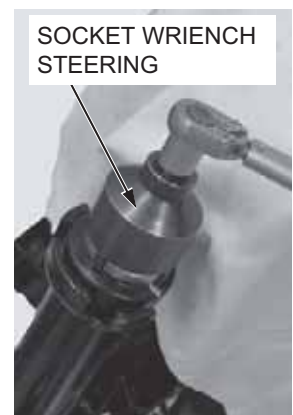


Install the adjusting nut and tighten it to the specified torque.

TOOL:

Socket wrench steering 070SRTKSP004

TORQUE: 27 N.m (2.7 kgf.m, 20 lbf.ft)



Turn the steering stem left and right several times.



Refer to torque wrench reading information on page 12-1 'Service information'.

Temporarily loosen the adjusting nut completely, then retighten the adjusting nut to the specified torque.

TOOL:

Socket wrench steering 070SRTKSP004

TORQUE:

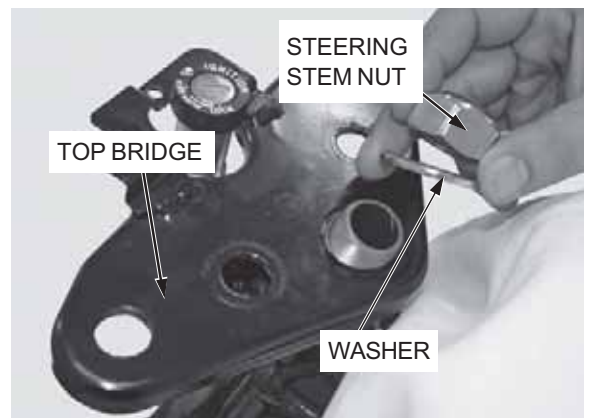
Actual 3.4 N.m (0.4 kgf.m, 2.5 lbf.ft)

Check that there is no vertical play and that the steering stem rotates smoothly.



Install the top bridge.

Install the washer and steering stem nut.



Loosen the bottom pinch bolts when tighten the stem nut.

Install the fork and temporarily tighten the top bridge bolts. Tighten the steering stem nut to the specified torque.

TORQUE : 74 N.m (7.5 kgf.m, 55 lbf.ft)

Turn the steering stem left and right several times and recheck that there is no vertical play and that the steering stem rotates smoothly.

Install the choke cable on the stay

Install the keyset cover.

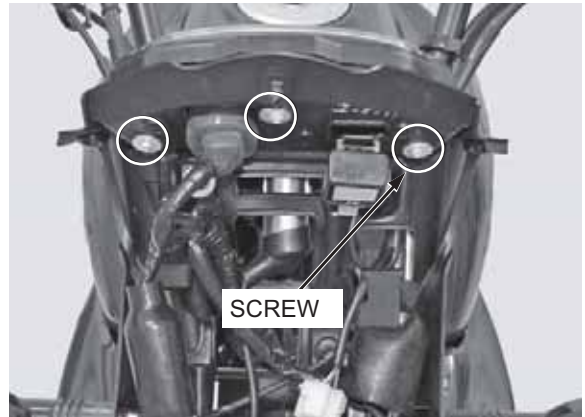


FRONT WHEEL/SUSPENSION/STEERING

Install the meter stay and tighten the meter stay screw (3 nos.).

Install the following;

- front fender (page 2-4)
- handlebar (page 12-4)

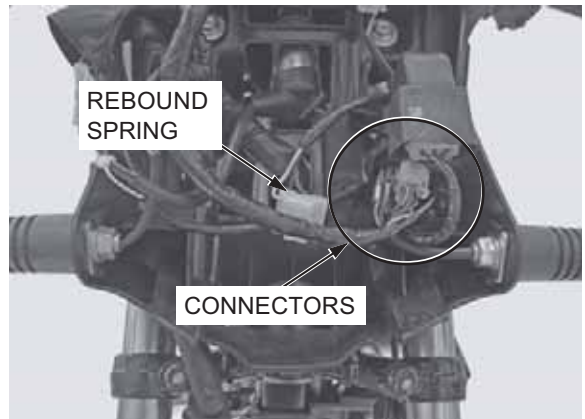


Connect the following:

- left handlebar switch 5P (White) connector 2P White winker relay connector.
- right handlebar starter switch 2P Connector and wire (Black) connector.
- ignition switch 2P (White) connector.
- tachometer wire connector.

Install the following:

- combination meter (page 17-4)
- front cowl (page 2-2)



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 tube between the fork top and bottom bridges.

Make sure that there is no cable or wire harness interference.

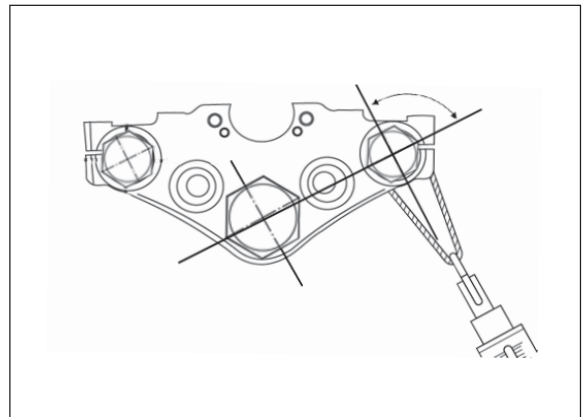
Pull the spring scale keeping the scale at a right angle to the steering stem.

Read the scale at the point where the steering stem just starts to move.

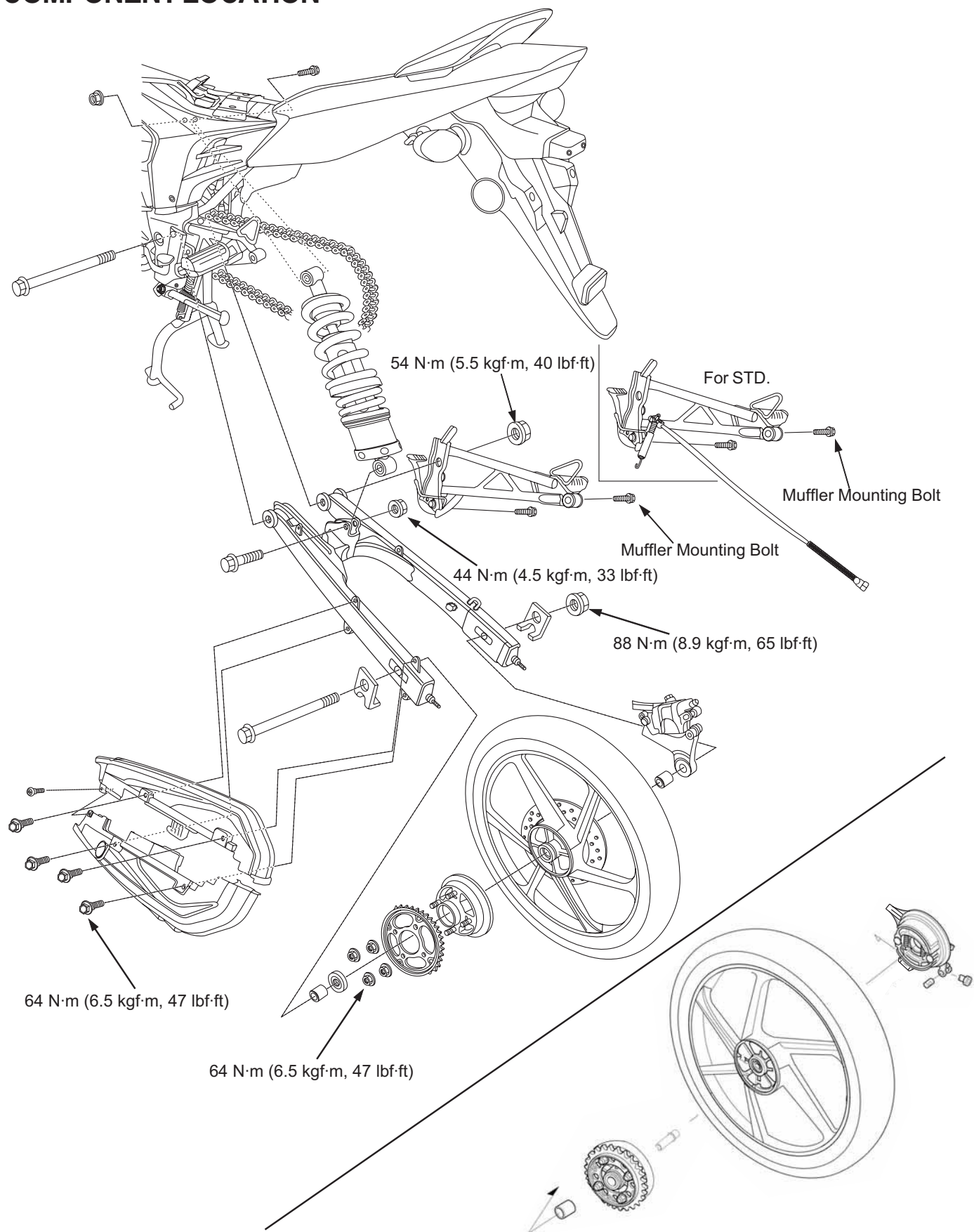
STEERING BEARING PRELOAD:

0.7-1.3 kgf (1.64 - 2.81 lbf)

If the readings do not fall within the limits, readjust the steering top thread.



COMPONENT LOCATION



13. REAR WHEEL/SUSPENSION

COMPONENT LOCATION	13-0	DRIVEN FLANGE	13-9
SERVICE INFORMATION	13-1	SHOCK ABSORBER	13-13
TROUBLESHOOTING	13-3	SWINGARM	13-15
REAR WHEEL	13-4		

SERVICE INFORMATION

GENERAL

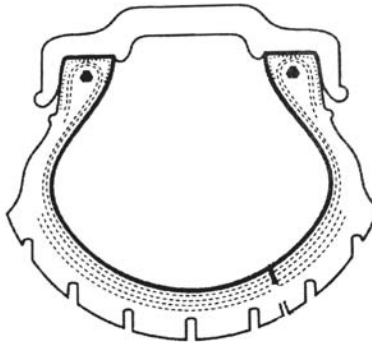
⚠ CAUTION

Frequent inhalation of brake pad (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.

- Riding on damaged rims impairs safe operation of the vehicle.
- When servicing the rear wheel and suspension, support the vehicle using a center stand or hoist.
- A contaminated brake drum or shoe reduces stopping power. Discard contaminated shoes, and clean a contaminated drum with a high quality brake degreasing agent.
- After the rear wheel installation, check the brake operation by applying the brake pedal.
- Refer to the brake system information (page 14-1).
- This vehicle is equipped with the TUBELESS tyre.
- The TUBELESS tyres does not use any inner tube, its inner layer (inner liner) used as instead of tube. Only tubeless tyre is mounted on the rim. Follow bellow caution:
 - Loose the tyre bid from rim with the help of bid breaker. Demount the tyre using a tyre demounting machine.
 - In nail hole puncture case drill the puncture hole to make the inner surface of the puncture hole smooth & to remove contamination
 - In pin hole puncture case mark the puncture hole on inner side. Clean the buffed area & apply chemical vulcanizing solution in the buffed area and in the hole.

13



NOTICE

- Apply soap water for smooth sliding -in of the wheel rim inside the tyre beading portion.
- *When a tire rim is wet or a tire seems under-inflated, check for any abnormalities on the tire and repair if necessary.*
- *Do not use lever or hamrage for demounting the tyre otherwise it breaks the bid or damage the rim.*
- Tyre mounting /demounting must be done only with machine to avoid rim damage.
- *Always use a new TUBELESS tyre that is proper for tire size when replacing.*
- Correct the tyre pressure as per specification.

Unit: mm (in)






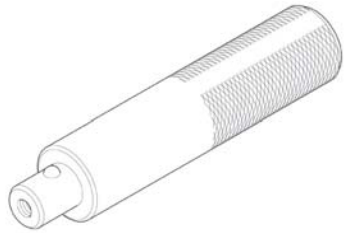
ITEM		STANDARD	SERVICE LIMIT
Minimum tire thread depth		—	2.0 (0.08)
Cold tire pressure	Driver only	200 kPa (2.00 kgf/cm ² , 29 psi)	—
	Driver and passenger	225 kPa (2.29 kgf/cm ² , 32 psi)	—
Axle runout		—	0.2 (0.01)
Wheel rim runout	Radial	—	1.0 (0.04)
	Axial	—	1.0 (0.04)
Drive chain	Size/link	428/126	—
	Slack	30 – 40 (1.1 – 1.5)	—
Brake (Mechanical)	Pedal free play	20 – 30 (0.8 – 1.2)	—
	Drum (ID)	130.0 – 130.2 (5.12 – 5.13)	131.0 (5.16)

SPECIFICATIONS

TORQUE VALUES

Driven sprocket nut	64 N·m (6.5 kgf·m, 47 lbf·ft)	U-nut
Rear axle nut	88 N·m (8.9 kgf·m, 65 lbf·ft)	U-nut
Shock absorber mounting nut	44 N·m (4.5 kgf·m, 33 lbf·ft)	
Swingarm pivot nut	54 N·m (5.5 kgf·m, 40 lbf·ft)	U-nut

TOOLS

Pilot, 12 mm 070GD0041130 	Pilot, 17 mm 070GD0041150 	Attachment, 37 x 40 mm 070GD0021150 
Bearing remover shaft 070GD0051100 	Bearing remover head, 12 mm 070GD0051130 	Driver 070GD0011100 

TROUBLESHOOTING

Rear wheel wobbling

- Bent rim
- Worn or damaged wheel bearings
- Worn or damaged driven flange bearing
- Faulty tire
- Worn or damaged swingarm bushings
- Bent frame or swingarm
- Axle not tightened properly
- Insufficient tire pressure

Wheel turns hard

- Brake drag
- Faulty wheel bearings
- Faulty driven flange bearing
- Bent axle
- Drive chain too tight (page 3-15)

Soft suspension

- Incorrect suspension adjustment
- Weak shock absorber springs
- Oil leakage from damper unit
- Insufficient tire pressure

Hard suspension

- Incorrect suspension adjustment
- Bent shock absorber damper rod
- Damaged suspension or swingarm pivot bushings
- Bent swingarm pivot or frame
- Insufficient tire pressure

Steers to one side or does not track straight

- Drive chain adjusters not adjusted equally
- Bent axle
- Bent frame and/or swingarm
- Damaged swingarm pivot bushings

Rear suspension noise

- Loose suspension fasteners
- Worn or damaged suspension pivot bushings
- Faulty shock absorber

REAR WHEEL

REMOVAL

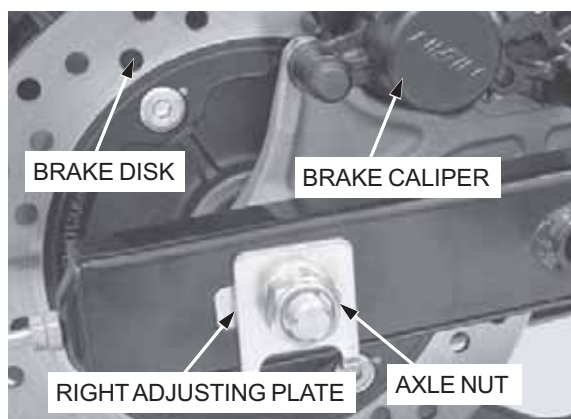
Support the motorcycle on its center stand.

Remove the drive chain (Page 3-15).

Do not hang the caliper by the brake hose. Do not twist the brake hose. Do not operate the brake pedal after removing the rear wheel.

Incase of disk brake

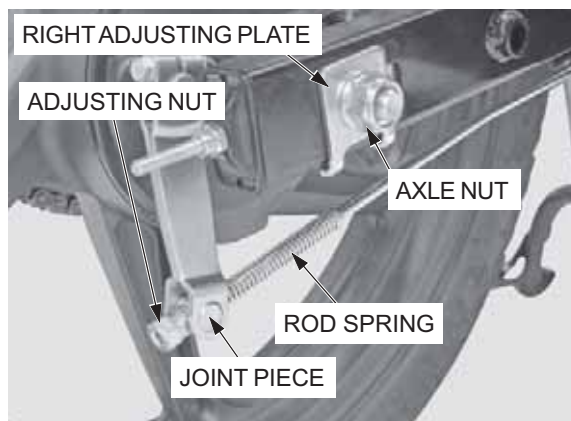
Remove the axle nut and pull out the axle shaft to the left side. Remove the right adjusting plate and slide the disk away from engine to remove rear wheel.



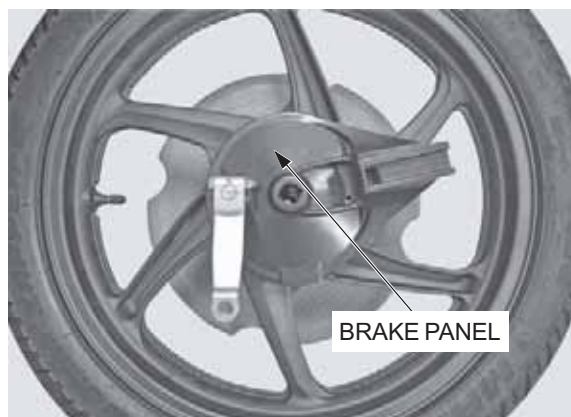
Incase of drum brake

Disconnect the brake rod by removing the brake adjusting nut and remove the rod spring and joint piece.

Remove the axle nut and pull out the axle shaft to the left side. Remove the right adjusting plate and rear wheel.



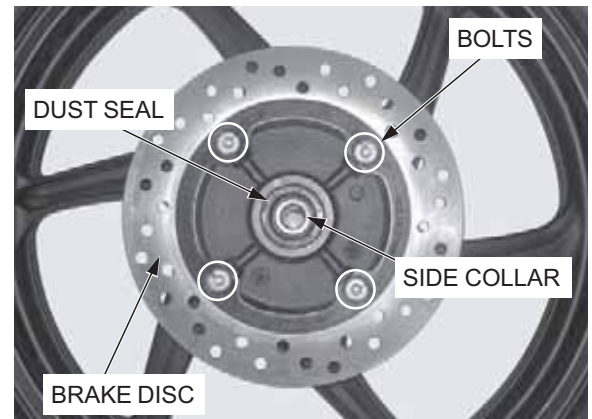
Remove the brake panel assembly from the right side of wheel hub



DISASSEMBLY

Remove the brake disc mounting bolts, collar and brake disc.

Remove the dust seal.



Remove the wheel rubber dampers.



WHEEL BEARING

Install the remover head into the bearing.

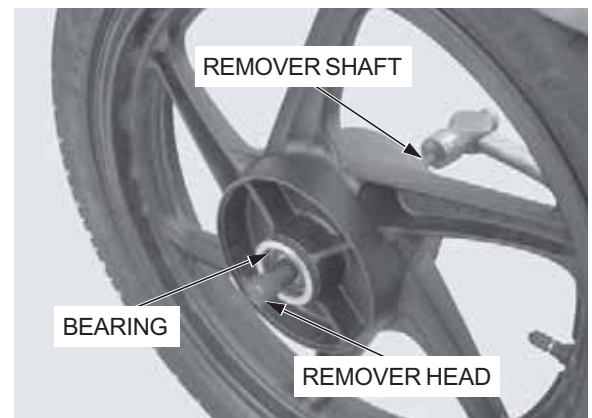
From the opposite side, install the bearing remover shaft, and drive the bearing out of the wheel hub.

Remove the distance collar, and drive out the other bearing.

TOOLS:

Bearing remover head, 12 mm 070GD0051130

Bearing remover shaft 070GD0051100



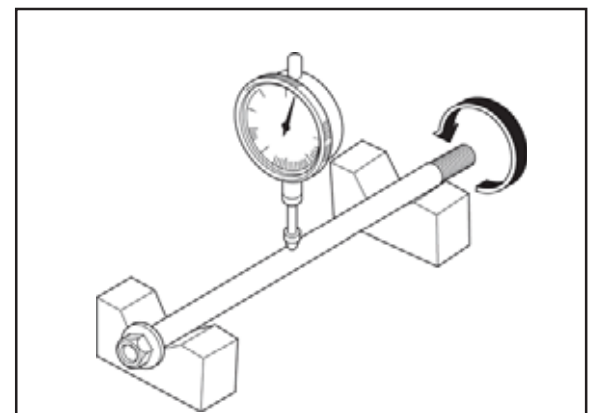
INSPECTION

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)



REAR WHEEL/SUSPENSION

Replace the bearings in pairs.

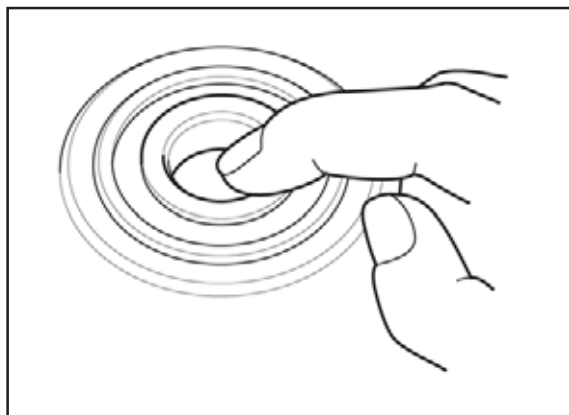
WHEEL BEARING

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.

Remove and discard the bearings if the inner races do not turn smoothly, quietly, or if they fit loosely in the hub.



WHEEL RIM

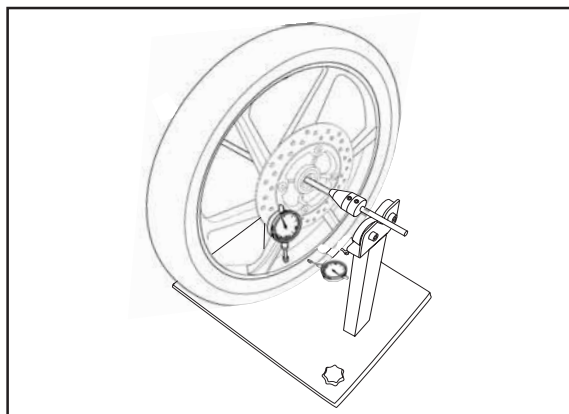
Check the wheel rim runout by placing the wheel in a turning stand.

Spin the wheel by hand, and read the runout using a dial indicator.

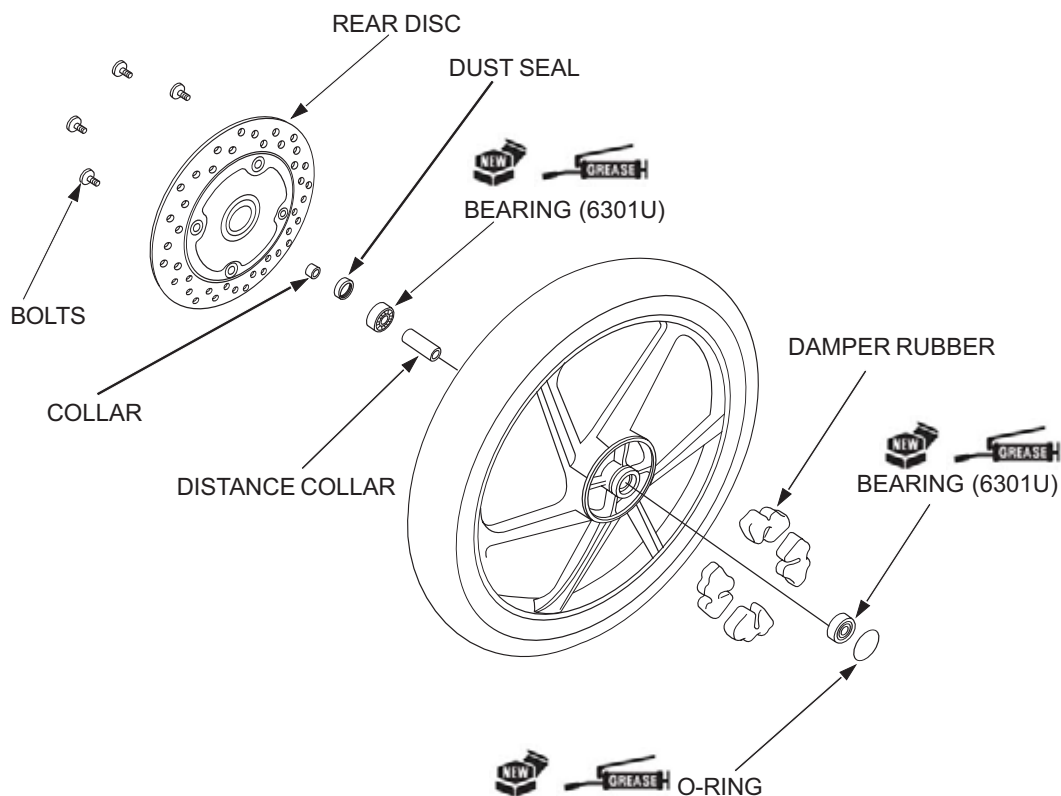
SERVICE LIMITS:

Radial: 1.0 mm (0.04 in)

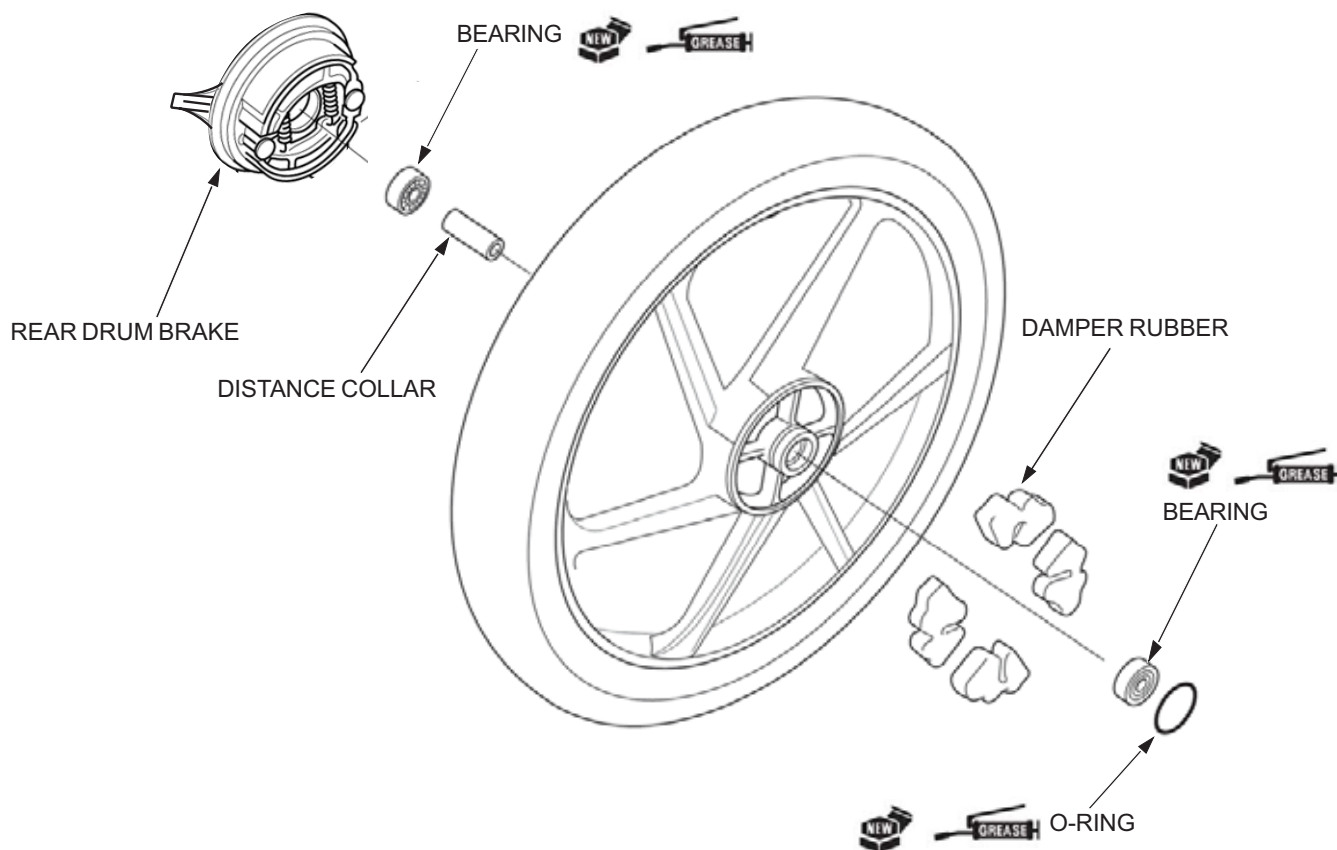
Axial: 1.0 mm (0.04 in)



ASSEMBLY OF DISK BRAKE



ASSEMBLY OF DRUM BRAKE



WHEEL BEARING

Pack new bearing cavities with grease.

Drive in a new right side bearing squarely with the sealed side facing up until it is fully seated.

Apply a thin coat of grease to the distance collar and install it.

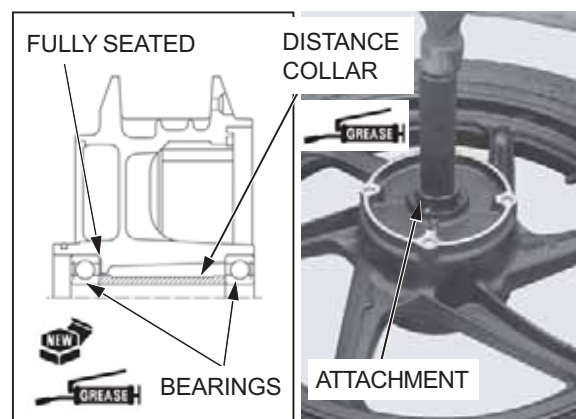
Drive in a new left side bearing with the sealed side facing up.

TOOLS:

Driver 070GD-001I100

Attachment. 42 x 47 mm 070GD-002I160

Pilot, 15 mm 07746-0040300



INSTALLATION IN CASE OF DISK BRAKE

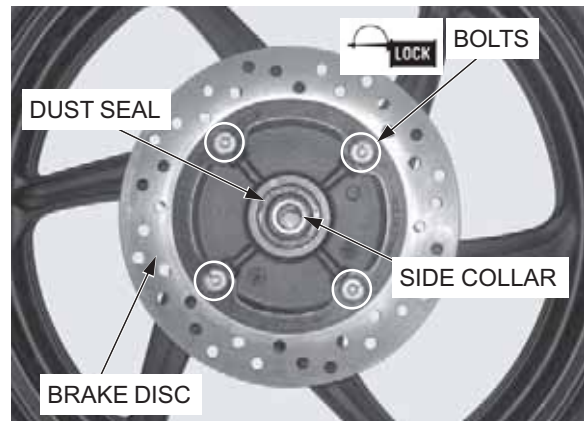
Install the wheel rubber dampers.



Install the brake disc.

Install and tighten the brake disc mounting bolts and apply thread lock in a crisscross pattern in 2 or 3 steps.

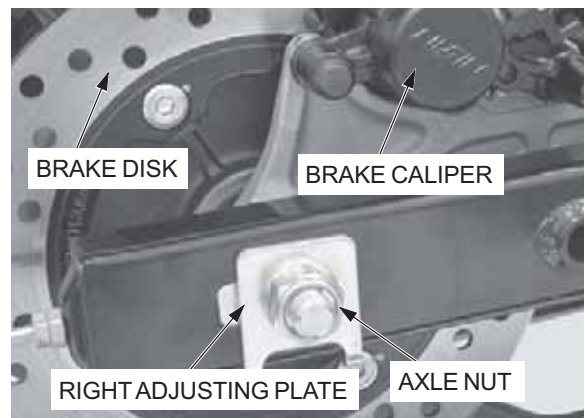
Install the side collar and dust seal.



Be careful not to damage the brake pads while installation.

Slide the disk towards the engine to install rear wheel between the brake pads. Hold the wheel upwards and install axle shaft from swingarm to the other end. Install right Adjusting Plate and screw axle nut to specified torque.

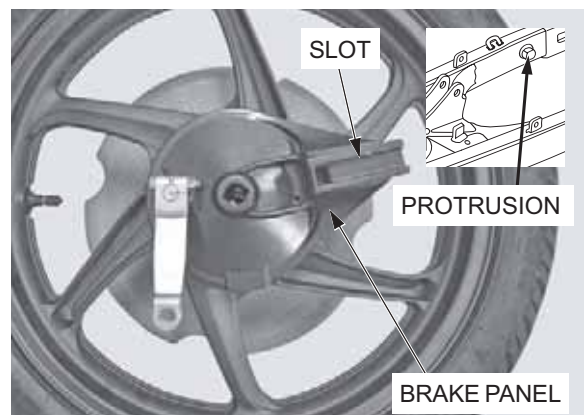
TORQUE: 88 N.m (8.97 kgf.m, 64.9 lbf. ft)



Do not apply grease on the brake drum and shoe linings

INCASE OF DRUM BRAKE

Install the brake panel assembly from the right side of wheel hub such that the slot given on panel could align with the protrusion given on swingarm.



Place the rear wheel in the swingarm by aligning the damper rubber grooves with the driven flange bosses.

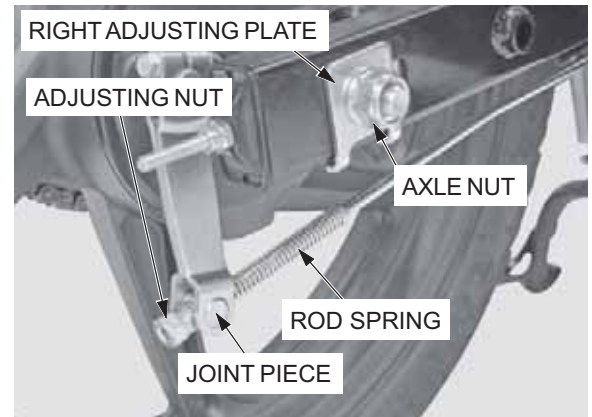
Hold the wheel up and Install rear Axle shaft from left hand side. Install right Adjusting Plate and screw axle nut to specified torque.

TORQUE: 88 N.m (8.97 kgf.m, 64.9 lbf. ft)

Install rod spring and after pushing down the brake pedal connect the brake rod by inserting it into the Joint Piece. Tighten the Adjusting Nut at the end of the rod.

Adjust brake free play.

Free Play: 20-30 mm(0.8 - 1.2 in)



Install drive chain (page 3-15)



DRIVEN FLANGE

REMOVAL

Remove the rear wheel (page 13-4)



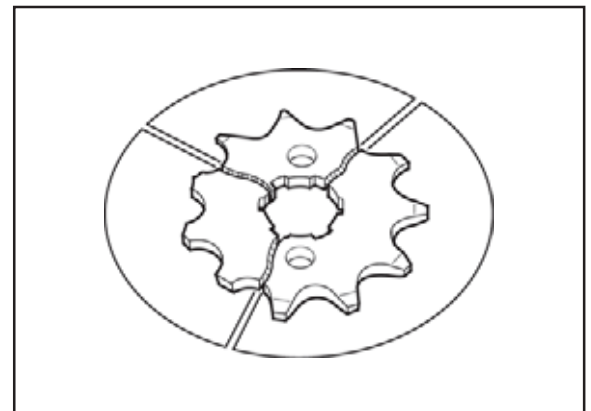
INSPECTION

DRIVEN SPROCKET

Check the condition of the driven sprocket teeth.

Replace the sprocket if it is worn or damaged.

- 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.

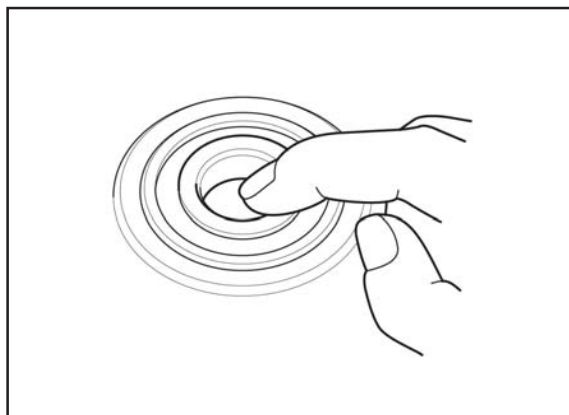


DRIVEN FLANGE BEARING

Turn the inner race of bearing with your finger.

The bearing should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the driven flange.

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



DISASSEMBLY

DRIVEN SPROCKET

Remove the collar.



Hold the drive flange with suitable means.

Remove the nuts and driven sprocket.

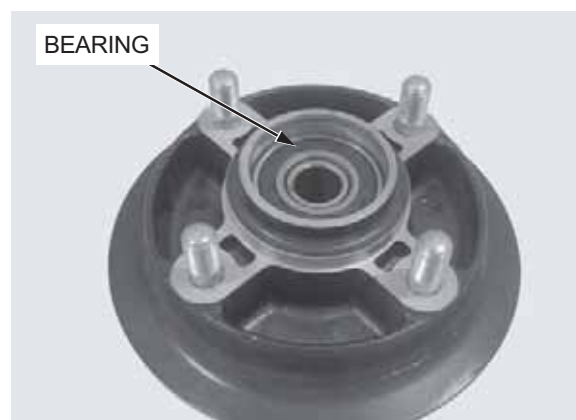


Remove the dust seal.

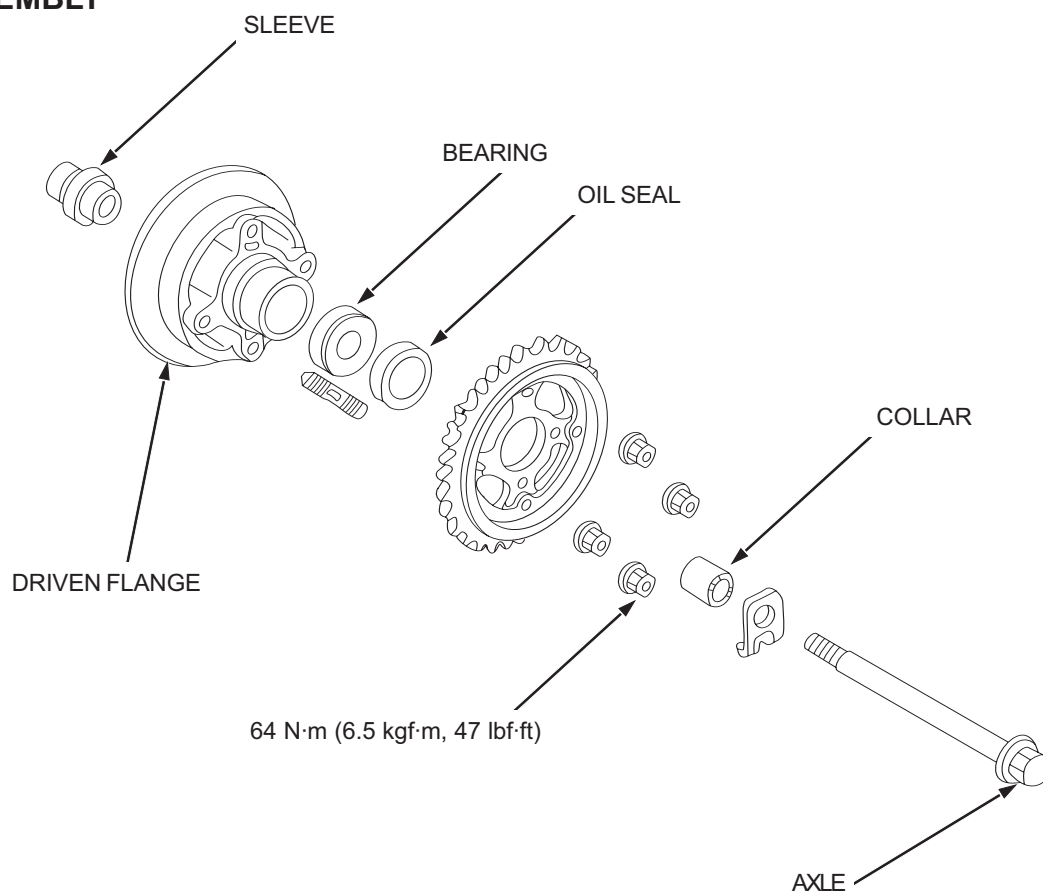


DRIVEN FLANGE BEARING

Drive out the driven flange bearing.



ASSEMBLY



DRIVEN FLANGE BEARING

Pack new bearing cavities with grease.

Drive in a new bearing squarely until it is fully seated.

TOOLS:

Driver	070GD001I100
Attachment, 37 x 40 mm	070GD002I150
Pilot, 17 mm	070GD004I150



REAR WHEEL/SUSPENSION

DRIVEN SPROCKET

Apply grease to the lip of a new dust seal.

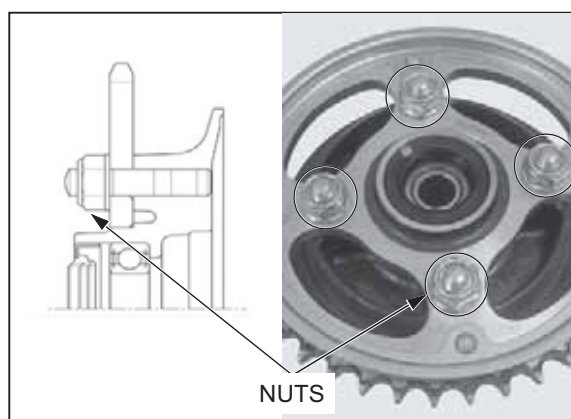
Install the dust seal.



Install the driven sprocket nuts with the chamfered side facing out.

Install the nuts and tighten them.

TORQUE: 64 N.m (6.5 kgf.m, 47 lbf. ft)



Install the collar.



INSTALLATION

Install rear wheel (page 13-8)



SHOCK ABSORBER

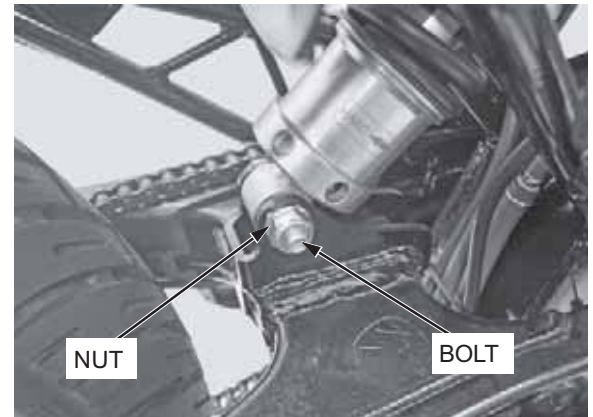
REMOVAL

Place the motorcycle on its center stand.

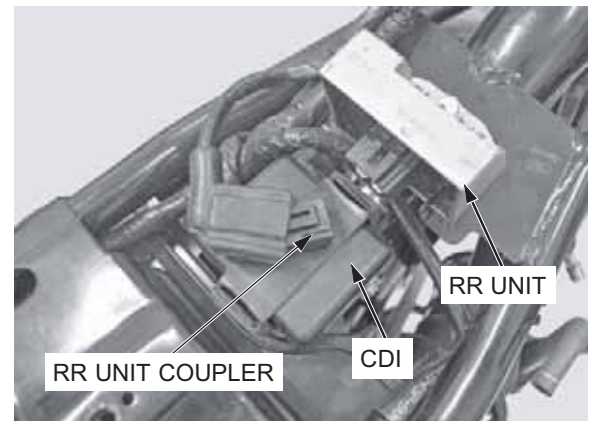
Remove the following:

- chain dust cover (page 3-16)
- fuel tank (page 2-3)

Remove the shock absorber lower mounting nut and bolt.



Remove the coupler of RR unit and remove CDI.



Remove the shock absorber upper mounting nut, bolt and shock absorber.



INSPECTION

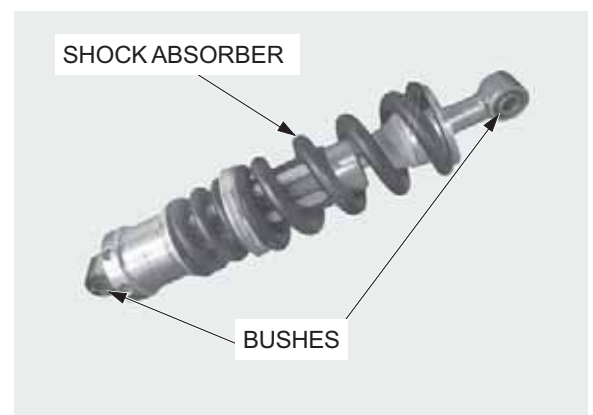
Visually inspect the shock absorber for wear, leakage or damage.

Check the following:

- damper rod for bend or damage.
- damper unit for leakage or other damage.
- bushing for wear or damage.

Check for smooth damper operation.

Replace the shock absorber as an assembly if necessary.



Shock absorber shall be installed with adjust label right side.

INSTALLATION

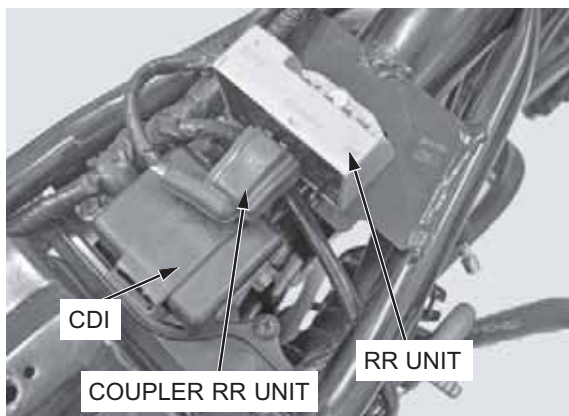
Install the shock absorber.



Install the upper mounting nut and bolt.



Install CDI and coupler of RR unit.



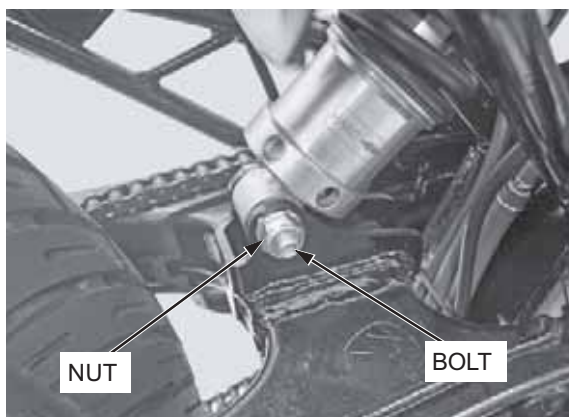
Install the lower bolt and nut.

Tighten the lower mounting nut to the specified torque.

TORQUE: 44 N.m (4.5 kgf.m, 33 lbf. ft)

Install the following:

- fuel tank (page 2-3)
- drive chain dust cover (page 3-16)



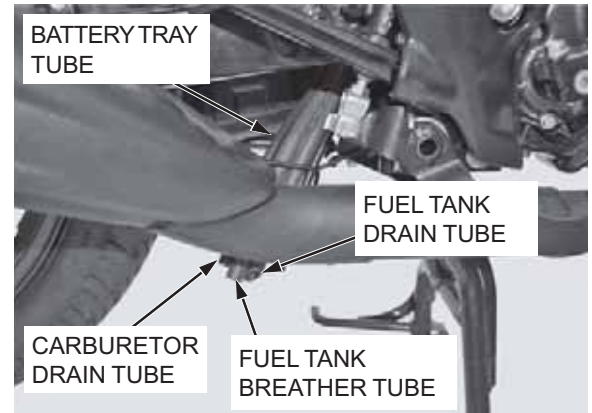
SWINGARM

REMOVAL

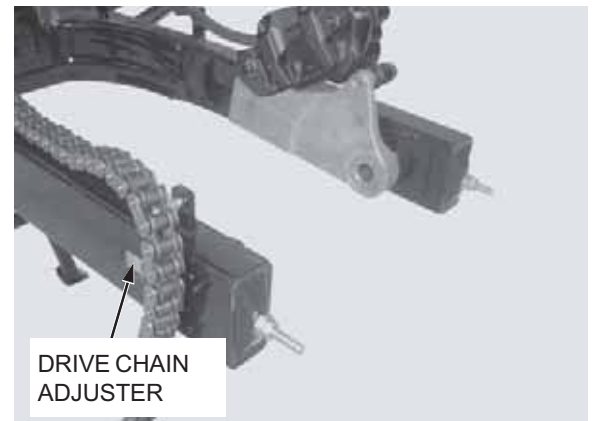
Remove the following:

- rear wheel (page 13-4)

Remove the carburetor drain tube, fuel tank drain tube, fuel tank breather tube and battery tray tube from the swingarm.

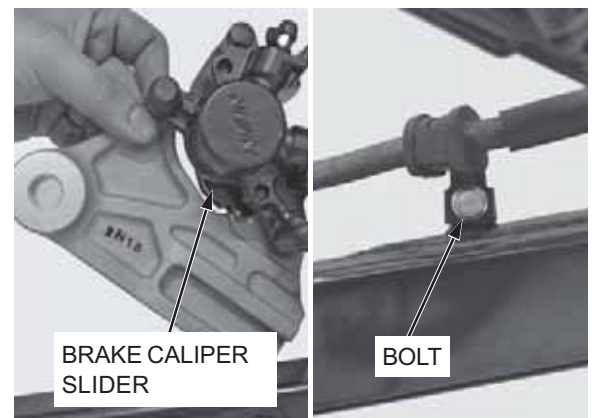


Remove the drive chain adjusters.

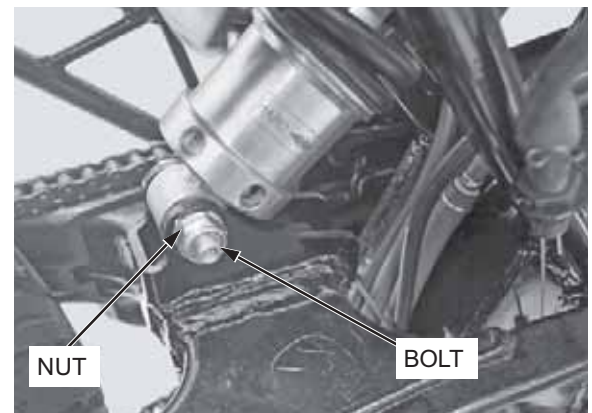


Remove the bolts from rear brake caliper hose and remove the brake caliper slider.

For drum brake disassembly refer (page 13-4) as it will come out with rear wheel.



Remove the shock absorber lower mounting nut and bolt.



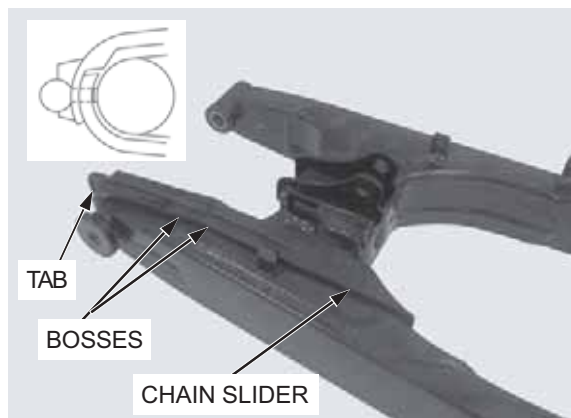
REAR WHEEL/SUSPENSION

Remove the swingarm pivot nut.



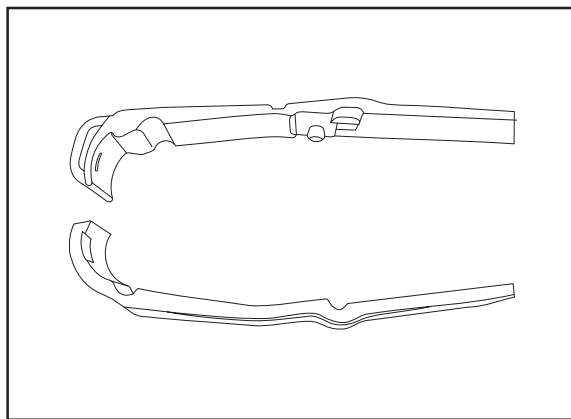
DISASSEMBLY

Remove the chain slider while releasing the bosses from the tabs.



Check the chain slider for wear or damage.

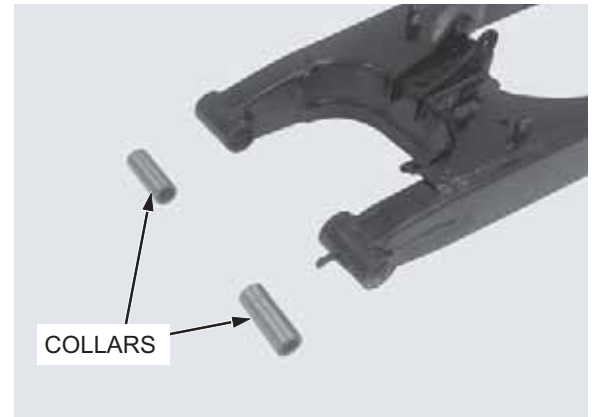
The chain slider must be replaced if it is worn to the wear limit cutout.



Remove the dust seal cap and dust seal.

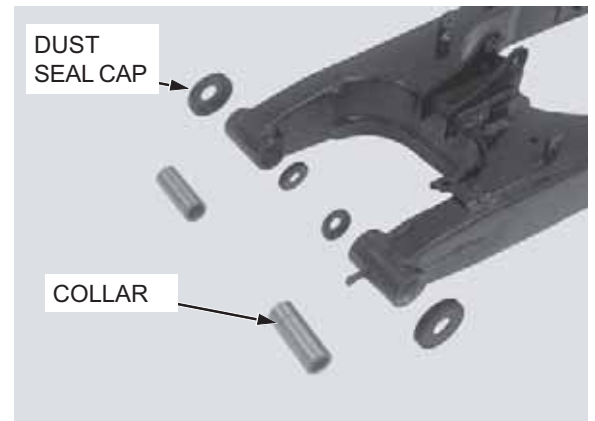


Remove the collars.



Inspect the swingarm dust seal cap, collar and pivot bearings for wear or damage.

Check the swingarm for any damage.



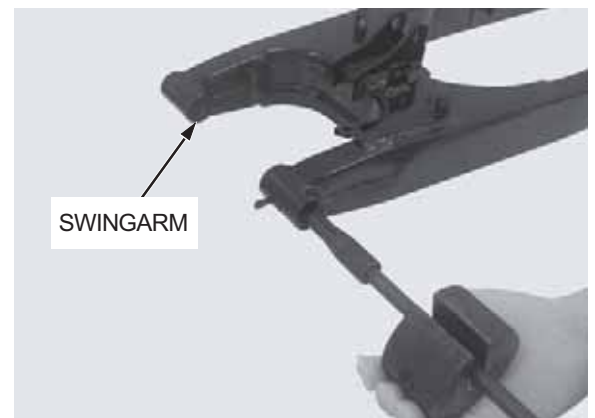
Remove the needle bearings from the swingarm.

TOOLS:

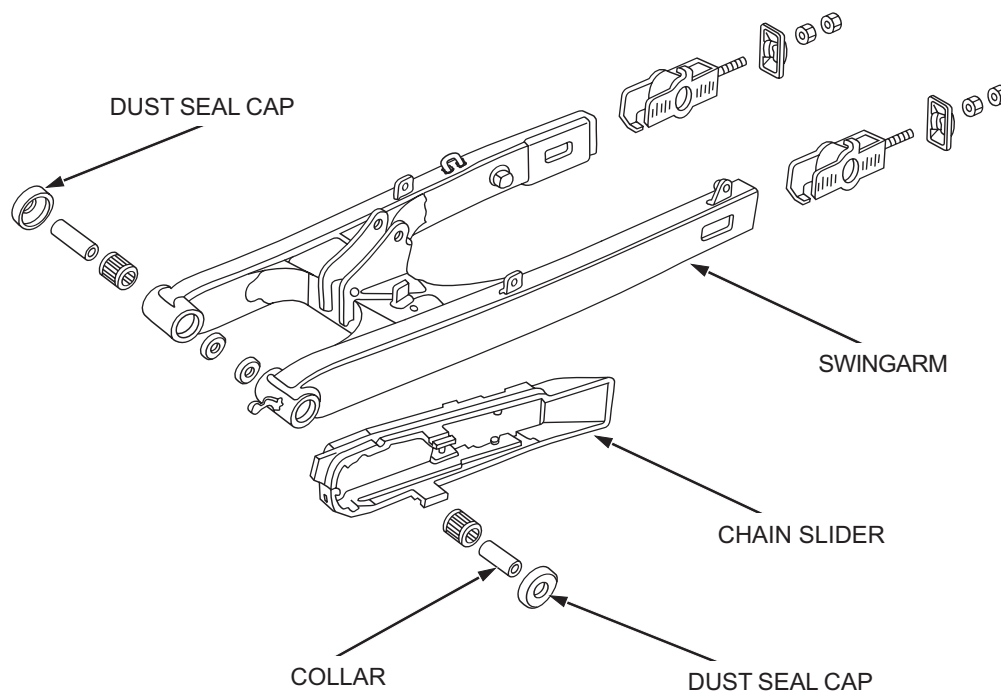
Bearing remover set, 20 mm 07936-3710600

Remover handle 07936-3710100

Remover weight 070MC-KPLI300



ASSEMBLY

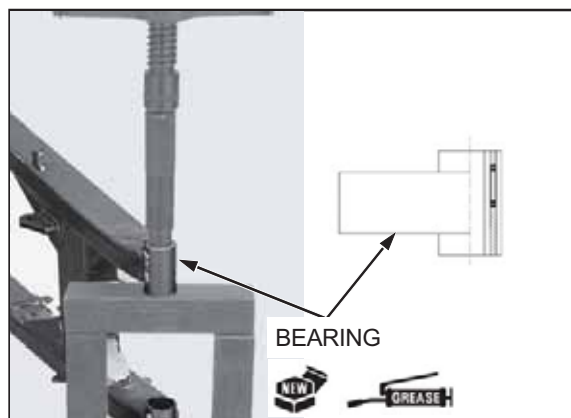


Apply grease to the new needle bearings.

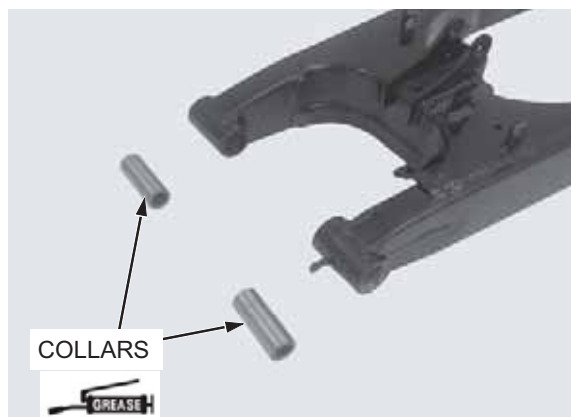
Press the needle bearings into the swingarm so that the needle bearing surface is 7mm (0.3 in) from the end of swingarm pivot, using the special tools and a hydraulic press.

TOOLS:

Driver	070GD-0011100
Attachment, 24 x 26 mm	070GD-0021120
Pilot, 20 mm	070GD-0041160



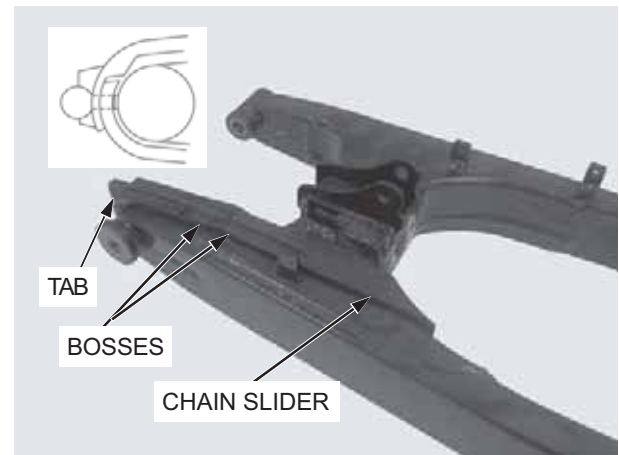
Apply grease to the collar surface and install them into the swingarm pivots.



- Apply grease to the dust seal cap tips.
- Install the dust seal caps.
- Install the chain slider tabs to the swingarm holes.



- Install the chain slider while aligning tabs with bosses.



INSTALLATION

- Install the swingram pivot nut.
 - Tighten the pivot nut to the specified torque.
- TORQUE: 54 N.m (5.5 kgf.m, 40 lbf.ft)**

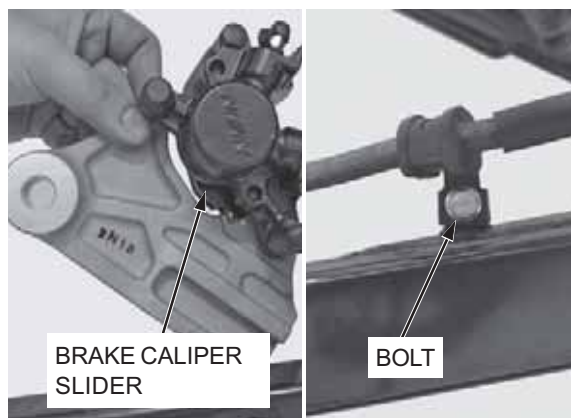


- Install the shock absorber lower mounting bolt and nut.
 - Tighten the nut to the specified Torque.
- TORQUE: 44 N.m (4.5 kgf.m, 33 lbf.ft)**

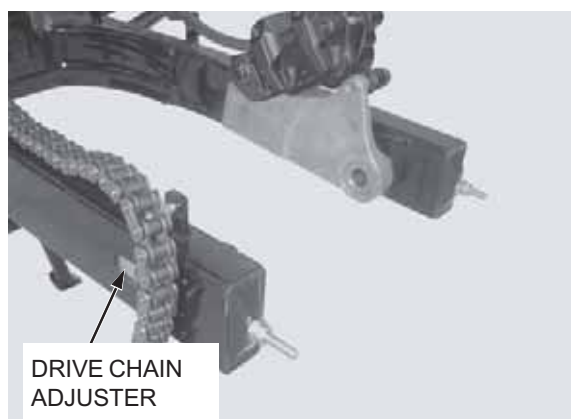


REAR WHEEL/SUSPENSION

Tighten the two bolts for rear brake caliper hose and install it.



Install the drive chain adjusters.



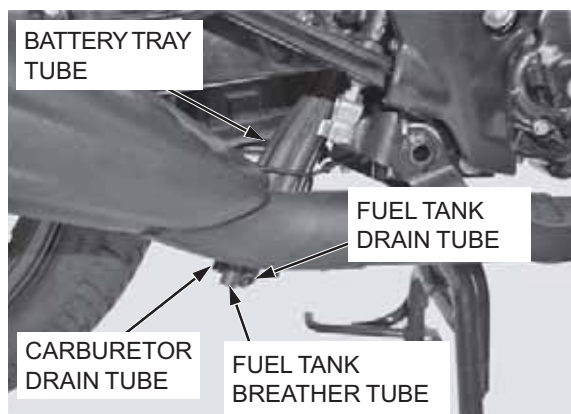
Install the carburetor drain tube, fuel tank drain tube, fuel tank breather tube and battery tray tube in to the swingarm.

Install the following:

- rear wheel (page 13-8)

Adjust the drive chain slack (page 3-15).

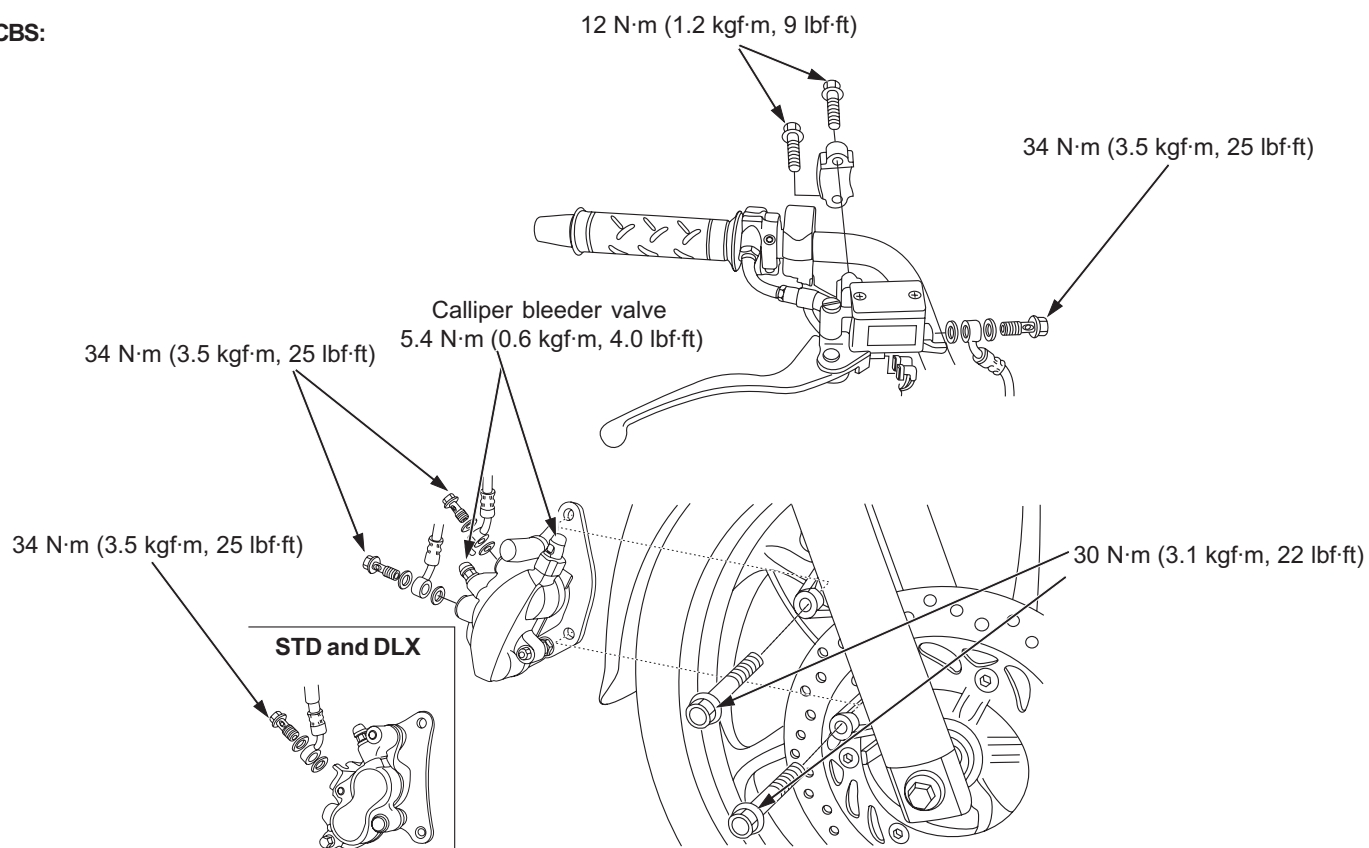
For drum brake installation (page13-8).



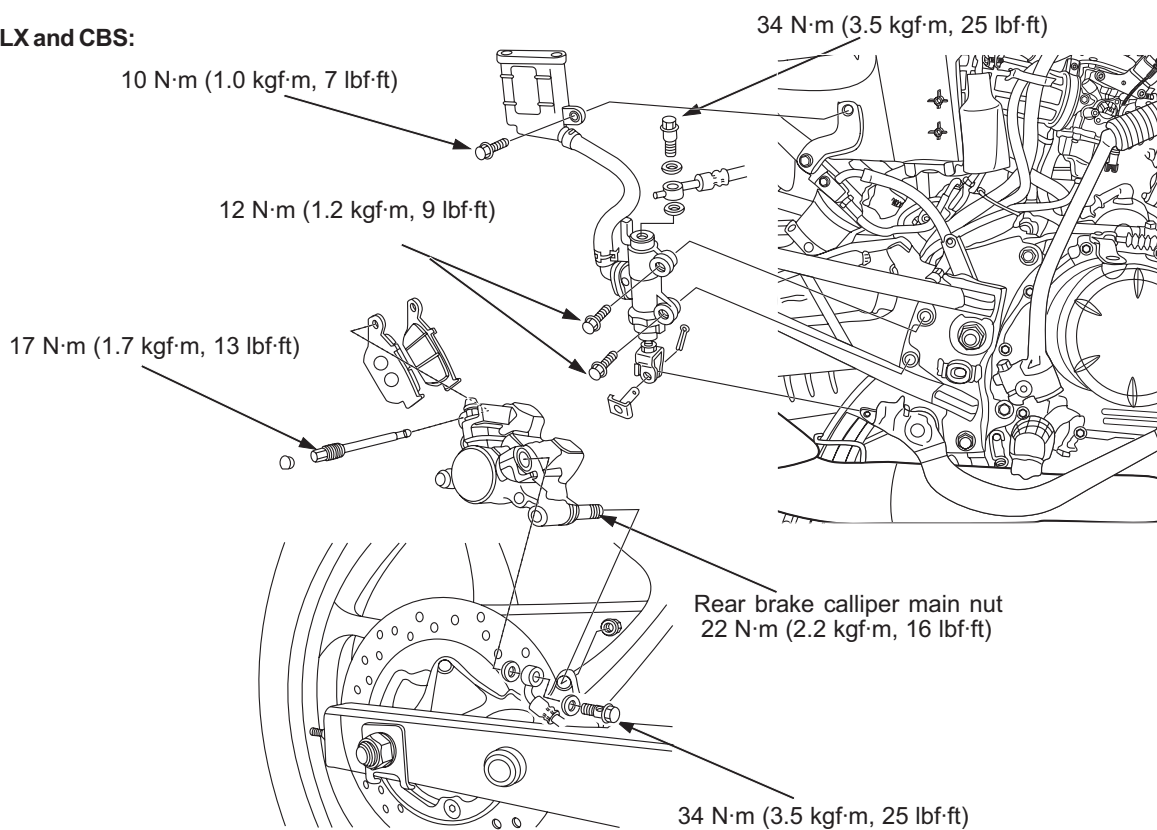
MEMO

COMPONENT LOCATION

CBS:



DLX and CBS:



14. BRAKE SYSTEM

COMPONENT LOCATION	14-0	REAR BRAKE	14-7
SERVICE INFORMATION	14-1	FRONT BRAKE PAD/ DISK	14-8
TROUBLESHOOTING	14-2	FRONT MASTER CYLINDER	14-11
BRAKE FLUID REPLACEMENT/ AIR BLEEDING (CBS)	14-4	FRONT BRAKE CALIPER	14-16
		REAR BRAKE PAD/ DISC	14-22
BRAKE FLUID FILLING/ AIR BLEEDING (CBS)	14-5	REAR MASTER CYLINDER	14-24
		REAR BRAKE CALIPER	14-28
PEDAL (COMBI) BRAKE FLUID FILLING	14-6	BRAKE PEDAL	14-31
FRONT BRAKE (CBS)	14-6	REAR DRUM BRAKE	14-32

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 cover; make sure the front reservoir is horizontal first.

- 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 or pedal 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.
- This section covers service of the combi brake components of the brake system.

14

SPECIFICATIONS

Unit: mm (in)

	ITEM		STANDARD	SERVICE LIMIT
Front	Specified brake fluid		DOT 3 or DOT 4	—
	Brake disc thickness		4 mm (0.15 in)	3.5 mm (0.13 in)
	Brake disc Runout		—	0.10 (0.004)
	Master cylinder I.D.	STD & DLX	12.700 - 12.743 (0.4999 - 0.5017)	12.775 (0.5029)
		CBS	11.000 - 11.043 (0.4331 - 0.4348)	11.055 (0.4352)
	Master Piston O.D.	STD & DLX	12.657 - 12.684 (0.4983 - 0.4994)	12.645 (0.4978)
		CBS	10.057 - 10.084 (0.4314 - 0.4324)	10.945 (0.4309)
	Caliper cylinder I.D. (STD & DLX)		25.400 - 25.450 (1.0000 - 1.0020)	25.460 (1.0024)
	Caliper cylinder I.D.(CBS)	Cylinder A	25.400 - 25.450 (1.0000 - 1.0020)	25.460 (1.0024)
		Cylinder B	22.650 - 22.700 (0.8917 - 0.8937)	22.710 (0.8941)
Rear	Specified brake fluid		DOT 3 or DOT 4	—
	Brake disc thickness		4 mm (0.15 in)	3.5 mm (0.13 in)
	Brake disc warpage		—	0.10 (0.004)
	Master cylinder I.D.	DLX	12.700 - 12.743 (0.4999 - 0.5017)	12.775 (0.5029)
		CBS	14.000 - 14.043 (0.5512 - 0.5529)	14.055 (0.5533)
	Caliper piston O.D. (STD & DLX)		25.318 - 25.368 (0.9968 - 0.9987)	25.31 (0.996)
	Caliper piston O.D. (CBS)	Piston A	25.318 - 25.368 (0.9968 - 0.9987)	25.31 (0.996)
		Piston B	22.585 - 22.618 (0.8892 - 0.8905)	22.56 (0.888)

BRAKE SYSTEM

Rear	Master cylinder O.D.	DLX	12.657 - 12.684 (0.4983 - 0.4994)	12.645 (0.4978)
		CBS	13.957 - 13.984 (0.5495 - 0.5529)	13.945 (0.5490)
	Caliper cylinder I.D.		32.030 - 32.080 (1.2610 - 1.2629)	32.090 (1.2634)
	Caliper piston O.D.		31.948 - 31.998 (1.2578 - 1.2598)	31.94 (1.2575)
	Brake Pedal Height		66.0 - 68.0 (2.60 - 2.67)	—

TORQUE VALUES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Caliper bleeder valve	1	10	5.4 (0.6, 4.0)	NOTE 2
Master cylinder reservoir cap screw	2	4	1.5 (0.1, 1.1)	
Brake caliper mounting bolt	2	8	30 (3.1, 22)	
Front brake light switch screw	1	4	1.2 (0.1, 0.9)	
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)	
Front brake caliper pin	2	8	17 (1.7, 12)	
Rear brake caliper hangar pin	1	10	17 (1.7, 12)	
Rear brake caliper secondary pin	1	8	12 (1.2, 9)	
Rear brake caliper main nut	1	12	22 (2.2, 16)	
RR M/C (Step holder fitting use)	2	6	12 (1.2, 9)	

TROUBLESHOOTING

FRONT/ REAR DISC BRAKE

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

REAR DRUM BRAKE

Poor brake performance

- Improperly adjusted brake
- Worn brake linings
- Worn brake drum
- Worn brake cam
- Improperly installed brake linings
- Brake cable sticking/needs lubrication
- Contaminated brake linings
- Contaminated brake drum
- Worn brake shoes at cam contact area
- Improper engagement between brake arm and serrations

Brake lever hard or slow return

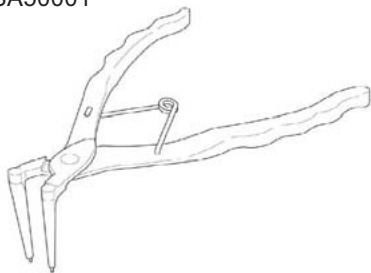
- Worn/broken return spring
- Improperly adjusted brake
- Sticking brake drum due to contamination
- Worn brake shoes at cam contact area
- Brake cable sticking/needs lubrication
- Improperly installed brake linings

Brake squeaks

- Worn brake linings
- Worn brake drum
- Contaminated brake linings
- Contaminated brake drum

TOOL

Snap ring pliers
07914-SA50001



BRAKE FLUID REPLACEMENT/ AIR BLEEDING(CBS)

Cover the painted parts and the surrounding area of master cylinder by shop cloth to avoid paint surface damage due to brake fluid seepage.

BRAKE FLUID DRAINING

Front brake:

Support the motorcycle on it's center stand.

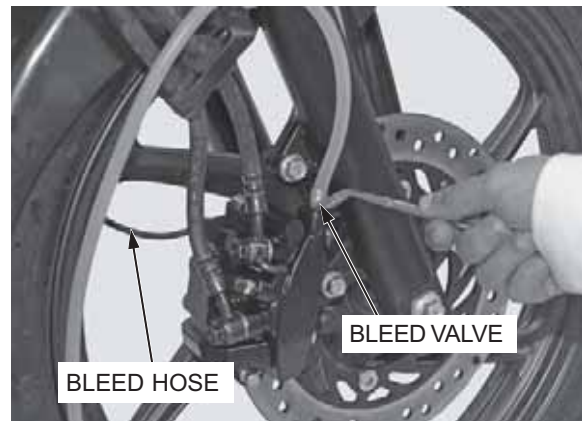
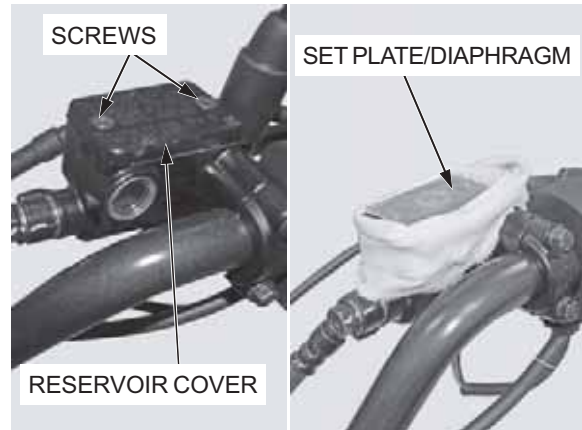
Turn the handlebar until the reservoir is parallel to the ground.

Remove the reservoir cover screws, reservoir cover, set plate and diaphragm.

Connect bleed hose to the front brake caliper to upper bleed valve.

Loosen the upper bleed valve and pump the brake lever untill no more fluid flows out of the bleed valve.

Tighten the bleed valve.



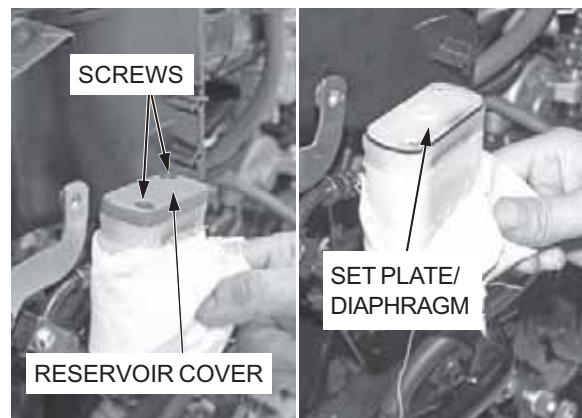
CBS Line:

Remove the right side cover (page 2-3)

Remove the mounting bolt of brake fluid reservoir. Remove reservoir cover screw, reservoir cover, setplate and diaphragm.

NOTE:

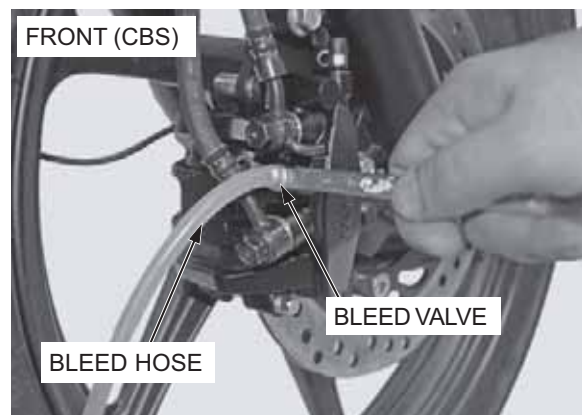
- Do not allow foreign material to enter the system when filling the reservoir.
- When using a commercially available brake bleeder, follow the manufacture's operating instructions.



Connect the bleed hose to the front brake caliper upper bleed valve.

Loosen the upper bleed valve and pump the brake lever untill no more fluid flows out of the bleed valve.

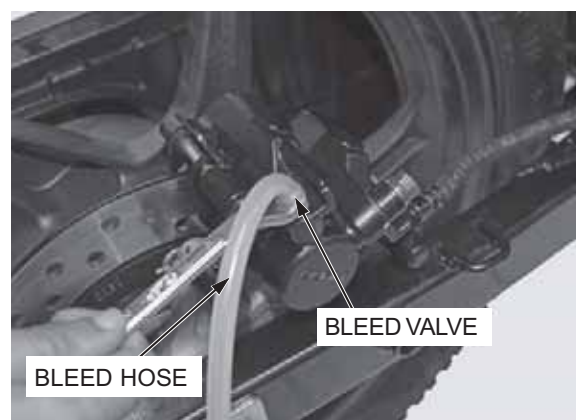
Tighten the bleed valve.



Connect a bleed hose to the rear brake caliper bleed valve.

Loosen the bleed valve and pump the brake pedal until no more fluid flows out of the bleed valve.

Tighten the bleed valve.



BRAKE FLUID FILLING/AIR BLEEDING

Front Brake:

Close the bleed valves.

Do not mix different types of fluid. These are not compatible.

Fill the reservoir with DOT 3 or DOT 4 brake fluid from a sealed container.

Connect an automatic refill system to the reservoir.

NOTE:

- If an automatic refill system is not used, add brake fluid when the fluid level in the reservoir is low.
- Check the fluid level often while bleeding the brakes to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.
- If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Connect a commercially available brake bleeder to the front brake caliper upper bleed valve.

Operate the brake bleeder and loosen the bleed valve.

Perform the bleeding procedure until the system is completely flushed/bled.

Close the bleed valve and operate the brake lever. If it is still spongy, bleed the system again.

After bleeding the air completely, tighten the brake caliper bleed valve to the specified torque.

TORQUE: 5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)

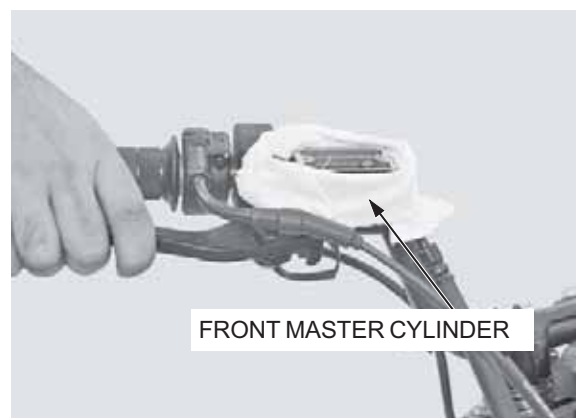
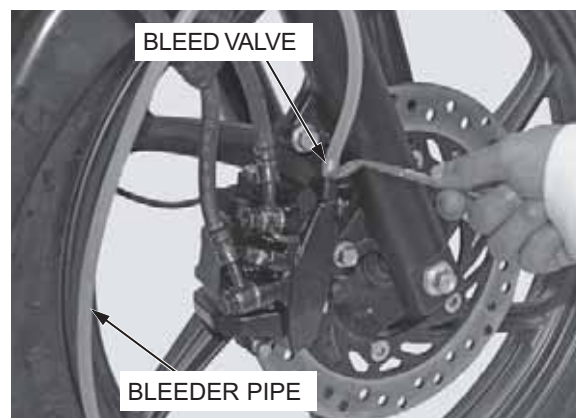
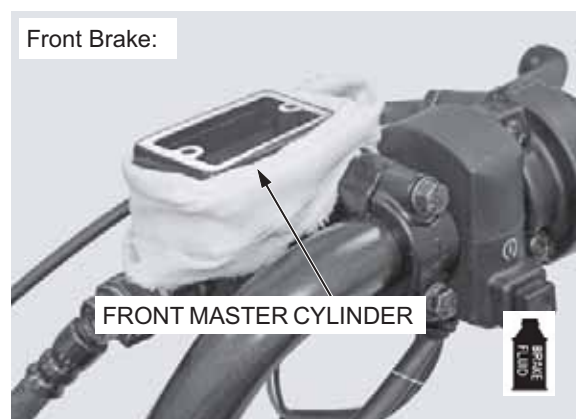
If a brake bleeder is not available, use the following procedure:

Fill the reservoir with DOT 3 or DOT 4 brake fluid from a sealed container.

Connect a bleed hose to the front brake caliper bleed valve.

Pressurize the system with the brake lever until lever resistance is felt.

1. Squeeze the brake lever, open the bleed valve ¼ turn and then close the valve.
2. Release the brake lever until the bleed valve has been closed.



BRAKE SYSTEM

NOTE:

- Do not release the lever until the bleed valve has been closed.

Repeat steps 1. and 2. until air bubbles do not appear in the bleed hose.

After bleeding the air completely, tighten the brake caliper bleed valve to the specified torque.

TORQUE: 5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)

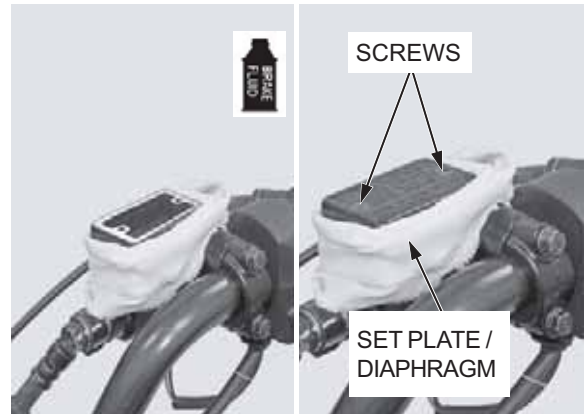


Fill the reservoir to upper level line (casting ledge) with DOT 3 or DOT 4 brake fluid.

Install the diaphragm and set plate.

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

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



Do not mix different types of fluid. These are not compatible.

PEDAL (COMBI) BRAKE FLUID FILLING

Add fluid and bleed any air from the pedal brake line in the sequence as follow:

1. Front brake caliper center bleed valve
2. Rear brake caliper bleed valve

Fill the reservoir with DOT 3 or DOT 4 brake fluid from a sealed container.

Operate the brake pedal several times to bleed the air from the master cylinder.



Always bleed front line of CBS before rear line.

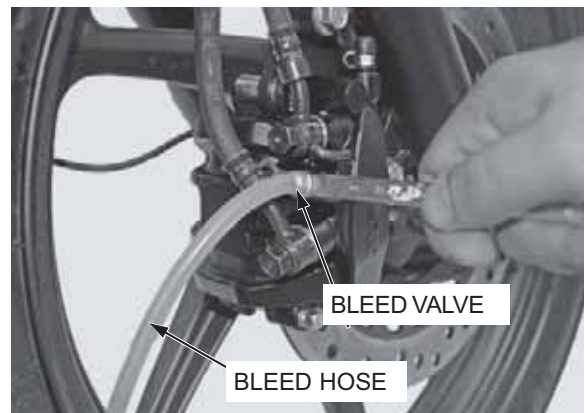
FRONT BRAKE (CBS)

Connect a commercially available brake bleeder to the front brake caliper center bleed valve.

NOTE:

If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

1. Operate the brake bleeder and loosen the front brake caliper center bleed valve. Add fluid when the fluid level in the master cylinder is low to prevent drawing air into the system.
2. Repeat the above procedures until a sufficient amount of fluid flows out of the front brake caliper center bleed valve.



If the fluid contains air bubbles in the line:

1. Pump the brake pedal several (5 – 10) times quickly, then push the brake pedal all the way down, loosen the front brake caliper center bleed valve 1/4 of turn.

Wait few seconds and close the bleed valve.

Release the brake pedal slowly and wait few seconds after it reaches the end of its travel.

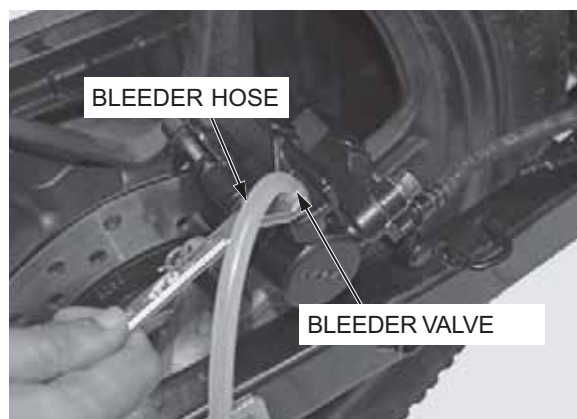
2. Repeat the above procedures until air bubbles do not appear in the transparent bleed hose.



REAR BRAKE

Connect a commercially available brake bleeder to the rear brake caliper bleed valve.

Repeat the above steps for rear brake bleeding.



If a brake bleeder is not available, use the following procedure:

Connect a bleed hose to the front brake caliper center bleed valve.

1. Pump the brake pedal several (5 – 10) times quickly, then push the brake pedal all the way down, loosen the front brake caliper center bleed valve 1/4 of turn. Wait several seconds and close the bleed valve.

Release the brake pedal slowly and wait few seconds after it reaches the end of its travel.

2. Repeat the above procedures until a sufficient amount of the fluid flows out from the front brake caliper center bleed valve.



After there are no more air bubbles in the fluid, repeat the air bleeding procedure about two or three times at each bleed valve.

Make sure the bleed valves are closed and operate the brake pedal. If it still feels spongy, bleed the system again.

After bleeding the air completely, tighten the brake caliper bleed valve to the specified torque.

TORQUE: 5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)

Fill the reservoir [1] to the "UPPER" level [2] with DOT 3 or DOT 4 brake fluid.

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

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



BRAKE SYSTEM

Install the rear reservoir and reservoir mounting bolt.

Tighten the rear reservoir mounting bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



BRAKE PAD/DISC

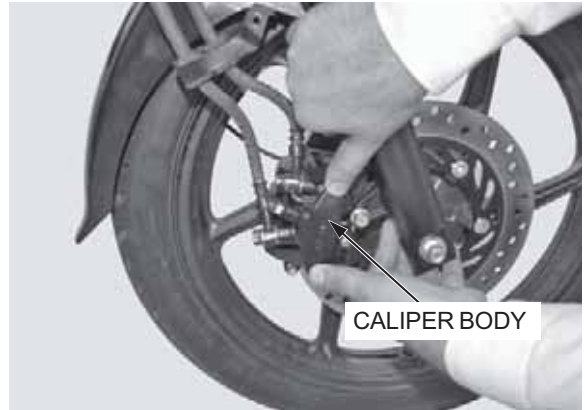
Always replace the brake pads in pairs to assure even disc pressure.

FRONT BRAKE PAD REPLACEMENT (CBS)

Push the caliper pistons all the way in to facilitate installation of new brake pads (giving some space).

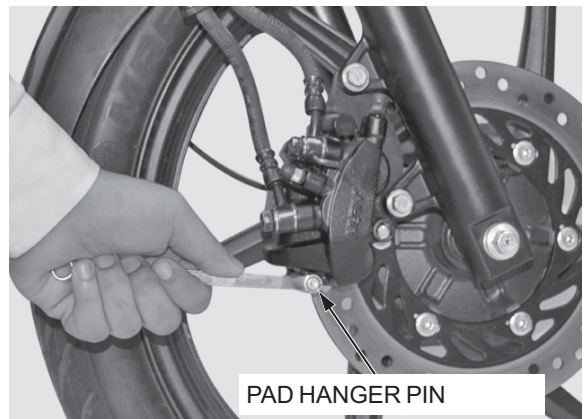
NOTE:

Check the brake fluid level in the brake master cylinder reservoir as this operation causes the level to rise.



Remove the brake pad hanger pin by unscrewing it with the help of wrench.

Check the pad pin for abnormal wear or distortion. Replace if necessary.

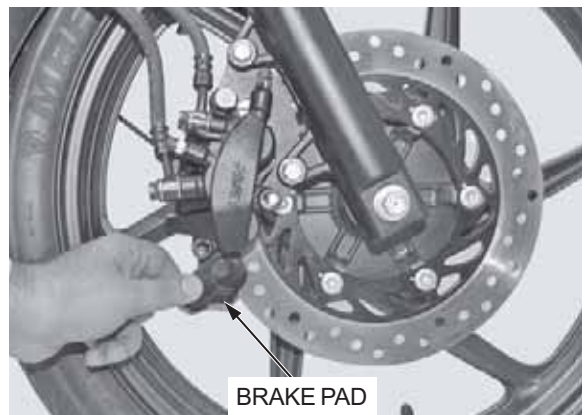


Do not operate the rear brake pedal or front brake lever after the brake pads are removed.

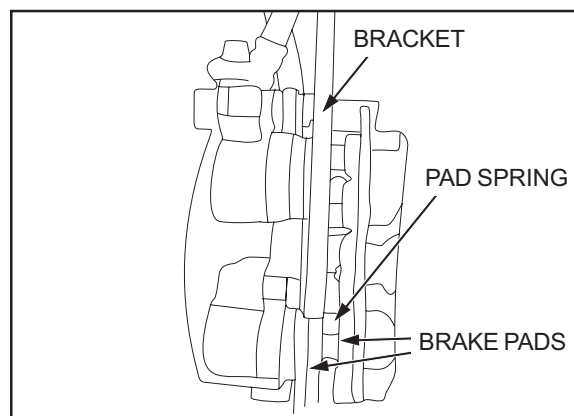
Remove the brake pads.

Clean the brake caliper inside especially around the piston.

Install new brake pads if found below specification.



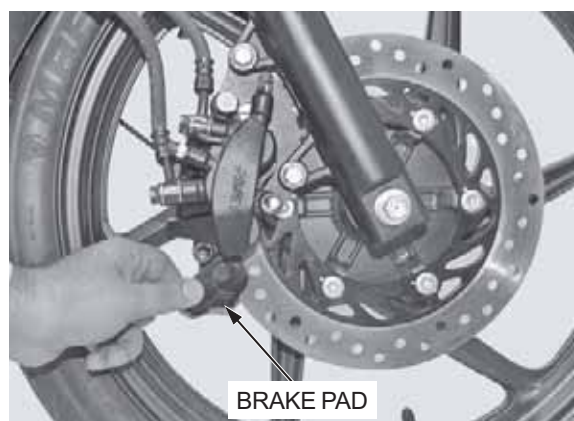
Make sure the pad spring is installed in position.



Be careful not to apply grease on brake pads.

INSTALLATION

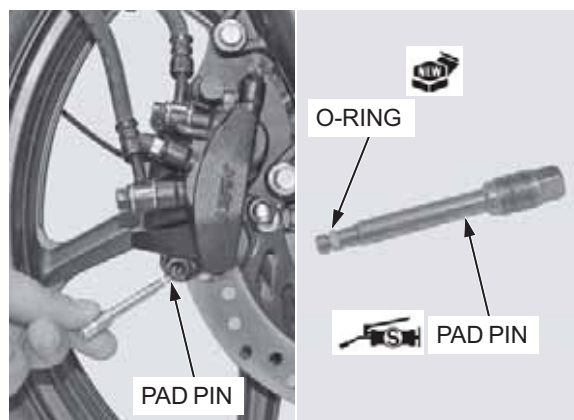
Install the new brake pad into the caliper.



Lubricate the pad pin with silicon grease before installation.

Install the brake pad pin by pushing the pads against the pad spring to align the pad pin holes in the pads and caliper.

Drive the pad pin into the caliper.



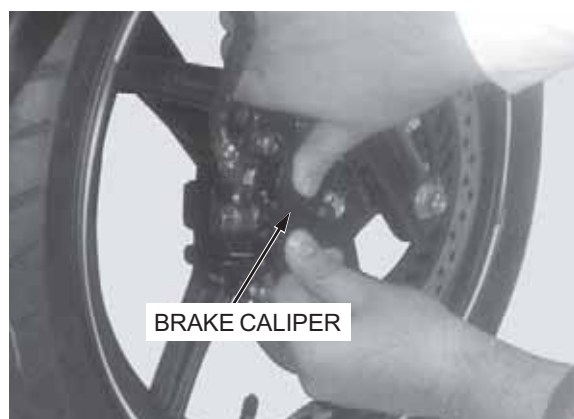
Always replace the brake pads in pairs to assure even disc pressure.

FRONT BRAKE PAD REPLACEMENT (NON CBS)

Push the caliper pistons all the way in to allow installation of new brake pads.

NOTE:

Check the brake fluid level in the brake master cylinder reservoir as this operation causes the level to rise.



BRAKE SYSTEM

Remove the brake pad pin by unscrewing it with the help of wrench.

Check the pad pin for abnormal wear or distortion. Replace if necessary.



Do not operate the rear brake pedal or front brake lever after the brake pads are removed.

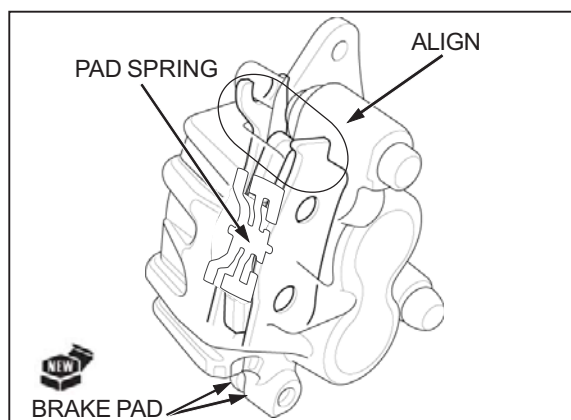
Remove the brake pads.

Clean the brake caliper inside especially around the piston.

Install new brake pads if found below specification.



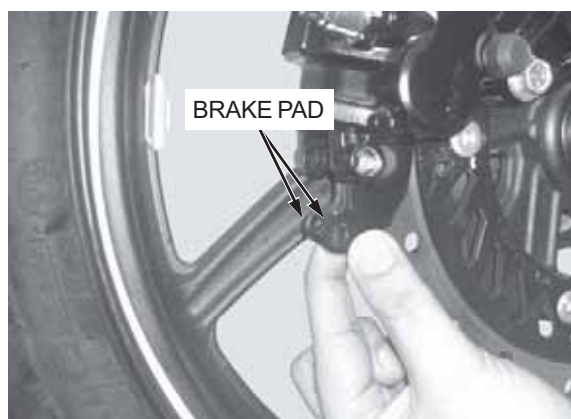
Make sure the pad spring is installed in position.



Be careful not to apply grease on brake pads.

INSTALLATION

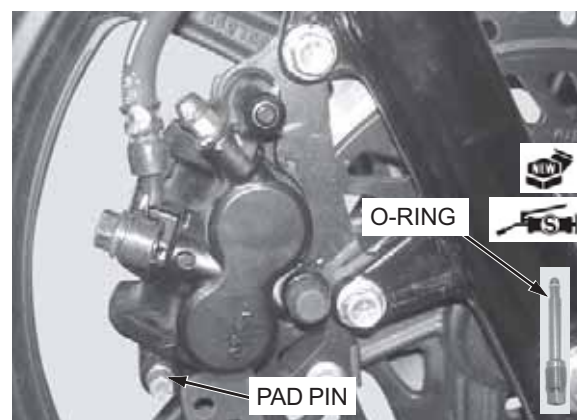
Install the new brake pad into the caliper.



Lubricate the pad pin with silicon grease before installation.

Install the brake pad pin by pushing the pads against the pad spring to align the pad pin holes in the pads and caliper.

Drive the pad pin into the caliper.



BRAKE DISC INSPECTION

Visually inspect the brake disc for damage or cracks.

Measure the brake disc thickness at several points.

SERVICE LIMIT: 3.5 mm (0.14 in)

Replace the brake disc if the smallest measurement is less than service limit.

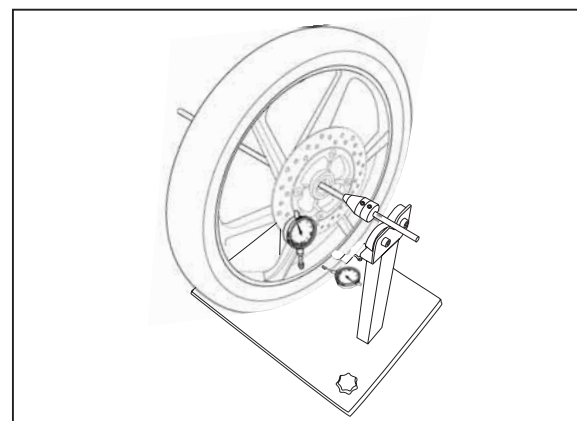


Check the brake disc warpage using a dial indicator.

SERVICE LIMIT: 0.10 mm (0.004 in)

Check the wheel bearings for excessive play, if the warpage exceeds the service limit.

Replace the brake disc if the wheel bearings are normal.



FRONT MASTER CYLINDER

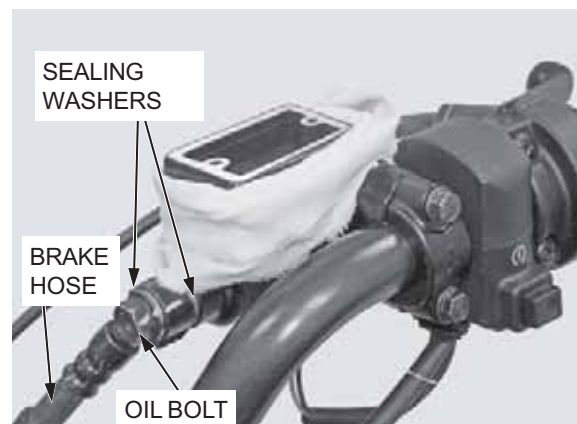
REMOVAL

Remove the right rearview mirror with rearview mirror adapter.

Disconnect the brake light switch connectors (page 17-11).

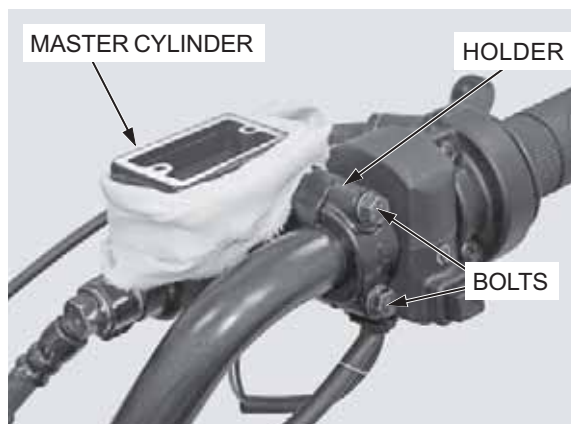
Drain the brake fluid from the hydraulic system (page 14-4).

Remove the brake hose by removing the oil bolt and sealing washers.



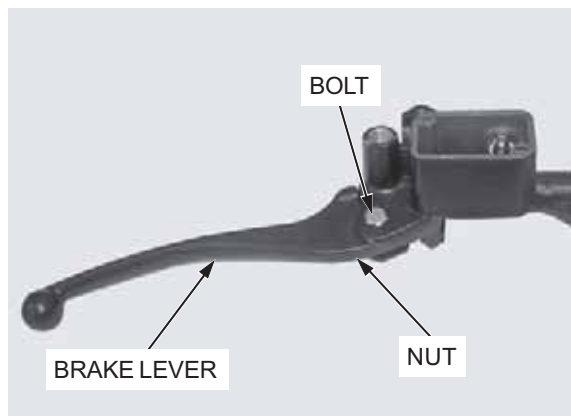
BRAKE SYSTEM

Remove the bolts, holder and master cylinder assembly.

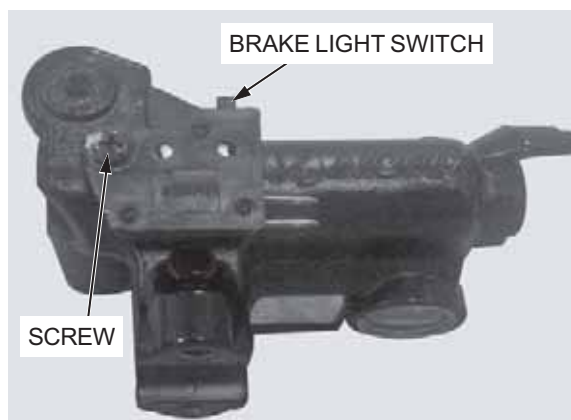


DISASSEMBLY

Remove the brake lever pivot nut, pivot bolt and brake lever.

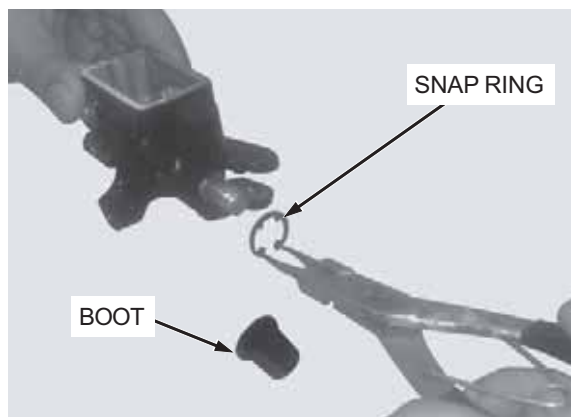


Remove the screw and brake light switch.

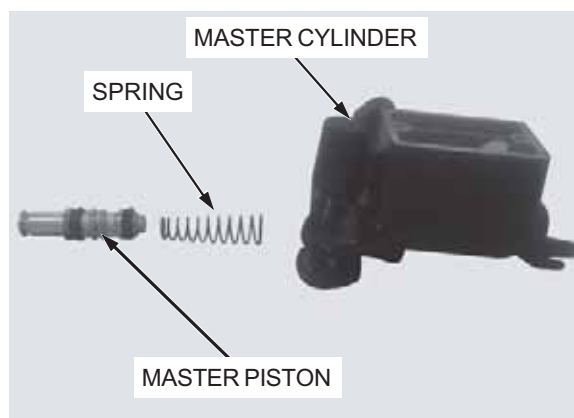


Remove the boot.

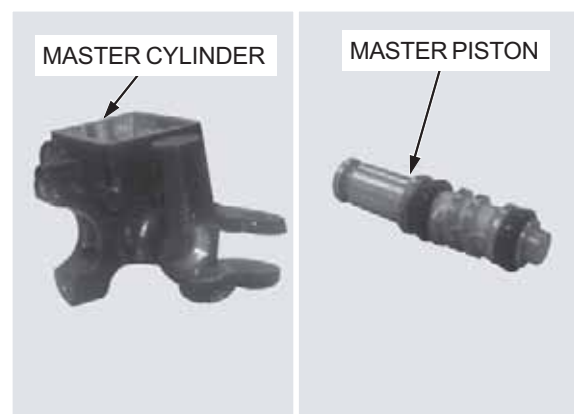
Remove the snap ring from the master cylinder body using snap ring plier.



Remove the master piston and spring from the master cylinder.



Clean the inside of the master cylinder and master piston with clean brake fluid.



INSPECTION

Check the master piston for scoring, scratches or damage.

Measure the master piston O.D.

SERVICE LIMIT: STD & DLX- 12.645 mm (0.4978 in)

CBS- 10.945 mm (0.4978 in)



Keep the piston, spring, snap ring and boot as a set. Do not substitute individual part.

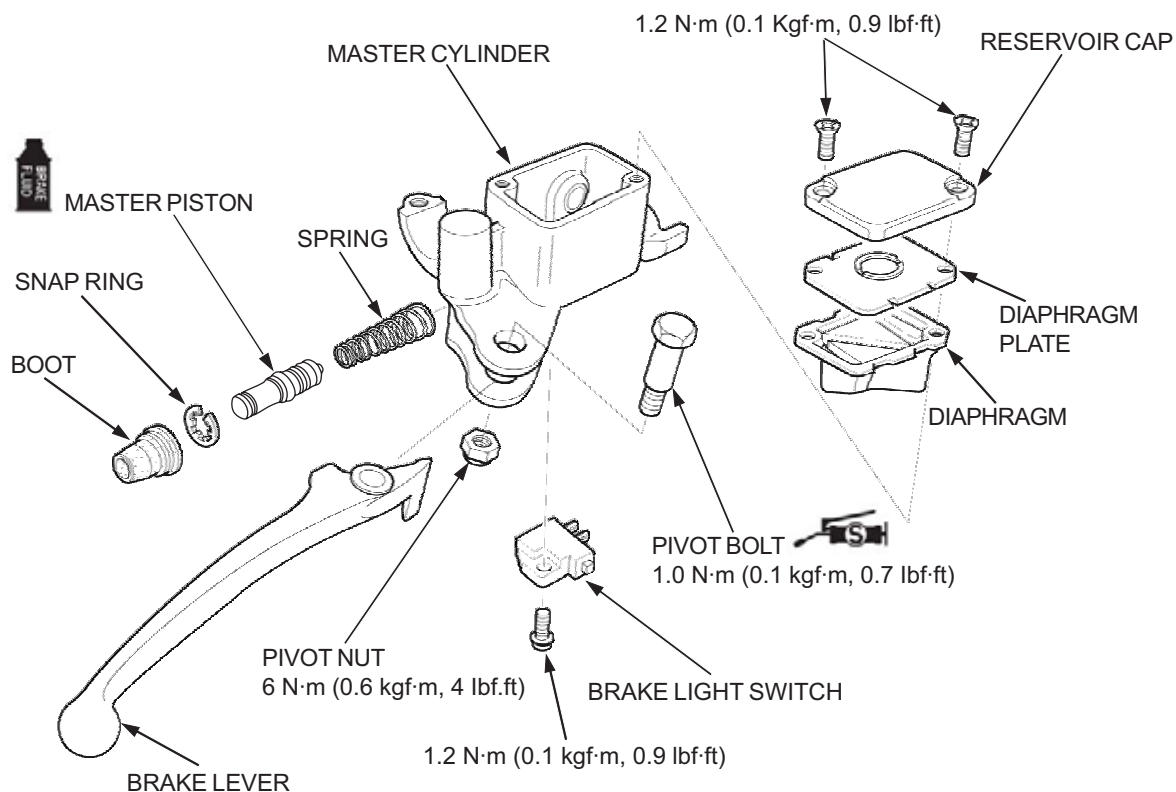
Check the master cylinder for scoring, scratches or damage.

Measure the master cylinder I.D.

SERVICE LIMIT: 12.755 mm (0.5022 in)



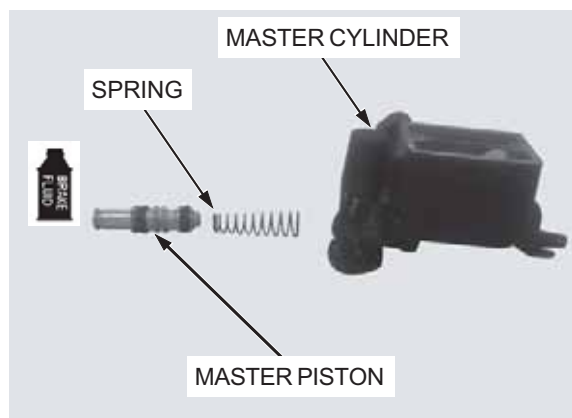
ASSEMBLY



INSTALLATION

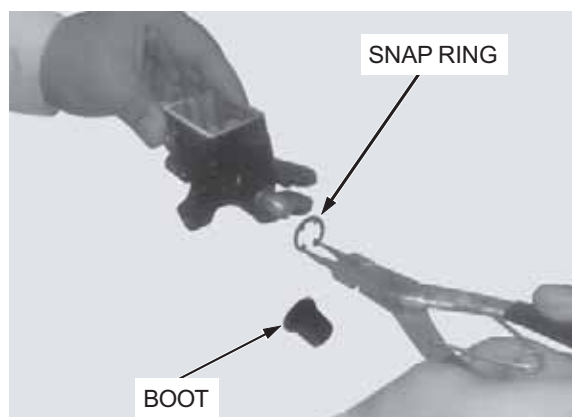
Apply clean brake fluid to the master piston.

Install the spring onto the piston end, and install it into the master cylinder.

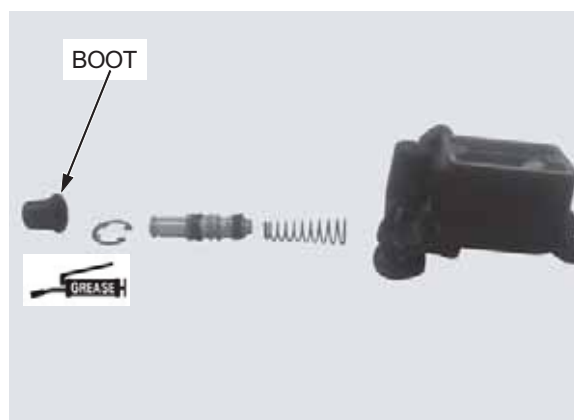


Be certain the snap ring is firmly seated in the groove.

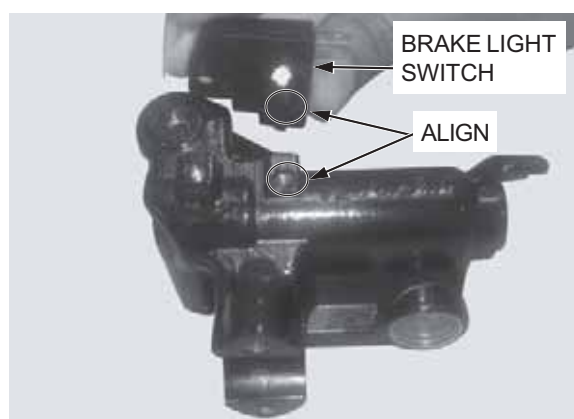
Install the snap ring into the groove in the master cylinder.



Apply grease to boot and install it to the master cylinder.

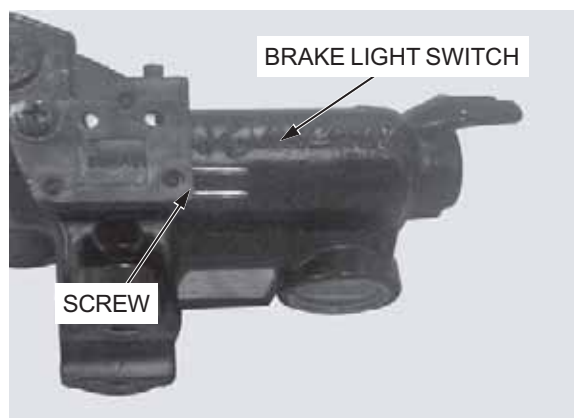


Install the brake light switch to the master cylinder by aligning the brake light switch boss with master cylinder hole.



Install and tighten the brake light switch screw to the specified torque.

TORQUE: 1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)



Apply grease to the brake lever pivot bolt rotating surface.

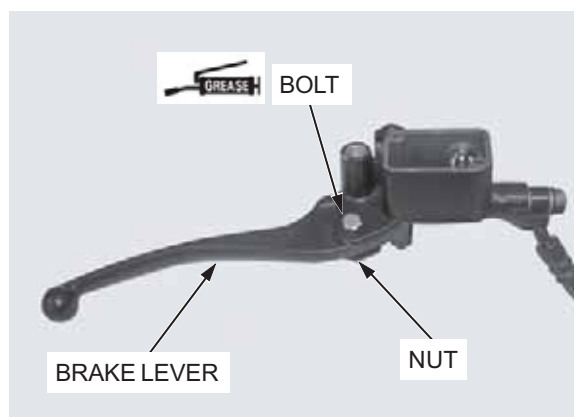
Install the brake lever to the master cylinder.

Install and tighten the pivot bolt to the specified torque.

TORQUE: 1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)

Install and tighten the pivot nut while holding the pivot bolt to the specified torque.

TORQUE: 6 N·m (0.6 kgf·m, 4 lbf·ft)



BRAKE SYSTEM

INSTALLATION OF MASTER CYLINDER

Place the master cylinder assembly on the handlebar.

Place the master cylinder holder with up mark facing forward, and install the bolts.

Align the end of the master cylinder with the punch mark on the handlebar.

Tighten the front bolt first, then tighten the rear bolt to the specified torque.

TORQUE: 9 N·m (0.9 kgf·m, 6.6 lbf·ft)



Rest the brake hose joint between the stoppers on the master cylinder.

Install the brake hose to the master cylinder with the oil bolt and new sealing washers.

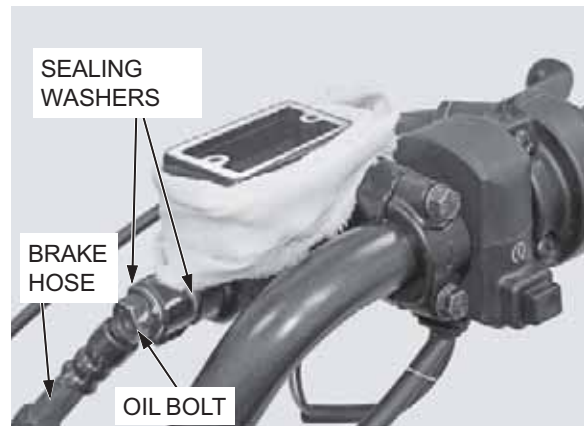
Tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Connect the brake light switch connectors.

Fill the brake fluid, and bleed the air for the hydraulic system (page 14-5).

Install the right rearview mirror.



FRONT BRAKE CALIPER

CBS FRONT BRAKE

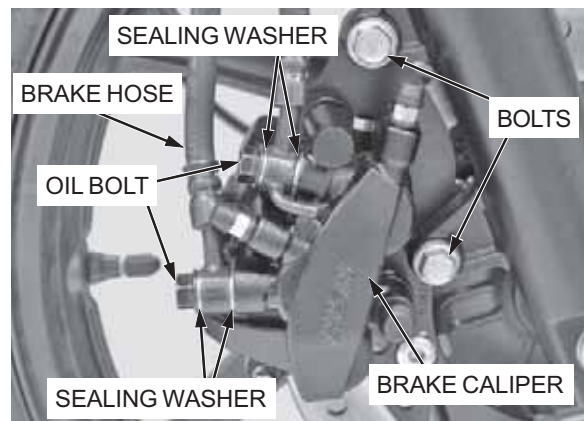
REMOVAL

Drain the brake fluid from the hydraulic system (page 14-4).

Remove the brake pads (page 14-8).

Remove the brake hose by removing the oil bolt and sealing washer.

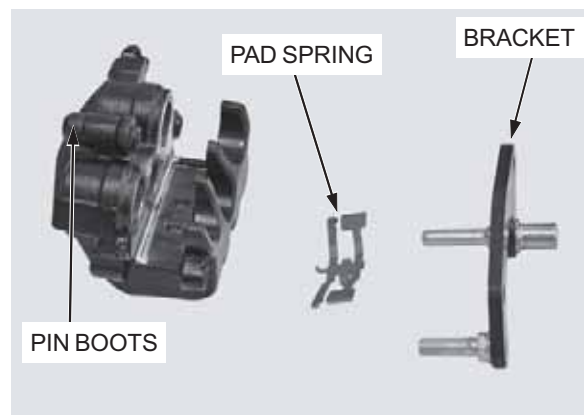
Remove the brake caliper mounting bolts and brake caliper.



DISASSEMBLY

Remove the following:

- Caliper bracket
- Pin boots
- Pad spring



Do not use high pressure air or bring the nozzle too close to the inlet.

Place a shop towel over the caliper pistons.

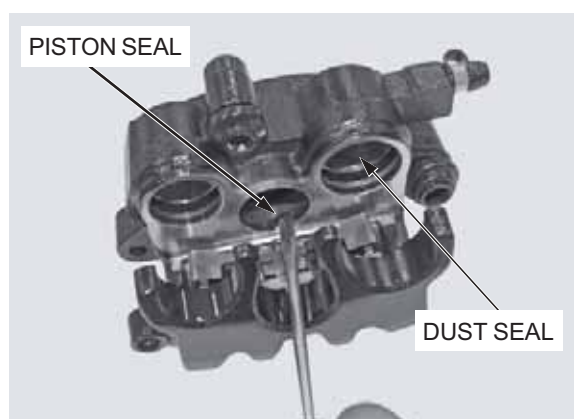
Position the caliper body with the piston down, and apply small squirts of air pressure to the fluid inlet to remove the caliper pistons.



Be careful not to damage the piston sliding surface.

Push the dust seals and piston seals in, and lift them out.

Clean the seal grooves, caliper piston sliding surfaces and caliper pistons with clean brake fluid.



INSPECTION

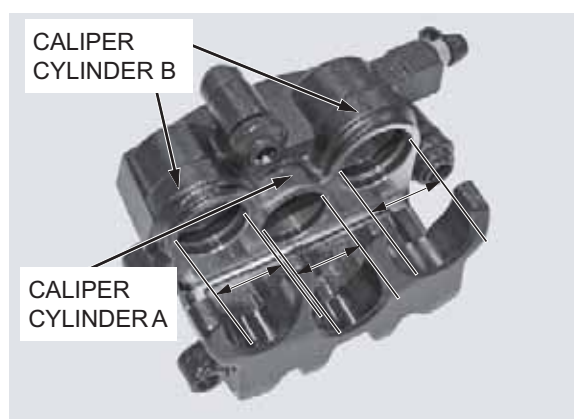
Check the caliper cylinder for scoring, scratches or damage.

Measure the each caliper cylinder I.D.

SERVICE LIMIT:

Caliper Cylinder A: 25.460 mm (1.0024 in)

Caliper Cylinder B: 22.710 mm (0.8941 in)



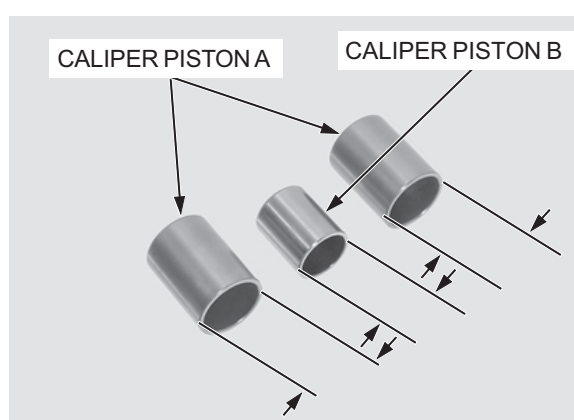
Check the caliper piston for scoring, scratches or damage.

Measure the each caliper piston O.D.

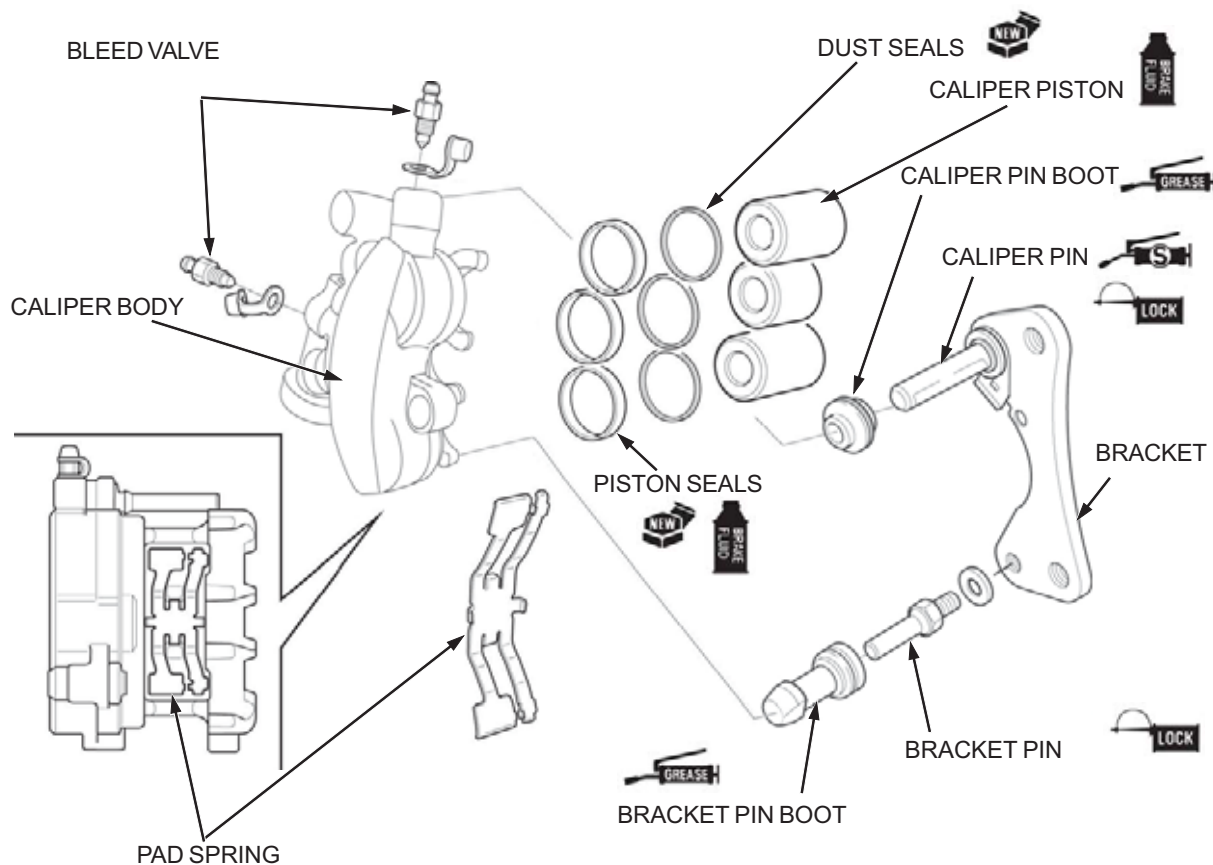
SERVICE LIMIT:

Caliper Cylinder A: 25.31 mm (0.996 in)

Caliper Cylinder B: 22.56 mm (0.888 in)



ASSEMBLY



INSTALLATION

Apply clean brake fluid to new piston and dust seals, and install them into the seal grooves in the caliper cylinder.

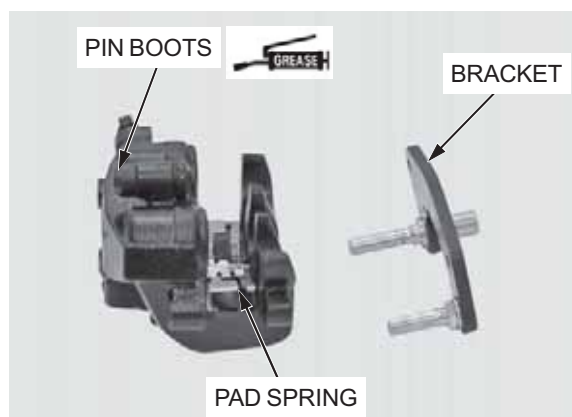
Apply clean brake fluid to the caliper pistons, and install them into the caliper cylinders with the opening side toward the pads.



Install the pad spring onto the caliper body.

Apply grease to the inner surface of brake caliper pin boots, and install them into the caliper body.

Install the caliper bracket into the caliper body.



Be careful not to damage the pads.

INSTALLATION ON DISK

Install the brake caliper to the right fork leg so that the disc is positioned between the pads.

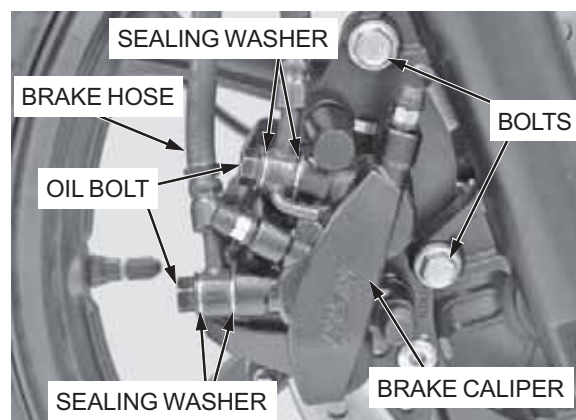
Install and tighten new brake caliper mounting bolts to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

Install the brake hose to the brake caliper with the oil bolt and new sealing washers.

Rest the hose joint onto the stoppers, and tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)



Install the brake pads (page 14-9).

Fill the brake fluid, and bleed the air for the hydraulic system (page 14-5).

NON CBS FRONT BRAKE

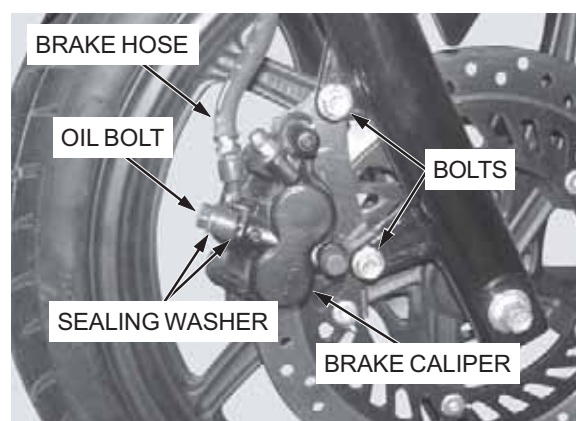
REMOVAL

Drain the brake fluid from the hydraulic system (page 14-4).

Remove the brake pads (page 14-10).

Remove the brake hose by removing the oil bolt and sealing washer.

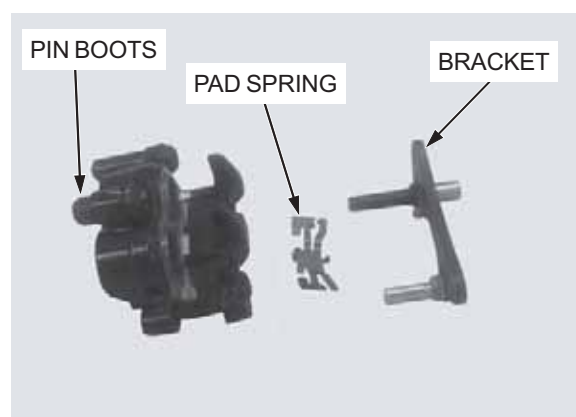
Remove the brake caliper mounting bolts and brake caliper.



DISASSEMBLY

Remove the following:

- Caliper bracket
- Pin boots
- Pad spring



BRAKE SYSTEM

Do not use high pressure air or bring the nozzle too close to the inlet.

Place a shop towel over the caliper pistons.

Position the caliper body with the piston down, and apply small squirts of air pressure to the fluid inlet to remove the caliper pistons.



Be careful not to damage the piston sliding surface.

Push the dust seals and piston seals in, and lift them out.

Clean the seal grooves, caliper piston sliding surfaces and caliper pistons with clean brake fluid.



INSPECTION

Check the caliper cylinder for scoring, scratches or damage.

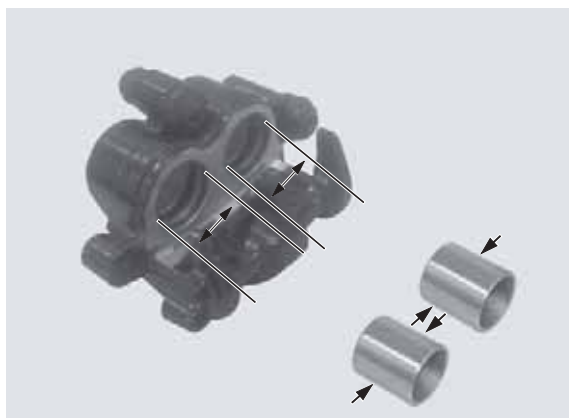
Measure the caliper cylinder I.D.

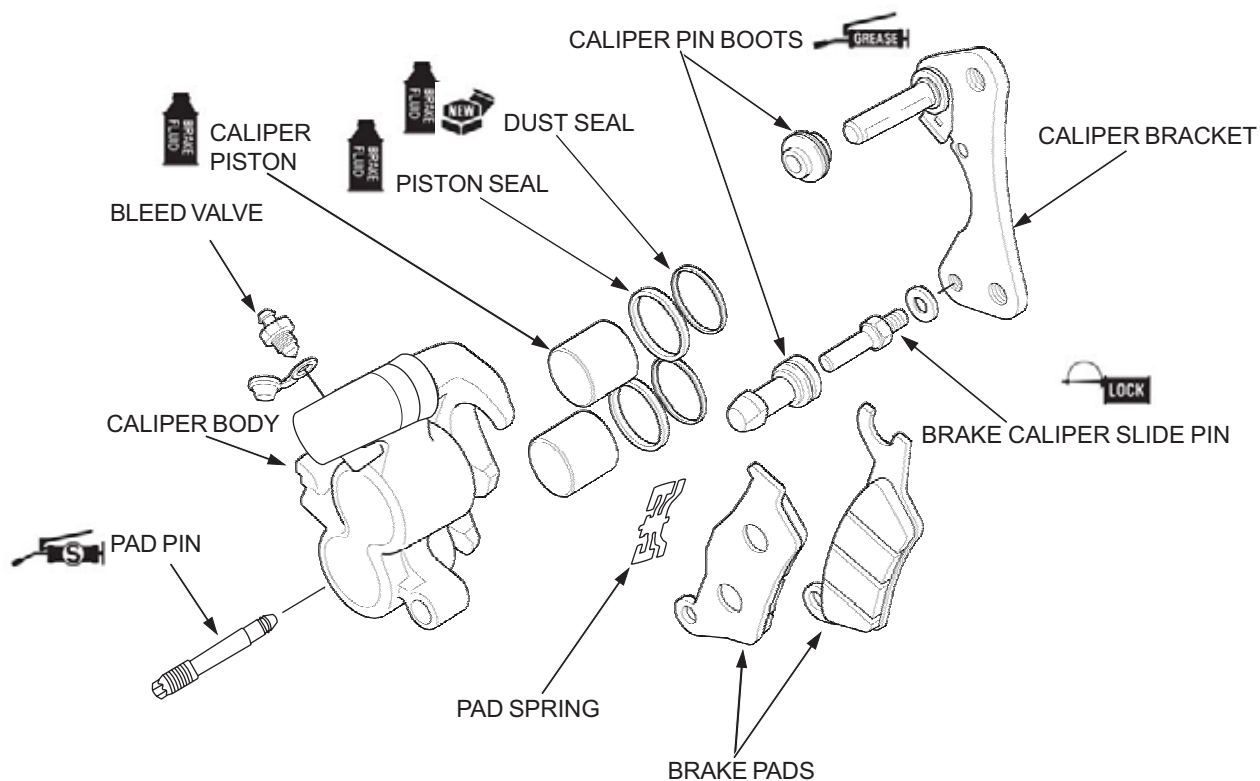
SERVICE LIMIT: 25.460 mm (1.0024 in)

Check the caliper piston for scoring, scratches or damage.

Measure the caliper piston O.D.

SERVICE LIMIT: 25.31 mm (0.9965 in)





INSTALLATION

Apply clean brake fluid to new piston and dust seals, and install them into the seal grooves in the caliper cylinder.

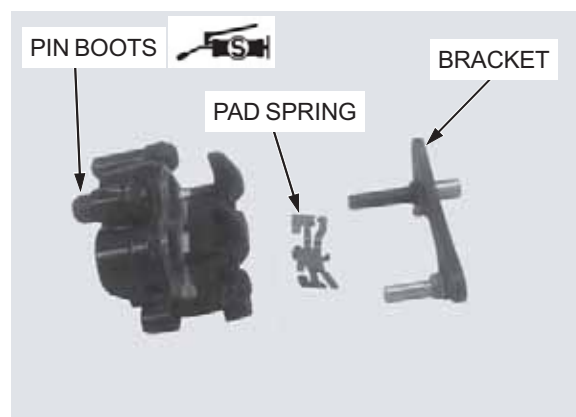
Apply clean brake fluid to the caliper pistons, and install them into the caliper cylinders with the opening side toward the pads.



Install the pad spring onto the caliper body.

Apply silicon grease to the inner surface of brake caliper pin boots, and install them into the caliper body.

Install the caliper bracket into the caliper body.



BRAKE SYSTEM

Be careful not to damage the pads.

INSTALLATION

Install the brake caliper to the right fork leg so that the disc is positioned between the pads.

Install and tighten new brake caliper mounting bolts to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

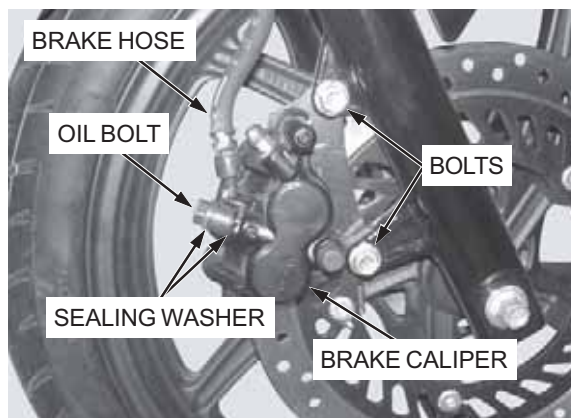
Install the brake hose to the brake caliper with the oil bolt and new sealing washers.

Rest the hose joint onto the stoppers, and tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Install the brake pads (page 14-10).

Fill the brake fluid, and bleed the air for the hydraulic system (page 14-5).

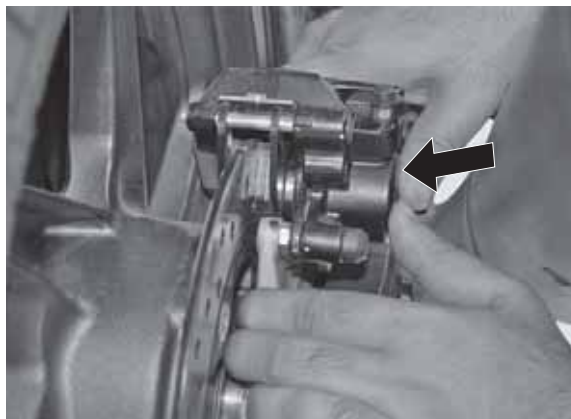


REAR BRAKE PAD/DISC

Check the fluid level in the master cylinder reservoir as this operation causes the fluid level to rise.

REAR DISK BRAKE PAD REPLACEMENT

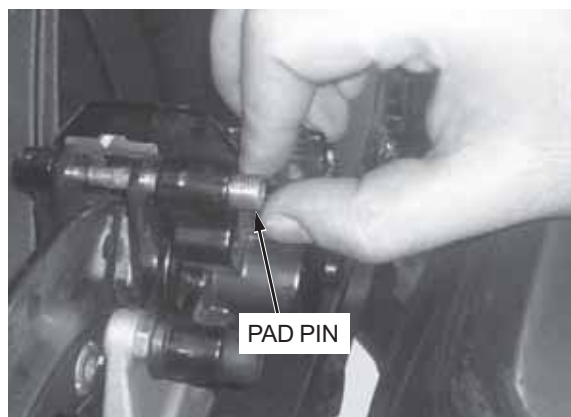
Push the caliper pistons all the way in by pushing the caliper body inward to facilitate installation of new brake pads.



Always replace the brake pads in pairs to assure even disc pressure.

Drive out the pad pin from the brake caliper.

Check the pad pin for abnormal wear or distortion, replace them if necessary.



Do not operate the front brake lever after the brake pads are removed.

Remove the brake pads.



INSTALLATION

Install new brake pads so that their ends rest on the caliper bracket properly.



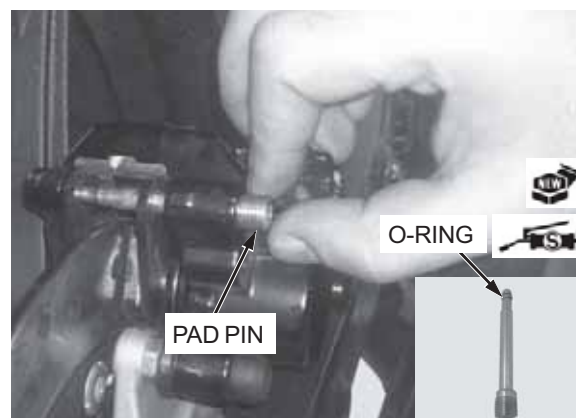
Install the brake pad pin by pushing the pads against the pad spring to align the pad pin holes in the pads and caliper.

Drive the pad pin into the caliper.

Apply silicon grease to new O-ring and install it to the pad pin groove.

Tighten the rear brake pad pin to the specified torque.

TORQUE: 17 N·m (1.7 kgf·m, 13 lbf·ft)



BRAKE SYSTEM

BRAKE DISC INSPECTION

Visually inspect the brake disc for damage or cracks.

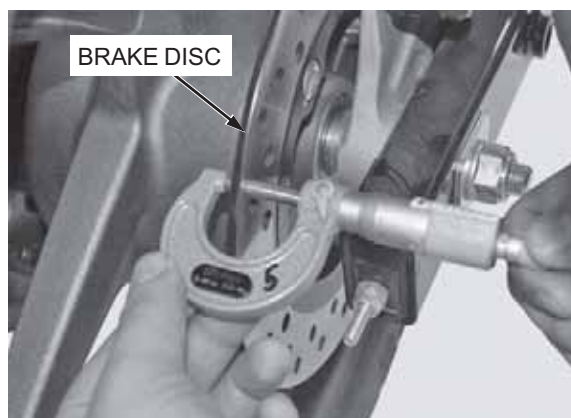
Measure the brake disc thickness at several points.

SERVICE LIMIT : 3.5 mm (0.14 in)

Replace the brake disc if the smallest measurement is less than service limit.

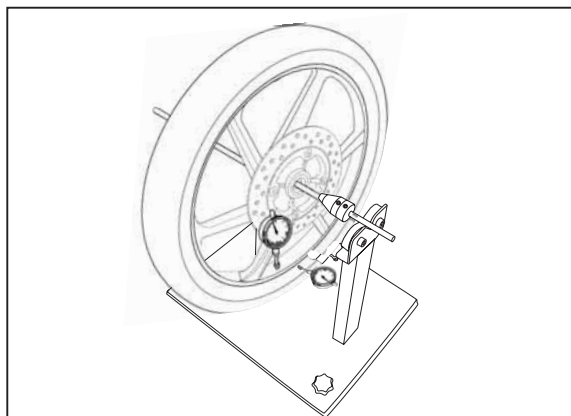
Check the brake disc warpage using a dial indicator.

SERVICE LIMIT : 0.10 mm (0.004 in)



Check the wheel bearings for excessive play, if the warpage exceeds the service limit.

Replace the brake disc if the wheel bearings are normal.



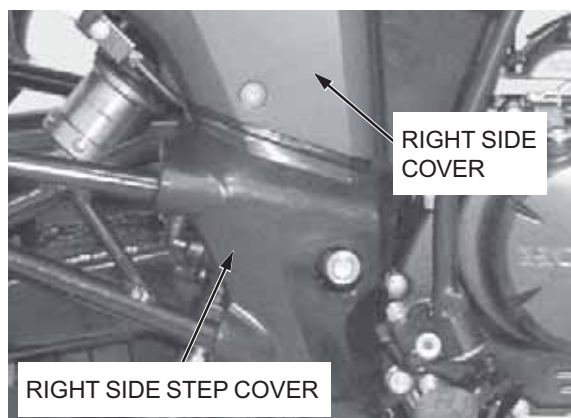
REAR MASTER CYLINDER

REMOVAL

Support the motorcycle on its center stand.

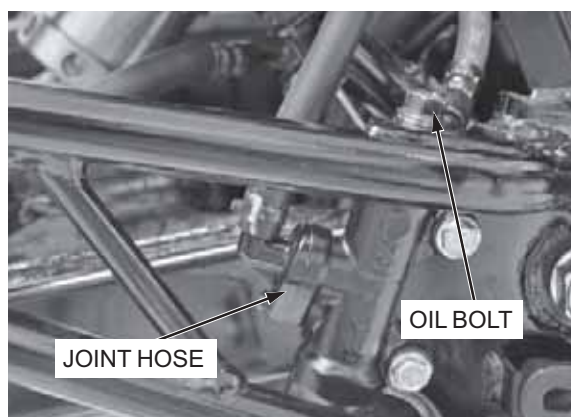
Remove the right side cover (page 2-3).

Remove right side step cover by removing screw (1 no).



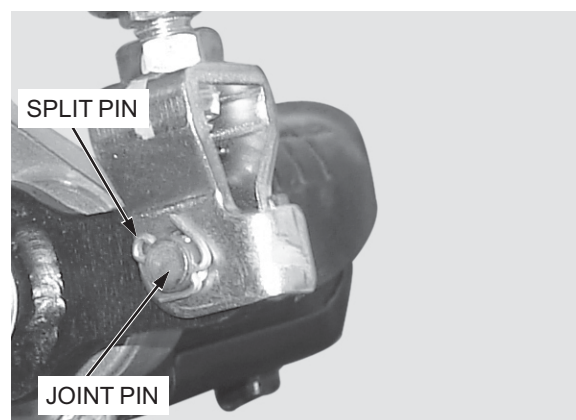
Drain the brake fluid from the hydraulic system (page 14-4).

Remove the brake hose oil bolt and joint hose from rear master cylinder.



Remove the split pin from the joint pin in the brake rod joint.

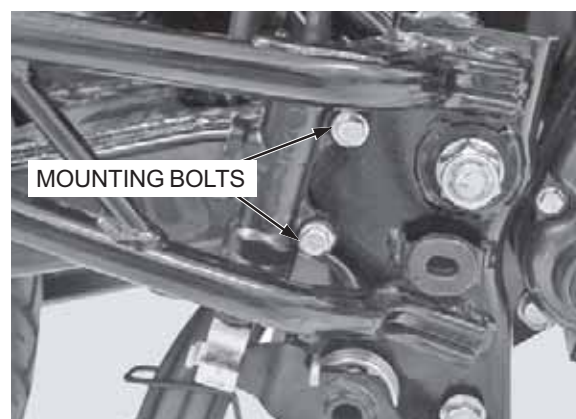
Remove the joint pin.



Remove the master cylinder mounting bolt (2 nos).

NOTICE

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



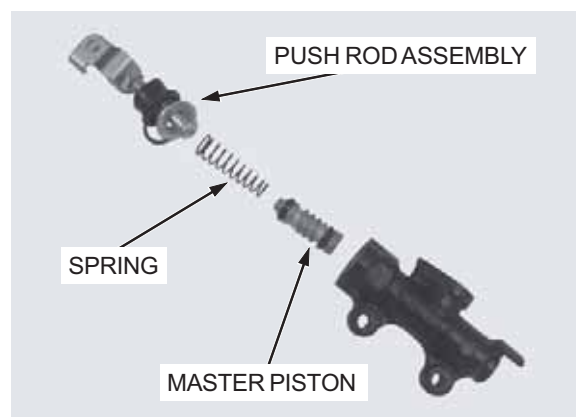
Remove the boot and snap ring from the master cylinder body.

TOOL: Snap ring plier: 07914-SA50001



Remove the push rod assembly, master piston and spring.

Clean the inside of the cylinder with clean brake fluid.



INSPECTION

Check the piston boot, primary cup and secondary cup for fatigue or damage.

Check the master cylinder and piston for abnormal scratches.

Measure the master cylinder I.D

SERVICE LIMIT :

DLX: 12.775 mm (0.5029 in)

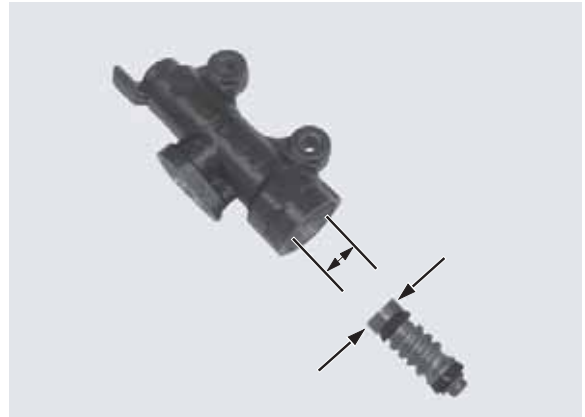
CBS: 14.055 mm (0.5533 in)

Measure the master cylinder O.D

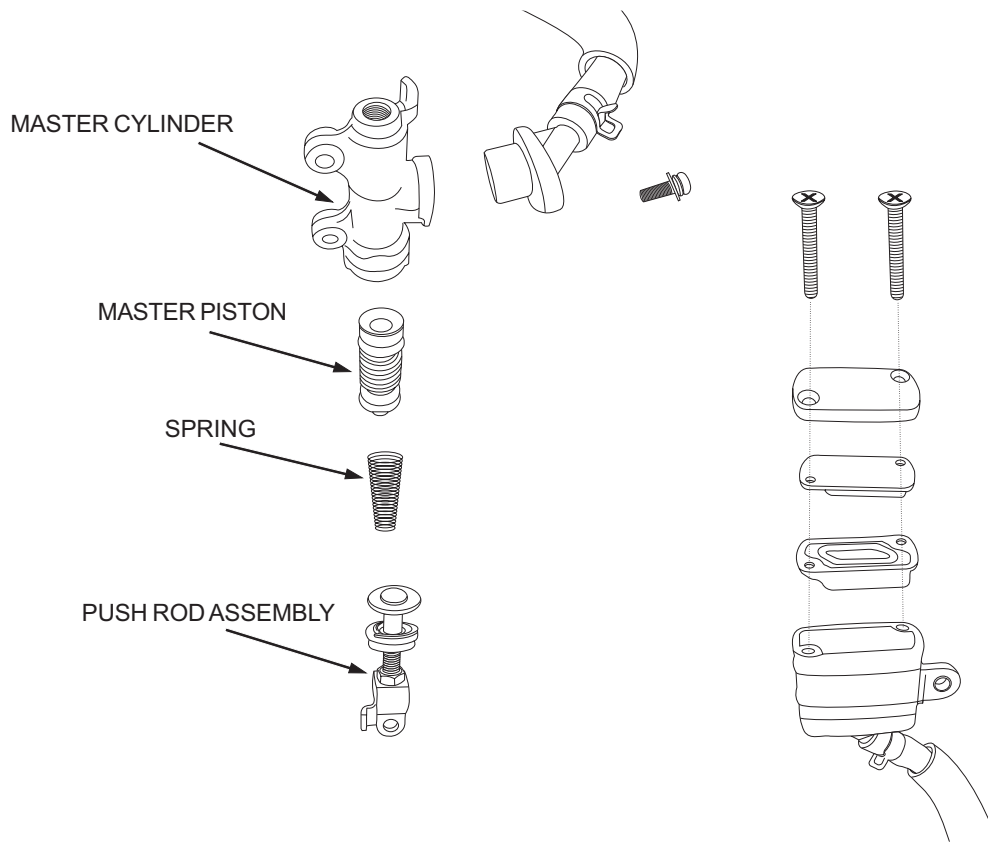
SERVICE LIMIT :

DLX: 12.645 mm (0.4978 in)

CBS: 13.945 mm (0.5490 in)



ASSEMBLY



INSTALLATION

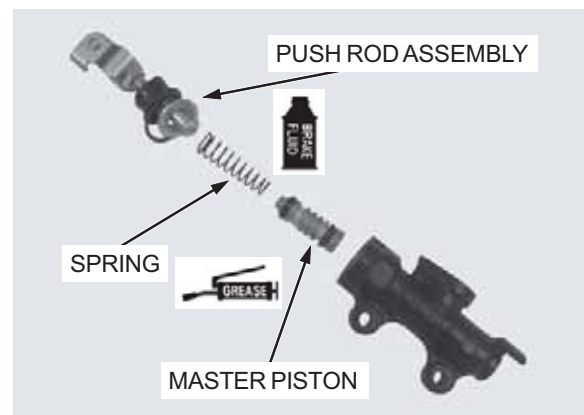
- Keep the piston, cups, spring, snap ring and boot as a set; do not substitute individual.

Coat new piston cups and piston with clean brake fluid before assembly. Install the spring to the master piston.

Install the spring and master piston assembly into the master cylinder.

Apply grease to the piston contact area of the push rod.

Install the push rod assembly into the master cylinder.



After installing the snap ring, always rotate it in its groove to be sure it is fully seated.

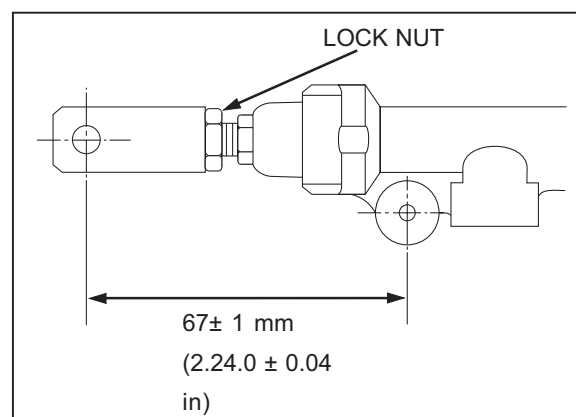
Install the snap ring. Install the boot.

TOOL: Snap ring plier: 07914-SA50001



BRAKE PEDAL HEIGHT

If the push rod is disassembled, adjust the push rod length so that the distance between the center of the master cylinder lower mounting bolt hole and joint pin hole is 67 ± 1 mm ($2.24.0 \pm 0.04$ in). After adjustment, tighten the lock nut.

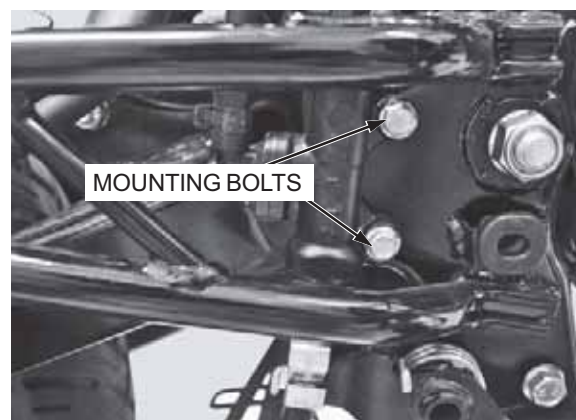


Connect the mounting bolt (2 nos). Connect the hose joint and rear brake hose oil bolt to the master cylinder and tighten it to the specified torque.

Torque: Oil Bolt - 34 N·m (3.5 kgf·m, 25 lbf·ft)

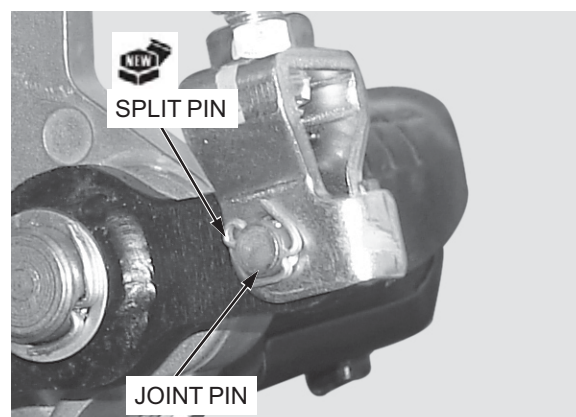
RR M/C (Step holder fitting use bolt)

Torque: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Install the brake rod joint on brake pedal by installing joint pin and split pin.

Install right side step cover and right side cover (page 2-3).



REAR BRAKE CALIPER

REMOVAL

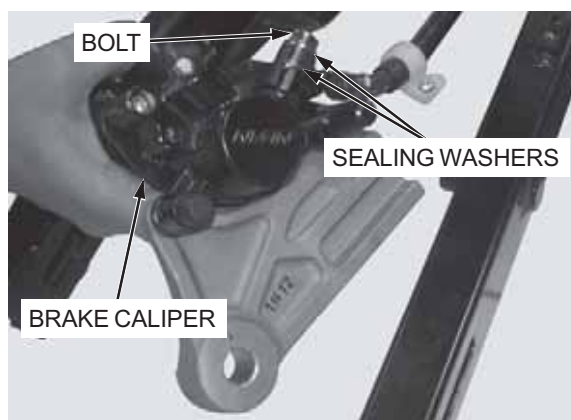
Drain the brake fluid from the rear brake hydraulic system (page 14-4).

Remove the brake pads by removing pad pin from the caliper (page 14-24).

Remove the oil bolt, sealing washers and brake hose eyelet joint.

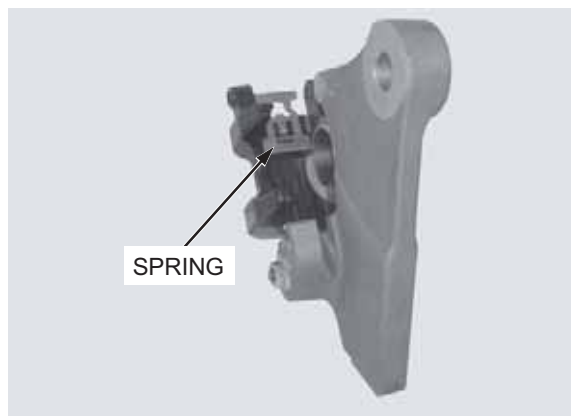
Remove the rear wheel (page 13-4).

Remove the brake caliper.



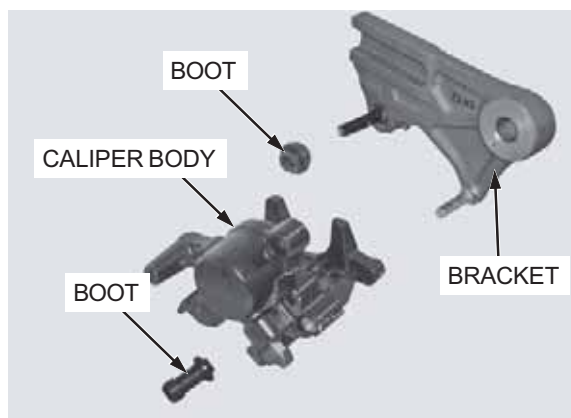
DISASSEMBLY

Remove the brake pad spring from the caliper body.



Remove the caliper bracket from the caliper body.

Remove the bracket pin boots.



Do not bring the air nozzle too close to the inlet or the pistons may be forced out with excessive force that could cause injury.

Lightly apply compressed air to the fluid inlet to get the piston out.

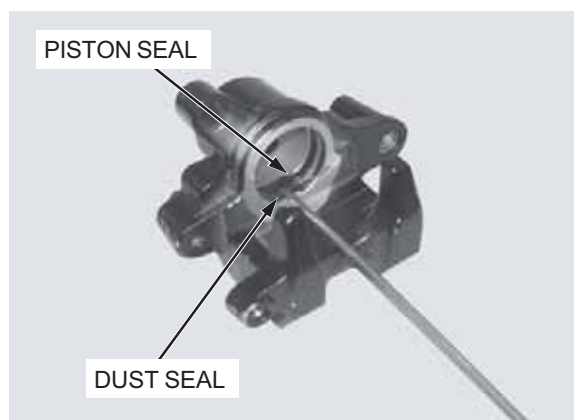
Place the shop rag under the caliper to cushion the piston when it is expelled.

Use the air in short spurts.



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 piston and caliper piston sliding surface with clean brake fluid.



INSPECTION

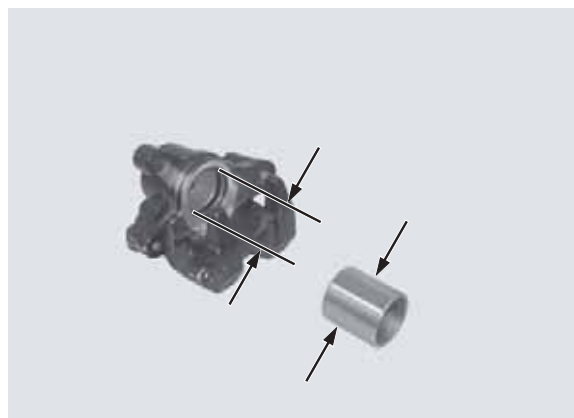
Check the caliper cylinder and pistons for scoring, scratches or damage.

Measure the caliper cylinder I.D.

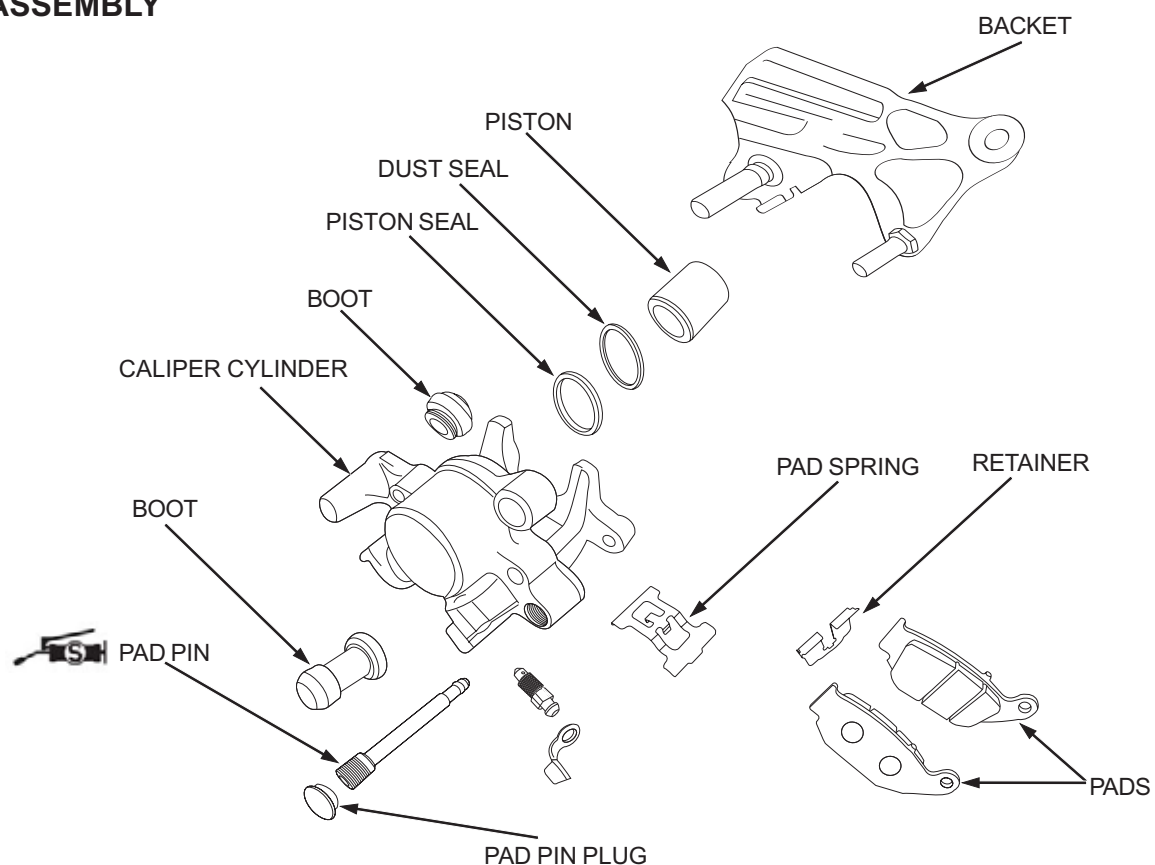
SERVICE LIMIT: 32.090 mm (1.2634 in)

Measure the caliper piston O.D.

SERVICE LIMITS: 31.94 mm (1.257 in)



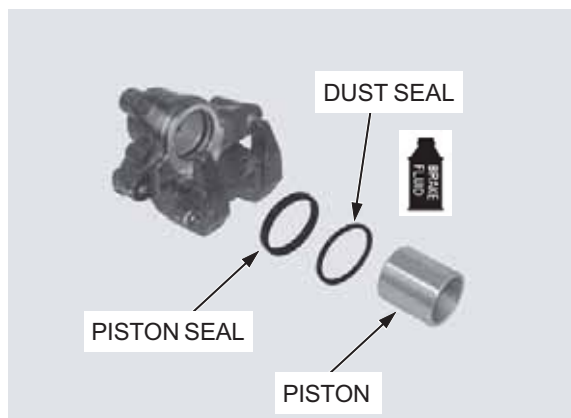
ASSEMBLY



BRAKE SYSTEM

Coat the new piston seal and dust seal with clean brake fluid and install them in the seal grooves of the caliper.

Apply brake fluid to the caliper piston and install it into the caliper cylinder with the opening towards the pads.

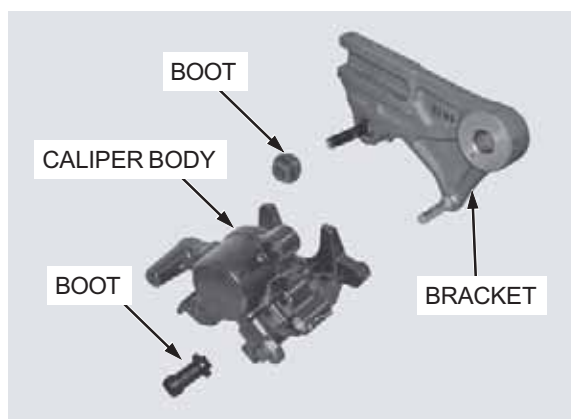


If the caliper and bracket pin boots are hard or deteriorated, replace them with new ones.

Apply silicone grease to the bracket pin boots and bracket pins and install them.

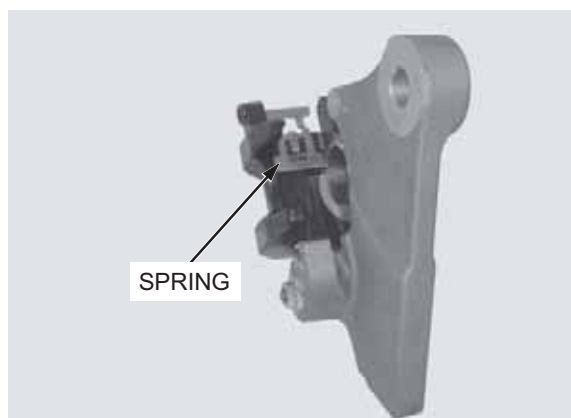
Make sure the boots are securely seated into the pin grooves.

Assemble the caliper bracket and caliper body.



Check the pad spring for damage and replace it if necessary.

Install the pad spring onto the caliper body.



INSTALLATION

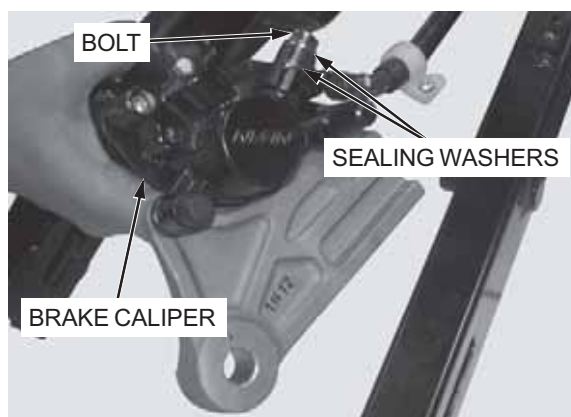
Lubricate the pad pin with silicon grease.

Install the rear brake caliper bracket assembly onto the swingarm by aligning the bracket slot with the boss on the swingarm.

Install the rear wheel (page 13-8).

Install the brake pads (page 14-23).

Fill and bleed the rear brake hydraulic system.

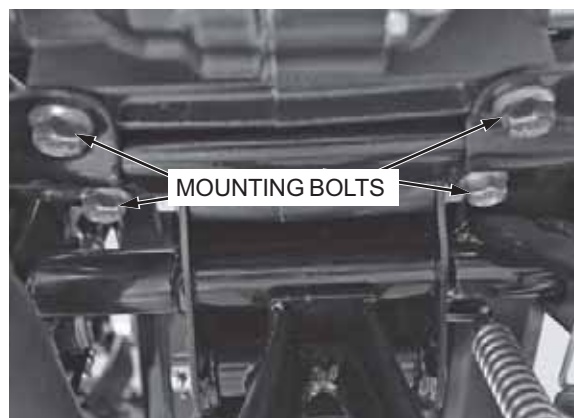


BRAKE PEDAL

REMOVAL

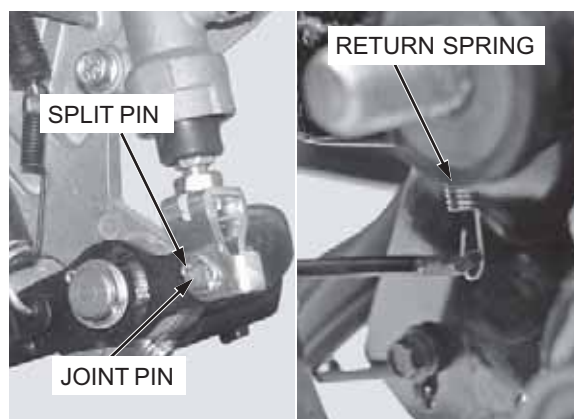
Remove the right side step cover screw (1 no.).

Remove the bolts (4 no.) of main step.



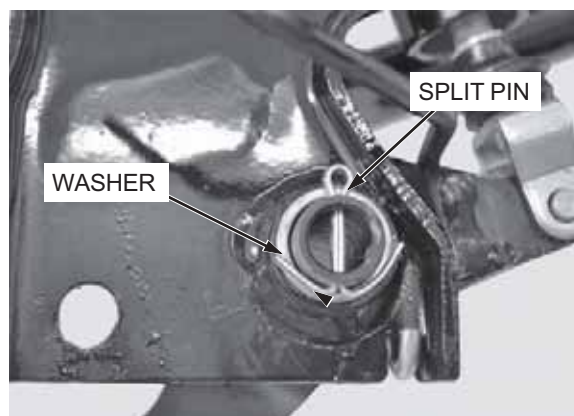
Remove the rear master cylinder split pin and take joint pin out to free the brake padle.

Dis-engage the brake light switch return spring.



Remove the following:

- Split pin
- Washer
- Brake Padel



INSTALLATION

Apply grease to the pedal pivot sliding surface and install the brake pedal into the right main step holder.

Secure the brake pedal with the washer and a new split pin.

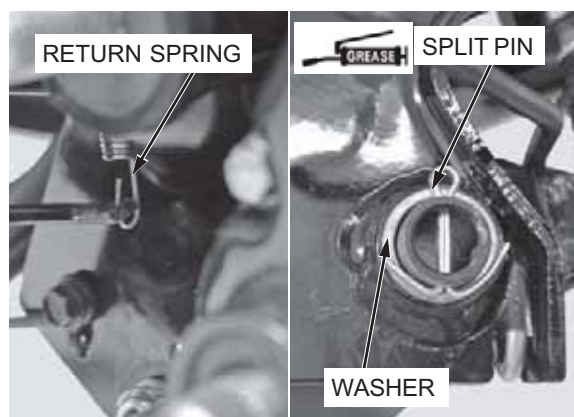
Install the brake light switch spring to the return spring.

Install the main step holder mounting bolts (4 no).

Tighten the bolt to the specified torque.

TORQUE 27 N.m (2.8 kgf.m, 20 lbf-ft)

Install the joint pin aligning the brake pedal and install new rear master cylinder split pin.



REAR DRUM BRAKE

INSPECTION

Remove the rear wheel and then remove the brake panel (page 13-4).

Measure the rear brake drum I.D.

SERVICE LIMIT: 131.0 mm (5.16 in)



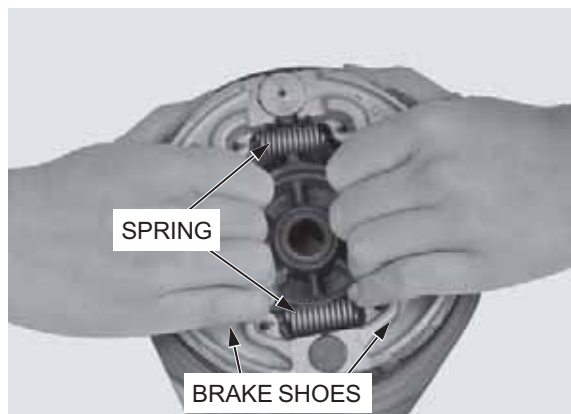
DISASSEMBLY

*Do not apply
grease on
brake lining.*

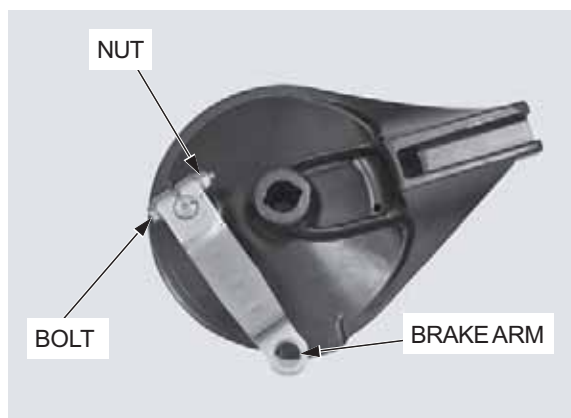
Expand the brake shoes and remove them from the brake panel.

Remove the shoe springs from the brake shoes.

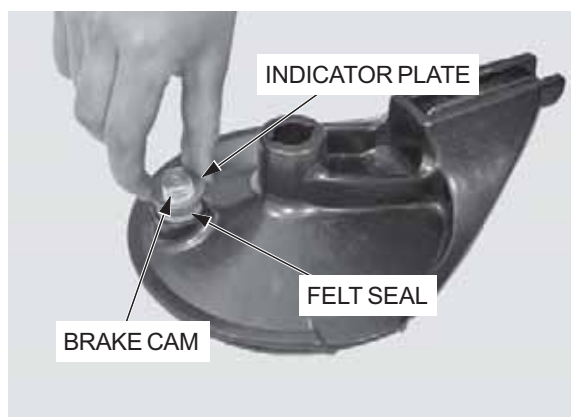
- Always replace the brake shoes as a set.
- When the brake shoes are reused, mark all parts before disassembly so they can be installed in their original locations.

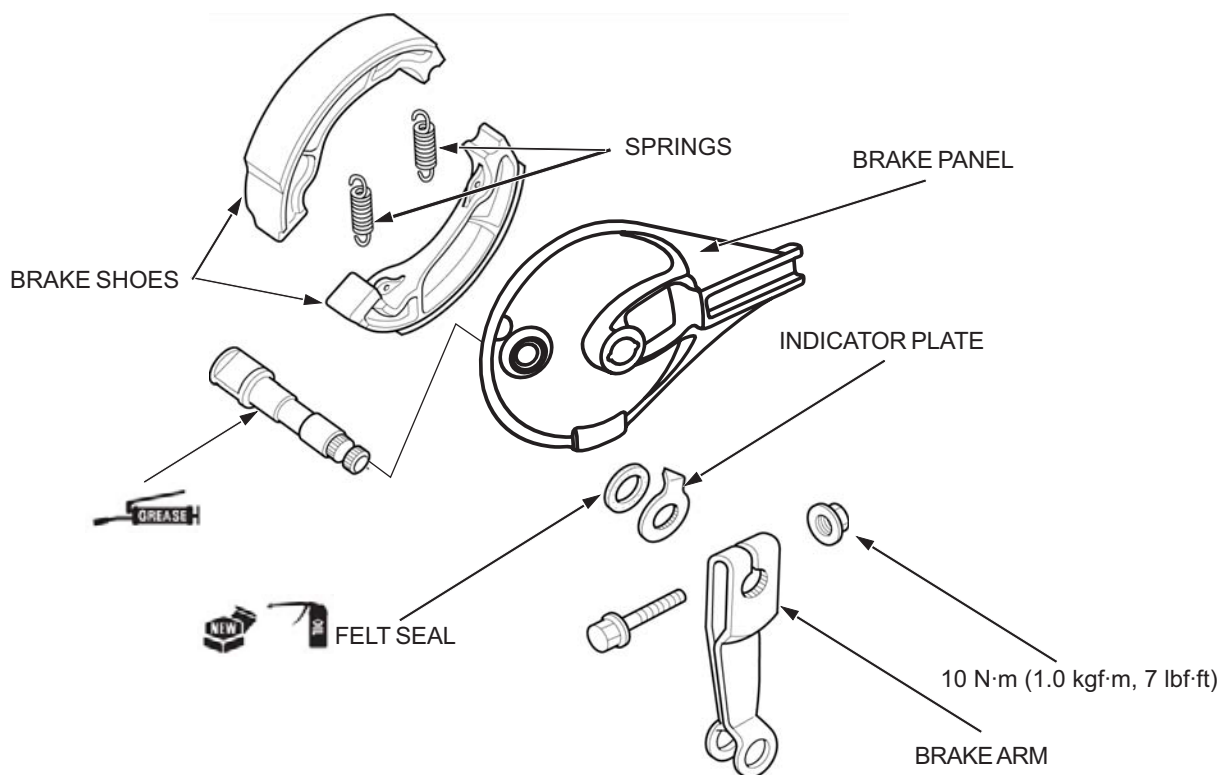


Remove the brake arm nut, bolt and brake arm.

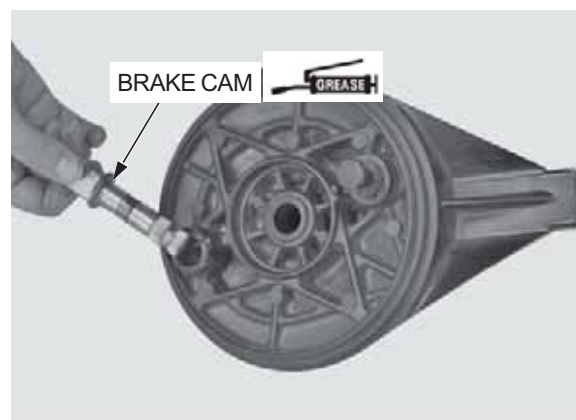


Remove the indicator plate, felt seal and brake cam.



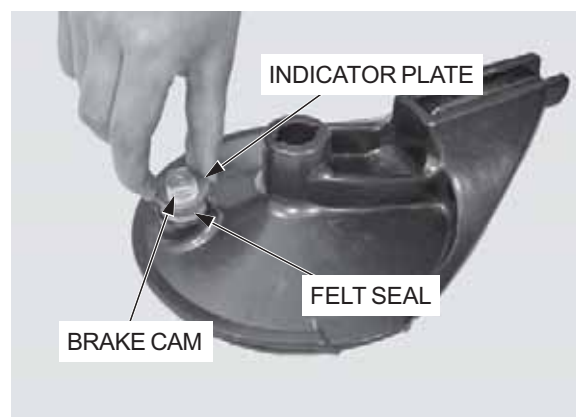


Apply grease to the brake cam sliding surface.
Install the brake cam to the brake panel.



Apply gear oil to a new felt seal, and install it onto the brake panel.

Install the indicator plate onto the brake cam by aligning its wide tooth with the wide groove on the brake cam.

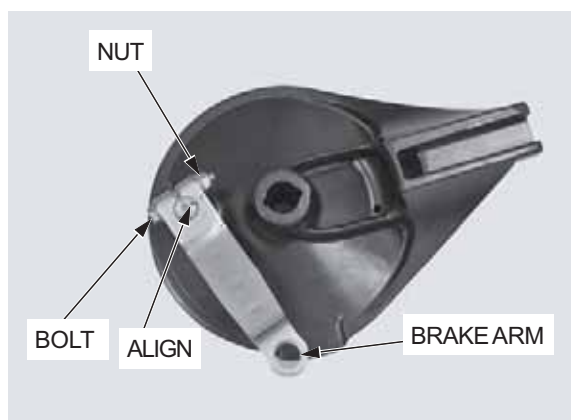


BRAKE SYSTEM

Install the brake arm by aligning the punch marks of the brake arm and brake cam.

Install the brake arm bolt and nut as shown, and tighten the nut to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



If the brake shoes are reused, the shoes and springs must be placed back in their original locations.

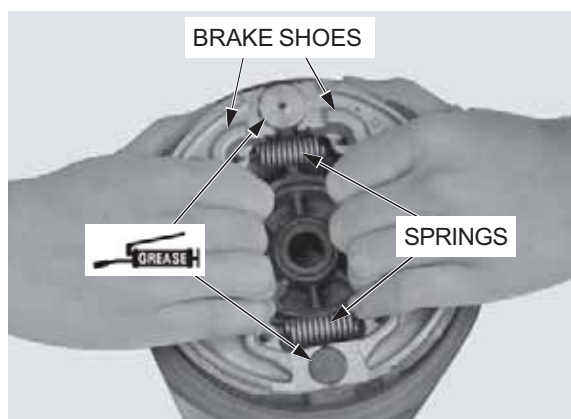
Apply grease to the anchor pin and brake cam shoe contacting area.

Assemble the brake shoes and springs as shown.

Install the shoe assembly onto the brake panel.

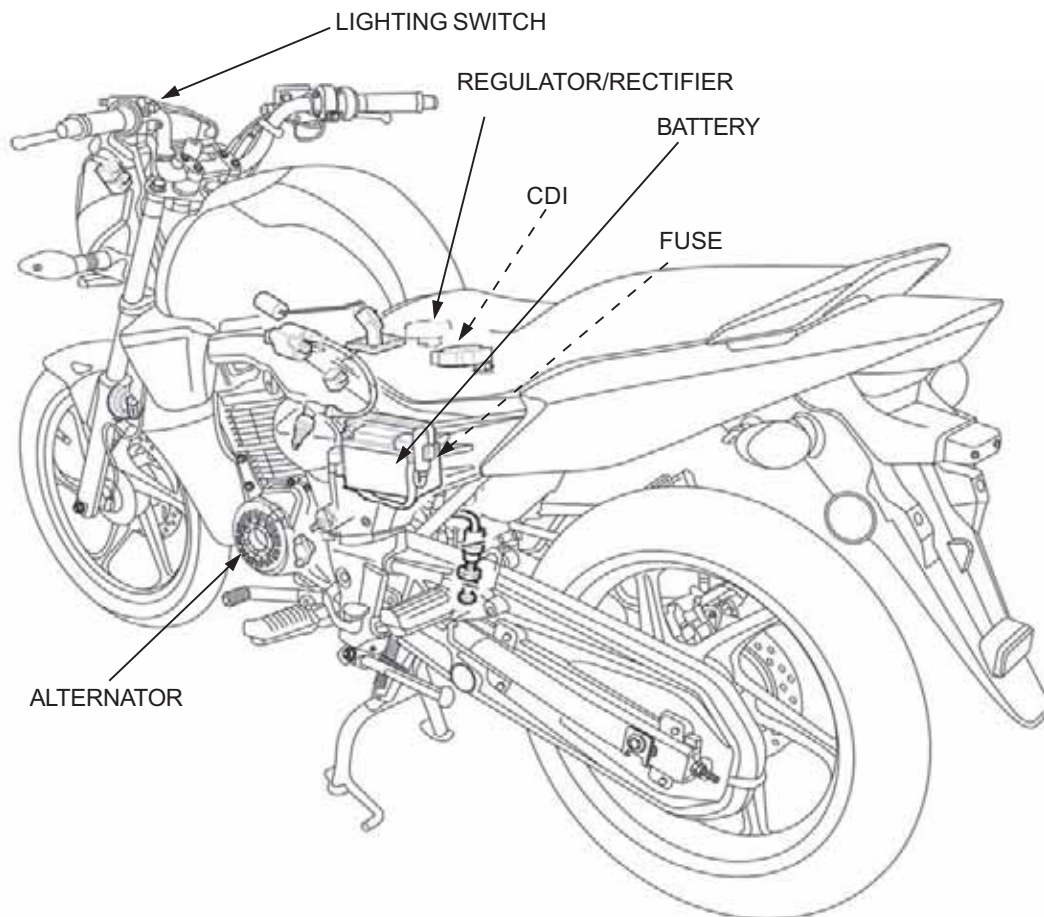
Wipe any excess grease off the brake cam and anchor pin.

Install the brake panel and then install the rear wheel (page 13-8).

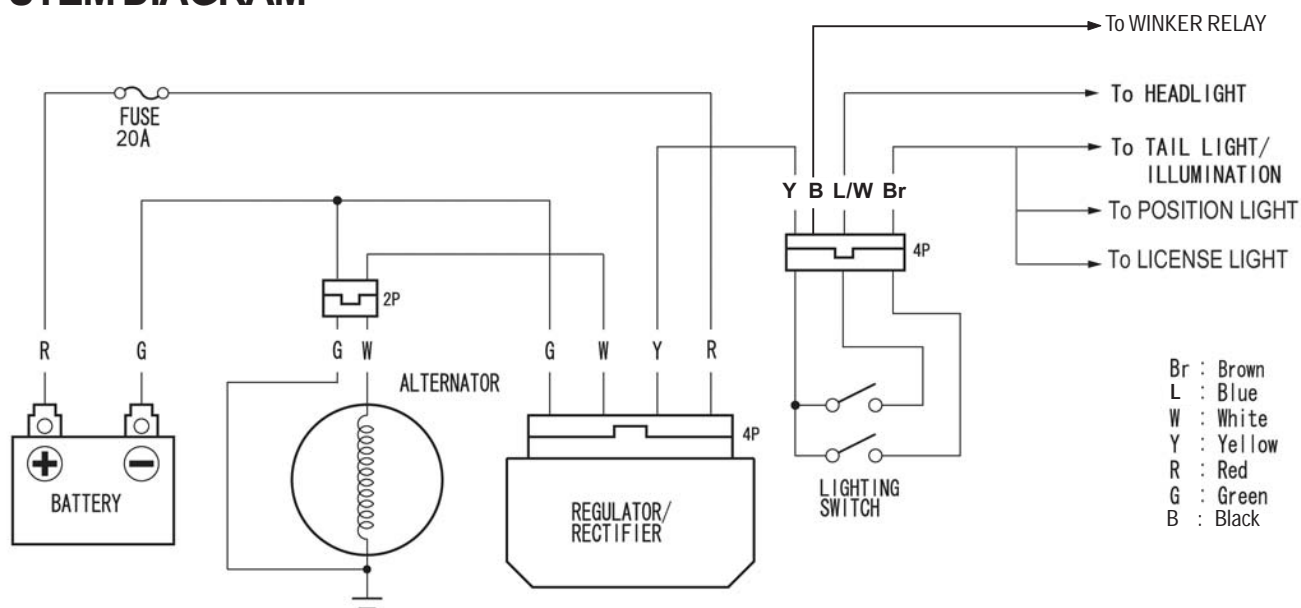


MEMO

SYSTEM LOCATION



SYSTEM DIAGRAM



15. BATTERY/CHARGING SYSTEM

SYSTEM LOCATION	15-0	BATTERY	15-3
SYSTEM DIAGRAM	15-0	CHARGING SYSTEM INSPECTION	15-7
SERVICE INFORMATION	15-1	ALTERNATOR CHARGING COIL	15-8
TROUBLESHOOTING	15-2	REGULATOR/RECTIFIER	15-9

SERVICE INFORMATION

GENERAL

WARNING

- The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.
- The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.
 - If electrolyte gets on your skin, flush with water.
 - If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.
- Electrolyte is poisonous.
 - If swallowed, drink large quantities of water or milk and call your local Poison Control Center or a physician immediately.

NOTICE

- *Always turn "OFF" the ignition switch before disconnecting any electrical component.*
- *Some electrical components may be damaged if terminals or connectors are connected or disconnected by the ignition switch is "ON", and current is present.*
- For extended storage, remove the battery, give it a full charge, and store it in a cool, dry space. For maximum service life, charge the stored battery every two weeks.
- For a battery remaining in a stored motorcycle, disconnect the negative battery cable from the battery terminal.
- The battery can be damaged if overcharged or undercharged, or if left to discharge for a long period. These same conditions contribute to shortening the "life span" of the battery. Even under normal use, the performance of the battery deteriorates after 2–3 years.
- Battery voltage may recover after battery charging, but under heavy load, battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected as the problem. Battery overcharge often results from problems in the battery itself, which may appear to be an overcharging symptom. If one of the battery cells is shorted and battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level goes down quickly.
- The battery will self-discharge when the motorcycle is not in use. For this reason, charge the battery every two weeks to prevent sulfation from occurring.
- When checking the charging system, always follow the steps in the troubleshooting flow chart (page 15-2).
- Refer to the alternator removal and disassembly (page 10-16).

15

BATTERY TESTING

Refer to instructions in the Operation Manual for the recommended battery tester for details about battery testing. The recommended battery tester puts a "load" on the battery so that the actual battery condition can be measured.

Recommended battery tester: FBT-50

SPECIFICATIONS

ITEM			SPECIFICATIONS
Battery	Capacity		12 V – 4 Ah
	Current leakage		0.096 mA max.
	Voltage	Fully charged	12.5 – 13.0 V
		Needs charging	Below 12.4 V
Alternator	Capacity		0.14 kW/5,000 min-1 (rpm)
	Charging coil resistance(20° C/68° F)		0.2 – 1.0 Ω

TROUBLESHOOTING**BATTERY IS DAMAGED OR WEAK****1. BATTERY TEST**

Remove the battery (page 15-3).

Check the battery condition using the recommended battery tester.

RECOMMENDED BATTERY TESTER: FBT-50 or equivalent

Is the battery in good condition?

NO – Faulty battery

YES – GO TO STEP 2.

2. CURRENT LEAKAGE TEST

Install the battery (page 15-3).

Check the battery current leakage (Leak test; page 15-7).

Is the current leakage below 0.096 mA?

YES – GO TO STEP 4.

NO – GO TO STEP 3.

3. CURRENT LEAKAGE TEST WITHOUT REGULATOR/RECTIFIER CONNECTOR

Disconnect the regulator/rectifier 4P connector, and recheck the battery current leakage.

Is the current leakage below 0.096 mA?

YES – Faulty regulator/rectifier

NO – • Shorted wire harness

• Faulty ignition switch

4. CHARGING VOLTAGE INSPECTION

Start the engine.

Measure the charging voltage (page 15-5).

Compare the measurements to the results of the following calculation.

STANDARD:

Measured BV < Measured CV < 13.5V-14.5V

• **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 15-8).

Is the alternator charging coil resistance within 0.2 – 1.0 Ω (20°C/68°F)?

NO – Faulty charging coil

YES – GO TO STEP 6.

6. REGULATOR/RECTIFIER SYSTEM INSPECTION

Check the voltage and resistance at the regulator/rectifier connector (page 15-9).

Are the results of the checked voltage and resistance correct?

YES – Faulty regulator/rectifier

NO – • Open circuit in related wire

• Loose or poor contacts of related terminal

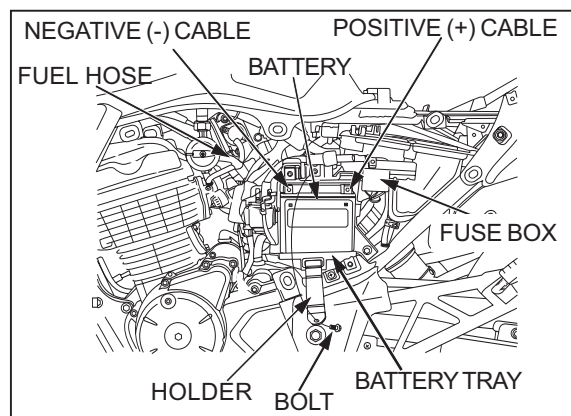
• Shorted wire harness

BATTERY

Always turn the ignition switch OFF before removing the battery.

REMOVAL/INSTALLATION

- Remove the left side cover (page 2-3).
- Disconnect the negative (-) cable by removing the bolt.
- Disconnect the positive (+) cable by removing the bolt.
- Remove the bolt and open the battery mounting stay.
- Remove the battery.
- Install the battery in the reverse order of removal.
- Connect the positive (+) cable first and then the negative (-) cable.



VOLTAGE INSPECTION

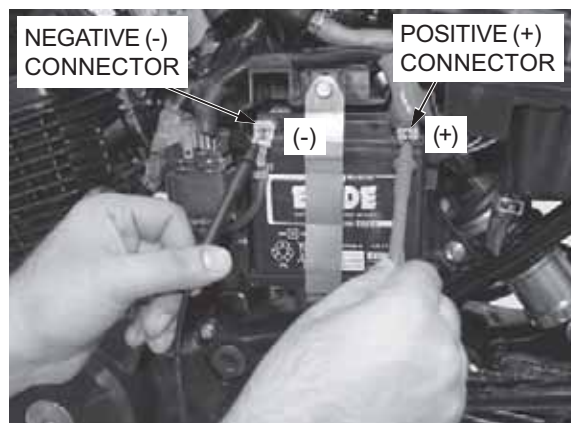
- Remove the left side cover (page 2-3).
- Measure the battery voltage using a commercially available FBT 50 battery tester.

VOLTAGE (20°C/68°F):

Fully charged: More than 12.4 V

Under charged: Below 12.4 V

If the battery voltage is below 12.3 V, charge the battery.



BATTERY TESTING PROCEDURE

Check the battery pin number and refer the table given below.

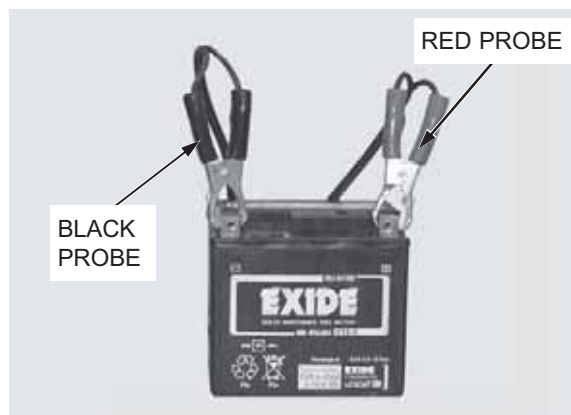
S No.	Battery PIN No.	Ref. No.
1	ETZ 3	3
2	ETZ 4	4
3	ETZ 5	33
4	ETZ 7	5

1. Find the battery type in the table below. 2. Use the information provided to select the Ref. No. from the table.		
TO FIND THE PIN ON THE BATTERY:		
Battery PIN	Ref. No.	No. of Cells
ETZ 3	3	10
ETZ 4	4	10
ETZ 5	33	10
ETZ 7	5	10
ETZ 8	4	10
ETZ 9	4	10
ETZ 10	4	10
ETZ 11	4	10
ETZ 12	4	10
ETZ 13	4	10
ETZ 14	4	10
ETZ 15	4	10
ETZ 16	4	10
ETZ 17	4	10
ETZ 18	4	10
ETZ 19	4	10
ETZ 20	4	10
ETZ 21	4	10
ETZ 22	4	10
ETZ 23	4	10
ETZ 24	4	10
ETZ 25	4	10
ETZ 26	4	10
ETZ 27	4	10
ETZ 28	4	10
ETZ 29	4	10
ETZ 30	4	10
ETZ 31	4	10
ETZ 32	4	10
ETZ 33	33	10
ETZ 34	4	10
ETZ 35	4	10
ETZ 36	4	10
ETZ 37	4	10
ETZ 38	4	10
ETZ 39	4	10
ETZ 40	4	10
ETZ 41	4	10
ETZ 42	4	10
ETZ 43	4	10
ETZ 44	4	10
ETZ 45	4	10
ETZ 46	4	10
ETZ 47	4	10
ETZ 48	4	10
ETZ 49	4	10
ETZ 50	4	10

Connect the tester probes to the battery terminal.

NOTICE

Always connect red probe to positive and black probe to negative terminal.



BATTERY/CHARGING SYSTEM

On connecting probes, the screen displays battery pin number.



Use yellow arrow buttons to select the correct pin number. According to the reference table given on page (15-3).



To check voltage press "V" button.



To load test the battery press "TEST" button.

NOTICE

Device will take approx. 3 seconds to display result.



BATTERY TEST RESULT

RESULT-1

Result indicator shows "Green light" with "OK".
This means battery is healthy ready to be used.



RESULT-2

Result indicator shows "Orange light" with "LOW".
This means battery is weak.
Battery needs bench charging.



RESULT-3

Result indicator shows "red light" with "X".
This means battery is dead.
Battery can not be used any further in the vehicle.



BATTERY CHARGING

Always charge batteries showing "LOW" with orange LED on tester.



BATTERY/CHARGING SYSTEM

Connect charger red probe to positive and black to negative terminal.



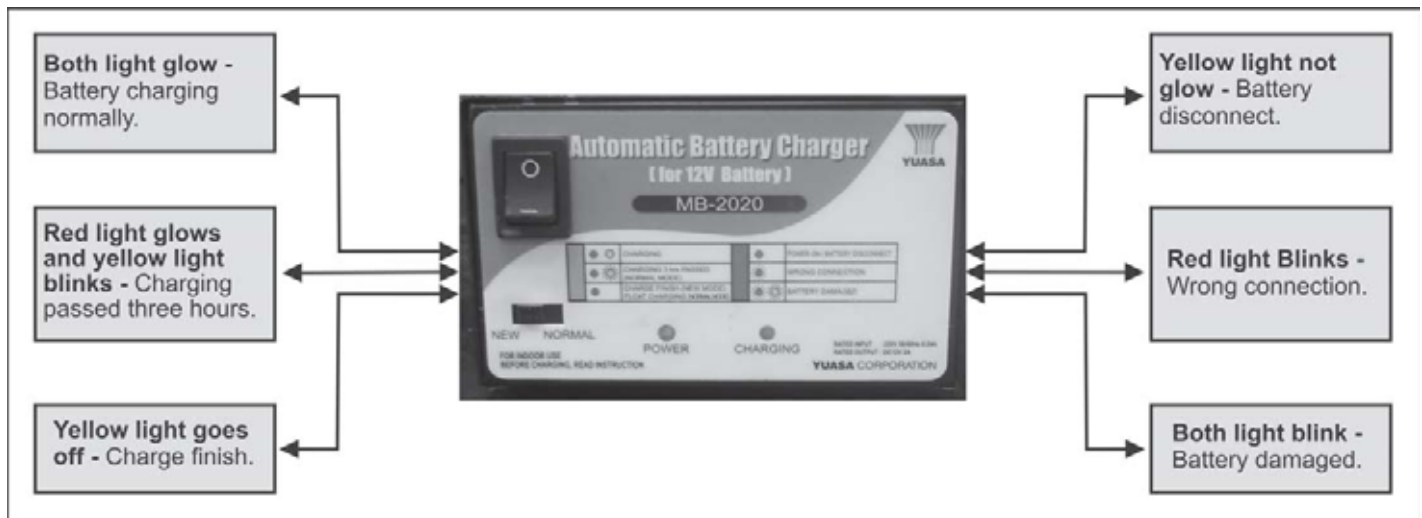
Select the normal mode by the selector switch. And switch on the charger.



On switching on the Power LED will glow instantly followed by yellow LED showing the battery is getting charged properly.



INDICATION TABLE FOR MF BATTERY CHARGER



CHARGING SYSTEM INSPECTION

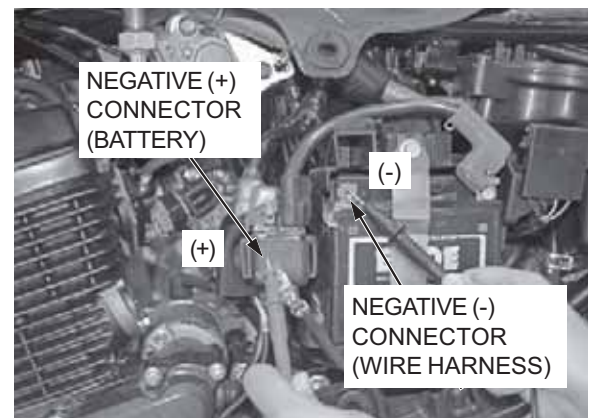
CURRENT LEAKAGE INSPECTION

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

Turn the ignition switch "OFF", and disconnect the negative (-) connector.

Connect the ammeter (+) probe to the wire harness negative (-) connector and ammeter (-) probe to the battery negative (-) connector.

With the ignition switch "OFF", and check for current leakage.



- When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher than the range selected may blow out the fuse in the tester.
- While measuring current, do not turn the ignition switch "ON". A sudden surge of current may blow out the fuse in the tester.

SPECIFIED CURRENT LEAKAGE: 0.096 mA max.

If current leakage exceeds the specified value, a short circuit already happen.

Locate the short circuit by disconnecting connections one by one and measuring the current.

BATTERY/CHARGING SYSTEM

*Reference
engine oil
temperature:
60 – 65 °C
(140 – 149°F).*

CHARGING VOLTAGE INSPECTION

Remove the left side cover

Be sure the battery is in good condition before performing this test.

Warm up the engine to normal operating temperature.

Stop the engine, and connect the multimeter between the battery positive (+) and negative (-) connector.

- To prevent a short, make absolutely certain which are the positive (+) and negative (-) connector.
- Do not disconnect the battery or any cable in the charging system without first turning the ignition switch to "OFF". Failure to follow this precaution can damage the tester or electrical components.

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

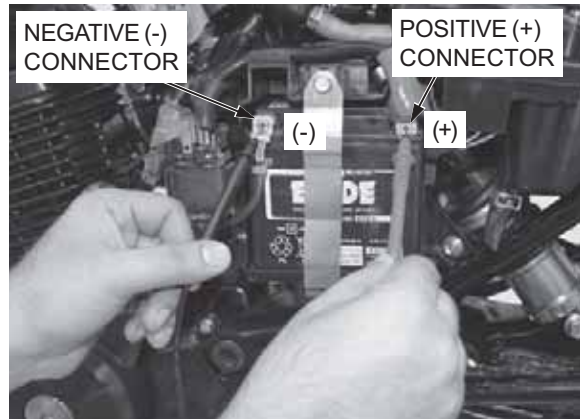
Restart the engine.

With the headlight high beam in "on" position, measure the voltage on the multimeter when the engine runs at 5,000 min⁻¹ (rpm).

STANDARD:

Measured BV < Measured CV < 13.5V-14.5V

- BV = Battery Voltage
- CV = Charging voltage



ALTERNATOR CHARGING COIL

INSPECTION

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

Disconnect the alternator 2P (White) connector.

Measure the resistance between each wire terminal of the alternator side connector.



CONNECTION: White – Green

STANDARD: 0.2 – 1.0 Ω (20°C/68°F)

Replace the alternator stator if resistance is out of specification.

Refer to the alternator stator replacement (page 10-16).



REGULATOR/RECTIFIER

SYSTEM INSPECTION

Remove the fuel tank (page 2-3).

Disconnect the regulator/rectifier connector, and check it for loose contacts or corroded terminals.

If the charging voltage reading (page 15-4) is out of the specification, check the following at the wire harness side connector:

Item	Terminal	Specification
Battery charging line	Red (+) and ground (-)	Battery voltage should register
Charging coil line	White and ground	0.2 – 1.0 Ω (20°C/68°F)
Ground line	Green and ground	Continuity should exist

If all components of the charging system are normal, and there are no loose connections at the regulator/rectifier connector, replace the regulator/rectifier unit.

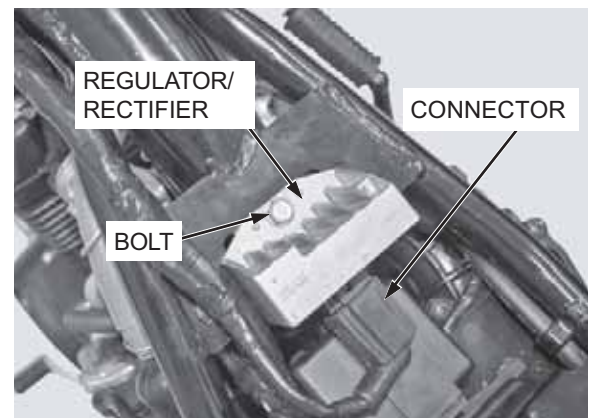
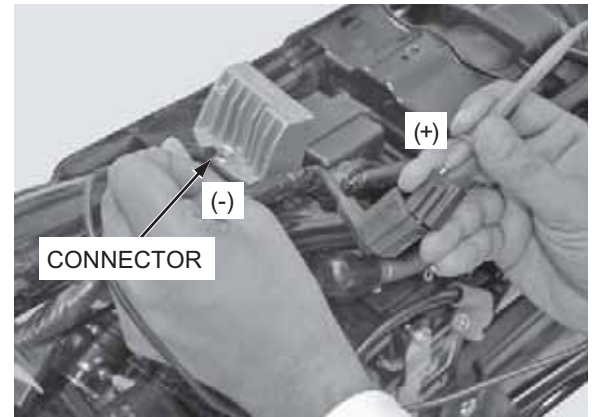
REMOVAL/INSTALLATION

Remove the fuel tank (page 2-3).

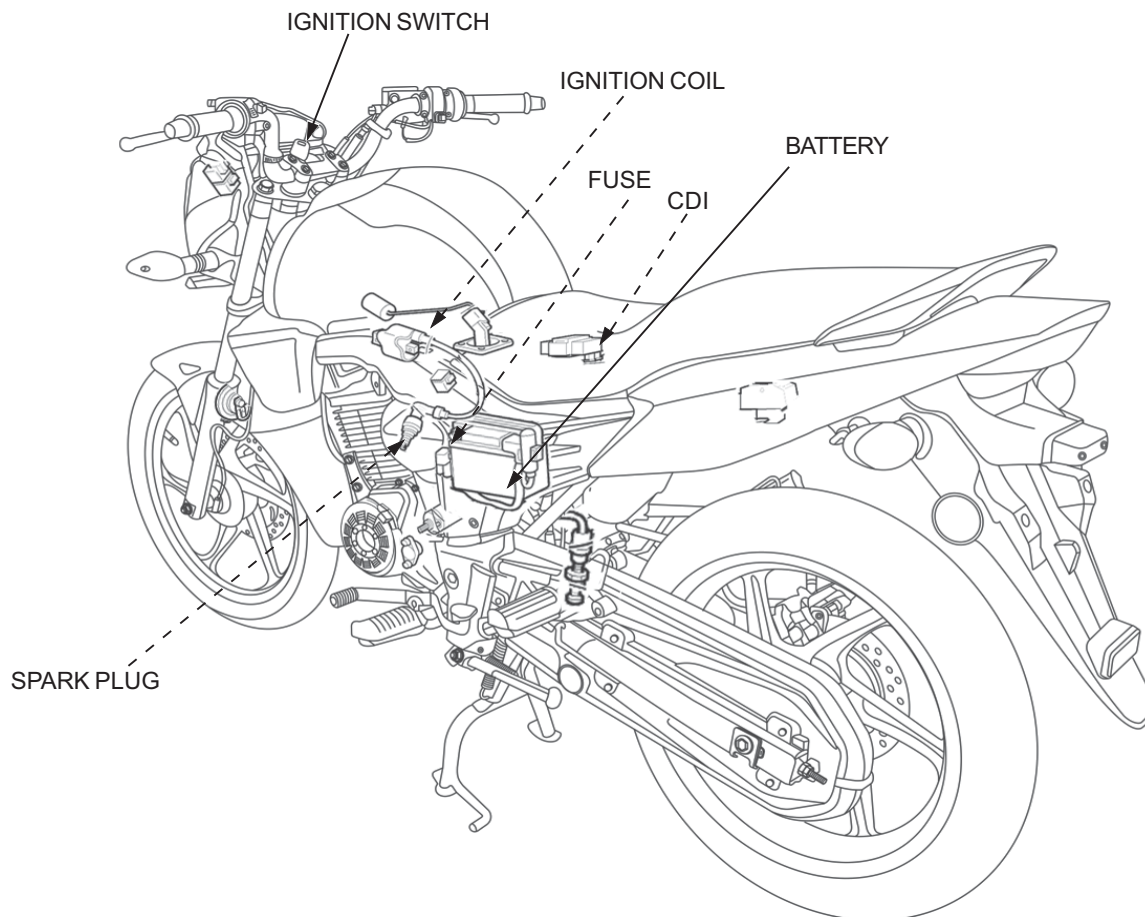
Disconnect the regulator/rectifier connector.

Remove the bolt and regulator/rectifier from the frame.

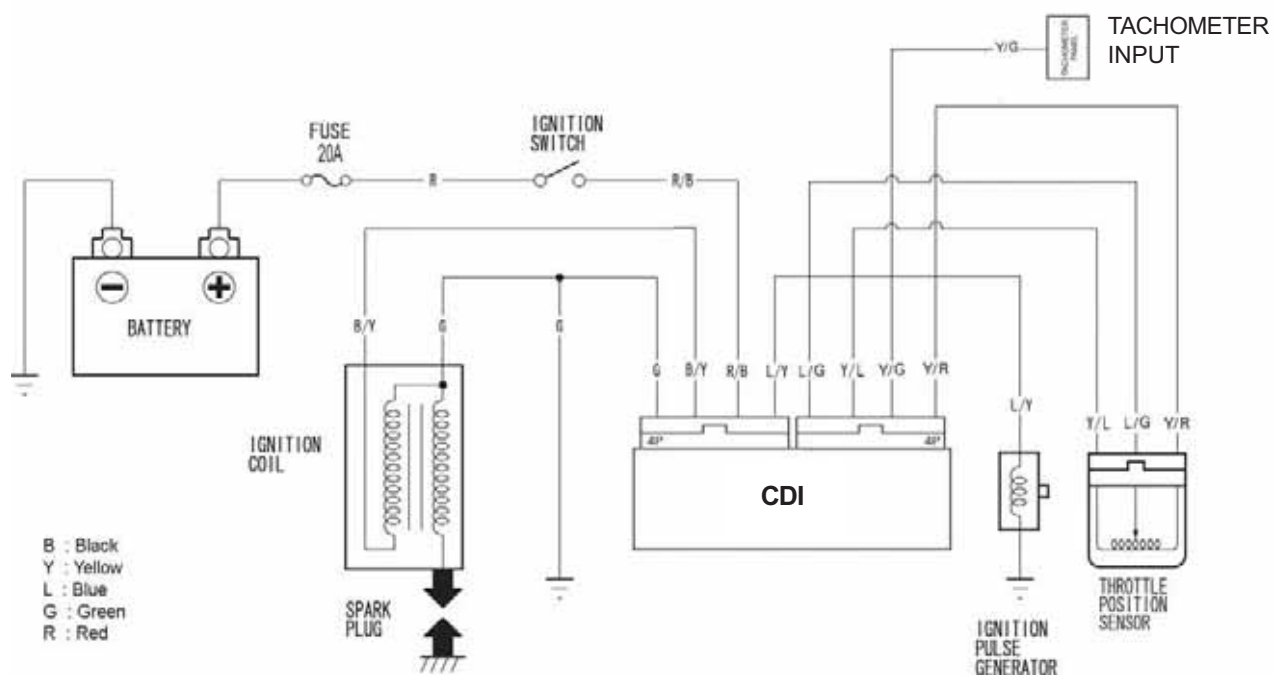
Install the regulator/rectifier in the reverse order of removal.



SYSTEM LOCATION



SYSTEM DIAGRAM



16. IGNITION SYSTEM

SYSTEM DIAGRAM	16-0	IGNITION TIMING	16-5
SERVICE INFORMATION	16-1	IGNITION COIL	16-6
TROUBLESHOOTING	16-2	CAPACITIVE DISCHARGE IGNITION (CDI)	16-6
IGNITION SYSTEM INSPECTION	16-3	TP SENSOR	16-7

SERVICE INFORMATION

GENERAL

NOTICE

- The CDI may be damaged if dropped. Also if the connector is disconnected when current is flowing, the excessive voltage may damage the module. Always turn "OFF" the ignition switch before servicing.
- Use spark plug of the correct heat range. Using a 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 16-2).
- The ignition timing cannot be adjusted since the CDI is factory preset.
- A faulty ignition system is often related to poor connections. Check those connections before proceeding.

SPECIFICATIONS

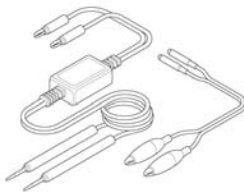
ITEM		SPECIFICATION
Spark plug	Standard	CPR8EA-9 (NGK)
Spark plug gap		0.8 – 0.9 mm (0.03 – 0.04 in)
Ignition coil primary peak voltage		100 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Ignition timing ("F" mark)		8° BTDC at idle
Throttle position sensor	Input voltage	4.75 – 5.25 V
	Resistance (20×C/68×F)	4.0 – 6.0 Ω

TORQUE VALUES

Timing hole cap	10 N·m (1.0 kgf·m, 7 lbf·ft)
Throttle position sensor screw	3.4 N·m (0.4 kgf·m, 2.5 lbf·ft)

Tool

Peak voltage adapter
07HGJ-0020100



with commercially available digital
multimeter (impedance 10 M /DCV
minimum)
or imrie diagnostic tester (model 625)

TROUBLESHOOTING

- Inspect the following before diagnosing the system.
 - Faulty spark plug
 - Loose spark plug cap or spark plug wire connections
 - Water got into the spark plug cap (Leaking the ignition coil secondary voltage)

No spark at spark plug

Unusual condition		Probable cause (check in numerical order)
Ignition coil primary voltage	Low peak voltage.	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too slow. 3. The sampling time of the tester and measured pulse were not synchronized. (System is normal if measured voltage is over the standard voltage at least once.) 4. Poorly connected connectors or an open circuit in the ignition system. 5. Faulty ignition coil. 6. Faulty capacitive discharge ignition (CDI) (in case when No.1-5 are normal).
	No peak voltage.	1. Incorrect peak voltage adapter connections. 2. Battery is undercharged. 3. Faulty ignition switch. 4. Loose or poorly connected CDI connectors. 5. Open circuit or poor connection in the Red/Black wire of the CDI. 6. Open circuit or poor connection in the green wire of the CDI. 7. Faulty peak voltage adapter. 8. Faulty ignition pulse generator. (Measure the peak voltage.) 9. Faulty CDI (in case when above No.1 – 8 are normal).
	Peak voltage is normal, but no spark jumps at the plug.	1. Faulty spark plug or leaking ignition coil secondary current. 2. Faulty ignition coil.
Ignition pulse generator	Low peak voltage.	1. The multimeter impedance is too low; below 10 MΩ/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

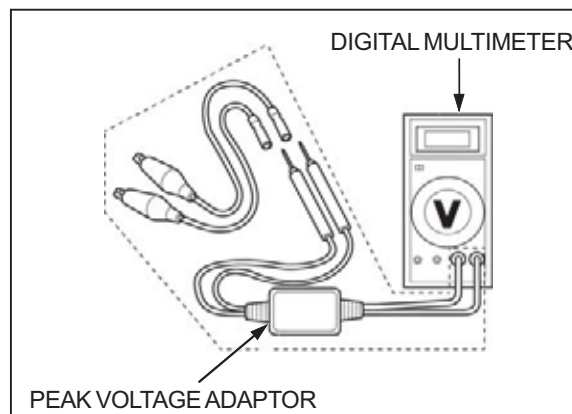
- If there is no spark at the plug, check all connections for loose or poor contact before measuring the peak voltage.
- Use a recommended digital multimeter or commercially available digital multimeter with an impedance of 10 M Ω /DCV. minimum.
- The display value differs depending upon the internal impedance of the multimeter.
- 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 07HG-J-0020100

with commercially available digital multimeter (impedance 10 M Ω /DCV minimum)



IGNITION COIL PRIMARY PEAK VOLTAGE

- Check all system connections before this inspection. Poor connected connectors can cause incorrect readings.
- If the system is disconnected, incorrect peak voltage might be measured.
- Check the cylinder compression, and check that the spark plug is installed correctly in the cylinder head.

Shift the transmission into neutral and 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.



Remove the fuel tank (page 2-3).

With the ignition coil primary wire connected, connect the peak voltage tester or adaptor probes to the ignition coil primary terminal 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 (+) – Body ground (–)

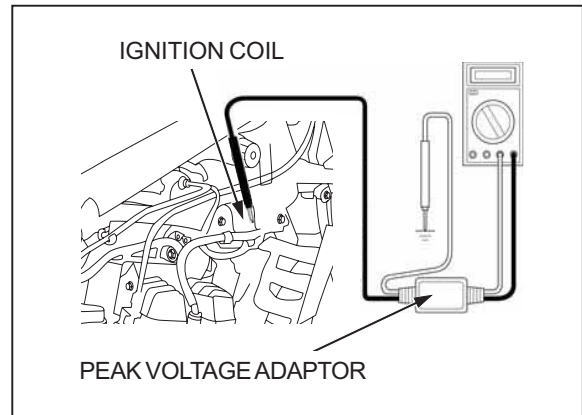
*Avoid touching
the
spark plug or
tester
probes to
prevent
electric shock.*

Turn the ignition switch “ON”.

Crank the engine with the starter switch, and read ignition coil primary peak voltage.

PEAK VOLTAGE: 100 V minimum

If the peak voltage is lower than specified value, follow the checks described in the troubleshooting chart (page 16-2).



IGNITION PULSE GENERATOR PEAK VOLTAGE

- Check the cylinder compression, and make sure the spark plug is installed correctly in the cylinder head.

Remove the fuel tank (page 2-3).

Disconnect the CDI 4P connector.

Connect the peak voltage tester or adaptor probes to the ignition pulse generator terminals (Blue/Yellow) of the 4P connector.

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 (+) – Green wire terminal (–)

Shift the transmission into neutral.

Turn the ignition switch “ON”.

Crank the engine with the kickstarter, and read ignition pulse generator peak voltage.

PEAK VOLTAGE: 0.7 V minimum

If the peak voltage measured at the CDI 4P connector is abnormal, measure the peak voltage at the ignition pulse generator connector.



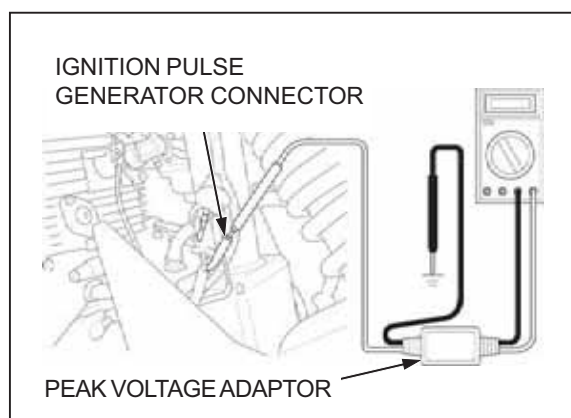
Remove the left side cover (page 2-3).

Disconnect the ignition pulse generator connector (Blue/Yellow) and connect the tester or adaptor probes to the ignition pulse generator side connector and body ground.

In the same manner as at the CDI connector, measure the peak voltage and compare it to the voltage measured at the CDI connector.

- If the peak voltage measured at the CDI 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 16-2).

Ignition pulse generator replacement (page 10-16).



IGNITION TIMING

Warm up the engine to normal operating temperature.

Stop the engine, and remove the timing hole cap.



Read the instructions for timing light operation.

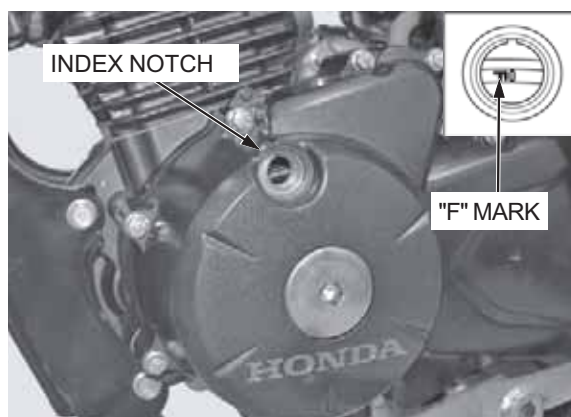
Connect a timing light to the spark plug wire.

Start the engine and let it idle.

IDLE SPEED: 1,400 ± 100 min-1 (rpm)



The ignition timing is correct if the "F" mark on the flywheel aligns with the index notch in the left crankcase cover.

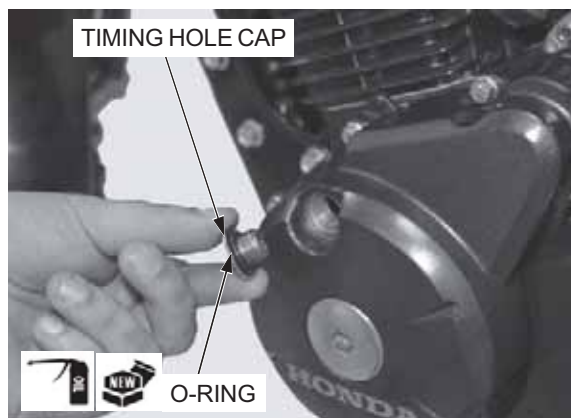


IGNITION SYSTEM

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

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

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



IGNITION COIL

REMOVAL/INSTALLATION

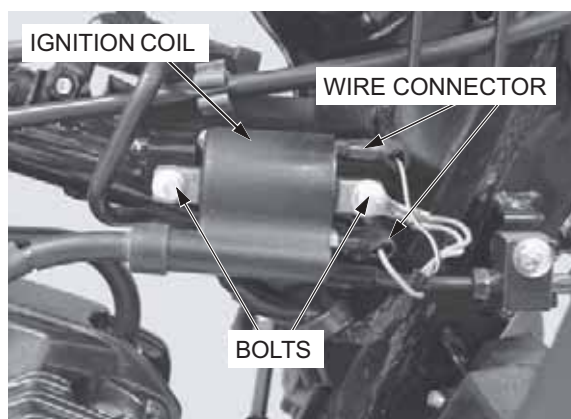
Remove the fuel tank (page 2-3).

Disconnect the spark plug cap from the spark plug.

Disconnect the wire connector from the ignition coil.

Remove the bolts and ignition coil.

Installation is in the reverse order of removal.



CDI (CAPACITIVE DISCHARGE IGNITION) SYSTEM INSPECTION

Remove the fuel tank. (page 2-3).

Disconnect the CDI 4P connector.

Turn the ignition switch "ON".

Check the following at the wire harness side connector:

Item	Terminal	Specification
Battery line	Red/Black (+) and body ground (-)	Battery voltage should register.
Ground line	Green and body ground	Continuity should exist



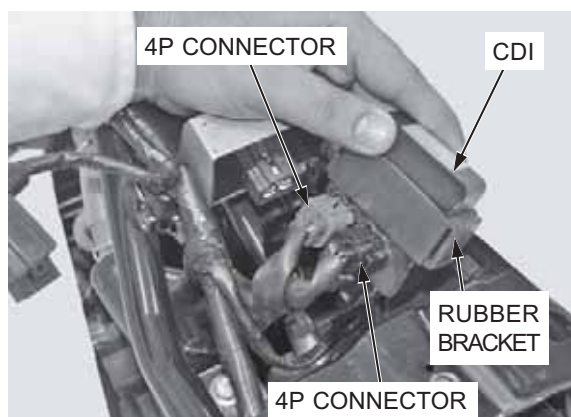
REMOVAL/INSTALLATION

Remove the fuel tank (page 2-3).

Disconnect the CDI 4P connector.

Remove the CDI from the bracket.

Installation is in the reverse order of removal.



THROTTLE POSITION SENSOR

INSPECTION

INPUT VOLTAGE

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

Disconnect the throttle position sensor 3P connector from carburetor assembly.

Turn the ignition switch "ON".

Check the following at the wiring harness side connector:

CONNECTION: Yellow/Red (+) – Blue/Green (–)

STANDARD: 4.75 – 5.25 V

If the measurement is out of specification, check the following:

- Loose connection of the CDI 4P connector
- Open circuit in wire harness

OPERATION INSPECTION

Connect the throttle position sensor 3P connector.

Disconnect the CDI 4P connector.

Check that the resistance at the CDI 4P connector terminals while operating the throttle grip.

CONNECTION: Yellow/Red – Yellow/Blue

RESISTANCE: 4.0 – 6.0 kΩ (20°C/68°F)

Item	Resistance
Full close to full open	Decreases
Full open to full close	Increases

If the resistance at the CDI 4P connector is abnormal, measure the resistance at throttle position sensor 3P connector.

Disconnect the TP sensor 3P connector from the carburetor.

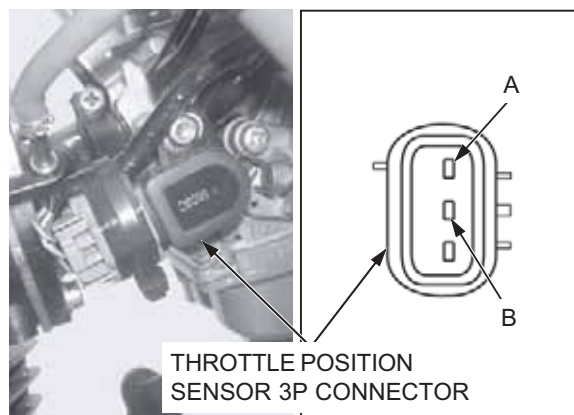
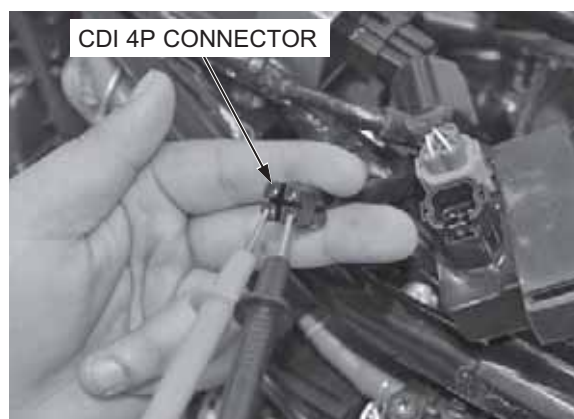
Check that the resistance at TP sensor 3P connector terminals while operating the throttle grip.

CONNECTION: A – B

STANDARD: 4.0 – 6.0 kΩ (20°C/68°F)

Item	Resistance
Full close to full open	Decreases
Full open to full close	Increases

- If the resistance at throttle position sensor 3P connector is normal, the wire harness has an open circuit or loose connection.
- If both measured resistance are abnormal, replace TP sensor (page 16-8).

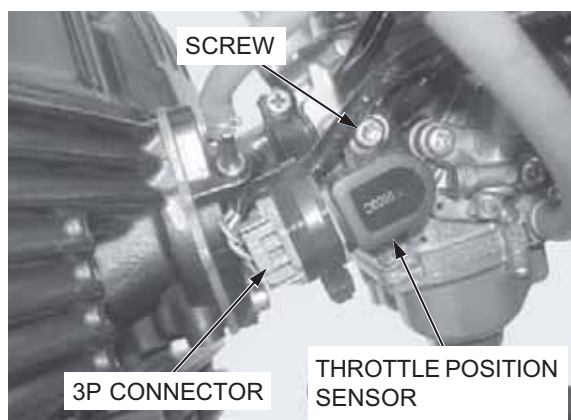


REMOVAL/INSTALLATION

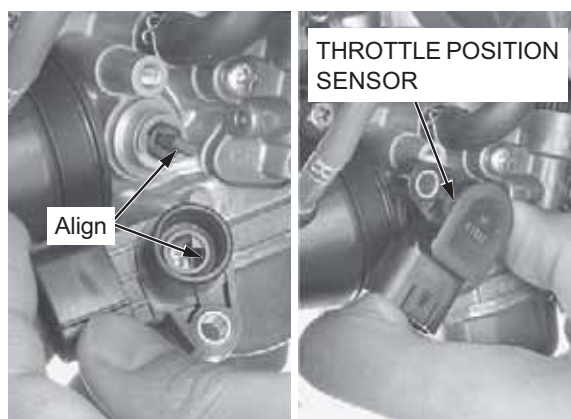
Remove the left side cover (page 2-3).

Disconnect the throttle position sensor 3P connector.

Remove the screw and throttle position sensor.



Install the throttle position sensor while aligning the groove of the sensor with the flat of the shaft as shown.



Rotate the throttle position sensor and align the hole in the sensor with the screw hole in the carburetor.

Install and tighten the screw.

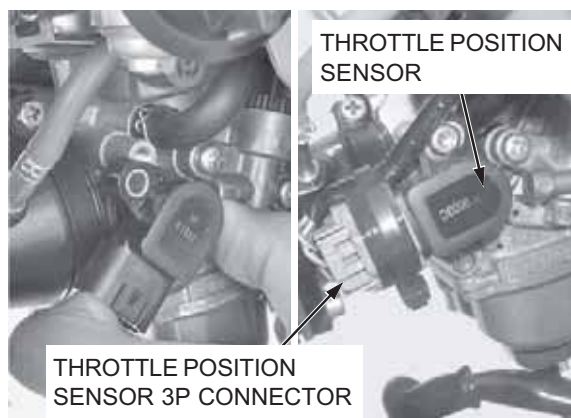
TORQUE: 3.4 N.m (0.4 kgf.m, 2.5 lbf.ft.)

Connect the throttle position sensor 3P connectors.

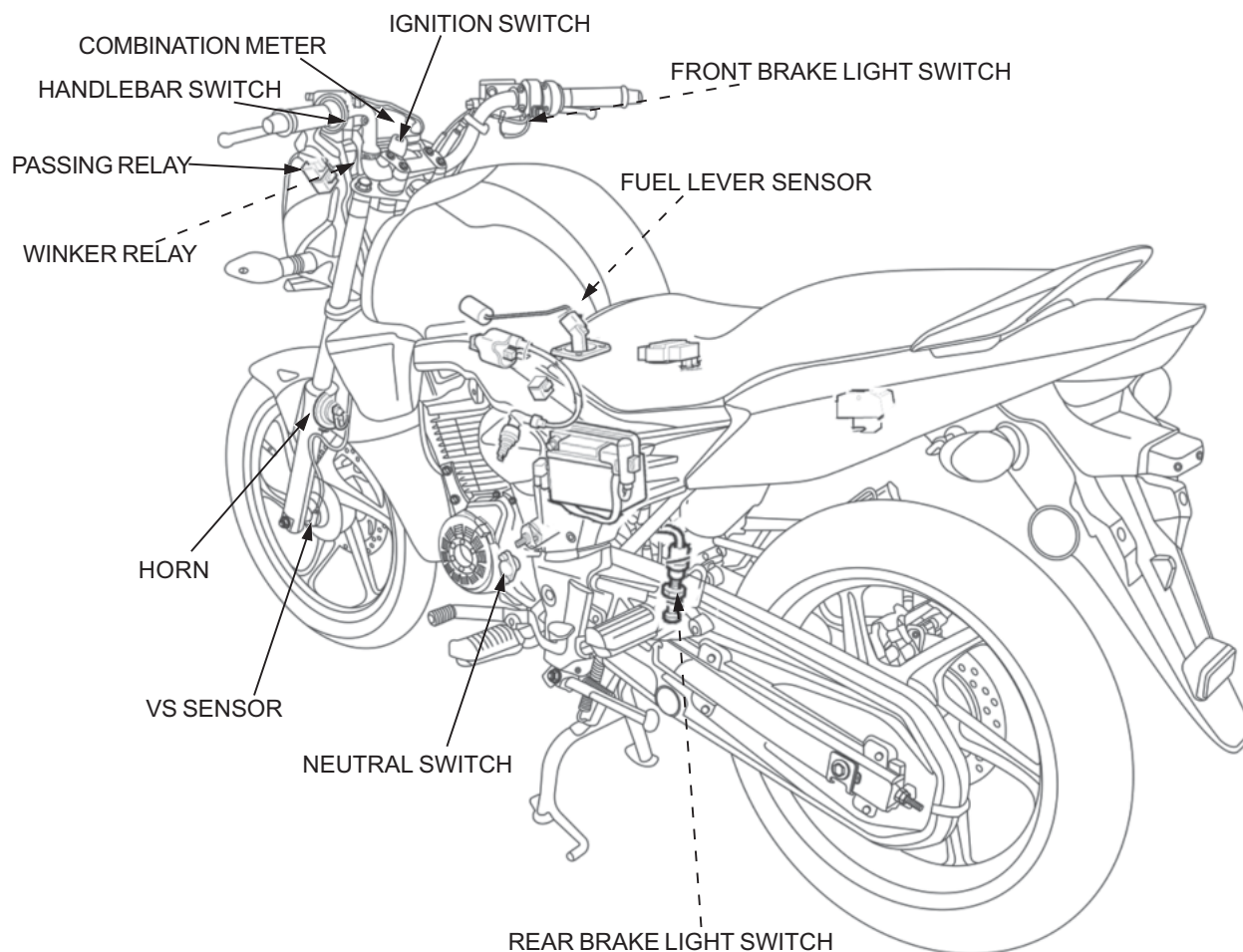
Check the throttle position sensor 3P connectors.

Check the throttle operation (page 3-5)

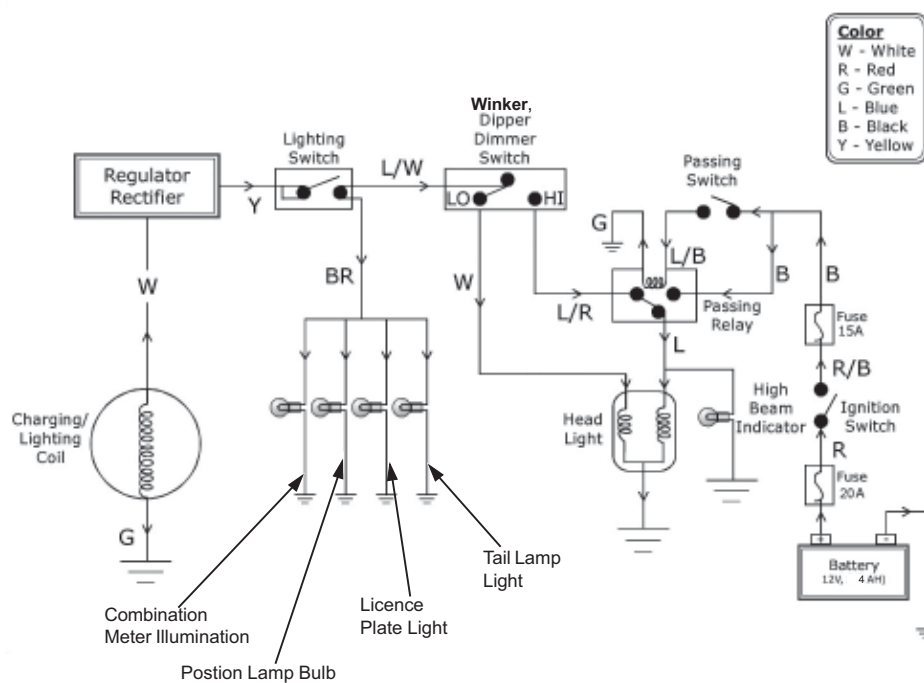
Install the left side cover (page 2-3).



SYSTEM LOCATION



SYSTEM DIAGRAM



17. LIGHTS/METERS/SWITCHES

SYSTEM LOCATION	17-0	IGNITION SWITCH	17-9
SYSTEM DIAGRAM	17.0	HANDLEBAR SWITCHES	17-10
SERVICE INFORMATION	17-1	LEFT HANDLEBAR SWITCH	17-10
HEADLIGHT	17-2	BRAKE LIGHT SWITCH	17-11
BRAKE/TAIL LIGHT	17-3	NEUTRAL SWITCH	17-11
TURN SIGNAL LIGHTS	17-4	FUEL GAUGE/FUEL LEVEL SENSOR	17-13
COMBINATION METER	17-4	HORN	17-15
SPEEDOMETER/VS SENSOR	17-6	PASSING RELAY	17-15
TACHOMETER	17-7	TURN SIGNAL RELAY	17-16
DIGITAL METER RESET PROCEDURE	17-8		

SERVICE INFORMATION

GENERAL

NOTICE

- A halogen headlight bulb becomes very hot while the headlight is "ON", and remains hot for a while after it is turned "OFF". Be sure to let it cool down before servicing.
- Note the following when replacing the halogen headlight bulb.
 - Wear clean gloves by 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 alcohol to prevent its early failure.
 - Be sure to install the dust cover after replacing the bulb.
- Keep all flammable materials away from the electric heating element. Wear protective clothing, insulated gloves and eye protection.
- 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.

L = Blue	G = Green	Lg = Light green	R = Red
B = Black	Gr = Gray	O = Orange	W = White
Br = Brown	Sb = Sky blue	P = Pink	Y = Yellow

SPECIFICATIONS

ITEM	SPECIFICATION	
Bulbs	Headlight (Hi/low beam)	12 V - 35/35 W
	Position Light	12V - 5W
	Brake/tail light (LED)	12 V - 3.5/0.7 W
	Turn signal light	12 V - 10 W x 4
	Instrument light	LED
	Turn signal indicator	LED (560 mcd)
	High-beam indicator	LED (213 mcd)
	Neutral indicator	LED (560 mcd)
Fuse	Main	20A
	Sub	15A & 10A
Fuel level sensor resistance (20°C/68°F)	Full	6 - 9 Ω
	Empty	266 - 274 Ω
Resistor comp (20°C/68°F)	Resistance	150 \pm 7.5 Ω
	Power	5W

TORQUE VALUES

Fuel level sensor mounting nut 10 N·m (1.0 kgf·m, 7 lbf·ft)

HEADLIGHT

BULB REPLACEMENT

Remove the front cowl (page 2-2)

Disconnect the headlight connector.



Remove the dust cover.

Remove the bulb retainer.

Remove the headlight bulb.

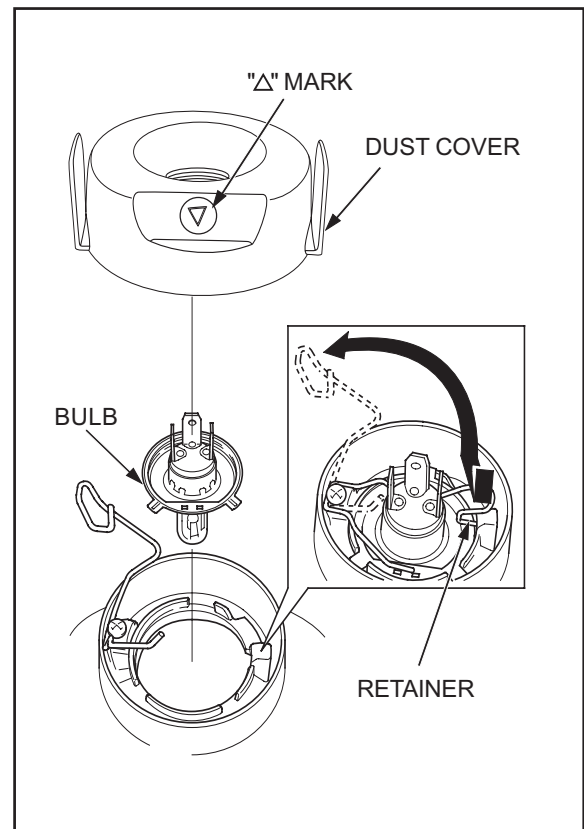
*Avoid touching
halogen
headlight bulb.*

Install the new bulb while aligning the tabs of the bulb
with the slots of the headlight unit.

Hook the bulb retainer into the headlight unit groove.

Install the dust cover with the "Δ" mark facing up.

*Finger prints
can create hot
spots that cause
a bulb to break.*



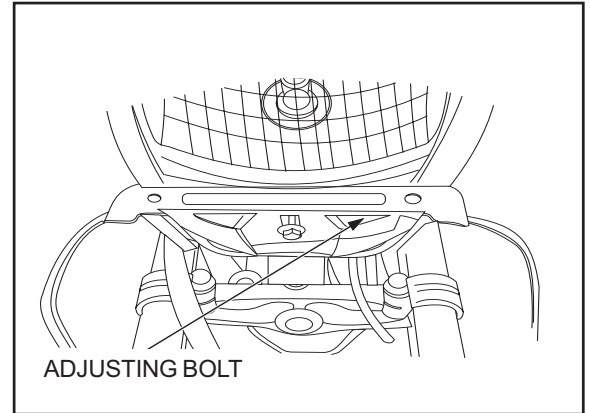
Connect the headlight connector.

Install the front cowl (page 2-2).

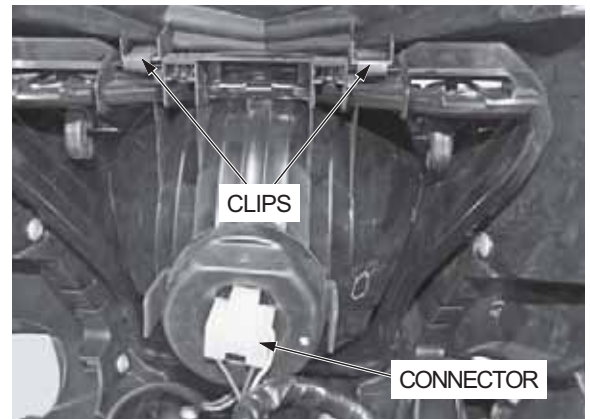


HEADLIGHT UNIT REMOVAL/INSTALLATION

Remove the headlight adjusting bolt.



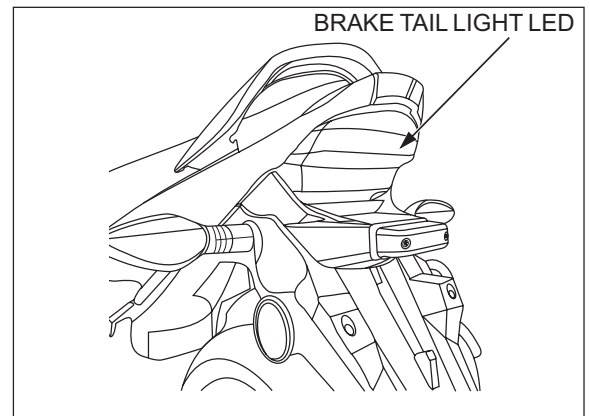
Remove the front cowl. (page 2-2)
 Disconnect the headlight connector.
 Remove the clips and headlight unit.
 Installation is in the reverse order of removal.
 Adjust the headlight beam vertically (page 3-21)



BRAKE/TAIL LIGHT

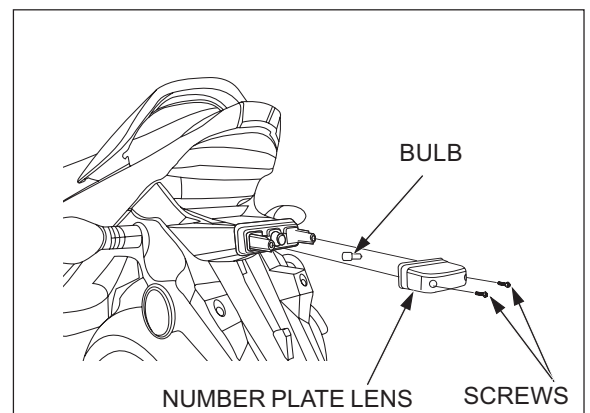
LED UNIT REPLACEMENT

Remove the LED brake/tail light by following the disassembly procedure as given in (page 2-5).
 Replace the LED with a new one under warranty (As per conditions).
 Installation is in the reverse order of removal.



NUMBER PLATE LIGHT BULB

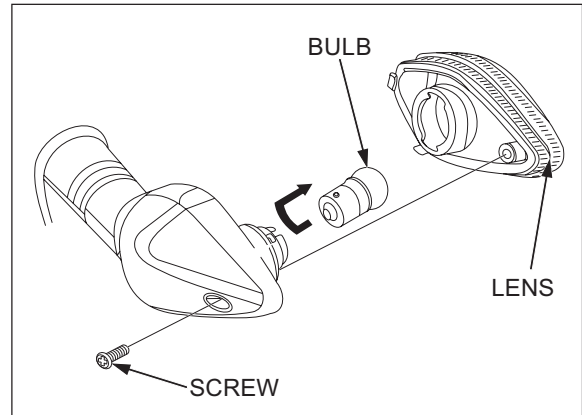
Remove the number plate light lens by removing the screws (2 nos.).
 Slightly press the bulb and turn it counterclockwise.
 Install a new bulb in the reverse order of removal.



TURN SIGNAL LIGHTS

BULB REPLACEMENT

Remove the screw and turn signal light lens.
Push the bulb in turn it counterclockwise and remove it.
Replace the bulb with a new one.
Installation is in the reverse order of removal.



COMBINATION METER

POWER/GROUND LINE INSPECTION

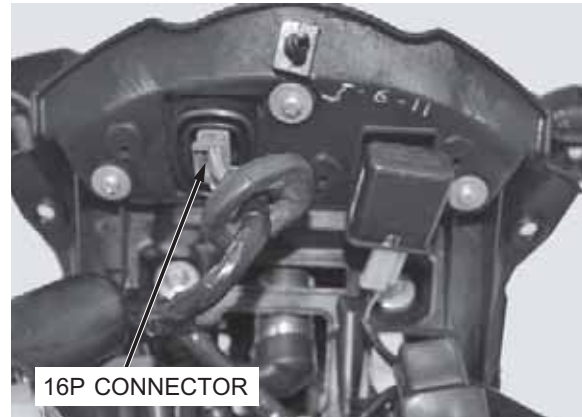
If any indication in the combination meter is abnormal, check the following item.

Remove the front cowl (page 2-2).

Remove the dust cover.

Disconnect the combination meter 16P (Gray) connector.

Check the following at the wire harness side connector terminals of the combination meter.

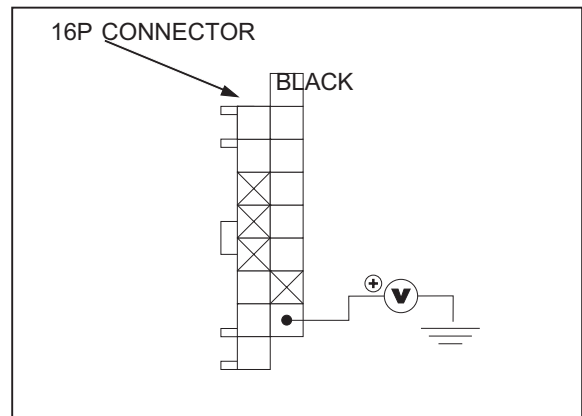


Power input line

Measure the voltage between the Black wire terminal (+) and body ground (-).

There should be battery voltage with the ignition switch ON.

If there is no voltage, check the fuse (15 Amp) and open circuit in Black wire.

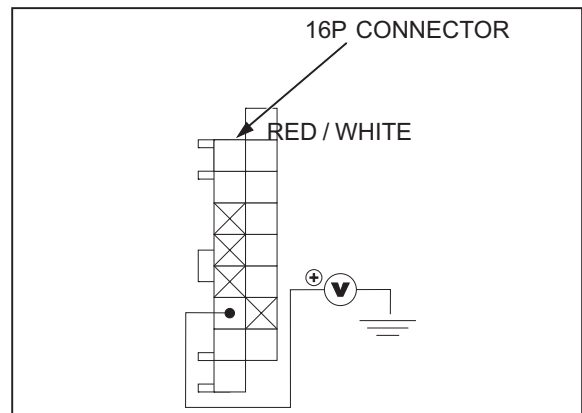


Back-up voltage line

Measure the voltage between the Red/white wire terminal (+) and body ground (-).

There should be battery voltage at all times.

If there is no voltage, check the fuse (10 Amp) and open circuit in Red / White wire.

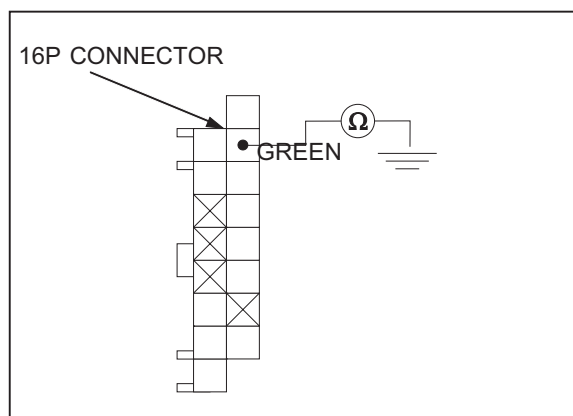


Ground line

Measure the continuity between the Green wire terminal and body ground.

There should be continuity.

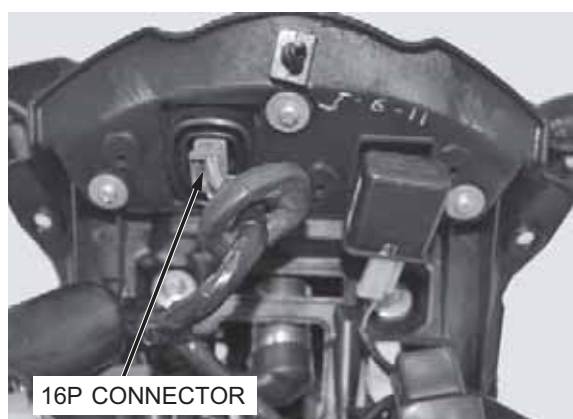
If there is no continuity, check for open circuit in Green wire.



REMOVAL/INSTALLATION

Remove front cowl (page 2-2)

Disconnect the combination meter 16P connector assy.



Remove the screws (3 nos.) and washers.

Remove the combination meter assy from front cowl stay.

Installation is in the reverse order of removal.



DISASSEMBLY

Remove the screws (10 nos.), meter lower cover and upper cover.

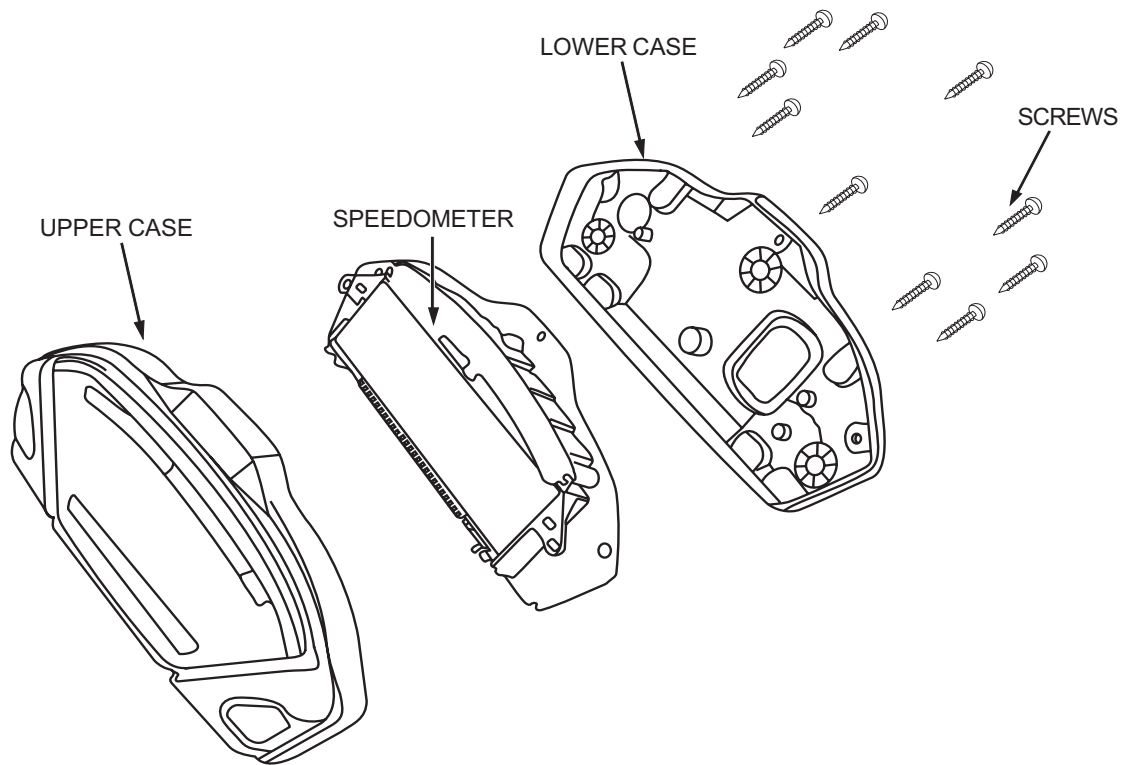
NOTICE

Check that the indicators function properly.

If they do not function, perform the power and ground line inspection combination meter.



ASSEMBLY



SPEEDOMETER VS SENSOR

SYSTEM INSPECTION

Check that the indicators function properly.

If they do not function, perform the power and ground line inspection of the combination meter (page 17-5).

Remove the front cowl (page 2-2).

Remove the dust cover.

Support the motorcycle on center stand and raise the front wheel off the ground.



Check the connection/connector for correct fitment.

Disconnect the VS sensor 2P (Black) connector. Turn the ignition switch to ON and measure the voltage between the Red (+) and Black/Blue (-) wire terminals at the harness side 2P (white) connector.

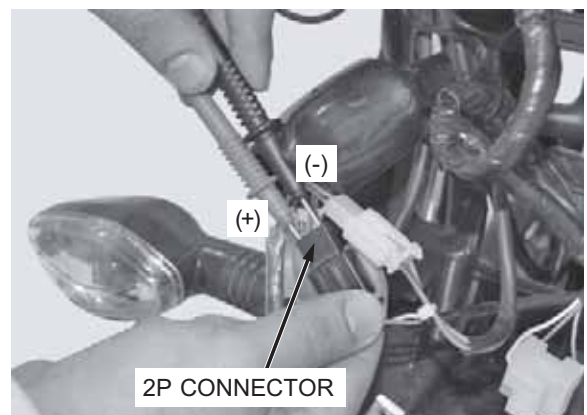
CONNECTION: Red (+) – Black/Blue (-)

STANDARD: Battery voltage- 12.4V

There should be battery voltage.

If there is no voltage, check for open circuit in related wires.

If there is voltage, check the VS sensor as follows.



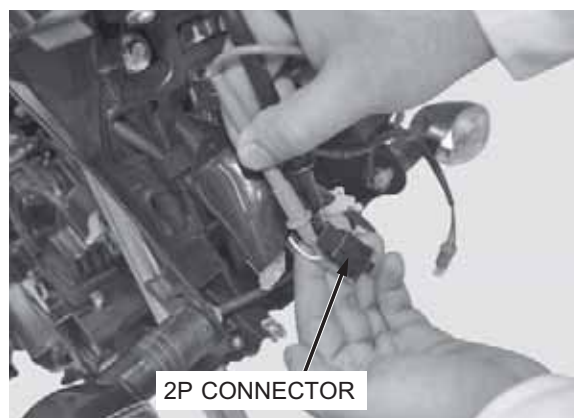
Connect the inspection adaptor to the sensor VS sensor 2P (Black) connectors.

Measure the voltage between the White (+) and Black (-) wire terminals of the wire harness side connector.

Slowly turn the front wheel by hand.

There should be **0 to 5 V pulse** voltage.

If pulse voltage does not appear, replace the VS sensor.



REMOVAL/INSTALLATION

Disconnect the VS sensor 2P (Black) connector.

Remove the VS sensor wire mounting bolts (2 nos.) (page 12-10)

Remove the front wheel (page 12-10).

Remove the VS sensor assy from the wheel.

Installation in the reverse order of the removal.



TACHOMETER

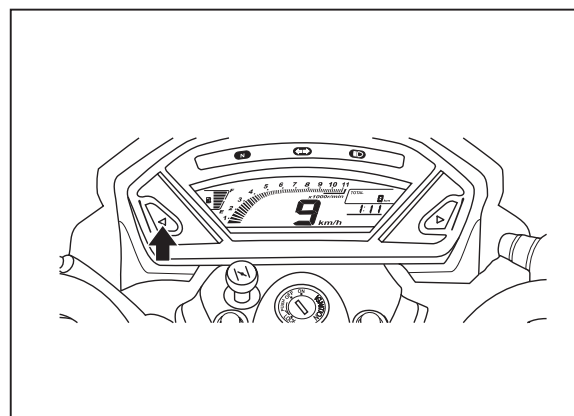
SYSTEM INSPECTION

Check for loose or poor contact terminals at the combination meter 16P (Gray).

Turn the ignition switch ON, check that the tachometer needle moves to full scale and then returns to zero.

If the needle does not show initial function, check the combination meter power input line (page 17-4).

Remove the front cowl (page 2-2) with combination meter 16P (Gray) connector connected.



Connect the peak voltage adaptor to the combination meter terminal and ground.

TOOL:

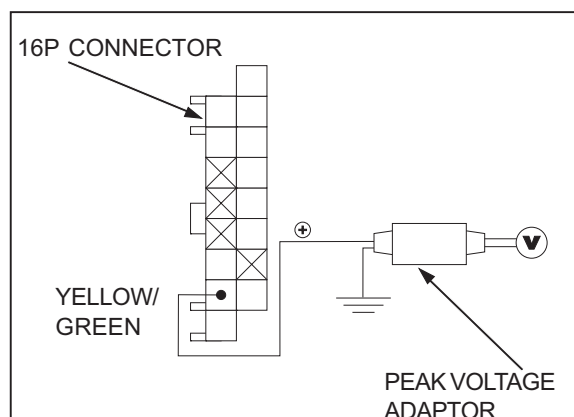
Peak voltage adapter 07HGJ-0020100

Connection: Yellow/green (+) - Ground (-)

Start the engine and measure the tachometer input peak voltage.

PEAK VOLTAGE: 10.5 V minimum

If the peak voltage is normal, replace the combination meter assembly (page 17-5).



If the measured value is below 10.5 V, replace the CDI.

If the value is 0 V, check for continuity between the combination meter 16P (Gray) connector and CDI 4P (Red) connector Yellow/green terminals.

TOOL:

Test probe **07ZAJ-RDJA 110**

If there is no continuity, check the wire harness and combination meter.

If there is continuity, replace the combination meter (page 17-5).

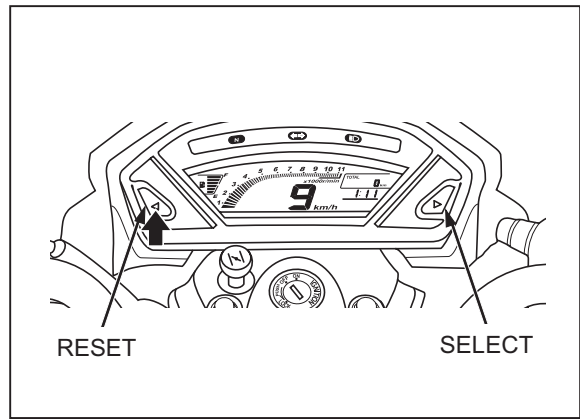
DIGITAL SPEEDOMETER RESET PROCEDURE

Tripmeter

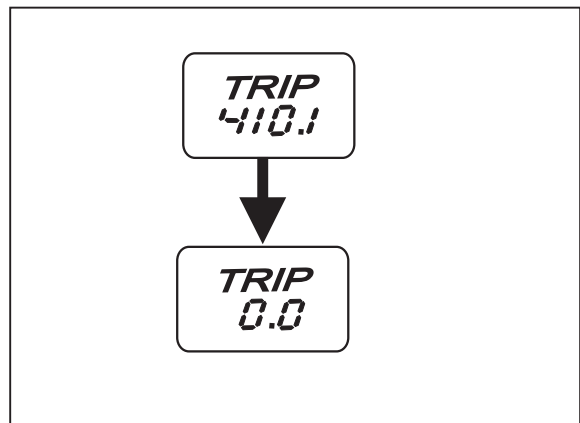
To reset the tripmeter proceed as follows:

Press the select button to select Tripmeter.

- Reset button
- Select button



To reset the tripmeter, press and hold the reset button for more than 3 seconds when the display is in the "Trip".

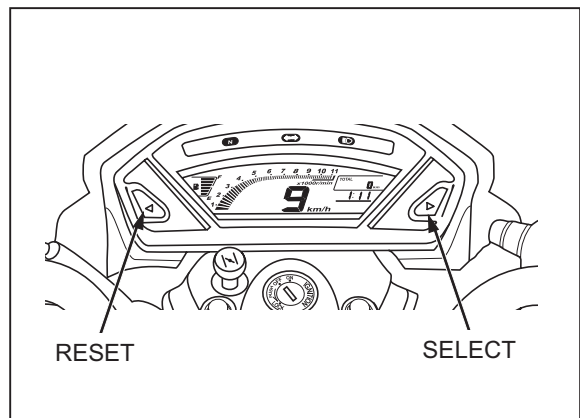


Digital Clock

The digital clock will show hours and minutes up to 11:59

To adjust the time, proceed as follows:

1. Turn the ignition switch ON.
 2. Press and hold the both buttons (1) and (2) for more than 3 seconds simultaneously. The clock will be set in the adjust mode with the hour flashing.
- Reset button
 - Select button



3. To set the hour, press the reset button until the desired hour is displayed.

- Quick setting - press and hold the reset button until the desired hour appears.

4. Press the select button (1) when the display reaches the desired hour.



5. To set the minute, press the reset button until the desired minute appears.

- Quick setting - press and hold the reset button until the desired minute appears.

6. Press the select button when the display reaches the desired minute.

The display will stop flashing.

If the ignition switch is turned off or no operation is performed for 30 seconds during the time adjustment mode, the clock will be reset.

The clock will be reset 1:00 if the battery is disconnected.



IGNITION SWITCH

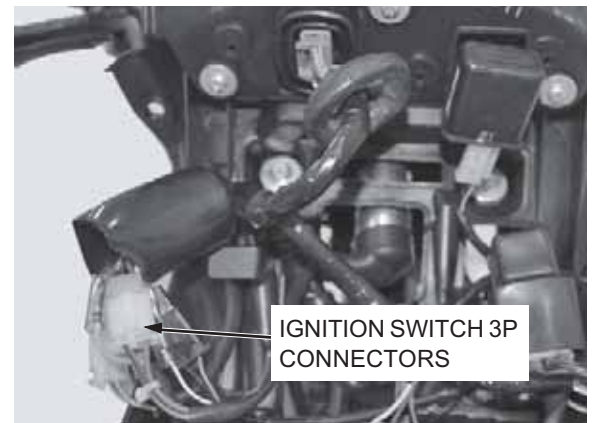
INSPECTION

Remove the front cowl. (page 2-2)

Disconnect the ignition switch 3P connectors.

Check for continuity between the ignition switch connector terminal in each switch position according to the table.

	BAT1	BAT2
LOCK		
OFF		
ON	○	○
COLOR	R	R/BI



REMOVAL/INSTALLATION

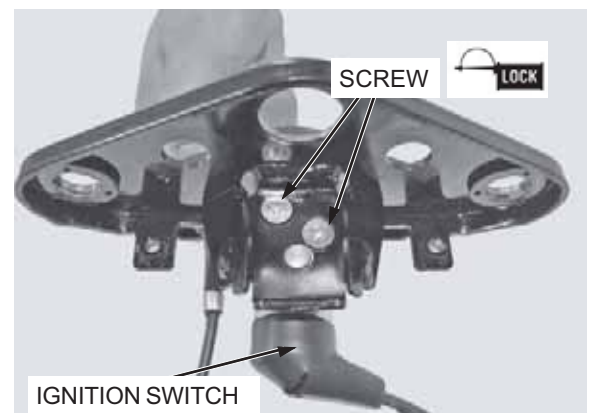
Remove the combination meter (page 17-5)

Remove the top bridge (page 12-23).

Remove the following:

- ignition switch mounting screws
- ignition switch.

Apply a locking agent to the ignition switch mounting screws threads before installing.



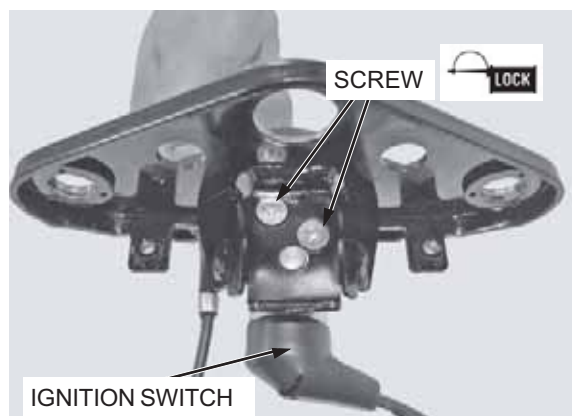
Install the following:

- ignition switch
- ignition switch mounting screws.

Install the top bridge (page 12-26)

Install the combination meter (page 17-5) in reverse order.

Install the front cowl (page 2-2)



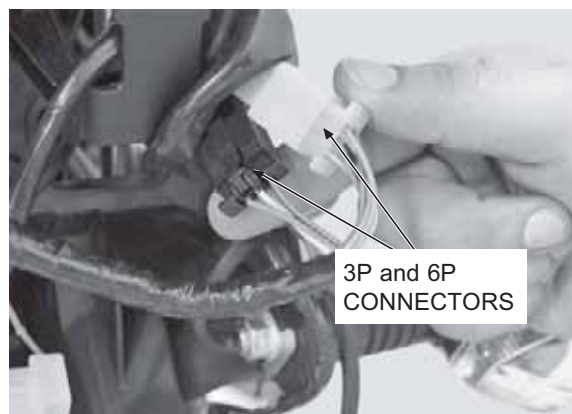
HANDLEBAR SWITCHES

LEFT HANDLEBAR SWITCH

Remove the front cowl (page 2-2).

Disconnect the handlebar switches 6P and 3P from left handlebar.

Check for continuity between the terminals in each switch position according to the table.

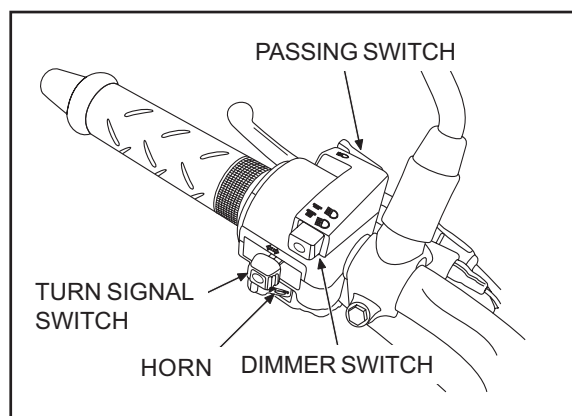


DIMMER SWITCH

	HL	HI	LO
	○	○	○
(N)	○	○	○
	○	○	○
COLOR	L/W	L/R	W

TURN SIGNAL SWITCH

	R	WR	L
	○	○	○
N			
			○
COLOR	SB	Gr	O

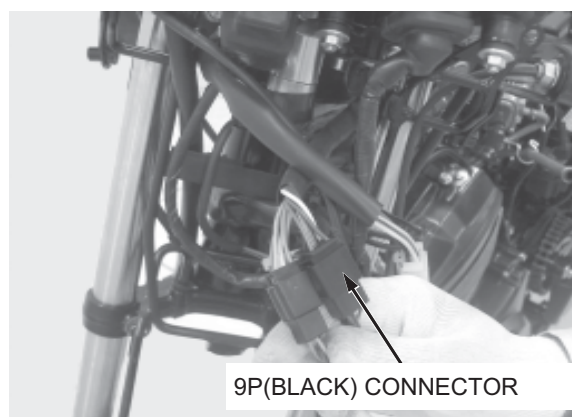


PASSING SWITCH

	PA	BAT
FREE		
PUSH	○	○
COLOR	L/B	B

HORN SWITCH

	BAT	HO
FREE		
PUSH	○	○
COLOR	B	Lg



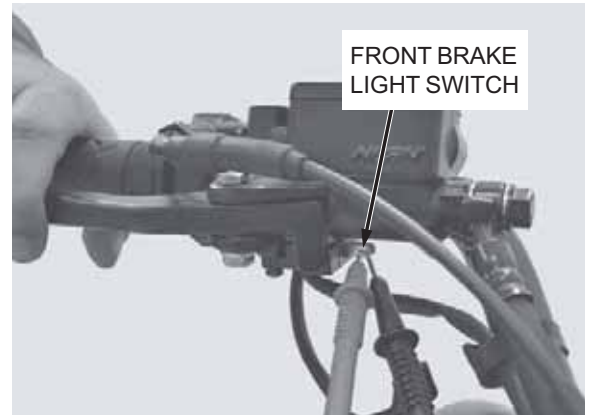
BRAKE LIGHT SWITCH

FRONT

Disconnect the front brake light switch connectors.

There should be continuity with the brake lever squeezed, and there should be no continuity when the brake lever is released.

Continuity : Green / Yellow - Black



REAR

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

Disconnect the rear brake light switch 2P (Natural) white connector, and check for continuity between the terminals.

There should be continuity with the brake pedal squeezed, and there should be no continuity when the brake pedal is released.

Continuity : Green / Yellow - Black

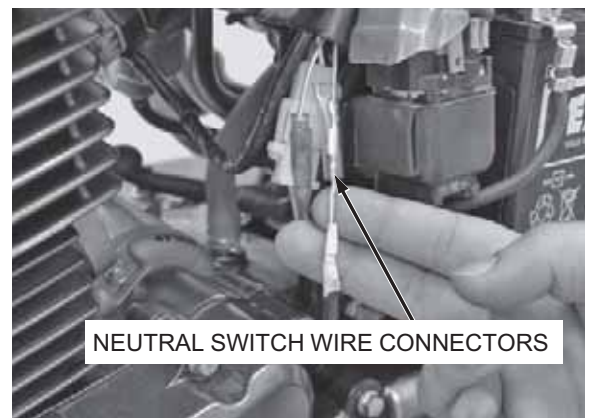


NEUTRAL SWITCH

INSPECTION

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

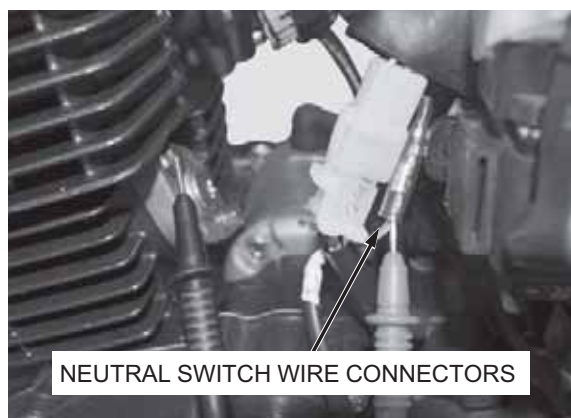
Disconnect the neutral switch connector.



Shift the gear position into the neutral.

Check for continuity between the light green/red terminal and body ground.

There should be continuity with the transmission is in neutral, and no continuity when the transmission is into gear.

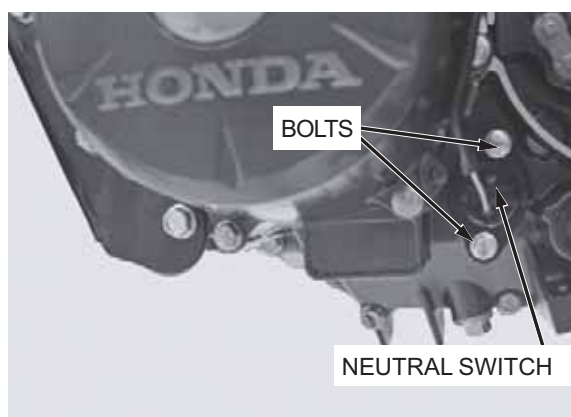


REMOVAL

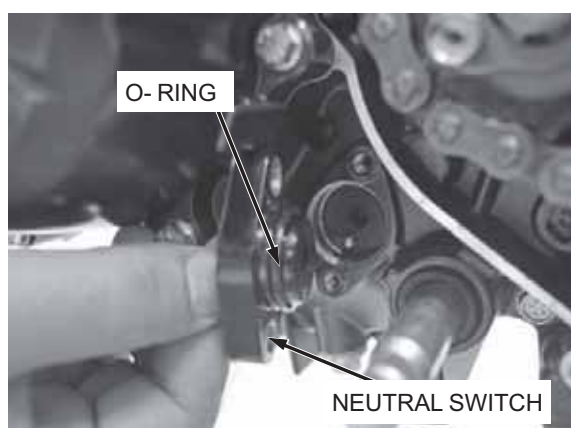
Remove the left crankcase rear cover (page 6-3).

Disconnect the neutral switch connector (page 17-11)

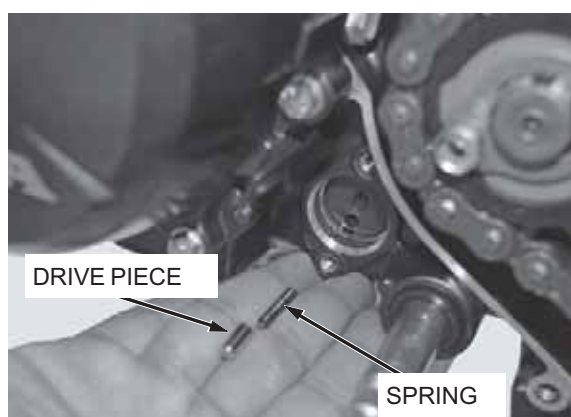
Remove the neutral switch mounting bolts.



Remove the neutral switch and O-ring.



Remove the drive piece and spring.

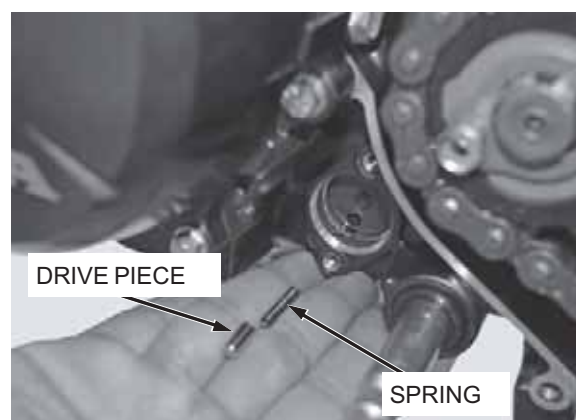


INSTALLATION

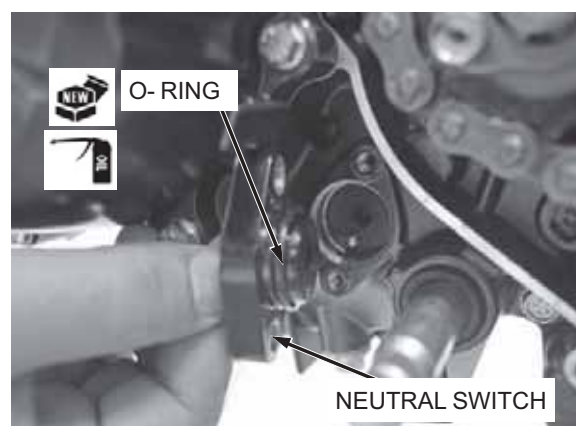
Check the drive piece and spring for wear or damage, replace them if necessary.

- Bent the drive piece by force or crush the contact point will cause poor electricity connection.

Install the spring and drive piece.



Apply clean engine oil to a new O-ring, and install it to the neutral switch.



Carrying out as shown that the direction of the neutral switch tab.

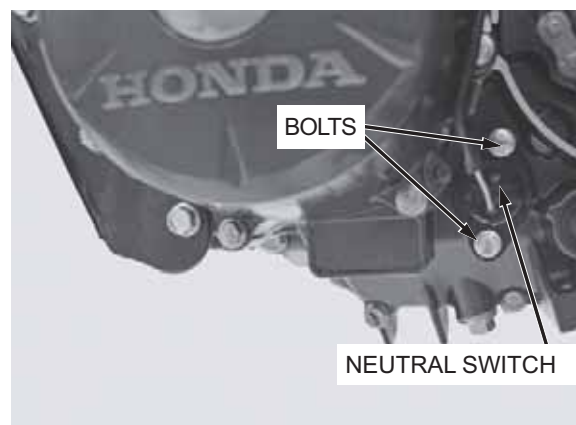
Install the neutral switch.

Install the neutral switch mounting bolts and tighten them.

Route the neutral switch wire to the left crankcase cover grooves properly.

Install the left crankcase rear cover (page 6-3).

Connect the neutral switch connector (page 17-11).



FUEL GAUGE/FUEL LEVEL SENSOR

SYSTEM INSPECTION

If the needle does not move

1. FUEL LEVEL SENSOR INSPECTION

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

Disconnect the fuel level sensor 2P (Black) connector.

Measure the resistance at the fuel level sensor terminals (Yellow / White - Green).

STANDARD: 4 – 100 Ω (20°C/68°F)

Is the resistance within 4 – 100 Ω (20°C/68°F)?

NO – Inspect the fuel level sensor (page 17-14)



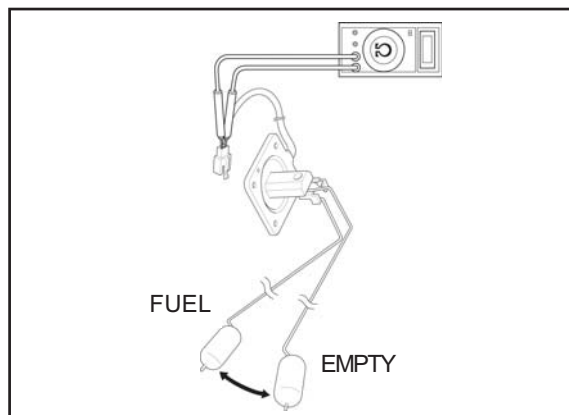
FUEL LEVEL SENSOR INSPECTION

Remove the fuel level sensor as discribed below.

Connect the ohmmeter to the fuel level sensor terminals.

Inspect the resistance of the float at the top and bottom positions.

	FULL	EMPTY
Resistance (20° C/68°F)	6-9 Ω	266-274 Ω

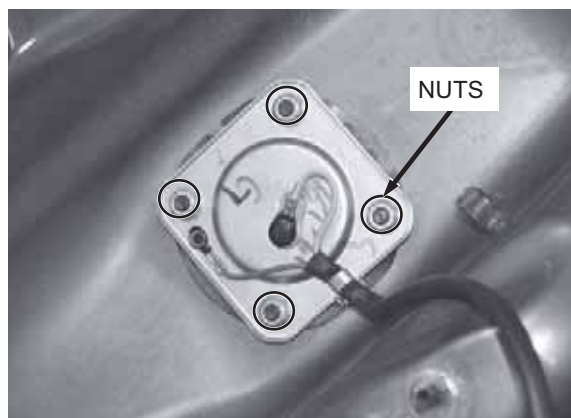


REMOVAL/INSTALLATION

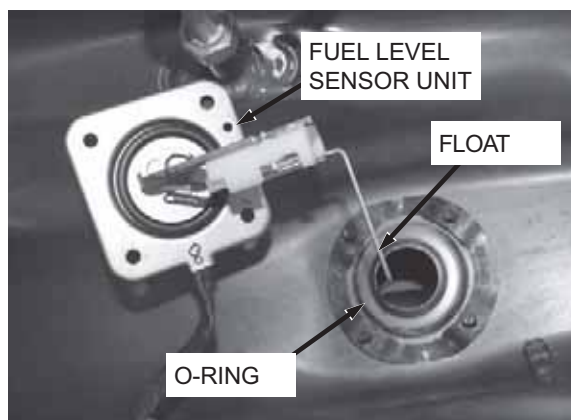
Drain the fuel from the fuel tank into the approved gasoline container.

Remove the fuel tank (page 2-3)

Remove the nuts.



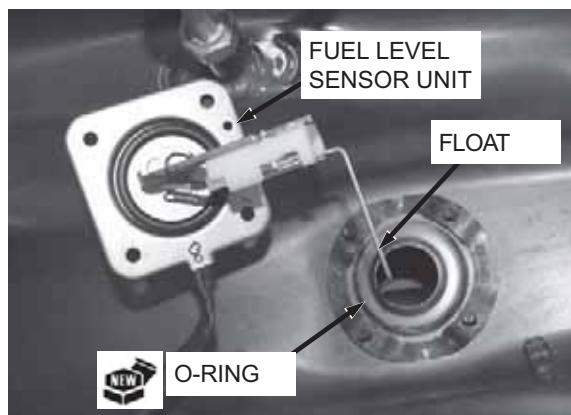
Remove the fuel level sensor unit and O-ring.



Be careful not to damage the float arm.

Install a new O-ring to the fuel tank.

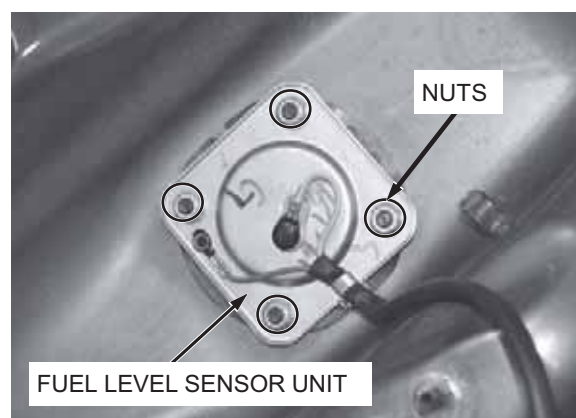
Install the fuel level sensor unit into the fuel tank



Install the nuts, then tighten them.

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

Install the fuel tank (page 2-3)



HORN

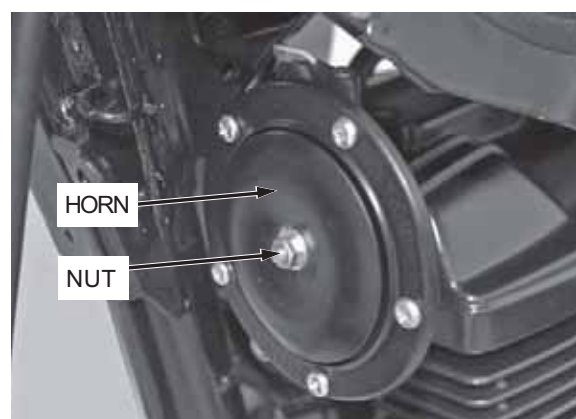
REMOVAL/INSTALLATION

Disconnect the wire connectors from the horn.

Remove the bolt and horn.

Installation is in the reverse order of removal.

Voltage : Light Green - Green

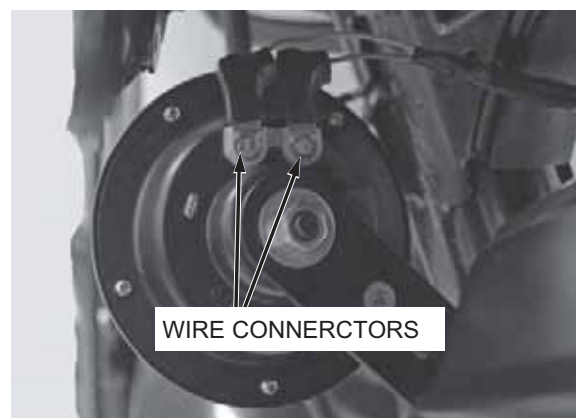


INSPECTION

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.



PASSING RELAY

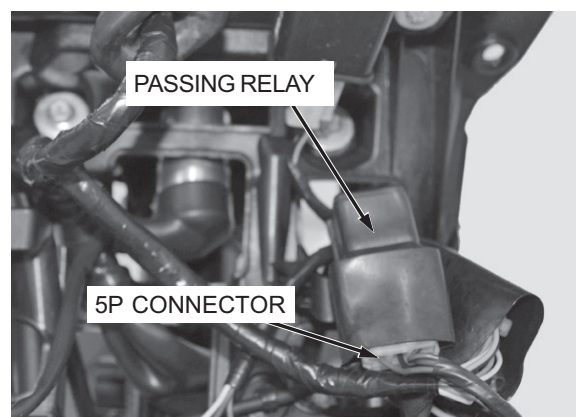
REMOVAL/INSTALLATION

Remove the front cowl (page 2-3).

Disconnect the passing relay 5P connector from the relay.

Remove the passing relay from the frame.

Installation is in the reverse order of removal.



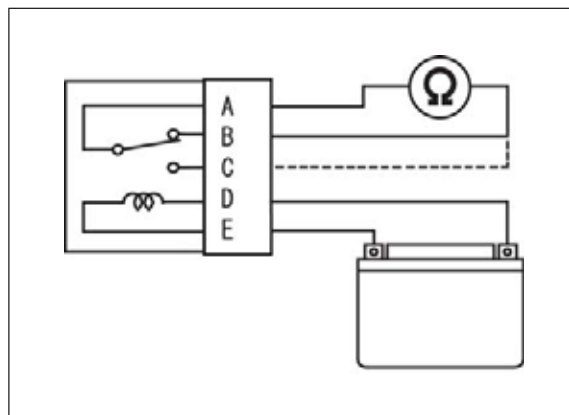
INSPECTION

Connect the ohmmeter to the passing relay connector terminals.

CONNECTION: A – B

A – C

Connect the battery to the passing relay connector terminals.



CONNECTION: D – E

Refer to the chart, and check for continuity between the terminals when 12V battery is connected.

	A-B	A-C
12V battery is connected	No continuity	Continuity
12V battery is not connected	Continuity	No continuity

TURN SIGNAL RELAY

INSPECTION

1. Recommended Inspection

Check the following:

- Battery condition
- Burned out bulb or non-specified wattage
- Burned fuse
- Ignition and turn signal switches function
- 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 front cowl (page 2-3)

Disconnect the turn signal relay 2P connector from the turn signal relay.

Short the Black and Gray terminals of the turn signal relay connector with a jumper wire.

Start the engine and check the turn signal light by turning the switch "ON"

Is the light come on?

YES – • Faulty turn signal relay

- Poor connection of the connector

NO – Open circuit in Black or Gray wires



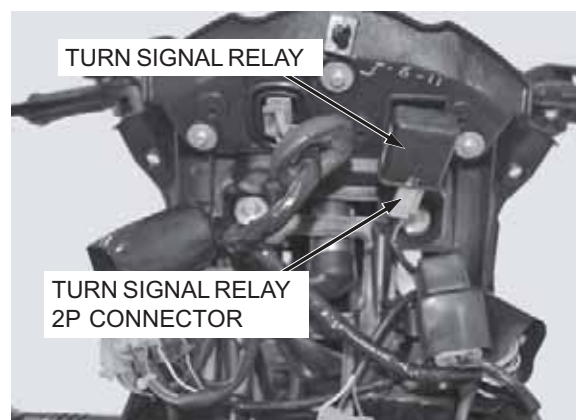
REMOVAL/INSTALLATION

Remove the front cowl. (page 2-2)

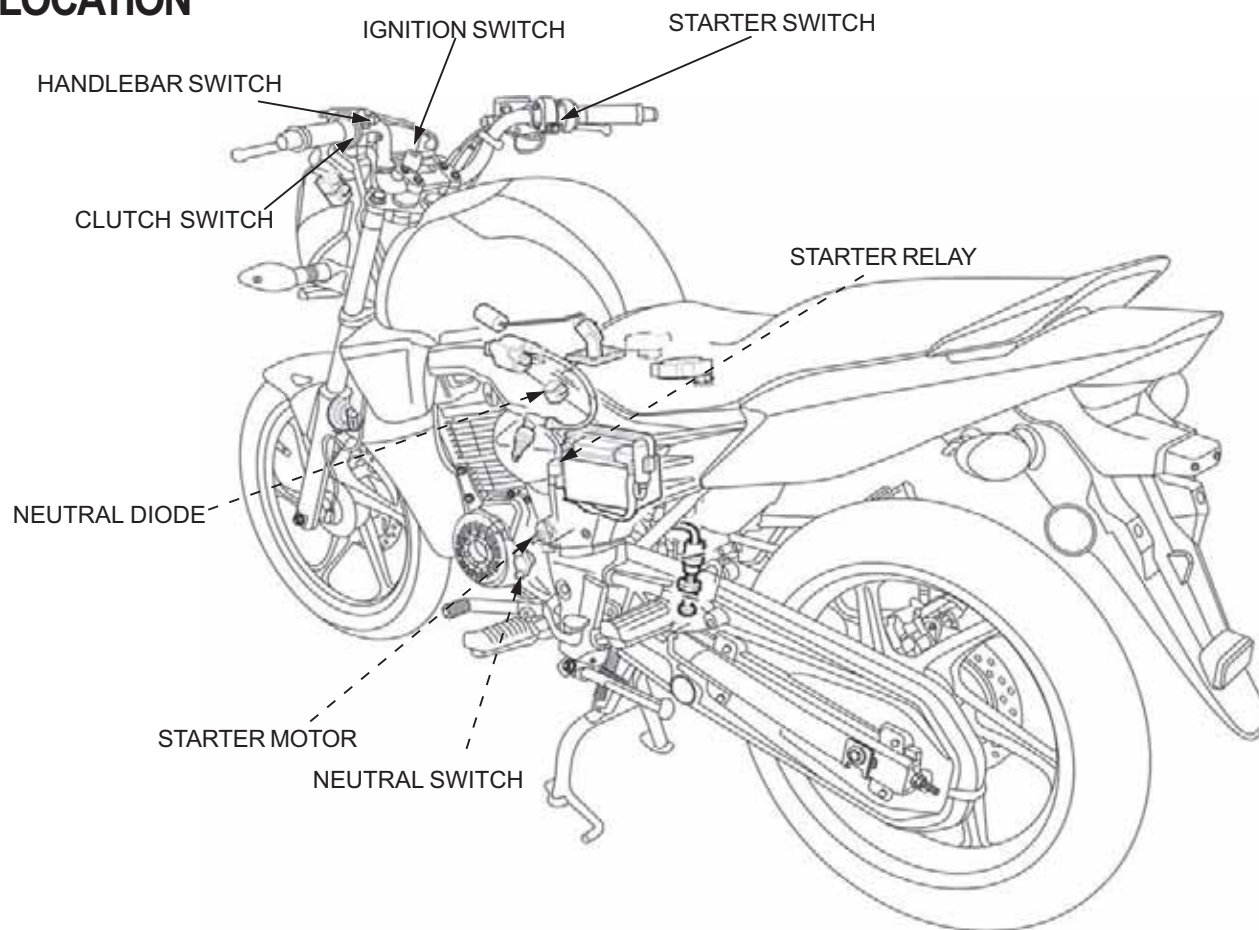
Disconnect the turn signal relay 2P connector from the relay.

Remove the turn signal relay from the bracket.

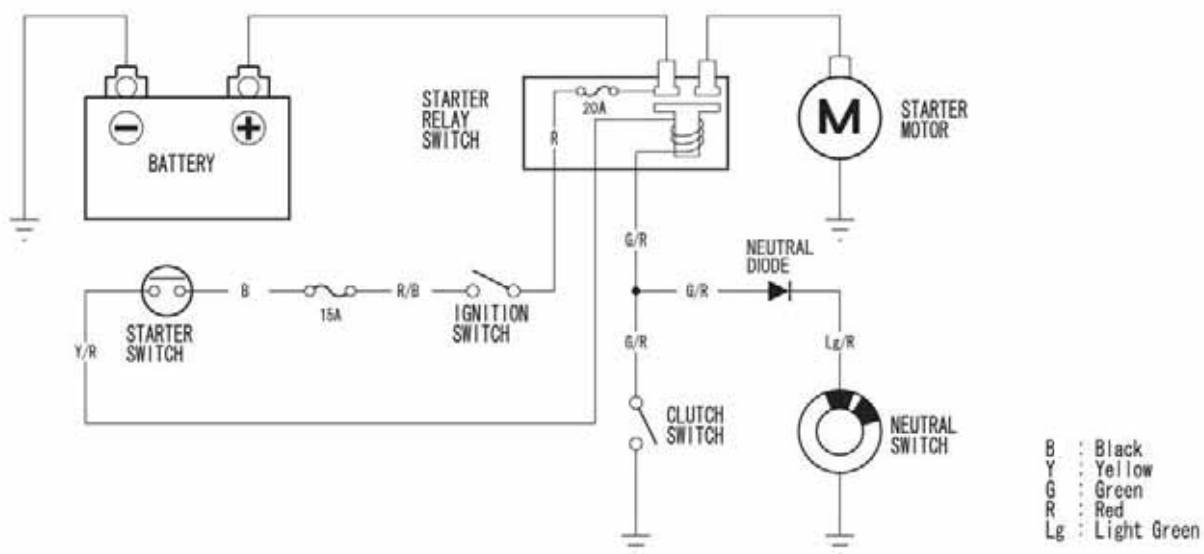
Installation is in the reverse order of removal.



ELECTRIC STARTER COMPONENT LOCATION



ELECTRIC STARTER SYSTEM DIAGRAM



18. ELECTRIC STARTER SYSTEM

ELECTRIC STARTER COMPONENT	18-0	STARTER RELAY SWITCH	18-3
ELECTRIC STARTER DIAGRAM	18-0	NEUTRAL DIODE	18-4
SERVICE INFORMATION	18-1	CLUTCH SWITCH	18-5
TROUBLE SHOOTING	18-1	RIGHT HANDLEBAR SWITCHES	18-5

ELECTRIC STARTER SERVICE INFORMATION

GENERAL

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 18-1).
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- Refer to the following:
 - Starter clutch (page 10-6)
 - Ignition switch (page 17-9)
 - Starter switch (page 18-3)
 - Neutral switch (page 17-11)
 - Clutch switch (page 18-5)

ELECTRIC STARTER TROUBLESHOOTING

BATTERY IS DAMAGED OR WEAK

1. Fuse Inspection

Check for blown main fuse or sub 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.

Is the battery in good condition?

YES – GO TO STEP 3.

NO – Change or replace the battery

3. Battery cable Inspection

Check the battery cables for loose or poorly connected terminal, and for an open circuit.

Is the battery cable in good condition?

YES – Faulty regulator/rectifier

NO – • Loose or poorly connected battery cables.
• Open circuit in the battery cable.

4. Starter Motor Cable Inspection

Check the starter motor cable for loose or poorly connected terminal, and for an open circuit.

Is the starter motor cable in good condition?

YES – GO TO STEP 4.

NO – • Loose or poorly connected starter motor cable.
• Open circuit in the starter motor cable.

5. Starter Relay Switch Operation Inspection

Check the operation of the starter relay switch (page 18-3)

Does the starter relay switch click?

YES – GO TO STEP 6.

NO – GO TO STEP 7.

ELECTRIC STARTER SYSTEM

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 – GO TO STEP 6.

NO – GO TO STEP 7.

7. Relay Coil Ground Line Inspection

Check the ground line of the starter relay switch (page 18-3)

Is the ground line normal?

YES – GO TO STEP 8.

NO –

- Faulty neutral switch (page 17-11)
- Faulty neutral diode (page 18-4)
- Faulty clutch switch (page 18-5)
- 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 18-3)

Is the power input line normal?

YES – GO TO STEP 9.

NO –

- Faulty ignition switch (page 17-9).
- Faulty starter switch (page 18-3).
- 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 18-3).

Does the starter relay switch function properly?

YES – Faulty starter relay switch.

NO – Loose or poor contact of the starter relay switch connector.

Starter motor turns engine slowly

- Low battery voltage
- Poorly connected battery cable
- Poorly connected starter motor cable
- Faulty starter clutch
- 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 over

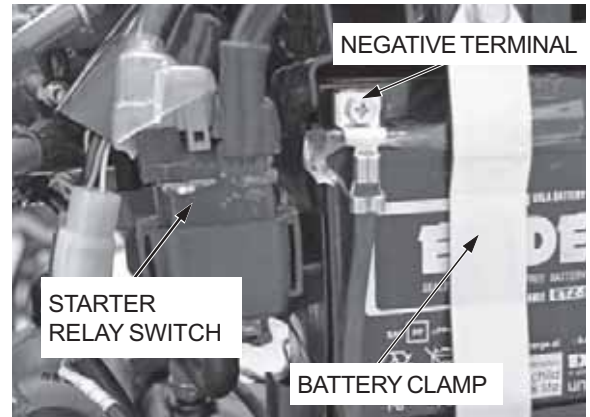
- Crankshaft does not turn due to engine problems

STARTER RELAY SWITCH

REMOVAL/INSTALLATION

Disconnect the negative (–) cable from the battery.

Pull the starter relay from the battery tray..

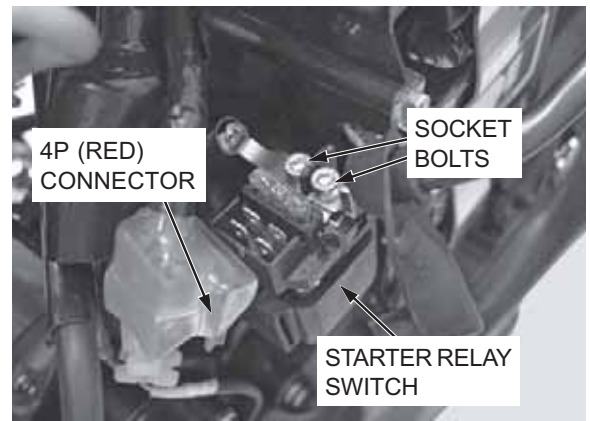


Disconnect the starter relay switch 4P (Red) connector.

Remove the socket bolts, battery cable and starter motor cable from the starter relay switch.

Remove the starter relay switch from the stay.

Installation is in the reverse order of removal.



OPERATION INSPECTION

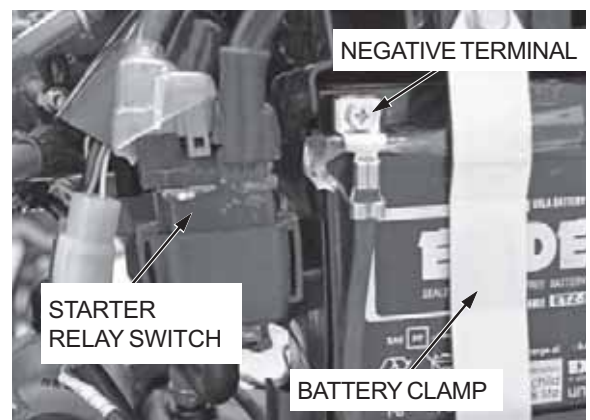
Remove the left side cover (page 2-3).

Shift the transmission into neutral.

Turn the ignition switch to "ON" 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 circuit.



CIRCUIT INSPECTION

GROUND LINE

Turn the ignition switch to "OFF".

Disconnect the starter relay switch 4P (Red) 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 or when the clutch lever is squeezed, the ground circuit is normal.



ELECTRIC STARTER SYSTEM

POWER INPUT LINE

Connect the starter relay switch 4P (Red) connector.

Turn the ignition switch to "ON".

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.



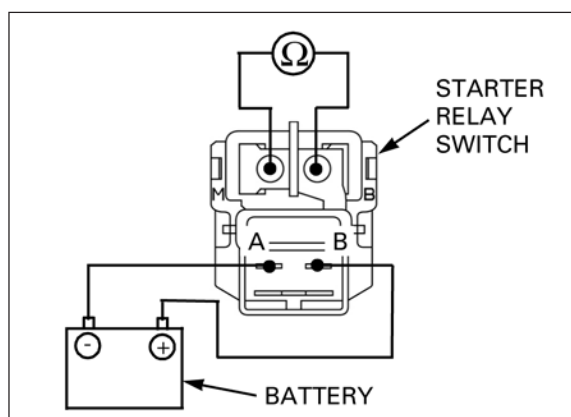
FUNCTION INSPECTION

Remove the starter relay switch (page 18-3)

Connect an ohmmeter to the starter relay switch cable terminals.

Connect the fully charged 12V battery to the starter relay switch connector terminals (A and B terminals).

There should be continuity between the cable terminals while the battery is connected and no continuity when the battery is disconnected.



NEUTRAL DIODE

INSPECTION

Remove the fuel tank (page 2-3).

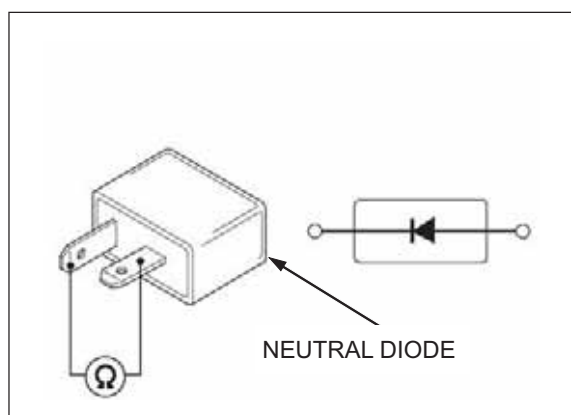
Release the neutral diode.



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 diode is normal.



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.



RIGHT HANDLEBAR SWITCHES

Remove the front cowl (page 2-2)

Disconnect the right handlebar switch 2P connector and Black wire.



Check for continuity between the terminals in each switch position according to the table.

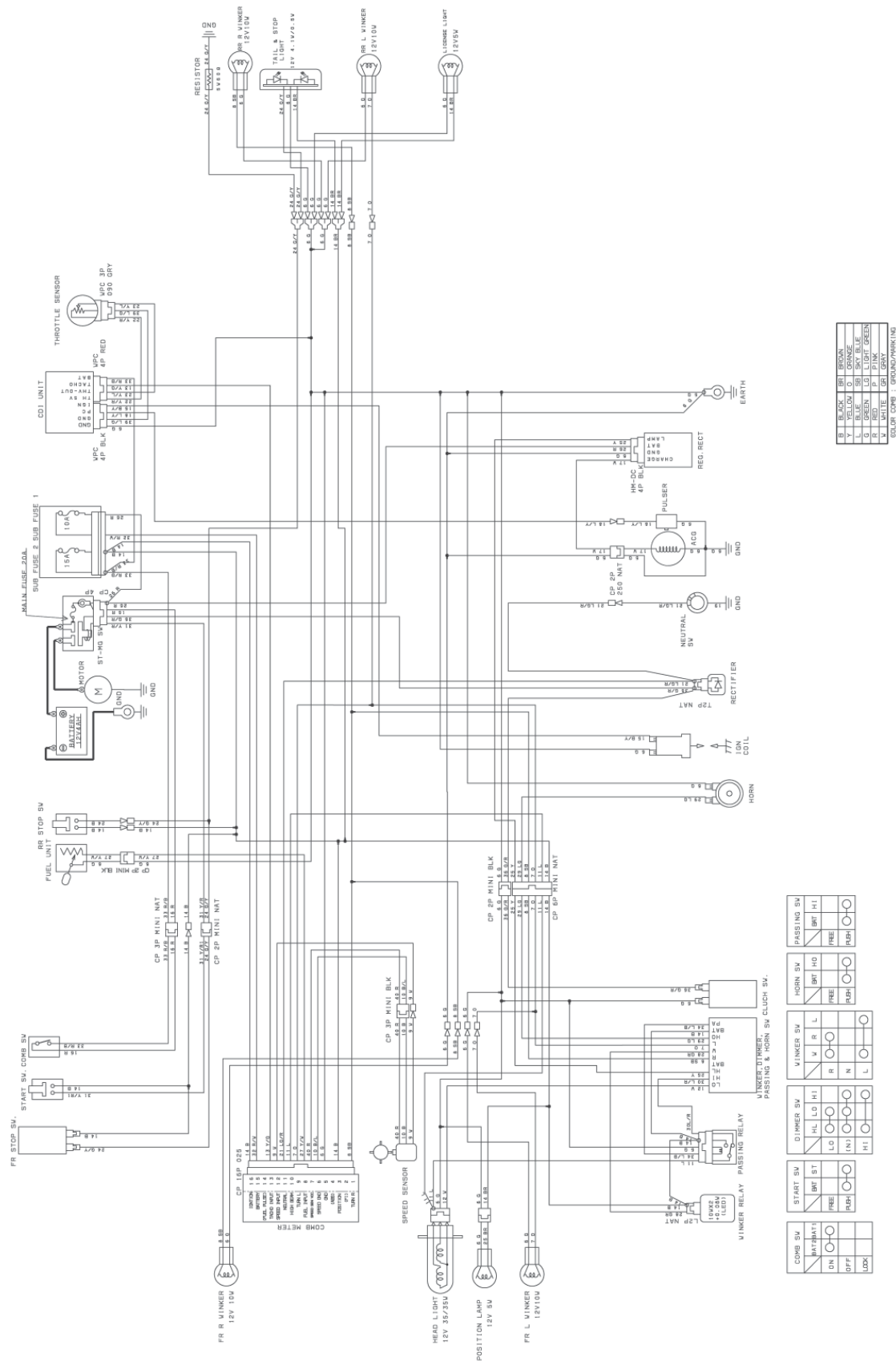
STARTER SWITCH

	BAT	ST
FREE		
PUSH	○—○	
COLOR	BI	Y/R



MEMO

19. WIRING DIAGRAM



20. TROUBLESHOOTING

ENGINE DOES NOT START OR IS HARD TO START	20-1	POOR PERFORMANCE AT HIGH SPEED	20-5
ENGINE LACKS POWER	20-2	POOR HANDLING	20-5
POOR PERFORMANCE AT LOW AND IDLE SPEED	20-4		

ENGINE DOES NOT START OR IS HARD TO START

1. FUEL LINE INSPECTION

Check fuel flow to carburetor.

Does fuel reach the carburetor?

NO - Faulty fuel system

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
- Loose or disconnected ignition system wires
- Broken or shorted spark plug wire
- Faulty ignition coil
- Faulty ignition pulse generator
- Faulty ignition switch
- Faulty CDI
- Faulty regulator, rectifier Assembly
- Shorted battery wire

NO - GO TO STEP 4.

4. Engine Starting Condition

Start by following normal procedure.

Does the engine start then stops?

YES -

- Improper choke operation
- Incorrectly adjusted carburetor
- Leaking carburetor insulator
- Improper ignition timing (Faulty CDI or ignition pulse generator)
- Contaminated fuel

NO - GO TO STEP 5.

5. Cylinder Compression Inspection

Test cylinder compression.

Is the compression low?

YES -

- Valve clearance too small
- Valve stuck open
- Worn cylinder and piston rings
- Leaking/damaged cylinder head gasket
- Seized valve
- Improper valve timing
- Loose spark plug
- Carbon deposition on valves

ENGINE LACKS POWER

1. Drive Train Inspection

Raise the wheels off the ground, and spin them by hand.

Does the wheel spin freely?

- NO** - • Brake dragging
• Worn or damaged wheel bearings
• Bent axle

YES - GO TO STEP 2.

2. Tire Pressure Inspection

Check tire pressure.

Are the tire pressures low?

- YES** - • Faulty tire valve
• Punctured tire

NO - GO TO STEP 3.

3. Clutch Inspection

Accelerate rapidly from low to second.

Does the engine speed change accordingly when clutch is engaged?

- NO** - • Clutch slipping
• Improperly adjusted clutch lever free play
• Worn clutch discs/plates
• Warped clutch discs/plates
• Weak clutch spring
• Additive in engine oil

YES - GO TO STEP 4.

4. Engine Performance 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 fill cap breather

YES - GO TO STEP 5.

5. Engine Performance Inspection

accelerate or run at high speed.

Is there knocking?

- YES** - • Worn piston and cylinder
• Use of poor quality fuel
• Excessive carbon build-up in combustion chamber
• Ignition timing too advance (Faulty CDI or ignition pulse generator)
• Lean fuel mixture

NO - GO TO STEP 6.

6. Ignition Timing Inspection

Check the ignition timing.

Is the ignition timing correct?

- NO** - • Faulty CDI
• Faulty ignition pulse generator

YES - GO TO STEP 7.

7. **Engine Oil Inspection**

Check the engine oil level and condition.

Is there correct level and good condition?

- NO** -
- Oil level too high
 - Oil level too low
 - Contaminated oil

YES - GO TO STEP 8.

8. **Spark Plug Inspection**

Remove and inspect the spark plug.

Are the spark plug in good condition?

- NO** -
- Plugs not serviced frequently enough
 - Incorrect spark plug used
 - Incorrect spark plug gap

YES - 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
 - Leaking/damaged cylinder head gasket
 - Seized valve
 - Improper valve timing

NO - GO TO STEP 10.

10. **Carburetor Inspection**

Check carburetor for clogging.

Is the carburetor for clogged?

YES - Carburetor not serviced frequently enough.

NO - GO TO STEP 11.

11. **Lubrication Inspection**

Remove the cylinder head cover, and inspect lubrication.

Is the valve train lubricated properly?

- NO** -
- Clogged oil passage
 - Clogged oil strainer
 - Broken gear oil pump
 - Faulty oil pump

POOR PERFORMANCE AT LOW AND IDLE SPEED

1. **Pilot Screw Inspection**

Check the pilot screw adjustment.

Is the adjustment correct?

NO - See page -19

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 no spark?

YES -

- Faulty spark plug
- Fouled spark plug
- Loose or disconnected ignition system wires
- Broken or shorted spark plug wire
- Faulty ignition coil
- Faulty ignition pulse generator
- Faulty ignition switch
- Faulty CDI

NO - GO TO STEP 4.

4. **Ignition Timing Inspection**

Check the ignition timing.

Is the ignition timing correct?

NO -

- Faulty CDI
- Faulty ignition pulse generator

POOR PERFORMANCE AT HIGH SPEED

1. **Fuel Line Inspection**
Disconnect the fuel line at carburetor.
Does fuel flow freely?
NO - Faulty fuel system
YES - GO TO STEP 2.
2. **Carburetor Inspection**
Check the carburetor for clogging.
Is the carburetor clogged?
YES - Carburetor not serviced frequently enough
NO - GO TO STEP 3.
3. **Ignition Timing Inspection**
Check the ignition timing.
Is the ignition timing correct?
NO -
 - Faulty CDI
 - Faulty ignition pulse generator**YES** - GO TO STEP 4.
4. **Valve Timing Inspection**
Check the valve timing.
Is the valve timing correct?
NO - Cam sprocket not installed properly
YES - GO TO STEP 5.
5. **Valve Spring Inspection**
Check the valve springs.
Are the valve spring free length as specified?
NO - Faulty valve spring
YES - Not weak

POOR HANDLING

Steering is heavy

- Steering bearing adjusting nut too tight
- Damaged steering head bearings

Either wheel is wobbling

- Excessive wheel bearing play
- Bent rim
- Improperly installed wheel hub
- Excessively worn swingarm pivot bushings
- Bent frame

Motorcycle pulls to one side

- Front and rear wheels not aligned
- Faulty shock absorber
- Bent fork
- Bent swingarm
- Bent axle
- Bent frame

MEMO

AIR CLEANER	3-6	DRIVEN FLANGE	13-9
AIR CLEANER HOUSING	5-3	EMISSION CONTROL SYSTEMS	1-25
AIR SCREW ADJUSTMENT	5-16	ENGINE & FRAME TORQUE VALUES	1-10
ALTERNATOR CHARGING COIL	15-8	ENGINE IDLE SPEED	3-14
AIR SCREW ADJUSTMENT	5-16	ENGINE INSTALLATION	6-4
BATTERY		ENGINE OIL	3-10
BATTERY/CHARGING SYSTEM	15-3	ENGINE OIL CENTRIFUGAL FILTER	3-12
MAINTENANCE	3-18	ENGINE OIL STRAINER SCREEN	4-2
BEARING REPLACEMENT OF CRANKCASE	11-9	ENGINE REMOVAL	6-2
BEARING REPLACEMENT OF CRANKSHAFT	11-12	EXHAUST PIPE/MUFFLER	2-7
BRAKE FLUID REPLACEMENT/AIR BLEEDING(CBS)	14-4	FLYWHEEL	10-4
BRAKE FLUID FILLING/AIR BLEEDING(CBS)	14-5	FORK	12-14
BRAKE FLUID	3-18	FRONT BRAKE(CBS)	14-6
BRAKE PEDAL	14-31	FRONT BRAKE PAD/DISC	14-8
BRAKE PADS WEAR	3-20	FRONT BRAKE CALIPER	14-16
BRAKE SYSTEM	3-20	FRONT COWL DISASSEMBLY	2-2
BRAKE LIGHT SWITCH(MAINTENANCE)	3-21	FRONT FENDER	2-4
BRAKE LIGHT SWITCH	17-11	FRONT WHEEL	12-10
BRAKE/TAIL LIGHT	17-3	FRONT MASTER CYLINDER	14-11
CAPACITIVE DISCHARGE IGNITION(CDI)	16-6	FUEL GAUGE/FUEL LEVEL SENSOR	17-13
CABLE & HARNESS ROUTING	1-18	FUEL LINE	3-4
CAM CHAIN TENSIONER LIFTER	7-23	FUEL STRAINER	5-21
CAM SHAFT HOLDER		FUEL STRAINER SCREEN	3-4
CYLINDER HEAD REMOVAL	7-7	FUEL TANK	2-3
DISASSEMBLY/ASSEMBLY	7-9	GEARSHIFT LINKAGE	9-13
CYLINDER HEAD INSTALLATION	7-21	GENERAL SPECIFICATIONS	1-4
CARBURETOR	5-6	HANDLEBAR	12-4
CHARGING SYSTEM INSPECTION	15-7	HANDLEBAR SWITCHES	17-10
CHOKE OPERATION	3-5	HEADLIGHT	17-2
CLUTCH	9-6	HEADLIGHT AIM	3-21
CLUTCH SYSTEM	3-21	HORN	17-15
CLUTCH SWITCH	18-5	IGNITION COIL	16-6
COMBINATION METER	17-4	IGNITION SWITCH	17-9
COVER HEADLIGHT RR	2-2	IGNITION SYSTEM INSPECTION	16-3
COMPONENT LOCATION		IGNITION TIMING	16-5
ALTERNATOR	10-0	KICKSTARTER IDLE GEAR	9-15
BRAKE SYSTEM	14-0	KICKSTARTER	9-16
CLUTCH/GEARSHIFT LINKAGE/KICKSTARTER	9-0	LEFT CRANKCASE COVER	10-2
CRANKCASE/CRANKSHAFT/TRANSMISSION	11-0	LEFT HANDLEBAR SWITCH	17-10
CYLINDER HEAD/VALVES	7-0	LUBRICATION & SEAL POINTS	1-15
CYLINDER/PISTON	8-0	LIGHT/METER/SWITCHES	17-8
ENGINE REMOVAL/INSTALLATION	6-0	LEFT SIDE COVER	2-3
FRONT WHEEL/SUSPENSION/STEERING	12-0	MAINTENANCE SCHEDULE	3-3
FUEL SYSTEM	5-0	MAINTENANCE	3-20
REAR WHEEL/SUSPENSION	13-0	MODEL IDENTIFICATION	1-2
CRANKCASE ASSEMBLY	11-17	NEUTRAL DIODE	18-4
CRANKCASE BREATHER	3-7	NEUTRAL SWITCH	17-11
CRANKSHAFT	11-8	NUTS, BOLTS, FASTENERS	3-23
CRANKCASE SEPARATION	11-4	OIL PUMP	4-2
CYLINDER COMPRESSION	7-4	TURN SIGNAL RELAY	17-16
CYLINDER HEAD COVER	7-4	PASSING RELAY	17-15
CYLINDER HEAD DISASSEMBLY/ASSEMBLY	7-12	PEDAL(COMBI) BRAKE FLUID FILLING	14-6
CYLINDER/PISTON	8-2	PRIMARY DRIVE GEAR/CRANKSHAFT COLLAR	9-19
DIGITAL METER RESET PROCEDURE	17-8	PILOT SCREW ADJUSTMENT	5-16
DRIVE CHAIN	3-15	REAR BRAKE PAD/DISC	14-22

INDEX

REAR BRAKE CALIPER	14-28	STANDARD TORQUE VALUES	1-10
REAR GRIP	2-4	STARTER CLUTCH	10-6
REAR COWL	2-5	STARTER MOTOR	10-8
REAR DRUM BRAKE	14-32	STARTER RELAY SWITCH	18-3
REAR FENDER	2-6	STATOR/IGNITION PULSE GENERATOR	10-16
REAR COWL	2-4	STEERING HEAD BEARINGS	3-24
REAR MASTER CYLINDER	14-24	STEERING STEM	12-22
REAR WHEEL	13-4	STARTING ENRICHMENT(SE) VALVE	5-5
REGULATOR/RECTIFIER	15-9	SUSPENSION	3-22
RIGHT CRANKCASE COVER	9-3	SWINGARM	13-15
RIGHT HANDLEBAR SWITCHES	18-5	SYSTEM DIAGRAM	
RIGHT SIDE COVER	2-3	BATTERY/CHARGING SYSTEM	15-0
RIGHT/LEFT SHROUD	2-3	IGNITION SYSTEM	16-0
SAREE GAURD	2-6	SYSTEM LOCATION	
SEAT	2-2	BATTERY/CHARGING SYSTEM	15-0
SECONDARY AIR SUPPLY SYSTEM		ELECTRIC STARTER SYSTEM	18-0
FUEL SYSTEM	5-20	IGNITION SYSTEM	16-0
MAINTENANCE	3-14	LIGHTS/METER/SWITCHES	17-0
SERVICE INFORMATION		LUBRICATION SYSTEM	4-0
ALTERNATOR	10-1	TACHOMETER	17-7
BATTERY/CHARGING SYSTEM	15-1	THROTTLE OPERATION	3-5
BRAKE SYSTEM	14-1	THROTTLE POSITION SENSOR	16-7
CLUTCH/GEARSHIFT LINKAGE/KICKSTARTER	9-1	TRANSMISSION	11-5
CRANKCASE/CRANKSHAFT/TRANSMISSION ...	11-1	TROUBLESHOOTING	
CYLINDER HEAD/VALVES	7-1	BATTERY/CHARGING SYSTEM	15-2
CYLINDER/PISTON	8-1	BRAKE SYSTEM	14-2
ELECTRIC STARTER SYSTEM	18-1	CLUTCH/GEARSHIFT LINKAGE/KICKSTARTER	9-2
ENGINE REMOVAL/INSTALLATION	6-1	CRANKCASE/CRANKSHAFT/TRANSMISSION ...	11-3
FRAME/BODY PANELS/EXHAUST SYSTEM	2-1	CYLINDER HEAD/VALVES	7-2
FRONT WHEEL/SUSPENSION/STEERING	12-1	CYLINDER/PISTON	8-1
FUEL SYSTEM	5-1	ELECTRIC STARTER SYSTEM	18-1
IGNITION SYSTEM	16-1	FRAME/BODY PANELS/EXHAUST SYSTEM	2-1
LIGHTS/METER/SWITCHES	17-1	FRONT WHEEL/SUSPENSION/STEERING	12-3
LUBRICATION SYSTEM	4-1	FUEL SYSTEM	5-2
MAINTENANCE	3-1	IGNITION SYSTEM	16-2
REAR WHEEL/SUSPENSION	13-1	LUBRICATION SYSTEM	4-1
SERVICE RULES	1-1	REAR WHEEL/SUSPENSION	13-3
SPECIFICATIONS		TURN SIGNAL LIGHTS	17-4
ALTERNATOR/STARTER CLUTCH	1-6	TURN SIGNAL RELAY	17-14
BATTERY/CHARGING SYSTEM	1-9	VALVE CLEARANCE	3-8
CLUTCH/GEARSHIFT LINKAGE/KICKSTARTER	1-6	WHEELS/TIRES	3-23
CRANKCASE/CRANKSHAFT/TRANSMISSION ...	1-7		
CYLINDER HEAD/VALVES	1-5		
CYLINDER/PISTON	1-6		
ELECTRIC STARTER	1-9		
FRONT WHEEL/SUSPENSION/STEERING	1-7		
FUEL SYSTEM	1-5		
HYDRAULIC BRAKE	1-8		
IGNITION SYSTEM	1-9		
LIGHTS/METER/SWITCHES	1-9		
LUBRICATION SYSTEM	1-5		
REAR WHEEL/BRAKE/SUSPENSION	1-8		
SHOCK ABSORBER	13-13		
SIDE COVERS	2-2		
SIDE STAND	3-22		
SPARK PLUG	3-7		
SPEEDOMETER/VS SENSOR	17-6		

