

2004-2013



**HONDA**

**SERVICE MANUAL**



**CRF250X**

## A Few Words About Safety

### Service Information

The service and repair information contained in this manual is intended for use by qualified, professional technicians. Attempting service or repairs without the proper training, tools, and equipment could cause injury to you or others. It could also damage the vehicle or create an unsafe condition.

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

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

### For Your Customer's Safety

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

### For Your Safety

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

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

### Important Safety Precautions

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

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

Make sure the engine is 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 CRF250X.

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

After '06 model:

The emission levels are within the standards set by the U.S. Environmental Protection Agency (EPA) and California Air Resources Board (CARB).

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

Sections 1 and 3 apply to the whole motorcycle. Section 2 illustrates procedures for removal/installation of components that may be required to perform service described in the following sections. Section 4 through 20 describe parts of the motorcycle, grouped according to location.

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

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

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

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

You must use your own good judgement.

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

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



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



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



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.

# CONTENTS

GENERAL INFORMATION	1
FRAME/BODY PANELS/EXHAUST SYSTEM	2
MAINTENANCE	3
LUBRICATION SYSTEM	4
FUEL SYSTEM	5
COOLING SYSTEM	6
ENGINE REMOVAL/INSTALLATION	7
CYLINDER HEAD/VALVES	8
CYLINDER/PISTON	9
CLUTCH/STARTER CLUTCH/KICKSTARTER/ GEARSHIFT LINKAGE	10
ALTERNATOR	11
CRANKCASE/TRANSMISSION/CRANKSHAFT/ BALANCER	12
FRONT WHEEL/SUSPENSION/STEERING	13
REAR WHEEL/BRAKE/SUSPENSION	14
HYDRAULIC BRAKE	15
BATTERY/CHARGING SYSTEM	16
IGNITION SYSTEM	17
ELECTRIC STARTER	18
LIGHTS/METER/SWITCHES	19
WIRING DIAGRAM	20
TROUBLESHOOTING	21
INDEX	22

## SYMBOLS

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

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

# 1. GENERAL INFORMATION

---

SERVICE RULES .....	1-2
MODEL IDENTIFICATION.....	1-2
GENERAL SPECIFICATIONS.....	1-5
LUBRICATION SYSTEM SPECIFICATIONS.....	1-6
FUEL SYSTEM SPECIFICATIONS.....	1-7
COOLING SYSTEM SPECIFICATIONS .....	1-7
CYLINDER HEAD/VALVES SPECIFICATIONS .....	1-8
CYLINDER/PISTON SPECIFICATIONS .....	1-8
CLUTCH/STARTER CLUTCH/ KICKSTARTER/GEARSHIFT LINKAGE SPECIFICATIONS .....	1-9
CRANKCASE/CRANKSHAFT/ TRANSMISSION/BALANCER SPECIFICATIONS .....	1-9
FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS .....	1-10
REAR WHEEL/SUSPENSION SPECIFICATIONS .....	1-10
HYDRAULIC BRAKE SPECIFICATIONS .....	1-11
BATTERY/CHARGING SYSTEM SPECIFICATIONS .....	1-11
IGNITION SYSTEM SPECIFICATIONS .....	1-11
ELECTRIC STARTER SPECIFICATION.....	1-12
LIGHTS/METER/SWITCHES SPECIFICATIONS .....	1-12
STANDARD TORQUE VALUES .....	1-13
ENGINE & FRAME TORQUE VALUES .....	1-13
LUBRICATION & SEAL POINTS .....	1-20
CABLE & HARNESS ROUTING .....	1-23
OPTIONAL PARTS.....	1-30
EMISSION CONTROL SYSTEMS .....	1-33

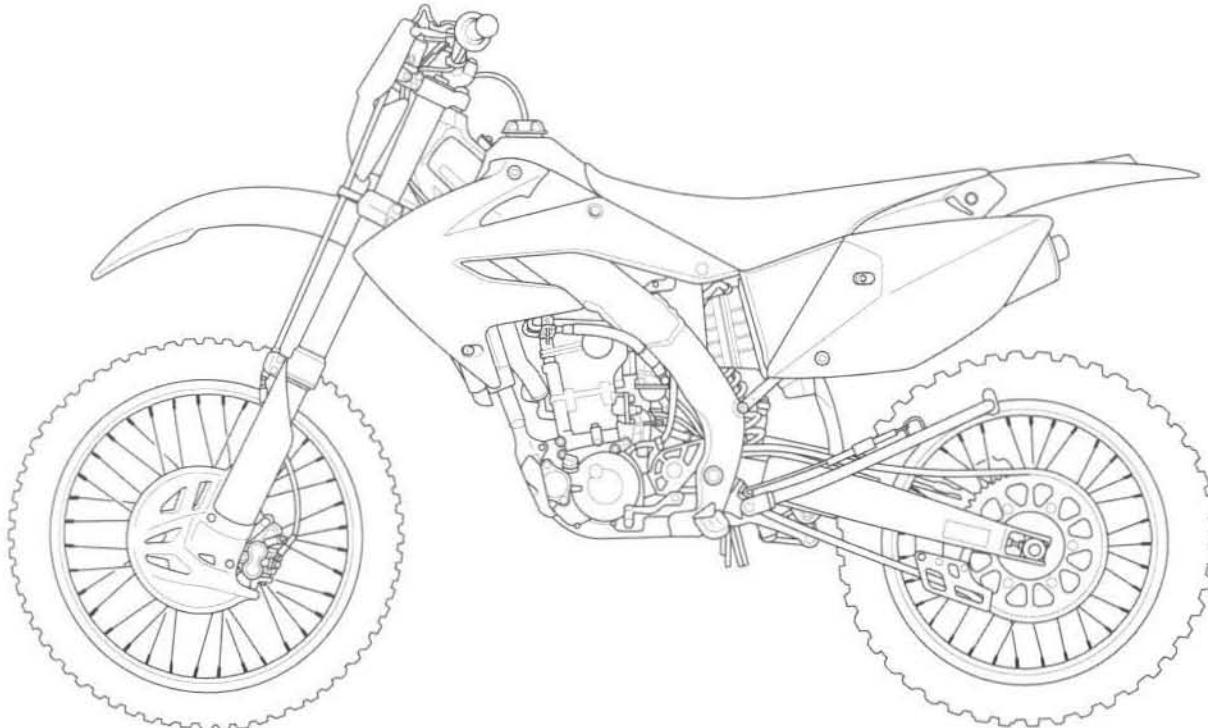
## GENERAL INFORMATION

---

## SERVICE RULES

1. Use genuine Honda or Honda-recommended parts and lubricants or their equivalents. Parts that do not meet Honda's design specifications may cause damage to the motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the motorcycle. Metric bolts, nuts and screws are not interchangeable with English fastener.
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 1-23).

## MODEL IDENTIFICATION

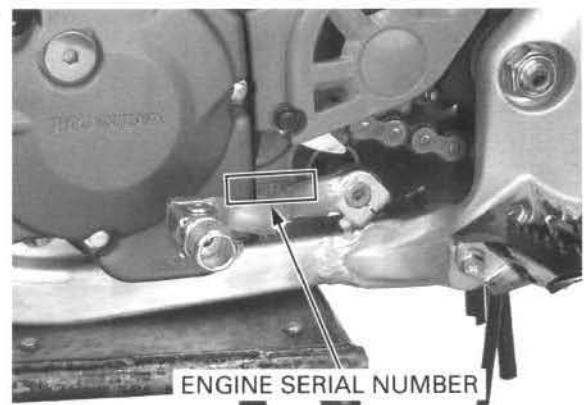


## GENERAL INFORMATION

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



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

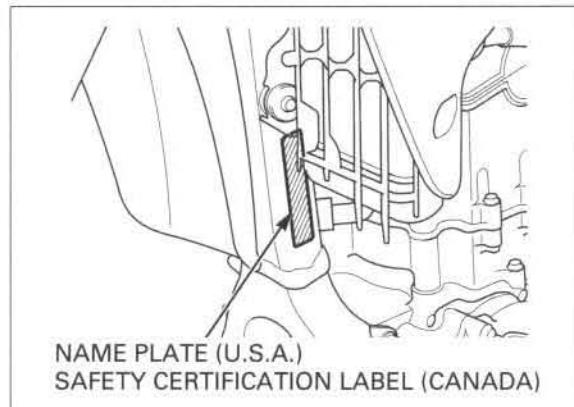


The carburetor identification number is stamped on the left side of the carburetor body.

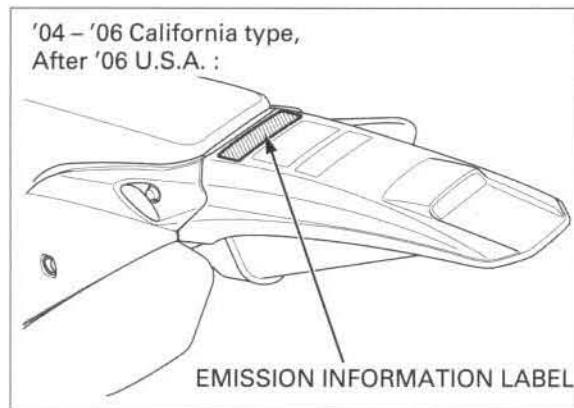


## GENERAL INFORMATION

The name plate (U.S.A.) or Safety Certification Label (Canada) is attached on the left side of the down tube.



The Vehicle Emission Information Label is attached on the rear fender ('04 – '06 California type, After '06 U.S.A.).



## GENERAL SPECIFICATIONS

ITEM		SPECIFICATION
DIMENSIONS	Overall length Overall width Overall height Wheelbase Seat height Footpeg height Ground clearance	('04, '05) (After '05)  2,174 mm (85.6 in) 2,172 mm (85.5 in) 827 mm (32.6 in) 1,261 mm (49.6 in) 1,483 mm (58.4 in) 1,481 mm (58.3 in) 958 mm (37.7 in) 432 mm (17.0 in) 346 mm (13.6 in)
FRAME	Frame type Front suspension Front suspension axle travel Front suspension cushion stroke Rear suspension Rear wheel travel Rear damper  Front tire size Rear tire size Tire brand (Dunlop) Front brake Front brake swept area Rear brake Rear brake swept area Caster angle Trail length Fuel tank capacity Fuel tank reserve capacity	Twin tube Telescopic fork 280 mm (11.0 in) 315 mm (12.4 in) Pro-Link 312 mm (12.3 in) Decarbon type with nitrogen gas filled damper 80/100-21 51M, 80/100-21 M/C 51M 100/100-18 59M, 100/100-18 M/C 59M Front: D742F/Rear: D756 Hydraulic single disc 334.5 cm <sup>2</sup> (51.8 in <sup>2</sup> ) Hydraulic single disc 391.1 cm <sup>2</sup> (60.6 in <sup>2</sup> ) 27°54' 118 mm (4.6 in) 8.3 liter (2.20 US gal, 1.83 Imp gal) 1.5 liter (0.40 US gal, 0.33 Imp gal)
ENGINE	Bore and stroke Displacement Compression ratio Valve train Intake valve Exhaust valve  Lubrication system Oil pump type Cooling system Air filtration Crankshaft type Engine dry weight ('04 – '06) (After '06) Cylinder arrangement	78.0 x 52.2 mm (3.07 x 2.06 in) 249.4 cm <sup>3</sup> (15.21 cu-in) 12.9 : 1 Chain drive and OHC with rocker arm  (49 State and Canada type) opens at 1 mm (0.04 in) lift closes at 1 mm (0.04 in) lift (California type) opens at 1 mm (0.04 in) lift closes at 1 mm (0.04 in) lift  (49 State and Canada type) opens at 1 mm (0.04 in) lift closes at 1 mm (0.04 in) lift (California type) opens at 1 mm (0.04 in) lift closes at 1 mm (0.04 in) lift  Forced pressure and wet sump Trochoid Liquid cooled Oiled polyurethane foam Assembled type 26.6 kg (58.6 lbs) 26.9 kg (59.3 lbs) Single cylinder, inclined 10° from vertical
CARBURETOR	Carburetor type Venturi diameter	Piston valve type 37 mm (1.46 in)

## GENERAL INFORMATION

ITEM		SPECIFICATION
DRIVE TRAIN	Clutch system Clutch operation system Transmission Primary reduction Final reduction Gear ratio	Multi-plate, wet Cable operated Constant mesh, 5-speed 3.611 (65/18) 3.786 (53/14) 2.384 (31/13) 1.750 (28/16) 1.333 (28/21) 1.041 (25/24) 0.814 (22/27)
	1st 2nd 3rd 4th 5th	
	Gearshift pattern	Left foot operated return system, 1 - N - 2 - 3 - 4 - 5
ELECTRICAL	Ignition system Starting system Charging system Regulator/rectifier  Lighting system	ICM (Ignition Control Module) Electric starter motor and kickstarter Single phase output alternator SCR shorted/Single phase, half wave rectification Battery and alternator

## LUBRICATION SYSTEM SPECIFICATIONS

ITEM		STANDARD	UNIT: mm (in) SERVICE LIMIT
Engine oil capacity	At draining	0.66 liter (0.70 US qt, 0.58 Imp qt)	-
	At filter change	0.69 liter (0.73 US qt, 0.61 Imp qt)	-
	At disassembly	0.85 liter (0.90 US qt, 0.75 Imp qt)	-
Transmission oil capacity	At draining	0.67 liter (0.71 US qt, 0.59 Imp qt)	-
	At disassembly	0.75 liter (0.79 US qt, 0.66 Imp qt)	-
Recommended engine oil		Pro Honda GN4 4-stroke oil (U.S.A. and Canada) or equivalent motor oil API service classification: SG or Higher JASO T 903 standard: MA Viscosity: SAE 10W-30	-
Recommended transmission oil		Pro Honda HP Trans Oil, Pro Honda GN4 4-stroke oil (U.S.A. and Canada) or equivalent motor oil API service classification: SG or Higher JASO T 903 standard: MA Viscosity: SAE 10W-30	-
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.20 (0.006 – 0.008)	-
	Side clearance	0.05 – 0.12 (0.002 – 0.005)	-

## FUEL SYSTEM SPECIFICATIONS

ITEM			SPECIFICATIONS
Fuel tank capacity			8.3 liter (2.20 US gal, 1.83 Imp gal)
Carburetor identification number	'04 – '06	49 State and Canada type	FCR02A
		California type	FCR03A
Main jet	After '06	49 State and Canada type	FCR02B
		California type	FCR03B
Slow jet	'04 – '06		#130
	After '06	49 State and Canada type	#130
Jet needle		California type	#132
	'04 – '06		#40
Jet needle clip position (Standard)	After '06		#42
	'04 – '06	49 State and Canada type	NCVT
Pilot screw initial opening		California type	NCYU
	'04 – '06	49 State and Canada type	NLAT
Float level		California type	NLBU
	'04 – '06	49 State and Canada type	3rd position from the top
Idle speed		California type	2nd position from the top
	After '06	49 State and Canada type	–
Throttle grip free play		California type	2nd position from the top
	'04 – '06	49 State and Canada type	2-1/4 turns out
Hot starter lever free play		California type	2 turns out
	After '06		2-1/4 turns out
PAIR control valve specified vacuum		'04 – '06 California type, After '06	8.0 mm (0.31 in) 1,700 ± 100 rpm 3 – 5 mm (1/8 – 3/16 in) 2 – 3 mm (1/16 – 1/8 in) 56 kPa (420 mmHg)

## COOLING SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS
Coolant capacity	At change	1.13 liter (1.19 US qt, 0.99 Imp qt)
	At disassembly	1.20 liter (1.27 US qt, 1.06 Imp qt)
Radiator cap relief pressure		93 – 123 kPa (0.95 – 1.25 kgf/cm <sup>2</sup> , 13.5 – 17.8 psi)
Recommended antifreeze		Pro Honda HP Coolant or an equivalent high quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors
Standard coolant concentration		1 : 1 mixture with distilled water

## GENERAL INFORMATION

## CYLINDER HEAD/VALVES SPECIFICATIONS

ITEM				STANDARD	SERVICE LIMIT	
Cylinder compression				392 kPa (4.0 kgf/cm <sup>2</sup> , 57 psi) at 800 rpm	-	
Cylinder head warpage				-	0.05 (0.002)	
Valve and valve guide	Valve clearance		IN	0.12 ± 0.03 (0.005 ± 0.001)	-	
			EX	0.28 ± 0.03 (0.011 ± 0.001)	-	
	Valve stem O.D.		IN	4.975 – 4.990 (0.1959 – 0.1965)	-	
			EX	4.965 – 4.980 (0.1955 – 0.1961)	4.955 (0.1951)	
	Valve guide I.D.		IN/EX	5.000 – 5.012 (0.1969 – 0.1973)	5.052 (0.1989)	
	Stem-to-guide clearance		IN	0.010 – 0.037 (0.0004 – 0.0015)	-	
			EX	0.020 – 0.047 (0.0008 – 0.0019)	-	
Valve	Valve guide projection above cylinder head		IN	14.8 – 15.0 (0.58 – 0.59)	-	
			EX	19.8 – 20.0 (0.78 – 0.79)	-	
Valve	Valve seat width		IN/EX	0.90 – 1.10 (0.035 – 0.043)	1.7 (0.07)	
	Valve spring free length		IN	39.47 (1.554)	38.5 (1.52)	
			EX	43.07 (1.696)	42.1 (1.66)	
Rocker arm	Rocker arm I.D.			12.016 – 12.034 (0.4731 – 0.4738)	12.07 (0.475)	
	Rocker arm shaft O.D.			11.977 – 11.985 (0.4715 – 0.4718)	11.93 (0.470)	
	Rocker arm-to-shaft clearance			0.031 – 0.057 (0.0012 – 0.0022)	0.11 (0.004)	
Camshaft	Cam lobe height	49 State and Canada type	IN	35.580 – 35.660 (1.4008 – 1.4039)	35.44 (1.395)	
			EX	25.081 – 25.161 (0.9874 – 0.9906)	24.98 (0.983)	
	California type	IN	35.280 – 35.360 (1.3890 – 1.3921)	35.14 (1.383)		
		EX	24.959 – 25.038 (0.9826 – 0.9857)	24.86 (0.979)		
Valve lifter O.D.				22.478 – 22.493 (0.8850 – 0.8855)	22.47 (0.885)	
Valve lifter bore I.D.				22.510 – 22.526 (0.8862 – 0.8868)	22.54 (0.887)	

## CYLINDER/PISTON SPECIFICATIONS

ITEM				STANDARD	Unit: mm (in)	
Cylinder	I.D.		78.000 – 78.015 (3.0709 – 3.0715)		78.025 (3.0718)	
	Out of round		-		0.010 (0.0004)	
	Taper		-		0.010 (0.0004)	
	Warpage		-		0.05 (0.002)	
Piston, piston ring	Piston mark direction			"IN" mark facing toward the intake side	-	
	Piston O.D.			77.970 – 77.980 (3.0697 – 3.0701)	77.940 (3.0685)	
	Piston O.D. measurement point			7.0 mm (0.28 in) from the bottom of skirt	-	
	Piston pin bore I.D.			16.002 – 16.008 (0.6300 – 0.6302)	16.03 (0.631)	
	Piston pin O.D.			15.994 – 16.000 (0.6297 – 0.6299)	15.98 (0.629)	
	Piston-to-piston pin clearance			0.002 – 0.014 (0.0001 – 0.0006)	0.04 (0.002)	
	Top ring mark			"R" mark side facing up	-	
	Piston ring-to-ring groove clearance	Top		0.065 – 0.100 (0.0026 – 0.0039)	0.115 (0.0045)	
		Piston ring end gap	'04 – '06	0.20 – 0.30 (0.008 – 0.012)	0.44 (0.017)	
			After '06	0.15 – 0.25 (0.006 – 0.010)	0.39 (0.015)	
	Oil ring (side rail)			0.20 – 0.70 (0.008 – 0.028)	0.90 (0.035)	
Cylinder-to-piston clearance				0.020 – 0.045 (0.0008 – 0.0018)	0.085 (0.0033)	
Connecting rod small end I.D.			'04 – '06	16.016 – 16.034 (0.6306 – 0.6313)	16.04 (0.631)	
			After '06	16.016 – 16.038 (0.6306 – 0.6314)	16.04 (0.631)	
Connecting rod-to-piston pin clearance			'04 – '06	0.016 – 0.040 (0.0006 – 0.0016)	0.06 (0.002)	
			After '06	0.016 – 0.044 (0.0006 – 0.0017)	0.06 (0.002)	

## CLUTCH/STARTER CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE SPECIFICATIONS

ITEM	STANDARD	Unit: mm (in) SERVICE LIMIT
Clutch lever free play	10 – 20 (3/8 – 13/16)	–
Clutch spring free length	38.8 (1.53)	38.0 (1.50)
Clutch disc A thickness	2.92 – 3.08 (0.115 – 0.121)	2.85 (0.112)
Clutch disc B thickness	2.92 – 3.08 (0.115 – 0.121)	2.85 (0.112)
Clutch plate warpage	–	0.10 (0.004)
Kickstarter pinion gear I.D.	16.516 – 16.534 (0.6502 – 0.6509)	16.55 (0.652)
Kickstarter spindle O.D.	16.466 – 16.484 (0.6483 – 0.6490)	16.46 (0.648)
Kickstarter idle gear I.D.	17.016 – 17.034 (0.6699 – 0.6706)	17.06 (0.672)
Countershaft O.D. at kickstarter idle gear	16.983 – 16.994 (0.6686 – 0.6691)	16.97 (0.668)
Starter driven gear boss	I.D.	35.009 – 35.034 (1.3783 – 1.3793)
	O.D.	45.660 – 45.673 (1.7976 – 1.7981)
Starter reduction gear I.D.	12.016 – 12.034 (0.4731 – 0.4738)	12.05 (0.474)
Starter idle gear I.D.	12.016 – 12.034 (0.4731 – 0.4738)	12.05 (0.474)
Starter gear holder shaft O.D.	11.983 – 11.994 (0.4718 – 0.4722)	11.98 (0.472)

## CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER SPECIFICATIONS

ITEM	STANDARD	Unit: mm (in) SERVICE LIMIT
Crankshaft	Side clearance	0.30 – 0.75 (0.012 – 0.030)
	Radial clearance	0.006 – 0.018 (0.0002 – 0.0007)
	Runout	R – L –
		0.03 (0.001) 0.05 (0.002)
Transmission	Gear I.D.	M4
		23.020 – 23.041 (0.9063 – 0.9071)
		M5
		23.020 – 23.041 (0.9063 – 0.9071)
		C1
		20.020 – 20.041 (0.7882 – 0.7890)
		C2
		27.020 – 27.041 (1.0638 – 1.0646)
		C3
		25.020 – 25.041 (0.9850 – 0.9859)
	Bushing O.D.	M4, M5
		22.979 – 23.000 (0.9047 – 0.9055)
		C1
		19.979 – 20.000 (0.7866 – 0.7874)
		C2
		26.979 – 27.000 (1.0622 – 1.0630)
		C3
		24.979 – 25.000 (0.9834 – 0.9843)
	Bushing I.D.	M5
		20.000 – 20.021 (0.7874 – 0.7882)
		C1
		17.000 – 17.018 (0.6693 – 0.6700)
		C2
		24.000 – 24.021 (0.9449 – 0.9457)
		C3
		22.000 – 22.021 (0.8661 – 0.8670)
Shift fork, shift fork shaft	Gear-to-bushing clearance	M4, M5
		0.020 – 0.062 (0.0008 – 0.0024)
		C1, C2, C3
	Mainshaft O.D.	0.020 – 0.062 (0.0008 – 0.0024)
		19.959 – 19.980 (0.7858 – 0.7866)
		M5 bushing
	Countershaft O.D.	16.983 – 16.994 (0.6686 – 0.6691)
		C1 bushing
		C2 bushing
	Bushing-to-shaft clearance	23.959 – 23.980 (0.9433 – 0.9441)
		C3 bushing
		21.959 – 21.980 (0.8645 – 0.8654)
Shift fork, shift fork shaft	Fork claw thickness	M5
		0.020 – 0.062 (0.0008 – 0.0024)
		C1
	Shift fork I.D.	0.006 – 0.035 (0.0002 – 0.0014)
		C2, C3
		0.020 – 0.062 (0.0008 – 0.0024)
	Fork shaft O.D.	C
		11.003 – 11.024 (0.4332 – 0.4340)
		R, L
		12.035 – 12.056 (0.4738 – 0.4746)
		C
		10.983 – 10.994 (0.4324 – 0.4328)
		R, L
		11.966 – 11.984 (0.4711 – 0.4718)
		11.95 (0.470)

## GENERAL INFORMATION

## FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS

ITEM			STANDARD	Unit: mm (in) SERVICE LIMIT	
Cold tire pressure			98 kPa (1.0 kgf/cm <sup>2</sup> , 14 psi)	–	
Axe runout			–	0.20 (0.008)	
Wheel rim runout	Radial		–	2.0 (0.08)	
	Axial		–	2.0 (0.08)	
Wheel hub-to-rim distance			28.0 ± 1.0 (1.10 ± 0.04)	–	
Fork	Spring free length	'04, '05	495 (19.5)	488 (19.2)	
		After '05	500 (19.7)	493 (19.4)	
	Tube runout		–	0.20 (0.008)	
	Recommended fork oil			Pro-Honda HP Fork Oil 5W or equivalent	
	Fluid capacity	Fork tube	'04, '05	345 cm <sup>3</sup> (11.7 US oz, 12.1 Imp oz)	
			'06	340 cm <sup>3</sup> (11.5 US oz, 12.0 Imp oz)	
			After '06	348 cm <sup>3</sup> (11.8 US oz, 12.2 Imp oz)	
	Fork damper			192 cm <sup>3</sup> (6.5 US oz, 6.8 Imp oz)	
Compression damping adjuster standard position			7 clicks out from full in	–	
Rebound damping adjuster standard position	'04, '05		10 clicks out from full in	–	
	'06		13 clicks out from full in	–	
	After '06		14 clicks out from full in	–	

## REAR WHEEL/SUSPENSION SPECIFICATIONS

ITEM			STANDARD	Unit: mm (in) SERVICE LIMIT	
Cold tire pressure			98 kPa (1.0 kgf/cm <sup>2</sup> , 14 psi)	–	
Axe runout			–	0.20 (0.008)	
Wheel rim runout	Radial		–	2.0 (0.08)	
	Axial		–	2.0 (0.08)	
Wheel hub-to-rim distance			45.5 ± 1.00 (1.79 ± 0.039)	–	
Drive chain slack			25 – 35 (1.0 – 1.4)	60 (2.4)	
Drive chain size/link	DID		520MXV - 116	–	
Drive chain slider thickness			–	5.0 (0.2)	
Drive chain roller I.D.	'04, '05	Upper	–	29 (1.1)	
		Lower	–	39 (1.5)	
	After '05	Upper	–	29 (1.1)	
		Lower	–	31 (1.2)	
Shock absorber	Damper gas pressure		981 kPa (10.0 kgf/cm <sup>2</sup> , 142 psi)	–	
	Damper compressed gas		Nitrogen gas	–	
	Damper rod compressed force at 9 mm compressed		20.0 – 24.0 kgf (44.1 – 52.9 lbf)	–	
	Spring installed length (standard)	'04, '05	254.4 (10.02)	–	
		After '05	256.6 (10.10)	–	
High speed compression damping adjuster standard position		'04, '05	1-7/12 – 2-1/12 turns out from full in	–	
		After '05	1-3/4 – 2-1/4 turns out from full in	–	
Low speed compression damping adjuster standard position			12 clicks out from full in	–	
Rebound damping adjuster standard position	'04, '05		13 – 16 clicks out from full in	–	
	'06		12 – 15 clicks out from full in	–	
	After '06		10 – 13 clicks out from full in	–	

## HYDRAULIC BRAKE SPECIFICATIONS

ITEM		STANDARD	Unit: mm (in) SERVICE LIMIT
Front	Brake fluid	DOT 4	-
	Brake pad wear indicator	-	1.0 (0.04)
	Brake disc thickness	3.0 (0.12)	2.5 (0.10)
	Brake disc runout	-	0.25 (0.010)
	Master cylinder I.D.	11.022 (0.4339)	11.050 (0.4350)
	Master piston O.D.	10.971 (0.4319)	10.840 (0.4268)
	Caliper cylinder I.D.	27.025 (1.0640)	27.060 (1.0654)
	Caliper piston O.D.	26.878 (1.0582)	26.853 (1.0572)
Rear	Brake fluid	DOT 4	-
	Brake pad wear indicator	-	1.0 (0.04)
	Brake disc thickness	4.0 (0.16)	3.5 (0.14)
	Brake disc runout	-	0.25 (0.010)
	Master cylinder I.D.	9.547 (0.3759)	9.575 (0.3770)
	Master piston O.D.	9.491 (0.3737)	9.465 (0.3726)
	Caliper cylinder I.D.	22.675 (0.8927)	22.712 (0.8942)
	Caliper piston O.D.	22.602 (0.8898)	22.573 (0.8887)

## BATTERY/CHARGING SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS
Battery	Capacity	12 V – 4 Ah
	Current leakage	0.1 mA max.
	Voltage (20°C/68°F)	Fully charged
		Needs charging
	Charging current	13.0 – 13.2 V
		Below 12.3 V
Alternator	Normal	0.5 A/5 – 10 h
	Quick	5.0 A/30 min.
Alternator	Capacity	64.4 W/5,000 rpm

## IGNITION SYSTEM SPECIFICATIONS

ITEM			SPECIFICATION	
Spark plug	Standard	(NGK)	IMR8C9H	
		(DENSO)	VUH24D	
	Optional	(NGK)	IMR9C9H	
		(DENSO)	VUH27D	
Spark plug gap			0.8 – 0.9 mm (0.03 – 0.04 in)	
Ignition coil resistance (at 20 °C/68 °F)		Primary	0.07 – 0.10 Ω	
		Secondary	4.6 – 6.8 kΩ	
Direct ignition coil input voltage			200 V minimum	
Ignition pulse generator peak voltage			0.7 V minimum	
Alternator exciter coil peak voltage			50 V minimum	
Ignition timing ("F" mark)			8° ± 2° BTDC/1,700 rpm	
Throttle position sensor resistance (at 20 °C/68 °F)			4 – 6 kΩ	

## GENERAL INFORMATION

### ELECTRIC STARTER SPECIFICATION

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	10.25 (0.404)	6.75 (0.266)

### LIGHTS/METER/SWITCHES SPECIFICATIONS

ITEM	SPECIFICATIONS
Headlight	12 V - 35 W
Tail light	LED
Main fuse	15 A

## STANDARD TORQUE VALUES

FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)	FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)
5 mm hex bolt and nut	4.9 (0.5, 3.6)	5 mm screw	3.9 (0.4, 2.9)
6 mm hex bolt and nut	9.8 (1.0, 7)	6 mm screw	8.8 (0.9, 6.5)
8 mm hex bolt and nut	22 (2.2, 16)	6 mm flange bolt (8 mm head)	8.8 (0.9, 6.5)
10 mm hex bolt and nut	34 (3.5, 25)	6 mm flange bolt (10 mm head) and nut	12 (1.2, 9)
12 mm hex bolt and nut	54 (5.5, 40)	8 mm flange bolt and nut	26 (2.7, 20)
		10 mm flange bolt and nut	39 (4.0, 29)

## 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 oil to the threads and seating surface.
2. Apply a locking agent to the threads.
3. Stake.
4. U-nut
5. Apply grease to the threads.
6. Left hand threads.
7. Apply a high strength locking agent to the threads.
8. ALOC bolt: replace with a new one.

## ENGINE

### MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Engine oil drain bolt ('04 – '06)	1	8	22 (2.2, 16)	NOTE 1
Engine oil drain bolt (After '06)	1	8	16 (1.6, 12)	NOTE 1
Transmission oil drain bolt ('04 – '06)	1	8	22 (2.2, 16)	NOTE 1
Transmission oil drain bolt (After '06)	1	8	16 (1.6, 12)	NOTE 1
Timing hole cap	1	14	5.9 (0.6, 4.3)	NOTE 5
Crankshaft hole cap	1	30	15 (1.5, 11)	NOTE 5
Spark plug	1	10	16 (1.6, 12)	

### LUBRICATION SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Oil jet ('04)	1	5	2.0 (0.2, 1.4)	NOTE 2
Oil jet mounting bolt (After '04)	1	6	9.8 (1.0, 7)	NOTE 2

## GENERAL INFORMATION

### FUEL SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Throttle drum cover bolt	1	5	3.9 (0.4, 2.9)	
Needle jet	1	7	2.0 (0.2, 1.4)	
Main jet	1	5	1.5 (0.15, 1.1)	
Slow jet	1	6	1.5 (0.15, 1.1)	
Slow air jet	1	5	1.0 (0.1, 0.7)	
Starter jet	1	5	1.5 (0.15, 1.1)	
Maintenance cover bolt	2	4	2.0 (0.2, 1.4)	
Top cover bolt	2	4	2.0 (0.2, 1.4)	
Throttle shaft screw ('04 – '06)	1	4	2.0 (0.2, 1.4)	NOTE 2
Throttle shaft torx screw (After '06)	1	4	2.0 (0.2, 1.4)	NOTE 2
Float chamber screw	4	4	2.0 (0.2, 1.4)	
Accelerator pump cover screw	3	4	2.0 (0.2, 1.4)	
Carburetor drain plug	1	18	4.9 (0.5, 3.6)	
Choke valve lock nut	1	12	2.0 (0.2, 1.4)	
Hot start valve cable nut	1	12	2.0 (0.2, 1.4)	
Needle holder	1	8	2.0 (0.2, 1.4)	
Throttle position sensor torx screw ('04 – '06)	1	5	3.9 (0.4, 2.9)	NOTE 2
Throttle position sensor bolt (After '06)	1	5	3.9 (0.4, 2.9)	NOTE 2
Acc. pump bypass jet	1	4	0.3 (0.03, 0.2)	
Air supply pipe mounting bolt ('04 – '06 California type, After '06)	1	6	9.8 (1.0, 7)	

### COOLING SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Water pump impeller	1	7	12 (1.2, 9)	NOTE 6

### CYLINDER HEAD/VALVES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder head cover bolt	2	6	9.8 (1.0, 7)	
Camshaft holder mounting bolt	4	7	16 (1.6, 12)	NOTE 1
Cylinder head nut	4	9	39 (4.0, 29)	NOTE 1
Cam chain tensioner bolt	1	6	12 (1.2, 9)	NOTE 2
Rocker arm shaft cap	1	14	5.9 (0.6, 4.3)	NOTE 5
Vacuum hose boost joint ('04 – '06 California type, After '06)	1	5	2.5 (0.25, 1.8)	

### CLUTCH/STARTER CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Gearshift drum center pin	1	8	22 (2.2, 16)	
Gearshift drum stopper arm bolt	1	6	12 (1.2, 9)	
Clutch center lock nut	1	18	80 (8.2, 59)	NOTE 1
Clutch spring bolt	5	6	12 (1.2, 9)	
Gearshift return spring pin	1	8	22 (2.2, 16)	
Gearshift pedal pinch bolt	1	6	12 (1.2, 9)	
Primary drive gear bolt	1	12	108 (11.0, 80)	NOTE 1
Water pump drive gear nut	1	14	44 (4.5, 33)	NOTE 1
Starter gear holder mounting bolt	3	8	22 (2.2, 16)	
Kickstarter pedal bolt	1	8	38 (3.9, 28)	

## GENERAL INFORMATION

### CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

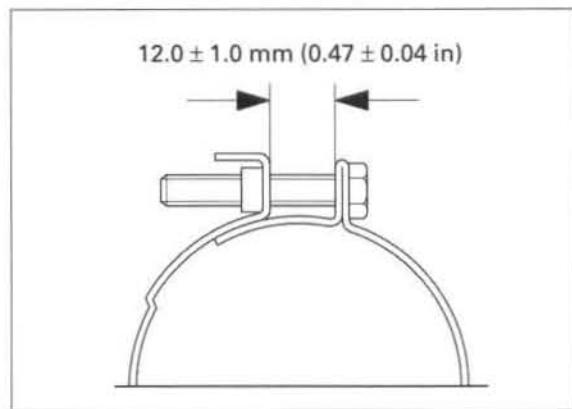
ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Crankshaft bearing set plate torx screw ('04 – '06)	2	6	12 (1.2, 9)	NOTE 7
Crankshaft bearing set plate torx screw (After '06)	2	6	20 (2.0, 14)	NOTE 7
Countershaft bearing set plate screw	2	6	9.8 (1.0, 7)	NOTE 2
Gearshift drum bearing set plate bolt	2	6	9.8 (1.0, 7)	NOTE 2
Mainshaft bearing set plate bolt	2	6	9.8 (1.0, 7)	NOTE 2
Balancer shaft bearing set plate bolt	2	6	9.8 (1.0, 7)	NOTE 2
Crankcase orifice (After '06)	1	5	2.1 (0.2, 1.5)	NOTE 8

### ALTERNATOR

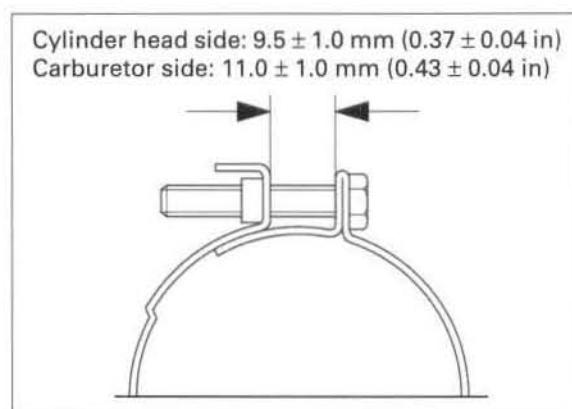
ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Flywheel nut	1	12	64 (6.5, 47)	NOTE 1
Ignition pulse generator mounting bolt	2	5	5.2 (0.53, 3.8)	NOTE 2
Stator mounting screw	3	4	2.5 (0.26, 1.9)	NOTE 2

## GENERAL INFORMATION

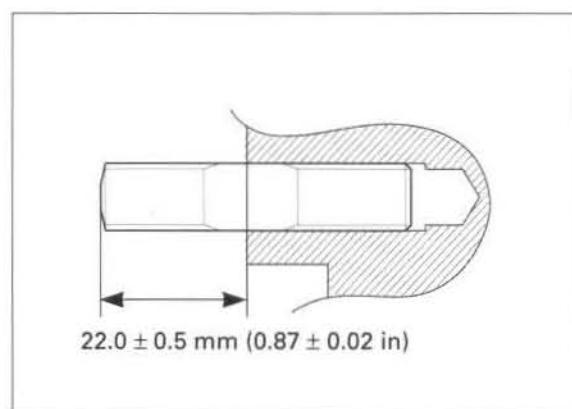
Insulator clamp ('04 – '06):



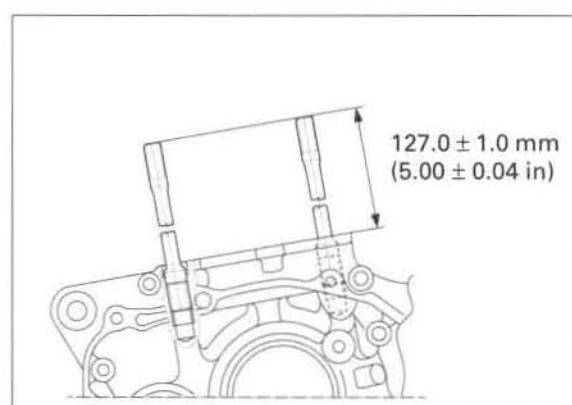
Insulator clamp (After '06):



Cylinder head stud bolt:



Cylinder stud bolt:



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

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Seat mounting bolt	2	8	26 (2.7, 20)	
Radiator shroud upper mounting bolt	4	5	4.9 (0.5, 3.6)	
Sub-frame mounting bolt (upper)	1	8	30 (3.1, 22)	
(lower)	2	10	49 (5.0, 36)	
Seat bracket screw	1	5	3.9 (0.4, 2.9)	
Seat band hook screw	1	5	3.9 (0.4, 2.9)	
Muffler joint band bolt	1	8	21 (2.1, 15)	
Muffler mounting bolt	2	8	26 (2.7, 20)	
Exhaust pipe joint nut	2	8	21 (2.1, 15)	
Heat shield bolt	2	6	12 (1.2, 9)	
Exhaust pipe protector bolt	2	6	12 (1.2, 9)	
Spark arrester assembly mounting bolt ('04 – '06)	4	6	12 (1.2, 9)	
Spark arrester assembly mounting bolt (After '06)	4	6	6.9 (0.7, 5.1)	See page 3-30
Diffuser mounting torx screw ('04 – '06)	1	6	11 (1.1, 8)	
Diffuser mounting torx screw (After '06)	2	5	11 (1.1, 8)	
Step bracket (upper)	2	12	54 (5.5, 40)	
(lower)	2	8	29 (3.0, 22)	
Rear fender mounting bolt	2	6	13 (1.3, 9)	

**MAINTENANCE**

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Throttle cable upper adjuster lock nut (After '06)	1	7	3.9 (0.4, 2.9)	
Throttle cable lower adjuster lock nut (After '06)	1	6	3.9 (0.4, 2.9)	

**FUEL SYSTEM**

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
PAIR control valve mounting nut	2	6	13 (1.3, 9)	

**COOLING SYSTEM**

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Radiator plug	1	16	18 (1.8, 13)	

**ENGINE REMOVAL/INSTALLATION**

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Engine hanger plate nut (engine side)	1	10	54 (5.5, 40)	
(frame side) '04:	2	8	26 (2.7, 20)	
After '04:	2	8	34 (3.5, 25)	
Engine mounting nut (front)	1	10	54 (5.5, 40)	
(lower)	1	10	64 (6.5, 47)	
Drive sprocket bolt	1	8	31 (3.2, 23)	

## GENERAL INFORMATION

### FRONT WHEEL/SUSPENSION/STEERING

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Front axle nut	1	16	88 (9.0, 65)	
Front axle holder bolt	4	8	20 (2.0, 14)	
Front spoke	36	BC3.5	3.7 (0.38, 2.7)	
Front rim lock	1	8	12 (1.2, 9)	
Front brake disc nut	6	6	16 (1.6, 12)	
Steering stem nut	1	26	108 (11.0, 80)	NOTE 4
Steering stem adjusting nut	1	30	See page 13-40	
Fork top bridge pinch bolt	4	8	23 (2.3, 17)	
Fork bottom bridge pinch bolt	4	8	21 (2.1, 15)	
Fork cap	2	39	29 (3.0, 22)	
Fork center bolt	2	22	69 (7.0, 51)	
Fork center bolt lock nut	2	12	22 (2.2, 16)	
Plug bolt	2	5	1.3 (0.13, 0.9)	
Fork damper	2	50	34 (3.5, 25)	
Fork protector mounting bolt	6	6	6.9 (0.7, 5.1)	NOTE 2
Front brake disc cover bolt	2	6	13 (1.3, 9)	
Handlebar upper holder bolt	4	8	22 (2.2, 16)	
Handlebar lower holder nut	2	10	44 (4.5, 33)	NOTE 4
Clutch lever pivot bolt	1	6	2.0 (0.2, 1.4)	
Clutch lever pivot nut	1	6	9.8 (1.0, 7)	NOTE 4
Engine stop button screw	1	4	1.5 (0.15, 1.1)	
Engine starter switch housing screw	2	4	0.7 (0.07, 0.5)	

### REAR WHEEL/BRAKE/SUSPENSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear axle nut	1	22	127 (13.0, 94)	NOTE 4
Rear spoke	32	4.5	3.7 (0.38, 2.7)	
Rear rim lock	1	8	12 (1.2, 9)	
Rear brake disc nut	6	6	16 (1.6, 12)	NOTE 4
Driven sprocket nut	6	8	32 (3.3, 24)	NOTE 4
Rear wheel bearing retainer	1	50	44 (4.5, 33)	
Swingarm pivot nut	1	14	88 (9.0, 65)	NOTE 4
Shock arm nut (swingarm side) (shock link side)	1	12	52 (5.3, 38)	NOTE 1, 4
Shock link nut (frame side)	1	12	52 (5.3, 38)	NOTE 1, 4
Shock absorber upper mounting nut	1	10	44 (4.5, 33)	NOTE 4
Shock absorber lower mounting nut	1	10	44 (4.5, 33)	NOTE 4
Shock absorber spring lock nut	1	60	44 (4.5, 33)	
Drive chain slider screw	3	5	3.9 (0.4, 2.9)	NOTE 2
Drive chain roller bolt/nut	2	8	12 (1.2, 9)	NOTE 4
Drive chain guide mounting bolt/nut	3	6	12 (1.2, 9)	NOTE 4
Drive chain adjusting bolt lock nut	2	8	27 (2.8, 20)	
Shock absorber damper rod end nut	1	12	37 (3.8, 27)	NOTE 3
Shock absorber damping adjuster	1	27	29 (3.0, 22)	NOTE 3

**HYDRAULIC BRAKE**

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Brake hose oil bolt	4	10	34 (3.5, 25)	
Brake lever adjuster lock nut	1	5	5.9 (0.6, 4.3)	
Brake lever pivot nut	1	6	5.9 (0.6, 4.3)	
Brake lever pivot bolt	1	6	1.0 (0.1, 0.7)	
Front brake hose guide bolt	4	6	5.2 (0.53, 3.8)	
Rear brake hose guide screw	2	5	1.2 (0.12, 0.9)	
Front master cylinder reservoir cover screw	2	4	1.5 (0.15, 1.1)	
Front master cylinder holder bolt	2	6	9.8 (1.0, 7)	
Front brake caliper mounting bolt	2	8	30 (3.1, 22)	
Caliper bleed valve	2	8	5.4 (0.55, 4.0)	NOTE 2
Rear master cylinder mounting bolt	2	6	13 (1.3, 9)	
Rear master cylinder reservoir cover bolt	2	4	1.5 (0.15, 1.1)	
Front caliper pin bolt	1	8	23 (2.3, 17)	
Rear caliper pin bolt	1	12	27 (2.8, 20)	
Brake caliper pad pin	2	10	18 (1.8, 13)	
Front brake caliper pad pin plug	1	10	2.0 (0.2, 1.4)	
Front caliper bracket pin bolt	1	8	23 (2.3, 17)	
Rear caliper bracket pin bolt	1	8	13 (1.3, 9)	NOTE 2
Brake pedal pivot bolt ('04 – '06)	1	8	25 (2.6, 19)	NOTE 2
Brake pedal pivot bolt (After '06)	1	10	36 (3.7, 27)	NOTE 2
Rear master cylinder push rod lock nut	1	6	5.9 (0.6, 4.3)	

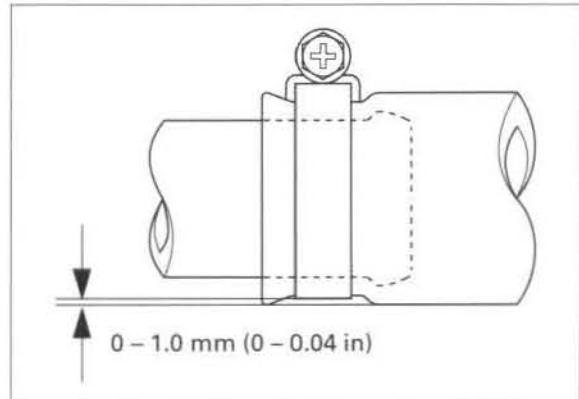
**LIGHTS/METERS/SWITCHES**

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Tail light mounting screw	2	5	3.9 (0.4, 2.9)	
Headlight mounting screw	2	5	0.7 (0.07, 0.5)	NOTE 2

**OTHERS**

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Side stand mounting bolt (upper)	1	10	54 (5.5, 40)	
(lower)	1	8	39 (4.0, 29)	
Side stand pivot bolt	1	10	See page 3-31	
Side stand pivot nut	1	10	39 (4.0, 29)	NOTE 4

Water hose clamp:



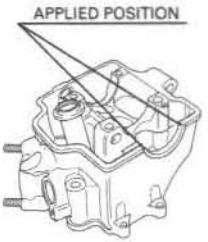
## GENERAL INFORMATION

# LUBRICATION & SEAL POINTS

### ENGINE

LOCATION	MATERIAL	REMARKS
Camshaft cam lobes Rocker arm bore and slider surfaces Valve stem (valve guide sliding surfaces) Valve stem end sliding surface Valve lifter outer surface Clutch outer guide sliding surfaces Clutch lifter lever cam area Kickstarter spindle spline area and gear rolling area Starter gear holder rolling surfaces Connecting rod small end inner surface Connecting rod big end sliding surface Mainshaft spline area and sliding surface Countershaft spline area and sliding surface Transmission gear sliding surfaces Shift fork gear guide area and bore Shift fork shafts outer surface	Use molybdenum oil solution (mixture of the engine oil and molybdenum grease with the ratio 100g : 70 cc)	
Camshaft holder mounting bolt threads and seating surface Cylinder head nut threads and seating surfaces Water pump drive gear nut threads and seating surface Piston outer surface and piston pin hole Piston pin outer surface Piston ring whole surface Cylinder bore Clutch lifter piece needle bearing Clutch disc lining surface Clutch center lock nut threads and seating surfaces Primary drive gear bolt threads and seating surface One-way clutch Starter clutch outer sliding surfaces Starter driven gear sliding surfaces Flywheel nut threads and seating surfaces Transmission gear teeth Shift drum guide grooves Gearshift spindle serration area Oil pump rotors sliding area Decompressor weight sliding area Engine oil drain bolt threads and seating surface Transmission oil drain bolt threads and seating surface Plug hole seal Crankshaft oil seal outer surface Clutch outer sliding surface Kickstarter spindle journal Each bearing rolling contact area Each O-rings	Engine oil	
Crankshaft hole cap threads Timing hole cap thread Rocker arm shaft cap threads Camshaft set ring Armature shaft end Each oil seal lips Dust seal lips Oil filter spring contact area Water seal lips	Multi-purpose grease	

## GENERAL INFORMATION

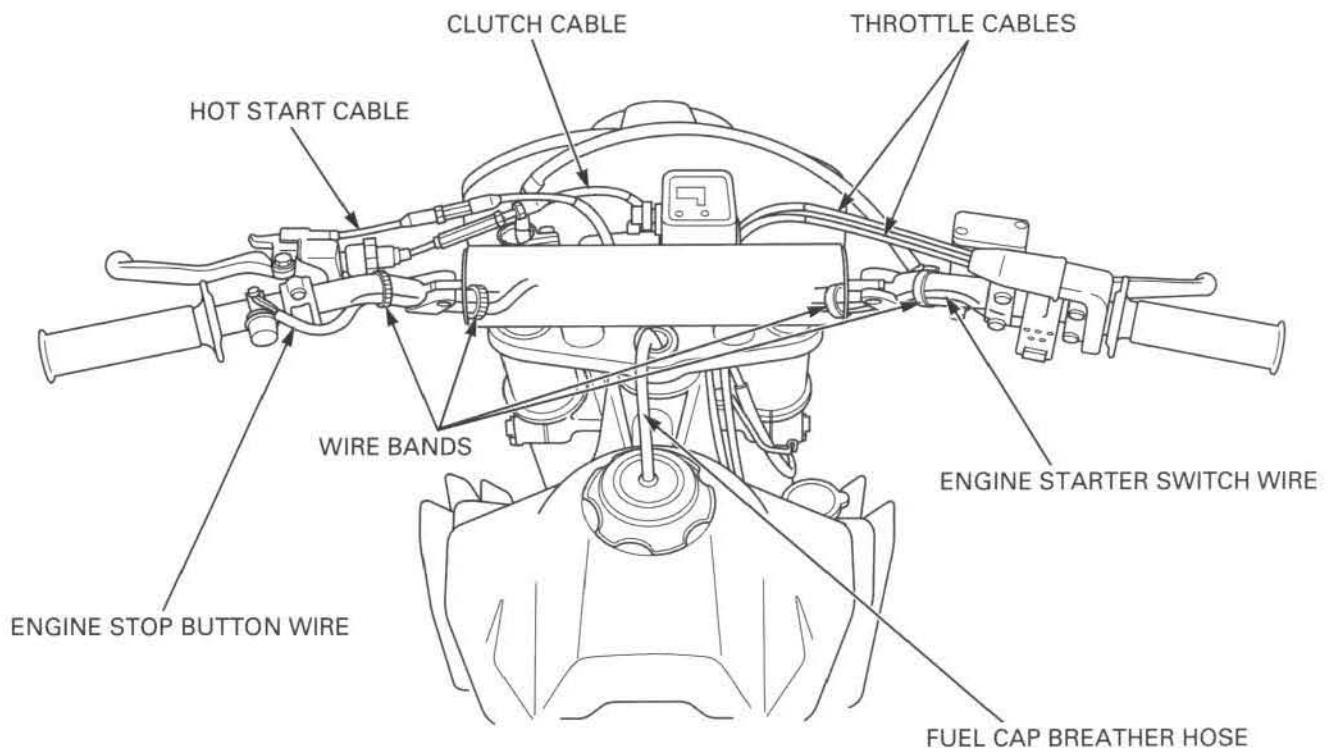
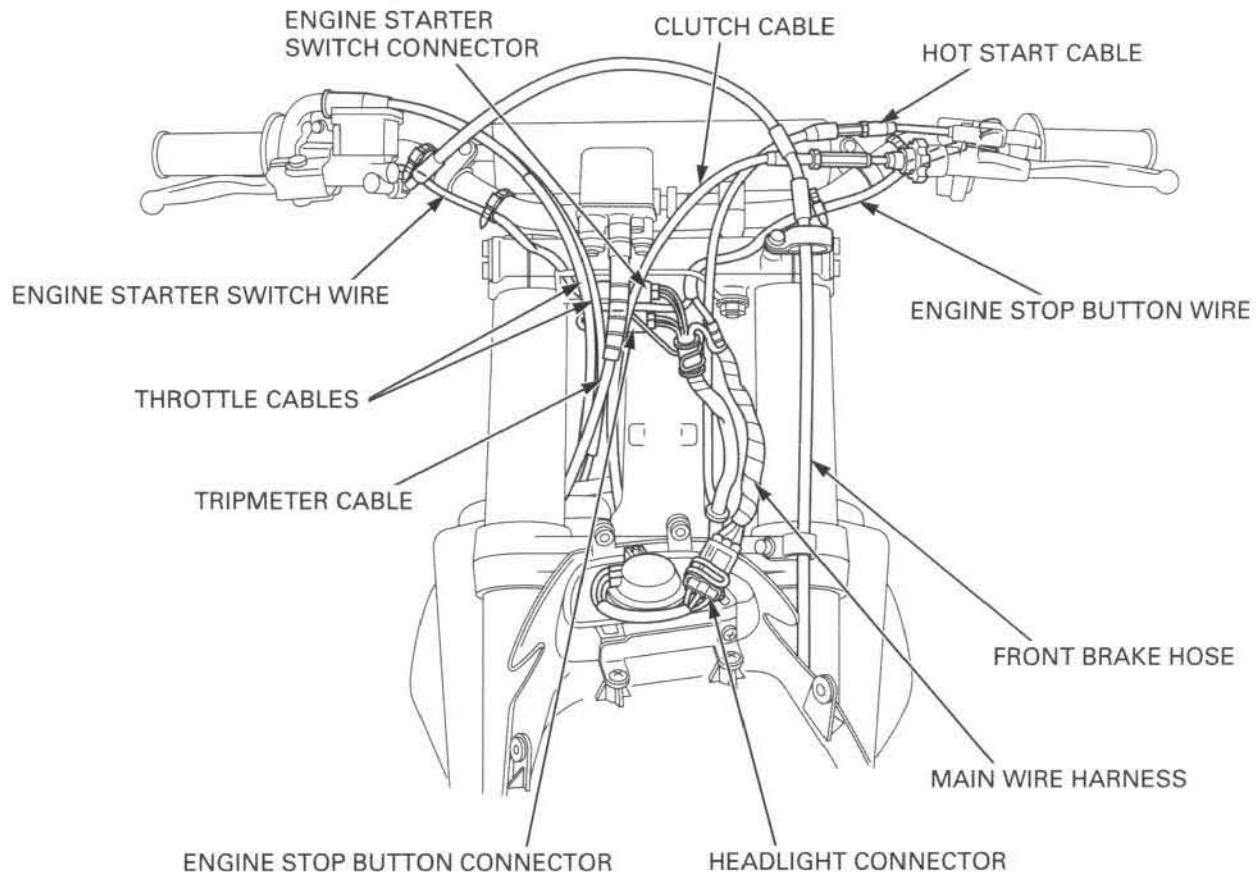
LOCATION	MATERIAL	REMARKS
Shift drum center pin bolt threads Stator screw threads	Locking agent	Coating width: 3.0 mm (0.12 in) from tip
Pulse generator mounting bolt		Coating width: 4.5 mm (0.18 in) from tip
Breather plate bolt threads		Coating width: 6.5 mm (0.26 in) from tip
Balancer shaft bearing set plate bolt threads		Coating width: 6.5 mm (0.26 in) from tip
Mainshaft bearing set plate bolt threads		Coating width: 6.5 mm (0.26 in) from tip
Oil jet threads ('04)		Coating width: 2.5 mm (0.10 in) from tip
Oil jet mounting bolt threads (After '04)		Coating width: 6.5 mm (0.26 in) from tip
Countershaft bearing set plate screw threads		Coating width: 3.5 mm (0.14 in) from tip
Cam chain tensioner bolt threads		Coating width: 6.5 mm (0.26 in) from tip
Decompressor cam stopper plate bolt thread		Coating width: 6.5 mm (0.26 in) from tip
Shift drum bearing set plate bolt threads Throttle shaft screw threads Throttle position sensor torx screw threads ('04 – '06) Throttle position sensor bolt threads (After '06) Brake pedal pivot threads		
Crankshaft bearing set plate torx screw threads	Locking agent (Pro Honda Hondalock 3 or equivalent high strength locking agent)	Coating width: 6.5 mm (0.26 in) from tip
Alternator wire grommet sealing surface Cylinder head surface	Liquid sealant	

## GENERAL INFORMATION

### FRAME

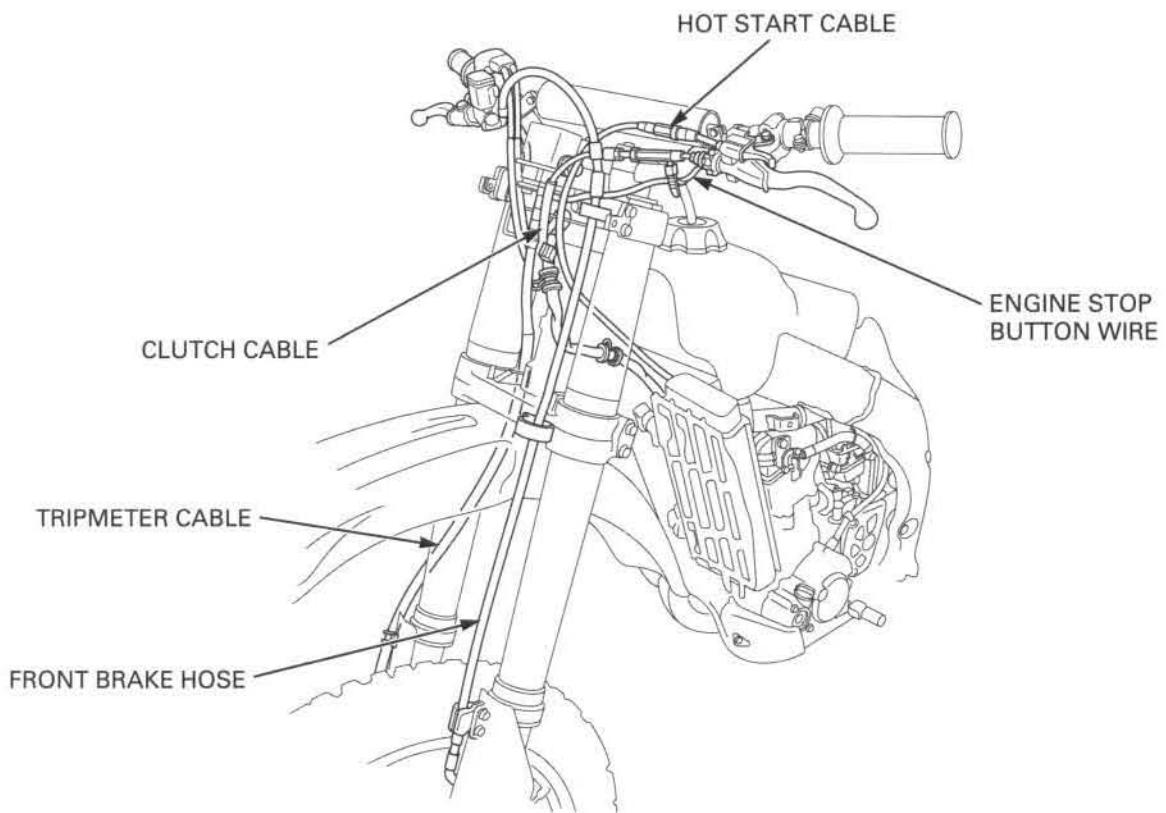
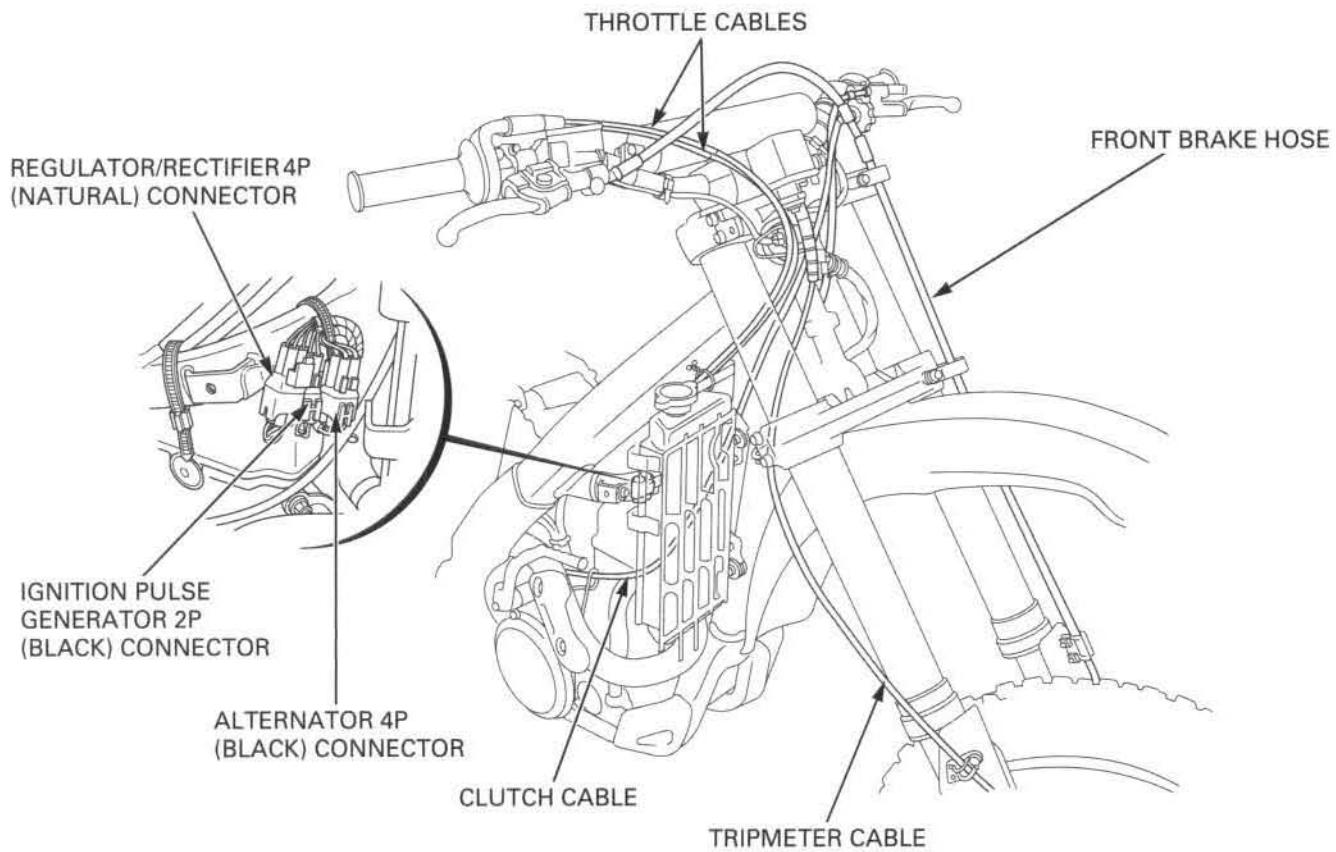
LOCATION	MATERIAL	REMARKS
Steering head bearing rolling area and dust seal lips	Urea based multi-purpose grease with extreme pressure (example: EXCELITE EP2 manufactured by KYODOYUSI Japan, Shell stamina EP2 or equivalent)	Apply 3 - 5 g for each bearing
Wheel bearing dust seal lips Wheel bearing rolling area Swingarm pivot bolt sliding surface Swingarm pivot needle bearing rolling area Swingarm pivot thrust bearing rolling area Swingarm pivot dust seal lips Shock arm and shock link needle bearing rolling area Shock arm dust seal lips Shock linkage side collar Rear shock absorber spherical bearing rolling area Rear shock absorber dust seal lips Brake pedal pivot shaft sliding area Shift change pedal sliding area of pin Clutch lever pivot bolt sliding surface Throttle cable sliding surface Clutch cable end adjuster inside surface Kick arm joint sliding area Side stand pivot bolt sliding surface	Multi-purpose grease	Apply 3 – 5 g  Apply 3 g
Brake caliper pin bolt sliding area Brake caliper bracket pin bolt sliding area Brake caliper dust seal lips Brake lever pivot bolt sliding surface Brake lever adjust bolt tip Rear master cylinder push rod sliding and boot fitting area	Silicone grease	
Drive chain slider mounting screw threads Front fork protector bolt threads Front brake caliper mounting bolt Caliper slide pins thread	Locking agent	
Brake caliper piston seal lips Brake caliper piston outer surface Master cylinder inner surface Master cylinder piston outer surface	DOT4 brake fluid	
Handlebar grip rubber inner surface	Honda Bond A or Honda Handgrip Cement (U.S.A. only)	
Fork cap O-rings Center bolt O-rings Fork oil seal Fork dust seal Damping adjuster O-ring	Pro-Honda HP Fork Oil 5W	
Shock link nut seating surface Throttle pipe flange and sliding area Shock arm and shock link nut threads	Engine oil	
Spark arrester assembly mounting bolt (After '06)	Molybdenum disulfide grease (THREEBOND 1901 or equivalent)	

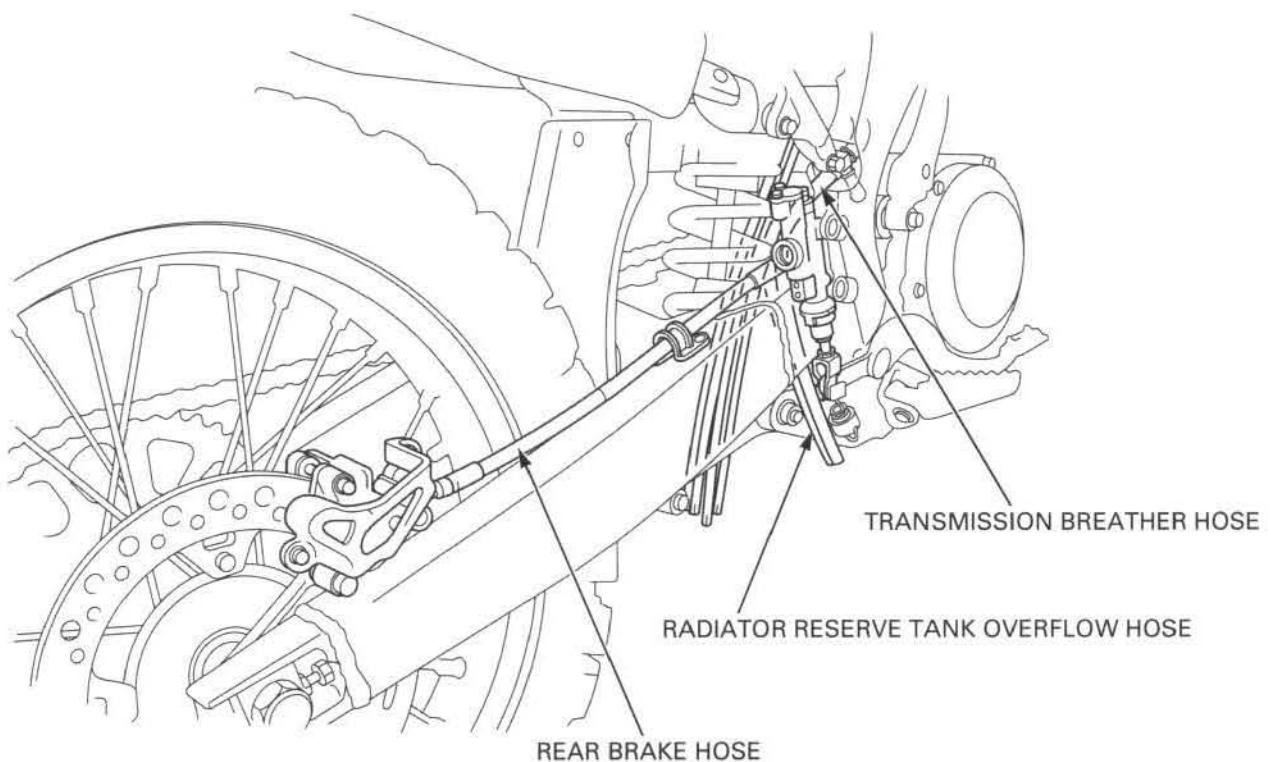
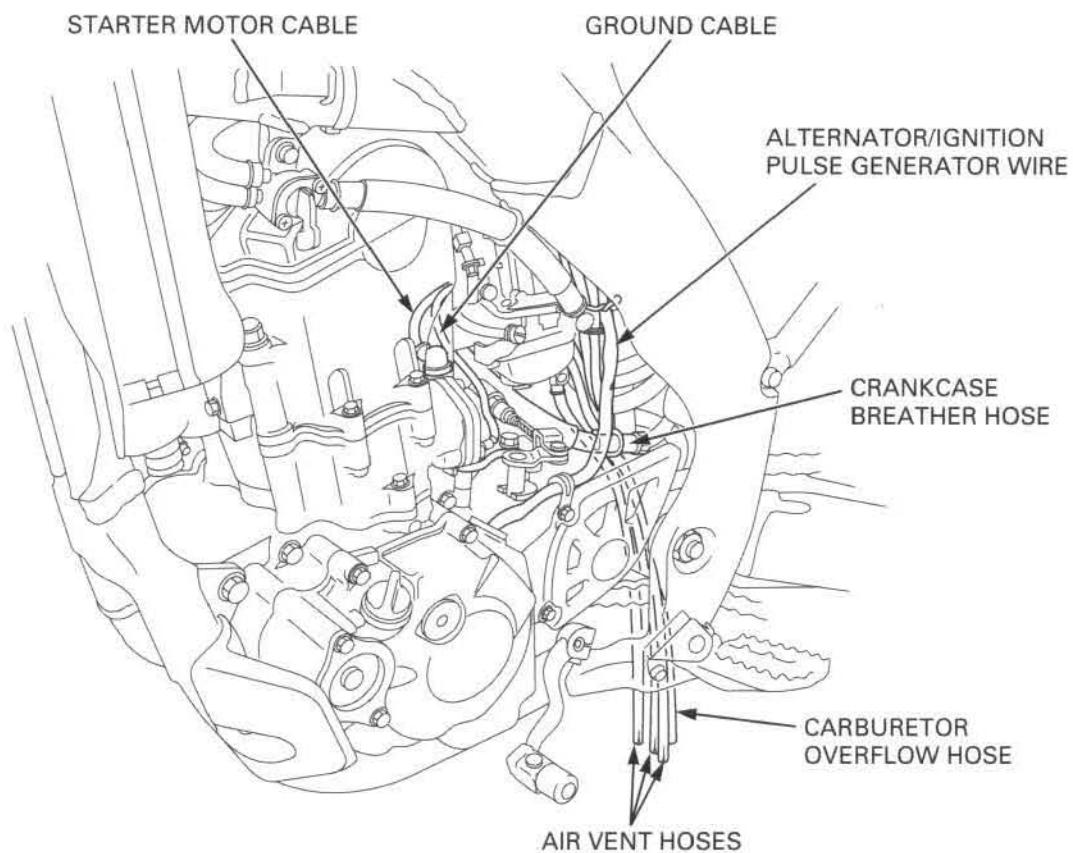
## CABLE & HARNESS ROUTING



## GENERAL INFORMATION

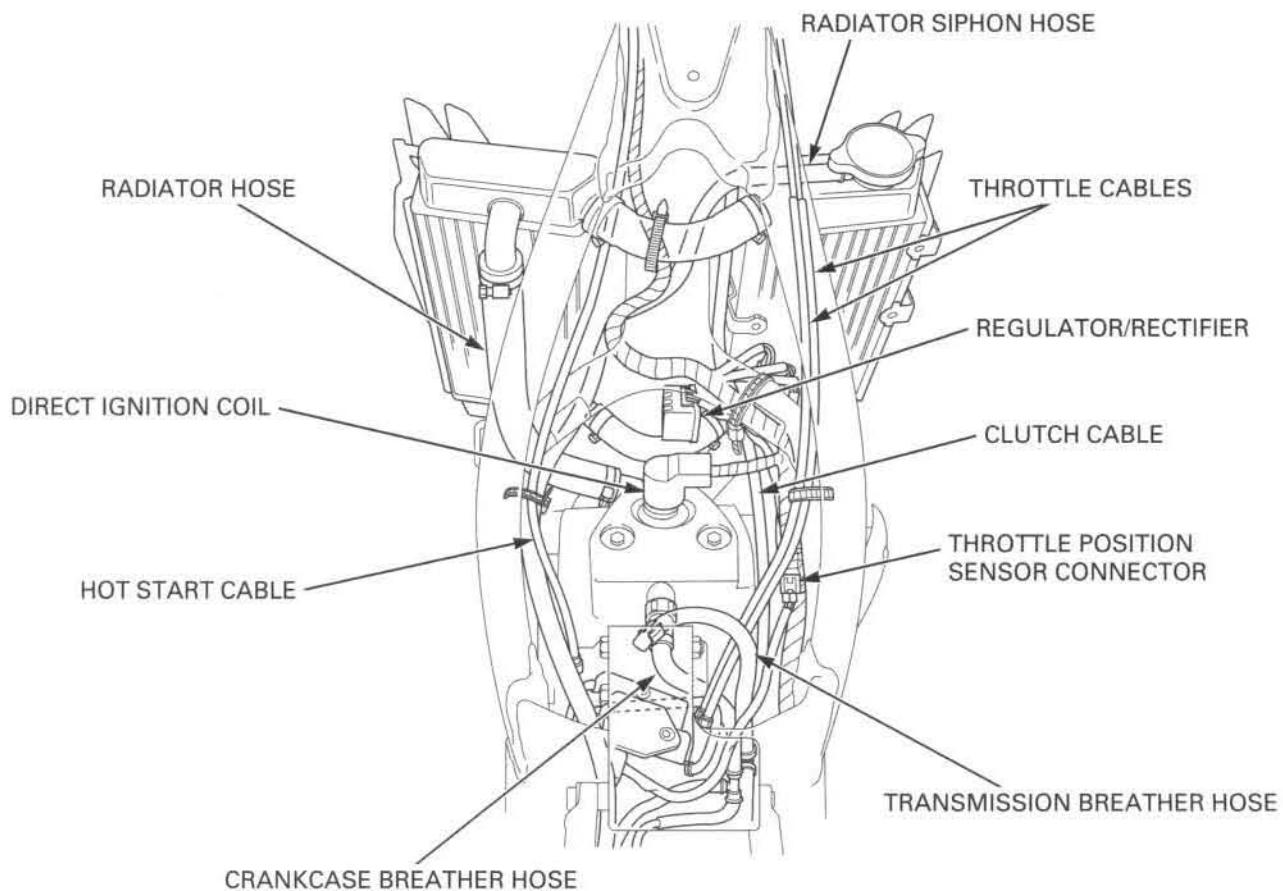
---



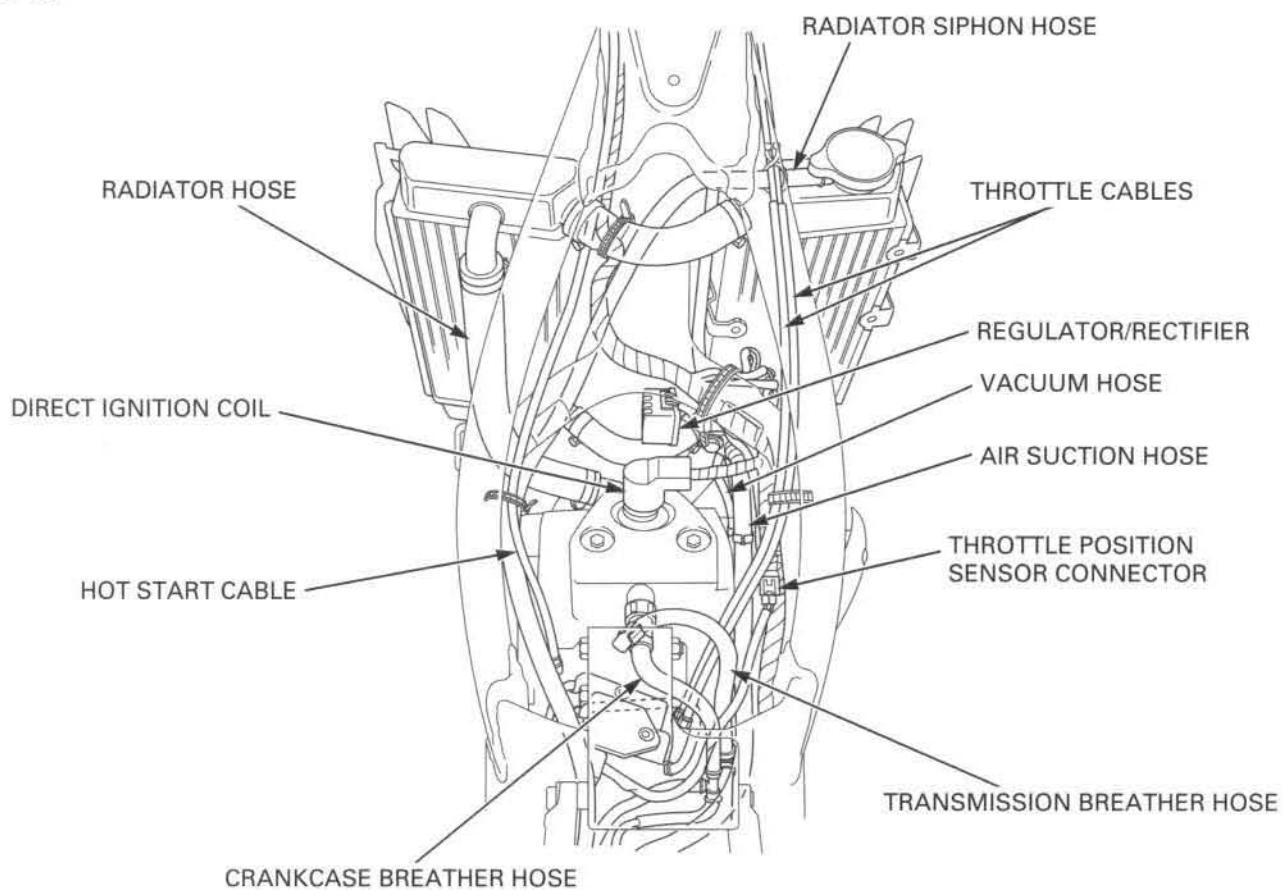


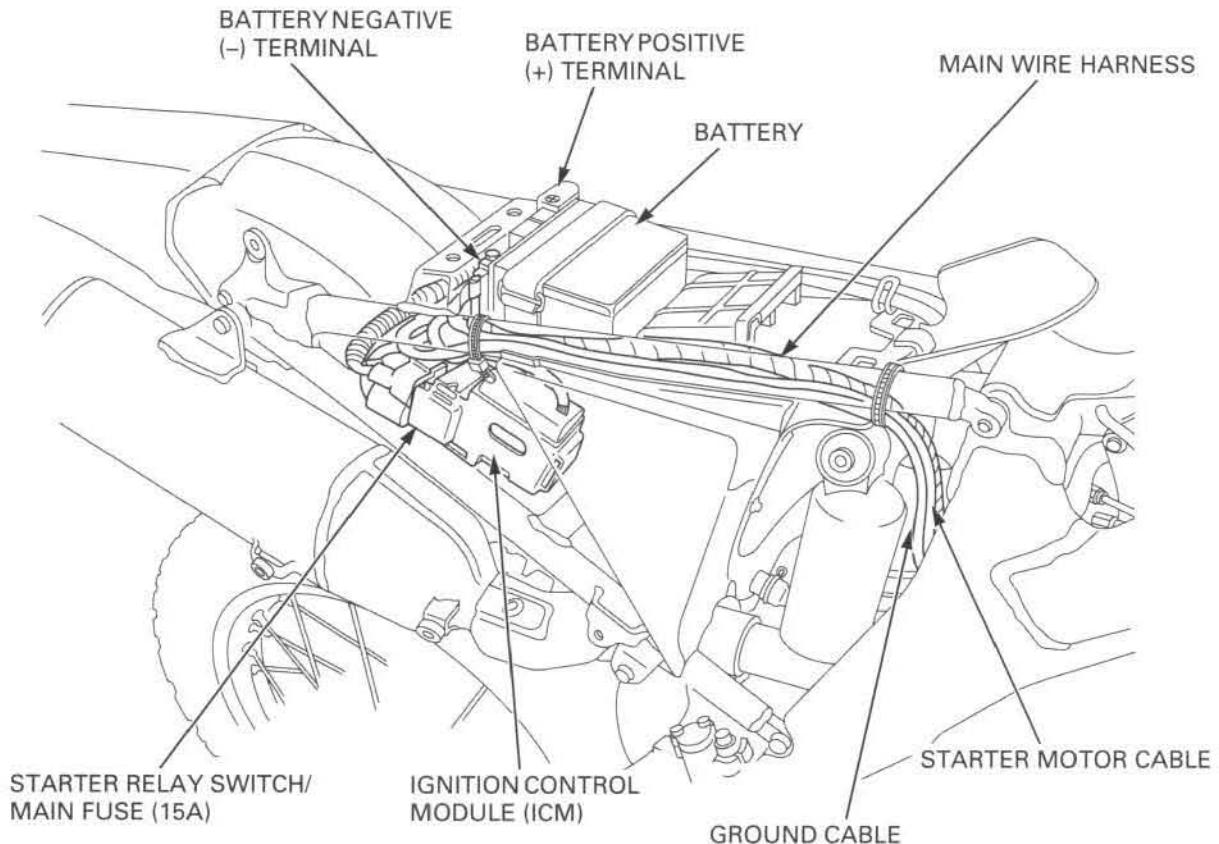
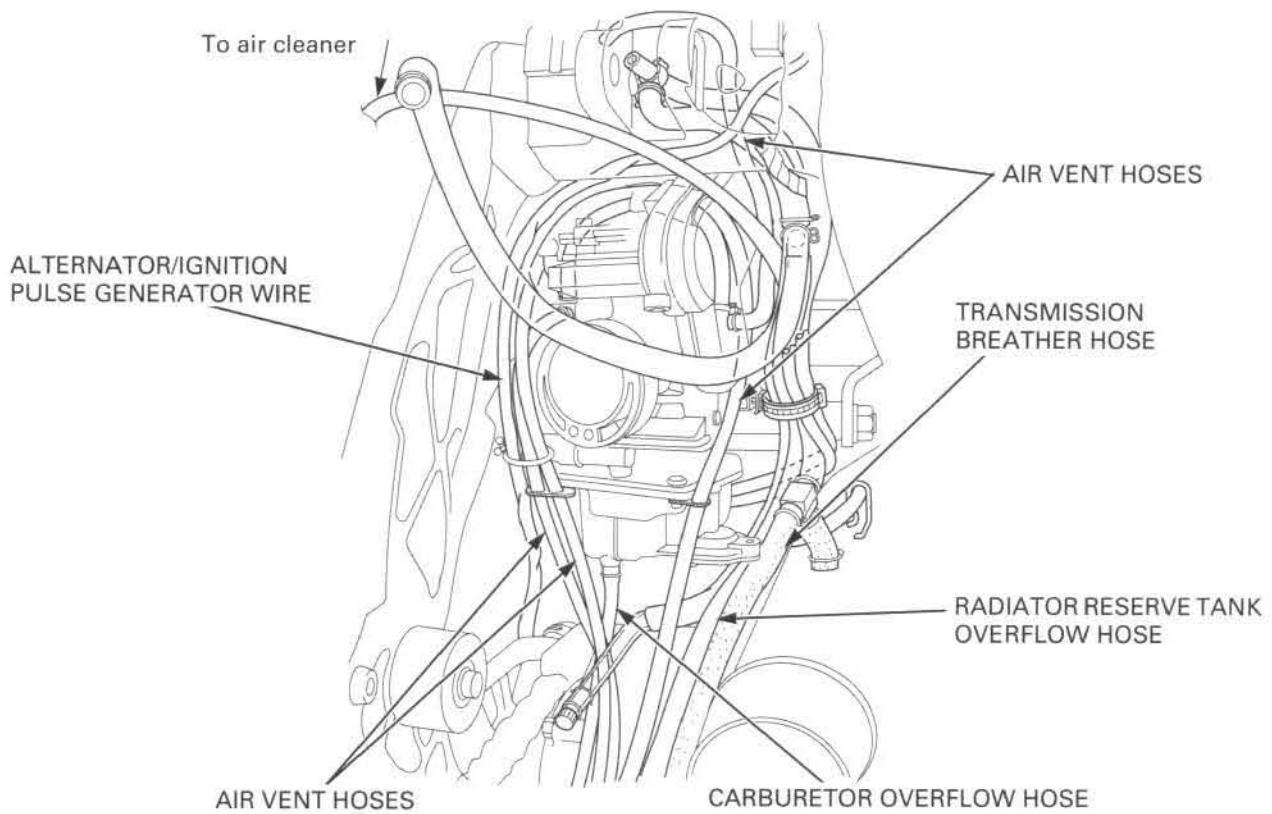
## GENERAL INFORMATION

'04 – '06:



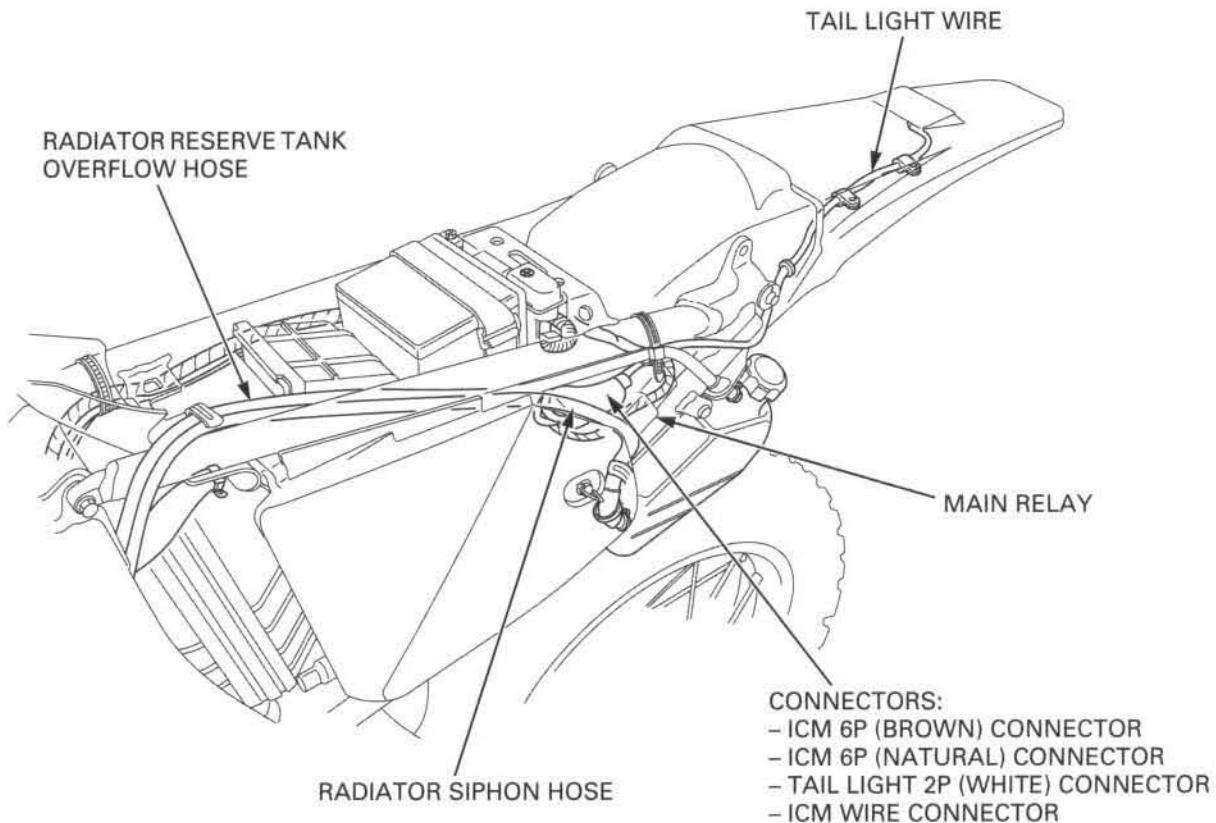
After '06:



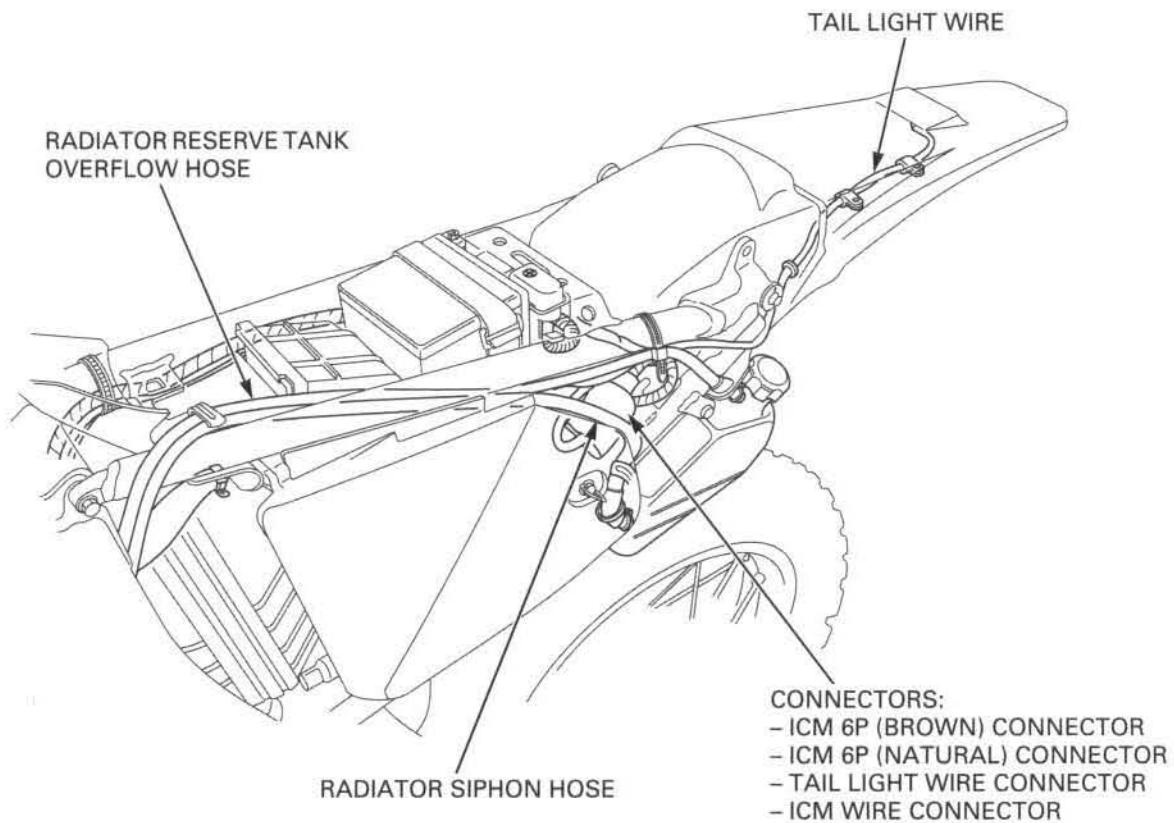


## GENERAL INFORMATION

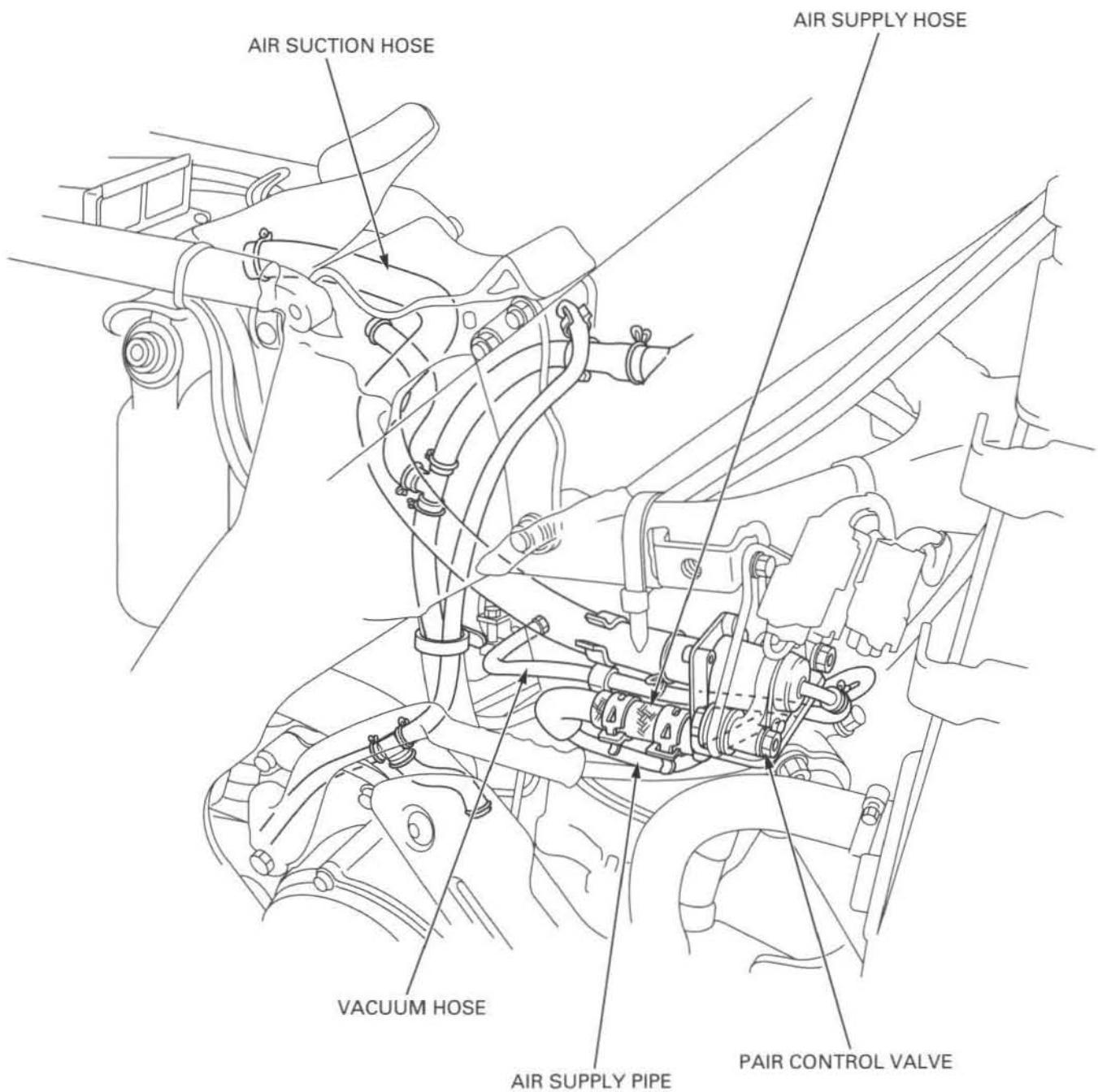
'04, '05:



After '05:



## SECONDARY AIR SUPPLY SYSTEM ('04 – '06 California type, After '06)

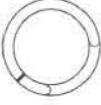
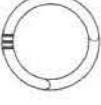
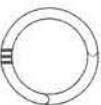


## GENERAL INFORMATION

### OPTIONAL PARTS

ITEM	REMARKS
<b>MAINTENANCE:</b> Work stand	For maintenance 
Pin spanner	Pin spanner A x 2 For shock absorber spring installed length (preload) adjustment (two required)
<b>DRIVE CHAIN &amp; SPROCKET:</b> Driven sprocket /chain link	Standard Optional 53T (Aluminum)/116 52T (Aluminum)/116 54T (Aluminum)/116
<b>HANDLEBAR LOWER HOLDER:</b>	Standard Optional 3 mm offset no offset
<b>COOLING FAN ('04, '05):</b> <ul style="list-style-type: none"><li>• Cooling fan</li><li>• Thermo switch</li></ul> <b>COOLING FAN (After '05):</b> <ul style="list-style-type: none"><li>• Cooling fan</li><li>• Thermo switch</li><li>• Condenser</li><li>• Fan motor relay</li><li>• Sub-harness</li></ul> <p>An optional cooling fan is available for competition use. The fan will help avoid engine damage if the engine is kept idling too long hot or when riding in mud or sand or any condition that causes high engine load at low vehicle speed.</p>	

## GENERAL INFORMATION

ITEM		REMARKS	
<b>FORK ('04, '05):</b>			
Spring	<b>TYPE</b>	<b>SPRING RATE</b>	<b>OIL CAPACITY</b>
	Light	3 scribe marks 	0.40 kgf/mm (22.40 lbf/in) Standard 350 cm³ (11.8 US oz) Maximum 403 cm³ (13.6 US oz) Minimum 308 cm³ (10.4 US oz)
	Standard	2 scribe mark (after market parts) 	0.42 kgf/mm (23.52 lbf/in) Standard 345 cm³ (11.7 US oz) Maximum 398 cm³ (13.5 US oz) Minimum 303 cm³ (10.2 US oz)
<b>FORK ('06):</b>	Heavy	1 scribe mark 	0.44 kgf/mm (24.64 lbf/in) Standard 401 cm³ (13.6 US oz) Maximum 348 cm³ (11.8 US oz) Minimum 306 cm³ (10.3 US oz)
	<b>TYPE</b>	<b>SPRING RATE</b>	<b>OIL CAPACITY</b>
	Light	3 scribe marks 	0.40 kgf/mm (22.40 lbf/in) Standard 345 cm³ (11.7 US oz) Maximum 404 cm³ (13.7 US oz) Minimum 308 cm³ (10.4 US oz)
<b>FORK (After '06):</b>	Standard	2 scribe mark (after market parts) 	0.42 kgf/mm (23.52 lbf/in) Standard 340 cm³ (11.5 US oz) Maximum 399 cm³ (13.5 US oz) Minimum 303 cm³ (10.2 US oz)
	Heavy	1 scribe mark 	0.44 kgf/mm (24.64 lbf/in) Standard 343 cm³ (11.6 US oz) Maximum 402 cm³ (13.6 US oz) Minimum 306 cm³ (10.3 US oz)
Spring	<b>TYPE</b>	<b>SPRING RATE</b>	<b>OIL CAPACITY</b>
	Light	3 scribe marks 	0.40 kgf/mm (22.40 lbf/in) Standard 353 cm³ (11.9 US oz) Maximum 404 cm³ (13.7 US oz) Minimum 308 cm³ (10.4 US oz)
	Standard	2 scribe mark (after market parts) 	0.42 kgf/mm (23.52 lbf/in) Standard 348 cm³ (11.8 US oz) Maximum 399 cm³ (13.5 US oz) Minimum 303 cm³ (10.2 US oz)
	Heavy	1 scribe mark 	0.44 kgf/mm (24.64 lbf/in) Standard 351 cm³ (11.9 US oz) Maximum 402 cm³ (13.6 US oz) Minimum 306 cm³ (10.3 US oz)

## GENERAL INFORMATION

ITEM	REMARKS	
<b>SHOCK ABSORBER:</b>		
Spring	<b>TYPE</b>	<b>SPRING RATE</b>
	Light	4.55 kgf/mm (254.8 lbf/in)
	Standard	4.80 kgf/mm (268.8 lbf/in)
	Heavy	5.00 kgf/mm (280.0 lbf/in) 5.20 kgf/mm (291.2 lbf/in)

The standard fork and shock springs mounted on the motorcycle when it leaves the factory are not marked. Before replacing the springs, be sure to mark them so they can be distinguished from other optional springs.

## EMISSION CONTROL SYSTEMS

'04 – '06:

The California Air Resources Board (CARB) require manufacturers to certify that their motorcycles comply with applicable exhaust emissions standards during their useful life, when operated and maintained according to the instructions provided, and that motorcycles built after January 1, 1983 comply with applicable noise emission standards for one year or 6,000 km (3,730 miles) after the time of sale to the ultimate purchaser, when operated and maintained according to the instructions provided. Compliance with the terms of the Distributor's Limited Warranty for Honda Motorcycle Emission Control Systems is necessary in order to keep the emissions system warranty in effect.

After '06:

The U.S. Environmental Protection Agency (EPA), and the California Air Resources Board (CARB) require that off-road motorcycle comply with applicable exhaust emissions standards during its useful life, when operated and maintained according to the instruction provided.

### SOURCE OF EMISSIONS

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

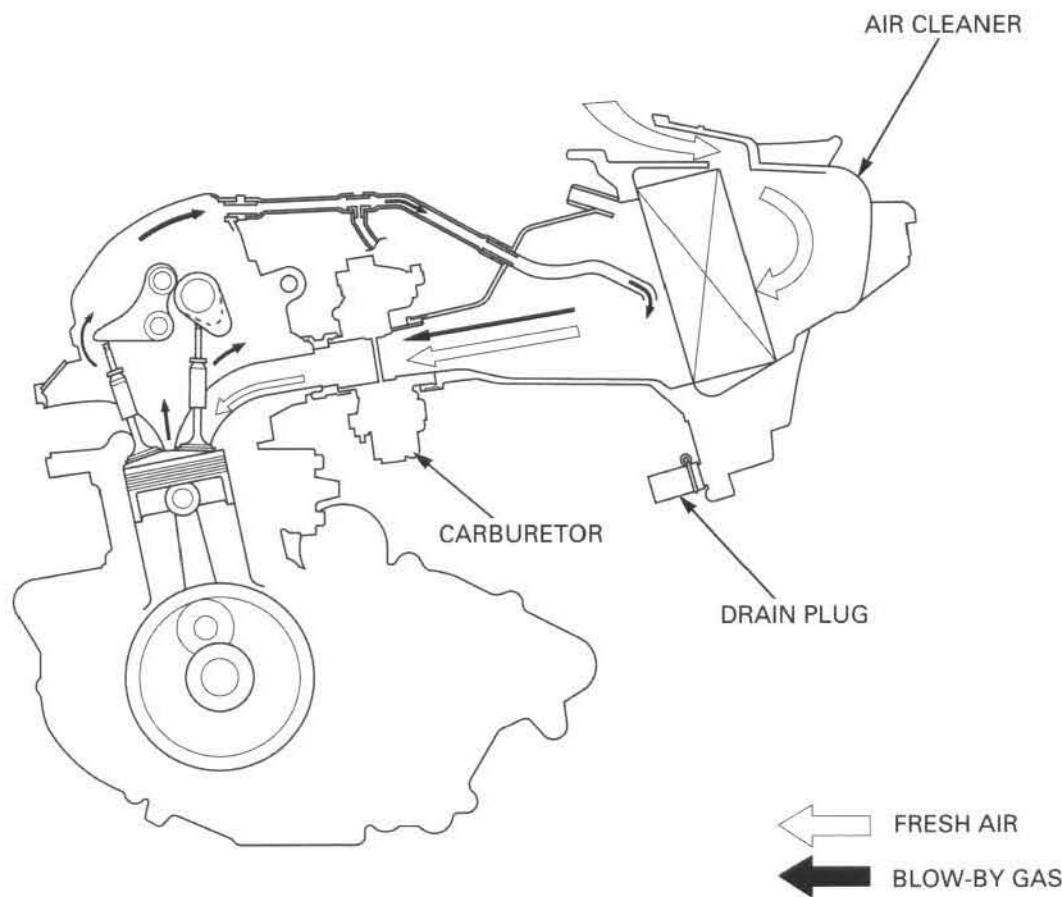
Honda Motor Co., Ltd. utilizes various systems to reduce carbon monoxide, oxides of nitrogen, and hydrocarbon.

### EXHAUST EMISSION CONTROL SYSTEM (After '06)

The exhaust emission control system includes a secondary air injection system and lean carburetor settings, no adjustments should be made except for high altitude setting and idle speed adjustment with the throttle stop screw. The exhaust emission control system is separate from the crankcase emission control system.

### CRANKCASE EMISSION CONTROL SYSTEM

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



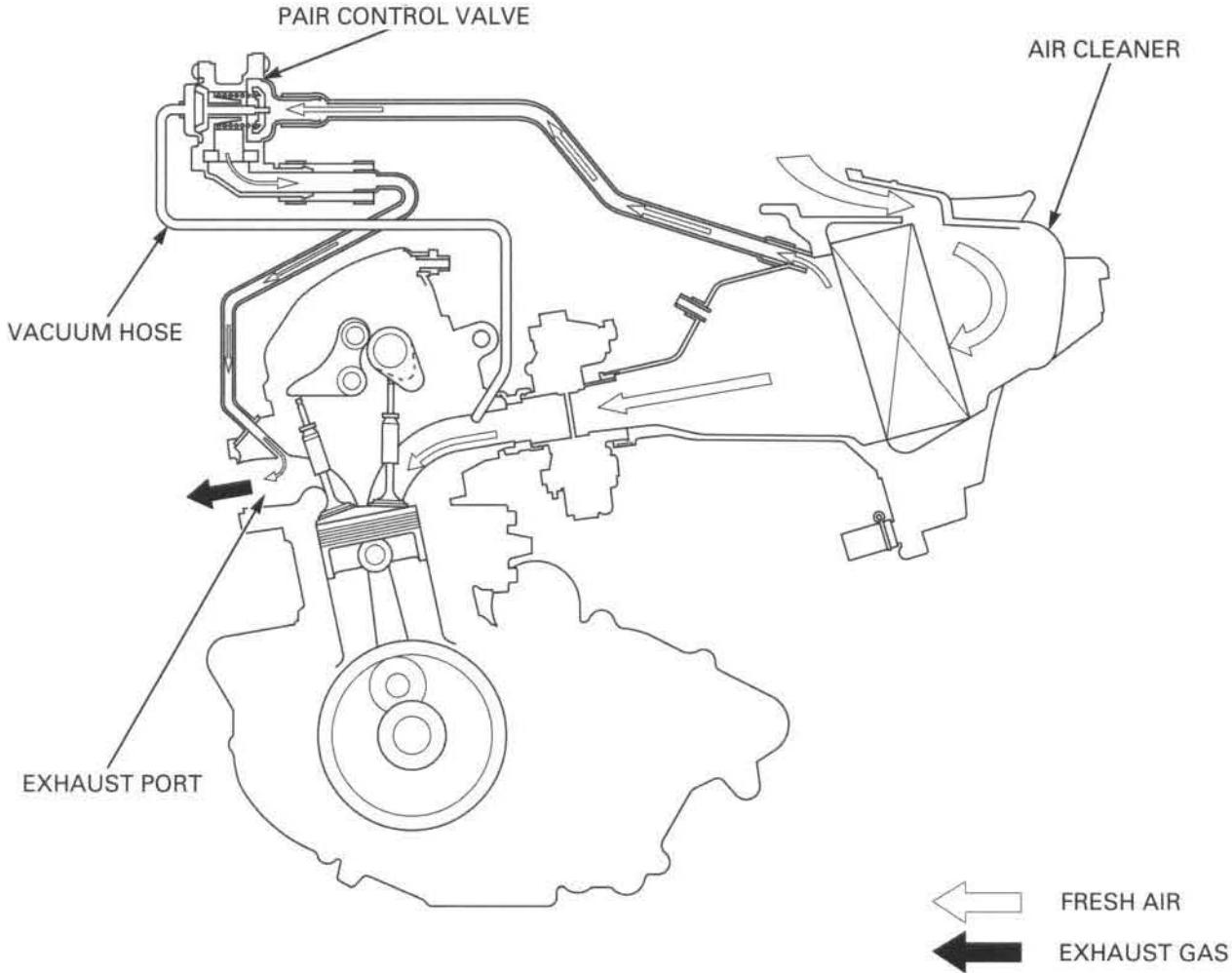
## GENERAL INFORMATION

### EXHAUST EMISSION CONTROL SYSTEM (PULSE SECONDARY AIR INJECTION SYSTEM): '04 – '06 California type, After '06

The exhaust emission control system includes of a secondary air supply system which introduces filtered air into the exhaust gases in the exhaust port. Fresh air is drawn into the exhaust port whenever there is a negative pressure pulse in the exhaust system. This charge of fresh air promotes burning of the unburned exhaust gases and changes a considerable amount of hydrocarbons and carbon monoxide into relatively harmless carbon dioxide and water vapor.

This model has a pulse secondary air injection (PAIR) control valve. A PAIR check 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 adjustment to the PAIR system should be made, although periodic inspection of the components is recommended.



**SERVICING THE HONDA (After '06)****U.S.A. Only**

Maintenance, replacement or repair of the emission control devices and systems may be performed by any motorcycle repair establishment or individual using parts that are "certified" to EPA standards.

**PROHIBITED ACTIONS (After '06)**

The following prohibitions apply to everyone with respect to the engines emission control system.

You may not remove or disable any device or element of design that may affect an engine's emission levels. This restriction applies before and after the engine is placed in service.

Vehicles that are used only for competition are exempt from this prohibition.

**NOISE EMISSION CONTROL SYSTEM**

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

AMONG THOSE ACTS PRESUMED TO CONSTITUTE TAMPERING ARE THE FOLLOWING ACTS:

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

**REBUILT ENGINE (After '06)**

When you rebuild your engine including a major overhaul in which you replace the engine's pistons or power assemblies or make other changes that significantly increase the service life of the engine, your Honda will continue to comply with all emissions regulations if you:

- Make sure you are technically qualified to rebuild the engine and have the proper tools
- Use only Genuine Honda parts or equivalents
- Make sure to maintain all specifications as described in this Service Manual

---

**MEMO**



---

## **2. FRAME/BODY PANELS/EXHAUST SYSTEM**

---

SERVICE INFORMATION .....	2-2	ENGINE GUARD .....	2-4
TROUBLESHOOTING .....	2-2	FRONT VISOR .....	2-5
SEAT .....	2-3	SUB-FRAME .....	2-5
SIDE COVER .....	2-3	FUEL TANK .....	2-7
RADIATOR SHROUD .....	2-4	EXHAUST SYSTEM .....	2-8

## SERVICE INFORMATION

### GENERAL

- 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 gaskets after removing the exhaust pipe from the engine.
- Always inspect the exhaust system for leaks after installation.

### TORQUE VALUES

Seat mounting bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)
Sub-frame mounting bolt (upper)	30 N·m (3.1 kgf·m, 22 lbf·ft)
(lower)	49 N·m (5.0 kgf·m, 36 lbf·ft)
Exhaust pipe joint nut	21 N·m (2.1 kgf·m, 15 lbf·ft)
Muffler joint band bolt	21 N·m (2.1 kgf·m, 15 lbf·ft)
Muffler mounting bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)
Heat shield bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Exhaust pipe protector bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Rear fender mounting bolt	13 N·m (1.3 kgf·m, 9 lbf·ft)
Diffuser mounting torx screw	11 N·m (1.1 kgf·m, 8 lbf·ft)
Radiator shroud upper mounting bolt	4.9 N·m (0.5 kgf·m, 3.6 lbf·ft)

### TROUBLESHOOTING

#### Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leak

#### Poor performance

- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

## SEAT

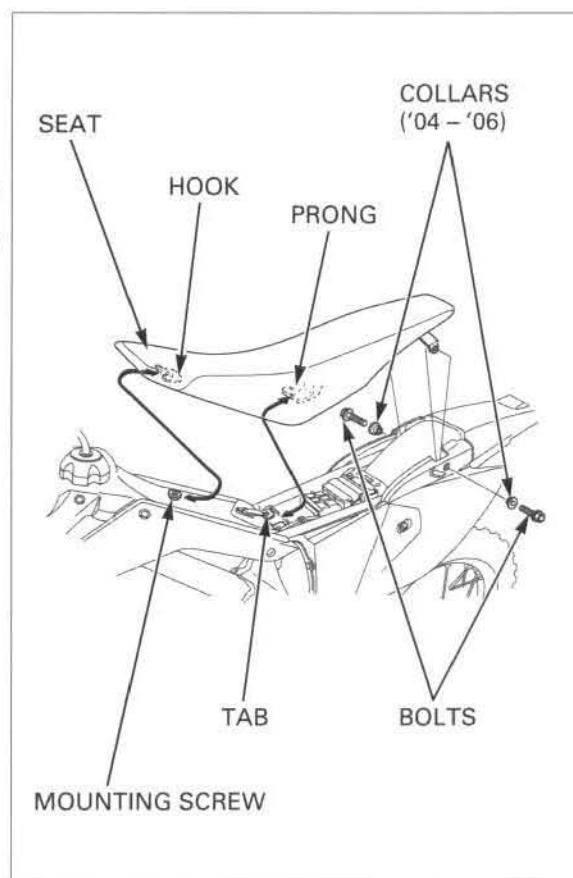
### REMOVAL

- '04 – '06: Remove the two bolts, collars and seat.  
After '06: Remove the two bolts and seat.

### INSTALLATION

Align the seat hook with the mounting screw on the fuel tank and the seat prong with the sub-frame tab. Install the seat mounting bolts with collars ('04 – '06 only) and tighten the bolts to the specified torque.

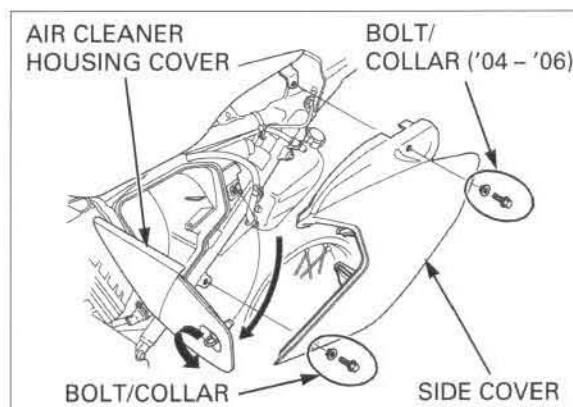
**TORQUE: 26 N·m (2.7 kgf·m, 20 lbf·ft)**



## SIDE COVER

### REMOVAL/INSTALLATION

- Left side only:* Open the air cleaner housing cover.  
'04 – '06: Remove the bolts, collars and side cover.  
After '06: Remove the seat mounting bolt, side cover bolt/collar and side cover.



## FRAME/BODY PANELS/EXHAUST SYSTEM

*Be careful not to damage the tab.*

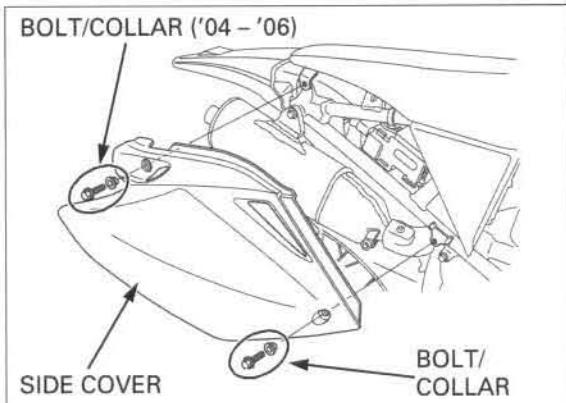
Install the side cover by inserting the side cover tab into the air cleaner housing.  
Install the collar, side cover bolt and tighten the bolt securely.

Install the collar ('04 – '06 only) and seat mounting bolt.

Tighten the bolt to the specified torque.

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

*Left side only:* Close the left air cleaner housing cover.



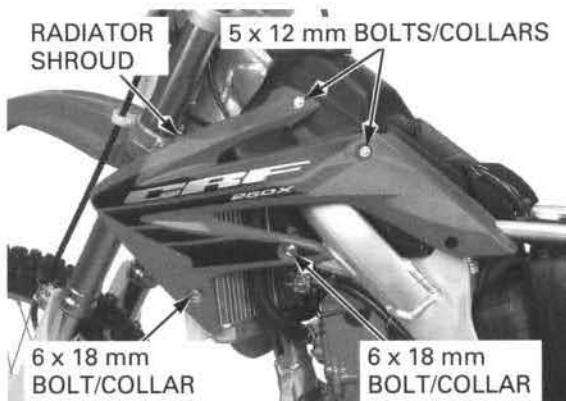
## RADIATOR SHROUD

### REMOVAL/INSTALLATION

Remove the seat (page 2-3).

*Note that the thinner collars are with the upper bolts.*

Remove the bolts, collars and radiator shroud.

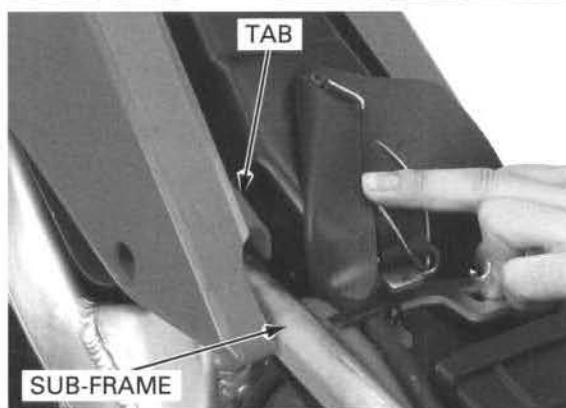


*Install the tab onto the sub-frame.*

Installation is in the reverse order of removal.

#### TORQUE:

Radiator shroud upper mounting bolt:  
4.9 N·m (0.5 kgf·m, 3.6 lbf·ft)

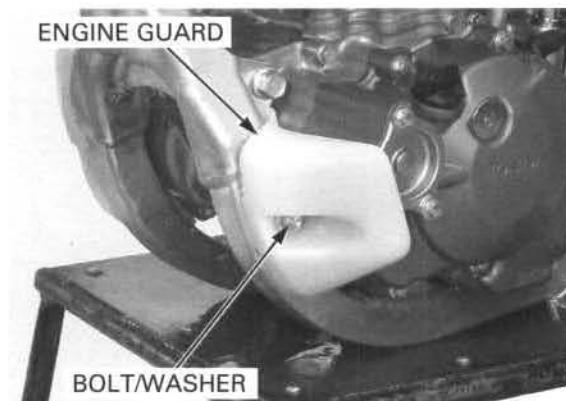


## ENGINE GUARD

### REMOVAL/INSTALLATION

Remove the bolts/washers and engine guards.

Install the engine guard and tighten the bolt securely.

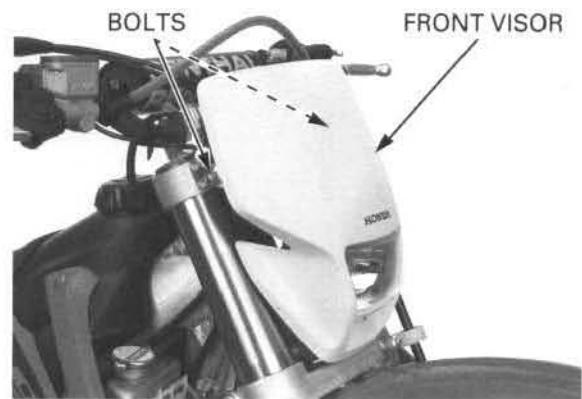


## FRONT VISOR

### REMOVAL/INSTALLATION

Remove the bolts and front visor.

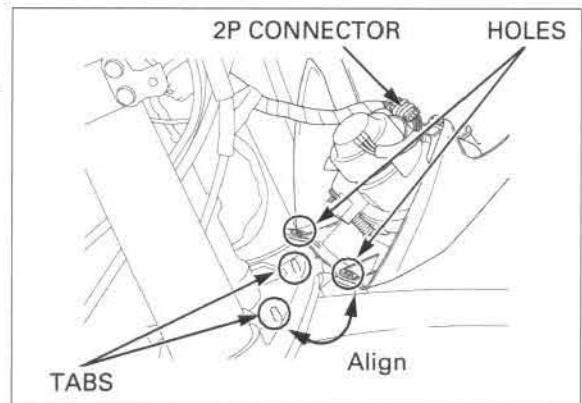
Remove the headlight 2P connector from clamp.  
Disconnect the headlight 2P connector.



Connect the headlight 2P connector.  
Clamp the headlight 2P connector securely.

Install the front visor by aligning its holes with the tabs on the steering stem.

Install and tighten the bolts securely.



## SUB-FRAME

### REMOVAL

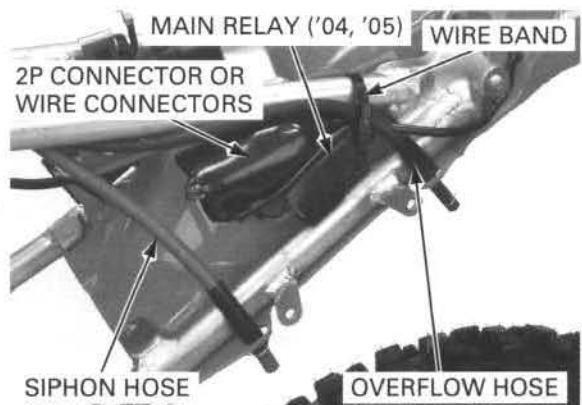
Remove the following:

- Radiator reserve tank (page 6-9)
- Battery (page 16-6)
- Air cleaner housing (page 5-7)

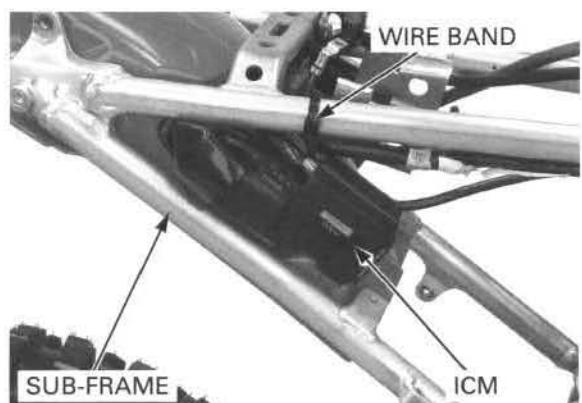
Remove the wire band and main relay ('04, '05 only) from sub-frame.

Remove the siphon and reserve tank overflow hoses from the rear fender.

Slide the rubber boot off, disconnect the tail light 2P connector ('04, '05) or wire connectors (after '05).

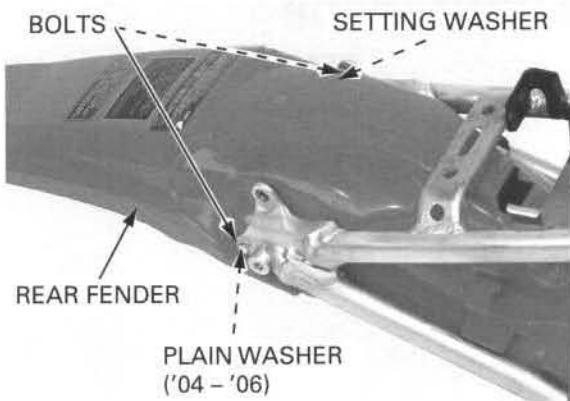


Remove the wire band and ICM from rear fender.

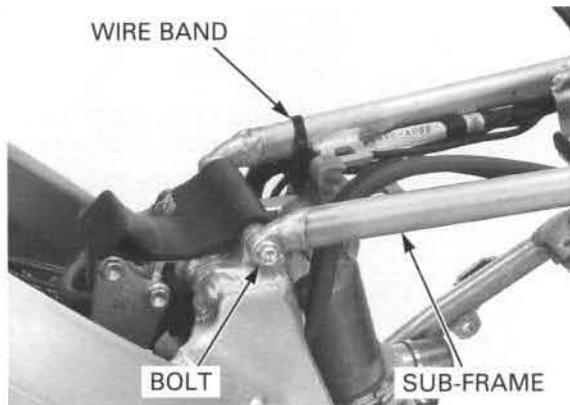


## FRAME/BODY PANELS/EXHAUST SYSTEM

Remove the bolts, setting washer, plain washer ('04 – '06 only) and rear fender.

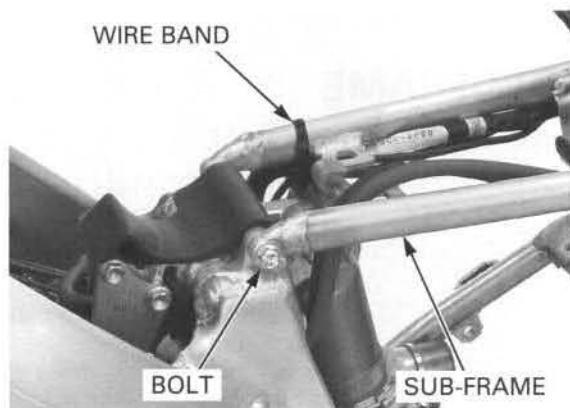


Remove the wire band, upper mounting bolt and sub-frame.



## INSTALLATION

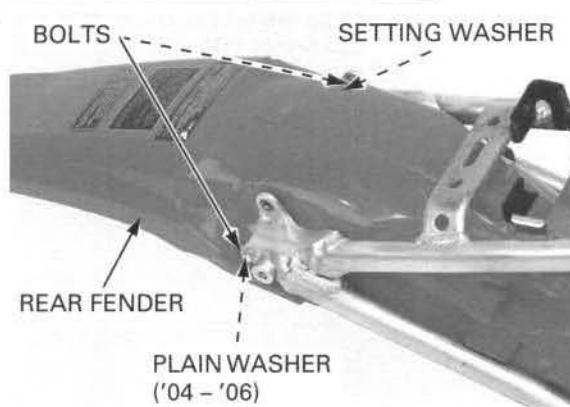
Install the sub-frame, upper mounting bolt and wire band.



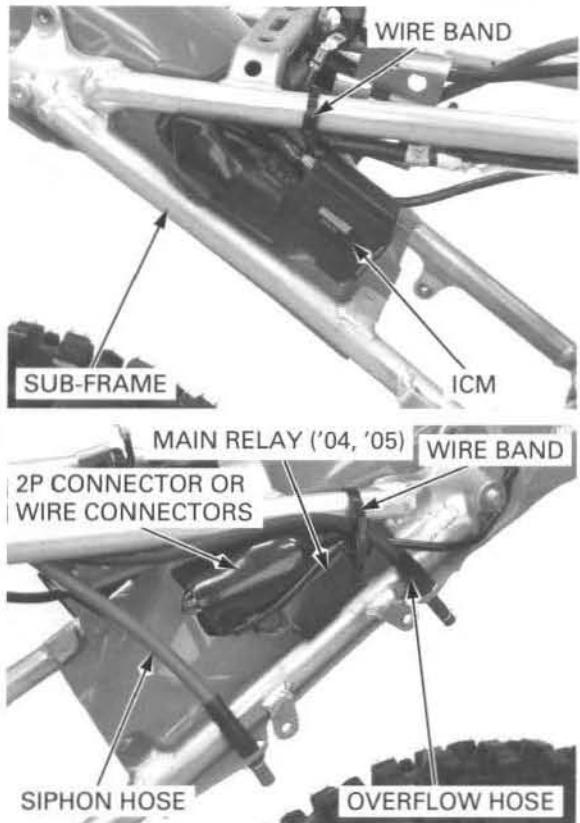
Install the rear fender, setting washer, plain washer ('04 – '06 only) and bolts.

Tighten the bolts to the specified torque.

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



- Do not tighten the sub-frame upper mounting bolt.*
- Install the sub-frame and upper mounting bolt.
  - Install the ICM and wire band securely.



- Connect the tail light 2P connector ('04, '05) or wire connectors (after '05) and install the rubber boot.

Install the siphon and reserve tank overflow hoses to the rear fender.

*Be careful not to damage the mud guard, hoses and cables.*

Install the main relay ('04, '05 only) and wire band for sub-frame.

Install the following:

- Radiator reserve tank (page 6-9)
- Battery (page 16-6)
- Air cleaner housing (page 5-7)

## FUEL TANK

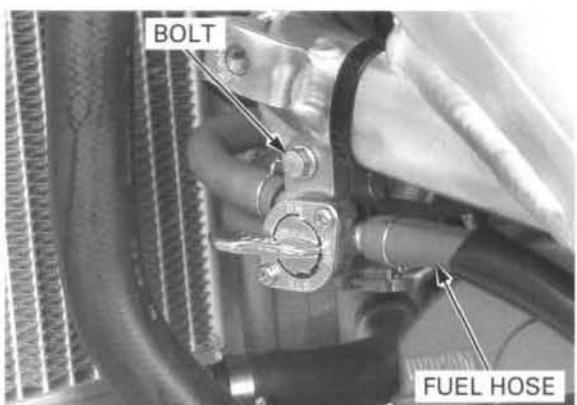
### REMOVAL/INSTALLATION

Remove the seat (page 2-3).

Remove the radiator shrouds (page 2-4).

Turn the fuel valve to "OFF" and disconnect the fuel hose.

Remove the fuel valve mounting bolt and fuel valve.



Remove the breather hose from the stem nut.

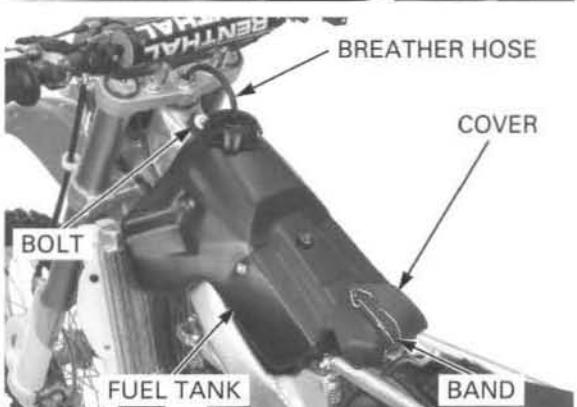
Unhook the band and air cleaner housing cover from the fuel tank.

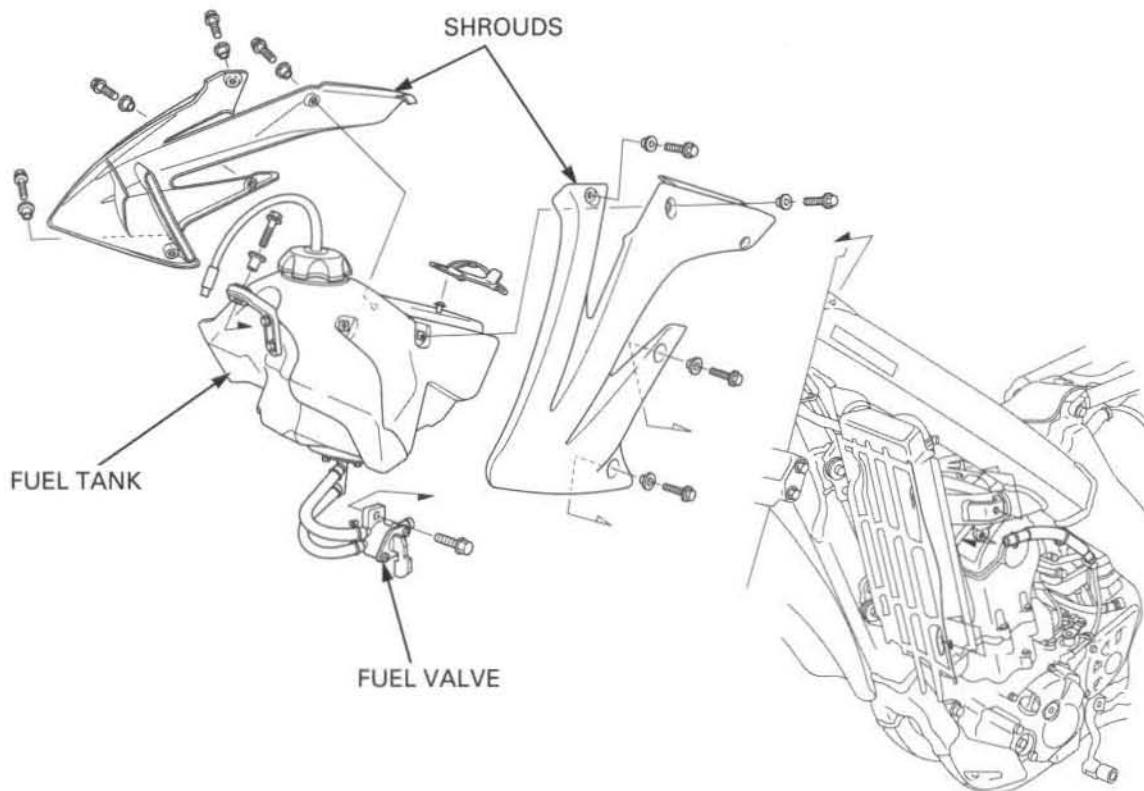
Remove the fuel tank mounting bolt and fuel tank.

Installation is in the reverse order of removal.

#### NOTE:

- Install the breather hose into the stem nut as shown.
- After installation, make sure there are no fuel leaks.





## EXHAUST SYSTEM

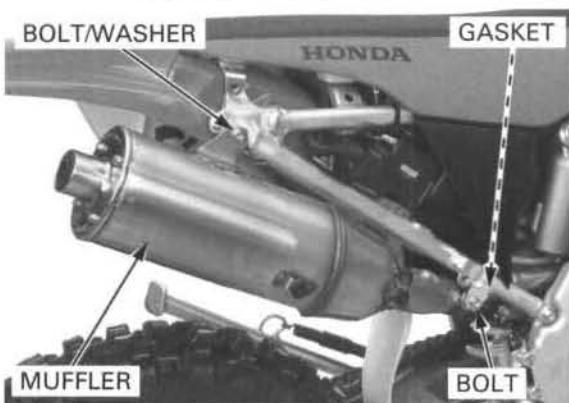
### MUFFLER REMOVAL/INSTALLATION

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

Loosen the muffler joint band bolt.



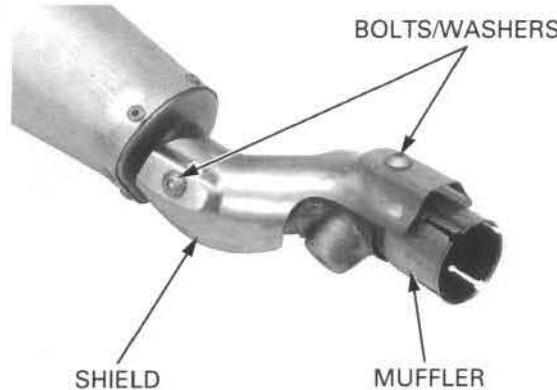
Remove the muffler mounting bolts, washer, muffler, band and gasket.



Remove the bolts, washers and heat shield from muffler.

Install the heat shield, washers and bolts.  
Tighten the mounting bolts to the specified torque.

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



Install a new gasket onto the exhaust pipe.

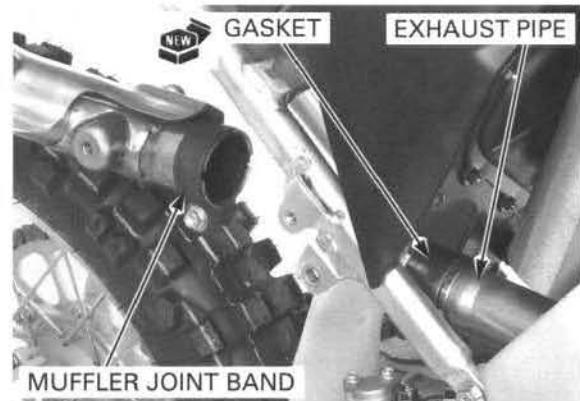
Install the muffler to the exhaust pipe.  
Install and tighten the muffler mounting bolts to the specified torque.

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

Tighten the muffler joint band bolt to the specified torque.

**TORQUE: 21 N·m (2.1 kgf·m, 15 lbf·ft)**

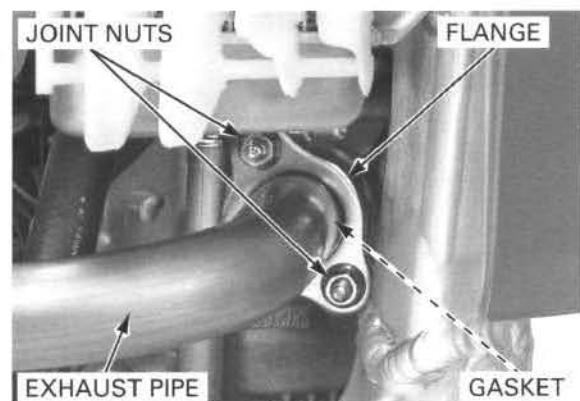
Install the right side cover (page 2-3).



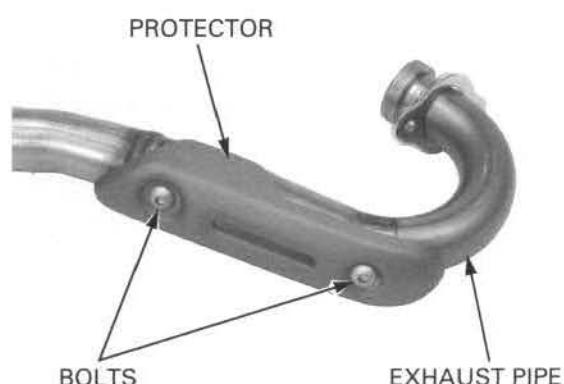
### EXHAUST PIPE REMOVAL

Remove the muffler (page 2-8).

Remove the exhaust pipe joint nuts, flange, exhaust pipe and gasket.

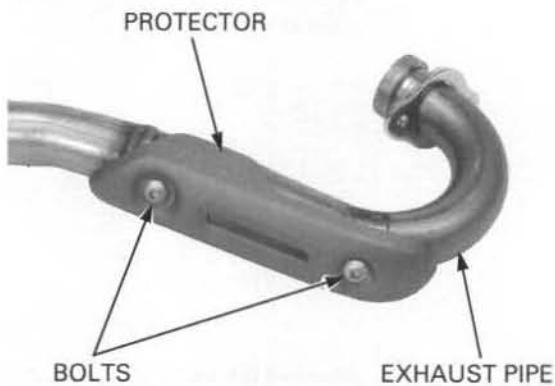
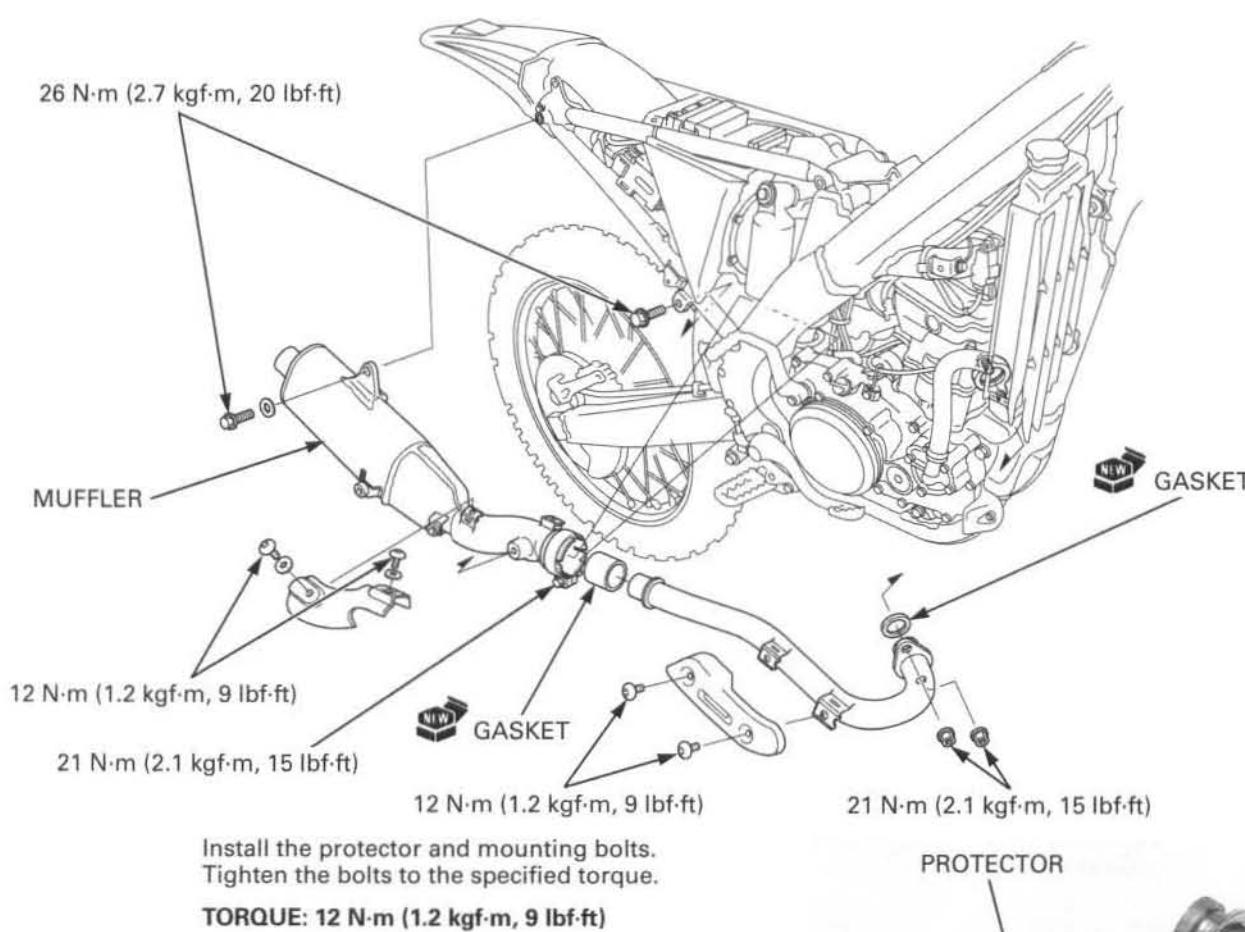


Remove the bolts and protector from exhaust pipe.



## FRAME/BODY PANELS/EXHAUST SYSTEM

### INSTALLATION



Install a new gasket to the cylinder head.

- Always replace the exhaust pipe gasket with a new one.

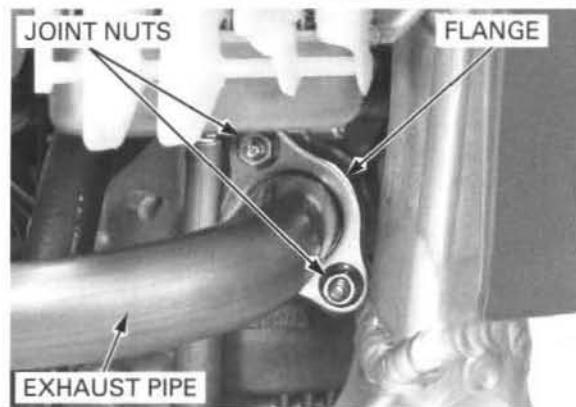


Install the exhaust pipe, flange and joint nuts.

Tighten the exhaust pipe joint nuts to the specified torque.

**TORQUE: 21 N·m (2.1 kgf·m, 15 lbf·ft)**

Install the muffler (page 2-8).



---

**MEMO**



SERVICE INFORMATION .....	3-2
MAINTENANCE SCHEDULE ('04 – '06) .....	3-4
MAINTENANCE SCHEDULE (After '06) .....	3-5
COMPETITION MAINTENANCE SCHEDULE .....	3-6
ADDITIONAL ITEMS REQUIRING FREQUENT REPLACEMENT .....	3-7
FUEL LINE .....	3-8
FUEL STRAINER SCREEN .....	3-8
THROTTLE OPERATION .....	3-8
HOT START .....	3-9
AIR CLEANER .....	3-10
CRANKCASE BREather .....	3-11
SPARK PLUG .....	3-11
RADIATOR COOLANT .....	3-13
COOLING SYSTEM .....	3-13
SECONDARY AIR SUPPLY SYSTEM ('04 – '06 California type, After '06) .....	3-14
VALVE CLEARANCE/DECOMPRESSOR SYSTEM .....	3-14
ENGINE OIL/OIL FILTER .....	3-17
ENGINE IDLE SPEED .....	3-19
TRANSMISSION OIL .....	3-20
DRIVE CHAIN .....	3-21
DRIVE CHAIN SLIDER .....	3-24
DRIVE CHAIN ROLLER .....	3-25
DRIVE/DRIVEN SPROCKET .....	3-25
BRAKE FLUID .....	3-26
BRAKE PAD WEAR .....	3-27
BRAKE SYSTEM .....	3-27
HEADLIGHT AIM .....	3-28
CLUTCH SYSTEM .....	3-28
CONTROL CABLES .....	3-29
EXHAUST PIPE/MUFFLER .....	3-29
SPARK ARRESTER .....	3-30
SIDE STAND .....	3-31
SUSPENSION .....	3-31
SWINGARM/SHOCK LINKAGE .....	3-32
NUTS, BOLTS, FASTENERS .....	3-33
WHEELS/TIRES .....	3-33
STEERING HEAD BEARINGS .....	3-34

## MAINTENANCE

# SERVICE INFORMATION

### GENERAL

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

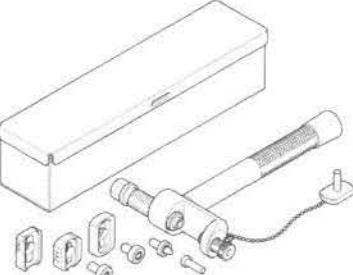
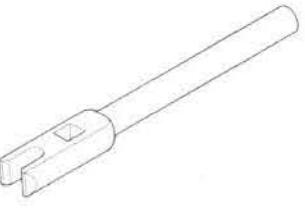
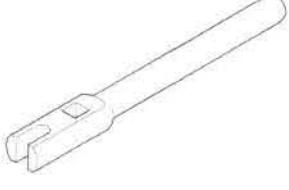
### SPECIFICATIONS

ITEM		SPECIFICATIONS	
Throttle grip free play		3 – 5 mm (1/8 – 3/16 in)	
Hot start lever free play		2 – 3 mm (1/16 – 1/8 in)	
Spark plug	Standard	NGK	DENSO
	Option	IMR8C9H	VUH24D
Spark plug gap		0.8 – 0.9 mm (0.03 – 0.04 in)	
Valve clearance	IN	0.12 ± 0.03 mm (0.005 ± 0.001 in)	
	EX	0.28 ± 0.03 mm (0.011 ± 0.001 in)	
Engine oil capacity	At draining	0.66 liter (0.70 US qt, 0.58 Imp qt)	
	At filter change	0.69 liter (0.73 US qt, 0.61 Imp qt)	
	At disassembly	0.85 liter (0.90 US qt, 0.75 Imp qt)	
Transmission oil capacity	At draining	0.67 liter (0.71 US qt, 0.59 Imp qt)	
	At disassembly	0.75 liter (0.79 US qt, 0.66 Imp qt)	
Recommended engine oil		Pro Honda GN4 4-stroke oil (U.S.A. and Canada) or equivalent motor oil API service classification: SG or Higher JASO T 903 standard: MA Viscosity: SAE 10W-30	
Recommended transmission oil		Pro Honda HP Trans Oil, Pro Honda GN4 4-stroke oil (U.S.A. and Canada) or equivalent motor oil API service classification: SG or Higher JASO T 903 standard: MA Viscosity: SAE 10W-30	
Engine idle speed		1,700 ± 100 rpm	
Drive chain slack		25 – 35 mm (1.0 – 1.4 in)	
Drive chain width		13.4 mm (0.53 in)	
Drive chain slider thickness		5.0 mm (0.2 in)	
Drive chain roller O.D.	'04, '05	Upper	29 mm (1.1 in)
		Lower	39 mm (1.5 in)
	After '05	Upper	29 mm (1.1 in)
		Lower	31 mm (1.2 in)
Clutch lever free play		10 – 20 mm (3/8 – 13/16 in)	
Tire size	Front	80/100-21 51M, 80/100-21 M/C 51M	
	Rear	100/100-18 59M, 100/100-18 M/C 59M	
Cold tire pressure	Front	98 kPa (1.0 kgf/cm <sup>2</sup> , 14 psi)	
	Rear	98 kPa (1.0 kgf/cm <sup>2</sup> , 14 psi)	

## TORQUE VALUES

Engine oil drain bolt ('04 – '06)	22 N·m (2.2 kgf·m, 16 lbf·ft)	Apply oil to the threads and seating surface
Engine oil drain bolt (After '06)	16 N·m (1.6 kgf·m, 12 lbf·ft)	Apply oil to the threads and seating surface
Transmission oil drain bolt ('04 – '06)	22 N·m (2.2 kgf·m, 16 lbf·ft)	Apply transmission oil to the threads and seating surface
Transmission oil drain bolt (After '06)	16 N·m (1.6 kgf·m, 12 lbf·ft)	Apply transmission 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
Spark plug	16 N·m (1.6 kgf·m, 12 lbf·ft)	
Brake lever adjuster lock nut	5.9 N·m (0.6 kgf·m, 4.3 lbf·ft)	
Rear axle nut	127 N·m (13.0 kgf·m, 94 lbf·ft)	U-nut
Drive chain roller bolt/nut	12 N·m (1.2 kgf·m, 9 lbf·ft)	U-nut
Drive sprocket bolt	31 N·m (3.2 kgf·m, 23 lbf·ft)	
Driven sprocket nut	32 N·m (3.3 kgf·m, 24 lbf·ft)	U-nut
Front master cylinder reservoir cover screw	1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)	
Rear master cylinder reservoir cover bolt	1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)	
Exhaust pipe joint nut	21 N·m (2.1 kgf·m, 15 lbf·ft)	
Muffler joint band bolt	21 N·m (2.1 kgf·m, 15 lbf·ft)	
Spark arrester mounting bolt ('04 – '06)	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Spark arrester mounting bolt (After '06)	6.9 N·m (0.7 kgf·m, 5.1 lbf·ft)	See page 3-30
Difuser mounting torx screw	11 N·m (1.1 kgf·m, 8 lbf·ft)	
Spoke	3.7 N·m (0.38 kgf·m, 2.7 lbf·ft)	
Rim lock	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Plug bolt	1.3 N·m (0.13 kgf·m, 0.9 lbf·ft)	
Side stand mounting bolt (upper)	54 N·m (5.5 kgf·m, 40 lbf·ft)	
(lower)	39 N·m (4.0 kgf·m, 29 lbf·ft)	
Side stand pivot bolt	See page 3-31	
Side stand pivot nut	39 N·m (4.0 kgf·m, 29 lbf·ft)	U-nut
Rear master cylinder push rod lock nut	5.9 N·m (0.6 kgf·m, 4.3 lbf·ft)	
Drive chain adjusting bolt lock nut	27 N·m (2.8 kgf·m, 20 lbf·ft)	
Throttle cable upper adjuster lock nut (After '06)	3.9 N·m (0.4 kgf·m, 2.9 lbf·ft)	
Throttle cable lower adjuster lock nut (After '06)	3.9 N·m (0.4 kgf·m, 2.9 lbf·ft)	

## TOOLS

Drive chain tool set 07HMH-MR10103 or   07HMH-MR1010C (U.S.A. only)	Spoke wrench, 6.1 mm 07JMA-MR60100 or   07701-0020300 or equivalent commercially available in U.S.A.	Spoke wrench, 6.6 mm 070MA-KZ30100 or   equivalent commercially available in U.S.A.
--	--	---

## MAINTENANCE

### MAINTENANCE SCHEDULE ('04 – '06)

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.

ITEMS	FREQUENCY	WHICHEVER COMES FIRST	INITIAL MAINTENANCE	REGULAR MAINTENANCE INTERVAL					REFER TO PAGE	
				mi	100	600	1,200	1,800	2,400	
				km	150	1,000	2,000	3,000	4,000	
NOTE	MONTH		1		6	12	18	24		
EMISSION RELATED ITEMS	* FUEL LINE					I		I	3-8	
	** FUEL STRAINER SCREEN					C		C	3-8	
	* THROTTLE OPERATION					I		I	3-8	
	AIR CLEANER	NOTE 1			C	C	C	C	3-10	
	CRANKCASE BREATHER	NOTE 2			I	I	I	I	3-11	
	SPARK PLUG				I	I	I	I	3-11	
	* VALVE CLEARANCE			I	I	I	I	I	3-14	
	ENGINE OIL			R	R	R	R	R	3-17	
	ENGINE OIL FILTER			R	R	R	R	R	3-17	
	* DECOMPRESSOR SYSTEM			I	I	I	I	I	3-17	
	** ENGINE IDLE SPEED			I	I	I	I	I	3-19	
	RADIATOR COOLANT	NOTE 3				I		R	3-13	
	* COOLING SYSTEM			I	I	I	I	I	3-13	
	* SECONDARY AIR SUPPLY SYSTEM	NOTE 2				I		I	3-14	
NON-EMISSION RELATED ITEMS	TRANSMISSION OIL			R	R	R	R	R	3-20	
	DRIVE CHAIN	NOTE 1		I, L	I, L: Every 300 mi (500 km) or 3 month					3-21
	DRIVE CHAIN SLIDER	NOTE 1			I, L: Every 300 mi (500 km) or 3 month					3-24
	BRAKE FLUID	NOTE 3			I	I	I	I	I	3-26
	BRAKE PAD WEAR				I	I	I	I	I	3-27
	BRAKE SYSTEM			I	I	I	I	I	I	3-27
	* HEADLIGHT AIM					I		I	3-28	
	CLUTCH SYSTEM			I	I	I	I	I	I	3-28
	SIDE STAND					I		I	3-31	
	* SUSPENSION					I		I	3-31	
	* SPARK ARRESTER				C: Every 1,000 mi (1,600 km) or every 100 operating hours					3-30
	* NUTS, BOLTS, FASTENERS			I		I		I	I	3-33
	** WHEELS/TIRES			I	I	I	I	I	I	3-33
	** STEERING HEAD BEARINGS			I		I		I	I	3-34

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

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

#### NOTES:

1. Service more frequently when ridden in wet or dusty conditions.
2. California type only.
3. Replace every 2 years. Replacement requires mechanical skill.

## MAINTENANCE SCHEDULE (After '06)

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.

ITEMS	FREQUENCY WHICHEVER COMES FIRST	NOTE	MONTH	REGULAR MAINTENANCE INTERVAL				REFER TO PAGE		
				mi	100	600	1,200	1,800	2,400	
				km	150	1,000	2,000	3,000	4,000	
					1	6	12	18	24	
* FUEL LINE						I		I		3-8
** FUEL STRAINER SCREEN						C		C		3-8
* THROTTLE OPERATION						I		I		3-8
AIR CLEANER	NOTE 1				C	C	C	C		3-10
CRANKCASE BREATHER					I	I	I	I		3-11
SPARK PLUG					I	I	I	I		3-11
* VALVE CLEARANCE				I	I	I	I	I		3-14
ENGINE OIL				R	R	R	R	R		3-17
ENGINE OIL FILTER				R	R	R	R	R		3-17
* DECOMPRESSOR SYSTEM				I	I	I	I	I		3-17
** ENGINE IDLE SPEED				I	I	I	I	I		3-19
RADIATOR COOLANT	NOTE 3					I		R		3-13
* COOLING SYSTEM				I	I	I	I	I		3-13
* SECONDARY AIR SUPPLY SYSTEM	NOTE 2					I		I		3-14
TRANSMISSION OIL				R	R	R	R	R		3-20
DRIVE CHAIN	NOTE 1			I, L	I, L: Every 300 mi (500 km) or 3 month					3-21
DRIVE CHAIN SLIDER					I	I	I	I		3-24
BRAKE FLUID	NOTE 3				I	I	I	I		3-26
BRAKE PADS WEAR					I	I	I	I		3-27
BRAKE SYSTEM				I	I	I	I	I		3-27
* HEADLIGHT AIM						I		I		3-28
CLUTCH SYSTEM				I	I	I	I	I		3-28
SIDE STAND						I		I		3-31
* SUSPENSION						I		I		3-31
* SPARK ARRESTER					C: Every 1,000 mi (1,600 km) or every 100 operating hours					3-30
* NUTS, BOLTS, FASTENERS				I		I		I		3-33
** WHEELS/TIRES				I	I	I	I	I		3-33
** STEERING HEAD BEARINGS				I		I		I		3-34

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

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

### NOTES:

1. Service more frequently when ridden in wet or dusty conditions.
2. U.S.A. and Canada type only.
3. Replace every 2 years. Replacement requires mechanical skill.

## MAINTENANCE

### COMPETITION MAINTENANCE SCHEDULE

Check all items before each race.

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.

ITEMS	FREQUENCY	NOTE	Each race or about 2.5 hours	Every 3 races or about 7.5 hours	Every 6 races or about 15.0 hours	Every 9 races or about 22.5 hours	Every 12 races or about 30.0 hours	Refer to page
THROTTLE OPERATION			I					3-8
HOT START			I					3-9
AIR CLEANER	(NOTE 1)	C						3-10
CRANKCASE BREATHER			I					3-11
SPARK PLUG			I					3-11
RADIATOR COOLANT	(NOTE 2)	I						3-13
VALVE CLEARANCE/ DECOMPRESSOR SYSTEM	(NOTE 4)				I			3-14
ENGINE OIL	(NOTE 3)	I			R			3-17
ENGINE OIL FILTER	(NOTE 3)				R			3-17
ENGINE IDLE SPEED			I					3-19
PISTON AND PISTON RINGS					R			9-5
PISTON PIN					R			9-5
TRANSMISSION OIL	(NOTE 5)	I			R			3-20
COOLING SYSTEM			I					3-13
DRIVE CHAIN			I, L	R				3-21
DRIVE CHAIN SLIDER			I					3-24
DRIVE CHAIN ROLLER			I					3-25
DRIVE/DRIVEN SPROCKET			I					3-25
BRAKE FLUID	(NOTE 2)	I						3-26
BRAKE PAD WEAR			I					3-27
BRAKE SYSTEM			I					3-27
CLUTCH SYSTEM	(NOTE 5)	I						3-28
CONTROL CABLES			I, L					3-29
EXHAUST PIPE/MUFFLER			I					3-29
SUSPENSION			I					3-31
SWINGARM/SHOCK LINKAGE				L				3-32
FORK OIL EXCEPT DAMPER	(NOTE 3)			R				13-28
FORK OIL DAMPER						R		13-21
NUTS, BOLTS, FASTENERS			I					3-33
WHEELS/TIRES			I					3-33
STEERING HEAD BEARINGS						I		3-34

This maintenance schedule is based upon average riding conditions. Machines subjected to severe use require more frequent servicing.

#### NOTES:

1. Clean after every heat for dusty riding conditions.
2. Replace every 2 years. Replacement requires mechanical skill.
3. Replace after the first break-in ride.
4. Inspect after the first break-in ride.
5. Replace the transmission oil, if the clutch discs and plates are replaced.

## ADDITIONAL ITEMS REQUIRING FREQUENT REPLACEMENT

### ENGINE

Item	Cause	Remark
Cylinder head gasket	Compression leak	Replace whenever disassembled
Clutch disc	Wear or discoloration	
Cylinder base gasket	Leakage	Replace whenever disassembled
Right crankcase cover gasket	Damage	Replace whenever disassembled

### FRAME

Item	Cause	Remark
Front/rear brake pad	Wear	Minimum thickness: 1.0 mm (0.04in)
Sub-frame mounting bolts	Fatigue or damage	
Chain guide plate	Wear or damage	
Side cover	Damage	
Front visor	Damage	
Front/rear fender	Damage	
Clutch lever/holder	Free play or damage	
Brake lever	Free play or damage	
Hot start lever	Free play or damage	
Handlebar	Bends or cracks	
Throttle housing	Damage	
Grip rubber	Damage	
Gearshift pedal	Damage	
Brake pedal	Damage	
Chain adjuster/bolt	Damage	
Air cleaner	Damage	

Note:

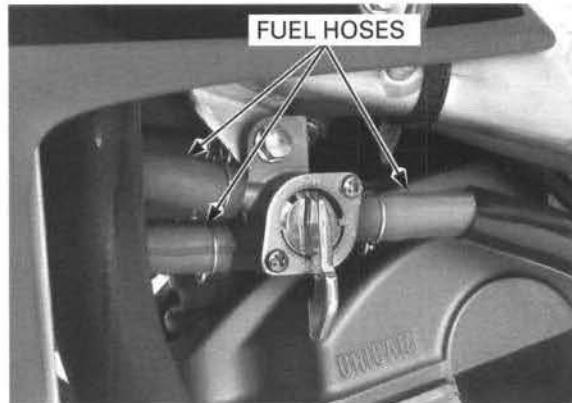
- These parts and their possible replacement schedule are based upon average riding conditions.
- Machines subjected to severe use require more frequent servicing.

## MAINTENANCE

### FUEL LINE

Check the fuel hoses for deterioration, damage or leakage.

Replace the fuel hose if necessary.



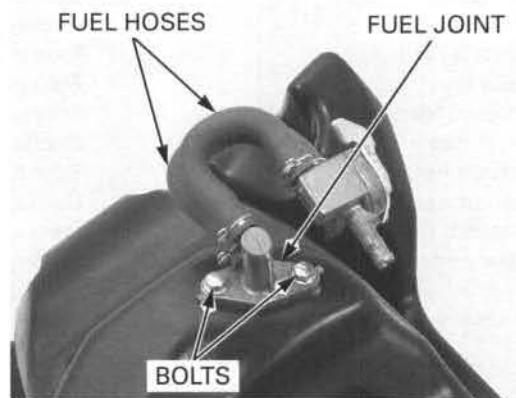
### FUEL STRAINER SCREEN

Remove the fuel tank (page 2-7).

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

Disconnect the fuel hoses from the fuel joint.

Remove the bolts and fuel joint.



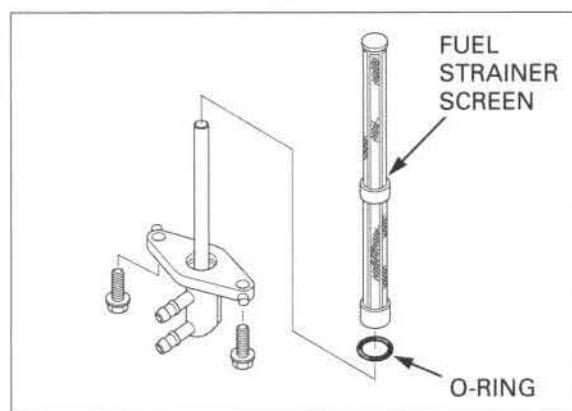
Wash the fuel strainer screen in high flash-point cleaning solvent.

Check that the O-ring is in good condition and install it onto the fuel valve.

*After installation,  
make sure there are  
no fuel leaks.*

Install the fuel joint in the reverse order of removal.

Install the fuel tank (page 2-7).



### THROTTLE OPERATION

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

Check the throttle cables and replace them if they are deteriorated, kinked or damaged.

Lubricate the throttle cables if throttle operation is not smooth.

Measure the free play at the throttle grip flange.

**FREE PLAY: 3 – 5 mm (1/8 – 3/16 in)**



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

Minor adjustments are made with the upper adjuster.

Remove the dust cover from the adjuster.

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

Tighten the lock nut after making the adjustment.

**TORQUE:**

After '06: 3.9 N·m (0.4 kgf·m, 2.9 lbf·ft)

Reinstall the dust cover.

Recheck the throttle operation.

Major adjustments are made with the carburetor end of the cable.

Remove the fuel tank (page 2-7).

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

After adjustment, tighten the lock nut securely.

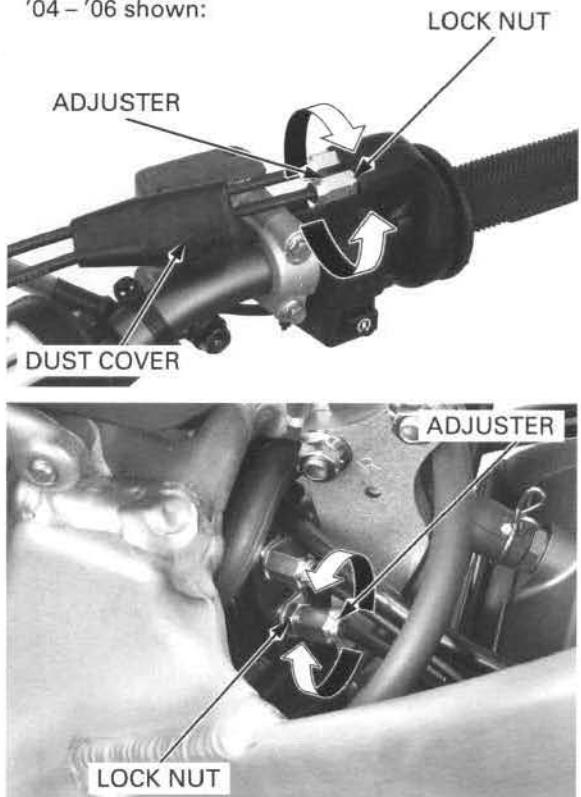
**TORQUE:**

After '06: 3.9 N·m (0.4 kgf·m, 2.9 lbf·ft)

Recheck the throttle operation.

Install the fuel tank (page 2-7).

'04 – '06 shown:



## HOT START

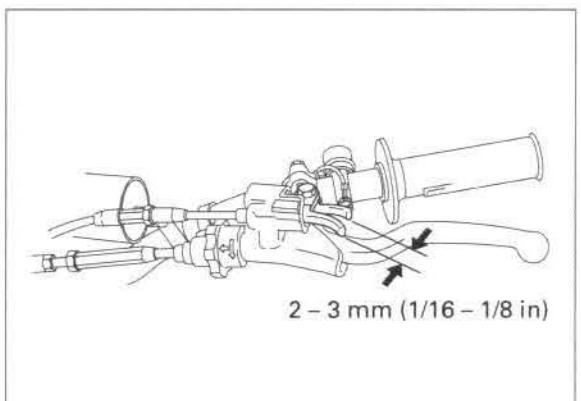
Check for smooth hot start lever operation and lubricate the cable if required.

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

Replace the cable if necessary.

Measure the hot start lever free play at the lever end.

**FREE PLAY: 2 – 3 mm (1/16 – 1/8 in)**



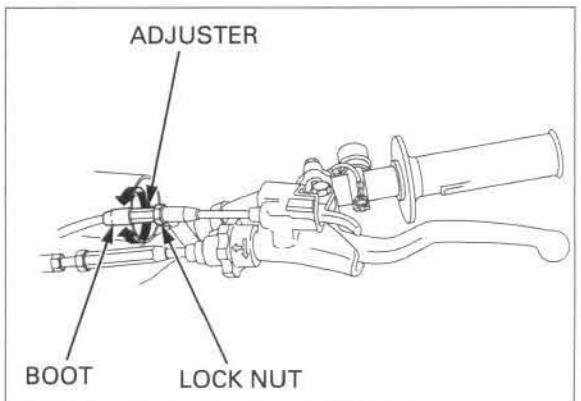
Hot start lever free play can be adjusted at the hot start cable.

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

Tighten the lock nut.

Reinstall the dust cover.

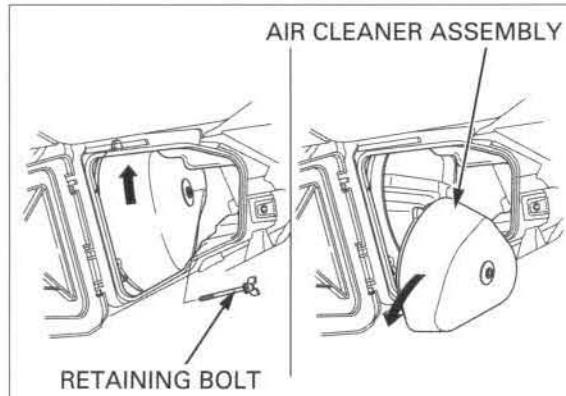
Recheck the free play at the lever.



## MAINTENANCE

### AIR CLEANER

Open the air cleaner housing cover.  
Remove the air cleaner retaining bolt.  
Remove the air cleaner assembly while turning it as shown.



Remove the air cleaner element from the element holder.

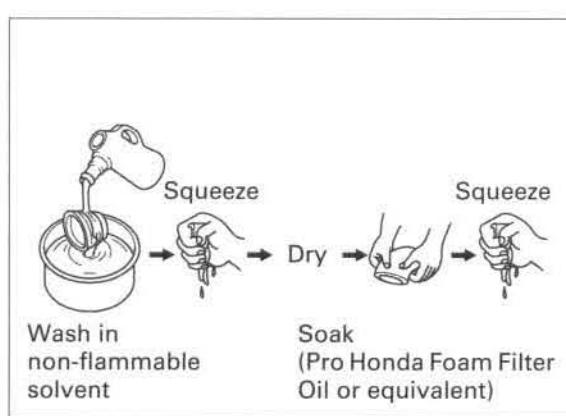
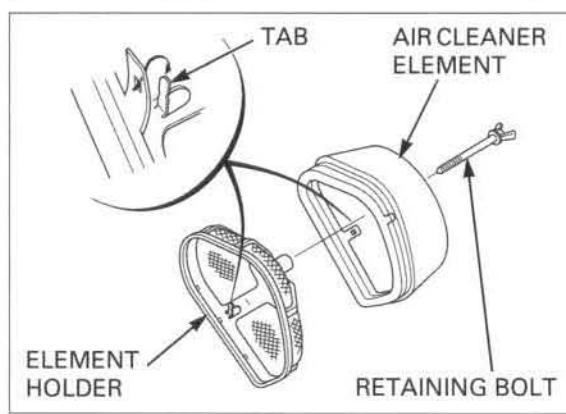
Thoroughly wash the air cleaner in clean nonflammable or high flash-point cleaning solvent.  
Then wash the element again in a solution of hot water and dishwashing liquid soap.  
Clean the inside of the air cleaner housing.

After cleaning, be sure there is no dirt or sand trapped between the inner and outer layer of the cleaner.  
Wash again if necessary.

Allow the air cleaner to dry thoroughly.  
After drying, soak the air cleaner in clean Pro Honda Foam Filter Oil or an equivalent.

Apply air filter oil to the entire surface of the air cleaner and rub it with both hands to saturate the element with oil.

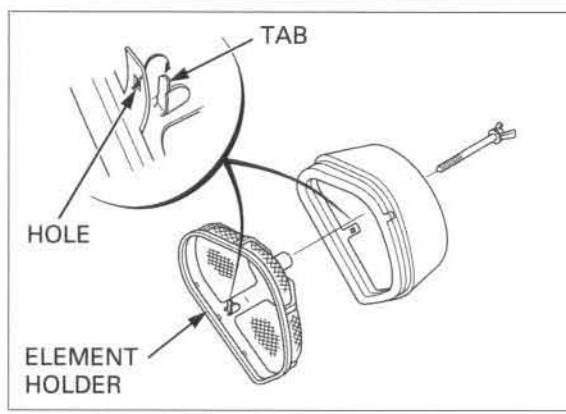
Gently squeeze out excess oil. It is important not to over-oil, or under-oil the element.



Apply a thin coat of Pro Honda Filter Grease or an equivalent to the sealing surface.

Assemble the air cleaner element and element holder.

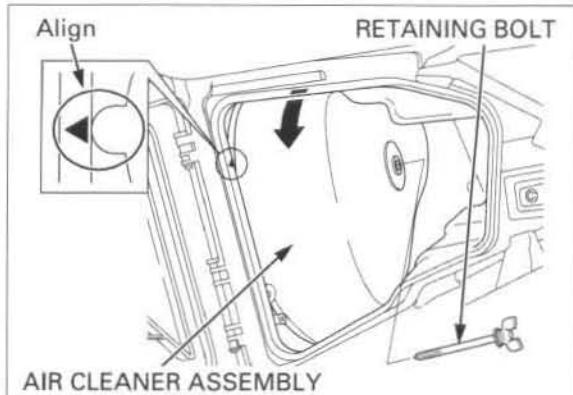
Hook the element hole onto the holder tab.



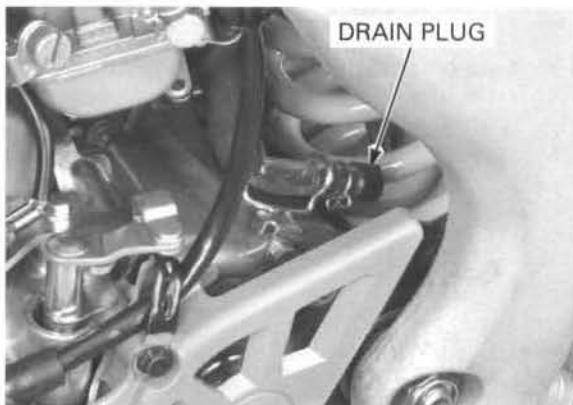
Install the air cleaner assembly into the air cleaner housing.  
Carefully position the sealing flange of the element to prevent dirt intrusion.  
Align the air cleaner tab with the "△" mark of the air cleaner housing by rotating the air cleaner counter-clockwise.  
Install and tighten the retaining bolt securely.

**NOTICE**

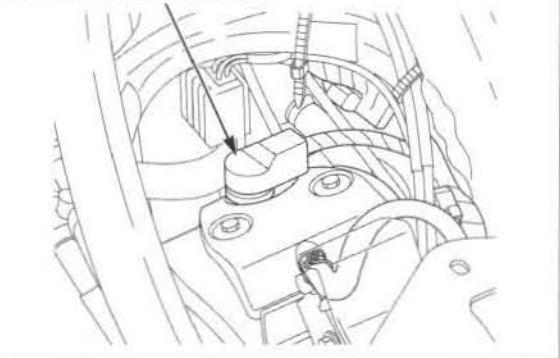
*If the air cleaner assembly is not installed correctly, dirt and dust may enter the engine resulting in wear of the piston ring and cylinder.*

**CRANKCASE BREATHER**

Remove the breather hose drain plug, then drain any fluids or dirt from the hose into a proper container.  
Reinstall the drain plug.

**SPARK PLUG****REMOVAL**

Remove the fuel tank (page 2-7).  
Disconnect the direct ignition coil from cylinder head.

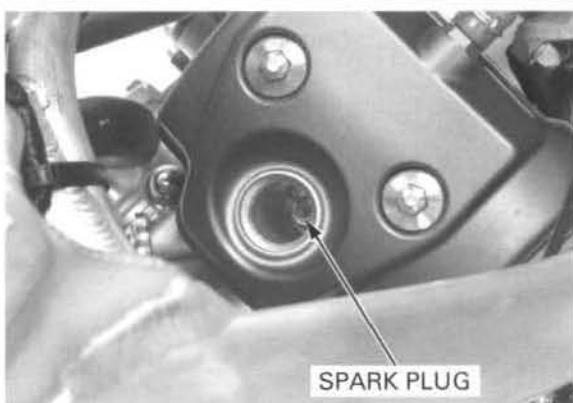
**DIRECT IGNITION COIL**

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

Remove the spark plug and inspect it for damage.

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

- '04 - '06 (page 3-4)
- After '06 (page 3-5)

**SPARK PLUG**

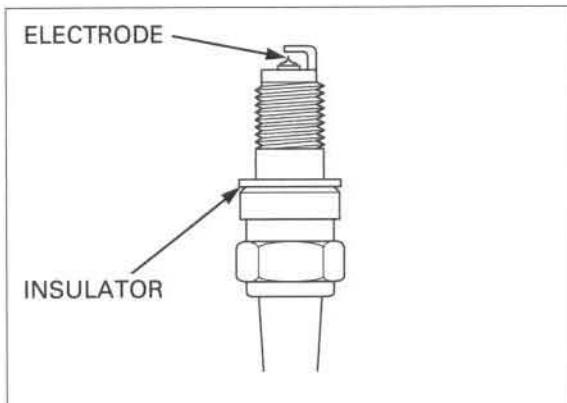
## MAINTENANCE

### INSPECTION

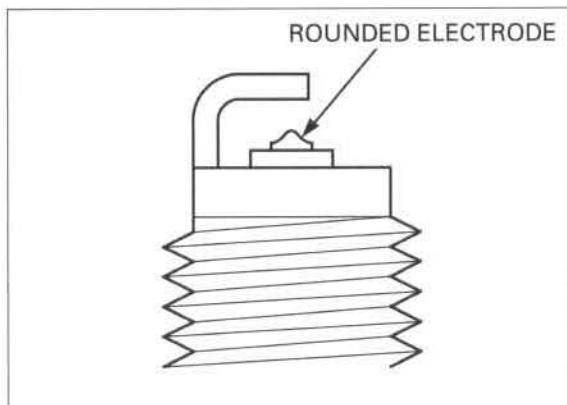
Check the following and replace if necessary (recommended spark plug: page 3-2)

- Insulator for damage
- Electrodes for wear
- Burning condition, coloration;

This motorcycle's spark plug is equipped with an iridium center electrode. Replace the spark plug if the electrode is contaminated.



Replace the plug if the center electrode is rounded as shown in the illustration.



Always use the specified spark plugs on this motorcycle.

#### RECOMMENDED SPARK PLUG (OR EQUIVALENT)

Standard	NGK: IMR8C9H DENSO: VUH24D
Optional	NGK: IMR9C9H DENSO: VUH27D

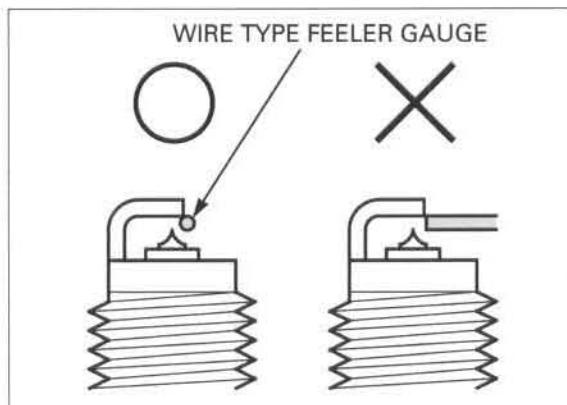
To prevent damaging the iridium center electrode, use a wire type feeler gauge to check the spark plug gap.

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

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

Do not adjust the spark plug gap. If the gap is out of specification, replace with a new one.

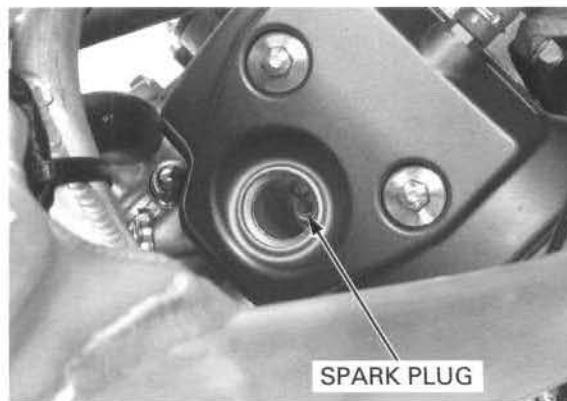
Make sure that the 1.0 mm (0.04 in) diameter plug gauge does not insert between the gap. If the gauge can be inserted into the gap, replace the plug with a new one.



### INSTALLATION

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

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



## RADIATOR COOLANT

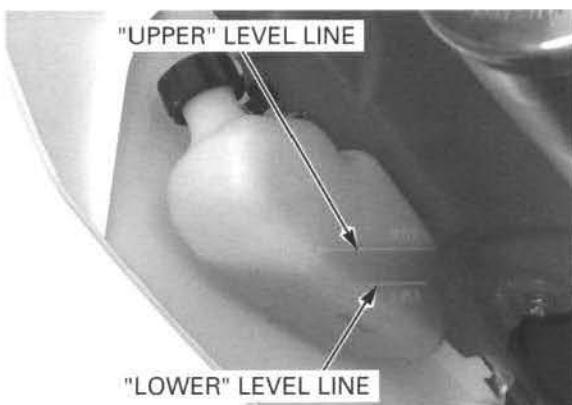
Check the coolant level of the reserve tank with the engine running at normal operating temperature.

The level should be between the "UPPER" and "LOWER" level lines.

If necessary, add recommended coolant.

### RECOMMENDED ANTIFREEZE:

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

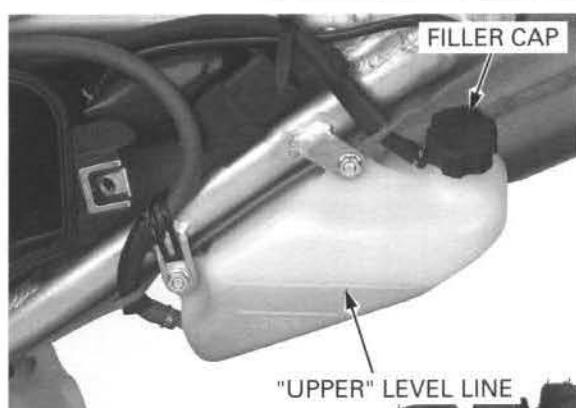


Remove the left side cover (page 2-3).

Remove the reserve tank filler cap and fill the "UPPER" level line with 1 : 1 mixture of distilled water and antifreeze.

Reinstall the filler cap.

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



## COOLING SYSTEM

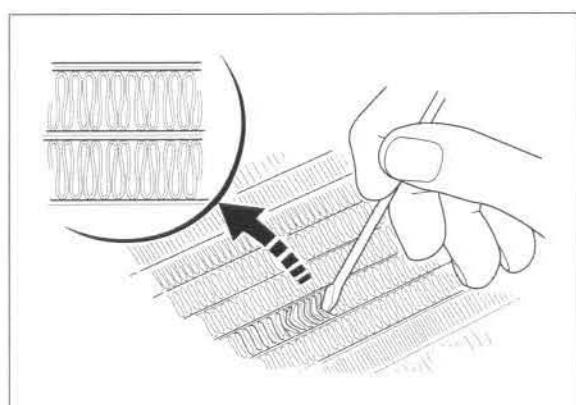
Remove the fuel tank (page 2-7).

Remove the radiator grill (page 6-8).

Check the radiator air passages for clogging or damage.

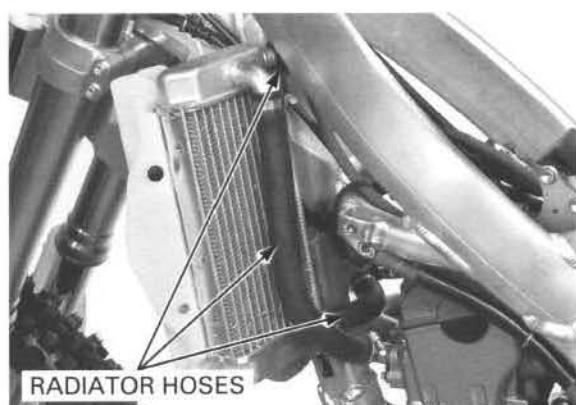
Straighten bent fins, and remove insects, mud or other obstructions with compressed air or low water pressure.

Replace the radiator if the air flow is restricted over more than 20 % of the radiating surface.



Inspect the radiator hoses for cracks or deterioration, and replace them if necessary.

Check the tightness of all hose clamps and fasteners.



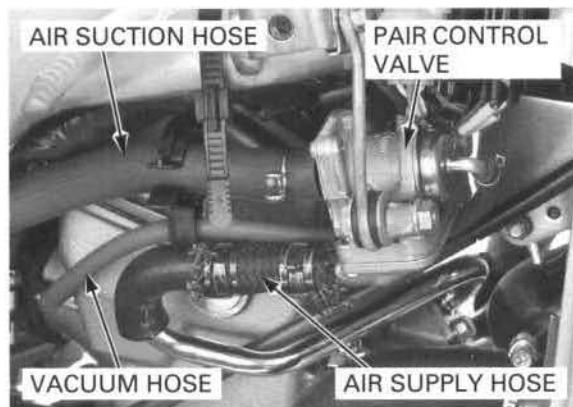
## MAINTENANCE

### SECONDARY AIR SUPPLY SYSTEM ('04 – '06 California type, After '06)

Check the air supply and air suction hoses for damage or loose connection.

Check the vacuum hose between the cylinder head vacuum joint and PAIR control valve for deterioration, damage or loose connection.

Also check that the hose is not kinked or pinched.



### VALVE CLEARANCE/DECOMPRESSOR SYSTEM

#### VALVE CLEARANCE INSPECTION

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

Remove the cylinder head cover (page 8-6).

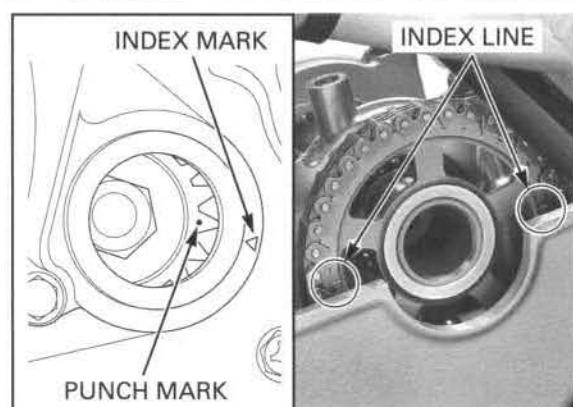
Remove the crankshaft hole cap and O-ring.



Turn the crankshaft clockwise to align the punch mark with the index mark on the right crankcase cover.

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

The index line on the cam sprocket must be flush with the cylinder head surface as shown.



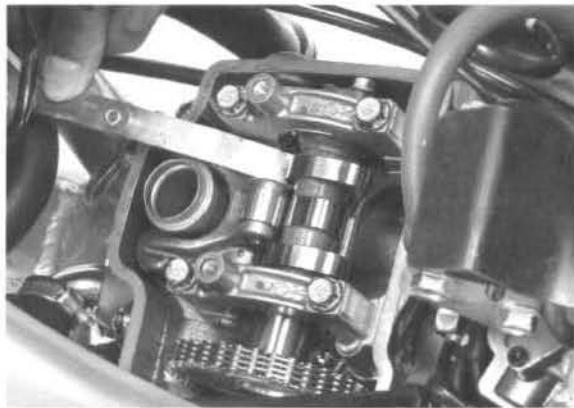
Insert the feeler gauge between the valve lifter and cam lobe.

*Record the clearance for each valve for reference in shim selection if adjustment is required.*

Check the valve clearance for the intake valves using a feeler gauge.

#### VALVE CLEARANCE:

IN:  $0.12 \pm 0.03 \text{ mm} (0.005 \pm 0.001 \text{ in})$



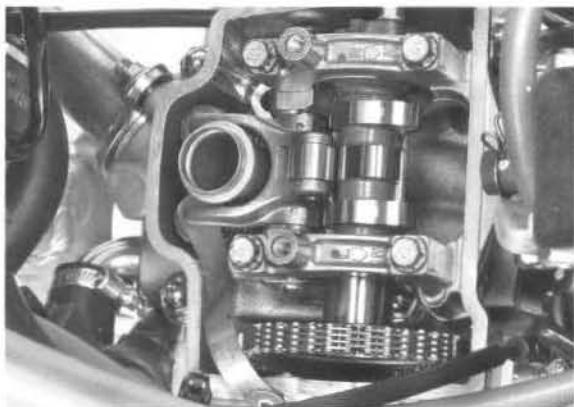
Insert the feeler gauge between the rocker arm and shim.

*Record the clearance for each valve for reference in shim selection if adjustment is required.*

Check the valve clearance for the exhaust valves using a feeler gauge.

#### VALVE CLEARANCE:

EX:  $0.28 \pm 0.03 \text{ mm} (0.011 \pm 0.001 \text{ in})$



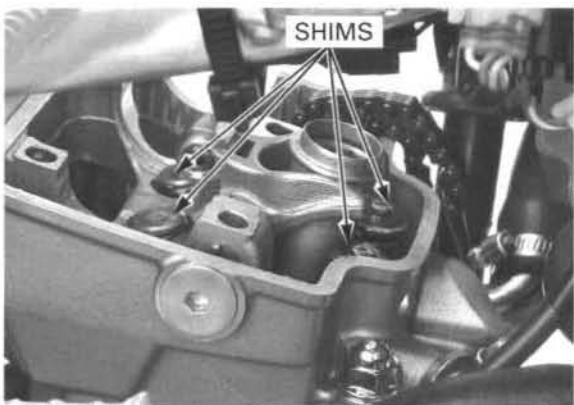
## VALVE CLEARANCE ADJUSTMENT

Remove the camshaft (page 8-7).

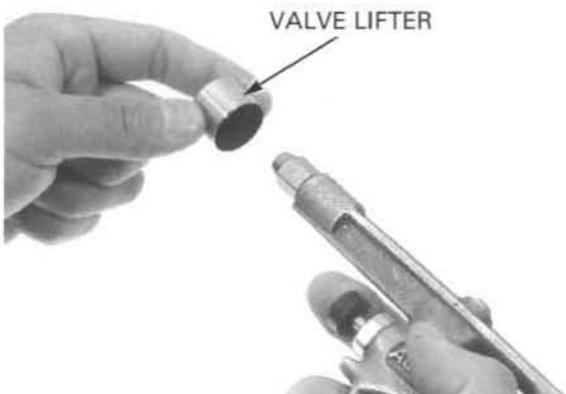
- The shims may stick to the inside of the valve lifter. Do not allow the shims to fall into the crankcase.

Remove the shims.

- Mark all valve lifters and shims to ensure correct reassembly in their original locations.
- The valve lifter can be easily removed with a valve lapping tool or magnet.
- The shims can be easily removed with tweezers or a magnet.



Clean the valve shim contact area in the valve lifter with compressed air.



## MAINTENANCE

Sixty-nine different thickness shims are available from 1.200 mm to 2.900 mm in intervals of 0.025 mm.

Measure the shim thickness and record it.

Calculate the new shim thickness using the equation below.

$$A = (B - C) + D$$

A: New shim thickness

B: Recorded valve clearance

C: Specified valve clearance

D: Old shim thickness



- Make sure of the correct shim thickness by measuring the shim using a micrometer.
- Reface the intake valve seat if carbon deposits result in a calculated dimension of over 2.450 mm.
- Reface the exhaust valve seat if carbon deposits result in a calculated dimension of over 2.900 mm.



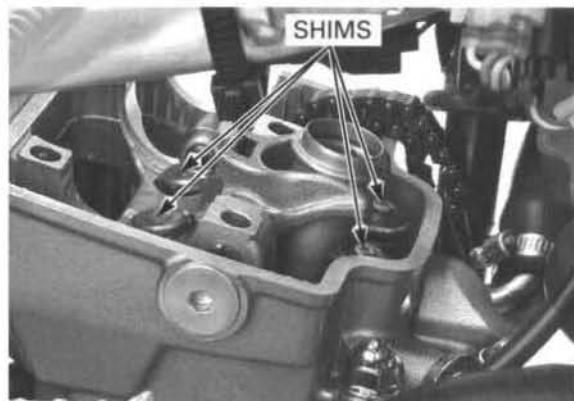
Install the shims in their original locations.

Install the newly selected shims on the valve spring retainers.

Install the camshaft (page 8-27).

Rotate the camshaft by rotating the crankshaft clockwise several times.

Recheck the valve clearance.



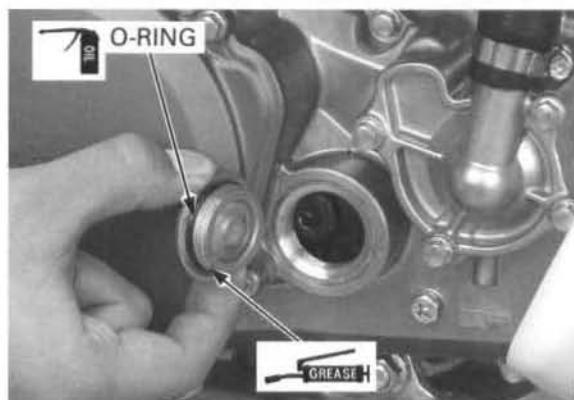
Check that the O-ring is in good condition, replace it if necessary.

Apply oil to the O-ring and install the O-ring onto crankshaft hole cap.

Apply grease to the crankshaft hole cap threads.

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

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



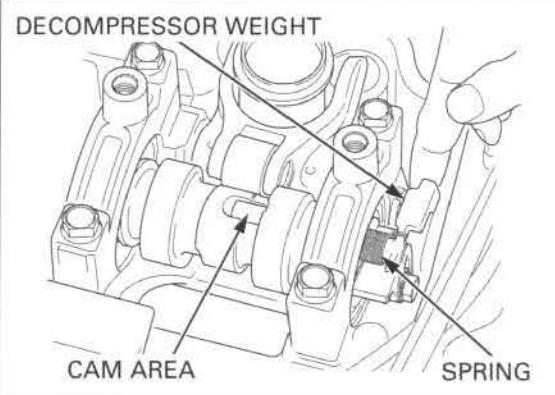
## DECOMPRESSOR SYSTEM

Remove the cylinder head cover (page 8-6).

Check the decompressor weight cam area for wear or damage.

Check the decompressor system for smooth operation.

Check the decompressor cam spring for damage or fatigue.



## ENGINE OIL/OIL FILTER

### OIL LEVEL INSPECTION

Start the engine and let it idle for 3 minutes.

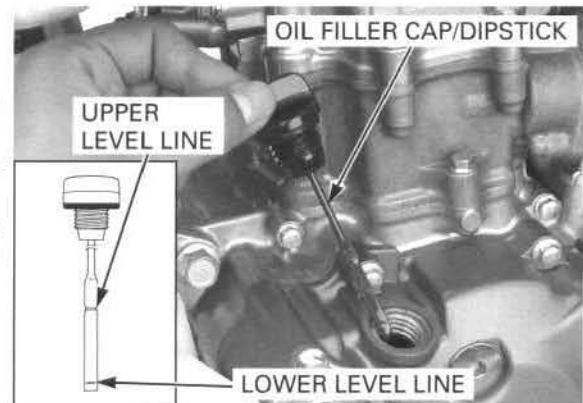
Stop the engine and wait 3 minutes.

Support the motorcycle upright on a level surface.

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

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

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



Add the recommended engine oil to the upper level line.

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

#### RECOMMENDED ENGINE OIL:

Pro Honda GN4 4-stroke oil (U.S.A. and Canada) or equivalent motor oil

API service classification: SG or Higher

JASO T 903 standard: MA

Viscosity: SAE 10W-30

#### OIL CAPACITY:

0.66 liter (0.70 US qt, 0.58 Imp qt) at draining

0.69 liter (0.73 US qt, 0.61 Imp qt) at oil filter change

Reinstall the oil filler cap/dipstick.

### ENGINE OIL & FILTER CHANGE

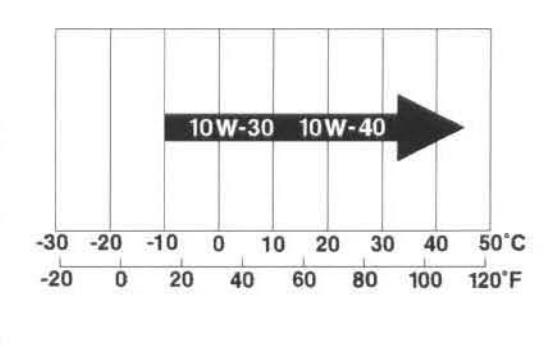
Remove the engine guard (page 2-4).

Start the engine and let it idle for 3 minutes.

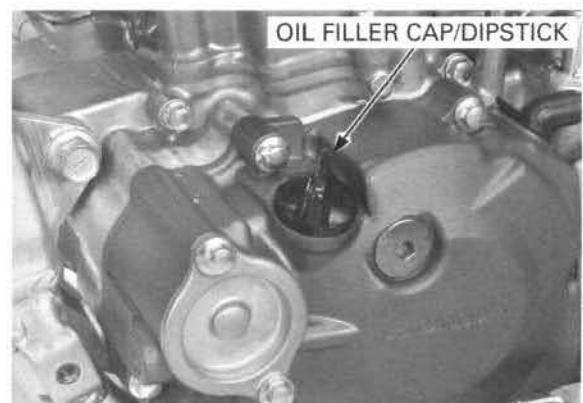
Stop the engine and wait 3 minutes.

Support the motorcycle upright on a level surface.

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



*Change the engine oil with the engine warm and the motorcycle on level ground to assure complete draining.*



## MAINTENANCE

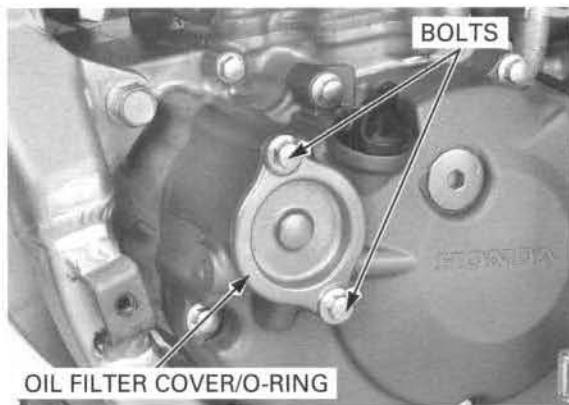
Remove the engine oil drain bolt and sealing washer.

Drain the engine oil.

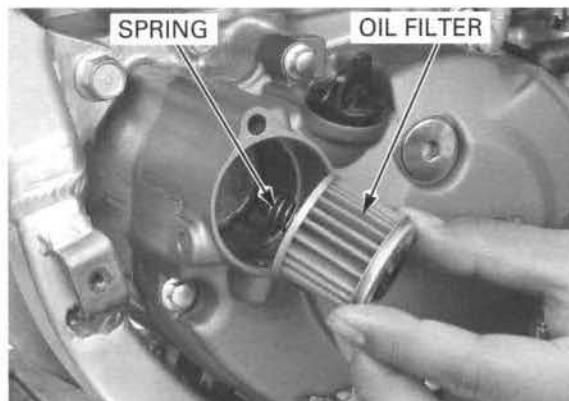
- Operate the kickstarter pedal five times or more while pushing the engine stop switch, so the engine oil completely drains.



Remove the bolts, O-ring and oil filter cover.



Remove the oil filter and spring.



Apply oil to the threads and seating surface.

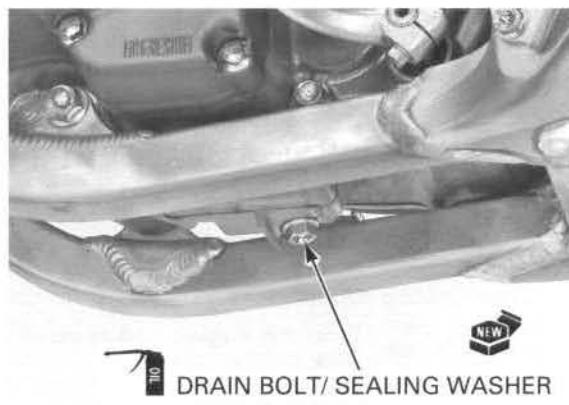
Install the engine oil drain bolt with a new sealing washer.

Tighten the engine oil drain bolt to the specified torque.

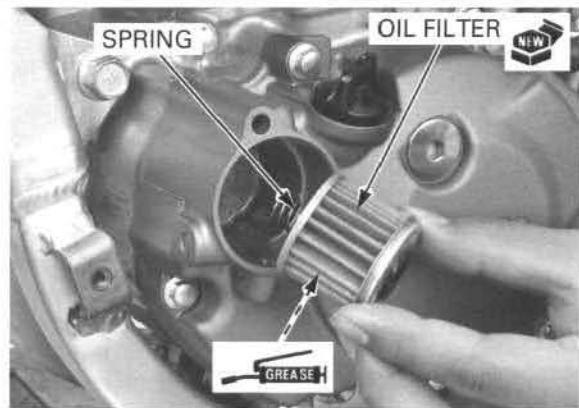
### TORQUE:

'04 - '06: 22 N·m (2.2 kgf·m, 16 lbf·ft)

After '06: 16 N·m (1.6 kgf·m, 12 lbf·ft)



Apply grease to the filter side of the spring end.  
Install the spring into the new oil filter.



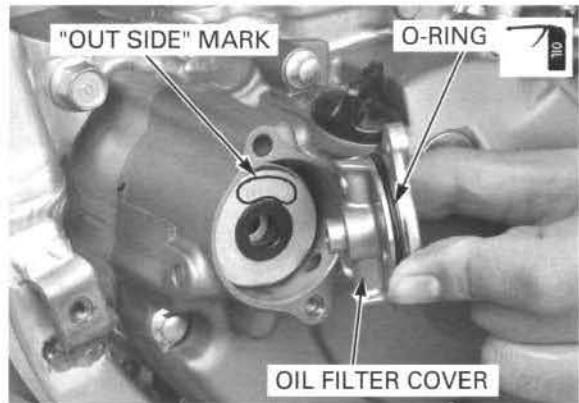
Install the oil filter with the "OUT SIDE" mark facing out.

#### NOTICE

*Installing the oil filter backwards will result in severe engine damage.*

Apply engine oil to a new O-ring and install it to the oil filter cover.

Install the oil filter cover and tighten the bolts.



Fill the engine with the recommended oil.

#### OIL CAPACITY:

0.66 liter (0.70 US qt, 0.58 Imp qt) at draining

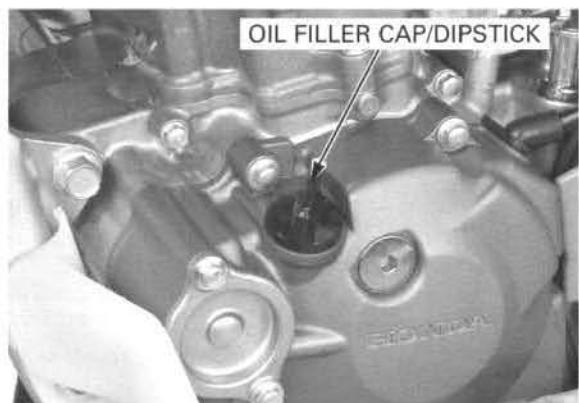
0.69 liter (0.73 US qt, 0.61 Imp qt) at oil filter change

Install the oil filler cap/dipstick.

Recheck the oil level (page 3-17).

Make sure there are no oil leaks.

Install the engine guard (page 2-4).



## ENGINE IDLE SPEED

#### NOTE:

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

Warm up the engine, shift the transmission into neutral, and hold the motorcycle upright. Connect a tachometer according to its manufacturer's instructions.

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

IDLE SPEED:  $1,700 \pm 100$  rpm



## MAINTENANCE

### TRANSMISSION OIL

#### OIL LEVEL INSPECTION

1. Start the engine and let it idle for 3 minutes.
2. Stop the engine and wait 3 minutes.
3. Support the motorcycle upright on a level surface.
4. Remove the oil filler cap and check bolt from the right crankcase cover. A small amount of oil should flow out of the check bolt hole.
5. If no oil flows out of the check bolt hole, add oil slowly through the oil filler hole until oil starts to flow out of the check bolt hole. Install the oil check bolt and filler cap.
6. Repeat steps 1 – 5.
7. After checking the oil level or adding oil, tighten the oil check bolt with a new sealing washer and filler cap securely.



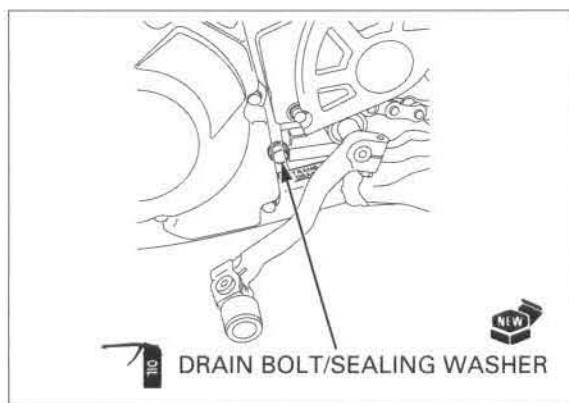
#### TRANSMISSION OIL CHANGE

- Transmission oil should be changed at least every six races or 15 hours of operation to ensure consistent performance and maximum service life of both transmission and clutch components.
  - Warm-up the engine before draining the oil. This will ensure complete and rapid draining.
1. Support the motorcycle in an upright position on level surface.
  2. Remove the oil filler cap from the right crankcase cover.
  3. Place an oil pan under the engine to catch the oil, then remove the drain bolt and washer.
  4. After the oil has drained completely, install the drain bolt with a new sealing washer. Tighten the transmission oil drain bolt to the specified torque.

##### TORQUE:

'04 – '06: 22 N·m (2.2 kgf·m, 16 lbf·ft)

After '06: 16 N·m (1.6 kgf·m, 12 lbf·ft)



5. Add the recommended oil.

**RECOMMENDED ENGINE OIL:**

Pro Honda HP Trans Oil, Pro Honda GN4 4-stroke oil (U.S.A. and Canada) or equivalent motor oil

API service classification: SG or Higher

JASO T 903 standard: MA

Viscosity: SAE 10W-30

**OIL CAPACITY:**

0.67 liter (0.71 US qt, 0.59 Imp qt) at draining

0.75 liter (0.79 US qt, 0.66 Imp qt) at disassembly

Check the oil level by following steps 1 – 4 in the oil level check procedure (page 3-20).

## DRIVE CHAIN

### DRIVE CHAIN SLACK INSPECTION

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

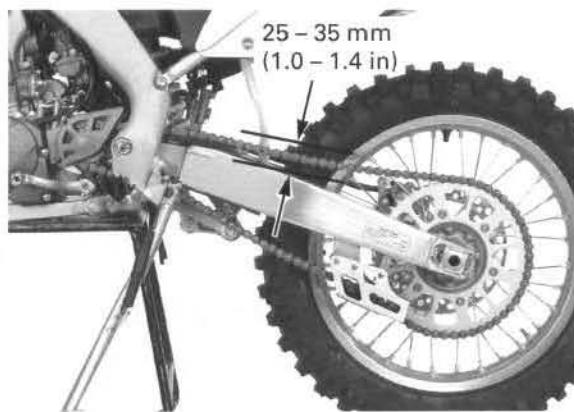
Raise the rear wheel off the ground by placing a workstand under the engine.

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

**CHAIN SLACK: 25 – 35 mm (1.0 – 1.4 in)**

**NOTICE**

*Excessive chain slack, 60 mm (2.4 in) or more, may damage the frame.*



### ADJUSTMENT

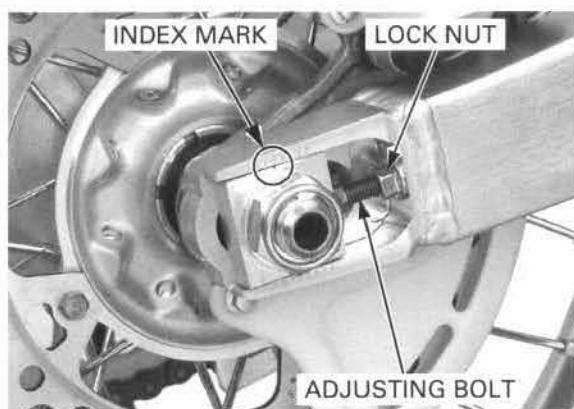
If the chain needs adjustment, loosen the axle nut and adjuster lock nuts, and turn the adjusting bolts.

Check that the chain adjuster index marks are in the same position on each side, then tighten the axle nut to the specified torque.

**TORQUE: 127 N·m (13.0 kgf·m, 94 lbf·ft)**

After torquing the axle nut, seat the adjusting bolts snugly against the axle adjustment plates and tighten the adjusting bolt lock nut to the specified torque.

**TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)**



### CLEANING AND LUBRICATION

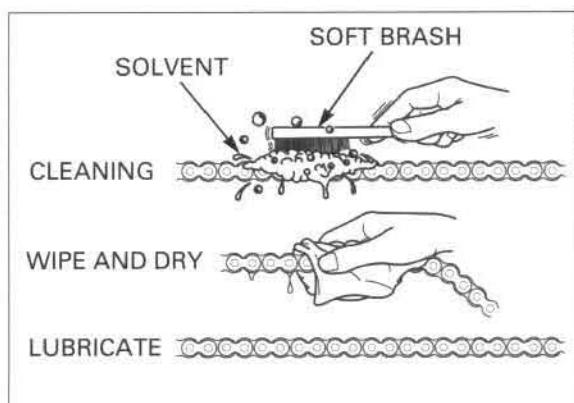
Clean the drive chain in non-flammable or high flash-point solvent and wipe it dry.

Be sure the chain has dried completely before lubricating.

Inspect the chain for possible wear or damage; replace any chain that has damaged rollers or loose fitting links.

Replace any chain that has damaged rollers, loose fitting links, or otherwise appears unserviceable. Installing a new chain on badly worn sprockets will cause the new chain to wear quickly.

Inspect and replace sprocket as necessary.

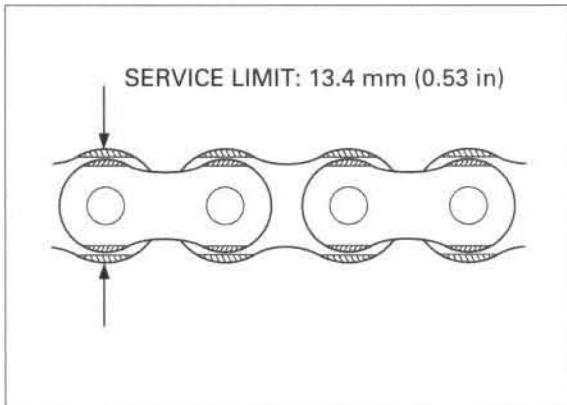


## MAINTENANCE

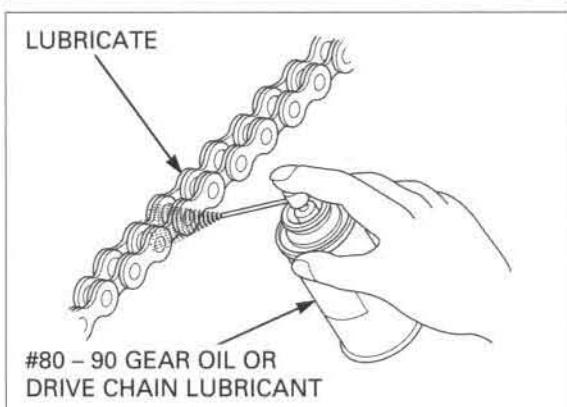
Measure the drive chain inner plate width.

**SERVICE LIMIT: 13.4 mm (0.53 in)**

If the measurement exceeds the service limit, replace the chain.



Lubricate the drive chain with #80 – 90 gear oil or drive chain lubricant designed specifically for use with O-ring chains. Wipe off the excess oil or chain lubricant.



### REPLACEMENT

This motorcycle uses a drive chain with a staked master link.

Loosen the drive chain (page 3-21).

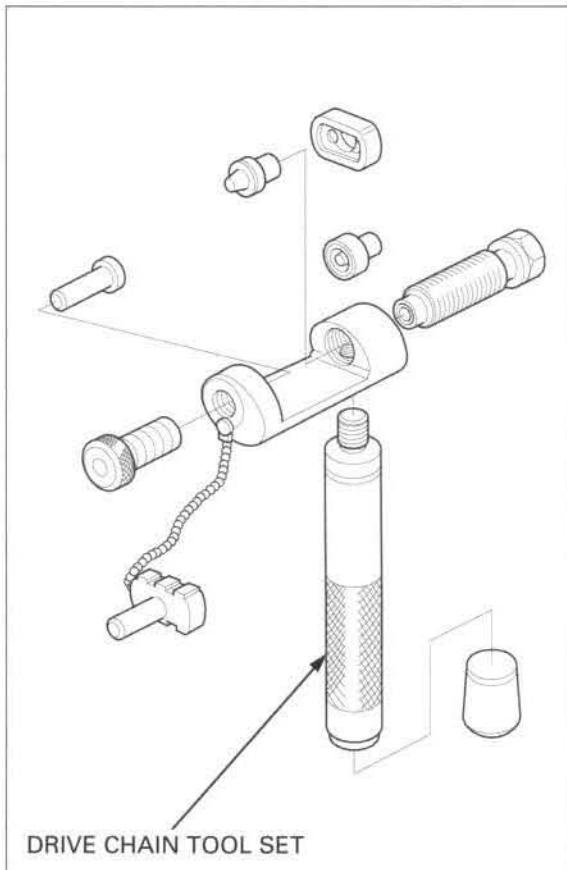
Assemble the special tool as shown.

*When using the special tool, follow the manufacturer's instruction.*

**TOOL:**

**Drive chain tool set**

**07HMH-MR10103 or  
07HMH-MR1010C  
(U.S.A. only)**

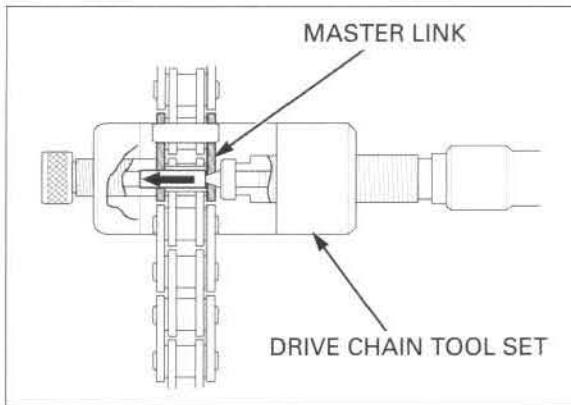


Locate the crimped pin ends of the master link from the outside of the chain, and remove the link with the drive chain tool set.

**TOOL:**  
Drive chain tool set

07HMH-MR10103 or  
07HMH-MR1010C  
(U.S.A. only)

Remove the drive chain.

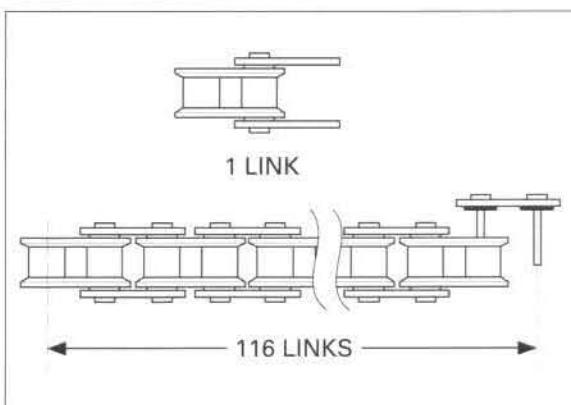


*Include the master link when you count the drive chain links.*

Remove the excess drive chain links from the new drive chain with the drive chain tool set.

**STANDARD LINKS: 116 LINKS**

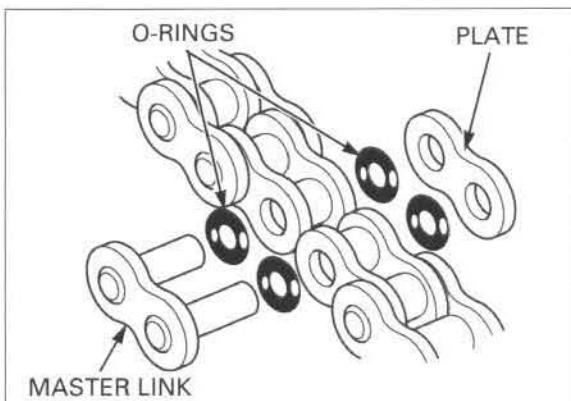
**REPLACEMENT CHAIN: DID520MXV**



- Never reuse the old drive chain, master link, master link plate and O-rings.

Assemble the new master link, O-rings and plate.

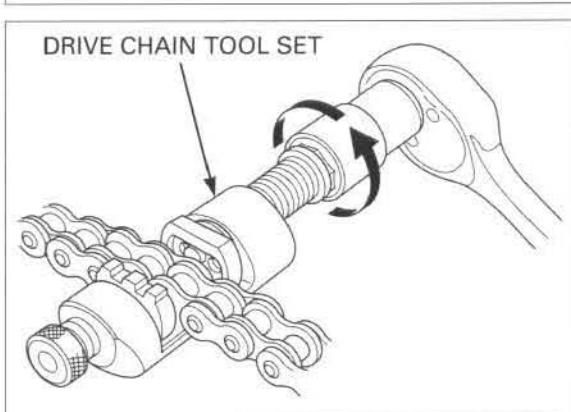
*Insert the master link from the inside of the drive chain, and install the plate with the identification mark facing the outside.*



Assemble and set the drive chain tool set.

**TOOL:**  
Drive chain tool set

07HMH-MR10103 or  
07HMH-MR1010C  
(U.S.A. only)



## MAINTENANCE

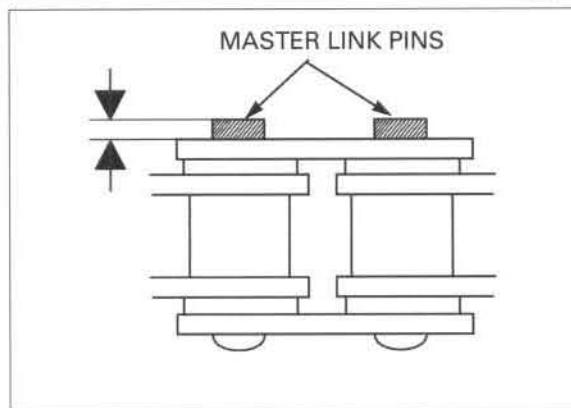
Make sure that the master link pins are installed properly.

Measure the master link pin length projected from the plate.

### STANDARD LENGTH:

1.15 – 1.55 mm (0.045 – 0.061 in)

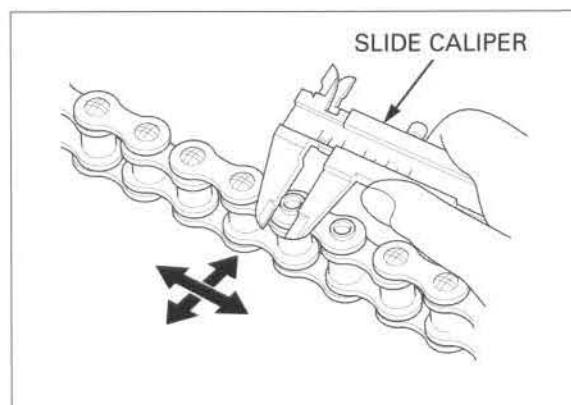
Stake the master link pins.



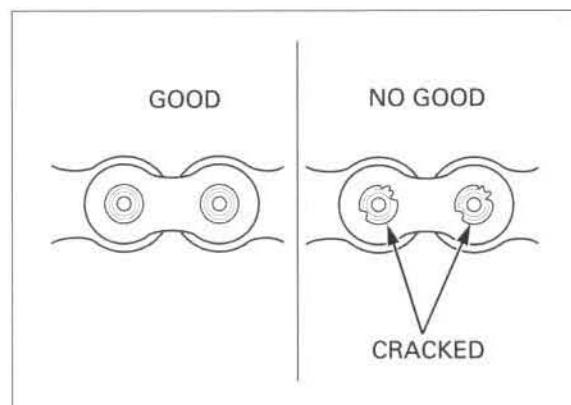
Make sure that the pins are staked properly by measuring the diameter of the staked area using a slide caliper.

### DIAMETER OF THE STAKED AREA:

5.50 – 5.80 mm (0.217 – 0.228 in)



A drive chain with a clip-type master link must not be used. After staking, check the staked area of the master link for cracks. If there is any cracking, replace the master link, O-rings and plate.



## DRIVE CHAIN SLIDER

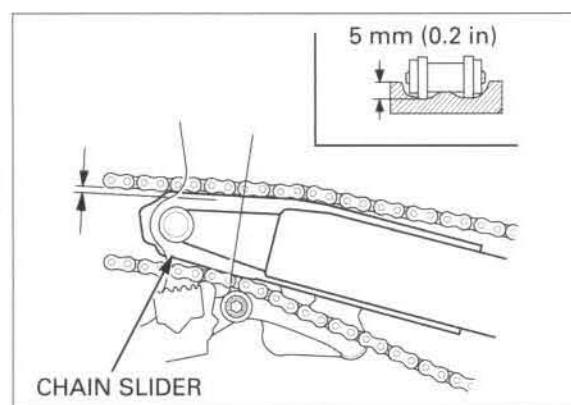
### CHAIN SLIDER

Inspect the drive chain slider for excessive wear.

**SERVICE LIMIT: 5 mm (0.2 in) from upper surface**

#### NOTICE

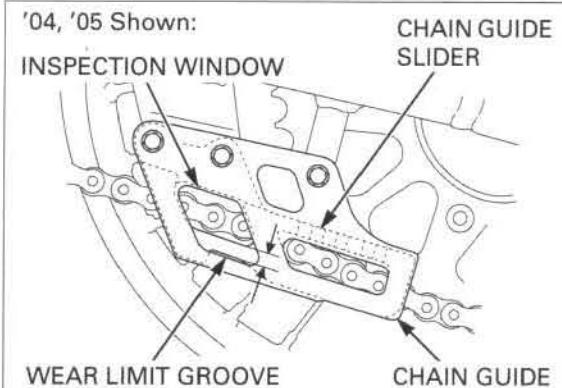
If the chain slider becomes worn to the swingarm, the chain will wear against the swingarm, damaging the chain and swingarm.



Check the chain guide and chain guide slider for alignment, wear or damage.

Replace the chain guide if it is damaged or worn.

Replace the chain guide slider if the slider is worn to the bottom of the wear limit groove.



## DRIVE CHAIN ROLLER

Remove the side stand (page 14-29).

Inspect the drive chain rollers for excessive wear or binding.

### SERVICE LIMIT:

**Minimum roller O.D. ('04, '05):**

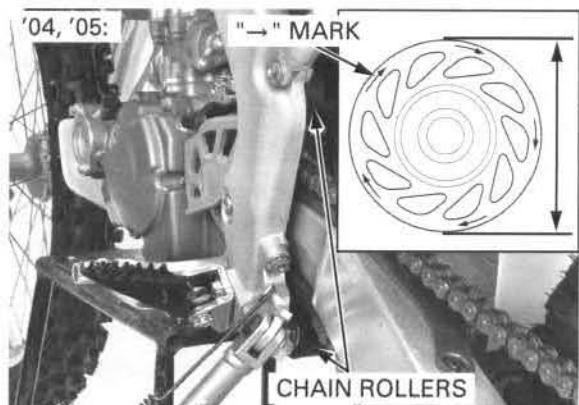
Upper: 29 mm (1.1 in)

Lower: 39 mm (1.5 in)

**Minimum roller O.D. (After '05):**

Upper: 29 mm (1.1 in)

Lower: 31 mm (1.2 in)



Replace the roller if necessary, and tighten the roller bolt/nut to the specified torque.

### TORQUE:

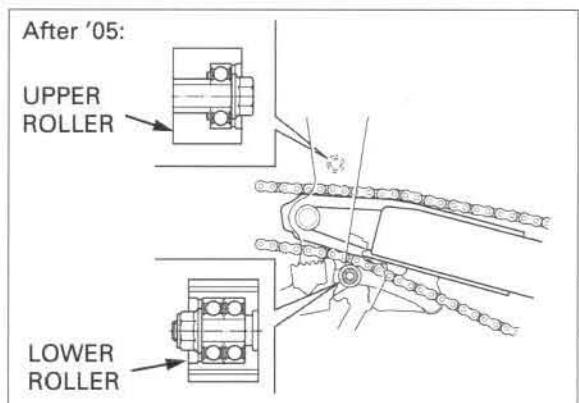
**Upper bolt:** 12 N·m (1.2 kgf·m, 9 lbf·ft)

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

Install the drive chain upper roller (Green) with the flat facing out.

'04, '05: Install the drive chain lower roller (Black) with the "→" mark facing out.

After '05: Install the drive chain lower roller (Black) with the flat facing the frame.



## DRIVE/DRIVEN SPROCKET

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 bolts and nuts on the drive and driven sprockets.

If any are loose, torque them.

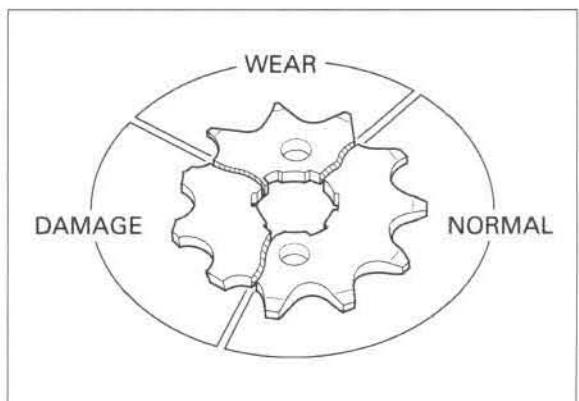
### TORQUE:

**Drive sprocket bolt:**

31 N·m (3.2 kgf·m, 23 lbf·ft)

**Driven sprocket nut:**

32 N·m (3.3 kgf·m, 24 lbf·ft)



## MAINTENANCE

### BRAKE FLUID

#### NOTICE

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

- 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.

#### FLUID LEVEL INSPECTION

When the fluid level is low, check the brake pads for wear (page 3-27).

A low fluid level may be due to wear of the brake pads. If the brake pads are worn, the caliper piston is pushed out, and this accounts for a low reservoir level. If the brake pads are not worn and the fluid level is low, check the entire system for leaks (page 3-26).

##### FRONT BRAKE:

Turn the handlebar so that the reservoir is level and check the front brake fluid level.

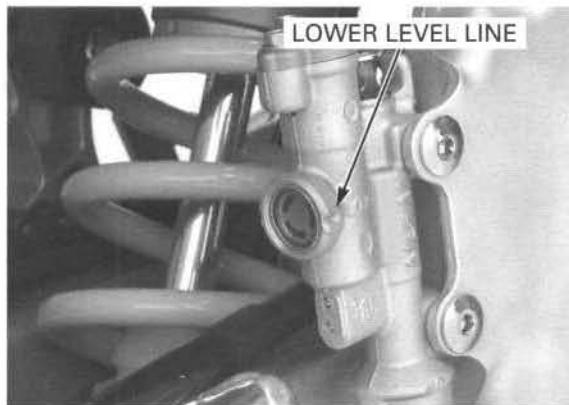
If the level is near the lower level line, check the brake pad wear (page 3-27).



##### REAR BRAKE:

Support the motorcycle in an upright position on level surface.

If the level is near the lower level line, check the brake pad wear (page 3-27).



#### FLUID FILLING

##### FRONT:

Remove the screws, cover and diaphragm.

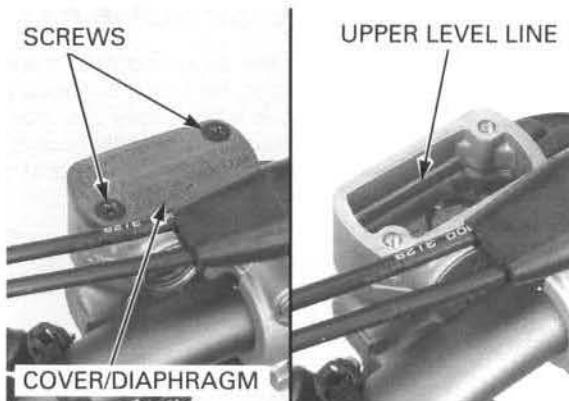
Fill the reservoir with DOT 4 brake fluid to the upper level line.

Install the diaphragm and cover.

Tighten the screws to the specified torque.

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

Check the entire system for leaks.



**REAR:**

Remove the bolts, cover, plate and diaphragm. Fill the reservoir with DOT 4 brake fluid to the upper level line.

*Do not bend the diaphragm during installation.*

Install the diaphragm, plate and cover.

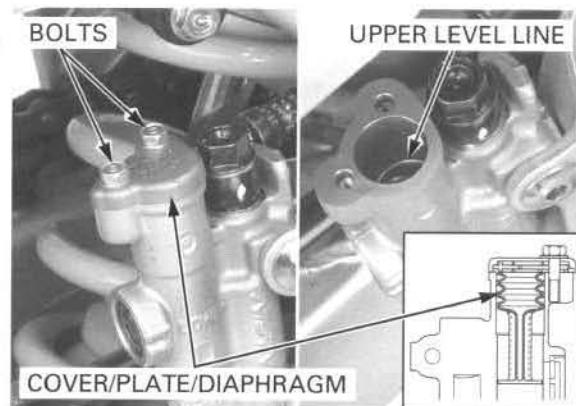
Tighten the bolts to the specified torque.

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

Check the entire system for leaks.

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

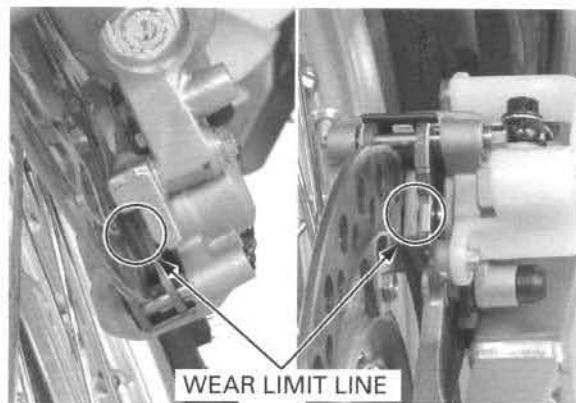
Replace the hose and fittings as required.

**BRAKE PAD WEAR**

Check the brake pads for wear.

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

For brake pad replacement (page 15-10).

**BRAKE SYSTEM****LEVER POSITION INSPECTION**

The brake lever position can be adjusted by loosening the lock nut and turning the adjuster.

Turning the adjuster clockwise moves the brake lever farther away from the grip; turning the adjuster counterclockwise moves the brake lever closer to the grip.

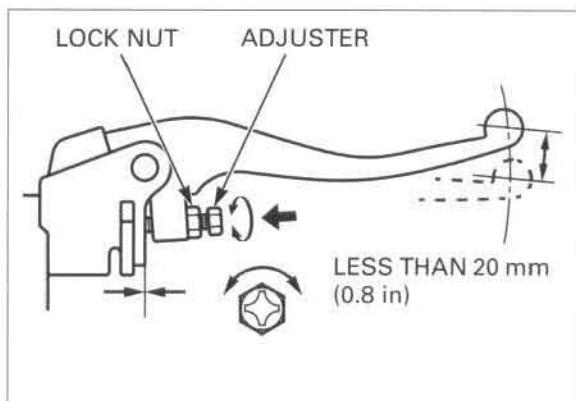
*Apply grease to the contact faces of the adjuster bolt and piston.*

After adjustment, hold the adjuster and tighten the lock nut to the specified torque.

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

If the brake lever free play exceeds 20 mm (0.8 in), there is air in the system that must be bled.

For brake system air bleeding (page 15-7).



## MAINTENANCE

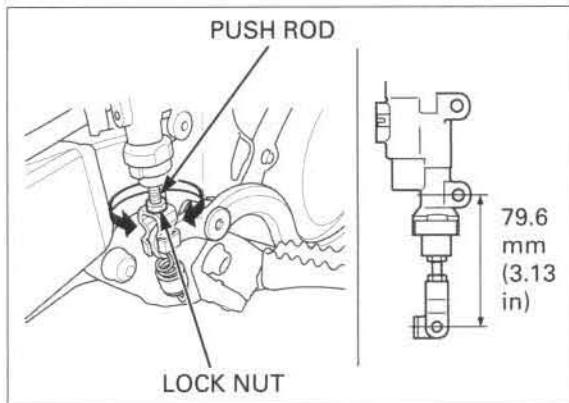
### BRAKE PEDAL HEIGHT

Adjust the brake pedal to the desired height by loosening the lock nut and turning the push rod.

**STANDARD HEIGHT: 79.6 mm (3.13 in)**

Tighten the lock nut to the specified torque.

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



### HEADLIGHT AIM

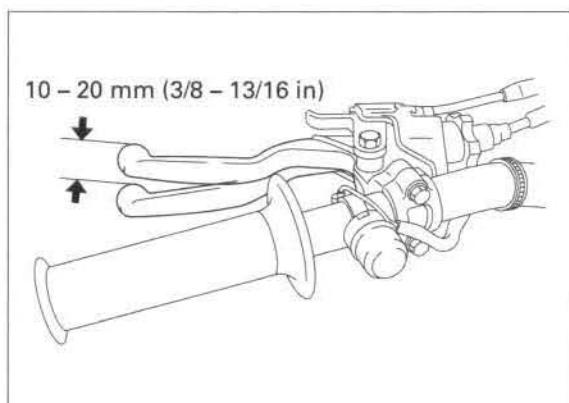
Adjust the headlight beam vertically by turning the adjusting screw on the front visor.



### CLUTCH SYSTEM

Measure the clutch free play at the lever end.

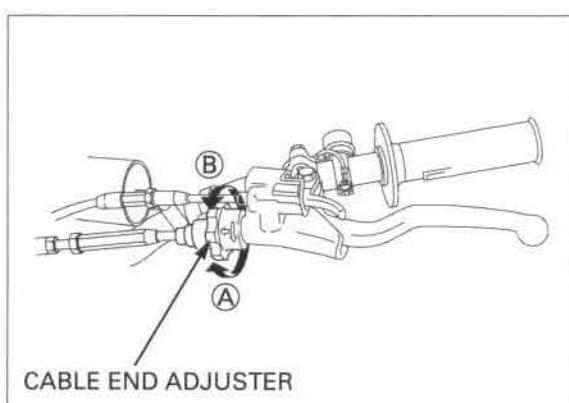
**FREE PLAY: 10 – 20 mm (3/8 – 13/16 in)**



Minor adjustments can be made at the cable end adjuster on the lever.

Turning the cable end adjuster in direction A will increase free play and turning it in direction B will decrease free play.

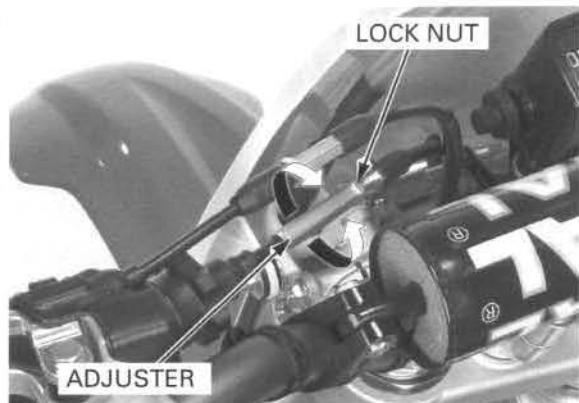
If the adjuster is threaded out near its limit or the correct free play cannot be reached, turn the adjuster all the way in and back out one turn and make the adjustment with the in-line cable adjuster.



Major adjustments can be made with the in-line cable adjuster located behind the number plate.

Loosen the lock nut and turn the adjuster.  
Tighten the lock nut.

If proper free play cannot be obtained using both procedures or the clutch slips during the test ride, disassemble and inspect the clutch (page 10-9).

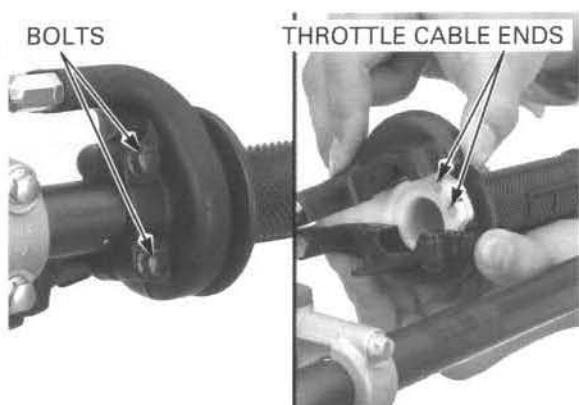


## CONTROL CABLES

Remove the dust cover and throttle housing bolts.  
Turn the handlebar to the right fully and remove the throttle housing from the handlebar.

Disconnect the throttle cable end from the throttle pipe.

Remove the clutch cable and adjuster.  
Disconnect the clutch cable upper end and the hot start cable upper end from the levers.



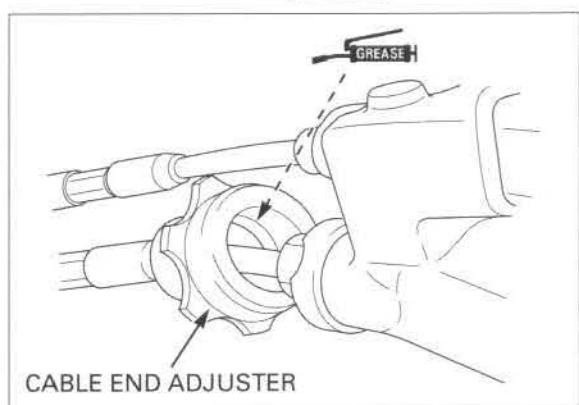
*It is not necessary to lubricate the entire cable.*

Thoroughly lubricate the cable ends with a commercially available cable lubricant.

Apply grease to the clutch cable end adjuster inside surface and install it onto the clutch lower holder.

If the clutch lever, hot start lever and throttle operation is not smooth, replace the cable.

Be sure the throttle returns freely from fully open to fully closed automatically, in all steering positions.



## EXHAUST PIPE/MUFFLER

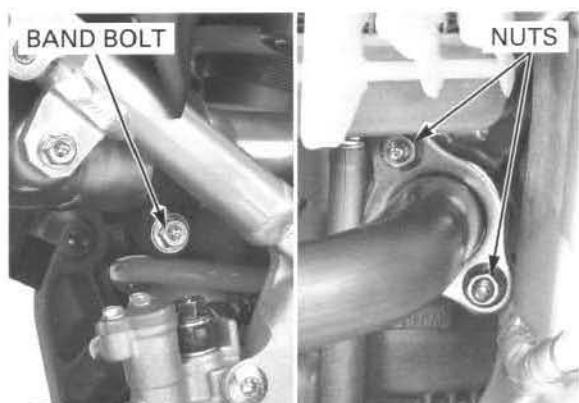
### EXHAUST SYSTEM INSPECTION

Check the joint band bolt and joint nut for looseness and exhaust gas leaks.

Tighten each bolt and nut of the exhaust system to the specified torque.

#### TORQUE:

- Exhaust pipe joint nut:  
21 N·m (2.1 kgf·m, 15 lbf·ft)
- Muffler joint band bolt:  
21 N·m (2.1 kgf·m, 15 lbf·ft)



## MAINTENANCE

### SPARK ARRESTER

#### REMOVAL/INSTALLATION

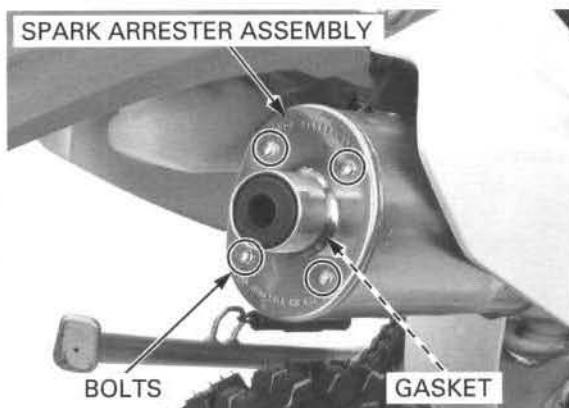
Remove the bolts, spark arrester assembly and gasket.

- '04 – '06: Install the gasket, spark arrester assembly and bolts. Tighten the bolts to the specified torque.

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

- After '06: Apply molybdenum disulfide grease (THREEBOND 1901 or equivalent) to the bolt threads. Install the gasket, spark arrester assembly and bolts. Tighten the bolts to the specified torque.

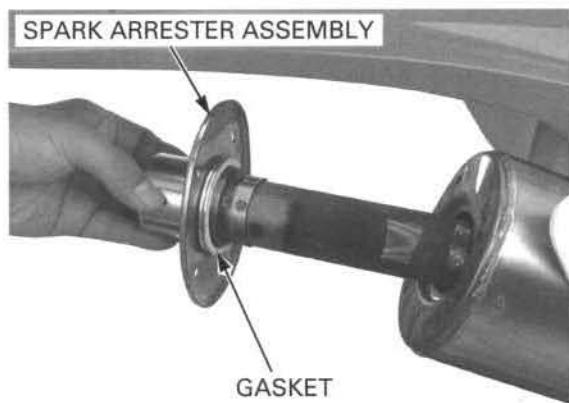
**TORQUE: 6.9 N·m (0.7 kgf·m, 5.1 lbf·ft)**



#### INSPECTION/CLEANING

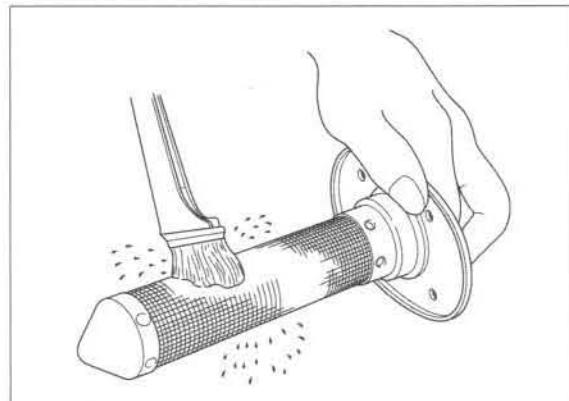
Remove the spark arrester assembly (page 3-30).

Check the mesh screen and gasket is in good condition.



Use a soft brush to remove carbon deposits from the spark arrester screen. Be careful to avoid damaging the spark arrester screen.

The spark arrester must be free of breaks and holes, replace if necessary.



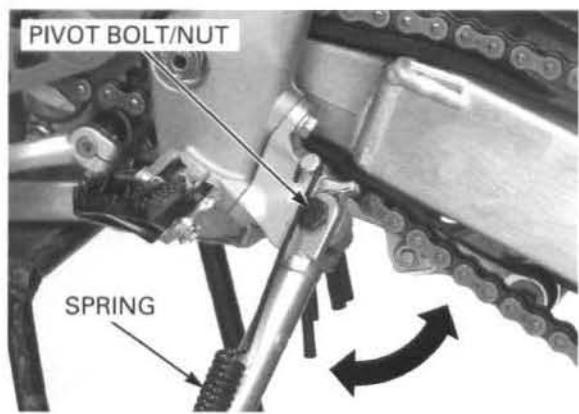
## SIDE STAND

### INSPECTION

- Support the motorcycle upright on a level surface.
- Check the side stand spring for damage or loss of tension.
- Check the side stand assembly for freedom of movement and lubricate the side stand pivot if necessary.
- Check the attaching pivot bolt and nut on the side stand.
- Tighten the pivot bolt to the specified torque.  
Loosen the pivot bolt to  $45^\circ$  –  $90^\circ$ , and tighten the pivot nut to the specified torque.

#### TORQUE:

Pivot bolt: 9.8 N·m (1.0 kgf·m, 7 lbf·ft) –  $45^\circ$  to  $90^\circ$   
Pivot nut: 39 N·m (4.0 kgf·m, 29 lbf·ft)



## SUSPENSION

### FRONT SUSPENSION INSPECTION

- Check the action of the forks by operating the front brakes and compressing the front suspension several times.
- Check the entire assembly for signs of leaks, damage or loose fasteners.
- Make sure the fork protectors and dust seals are clean and not packed with mud and dirt.
- Remove any dirt that has accumulated on the bottom of the fork seals.
- Replace damaged components which cannot be repaired.
- Tighten all nuts and bolts.
- For fork service (page 13-12).



Air pressure acts as a progressive spring and affects the entire range of fork travel.

Air is an unstable gas; it increases in pressure as it is worked (such as in a fork), so the fork action on your CRF will get stiffer as the race progresses.

Release built-up air pressure from the fork legs after practice and between heats.

Be sure the fork is fully extended with the front tire off the ground.

Loosen the plug bolt fully, then tighten them.

**TORQUE: 1.3 N·m (0.13 kgf·m, 0.9 lbf·ft)**



## MAINTENANCE

### REAR SUSPENSION INSPECTION

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



Lift the sub-frame (page 5-7).

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

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

For shock absorber service (page 14-13).



### SWINGARM/SHOCK LINKAGE

Raise the rear wheel off the ground by placing a workstand or equivalent under the engine.

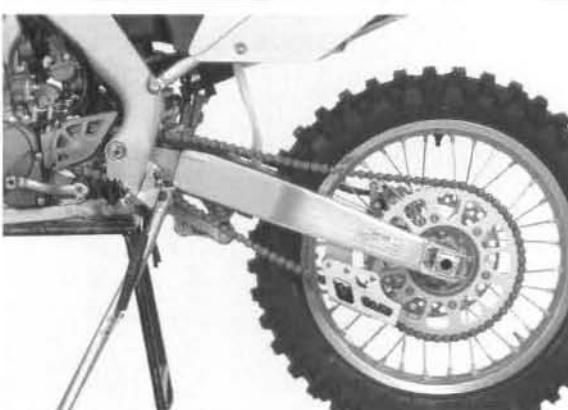
Check for worn swingarm bearings by grabbing the rear swingarm and attempting to move the swingarm side-to-side.

Replace the bearings if excessively worn (page 14-35).

Check the shock linkage and replace any damaged needle bearings.



Disassemble, clean, inspect the swingarm and shock linkage pivot bearings and related seals every three races or about 7.5 hours of operation (page 14-29). Lubricate and reassemble.



## NUTS, BOLTS, FASTENERS

Check that all chassis nuts and bolts are tightened to their correct torque values (page 1-13).

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

## WHEELS/TIRES

Raise the front wheel off the ground by placing a work stand or equivalent under the engine.

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



Raise the rear wheel off the ground by placing a workstand or equivalent under the engine.

Hold the swingarm and move the rear wheel sideways with force to see if the wheel bearings are worn.



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

Check the following:

- front wheel (page 13-3)
- rear wheel (page 14-3)

Check the cold tire pressure.

### TIRE PRESSURE:

**FRONT:** 98 kPa (1.0 kgf/cm<sup>2</sup>, 14 psi)

**REAR:** 98 kPa (1.0 kgf/cm<sup>2</sup>, 14 psi)

*Tire pressure  
should be checked  
when the tires are  
cold.*



## MAINTENANCE

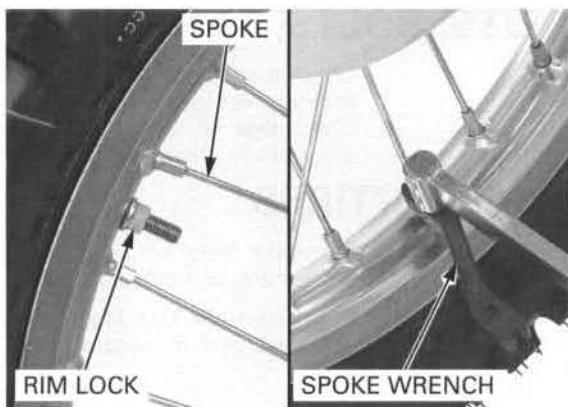
Inspect the wheel rims and spokes for damage. Tighten any loose spokes and rim locks to the specified torque.

**TOOLS:**

Spoke wrench, 6.1 mm

07JMA-MR60100 or  
07701-0020300 or  
equivalent commercially available in  
U.S.A.  
070MA-KZ30100 or  
equivalent commercially available in  
U.S.A.

Spoke wrench, 6.6 mm



**TORQUE:**

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

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

## STEERING HEAD BEARINGS

Raise the front wheel off the ground by placing a workstand or equivalent under the engine.

*Be sure the control cables do not interfere with handlebar rotation.*

Check that the handlebar moves freely from side-to-side.

If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (page 13-38).

If excessive play has developed, check the steering stem for cracks.



## 4. LUBRICATION SYSTEM

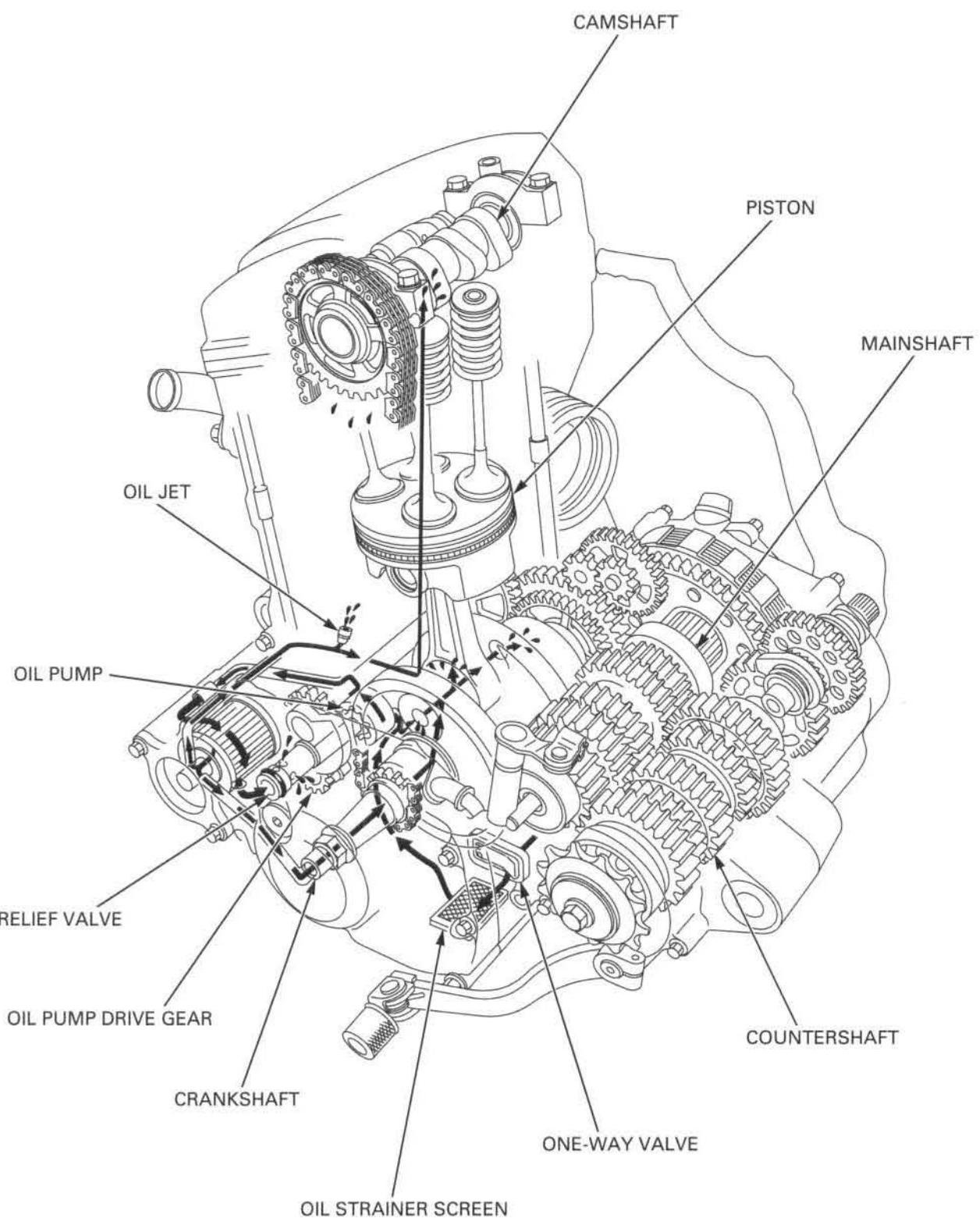
---

4

LUBRICATION SYSTEM DIAGRAM .....	4-2	PRESSURE RELIEF VALVE .....	4-5
SERVICE INFORMATION .....	4-3	OIL JET .....	4-6
TROUBLESHOOTING .....	4-3	OIL PUMP .....	4-7
OIL STRAINER .....	4-4		

## LUBRICATION SYSTEM

### LUBRICATION SYSTEM DIAGRAM



# SERVICE INFORMATION

## GENERAL

### ⚠ CAUTION

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

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

## SPECIFICATIONS

ITEM	STANDARD	Unit: mm (in) SERVICE LIMIT
Engine oil capacity	At draining 0.66 liter (0.70 US qt, 0.58 Imp qt)	-
	At filter change 0.69 liter (0.73 US qt, 0.61 Imp qt)	-
	At disassembly 0.85 liter (0.90 US qt, 0.75 Imp qt)	-
Transmission oil capacity	At draining 0.67 liter (0.71 US qt, 0.59 Imp qt)	-
	At disassembly 0.75 liter (0.79 US qt, 0.66 Imp qt)	-
Recommended engine oil	Pro Honda GN4 4-stroke oil (U.S.A. and Canada) or equivalent motor oil API service classification: SG or Higher JASO T 903 standard: MA Viscosity: SAE 10W-30	-
Recommended transmission oil	Pro Honda HP Trans Oil, Pro Honda GN4 4-stroke oil (U.S.A. and Canada) or equivalent motor oil API service classification: SG or Higher JASO T 903 standard: MA Viscosity: SAE 10W-30	-
Oil pump rotor	Tip clearance 0.15 (0.006)	0.20 (0.008)
	Body clearance 0.15 – 0.20 (0.006 – 0.008)	-
	Side clearance 0.05 – 0.12 (0.002 – 0.005)	-

## TORQUE VALUES

Engine oil drain bolt ('04 – '06)	22 N·m (2.2 kgf·m, 16 lbf·ft)	Apply oil to the threads and seating surface
Engine oil drain bolt (After '06)	16 N·m (1.6 kgf·m, 12 lbf·ft)	Apply oil to the threads and seating surface
Oil jet ('04)	2.0 N·m (0.2 kgf·m, 1.4 lbf·ft)	Apply locking agent to the threads
Oil jet mounting bolt (After '04)	9.8 N·m (1.0 kgf·m, 7 lbf·ft)	Apply locking agent to the threads

## TROUBLESHOOTING

### Oil level too low- high oil consumption

- Oil not changed often enough
- External oil leaks
- Worn piston rings or incorrect piston ring installation
- Worn valve guide or seal

### Oil contamination

- Oil not changed often enough
- Worn piston rings or incorrect piston ring installation
- Worn valve guide or seal

## LUBRICATION SYSTEM

### OIL STRAINER

#### REMOVAL/INSPECTION

- Drain the engine oil (page 3-17).
- Remove the left crankcase cover (page 11-4).
- Remove the oil strainer screen.



Check the oil strainer screen for damage or clogs.



#### INSTALLATION

- Install the oil strainer screen to the crankcase.
- Install the left crankcase cover (page 11-7).
- Fill the engine with the recommended engine oil (page 3-17).



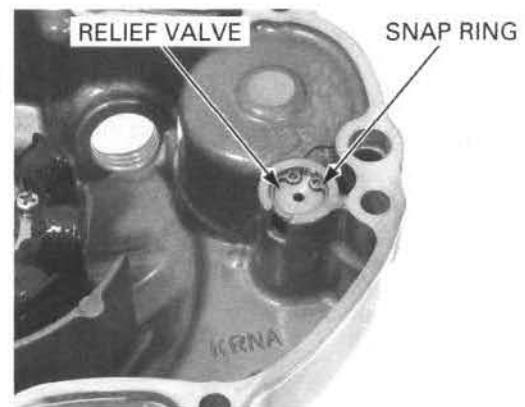
## PRESSURE RELIEF VALVE

### REMOVAL/INSPECTION

Drain the engine oil (page 3-17).

Remove the left crankcase cover (page 11-4).

Remove the snap ring and relief valve from the left crankcase cover.



Check the relief valve for damage or clogs.



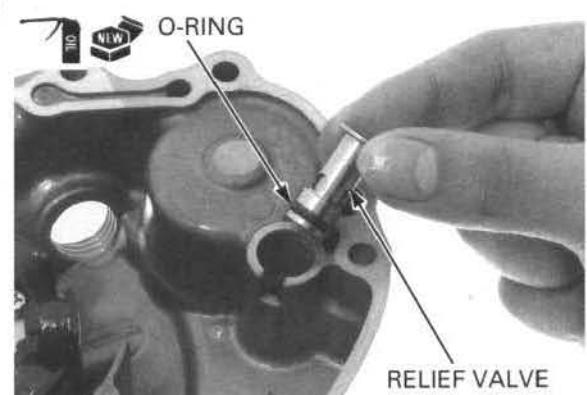
### INSTALLATION

Apply oil to a new O-ring and install it onto the relief valve.

Install the relief valve into the left crankcase cover.  
Install the snap ring securely.

Install the left crankcase cover (page 11-7).

Fill the engine with the recommended engine oil (page 3-19).



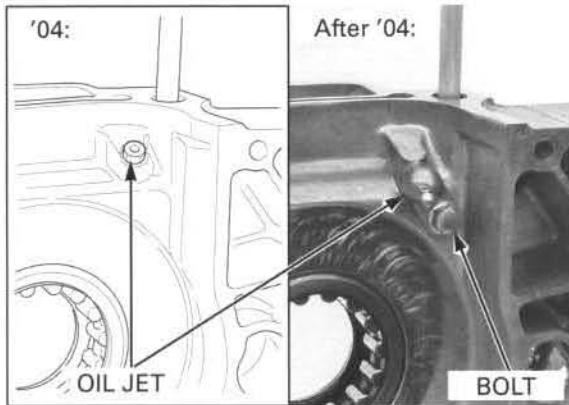
## LUBRICATION SYSTEM

### OIL JET

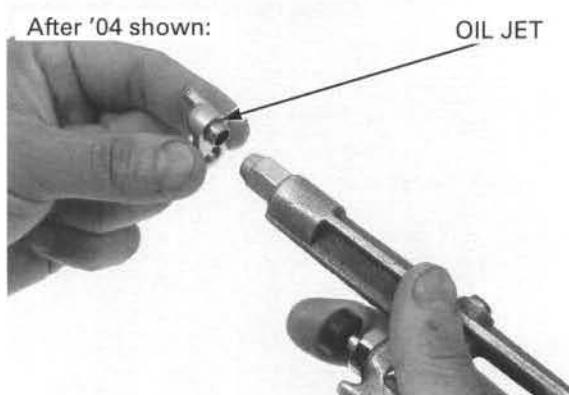
#### REMOVAL/INSPECTION

Separate the left and right crankcase halves (page 12-7).

- '04: Remove the oil jet from the left crankcase.
- After '04: Remove the bolt and oil jet from the left crankcase.  
Check the left crankcase oil passage for clogging.  
Clean the oil passage.



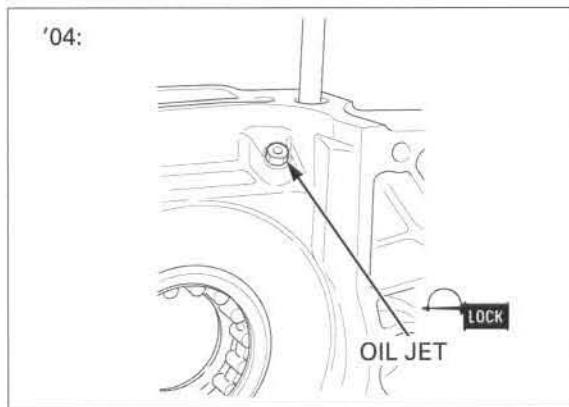
Check the oil jet for damage or clogging.  
Blow open the oil passage in the oil jet with compressed air.



#### INSTALLATION

- '04: Apply locking agent to the oil jet threads and tighten it to the specified torque.

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

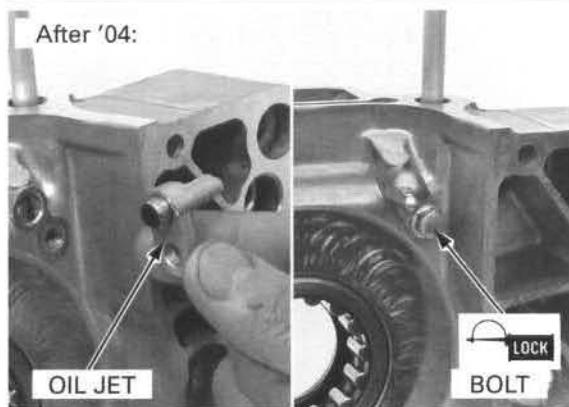


- After '04: Install the oil jet onto the left crankcase.

Apply locking agent to the oil jet mounting bolt threads and tighten it to the specified torque.

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

Assemble the left and right crankcase (page 12-21).



## OIL PUMP

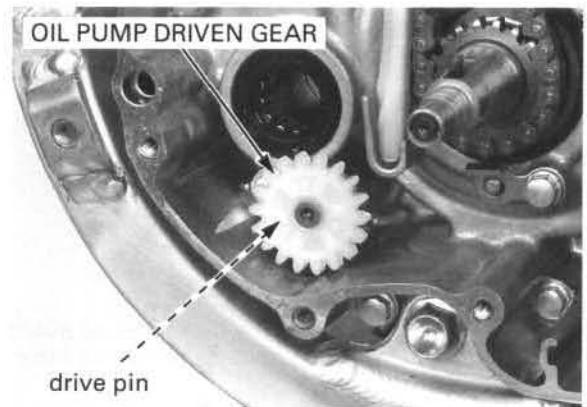
### DISASSEMBLY

Remove the following:

- Left crankcase cover (page 11-4)
- Flywheel (page 11-5)
- Balancer (page 12-6)

Remove the oil pump driven gear and drive pin.

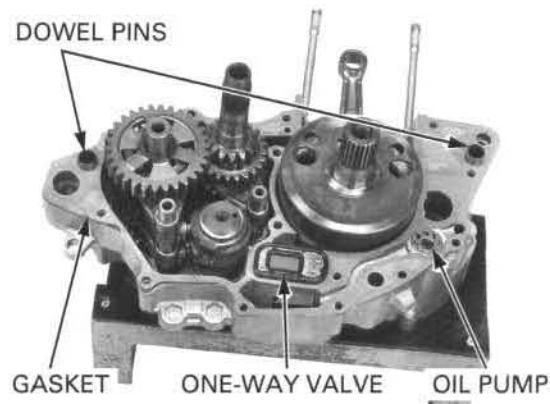
Remove the engine from the frame (page 7-5).  
Separate the left and right crankcase halves (page 12-7).



Remove the gasket and dowel pins.

Remove the oil pump inner/outer rotor and shaft.

Remove the one-way valve.



### INSPECTION

Check the oil pump driven gear for wear or damage.

Check the oil pump shaft for wear or damage.



Check the one-way valve for wear or damage, replace if necessary.

Check the reed valve for damage or fatigue, and replace the one-way valve if necessary.

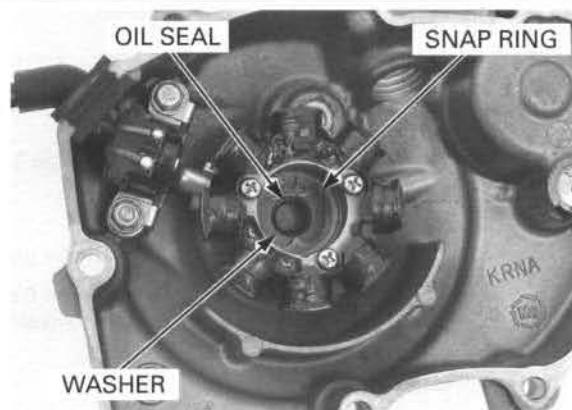


## LUBRICATION SYSTEM

Check the oil seal for damage or deterioration.

Replace the oil seal if necessary.

*After installing a snap ring, always rotate it in its groove to be sure it is fully seated.*

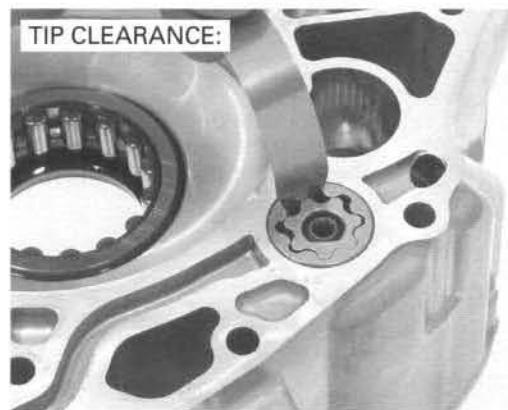


Temporarily install the oil pump shaft.

Install the outer and inner rotors into the crankcase.

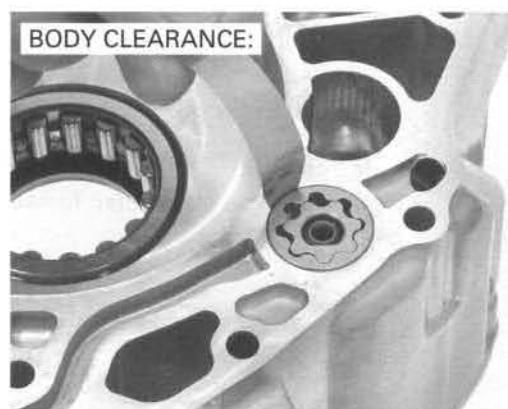
Measure the tip clearance.

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



Measure the body clearance.

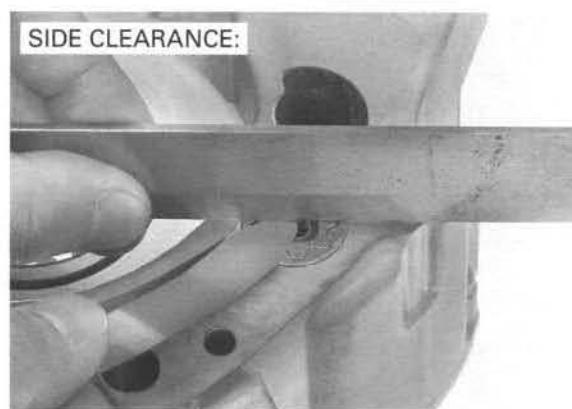
**STANDARD: 0.15 – 0.20 mm (0.006 – 0.008 in)**



*Measure the clearance with the gasket installed.*

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

**STANDARD: 0.05 – 0.12 mm (0.002 – 0.005 in)**



## ASSEMBLY

Coat the oil pump rotors with oil.  
Install the outer rotor and oil pump shaft into left crankcase.  
Install the inner rotor aligning the cut-out of the inner rotor with the cut-out of the oil pump shaft.  
Install the one-way valve onto the left crankcase as shown.

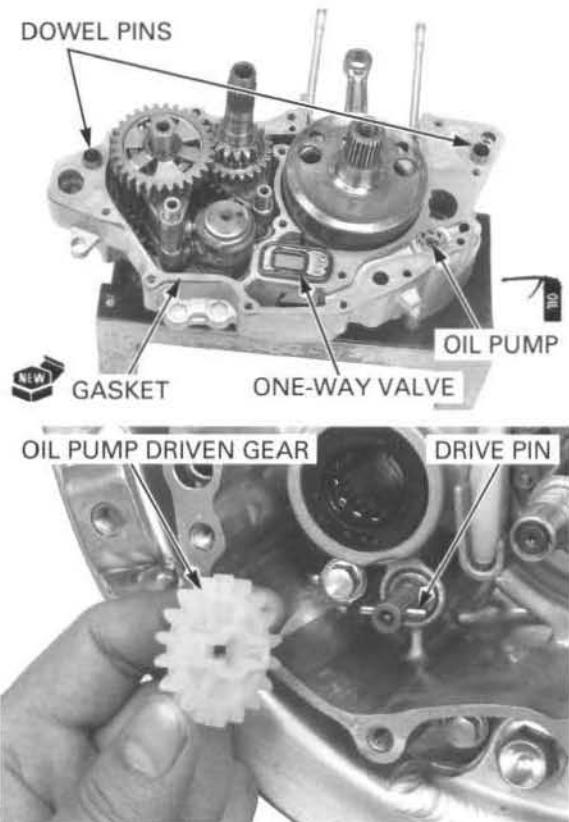
Install the new gasket and dowel pins.

Assemble the left and right crankcase (page 12-21).  
Install the engine to the frame (page 7-7).

Install the drive pin into the oil pump shaft.  
Install the oil pump driven gear aligning its cut-outs with the drive pin.

Install the following:

- Balancer (page 12-6)
- Flywheel (page 11-6)
- Left crankcase cover (page 11-7)



---

**MEMO**

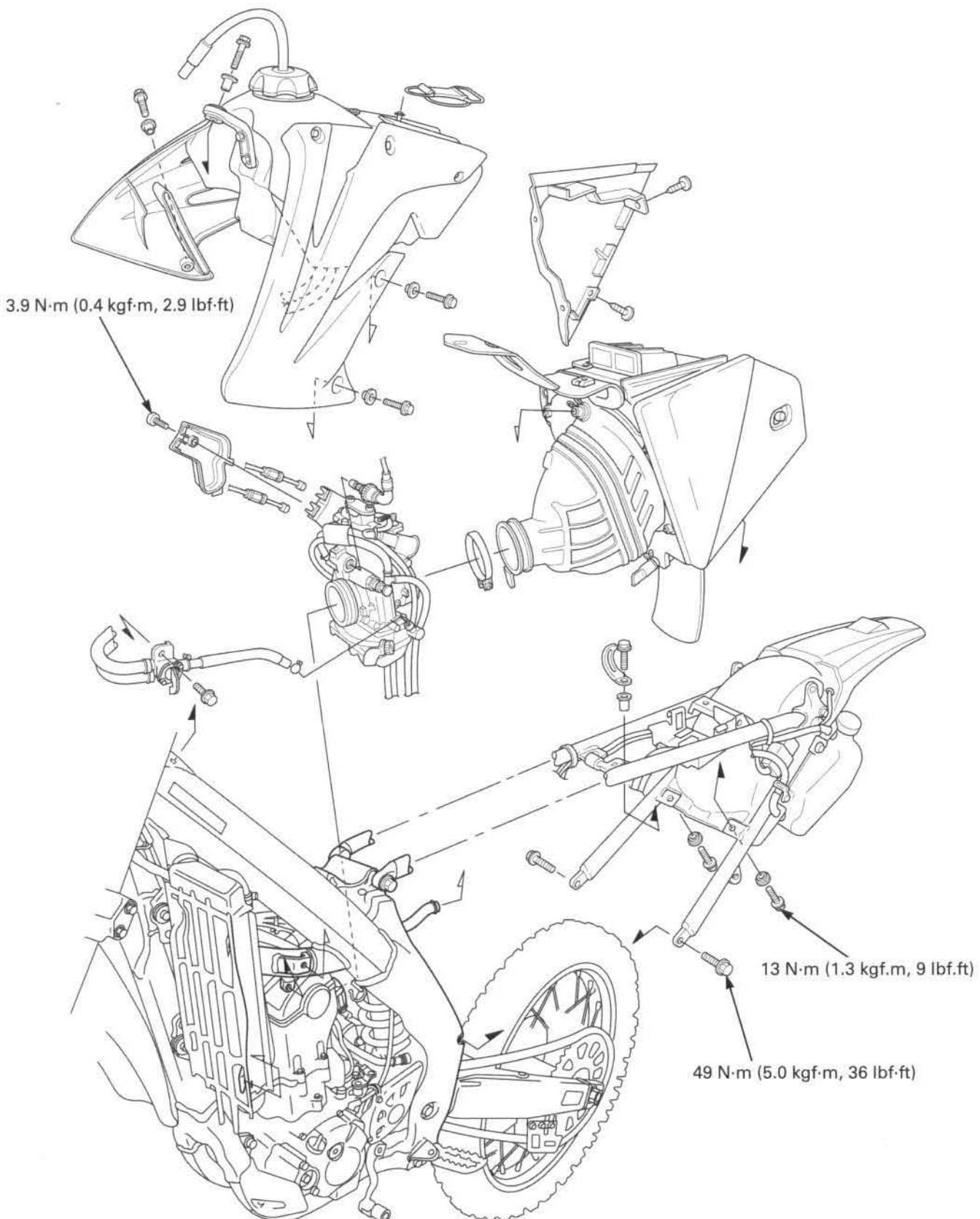


---

COMPONENT LOCATION .....	5-2
SERVICE INFORMATION .....	5-3
TROUBLESHOOTING .....	5-5
CARBURETOR ADJUSTMENT .....	5-6
AIR CLEANER HOUSING .....	5-7
CARBURETOR REMOVAL.....	5-11
CARBURETOR DISASSEMBLY.....	5-13
CARBURETOR ASSEMBLY .....	5-18
CARBURETOR INSTALLATION .....	5-24
THROTTLE POSITION SENSOR REPLACEMENT .....	5-26
PILOT SCREW ADJUSTMENT .....	5-27
HIGH ALTITUDE ADJUSTMENT (California type only) .....	5-29
SECONDARY AIR SUPPLY SYSTEM ('04 – '06 California type, After '06) .....	5-31

## FUEL SYSTEM

### COMPONENT LOCATION



## SERVICE INFORMATION

### GENERAL

- Bending or twisting the control cables will impair smooth operation and could cause the cable to stick or bind, resulting in loss of vehicle control.
- Refer to the fuel tank removal and Installation (page 2-7).
- 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.
- Before disassembling the carburetor, place an approved gasoline container under the carburetor drain plug, remove the drain plug and drain the carburetor.
- When disassembling the fuel system parts, note the locations of the O-rings. Replace them with new ones on reassembly.
- After removing the carburetor, wrap the intake port of the engine with a shop towel or cover it with a piece of tape to prevent any foreign material from dropping into the engine. Be sure to remove the cover when reinstalling the carburetor.
- If the vehicle is to be stored for more than one month, drain the float chamber. Fuel left in the float chamber may cause clogged jets resulting in hard starting or poor driveability.

### SPECIFICATIONS

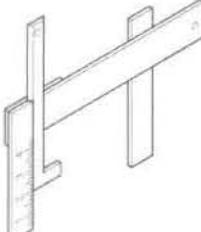
ITEM			SPECIFICATIONS
Fuel tank capacity			8.3 liter (2.20 US gal, 1.83 Imp gal)
Carburetor identification number	'04 – '06	49 State and Canada type	FCR02A
		California type	FCR03A
	After '06	49 State and Canada type	FCR02B
		California type	FCR03B
Main jet	'04 – '06		#130
	After '06	49 State and Canada type	#130
		California type	#132
Slow jet	'04 – '06		#40
	After '06		#42
Jet needle	'04 – '06	49 State and Canada type	NCVT
		California type	NCYU
	After '06	49 State and Canada type	NLAT
		California type	NLBU
Jet needle clip position (Standard)	'04 – '06	49 State and Canada type	3rd position from the top
		California type	2nd position from the top
	After '06	49 State and Canada type	–
		California type	2nd position from the top
Pilot screw initial opening	'04 – '06	49 State and Canada type	2-1/4 turns out
		California type	2 turns out
	After '06		2-1/4 turns out
Float level			8.0 mm (0.31 in)
Idle speed			1,700 ± 100 rpm
Throttle grip free play			3 – 5 mm (1/8 – 3/16 in)
Hot starter lever free play			2 – 3 mm (1/16 – 1/8 in)
PAIR control valve specified vacuum	'04 – '06 California type, After '06		56 kPa (420 mmHg)

## FUEL SYSTEM

### TORQUE VALUES

Rear fender mounting bolt	13 N·m (1.3 kgf·m, 9 lbf·ft)	
Sub-frame mounting bolt (upper) (lower)	30 N·m (3.1 kgf·m, 22 lbf·ft) 49 N·m (5.0 kgf·m, 36 lbf·ft) 44 N·m (4.5 kgf·m, 33 lbf·ft)	
Shock absorber upper mounting bolt	3.9 N·m (0.4 kgf·m, 2.9 lbf·ft)	U-nut
Throttle drum cover bolt	2.0 N·m (0.2 kgf·m, 1.4 lbf·ft)	
Needle jet	1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)	
Main jet	1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)	
Slow air jet	1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)	
Starter jet	1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)	
Slow jet	1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)	
Maintenance cover bolt	2.0 N·m (0.2 kgf·m, 1.4 lbf·ft)	
Top cover bolt	2.0 N·m (0.2 kgf·m, 1.4 lbf·ft)	
Float chamber screw	2.0 N·m (0.2 kgf·m, 1.4 lbf·ft)	
Carburetor drain plug	4.9 N·m (0.5 kgf·m, 3.6 lbf·ft)	
Choke valve lock nut	2.0 N·m (0.2 kgf·m, 1.4 lbf·ft)	
Throttle shaft screw ('04 – '06)	2.0 N·m (0.2 kgf·m, 1.4 lbf·ft)	
Throttle shaft torx screw (After '06)	2.0 N·m (0.2 kgf·m, 1.4 lbf·ft)	
Jet needle holder	2.0 N·m (0.2 kgf·m, 1.4 lbf·ft)	
Accelerator pump cover screw	2.0 N·m (0.2 kgf·m, 1.4 lbf·ft)	
Hot start valve cable nut	2.0 N·m (0.2 kgf·m, 1.4 lbf·ft)	
Throttle position sensor torx screw ('04 – '06)	3.9 N·m (0.4 kgf·m, 2.9 lbf·ft)	Apply locking agent to the threads
Throttle position sensor bolt (After '06)	3.9 N·m (0.4 kgf·m, 2.9 lbf·ft)	Apply locking agent to the threads
Acc. pump bypass jet	0.3 N·m (0.03 kgf·m, 0.2 lbf·ft)	
PAIR control valve mounting nut ('04 – '06 California type, After '06)	13 N·m (1.3 kgf·m, 9 lbf·ft)	
Air supply pipe mounting bolt ('04 – '06 California type, After '06)	9.8 N·m (1.0 kgf·m, 7 lbf·ft)	
Throttle cable lower adjuster lock nut (After '06)	3.9 N·m (0.4 kgf·m, 2.9 lbf·ft)	

### TOOL

Carburetor float level gauge 07401-0010000	Pilot screw wrench ('04 – '06) 07908-4730002	Pilot screw wrench (After '06) 07KMA-MS60102
		 and 07PMA-MZ20110 or 07KMA-MN9A100 (U.S.A. only)
Pilot screw elbow guide (After '06) 07PMA-MZ20110	 not available in U.S.A.	

## TROUBLESHOOTING

### Engine will not start

- Too much fuel getting to the engine
  - Air cleaner clogged
  - Flooded carburetor
- Intake air leak
- Fuel contaminated/deteriorated
- No fuel to carburetor
  - Fuel filter clogged
  - Fuel line clogged
  - Fuel valve stuck
  - Float level misadjusted
  - Fuel tank breather hose clogged
- Slow circuit clogged
- No spark at plug (faulty spark plug or ignition system malfunction)

### Lean mixture

- Fuel jets clogged
- Fuel tank breather hose clogged
- Fuel filter clogged
- Fuel hose restricted
- Float valve faulty
- Float level too low
- Air vent hose clogged
- Intake air leak
- Jetting incorrect for altitude/temperature conditions

### Misfiring during acceleration

- Ignition system faulty
- Lean mixture

### Afterburn during acceleration

- Ignition system faulty
- Lean mixture
- Accelerator pump faulty

### Rich mixture

- Choke valve in the "ON" position
- Float valve faulty
- Float level too high
- Air jets clogged
- Air cleaner element contaminated
- Flooded carburetor
- Jetting incorrect for altitude/temperature conditions

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

- Fuel line restricted
- Ignition system malfunction
- Low cylinder compression
- Fuel mixture too lean/rich
- Fuel contaminated/deteriorated
- Intake air leak
- Float level misadjusted
- Fuel tank breather hose clogged
- Pilot screw misadjusted
- Slow circuit or starting enrichment circuit clogged
- Idle speed misadjusted
- Air cleaner clogged

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

- Fuel system clogged
- Ignition system faulty
- Air cleaner clogged

### Afterfiring

- Ignition system malfunction
- Carburetor malfunction
- Lean mixture
- Rich mixture

## FUEL SYSTEM

# CARBURETOR ADJUSTMENT

## IDLE MIXTURE AND IDLE SPEED

### STANDARD SETTING:

FLOAT LEVEL: 8.0 mm (0.31 in)

### PILOT SCREW INITIAL OPENING:

'04 - '06:

49 State and Canada type: 2-1/4 turns out

California type: 2 turns out

After '06:

2-1/4 turns out

### SLOW JET:

'04 - '06:

#40

After '06:

#42

### MAIN JET:

'04 - '06:

#130

After '06:

49 State and Canada type: #130

California type: #132

### JET NEEDLE:

'04 - '06:

49 State and Canada type: NCVT

California type: NCYU

After '06:

49 State and Canada type: NLAT

California type: NLBU

### JET NEEDLE CLIP POSITION:

'04 - '06:

49 State and Canada type: 3rd position from  
the top

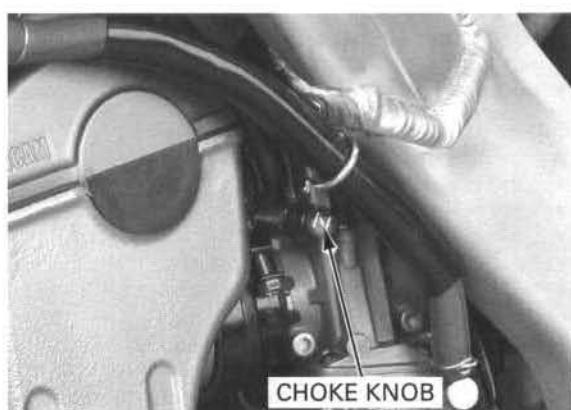
California type: 2nd position from  
the top

After '06:

49 State and Canada type: no position

California type: 2nd position from  
the top

1. When the engine is warm enough to run without the choke, push the choke knob in to its off position.



2. Turn the throttle stop screw to obtain the smoothest idle:

- To decrease idle speed, turn the throttle stop screw counterclockwise.
- To increase idle speed, turn the throttle stop screw clockwise.



THROTTLE STOP SCREW

3. Adjust the pilot screw to obtain the best off-idle performance.

**TOOL:****Pilot screw wrench**

'04 – '06: 07908-4730002

After '06: 07KMA-MN90101 and

07PMA-MZ20110 or

07KMA-MN9-A100 (U.S.A only)

- If the engine runs rich exiting a corner, turn the pilot screw clockwise to lean the mixture.
- If the engine runs lean exiting a corner, turn the pilot screw counterclockwise to richen the mixture.



PILOT SCREW

## AIR CLEANER HOUSING

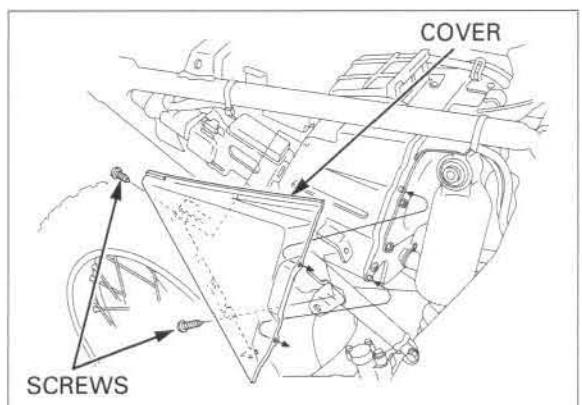
### REMOVAL

Remove the following:

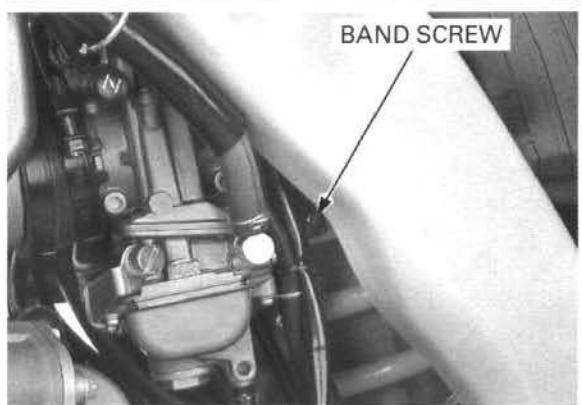
- Seat (page 2-3)
- Fuel tank (page 2-7)
- Side covers (page 2-3)
- Muffler (page 2-8)
- Battery (page 16-6)

Support the motorcycle using a workstand or equivalent under the engine.

Remove the screws and right air cleaner housing cover.



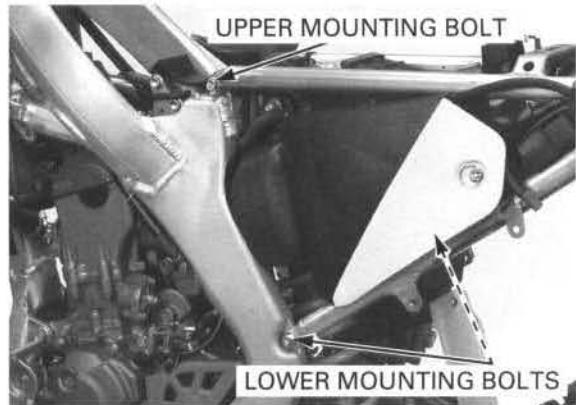
Loosen the air cleaner connecting boot band screw.



BAND SCREW

## FUEL SYSTEM

Remove the lower mounting bolts and loosen the upper mounting bolt.



*Be careful not to damage the mud guard, hoses and cables.*

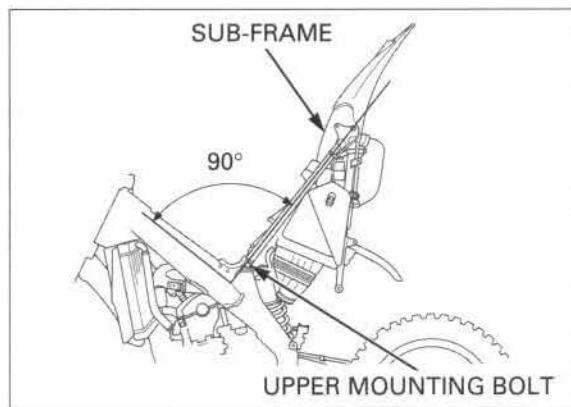
Lift up the sub-frame as shown.

### NOTICE

*Do not lift up the sub-frame over 90° to avoid damaging the wire harness.*

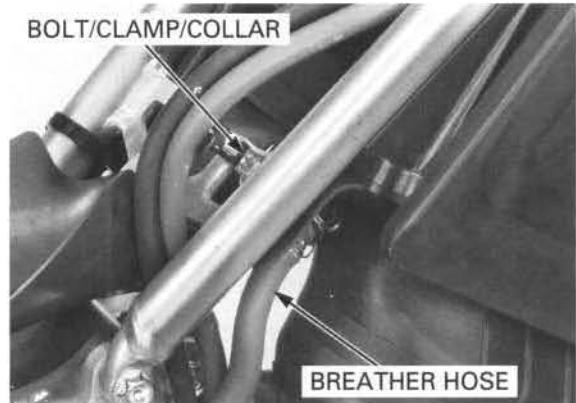
Tighten the sub-frame upper mounting bolt to the specified torque.

**TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)**



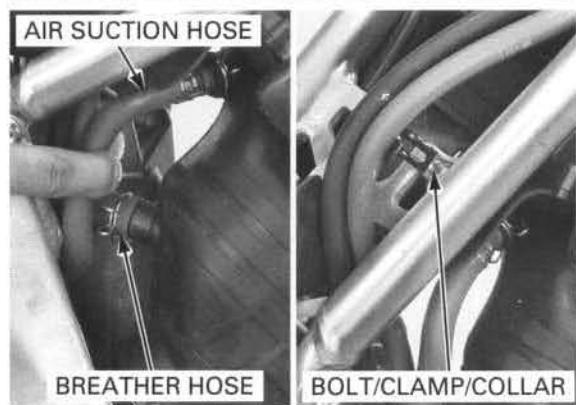
'04 - '06 49 states: Disconnect the breather hose.

and Canada type: Remove the bolt, clamp and collar.

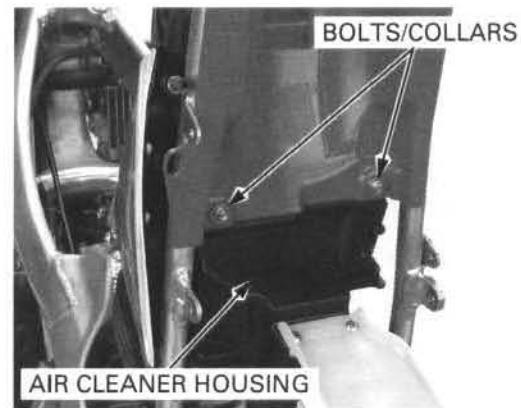


'04 - '06 California type, After '06: Disconnect the breather hose and air suction hose.

Remove the bolt, clamp and collar.



Remove the bolts, collars and air cleaner housing.



Remove the screws and mud guard.

Check the carburetor connecting boot is sealed properly at the air cleaner housing.  
Check the air cleaner housing for damage.

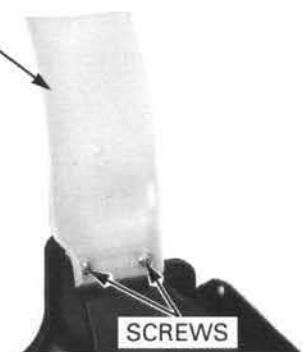
Remove the carburetor connecting boot from the air cleaner housing and seal thoroughly if any sign of inadequate sealing is detected.

*Apply sealing agent all the way around the connecting surface of the air cleaner housing.*

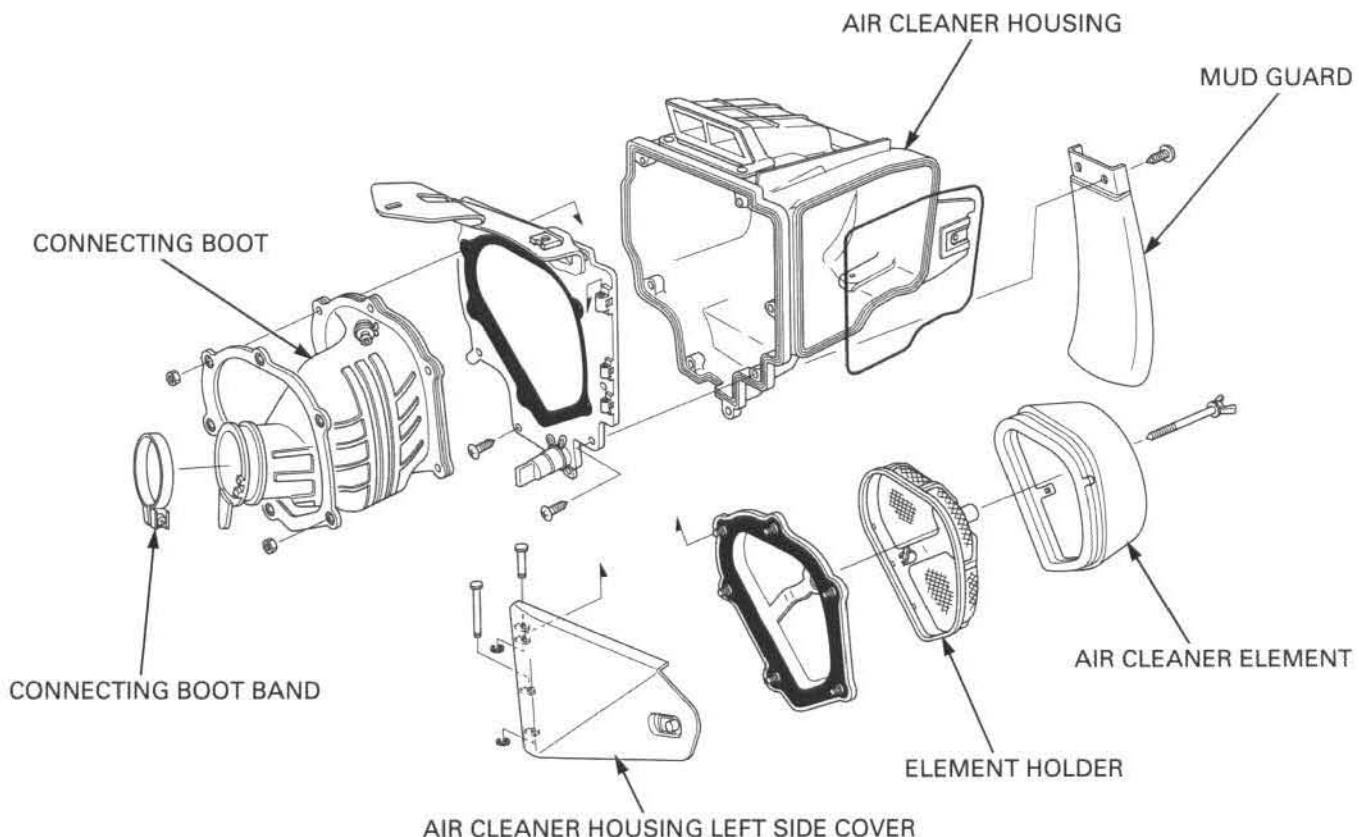
Install the removed parts in the reverse order of removal.

MUD GUARD

AIR CLEANER HOUSING



## INSTALLATION



: Apply Honda Bond A or Honda Handgrip Cement or equivalent

## FUEL SYSTEM

Lift the sub-frame.

Tighten the sub-frame upper mounting bolt to the specified torque.

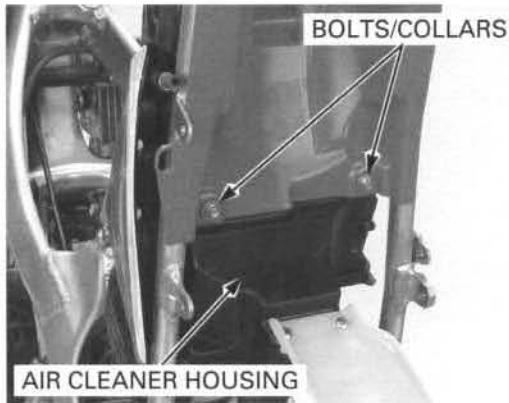
**TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)**

*Route the wires and hoses properly (page 1-23). Be careful not to damage the wires and hoses.*

Install the air cleaner housing, collars and bolts.

Tighten the rear fender mounting bolts to the specified torque.

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

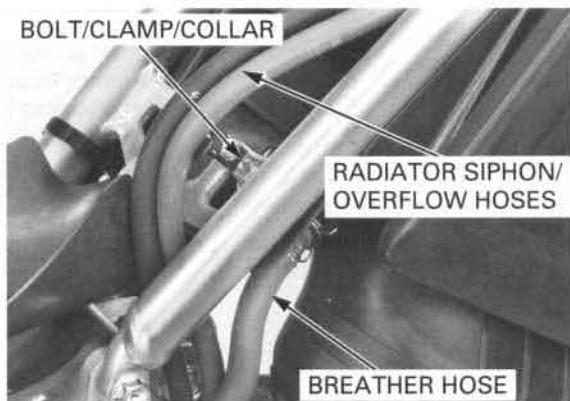


*'04 – '06 49 states and Canada type:*

Install the collar, clamp and bolt.

Clamp the radiator siphon and overflow hoses securely.

Connect the breather hose.

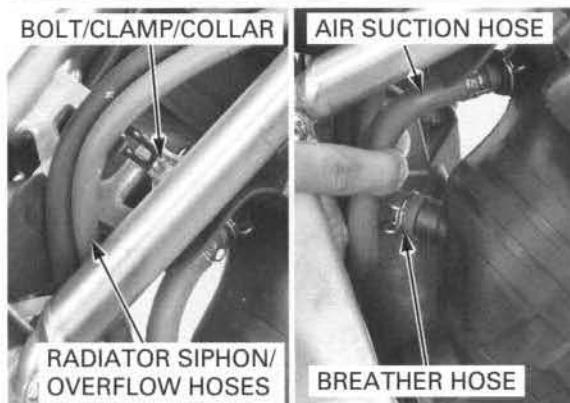


*'04 – '06 California type, After '06:*

Install the collar, clamp and bolt.

Clamp the radiator siphon and overflow hoses securely.

Connect the breather hose and air suction hose.



*Route the wires and hoses properly (page 1-23). Be careful not to damage the wires and hoses.*

Loosen the sub-frame upper mounting bolt, then lower the sub-frame.

Install the air cleaner connecting boot securely.

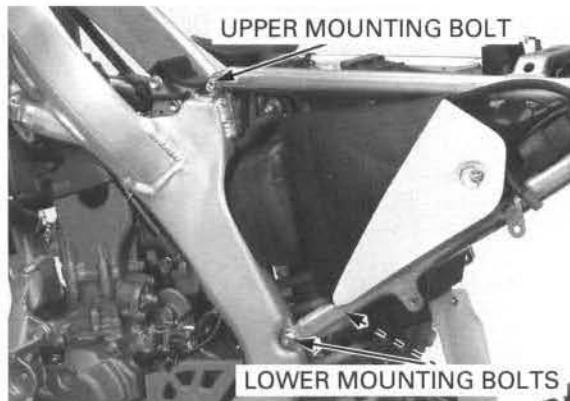
Install the sub-frame lower mounting bolts.

Tighten the sub-frame upper mounting bolt first, then tighten the lower mounting bolts to the specified torque.

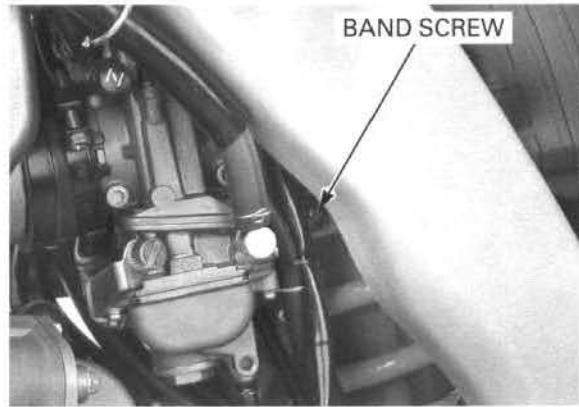
**TORQUE:**

Upper: 30 N·m (3.1 kgf·m, 22 lbf·ft)

Lower: 49 N·m (5.0 kgf·m, 36 lbf·ft)



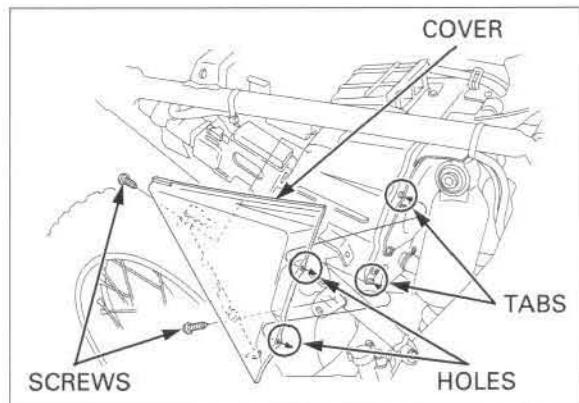
Tighten the air cleaner connecting boot band screw securely.



Install the right air cleaner housing right cover by aligning its holes with the tabs on the air cleaner housing.

Install the following:

- Battery (page 16-6)
- Muffler (page 2-10)
- Side covers (page 2-3)
- Fuel tank (page 2-7)
- Seat (page 2-3)



## CARBURETOR REMOVAL

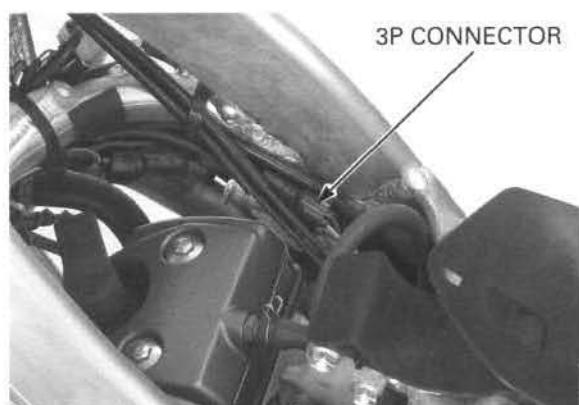
Lift up the sub-frame (page 5-7).

Remove the shock absorber upper mounting nut and bolt.

Pull back the shock absorber.



Disconnect the throttle position sensor 3P connector.



## FUEL SYSTEM

Turn the handlebar to the right fully.

Loosen the carburetor insulator band screw and remove the carburetor from the insulator.

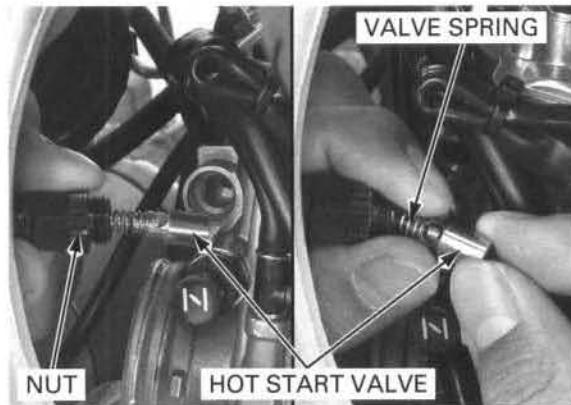


Loosen the hot start cable nut and remove the hot start valve from the carburetor.

Disconnect the hot start cable end from the hot start valve and remove the valve spring.

Check the hot starter valve for nicks, grooves or other damage.

Check the hot start valve seat for wear.

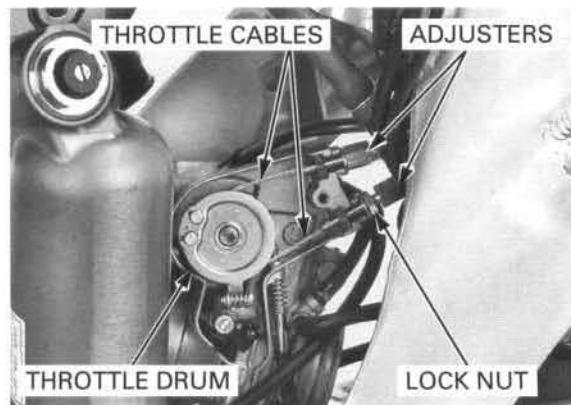


Remove the bolt and throttle drum cover.



Loosen the lock nut, adjusters and disconnect the throttle cables from the throttle drum.

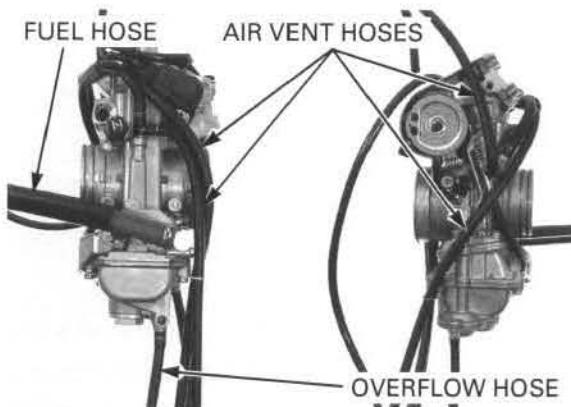
Remove the carburetor to the rearward from the frame.



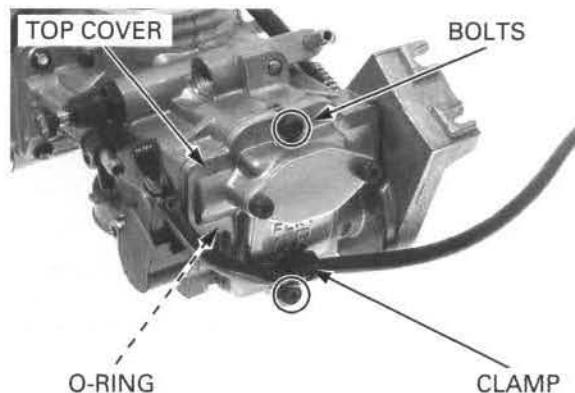
## CARBURETOR DISASSEMBLY

### JET NEEDLE/THROTTLE VALVE

Disconnect the fuel, air vent and overflow hoses.



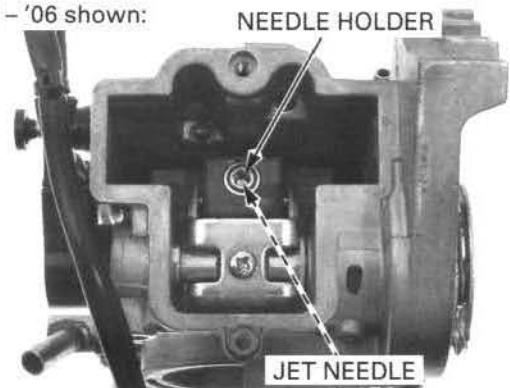
Remove the bolts, clamp, top cover and O-ring.



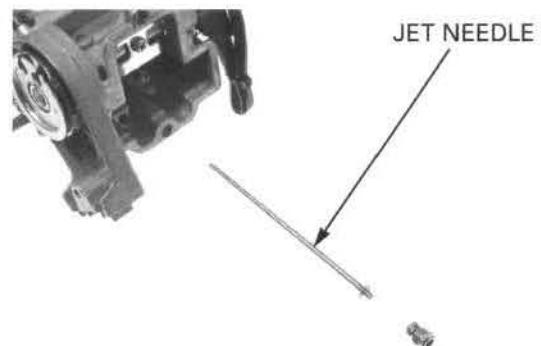
'04 - '06: Remove the needle holder and jet needle.

After '06: Remove the jet needle/holder assembly.

'04 - '06 shown:



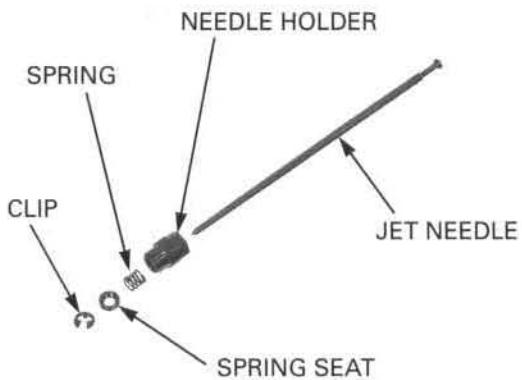
'04 - '06: Check the jet needle for wear, nicks or other damage.



## FUEL SYSTEM

After '06: Remove the jet needle clip, spring seat, spring and jet needle from the needle holder.

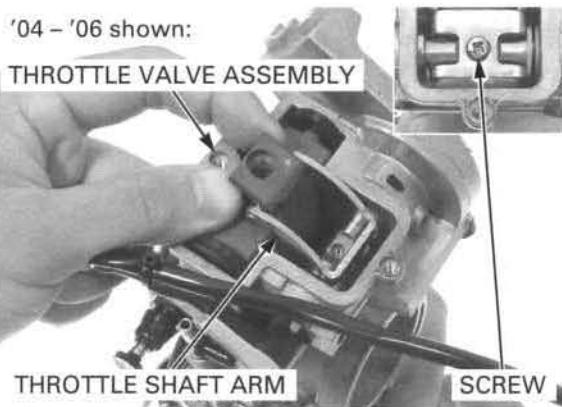
Check the jet needle for wear, nicks or other damage.



'04 - '06: Remove the throttle shaft screw.

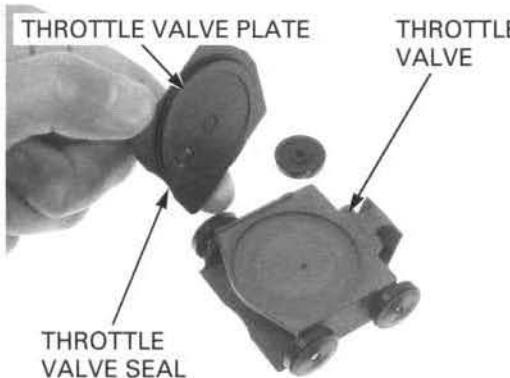
After '06: Remove the throttle shaft torx screw.

Lift up the throttle shaft arm and remove the throttle valve assembly.



Remove the throttle valve plate from the throttle valve.

Check the throttle valve, throttle valve seal and throttle valve plate for scratches, wear or damage. Replace the parts if necessary.



## CHOKE KNOB/THROTTLE POSITION SENSOR

Unscrew the lock nut and remove the choke knob.



Check the valve for damage or stepped wear.



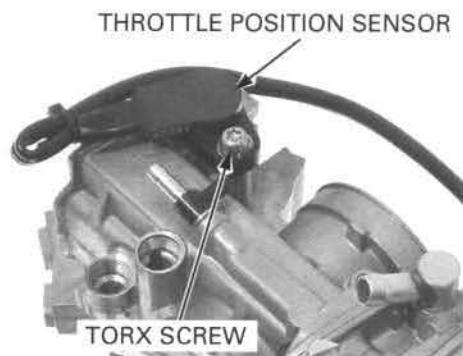
VALVE

'04 – '06: Remove the torx screw and throttle position sensor.

After '06: Remove the bolt and throttle position sensor.

*When removing the throttle position sensor, mark the sensor position ensure that it reinstalled in the original location.*

'04 – '06 shown:

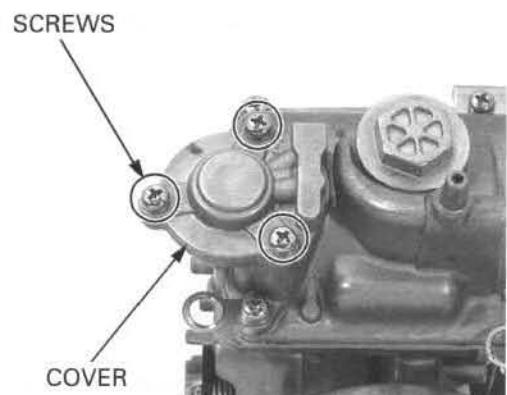


## ACCELERATOR PUMP/FLOAT/JETS

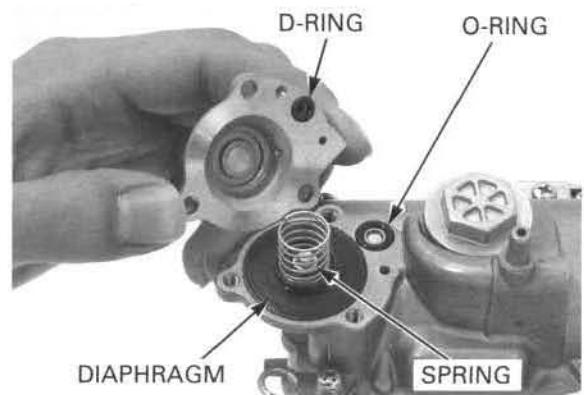
Remove the screws and accelerator pump cover.

### NOTE:

- The accelerator pump cover is under spring pressure.
- Do not lose the screws and O-ring.



Remove the spring, diaphragm, D-ring and O-ring.

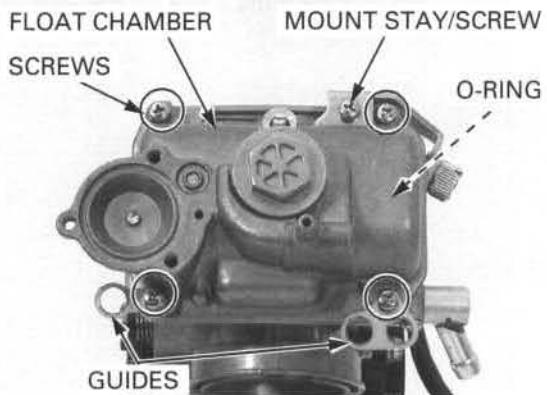


## FUEL SYSTEM

Remove the screw and throttle stop screw mount stay.

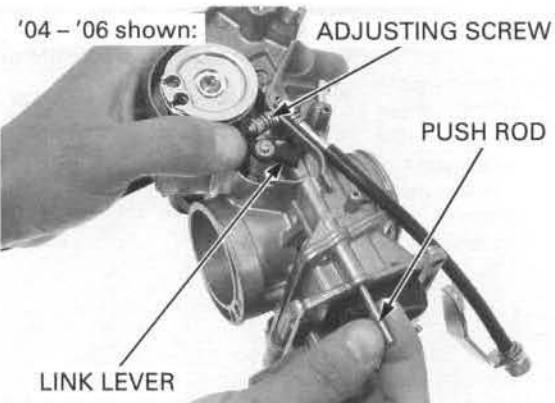
Remove the four screws, hose guides, and float chamber.

Remove the O-ring from the float chamber.



*The push rod link lever adjusting screw is factory pre-set. Adjustment and disassembly are not necessary.*

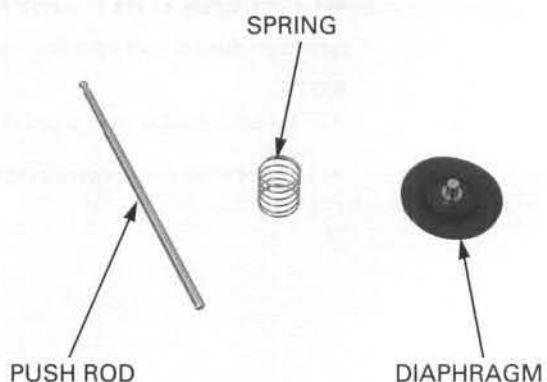
Pull out the push rod while pushing the push rod link lever.



Check the diaphragm for deterioration or pin hole.

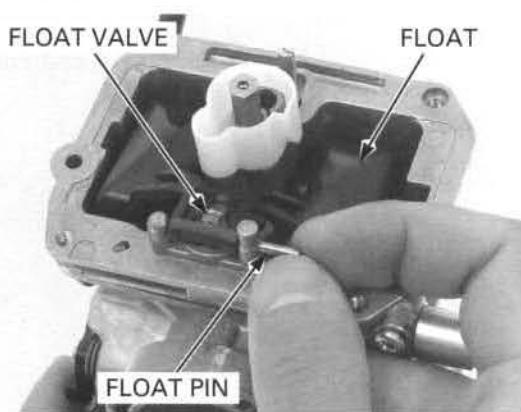
Check the spring for damage or fatigue.

Check the push rod for wear, bent or damage.



Remove the float pin, float and float valve.

Check the float for damage or fuel in the float.



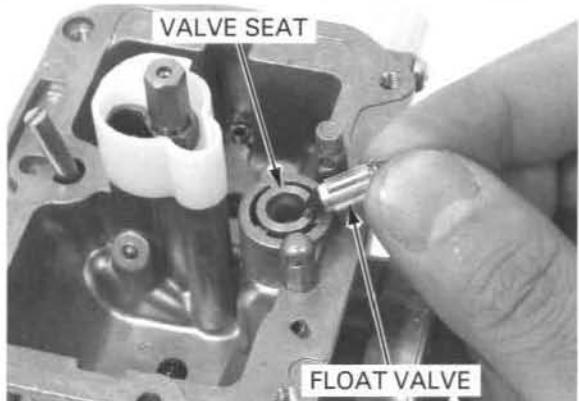
Check the float valve and valve seat for scoring, scratches, clogs or damage.

*A worn or contaminated float valve will not seat properly and will eventually flood the carburetor.*

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

Check the valve seat for wear or damage.

Replace or clean the parts if necessary.



Remove the following:

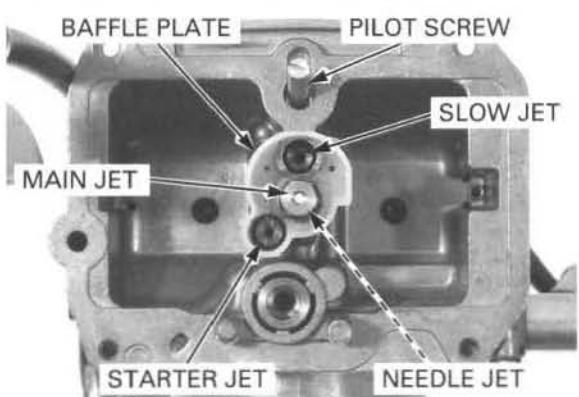
- Main jet
- Needle jet
- Baffle plate
- Starter jet
- Slow jet

Before removing the pilot screw, turn it in, counting the number of turns until it seats lightly so you can return the pilot screw to its original position when reassembling.

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

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

Remove the slow air jet.



Remove the acc. pump bypass jet from the float chamber.

Blow open the acc. pump bypass jet with compressed air.

Check the acc. pump bypass jet for clogs or damage.



## FUEL SYSTEM

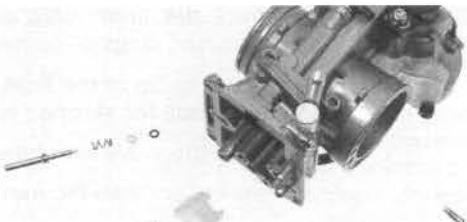
Blow open all jets with compressed air.

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

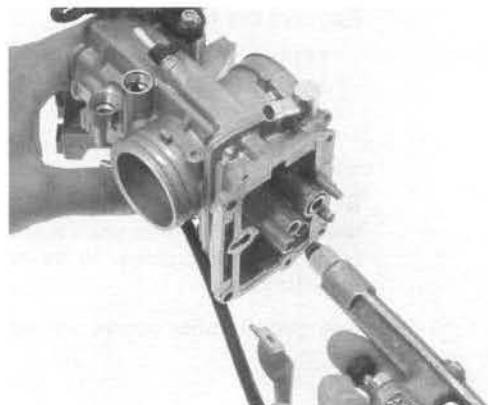
Check the pilot screw for stepped wear or damage.

Check the spring for fatigue or damage.

Replace these parts if necessary.

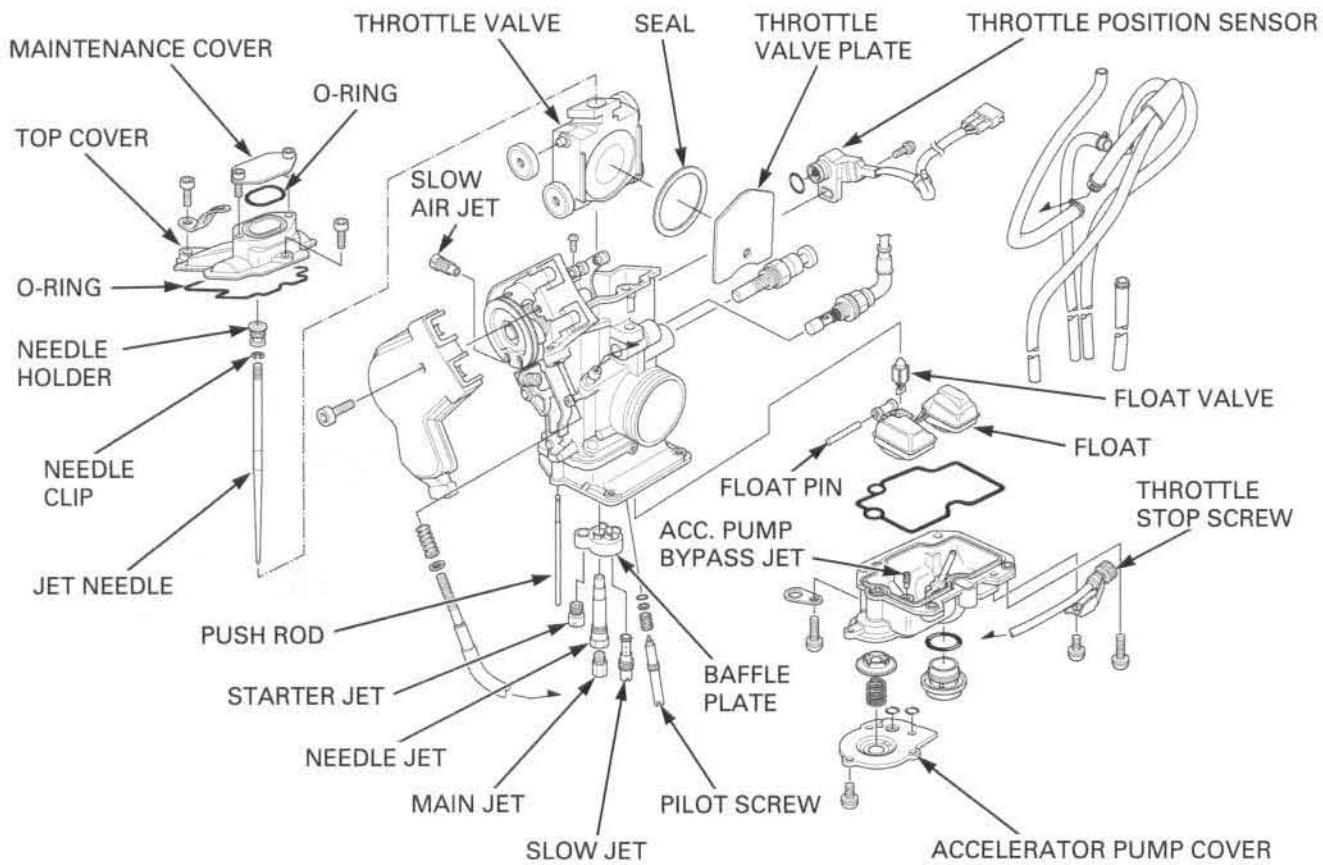


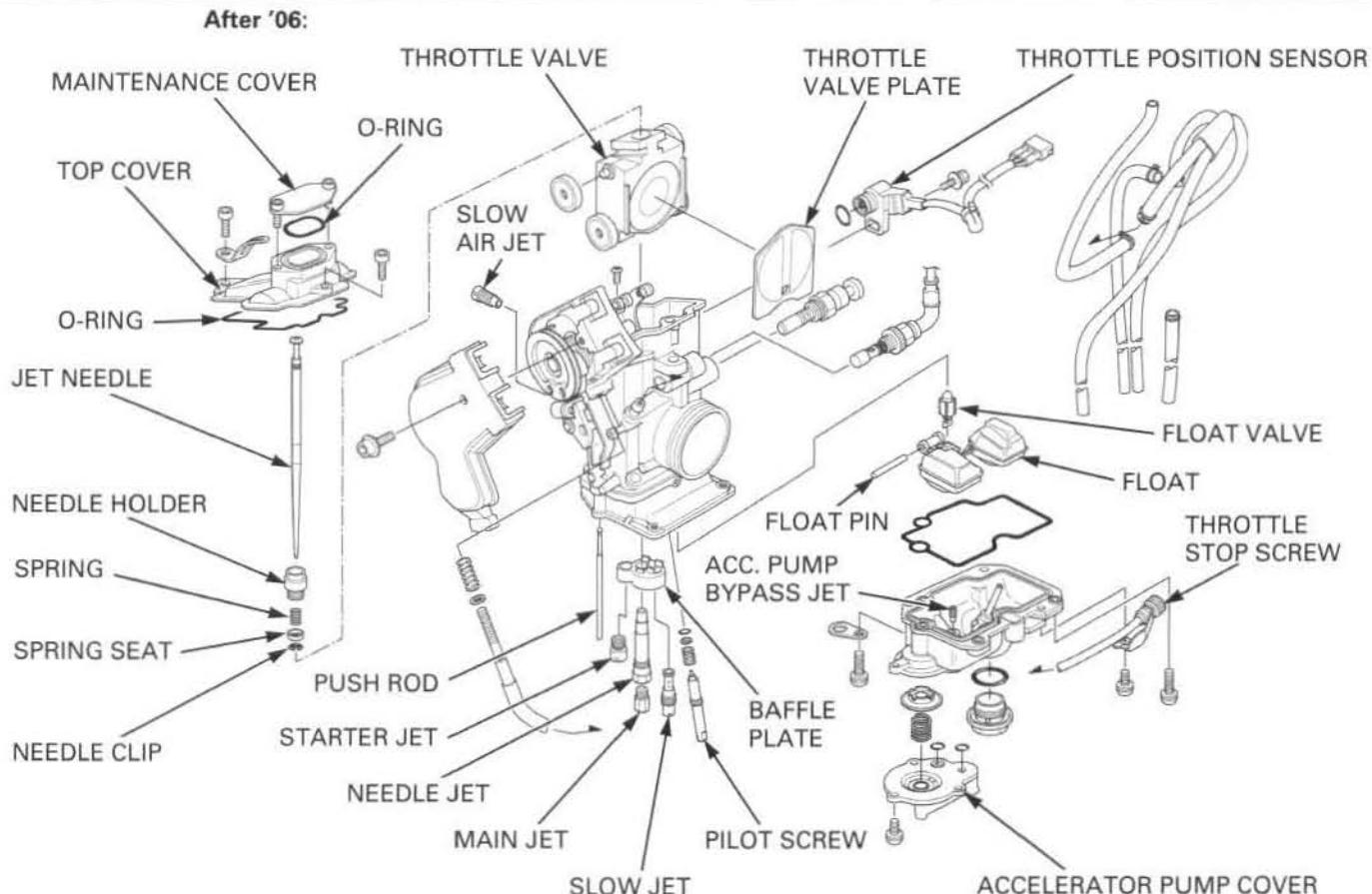
Blow open all carburetor body openings with compressed air.



## CARBURETOR ASSEMBLY

'04 - '06:





*Install the throttle position sensor to its original position as marked during removal.*

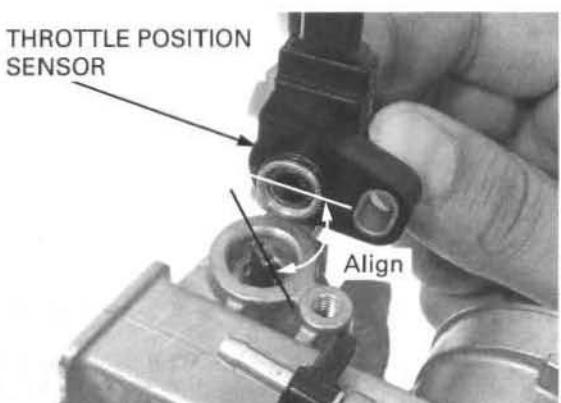
'04 - '06: Apply locking agent to the torx screw threads. Tighten the torx screw to the specified torque.

**TORQUE: 3.9 N·m (0.4 kgf·m, 2.9 lbf·ft)**

After '06: Apply locking agent to a new bolt threads. Tighten the bolt to the specified torque.

**TORQUE: 3.9 N·m (0.4 kgf·m, 2.9 lbf·ft)**

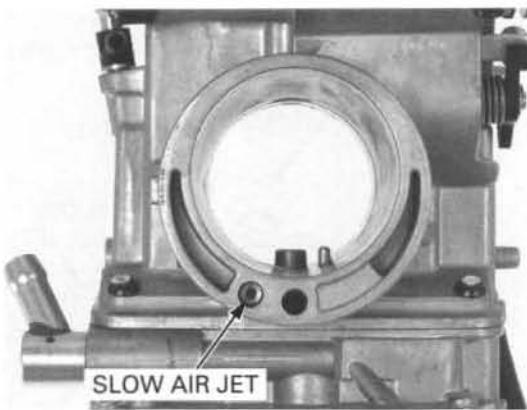
- The throttle position sensor is factory pre-set and no adjustment is necessary unless the throttle position sensor is replaced.
- For sensor inspection, refer to page 17-9.
- For sensor replacement, refer to page 5-26.



## FUEL SYSTEM

Install and tighten the slow air jet to the specified torque.

**TORQUE:** 1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)



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

Perform pilot screw adjustment if a new pilot screw is installed (page 5-27).

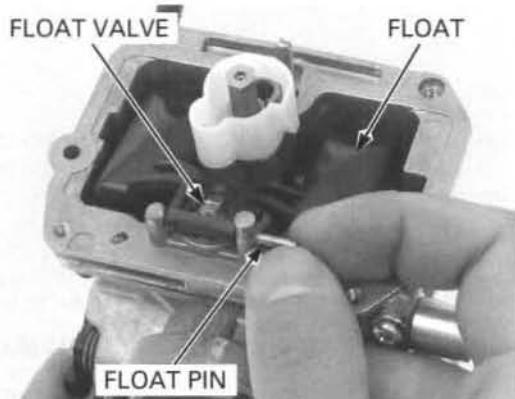
- Install the pilot screw and return it to its original position as noted during removal.

Install the slow jet, starter jet, baffle plate, needle jet and main jet.

### TORQUE:

Slow jet: 1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)  
Starter jet: 1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)  
Needle jet: 2.0 N·m (0.2 kgf·m, 1.4 lbf·ft)  
Main jet: 1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)

Install the float valve, float and float pin.



Check the float level after checking the float valve and float.

Set the float level gauge so it is perpendicular to the float chamber face and in-line with the main jet.

Set the carburetor so the float valve just contacts the float arm lip. Make sure the float valve tip is securely in contact with the valve seat.

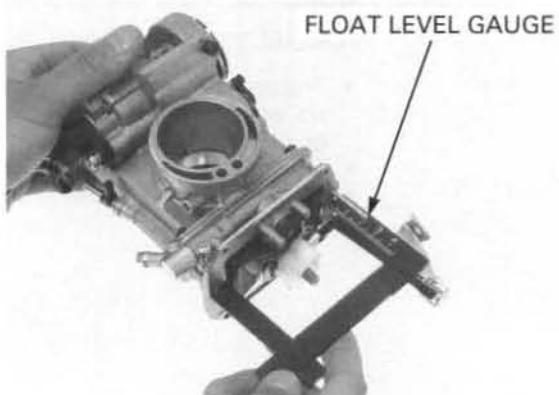
Make sure the float is level with the float level gauge.

### TOOL:

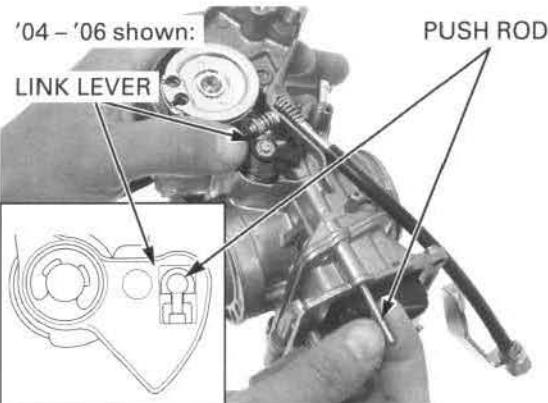
Carburetor float level gauge 07401-0010000

**FLOAT LEVEL:** 8.0 mm (0.31 in)

If the float level is out of specification, adjust it by bending the lip.



Install the push rod while pushing the push rod link lever.

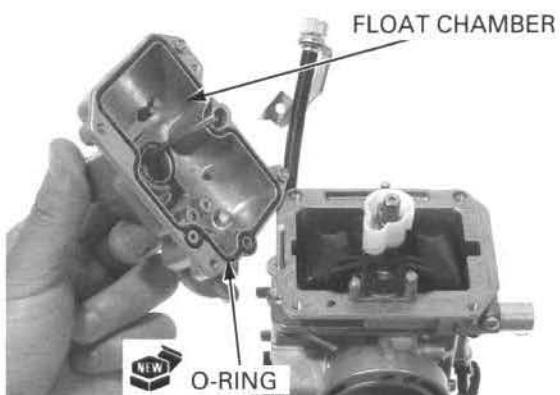


Tighten the acc. pump bypass jet into the float chamber.

**TORQUE: 0.3 N·m (0.03 kgf·m, 0.2 lbf·ft)**



Install a new O-ring to the float chamber.  
Install the float chamber to the carburetor.

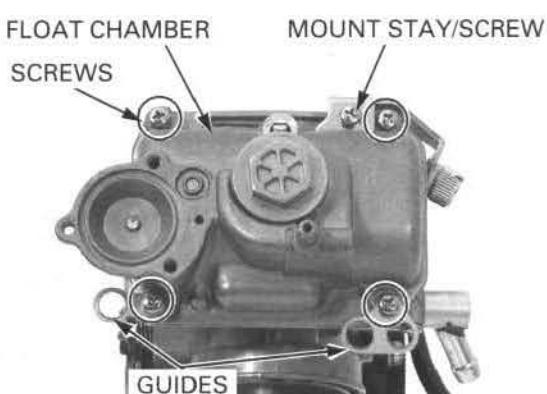


Install the hose guides and four float chamber screws.

Tighten the screws to the specified torque.

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

Install the throttle stop screw mount stay and tighten the screw securely.

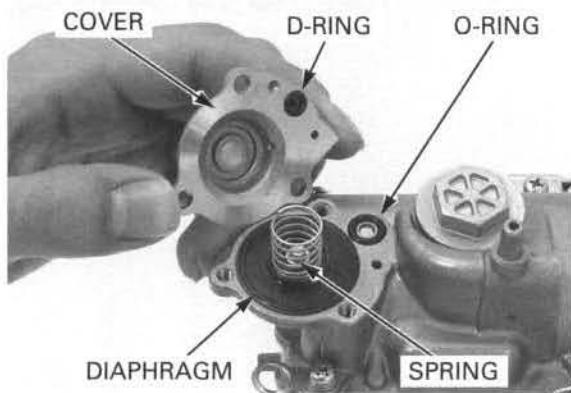


## FUEL SYSTEM

Install the D-ring with the flat facing the cover.  
Install the diaphragm, spring, O-ring and accelerator pump cover.

Install and tighten the three screws to the specified torque.

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

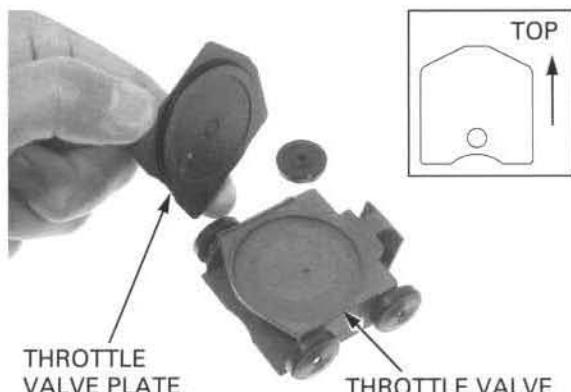


Install the choke knob and tighten the lock nut to the specified torque.

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



*Note the installation direction of the throttle valve plate:* Assemble the throttle valve plate on the throttle valve.



Install the throttle valve assembly into the carburetor with the valve plate facing towards the engine side.

- Make sure the throttle valve moves smoothly.

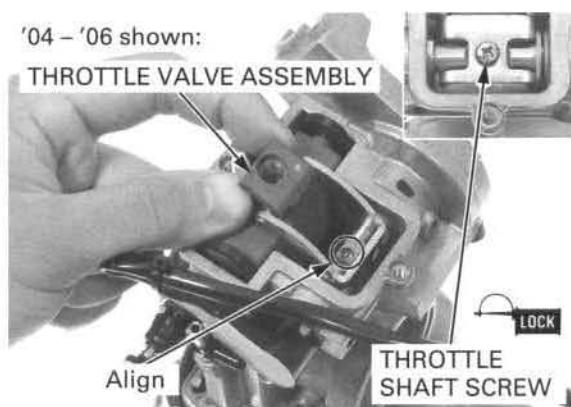
Align the holes in the throttle shaft arm and throttle shaft.

'04 - '06: Apply a locking agent to the screw threads.  
Install and tighten the throttle shaft screw.

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

After '06: Apply a locking agent to the torx screw threads.  
Install and tighten the throttle shaft torx screw.

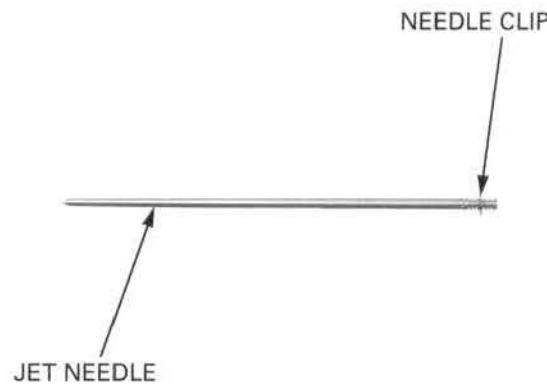
**TORQUE: 2.0 N·m (0.2 kgf·m, 1.4 lbf·ft)**



'04 - '06: Install the clip to the jet needle groove.

**STANDARD CLIP POSITION:**

49 State and Canada type:	3rd position
California type:	2nd position

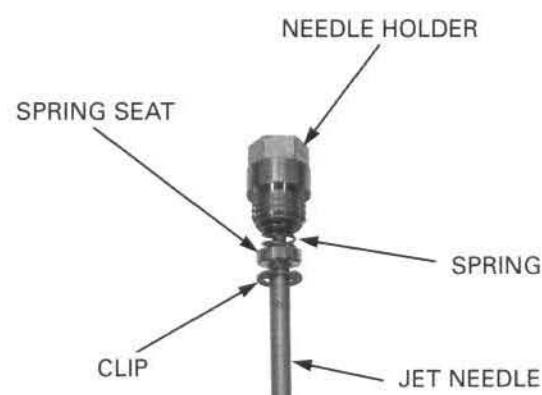


After '06: Install the jet needle, spring, spring seat to the needle holder.

Install the jet needle clip to the jet needle.

**STANDARD CLIP POSITION:**

49 State and Canada type:	no position
California type:	2nd position



'04 - '06: Install the jet needle and jet needle holder into the throttle valve.

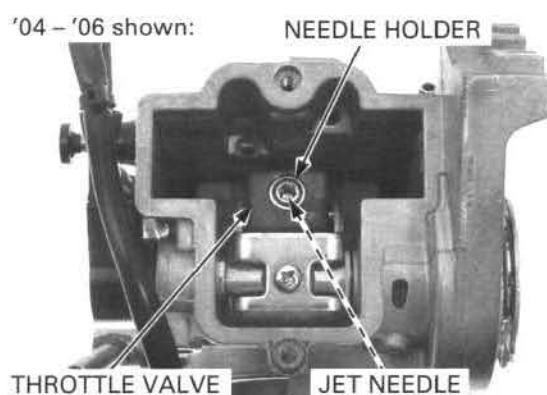
Tighten the needle holder to the specified torque.

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

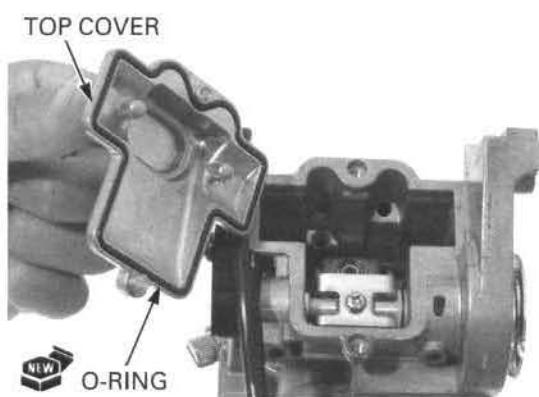
After '06: Install the jet needle/holder assembly into the throttle valve.

Tighten the jet needle/holder assembly to the specified torque.

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



Install a new O-ring and top cover.

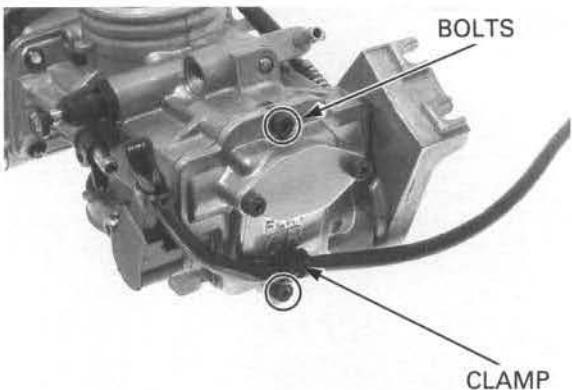


## FUEL SYSTEM

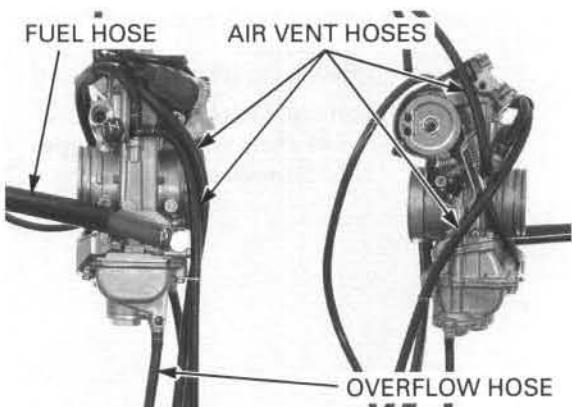
Install the clamp and bolts.  
Tighten the bolts to the specified torque.

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

Clamp the throttle position sensor wire as shown.



*Route the hoses* Connect the overflow, air vent and fuel hoses properly (page 1-23).



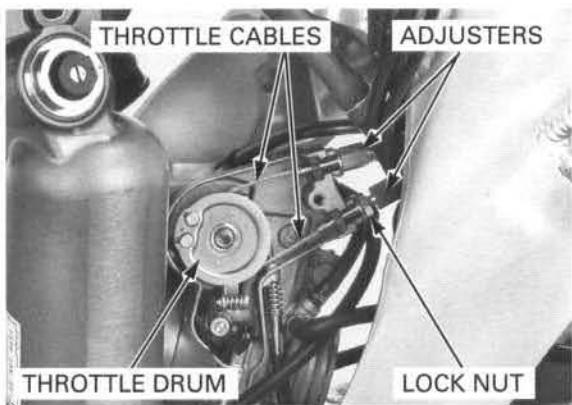
## CARBURETOR INSTALLATION

Connect the throttle cables to the throttle drum.  
Set the cables into the carburetor body grooves as shown.

Tighten the lock nut.

**TORQUE:**

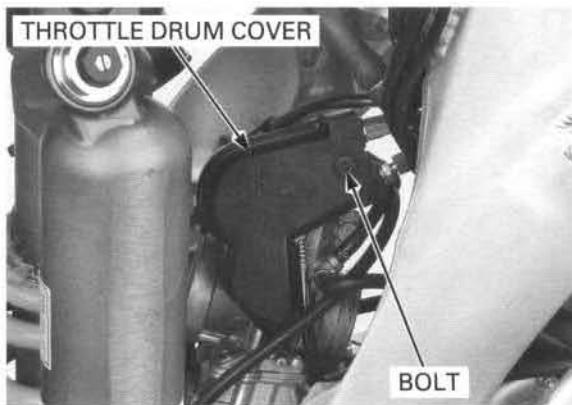
After '06: 3.9 N·m (0.4 kgf·m, 2.9 lbf·ft)



Install the throttle drum cover and bolt.

Tighten the bolt to the specified torque.

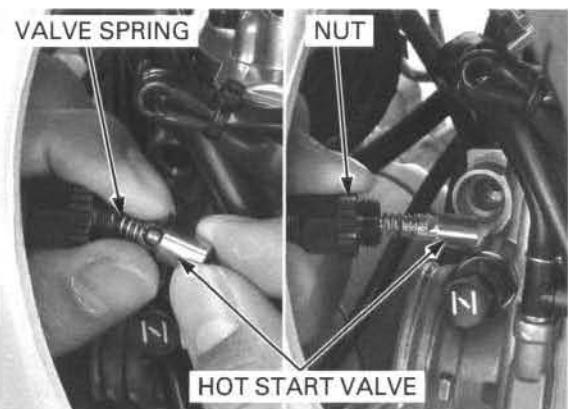
**TORQUE: 3.9 N·m (0.4 kgf·m, 2.9 lbf·ft)**



Install the valve spring over the starter cable and connect the cable end to the hot start valve.

Install the hot start valve to the carburetor body, and tighten the lock nut to the specified torque.

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



Align the lug on the carburetor with the groove in the carburetor insulator.

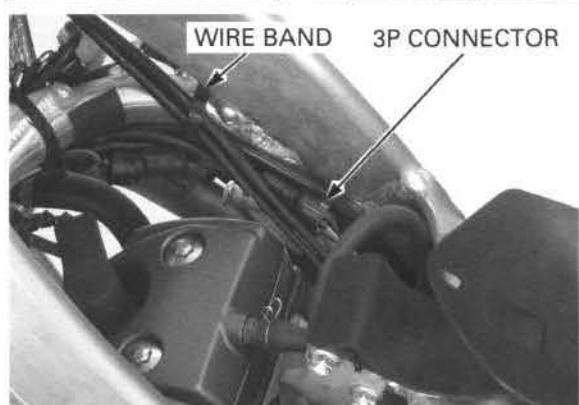
Tighten the insulator band screw securely.



Connect the throttle position sensor 3P connector. Install the wire band.

Perform the following inspections and adjustments:

- Throttle operation (page 3-8)
- Hot start lever (page 3-9)



Install the shock absorber upper mounting bolt and nut.

Tighten the upper mounting nut to the specified torque.

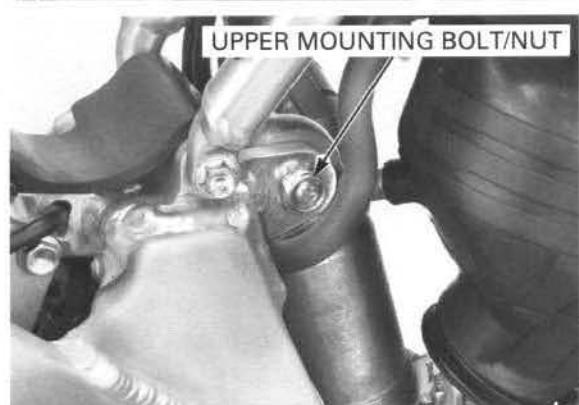
**TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)**

Lower the sub-frame (page 5-9).

After installation adjust the pilot screw (page 5-27).

After installation check the following:

- Secondary air leak around the insulator and connecting boot
- Fuel leaks around the fuel hose and carburetor
- Route the overflow, air vent and fuel hoses (page 1-23).



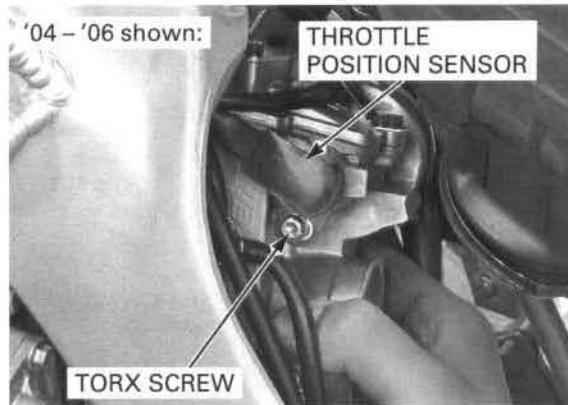
## FUEL SYSTEM

### THROTTLE POSITION SENSOR REPLACEMENT

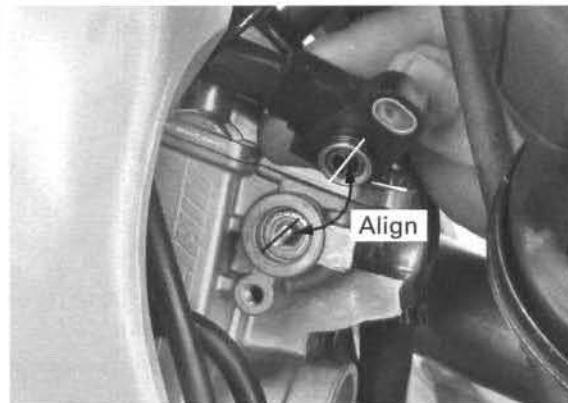
Remove the carburetor from the engine (page 5-11).

'04 - '06: Remove the torx screw and throttle position sensor.

After '06: Remove the bolt and throttle position sensor.

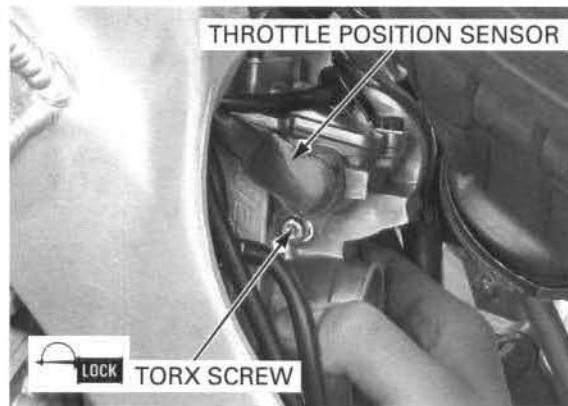


Install a new throttle position sensor by aligning the tabs of the throttle position sensor with the flat side of the shaft as shown.



'04 - '06: Apply locking agent to the torx screw threads and loosely install the screw.

After '06: Apply locking agent to a new bolt threads and loosely install the bolt.



Measure the resistance between the Blue and Black wire terminals of the sensor side connector.

**STANDARD: 4 – 6 kΩ (20°C/68°F)**

Calculate the throttle position sensor resistance at idle speed using the equation below.

$$A \times (0.13 - 0.15) = B$$

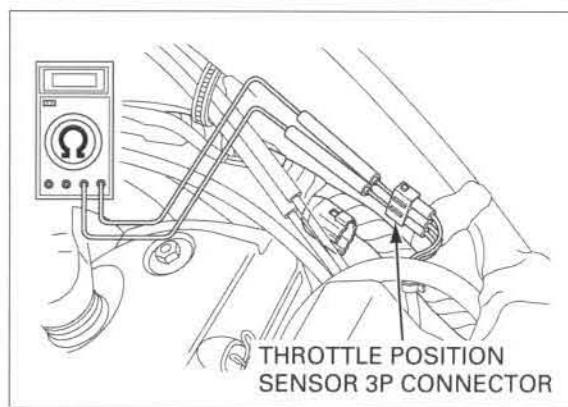
A: Blue and Black wire terminals resistance

B: Throttle position sensor resistance at idle speed

(Ex.)

If the Blue and Black wire terminals resistance is 5kΩ, then the throttle position sensor resistance at idle speed is:

$$5\text{k}\Omega \times (0.13 - 0.15) = 650 - 750 \text{ }\Omega$$



Adjust the throttle position sensor position so the resistance between Yellow and Black terminals is calculated resistance

'04 - '06: Tighten the torx screw to the specified torque.

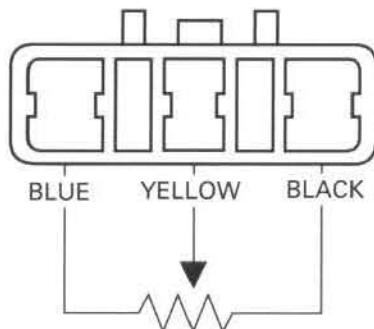
**TORQUE: 3.9 N·m (0.4 kgf·m, 2.9 lbf·ft)**

After '06: Tighten the bolt to the specified torque.

**TORQUE: 3.9 N·m (0.4 kgf·m, 2.9 lbf·ft)**

Connect the throttle position sensor connector.

Install the removed parts in the reverse order of removal.



## PILOT SCREW ADJUSTMENT

### BEST IDLE ('04 - '06 49 States and Canada type)

#### NOTE:

- The pilot screw is factory pre-set and no adjustment is necessary unless the pilot screw is replaced.
- Use a tachometer with graduations of 50 rpm or smaller that will accurately indicate a 50 rpm change.

*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, then back it out the specified number of turns.

#### TOOL:

Pilot screw wrench 07908-4730002

**STANDARD OPENING: 2-1/4 turns out**



- Warm up the engine to operating temperature. Ride the motorcycle for approximately 10 minutes.
- Stop the engine and attach a tachometer according to its manufacturer's instruction.
- Start the engine and adjust the engine idle speed to the specified rpm with the throttle stop screw.

**IDLE SPEED: 1,700 ± 100 rpm**

- Turn the pilot screw in or out slowly to obtain the highest engine speed.
- Readjust the idle speed to the specified rpm with the throttle stop screw.
- Disconnect the tachometer.



## FUEL SYSTEM

### IDLE DROP PROCEDURE ('04 – '06 California type, After '06)

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.

#### TOOL:

Pilot screw wrench

'04 – '06: 07908-4730002

After '06: 07KMA-MN90101 and

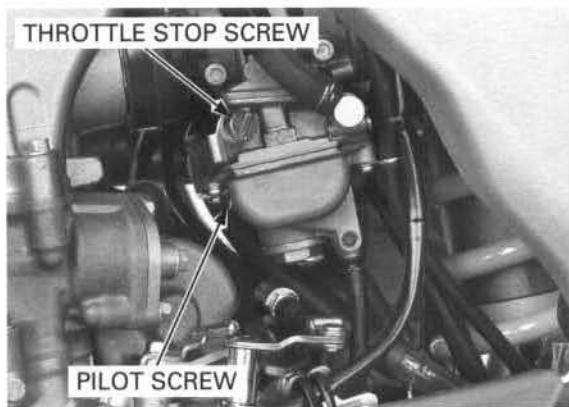
07PMA-MZ20110 or

07KMA-MN9-A100 (U.S.A only)

#### INITIAL OPENING:

'04 – '06: 2 turns out

After '06: 2-1/4 turns out



- Warm the engine up to operating temperature.  
Stop and go riding for 10 minutes is sufficient.
- Stop the engine and connect a tachometer according to its manufacturer's instruction.
- Disconnect the PAIR control valve vacuum hose and plug it to keep air from entering, then connect the vacuum pump to the PAIR control valve vacuum hose joint.
- Apply the specified vacuum to the PAIR control valve vacuum hose more than 56 kPa (420 mmHg).
- Start the engine and adjust the idle speed with the throttle stop screw.

**IDLE SPEED:  $1,700 \pm 100$  rpm**

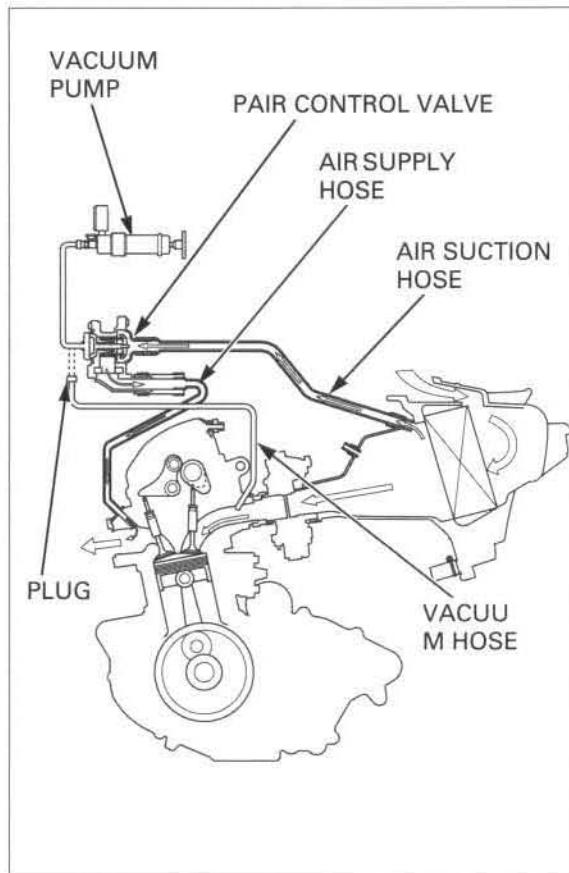
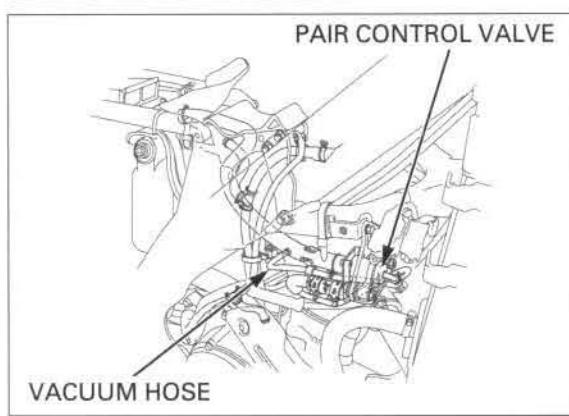
- Turn the pilot screw in or out slowly to obtain the highest engine speed.
- Lightly open the throttle 2 or 3 times, then adjust the idle speed with the throttle stop screw.
- Turn the pilot screw in until the engine speed drops by 50 rpm.
- Turn the pilot screw counterclockwise to the final opening from the position obtained in step 9.

**FINAL OPENING: 1/2 turns out**

- Remove the plug from the vacuum hose, then disconnect the vacuum pump and connect the vacuum hose to the PAIR control valve.
- Readjust the idle speed with the throttle stop screw.

**IDLE SPEED:  $1,700 \pm 100$  rpm**

- Disconnect the tachometer.



## HIGH ALTITUDE ADJUSTMENT (California type only)

At high altitude, the standard carburetor air-fuel mixture will be too rich. Performance will decrease, and fuel consumption will increase. A very rich mixture will also foul the spark plug and cause hard starting. Operation at an altitude that differs from that at which this engine was certified, for extended periods of time, may increase emissions.

High altitude performance can be improved by specific modifications to the carburetor. If your customer always operates the motorcycle at altitudes above 6,500 feet (2,000 meters), you should perform this carburetor modification.

Even with carburetor modification, engine horsepower will decrease about 3.5% for each 1,000-foot (300-meter) increase in altitude. The effect of altitude on horsepower will be greater than this if no carburetor modification is made.

This engine, when operated at high altitude with the carburetor modifications for high altitude use, will meet each emission standard throughout its useful life.

Remove the carburetor (page 5-11).

Remove the float chamber.

Replace the standard main jet with the high altitude type.

### HIGH ALTITUDE MAIN JET:

'04 - '06: # 128

After '06: # 130

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

Install the float chamber.

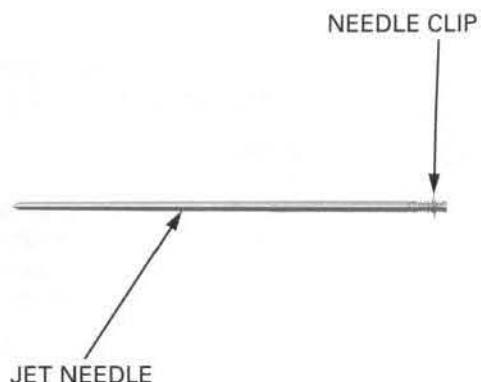
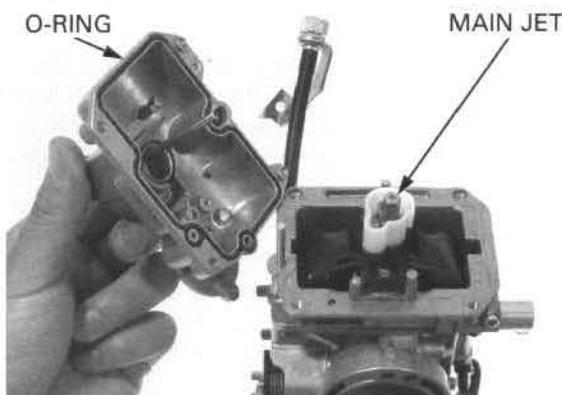
Remove the jet needle (page 5-13).

Change the jet needle clip to high altitude clip position.

### HIGH ALTITUDE CLIP POSITION: 1st position from the top

Install the jet needle (page 5-23).

Install the carburetor (page 5-24).



## FUEL SYSTEM

Start the engine and let it idle for 3 minutes.

Turn the pilot screw in to the specification given.

### HIGH ALTITUDE PILOT SCREW OPENING:

1/4 turn in from the factory preset position

#### TOOL:

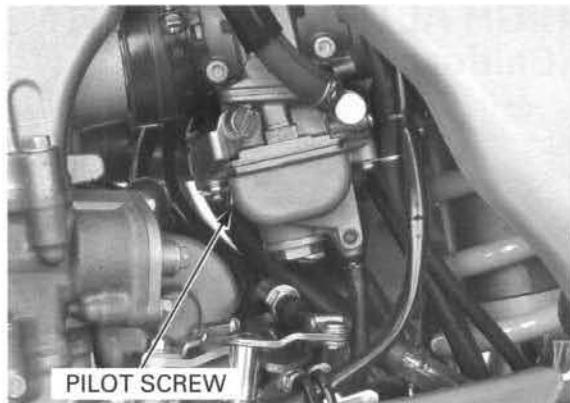
Pilot screw wrench

'04 - '06: 07908-4730002

After '06: 07KMA-MN90101 and

07PMA-MZ20110 or

07KMA-MN9-A100 (U.S.A only)



Adjust the idle speed with the throttle stop screw.

**IDLE SPEED:** 1,700 ± 100 rpm

#### NOTICE

*When the carburetor has been modified for high altitude operation, the air-fuel mixture will be too lean for low altitude use. Operation at altitudes below 5,000 feet (1,500 m) with a modified carburetor may cause the engine overheat, resulting in serious engine damage and increased exhaust emissions.*

*For use at low altitudes, you should return the carburetor to original factory specifications.*



Replace the main jet with the standard main jet.

Change the jet needle clip position to the standard position.

Screw out the pilot screw the specified number of turns from the high altitude setting.

#### STANDARD MAIN JET:

'04 - '06: # 130

After '06: # 132

**STANDARD CLIP POSITION:** 2nd position from the top

#### LOW ALTITUDE PILOT SCREW OPENING:

1/4 turn out from the high altitude setting

#### TOOL:

Pilot screw wrench

'04 - '06: 07908-4730002

After '06: 07KMA-MN90101 and

07PMA-MZ20110 or

07KMA-MN9-A100 (U.S.A only)

Warm up the engine and adjust the idle speed at low altitude with the throttle stop screw.

**IDLE SPEED:** 1,700 ± 100 rpm

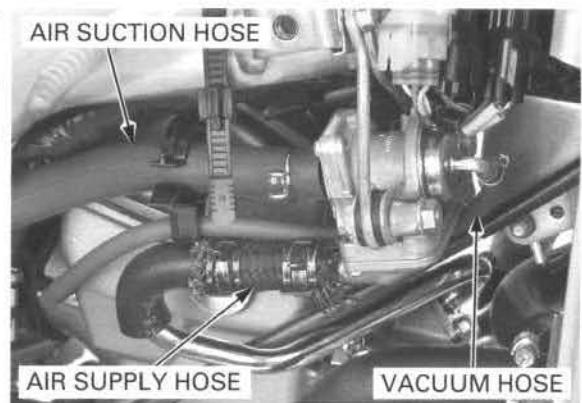
## SECONDARY AIR SUPPLY SYSTEM ('04 – '06 California type, After '06)

### SYSTEM INSPECTION

Warm up the engine to normal operating temperature.

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

Check the pulse secondary air injection (PAIR) check valve if the port is carbon fouled (page 5-32).



Disconnect the PAIR control valve vacuum hose and plug the vacuum hose.

Connect a vacuum pump to the PAIR control valve.

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

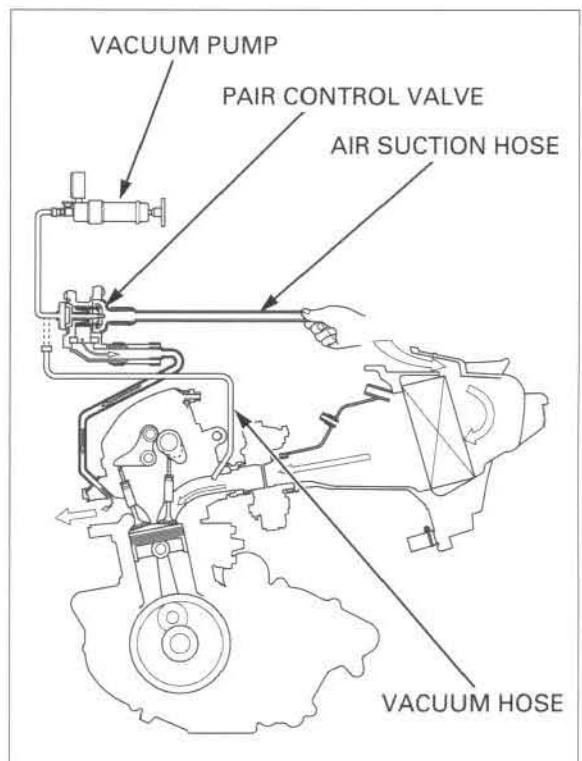
If the air is not drawn in, check the air suction hose for clogs.

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

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

#### SPECIFIED VACUUM: 56 kPa (420 mmHg)

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



### PAIR CONTROL VALVE REMOVAL/ INSTALLATION

Remove the right radiator shroud (page 2-4).

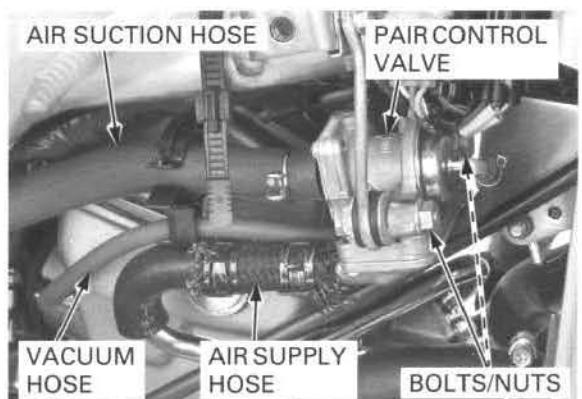
Disconnect the vacuum, air supply and air suction hoses.

Remove the bolts, nuts and PAIR control valve.

Installation is in the reverse order of removal.

#### TORQUE:

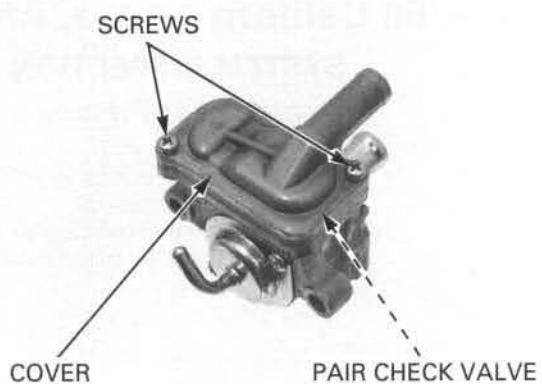
**PAIR control valve mounting nut:**  
13 N·m (1.3 kgf·m, 9 lbf·ft)



### PAIR CHECK VALVE INSPECTION

Remove the PAIR control valve (page 5-31).

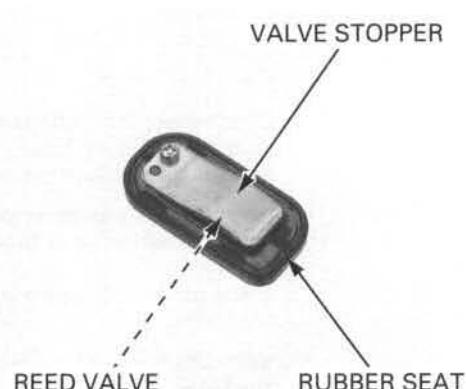
Remove the screws, PAIR check valve cover and PAIR check valve.



Check the reed for damage or fatigue.

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

Installation is in the reverse order of removal.



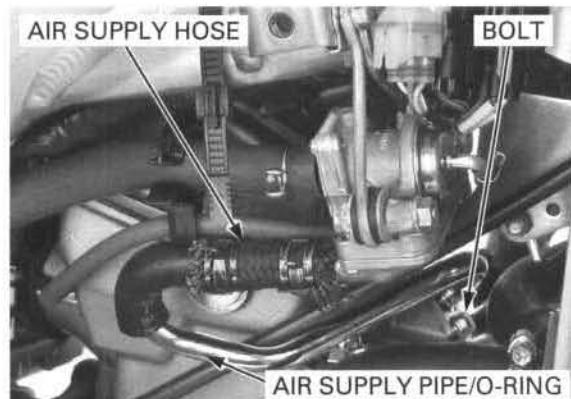
### AIR SUPPLY PIPE REMOVAL/ INSTALLATION

Remove the right radiator shroud (page 2-4).

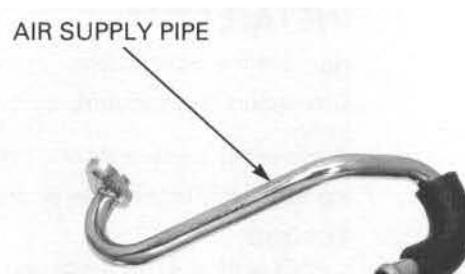
Remove the bolt.

Disconnect the air supply hose.

Remove the air supply pipe and O-ring.



Check the air supply pipe for damage or deformation.



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

Coat the O-ring with engine oil and install it onto the air supply pipe.

Connect the air supply hose to the pipe.

Install the air supply pipe and tighten the bolt to the specified torque.

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

Install the right radiator shroud (page 2-4).



---

**MEMO**



## 6. COOLING SYSTEM

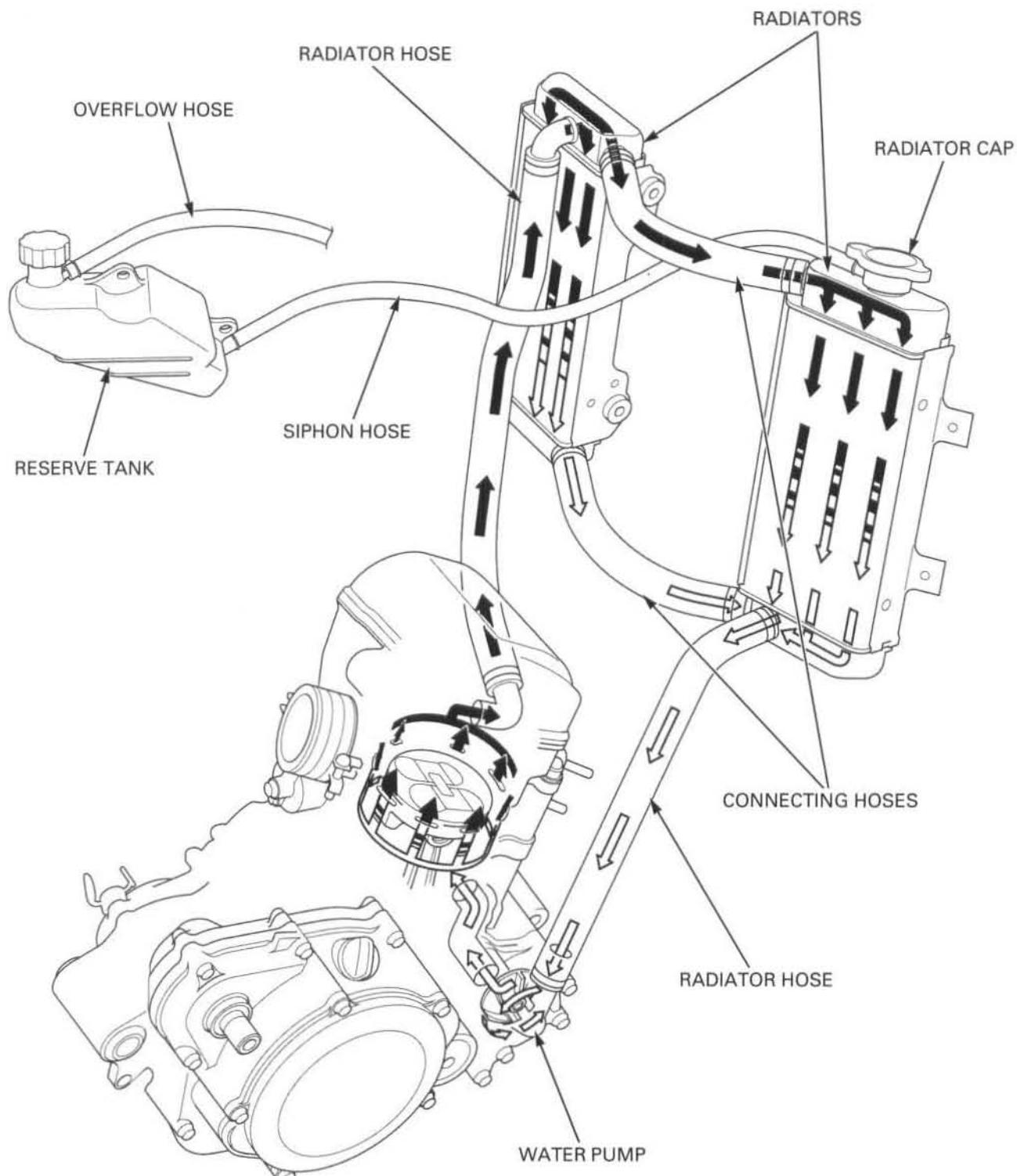
---

6

SYSTEM FLOW PATTERN .....	6-2	COOLANT REPLACEMENT.....	6-6
SERVICE INFORMATION .....	6-3	RADIATOR .....	6-8
TROUBLESHOOTING .....	6-4	RADIATOR RESERVE TANK.....	6-9
SYSTEM TESTING.....	6-5	WATER PUMP .....	6-10

## COOLING SYSTEM

### SYSTEM FLOW PATTERN



# SERVICE INFORMATION

## GENERAL

### ⚠ WARNING

Removing the radiator cap while the engine is hot can allow the coolant to spray out, seriously scalding you. Always let the engine and radiator cool down before removing the radiator cap.

### NOTICE

*Using coolant with silicon-corrosion inhibitors may cause premature wear of water pump seals or blockage of radiator passages. Using tap water may cause engine damage.*

- Add coolant at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system services can be done with the engine in the frame.
- Avoid spilling coolant on painted surfaces.
- After servicing the system, check for leaks with a cooling system tester.

## SPECIFICATIONS

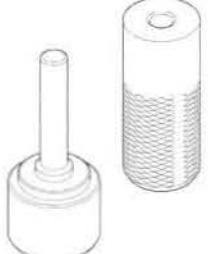
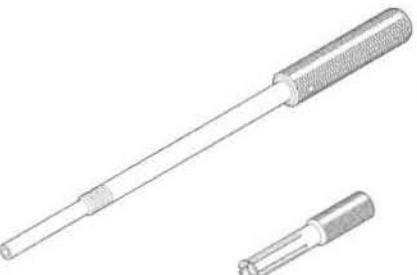
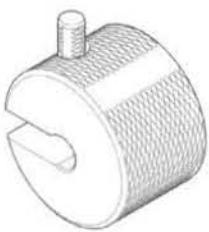
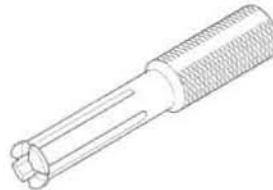
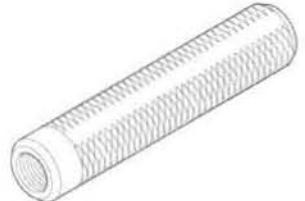
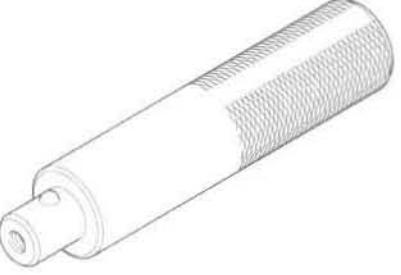
ITEM	SPECIFICATIONS	
Coolant capacity	At change	1.13 liter (1.19 US qt, 0.99 Imp qt)
	At disassembly	1.20 liter (1.27 US qt, 1.06 Imp qt)
Radiator cap relief pressure	93 – 123 kPa (0.95 – 1.25 kgf/cm <sup>2</sup> , 13.5 – 17.8 psi)	
Recommended antifreeze	Pro Honda HP Coolant or an equivalent high quality ethylene glycol antifreeze containing silicate-free corrosion inhibitors	
Standard coolant concentration	1 : 1 mixture with distilled water	

## TORQUE VALUES

Water pump impeller                    12 N·m (1.2 kgf·m, 9 lbf·ft)                    Left hand threads

## COOLING SYSTEM

### TOOLS

Water seal driver 07945-KA30000 or   07965-415000A (U.S.A. only)	Bearing remover set, 12 mm 07936-1660101   not available in U.S.A.	Remover weight 07741-0010201   or 07936-3710200/07936-371020A (U.S.A. only)
Remover head, 12 mm 07936-1660110   or 07936-166010A	Remover shaft 07936-1660120   not available in U.S.A.	Remover handle 07936-3710100 (U.S.A. only)  
Driver 07749-0010000  	Attachment, 28 x 30 mm 07946-1870100  	Pilot, 12 mm 07746-0040200  

### TROUBLESHOOTING

#### Engine temperature too high

- Faulty radiator cap
- Insufficient coolant
- Passage blocked in radiator, hoses or water jacket
- Radiator air passage clogged with dirt
- Air in system
- Faulty water pump

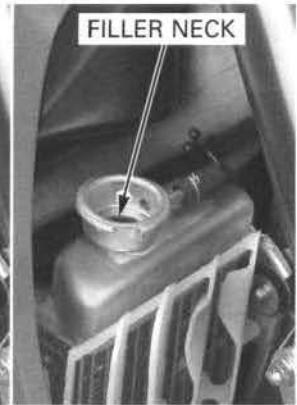
#### Coolant leak

- Faulty water pump oil seal and water seal
- Deteriorated water pump oil and water seal
- Damaged or deteriorated O-ring
- Loose hose connection or clamp
- Damaged or deteriorated hose
- Faulty radiator cap
- Damaged radiator

## SYSTEM TESTING

### COOLANT (HYDROMETER TEST)

Make sure the engine is cool, remove the radiator cap.



Test the coolant specific gravity using a hydrometer.

#### STANDARD COOLANT CONCENTRATION: 1 : 1

Look for contamination and replace the coolant if necessary.



#### COOLANT GRAVITY CHART

Coolant ratio%	Coolant temperature °C (°F)										
	0 (32)	5 (41)	10 (50)	15 (59)	20 (68)	25 (77)	30 (86)	35 (95)	40 (104)	45 (113)	50 (122)
5	1.009	1.009	1.008	1.008	1.007	1.006	1.005	1.003	1.001	0.999	0.997
10	1.018	1.017	1.017	1.016	1.015	1.014	1.013	1.011	1.009	1.007	1.005
15	1.028	1.027	1.026	1.025	1.024	1.022	1.020	1.018	1.016	1.014	1.012
20	1.036	1.035	1.034	1.033	1.031	1.029	1.027	1.025	1.023	1.021	1.019
25	1.045	1.044	1.043	1.042	1.040	1.038	1.036	1.034	1.031	1.028	1.025
30	1.053	1.052	1.051	1.047	1.046	1.045	1.043	1.041	1.038	1.035	1.032
35	1.063	1.062	1.060	1.058	1.056	1.054	1.052	1.049	1.046	1.043	1.040
40	1.072	1.070	1.068	1.066	1.064	1.062	1.059	1.056	1.053	1.050	1.047
45	1.080	1.078	1.076	1.074	1.072	1.069	1.066	1.063	1.060	1.057	1.054
50	1.086	1.084	1.082	1.080	1.077	1.074	1.071	1.068	1.065	1.062	1.059
55	1.095	1.093	1.091	1.088	1.085	1.082	1.079	1.076	1.073	1.070	1.067
60	1.100	1.098	1.095	1.092	1.089	1.086	1.083	1.080	1.077	1.074	1.071

## COOLING SYSTEM

### RADIATOR CAP/SYSTEM PRESSURE INSPECTION

Remove the radiator cap (page 6-5).

*Wet the sealing surface with water.*

Install the radiator cap on the tester.

Pressure test the radiator cap.

Replace the radiator cap if it does not hold pressure, or if the relief pressure is too high or too low.

It must hold the specified pressure for at least 6 seconds.

#### RADIATOR CAP RELIEF PRESSURE:

93 – 123 kPa (0.95 – 1.25 kgf/cm<sup>2</sup>, 13.5 – 17.8 psi)



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

#### NOTICE

*Excessive pressure can damage the cooling system components. Do not exceed 123 kPa(1.25 kgf/cm<sup>2</sup>, 17.8 psi).*

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



## COOLANT REPLACEMENT

### PREPARATION

If any coolant gets in your eyes, rinse them with water and consult a doctor immediately.

If any coolant is swallowed, induce vomiting, gargle and consult a physician immediately.

If any coolant gets on your skin or clothes, rinse thoroughly with plenty of water.

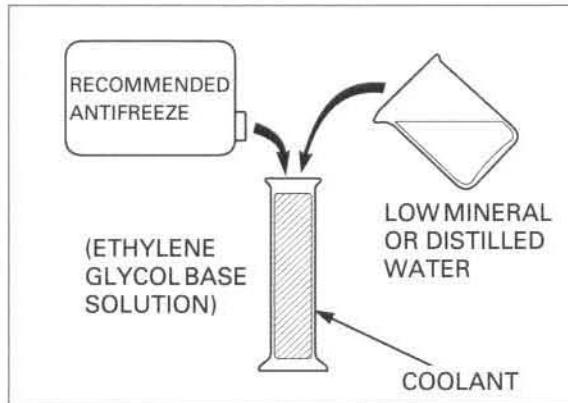
- The effectiveness of coolant decreases with the accumulation of rust or if there is a change in the mixing proportion during usage. Therefore, for best performance, change the coolant regularly as specified in the maintenance schedule.
- Mix only distilled, low mineral water with the antifreeze.

#### RECOMMENDED ANTIFREEZE:

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

#### RECOMMENDED MIXTURE:

1 : 1 (distilled water and recommended antifreeze)



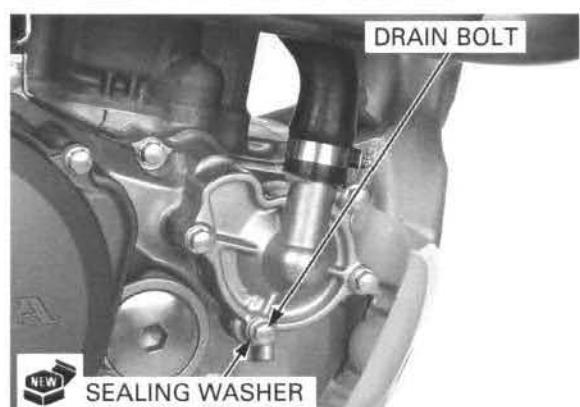
**REPLACEMENT/AIR BLEEDING**

Remove the engine guard (page 2-4).  
 Remove the left side cover (page 2-3).  
 Remove the radiator cap.



Drain the coolant from the system, removing the drain bolt and sealing washer on the water pump cover.

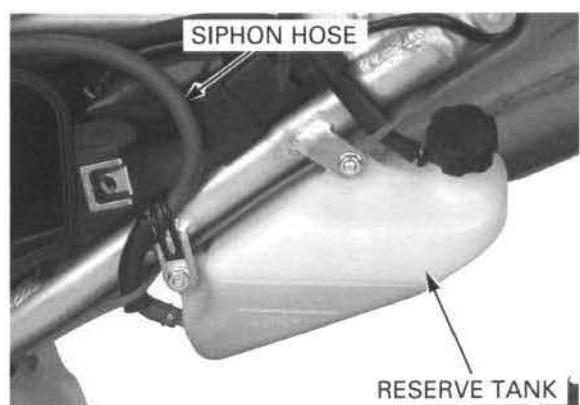
Reinstall the drain bolt with a new sealing washer.  
 Tighten the drain bolt securely.



Disconnect the siphon hose from the radiator.

Drain the reserve tank coolant.  
 Empty the coolant and rinse the inside of the reserve tank with water.

Reinstall the radiator siphon hose.

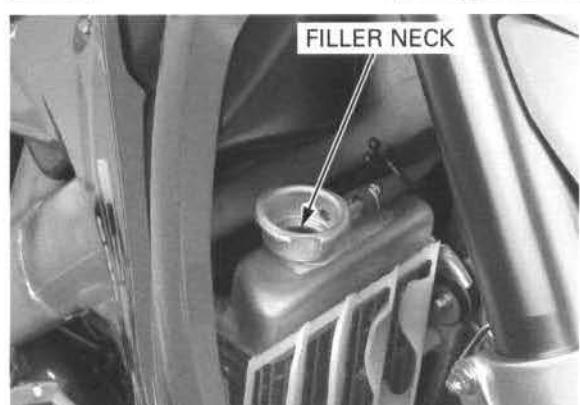


Fill the system with the recommended coolant through the filler opening up to the filler neck.

**CAPACITY:**

**1.13 liter (1.19 US qt, 0.99 Imp qt) at change**

Lean the machine approximately 20° to the right and left several times to bleed any air trapped in the cooling system. If the coolant level drops, add more coolant and repeat the air bleeding procedure.

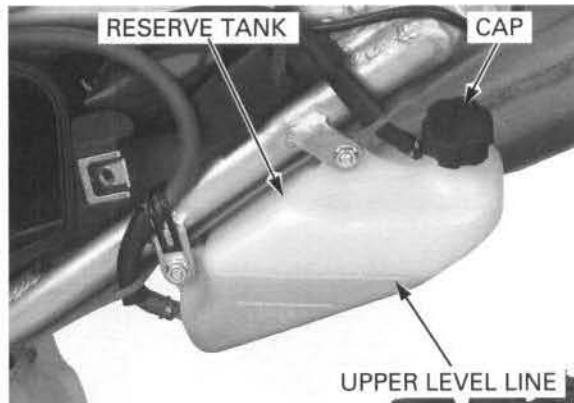


## COOLING SYSTEM

Remove the radiator reserve tank cap and fill the reserve tank to the upper level line.

Bleed air from the system as follow:

- Shift the transmission into neutral. Start the engine and let it idle for 2 – 3 minutes.
- Snap the throttle three to four times to bleed air from the system.
- Stop the engine and add coolant up to proper level if necessary. Reinstall the radiator cap.
- Check the level of coolant in the reserve tank and fill to the upper level line if it is low.



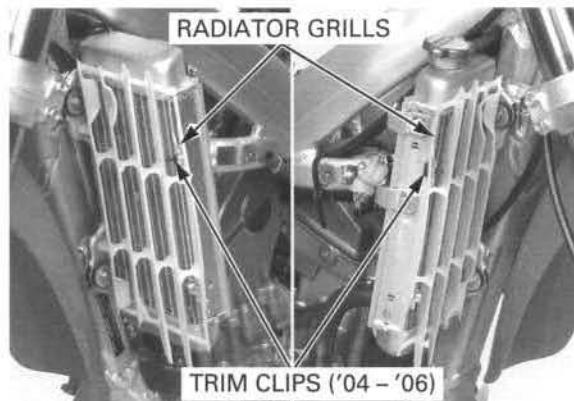
## RADIATOR

### REMOVAL

Drain the coolant (page 6-7).

Remove the radiator shrouds (page 2-4).

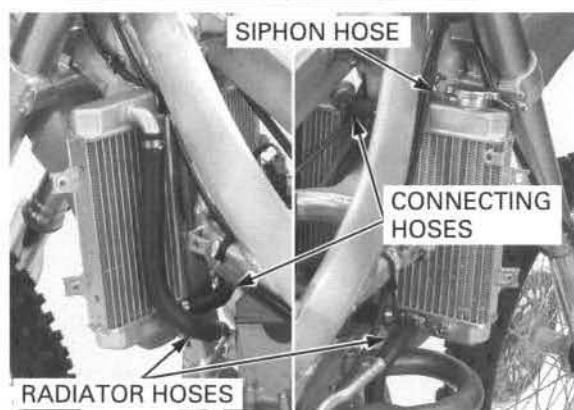
Remove the trim clips ('04 – '06 only) and radiator grills.



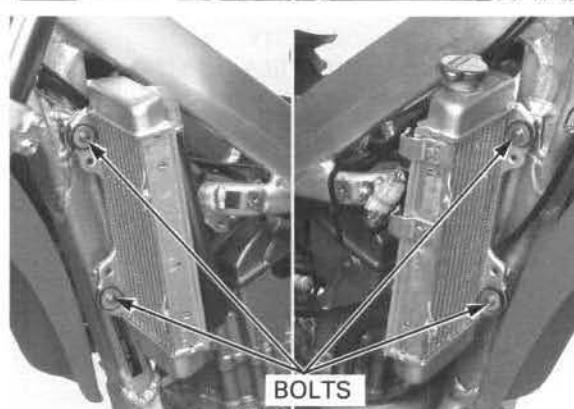
*Note the direction  
of the hose clamp.  
Be careful not to  
damage the radiator  
core.*

Disconnect the following:

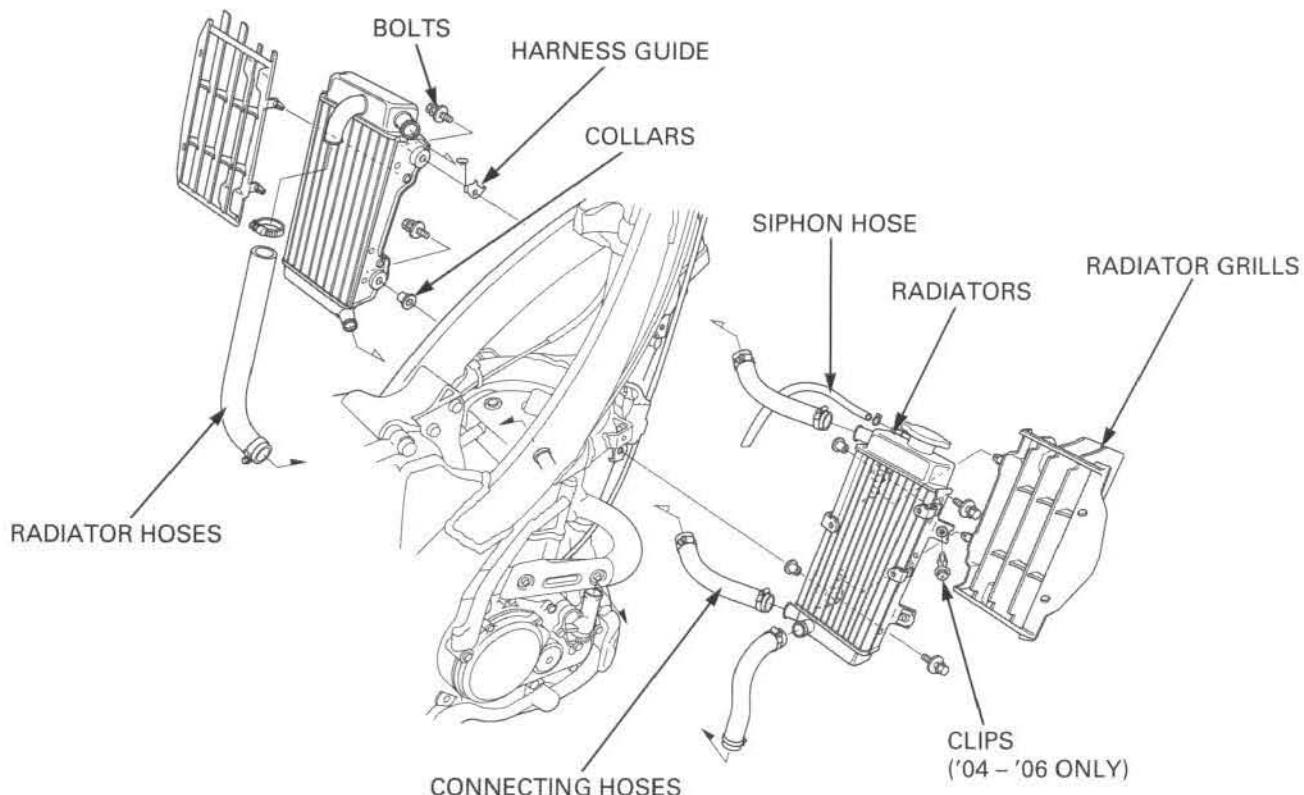
- Coolant siphon hose
- Connecting hoses
- Upper and lower radiator hose



Remove the upper and lower mounting bolts.  
Remove the radiator from the frame.



## INSTALLATION

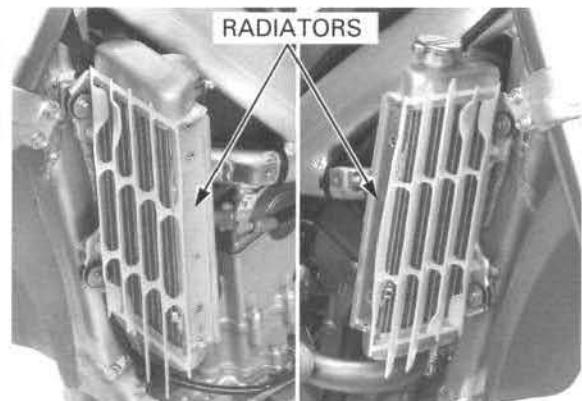


*Be careful not to damage the radiator core.*

Installation is in the reverse order of removal.

Fill the system with the recommended coolant and bleed the air (page 6-7).

After installation, check the radiator and radiator hoses for leaks.



## RADIATOR RESERVE TANK

## REMOVAL/INSTALLATION

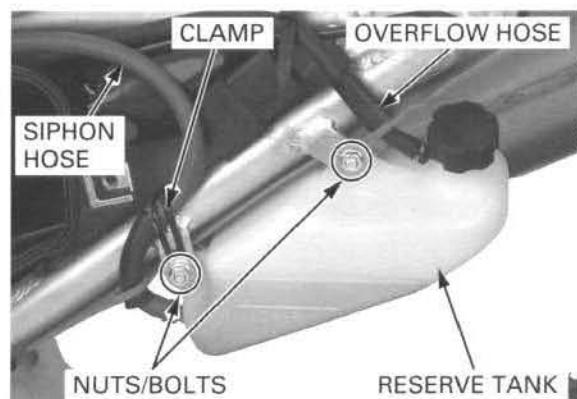
Drain the coolant (page 6-7).

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

Disconnect the radiator siphon and reserve tank overflow hoses from radiator reserve tank.

Remove the nuts, clamp, bolts and reserve tank.

Installation is in the reverse order of removal.



## COOLING SYSTEM

### WATER PUMP

#### WATER SEAL INSPECTION

Inspect the telltale hole for signs of coolant leakage. If there is leakage, the water seal is defective and the water pump must be replaced as an assembly.



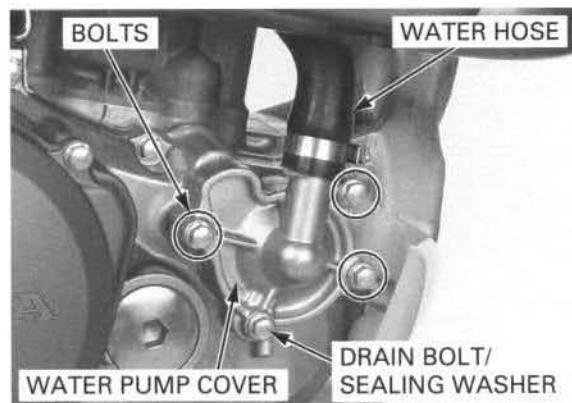
#### REMOVAL

Drain the coolant (page 6-7).

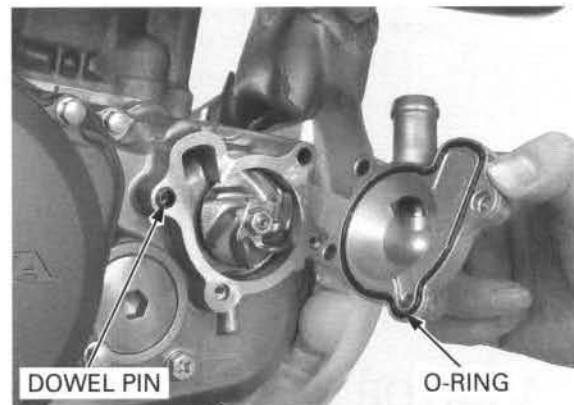
Loosen the hose band screw and disconnect the water hose.

Remove the drain bolt and sealing washer.

Remove the three bolts and water pump cover.



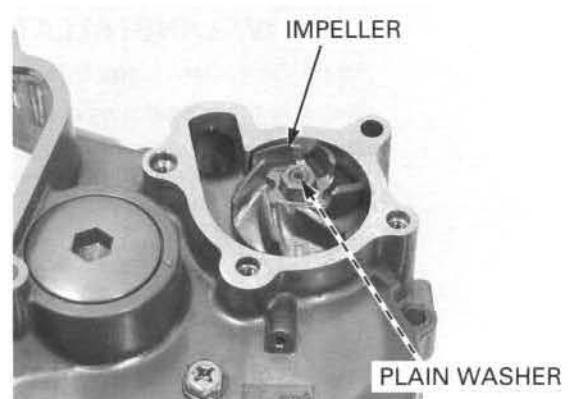
Remove the O-ring and dowel pin.



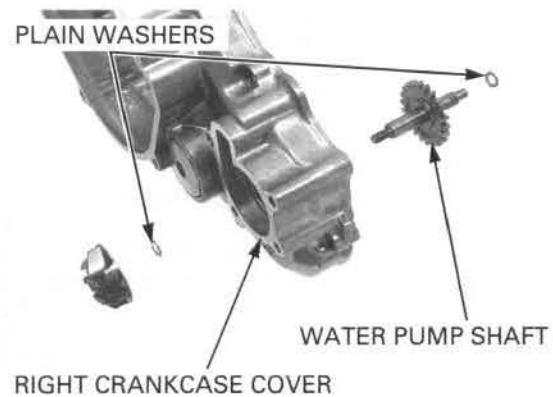
Remove the right crankcase cover (page 10-5)

Remove the impeller and plain washer.

- The impeller has left hand threads.



Remove the water pump shaft from the right crankcase cover.



Check the water pump shaft for a bend or damage.

Check the gear for wear or damage.

Check the shaft for excessive wear or damage.



Turn the inner race of the water pump shaft bearing with your finger. The bearing should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the right crankcase cover.

Replace the water pump shaft bearing if necessary (page 6-12).



Check the water seal for damage or deterioration.

Replace the water seal if necessary (page 6-12).



## COOLING SYSTEM

### BEARING/WATER SEAL/OIL SEAL REPLACEMENT

Remove the water pump shaft bearing using the special tools.

#### TOOLS:

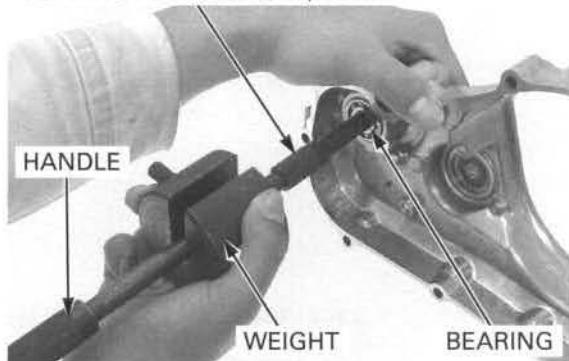
Bearing remover set, 12mm	07936-1660101 not available in U.S.A.
- Remover weight	07741-0010201
- Remover head, 12 mm	07936-1660110 not available in U.S.A.
- Remover shaft	07936-1660120 not available in U.S.A.

#### TOOLS, U.S.A. only:

Bearing remover, 12 mm	07936-166010A
Remover handle	07936-3710100
Remover weight	07936-3710200 or 07936-371020A

Check the oil seal for damage or deterioration, replace the oil seal if necessary (page 6-12).

BEARING REMOVER SET, 12 mm



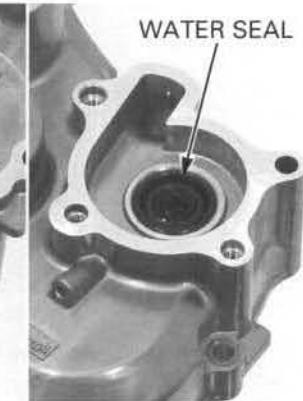
OIL SEAL



Remove the oil seal and water seal from right crankcase cover.

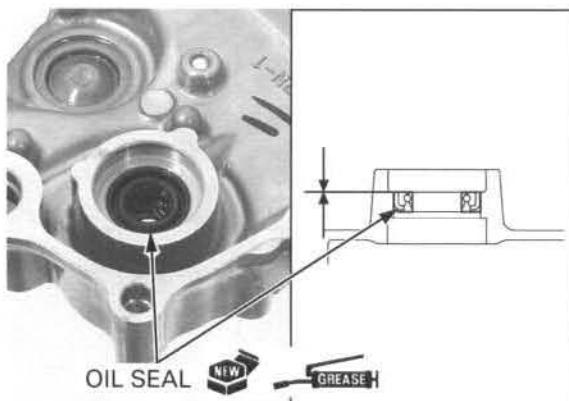


WATER SEAL



Apply grease to a new oil seal lips.

Install a new oil seal into the right crankcase as shown.



Apply grease to a new water seal lips.

Set the water seal driver into the right crankcase cover as shown.

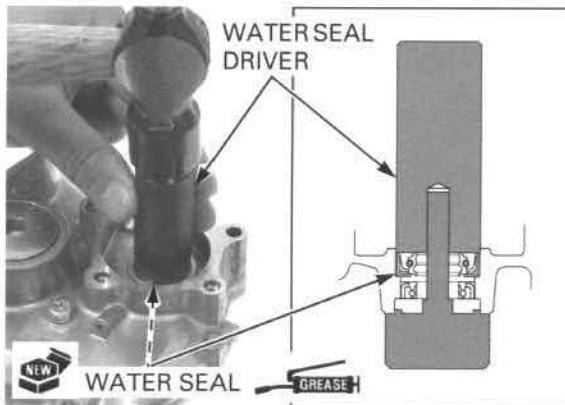
*Be careful not to damage the water seal lips.*

Drive in a new water seal using the special tool as shown.

**TOOL:**

Water seal driver

07945-KA30000 or  
07965-415000A  
(U.S.A. only)



Drive in a new bearing into the right crankcase cover using the special tools as shown.

**TOOLS:**

Driver

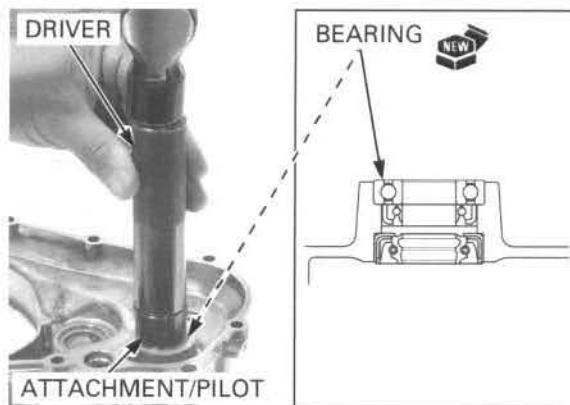
07749-0010000

Attachment, 28 x 30 mm

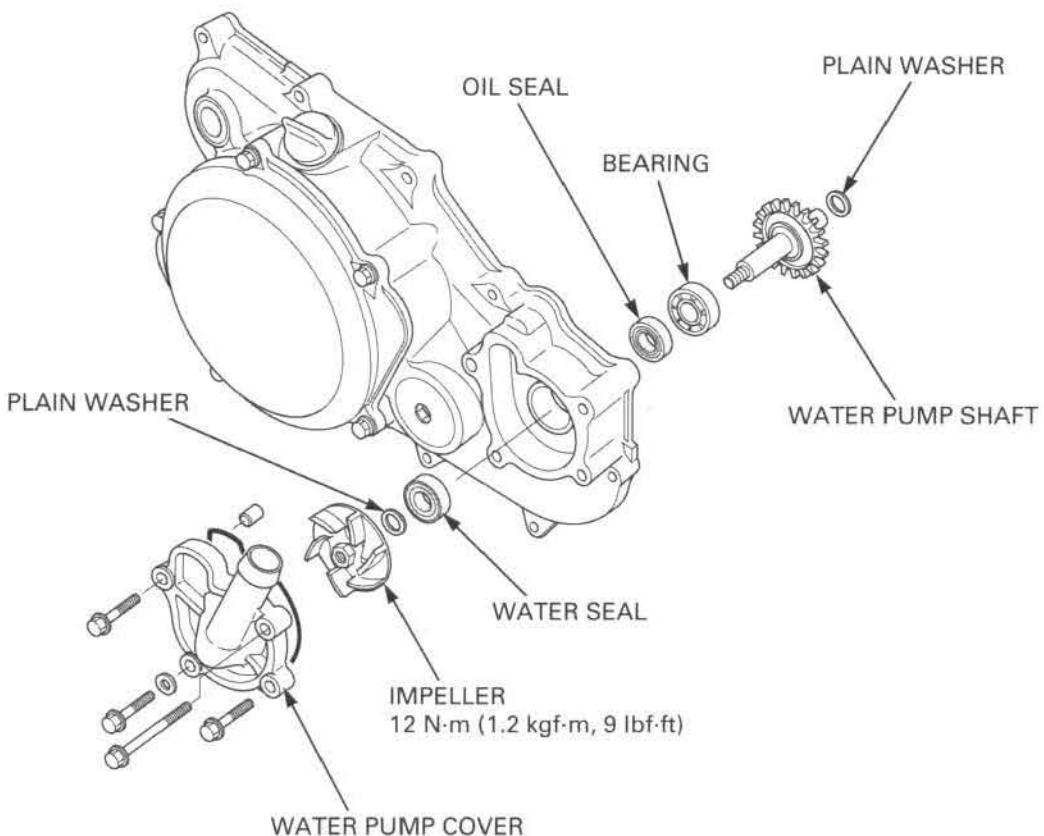
07946-1870100

Pilot, 12mm

07746-0040200

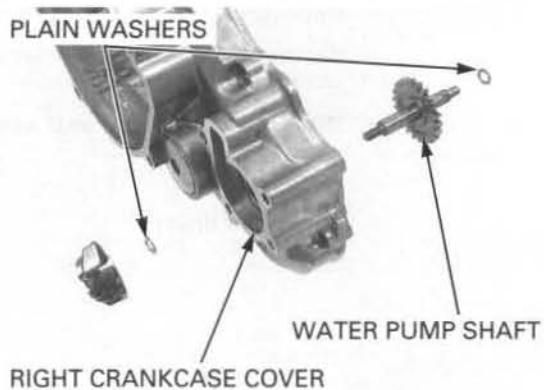


## INSTALLATION



## COOLING SYSTEM

Install the water pump shaft into the right crankcase cover.



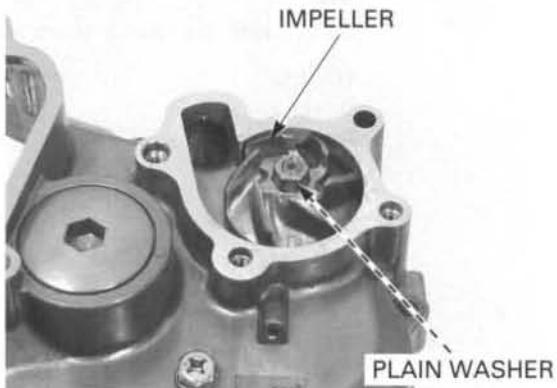
Install the plain washer and impeller onto the water pump shaft.

- The impeller has left hand threads.

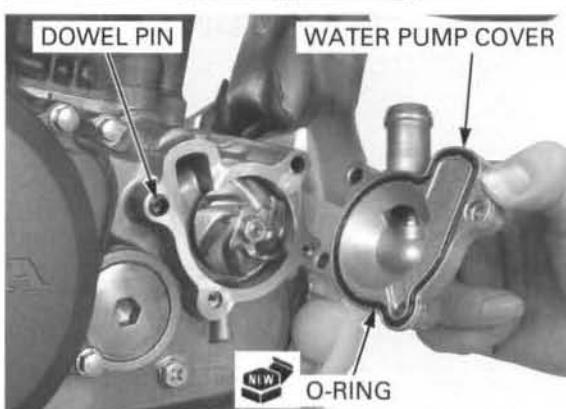
Tighten the impeller to the specified torque.

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

Install the right crankcase cover (page 10-6).



Install a new O-ring onto water pump cover.  
Install the dowel pin.

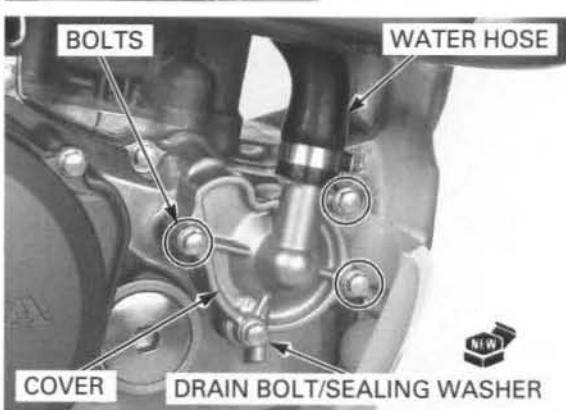


Install the water pump cover and tighten the bolts.

Tighten the drain bolt with new sealing washer.

Connect the water hose and tighten the band screw.

Fill the system with the recommended coolant and bleed the air (page 6-7).



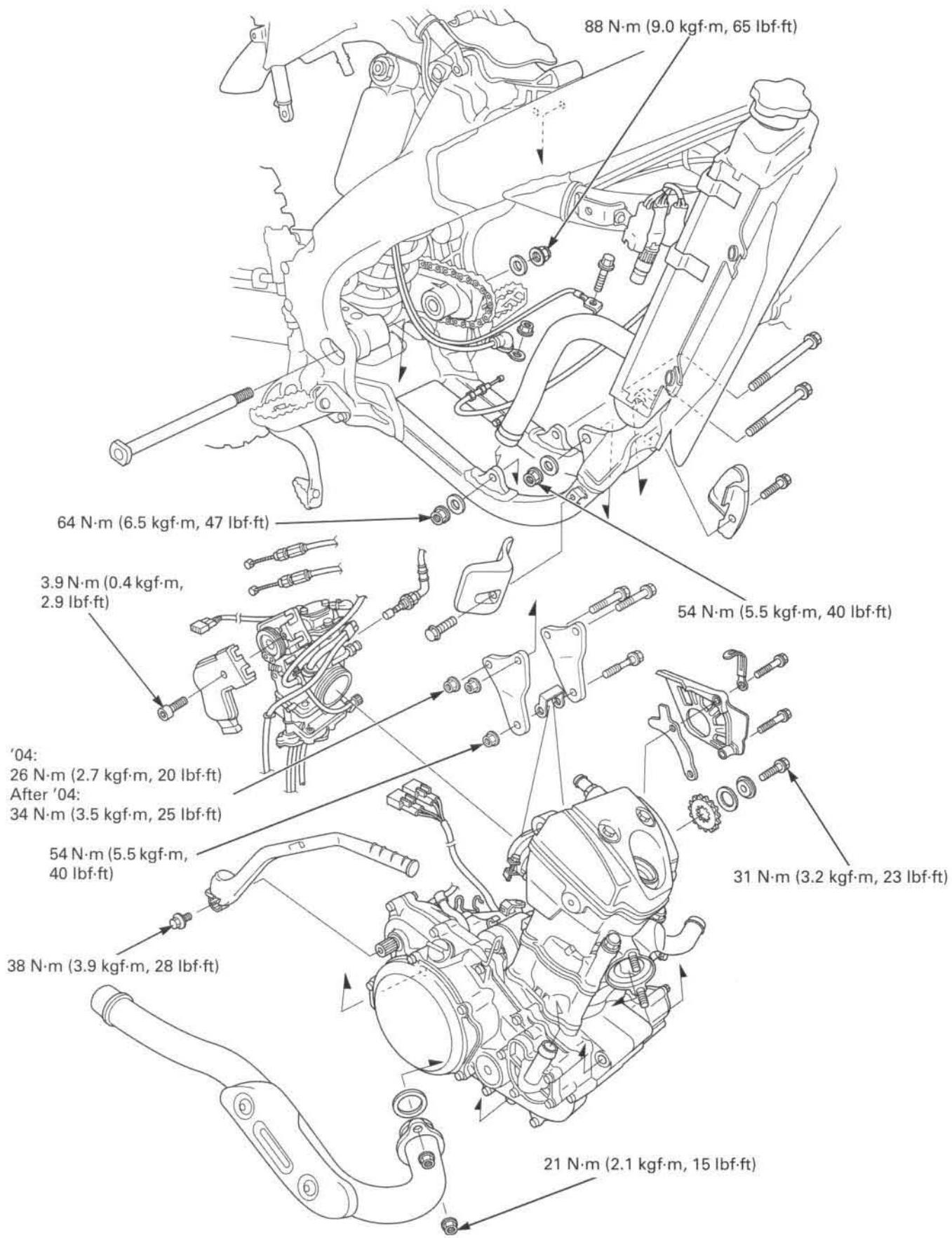
## **7. ENGINE REMOVAL/INSTALLATION**

---

COMPONENT LOCATION .....	7-2	ENGINE REMOVAL .....	7-5
SERVICE INFORMATION .....	7-3	ENGINE INSTALLATION.....	7-7
DRIVE SPROCKET .....	7-4		

## ENGINE REMOVAL/INSTALLATION

### COMPONENT LOCATION



## SERVICE INFORMATION

### GENERAL

- During engine removal and installation, support the motorcycle using a workstand or equivalent.
- The following components require engine removal for service.
  - Crankcase (page 12-7)
  - Crankshaft (page 12-12)
  - Transmission (page 12-9)
  - Oil pump (page 4-7)
- The following components can be serviced with the engine installed in the frame.
  - Cylinder head (page 8-12)
  - Valves (page 8-15)
  - Cylinder (page 9-4)
  - Piston (page 9-4)
  - Clutch (page 10-7)
  - Kickstarter (page 10-15)
  - Gearshift linkage (page 10-25)
  - Carburetor (page 5-11)
  - Flywheel (page 11-5)
  - Water pump (page 6-10)
  - Balancer (page 12-6)

### SPECIFICATION

ITEM	SPECIFICATIONS	
Engine dry weight	'04 – '06	26.6 kg (58.6 lbs)
	After '06	26.9 kg (59.3 lbs)
Recommended engine oil		Pro Honda GN4 4-stroke oil (U.S.A. and Canada) or equivalent motor oil API service classification: SG or Higher JASO T 903 standard: MA Viscosity: SAE 10W-30
Recommended transmission oil		Pro Honda HP Trans Oil, Pro Honda GN4 4-stroke oil (U.S.A. and Canada) or equivalent motor oil API service classification: SG or Higher JASO T 903 standard: MA Viscosity: SAE 10W-30
Engine oil capacity	At draining	0.66 liter (0.70 US qt, 0.58 Imp qt)
	At filter change	0.69 liter (0.73 US qt, 0.61 Imp qt)
	At disassembly	0.85 liter (0.90 US qt, 0.75 Imp qt)
Transmission oil capacity	At draining	0.67 liter (0.71 US qt, 0.59 Imp qt)
	At disassembly	0.75 liter (0.79 US qt, 0.66 Imp qt)
Coolant capacity	At change	1.13 liter (1.19 US qt, 0.99 Imp qt)
	At disassembly	1.20 liter (1.27 US qt, 1.06 Imp qt)

### TORQUE VALUES

Engine hanger plate nut	(engine side) (frame side)	'04: After '04:	54 N·m (5.5 kgf·m, 40 lbf·ft) 26 N·m (2.7 kgf·m, 20 lbf·ft) 34 N·m (3.5 kgf·m, 25 lbf·ft)
Engine mounting nut	(front) (lower)		54 N·m (5.5 kgf·m, 40 lbf·ft) 64 N·m (6.5 kgf·m, 47 lbf·ft)
Drive sprocket bolt			31 N·m (3.2 kgf·m, 23 lbf·ft)
Kickstarter pedal bolt			38 N·m (3.9 kgf·m, 28 lbf·ft)
Gearshift pedal pinch bolt			12 N·m (1.2 kgf·m, 9 lbf·ft)
Brake pedal pivot bolt		'04 – '06: After '06:	25 N·m (2.6 kgf·m, 19 lbf·ft) 36 N·m (3.7 kgf·m, 27 lbf·ft)
Swingarm pivot nut			88 N·m (9.0 kgf·m, 65 lbf·ft)
Throttle drum cover bolt			3.9 N·m (0.4 kgf·m, 2.9 lbf·ft)
			U-nut

## ENGINE REMOVAL/INSTALLATION

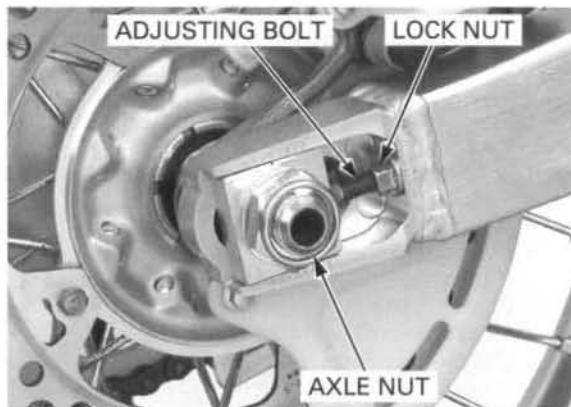
### DRIVE SPROCKET

#### REMOVAL

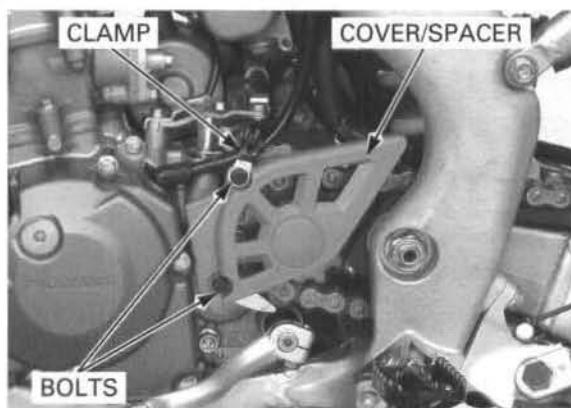
Raise the rear wheel off the ground by placing a workstand or equivalent under the engine.

Loosen the axle nut.

Loosen the drive chain adjuster lock nuts and turn the adjusting bolts clockwise fully.



Remove the bolts, clamp, sprocket cover and spacer.



Shift the transmission into except neutral position.

Remove the sprocket bolt, thrust washer, collar and drive sprocket.

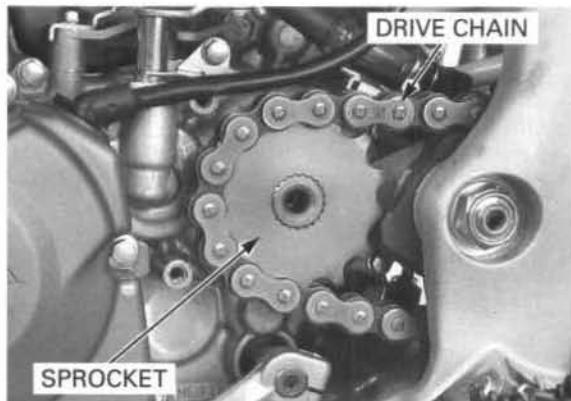


#### INSTALLATION

Install the drive sprocket with its flat side facing out.

Install the drive chain to the drive sprocket.

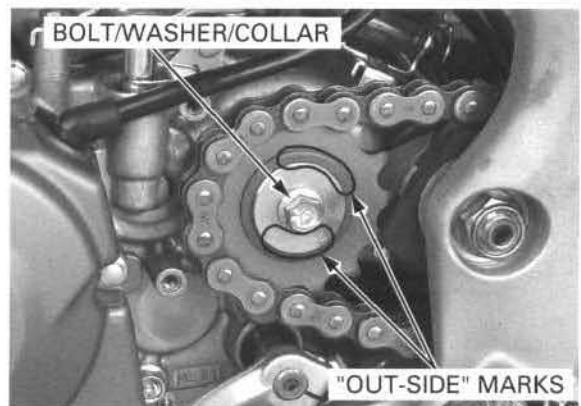
Install the drive sprocket onto the countershaft.



Install the lock washer and collar with the "OUT-SIDE" marks facing out.

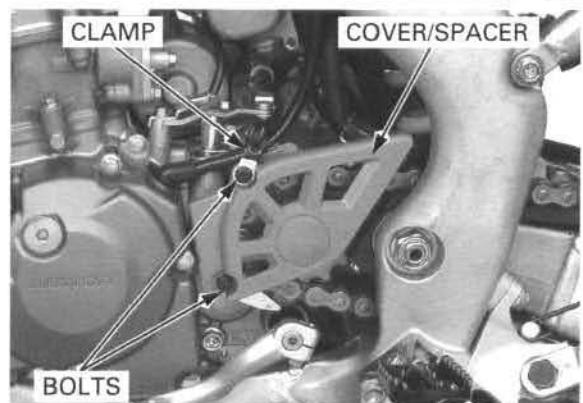
Install and tighten the drive sprocket bolt to the specified torque.

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



Install the spacer, sprocket cover, clamp and bolts.

Adjust drive chain slack (page 3-21).



## ENGINE REMOVAL

Drain the engine oil (page 3-17).

Drain the transmission oil (page 3-20).

Drain the coolant (page 6-7).

Remove the following:

- Seat (page 2-3)
- Engine guards (page 2-4)
- Fuel tank (page 2-7)
- Exhaust pipe (page 2-9)
- Carburetor (page 5-11)
- Drive sprocket (page 7-4)
- Kickstarter pedal (page 10-5)
- Gearshift pedal (page 10-25)
- Brake pedal (page 15-24)

'04 - '06 California type, After '06: Remove the PAIR control valve (page 5-31).

Remove the direct ignition coil.

Disconnect the crankcase breather hose.

Loosen the radiator hose band screw and disconnect the radiator hose from the water hose pipe.

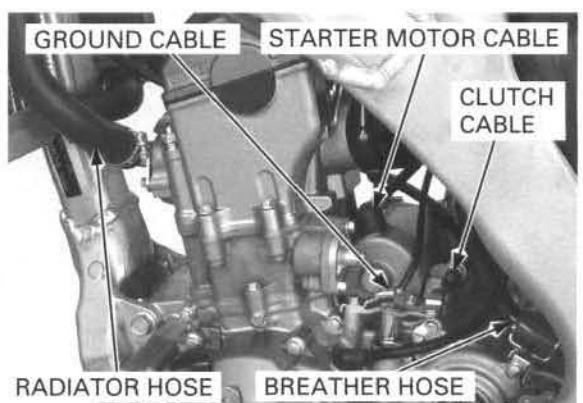
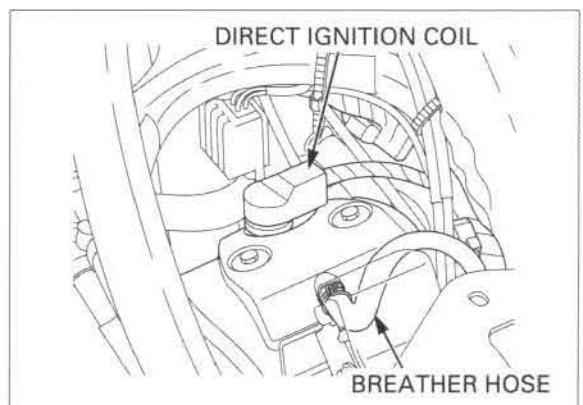
Remove the nut and starter motor cable.

Remove the bolt and ground cable.

Loosen the clutch cable nut and remove the clutch cable from the starter motor stay.

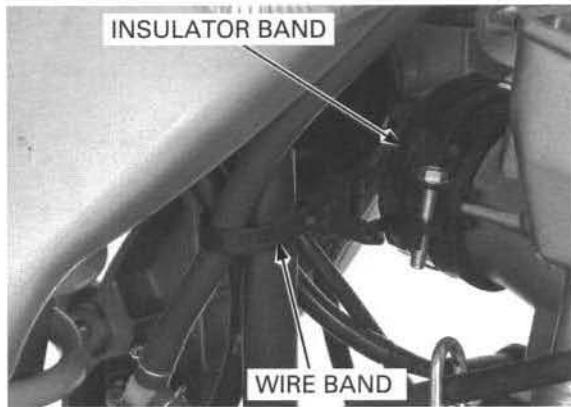
Disconnect the clutch cable from the clutch lifter lever.

Release the crankcase breather hose from the clamp.



## ENGINE REMOVAL/INSTALLATION

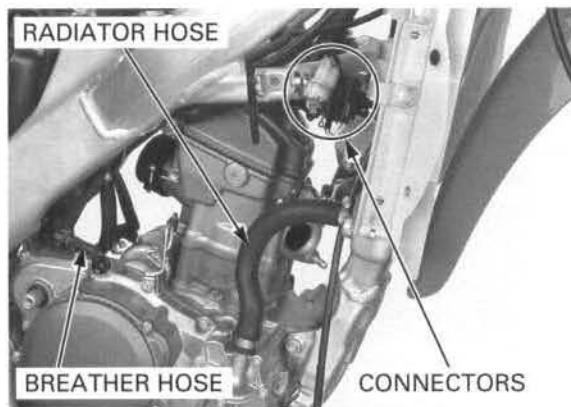
Release the wire band from the carburetor insulator band.



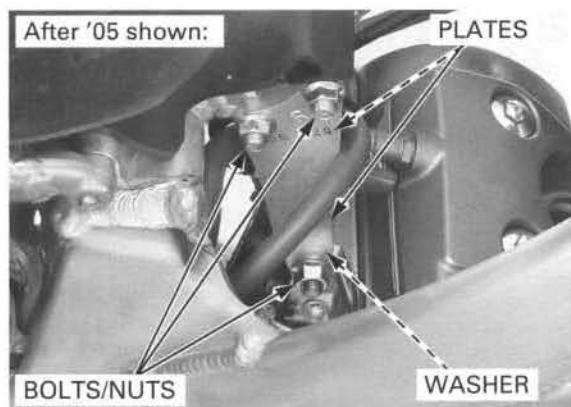
Disconnect the crankcase breather hose.

Loosen the hose band screw and disconnect the lower radiator hose from the right crankcase cover.

Disconnect the alternator and ignition pulse generator connectors.



Remove the bolts, nuts, engine hanger plates and washer.



Loosen the swingarm pivot nut.

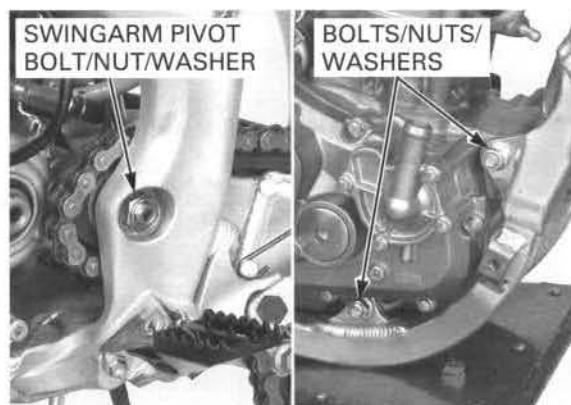
Loosen the engine front and lower mounting nuts.

Remove the swingarm pivot nut, washer and bolt.

Remove the engine front and lower mounting nuts, washers and bolts.

Remove the engine.

- During engine removal, lift the engine up and back, then rotate the engine forward and to the left. Remove the engine from the left side of the frame.
- A workstand or equivalent is necessary to support the swingarm when removing the engine.



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

Temporarily install the swingarm pivot bolt so the chassis can be moved and stored safely.



## ENGINE INSTALLATION

*Install the engine bottom end first from the left side of the frame.*

Install the engine in the frame.  
Apply thin coat of grease to the swingarm pivot bolt sliding surface.

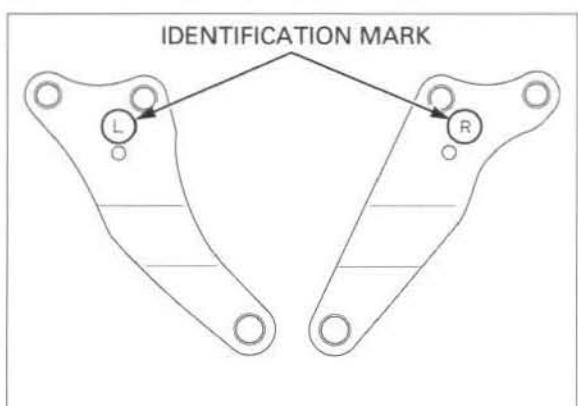
Install the swingarm pivot bolt, washer and nut.  
Carefully align the bolt holes in the frame and engine.

Install the engine mounting bolts, washers and nuts.

- Route the wires and cables properly (page 1-23).
- Do not tighten the swingarm pivot nut and engine mounting nuts yet.



- Each engine hanger plates have an identification mark, "L" is for the left side and "R" is for right side.
- Install the hanger plates with the identification mark facing out.



Install the washer, engine hanger plates, bolts and nuts.

Tighten the engine mounting nuts, engine hanger plate nuts and swingarm pivot nut to the specified torque.

### TORQUE:

Swingarm pivot nut: 88 N·m (9.0 kgf·m, 65 lbf·ft)

Engine hanger plate nut

(engine side): 54 N·m (5.5 kgf·m, 40 lbf·ft)

(frame side):

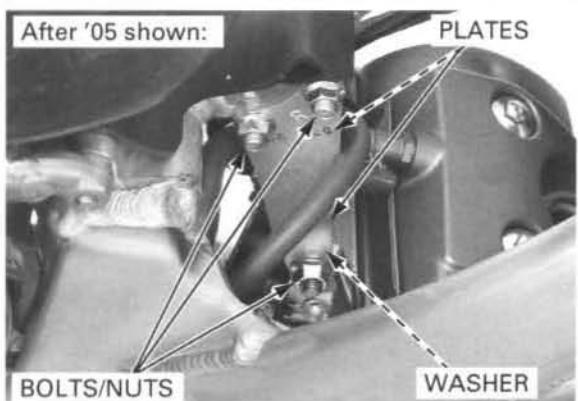
'04: 26 N·m (2.7 kgf·m, 20 lbf·ft)

After '04: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Engine mounting nut

(front): 54 N·m (5.5 kgf·m, 40 lbf·ft)

(lower): 64 N·m (6.5 kgf·m, 47 lbf·ft)

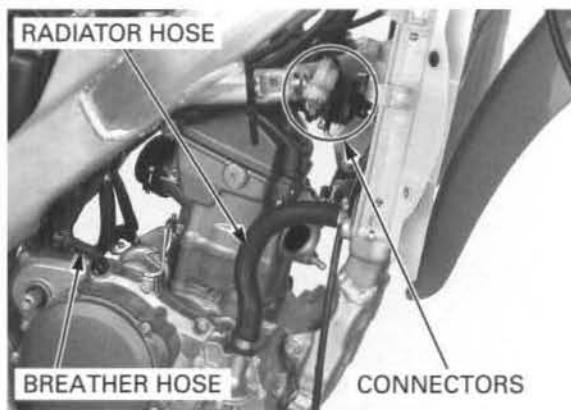


## ENGINE REMOVAL/INSTALLATION

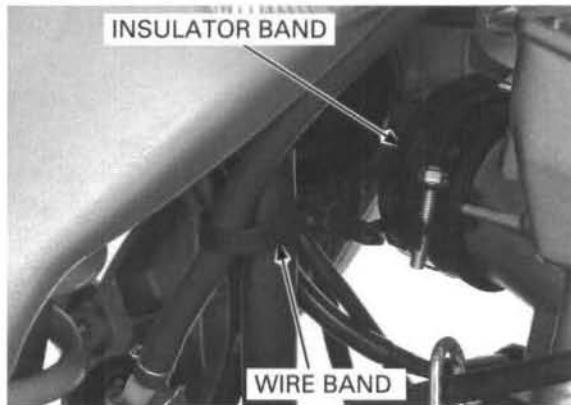
Connect the alternator and ignition pulse generator connectors.

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

Connect the crankcase breather hose.



Install the wire band to the carburetor insulator band.



Install the crankcase breather hose to the clamp.

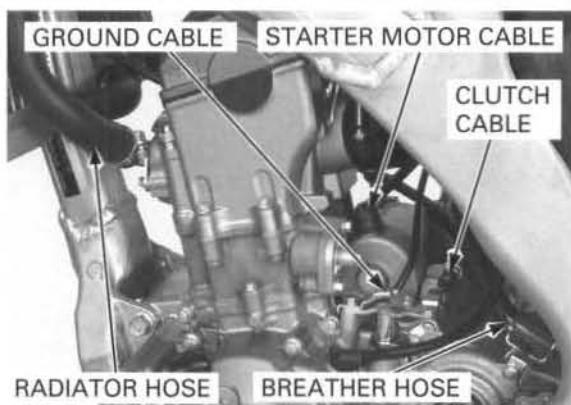
Connect the upper radiator hose and tighten the band screw securely.

Connect the clutch cable into the clutch lifter lever.  
Install the clutch cable to starter motor stay and tighten the clutch cable nut.

Install the ground cable and bolt.

Install the starter motor cable and nut.

Connect the radiator hose to the water hose pipe and tighten the radiator hose band screw.



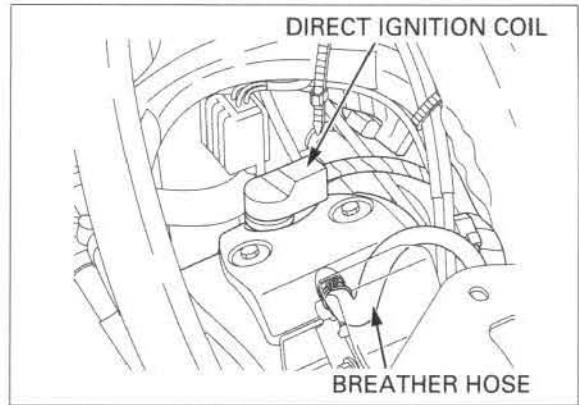
Connect the crankcase breather hose.  
Install the direct ignition coil.

*Always install a new gasket when installing the exhaust pipe.*

Install the following:

- Brake pedal (page 15-25)
- Gearshift pedal (page 10-28)
- Kickstarter pedal (page 10-6)
- Drive sprocket (page 7-4)
- Carburetor (page 5-24)
- Exhaust pipe (page 2-10)
- Fuel tank (page 2-7)
- Engine guard (page 2-4)
- Seat (page 2-3)

'04 – '06 California type, After '06:  
Install the PAIR control valve (page 5-31).



Fill the system with the recommended coolant and bleed the air (page 6-7).

Fill the engine with the recommended engine oil (page 3-17).

Fill the transmission with the recommended transmission oil (page 3-20).

After installing the engine, perform the following inspections and adjustments:

- Throttle grip free play (page 3-8)
- Rear brake pedal height (page 3-28)
- Drive chain slack (page 3-21)
- Clutch lever free play (page 3-28)

Check the exhaust system for leaks.

---

**MEMO**



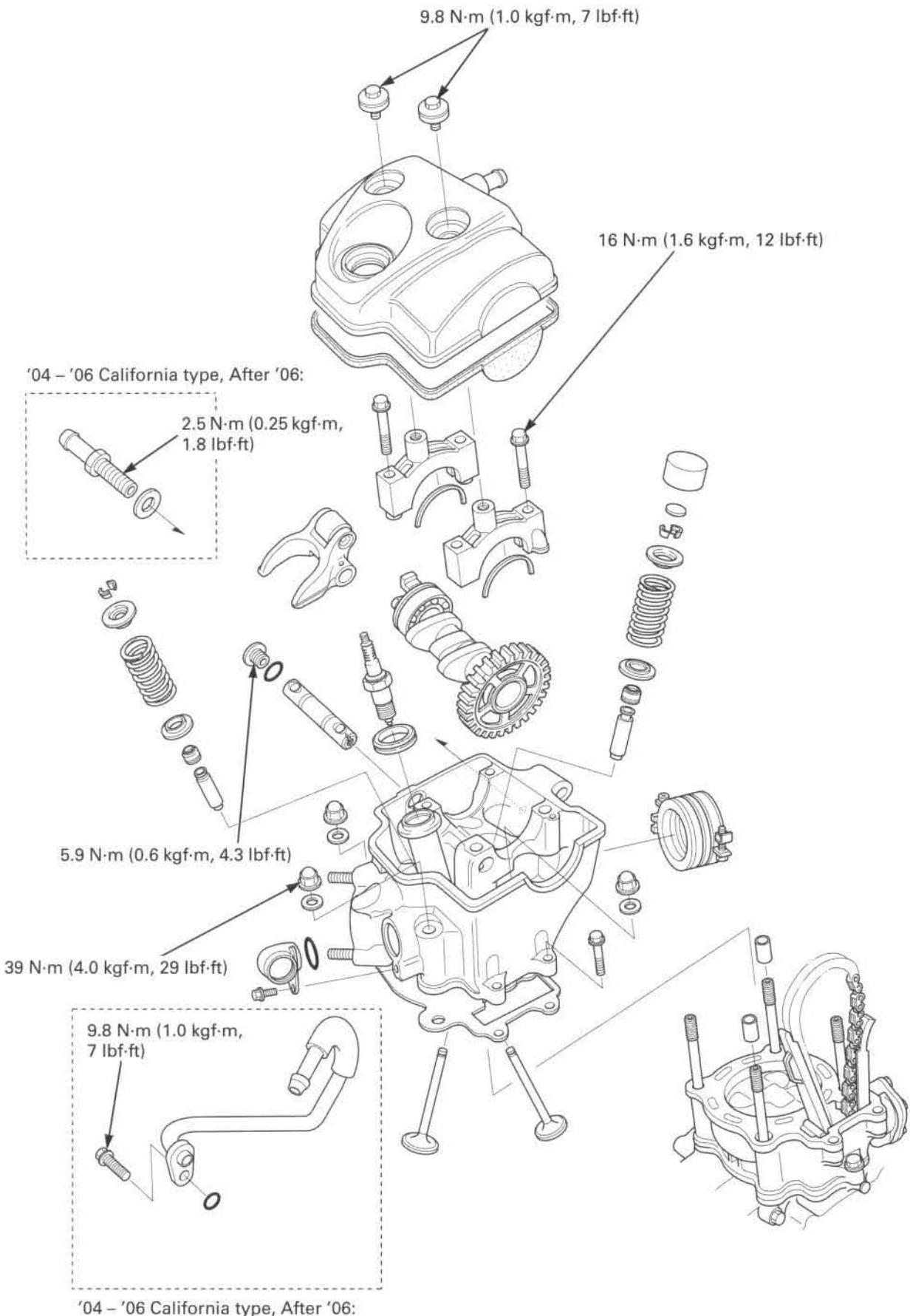
## **8. CYLINDER HEAD/VALVES**

---

COMPONENT LOCATION .....	8-2	CYLINDER HEAD DISASSEMBLY .....	8-15
SERVICE INFORMATION .....	8-3	CYLINDER HEAD INSPECTION .....	8-17
TROUBLESHOOTING .....	8-5	VALVE GUIDE REPLACEMENT .....	8-19
CYLINDER COMPRESSION TEST.....	8-6	VALVE SEAT INSPECTION/ REFACING.....	8-19
CYLINDER HEAD COVER REMOVAL .....	8-6	CYLINDER HEAD ASSEMBLY .....	8-23
CAMSHAFT/ROCKER ARM REMOVAL ....	8-7	CYLINDER HEAD INSTALLATION.....	8-25
CYLINDER HEAD REMOVAL .....	8-12	CAMSHAFT/ROCKER ARM INSTALLATION .....	8-27
CAM CHAIN TENSIONER/ CAM CHAIN GUIDE .....	8-14	CYLINDER HEAD COVER INSTALLATION .....	8-30

## CYLINDER HEAD/VALVES

### COMPONENT LOCATION



## SERVICE INFORMATION

### GENERAL

- This section covers service of the camshaft, cylinder head and valves. These services can be done with the engine installed in the frame.
- During disassembly, 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 lubrication oil is fed through oil passages in the cylinder head. Clean the oil passages before assembling the cylinder head.
- Be careful not to damage the mating surfaces when removing the cylinder head cover and cylinder head.

### SPECIFICATIONS

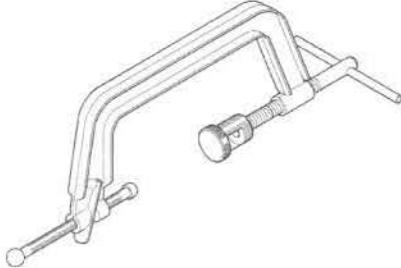
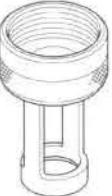
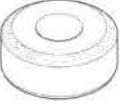
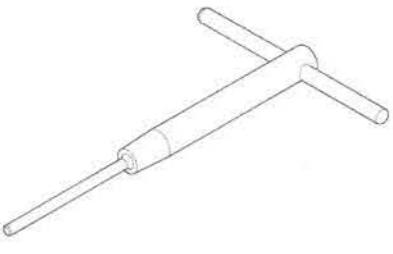
ITEM				STANDARD	Unit: mm (in) SERVICE LIMIT		
Cylinder compression				392 kPa (4.0 kgf/cm <sup>2</sup> , 57 psi) at 800 rpm	-		
Cylinder head warpage				-	0.05 (0.002)		
Valve and valve guide	Valve clearance		IN	0.12 ± 0.03 (0.005 ± 0.001)	-		
			EX	0.28 ± 0.03 (0.011 ± 0.001)	-		
	Valve stem O.D.		IN	4.975 – 4.990 (0.1959 – 0.1965)	-		
			EX	4.965 – 4.980 (0.1955 – 0.1961)	4.955 (0.1951)		
	Valve guide I.D.		IN/EX	5.000 – 5.012 (0.1969 – 0.1973)	5.052 (0.1989)		
	Stem-to-guide clearance		IN	0.010 – 0.037 (0.0004 – 0.0015)	-		
			EX	0.020 – 0.047 (0.0008 – 0.0019)	-		
	Valve guide projection above cylinder head		IN	14.8 – 15.0 (0.58 – 0.59)	-		
			EX	19.8 – 20.0 (0.78 – 0.79)	-		
Valve seat width				0.90 – 1.10 (0.035 – 0.043)	1.7 (0.07)		
Valve spring free length				IN 39.47 (1.554)	38.5 (1.52)		
				EX 43.07 (1.696)	42.1 (1.66)		
Rocker arm	Rocker arm I.D.			12.016 – 12.034 (0.4731 – 0.4738)	12.07 (0.475)		
	Rocker arm shaft O.D.			11.977 – 11.985 (0.4715 – 0.4718)	11.93 (0.470)		
	Rocker arm-to-shaft clearance			0.031 – 0.057 (0.0012 – 0.0022)	0.11 (0.004)		
Camshaft	Cam lobe height	49 State and Canada type	IN	35.580 – 35.660 (1.4008 – 1.4039)	35.44 (1.395)		
			EX	25.081 – 25.161 (0.9874 – 0.9906)	24.98 (0.983)		
	California type	IN	35.280 – 35.360 (1.3890 – 1.3921)	35.14 (1.383)			
		EX	24.959 – 25.038 (0.9826 – 0.9857)	24.86 (0.979)			
Valve lifter O.D.				22.478 – 22.493 (0.8850 – 0.8855)	22.47 (0.885)		
Valve lifter bore I.D.				22.510 – 22.526 (0.8862 – 0.8868)	22.54 (0.887)		

### TORQUE VALUES

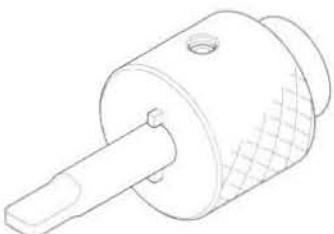
Cylinder head cover bolt	9.8 N·m (1.0 kgf·m, 7 lbf·ft)	
Camshaft holder mounting bolt	16 N·m (1.6 kgf·m, 12 lbf·ft)	Apply oil to the threads
Cylinder head nut	39 N·m (4.0 kgf·m, 29 lbf·ft)	Apply oil to the seating surface
Crankshaft hole cap	15 N·m (1.5 kgf·m, 11 lbf·ft)	Apply grease to the threads
Rocker arm shaft cap	5.9 N·m (0.6 kgf·m, 4.3 lbf·ft)	Apply grease to the threads
Engine hanger plate nut	54 N·m (5.5 kgf·m, 40 lbf·ft)	
	26 N·m (2.7 kgf·m, 20 lbf·ft)	
	34 N·m (3.5 kgf·m, 25 lbf·ft)	
Spark plug	16 N·m (1.6 kgf·m, 12 lbf·ft)	
Vacuum hose boost joint ('04 – '06 California type, After '06)	2.5 N·m (0.25 kgf·m, 1.8 lbf·ft)	

## CYLINDER HEAD/VALVES

### TOOLS

Valve spring compressor 07757-0010000	Valve spring compressor attachment 07JME-KY20100	Valve guide driver, 5.0 mm 07942-MA60000
		
Valve guide reamer, 5.0 mm 07984-MA60001 or  	Valve seat cutter, 33 mm (45°, IN) 07780-0010800  	Valve seat cutter, 27.5 mm (45°, EX) 07780-0010200  
07984-MA6000D (U.S.A. only)  or equivalent commercially available in U.S.A.	or equivalent commercially available in U.S.A.	or equivalent commercially available in U.S.A.
Flat cutter, 33 mm (32°, IN) 07780-0012900  	Flat cutter, 28 mm (32°, EX) 07780-0012100  	Interior cutter, 37.5 mm (60°, IN) 07780-0014100  
or equivalent commercially available in U.S.A.	or equivalent commercially available in U.S.A.	or equivalent commercially available in U.S.A.
Interior cutter, 30 mm (60°, EX) 07780-0014000  	Cutter holder, 5.0 mm 07781-0010400  	Tappet hole protector 07JMG-KY20100    or make your own from 35 mm film canister
or equivalent commercially available in U.S.A.	or equivalent commercially available in U.S.A.	or make your own from 35 mm film canister

Chain tensioner stopper  
070MG-0010100



or 07AMG-001A100 (U.S.A. only)

## 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 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.

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

- Valves:
  - Incorrect valve adjustment
  - Burned or bent valves
  - Incorrect valve timing
  - Broken valve spring
  - Uneven valve seating
- Cylinder head:
  - Leaking or damaged cylinder head gasket
  - Warped or cracked cylinder head
- Loose spark plug
- Faulty cylinder, piston (page 9-5)

### Compression too high

- Excessive carbon build-up in cylinder head or on top of piston

### Excessive smoke

- Worn valve stem or valve guide
- Damaged stem seal
- Faulty cylinder, piston (page 9-5)

### Excessive noise

- Incorrect valve adjustment
- Sticking valve or broken valve spring
- Worn or damaged camshaft
- Worn or damaged valve lifter
- Worn or loose cam chain
- Worn or damaged cam chain tensioner
- Worn cam sprocket teeth
- Faulty cylinder, piston (page 9-5)

### Rough idle

- Low cylinder compression

## CYLINDER HEAD/VALVES

### CYLINDER COMPRESSION TEST

Remove the fuel tank (page 2-7).

Warm up the engine.

Stop the engine and remove the spark plug.

Connect a compression gauge.

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

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

**COMPRESSION: 392 kPa (4.0 kg/cm<sup>2</sup>, 57 psi) at 800 rpm**

**Low compression can be caused by:**

- Improper valve adjustment
- Valve leakage
- Blown cylinder head gasket
- Worn piston ring or cylinder (page 9-5)

**High compression can be caused by:**

- Carbon deposits in combustion chamber or on piston head
- Faulty decompressor cam

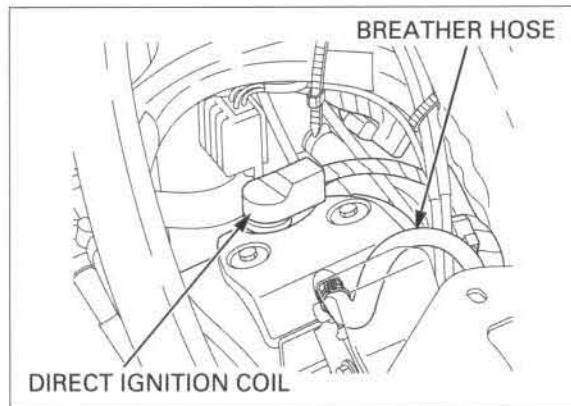


### CYLINDER HEAD COVER REMOVAL

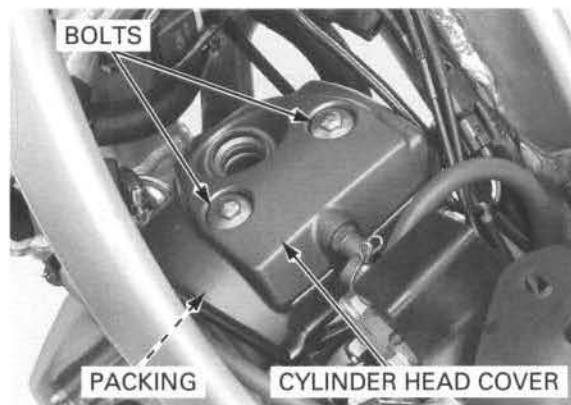
Remove the fuel tank (page 2-7).

Remove the direct ignition coil.

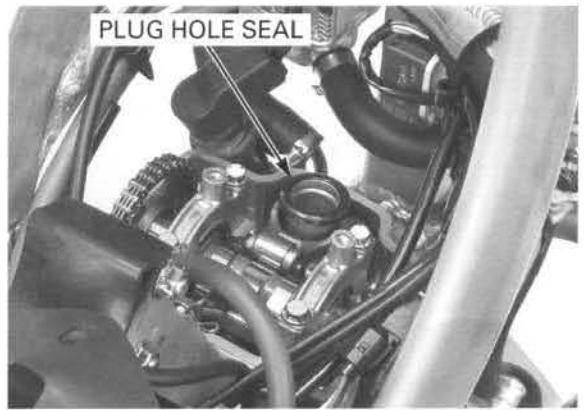
Disconnect the crankcase breather hose.



Remove the bolts, cylinder head cover and packing.



Remove the plug hole seal.

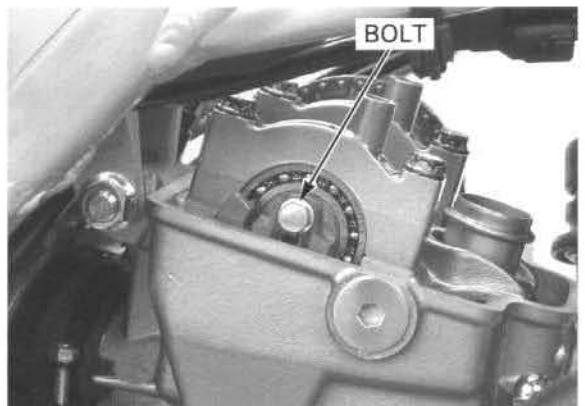


## CAMSHAFT/ROCKER ARM REMOVAL

### CAMSHAFT

Remove the cylinder head cover (page 8-6).

The decompressor cam will be disassembled later, loosen the stopper plate bolt, but do not remove it yet.



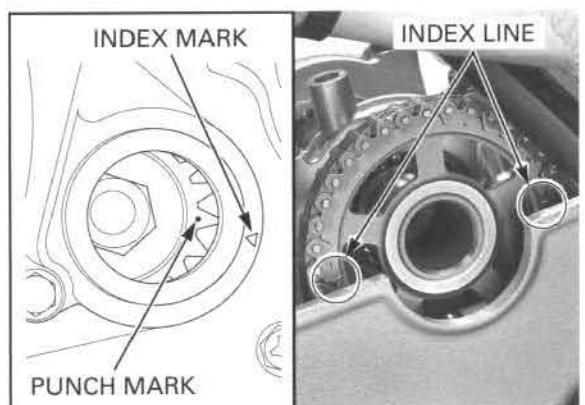
Remove the crankshaft hole cap and O-ring.



Turn the crankshaft clockwise to align the punch mark with the index mark on the right crankcase cover.

Make sure the piston is at T.D.C. (Top Dead Center) on the compression stroke.

The index line on the cam sprocket must be flush with the cylinder head surface as shown.



## CYLINDER HEAD/VALVES

Remove the cam chain tensioner lifter bolt and sealing washer.

If a special tool is not available, refer to the next step to make an alternative tool.

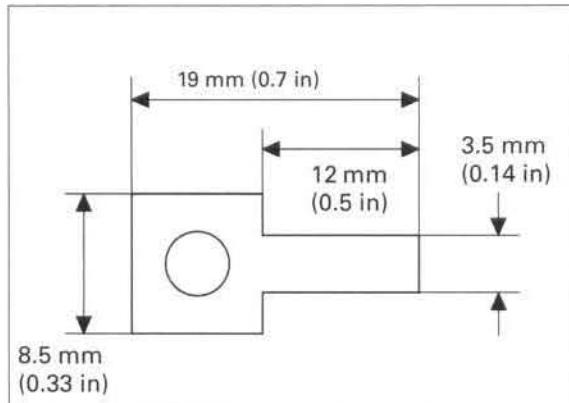
Turn the cam chain tensioner lifter shaft clockwise fully and secure it with the special tool.

**TOOL:**  
**Tensioner stopper**

070MG-0010100 or  
07AMG-001A100  
(U.S.A. only)



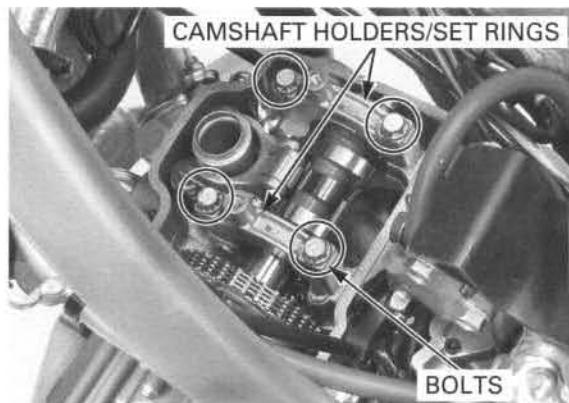
A tool can easily be made from a thin (1 mm thick) piece of steel as shown.



Loosen the camshaft holder bolts in a crisscross pattern in two or three steps.

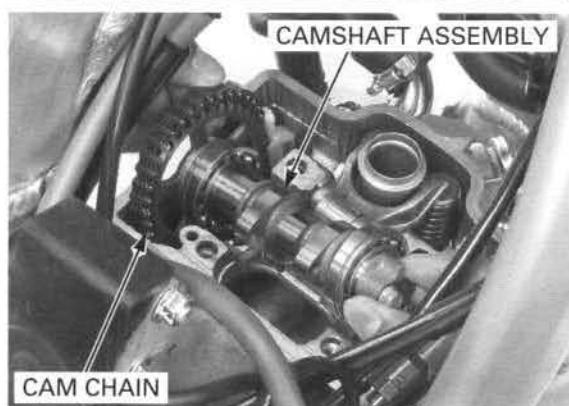
*Be careful not to let the set rings fall into the crankcase.*

Remove the camshaft holders and set rings.



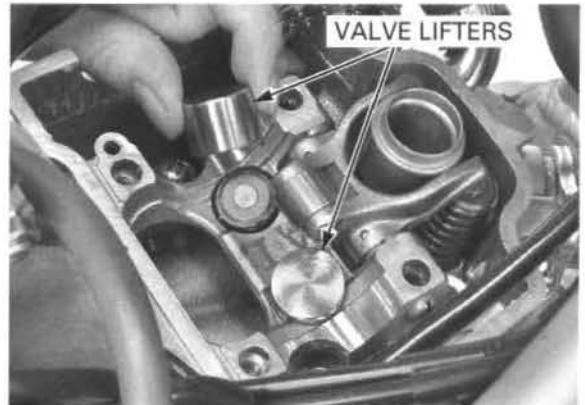
Remove the cam chain from the cam sprocket and suspend the cam chain with a piece of wire to prevent it from falling into the crankcase.

Remove the camshaft assembly.



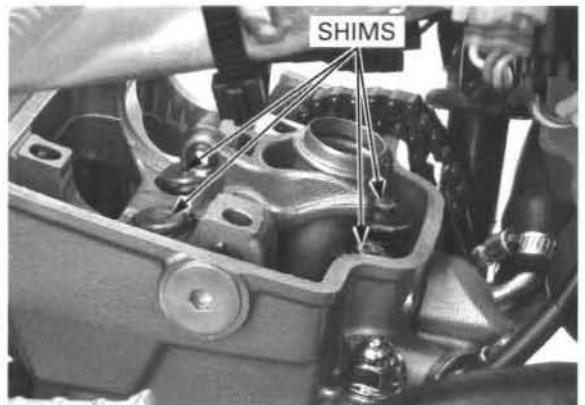
Remove the valve lifters from the cylinder head.

- Shims may stick to the inside of the valve lifters. Do not allow the shims to fall into the left crankcase.
- Make all valve lifters to ensure correct reassembly in their original locations.



Remove the shims.

- Be careful not to let the shims fall into the left crankcase.
- Make all shims to ensure correct reassembly in their original locations.

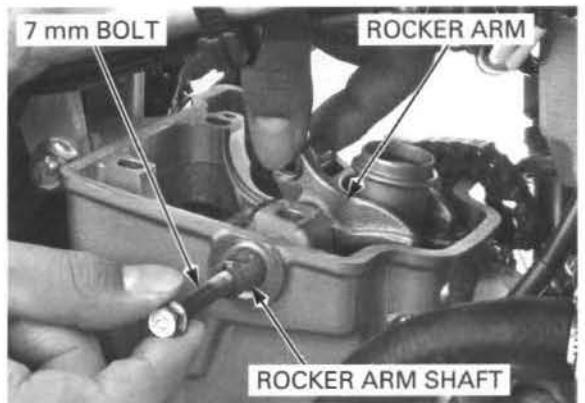


### ROCKER ARM

Remove the rocker arm shaft cap and O-ring from the cylinder head.



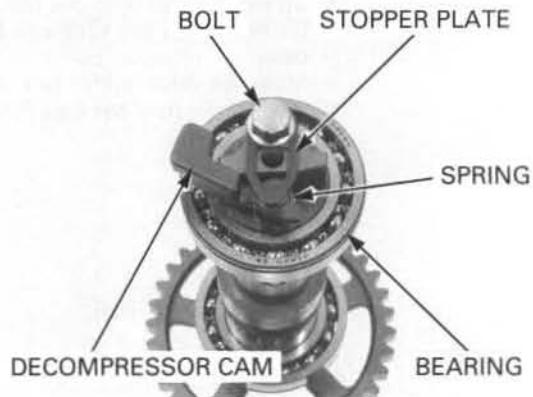
Thread a 7 mm bolt into the rocker arm shaft and pull the rocker arm shaft out of the cylinder head. Remove the rocker arm from the cylinder head.



## CYLINDER HEAD/VALVES

### DISASSEMBLY

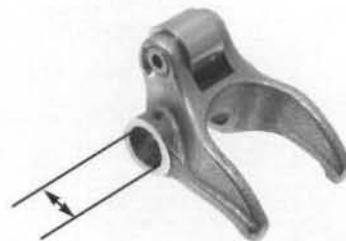
Remove the bolt, stopper plate, decompressor cam, spring and bearing.



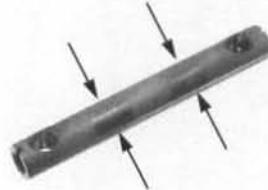
### INSPECTION

If the camshaft contact surface of the rocker arm for wear or damage.  
the rocker arm is damaged or abnormally worn, check the cam lobes for damage.

Inspect the camshaft contact surface of the rocker arm for wear or damage.  
Inspect the rocker arm oil passage for clog.  
Measure the rocker arm I.D.  
**SERVICE LIMIT: 12.07 mm (0.475 in)**

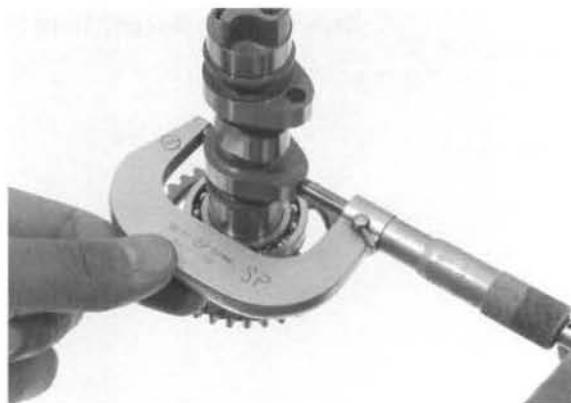


Inspect the rocker arm shaft for wear or damage.  
Measure the rocker arm shaft O.D.  
**SERVICE LIMIT: 11.93 mm (0.470 in)**  
Calculate the rocker arm-to-shaft clearance.  
**SERVICE LIMIT: 0.11 mm (0.004 in)**



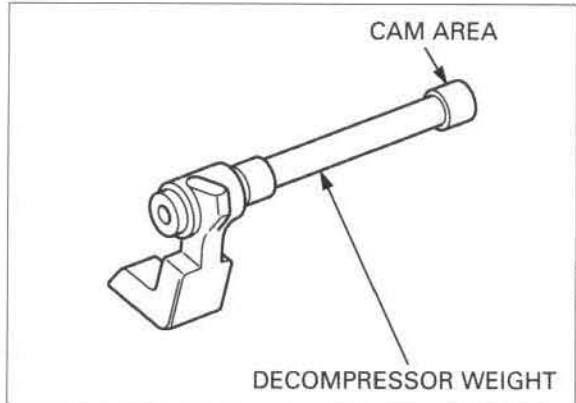
Measure the height of each cam lobe.

**SERVICE LIMITS:**  
49 State and Canada type:  
IN: 35.44 mm (1.395 in)  
EX: 24.98 mm (0.983 in)  
California type:  
IN: 35.14 mm (1.383 in)  
EX: 24.86 mm (0.979 in)



Check the decompressor weight for bend or damage.

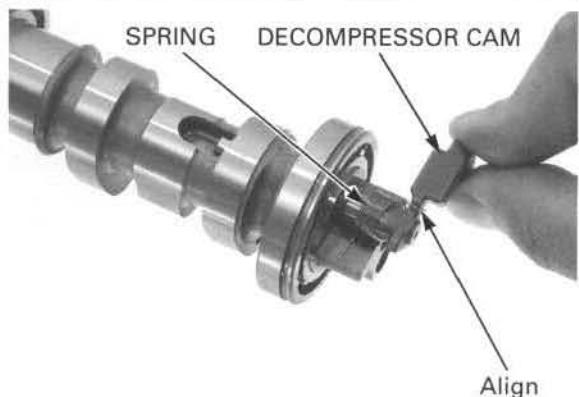
Check the decompressor weight cam area for wear or damage.



Temporarily install the spring and decompressor weight into camshaft.

Check the decompressor cam spring for damage or fatigue.

Check the decompressor system for smooth operation, replace if necessary.



Turn the outer race of each bearing with your finger. The bearing should turn smoothly and quietly. Also check that the bearing inner races fit tightly in the camshaft.

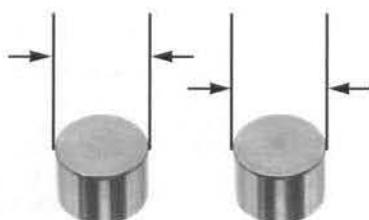
Replace the camshaft if each bearing do not turn smoothly, quietly, or if they fit loosely on the cam-shaft.



Check the valve lifter for scoring, scratches or damage.

Measure each valve lifter O.D.

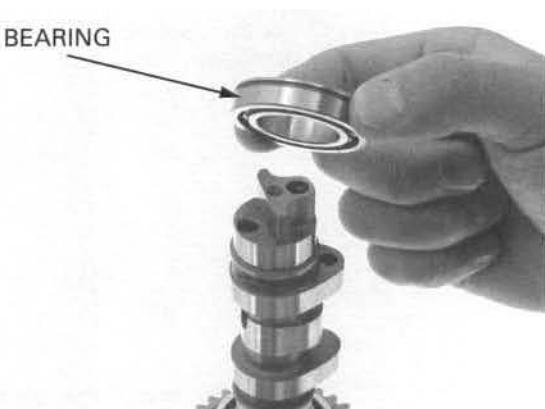
**SERVICE LIMIT: 22.47 mm (0.885 in)**



## CYLINDER HEAD/VALVES

### ASSEMBLY

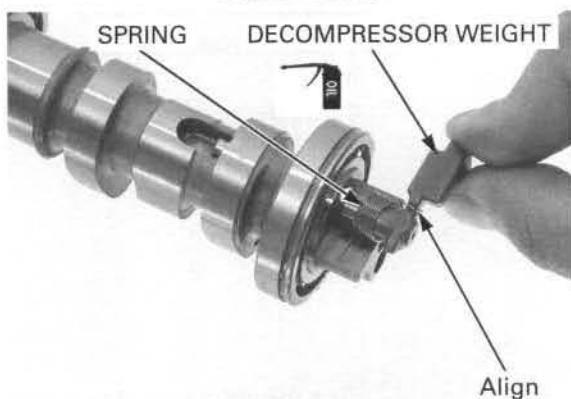
Install the bearing with its ring groove facing outside.



Apply oil to the decompressor weight sliding area.

Install the spring and decompressor weight into the camshaft.

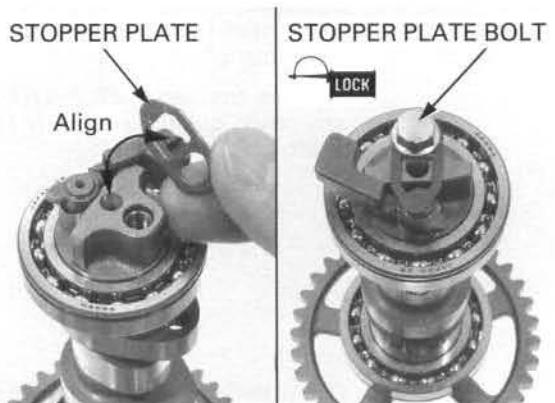
- Align the spring end and decompressor cam as shown.



Clean and apply a locking agent to the decompressor cam stopper plate bolt threads.

Install the decompressor cam stopper plate by aligning the tab of the stopper plate with the hole of the camshaft as shown.

Loosely install the stopper plate bolt.



## CYLINDER HEAD REMOVAL

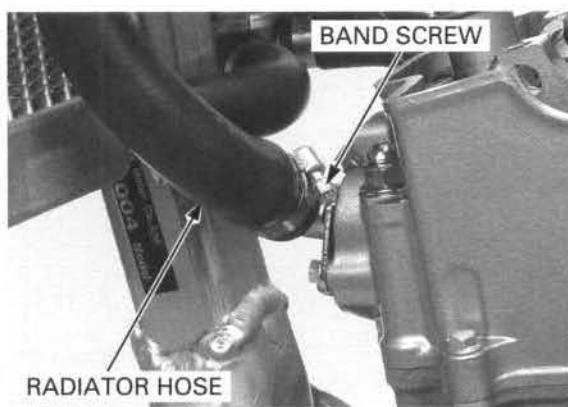
Remove the following:

- Spark plug (page 3-11)
- Exhaust pipe (page 2-9)
- Carburetor (page 5-11)
- Cylinder head cover (page 8-6)
- Camshaft (page 8-7)
- Rocker arm (page 8-9)

'04 – '06 California type, After '06: Remove the PAIR control valve and air supply pipe (page 5-31).

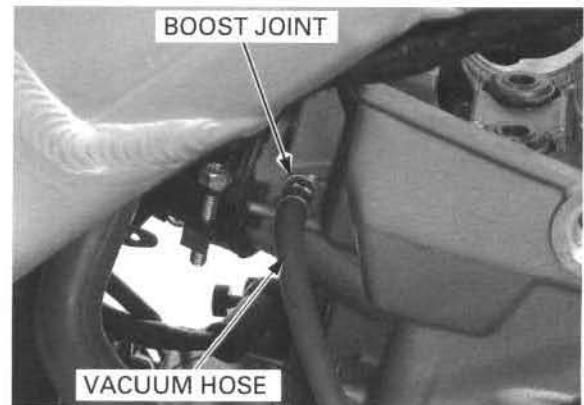
Drain the coolant (page 6-7).

Loosen the radiator hose band screw.  
Disconnect the radiator hose from the water hose pipe.

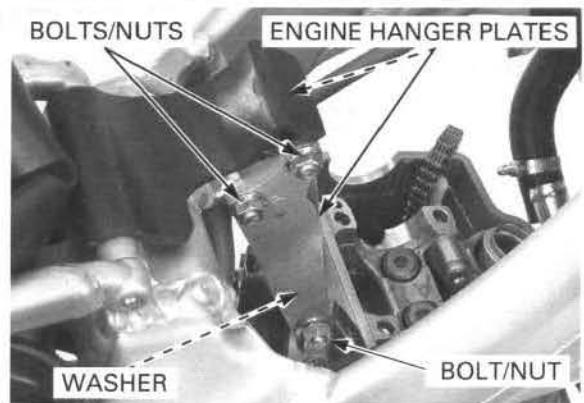


## CYLINDER HEAD/VALVES

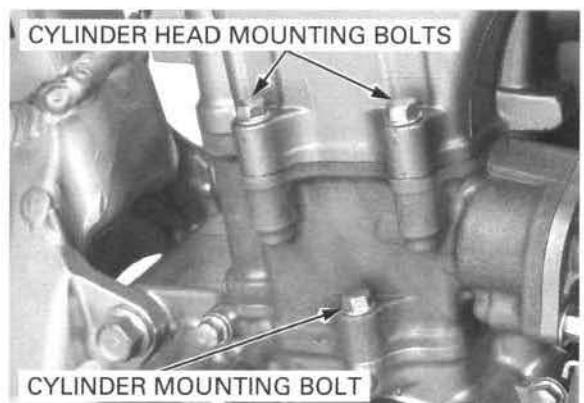
'04 - '06 California type, After '06: Disconnect the vacuum hose from the boost joint.



Remove the engine hanger plate bolts, nuts, plates and washer.

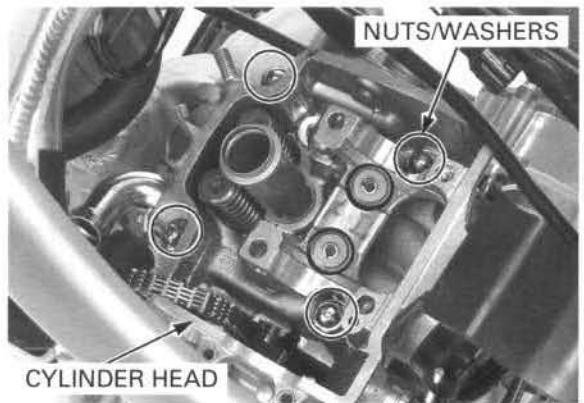


Remove the cylinder head mounting bolts.  
Loosen the cylinder mounting bolt.



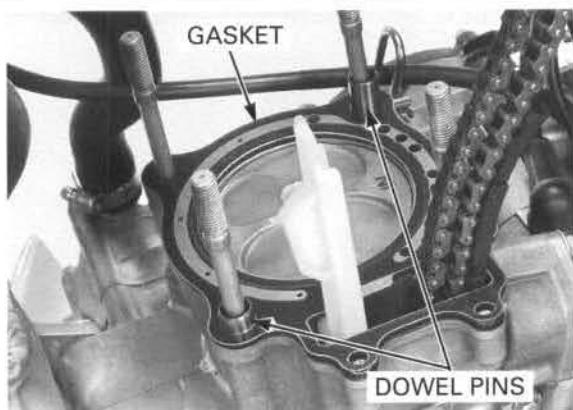
*Be careful not to let the nuts and washers fall into the left crankcase.*  
Loosen the cylinder head nuts in a crisscross pattern in two or three steps.

Remove the nuts, washers and cylinder head.



## CYLINDER HEAD/VALVES

Remove the gasket and dowel pins.

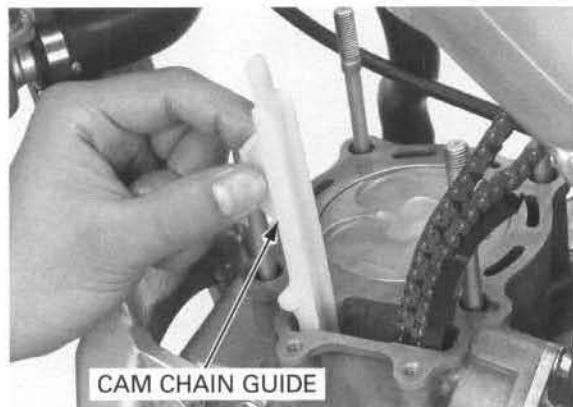


## CAM CHAIN TENSIONER/CAM CHAIN GUIDE

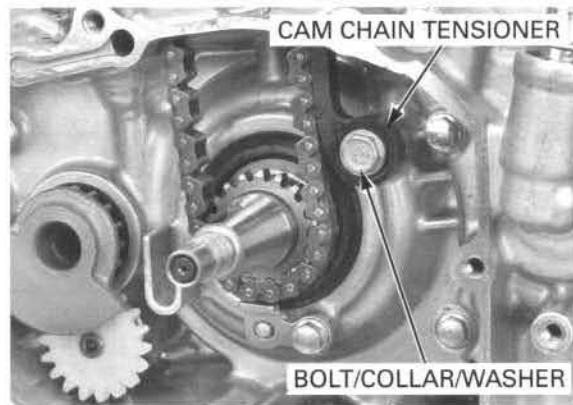
### REMOVAL

Remove the cylinder head (page 8-12).  
Remove the left crankcase cover (page 11-4).  
Remove the flywheel (page 11-5).

Remove the cam chain guide.

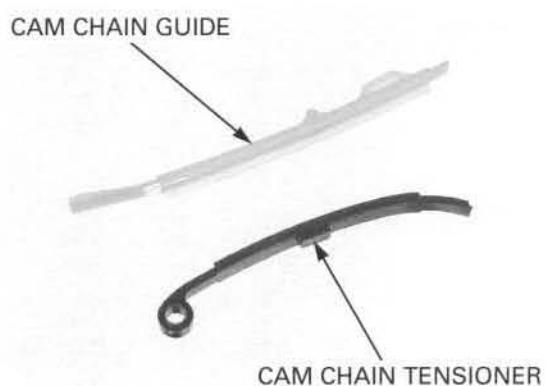


Remove the bolt, cam chain tensioner, collar and washer.



### INSPECTION

Inspect the cam chain tensioner and cam chain guide for excessive wear or damage, replace if necessary.



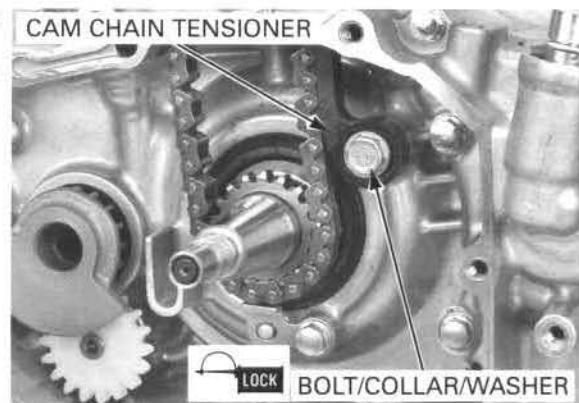
## INSTALLATION

Apply locking agent to the cam chain tensioner bolt threads.

Install the washer, collar, cam chain tensioner and bolt.

Tighten the bolt to the specified torque.

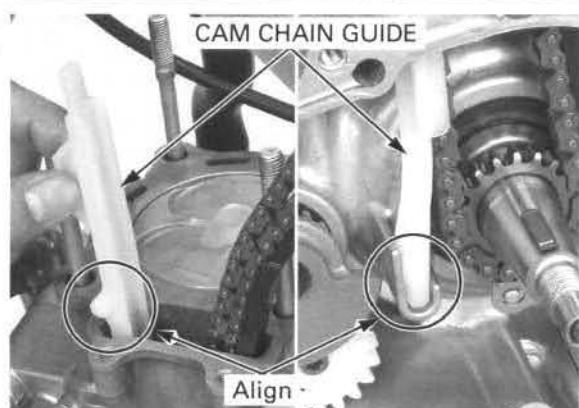
**TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)**



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

Install the following:

- Flywheel (page 11-6)
- Left crankcase cover (page 11-7)
- Cylinder head (page 8-25)

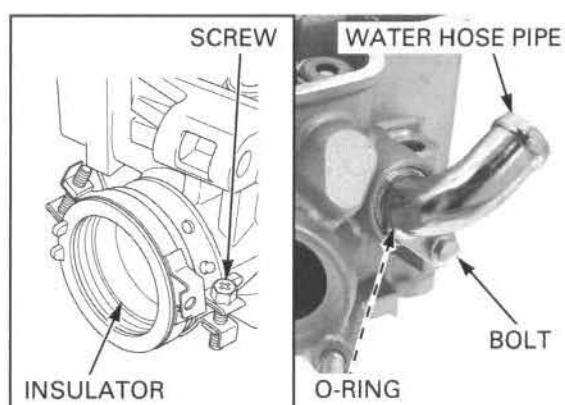


## CYLINDER HEAD DISASSEMBLY

Remove the cylinder head (page 8-12).

Loosen the insulator band screw and remove the insulator from the cylinder head.

Remove the bolt, O-ring and water hose pipe.



'04 - '06 California type, After '06: Remove the boost joint and sealing washer.



## CYLINDER HEAD/VALVES

If a special tool is not available, refer to the next step to make an alternative tool.

Install the tappet hole protector into the intake valve lifter bore.

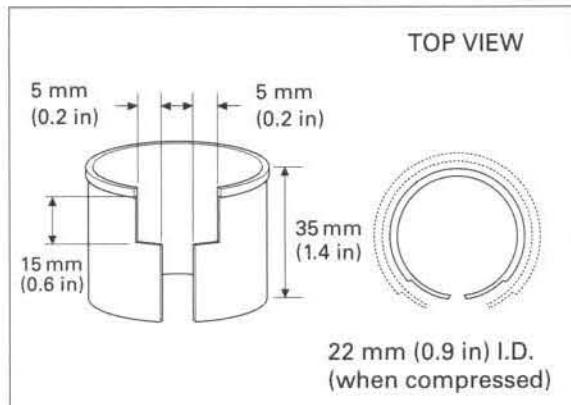
**TOOL:**

Tappet hole protector

07JMG-KY20100



An equivalent tool can easily be made from a plastic 35 mm (1.4 in) film container as shown.



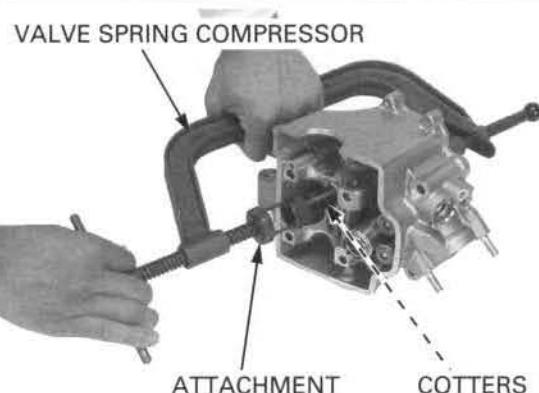
To prevent loss of tension, do not compress the valve springs more than necessary to remove the cotters.

Remove the valve spring cotters using the special tools.

**TOOLS:**

Valve spring compressor  
Compressor attachment

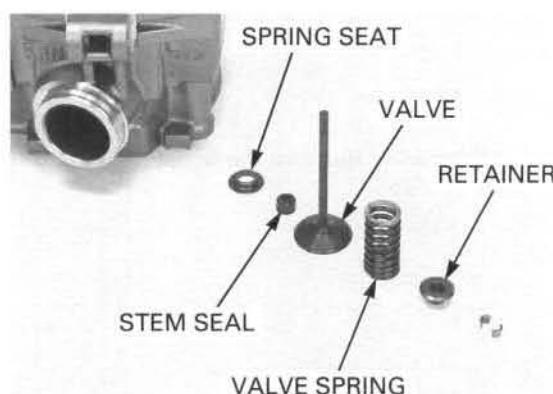
07757-0010000  
07JME-KY20100



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

Remove the following:

- Spring retainer
- Valve spring
- Valve
- Stem seal
- Spring seat



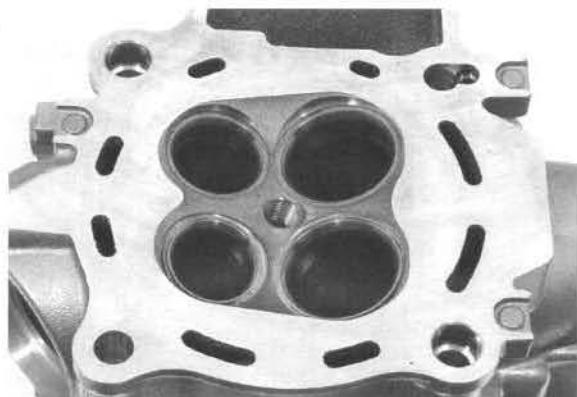
## CYLINDER HEAD INSPECTION

### CYLINDER HEAD

*Use care not to scratch the combustion chamber or the head gasket surface.*

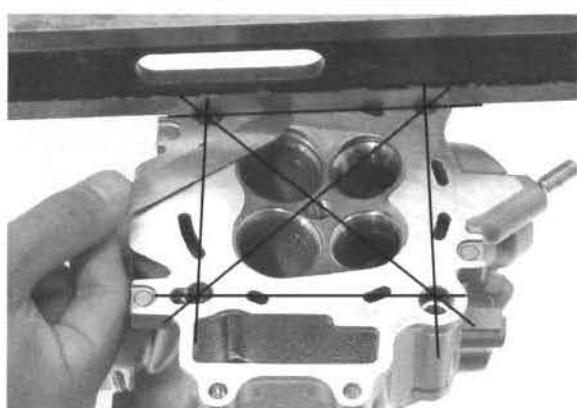
Remove the carbon deposits from the combustion chamber or exhaust port.

Check the spark plug hole and valve area for cracks.



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

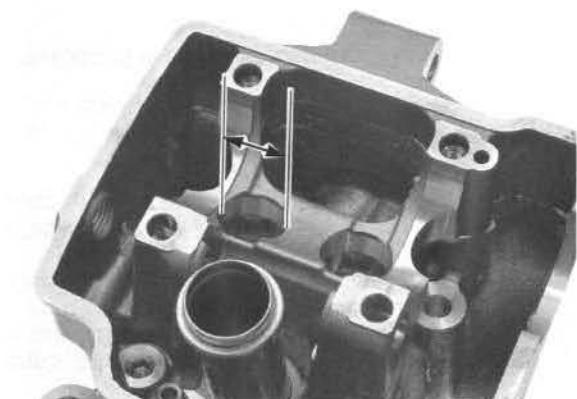
**SERVICE LIMIT:** 0.05 mm (0.002 in)



Check the valve lifter bore for scoring, scratches or damage.

Measure each valve lifter bore I.D.

**SERVICE LIMIT:** 22.54 mm (0.887 in)



### VALVE SPRING

Check the valve springs for fatigue or damage.

Measure the free length of the intake and exhaust valve springs.

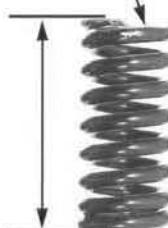
#### SERVICE LIMITS:

**IN:** 38.5 mm (1.52 in)

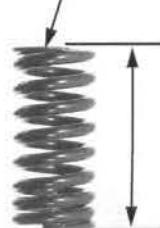
**EX:** 42.1 mm (1.66 in)

Replace the springs if they are shorter than the service limits.

EXHAUST  
VALVE SPRING



INTAKE VALVE  
SPRING



## CYLINDER HEAD/VALVES

### VALVE/VALVE GUIDE

Inspect each valve for out-of-round, burns, scratches or abnormal stem wear.

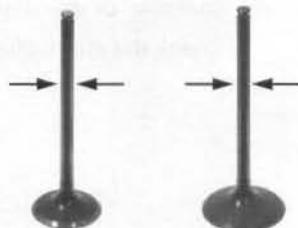
Check the valve movement in the guide.  
Measure and record the valve stem O.D.

#### STANDARD:

IN: 4.975 – 4.990 mm (0.1959 – 0.1965 in)  
EX: 4.965 – 4.980 mm (0.1955 – 0.1961 in)

#### SERVICE LIMIT:

EX: 4.955 mm (0.1951 in)



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

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

#### TOOL:

Valve guide reamer, 5.0 mm      07984-MA60001 or  
    07984-MA6000D  
    (U.S.A. only)



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

#### SERVICE LIMITS:

IN/EX: 5.052 mm (0.1989 in)

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

#### STANDARD:

IN: 0.010 – 0.037 mm (0.0004 – 0.0015 in)  
EX: 0.020 – 0.047 mm (0.0008 – 0.0019 in)

*Reface the valve seats whenever the valve guides are replaced (page 8-19).*

If the stem-to-guide clearance exceeds the service limits, 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 exceeds the service limits with new guides also, replace the valves and guides.



## VALVE GUIDE REPLACEMENT

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

Mark new valve guides at the proper depth (see specification below) using a marker. Chill the new valve guides in a freezer for about 1 hour.

Heat the cylinder head to 100 – 150 °C (212 – 302 °F) with a hot plate or oven. Do not heat the cylinder head beyond 160 °C (320 °F). Use temperature indicator sticks, available from welding supply stores, to be sure the cylinder head is heated to the proper temperature.

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

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

**TOOL:**

**Valve guide driver, 5.0 mm      07942-MA60000**

While the cylinder head is still heated, drive new valve guides into the cylinder head from the top of the cylinder (camshaft and rocker arm side).

Remove the guides from the freezer.

Drive in the guides until the marks are parallel with the cylinder head.

Check that the valve guides are at the proper depth, adjust the height if necessary.

**SPECIFIED DEPTH:**

**IN: 14.8 – 15.0 mm (0.58 – 0.59 in)**

**EX: 19.8 – 20.0 mm (0.78 – 0.79 in)**

**TOOL:**

**Valve guide driver, 5.0 mm      07942-MA60000**

Let the cylinder head cool to room temperature.

Ream the new valve guides.

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

**TOOL:**

**Valve guide reamer, 5.0 mm      07984-MA60001 or  
07984-MA6000D  
(U.S.A. only)**

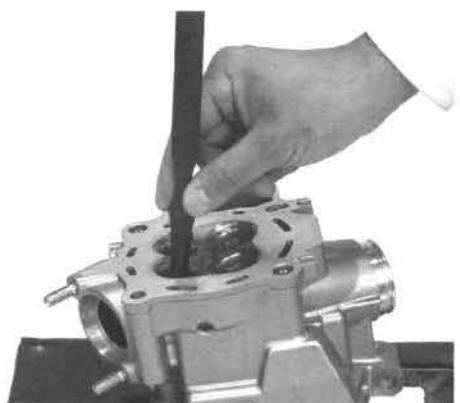
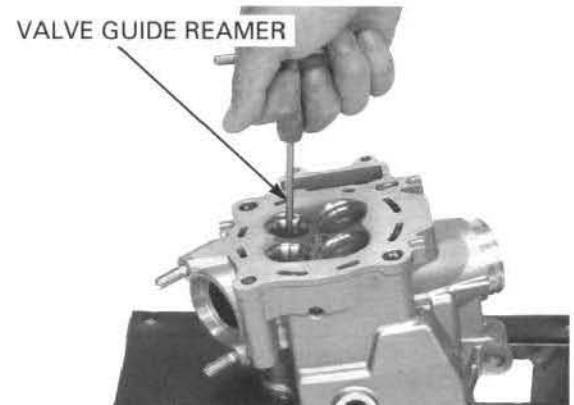
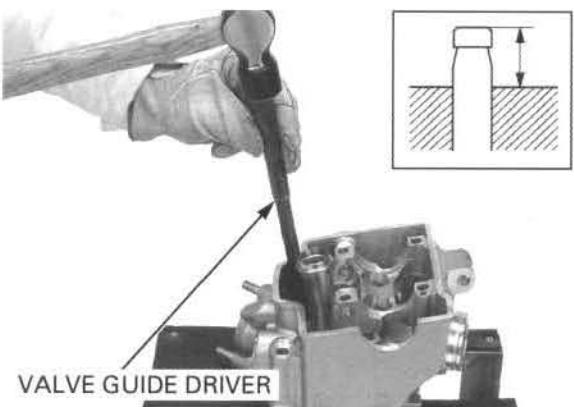
Clean the cylinder head thoroughly to remove any metal particles after reaming and reface the valve seats (page 8-19).

## VALVE SEAT INSPECTION/REFACING

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

Apply a light coating of Prussian Blue to the valve seat.

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



## CYLINDER HEAD/VALVES

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

### STANDARD:

IN/EX: 0.90 – 1.10 mm (0.035 – 0.043 in)

### SERVICE LIMIT:

IN/EX: 1.7 mm (0.07 in)

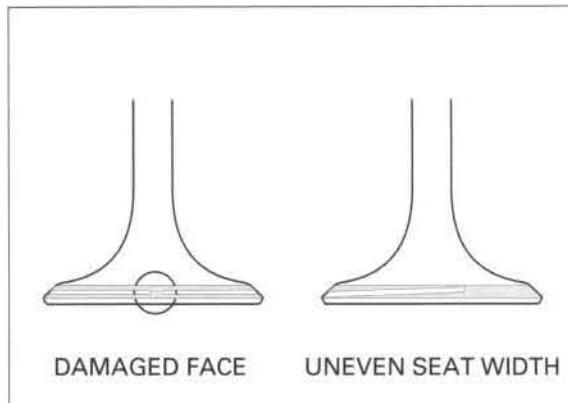
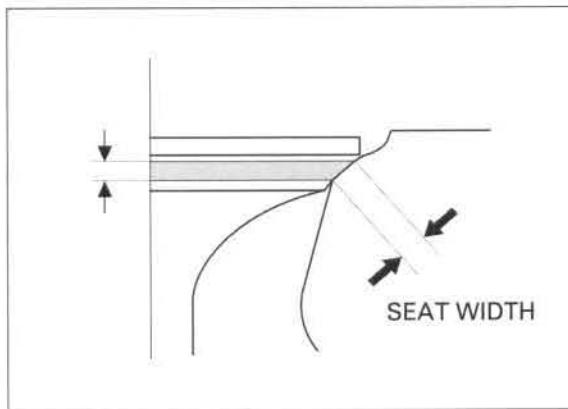
### NOTE:

- When the service limits are exceeded, replace the intake valve and recheck the valve seat width.

If the seat width is not within specification, reface the valve seat (page 8-20).

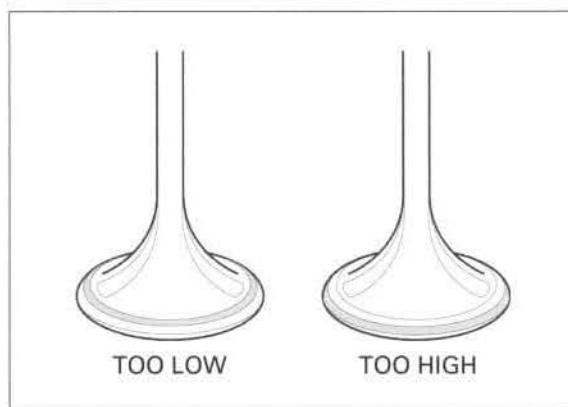
Inspect the valve seat face for:

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



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

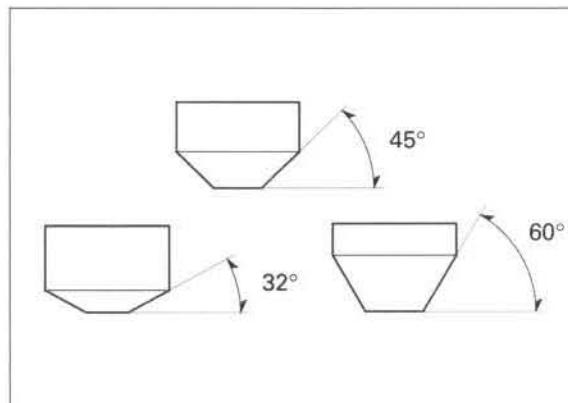
- Contact area (too high or too low)
  - Reface the valve seat.



## VALVE SEAT REFACING

Follow the refacing manufacturer's operating instructions.

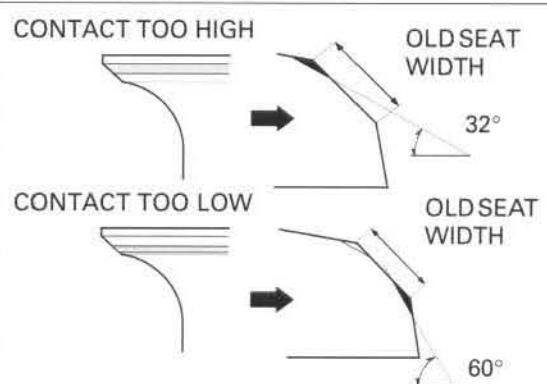
Valve seat cutters/grinders or equivalent valve seat refacing equipments are recommended to correct worn valve seats.



## CYLINDER HEAD/VALVES

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

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



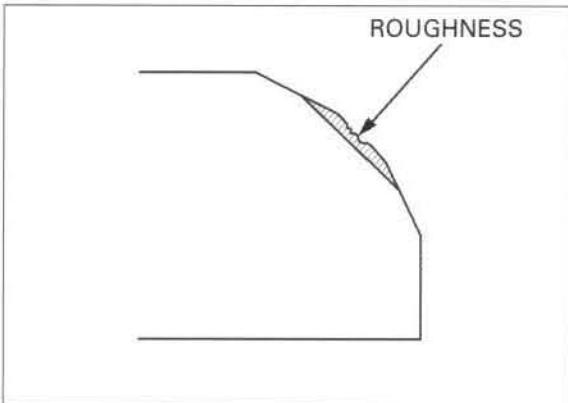
*Reface the seat with a 45° cutter whenever a valve guide is replaced.*

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

### TOOLS:

Seat cutter, 27.5 mm 07780-0010200  
Seat cutter, 33 mm 07780-0010800

Cutter holder, 5.0 mm 07781-0010400  
or equivalent commercially available in U.S.A.

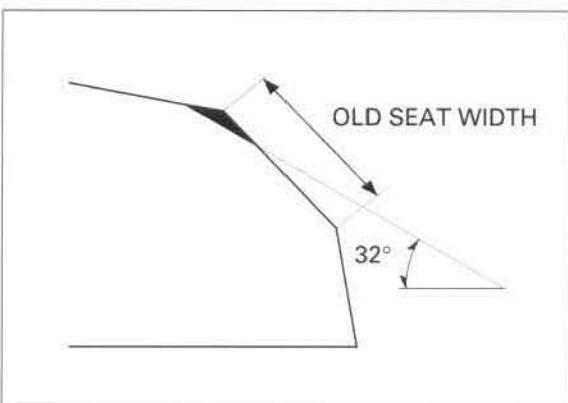


Use a 32° flat cutter, remove 1/4 of the existing valve seat material.

### TOOLS:

Flat cutter, 33 mm 07780-0012900  
Flat cutter, 28 mm 07780-0012100

Cutter holder, 5.0 mm 07781-0010400  
or equivalent commercially available in U.S.A.

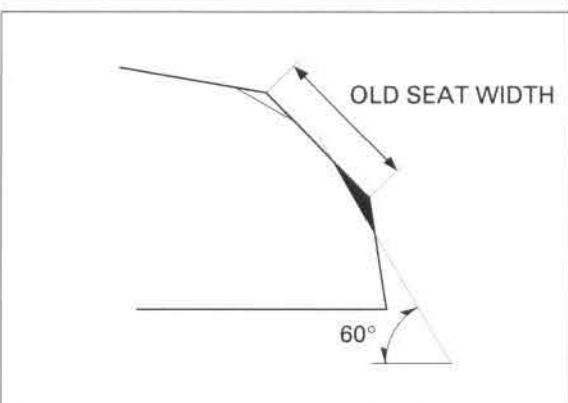


Use a 60° interior cutter, remove 1/4 of the existing valve seat material.

### TOOLS:

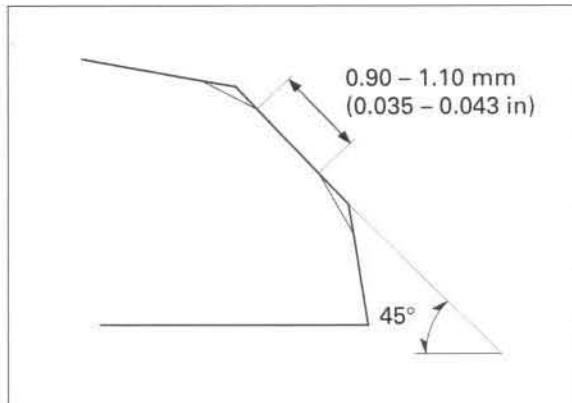
Interior cutter, 37.5 mm 07780-0014100  
Interior cutter, 30 mm 07780-0014000

Cutter holder, 5.0 mm 07781-0010400  
or equivalent commercially available in U.S.A.



## CYLINDER HEAD/VALVES

Using a 45° seat cutter, cut the seat to proper width. Make sure all pitting and irregularities are removed. Refinish if necessary.



### INTAKE SIDE:

After refacing, wash the cylinder head and valve.

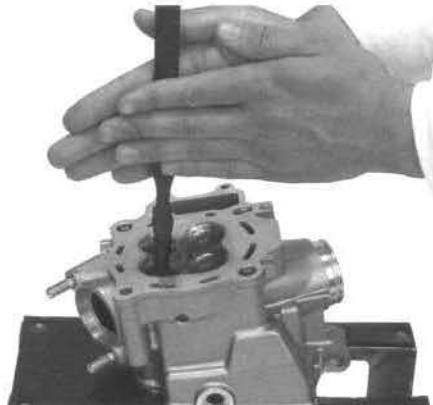
#### NOTICE

- Do not lap the intake valves. They are titanium and have a thin oxide coating. Lapping will damage this coating.
- Use the intake valve as a new one.

### EXHAUST SIDE:

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

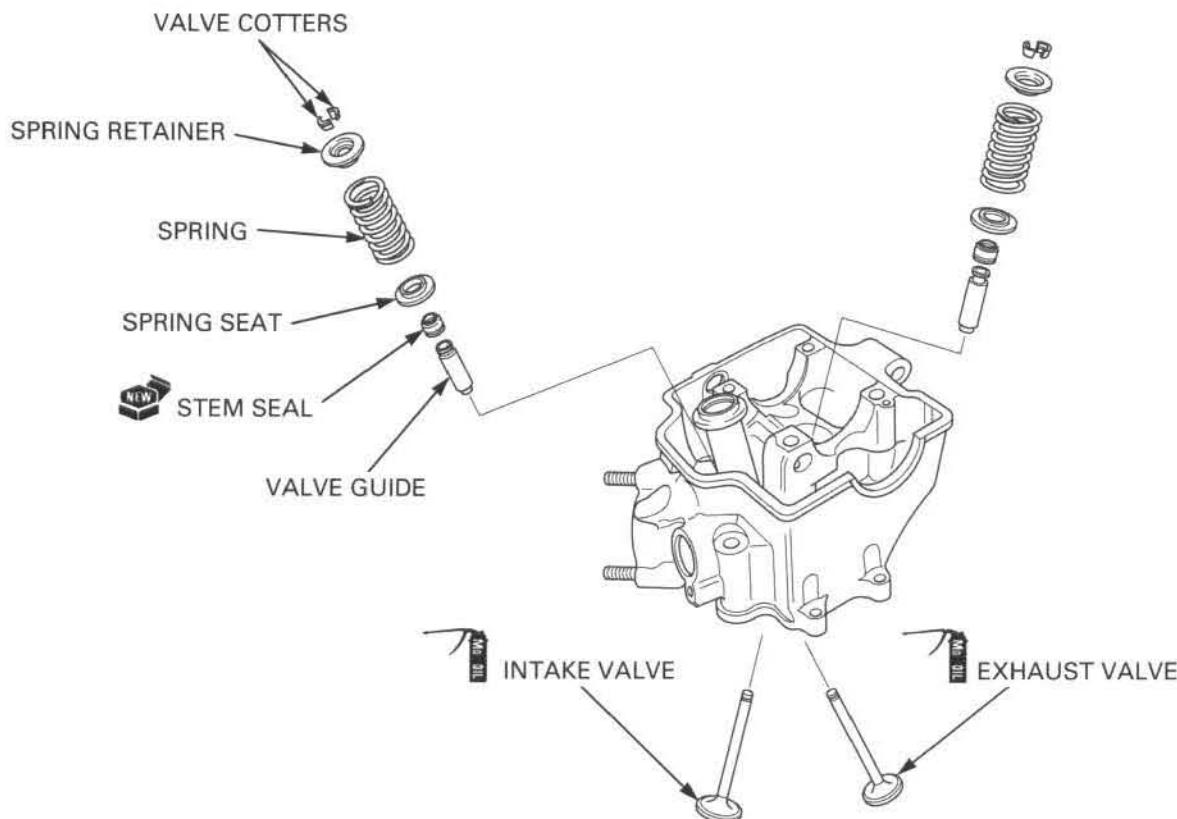
After lapping, wash any residual compound off the cylinder head and valve.



#### NOTICE

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

## CYLINDER HEAD ASSEMBLY

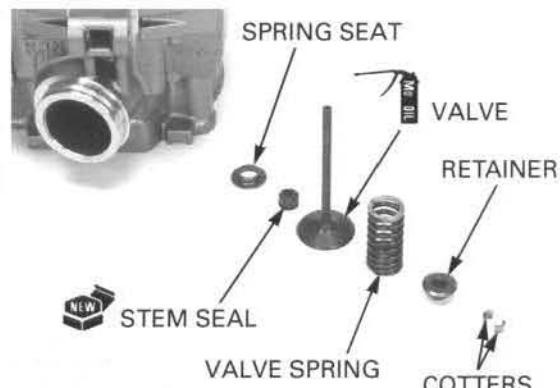


Blow out all oil passages in the cylinder head with compressed air.

Install the spring seat and new stem seal.

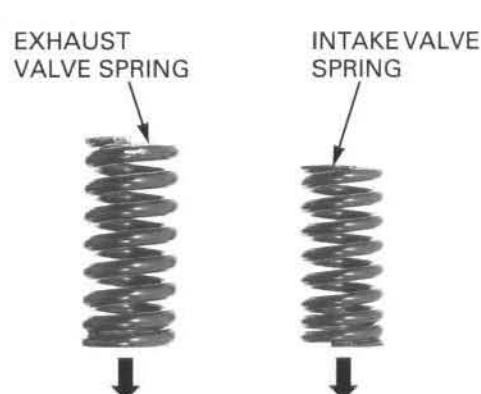
Lubricate the valve stem and stem end sliding surface with molybdenum oil solution.

Insert the valves into the guide while turning it slowly to avoid damage to the stem seal.



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

Install the spring retainers.



## CYLINDER HEAD/VALVES

Install the tappet hole protector into the intake valve lifter bore.

**TOOL:**

Tappet hole protector

07JMG-KY20100

TAPPET HOLE PROTECTOR



*Grease the cotters to ease installation.*

Install the cotters using the special tools.

**TOOLS:**

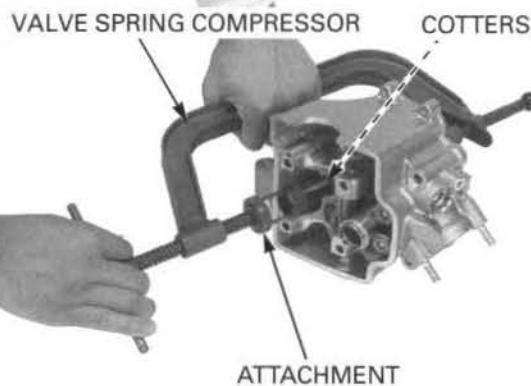
Valve spring compressor

07757-0010000

Valve spring compressor attachment

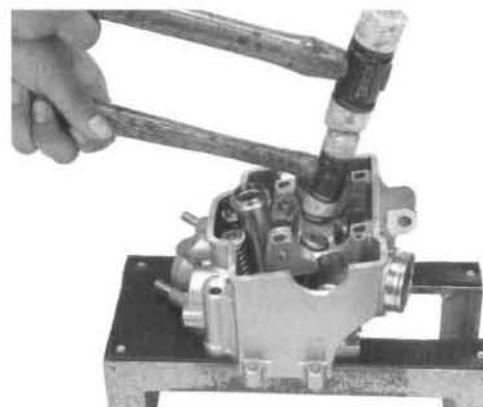
07JME-KY20100

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



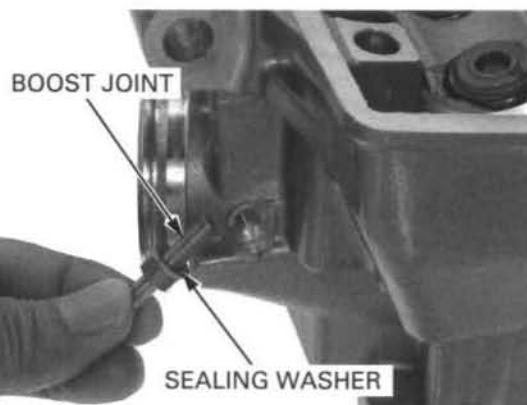
*Support the cylinder head so the valve heads do not contact anything that may damage them.*

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



'04 - '06 California type, After '06: Install the boost joint with sealing washer. Tighten the boost hose joint to the specified torque.

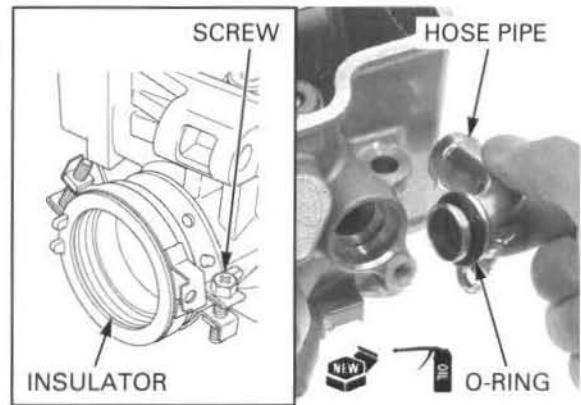
**TORQUE: 2.5 N·m (0.25 kgf·m, 1.8 lbf·ft)**



Install the insulator and tighten the screw.

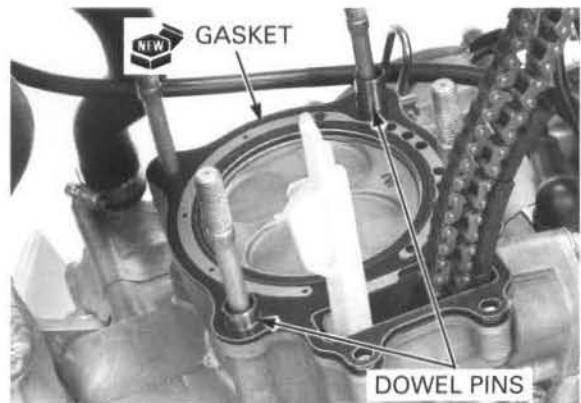
Apply oil to a new O-ring and install it to the water hose pipe.

Install the water hose pipe and tighten the bolt.



## CYLINDER HEAD INSTALLATION

Install the dowel pins and a new gasket.



Apply oil to the cylinder head nut seating surface.

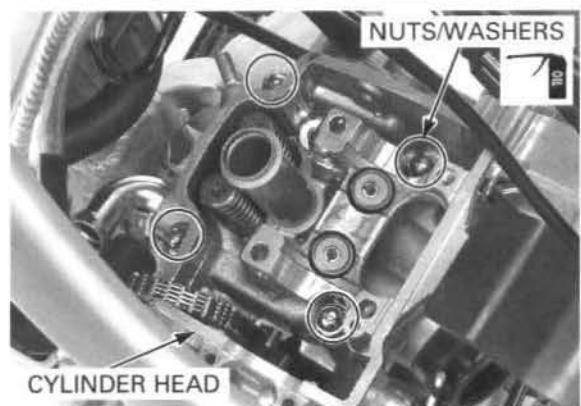
Install the cylinder head onto the cylinder.

Install the washers and cylinder head nuts.

Tighten the nuts in a crisscross pattern in two or three steps to the specified torque.

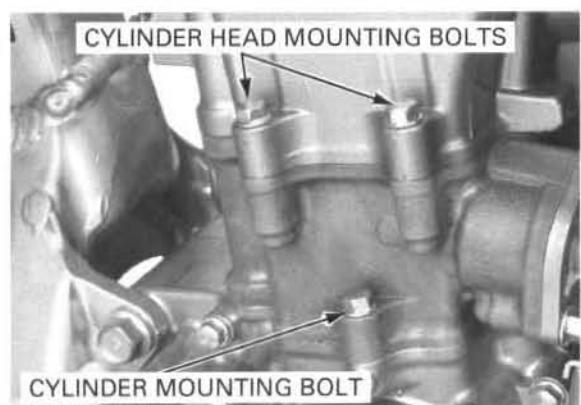
**TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)**

*Be careful not to let  
the nuts and  
washers fall into  
the left crankcase*



Install the cylinder head mounting bolts.

Tighten the cylinder mounting bolt and cylinder head mounting bolts.



## CYLINDER HEAD/VALVES

Install the hanger plates with its identification mark facing out (page 7-7).

### TORQUE:

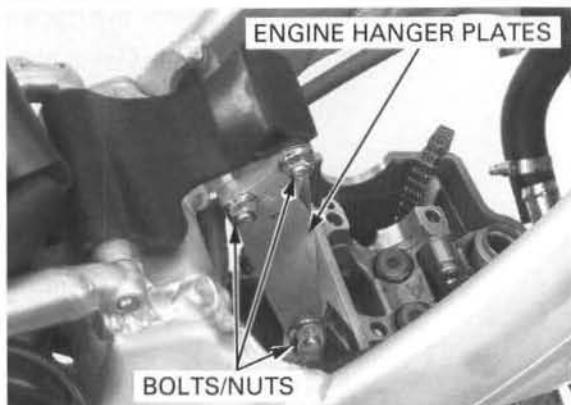
#### Engine hanger plate nut

engine side: 54 N·m (5.5 kgf·m, 40 lbf·ft)

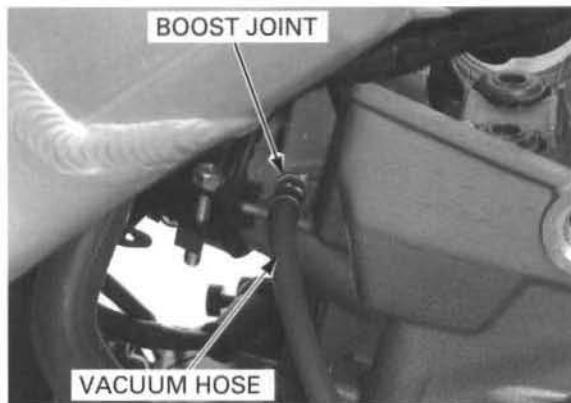
frame side:

'04: 26 N·m (2.7 kgf·m, 20 lbf·ft)

After '04: 34 N·m (3.5 kgf·m, 25 lbf·ft)



'04 – '06 California type, After '06: Connect the vacuum hose to the boost joint.



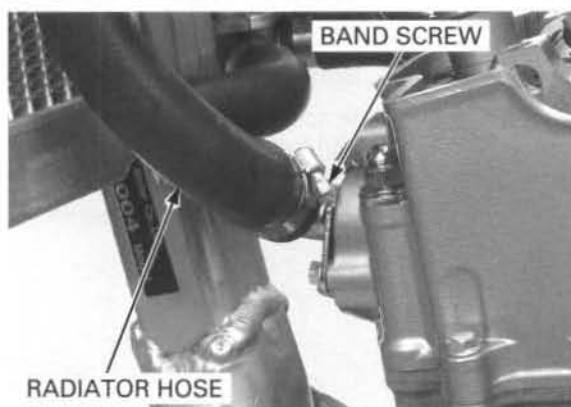
Connect the radiator hose and tighten the band screw securely.

'04 – '06 California type, After '06: Install the PAIR control valve and air supply pipe (page 5-31).

Install the following:

- Rocker arm (page 8-27)
- Camshaft (page 8-27)
- Cylinder head cover (page 8-30)
- Spark plug (page 3-12)
- Carburetor (page 5-24)
- Exhaust pipe (page 2-10)

Fill the system with the recommended coolant and bleed the air (page 6-7).

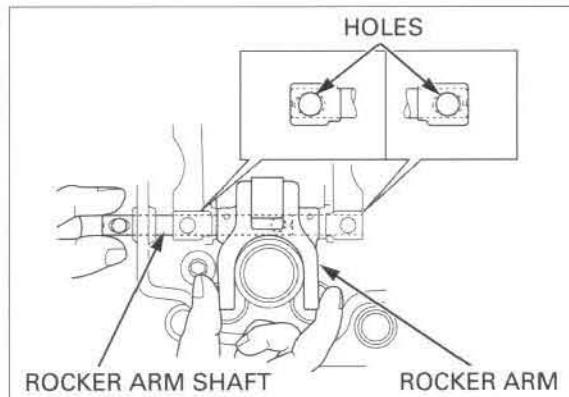


## CAMSHAFT/ROCKER ARM INSTALLATION

### ROCKER ARM

Apply molybdenum oil solution to the rocker arm bore and slider surfaces.

Install the rocker arm and rocker arm shaft while aligning the camshaft holder bolt holes with the rocker arm shaft holes.



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

Apply oil to the O-ring and install it onto rocker arm shaft cap.

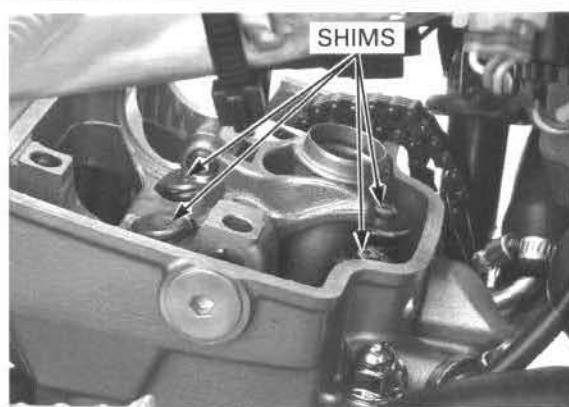
Apply grease to the rocker arm shaft cap threads.

Install the rocker arm shaft cap and tighten to the specified torque.

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



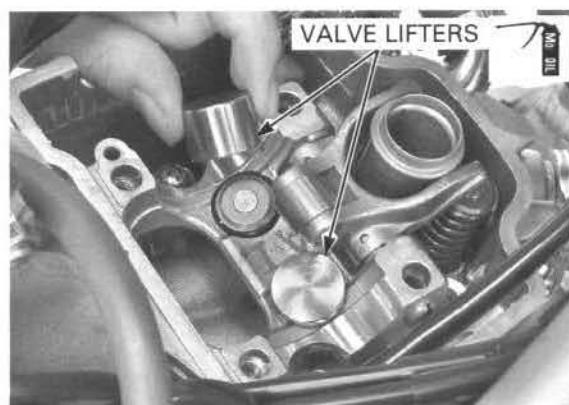
*Be careful not to let the shims fall into the left crankcase.* Install the shims in their original locations.



### CAMSHAFT

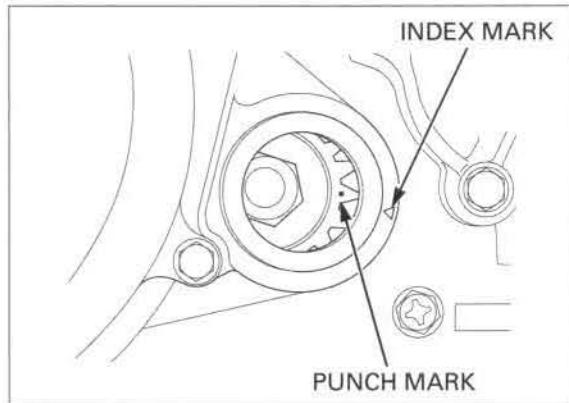
Apply molybdenum oil solution to the outer surface of each valve lifter.

Install the valve lifters in their original locations.



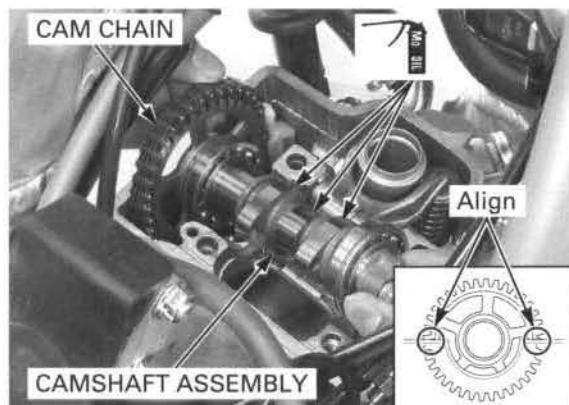
## CYLINDER HEAD/VALVES

Turn the crankshaft clockwise to align the punch mark with the index mark on the right crankcase cover.  
Make sure the piston is at T.D.C. (Top Dead Center).

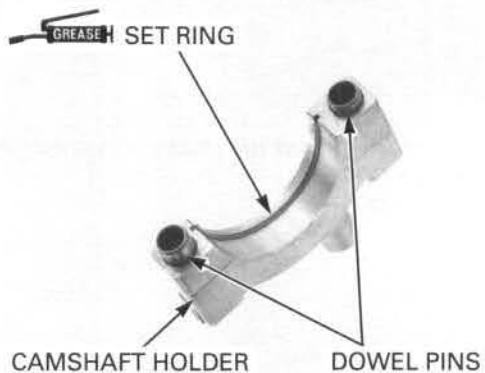


*Do not get molybdenum oil solution on the mating surfaces and in the holder bolt holes.*

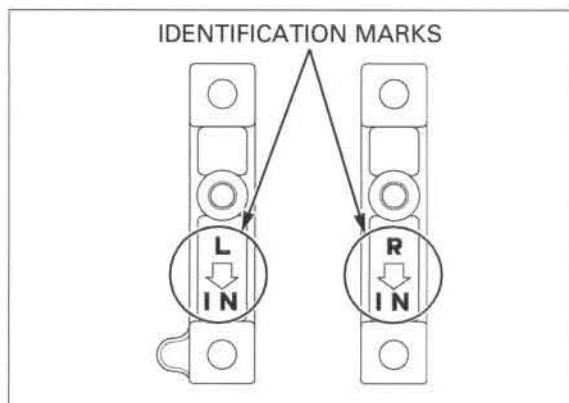
Apply molybdenum oil solution to the cam lobes. Install the cam chain onto the cam sprocket, then install the cam shaft onto the cylinder head with the cam lobes facing up. Align the index line of the cam sprocket with the cylinder head surface.



Check the set ring for damage. Apply grease to the set ring. Install the set ring to the camshaft holder groove. Make sure the dowel pins are installed into the cam-shaft holder.

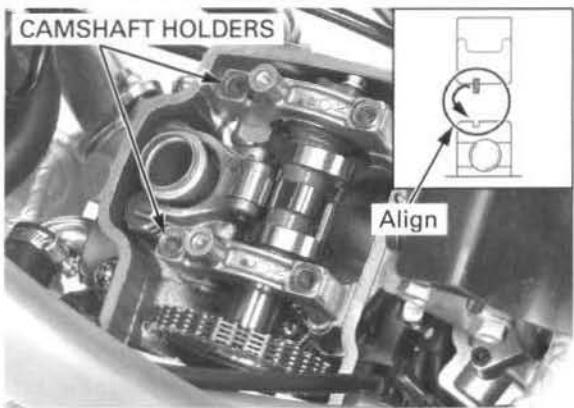


- Each camshaft holder has an identification mark, "L" is for the left side and "R" is for right side.
- Install the camshaft holder with the "IN" (arrow) mark facing to the intake side.



Be careful not to let  
the set rings fall  
into the crankcase.

Install the camshaft holders in their proper position  
by aligning the camshaft bearing groove with the  
set ring.

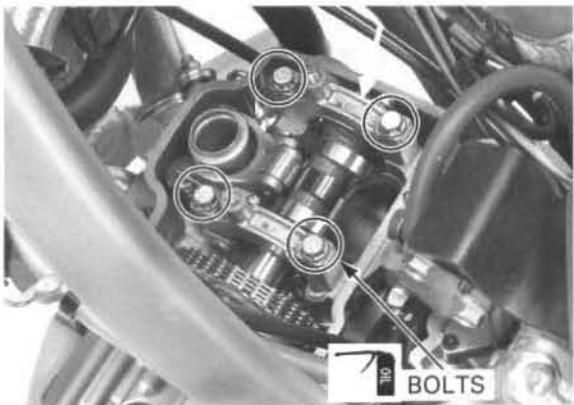


Apply oil to the camshaft holder bolt threads.

Install the camshaft holder bolts.

Tighten the bolts to the specified torque in a criss-cross pattern in two or three steps.

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



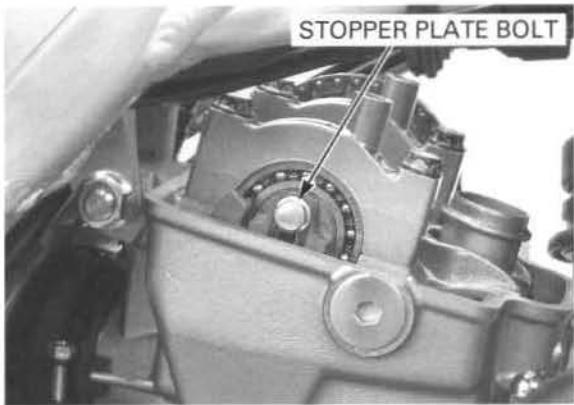
Remove the special tool from the cam chain tensioner lifter.

Install the bolt with a new sealing washer.

Tighten the cam chain tensioner bolt securely.



If decompressor cam is disassembled, tighten the stopper plate bolt.



## CYLINDER HEAD/VALVES

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

Apply transmission oil to the O-ring and install the O-ring onto crankshaft hole cap.

Apply grease to the crankshaft hole cap threads.

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

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

Install the cylinder head cover (page 8-30).



## CYLINDER HEAD COVER INSTALLATION

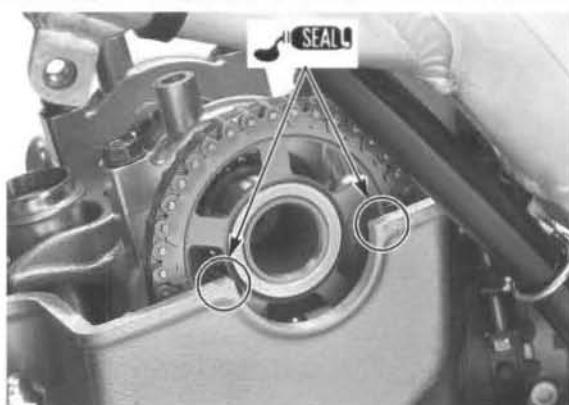
Check the plug hole seal is in good condition, replace if necessary.

Apply oil to the plug hole seal.

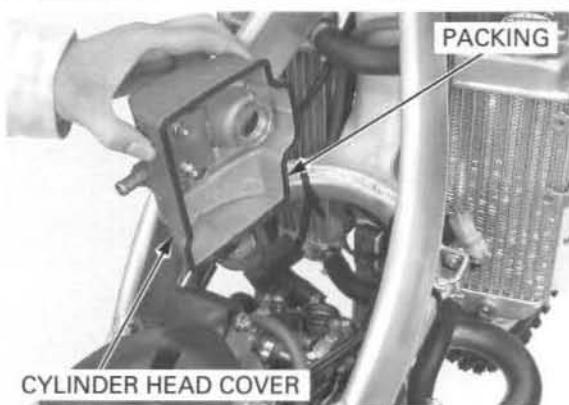
Install the plug hole seal.



Apply liquid sealant to the cylinder head and head cover mating surface as shown.



Inspect the cylinder head cover packing for damage or deterioration and replace it with a new one if necessary.



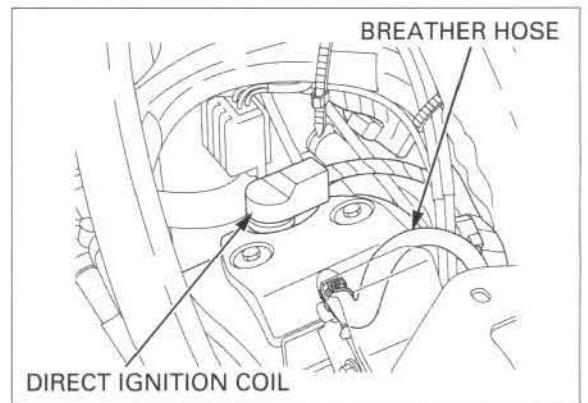
Install the cylinder head cover and tighten the bolts to the specified torque.

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



Connect the cylinder head breather hose.  
Install the direct ignition coil.

Install the fuel tank (page 2-7).



---

**MEMO**



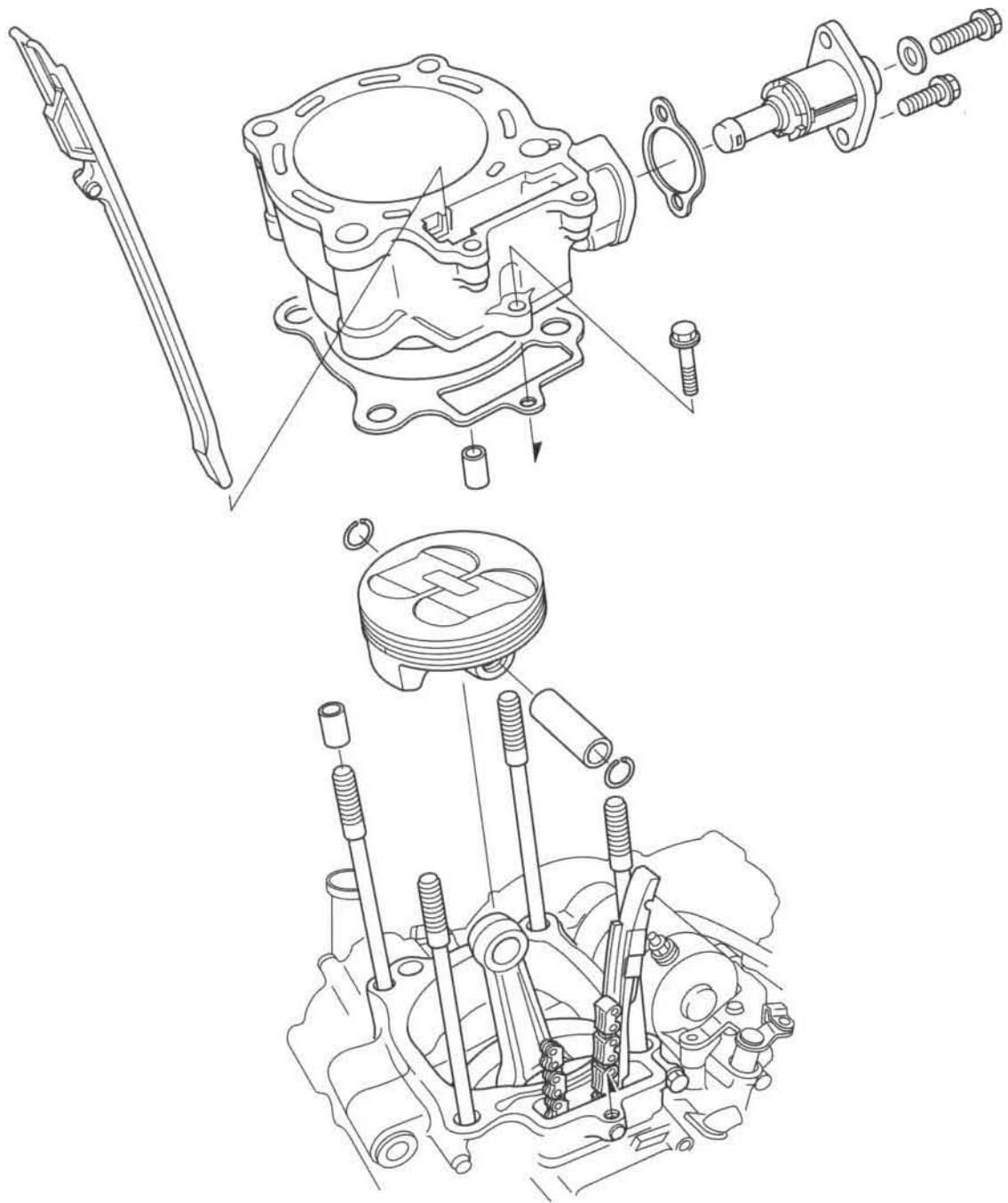
## **9. CYLINDER/PISTON**

---

COMPONENT LOCATION .....	9-2	PISTON REMOVAL .....	9-4
SERVICE INFORMATION .....	9-3	CYLINDER/PISTON INSPECTION .....	9-5
TROUBLESHOOTING .....	9-3	PISTON INSTALLATION .....	9-8
CYLINDER REMOVAL .....	9-4	CYLINDER INSTALLATION .....	9-8

## CYLINDER/PISTON

### COMPONENT LOCATION



# SERVICE INFORMATION

## GENERAL

- This section covers maintenance of the cylinder and piston. These procedures can be done with the engine installed in the frame.
- Before disassembly, clean the engine thoroughly to prevent dirt from entering it.
- Be careful not to damage the mating surfaces when removing the cylinder. For example, do not use a screwdriver to pry the cylinder.
- Clean all disassembled parts with clean solvent before inspection, use compressed air to dry the parts.
- Under racing conditions, the piston and piston rings should be replaced after 15 hours of operation. Replace the piston pin after 15 hours of operation.

## SPECIFICATIONS

ITEM			STANDARD	Unit: mm (in) SERVICE LIMIT		
Cylinder	I.D.		78.000 – 78.015 (3.0709 – 3.0715)	78.025 (3.0718)		
	Out of round		–	0.010 (0.0004)		
	Taper		–	0.010 (0.0004)		
	Warpage		–	0.05 (0.002)		
Piston, piston ring	Piston mark direction		"IN" mark facing toward the intake side	–		
	Piston O.D.		77.970 – 77.980 (3.0697 – 3.0701)	77.940 (3.0685)		
	Piston O.D. measurement point		7.0 mm (0.28 in) from the bottom of skirt	–		
	Piston pin bore I.D.		16.002 – 16.008 (0.6300 – 0.6302)	16.03 (0.631)		
	Piston pin O.D.		15.994 – 16.000 (0.6297 – 0.6299)	15.98 (0.629)		
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.04 (0.002)		
	Top ring mark		"R" mark side facing up	–		
	Piston ring-to-ring groove clearance	Top	0.065 – 0.100 (0.0026 – 0.0039)	0.115 (0.0045)		
	Piston ring end gap	Top ring	'04 – '06	0.20 – 0.30 (0.008 – 0.012)		
			After '06	0.15 – 0.25 (0.006 – 0.010)		
	Oil ring (side rail)			0.20 – 0.70 (0.008 – 0.028)		
Cylinder-to-piston clearance			0.020 – 0.045 (0.0008 – 0.0018)	0.085 (0.0033)		
Connecting rod small end I.D.			'04 – '06	16.016 – 16.034 (0.6306 – 0.6313)		
			After '06	16.016 – 16.038 (0.6306 – 0.6314)		
Connecting rod-to-piston pin clearance			'04 – '06	0.016 – 0.040 (0.0006 – 0.0016)		
			After '06	0.016 – 0.044 (0.0006 – 0.0017)		

## TROUBLESHOOTING

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

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

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

### Compression too high, over-heating or knocking

- Excessive carbon build-up in cylinder head or on top of piston

### Abnormal noise

- Worn cylinder and piston
- Worn piston pin or piston pin hole
- Worn connecting rod small end

### Excessive smoke

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

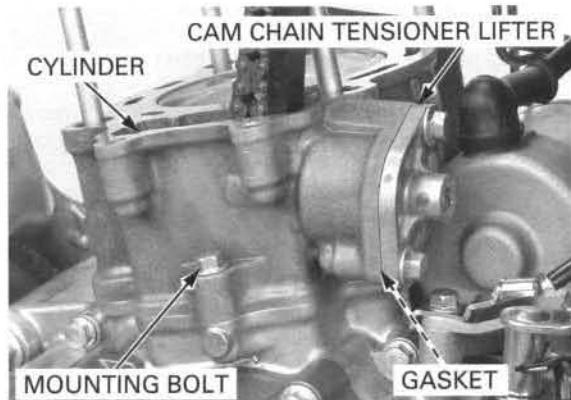
## CYLINDER/PISTON

### CYLINDER REMOVAL

Remove the cylinder head (page 8-12).

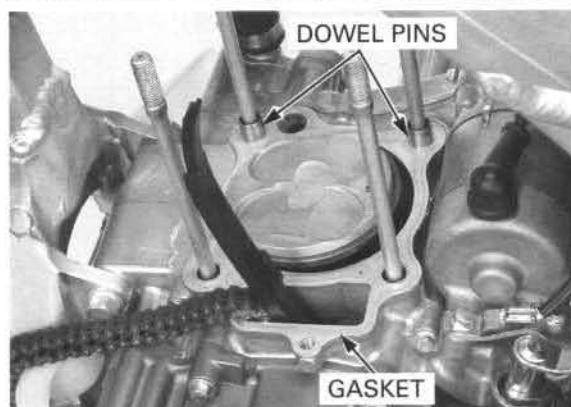
Remove the bolts, cam chain tensioner lifter and gasket.

Remove the mounting bolt and cylinder.



*Prevent the cam chain from the falling into the crankcase.*

Remove the dowel pins and gasket.



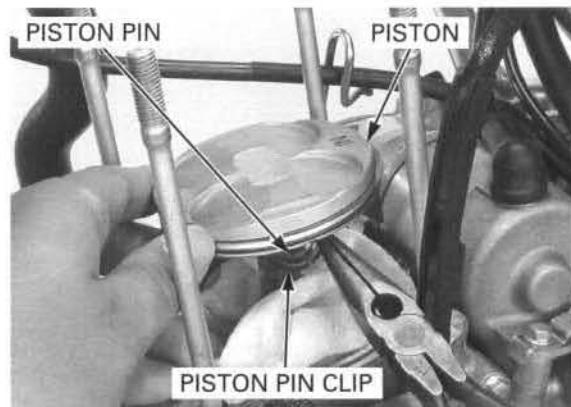
### PISTON REMOVAL

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

Remove the piston pin clips with pliers.

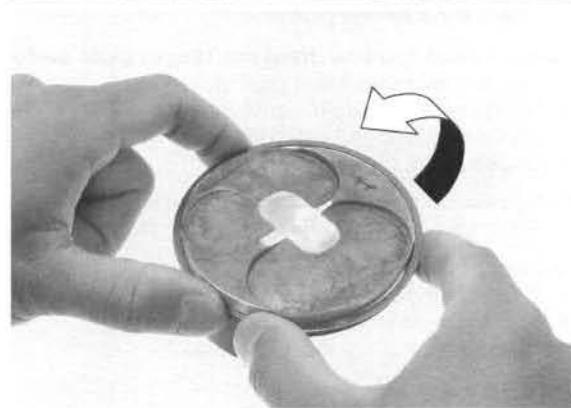
Press the piston pin out of the piston and remove the piston.

- Under racing conditions, the piston, piston rings and piston pin should be replaced according to the maintenance schedule (page 3-6).



*Piston rings are easily broken; take care not to damage them during removal.*

Spread the piston rings and remove them by lifting up at a point just opposite the gap.



## CYLINDER/PISTON INSPECTION

### CYLINDER

Inspect the cylinder bore for scratch, wear or damage.

Measure the cylinder I.D. in the X and Y axes at three levels.

Take the maximum reading to determine the cylinder wear.

**SERVICE LIMIT: 78.025 mm (3.0718 in)**

Calculate the piston-to-cylinder clearance.

Take a maximum reading to determine the clearance.

For piston O.D (page 9-6).

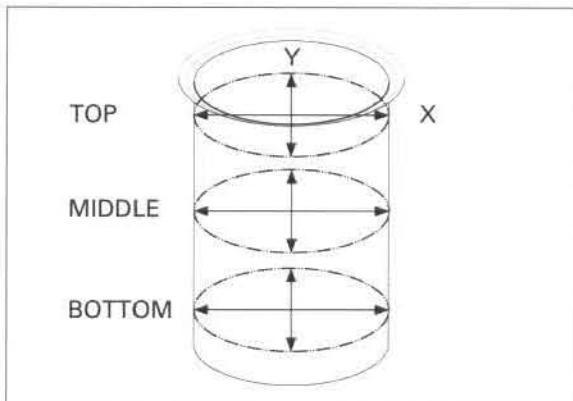
**SERVICE LIMIT: 0.085 mm (0.0033 in)**

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

**SERVICE LIMITS:**

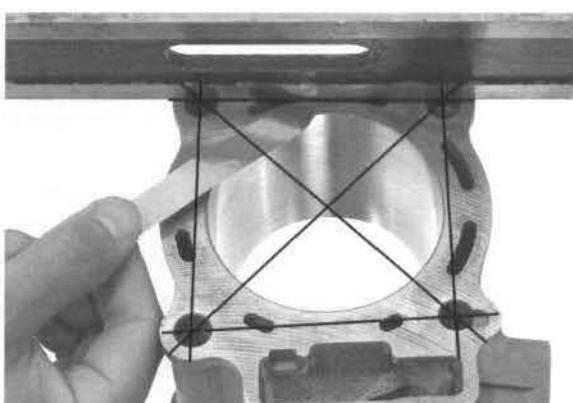
Taper: 0.010 mm (0.0004 in)

Out-of-round: 0.010 mm (0.0004 in)



Inspect the top of the cylinder for warpage.

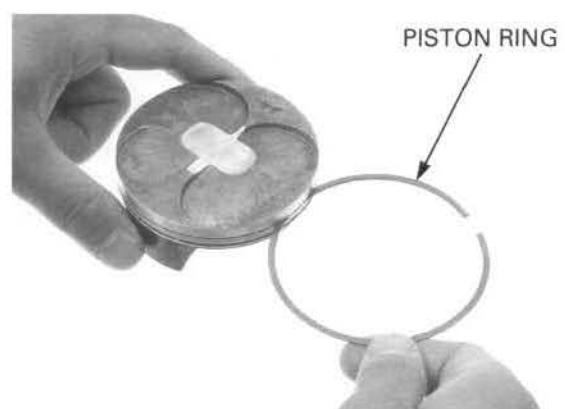
**SERVICE LIMIT: 0.05 mm (0.002 in)**



### PISTON/PISTON RING INSPECTION

Remove the carbon or deposits from the piston head or piston ring grooves.

Inspect the piston for damage and the ring grooves for wear.



## CYLINDER/PISTON

Temporarily install the top ring to their proper position with the mark facing up.  
Measure the piston ring-to-groove clearance with the ring pushed into the groove.

**SERVICE LIMIT: 0.115 mm (0.0045 in)**

Inspect the piston ring grooves for wear or damage.



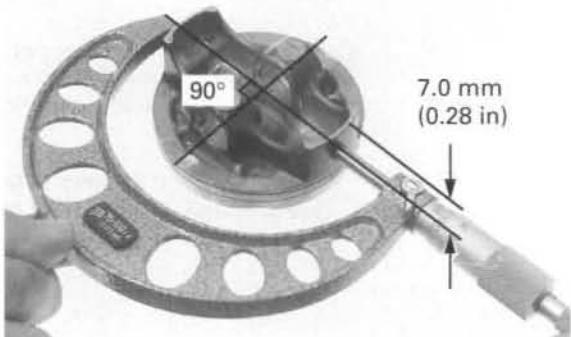
Measure the diameter of the piston at 7.0 mm (0.28 in) from the bottom and 90 degrees to the piston pin hole.

**SERVICE LIMIT: 77.940 mm (3.0685 in)**

If the O.D. is under the service limit or nearly 15.0 hours of running time have elapsed, replace the piston with a new one.

Calculate the piston-to-cylinder clearance.

**SERVICE LIMIT: 0.085 mm (0.0033 in)**



Measure the piston pin bore I.D.

**SERVICE LIMIT: 16.03 mm (0.631 in)**

Check the piston pin for wear and excessive discoloration.

Measure the piston pin O.D.

**SERVICE LIMIT: 15.98 mm (0.629 in)**

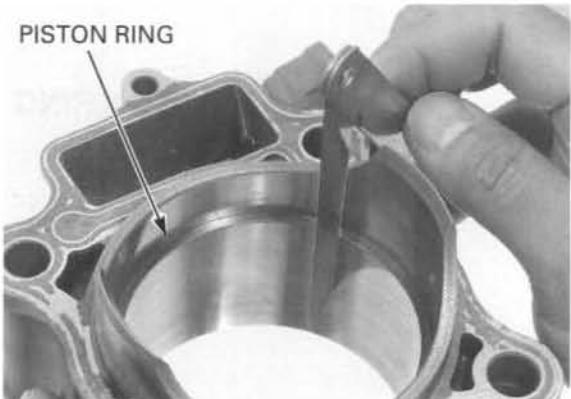
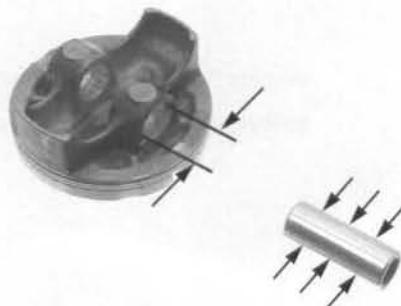
If the O.D. is under the service limit, discolored, or nearly 15.0 hours of running time have elapsed, replace the piston pin.

Calculate the piston pin-to-piston clearance.

**SERVICE LIMIT: 0.04 mm (0.002 in)**

Push the ring into the bottom of the cylinder using the piston head to be sure the ring is squarely in the cylinder.

Top: '04 - '06: 0.44 mm (0.017 in)  
After '06: 0.39 mm (0.015 in)  
Oil (side rail): 0.90 mm (0.035 in)



## CONNECTING ROD INSPECTION

Measure the connecting rod small end I.D.

**SERVICE LIMIT: 16.04 mm (0.631 in)**

Calculate the connecting rod-to-piston pin clearance.

**SERVICE LIMIT: 0.06 mm (0.002 in)**

- If the I.D. is not over the service limit, replace the piston pin.
- If the I.D. is over the service limit, replace the crankshaft (page 12-12).



## PISTON RING INSTALLATION

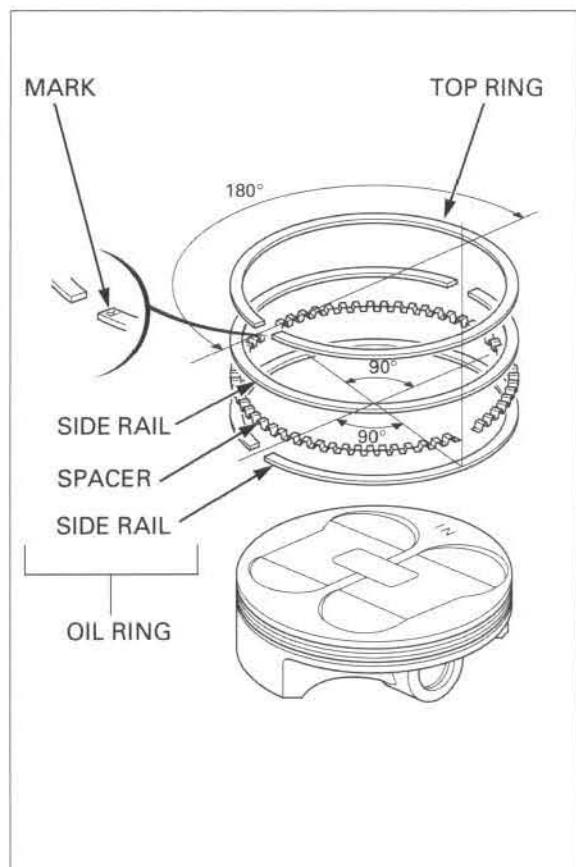
Clean the piston ring grooves thoroughly.

*Install the piston ring on the piston with the marked side facing up.*

Apply oil to the piston rings and install them into the piston ring grooves.

- Do not damage the piston ring by spreading the ends too far.
- Be careful not to damage the piston during piston ring installation.
- Do not align the oil ring (side rails) gaps.
- Space the piston ring end as shown.

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



## CAM CHAIN TENSIONER LIFTER 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 screwdriver, the tensioner shaft should be pulled into the body. The shaft should spring out of the body as soon as the screwdriver is released.



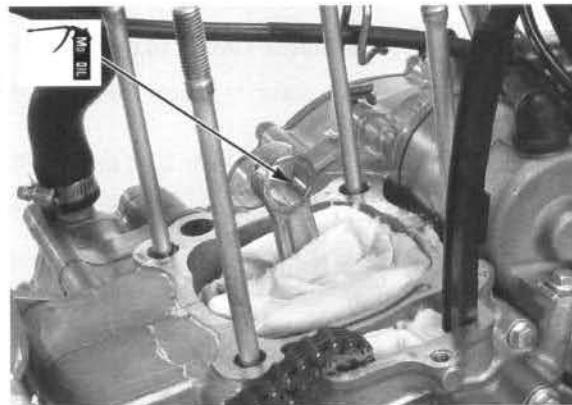
## CYLINDER/PISTON

### PISTON INSTALLATION

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

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

Apply molybdenum oil solution to the connecting rod small end.



Place a shop towel around the piston skirt and in the crankcase to prevent the piston pin clips from falling into the crankcase.

Apply oil to the piston pin outer surface and piston pin hole of the piston.

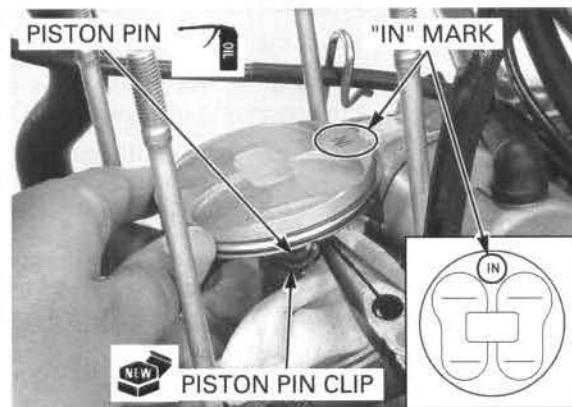
Install the piston with the "IN" mark facing intake side.

*Be careful not to drop the piston pin clips into the crankcase.*

Install the piston pin and new piston pin clips.

- Always use new piston pin clips. Reinstalling used piston pin clips may lead to serious engine damage.

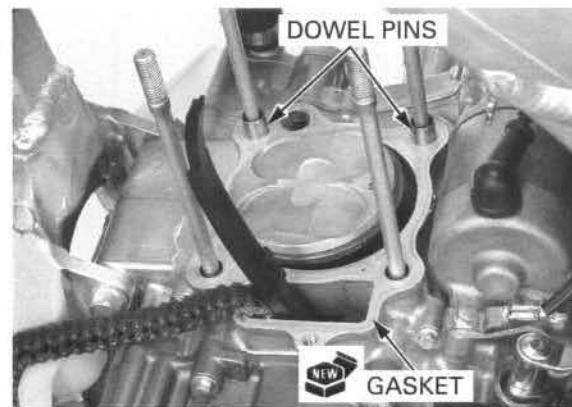
Do not align the piston pin clip end gap with the piston cut-out.



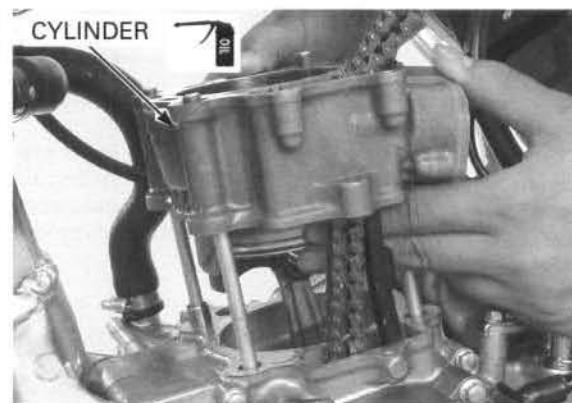
### CYLINDER INSTALLATION

Install the dowel pins.

Install a new cylinder base gasket on the crankcase.



*Avoid piston ring damage during installation.* Coat the cylinder bore, piston and piston rings with oil and install the cylinder while compressing the piston rings.



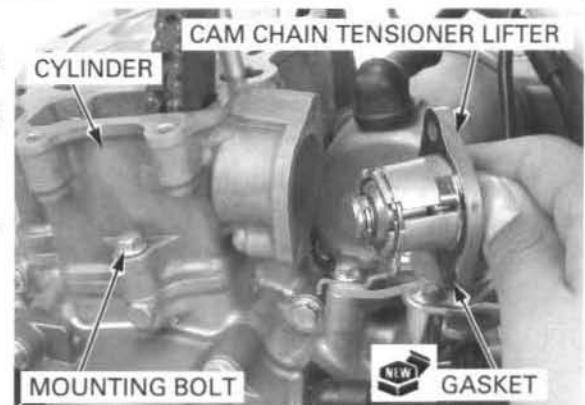
Install the cylinder mounting bolt.

Install a new gasket, cam chain tensioner lifter and bolts.

Tighten the cam chain tensioner lifter mounting bolts securely.

Install the cylinder head (page 8-25).

After tightening the cylinder head mounting nut, tighten the cylinder mounting bolt securely.



---

**MEMO**



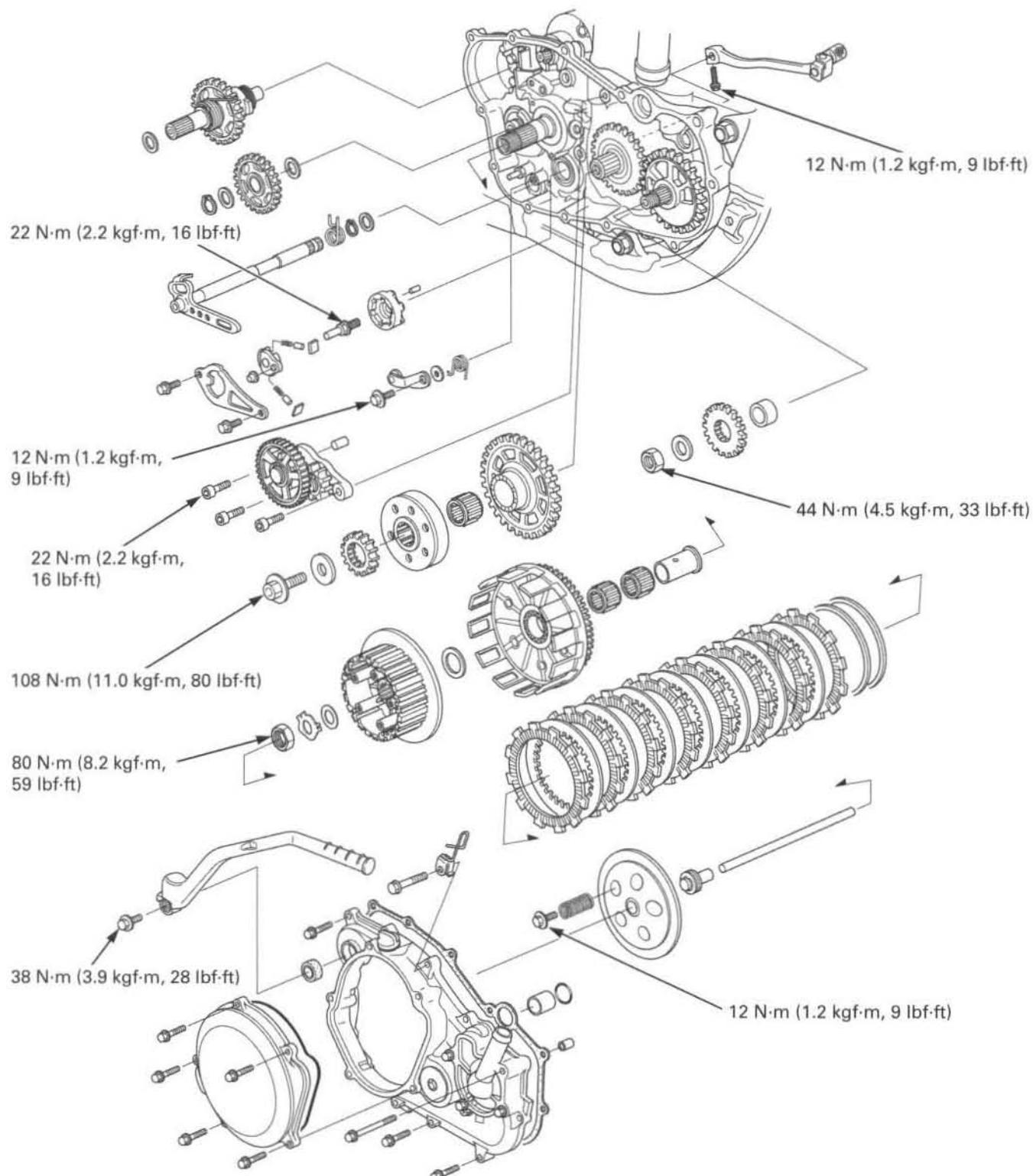
## **10. CLUTCH/STARTER CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE**

---

COMPONENT LOCATION .....	10-2	CLUTCH .....	10-7
SERVICE INFORMATION .....	10-3	KICKSTARTER .....	10-15
TROUBLESHOOTING .....	10-4	STARTER CLUTCH .....	10-19
RIGHT CRANKCASE COVER.....	10-5	GEARSHIFT LINKAGE.....	10-25

## CLUTCH/STARTER CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

### COMPONENT LOCATION



## SERVICE INFORMATION

### GENERAL

- This section covers service of the clutch, kickstarter and gearshift linkage. All service can be done with the engine installed in the frame.
- Transmission oil viscosity and level have an effect on clutch disengagement. Oil additives also affect clutch performance and are not recommended. When the clutch does not disengage or the motorcycle creeps with the clutch pulled in, inspect the transmission oil level before servicing the clutch system.

### SPECIFICATIONS

ITEM	STANDARD	Unit: mm (in) SERVICE LIMIT
Clutch lever free play	10 – 20 (3/8 – 13/16)	–
Clutch spring free length	38.8 (1.53)	38.0 (1.50)
Clutch disc A thickness	2.92 – 3.08 (0.115 – 0.121)	2.85 (0.112)
Clutch disc B thickness	2.92 – 3.08 (0.115 – 0.121)	2.85 (0.112)
Clutch plate warpage	–	0.10 (0.004)
Kickstarter pinion gear I.D.	16.516 – 16.534 (0.6502 – 0.6509)	16.55 (0.652)
Kickstarter spindle O.D.	16.466 – 16.484 (0.6483 – 0.6490)	16.46 (0.648)
Kickstarter idle gear I.D.	17.016 – 17.034 (0.6699 – 0.6706)	17.06 (0.672)
Countershaft O.D. at kickstarter idle gear	16.983 – 16.994 (0.6686 – 0.6691)	16.97 (0.668)
Starter driven gear boss	I.D.	35.009 – 35.034 (1.3783 – 1.3793)
	O.D.	45.660 – 45.673 (1.7976 – 1.7981)
Starter reduction gear I.D.	12.016 – 12.034 (0.4731 – 0.4738)	12.05 (0.474)
Starter idle gear I.D.	12.016 – 12.034 (0.4731 – 0.4738)	12.05 (0.474)
Starter gear holder shaft O.D.	11.983 – 11.994 (0.4718 – 0.4722)	11.98 (0.472)

### TORQUE VALUES

Clutch center lock nut	80 N·m (8.2 kgf·m, 59 lbf·ft)	Apply oil to the seating surface
Clutch spring bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Gearshift drum center pin	22 N·m (2.2 kgf·m, 16 lbf·ft)	Apply locking agent to the threads
Gearshift drum stopper arm bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Starter gear holder mounting bolt	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Kickstarter pedal bolt	38 N·m (3.9 kgf·m, 28 lbf·ft)	
Gearshift pedal pinch bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Gearshift return spring pin	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Primary drive gear bolt	108 N·m (11.0 kgf·m, 80 lbf·ft)	Apply oil to the threads
Water pump drive gear nut	44 N·m (4.5 kgf·m, 33 lbf·ft)	Apply oil to the seating surface

### TOOLS



### TROUBLESHOOTING

#### Hard to shift

- Improper clutch operation
- Improper oil viscosity
- Bent shift fork
- Bent shift fork shaft
- Bent fork claw
- Incorrect clutch adjustment
- Loose stopper plate bolt
- Damaged stopper plate and pin
- Damaged gearshift spindle

#### Transmission jumps out of gear

- Worn shift drum stopper arm
- Weak or broken shift arm return spring
- Loose stopper plate bolt
- Bent shift fork shaft
- Damaged shift drum cam groove
- Damaged or bent shift fork
- Worn gear engagement dogs or slot

#### Gearshift pedal will not return

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

#### Clutch slips when accelerating

- Incorrect clutch adjustment
- Worn clutch discs
- Weak clutch springs
- Transmission oil mixed with molybdenum or graphite additives

#### Motorcycle creeps with the engine idling

- Incorrect clutch adjustment
- Clutch plate warped
- Faulty clutch lifter
- Incorrect transmission oil

## RIGHT CRANKCASE COVER

### REMOVAL

Drain the coolant (page 6-7).  
 Drain the transmission oil (page 3-20).  
 Remove the brake pedal (page 15-24).  
 Remove the right engine guard (page 2-4).

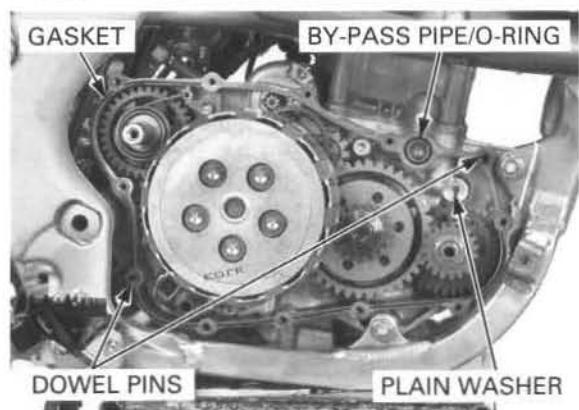
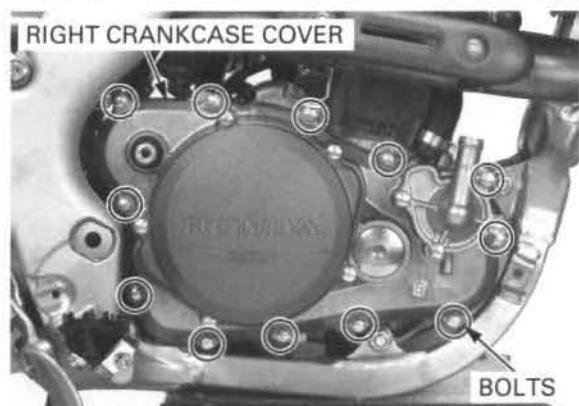
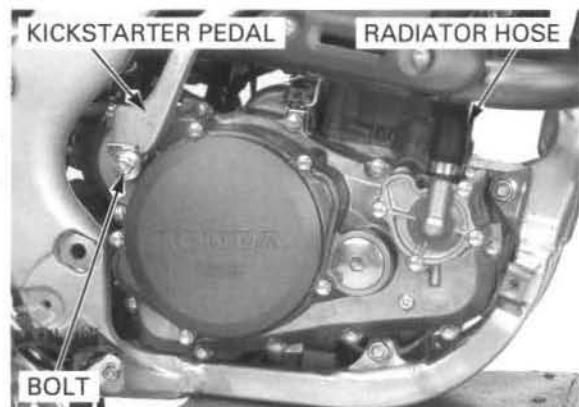
Remove the kickstarter pedal bolt and kickstarter pedal.  
 Loosen the band screw and disconnect the radiator hose from the water pump cover.

Loosen the right crankcase cover bolts in a criss-cross pattern in two or three steps.

Remove the bolts and right crankcase cover.

Remove the water by-pass pipe and O-ring.  
 Remove the gasket and dowel pins.  
 Remove the plain washer.

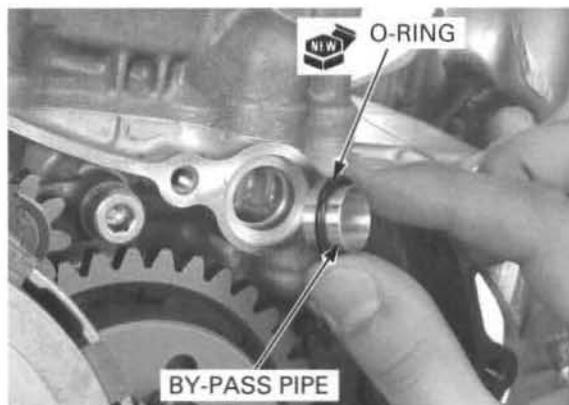
Check the kickstarter spindle oil seal for deterioration or damage.



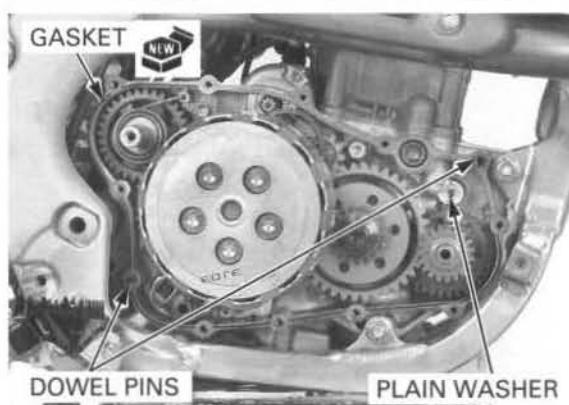
## CLUTCH/STARTER CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

### INSTALLATION

Install a new O-ring onto the by-pass pipe.  
Install the by-pass pipe into the crankcase.



Install the plain washer.  
Install the dowel pins and a new gasket.



Install the right crankcase cover while engaging the water pump driven gear with the water pump drive gear.

Install the right crankcase cover bolts.

Tighten the right crankcase cover bolts in a criss-cross pattern in two or three steps.



Connect the radiator hose to the water pump cover and tighten the band screw securely.

Install the kickstarter pedal and bolt.  
Tighten the kickstarter pedal bolt to the specified torque.

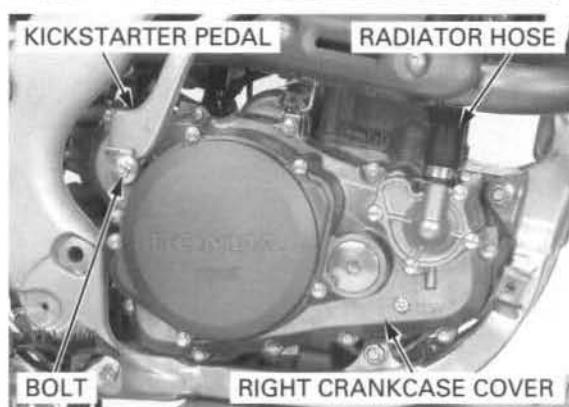
**TORQUE: 38 N·m (3.9 kgf·m, 28 lbf·ft)**

Install the engine guard (page 2-4).  
Install the brake pedal (page 15-25).

Fill the cooling system with the recommended coolant and bleed the air (page 6-7).

Fill the transmission with the recommended transmission oil (page 3-20).

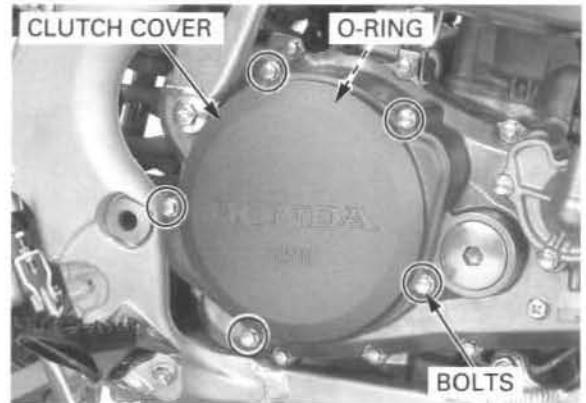
Check and adjust the rear brake pedal height (page 3-28).  
Start the engine and check for oil leaks.



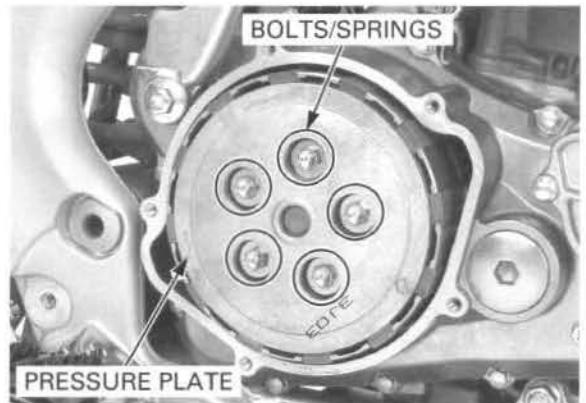
## CLUTCH

### REMOVAL

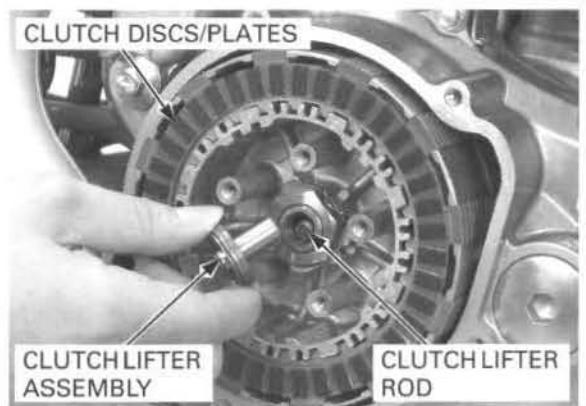
Remove the brake pedal (page 15-24).  
Remove the bolts, clutch cover and O-ring.



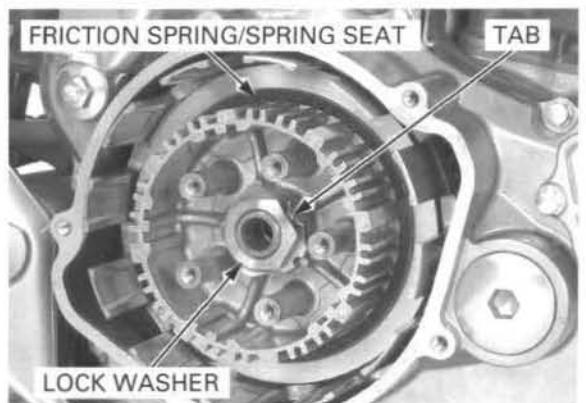
Remove the five clutch spring bolts in a crisscross pattern in two or three steps.  
Remove the clutch springs.  
Remove the clutch pressure plate.



Remove the clutch lifter assembly and clutch lifter rod.  
Remove the eight clutch discs and seven clutch plates.



Remove the friction spring and spring seat.  
Bend the tabs of the lock washer away from the lock nut.



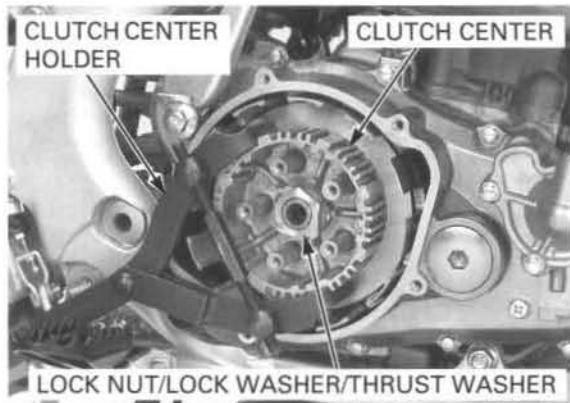
## CLUTCH/STARTER CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

Remove the clutch center lock nut using the special tool.

**TOOL:**

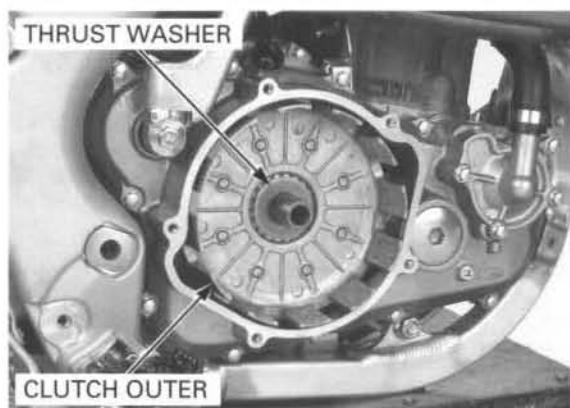
Clutch center holder

07724-0050001 or  
07724-0050002 or  
equivalent com-  
mercially avail-  
able in U.S.A.

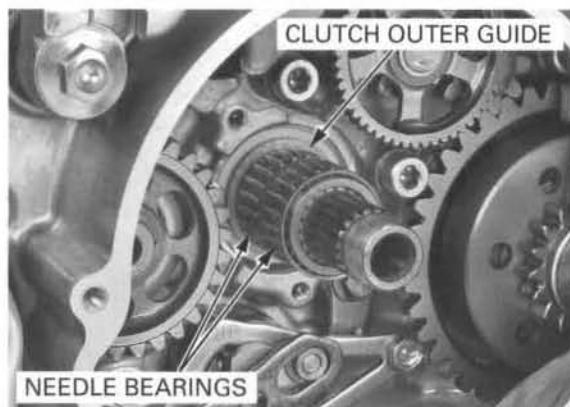


Remove the lock washer and thrust washer.  
Remove the clutch center.

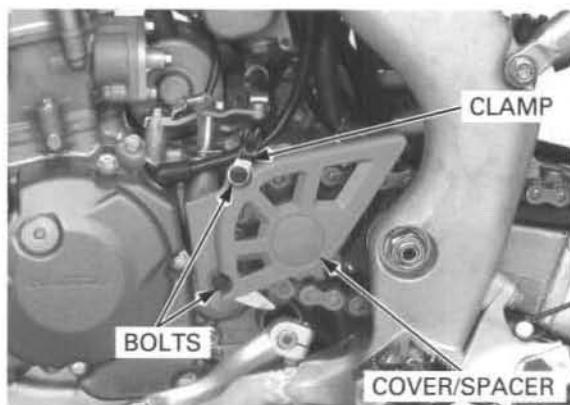
Remove the thrust washer and clutch outer.



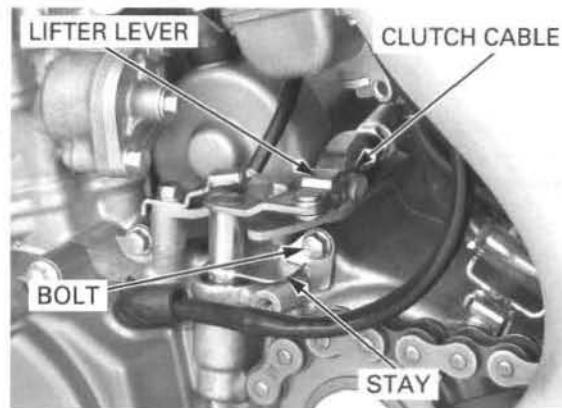
Remove the needle bearings and clutch outer guide.



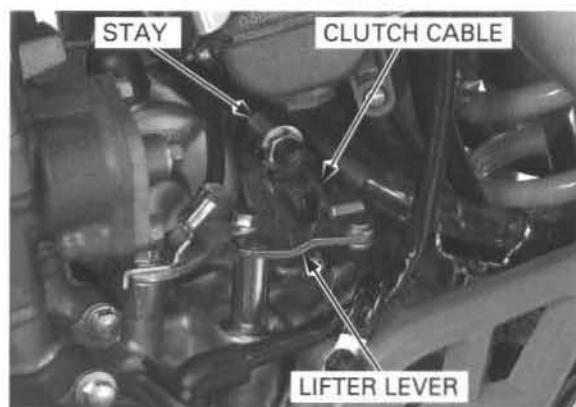
'04 – '06: Remove the bolts, wire clamp, drive sprocket cover and spacer.



- '04 - '06:** Loosen the clutch cable nut and remove the clutch cable from the stay.  
 Disconnect the clutch cable from the clutch lifter lever.  
 Remove the bolt, stay and clutch lifter lever from the left crankcase.



- After '06:** Loosen the clutch cable nut and remove the clutch cable from the stay.  
 Disconnect the clutch cable from the clutch lifter lever.  
 Remove the clutch lifter lever from the left crankcase.



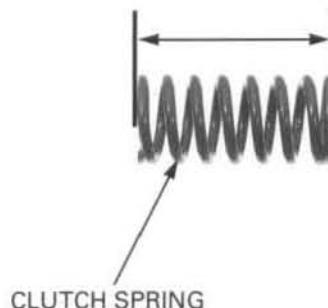
## INSPECTION

### CLUTCH SPRING

*Clutch springs should be replaced as a set if one or more is less than the service limit.*

Measure the clutch spring free length.

**SERVICE LIMIT: 38.0 mm (1.50 in)**



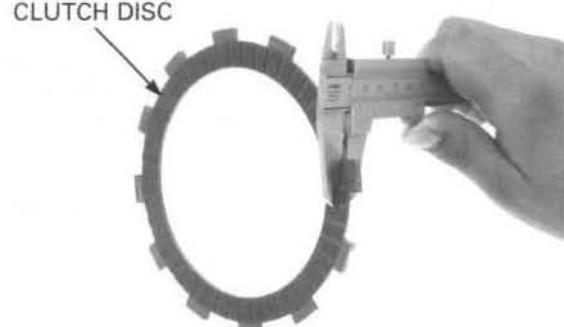
### CLUTCH DISCS

Check the clutch discs for signs of scoring or discoloration.

*Clutch discs should be replaced as a set if one or more is less than the service limit.*

Measure the thickness of each disc.

**SERVICE LIMIT: 2.85 mm (0.112 in)**



## CLUTCH/STARTER CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

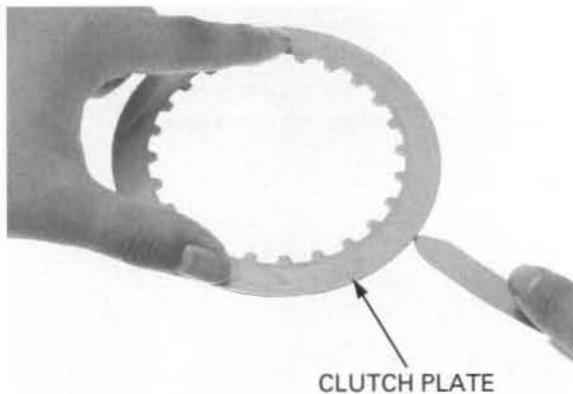
### CLUTCH PLATES

Check the plates for excessive warpage or discoloration.

*Clutch plates should be replaced as a set if one or more is less than the service limit.*

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

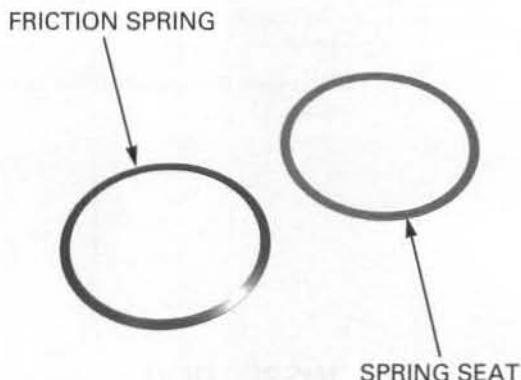
**SERVICE LIMIT: 0.10 mm (0.004 in)**



### FRICITION SPRING/SPRING SEAT

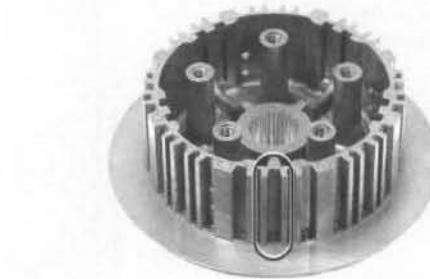
Check the friction spring and spring seat for deformation, warpage or damage; replace if necessary.

- A damaged or warped spring seat will cause the friction spring to be pressed unevenly.
- A damaged friction spring also causes the weak contact between the discs and plates or uneven disc/plate contact.



### CLUTCH CENTER

Check the clutch center for nicks, indentations or abnormal wear made by the clutch plates.



### CLUTCH LIFTER/NEEDLE BEARING

Remove the stopper ring, washer and needle bearing from the clutch lifter.

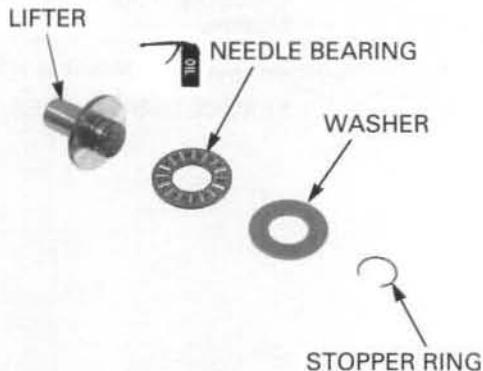
Check the lifter for wear or damage.

Check the needle bearing for wear or damage.

Replace the needle bearing and washer as a set if necessary.

Apply transmission oil to the needle bearing.

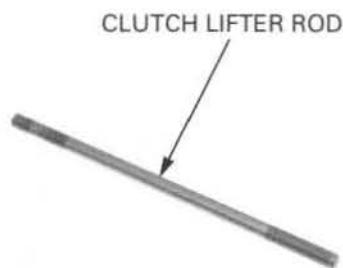
Install the needle bearing, washer and stopper ring.



## CLUTCH/STARTER CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

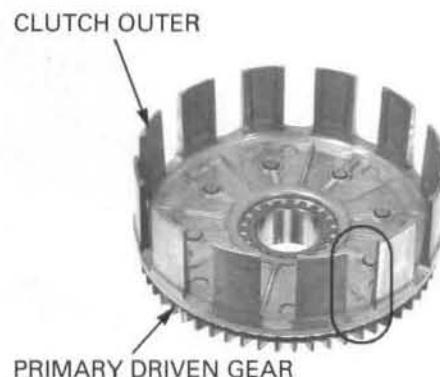
### CLUTCH LIFTER ROD

Check the clutch lifter rod for damage or bend.



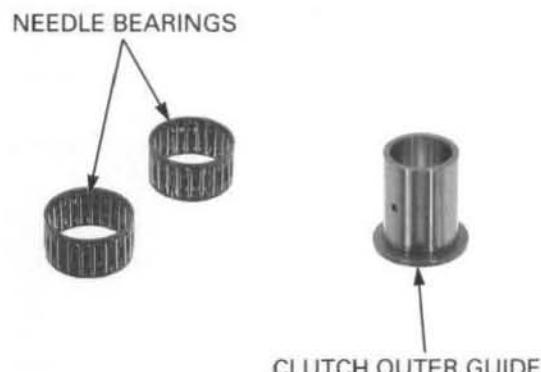
### CLUTCH OUTER

Check the clutch outer for nicks, indentations or abnormal wear made by the clutch discs.  
Check the serrated teeth of the primary driven gear for wear or damage.



### NEEDLE BEARING/CLUTCH OUTER GUIDE

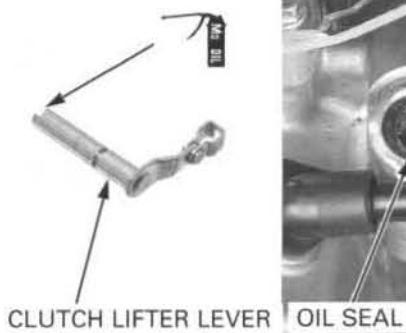
Check the needle bearing for wear or damage.  
Check the mainshaft for wear or damage at the sliding surface of the clutch outer guide.  
Check the clutch outer guide for abnormal wear or damage.



### CLUTCH LIFTER LEVER

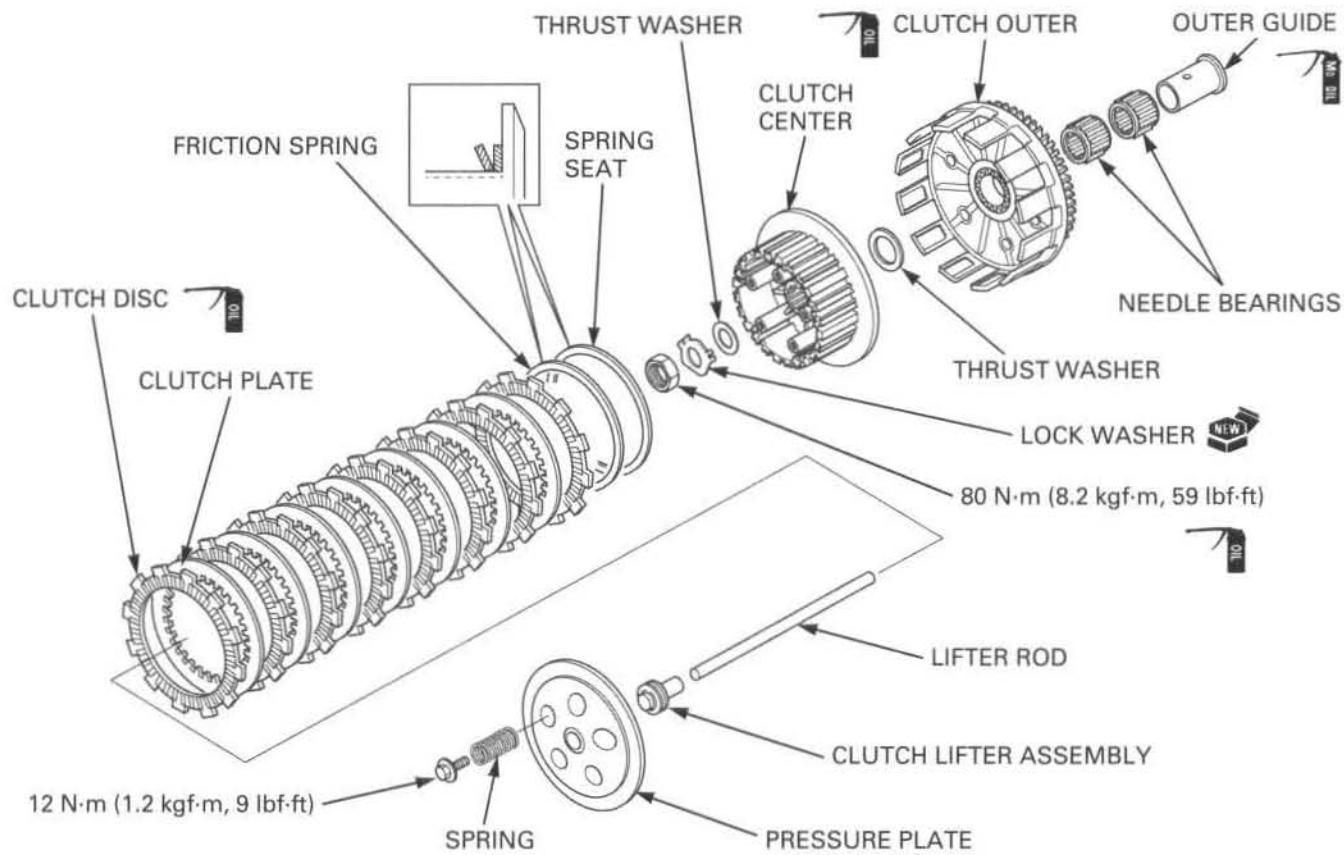
Check the clutch lifter lever for damage.  
Check the oil seal and needle bearing for wear or damage.  
Apply molybdenum oil solution to the clutch lifter lever cam area.

'04 - '06 Shown:



## CLUTCH/STARTER CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

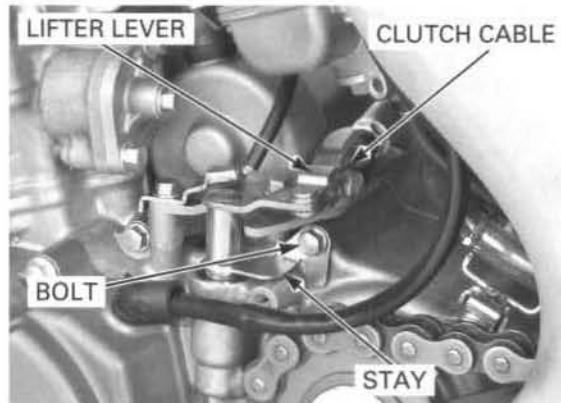
### INSTALLATION



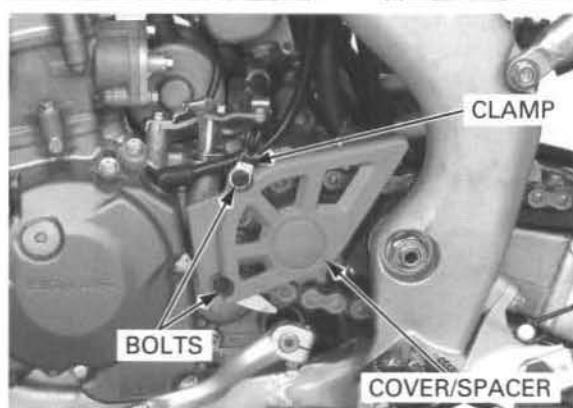
'04 – '06: Install the clutch lifter lever into the left crankcase. Install the clutch lifter lever stay and tighten the bolt.

Connect the clutch cable end to the clutch lifter lever.

Install the clutch cable to the stay and tighten the clutch cable nut securely.



'04 – '06: Install the spacer, drive sprocket cover, wire clamp and bolts.

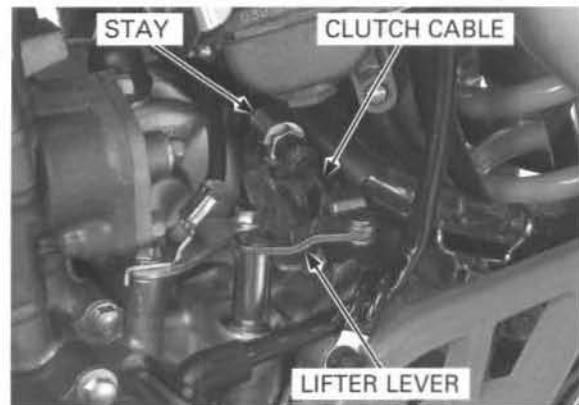


## CLUTCH/STARTER CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

After '06: Install the clutch lifter lever into the left crankcase.

Connect the clutch cable end to the clutch lifter lever.

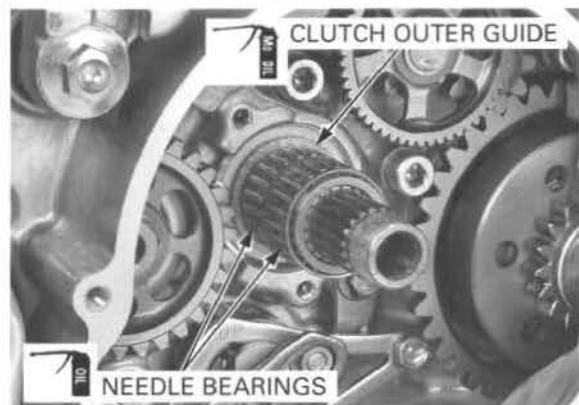
Install the clutch cable to the stay and tighten the clutch cable nut securely.



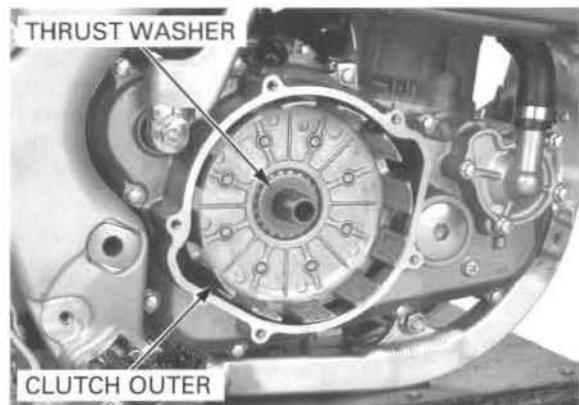
Apply transmission oil to the needle bearing.

Apply molybdenum oil solution to the clutch outer guide sliding surface.

Install the clutch outer guide and needle bearings onto the mainshaft.



Install the clutch outer and thrust washer.



Install the clutch center onto the mainshaft.

Install the thrust washer.

Install a new lock washer by aligning its groove with the clutch center rib.



## CLUTCH/STARTER CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

Apply transmission oil to the threads and seating surface of a clutch center lock nut, then install it onto the main shaft.

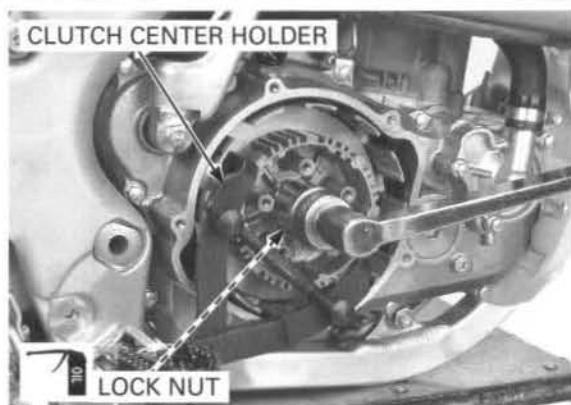
Tighten the lock nut to the specified torque using the special tool.

### TOOL:

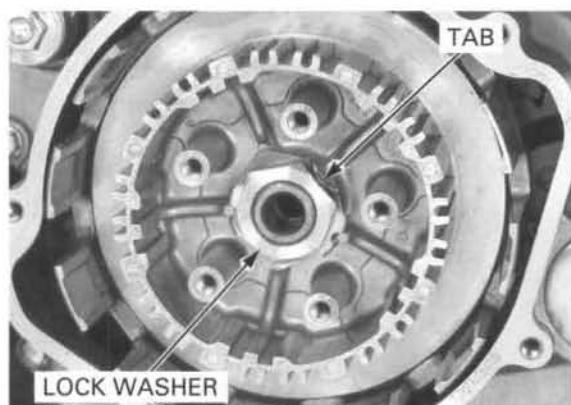
Clutch center holder

07724-0050001 or  
07724-0050002 or  
equivalent com-  
mercially avail-  
able in U.S.A.

**TORQUE: 80 N·m (8.2 kgf·m, 59 lbf·ft)**

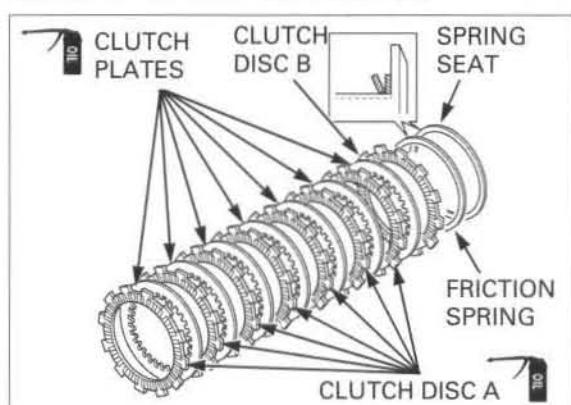


Bend the tab of the lock washer up against the clutch center lock nut.



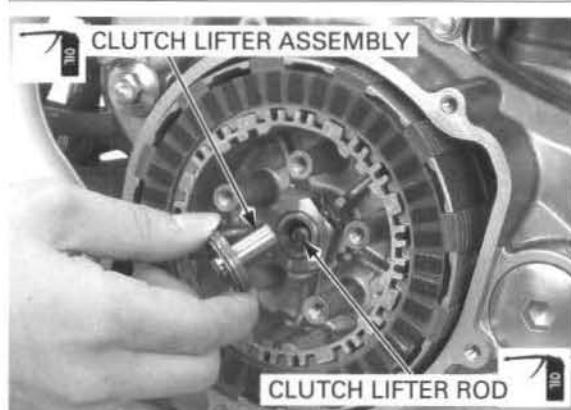
Coat the clutch plates and discs with clean transmission oil.

Install the spring seat and friction spring.  
Install the clutch disc B (large I.D. disc).  
Stack the clutch plates and disc A alternately.



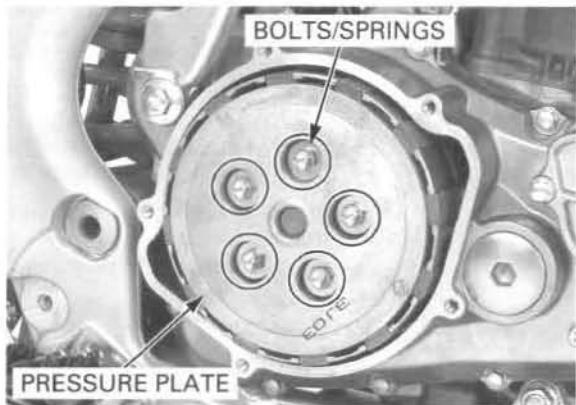
Apply transmission oil to the lifter assembly and clutch lifter rod contact surface.

Insert the clutch lifter rod into the mainshaft.  
Install the clutch lifter assembly.

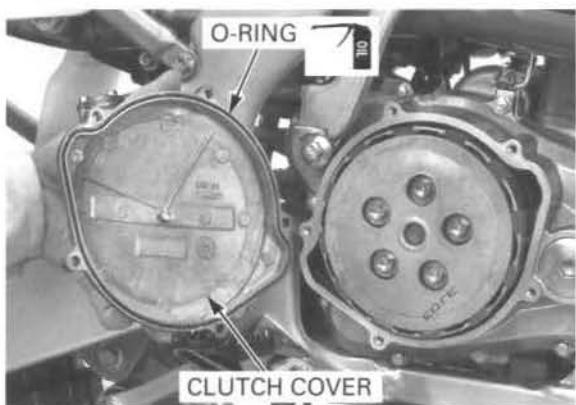


Install the clutch pressure plate.  
 Install the five springs and spring bolts.  
 Tighten the bolts to the specified torque in a criss-cross pattern in two or three steps.

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



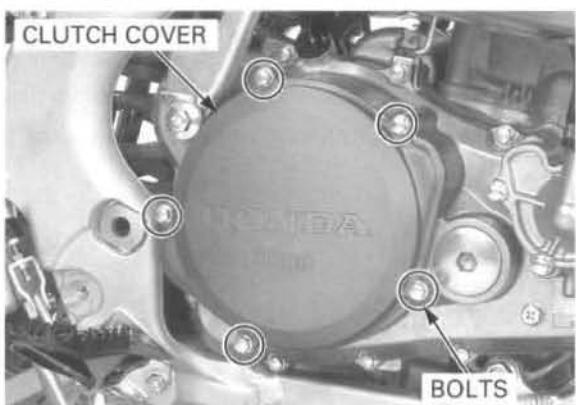
Check that the clutch cover O-ring is in good condition.  
 Replace if necessary.  
 Apply transmission oil to the O-ring and install the clutch cover.



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

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

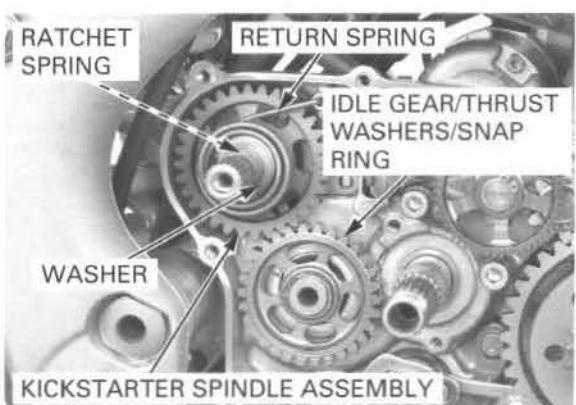
Install the brake pedal (page 15-25).  
 Adjust the clutch lever free play (page 3-28).  
 Fill the cooling system with the recommended coolant and bleed the air (page 6-7).  
 Fill the engine with the recommended transmission oil (page 3-20)  
 Start the engine and check for oil leaks.



## KICKSTARTER

### REMOVAL

Remove the right crankcase cover (page 10-5).  
 Remove the clutch (page 10-7).  
 Remove the snap ring, thrust washers and starter idle gear.  
 Unhook the kickstarter return spring from the crankcase.  
 Remove the washer, kickstarter spindle assembly and ratchet spring.



## CLUTCH/STARTER CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

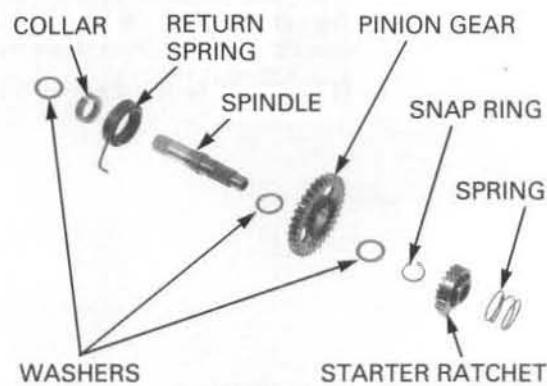
### DISASSEMBLY/INSPECTION

Disassemble the kickstarter spindle by removing the following:

- Return spring and collar
- Ratchet spring and starter ratchet
- Snap ring, thrust washers and pinion gear

Check the return spring and ratchet spring for fatigue or damage.

Check the starter ratchet for wear or damage.



Check the kickstarter pinion for wear or damage.

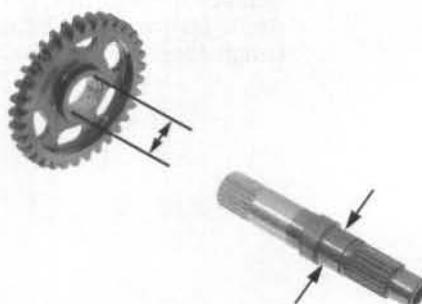
Check the kickstarter spindle for bend, wear or damage.

Measure the kickstarter pinion gear I.D.

**SERVICE LIMIT: 16.55 mm (0.652 in)**

Measure the kickstarter spindle O.D.

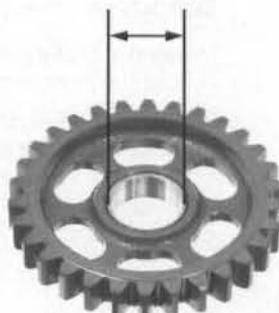
**SERVICE LIMIT: 16.46 mm (0.648 in)**



Check the kickstarter idle gear for wear or damage.

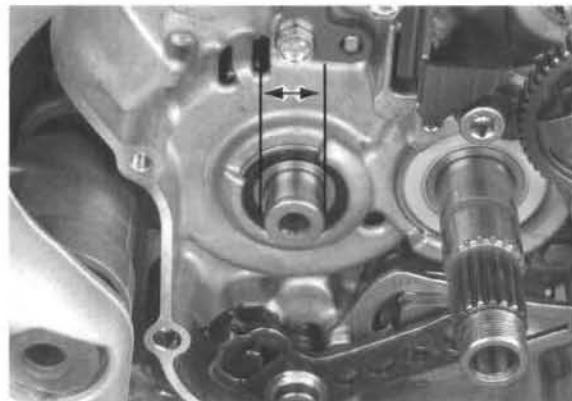
Measure the kickstarter idle gear I.D.

**SERVICE LIMIT: 17.06 mm (0.672 in)**

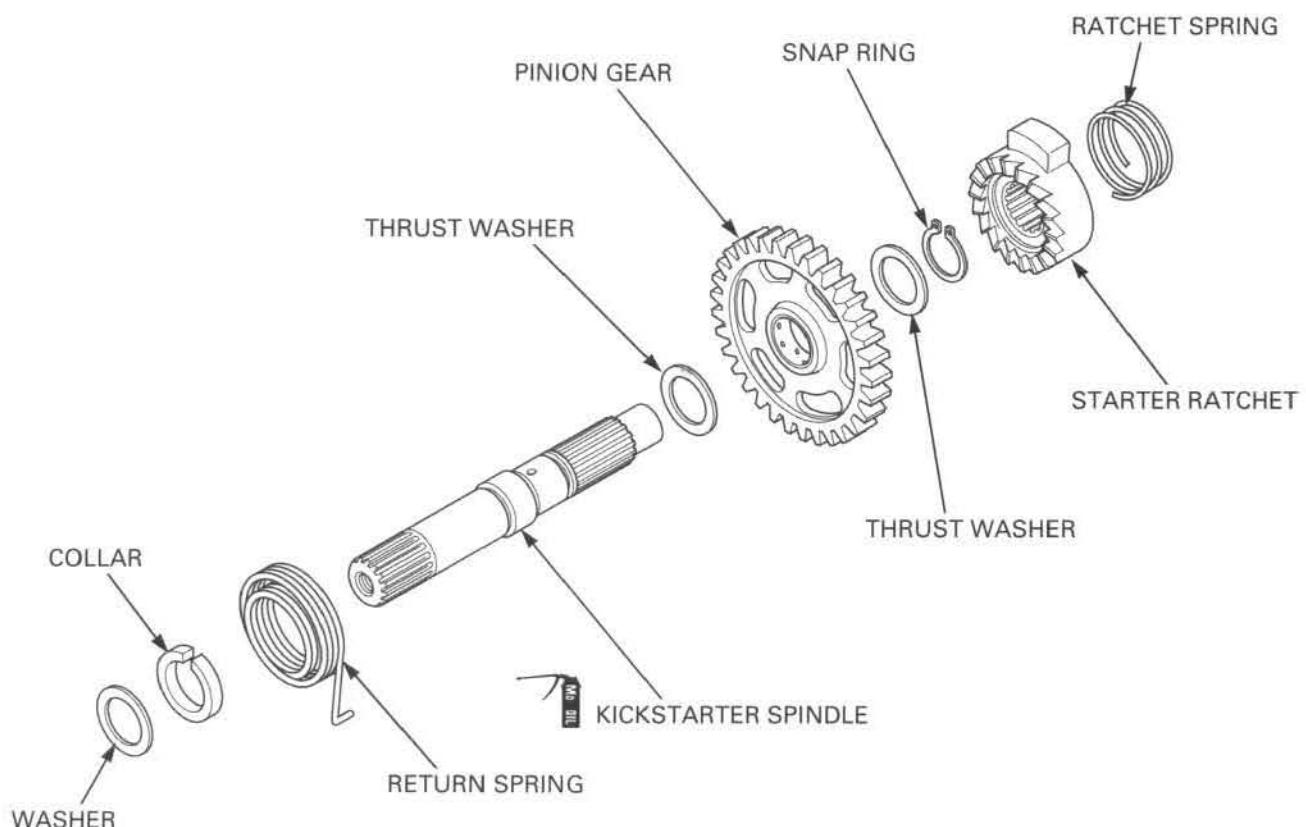


Measure the countershaft O.D. at the idle gear sliding surface.

**SERVICE LIMIT: 16.97 mm (0.668 in)**

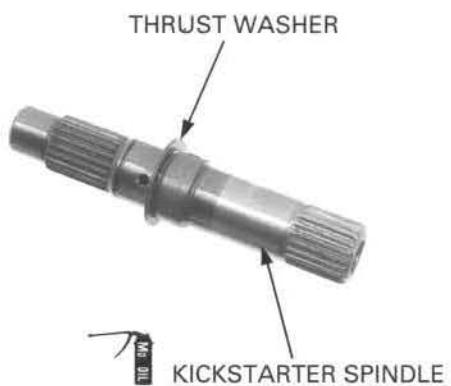


## ASSEMBLY



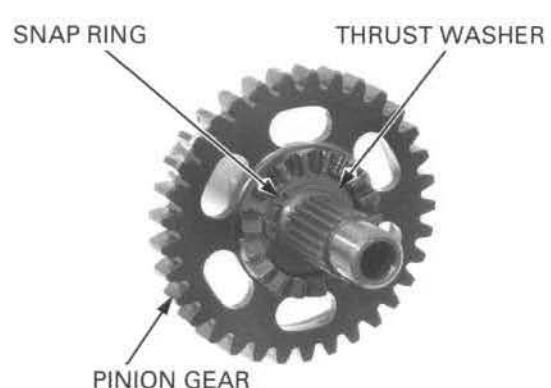
Apply molybdenum oil solution to the kickstarter spindle spline and gear rolling area.

Install the thrust washer into the kickstarter spindle.



*Set the sharp edge of the snap ring facing out.*

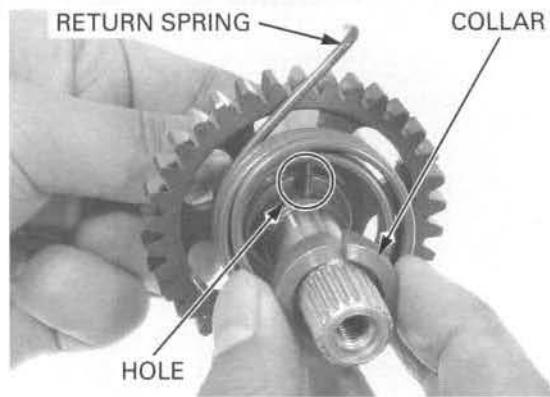
Install the pinion gear and thrust washer.  
Install the snap ring in the groove of the spindle.



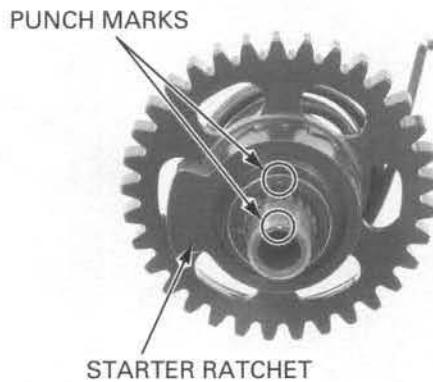
## CLUTCH/STARTER CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

Insert the return spring into the spring hole on the kickstarter spindle.

Install the collar by aligning its gap with the spring.



Align the punch marks and install the starter ratchet.



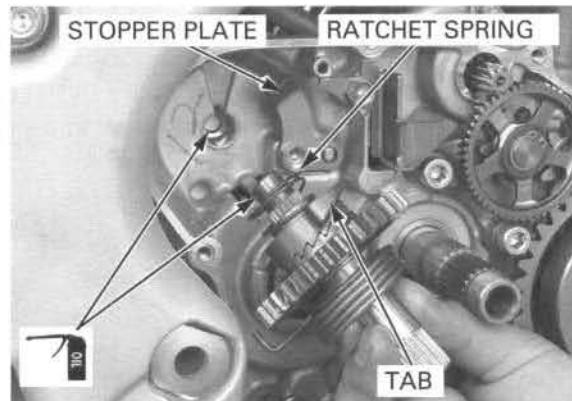
### INSTALLATION

Install the ratchet spring.

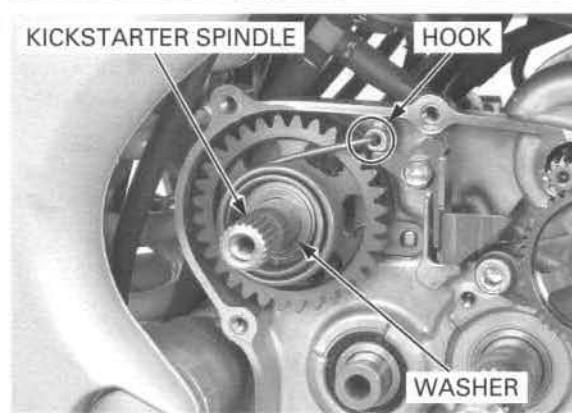
Apply transmission oil to the kickstarter spindle journal.

*Be sure the spring seat did not fall off the spindle during installation.*

Install the kickstarter assembly to the crankcase and rotate the spindle counterclockwise until the ratchet tab is clear of the stopper plate.



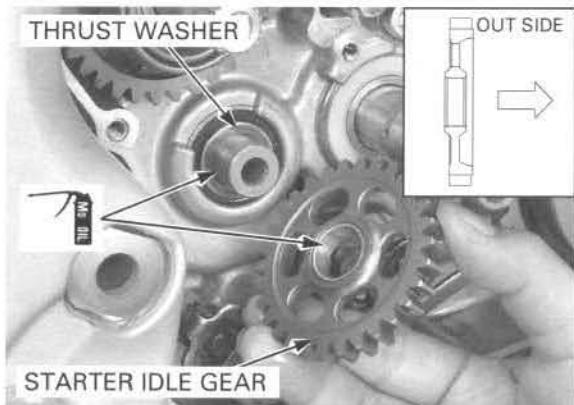
Hook the return spring end into the hole in the crankcase.  
Install the washer.



## CLUTCH/STARTER CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

Install the thrust washer onto the countershaft.

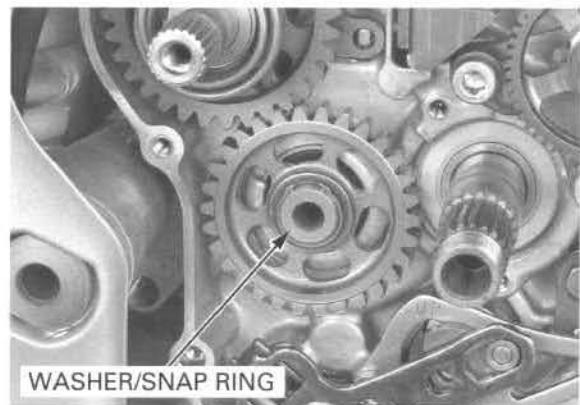
Apply molybdenum oil solution to the countershaft and idle gear inner surface.



Install the thrust washer and snap ring.

Install the clutch (page 10-12).

Install the right crankcase cover (page 10-6).



## STARTER CLUTCH

### REMOVAL

Remove the following:

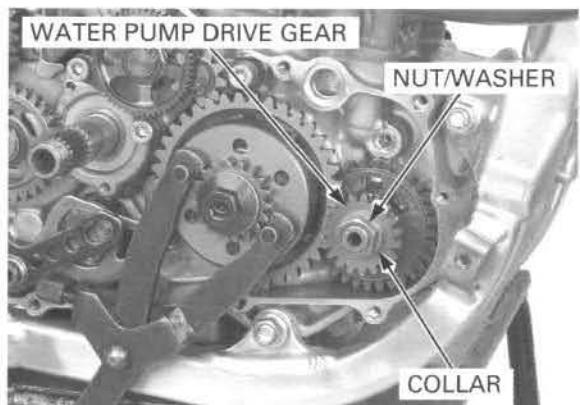
- Right crankcase cover (page 10-5)
- Clutch (page 10-7)

Loosen the water pump drive gear nut using the special tool.

#### TOOL:

Universal holder 07725-0030000

Remove the nut, washer, water pump drive gear and collar.

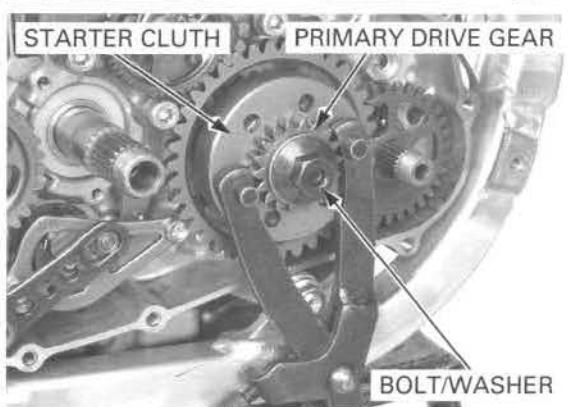


Loosen the primary drive gear bolt using the special tool.

#### TOOL:

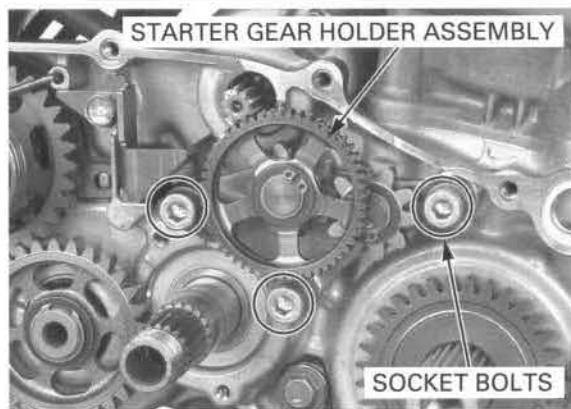
Universal holder 07725-0030000

Remove the bolt, washer, primary drive gear and starter clutch.

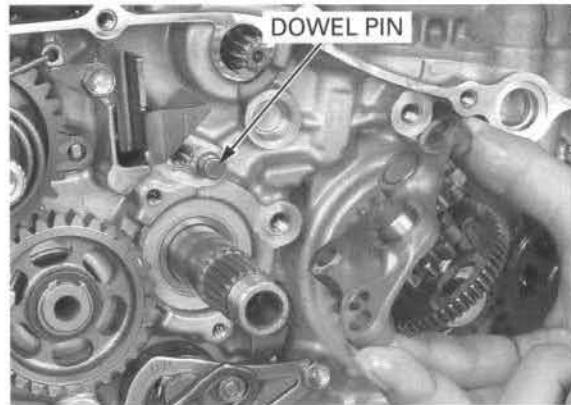


## CLUTCH/STARTER CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

Remove the socket bolts and starter gear holder assembly.



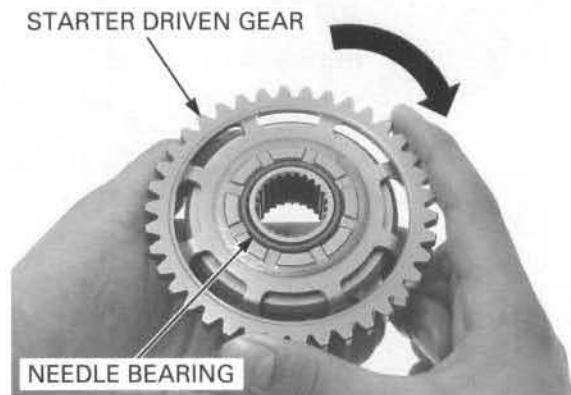
Remove the dowel pin.



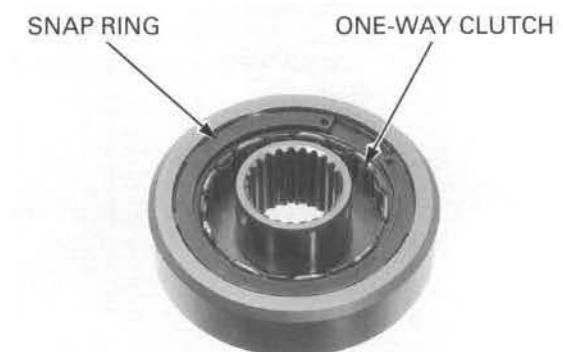
### DISASSEMBLY/INSPECTION

Check that the starter driven gear turns clockwise smoothly and does not turn counterclockwise.

Remove the driven gear and needle bearing from starter clutch outer.



Remove the snap ring and one-way clutch from the clutch outer.



## CLUTCH/STARTER CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

Check the needle bearing for abnormal wear or damage.



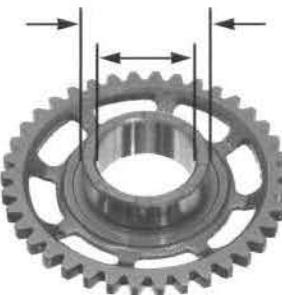
Check the starter driven gear for abnormal wear or damage.

Measure the driven gear boss I.D.

**SERVICE LIMIT:** 35.07 mm (1.381 in)

Measure the driven gear boss O.D.

**SERVICE LIMIT:** 45.64 mm (1.797 in)



Check the one-way clutch sprag for abnormal wear or damage.

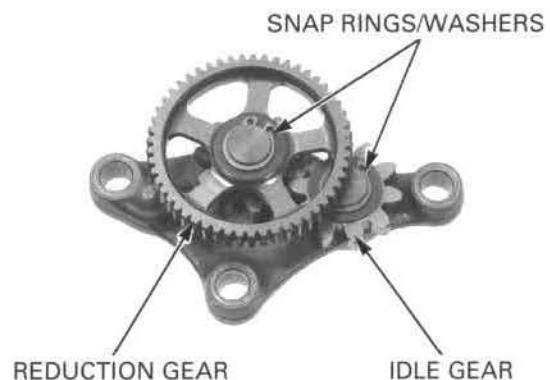
Check the starter clutch outer inner surface for wear or damage.

ONE-WAY CLUTCH



CLUTCH OUTER

Remove the snap rings, washers, starter reduction gear and idle gear.



IDLE GEAR

## CLUTCH/STARTER CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

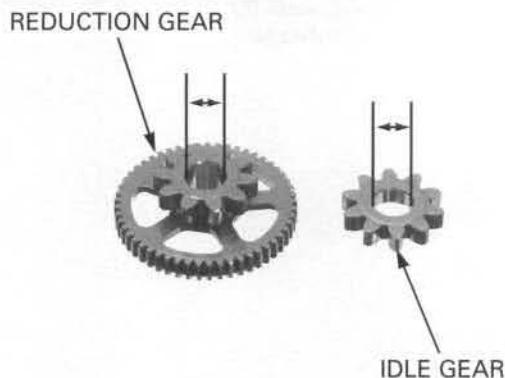
Check the starter reduction gear and idle gear for wear or damage.

Measure the reduction gear I.D.

**SERVICE LIMIT: 12.05 mm (0.474 in)**

Measure the idle gear I.D.

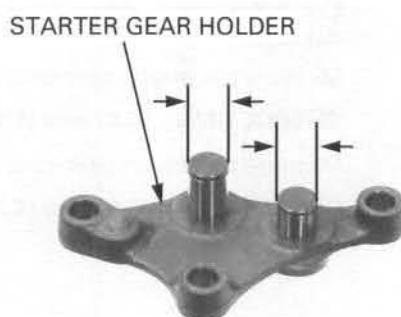
**SERVICE LIMIT: 12.05 mm (0.474 in)**



Check the starter gear holder sliding surface for wear or damage.

Measure the starter gear holder shaft O.D.

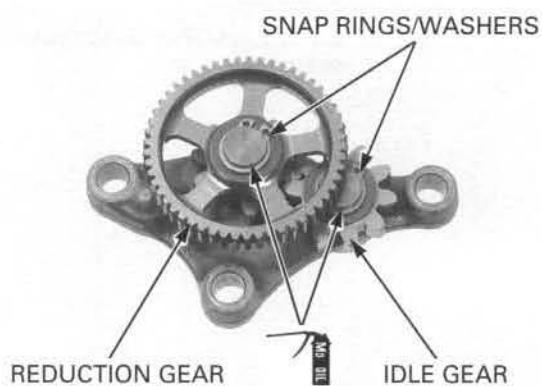
**SERVICE LIMIT: 11.98 mm (0.472 in)**



## ASSEMBLY

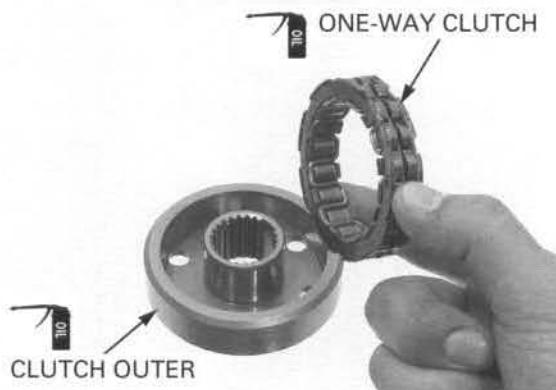
Apply molybdenum oil solution to the starter gear holder rolling surfaces.

Install the starter reduction gear, idle gear, washers and snap rings.



Apply transmission oil to the one-way clutch and starter clutch outer sliding surface.

Install the one-way clutch into the starter clutch outer with the white paint facing out.



Install the snap ring securely.



### INSTALLATION

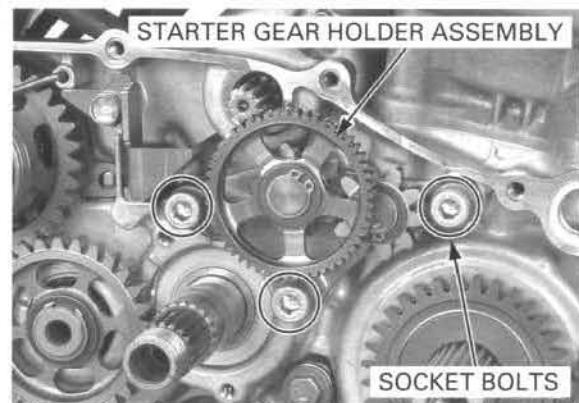
Install the dowel pin.



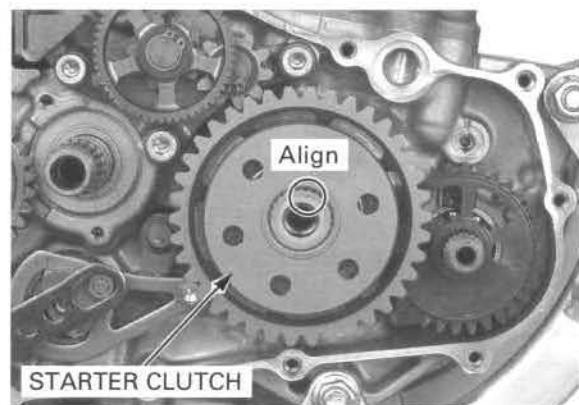
Install the starter gear holder assembly and socket bolt.

Tighten the bolts to the specified torque.

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

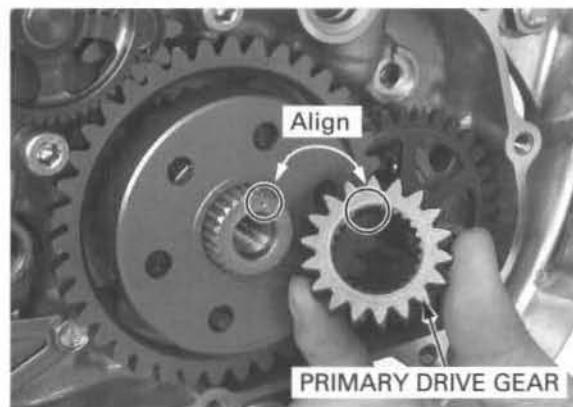


Install the starter clutch while aligning its wide cut-out in the splines with the punch mark on the mainshaft.



## CLUTCH/STARTER CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

Install the primary drive gear while aligning its wide cut-out in the splines with the punch mark on the mainshaft.



Apply transmission oil to the primary drive gear bolt threads and seating surface.

Install the washer and bolt.

Tighten the primary drive gear bolt to the specified torque using the special tool.

**TOOL:**

Universal holder

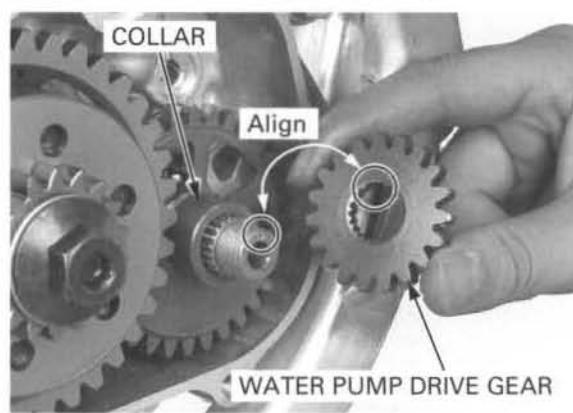
07725-0030000

**TORQUE: 108 N·m (11.0 kgf·m, 80 lbf·ft)**



Install the collar onto the balancer shaft.

Install the water pump drive gear while aligning its wide cut-out in the splines with the punch mark on the balancer shaft.



Apply transmission oil to the water pump drive gear nut threads and seating surface.

Install the washer and nut.

Tighten the water pump drive gear nut to the specified torque using the special tool.

**TOOL:**

Universal holder

07725-0030000

**TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)**

Install the following:

- Clutch (page 10-12)
- Right crankcase cover (page 10-6)



## GEARSHIFT LINKAGE

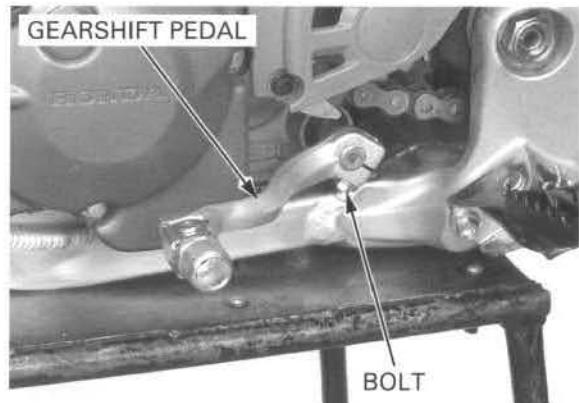
### REMOVAL

Remove the following:

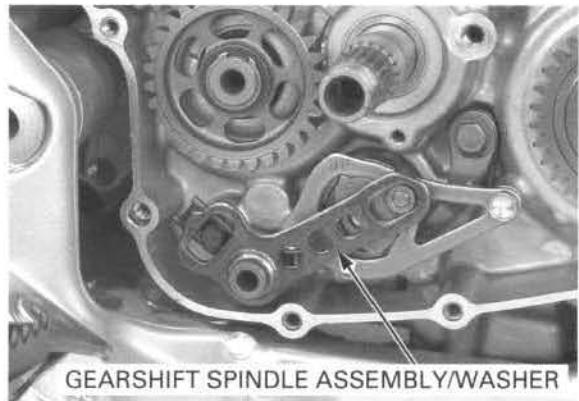
- Right crankcase cover (page 10-5)
- Clutch (page 10-7)
- Starter clutch (page 10-19)

*When disassembling the gearshift pedal, mark the pedal position to ensure correct reassembly in its original location.*

Remove the bolt and gearshift pedal.



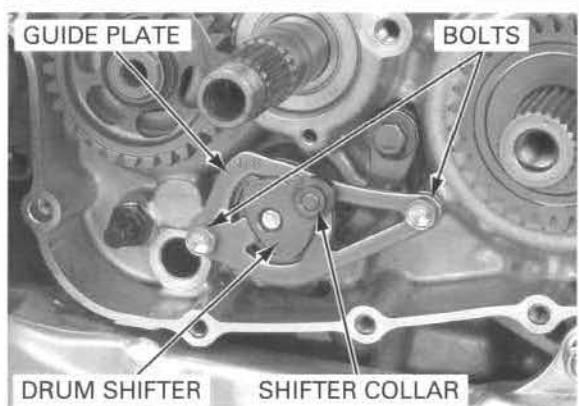
Remove the gearshift spindle assembly and washer from the crankcase.



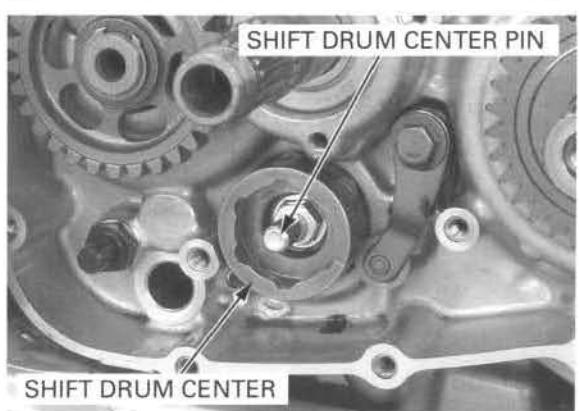
Remove the shifter collar.

*Do not let the ratchet pawls fall when removing the guide plate and drum shifter.*

Remove the bolts, guide plate and drum shifter as an assembly.



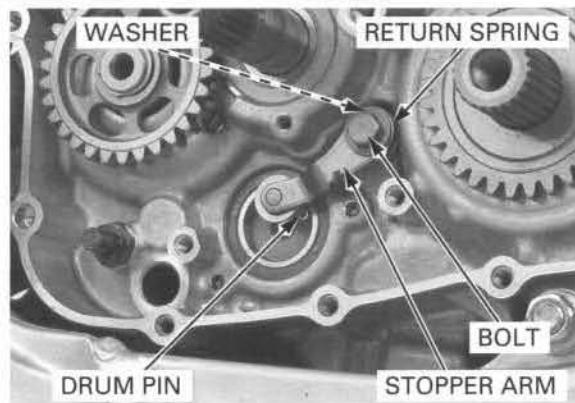
Remove the shift drum center pin and shift drum center.



## CLUTCH/STARTER CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

Remove the bolt, stopper arm, return spring and washer.

Remove the drum pin from the shift drum.

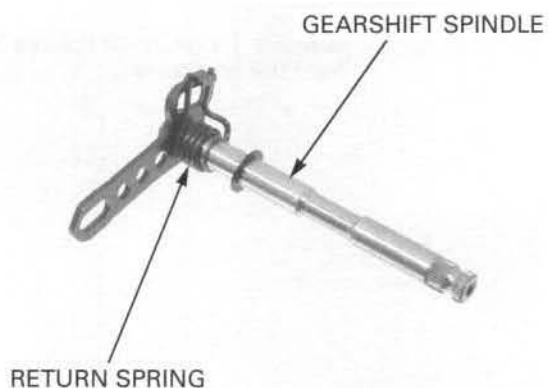


### INSPECTION

#### GEARSHIFT SPINDLE

Check the gearshift spindle for bend, wear or damage.

Check the return spring for fatigue or damage.



#### RATCHET PAWL

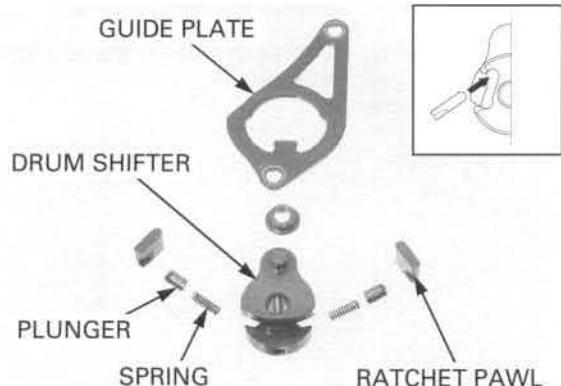
Remove the following:

- Guide plate
- Drum shifter
- Ratchet pawls
- Plungers
- Springs

Clean the ratchet pawls, plungers, springs and drum shifter with clean transmission oil.

Check each part for wear or damage.

Assemble the drum shifter, springs, plungers and ratchet pawls in the guide plate as shown.



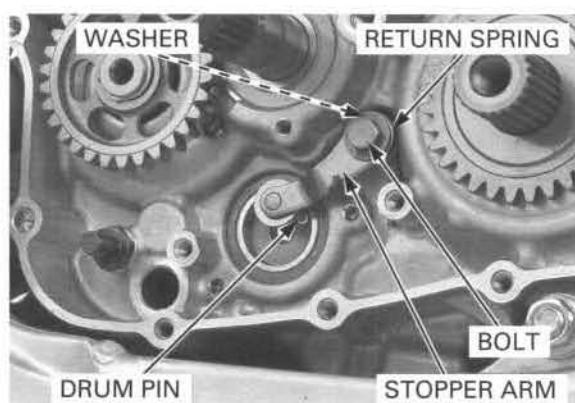
### INSTALLATION

Install the drum pin into the hole on the shift drum.

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

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

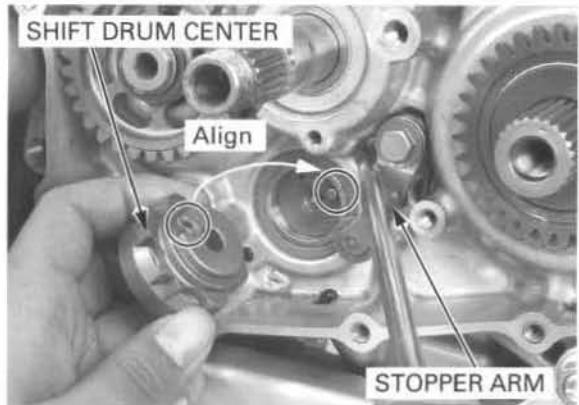
Check the stopper arm for proper operation.



## CLUTCH/STARTER CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

Move the stopper arm out of the way using a screwdriver.

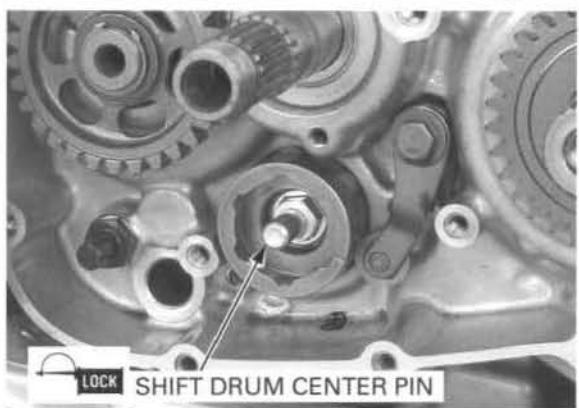
Align the shift drum center groove with the drum pin.



Apply a locking agent to the gear shift drum center pin threads and then install the center pin.

Tighten the shift drum center pin to the specified torque.

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

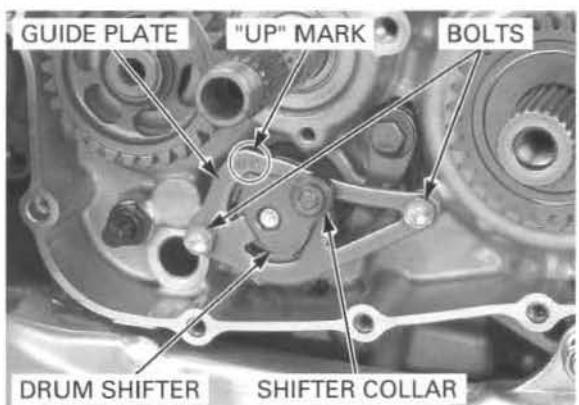


Set the drum center in a position other than neutral. While holding the ratchet pawls in place in the guide plate and drum shifter.

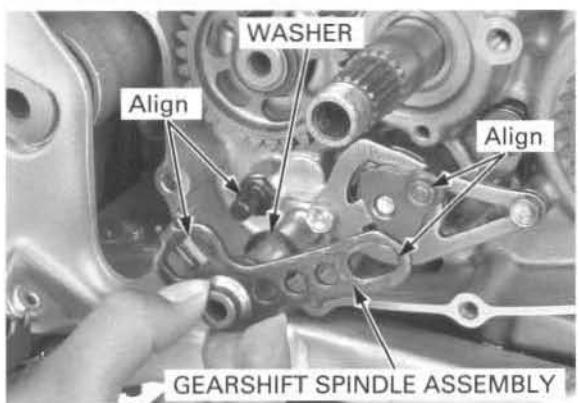
Install the drum shifter assembly by aligning the hole of the drum shifter with the shift drum center pin, and guide plate "UP" mark facing up.

Install and tighten the guide plate bolt.

Install the shifter collar onto the drum shifter.



*Do not forget to install the washer and gearshift spindle assembly into the crankcase while aligning the spring ends with the crankcase stopper pin.*



## CLUTCH/STARTER CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

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

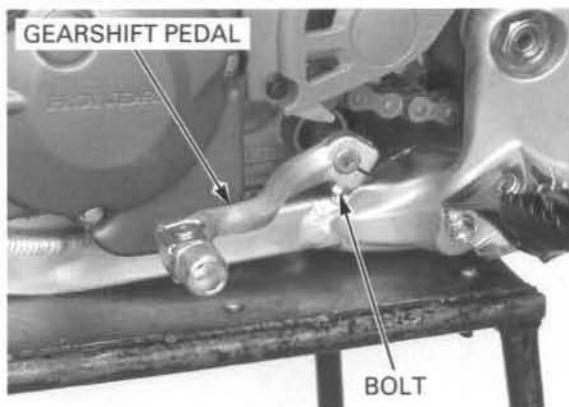
Tighten the bolt to the specified torque.

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

Move the gearshift pedal and check the shift mechanism for smooth operation.

Install the following:

- Starter clutch (page 10-23)
- Clutch (page 10-12)
- Right crankcase cover (page 10-6)



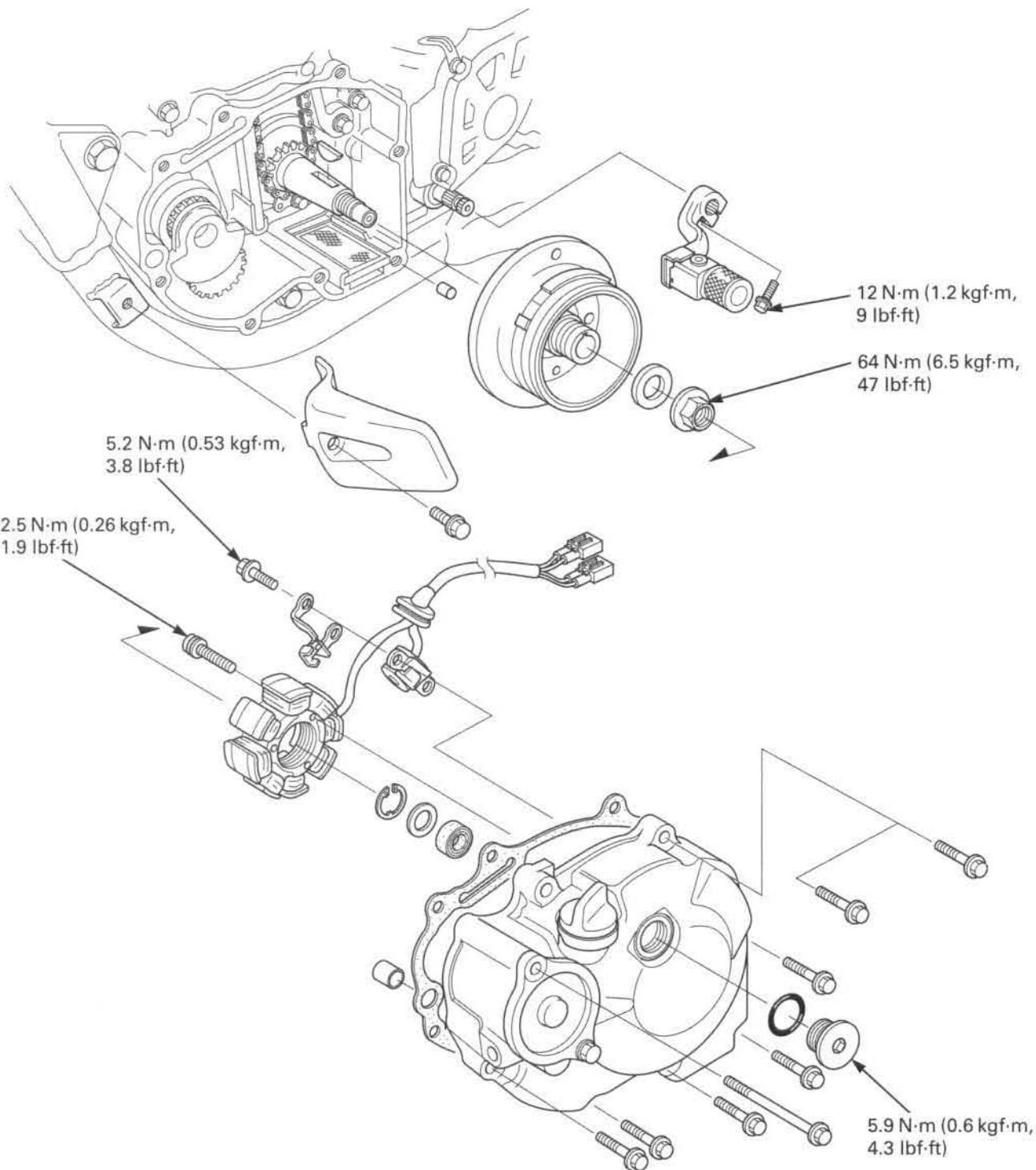
# **11. ALTERNATOR**

---

COMPONENT LOCATION .....	11-2	STATOR .....	11-5
SERVICE INFORMATION .....	11-3	FLYWHEEL.....	11-5
LEFT CRANKCASE COVER REMOVAL ..	11-4	LEFT CRANKCASE COVER INSTALLATION .....	11-7

## ALTERNATOR

### COMPONENT LOCATION



## SERVICE INFORMATION

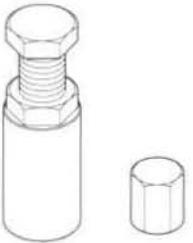
### GENERAL

- This section covers the removal and installation of the alternator stator and flywheel. These services can be done with the engine installed in the frame.
- For alternator stator inspection (page 16-8).

### TORQUE VALUES

Flywheel nut	64 N·m (6.5 kgf·m, 47 lbf·ft)	Apply oil to the threads and seating surface
Timing hole cap	5.9 N·m (0.6 kgf·m, 4.3 lbf·ft)	Apply grease to the threads
Ignition pulse generator mounting bolt	5.2 N·m (0.53 kgf·m, 3.8 lbf·ft)	Apply a locking agent to the threads
Stator mounting screw	2.5 N·m (0.26 kgf·m, 1.9 lbf·ft)	Apply a locking agent to the threads

### TOOLS

Flywheel holder 070MB-KRN0100    or 07AMB-KRNA100 (U.S.A. only)	Flywheel puller 07AMC-MEBA100 (U.S.A. only)    or 07933-1480000 and 070MG-KSE0100
--	---

## ALTERNATOR

### LEFT CRANKCASE COVER REMOVAL

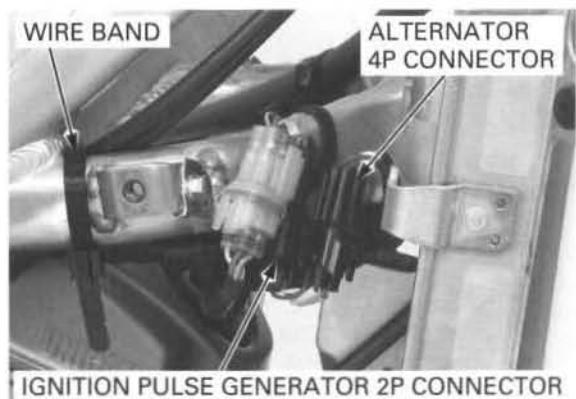
Remove the following:

- Fuel tank (page 2-7)
- Left engine guard (page 2-4)
- Gearshift pedal (page 10-25)

Drain the engine oil (page 3-17).

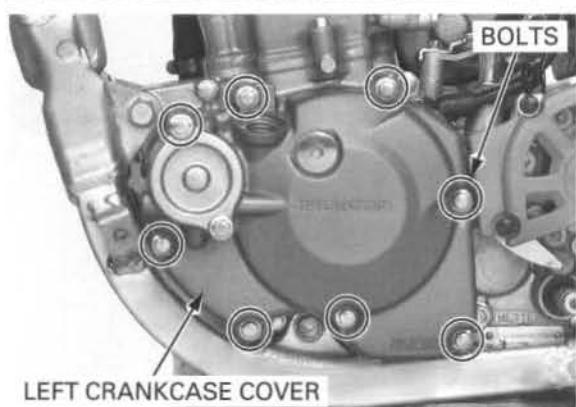
Remove the wire band.

Disconnect the alternator 4P (Black) connector and ignition pulse generator 2P (Black) connector.

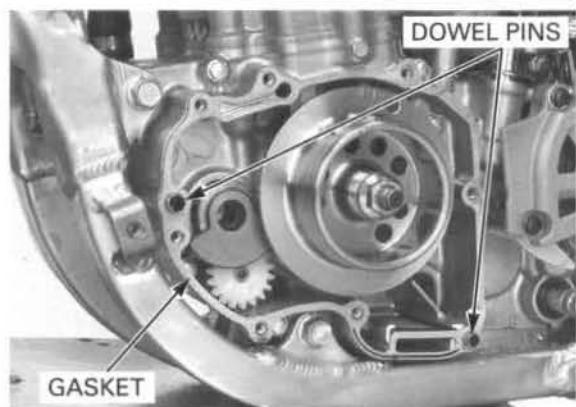


Loosen the bolts in a crisscross pattern in two or three steps.

Remove the bolts and left crankcase cover.



Remove the gasket and dowel pins.



## STATOR

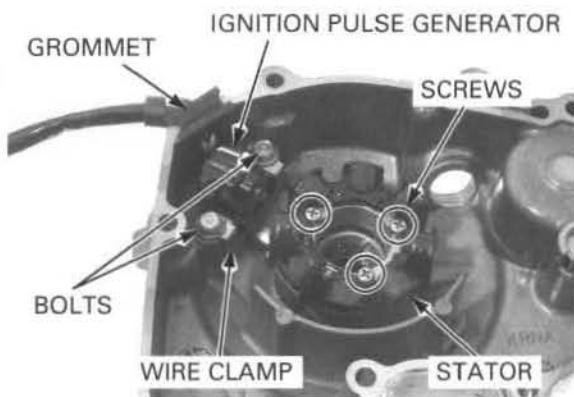
### REMOVAL

Remove the left crankcase cover (page 11-4).

Remove the bolts and wire clamp.

Remove the ignition pulse generator and grommet from the left crankcase cover.

Remove the screws and stator.



### INSTALLATION

Place the stator/ignition pulse generator into the left crankcase cover.

Apply liquid sealant to the wire grommet seating surface and install the grommet into the groove in the left crankcase cover.

Apply locking agent to the ignition pulse generator mounting bolt and stator mounting screw threads. Install the wire clamp and tighten the ignition pulse generator mounting bolts and stator mounting screws to the specified torque.

#### TORQUE:

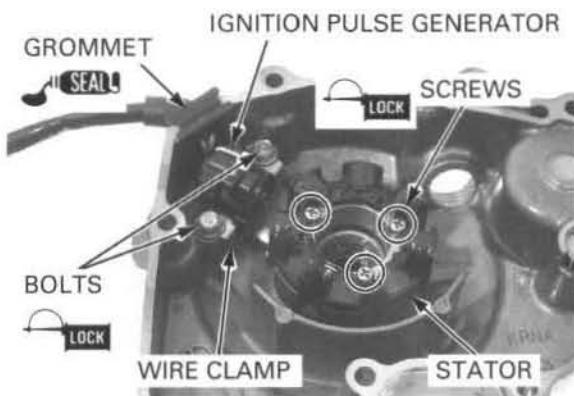
**Ignition pulse generator mounting bolt:**

5.2 N·m (0.53 kgf·m, 3.8 lbf·ft)

**Stator mounting screw:**

2.5 N·m (0.26 kgf·m, 1.9 lbf·ft)

Install the left crankcase cover (page 11-7).



## FLYWHEEL

### REMOVAL

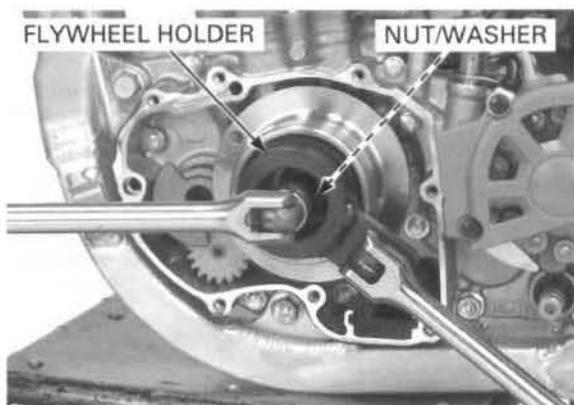
Remove the left crankcase cover (page 11-4).

Hold the flywheel with the special tool and remove the nut and washer.

#### TOOL:

Flywheel holder

070MB-KRN0100 or  
07AMB-KRNA100  
(U.S.A. only)



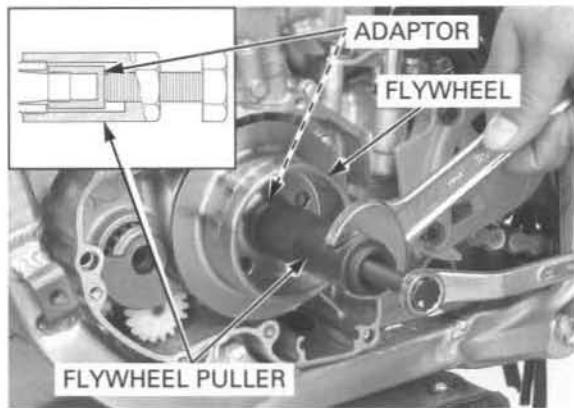
## ALTERNATOR

Remove the flywheel using the special tools.

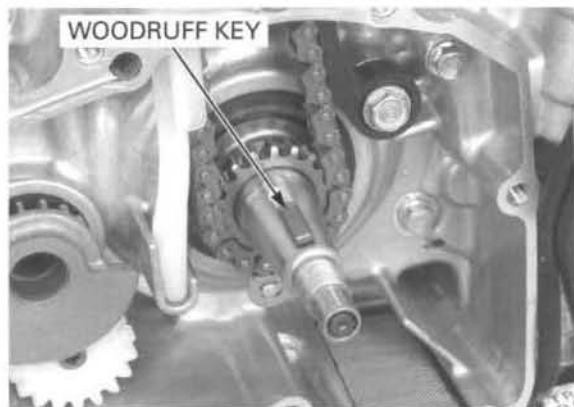
**TOOLS:**

Flywheel puller

07AMC-MEBA100  
(U.S.A. only) or  
07933-1480000 and  
070MG-KSE0100

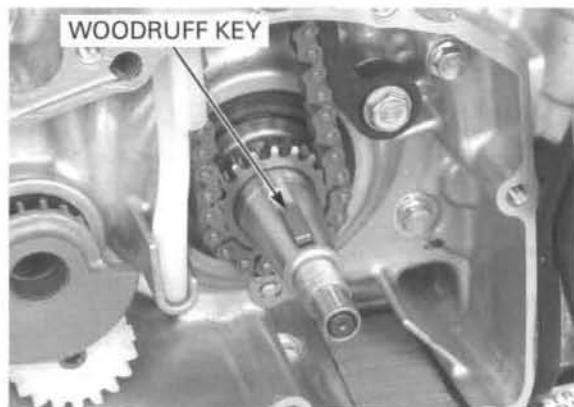


Remove the woodruff key.



## INSTALLATION

Install the woodruff key in the groove in the crankshaft.



Install the flywheel to the crankshaft by aligning the groove in the flywheel with the woodruff key.

Apply oil to the flywheel nut threads and seating surface.

Install the washer and nut.

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

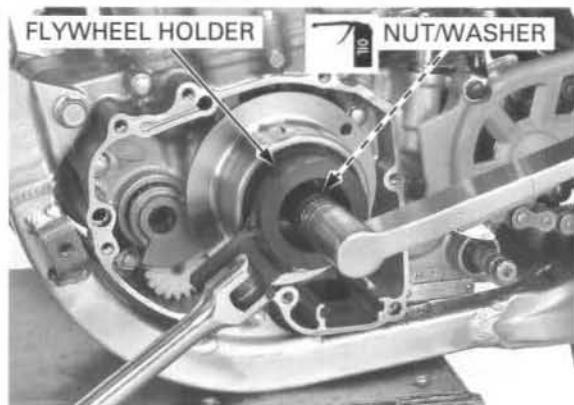
**TOOL:**

Flywheel holder

070MB-KRN0100 or  
07AMB-KRNA100  
(U.S.A. only)

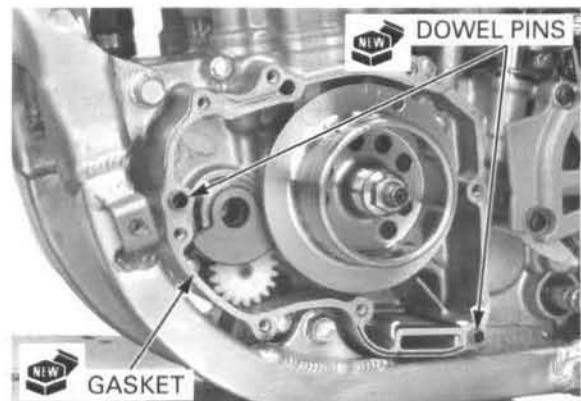
**TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)**

Install the left crankcase cover (page 11-7).

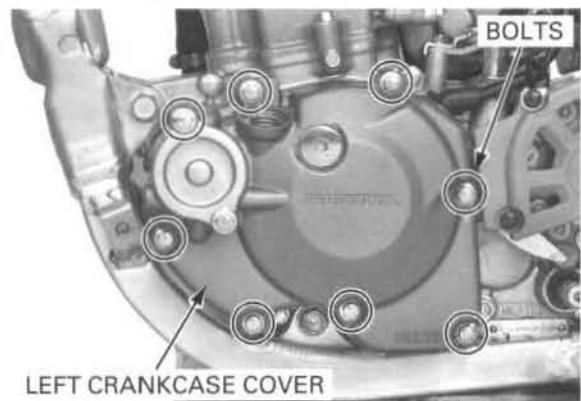


## LEFT CRANKCASE COVER INSTALLATION

Install a new gasket and dowel pins.



Install the left crankcase cover and bolts.  
Tighten the left crankcase cover bolts in a crisscross pattern in two or three steps.



Connect the ignition pulse generator 2P (Black) connector and alternator 4P (Black) connector.

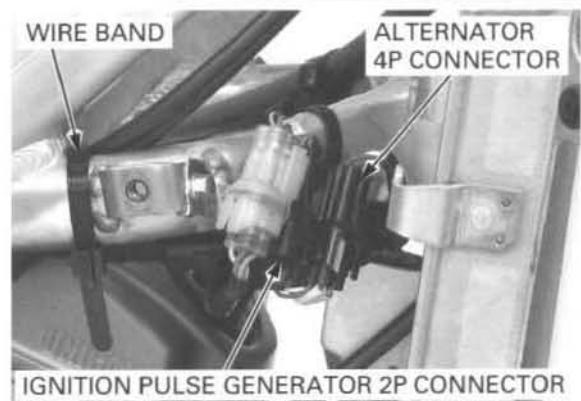
*Route the wires properly (page 1-23).*

Clamp the wire with the band.

Install the following:

- Gearshift pedal (page 10-28)
- Engine guard (page 2-4)
- Fuel tank (page 2-7)

Fill the engine with the recommended engine oil (page 3-17).



---

**MEMO**



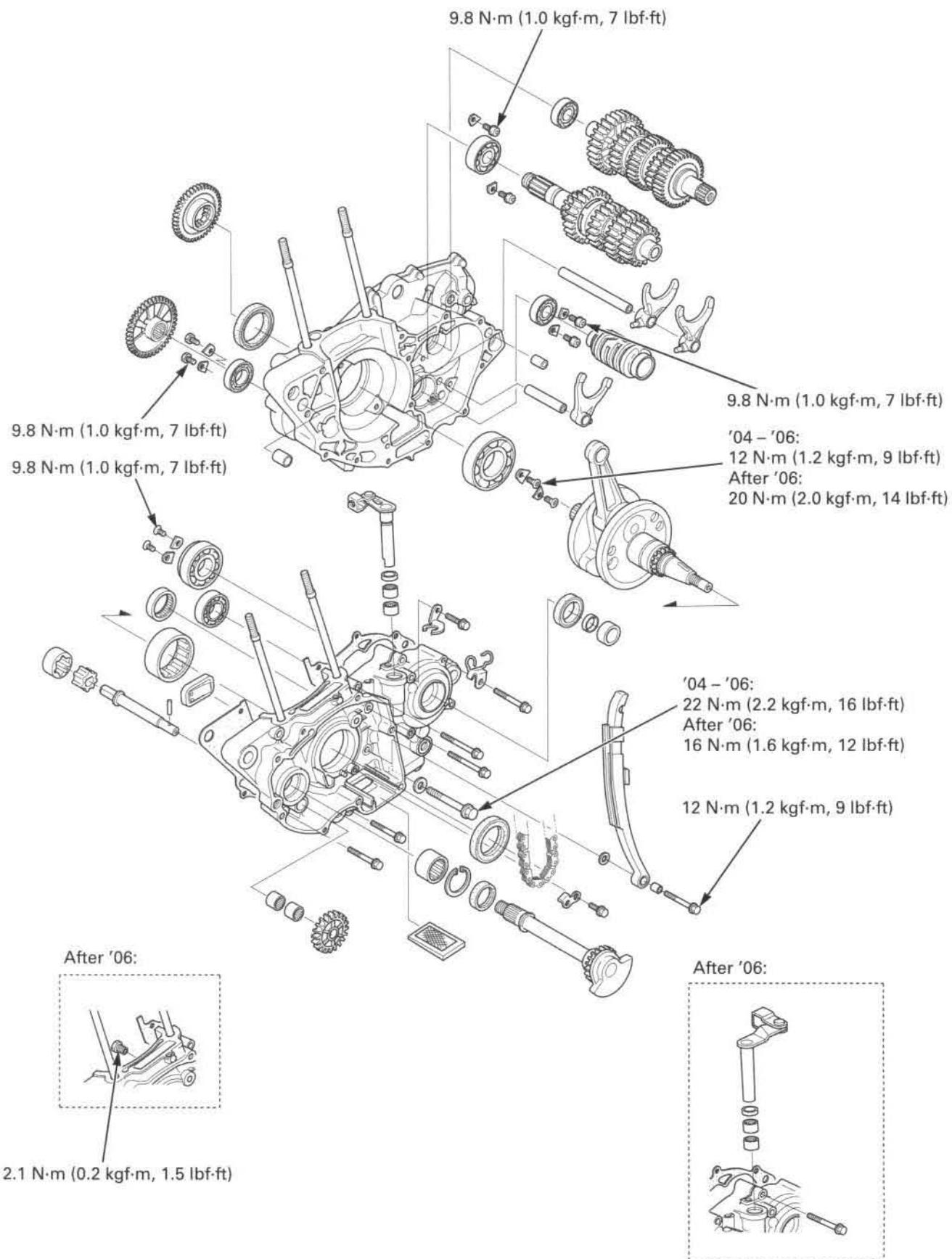
## **12. CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER**

---

COMPONENT LOCATION .....	12-2	CRANKSHAFT REMOVAL .....	12-12
SERVICE INFORMATION .....	12-3	CRANKCASE BEARING REPLACEMENT .....	12-13
TROUBLESHOOTING .....	12-5	CRANKSHAFT INSTALLATION .....	12-18
BALANCER GEAR/BALANCER .....	12-6	TRANSMISSION ASSEMBLY .....	12-19
CRANKCASE SEPARATION .....	12-7	CRANKCASE ASSEMBLY .....	12-21
TRANSMISSION DISASSEMBLY .....	12-9		

## CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

### COMPONENT LOCATION



# SERVICE INFORMATION

## GENERAL

- This section covers crankcase separation for service of the crankshaft, transmission and balancer.
- The crankcase must be separated to service the crankshaft and transmission.
- The engine must be out of the frame for this service.
- The following parts must be removed before separating the crankcase.
  - Balancer (page 12-6)
  - Clutch (page 10-7)
  - Stater clutch (page 10-19)
  - Kickstarter (page 10-15)
  - Gearshift linkage (page 10-25)
  - Cylinder head (page 8-12)
  - Valve (page 8-15)
  - Cylinder (page 9-4)
  - Piston (page 9-4)
  - Engine (page 7-5)
  - Flywheel (page 11-5)
  - Oil pump drive gear/drive pin (page 4-7)
  - Starter motor (page 18-6)

## SPECIFICATIONS

ITEM		STANDARD	Unit: mm (in) SERVICE LIMIT
Crankshaft	Side clearance	0.30 – 0.75 (0.012 – 0.030)	0.8 (0.03)
	Radial clearance	0.006 – 0.018 (0.0002 – 0.0007)	0.05 (0.002)
	Runout	R L	– –
Transmission	Gear I.D.	M4	23.020 – 23.041 (0.9063 – 0.9071)
		M5	23.020 – 23.041 (0.9063 – 0.9071)
		C1	20.020 – 20.041 (0.7882 – 0.7890)
		C2	27.020 – 27.041 (1.0638 – 1.0646)
		C3	25.020 – 25.041 (0.9850 – 0.9859)
	Bushing O.D.	M4, M5	22.979 – 23.000 (0.9047 – 0.9055)
		C1	19.979 – 20.000 (0.7866 – 0.7874)
		C2	26.979 – 27.000 (1.0622 – 1.0630)
		C3	24.979 – 25.000 (0.9834 – 0.9843)
	Bushing I.D.	M5	20.000 – 20.021 (0.7874 – 0.7882)
		C1	17.000 – 17.018 (0.6693 – 0.6700)
		C2	24.000 – 24.021 (0.9449 – 0.9457)
		C3	22.000 – 22.021 (0.8661 – 0.8670)
	Gear-to-bushing clearance	M4, M5	0.020 – 0.062 (0.0008 – 0.0024)
		C1, C2, C3	0.020 – 0.062 (0.0008 – 0.0024)
	Mainshaft O.D.	M5 bushing	19.959 – 19.980 (0.7858 – 0.7866)
	Countershaft O.D.	C1 bushing	16.983 – 16.994 (0.6686 – 0.6691)
		C2 bushing	23.959 – 23.980 (0.9433 – 0.9441)
		C3 bushing	21.959 – 21.980 (0.8645 – 0.8654)
	Bushing-to-shaft clearance	M5	0.020 – 0.062 (0.0008 – 0.0024)
		C1	0.006 – 0.035 (0.0002 – 0.0014)
		C2, C3	0.020 – 0.062 (0.0008 – 0.0024)
Shift fork, shift fork shaft	Fork claw thickness	C	4.93 – 5.00 (0.194 – 0.197)
		R, L	4.93 – 5.00 (0.194 – 0.197)
	Shift fork I.D.	C	11.003 – 11.024 (0.4332 – 0.4340)
		R, L	12.035 – 12.056 (0.4738 – 0.4746)
	Fork shaft O.D.	C	10.983 – 10.994 (0.4324 – 0.4328)
		R, L	11.966 – 11.984 (0.4711 – 0.4718)

## CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

### TORQUE VALUE

Crankshaft bearing set plate torx screw ('04 – '06)	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply high strength locking agent to the threads (Pro Honda Hondalock 3 or equivalent high strength locking agent)
Crankshaft bearing set plate torx screw (After '06)	20 N·m (2.0 kgf·m, 14 lbf·ft)	Apply high strength locking agent to the threads (Pro Honda Hondalock 3 or equivalent high strength locking agent)
Countershaft bearing set plate screw	9.8 N·m (1.0 kgf·m, 7 lbf·ft)	Apply locking agent to the threads
Gearshift drum bearing set plate bolt	9.8 N·m (1.0 kgf·m, 7 lbf·ft)	Apply locking agent to the threads
Mainshaft bearing set plate bolt	9.8 N·m (1.0 kgf·m, 7 lbf·ft)	Apply locking agent to the threads
Balancer shaft bearing set plate bolt	9.8 N·m (1.0 kgf·m, 7 lbf·ft)	Apply locking agent to the threads
Cam chain tensioner bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply locking agent to the threads
Transmission oil drain bolt ('04 – '06)	22 N·m (2.2 kgf·m, 16 lbf·ft)	Apply oil to the threads and seating surface
Transmission oil drain bolt (After '06)	16 N·m (1.6 kgf·m, 12 lbf·ft)	Apply oil to the threads and seating surface
Orifice (After '06)	2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)	ALOC bolt: replace with a new one

### TOOLS

Bearing remover, 17 mm 07936-3710300	Bearing remover, 20 mm 07936-3710600	Remover weight 07741-0010201  or 07936-371020A (U.S.A. only) or 07936-371020
Remover handle 07936-3710100	Driver 07749-0010000	Attachment, 62 x 68 mm 07746-0010500
Attachment, 52 x 55 mm 07746-0010400	Attachment, 37 x 40 mm 07746-0010200	Attachment, 32 x 35 mm 07746-0010100

Attachment, 42 x 47 mm 07746-0010300	Pilot, 20 mm 07746-0040500	Pilot, 30 mm 07746-0040700
		

Pilot, 17 mm 07746-0040400	Pilot, 22 mm 07746-0041000	Pilot, 25 mm 07746-0040600
		

## TROUBLESHOOTING

### Excessive noise

- Worn crankshaft main journal bearings
- Worn or damaged connecting rod bearings
- Worn connecting rod small end
- Worn balancer bearings
- Improper balancer installation
- Worn, seized or chipped transmission gear
- Worn or damaged transmission bearing

### Transmission jumps out of gear

- Worn gear dogs
- Worn gear shifter groove
- Bent shift fork shaft
- Broken shift drum stopper arm
- Broken shift drum stopper arm spring
- Worn or bent shift forks
- Broken gearshift spindle return spring

### Hard to shift

- Improper clutch operation
- Incorrect transmission oil weight
- Incorrect clutch adjustment
- Bent shift fork
- Bent fork shaft
- Bent fork claw
- Damaged shift drum guide grooves
- Bent shift spindle

### Engine vibration

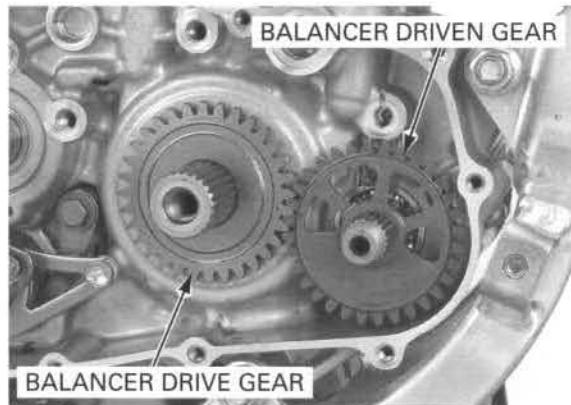
- Excessive crankshaft runout
- Improper balancer timing

**BALANCER GEAR/BALANCER****REMOVAL**

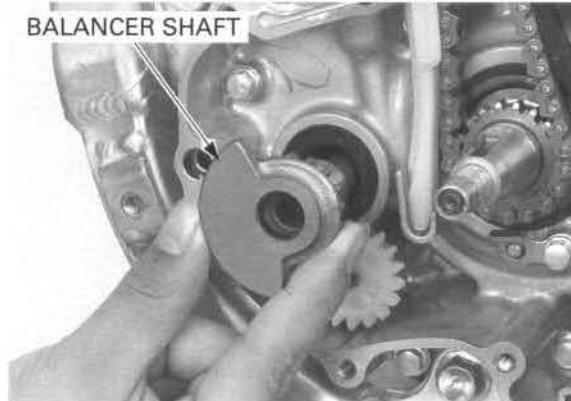
Remove the following:

- Right crankcase cover (page 10-5)
- Clutch (page 10-7)
- Starter clutch (page 10-19)
- Flywheel (page 11-5)

Remove the balancer drive and driven gears.



Turn the balancer shaft so it does not interfere with the crankcase as shown and remove it.

**INSPECTION**

Check the balancer shaft for wear, damage or excessive scratches.

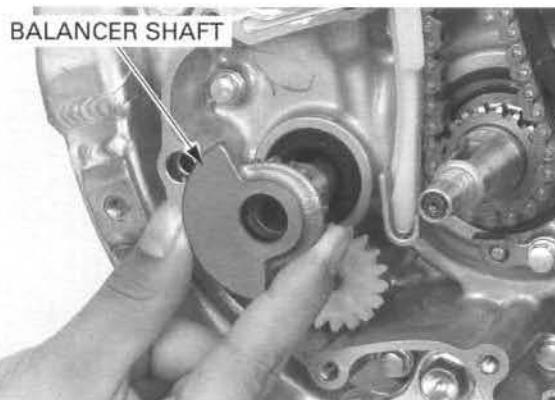
Check the balancer shaft gear for wear or damage.

Check the balancer drive/driven gear for wear or damage.

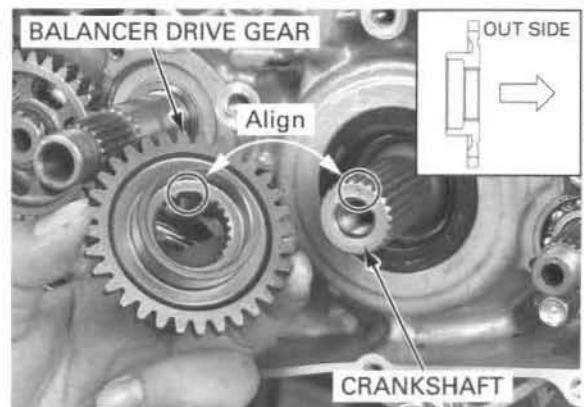
BALANCER SHAFT

**INSTALLATION**

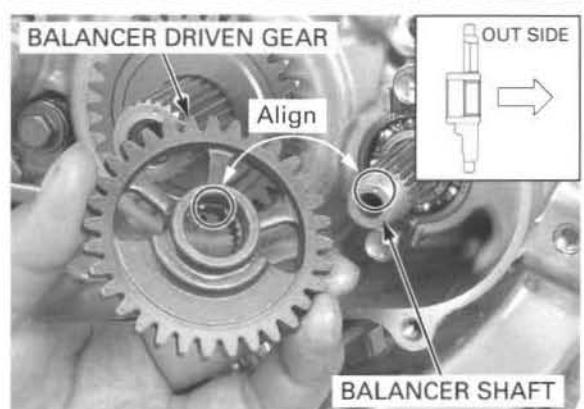
*Engage the balancer shaft gear portion with the oil pump driven gear.*  
Install the balancer shaft into the crankcase as shown.



Install the balancer drive gear while aligning its wide cut-out in the splines with the punch mark on the crankshaft.



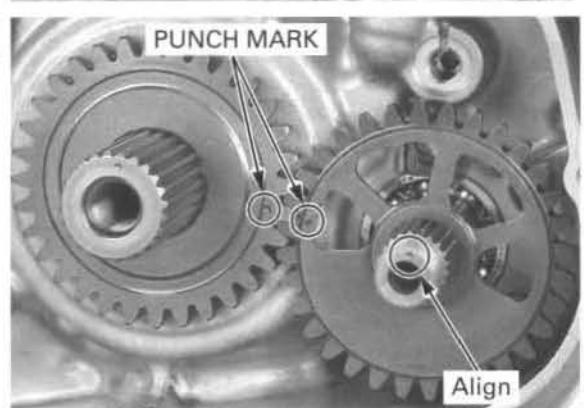
Install the balancer driven gear while aligning its wide cut-out in the splines with the punch mark on the balancer shaft.



Align the punch mark of the driven gear with the punch mark of the drive gear by turning the balancer shaft.

Install the following:

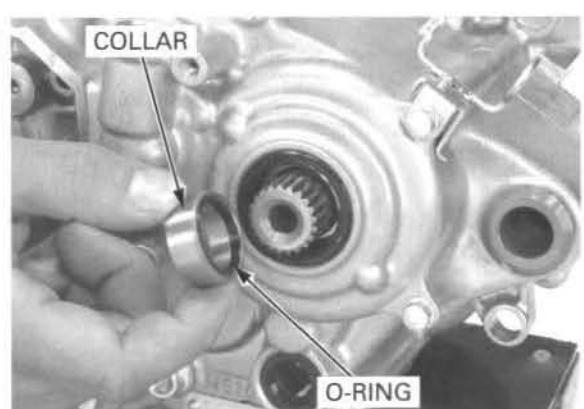
- Flywheel (page 11-6)
- Starter clutch (page 10-23)
- Clutch (page 10-12)
- Right crankcase cover (page 10-6)



## CRANKCASE SEPARATION

Refer to service information for removal of necessary parts before separating the crankcase (page 12-3).

Remove the collar and O-ring.

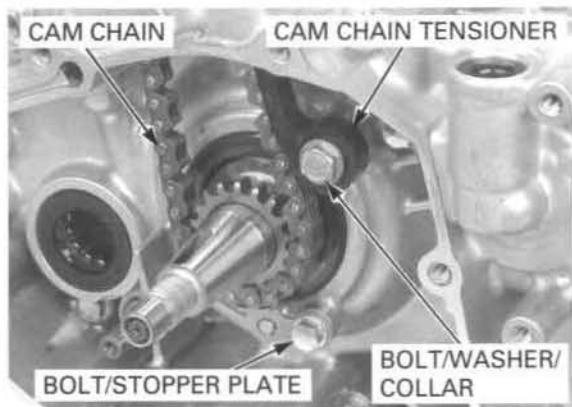


## CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

Remove the bolt, washer, collar and cam chain tensioner.

Remove the bolt and cam chain stopper plate.

Remove the cam chain from the timing sprocket.

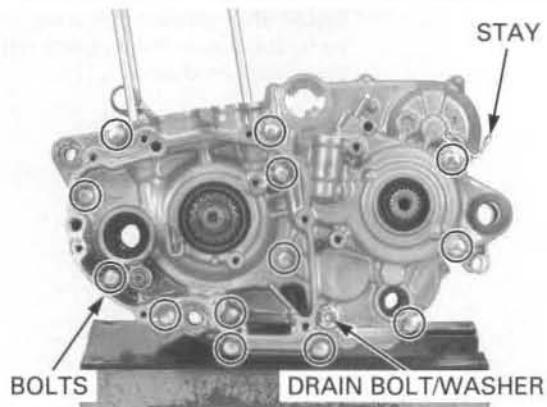


'04 - '06: Remove the transmission oil drain bolt and washer.

Loosen the crankcase bolts in a crisscross pattern in

two or three steps.

Remove the crankcase bolts and stay.

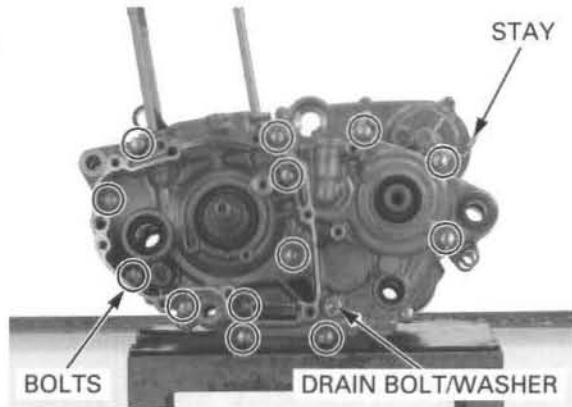


After '06: Remove the transmission oil drain bolt and washer.

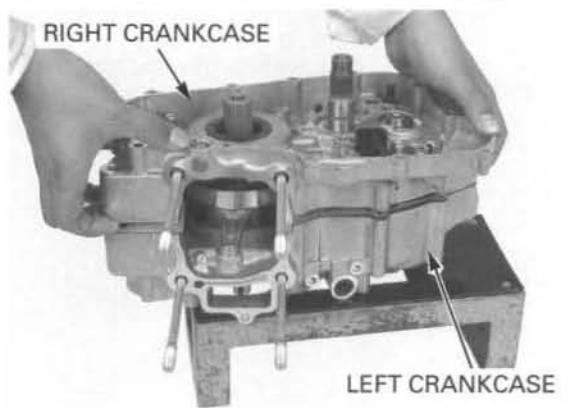
Loosen the crankcase bolts in a crisscross pattern in

two or three steps.

Remove the crankcase bolts and stay.

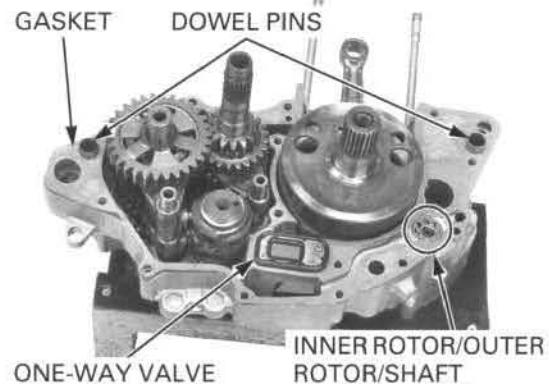


Place the left crankcase facing down and separate the left and right crankcase halves.



Remove the oil pump inner/outer rotors and shaft.  
Remove the one-way valve.

Remove the dowel pins and gasket.



**After '06:**  
*Do not remove the crankcase orifice unless it is necessary to replace with a new one.*

Check the orifice for damage or clogging.  
Blow open passage in the orifice with compressed air.

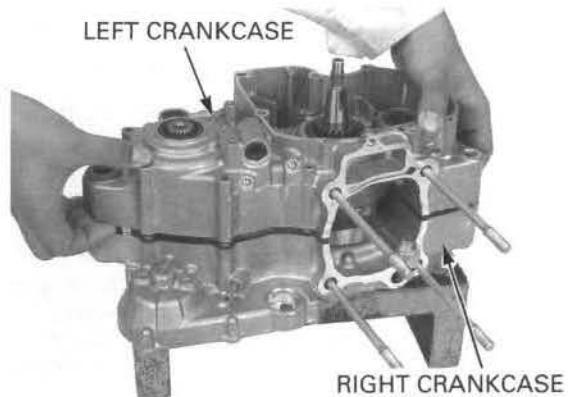


### TRANSMISSION DISASSEMBLY

Separate the crankcase halves (page 12-7).

Temporarily install the right crankcase.

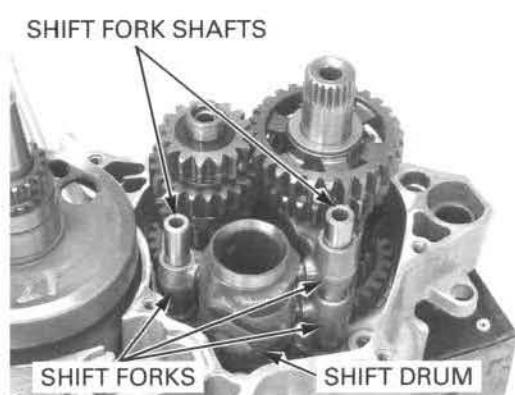
Place the right crankcase facing down and separate the right and left crankcase halves.



Remove the shift fork shafts.

Remove the shift fork guide pins from shift drum grooves and remove the shift drum.

Remove the shift forks.

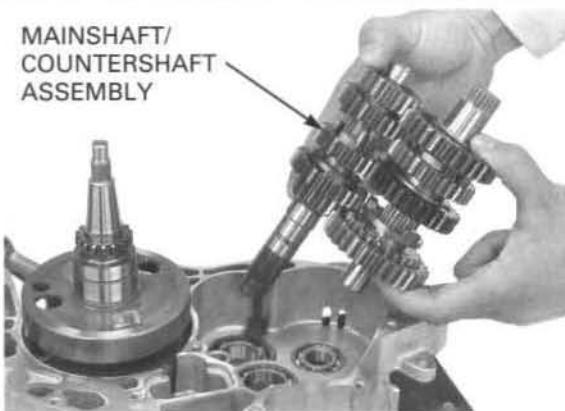


## CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

Remove the mainshaft and countershaft as an assembly from the right crankcase.

### Disassemble the transmission:

- Keep track of the disassembled parts (gears, bushings, washers, and rings) by sliding them onto a tool or a piece of wire.
- Do not remove the snap rings over the shafts. Expand the snap ring ends and slide the snap ring off the shaft, along with the gear behind it.



## INSPECTION

### GEAR

Check the gear dogs, dog holders and teeth for damage or excessive wear.

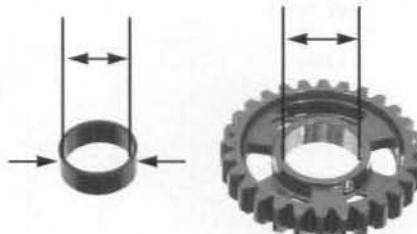
Measure the I.D. of each gear.

**SERVICE LIMITS:** M4, M5: 23.07 mm (0.908 in)

C1: 20.07 mm (0.790 in)

C2: 27.07 mm (1.066 in)

C3: 25.07 mm (0.987 in)



### BUSHING

Check the bushings for damage or excessive wear.

Measure the O.D. of each bushing.

**SERVICE LIMITS:** M4, M5: 22.96 mm (0.904 in)

C1: 19.95 mm (0.785 in)

C2: 26.95 mm (1.061 in)

C3: 24.96 mm (0.983 in)

Measure the I.D. of each bushing.

**SERVICE LIMITS:** M5: 20.04 mm (0.789 in)

C1: 17.04 mm (0.671 in)

C2: 24.04 mm (0.946 in)

C3: 22.04 mm (0.868 in)

### MAINSHAFT/COUNTERSHAFT

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

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

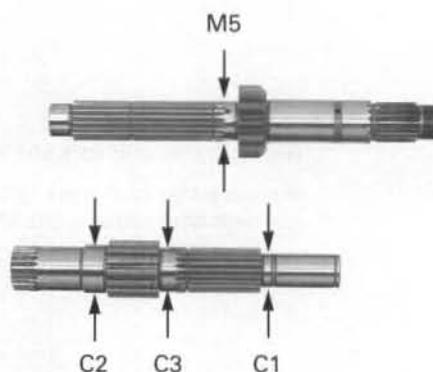
### SERVICE LIMITS:

Mainshaft: M5 bushing: 19.94 mm (0.785 in)

Countershaft: C1 bushing: 16.97 mm (0.668 in)

C2 bushing: 23.94 mm (0.943 in)

C3 bushing: 21.94 mm (0.864 in)



**SHIFT FORK**

Check the shift fork for abnormal wear or deformation.

Measure the shift fork I.D. and claw thickness.

**SERVICE LIMITS:****I.D.:**

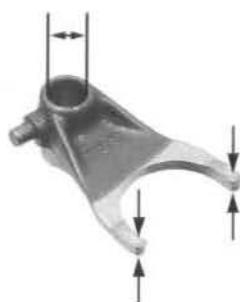
Center: 11.04 mm (0.435 in)

Right and left: 12.07 mm (0.475 in)

**Claw thickness:**

Center: 4.8 mm (0.19 in)

Right and left: 4.8 mm (0.19 in)

**SHIFT FORK SHAFT**

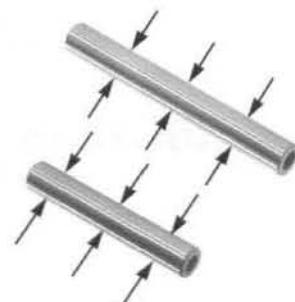
Check the shift fork shaft for abnormal wear or deformation.

Measure the shift fork shaft O.D.

**SERVICE LIMITS:**

Center: 10.97 mm (0.432 in)

Right and left: 11.95 mm (0.470 in)

**SHIFT DRUM**

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

Check the shift drum grooves for abnormal wear or damage.

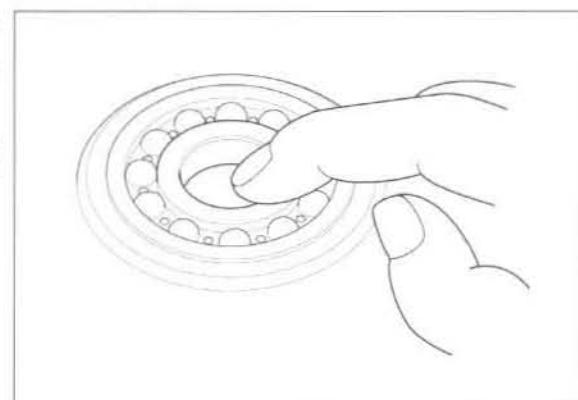
**SHIFT DRUM**

**TRANSMISSION 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 crankcase.

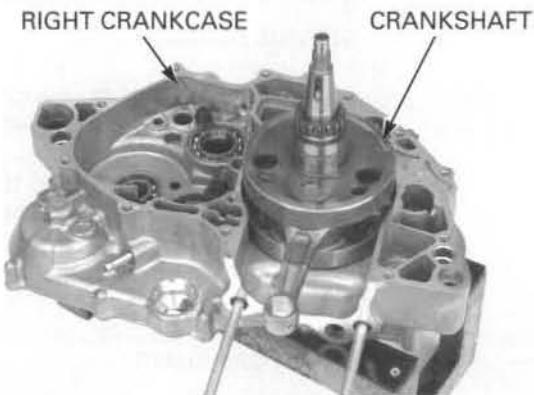
Replace any bearing if the race does not turn smoothly and quietly, or if the bearing fits loosely in the crankcase (page 12-13).



## CRANKSHAFT REMOVAL

### REMOVAL

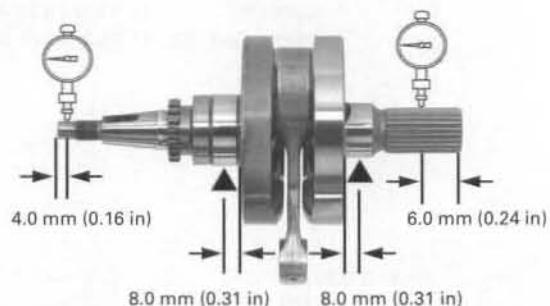
- Separate the crankcase (page 12-7).
- Remove the transmission (page 12-9).
- Remove the crankshaft from the right crankcase.



### INSPECTION

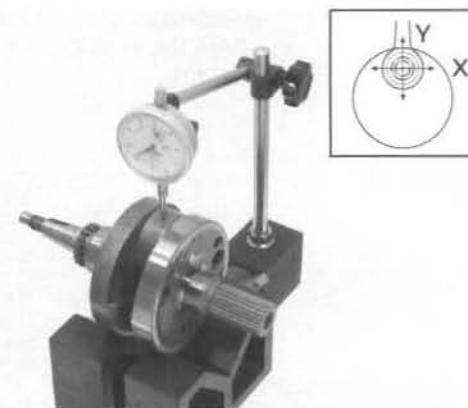
- Place the crankshaft on a stand or V-blocks.
- Set the dial indicator on the main journal.
- Rotate the crankshaft two revolutions ( $720^\circ$ ) and read the runout.

**SERVICE LIMITS:** L: 0.05 mm (0.002 in)  
R: 0.03 mm (0.001 in)



Measure the connecting rod big end radial clearance in both X and Y directions.

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



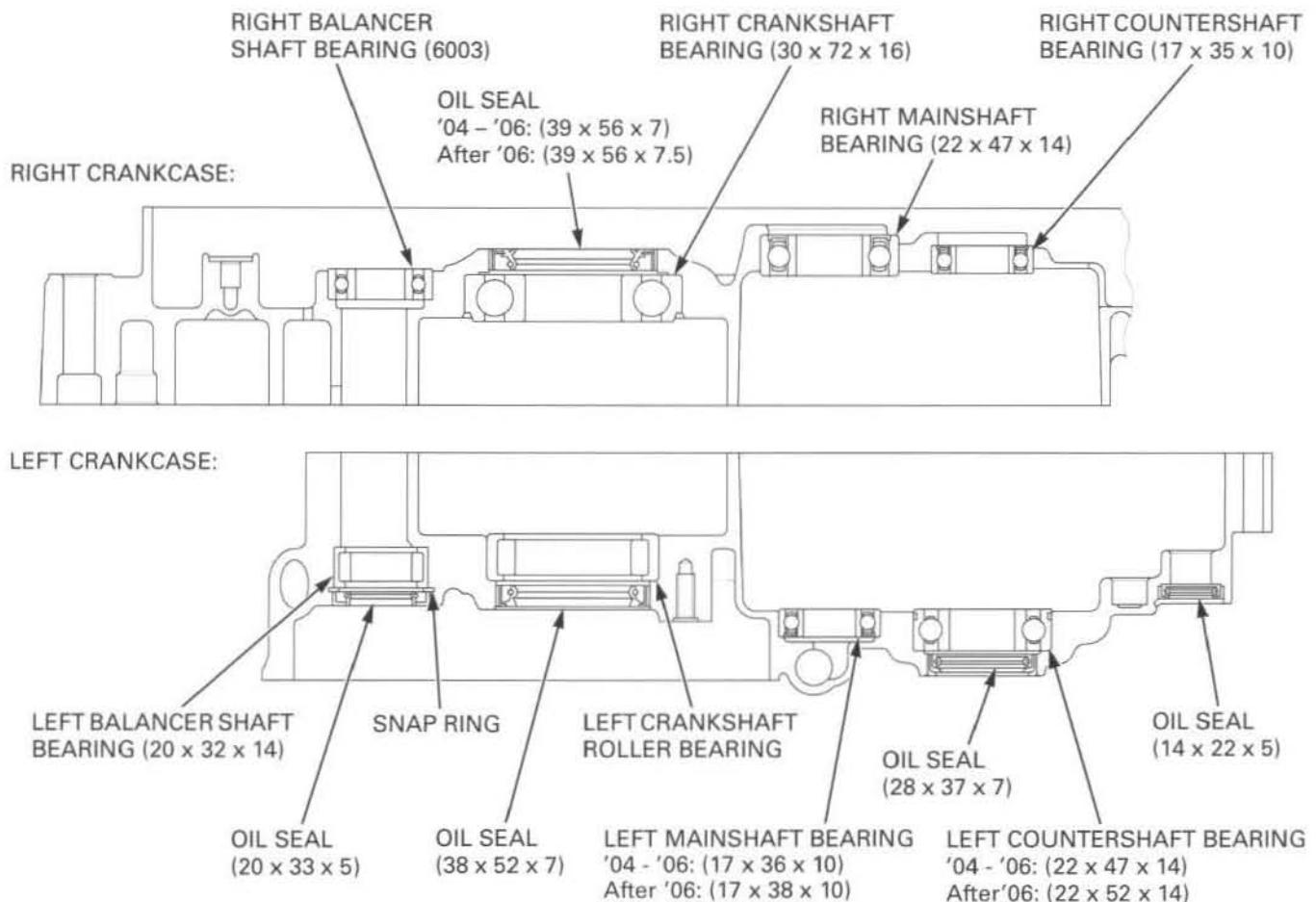
Measure the connecting rod big end side clearance.

**SERVICE LIMIT:** 0.8 mm (0.03 in)



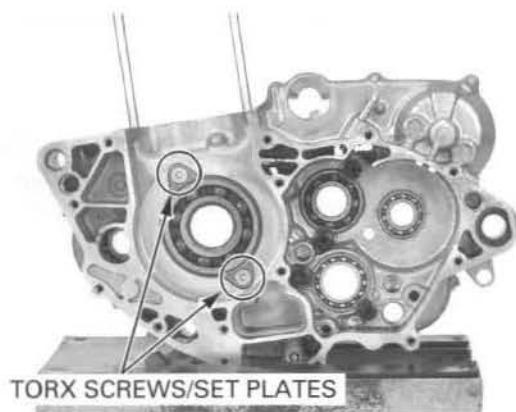
## CRANKCASE BEARING REPLACEMENT

### CRANKCASE BEARING/OIL SEAL LOCATION



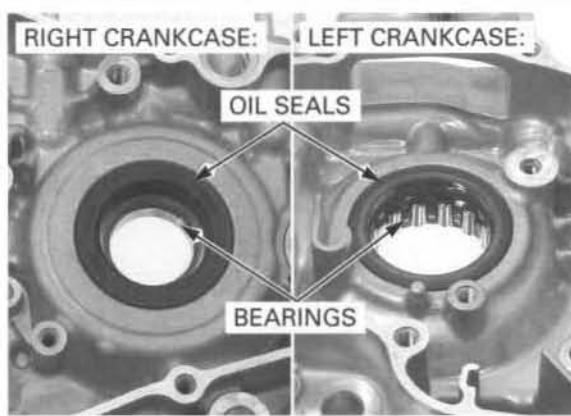
### CRANKSHAFT BEARING

Remove the torx screws and right crankcase bearing set plates.



## CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

Remove the crankshaft oil seals and bearings from both crankcase halves.



Drive in the new bearing squarely with the marking side facing toward the inside of the crankcase.

Drive new crankshaft bearings into both crankcase halves using the special tools.

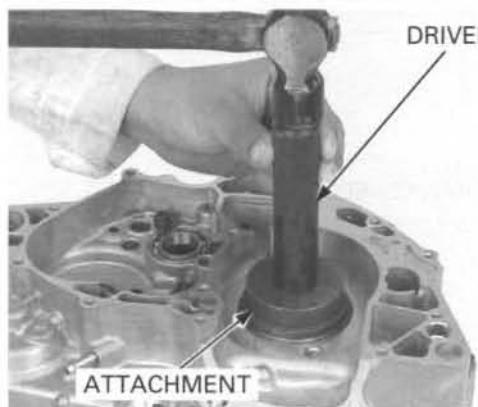
### TOOLS:

#### Left crankshaft bearing:

Driver	07749-0010000
Attachment, 52 x 55 mm	07746-0010400

#### Right crankshaft bearing:

Driver	07749-0010000
Attachment, 62 x 68 mm	07746-0010500
Pilot, 30 mm	07746-0040700



Clean and apply a locking agent to the set plate torx screws.

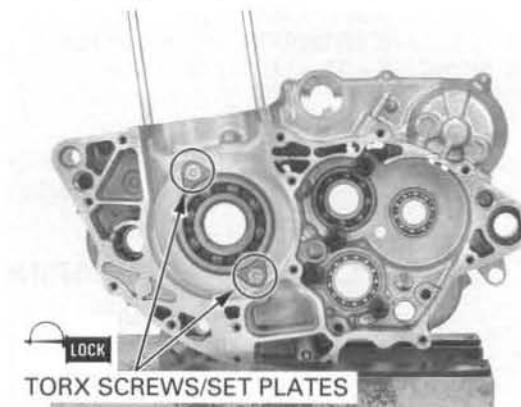
### NOTE:

Use Pro Honda Hondalock 3 or equivalent high strength locking agent.

Install the torx screws with the set plates and tighten them to the specified torque.

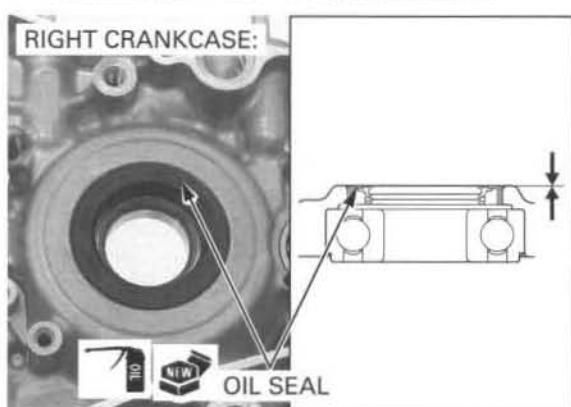
### TORQUE:

'04 - '06: 12 N·m (1.2 kgf·m, 9 lbf·ft)  
After '06: 20 N·m (2.0 kgf·m, 14 lbf·ft)



Apply oil to a new oil seal outer surface.

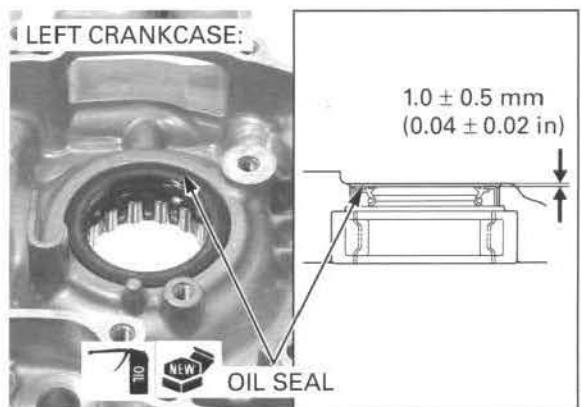
Install a new right crankshaft bearing oil seal to the crankcase until it is flush with the crankcase surface.



## CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

Apply oil to a new oil seal outer surface.

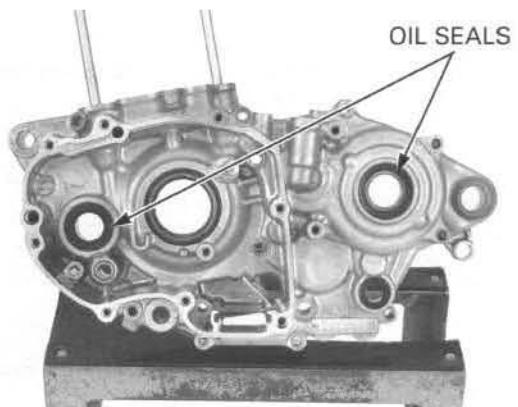
Install a new left crankshaft bearing oil seal to the specified depth below the crankcase surface as shown.



### TRANSMISSION/BALANCER/SHIFT DRUM BEARINGS

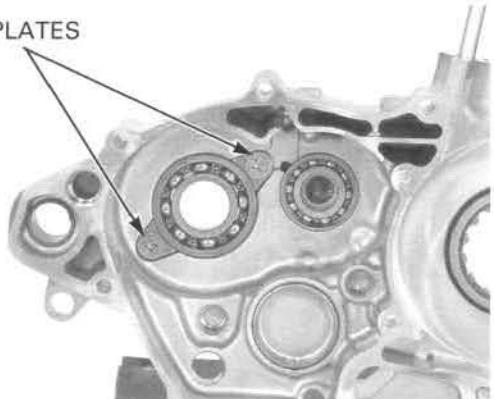
#### LEFT CRANKCASE

Remove the countershaft oil seal and balancer shaft oil seal.



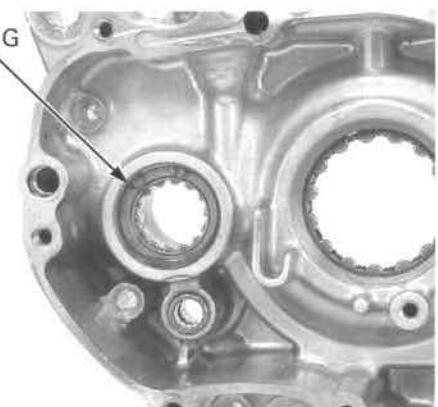
Remove the screws and countershaft bearing set plates.

SET PLATES



Remove the snap ring from the left crankcase.

SNAP RING



## CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

Remove the countershaft bearing out of the crankcase.

Remove the mainshaft bearing, balancer shaft bearing using the special tools as shown.

### TOOLS:

#### Mainshaft bearing:

Bearing remover, 17 mm	07936-3710300
Remover handle	07936-3710100
Remover weight	07741-0010201 or 07936-3710200 or 07936-371020A (U.S.A. only)

#### Balancer shaft bearing:

Remover handle	07936-3710100
Bearing remover, 20 mm	07936-3710600
Remover weight	07741-0010201 or 07936-3710200 or 07936-371020A (U.S.A. only)

Remove the shift drum bearing and countershaft bearing.

*Drive in the new bearings squarely with the marking side facing toward the inside of the crankcase.*

Drive new bearings into the left crankcase using the special tools.

### TOOLS:

#### Countershaft bearing:

'04 - '06:	
Driver	07749-0010000
Attachment, 42 x 47 mm	07746-0010300
Pilot, 22 mm	07746-0041000
After '06:	
Driver	07749-0010000
Attachment, 52 x 55 mm	07746-0010400
Pilot, 22 mm	07746-0041000

#### Mainshaft bearing:

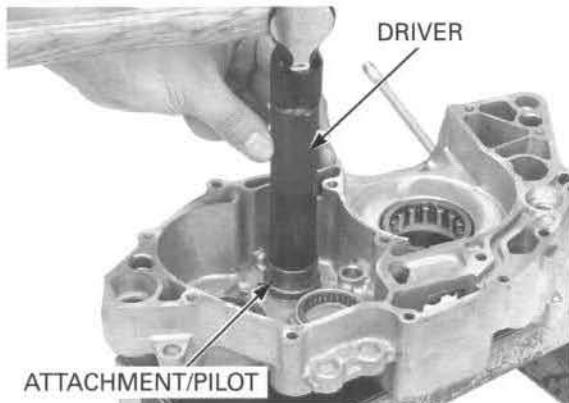
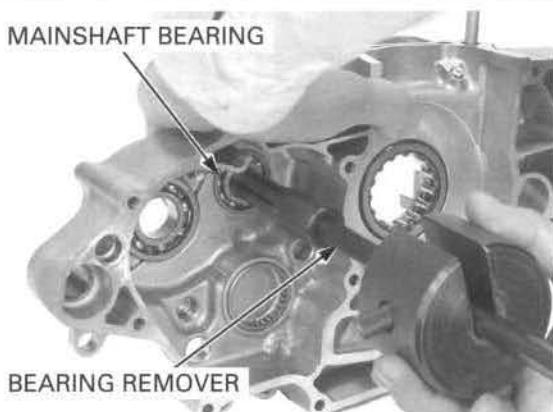
'04 - '06:	
Driver	07749-0010000
Attachment, 32 x 35 mm	07746-0010100
Pilot, 17 mm	07746-0040400
After '06:	
Driver	07749-0010000
Attachment, 37 x 40 mm	07746-0010200
Pilot, 17 mm	07746-0040400

#### Balancer shaft bearing:

Driver	07749-0010000
Attachment, 32 x 35 mm	07746-0010100
Pilot, 20 mm	07746-0040500

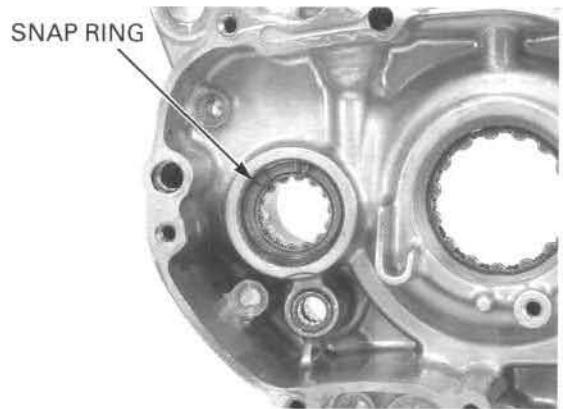
#### Shift drum bearing:

Driver	07749-0010000
Attachment, 37 x 40 mm	07746-0010200



## CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

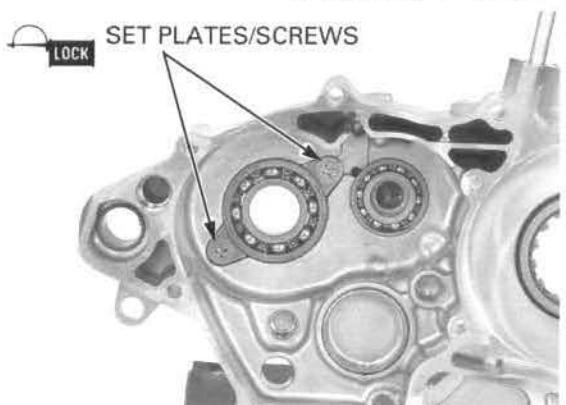
Install the snap ring into the left crankcase groove securely.



Clean and apply a locking agent to the countershaft bearing set plate screws.

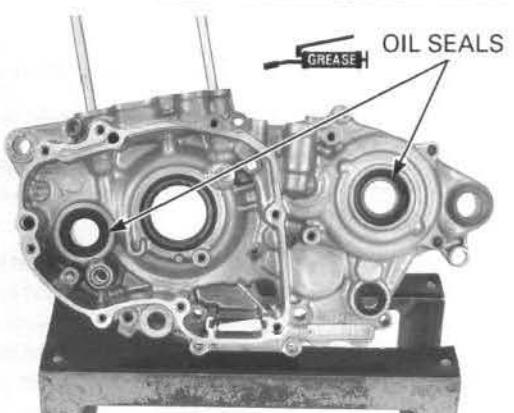
Install the screws with the set plates and tighten the screws to the specified torque.

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



Apply grease to the countershaft and balancer shaft oil seal lips.

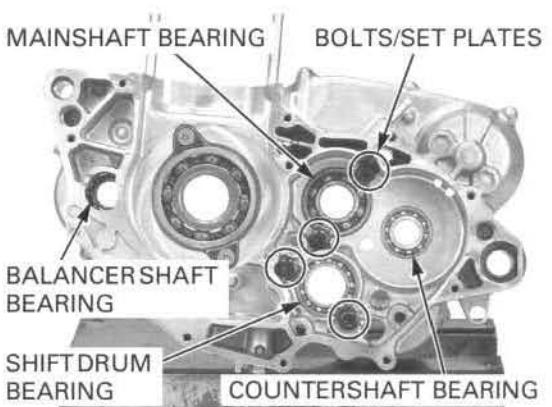
Install the oil seals to the crankcase until it is flush with the crankcase surface.



### RIGHT CRANKCASE

Remove the socket bolts and set plates.

Remove the countershaft bearing, mainshaft bearing and shift drum bearing.



## CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

Remove the bolts and set plates.

Remove the balancer shaft bearing.

*Drive in the new bearings squarely with the marked side facing toward the inside of the crankcase.*

Drive in new bearings into the right crankcase using the special tools.

### TOOLS:

#### Shift drum bearing:

Driver	07749-0010000
Attachment, 42 x 47 mm	07746-0010300
Pilot, 25 mm	07746-0040600

#### Mainshaft bearing:

Driver	07749-0010000
Attachment, 42 x 47 mm	07746-0010300
Pilot, 22 mm	07746-0041000

#### Countershaft bearing:

Driver	07749-0010000
Attachment, 32 x 35 mm	07746-0010100
Pilot, 17 mm	07746-0040400

Install the balancer shaft bearing.

Clean and apply a locking agent to the set plate socket bolts.

Install the bolts with the set plates and tighten the bolts to the specified torque.

### TORQUE:

#### Shift drum bearing set plate bolts:

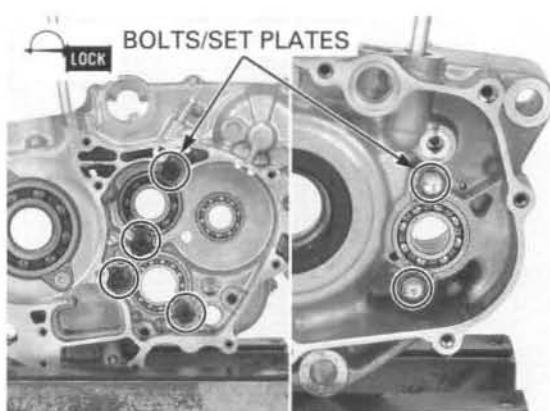
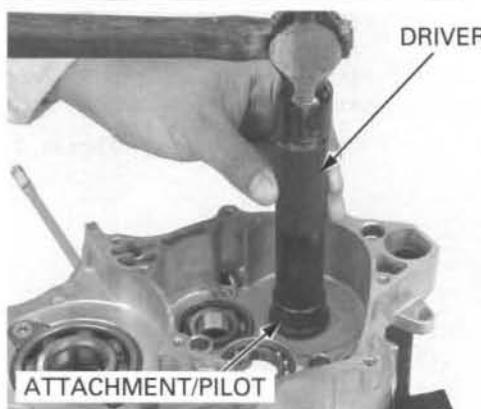
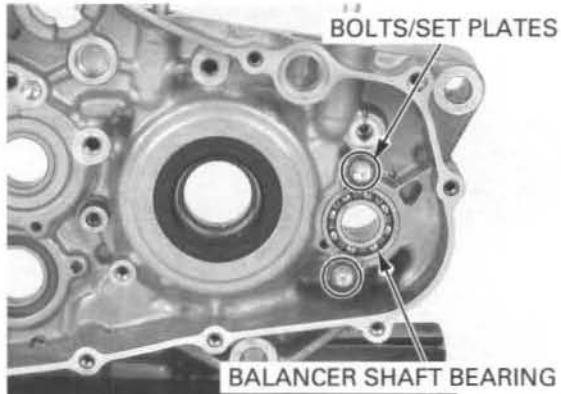
9.8 N·m (1.0 kgf-m, 7 lbf-ft)

#### Mainshaft bearing set plate bolts:

9.8 N·m (1.0 kgf-m, 7 lbf-ft)

#### Balancer shaft bearing set plate bolts:

9.8 N·m (1.0 kgf-m, 7 lbf-ft)



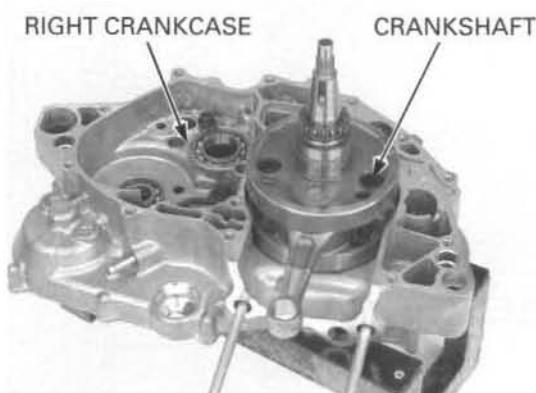
## CRANKSHAFT INSTALLATION

Clean both crankcase mating surfaces before assembling and check for wear or damage.

If there is minor roughness or irregularities on the crankcase mating surfaces, dress them with an oil stone.

After cleaning, lubricate the bearings and connecting rod big end with clean engine oil.

Install the crankshaft into the right crankcase.



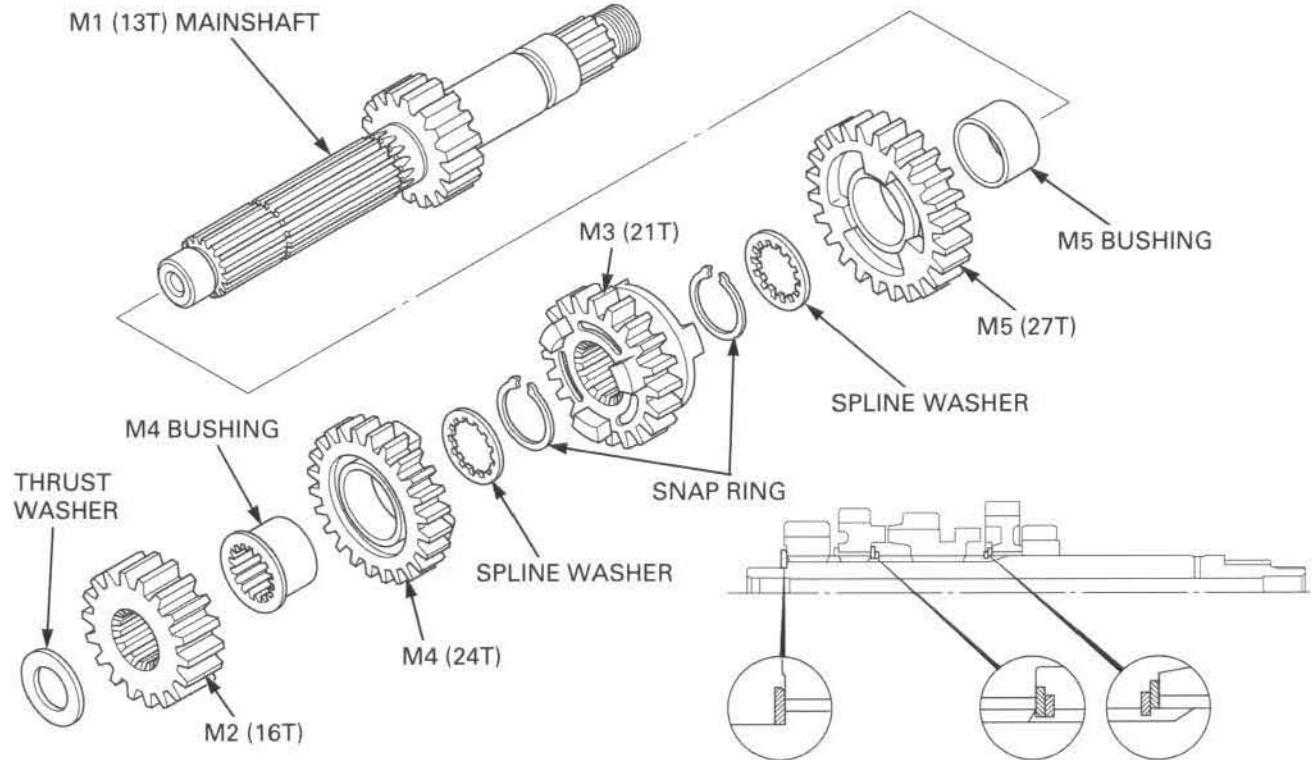
## TRANSMISSION ASSEMBLY

Coat the spline area, rolling and sliding area of each gear with molybdenum oil solution.

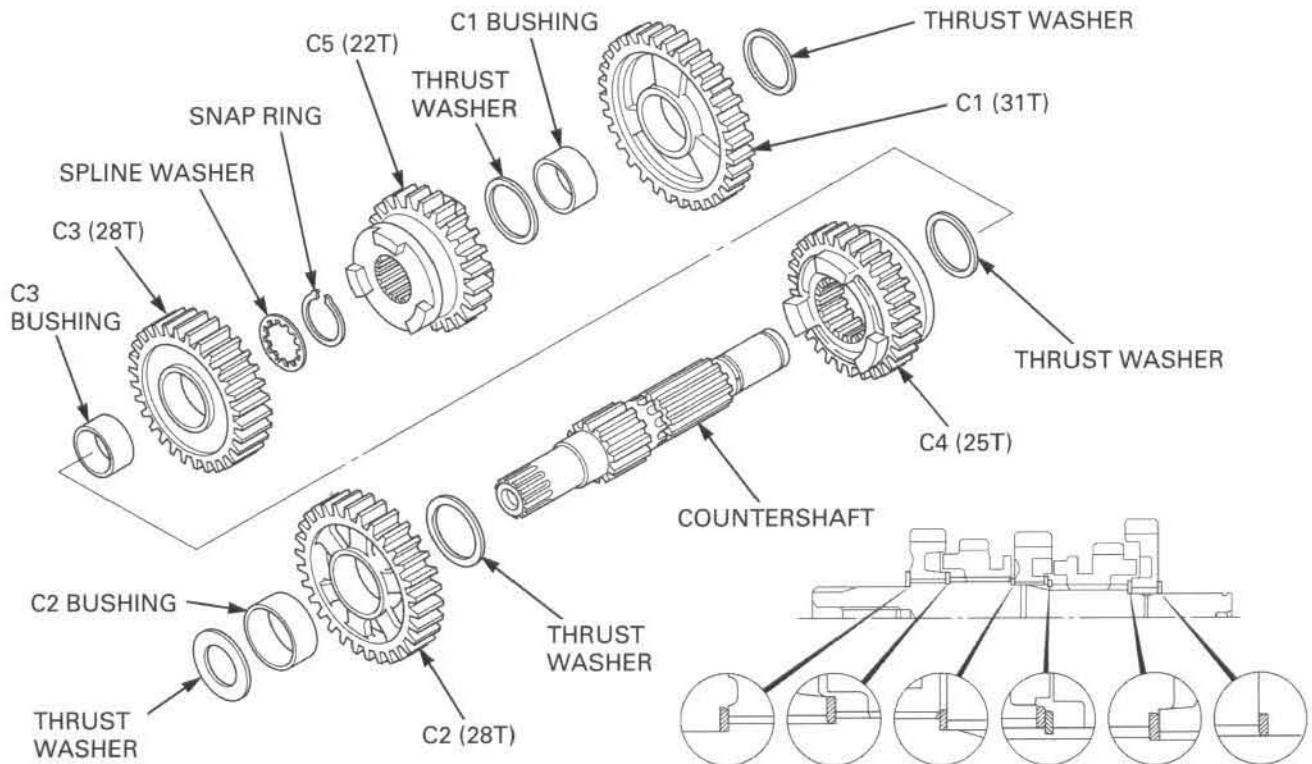
Apply transmission oil to the gear teeth of the each gears.

Assemble the mainshaft and countershaft.

### MAINSHAFT:



### COUNTERSHAFT:

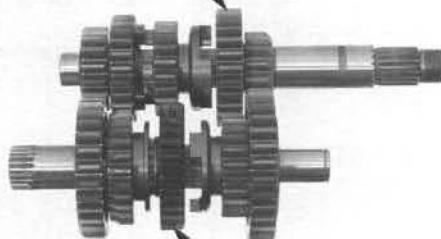


## CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

### INSTALLATION

- Check the gear movement and rotation on the shaft.
- Install the washers and snap rings with the chamfered edge facing the thrust load side.
- Do not reuse worn snap rings which could easily spin in the grooves.
- Check that the snap rings are seated in the grooves. Align their end gaps with the grooves in the spline.

MAINSHAFT ASSEMBLY



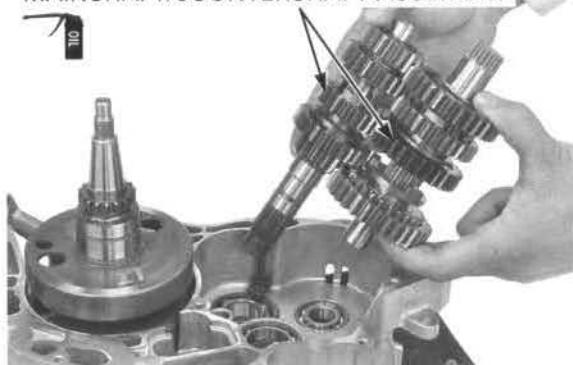
COUNTERSHAFT ASSEMBLY

Apply transmission oil to the following parts:

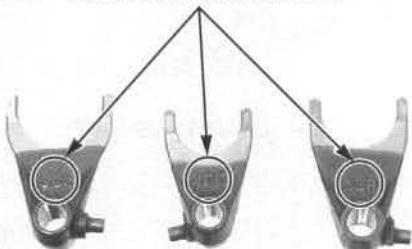
- Each gear
- Mainshaft bearings
- Countershaft bearings
- Shift drum bearings

Engage the mainshaft and countershaft gears and place the transmission assembly into the right crankcase.

MAINSHAFT/COUNTERSHAFT ASSEMBLY



IDENTIFICATION MARK



- Each shift fork has an identification mark, "R" is for the right shift fork, "L" is the left shift fork and "C" is for the center shift fork.
- Face the shift fork marks to the right crankcase.

Apply transmission oil to the shift drum guide grooves.

Apply molybdenum oil solution to the following parts:

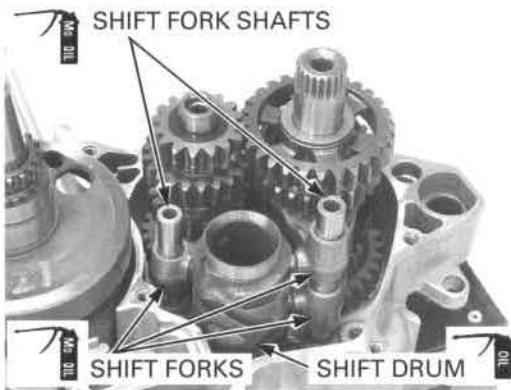
- Shift fork claws and guide pins
- Shift fork sliding surfaces
- Shift fork shafts

Install the shift forks to the grooves in the sliding gears.

Install the shift drum by aligning the guide pins on the shift forks with the guide grooves in the shift drum.

Slide the shift fork shafts through the shift forks, and into the crankcase.

SHIFT FORK SHAFTS



SHIFT FORKS

SHIFT DRUM

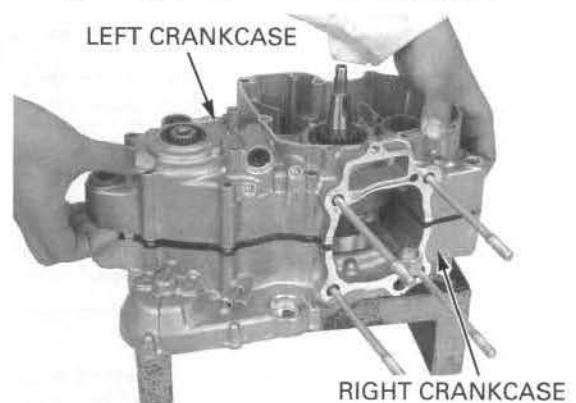
## CRANKCASE ASSEMBLY

**After '06:** If the crankcase orifice was removed, install a new crankcase orifice to the left crankcase and tighten it to the specified torque.

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



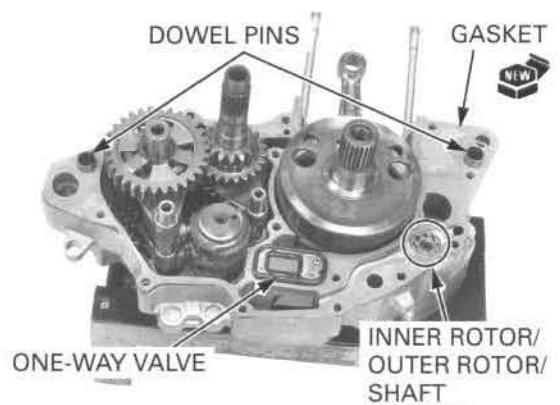
Temporarily install the left crankcase.  
Place the left crankcase facing down and separate the left and right crankcase halves.



Install the oil pump inner/outer rotor and shaft in the left crankcase.

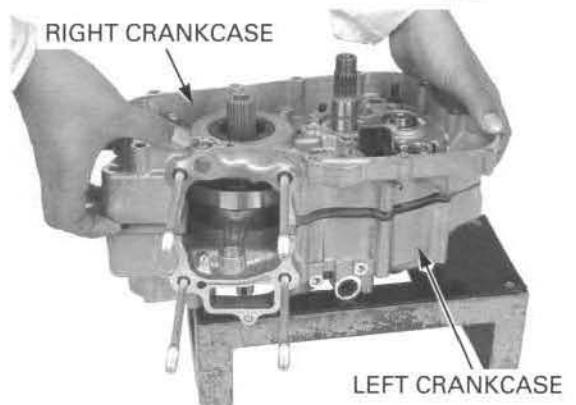
Install the one-way valve.

Install the dowel pins and a new gasket.



*Before assembly,  
lubricate the  
transmission  
bearings with clean  
transmission oil.*

Place the right crankcase onto the left crankcase.



## CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

'04 - '06: Install a new washer and tighten the transmission drain bolt to the specified torque.

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

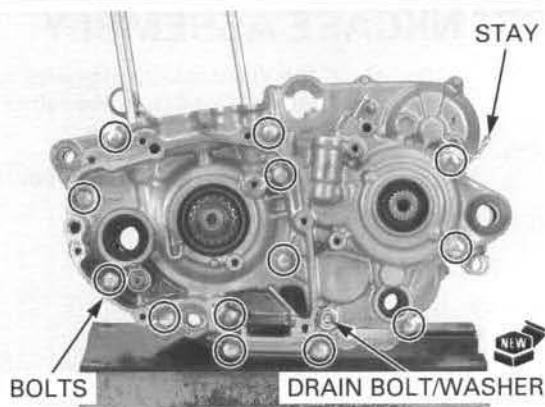
Tighten the crankcase bolts in a crisscross pattern in two or three progressive steps.

Carefully trim the protruding gasket material from the cylinder base gasket surface.

**NOTE:**

- Do not let gasket material fall into the crankcase.
- Do not damage the base gasket surface.

Check that the crankshaft turns smoothly.



After 06: Install a new washer and tighten the transmission drain bolt to the specified torque.

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

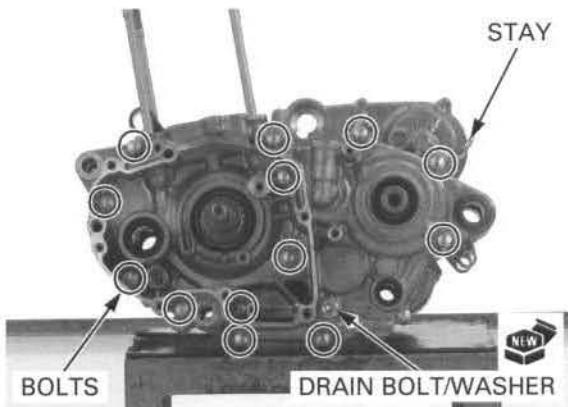
Tighten the crankcase bolts in a crisscross pattern in two or three progressive steps.

Carefully trim the protruding gasket material from the cylinder base gasket surface.

**NOTE:**

- Do not let gasket material fall into the crankcase.
- Do not damage the base gasket surface.

Check that the crankshaft turns smoothly.



Install the cam chain to the timing sprocket.

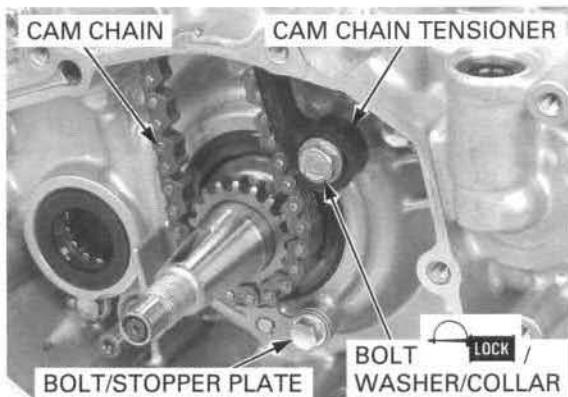
Install the cam chain stopper plate and tighten the bolt.

Clean and apply locking agent to the cam chain tensioner bolt.

Install the cam chain tensioner, collar, washer and bolt.

Tighten the cam chain tensioner bolt to the specified torque.

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

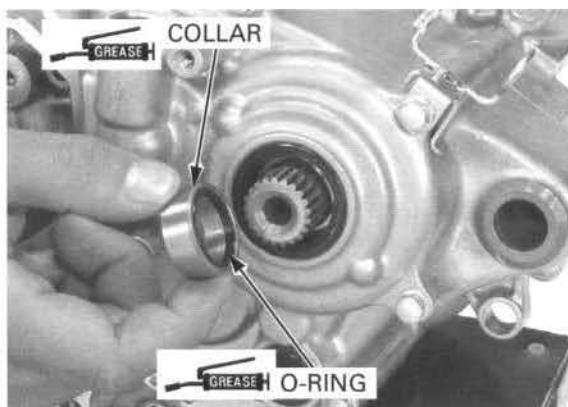


Coat the countershaft O-ring and inside of the countershaft collar with grease.

Install the O-ring and collar onto the countershaft.

Install the remaining parts in the reverse order of removal.

- Refer to service information for installation of the removed parts for crankcase/transmission service (page 12-3).



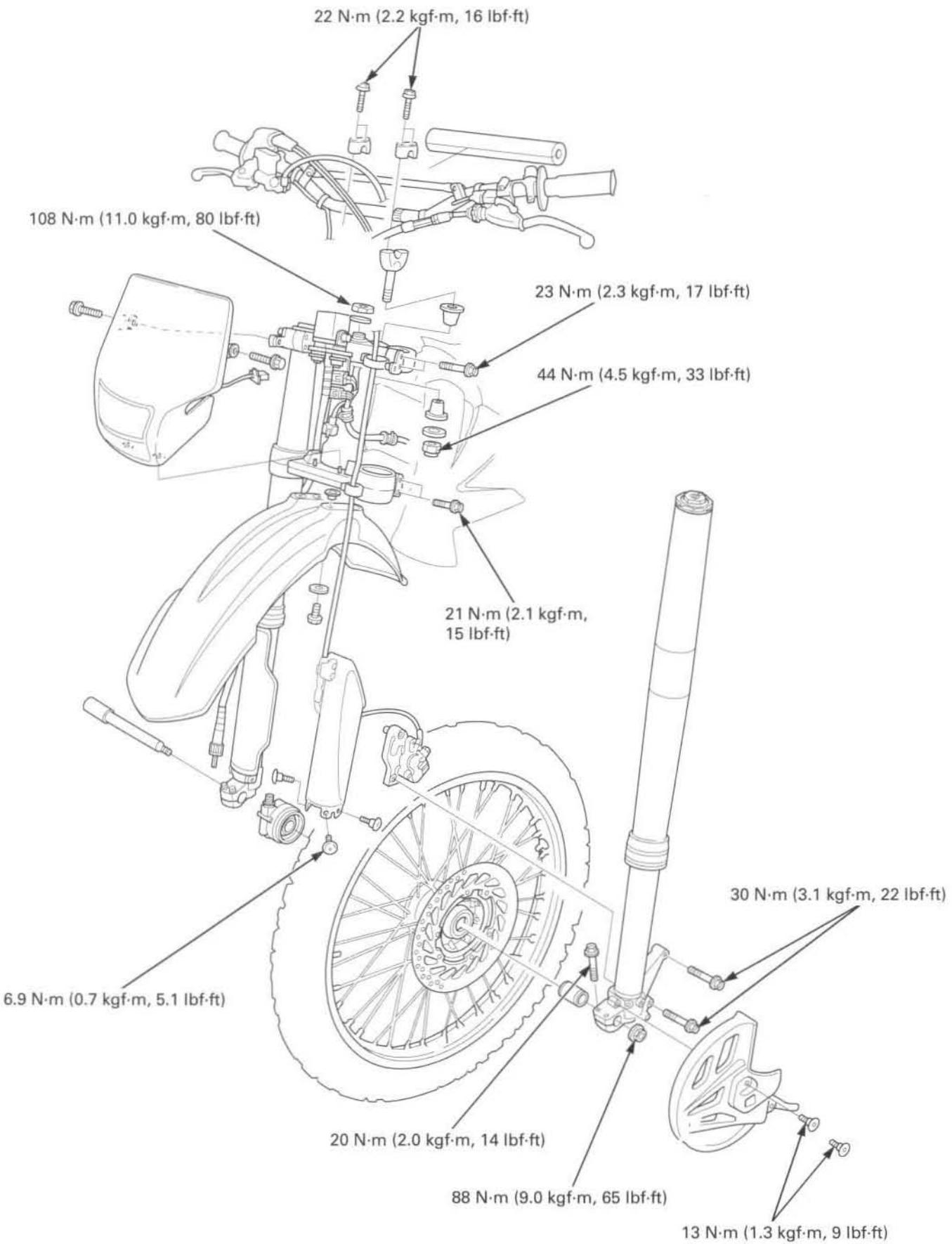
# **13. FRONT WHEEL/SUSPENSION/STEERING**

---

COMPONENT LOCATION .....	13-2	FORK .....	13-12
SERVICE INFORMATION .....	13-3	HANDLEBAR .....	13-31
TROUBLESHOOTING .....	13-6	STEERING STEM .....	13-37
FRONT WHEEL .....	13-7		

## FRONT WHEEL/SUSPENSION/STEERING

### COMPONENT LOCATION



## SERVICE INFORMATION

### GENERAL

- Keep grease off the brake pads and disc.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- When servicing the front wheel, fork or steering stem, support the motorcycle using a safety stand or hoist.
- After front wheel installation, check the brake operation by applying the brake lever.
- Refer to the brake system information (page 15-3).
- When using the lock nut wrench, use a 20-inch long deflecting beam type torque wrench. The lock nut wrench increases the torque wrench's leverage, so the torque wrench reading will be less than the torque actually applied to the fork damper. The specification given on this page is actual torque applied to the fork damper, not the reading on the torque wrench when used with the lock nut wrench. The procedure later in the text gives the actual and indicated torque.

### SPECIFICATIONS

Unit: mm (in)

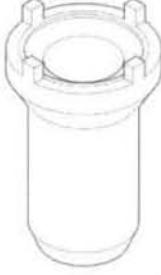
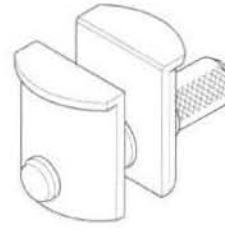
ITEM			STANDARD	SERVICE LIMIT
Cold tire pressure			98 kPa (1.0 kgf/cm <sup>2</sup> , 14 psi)	-
Axle runout			-	0.20 (0.008)
Wheel rim runout	Radial		-	2.0 (0.08)
	Axial		-	2.0 (0.08)
Wheel hub-to-rim distance			28.0 ± 1.0 (1.10 ± 0.04)	-
Fork	Spring free length	'04, '05	495 (19.5)	488 (19.2)
		After '05	500 (19.7)	493 (19.4)
	Tube runout		-	0.20 (0.008)
	Recommended fork oil		Pro-Honda HP Fork Oil 5W or equivalent	-
	Fluid capacity	Fork tube	'04, '05	345 cm <sup>3</sup> (11.7 US oz, 12.1 Imp oz)
			'06	340 cm <sup>3</sup> (11.5 US oz, 12.0 Imp oz)
		Fork damper	348 cm <sup>3</sup> (11.8 US oz, 12.2 Imp oz)	-
			192 cm <sup>3</sup> (6.5 US oz, 6.8 Imp oz)	-
Compression damping adjuster standard position			7 clicks out from full in	-
Rebound damping adjuster standard position			10 clicks out from full in	-
			'06	13 clicks out from full in
			After '06	14 clicks out from full in

## FRONT WHEEL/SUSPENSION/STEERING

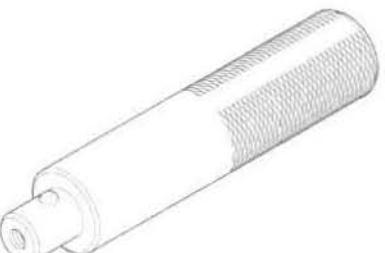
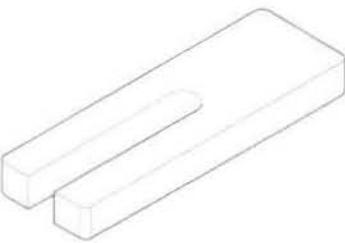
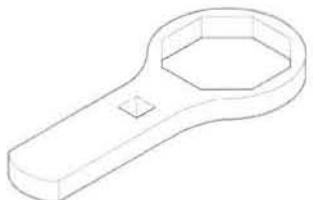
### TORQUE VALUES

Front axle holder bolt	20 N·m (2.0 kgf·m, 14 lbf·ft)	
Front axle nut	88 N·m (9.0 kgf·m, 65 lbf·ft)	
Front brake disc nut	16 N·m (1.6 kgf·m, 12 lbf·ft)	
Front spoke	3.7 N·m (0.38 kgf·m, 2.7 lbf·ft)	
Front rim lock	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Handlebar upper holder bolt	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Handlebar lower holder nut	44 N·m (4.5 kgf·m, 33 lbf·ft)	
Front master cylinder holder bolt	9.8 N·m (1.0 kgf·m, 7 lbf·ft)	
Clutch lever pivot bolt	2.0 N·m (0.2 kgf·m, 1.4 lbf·ft)	
Starter switch housing screw	0.7 N·m (0.07 kgf·m, 0.5 lbf·ft)	
Engine stop button screw	1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)	
Front brake caliper mounting bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	
Fork cap	29 N·m (3.0 kgf·m, 22 lbf·ft)	
Fork center bolt	69 N·m (7.0 kgf·m, 51 lbf·ft)	
Fork center bolt lock nut	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Plug bolt	1.3 N·m (0.13 kgf·m, 0.9 lbf·ft)	
Fork damper	34 N·m (3.5 kgf·m, 25 lbf·ft)	
Fork protector mounting bolt	6.9 N·m (0.7 kgf·m, 5.1 lbf·ft)	
Front brake disc cover bolt	13 N·m (1.3 kgf·m, 9 lbf·ft)	
Fork top bridge pinch bolt	23 N·m (2.3 kgf·m, 17 lbf·ft)	
Fork bottom bridge pinch bolt	21 N·m (2.1 kgf·m, 15 lbf·ft)	
Steering stem nut	108 N·m (11.0 kgf·m, 80 lbf·ft)	
Steering stem adjusting nut	See page 13-40	
Brake lever pivot nut	5.9 N·m (0.6 kgf·m, 4.3 lbf·ft)	
Brake lever pivot bolt	1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)	
Brake lever adjuster lock nut	5.9 N·m (0.6 kgf·m, 4.3 lbf·ft)	
		Apply locking agent to the threads
		Apply locking agent to the threads

### TOOLS

Spoke wrench, 6.1 mm 07JMA-MR60100	Steering stem socket 07916-3710101    or 07701-0020300 (6.1 mm) or equivalent commercially available in U.S.A.	Ball race remover 07946-3710500  
---------------------------------------	--	---

## FRONT WHEEL/SUSPENSION/STEERING

Fork seal driver, 47 mm 07VMD-KZ30100   or 07VMD-KZ3010A (U.S.A. only)	Driver 07749-0010000  	Attachment, 30 mm I.D. 07746-0030300  
Attachment, 37 x 40 mm 07746-0010200  	Pilot, 20 mm 07746-0040500  	Bearing remover head, 20 mm 07746-0050600  
Bearing remover shaft 07GGD-0010100  	Piston base 07958-2500001  	Bearing race installer (2 required) 07VMF-KZ30100  
Installer shaft 07VMF-KZ30200  	Lock nut wrench, 50 mm 07WMA-KZ30100  	Fork rod stopper 07AMB-KZ3A100 (U.S.A only)  

## FRONT WHEEL/SUSPENSION/STEERING

---

### TROUBLESHOOTING

#### Hard steering

- Steering stem adjusting nut too tight
- Faulty or damaged steering head bearings
- Insufficient tire pressure

#### Steers to one side or does not track straight

- Bent fork tube
- Bent axle
- Wheel installed incorrectly
- Unequal oil quantity in each fork tube
- Faulty steering head bearings
- Bent frame
- Worn wheel bearings
- Worn swingarm pivot components
- Unevenly adjusted right and left fork legs

#### Front wheel wobbling

- Bent rim
- Worn front wheel bearings
- Bent spokes
- Faulty tire
- Axle not tightened properly
- Unbalanced tire and wheel

#### Wheel hard to turn

- Faulty wheel bearing
- Bent front axle
- Brake drag
- Soft suspension
- Insufficient fluid in fork
- Fork oil viscosity too high
- Weak fork spring
- Tire pressure too low

#### Soft suspension

- Weak springs
- Low fork fluid level
- Low tire pressure

#### Stiff suspension

- Fork oil quantity too much
- Fork oil viscosity too thick
- Bent or damaged fork tubes
- Clogged fork fluid passage

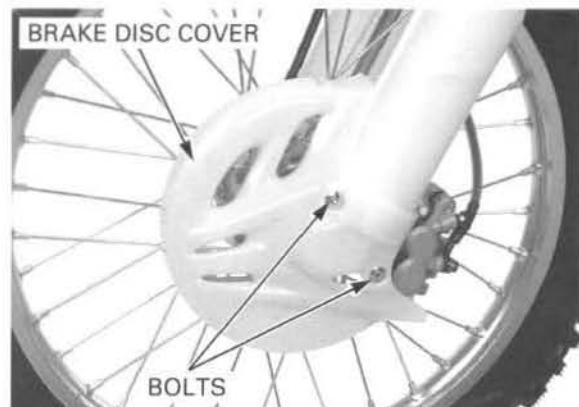
#### Front suspension noisy

- Insufficient fluid in fork
- Loose fork fastener

## FRONT WHEEL

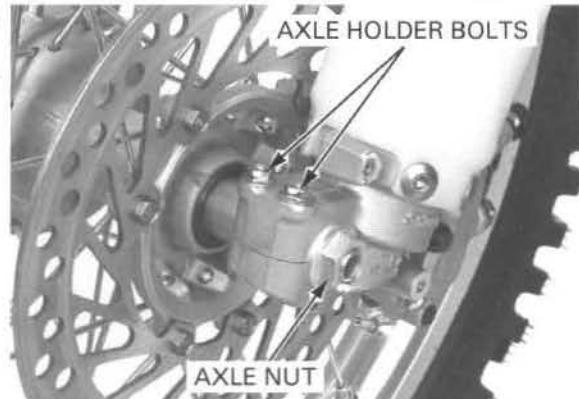
### REMOVAL

Remove the bolts and brake disc cover.



Raise the front wheel off the ground by placing a workstand or equivalent under the engine.

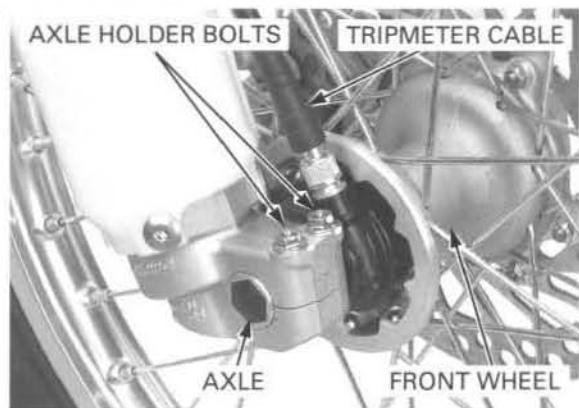
Remove the axle nut and loosen the left axle holder bolts.



Loosen the lock nut and disconnect the tripmeter cable.

Loosen the right axle holder bolts.

Remove the axle and front wheel.



### INSPECTION

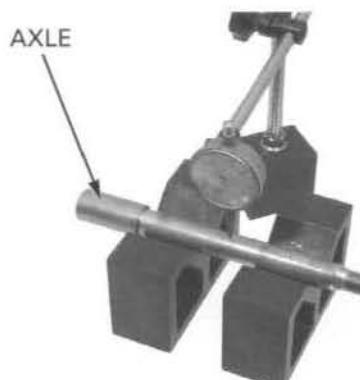
#### AXLE

Set the axle on V-blocks.

Turn the axle and measure the runout using a dial indicator.

Actual runout is 1/2 of the total indicator reading.

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

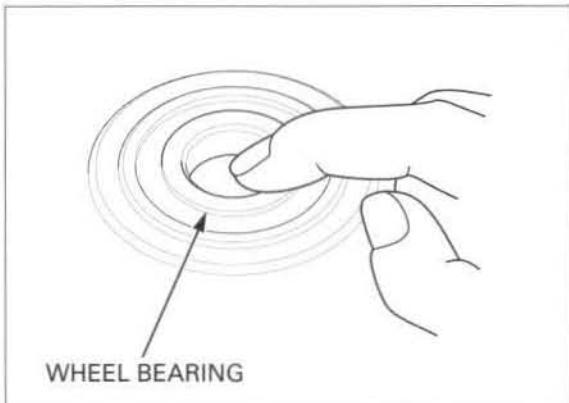


## FRONT WHEEL/SUSPENSION/STEERING

### WHEEL BEARING

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

*Replace the bearings in pairs.* Remove and discard the bearings if the races do not turn smoothly, quietly, or if they fit loosely in the hub.



### WHEEL RIM

Check the rim runout by placing the wheel on a turning stand.

Spin the wheel by hand, and read the runout using a dial indicator.

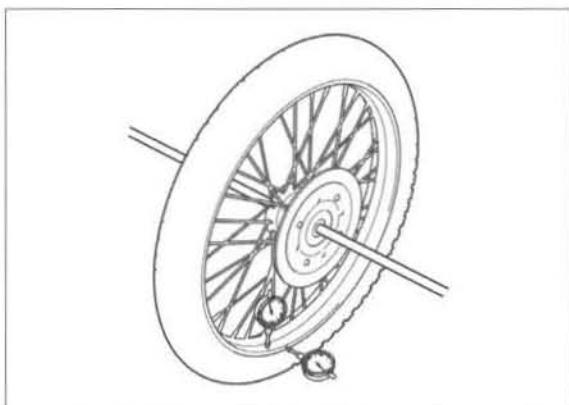
Actual runout is 1/2 the total indicator reading.

### SERVICE LIMITS:

Radial: 2.0 mm (0.08 in)

Axial: 2.0 mm (0.08 in)

Check the spokes and tighten any that are loose.



### DISASSEMBLY

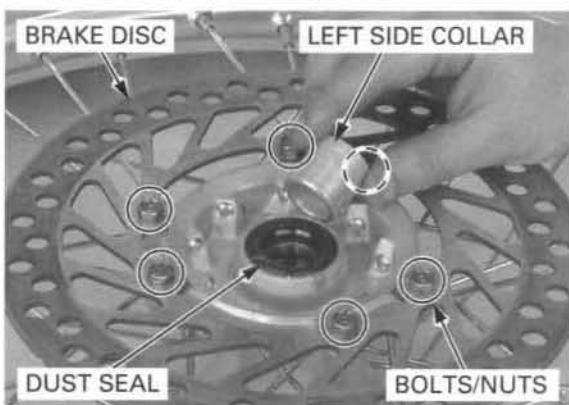
Remove the tripmeter gear box.



Remove the left side collar and dust seal.

Remove the brake disc bolts and nuts.

Remove the brake disc.



Install the remover head into the bearing. From the opposite side of the wheel, install the remover shaft and drive the bearing out of the wheel hub. Remove the distance collar and drive out the outer bearing.

## TOOLS:

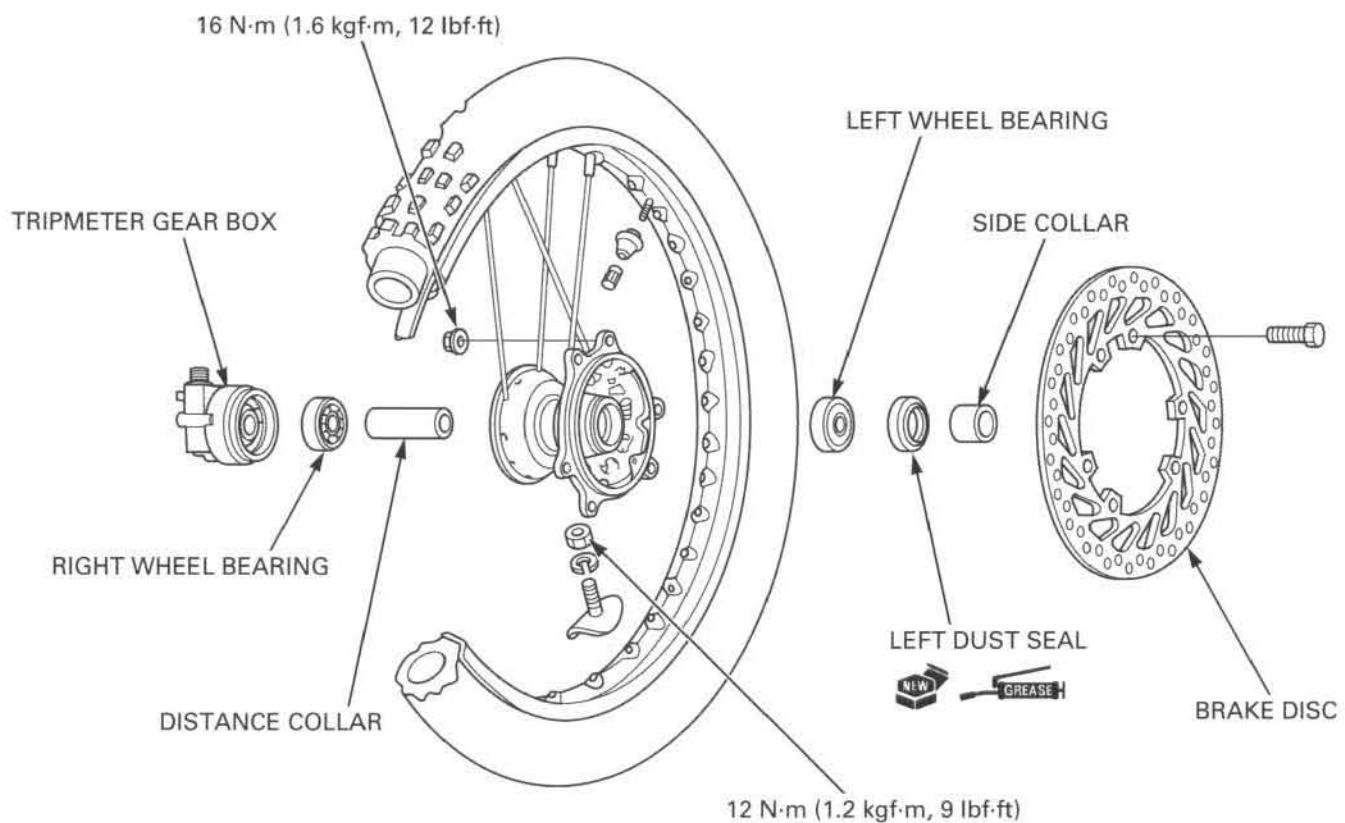
Bearing remover head, 20 mm    07746-0050600  
 Bearing remover shaft        07GGD-0010100

## NOTE:

- Never reinstall old bearings; once the bearings have been removed, they must be replaced with new ones.
- Replace the bearings in pairs.

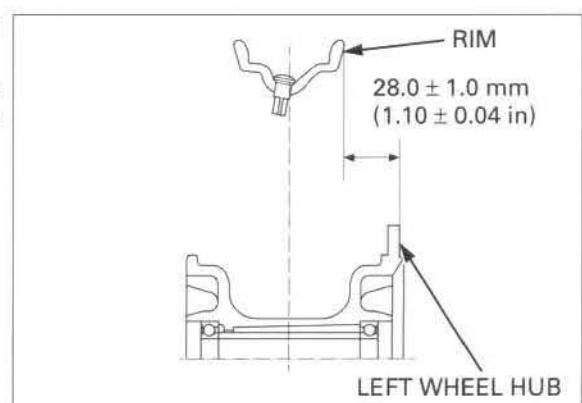


## ASSEMBLY



Place the hub in the center of the rim, and begin the lacing with new spokes.

Adjust the hub position so the distance from the hub left end surface to the side of the rim is  $28.0 \pm 1.0$  mm ( $1.10 \pm 0.04$  in) as shown.



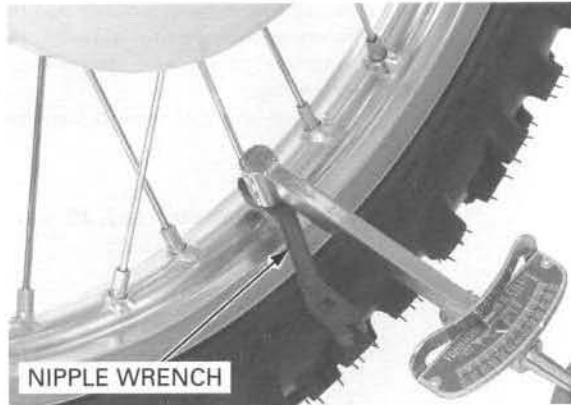
## FRONT WHEEL/SUSPENSION/STEERING

Torque the spokes in two or three progressive steps

**TOOL:**

Wheel nipple wrench, 6.1 mm 07JMA-MR60100 or  
07701-0020300

**TORQUE: 3.7 N·m (0.38 kgf·m, 2.7 lbf·ft)**

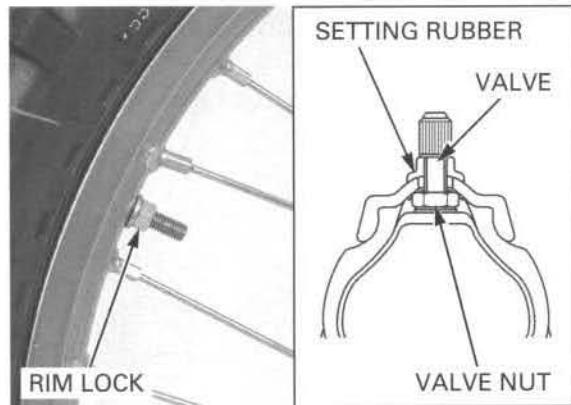


NIPPLE WRENCH

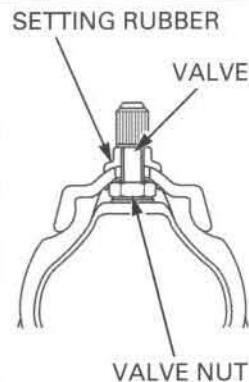
Install the rim band, rim lock, tube and tire.

Tighten the rim lock to the specified torque.

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



RIM LOCK



SETTING RUBBER  
VALVE  
VALVE NUT

Pack all bearing cavities with grease.

Drive the left wheel bearing in the wheel hub until it is fully seated using special tools.

*Replace the wheel bearings in pairs.  
Do not reuse old bearings.*

- Install the wheel bearings with the sealed ends toward the outside.

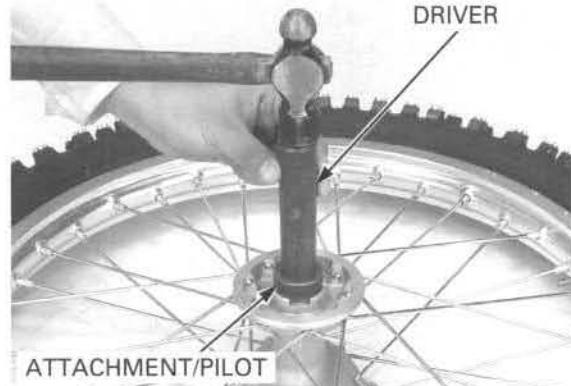
**TOOLS:**

Driver 07749-0010000

Attachment, 37 x 40 mm 07746-0010200

Pilot, 20 mm 07746-0040500

Install the distance collar into place, then drive the right wheel bearing using the same special tools.



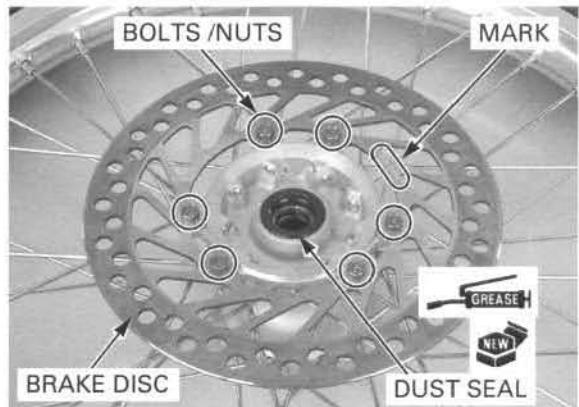
DUST SEAL  
GREASE  
NEW

Install the brake disc onto the wheel hub with the drive mark facing out.

Install the brake disc bolts and nuts.  
Tighten the nuts to the specified torque.

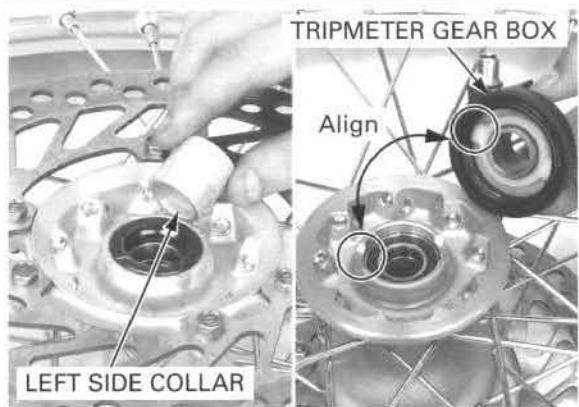
**TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)**

Pack a new left dust seal lip with grease and install it into the hub.



Check the left side collar and tripmeter gear box for wear or damage.

Install the left side collar to the wheel.  
Install the gear box while aligning its tabs of the gear box with the grooves on the wheel.



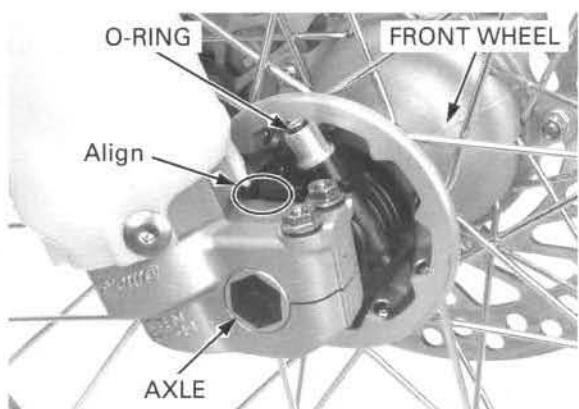
## INSTALLATION

Clean the clamping surface of the axle and axle holders.

Install the front wheel between the fork legs while inserting the disc between the pads, and align the tab of the tripmeter gear as shown.

Check that the tripmeter gear box O-ring is in good condition, replace if necessary.

Apply a thin layer of grease to the axle and insert the axle from the right side.

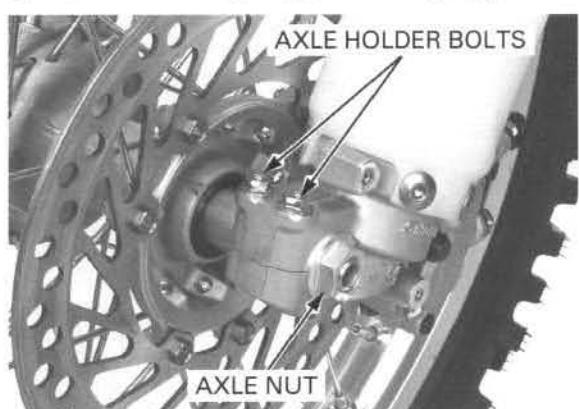


Install and tighten the axle nut to the specified torque.

**TORQUE: 88 N·m (9.0 kgf·m, 65 lbf·ft)**

Tighten the left axle holder bolts to the specified torque.

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



## FRONT WHEEL/SUSPENSION/STEERING

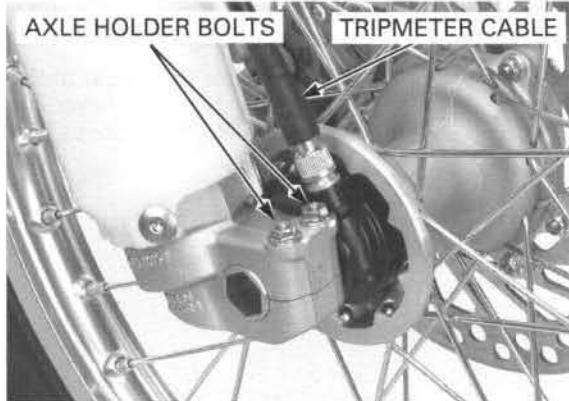
With the front brake applied, pump the front suspension up and down several times to seat the axle and check the front brake operation.



Be sure the fork legs are parallel, then tighten the right axle holder bolts to the specified torque.

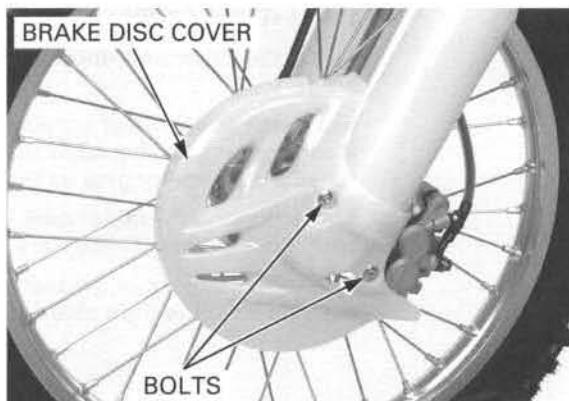
**TORQUE: 20 N·m (2.0 kgf·m, 14 lbf·ft)**

Connect the tripmeter cable and tighten the lock nut securely.



Install the brake disc cover and bolts.  
Tighten the bolts to the specified torque.

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



## FORK

### REMOVAL

Remove the front wheel (page 13-7).

*Do not suspend the  
brake caliper from  
the brake hose.  
Do not twist the  
brake hose.*

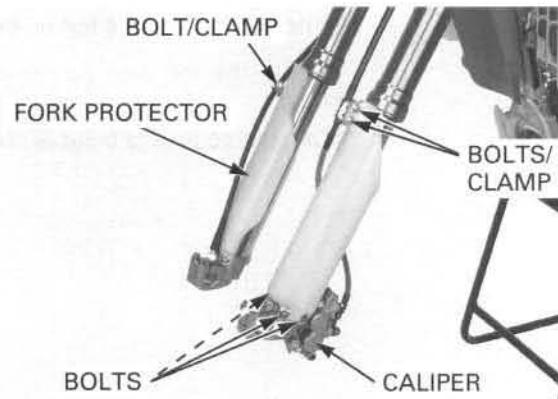
Remove the mounting bolts and front brake caliper.

Do not operate the brake lever after removing the caliper and front wheel. To do so will cause difficulty in fitting the brake disc between the brake pad.

Remove the bolts and brake hose clamp.

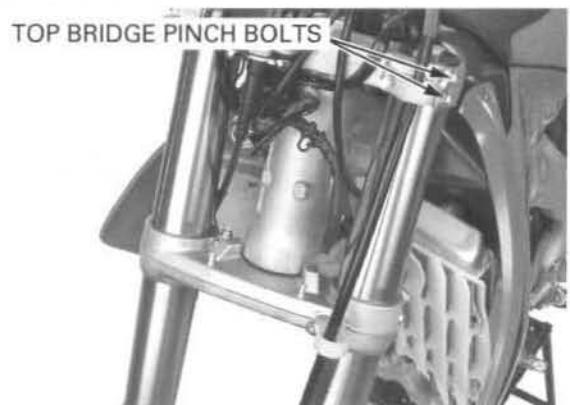
Remove the bolt and tripmeter cable clamp.

Remove the bolts and fork protector.

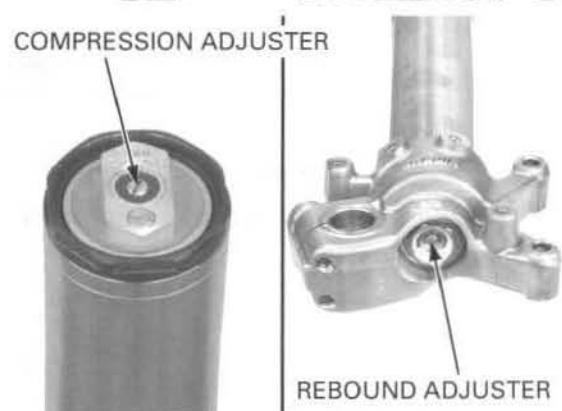


Loosen the fork top bridge pinch bolts.

When the fork is ready to be disassembled, remove the handlebar and holders (page 13-31) and loosen the fork damper using the following procedure.



When disassembling the fork leg, turn the rebound and compression adjusters counterclockwise to the softest position to prevent damaging the adjustment needle (be sure to record the number of turns from the starting position).



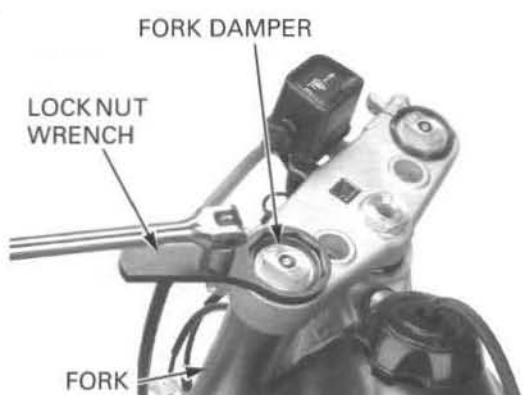
*Do not use a crescent or adjustable wrench to loosen the fork damper; it could be damaged.*

Loosen the fork damper using the special tool, but do not remove it yet.

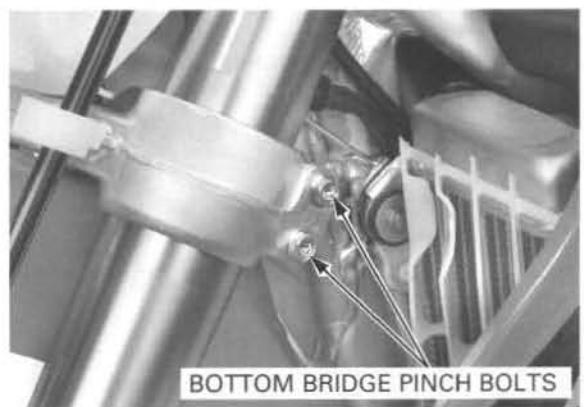
**TOOL:**

**Lock nut wrench, 50 mm**

**07WMA-KZ30100**



Loosen the fork bottom bridge pinch bolts and pull the fork leg down and out of the fork bridge.



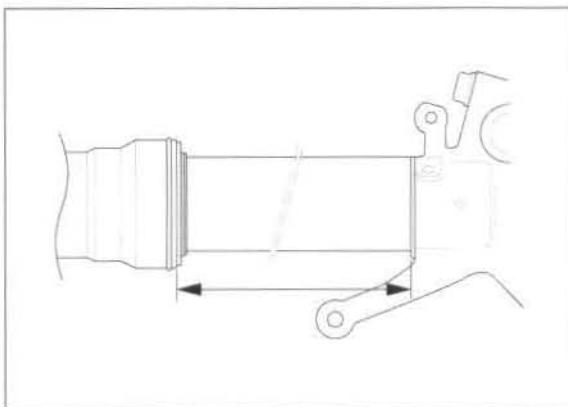
**BOTTOM BRIDGE PINCH BOLTS**

## FRONT WHEEL/SUSPENSION/STEERING

### DISASSEMBLY

*Be careful not to scratch the slider and not to damage the dust seal.*

Measure the length between the axle holder and outer tube, and record it before disassembling the fork.

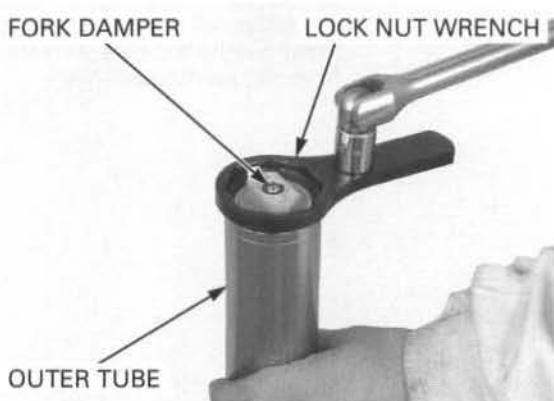


Hold the outer tube and remove the fork damper from the outer tube using the special tool.

**TOOL:**

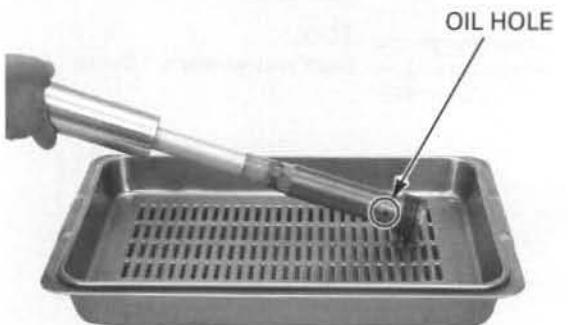
Lock nut wrench, 50 mm      07WMA-KZ30100

Slide the outer tube down onto the axle holder.

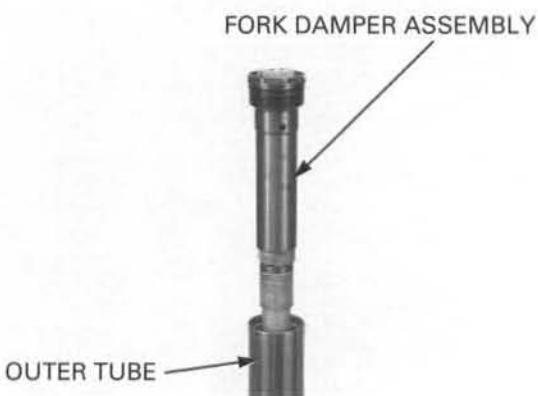


Drain the fork oil from the fork leg.

Drain the fork oil from the oil hole in the fork damper.



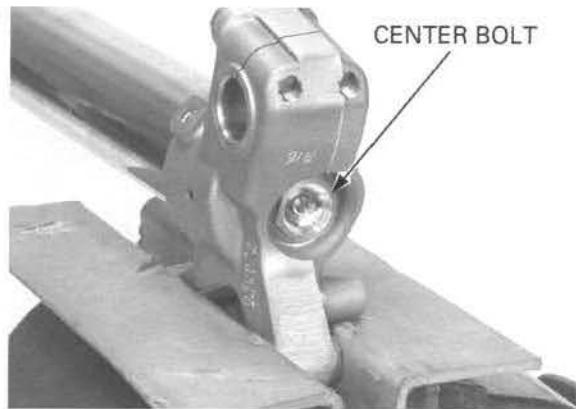
Temporarily install the fork damper assembly into the outer tube.



*Do not over-tighten the vise on the axle holder.*

Set the axle holder of the slider in a vise with a piece of wood or soft jaws to avoid damage.

Loosen the center bolt.



*If a piston base is not available, refer to the next step to make an alternative tool.*

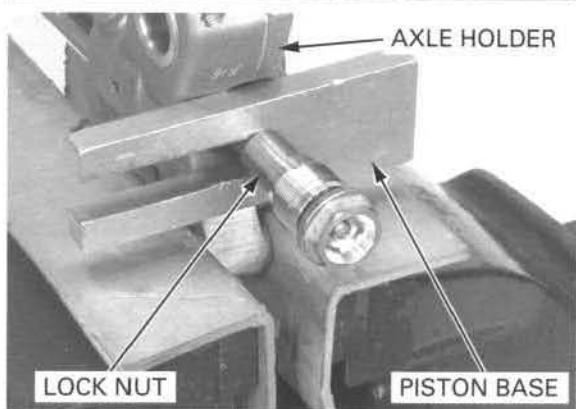
Push the fork cap in so the lock nut comes out of the slider and install the piston base or mechanic's stopper tool between the axle holder and lock nut.

**TOOL:**

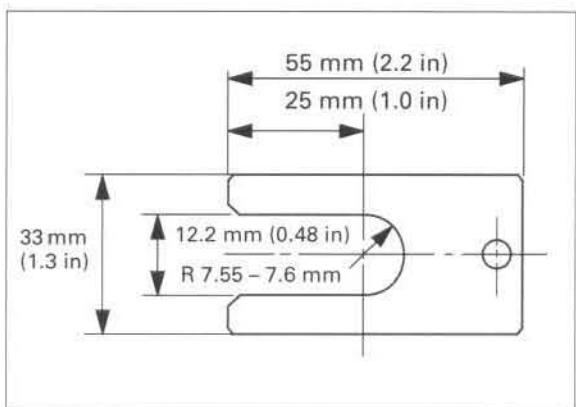
Piston base

Fork rod stopper

07958-2500001 or  
07AMB-KZ3A100  
(U.S.A. only)

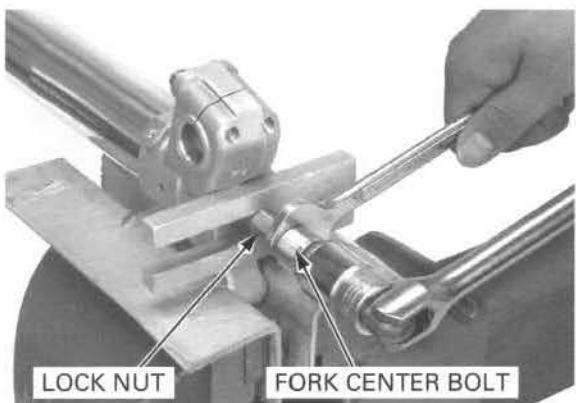


Make the mechanic's stopper tool from a thin piece of steel (1.0 mm thick) as shown if you do not have a special tool.



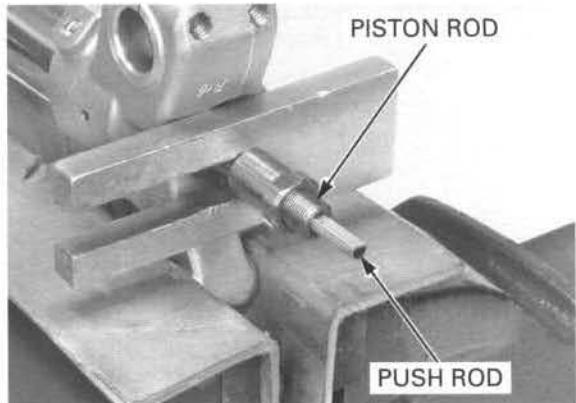
*Do not remove the lock nut from the fork damper piston rod. If the lock nut is removed, the piston rod will fall into the fork damper and you will not be able to reassemble the fork damper.*

Hold the lock nut and remove the fork center bolt from the fork damper.

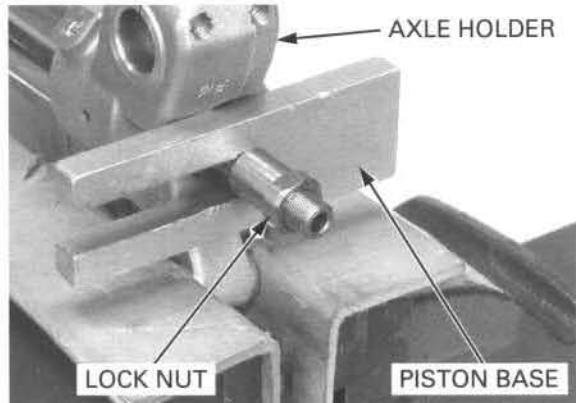


## FRONT WHEEL/SUSPENSION/STEERING

Remove the push rod from the piston rod.



*Be careful not to damage the lock nut and fork center bolt hole.*  
Remove the piston base or mechanic's stopper tool while pushing the fork cap.



Remove the fork damper assembly from the fork assembly.  
Remove the fork assembly from the vise.  
Remove the fork spring from the fork assembly.

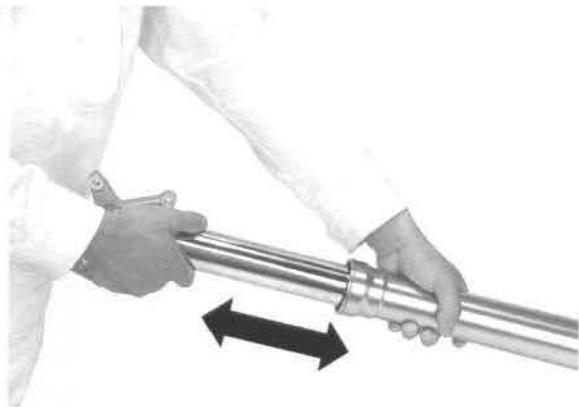


### OUTER TUBE AND SLIDER DISASSEMBLY

*Be careful not to scratch the slider.*  
Remove the dust seal and stopper ring.  
Check that the slider moves smoothly in the outer tube.  
If it does not, check the slider for bends or damage, and the bushings for wear or damage (page 13-18).



Using quick successive motions, pull the slider out of the outer tube.



*Do not damage the slider bushing, especially the sliding surface. To prevent loss of tension, do not open the bushing more than necessary.*

Carefully remove the slider bushing by prying the slot with a screwdriver until the bushing can be pulled off by hand.

Remove the following:

- Guide bushing
- Back-up ring
- Oil seal
- Stopper ring
- Dust seal



## FORK DAMPER DISASSEMBLY

*Check the lock nut installation. If the lock nut is removed, the piston rod will fall into the fork damper and you will not be able to reassemble the fork damper.*

Set the fork damper in a vise with a piece of wood or soft jaws to avoid damage.

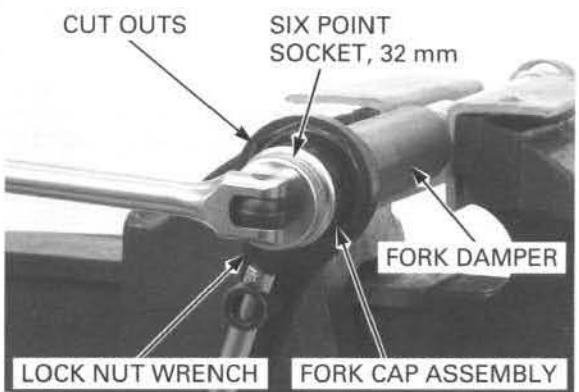
Hold the fork damper assembly using the special tool.

### TOOL:

**Lock nut wrench, 50 mm**

**07WMA-KZ30100**

Loosen the fork cap assembly.



Remove the fork cap assembly from the fork damper.

### NOTE:

- Be careful not to damage the fork cap bushing.
- Do not disassemble the fork cap assembly.
- Replace the fork cap as an assembly if it is damaged.



## FRONT WHEEL/SUSPENSION/STEERING

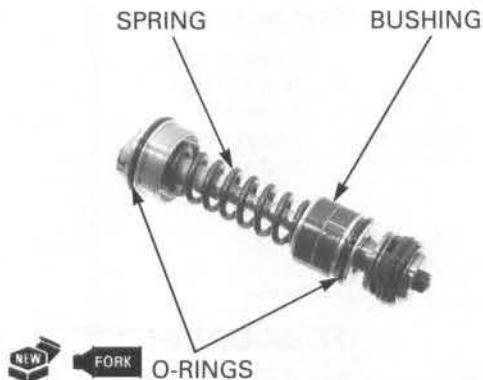
Empty the fork oil from the fork damper by pumping the damper rod several times.



### INSPECTION

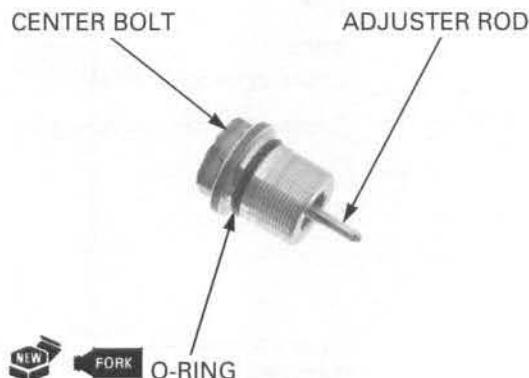
#### FORK CAP

Check the fork cap assembly for damage.  
Check the bushing for excessive wear or scratches.  
Check the spring for fatigue or damage.  
Check the compression adjuster for clicks.  
  
Replace the fork cap as an assembly if necessary.  
Apply fork oil to the new O-rings and install it.



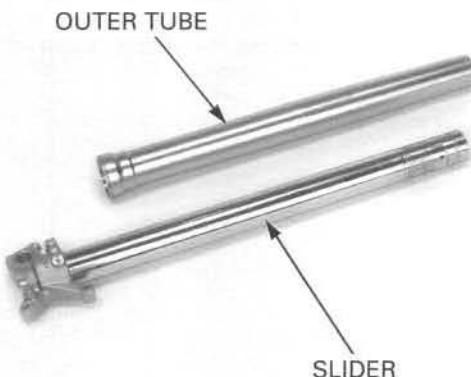
#### FORK CENTER BOLT

Check the fork center bolt for damage.  
Check the adjuster rod for stepped wear or damage.  
Check the rebound adjuster for clicks.  
  
Replace the fork center bolt as an assembly if necessary.  
Apply fork oil to a new O-ring and install it.



#### SLIDER/OUTER TUBE

Check the outer tube and slider for score marks, scratches and excessive or abnormal wear.  
Check the outer tube for damage or bend.

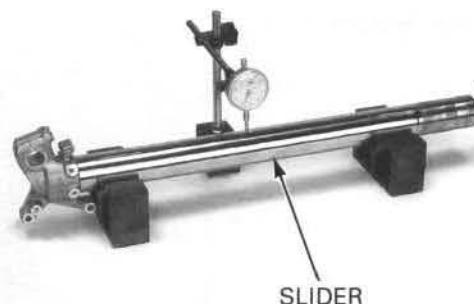


Set the slider on V-blocks and measure the runout. Turn the slider and measure the runout using a dial indicator.

Actual runout is 1/2 of the total indicator reading.

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

*Do not reuse the slider if it is bent.* Replace if the service limit is exceeded, or there are scratches or nicks that will allow fork oil to leak past the seals.



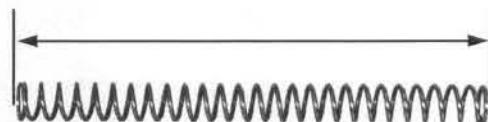
#### FORK SPRING

Measure the fork spring free length by placing it on a flat surface.

#### SERVICE LIMIT:

'04, '05: 488 mm (19.2 in)

After '05: 493 mm (19.4 in)

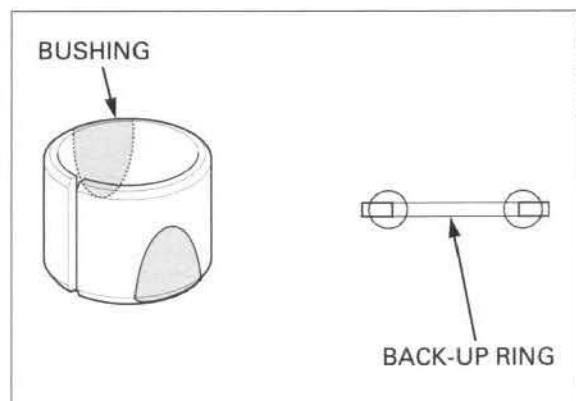


#### BUSHING/BACK-UP RING

Check the bushing for excessive wear or scratches. If copper appears on the surface, replace the bushing.

Replace the back-up ring if there is distortion at the points shown.

Remove any metal powder from the slider and guide bushings with a nylon brush and fork oil.



#### FORK DAMPER

Check the fork damper for bends or damage.

Check the fork damper piston rod for bends, wear or damage.

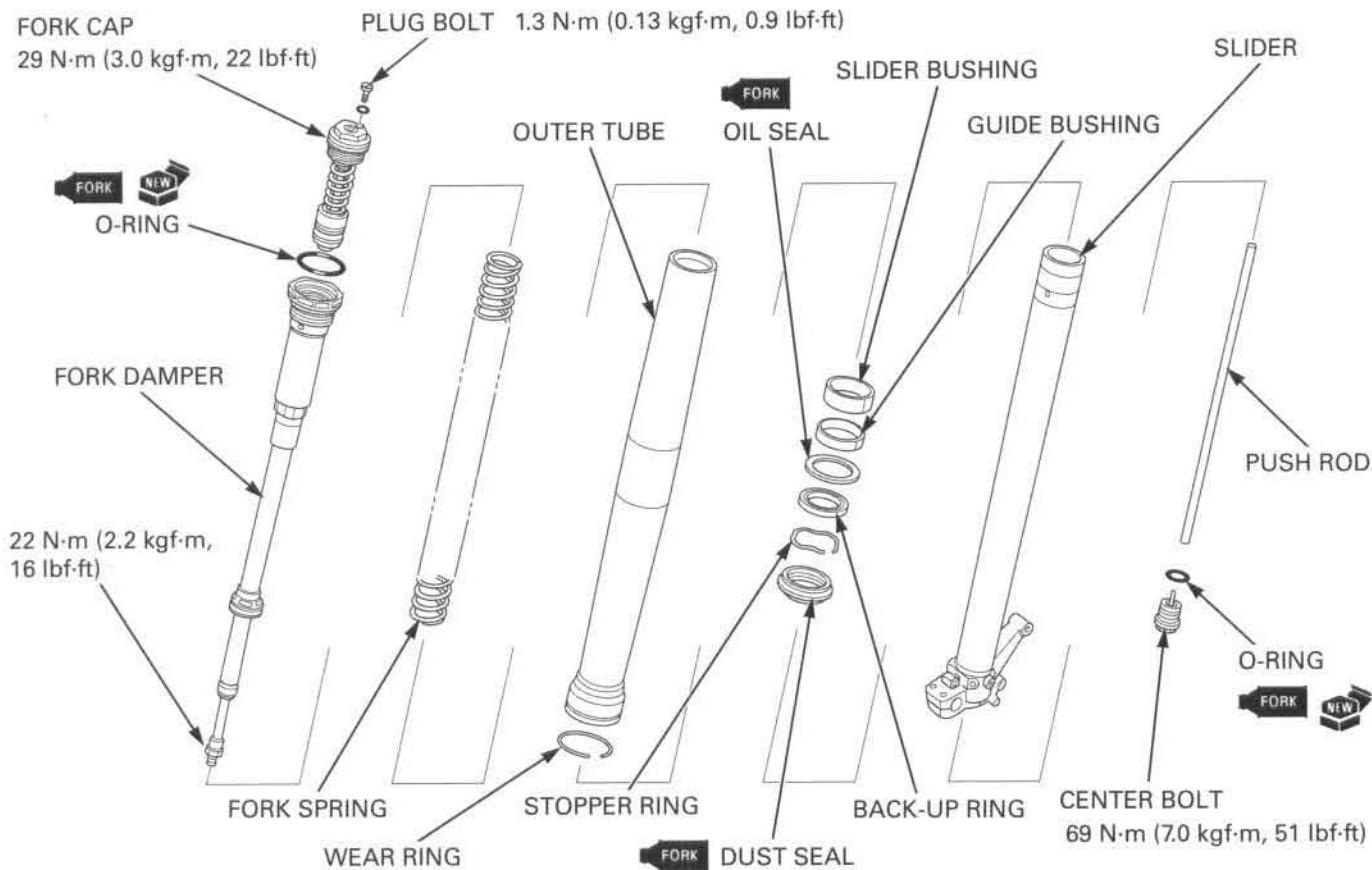
Check the fork damper operation by pumping the piston rod.

If the operation is not smooth, fill the fork damper with fork oil and check the fork damper operation again (page 13-25).



## FRONT WHEEL/SUSPENSION/STEERING

### ASSEMBLY



Before assembly, wash all parts with a high flash point or non-flammable solvent and wipe them dry.

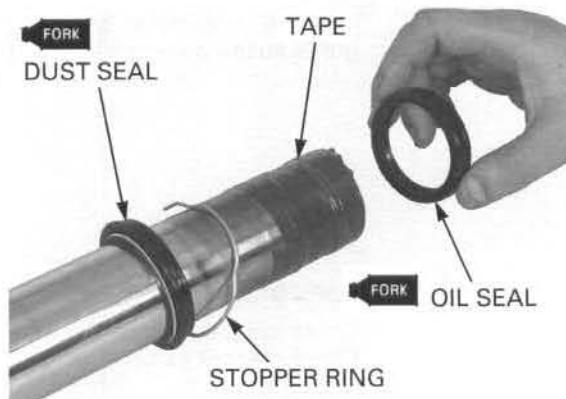
#### OUTER TUBE AND SLIDER ASSEMBLY

Wrap the end of the slider with tape.

Coat the oil seal and dust seal lips with fork oil.

Install the dust seal and stopper ring onto the slider. Install the oil seal onto the slider with its marked side facing the dust seal.

Remove the tape from the end of the slider.

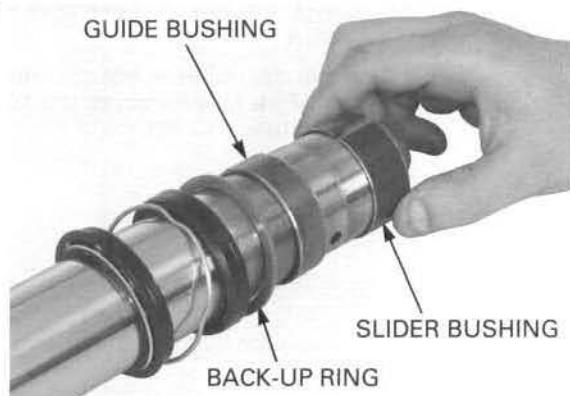


*Be careful not to damage the slider bushing coating. Do not open the slider bushing more than necessary.*

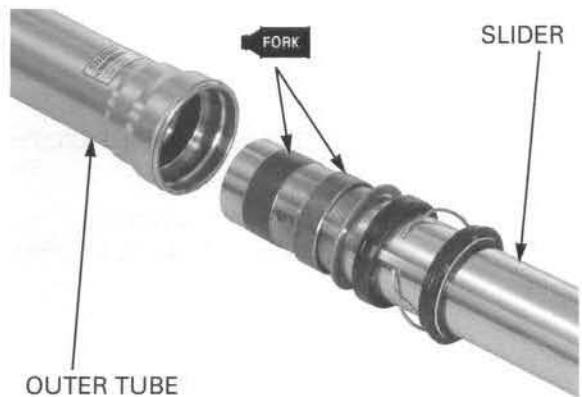
Install the back-up ring, guide bushing and slider bushing.

#### NOTE:

Remove the burrs from the bushing mating surface, being careful not to peel off the coating.



Coat the slider and guide bushings with fork oil and install the slider into the outer tube.



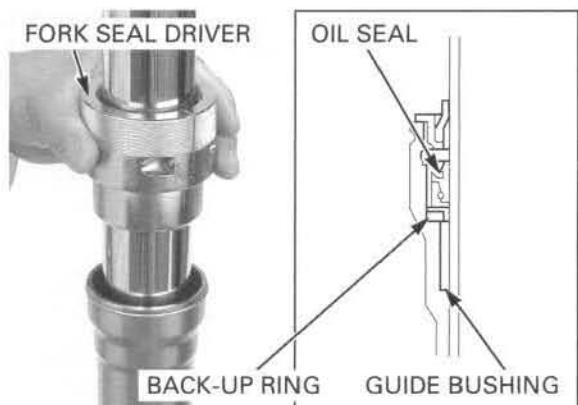
Drive in the guide bushing together with the backup ring into the outer tube using the special tool.

Drive the oil seal into the outer tube using the special tool.

**TOOLS:**

Fork seal driver, 47 mm

07VMD-KZ30100 or  
07VMD-KZ3010A  
(U.S.A. only)



Install the stopper ring into the groove in the slider.  
Install the dust seal.



### FORK DAMPER REFILLING/ASSEMBLY

Clean the fork cap assembly and fork damper threads.



## FRONT WHEEL/SUSPENSION/STEERING

Extend the fork damper piston rod to its maximum length.

Pour the recommended fork oil into the fork damper.

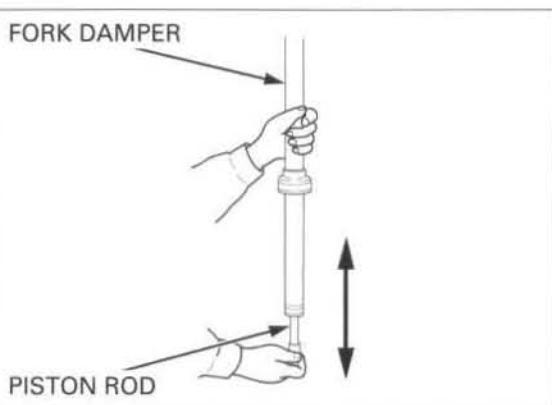
**RECOMMENDED FORK OIL:** Pro-Honda HP Fork Oil 5W or equivalent

**STANDARD CAPACITY:**

192 cm<sup>3</sup> (6.5 US oz, 6.8 Imp oz)



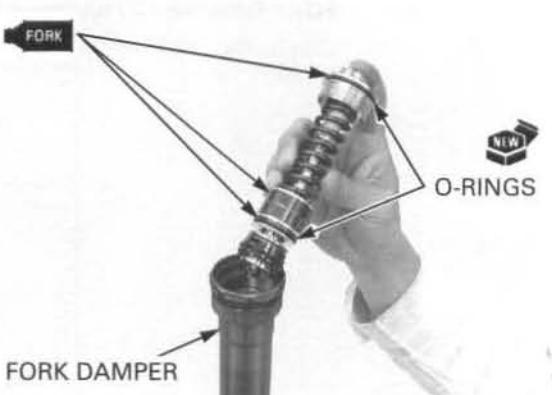
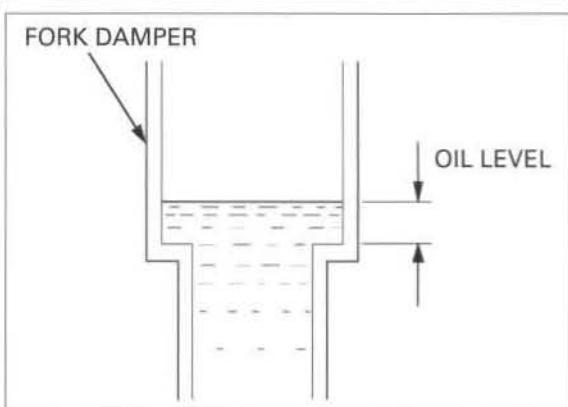
Pump the fork damper piston rod slowly several times and bleed any air from the fork damper.



Extend the fork damper piston rod to its maximum length.

Adjust the oil level of the fork damper as shown.

**OIL LEVEL: 42 – 47 mm (1.65 – 1.85 in)**



*Be careful not to damage the fork cap bushing.*

Apply fork oil to the bushing and new O-rings on the fork cap assembly.

Extend the fork damper piston rod to its maximum length.

Hold the rod end, install the fork cap assembly into the fork damper.

If it is difficult to install the fork cap assembly, the fork damper oil level might be higher than standard. Inspect the fork damper oil level again.

Set the fork damper in a vise with a piece of wood or soft jaws to avoid damage.

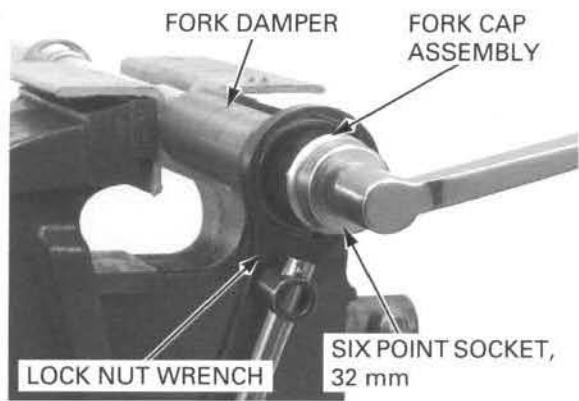
Tighten the fork cap assembly to the specified torque by holding the fork damper using the special tool.

**TOOL:**

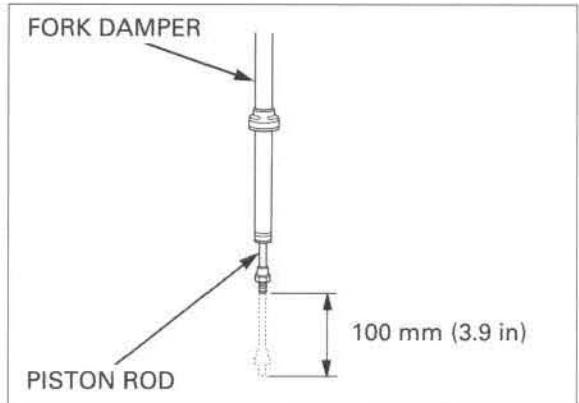
Lock nut wrench, 50 mm

07WMA-KZ30100

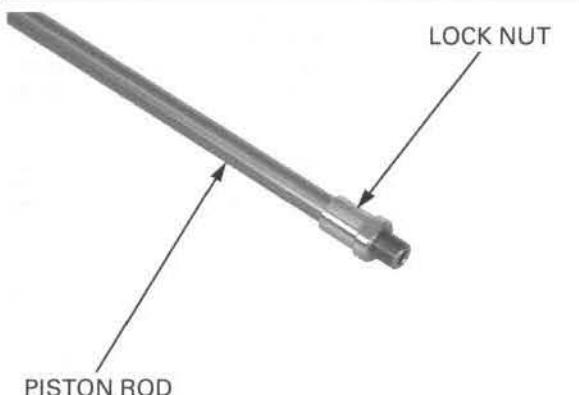
**TORQUE: 29 N·m (3.0 kgf·m, 22 lbf·ft)**



Hold the fork damper in an upright position and pump the fork piston rod 100 mm (3.9 in) slowly, several times.



Turn the lock nut clockwise until it is lightly seated.



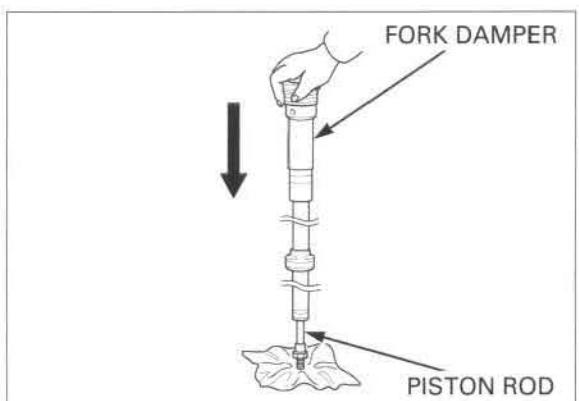
**NOTE:**

- Make sure the rebound adjuster and compression adjuster are softest position.
- Check the fork damper piston rod sliding surface for damage.
- Apply fork oil to the fork damper piston rod sliding surface.

*Be careful not to bend or damage the fork damper piston rod when the piston rod is stroked.*

Cover the piston rod end to prevent damage.

Blow out any extra oil in the fork damper spring chamber by fully stroking the fork damper piston rod.



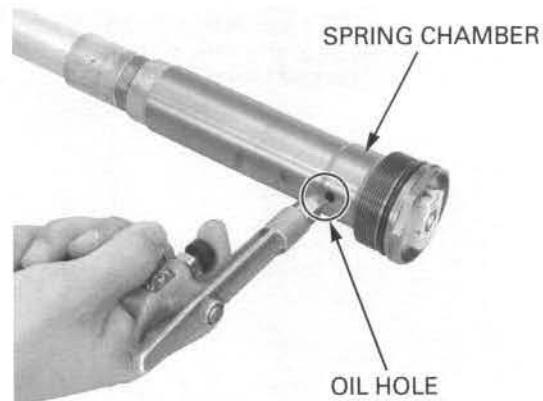
## FRONT WHEEL/SUSPENSION/STEERING

By doing this procedure, about 17 cm<sup>3</sup> of fork fluid will be drained from the damper spring chamber through the oil hole. This will cause 175 cm<sup>3</sup> of fork fluid to be left in the chamber.



Blow out any oil from the oil hole of the fork damper using compressed air.

Wipe off the oil completely from the fork damper spring chamber.

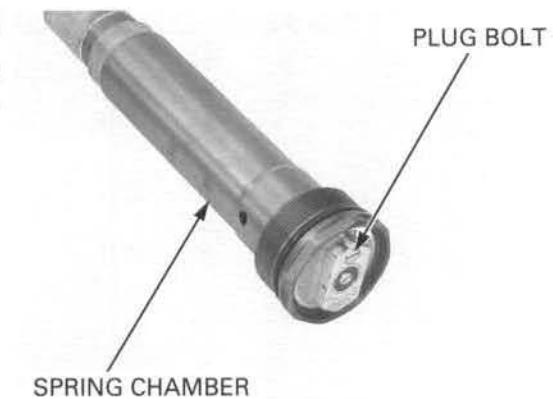


If you cannot use compressed air, remove the plug bolt on the fork cap.

Hold the fork damper upside down for 10 minutes and drain the oil from the fork damper spring chamber.

Tighten the plug bolt to the specified torque.

**TORQUE: 1.3 N·m (0.13 kgf·m, 0.9 lbf·ft)**



### FORK DAMPER OPERATION INSPECTION

- Turn the compression adjuster counterclockwise to the softest position.
- Check the fork damper piston rod sliding surface for damage.
- Apply fork oil to the fork damper piston rod sliding surface.

Be careful not to bend or damage the fork damper piston rod when the piston rod is stroked.

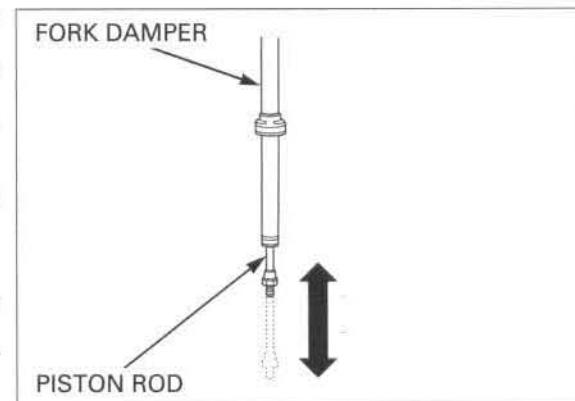
Inspect the fork damper operation after air bleeding (page 13-22).

Cover the piston rod end to prevent damage.

Fully stroke the fork damper piston rod by pushing down the fork damper.

Check the fork damper piston rod for smooth operation.

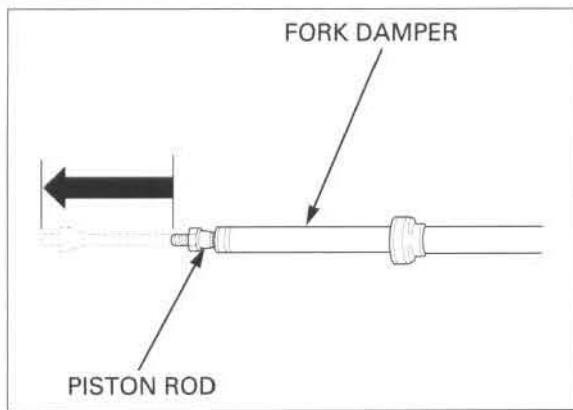
If the fork damper piston rod operation is not smooth, check the piston rod for bends or damage.



Hold the fork damper on level ground while the fork damper piston rod is fully extended and compressed by hand.

Release the fork damper piston rod then check that it extends to its maximum length.

If the fork damper piston rod does not extend to maximum, bleed the fork damper again.

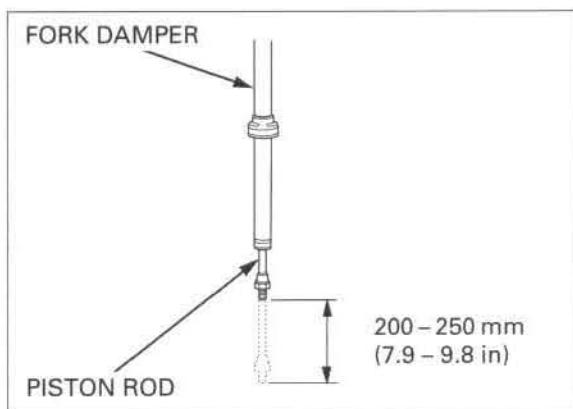


Wipe the oil completely off from the fork damper. Compress the fork piston rod 200 – 250 mm (7.9 – 9.8 in) from fully extended and hold the fork damper in an upright position for 10 minutes.

There should be no oil leaking from the fork damper spring chamber and piston rod.

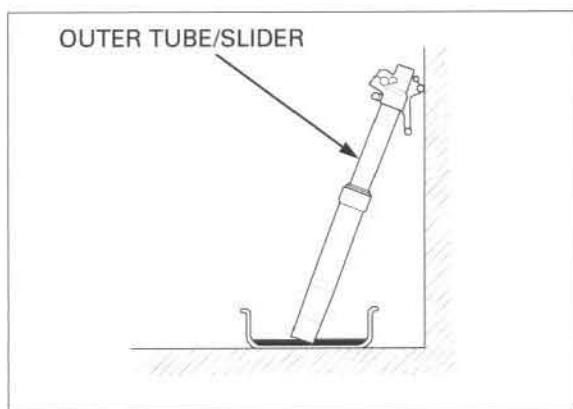
If oil leaks from the spring chamber or piston rod, replace the fork damper assembly.

Hold the fork damper on level ground and release the fork damper piston rod, then check that the piston rod extends to its maximum length.



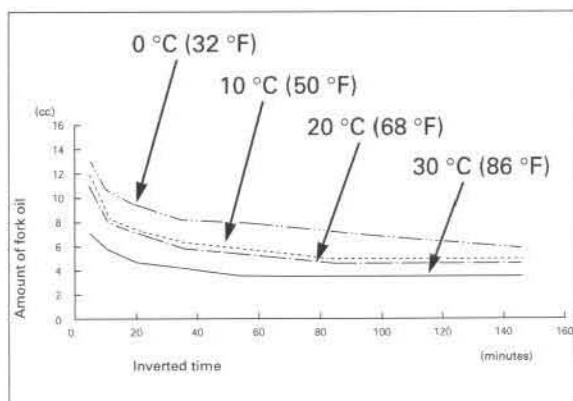
### FORK DAMPER INSTALLATION/PREPARED

If the outer tube and slider (fork) have not been disassembled, turn the fork upside down for 20 minutes and drain the oil from the inside of the outer tube and slider completely (7.1 cc at 20 °C/ 68 °F).



Amount of fork oil left in the fork  
(without damper and spring)

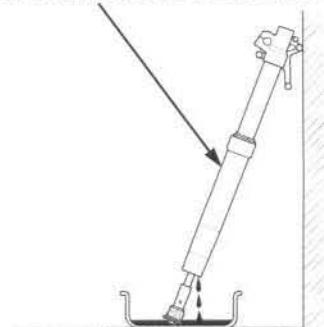
°C/°F	unit: cc						
	5	10	20	35	55	85	145
30/86	7.1	5.9	4.7	4.2	3.5	3.5	3.5
20/68	10.6	8.2	7.1	5.9	5.6	4.7	4.7
10/50	11.8	8.3	7.2	6.2	5.8	4.9	4.8
0/32	12.9	10.6	9.4	8.2	7.9	7.1	5.9



## FRONT WHEEL/SUSPENSION/STEERING

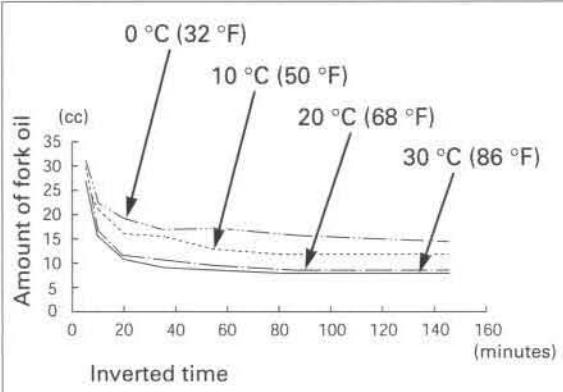
If the fork damper has not been disassembled from the outer tube/slider, turn it upside down for 20 minutes and drain the oil from the inside of the outer tube and slider completely (11.8 cc at 20 °C/ 68 °F)

FORK DAMPER/OUTER TUBE/SLIDER



Amount of fork oil left in the fork  
(with damper and spring)

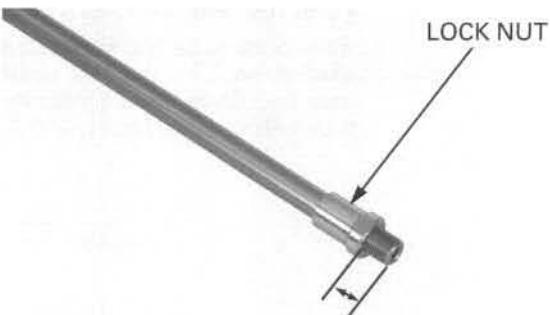
°C/°F		minute							unit: cc
		5	10	20	35	55	85	145	
30/86	27	15.3	10.6	9.4	8.3	7.9	7.9		
20/68	29.4	16.5	11.8	10.6	9.4	8.2	8.2		
10/50	28.2	21.4	16.5	15.3	12.9	11.8	11.8		
0/32	30.6	22.4	18.8	16.5	16.5	15.3	14.1		



Turn the lock nut so the length from the rod end is specified.

**STANDARD: 11 – 13 mm (0.4 – 0.5 in)**

Wipe the oil completely off from the fork damper.



### FORK DAMPER INSTALLATION

Wipe the oil off completely from the fork spring.  
Install the fork spring into the fork assembly.  
Temporarily install the fork damper assembly into the fork assembly.



*Do not over-tighten the vise on the axle holder.*

Set the axle holder of the slider in a vise with a piece of wood or soft jaws to avoid damage.

Push the fork cap in so the lock nut comes out of the slider and install the piston base or mechanic's stopper tool between the axle holder and lock nut.

**TOOL:**

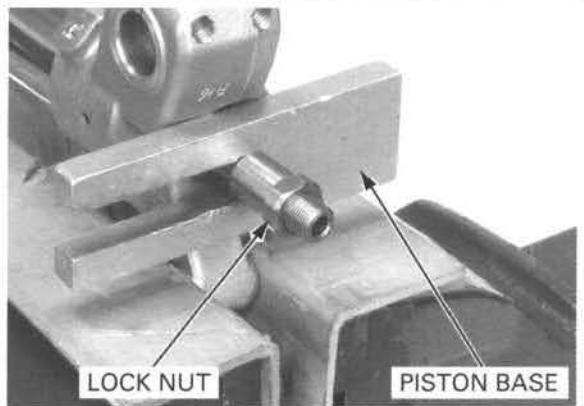
**Piston base**

07958-2500001 or

**Fork rod stopper**

07AMB-KZ3A100

(U.S.A. only)



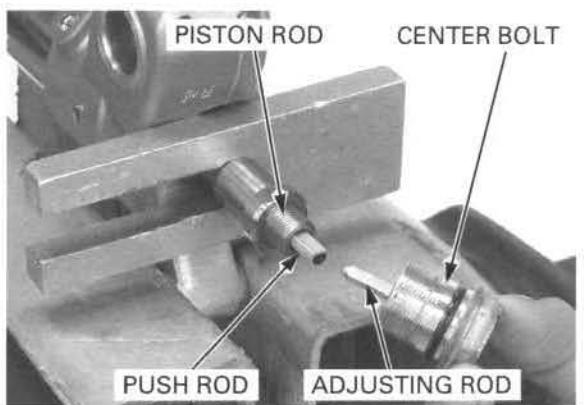
Measure the combined length of the lock nut and piston rod end again.

**STANDARD: 11 – 13 mm (0.4 – 0.5 in)**

*Check the push rod installation by turning the push rod right and left.*

Install the push rod into the piston rod until it stops.

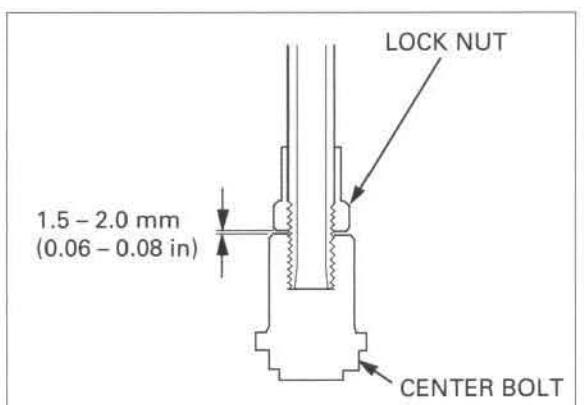
Install the fork center bolt to the fork damper piston rod by aligning the flat-side of the center bolt adjusting rod with the flat-side of the push rod. Tighten the center bolt fully by hand.



Measure the length of the lock nut and center bolt clearance.

**STANDARD: 1.5 – 2.0 mm (0.06 – 0.08 in)**

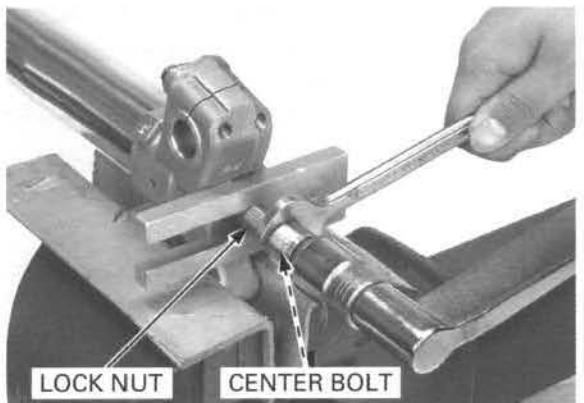
If the clearance is out of specification, check the lock nut and center bolt installation.



Tighten the lock nut to the center bolt by hand until they touch.

Tighten the lock nut to the specified torque.

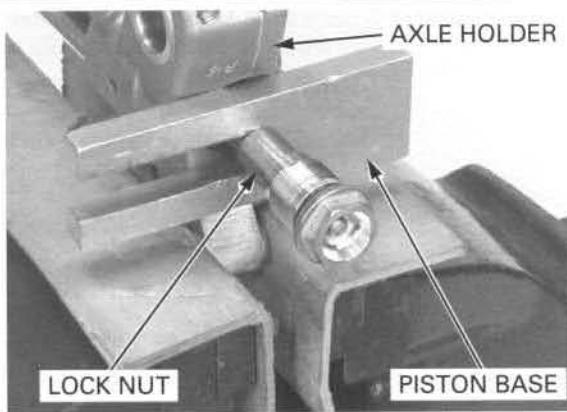
**TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)**



## FRONT WHEEL/SUSPENSION/STEERING

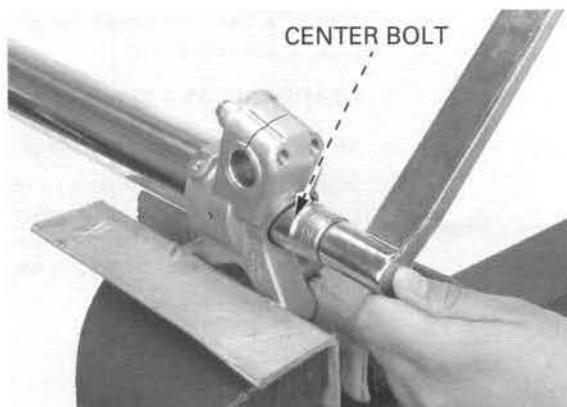
*Be careful not to damage the lock nut and fork center bolt hole.*

Remove the piston base or mechanic's stopper tool between the axle holder and lock nut while pushing the fork cap.



Install the center bolt into the axle holder and tighten it to the specified torque.

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

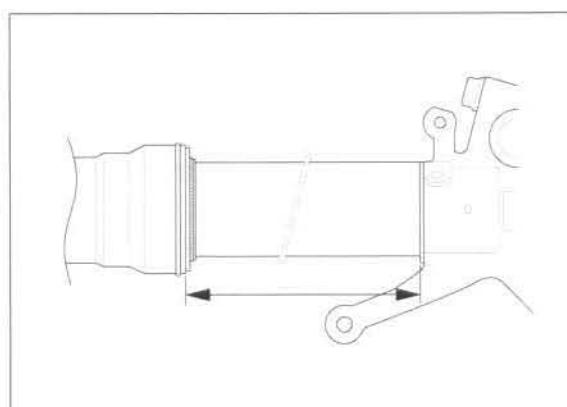


Measure the length between the axle holder and outer tube.

Compare the length at assembly and disassembly; they should be same length.

**STANDARD:  $317 \pm 2$  mm (12.5  $\pm$  0.1 in)**

If the length at assembly is longer than at disassembly, check the center bolt and lock nut installation.



### OIL CAPACITY ADJUSTMENT

Remove the fork damper assembly from the outer tube.

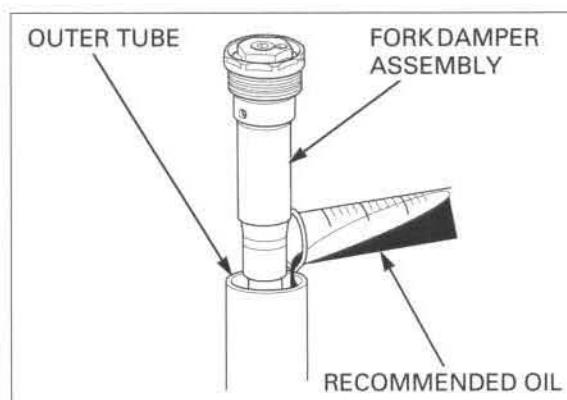
*Be sure the oil capacity is the same in both fork legs.*

Pour the recommended fork oil into the fork leg.

**RECOMMENDED OIL: Pro-Honda HP Fork Oil 5W or equivalent**

#### STANDARD OIL CAPACITY:

'04, '05:  $345 \text{ cm}^3$  (11.7 US oz, 12.1 Imp oz)  
 '06:  $340 \text{ cm}^3$  (11.5 US oz, 12.0 Imp oz)  
 After '06:  $348 \text{ cm}^3$  (11.8 US oz, 12.2 Imp oz)



Maximum oil capacity ('04, '05)	$398 \text{ cm}^3$ (13.5 US oz)	Slightly stiffer near full compression.
Maximum oil capacity (After '05)	$399 \text{ cm}^3$ (13.5 US oz)	Slightly stiffer near full compression.
Minimum oil capacity	$303 \text{ cm}^3$ (10.2 US oz)	Slightly softer near full compression.

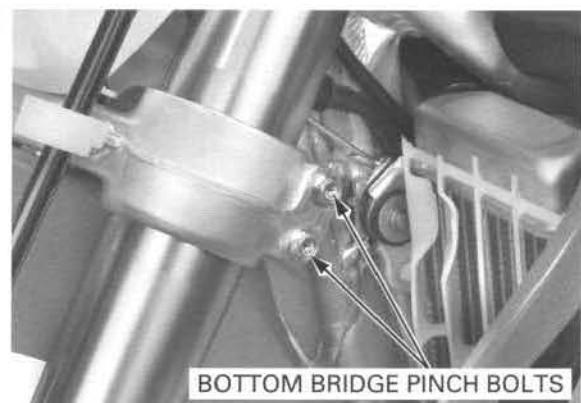
Pull up the outer tube slowly and install the fork damper assembly into the outer tube.



## INSTALLATION

Install the fork leg and tighten the bottom bridge pinch bolts to the specified torque.

**TORQUE:** 21 N·m (2.1 kgf·m, 15 lbf·ft)



Tighten the fork damper to the specified torque using the special tool.

**TOOL:**

Lock nut wrench, 50 mm      07WMA-KZ30100

**TORQUE:** Actual: 34 N·m (3.5 kgf·m, 25 lbf·ft)  
Indicated: 31 N·m (3.2 kgf·m, 23 lbf·ft)



## STANDARD POSITION

Loosen the bottom bridge pinch bolts.

For ease when releasing the air pressure after the forks are installed, position the fork outer tubes so the plug bolts are in front of the rebound adjusters. Align the top surface of the top bridge with the outer tube upper surface as shown.

For changing position, see the Owner's Manual.



## FRONT WHEEL/SUSPENSION/STEERING

Tighten the bottom bridge pinch bolts to the specified torque.

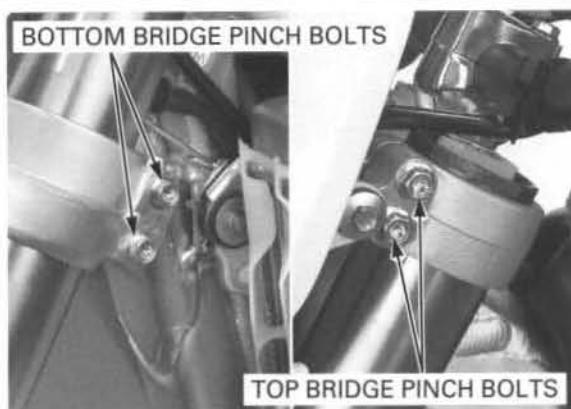
**TORQUE: 21 N·m (2.1 kgf·m, 15 lbf·ft)**

Tighten the top bridge pinch bolts to the specified torque.

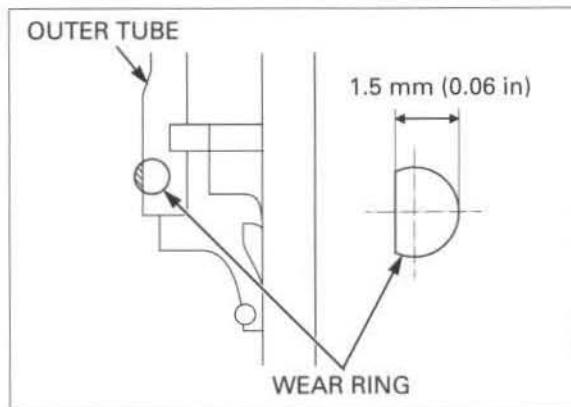
**TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)**

### NOTICE

*Over-tightening the pinch bolts can deform the outer tube. A deformed outer tube must be replaced.*



Inspect the wear rings for wear or damage. Replace the wear ring, if it is 1.5 mm (0.06 in) or flat with the outer tube.



Install the wear rings with their end gaps facing rearward.



Clean and apply a locking agent to the fork protector mounting bolt threads.

Install the fork protector and tighten the mounting bolts to the specified torque.

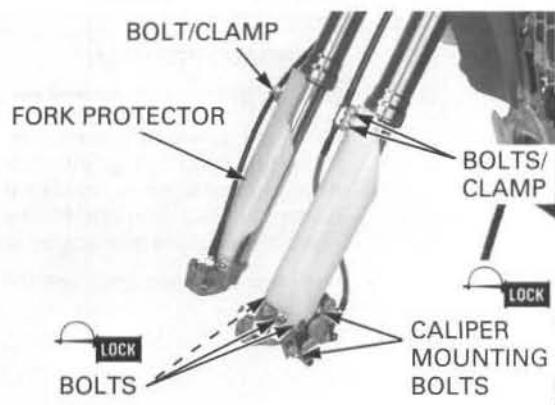
**TORQUE: 6.9 N·m (0.7 kgf·m, 5.1 lbf·ft)**

Clean and apply a locking agent to the front brake caliper mounting bolt threads.

Install the front brake caliper and tighten the mounting bolts to the specified torque.

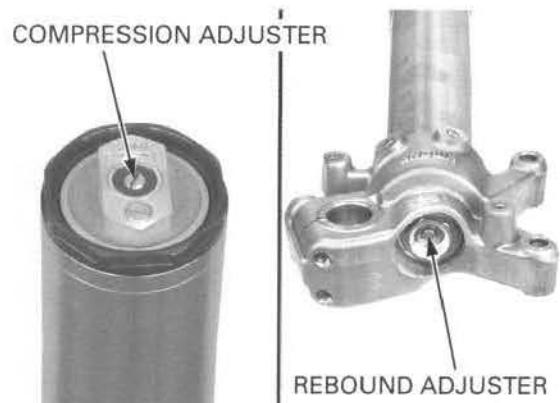
**TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)**

Install the tripmeter cable clamp and bolt.  
Install the brake hose clamp and bolts.



Return the rebound adjuster and compression adjuster to the original positions as noted during removal.

Install the front wheel (page 13-11).



## HANDLEBAR

### REMOVAL

Remove the front visor (page 2-5).

Remove the handlebar pad from the handlebar.

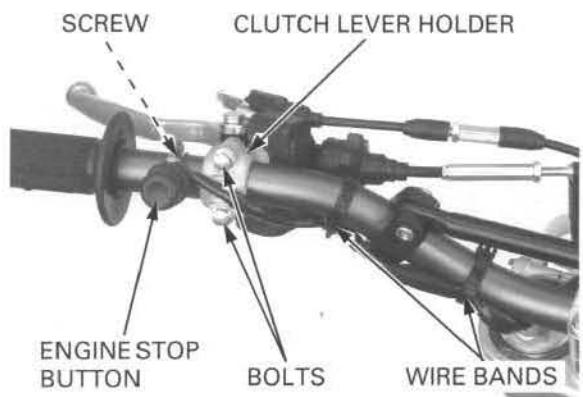
Disconnect the fuel cap breather hose from the stem nut.



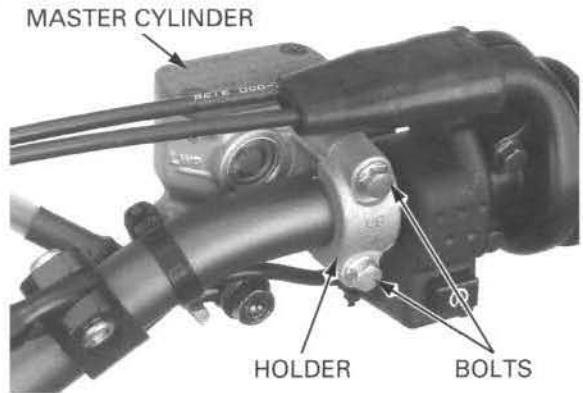
Remove the wire bands.

Remove the screw and engine stop button.

Remove the bolts and clutch lever holder.



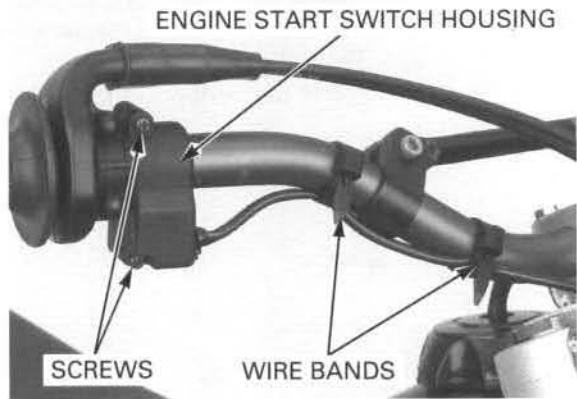
*Do not disconnect the hydraulic line.* Remove the bolts and front brake master cylinder holder.



## FRONT WHEEL/SUSPENSION/STEERING

Remove the wire bands.

Remove the screws and engine start switch housing.



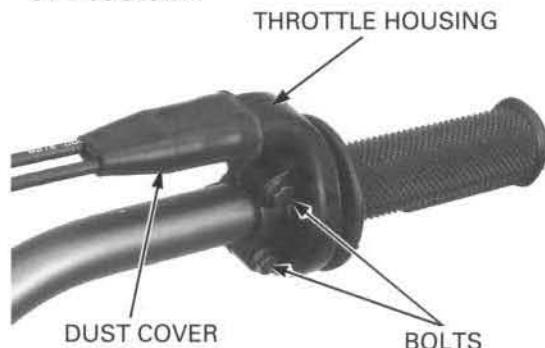
If you will not disassemble the throttle housing, remove the throttle housing as an assembly as follows.

Loosen the throttle housing bolts, turn the handlebar to the right fully, then remove the throttle housing.

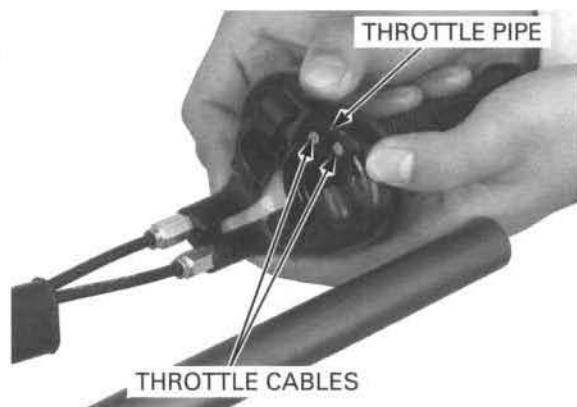


If you will disassemble the throttle housing, remove the dust cover and bolts.

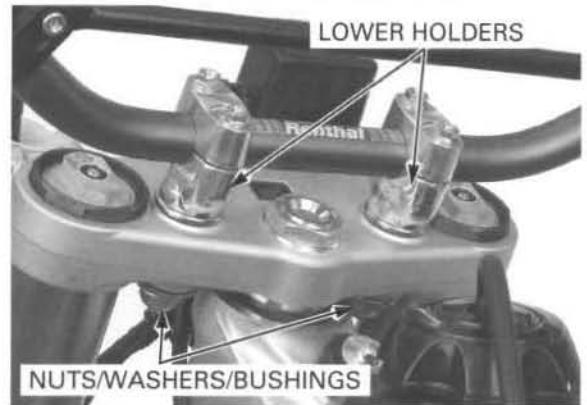
'04 - '06 shown:



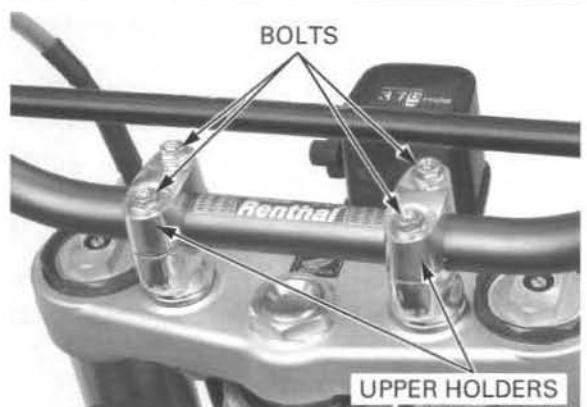
Remove the throttle housing from handlebar.  
Disconnect the throttle cables from the throttle pipe.



Loosen the handlebar lower holder nuts.



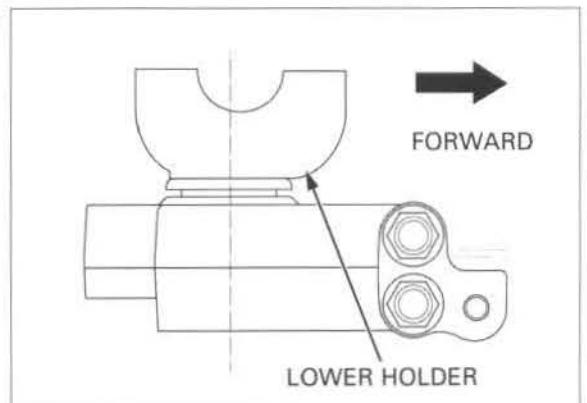
Remove the bolts, upper holders and handlebar.  
Remove the nuts, washers, bushings and lower  
holders.



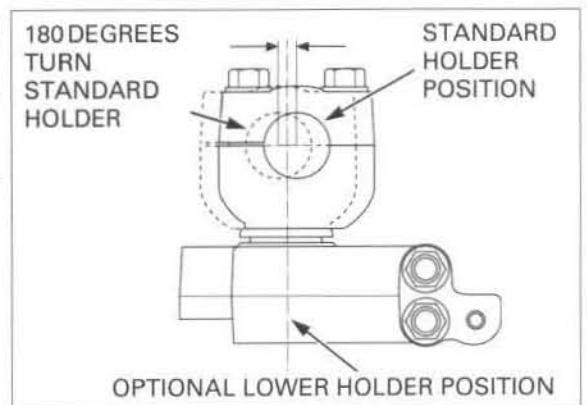
## INSTALLATION

Install the bushings, lower holders, washers and lower holder nuts as shown (standard position).

The lower holder standard position as shown.

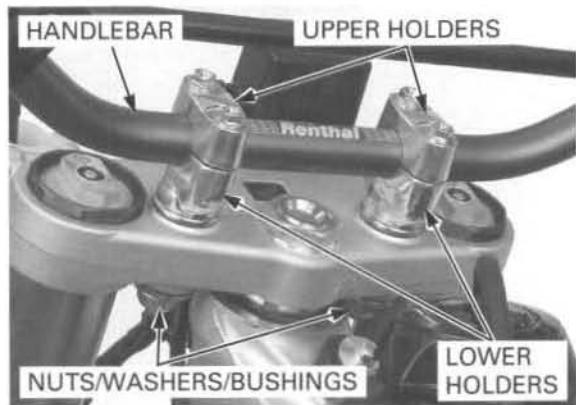


- By turning the lower holder 180 degrees, you can install it 6 mm (0.24 in) rearward of the standard position. By installing the optional lower holder, you can set it 3 mm (0.12 in) rearward of the standard position.
  - Standard: 3 mm (0.12 in) offset to forward
  - Standard 180 degrees turn: 3 mm (0.12 in) offset to rearward
  - Optional: No offset



## FRONT WHEEL/SUSPENSION/STEERING

Loosely install the handlebar and upper holders.



Align the paint mark on the handlebar with the top of the lower holder.

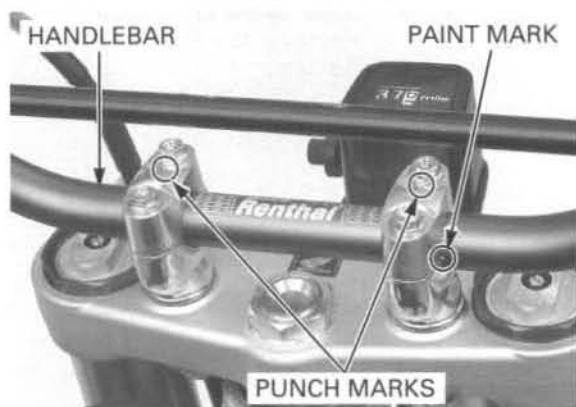
Place the upper holder on the handlebar with the punch marks facing forward.

Install and tighten the front handlebar holder bolts first, then tighten the rear bolts.

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

Tighten the lower holder nuts.

**TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)**

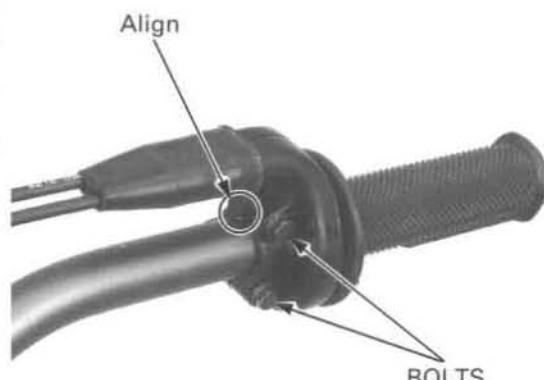


If you did not disassemble the throttle housing, apply grease to the sliding surface of the throttle pipe.

Install the throttle housing, aligning the end of the housing with the paint mark on the handlebar.

Tighten the throttle housing upper bolt first, then the lower bolt.

Adjust the throttle grip free play (page 3-8).



If you disassemble the throttle housing, install it as follows:

Apply oil to the throttle cable sliding surface.

Connect the throttle cables to the throttle pipe.

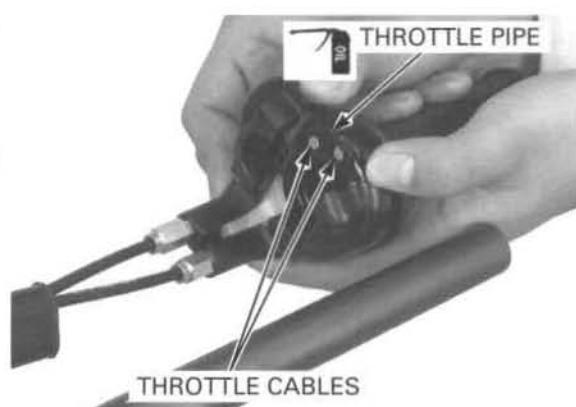
Place the throttle cables inside their guide.

Install the throttle housing, aligning the end of the housing with the mark on the handlebar.

Tighten the upper bolt first, then the lower bolt.

Install the throttle housing dust cover.

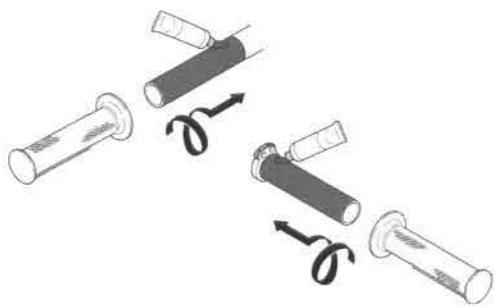
Check the throttle grip free play (page 3-8).



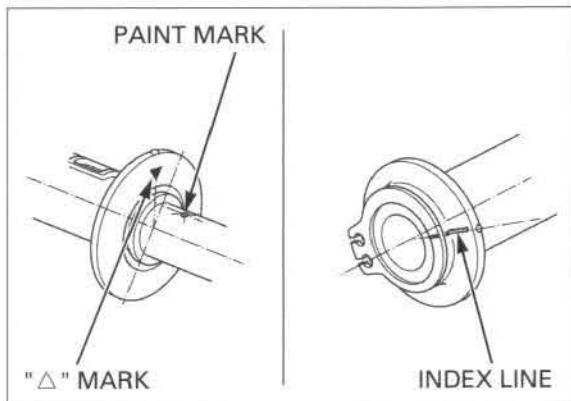
If the handlebar grips are removed, apply Honda Bond A or Pro Honda Hand Grip Cement (U.S.A. only) to the inside of the grip and to the clean surfaces of the right of the throttle pipe and left sides of the handlebar.

*Allow the adhesive to dry for approximately 1 hour before using.*

Wait 3 – 5 minutes and install the grip.  
Rotate the grips for even application of the adhesive.



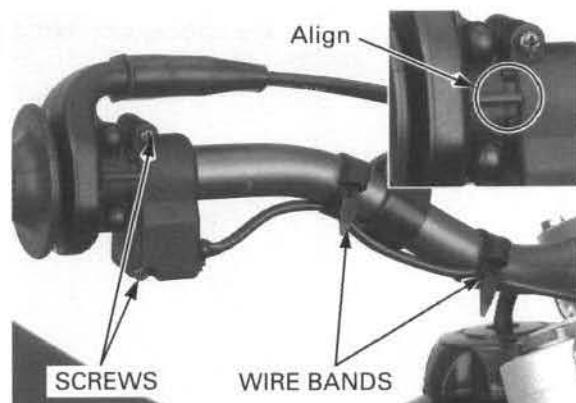
Align the "△" mark on the left grip with the paint mark on the handlebar.  
Align the mark on the right grip with the edge of the throttle grip end.



Align the starter switch housing as shown.  
Install and tighten the screws to the specified torque.

**TORQUE: 0.7 N·m (0.07 kgf·m, 0.5 lbf·ft)**

Install the wire bands.



Position the brake master cylinder on the handlebar.  
Install the master cylinder holder with the "UP" mark facing up and align the end of the holder with the paint mark on the handlebar.

Tighten the upper master cylinder holder bolt first, then tighten the lower bolt.

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



## FRONT WHEEL/SUSPENSION/STEERING

Install the clutch lever bracket and holder with the punch mark on the holder facing up.  
Align the end of the holder with the paint mark on the handlebar.  
Tighten the upper bolt first, then the lower bolt.

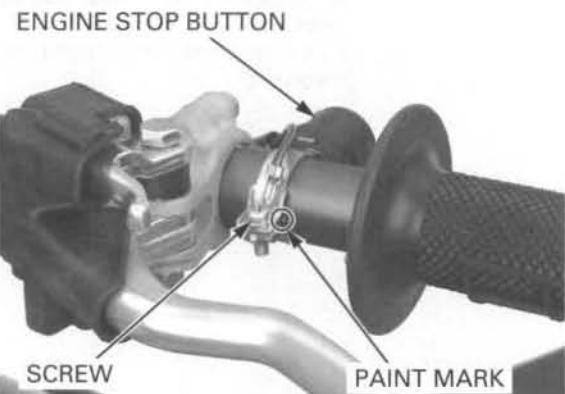
**TORQUE: 8.8 N·m (0.9 kgf·m, 6.5 lbf·ft)**



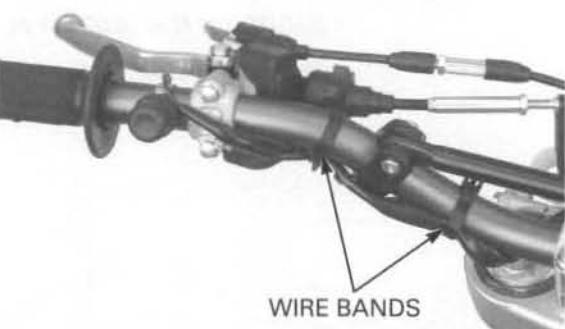
Install the engine stop button on the handlebar.  
Align the end of the holder with the paint mark on the handlebar.

Tighten the engine stop button screw to the specified torque.

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



Clamp the engine stop button wire with the wire bands.



Route the fuel cap breather hose as shown.

Install the handlebar pad.

Install the front visor (page 2-5).

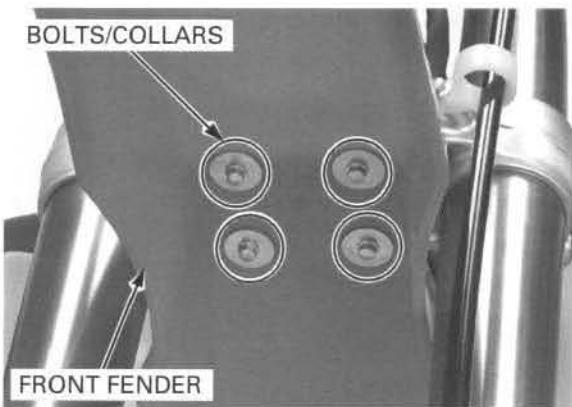
Check the clutch lever free play (page 3-28).



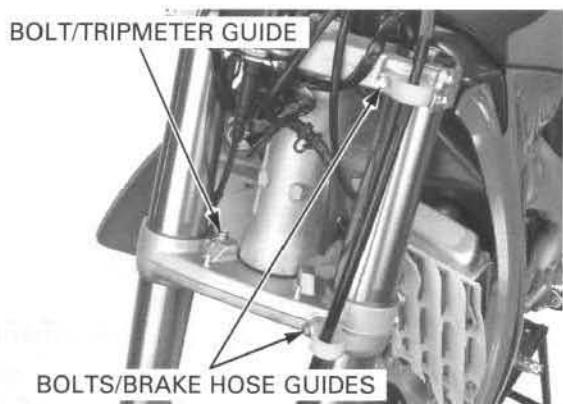
## STEERING STEM

### REMOVAL

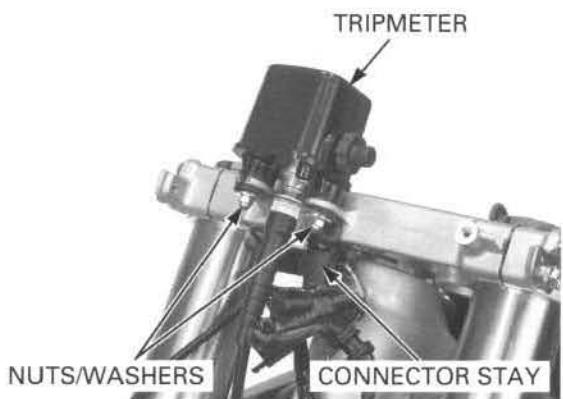
- Remove the front visor (page 2-5).
- Remove the handlebar (page 13-31).
- Remove the front wheel (page 13-7).
- Remove the bolts, collars and front fender.



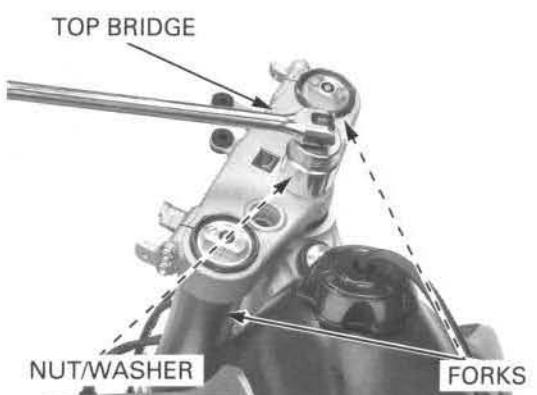
- Remove the bolts and brake hose guides.
- Remove the bolt and tripmeter cable guide.



- Remove the nuts, washers, tripmeter stay and connector stay.



- Remove the steering stem nut and washer.
- Remove the forks (page 13-12).
- Remove the fork top bridge.



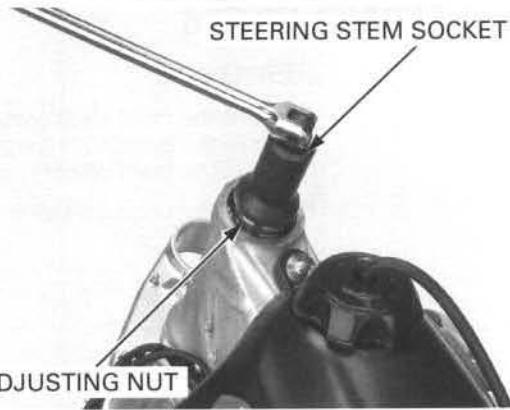
## FRONT WHEEL/SUSPENSION/STEERING

Remove the steering stem adjusting nut using the special tool.

**TOOL:**

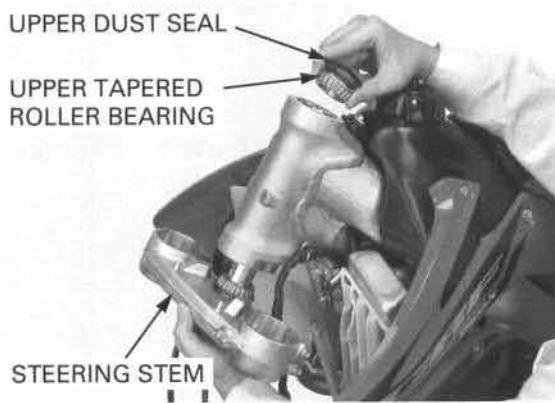
Steering stem socket

07916-3710101 or  
07702-0020001  
(U.S.A. only)



Remove the upper dust seal, upper tapered roller bearing and steering stem.

Check the bearings and outer races for wear or damage.



### BEARING REPLACEMENT

*Always replace the bearings and races as a set.*

**TOOL:**

Ball race remover

07946-3710500



Install a new lower outer race, bearing race installers and installer shaft as shown.

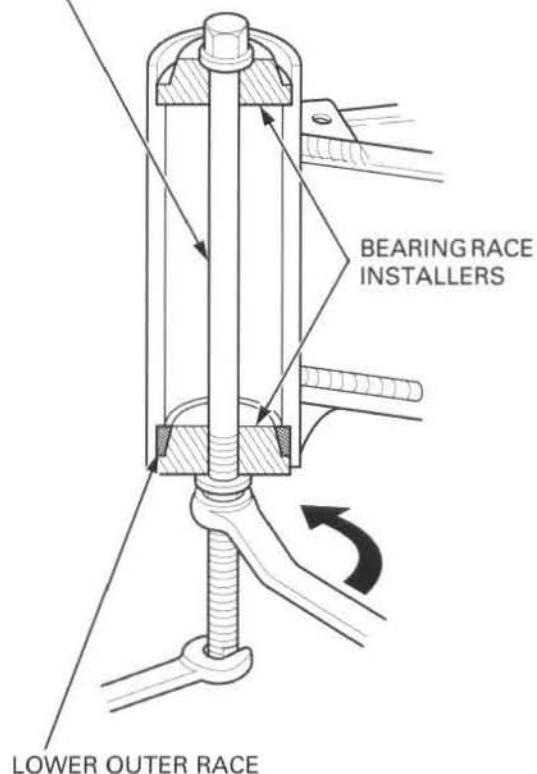
Hold the shaft with a wrench and turn the installer to install the lower outer race.

**TOOLS:**

Bearing race installer  
(2 required)  
Installer shaft

07VMF-KZ30100  
07VMF-KZ30200

INSTALLER SHAFT



Install a new upper outer race, bearing race installers and installer shaft as shown.

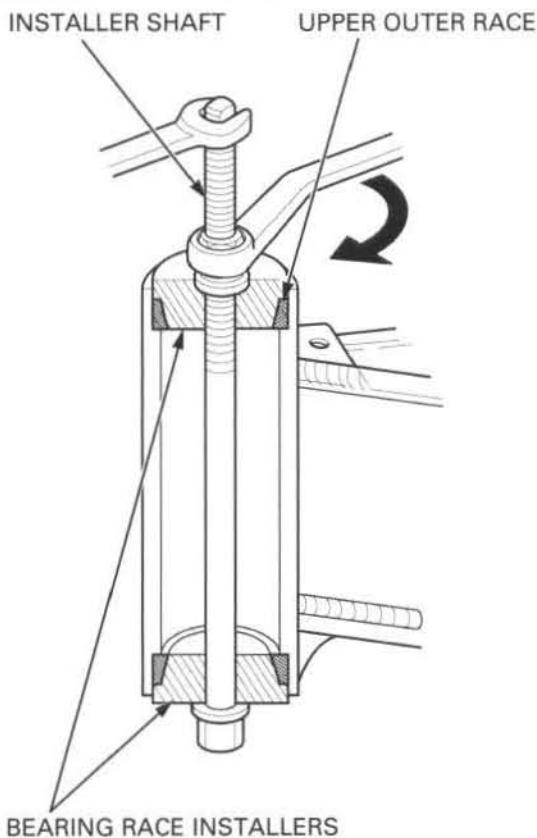
Hold the shaft with a wrench and turn the installer to install the upper outer race.

**TOOLS:**

Bearing race installer  
(2 required)  
Installer shaft

07VMF-KZ30100  
07VMF-KZ30200

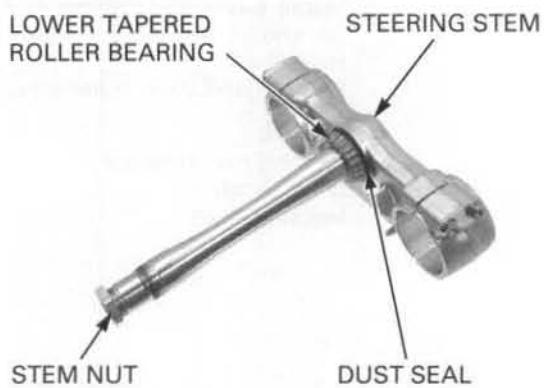
INSTALLER SHAFT



## FRONT WHEEL/SUSPENSION/STEERING

Temporarily install the stem nut to avoid damaging the steering stem threads.

Remove the lower tapered roller bearing and dust seal from the steering stem.



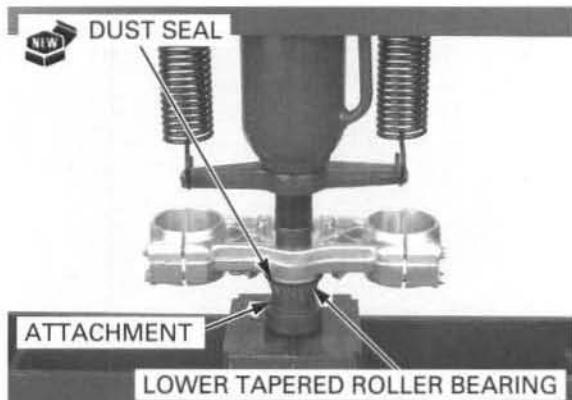
Install a new dust seal.

Install the lower bearing using a hydraulic press and special tool as shown.

### TOOL:

Attachment, 30 mm I.D.

07746-0030300



## INSTALLATION

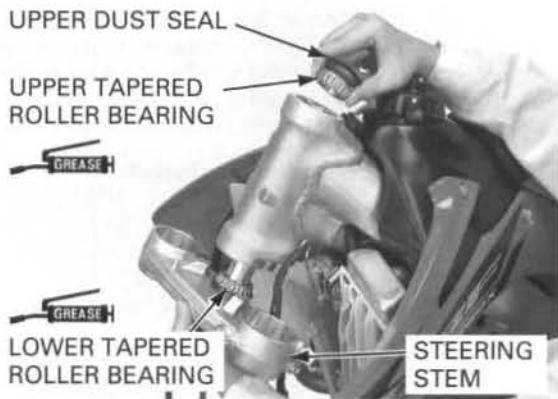
Pack the upper and lower tapered roller bearings with specified grease (page 1-22).

Apply specified grease (page 1-22) to all of the bearing surfaces.

Install the upper tapered roller bearing in the steering head.

Slide the steering stem into the steering head from the bottom.

Install the upper dust seal.



Install the steering stem adjusting nut.

Tighten the steering stem adjusting nut to the specified torque using the special tool.

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

### TOOL:

Steering stem socket

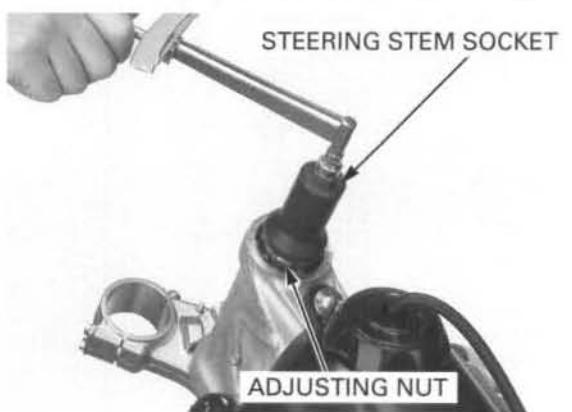
07916-3710101 or  
07702-0020001  
(U.S.A. only)

Move the steering stem lock-to-lock several times to seat the bearings.

Loosen the adjusting nut to torque of 0 N·m (0 kgf·m, 0 lbf·ft), and retighten to the specified torque.

**TORQUE: 6.9 N·m (0.7 kgf·m, 5.1 lbf·ft)**

Recheck that the steering stem moves smoothly without play or binding.



Install the top bridge and washer.  
Loosely install the stem nut.

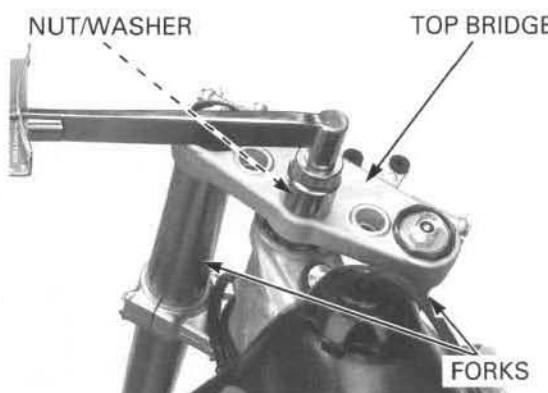
Insert the fork leg (page 13-29).

Tighten the stem nut to the specified torque.

**TORQUE: 108 N·m (11.0 kgf·m, 80 lbf·ft)**

Recheck the steering stem adjustment by turning bridge lock-to-lock and checking for smoothness. There should be no binding.

Install the remaining removed parts in the reverse order of removal.



---

**MEMO**

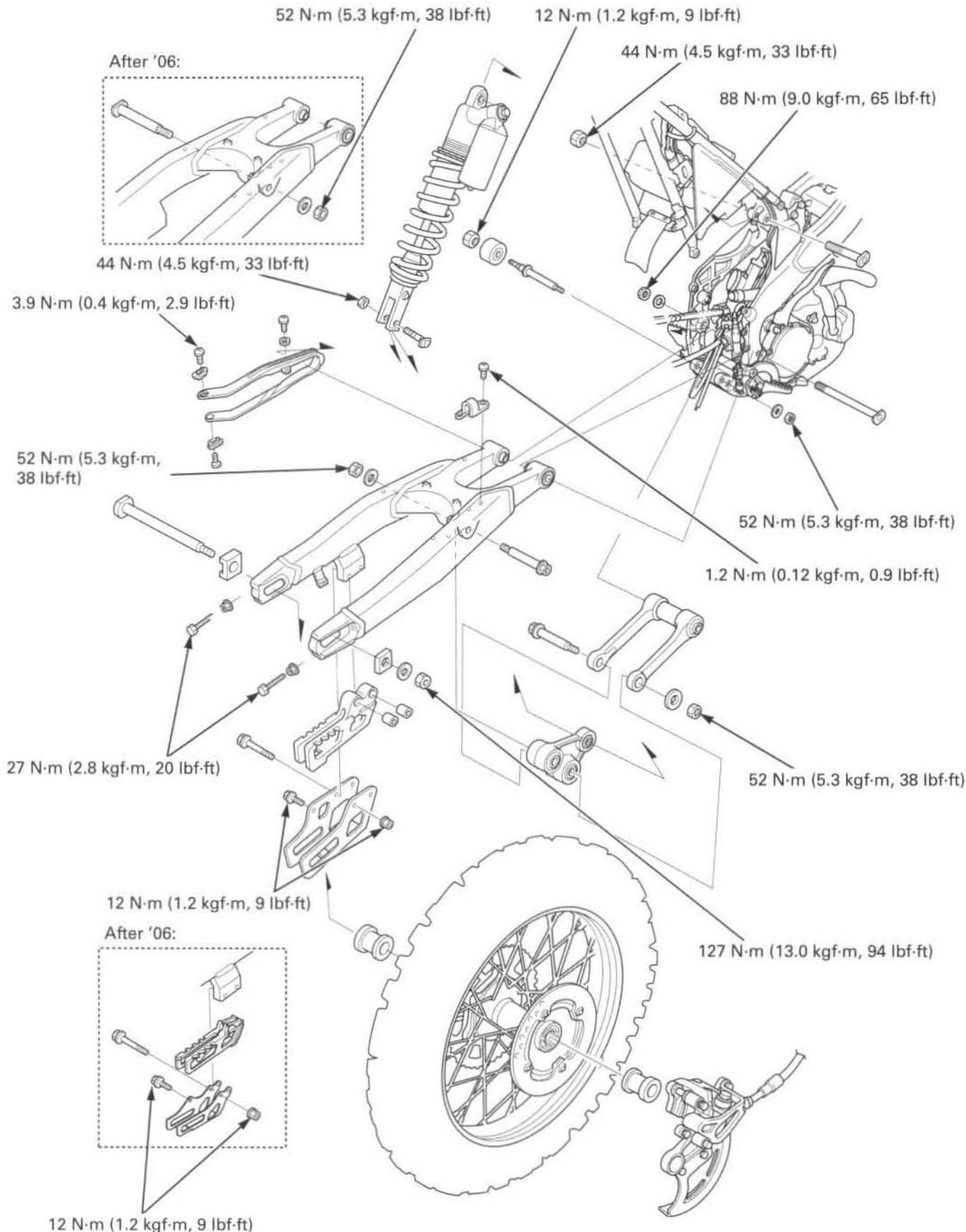


# **14. REAR WHEEL/SUSPENSION**

---

COMPONENT LOCATION .....	14-2	SHOCK ABSORBER.....	14-13
SERVICE INFORMATION .....	14-3	SHOCK LINKAGE .....	14-29
TROUBLESHOOTING .....	14-6	SWINGARM .....	14-35
REAR WHEEL .....	14-7		

## REAR WHEEL/SUSPENSION COMPONENT LOCATION



# SERVICE INFORMATION

## GENERAL

### WARNING

- Use only nitrogen to pressurize the shock absorber. The use of an unstable gas can cause a fire or explosion resulting in serious injury.
- The shock absorber contains nitrogen under high pressure. Do not allow fire or heat near the shock absorber.
- Before disposal of the shock absorber, release the nitrogen by pressing the valve core. Then remove the valve from the shock absorber.
  
- Keep grease off of the brake pads and disk.
- A contaminated brake disk or pad reduces stopping power. Discard contaminated pads and clean a contaminated disk with a high quality brake degreasing agent.
- When servicing the rear wheel, support the motorcycle using a safety stand or hoist.
- For optimum suspension performance and linkage component service life, the swingarm and shock linkage pivot bearing (along with related seals and bushings) should be disassembled, cleaned, inspected for wear and lubricated with multi-purpose grease NLGI No.2 (molybdenum disulfide additive) every three races or 7.5 hours of operation.
- Optional rear wheel sprockets, drive chain, shock springs and spring preload pin spanners are available. Refer to general information (page 1-30).
- For brake system information (page 15-3).
- Use genuine Honda replacement bolts and nuts for all suspension pivot and mounting points.

## SPECIFICATIONS

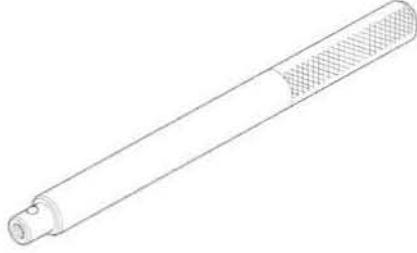
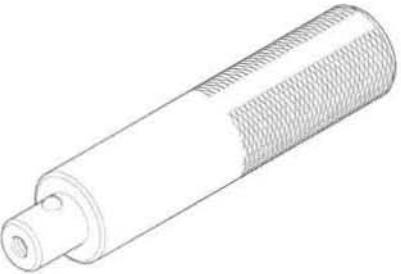
ITEM			STANDARD	Unit: mm (in) SERVICE LIMIT
Cold tire pressure			98 kPa (1.0 kgf/cm <sup>2</sup> , 14 psi)	-
Axle runout			-	0.20 (0.008)
Wheel rim runout	Radial		-	2.0 (0.08)
	Axial		-	2.0 (0.08)
Wheel hub-to-rim distance			45.5 ± 1.00 (1.79 ± 0.039)	-
Drive chain slack			25 – 35 (1.0 – 1.4)	60 (2.4)
Drive chain size/link	DID		520MXV - 116	-
Drive chain slider thickness			-	5.0 (0.2)
Drive chain roller I.D.	'04, '05	Upper	-	29 (1.1)
		Lower	-	39 (1.5)
	After '05	Upper	-	29 (1.1)
		Lower	-	31 (1.2)
Shock absorber	Damper gas pressure		981 kPa (10.0 kgf/cm <sup>2</sup> , 142 psi)	-
	Damper compressed gas		Nitrogen gas	-
	Damper rod compressed force at 9 mm compressed		20.0 – 24.0 kgf (44.1 – 52.9 lbf)	-
	Spring installed length (standard)	'04, '05	254.4 (10.02)	-
		After '05	256.6 (10.10)	-
High speed compression damping adjuster standard position	'04, '05		1-7/12 – 2-1/12 turns out from full in	-
	After '05		1-3/4 – 2-1/4 turns out from full in	-
Low speed compression damping adjuster standard position			12 clicks out from full in	-
Rebound damping adjuster standard position	'04, '05		13 – 16 clicks out from full in	-
	'06		12 – 15 clicks out from full in	-
	After '06		10 – 13 clicks out from full in	-

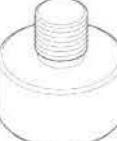
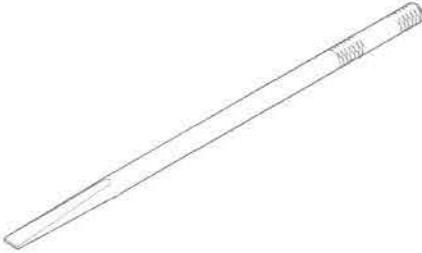
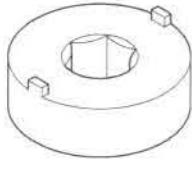
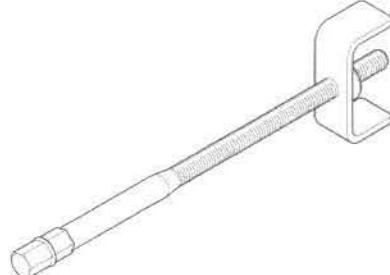
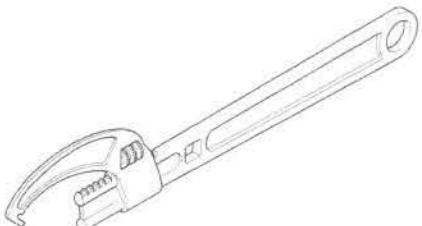
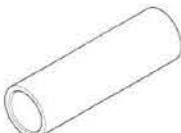
## REAR WHEEL/SUSPENSION

### TORQUE VALUES

Rear axle nut		127 N·m (13.0 kgf·m, 94 lbf·ft)	U-nut
Rear spoke		3.7 N·m (0.38 kgf·m, 2.7 lbf·ft)	
Rear rim lock		12 N·m (1.2 kgf·m, 9 lbf·ft)	
Driven sprocket nut		32 N·m (3.3 kgf·m, 24 lbf·ft)	U-nut
Rear brake disc nut		16 N·m (1.6 kgf·m, 12 lbf·ft)	U-nut
Rear wheel bearing retainer		44 N·m (4.5 kgf·m, 33 lbf·ft)	
Shock absorber upper mounting nut		44 N·m (4.5 kgf·m, 33 lbf·ft)	U-nut
Shock absorber lower mounting nut		44 N·m (4.5 kgf·m, 33 lbf·ft)	U-nut
Shock absorber damper rod end nut		37 N·m (3.8 kgf·m, 27 lbf·ft)	Stake
Shock absorber damping adjuster		29 N·m (3.0 kgf·m, 22 lbf·ft)	Stake
Shock absorber spring lock nut		44 N·m (4.5 kgf·m, 33 lbf·ft)	
Drive chain roller bolt/nut		12 N·m (1.2 kgf·m, 9 lbf·ft)	
Shock arm nut	(swingarm side)	52 N·m (5.3 kgf·m, 38 lbf·ft)	Apply oil to the threads and flange surface, U-nut
	(shock link side)	52 N·m (5.3 kgf·m, 38 lbf·ft)	Apply oil to the threads and flange surface, U-nut
Shock link nut	(frame side)	52 N·m (5.3 kgf·m, 38 lbf·ft)	Apply oil to the threads and flange surface, U-nut
Swingarm pivot nut		88 N·m (9.0 kgf·m, 65 lbf·ft)	U-nut
Drive chain guide mounting bolt/nut		12 N·m (1.2 kgf·m, 9 lbf·ft)	U-nut
Drive chain slider screw		3.9 N·m (0.4 kgf·m, 2.9 lbf·ft)	Apply locking agent to the threads
Rear brake hose guide screw		1.2 N·m (0.12 kgf·m, 0.9 lbf·ft)	
Drive chain adjusting bolt lock nut		27 N·m (2.8 kgf·m, 20 lbf·ft)	
Sub-frame mounting bolt	(upper)	30 N·m (3.1 kgf·m, 22 lbf·ft)	
	(lower)	49 N·m (5.0 kgf·m, 36 lbf·ft)	
Side stand mounting bolt	(upper)	54 N·m (5.5 kgf·m, 40 lbf·ft)	
	(lower)	39 N·m (4.0 kgf·m, 29 lbf·ft)	

### TOOLS

Spoke wrench, 6.6 mm 070MA-KZ30100   or equivalent commercially available in U.S.A.	Slider guide, 16 mm 07PMG-KZ40100 (not available in U.S.A.)  	Driver 07949-3710001  
Driver 07749-0010000  	Attachment, 28 x 30 mm 07946-1870100  	Attachment, 40 x 42 mm 07746-0010900  

Attachment, 24 x 26 mm 07746-0010700	Pilot, 19 mm 07746-0041400	Pilot, 20 mm 07746-0040500
		
Pilot, 22 mm 07746-0041000	Pilot, 25 mm 07746-0040600	Bearing remover head, 25 mm 07746-0050800
		
Bearing remover shaft 07GGD-0010100	Retainer wrench, 48 x 15 mm 07YMA-KZ40100  or 07HMA-KS70100 (U.S.A. only)	Retainer wrench body 07710-0010401
	  or 	
Pin spanner (2 required) 07702-0020001    or Pin spanner A 89201-KS6-810 (2 required)	Piston ring guide 070MG-KZ30100 (not available in U.S.A.)  	Collar, 23 x 17 mm 07GMD-KT8A110  

## REAR WHEEL/SUSPENSION

---

Attachment, 30 mm I.D.  
07746-0030300



## TROUBLESHOOTING

### Soft suspension

- Weak shock absorber springs
- Incorrect suspension adjustment
- Oil leakage from damper unit
- Tire pressure too low

### Stiff suspension

- Damaged shock absorber mounting bearing
- Bent damper rod
- Damaged swingarm pivot bearings
- Damaged suspension linkage bearings
- Bent swingarm pivot
- Incorrect suspension adjustment
- Tire pressure too high

### Steers to one side or does not track straight

- Bent rear axle
- Axle alignment/chain adjustment not equal on both sides

### Rear wheel wobbles

- Bent rim
- Worn rear wheel bearings
- Faulty tire
- Tire pressure too low
- Faulty swingarm pivot bearings

## REAR WHEEL

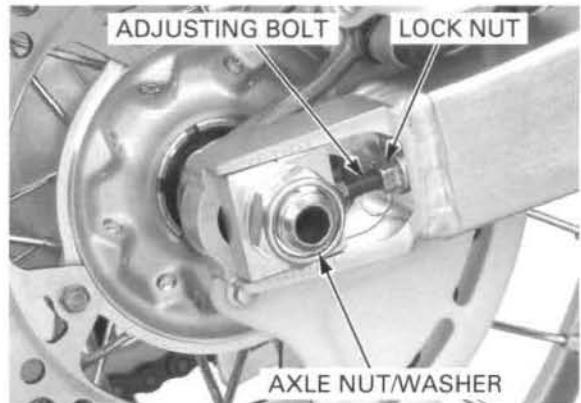
### REMOVAL

Raise the rear wheel off the ground by placing a workstand or equivalent under the engine.

Loosen the axle nut.

Loosen the drive chain adjuster lock nuts and turn the adjusting bolts clockwise fully.

Remove the axle nut and washer.

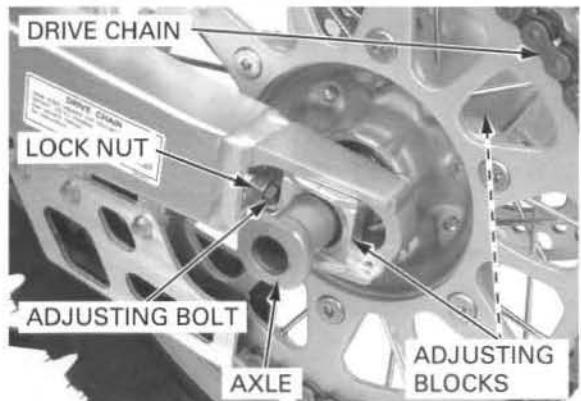


Push the rear wheel forward to derail the drive chain from the driven sprocket.

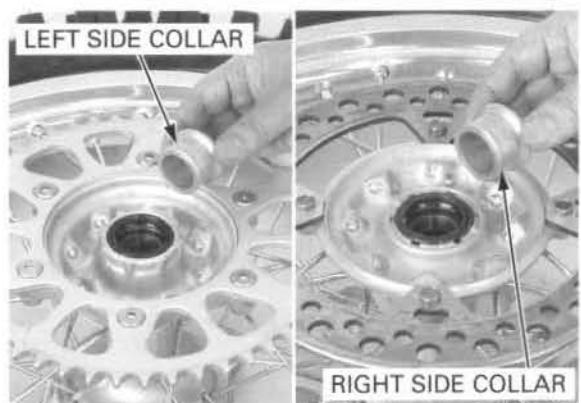
*Be careful not to damage the brake pads with disc.*

Remove the axle, adjusting blocks and rear wheel.

Do not operate the brake pedal after removing the rear wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.



Remove the right and left side collars.



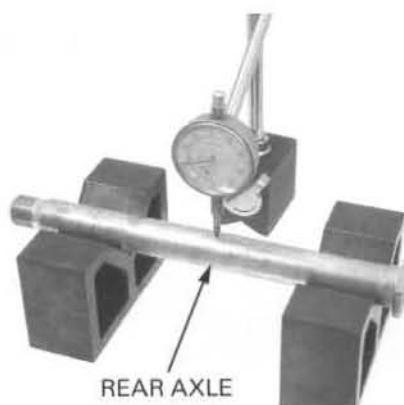
### INSPECTION

#### AXLE

Set the axle on V-blocks and measure the runout. Turn the axle and measure the runout using a dial indicator.

Actual runout is 1/2 of the total indicator reading.

SERVICE LIMIT: 0.20 mm (0.008 in)



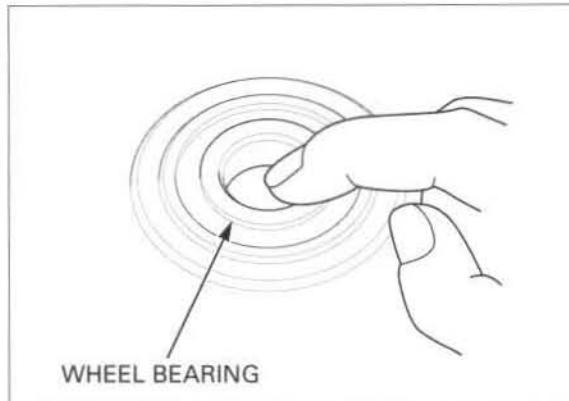
## REAR WHEEL/SUSPENSION

### WHEEL BEARING

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

*Replace the wheel bearings in pairs.*

Remove and discard the bearings if the races do not turn smoothly, quietly, or if they fit loosely in the hub.



WHEEL BEARING

### WHEEL RIM RUNOUT

Check the rim runout by placing the wheel in a turning stand.

Spin the wheel by hand, and read the runout using a dial indicator.

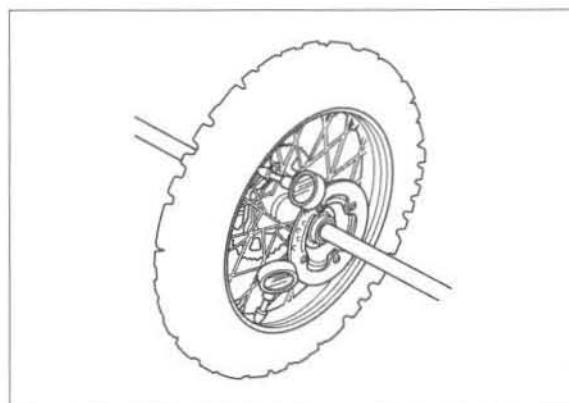
Actual runout is 1/2 the indicator reading.

### SERVICE LIMITS:

Radial: 2.0 mm (0.08 in)

Axial: 2.0 mm (0.08 in)

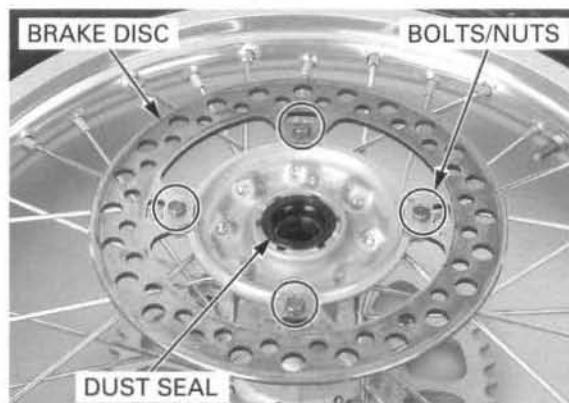
Check the spokes and tighten any that are loose.



### DISASSEMBLY

Remove the bolts, nuts and brake disc.

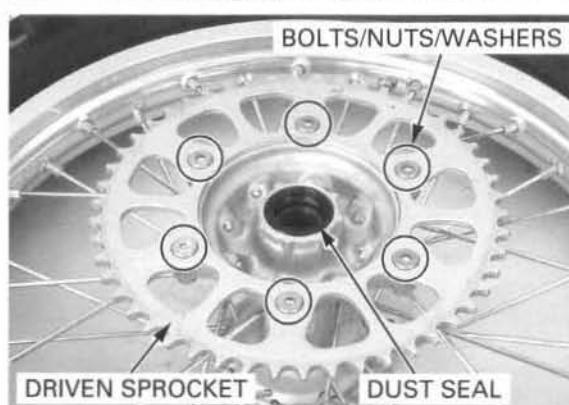
Remove the right dust seal.



Remove the driven sprocket bolts, nuts and washers.

Remove the driven sprocket.

Remove the left dust seal.



Remove the bearing retainer using the special tools.

**TOOLS:**

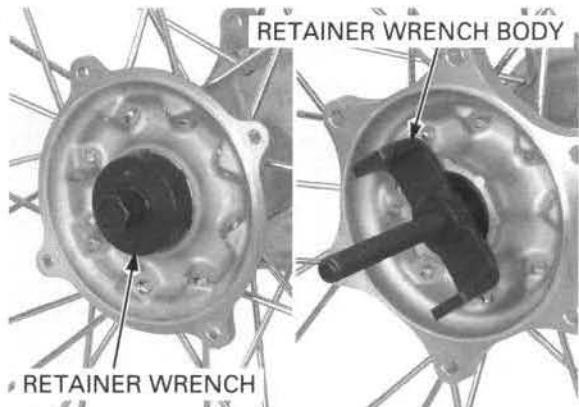
Retainer wrench, 48 x 15 mm 07YMA-KZ40100 or

07HMA-KS70100

(U.S.A. only)

Retainer wrench body

07710-0010401



Install the remover head into the bearing.

From the opposite side of the wheel, install the remover shaft and drive the bearing out of the wheel hub.

Remove the distance collar and drive out the bearings.

**TOOLS:**

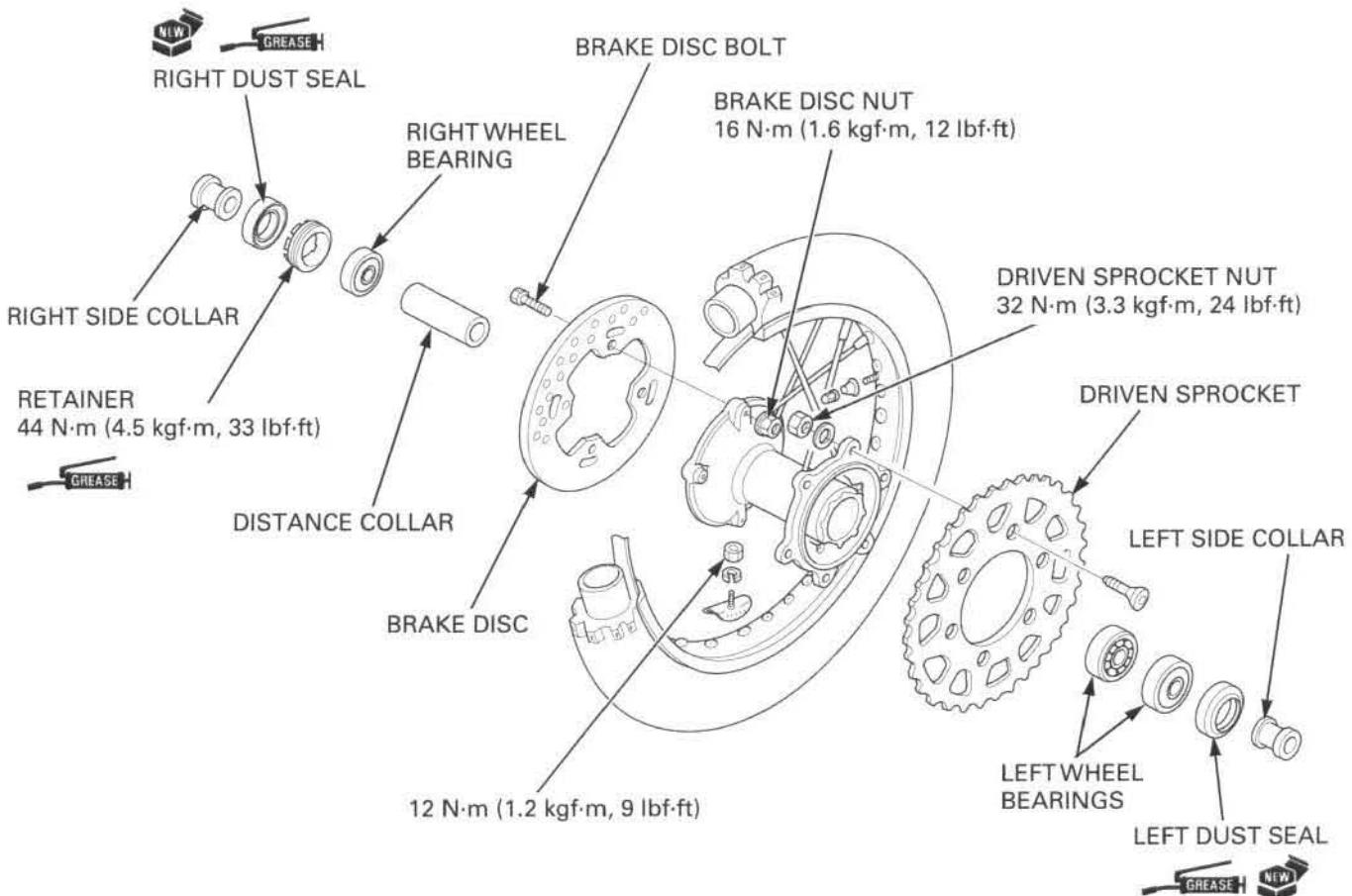
Bearing remover head, 25 mm 07746-0050800

Bearing remover shaft 07GGD-0010100

- Never install the old bearings; once the bearing have been removed, they must be replaced with new ones.
- Replace the bearings in pairs.



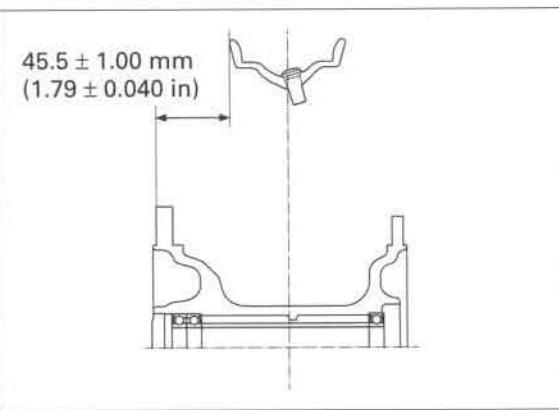
## ASSEMBLY



## REAR WHEEL/SUSPENSION

Place the hub in the center of the rim, and begin lacing with new spokes.

Adjust the hub position so the distance from the hub left end surface to the side of the rim is  $45.5 \pm 1.00$  mm ( $1.79 \pm 0.040$  in) as shown.



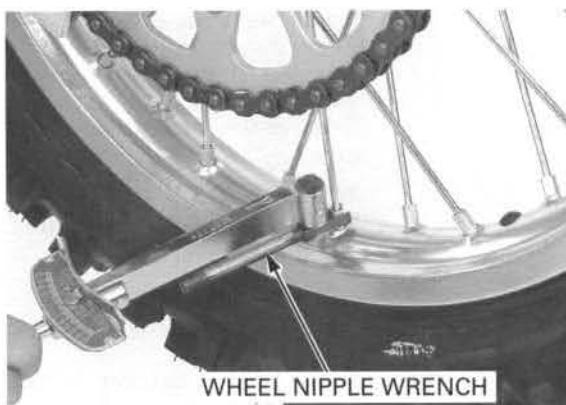
Torque the spoke in two or three progressive steps.

**TOOL:**

Spoke wrench, 6.6 mm

070MA-KZ30100 or  
equivalent  
commercially  
available in U.S.A.

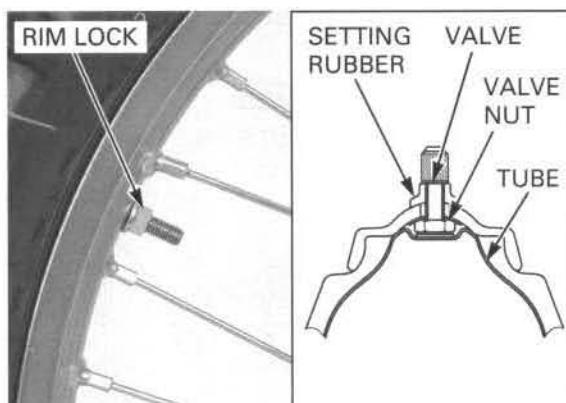
**TORQUE: 3.7 N·m (0.38 kgf·m, 2.7 lbf·ft)**



Install the rim band, rim lock, tube and tire.

Tighten the rim lock to the specified torque.

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



*Never install the old bearings; once the bearings have been removed, the bearing must be replaced with new ones.*

Drive in a new right bearing using the special tools.

**TOOLS:**

Driver

07749-0010000

Attachment, 40 x 42 mm

07746-0010900

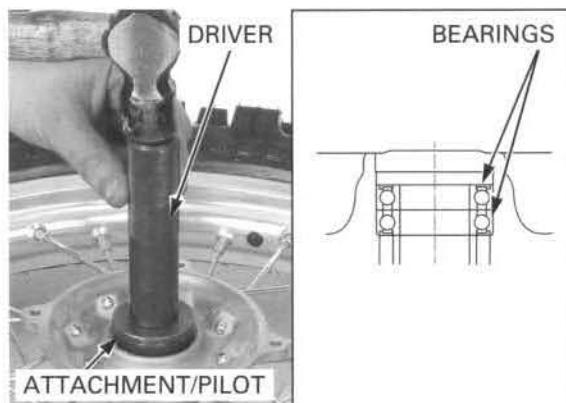
Pilot, 25 mm

07746-0040600

**NOTE:**

Drive the right bearing in the wheel hub until it is fully seated.

Install the distance collar into place, then drive the left inner and outer bearings using the same tools as shown.



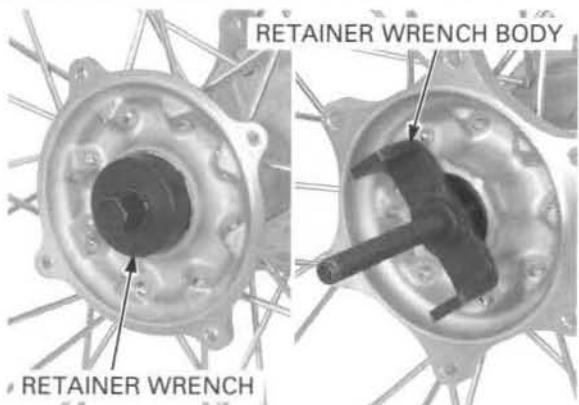
Apply grease to the bearing retainer threads. Install and tighten the bearing retainer to the specified torque using the special tools.

## TOOLS:

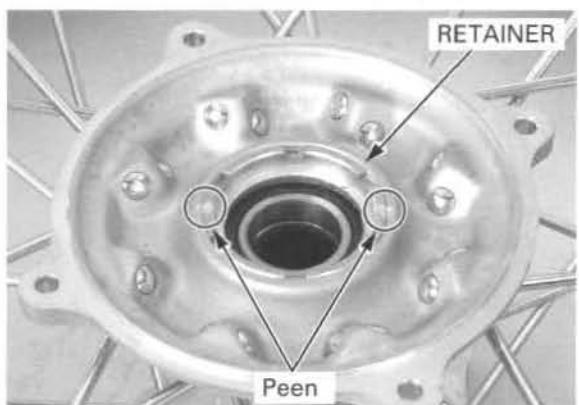
**TOOL:**  
Retainer wrench, 48 x 15 mm 07YMA-KZ40100 or  
07HMA-KS70100  
(U.S.A. only)

**Retainer wrench body** 07710-0010401

**TORQUE:** 44 N·m (4.5 kgf·m, 33 lbf·ft)



Peen the edge of the retainer.

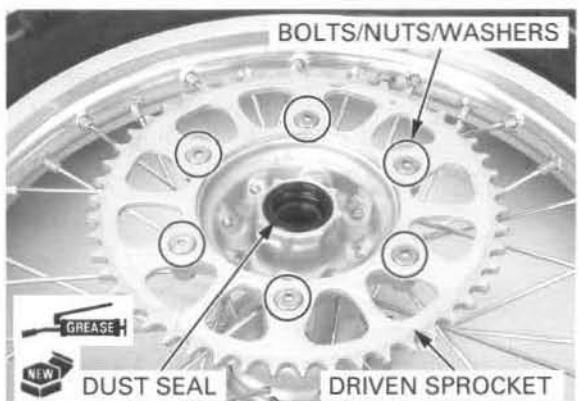


Install the driven sprocket.

Install the driven sprocket.

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

Apply grease to a new left dust seal lips, then install the seal.



Install the brake disc onto the wheel hub with the minimum thickness mark (MIN TH 3.5 mm) facing out.

**Install the bolts and nuts.**

Tighten the nuts to the specified torque.

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

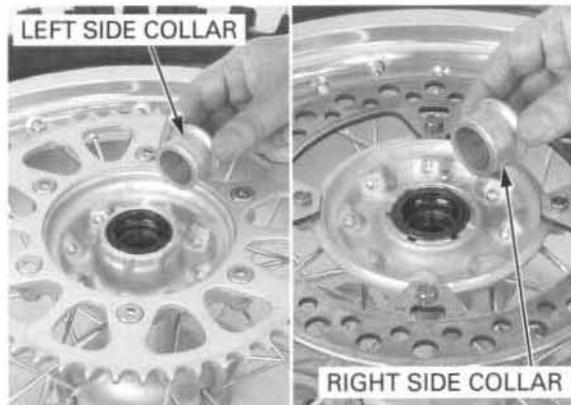
Apply grease to a new right dust



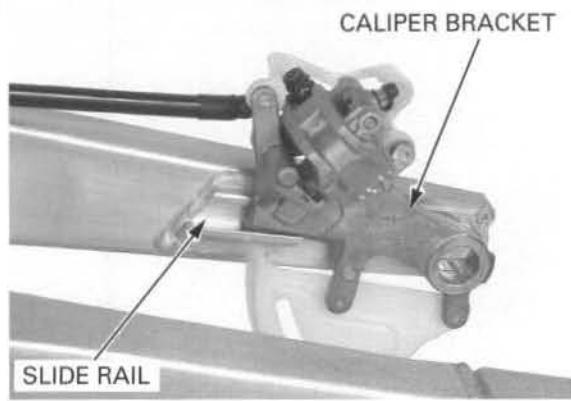
## REAR WHEEL/SUSPENSION

### INSTALLATION

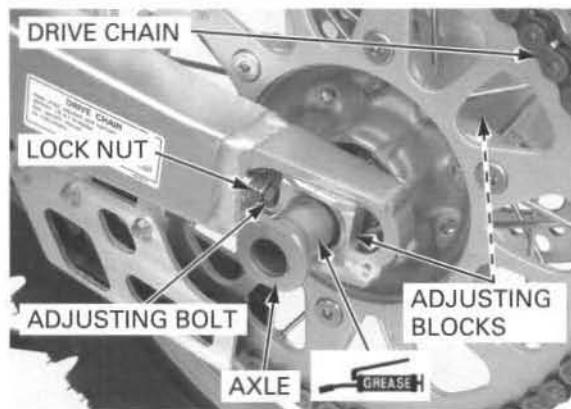
Install the right and left side collars.



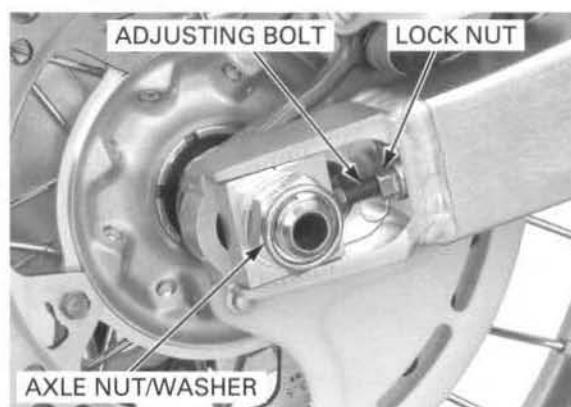
Install the rear brake caliper bracket onto the slide rail of the swingarm.



Place the rear wheel into the swingarm.  
Install the drive chain over the driven sprocket.  
Apply a thin coat of grease to the axle.  
Install the adjusting block and axle from the left side.



Install the adjusting block, washer and axle nut.  
Adjust the drive chain slack (page 3-21).  
Tighten the axle nut to the specified torque.  
**TORQUE: 127 N·m (13.0 kgf·m, 94 lbf·ft)**  
Snug the adjusting bolts against the chain adjusters  
and tighten the lock nuts to the specified torque.  
**TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)**



## SHOCK ABSORBER

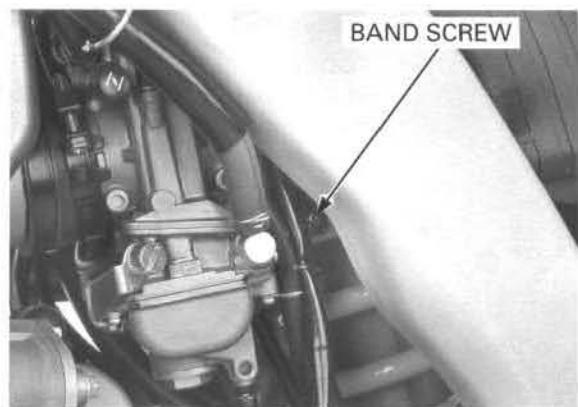
### REMOVAL

Remove the seat (page 2-3).

Remove the fuel tank (page 2-7).

Raise the rear wheel off the ground by placing a workstand or equivalent under the engine.

Loosen the air cleaner connecting boot band screw.



Remove the sub-frame lower mounting bolts and loosen the sub-frame upper mounting bolt.

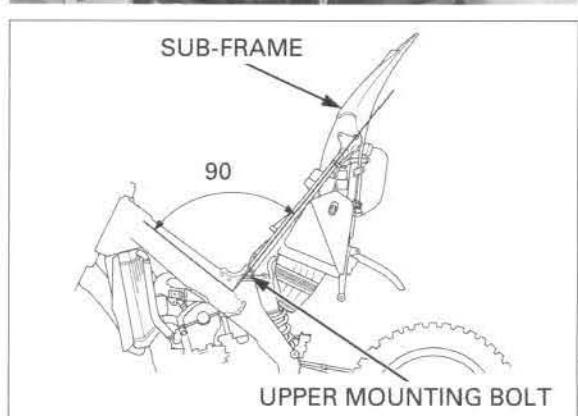
Lift the sub-frame as shown.

#### NOTICE

*Do not lift up the sub-frame over 90° to avoid damaging the wire harness.*

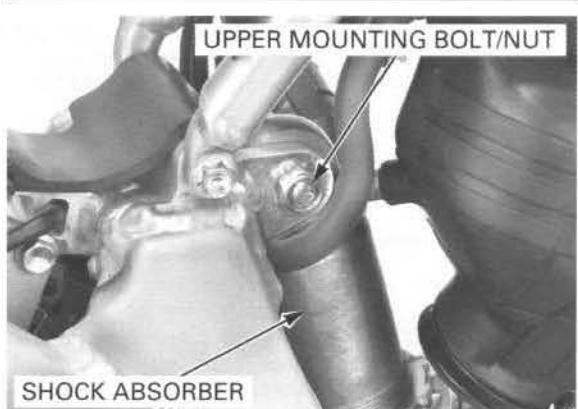
Tighten the sub-frame upper mounting bolt to the specified torque.

**TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)**

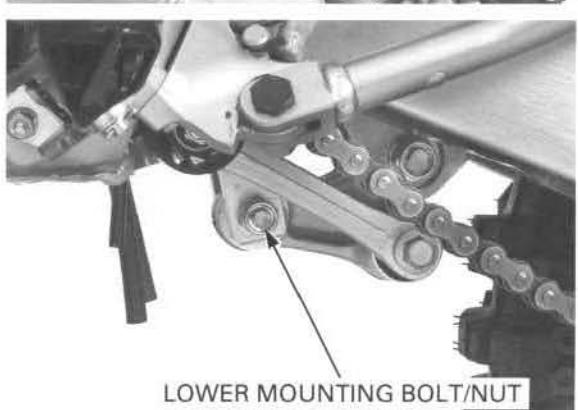


*If you plan to disassemble the shock absorber, loosen the spring lock nut and adjusting nut.*

Remove the shock absorber upper mounting bolt and nut.



Remove the shock absorber lower mounting bolt/nut and shock absorber.



## REAR WHEEL/SUSPENSION

### DISASSEMBLY

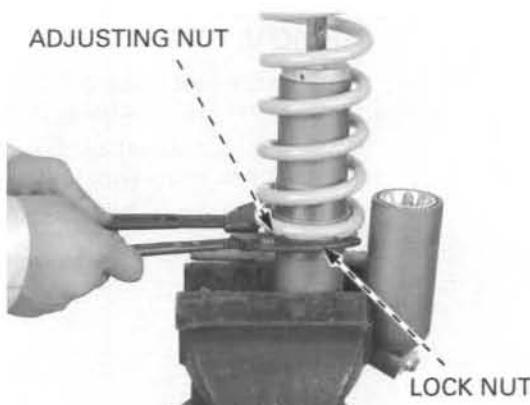
Measure the spring length for reinstallation later.

Set the shock absorber upper mount in a vise with a piece of wood or soft jaws to avoid damage.

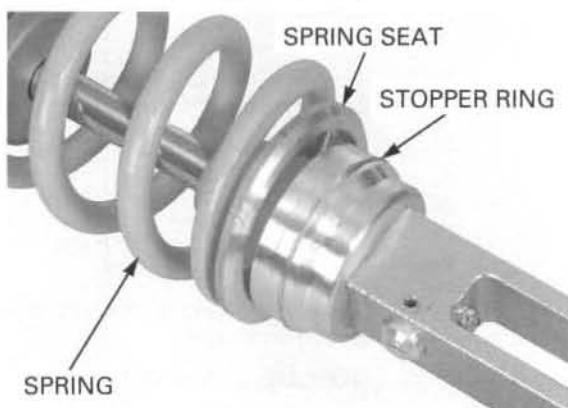
Loosen the lock nut and adjusting nut.

#### TOOLS:

Pin spanner A      89201-KS6-810 (2 required) or  
Pin spanner      07702-0020001 (2 required)



Remove the stopper ring, spring seat and spring.



### BLADDER REPLACEMENT

Replace the bladder when oil leaks around the chamber cap or oil spills out when releasing the nitrogen from the reservoir.

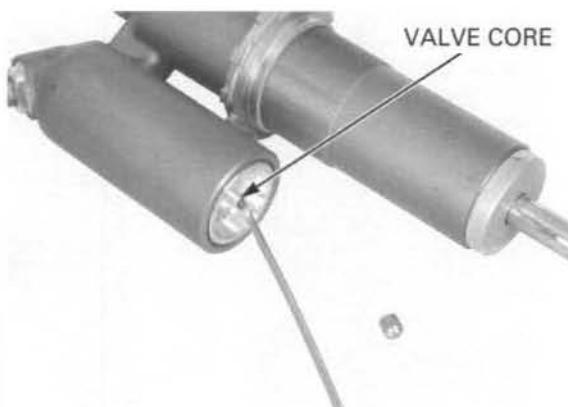
Perform this procedure before draining the oil from the damper.

Point the valve away from you to prevent debris getting in your eyes.

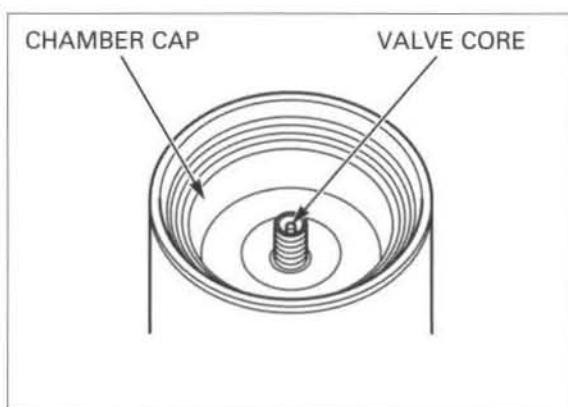
Depress the valve core to release the nitrogen from the reservoir.

#### WARNING

- The chamber cap will be under significant pressure and could cause serious injury.
- Release all nitrogen pressure before disassembly.
- Wear protective clothing and adequate eye protection to prevent injury and debris entering your eyes.



Remove the valve core.

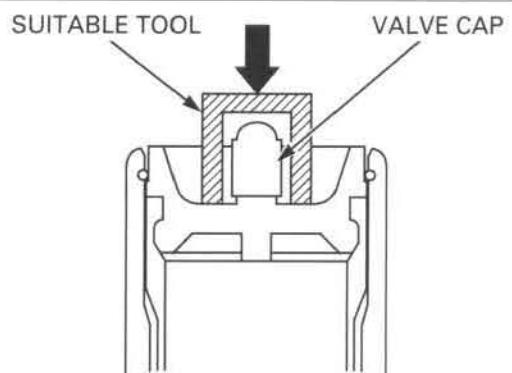


Depress the chamber cap just the minimum amount for stopper ring access.

Put a suitable tool on the chamber cap and push it in by lightly tapping on the tool with a plastic hammer until you have good access to the stopper ring.

### NOTICE

To avoid damaging the threads of the gas valve, install the valve cap before depressing the chamber cap.



To avoid damaging the inside surfaces of the reservoir, cover the screwdriver with a shop towel.

Two small screwdrivers and a shop towel are required to remove the stopper ring.

The stopper ring groove in the reservoir is ramped toward the inside to give the stopper ring a square shoulder on which to seat securely.

To remove the stopper ring, first push one end of the stopper ring out of its groove, then slip the second screwdriver between the stopper ring and the reservoir to act as a ramp.

Now, use the other screwdriver to pull the stopper ring completely out.

- Check the stopper ring groove for burrs. Remove any burrs with a fine emery cloth before pulling the damper rod out of the case.

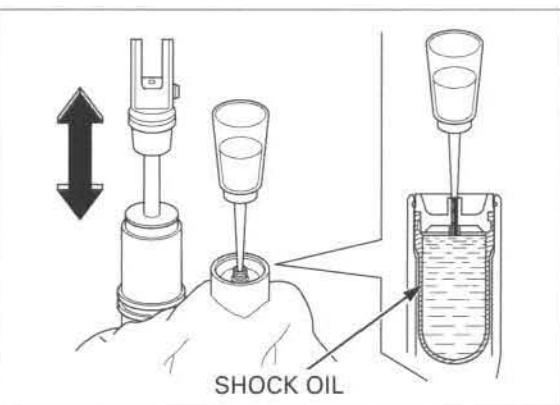
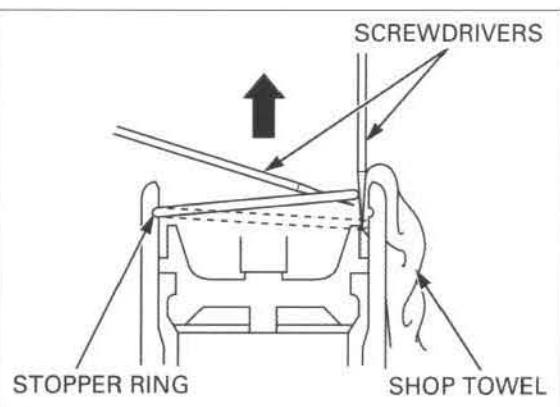
Set the shock absorber in a vise with a piece of wood or soft jaws to avoid damage.

Using a suitable squeeze bottle, fill the reservoir with the recommended shock oil.

### RECOMMENDED SHOCK OIL:

Pro-Honda HP Fork Oil 5W or equivalent

Slowly pump the damper rod until no air bubbles appear in the valve core hole, then pull the damper rod all the way out.



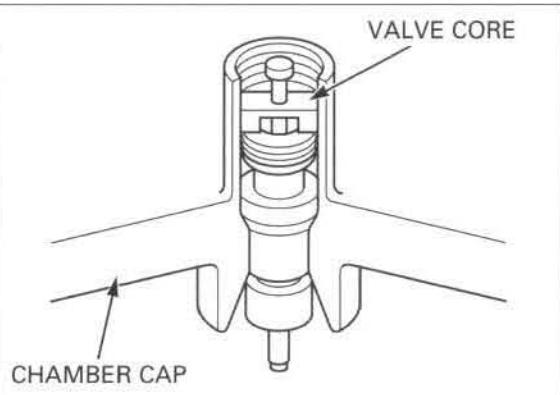
Install the valve core securely.

Wear protective clothing and a face guard to protect your eyes and face in case the chamber cap pops out quickly and forcibly.

Remove the chamber cap and bladder following the procedure below:

#### NOTE:

- The chamber cap will be removed with hydraulic pressure so its force can be significant considering the air in the bladder.
- Wrap the shop towel around the chamber cap. Compress the damper rod slowly, to force the chamber cap out.



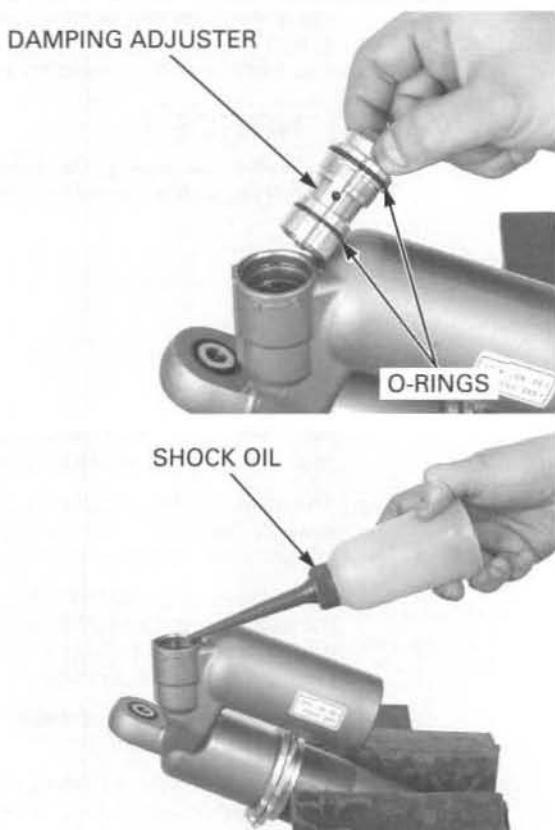
## REAR WHEEL/SUSPENSION

- Set the damper in a vise with soft jaws with the damping adjuster facing up, being careful not to distort the damper body. Remove the damping adjuster and O-rings.

### NOTICE

*Do not overtighten the vise. Damage to the damper case will result.*

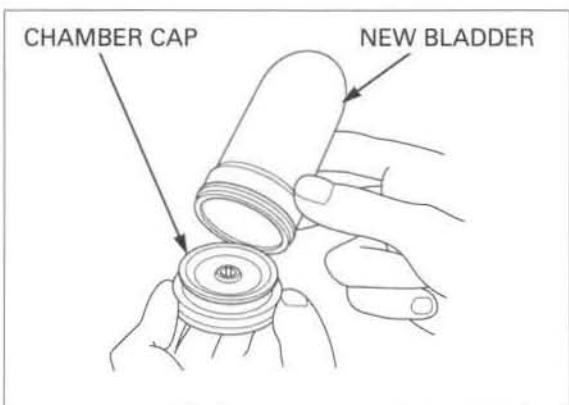
- Fill the damper with Pro-Honda HP Fork Oil 5W through the damping adjuster hole, while slowly pulling the damper rod out.
- Reinstall the damping adjuster after filling the damper.
  - The damper must be kept upright to prevent oil from leaking out.
- Place the damper with the reservoir chamber cap facing up.
- Repeat steps 1 to 5 until the chamber cap is removed from the reservoir.



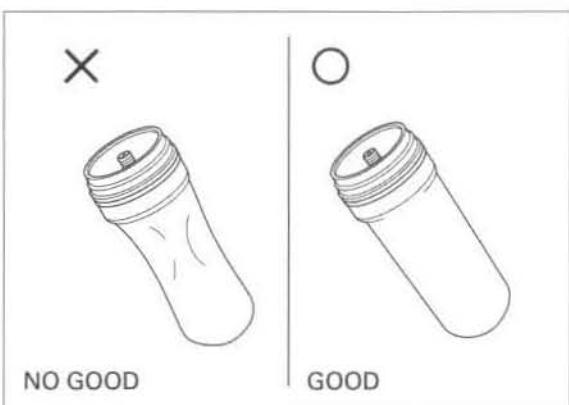
*Do not use any sort of tool to remove the bladder, because it may damage the chamber cap.*

Remove the bladder from the chamber cap.

Attach a new bladder to the chamber cap.



*Do not reuse the bladder. If the bladder becomes distorted during installation, depress the valve core to reform it.*



Clean the inside of the reservoir and fill it with Pro - Honda HP Fork Oil 5W.

#### RECOMMENDED SHOCK OIL:

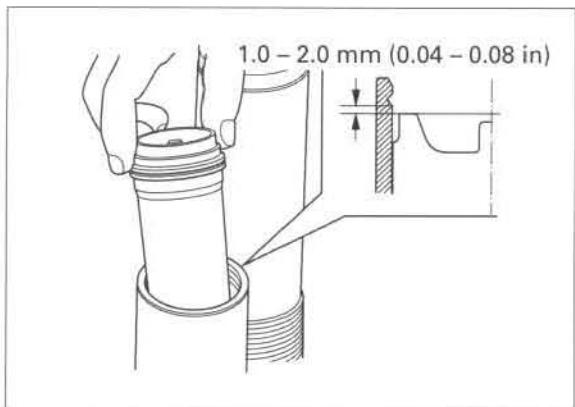
**Pro-Honda HP Fork Oil 5W or equivalent**

Apply a light coat of shock oil to the lip of the bladder, and press the chamber cap into the reservoir to about 1.0 – 2.0 mm (0.04 – 0.08 in) below the stopper ring groove.

*Be sure the stopper ring is seated in the ring groove all the way around or the chamber cap can come apart when riding the motorcycle.*

Install the stopper ring in the groove of the reservoir securely.

Temporarily fill the reservoir with air slowly until the chamber cap seats against the stopper ring.



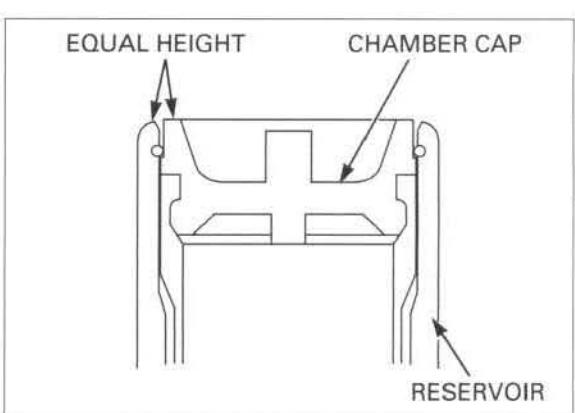
Make sure the chamber cap face is level with the reservoir face.

If the chamber cap does not seat fully, the chamber cap may fly out when filling the reservoir with nitrogen.

Release the air from the reservoir by depressing the valve core.

Bleed the air from the shock absorber bladder (page 14-25). Fill the reservoir with nitrogen to the specified pressure (page 14-26).

EQUAL HEIGHT CHAMBER CAP



## DAMPER DISASSEMBLY

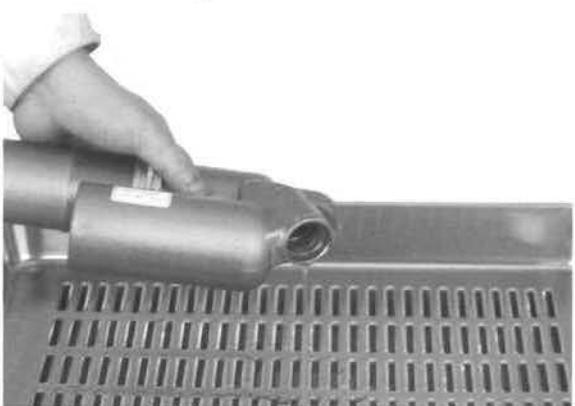
*Point the valve away from you to prevent debris getting in your eyes.*

Depress the valve core to release the nitrogen from the reservoir (page 14-14). Before disposal of the shock absorber, release the nitrogen by pressing the valve core. Then remove the valve from the shock absorber.

Remove the damping adjuster.



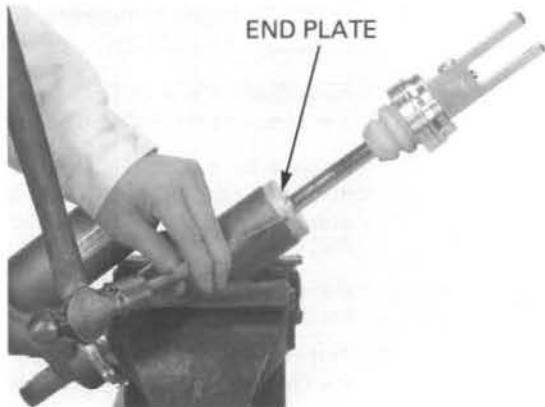
Drain most of the shock oil from the damper and reservoir, by pumping the damper rod in and out several times.



## REAR WHEEL/SUSPENSION

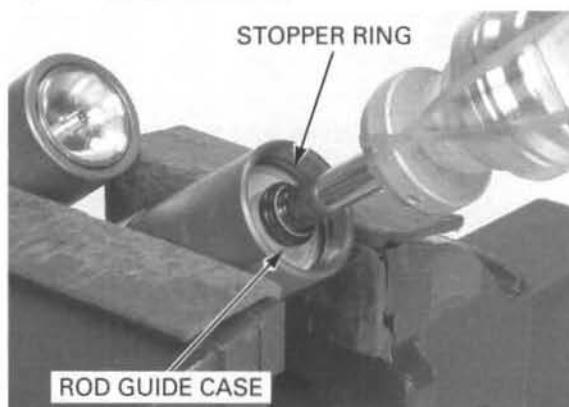
Set the shock absorber in a vise with a piece of wood or soft jaws to avoid damage.

Remove the end plate and tape or tie it to the rubber stopper so it will not get in the way.



Push in the rod guide case until you have good access to the stopper ring.

Two small screwdrivers are required to remove the stopper ring. The stopper ring groove in the damper case is ramped towards the inside to give the stopper ring a square shoulder on which to seat securely.

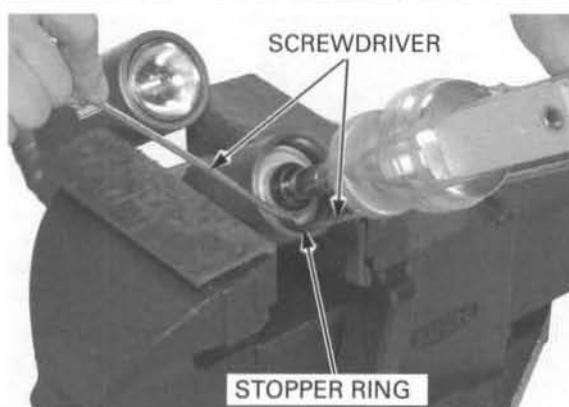


To remove the stopper ring, first push one end of the stopper ring out of its groove, then slip the second screwdriver between the stopper ring and the damper case to act as a ramp.

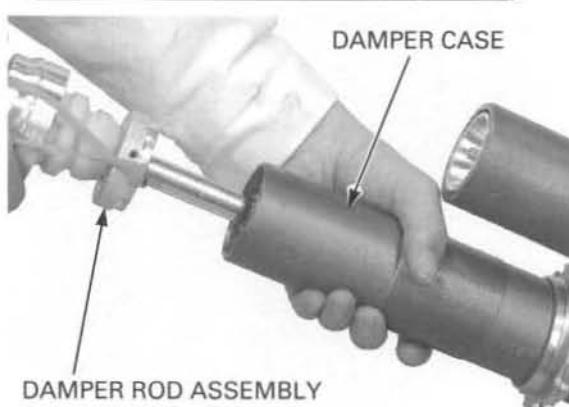
Now, use the other screwdriver to pull the stopper ring completely out.

Check the stopper ring groove for burrs.

*Burrs will damage the damper rod piston ring.*



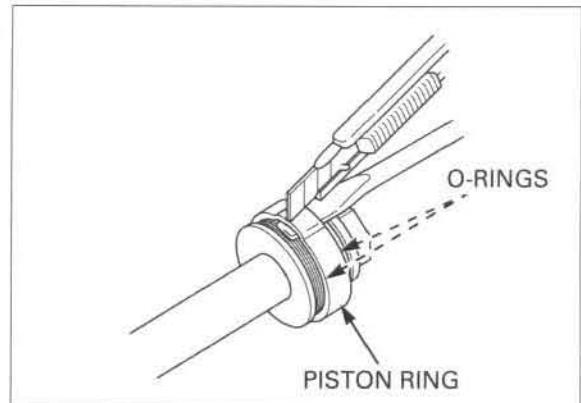
Carefully pull the damper rod assembly out of the damper case.



## PISTON RING REPLACEMENT

Inspect the piston ring.

If the piston ring is damaged, cut the piston ring and replace it along with a new O-rings.



Coat new O-rings and piston ring with shock oil.

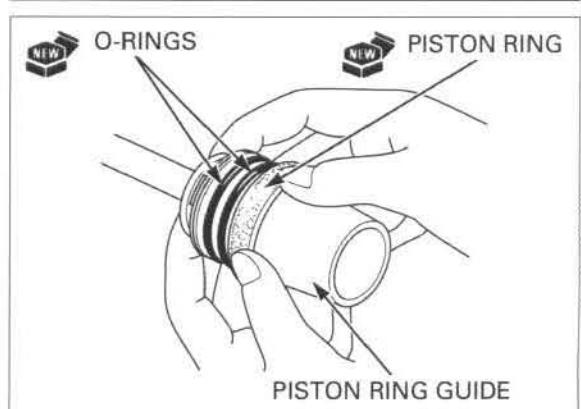
Place the piston ring guide over the piston and install a new O-rings and piston ring into place by hand.

### TOOL:

Piston ring guide

**070MG-KZ30100**  
not available in  
U.S.A.

Compress the piston ring against the ring groove and seat the piston ring into the ring groove.



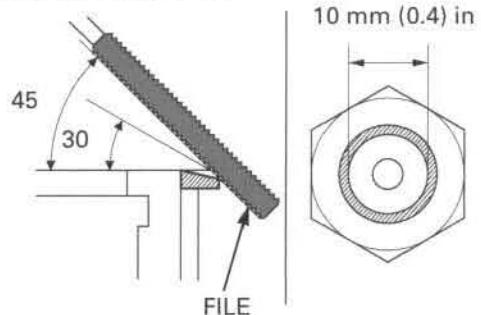
## DAMPER ROD DISASSEMBLY

To keep lint or dirt from getting onto the damper rod parts, do not wear gloves while working on the damper rod.

Set the lower shock mount in a vise with a piece of wood or soft jaws to avoid damage.

Be careful to file the rod end by hand so that the O.D. of the rod end is about 10 mm (0.4 in). Be careful not to over-file.

30 ° at first then  
gradually angle to 45 °



Turn the end nut back-and-forth in 1/4 turn increments until it loosens, then rotate another 1/4 turn and repeat turning back-and-forth until the nut loosens completely.

If the damper rod is cracked or damaged when removing the end nut, replace the damper rod assembly with a new one.



## REAR WHEEL/SUSPENSION

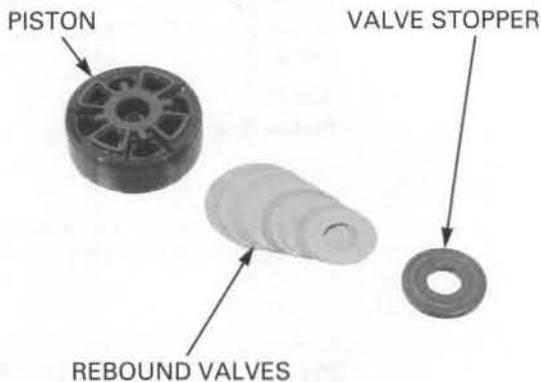
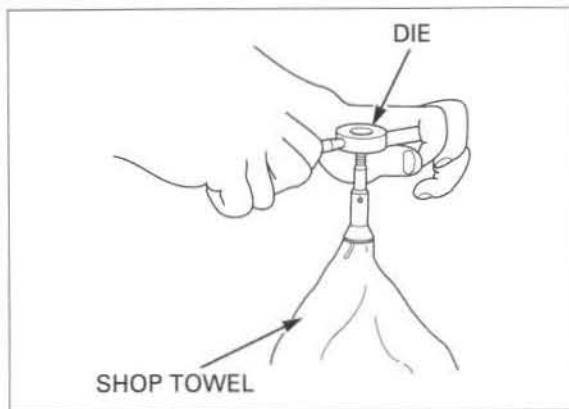
Make sure that filings are not stuck in the damper rod.

**DIE: 12 x 1.25 mm**

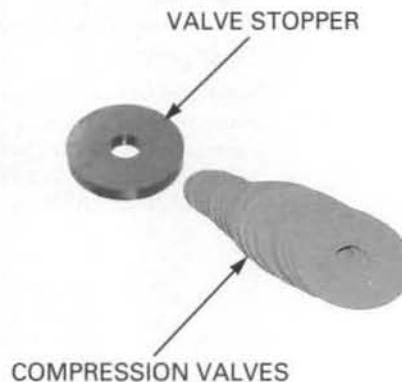
Clean the damper rod with solvent after correcting the threads.

- Use a piece of mechanics wire to keep the removed valves in the correct order.
- Keep dust and abrasive away from all damper rod parts.
- Thoroughly clean the valves in solvent and blow them dry with compressed air.
- Be careful not to get solvent on the O-ring and piston ring.
- The valve arrangement and number of valves shown is typical and may not represent this model exactly.

Remove the valve stopper, rebound valves and piston from the damper rod.



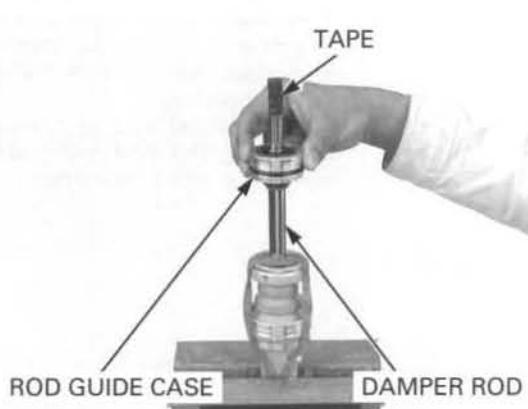
Remove the compression valves and valve stopper.



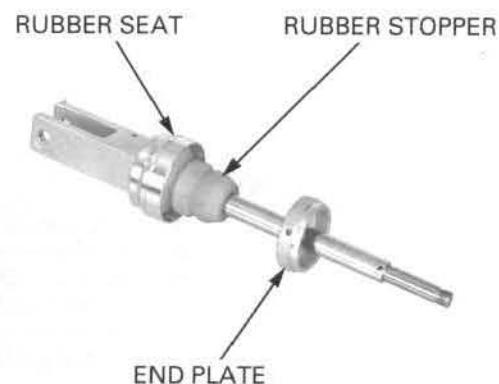
Chase the threads with a die and clean with oil.  
Back out the damping adjuster.

Wrap the threads of the damper rod with tape.

Remove the rod guide case from the damper rod.



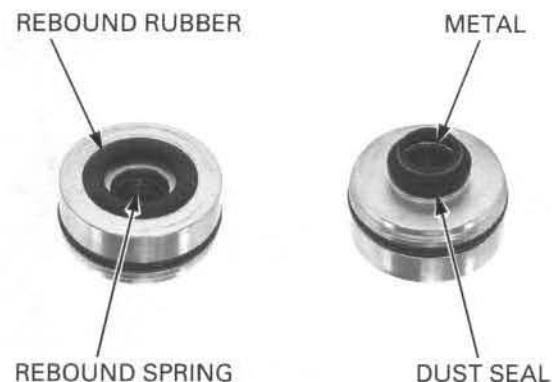
Remove the end plate, rubber stopper and rubber seat from the damper rod.



### ROD GUIDE CASE INSPECTION

Inspect the rebound rubber and dust seal lips for wear or damage and replace the rod guide case with a new one if necessary.

Visually inspect the rod guide case metal.  
If the metal is worn so that the copper surface appears, replace the rod guide case with a new one.

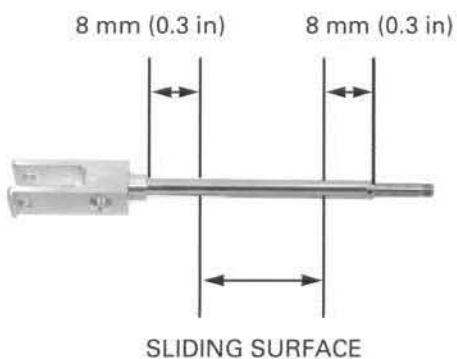


Remove the O-ring from the rod guide case and replace it with a new one.



### DAMPER ROD INSPECTION

Inspect the damper rod sliding surface for damage or distortion.



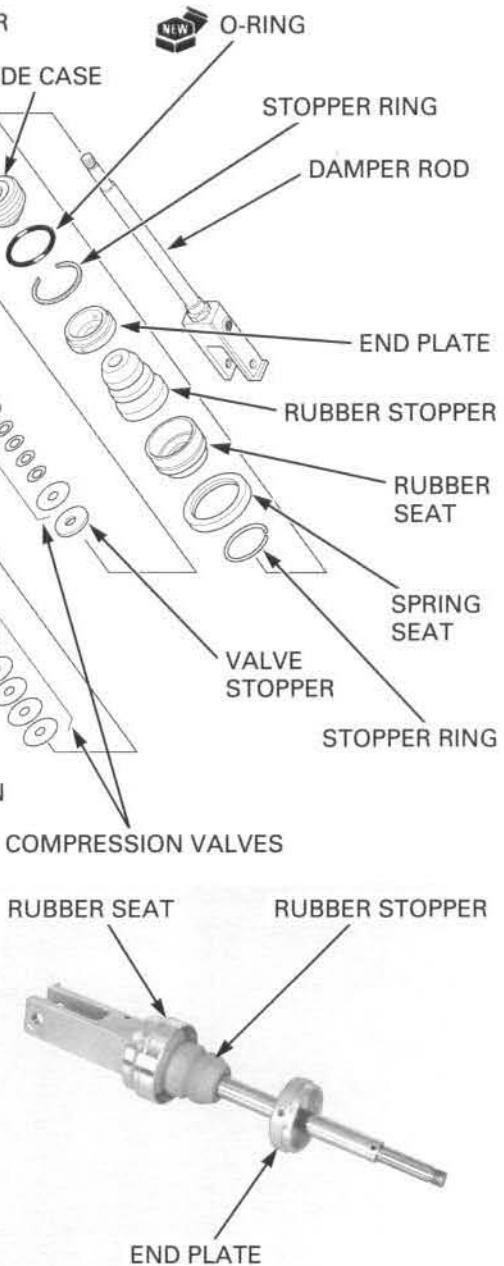
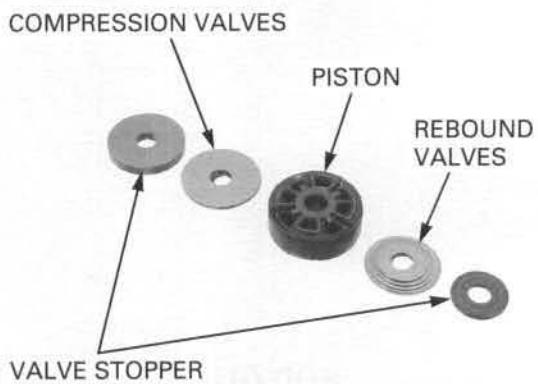
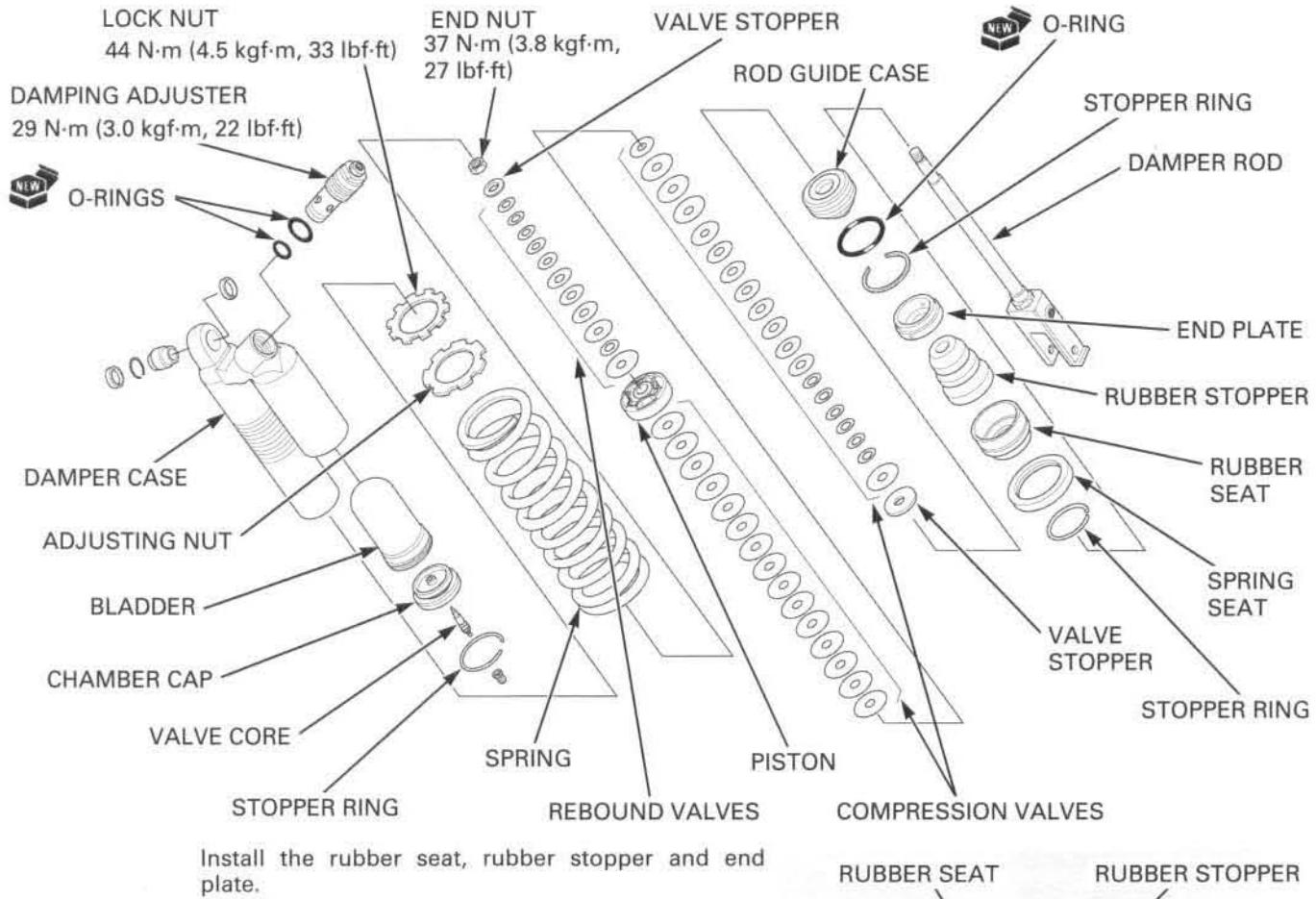
## REAR WHEEL/SUSPENSION

### DAMPER ASSEMBLY

Before assembly, wash all parts with solvent and blow them dry with compressed air. Make sure there is no dust or lint on any of the parts.

#### NOTICE

- Never assemble valves which might have gotten dusty or otherwise contaminated during the disassembly process. Disassemble them, thoroughly clean them with solvent and blow them dry with compressed air before assembly.
- Use care to avoid getting solvent on the piston ring and O-ring.
- The valve arrangement and number of valves may differ from those shown.



Install the special tool onto the damper rod.

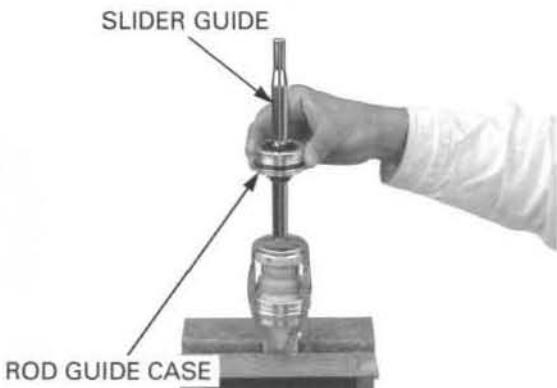
**TOOL:**

Slider guide, 16 mm

07PMG-KZ40100  
not available in  
U.S.A.

*Be careful not to remove grease from the seal.  
Be careful not to damage the dust seal lip or turn it inside out.*

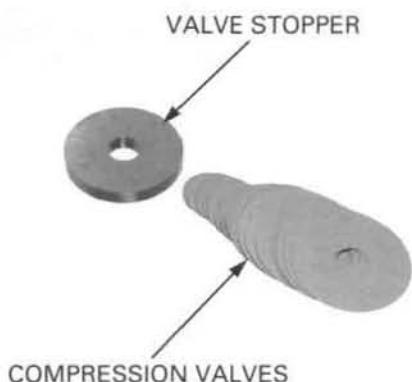
*The valve arrangement and number of valves may vary from those shown.*



Carefully install the rod guide case with the rebound rubber facing up, over the damper rod.

Remove the special tool.

Install the valve stopper and compression valves onto the damper rod.



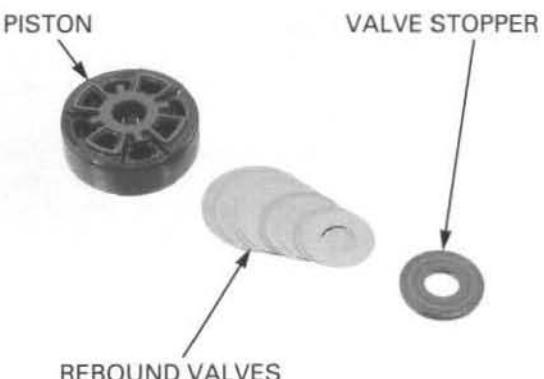
Install the piston onto the damper rod.

*Note the installation direction of the piston valves.*

**NOTICE**

*Be careful not to bind the valves when installing the piston onto the damper rod. Also, check that they are concentric with the damper rod.*

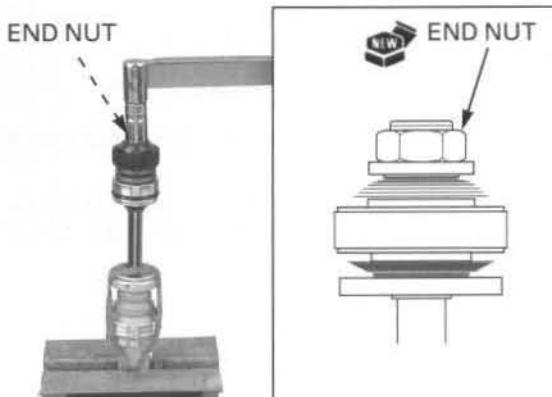
Install the valve stopper.



Set the lower shock mount in a vise with a piece of wood or soft jaws to avoid damage.

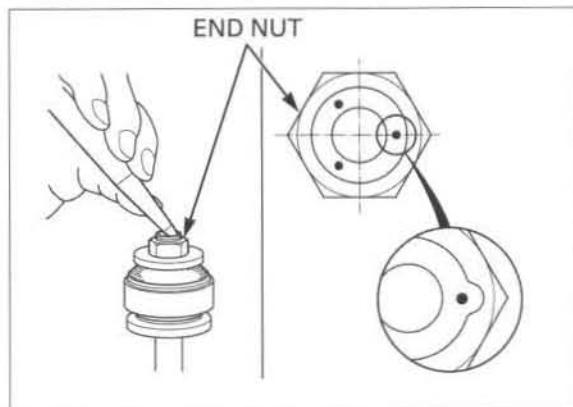
Install and tighten a new end nut to the specified torque.

**TORQUE: 37 N·m (3.8 kgf·m, 27 lbf·ft)**

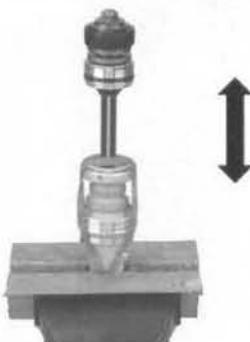


## REAR WHEEL/SUSPENSION

Stake the end of the damper rod in three places as shown, to the end nut.

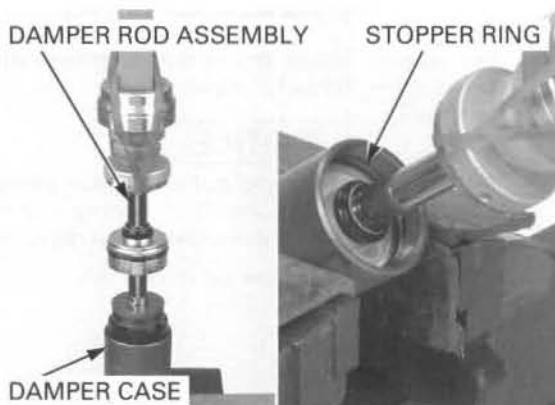


Coat the damper rod with Pro-Honda HP Fork Oil 5W or equivalent. Check the rod guide case by sliding it up and down fully to be sure there is no restriction.



Coat the damper case inner surface, piston ring and O-ring with Pro-Honda HP Fork Oil 5W or equivalent, and insert the damper rod assembly carefully. Install the stopper ring into the groove in the damper case.

After assembling, check that the stopper ring is seated in the groove of the damper case completely. You should not be able to pull the damper rod out of the damper case.

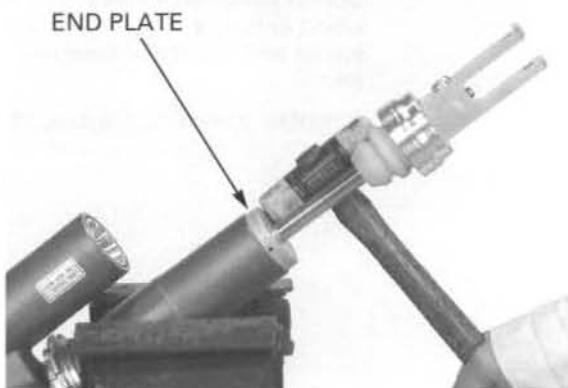


Set the shock absorber in a vise with a piece of wood or soft jaws to avoid damage.

### NOTICE

*Do not overtighten the vise and distort the damper case.*

Drive the end plate squarely and evenly into the damper case with a plastic hammer.



Fill the damper case and reservoir with Pro-Honda HP Fork Oil 5W through the damping adjuster hole.

**RECOMMENDED SHOCK OIL:**  
Pro-Honda HP Fork Oil 5W or equivalent

*Make sure the rod guide case is seated against the stopper ring by pulling the damper rod all the way out.*

Slowly pump the damper rod until there are no bubbles in the oil that overflows from the damper case.

Remove the damper unit from the vise.



*Do not let oil flow out of the reservoir.*

Position the damper unit so the damping adjuster hole faces up. Turn the damper unit as shown to bleed any air from the reservoir completely.

- When bleeding air from the reservoir, be careful to hold the damper at the angles shown so the filler hole points up.

*Be sure the reservoir pressure is correct using an accurate pressure gauge.*

Temporarily charge the reservoir with 49 kPa (0.5 kgf/cm<sup>2</sup>, 7.1 psi) of air slowly to inflate the bladder.

Check for any oil that may leak out of the valve while pressurizing. Replenish oil as necessary.



Fill the damper with Pro-Honda HP Fork Oil 5W to the damping adjuster hole neck.

Apply shock oil to the new O-rings and install them to the damping adjuster.

Dip the damping adjuster in clean shock oil.

Slowly install the damping adjuster.

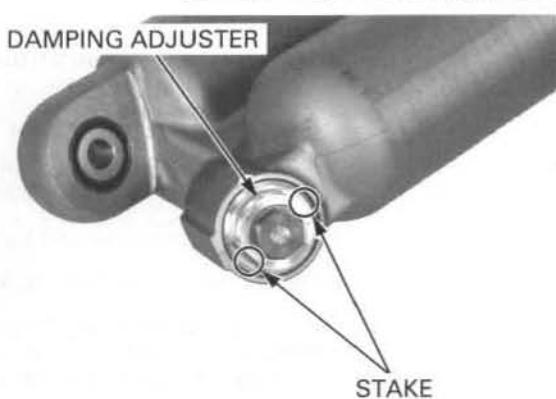
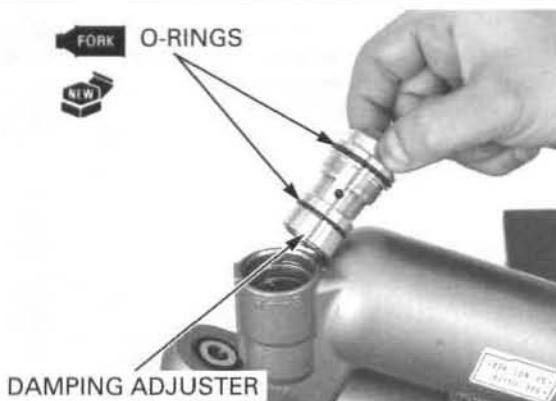
Tighten the damping adjuster to the specified torque.

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

Wipe off all oil from the damper rod; oil left on the damper rod can lead to premature failure of the oil seal.

Check the oil leaks.

Stake the damping adjuster as shown.



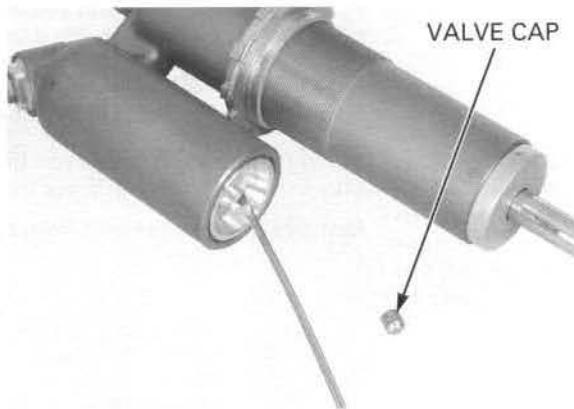
## REAR WHEEL/SUSPENSION

Release the air that was in the reservoir at precompression. Fill the reservoir with 981 kPa (10.0 kgf/cm<sup>2</sup>, 142 psi) of nitrogen gas.

### CAUTION

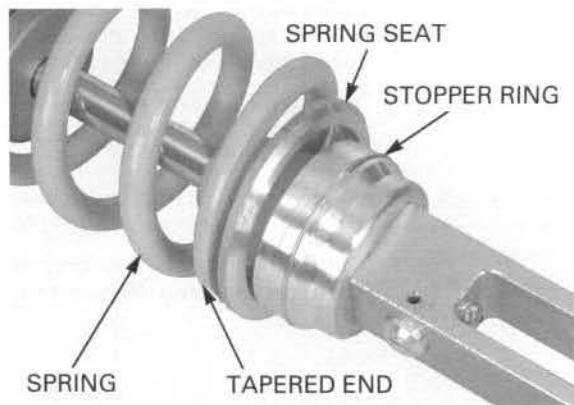
The shock absorber is fitted with a gas-filled reservoir. Use only nitrogen gas to pressurize the shock absorber. The use of an unstable gas can cause a fire or explosion resulting in serious injury.

Install the valve cap.

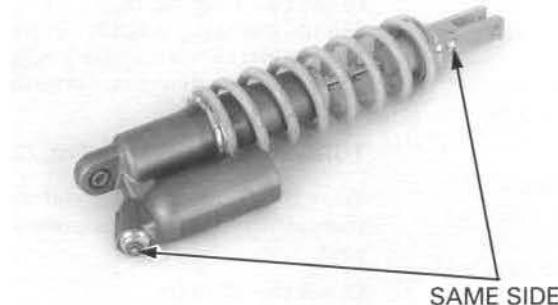


Install the spring with its tapered end facing down.  
Install the spring seat and stopper ring.

Loosely tighten the adjusting nut and lock nut.



Turn the shock absorber lower mount so the rebound adjuster screw is on the same side of the shock reservoir.



One turn of the  
adjusting nut  
changes the spring  
length by 1.5 mm  
(0.06 in).

Turn the spring adjusting nut until the spring length measurement recorded at disassembly is reached or until the spring length is as specified below.

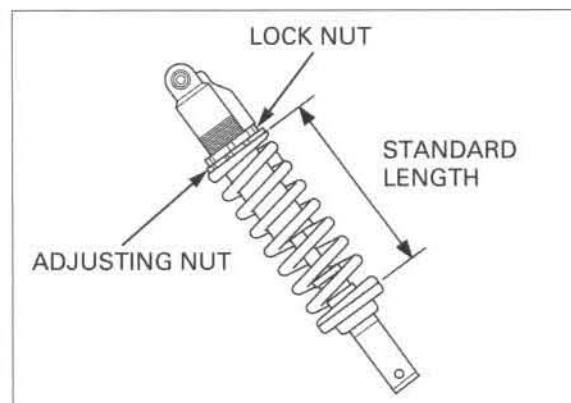
#### STANDARD SPRING LENGTH:

'04, '05: 254.4 mm (10.02 in)  
After '05: 256.6 mm (10.10 in)

Hold the adjusting nut and tighten the lock nut.

**TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)**

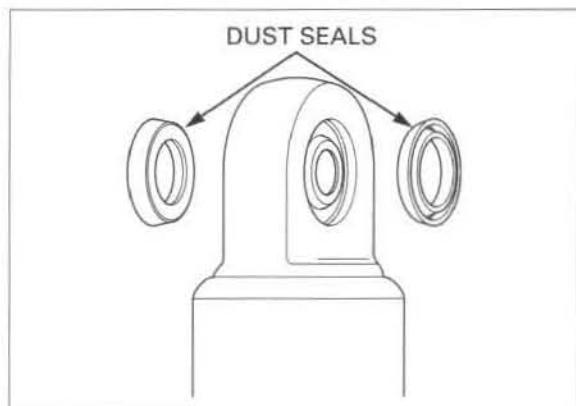
Use this standard spring length as the baseline.  
See the Owner's Manual for detailed instructions on  
adjusting preload and damping for riding conditions  
and rider skill.



**SPHERICAL BEARING REPLACEMENT**

Remove the dust seals.

Check the spherical bearing for wear or damage.  
If it is worn or damaged, it must be replaced.



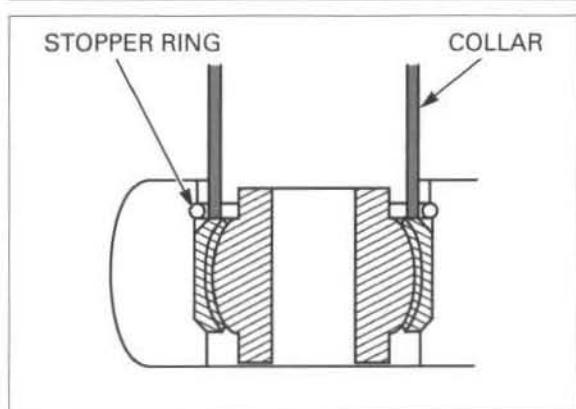
Press the spherical bearing to get the clearance necessary to remove the stopper ring using the special tool.

**TOOL:**

Collar, 23 x 17 mm

07GMD-KT8A110

Remove the stopper ring.



Press the spherical bearing out of the upper mount using the special tools.

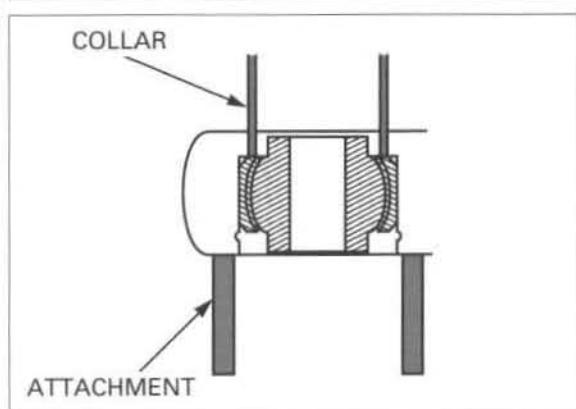
**TOOLS:**

Collar, 23 x 17 mm

07GMD-KT8A110

Attachment, 30 mm I.D.

07746-0030300



Apply multi-purpose grease NLGI No.2 (molybdenum disulfide MoS<sub>2</sub> additive) to the new spherical bearing.

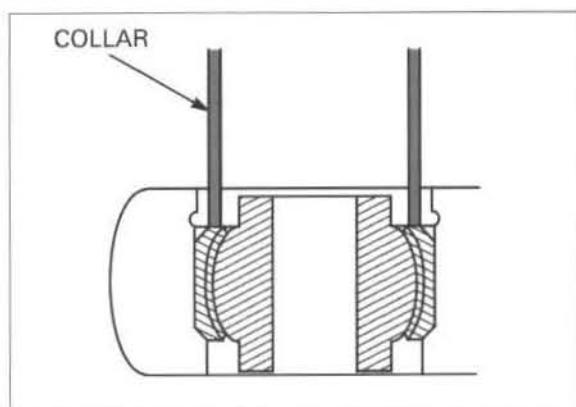
Drive the bearing in evenly; do not allow it to tilt.

*Drive the bearing in evenly; do not allow it to tilt.*

**TOOL:**

Collar, 23 x 17 mm

07GMD-KT8A110



## REAR WHEEL/SUSPENSION

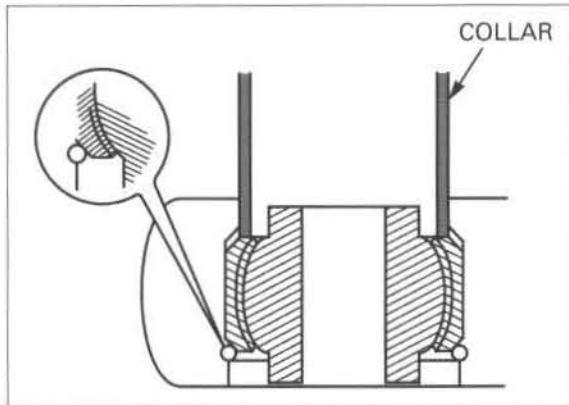
Install a new stopper ring into the groove of the upper mount securely.

Press the spherical bearing into the upper mount using the special tool, until it seats against the stopper ring.

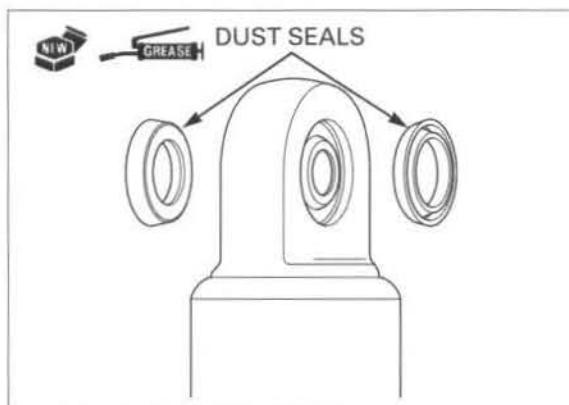
### TOOL:

Collar, 23 x 17 mm

07GMD-KT8A110



*Be sure to install the correct dust seal in each side.* Apply grease to new dust seal lips and install them.



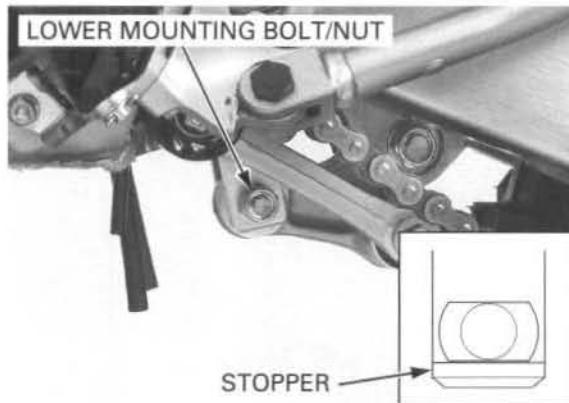
## INSTALLATION

Set the shock absorber onto the shock arm with the rebound adjuster facing right side.

Install the lower mounting bolt by aligning the flat side of the bolt with the stopper on the shock absorber.

Install and tighten the lower mounting nut to the specified torque.

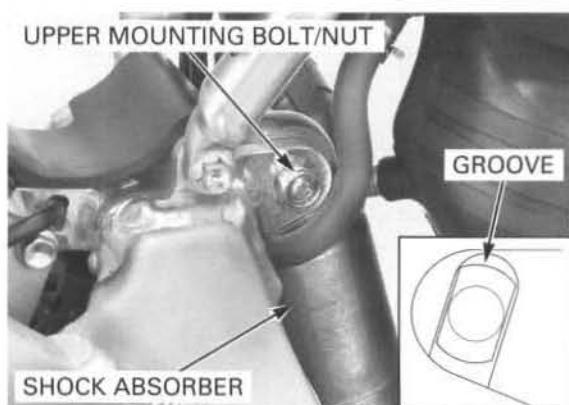
**TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)**



Install the upper mounting bolt by aligning the flat side of the bolt with groove of the frame.

Install and tighten the shock absorber upper mounting nut to the specified torque.

**TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)**



Loosen the sub-frame upper mounting bolt and install the air cleaner connecting bolt securely.

Install the sub-frame lower mounting bolts.

Tighten the sub-frame upper mounting bolt first, then tighten the lower mounting bolts to the specified torque.

#### TORQUE:

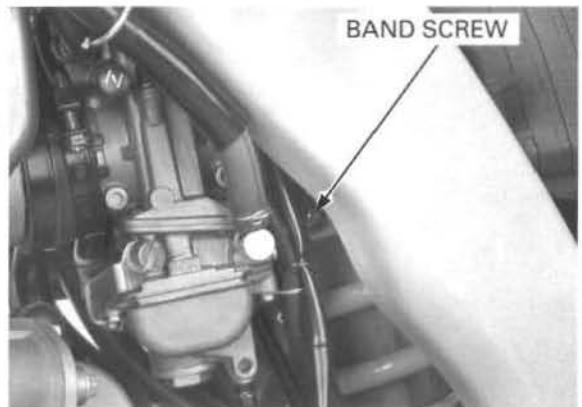
Upper: 30 N·m (3.1 kgf·m, 22 lbf·ft)

Lower: 49 N·m (5.0 kgf·m, 36 lbf·ft)

Tighten the air cleaner connecting boot band screw securely.

Install the fuel tank (page 2-7).

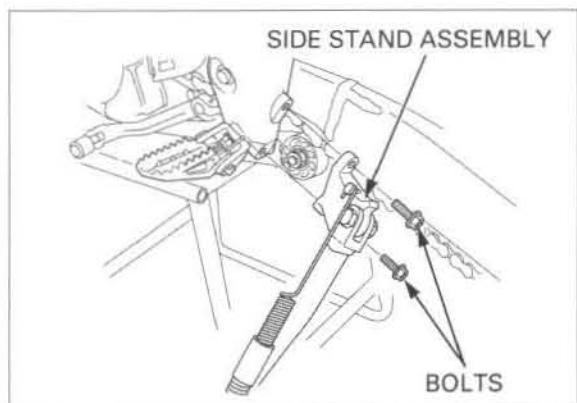
Install the seat (page 2-3).



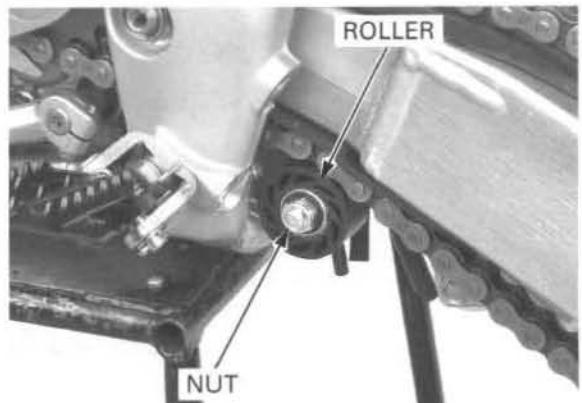
## SHOCK LINKAGE

### REMOVAL

Remove the mounting bolts and side stand assembly.

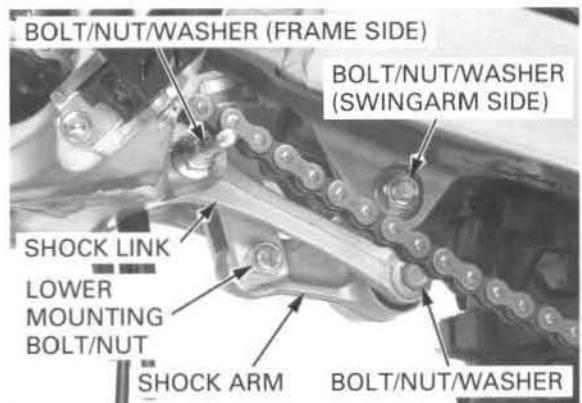


Remove the nut and drive chain roller.



'04 - '06: Remove the following:

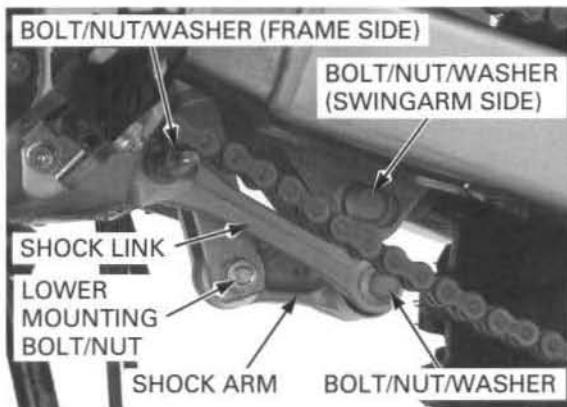
- Shock absorber lower mounting bolt/nut
- Shock arm bolt/nut/washer (shock link side)
- Shock arm bolt/nut/washer (swingarm side)
- Shock arm
- Shock link bolt/nut/washer (frame side)
- Shock link



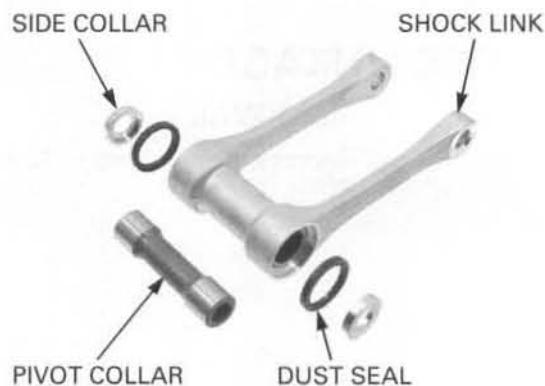
## REAR WHEEL/SUSPENSION

After '06: Remove the following:

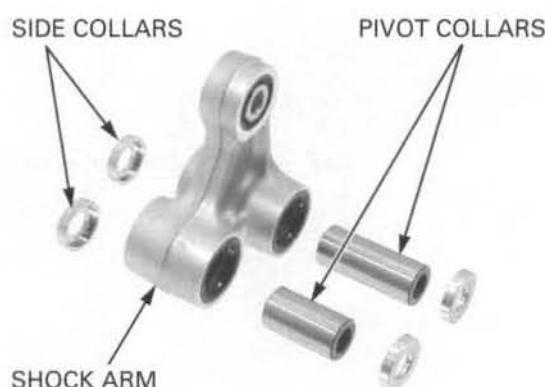
- Shock absorber lower mounting bolt/nut
- Shock arm bolt/nut/washer (shock link side)
- Shock arm bolt/nut/washer (swingarm side)
- Shock arm
- Shock link bolt/nut/washer (frame side)
- Shock link



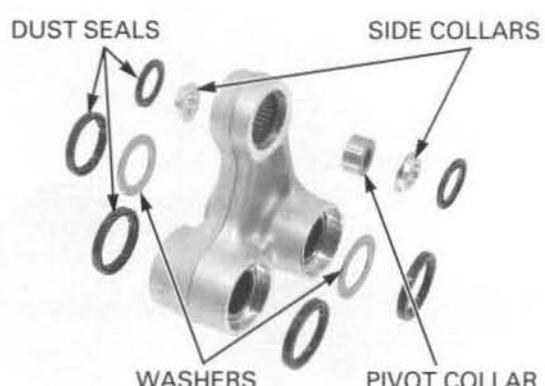
Remove the side collars, pivot collar and dust seals from the shock link.



Remove the side collars and pivot collars from the shock arm (swingarm side, shock link side).

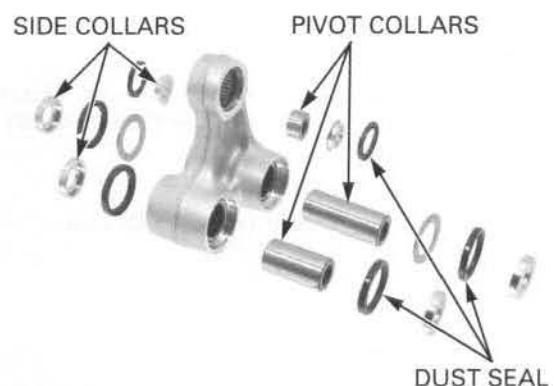


Remove the dust seals and washers (swingarm side, shock link side).

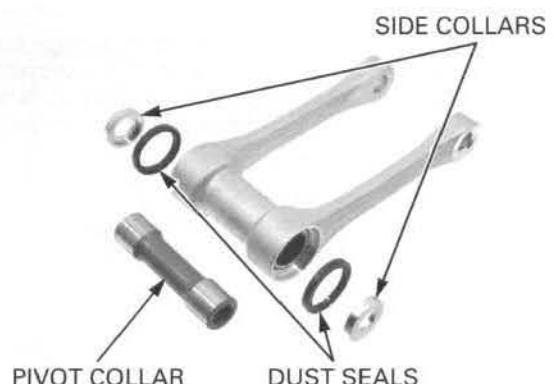


**INSPECTION**

Check the dust seals and collars for wear, damage or fatigue.  
 Check the needle bearings for damage or loose fit.  
 Check the shock arm for cracks or damage.  
 If the needle bearings are damaged, replace them.



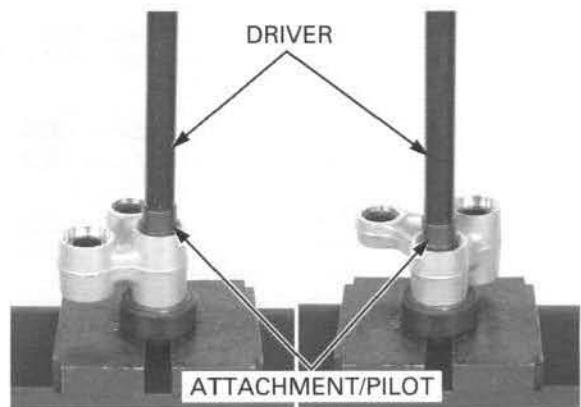
Check the dust seals and collars for wear, damage or fatigue.  
 Check the needle bearings for damage or loose fit.  
 Check the shock link for cracks or damage.  
 If the needle bearings are damaged, replace them.

**BEARING REPLACEMENT****SHOCK ARM NEEDLE BEARING**

Press the needle bearings (shock link side, swingarm side) out of the shock link using the special tools and a hydraulic press.

**TOOLS:**

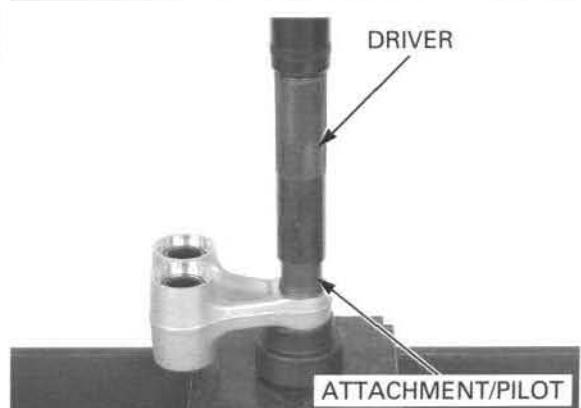
Driver	07949-3710001
Attachment, 24 x 26 mm	07746-0010700
Pilot, 20 mm	07746-0040500
Attachment, 30 mm I.D.	07746-0030300



Press the needle bearing (shock absorber side) out of the shock link using special tools and a hydraulic press.

**TOOLS:**

Driver	07749-0010000
Attachment, 24 x 26 mm	07746-0010700
Pilot, 19 mm	07746-0041400
Attachment, 30 mm I.D.	07746-0030300



## REAR WHEEL/SUSPENSION

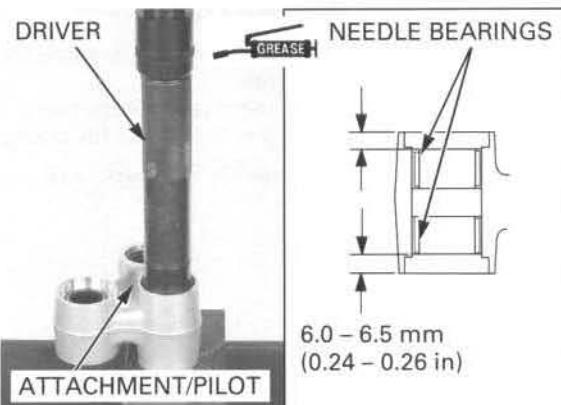
Pack new needle bearings with multi-purpose grease.

*Press the needle bearing into the shock arm with the marked side facing out.*

Press new needle bearings into the shock link side pivot with the special tools and a hydraulic press so that the needle bearing surface is 6.0 – 6.5 mm (0.24 – 0.26 in) below the end of the shock arm surface.

### TOOLS:

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



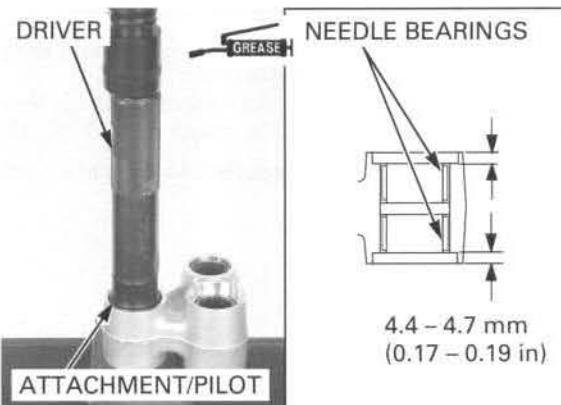
Pack new needle bearings with multi-purpose grease.

*Press the needle bearing into the shock arm with the marked side facing out.*

Press new needle bearings into the swingarm side pivot with the special tools and a hydraulic press so that the needle bearing surface is 4.4 – 4.7 mm (0.17 – 0.19 in) below the end of the shock arm surface.

### TOOLS:

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



Pack a new needle bearing with multi-purpose grease.

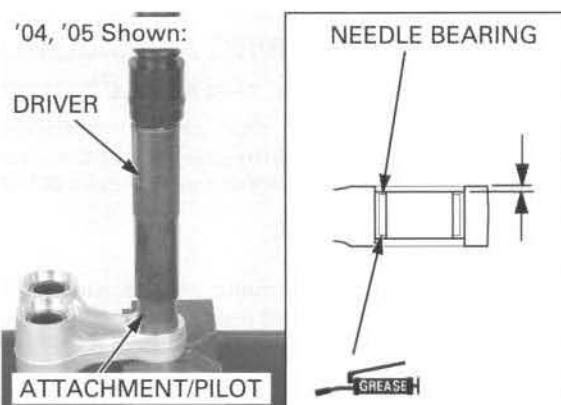
*Press the needle bearing into the shock absorber side pivot with the special tools and a hydraulic press so that the needle bearing surface is the specified depth below the end of the shock arm surface.*

### SPECIFIED DEPTH:

- '04, '05: 2.0 – 2.2 mm (0.08 – 0.09 in)
- After '05: 3.0 – 3.2 mm (0.12 – 0.13 in)

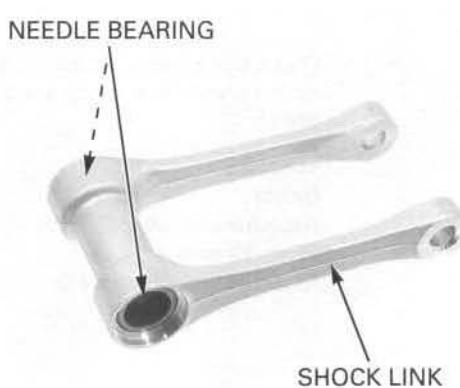
### TOOLS:

Driver	07749-0010000
Attachment, 24 x 26 mm	07746-0010700
Pilot, 19 mm	07746-0041400



### SHOCK LINK NEEDLE BEARING

Remove the needle bearing from the shock link.

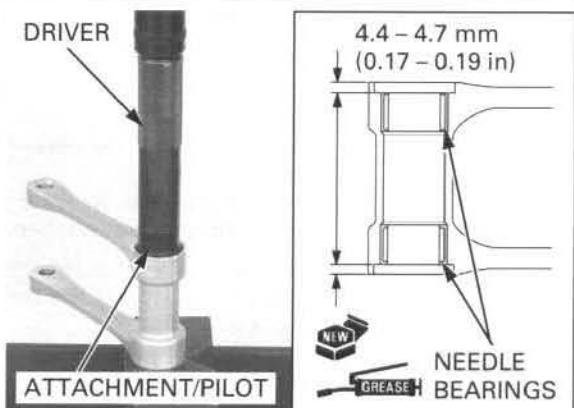


Pack new needle bearings with multi-purpose grease.

*Press the needle bearing into the shock arm with the marked side facing out.*

#### TOOLS:

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



## INSTALLATION

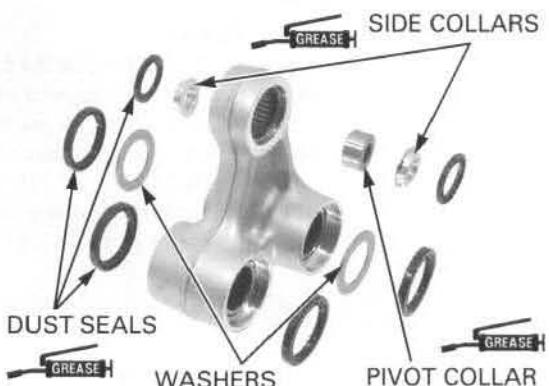
Apply multi-purpose grease NLGI No.2 (molybdenum disulfide additive) to the shock arm, dust seal lips, collars and bearings.

- Make sure the needle bearing rollers are in position before installing.

Number of needle rollers:

Shock link side: 32  
Swingarm side: 32  
Shock absorber side: 27

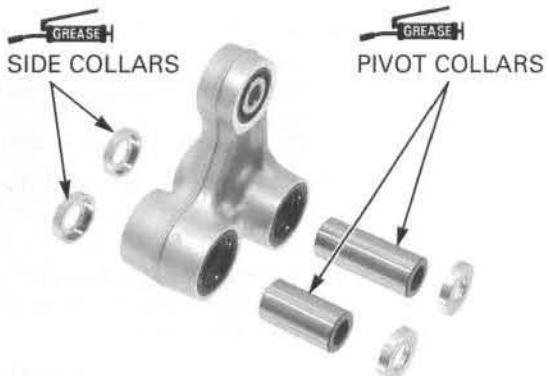
Install the dust seals and washers (shock link side).



Install the dust seals to the shock arm (swingarm side).

Install the pivot collar, side collars and dust seals (shock absorber side).

Install the pivot collars and side collars to the shock arm (swingarm side, shock link side).



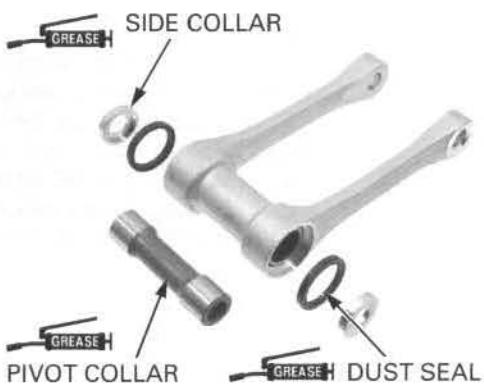
Apply multi-purpose grease NLGI No.2 (molybdenum disulfide additive) to the dust seal lips, collars and bearings.

Install the dust seals, pivot collar and side collars.

- Make sure the needle bearing rollers are in position before installing.

Number of needle rollers:

Number of needle rollers: 32



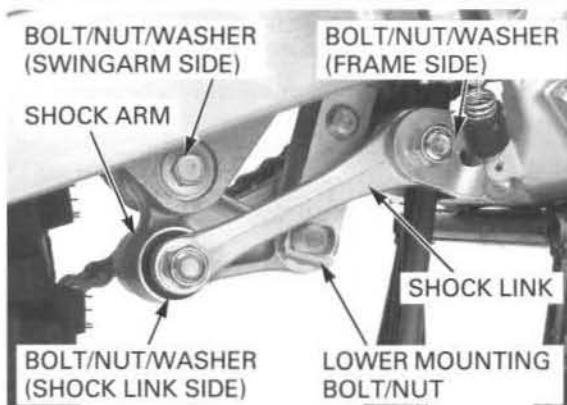
## REAR WHEEL/SUSPENSION

'04 - '06: Apply oil to the shock arm and shock link nut threads and flange surface.

Loosely install the following:

- Shock link
- Shock link bolt/nut/washer (frame side)
- Shock arm
- Shock arm bolt/nut/washer (swingarm side)
- Shock arm bolt/nut/washer (shock link side)

Install the shock absorber lower mounting bolt aligning the flat side of the bolt with the stopper on the shock absorber.



'04 - '06: Tighten all nuts to the specified torque.

### TORQUE:

**Shock link nut:**

52 N·m (5.3 kgf·m, 38 lbf·ft)

**Shock arm nut (swingarm side):**

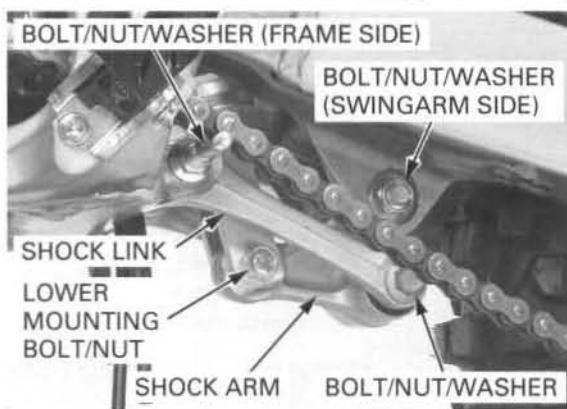
52 N·m (5.3 kgf·m, 38 lbf·ft)

**Shock arm nut (shock link side):**

52 N·m (5.3 kgf·m, 38 lbf·ft)

**Shock absorber lower mounting nut:**

44 N·m (4.5 kgf·m, 33 lbf·ft)



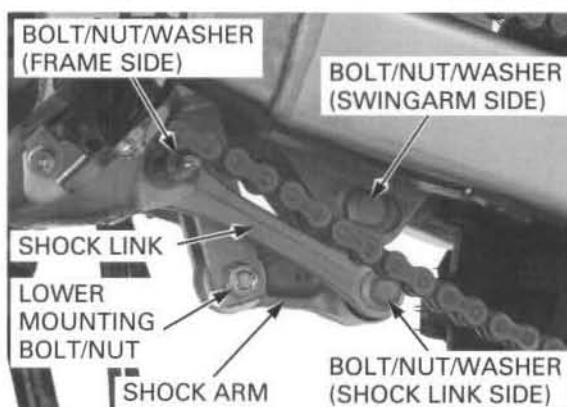
After '06: Apply oil to the shock arm and shock link nut threads and flange surface.

Loosely install the following:

- Shock link
- Shock link bolt/nut/washer (frame side)
- Shock arm
- Shock arm bolt/nut/washer (shock link side)

Install the shock arm bolt (swingarm side) aligning the flat side of the bolt with the stopper on the swingarm.

Install the shock absorber lower mounting bolt aligning the flat side of the bolt with the stopper on the shock absorber.



After '06: Tighten all nuts to the specified torque.

### TORQUE:

**Shock link nut:**

52 N·m (5.3 kgf·m, 38 lbf·ft)

**Shock arm nut (swingarm side):**

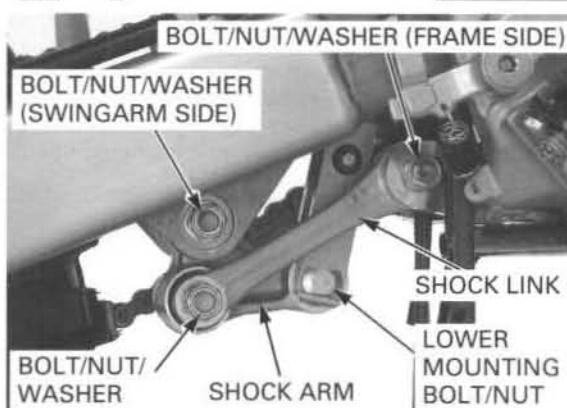
52 N·m (5.3 kgf·m, 38 lbf·ft)

**Shock arm nut (shock link side):**

52 N·m (5.3 kgf·m, 38 lbf·ft)

**Shock absorber lower mounting nut:**

44 N·m (4.5 kgf·m, 33 lbf·ft)

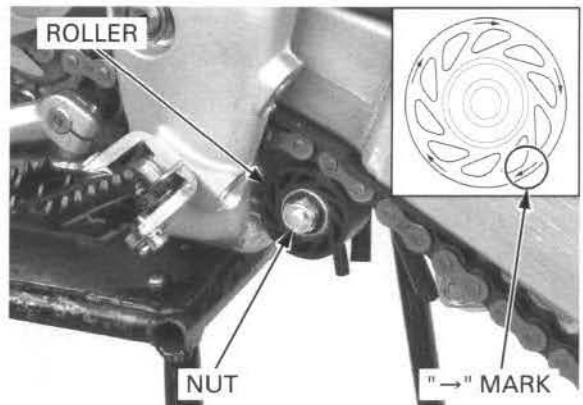


'04, '05: Install the drive chain roller with the "→" mark facing out.

After '05: Install the drive chain roller with the flat facing the frame.

Install and tighten the nut to the specified torque.

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

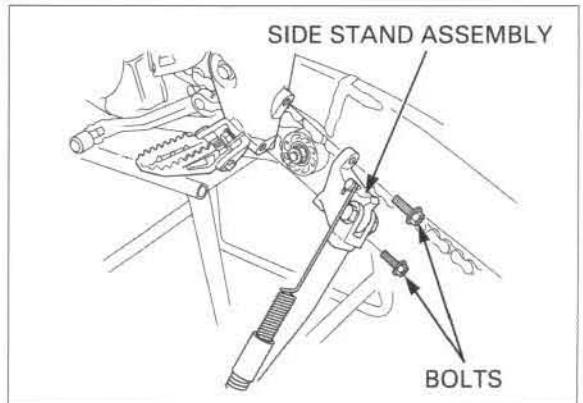


Install the side stand assembly and mounting bolts. Tighten the upper mounting bolt to the specified torque.

**TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)**

Tighten the lower mounting bolt to the specified torque.

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



## SWINGARM

### REMOVAL

Remove the following:

- Rear wheel (page 14-7)
- Drive sprocket (page 7-4)
- Brake pedal (page 15-24)

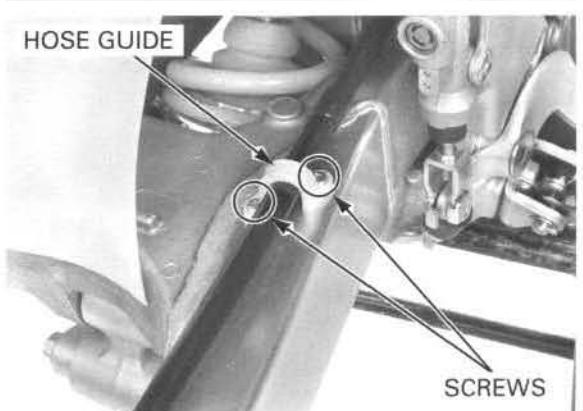
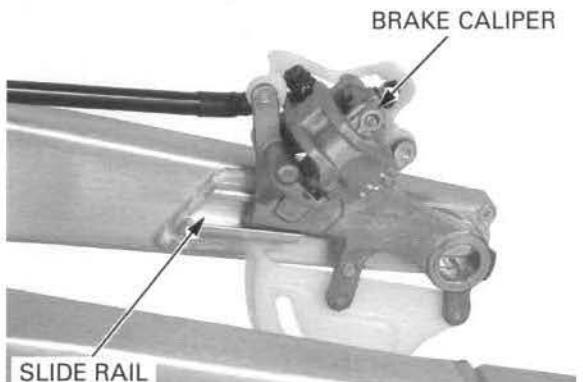
*Do not disconnect the hydraulic line.*

Remove the rear brake caliper from the slide rail on the swingarm.

### NOTICE

*Do not suspend the brake caliper from the brake hose. The brake hose may be damaged.*

Remove the screws and brake hose guide.

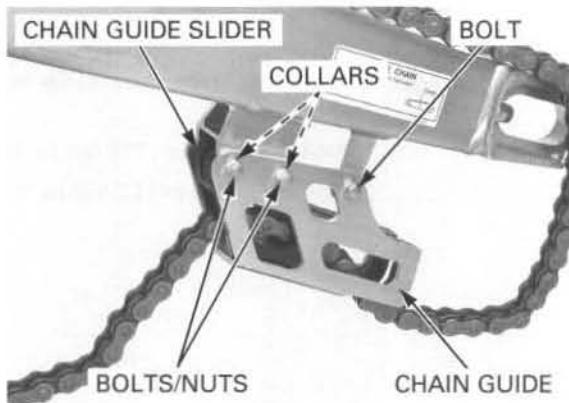


## REAR WHEEL/SUSPENSION

'04 - '06: Check the chain guide slider for wear or damage.

Remove the following:

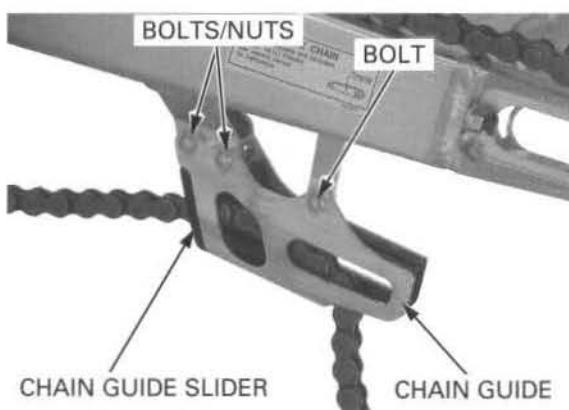
- Bolts
- Nuts
- Chain guide
- Chain guide slider
- Collars
- Drive chain



After '06: Check the chain guide slider for wear or damage.

Remove the following:

- Bolts
- Nuts
- Chain guide
- Chain guide slider
- Drive chain



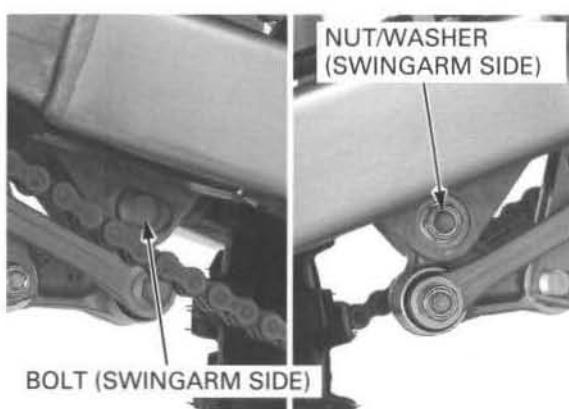
'04 - '06: Raise the rear wheel off the ground by placing a workstand or equivalent under the engine.

Remove the shock arm bolt, nut and washer (swingarm side).



After '06: Raise the rear wheel off the ground by placing a workstand or equivalent under the engine.

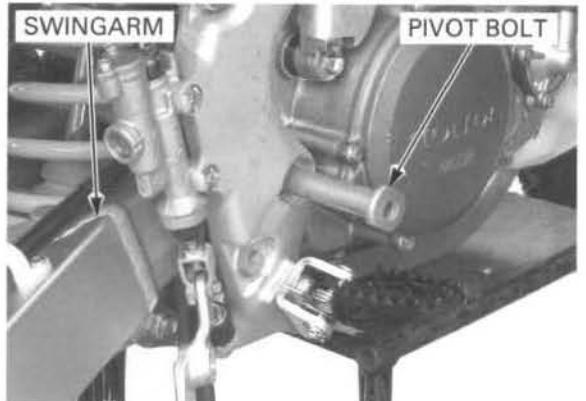
Remove the shock arm bolt, nut and washer (swingarm side).



Remove the swingarm pivot nut and washer.



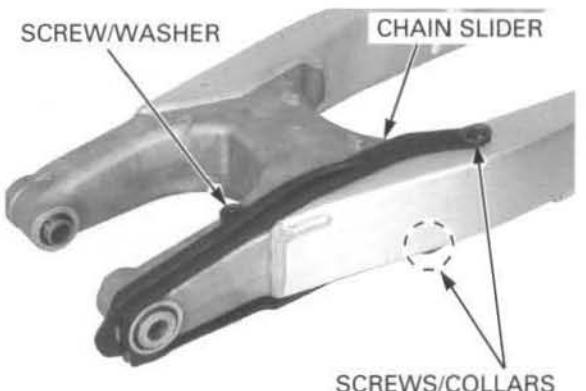
Remove the swingarm pivot bolt and swingarm.



## DISASSEMBLY

Check the chain slider for wear or damage.

Remove the screws, washer, collar and chain slider.



Remove the following:

- Side collars
- Dust seals
- Washers
- Thrust needle bearings
- Pivot collars

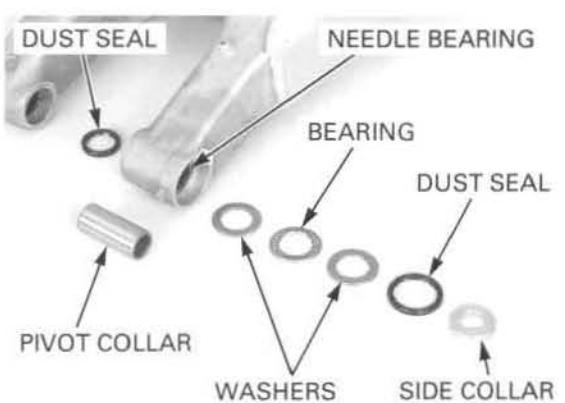
Check the dust seals and collars for wear, damage or fatigue.

Check the needle bearings for damage or loose fit.

Check the thrust needle bearings for wear or damage, replace if necessary.

Check the swingarm for cracks or damage.

Replace any damaged parts, if necessary.



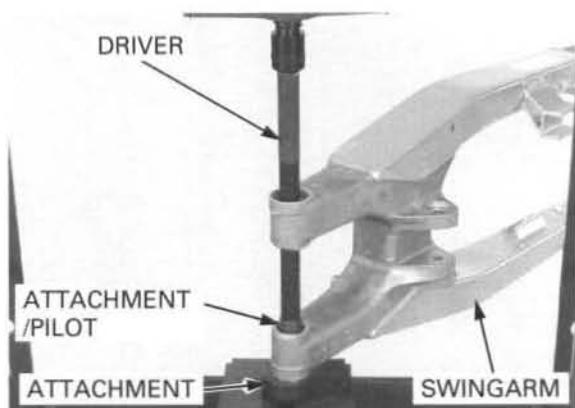
## REAR WHEEL/SUSPENSION

### BEARING REPLACEMENT

Press the needle bearings out of the swingarm using the special tools and a hydraulic press.

#### TOOLS:

Driver	07949-3710001
Attachment, 24 x 26 mm	07746-0010700
Pilot, 22 mm	07746-0041000
Attachment, 30 mm I.D.	07746-0030300

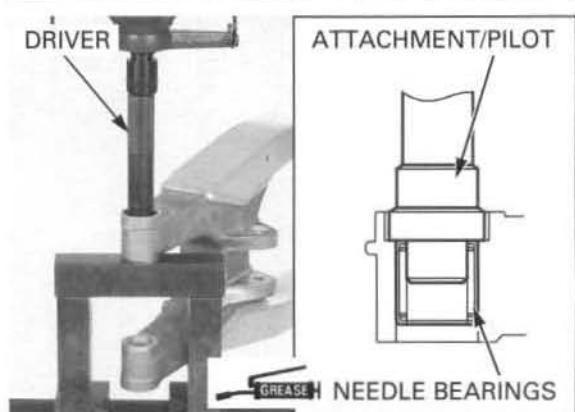


Pack a new needle bearing with multi-purpose grease.

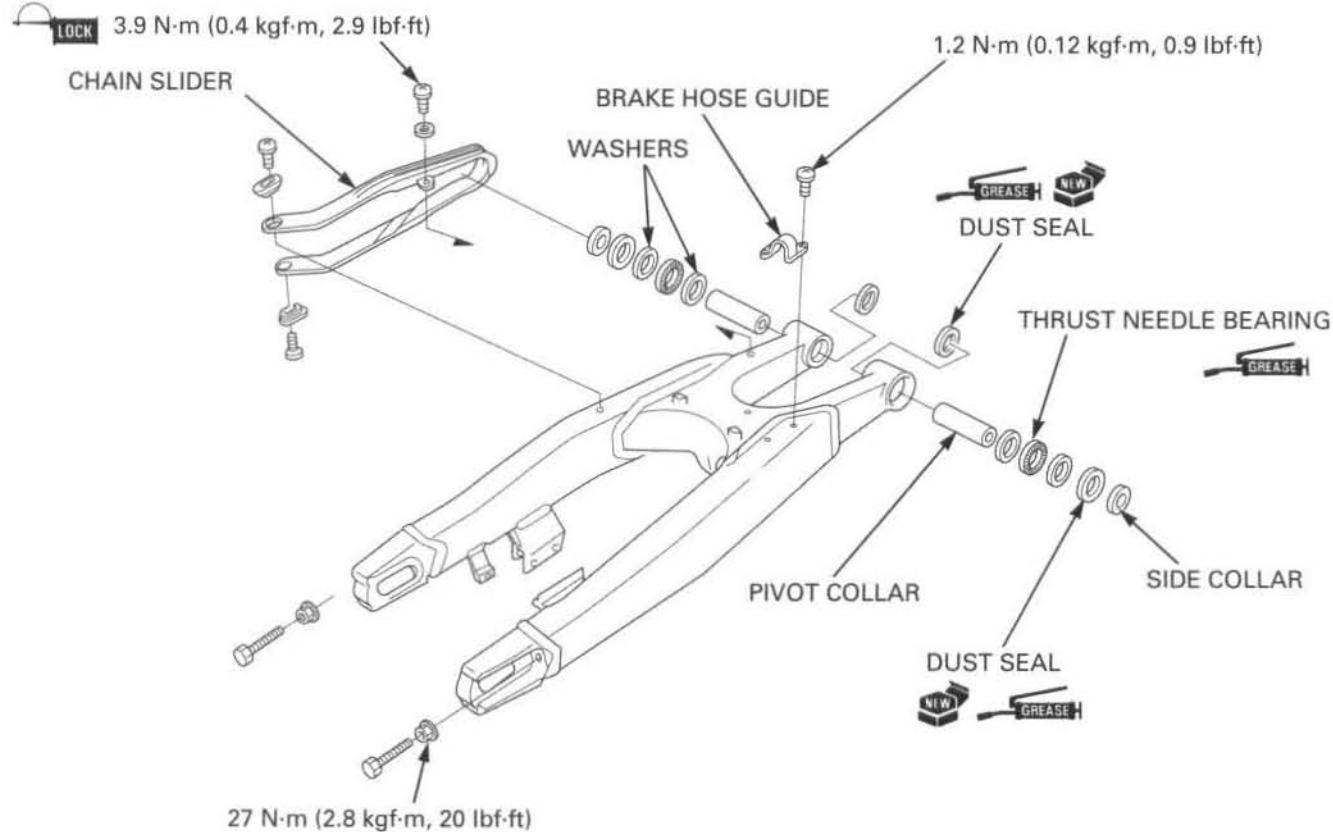
Press the needle bearing into the swingarm using the special tools and a hydraulic press as shown.

#### TOOLS:

Driver	07749-0010000
Attachment, 28 x 30 mm	07946-1870100
Pilot, 22 mm	07746-0041000



### ASSEMBLY

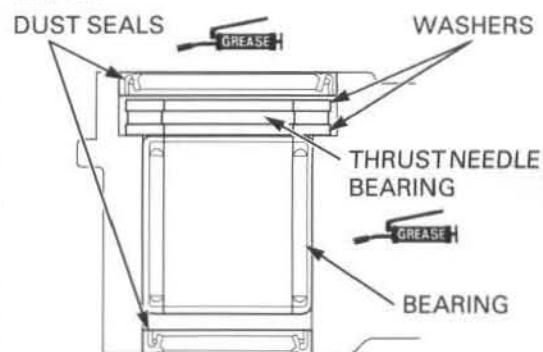


'04, '05: Apply grease to the thrust needle bearing and dust seal lips.

Install the following:

- Washers
- Thrust needle bearings
- Pivot collars
- Dust seals
- Side collars

'04, '05:



After '05: Apply grease to the thrust needle bearing and dust seal lips.

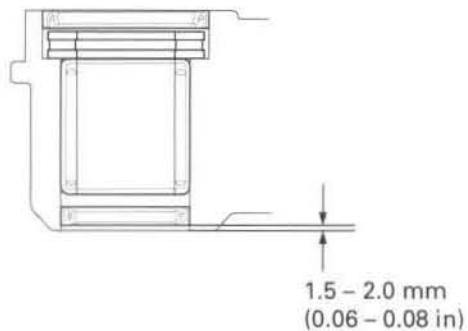
Install the following:

- Washers
- Thrust needle bearings
- Pivot collars
- Dust seals

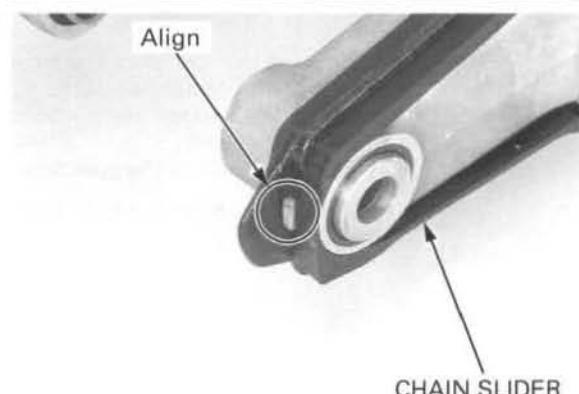
*Install the dust seals into the swingarm pivot so that the dust seal surface is 1.5 – 2.0 mm (0.06 – 0.08 in) below the end of the swingarm surface.*

Install the side collars.

After '05:



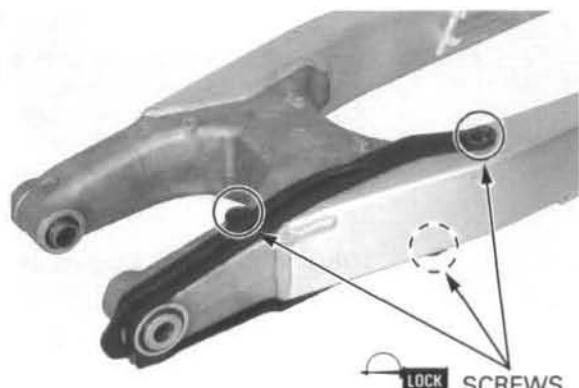
Install the chain slider so its hole fits over the tab on the swingarm.



Clean and apply a locking agent to the screw threads.

Install and tighten the screws to the specified torque.

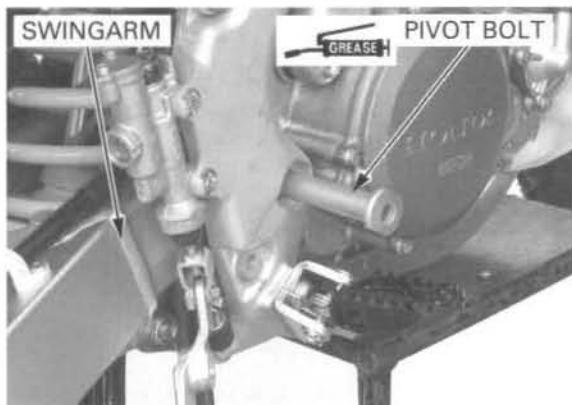
**TORQUE: 3.9 N·m (0.4 kgf·m, 2.9 lbf·ft)**



## REAR WHEEL/SUSPENSION

### INSTALLATION

Apply a thin coat of grease to the swingarm pivot bolt sliding surface.  
Install the swingarm onto the frame.  
Install the swingarm pivot bolt through the frame and swingarm pivot.



Install the washer and swingarm pivot nut.  
Tighten the swingarm pivot nut to the specified torque.

**TORQUE: 88 N·m (9.0 kgf·m, 65 lbf·ft)**



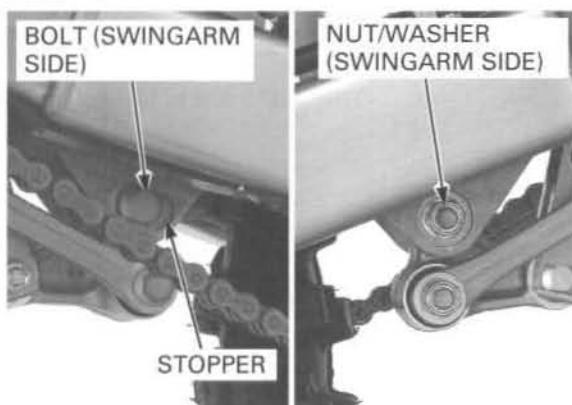
'04 - '06: Apply oil to the shock arm nut (swingarm side) threads and seating surface.  
Install the shock arm bolt, nut and washer (swingarm side).  
Tighten the nut to the specified torque.

**TORQUE: 52 N·m (5.3 kgf·m, 38 lbf·ft)**



After '06: Apply oil to the shock arm nut (swingarm side) threads and seating surface.  
Install the shock arm bolt (swingarm side) aligning the flat side of the bolt with the stopper on the swingarm.  
Install the washer and tighten the nut to the specified torque.

**TORQUE: 52 N·m (5.3 kgf·m, 38 lbf·ft)**

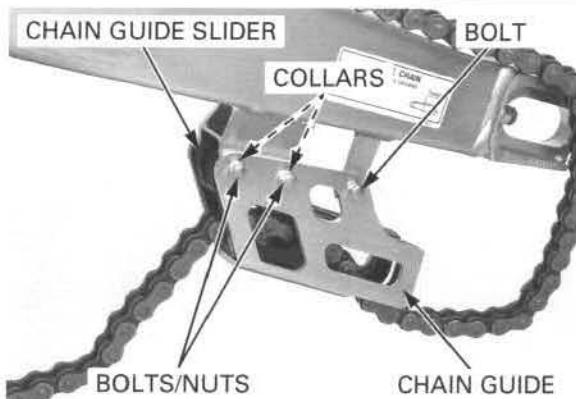


'04 - '06: Install the following:

- Drive chain
- Collars
- Chain guide slider
- Chain guide

Install and tighten the bolts and nuts to the specified torque.

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

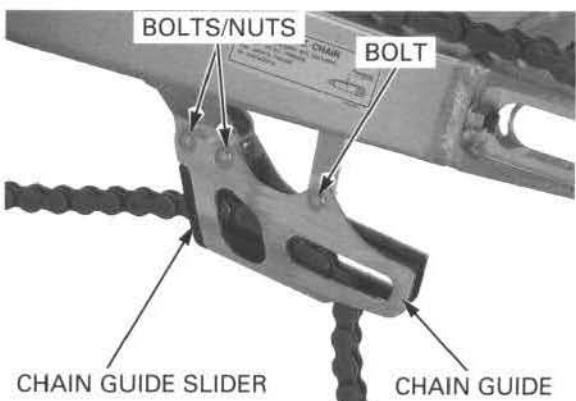


After '06: Install the following:

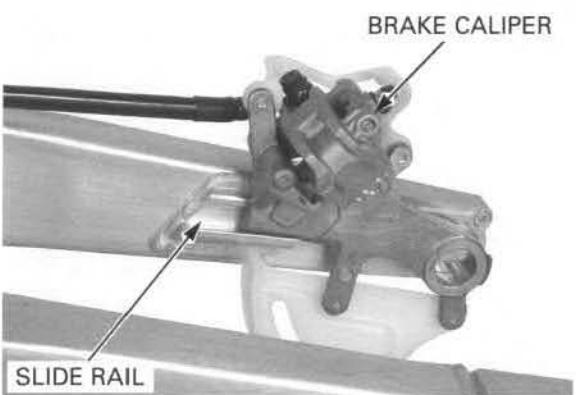
- Drive chain
- Chain guide slider
- Chain guide

Install and tighten the bolts and nuts to the specified torque.

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



*Do not twist the brake hose.* Install the rear brake caliper to the slide rail on the swingarm.

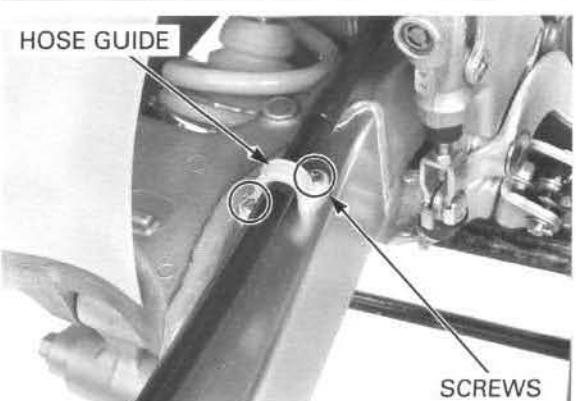


Install the brake hose guides and tighten the screws to the specified torque.

**TORQUE: 1.2 N·m (0.12 kgf·m, 0.9 lbf·ft)**

Install the following:

- Brake pedal (page 15-25)
- Drive sprocket (page 7-4)
- Rear wheel (page 14-12)



---

**MEMO**

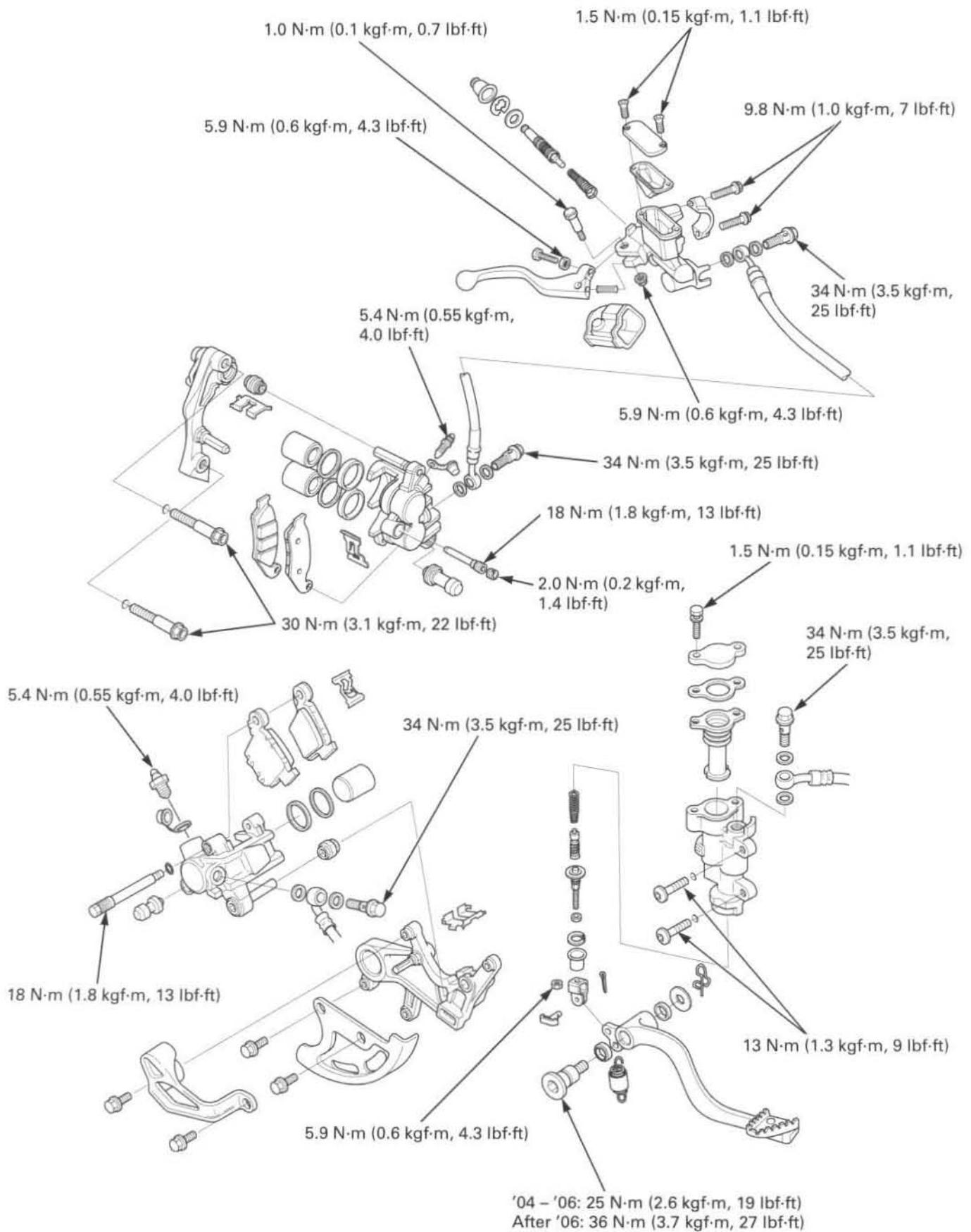
# 15. HYDRAULIC BRAKE

---

COMPONENT LOCATION .....	15-2	FRONT MASTER CYLINDER.....	15-12
SERVICE INFORMATION .....	15-3	REAR MASTER CYLINDER .....	15-15
TROUBLESHOOTING .....	15-5	FRONT BRAKE CALIPER.....	15-18
BRAKE FLUID REPLACEMENT/ AIR BLEEDING .....	15-6	REAR BRAKE CALIPER .....	15-20
BRAKE PAD/DISC.....	15-10	BRAKE PEDAL .....	15-24

## HYDRAULIC BRAKE

### COMPONENT LOCATION



# SERVICE INFORMATION

## GENERAL

### ⚠ WARNING

Frequent inhalation of brake pad dust, regardless of material composition could be hazardous to your health.

- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

### NOTICE

*Spilled brake fluid will severely damage instrument lenses and painted surfaces. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap; make sure the front reservoir is horizontal first.*

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with 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 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.

## SPECIFICATIONS

ITEM		STANDARD	Unit: mm (in) SERVICE LIMIT
Front	Brake fluid	DOT 4	-
	Brake pad wear indicator	-	1.0 (0.04)
	Brake disc thickness	3.0 (0.12)	2.5 (0.10)
	Brake disc runout	-	0.25 (0.010)
	Master cylinder I.D.	11.022 (0.4339)	11.050 (0.4350)
	Master piston O.D.	10.971 (0.4319)	10.840 (0.4268)
	Caliper cylinder I.D.	27.025 (1.0640)	27.060 (1.0654)
	Caliper piston O.D.	26.878 (1.0582)	26.853 (1.0572)
Rear	Brake fluid	DOT 4	-
	Brake pad wear indicator	-	1.0 (0.04)
	Brake disc thickness	4.0 (0.16)	3.5 (0.14)
	Brake disc runout	-	0.25 (0.010)
	Master cylinder I.D.	9.547 (0.3759)	9.575 (0.3770)
	Master piston O.D.	9.491 (0.3737)	9.465 (0.3726)
	Caliper cylinder I.D.	22.675 (0.8927)	22.712 (0.8942)
	Caliper piston O.D.	22.602 (0.8898)	22.573 (0.8887)

## HYDRAULIC BRAKE

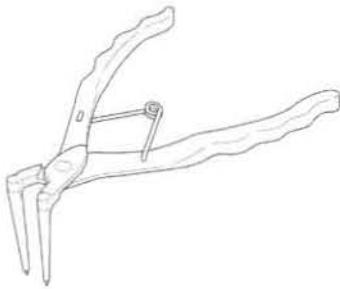
### TORQUE VALUES

Brake hose oil bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)
Brake lever pivot nut	5.9 N·m (0.6 kgf·m, 4.3 lbf·ft)
Brake lever pivot bolt	1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)
Brake lever adjuster lock nut	5.9 N·m (0.6 kgf·m, 4.3 lbf·ft)
Front brake hose guide bolt	5.2 N·m (0.53 kgf·m, 3.8 lbf·ft)
Rear brake hose guide screw	1.2 N·m (0.12 kgf·m, 0.9 lbf·ft)
Front master cylinder reservoir cover screw	1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)
Front master cylinder holder bolt	9.8 N·m (1.0 kgf·m, 7 lbf·ft)
Front brake caliper mounting bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)
Caliper bleed valve	5.4 N·m (0.55 kgf·m, 4.0 lbf·ft)
Front brake disc cover bolt	13 N·m (1.3 kgf·m, 9 lbf·ft)
Rear master cylinder reservoir cover bolt	1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)
Rear master cylinder mounting bolt	13 N·m (1.3 kgf·m, 9 lbf·ft)
Front caliper bracket pin bolt	23 N·m (2.3 kgf·m, 17 lbf·ft)
Rear caliper bracket pin bolt	13 N·m (1.3 kgf·m, 9 lbf·ft)
Front caliper pin bolt	23 N·m (2.3 kgf·m, 17 lbf·ft)
Rear caliper pin bolt	27 N·m (2.8 kgf·m, 20 lbf·ft)
Brake caliper pad pin	18 N·m (1.8 kgf·m, 13 lbf·ft)
Front brake caliper pad pin plug	2.0 N·m (0.2 kgf·m, 1.4 lbf·ft)
Brake pedal pivot bolt ('04 – '06)	25 N·m (2.6 kgf·m, 19 lbf·ft)
Brake pedal pivot bolt (After '06)	36 N·m (3.7 kgf·m, 27 lbf·ft)
Rear master cylinder push rod lock nut	5.9 N·m (0.6 kgf·m, 4.3 lbf·ft)

Apply locking agent to the threads

### TOOL

Snap ring pliers  
07914-SA50001



## TROUBLESHOOTING

### Brake lever/pedal soft or spongy

- Air in hydraulic system
- Leaking hydraulic system
- Contaminated brake pads/disc
- Worn caliper piston seal
- Worn master cylinder piston cups
- Worn brake pads/disc
- Contaminated caliper
- Caliper not sliding properly
- Low brake fluid level
- Clogged fluid passage
- Warped/deformed brake disc
- Sticking/worn caliper piston
- Sticking/worn master cylinder piston
- Contaminated master cylinder
- Bent brake lever/pedal

### Brake lever/pedal hard

- Clogged/restricted brake system
- Sticking/worn caliper piston
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Worn caliper piston seal
- Sticking/worn master cylinder piston
- Bent brake lever/pedal

### Brake drags

- Contaminated brake pads/disc
- Misaligned wheel
- Clogged/restricted brake hose joint
- Warped/deformed brake disc
- Caliper not sliding properly
- Clogged/restricted brake hydraulic system
- Sticking/worn caliper piston
- Clogged master cylinder port

## HYDRAULIC BRAKE

### BRAKE FLUID REPLACEMENT/AIR BLEEDING

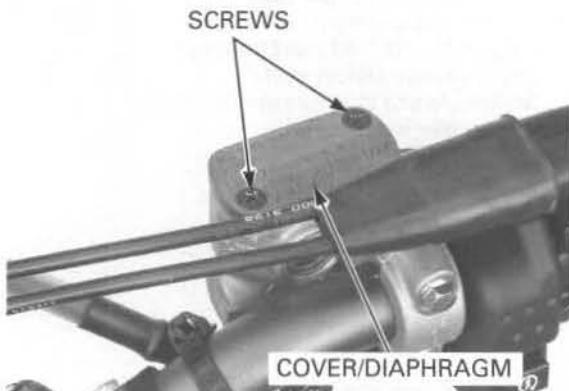
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Once the hydraulic system has been opened, or if the brake feels spongy the system must be bled.
- Do not allow foreign material to enter the system when filling the reservoir.
- Avoid spilling fluid on plastic or rubber parts. Place a rag over these parts whenever the system is serviced.



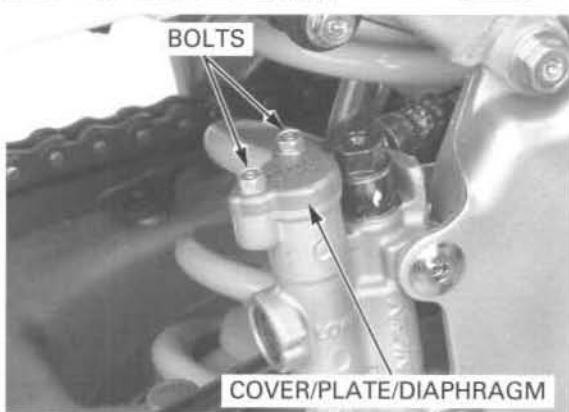
#### BRAKE FLUID DRAINING

Check the master cylinder parallel to the ground, before removing the reservoir cover.

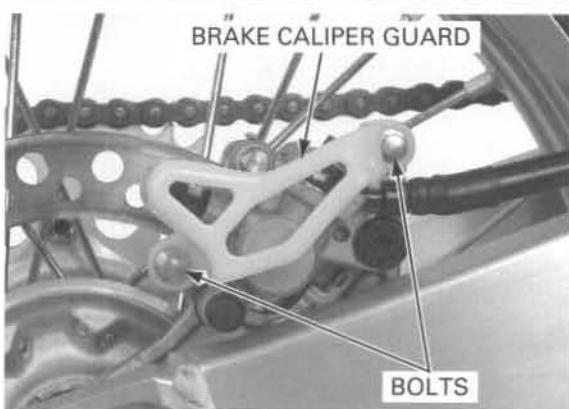
For the front brake, remove the screws, reservoir cover and diaphragm.



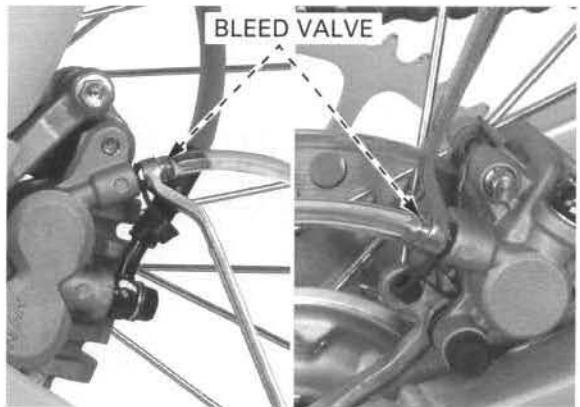
For the rear brake, remove the bolts, reservoir cover, set plate and diaphragm.



For the rear brake, remove the bolts and rear brake caliper guard.



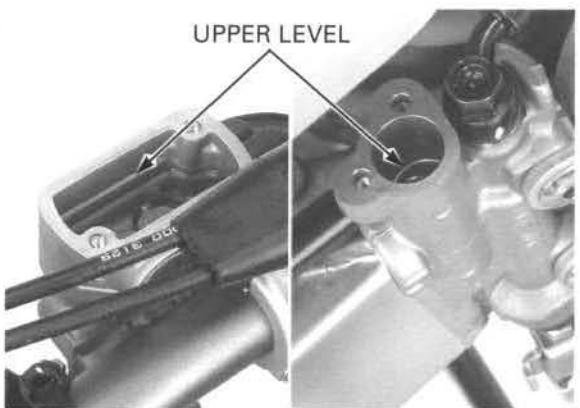
Connect a bleed hose to the bleed valve.  
 Loosen the bleed valve and pump the brake lever (pedal).  
 Stop operating the brake when no more fluid flows out of the bleed valve.



### BRAKE FLUID FILLING/AIR BLEEDING

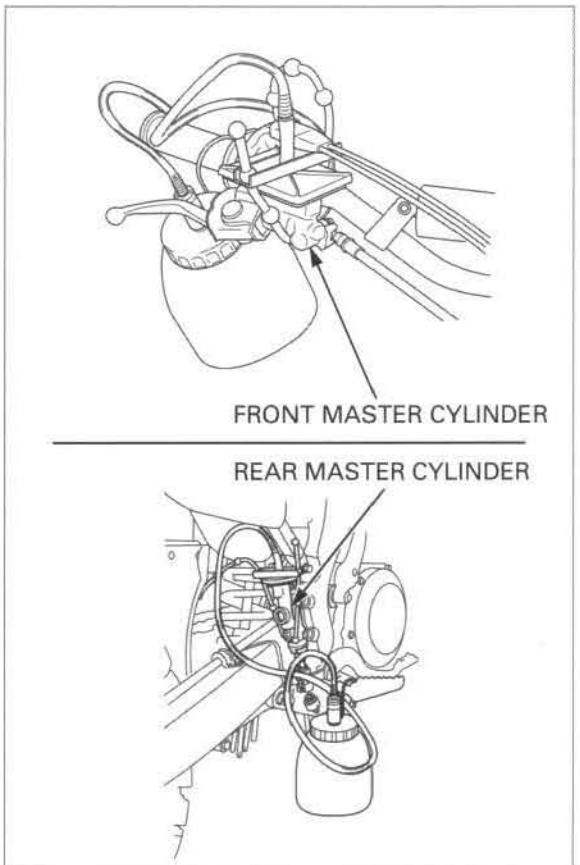
*Do not mix different types of fluid since they are not compatible.*

Fill the master cylinder with DOT4 brake fluid to the upper level.



*When using a commercially available brake bleeder, follow the manufacturer's operating instruction.*

Connect a commercially available brake bleeder to the bleed valve.



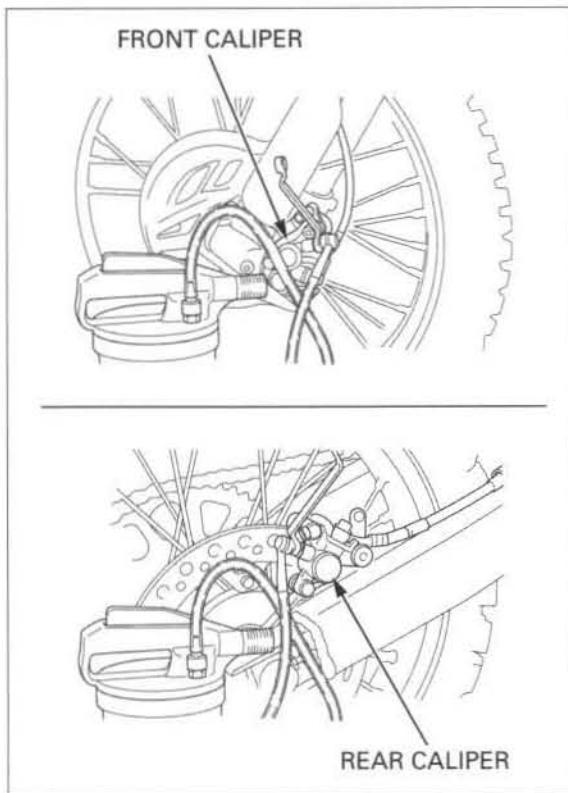
## HYDRAULIC BRAKE

Operate the brake bleeder and loosen the bleed valve. If an automatic refill system is not used, add fluid when the fluid level in the reservoir is low.

If air enters the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Perform the bleeding procedure until the system is completely flushed/bled.

Close the bleed valve and operate the brake lever. If it still feels spongy, bleed the system again.



If a brake bleeder is not available, perform the following procedure.

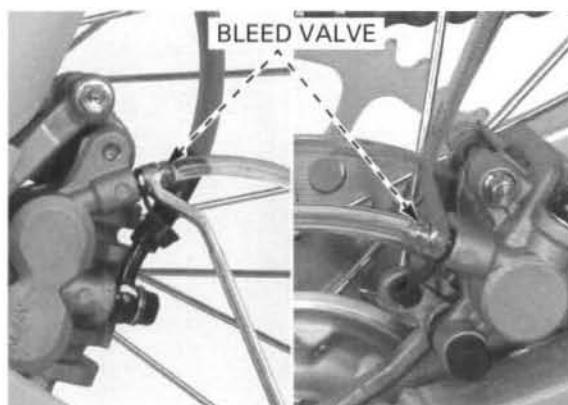
Pressurize the system with the lever until there are no air bubbles in the fluid flowing out of the small hole in the reservoir and lever resistance is felt.



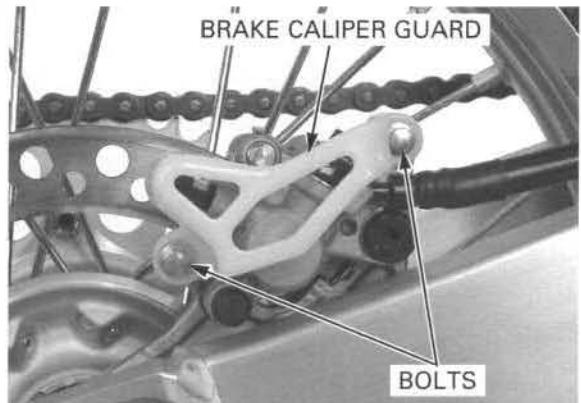
1. Pump the brake lever or pedal several times, then squeeze the brake lever or pedal all the way and loosen the bleed valve 1/2 of a turn. Wait several seconds and close the bleed valve.
2. Release the brake lever or pedal slowly and wait several seconds after it reaches the end of its travel.
3. Repeat steps 1-2 until there are no air bubbles in the bleed hose.

After bleeding air completely, tighten the bleed valves to the specified torque.

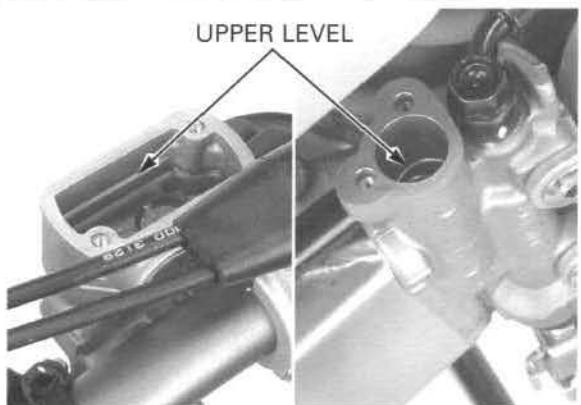
**TORQUE: 5.4 N·m (0.55 kgf·m, 4.0 lbf·ft)**



For the rear brake, install the brake caliper guard and tighten the bolts securely.

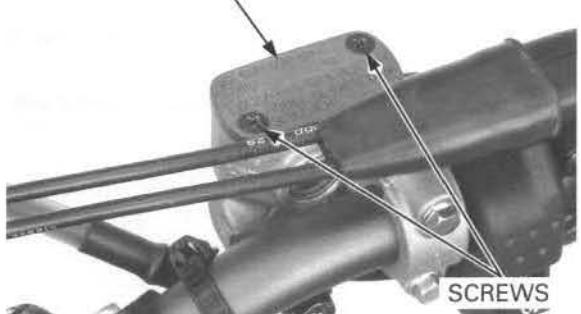


Fill the reservoir with DOT 4 brake fluid to the top of the upper level.



Install the diaphragm and reservoir cover.  
Tighten the reservoir cover screws to the specified torque.

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

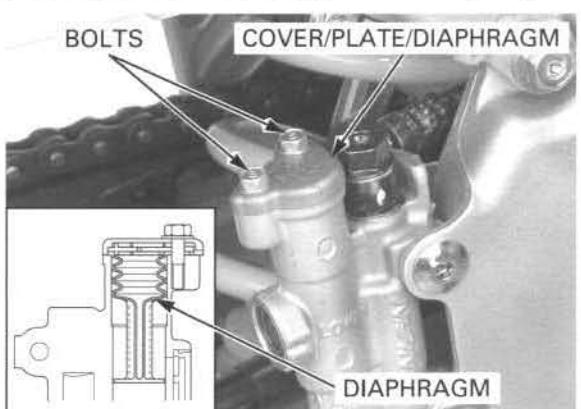


Straighten the diaphragm and install it to the rear master cylinder.

Check the diaphragm installation as shown.

Install the set plate and reservoir cover.  
Tighten the reservoir cover bolts to the specified torque.

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

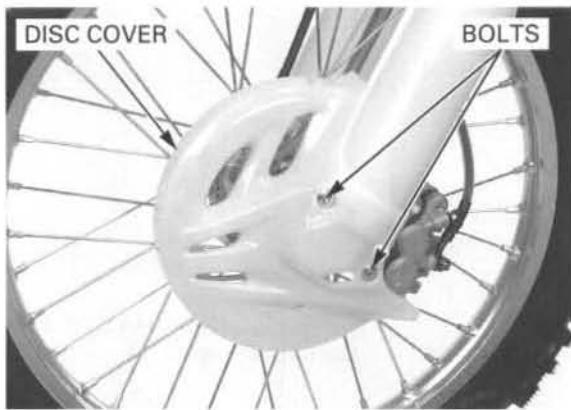


## HYDRAULIC BRAKE

### BRAKE PAD/DISC

#### BRAKE PAD REPLACEMENT

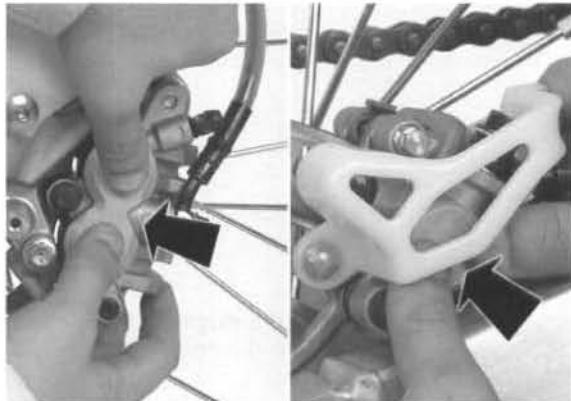
Remove the bolts and brake disc cover.



Push the caliper pistons all the way in to allow installation of new brake pads.

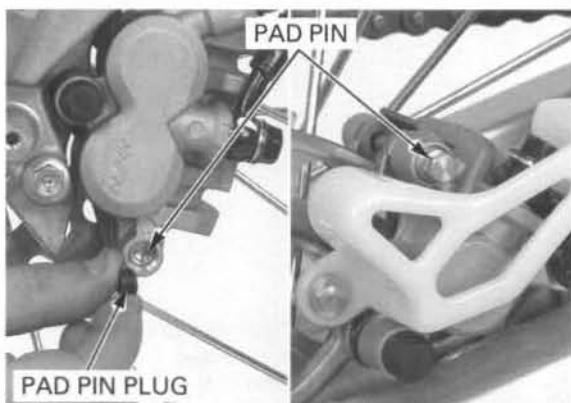
NOTE:

- Check the brake fluid level in the brake master cylinder reservoir as this operation causes the level to rise.



For the front brake, remove the pad pin plug and pad pin.

For the rear brake, remove the pad pin.

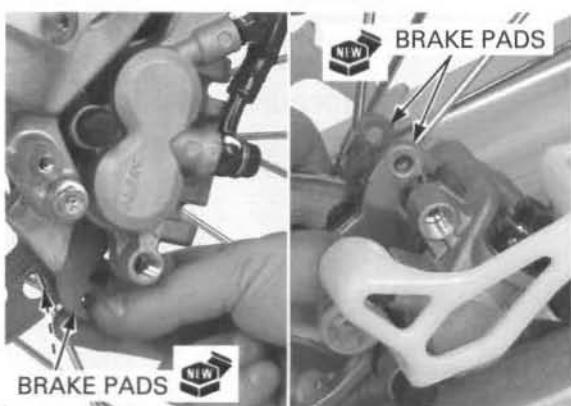


Remove the brake pads.

Install the new brake pads to the pad retainer securely.

NOTE:

- Always replace the brake pads in pairs to assure even disc pressure.
- A contaminated brake disc or pad reduces stopping power.
- Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.



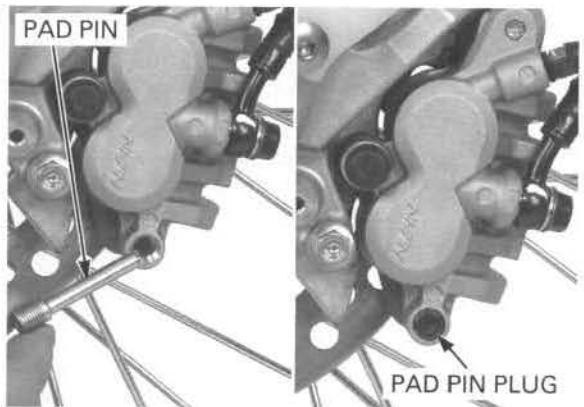
For the front brake, push the brake pads against the pad spring, then install the pad pin.

Tighten the pad pin to the specified torque.

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

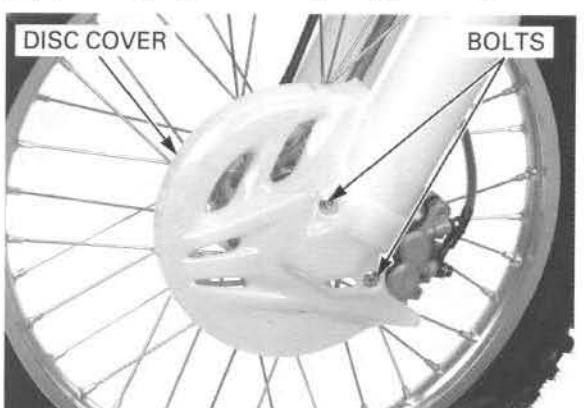
Install and tighten the pad pin plug to the specified torque.

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



Install the brake disc cover and tighten the bolts specified torque.

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

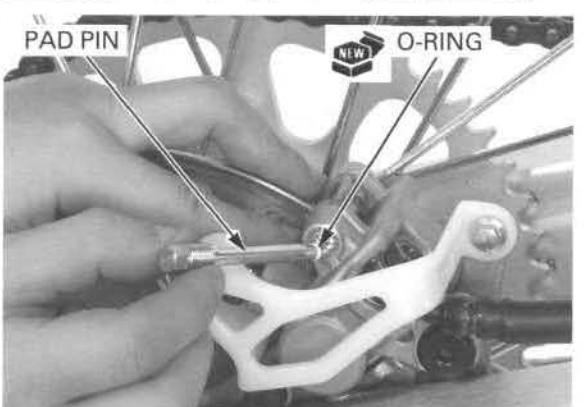


For the rear brake, install a new O-ring into the pad pin groove.

Install and tighten the pad pin to the specified torque.

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

Operate the brake lever or pedal to seat the caliper piston against the pads.



## BRAKE DISC INSPECTION

Remove the brake disc cover (page 15-10).

Visually inspect the brake disc for damage or cracks.

Measure the brake disc thickness with a micrometer.

### SERVICE LIMITS:

- FRONT: 2.5 mm (0.10 in)

- REAR: 3.5 mm (0.14 in)

Replace the brake disc if the smallest measurement is less than the service limit.

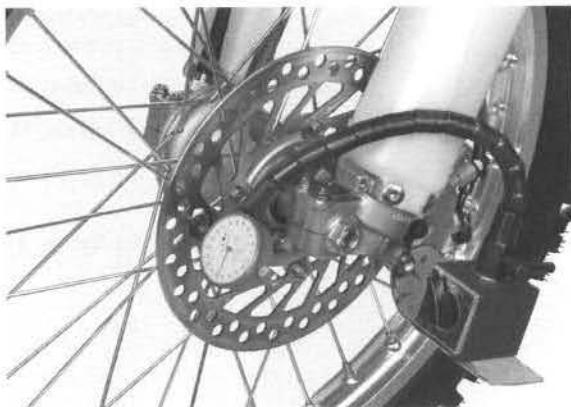


## HYDRAULIC BRAKE

Measure the brake disc warpage with a dial indicator.

**SERVICE LIMIT: 0.25 mm (0.010 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.



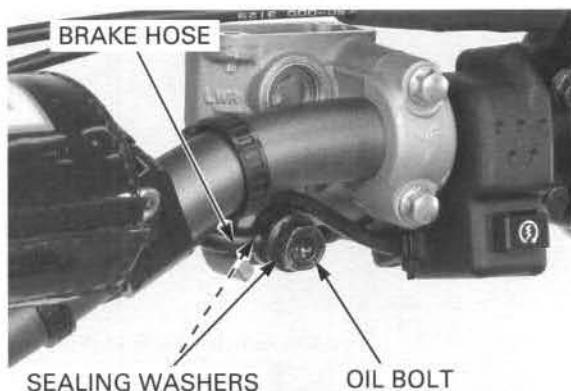
## FRONT MASTER CYLINDER

### REMOVAL

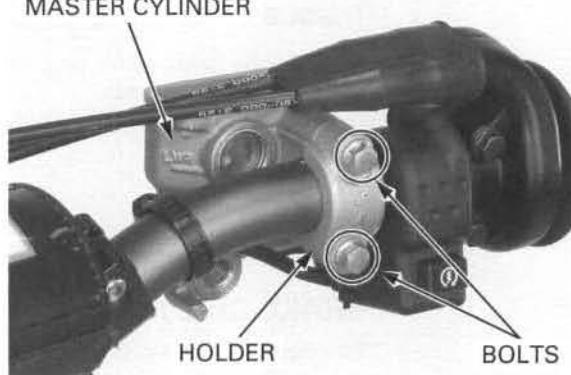
Drain the front brake hydraulic system (page 15-6).

*When removing the brake hose bolt, cover the end of the hose to prevent contamination. Secure the hose to prevent fluid from leaking out.*

Remove the brake hose oil bolt, sealing washers and brake hose eyelet.



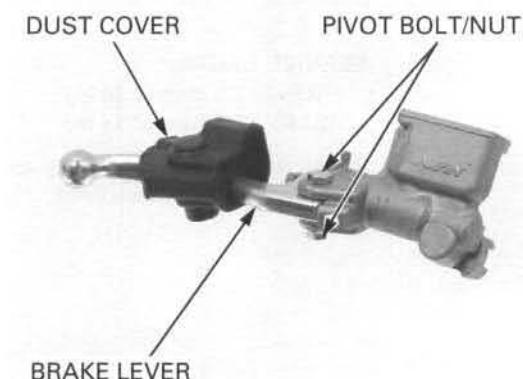
Remove the bolts, holder and master cylinder assembly.



### DISASSEMBLY

Remove the dust cover.

Remove the pivot bolt/nut and brake lever assembly.



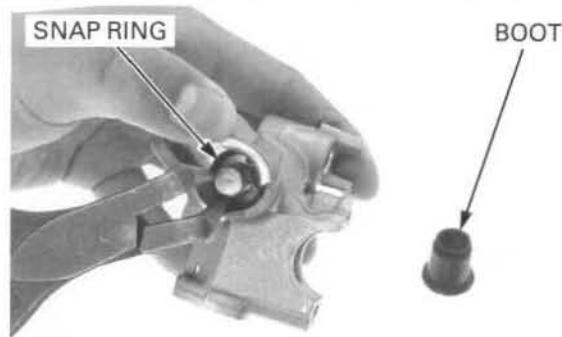
Remove the boot.

Remove the snap ring from the master cylinder body using the special tool as shown.

**TOOL:**

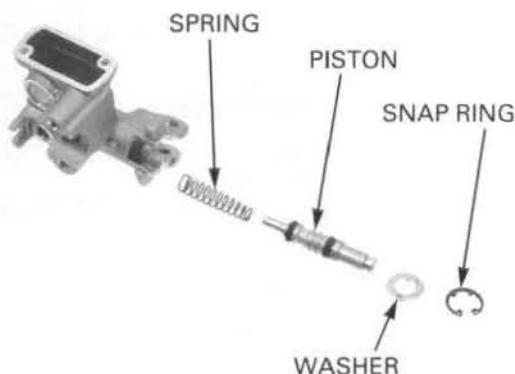
Snap ring pliers

07914-SA50001



Remove the washer, master piston and spring.

Clean the inside of the cylinder and reservoir with brake fluid.



## INSPECTION

Check the piston boot, primary cup and secondary cup for fatigue or damage.

Check the master cylinder and piston for abnormal scratches.

Measure the master cylinder I.D.

**SERVICE LIMIT: 11.050 mm (0.4350 in)**



Measure the master piston O.D.

**SERVICE LIMIT: 10.840 mm (0.4268 in)**



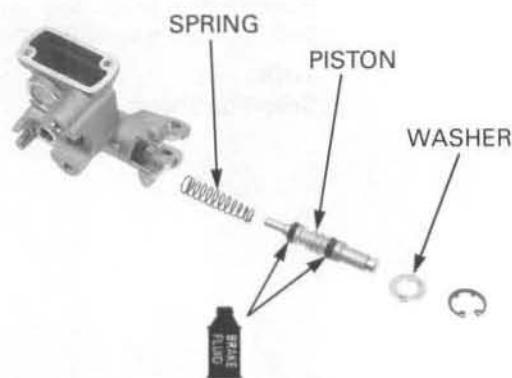
## HYDRAULIC BRAKE

### ASSEMBLY

Replace the piston, cups, spring, snap ring and boot as a set; do not substitute individual parts.

Dip the piston in brake fluid.  
Install the spring to the piston.

When installing the cups, do not allow the lips to turn inside out.



Be certain the snap ring is firmly seated in the groove.

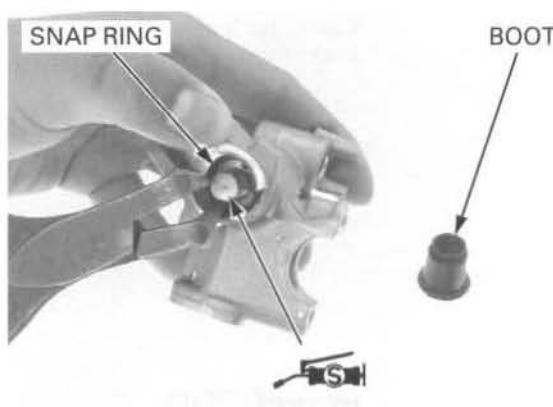
Install the snap ring using the special tool.

**TOOL:**

**Snap ring pliers** **07914-SA50001**

Apply silicone grease to the lever contacting area of the piston.

Install the boot to the master cylinder.



Apply silicone grease to the pivot bolt sliding surface.

Install the brake lever.

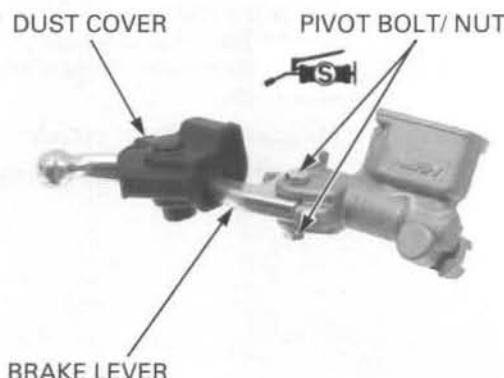
Install and tighten the pivot bolt to the specified torque.

**TORQUE: 1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)**

Tighten the pivot nut to the specified torque.

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

Install the dust cover.



### INSTALLATION

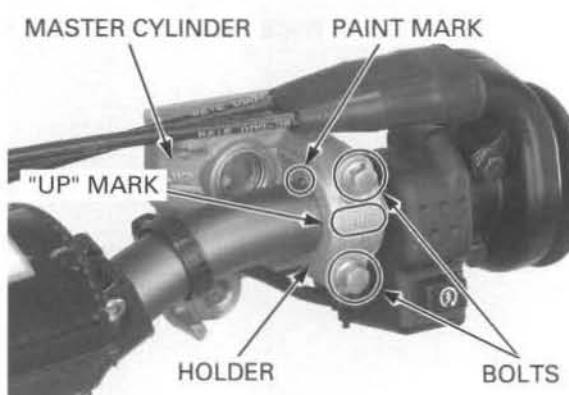
Place the master cylinder assembly on the handlebar.

Align the end of the master cylinder with the paint mark on the handlebar.

Install the master cylinder holder with the "UP" mark facing up.

Tighten the upper bolt first, then the lower bolt.

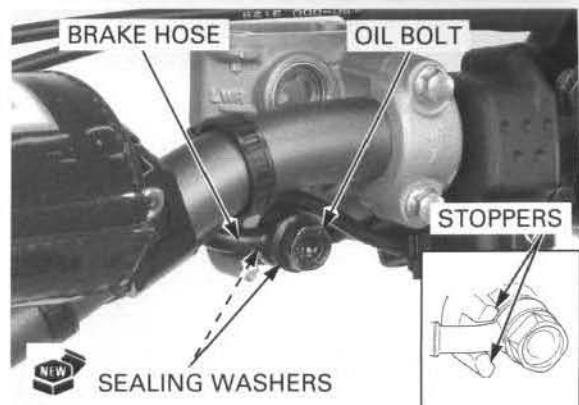
**TORQUE: 9.8 N·m (1.0 kgf·m, 7 lbf·ft)**



Align the brake hose eyelet between the stoppers.  
Install the brake hose eyelet with the oil bolt and new sealing washers.  
Tighten the brake hose oil bolt to the specified torque.

**TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)**

Fill the reservoir to the upper level and bleed the front brake hydraulic system (page 15-7).



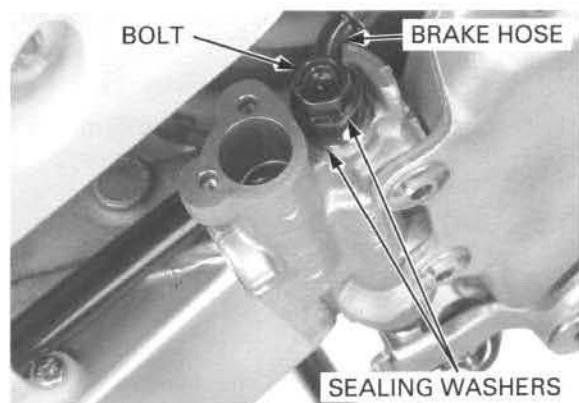
## REAR MASTER CYLINDER

### REMOVAL

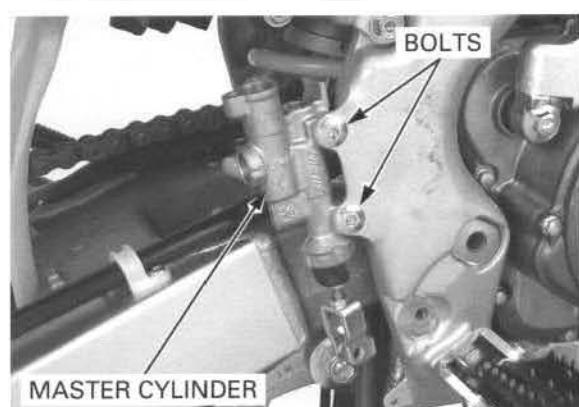
Drain the rear brake hydraulic system (page 15-6).  
Remove the brake pedal (page 15-24).

*When removing the brake hose bolt, cover the end of the hose to prevent contamination. Secure the hose to prevent fluid from leaking out.*

Remove the brake hose oil bolt, sealing washers and brake hose eyelet.



Remove the master cylinder mounting bolts and rear master cylinder.



### DISASSEMBLY

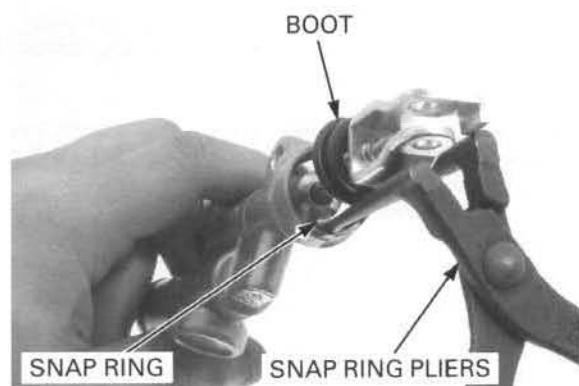
Remove the boot.

Remove the snap ring from the master cylinder body using the special tool as shown.

#### TOOL:

Snap ring pliers

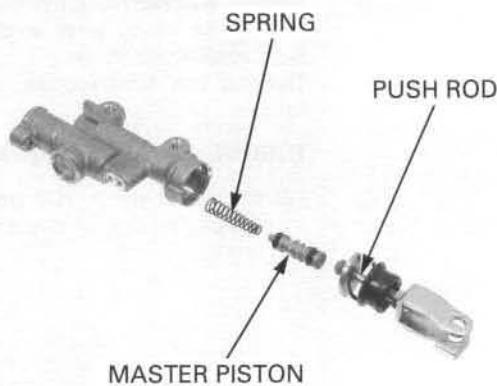
07914-SA50001



## HYDRAULIC BRAKE

Remove the push rod, master piston and spring.

Clean the inside of the cylinder with brake fluid.



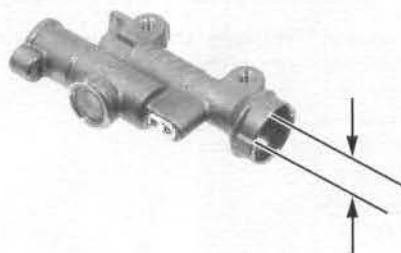
### INSPECTION

Check the piston boot, primary cup and secondary cup for fatigue or damage.

Check the master cylinder and piston for abnormal scratches.

Measure the master cylinder I.D.

**SERVICE LIMIT: 9.575 mm (0.3770 in)**



Measure the master piston O.D.

**SERVICE LIMIT: 9.465 mm (0.3726 in)**



### ASSEMBLY

Replace the piston, cups, spring, snap ring and boot as a set; do not substitute individual parts.

Coat all of the parts with clean brake fluid before assembly.

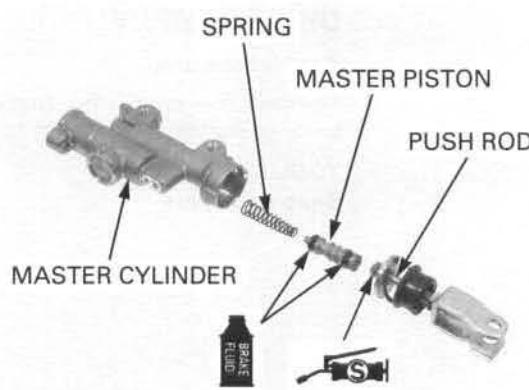
Dip the piston in brake fluid.

Install the spring to the piston.

When installing the cups, do not allow the lips to turn inside out.

Install the piston assembly into the master cylinder.

Apply silicone grease to the piston contact area of the push rod.



Install the push rod into the master cylinder.

*Be certain the snap ring is firmly seated in the groove*

Install the snap ring using the special tool.

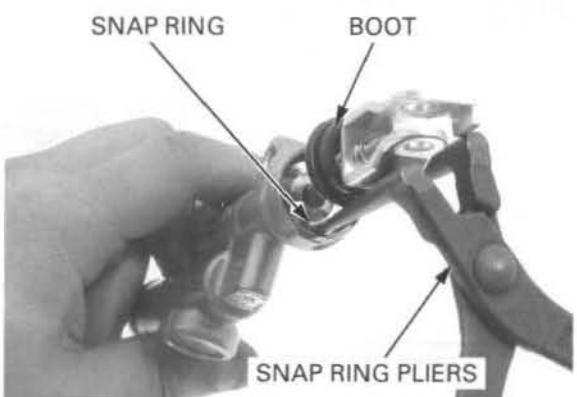
**TOOL:**

**Snap ring pliers**

07914-SA50001

Apply silicone grease to the boot fitting area of the push rod.

Install the boot.

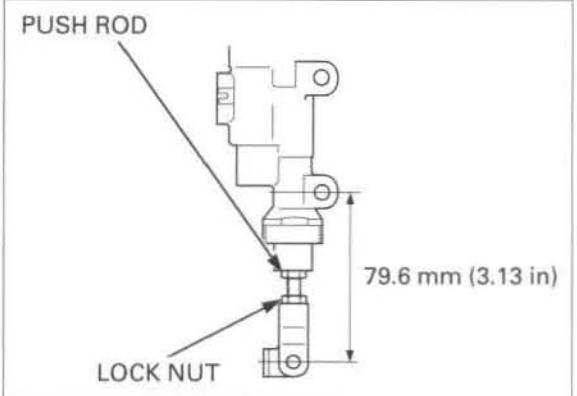


Adjust the brake pedal to the desired height by loosening the lock nut and turning the push rod.

**STANDARD LENGTH: 79.6 mm (3.13 in)**

Tighten the lock nut to the specified torque.

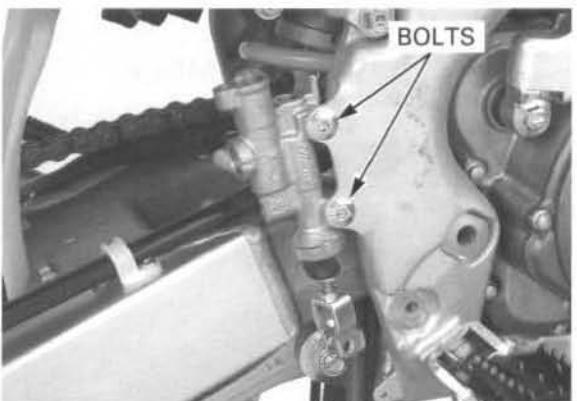
**TORQUE: 5.9 N·m (0.6 kgf·m, 4.3 lbf·ft)**



## INSTALLATION

Install the master cylinder and tighten the mounting bolts to the specified torque.

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



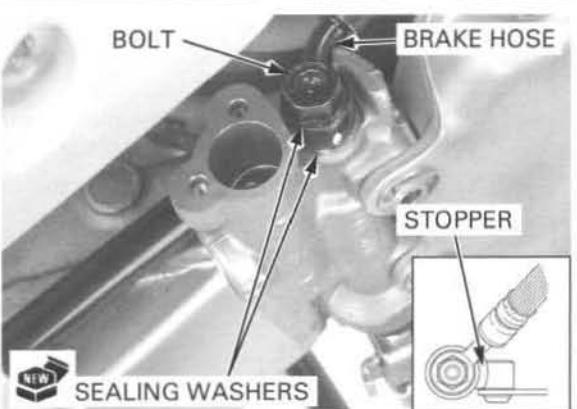
Install the brake hose with the oil bolt and new sealing washers.

Push the eyelet joint against the stopper, then tighten the brake hose oil bolt to the specified torque.

**TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)**

Install the brake pedal (page 15-25).

Fill the reservoir to the upper level and bleed the brake system (page 15-7).



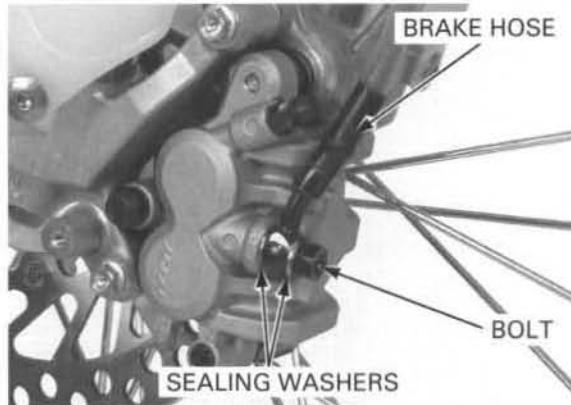
## HYDRAULIC BRAKE

# FRONT BRAKE CALIPER

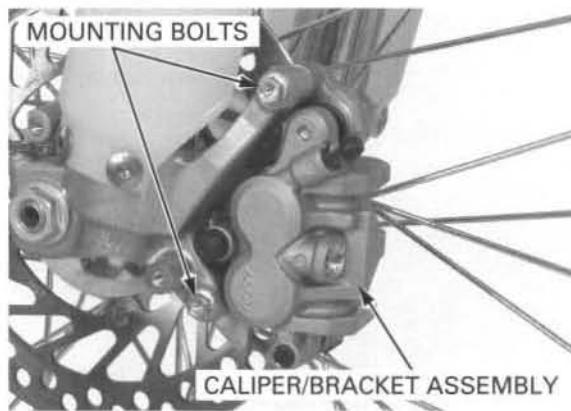
### REMOVAL

Drain the front brake hydraulic system (page 15-6).  
Remove the brake pads (page 15-10).

Remove the brake hose oil bolt, sealing washers and brake hose eyelet.



Remove the caliper mounting bolts and then remove the caliper and bracket as an assembly.

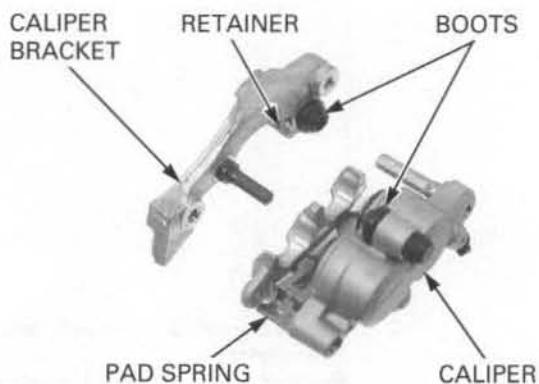


### DISASSEMBLY

Remove the caliper bracket from the caliper body.

Remove the brake pad spring from the caliper body.  
Remove the brake pad retainer from the caliper bracket

Remove the caliper pin boot and bracket pin boot.

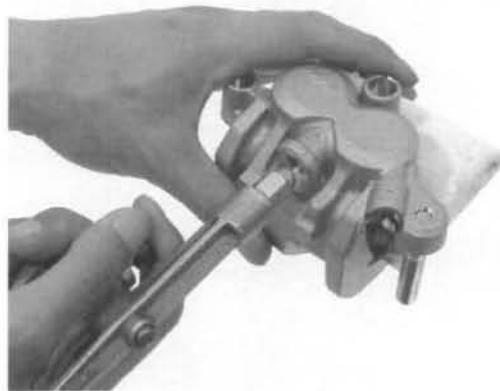


If necessary, lightly apply compressed air to the caliper fluid inlet to get the piston out.

Place a shop rag under the caliper to cushion the piston when it is expelled.

Use the air in short spurts.

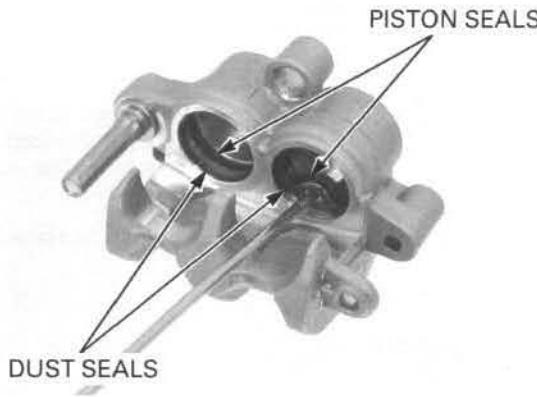
*Do not bring the air nozzle too close to the inlet or the pistons may be forced out with excessive force that could cause injury.*



*Be careful not to damage the piston sliding surface.*

Push the dust seals and piston seals in and lift them out.

Clean the seal grooves, caliper pistons and caliper piston sliding surfaces with clean brake fluid.



## INSPECTION

Check the caliper cylinder and pistons for scoring, scratches or damage.

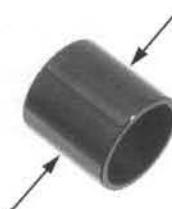
Measure the master cylinder I.D.

**SERVICE LIMIT:** 27.060 mm (1.0654 in)



Measure the caliper piston O.D.

**SERVICE LIMIT:** 26.853 mm (1.0572 in)



## ASSEMBLY

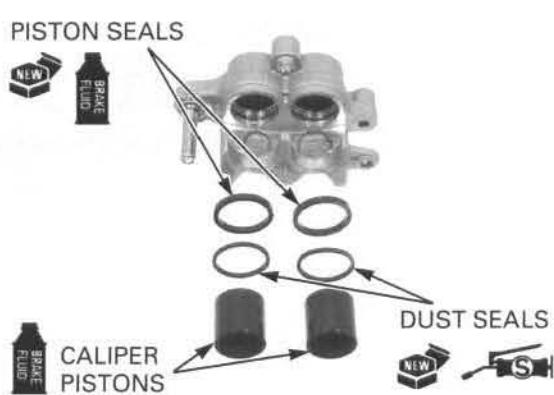
Coat the new piston seals with clean brake fluid.

Coat the new dust seals with silicon grease.

*Install each piston seal, dust seal and caliper piston in their proper locations.*

Install the piston and dust seals into the grooves in the caliper body.

Coat the caliper pistons with clean brake fluid and install them into the caliper cylinder with their open ends facing the pad.



## HYDRAULIC BRAKE

Install the brake pad retainer onto the caliper bracket.

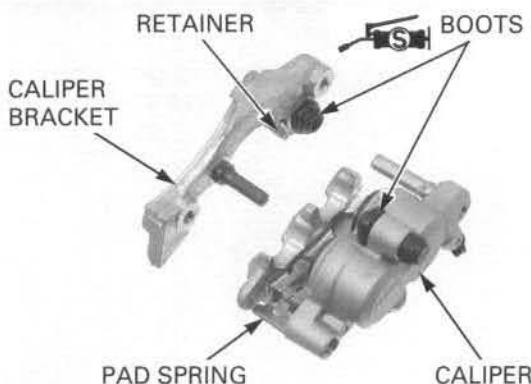
Note the installation direction of the pad spring.

Install the pad spring into the caliper body.

Replace the caliper and bracket pin boots if there is wear, deterioration or damage.

Apply silicone grease to the inside of the boots then install them.

When assembling the caliper and bracket, set the boot into the side pin groove.

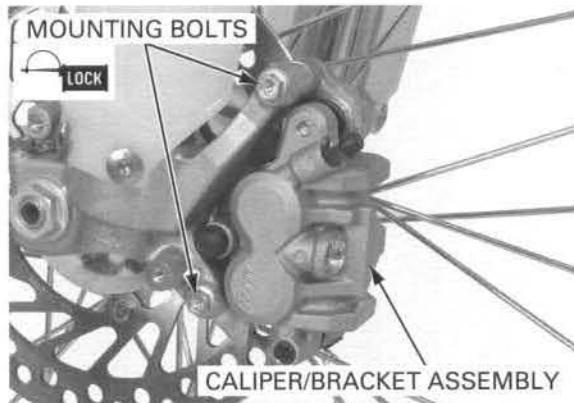


### INSTALLATION

Install the caliper/bracket assembly to the fork leg. Clean and apply locking agent to the caliper mounting bolt threads.

Install and tighten the mounting bolts to the specified torque.

**TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)**



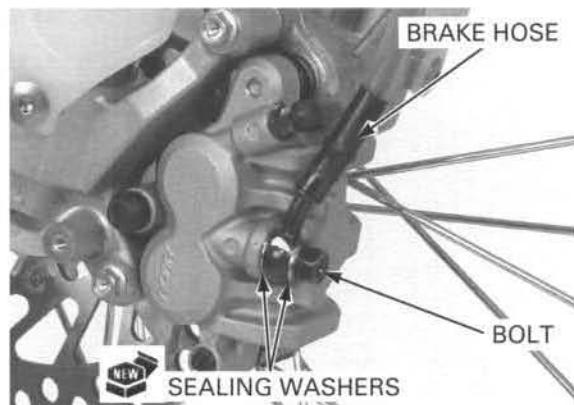
Install the brake hose eyelet to the caliper body with new sealing washers and oil bolt.

Push the brake hose eyelet to the stopper on the caliper, then tighten the oil bolt to the specified torque.

**TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)**

Install the brake pad (page 15-10).

Fill the reservoir to the upper level and bleed the front hydraulic system (page 15-7).



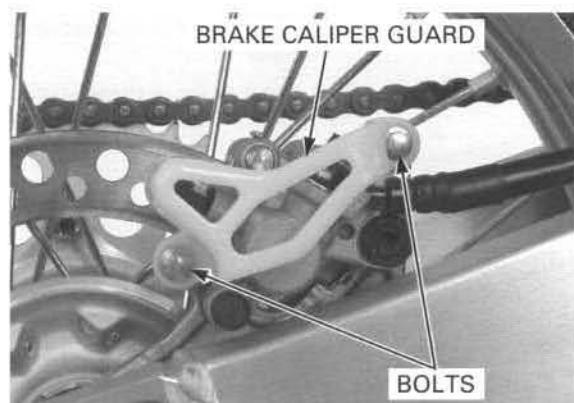
## REAR BRAKE CALIPER

### REMOVAL

Drain the rear brake hydraulic system (page 15-6).

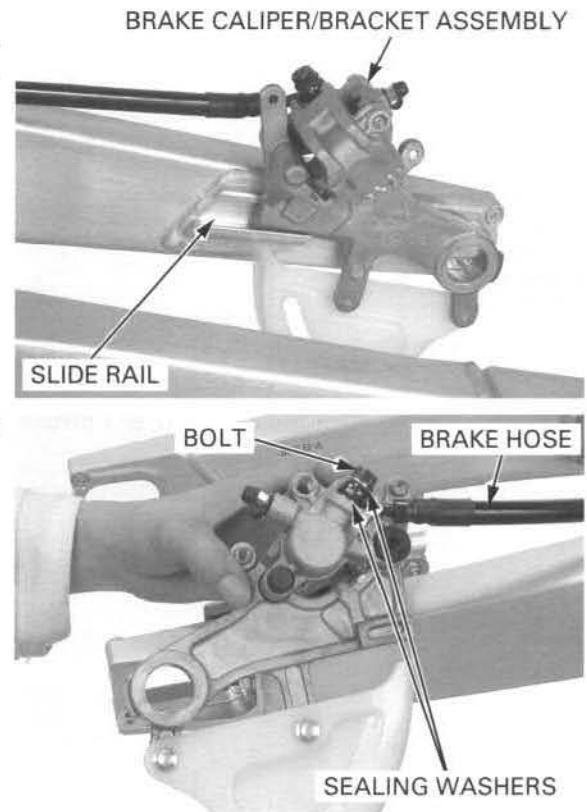
Remove the brake pads (page 15-10).

Remove the bolts and brake caliper guard.



Remove the rear wheel (page 14-7).

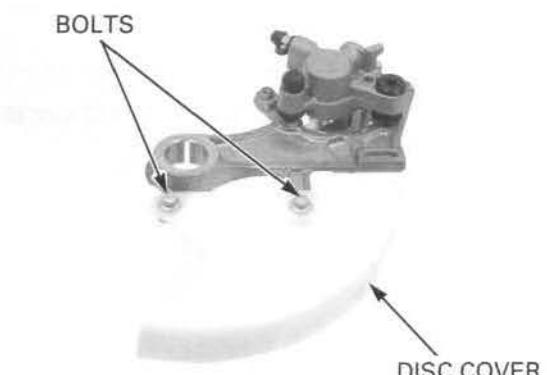
Slide the brake caliper and bracket assembly backward and pull it off of the slide rail on the swingarm.



Remove the brake hose oil bolts, sealing washers and brake hose eyelet.

## DISASSEMBLY

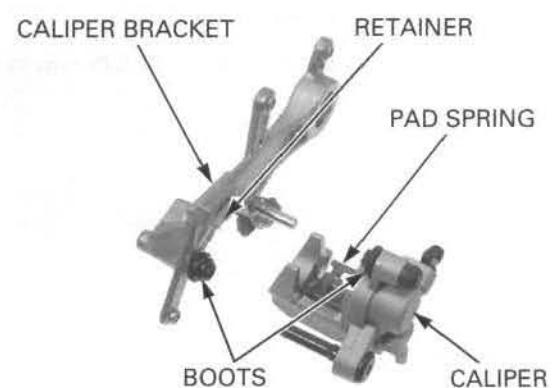
Remove the bolts and brake disc cover.



Remove the caliper bracket from the caliper body.

Remove the brake pad spring from the caliper body.  
Remove the brake pad retainer from the caliper bracket.

Remove the caliper pin boot and bracket pin boot.



## HYDRAULIC BRAKE

If necessary, lightly apply compressed air to the caliper fluid inlet to get piston out.

Place a shop rag under the caliper to cushion the piston when it is expelled.

Use the air in short spurts.

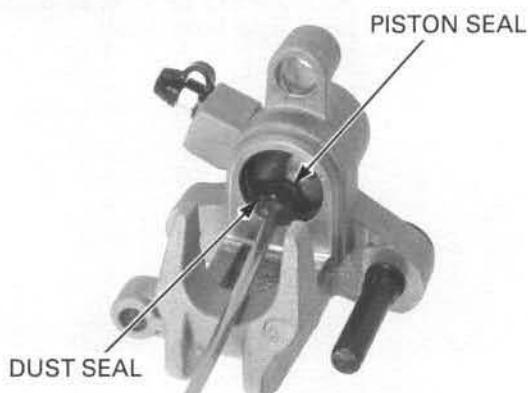
*Do not bring the air nozzle too close to the inlet or the pistons may be forced out with excessive force that could cause injury.*



*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 master cylinder I.D.

**SERVICE LIMIT: 22.712 mm (0.8942 in)**



Measure the caliper piston O.D.

**SERVICE LIMIT: 22.573 mm (0.8887 in)**



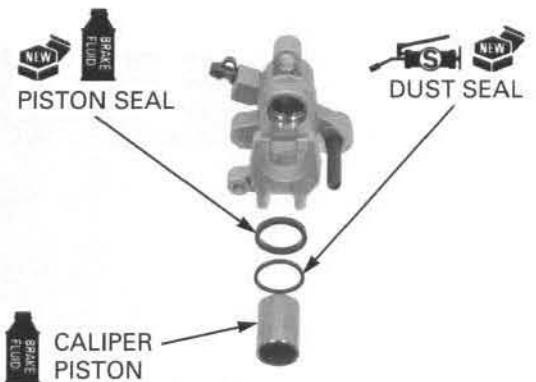
## ASSEMBLY

Coat a new piston seal with clean brake fluid.  
Coat a new dust seal with silicone grease.

*Install the piston seal, dust seal and caliper piston in their proper locations.*

Install the piston and dust seals into the grooves in the caliper body.

Coat the caliper pistons with clean brake fluid and install them into the caliper cylinder with its open end facing the pad.



Install the brake pad retainer onto the caliper bracket.

*Note the installation direction of the pad spring.*

Install the pad spring into the caliper body.

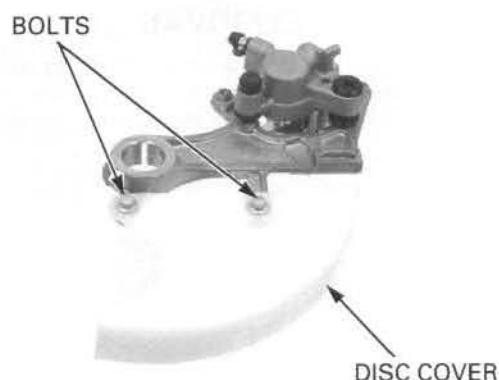
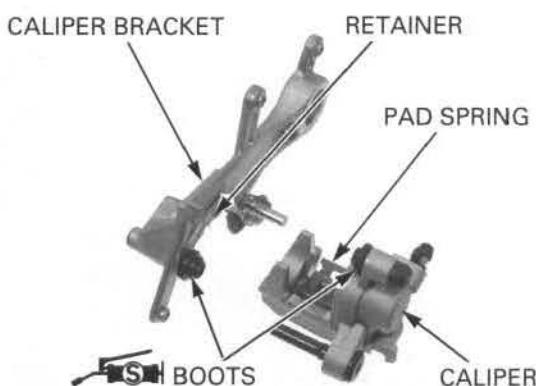
Replace the caliper and bracket pin boots if there is wear, deterioration or damage.

Apply silicone grease to the inside of the boots then install them.

*When assembling the caliper and bracket, set the boot into the slide pin groove.*

Assemble the caliper and bracket.

Install the brake disc cover and tighten the bolts.

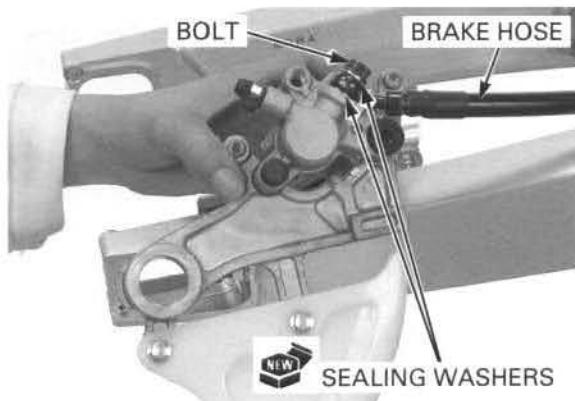


## INSTALLATION

Install the brake hose eyelets to the caliper body with new sealing washers and oil bolt.

Push the brake hose eyelet to the stopper on the caliper, then tighten the oil bolt to the specified torque.

**TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)**

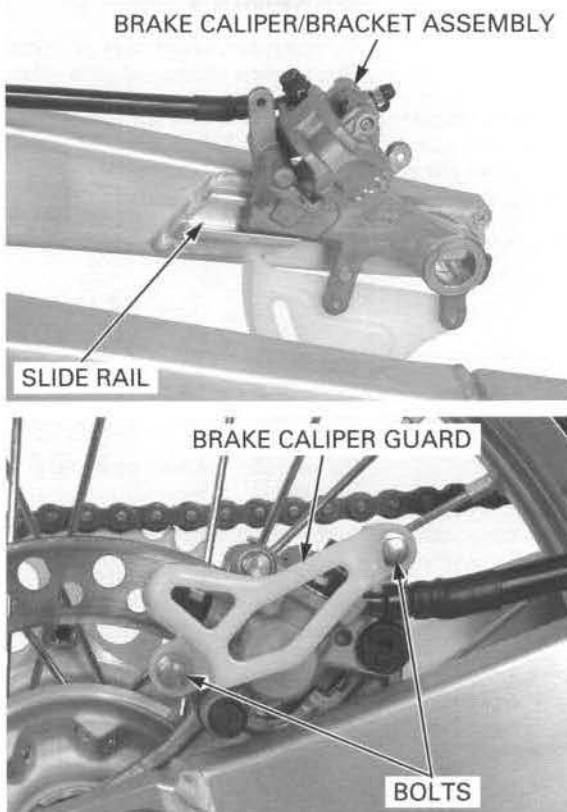


## HYDRAULIC BRAKE

Install the brake caliper/bracket assembly onto the swingarm by aligning the bracket tab with the slide rail on the swingarm.

Install the rear wheel (page 14-12).  
Install the brake pad (page 15-10).

Fill the reservoir to the upper level and bleed the hydraulic system (page 15-7).



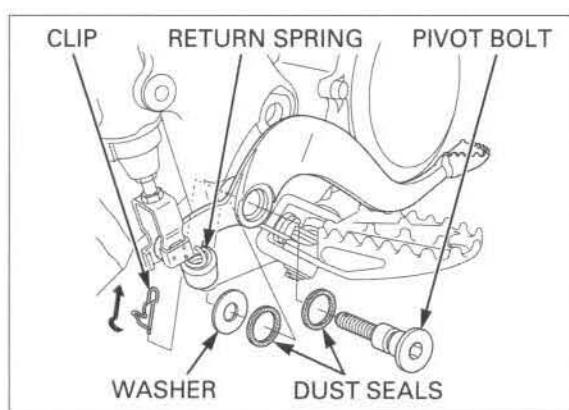
Install the caliper guard and tighten the bolts securely.

## BRAKE PEDAL

### REMOVAL

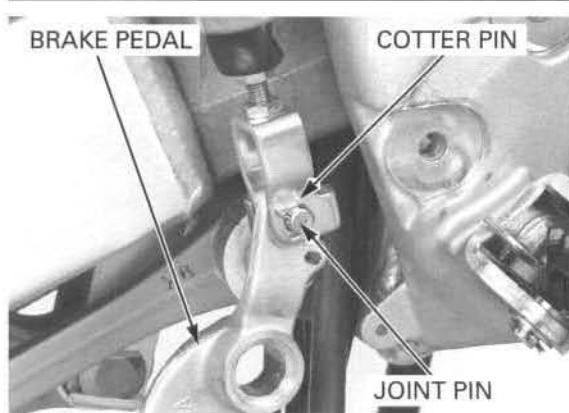
Remove the clip, brake pedal pivot bolt, washer and dust seals.

Remove the return spring.



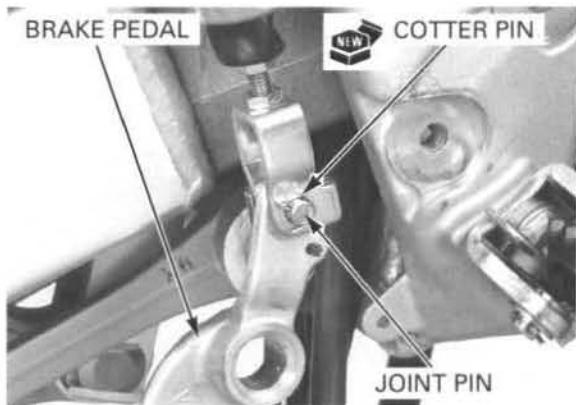
Remove and discard the cotter pin.

Remove the joint pin and brake pedal.



## INSTALLATION

Connect the brake pedal to the push rod.  
Install the joint pin and a new cotter pin.



Install the dust seals to the brake pedal.

Apply grease to the sliding surface of the brake pedal and pivot bolt.

**'04 – '06 only:** Clean and apply a locking agent to the threads of the brake pedal.

Install the washer and pivot bolt.

Tighten the brake pedal pivot bolt to the specified torque.

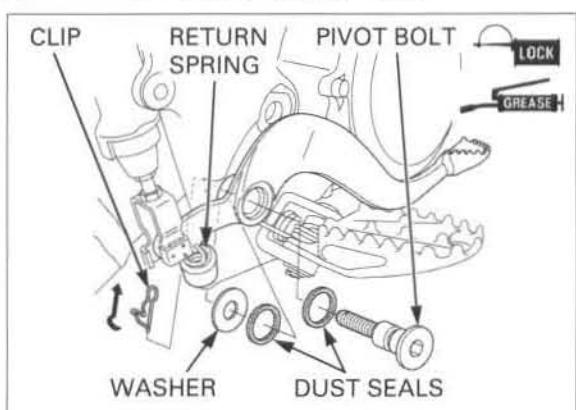
### TORQUE:

**'04 – '06:** 25 N·m (2.6 kgf·m, 19 lbf·ft)  
**After '06:** 36 N·m (3.7 kgf·m, 27 lbf·ft)

Install the brake pedal clip securely.

Install the clip into the pivot bolt hole.

Install the return spring.



---

**MEMO**

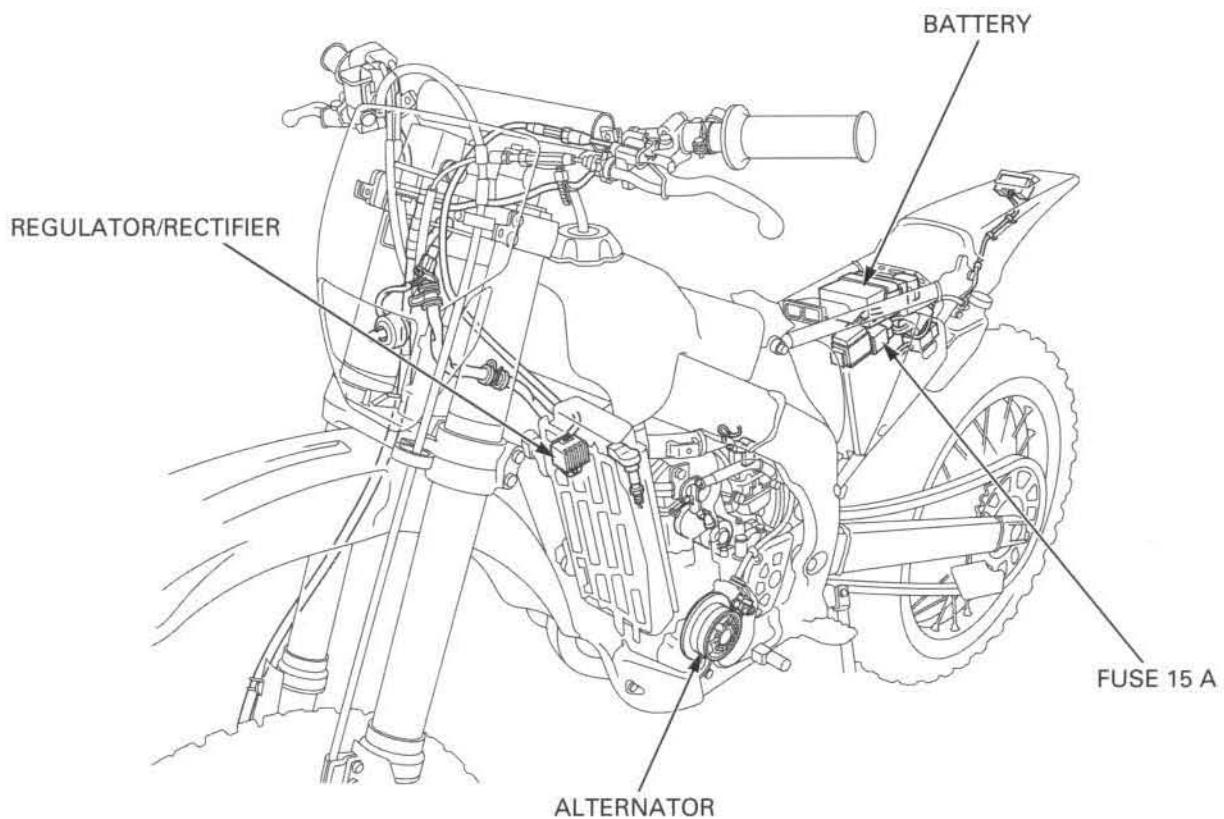
# **16. BATTERY/CHARGING SYSTEM**

---

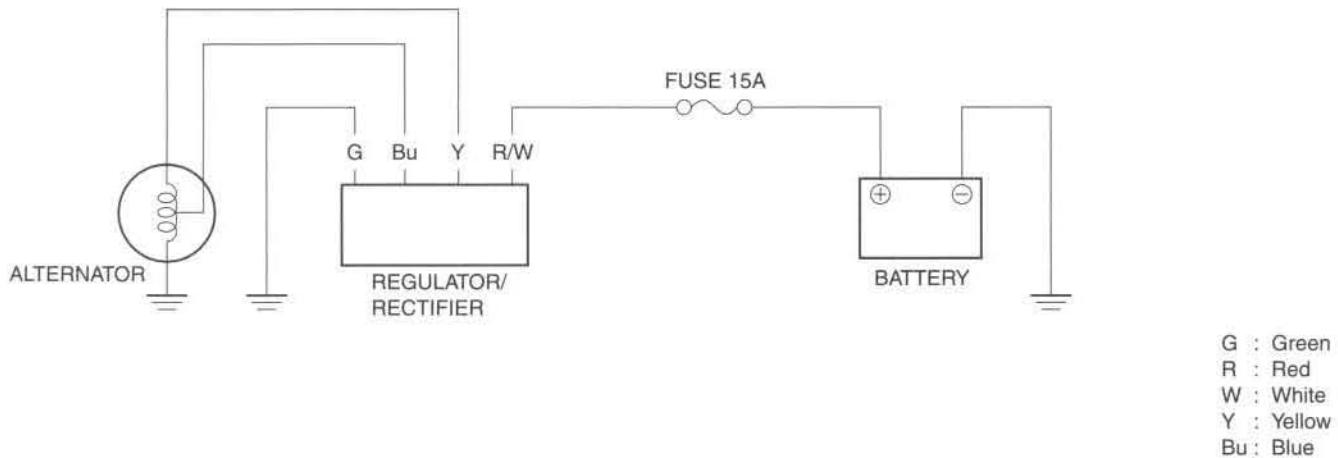
COMPONENT LOCATION .....	16-2	BATTERY .....	16-6
SYSTEM DIAGRAM.....	16-2	CHARGING SYSTEM INSPECTION.....	16-6
SERVICE INFORMATION .....	16-3	REGULATOR/RECTIFIER .....	16-7
TROUBLESHOOTING .....	16-5	ALTERNATOR CHARGING COIL .....	16-8

## BATTERY/CHARGING SYSTEM

### COMPONENT LOCATION



### SYSTEM DIAGRAM



## SERVICE INFORMATION

### GENERAL

#### ⚠ WARNING

- The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.
  - The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.
    - If electrolyte gets on your skin, flush with water.
    - If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.
  - Electrolyte is poisonous.
    - If swallowed, drink large quantities of water or milk and call your local Poison Control Center or a physician immediately.
- 
- For extended storage, remove the battery, give it a full charge, and store it in a cool, dry space.
  - For a battery remaining in a stored motorcycle, disconnect the negative battery cable from the battery terminal.
  - The battery sealing caps should not be removed. Attempting to remove the sealing caps from the cells may damage the battery.
  - The maintenance free battery must be replaced when it reaches the end of its service life.
  - The battery can be damaged if overcharged or undercharged, or if left 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.
  - Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under heavy load.
  - The battery will self-discharge when the motorcycle is not in use. For this reason, charge the battery every 2 weeks to prevent sulfation from occurring.
  - Filling a new battery with electrolyte will produce some voltage, but in order to achieve its maximum performance, always charge the battery. Also, the battery life is lengthened when it is initially charged.
  - When checking the charging system, always follow the steps in the troubleshooting flow chart (page 16-5).

### BATTERY CHARGING

- This model comes with a maintenance free (MF) battery. Remember the following about MF batteries.
  - Use only the electrolyte that comes with the battery.
  - Use all of the electrolyte.
  - Seal the battery properly.
  - Never open the seals after installation.
- Turn power ON/OFF at the charger, not at the battery terminal.
- For battery charging, do not exceed the charging current and time specified on the battery. Using excessive current or extending the charging time may damage the battery.
- Quick charging should only be done in an emergency; slow charging is preferred.

### BATTERY TESTING

Refer to the 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.

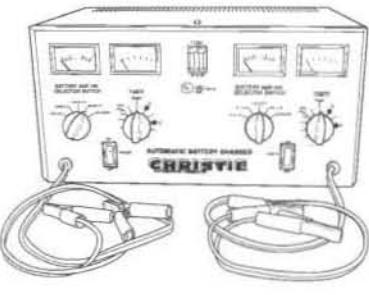
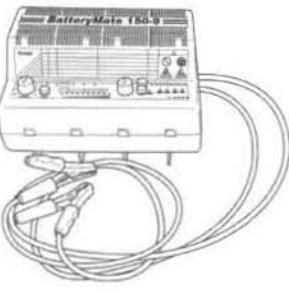
**Recommended battery tester: BM-210-AH (U.S.A. only), BM-210, BATTERY MATE (MTP08-0192, U.S.A. only) or equivalent**

## BATTERY/CHARGING SYSTEM

### SPECIFICATIONS

ITEM		SPECIFICATIONS
Battery	Capacity	12 V - 4 Ah
	Current leakage	0.1 mA max.
Voltage (20°C/68°F)	Fully charged	13.0 - 13.2 V
	Needs charging	Below 12.3 V
	Charging current	0.5 A/5 - 10 h 5.0 A/30 min.
Alternator	Capacity	64.4 W/5,000 rpm

### TOOLS

Battery tester BM-210-AH (U.S.A. only) 	Christie battery charger MC1012/2 (U.S.A. only) 	Battery Mate tester/charger MTP08-0192 (U.S.A only) 
--	---	---

## TROUBLESHOOTING

### BATTERY IS DAMAGED OR WEAK

#### 1. BATTERY TEST

Remove the battery (page 16-6).

Check the battery condition using the recommended battery tester.

##### RECOMMENDED BATTERY TESTER:

BM-210-AH (U.S.A. only), BM-210, BATTERY MATE (MTP08-0192, U.S.A. only) or equivalent

*Is the battery in good condition?*

**NO** – Faulty battery.

**YES** – GO TO STEP 2.

#### 2. CURRENT LEAKAGE TEST

Install the battery (page 16-6).

Check the battery current leakage test (Leak test; page 16-6).

*Is the current leakage below 0.1 mA?*

**YES** – GO TO STEP 4.

**NO** – GO TO STEP 3.

#### 3. CURRENT LEAKAGE TEST WITHOUT REGULATOR/RECTIFIER CONNECTED

Disconnect the regulator/rectifier connector and recheck the battery current leakage.

*Is the current leakage below 0.1 mA?*

**YES** – Faulty regulator/rectifier

**NO** – • Shorted wire harness  
• Faulty main relay ('04, '05 only)

#### 4. ALTERNATOR CHARGING COIL INSPECTION

Check the alternator charging coil (page 16-8).

Check for continuity between Yellow terminal and Ground, Blue terminal and Ground.

*Is there continuity?*

**NO** – Faulty charging coil

**YES** – GO TO STEP 5.

#### 5. CHARGING VOLTAGE INSPECTION

Measure and record the battery voltage using a digital multimeter (page 16-6).

Start the engine.

Measure the charging voltage (page 16-7).

Compare the measurements to the results of the following calculation.

##### STANDARD:

Measured BV < Measured CV < 15.5 V

– BV = Battery Voltage

– CV = Charging Voltage

*Is the measured charging voltage within the standard voltage?*

**YES** – Faulty battery

**NO** – GO TO STEP 6.

#### 6. REGULATOR/RECTIFIER SYSTEM INSPECTION

Check the voltage and resistance at the regulator/rectifier connector (page 16-7).

*Are the result of checked voltage and resistance correct?*

**YES** – Faulty regulator/rectifier

**NO** – • Open circuit in related wire  
• Loose or poor contacts of related terminal  
• Shorted wire harness

## BATTERY/CHARGING SYSTEM

### BATTERY

#### REMOVAL/INSTALLATION

Remove the seat (page 2-3).

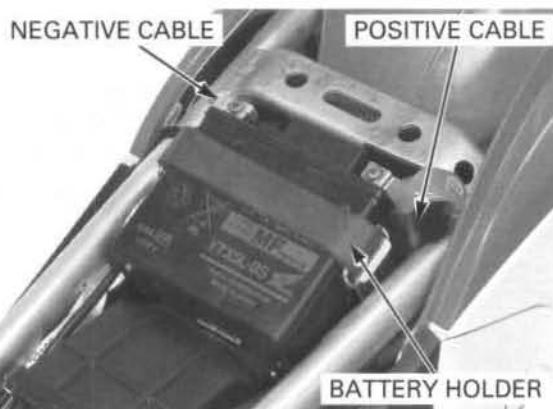
Remove the battery holder.

Disconnect the negative (-) cable and then the positive (+) cable, and remove the battery.

*Connect the positive terminal first and then the negative cable.*

Install the battery in the reverse order of removal.

After installing the battery, coat the terminals with clean dielectric grease.



#### VOLTAGE INSPECTION

Measure the battery voltage using a digital multimeter.

##### VOLTAGE:

Fully charged: 13.0 – 13.2 V

Under charged: Below 12.3 V

##### TOOL:

Digital multimeter      Commercially available in U.S.A.



### CHARGING SYSTEM INSPECTION

#### CURRENT LEAKAGE INSPECTION

Remove the seat (page 2-3).

Disconnect the negative (-) cable from the battery. Connect the ammeter (+) probe to the negative (-) cable and the ammeter (-) probe to the battery (-) terminal.

Check for current leakage.

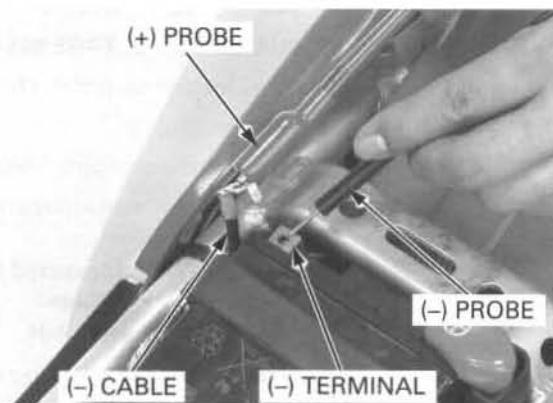
##### NOTE:

When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher than the range selected may blow the fuse in the tester.

**SPECIFIED CURRENT LEAKAGE: 0.1 mA max.**

If current leakage exceeds the specified value, a shorted circuit is likely.

Locate the short by disconnecting connections one by one and measuring the current.



## CHARGING VOLTAGE INSPECTION

Be sure the battery is in good condition before performing this test.

Warm up the engine to normal operating temperature.

Connect the multimeter between the battery positive (+) and negative (-) terminals.

**NOTE:**

To prevent a short, make absolutely certain which are the positive (+) and negative (-) terminals or cables.

Measure the voltage on the multimeter when the engine runs at 5,000 rpm.

**Standard:**

Measured BV < Measured CV < 15.5 V at 5,000 rpm

- BV = Battery Voltage

- CV = Charging Voltage



## REGULATOR/RECTIFIER

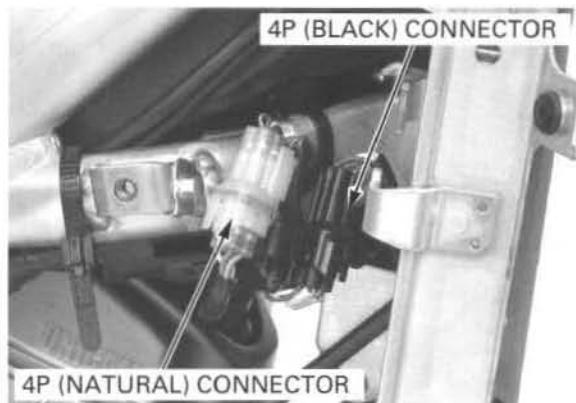
### SYSTEM INSPECTION

Remove the fuel tank (page 2-7).

Disconnect the regulator/rectifier 4P (Natural) connector and alternator 4P (Black) connector, and check it for loose contacts or corroded terminals.

If the charging voltage reading (page 16-7) is out of the specification, check the following at the wire harness side connector:

Item	Terminal	Specification
Battery charging line	Red/White (+) and ground (-)	Battery voltage should register
Charging coil line	Yellow and ground	Continuity should exist
	Blue and ground	Continuity should exist
Ground line	Green and ground	Continuity should exist



If all lines 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 2-7).

Remove the wire band.

Disconnect the regulator/rectifier 4P (Natural) connector.

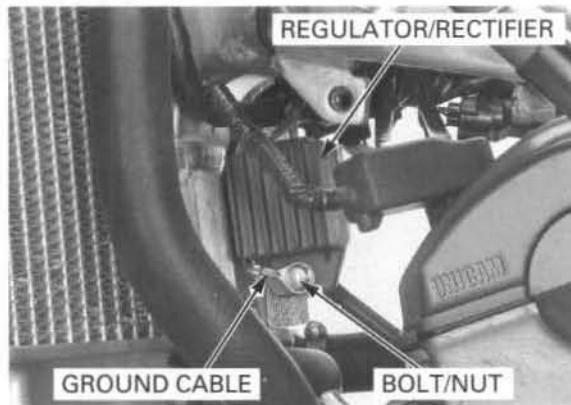


REGULATOR/RECTIFIER 4P CONNECTOR

## BATTERY/CHARGING SYSTEM

Remove the bolt, nut, ground cable and regulator/rectifier unit from the frame.

Installation is in the reverse order of removal.



## ALTERNATOR CHARGING COIL

### INSPECTION

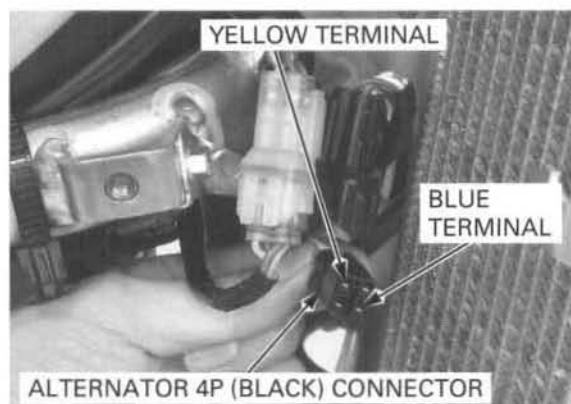
Remove the right radiator shroud (page 2-4).

Disconnect the alternator 4P (Black) connector.  
Check for continuity between the terminal of the alternator side connector and ground.

**CONNECTION:** Yellow terminal – Body ground  
Blue terminal – Body ground

If any wire has no continuity to ground, replace the alternator stator.

For stator removal (page 11-5).



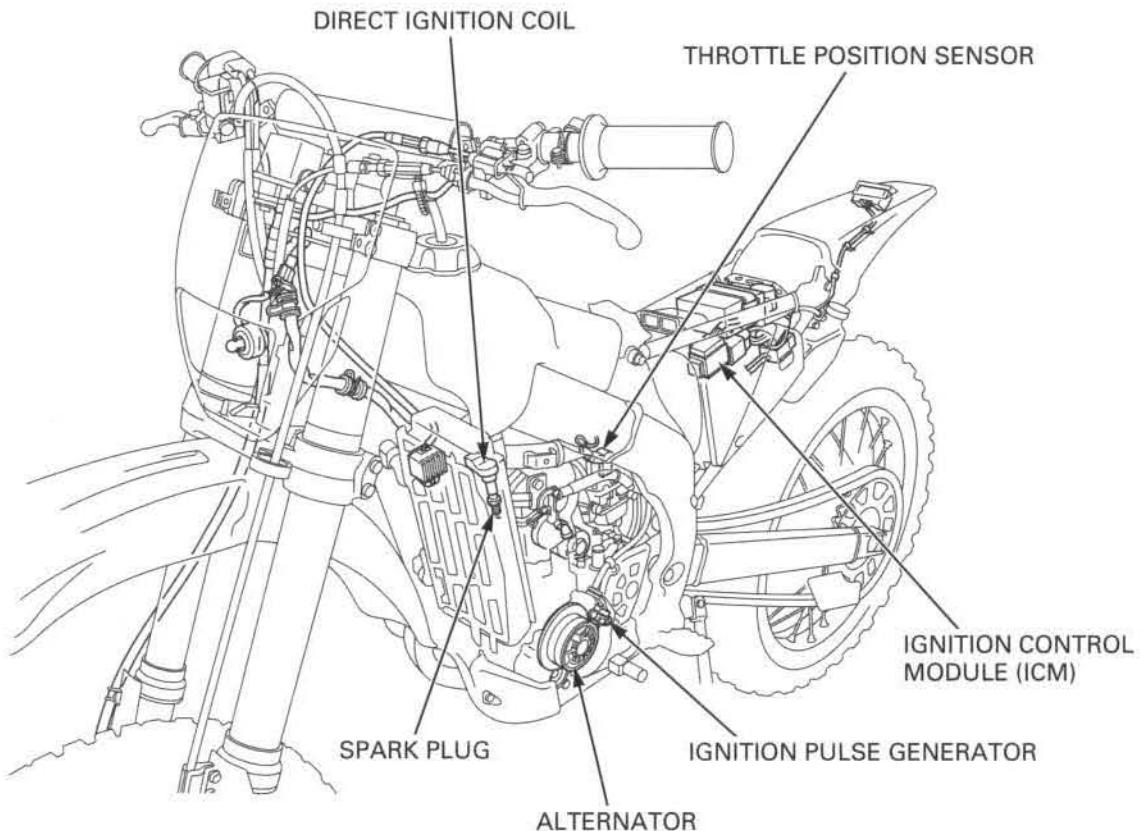
# **17. IGNITION SYSTEM**

---

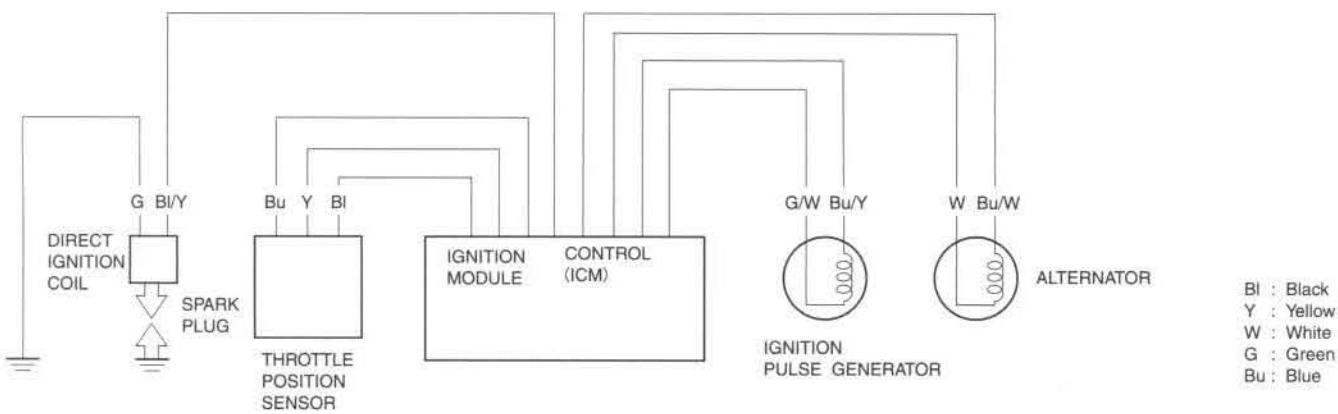
COMPONENT LOCATION .....	17-2	IGNITION SYSTEM INSPECTION .....	17-5
SYSTEM DIAGRAM .....	17-2	IGNITION CONTROL MODULE (ICM) .....	17-8
SERVICE INFORMATION .....	17-3	IGNITION TIMING .....	17-8
TROUBLESHOOTING .....	17-4	THROTTLE POSITION SENSOR INSPECTION .....	17-9

## IGNITION SYSTEM

### COMPONENT LOCATION



### SYSTEM DIAGRAM



## SERVICE INFORMATION

### GENERAL

- When servicing the ignition system, always follow the steps in the troubleshooting sequence on page 17-4.
- The ignition timing cannot be adjusted since the Ignition Control Module (ICM) is factory preset.
- The Ignition control module (ICM) may be damaged if dropped. Also, if the connector is disconnected when current is flowing, the excessive voltage may damage the module.
- A faulty ignition system is often related to poor connections. Check connections before proceeding.
- Use a spark plug of the correct heat range. Using a spark plug with an incorrect heat range can damage the engine.

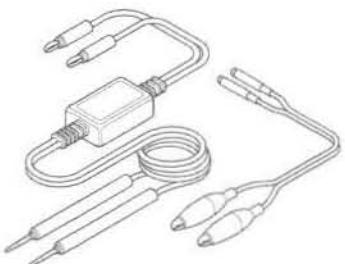
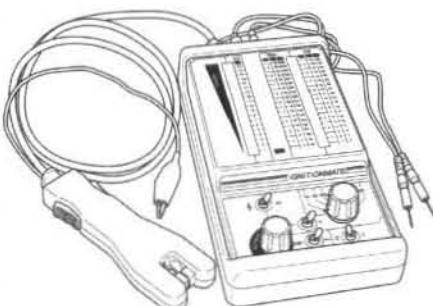
### SPECIFICATION

ITEM		SPECIFICATION
Spark plug	Standard	(NGK) (DENSO)
	Optional	(NGK)
		(DENSO)
		IMR8C9H VUH24D IMR9C9H VUH27D
Spark plug gap		0.8 – 0.9 mm (0.03 – 0.04 in)
Ignition coil resistance (at 20 °C/68 °F)	Primary	0.07 – 0.10 Ω
	Secondary	4.6 – 6.8 kΩ
Direct ignition coil input voltage		200 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Alternator exciter coil peak voltage		50 V minimum
Ignition timing ("F" mark)		8° ± 2° BTDC/1,700 rpm
Throttle position sensor resistance (at 20 °C/68 °F)		4 – 6 kΩ

### TORQUE VALUES

Timing hole cap                    5.9 N·m (0.6 kgf·m, 4.3 lbf·ft)                    Apply grease to the threads

### TOOLS

Peak voltage adaptor 07HGJ-0020100 (not available in U.S.A.)  	IgnitionMate peak voltage tester MTP07-0286 (U.S.A. only)    with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)
---	--

## IGNITION SYSTEM

### TROUBLESHOOTING

- Inspect the following before diagnosing the system.
  - Faulty spark plug
  - Loose direct ignition coil or direct ignition coil connector connection
  - Water got into the direct ignition coil (affecting the direct ignition coil secondary voltage)
- If there is no spark at cylinder, temporarily exchange the direct ignition coil with a known good one and perform the spark test. If there is spark, the original direct ignition coil is faulty.

#### No spark at plug

Unusual condition		Probable cause (check in numerical order)
Ignition coil primary voltage	Low peak voltage.	<ol style="list-style-type: none"><li>1. Incorrect peak voltage adaptor connections (System is normal if measured voltage is over the specifications with reverse connection).</li><li>2. The multimeter impedance is too low; below <math>10M\Omega</math>/DCV.</li><li>3. Cranking speed too slow.<ul style="list-style-type: none"><li>- Kickstarter is weak</li><li>- Battery under charged</li></ul></li><li>4. The sample timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once).</li><li>5. Poorly connected connectors or an open circuit in the ignition system.</li><li>6. Faulty exciter coil (measure the peak voltage).</li><li>7. Faulty direct ignition coil.</li><li>8. Faulty ICM (When above No. 1 – 7 are normal).</li></ol>
	No peak voltage.	<ol style="list-style-type: none"><li>1. Incorrect peak voltage adaptor connections (System is normal if measured voltage is over the specifications with reverse connection).</li><li>2. Short circuit in engine stop button wire.</li><li>3. Faulty engine stop button.</li><li>4. Loose or poorly connected ICM connectors.</li><li>5. An open circuit or loose direct ignition coil connector.</li><li>6. Faulty exciter coil (measure the peak voltage).</li><li>7. Faulty ignition pulse generator (measure the peak voltage).</li><li>8. Faulty ICM (When above No. 1 – 7 are normal).</li></ol>
	Peak voltage is normal, but no spark jumps at the plug.	<ol style="list-style-type: none"><li>1. Faulty spark plug or leaking direct ignition coil secondary current ampere.</li><li>2. Faulty direct ignition coil.</li></ol>
Exciter coil	Low peak voltage.	<ol style="list-style-type: none"><li>1. The multimeter impedance is too low; below <math>10M\Omega</math>/DCV.</li><li>2. Cranking speed is too low.<ul style="list-style-type: none"><li>- Kickstarter is weak</li><li>- Battery under charged</li></ul></li><li>3. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once).</li><li>4. Faulty exciter coil (when above No. 1 – 3 are normal).</li></ol>
	No peak voltage.	<ol style="list-style-type: none"><li>1. Faulty peak voltage adaptor.</li><li>2. Faulty exciter coil.</li></ol>
Ignition pulse generator	Low peak voltage.	<ol style="list-style-type: none"><li>1. The multimeter impedance is too low; below <math>10M\Omega</math>/DCV.</li><li>2. Cranking speed is too low.<ul style="list-style-type: none"><li>- Kickstarter is weak</li><li>- Battery under charged</li></ul></li><li>3. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once).</li><li>4. Faulty ignition pulse generator (when above No. 1 – 3 are normal).</li></ol>
	No peak voltage.	<ol style="list-style-type: none"><li>1. Faulty peak voltage adaptor.</li><li>2. Faulty ignition pulse generator.</li></ol>

## IGNITION SYSTEM INSPECTION

- If there is no spark at the plug, check all connections for loose or poor contact before measuring each peak voltage.
- Use the recommended digital multimeter or a commercially available digital multimeter with an impedance of  $10\text{ M}\Omega/\text{DCV}$  minimum.
- The display value differs depending upon the internal impedance of the multimeter.

*Avoid touching the spark plug and tester probes to prevent electric shock.*

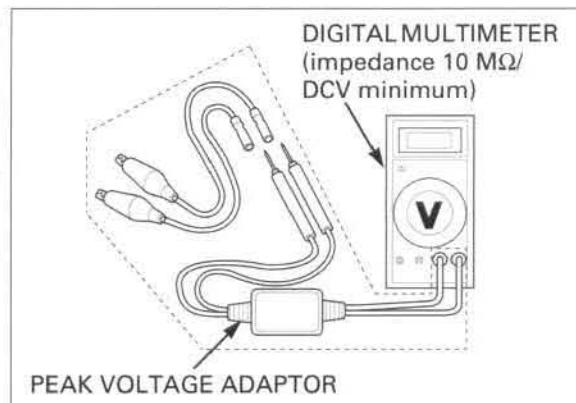
Connect the peak voltage tester (IgnitionMate, U.S.A. only) or peak voltage adaptor to the digital multimeter.

### TOOLS:

IgnitionMate peak voltage tester MTP07-0286  
(U.S.A. only) or

Peak voltage adaptor 07HGJ-0020100  
(not available in U.S.A.)

with commercially available digital multimeter  
(impedance  $10\text{ M}\Omega/\text{DCV}$  minimum)



## IGNITION COIL PRIMARY PEAK VOLTAGE

Check all system connections before inspection.

Check cylinder compression and check that the spark plug is installed correctly.

Shift the transmission into neutral.

Remove the fuel tank (page 2-7).

Disconnect the direct ignition coil 2P connector and connect the peak voltage adaptor test probes to the terminals.

### TOOLS:

IgnitionMate peak voltage tester MTP07-0286  
(U.S.A. only) or

Peak voltage adaptor 07HGJ-0020100  
(not available in U.S.A.)

with commercially available digital multimeter  
(impedance  $10\text{ M}\Omega/\text{DCV}$  minimum)

**CONNECTION:** Black/yellow (+) – Green (-)

Crank the engine with the starter motor or kickstarter and read the direct ignition coil input voltage.

**STANDARD:** 200 V minimum

If the voltage cannot be measured, follow the checks described in the troubleshooting chart on page 17-4.



## IGNITION SYSTEM

### DIRECT IGNITION COIL INSPECTION

Remove the direct ignition coil from the cylinder head.

Measure the direct ignition coil resistance between the connector terminals.

**CONNECTION: A – B**

**STANDARD: 0.07 – 0.10 Ω (20 °C/68 °F)**

If resistance is out of specification, replace the direct ignition coil.

Measure the direct ignition coil secondary coil resistance between the primary terminal and spark plug terminal.

**CONNECTION: B – C**

**STANDARD: 4.6 – 6.8 kΩ (20 °C/68 °F)**

If resistance is out of specification, replace the direct ignition coil.

### EXCITER COIL PEAK VOLTAGE

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

Disconnect the ICM 6P (Brown) connector.

Connect the peak voltage adaptor probes to the wire harness side connector terminals.

#### TOOLS:

IgnitionMate peak voltage tester MTP07-0286  
(U.S.A. only) or

Peak voltage adaptor 07HGJ-0020100  
(not available in U.S.A.)

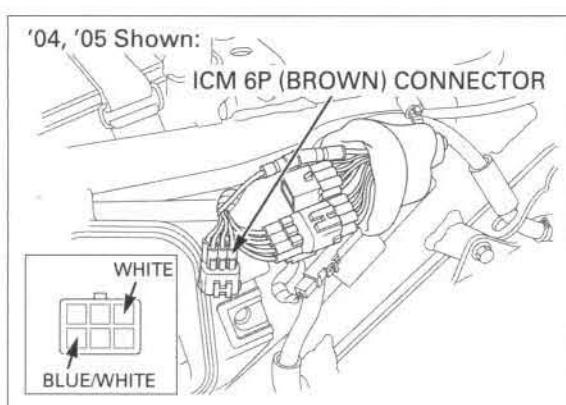
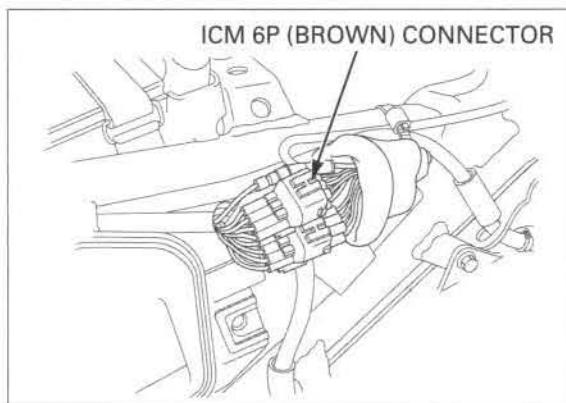
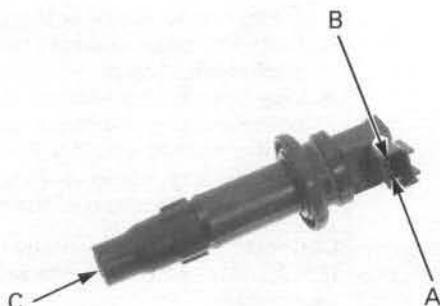
with commercially available digital multimeter  
(impedance 10 MΩ/DCV minimum)

**CONNECTION: Blue/White (+) – White (–)**

Shift the transmission into neutral.

Crank the engine with the starter motor or kickstarter and read the peak voltage.

**PEAK VOLTAGE: 50 V minimum**



If the peak voltage measured is abnormal, recheck the following:

Remove the right radiator shroud (page 2-7).

Disconnect the alternator 4P (Black) connector.

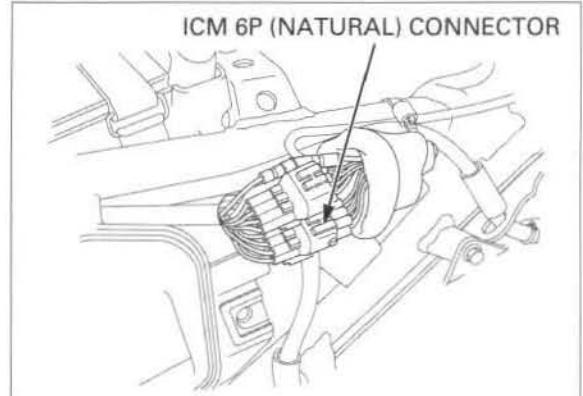
Connect the peak voltage adapter to the connector terminals of the alternator side, recheck the peak voltage.

If the peak voltage measured at the ICM connector is abnormal and the one measured at the alternator connector is normal, check the connectors for loose connection and the wire harness for an open circuit or loose connection.

If both peak voltage measured are abnormal, check each item in the troubleshooting (page 17-4).

## IGNITION PULSE GENERATOR PEAK VOLTAGE

Remove the left side cover (page 2-3).  
Disconnect the ICM 6P (Natural) connector.



Connect the peak voltage adaptor probes to the connector terminals of the wire harness side.

### TOOLS:

**IgnitionMate peak voltage tester MTP07-0286  
(U.S.A. only) or  
Peak voltage adaptor  
07HGJ-0020100  
(not available in  
U.S.A.)**  
with commercially available digital multimeter  
(impedance  $10 \text{ M}\Omega/\text{DCV}$  minimum)

### CONNECTION: Blue/Yellow (+) – Green/White (-)

Crank the engine with the stator motor or kickstarter and read the peak voltage.

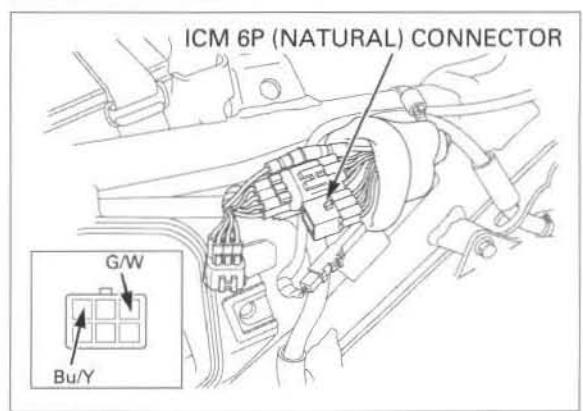
### PEAK VOLTAGE: 0.7 V minimum

If the peak voltage measured is abnormal, recheck the following:

Remove the right radiator shroud (page 2-7).  
Disconnect the ignition pulse generator 2P (Black) connector.  
Connect the peak voltage adapter to the connector terminals of the ignition pulse generator side and recheck the peak voltage.

If the peak voltage measured at the ICM connector is abnormal and the one measured at the alternator connector is normal, check the connectors for loose connection and the wire harness for an open circuit or loose connection.

If both peak voltage measured are abnormal, check each item in the troubleshooting (page 17-4).



## IGNITION SYSTEM

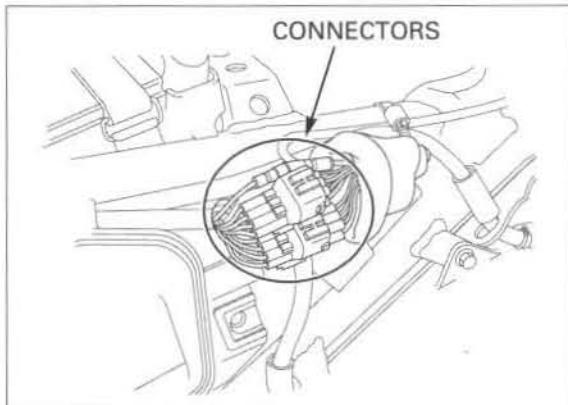
### IGNITION CONTROL MODULE (ICM)

#### REMOVAL/INSTALLATION

Remove the side covers (page 2-3).

Remove the battery (page 16-6).

Disconnect the ICM 6P connectors and wire connector.



Remove the ICM from the rubber case.

Route the wires and harness properly (page 1-23).  
Installation is in the reverse order of removal.

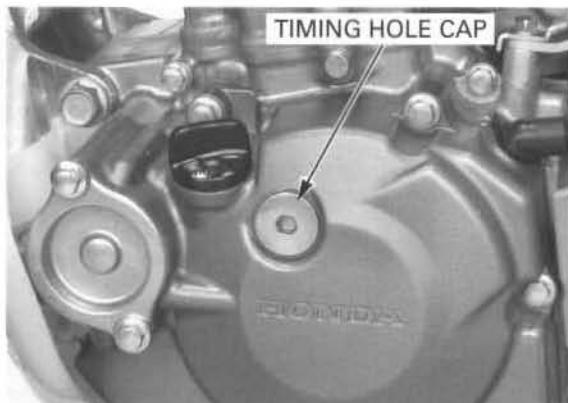


### IGNITION TIMING

- The ignition timing is factory preset and only needs to be checked when an electrical system component is replaced.

Warm up the engine to normal operating temperature.

Stop the engine and remove the timing hole cap. Connect the timing light to the direct ignition coil connector wire.

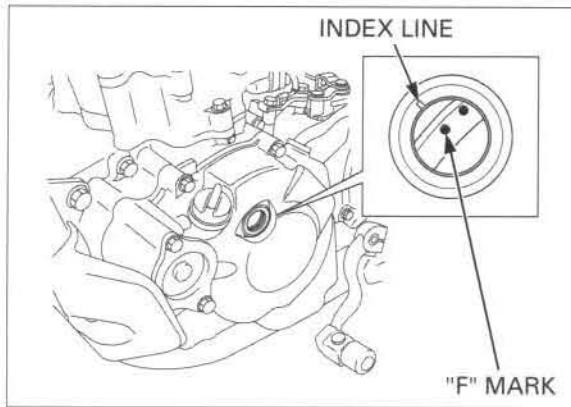


Connect a tachometer.

Read the instruction for timing light operation. Start the engine and hold it at  $1,700 \pm 100$  rpm while pointing the timing light towards the index mark.



The ignition timing is correct if the "F" mark on the flywheel aligns with the index notch in the left crankcase cover.



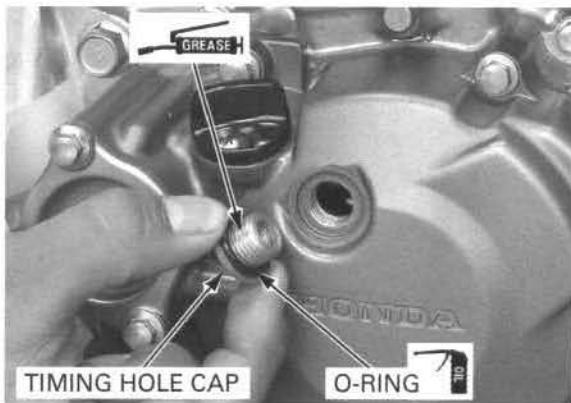
Check that the O-ring is in good condition, replace if necessary.

Apply oil to the O-ring and install it onto the timing hole cap.

Apply grease to the timing hole cap threads.

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

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



## THROTTLE POSITION SENSOR INSPECTION

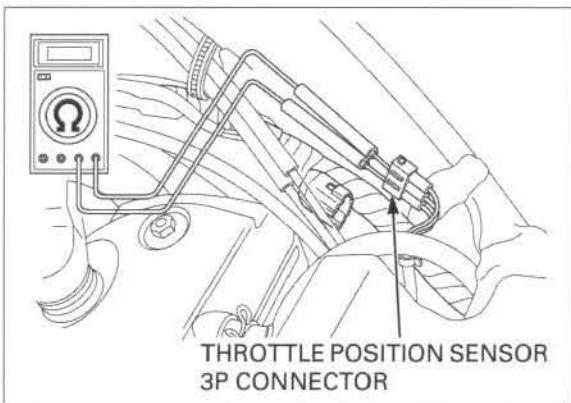
### INSPECTION

Remove the fuel tank (page 2-7).

Disconnect the throttle position sensor 3P connector.

Measure the resistance between the Blue and Black wire terminals of the sensor side connector.

**STANDARD: 4 – 6 kΩ (20 °C/68 °F)**



Check that the resistance between the Yellow and Blue wire terminals varies with the throttle position while operating the throttle grip.

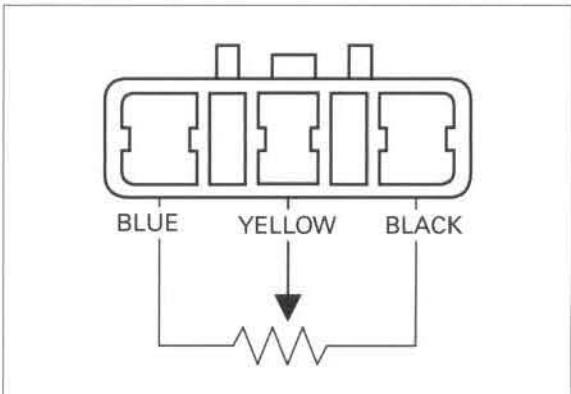
**Fully closed-Fully open position:**

Resistance decreases

**Fully open-Fully closed position:**

Resistance increases

If both measurements are abnormal, replace the throttle position sensor connector (page 5-26).



---

**MEMO**



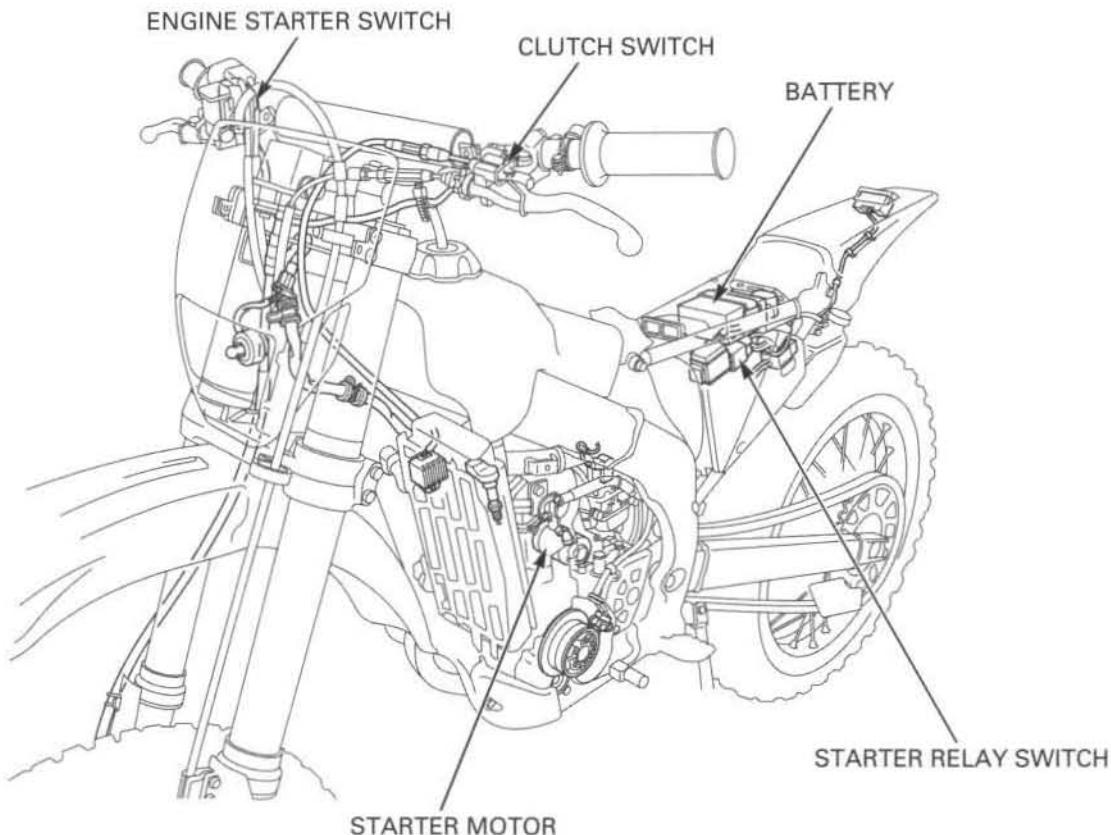
## **18. ELECTRIC STARTER**

---

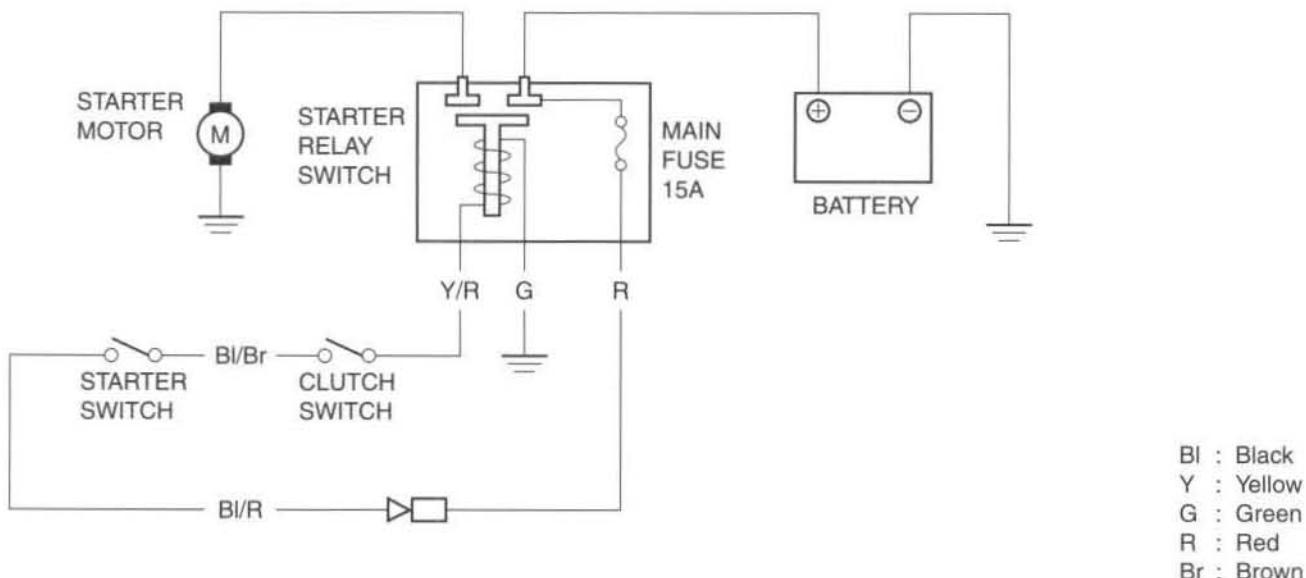
COMPONENT LOCATION .....	18-2	TROUBLESHOOTING .....	18-4
SYSTEM DIAGRAM .....	18-2	STARTER MOTOR .....	18-6
SERVICE INFORMATION .....	18-3	STARTER RELAY SWITCH .....	18-11

## ELECTRIC STARTER

### COMPONENT LOCATION



### SYSTEM DIAGRAM



# SERVICE INFORMATION

## GENERAL

### NOTICE

If the current is kept flowing through the starter motor to turn it while the engine is not cranking over, the starter motor may be damaged.

- The starter motor can be serviced with the engine in the frame.
- When checking the starter system, always follow the steps in the troubleshooting (page 18-4).
- Always disconnect the negative cable at the battery before servicing the starter motor. The motor could suddenly start, causing serious injury.
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.

Refer to the following components informations.

- Starter switch (page 19-8)
- Clutch switch (page 19-7)
- Starter clutch (page 10-19)

## SPECIFICATION

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	10.25 (0.404)	6.75 (0.266)

## ELECTRIC STARTER

# TROUBLESHOOTING

**Starter motor does not turn**

### 1. Fuse Inspection

Check for blown fuse (15 A).

*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** – Charge or replace the battery (page 16-6).

### 3. Starter Relay Switch Operation

Check the starter relay switch operation.

You should hear the relay "CLICK" when the starter switch is depressed and pull the clutch lever.

*Is there a "CLICK"?*

**YES** – GO TO STEP 4.

**NO** – GO TO STEP 5.

### 4. Starter Motor Inspection

Apply battery voltage directly to the starter motor and check the operation.

*Does the starter motor turn?*

**YES** – • Poorly connected starter motor cable.  
• Faulty starter relay switch.

**NO** – Faulty starter motor.

### 5. Starter Relay Switch Operation Inspection

Disconnect the starter relay switch connector, and check the relay coil Green terminal for continuity.

*Is there continuity?*

**NO** – • Open circuit in wire harness  
• Loose or poor contact connector

**YES** – GO TO STEP 6.

### 6. Starter Relay Switch Power Input Line Inspection

Connect the starter relay switch connector.

Pull the clutch lever and starter switch is pushed, measure the voltage at the starter relay switch connector (between Yellow/Red (+) and body ground (-)).

*Is the ground line normal?*

**YES** – GO TO STEP 7.

**NO** – • Faulty clutch switch (page 19-7).  
• Faulty engine starter switch (page 19-8).  
• Loose or poor contact of the related connector terminal.  
• Open circuit in the wire harness.

### 7. Starter Relay Switch Continuity Inspection

Connect the starter relay switch connector.

Pull the clutch lever and starter switch is pushed, check for continuity at the starter relay switch.

*Is there continuity?*

**NO** – Faulty starter relay switch.

**YES** – 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 motor
- Poorly connected ground cable terminal

#### **Starter motor turns, but engine does not turn**

- Starter motor is running backwards
  - Case assembled improperly
  - Terminals connected improperly
- Faulty starter clutch
- Damaged starter gear train

#### **Starter relay switch clicks, but engine does not turn over**

- Crankshaft does not turn due to engine problems

## ELECTRIC STARTER

# STARTER MOTOR

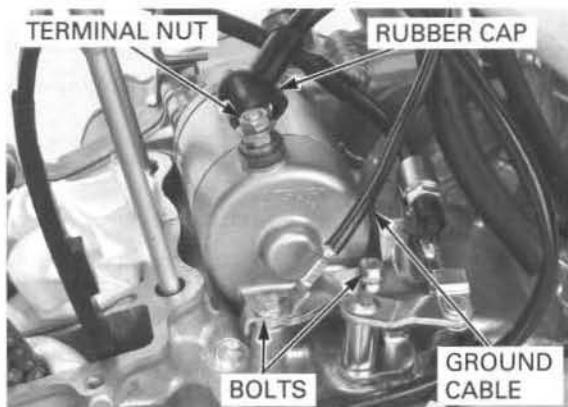
### REMOVAL

- Remove the negative cable at the battery before servicing the starter motor.

Remove the cylinder (page 9-4).

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, stay and starter motor from the crankcase.



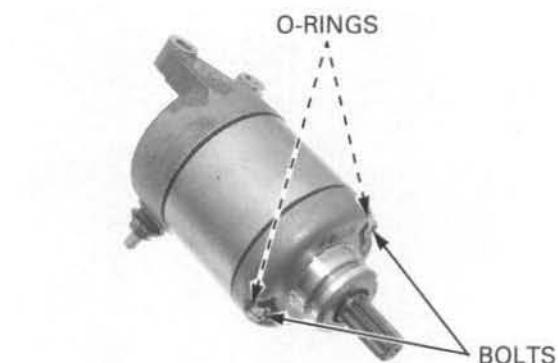
### DISASSEMBLY/INSPECTION

Remove the following:

- O-ring

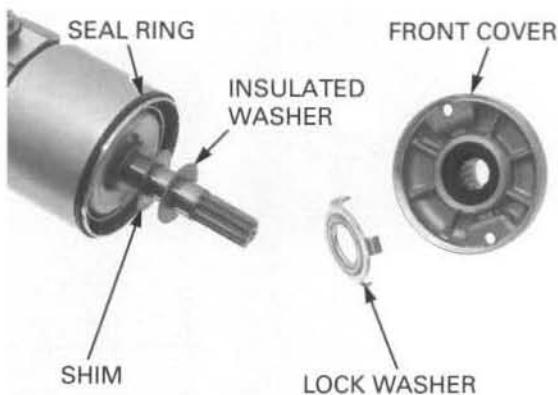


- Starter motor case bolts and O-rings

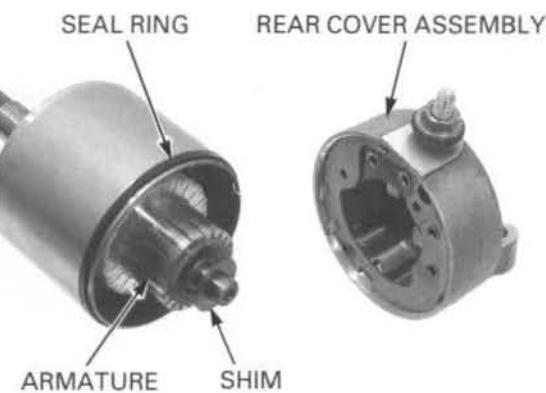


Record the location  
and number of  
shims.

- Front cover
- Seal ring
- Lock washer
- Insulated washer
- Shim



- Record the location and number of shims.
- Rear cover assembly
  - Seal ring
  - Shims
  - Armature



Check for continuity between the cable terminal and insulated brush.  
There should be continuity.

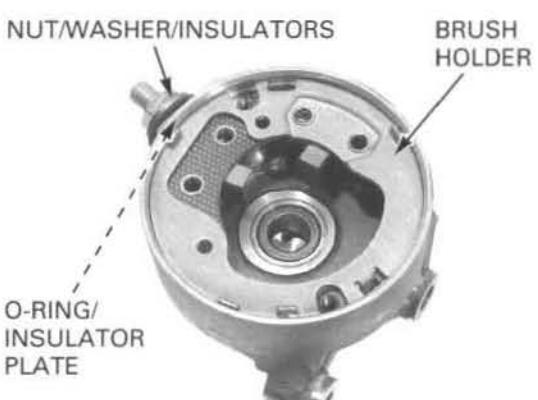


Check for continuity between the cable terminal and rear cover.  
There should be no continuity.



Remove the following:

- Nut
- Washer
- Insulators
- O-ring
- Brush holder
- Insulator plate

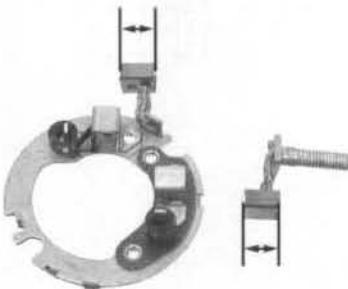


## ELECTRIC STARTER

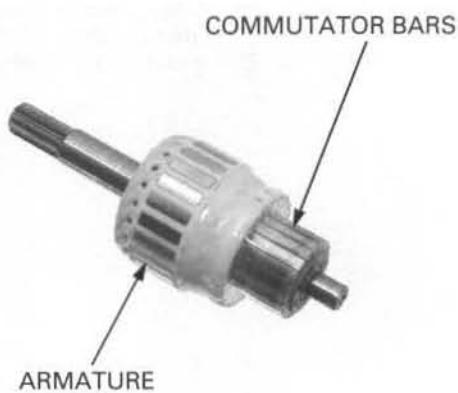
Remove the insulated brush from the brush holder.

Measure the brush length.

**SERVICE LIMIT: 6.75 mm (0.266 in)**



*Do not use emery or sand paper on the commutator.* Inspect the commutator bars of the armature for discoloration.



Check for continuity between pairs of commutator bars.

There should be continuity.

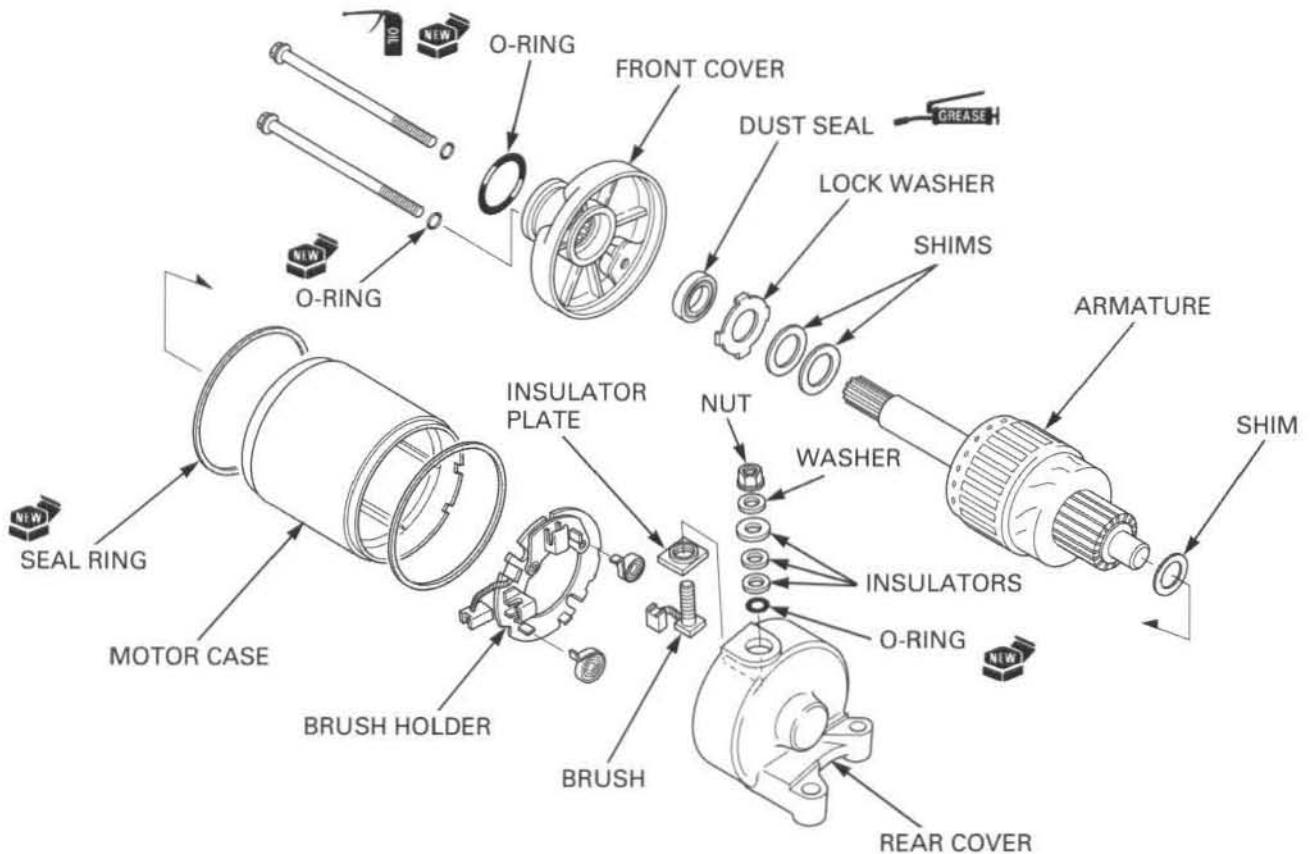


Check for continuity between each commutator bar and armature shaft.

There should be no continuity.



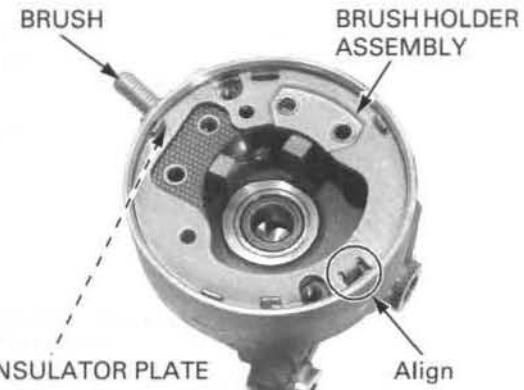
## ASSEMBLY



Install the brush in the brush holder.

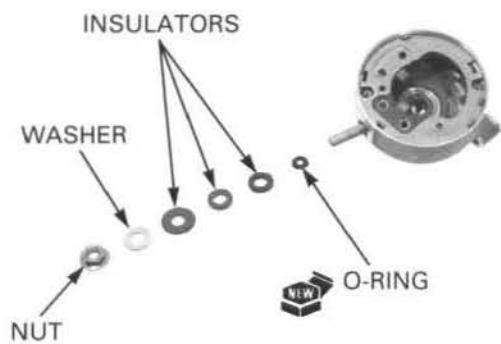
Install the insulator plate onto the cable terminal.

Install the brush holder assembly to the rear cover, aligning the tab with the groove in the rear cover.



Install the following:

- New O-ring
- Insulators
- Washer
- Nut



## ELECTRIC STARTER

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

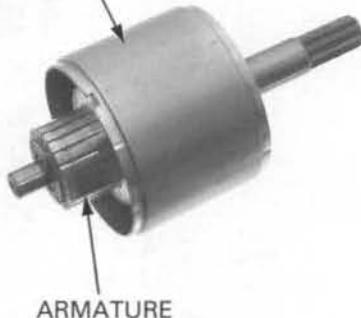
### NOTICE

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

*Install the shims properly as noted during removal.*

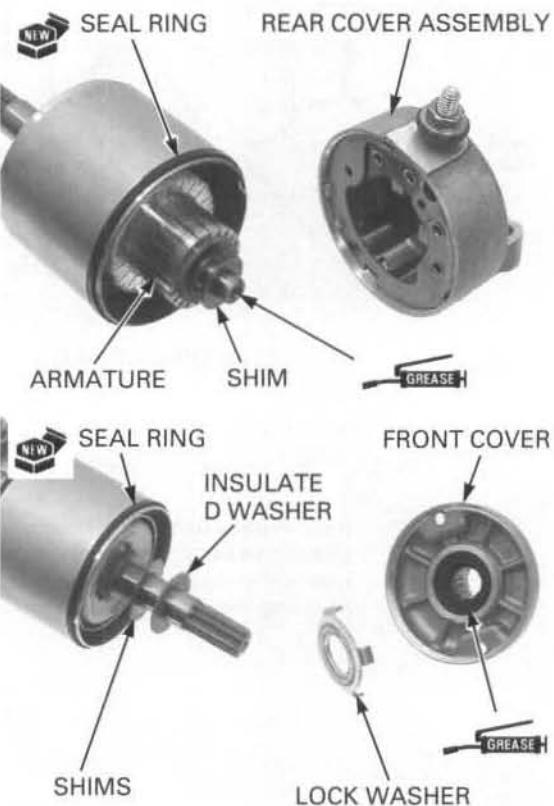
- Install the shim onto the armature shaft.
- Install a new seal ring onto the motor case.
- Apply a thin coat of grease to the armature shaft end.
- Install the rear cover assembly while pushing the brushes into the brush holder.

MOTOR CASE

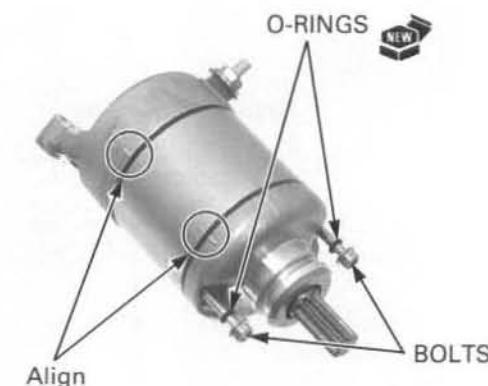


*Install the shims properly as noted during removal.*

- Install the shims and insulated washer onto the armature shaft.
- Install a 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.



- Make sure the index lines are aligned.
- Install the new O-rings onto the motor case bolts.
- Install the motor case bolts and tighten them securely.



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



## INSTALLATION

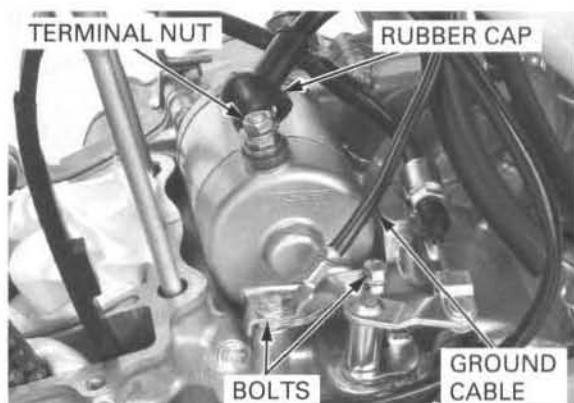
Install the starter motor into the right crankcase and onto the crankcase.

Install the stay, ground cable and mounting bolt.

Install the starter motor cable and terminal nut onto the motor terminal and tighten the nut securely.

Install the rubber cap over the motor terminal properly.

Install the cylinder (page 9-8).



## STARTER RELAY SWITCH

Remove the seat (page 2-3).

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

### OPERATION INSPECTION

Shift the transmission into neutral.

Pull the clutch lever fully, and push the starter switch.

The coil is normal if the starter relay switch "clicks".

If you don't hear the switch "click", inspect the relay switch using the procedure below.

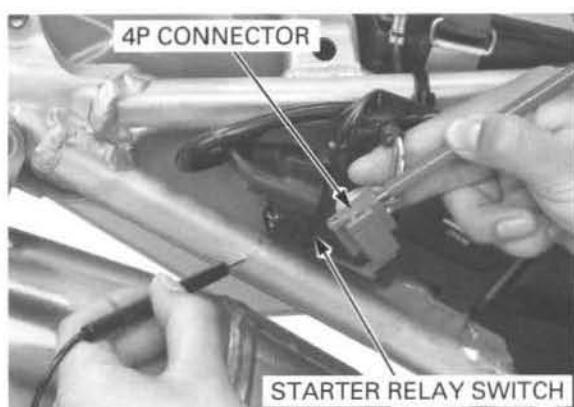


### GROUND LINE

Disconnect the starter relay switch 4P connector.

Check for continuity between the Green wire terminal of the wire harness side connector and ground.

If there is continuity, the ground circuit is normal.



## ELECTRIC STARTER

### POWER INPUT LINE

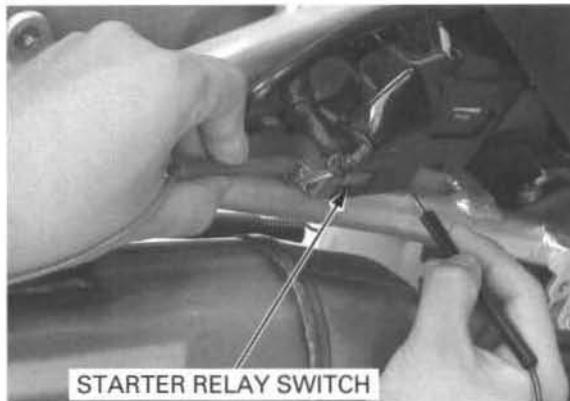
Connect the starter relay switch 4P connector.

Shift the transmission into neutral.

Pull the clutch lever fully, and push the starter switch.

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.



STARTER RELAY SWITCH

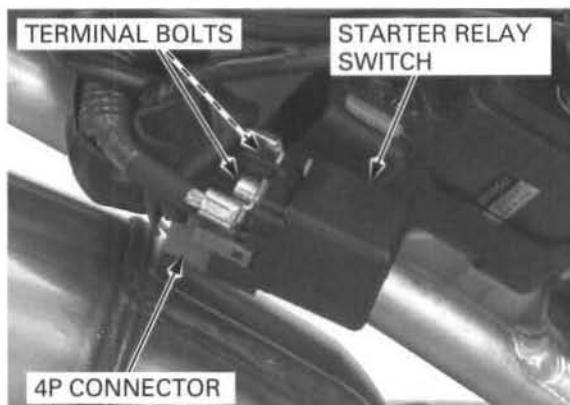
### FUNCTION INSPECTION

Disconnect the battery negative (-) cable from the battery.

Remove the starter relay switch from the rubber case.

Remove the terminal bolts and disconnect the starter relay switch cables.

Remove the 4P connector from the starter relay switch.

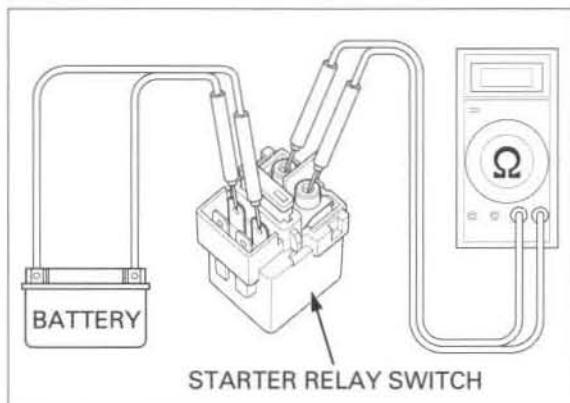


Connect an ohmmeter to the starter relay switch cable terminals.

Connect the fully charged 12 V battery positive terminal to the Yellow/red wire terminal and negative terminal to the Green wire terminal of the starter relay switch.

There should be continuity between the cable terminals while the battery is connected, and no continuity when the battery is disconnected.

Install the starter relay switch in the reverse order of removal.



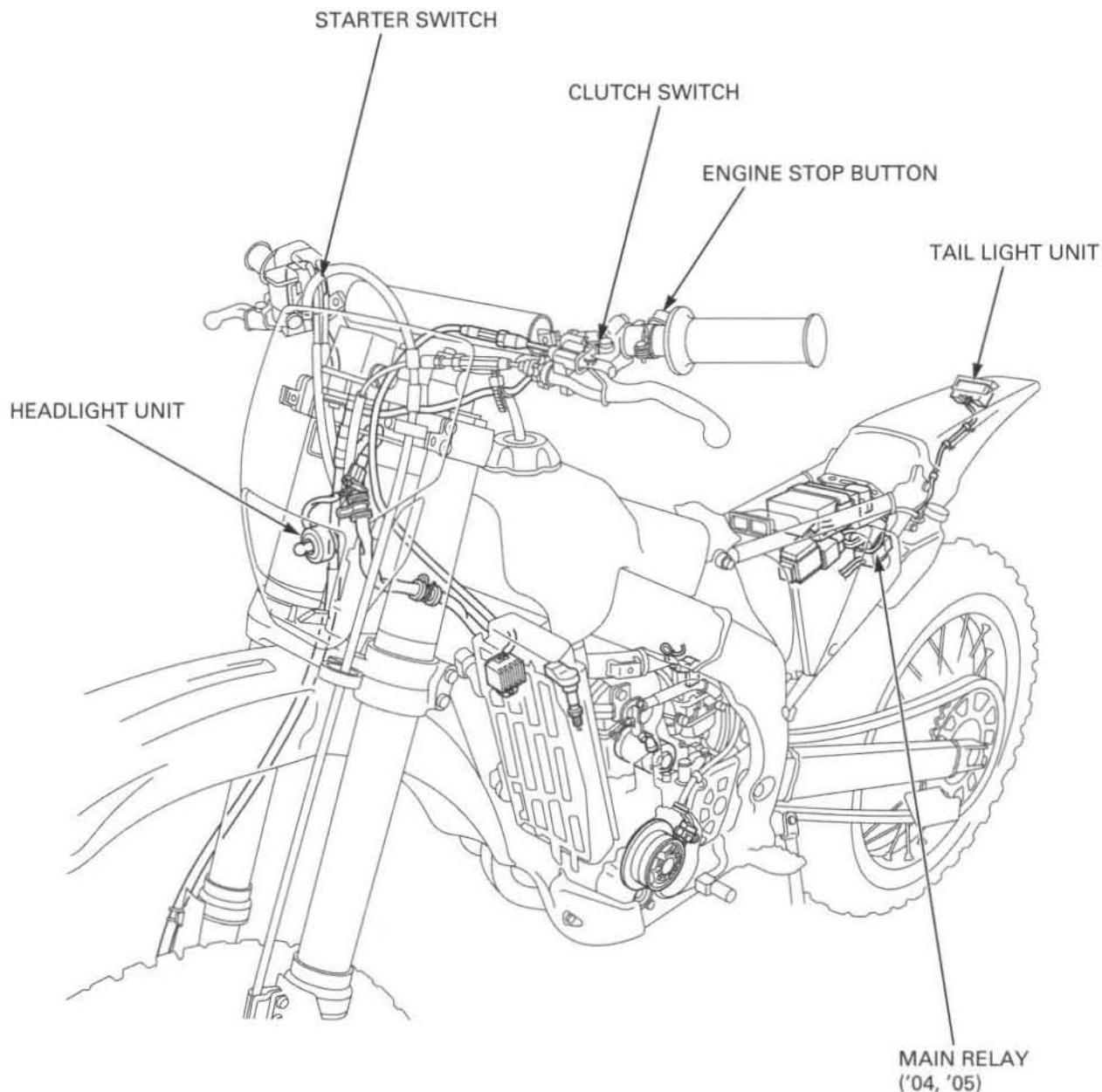
## **19. LIGHTS/METER/SWITCHES**

---

COMPONENT LOCATION .....	19-2	CLUTCH SWITCH .....	19-7
SERVICE INFORMATION .....	19-3	STARTER SWITCH .....	19-8
HEADLIGHT.....	19-4	TRIPMETER.....	19-8
TAIL LIGHT.....	19-5	MAIN RELAY ('04, '05) .....	19-9
ENGINE STOP BUTTON.....	19-6		

## LIGHTS/METER/SWITCHES

### COMPONENT LOCATION



## SERVICE INFORMATION

### GENERAL

#### NOTICE

- A halogen headlight bulb becomes very hot while the headlight is ON, and remain hot for a while after it is turned OFF. Be sure to let it cool down before servicing.
- Note the following when replacing the halogen headlight bulb.
  - Wear clean gloves while replacing the bulb. Do not put finger prints on the headlight bulb, as they may create hot spots on the bulb and cause it to fail.
  - If you touch the bulb with your bare hands, clean it with a cloth moistened with denatured alcohol to prevent its early failure.
  - Be sure to install the dust cover after replacing the bulb.
- Check the battery condition before performing any inspection that requires proper battery voltage.
- A continuity test can be made with the switches installed on the motorcycle.

### SPECIFICATIONS

ITEM	SPECIFICATIONS
Headlight	12 V – 35 W
Tail light	LED
Main fuse	15 A

### TORQUE VALUES

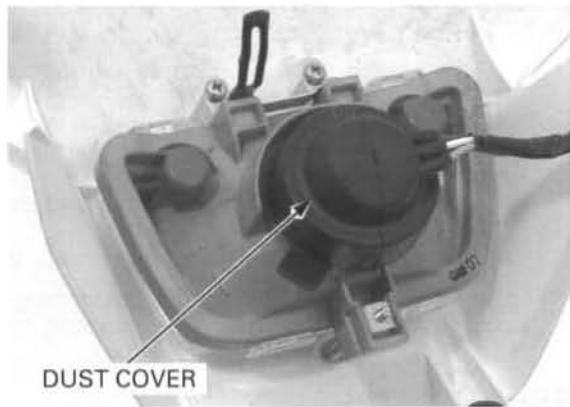
Rear fender mounting bolt	13 N·m (1.3 kgf·m, 9 lbf·ft)	
Tail light mounting screw	3.9 N·m (0.4 kgf·m, 2.9 lbf·ft)	Apply locking agent to the threads
Headlight mounting screw	0.7 N·m (0.07 kgf·m, 0.5 lbf·ft)	

### HEADLIGHT

#### BULB REPLACEMENT

Remove the front visor (page 2-5).

Remove the dust cover.

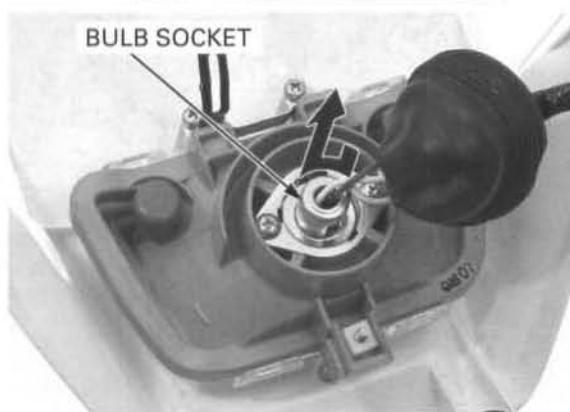


While pushing the bulb socket, turn it counterclockwise and remove the bulb socket.

Remove the bulb.

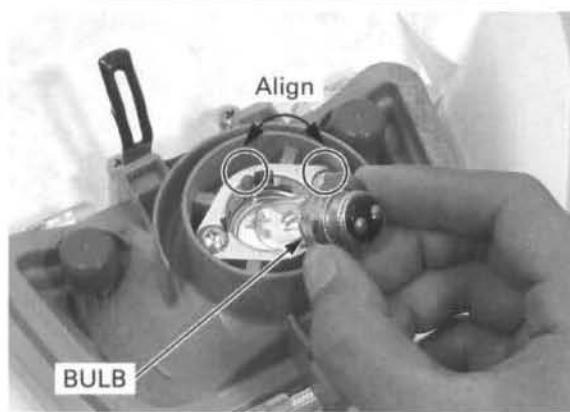
#### NOTICE

*Avoid touching the halogen headlight bulb. Finger prints can create hot spots that cause a bulb to break.*

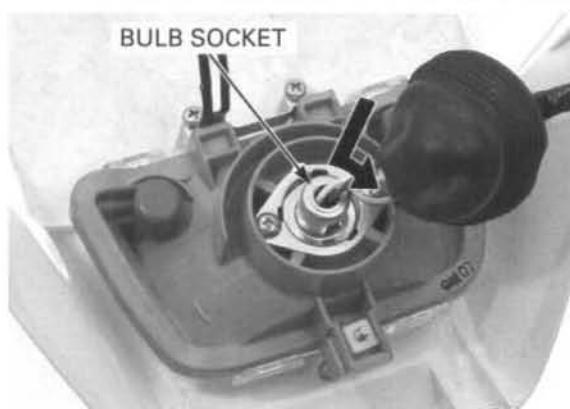


Install a new bulb into headlight unit while aligning the tabs with groove of the headlight unit.

If you touch the bulb with your bare hands, clean it with a cloth moistened with denatured alcohol to prevent early bulb failure.

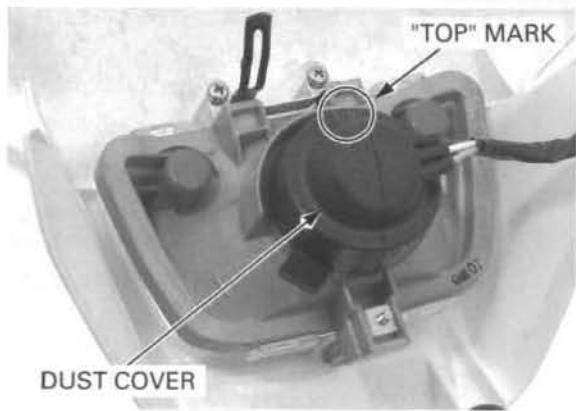


While pushing the bulb socket, turn it clockwise and install the bulb socket.



Install the dust cover tightly against the headlight unit with its "TOP" mark facing up.

Install the front visor (page 2-5).



## REMOVAL/INSTALLATION

Remove the front visor (page 2-5).

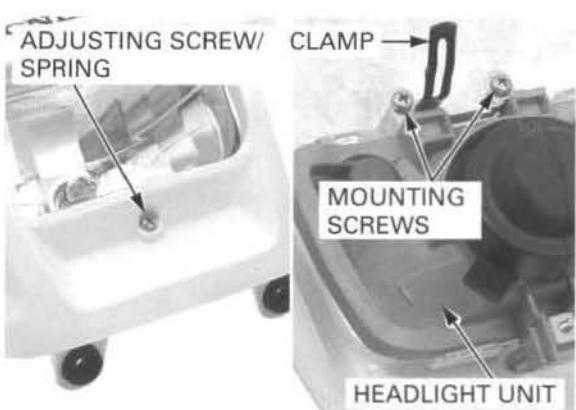
Remove the vertical beam adjusting screw, spring, mounting screws, clamp and headlight unit.

Install the headlight unit in the reverse order of removal.

### TORQUE:

**Headlight mounting screw:**  
0.7 N·m (0.07 kgf·m, 0.5 lbf·ft)

Adjust the headlight aim (page 3-28).

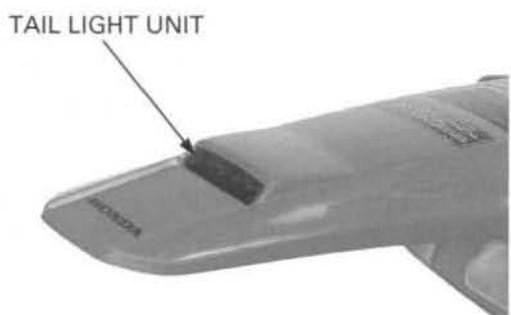


## TAIL LIGHT

### INSPECTION

Start the engine and check the tail light illumination.

If any LED does not turn on, replace the tail light unit.



## LIGHTS/METER/SWITCHES

### REMOVAL/INSTALLATION

Remove the seat (page 2-3).

Remove the side cover (page 2-3).

'04, '05: Disconnect the tail light 2P connector.

After '05: Disconnect the tail light and ICM wire connectors.

Remove the bolt, washer, screws and wire clamps.  
Remove the bolts, stay and tail light unit.

Install the tail light unit is in the reverse order of removal.

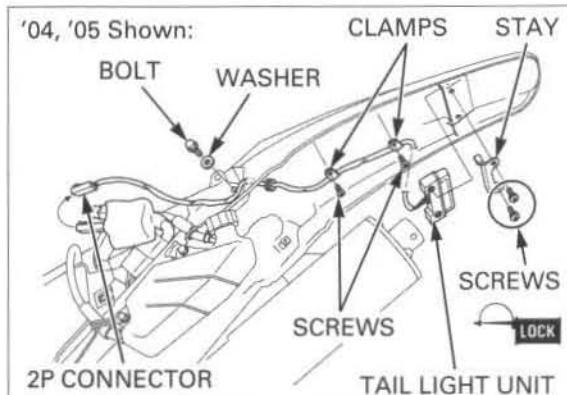
#### TORQUE:

Rear fender mounting bolt:

13 N·m (1.3 kgf·m, 9 lbf·ft)

Tail light mounting screw:

3.9 N·m (0.4 kgf·m, 2.9 lbf·ft)



## ENGINE STOP BUTTON

Remove the front visor (page 2-5).

Disconnect the engine stop button 3P connector.



Check for continuity between the Black/White terminal and Black/Green terminal.

There should be continuity with the engine stop button depressed, and no continuity with the button released.

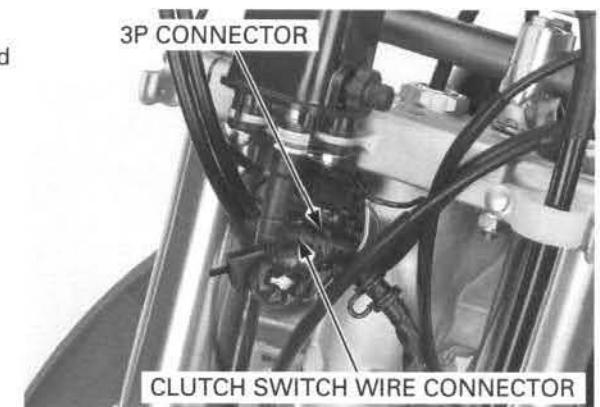


# CLUTCH SWITCH

## INSPECTION

Remove the front visor (page 2-5).

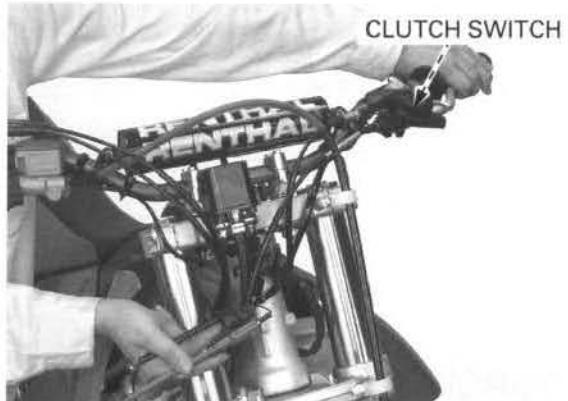
Disconnect the engine stop button 3P connector and clutch switch wire connector.



Check for continuity between the Black/Brown terminal and Black/red wire connector.

There should be continuity with the clutch lever squeezed, and no continuity with the clutch lever released.

If the continuity is abnormal, remove the clutch switch (page 19-7).

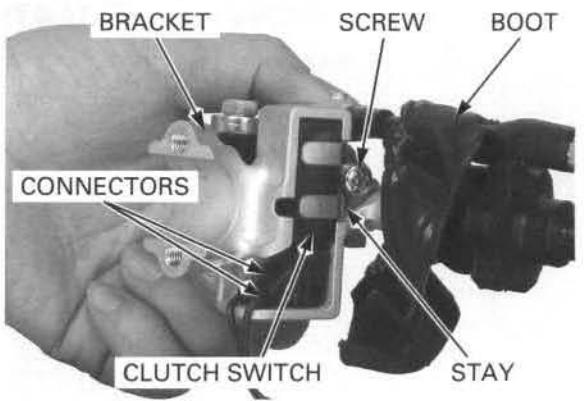


Remove the clutch lever bracket (page 13-31).

Remove the boot.

Remove the screw, stay and clutch switch.

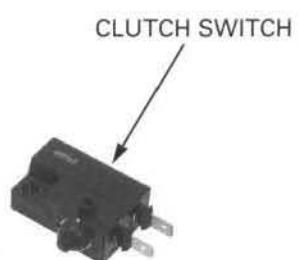
Disconnect the connectors.



Check for continuity between the clutch switch terminals.

There should be continuity with the switch applied, and there should be no continuity with the switch is released.

If the continuity at the connectors is abnormal and the continuity at the clutch switch terminal is normal, check the connectors for loose connection and the wire harness for an open circuit or loose connection.



## LIGHTS/METER/SWITCHES

### STARTER SWITCH

Remove the front visor (page 2-5).  
Disconnect the starter switch 2P connector.



Check for continuity between the starter switch connector terminals.

There should be continuity with the starter switch depressed, and no continuity with the switch released.



### TRIPMETER

#### REMOVAL/INSTALLATION

Remove the front visor (page 2-5).  
Loosen the lock nut and remove the tripmeter cable.  
Remove the nuts, washers and tripmeter.  
Install the tripmeter is in the reverse order of removal.

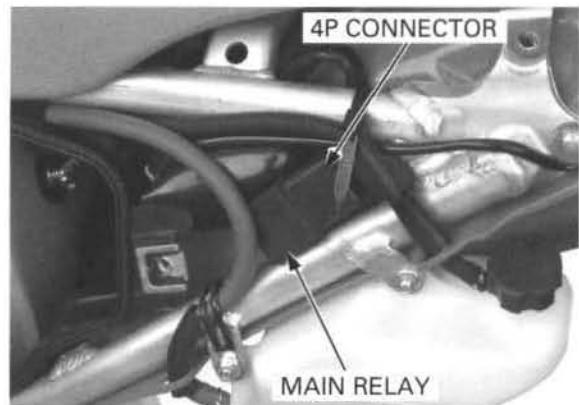


## MAIN RELAY ('04, '05)

### INSPECTION

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

Disconnect the main relay 4P connector, then remove the relay.



Connect the ohmmeter to the main relay connector terminals.

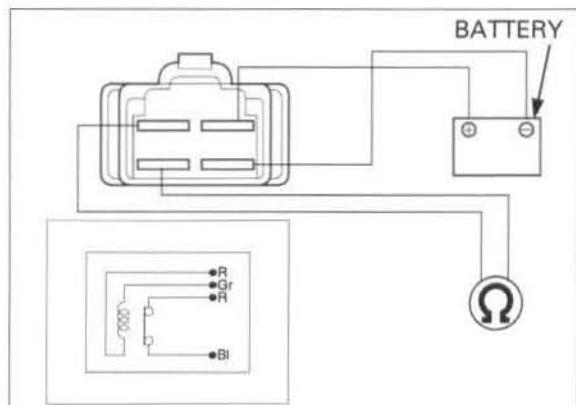
#### **CONNECTION: Red terminal – Gray terminal**

Connect the 12 V battery to the main relay connector terminals.

#### **CONNECTION: Red terminal – Black terminal**

There should be continuity only when the 12 V battery is connected.

If there is no continuity when the 12 V battery is connected, replace the main relay.



---

**MEMO**



## 20. WIRING DIAGRAM

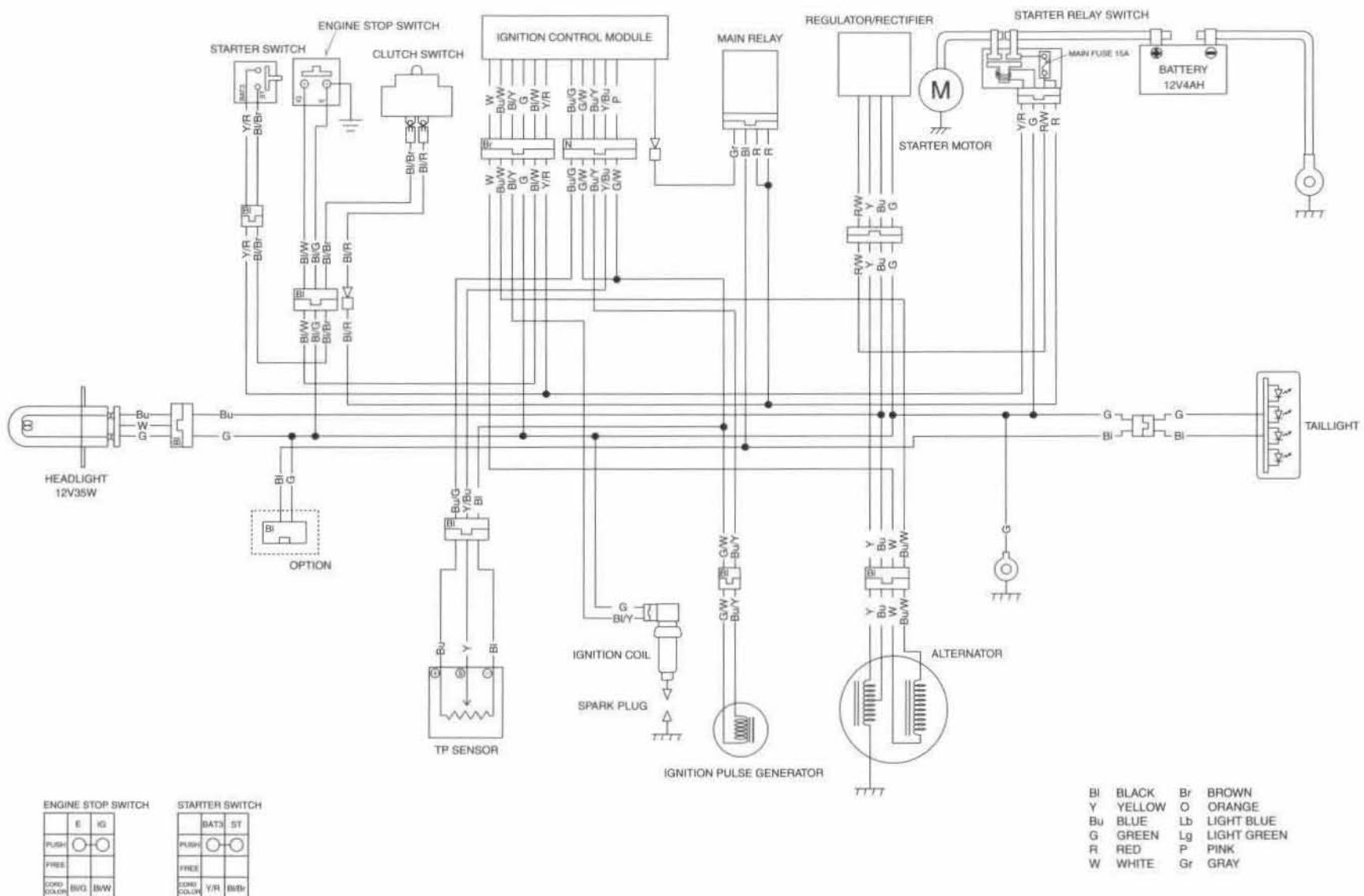
---

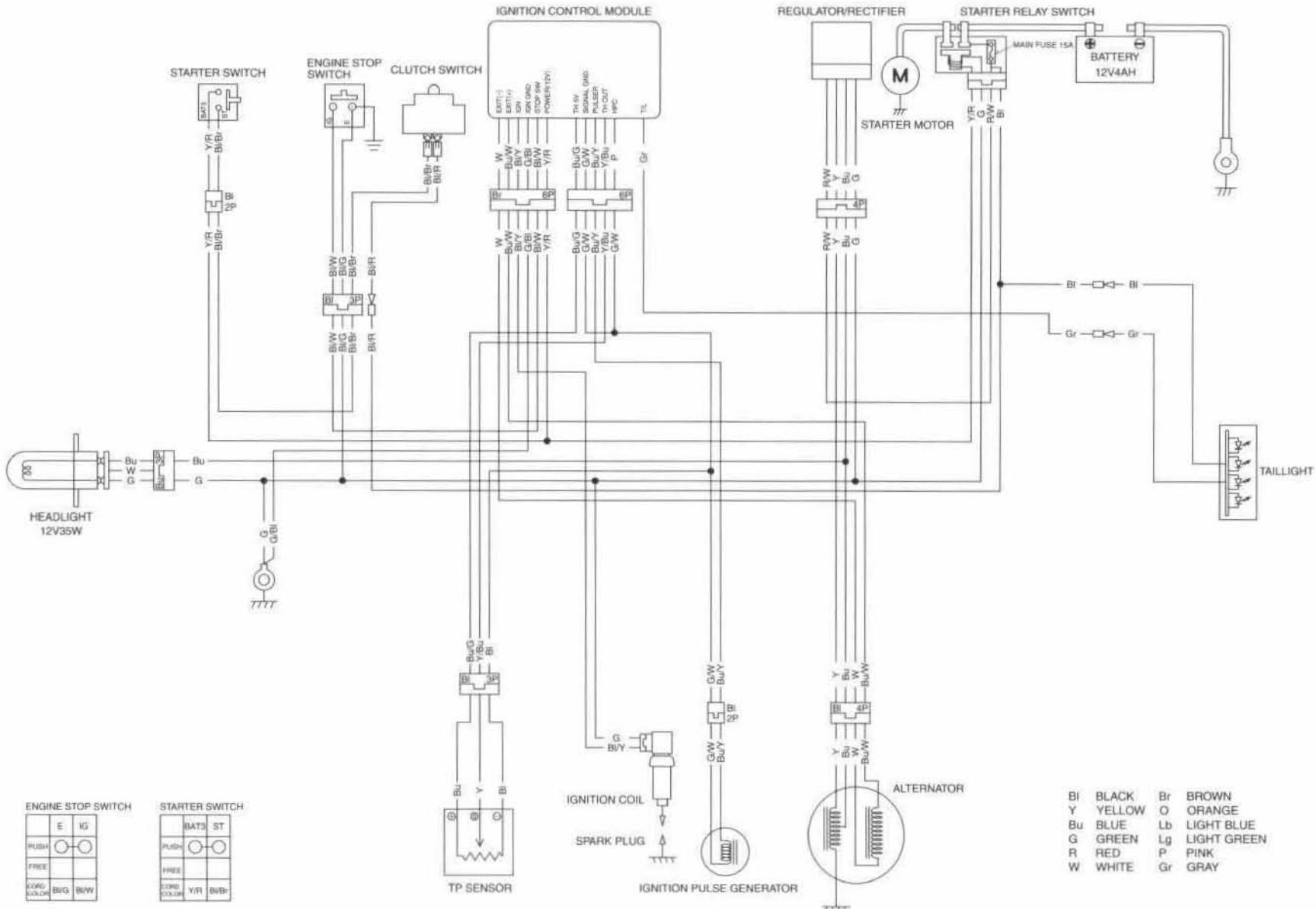
'04, '05 ..... 20-2      After '05 ..... 20-3

# WIRING DIAGRAM

## WIRING DIAGRAM

'04, '05:





E	Ig	Br	BROWN
PUSH		O	ORANGE
FREE		Lb	LIGHT BLUE
CORD COLOR	BIG B/W	G	GREEN

BAT3 ST	Br	BROWN	
PUSH	O	ORANGE	
FREE	Lb	LIGHT BLUE	
CORD COLOR	G	GREEN	

BI	BLACK	Br	BROWN
Y	YELLOW	O	ORANGE
Bu	BLUE	Lb	LIGHT BLUE
G	GREEN	Lg	LIGHT GREEN
R	RED	P	PINK
W	WHITE	Gr	GRAY

---

**MEMO**



---

## **21. TROUBLESHOOTING**

---

ENGINE DOES NOT START OR IS HARD TO START .....	21-2	POOR PERFORMANCE AT HIGH SPEED .....	21-6
ENGINE LACKS POWER .....	21-3	POOR HANDLING .....	21-7
POOR PERFORMANCE AT LOW AND IDLE SPEED.....	21-5		

## TROUBLESHOOTING

# ENGINE DOES NOT START OR IS HARD TO START

### 1. Fuel Line Inspection

Check fuel flow to carburetor.

*Does fuel reach the carburetor?*

- NO – • Clogged fuel hose or fuel strainer  
• Clogged fuel valve  
• Clogged fuel cap breather hose

YES – GO TO STEP 2.

### 2. Spark Plug Inspection

Remove and inspect spark plug.

*Is the spark plug wet?*

- YES – • Flooded carburetor  
• Throttle valve open  
• Dirty air cleaner  
• Improperly adjusted pilot screw

NO – GO TO STEP 3.

### 3. 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 direct ignition coil wire  
• Faulty direct ignition coil  
• Faulty igniting pulse generator  
• Faulty exciter coil  
• Faulty engine stop button  
• Faulty ignition control module (ICM)

NO – GO TO STEP 4.

### 4. Engine Starting Condition

Start engine by normal procedure.

*Does the engine start then stops?*

- YES – • Improper choke operation  
• Incorrectly adjusted carburetor  
• Leaking carburetor insulator  
• Improper ignition timing (Faulty ICM or ignition pulse generator)  
• Contaminated fuel  
• Improper hot start operation

NO – GO TO STEP 5.

### 5. Cylinder Compression

Test cylinder compression.

*Is the compression low?*

- YES – • Valve clearance too small  
• Valve stuck open  
• Worn cylinder and piston rings  
• Damaged cylinder head gasket  
• Seized valve  
• Improper valve timing  
• Faulty decompressor cam

## ENGINE LACKS POWER

### 1. Drive Train Inspection

Raise wheel off the ground and spin by hand.

*Did the wheel spin freely?*

- NO – • Brake dragging  
• Worn or damaged wheel bearings  
• Bent axle  
• Drive chain too tight

YES – GO TO STEP 2.

### 2. Tire Pressure Inspection

Check tire pressure.

*Is the tire pressures low?*

- YES – • Faulty tire valve  
• Punctured tire

NO – GO TO STEP 3.

### 3. Clutch Inspection

Accelerate rapidly from low to second.

*Did the engine speed change accordingly when clutch is engaged?*

- NO – • Clutch slipping  
• Worn clutch discs/plates  
• Warped clutch discs/plates  
• Weak clutch spring  
• Sticking clutch lifter  
• Additive in transmission oil

YES – GO TO STEP 4.

### 4. Engine Condition Inspection

Accelerate lightly.

*Did the engine speed increase?*

- NO – • Fuel/air mixture too rich or lean  
• Clogged air cleaner  
• Restricted fuel flow  
• Clogged muffler  
• Clogged fuel cap breather hose  
• Carburetor choke is on  
• Excessive carbon build-up in combustion chamber

YES – GO TO STEP 5.

### 5. Engine Knocking Inspection

Accelerate or run at high speed.

*Is there knocking?*

- YES – • Worn piston and cylinder  
• Use of poor quality fuel  
• Excessive carbon build-up in combustion chamber  
• Ignition timing too advance (Faulty ICM)  
• Lean fuel mixture

NO – GO TO STEP 6.

### 6. Ignition Timing Inspection

Check ignition timing.

*Is the ignition timing correct?*

- NO – • Faulty ignition control module (ICM)  
• Faulty ignition pulse generator

YES – GO TO STEP 7.

## TROUBLESHOOTING

---

### 7. Cylinder compression Inspection

Test the cylinder compression.

*Is the compression low?*

- YES – • Valve clearance too small  
• Valve stuck open  
• Worn cylinder and piston rings  
• Damaged cylinder head gasket  
• Improper valve timing  
• Faulty decompressor cam

NO – GO TO STEP 8.

### 8. Carburetor Inspection

Check carburetor for clogs.

*Is the carburetor for clogged?*

- YES – • Carburetor not serviced frequently enough  
• Carburetor dirty  
• Dirt getting past air cleaner

NO – GO TO STEP 9.

### 9. Spark Plug Inspection

Remove and inspect spark plug.

*Is the spark plug fouled or discolored?*

- NO – • Plug not serviced frequently enough  
• Incorrect spark plug heat range  
• Incorrect spark plug gap

YES – GO TO STEP 10.

### 10. Engine Oil Inspection

Check oil level and condition.

*Is there correct level and good condition?*

- NO – • Oil level too high  
• Oil level too low  
• Contaminated oil

YES – GO TO STEP 11.

### 11. Over Heating Inspection

Check engine overheating.

*Is the engine overheating?*

- YES – • Coolant level too low  
• Excessive carbon build-up in combustion chamber  
• Use of poor quality fuse  
• Clutch slipping

NO – GO TO STEP 12.

### 12. Lubrication Inspection

Remove cylinder head cover and inspect lubrication.

*Is the valve train lubricated properly?*

- NO – • Faulty oil pump  
• Faulty pressure relief valve  
• Clogged oil passage  
• Clogged oil strainer

YES – Valve train lubrication is normal

## POOR PERFORMANCE AT LOW AND IDLE SPEED

### 1. Pilot Screw Inspection

Check carburetor pilot screw adjustment.

*Is the adjustment correct?*

**NO** – See page 5-27

**YES** – GO TO STEP 2.

### 2. Accelerator Pump Inspection

Check accelerator pump for clogs.

*Is the accelerator pump clogged?*

**YES** – Accelerator not serviced frequently enough

**NO** – GO TO STEP 3.

### 3. Intake Air Leak Inspection

Check for leaking carburetor insulator.

*Is there leaking?*

**YES** – • Loose carburetor insulator bands  
• Damaged insulator

**NO** – GO TO STEP 4.

### 4. Spark Test

Perform spark test.

*Is there weak or intermittent spark?*

**YES** – • Faulty spark plug  
• Fouled spark plug  
• Loose or disconnected ignition system wires  
• Broken or shorted direct ignition coil wire  
• Faulty direct ignition coil  
• Faulty ignition pulse generator  
• Faulty exciter coil  
• Faulty engine stop button  
• Faulty ignition control module (ICM)

**NO** – GO TO STEP 5.

### 5. Ignition Timing Inspection

Check ignition timing.

*Is the ignition timing correct?*

**YES** – Ignition timing is normal

**NO** – • Faulty ignition control module (ICM)  
• Faulty ignition pulse generator

## TROUBLESHOOTING

### POOR PERFORMANCE AT HIGH SPEED

#### 1. Fuel Line Inspection

Disconnect fuel line at carburetor.

*Does fuel flow freely?*

- NO – • Clogged fuel line  
• Clogged fuel cap breather  
• Faulty fuel valve  
• Clogged the fuel strainer screen

YES – GO TO STEP 2.

#### 2. Carburetor Inspection

Check carburetor for clogs.

*Is the carburetor clogged?*

YES – Carburetor not serviced frequently enough

NO – GO TO STEP 3.

#### 3. Ignition Timing Inspection

Check ignition timing.

*Is the ignition timing correct?*

- NO – • Faulty ignition control module (ICM)  
• Faulty ignition pulse generator

YES – GO TO STEP 4.

#### 4. Valve Timing Inspection

Check valve timing.

*Is the valve timing correct?*

NO – Cam chain not installed properly

YES – GO TO STEP 5.

#### 5. Valve Spring Inspection

Check valve springs.

*Are the valve springs weak?*

YES – Faulty valve spring

NO – Not weak

## POOR HANDLING

### Steering is heavy

- Steering stem adjusting nut adjusted too tight
- Damaged steering head bearings
- Low tire pressure

### Either wheel is wobbling

- Excessive wheel bearing play
- Bent rim
- Improperly installed wheel hub
- Excessively worn swingarm pivot bearings
- Bent frame

### The motorcycle pulls to one side

- Front and rear wheels not aligned
- Bent fork
- Bent swingarm
- Bent axle
- Bent frame

#### NOTE:

- For the following recommendations to be useful, the motorcycle must be adjusted as follows:
  - Fork: compression damping at standard position, at standard fork oil quantity and viscosity, and air pressure zero.
  - Shock: nitrogen pressure 981 kPa (10.0 kgf/cm<sup>2</sup>, 142 psi), compression and rebound damping standard position, and spring preload adjusted so the bike sags with rider seated - see Owner's manual for spring preload adjustment
- The following recommendations are given in the preferred sequence of adjustment

### Front End Overshoots; It Cuts Too Sharply (such as in sand)

- Increase the fork oil capacity
- Use stiffer fork spring

### Front End Understeers; It Washes Out Or Pushes (such as on at tight track with hard ground)

- Lower fork oil capacity
- Use softer fork spring

### Front End Hunts At High Speed; It Wanders Under Power

- Increase the fork oil capacity
- Increase the shock oil preload

### Front End Shakes Under Heavy Braking

- Decrease shock preload
- Increase shock rebound damping
- Increase the fork oil capacity

### Front End Hops Over Bumps In Smooth Turns

- Change the lighter fork oil
- Decrease the fork oil capacity
- Decrease fork compression damping
- Use softer fork spring

### Rear End Hops Over Bumps While Accelerating

- Decrease shock pre load
- Decrease shock compression damping

### Rear End Gets Poor Traction While Accelerating Away From A Corner

- Decrease shock preload
- Decrease shock compression damping

---

**MEMO**

---

ADDITIONAL ITEMS REQUIRING FREQUENT REPLACEMENT.....	3-7
AIR CLEANER.....	3-10
AIR CLEANER HOUSING.....	5-7
ALTERNATOR CHARGING COIL.....	16-8
BALANCER GEAR/BALANCER.....	12-6
BATTERY.....	16-6
BATTERY/CHARGING SYSTEM SPECIFICATIONS.....	1-11
BRAKE FLUID.....	3-26
BRAKE FLUID REPLACEMENT/AIR BLEEDING.....	15-6
BRAKE PAD WEAR.....	3-27
BRAKE PAD/DISC.....	15-10
BRAKE PEDAL.....	15-24
BRAKE SYSTEM.....	3-27
CABLE & HARNESS ROUTING.....	1-23
CAM CHAIN TENSIONER/CAM CHAIN GUIDE.....	8-14
CAMSHAFT/ROCKER ARM INSTALLATION.....	8-27
CAMSHAFT/ROCKER ARM REMOVAL.....	8-7
CARBURETOR ADJUSTMENT.....	5-6
CARBURETOR ASSEMBLY.....	5-18
CARBURETOR DISASSEMBLY.....	5-13
CARBURETOR INSTALLATION.....	5-24
CARBURETOR REMOVAL.....	5-11
CHARGING SYSTEM INSPECTION.....	16-6
CLUTCH.....	10-7
CLUTCH SWITCH.....	19-7
CLUTCH SYSTEM.....	3-28
CLUTCH/STARTER CLUTCH/KICKSTARTER/ GEARSHIFT LINKAGE SPECIFICATIONS.....	1-9
COMPETITION MAINTENANCE SCHEDULE.....	3-6
COMPONENT LOCATION	
ALTERNATOR.....	11-2
BATTERY/CHARGING SYSTEM.....	16-2
CLUTCH/STARTER CLUTCH/	
KICKSTARTER/GEARSHIFT LINKAGE.....	10-2
CRANKCASE/CRANKSHAFT/TRANSMISSION/ BALANCER.....	12-2
CYLINDER HEAD/VALVES.....	8-2
CYLINDER/PISTON.....	9-2
ELECTRIC STARTER.....	18-2
ENGINE REMOVAL/INSTALLATION.....	7-2
FRONT WHEEL/SUSPENSION/STEERING.....	13-2
FUEL SYSTEM.....	5-2
HYDRAULIC BRAKE.....	15-2
IGNITION SYSTEM.....	17-2
LIGHTS/METER/SWITCHES.....	19-2
REAR WHEEL/SUSPENSION.....	14-2
CONTROL CABLES.....	3-29
COOLANT REPLACEMENT.....	6-6
COOLING SYSTEM.....	3-13
COOLING SYSTEM SPECIFICATIONS.....	1-7
CRANKCASE ASSEMBLY.....	12-21
CRANKCASE BEARING REPLACEMENT.....	12-13
CRANKCASE BREather.....	3-11
CRANKCASE SEPARATION.....	12-7
CRANKCASE/CRANKSHAFT/TRANSMISSION/ BALANCER SPECIFICATIONS.....	1-9
CRANKSHAFT INSTALLATION.....	12-18
CRANKSHAFT REMOVAL.....	12-12
CYLINDER COMPRESSION TEST.....	8-6
CYLINDER HEAD ASSEMBLY.....	8-23
CYLINDER HEAD COVER INSTALLATION.....	8-30
CYLINDER HEAD COVER REMOVAL.....	8-6
CYLINDER HEAD DISASSEMBLY.....	8-15
CYLINDER HEAD INSPECTION.....	8-17
CYLINDER HEAD INSTALLATION.....	8-25
CYLINDER HEAD REMOVAL.....	8-12
CYLINDER HEAD/VALVES SPECIFICATIONS.....	1-8
CYLINDER INSTALLATION.....	9-8
CYLINDER REMOVAL.....	9-4
CYLINDER/PISTON INSPECTION.....	9-5
CYLINDER/PISTON SPECIFICATIONS.....	1-8
DRIVE CHAIN.....	3-21
DRIVE CHAIN ROLLER.....	3-25
DRIVE CHAIN SLIDER.....	3-24
DRIVE SPROCKET.....	7-4
DRIVE/DRIVEN SPROCKET.....	3-25
ELECTRIC STARTER SPECIFICATIONS.....	1-12
EMISSION CONTROL SYSTEMS.....	1-33
ENGINE & FRAME TORQUE VALUES.....	1-13
ENGINE GUARD.....	2-4
ENGINE IDLE SPEED.....	3-19
ENGINE INSTALLATION.....	7-7
ENGINE OIL/OIL FILTER.....	3-17
ENGINE REMOVAL.....	7-5
ENGINE STOP BUTTON.....	19-6
EXHAUST PIPE/MUFFLER.....	3-29
EXHAUST SYSTEM.....	2-8
FLYWHEEL.....	11-5
FORK.....	13-12
FRONT BRAKE CALIPER.....	15-18
FRONT MASTER CYLINDER.....	15-12
FRONT VISOR.....	2-5
FRONT WHEEL.....	13-7
FRONT WHEEL/SUSPENSION/ STEERING SPECIFICATIONS.....	1-10
FUEL LINE.....	3-8
FUEL STRAINER SCREEN.....	3-8
FUEL SYSTEM SPECIFICATIONS.....	1-7
FUEL TANK.....	2-7
GEARSHIFT LINKAGE.....	10-25
GENERAL SPECIFICATIONS.....	1-5
HANDLEBAR.....	13-31
HEADLIGHT.....	19-4
HEADLIGHT AIM.....	3-28
HIGH ALTITUDE ADJUSTMENT (California type only).....	5-29
HOT START.....	3-9
HYDRAULIC BRAKE SPECIFICATIONS.....	1-11
IGNITION CONTROL MODULE (ICM).....	17-8
IGNITION SYSTEM INSPECTION.....	17-5
IGNITION SYSTEM SPECIFICATIONS.....	1-11
IGNITION TIMING.....	17-8
KICKSTARTER.....	10-15
LEFT CRANKCASE COVER INSTALLATION.....	11-7
LEFT CRANKCASE COVER REMOVAL.....	11-4
LIGHTS/METER/SWITCHES SPECIFICATIONS.....	1-12
LUBRICATION & SEAL POINTS.....	1-20
LUBRICATION SYSTEM DIAGRAM.....	4-2
LUBRICATION SYSTEM SPECIFICATIONS.....	1-6
MAIN RELAY ('04, '05).....	19-9
MAINTENANCE SCHEDULE	
'04 – '06 .....	3-4
After '06 .....	3-5
MODEL IDENTIFICATION.....	1-2
NUTS, BOLTS, FASTENERS.....	3-33
OIL JET.....	4-6
OIL PUMP.....	4-7
OIL STRAINER.....	4-4
OPTIONAL PARTS.....	1-30
PILOT SCREW ADJUSTMENT.....	5-27
PISTON INSTALLATION.....	9-8
PISTON REMOVAL.....	9-4
PRESSURE RELIEF VALVE.....	4-5
RADIATOR.....	6-8
RADIATOR COOLANT.....	3-13
RADIATOR RESERVE TANK.....	6-9
RADIATOR SHROUD.....	2-4

## INDEX

REAR BRAKE CALIPER .....	15-20	SUSPENSION .....	3-31
REAR MASTER CYLINDER .....	15-15	SWINGARM .....	14-35
REAR WHEEL .....	14-7	SWINGARM/SHOCK LINKAGE .....	3-32
REAR WHEEL/SUSPENSION SPECIFICATIONS .....	1-10	SYSTEM DIAGRAM .....	
REGULATOR/RECTIFIER .....	16-7	BATTERY/CHARGING SYSTEM .....	16-2
RIGHT CRANKCASE COVER .....	10-5	ELECTRIC STARTER .....	18-2
SEAT .....	2-3	IGNITION SYSTEM .....	17-2
SECONDARY AIR SUPPLY SYSTEM ('04 - '06 California type, After '06)		SYSTEM FLOW PATTERN .....	6-2
FUEL SYSTEM .....	5-31	SYSTEM TESTING .....	6-5
MAINTENANCE .....	3-14	TAIL LIGHT .....	19-5
SERVICE INFORMATION .....		THROTTLE OPERATION .....	3-8
ALTERNATOR .....	11-3	THROTTLE POSITION SENSOR INSPECTION .....	17-9
BATTERY/CHARGING SYSTEM .....	16-3	THROTTLE POSITION SENSOR REPLACEMENT .....	5-26
CLUTCH/STARTER CLUTCH/ KICKSTARTER/GEARSHIFT LINKAGE .....	10-3	TRANSMISSION ASSEMBLY .....	12-19
COOLING SYSTEM .....	6-3	TRANSMISSION DISASSEMBLY .....	12-9
CRANKCASE/CRANKSHAFT/TRANSMISSION/ BALANCER .....	12-3	TRANSMISSION OIL .....	3-20
CYLINDER HEAD/VALVES .....	8-3	TRIPMETER .....	19-8
CYLINDER/PISTON .....	9-3	TROUBLESHOOTING .....	
ELECTRIC STARTER .....	18-3	BATTERY/CHARGING SYSTEM .....	16-5
ENGINE REMOVAL/INSTALLATION .....	7-3	CLUTCH/STARTER CLUTCH/ KICKSTARTER/GEARSHIFT LINKAGE .....	10-4
FRAME/BODY PANELS/EXHAUST SYSTEM .....	2-2	COOLING SYSTEM .....	6-4
FRONT WHEEL/SUSPENSION/STEERING .....	13-3	CRANKCASE/CRANKSHAFT/TRANSMISSION/ BALANCER .....	12-5
FUEL SYSTEM .....	5-3	CYLINDER HEAD/VALVES .....	8-5
HYDRAULIC BRAKE .....	15-3	CYLINDER/PISTON .....	9-3
IGNITION SYSTEM .....	17-3	ELECTRIC STARTER .....	18-4
LIGHTS/METER/SWITCHES .....	19-3	ENGINE DOES NOT START OR IS HARD TO START .....	21-2
LUBRICATION SYSTEM .....	4-3	ENGINE LACKS POWER .....	21-3
MAINTENANCE .....	3-2	FRAME/BODY PANELS/EXHAUST SYSTEM .....	2-2
REAR WHEEL/SUSPENSION .....	14-3	FRONT WHEEL/SUSPENSION/STEERING .....	13-6
SERVICE RULES .....	1-2	FUEL SYSTEM .....	5-5
SHOCK ABSORBER .....	14-13	HYDRAULIC BRAKE .....	15-5
SHOCK LINKAGE .....	14-29	IGNITION SYSTEM .....	17-4
SIDE COVER .....	2-3	LUBRICATION SYSTEM .....	4-3
SIDE STAND .....	3-31	POOR HANDLING .....	21-7
SPARK ARRESTER .....	3-30	POOR PERFORMANCE AT HIGH SPEED .....	21-6
SPARK PLUG .....	3-11	POOR PERFORMANCE AT LOW AND IDLE SPEED .....	21-5
STANDARD TORQUE VALUES .....	1-13	REAR WHEEL/SUSPENSION .....	14-6
STARTER CLUTCH .....	10-19	VALVE CLEARANCE/DECOMPRESSOR SYSTEM .....	3-14
STARTER MOTOR .....	18-6	VALVE GUIDE REPLACEMENT .....	8-19
STARTER RELAY SWITCH .....	18-11	VALVE SEAT INSPECTION/REFACING .....	8-19
STARTER SWITCH .....	19-8	WATER PUMP .....	6-10
STATOR .....	11-5	WHEELS/TIRES .....	3-33
STEERING HEAD BEARINGS .....	3-34	WIRING DIAGRAM .....	20-2
STEERING STEM .....	13-37		
SUB-FRAME .....	2-5		