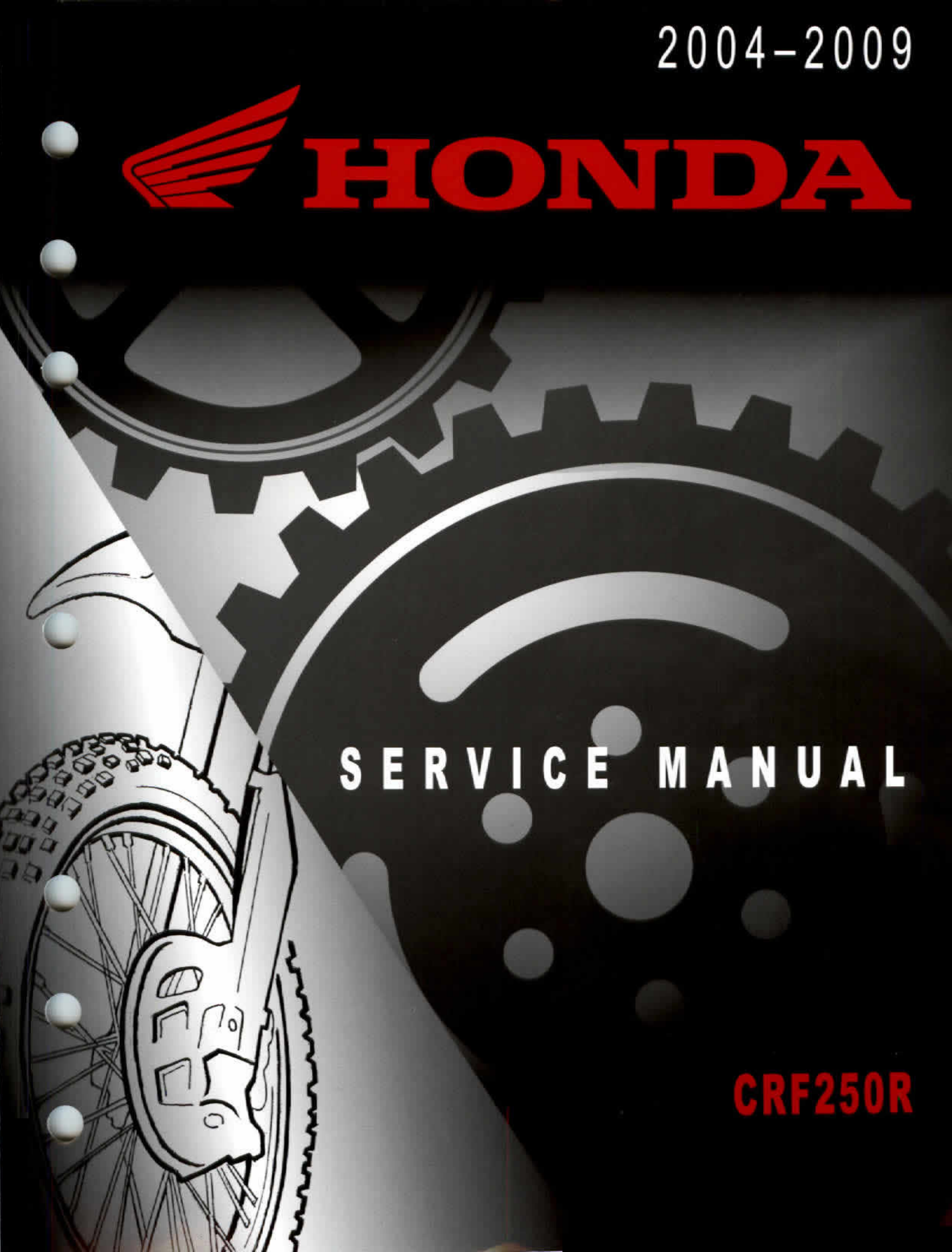
2004–2009

HONDA



SERVICE MANUAL

CRF250R

A Few Words About Safety

Service Information

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

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

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

For Your Customer's Safety

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

⚠WARNING

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

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

For Your Safety

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

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

⚠WARNING

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

Follow the procedures and precautions in this manual carefully.

Important Safety Precautions

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

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

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

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

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

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

HOW TO USE THIS MANUAL

This service manual describes the service procedures for the CRF250R.

Follow the Maintenance Schedule (Section 4) recommendations to ensure that the vehicle is in peak operating condition.

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

Sections 1 and 4 apply to the whole motorcycle. Section 3 illustrates procedures for removal/installation of components that may be required to perform service described in the following sections.
Section 5 through 17 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 are not familiar with this motorcycle, read Technical Feature in Section 2.
If you don't know the source of the trouble, go to section 18 Troubleshooting.

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

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

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

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

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

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

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

CONTENTS

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.

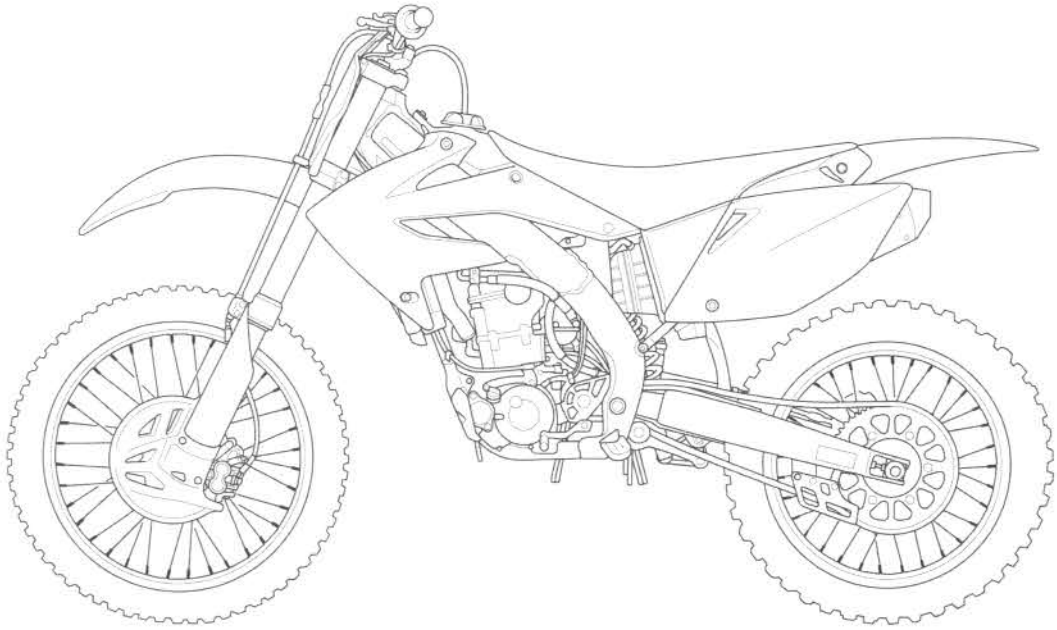
1. GENERAL INFORMATION

SERVICE RULES

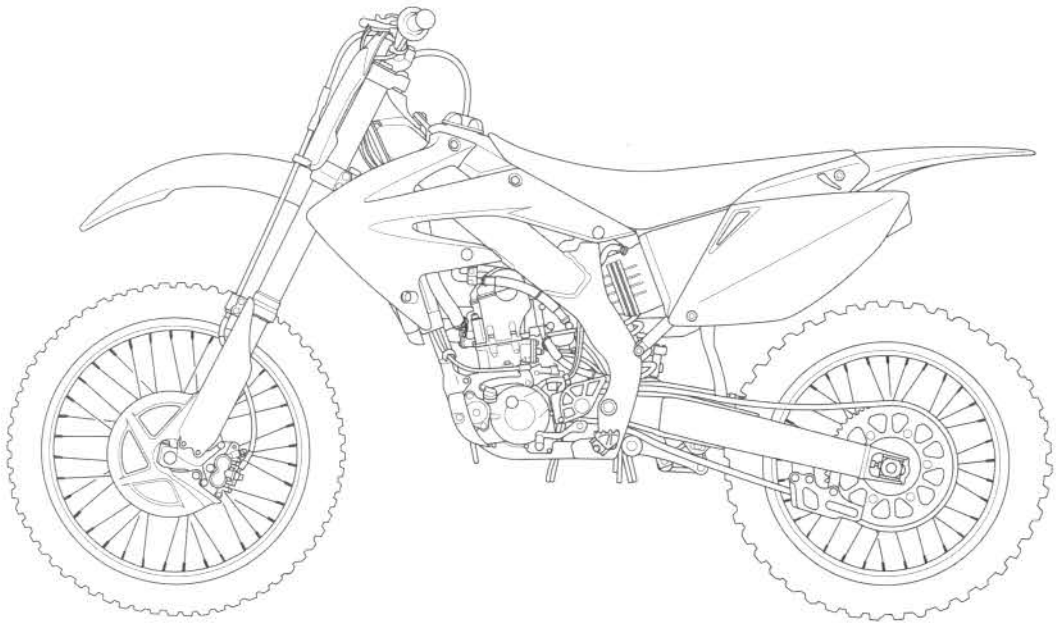
1. Use genuine Honda or Honda-recommended parts and lubricants or their equivalents. Parts that do not meet Honda's design specifications may cause damage to the motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing 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 1-22).

MODEL IDENTIFICATION

'04 model shown:



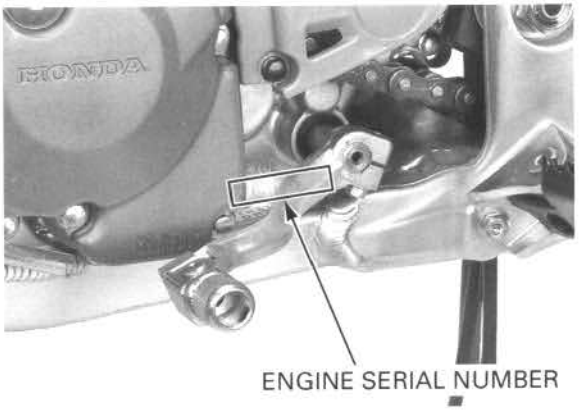
After '08:



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


VEHICLE IDENTIFICATION NUMBER (VIN)

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



ENGINE SERIAL NUMBER

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


CARBURETOR IDENTIFICATION NUMBER

GENERAL SPECIFICATIONS

ITEM			SPECIFICATION
DIMENSIONS	Overall length	('04 - '07)	2,172 mm (85.5 in)
		(After '07)	2,170 mm (85.4 in)
	Overall width		827 mm (32.6 in)
	Overall height	('04)	1,263 mm (49.7 in)
		(After '04)	1,277 mm (50.3 in)
	Wheelbase	('04 - '07)	1,479 mm (58.2 in)
		(After '07)	1,477 mm (58.1 in)
	Seat height	('04)	957 mm (37.7 in)
		(After '04)	965 mm (38.0 in)
	Footpeg height	('04)	434 mm (17.1 in)
		(After '04)	446 mm (17.6 in)
	Ground clearance	('04)	349 mm (13.7 in)
		('05 - '07)	361 mm (14.2 in)
		(After '07)	362 mm (14.3 in)
FRAME	Frame type		Twin tube
	Front suspension		Telescopic fork
	Front suspension axle travel	('04)	280 mm (11.0 in)
		(After '04)	279 mm (11.0 in)
	Front suspension cushion stroke		315 mm (12.4 in)
	Rear suspension		Pro-Link
	Rear wheel travel	('04)	312 mm (12.3 in)
		(After '04)	313 mm (12.3 in)
	Rear damper		Decarbon type with nitrogen gas filled damper
	Front tire size		80/100-21 51M
	Rear tire size		100/90-19 57M
	Tire brand (Dunlop)	('04 - '06)	Front: D742F/Rear: D756
		(After '06)	Front: D742FA/Rear: D756
	Front brake		Hydraulic single disc
	Front brake swept area		334.5 cm^2 (51.8 in^2)
	Rear brake		Hydraulic single disc
	Rear brake swept area		391.1 cm^2 (60.6 in^2)
	Caster angle	('04)	27°44'
		(After '04)	27°50'
	Trail length	('04)	112 mm (4.4 in)
		('05 - '07)	123 mm (4.8 in)
		(After '07)	125 mm (4.9 in)
	Fuel tank capacity		7.3 liter (1.93 US gal, 1.61 Imp gal)

ITEM				SPECIFICATION
ENGINE	Bore and stroke			78.0 x 52.2 mm (3.07 x 2.06 in)
	Displacement			249.4 cm^3 (15.21 cu-in)
	Compression ratio		('04 - '07)	12.9 : 1
			('08)	13.1 : 1
			(After '08)	13.0 : 1
	Valve train			Chain drive and OHC with rocker arm
	Intake valve	opens	('04 - '07) at 1 mm (0.04 in) lift	15° BTDC
			(After '07) at 1 mm (0.04 in) lift	20° BTDC
		closes	at 1 mm (0.04 in) lift	50° ABDC
	Exhaust valve	opens	at 1 mm (0.04 in) lift	50° BBDC
		closes	('04 and After '07) at 1 mm (0.04 in) lift	20° ATDC
			('05 - '07) at 1 mm (0.04 in) lift	15° ATDC
	Lubrication system			Forced pressure and wet sump
	Oil pump type			Trochoid
	Cooling system			Liquid cooled
	Air filtration			Oiled polyurethane foam
	Crankshaft type			Assembled type
	Engine dry weight		('04, '05)	23.90 kg (52.68 lbs)
			('06)	24.05 kg (53.02 lbs)
			('07)	24.08 kg (53.09 lbs)
			(After '07)	24.10 kg (53.13 lbs)
	Cylinder arrangement			Single cylinder, inclined 10° from vertical
CARBURETOR	Carburetor type			Piston valve type
	Venturi diameter		('04, '05)	37 mm (1.5 in)
			(After '05)	40 mm (1.6 in)
DRIVE TRAIN	Clutch system			Multi-plate, wet
	Clutch operation system			Cable operated
	Transmission			Constant mesh, 5-speed
	Primary reduction			3.166 (57/18)
	Final reduction			3.923 (51/13)
	Gear ratio		1st	2.142 (30/14)
			2nd	1.750 (28/16)
			3rd	1.450 (29/20)
			4th	1.227 (27/22)
			5th	1.041 (25/24)
	Gearshift pattern			Left foot operated return system, 1 - N - 2 - 3 - 4 - 5
ELECTRICAL	Ignition system			ICM (Ignition Control Module)

LUBRICATION SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	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	'04	0.72 liter (0.76 US qt, 0.63 Imp qt)	–
		After '04	0.60 liter (0.63 US qt, 0.53 Imp qt)	–
	At disassembly	'04	0.77 liter (0.81 US qt, 0.68 Imp qt)	–
		After '04	0.70 liter (0.74 US qt, 0.62 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 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 – 0.22 (0.002 – 0.009)	–

FUEL SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS
Fuel tank capacity		7.3 liter (1.93 US gal, 1.61 Imp gal)
Carburetor identification number	'04	FCR01A
	'05	FCR01B
	'06	FCR01C
	'07	FCR01D
	'08	FCR01E
	After '08	FCR01F
Main jet	'04	#160
	'05 - '06	#172
	'07	#175
	After '07	#188
	After '08	#185
Slow jet	'04 and '06	#40
	'05 and After '06	#42
Jet needle	'04	NCYR
	'05	NCYQ
	'06	NHFS
	'07	NKBT
	'08	NMGU
	After '08	NNSU
Jet needle clip position (Standard)	'04	4th from the top
	After '04	3rd from the top
Pilot screw initial opening	'04 and '07	2-1/4 turns out
	'05 and '06	1-3/4 turns out
	'08	1-7/8 turns out
	After '08	1-1/4 turns out
Float level	'04 - '05	8.0 mm (0.31 in)
	After '05	6.0 mm (0.24 in)
Idle speed		1,700 ± 100 rpm
Throttle grip freeplay		3 – 5 mm (1/8 – 3/16 in)
Hot starter lever freeplay		2 – 3 mm (1/16 – 1/8 in)

COOLING SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS
Coolant capacity	At change	0.93 liter (0.98 US qt, 0.82 Imp qt)
	At disassembly	1.00 liter (1.06 US qt, 0.88 Imp qt)
Radiator cap relief pressure		93 – 123 kPa (0.95 – 1.25 kgf/cm², 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

CYLINDER HEAD/VALVES SPECIFICATIONS

Unit: mm (in)

ITEM				STANDARD	SERVICE LIMIT
Cylinder compression				392 kPa (4.0 kgf/cm², 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	'04 - '07	4.965 – 4.980 (0.1955 – 0.1961)	4.955 (0.1951)
			After '07	4.465 – 4.480 (0.1758 – 0.1764)	4.455 (0.1754)
	Valve guide I.D.	IN		5.000 – 5.012 (0.1969 – 0.1973)	5.052 (0.1989)
		EX	'04 - '07	5.000 – 5.012 (0.1969 – 0.1973)	5.052 (0.1989)
			After '07	4.500 – 4.512 (0.1772 – 0.1776)	4.552 (0.1792)
	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	'04 - '07	19.8 – 20.0 (0.78 – 0.79)	–
			After '07	19.9 – 20.1 (0.78 – 0.79)	–
	Valve seat width	IN/EX		0.90 – 1.10 (0.035 – 0.043)	1.7 (0.07)
Valve spring free length		IN	'04 - '07	39.47 (1.532)	38.5 (1.52)
			After '07	38.51 (1.516)	37.7 (1.48)
		EX	'04 - '07	43.07 (1.696)	42.1 (1.66)
			After '07	43.03 (1.694)	42.2 (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 – 0.4719)	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	IN	'04 - '06	36.000 – 36.240 (1.4173 – 1.4268)	35.86 (1.412)
			'07	36.200 – 36.440 (1.4252 – 1.4346)	36.06 (1.420)
			After '07	36.280 – 36.360 (1.4283 – 1.4315)	36.14 (1.423)
		EX	'04 and '06	25.667 – 25.907 (1.0105 – 1.0120)	25.56 (1.006)
			'05	25.501 – 25.741 (1.0040 – 1.0134)	24.40 (0.961)
			'07	25.501 – 25.721 (1.0040 – 1.0126)	24.40 (0.961)
			After '07	25.750 – 25.830 (1.0138 – 1.0169)	25.64 (1.009)
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 – 0.8869)	22.54 (0.887)

CYLINDER/PISTON SPECIFICATIONS

Unit: mm (in)

ITEM				STANDARD	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		'04 - '07	"IN" mark facing toward the intake side	–
			After '07	"○" 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		'04 - '07	"R" mark side facing up	–
			After '07	"RK" mark side facing up	–
	Piston ring -to-ring groove clearance	Top	'04 - '07	0.065 – 0.100 (0.0026 – 0.0039)	0.115 (0.0045)
			After '07	0.035 – 0.065 (0.0014 – 0.0026)	0.08 (0.003)
	Piston ring end gap	Top ring	'04, '05	0.20 – 0.30 (0.008 – 0.012)	0.44 (0.017)
			After '05	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.				16.016 – 16.034 (0.6305 – 0.6313)	16.04 (0.631)
Connecting rod-to-piston pin clearance				0.016 – 0.040 (0.0006 – 0.0016)	0.06 (0.002)

CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Clutch lever freeplay		10 – 20 (3/8 – 13/16)	–
Clutch spring free length	'04	37.1 (1.46)	36.3 (1.43)
	'05 - '07	38.0 (1.50)	37.2 (1.46)
	After '07	38.5 (1.52)	37.7 (1.48)
Clutch disc 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)

CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER SPECIFICATIONS

Unit: mm (in)

ITEM				STANDARD	SERVICE LIMIT
Crankshaft	Side clearance			0.30 – 0.75 (0.01 – 0.03)	0.8 (0.03)
	Radial clearance			0.006 – 0.018 (0.0002 – 0.0007)	0.05 (0.002)
	Runout	R		–	–
		L		–	0.05 (0.002)
Transmission	Gear I.D.	M4, M5		23.020 – 23.041 (0.9063 – 0.9071)	23.07 (0.908)
		C1		20.020 – 20.041 (0.7882 – 0.7890)	20.07 (0.790)
		C2		27.020 – 27.041 (1.0638 – 1.0646)	27.07 (1.066)
		C3		25.020 – 25.041 (0.9850 – 0.9859)	25.07 (0.987)
	Bushing O.D.	M4, M5		22.979 – 23.000 (0.9047 – 0.9055)	22.96 (0.904)
		C1		19.979 – 20.000 (0.7866 – 0.7874)	19.95 (0.785)
		C2		26.979 – 27.000 (1.0622 – 1.0630)	26.95 (1.061)
		C3		24.979 – 25.000 (0.9834 – 0.9843)	24.96 (0.983)
	Bushing I.D.	M5		20.000 – 20.021 (0.7874 – 0.7882)	20.04 (0.789)
		C1		17.000 – 17.018 (0.6693 – 0.6700)	17.04 (0.671)
		C2		24.000 – 24.021 (0.9449 – 0.9457)	24.04 (0.946)
		C3		22.000 – 22.021 (0.8661 – 0.8670)	22.04 (0.868)
	Gear-to-bushing clearance	M4, M5		0.020 – 0.062 (0.0008 – 0.0024)	0.12 (0.005)
		C1, C2, C3		0.020 – 0.062 (0.0008 – 0.0024)	0.12 (0.005)
	Mainshaft O.D.	M5 bushing		19.959 – 19.980 (0.7858 – 0.7866)	19.94 (0.785)
	Countershaft O.D.	C1 bushing	'04 - '06	16.983 – 16.994 (0.6686 – 0.6691)	16.97 (0.668)
			After '06	16.981 – 16.992 (0.6685 – 0.6690)	16.97 (0.668)
		C2 bushing		23.959 – 23.980 (0.9433 – 0.9441)	23.94 (0.943)
		C3 bushing		21.959 – 21.980 (0.8645 – 0.8654)	21.94 (0.864)
	Bushing-to-shaft clearance	M5		0.020 – 0.062 (0.0008 – 0.0024)	0.12 (0.005)
		C1	'04 - '06	0.006 – 0.035 (0.0002 – 0.0014)	0.07 (0.003)
			After '06	0.008 – 0.037 (0.0003 – 0.0015)	0.07 (0.003)
		C2, C3		0.020 – 0.062 (0.0008 – 0.0024)	0.12 (0.005)
Shift fork, shift fork shaft	Fork claw thickness			4.93 – 5.00 (0.194 – 0.197)	4.8 (0.19)
	Shift fork I.D.	C		11.003 – 11.024 (0.4332 – 0.4340)	11.04 (0.435)
		R, L		12.035 – 12.056 (0.4738 – 0.4746)	12.07 (0.475)
	Fork shaft O.D.	C		10.983 – 10.994 (0.4324 – 0.4328)	10.97 (0.432)
		R, L		11.966 – 11.984 (0.4711 – 0.4718)	11.95 (0.470)

FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS

Unit: mm (in)

ITEM				STANDARD	SERVICE LIMIT
Cold tire pressure				98 kPa (1.0 kgf/cm^2, 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 - '07	495 (19.5)	488 (19.2)
			After '07	494 (19.4)	487 (19.2)
	Slider runout			–	0.20 (0.008)
	Recommended fork oil			Pro-Honda HP Fork Oil 5W or equivalent	–
	Oil level			42 – 47 mm (1.65 – 1.85 in)	–
	Fluid capacity	Fork tube	'04	379 cm^3 (12.8 US oz, 13.3 Imp oz)	–
			'05	371 cm^3 (12.5 US oz, 13.1 Imp oz)	–
			'06	369 cm^3 (12.5 US oz, 13.0 Imp oz)	–
			'07	372 cm^3 (12.6 US oz, 13.1 Imp oz)	–
			'08	408 cm^3 (13.8 US oz, 14.4 Imp oz)	–
			After '08	368 cm^3 (12.4 US oz, 13.0 Imp oz)	–
		Fork damper	'04, '05	195 cm^3 (6.6 US oz, 6.9 Imp oz)	–
			'06, '07	192 cm^3 (6.5 US oz, 6.8 Imp oz)	–
			After '07	187 cm^3 (6.3 US oz, 6.6 Imp oz)	–
Compression damping adjuster standard position			'04	12 clicks out from full in	–
			'05	10 clicks out from full in	–
			'06, '07	8 clicks out from full in	–
			After '07	7 clicks out from full in	–
Rebound damping adjuster standard position			'04, '05	8 clicks out from full in	–
			After '05	9 clicks out from full in	–
HPSD (After '07)	Recommended damper oil			Pro-Honda HP Fork Oil 5W or equivalent	–
	Free piston depth at 20°C (68°F)			27.3 – 27.9 (1.07 – 1.10)	–
	Damping force adjuster standard position			7 clicks out from full in	–

REAR WHEEL/SUSPENSION SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cold tire pressure			98 kPa (1.0 kgf/cm², 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			48.75 ± 1.00 (1.919 ± 0.039)	–
Drive chain slack			25 – 35 (1.0 – 1.4)	50 (2.0)
Drive chain size/link	DID	'04 – '08	520DMA2 - 114	–
		After '08	520DMA4 - 114	–
	RK (After '07)		520TXZ - 114	–
Drive chain slider thickness			–	5.0 (0.2)
Drive chain roller O.D.	'04		–	39 (1.5)
	After '04	Upper	–	38 (1.5)
		Lower	–	31 (1.2)
Shock absorber	Damper gas pressure		980 kPa (10.0 kg/cm², 142 psi)	–
	Damper compressed gas		Nitrogen gas	–
	Recommended shock oil		Pro-Honda HP Fork oil 5W or equivalent	–
	Damper rod compressed force at 12 mm compressed		20.0 – 24.0 kgf (44.1 – 52.9 lbf)	–
	Spring installed length (standard)	'04	260.1 (10.24)	–
		'05	261.3 (10.29)	–
		'06 - '07	259.0 (10.20)	–
		After '07	259.6 (10.22)	–
		After '08	258.1 (10.16)	–
High speed side compression damping adjuster standard position		'04	1-7/12 – 2-1/12 turns out from full in	–
		'05 – '08	1-3/4 – 2-1/4 turns out from full in	–
		After '08	1-5/6 – 2-1/3 turns out from full in	–
Low speed side compression damping adjuster standard position		'04, '05	7 clicks out from full in	–
		'06, '07	9 clicks out from full in	–
		'08	14 clicks out from full in	–
		After '08	11 clicks out from full in	–
Rebound damping adjuster standard position		'04	8 – 11 clicks out from full in	–
		'05 – '08	7 – 10 clicks out from full in	–
		After '08	9 – 12 clicks out from full in	–

HYDRAULIC BRAKE SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	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	–	0.15 (0.006)
	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	–	0.15 (0.006)
	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)

ELECTRICAL SYSTEM SPECIFICATIONS

ITEM				SPECIFICATION
Spark plug	Standard	(NGK)	'04	IMR8C9H
			After '04	R0409 B-8
		(DENSO)	'04 only	VUH24D
	Optional	(NGK)	'04	IMR9C9H
			After '04	R0409 B-9
		(DENSO)	'04 only	VUH27D
Spark plug gap			'04	0.8 – 0.9 mm (0.032 – 0.035 in)
			After '04	0.6 – 0.7 mm (0.024 – 0.028 in)
Direct 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				100 V minimum
CKP (crankshaft position) sensor peak voltage				0.7 V minimum
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

STANDARD TORQUE VALUES

FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)	FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)
5 mm bolt and nut	5.2 (0.5, 3.8)	5 mm screw	4.2 (0.4, 3.1)
6 mm bolt and nut	10 (1.0, 7)	6 mm screw	9.0 (0.9, 6.6)
8 mm bolt and nut	22 (2.2, 16)	6 mm flange bolt (8 mm head, small flange)	10 (1.0, 7)
10 mm bolt and nut	34 (3.5, 25)	6 mm flange bolt (8 mm head, large flange)	12 (1.2, 9)
12 mm bolt and nut	54 (5.5, 40)	6 mm flange bolt (10 mm head) and nut	12 (1.2, 9)
		8 mm flange bolt and nut	27 (2.8, 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. Apply a high strength locking agent to the threads.
4. Apply grease to the threads.
5. Stake.
6. U-nut
7. Left hand threads.
8. ALOC bolt/screw: replace with a new one.
9. UBS bolt/nut

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	6.0 (0.6, 4.4)	NOTE 4
Crankshaft hole cap	1	30	15 (1.5, 11)	NOTE 4
Spark plug	1	10	16 (1.6, 12)	

LUBRICATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Oil jet ('04)	1	5	2.0 (0.2, 1.5)	NOTE 2
Oil jet mounting bolt (After '04)	1	6	10 (1.0, 7)	NOTE 2

FUEL

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Throttle drum cover bolt	1	5	3.4 (0.3, 2.5)	
Needle jet	1	7	1.8 (0.2, 1.3)	
Main jet	1	5	1.5 (0.2, 1.1)	
Slow jet	1	6	1.5 (0.2, 1.1)	
Slow air jet ('04 - '07)	1	4.5	1.0 (0.1, 0.7)	
Starter jet	1	5	1.5 (0.2, 1.1)	
Maintenance cover bolt	2	4	2.1 (0.2, 1.5)	
Top cover bolt	2	4	2.1 (0.2, 1.5)	
Throttle shaft screw ('04 - '06)	1	4	2.1 (0.2, 1.5)	NOTE 2
Throttle shaft torx screw (After '06)	1	4	2.1 (0.2, 1.5)	NOTE 2
Float chamber screw	4	4	2.1 (0.2, 1.5)	
Accelerator pump cover screw	3	4	2.1 (0.2, 1.5)	
Carburetor drain plug	1	18	4.9 (0.5, 3.6)	
SE valve lock nut	1	12	2.1 (0.2, 1.5)	
Hot start valve lock nut	1	12	2.1 (0.2, 1.5)	
Jet needle holder	1	8	2.1 (0.2, 1.5)	
Throttle position sensor torx screw	1	5	3.4 (0.3, 2.5)	NOTE 2
Acc. pump bypass jet	1	4	0.3 (0.03, 0.2)	

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 7

CYLINDER HEAD/VALVES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder head cover bolt	2	6	10 (1.0, 7)	
Camshaft holder mounting bolt	4	7	16 (1.6, 12)	NOTE 1
Decompressor cam stopper plate bolt	1	5	10 (1.0, 7)	NOTE 2
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	6.0 (0.6, 4.4)	NOTE 4

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)	NOTE 2
Gearshift drum stopper arm bolt	1	6	12 (1.2, 9)	
Clutch center lock nut	1	18	69 (7.0, 51)	NOTE 1
Clutch spring bolt	5	6	12 (1.2, 9)	
Clutch cover bolt	5	6	10 (1.0, 7)	
Gearshift return spring pin	1	8	22 (2.2, 16)	
Gearshift pedal pinch bolt	1	6	12 (1.2, 9)	
Kickstarter pedal bolt	1	8	38 (3.9, 28)	

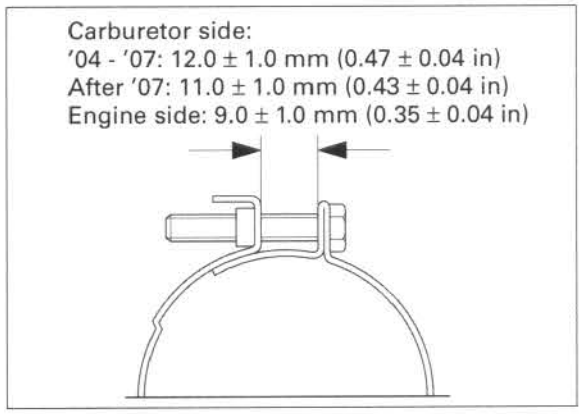
CRANKCASE/CRANKSHAFT/TRANSMISSION/BALANCER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Crankshaft bearing set plate screw	2	6	20 (2.0, 15)	NOTE 3
Countershaft bearing set plate screw	2	6	10 (1.0, 7)	NOTE 2
Gearshift drum bearing set plate bolt	2	6	10 (1.0, 7)	NOTE 2
Mainshaft bearing set plate bolt	2	6	10 (1.0, 7)	NOTE 2
Balancer shaft bearing set plate bolt	2	6	10 (1.0, 7)	NOTE 2
Drive sprocket bolt	1	8	31 (3.2, 23)	NOTE 9
Primary drive gear bolt	1	12	108 (11.0, 80)	NOTE 1
Crankcase orifice ('07 only)	1	5	2.0 (0.2, 1.5)	NOTE 8
Balancer shaft nut	1	14	44 (4.5, 32)	NOTE 1

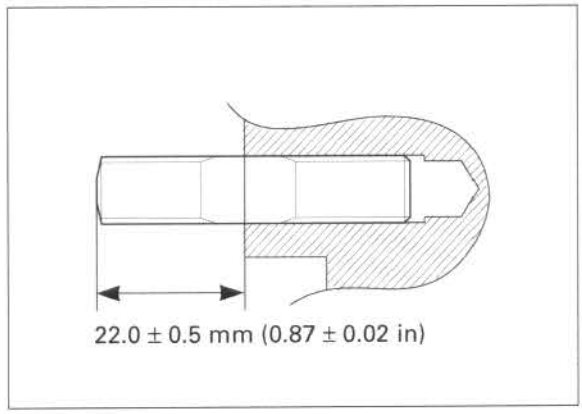
ALTERNATOR

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Flywheel nut	1	12	64 (6.5, 47)	NOTE 1
CKP sensor mounting bolt	2	5	5.2 (0.5, 3.8)	NOTE 2
Stator mounting screw	3	4	2.6 (0.3, 1.9)	NOTE 2

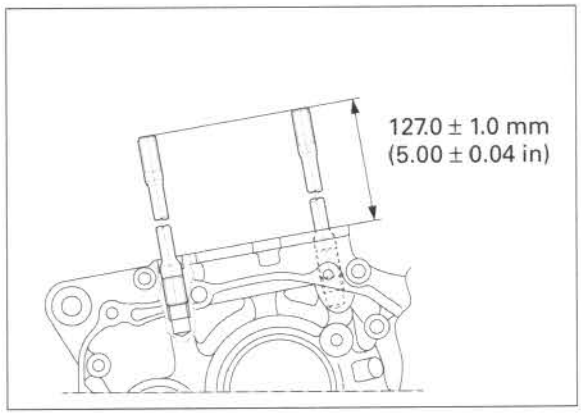
Insulator clamp:



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, 19)	
Sub-frame mounting bolt	(upper)		1	8	30 (3.1, 22)	
	(lower)		2	10	49 (5.0, 36)	
Seat bracket screw			1	5	4.0 (0.4, 3.0)	
Fuel tank band hook screw			1	5	4.0 (0.4, 3.0)	
Muffler joint band bolt		'04 – '05:	1	8	21 (2.1, 15)	
		After '05:	2	8	21 (2.1, 15)	
Muffler mounting bolt			2	8	26 (2.7, 19)	
Exhaust pipe joint nut			2	8	21 (2.1, 15)	
Muffler protector bolt ('04)			2	6	12 (1.2, 9)	
Exhaust joint pipe mounting bolt (After '05)			1	8	26 (2.7, 19)	
Exhaust pipe joint band bolt (After '05)			1	8	21 (2.1, 15)	
Shroud mounting bolt (fuel tank side)			4	5	5.0 (0.5, 3.7)	
Exhaust pipe protector bolt			2	6	12 (1.2, 9)	
Side cover bolt			2	6	10 (1.0, 7)	
Step bracket	(upper)		2	12	55 (5.6, 41)	
	(lower)		2	8	30 (3.1, 22)	
Rear fender mounting bolt			4	6	13 (1.3, 10)	
Mudguard mounting screw			2	5	1.1 (0.1, 0.8)	

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	4.0 (0.4, 3.0)	
Throttle cable lower adjuster lock nut (After '06)	1	6	4.0 (0.4, 3.0)	

ENGINE MOUNTING

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	64 (6.5, 47)	
	(lower)		1	10	64 (6.5, 47)	

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, 15)	
Front spoke		36	BC3.5	3.7 (0.4, 2.7)	
Front rim lock		1	8	12 (1.2, 9)	
Front brake disc nut		6	6	16 (1.6, 12)	NOTE 6
Steering stem nut		1	26	108 (11.0, 80)	
Steering stem adjusting nut		1	30	See page 13-57	
Fork top bridge pinch bolt		4	8	22 (2.2, 16)	
Fork bottom bridge pinch bolt		4	8	20 (2.0, 15)	
Fork cap		2	39	30 (3.1, 22)	
Fork center bolt		2	22	69 (7.0, 51)	
Fork center bolt lock nut		2	12	22 (2.2, 16)	
Fork air plug bolt		2	5	1.2 (0.1, 0.9)	
Fork damper		2	50	34 (3.5, 25)	
Fork protector mounting bolt		6	6	7.0 (0.7, 5.2)	NOTE 2
Front brake disc cover bolt	'04 – '08:	2	6	13 (1.3, 10)	
	After '08:	1	6	13 (1.3, 10)	
Handlebar upper holder bolt		4	8	22 (2.2, 16)	
Handlebar lower holder nut		2	10	44 (4.5, 32)	NOTE 6
Clutch lever pivot bolt		1	6	2.0 (0.2, 1.5)	Loosen the bolt 45° - 90° after tightening.
Clutch lever pivot nut		1	6	10 (1.0, 7)	NOTE 6 Tighten while holding the pivot bolt.
Clutch lever holder bolt		2	6	8.8 (0.9, 6.5)	
Throttle housing bolt		2	6	8.8 (0.9, 6.5)	
Engine stop button screw		1	4	1.5 (0.2, 1.1)	
Steering damper bolt (After '07)		2	7	20 (2.0, 15)	NOTE 2

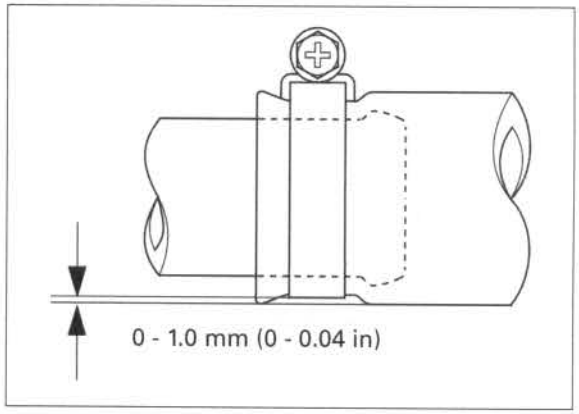
REAR WHEEL/BRAKE/SUSPENSION

ITEM		Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear axle nut		1	22	128 (13.1, 94)	NOTE 6
Rear spoke		32	4.5	3.7 (0.4, 2.7)	
Rear rim lock		1	8	12 (1.2, 9)	
Rear brake disc nut		4	6	16 (1.6, 12)	NOTE 6
Driven sprocket nut		6	8	32 (3.3, 24)	NOTE 6
Rear wheel bearing retainer		1	50	44 (4.5, 32)	NOTE 5
Swingarm pivot nut		1	14	88 (9.0, 65)	NOTE 6
Shock arm nut	(swingarm side)	1	12	53 (5.4, 39)	NOTE 1, 6
	(shock link side)	1	12	53 (5.4, 39)	NOTE 1, 6
Shock link nut	(frame side)	1	12	53 (5.4, 39)	NOTE 1, 6
Shock absorber upper mounting nut		1	10	44 (4.5, 32)	NOTE 6
Shock absorber lower mounting nut		1	10	44 (4.5, 32)	NOTE 6
Shock absorber spring adjuster lock nut		1	60	44 (4.5, 32)	
Drive chain slider screw		3	5	3.9 (0.4, 2.9)	NOTE 2
Drive chain upper roller bolt		1	8	12 (1.2, 9)	
Drive chain lower roller nut		1	6	12 (1.2, 9)	NOTE 6
Drive chain guide mounting nut		3	6	12 (1.2, 9)	NOTE 6
Drive chain adjusting bolt lock nut		2	8	27 (2.8, 20)	NOTE 9
Shock absorber damper rod end nut		1	12	37 (3.8, 27)	NOTE 5
Shock absorber damping adjuster		1	27	30 (3.1, 22)	

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, 4.4)	
Brake lever pivot nut	1	6	5.9 (0.6, 4.4)	
Brake lever pivot bolt	1	6	1.0 (0.1, 0.7)	
Front brake hose guide bolt	1	6	5.2 (0.5, 3.8)	
Rear brake hose guide screw	2	5	1.2 (0.1, 0.9)	
Front master cylinder reservoir cover screw	2	4	1.0 (0.1, 0.7)	
Front master cylinder holder bolt	2	6	9.9 (1.0, 7.3)	
Front brake caliper mounting bolt	2	8	30 (3.1, 22)	NOTE 2
Caliper bleed valve	2	8	5.4 (0.6, 4.0)	
Rear master cylinder mounting bolt	2	6	13 (1.3, 10)	
Rear master cylinder reservoir cover bolt	2	4	1.0 (0.1, 0.7)	
Front caliper pin bolt	1	8	22 (2.2, 16)	NOTE 2
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	2.5 (0.3, 1.8)	
Front caliper bracket pin bolt	1	8	22 (2.2, 16)	NOTE 2
Rear caliper bracket pin bolt	1	8	12 (1.2, 9)	NOTE 2
Brake pedal pivot bolt '04:	1	8	25 (2.6, 19)	NOTE 2
After '04:	1	10	36 (3.7, 27)	NOTE 2
Rear master cylinder push rod lock nut	1	6	5.9 (0.6, 4.4)	

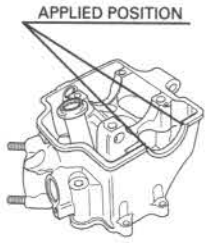
Water hose clamp:



LUBRICATION & SEAL POINTS

ENGINE

LOCATION	MATERIAL	REMARKS
Camshaft lobes Rocker arm (shaft hole inner surface and valve stem end contact area) Valve stem (valve guide sliding surface) Valve stem end sliding surface Valve lifter outer surface Clutch outer guide sliding surfaces Clutch outer needle bearing rolling area Clutch lifter lever cam area Kickstarter pinion gear sliding surface Kickstarter spindle spline area and gear rolling area Connecting rod small end inner surface Connecting rod big end (side sliding area) Mainshaft spline area and gear rolling area Countershaft spline area and gear rolling area Transmission gear and sliding surfaces Shift fork gear guide area and guide pin area Shift fork sliding surface Shift fork shaft outer surface Each gear sliding area	Molybdenum oil solution (mixture of the engine oil and molybdenum disulfide grease with the ratio 100g : 70 cm^3)	
Engine oil drain bolt threads and seating surface Transmission oil drain bolt threads and seating surface Camshaft holder mounting bolt threads and seating surface Cylinder head nut threads and seating surfaces Balancer shaft nut threads and seating surface Piston outer surface and piston pin hole Piston pin outer surface Piston ring whole surfaces Cylinder bore Clutch lifter and lifter rod sliding area Clutch lifter needle bearing Clutch disc linings Clutch center lock nut threads and seating surface Primary drive gear bolt threads and seating surface Flywheel nut threads and seating surface Crankshaft (oil seal contact area) Kickstarter spindle (crankcase contact area) Decompressor cam sliding area Transmission gear teeth Plug hole seal Clutch outer sliding surface Shift drum guide grooves Shift spindle serration area Oil pump rotors sliding area Each bearing rolling area Each O-ring	Engine oil	
Crankshaft hole cap threads Timing hole cap threads Rocker arm shaft cap threads Camshaft set ring Oil seal lips Oil filter spring contact area Water seal lips	Multi-purpose grease	

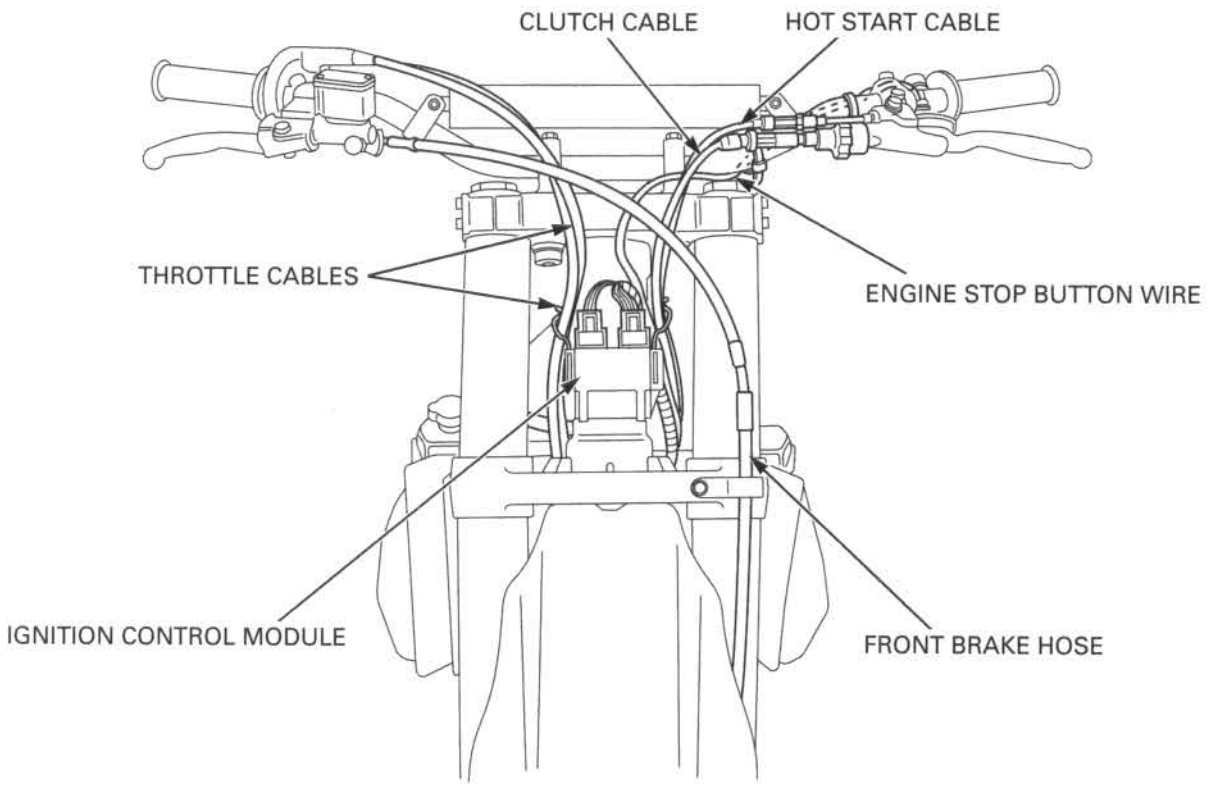
LOCATION	MATERIAL	REMARKS
Shift drum center pin bolt threads Oil jet threads ('04) Oil jet mounting bolt threads (After '04) Decompressor cam stopper plate bolt threads Cylinder head cover breather plate bolt threads Oil guide plate bolt threads	Locking agent	Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in); except 1 – 2 mm (0.04 – 0.08 in) from tip
Cam chain tensioner pivot bolt threads Stator screw threads CKP sensor mounting bolt threads Countershaft bearing set plate screw threads	Locking agent	Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in); except 3 – 4 mm (0.1 – 0.2 in) from tip Coating width: 3.0 ± 1.0 mm (0.12 ± 0.04 in) from tip Coating width: 4.5 ± 1.0 mm (0.18 ± 0.04 in) from tip Coating width: 3.5 ± 1.0 mm (0.14 ± 0.04 in) from tip
Mainshaft bearing set plate bolt threads Shift drum bearing set plate bolt threads Balancer shaft bearing set plate bolt threads Throttle shaft screw threads Throttle position sensor mounting screw threads	Locking agent	
Crankshaft bearing set plate torx screw threads	Locking agent (Pro Honda Hondalock 3 or equivalent high strength locking agent)	Coating width: 6.5 ± 1.0 mm (0.26 ± 0.04 in); except 3 – 4 mm (0.1 – 0.2 in) from tip
Alternator wire grommet sealing surface Air cleaner housing connecting surface Cylinder head surface	Liquid sealant	

FRAME

LOCATION	MATERIAL	REMARKS
Steering head bearing (upper and lower) rolling area Steering head dust seal lips	Urea based multi-purpose grease with extreme pressure (example: EXCELITE EP2 manufactured by KYODO YUSHI, Japan), Shell Stamina EP2 or equivalent	Apply each 3 – 5 g
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 linkage needle bearing rolling area Shock linkage dust seal lips Shock arm side collar inside (bearing side) Rear shock absorber spherical bearing rolling area Rear shock absorber dust seal lips Brake pedal pivot bolt sliding area Gearshift pedal sliding area of pin Throttle cable slider (cable sliding area) Throttle cable end (throttle grip side) Clutch cable end adjuster inside surface	Multi-purpose grease	Apply 3 g Apply 3 g
Brake caliper pin bolt sliding area Brake caliper bracket pin bolt sliding area Brake caliper dust seal lips Brake caliper and brake pin boots inside surface Brake lever pivot bolt sliding surface Brake lever adjusting bolt tip Clutch lever pivot bolt sliding surface Clutch lever adjusting bolt tip Clutch cable end adjuster inner sliding surface Rear master cylinder push rod rounded surface Rear master cylinder boot fitting area Brake lever spring contact area Brake lever pivot bushing sliding surface (After '06) Brake lever push rod sliding surface (After '06)	Silicone grease	
Drive chain slider mounting screw threads Front fork protector bolt threads Front disc cover bolt threads Front brake caliper mounting bolt Caliper slide pins thread Brake pedal pivot bolt threads Steering damper bolt (After '07)	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 Hand Grip Cement (U.S.A only)	
Fork cap O-rings Fork center bolt O-rings Fork oil seal lips Fork dust seal lips Damping adjuster O-rings Steering damper plug bolt O-ring (After '07) Steering damper rod O-ring (After '07) Steering damper free piston O-ring (After '07) Steering damper end cap O-ring (After '07)	Pro-Honda HP Fork Oil 5W	
Shock link nut threads and seating surface	Engine oil	

CABLE & HARNESS ROUTING

'04 - '07:



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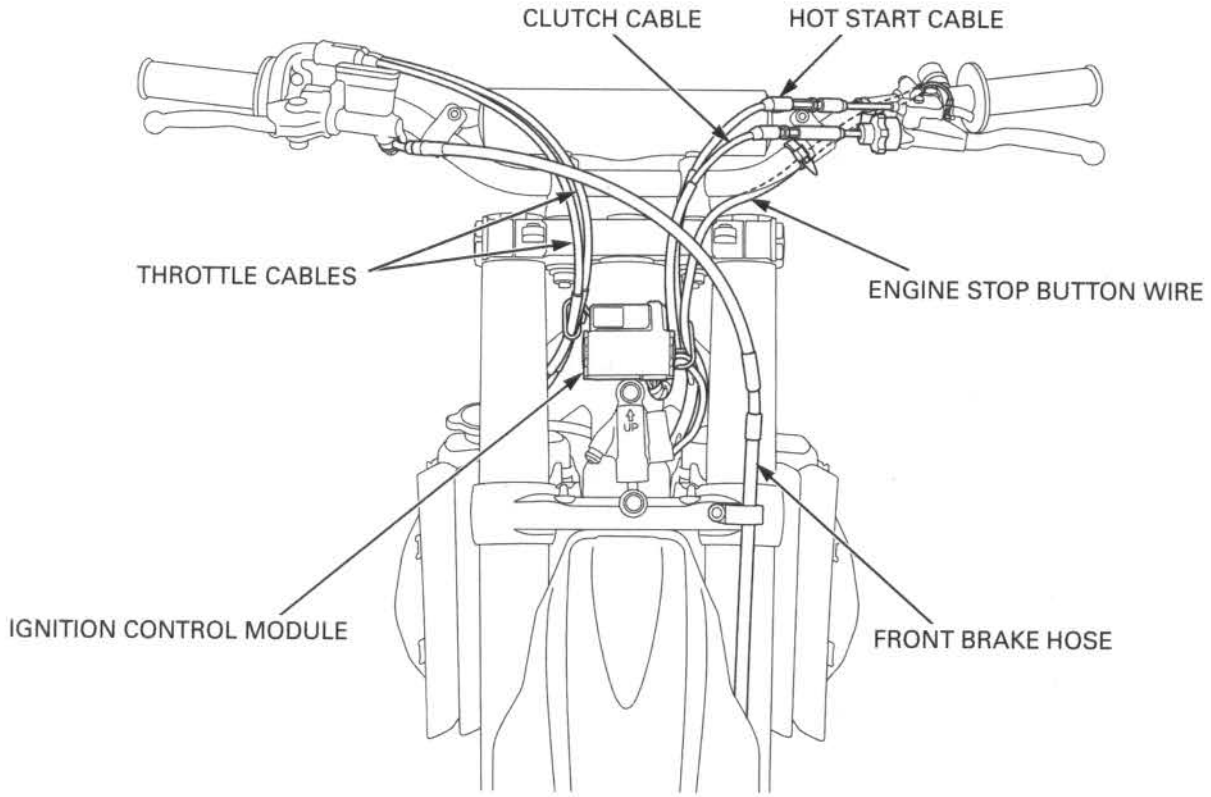

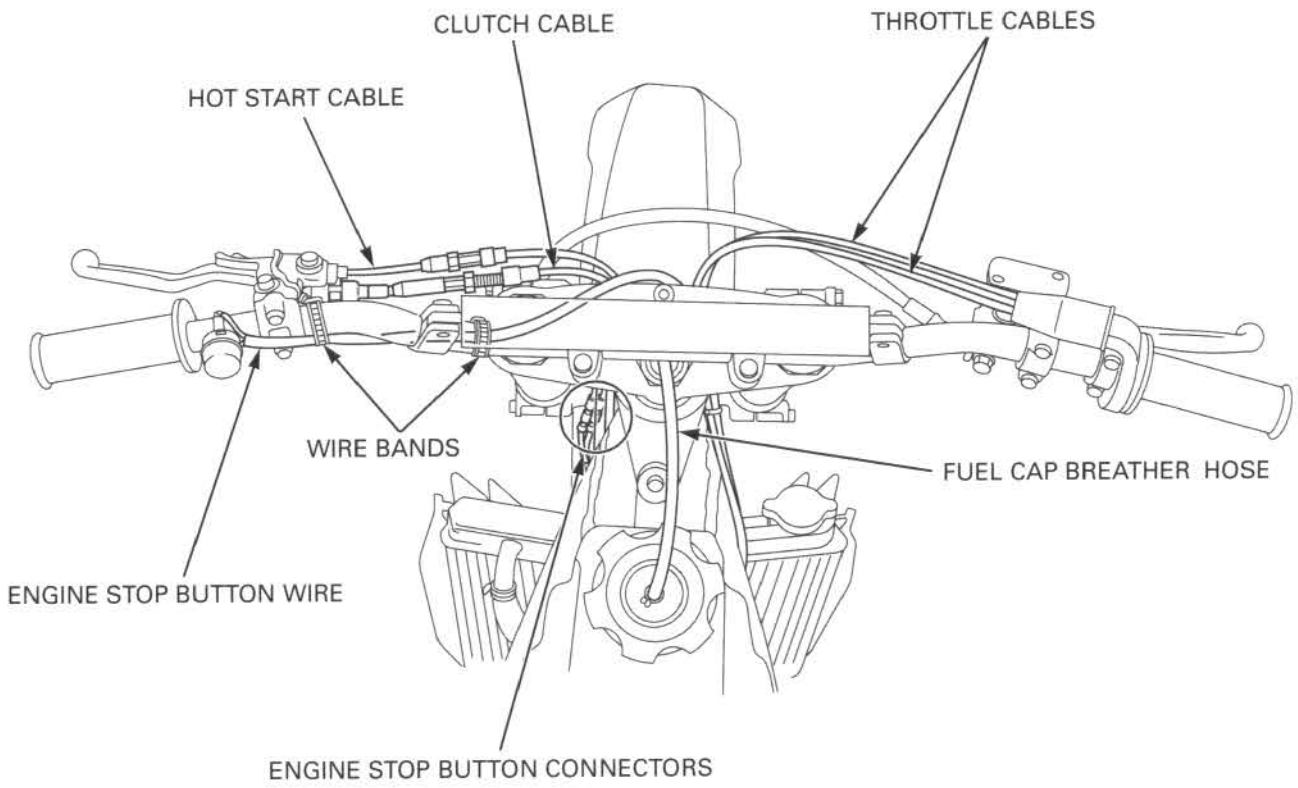

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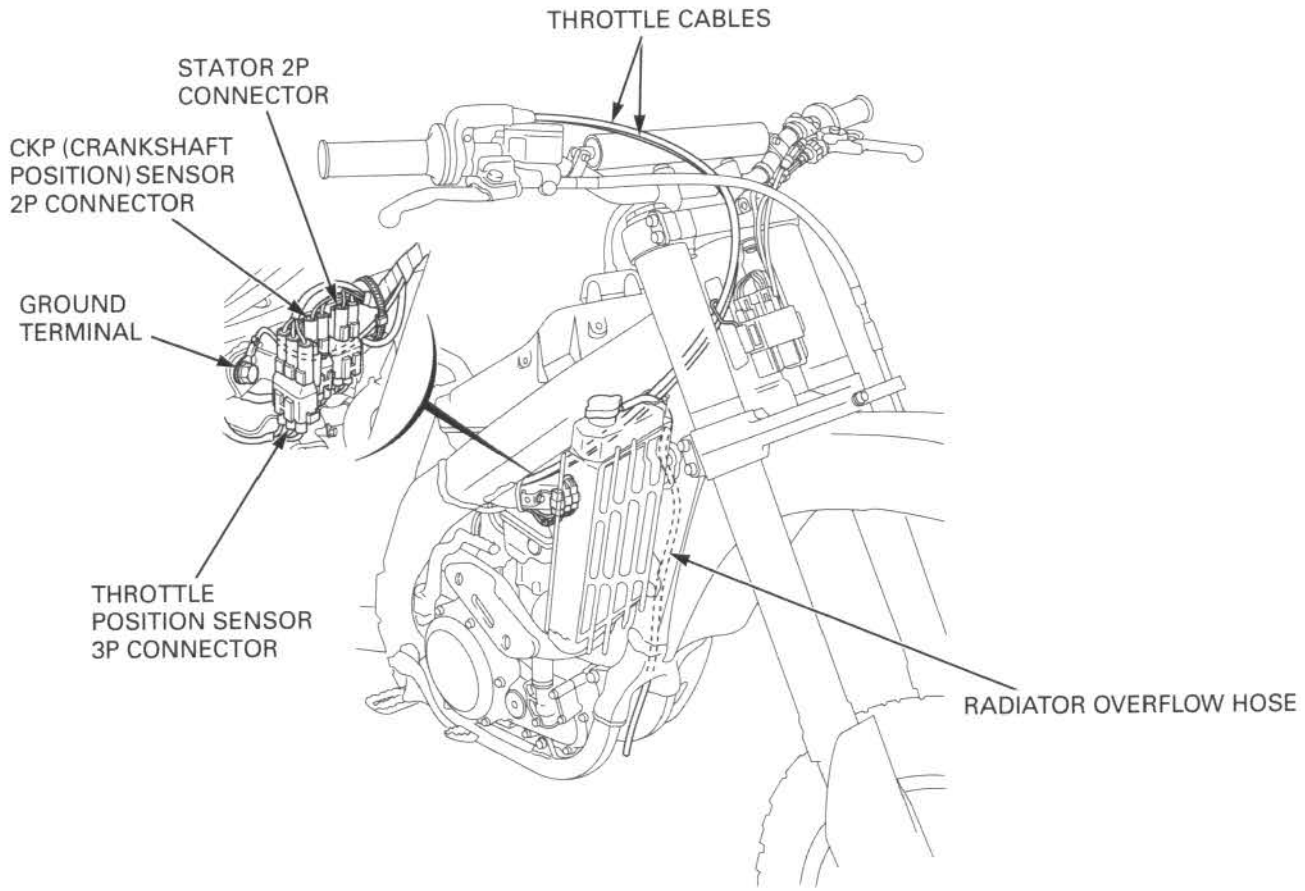
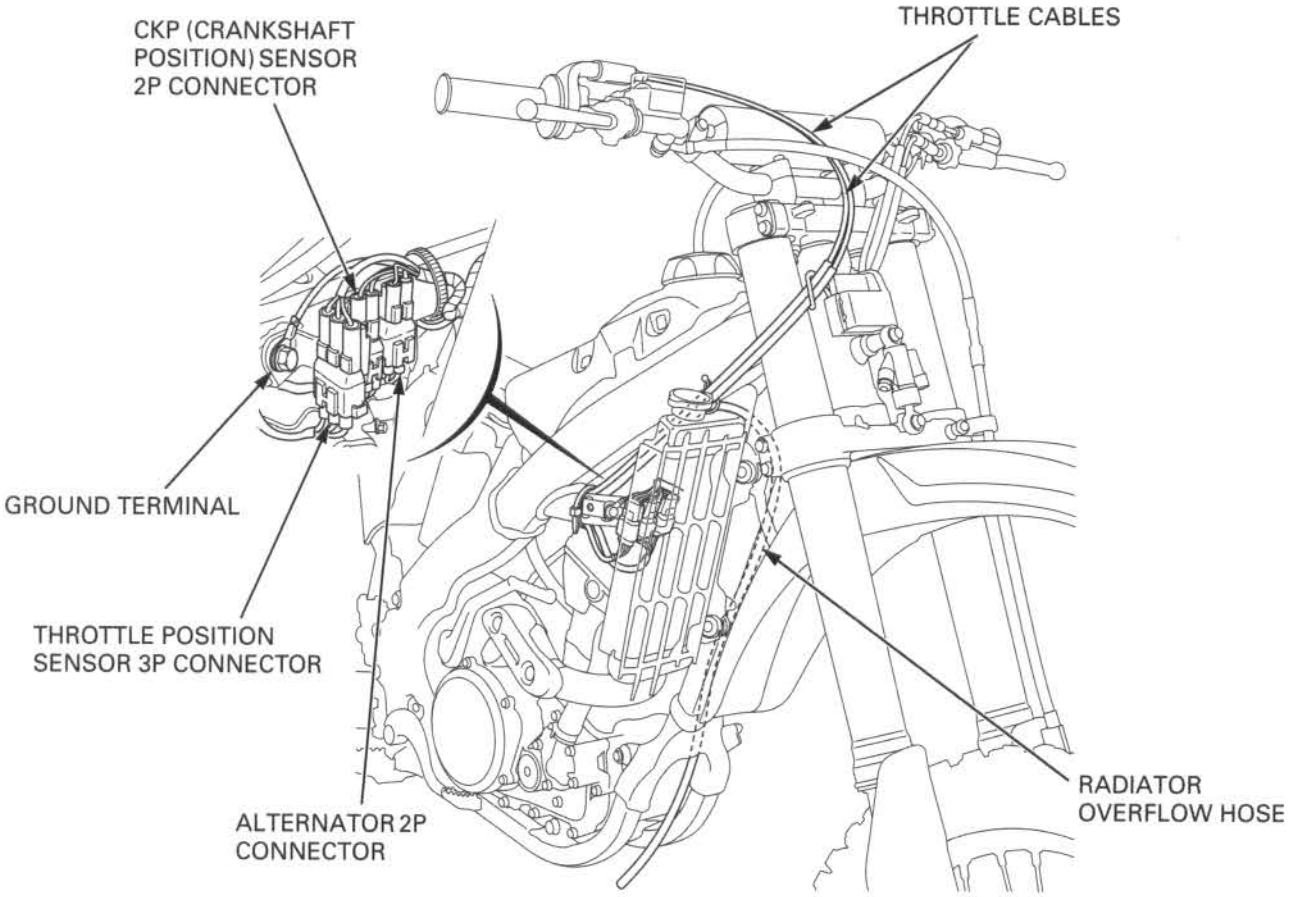
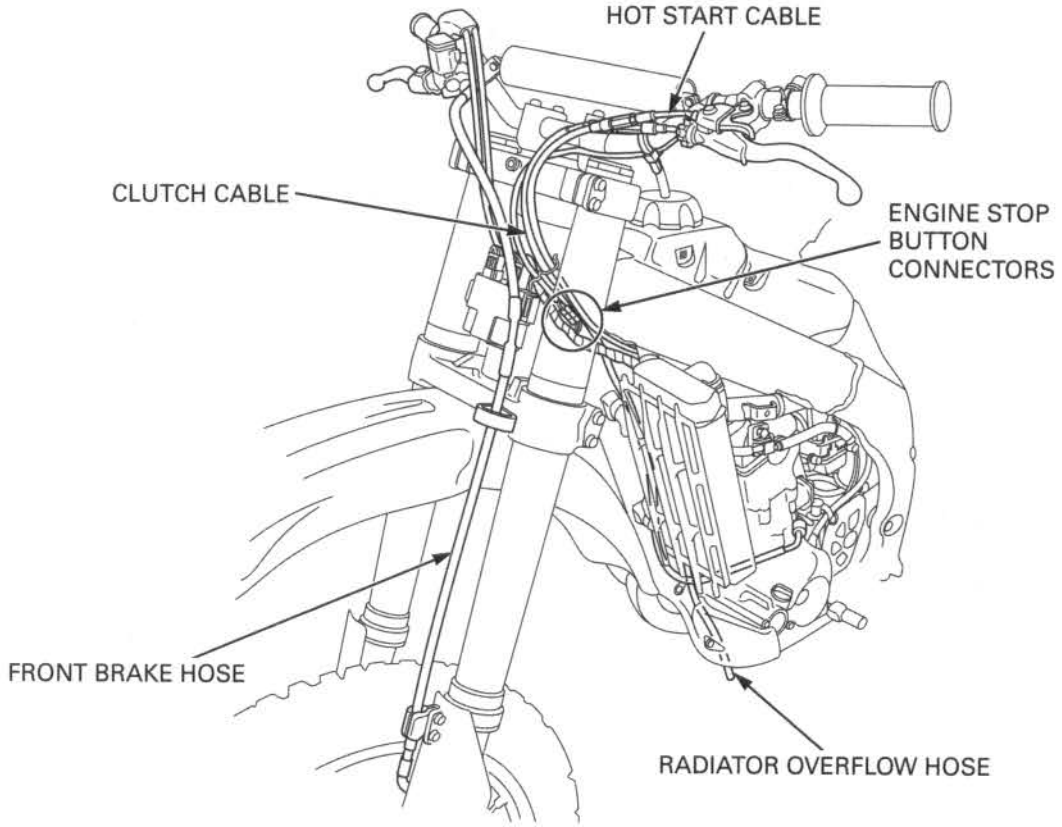


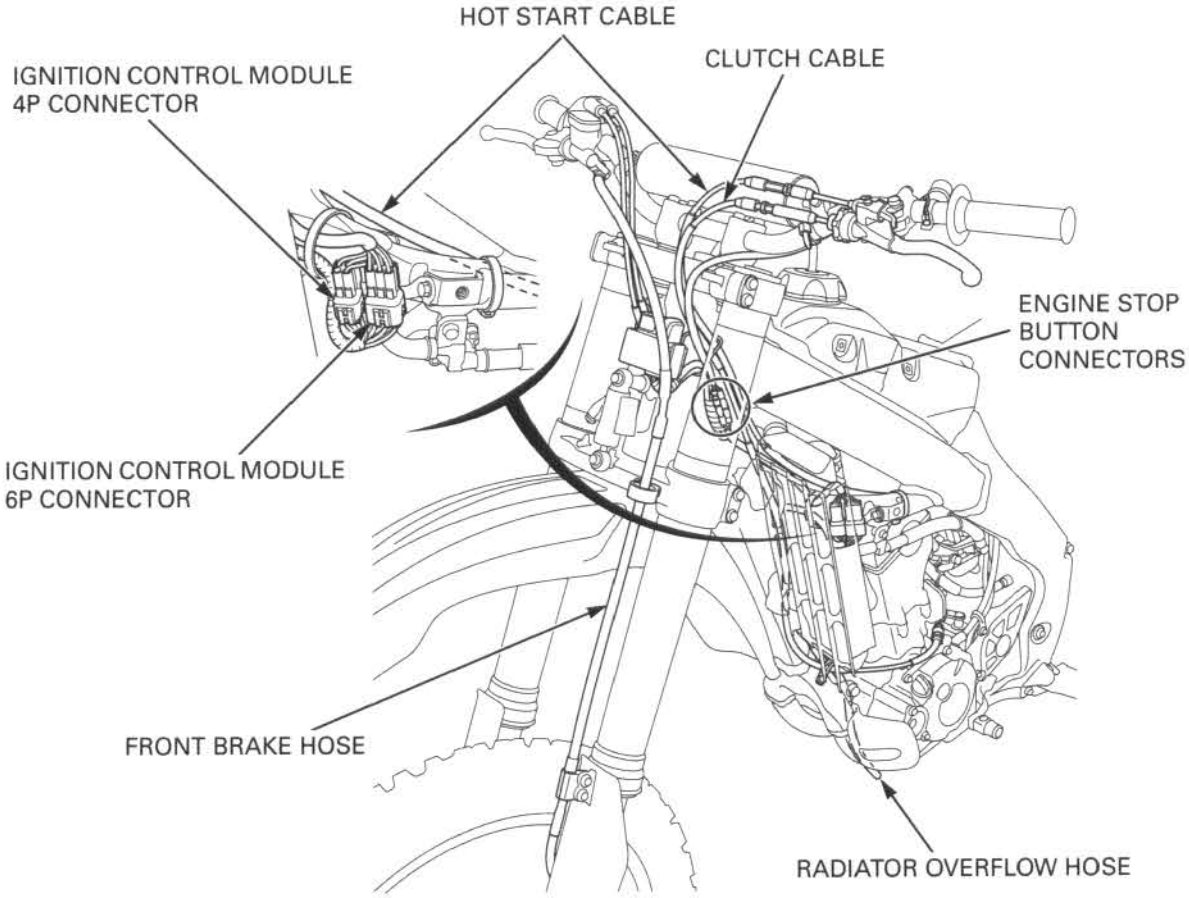
After '07:



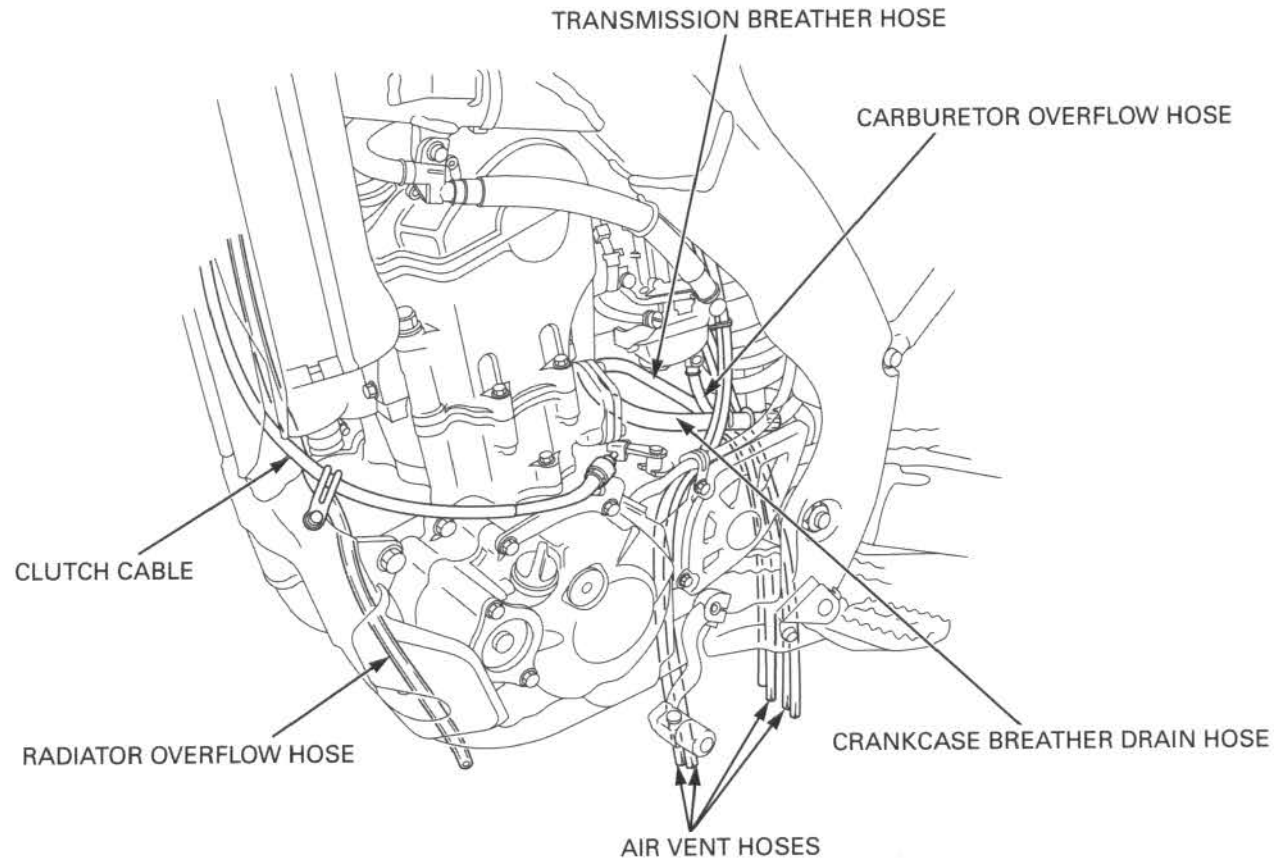
'04 - '07:



After '07:



'04 - '07:



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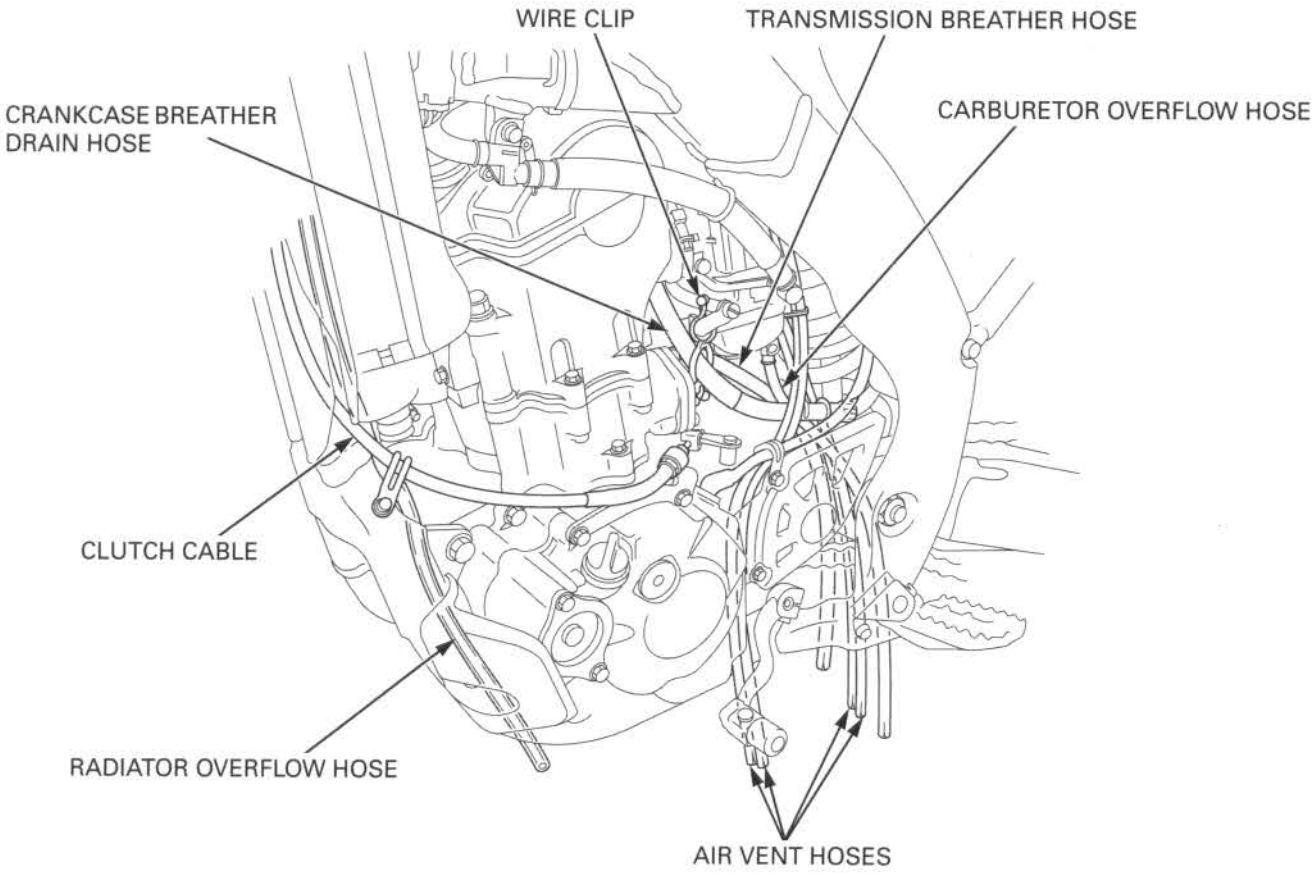
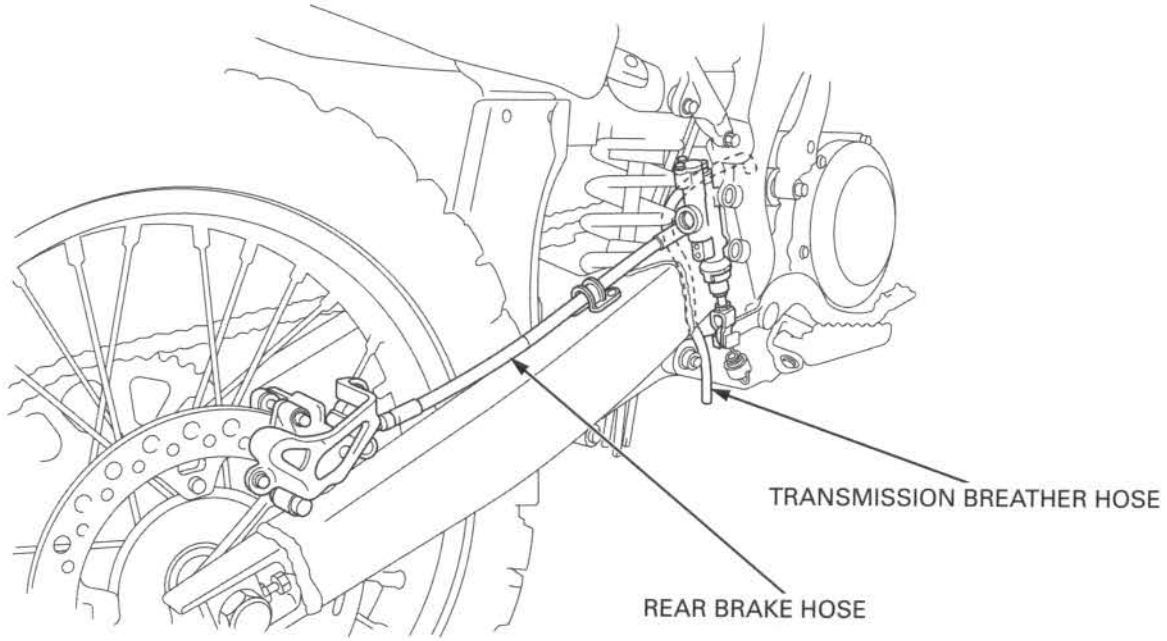
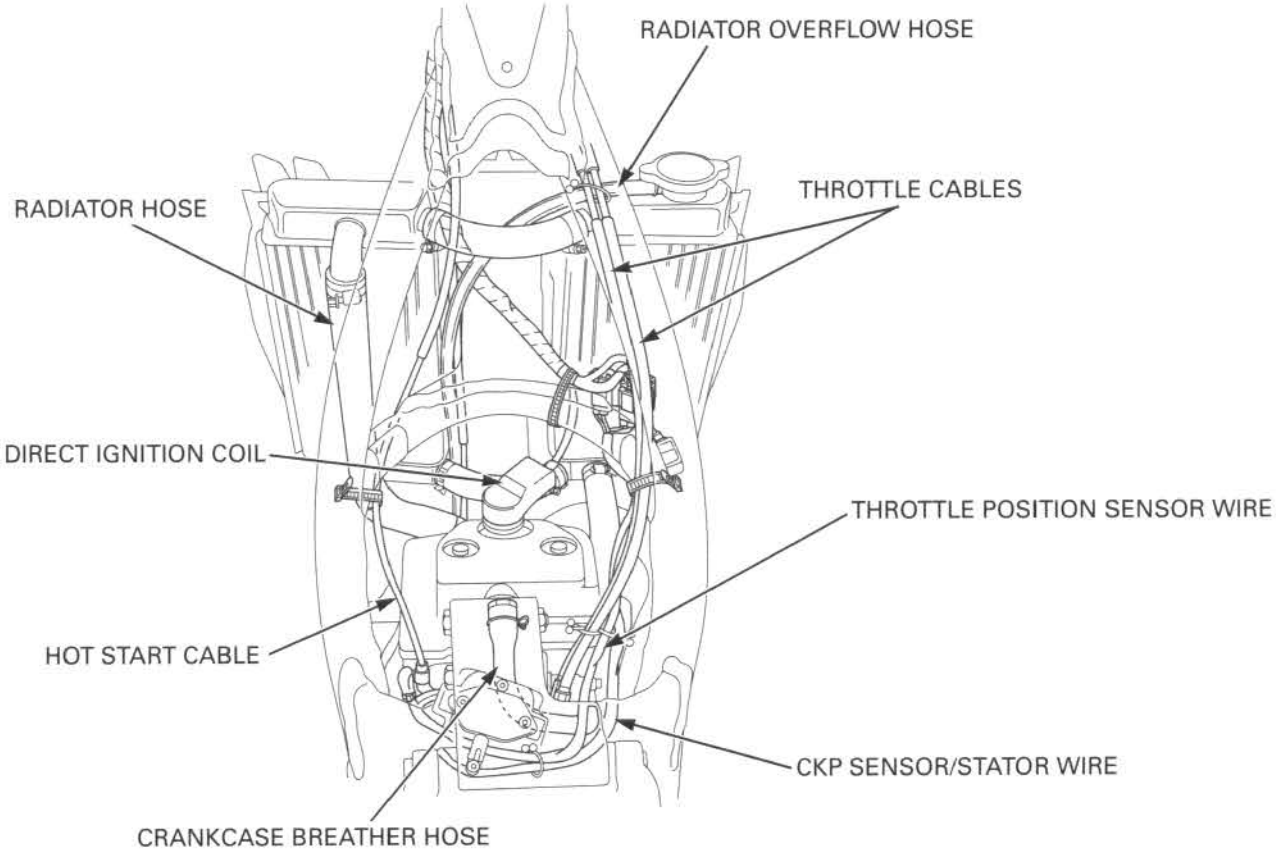
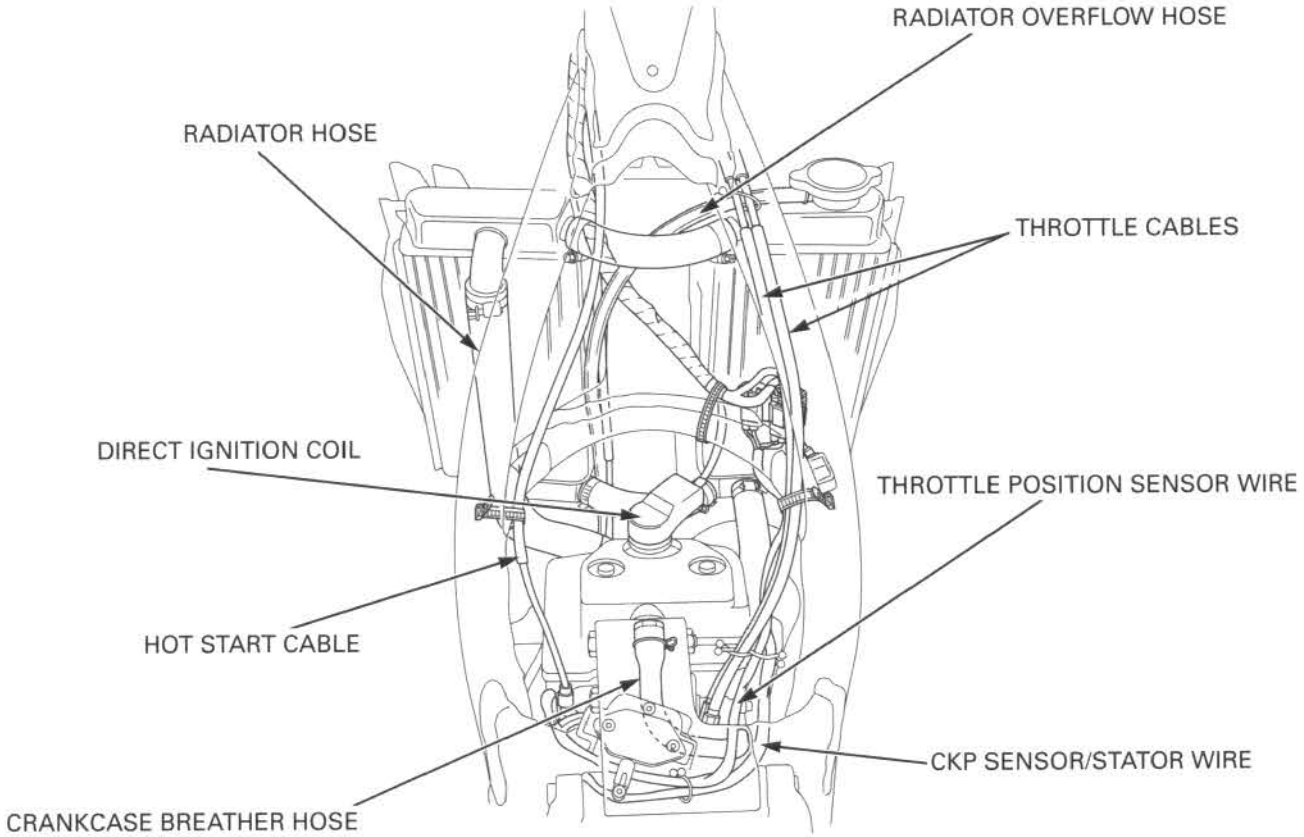




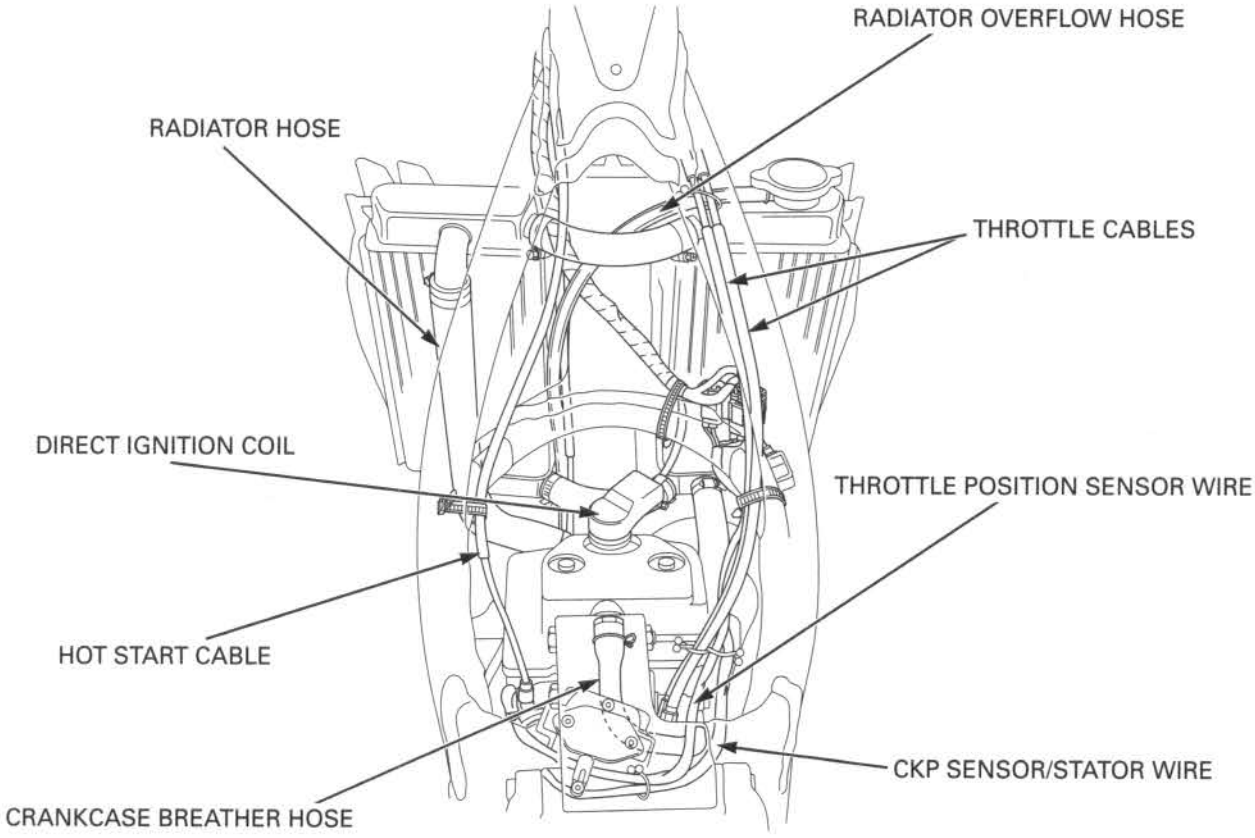
'04:


RADIATOR OVERFLOW HOSE
RADIATOR HOSE
THROTTLE CABLES
DIRECT IGNITION COIL
THROTTLE POSITION SENSOR WIRE
HOT START CABLE
CKP SENSOR/STATOR WIRE
CRANKCASE BREATHER HOSE

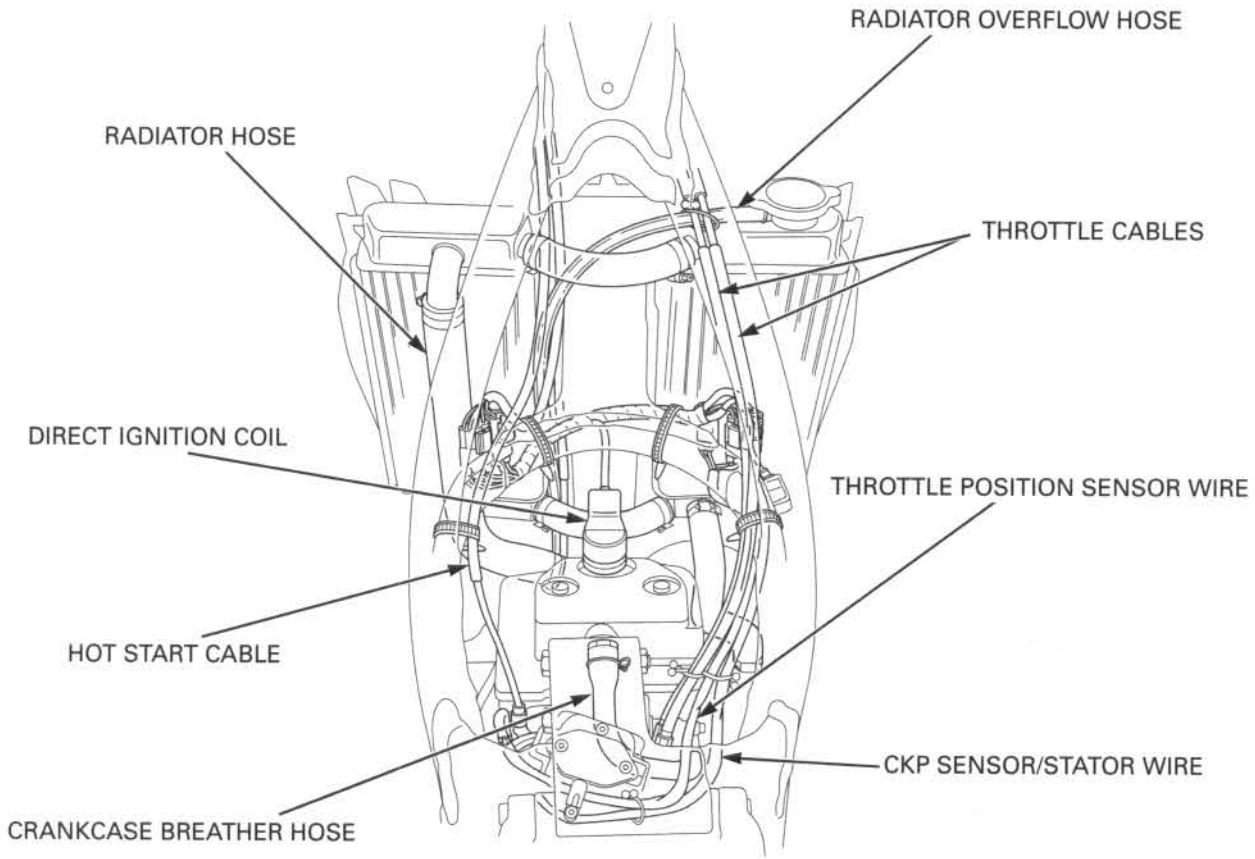
'05 and '06:


RADIATOR OVERFLOW HOSE
RADIATOR HOSE
THROTTLE CABLES
DIRECT IGNITION COIL
THROTTLE POSITION SENSOR WIRE
HOT START CABLE
CKP SENSOR/STATOR WIRE
CRANKCASE BREATHER HOSE

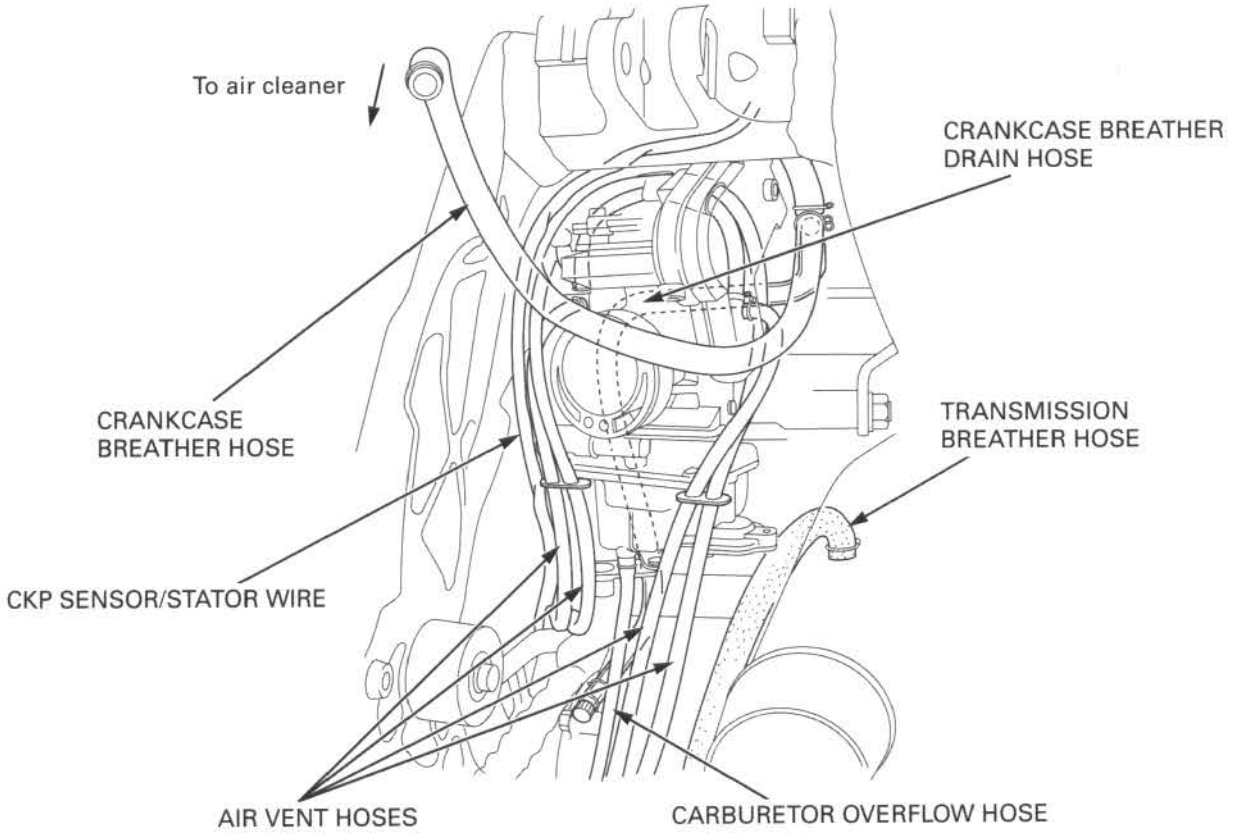
'07:


RADIATOR OVERFLOW HOSE
RADIATOR HOSE
THROTTLE CABLES
DIRECT IGNITION COIL
THROTTLE POSITION SENSOR WIRE
HOT START CABLE
CKP SENSOR/STATOR WIRE
CRANKCASE BREATHER HOSE

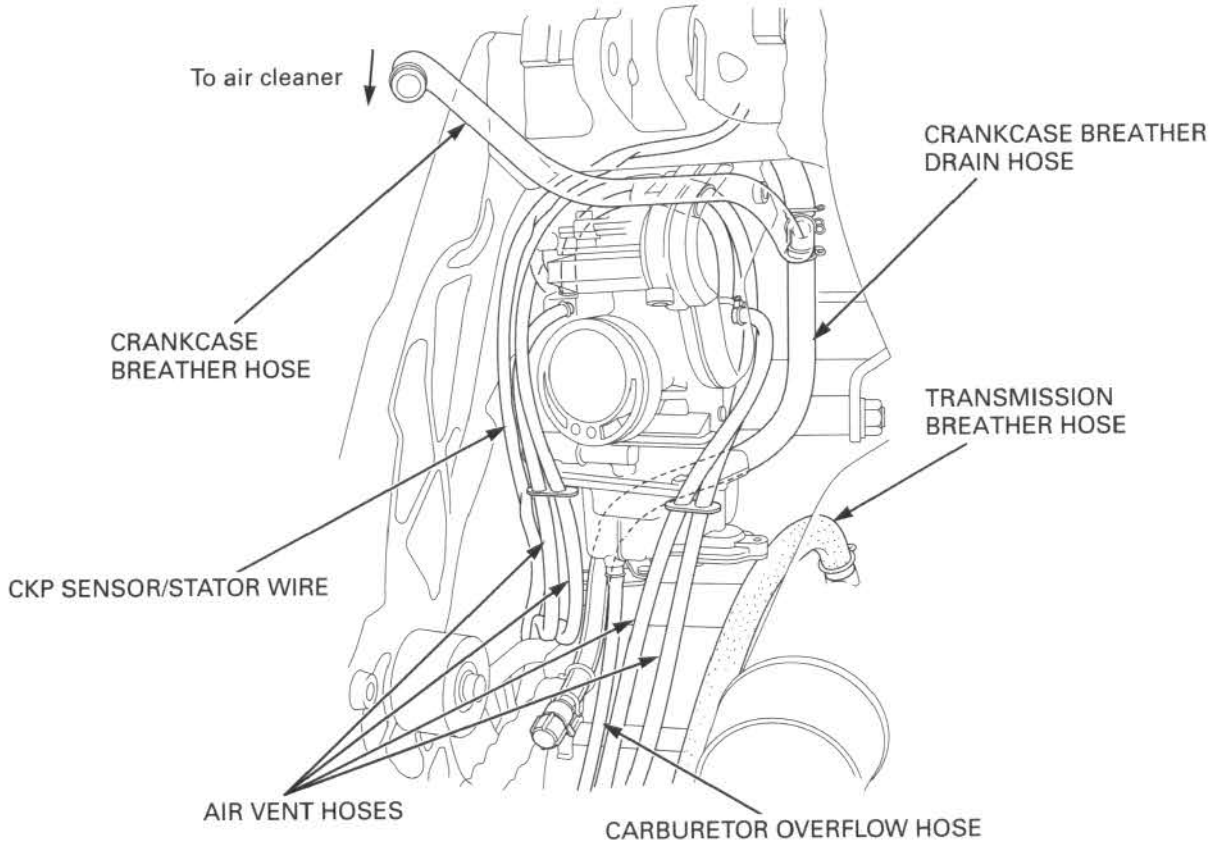
After '07:


RADIATOR OVERFLOW HOSE
RADIATOR HOSE
THROTTLE CABLES
DIRECT IGNITION COIL
THROTTLE POSITION SENSOR WIRE
HOT START CABLE
CKP SENSOR/STATOR WIRE
CRANKCASE BREATHER HOSE

'04 - '07:

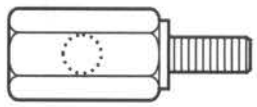
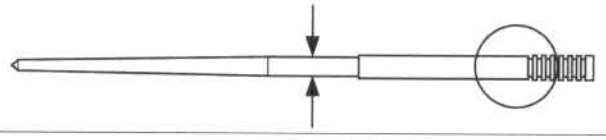


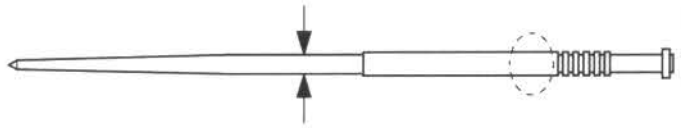
After '07:



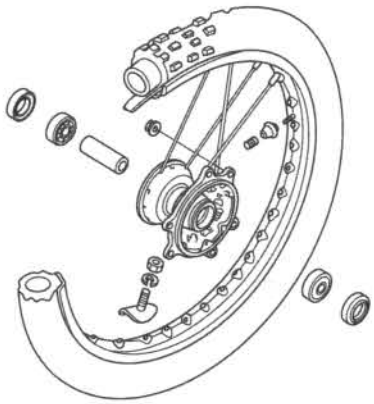
OPTIONAL PARTS

ENGINE

ITEM			REMARKS	
CARBURETOR:				
Main jet	Standard	('04)	#160	
		('05 and '06)	#172	
		('07)	#175	
		('08)	#188	
		(After '08)	#185	
	Optional	('04)	#150 – 170 (increments of 2 or 3)	
		('05 and '06)	#162 – 182 (increments of 2 or 3)	
		('07)	#165 – 185 (increments of 2 or 3)	
		('08)	#178 – 198 (increments of 2 or 3)	
		(After '08)	#175 – 195 (increments of 2 or 3)	
				
Jet needle	Standard ('04)		NCYR (ϕ2.755 mm)	
	Specific flow characteristics at 1/6 to 1/4 throttle		Jet needle number (Standard series)	Jet needle number (1/2 clip position leaner than standard series)
	Rich		NCYP (ϕ2.735 mm)	NCVP (ϕ2.735 mm)
			NCYQ (ϕ2.745 mm)	NCVQ (ϕ2.745 mm)
	General flow characteristics (at 1/16 to 1/4 throttle)		NCYR (ϕ2.755 mm) (Standard needle)	NCVR (ϕ2.755 mm)
			NCYS (ϕ2.765 mm)	NCVS (ϕ2.765 mm)
	Lean		NCYT (ϕ2.775 mm)	NCVT (ϕ2.775 mm)
	Standard ('05)		NCYQ (ϕ2.745 mm)	
	Specific flow characteristics at 1/6 to 1/4 throttle		Jet needle number (Standard series)	Jet needle number (1/2 clip position leaner than standard series)
	Rich		NCYN (ϕ2.725 mm)	NCVN (ϕ2.725 mm)
			NCYP (ϕ2.735 mm)	NCVP (ϕ2.735 mm)
	General flow characteristics (at 1/16 to 1/4 throttle)		NCYQ (ϕ2.745 mm) (Standard needle)	NCVQ (ϕ2.745 mm)
			NCYR (ϕ2.755 mm)	NCVR (ϕ2.755 mm)
	Lean		NCYS (ϕ2.765 mm)	NCVS (ϕ2.765 mm)
	Standard ('06)		NHFS (ϕ2.765 mm)	
	Specific flow characteristics at 1/6 to 1/4 throttle		Jet needle number (Standard series)	Jet needle number (1/2 clip position leaner than standard series)
	Rich		NHFQ (ϕ2.745 mm)	NHGQ (ϕ2.745 mm)
			NHFR (ϕ2.755 mm)	NHGR (ϕ2.755 mm)
	General flow characteristics (at 1/16 to 1/4 throttle)		NHFS (ϕ2.765 mm) (Standard needle)	NHGS (ϕ2.765 mm)
			NHFT (ϕ2.775 mm)	NHGT (ϕ2.775 mm)
	Lean		NHFU (ϕ2.785 mm)	NHGU (ϕ2.785 mm)
			Explanation of the jet needle numbers (Example)	
				

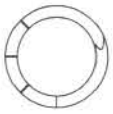
ITEM			REMARKS	
CARBURETOR:				
	Standard ('07)		NKBT (ϕ2.775 mm)	
	Specific flow characteristics at 1/6 to 1/4 throttle		Jet needle number (Standard series)	Jet needle number (1/2 clip position leaner than standard series)
	Rich		NKBR (ϕ2.755 mm)	NKUR (ϕ2.755 mm)
			NKBS (ϕ2.765 mm)	NKUS (ϕ2.765 mm)
	General flow characteristics (at 1/16 to 1/4 throttle)		NKBT (ϕ2.775 mm) (Standard needle)	NKUT (ϕ2.775 mm)
			NKBU (ϕ2.785 mm)	NKUU (ϕ2.785 mm)
	Lean		NKBV (ϕ2.795 mm)	NKUV (ϕ2.795 mm)
	Standard ('08)		NMGU (ϕ2.785 mm)	
	Specific flow characteristics at 1/6 to 1/4 throttle		Jet needle number (Standard series)	Jet needle number (1/2 clip position leaner than standard series)
	Rich		NMGS (ϕ2.765 mm)	NMUS (ϕ2.765 mm)
			NMGT (ϕ2.775 mm)	NMUT (ϕ2.775 mm)
	General flow characteristics (at 1/16 to 1/4 throttle)		NMGU (ϕ2.785 mm) (Standard needle)	NMUU (ϕ2.785 mm)
			NMGV (ϕ2.795 mm)	NMUV (ϕ2.795 mm)
	Lean		NMGW (ϕ2.805 mm)	NMUW (ϕ2.805 mm)
	Standard (After '08)		NNSU (ϕ2.785 mm)	
	Specific flow characteristics at 1/6 to 1/4 throttle		Jet needle number (Standard series)	Jet needle number (1/2 clip position leaner than standard series)
	Rich		NNSS (ϕ2.765 mm)	NNWS (ϕ2.765 mm)
			NNST (ϕ2.775 mm)	NNWT (ϕ2.775 mm)
	General flow characteristics (at 1/16 to 1/4 throttle)		NNSU (ϕ2.785 mm) (Standard needle)	NNWU (ϕ2.785 mm)
			NNSV (ϕ2.795 mm)	NNWV (ϕ2.795 mm)
	Lean		NNSW (ϕ2.805 mm)	NNWW (ϕ2.805 mm)
			Explanation of the jet needle numbers (Example) 	
Jet needle clip standard position				
		('04)	4th groove	
		(After '04)	3rd groove	
Slow jet	Standard	('04 and '06)	#40	
		('05 and After '06)	#42	
	Optional	('04 and '06)	#35 – 45 (increments of 2 or 3)	
		('05 and After '06)	#38 – 48 (increments of 2 or 3)	
Acc. pump bypass jet				
	Standard	('04, '05)	#70	
		('06)	#55	
		(After '06)	#70	
	Optional	('06)	#40 – #50 (increments of 5)	
		(After '06)	#60 – #80 (increments of 5)	

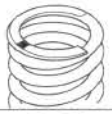
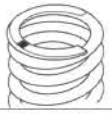
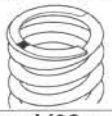
FRAME

ITEM	REMARKS
MAINTENANCE:	
Work stand 	For maintenance
Pin spanner	Pin spanner A x 2 For shock absorber spring installed length (preload) adjustment (two required)
DRIVE CHAIN & SPROCKET:	
Driven sprocket /chain link Standard Optional	51T (Aluminum)/114 50T (Aluminum)/114 52T (Aluminum)/114
HANDLEBAR LOWER HOLDER:	
Standard Optional	3 mm offset no offset
20 INCH FRONT WHEEL ('04, '05): • Front wheel sub assembly – Rim (20 x 1.85) – Spoke (226.5 mm) – Distance collar – Wheel bearing – Dust seal • Rim lock (1.85) • Tire (Dunlop D739A 90/100-20) • Tire flap • Tire tube Front wheel assembly, (page 13-13) • Brake disc, disc bolts and side collars using the original parts.	
Align the top surface of the top bridge with the line in the outer tube.	

ITEM		REMARKS	
FORK ('04 - '07):			
Spring	**TYPE**	**SPRING RATE**	**OIL CAPACITY**
	Light  3 scribe marks	4.22 N/mm (0.43 kgf/mm)	'04: Standard 376 cm^3 (12.7 US oz, 13.2 Imp oz) Maximum 413 cm^3 (14.0 US oz, 14.5 Imp oz) Minimum 317 cm^3 (10.7 US oz, 11.2 Imp oz)
			'05: Standard 368 cm^3 (12.4 US oz, 13.0 Imp oz) Maximum 414 cm^3 (14.0 US oz, 14.6 Imp oz) Minimum 318 cm^3 (10.8 US oz, 11.2 Imp oz)
			'06: Standard 366 cm^3 (12.4 US oz, 12.9 Imp oz) Maximum 410 cm^3 (13.9 US oz, 14.4 Imp oz) Minimum 314 cm^3 (10.6 US oz, 11.1 Imp oz)
			'07: Standard 369 cm^3 (12.5 US oz, 13.0 Imp oz) Maximum 410 cm^3 (13.9 US oz, 14.4 Imp oz) Minimum 314 cm^3 (10.6 US oz, 11.1 Imp oz)
	Standard  1 scribe mark (after market parts)	4.51 N/mm (0.45 kgf/mm)	'04: Standard 379 cm^3 (12.8 US oz, 13.3 Imp oz) Maximum 416 cm^3 (14.1 US oz, 14.6 Imp oz) Minimum 320 cm^3 (10.8 US oz, 11.3 Imp oz)
			'05: Standard 371 cm^3 (12.5 US oz, 13.1 Imp oz) Maximum 417 cm^3 (14.1 US oz, 14.7 Imp oz) Minimum 321 cm^3 (10.9 US oz, 11.3 Imp oz)
			'06: Standard 369 cm^3 (12.5 US oz, 13.0 Imp oz) Maximum 413 cm^3 (14.0 US oz, 14.5 Imp oz) Minimum 317 cm^3 (10.7 US oz, 11.2 Imp oz)
			'07: Standard 372 cm^3 (12.6 US oz, 13.1 Imp oz) Maximum 413 cm^3 (14.0 US oz, 14.5 Imp oz) Minimum 317 cm^3 (10.7 US oz, 11.2 Imp oz)

ITEM			REMARKS
	Heavy  1 scribe mark and 3 scribe marks 75 degrees apart	4.61 N/mm (0.47 kgf/mm)	'04: Standard 419 cm^3 (14.2 US oz, 14.7 Imp oz) Maximum 382 cm^3 (12.9 US oz, 13.4 Imp oz) Minimum 323 cm^3 (10.9 US oz, 11.4 Imp oz)
			'05: Standard 374 cm^3 (12.6 US oz, 13.2 Imp oz) Maximum 420 cm^3 (14.2 US oz, 14.8 Imp oz) Minimum 324 cm^3 (11.0 US oz, 11.4 Imp oz)
			'06: Standard 372 cm^3 (12.6 US oz, 13.1 Imp oz) Maximum 416 cm^3 (14.1 US oz, 14.6 Imp oz) Minimum 320 cm^3 (10.8 US oz, 11.3 Imp oz)
			'07: Standard 375 cm^3 (12.7 US oz, 13.2 Imp oz) Maximum 416 cm^3 (14.1 US oz, 14.6 Imp oz) Minimum 320 cm^3 (10.8 US oz, 11.3 Imp oz)
FORK (After '07):			
Spring	**TYPE**	**SPRING RATE**	**OIL CAPACITY**
	Light  4 scribe marks	4.31 N/mm (0.44 kgf/mm)	'08: Standard 413 cm^3 (14.0 US oz, 14.5 Imp oz) Maximum 421 cm^3 (14.2 US oz, 14.8 Imp oz) Minimum 325 cm^3 (11.0 US oz, 11.4 Imp oz)
			After '08: Standard 373 cm^3 (12.6 US oz, 13.1 Imp oz) Maximum 419 cm^3 (14.2 US oz, 14.7 Imp oz) Minimum 323 cm^3 (10.9 US oz, 11.4 Imp oz)
	Standard  5 scribe mark (after market parts)	4.51 N/mm (0.46 kgf/mm)	'08: Standard 408 cm^3 (13.8 US oz, 14.4 Imp oz) Maximum 416 cm^3 (14.1 US oz, 14.6 Imp oz) Minimum 320 cm^3 (10.8 US oz, 11.3 Imp oz)
			After '08: Standard 368 cm^3 (12.4 US oz, 13.0 Imp oz) Maximum 414 cm^3 (14.0 US oz, 14.6 Imp oz) Minimum 318 cm^3 (10.8 US oz, 11.2 Imp oz)

ITEM			REMARKS
	Heavy  3 scribe marks	4.71 N/mm (0.48 kgf/mm)	'08: Standard 402 cm³ (13.6 US oz, 14.2 Imp oz) Maximum 410 cm³ (13.9 US oz, 14.4 Imp oz) Minimum 314 cm³ (10.6 US oz, 11.1 Imp oz)
			After '08: Standard 362 cm³ (12.2 US oz, 12.7 Imp oz) Maximum 409 cm³ (13.8 US oz, 14.4 Imp oz) Minimum 313 cm³ (10.6 US oz, 11.0 Imp oz)

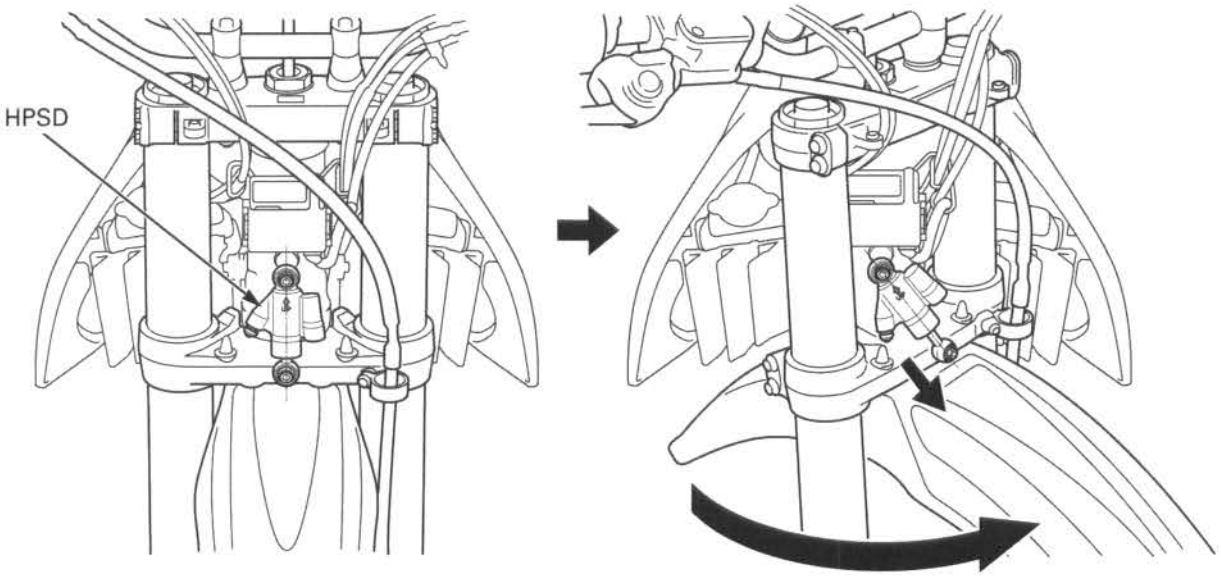
ITEM			REMARKS
SHOCK ABSORBER ('04 – '08 model A, CM type):			
Spring	**TYPE**	**SPRING RATE**	**IDENTIFICATION MARK**
	Light 	50.0 N/mm (5.1 kgf/mm)	White paint
	Standard 	52.0 N/mm (5.3 kgf/mm)	Blue paint
	Heavy 	53.9 N/mm (5.5 kgf/mm) 55.9 N/mm (5.7 kgf/mm)	Red paint Pink paint
SHOCK ABSORBER (After '08 and '08 model IIA, IICM type):			
Spring	**TYPE**	**SPRING RATE**	**IDENTIFICATION MARK**
	Light 	50.0 N/mm (5.1 kgf/mm)	White paint
	Standard 	52.0 N/mm (5.3 kgf/mm)	Blue paint
	Heavy 	53.9 N/mm (5.5 kgf/mm)	Red paint

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.

2. TECHNICAL FEATURE

HPSD (Honda Progressive Steering Damper/After '07)

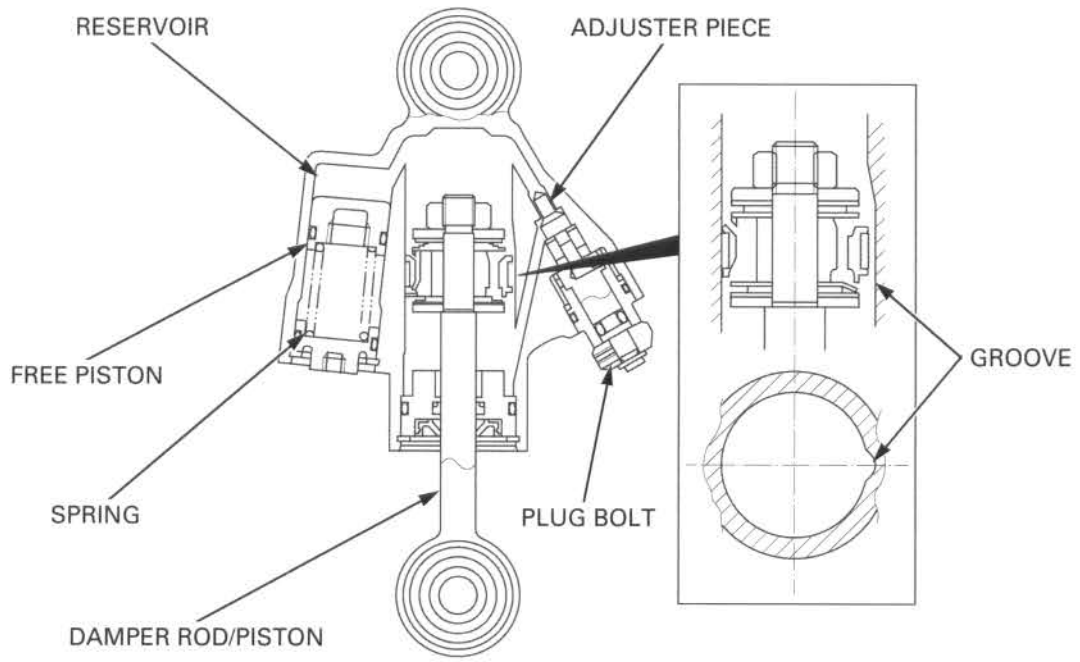
The steering damper is installed on the steering head pipe and the bottom bridge.
HPSD utilizes the angle change of the bottom bridge relative to the steering head pipe to compress or extend the damper rod.



The steering damper can be serviced, however the damper rod/piston is not serviceable.

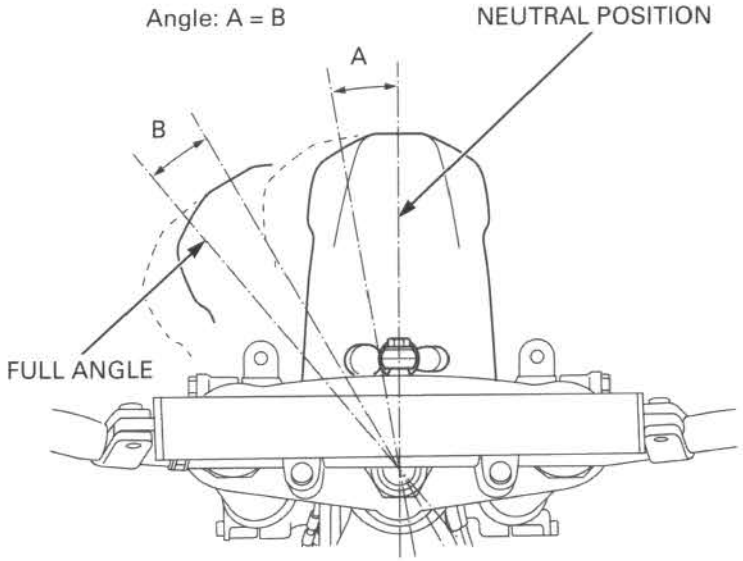
Each component of HPSD functions as follows:

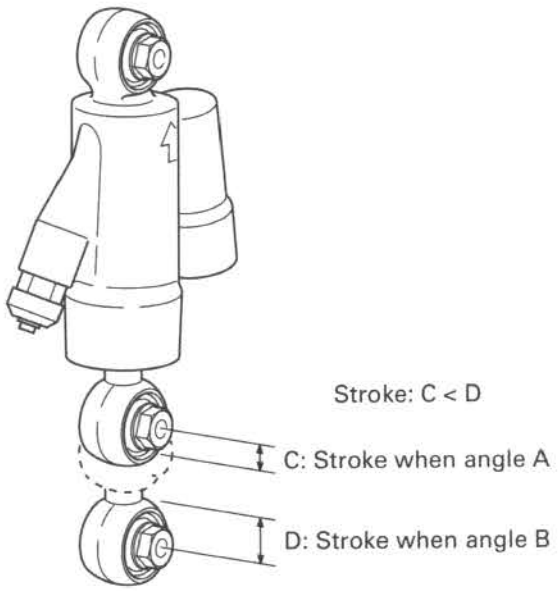
- **Damper rod/piston**
  The damping force is generated by the extension or the compression of the damper rod.
- **Adjuster piece/Plug bolt**
  The damping force can be adjusted with the adjuster piece by turning the plug bolt. The adjuster piece adjusts the damping force of both compression and extension. Turning the plug bolt clockwise will increase damping force and turning it counterclockwise will decrease damping force.
- **Free piston/Reservoir/Spring**
  When compressing the damper rod, damper oil moves temporarily into the reservoir. The damper oil stored in the reservoir is pushed back by the free piston. The free piston is moved by the spring tension and damper oil pressure.
- **Damper case**
  There is a groove inside the damper case. Progressive damping force is controlled by the configuration of the groove within the damper case.



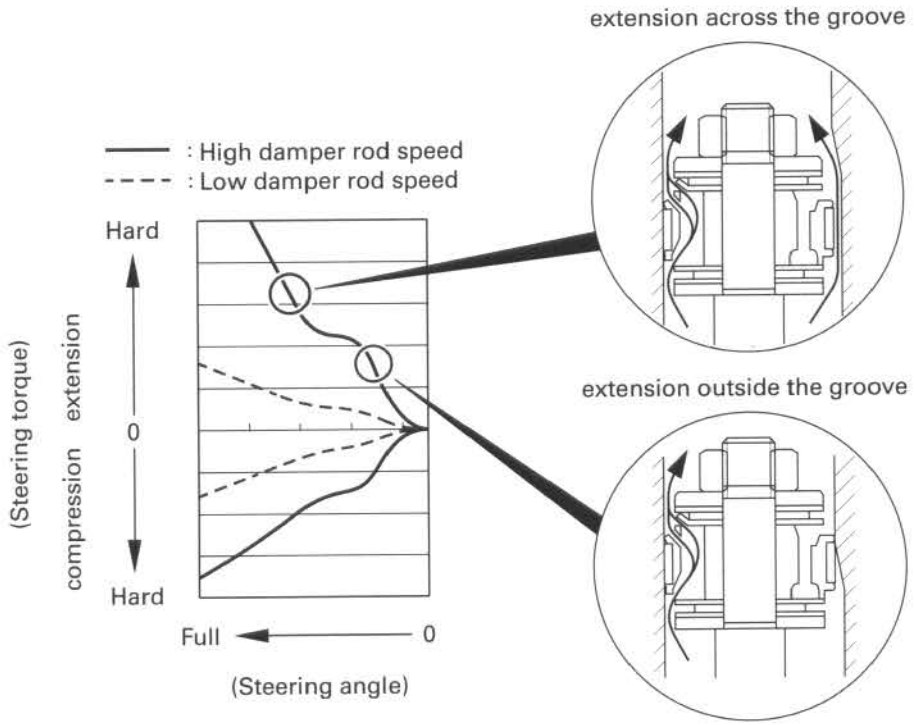
HPSD CHARACTERISTICS

- The required steering torque when turning the handlebar fully (within angle B) is greater than the required steering torque when turning the handlebar slightly (within angle A).





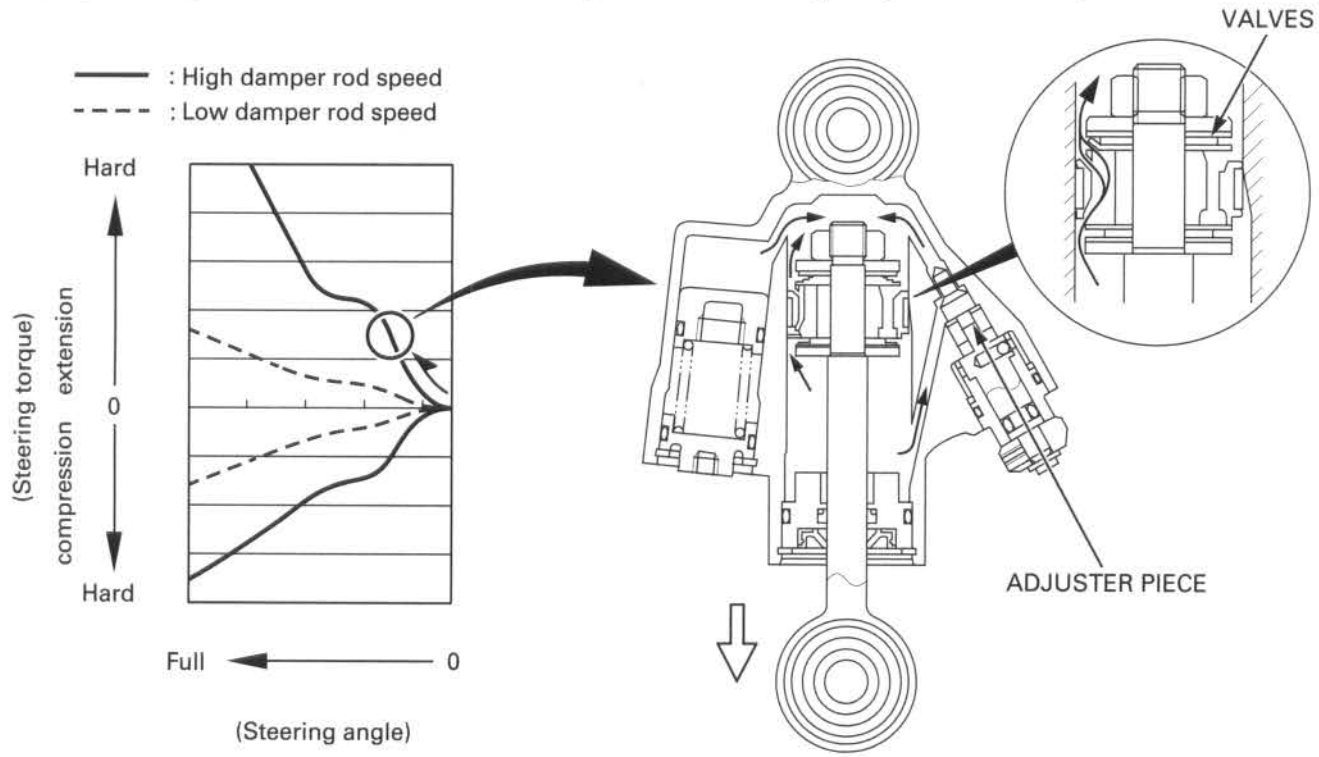
- When the steering is in the neutral position, HPSD generates no damping force and has no effect on steering torque.
- The steering torque differs between the extension and compression of the damper rod.
- The required damping force is controlled when the damper piston travels across at the groove in the damper case.
- The required steering torque differs between high and low damper rod speed.



Turning the handlebar from neutral position to full angle (extension).

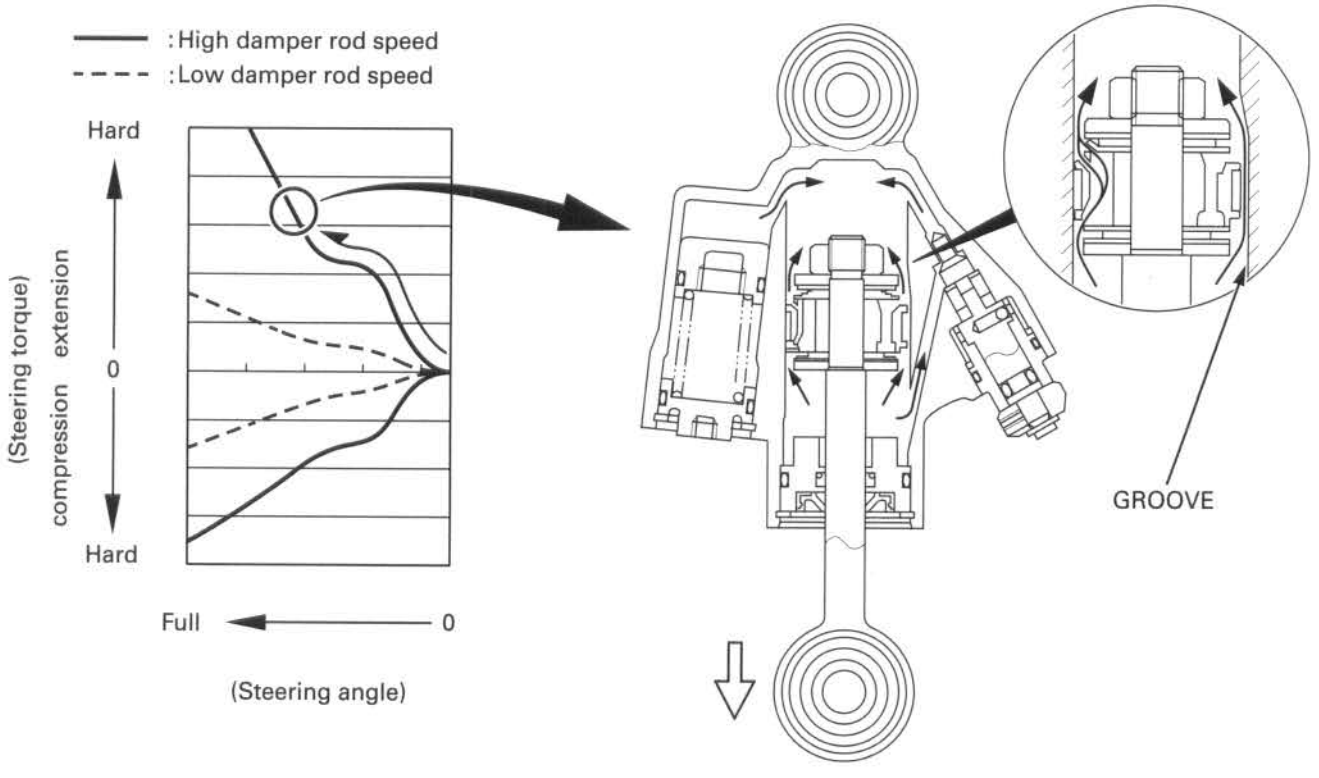
When the damper rod is extended outside of the groove.

Damping force is generated when the oil flows through the valves and adjuster piece in the damper case.



When the damper rod is extended across the groove.

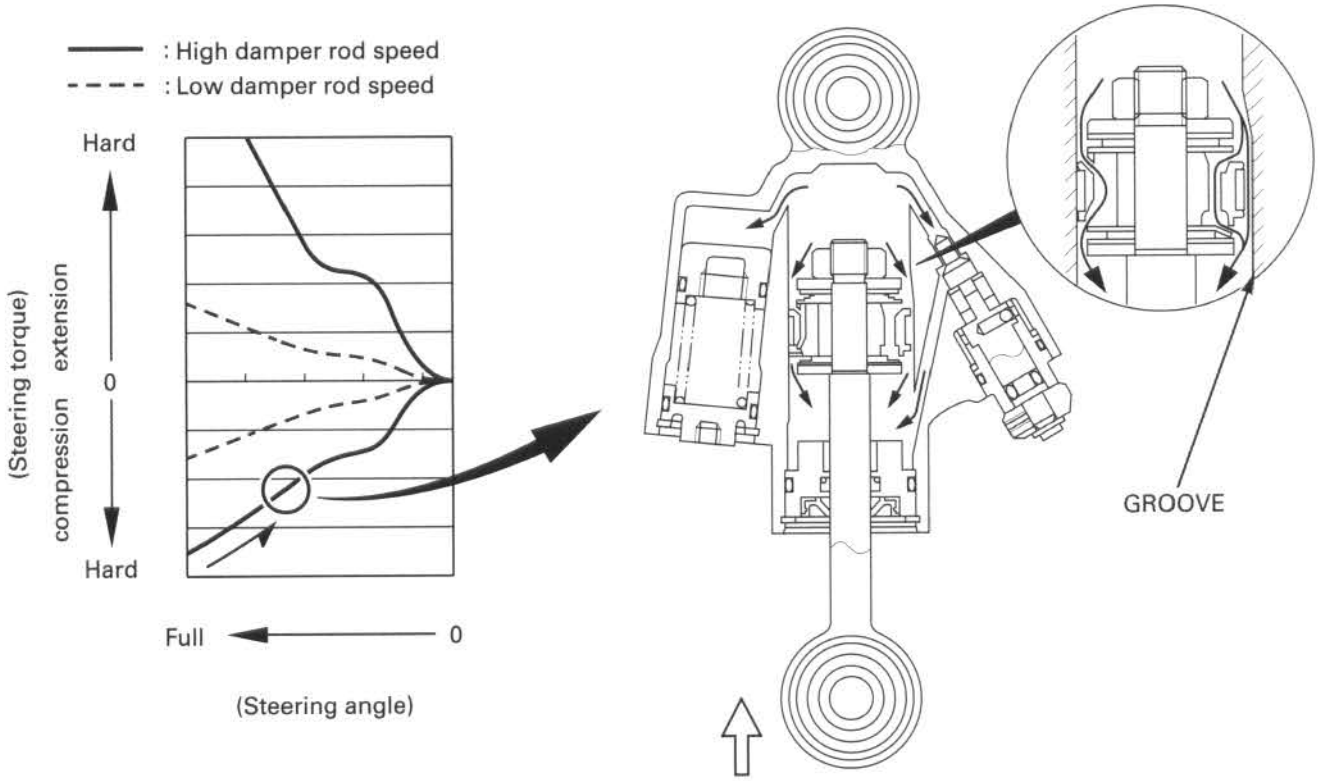
Damping force is controlled when the oil flows through the groove in the damper case.



Turning the handlebar from full angle to neutral position (compression).

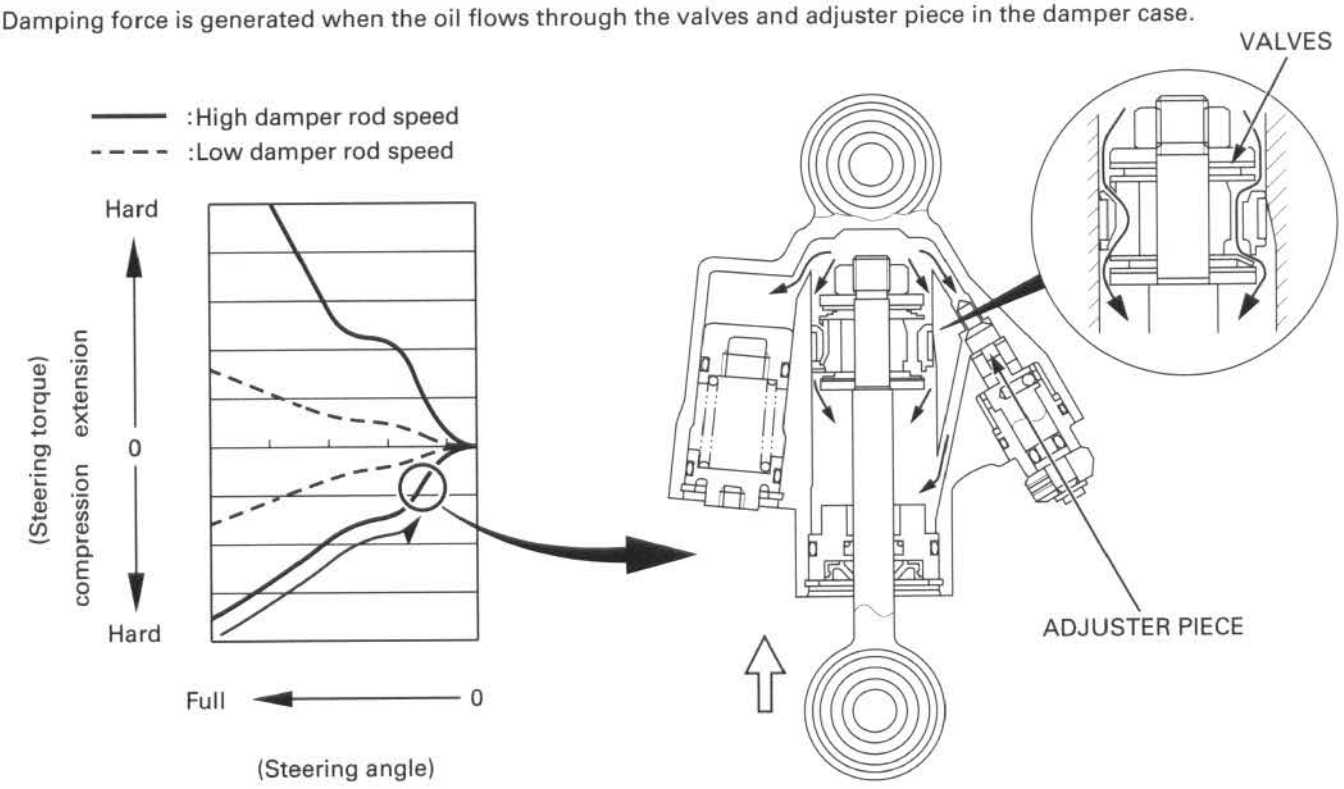
When the damper rod is compressed across the groove.

Damping force is controlled when the oil flows through the groove in the damper case.



When the damper rod is compressed outside of the groove.

Damping force is generated when the oil flows through the valves and adjuster piece in the damper case.



3. FRAME/BODY PANELS/EXHAUST SYSTEM

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, 19 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, 19 lbf·ft)
Muffler protector bolt ('04)		12 N·m (1.2 kgf·m, 9 lbf·ft)
Exhaust joint pipe mounting bolt (After '05)		26 N·m (2.7 kgf·m, 19 lbf·ft)
Exhaust pipe joint band bolt (After '05)		21 N·m (2.1 kgf·m, 15 lbf·ft)
Exhaust pipe protector bolt		12 N·m (1.2 kgf·m, 9 lbf·ft)
Side cover bolt		10 N·m (1.0 kgf·m, 7 lbf·ft)
Shroud mounting bolt (fuel tank side)		5.0 N·m (0.5 kgf·m, 3.7 lbf·ft)
Mudguard mounting screw		1.1 N·m (0.1 kgf·m, 0.8 lbf·ft)

TROUBLESHOOTING

Excessive exhaust noise
- Broken exhaust system
- Exhaust gas leak

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

SEAT

REMOVAL

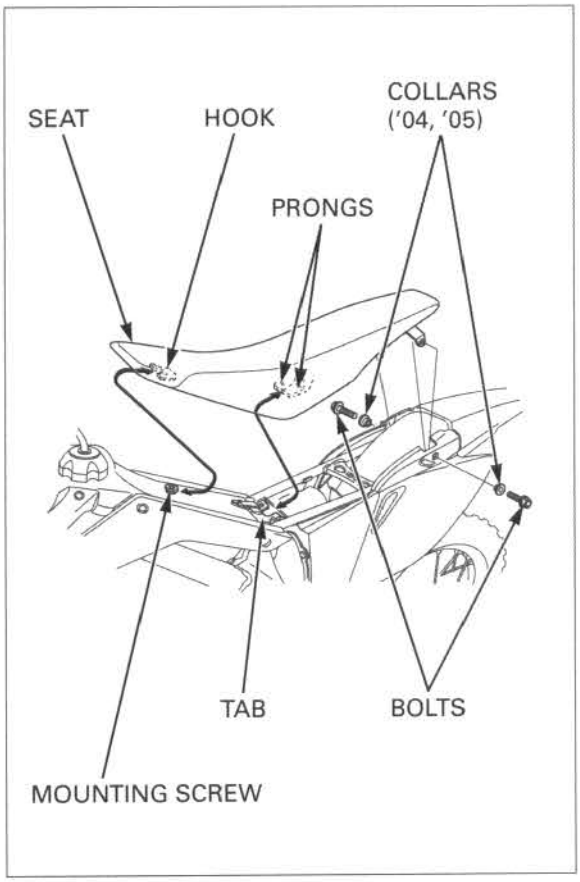
'04, '05: Remove the seat mounting bolts, collars and seat.

After '05: Remove the seat mounting bolts and seat.

INSTALLATION

Align the seat hook with the mounting screw on the fuel tank and the seat prongs with the sub-frame tab.
Install and tighten the seat mounting bolts to the specified torque.

TORQUE: 26 N·m (2.7 kgf·m, 19 lbf·ft)

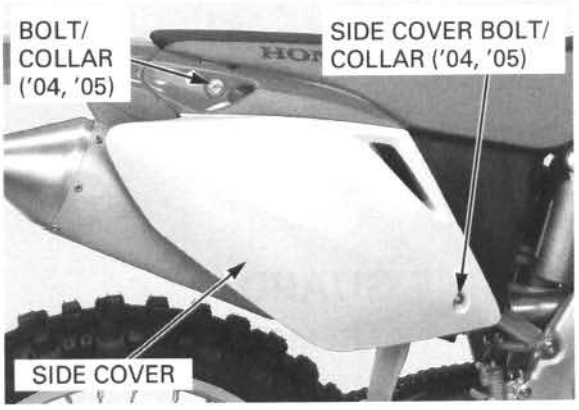


SIDE COVER

REMOVAL/INSTALLATION

'04, '05: Remove the seat mounting bolt and collar.
Remove the side cover bolt, collar and side cover.

After '05: Remove the seat mounting bolt, side cover bolt and side cover.



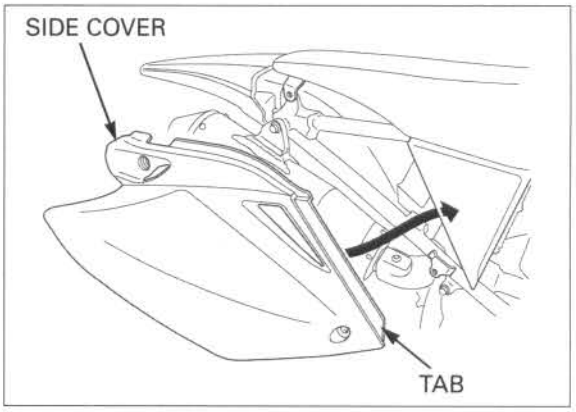
Be careful not to damage the tab. Install the side cover by inserting the side cover tab into the air cleaner housing.

'04, '05: Install the collars, seat mounting bolt and side cover bolt.

After '05: Install the seat mounting bolt and side cover bolt.

Tighten the bolts to the specified torque.

TORQUE:
Seat mounting bolt: 26 N·m (2.7 kgf·m, 19 lbf·ft)
Side cover bolt: 10 N·m (1.0 kgf·m, 7 lbf·ft)

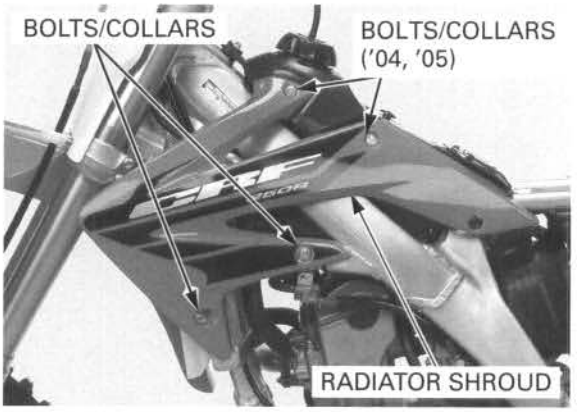


RADIATOR SHROUD

REMOVAL/INSTALLATION

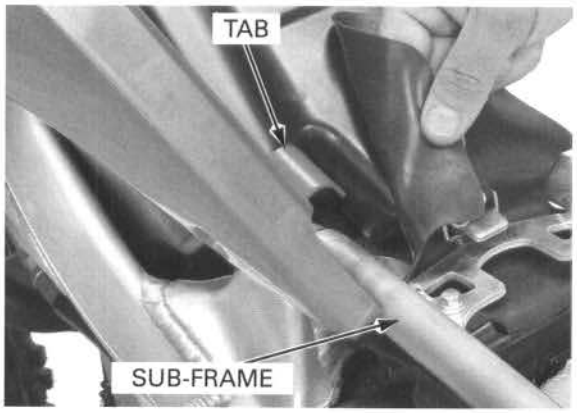
Remove the seat (page 3-3).

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:
Shroud mounting bolt (fuel tank side): 5.0 N·m (0.5 kgf·m, 3.7 lbf·ft)

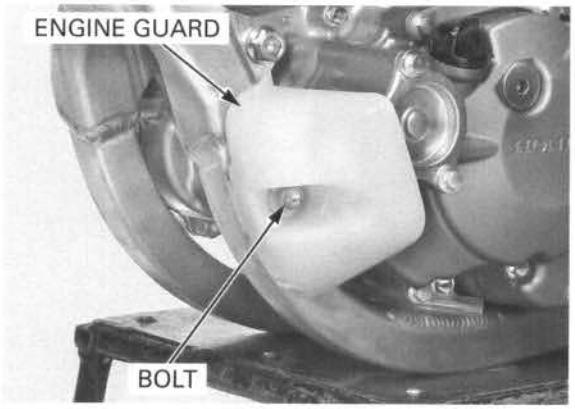


ENGINE GUARD

REMOVAL/INSTALLATION

Remove the bolt and engine guard.

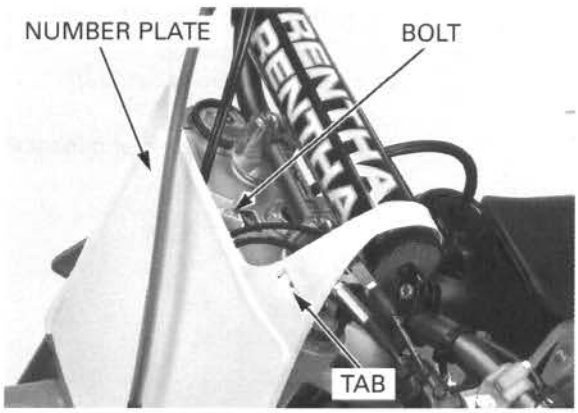
Install the engine guard and tighten the bolt securely.



NUMBER PLATE

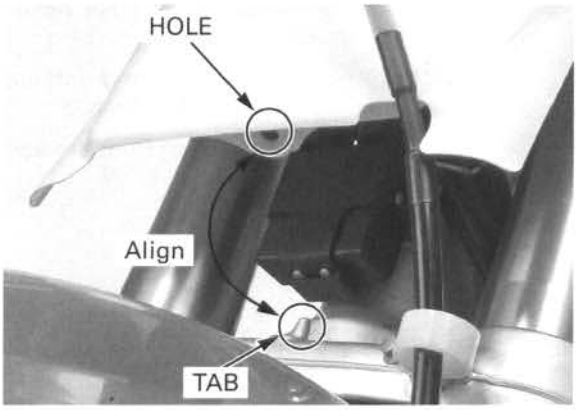
REMOVAL/INSTALLATION: '04 - '07

Remove the number plate tab from the handlebar pad.
Remove the bolt and number plate.



Installation is in the reverse order of removal.

- Install the number plate by aligning its hole with the tab on the steering stem.

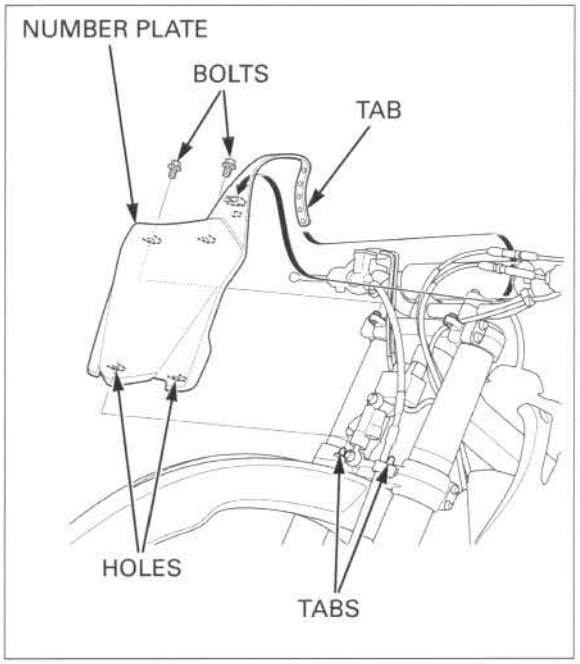


REMOVAL/INSTALLATION: After '07

Remove the number plate tab from the handlebar pad.
Remove the bolts and number plate.

Installation is in the reverse order of removal.

- Install the number plate by aligning its holes with the tabs on the steering stem.



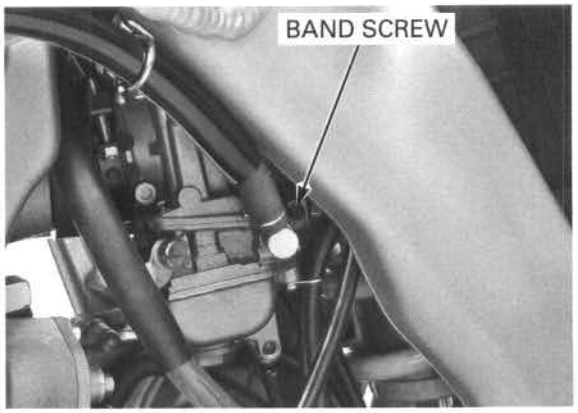
SUB-FRAME

REMOVAL

Remove the following:

- Seat (page 3-3)
- Side covers (page 3-3)
- Muffler (page 3-9)

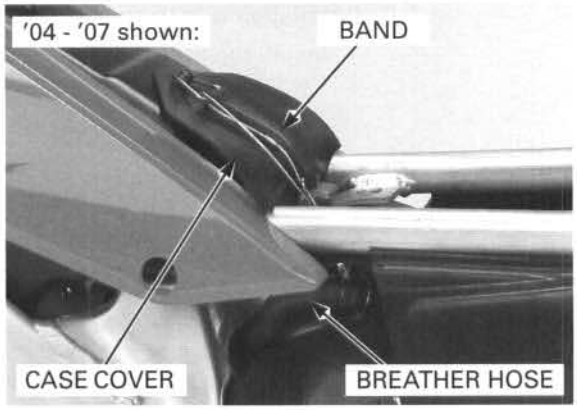
Loosen the air cleaner connecting boot band screw.



Disconnect the breather hose from the air cleaner housing.

'04 - '07: Remove the band and unhook the air cleaner case cover from the fuel tank.

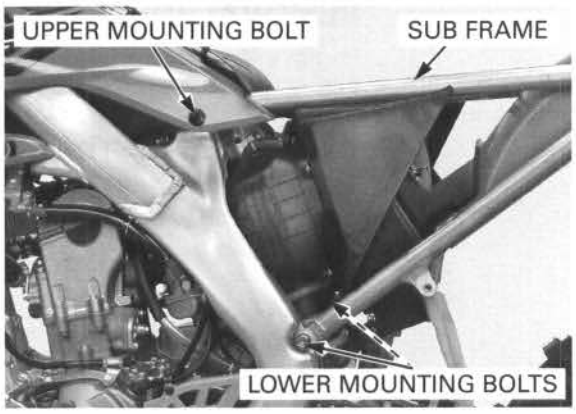
After '07: Remove the band from the fuel tank.



Remove the three sub-frame mounting bolts.

Be careful not to damage the mud guard.

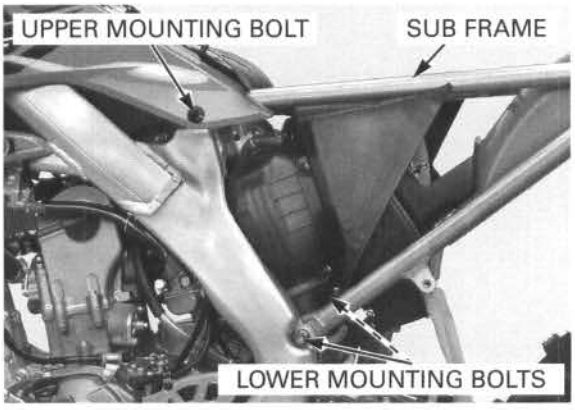
Remove the sub-frame by pulling it straight back.



INSTALLATION

Install the sub-frame while aligning the connecting boot and carburetor.
Tighten the sub-frame upper mounting bolt first, then tighten the lower mounting bolts to the specified torque.

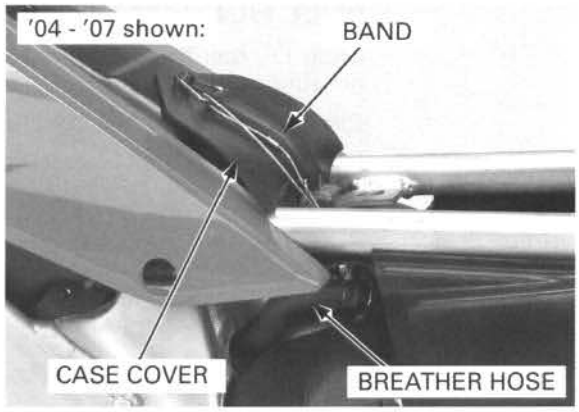
TORQUE:
Upper: 30 N·m (3.1 kgf·m, 22 lbf·ft)
Lower: 49 N·m (5.0 kgf·m, 36 lbf·ft)



'04 - '07: Hook the air cleaner case cover and install the band to the fuel tank.

After '07: Install the band to the fuel tank.

Connect the breather hose to the air cleaner housing.

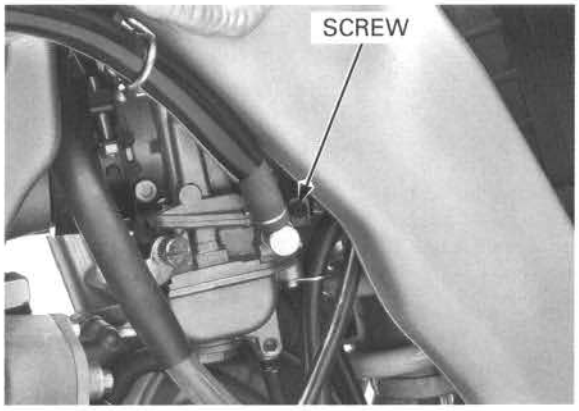


Connect the air cleaner connecting boot to the carburetor.

Tighten the screw on the connecting boot clamp.

Install the following:

- Muffler (page 3-9)
- Side covers (page 3-3)
- Seat (page 3-3)



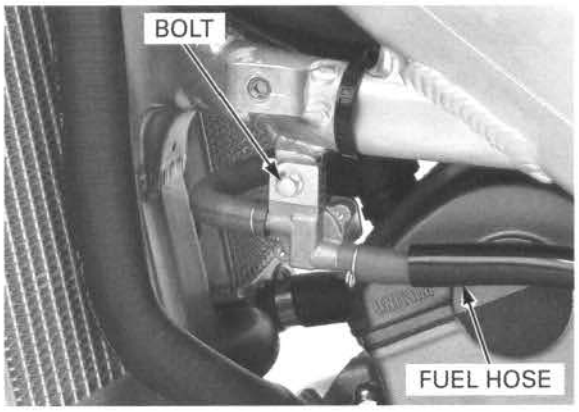
FUEL TANK

REMOVAL/INSTALLATION

Remove the seat (page 3-3).
Remove the radiator shrouds (page 3-4).

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.

'04 - '07: Remove the band and unhook the air cleaner case cover from the fuel tank.

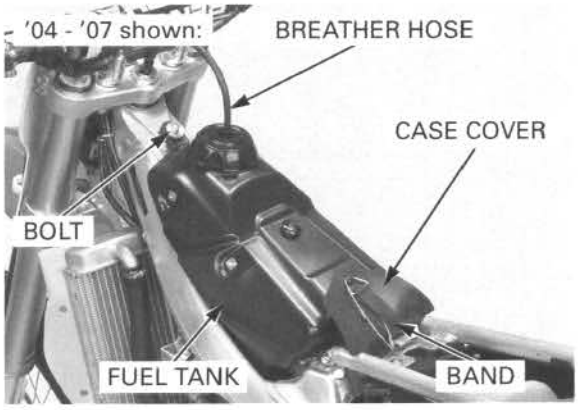
After '07: Remove the band from the fuel tank.

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.

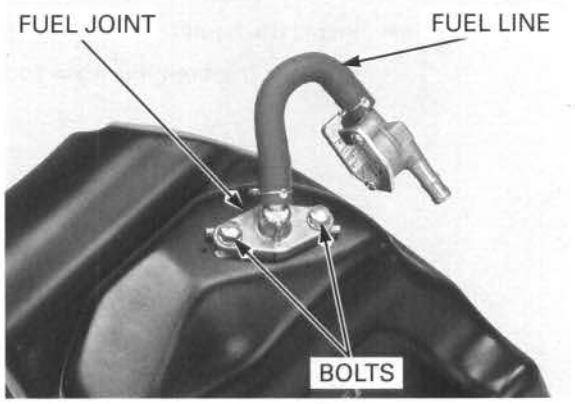


FUEL FILTER MAINTENANCE

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

Disconnect the fuel line from the fuel joint.

Remove the bolts and fuel joint.

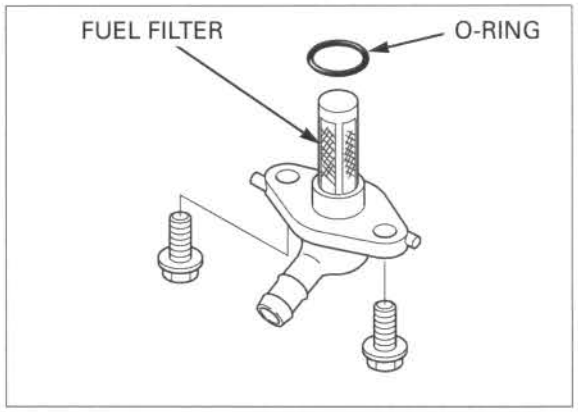


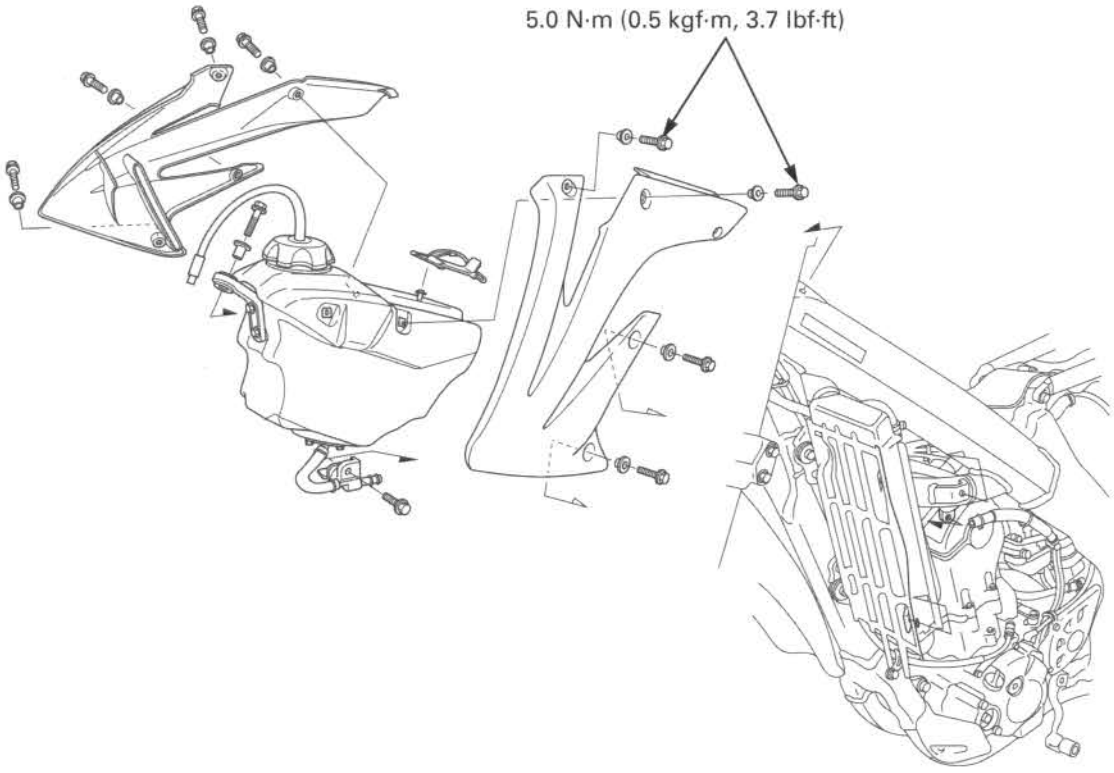
Wash the fuel filter in high flash-point cleaning solvent.

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.



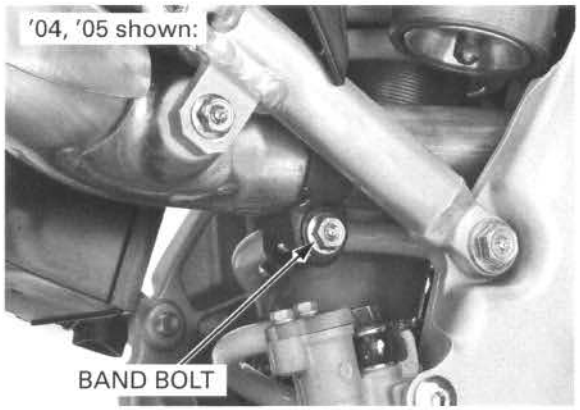


EXHAUST SYSTEM

MUFFLER REMOVAL/INSTALLATION

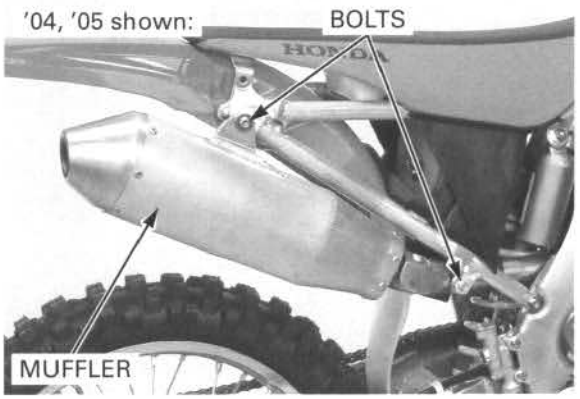
Remove the side cover (page 3-3).

Loosen the muffler joint band bolt.



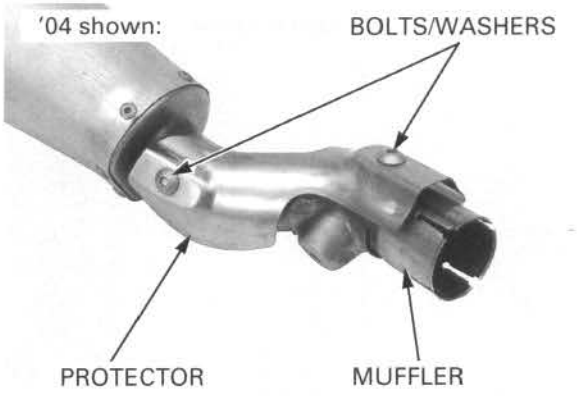
'04, '05: Remove the muffler mounting bolts, muffler and band.

After '05: Remove the muffler mounting bolt, washer and muffler.



'04 only: Remove the bolts, washers and muffler protector from muffler.
Install the muffler protector, 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 to the exhaust pipe.

'04, '05: Install the muffler and muffler mounting bolts.

After '05: Install the muffler, washer and muffler mounting bolt.

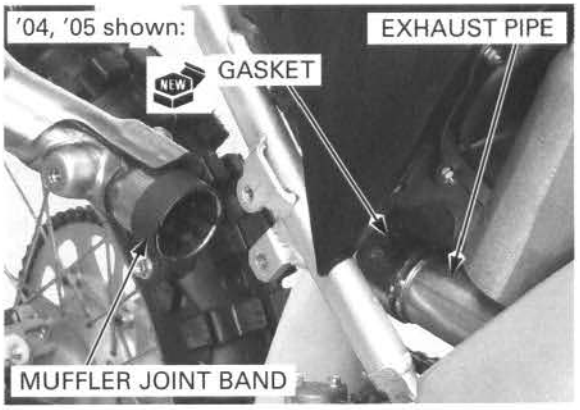
Tighten the muffler joint band bolt to the specified torque.

TORQUE: 21 N·m (2.1 kgf·m, 15 lbf·ft)

Tighten the muffler mounting bolts to the specified torque.

TORQUE: 26 N·m (2.7 kgf·m, 19 lbf·ft)

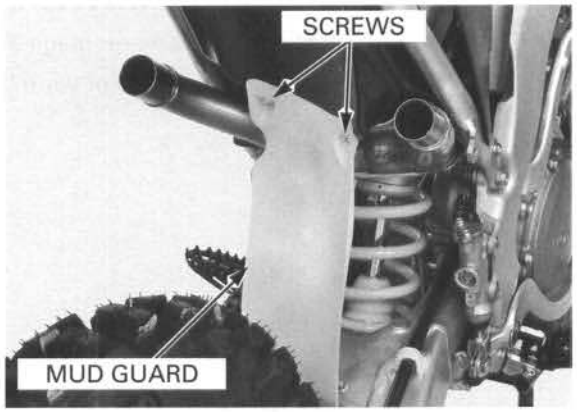
Install the side cover (page 3-3).



EXHAUST JOINT PIPE REMOVAL/ INSTALLATION: AFTER '05

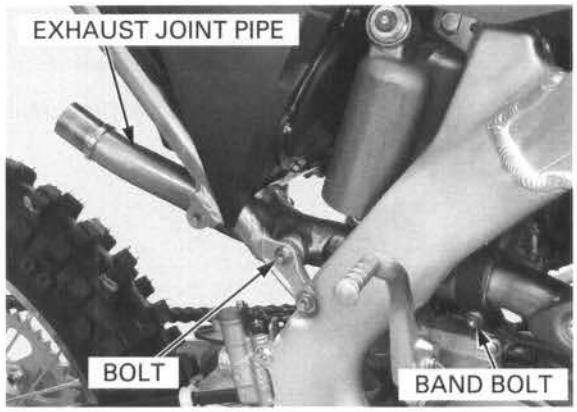
Remove the mufflers (page 3-9).

Remove the screws and mud guard.



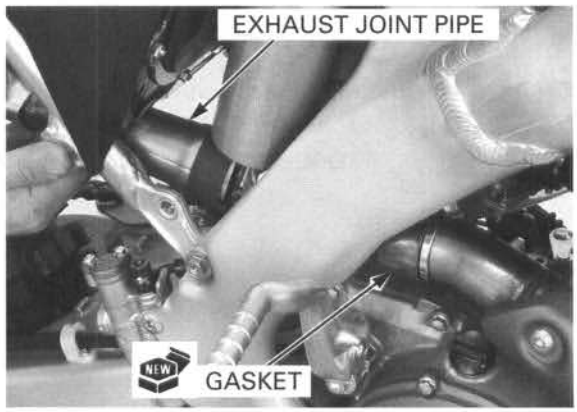
Loosen the exhaust pipe joint band bolt.

Remove the bolt, exhaust joint pipe and gasket.



Install a new gasket to the exhaust pipe.

Install the exhaust joint pipe.



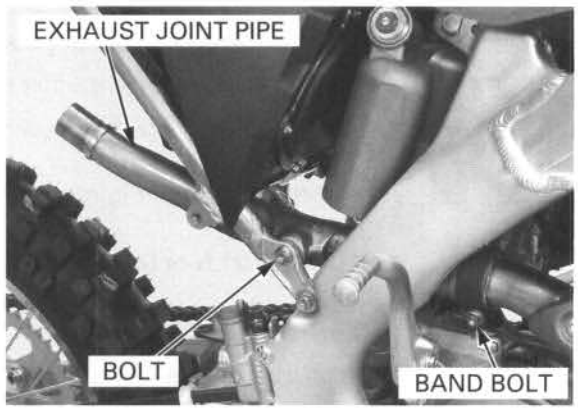
Temporarily install the exhaust joint pipe mounting bolt.

After installing the mufflers (page 3-9), tighten the bolts to the specified torque.

TORQUE:

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

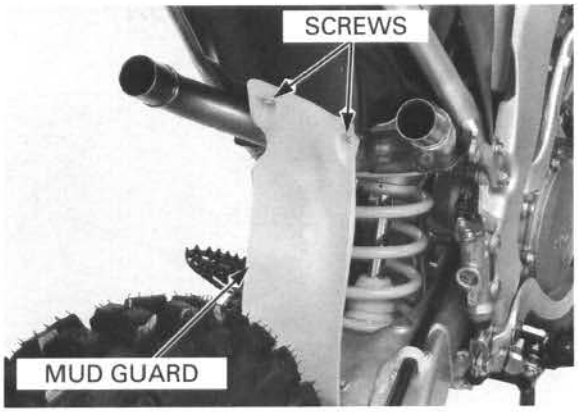
Exhaust joint pipe mounting bolt:
26 N·m (2.7 kgf·m, 19 lbf·ft)



Install the mud guard, then tighten the screws to the specified torque.

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

Install the mufflers (page 3-9).

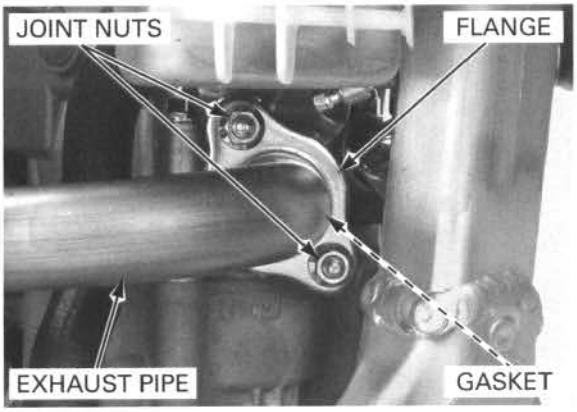


EXHAUST PIPE REMOVAL

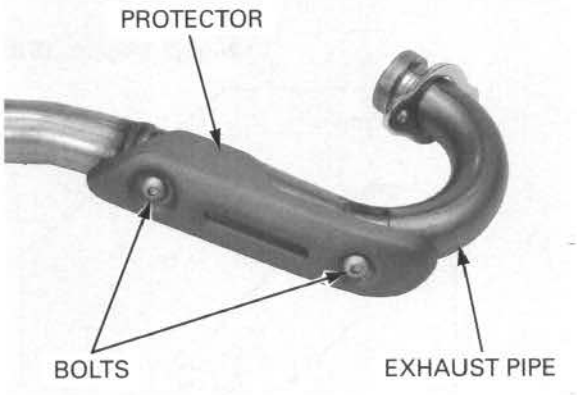
Remove the muffler (page 3-9).

After '05: Remove the exhaust joint pipe (page 3-10).

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

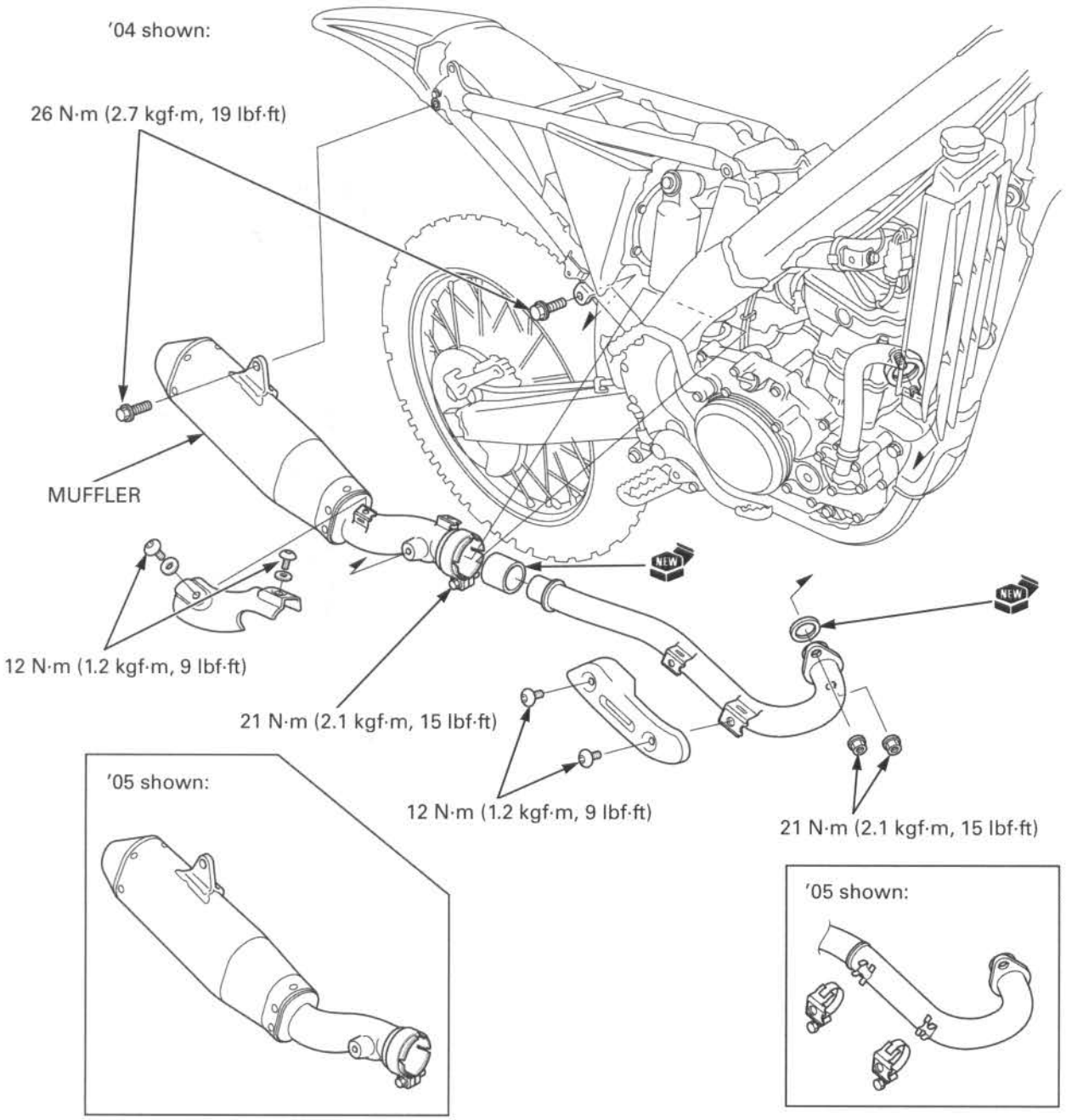


Remove the bolts and protector from exhaust pipe.

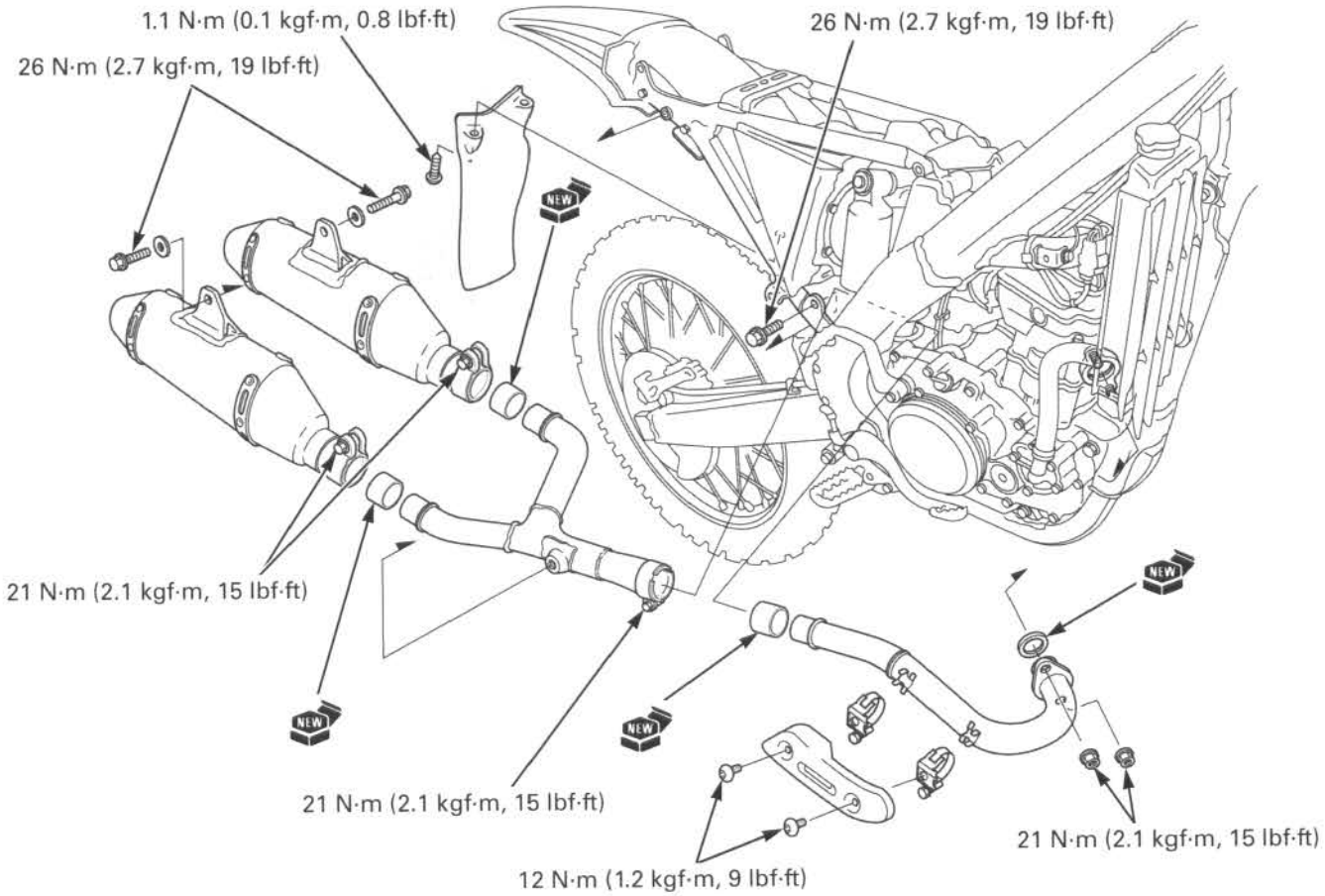


INSTALLATION

'04, '05:

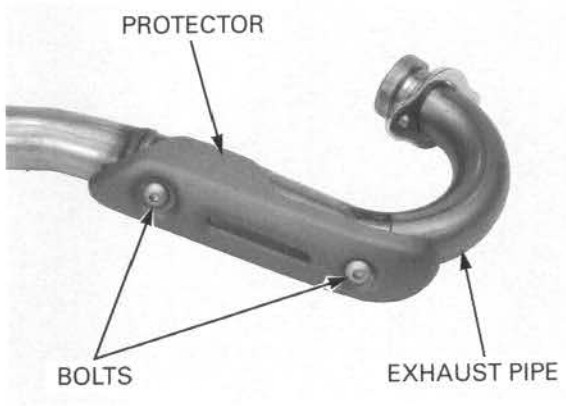


After '05:



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

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Install a new gasket to the cylinder head.

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

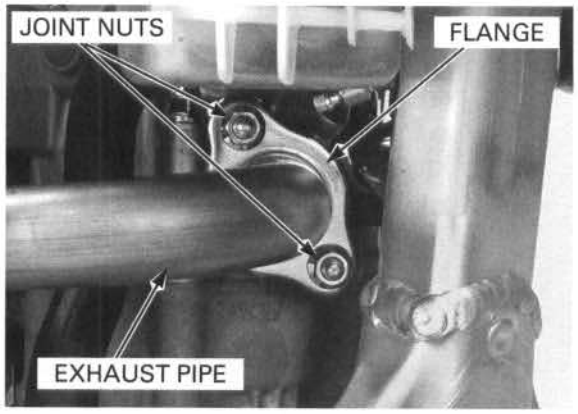
Install the exhaust pipe, flange and joint nuts.

Tighten the exhaust pipe joint nuts to the specified torque.

TORQUE: 21 N·m (2.1 kgf·m, 15 lbf·ft)

After '05: Install the exhaust joint pipe (page 3-10).

Install the muffler (page 3-9).



4. 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.

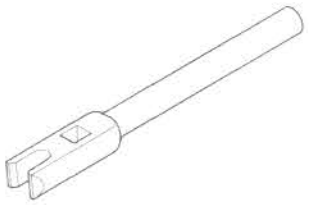
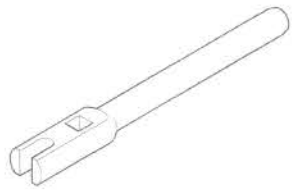
SPECIFICATIONS

ITEM				SPECIFICATIONS
Throttle grip freeplay				3 – 5 mm (1/8 – 3/16 in)
Hot start lever freeplay				2 – 3 mm (1/16 – 1/8 in)
Spark plug	Standard	(NGK)	'04	IMR8C9H
			After '04	R0409 B-8
		(DENSO)	'04 only	VUH24D
	Optional	(NGK)	'04	IMR9C9H
			After '04	R0409 B-9
		(DENSO)	'04 only	VUH27D
Spark plug gap			'04	0.8 – 0.9 mm (0.032 – 0.035 in)
			After '04	0.6 – 0.7 mm (0.024 – 0.028 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	'04	0.72 liter (0.76 US qt, 0.63 Imp qt)
			After '04	0.60 liter (0.63 US qt, 0.53 Imp qt)
		At disassembly	'04	0.77 liter (0.81 US qt, 0.68 Imp qt)
			After '04	0.70 liter (0.74 US qt, 0.62 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 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	Size/link	D.I.D	'04 – '08	520DMA2-114
			After '08	520DMA4-114
		RK (After '07)		520TXZ-114
	Slack			25 – 35 mm (1.0 – 1.4 in)
Drive chain length				259 mm (10.2 in)
Drive chain slider thickness				5.0 mm (0.2 in)
Drive chain roller O.D.		'04		39 mm (1.5 in)
		After '04	Upper	38 mm (1.5 in)
			Lower	31 mm (1.2 in)
Clutch lever freeplay				10 – 20 mm (3/8 – 13/16 in)
Cold tire pressure		Front		98 kPa (1.0 kgf/cm^2, 14 psi)
		Rear		98 kPa (1.0 kgf/cm^2, 14 psi)

TORQUE VALUES

Engine oil drain bolt ('04 - '06)	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Engine oil drain bolt (After '06)	16 N·m (1.6 kgf·m, 12 lbf·ft)	
Transmission oil drain bolt ('04 - '06)	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Transmission oil drain bolt (After '06)	16 N·m (1.6 kgf·m, 12 lbf·ft)	
Timing hole cap	6.0 N·m (0.6 kgf·m, 4.4 lbf·ft)	Apply grease to the threads
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, 4.4 lbf·ft)	
Rear axle nut	128 N·m (13.1 kgf·m, 94 lbf·ft)	
Drive chain roller bolt/nut	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Drive sprocket bolt	31 N·m (3.2 kgf·m, 23 lbf·ft)	UBS bolt
Driven sprocket nut	32 N·m (3.3 kgf·m, 24 lbf·ft)	U-nut
Front master cylinder reservoir cover screw	1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)	
Rear master cylinder reservoir cover bolt	1.0 N·m (0.1 kgf·m, 0.7 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)	
Spoke	3.7 N·m (0.4 kgf·m, 2.7 lbf·ft)	
Rim lock	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Fork air plug bolt	1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)	
Rear master cylinder push rod lock nut	5.9 N·m (0.6 kgf·m, 4.4 lbf·ft)	
Throttle cable upper adjuster lock nut (After '06)	4.0 N·m (0.4 kgf·m, 3.0 lbf·ft)	
Throttle cable lower adjuster lock nut (After '06)	4.0 N·m (0.4 kgf·m, 3.0 lbf·ft)	

TOOLS

Spoke wrench, 6.1 mm 07JMA-MR60100  or 07701-0020300 (6.1 mm)	Spoke wrench, 6.6 mm 070MA-KZ30100 

MAINTENANCE SCHEDULE

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

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

FREQUENCY / ITEMS	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					4-6
HOT START		I					4-6
AIR CLEANER	(NOTE 1)	C					4-7
CRANKCASE BREATHER		I					4-8
SPARK PLUG		I					4-9
RADIATOR COOLANT	(NOTE 2)	I					4-10
VALVE CLEARANCE/ DECOMPRESSOR SYSTEM	(NOTE 4)			I			4-11
ENGINE OIL	(NOTE 3)	I		R			4-13
ENGINE OIL FILTER	(NOTE 3)			R			4-13
ENGINE IDLE SPEED	(NOTE 4)	I					4-16
PISTON AND PISTON RINGS				R			10-5
PISTON PIN				R			10-5
TRANSMISSION OIL	(NOTE 5)	I		R			4-16
COOLING SYSTEM		I					4-17
DRIVE CHAIN		I, L	R				4-18
DRIVE CHAIN SLIDER		I					4-19
DRIVE CHAIN ROLLER		I					4-20
DRIVE/DRIVEN SPROKET		I					4-20
BRAKE FLUID	(NOTE 2)	I					4-21
BRAKE PAD WEAR		I					4-22
BRAKE SYSTEM		I					4-22
CLUTCH SYSTEM	(NOTE 5)	I					4-23
CONTROL CABLES		I, L					4-25
EXHAUST PIPE/MUFFLER		I					4-25
SUSPENSION		I					4-28
SWINGARM/SHOCK LINKAGE			L				4-29
FORK OIL EXCEPT DAMPER	(NOTE 3)		R				13-36
FORK OIL DAMPER					R		13-29
NUTS, BOLTS, FASTENERS		I					4-29
WHEELS/TIRES		I					4-30
STEERING HEAD BEARINGS					I		4-31

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

NOTES:
1. Clean after every moto 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 and left 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 number plate	Damage	
Front/rear fender	Damage	
Clutch lever/holder	Freeplay or damage	
Brake lever	Freeplay or damage	
Hot start lever	Freeplay 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	

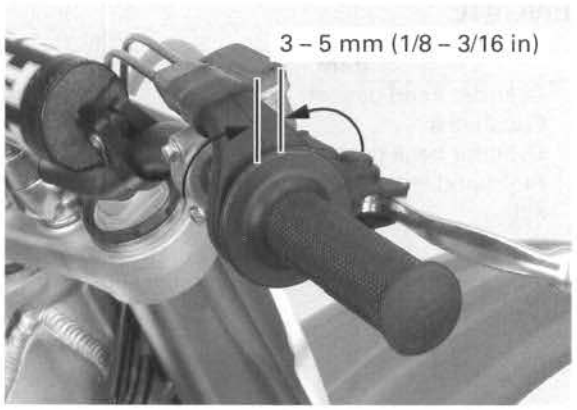
NOTE:
- These parts and their possible replacement schedule are based upon average riding conditions.
- Machines subjected to severe use require more frequent servicing.

THROTTLE OPERATION

Check for smooth operation of the throttle and that it returns automatically to the fully closed position from any open position and from any steering position.
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 freeplay at the throttle grip flange.

FREEPLAY: 3 – 5 mm (1/8 – 3/16 in)



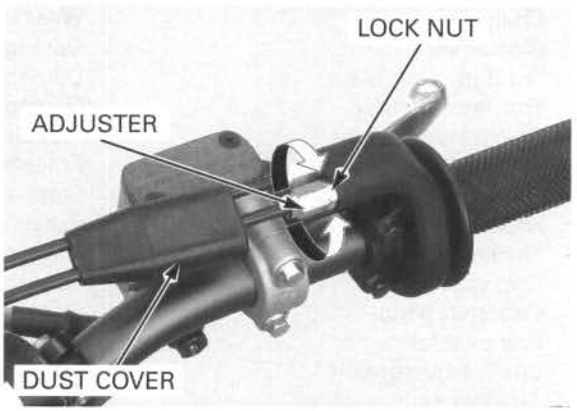
Throttle grip freeplay can be adjusted at either end of the throttle cable.

Minor adjustments are made with the upper adjuster.
Remove the dust cover from the adjuster.
Adjust the freeplay by loosening the lock nut and turning the adjuster.

Tighten the lock nut after making the adjustment.

TORQUE:
After '06: 4.0 N·m (0.4 kgf·m, 3.0 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 3-7).

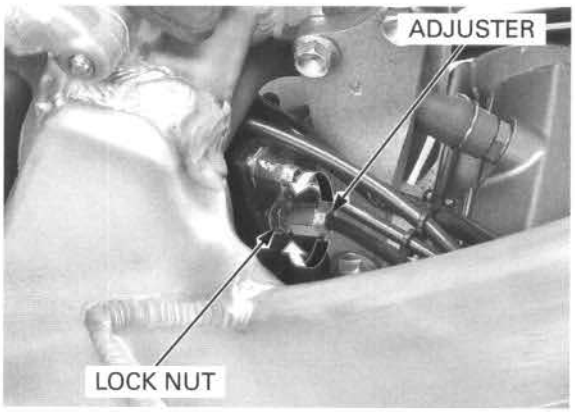
Adjust the freeplay by loosening the lock nut and turning the adjuster.

After adjustment, tighten the lock nut securely.

TORQUE:
After '06: 4.0 N·m (0.4 kgf·m, 3.0 lbf·ft)

Recheck the throttle operation.

Install the fuel tank (page 3-7).



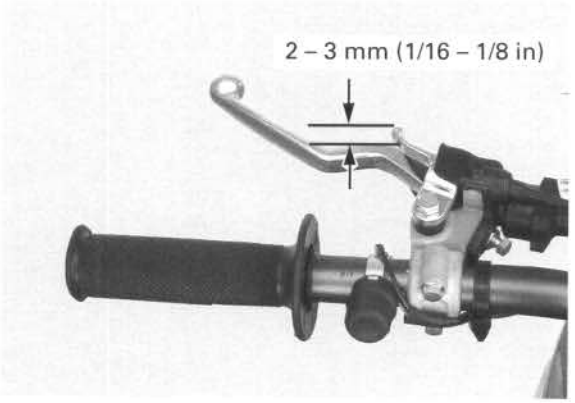
HOT START

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 freeplay at the lever end.

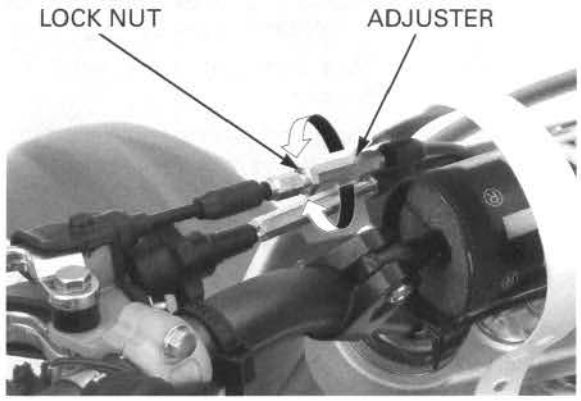
FREEPLAY: 2 – 3 mm (1/16 – 1/8 in)



Hot start lever freeplay can be adjusted at the hot start cable.

Adjust the freeplay by loosening the lock nut and turning the adjuster.
Tighten the lock nut.
Reinstall the dust cover.

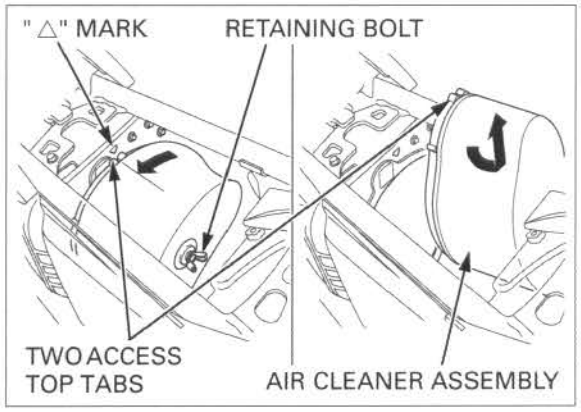
Recheck the freeplay at the lever.



AIR CLEANER

Remove the seat (page 3-3).

Loosen the air cleaner retaining bolt.
Align the two access top tabs of the air cleaner and "△" mark of the air cleaner housing by rotating the air cleaner counterclockwise.
Remove the air cleaner assembly.

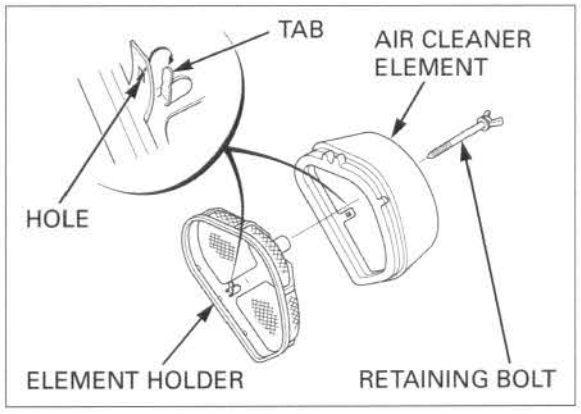


Remove the air cleaner element from the element holder.

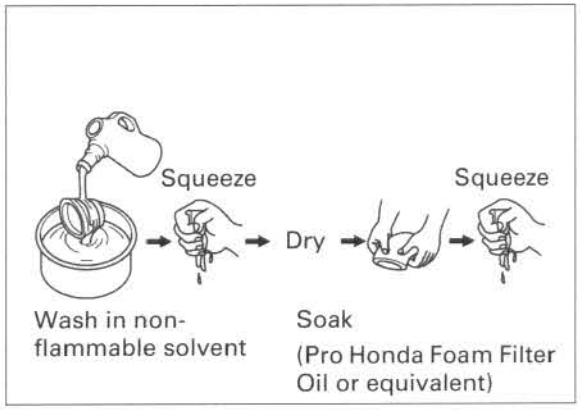
Thoroughly wash the air cleaner in clean nonflammable or high flash-point cleaning solvent.
Then wash the element again in a solution of hot water and dishwashing liquid soap.
Clean the inside of the air cleaner housing.

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.



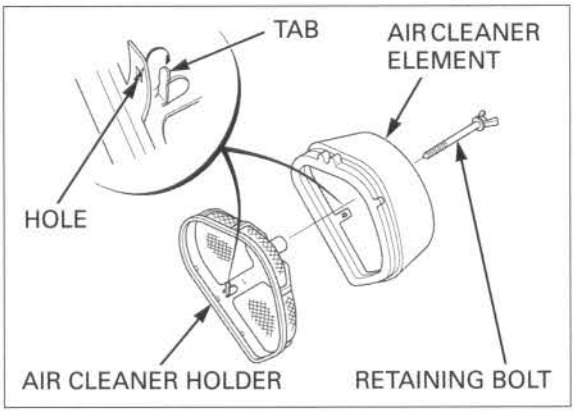
Apply air filter oil to the entire surface of the air cleaner and rub it with both hands to saturate the element with oil.
Gently squeeze out excess oil. It is important not to over-oil, or under-oil the element.



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

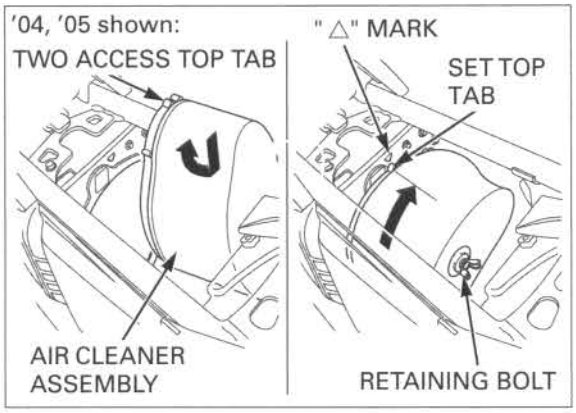
Assemble the air cleaner element and element holder.

Hook the element hole onto the holder tab.
Install the retaining bolt to the air cleaner element assembly.



Install the air cleaner assembly into the air cleaner housing with the two access top tabs facing up.
Carefully position the sealing flange of the element to prevent dirt intrusion.

'04, '05: Align the air cleaner tab with the "△" mark of the air cleaner housing by rotating the air cleaner clockwise.



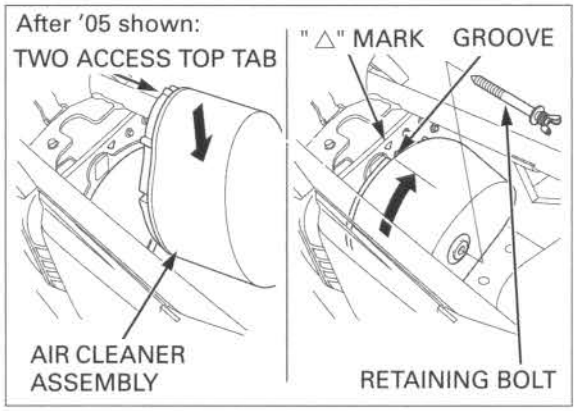
After '05: Align the air cleaner groove with the "△" mark of the air cleaner housing by rotating the air cleaner clockwise.

Tighten the retaining bolt securely.

Install the seat (page 3-3).

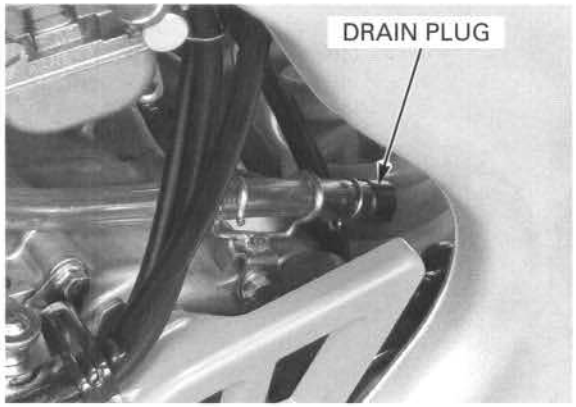
NOTICE

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.

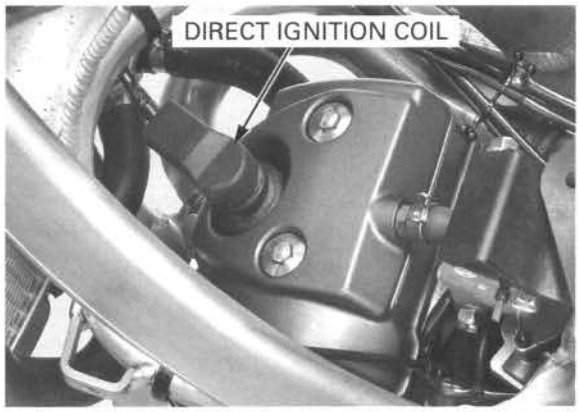


SPARK PLUG

REMOVAL

Remove the fuel tank (page 3-7).

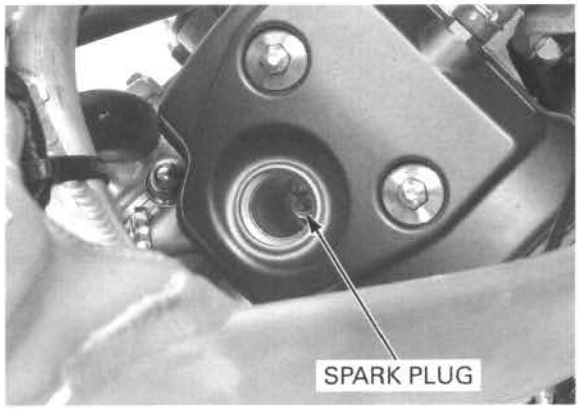
Disconnect the direct ignition coil from cylinder head.



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 4-4).



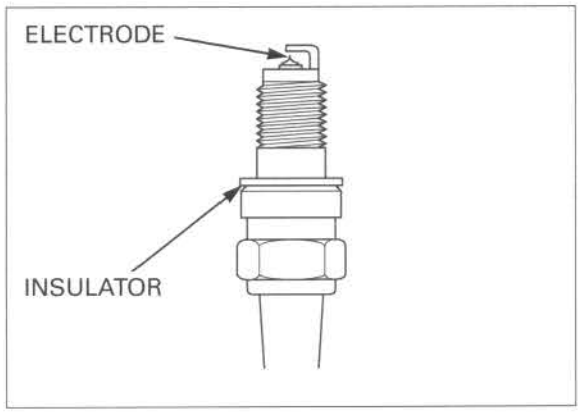
INSPECTION

Check the following and replace if necessary (recommended spark plug: page 4-2)

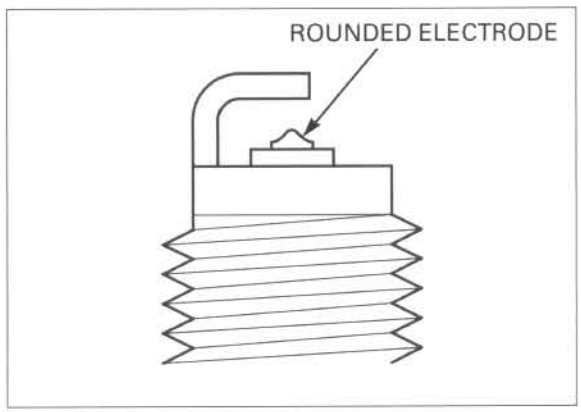
- Insulator for damage
- Electrodes for wear
- Burning condition, coloration;

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

If the electrode is contaminated with accumulated objects or dirt, replace the spark plug.



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



Always use the specified spark plugs on this motorcycle.

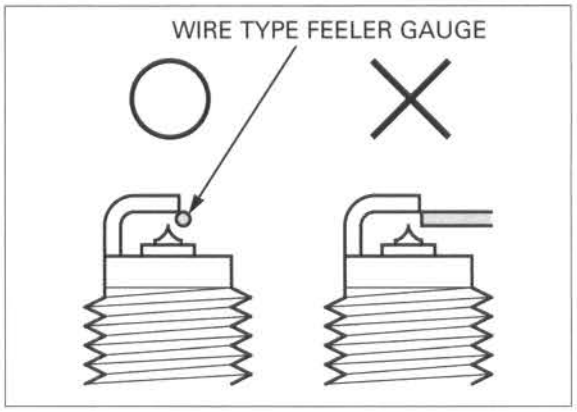
RECOMMENDED SPARK PLUG (OR EQUIVALENT)

Standard	**NGK:**	**'04:**	**IMR8C9H**
		After '04:	**R0409 B-8**
	DENSO:	**'04 only:**	**VUH24D**
Optional	**NGK:**	**'04:**	**IMR9C9H**
		After '04:	**R0409 B-9**
	DENSO:	**'04 only:**	**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:
'04: 0.8 – 0.9 mm (0.032 – 0.035 in)
After '04: 0.6 – 0.7 mm (0.024 – 0.028 in)



'04: Make sure that the 1.0 mm (0.04 in) diameter plug gauge does not insert between the gap.

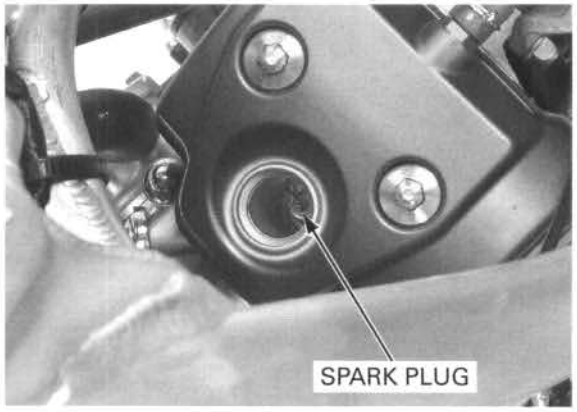
After '04: Make sure that the 0.8 mm (0.03 in) diameter plug gauge does not insert between the gap.

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

If the gauge can be inserted into the gap, replace the plug with a new one.

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)

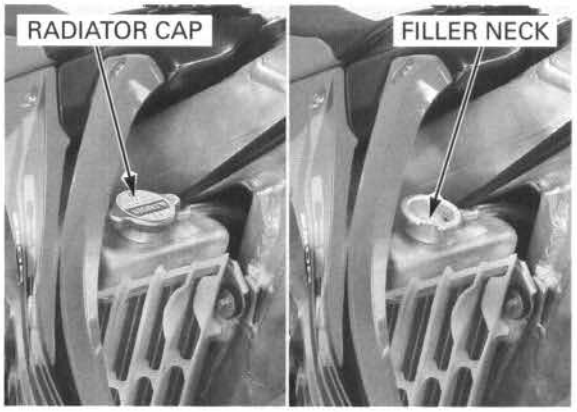


RADIATOR COOLANT

Remove the radiator cap.

Check the coolant level with the engine cold, it should be up to the filler neck.

Add coolant as required (page 7-6).



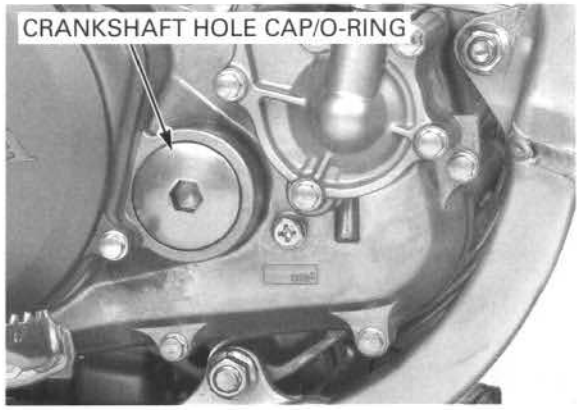
VALVE CLEARANCE/DECOMPRESSOR SYSTEM

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 9-7).

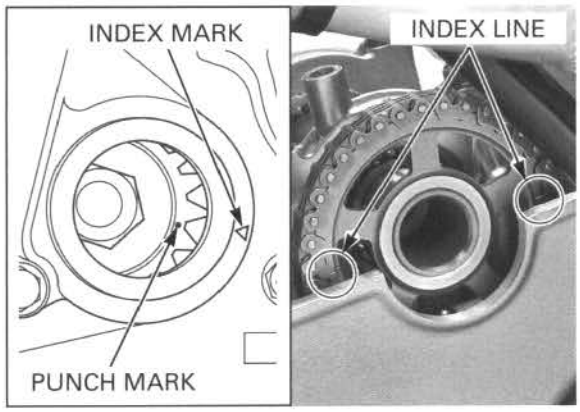
Remove the crankshaft hole cap and O-ring.



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.

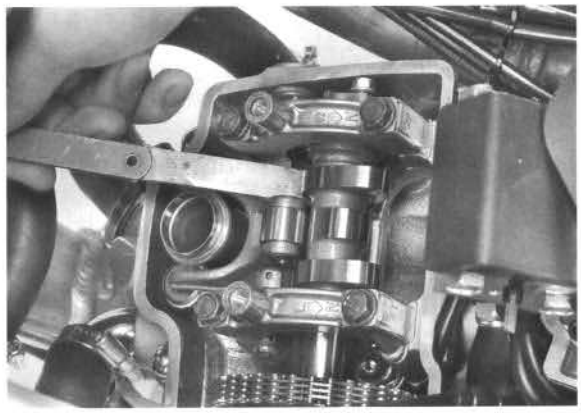


Insert the feeler gauge between the valve lifter and the cam lobe.

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 ± 0.03 mm (0.005 ± 0.001 in)

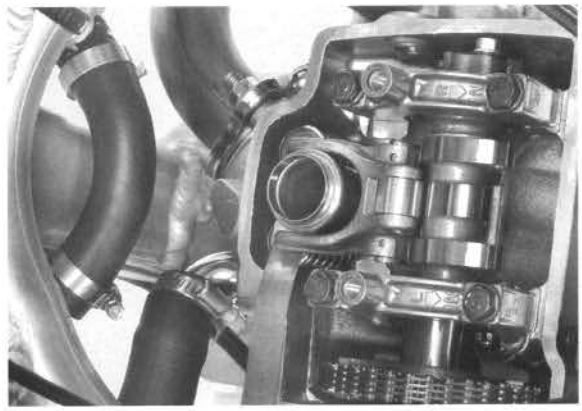


Insert the feeler gauge between the rocker arm and shim.

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 ± 0.03 mm (0.011 ± 0.001 in)



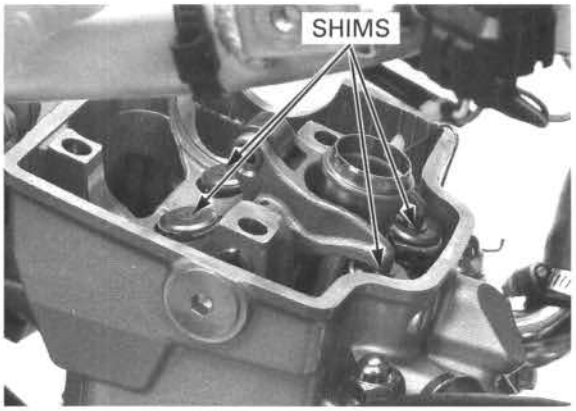
VALVE CLEARANCE ADJUSTMENT

Remove the camshaft (page 9-8).

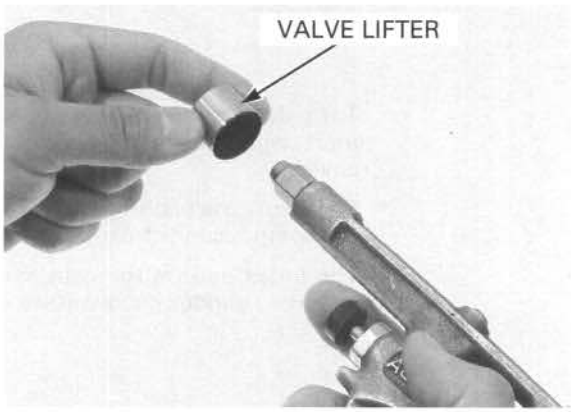
- The shims may stick to the inside of the valve lifter. Do not allow the shims to fall into the crankcase.

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.



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

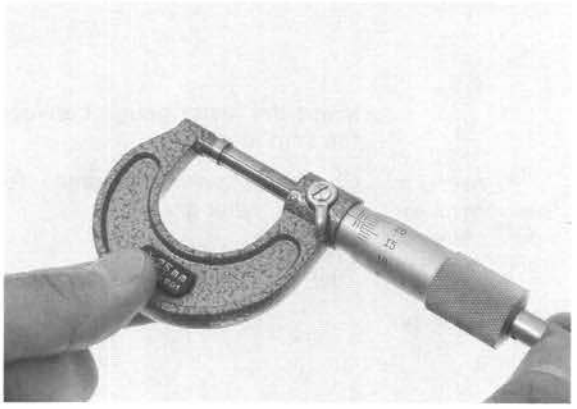
Measure the shim thickness and record it.

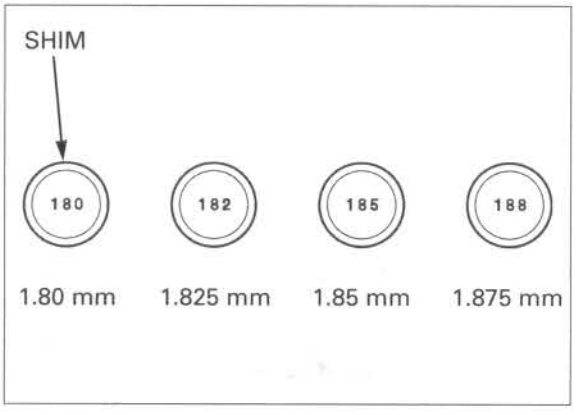
Calculate the new shim thickness using the equation below.

$A = (B - C) + D$

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 valve seat if carbon deposits result in a calculated dimension of over 2.900 mm.





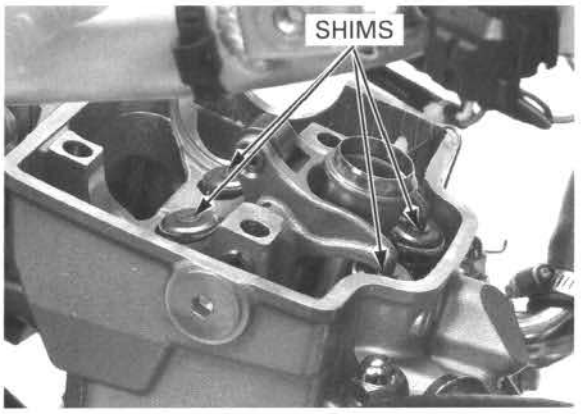
Install the shims in their original locations.

Install the newly selected shims on the valve spring retainers.

Install the camshaft (page 9-29).

Rotate the camshaft by rotating the crankshaft clockwise several times.

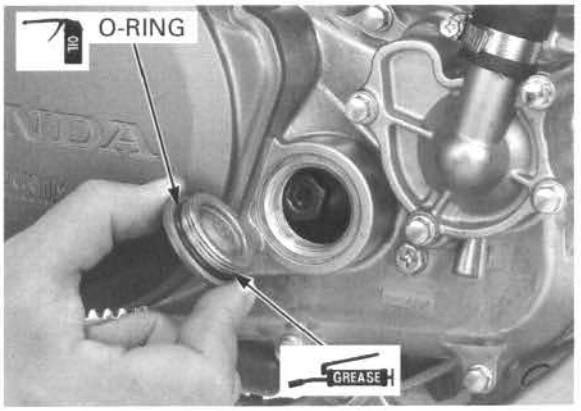
Recheck the valve clearance.



Check that the O-ring 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)



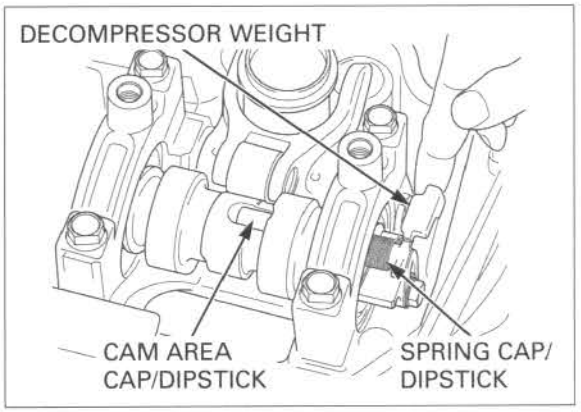
DECOMPRESSOR SYSTEM

Remove the cylinder head cover (page 9-7).

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.



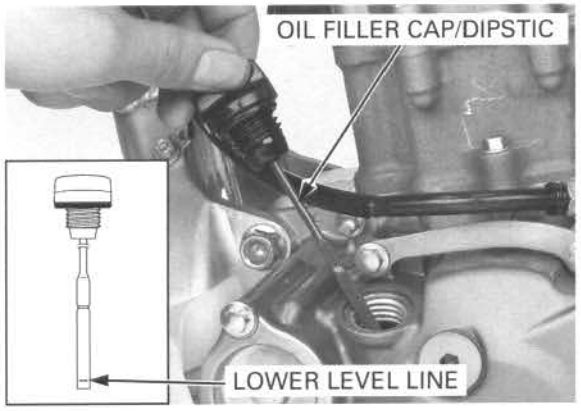
ENGINE OIL/OIL FILTER

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.

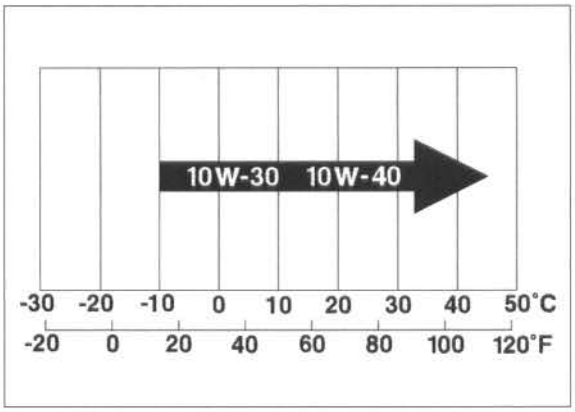
If the oil level is below or near the lower level line on the dipstick, add the recommended engine oil to the upper level line through the oil filler hole.



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.

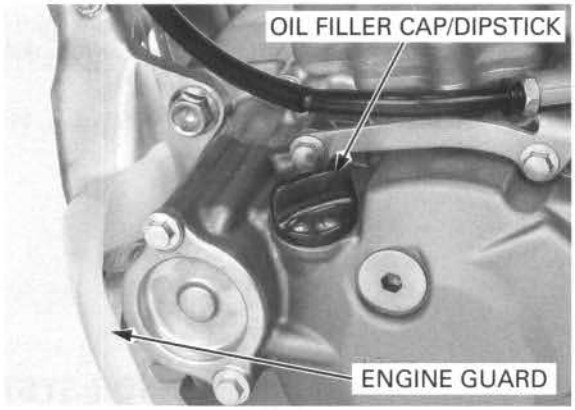
ENGINE OIL & FILTER CHANGE

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

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.

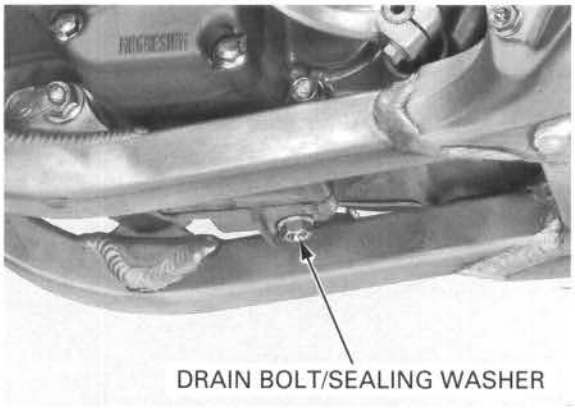
Stop the engine and remove the oil filler cap/dipstick.

Remove the engine guard (page 3-4).

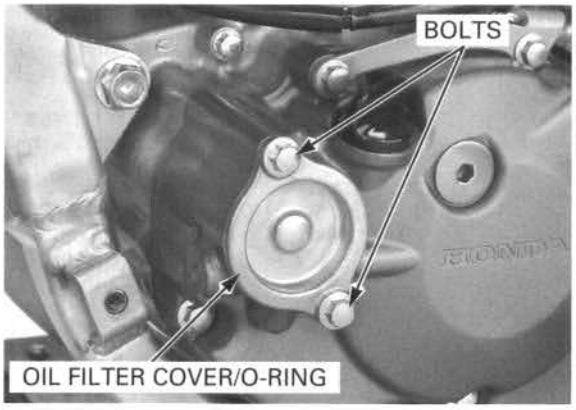


Remove the engine oil drain bolt and sealing washer.
Drain the engine oil.

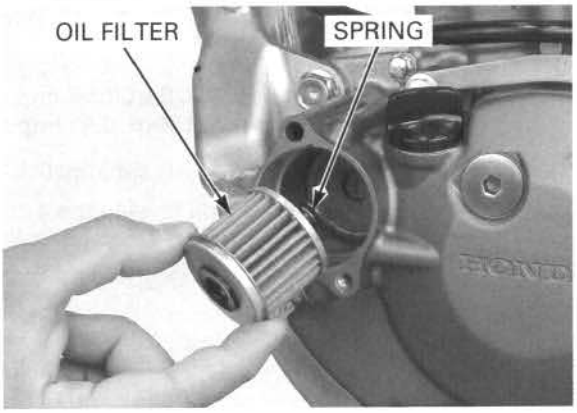
- Operate the kickstarter pedal five times or more while pushing the engine stop button, so the engine oil completely drains.



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

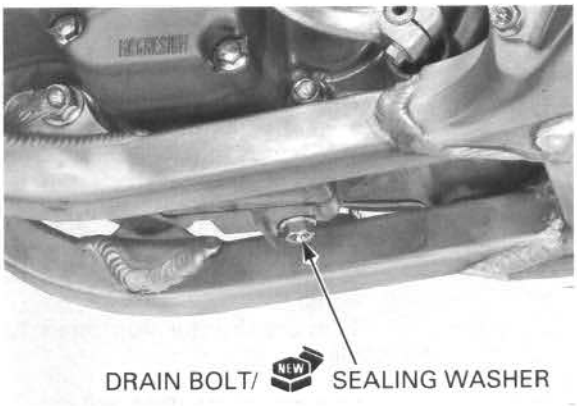


Remove the oil filter and spring.

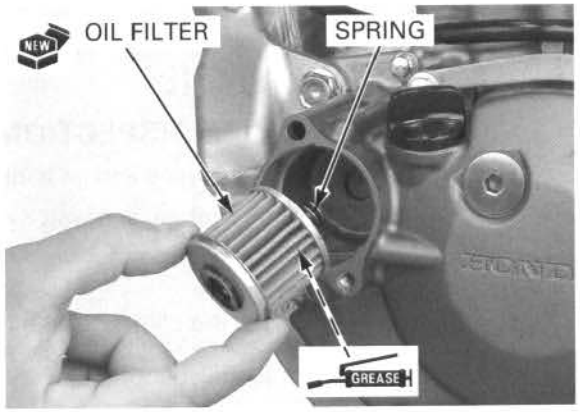


Install the engine oil drain bolt with a new sealing washer.
Tighten the engine oil drain bolt to the specified torque.

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.



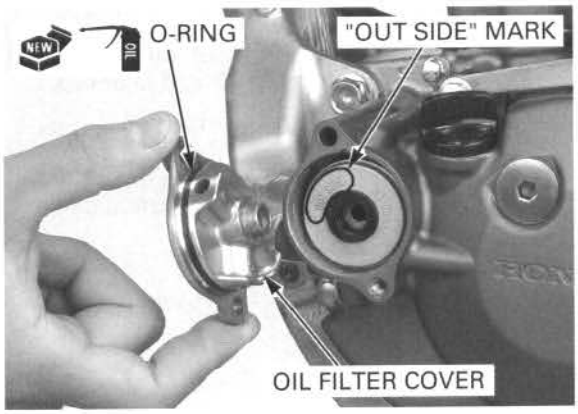
Install the oil filter with the "OUT SIDE" mark facing out.

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 bolt securely.



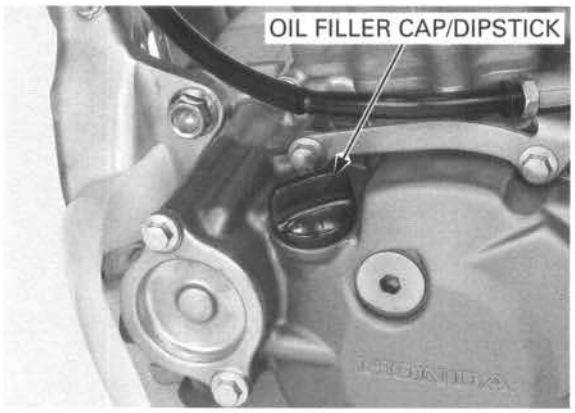
Fill the engine with the recommended oil.

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 4-13).
Make sure there are no oil leaks.

Install the engine guard (page 3-4).

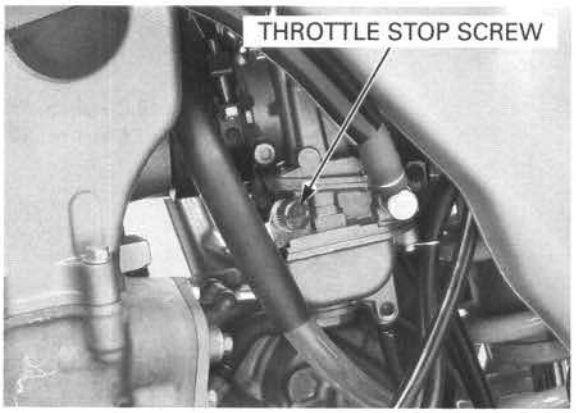


ENGINE IDLE SPEED

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.

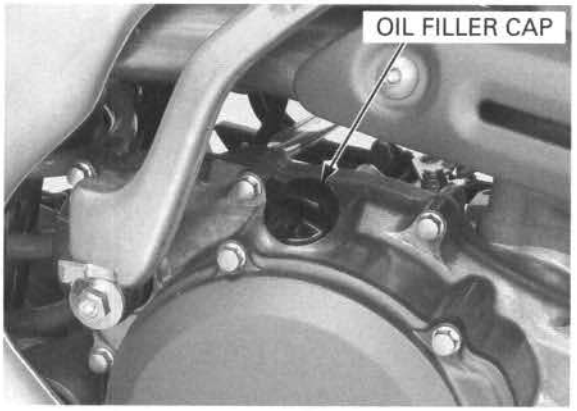
IDLE SPEED: 1,700 ± 100 rpm

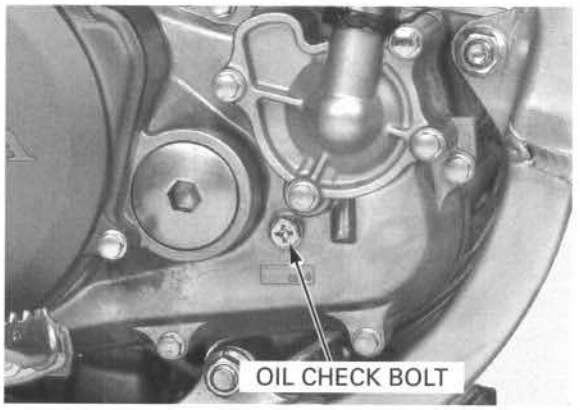


TRANSMISSION OIL

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 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.

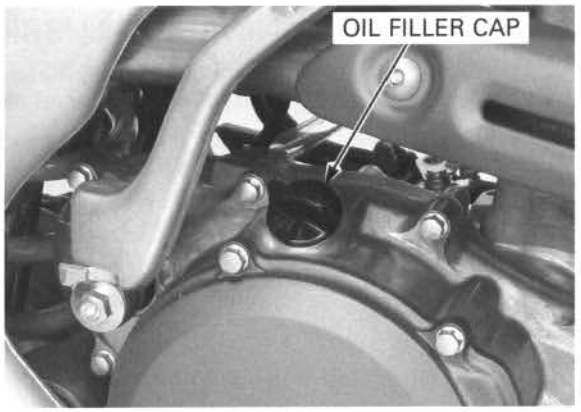
1. Support the motorcycle in an upright position on level surface.
2. Remove the oil filler cap from the right crankcase cover.
3. Place an oil pan under the engine to catch the oil, then remove the drain bolt and washer.
4. After the oil has drained completely, install the drain bolt with a new sealing washer.
   Tighten the transmission oil drain bolt to the specified torque.

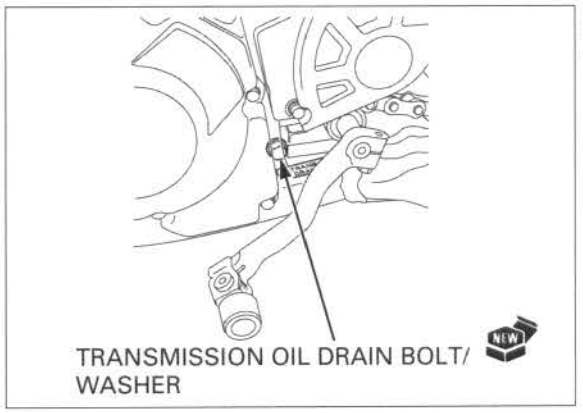
   TORQUE:
   '04 - '06: 22 N·m (2.2 kgf·m, 16 lbf·ft)
   After '06: 16 N·m (1.6 kgf·m, 12 lbf·ft)
5. Add the recommended oil.

   RECOMMENDED TRANSMISSION OIL:
   Pro Honda GN4 4-stroke oil (U.S.A. and Canada) or an equivalent motor oil
   API service classification: SG or higher
   JASO T 903 standard: MA
   Viscosity: SAE 10W-30

   OIL CAPACITY:
   '04:
   0.72 liter (0.76 US qt, 0.63 Imp qt) at draining
   0.77 liter (0.81 US qt, 0.68 Imp qt) at disassembly
   After '04:
   0.60 liter (0.63 US qt, 0.53 Imp qt) at draining
   0.70 liter (0.74 US qt, 0.62 Imp qt) at disassembly

Check the oil level by following steps 1 – 4 in the oil level check procedure (page 4-16).



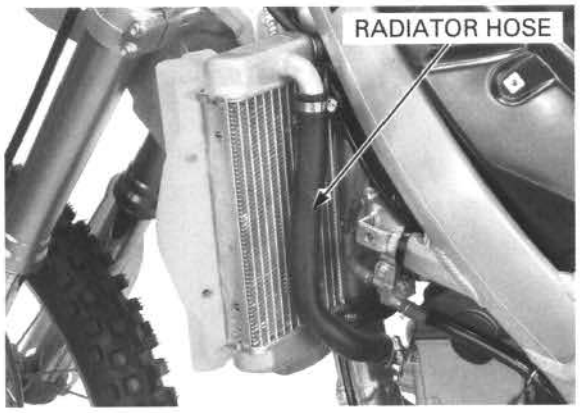


COOLING SYSTEM

Remove the radiator shrouds (page 3-4).

Check the radiator air passage for clogs or damage. Straighten bent fins, and remove insects, mud or other obstructions with compressed air or low water pressure.

Inspect the hoses for cracks and deterioration.
Check the tightness of all hose clamps and fasteners.



DRIVE CHAIN

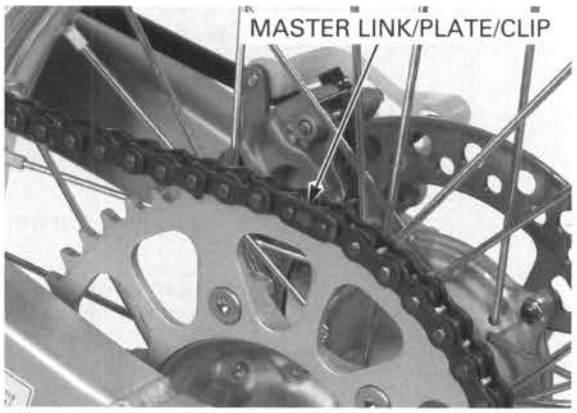
CLEANING AND LUBRICATION

- For maximum service life, the drive chain should be cleaned and lubricated after every ride.

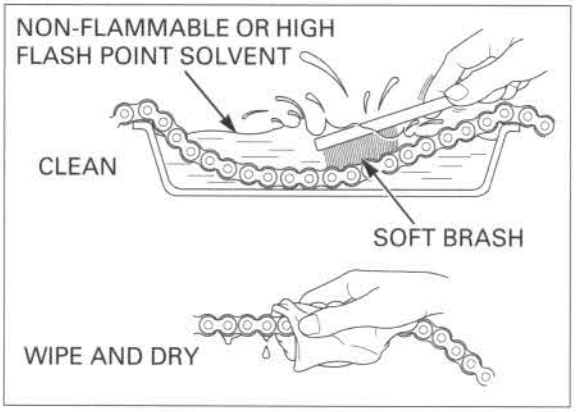
Perform the following service with the engine stopped and the transmission in neutral.
Place a workstand or equivalent under the engine.

Carefully remove the master link clip with pliers.

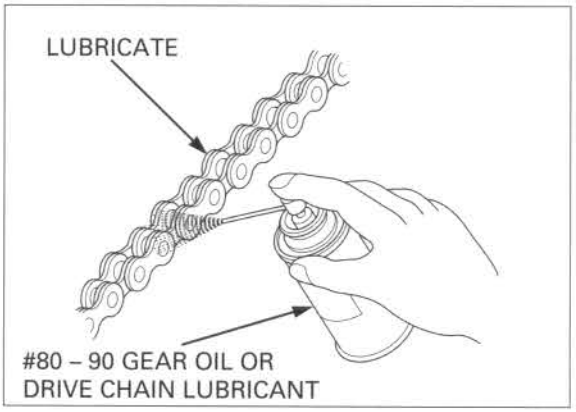
Remove the master link, plate and disconnect the drive chain.



Clean the chain with non-flammable or high flash point solvent and wipe it dry.
Be sure the chain has dried completely before lubricating.
Inspect the drive chain for possible damage or wear. Replace any chain that has damaged rollers, loose fitting links, or otherwise appears unserviceable.
Installing a new chain on badly worn sprockets will cause the new chain to wear quickly.
Inspect and replace sprocket as necessary.



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



Measure the distance between a span of 17 pins (16 pitches) from pin center to pin center.

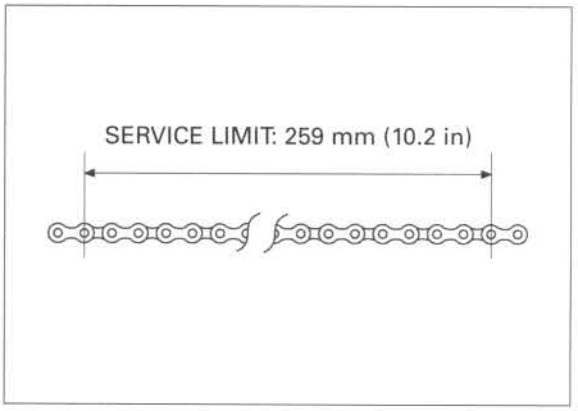
SERVICE LIMIT: 259 mm (10.2 in)

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

REPLACEMENT CHAIN:

DID:

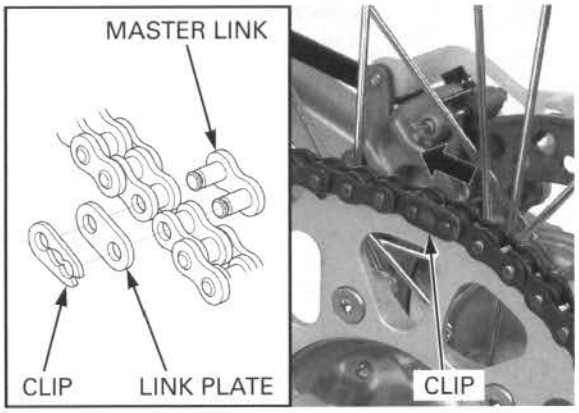
'04 – '08:	**520DMA2-114 links**
After '08:	**520DMA4-114 links**
RK (After '07):	**520TXZ-114 links**



Check the master link clip is in good condition, and replace it if necessary.

Install the drive chain onto the sprockets.
Install the master link and link plate.

Install the open end of the master link clip opposite the direction of chain travel.



DRIVE CHAIN SLACK INSPECTION

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

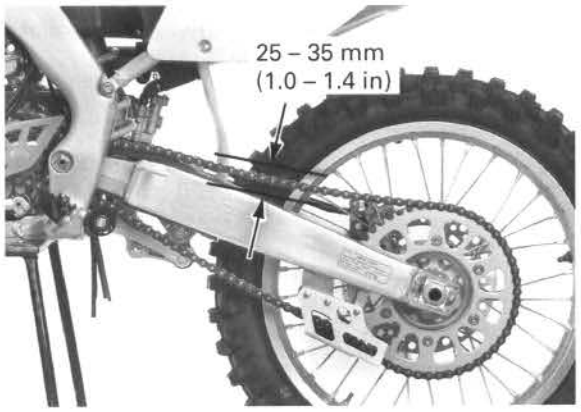
Raise the rear wheel off the ground by placing a workstand under the engine.

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



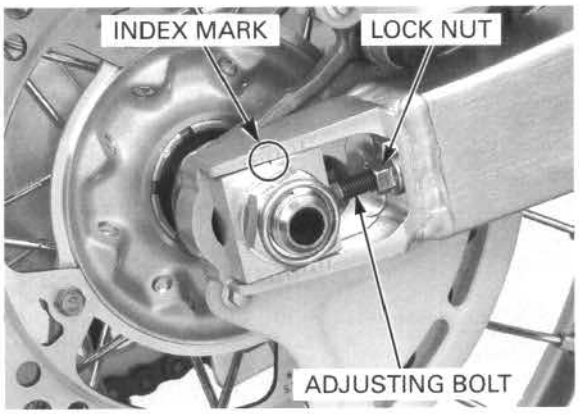
ADJUSTMENT

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: 128 N·m (13.1 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.



DRIVE CHAIN SLIDER

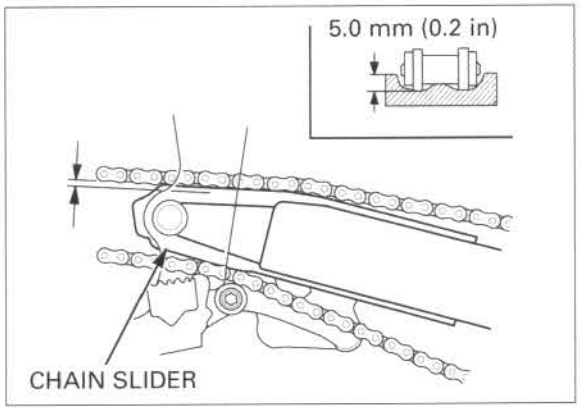
CHAIN SLIDER

Inspect the drive chain sliders for excessive wear.

SERVICE LIMIT: 5.0 mm (0.2 in) from upper surface

NOTICE

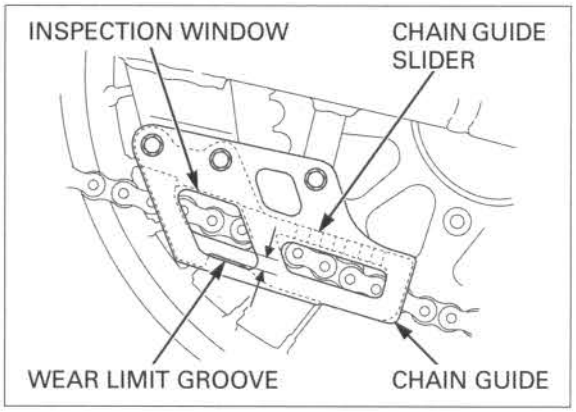
If the chain slider becomes worn through to the swingarm, the chain will wear against the swingarm, damaging the chain and swingarm.



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

Replace the chain guide if it is damaged or worn.

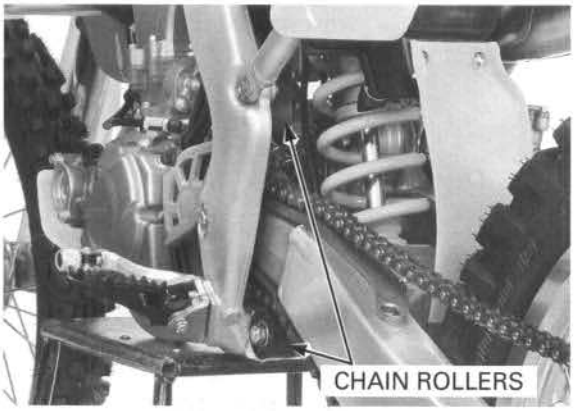
Replace the chain guide slider if the slider is worn to the bottom of the wear limit groove.



DRIVE CHAIN ROLLER

Inspect the drive chain rollers for excessive wear, crack or binding.

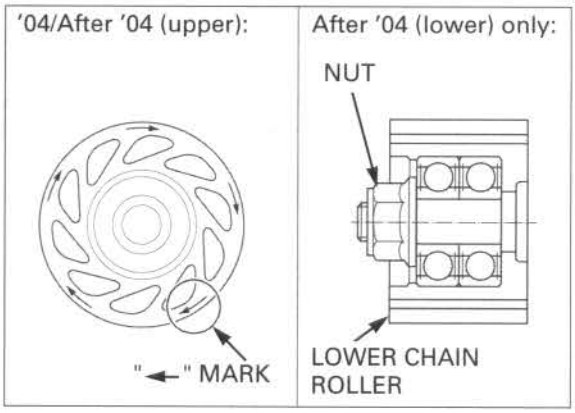
SERVICE LIMIT:
Minimum roller O.D.:
'04: 39 mm (1.5 in)
After '04: Upper: 38 mm (1.5 in)
Lower: 31 mm (1.2 in)



Replace the drive chain 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)

NOTE:
- Install the drive chain rollers as follows:
  - Lower: Black roller
  - Upper: Green roller
- Install the drive chain roller with the "→" mark facing out.
- Install the lower drive chain roller as shown (After '04 only).

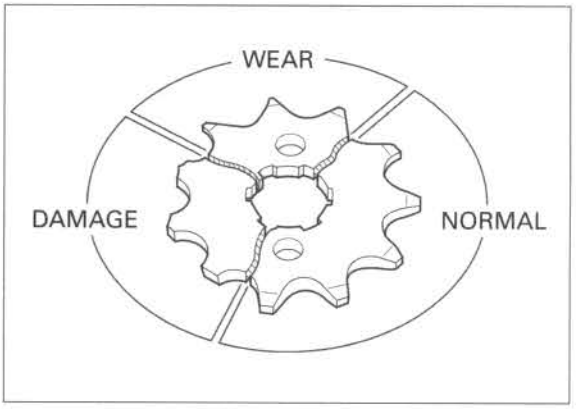


DRIVE/DRIVEN SPROCKET

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)



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 4-22).
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 4-21).

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 4-22).

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 4-22).

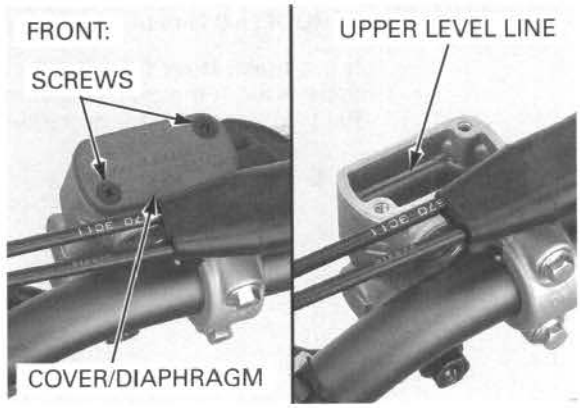
FLUID FILLING

FRONT:

Remove the screws, cover and diaphragm and 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: 1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)

Check the entire system for leaks.



REAR:

Remove the bolts, cover, plate and diaphragm and 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.

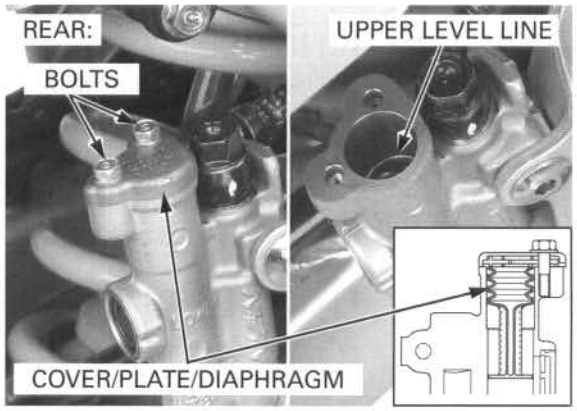
Tighten the bolts to the specified torque.

TORQUE: 1.0 N·m (0.1 kgf·m, 0.7 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.

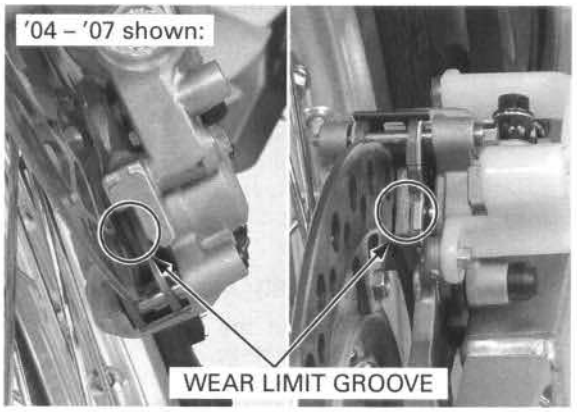
Replace the hose and fittings as required.



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.

Refer to page 15-10 for brake pad replacement.



BRAKE SYSTEM

LEVER POSITION INSPECTION

'04 - '06

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

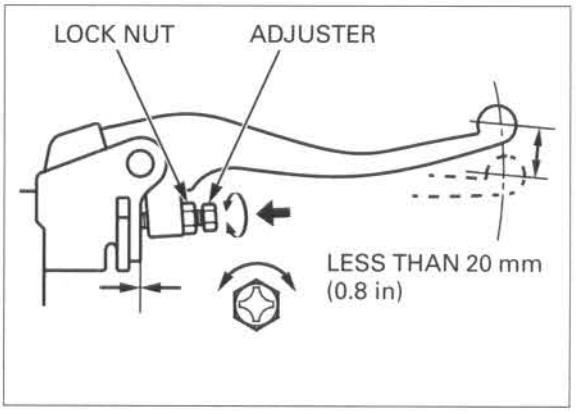
Turning the adjuster clockwise moves the brake lever farther away from the grip; turning the adjuster counterclockwise moves the brake lever closer to the grip.

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, 4.4 lbf·ft)

If the brake lever freeplay exceeds 20 mm (0.8 in), there is air in the system that must be bled.
Refer to page 15-7 for brake system bleeding.



AFTER '06

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

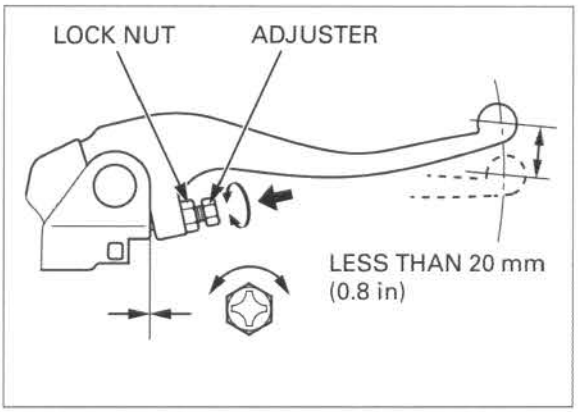
Turning the adjuster clockwise moves the brake lever farther away from the grip; turning the adjuster counterclockwise moves the brake lever closer to the grip.

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, 4.4 lbf·ft)

If the brake lever freeplay exceeds 20 mm (0.8 in), there is air in the system that must be bled.
Refer to page 15-7 for brake system bleeding.



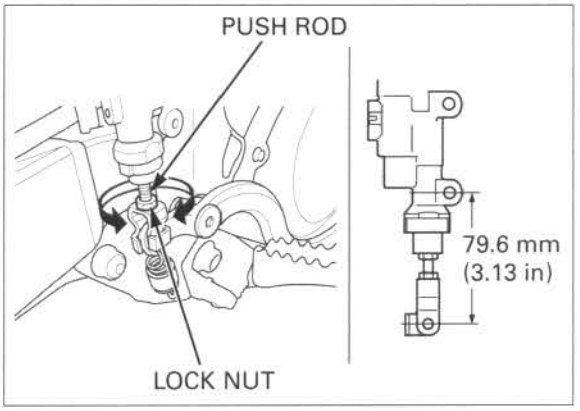
BRAKE PEDAL HEIGHT

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.

TORQUE: 5.9 N·m (0.6 kgf·m, 4.4 lbf·ft)



CLUTCH SYSTEM

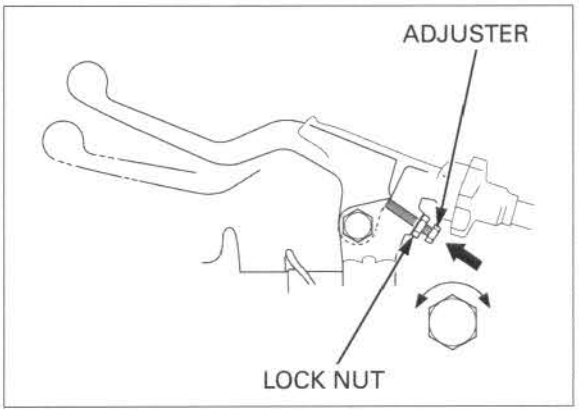
CLUTCH LEVER POSITION

Make sure to adjust the clutch lever freeplay after the clutch lever position adjustment or when the clutch cable is disconnected.

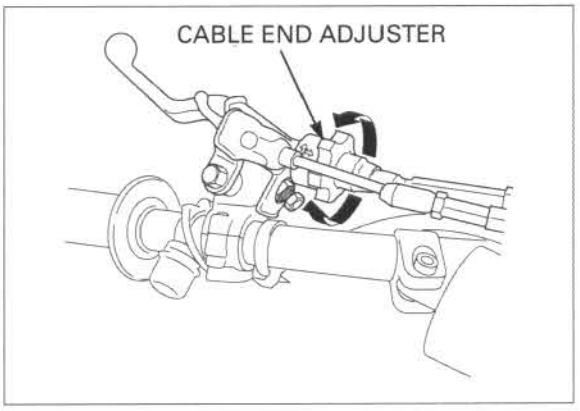
The clutch lever position can be adjusted by loosening the lock nut and turning the adjuster.
Turning the adjust bolt counterclockwise moves the clutch lever farther away from the grip; turning the adjuster clockwise moves the clutch lever closer to grip. Tighten the lock nut securely.

NOTICE

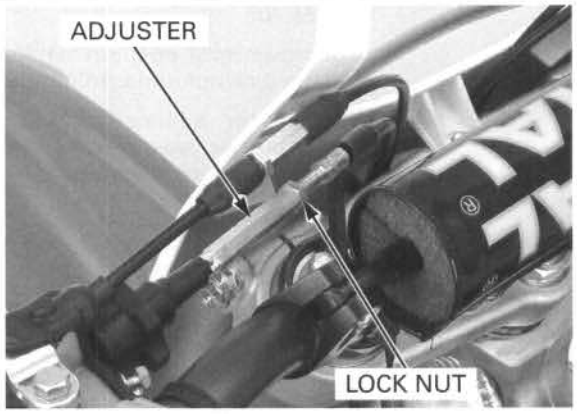
Failure to check the clutch lever freeplay may result in damaged clutch plate.



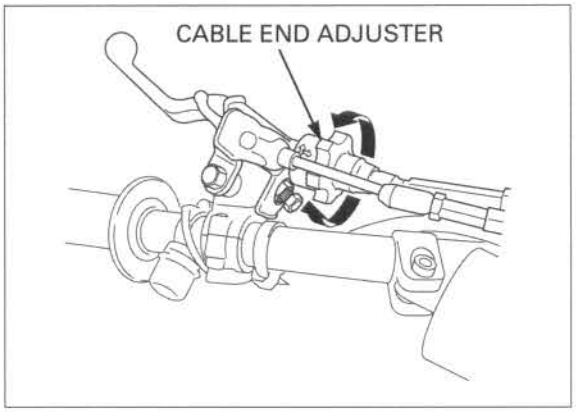
Turn the cable end adjuster counterclockwise until it seats lightly and then turn it out 5 turns.



Loosen the lock nut and turn the cable adjuster to adjust the clutch lever freeplay 10 – 20 mm (3/8 – 13/16 in) at the tip of lever. Tighten the lock nut.



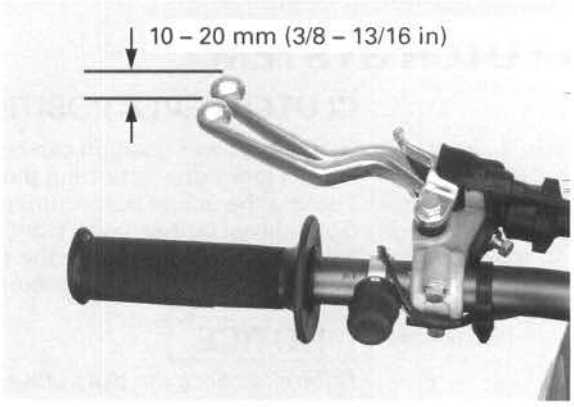
Adjust the clutch cable end adjuster for minor adjustment.



CLUTCH LEVER FREEPLAY

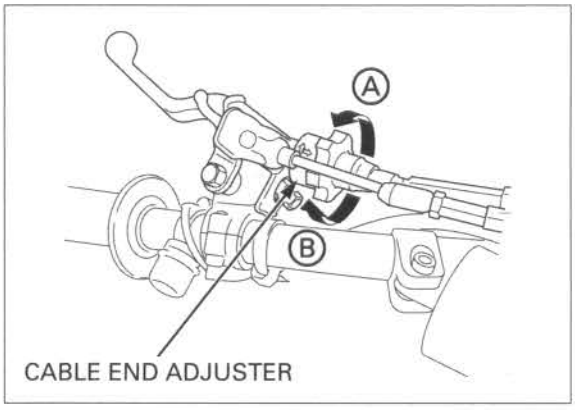
Measure the clutch freeplay at the lever end.

FREEPLAY: 10 – 20 mm (3/8 – 13/16 in)



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

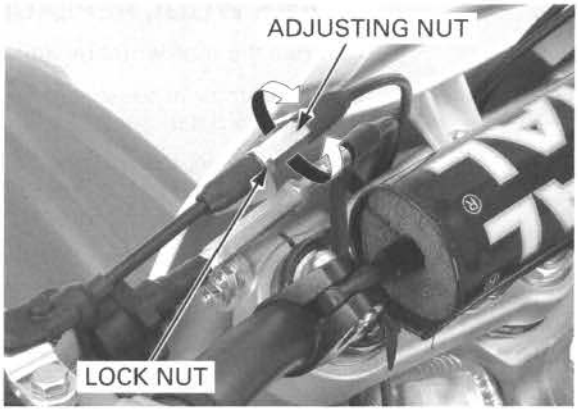
Turning the cable end adjuster in direction A will increase freeplay and turning it in direction B will decrease freeplay.
If the adjuster is threaded out near its limit and the correct freeplay cannot be reached, turn the adjuster in direction A until it seats lightly and then turn it out one turn in direction B.
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 freeplay cannot be obtained using both procedures or the clutch slips during the test ride, disassemble and inspect the clutch (page 11-9).



CONTROL CABLES

Remove the throttle housing bolts.
Disconnect the throttle cable end from the throttle pipe and remove the throttle housing.

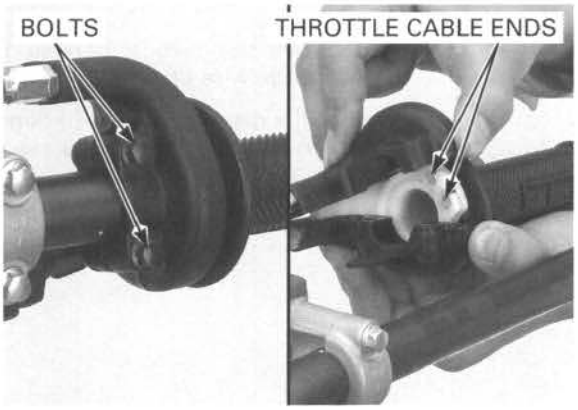
Disconnect the clutch cable upper end and the hot start cable upper end from the levers.

It is not necessary to lubricate the entire cable.

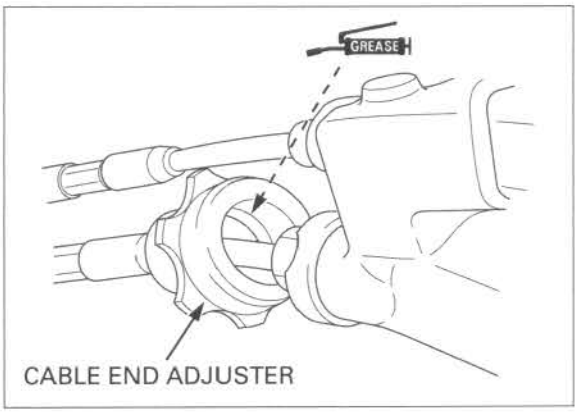
Thoroughly lubricate the cable ends with a commercially available cable lubricant.

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.



Remove the clutch cable end adjuster.
Apply grease to the clutch cable end inside surface.

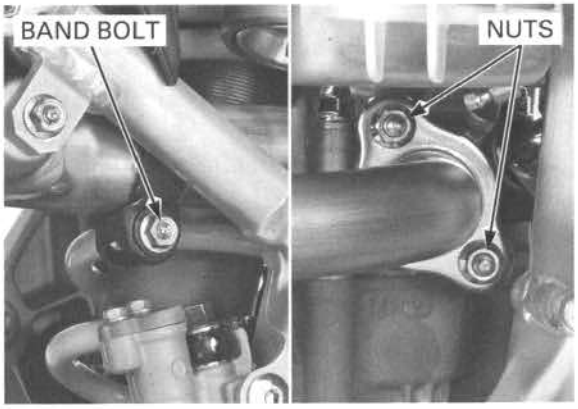


EXHAUST PIPE/MUFFLER

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)



GLASS WOOL REPLACEMENT: '04, '05

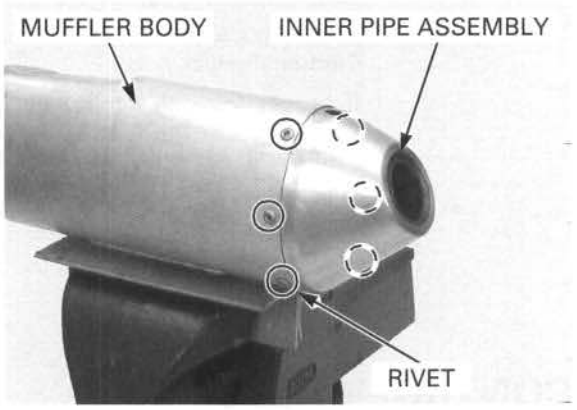
Remove the muffler (page 3-9).

Do not overtighten the vise and distort the muffler mounting tab.

Set the muffler in a vise with a piece of wood or soft jaws to avoid damage.

Remove the six rivets using a 5 mm drill.
Pull out the inner pipe assembly from the muffler body.

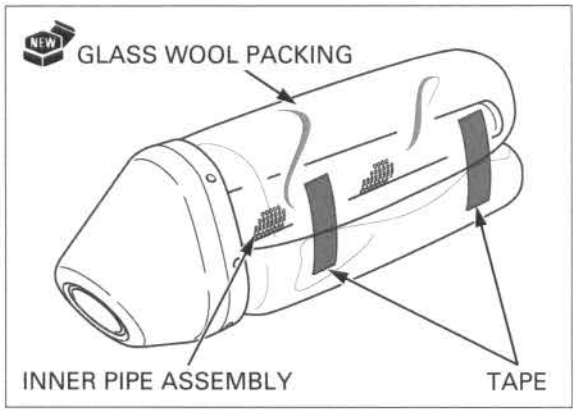
- Be careful not to damage the rivet holes, muffler body and inner pipe assembly.



Remove the glass wool packing from the inner pipe assembly.
Remove the carbon deposit from the inner pipe using the wire brush.

Be careful not to damage the glass wool.

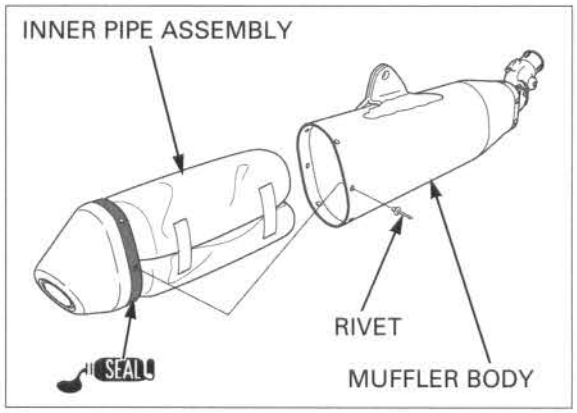
Install a new glass wool packing onto the inner pipe assembly, and hold the glass wool packing with a tape as shown.



Apply muffler sealant (high-temperature silicone) to the inner pipe assembly as shown.

Install the inner pipe assembly into the muffler body and align the rivet holes.
Install the rivets.

Install the muffler (page 3-9).



GLASS WOOL REPLACEMENT: '06

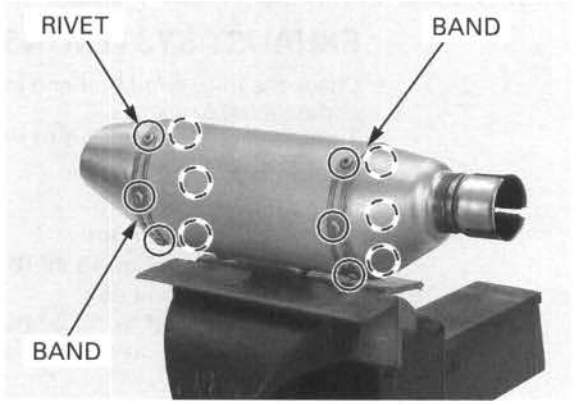
Remove the mufflers (page 3-9).

Do not overtighten the vise and distort the muffler mounting tab.

Set the muffler in a vise with a piece of wood or soft jaws to avoid damage.

Remove the rivets and muffler bands using a 5 mm drill.
Pull out the inner pipe assembly from the muffler body.

- Be careful not to damage the rivet holes.

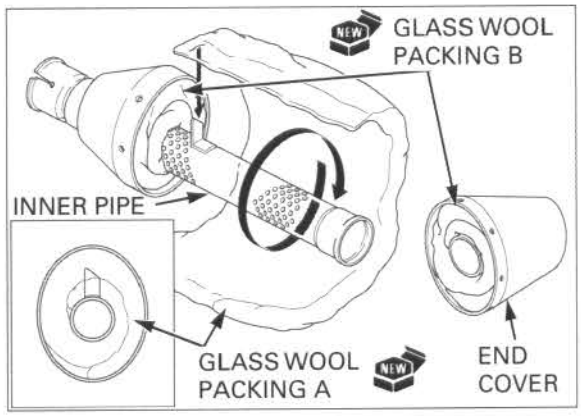


Remove the glass wool packing from the inner pipe and end cover.
Remove the carbon deposit from the inner pipe using the wire brush.

Be careful not to damage the glass wool.

Install new glass wool packing B into the inner pipe and end cover as shown.

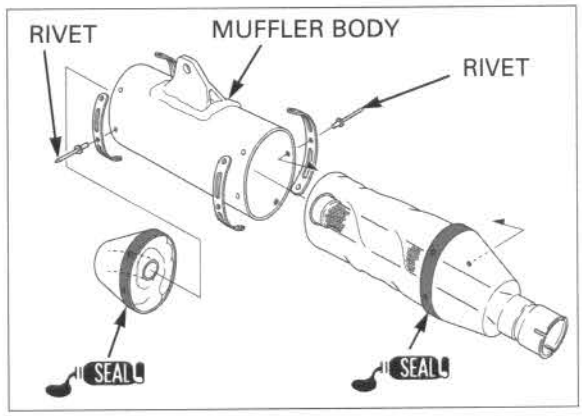
Install a new glass wool packing A onto the inner pipe as shown.



Apply muffler sealant (high-temperature silicone) to the inner pipe assembly and end cover as shown.

Install the inner pipe and end cover to the muffler body and align the rivet holes.
Install the rivets.

Install the mufflers (page 3-9).



GLASS WOOL REPLACEMENT: AFTER '06

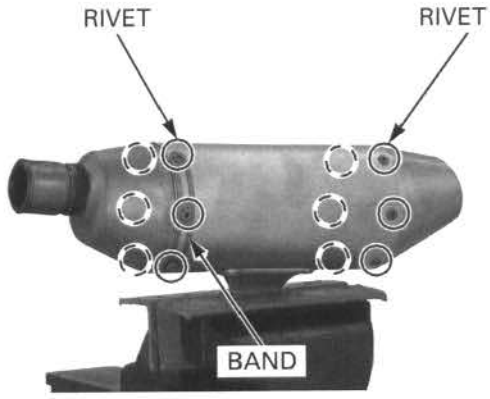
Remove the mufflers (page 3-9).

Do not overtighten the vise and distort the muffler mounting tab.

Set the muffler in a vise with a piece of wood or soft jaws to avoid damage.

Remove the rivets and muffler band using a 5 mm drill.
Pull out the inner pipe assembly from the muffler body.

- Be careful not to damage the rivet holes.

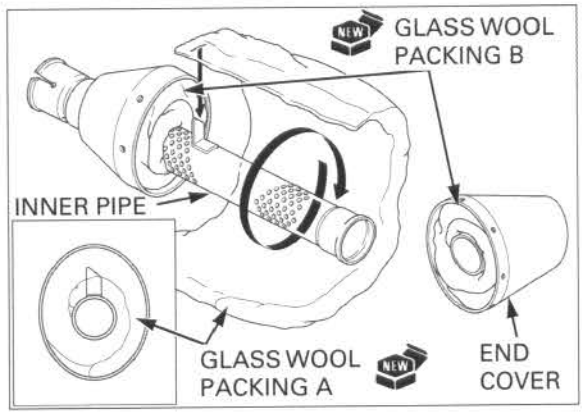


Remove the glass wool packing from the inner pipe and end cover.
Remove the carbon deposit from the inner pipe using the wire brush.

Be careful not to damage the glass wool.

Install new glass wool packing B into the inner pipe and end cover as shown.

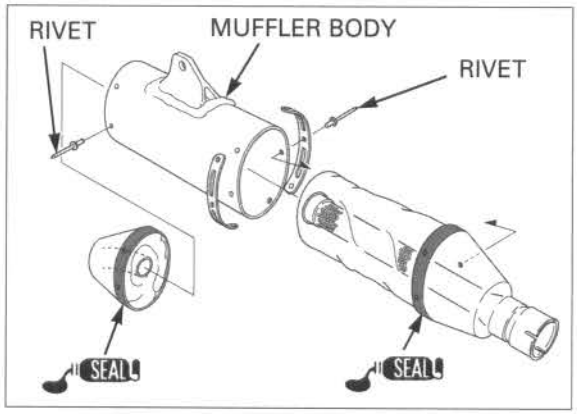
Install a new glass wool packing A onto the inner pipe as shown.



Apply muffler sealant (high-temperature silicone) to the inner pipe assembly and end cover as shown.

Install the inner pipe and end cover to the muffler body and align the rivet holes.
Install the rivets.

Install the mufflers (page 3-9).



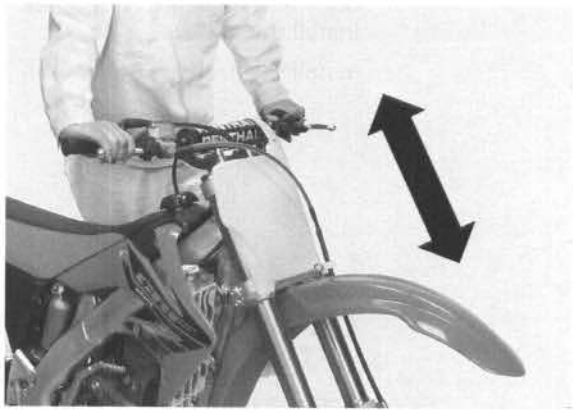
SUSPENSION

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.

Refer to page 13-19 for fork service.

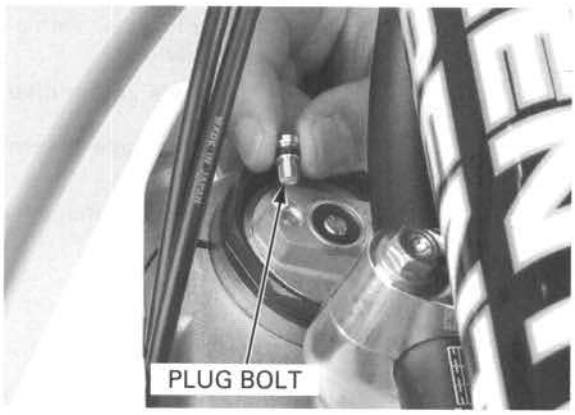


Air pressure acts as a progressive spring and affects the entire range of fork travel.

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.

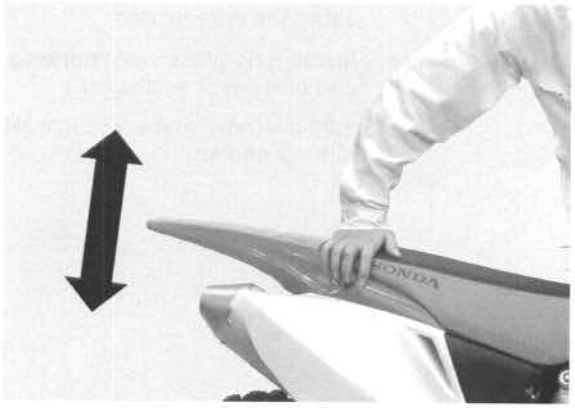
Release built-up air pressure from the fork legs after practice and between heats.
Be sure the fork is fully extended with the front tire off the ground.
Loosen the plug bolt fully, then tighten them.

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



REAR SUSPENSION INSPECTION

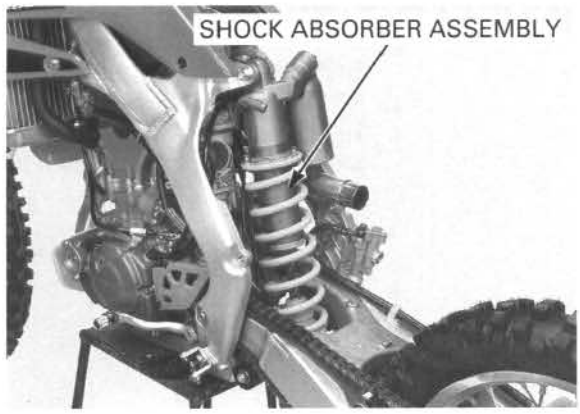
Check the action of the shock absorber by compressing it several times.



Remove the sub-frame (page 3-6).

Check the entire shock absorber assembly for signs of leaks, damage or loose fasteners.
Replace damaged components which cannot be repaired.
Tighten all nuts and bolts.

Refer to page 14-14 for shock absorber service.



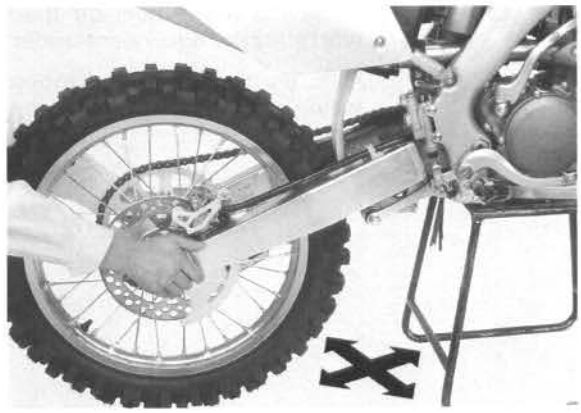
SWINGARM/SHOCK LINKAGE

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

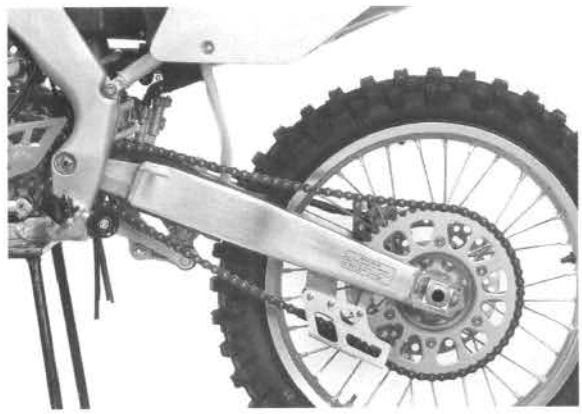
Check for worn swingarm bearings by grabbing the rear swingarm and attempting to move the swingarm side-to-side.

Replace the bearings if excessively worn (page 14-36).

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 14-30).
Lubricate and reassemble.



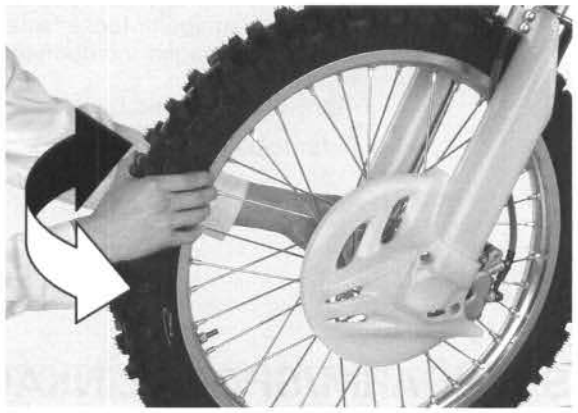
NUTS, BOLTS, FASTENERS

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

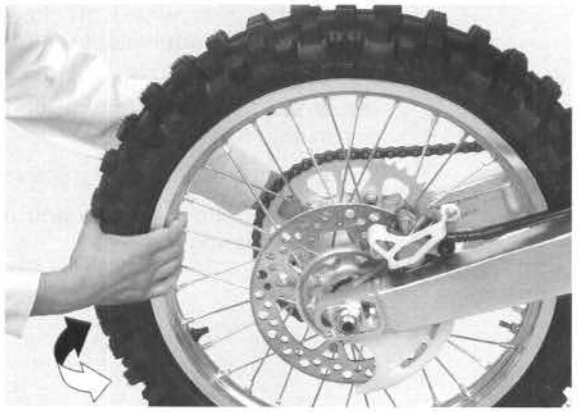
Raise the front wheel off the ground by placing a work stand or equivalent under the engine.

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.

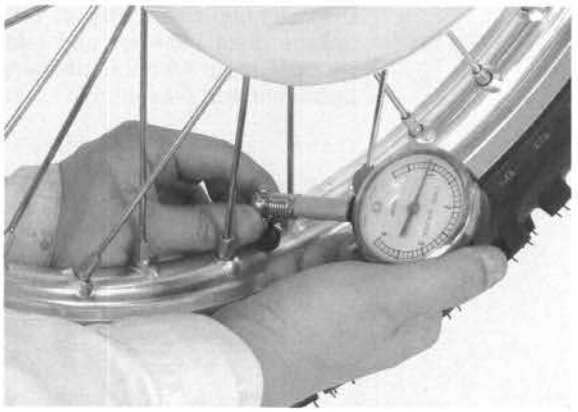


Check the tires for cuts, embedded nails, or other damage.
Check the front wheels for trueness (page 13-5).
Check the rear wheels for trueness (page 14-3).

Tire pressure should be checked when the tires are cold.

Check the cold tire pressure.

TIRE PRESSURE:
FRONT: 98 kPa (1.0 kgf/cm², 14 psi)
REAR: 98 kPa (1.0 kgf/cm², 14 psi)

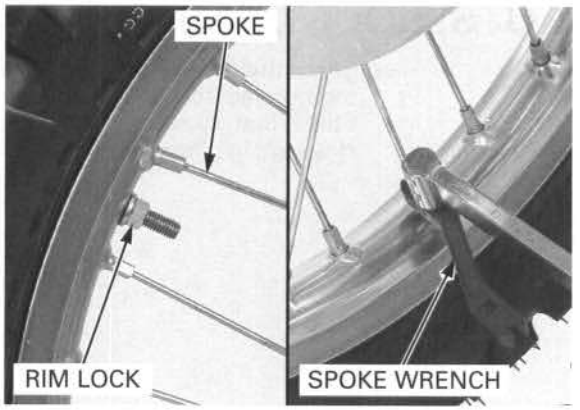


Inspect the wheel rims and spokes for damage. Tighten any loose spokes and rim locks to the specified torque.

TOOLS:

Spoke wrench, 6.1 mm	**07JMA-MR60100 or 07701-0020300 (6.1 mm)**
Spoke wrench, 6.6 mm	**070MA-KZ30100**

TORQUE:
SPOKE: 3.7 N·m (0.4 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.

'04 - '07:

If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (page 13-55).

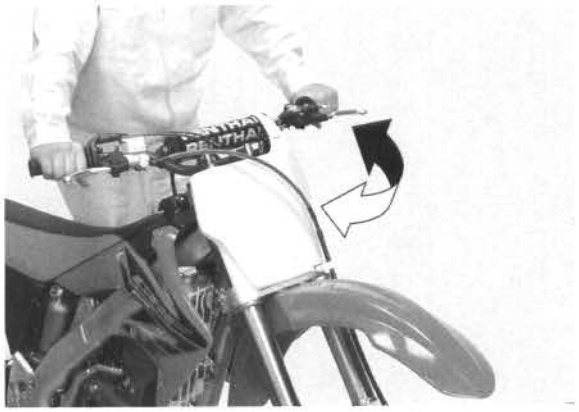
After '07:

If the handlebar moves unevenly, binds, or has vertical movement, remove the steering damper and then inspect the steering head bearings.

- Steering damper removal/installation (page 13-44)
- Steering head bearing replacement (page 13-55)

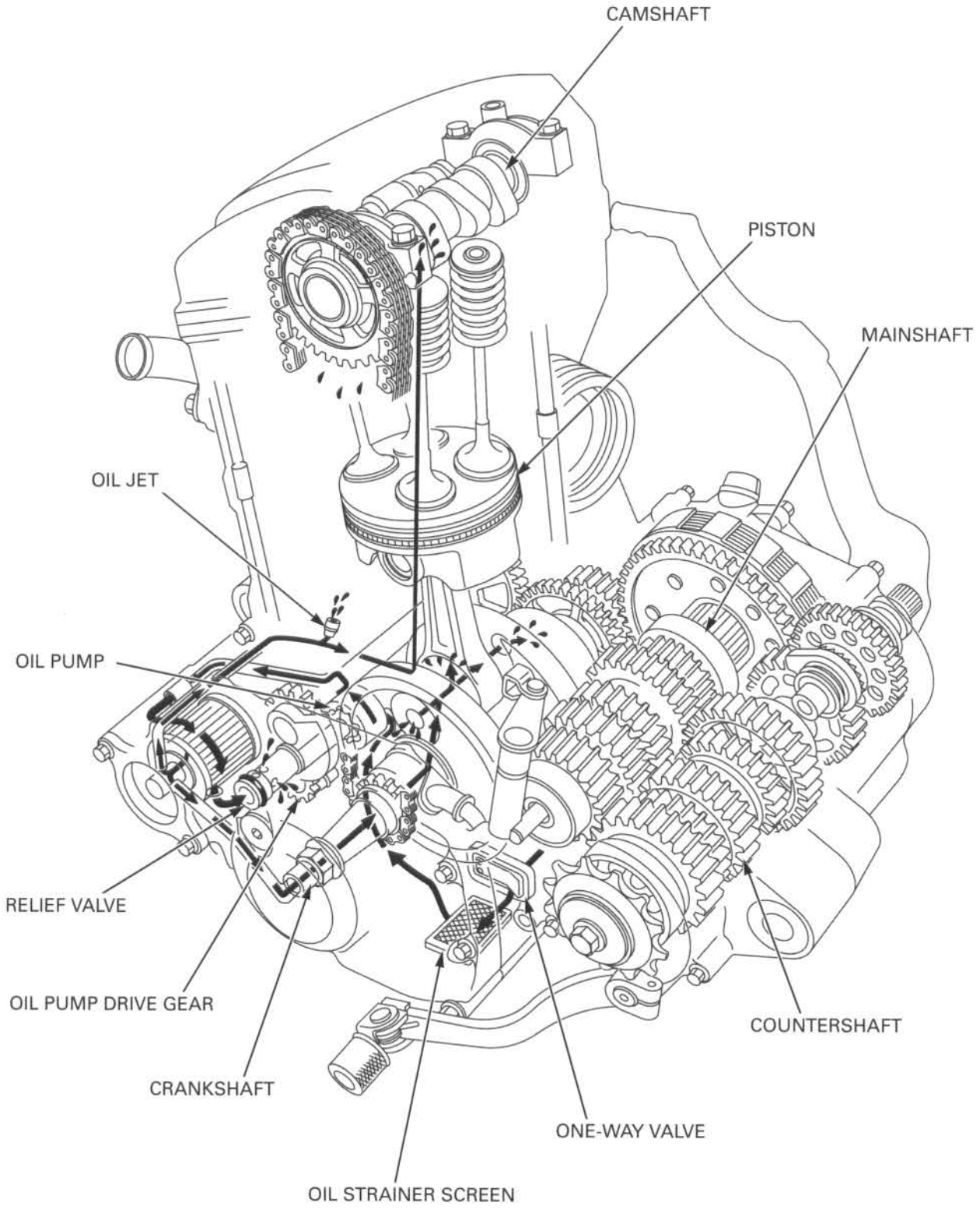
Inspect the steering damper (page 13-45) in case of no faulty parts at steering.

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



5. 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 preformed 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

Unit: mm (in)

ITEM			STANDARD	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	'04	0.72 liter (0.76 US qt, 0.63 Imp qt)	–
		After '04	0.60 liter (0.63 US qt, 0.53 Imp qt)	–
	At disassembly	'04	0.77 liter (0.81 US qt, 0.68 Imp qt)	–
		After '04	0.70 liter (0.74 US qt, 0.62 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 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 10 W-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 – 0.22 (0.002 – 0.009)	–

TORQUE VALUES

Engine oil drain bolt ('04 - '06)	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Engine oil drain bolt (After '06)	16 N·m (1.6 kgf·m, 12 lbf·ft)	
Oil jet ('04)	2.0 N·m (0.2 kgf·m, 1.5 lbf·ft)	Apply locking agent to the threads
Oil jet mounting bolt (After '04)	10 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

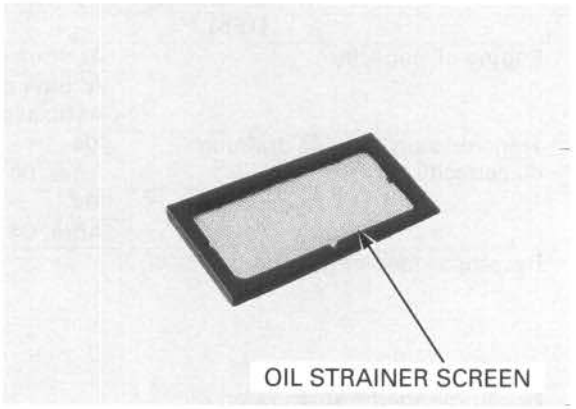
OIL STRAINER

REMOVAL/INSPECTION

Drain the engine oil (page 4-14).
Remove the left crankcase cover (page 16-10).

Remove the oil strainer screen.

Check the oil strainer screen for damage or clogs.

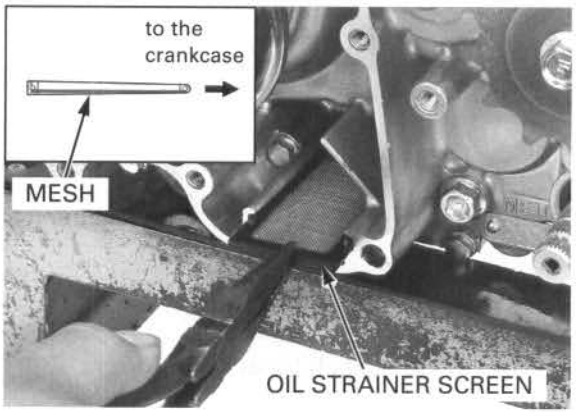


INSTALLATION

Install the oil strainer screen to the crankcase as shown.

Install the left crankcase cover (page 16-13).

Fill the engine with the recommended oil (page 4-13).

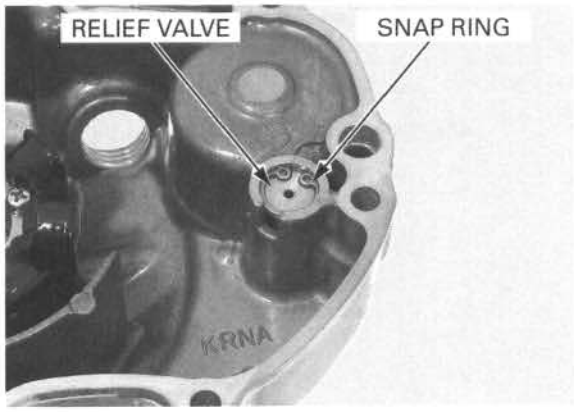


OIL RELIEF VALVE

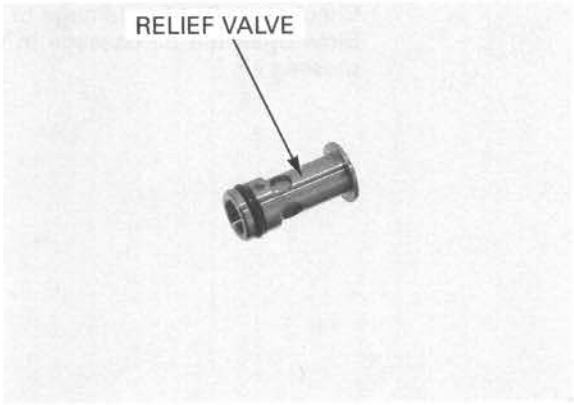
REMOVAL/INSPECTION

Drain the engine oil (page 4-14).
Remove the left crankcase cover (page 16-10).

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



Check the relief valve for damage or clogs.

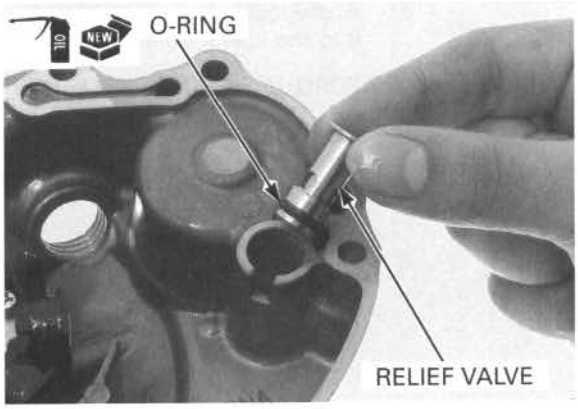


INSTALLATION

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 16-13).

Fill the engine with the recommended oil (page 4-16).



OIL JET

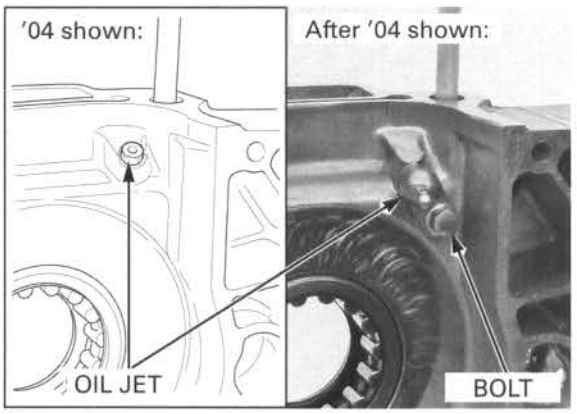
REMOVAL/INSPECTION

Separate the left and right crankcase halves (page 12-9).

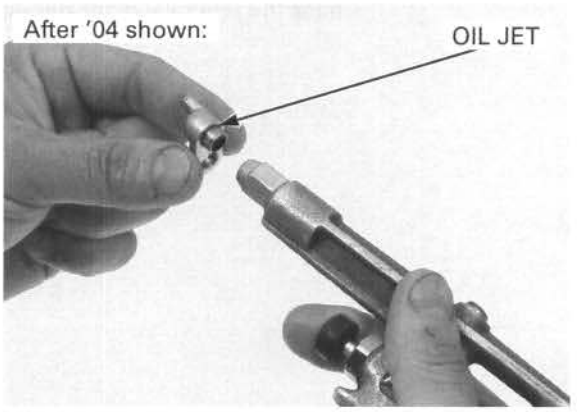
'04: Remove the oil jet from the left crankcase.

After '04: Remove the bolt and oil jet from the left crankcase.

Check the left crankcase oil passage for clogging. Clean the oil passage.



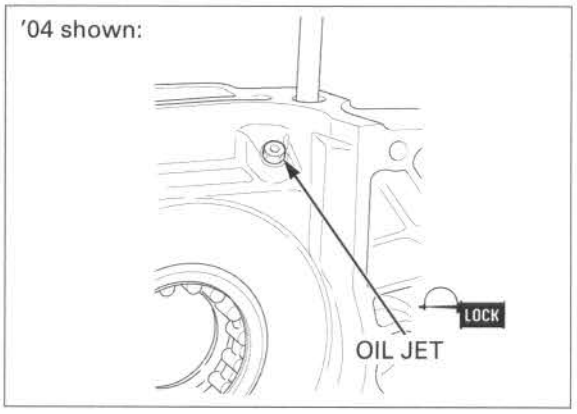
Check the oil jet for damage or clogging.
Blow open the oil passage in the oil jet with compressed air.



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, 1.5 lbf·ft)

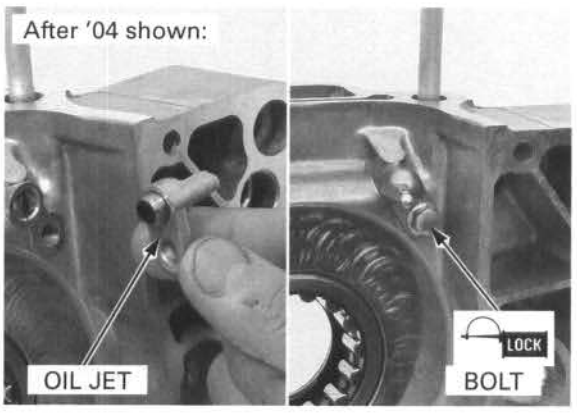


After '04: Install the oil jet onto the left crankcase.

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

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Assemble the left and right crankcase (page 12-25).



OIL PUMP

DISASSEMBLY

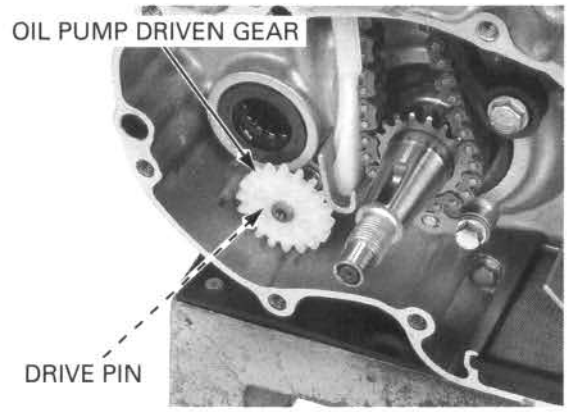
Remove the engine from the frame (page 8-5).

Remove the following:

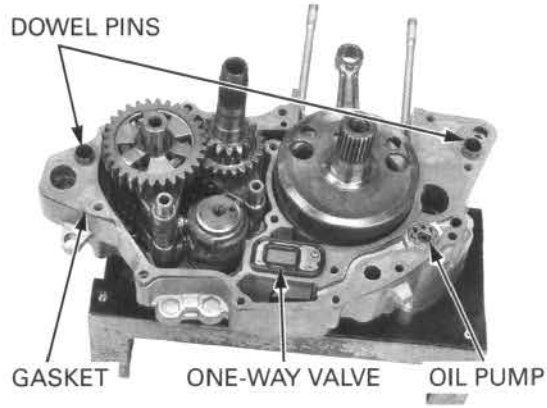
- Left crankcase cover (page 16-10)
- Flywheel (page 16-11).
- Balancer (page 12-7).

Remove the oil pump driven gear and drive pin.

Separate the left and right crankcase halves (page 12-9).



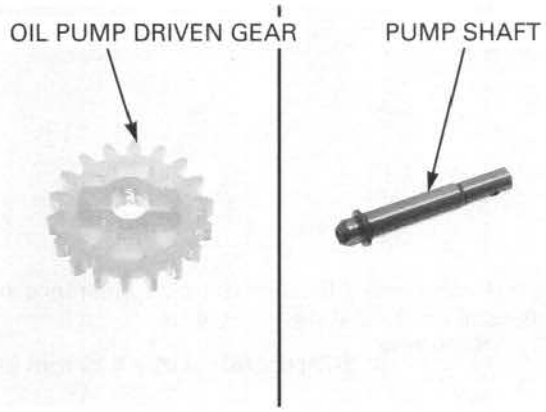
Remove the gasket and dowel pins.
Remove the oil pump inner/outer rotor and shaft.
Remove the one-way valve.



INSPECTION

Check the oil pump driven gear for wear or damage.

Check the oil pump shaft for wear or damage.



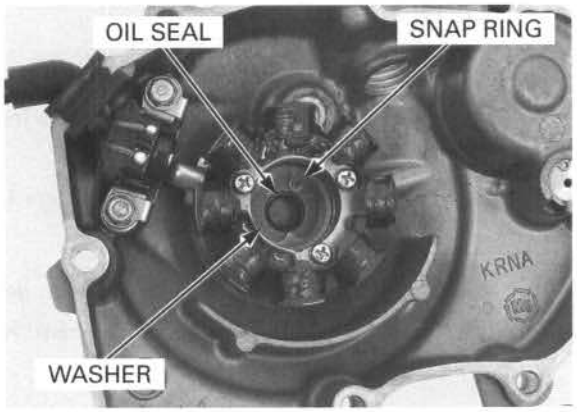
Check the one-way valve for wear or damage, replace if necessary.
Check the reed for damage or fatigue, and replace the one-way valve if necessary.

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.

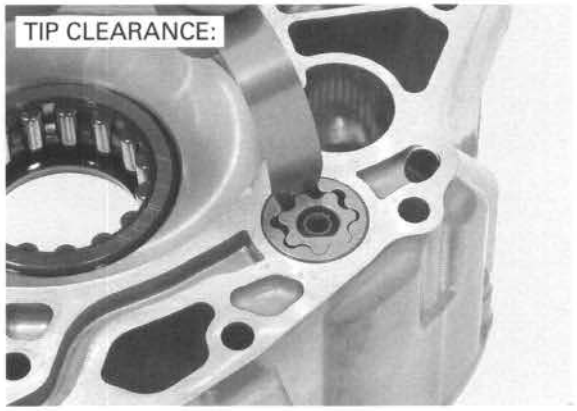
Check that the washer and snap ring are installed in the left crankcase cover securely.



Temporarily install the oil pump shaft.
Install the outer and inner rotors into the crankcase.

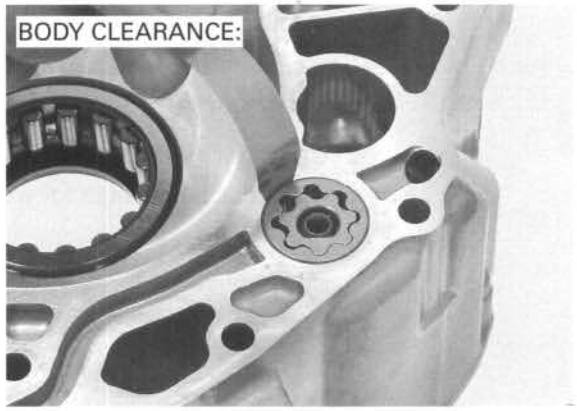
Measure the tip clearance.

SERVICE LIMIT: 0.20 mm (0.008 in)



Measure the body clearance.

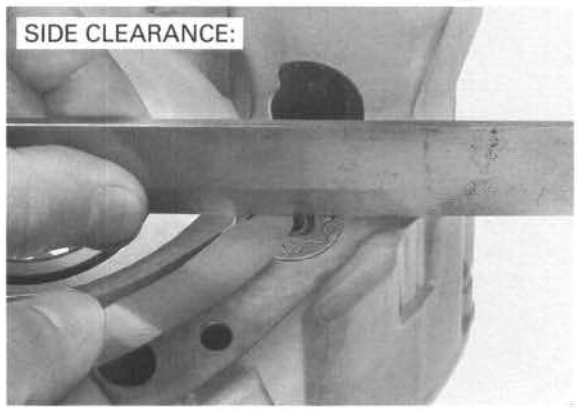
STANDARD: 0.15 – 0.20 mm (0.006 – 0.008 in)



Measure the clearance with the gasket installed.

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

STANDARD: 0.05 – 0.22 mm (0.002 – 0.009 in)

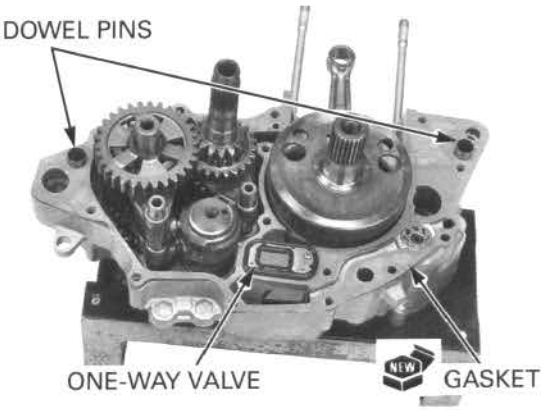


ASSEMBLY

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 a new gasket and dowel pins.

Assemble the left and right crankcase (page 12-25).

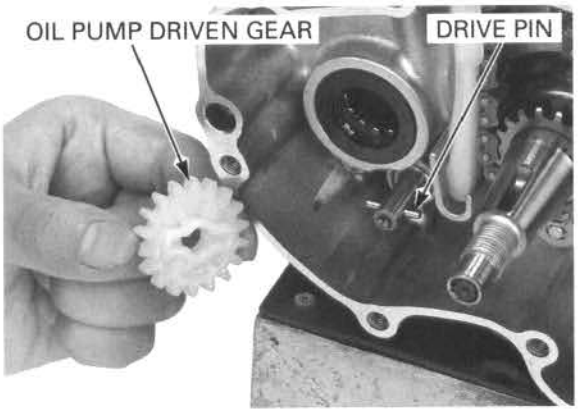


Install the drive pin into the oil pump shaft.
Install the oil pump driven gear aligning its cut-outs with the drive pin.

Install the following:

- Balancer (page 12-8).
- Flywheel (page 16-12).
- Left crankcase cover (page 16-13)

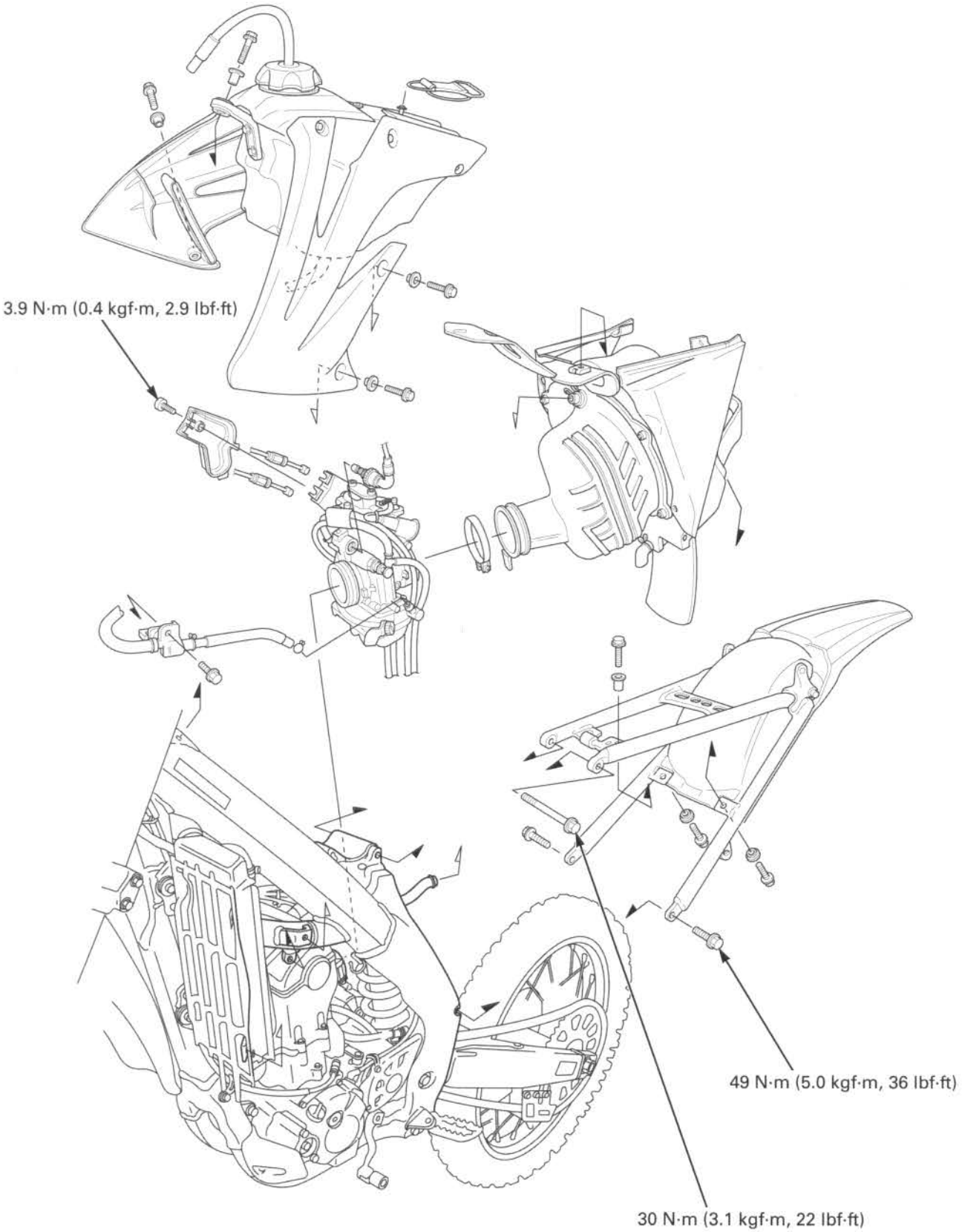
Install the engine to the frame (page 8-6).



6. FUEL SYSTEM

COMPONENT LOCATION

'04, '05 model shown:



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.
- Removal and Installation the followings.
  - Fuel tank (page 3-7)
  - Sub-frame (page 3-6)
- 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 bolt, loosen the screw and drain the carburetor.
- When disassembling the fuel system parts, note the locations of the O-rings. Replace them with new ones on reassembly.
- After removing the carburetor, wrap the intake port of the engine with a shop towel or cover it with a piece of tape to prevent any foreign material from dropping into the engine. Be sure to remove the cover when reinstalling the carburetor.
- 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

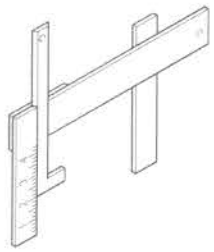
ITEM		SPECIFICATIONS
Fuel tank capacity		7.3 liter (1.93 US gal, 1.61 Imp gal)
Carburetor identification number	'04	FCR01A
	'05	FCR01B
	'06	FCR01C
	'07	FCR01D
	'08	FCR01E
	After '08	FCR01F
Main jet	'04	#160
	'05 - '06	#172
	'07	#175
	'08	#188
	After '08	#185
Slow jet	'04 and '06	#40
	'05 and After '06	#42
Jet needle	'04	NCYR
	'05	NCYQ
	'06	NHFS
	'07	NKBT
	'08	NMGU
	After '08	NNSU
Jet needle clip position (Standard)	'04	4th from the top
	After '04	3rd from the top
Pilot screw initial opening	'04 and '07	2-1/4 turns out
	'05 and '06	1-3/4 turns out
	'08	1-7/8 turns out
	After '08	1-1/4 turns out
Float level	'04 - '05	8.0 mm (0.31 in)
	After '05	6.0 mm (0.24 in)
Idle speed		1,700 ± 100 rpm
Throttle grip freeplay		3 – 5 mm (1/8 – 3/16 in)
Hot starter lever freeplay		2 – 3 mm (1/16 – 1/8 in)

TORQUE VALUES

Rear fender mounting bolt		13 N·m (1.3 kgf·m, 10 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)	
Shock absorber upper mounting nut		44 N·m (4.5 kgf·m, 32 lbf·ft)	U-nut
Throttle drum cover bolt		3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)	
Needle jet		1.8 N·m (0.2 kgf·m, 1.3 lbf·ft)	
Main jet		1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)	
Slow air jet ('04 - '07)		1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)	
Starter jet		1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)	
Slow jet		1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)	
Maintenance cover bolt		2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)	
Top cover bolt		2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)	
Float chamber screw		2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)	
Carburetor drain plug		4.9 N·m (0.5 kgf·m, 3.6 lbf·ft)	
SE valve lock nut		2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)	
Throttle shaft screw ('04 - '06)		2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)	Apply locking agent to the threads
Throttle shaft torx screw (After '06)		2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)	Apply locking agent to the threads
Jet needle holder		2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)	
Accelerator cover screw		2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)	
Hot start valve lock nut		2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)	
Throttle position sensor torx screw		3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)	Apply locking agent to the threads
Acc. pump bypass jet		0.3 N·m (0.03 kgf·m, 0.2 lbf·ft)	
Throttle cable lower adjuster lock nut (After '06)		4.0 N·m (0.4 kgf·m, 3.0 lbf·ft)	
Mudguard mounting screw		1.1 N·m (0.1 kgf·m, 0.8 lbf·ft)	

TOOL

Carburetor float level gauge
07401-0010000



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
- SE 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

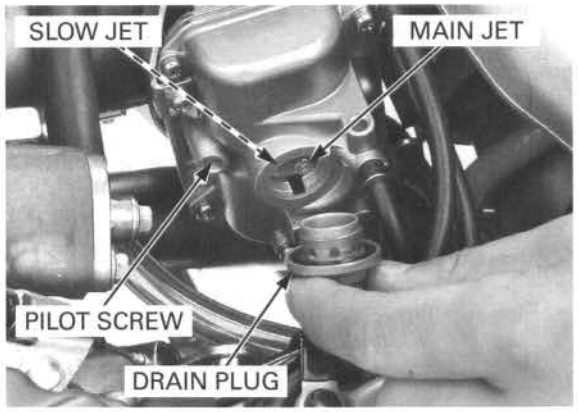
Afterfiring
- Ignition system malfunction
- Carburetor malfunction
- Lean mixture
- Rich mixture

CARBURETOR ADJUSTMENT, MINOR

IDLE MIXTURE AND IDLE SPEED

The standard carburetor settings are ideal for the following conditions: sea level altitude, and 20°C (68°F) air temperature. If your conditions are different, you may need to adjust the carburetor setting using the tuning information chart (page 6-10).

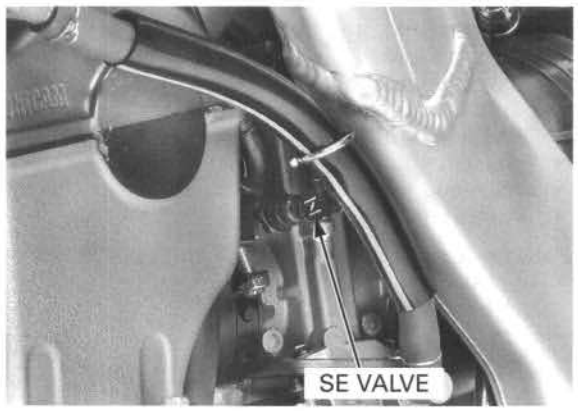
1. Adjust the carburetor setting using the tuning information chart (page 6-10).



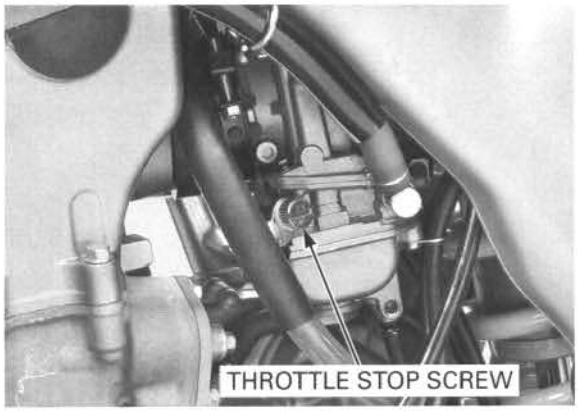
STANDARD SETTING:

FLOAT LEVEL:	
'04 and '05:	**8.0 mm (0.31 in)**
After '05:	**6.0 mm (0.24 in)**
PILOT SCREW INITIAL OPENING:	
'04 and '07:	**2-1/4 turns out**
'05 and '06:	**1-3/4 turns out**
'08:	**1-7/8 turns out**
After '08:	**1-1/4 turns out**
SLOW JET:	
'04 and '06:	**#40**
'05 and After '06:	**#42**
MAIN JET:	
'04:	**#160**
'05 and '06:	**#172**
'07:	**#175**
'08:	**#188**
After '08:	**#185**
JET NEEDLE:	
'04:	**NCYR**
'05:	**NCYQ**
'06:	**NHFS**
'07:	**NKBT**
'08:	**NMGU**
After '08:	**NNSU**
JET NEEDLE CLIP POSITION:	
'04:	**4th position from the top**
After '04:	**3rd position from the top**
ACC. PUMP BYPASS JET	
'04, '05:	**#70**
'06:	**#55**
After '06:	**#70**

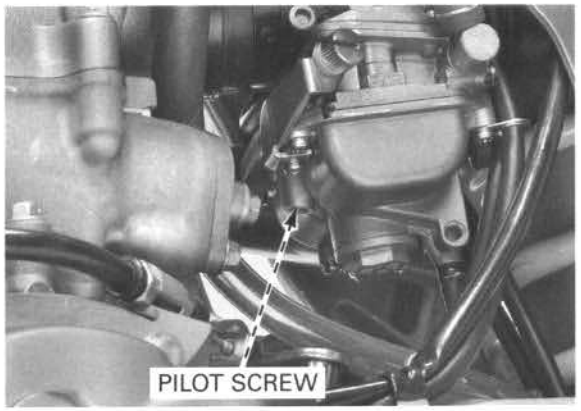
2. When the engine is warm enough to run, push the SE valve in to its off position.



3. 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.



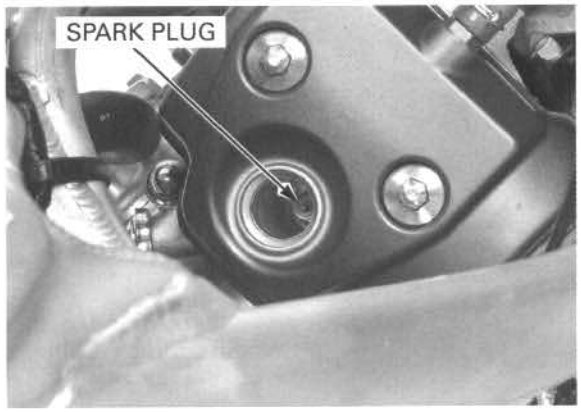
4. Adjust the pilot screw to obtain the best off-idle performance.
   - If the engine runs rich exiting a corner, turn the pilot screw clockwise to lean the mixture.
   - If the engine runs lean exiting a corner, turn the pilot screw counterclockwise to richen the mixture.



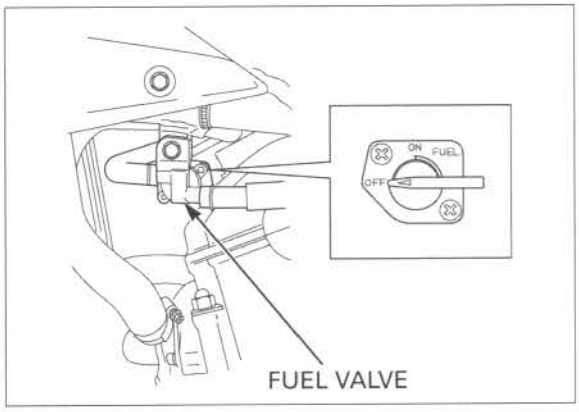
CARBURETOR ADJUSTMENT, MAJOR

FOR TEMPERATURE AND ALTITUDE

1. Warm up the engine.
2. Make two or three laps on a course with the standard setting. Note engine acceleration and other engine conditions in relation to throttle opening. Verify the mixture by removing the spark plug and reading the firing end.
3. Change the carburetor settings or select suitable carburetor jets, taking into consideration the engine conditions and tuning information chart for temperature and altitude (page 6-10).

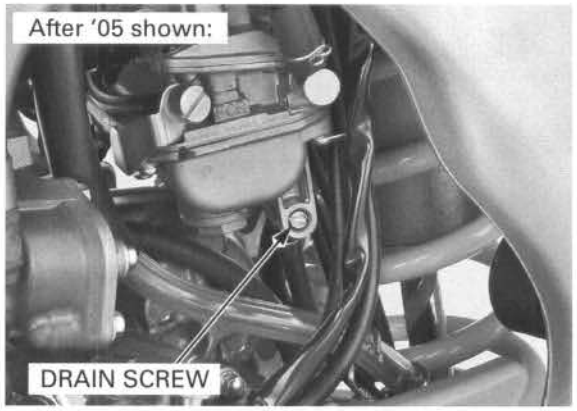


4. Turn the fuel valve to "OFF".

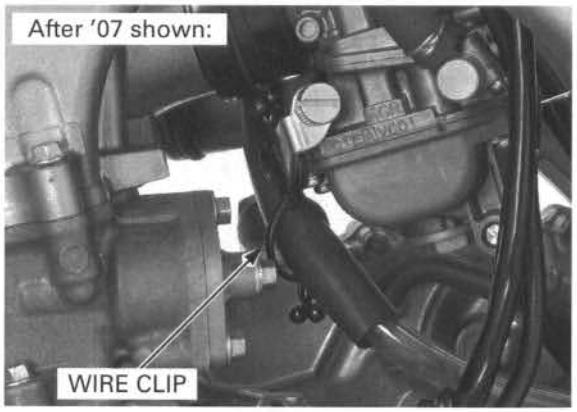


After '05: 5. Loosen the drain screw and drain the fuel from the float chamber.

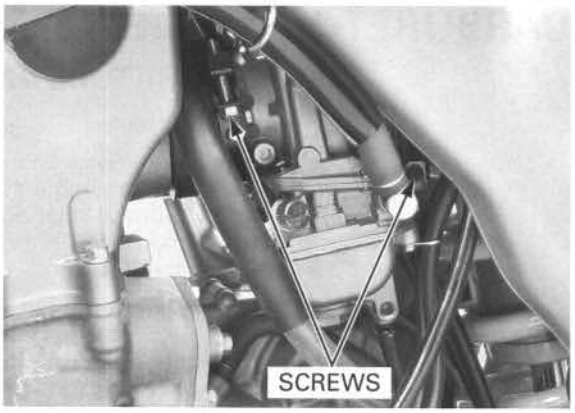
Tighten the drain screw securely.



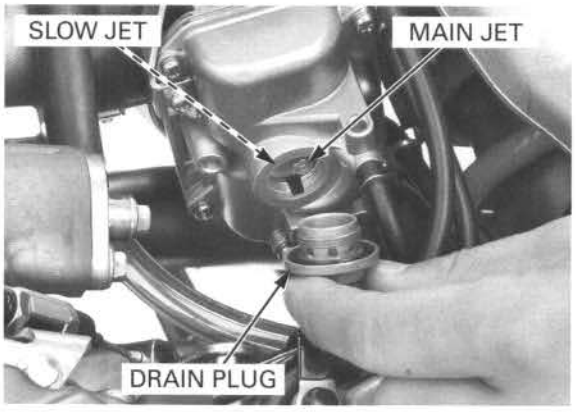
After '07: 6. Remove the wire clip from the throttle stop screw stay.



7. Loosen the carburetor insulator and connecting boot band screws and rotate the carburetor body to right side.



8. Remove the carburetor drain plug and drain the gasoline from the carburetor. Change the jets as required and reinstall the carburetor drain plug.

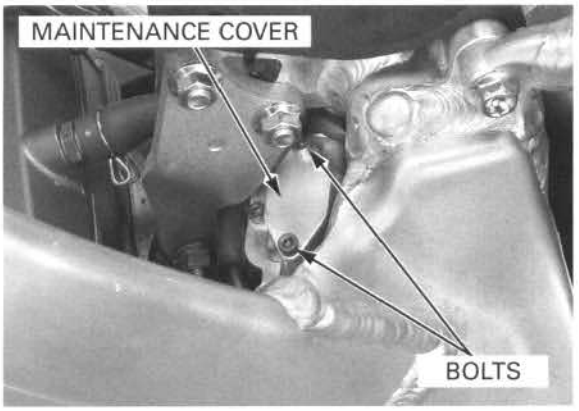


9. Remove the fuel tank (page 3-7).

'04 - '07: Rotate the carburetor to left side.
Loosen the maintenance cover bolts alternately.

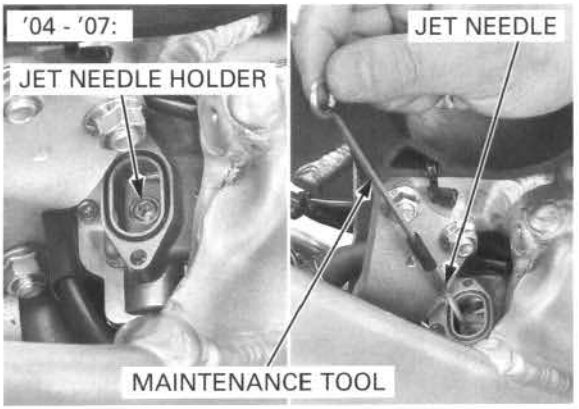
After '07: Loosen the maintenance cover bolts alternately by rotating the carburetor to either side.

Remove the maintenance cover.

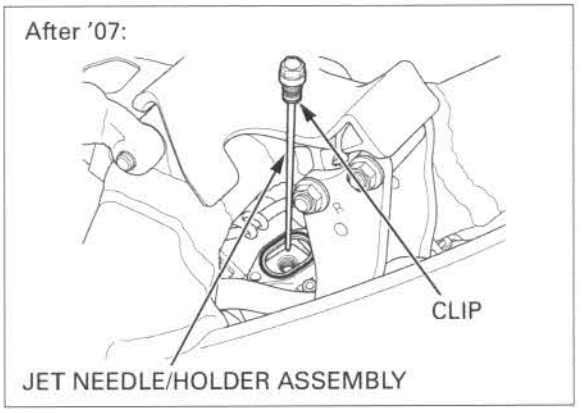


'04 – '07: 10. Open the throttle grip fully and remove the jet needle holder. Remove the jet needle from carburetor using the carburetor maintenance tool. Change the jet needle clip position as required.

NOTE:
Be careful not to let the jet needle holder fall into the carburetor.



After '07: Open the throttle grip fully and remove the jet needle/holder assembly. Change the jet needle clip position as required.



11. Reinstall the jet needle, jet needle holder and tighten it to the specified torque.

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

12. Install the maintenance cover and tighten the bolts to the specified torque in several step alternately.

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

13. Tighten the carburetor insulator and connecting boot band screws.

After '07: 14. Install the wire clip to the throttle stop screw stay.

15. Adjust the pilot screw opening as required.

TUNING INFORMATION CHART: '04

Altitude			Temperature						
		Cent.	-30°~-17°	-18°~-6°	-7°~5°	-4°~16°	15°~27°	26°~38°	37°~49°
		Fahr.	-21°~0°	-1°~20°	19°~40°	39°~60°	59°~80°	79°~100°	99°~120°
	3,050 m (10,000 ft)	PS:	2-1/4	2-1/4	2	2	2	1-3/4	1-3/4
		SJ:	40	40	40	40	40	40	40
	|	JN CLIP:	4 th	4 th	3 rd	3 rd	3 rd	3 rd	3 rd
	2,300 m (7,500 ft)	JN:	NCYR	NCYR	NCYR	NCYR	NCYR	NCYR	NCYR
		MJ:	160	158	158	155	155	152	152
	2,299 m (7,499 ft)	PS:	2-1/4	2-1/4	2-1/4	2	2	2	1-3/4
		SJ:	40	40	40	40	40	40	40
	|	JN CLIP:	4 th	4 th	4 th	3 rd	3 rd	3 rd	3 rd
	1,500 m (5,000 ft)	JN:	NCYR	NCYR	NCYR	NCYR	NCYR	NCYR	NCYR
		MJ:	162	160	158	158	155	155	152
	1,499 m (4,999 ft)	PS:	2-1/2	2-1/4	2-1/4	2-1/4	2	2	2
		SJ:	40	40	40	40	40	40	40
	|	JN CLIP:	4 th	4 th	4 th	4 th	3 rd	3 rd	3 rd
	750 m (2,500 ft)	JN:	NCYR	NCYR	NCYR	NCYR	NCYR	NCYR	NCYR
		MJ:	162	162	160	158	158	155	155
	749 m (2,499 ft)	PS:	2-1/2	2-1/2	2-1/4	2-1/4	2-1/4	2	2
		SJ:	40	40	40	40	40	40	40
	|	JN CLIP:	5 th	4 th	4 th	4 th	4 th	3 rd	3 rd
	300 m (1,000 ft)	JN:	NCYR	NCYR	NCYR	NCYR	NCYR	NCYR	NCYR
		MJ:	165	162	162	160	158	158	155
	299 m (999 ft)	PS:	2-1/2	2-1/2	2-1/2	2-1/4	2-1/4	2-1/4	2
		SJ:	40	40	40	40	40	40	40
	|	JN CLIP:	5 th	5 th	4 th	4 th	4 th	4 th	3 rd
	0 m Sea level	JN:	NCYR	NCYR	NCYR	NCYR	NCYR	NCYR	NCYR
		MJ:	165	165	162	162	160	158	158

* STD SETTING

TUNING INFORMATION CHART: '05

Altitude			Temperature						
		Cent.	-30°~-17°	-18°~-6°	-7°~5°	-4°~16°	15°~27°	26°~38°	37°~49°
		Fahr.	-21°~0°	-1°~20°	19°~40°	39°~60°	59°~80°	79°~100°	99°~120°
	3,050 m (10,000 ft)	PS:	1-3/4	1-3/4	1-1/2	1-1/2	1-1/2	1-1/4	1-1/4
		SJ:	42	42	42	42	42	42	42
	|	JN CLIP:	3 rd	3 rd	2 nd	2 nd	2 nd	2 nd	2 nd
	2,300 m (7,500 ft)	JN:	NCYQ	NCYQ	NCYQ	NCYQ	NCYQ	NCYQ	NCYQ
		MJ:	172	170	170	168	168	165	165
	2,299 m (7,499 ft)	PS:	1-3/4	1-3/4	1-3/4	1-1/2	1-1/2	1-1/2	1-1/4
		SJ:	42	42	42	42	42	42	42
	|	JN CLIP:	3 rd	3 rd	3 rd	2 nd	2 nd	2 nd	2 nd
	1,500 m (5,000 ft)	JN:	NCYQ	NCYQ	NCYQ	NCYQ	NCYQ	NCYQ	NCYQ
		MJ:	175	172	170	170	168	168	165
	1,499 m (4,999 ft)	PS:	2	1-3/4	1-3/4	1-3/4	1-1/2	1-1/2	1-1/2
		SJ:	42	42	42	42	42	42	42
	|	JN CLIP:	4 th	3 rd	3 rd	3 rd	2 nd	2 nd	2 nd
	750 m (2,500 ft)	JN:	NCYQ	NCYQ	NCYQ	NCYQ	NCYQ	NCYQ	NCYQ
		MJ:	175	175	172	170	170	168	168
	749 m (2,499 ft)	PS:	2	2	1-3/4	1-3/4	1-3/4	1-1/2	1-1/2
		SJ:	42	42	42	42	42	42	42
	|	JN CLIP:	4 th	4 th	3 rd	3 rd	3 rd	2 nd	2 nd
	300 m (1,000 ft)	JN:	NCYQ	NCYQ	NCYQ	NCYQ	NCYQ	NCYQ	NCYQ
		MJ:	178	175	175	172	170	170	168
	299 m (999 ft)	PS:	2	2	2	1-3/4	1-3/4	1-3/4	1-1/2
		SJ:	42	42	42	42	42	42	42
	|	JN CLIP:	4 th	4 th	4 th	3 rd	3 rd	3 rd	2 nd
	0 m Sea level	JN:	NCYQ	NCYQ	NCYQ	NCYQ	NCYQ	NCYQ	NCYQ
		MJ:	178	178	175	175	172	170	170

* STD SETTING

PS: Pilot screw opening from fully seated
SJ: Slow jet
JN CLIP: Needle clip position
JN: Jet needle
MJ: Main jet

TUNING INFORMATION CHART: '06

Altitude			Temperature						
		Cent.	–30°~–17°	–18°~–6°	–7°~5°	–4°~16°	15°~27°	26°~38°	37°~49°
		Fahr.	–21°~0°	–1°~20°	19°~40°	39°~60°	59°~80°	79°~100°	99°~120°
	3,050 m (10,000 ft) | 2,300 m (7,500 ft)	PS:	1-3/4	1-3/4	1-1/2	1-1/2	1-1/2	1-1/4	1-1/4
		SJ:	40	40	40	40	40	40	40
		JN CLIP:	3 rd	3 rd	2 nd	2 nd	2 nd	2 nd	2 nd
		JN:	NHFS	NHFS	NHFS	NHFS	NHFS	NHFS	NHFS
		MJ:	172	170	170	168	168	165	165
	2,299 m (7,499 ft) | 1,500 m (5,000 ft)	PS:	1-3/4	1-3/4	1-3/4	1-1/2	1-1/2	1-1/2	1-1/4
		SJ:	40	40	40	40	40	40	40
		JN CLIP:	3 rd	3 rd	3 rd	2 nd	2 nd	2 nd	2 nd
		JN:	NHFS	NHFS	NHFS	NHFS	NHFS	NHFS	NHFS
		MJ:	175	172	170	170	168	168	165
	1,499 m (4,999 ft) | 750 m (2,500 ft)	PS:	2	1-3/4	1-3/4	1-3/4	1-1/2	1-1/2	1-1/2
		SJ:	42	40	40	40	40	40	40
		JN CLIP:	4 th	3 rd	3 rd	3 rd	2 nd	2 nd	2 nd
		JN:	NHFS	NHFS	NHFS	NHFS	NHFS	NHFS	NHFS
		MJ:	175	175	172	170	170	168	168
	749 m (2,499 ft) | 300 m (1,000 ft)	PS:	2	2	1-3/4	1-3/4	1-3/4	1-1/2	1-1/2
		SJ:	42	42	40	40	40	40	40
		JN CLIP:	4 th	4 th	3 rd	3 rd	3 rd	2 nd	2 nd
		JN:	NHFS	NHFS	NHFS	NHFS	NHFS	NHFS	NHFS
		MJ:	178	175	175	172	170	170	168
	299 m (999 ft) | 0 m Sea level	PS:	2	2	2	1-3/4	1-3/4	1-3/4	1-1/2
		SJ:	42	42	42	40	40	40	40
		JN CLIP:	4 th	4 th	4 th	3 rd	3 rd	3 rd	2 nd
		JN:	NHFS	NHFS	NHFS	NHFS	NHFS	NHFS	NHFS
		MJ:	178	178	175	175	172	170	170

* STD SETTING

TUNING INFORMATION CHART: '07

Altitude			Temperature						
		Cent.	–30°~–17°	–18°~–6°	–7°~5°	–4°~16°	15°~27°	26°~38°	37°~49°
		Fahr.	–21°~0°	–1°~20°	19°~40°	39°~60°	59°~80°	79°~100°	99°~120°
	3,050 m (10,000 ft) | 2,300 m (7,500 ft)	PS:	2-1/4	2-1/4	2	2	2	1-3/4	1-3/4
		SJ:	42	42	42	42	42	42	42
		JN CLIP:	3rd	3rd	2nd	2nd	2nd	2nd	2nd
		JN:	NKBT	NKBT	NKBT	NKBT	NKBT	NKBT	NKBT
		MJ:	175	172	172	170	170	168	168
	2,299 m (7,499 ft) | 1,500 m (5,000 ft)	PS:	2-1/4	2-1/4	2-1/4	2	2	2	1-3/4
		SJ:	42	42	42	42	42	42	42
		JN CLIP:	3rd	3rd	3rd	2nd	2nd	2nd	2nd
		JN:	NKBT	NKBT	NKBT	NKBT	NKBT	NKBT	NKBT
		MJ:	178	175	172	172	170	170	168
	1,499 m (4,999 ft) | 750 m (2,500 ft)	PS:	2-1/2	2-1/4	2-1/4	2-1/4	2	2	2
		SJ:	45	42	42	42	42	42	42
		JN CLIP:	4th	3rd	3rd	3rd	2nd	2nd	2nd
		JN:	NKBT	NKBT	NKBT	NKBT	NKBT	NKBT	NKBT
		MJ:	178	178	175	172	172	170	170
	749 m (2,499 ft) | 300 m (1,000 ft)	PS:	2-1/2	2-1/2	2-1/4	2-1/4	2-1/4	2	2
		SJ:	45	45	42	42	42	42	42
		JN CLIP:	4th	4th	3rd	3rd	3rd	2nd	2nd
		JN:	NKBT	NKBT	NKBT	NKBT	NKBT	NKBT	NKBT
		MJ:	180	178	178	175	172	172	170
	299 m (999 ft) | 0 m Sea level	PS:	2-1/2	2-1/2	2-1/2	2-1/4	2-1/4	2-1/4	2
		SJ:	45	45	45	42	42	42	42
		JN CLIP:	4th	4th	4th	3rd	3rd	3rd	2nd
		JN:	NKBT	NKBT	NKBT	NKBT	NKBT	NKBT	NKBT
		MJ:	180	180	178	178	175	172	172

* STD SETTING

PS: Pilot screw opening from fully seated
SJ: Slow jet
JN CLIP: Needle clip position
JN: Jet needle
MJ: Main jet

TUNING INFORMATION CHART: '08

Altitude		Temperature							
		Cent.	–30°~–17°	–18°~–6°	–7°~5°	–4°~16°	15°~27°	26°~38°	37°~49°
		Fahr.	–21°~0°	–1°~20°	19°~40°	39°~60°	59°~80°	79°~100°	99°~120°
	3,050 m (10,000 ft)	PS:	1-7/8	1-7/8	1-5/8	1-5/8	1-5/8	1-3/8	1-3/8
		SJ:	42	42	42	42	42	42	42
	|	JN CLIP:	3rd	3rd	2nd	2nd	2nd	2nd	2nd
	2,300 m (7,500 ft)	JN:	NMGU	NMGU	NMGU	NMGU	NMGU	NMGU	NMGU
		MJ:	188	185	185	182	182	180	180
	2,299 m (7,499 ft)	PS:	1-7/8	1-7/8	1-7/8	1-5/8	1-5/8	1-5/8	1-3/8
		SJ:	42	42	42	42	42	42	42
	|	JN CLIP:	3rd	3rd	3rd	2nd	2nd	2nd	2nd
	1,500 m (5,000 ft)	JN:	NMGU	NMGU	NMGU	NMGU	NMGU	NMGU	NMGU
		MJ:	190	188	185	185	182	182	180
	1,499 m (4,999 ft)	PS:	2-1/8	1-7/8	1-7/8	1-7/8	1-5/8	1-5/8	1-5/8
		SJ:	45	42	42	42	42	42	42
	|	JN CLIP:	4th	3rd	3rd	3rd	2nd	2nd	2nd
	750 m (2,500 ft)	JN:	NMGU	NMGU	NMGU	NMGU	NMGU	NMGU	NMGU
		MJ:	190	190	188	185	185	182	182
	749 m (2,499 ft)	PS:	2-1/8	2-1/8	1-7/8	1-7/8	1-7/8	1-5/8	1-5/8
		SJ:	45	45	42	42	42	42	42
	|	JN CLIP:	4th	4th	3rd	3rd	3rd	2nd	2nd
	300 m (1,000 ft)	JN:	NMGU	NMGU	NMGU	NMGU	NMGU	NMGU	NMGU
		MJ:	192	190	190	188	185	185	182
	299 m (999 ft)	PS:	2-1/8	2-1/8	2-1/8	1-7/8	1-7/8	1-7/8	1-5/8
		SJ:	45	45	45	42	42	42	42
	|	JN CLIP:	4th	4th	4th	3rd	3rd	3rd	2nd
	0 m Sea level	JN:	NMGU	NMGU	NMGU	NMGU	NMGU	NMGU	NMGU
		MJ:	192	192	190	190	188	185	185

* STD SETTING

TUNING INFORMATION CHART: After '08

Altitude		Temperature							
		Cent.	–30°~–17°	–18°~–6°	–7°~5°	–4°~16°	15°~27°	26°~38°	37°~49°
		Fahr.	–21°~0°	–1°~20°	19°~40°	39°~60°	59°~80°	79°~100°	99°~120°
	3,050 m (10,000 ft)	PS:	1-1/4	1-1/4	1	1	1	3/4	3/4
		SJ:	42	42	42	42	42	42	42
	|	JN CLIP:	3rd	3rd	2nd	2nd	2nd	2nd	2nd
	2,300 m (7,500 ft)	JN:	NNSU	NNSU	NNSU	NNSU	NNSU	NNSU	NNSU
		MJ:	185	182	182	180	180	178	178
	2,299 m (7,499 ft)	PS:	1-1/4	1-1/4	1-1/4	1	1	1	3/4
		SJ:	42	42	42	42	42	42	42
	|	JN CLIP:	3rd	3rd	3rd	2nd	2nd	2nd	2nd
	1,500 m (5,000 ft)	JN:	NNSU	NNSU	NNSU	NNSU	NNSU	NNSU	NNSU
		MJ:	188	185	182	182	180	180	178
	1,499 m (4,999 ft)	PS:	1-1/2	1-1/4	1-1/4	1-1/4	1	1	1
		SJ:	45	42	42	42	42	42	42
	|	JN CLIP:	4th	3rd	3rd	3rd	2nd	2nd	2nd
	750 m (2,500 ft)	JN:	NNSU	NNSU	NNSU	NNSU	NNSU	NNSU	NNSU
		MJ:	188	188	185	182	182	180	180
	749 m (2,499 ft)	PS:	1-1/2	1-1/2	1-1/4	1-1/4	1-1/4	1	1
		SJ:	45	45	42	42	42	42	42
	|	JN CLIP:	4th	4th	3rd	3rd	3rd	2nd	2nd
	300 m (1,000 ft)	JN:	NNSU	NNSU	NNSU	NNSU	NNSU	NNSU	NNSU
		MJ:	190	188	188	185	182	182	180
	299 m (999 ft)	PS:	1-1/2	1-1/2	1-1/2	1-1/4	1-1/4	1-1/4	1
		SJ:	45	45	45	42	42	42	42
	|	JN CLIP:	4th	4th	4th	3rd	3rd	3rd	2nd
	0 m Sea level	JN:	NNSU	NNSU	NNSU	NNSU	NNSU	NNSU	NNSU
		MJ:	190	190	188	188	185	182	182

* STD SETTING

PS: Pilot screw opening from fully seated
SJ: Slow jet
JN CLIP: Needle clip position
JN: Jet needle
MJ: Main jet

- If you use the chart correctly, it should not be necessary to adjust more than one jet size richer or leaner to fine tune your CRF. If a very large adjustment is required, there may be something wrong elsewhere. Check for worn crankshaft seals, air leaks, blocked exhaust or fuel system, or dirty air cleaner element.
- The tuning information chart will get you very close to the ideal setting. However, because of differences in pressure and humidity, you may need to fine tune the carburetor for race day conditions.

Just off idle:

- Engine stumbles/hesitates (rich): turn in the pilot screw 1/4 turn.
  Engine surges (lean): turn out the pilot screw 1/4 turn.

Refer to turning information chart for minimum to maximum range of pilot screw adjustment.

- '04: page 6-10
- '05: page 6-10
- '06: page 6-11
- '07: page 6-11
- '08: page 6-12
- After '08: page 6-12

If you exceed maximum range, the next larger slow jet is needed.

If you are under minimum range, the next smaller slow jet is needed.

- On the top end:
  Engine stumbles/hesitates (rich): go to next smaller main jet.
  Engine surges (lean): go to next larger main jet.
- To prevent engine damage, always adjust the main jet (top end) before adjusting the jet needle (mid-range).
- In the mid-range:
  Engine stumbles/hesitates (rich): lower the jet needle by raising the needle clip one position.
  Engine surges (lean): raise the jet needle by lowering the needle clip one position.

TUNING FOR SPECIAL CONDITIONS

Once you have adjusted the carburetor for temperature and altitude, it should not need major readjustment unless the race conditions change drastically. Exclusive of the tuning information chart, there are some unique atmospheric conditions that may require additional adjustments. See below:

Main jet:

- Go richer on the main jet, by one number, when the track has a very long straightaway, steeps climbs, a high percentage of sand, or the track is muddy.
- Go leaner on the main jet, by one number, when it is very humid or raining, or if it is hotter than 45 °C (113 °F).

Jet needles:

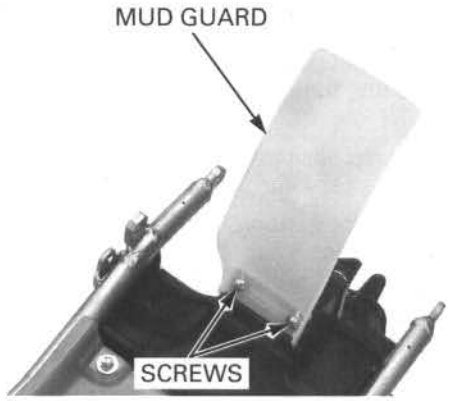
- Under normal circumstances, the standard jet needle can be adjusted to suit most situations. However, a peculiar condition may require replacement of the standard jet needle. But before replacing the standard needle, complete all the carburetor adjustments (page 6-6).
  If mid-range performance is still not satisfactory, try one of the optional jet needles. See page 1-30

AIR CLEANER HOUSING

REMOVAL: '04, '05

Remove the sub-frame (page 3-6)

Remove the screws and mud guard.

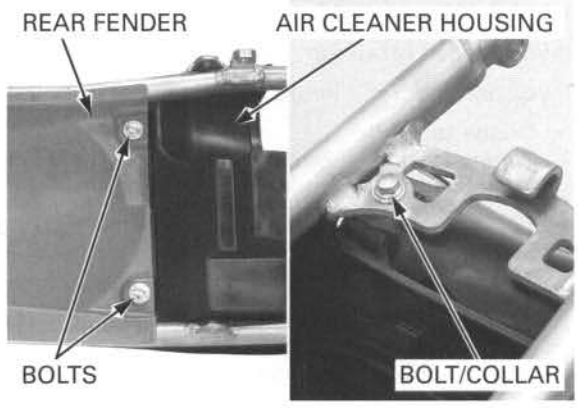


Remove the rear fender bolts.

Remove the bolt, collar and air cleaner housing from the sub-frame.

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

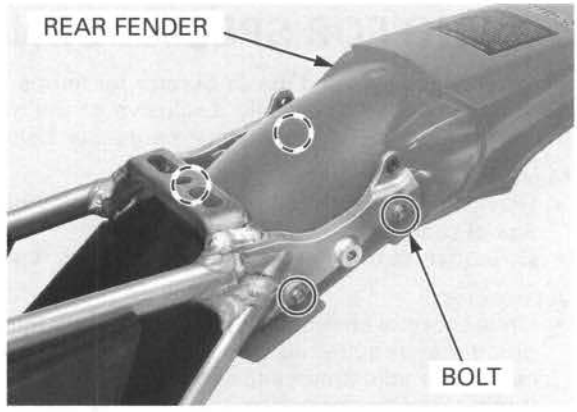
Remove the carburetor connecting boot from the air cleaner housing and seal thoroughly if any sign of inadequate sealing is detected.



REMOVAL: AFTER '05

Remove the sub-frame (page 3-6)

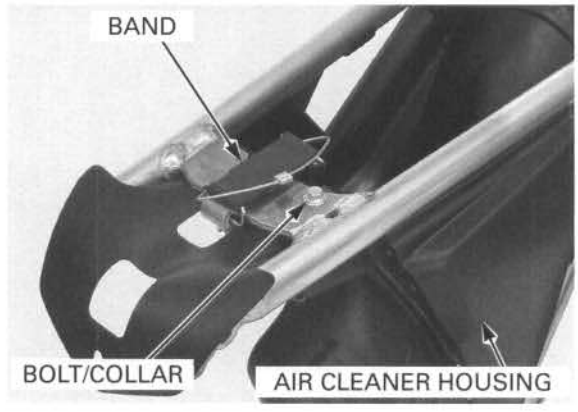
Remove the bolts and rear fender.



Remove the band.
Remove the bolt, collar and air cleaner housing.

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

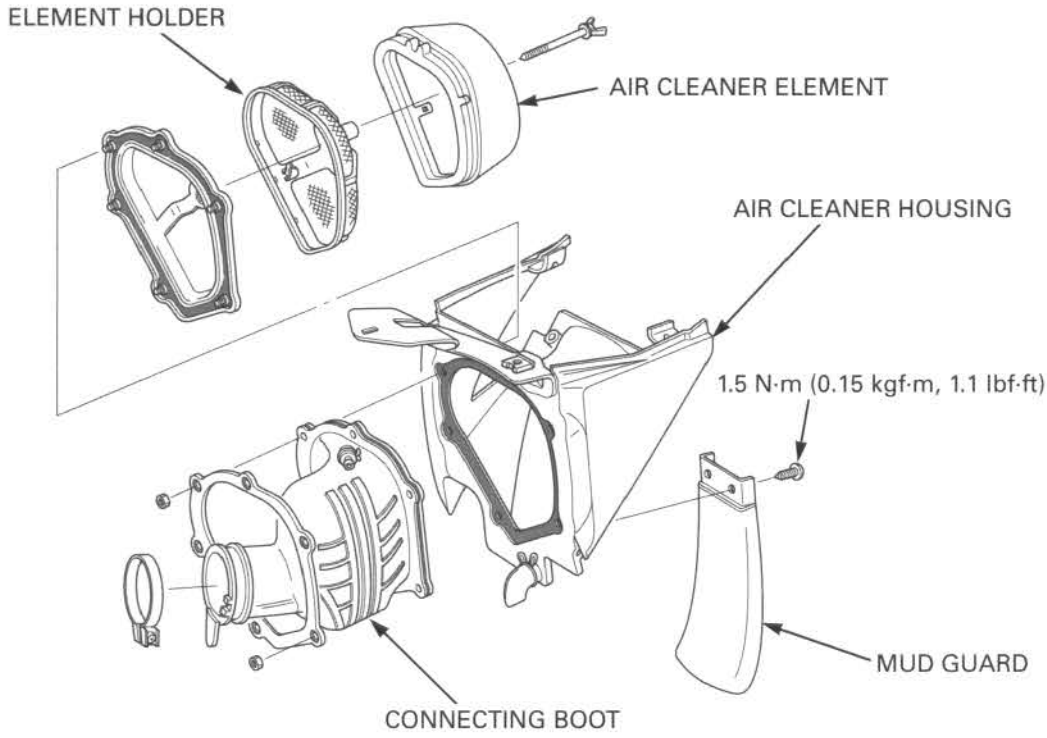
Remove the carburetor connecting boot from the air cleaner housing and seal thoroughly if any sign of inadequate sealing is detected.



INSTALLATION

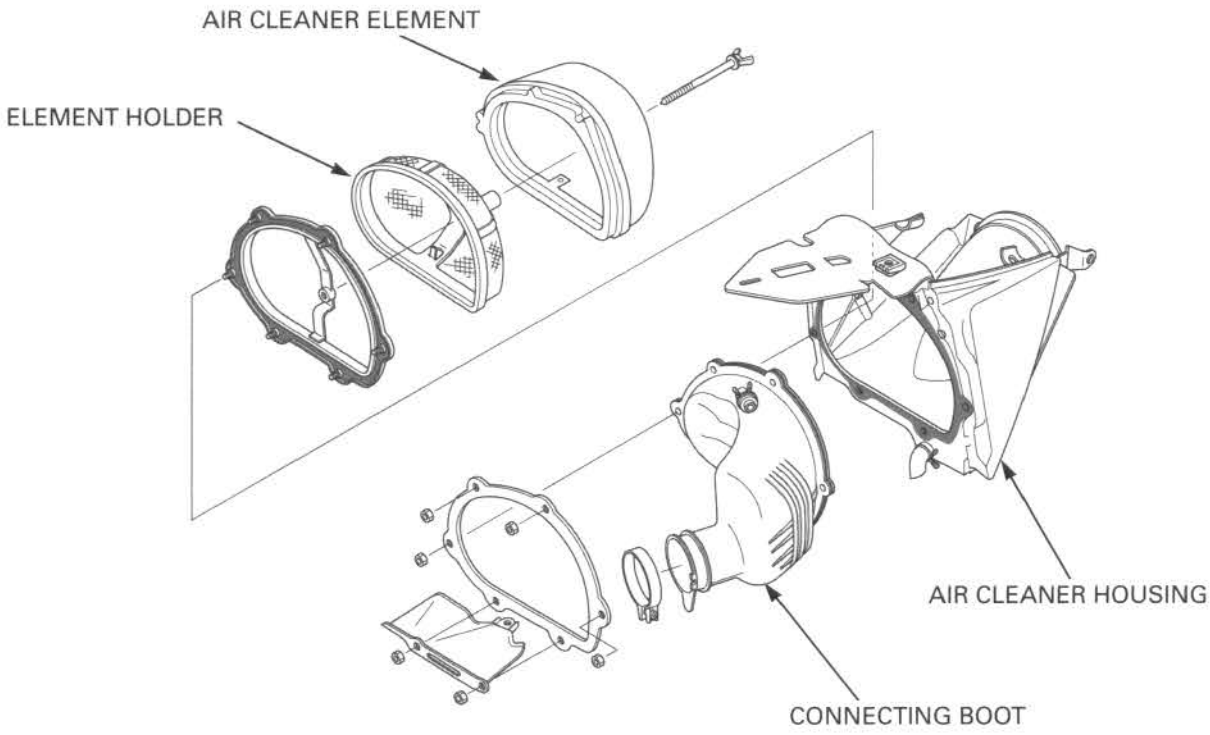
Install the removed parts in the reverse order of removal.

'04, '05:



: Apply Honda Bond A or Honda Hand Grip Cement or equivalent

After '05:



: Apply Honda Bond A or Honda Hand Grip Cement or equivalent

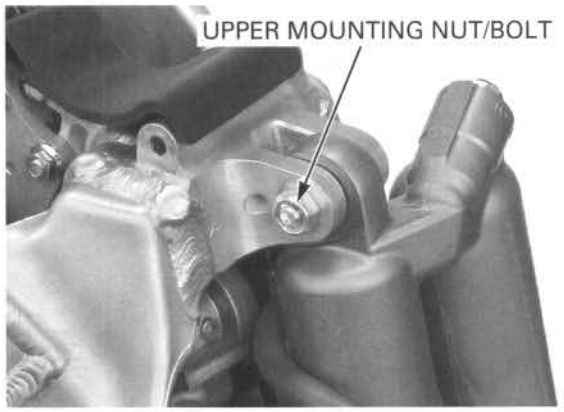
CARBURETOR REMOVAL

Remove the following:

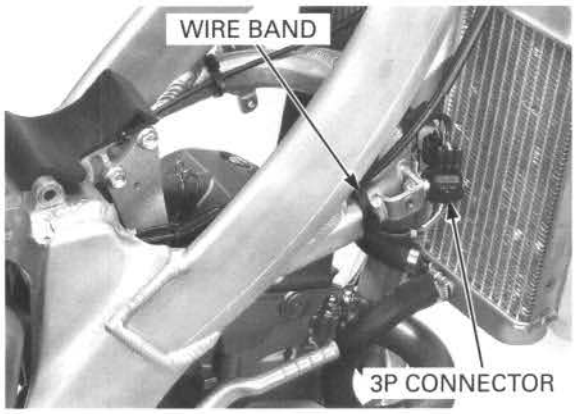
- Seat (page 3-3)
- Muffler (page 3-9)
- Fuel tank (page 3-7)
- Sub-frame (page 3-6)

Remove the shock absorber upper mounting nut and bolt.

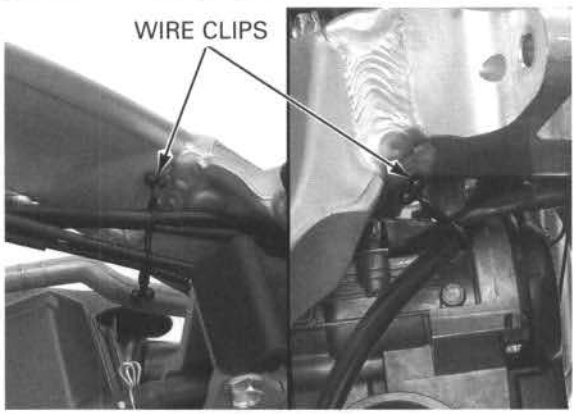
Pull back the shock absorber.



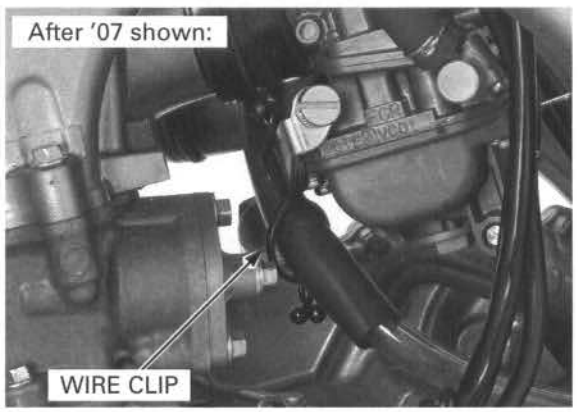
Remove the wire band.
Disconnect the throttle position sensor 3P connector.



Release the throttle position sensor wire from the wire clips.

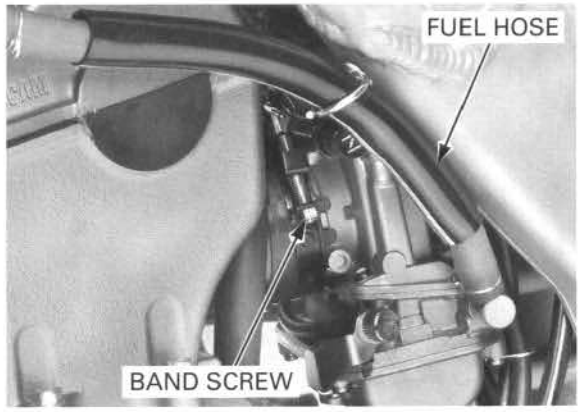


After '07: Remove the wire clip from the throttle stop screw stay.



Turn the handlebar to the right fully.

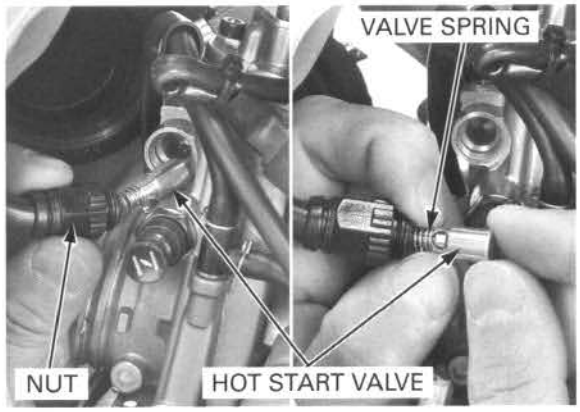
Loosen the carburetor insulator band screw and remove the carburetor.



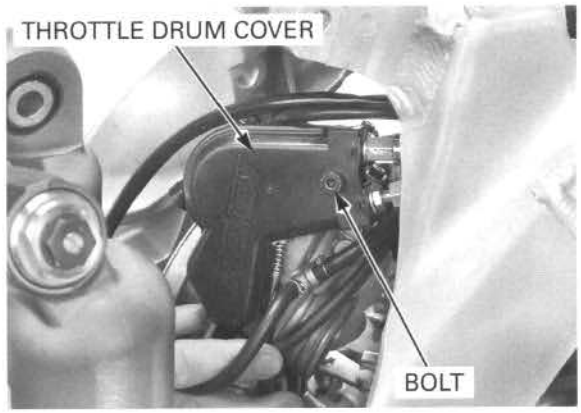
Loosen the hot start valve nut and remove the hot start valve from the carburetor.

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

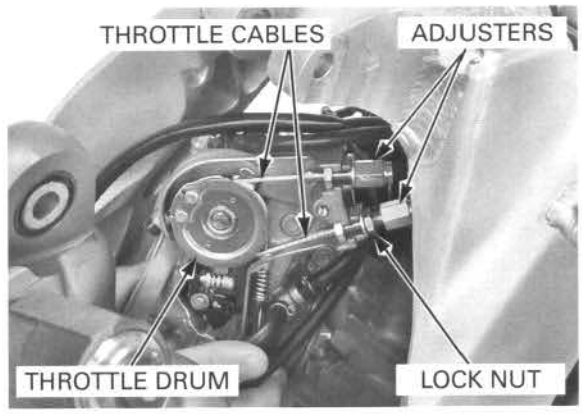
Check the hot starter valve for nicks, grooves or other damage.
Check the hot start valve seat for wear.



Remove the bolt and throttle drum cover.



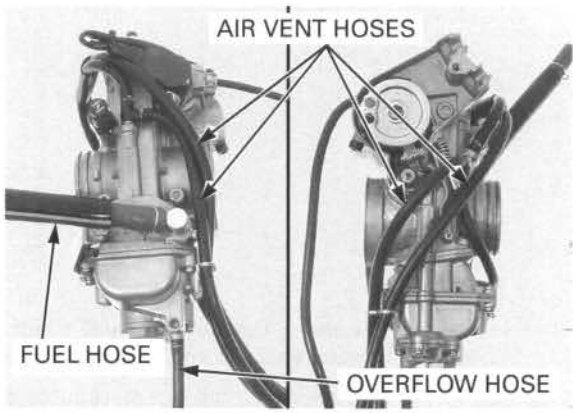
Loosen the lock nut, adjusters and disconnect the throttle cables from the throttle drum.



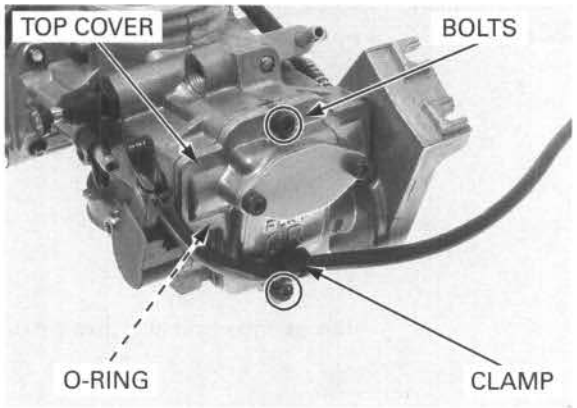
CARBURETOR DISASSEMBLY

JET NEEDLE/THROTTLE VALVE

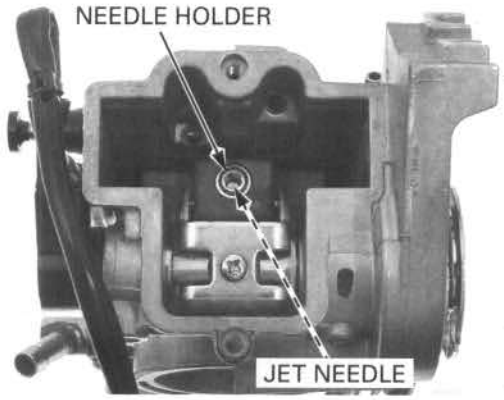
Remove the fuel hose, air vent hoses and overflow hose.



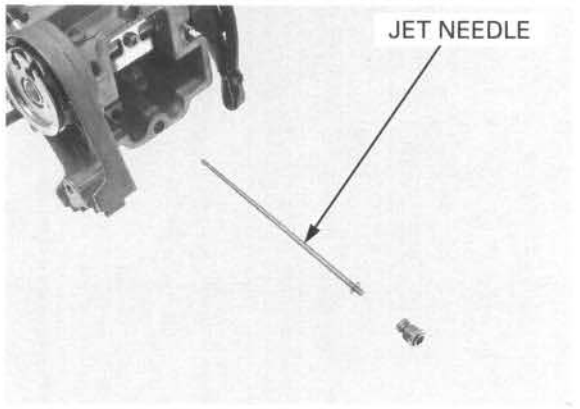
Remove the bolts, clamp, top cover and O-ring.



Remove the needle holder and jet needle.

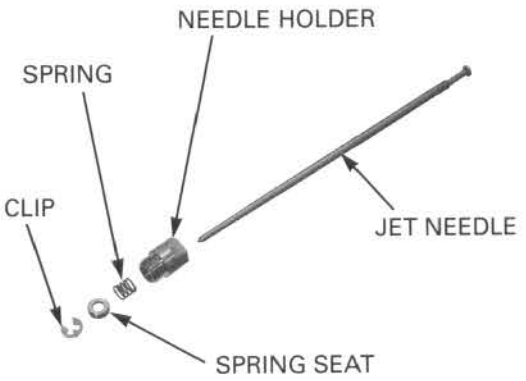


'04 – '06: Check the throttle valve and jet needle for wear, nicks or other damage.



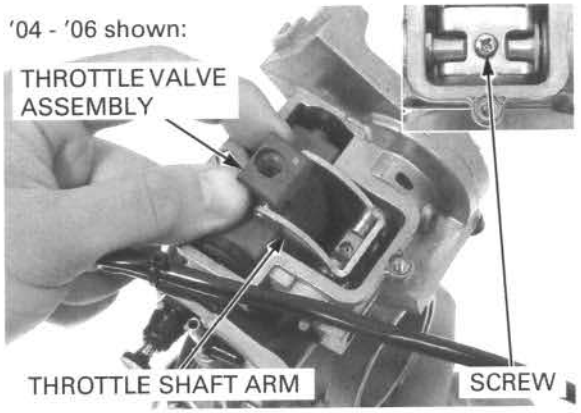
After '06: Remove the jet needle clip, spring seat, spring and jet needle from the needle holder.

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



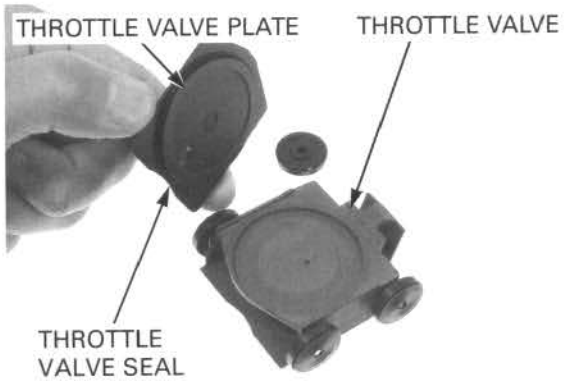
Remove the throttle shaft screw ('04 - '06).
Remove the throttle shaft torx screw (After '06).
Lift up the throttle shaft arm and remove the throttle valve assembly.

'04 - '06 shown:



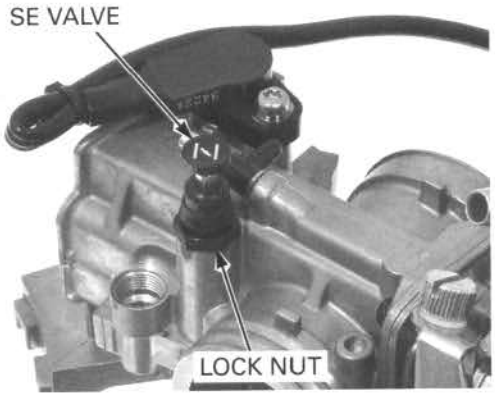
Remove the throttle valve plate from the throttle valve.

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

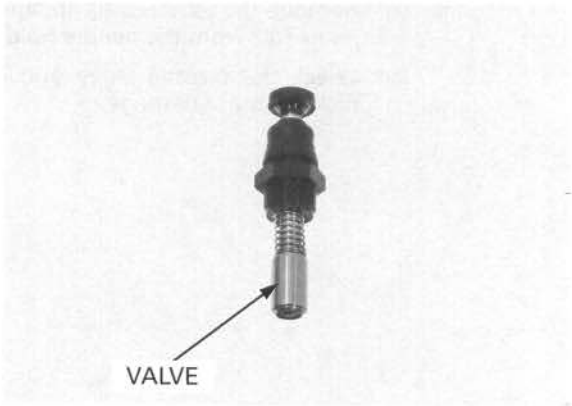


SE VALVE/THROTTLE POSITION SENSOR

Unscrew the lock nut and remove the SE valve.

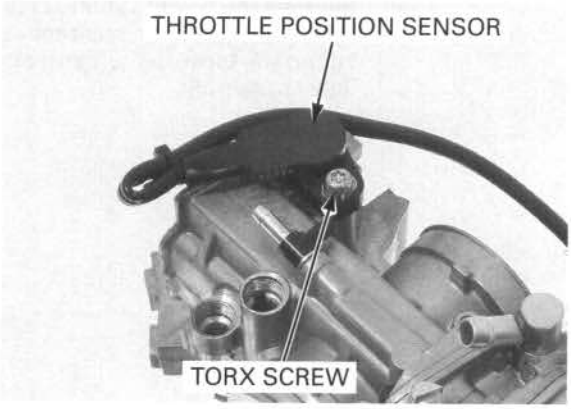


Check the valve for damage or stepped wear.



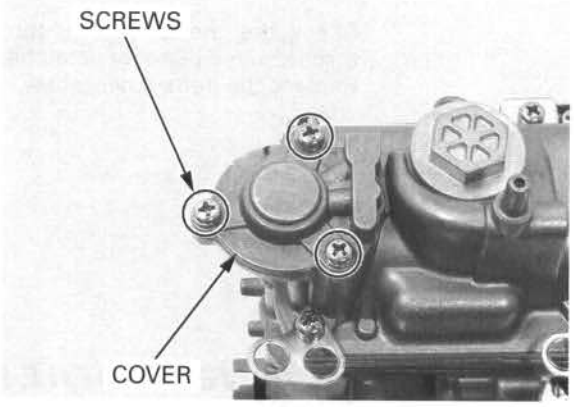
Remove the torx screw and throttle position sensor.

- Do not remove the throttle position sensor unless it is necessary to replace it or disassemble the carburetor.
  For sensor inspection (page 16-16).
  For replacement (page 6-32).

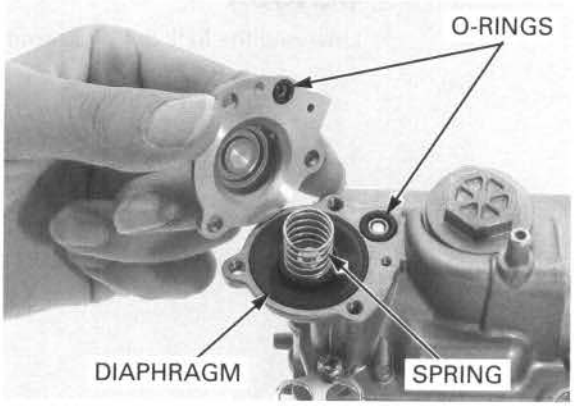


ACCELERATOR PUMP/FLOAT/JETS

Remove the accelerator pump cover screws and cover.

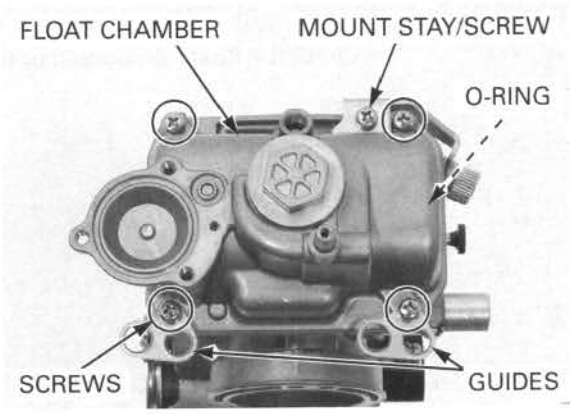


Remove the spring, diaphragm and O-rings.

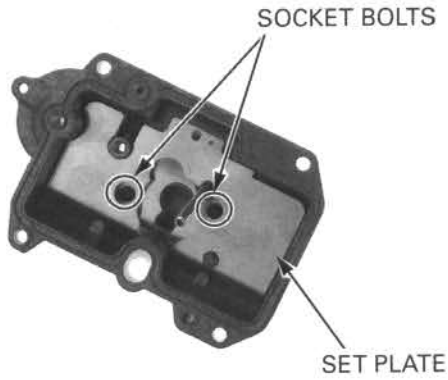


Remove the screw and throttle stop screw mount stay.
Remove the four screws, hose guides, and float chamber.

Remove the O-ring from the float chamber.

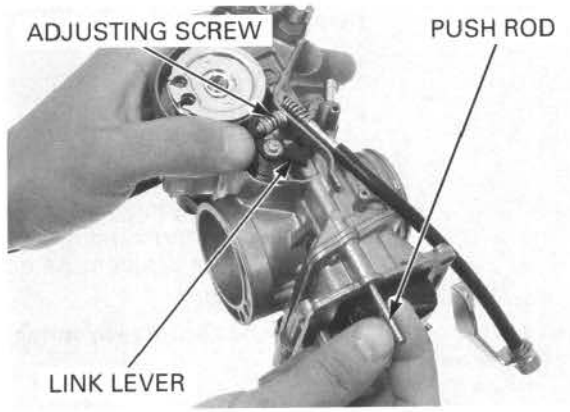


After '06: Remove the socket bolts and set plate.

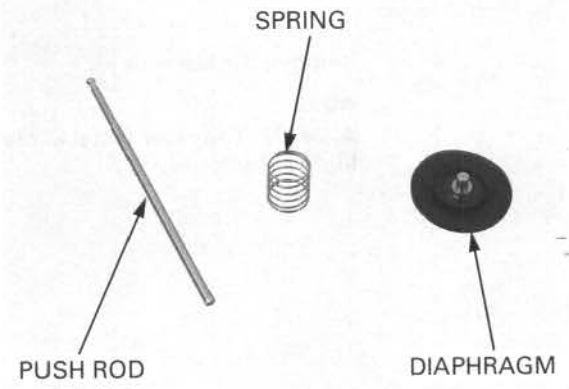


The push rod link lever adjusting screw is factory pre-set. Adjustment and disassembly are not necessary.

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

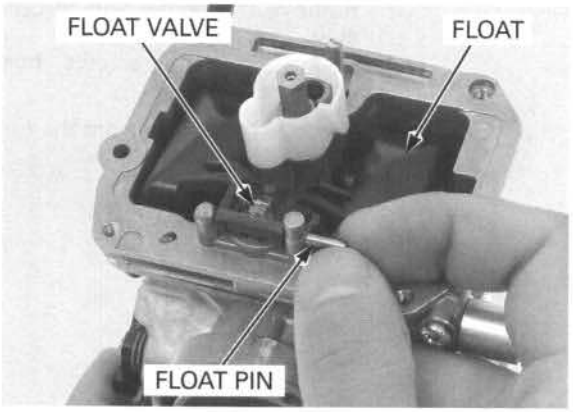


Check the diaphragm for deterioration or pin hole.
Check the spring for damage or fatigue.
Check the push rod for wear, bent or damage.



Remove the float pin, float and float valve.

Check the float for damage or fuel in the float.



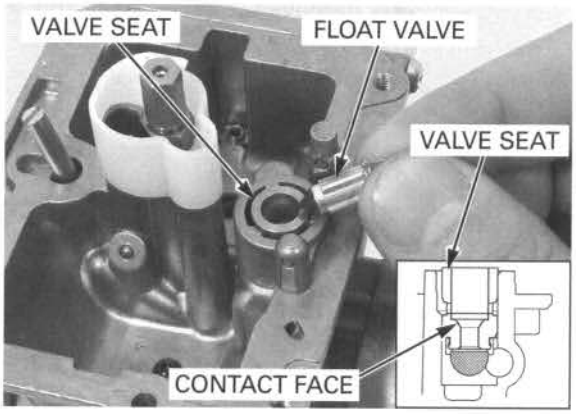
Check the float valve and valve seat for scoring, scratches, clogs or damage.

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.



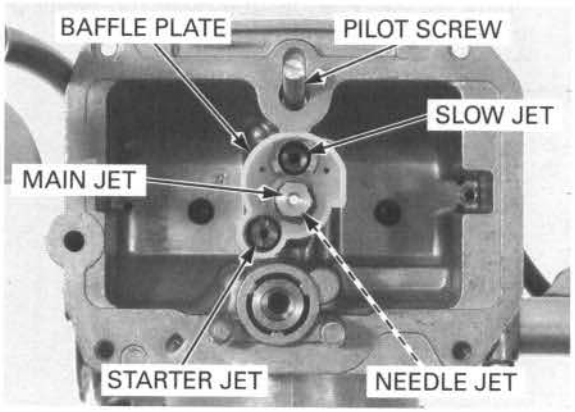
Remove the following:

- 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.

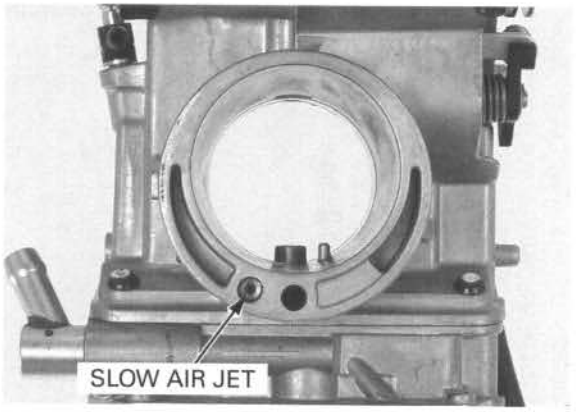
Remove the pilot screw, spring, washer and O-ring.



'04 - '07: Remove the slow air jet.

NOTE:

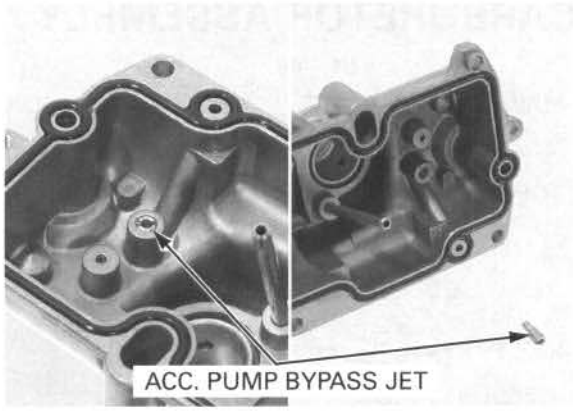
After '07: The slow air jet is press-fitted into the carburetor body.



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

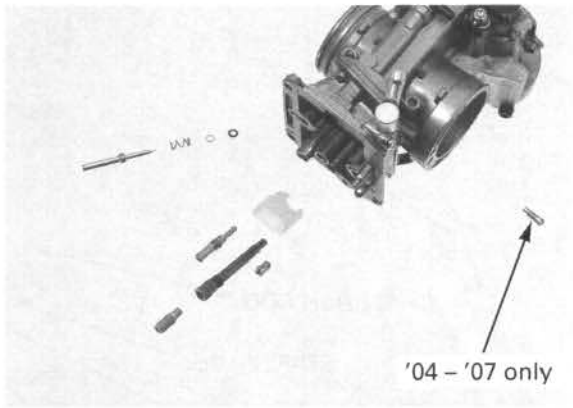
Blow open the acc. pump bypass jet with compressed air.

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



Blow open all jets with compressed air.

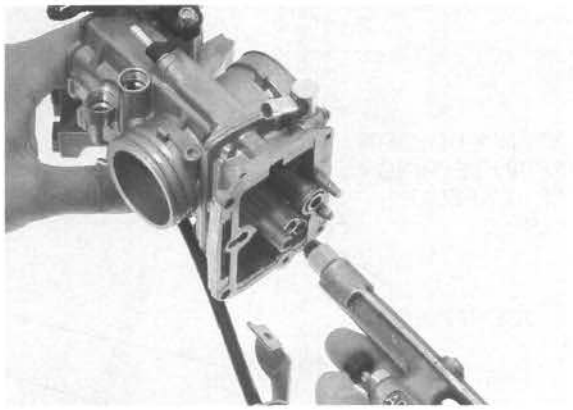
Inspect each jet for clogs, wear or damage and replace if necessary.
Check the pilot screw for stepped wear or damage.
Check the spring for fatigue or damage.
Replace these parts if necessary.



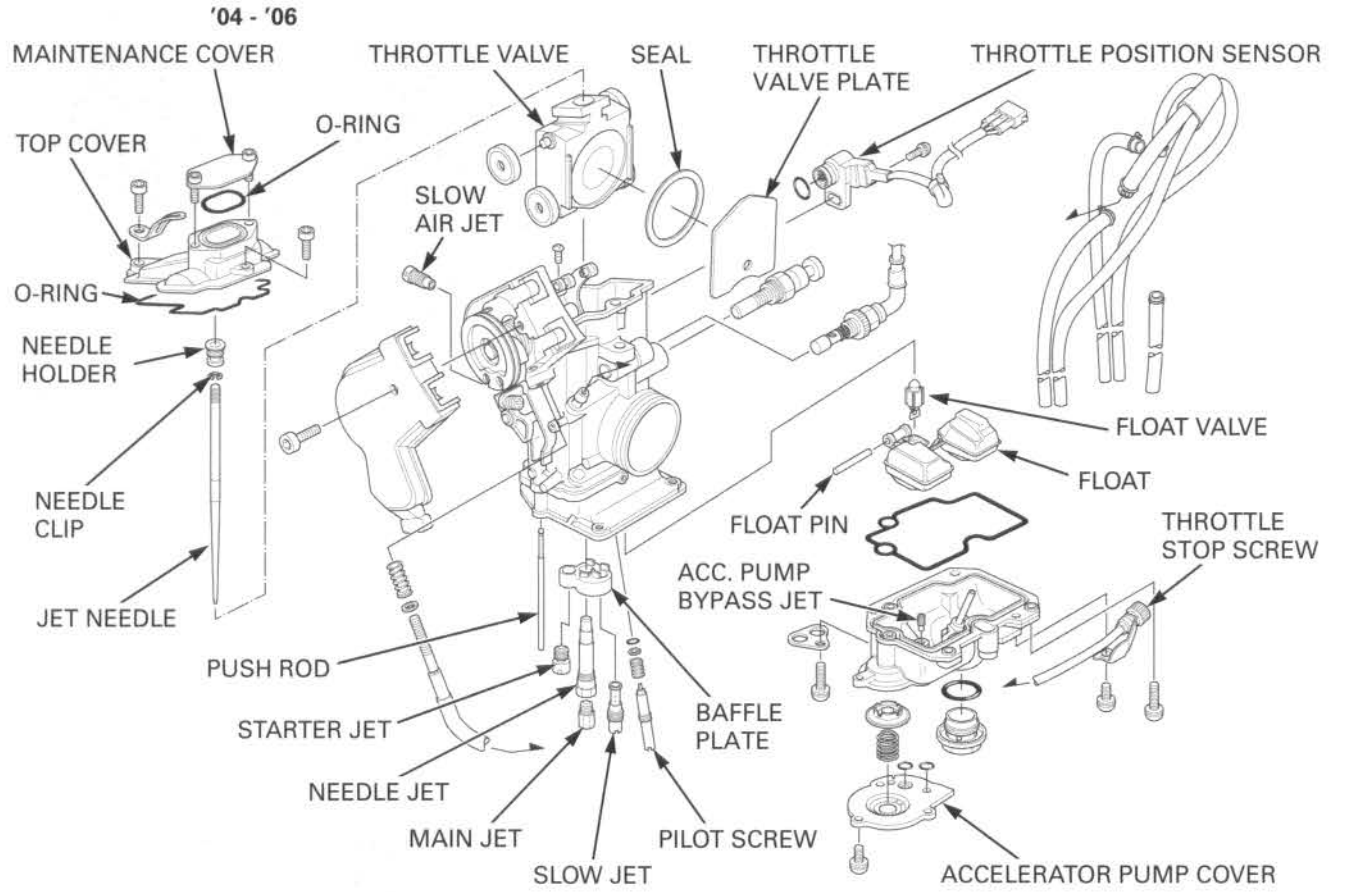
After '07: Blow open the slow air jet with compressed air.

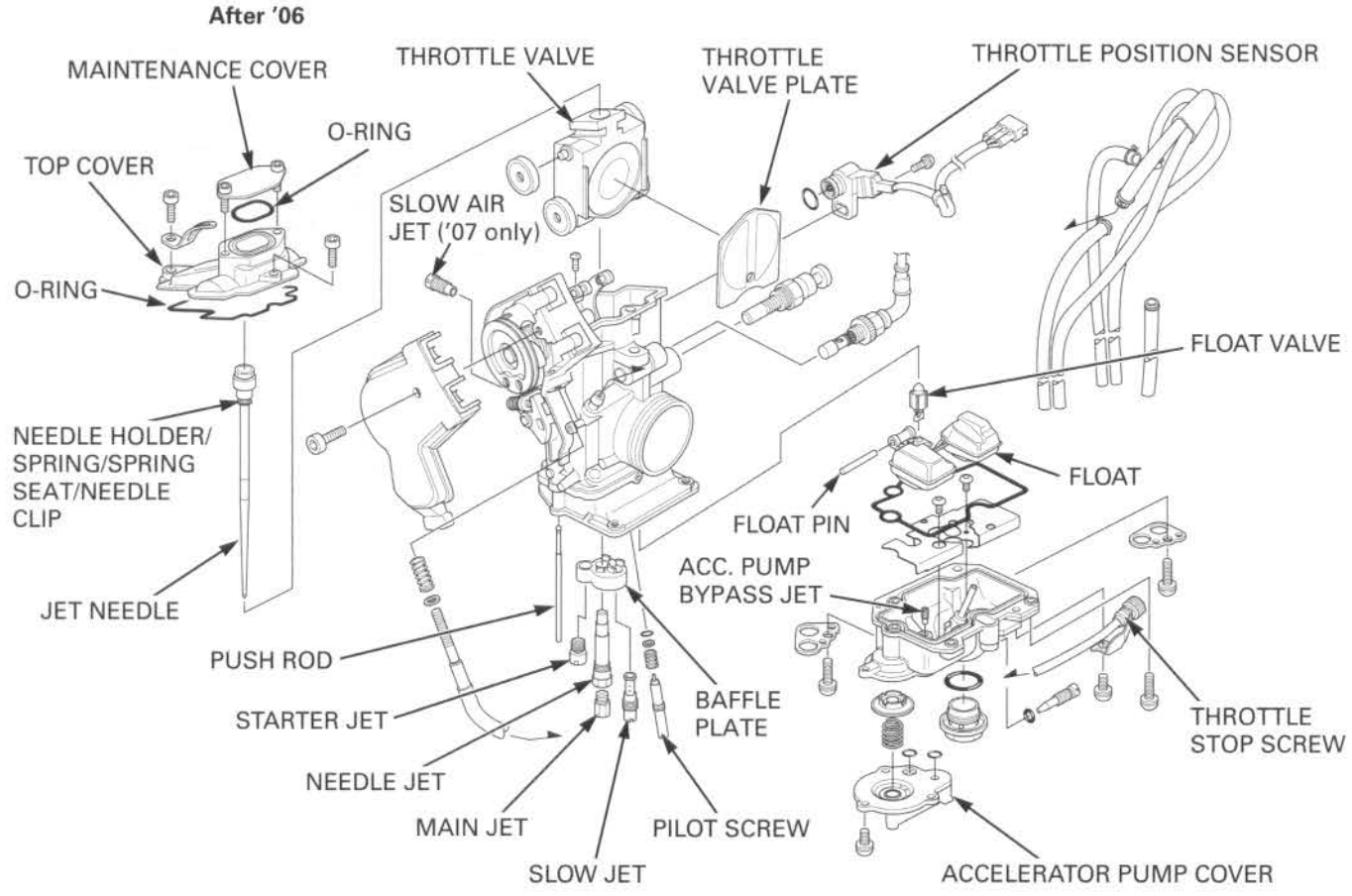
Inspect the slow air jet for clogs and replace the carburetor body if necessary.

Blow open all carburetor body openings with compressed air.



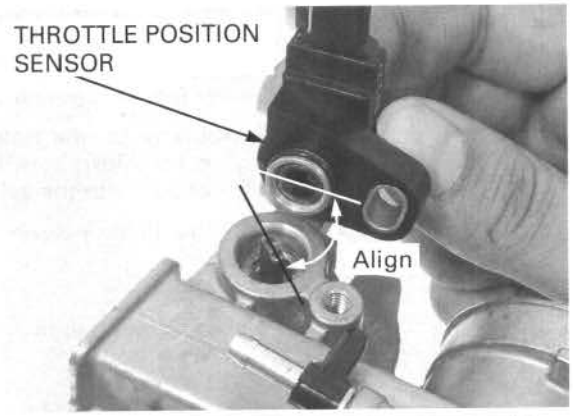
CARBURETOR ASSEMBLY





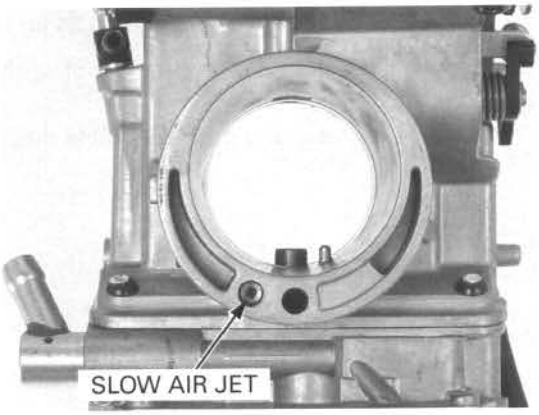
Install the throttle position sensor by aligning the tabs of the throttle position sensor with the flat side of the shaft as shown.
Install the torx screw.

- Do not remove the throttle position sensor unless it is necessary to replace it or disassemble the carburetor.
  For sensor inspection (page 16-16).
  For sensor replacement (page 6-32).



'04 - '07: 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 6-33).

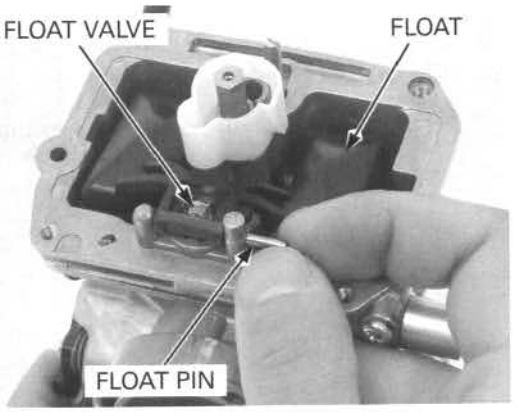
- Install the pilot screw and return it to its original position as noted during removal.

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

TORQUE:

Slow jet:	**1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)**
Starter jet:	**1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)**
Needle jet:	**1.8 N·m (0.2 kgf·m, 1.3 lbf·ft)**
Main jet:	**1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)**

Install the float valve, float and float pin.



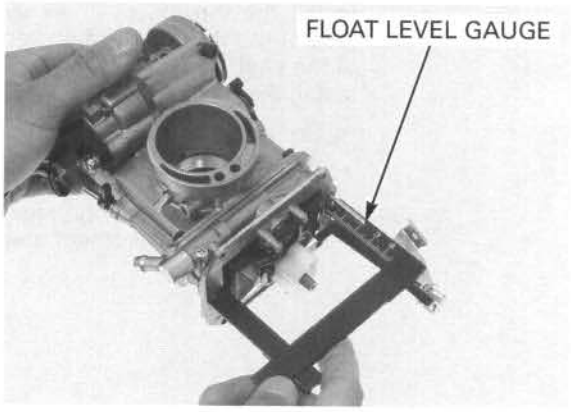
Check the float level after checking the float valve and float.
Set the float level gauge so it is perpendicular to the float chamber face and in-line with the main jet.

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.

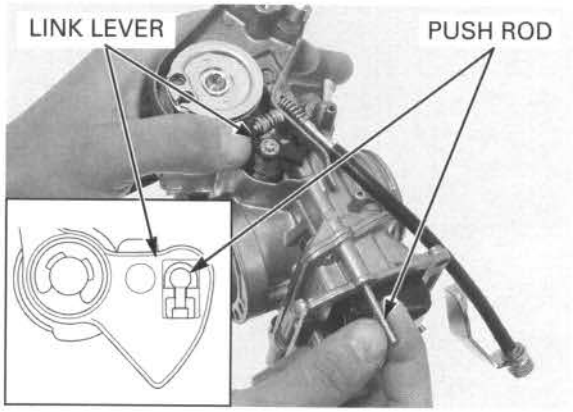
TOOL:
Carburetor float level gauge 07401-0010000

FLOAT LEVEL:
'04, '05: 8.0 mm (0.31 in)
After '05: 6.0 mm (0.24 in)



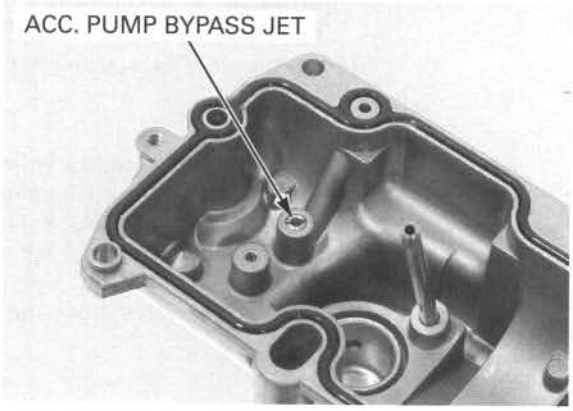
If the float level is out of specification, adjust it by bending the lip.

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

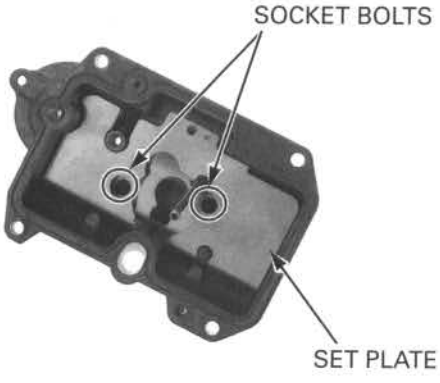


Install the acc. pump bypass jet into the float chamber.

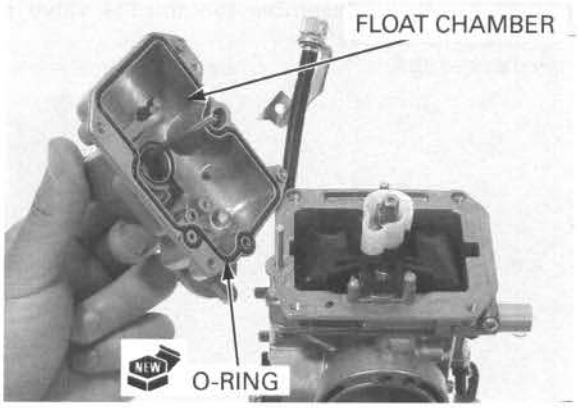
TORQUE: 0.3 N·m (0.03 kgf·m, 0.2 lbf·ft)



After '06: Install the set plate to the float camber and tighten the socket bolts securely.



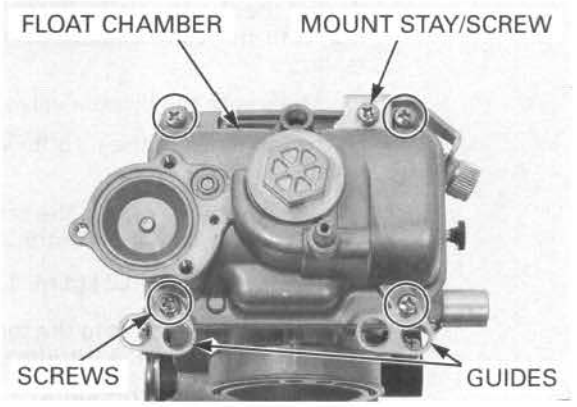
Install a new O-ring to the float chamber.
Install the float chamber to the carburetor.



Install the hose guides and four float chamber screws.
Tighten the screws to the specified torque.

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

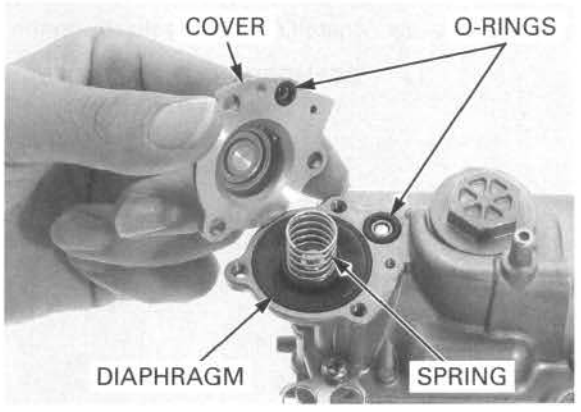
Install the throttle stop screw mount stay and tighten the screw securely.



Install the diaphragm, spring, O-rings and accelerator pump cover.

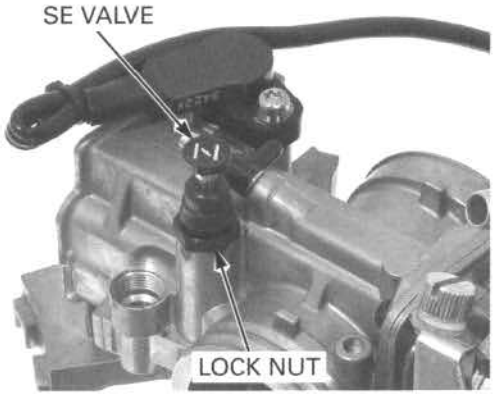
Install and tighten the three screws to the specified torque.

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



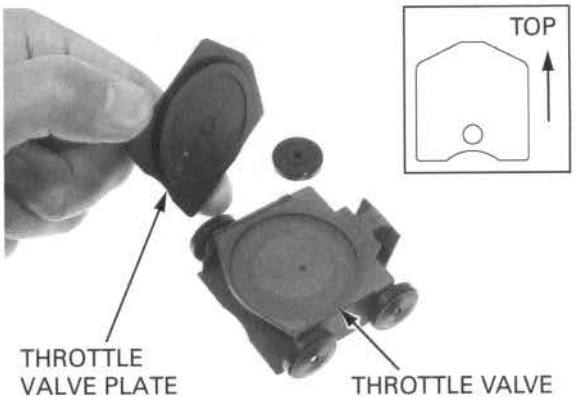
Install the SE valve and tighten the lock nut to the specified torque.

TORQUE: 2.1 N·m (0.2 kgf·m, 1.5 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.

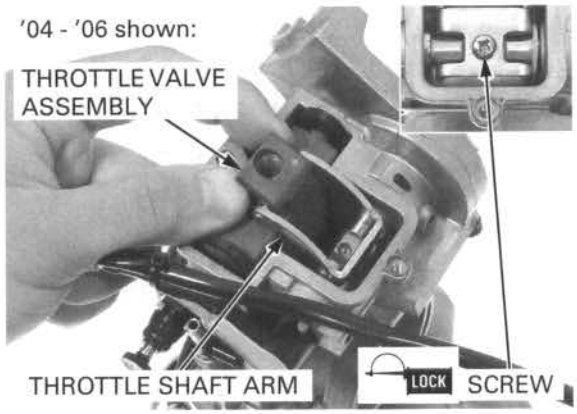
Align the holes in the throttle shaft arm and throttle shaft.

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

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

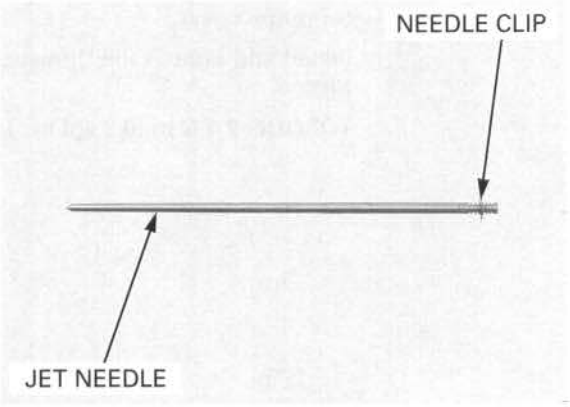
After '06: Apply a locking agent to the torx screw threads.
Install and tighten the throttle shaft torx screw.

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



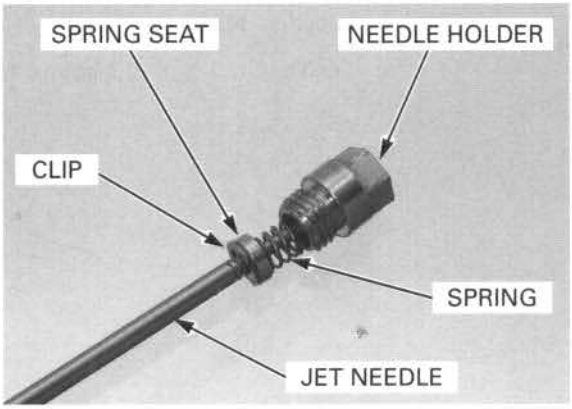
'04 - '06: Install the jet needle clip to the jet needle.

STANDARD CLIP POSITION:
4th position from the top



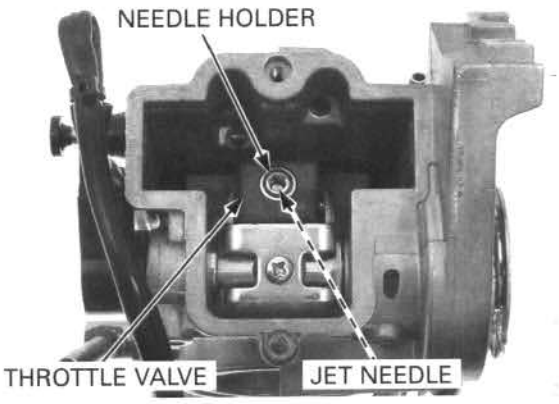
After '06: Install the jet needle, spring, spring seat to the needle holder.
Install the jet needle clip to the jet needle.

STANDARD CLIP POSITION:
3rd position from the top

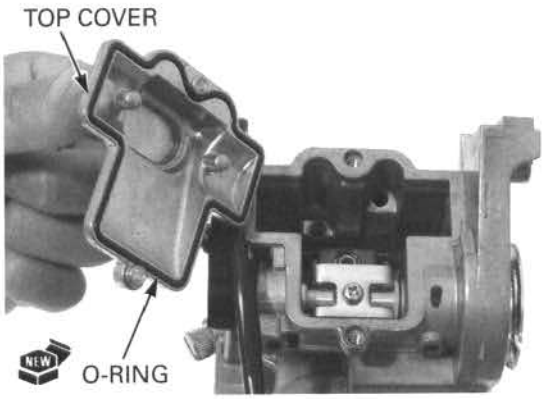


Install the jet needle and jet needle holder into the throttle valve.
Tighten the jet needle holder to the specified torque.

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



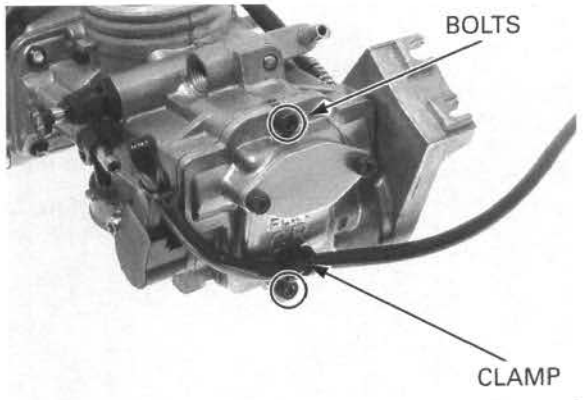
Install a new O-ring and top cover.



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

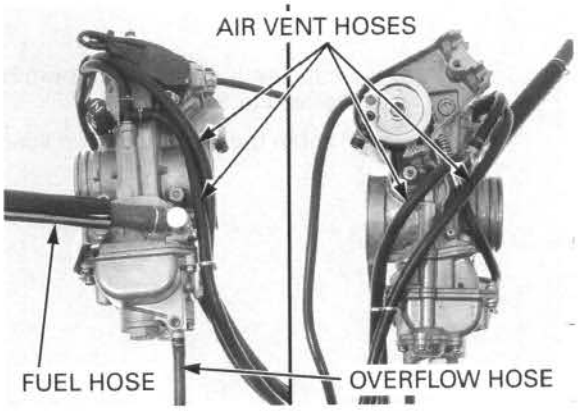
TORQUE: 2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)

Clamp the throttle position sensor wire as shown.



Route the hoses properly (page 1-22).

Install the overflow hose, air vent hoses and fuel hose.

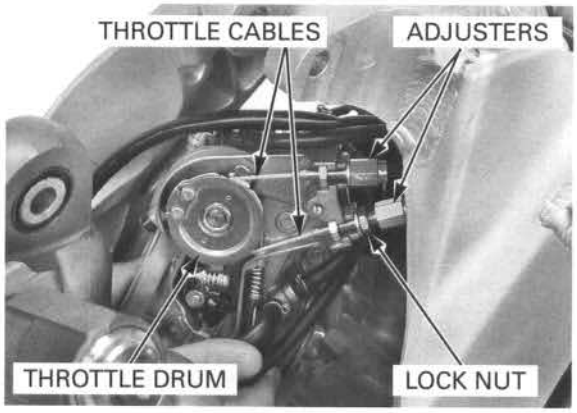


CARBURETOR INSTALLATION

Connect the throttle cables to the throttle drum.

Tighten the lock nut.

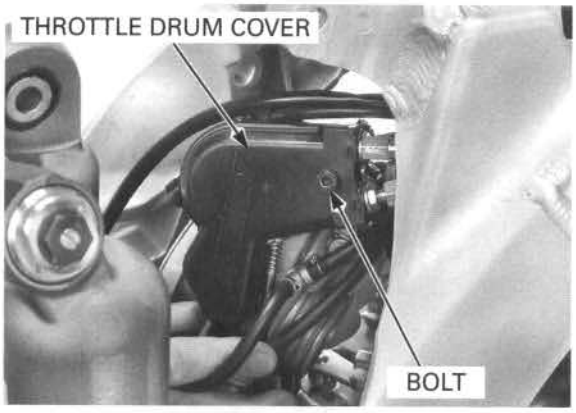
TORQUE:
After '06: 4.0 N·m (0.4 kgf·m, 3.0 lbf·ft)



Install the throttle drum cover and bolt.

Tighten the bolt to the specified torque.

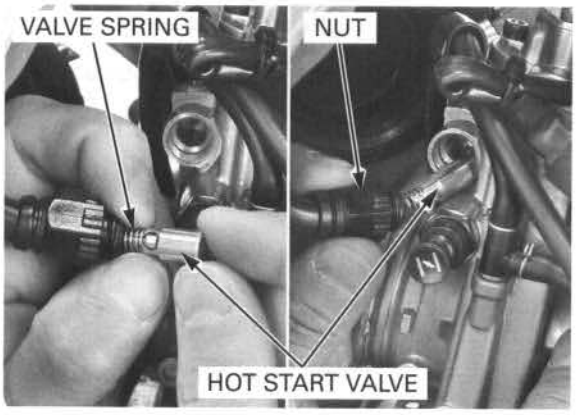
TORQUE: 3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)



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

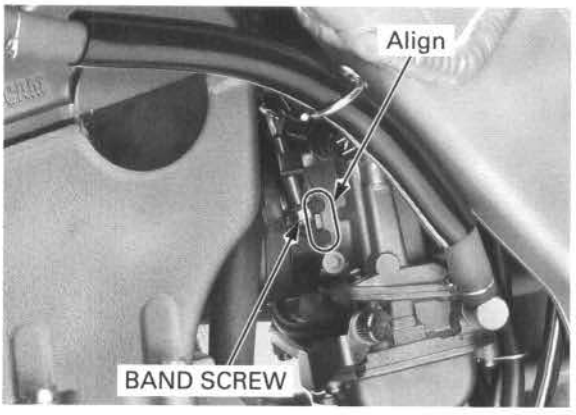
Install the hot start valve to the carburetor body, and tighten the lock nut to the specified torque.

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

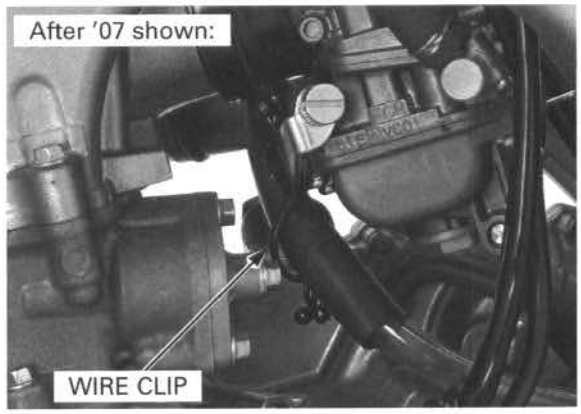


Align the lug on the carburetor with the groove in the carburetor insulator.

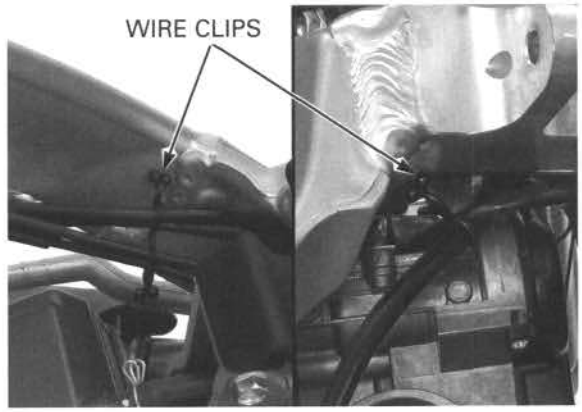
Tighten the insulator band screw securely.



After '07: Install the wire clip to the throttle stop screw stay.

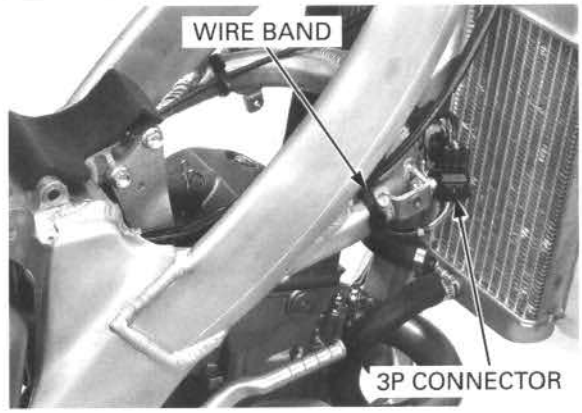


Route the throttle position sensor wire properly and secure it with the wire clips (page 1-22).



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

Perform the following inspections and adjustments:
- Throttle operation (page 4-6)
- Hot start lever (page 4-6)



Install the shock absorber upper mounting bolt and nut.

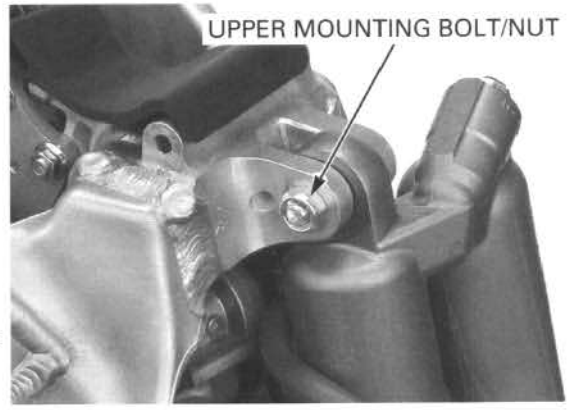
Tighten the upper mounting nut to the specified torque.

TORQUE: 44 N·m (4.5 kgf·m, 32 lbf·ft)

Install the following:
- Sub-frame (page 3-6)
- Muffler (page 3-9)
- Fuel tank (page 3-7)
- Seat (page 3-3)

After installation adjust the pilot screw adjustment (page 6-33).

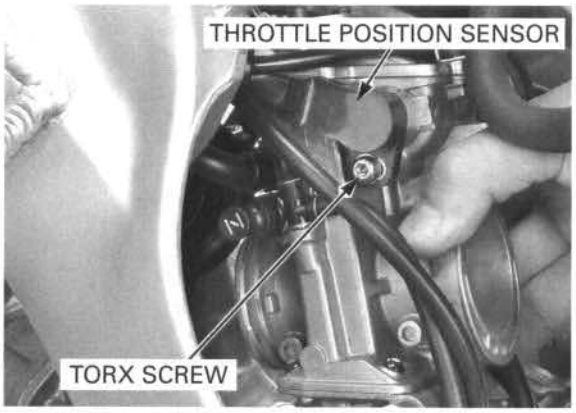
After installation check the following:
- Secondary air leak around the insulator and connecting boot
- Fuel leaks around the fuel hose and carburetor
- Route the overflow hose, air vent hoses and fuel hose (page 1-22)



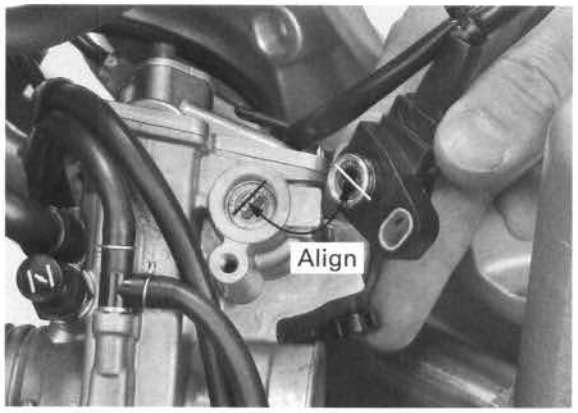
THROTTLE POSITION SENSOR REPLACEMENT

Remove the carburetor from the engine (page 6-16).

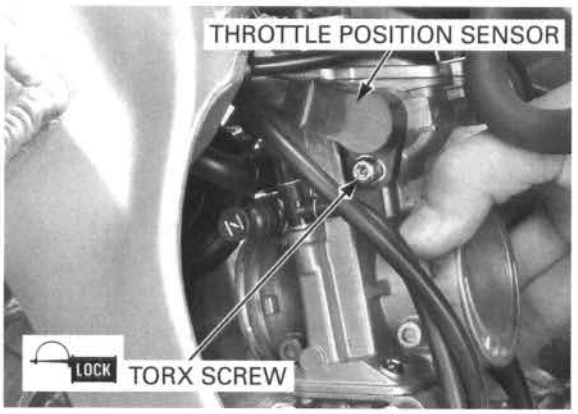
Remove the torx screw and throttle position sensor.



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



Apply locking agent to the torx screw threads and loosely install the screws.



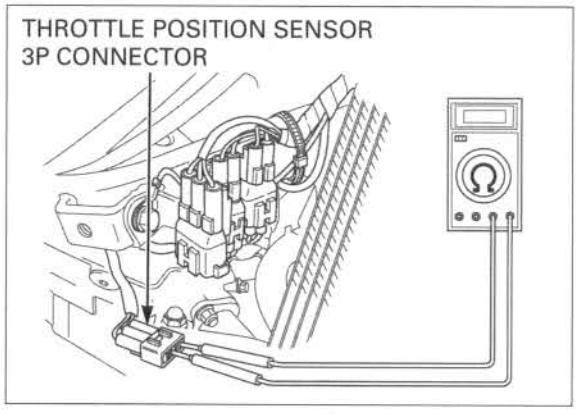
Measure the resistance between the Blue and Black wire terminals of the sensor side connector.

STANDARD: 4 – 6 kΩ (20°C/68°F)

Calculated the throttle position sensor resistance at idle speed using the equation below.
A x (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:
5kΩ x (0.13 – 0.15) = 650 – 750 Ω

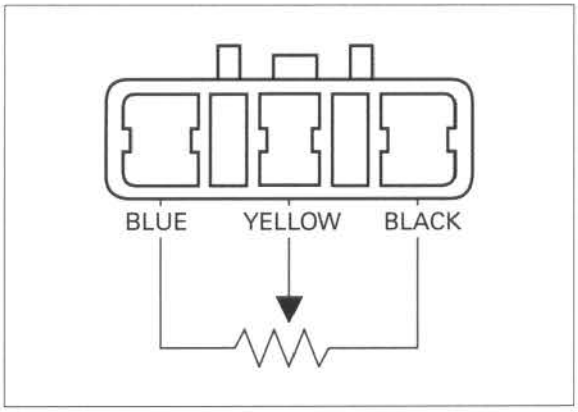


Adjust the throttle position sensor position so the resistance between terminals Yellow and Black is resistance calculated, and tighten the torx screw to the specified torque.

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

Connect the throttle position sensor connector.

Install the removed parts in the reverse order of removal.



PILOT SCREW ADJUSTMENT

The pilot screw is factory pre-set, if adjustment is necessary refer to page 6-10.
Use a tachometer with graduations of 50 rpm or smaller that will accurately indicate 50 rpm change.

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

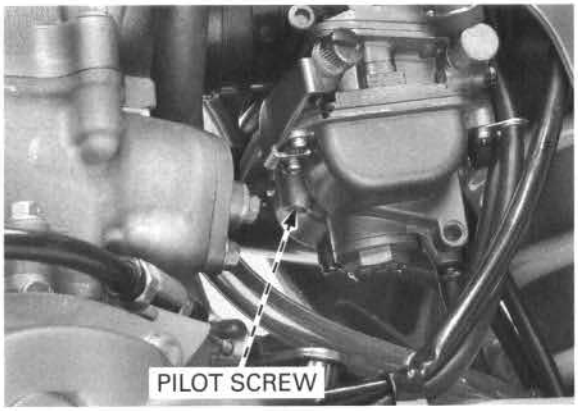
1. Turn the pilot screw clockwise until it seats lightly, then back it out the specified number of turns.

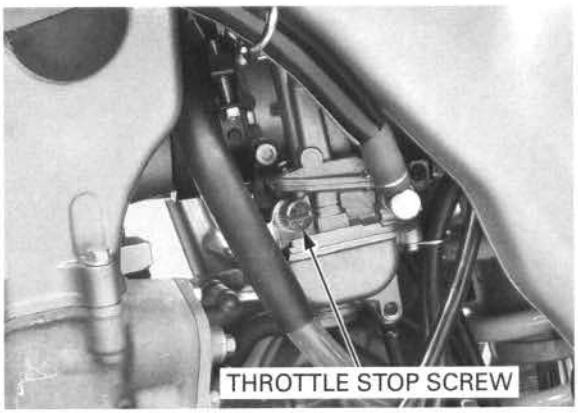
   STANDARD SETTING:
   '04 and '07: 2-1/4 turns out
   '05 and '06: 1-3/4 turns out
   '08: 1-7/8 turns out
   After '08: 1-1/4 turns out

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

   IDLE SPEED: 1,700 ± 100 rpm

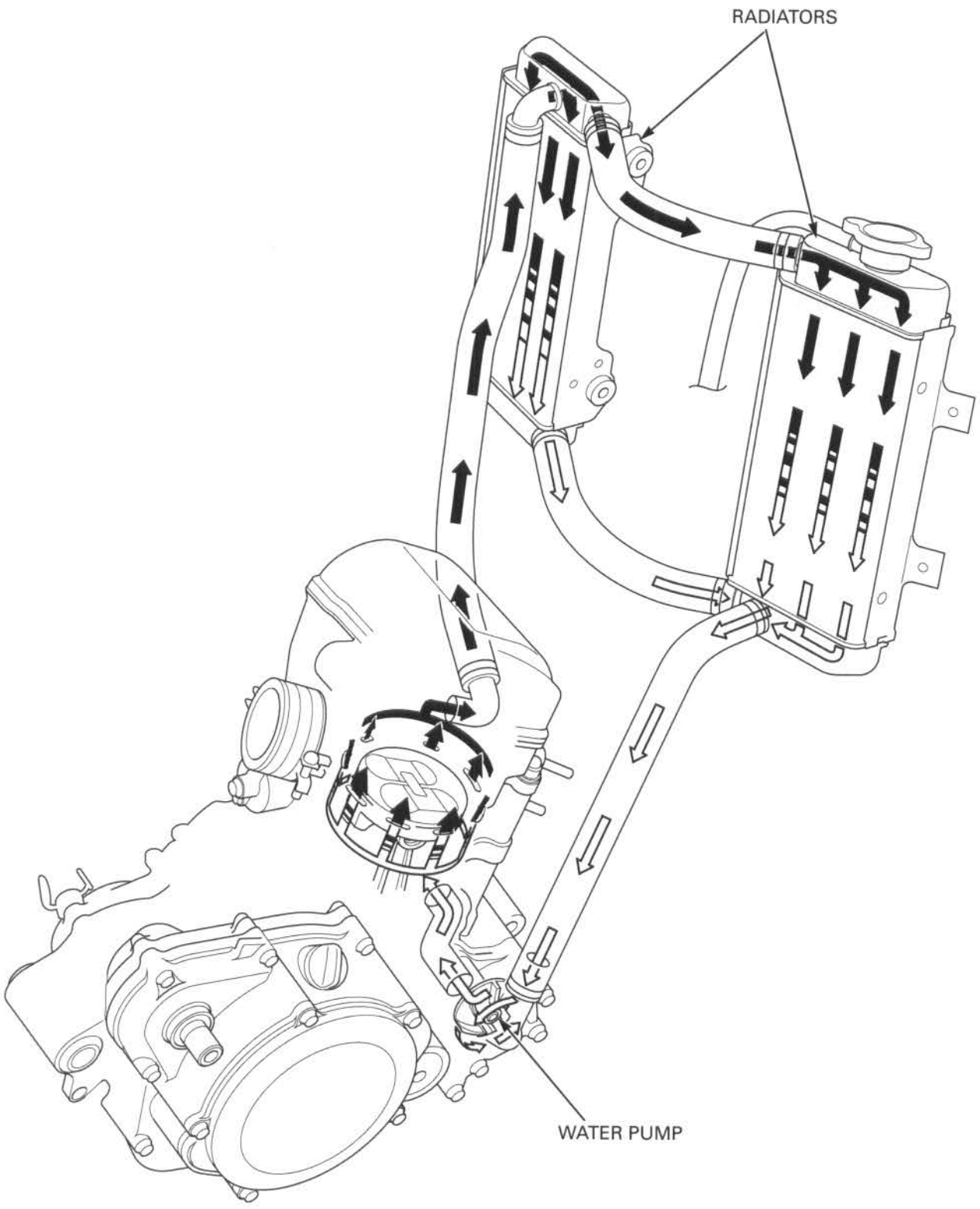
If your conditions are different, you may need to adjust the carburetor setting using the tuning information chart (page 6-10).





7. 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.

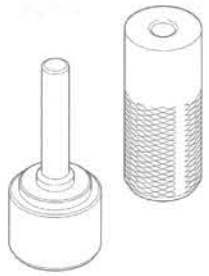
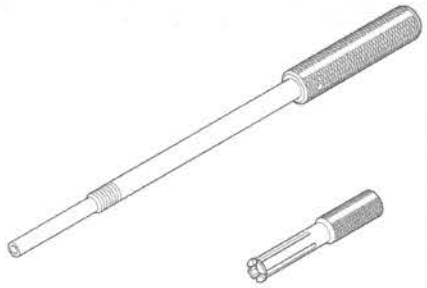
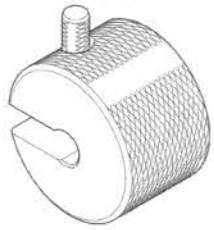
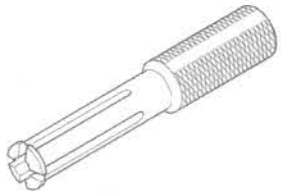
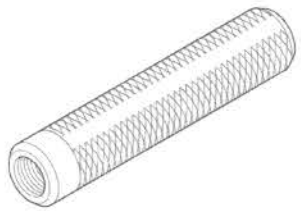
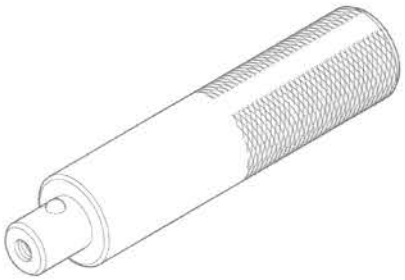
SPECIFICATIONS

ITEM		SPECIFICATIONS
Coolant capacity	At change	0.93 liter (0.98 US qt, 0.82 Imp qt)
	At disassembly	1.00 liter (1.06 US qt, 0.88 Imp qt)
Radiator cap relief pressure		93 – 123 kPa (0.95 – 1.25 kgf/cm^2, 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 VALUE

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

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 or 07936-371020A
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

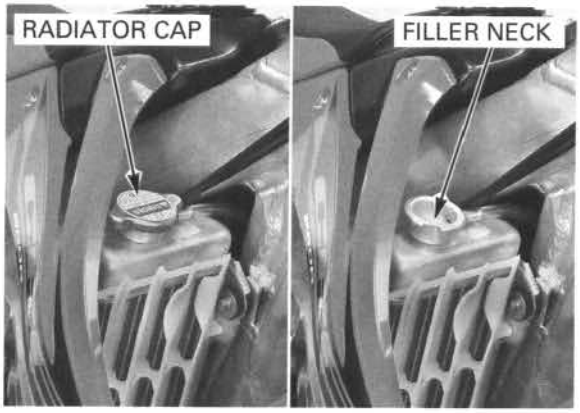
Engine temperature too high
- Faulty radiator cap
- Insufficient coolant
- Passage blocked in radiator, hoses or water jacket
- Radiator air passage clogged with dirt
- Air in system
- Faulty water pump

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 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)
Coolant ratio%	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

RADIATOR CAP/SYSTEM PRESSURE INSPECTION

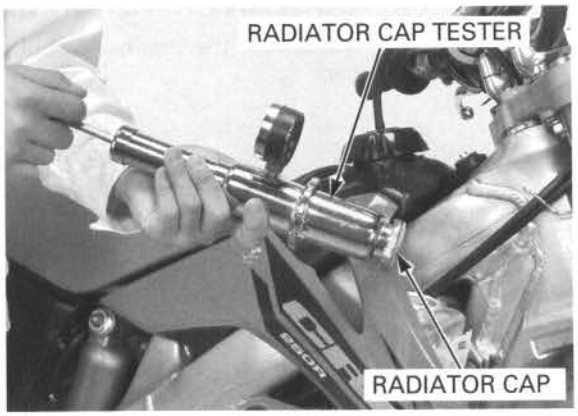
Remove the radiator cap (page 7-5).

Wet the sealing surface with water.

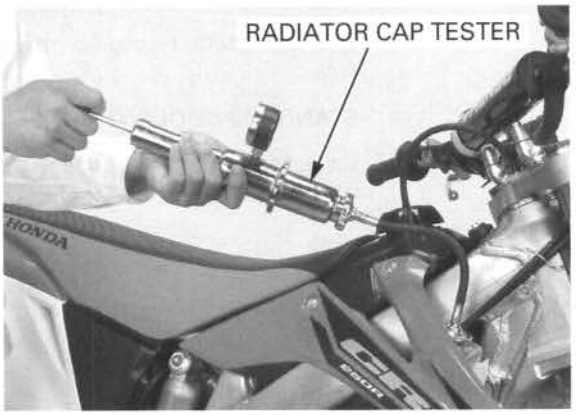
Install the radiator cap on the tester.

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/cm², 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/cm², 17.8 psi).

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

COOLANT REPLACEMENT

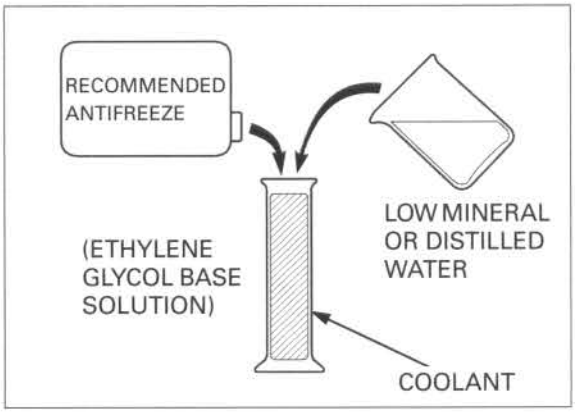
PREPARATION

If any coolant gets in your eyes, rinse them with water and consult a doctor immediately.
If any coolant in swallowed, induce vomiting, gargle and consult a physician immediately.
If any coolant gets on your skin or clothes, rinse thoroughly with plenty of water.

NOTICE

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

- 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.



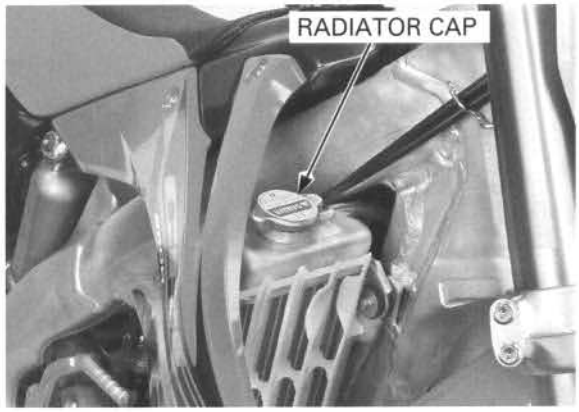
RECOMMENDED ANTIFREEZE:
Pro Honda HP coolant or an equivalent high quality ethylene glycol antifreeze containing silicate free corrosion inhibitors

RECOMMENDED MIXTURE:
1 : 1 (distilled water and recommended antifreeze)

REPLACEMENT/AIR BLEEDING

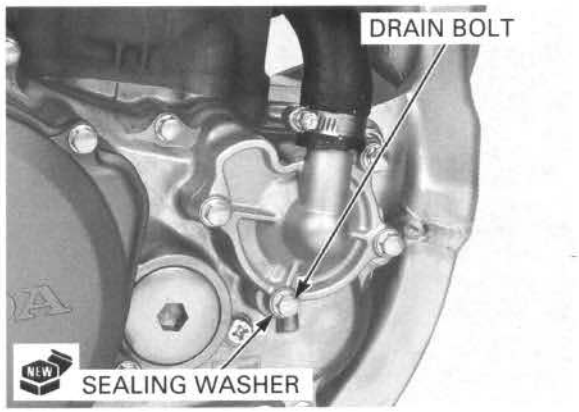
Remove the engine guard (page 3-4).

Remove the radiator cap.



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

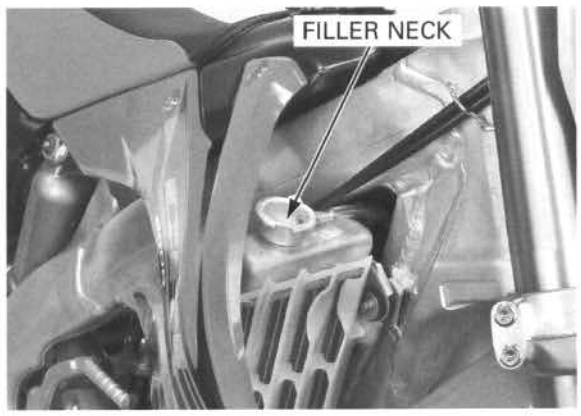
Reinstall the drain bolt with a new sealing washer. Tighten the drain bolt securely.



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

CAPACITY:
0.93 liter (0.98 US qt, 0.82 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.

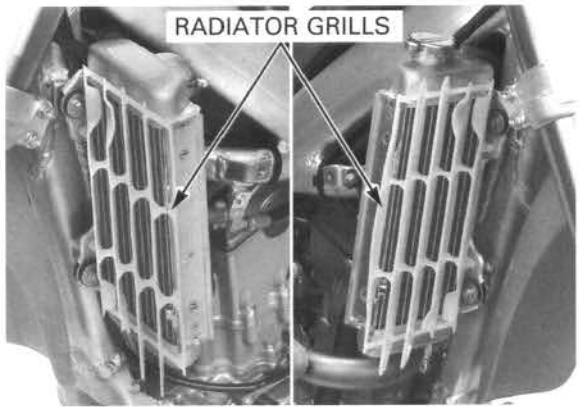


RADIATOR

REMOVAL

Drain the coolant (page 7-7).
Remove the radiator shrouds (page 3-4).

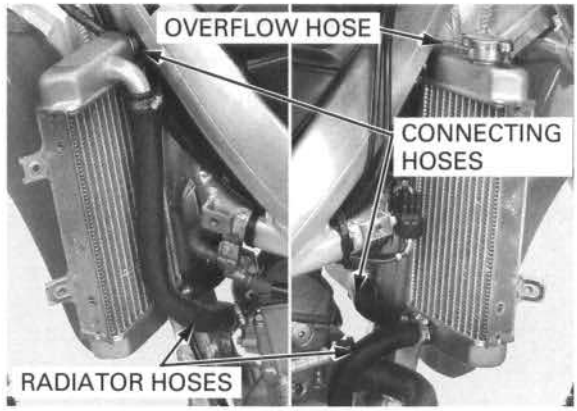
Remove the radiator grills.



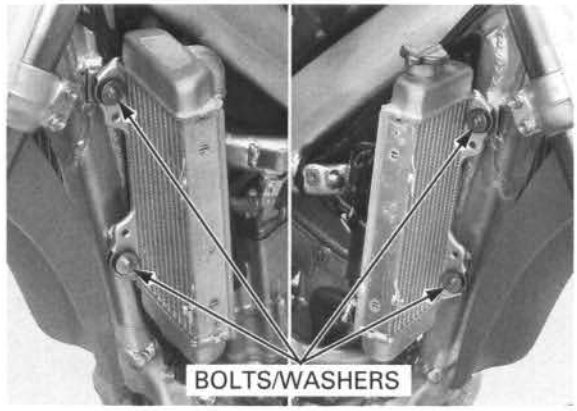
Note the direction of the hose clamp. Be careful not to damage the radiator core.

Disconnect the following:

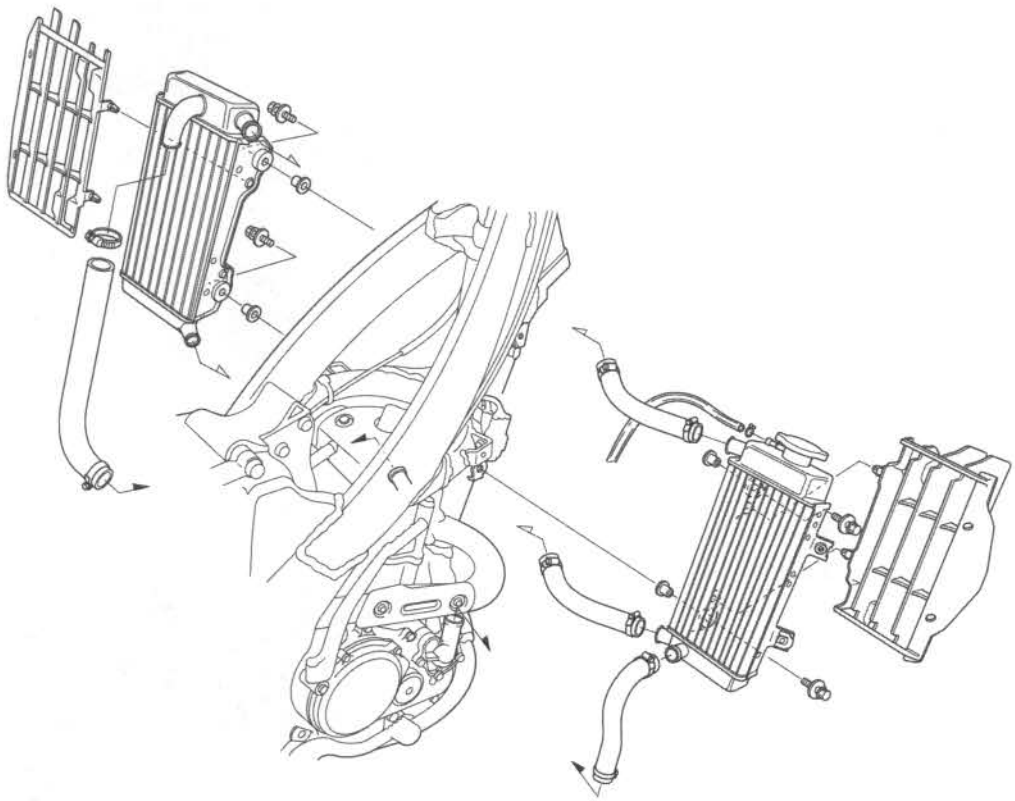
- Coolant overflow hose
- Connecting hoses
- Upper and lower radiator hose



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



INSTALLATION

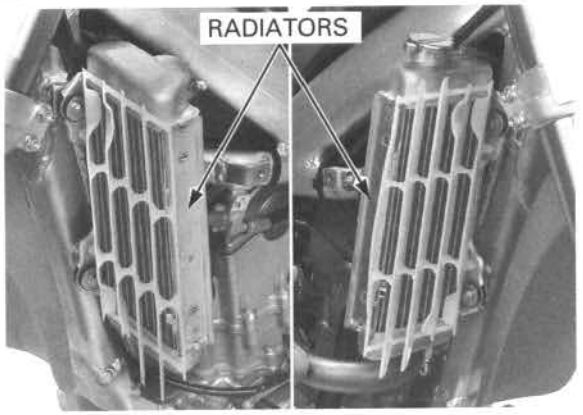


Be careful not to damage the radiator core.

Installation is in the reverse order of removal.

Add the recommended coolant mixture to the filler neck and bleed the air (page 7-7).

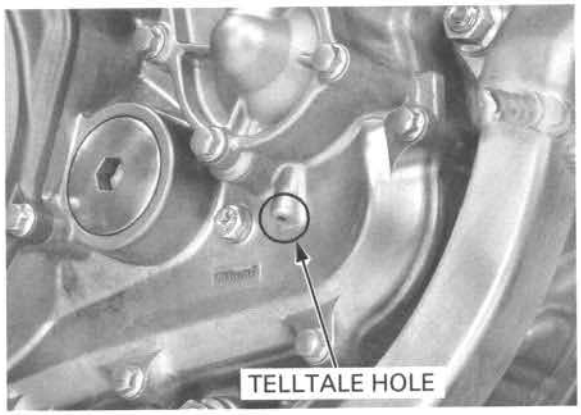
After installation, check the radiator and radiator hoses for leaks.



WATER PUMP

WATER SEAL INSPECTION

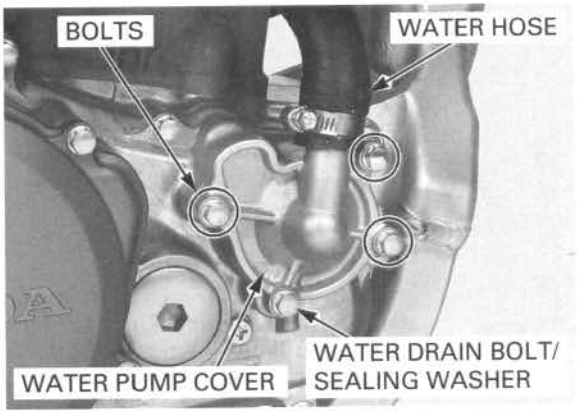
Inspect the telltale hole for signs of coolant leakage. If there is leakage, the water seal is defective and rebuild the water pump as an assembly.



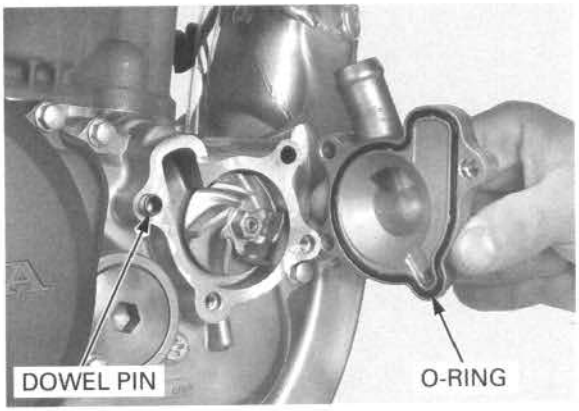
REMOVAL

Drain the coolant (page 7-7).

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.



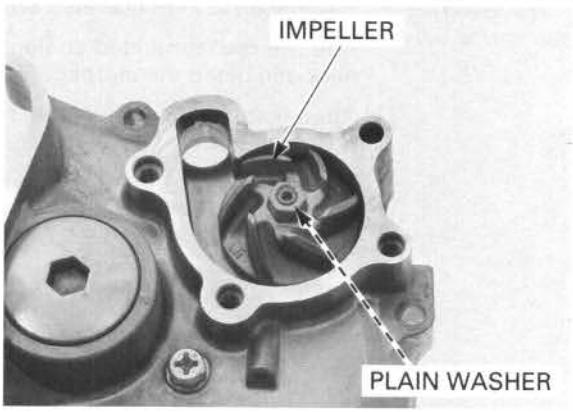
Remove the O-ring and dowel pin.



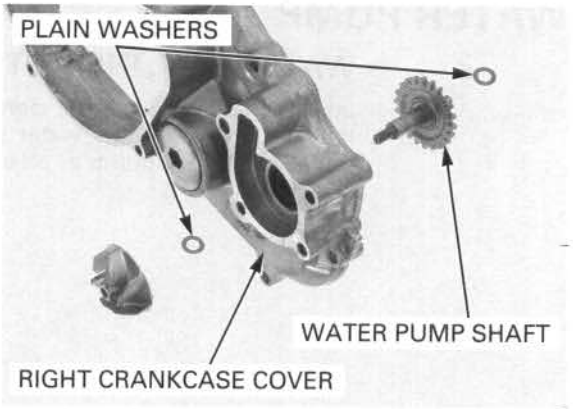
Remove the right crankcase cover (page 11-5)

Remove the impeller and plain washer.

- The impeller has left hand threads.

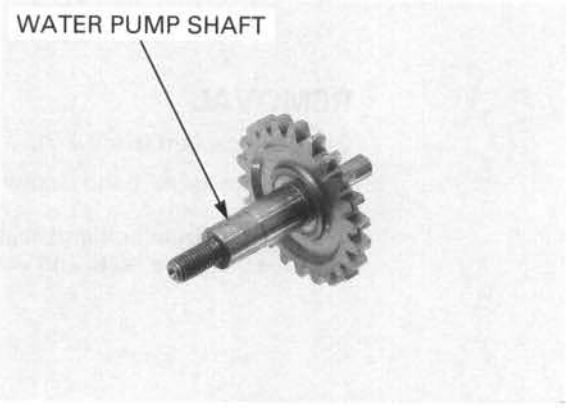


Remove the water pump shaft from the right crankcase cover.



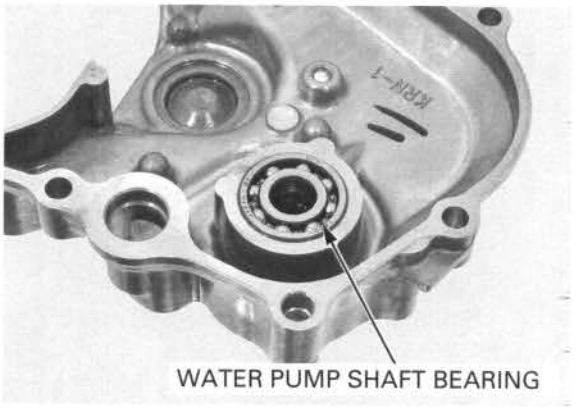
Check the water pump shaft for a bend or damage.

Check the gear for wear or damage.



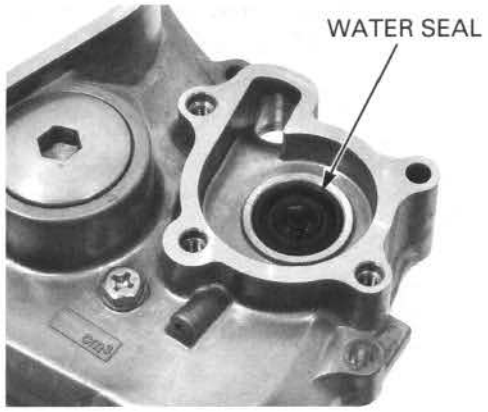
Turn the inner race of the water pump shaft bearing with your finger. The bearing should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the right crankcase cover.

Replace the water pump shaft bearing if necessary (page 7-11).



Check the water seal for damage or deterioration.

Replace the water seal if necessary (page 7-11).



BEARING/WATER SEAL/OIL SEAL REPLACEMENT

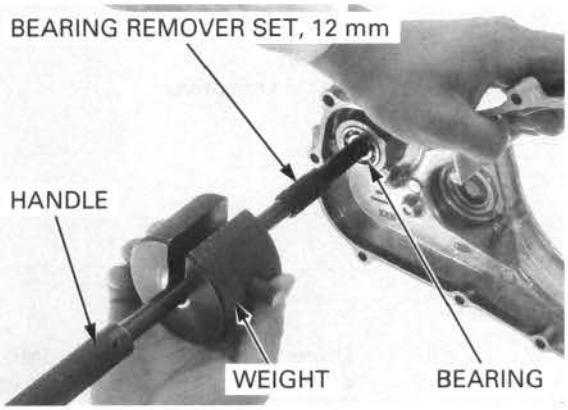
Remove the water pump shaft bearing using the special tools.

TOOLS:

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

TOOLS, U.S.A. only:

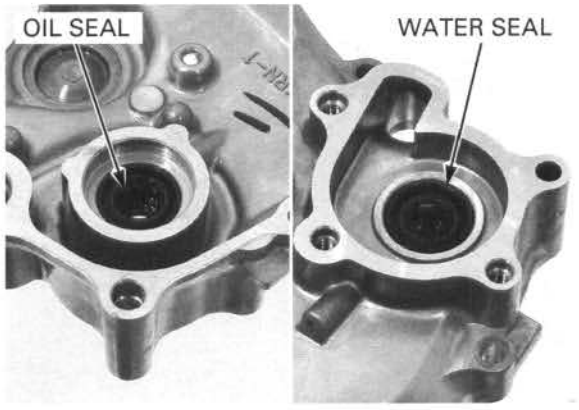
Bearing remover, 12 mm	**07936-166010A**
Remover handle	**07936-3710100**
Remover weight	**07741-0010201 or 07936-3710200 or 07936-371020A**



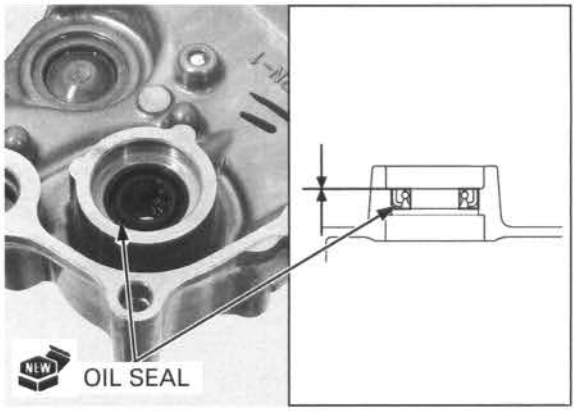
Check the oil seal for damage or deterioration.

Replace the oil seal if necessary (page 7-11).

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



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

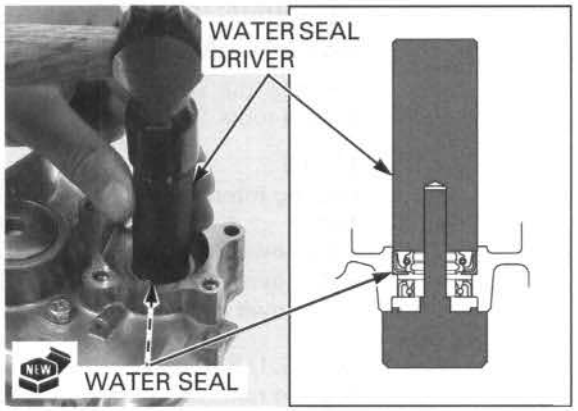


Be careful not to damage the water seal lips.

Install the water seal driver into the right crankcase cover as shown.
Drive in a new water seal using the special tool as shown.

TOOL:

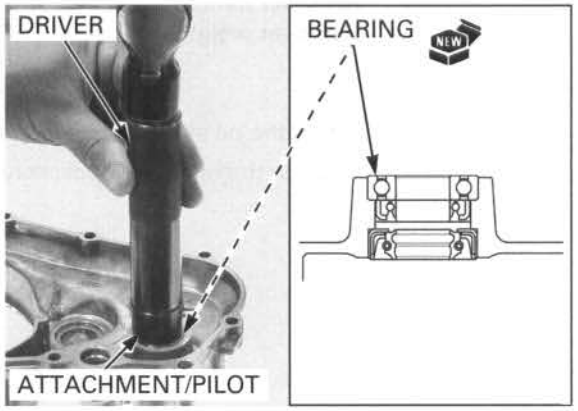
Water seal driver	**07945-KA30000 or 07965-415000A (U.S.A. only)**



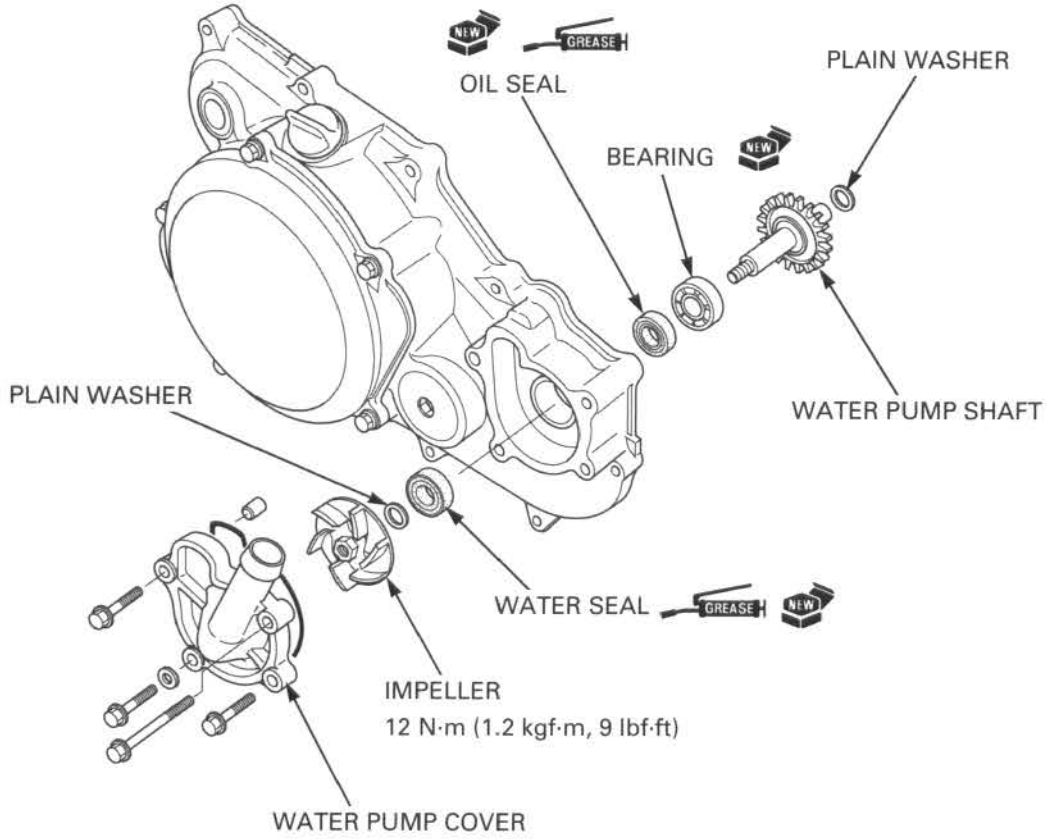
Drive in a new bearing into the right crankcase cover using the special tools as shown.

TOOLS:

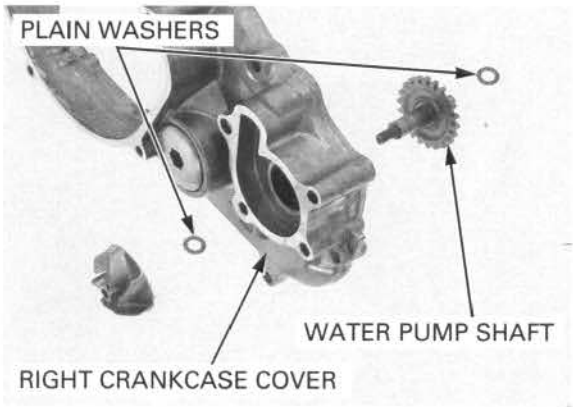
Driver	**07749-0010000**
Attachment, 28 x 30 mm	**07946-1870100**
Pilot, 12mm	**07746-0040200**



INSTALLATION



Install the water pump shaft into the right crankcase cover.



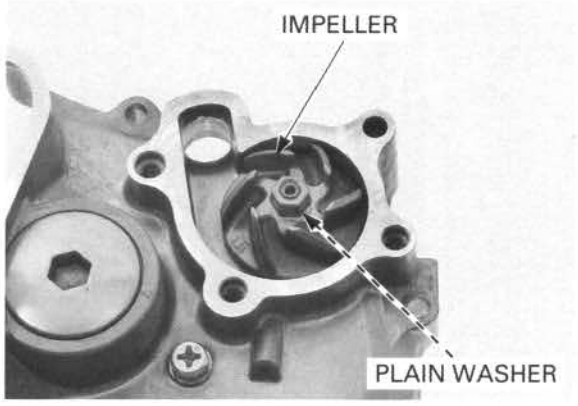
Install the plain washer and impeller onto the water pump shaft.

- The impeller has left hand threads.

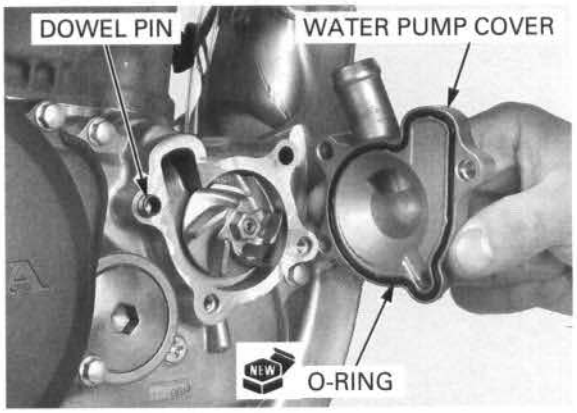
Tighten the impeller to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the right crankcase cover (page 11-6).



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

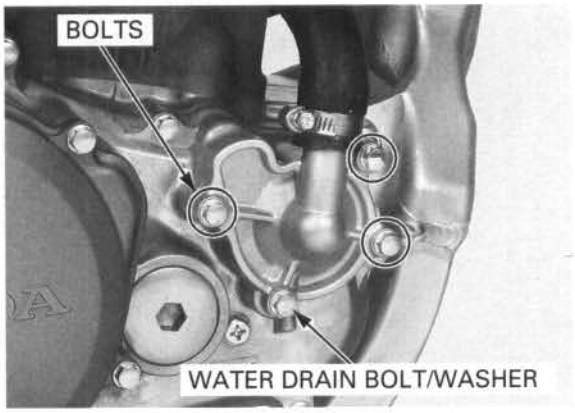


Install the water pump cover and tighten the bolts securely.

Install the water drain bolt and washer.
Tighten the water drain bolt securely.

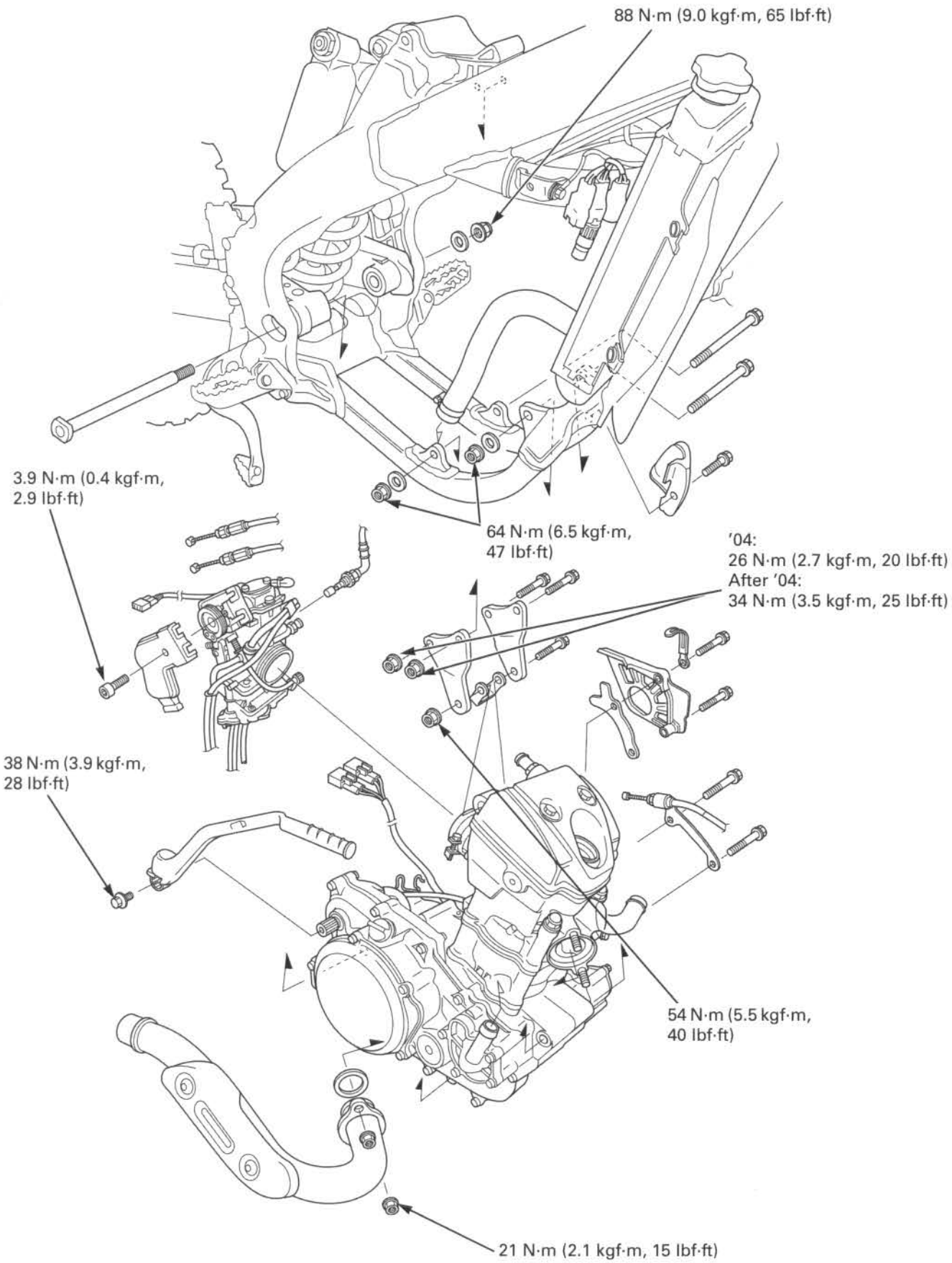
Connect the water hose and tighten the band screw.

Add the recommended coolant mixture to the filler neck and bleed the air (page 7-7).



8. 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 12-9)
  - Crankshaft (page 12-15)
  - Transmission (page 12-12)
  - Oil pump (page 5-7)
- The following components can be serviced with the engine installed in the frame.
  - Cylinder head (page 9-13)
  - Valves (page 9-16)
  - Cylinder (page 10-4)
  - Piston (page 10-4)
  - Clutch (page 11-7)
  - Kickstarter (page 11-16)
  - Gearshift linkage (page 11-19)
  - Carburetor (page 6-16)
  - Flywheel (page 16-11)
  - Water pump (page 7-9)
  - Balancer (page 12-7)

SPECIFICATION

ITEM			SPECIFICATIONS
Engine dry weight		'04, '05	23.90 kg (52.68 lbs)
		'06	24.05 kg (53.02 lbs)
		'07	24.08 kg (53.09 lbs)
		After '07	24.10 kg (53.13 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 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 10 W-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	'04	0.72 liter (0.76 US qt, 0.63 Imp qt)
		After '04	0.60 liter (0.63 US qt, 0.53 Imp qt)
	At disassembly	'04	0.77 liter (0.81 US qt, 0.68 Imp qt)
		After '04	0.70 liter (0.74 US qt, 0.62 Imp qt)
Coolant capacity	At change		0.93 liter (0.98 US qt, 0.82 Imp qt)
	At disassembly		1.00 liter (1.06 US qt, 0.88 Imp qt)

TORQUE VALUES

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)		64 N·m (6.5 kgf·m, 47 lbf·ft)	
	(lower)		64 N·m (6.5 kgf·m, 47 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:	25 N·m (2.6 kgf·m, 19 lbf·ft)	Apply locking agent to the threads
		After '04:	36 N·m (3.7 kgf·m, 27 lbf·ft)	Apply locking agent to the threads
Exhaust pipe joint nut			21 N·m (2.1 kgf.m, 15 lbf·ft)	
Swingarm pivot nut			88 N·m (9.0 kgf.m, 65 lbf·ft)	U-nut
Throttle drum cover bolt			3.9 N·m (0.4 kgf.m, 2.9 lbf·ft)	

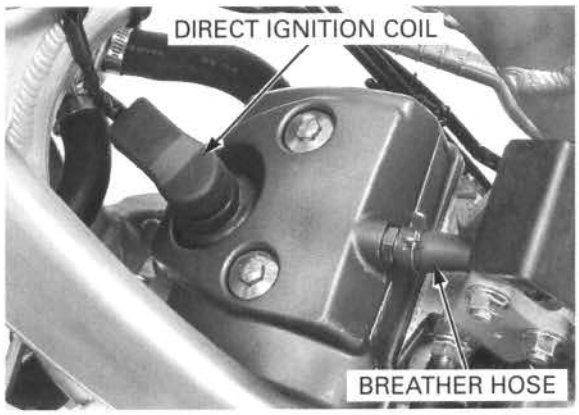
ENGINE REMOVAL

Drain the engine oil (page 4-13).
Drain the transmission oil (page 4-16).
Drain the coolant (page 7-7).

Remove the following:

- Seat (page 3-3)
- Engine guard (page 3-4)
- Fuel tank (page 3-7)
- Exhaust pipe (page 3-11)
- Carburetor (page 6-16)
- Kickstarter(page 11-16)
- Gearshift pedal(page 11-19)
- Brake pedal(page 15-32)

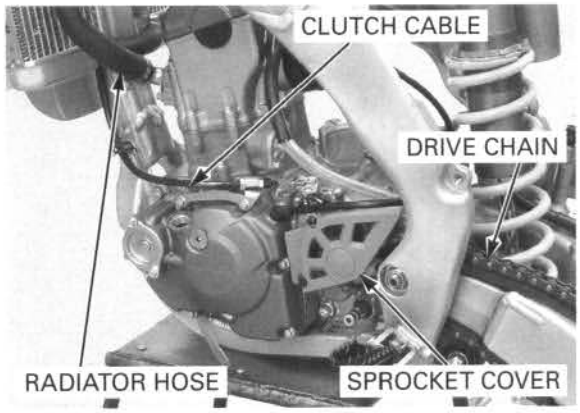
Remove the direct ignition coil.
Disconnect the crankcase breather hose.



Remove the bolts, spacer and drive sprocket cover.
Disconnect the drive chain and remove it.

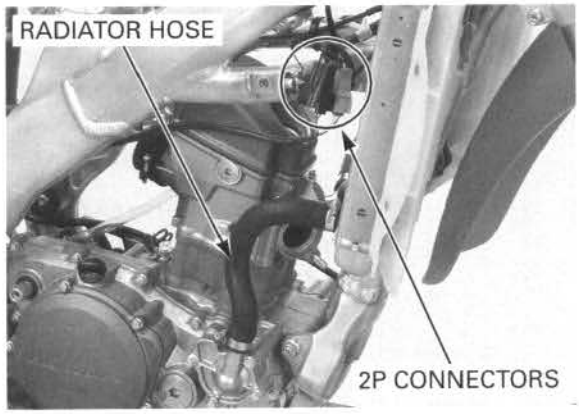
Remove the bolts and clutch cable stay.
Disconnect the clutch cable from the lifter lever.

Loosen the hose band screw and disconnect the upper radiator hose.

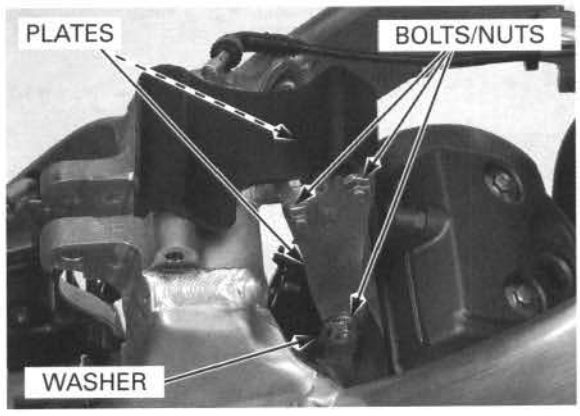


Loosen the hose band screw and disconnect the lower radiator hose from right crankcase cover.

Disconnect the alternator and CKP (crankshaft position) sensor 2P connectors.



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



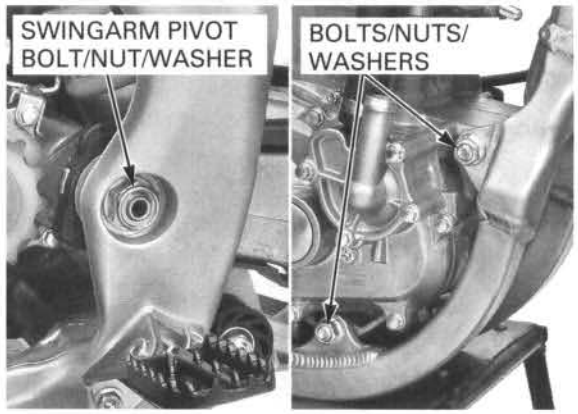
Loosen the swingarm pivot nut.
Loosen the engine front/lower mounting nuts.

Remove the swingarm pivot nut, washer and bolt.

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

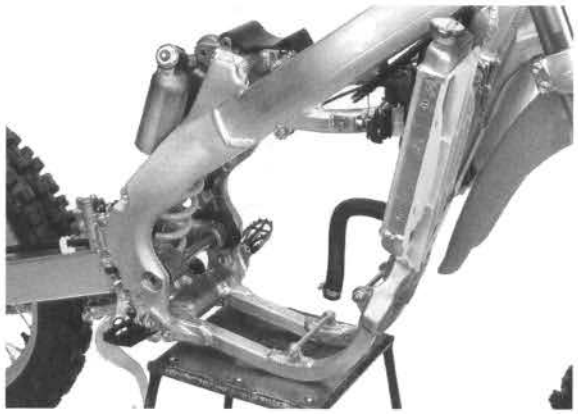
Remove the engine.

- A workstand or equivalent is to support the swingarm when removing 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.



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.



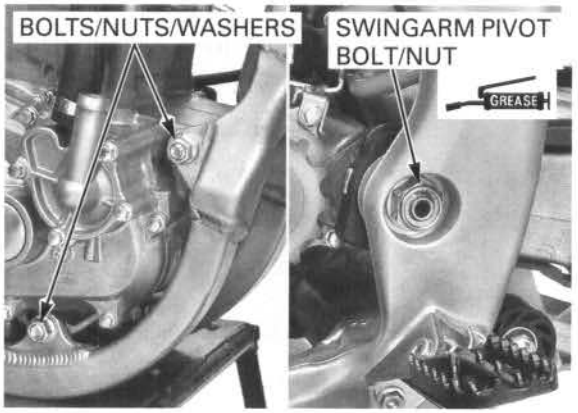
ENGINE INSTALLATION

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

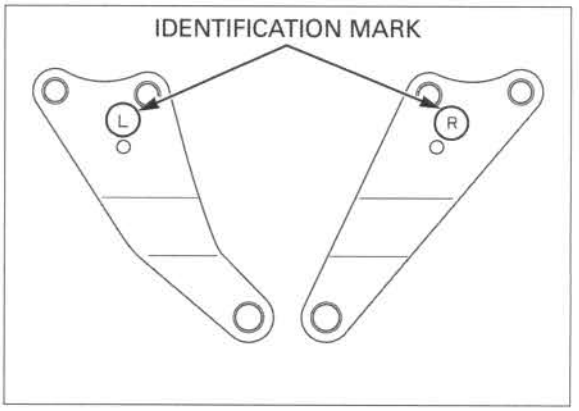
Install the engine in the frame.
Carefully align the bolt holes in the frame and engine.
Install the engine mounting bolts, washers and nuts.

Apply thin coat of grease to the swingarm pivot bolt sliding surface.
Install the swingarm pivot bolt, washer and nut.

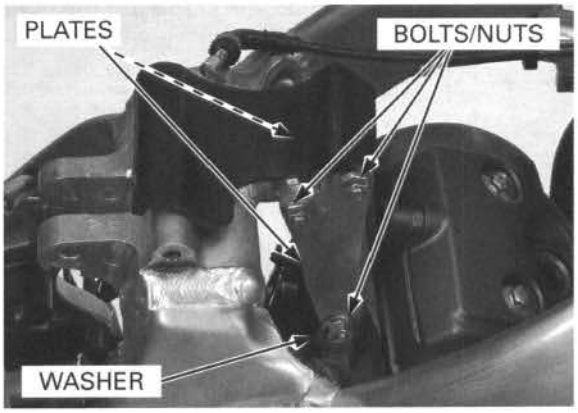
- Route the wires and cables properly (page 1-22).
- Do not tighten the swingarm pivot nut and engine mounting nuts yet.



- Each engine hanger plates has an identification mark, "L" is for the left side and "R" is for right side.
- Identification mark facing to the inside.



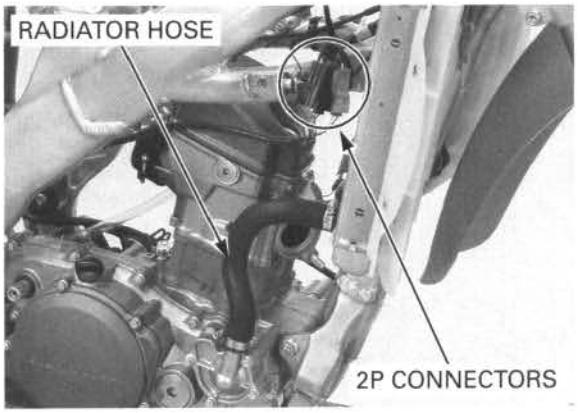
Install the washer, engine hanger plates, bolts and nuts.
Tighten the engine mounting nuts, engine hanger plate bolts and swingarm pivot nut to the specified torque.



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

Connect the alternator and CKP sensor 2P connectors.

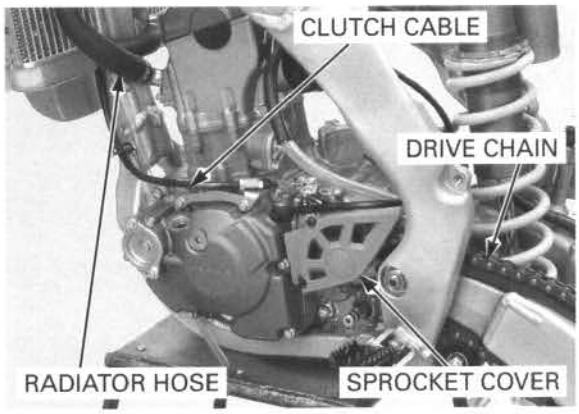
Connect the lower radiator hose and tighten the band screw securely.



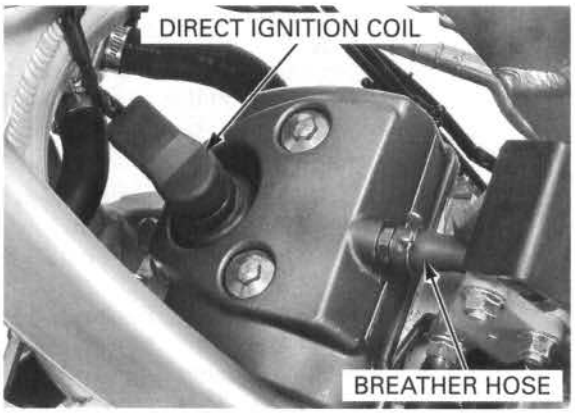
Connect the upper radiator hose and tighten the band screw securely.

Connect the clutch cable into the clutch lifter lever.

Install and connect the drive chain.
Install the drive sprocket cover and tighten the bolt securely.



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 15-32)
- Gearshift pedal(page 11-22)
- Kickstarter pedal(page 11-6)
- Carburetor (page 6-30)
- Exhaust pipe (page 3-12)
- Fuel tank (page 3-7)
- Engine guard (page 3-4)
- Seat (page 3-3)

Add the recommended coolant mixture to the filler neck and bleed the air (page 7-7).
Fill the engine with the recommended oil (page 4-13).
Fill the transmission with the recommended oil (page 4-16).

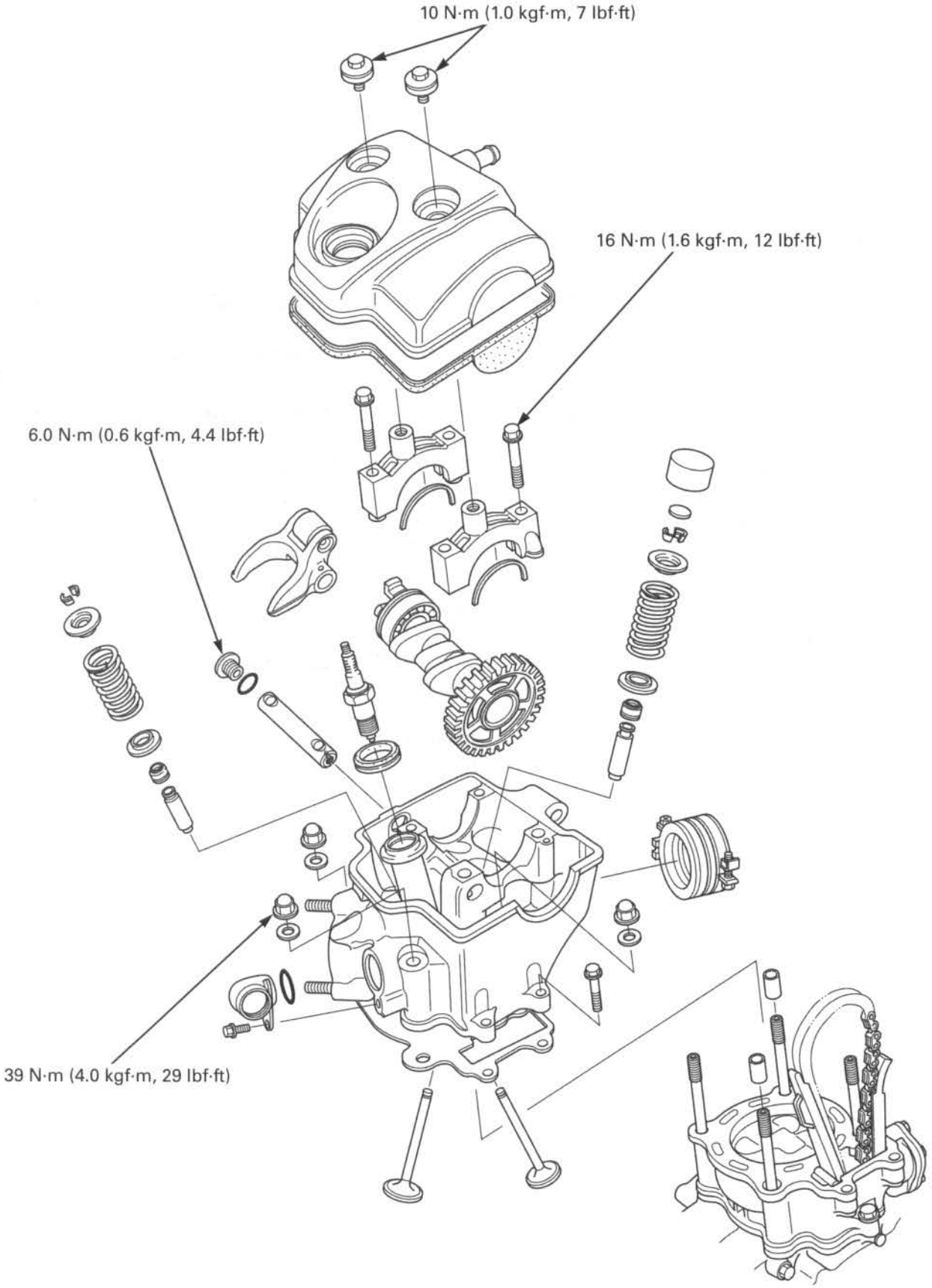
After installing the engine, perform the following inspections and adjustments:

- Throttle grip freeplay (page 4-6)
- Rear brake pedal height (page 4-23)
- Drive chain slack (page 4-19)
- Clutch lever freeplay (page 4-24)

Check the exhaust system for leaks.

9. 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

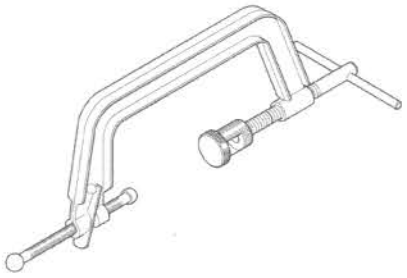
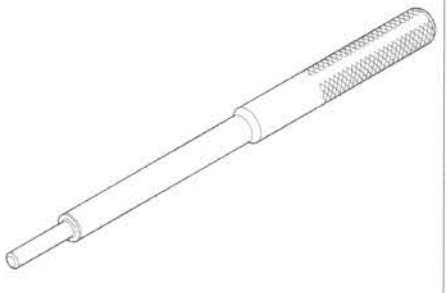
Unit: mm (in)

ITEM					STANDARD	SERVICE LIMIT
Cylinder compression					392 kPa (4.0 kgf/cm², 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	'04 - '07		4.965 – 4.980 (0.1955 – 0.1961)	4.955 (0.1951)
			After '07		4.465 – 4.480 (0.1758 – 0.1746)	4.455 (0.1754)
	Valve guide I.D.	IN			5.000 – 5.012 (0.1969 – 0.1973)	5.052 (0.1989)
		EX	'04 - '07		5.000 – 5.012 (0.1969 – 0.1973)	5.052 (0.1989)
			After '07		4.500 – 4.512 (0.1772 – 0.1776)	4.552 (0.1792)
	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	'04 - '07		19.8 – 20.0 (0.78 – 0.79)	–
			After '07		19.9 – 20.1 (0.78 – 0.79)	–
	Valve seat width	IN/EX			0.90 – 1.10 (0.035 – 0.043)	1.7 (0.07)
Valve spring free length		IN	'04 - '07		39.47 (1.532)	38.5 (1.52)
			After '07		38.51 (1.516)	37.7 (1.48)
		EX	'04 - '07		43.07 (1.696)	42.1 (1.66)
			After '07		43.03 (1.694)	42.2 (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 – 0.4719)	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	IN	'04 - '06		36.000 – 36.240 (1.4173 – 1.4268)	35.86 (1.412)
			'07		36.200 – 36.440 (1.4252 – 1.4346)	36.06 (1.420)
			After '07		36.280 – 36.360 (1.4280 – 1.4315)	36.14 (1.423)
		EX	'04 and '06		25.667 – 25.907 (1.0105 – 1.0120)	25.56 (1.006)
			'05		25.501 – 25.741 (1.0040 – 1.0134)	24.40 (0.961)
			'07		25.501 – 25.721 (1.0040 – 1.0126)	24.40 (0.961)
			After '07		25.750 – 25.830 (1.0138 – 1.0169)	25.64 (1.009)
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 – 0.8869)	22.54 (0.887)

TORQUE VALUES

Cylinder head cover bolt		10 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
Decompressor cam stopper plate bolt		10 N·m (1.0 kgf·m, 7 lbf·ft)	Apply locking agent to the threads
Cylinder head nut		39 N·m (4.0 kgf·m, 29 lbf·ft)	Apply oil to the seating surface
Cam chain tensioner bolt		12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply locking agent to the threads
Crankshaft hole cap		15 N·m (1.5 kgf·m, 11 lbf·ft)	
Rocker arm shaft cap		6.0 N·m (0.6 kgf·m, 4.4 lbf·ft)	Apply grease to the threads
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)	
Spark plug		16 N·m (1.6 kgf·m, 12 lbf·ft)	

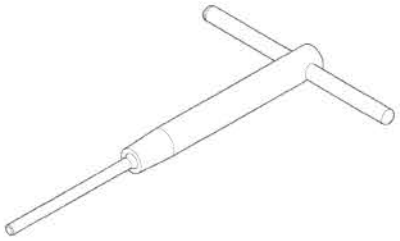
TOOLS

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  07984-MA6000D (U.S.A. only)	Valve seat cutter, 33 mm (45°, IN) 07780-0010800  or equivalent commercially available in U.S.A.	Valve seat cutter, 27.5 mm (45°, EX) 07780-0010200  or equivalent commercially available in U.S.A.
Flat cutter, 33 mm (32°, IN) 07780-0012900  or equivalent commercially available in U.S.A.	Flat cutter, 28 mm (32°, EX) 07780-0012100  or equivalent commercially available in U.S.A.	Interior cutter, 37.5 mm (60°, IN) 07780-0014100  or equivalent commercially available in U.S.A.

Interior cutter, 30 mm (60°, EX)
07780-0014000

or equivalent commercially available in U.S.A.

Cutter holder, 5.0 mm
07781-0010400



or equivalent commercially available in U.S.A.

Tappet hole protector
07JMG-KY20100

or make your own from 35 mm film canister

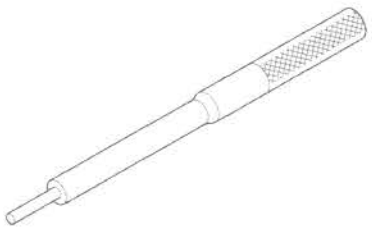
Tensioner stopper
070MG-0010100

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

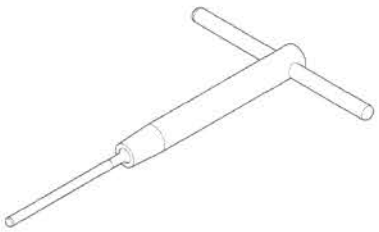
Valve guide reamer, 4.5 mm
07HMH-ML00101

or 07HMH-ML0010B (U.S.A. only)

Valve guide driver, 4.5 mm
07HMD-ML00101



Cutter holder, 4.5 mm
07781-0010600



or equivalent commercially available in U.S.A.

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

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

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

Rough idle

- Low cylinder compression

CYLINDER COMPRESSION TEST

Remove the fuel tank (page 3-7).

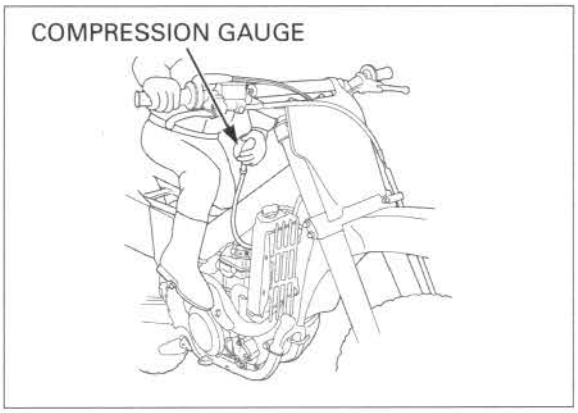
Warm up the engine.
Stop the engine and remove the spark plug.
Connect a compression gauge.

Open the throttle fully.

Make sure the compression gauge connection does not leak.

Operate the kickstarter pedal forcefully several times until the gauge needle stops moving.

COMPRESSION: 392 kPa (4.0 kg/cm², 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 10-5)

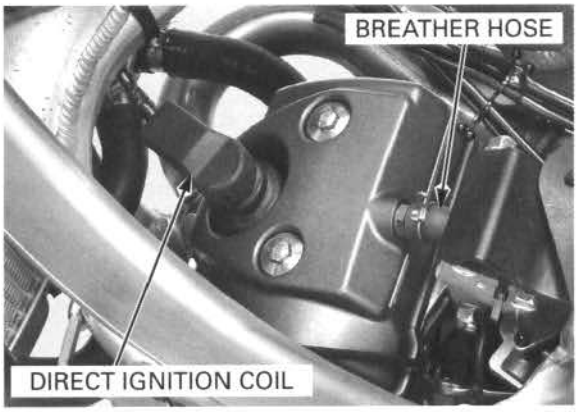
High compression can be caused by:

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

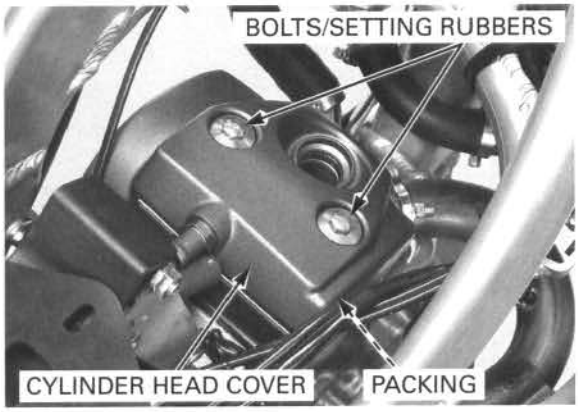
CYLINDER HEAD COVER REMOVAL

Remove the fuel tank (page 3-7).

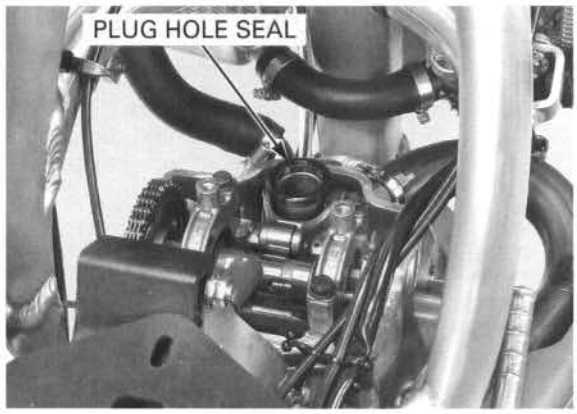
Remove the direct ignition coil.
Disconnect the crankcase breather hose.



Remove the bolts/setting rubbers, cylinder head cover and packing.



Remove the plug hole seal.

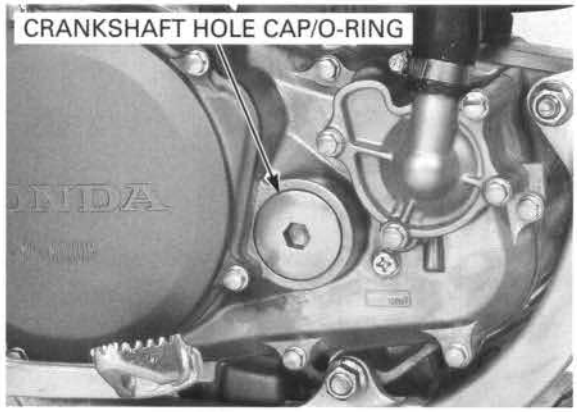


CAMSHAFT/ROCKER ARM REMOVAL

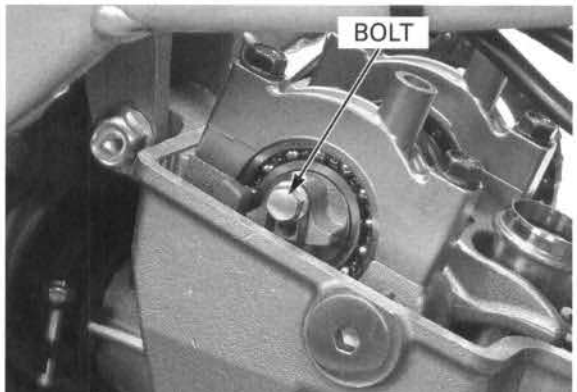
CAMSHAFT

Remove the cylinder head cover (page 9-7).

Remove the crankshaft hole cap and O-ring.

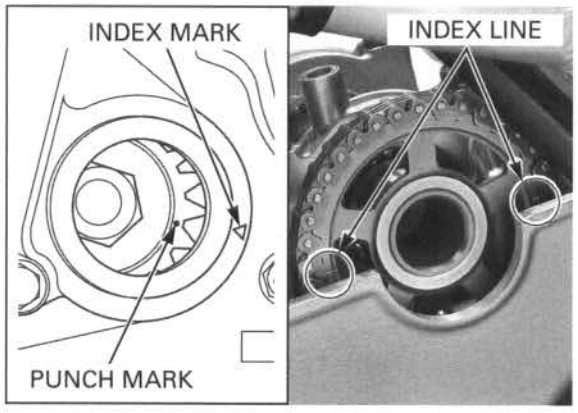


The decompressor cam will be disassembled later, loosen the stopper plate bolt, but do not remove it yet.

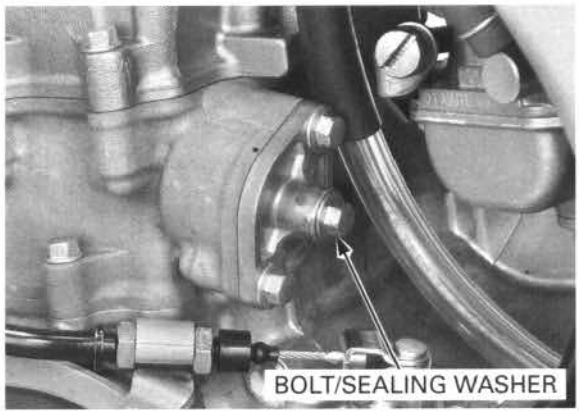


Turn the crankshaft clockwise to align the punch mark with the index mark on the right crankcase cover.
Make sure the piston is at T.D.C. (Top Dead Center) on the compression stroke.

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



Remove the cam chain tensioner lifter bolt and sealing washer.

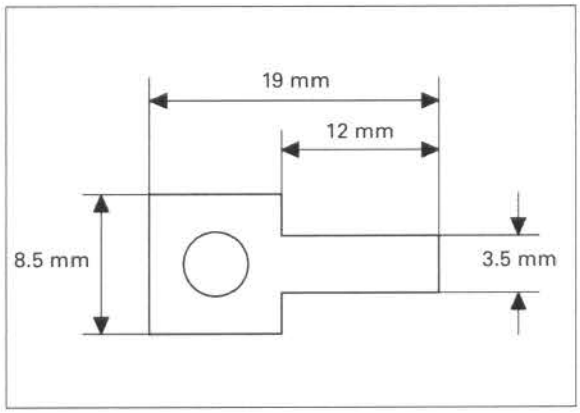


Turn the cam chain tensioner lifter shaft clockwise fully and secure it using the special tool.

TOOL:

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

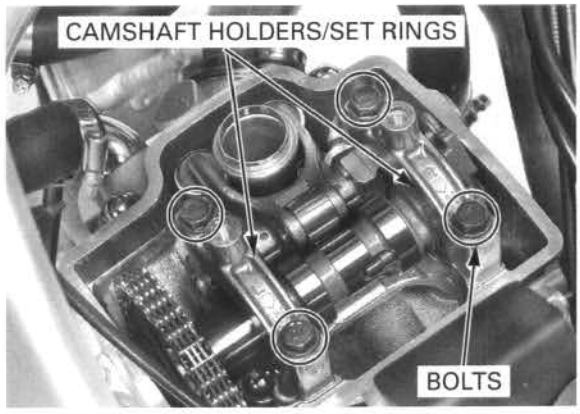
This tool can easily be made from a thin (1 mm thick) piece of steel as shown below.



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

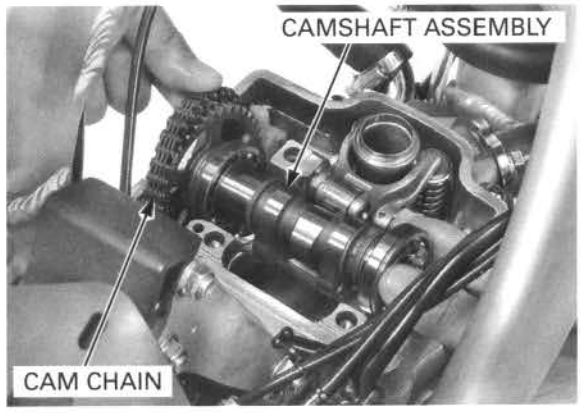
Be careful not to let the set rings fall into the crankcase.

Remove the camshaft holders and set rings.



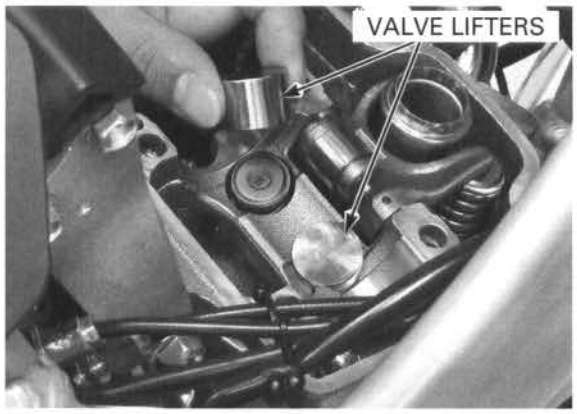
Remove the cam chain from the cam sprocket and suspend the cam chain with a piece of wire to prevent it from falling into the crankcase.

Remove the camshaft assembly.



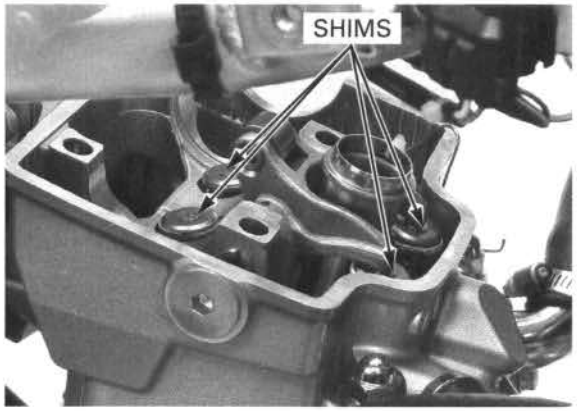
Remove the valve lifters from cylinder head.

- 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 and shims to ensure correct reassembly in their original locations.



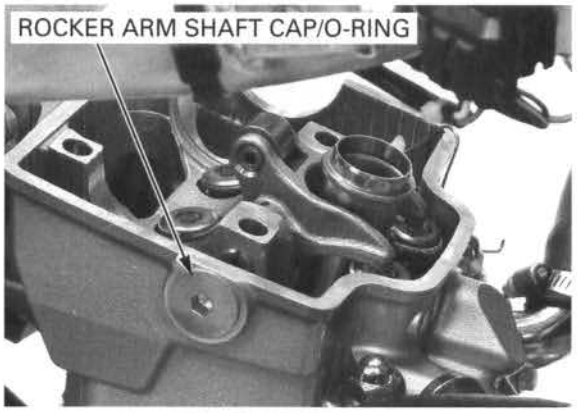
Remove the shims.

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

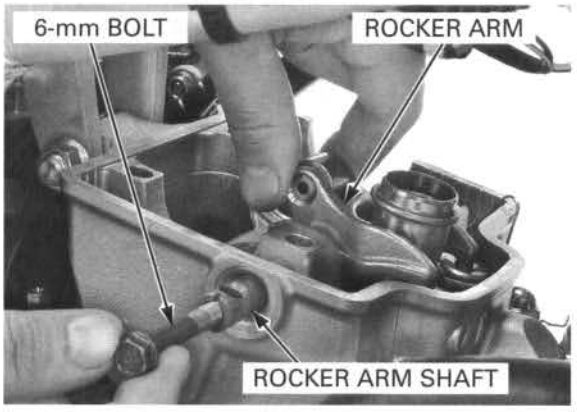


ROCKER ARM

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

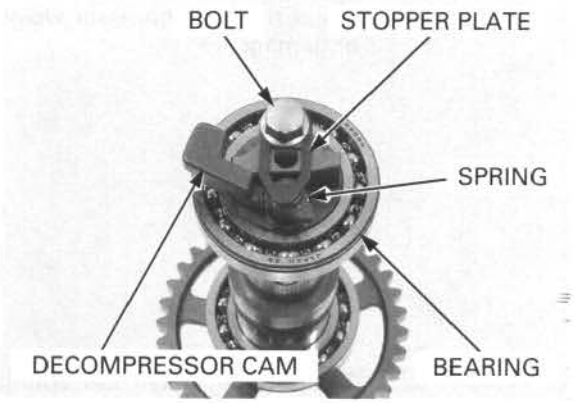


Thread a 6-mm bolt into the rocker arm shaft and pull the rocker arm shaft out of the cylinder head. Remove the rocker arm from the cylinder head.



DISASSEMBLY

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



INSPECTION

If the camshaft contact surface of 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)

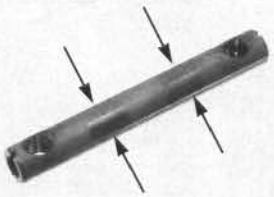
Inspect the rocker arm shaft for wear or damage.

Measure the rocker arm shaft O.D.

SERVICE LIMIT: 11.93 mm (0.470 in)

Calculate the rocker arm-to-shaft clearance.

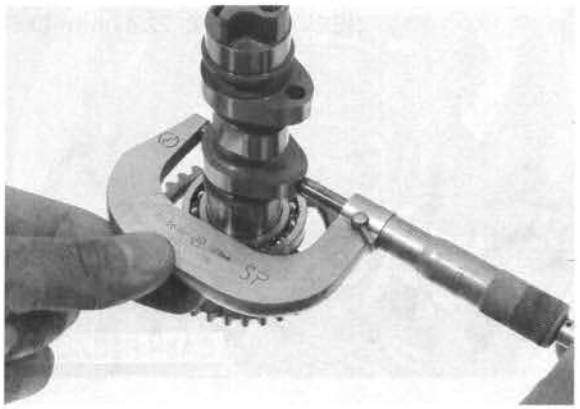
SERVICE LIMIT: 0.11 mm (0.004 in)



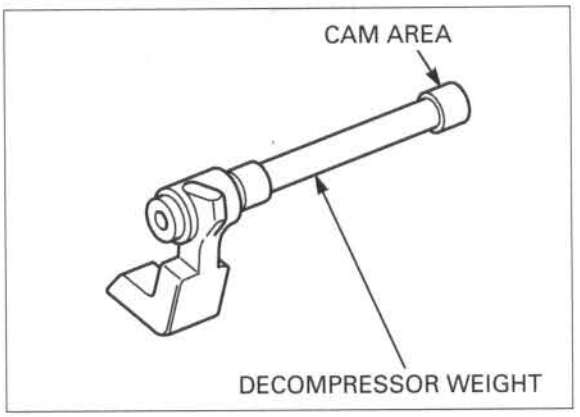
Measure the height of each cam lobe.

SERVICE LIMITS:

IN:	**'04 - '06:**	**35.86 mm (1.412 in)**
	'07:	**36.06 mm (1.420 in)**
	After '07:	**36.14 mm (1.423 in)**
EX:	**'04 and '06:**	**25.56 mm (1.006 in)**
	'05:	**24.40 mm (0.961 in)**
	'07:	**24.40 mm (0.961 in)**
	After '07:	**25.64 mm (1.009 in)**



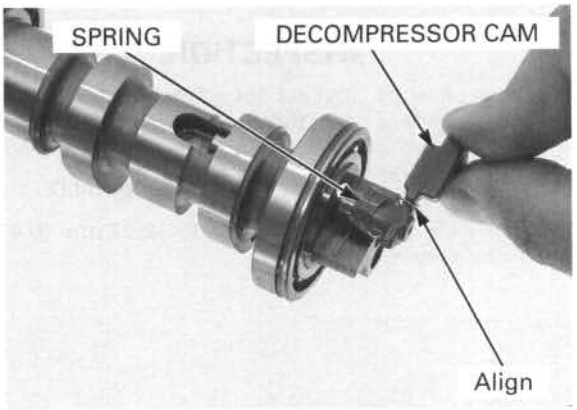
Check the decompressor weight for bends or damage.
Check the decompressor weight cam area for wear or damage.



Temporarily install the spring and decompressor weight into camshaft.

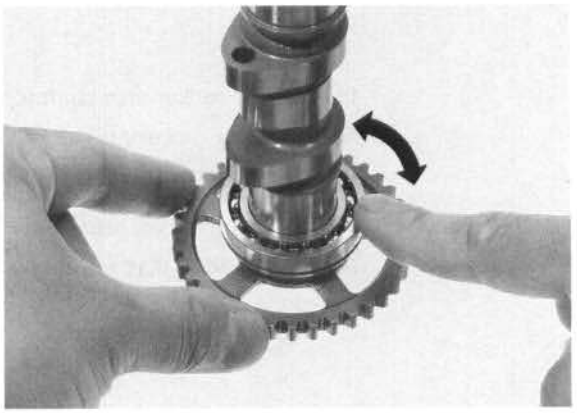
Check the decompressor cam spring for damage or fatigue.

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



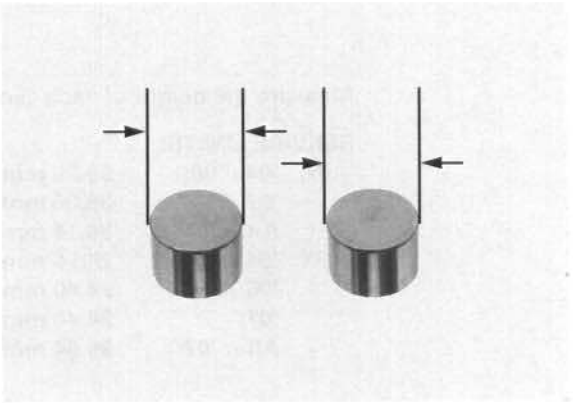
Turn the outer race of each bearing with your finger. The bearing should turn smoothly and quietly.
Also check that the bearing inner races fit tightly in the camshaft.

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



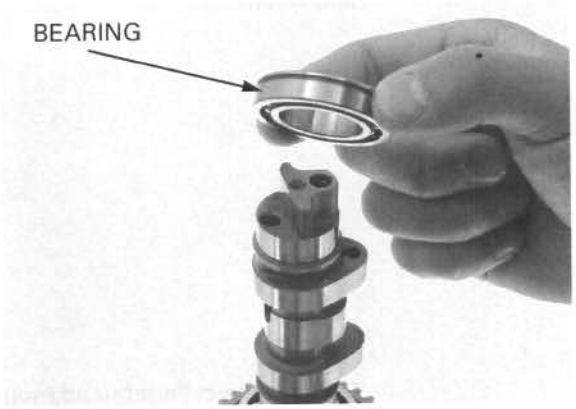
Check the valve lifter for scoring, scratches or damage.
Measure each valve lifter O.D.

SERVICE LIMIT: 22.47 mm (0.885 in)



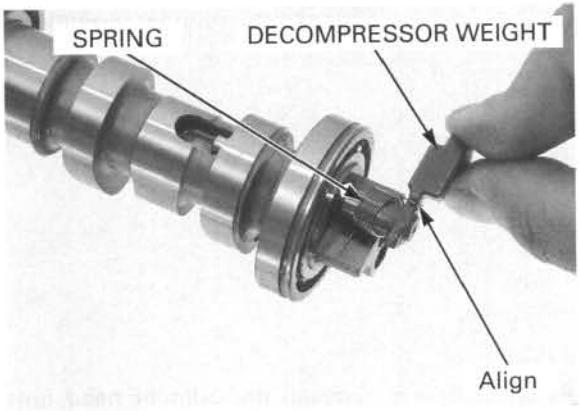
ASSEMBLY

Install the camshaft bearing onto the camshaft as shown.



Install the spring and decompressor weight into the camshaft.

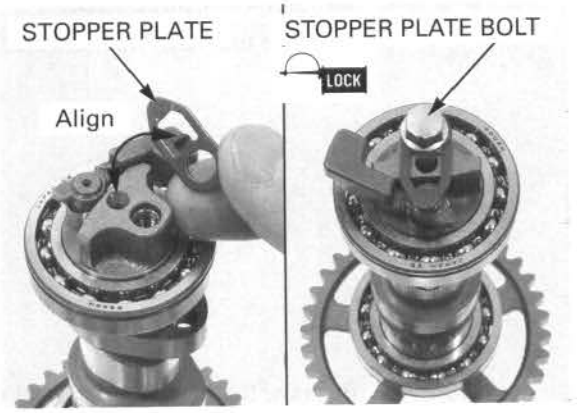
- Align the spring end and decompressor cam as shown.



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.



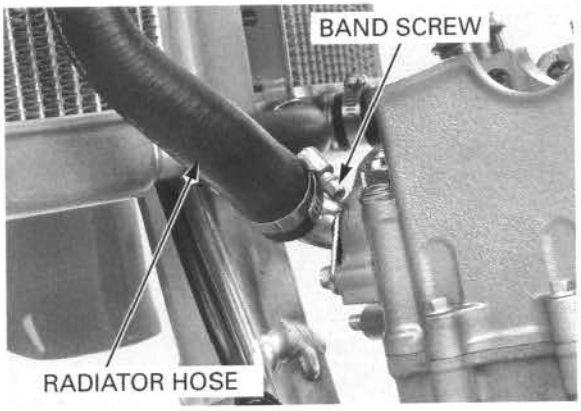
CYLINDER HEAD REMOVAL

Remove the following:

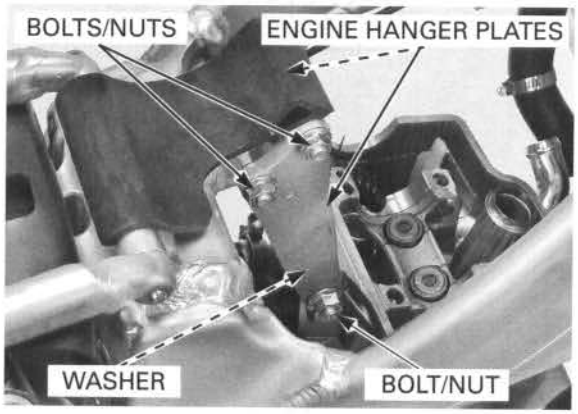
- Exhaust pipe (page 3-11)
- Carburetor (page 6-16)
- Camshaft (page 9-8)
- Rocker arm (page 9-10)
- Spark plug (page 4-9)
- Cylinder head cover (page 9-7)

Drain the coolant (page 7-7).

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

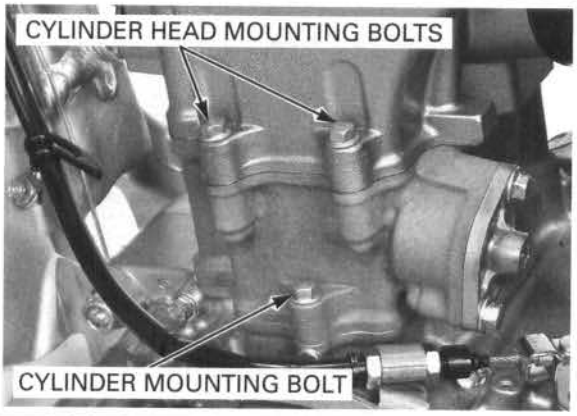


Remove the engine hanger plate bolts, nuts, plates and washer.



Remove the cylinder head mounting bolts.

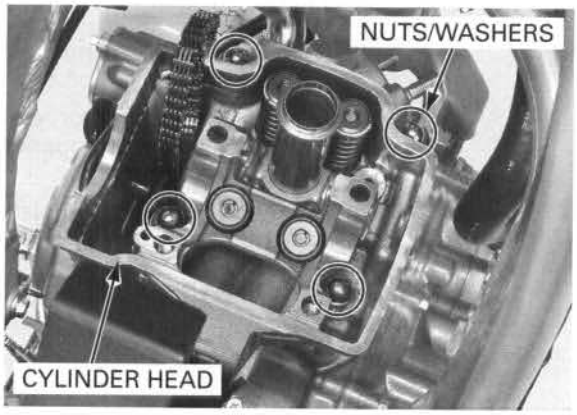
Loosen the cylinder mounting bolt.



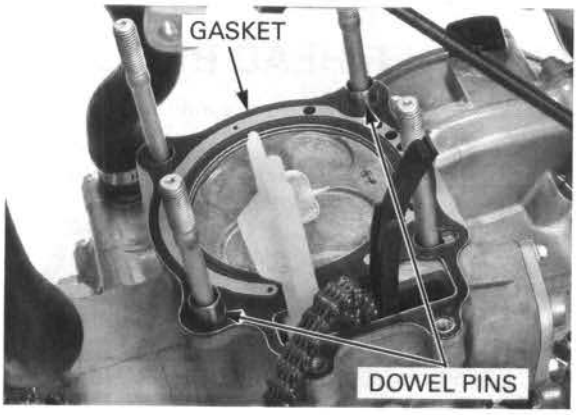
Be careful not to let the nuts and washers fall into the left crankcase.

Loosen the cylinder head nuts in a crisscross pattern in two or three steps.

Remove the nuts, washers and cylinder head.



Remove the gasket and dowel pins.



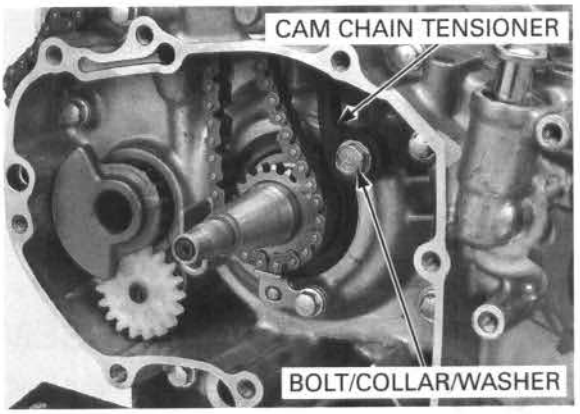
CAM CHAIN TENSIONER/CAM CHAIN GUIDE

REMOVAL

Remove the cylinder head (page 9-13).
Remove the left crankcase cover (page 16-10).
Remove the flywheel (page 16-11).

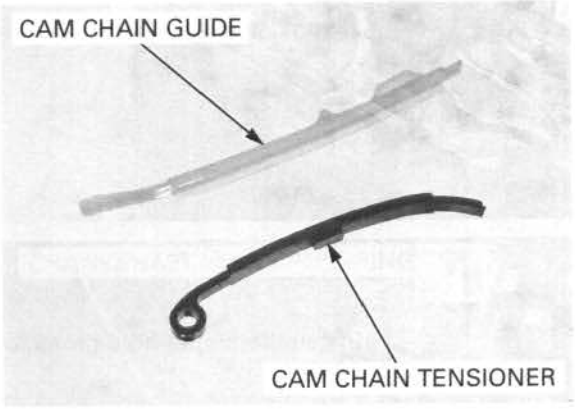
Remove the cam chain guide.

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



INSPECTION

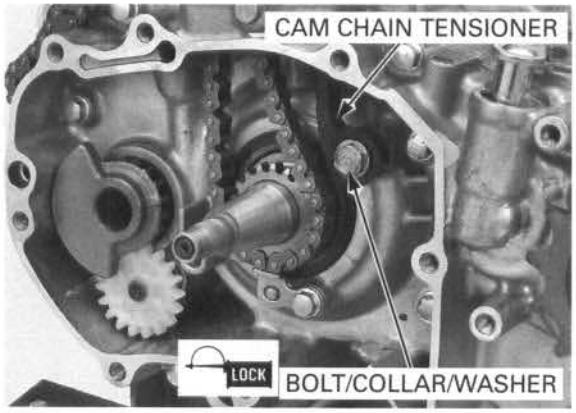
Inspect the cam chain tensioner and cam chain guide for excessive wear or damage, replace if necessary.



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.

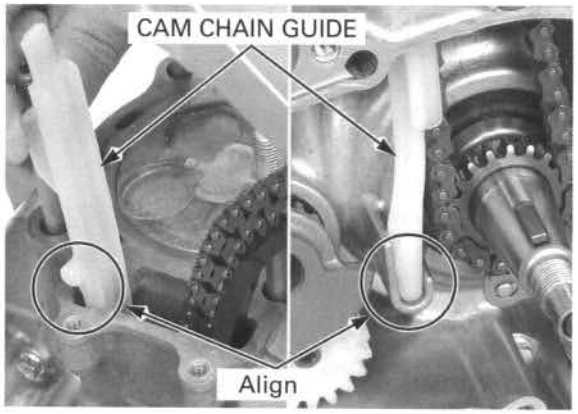
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



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 16-12)
- Left crankcase cover (page 16-13)
- Cylinder head (page 9-27)

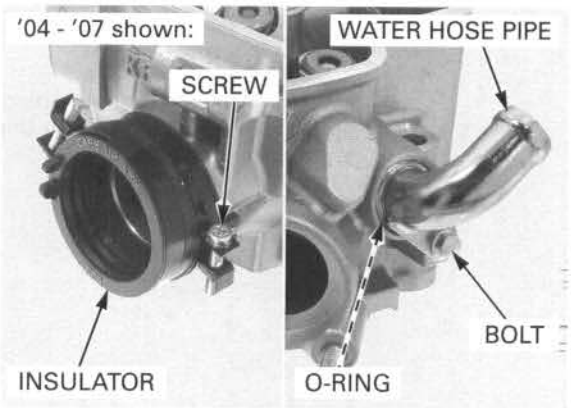


CYLINDER HEAD DISASSEMBLY

Remove the cylinder head (page 9-13).

Loosen the insulator band screw and remove the insulator from the cylinder head.

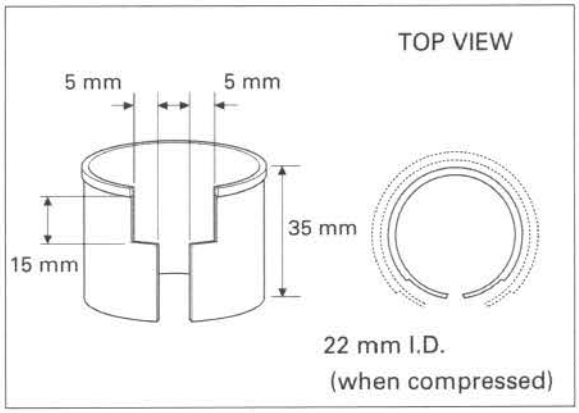
Remove the bolt, O-ring and water hose pipe.



Install the tappet hole protector into the valve lifter bore.

TOOLS:
Tappet hole protector **07JMG-KY20100**

An equivalent tool can easily be made from a plastic 35 mm film container as shown.

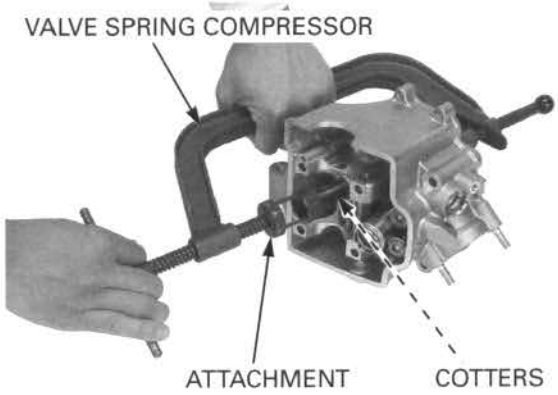


To prevent loss of tension, do not compress the valve springs more than necessary to remove the cotters.

Remove the valve spring cotters using the special tools.

TOOLS:

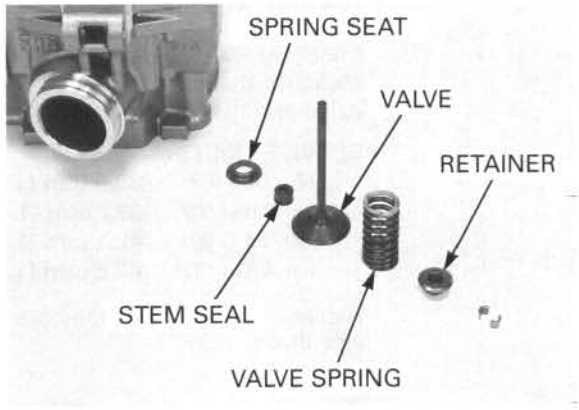
Valve spring compressor	**07757-0010000**
Valve spring compressor attachment	**07JME-KY20100**



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

Remove the following:

- Spring retainer
- Valve spring
- Valve
- Stem seal
- Spring seat



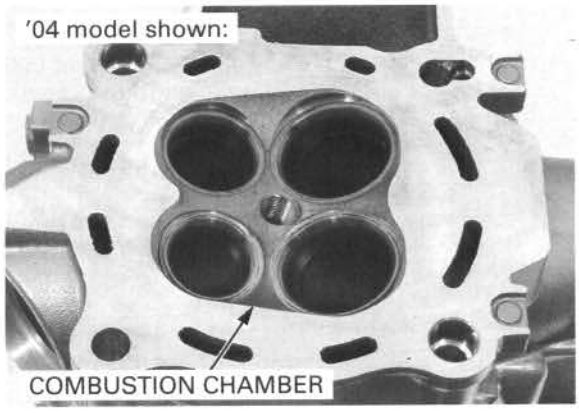
CYLINDER HEAD INSPECTION

CYLINDER HEAD

Use care not to scratch the combustion chamber or the head gasket surface.

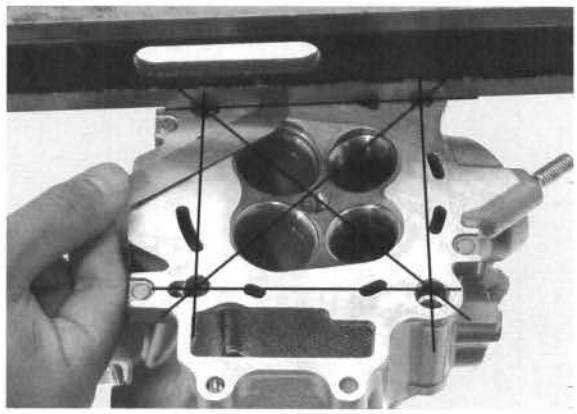
Remove the carbon deposits from the combustion chamber or exhaust port.

Check the spark plug hole and valve area for cracks.



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

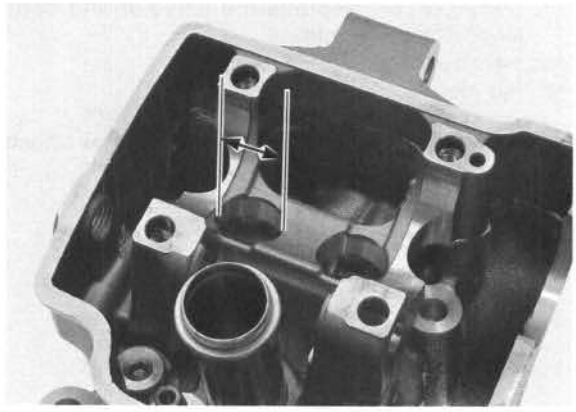
SERVICE LIMIT: 0.05 mm (0.002 in)



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)



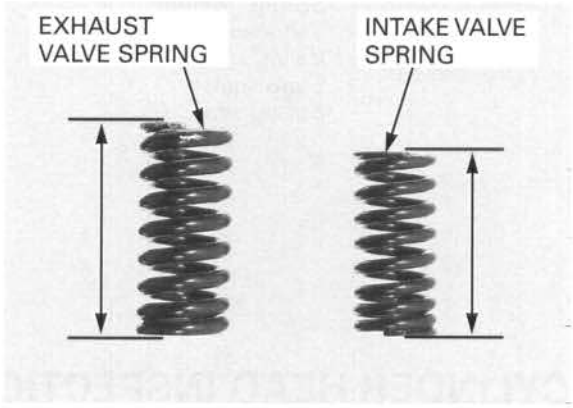
VALVE SPRING

Check the valve springs for fatigue or damage.
Measure the free length of the intake and exhaust valve springs.

SERVICE LIMITS:

IN:	**'04 - '07:**	**38.5 mm (1.52 in)**
	After '07:	**37.7 mm (1.48 in)**
EX:	**'04 - '07:**	**42.1 mm (1.66 in)**
	After '07:	**42.2 mm (1.66 in)**

Replace the springs if they are shorter than the service limits.



VALVE/VALVE GUIDE

Inspect each valve for out-of-round, burns, scratches or abnormal stem wear.

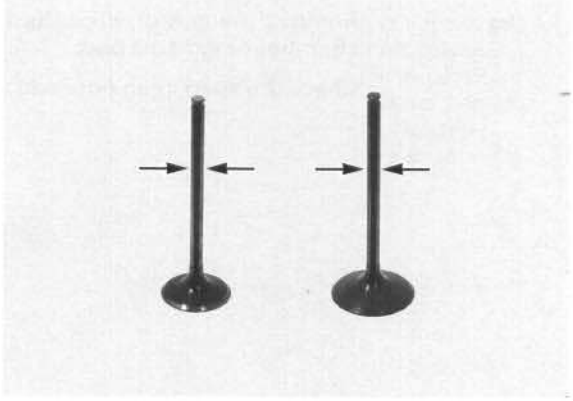
Check the valve movement in the guide.
Measure and record the valve stem O.D.

STANDARD:

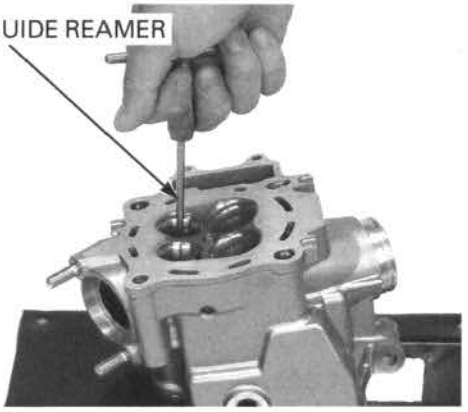
IN:		**4.975 – 4.990 mm (0.1959 – 0.1965 in)**
EX:		
	'04 - '07:	**4.965 – 4.980 mm (0.1955 – 0.1961 in)**
	After '07:	**4.465 – 4.480 mm (0.1758 – 0.1746 in)**

SERVICE LIMIT:

EX:	**'04 - '07:**	**4.955 mm (0.1951 in)**
	After '07:	**4.455 mm (0.1754 in)**



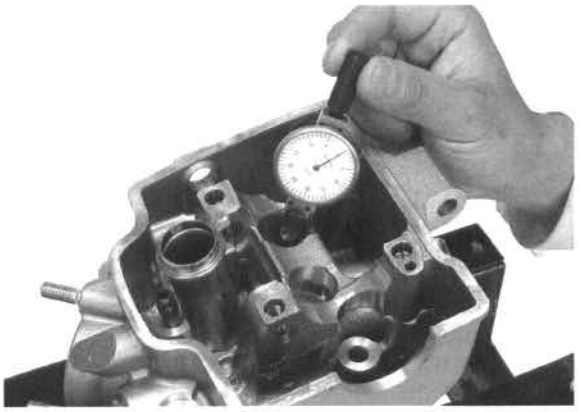
Ream the valve guide to remove any carbon build-up before measuring the guide.
Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise.



TOOLS:

IN and '04 - '07 EX:	
Valve guide reamer, 5.0 mm	**07984-MA60001 or 07984-MA6000D (U.S.A. only)**
After '07 EX:	
Valve guide reamer, 4.5 mm	**07HMH-ML00101**

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



SERVICE LIMITS:
IN/EX ('04 - '07): 5.052 mm (0.1989 in)
EX (After '07): 4.552 mm (0.1792 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 9-19).

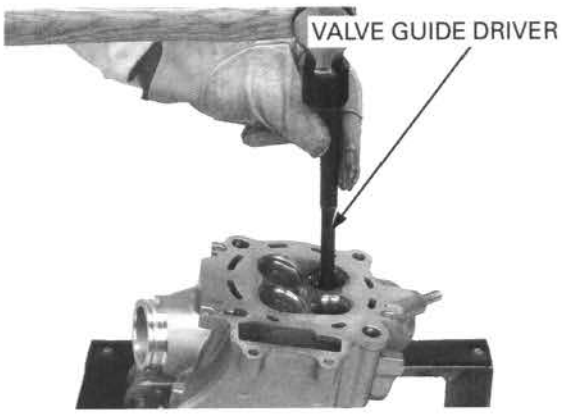
If the stem-to-guide clearance exceeds the service limits, determine if a new guide with standard dimensions would bring the clearance within tolerance. If so, replace the guides as necessary and ream to fit.

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 new valve guides in a freezer for about 1 hour.
Heat the cylinder head to 100 – 150 °C (212 – 300 °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.

TOOLS:

IN and '04 - '07 EX:	
Valve guide driver, 5.0 mm	**07942-MA60000**
After '07 EX:	
Valve guide driver, 4.5 mm	**07HMD-ML00101**

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).

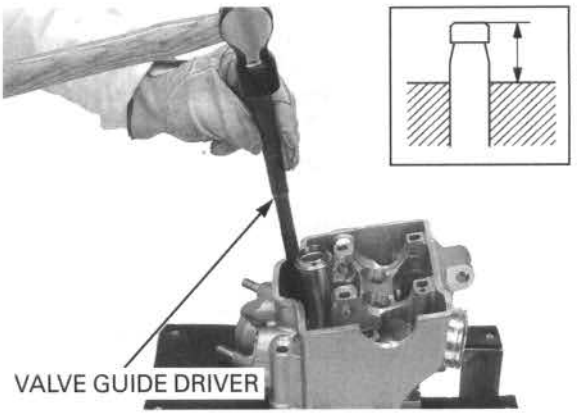
Remove the guides from the freezer.

The exhaust valve guide (I.D.; 4.5 mm) is longer than the intake valve guide (I.D.; 5.0 mm).

Drive in the guides until the marks are parallel with the cylinder head.
Check that the valve guides are at the proper depth using a caliper, adjust the height if necessary.

SPECIFIED DEPTH:

IN:	**14.8 – 15.0 mm (0.58 – 0.59 in)**
EX: '04 - '07:	**19.8 – 20.0 mm (0.78 – 0.79 in)**
After '07:	**19.9 – 20.1 mm (0.78 – 0.79 in)**



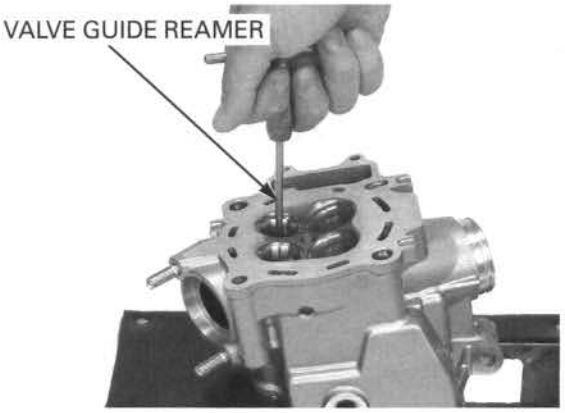
TOOLS:

IN and '04 - '07 EX:	
Valve guide driver, 5.0 mm	**07942-MA60000**
After '07 EX:	
Valve guide driver, 4.5 mm	**07HMD-ML00101**

Let the cylinder head cool to room temperature.

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

Ream new valve guides.
Insert the reamer from the combustion chamber side of the cylinder head and always rotate the reamer clockwise.



TOOLS:

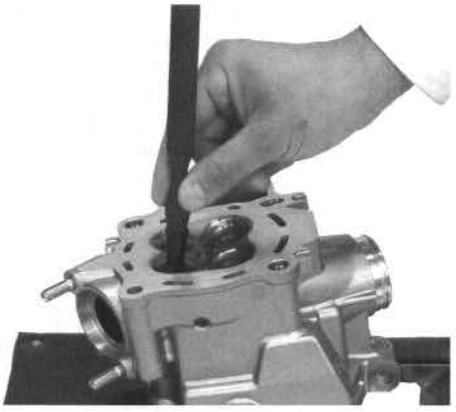
IN and '04 - '07 EX:	
Valve guide reamer, 5.0 mm	**07984-MA60001 or 07984-MA6000D (U.S.A. only)**
After '07 EX:	
Valve guide reamer, 4.5 mm	**07HMH-ML00101 or 07HMH-ML0010B (U.S.A. only)**

Clean the cylinder head thoroughly to remove any metal particles after reaming and reface the valve seats (page 9-20).

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.



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.

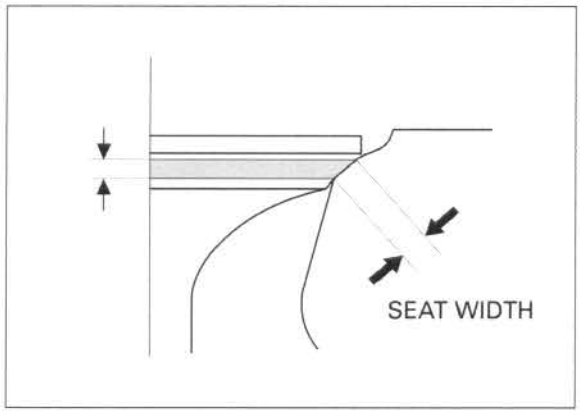
STANDARD:
IN/EX: 0.90 – 1.10 mm (0.035 – 0.043 in)

SERVICE LIMIT:
IN/EX: 1.7 mm (0.07 in)

NOTE:

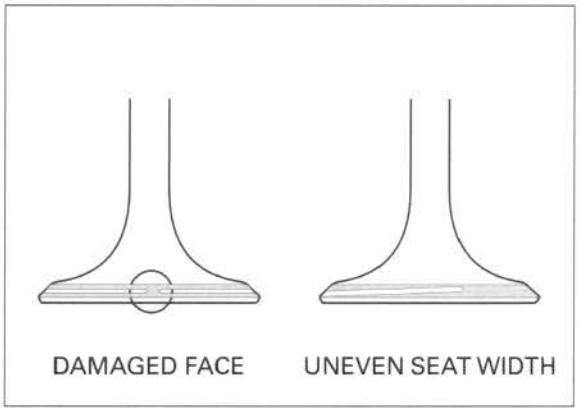
- When the service limits are exceed, replace the intake valve and recheck the valve seat width.

If the seat width is not within specification, reface the valve seat (page 9-21).



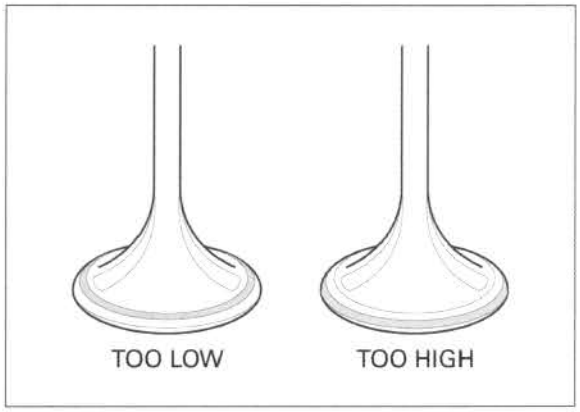
Inspect the valve seat face for:

- 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.

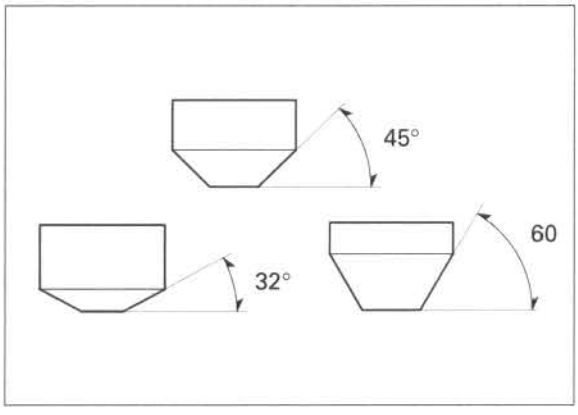
- Contact area (too high or too low)
  – Reface the valve seat.



VALVE SEAT REFACING

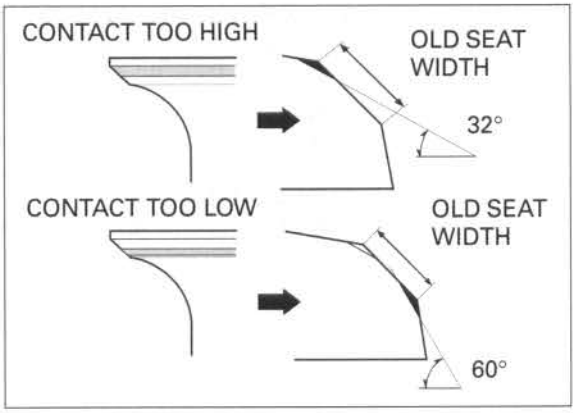
Follow the refacing manufacturer's operating instructions.

Valve seat cutters/grinders or equivalent valve seat refacing equipment are recommended to correct worn valve seats.



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

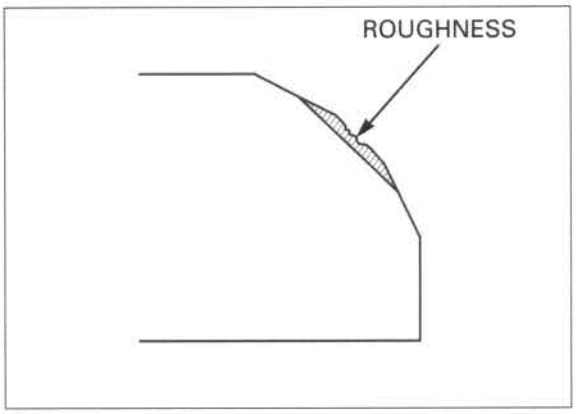
If the contact area is too low on the valve, the seat must be raised using a 60° interior cutter.



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

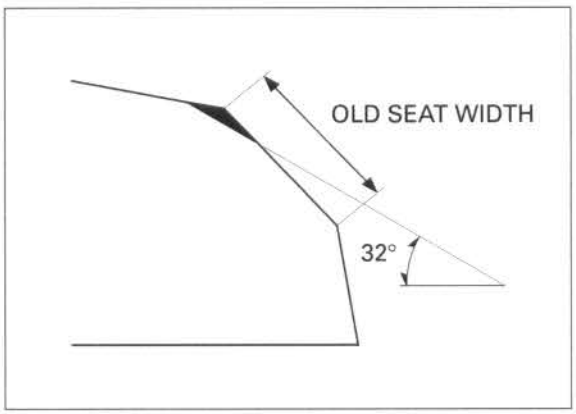
Use a 45° seat cutter, remove any roughness or irregularities from the seat.

TOOLS:
Valve seat cutter, 33 mm (IN) 07780-0010800
Valve seat cutter, 27.5 mm (EX) 07780-0010200
IN and '04 - '07 EX:
Cutter holder, 5.0 mm 07781-0010400
or equivalent commercially available in U.S.A.
After '07 EX:
Cutter holder, 4.5 mm 07781-0010600
or equivalent commercially available in U.S.A.



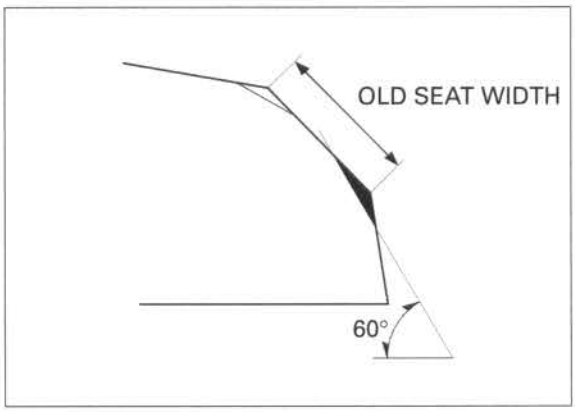
Use a 32° flat cutter, remove 1/4 of the existing valve seat material.

TOOLS:
Flat cutter, 33 mm (IN) 07780-0012900
Flat cutter, 28 mm (EX) 07780-0012100
IN and '04 - '07 EX:
Cutter holder, 5.0 mm 07781-0010400
or equivalent commercially available in U.S.A.
After '07 EX:
Cutter holder, 4.5 mm 07781-0010600
or equivalent commercially available in U.S.A.

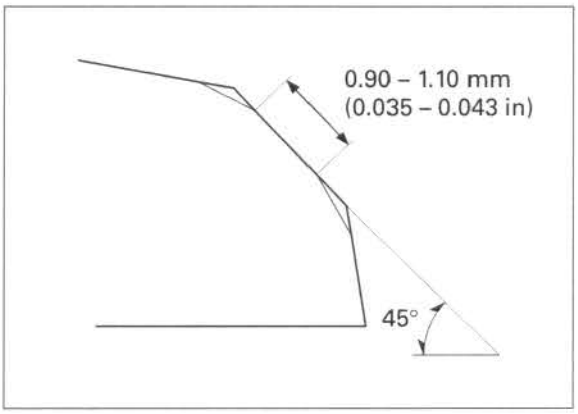


Use a 60° interior cutter, remove 1/4 of the existing valve seat material.

TOOLS:
Interior cutter, 37.5 mm (IN) 07780-0014100
Interior cutter, 30 mm (EX) 07780-0014000
IN and '04 - '07 EX:
Cutter holder, 5.0 mm 07781-0010400
or equivalent commercially available in U.S.A.
After '07 EX:
Cutter holder, 4.5 mm 07781-0010600
or equivalent commercially available in U.S.A.



Using a 45° seat cutter, cut the seat to proper width. Make sure all pitting and irregularities are removed. Refinish if necessary.

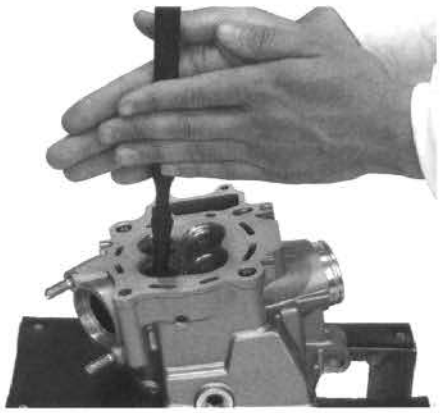


INTAKE SIDE:

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:

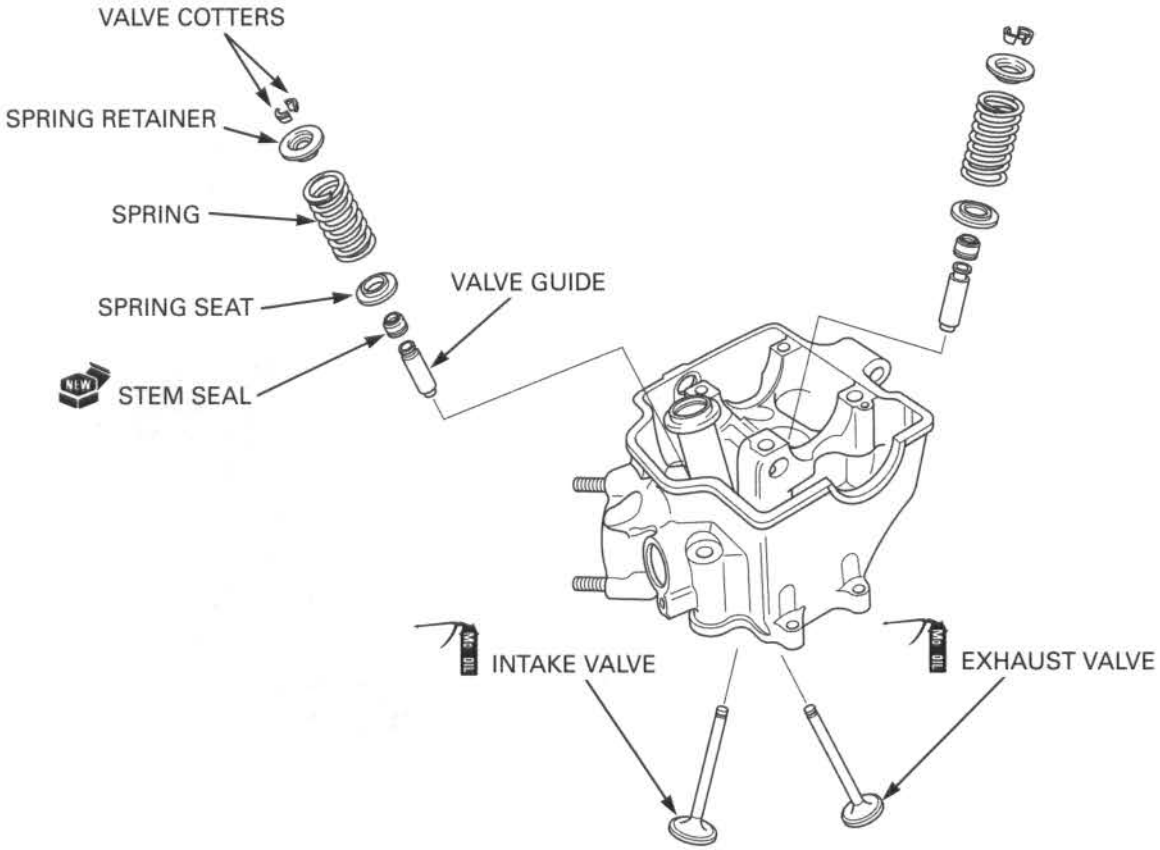
After cutting the exhaust seats, apply lapping compound to the exhaust valve face, and lap the exhaust valve using light pressure.

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.

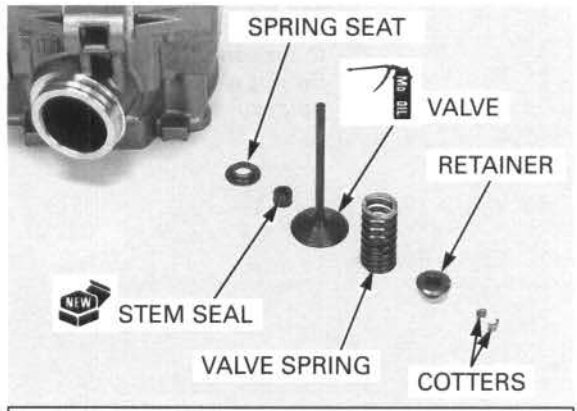
Install the spring seat and new stem seal.

NOTE:

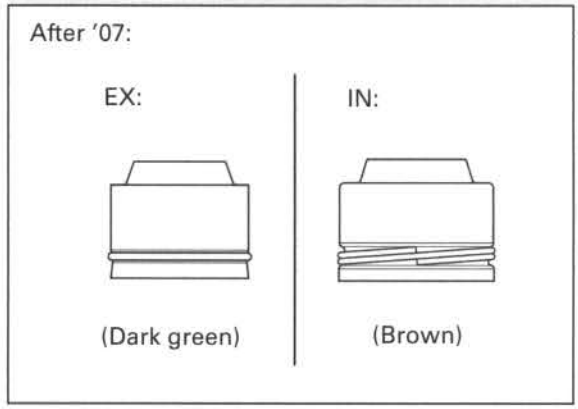
After '07: Do not interchange the intake and exhaust stem seals.

- Intake stem seal: Brown
- Exhaust stem seal: Dark green

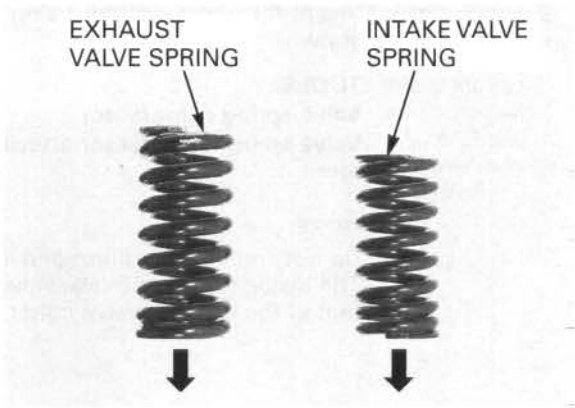
Lubricate the valve stem sliding surface with molybdenum oil solution.
Insert the valves into the guide while turning it slowly to avoid damage to the stem seal.



After '07:



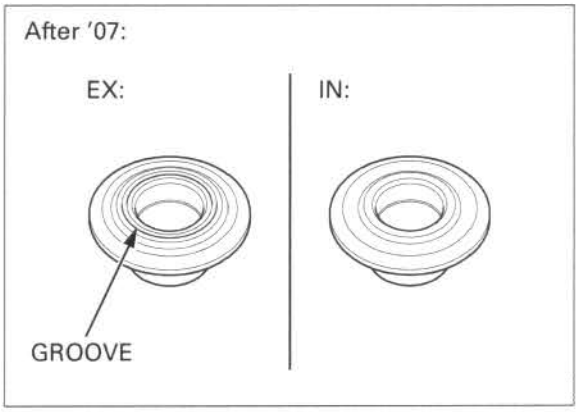
Install the valve springs with the tightly wound coils facing the combustion chamber.



Install the spring retainers.

NOTE:

After '07: Do not confuse the intake spring retainers and exhaust spring retainers. The exhaust spring retainer has a groove.



Install the tappet hole protector into the valve lifter bore.

TOOL:

Tappet hole protector	**07JMG-KY20100**

Grease the cotters to ease installation.

Install the valve cotters using the special tools as shown.

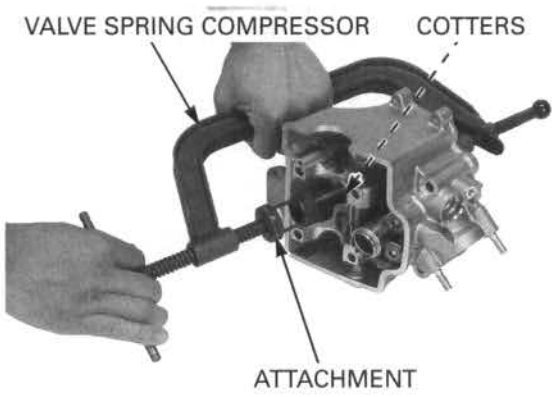
To prevent loss of tension, do not compress the valve springs more than necessary.

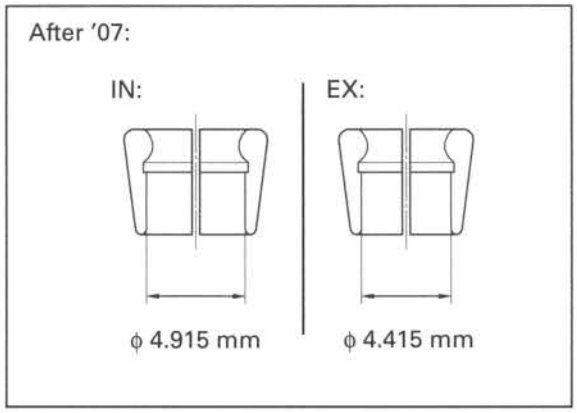
TOOLS:

Valve spring compressor	**07757-0010000**
Valve spring compressor attachment	**07JME-KY20100**

NOTE:

After '07: Do not confuse the intake and exhaust valve cotters. The inside radius of intake valve cotter is larger than that of the exhaust valve cotter.



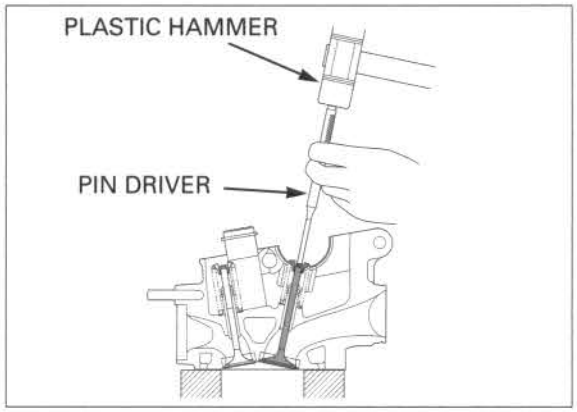


Support the cylinder head above the work bench surface to prevent possible valve damage.

Tap the valve stems gently with plastic hammer and pin driver as shown to seat the cotters firmly.

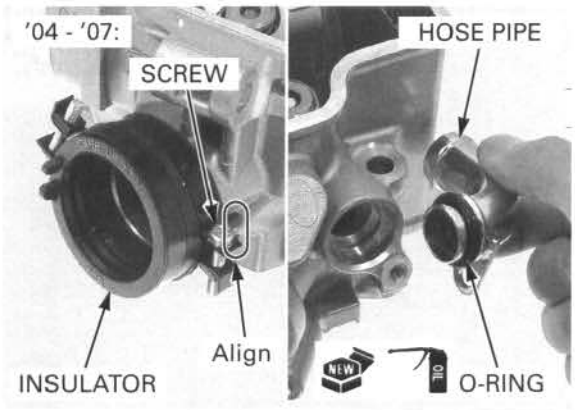
Install and tighten the spark plug.

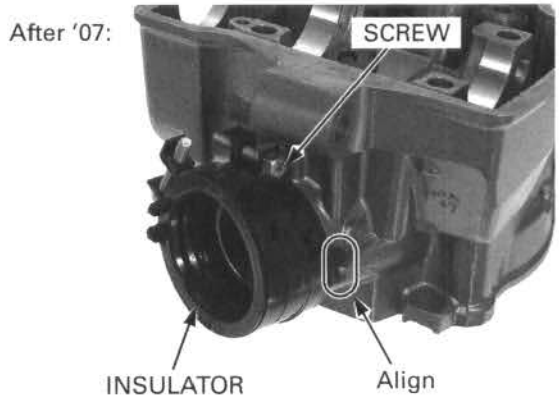
TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)



Install the insulator to the cylinder head by aligning the groove of the insulator with the tab of the cylinder head.
Tighten the insulator band screw (page 1-15).

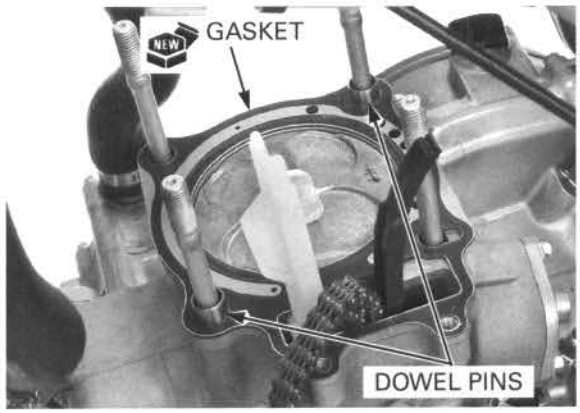
Apply oil to a new O-ring and install it to the water hose pipe.
Install the water hose pipe and tighten the bolt.





CYLINDER HEAD INSTALLATION

Install the dowel pins and a new gasket.



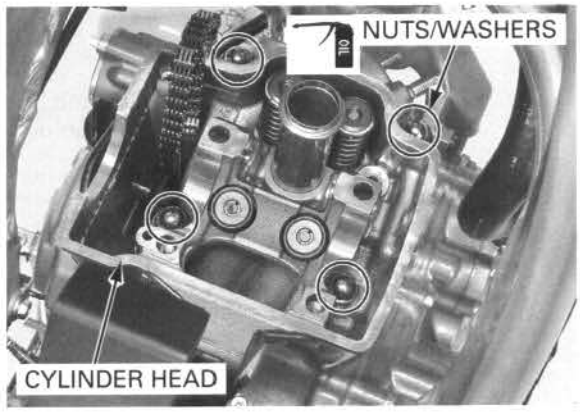
Apply oil to the cylinder head nut seating surface.

Install the cylinder head onto the cylinder.

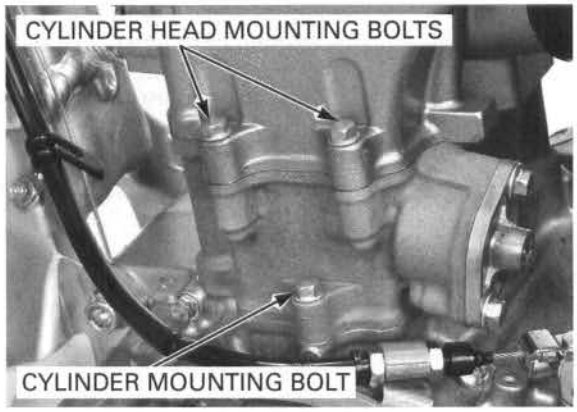
Be careful not to let the nuts and washers fall into the left crankcase

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)



Install the cylinder head mounting bolts.
Tighten the cylinder mounting bolt and cylinder head mounting bolts securely.



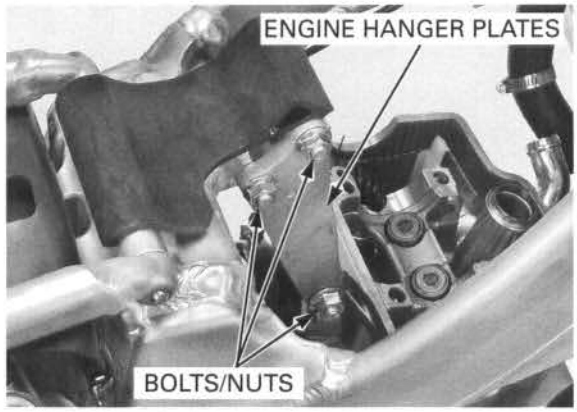
Install the washer, engine hanger plates, bolts and nuts.

Tighten the nuts to the specified torque.

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)**

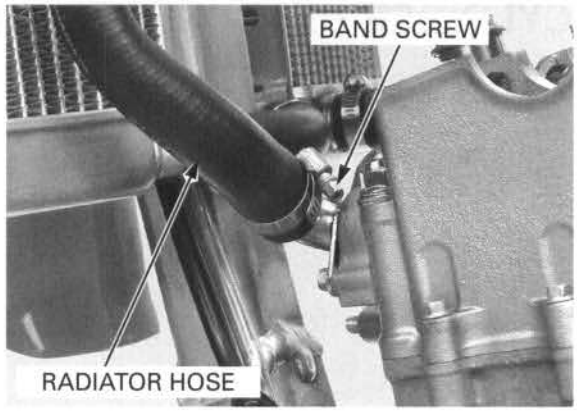


Connect the radiator hose and tighten the band screw securely.

Install the following:

- Rocker arm (page 9-28)
- Camshaft (page 9-29)
- Carburetor (page 6-30)
- Exhaust pipe (page 3-12)

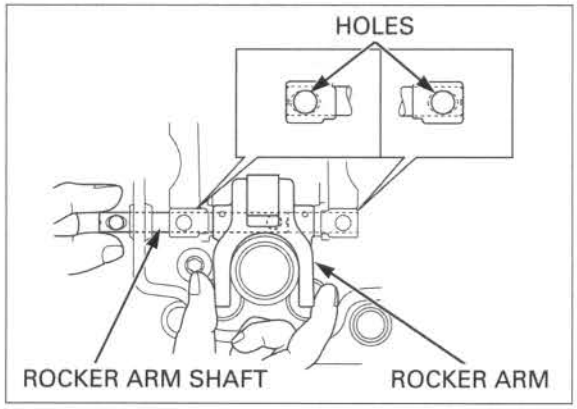
Add the recommended coolant mixture to the filler neck and bleed the air (page 7-7).



CAMSHAFT/ROCKER ARM INSTALLATION

ROCKER ARM

Install the rocker arm and rocker arm shaft while aligning the camshaft holder bolt holes with the rocker arm shaft holes.

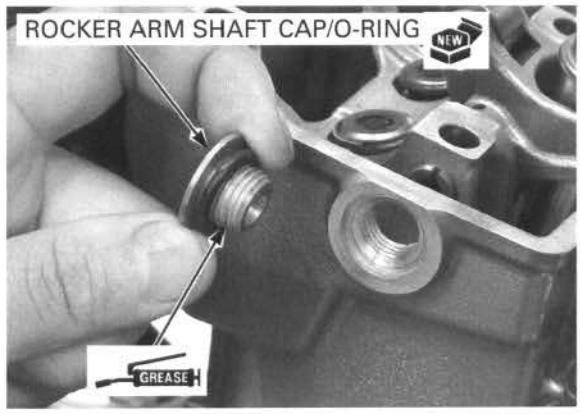


Check that the O-ring is in good condition, replace if necessary.

Apply oil to the O-ring and install the O-ring onto rocker arm shaft cap.
Apply grease to the rocker arm shaft cap threads.

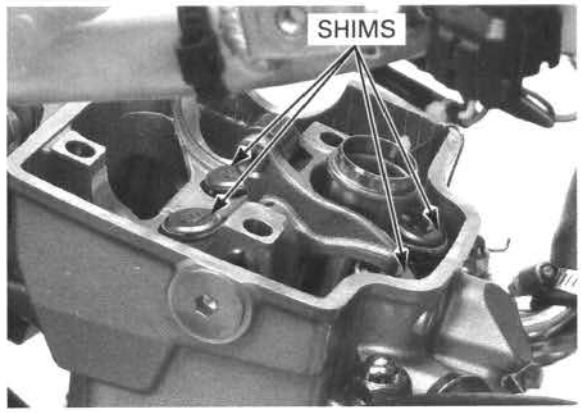
Install the rocker arm shaft cap and tighten to the specified torque.

TORQUE: 6.0 N·m (0.6 kgf·m, 4.4 lbf·ft)



Be careful not to let the shims fall into the left crankcase.

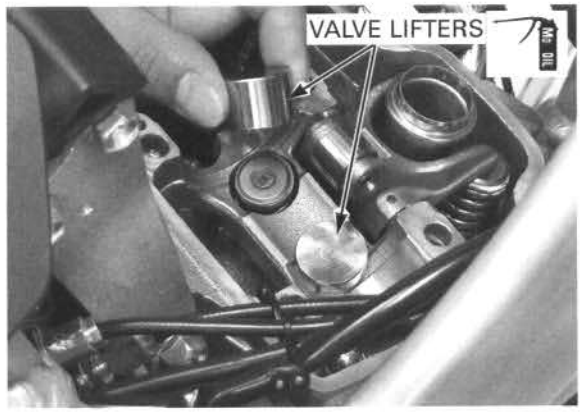
Install the shims.



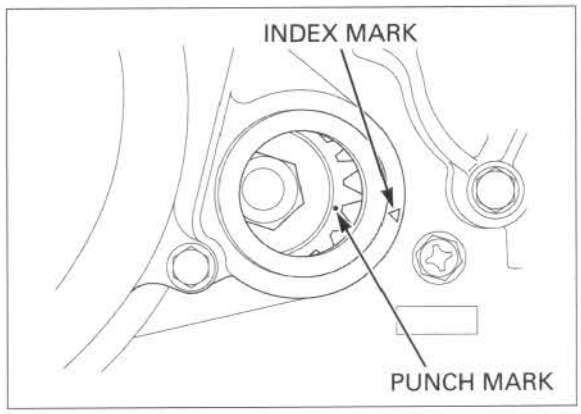
CAMSHAFT

Apply molybdenum oil solution to the outer surface of each valve lifter.

Install the valve lifters into the cylinder head.

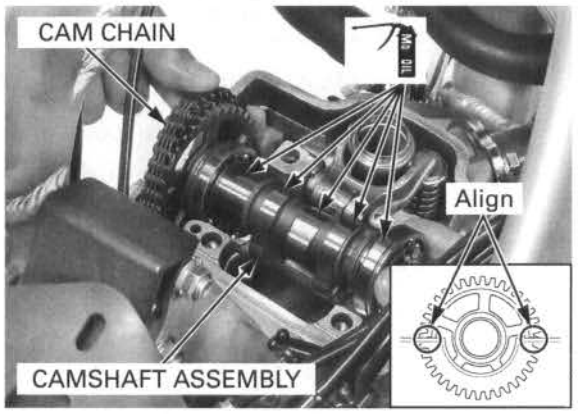


Turn the crankshaft clockwise to align the punch mark with the index mark on the right crankcase cover.
Make sure the piston is at T.D.C. (Top Dead Center).



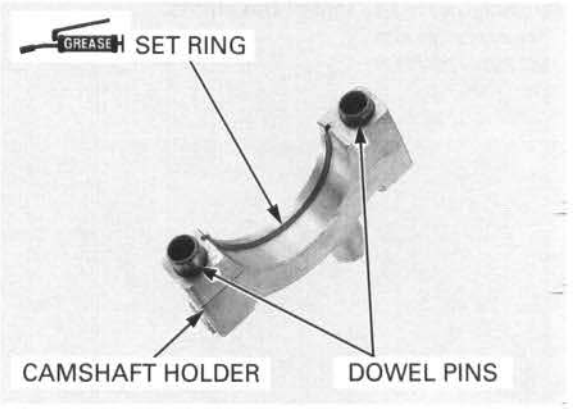
Do not get molybdenum oil solution on the camshaft holder mating surfaces and in the holder bolt holes.

Apply molybdenum oil solution to the cam journals and cam lobes.
Install the cam chain onto the cam sprocket, then install the cam shaft onto the cylinder head with cam lobes facing up.
Align the index line of the cam sprocket with the cylinder head surface.

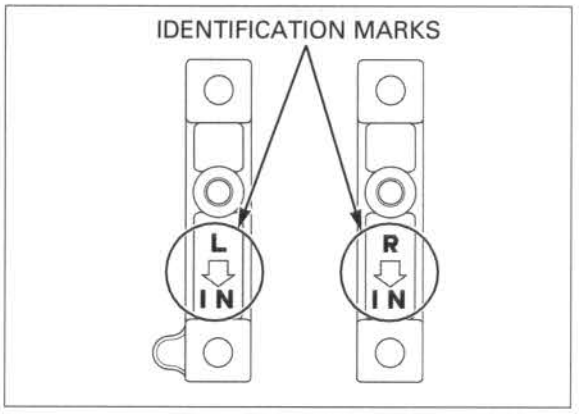


Check the set ring for damage.
Apply grease to the set ring.
Install the set ring to the camshaft holder groove.
Make sure the dowel pins are installed into the camshaft holder.

Check the camshaft holder has the dowel pins installed.

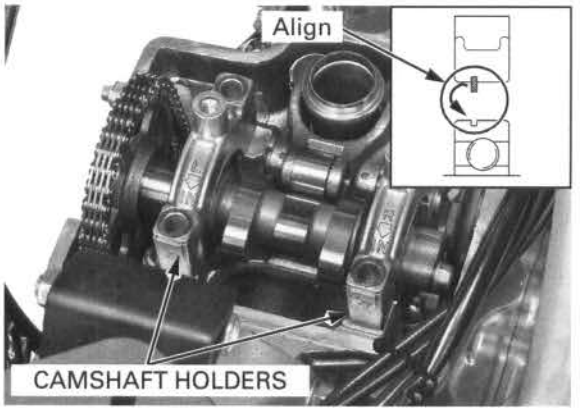


- Each camshaft holder has an identification mark, "L" is for the left side and "R" is for right side.
- "IN" (arrow) mark facing to the intake side.



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

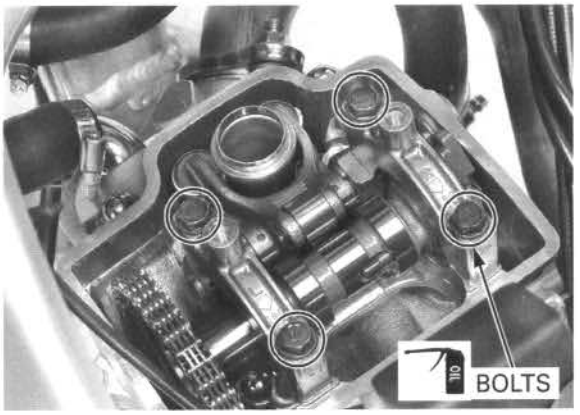
Install the camshaft holders in their proper position by aligning the camshaft bearing groove with the set ring.



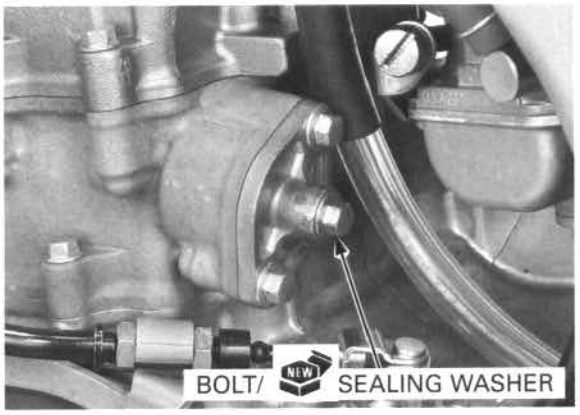
Apply oil to the camshaft holder bolt threads.

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)

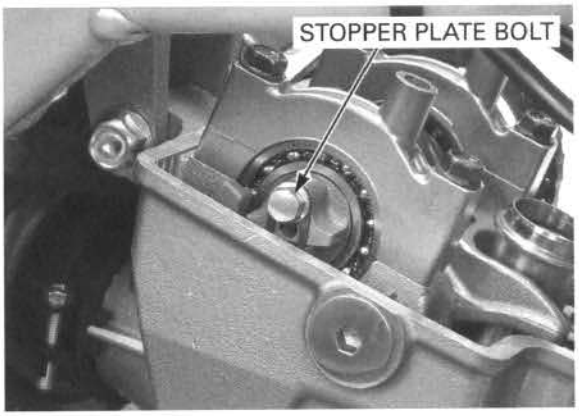


Remove the tensioner stopper from the cam chain tensioner lifter.
Install the bolt with a new sealing washer.
Tighten the cam chain tensioner bolt securely.



If decompressor cam was disassembled, tighten the stopper plate bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



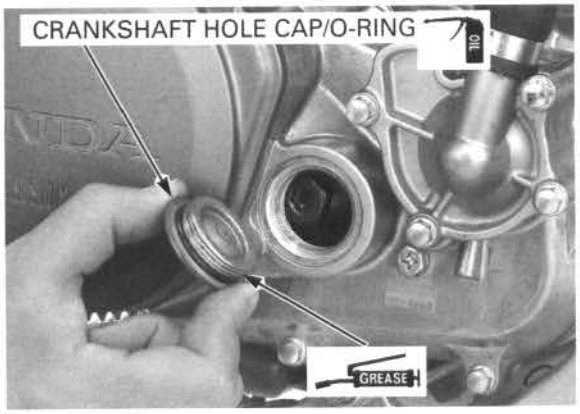
Check that the O-ring is in good condition, replace if necessary.

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

Install 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 9-32).

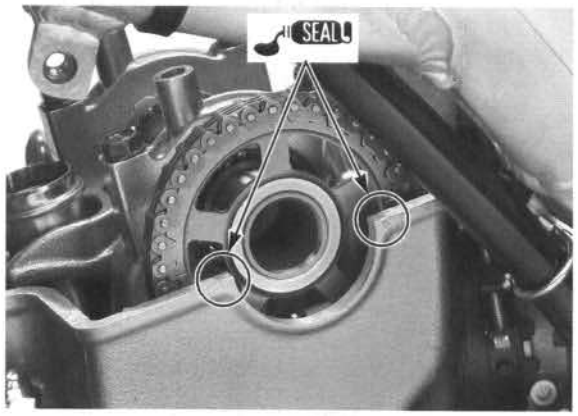


CYLINDER HEAD COVER INSTALLATION

Check the plug hole seal is in good condition, replace if necessary.

Install the plug hole seal.

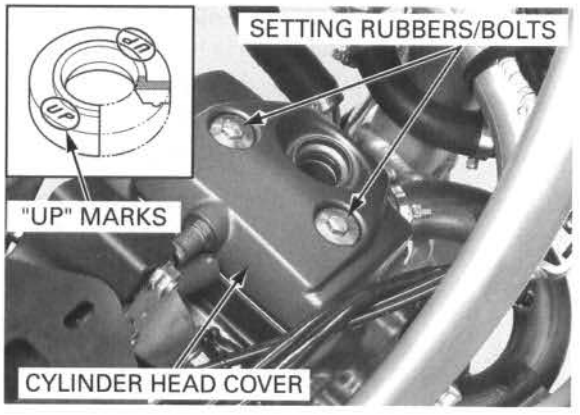
Apply liquid sealant to the cylinder head and head cover mating surface as shown.



Inspect the cylinder head cover packing for damage or deterioration and replace it with a new one if necessary.

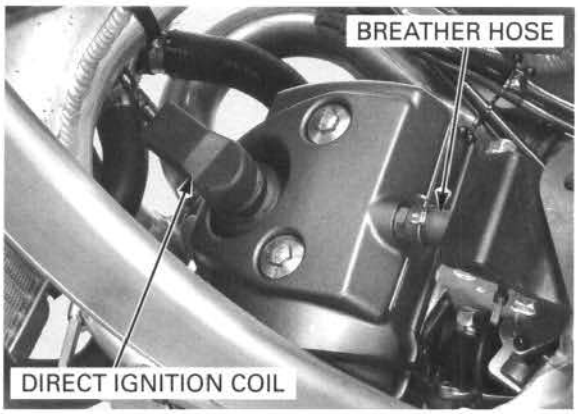
Install the cylinder head cover onto the cylinder head.
Install the setting rubbers with the "UP" marks facing up.
Install and tighten the cylinder head cover bolts to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



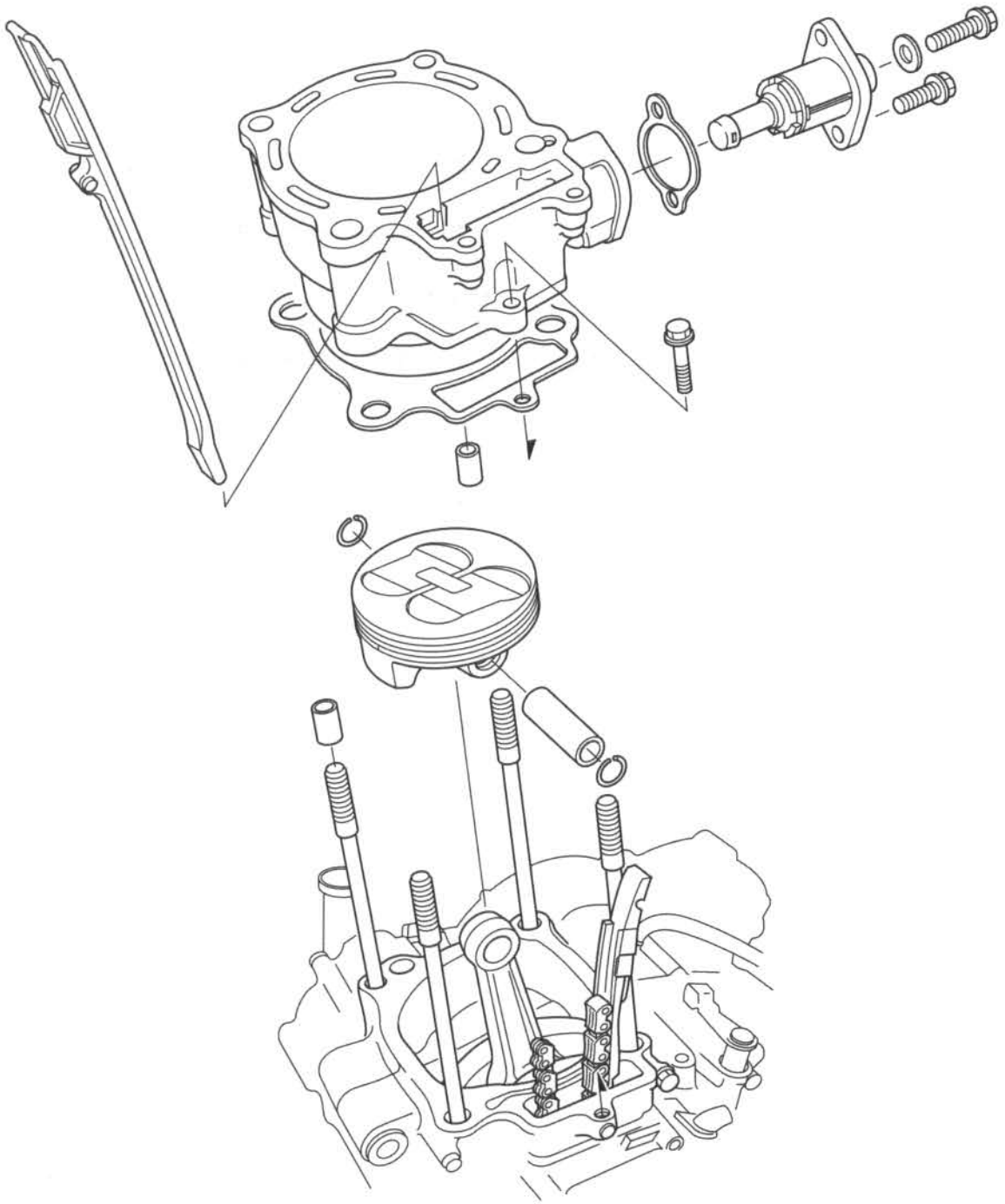
Connect the cylinder head breather hose.
Install the direct ignition coil.

Install the fuel tank (page 3-7).



10. 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

Unit: mm (in)

ITEM				STANDARD	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		'04 - '07	"IN" mark facing toward the intake side	–
			After '07	"○" 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		'04 - '07	"R" mark side facing up	–
			After '07	"RK" mark side facing up	–
	Piston ring -to-ring groove clearance	Top	'04 - '07	0.065 – 0.100 (0.0026 – 0.0039)	0.115 (0.0045)
			After '07	0.035 – 0.065 (0.0014 – 0.0026)	0.08 (0.003)
	Piston ring end gap	Top ring	'04, '05	0.20 – 0.30 (0.008 – 0.012)	0.44 (0.017)
			After '05	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.				16.016 – 16.034 (0.6305 – 0.6313)	16.04 (0.631)
Connecting rod-to-piston pin clearance				0.016 – 0.040 (0.0006 – 0.0016)	0.06 (0.002)

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

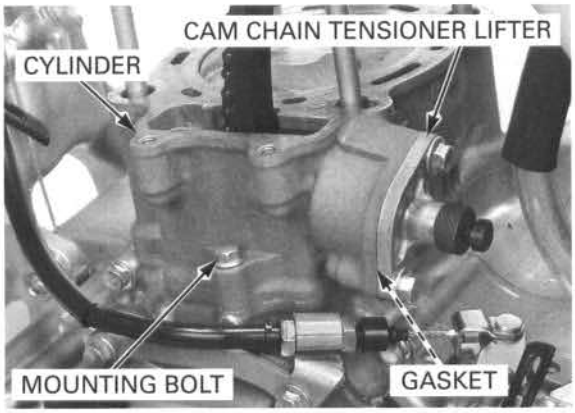
Excessive smoke
- Worn cylinder, piston and piston rings
- Improper installation of piston rings
- Scored or scratched piston or cylinder wall

CYLINDER REMOVAL

Remove the cylinder head (page 9-13).

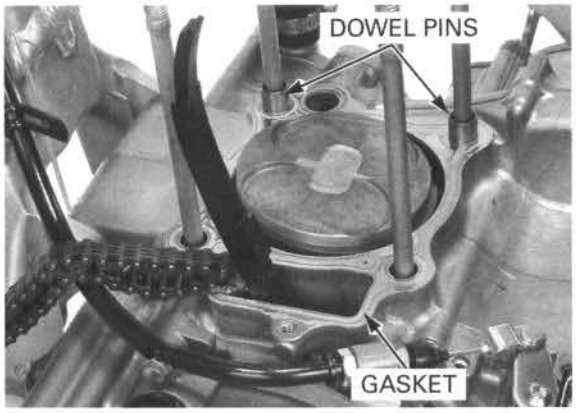
Remove the bolts, cam chain tensioner lifter and gasket.

Remove the mounting bolt and cylinder.



Prevent the cam chain from the falling into the crankcase.

Remove the dowel pins and gasket.



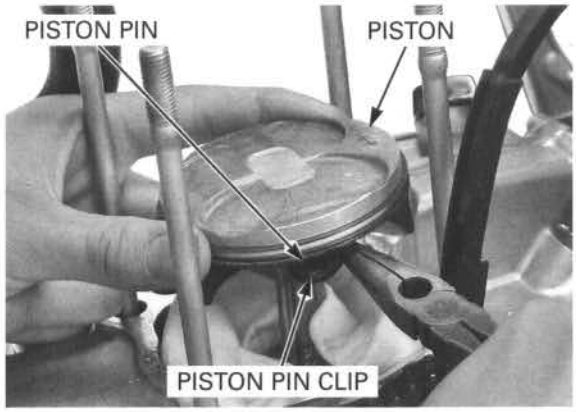
PISTON REMOVAL

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

Remove the piston pin clips with pliers.

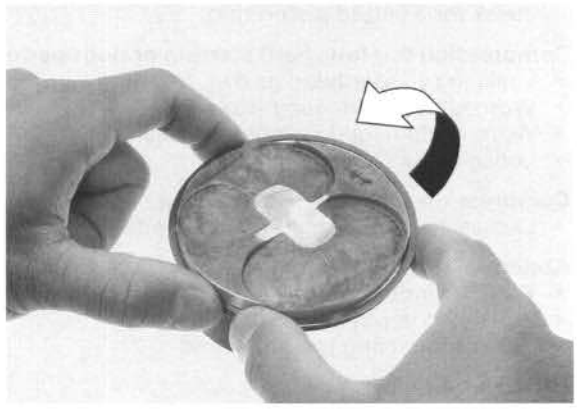
Press the piston pin out of the piston and remove the piston.

- Under racing conditions, the piston and piston rings should be replaced according to the maintenance schedule (page 4-4).



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

Spread the piston rings and remove them by lifting up at a point just opposite the gap.

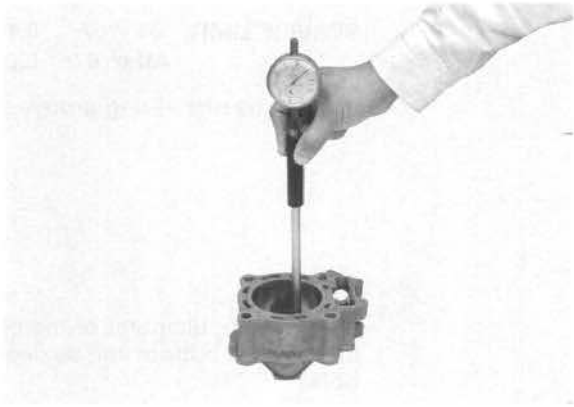


CYLINDER/PISTON INSPECTION

CYLINDER

Inspect the cylinder bore for 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)

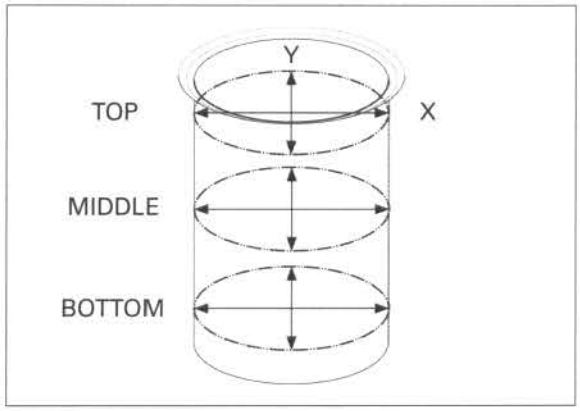


Calculate the piston-to-cylinder clearance.
Take a maximum reading to determine the clearance.
Refer to page 10-6 for piston O.D.

SERVICE LIMIT: 0.085 mm (0.0033 in)

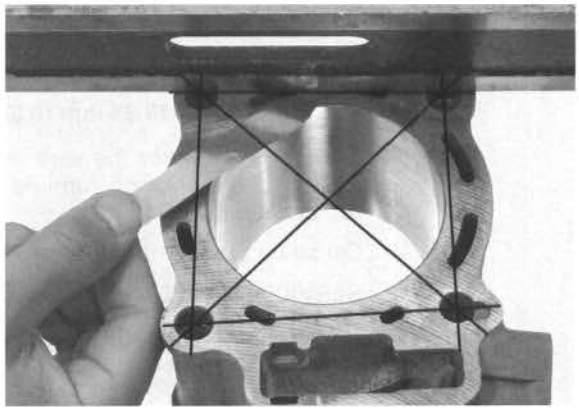
Calculate the taper and out-of-round at three levels in the X and Y axes. Take the maximum reading to determine the cylinder condition.

SERVICE LIMITS:
Taper: 0.010 mm (0.0004 in)
Out-of-round: 0.010 mm (0.0004 in)



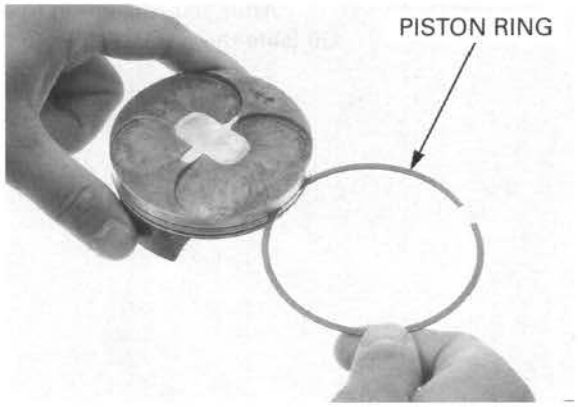
Inspect the top of the cylinder for warpage.

SERVICE LIMIT: 0.05 mm (0.002 in)



PISTON/PISTON RING INSPECTION

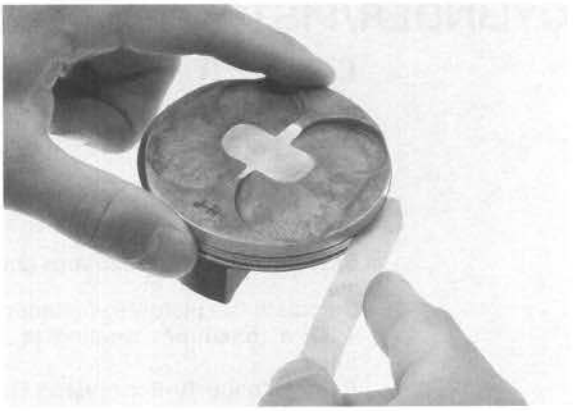
Remove the carbon or deposits from the piston head or piston ring grooves.
Inspect the piston for damage and the ring grooves for wear.



Temporarily install the piston rings to their proper position with the mark facing up.
Measure the piston ring-to-groove clearance with the rings pushed into the grooves.

SERVICE LIMIT: '04 - '07: 0.115 mm (0.0045 in)
After '07: 0.08 mm (0.003 in)

Inspect the piston ring grooves for wear or damage.



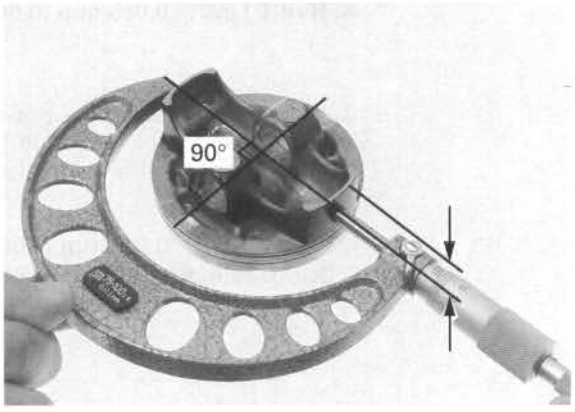
Measure the diameter of the piston at 7.0 mm (0.28 in) from the bottom and 90 degrees to the piston pin hole.

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.

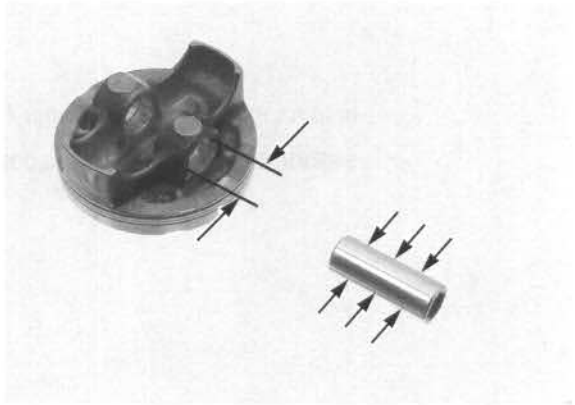
Measure the piston pin O.D.

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.

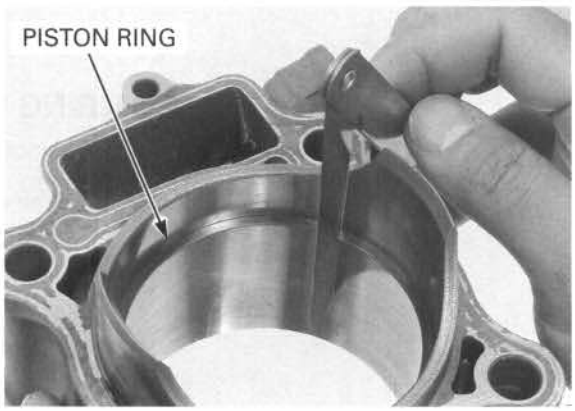
SERVICE LIMIT: 0.04 mm (0.002 in)



Push the ring into the bottom of the cylinder using the piston head to be sure the ring is squarely in the cylinder.

Insert each piston ring into the cylinder and measure the ring end gap.

SERVICE LIMITS:
Top: '04, '05: 0.44 mm (0.017 in)
After '05: 0.39 mm (0.015 in)
Oil (side rail): 0.90 mm (0.035 in)

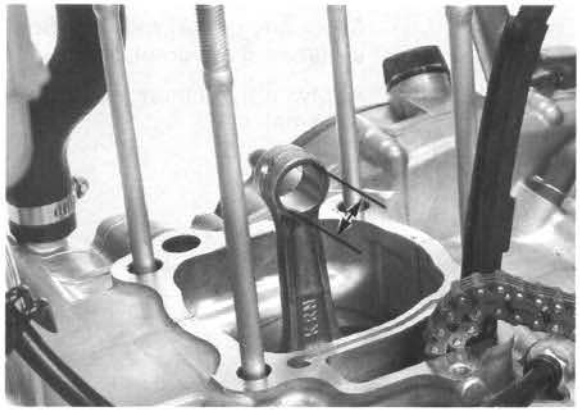


CONNECTING ROD INSPECTION

Measure the connecting rod small end I.D.

SERVICE LIMIT: 16.04 mm (0.631 in)

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 12-15).



PISTON RING INSTALLATION

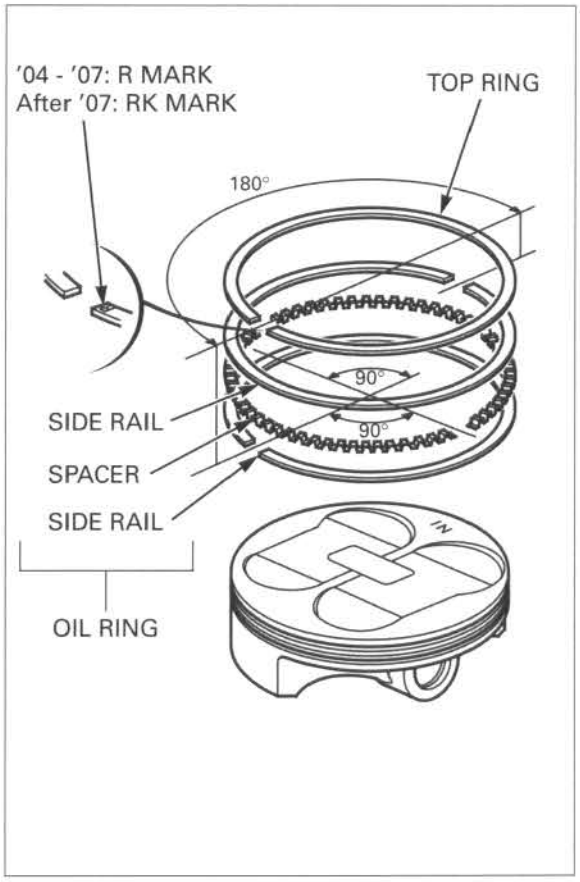
Clean the piston ring grooves thoroughly.

Install the piston ring on the piston with the marked side facing up.

Apply engine oil to the piston rings and install the piston rings.

- 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 180 degrees apart.

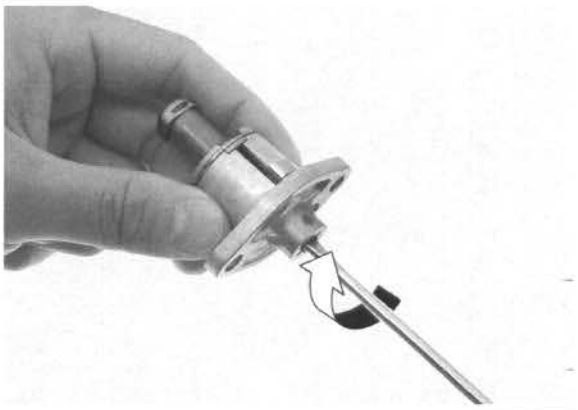
After installation, the rings should rotate freely in the ring grooves.



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.

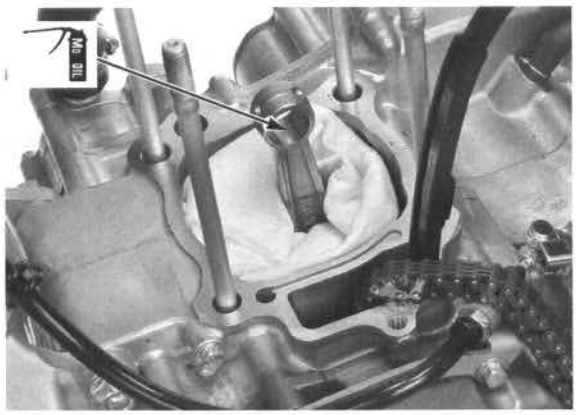


PISTON INSTALLATION

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 solution oil 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 engine oil to the piston pin outer surface and piston pin hole of the piston.

'04 - '07: Install the piston with the "IN" mark facing intake side.

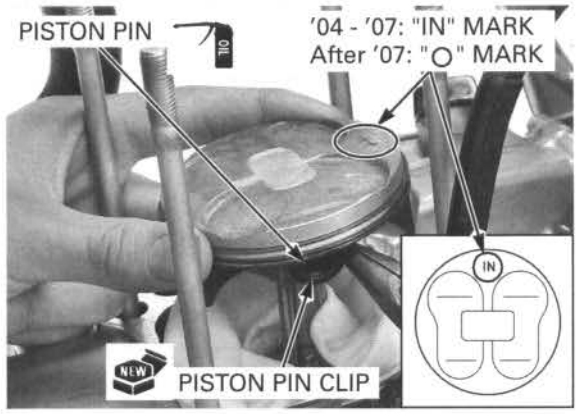
After '07: Install the piston with the " ○ " mark facing intake side.

Be careful not to drop the piston pin clip into the crankcase.

Install the piston pin and new piston pin clips.

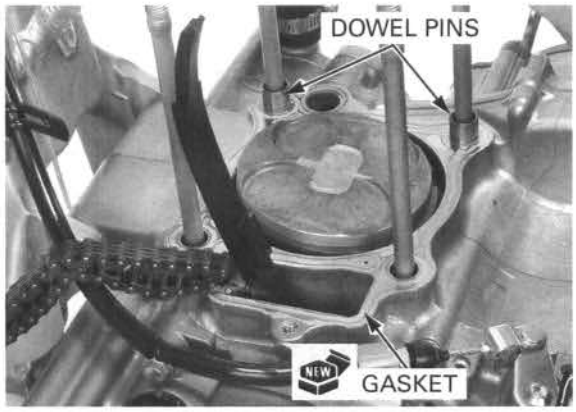
- Always use new piston pin clips. Reinstalling used piston pin clips may lead to serious engine damage.

Do not align the piston pin clip end gap with the piston cut-out.



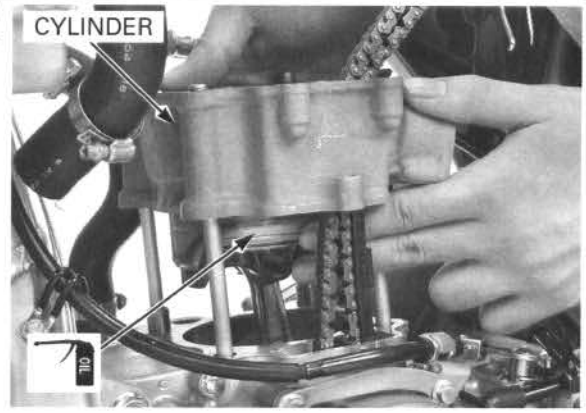
CYLINDER INSTALLATION

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 engine oil and install the cylinder while compressing the piston rings.



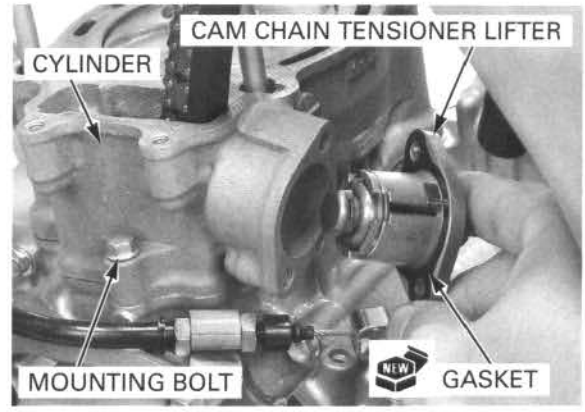
Install the cylinder mounting bolt.

Install a new gasket, cam chain tensioner lifter and bolts.

Tighten the cam chain tensioner lifter mounting bolt securely.

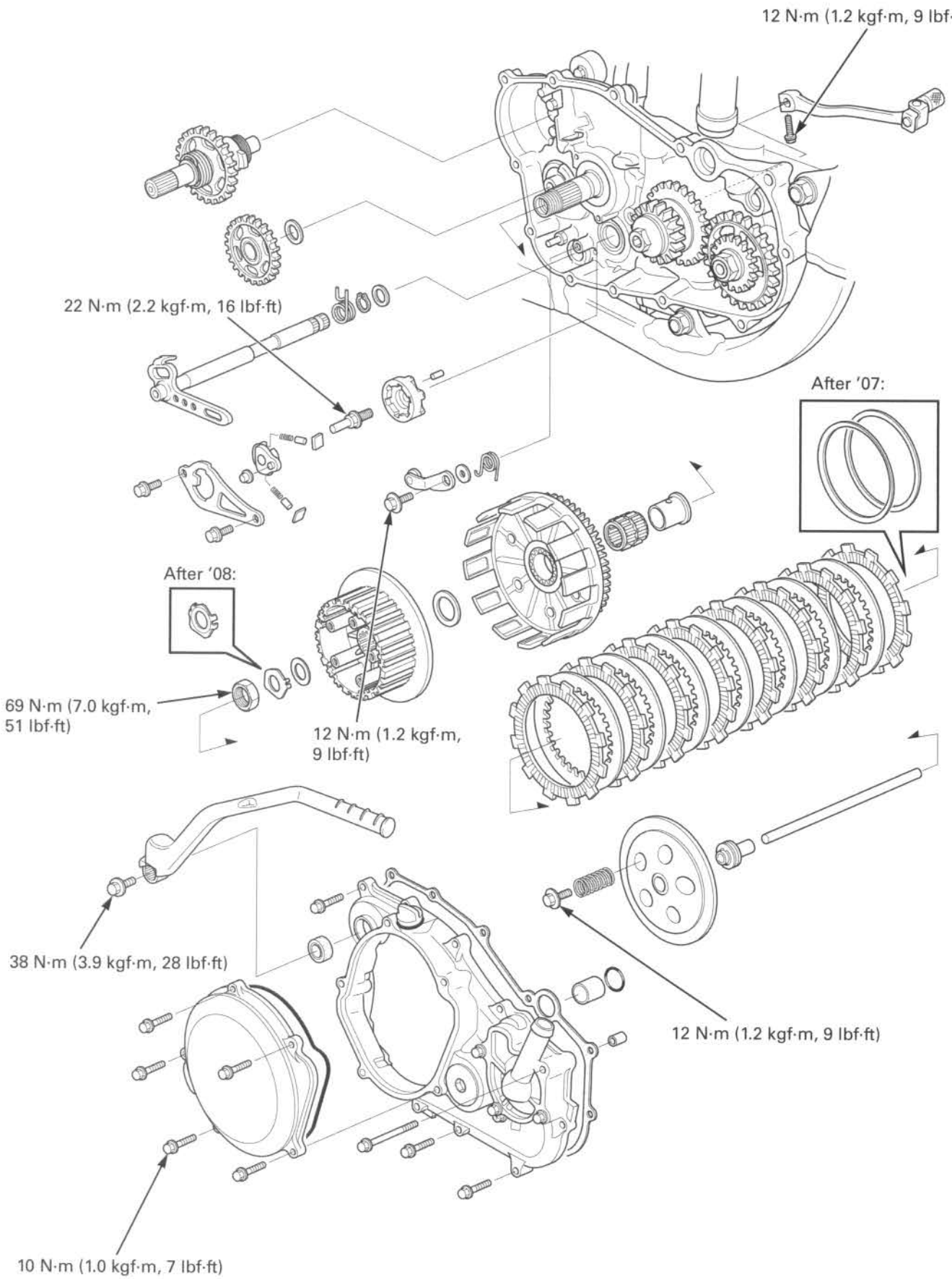
Install the cylinder head (page 9-27).

After tightening the cylinder head mounting nut, tighten the cylinder mounting bolt securely.



11. 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

Unit: mm (in)

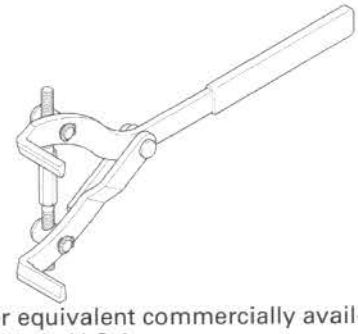
ITEM		STANDARD	SERVICE LIMIT
Clutch lever freeplay		10 – 20 (3/8 – 13/16)	–
Clutch spring free length	'04	37.1 (1.46)	36.3 (1.43)
	'05 - '07	38.0 (1.50)	37.2 (1.46)
	After '07	38.5 (1.52)	37.7 (1.48)
Clutch disc thickness		2.92 – 3.08 (0.115 – 0.121)	2.85 (0.112)
Clutch plate warpage		–	0.10 (0.004)
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)

TORQUE VALUES

Clutch center lock nut	69 N·m (7.0 kgf·m, 51 lbf·ft)	Apply oil to the seating surface
Clutch spring bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Clutch cover bolt	10 N·m (1.0 kgf·m, 7 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)	
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)	

TOOL

Clutch center holder
07724-0050001 or 07724-0050002



or equivalent commercially available in U.S.A.

TROUBLESHOOTING

Hard to shift
- 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

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

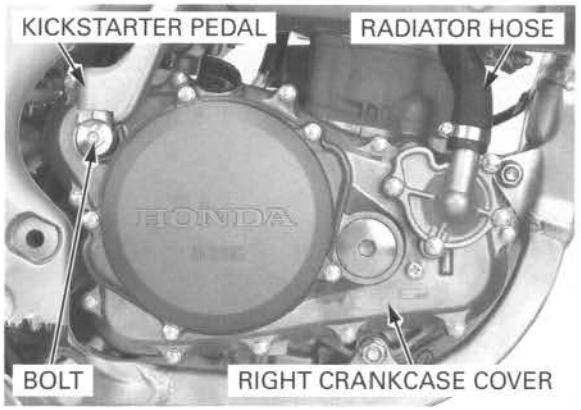
Motorcycle creeps with the engine idling
- Incorrect clutch adjustment
- Clutch plate warped
- Faulty clutch lifter
- Incorrect transmission oil

RIGHT CRANKCASE COVER

REMOVAL

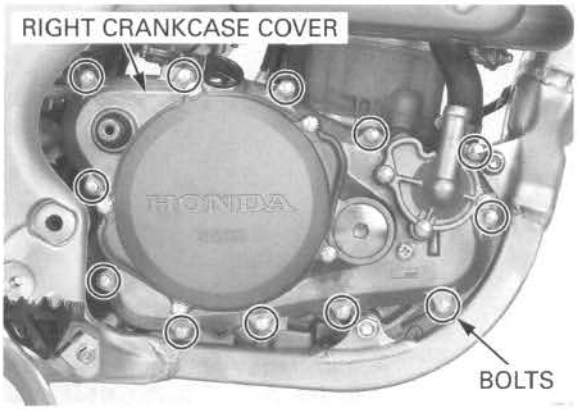
Drain the coolant (page 7-7).
Drain the transmission oil (page 4-17).
Remove the brake pedal (page 15-32).

Remove the kickstarter pedal bolt and kickstarter pedal.
Loosen the band screw and disconnect the radiator hose from the right crankcase cover.

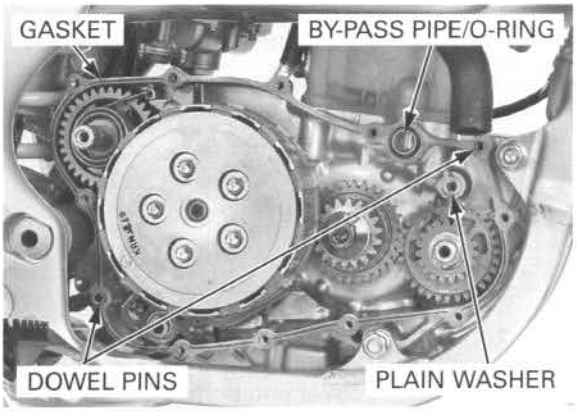


Loosen the right crankcase cover bolts in a criss-cross pattern in two or three steps.

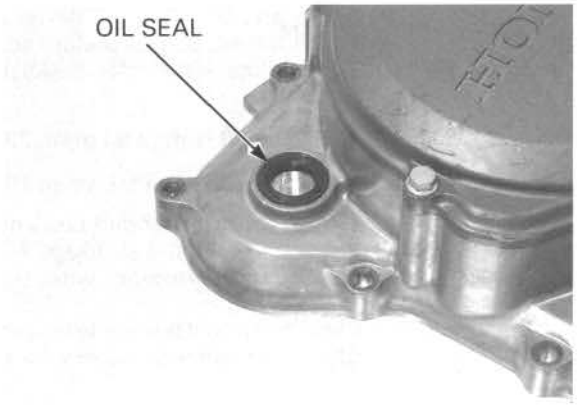
Remove the bolts and right crankcase cover.



Remove the water by-pass pipe and O-ring.
Remove the gasket and dowel pins.
Remove the plain washer.

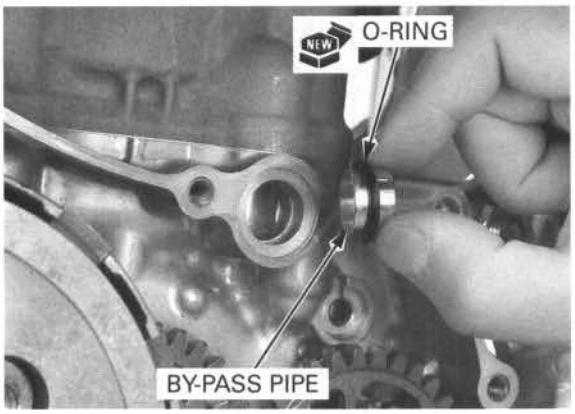


Check the kickstarter spindle oil seal for deterioration or damage.



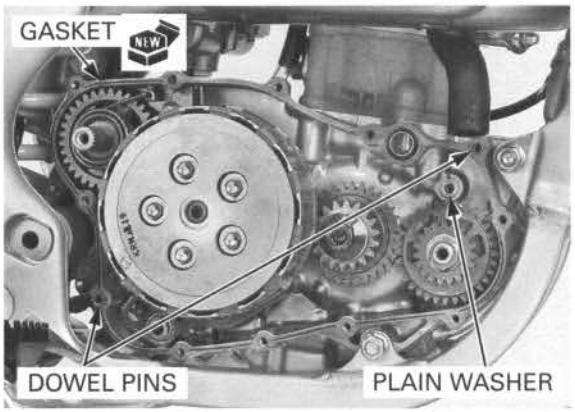
INSTALLATION

Install a new O-ring onto the by-pass pipe.
Install the by-pass pipe into the crankcase.



Install the plain washer.

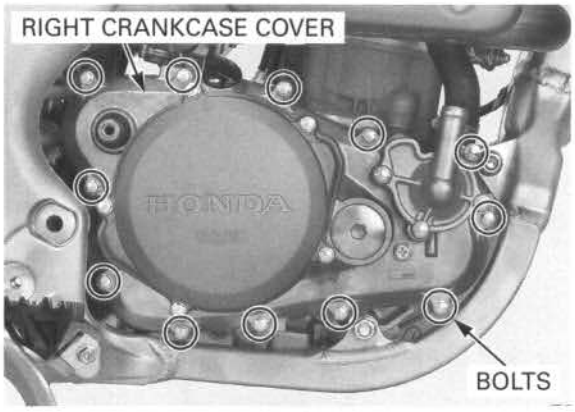
Install the dowel pins and a new gasket.



Install the right crankcase cover while engaging the water pump driven gear with 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.



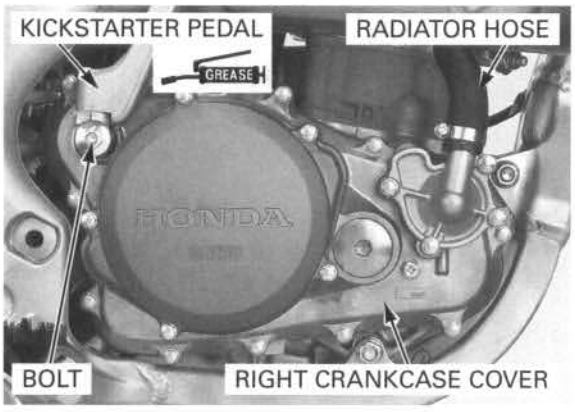
Connect the radiator hose to the right crankcase cover and tighten the band screw securely.

Apply grease to the kickstarter pedal spline area.
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 brake pedal (page 15-32).

Add the recommended coolant mixture to the filler neck and bleed the air (page 7-7).
Fill the transmission with the recommended oil (page 4-16).
Check and adjust the rear brake pedal height (page 4-23).
Start the engine and check for oil leaks.

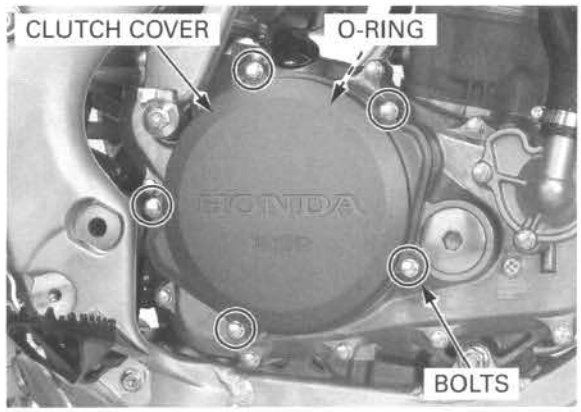


CLUTCH

REMOVAL

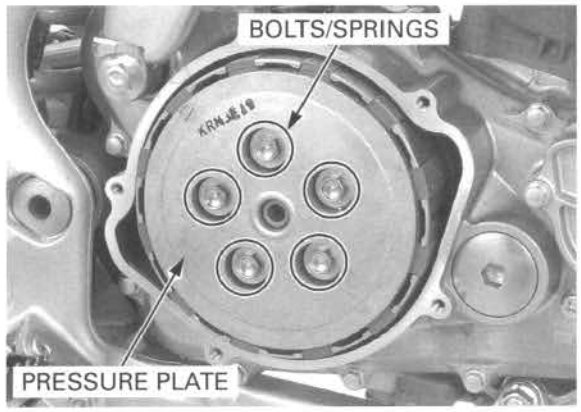
Remove the brake pedal (page 15-32).

Remove the bolts, clutch cover and O-ring.

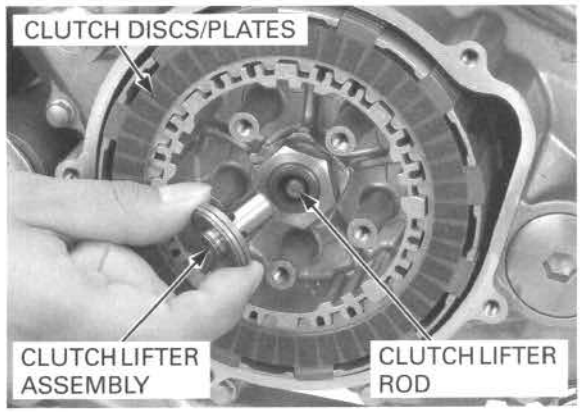


Remove the five clutch spring bolts in a crisscross pattern in two or three steps.
Remove the clutch springs.

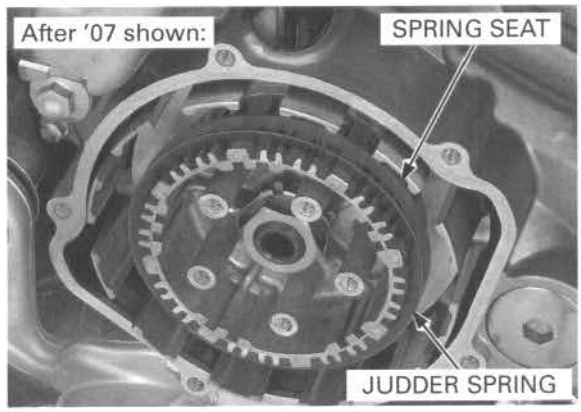
Remove the clutch pressure plate.



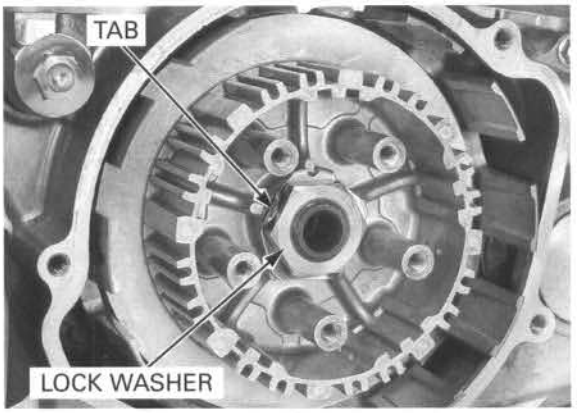
Remove the clutch lifter assembly and clutch lifter rod.
Remove the eight clutch discs and seven clutch plates.



After '07: Remove the judder spring and spring seat.



Bend the tabs of the lock washer away from the lock nut.

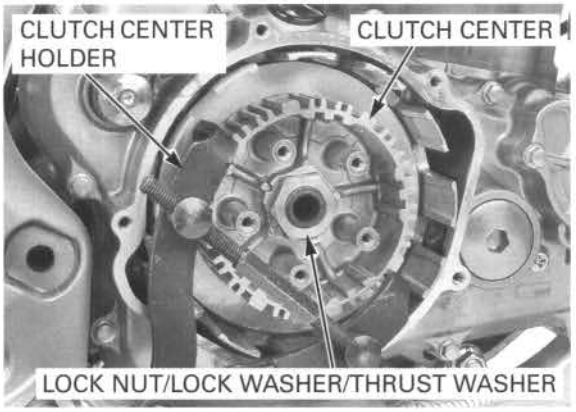


Remove the clutch center lock nut using the special tool.

TOOL:

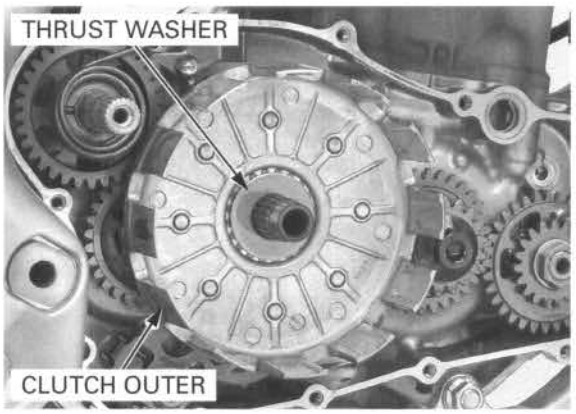
Clutch center holder	**07724-0050001 or 07724-0050002 or equivalent commercially available in U.S.A.**

Remove the lock washer and thrust washer.
Remove the tool and clutch center.

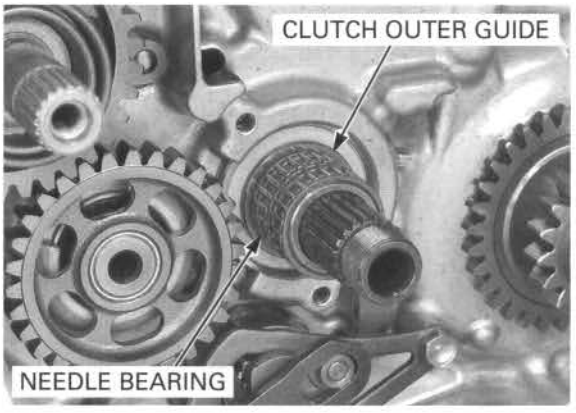


Remove the right crankcase cover (page 11-5).

Remove the thrust washer and clutch outer.

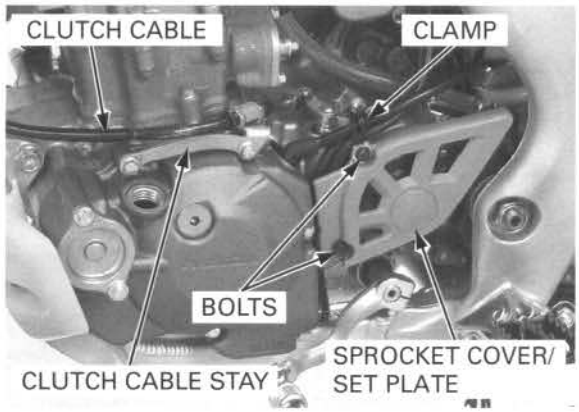


Remove the needle bearing and clutch outer guide.



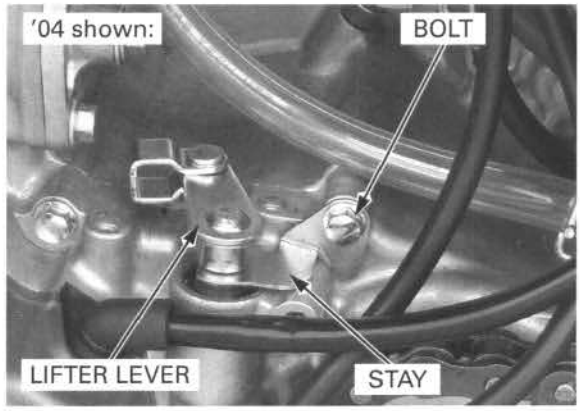
'04: Disconnect the clutch cable from the clutch lifter lever by removing the clutch cable stay.
Remove the bolt, wire clamp, drive sprocket cover and set plate.

After '04: Disconnect the clutch cable from the clutch lifter lever.



'04: Remove the bolts and stay.

Remove the clutch lifter lever from the left crankcase.



INSPECTION

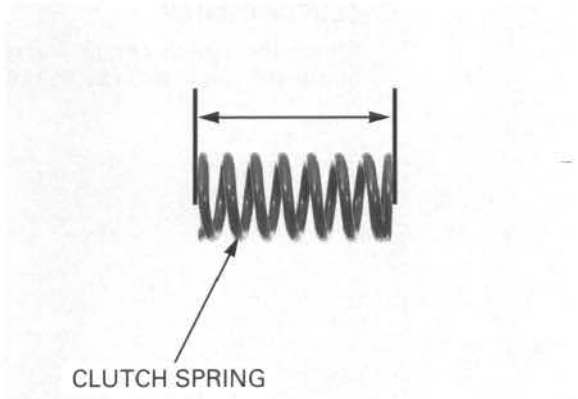
CLUTCH SPRING

Clutch springs should be replaced as a set if one or more is below the service limit.

Measure the clutch spring free length.

SERVICE LIMITS:

'04:	**36.3 mm (1.43 in)**
'05 - '07:	**37.2 mm (1.46 in)**
After '07:	**37.7 mm (1.48 in)**



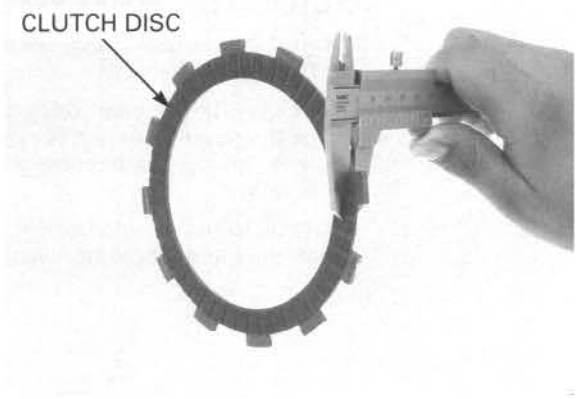
CLUTCH DISCS

Check the clutch discs for signs of scoring or discoloration.

Clutch discs should be replaced as a set if one or more is less the service limit.

Measure the thickness of each disc.

SERVICE LIMIT: 2.85 mm (0.112 in)



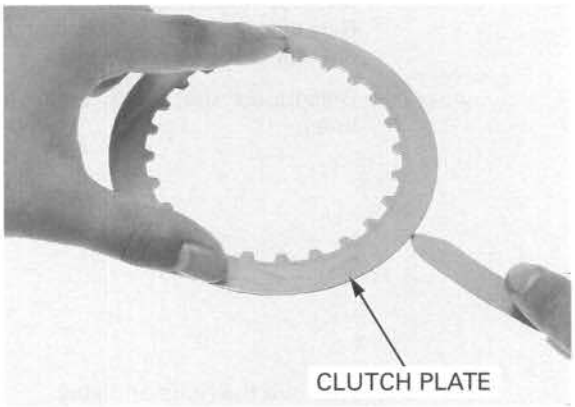
CLUTCH PLATES

Check the plates for excessive warpage or discoloration.

Clutch plates should be replace as a set if one or more is less the service limit.

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

SERVICE LIMIT: 0.10 mm (0.004 in)

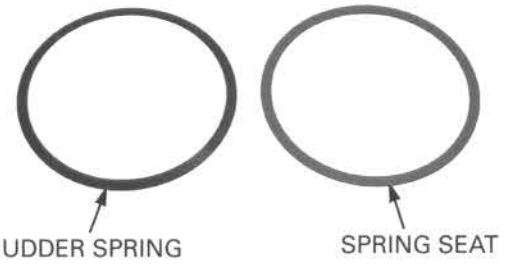


JUDDER SPRING/SPRING SEAT (After '07)

Check the judder spring and spring seat for deformation, warpage or damage; replace if necessary.

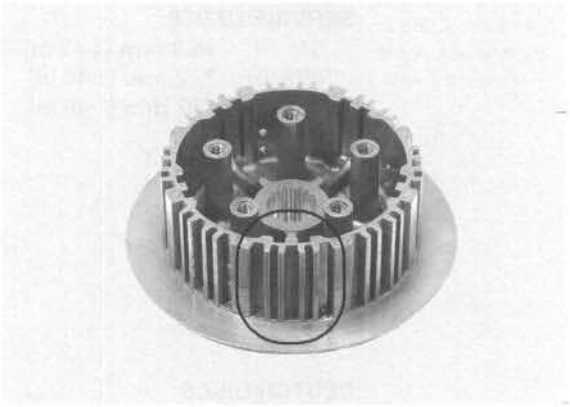
- A damaged or warped spring seat will cause the judder spring to be pressed unevenly.
- A damaged judder spring also causes the weak contact between the discs and plates or uneven disc/plate contact.

After '07 shown:



CLUTCH CENTER

Check the clutch center for nicks, indentations or abnormal wear made by the clutch plates.

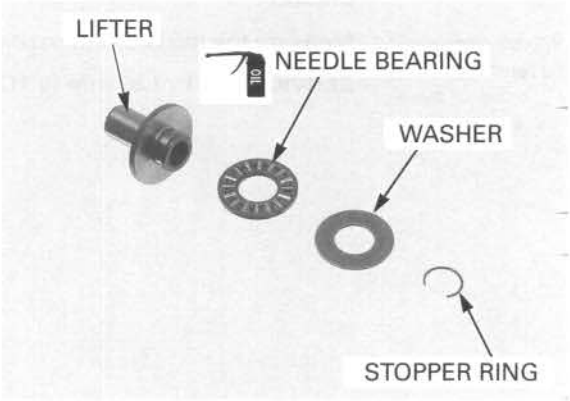


CLUTCH LIFTER/NEEDLE BEARING

Remove the stopper ring, washer and needle bearing from the clutch lifter.

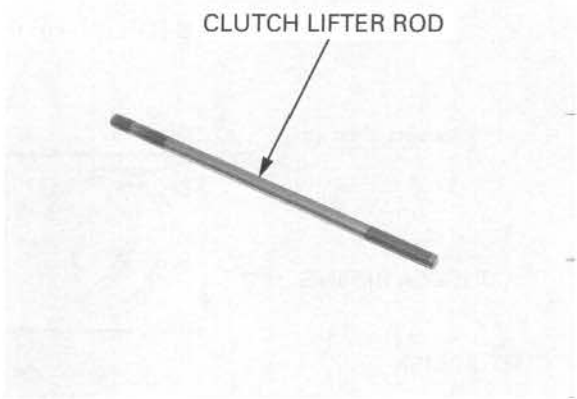
Check the lifter for wear or damage.
Check the needle bearing for wear or damage.
Replace the needle bearing and washer as a set if necessary.

Apply oil to the needle bearing.
Install the needle bearing, washer and stopper ring.



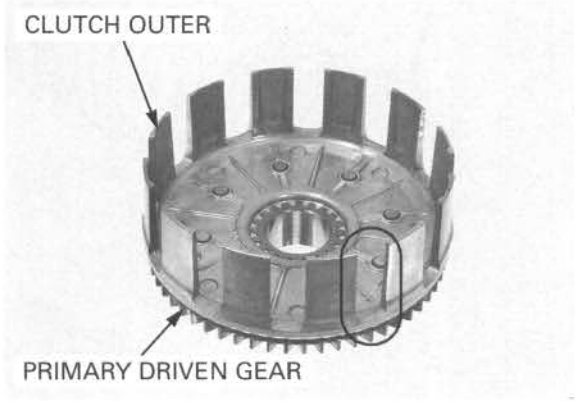
CLUTCH LIFTER ROD

Check the clutch lifter rod for damage and straightness.



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.



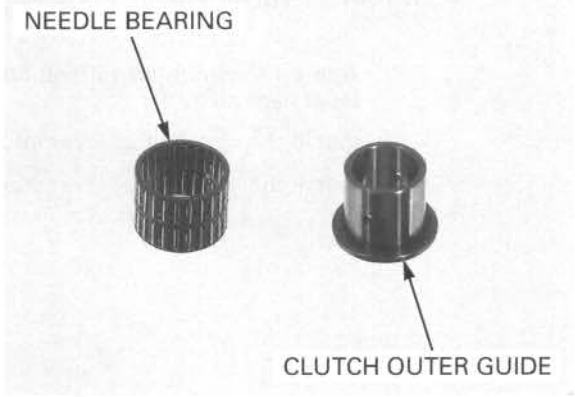
CLUTCH OUTER GUIDE

Check the clutch outer guide for abnormal wear or damage.

NEEDLE BEARING

Check the needle bearing for wear or damage.

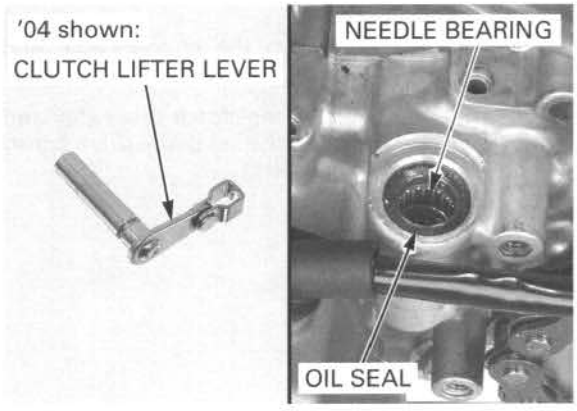
Check the mainshaft for wear or damage at the sliding surface of the clutch outer guide.



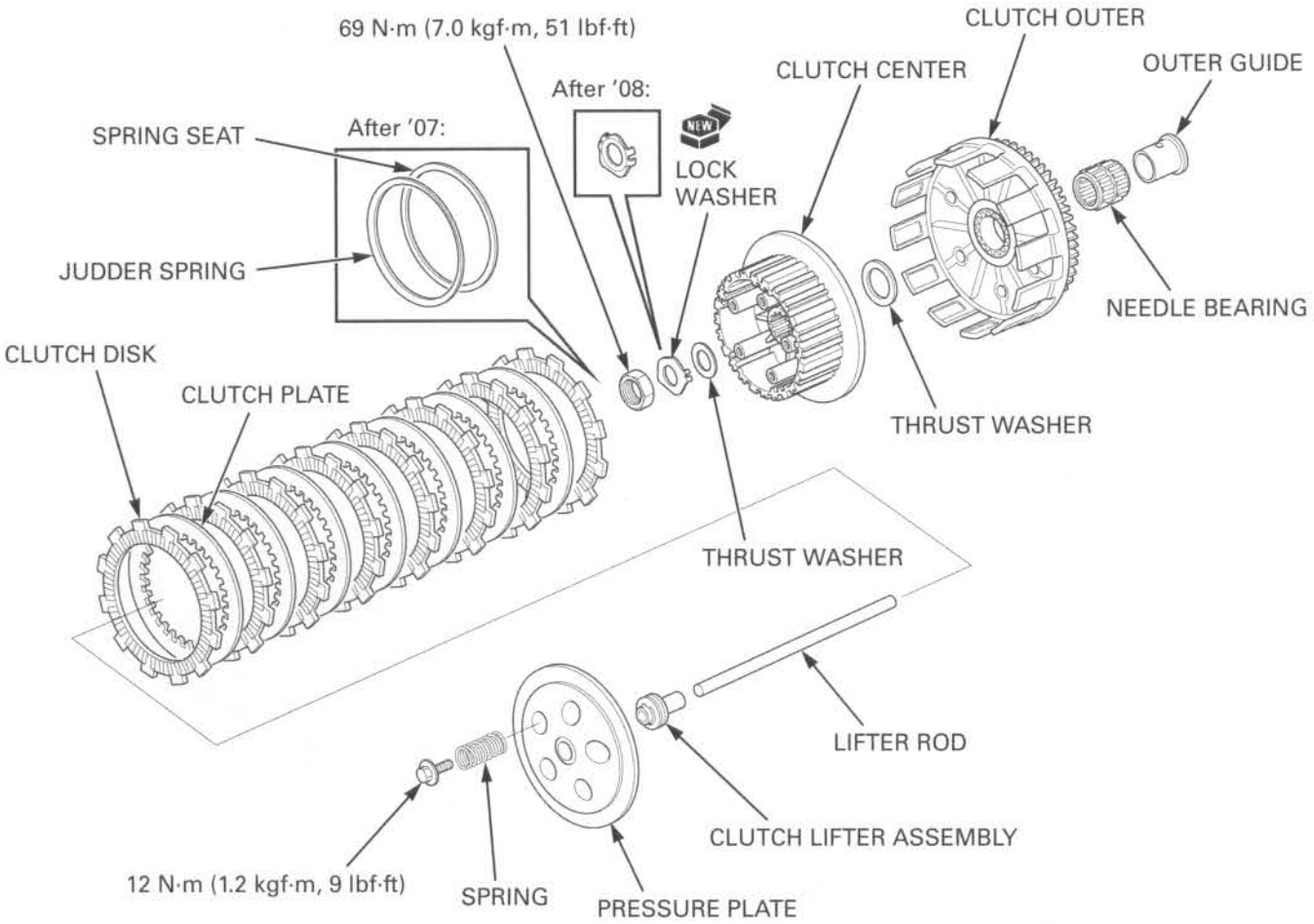
CLUTCH LIFTER LEVER

Check the clutch lifter lever for damage.

Check the oil seal and needle bearing for wear or damage.



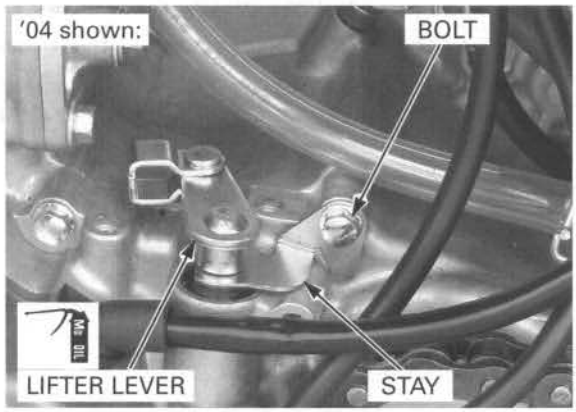
INSTALLATION



Apply molybdenum oil solution to the clutch lifter lever cam area.

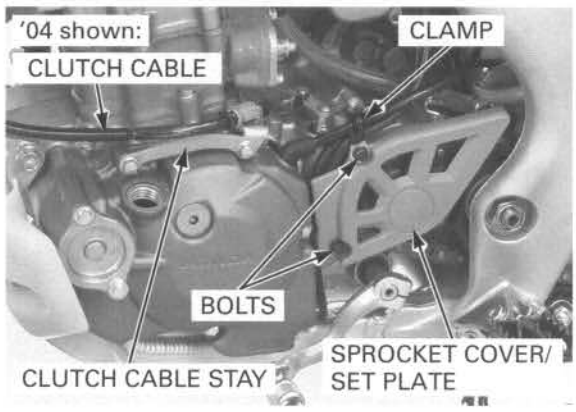
Install the clutch lifter lever into the left crankcase.

'04: Install the clutch lifter lever stay and bolt.

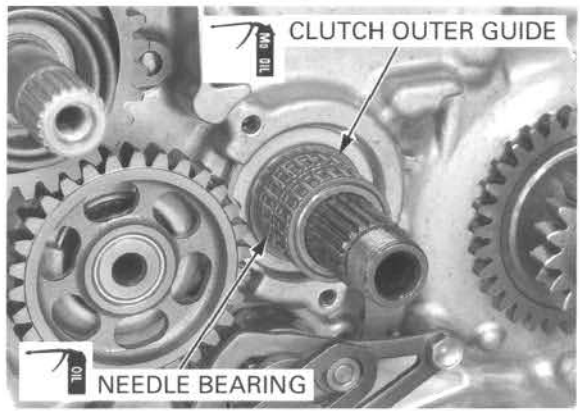


Connect the clutch cable end to the clutch lifter lever.

'04: Install the clutch cable stay and bolts.
Install the set plate, drive sprocket cover, wire clamp and bolts.



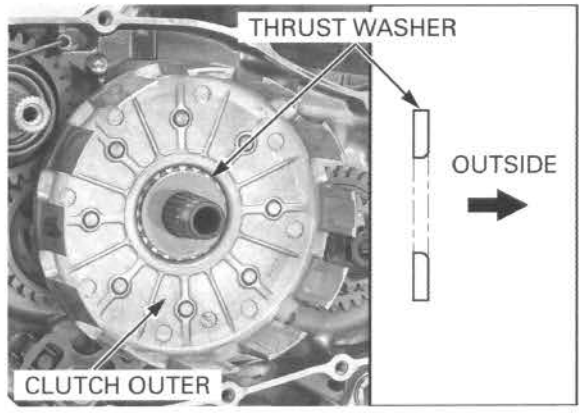
Apply transmission oil to the needle bearing.
Apply molybdenum oil solution to the clutch outer guide inner surface.
Install the clutch outer guide and needle bearing onto the mainshaft.



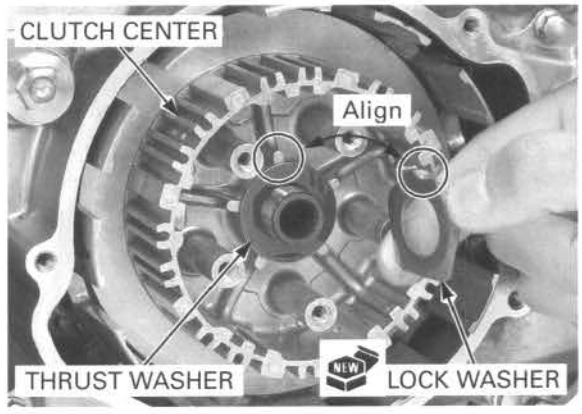
Install the thrust washer with its chamfered edge facing out.

Install the clutch outer and thrust washer.

Install the right crankcase cover (page 11-6).



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.



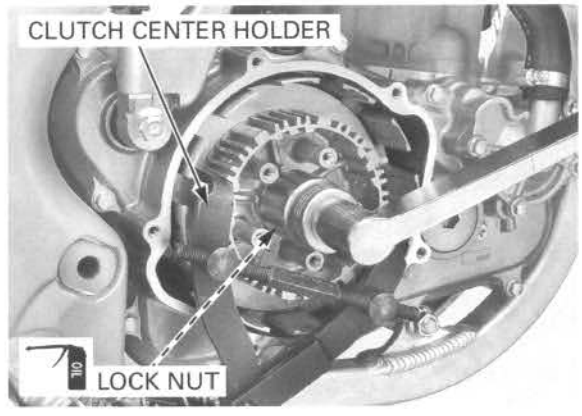
Apply oil to the threads and seating surface of a clutch center lock nut, then install it onto the main shaft.

Tighten the lock nut to the specified torque using the special tool.

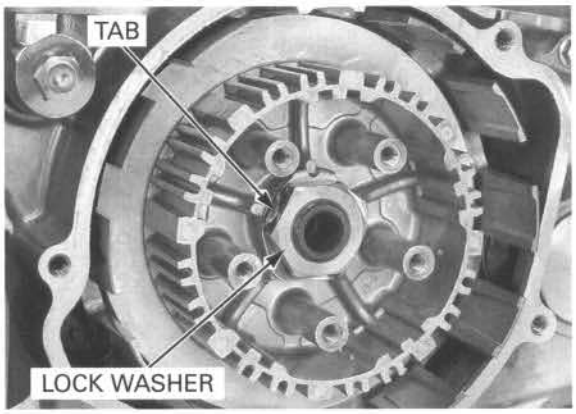
TOOL:

Clutch center holder	**07724-0050001 or 07724-0050002 or equivalent commercially available in U.S.A.**

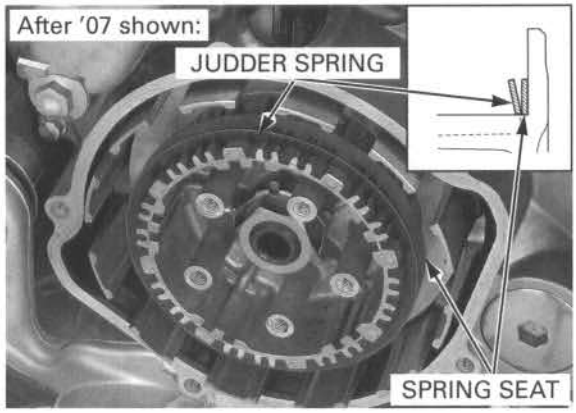
TORQUE: 69 N·m (7.0 kgf·m, 51 lbf·ft)



Bend the tabs of the lock washer up against the clutch center lock nut.



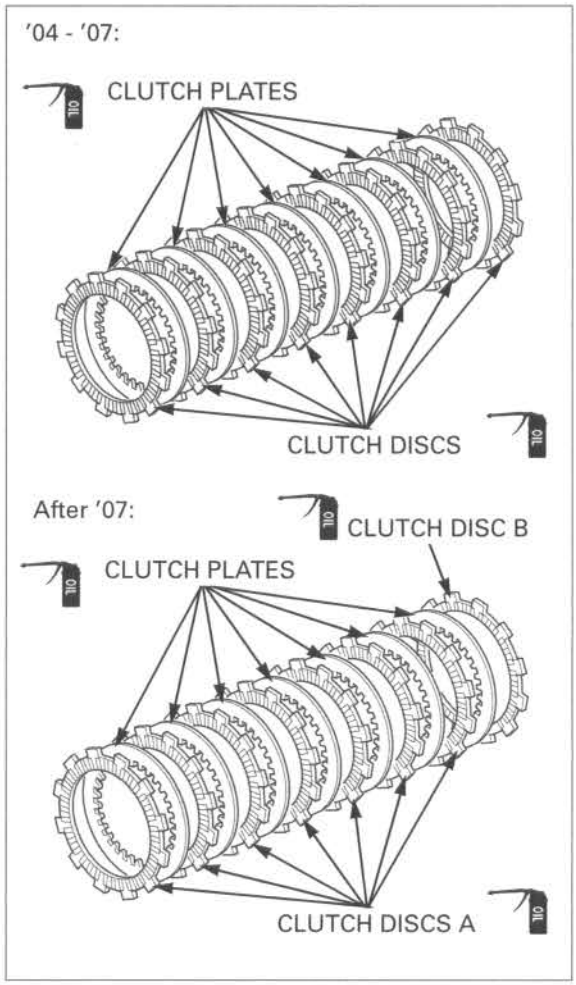
After '07: Install the spring seat.
Install the judder spring with the concaved side facing out.



Coat the clutch plates and discs with clean engine oil.

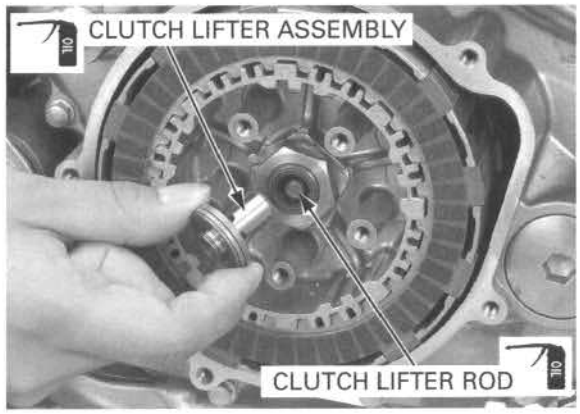
'04 - '07: Install the eight clutch discs and seven clutch plates alternately, starting with a disc.

After '07: Install the clutch disc B (large I.D. disc) and then stack the seven clutch plates and seven disc A alternately, starting with a disc.



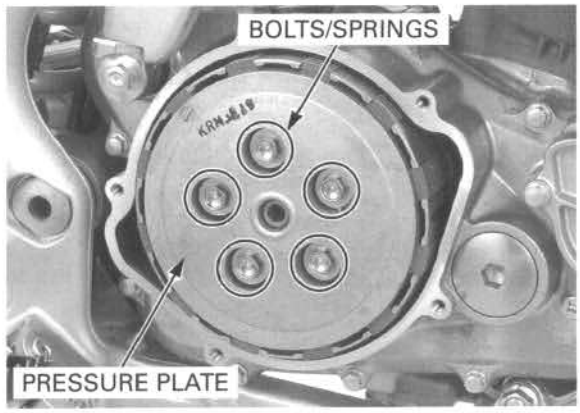
Apply engine oil to the lifter assembly and clutch lifter rod contact surface.

Insert the clutch lifter rod into the mainshaft.
Install the clutch lifter assembly.

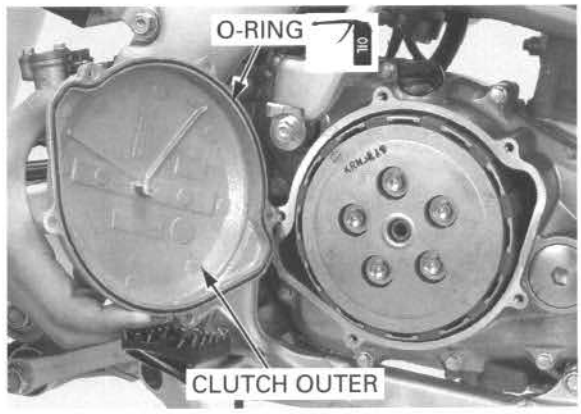


Install the clutch pressure plate.
Install the five springs and spring bolts.
Tighten the bolts to the specified torque in a criss-cross pattern in two or three steps.

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 oil to the O-ring and install the clutch cover.



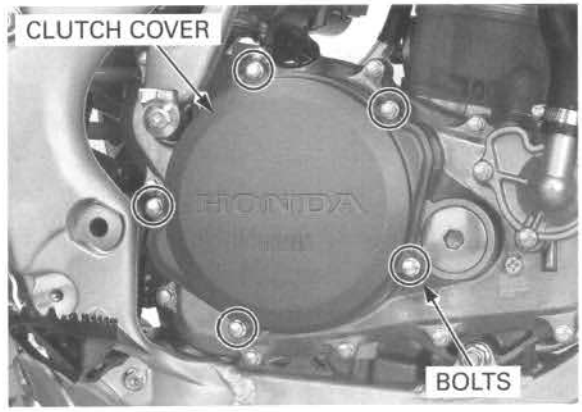
Install and tighten the cover bolts in a crisscross pattern in two or three steps.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the brake pedal (page 15-32).
Adjust the clutch lever freeplay (page 4-24).

Add the recommended coolant mixture to the filler neck and bleed the air (page 7-7).
Fill the engine with the recommended oil (page 4-14)

Start the engine and check for oil leaks.



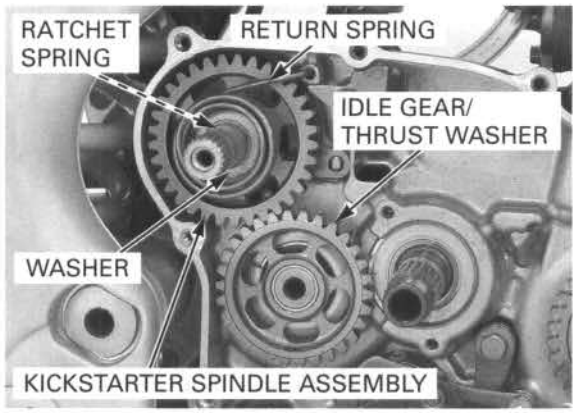
KICKSTARTER

REMOVAL

Remove the right crankcase cover (page 11-5).
Remove the clutch (page 11-7).

Remove the idle gear and thrust washer.

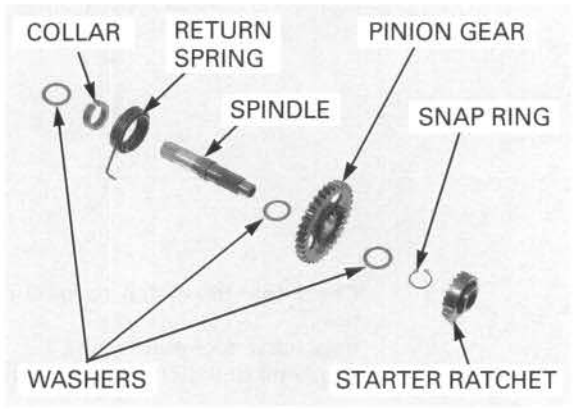
Unhook the kickstarter return spring from the crankcase.
Remove the washer, kickstarter spindle assembly and ratchet spring.



DISASSEMBLY

Disassemble the kickstarter spindle by removing the following:

- Return spring and collar
- Starter ratchet
- Snap ring, thrust washers and pinion gear



INSPECTION

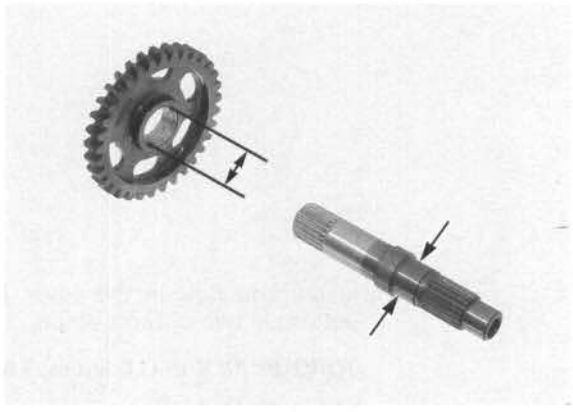
Check the return spring and ratchet spring for fatigue or damage.
Check the starter ratchet for wear or damage.

Check the kickstarter pinion for wear or damage.
Check the kickstarter spindle for bend, wear or damage.
Measure and record the kickstarter pinion gear I.D.

SERVICE LIMIT: 16.55 mm (0.652 in)

Measure the kickstarter spindle O.D.

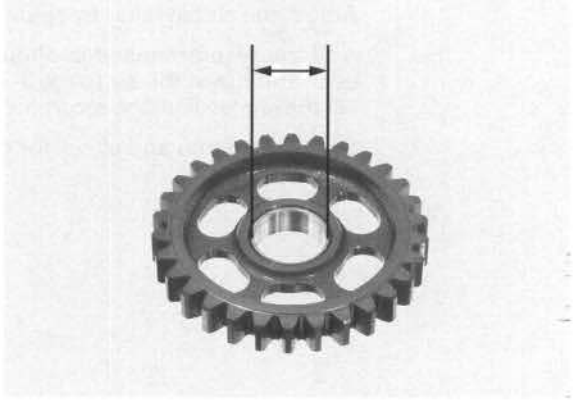
SERVICE LIMIT: 16.46 mm (0.648 in)



Check the starter idle gear for wear or damage.

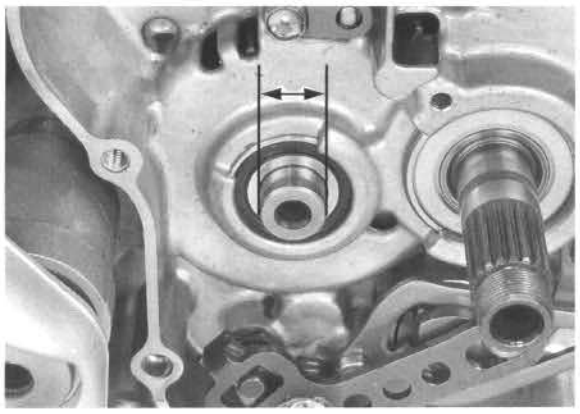
Measure and record the starter idle gear I.D.

SERVICE LIMIT: 17.06 mm (0.672 in)

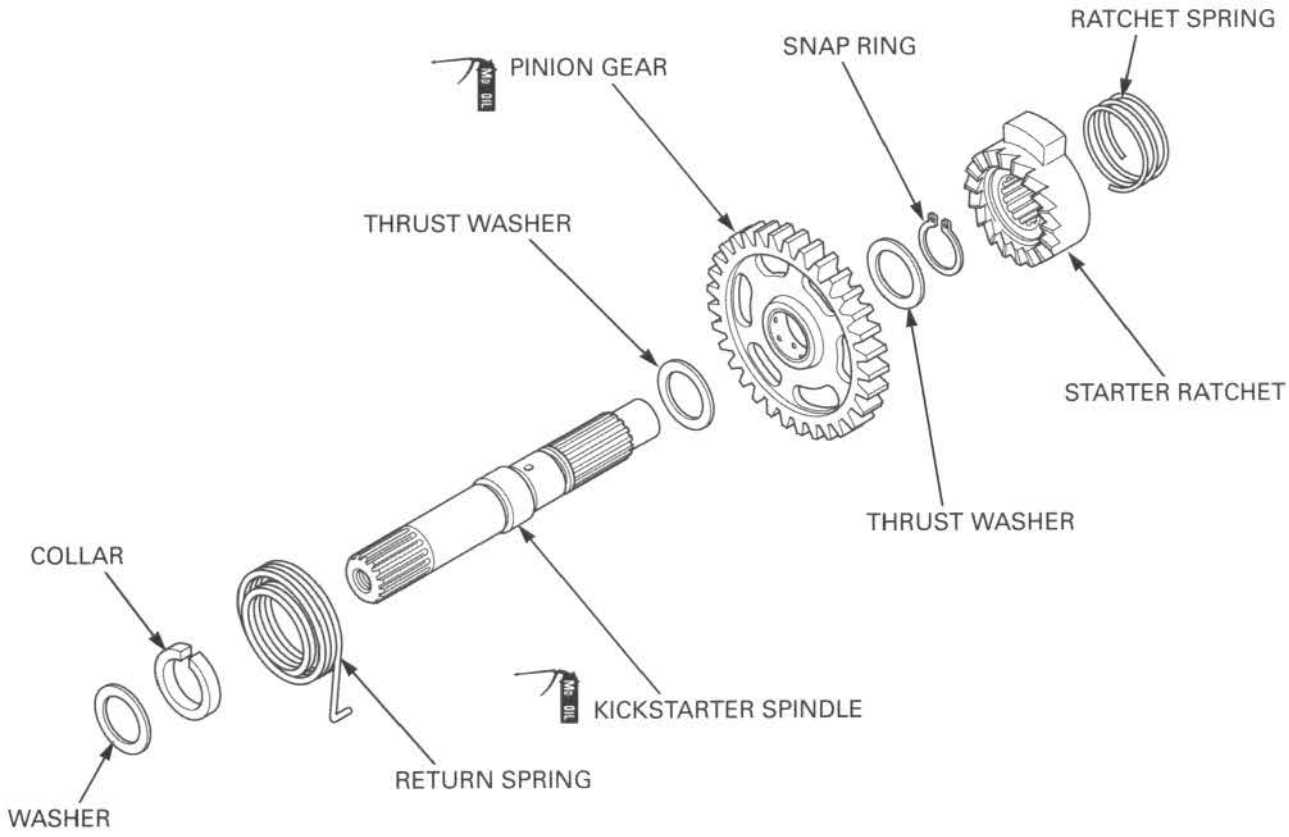


Measure the countershaft O.D. at the idle gear sliding surface.

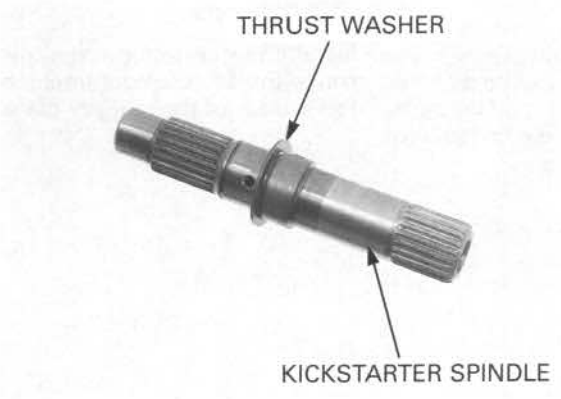
SERVICE LIMIT: 16.97 mm (0.668 in)



ASSEMBLY



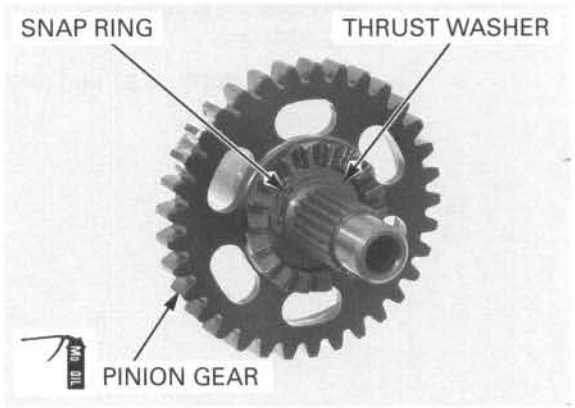
Install the thrust washer into the kickstarter spindle.



Apply molybdenum oil solution to the pinion gear inner surface.
Install the pinion gear and thrust washer.

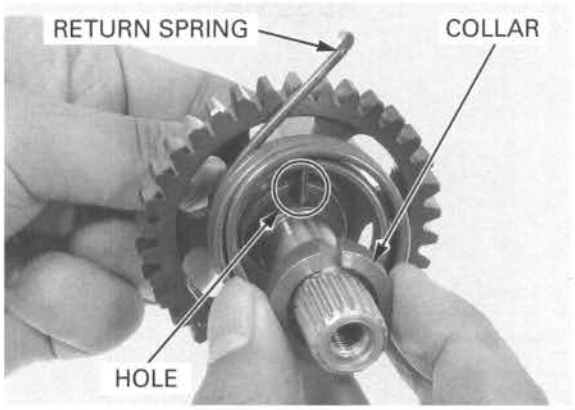
Set the sharp edge of the snap ring facing out.

Install the snap ring in the groove of the spindle.

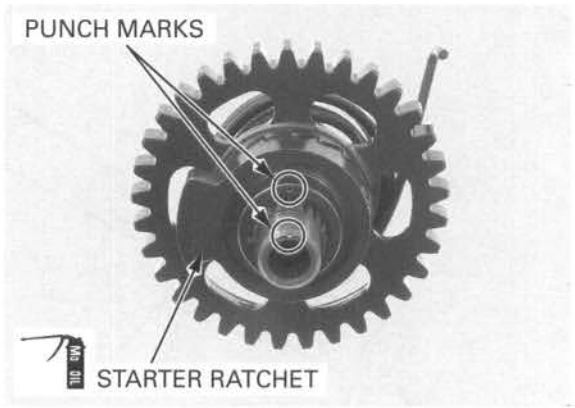


Insert the return spring into the spring hole on the kickstarter spindle.

Install the collar by aligning its cut-out with the spring.



Apply molybdenum oil solution to the starter ratchet inner surface.
Align the punch marks and install the starter ratchet.

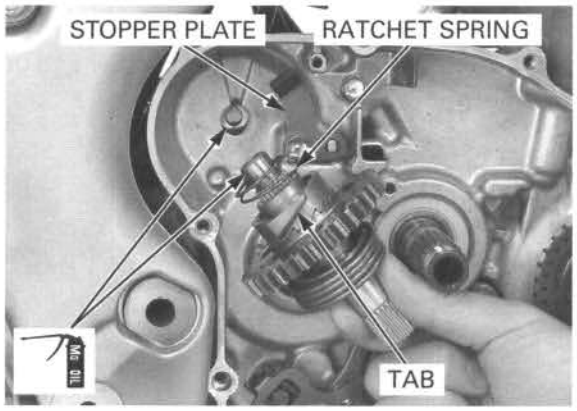


INSTALLATION

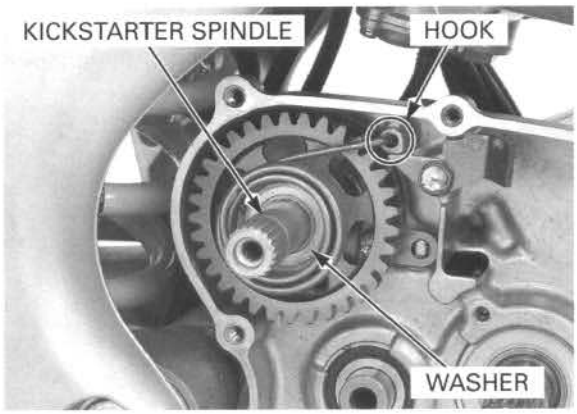
Install the ratchet spring.
Apply molybdenum oil solution to the kickstarter spindle journal.

Be sure the ratchet spring 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.

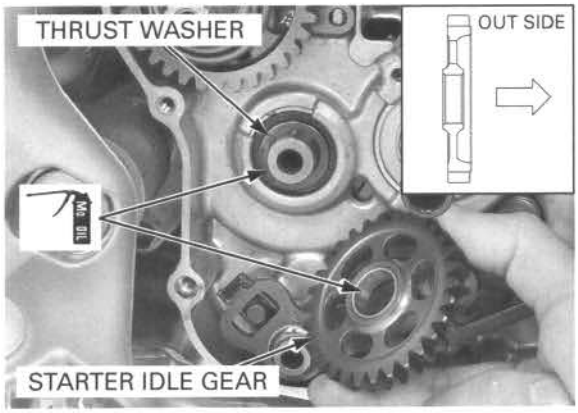


Hook the return spring end into the hole in the crankcase.
Install the washer.



Install the thrust washer and starter idle gear onto the countershaft.

Install the clutch (page 11-12).
Install the right crankcase cover (page 11-6).



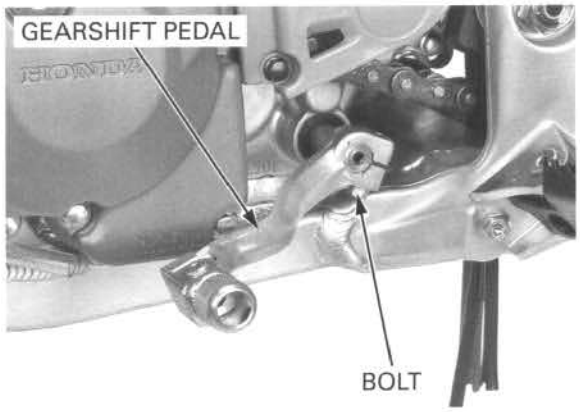
GEARSHIFT LINKAGE

REMOVAL

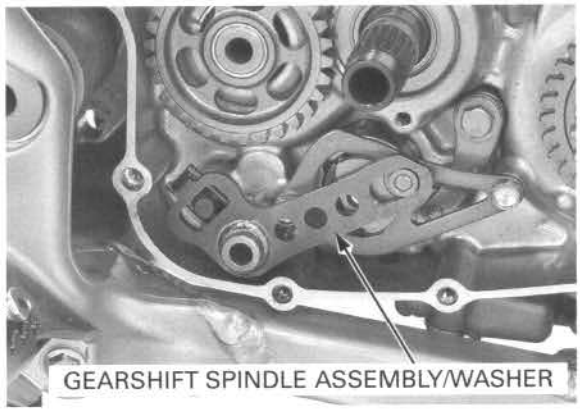
Remove the right crankcase cover (page 11-5).
Remove the clutch (page 11-7).

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

Remove the bolt and gearshift pedal.



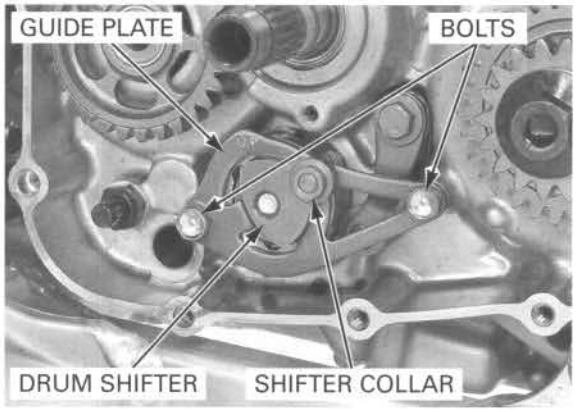
Remove the gearshift spindle assembly and washer from the crankcase.



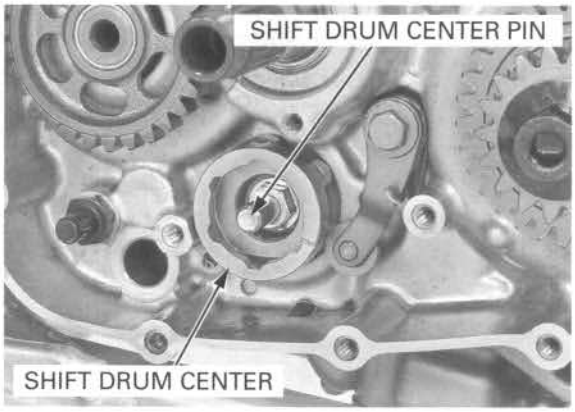
Remove the shifter collar.

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.

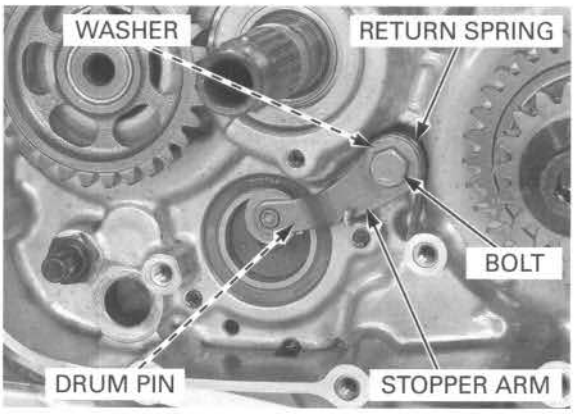


Remove the shift drum center pin and shift drum center.



Remove the bolt, stopper arm, return spring and washer.

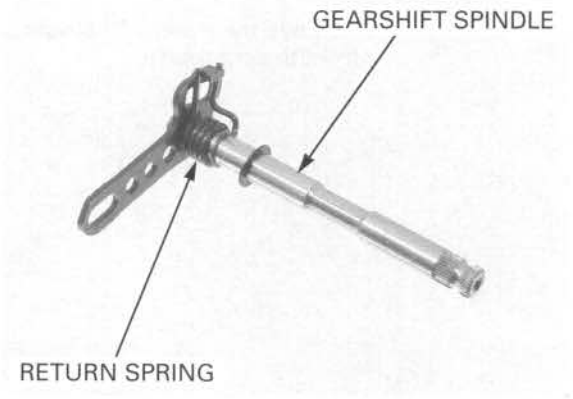
Remove the drum pin from the shift drum.



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:

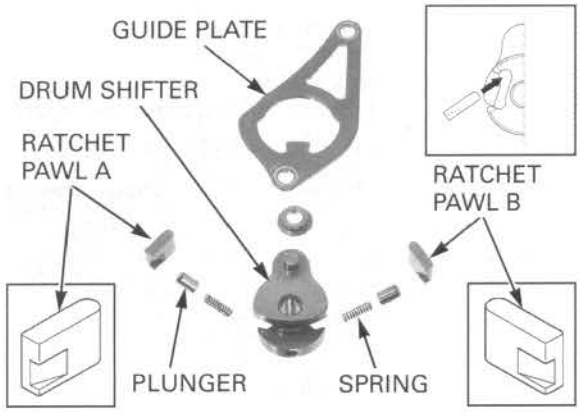
- Guide plate
- Drum shifter
- Ratchet pawls
- Plungers
- Springs

Clean the ratchet pawls, plungers, springs and drum shifter with clean transmission oil.

Check each part for wear or damage.

Apply clean transmission oil to each part.
Assemble the drum shifter, springs, plungers and ratchet pawls in the guide plate as shown.

NOTE:
Do not interchange the ratchet pawls A and B.



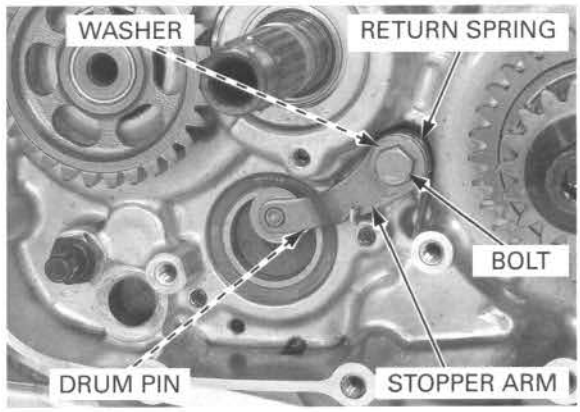
INSTALLATION

Install the drum pin into the hole on the shift drum.

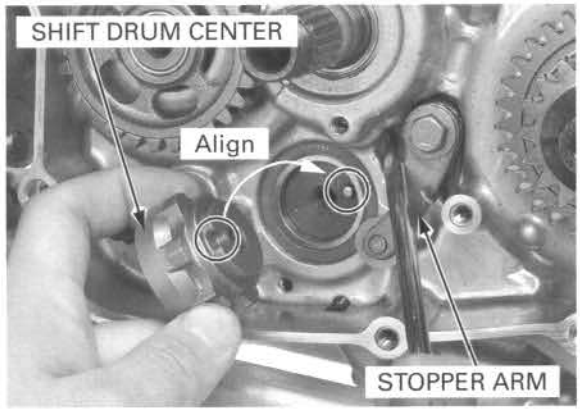
Install the return spring, washer and stopper arm and tighten the stopper arm bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Check the stopper arm for proper operation.

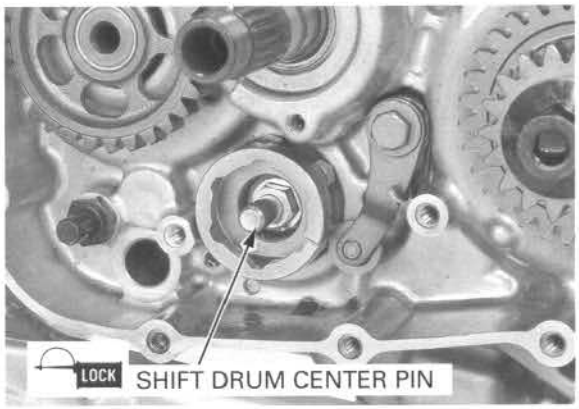


Move the stopper arm out of the way using a screwdriver.
Align the shift drum center groove with the drum pin.



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.

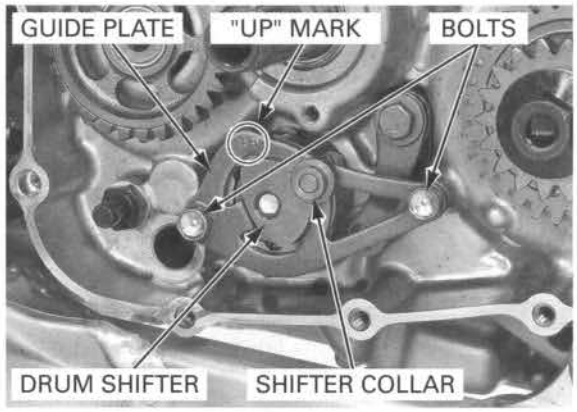
TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)



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.

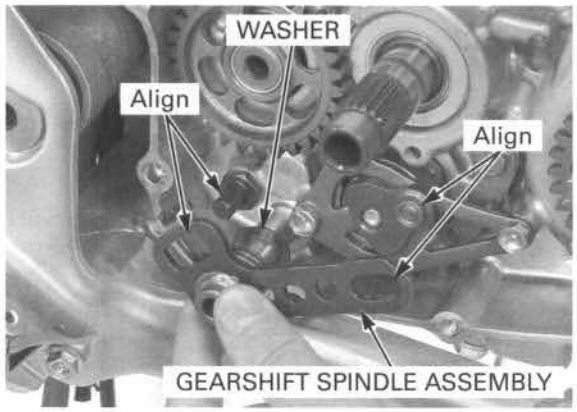
Install and tighten the guide plate bolts securely.

Install the shifter collar onto the drum shifter.



Do not forget to install the washer onto the gearshift spindle.

Install the washer and gear shift spindle assembly into the crankcase while aligning the spring ends with the crankcase stopper pin.

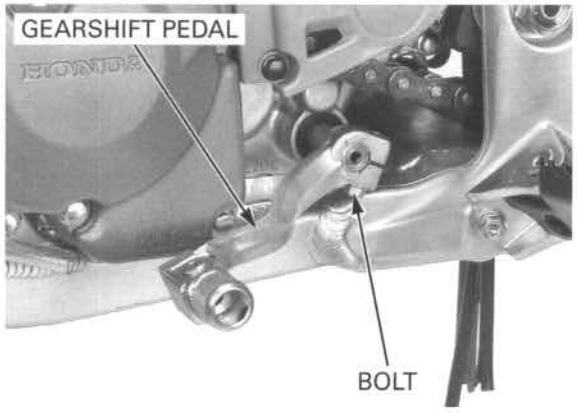


Install the gearshift pedal on its original position as marked during removal.
Tighten the bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

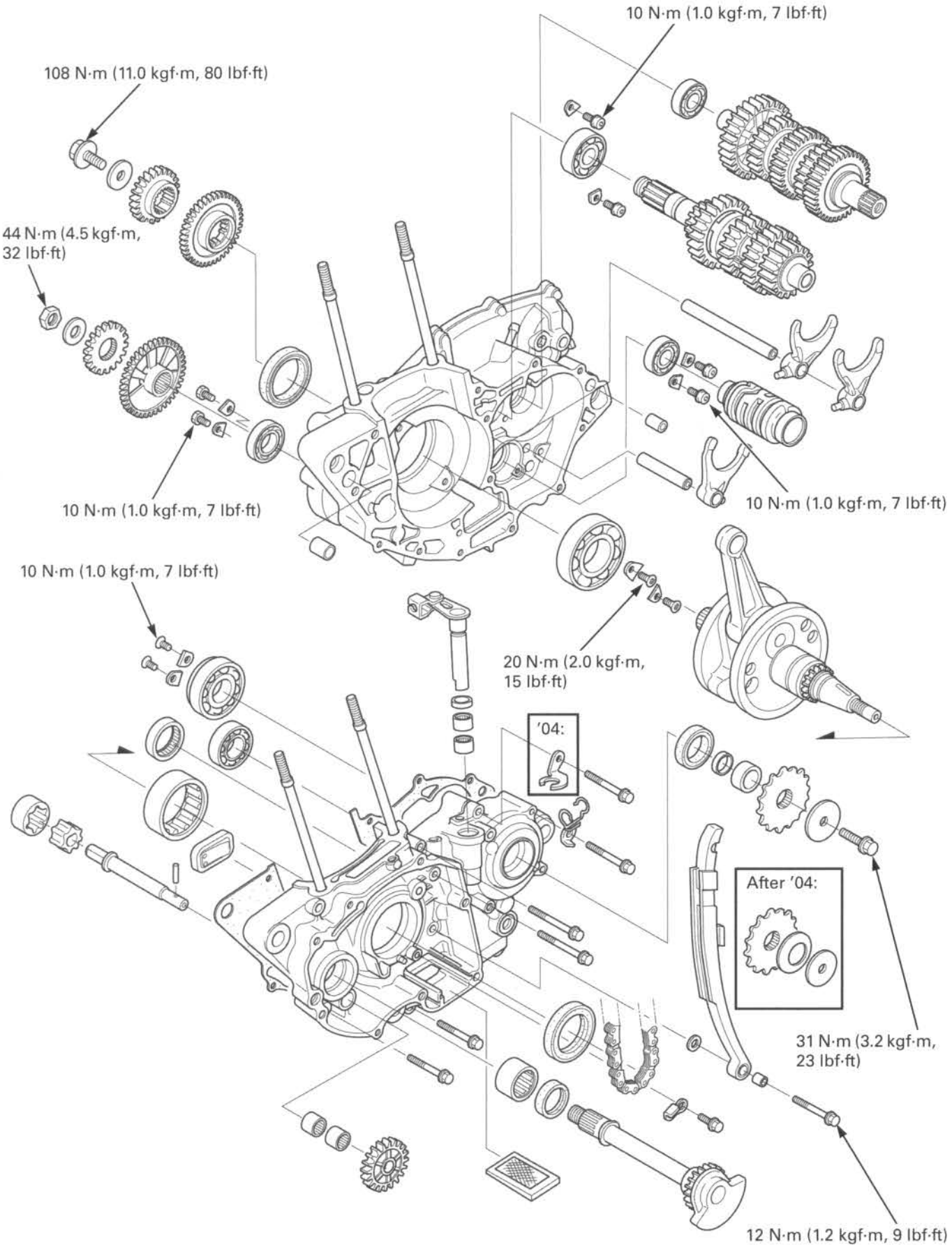
Move the gearshift pedal and check the shift mechanism for smooth operation.

Install the clutch (page 11-12).
Install the right crankcase cover (page 11-6).



12. 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 12-7)
  - Clutch (page 11-7)
  - Kickstarter (page 11-16)
  - Gearshift linkage (page 11-19)
  - Cylinder head (page 9-13)
  - Valve (page 9-16)
  - Cylinder (page 10-4)
  - Piston (page 10-4)
  - Engine (page 8-5)
  - Flywheel (page 16-11)
  - Oil pump drive gear/drive pin (page 5-7)

SPECIFICATIONS

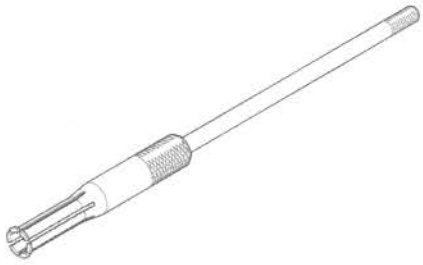
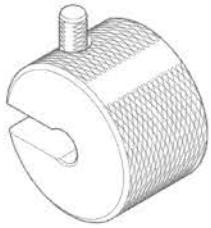
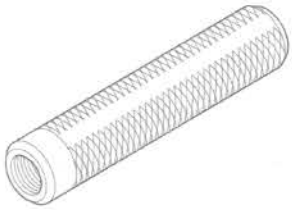
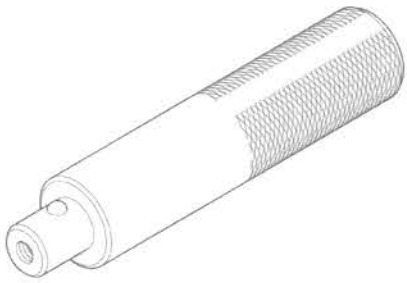
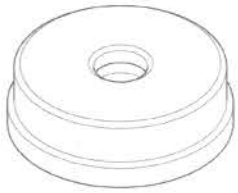
Unit: mm (in)

ITEM				STANDARD	SERVICE LIMIT
Crankshaft	Side clearance			0.30 – 0.75 (0.01 – 0.03)	0.8 (0.03)
	Radial clearance			0.006 – 0.018 (0.0002 – 0.0007)	0.05 (0.002)
	Runout	R		–	–
		L		–	0.05 (0.002)
Transmission	Gear I.D.	M4, M5		23.020 – 23.041 (0.9063 – 0.9071)	23.07 (0.908)
		C1		20.020 – 20.041 (0.7882 – 0.7890)	20.07 (0.790)
		C2		27.020 – 27.041 (1.0638 – 1.0646)	27.07 (1.066)
		C3		25.020 – 25.041 (0.9850 – 0.9859)	25.07 (0.987)
	Bushing O.D.	M4, M5		22.979 – 23.000 (0.9047 – 0.9055)	22.96 (0.904)
		C1		19.979 – 20.000 (0.7866 – 0.7874)	19.95 (0.785)
		C2		26.979 – 27.000 (1.0622 – 1.0630)	26.95 (1.061)
		C3		24.979 – 25.000 (0.9834 – 0.9843)	24.96 (0.983)
	Bushing I.D.	M5		20.000 – 20.021 (0.7874 – 0.7882)	20.04 (0.789)
		C1		17.000 – 17.018 (0.6693 – 0.6700)	17.04 (0.671)
		C2		24.000 – 24.021 (0.9449 – 0.9457)	24.04 (0.946)
		C3		22.000 – 22.021 (0.8661 – 0.8670)	22.04 (0.868)
	Gear-to-bushing clearance	M4, M5		0.020 – 0.062 (0.0008 – 0.0024)	0.12 (0.005)
		C1, C2, C3		0.020 – 0.062 (0.0008 – 0.0024)	0.12 (0.005)
	Mainshaft O.D.	M5 bushing		19.959 – 19.980 (0.7858 – 0.7866)	19.94 (0.785)
	Countershaft O.D.	C1 bushing	'04 - '06	16.983 – 16.994 (0.6686 – 0.6691)	16.97 (0.668)
			After '06	16.981 – 16.992 (0.6685 – 0.6690)	16.97 (0.668)
		C2 bushing		23.959 – 23.980 (0.9433 – 0.9441)	23.94 (0.943)
		C3 bushing		21.959 – 21.980 (0.8645 – 0.8654)	21.94 (0.864)
	Bushing-to-shaft clearance	M5		0.020 – 0.062 (0.0008 – 0.0024)	0.12 (0.005)
		C1	'04 - '06	0.006 – 0.035 (0.0002 – 0.0014)	0.07 (0.003)
			After '06	0.008 – 0.037 (0.0003 – 0.0015)	0.07 (0.003)
		C2, C3		0.020 – 0.062 (0.0008 – 0.0024)	0.12 (0.005)
Shift fork, shift fork shaft	Fork claw thickness			4.93 – 5.00 (0.194 – 0.197)	4.8 (0.19)
	Shift fork I.D.	C		11.003 – 11.024 (0.4332 – 0.4340)	11.04 (0.435)
		R, L		12.035 – 12.056 (0.4738 – 0.4746)	12.07 (0.475)
	Fork shaft O.D.	C		10.983 – 10.994 (0.4324 – 0.4328)	10.97 (0.432)
		R, L		11.966 – 11.984 (0.4711 – 0.4718)	11.95 (0.470)

TORQUE VALUES

Crankshaft bearing set plate torx screw	20 N·m (2.0 kgf·m, 15 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	10 N·m (1.0 kgf·m, 7 lbf·ft)	Apply locking agent to the threads
Gearshift drum bearing set plate bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	Apply locking agent to the threads
Mainshaft bearing set plate bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	Apply locking agent to the threads
Balancer shaft bearing set plate bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	Apply locking agent to the threads
Drive sprocket bolt	31 N·m (3.2 kgf·m, 23 lbf·ft)	UBS bolt
Primary drive gear bolt	108 N·m (11.0 kgf·m, 80 lbf·ft)	Apply oil to the threads
Balancer shaft nut	44 N·m (4.5 kgf·m, 32 lbf·ft)	Apply oil to the seating surface
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)	
Transmission oil drain bolt (After '06)	16 N·m (1.6 kgf·m, 12 lbf·ft)	
Crankcase orifice ('07 only)	2.0 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 set, 20 mm 07936-3710600 	Remover weight 07741-0010201  or 07936-371020A or 07936-3710200
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

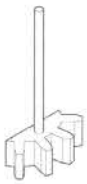
Pilot, 30 mm
07746-0040700

Pilot, 17 mm
07746-0040400

Pilot, 22 mm
07746-0041000

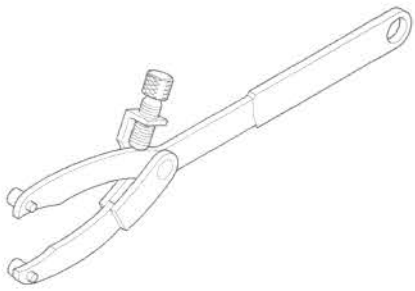
Pilot, 25 mm
07746-0040600

Gear holder, M2.5
07724-0010100



or 07724-001A100 (U.S.A. only)

Universal holder
07725-0030000



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

This service can be performed with the engine installed in the frame.

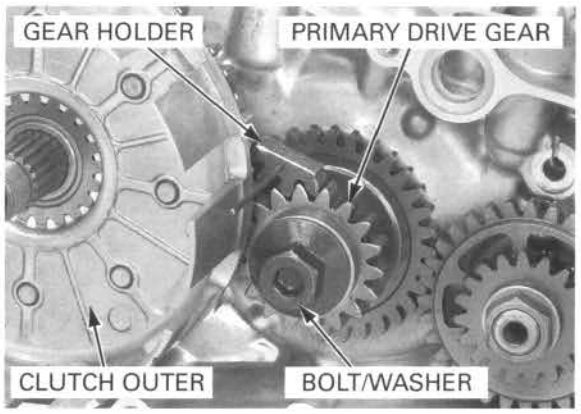
Remove the right crankcase cover (page 11-5).
Remove the clutch (page 11-7).
Remove the flywheel (page 16-11).

Temporarily install the clutch outer guide, needle bearing and clutch outer onto the mainshaft.

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

TOOL:

Gear holder, M2.5	**07724-0010100 or 07724-001A100 (U.S.A. only)**



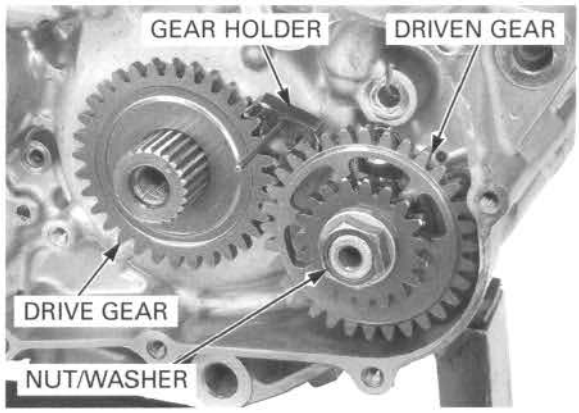
Remove the primary drive gear bolt, then remove the washer and drive gear.

Remove the gear holder, clutch outer, outer guide and needle bearing.

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

TOOL:

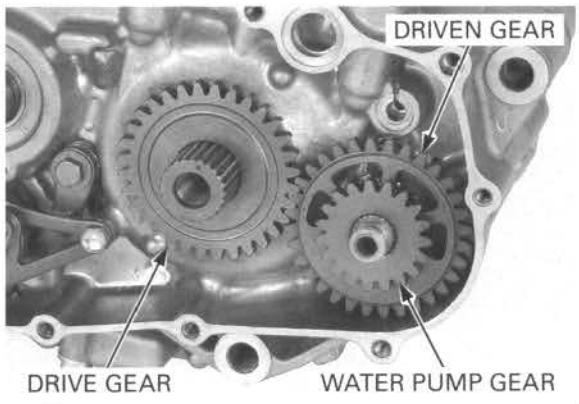
Gear holder, M2.5	**07724-0010100 or 07724-001A100 (U.S.A. only)**



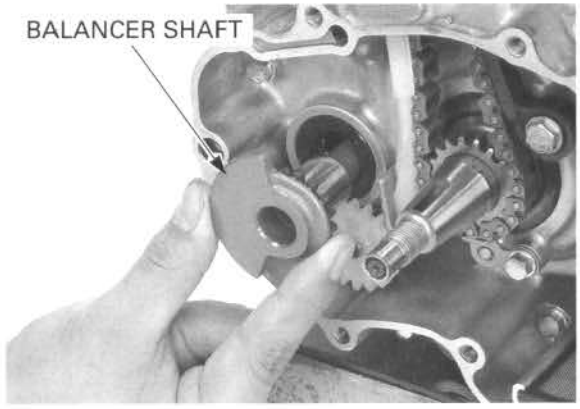
Remove the balancer shaft nut and washer.

Remove the gear holder.

Remove the water pump gear, balancer drive and driven gears.



Turn the balancer shaft as shown and remove it.



INSPECTION

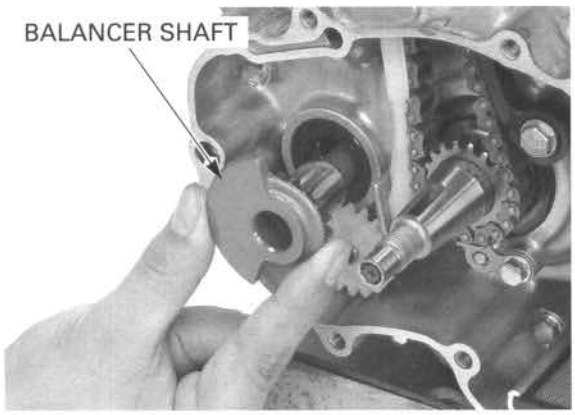
Check the balancer shaft for wear, damage or excessive scratches.
Check the balancer shaft gear for wear or damage.

Check the primary drive gear for wear or damage.
Check the balancer drive/driven gear for wear or damage.
Check the water pump drive gear for wear or damage.

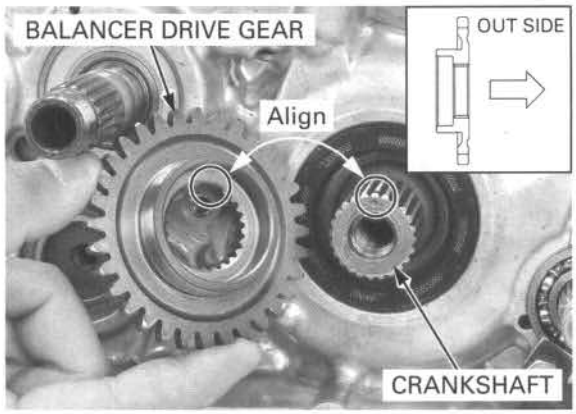
INSTALLATION

Engage the balancer shaft gear portion with oil pump driven gear.

Install the balancer shaft into the crankcase as shown.

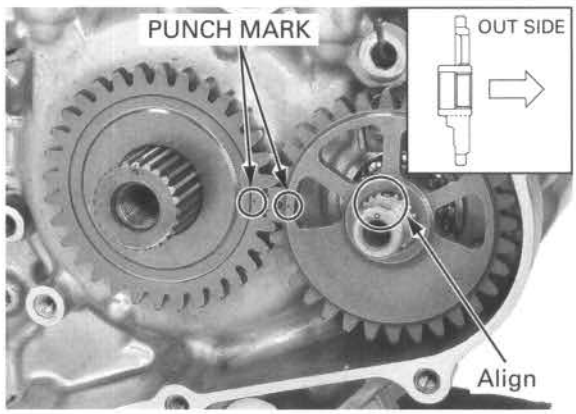


Install the balancer drive gear while aligning its wide cut-out in the splines with the punch mark on the crankshaft.

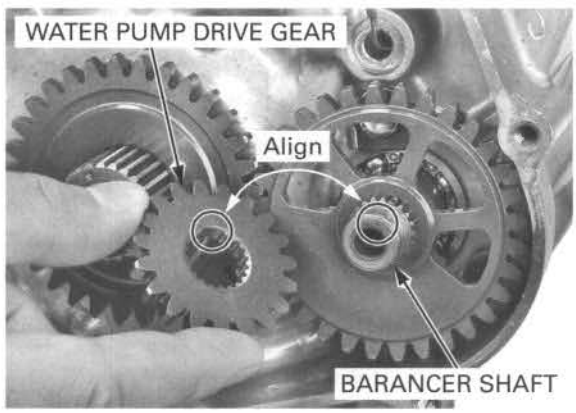


Install the driven gear into the balancer shaft while aligning its wide cut-out in the splines with the punch mark on the balancer shaft.

Align the punch mark of the driven gear with the punch mark of the drive gear.



Install the water pump drive gear while aligning its wide cut-out in the splines with the punch mark on the balancer shaft.



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

TOOL:

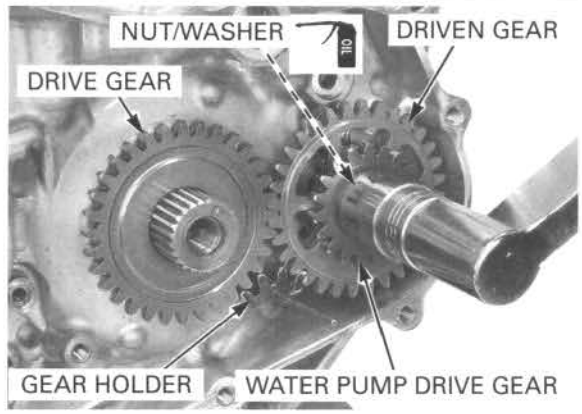
Gear holder, M2.5	**07724-0010100 or 07724-001A100 (U.S.A. only)**

Apply oil to the balancer shaft nut seating surface.

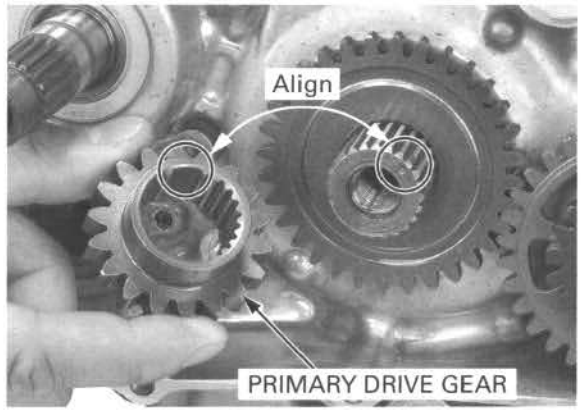
Install and tighten the balancer shaft nut to the specified torque.

TORQUE: 44 N·m (4.5 kgf·m, 32 lbf·ft)

Remove the gear holder.



Install the primary drive gear aligning its wide cut-out in the driver gear with the punch mark on the crankshaft.



Temporarily install the clutch outer guide, needle bearing and clutch outer onto the mainshaft.

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

TOOL:

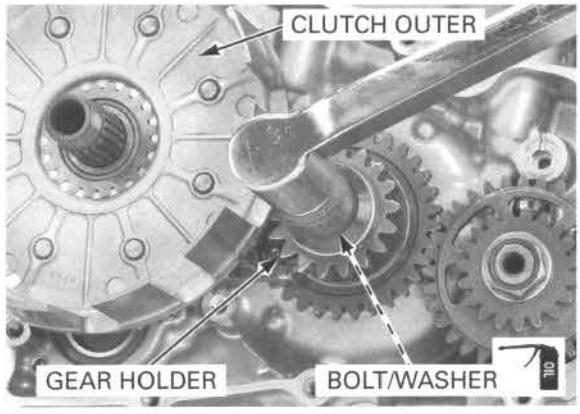
Gear holder, M2.5	**07724-0010100 or 07724-001A100 (U.S.A. only)**

Apply oil to the primary drive gear bolt threads.

Install the washer and bolt, and tighten the bolt to the specified torque.

TORQUE: 108 N·m (11.0 kgf·m, 80 lbf·ft)

Remove the gear holder.



Install the flywheel (page 16-12).
Install the clutch (page 11-12).
Install the right crankcase cover (page 11-6).

CRANKCASE SEPARATION

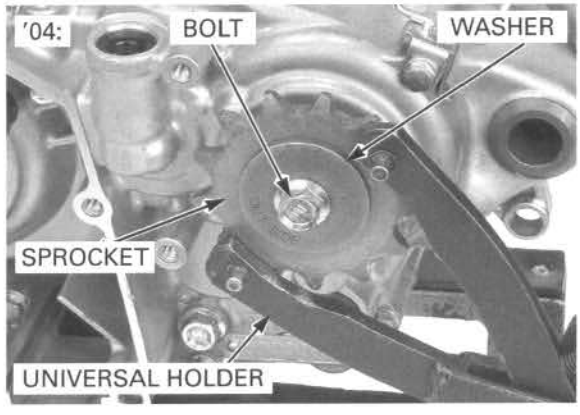
Refer to service information (page 12-3) for removal of necessary parts before separating the crankcase.

Loosen the drive sprocket bolt while holding the sprocket with the special tool as shown.

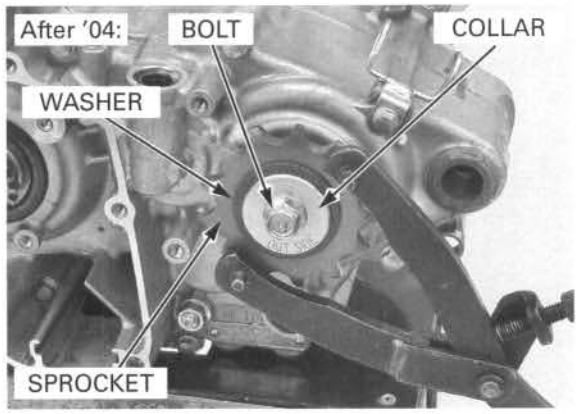
TOOL:

Universal holder	**07725-0030000**

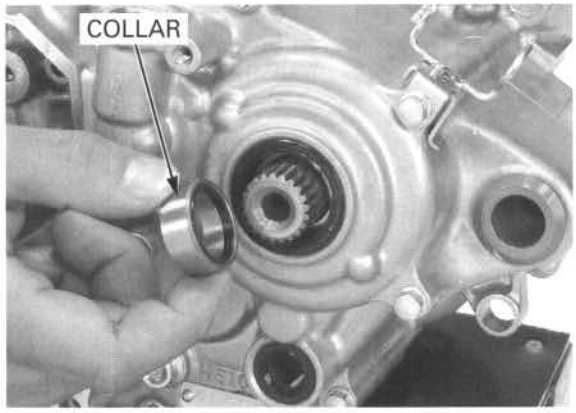
'04: Remove the bolt, washer and drive sprocket.



After '04: Remove the bolt, collar, washer and drive sprocket.

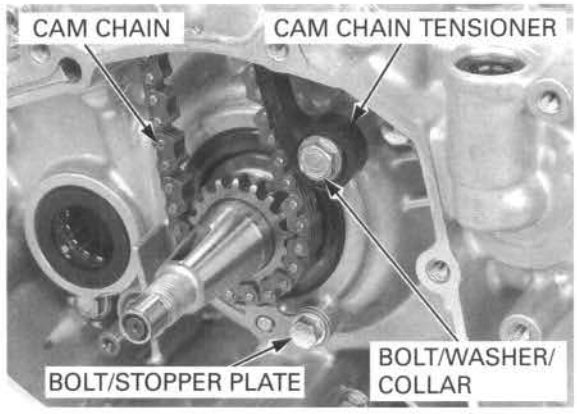


Remove the collar.

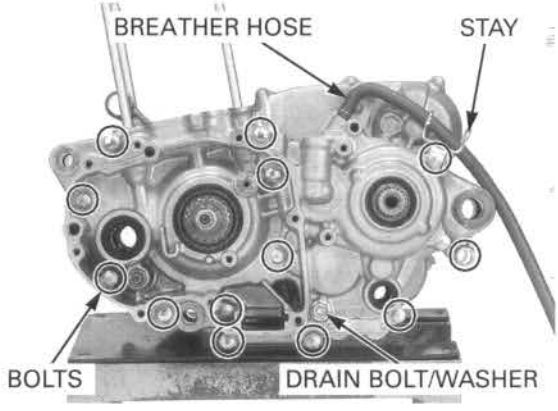


Remove the bolt, washer, collar and cam chain tensioner.

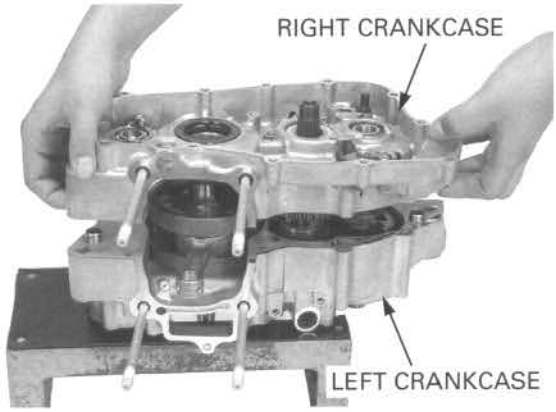
Remove the bolt and cam chain stopper plate.
Remove the cam chain from the crankshaft gear.



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.
Remove the transmission breather hose from the right crankcase.

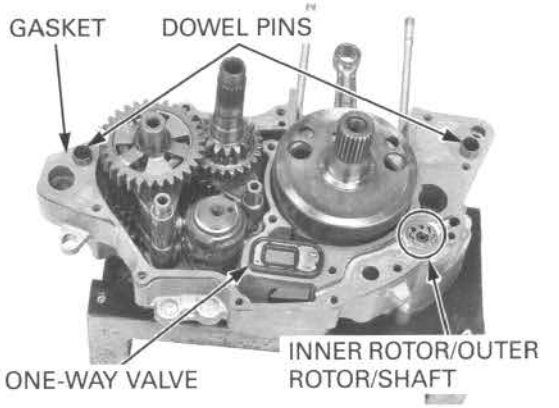


Place the left crankcase facing down and separate the left and right crankcase halves.



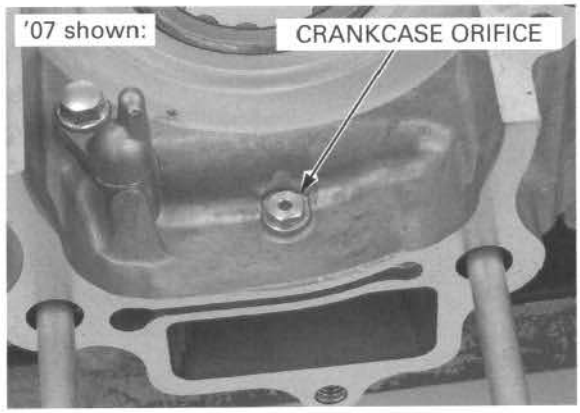
Remove the oil pump inner/outer rotors and shaft.
Remove the one-way valve.

Remove the dowel pins and gasket.

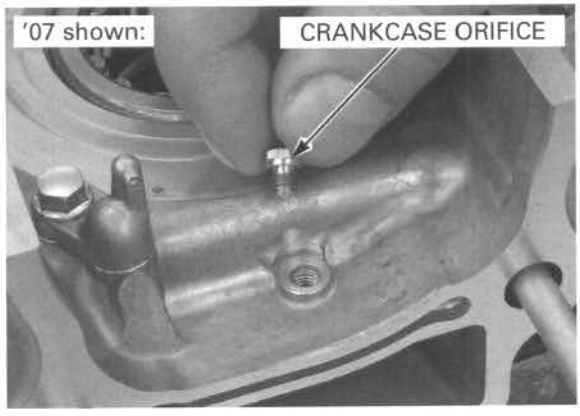


'07 model only: Do not remove the crankcase orifice unless it is necessary to replace with a new one.

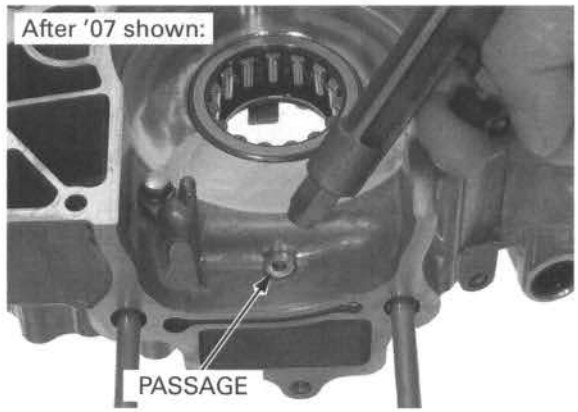
Remove the crankcase orifice from the left crankcase.



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



After '07: Check the passage in the left crankcase for clogging. Blow open the passage with compressed air.

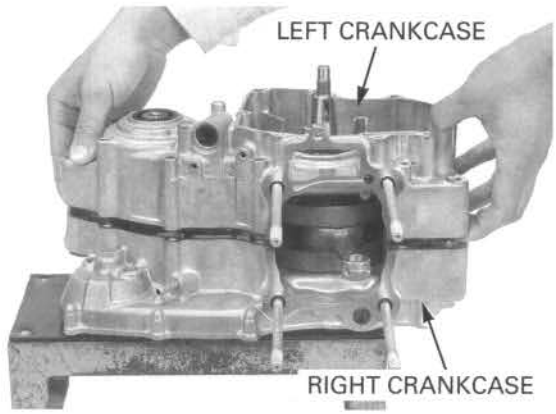


TRANSMISSION DISASSEMBLY

Separate the crankcase halves (page 12-9).

Temporarily install the right crankcase.

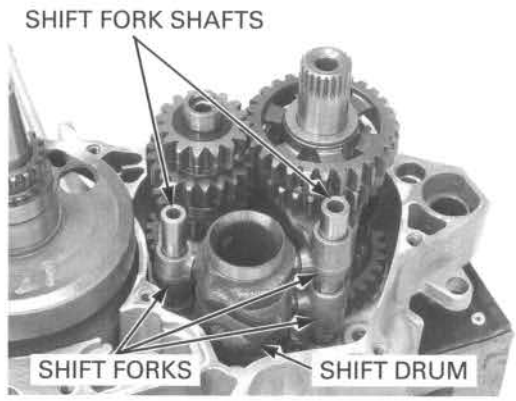
Place the right crankcase facing down and separate the right and left crankcase halves.



Remove the shift fork shafts.

Remove the shift fork guide pins from shift drum grooves and remove the shift drum.

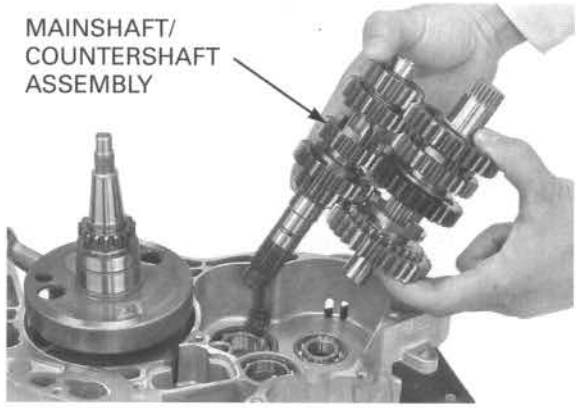
Remove the shift forks.



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.

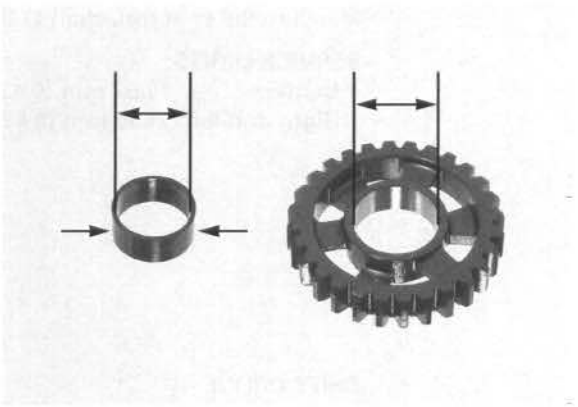


INSPECTION

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)

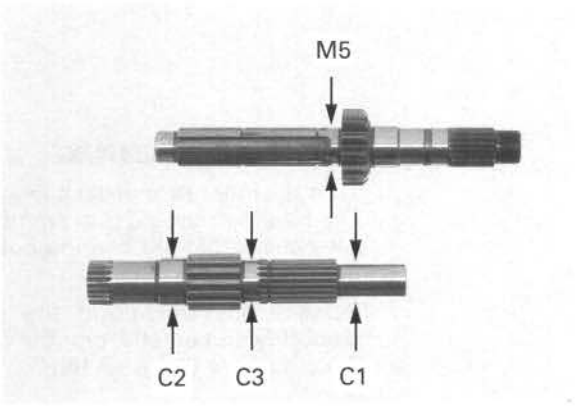
Measure the I.D. of each bushing.

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.

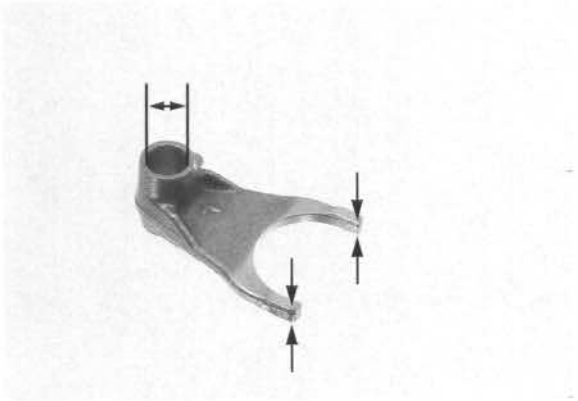
SERVICE LIMITS:
Mainshaft: M5 bushing: 19.94 mm (0.785 in)
Countershaft: C1 bushing: 16.97 mm (0.668 in)
C2 bushing: 23.94 mm (0.943 in)
C3 bushing: 21.94 mm (0.864 in)



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: 4.8 mm (0.19 in)

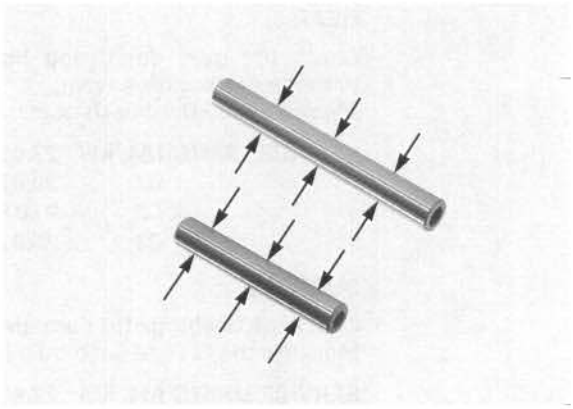


SHIFT FORK SHAFT

Check the shift fork shaft for abnormal wear or deformation.
Measure the shift fork shaft O.D.

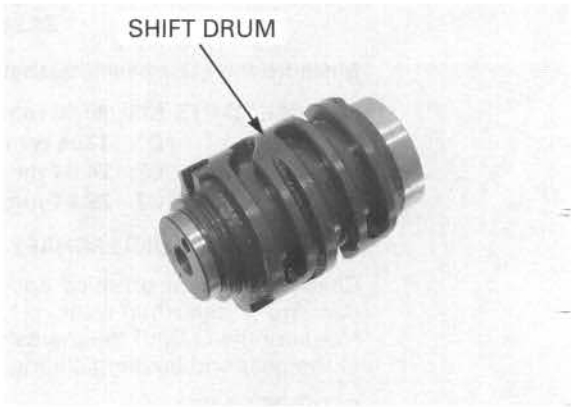
SERVICE LIMITS:

Center: 10.97 mm (0.432 in)
Right and left: 11.95 mm (0.470 in)



SHIFT DRUM

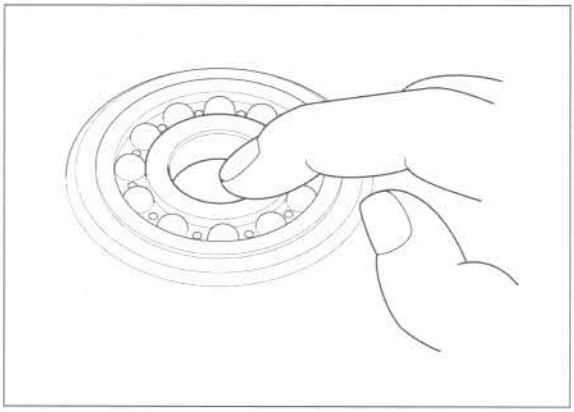
Inspect the shift drum for scoring, scratches or evidence of insufficient lubrication.
Check the shift drum grooves for abnormal wear or damage.



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 12-16).

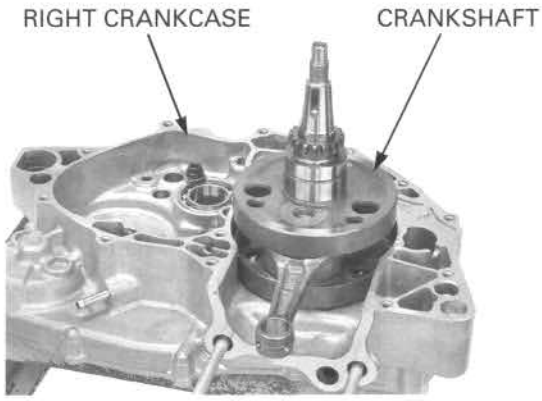


CRANKSHAFT REMOVAL

REMOVAL

Separate the crankcase (page 12-9).
Remove the transmission (page 12-12).

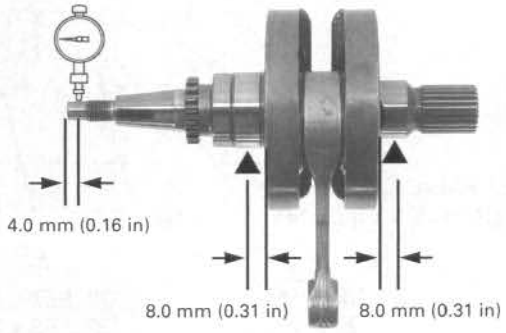
Remove the crankshaft from the right crankcase.



INSPECTION

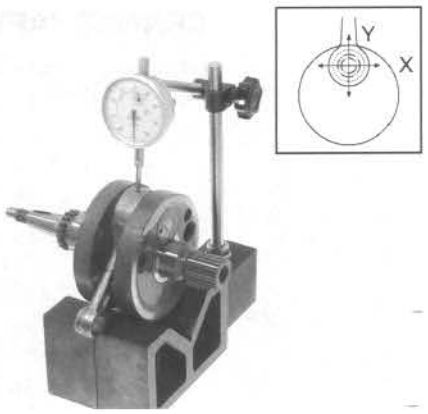
Place the crankshaft on a stand or V-blocks.
Set the dial indicator on the main journal.
Rotate the crankshaft two revolutions (720°) and read the runout.

SERVICE LIMITS: L: 0.05 mm (0.002 in)



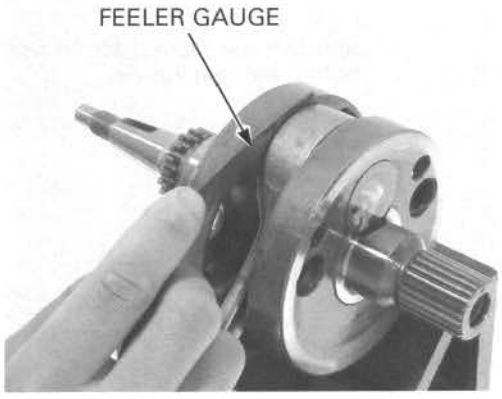
Measure the connecting rod big end radial clearance in both X and Y directions.

SERVICE LIMIT: 0.05 mm (0.002 in)



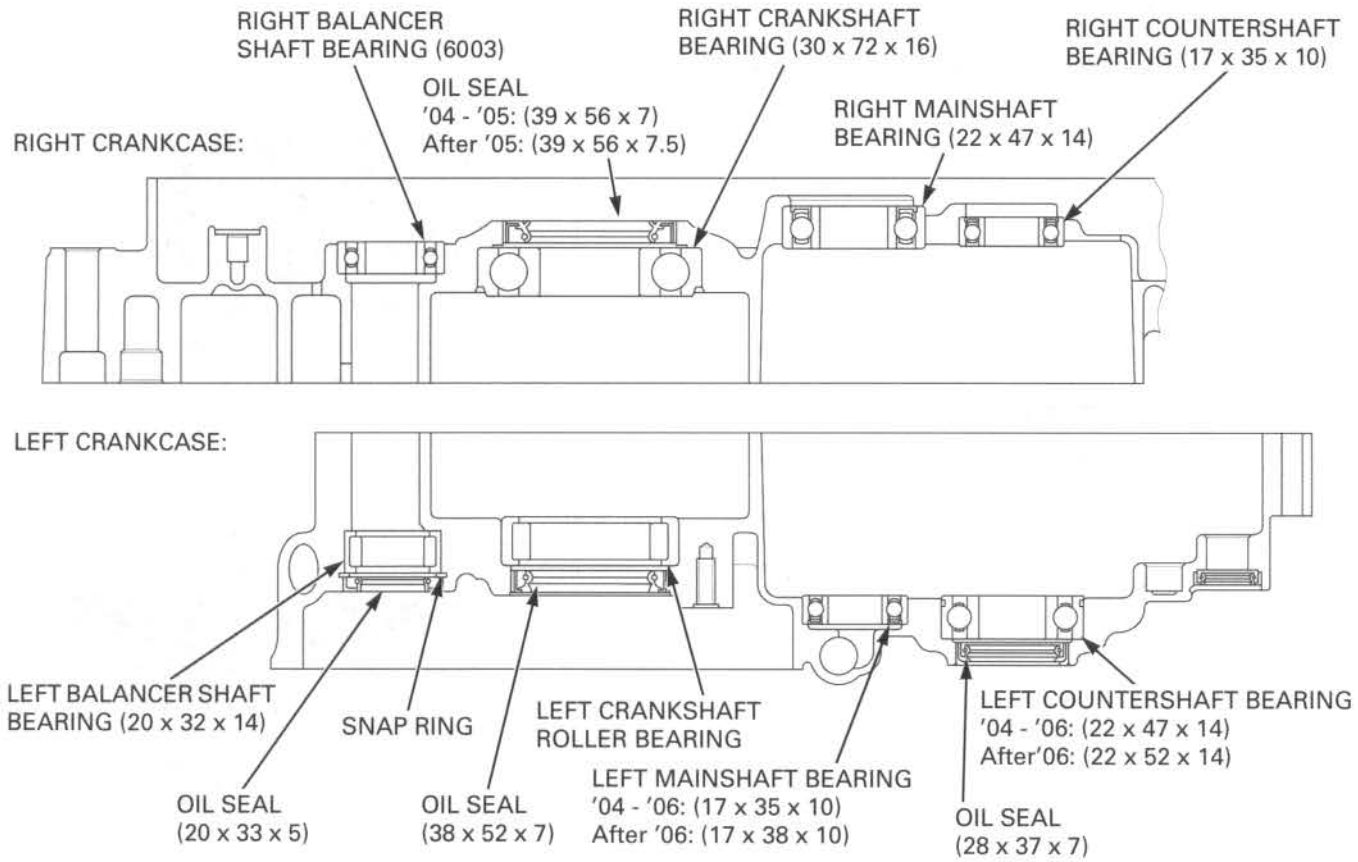
Measure the connecting rod big end side clearance.

SERVICE LIMIT: 0.8 mm (0.03 in)



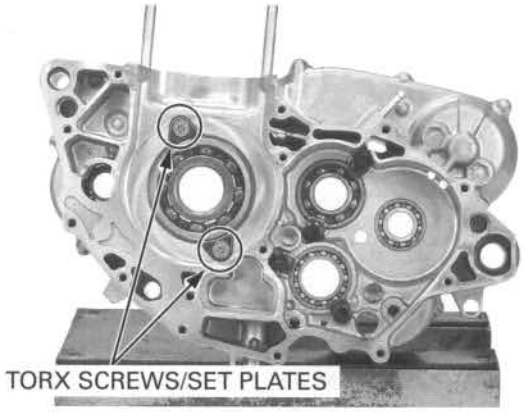
CRANKCASE BEARING REPLACEMENT

CRANKCASE BEARING/OIL SEAL LOCATION

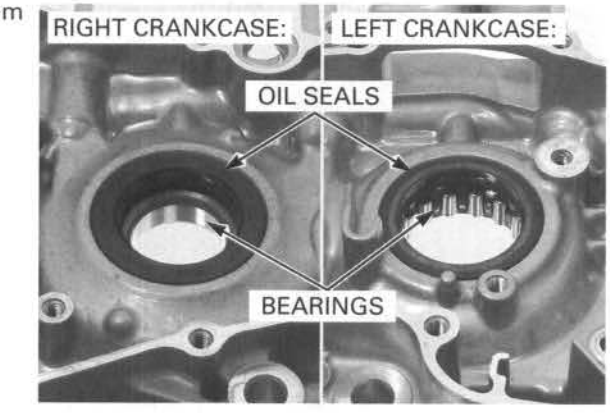


CRANKSHAFT BEARING

Remove the torx screws and right crankcase bearing set plates.



Remove the crankshaft oil seals and bearings from both crankcase halves.

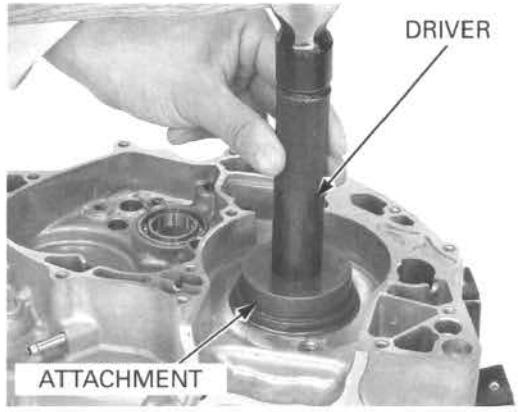


Drive in new bearings squarely with the marking side facing toward the inside of the crankcase.

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**



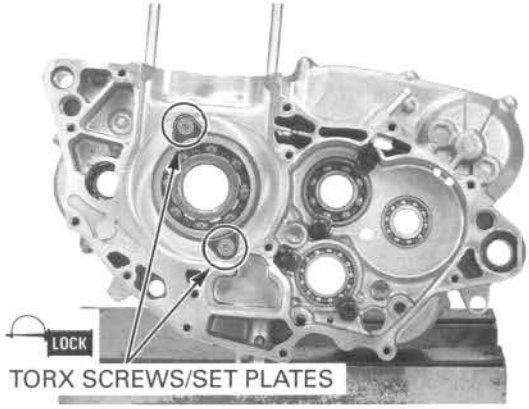
Clean and apply a locking agent to the set plate torx screws.

NOTE:

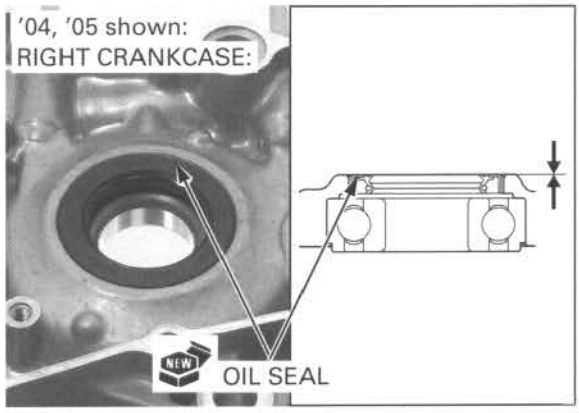
Use Pro Honda Hondalock 3 or equivalent high strength locking agent.

Install the torx screws with the set plates and tighten to the specified torque.

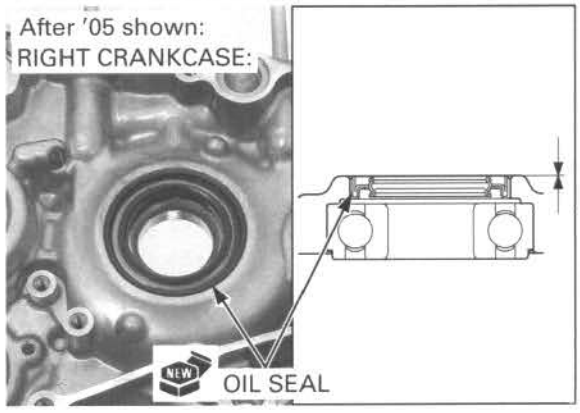
TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)



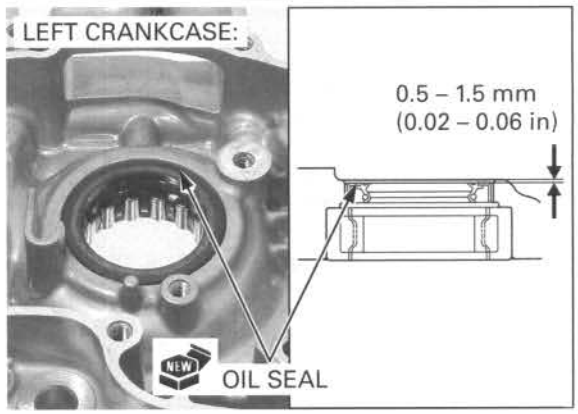
'04, '05: Install a new right crankshaft bearing oil seal with the marking side facing out side until it is flush with the crankcase surface as shown.



After '05: Install a new right crankshaft bearing oil seal until it is flush with the crankcase surface as shown.



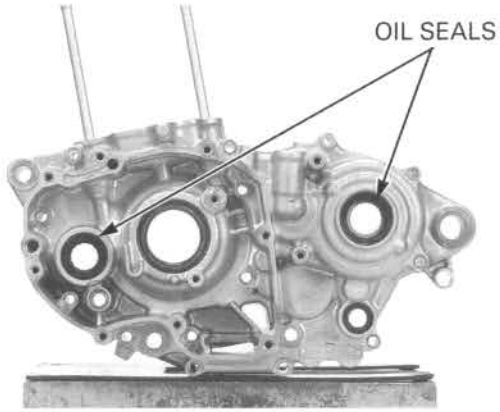
Install a new left crankshaft bearing oil seal to the specified depth below the crankcase surface as shown.



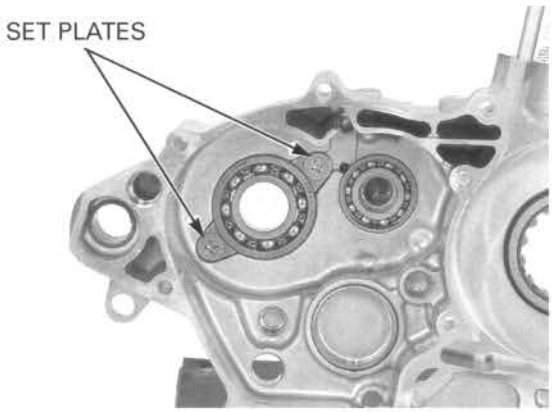
TRANSMISSION/BALANCER/SHIFT DRUM BEARINGS

LEFT CRANKCASE

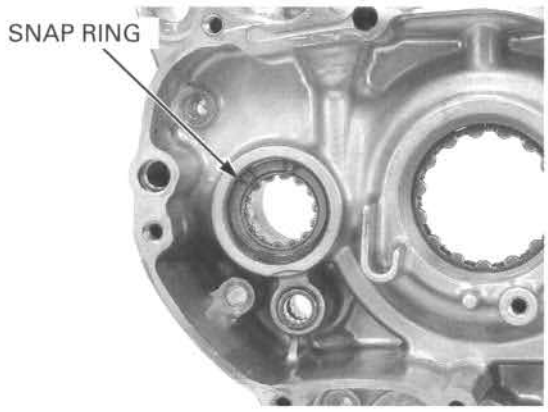
Remove the countershaft oil seal and balancer shaft oil seal.



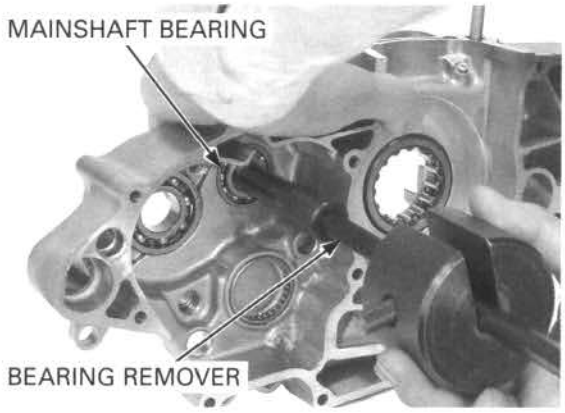
Remove the screws and countershaft bearing set plates.



Remove the snap ring from left crankcase.



Remove the mainshaft bearing, countershaft bearing and balancer shaft bearing using the special tools as shown.



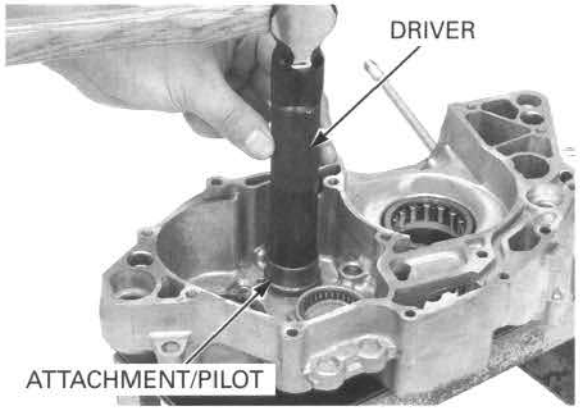
TOOLS:

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 set, 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 new bearings squarely with the marking side facing toward the inside of the crankcase.

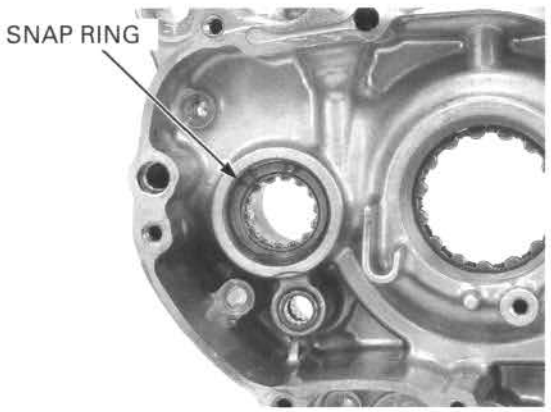
Drive new bearings into the left crankcase using the special tools.



TOOLS:

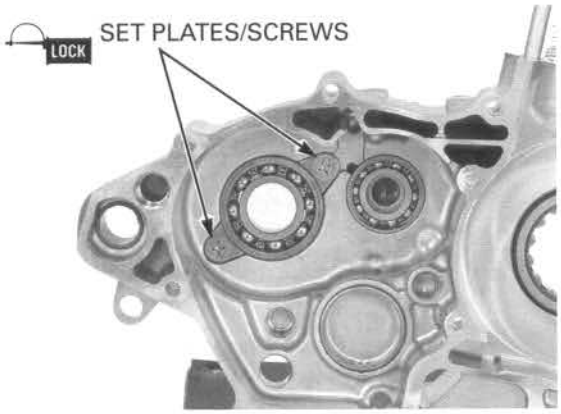
Countershaft bearing ('04 - '06):	
Driver	**07749-0010000**
Attachment, 42 x 47 mm	**07746-0010300**
Pilot, 22 mm	**07746-0041000**
Countershaft bearing (After '06):	
Driver	**07749-0010000**
Attachment, 52 x 55 mm	**07746-0010400**
Pilot, 22 mm	**07746-0041000**
Mainshaft bearing ('04 - '06):	
Driver	**07749-0010000**
Attachment, 32 x 35 mm	**07746-0010100**
Pilot, 17 mm	**07746-0040400**
Mainshaft bearing (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**

Install the snap ring into the left crankcase securely.

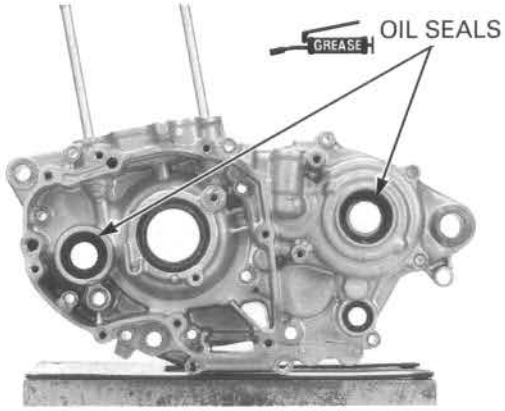


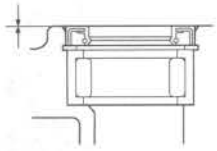
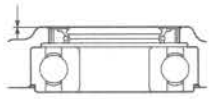
Clean and apply a locking agent to the countershaft bearing set plate screws.
Install the screws with the set plates and tighten the screws to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



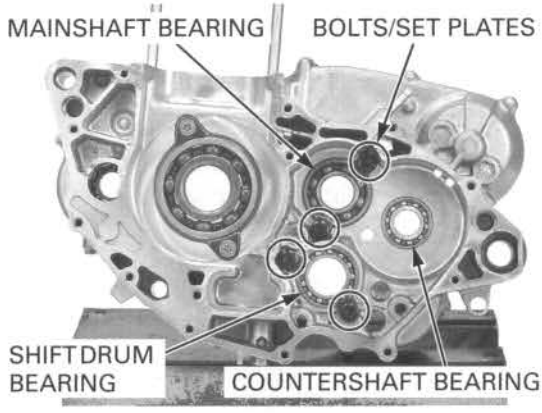
Apply grease to the countershaft oil seal lip and balancer shaft oil seal lips.
Install the oil seals to the crankcase until it is flush with the crankcase surface.



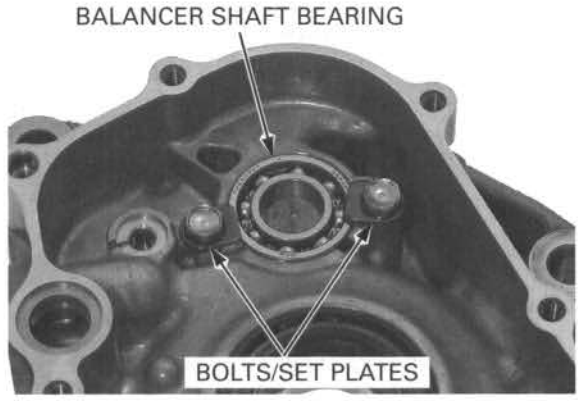
BALANCER SHAFT OIL SEAL:	COUNTERSHAFT OIL SEAL:
	

RIGHT CRANKCASE

Remove the socket bolts and set plates.
Remove the countershaft bearing, mainshaft bearing and shift drum bearing.



Remove the bolts and set plates.
Remove the balancer shaft bearing.

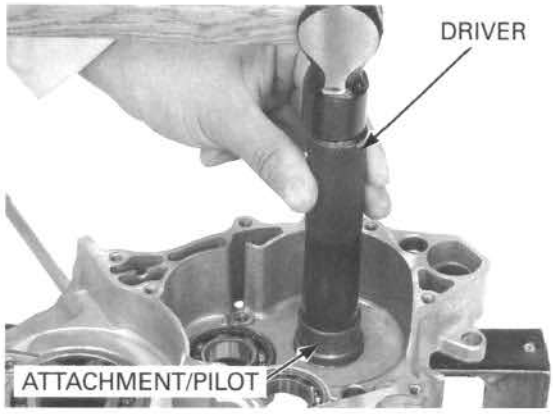


Drive in new bearings squarely with the marked side facing toward the inside of the crankcase.

Drive in new bearings into the right crankcase using the special tools.

TOOLS:

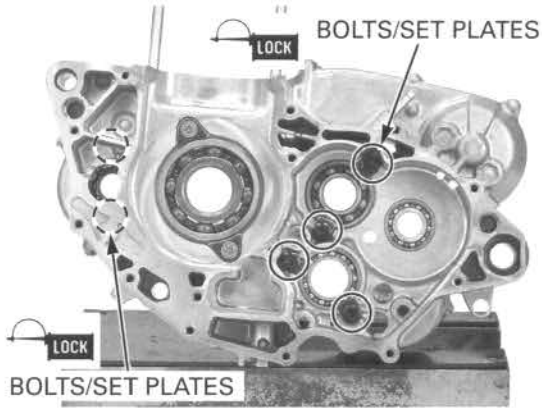
Shift drum bearing:	
Driver	**07749-0010000**
Attachment, 42 x 47 mm	**07746-0010300**
Pilot, 25 mm	**07746-0040600**
Mainshaft bearing:	
Driver	**07749-0010000**
Attachment, 42 x 47 mm	**07746-0010300**
Pilot, 22 mm	**07746-0041000**
Countershaft bearing:	
Driver	**07749-0010000**
Attachment, 32 x 35 mm	**07746-0010100**
Pilot, 17 mm	**07746-0040400**
Balancer shaft bearing:	
Driver	**07749-0010000**
Attachment, 32 x 35 mm	**07746-0010100**
Pilot, 17 mm	**07746-0040400**



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:

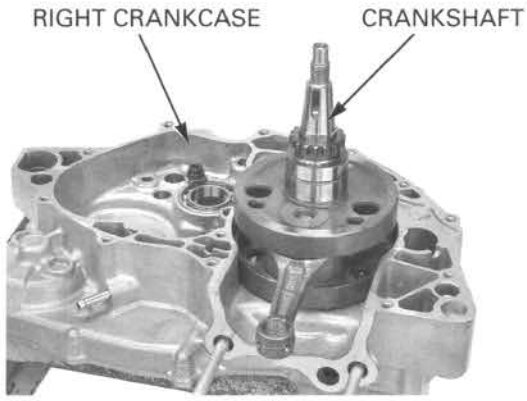
Shift drum bearing set plate bolt:
10 N·m (1.0 kgf·m, 7 lbf·ft)
Mainshaft bearing set plate bolt:
10 N·m (1.0 kgf·m, 7 lbf·ft)
Balancer shaft bearing set plate bolt:
10 N·m (1.0 kgf·m, 7 lbf·ft)



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 molybdenum oil solution.

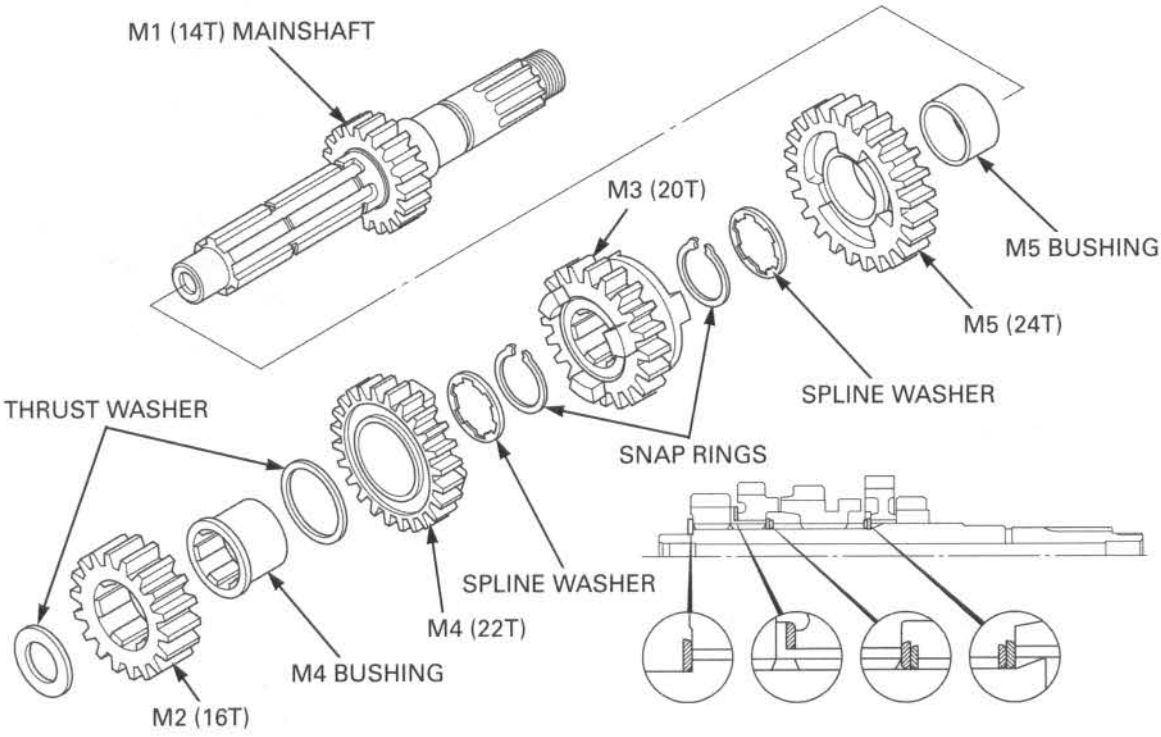
Install the crankshaft into the right crankcase.



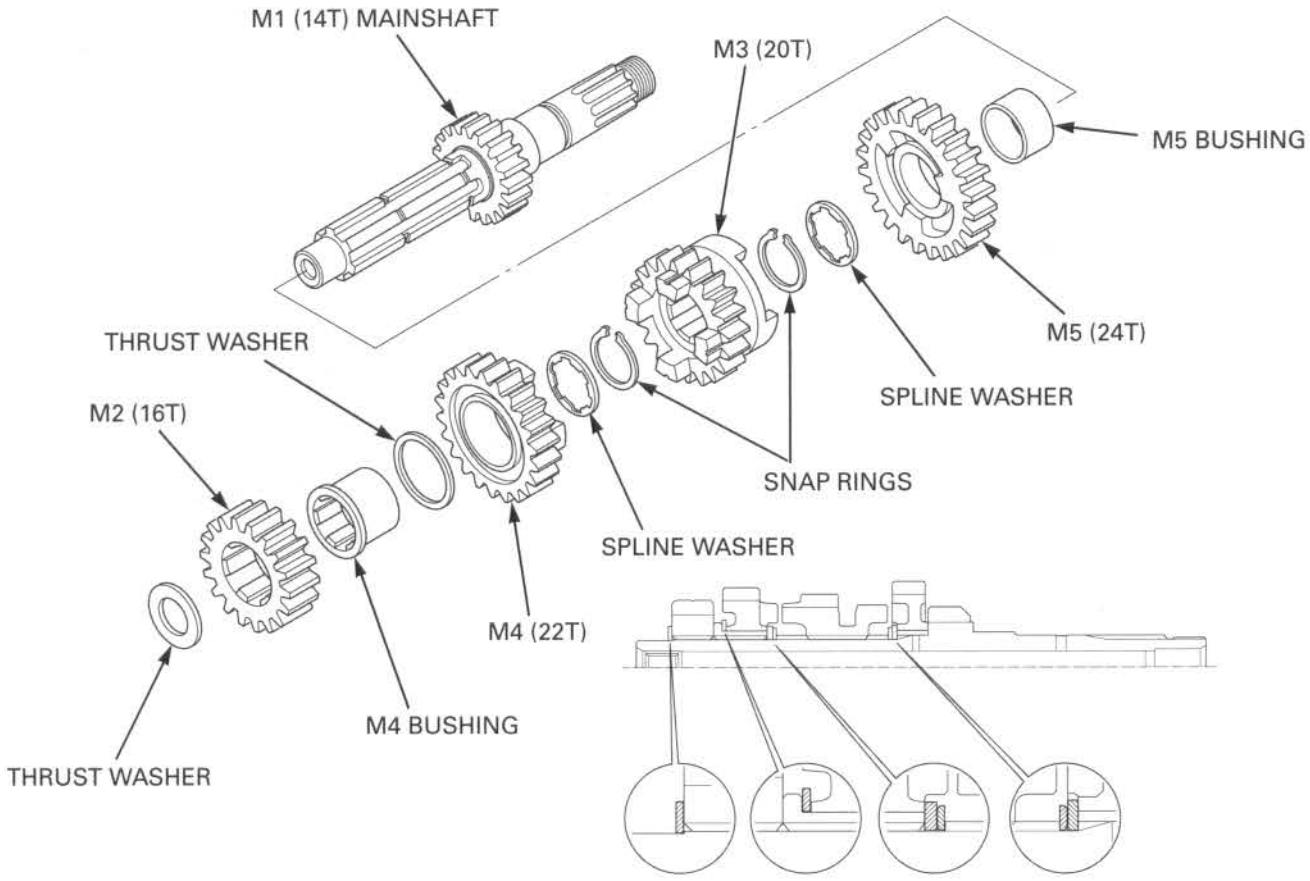
TRANSMISSION ASSEMBLY

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.

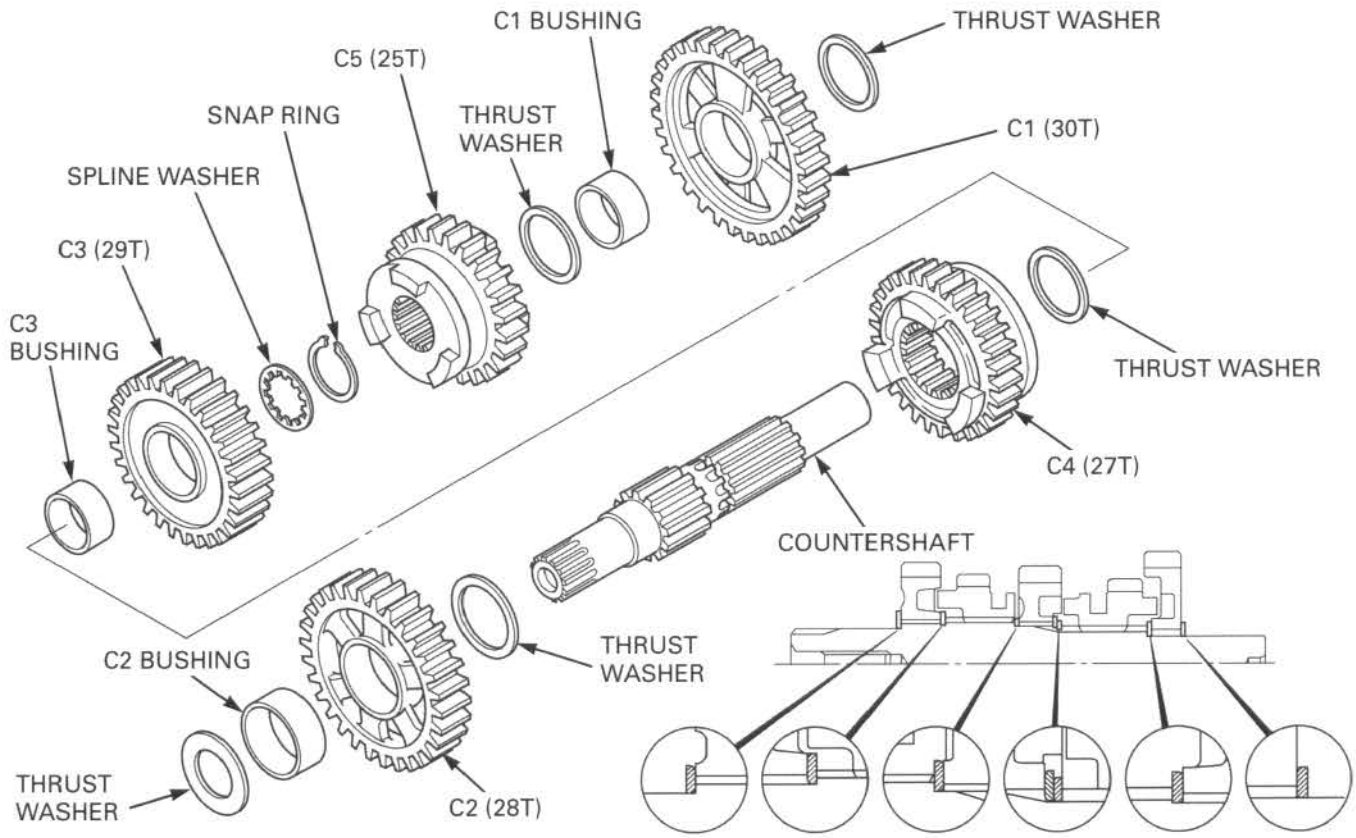
MAINSHAFT ('04 – '08):



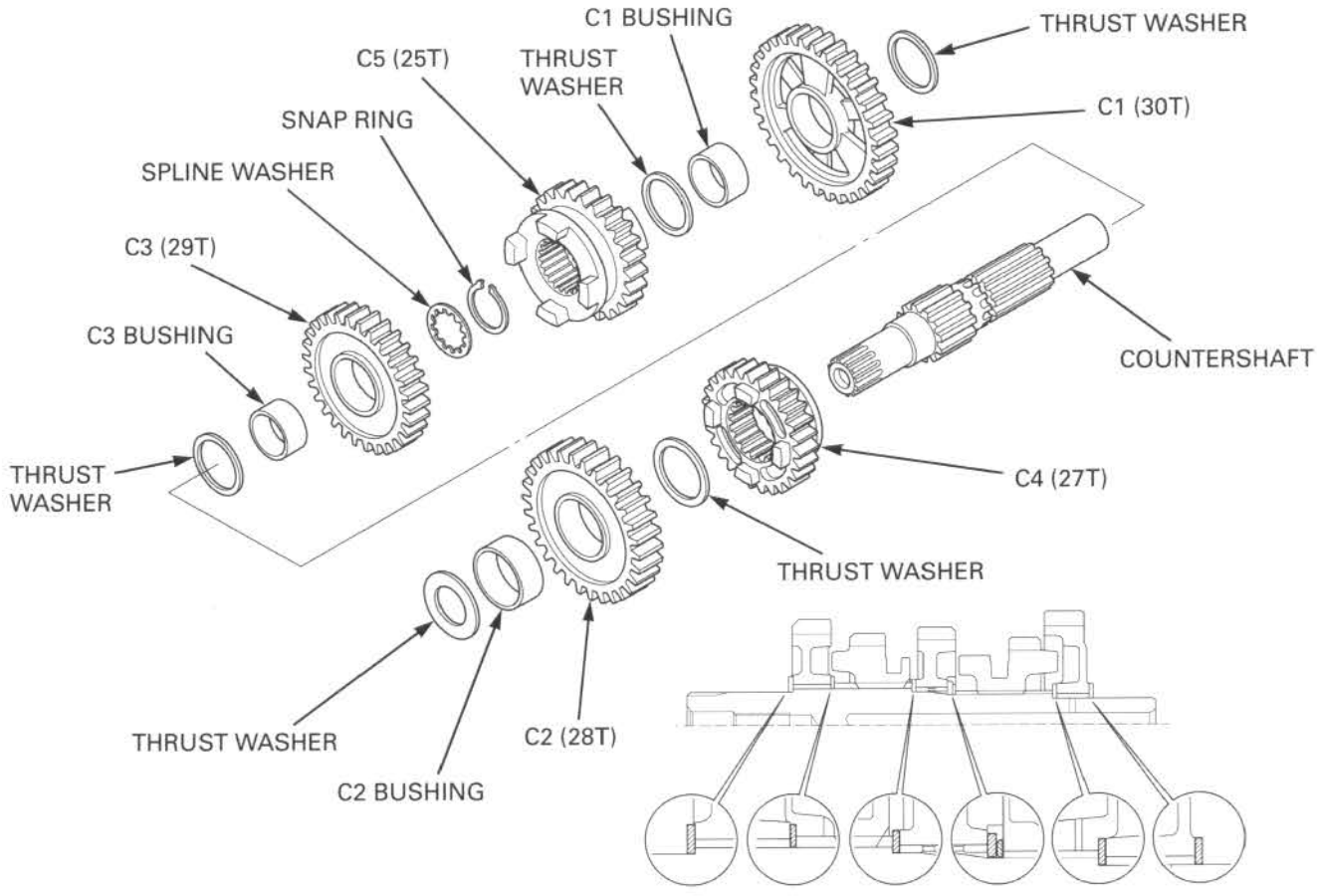
MAINSHAFT (After '08):



COUNTERSHAFT ('04 – '08):

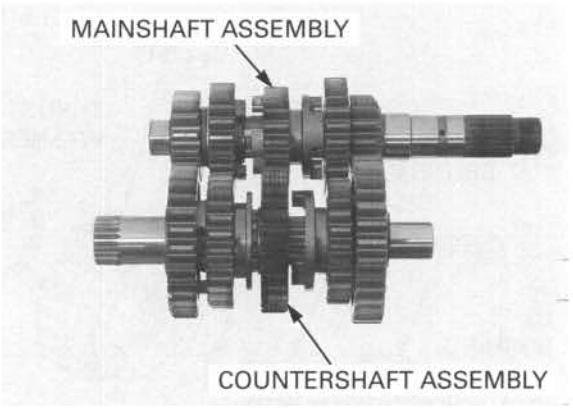


COUNTERSHAFT (After '08):



INSTALLATION

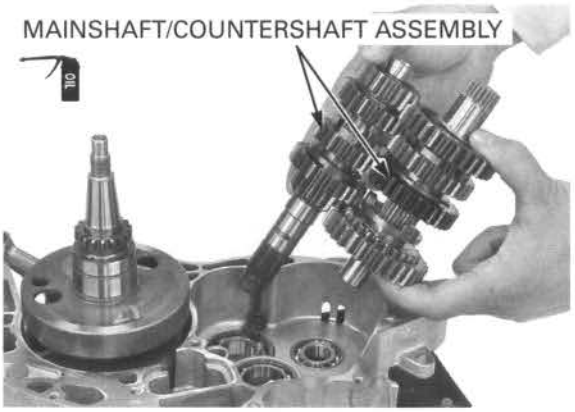
- Check the gear movement and rotation on the shaft.
- Install the washers and snap rings with the chamfered edge facing the thrust load side.
- Do not reuse worn snap rings which could easily spin in the grooves.
- Check that the snap rings are seated in the grooves. Align their end gaps with the grooves in the spline.



Apply transmission oil to the following parts:

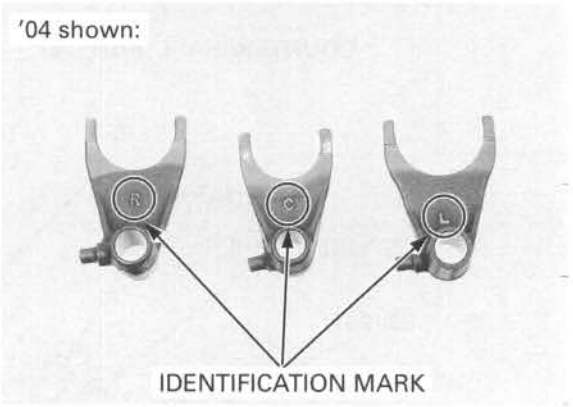
- Mainshaft
- Countershaft
- Each gear
- Mainshaft bearing
- Countershaft bearing
- Shift drum bearing

Engage the mainshaft and countershaft gears and place the transmission assembly into the right crankcase.



'04:
- 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.

After '04:
- Each shift fork has an identification mark, "RNR" is for the right shift fork, "RNL" is the left shift fork and "RNC" is for the center shift fork.
- Face the shift fork marks as follows:
  - Right and left fork marks to the left crankcase
  - Center fork mark to the right crankcase



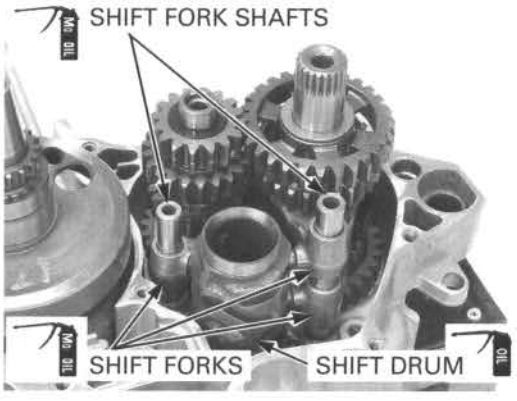
Apply transmission oil to the shift drum guide grooves.

Apply molybdenum oil solution to the following parts:

- Shift fork claws and guide pins
- Shift fork sliding surfaces
- Shift fork shaft

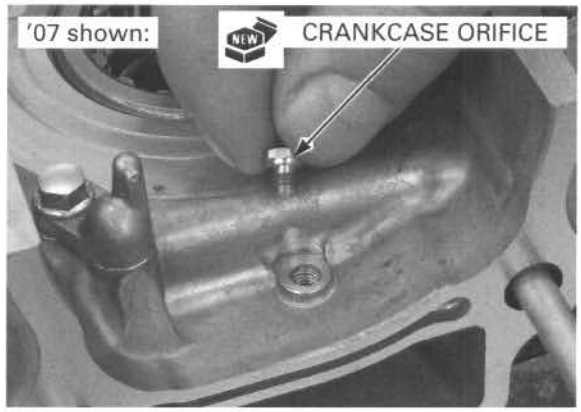
Install the shift forks to the grooves in the sliding gears.
Install the shift drum by aligning the guide pins on the shift forks with the guide grooves in the shift drum.

Slide the shift fork shafts through the shift forks, and into the crankcase.



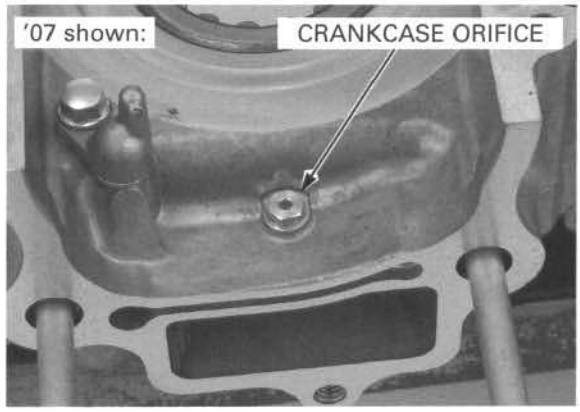
CRANKCASE ASSEMBLY

'07: If the crankcase orifice was removed, install a new crankcase orifice to the left crankcase.

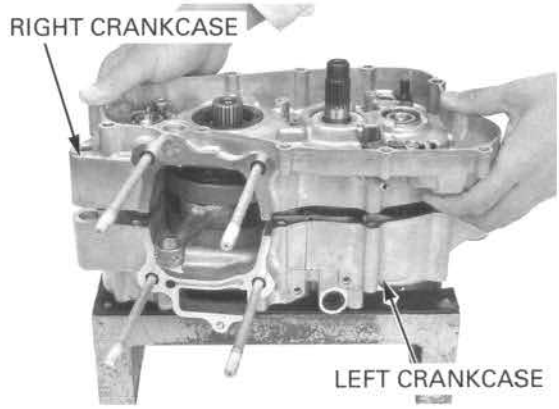


'07: Tighten the crankcase orifice securely.

TORQUE: 2.0 N·m (0.2 kgf·m, 1.5 lbf·ft)

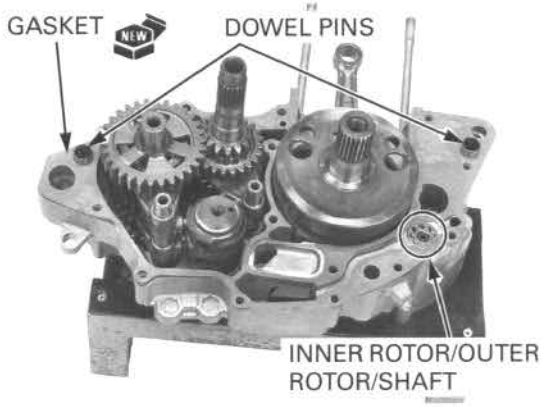


Temporarily install the left crankcase.
Place the left crankcase facing down and separate the left and right crankcase halves.

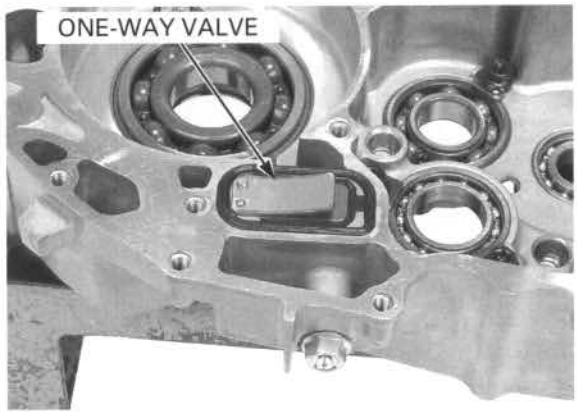


Install the oil pump inner/outer rotor and shaft in the left crankcase.

Install the dowel pins and a new gasket.

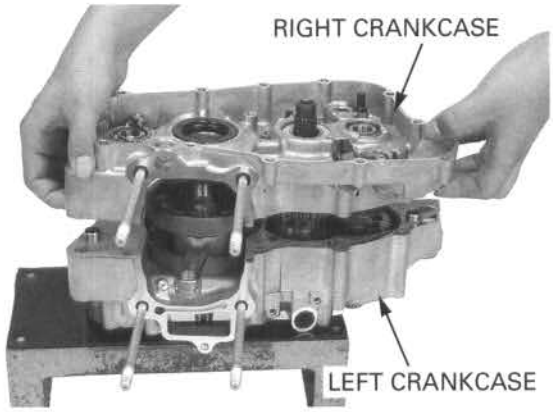


Install the one-way valve to the right crankcase cover.



Before assembly, lubricate the transmission bearings with clean transmission oil.

Place the right crankcase onto the left crankcase.



Tighten the crankcase bolts in a crisscross pattern in two or three progressive steps.

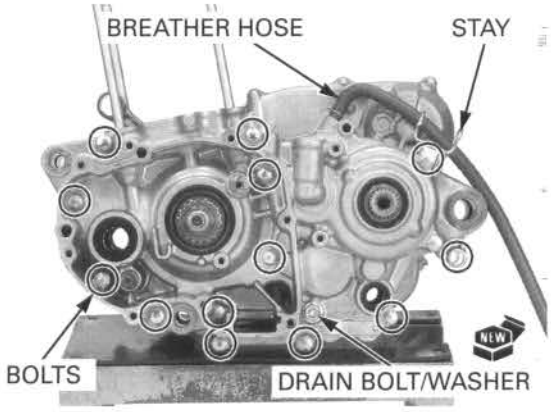
Install a new washer and tighten the drain bolt to the specified torque.

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)

Install the crankcase breather hose onto the left crankcase.

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.



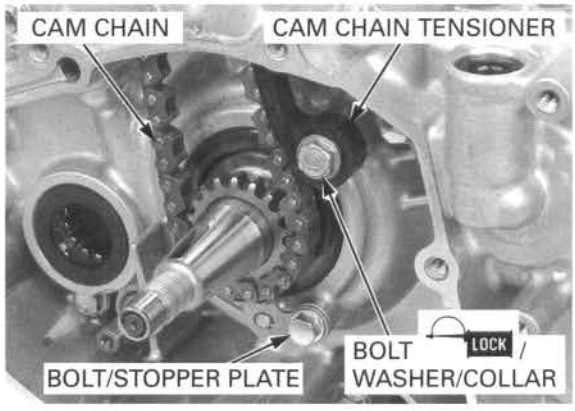
Check that the crankshaft turns smoothly.

Install the cam chain to the crankshaft.
Install the cam chain stopper plate and bolt.

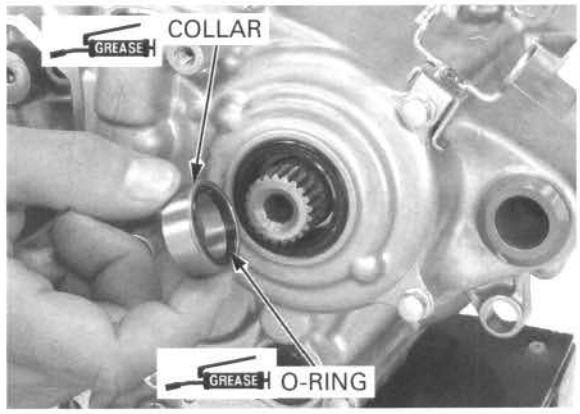
Clean and apply locking agent to the cam chain tensioner bolt.
Install the cam chain tensioner, collar, washer and bolt.

Tighten the cam chain tensioner bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

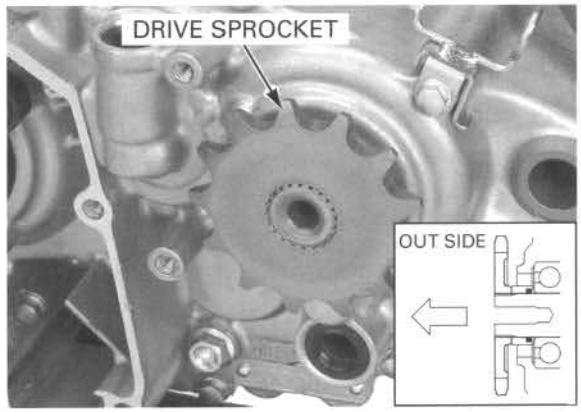


Coat the countershaft O-ring and the inside of the countershaft collar with grease.
Install the O-ring and collar onto the countershaft.



Install the drive sprocket with its flat side facing out.

Install the drive sprocket onto the countershaft.



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

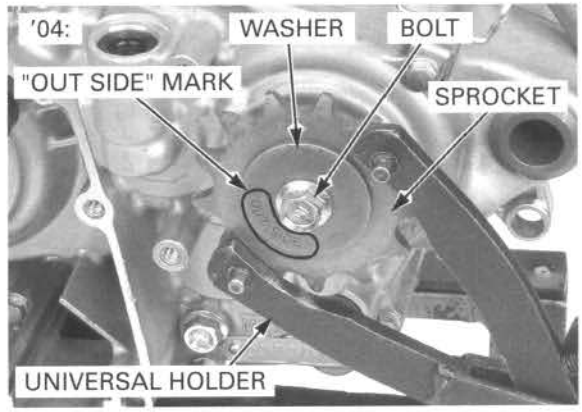
After '04: Install the collar with the "OUT SIDE" mark facing out.

Hold the drive sprocket using the special tool.

TOOL:
Universal holder **07725-0030000**

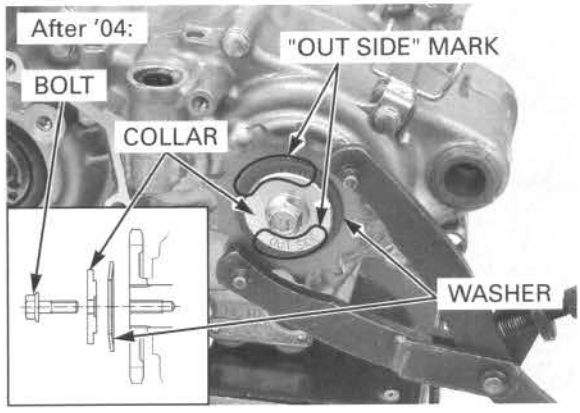
Tighten the sprocket bolt to the specified torque.

TORQUE: 31 N·m (3.2 kgf·m, 23 lbf·ft)



Install the remaining parts in the reverse order of removal.

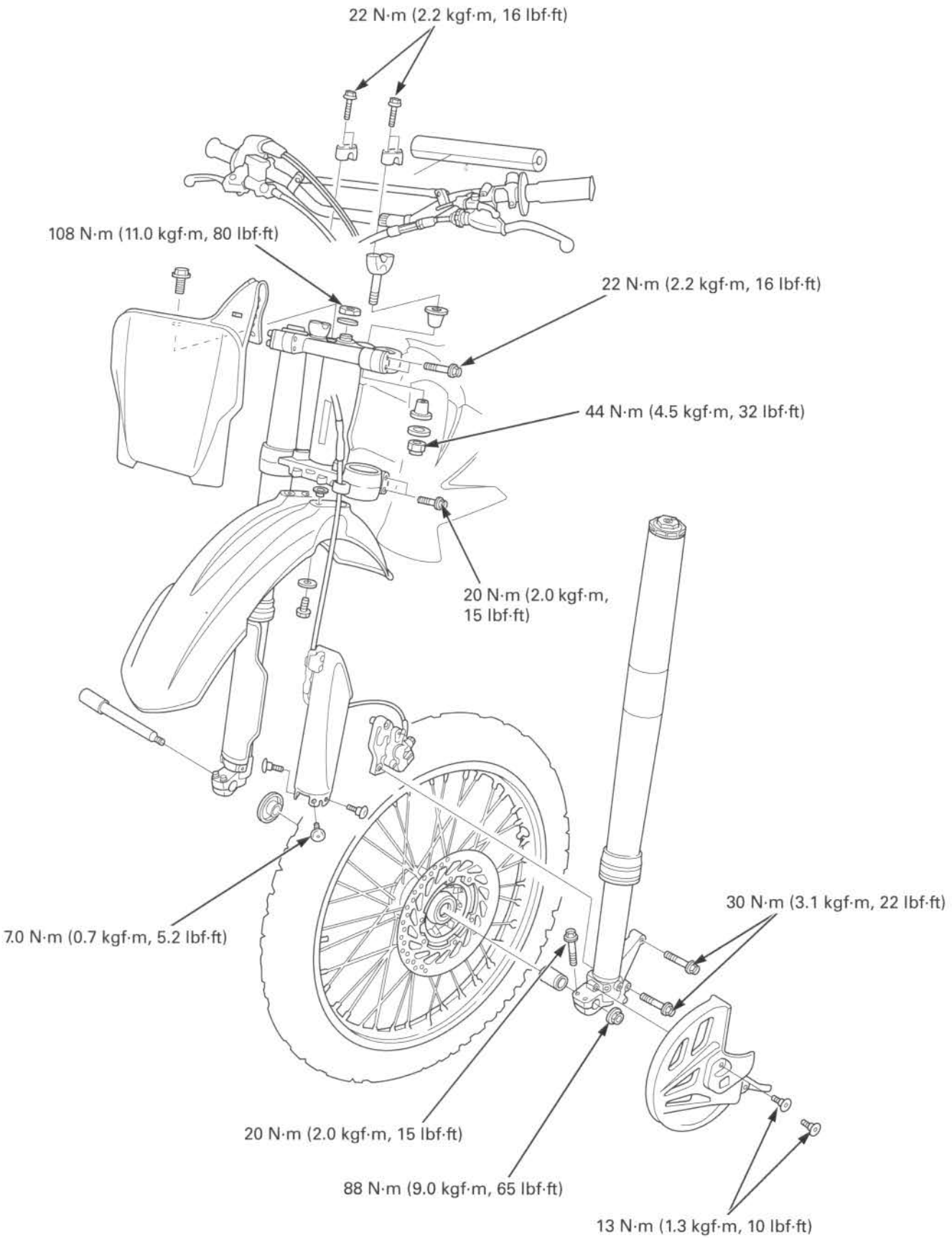
- Installation of the removed parts for crankcase/transmission service (page 12-3).



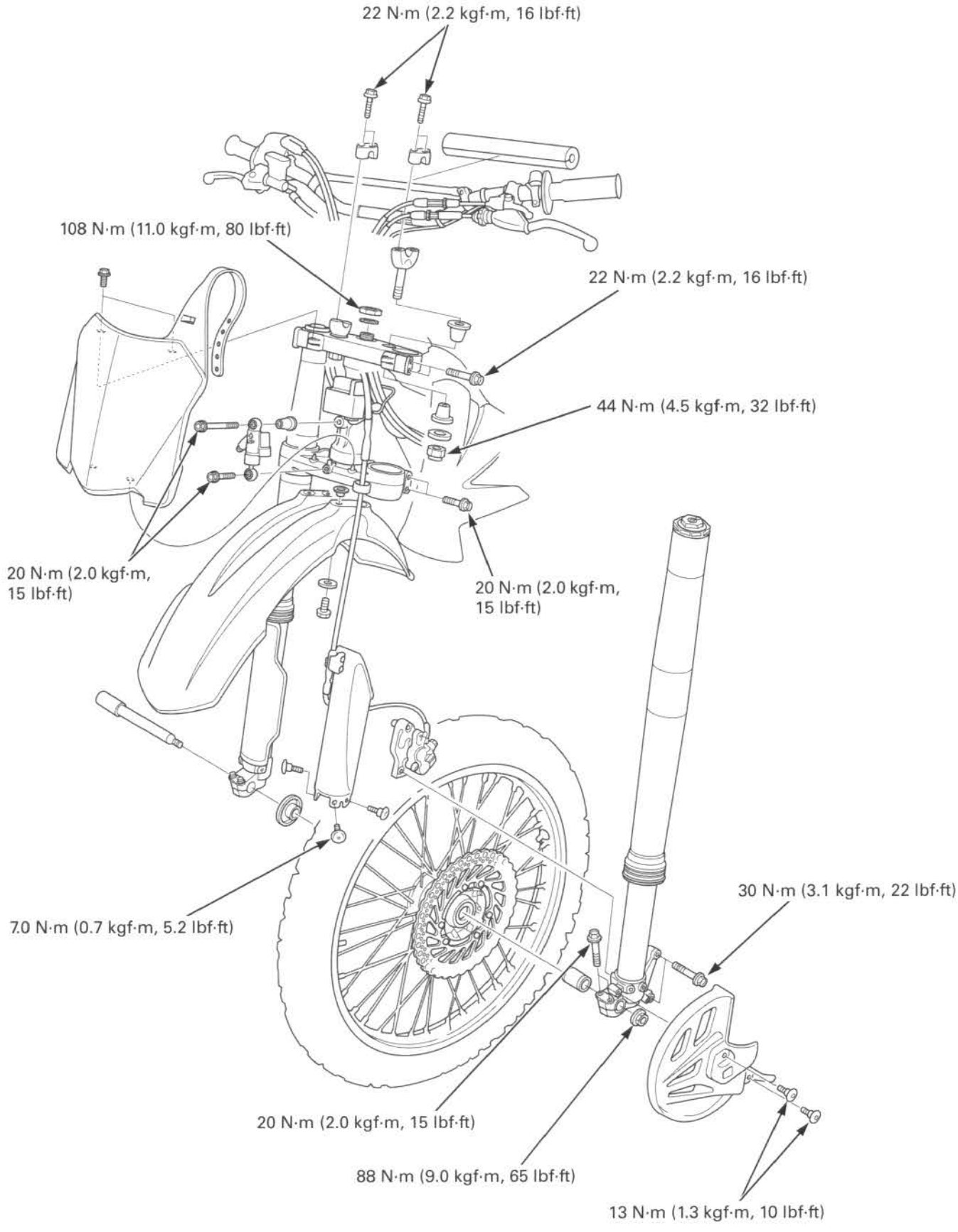
13. FRONT WHEEL/SUSPENSION/STEERING

COMPONENT LOCATION

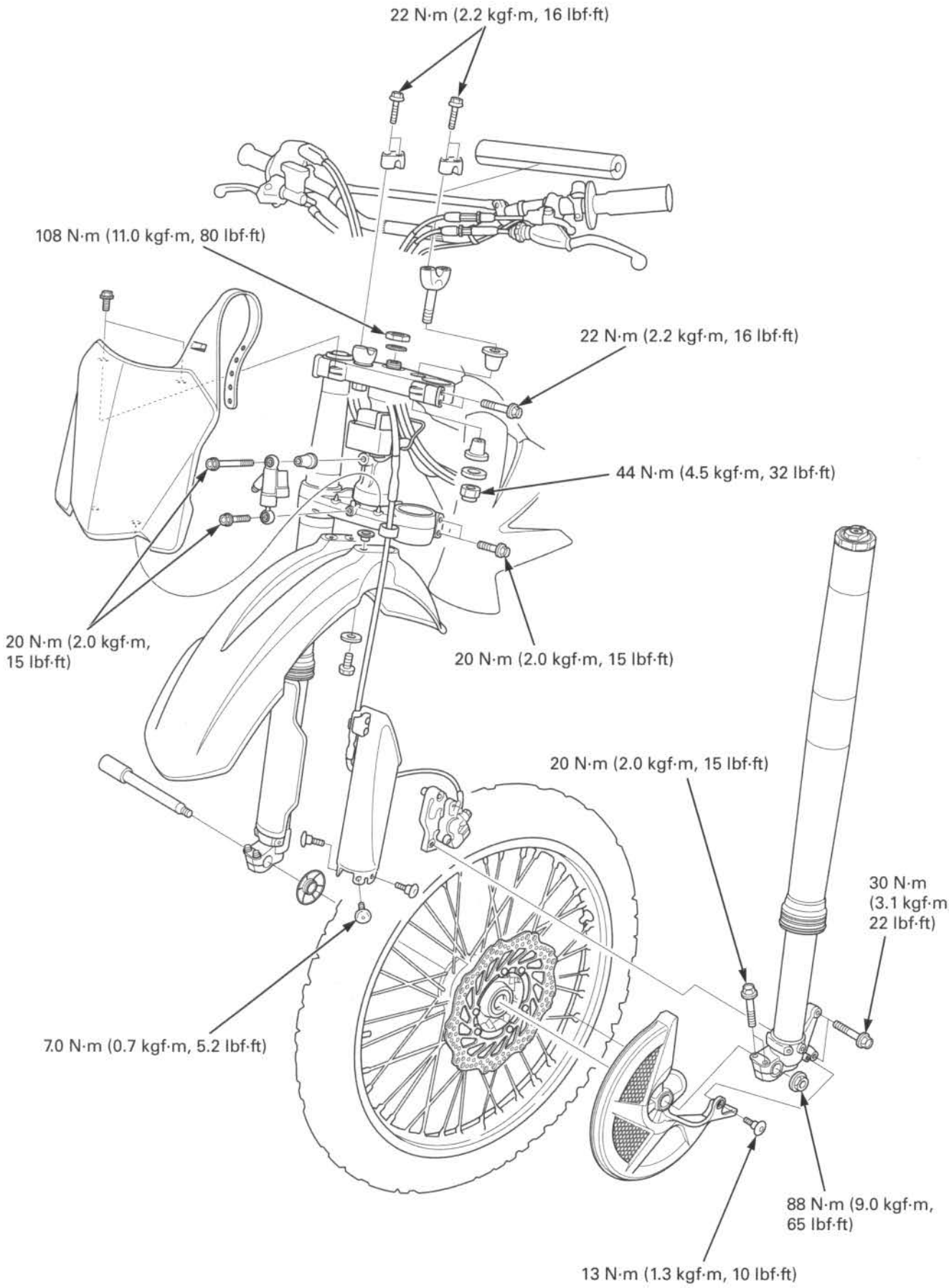
'04 - '07:



'08:


22 N·m (2.2 kgf·m, 16 lbf·ft)
108 N·m (11.0 kgf·m, 80 lbf·ft)
22 N·m (2.2 kgf·m, 16 lbf·ft)
44 N·m (4.5 kgf·m, 32 lbf·ft)
20 N·m (2.0 kgf·m, 15 lbf·ft)
20 N·m (2.0 kgf·m, 15 lbf·ft)
7.0 N·m (0.7 kgf·m, 5.2 lbf·ft)
30 N·m (3.1 kgf·m, 22 lbf·ft)
20 N·m (2.0 kgf·m, 15 lbf·ft)
88 N·m (9.0 kgf·m, 65 lbf·ft)
13 N·m (1.3 kgf·m, 10 lbf·ft)

After '08:



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

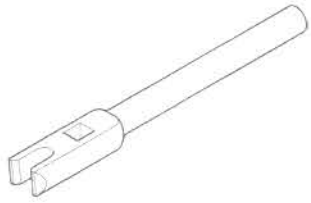
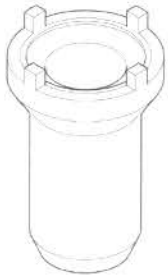
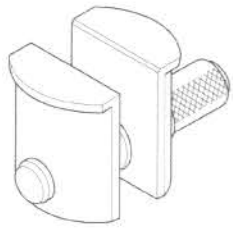
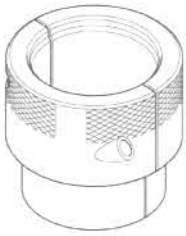
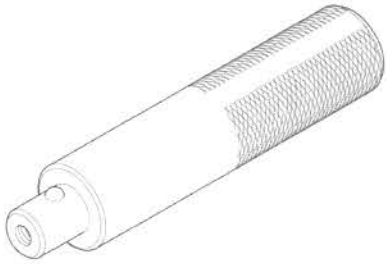
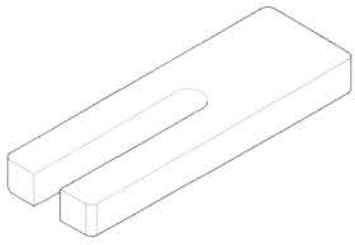
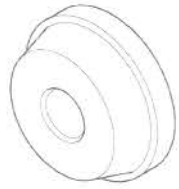
Unit: mm (in)

ITEM				STANDARD	SERVICE LIMIT
Cold tire pressure				98 kPa (1.0 kgf/cm^2, 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 - '07	495 (19.5)	488 (19.2)
			After '07	494 (19.4)	487 (19.2)
	Slider runout			–	0.20 (0.008)
	Recommended fork oil			Pro-Honda HP Fork Oil 5W or equivalent	–
	Oil level			42 – 47 mm (1.65 – 1.85 in)	–
	Fluid capacity	Fork tube	'04	379 cm^3 (12.8 US oz, 13.3 Imp oz)	–
			'05	371 cm^3 (12.5 US oz, 13.1 Imp oz)	–
			'06	369 cm^3 (12.5 US oz, 13.0 Imp oz)	–
			'07	372 cm^3 (12.6 US oz, 13.1 Imp oz)	–
			'08	408 cm^3 (13.8 US oz, 14.4 Imp oz)	–
			After '08	368 cm^3 (12.4 US oz, 13.0 Imp oz)	–
		Fork damper	'04, '05	195 cm^3 (6.6 US oz, 6.9 Imp oz)	–
			'06, '07	192 cm^3 (6.5 US oz, 6.8 Imp oz)	–
			After '07	187 cm^3 (6.3 US oz, 6.6 Imp oz)	–
Compression damping adjuster standard position			'04	12 clicks out from full in	–
			'05	10 clicks out from full in	–
			'06, '07	8 clicks out from full in	–
			After '07	7 clicks out from full in	–
Rebound damping adjuster standard position			'04, '05	8 clicks out from full in	–
			After '05	9 clicks out from full in	–
HPSD (After '07)	Recommended damper oil			Pro-Honda HP Fork Oil 5W or equivalent	–
	Free piston depth at 20°C (68°F)			27.3 – 27.9 (1.07 – 1.10)	–
	Damping force adjuster standard position			7 clicks out from full in	–

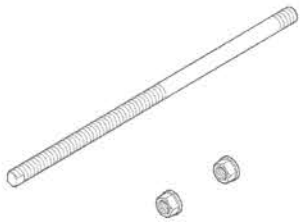
TORQUE VALUES

Front axle holder bolt	20 N·m (2.0 kgf·m, 15 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)	U-nut
Front spoke	3.7 N·m (0.4 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, 32 lbf·ft)	U-nut
Front master cylinder holder bolt	9.9 N·m (1.0 kgf·m, 7.3 lbf·ft)	
Clutch lever holder bolt	8.8 N·m (0.9 kgf·m, 6.5 lbf·ft)	
Clutch lever pivot bolt	2.0 N·m (0.2 kgf·m, 1.5 lbf·ft)	Loosen the bolt 45° – 90° after tightening
Clutch lever pivot nut	10 N·m (1.0 kgf·m, 7 lbf·ft)	Tighten while holding the pivot bolt
Throttle housing bolt	8.8 N·m (0.9 kgf·m, 6.5 lbf·ft)	
Engine stop button screw	1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)	
Front brake caliper mounting bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	Apply locking agent to the threads
Fork cap	30 N·m (3.1 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)	
Fork air plug bolt	1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)	
Fork damper	34 N·m (3.5 kgf·m, 25 lbf·ft)	
Fork protector mounting bolt	7.0 N·m (0.7 kgf·m, 5.2 lbf·ft)	Apply locking agent to the threads
Front brake disc cover bolt	13 N·m (1.3 kgf·m, 10 lbf·ft)	
Fork top bridge pinch bolt	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Fork bottom bridge pinch bolt	20 N·m (2.0 kgf·m, 15 lbf·ft)	
Steering stem nut	108 N·m (11.0 kgf·m, 80 lbf·ft)	
Steering stem adjusting nut	See page 13-57	
Brake lever pivot nut	5.9 N·m (0.6 kgf·m, 4.4 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, 4.4 lbf·ft)	
Steering damper bolt (After '07)	20 N·m (2.0 kgf·m, 15 lbf·ft)	Apply locking agent to the threads

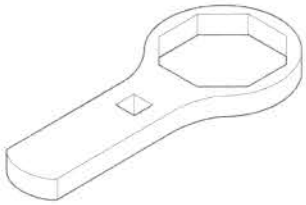
TOOLS

Spoke wrench, 6.1 mm 07JMA-MR60100  or 07701-0020300 (6.1 mm)	Steering stem socket 07916-3710101  or 07702-0020001 (U.S.A. only)	Ball race remover 07946-3710500 
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

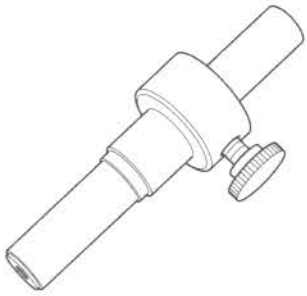


Lock nut wrench, 50 mm
07WMA-KZ30100

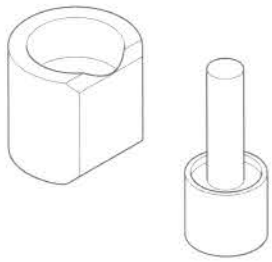


Fork rod stopper
07AMB-KZ3A100 (U.S.A. only)

Depth gauge (After '07)
07AMJ-MENA100 (U.S.A. only)



Spherical bearing remover (After '07)
07AMD-MENA100 (U.S.A. only)



TROUBLESHOOTING

NOTE:

After '07: If there is any problem at steering, remove the steering damper (page 13-44) and inspect the steering condition. Inspect the steering damper (page 13-45) in case of no faulty parts at steering.

Hard steering
- Steering stem adjusting nut too tight
- Faulty or damaged steering head bearings
- Insufficient tire pressure
- Faulty HPSD (After '07)

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
- Faulty steering damper (After '07)

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

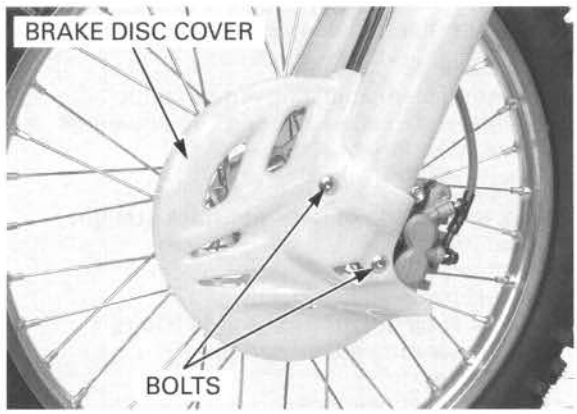
Stiff suspension
- Fork oil quantity too much
- Fork oil viscosity too thick
- Bent or damaged fork tubes
- Clogged fork fluid passage

Front suspension noisy
- Insufficient fluid in fork
- Loose fork fastener

FRONT WHEEL

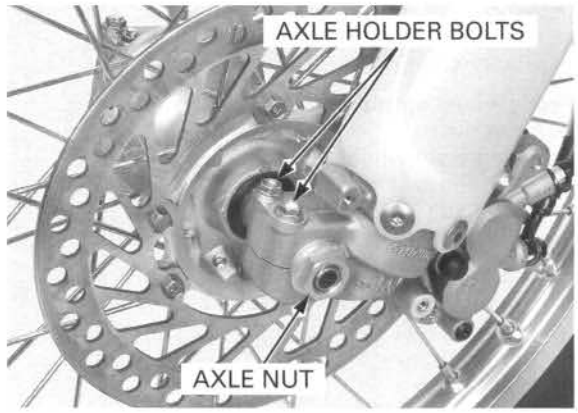
REMOVAL: '04 – '08

Remove the bolts and brake disc cover.

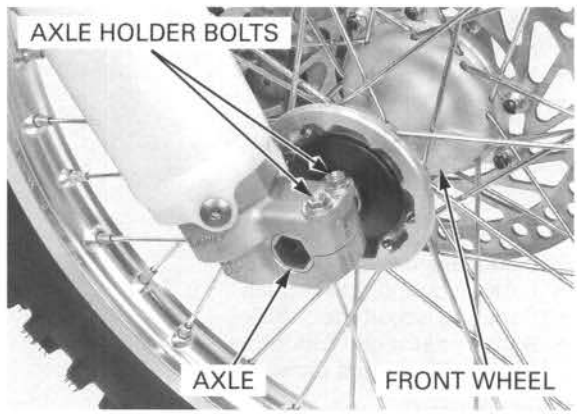


Raise the front wheel off the ground by placing a work stand or equivalent under the engine.

Remove the axle nut and loosen the left axle holder bolts.

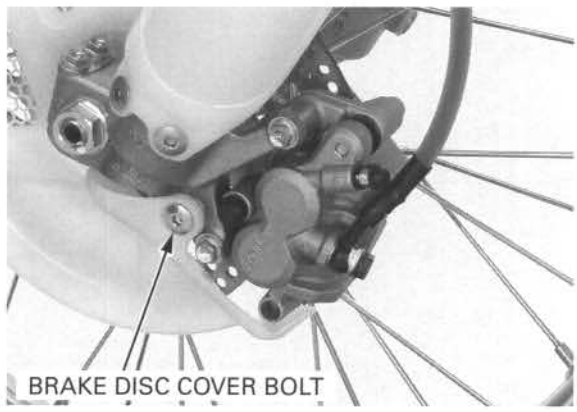


Loosen the right axle holder bolts.
Remove the axle and front wheel.



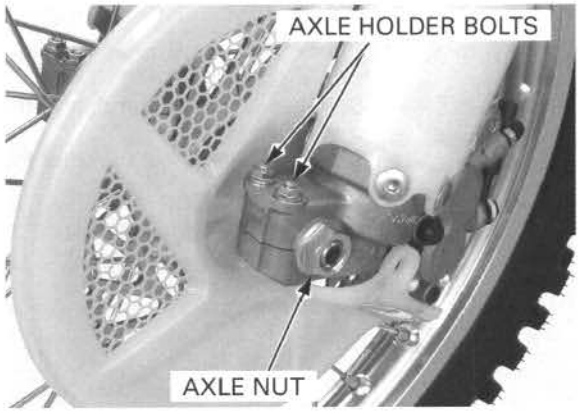
REMOVAL: After '08

Remove the front brake disc cover bolt.

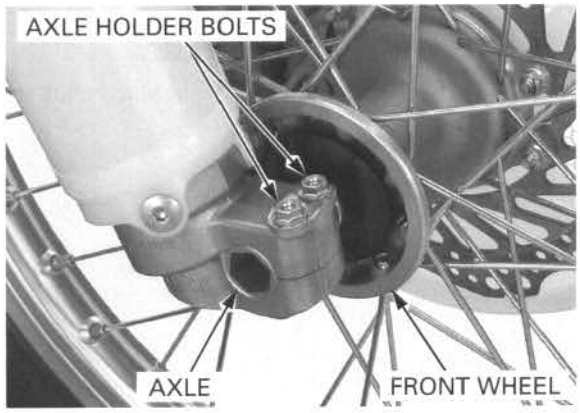


Raise the front wheel off the ground by placing a work stand or equivalent under the engine.

Remove the axle nut and loosen the left axle holder bolts.



Loosen the right axle holder bolts.
Remove the axle, then remove the front wheel with the brake disc cover.

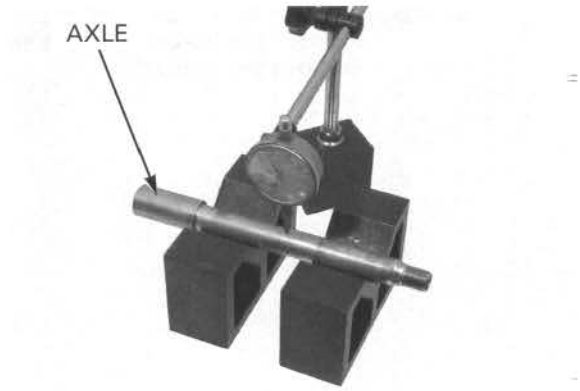


INSPECTION

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)

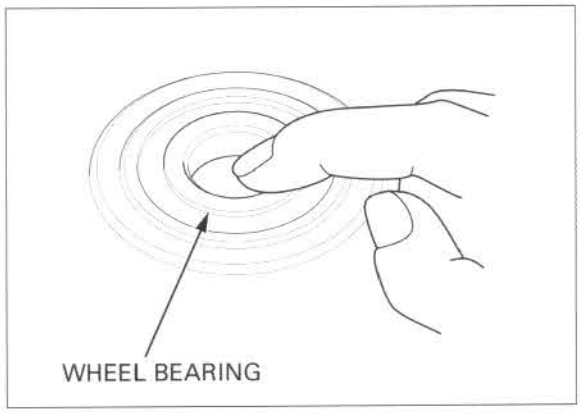


WHEEL BEARING

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.

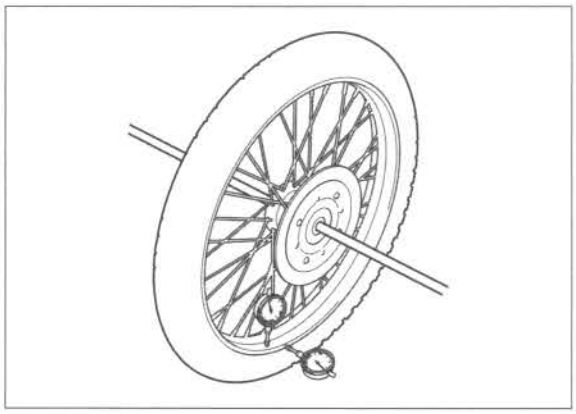


WHEEL RIM

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.

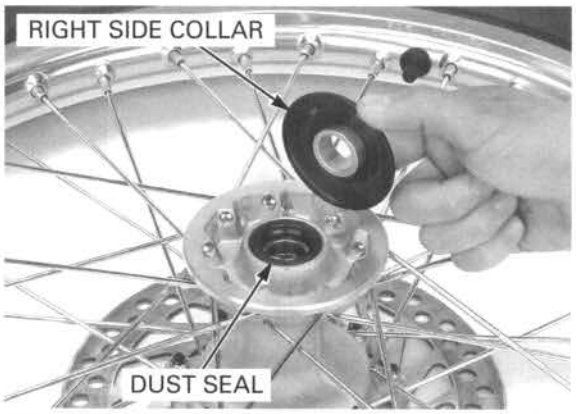
SERVICE LIMITS:
Radial: 2.0 mm (0.08 in)
Axial: 2.0 mm (0.08 in)

Check the spokes and tighten any that are loose.

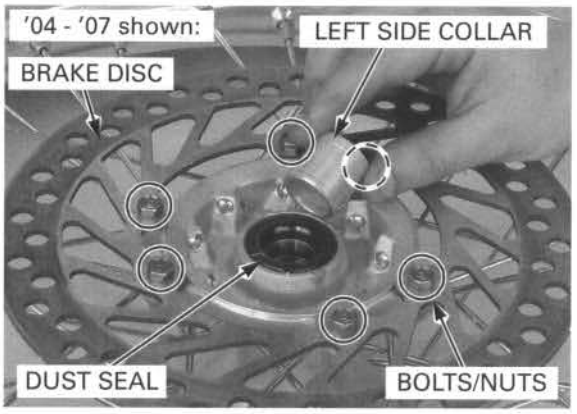


DISASSEMBLY

Remove the right side collar and dust seal.

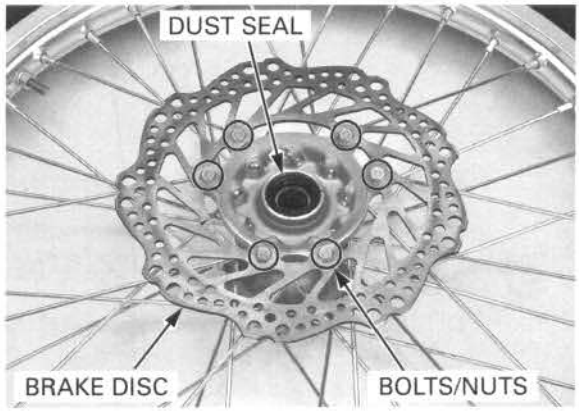


'04 – '08: Remove the left side collar and dust seal.
Remove the brake disc bolts and nuts.
Remove the brake disc.



After '08: Remove the brake disc cover from the left wheel hub.

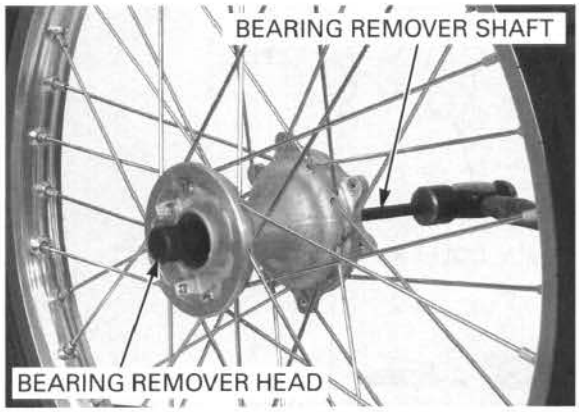
After '08: Remove the dust seal.
Remove the nuts, bolts and the brake disc.



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**



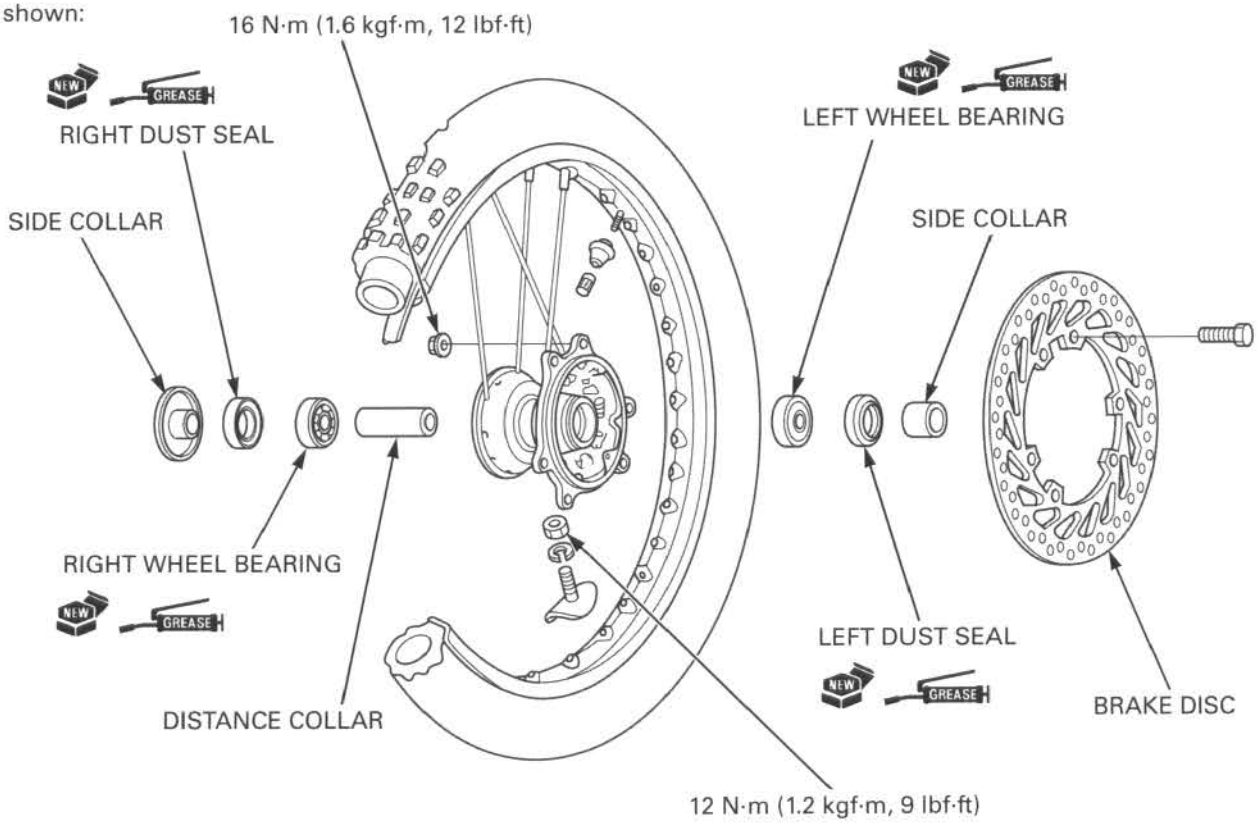
NOTE:

- Never reinstall old bearings; once the bearings have been removed, they must be replaced with new ones.
- Replace the bearings in pairs.

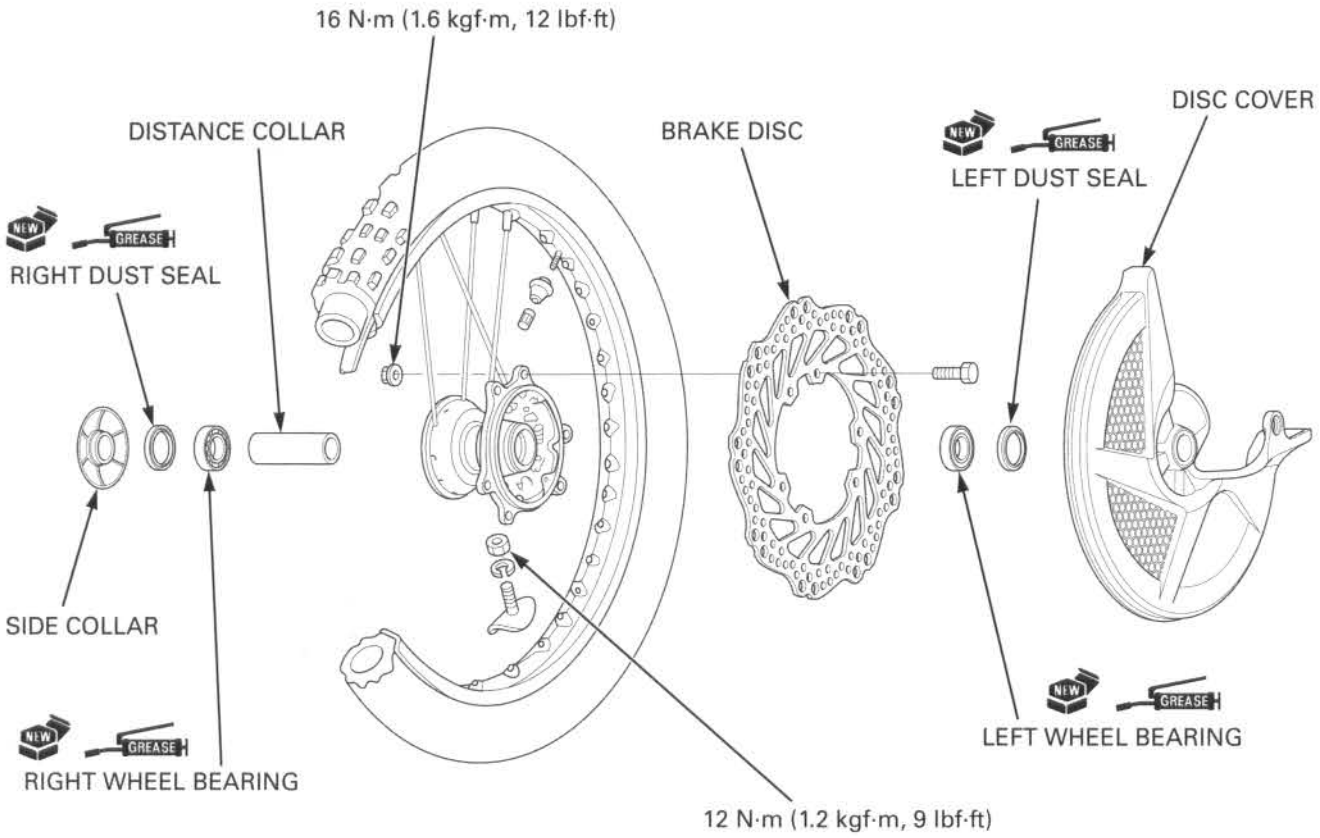
ASSEMBLY

'04 – '08:

'04 - '07 shown:



After '08:

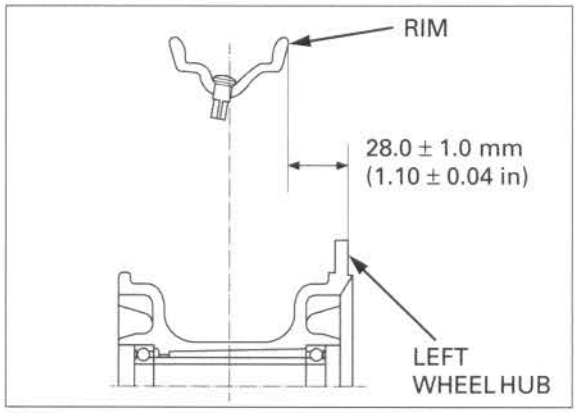


Place the rim on a work bench, with its directional arrow facing counterclockwise.

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 (brake disc side) surface to the side of the rim is specified.

RIM TO HUB DISTANCE:
28.0 ± 1.0 mm (1.10 ± 0.04 in)



Torque the spokes in two or three progressive steps

TOOL:

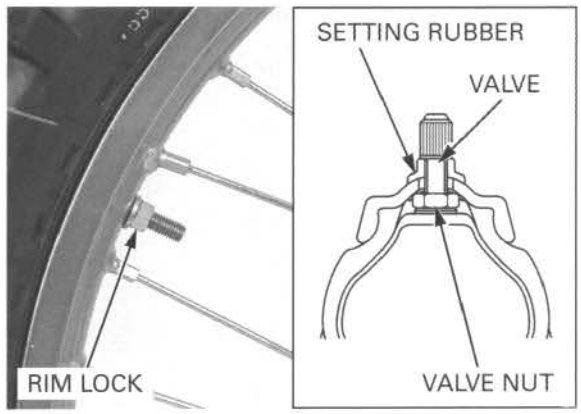
Spoke wrench, 6.1 mm	**07JMA-MR60100 or 07701-0020300 (6.1 mm)**

TORQUE: 3.7 N·m (0.4 kgf·m, 2.7 lbf·ft)

Install the rim lock, rim band, tube and tire.

Tighten the rim lock to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Pack all bearing cavities with grease.

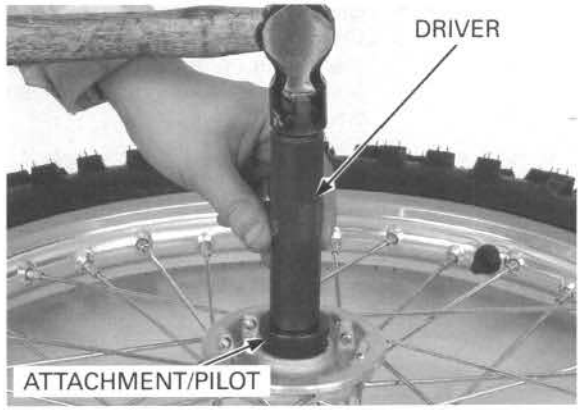
Drive the left wheel bearing in the wheel hub until it is fully seated using special tools.

Replace the wheel bearings in pairs. Do not reuse old bearings.

- Install the wheel bearings with the sealed ends toward the outside.

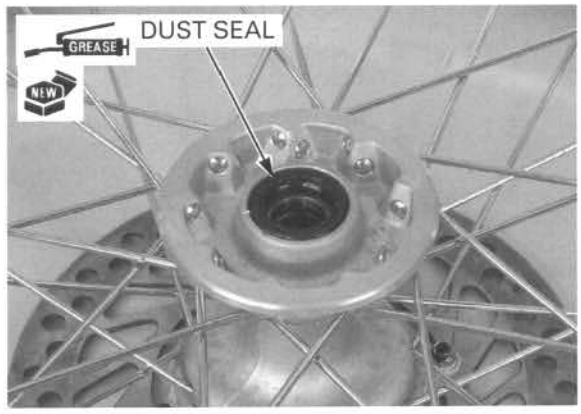
TOOLS:

Driver	**07749-0010000**
Attachment, 37 x 40 mm	**07746-0010200**
Pilot, 20 mm	**07746-0040500**



Install the distance collar into place, than drive the right wheel bearing using the same special tools.

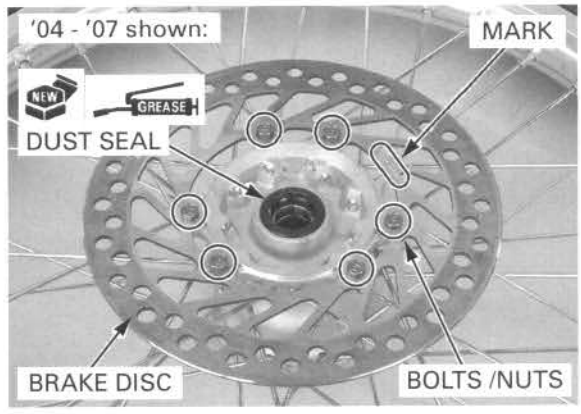
Pack the right dust seal lip with grease and install the right dust seal.



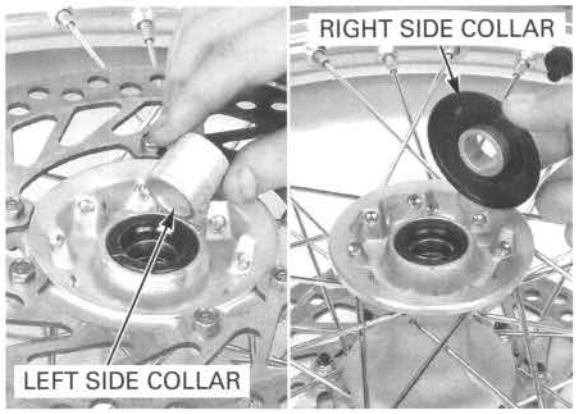
Install the brake disc onto the wheel hub with the drive mark facing out.
Install the brake disc bolts and nuts.
Tighten the nuts to the specified torque.

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)

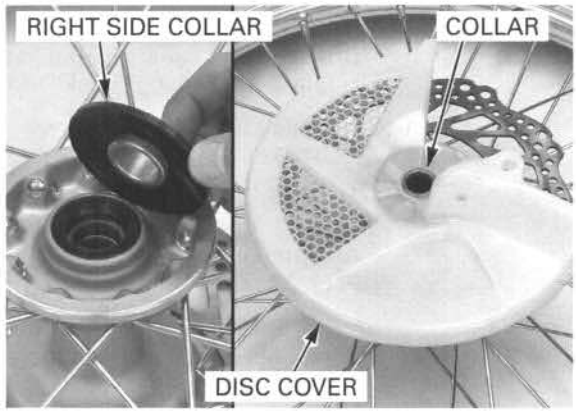
Pack the dust seal lip with grease and install the left dust seal.



'04 – '08: Check the right and left side collar for wear or damage.
Install the right and left side collar to the wheel.



After '08: Check the right side collar for wear or damage.
Check the disc cover for damage, and also check the disc cover collar for wear or damage.
Install the right side collar and disc cover to the wheel hub.

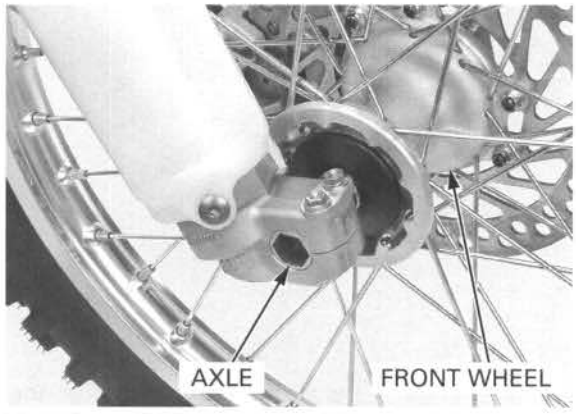


INSTALLATION: '04 – '08

Clean the clamping surface of the axle and axle holders.

Install the front wheel between the fork legs so that the brake disc is positioned between the pads, being careful not to damage the pads.

Apply a thin layer of grease to the axle and insert the axle from the right side.

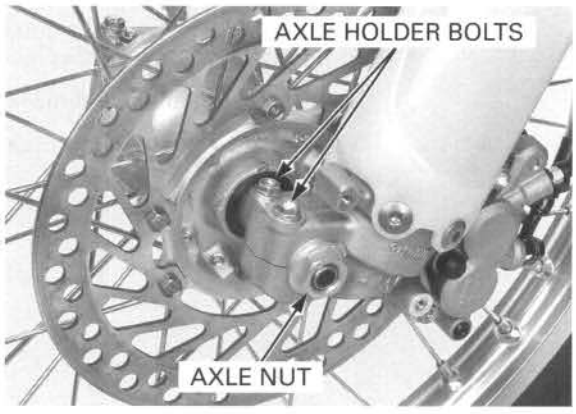


Install and tighten the axle nut to the specified torque.

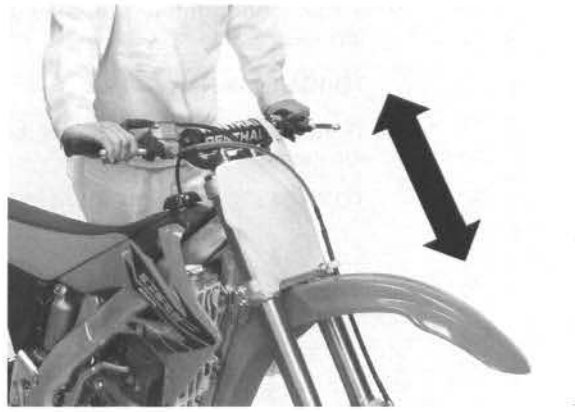
TORQUE: 88 N·m (9.0 kgf·m, 65 lbf·ft)

Tighten the left axle holder bolts to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)

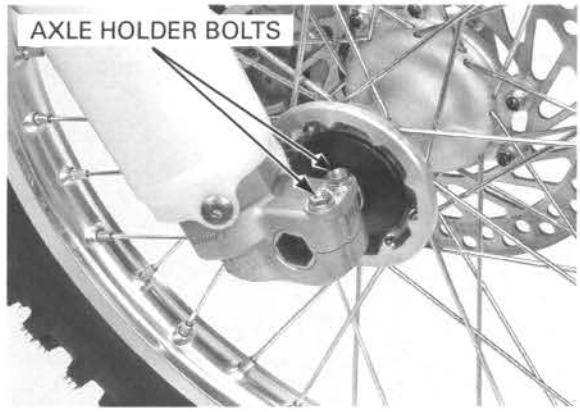


With the front brake applied, pump the front suspension up and down several times to seat the axle and check the front brake operation.



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, 15 lbf·ft)



Install the brake disc cover and bolts.
Tighten the bolts to the specified torque.

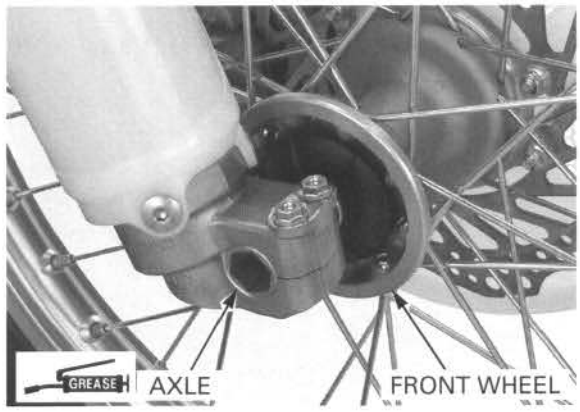
TORQUE: 13 N·m (1.3 kgf·m, 10 lbf·ft)

INSTALLATION: After '08

Clean the clamping surface of the axle and axle holders.

Install the front wheel between the fork legs so that the brake disc is positioned between the pads, being careful not to damage the pads.

Apply a thin layer of grease to the front axle sliding surface and insert the axle from the right side.

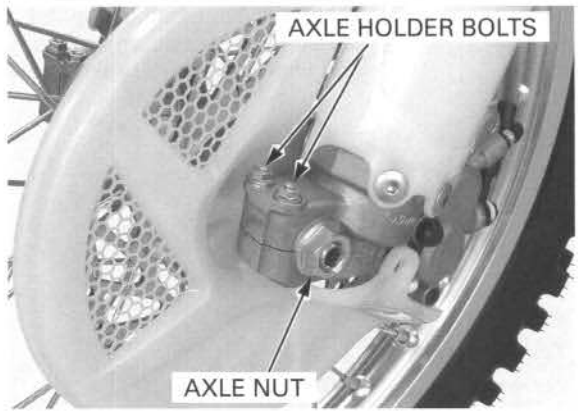


Install and tighten the axle nut to the specified torque.

TORQUE: 88 N·m (9.0 kgf·m, 65 lbf·ft)

Tighten the left axle holder bolts to the specified torque.

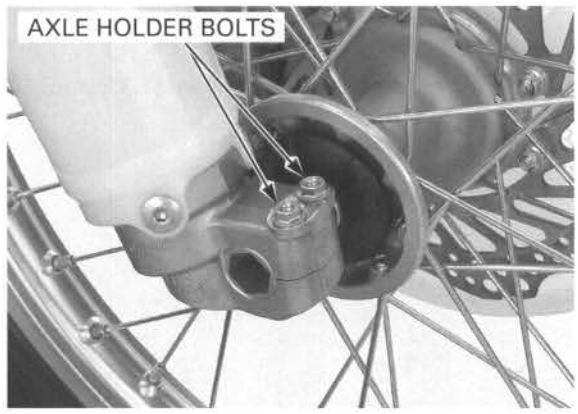
TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)



With the front brake applied, pump the front suspension up and down several times to seat the axle and check the front brake operation.

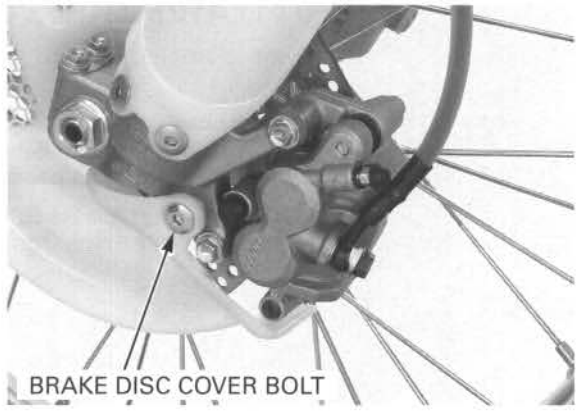
Be sure the fork legs are parallel, then tighten the right axle holder bolts to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)



Install the brake disc cover bolt and tighten it to the specified torque.

TORQUE: 13 N·m (1.3 kgf·m, 10 lbf·ft)



FORK

REMOVAL

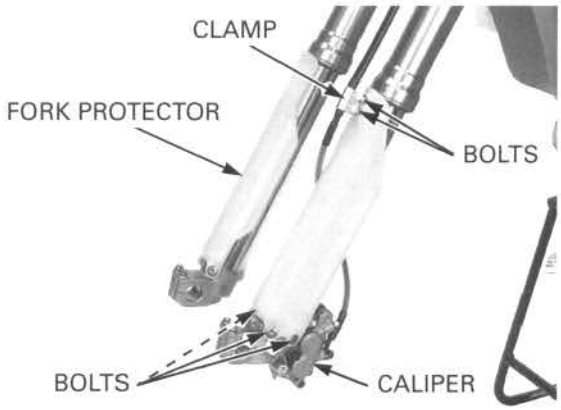
Remove the front wheel (page 13-10).

Do not suspend the brake caliper from the brake hose. Do not twist the brake hose.

Remove the mounting bolts and front brake caliper.

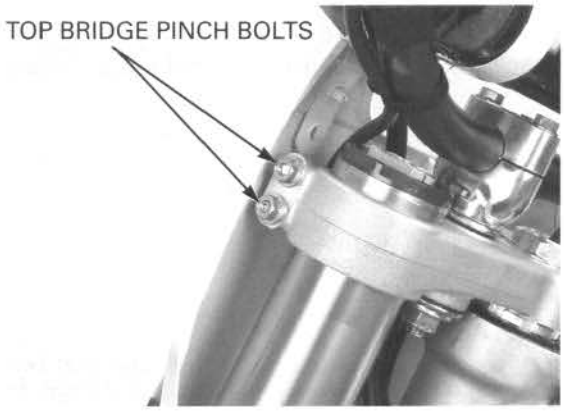
Do not operate the brake lever after removing the caliper and front wheel. To do so will cause difficulty in fitting the brake disc between the brake pad. Remove the bolts and brake hose clamp.

Remove the bolts and fork protector.

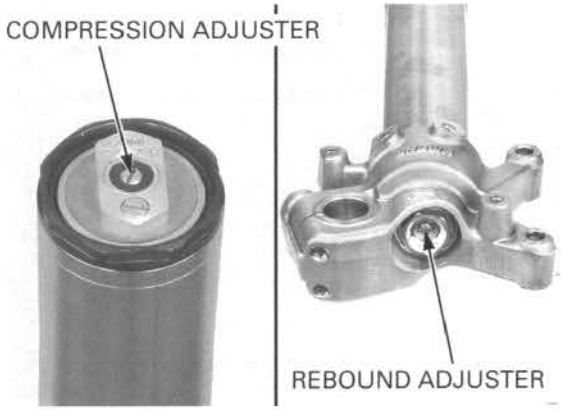


Loosen the fork top bridge pinch bolts.

When the fork is ready to be disassembled, remove the handlebar and holders (page 13-39) 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).

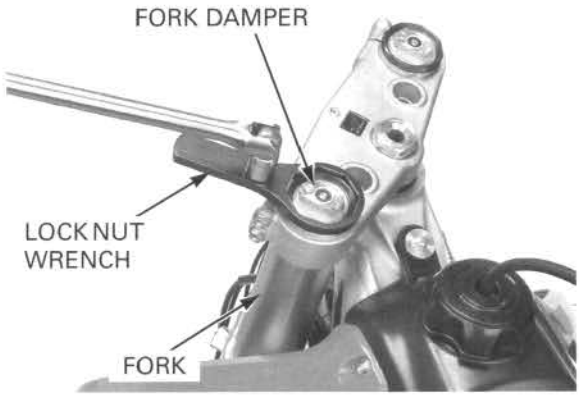


Do not use a crescent or adjustable wrench to the loosen the fork damper; it could be damaged.

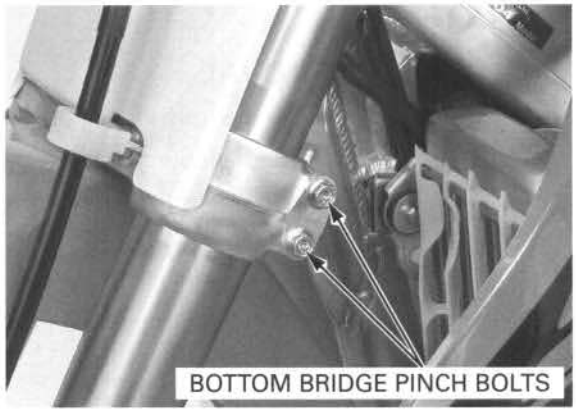
Loosen the fork damper using the special tool, but do not remove it yet.

TOOL:

Lock nut wrench, 50 mm	**07WMA-KZ30100**



Loosen the fork bottom bridge pinch bolts and pull the fork leg down and out.

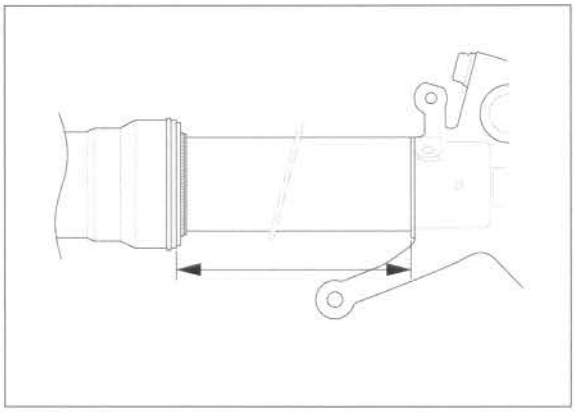


DISASSEMBLY

Be careful not to scratch the slider and not to damage the dust seal.

Clean the fork assembly, the sliding surface of the fork slider and the bottom of the slider around the center bolt before disassembling the fork.

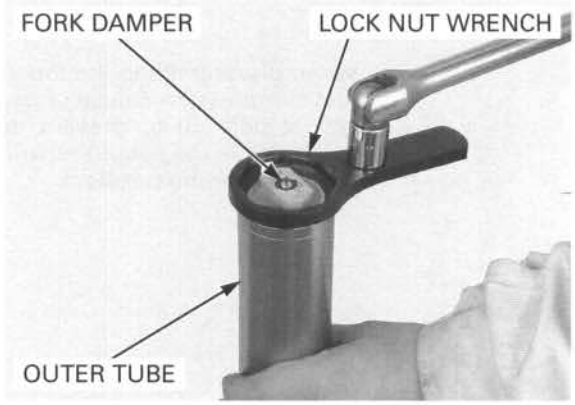
Measure the length between the axle holder and outer tube, and record it before disassembling the fork.



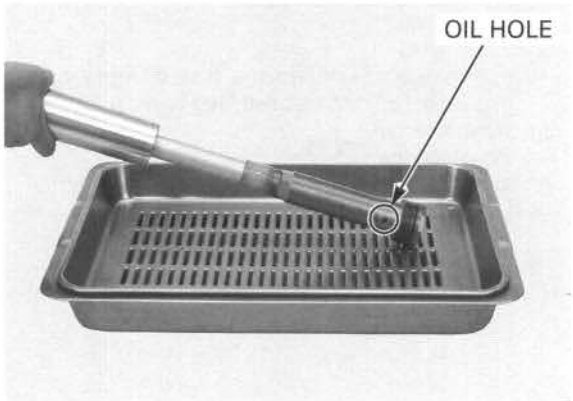
Hold the outer tube and remove the fork damper using the special tool from the outer tube.

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.

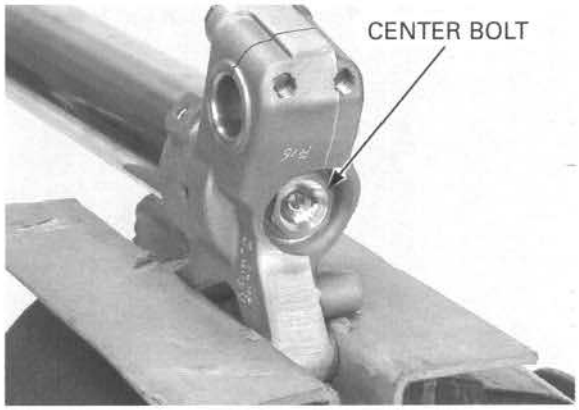


Temporarily install the fork damper assembly into the outer tube.

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.

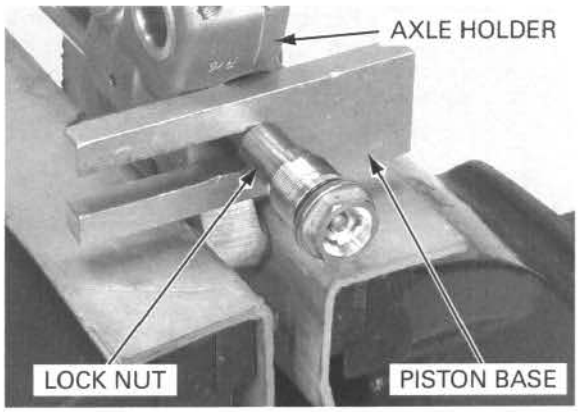


If a piston base is not available, refer to the next step to make an alternative tool.

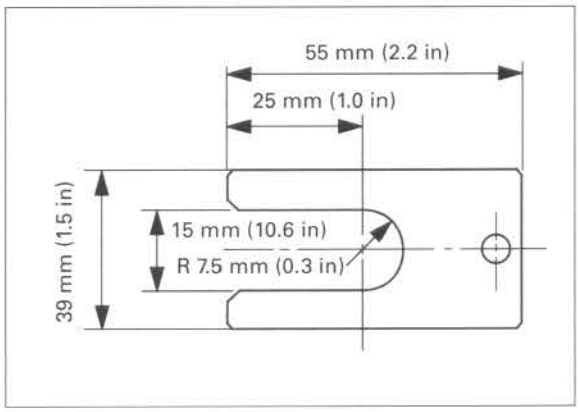
Push the fork damper out of the lock nut from slider while install the piston base or mechanic's stopper tool between the axle holder and lock nut.

TOOL:

Piston base	**07958-2500001 or**
Fork rod stopper	**07AMB-KZ3A100 (U.S.A. only)**

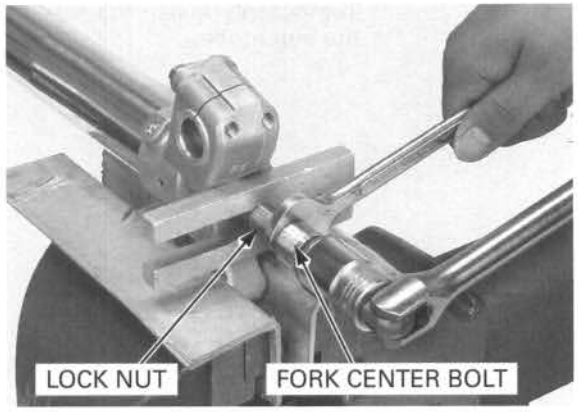


Make the mechanic's stopper tool from a thin piece of steel (2.0 mm (0.08 in) thick) as shown if you do not have a special tool.

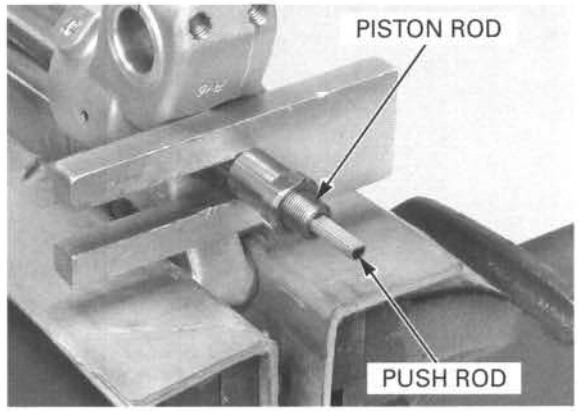


Do not remove the lock nut from the fork damper piston rod. If the lock nut is removed, the piston rod will fall into the fork damper and you will not be able to reassemble the fork damper.

Hold the lock nut and remove the fork center bolt from the fork damper.

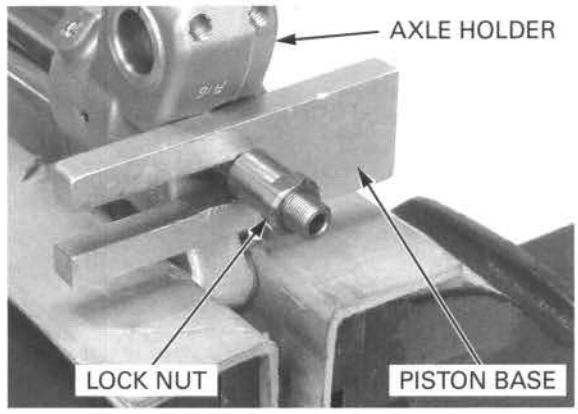


Remove the push rod from the piston rod.

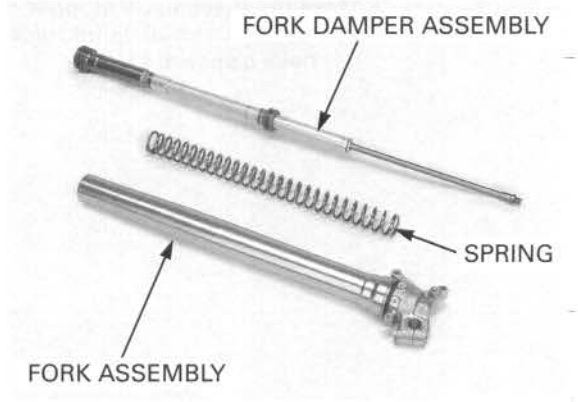


Be careful not to damage the lock nut and fork center bolt hole.

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

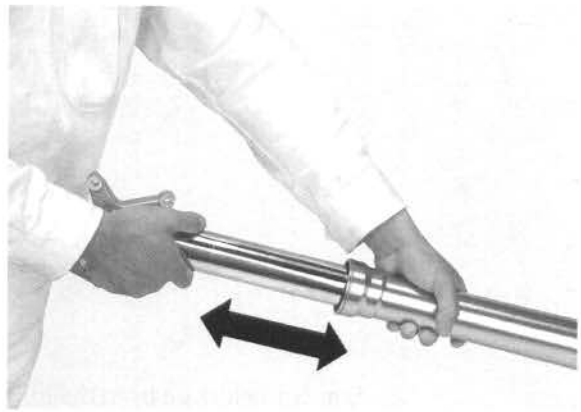
Be careful not to scratch the slider.

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 13-25).

Using quick successive motions, pull the slider out of the outer tube.

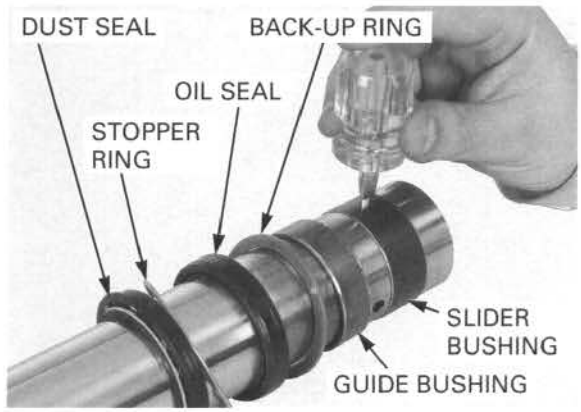


Do not damage the slider bushing, especially the sliding surface. To prevent loss of tension, do not open the bushing more than necessary.

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
- Slider



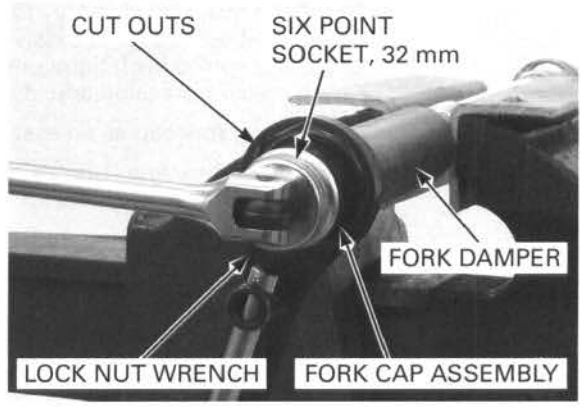
FORK DAMPER DISASSEMBLY

Check the lock nut installation. If the lock nut was 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**



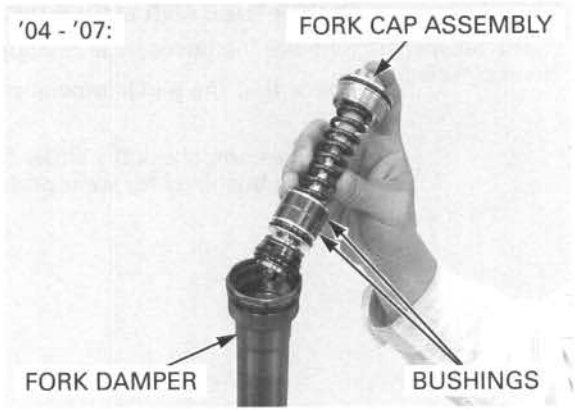
Remove the fork cap assembly from the fork damper.

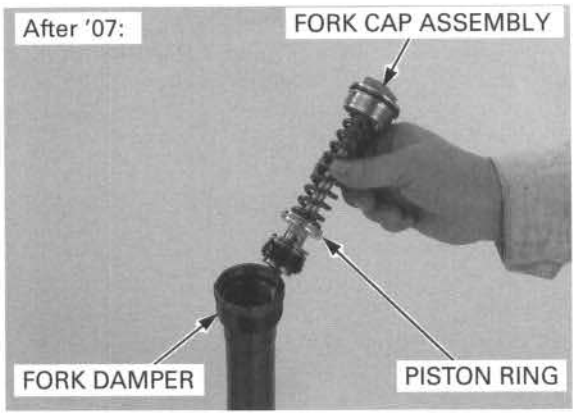
NOTE:

- Do not disassemble the fork cap assembly.
- Replace the fork cap as an assembly if it is damaged.

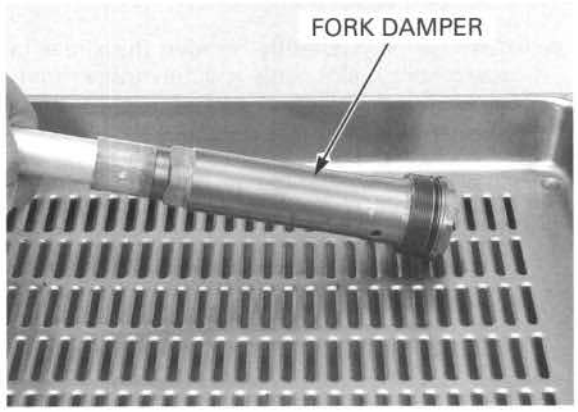
'04 -'07:
- Be careful not to damage the fork cap bushing.

After '07:
- Be careful not to damage the fork cap piston ring.





Empty the fork oil from the fork damper by pumping the damper rod several times.



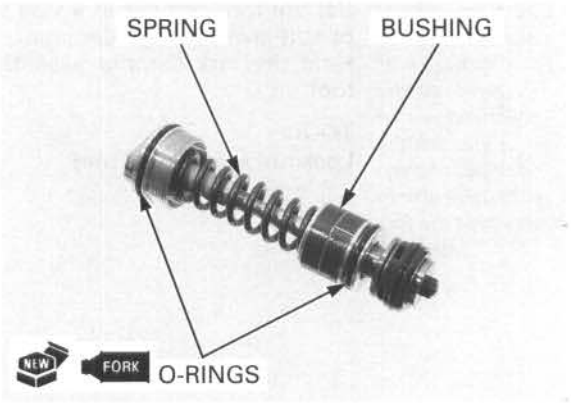
INSPECTION

FORK CAP ASSEMBLY ('04 - '07)

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 new O-rings and install it.



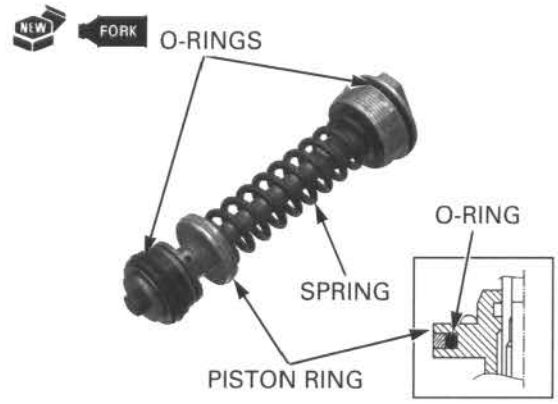
FORK CAP ASSEMBLY (After '07)

Check the fork cap assembly for damage.
Check the spring for fatigue or damage.
Check the compression damping adjuster for clicks.

Replace the fork cap as an assembly if necessary.

Check the fork cap piston ring for excessive wear or scratches, replace it with O-ring if necessary.

Apply fork oil to new O-rings and install it.

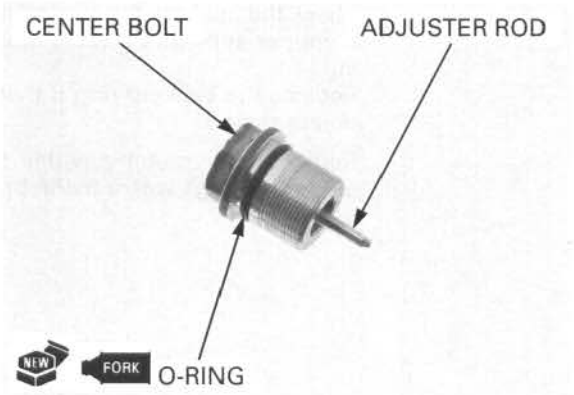


FORK CENTER BOLT

Check the fork center bolt for damage.
Check the adjuster rod for stepped wear or damage.
Check the rebound adjuster for clicks.

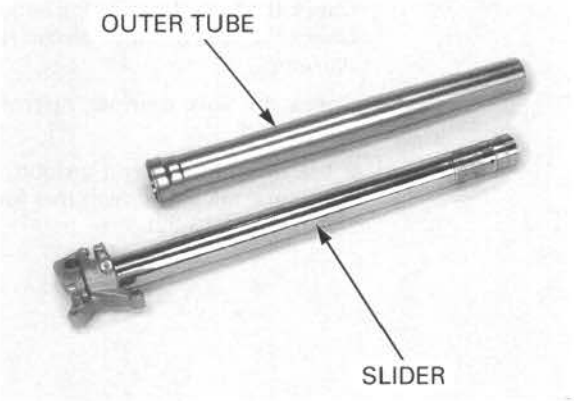
Replace the fork center bolt as an assembly if necessary.

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.

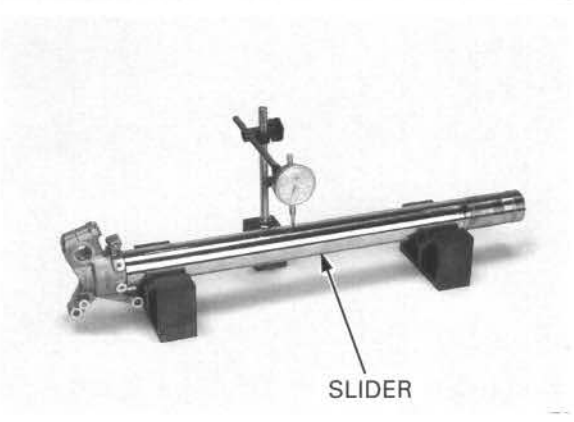


Set the slider on V-blocks and measure the runout.
Turn the slider and measure the runout using a dial indicator.
Actual runout is 1/2 of the total indicator reading.

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.

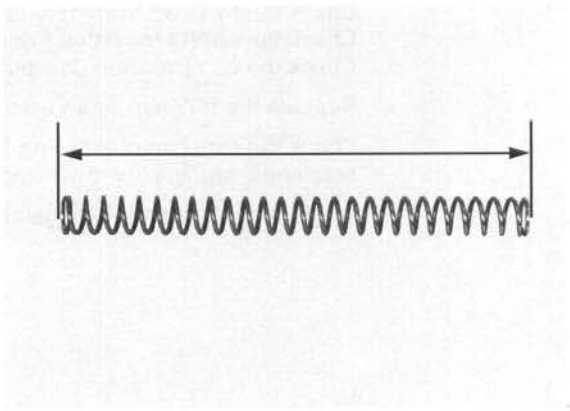


FORK SPRING

Measure the fork spring free length by placing it on a flat surface.

SERVICE LIMIT:

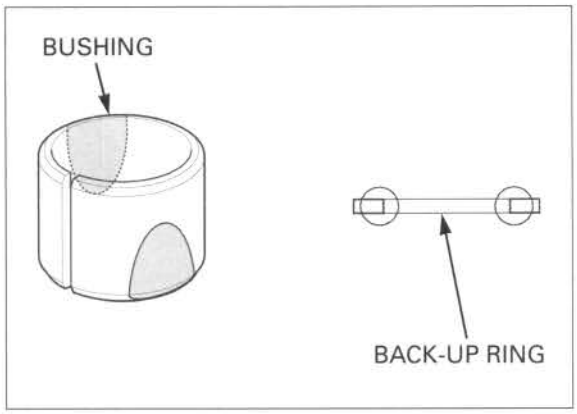
'04 - '07:	**488 mm (19.2 in)**
After '07:	**487 mm (19.2 in)**



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.

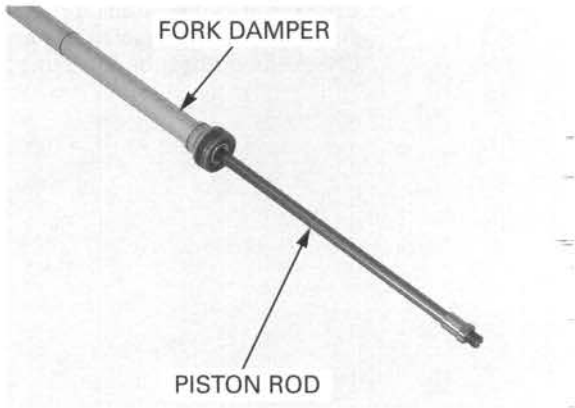


FORK DAMPER

Check the fork damper for bends or damage.
Check the fork damper piston rod for bends, wear or damage.

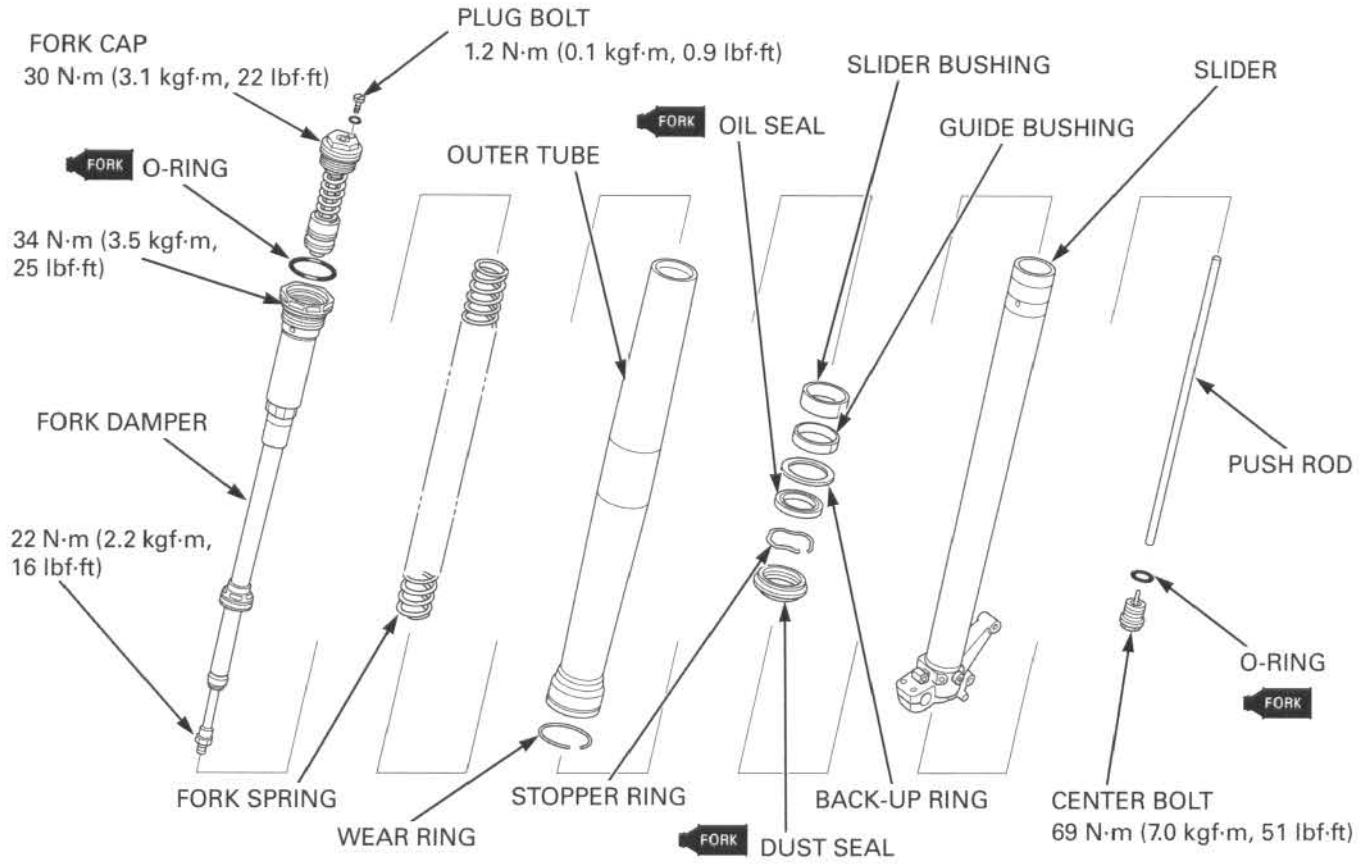
Check the fork damper operation by pumping the piston rod.

If the operation is not smooth, fill the fork damper with fork oil and check the fork damper operation again (page 13-32).

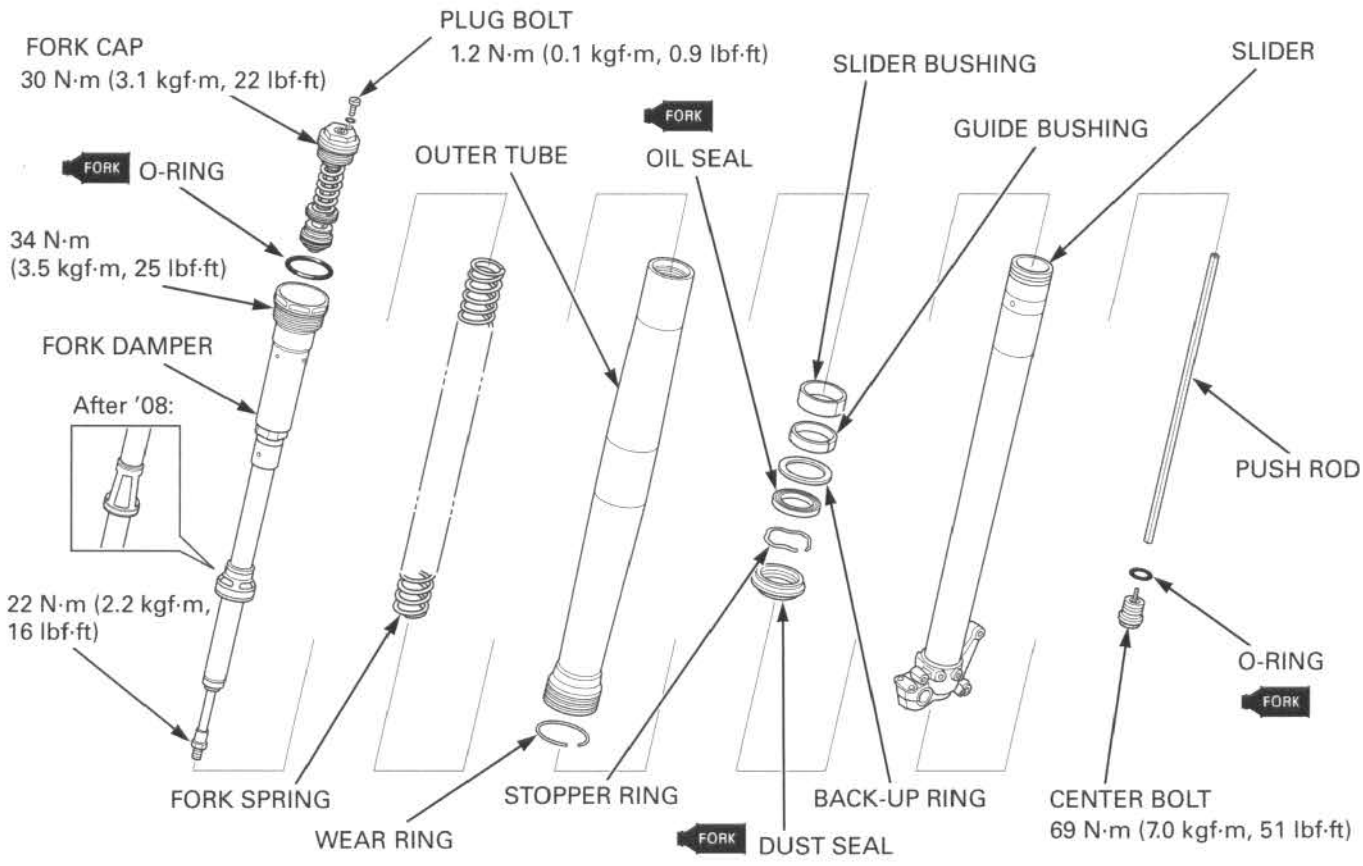


ASSEMBLY

'04 - '07:



After '07:



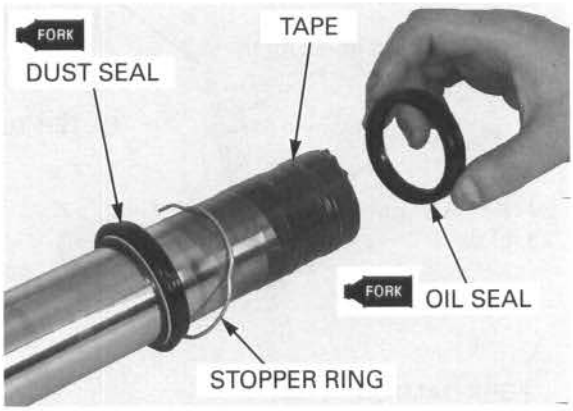
Before assembly, wash all parts with a high flash-point or non-flammable solvent and wipe them dry.

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.

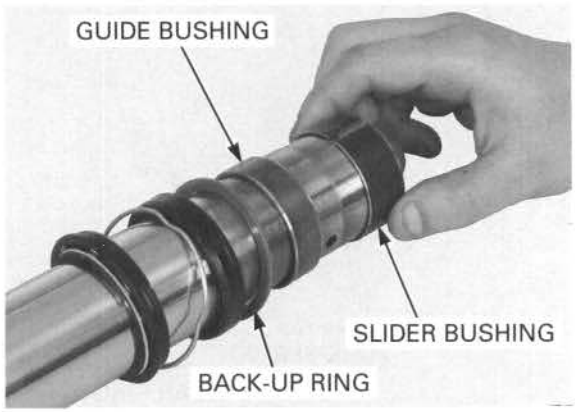
Remove the tape from the end of the slider.



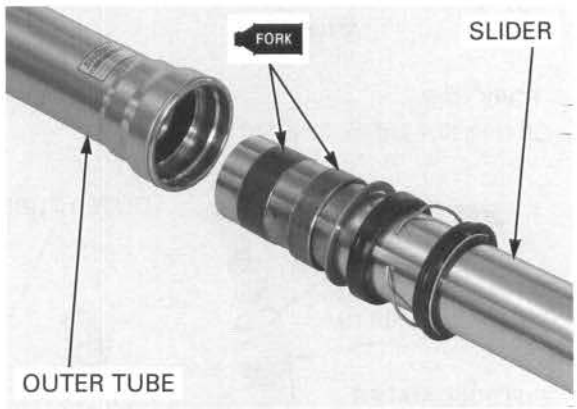
Be careful not to damage the slider bushing coating. Do not open the slider bushing more than necessary.

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.



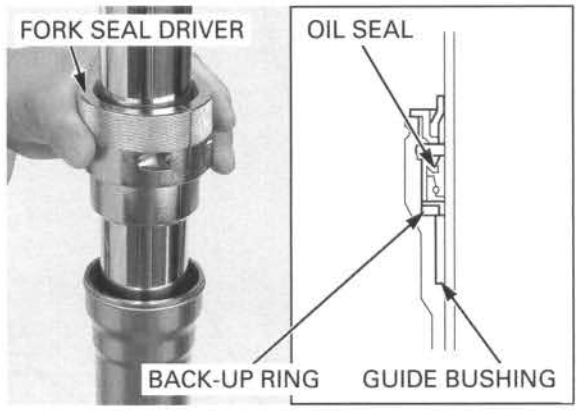
Coat the slider and guide bushings with fork oil and install the slider into the outer tube.



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:

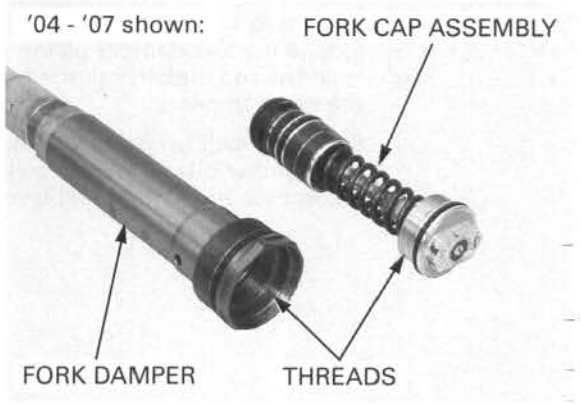
Fork seal driver, 47 mm	**07VMD-KZ30100 or 07VMD-KZ3010A (U.S.A. only)**



Install the stopper ring into the groove in the slider.
Install the dust seal.

FORK DAMPER REFILLING/ASSEMBLY

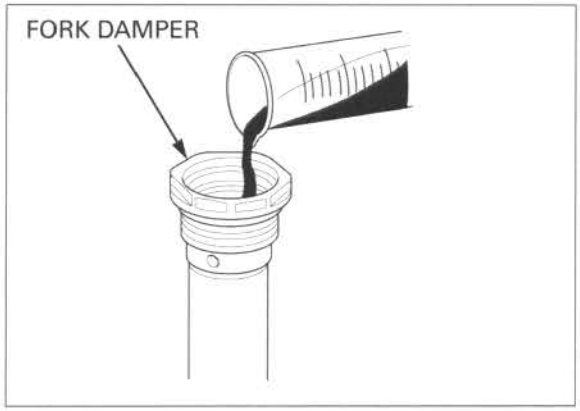
Clean the fork cap assembly and fork damper threads.



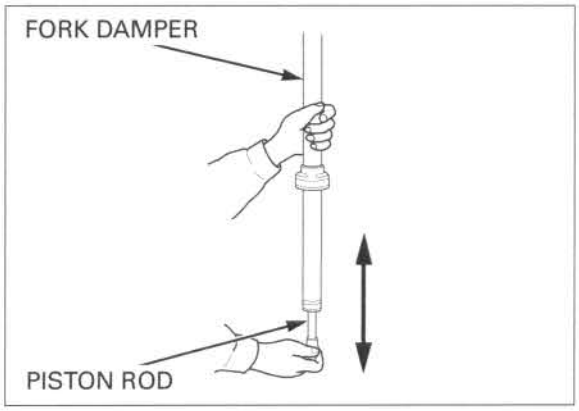
Extend the fork damper piston rod to its maximum length.
Pour the recommended fork oil into the fork damper.

RECOMMENDED FORK OIL:
Pro-Honda HP Fork Oil 5W or equivalent

STANDARD CAPACITY:
'04, '05: 195 cm³ (6.6 US oz, 6.9 Imp oz)
'06, '07: 192 cm³ (6.5 US oz, 6.8 Imp oz)
After '07: 187 cm³ (6.3 US oz, 6.6 Imp oz)

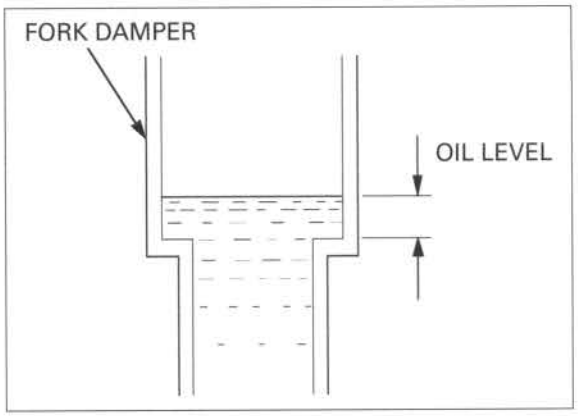


Pump the fork damper piston rod slowly several times and bleed any air from the fork damper.



Extend the fork damper piston rod to its maximum length.
Adjust the oil level of the fork damper as shown.

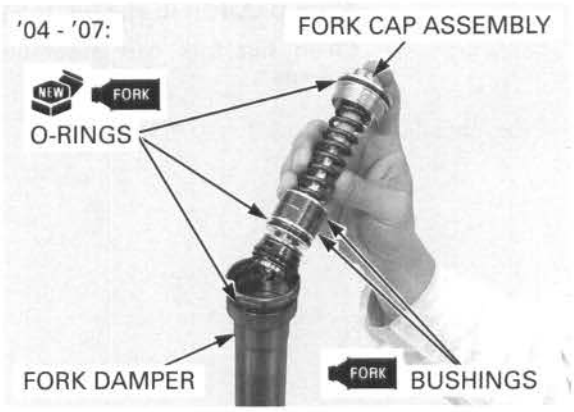
OIL LEVEL: 42 – 47 mm (1.65 – 1.85 in)

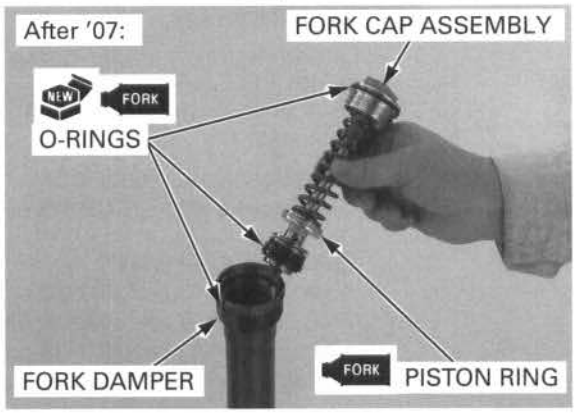


Be careful not to damage the fork cap bushing (After '07: fork cap piston ring).

Apply fork oil to the bushings (After '07: fork cap piston ring) and new O-rings on the fork cap assembly and fork damper.
Extend the fork damper piston rod to maximum.
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.



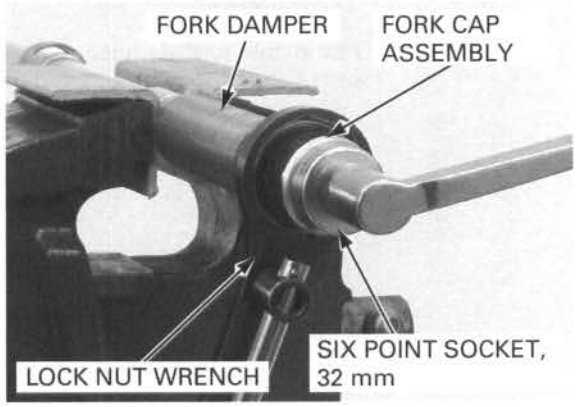


Set the fork damper in a vise with a piece of wood or soft jaws to avoid damage.

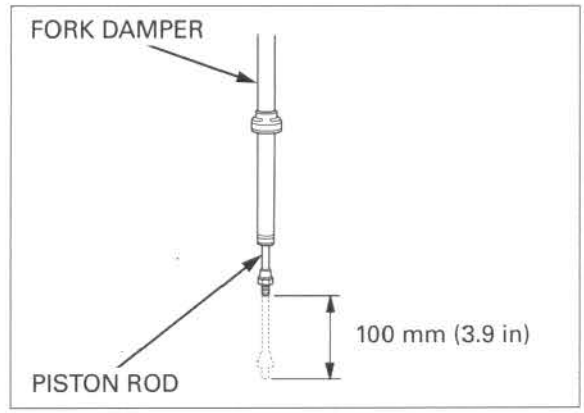
Tighten the fork cap assembly to the specified torque by holding the fork damper using the special tool.

TOOL:
Lock nut wrench, 50 mm **07WMA-KZ30100**

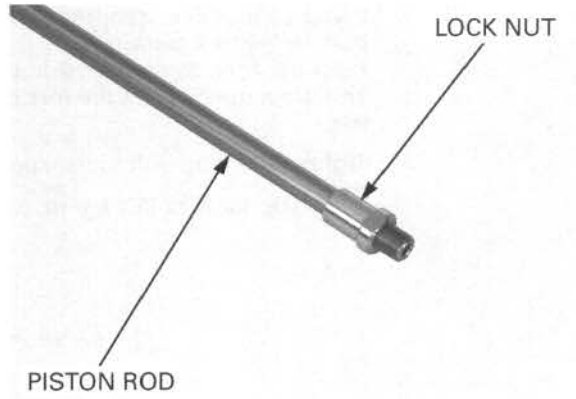
TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)



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.



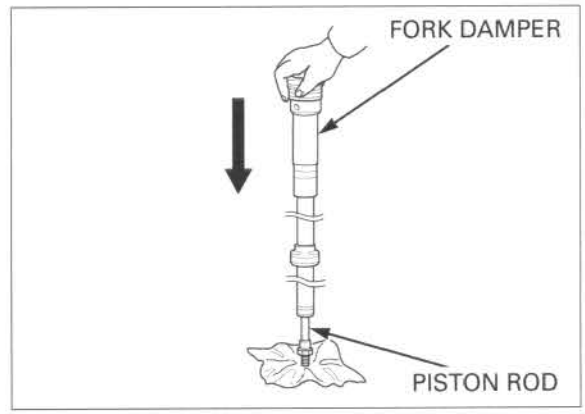
NOTE:

- Set the rebound adjuster and 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.

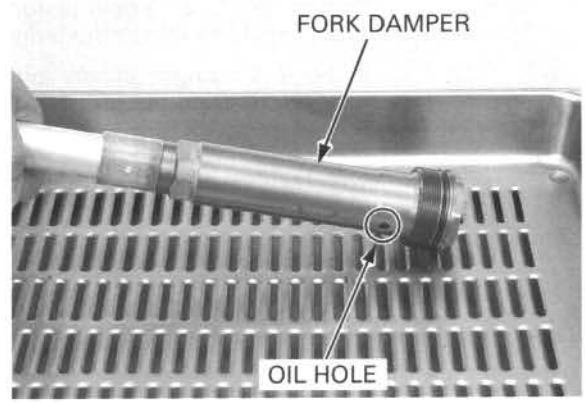
Cover the piston rod end to prevent damage.

Blow out any extra oil in the fork damper spring chamber by fully stroking the fork damper piston rod.



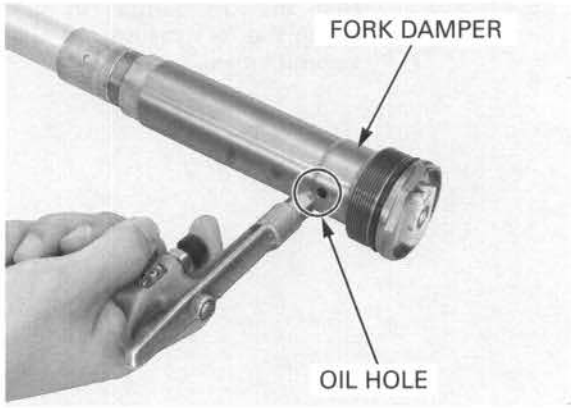
Drain the extra oil from the oil hole of the fork damper.

- By doing this procedure, about 17 cm^3 of fork fluid will be drained from the damper spring chamber through the oil hole. This will cause 178 cm^3 ('04, '05), 175 cm^3 ('06, '07), 170 cm^3 (After '07) of fork fluid to be left in the chamber.



Blow out any oil from the oil hole of the fork damper using compressed air.

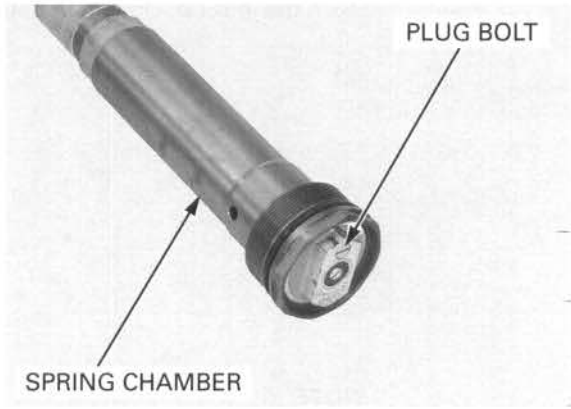
Wipe off the oil completely from the fork damper.



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: 1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)



FORK DAMPER OPERATION INSPECTION

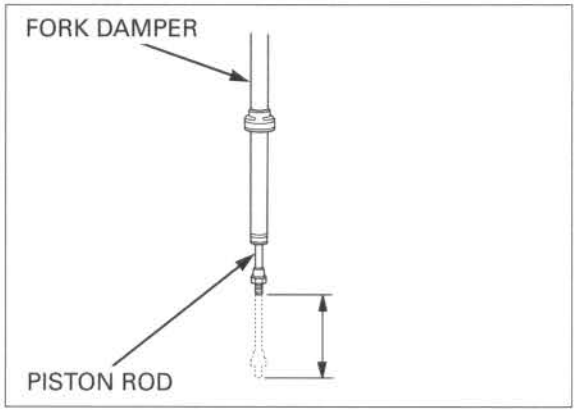
- Turn the compression adjuster counterclockwise to the softest position.
- Check the fork damper piston rod sliding surface for damage.
- Apply fork oil to the fork damper piston rod sliding surface.

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 13-29).

Cover the piston rod end to prevent damage.

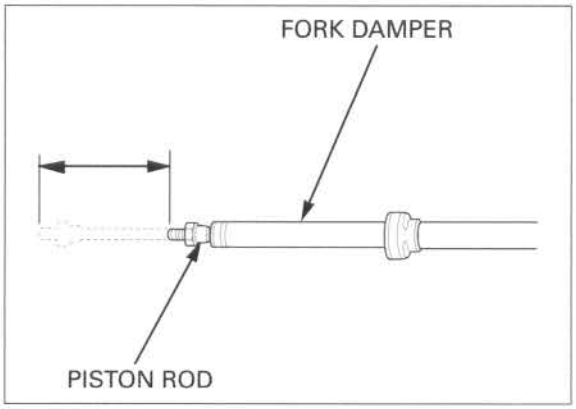
Fully stroke the fork damper piston rod by pushing down the fork damper.
Check the fork damper piston rod for smooth operation.



If the fork damper piston rod operation is not smooth, check the piston rod for bends or damage.

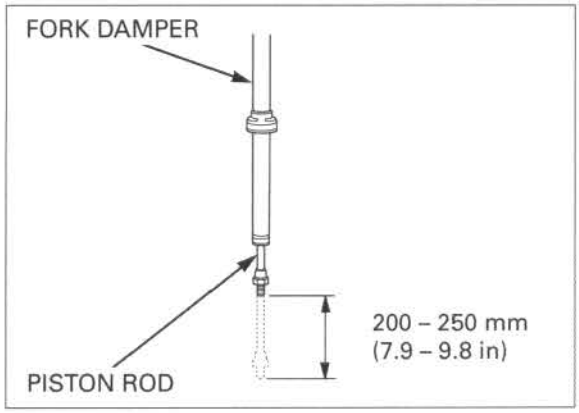
Hold the fork damper on level ground while the fork damper piston rod is fully extended and compressed by hand.
Release the fork damper piston rod then check that it extends to its maximum length.

If the fork damper piston rod does not extend to maximum, bleed the fork damper again.



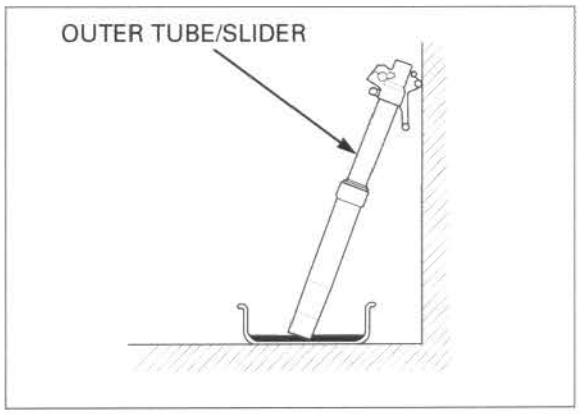
Wipe the oil completely off from the fork damper. Compress the fork piston rod 200 – 250 mm (7.9 – 9.8 in) from fully extended and hold the fork damper in an upright position for 10 minutes.

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/PREPARATION

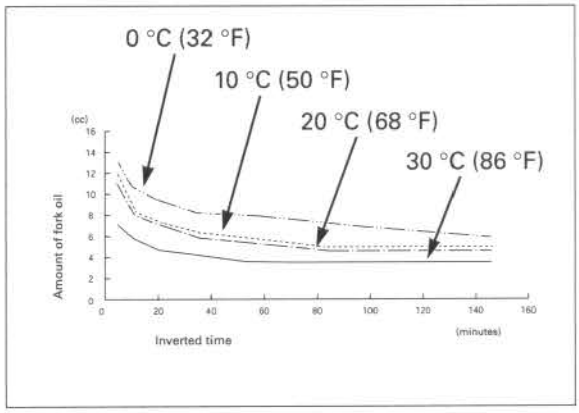
If the outer tube and slider (fork) have not been disassembled, turn the fork upside down for 20 minutes and drain the oil from the inside of the outer tube and slider completely (7 cm^3 at 20 °C/ 68 °F)



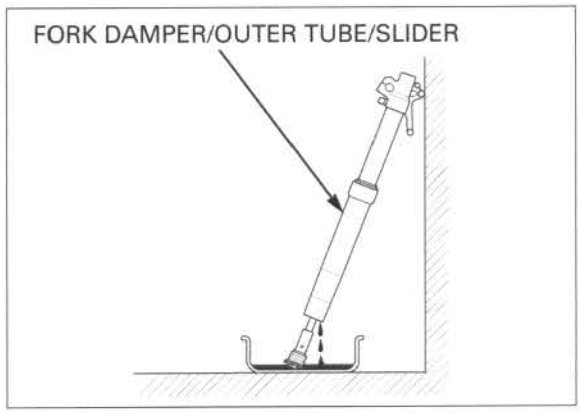
Amount of fork oil left in the fork
(without damper and spring)

unit: cm^3

		minute						
		5	10	20	35	55	85	145
°C/°F	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



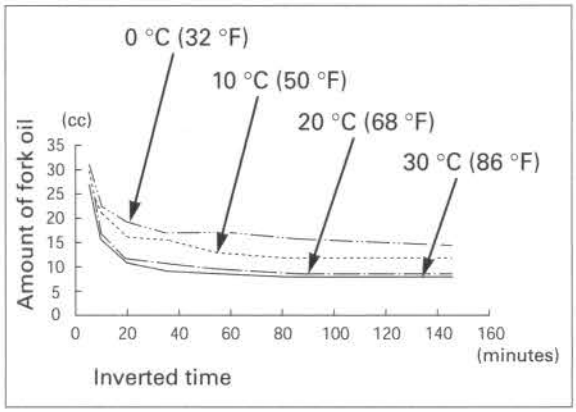
If the fork damper has not been disassembled from the outer tube/slider, turn it upside down for 20 minutes and drain the oil from the inside of the outer tube and slider completely (12 cm^3 at 20 °C/ 68 °F)



Amount of fork oil left in the fork (with damper and spring)

unit: cm^3

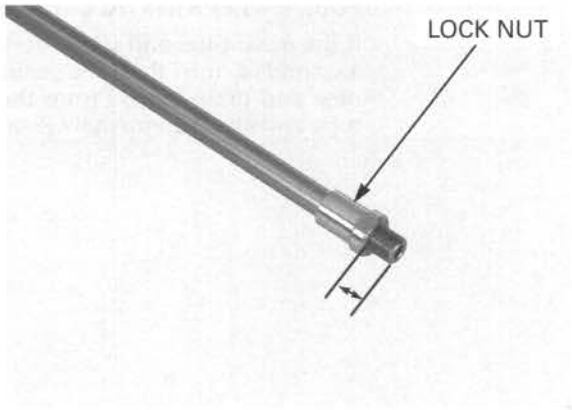
		minute						
		5	10	20	35	55	85	145
°C/°F	30/86	27	15.3	10.6	9.4	8.3	7.9	7.9
	20/68	29.4	16.5	11.8	10.6	9.4	8.2	8.2
	10/50	28.2	21.2	16.5	15.3	12.9	11.8	11.8
	0/32	30.6	22.4	18.8	16.5	16.5	15.3	14.1



Tighten the lock nut fully and measure the length as shown.

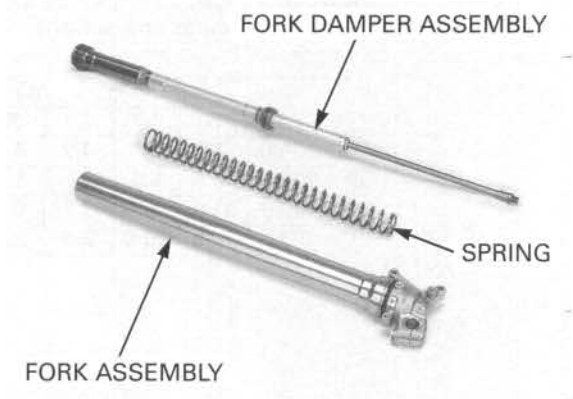
STANDARD: 11 – 13 mm (0.43 – 0.51 in)

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.



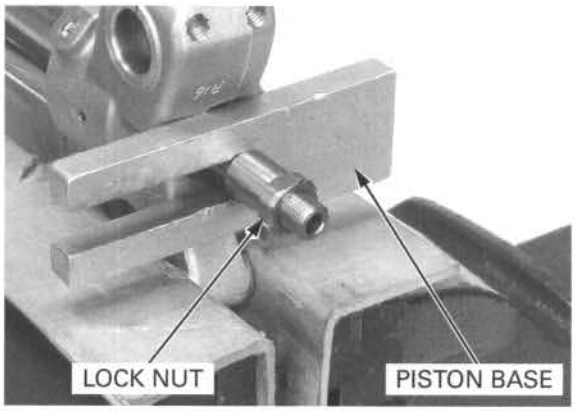
Do not over-tighten the vise on the axle holder.

Set the axle holder of the slider in a vise with a piece of wood or soft jaws to avoid damage.

Push the fork damper out of the lock nut from slider, while 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)**



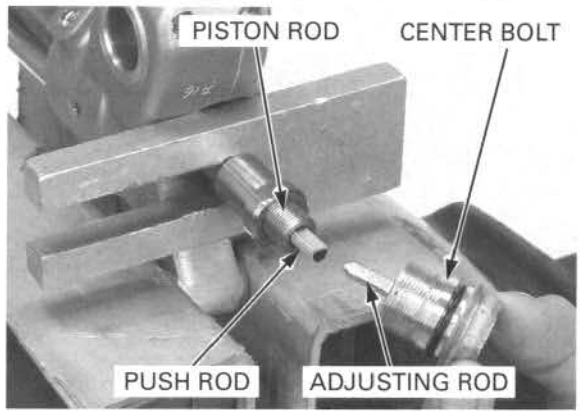
Measure the combined length of the lock nut and piston rod end again.

STANDARD: 11 – 13 mm (0.43 – 0.51 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.

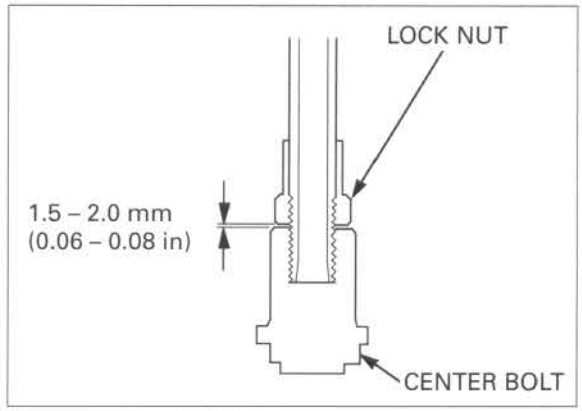
Install the fork center bolt to the fork damper piston rod by aligning the flat-side of the center bolt adjusting rod with the flat-side of the push rod.
Tighten the center bolt fully by hand.



Measure the length of the lock nut and center bolt clearance.

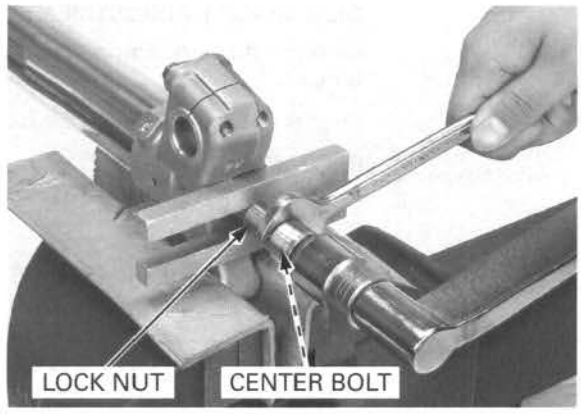
STANDARD: 1.5 – 2.0 mm (0.06 – 0.08 in)

If the clearance is out of specification, check the lock nut and center bolt installation.



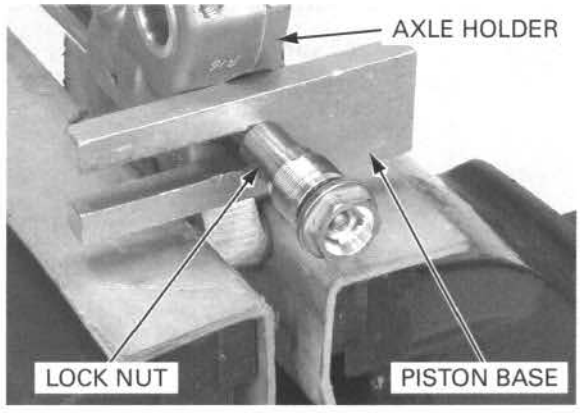
Tighten the lock nut to the center bolt by hand until they touch.
Tighten the lock nut to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)



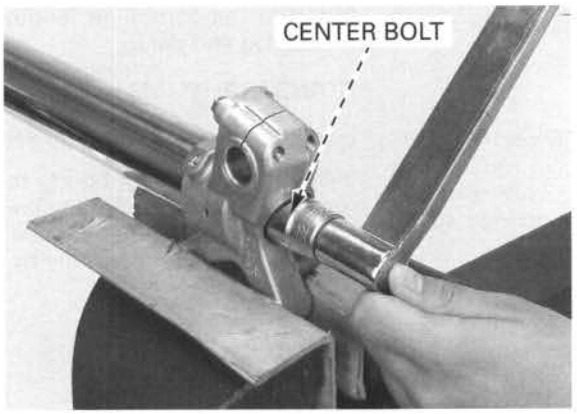
Be careful not to damage the lock nut and fork center bolt hole.

Remove the piston base or mechanic's stopper tool between the axle holder and lock nut while pushing the fork damper.



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)

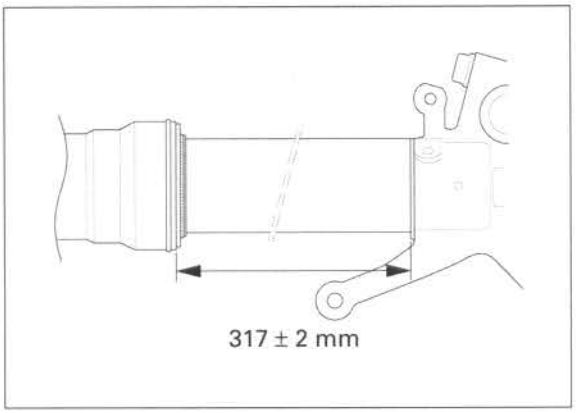


Measure the length between the axle holder and outer tube.

Compare the length at assembly and disassembly; they should be same length.

STANDARD: 317 ± 2 mm

If the length at assembly is longer than at disassembly, check the center bolt and lock nut installation.



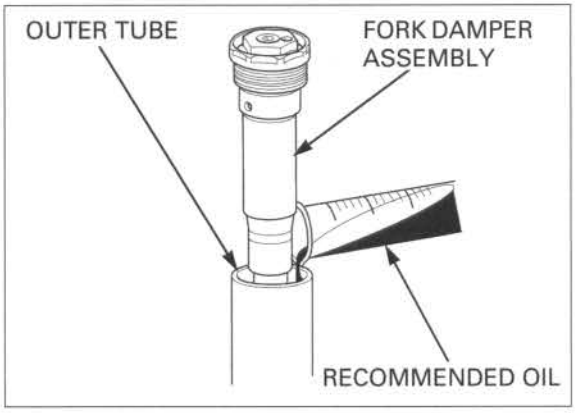
OIL CAPACITY ADJUSTMENT

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:	**379 cm³ (12.8 US oz, 13.3 Imp oz)**
'05:	**371 cm³ (12.5 US oz, 13.1 Imp oz)**
'06:	**369 cm³ (12.5 US oz, 13.0 Imp oz)**
'07:	**372 cm³ (12.6 US oz, 13.1 Imp oz)**
'08:	**408 cm³ (13.8 US oz, 14.4 Imp oz)**
After '08:	**368 cm³ (12.4 US oz, 13.0 Imp oz)**

'04 and '08:

Maximum oil capacity	416 cm³ (14.1 US oz, 14.6 Imp oz)	Slightly stiffer near full compression.
Minimum oil capacity	320 cm³ (10.8 US oz, 11.3 Imp oz)	Slightly softer near full compression.

'05:

Maximum oil capacity	417 cm³ (14.1 US oz, 14.7 Imp oz)	Slightly stiffer near full compression.
Minimum oil capacity	321 cm³ (10.9 US oz, 11.3 Imp oz)	Slightly softer near full compression.

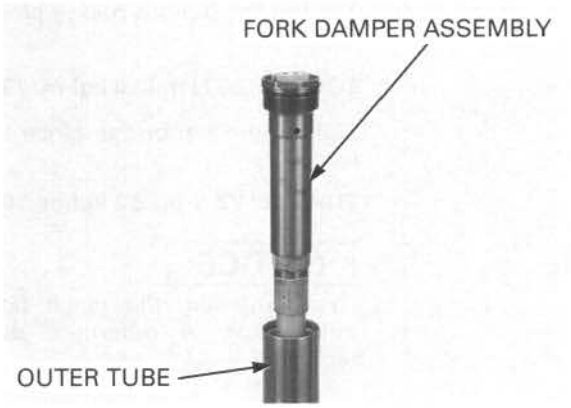
'06, '07:

Maximum oil capacity	413 cm^3 (14.0 US oz, 14.5 Imp oz)	Slightly stiffer near full compression.
Minimum oil capacity	317 cm^3 (10.7 US oz, 11.2 Imp oz)	Slightly softer near full compression.

After '08:

Maximum oil capacity	414 cm^3 (14.0 US oz, 14.6 Imp oz)	Slightly stiffer near full compression.
Minimum oil capacity	318 cm^3 (10.8 US oz, 11.2 Imp oz)	Slightly softer near full compression.

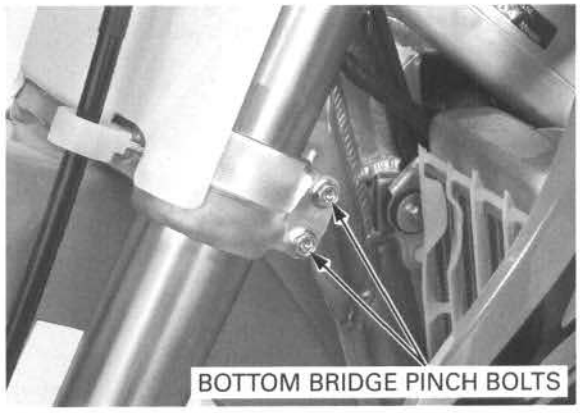
Pull up the outer tube slowly and install the fork damper assembly into the outer tube.



INSTALLATION

Install the fork leg and tighten the bottom bridge pinch bolts to the specified torque.

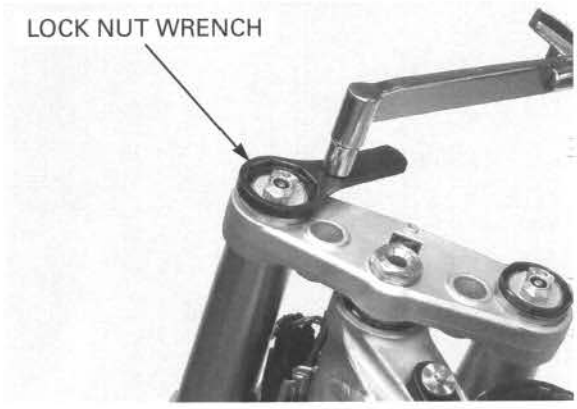
TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)



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

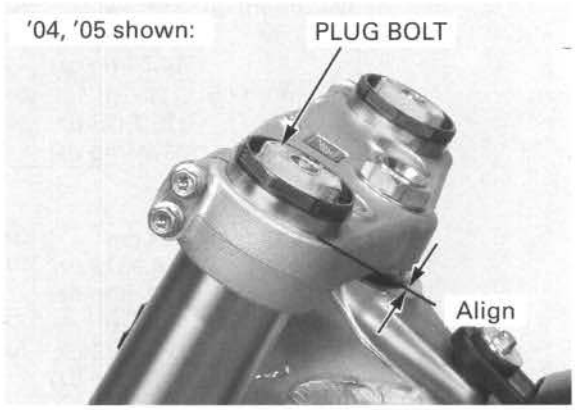
Loosen the bottom bridge pinch bolts.

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.

'04, '05: Align the top of surface of the top bridge with the line in the outer tube.

After '05: Align the top of surface of the top bridge with the top of the outer tube.

'04 – '07: For changing position, see the Owner's Manual.

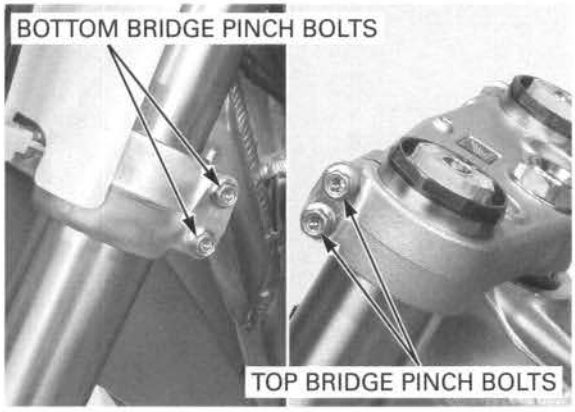


Tighten the bottom bridge pinch bolts to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)

Tighten the top bridge pinch bolts to the specified torque.

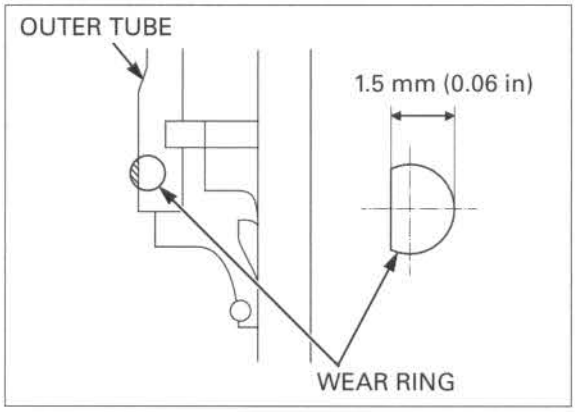
TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)



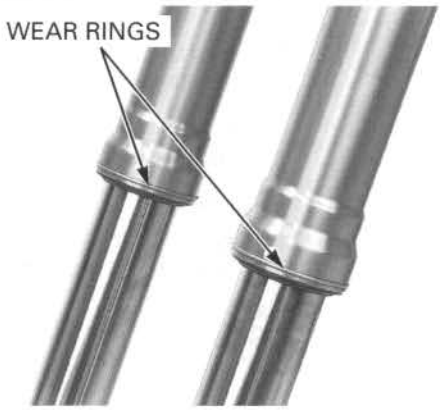
NOTICE

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.



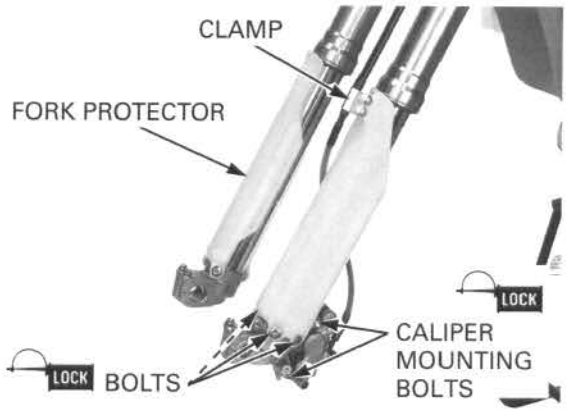
Clean and apply a locking agent to the fork protector mounting bolt threads.
Install the fork protector and tighten the mounting bolts to the specified torque.

TORQUE: 7.0 N·m (0.7 kgf·m, 5.2 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.

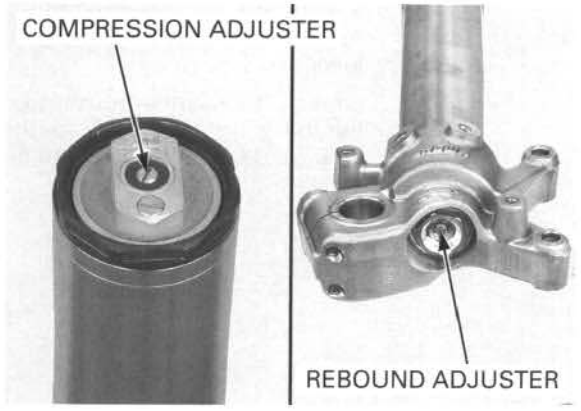
TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

Install the 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 13-16).



HANDLEBAR

REMOVAL

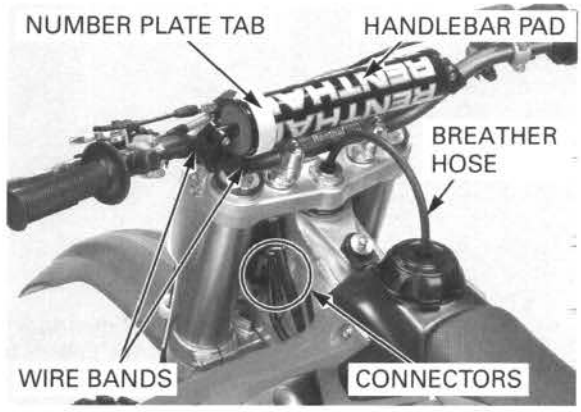
Disconnect the engine stop button connectors.

Unlock the number plate tab from handlebar pad.

Remove the handlebar pad from the handlebar.

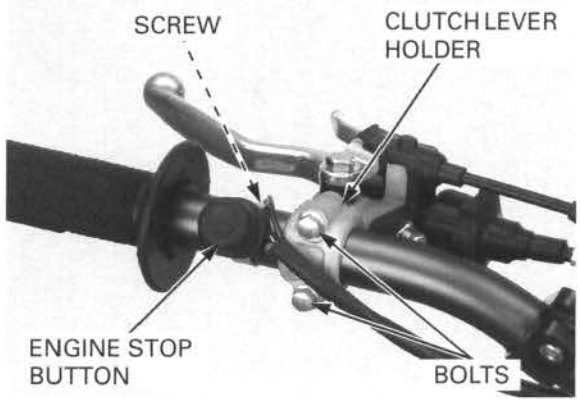
Disconnect the fuel cap breather hose from the stem nut.

Remove the wire bands.



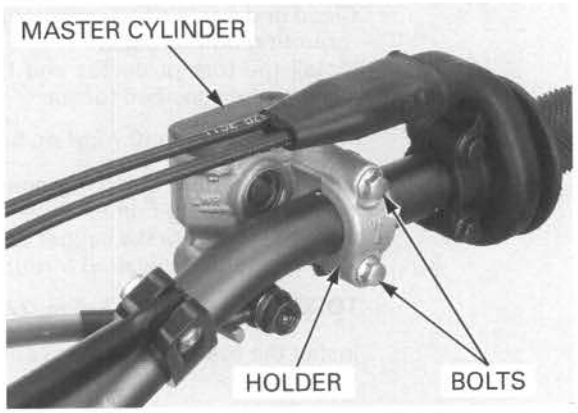
Remove the screw and engine stop button.

Remove the bolts and clutch lever holder.



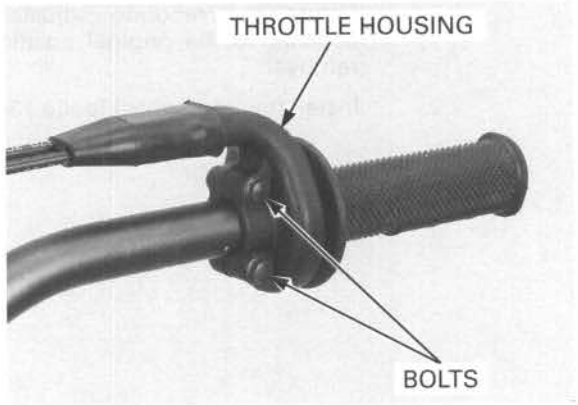
Do not disconnect the hydraulic line.

Remove the bolts and front brake master cylinder holder.

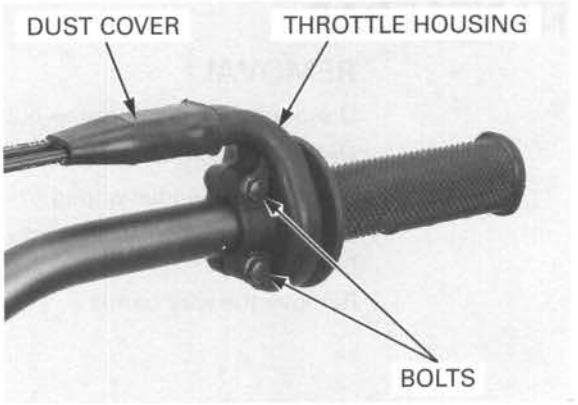


If you will not disassemble the throttle housing, remove the throttle housing as an assembly as follows.

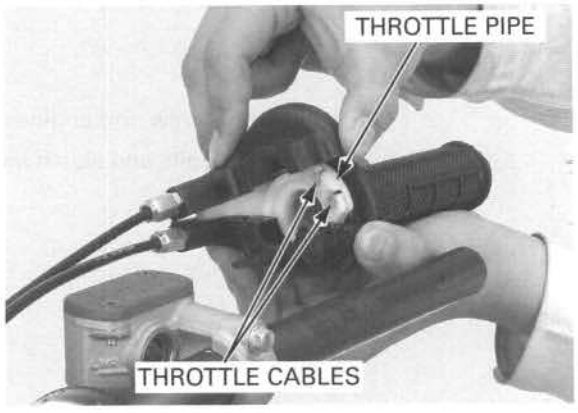
Loosen the throttle housing bolts, turn the handlebar to the right fully, release the throttle cables from their guide, then remove the throttle housing.



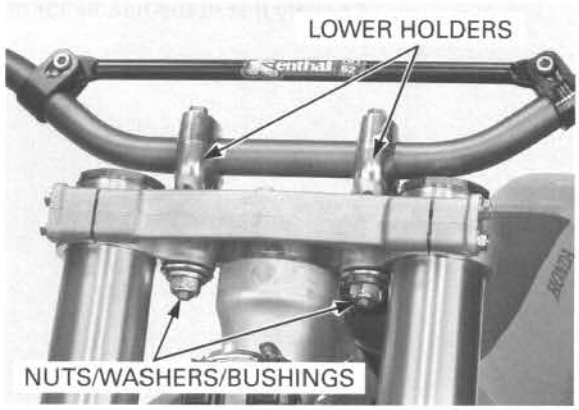
If you will disassemble the throttle housing, remove the dust cover and bolts.



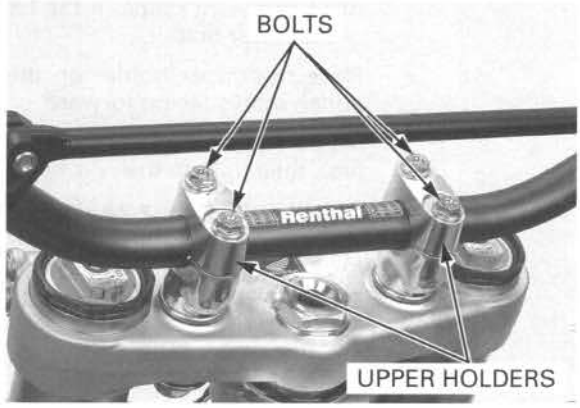
Remove the throttle housing from handlebar. Disconnect the throttle cables to the throttle pipe.



Loosen the handlebar lower holder nuts.



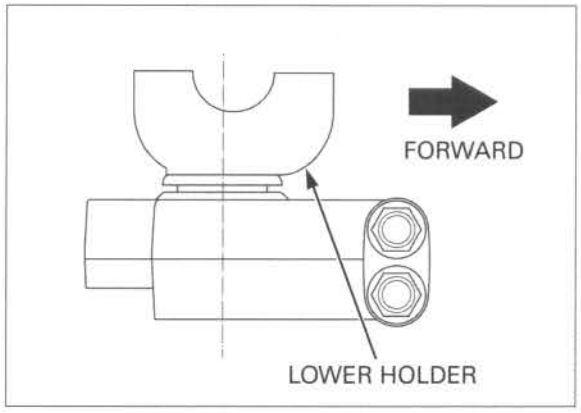
Remove the bolts, upper holders and handlebar. Remove the nuts, washers, bushings and lower holders.



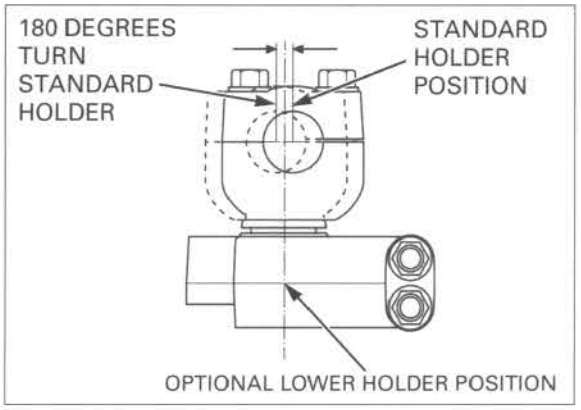
INSTALLATION

Install the bushings, lower holders, washers and handlebar holder nuts as shown (standard position).

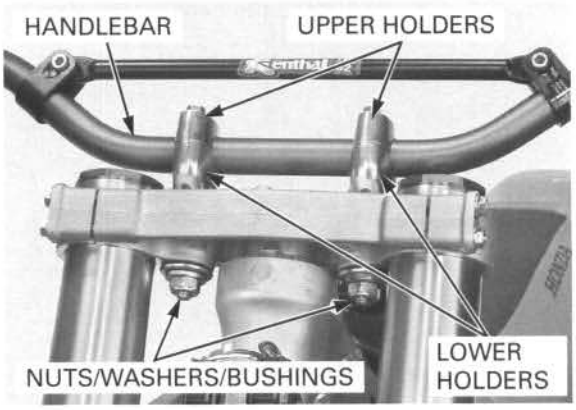
The lower holder standard position as shown.



- 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



Loosely install the handlebar and upper holders.



Align the paint mark on the handlebar with the top of the lower holder.

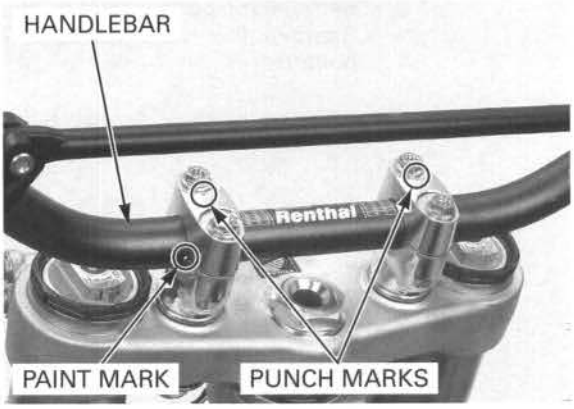
Place the upper holder on the handlebar with the punch marks facing forward.

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.

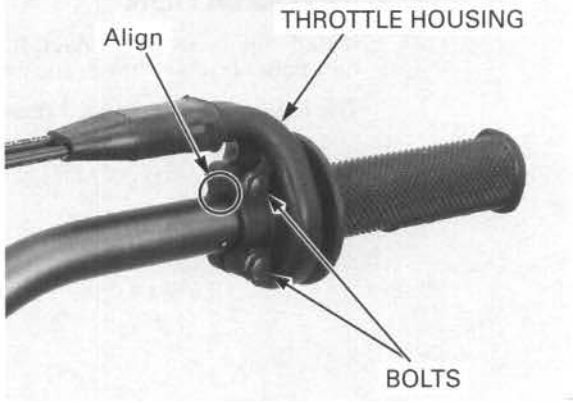
TORQUE: 44 N·m (4.5 kgf·m, 32 lbf·ft)



If you did not disassemble the throttle housing, install it as follows:
Apply oil to the sliding surface of the throttle pipe ('04 – '08).
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.
Place the throttle cables inside their guide.

TORQUE: 8.8 N·m (0.9 kgf·m, 6.5 lbf·ft)

Adjust the throttle grip freeplay (page 4-6).

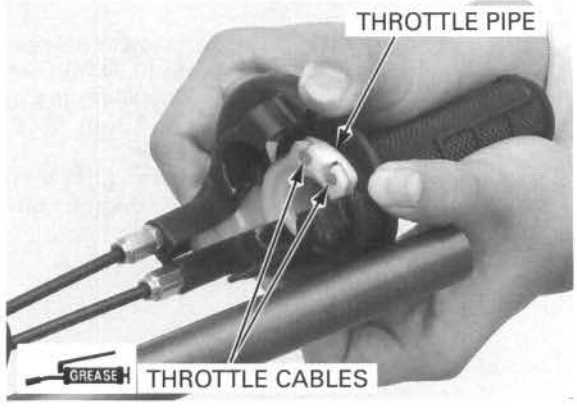


If you disassemble the throttle housing, install it as follows:
Apply grease to the throttle cable sliding surface on the throttle slider and throttle cable ends.
Apply oil to the sliding surface of the throttle pipe ('04 – '08).
Connect the throttle cables to the throttle pipe.
Install the throttle housing, aligning the end of the housing with the mark on the handlebar.
Tighten the upper bolt first, then the lower bolt.

TORQUE: 8.8 N·m (0.9 kgf·m, 6.5 lbf·ft)

Install the throttle housing dust cover.

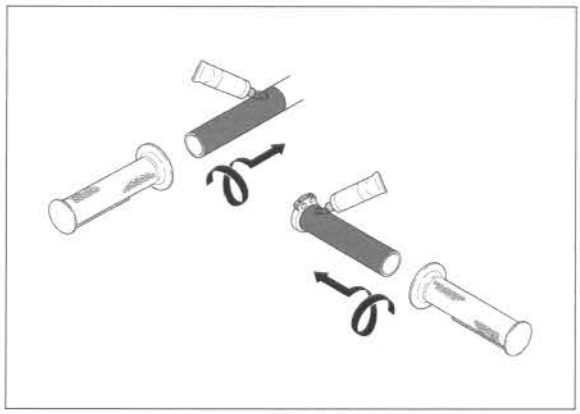
Adjust the throttle grip freeplay (page 4-6).



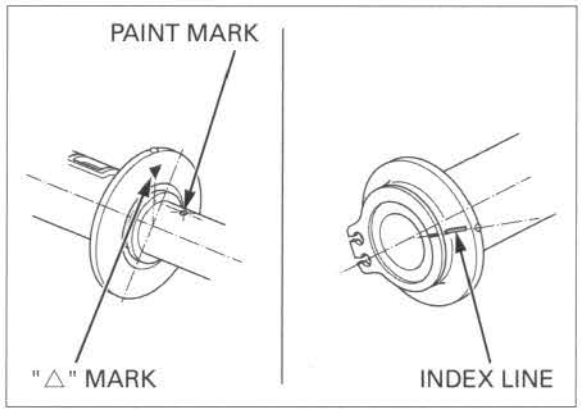
If the handlebar grips are removed, apply Honda Bond A or Pro Honda Hand Grip Cement (U.S.A. only) to the inside of the grip and to the clean surfaces of the right of the throttle pipe and left sides of the handlebar.

Allow the adhesive to dry for approximately 1 hour before using.

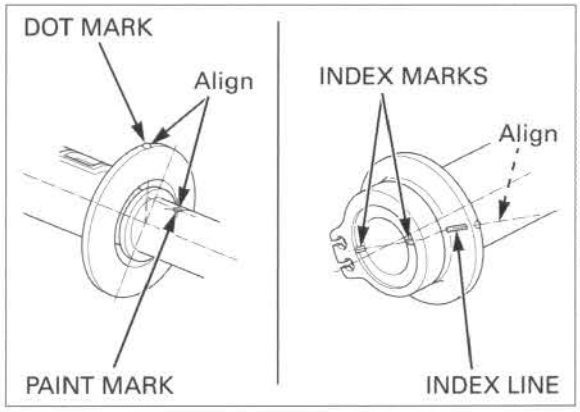
Wait 3 – 5 minutes and install the grip.
Rotate the grips for even application of the adhesive.



'04 – '08: 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.



After '08: Align the dot mark on the left grip with the paint mark on the handlebar.
Align the index line with the index marks on the throttle grip end as shown.

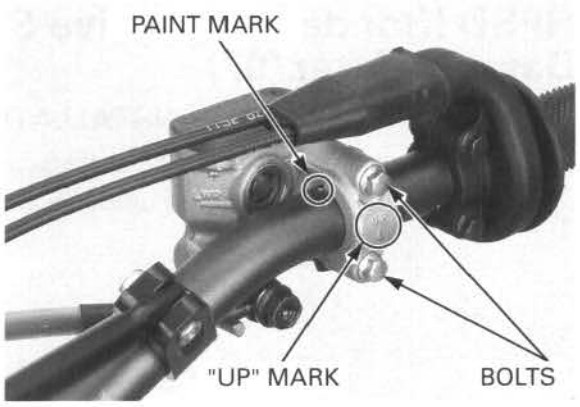


Position the brake master cylinder on the handlebar.

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.

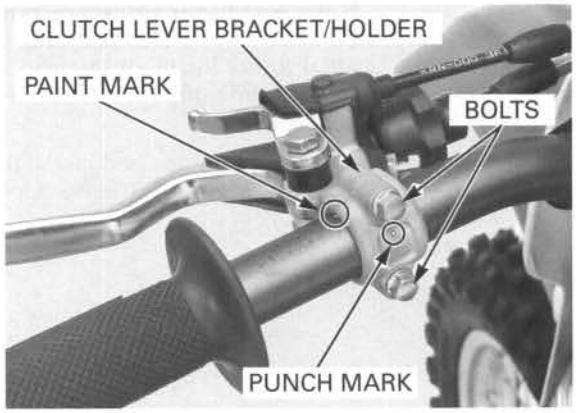
Tighten the upper master cylinder holder bolt first, then tighten the lower bolt.

TORQUE: 9.9 N·m (1.0 kgf·m, 7.3 lbf·ft)



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.

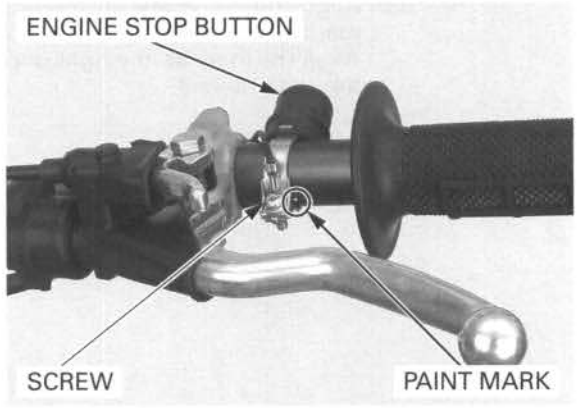
TORQUE: 8.8 N·m (0.9 kgf·m, 6.5 lbf·ft)



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 (0.2 kgf·m, 1.1 lbf·ft)

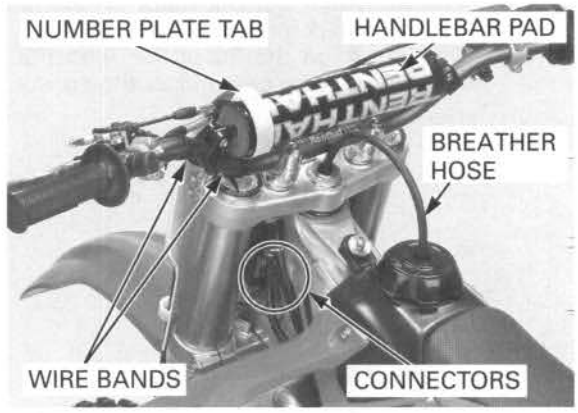


Clamp the engine stop button wire with wire bands.

Route the fuel cap breather hose as shown.

Connect the engine stop button connectors.
Route the number plate tab around the handlebar pad as shown.

Adjust the clutch lever freeplay (page 4-24).

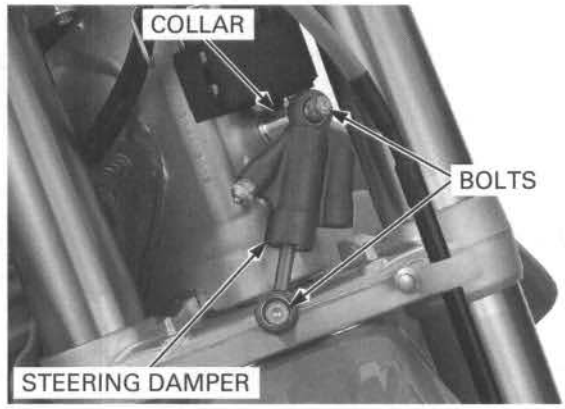


HPSD (Honda Progressive Steering Damper/After '07)

REMOVAL/INSTALLATION

Remove the number plate (page 3-5).

Remove the steering damper bolts, collar and steering damper.



Clean and apply a locking agent to the steering damper bolts.

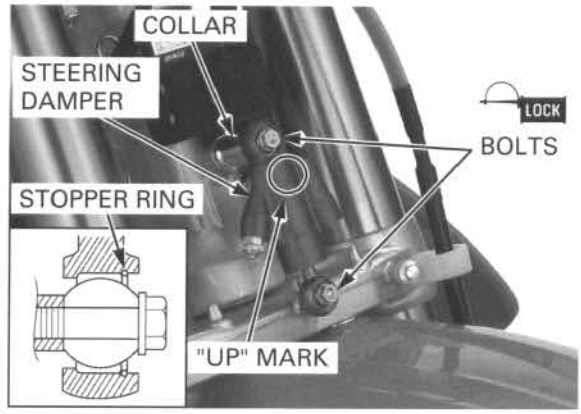
Install the steering damper onto the steering head pipe with its "UP" mark facing up and facing toward the front.

Install the steering damper, collar and bolts.

- Check that the stopper ring side of the damper rod is facing toward the front.

Tighten the steering damper bolts to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)



Raise the front wheel off the ground by placing a workstand or equivalent under the engine.
Check that the steering moves smoothly from side-to-side.

Install the number plate (page 3-5).

INSPECTION

Remove the steering damper (page 13-44).

Visually inspect the steering damper for wear or damage.

Check the following:

- Damper case for deformation or oil leakage
- Damper rod for bending or damage

Replace the damper case or damper rod if necessary.

Measure the damper rod length with the "inside" jaws of a vernier caliper.

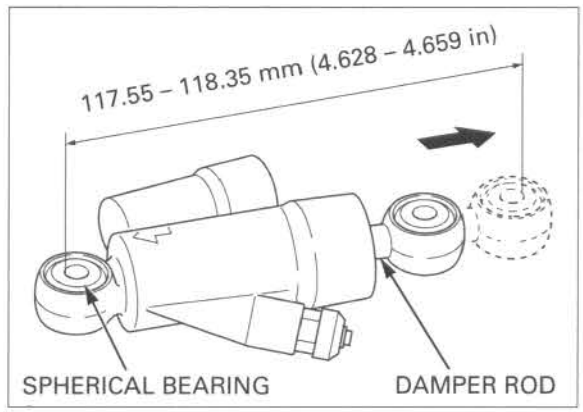
Fully extend and compress the damper rod by hand. Release the damper rod then check that it extends to its maximum length.

STANDARD (maximum length):
117.55 – 118.35 mm (4.628 – 4.659 in)

Check the damper rod for smooth operation.
If the damper rod operation is not smooth, check the damper rod for bends or damage.
If the damper rod does not extend to maximum, disassemble the steering damper (page 13-47).

Check the spherical bearings for wear or damage.
Move the spherical bearing with your finger. The spherical bearing should move smoothly and quietly.
Replace the spherical bearing if it does not move smoothly or quietly.

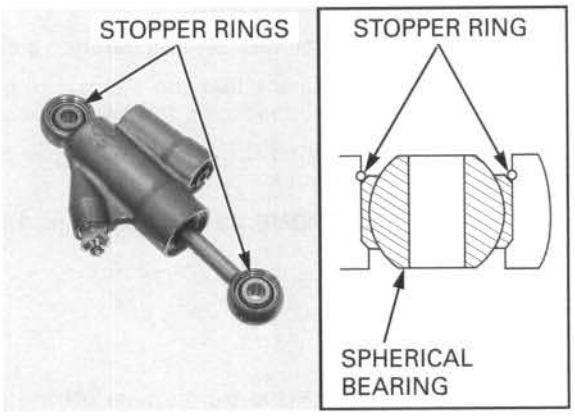
Install the steering damper (page 13-44).



SPHERICAL BEARING REPLACEMENT

Remove the steering damper (page 13-44).

Remove the stopper ring from the damper mount.

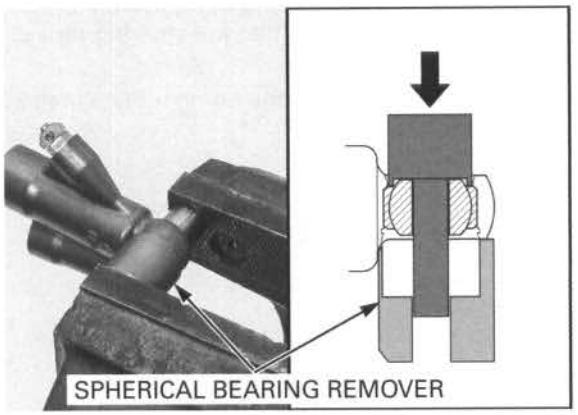


Assemble the special tool and steering damper as shown, then place it in a vise.

TOOL:

Spherical bearing remover	**07AMD-MENA100 (U.S.A. only)**

Gently press the spherical bearing out of the damper.

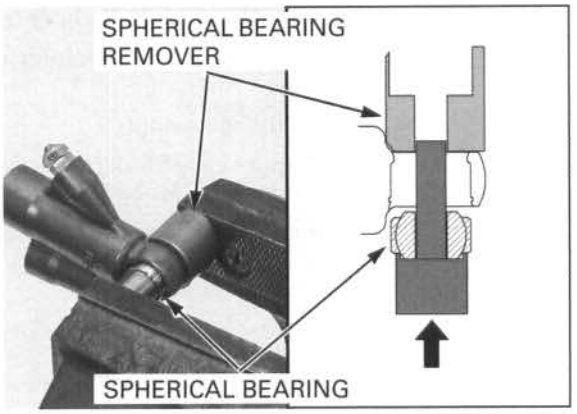


Assemble the special tool and steering damper with a new spherical bearing as shown, then place it in a vise.

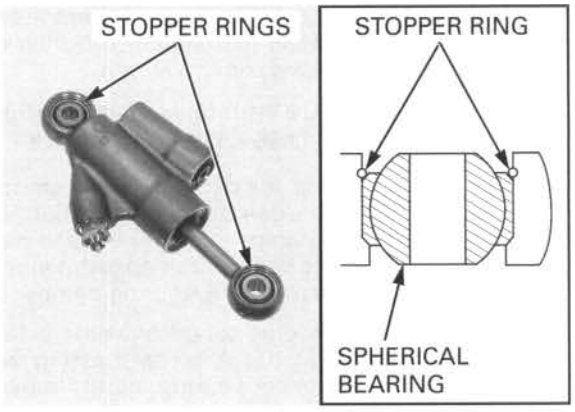
TOOL:

Spherical bearing remover	**07AMD-MENA100 (U.S.A. only)**

Use the pressure of the vise to gently press the bearing back into place.



Install the stopper ring into the groove of the damper mount securely.

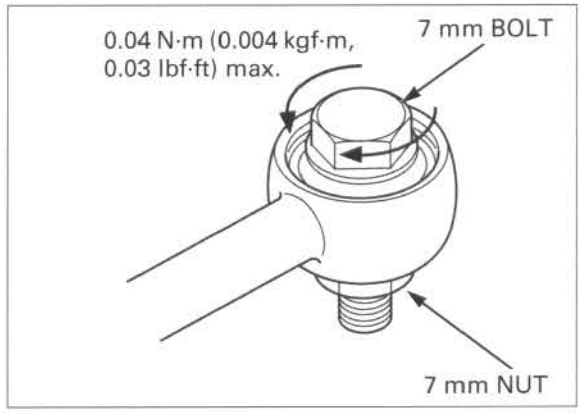


Set a 7 mm bolt and nut to the spherical bearing as shown.

Measure the stabled rotation torque of the spherical bearing inner by rotating the bolt.

STANDARD: 0.04 N·m (0.004 kgf·m, 0.03 lbf·ft) max.

Install the steering damper (page 13-44).



HPSD DISASSEMBLY

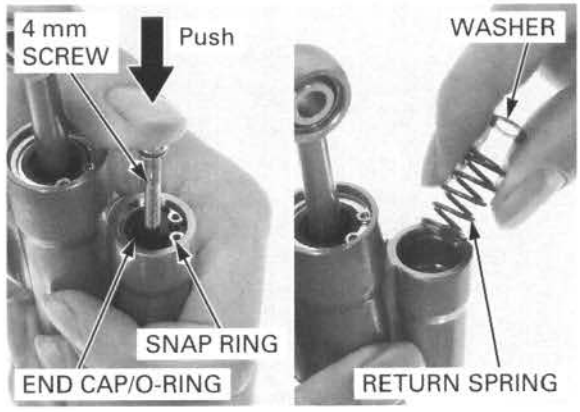
Record the damping force adjuster position.

Remove the steering damper (page 13-44).

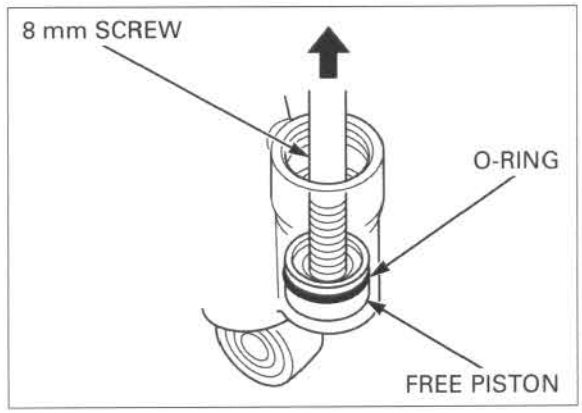
Clean the damper assembly thoroughly.

Install a 4 mm screw to the end cap.
Remove the snap ring while pushing the end cap, and then remove the end cap and O-ring.

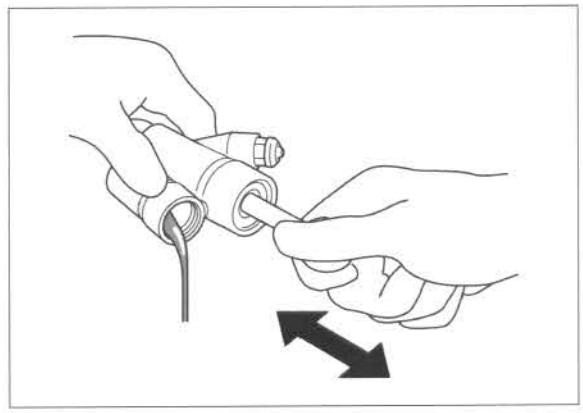
Remove the washer and return spring from the damper case.



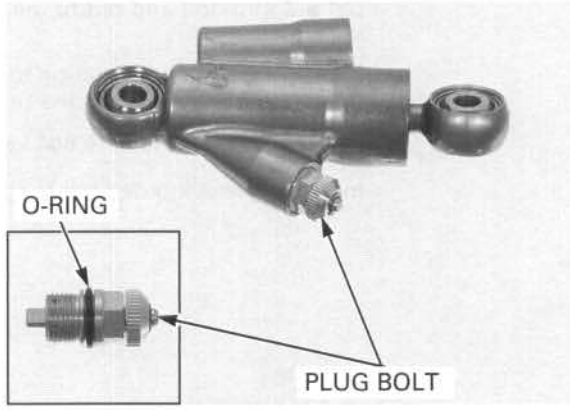
Install a 8 mm screw to the free piston, then remove the free piston and O-ring.



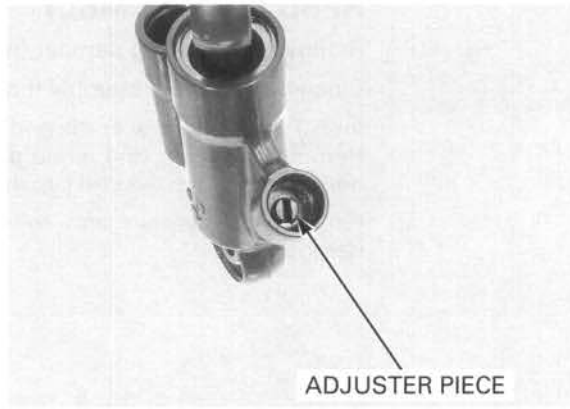
Drain the damper oil from the damper case.



Remove the plug bolt and O-ring.

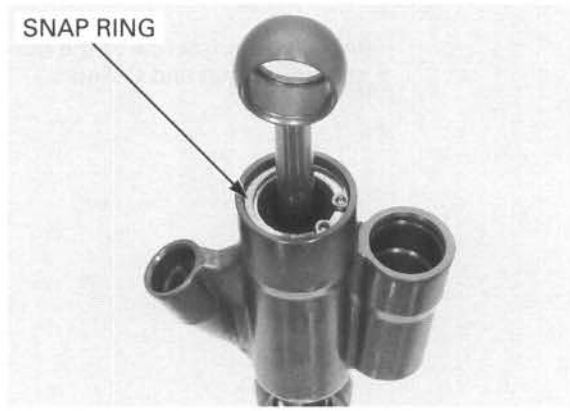


Remove the adjuster piece from the damper case.

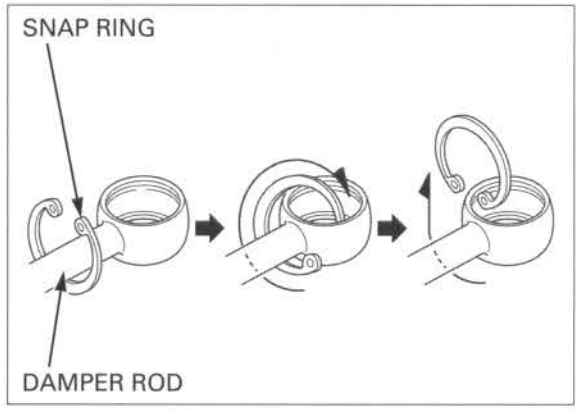


Remove the spherical bearing of the damper rod side (page 13-46).

Remove the snap ring from the damper case groove.



Remove the snap ring from the damper rod as shown.

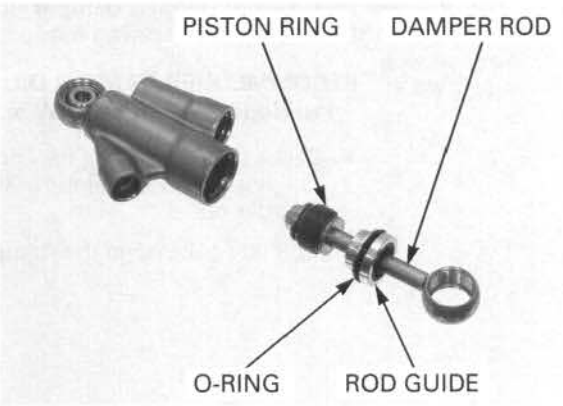


Carefully pull the damper rod and rod guide with the O-ring out of the damper case.

Check the following:

- Rod guide for abnormal scratches
- Damper piston ring for fatigue or damage
- Damper case inner surface for abnormal scratches

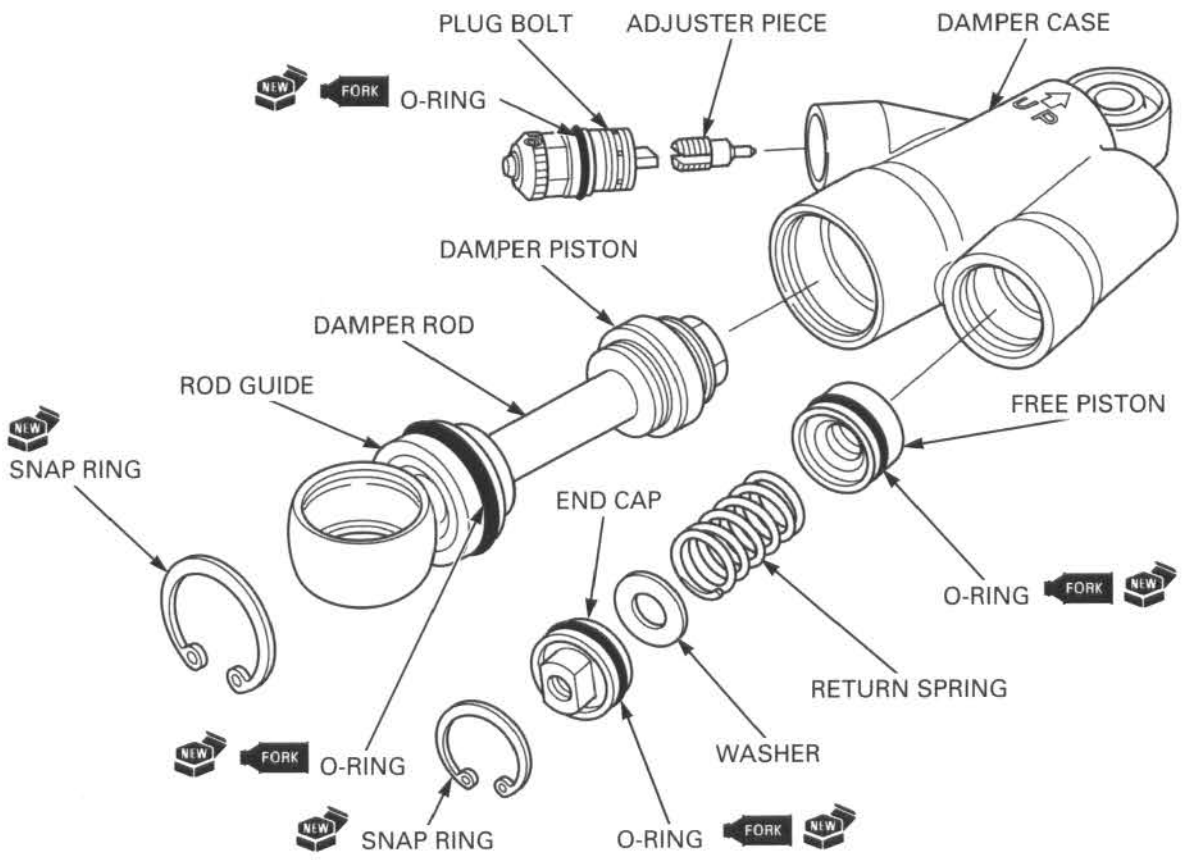
Replace the damper case if necessary.
Replace the damper rod as an assembly if necessary.



HPSD ASSEMBLY

NOTE:

- When assembling the HPSD, follow the procedures below.
- Clean the inner surface of the damper case thoroughly.
- Bleed air from the damper while having it completely submerged in oil.



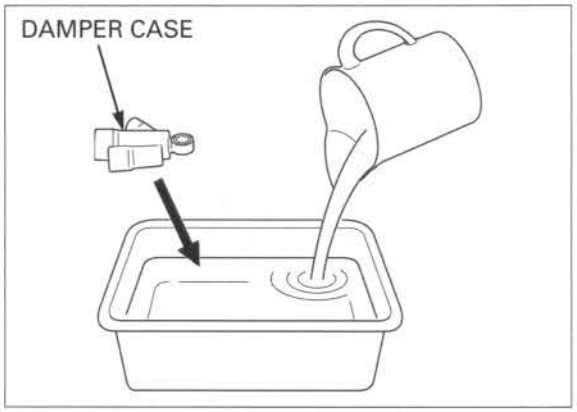
Check that the damper oil temperature is 20°C (68°F).

Pour recommended damper oil into a suitable container until the steering damper is fully submerged.

RECOMMENDED DAMPER OIL:
Pro Honda HP Fork Oil 5W or equivalent

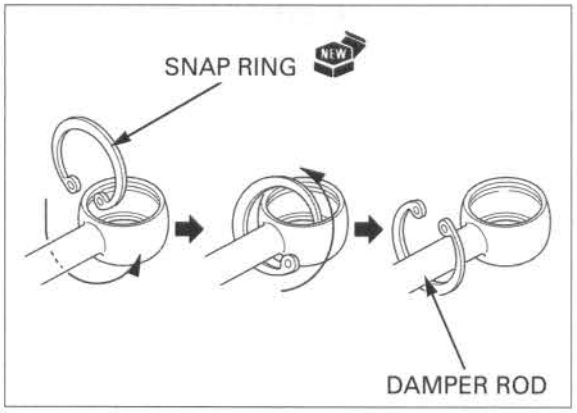
- Check the damper oil for contamination.
- Do not allow foreign materials to enter the damper oil.

Completely submerge the damper in the oil.



Be careful not to damage or deform the snap ring.

Install a new snap ring to the damper rod as shown.



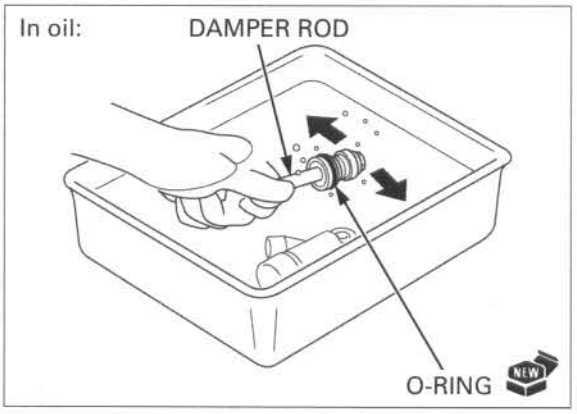
Completely submerge the damper rod in the oil.

Bleed any trapped air at the O-ring seating surface by turning the O-ring.

Install a new O-ring to the rod guide.

Shake the damper rod until there are no air bubbles.

- Be careful not to damage the damper rod and damper piston, especially around the damper rod sliding surface.



Bleed any air out from the damper case and damper piston following the procedure below:

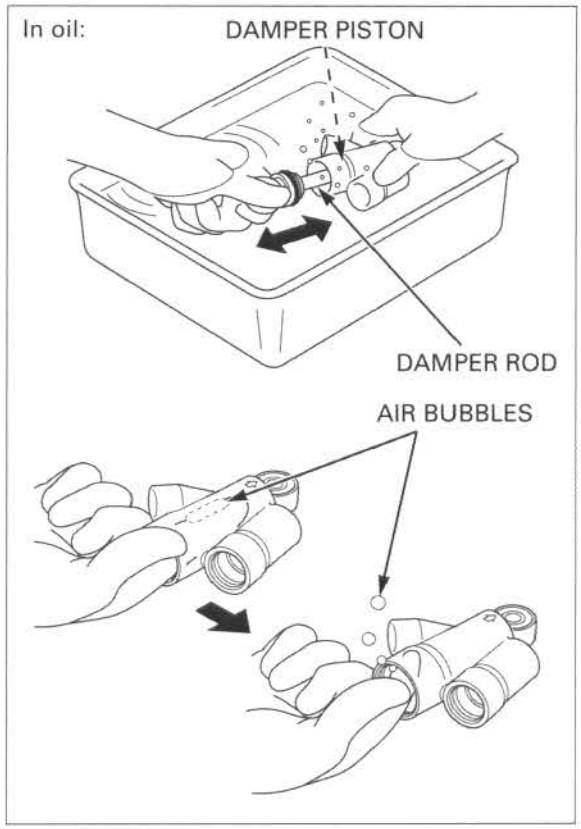
1. Install the damper piston into the damper case, pump the damper rod quickly.

NOTE:

- To open the piston valve, pump the piston rod quickly.

2. Remove the damper piston from the damper case.
3. Bring any air out from the damper case by using your finger as shown.
4. Repeat steps 1 through 3 at least three times until there are no air bubbles in the damper case and damper piston.

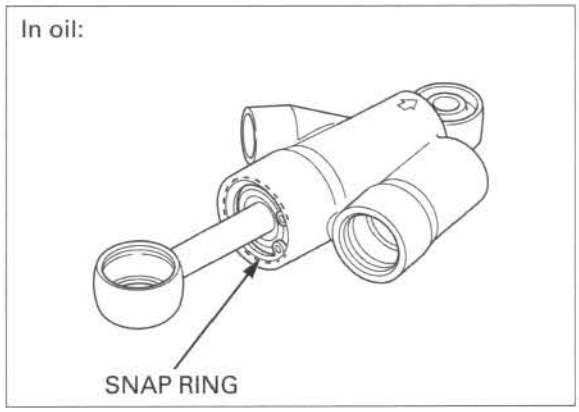
   Install the damper rod into the damper case carefully.



Keep the damper case submerged in oil.

Install the snap ring to the damper case groove.

- Be careful not to damage or deform the snap ring.
- Be certain the snap ring is firmly seated in the groove.



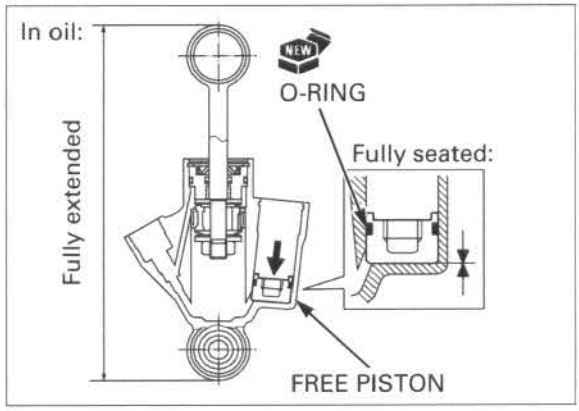
Fully extend the damper rod.

Bleed any trapped air at the O-ring seating surface by turning the O-ring.

Install a new O-ring to the free piston.

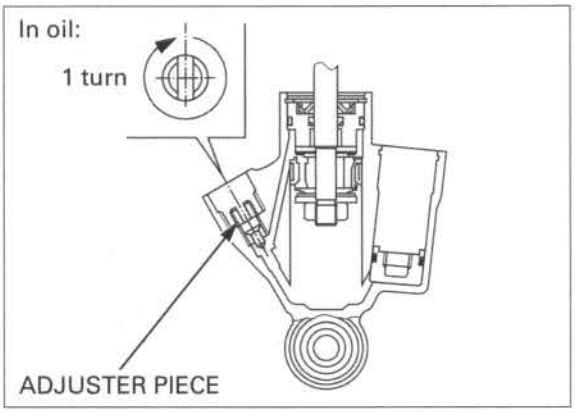
Install and push the free piston fully into the damper case while holding the damper rod at maximum length.

- Check that the free piston is fully seated to the damper case.



Keep the damper assembly submerged in oil.

Install the adjuster piece into the threads of the damper case and thread it one turn.



Check that the damper rod is fully extended to its maximum length.

Bleed any trapped air at the O-ring seating surface by turning the O-ring.

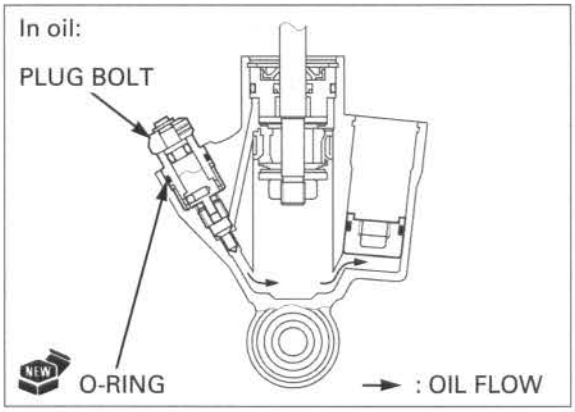
Install a new O-ring to the plug bolt.

Make sure the adjuster knob moves freely before tightening the plug bolt.

Install and tighten the plug bolt securely.

NOTE:

Oil is displaced as the adjuster piece and plug bolt are installed into the damper case. The displaced oil causes the free piston to move slightly as shown in the illustration.

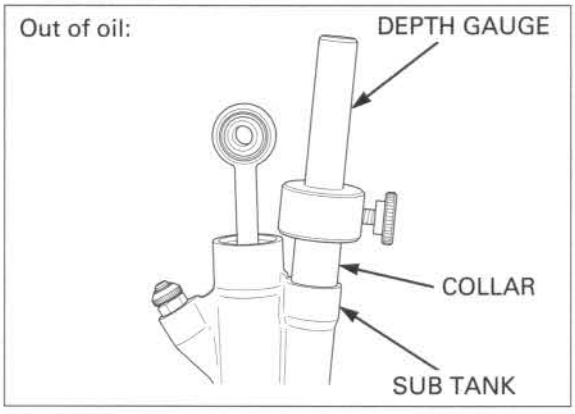


Remove the steering damper from the oil.
Drain the damper oil from the sub tank.

Gauge the depth between the spring seating surface of the free piston and surface of the damper case using the special tool as shown.

TOOL:

Depth gauge	**07AMJ-MENA100 (U.S.A. only)**

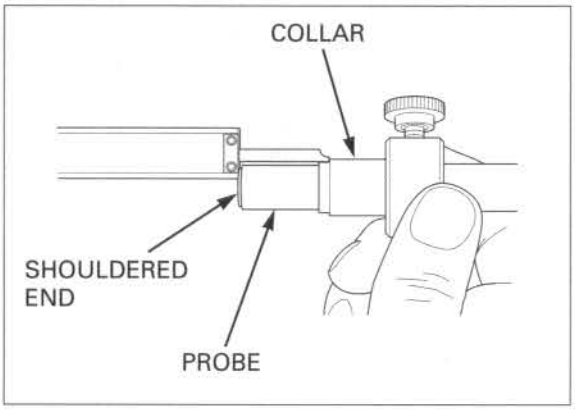


Before using the tool, make sure that the shouldered end of the probe is extending from the collar side of the depth gauge.

Insert the collar of the depth gauge into the sub tank. Loosen the thumb screw and lower the shouldered end of the probe until it stops. Tighten the thumb screw and remove the tool.

Measure the depth of the free piston with a caliper by measuring the distance between the end of the probe and the collar.

STANDARD:
27.3 – 27.9 mm (1.07 – 1.10 in)
at oil temperature 20°C (68°F)



Measure the oil temperature.

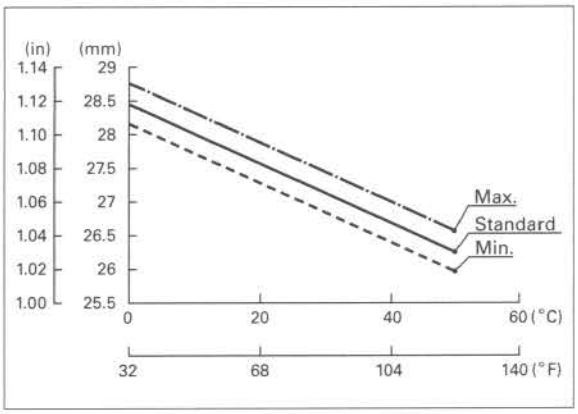
If measured temperature is other than 20°C (68°F), refer to the oil chart (page 13-53).

If the measured depth is other than the standard length, disassemble the steering damper and start over.

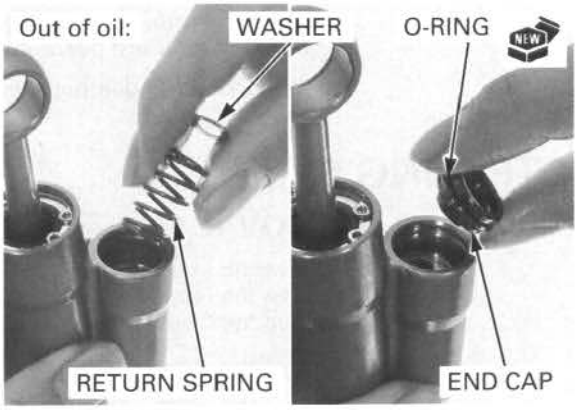
The depth of the free piston will change according to the oil temperature as shown.

unit: mm (in)

		Depth		
		Max.	Standard	Min.
°C/°F	0/32	28.8 (1.13)	28.5 (1.12)	28.2 (1.11)
	10/50	28.3 (1.11)	28.4 (1.10)	27.7 (1.09)
	20/68	27.9 (1.10)	27.6 (1.09)	27.3 (1.07)
	30/86	27.5 (1.08)	27.2 (1.07)	26.9 (1.06)
	40/104	27.0 (1.06)	26.7 (1.05)	26.4 (1.04)
	50/122	26.6 (1.05)	26.3 (1.04)	26.0 (1.02)

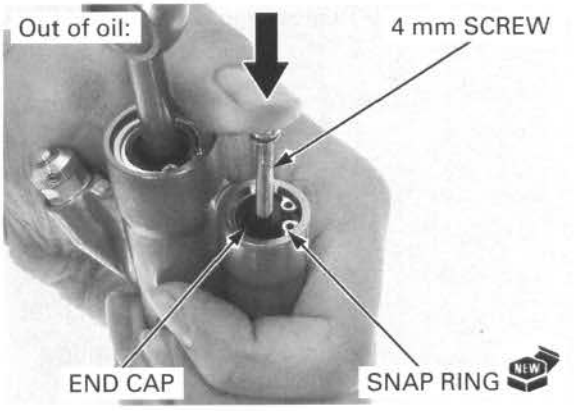


Install the return spring and washer into the damper case.
Apply damper oil to a new O-ring and install it to the end cap groove.
Install the end cap.



Be certain the snap ring is firmly seated in the groove.

Thread a 4 mm screw to the end cap and install a new snap ring to the damper case while pushing the end cap until the snap ring groove appear.



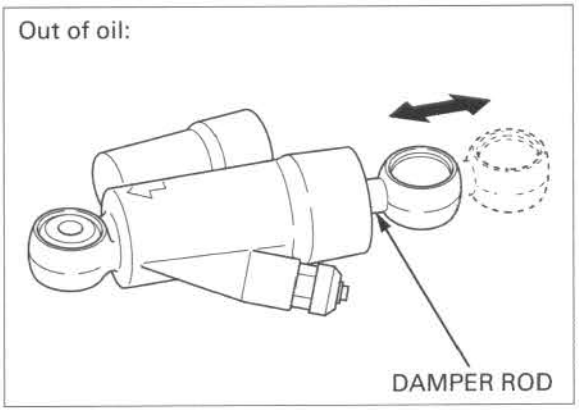
Check the operation of the damper rod, by pumping it slowly; extending and compressing by hand.

Check the following:

- Oil leakage
- Abnormal noise by trapped air

If you hear an abnormal noise, caused by trapped air, reassemble the steering damper.

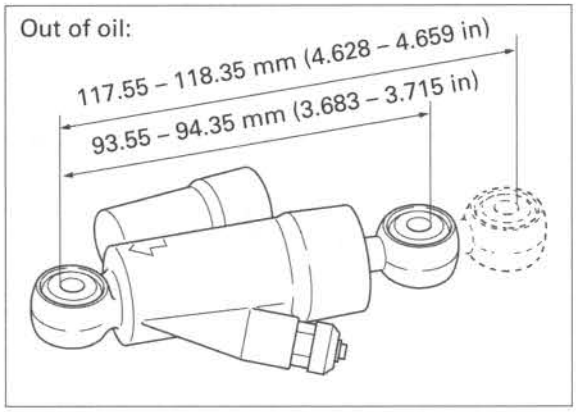
Install the damper rod side spherical bearing (page 13-46).



Measure the damper rod length with the inside jaws of a vernier caliper.

Measure the length between the spherical bearings as shown:

STANDARD:
Fully compressed damper rod length:
93.55 – 94.35 mm (3.683 – 3.715 in)
Fully extended damper rod length:
117.55 – 118.35 mm (4.628 – 4.659 in)



If the measured lengths are outside the standard length, disassemble the steering damper and start over.

NOTE:
The HPSD will not work correctly if the fully compressed damper rod length is more than standard.

Return the damping force adjuster to its original position, for standard position (page 13-5).

Install the steering damper (page 13-44).

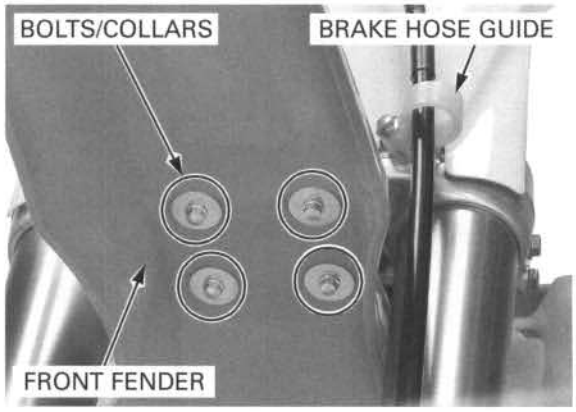
STEERING STEM

REMOVAL

Remove the number plate (page 3-5).
Remove the handlebar (page 13-39).
Remove the front wheel (page 13-10).

After '07: Remove the steering damper (page 13-44).

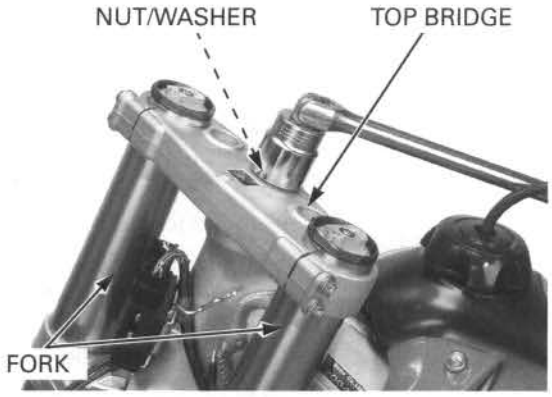
Remove the bolts, collars and front fender.
Remove the bolt and brake hose guide.



Remove the steering stem nut and washer.

Remove the fork (page 13-19).

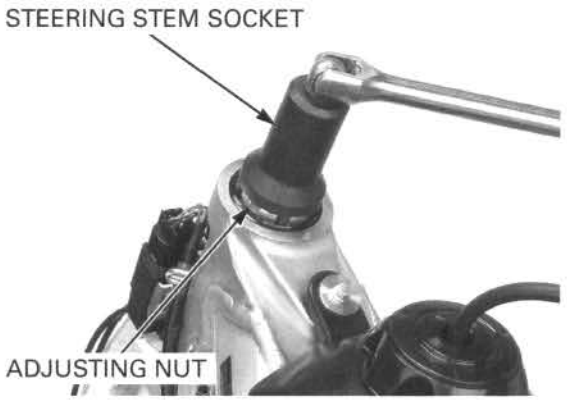
Remove the fork top bridge.



Remove the steering stem adjusting nut using the special tool.

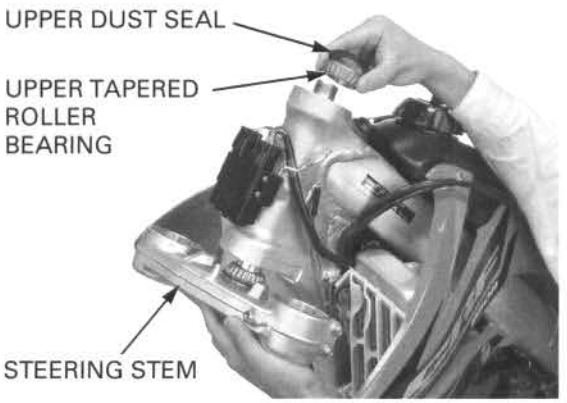
TOOL:

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.



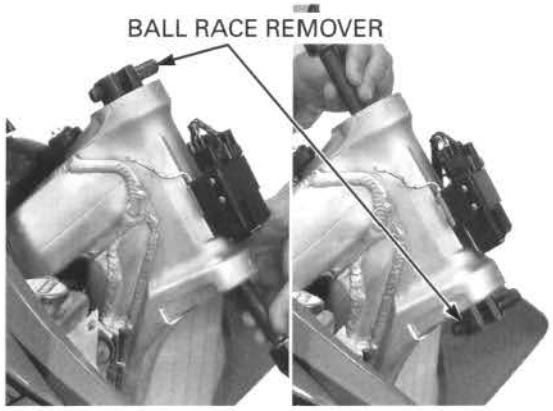
BEARING REPLACEMENT

Always replace the bearings and races as a set.

Remove the upper and lower bearing outer races from the head pipe using the special tools.

TOOL:

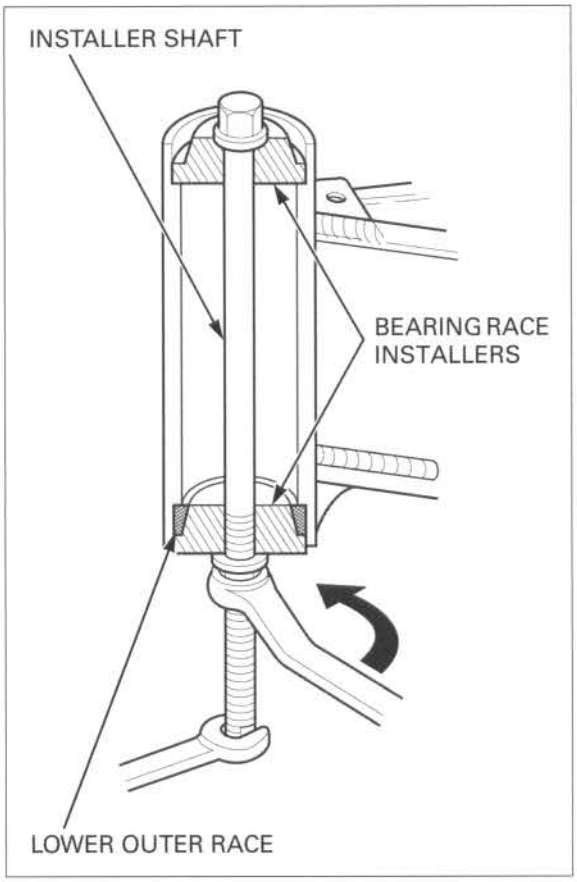
Ball race remover	**07946-3710500**



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:

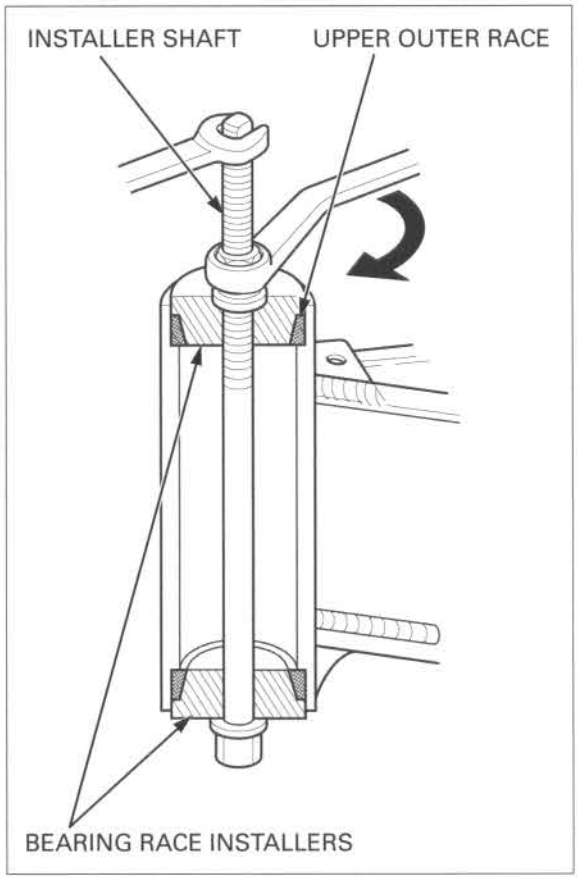
Bearing race installer (2 required)	**07VMF-KZ30100**
Installer shaft	**07VMF-KZ30200**



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.

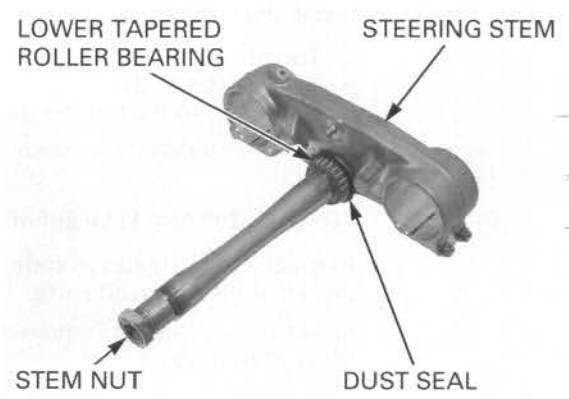
TOOLS:

Bearing race installer (2 required)	**07VMF-KZ30100**
Installer shaft	**07VMF-KZ30200**



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.

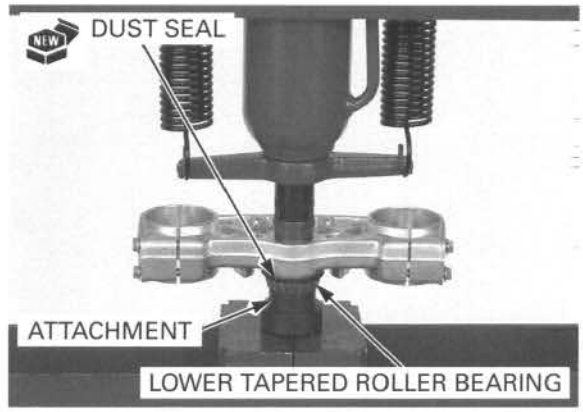


Install a new dust seal.

Install the lower bearing using a hydraulic press and the special tool as shown.

TOOL:

Attachment, 30 mm I.D.	**07746-0030300**



INSTALLATION

NOTE:

- Use water resistant grease #2 (urea based multi-purpose grease) for the steering bearings and dust seals:
  - Excelite EP2 (Kyodo Yushi)
  - Stamina EP2 (Shell) or equivalent

Pack the upper and lower tapered roller bearings with grease.
Apply grease 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 head adjusting nut.

Tighten the steering stem adjusting nut to the specified torque using the special tool.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

TOOL:

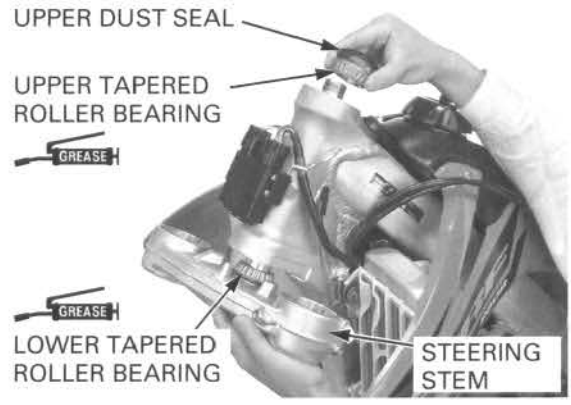
Steering stem socket	**07916-3710101 or 07702-0020001 (U.S.A. only)**

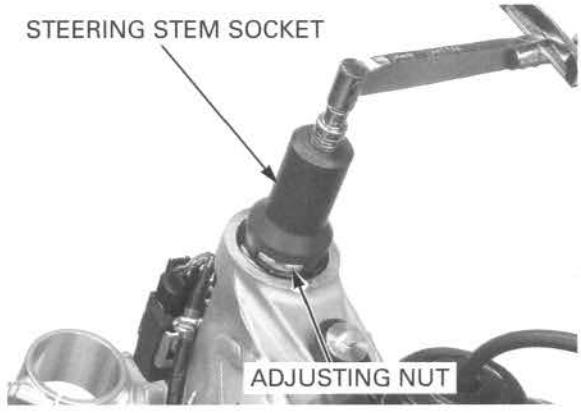
Move the steering stem lock-to-lock several times to seat the bearings.

Loosen the steering stem adjusting nut and retighten the nut to the specified torque.

TORQUE: 7.0 N·m (0.7 kgf·m, 5.2 lbf·ft)

Recheck that the steering stem moves smoothly without play or binding.





Install the following:

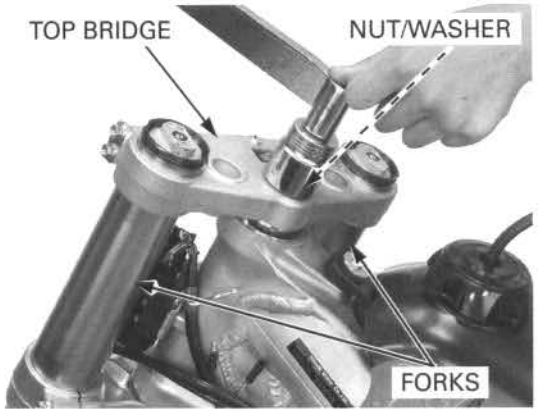
- Top bridge
- Forks (page 13-37)
- Washer onto the top bridge

Install and tighten the stem nut to the specified torque.

TORQUE: 108 N·m (11.0 kgf·m, 80 lbf·ft)

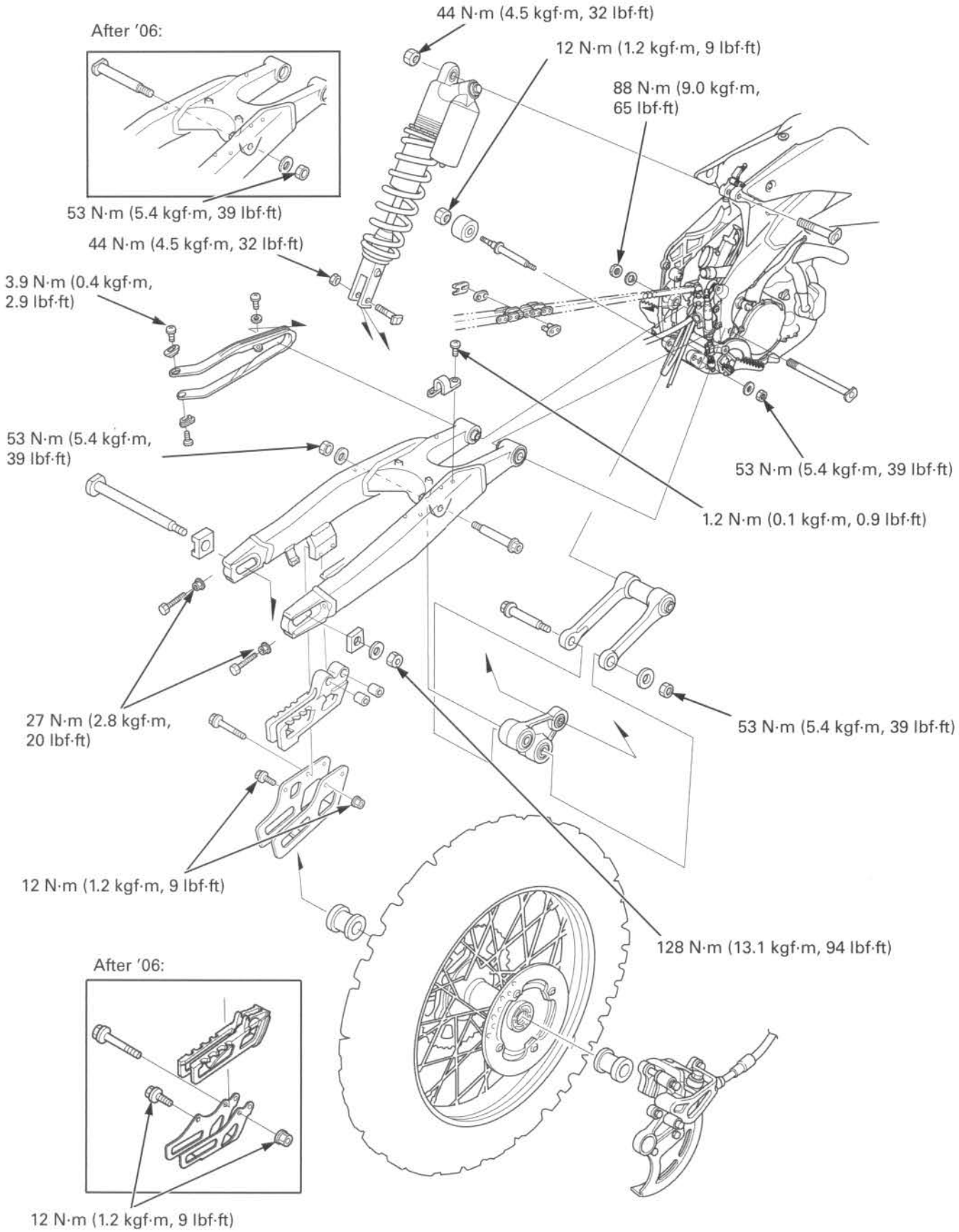
Recheck the steering stem adjustment before installing the removed parts.

Install the remaining removed parts in the reverse order of removal.



14. 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.

- Brake dust may contain asbestos fibers.
- Never use an air hose or dry brush to clean brake assemblies.
- 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).
- Refer to page 15-3 for brake system information.
- Use genuine Honda replacement bolts and nuts for all suspension pivot and mounting points.

SPECIFICATIONS

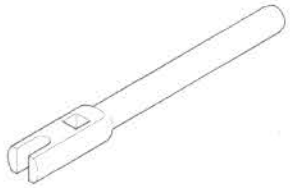
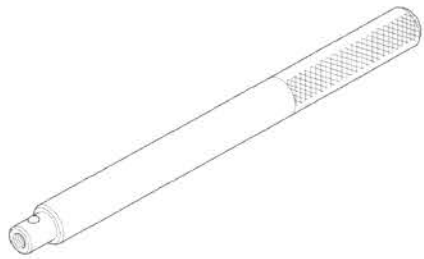
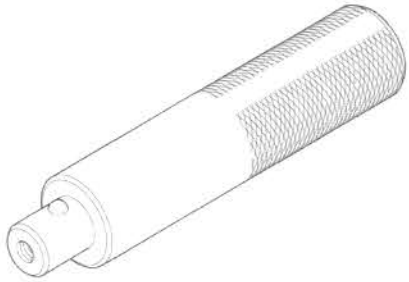
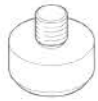
Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cold tire pressure			98 kPa (1.0 kgf/cm^2, 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			48.75 ± 1.00 (1.919 ± 0.039)	–
Drive chain slack			25 – 35 (1.0 – 1.4)	50 (2.0)
Drive chain size/link	DID	'04 – '08	520DMA2 - 114	–
		After '08	520DMA4 - 114	–
	RK (After '07)		520TXZ - 114	–
Drive chain slider thickness			–	5.0 (0.2)
Drive chain roller O.D.	'04		–	39 (1.5)
	After '04	Upper	–	38 (1.5)
		Lower	–	31 (1.2)
Shock absorber	Damper gas pressure		980 kPa (10.0 kg/cm^2, 142 psi)	–
	Damper compressed gas		Nitrogen gas	–
	Recommended shock oil		Pro-Honda HP Fork oil 5W or equivalent	–
	Damper rod compressed force at 12 mm compressed		20.0 – 24.0 kgf (44.1 – 52.9 lbf)	–
	Spring installed length (standard)	'04	260.1 (10.24)	–
		'05	261.3 (10.29)	–
		'06 – '07	259.0 (10.20)	–
		'08	259.6 (10.22)	–
		After '08	258.1 (10.16)	–
High speed side compression damping adjuster standard position		'04	1-7/12 – 2-1/12 turns out from full in	–
		'04 – '08	1-3/4 – 2-1/4 turns out from full in	–
		After '08	1-5/6 – 2-1/3 turns out from full in	–
Low speed side compression damping adjuster standard position		'04, '05	7 clicks out from full in	–
		'06, '07	9 clicks out from full in	–
		'08	14 clicks out from full in	–
		After '08	11 clicks out from full in	–
Rebound damping adjuster standard position		'04	8 – 11 clicks out from full in	–
		'05 – '08	7 – 10 clicks out from full in	–
		After '08	9 – 12 clicks out from full in	–

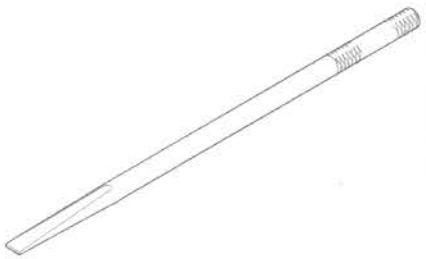
TORQUE VALUES

Rear axle nut	128 N·m (13.1 kgf·m, 94 lbf·ft)	U-nut
Rear spoke	3.7 N·m (0.4 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, 32 lbf·ft)	
Shock absorber upper mounting nut	44 N·m (4.5 kgf·m, 32 lbf·ft)	U-nut
Shock absorber lower mounting nut	44 N·m (4.5 kgf·m, 32 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	30 N·m (3.1 kgf·m, 22 lbf·ft)	
Shock absorber spring adjuster lock nut	44 N·m (4.5 kgf·m, 32 lbf·ft)	
Drive chain upper roller bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Drive chain lower roller nut	12 N·m (1.2 kgf·m, 9 lbf·ft)	U-nut
Shock arm nut (swingarm side)	53 N·m (5.4 kgf·m, 39 lbf·ft)	U-nut, Apply oil to the threads and flange surface
(shock link side)	53 N·m (5.4 kgf·m, 39 lbf·ft)	U-nut, Apply oil to the threads and flange surface
Shock link nut	53 N·m (5.4 kgf·m, 39 lbf·ft)	U-nut, Apply oil to the threads and flange surface
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 (0.1 kgf·m, 0.9 lbf·ft)	
Drive chain adjusting bolt lock nut	27 N·m (2.8 kgf·m, 20 lbf·ft)	UBS nut

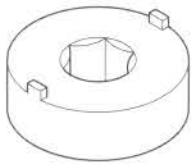
TOOLS

Spoke wrench, 6.6 mm 070MA-KZ30100 	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

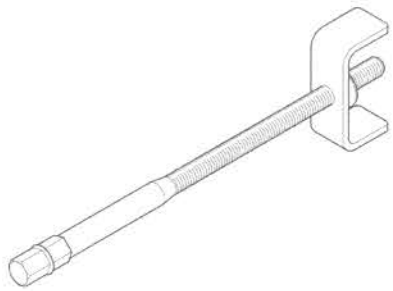


Retainer wrench, 48 x 15 mm
07YMA-KZ40100

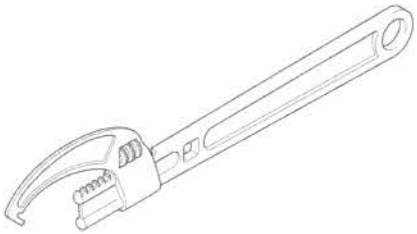


or 07HMA-KS70100 (U.S.A. only)

Retainer wrench body
07710-0010401



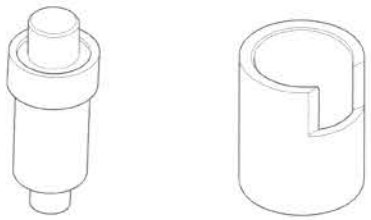
Pin spanner (2 required)
07702-0020001



or Pin spanner A
89201-KS6-810 (2 required)

Piston ring guide
070MG-KZ30100

Collar, 23 x 17 mm
07GMD-KT8A110 (U.S.A. only)



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

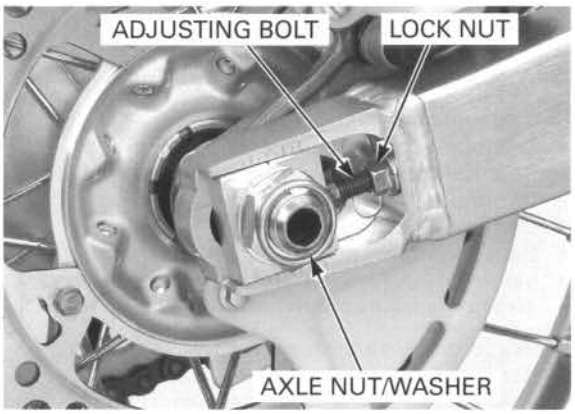
REAR WHEEL

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.

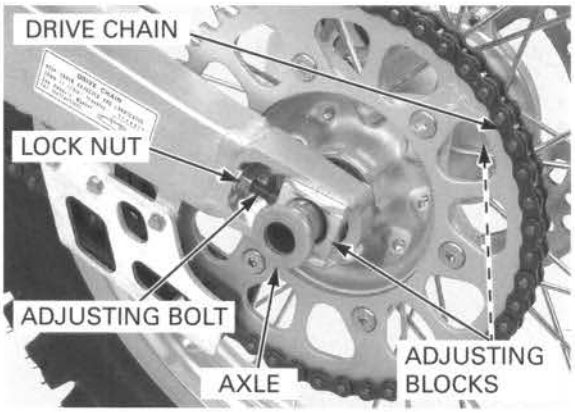


Push the rear wheel forward to derail the drive chain from the driven sprocket.

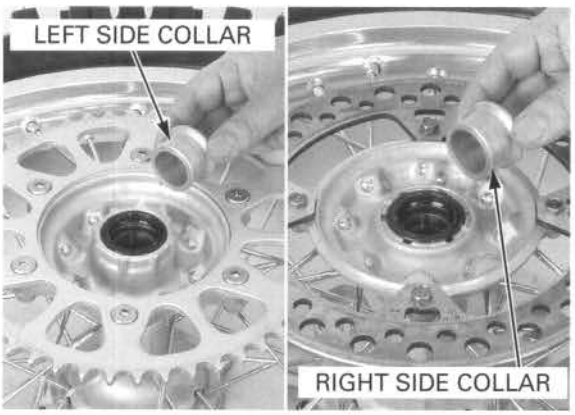
Be careful not to damage the brake pads with disc.

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.

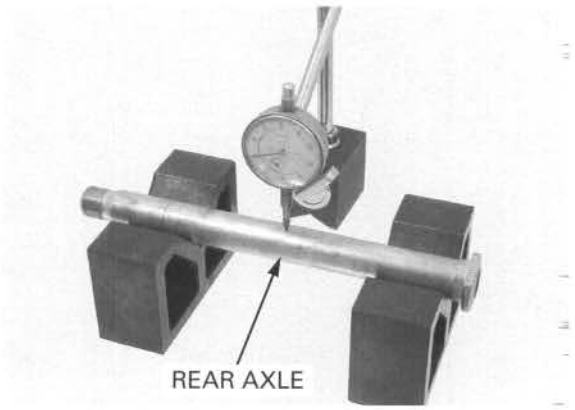


INSPECTION

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)

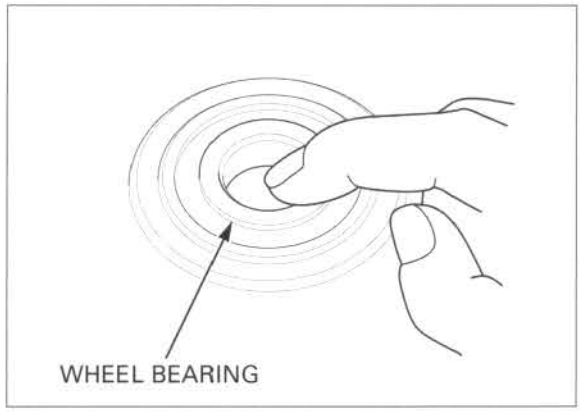


WHEEL BEARING

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.

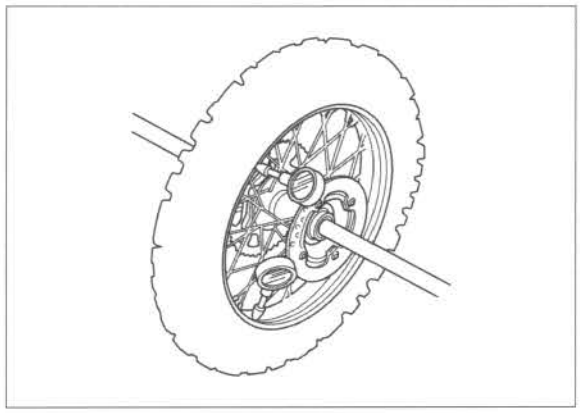


WHEEL RIM RUNOUT

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.

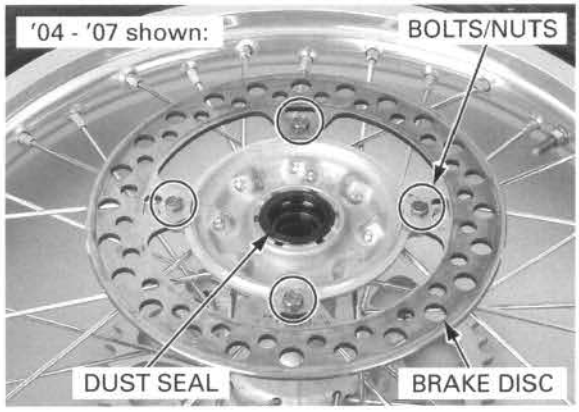
SERVICE LIMITS:
Radial: 2.0 mm (0.08 in)
Axial: 2.0 mm (0.08 in)

Check the spokes and tighten any that are loose.

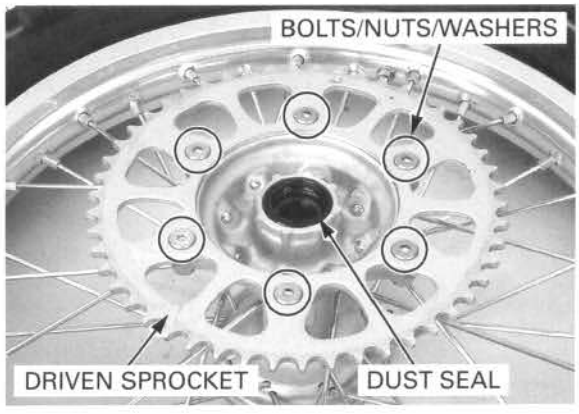


DISASSEMBLY

Remove the bolts, nuts and brake disc.
Remove the right dust seal.



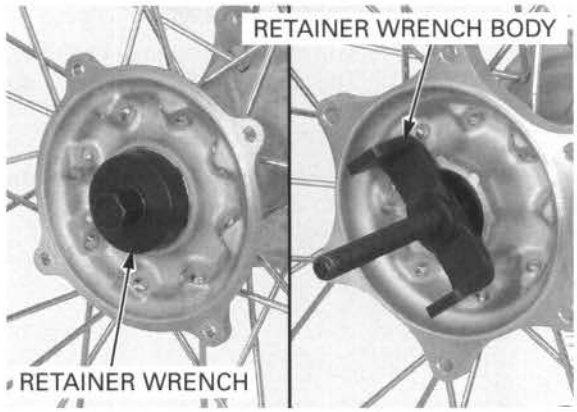
Remove the driven sprocket bolts, nuts and washers.
Remove the driven sprocket.
Remove the left dust seal.



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.

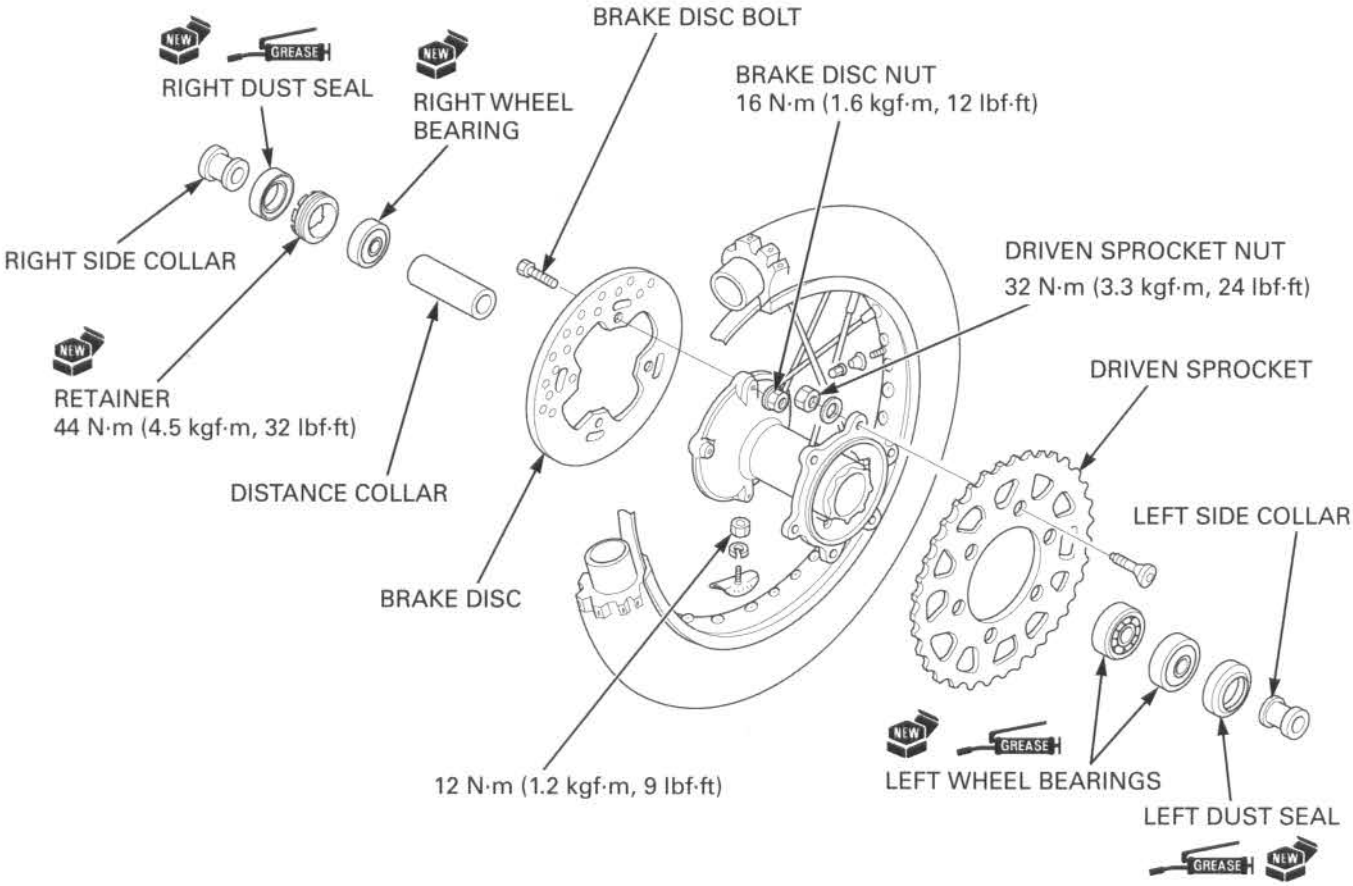
TOOLS:

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

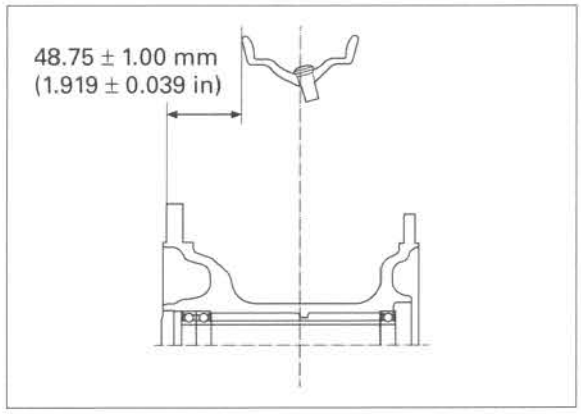
'04 - '07 shown:



Place the rim on a work bench, with its directional arrow facing counterclockwise.

Place the hub in the center of the rim, and begin lacing with new spokes.

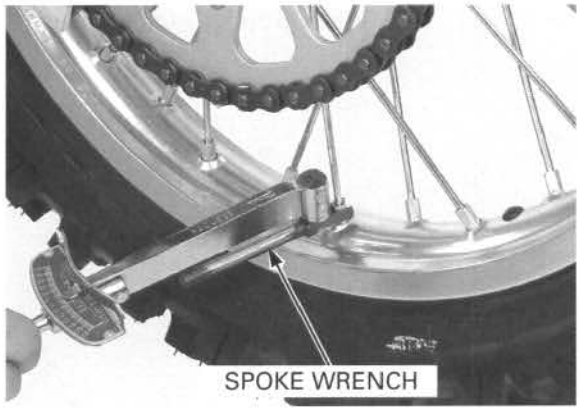
Adjust the hub position so the distance from the hub left end surface to the side of the rim is 48.75 ± 1.00 mm (1.919 ± 0.039 in) as shown.



Torque the spoke in two or three progressive steps.

TOOL:
Spoke wrench, 6.6 mm **070MA-KZ30100**

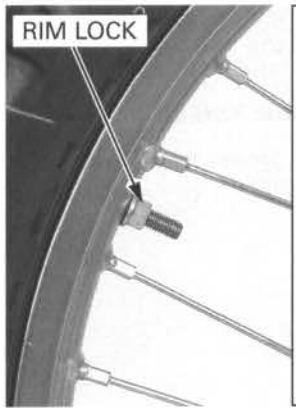
TORQUE: 3.7 N·m (0.4 kgf·m, 2.7 lbf·ft)

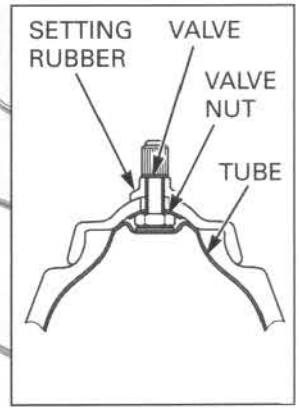


Install the rim lock, rim band, tube and tire.

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 new right bearings using the special tools.

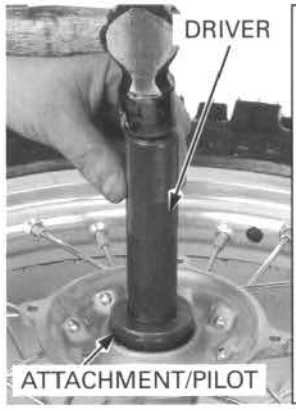
TOOLS:

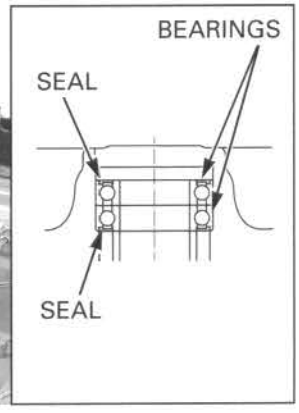
Driver	**07749-0010000**
Attachment, 40 x 42 mm	**07746-0010900**
Pilot, 25 mm	**07746-0040600**

NOTE:
Drive the right bearing in the wheel hub until it is fully seated.

Pack all bearing cavities with grease.

Install the distance collar into place, then drive the left inner and outer bearings using the same tools as shown.



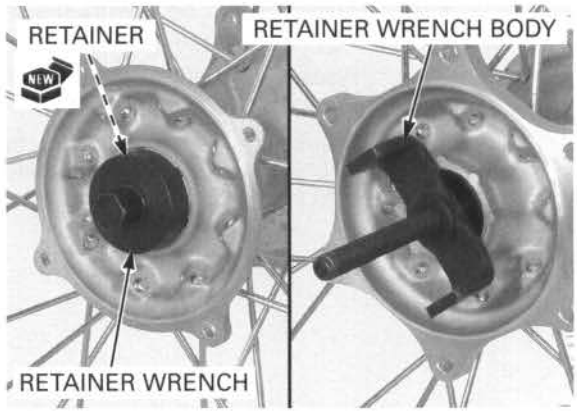


Apply grease to the bearing retainer threads.
Install and tighten a new bearing retainer to the specified torque using the special tools.

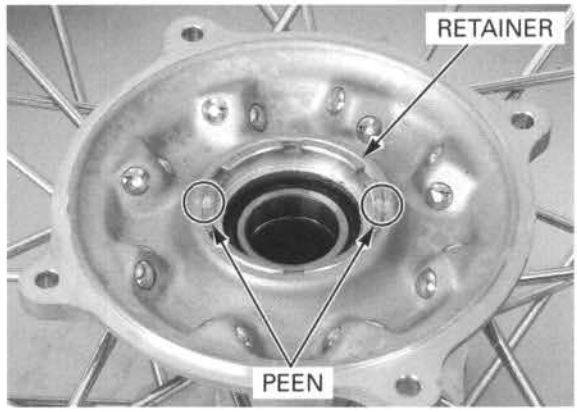
TOOLS:

Retainer wrench, 48 x 15 mm	**07YMA-KZ40100 or 07HMA-KS70100 (U.S.A. only)**
Retainer wrench body	**07710-0010401**

TORQUE: 44 N·m (4.5 kgf·m, 32 lbf·ft)



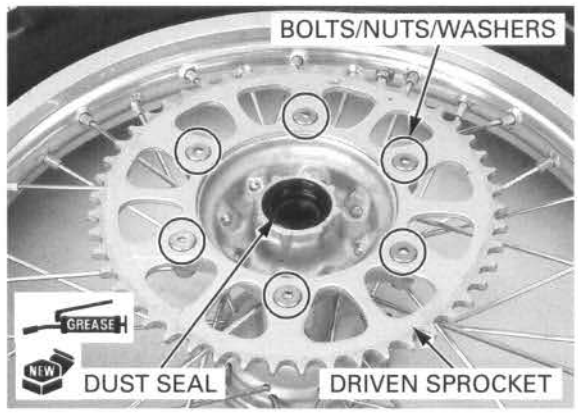
Peen the edge of the retainer.



Install the driven sprocket.
Install the bolts, washers and nuts, and tighten the nuts to the specified torque.

TORQUE: 32 N·m (3.3 kgf·m, 24 lbf·ft)

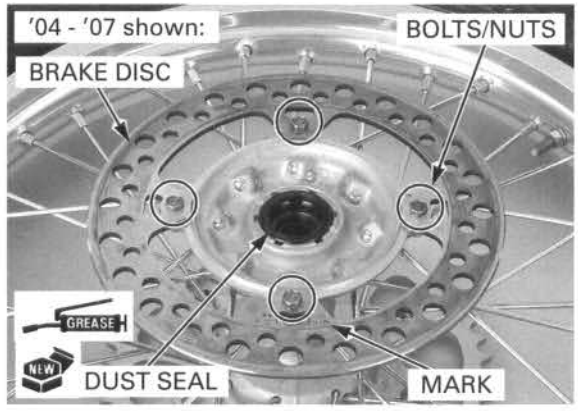
Apply grease to new left dust seal lips, then install the seal.



Install the brake disc onto the wheel hub with the minimum thickness mark (MIN TH 3.5 mm) facing out.
Install the bolts/nuts.
Tighten the nuts to the specified torque.

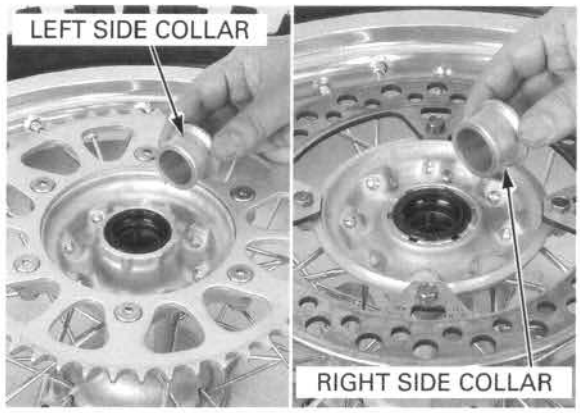
TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)

Apply grease to new right dust seal lips, then install the seal.

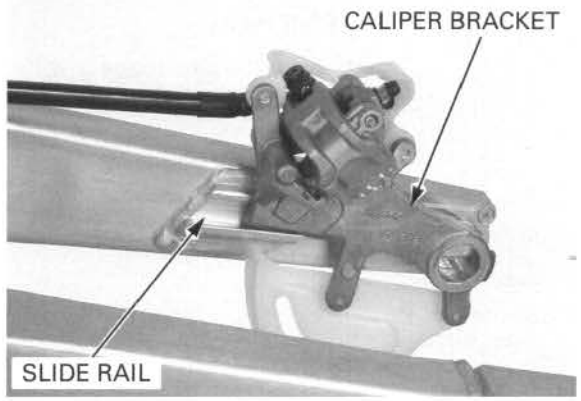


INSTALLATION

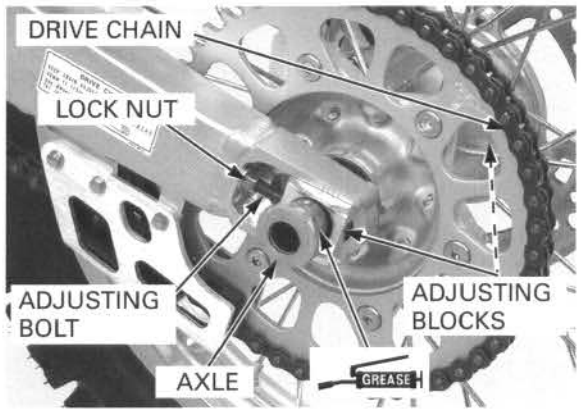
Install the right and left side collars.



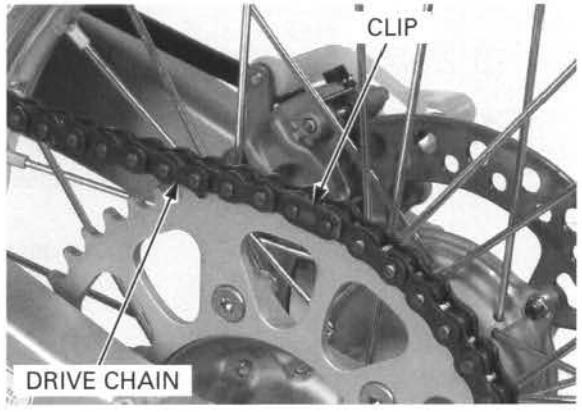
If the rear brake caliper bracket is removed, install it onto the slide rail of the swingarm.



Place the rear wheel into the swingarm.
Apply a thin coat of grease to the axle.
Install the drive chain over the driven sprocket.
Install the adjusting blocks and axle from the left side.



If the master link retaining clip is removed, install it on the drive chain with the closed end of the clip in the direction of wheel rotation.



Install the washer and axle nut.

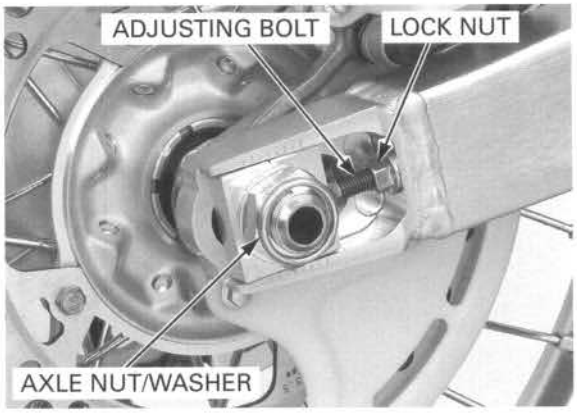
Adjust the drive chain slack (page 4-19).

Tighten the axle nut to the specified torque.

TORQUE: 128 N·m (13.1 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

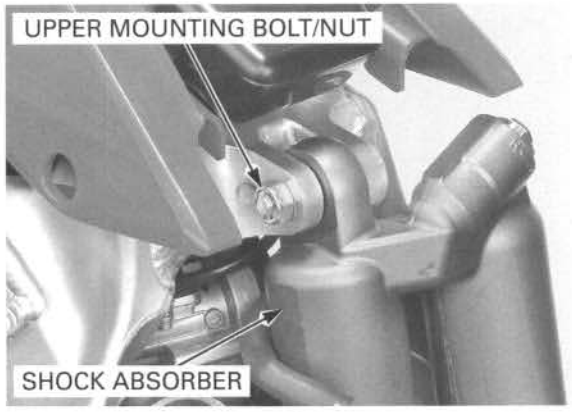
REMOVAL

Remove the seat (page 3-3).
Remove the sub-frame (page 3-6).

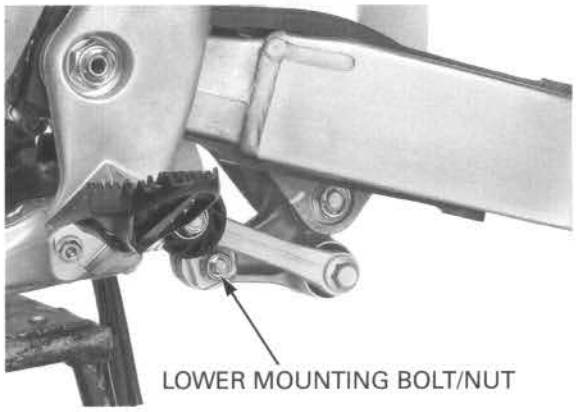
Raise the rear wheel off the ground by placing a workstand or equivalent under the engine.

If you plan to disassemble the shock absorber, loosen the spring lock nut and adjusting nut.

Remove the upper mounting bolt/nut.



Remove the shock absorber lower mounting bolt/nut and shock absorber.



DISASSEMBLY

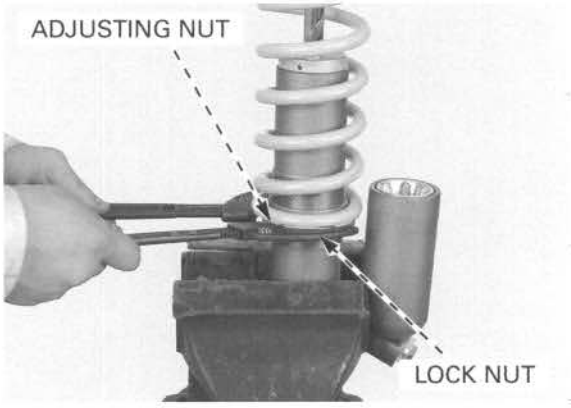
Measure the spring length for reinstallation later (page 14-27).

Set the shock absorber upper mount in a vise with a piece of wood or soft jaws to avoid damage.

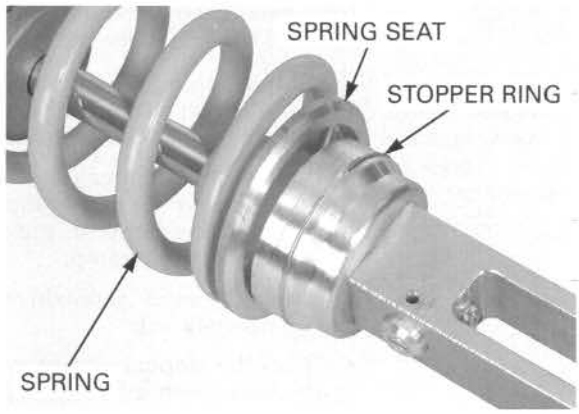
Loosen the lock nut and adjusting nut.

TOOLS:

Pin spanner	**07702-0020001 (2 required) or**
Pin spanner A	**89201-KS6-810 (2 required)**



Remove the stopper ring, spring seat and spring.



BLADDER REPLACEMENT

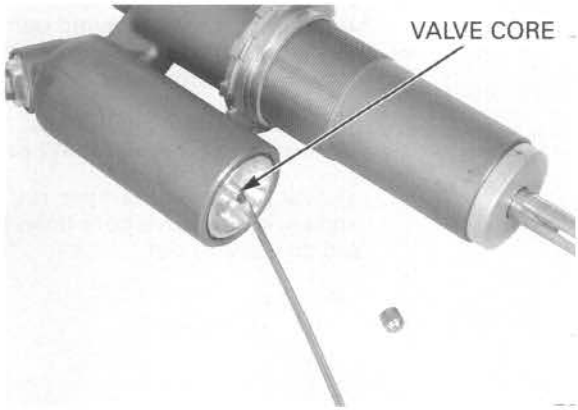
Replace the bladder when oil leaks around the chamber cap or oil spills out when releasing the nitrogen from the reservoir.
Perform this procedure before draining the oil from the damper.

Point the valve away from you to prevent debris getting in your eyes.

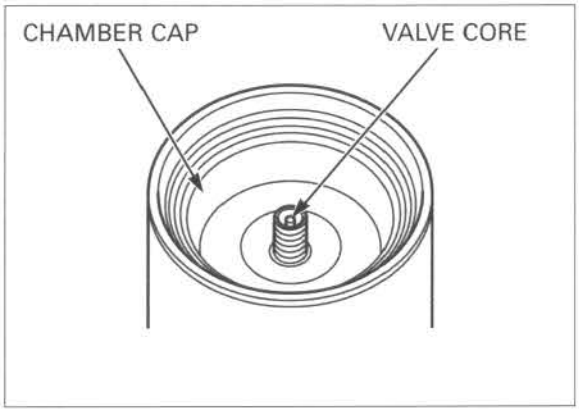
Depress the valve core to release the nitrogen from the reservoir.

⚠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.

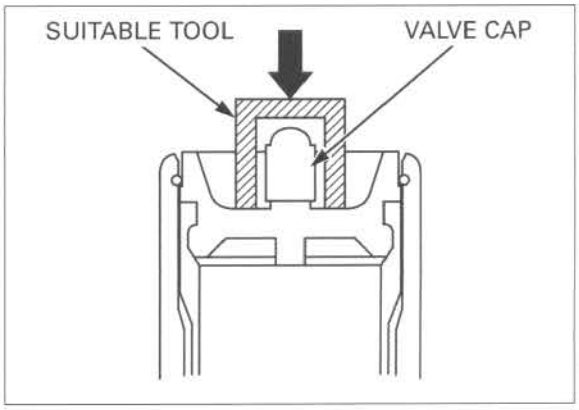


Depress the chamber cap just the minimum amount for stopper ring access.

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.



Two small screwdrivers and a shop towel are required to remove the stopper ring.

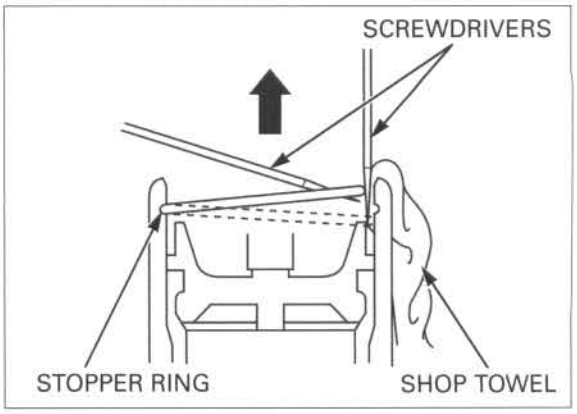
To avoid damaging the inside surfaces of the reservoir, cover the screwdriver with a shop towel.

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.

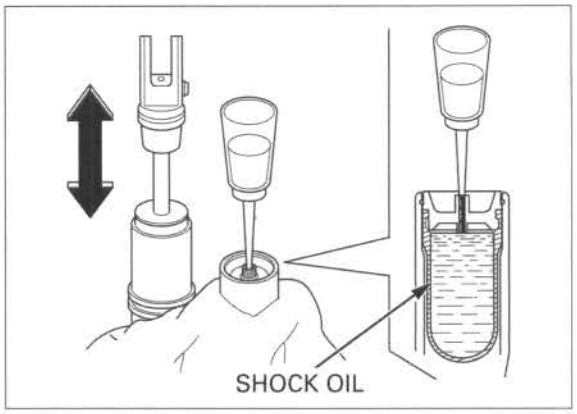
- Check the stopper ring groove for burrs. Remove any burrs with a fine emery cloth before pulling the damper rod out of the case.



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.

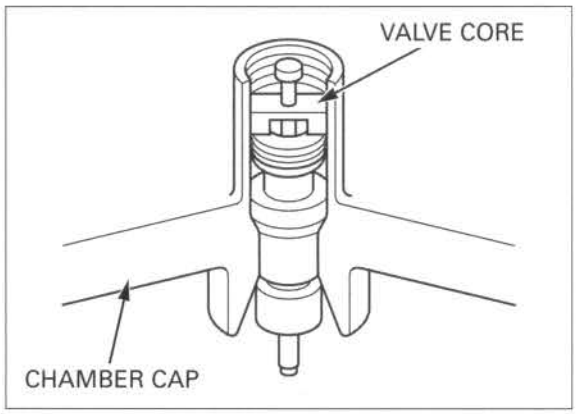


Install the valve core securely.
Wear protective clothing and a face guard to protect your eyes and face in case the chamber cap pops out quickly and forcibly.
Remove the chamber cap and bladder following the procedure below:

NOTE:

- The chamber cap will be removed with hydraulic pressure so its force can be significant considering the air in the bladder.

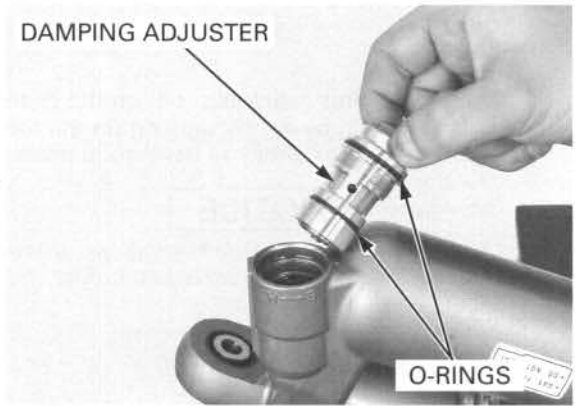
1. Wrap the shop towel around the chamber cap. Compress the damper rod slowly, to force the chamber cap out.



2. 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.

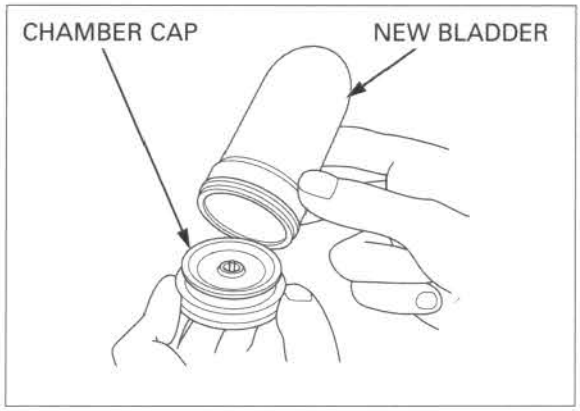


3. Fill the damper with Pro-Honda HP Fork Oil 5W through the damping adjuster hole, while slowly pulling the damper rod out.
4. Reinstall the damping adjuster after filling the damper.
   - The damper must be kept upright to prevent oil from leaking out.
5. Place the damper with the reservoir chamber cap facing up.
6. 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.

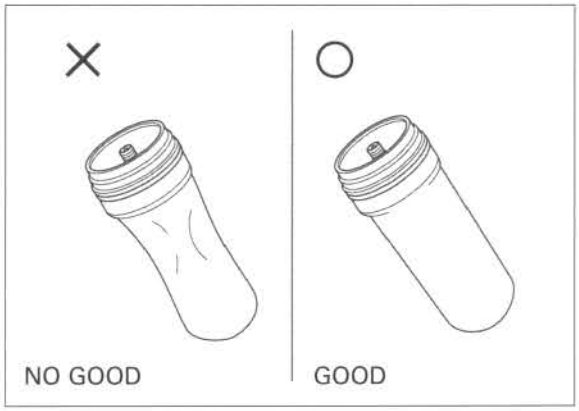
Remove the bladder from the chamber cap.

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.

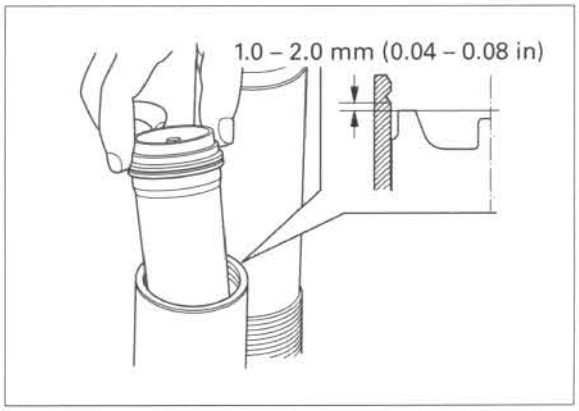
RECOMMENDED SHOCK OIL:
Pro-Honda HP Fork Oil 5W or equivalent

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.

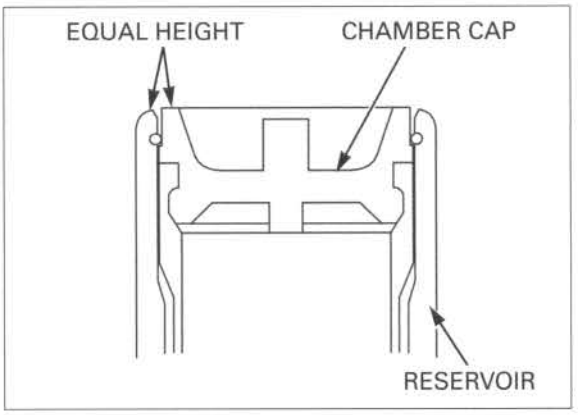
Temporarily fill the reservoir with air slowly until the chamber cap seats against the stopper ring.



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 14-26).
Fill the reservoir with nitrogen to the specified pressure (page 14-27).



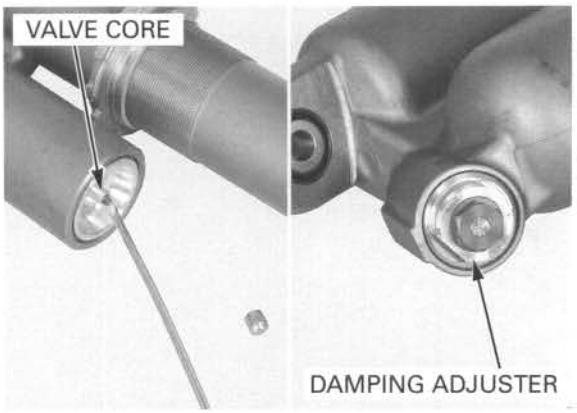
DAMPER DISASSEMBLY

Point the valve away from you to prevent debris getting in your eyes.

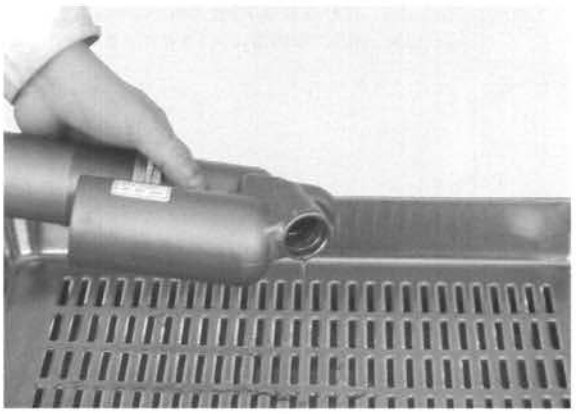
Depress the valve core to release the nitrogen from the reservoir (page 14-15).

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.

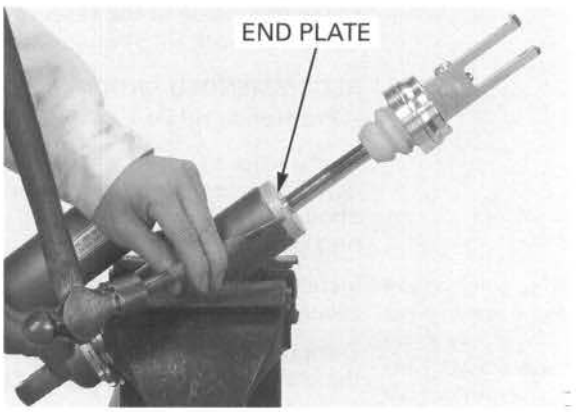


Drain most of the shock oil from the damper and reservoir, by pumping the damper rod in and out several times.

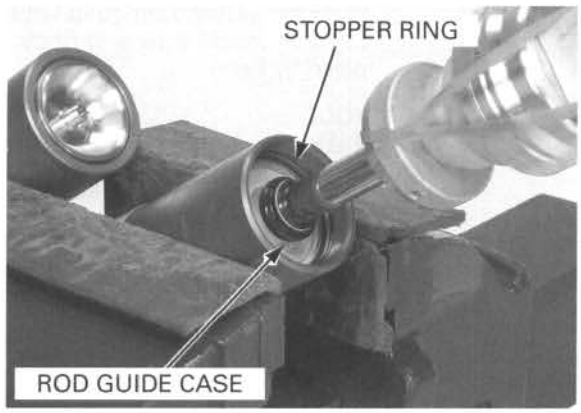


Set the shock absorber in a vise with a piece of wood or soft jaws to avoid damage.

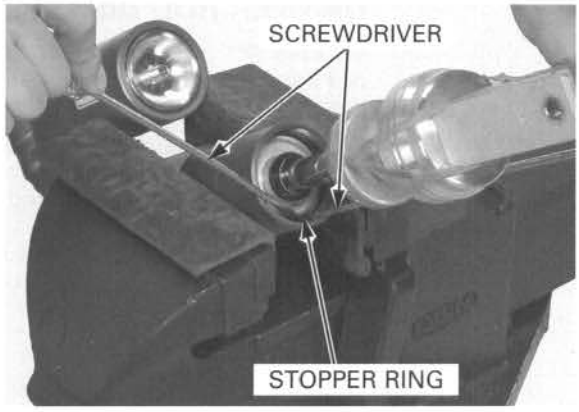
Remove the end plate and tape or tie it to the rubber stopper so it will not get in the way.



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.

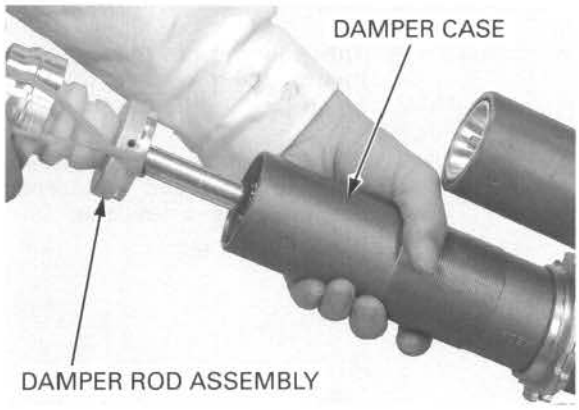


Check the stopper ring groove for burrs.

Burrs will damage the damper rod piston ring.

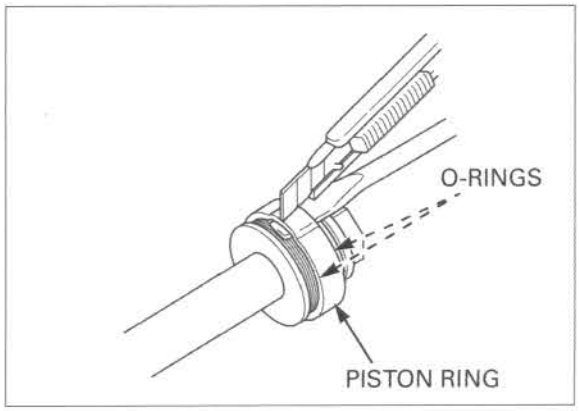
Remove any burrs with fine emery cloth pulling the damper rod out of the case.

Carefully pull the damper rod assembly out of the damper case.



PISTON RING REPLACEMENT

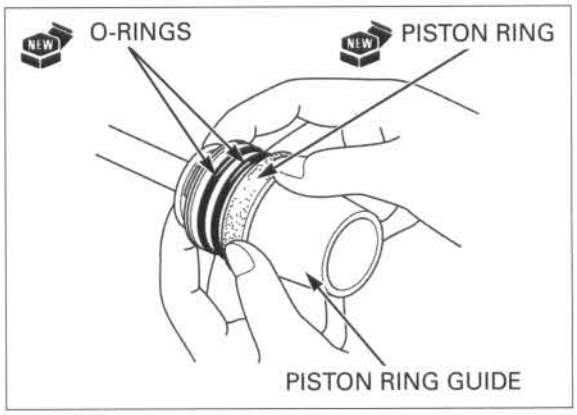
Inspect the piston ring.
If the piston ring is damaged, cut the piston ring and replace it along with a new O-rings.



Place the piston ring guide attachment over the piston and install a new O-rings and piston ring into place by hand.

TOOL:
Piston ring guide **070MG-KZ30100**

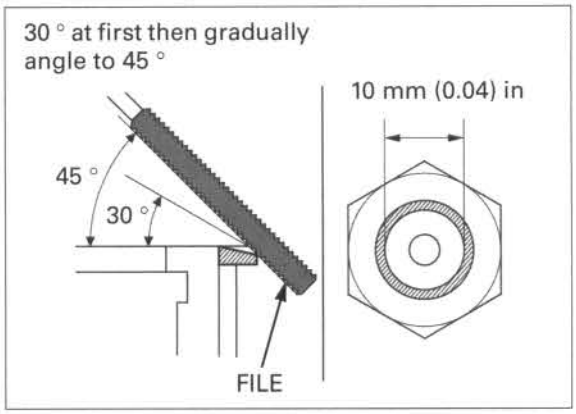
Compress the piston ring against the ring groove and seat the piston ring into the ring groove.



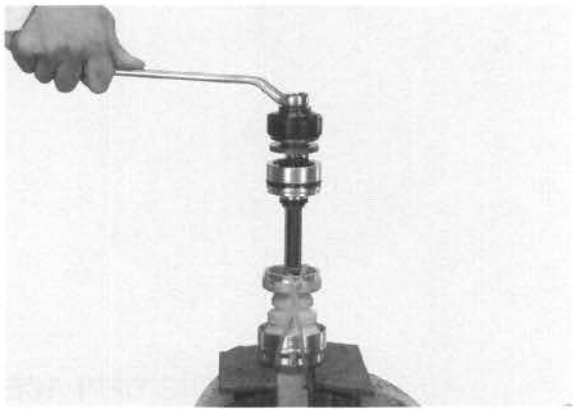
DAMPER ROD DISASSEMBLY

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.
Unstake the damper rod end nut with a file as shown.
Be careful to file the end nut by hand so that the O.D. of the rod end is about 10 mm (0.4 in). Be careful not to over-file.



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.



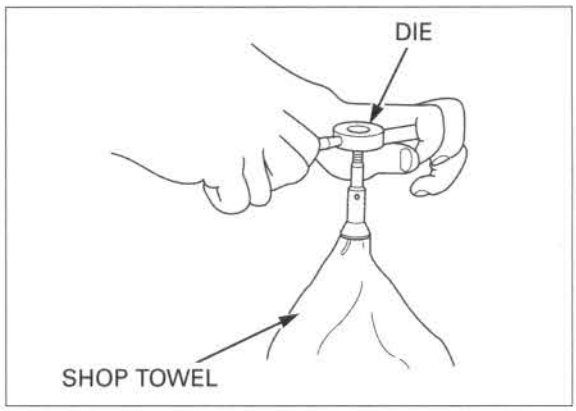
Make sure that filings are not stuck in the damper rod.

Remove the burrs from the damper rod end with a file and correct the threads with a die.

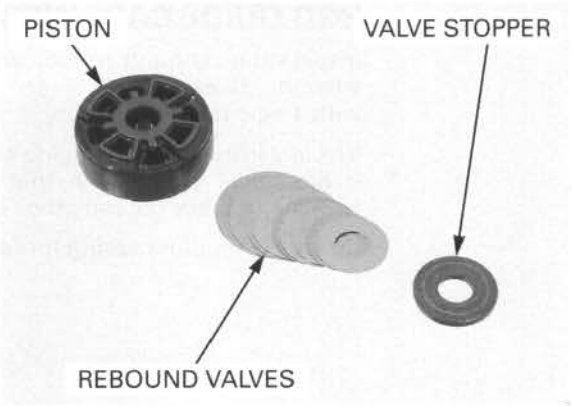
DIE: 12 x 1.25 mm

Clean the damper rod with solvent after correcting the threads.

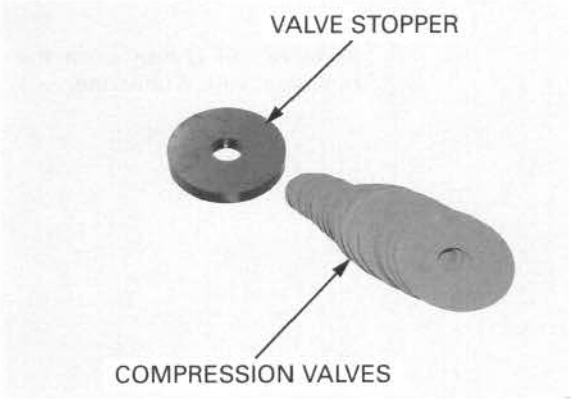
- Use a piece of mechanics wire to keep the removed valves in the correct order.
- Keep dust and abrasive away from all damper rod parts.
- Thoroughly clean the valves in solvent and blow them dry with compressed.
- Be careful not to get solvent on the O-ring and piston ring.
- The valve arrangement 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.



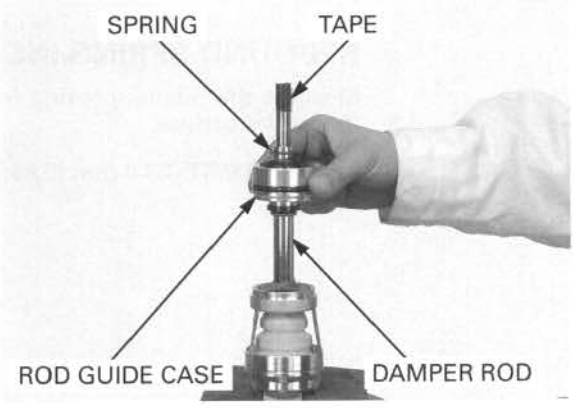
Remove the compression valves and valve stopper.



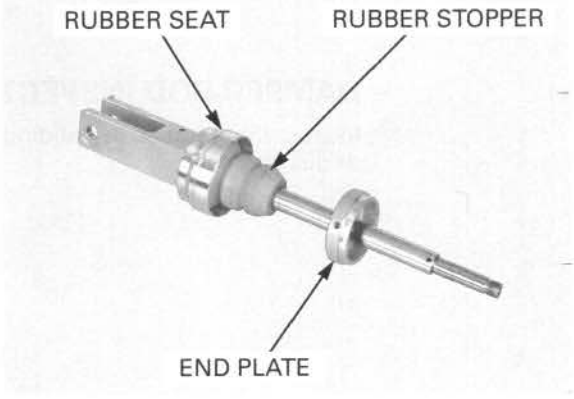
Chase the threads with a die and clean with oil.
Back out the rebound damping adjuster and flush with solvent.
Reinstall the adjuster.

Wrap the top threads of the damper rod with tape.

Remove the spring and rod guide case from the damper rod.



Remove the end plate, rubber stopper and rubber seat from the damper rod.

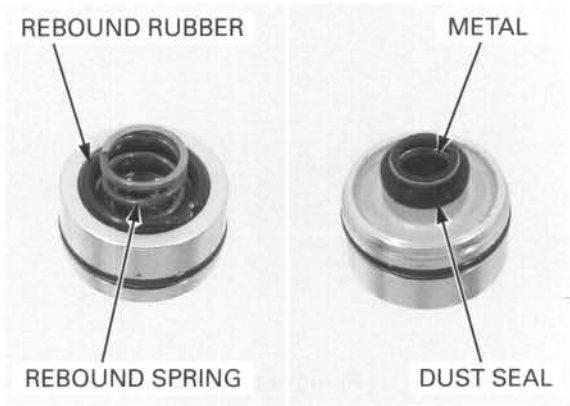


ROD GUIDE CASE INSPECTION

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.

Check the rebound spring for fatigue or damage.

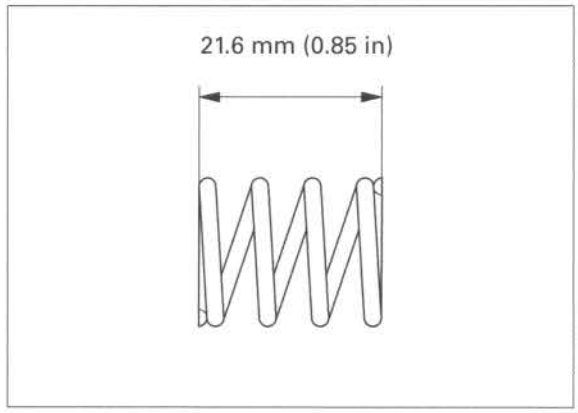


Remove the O-ring from the rod guide case and replace it with a new one.

REBOUND SPRING INSPECTION

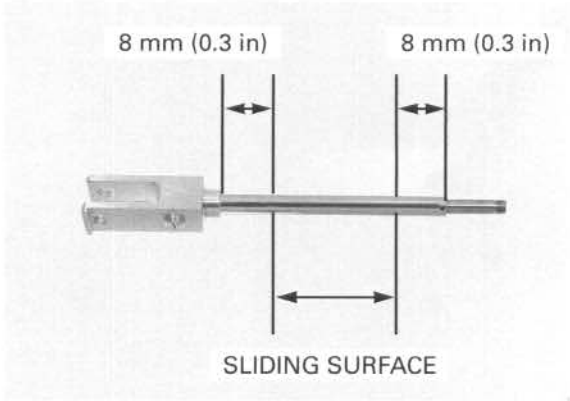
Measure the rebound spring free length by placing it on a flat surface.

SERVICE LIMIT: 21.6 mm (0.85 in)



DAMPER ROD INSPECTION

Inspect the damper rod sliding surface for damage or distortion.

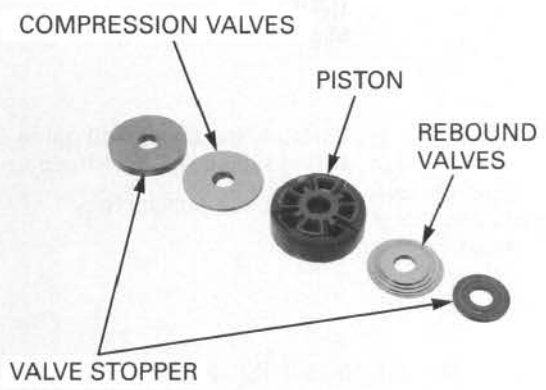


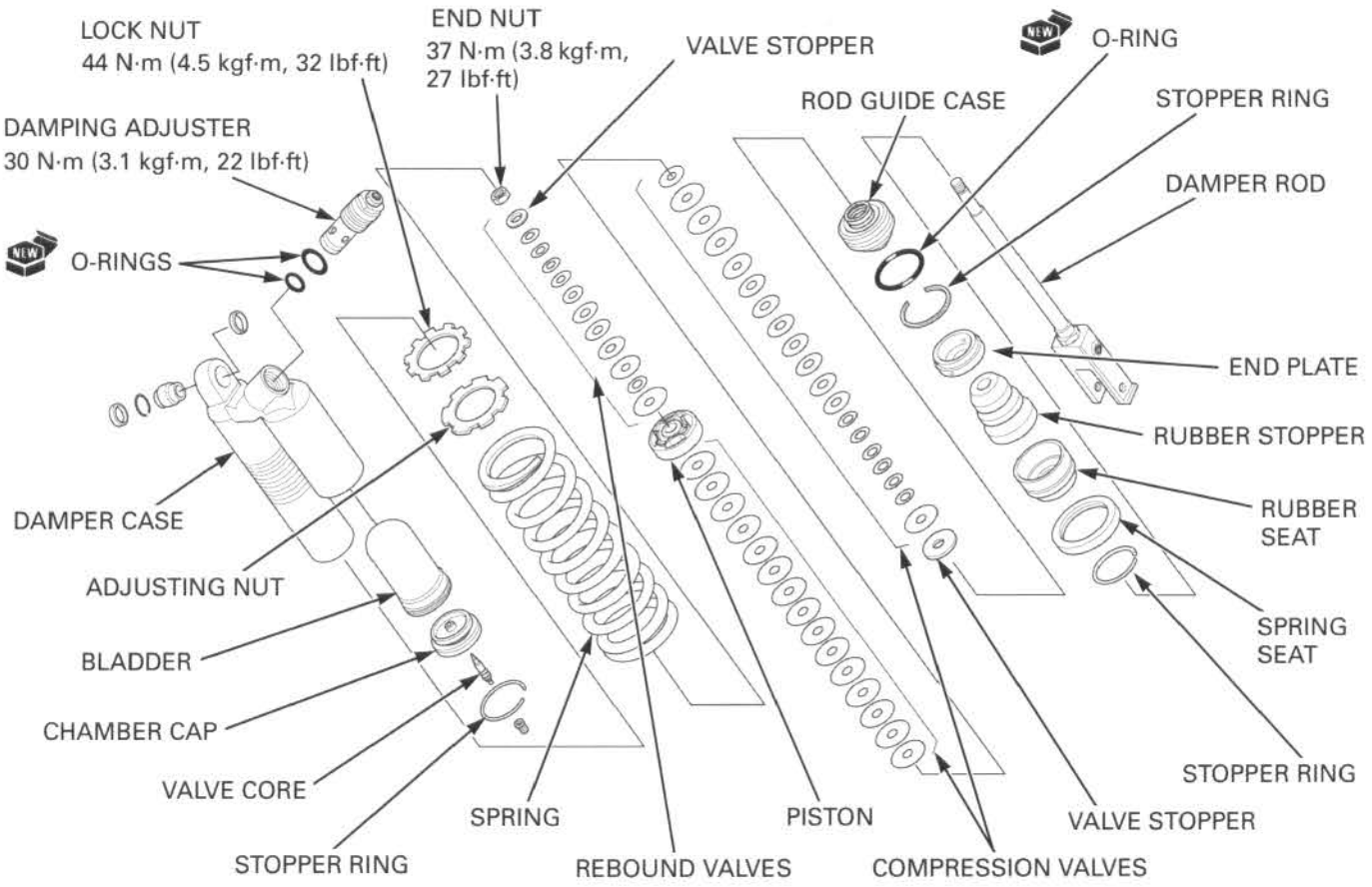
DAMPER ASSEMBLY

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.

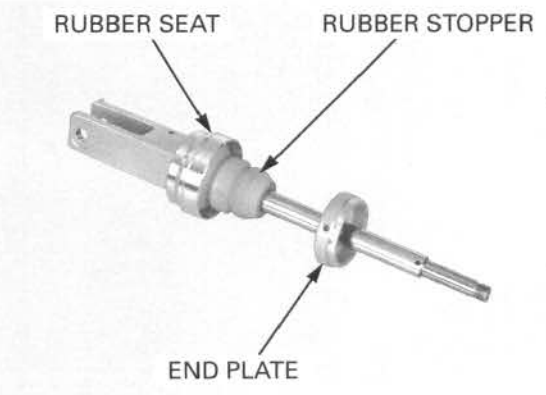
NOTICE

- *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.*



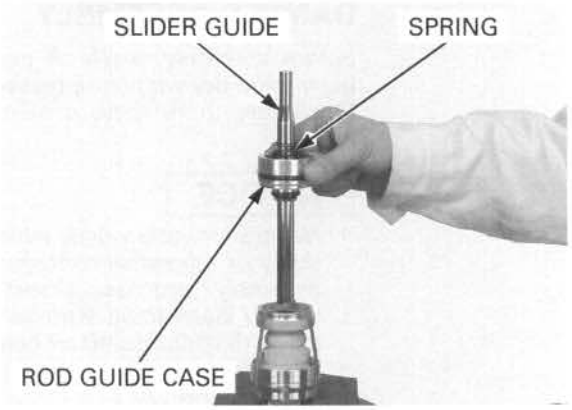


Install the rubber seat, rubber stopper and end plate.



Install the special tool onto the damper rod.

TOOL:
Slider guide, 16 mm **07PMG-KZ40100 not available in U.S.A.**



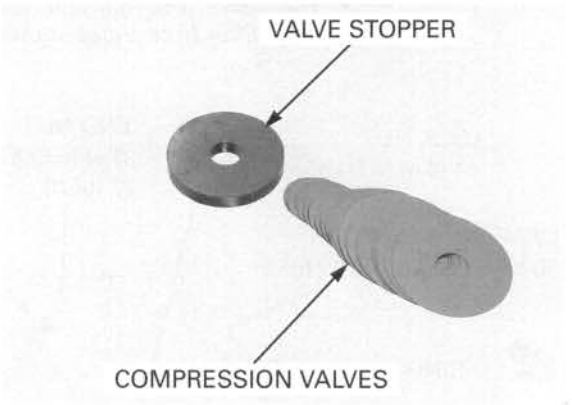
Be careful not to remove grease from the seal. Be careful not to damage the dust seal lip or turn it inside out.

Carefully install the rod guide case with the rebound spring facing up, over the damper rod.

Remove the special tool.

The valve arrangement and number of valves may vary from those shown.

Install the valve stopper and compression valves onto the damper rod.



Install the piston onto the damper rod.

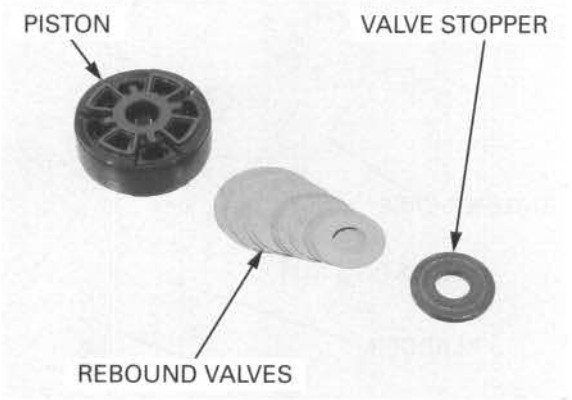
Note the installation direction of the piston valves.

Install the rebound valves with their polished surfaces facing down.

NOTICE

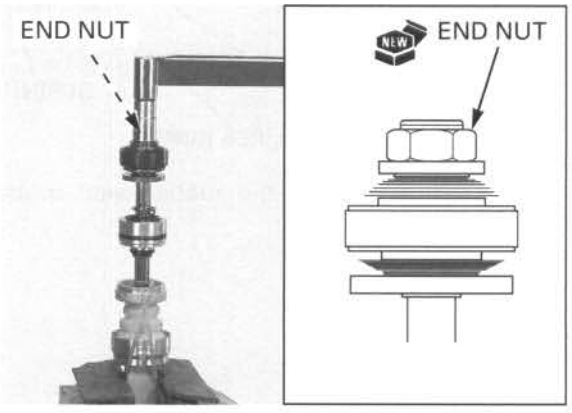
Be careful not to bind the valves when installing the piston onto the damper rod. Also, check that they are concentric with the damper rod.

Install the valve stopper.

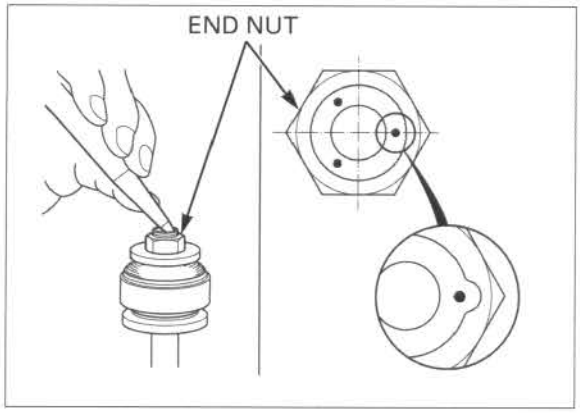


Set the lower shock mount in a vise with a piece of wood or soft jaws to avoid damage.
Install and tighten a new end nut to the specified torque.

TORQUE: 37 N·m (3.8 kgf·m, 27 lbf·ft)



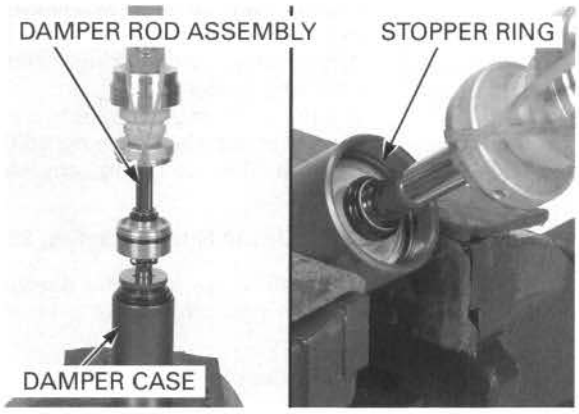
Stake the end of the damper rod in three places as shown, to the end nut.



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.

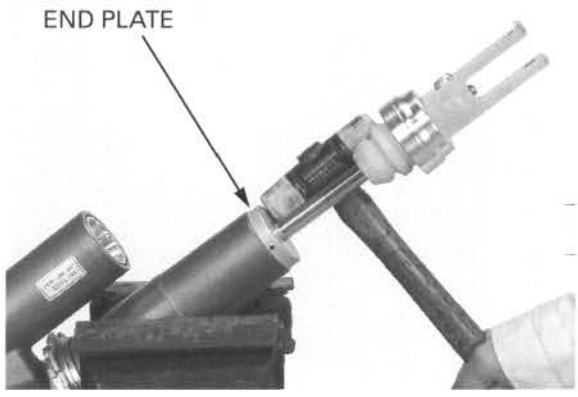


Set the shock absorber in a vise with a piece of wood or soft jaws to avoid damage.

NOTICE

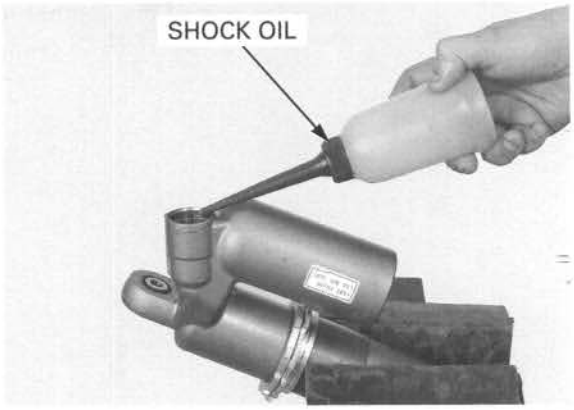
Do not overtighten the vise and distort the damper case.

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.

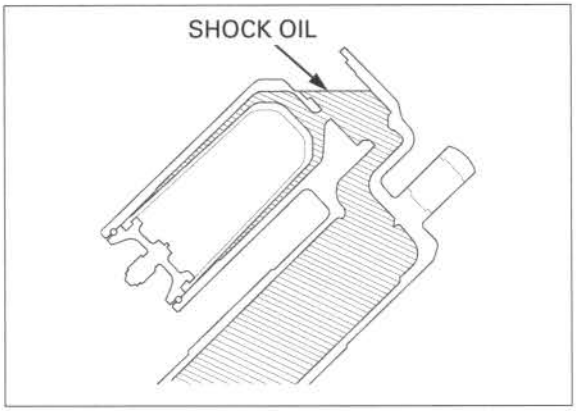
Slowly pump the damper rod until there are no bubbles in the oil that overflows from the damper case.

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.



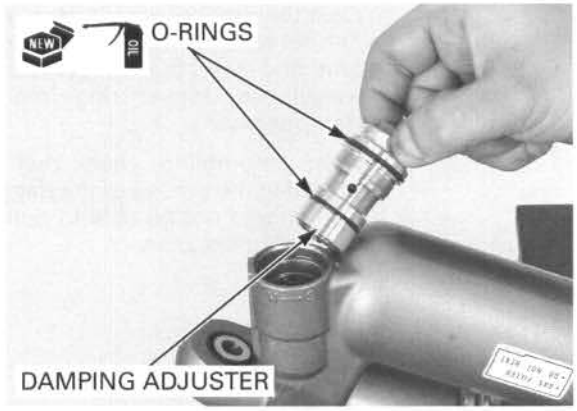
Be sure the reservoir pressure is correct using an accurate pressure gauge.

Temporarily charge the reservoir with 49 kPa (0.5 kgf/cm^2, 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 oil to 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.

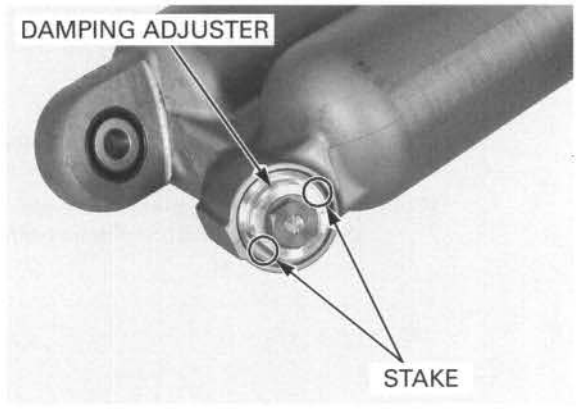
TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)



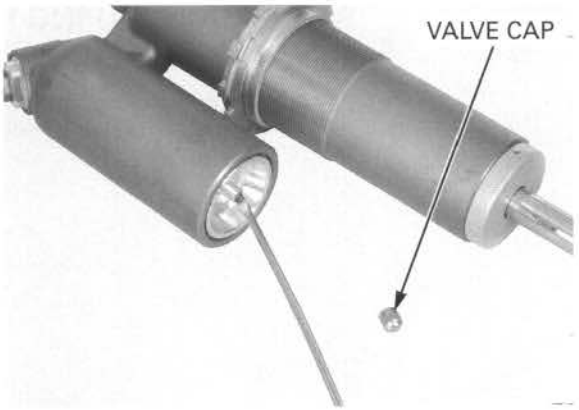
Wipe off all oil from the damper rod; oil left on the damper rod can lead to premature failure of the oil seal.

Check the oil leaks.

Stake the damping adjuster as shown.



Release the air that was in the reservoir at precompression. Fill the reservoir with 980 kpa (10.0 kgf/cm^2, 142 psi) of nitrogen gas.



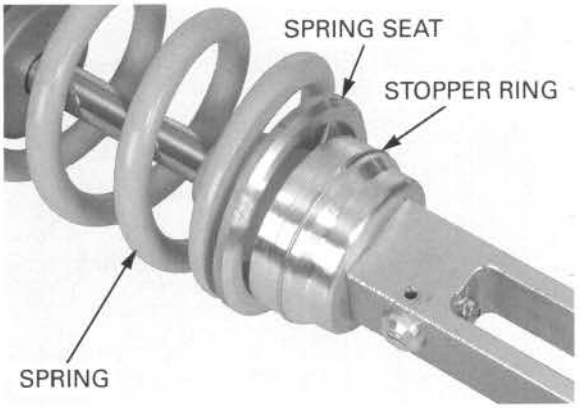
⚠CAUTION

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.

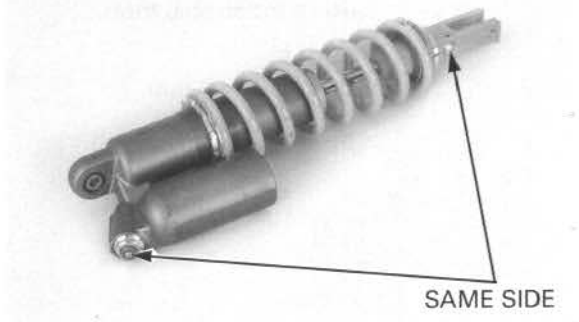
Install the valve cap.

Install the spring, 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.

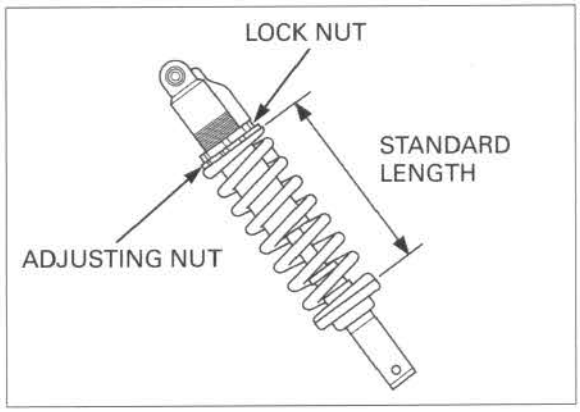


One turn of the adjusting nut changes the spring length by 1.5 mm (0.06 in).

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:	**260.1 mm (10.24 in)**
'05:	**261.3 mm (10.29 in)**
'06 - '07:	**259.0 mm (10.20 in)**
'08:	**259.6 mm (10.22 in)**
After '08:	**258.1 mm (10.16 in)**



Hold the adjusting nut and tighten the lock nut.

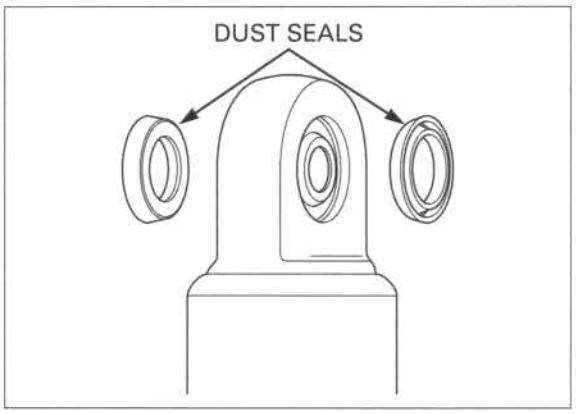
TORQUE: 44 N·m (4.5 kgf·m, 32 lbf·ft)

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.

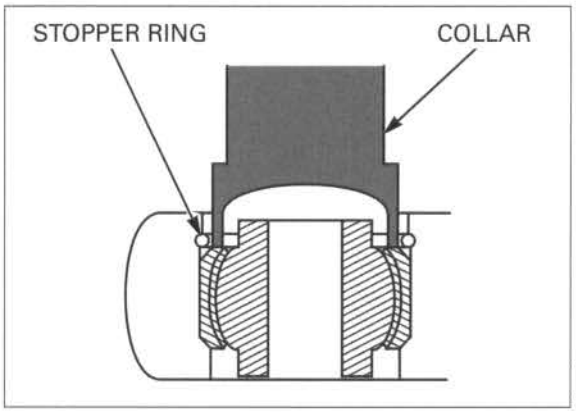


Press the spherical bearing to get the clearance necessary to remove the stopper ring using the special tool.

TOOL:

Collar, 23 x 17 mm	**07GMD-KT8A110 (U.S.A. only)**

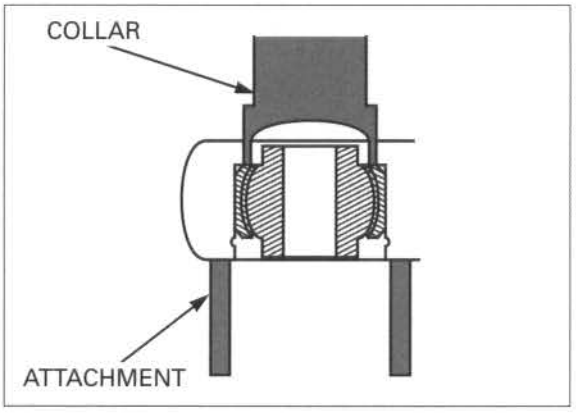
Remove the stopper ring.



Press the spherical bearing out of the upper mount using the special tools.

TOOLS:

Collar, 23 x 17 mm	**07GMD-KT8A110 (U.S.A. only)**
Attachment, 30 mm I.D.	**07746-0030300**



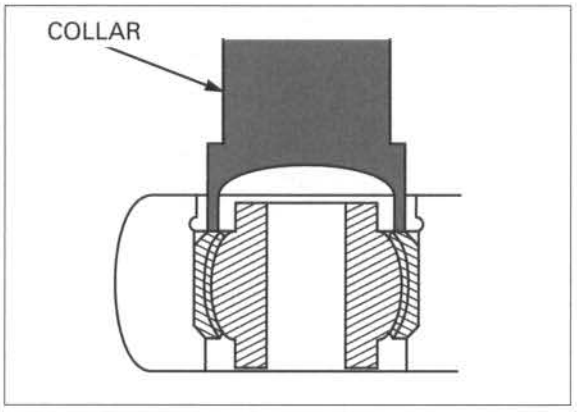
Apply multi-purpose grease NLGI No.2 (molybdenum disulfide MoS2 additive) to a new spherical bearing.

Drive the bearing in evenly; do not allow it to tilt.

Press a new spherical bearing into the upper mount.

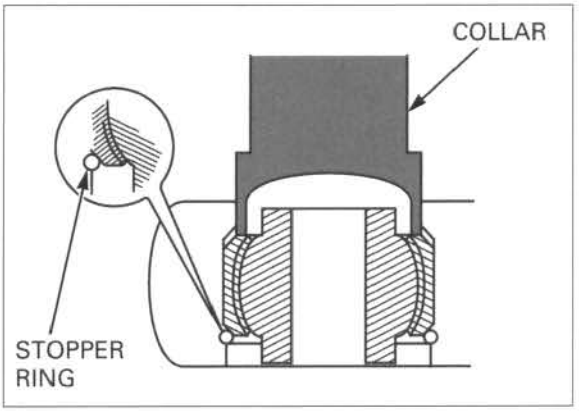
TOOL:

Collar, 23 x 17 mm	**07GMD-KT8A110 (U.S.A. only)**



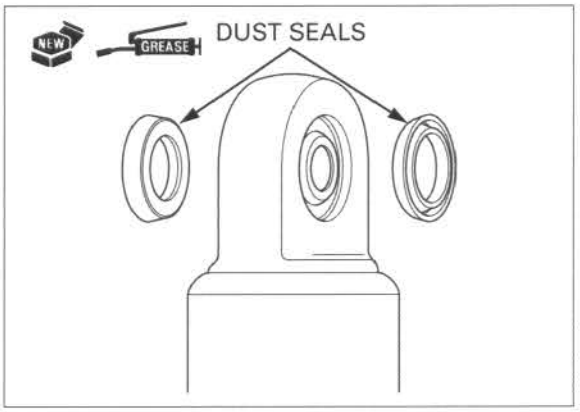
Install a new stopper ring into the groove of the upper mount securely.
Press the spherical bearing into the upper mount using the special tool, until it seats against the stopper ring.

TOOL:
Collar, 23 x 17 mm **07GMD-KT8A110 (U.S.A. only)**



Be sure to install the correct dust seal in each side.

Apply grease to new dust seal lips and install them.

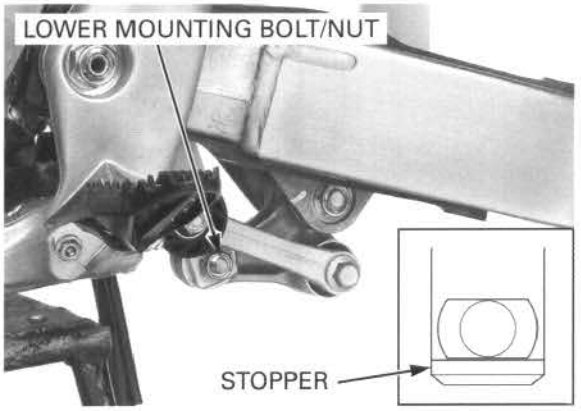


INSTALLATION

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.

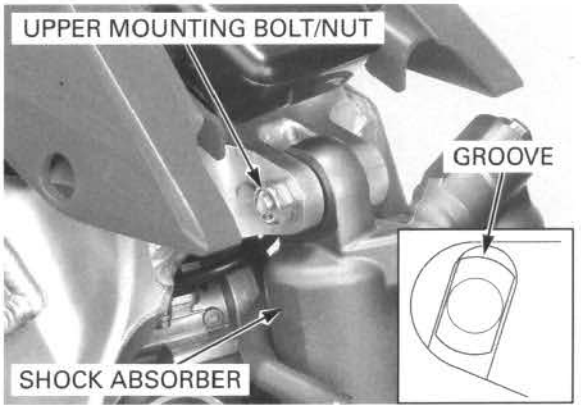
TORQUE: 44 N·m (4.5 kgf·m, 32 lbf·ft)



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, 32 lbf·ft)

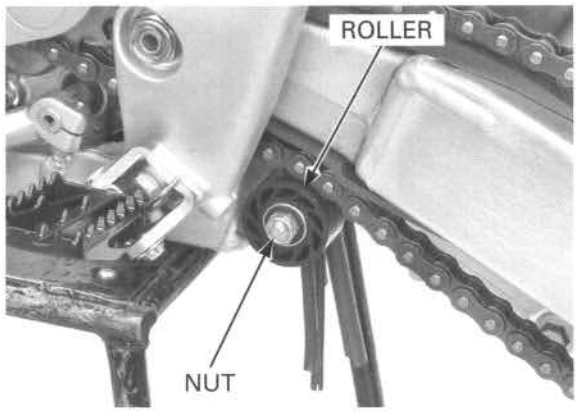
Install the sub-frame (page 3-6).
Install the seat (page 3-3).



SHOCK LINKAGE

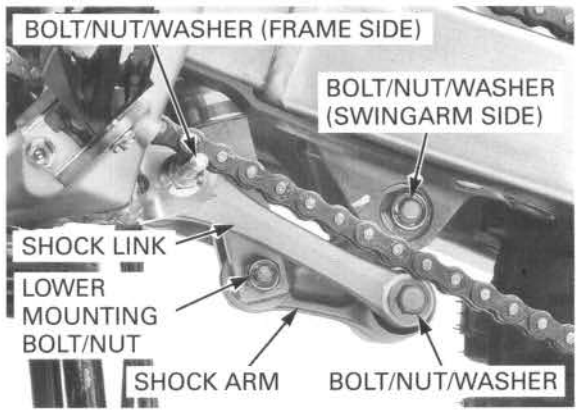
REMOVAL

Remove the nut and lower drive chain roller.



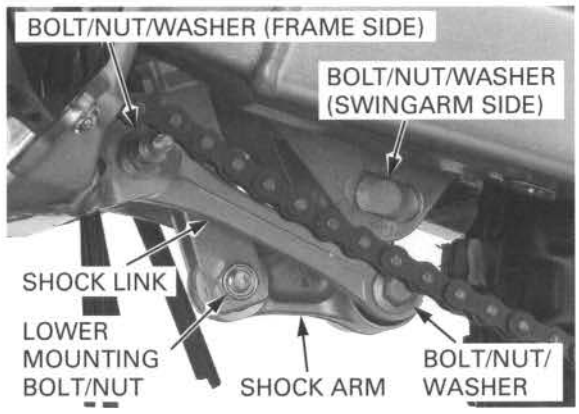
'04 - '06: Remove the following:

- 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

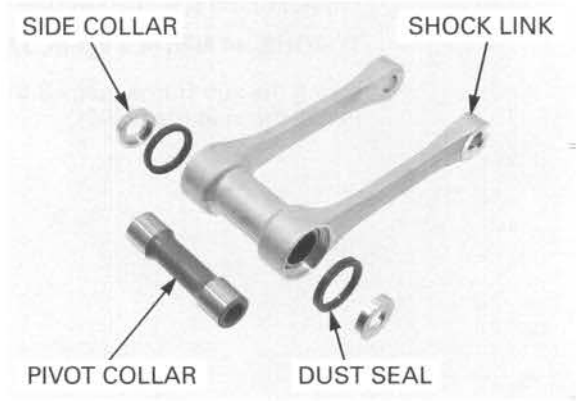


After '06: Remove the following:

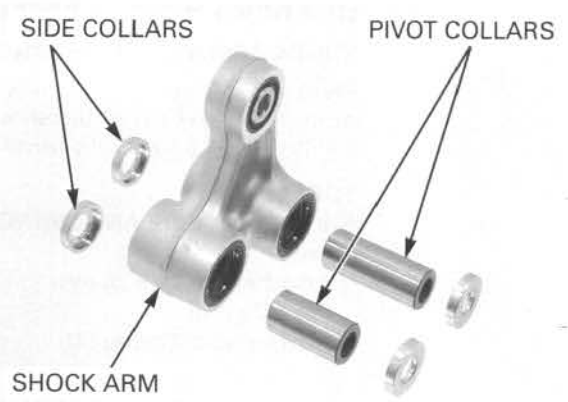
- Shock absorber lower mounting bolt/nut
- Shock arm bolt/nut/washer (shock link side)
- Shock arm bolt/nut/washer (swingarm side)
- Shock arm
- Shock link bolt/nut/washer (frame side)
- Shock link



Remove the side collars, pivot collar and dust seals from the shock link.

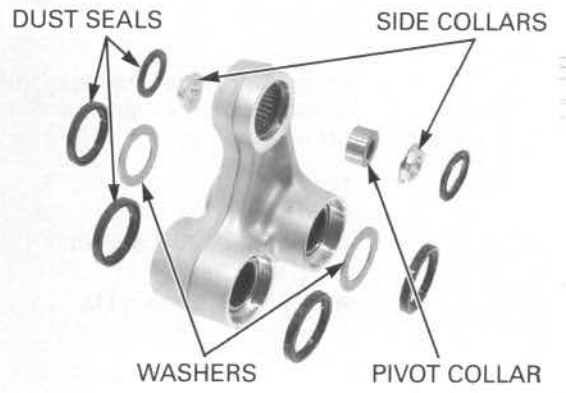


Remove the side collars and pivot collars from the shock arm (swingarm side, shock link side).



Remove the dust seals and washers (swingarm side, shock link side).

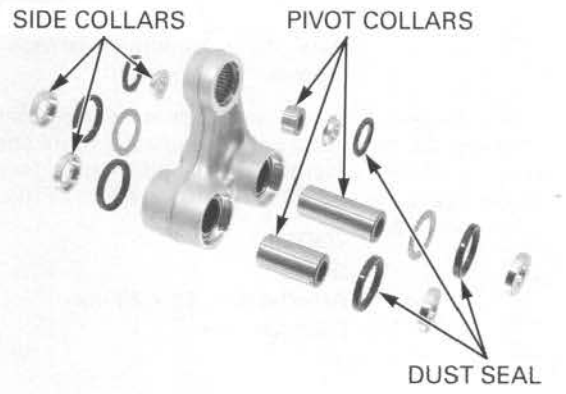
Remove the dust seals, side collars and pivot collar (shock absorber side).



INSPECTION

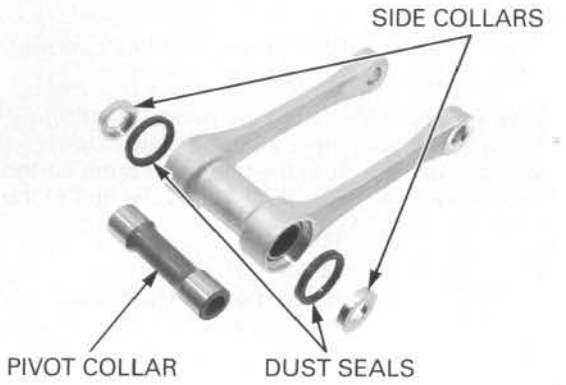
Check the dust seals and collars for wear, damage or fatigue.
Check the needle bearings for damage or loose fit.
Check the shock arm for cracks or damage.

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.



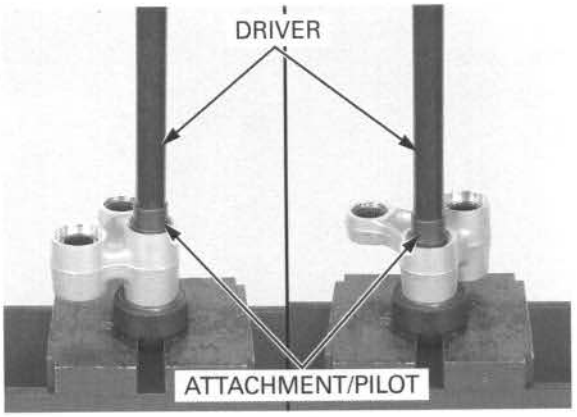
BEARING REPLACEMENT

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:
SHOCK LINK SIDE AND SWINGARM SIDE:

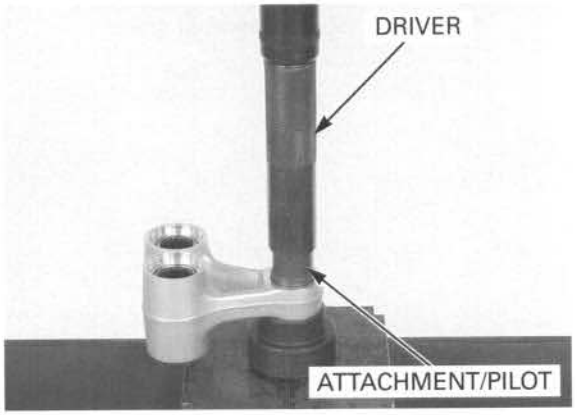
Driver	**07949-3710001**
Attachment, 24 x 26 mm	**07746-0010700**
Pilot, 20 mm	**07746-0040500**
Attachment, 30 mm I.D.	**07746-0030300**



Press the needle bearings (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**



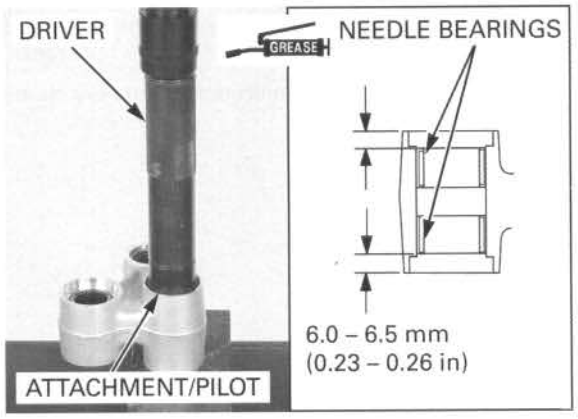
Pack new needle bearings with multi-purpose grease.

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 (0.23 – 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**



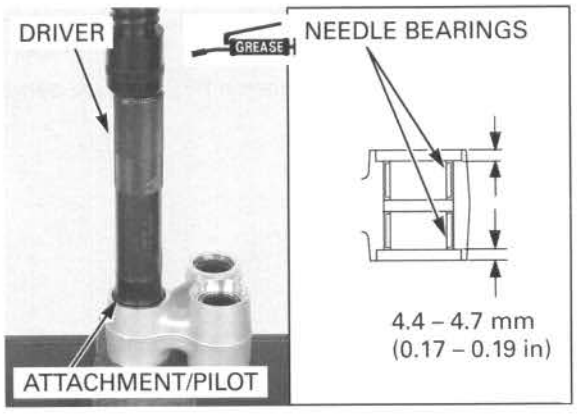
Pack new needle bearings with multi-purpose grease.

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, 24 x 26 mm	**07746-0010700**
Pilot, 20 mm	**07746-0040500**



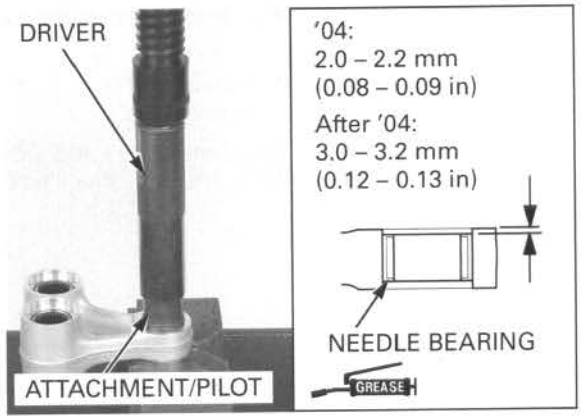
Pack a new needle bearing with multi-purpose grease.

Press the needle bearing into the shock arm with the marked side facing out.

Press a new 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 as shown.

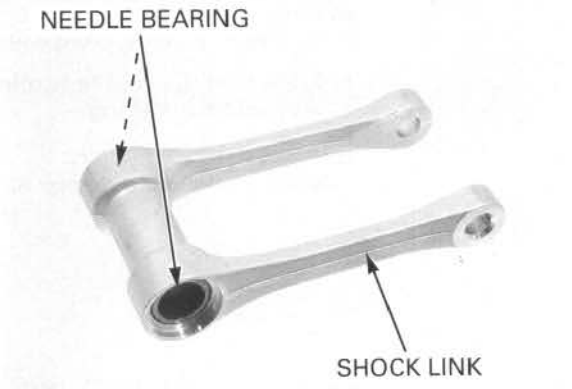
TOOLS:

Driver	**07749-0010000**
Attachment, 24 x 26 mm	**07746-0010700**
Pilot, 19 mm	**07746-0041400**



SHOCK LINK NEEDLE BEARING

Remove the needle bearings from the shock link.



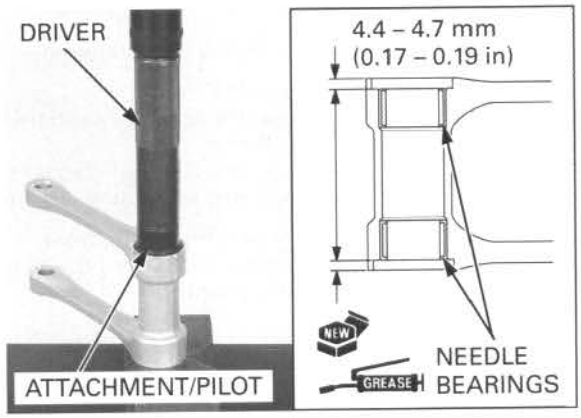
Pack new needle bearings with multi-purpose grease.

Press the needle bearing into the shock arm with the marked side facing out.

Press new needle bearings into the frame 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, 24 x 26 mm	**07746-0010700**
Pilot, 20 mm	**07746-0040500**



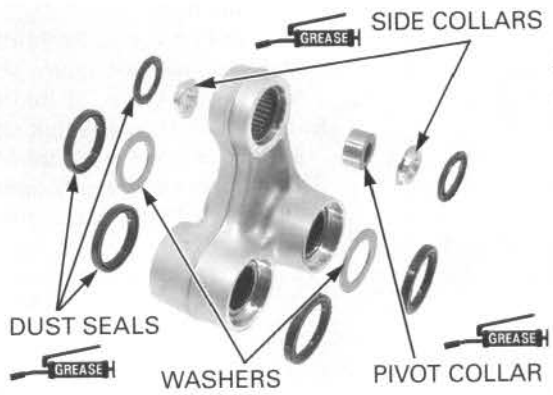
INSTALLATION

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

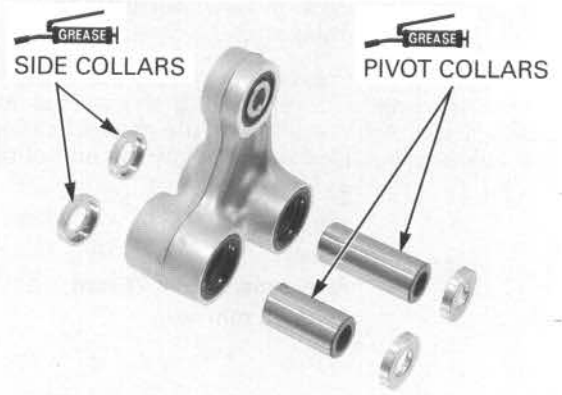
Install the dust seals and washers (shock link side).



Install the dust seals to the shock arm (swingarm side).

Install the pivot collar, side collars and dust seals (shock absorber side).

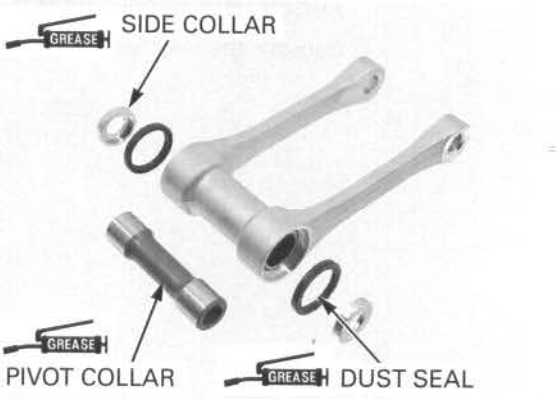
Install the pivot collars and side collars to the shock arm (swingarm side, shock link side).



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

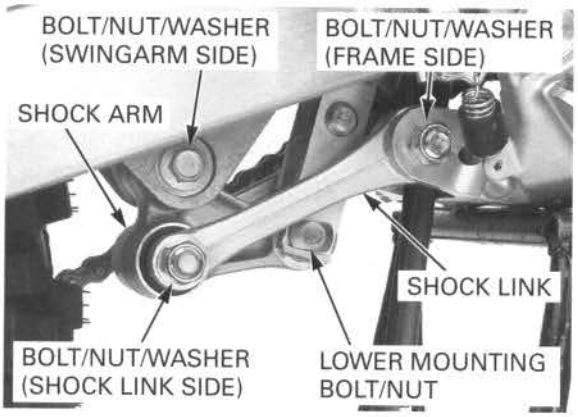


'04 – '06: Apply oil to the shock arm and shock link nut threads and flange surface.

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)

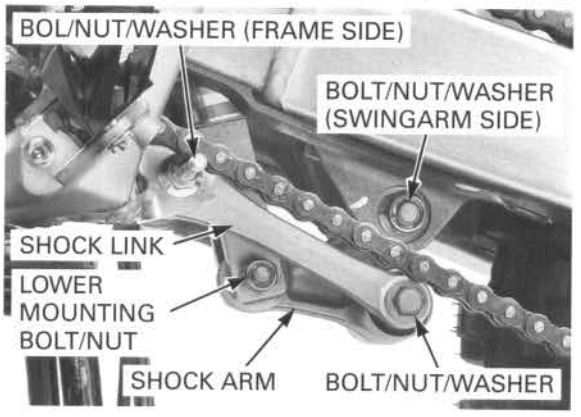
Install the shock absorber lower mounting bolt aligning the flat side of the bolt with the stopper on the shock absorber.



Tighten all nuts to the specified torque.

TORQUE:

Shock link nut:
53 N·m (5.4 kgf·m, 39 lbf·ft)
Shock arm nut (swingarm side):
53 N·m (5.4 kgf·m, 39 lbf·ft)
Shock arm nut (shock link side):
53 N·m (5.4 kgf·m, 39 lbf·ft)
Shock absorber lower mounting nut:
44 N·m (4.5 kgf·m, 32 lbf·ft)

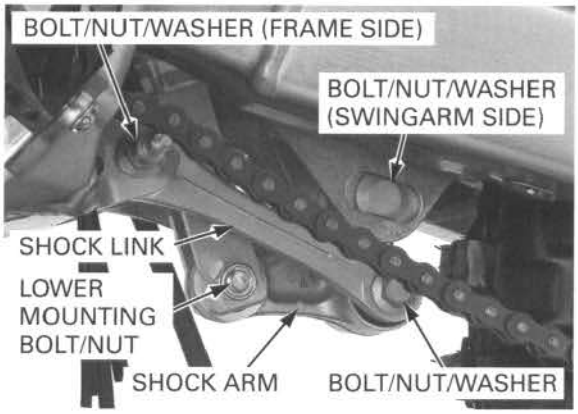


After '06: Apply oil to the shock arm and shock link nut threads and flange surface.

Loosely install the following:

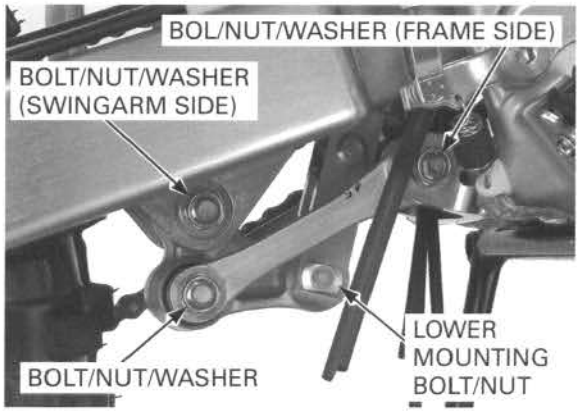
- Shock link
- Shock link bolt/nut/washer (frame side)
- Shock arm
- Shock arm bolt/nut/washer (swingarm side)
- Shock arm bolt/nut/washer (shock link side)

Install the shock absorber lower mounting bolt aligning the flat side of the bolt with the stopper on the shock absorber.

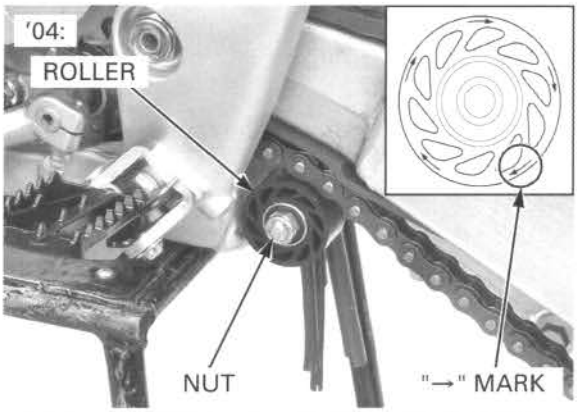


Tighten all nuts to the specified torque.

TORQUE:
Shock link nut:
53 N·m (5.4 kgf·m, 39 lbf·ft)
Shock arm nut (swingarm side):
53 N·m (5.4 kgf·m, 39 lbf·ft)
Shock arm nut (shock link side):
53 N·m (5.4 kgf·m, 39 lbf·ft)
Shock absorber lower mounting nut:
44 N·m (4.5 kgf·m, 32 lbf·ft)



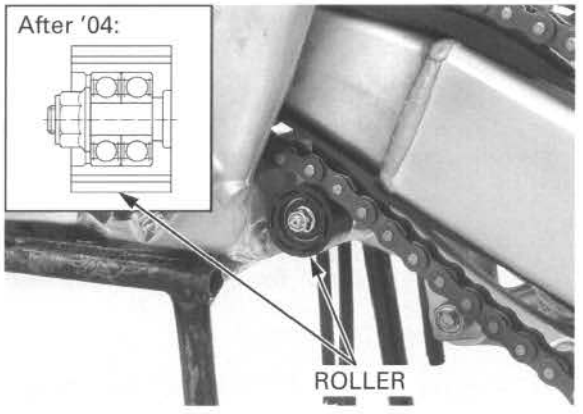
'04: Install the lower drive chain roller with the "→" mark facing out.



After '04: Install the lower drive chain roller as shown.

Install and tighten the nut to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



SWINGARM

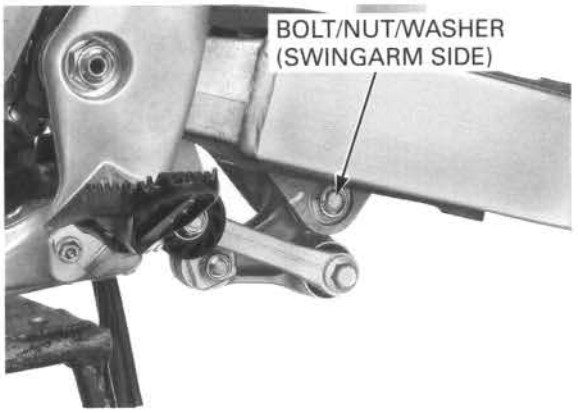
REMOVAL

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

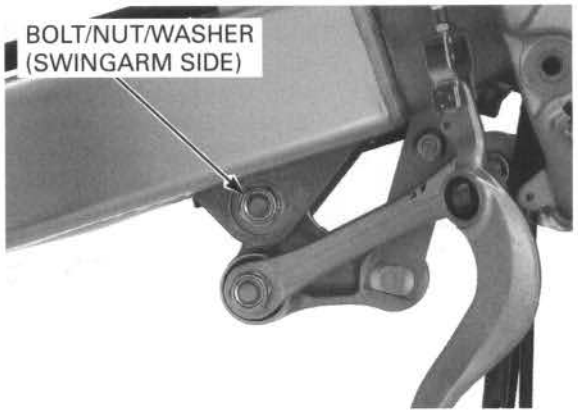
Remove the following:

- Rear wheel (page 14-8)
- Drive chain (page 4-18)
- Brake pedal (page 15-32)

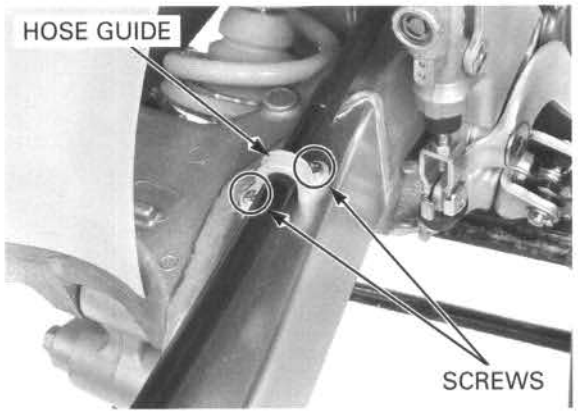
'04 - '06: Remove the shock arm bolt and nut (swingarm side).



After '06: Remove the shock arm bolt and nut (swingarm side).



Remove the screws and brake hose guide.

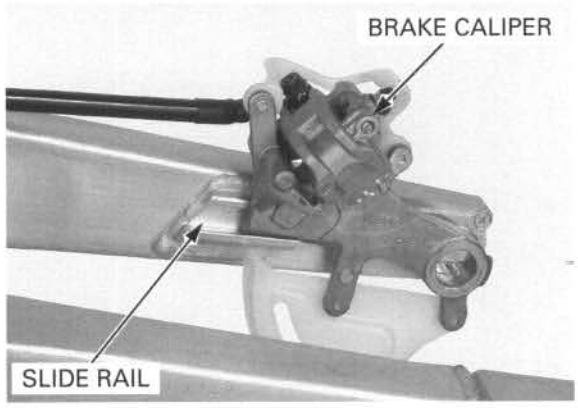


Do not disconnect the hydraulic line.

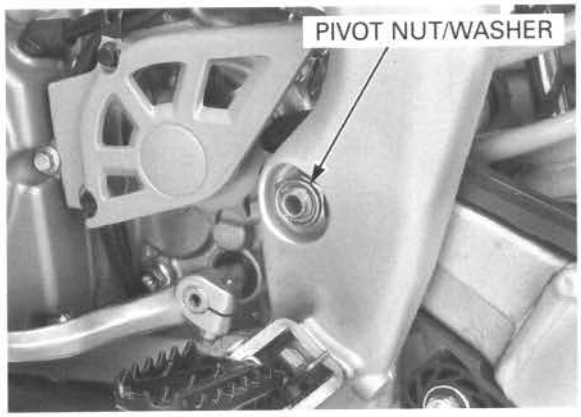
Remove the rear brake caliper from the slide rail on the swingarm.

NOTICE

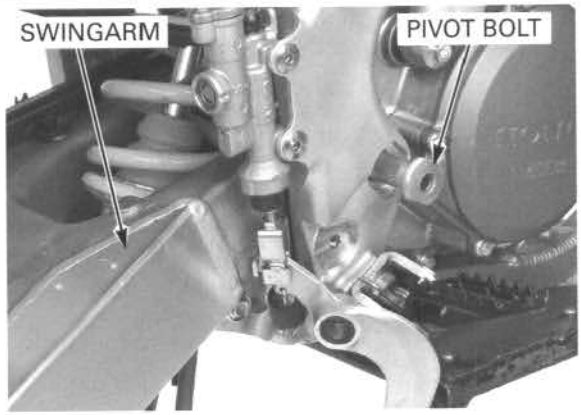
Do not suspend the brake caliper from the brake hose. The brake hose may be damaged.



Remove the swingarm pivot nut and washer.



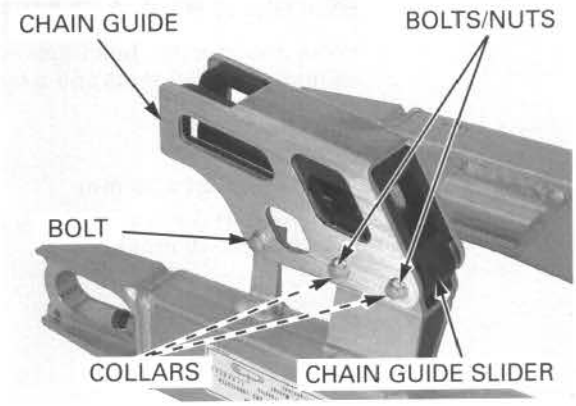
Remove the swingarm pivot bolt and swingarm.



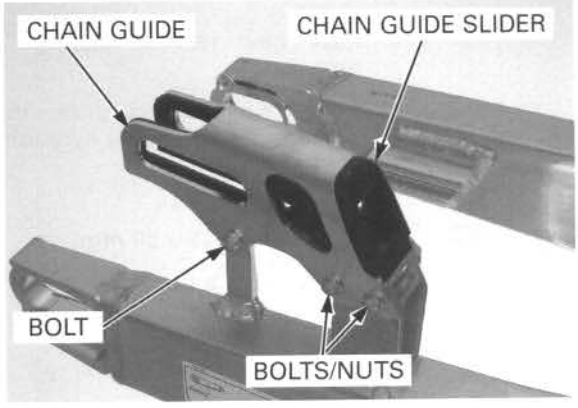
Check the chain slider and chain guide for wear or damage (page 4-19).

DISASSEMBLY

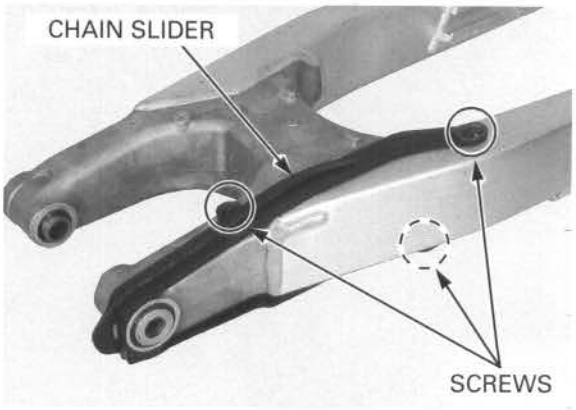
'04 - '06: Remove the bolts, nuts, chain guide, collars and chain guide slider.



After '06: Remove the bolts, nuts, chain guide and chain guide slider.



Remove the screws and chain slider.

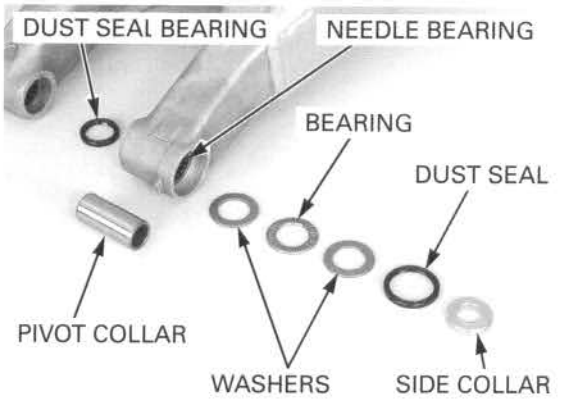


Remove the following:

- 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.

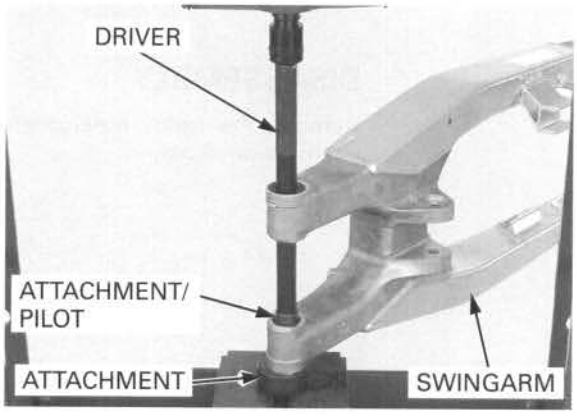


BEARING REPLACEMENT

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**



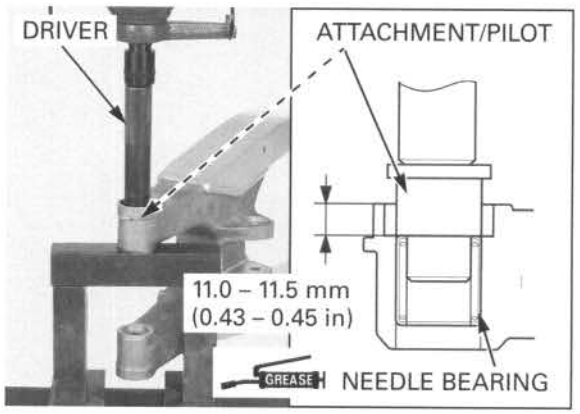
Pack new needle bearings with multi-purpose grease.

Press the needle bearing into the shock link with the marked side facing out.

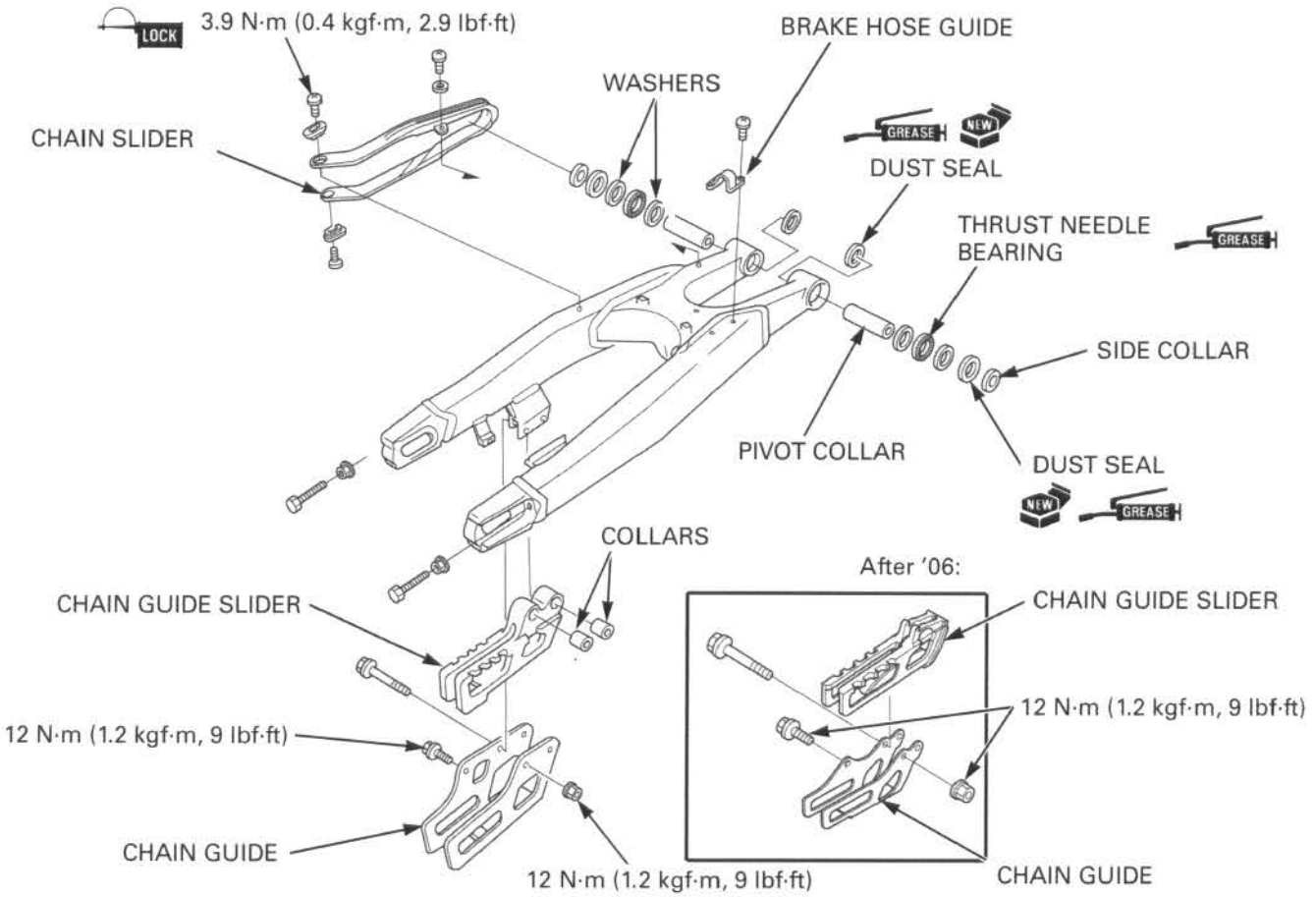
Press a new needle bearing into the swingarm using the special tools and a hydraulic press as shown.

TOOLS:

Driver	**07749-0010000**
Attachment, 28 x 30 mm	**07946-1870100**
Pilot, 22 mm	**07746-0041000**



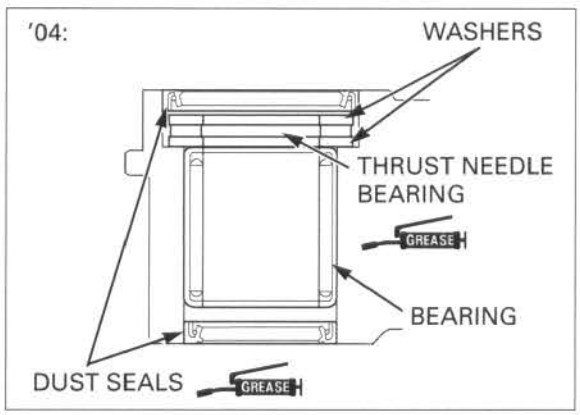
ASSEMBLY

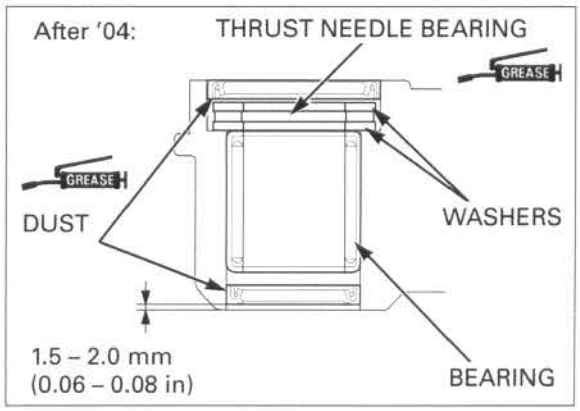


Apply grease to the thrust needle bearing and dust seal lips.

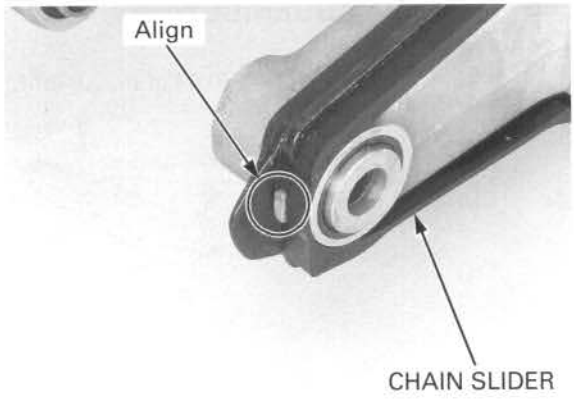
Install the following:

- Washers
- Thrust needle bearings
- Pivot collars
- Dust seals
- Side collars



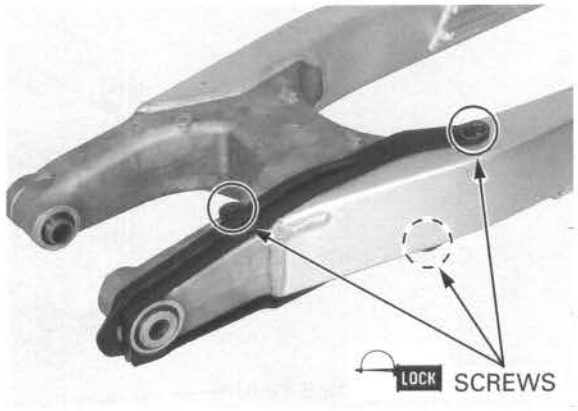


Install the chain slider so its hole fits over the tab on the swingarm.



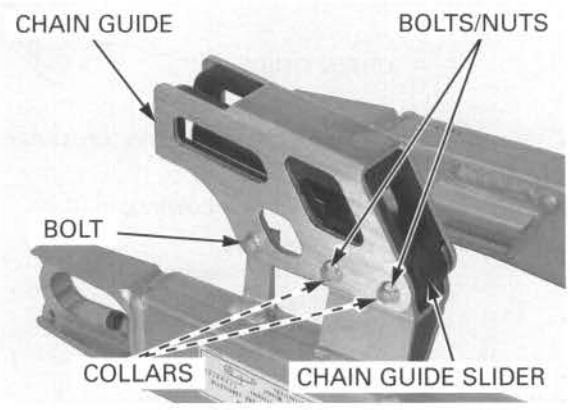
Clean and apply a locking agent to the screw threads.
Install and tighten the screws to the specified torque.

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



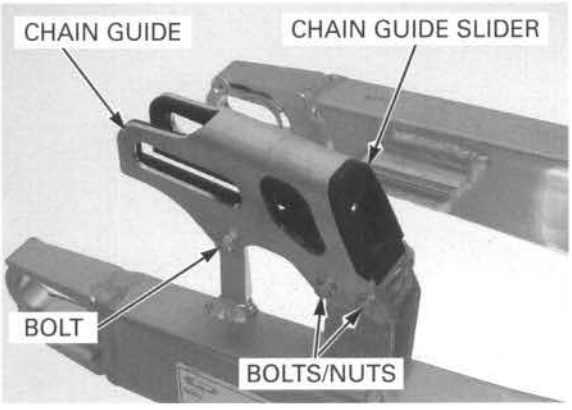
'04 - '06: Install the chain guide slider collar and chain guide.
Install and tighten the bolts and nuts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



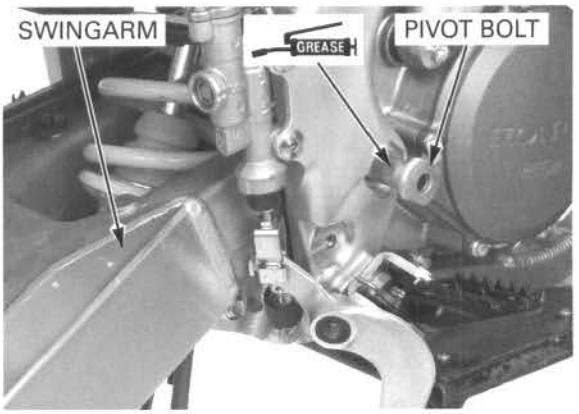
After '06: Install the chain guide slider and chain guide.
Install and tighten the bolts and nuts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



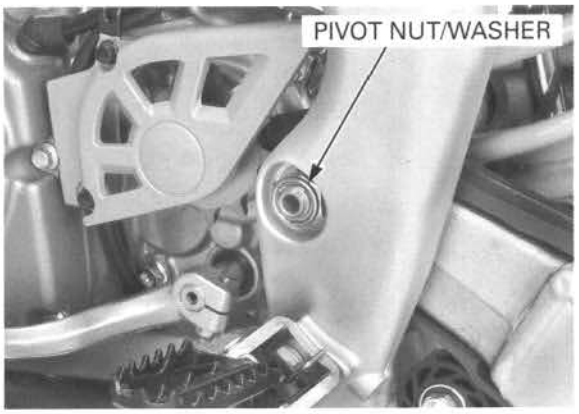
INSTALLATION

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.



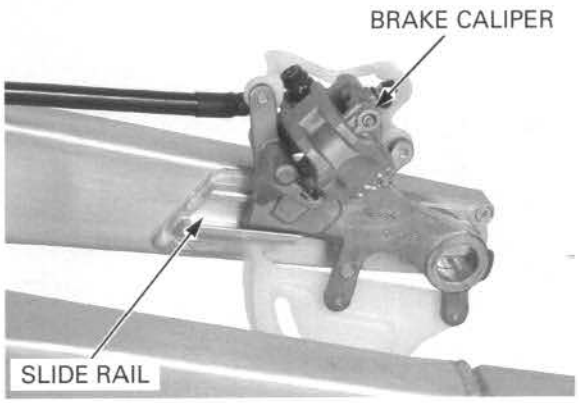
Install the washer and swingarm pivot nut.
Tighten the swingarm pivot nut to the specified torque.

TORQUE: 88 N·m (9.0 kgf·m, 65 lbf·ft)



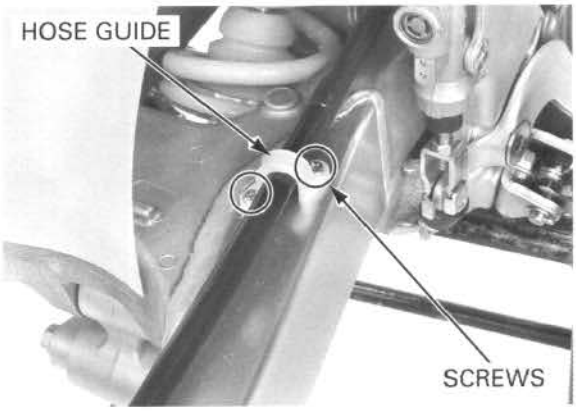
Do not twist the brake hose.

Install the rear brake caliper to the slide rail on the swingarm.



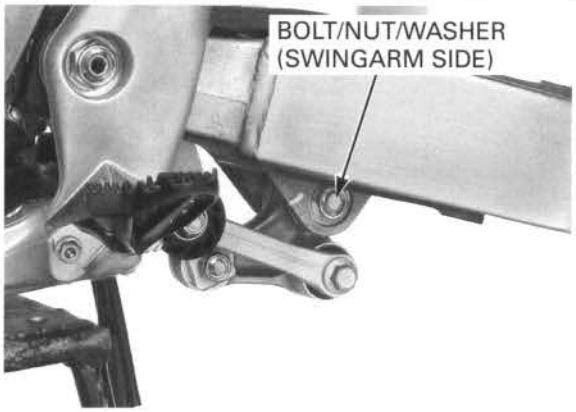
Install the brake hose guides and tighten the screws to the specified torque.

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



'04 - '06: Apply oil to the shock arm nut (swingarm side) threads and seating surface.
Install the shock arm bolt and nut (swingarm side).
Tighten the nut to the specified torque.

TORQUE: 53 N·m (5.4 kgf·m, 39 lbf·ft)

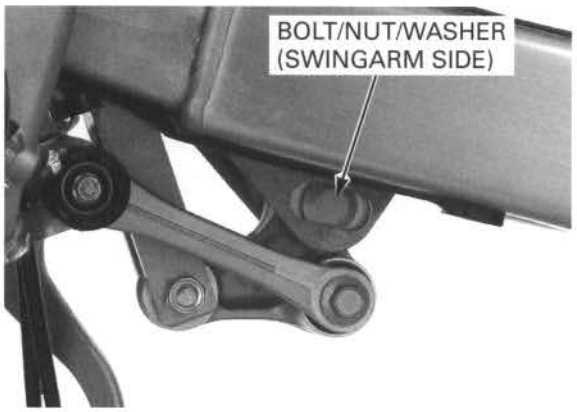


After '06: Apply oil to the shock arm nut (swingarm side) threads and seating surface.
Install the shock arm bolt and nut (swingarm side).
Tighten the nut to the specified torque.

TORQUE: 53 N·m (5.4 kgf·m, 39 lbf·ft)

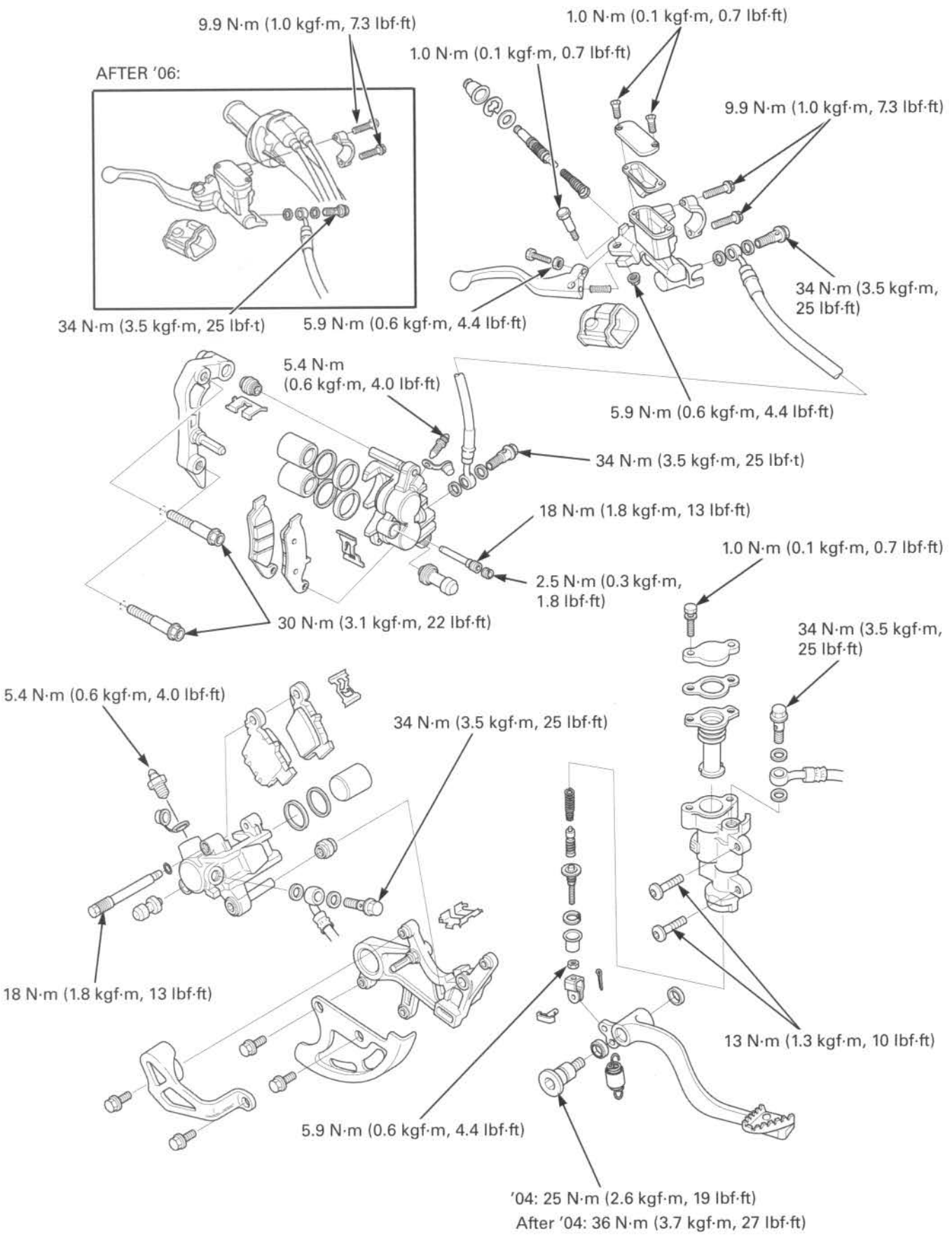
Install the following:

- Brake pedal (page 15-32)
- Drive chain (page 4-18)
- Rear wheel (page 14-13)



15. HYDRAULIC BRAKE

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

⚠CAUTION

Frequent inhalation of brake pad dust, regardless of material composition could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

NOTICE

Spilled brake fluid will severely damage instrument lenses and painted surfaces. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap; make sure the 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 contaminates (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

Unit: mm (in)

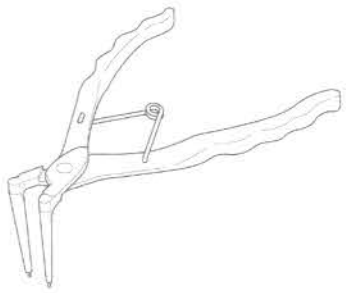
ITEM		STANDARD	SERVICE LIMIT
Front	Brake fluid	DOT 4	–
	Brake pad wear indicator	–	1.0 (0.04)
	Brake disc thickness	3.0 (0.12)	2.5 (0.10)
	Brake disc runout	–	0.15 (0.006)
	Master cylinder I.D.	11.022 (0.4339)	11.050 (0.4350)
	Master piston O.D.	10.971 (0.4319)	10.840 (0.4268)
	Caliper cylinder I.D.	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	–	0.15 (0.006)
	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)

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, 4.4 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, 4.4 lbf·ft)	
Front brake hose guide bolt	5.2 N·m (0.5 kgf·m, 3.8 lbf·ft)	
Rear brake hose guide screw	1.2 N·m (0.1 kgf·m, 0.9 lbf·ft)	
Front master cylinder reservoir cover screw	1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)	
Front master cylinder holder bolt	9.9 N·m (1.0 kgf·m, 7.3 lbf·ft)	
Front brake caliper mounting bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	Apply locking agent to the threads
Caliper bleed valve	5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)	
Front brake disc cover bolt	13 N·m (1.3 kgf·m, 10 lbf·ft)	
Rear master cylinder reservoir cover bolt	1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)	
Rear master cylinder mounting bolt	13 N·m (1.3 kgf·m, 10 lbf·ft)	
Front caliper bracket pin bolt	22 N·m (2.2 kgf·m, 16 lbf·ft)	Apply locking agent to the threads
Rear caliper bracket pin bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply locking agent to the threads
Front caliper pin bolt	22 N·m (2.2 kgf·m, 16 lbf·ft)	Apply locking agent to the threads
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	2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)	
Brake pedal pivot bolt '04:	25 N·m (2.6 kgf·m, 19 lbf·ft)	Apply locking agent to the threads
After '04:	36 N·m (3.7 kgf·m, 27 lbf·ft)	Apply locking agent to the threads
Brake pedal adjusting bolt lock nut	5.9 N·m (0.6 kgf·m, 4.4 lbf·ft)	

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

BRAKE FLUID REPLACEMENT/AIR BLEEDING

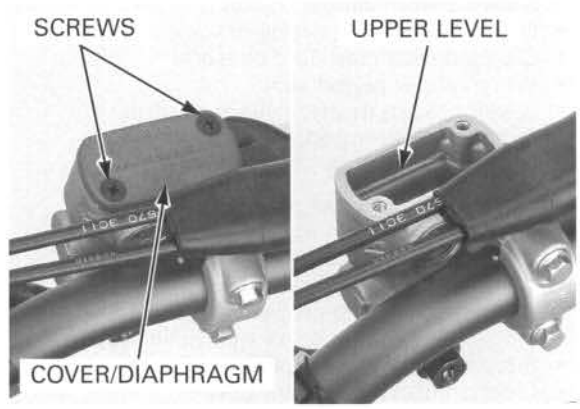
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Once the hydraulic system has been opened, or if the brake feels spongy the system must be bled.
- When using a commercially available brake bleeder, follow the manufacturer's operating instruction.

BRAKE FLUID DRAINING

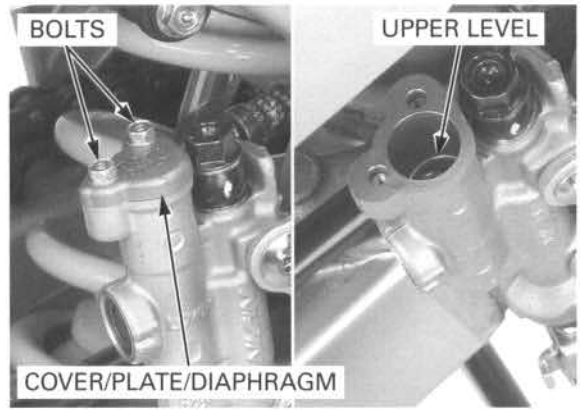
Do not allow foreign material to enter the system when filling the reservoir. Avoid spilling fluid on plastic or rubber parts. Place a rag over these parts whenever the system is serviced.

Check the master cylinder parallel to the ground, before removing the reservoir cover.

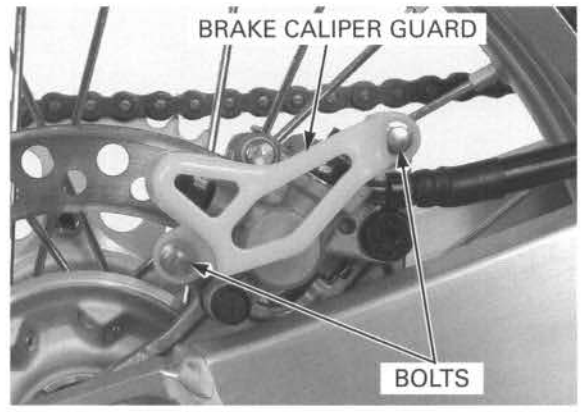
For the front brake, remove the screws, reservoir cover and diaphragm.



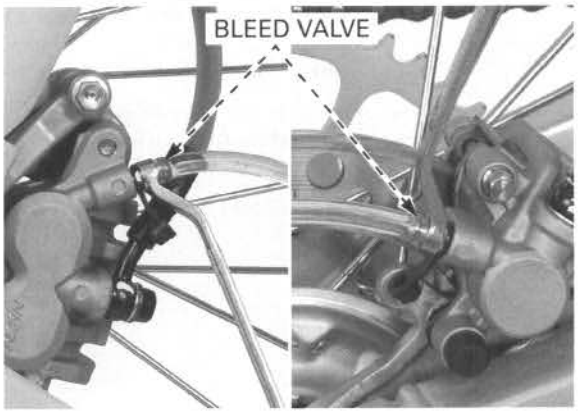
For the rear brake, remove the bolts, reservoir cover, set plate and diaphragm.



For the rear brake, remove the bolts and rear brake caliper guard.



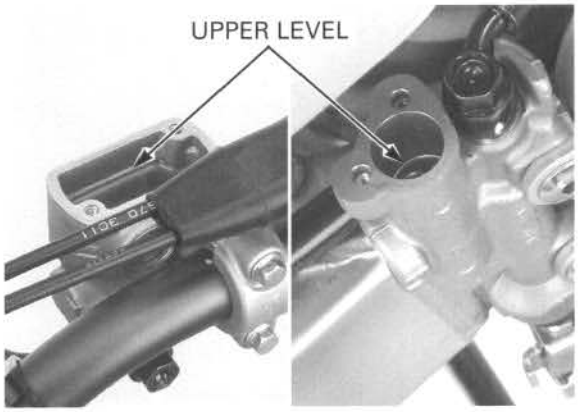
Connect a bleed hose to the bleed valve.
Loosen the bleed valve and pump the brake lever (pedal).
Stop operating the brake when no more fluid flows out of the bleed valve.



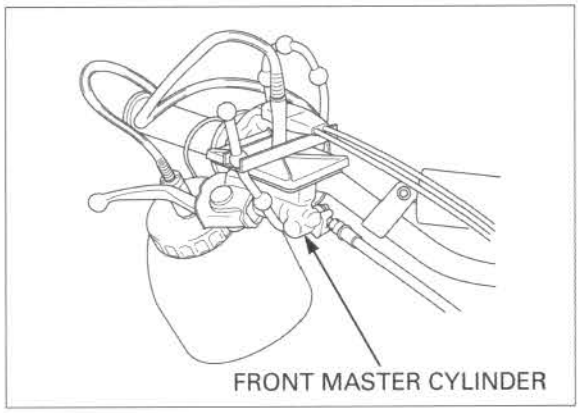
BRAKE FLUID FILLING/AIR BLEEDING

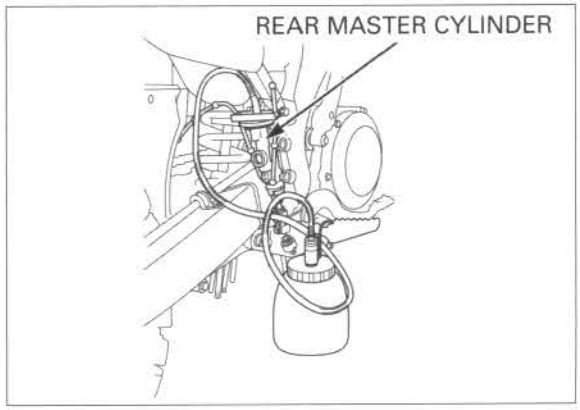
Do not mix different types of fluid since they are not compatible.

Fill the master cylinder with DOT4 brake fluid to the upper level.



Connect a commercially available brake bleeder to the bleed valve.



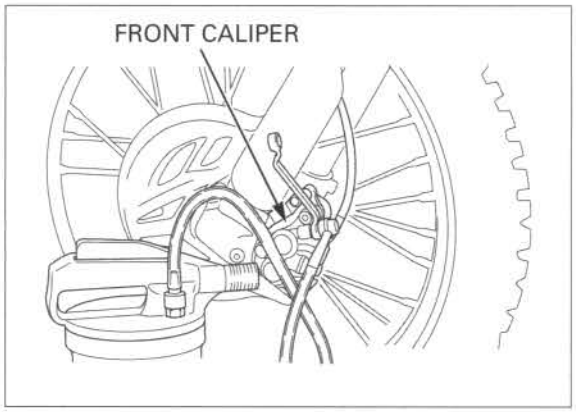


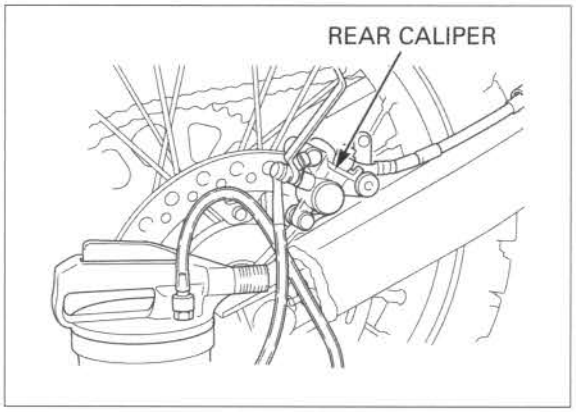
Operate the brake bleeder and loosen the bleed valve. If an automatic refill system is not used, add fluid when the fluid level in the reservoir is low.

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.

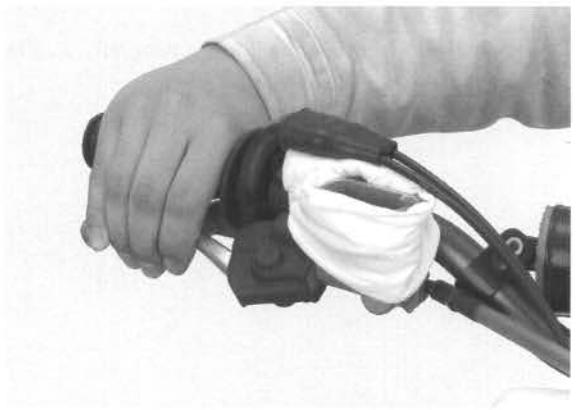
Close the bleed valve and operate the brake lever. If it still feels spongy, bleed the system again.





If a brake bleeder is not available, perform the following procedure.

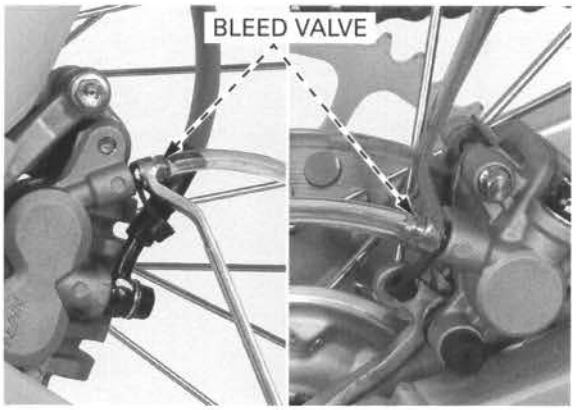
Pressurize the system with the lever until there are no air bubbles in the fluid flowing out of the small hole in the reservoir and lever resistance is felt.



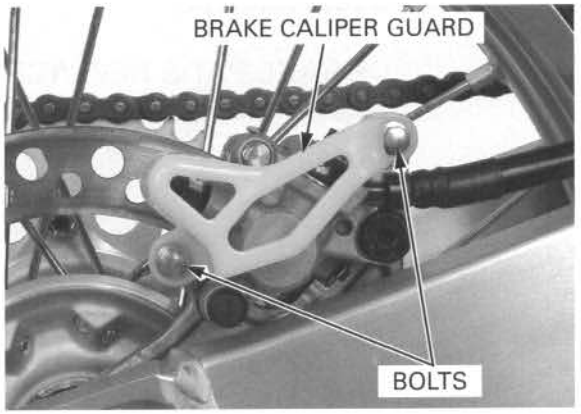
1. Pump the brake lever or pedal several times, then squeeze the brake lever or pedal all the way and loosen the bleed valve 1/2 of a turn. Wait several seconds and close the bleed valve.
2. Release the brake lever or pedal slowly and wait several seconds after it reaches the end of its travel.
3. Repeat 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.

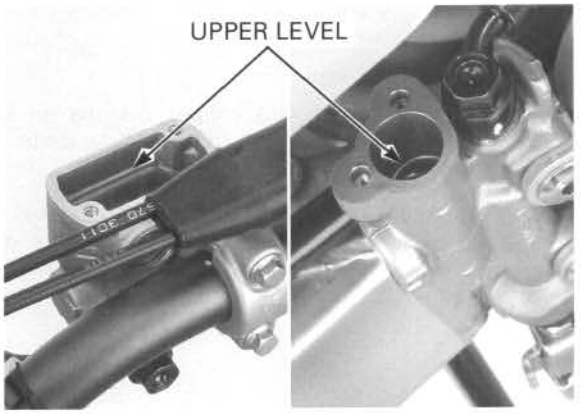
TORQUE: 5.4 N·m (0.6 kgf·m, 4.0 lbf·ft)



For the rear brake, install the brake caliper guard and tighten the bolts securely.

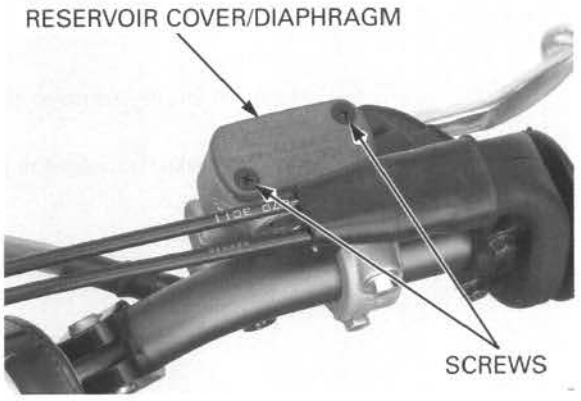


Fill the reservoir with DOT 4 brake fluid to the top of the upper level.



Install the diaphragm and reservoir cover.
Tighten the reservoir cover screws to the specified torque.

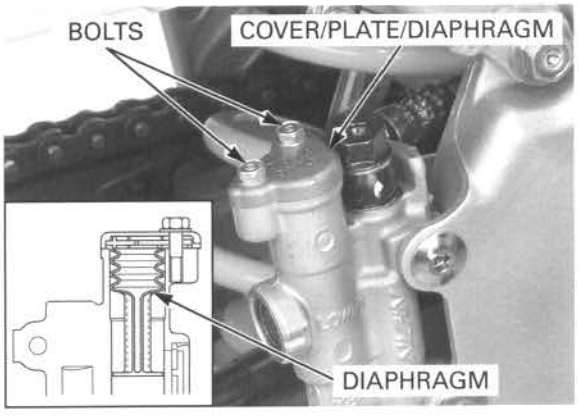
TORQUE: 1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)



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.

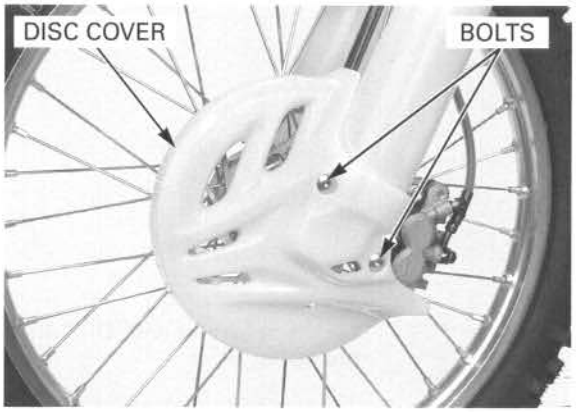
TORQUE: 1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)



BRAKE PADS/DISC

BRAKE PADS REPLACEMENT: '04 – '08

Remove the bolts and brake disc cover.

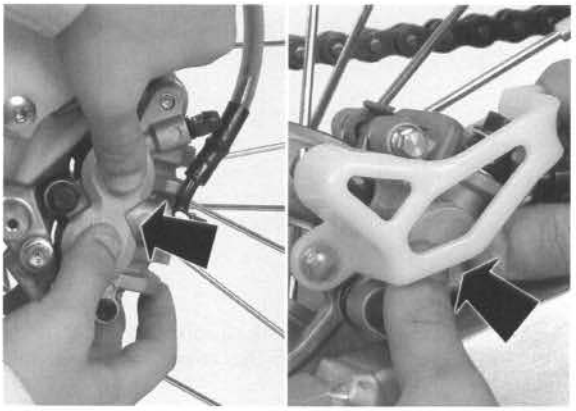


Always replace the brake pads in pairs to assure even disc pressure.

Push the caliper pistons all the way in to allow installation of new brake pads.

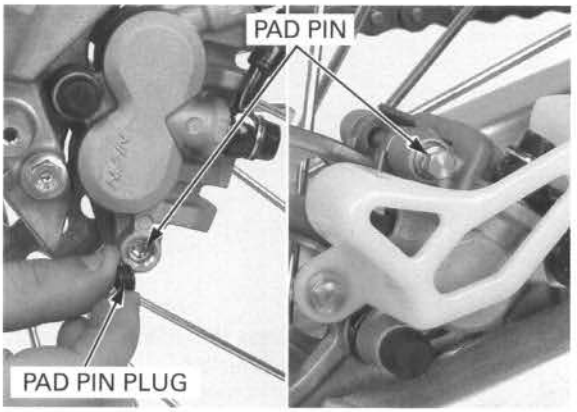
NOTE:

- 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.

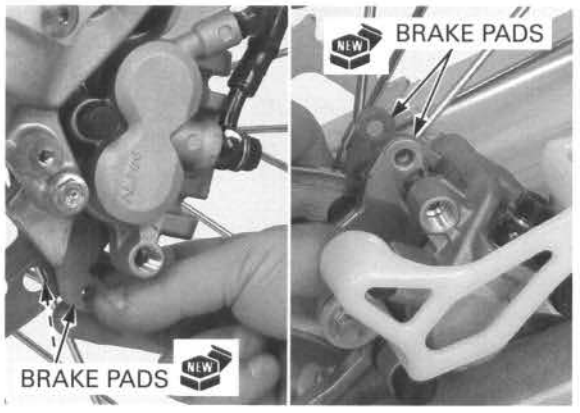


Remove the brake pads.

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.



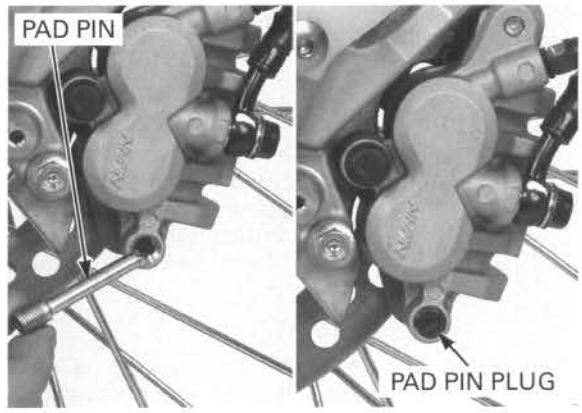
For the front brake, push the brake pads against the pad spring, then install the pad pin.

Tighten the pad pin to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

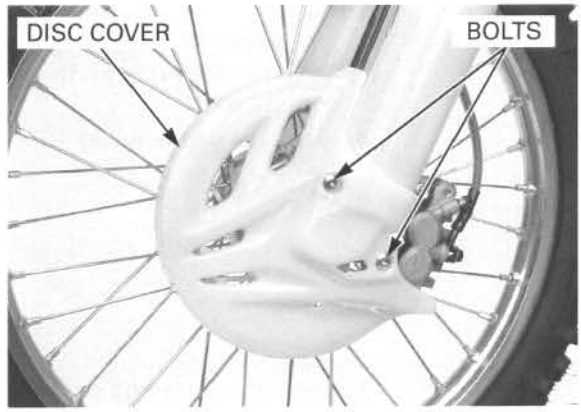
Install and tighten the pad pin plug to the specified torque.

TORQUE: 2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)



Install the brake disc cover and tighten the bolts specified torque.

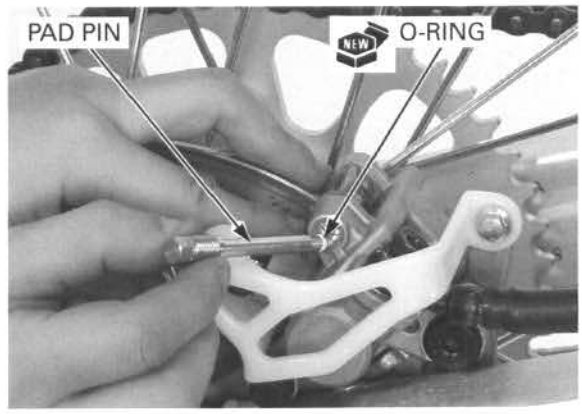
TORQUE: 13 N·m (1.3 kgf·m, 10 lbf·ft)



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 PADS REPLACEMENT: After '08

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.

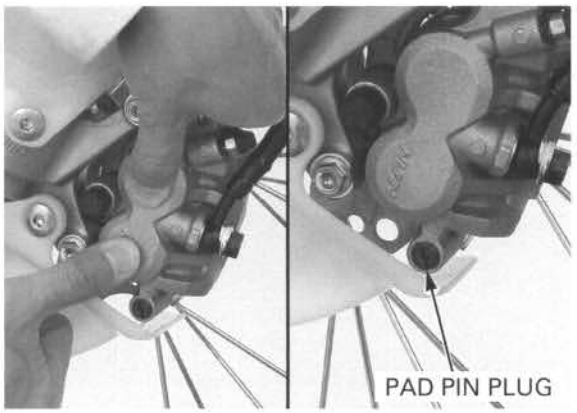
FRONT:

Push the caliper pistons all the way in to allow installation of new brake pads.

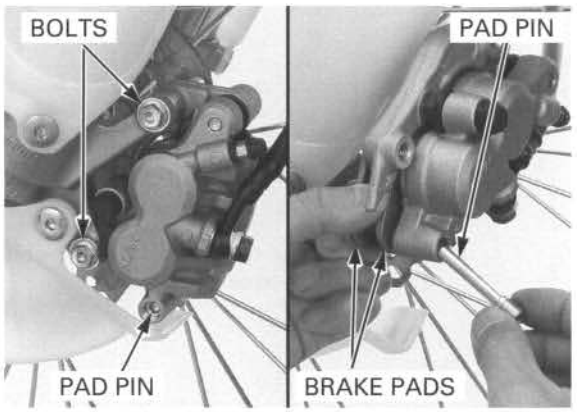
NOTE:

- Check the brake fluid level in the brake master cylinder reservoir as this operation causes the level to rise.

Remove the pad pin plug.

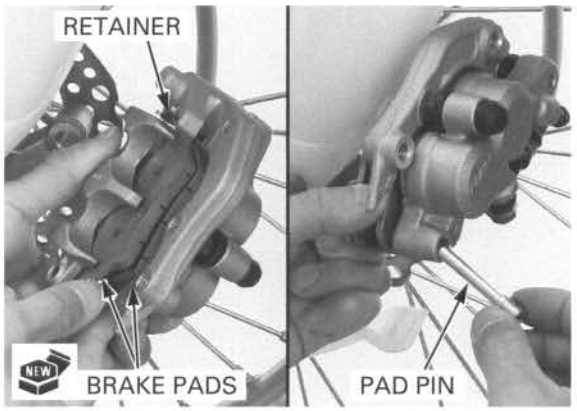


Loosen the pad pin.
Remove the mounting bolts and front brake caliper/bracket, then remove the pad pin and brake pads.



Install new brake pads to the pad retainer securely.

Push the brake pads against the pad spring, then install the pad pin.



Clean and apply locking agent to the caliper mounting bolt threads.

Install the caliper/bracket assembly to the fork leg. Install the mounting bolts and tighten them to the specified torque.

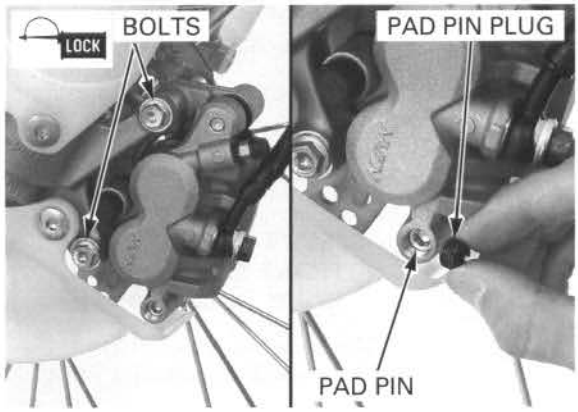
TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

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: 2.5 N·m (0.3 kgf·m, 1.8 lbf·ft)



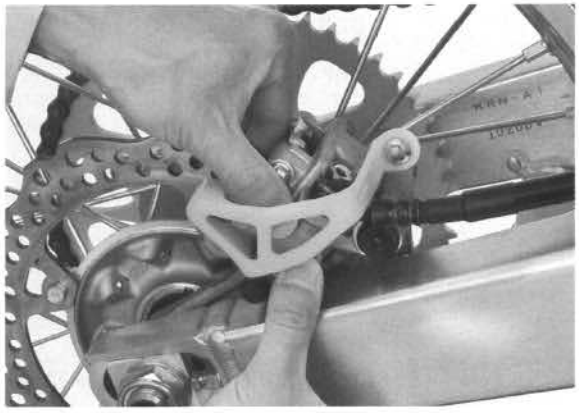
Operate the brake lever to seat the caliper piston against the pads.

REAR:

Push the caliper piston all the way in to allow installation of new brake pads.

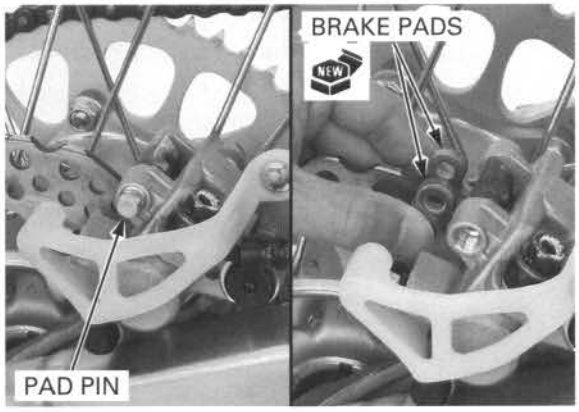
NOTE:

- Check the brake fluid level in the brake master cylinder reservoir as this operation causes the level to rise.



Remove the pad pin and brake pads.

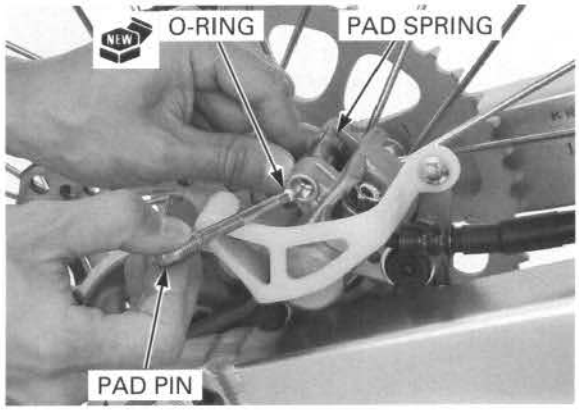
Install new brake pads to the pad retainer securely.



Install a new O-ring into the pad pin groove.
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)

Operate the brake pedal to seat the caliper piston against the pads.



BRAKE DISC INSPECTION

'04 – '08: Remove the front brake disc cover (page 15-10).

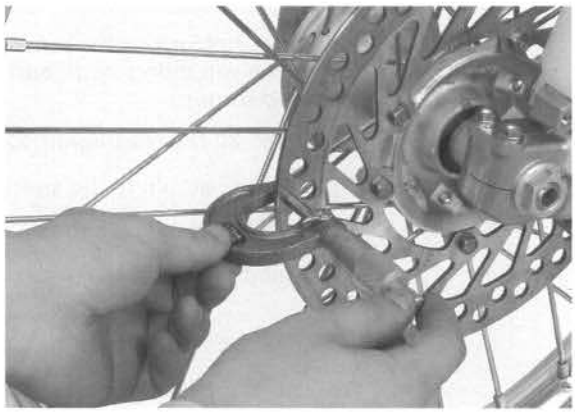
After '08: Remove the front brake caliper (page 15-25).

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.



Measure the brake disc warpage with a dial indicator.

SERVICE LIMIT: 0.15 mm (0.006 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.

'04 – '08: Install the front brake disc cover (page 15-11).

After '08: Install the front brake caliper (page 15-28).

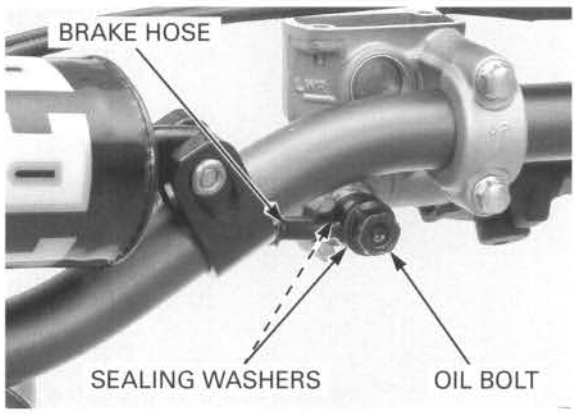
FRONT MASTER CYLINDER: '04 - '06

REMOVAL

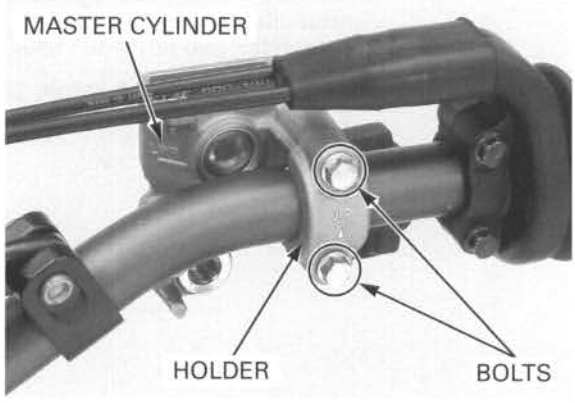
Drain the front brake hydraulic system (page 15-6).

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.

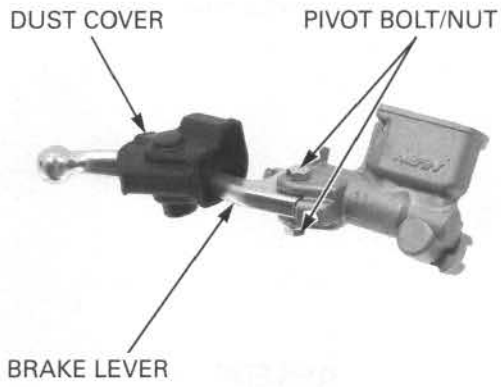


Remove the bolts, holder and master cylinder assembly.



DISASSEMBLY

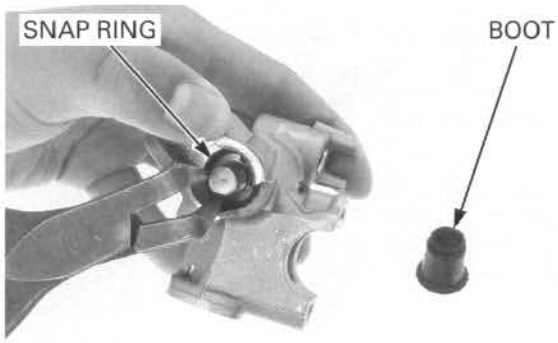
Remove the dust cover.
Remove the pivot bolt/nut and brake lever assembly.



Remove the boot.

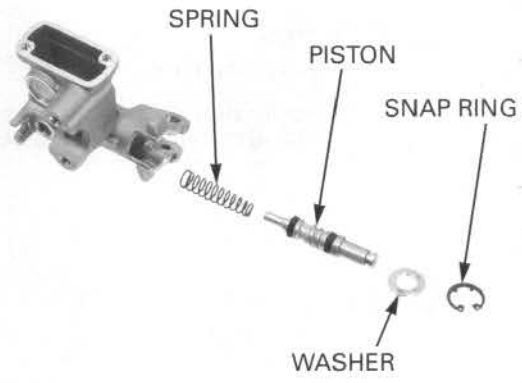
Remove the snap ring from the master cylinder body using the special tool as shown.

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

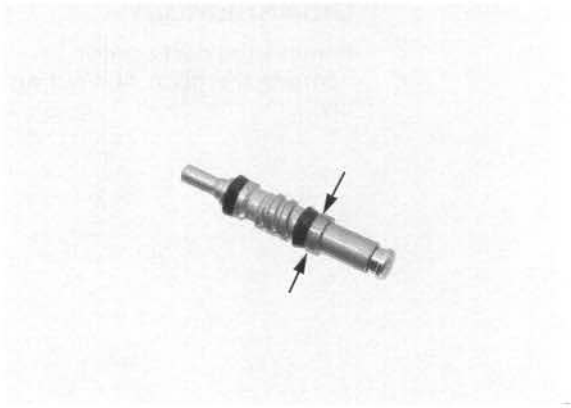
Check the piston boot, primary cup and secondary cup for fatigue or damage.
Check the master cylinder and piston for abnormal scratches.

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)



ASSEMBLY

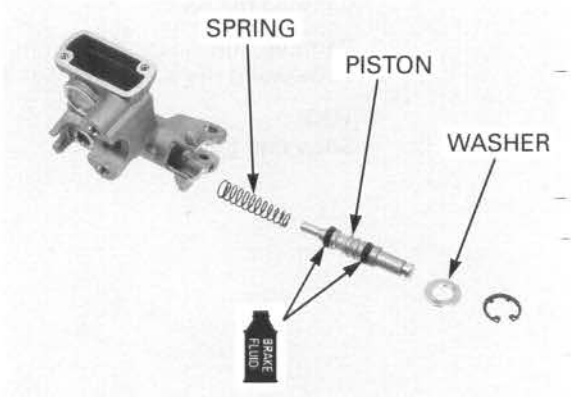
Replace the piston, cups, spring, snap ring and boot as a set; do not substitute individual parts.

Coat all 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.

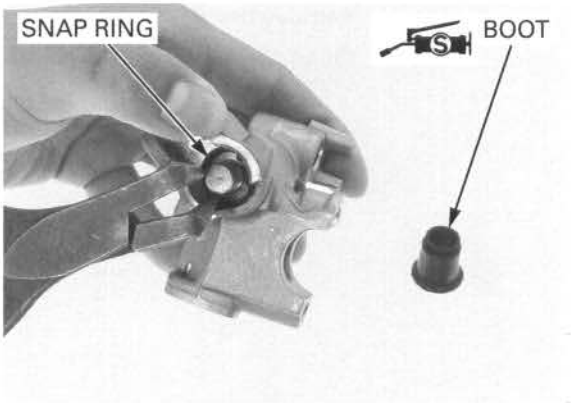


Be certain the snap ring is firmly seated in the groove

Install the snap ring using the special tool.

TOOL:
Snap ring pliers **07914-SA50001**

Apply silicone grease to the inside of the boot.
Install the boot to the master cylinder.



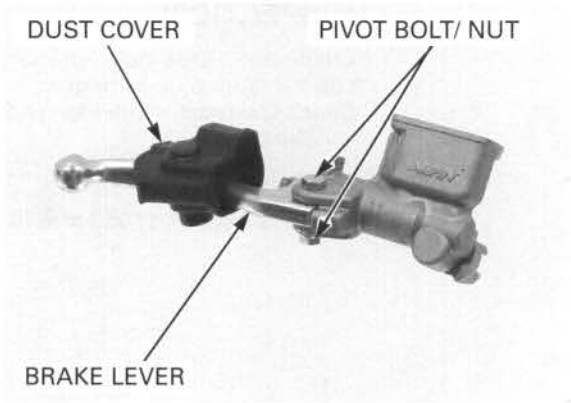
Install the brake lever.
Install and tighten the pivot bolt to the specified torque.

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, 4.4 lbf·ft)

Install the dust cover.

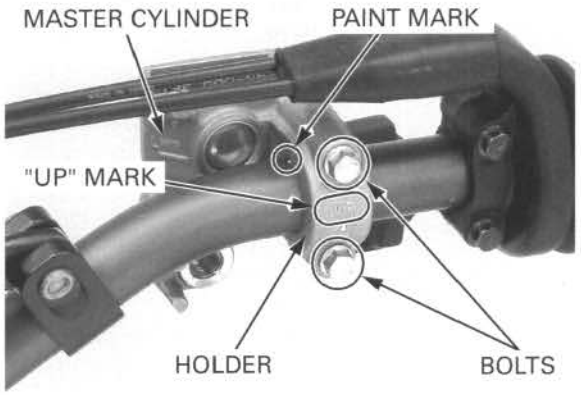


INSTALLATION

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.

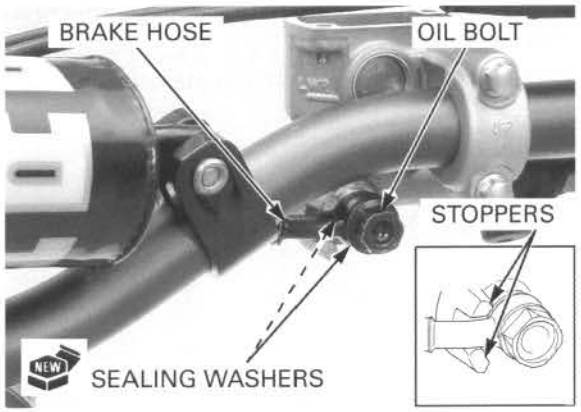
TORQUE: 9.9 N·m (1.0 kgf·m, 7.3 lbf·ft)



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 system (page 15-7).



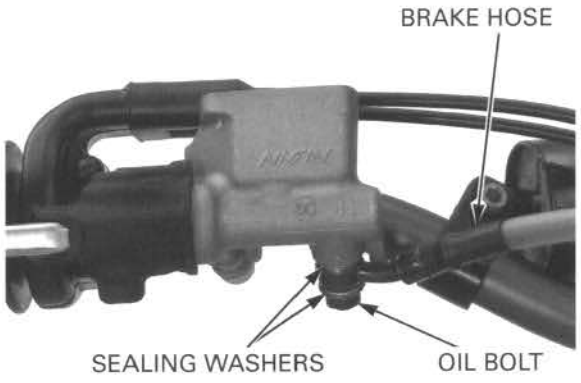
FRONT MASTER CYLINDER: AFTER '06

REMOVAL

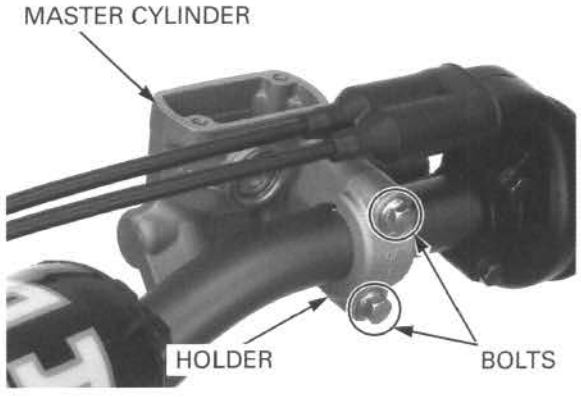
Drain the front brake hydraulic system (page 15-6).

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.

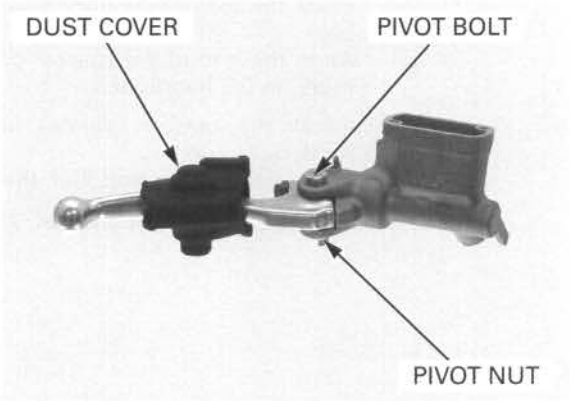


Remove the bolts, holder and master cylinder assembly.



DISASSEMBLY

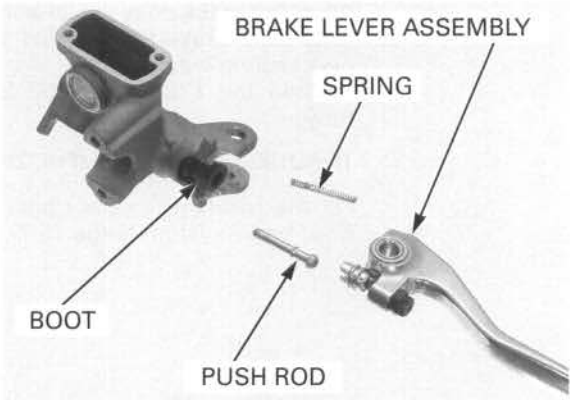
Remove the dust cover.
Remove the pivot nut and bolt.



Be careful not to damage the boot.

Release the boot from the brake lever assembly.

Remove the brake lever assembly, spring and push rod from the master cylinder.

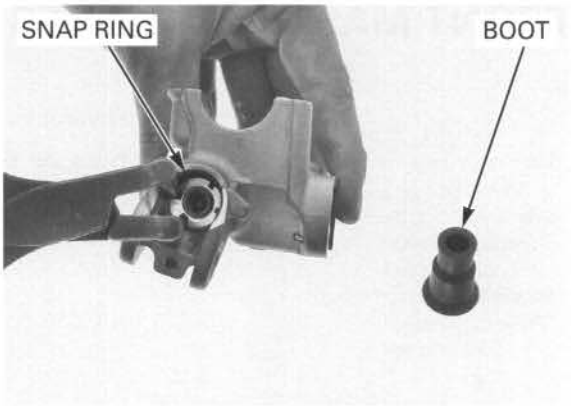


Be careful not to damage the boot.

Remove the boot.

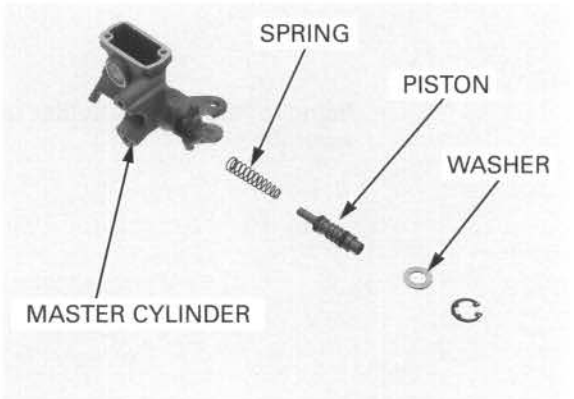
Remove the snap ring from the master cylinder body using the special tool as shown.

TOOL:
Snap ring pliers **07914-SA50001**



Remove the washer, master piston and spring.

Clean the inside of the cylinder and reservoir with brake fluid.

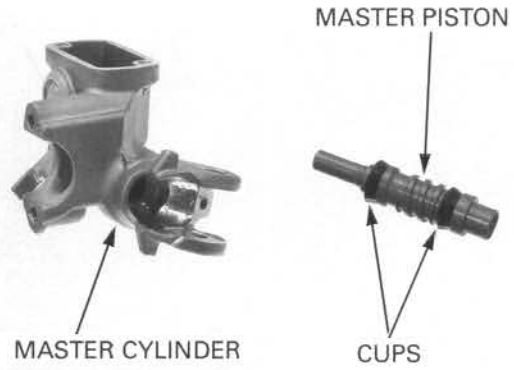


INSPECTION

Check the master cylinder for abnormal scratches.

Check the master piston for abnormal scratches.
Check the primary cup and secondary cup for fatigue or damage.

Replace the master piston, primary cup and secondary cup as an assembly if necessary.

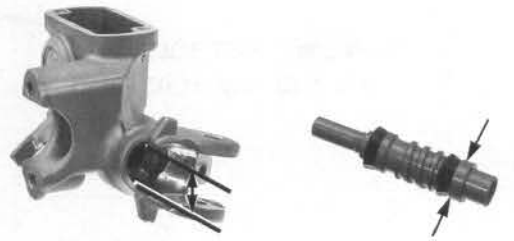


Measure the master cylinder I.D.

SERVICE LIMIT: 11.050 mm (0.4350 in)

Measure the master piston O.D.

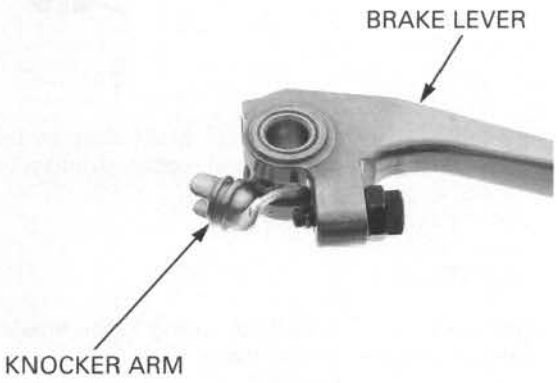
SERVICE LIMIT: 10.840 mm (0.4268 in)



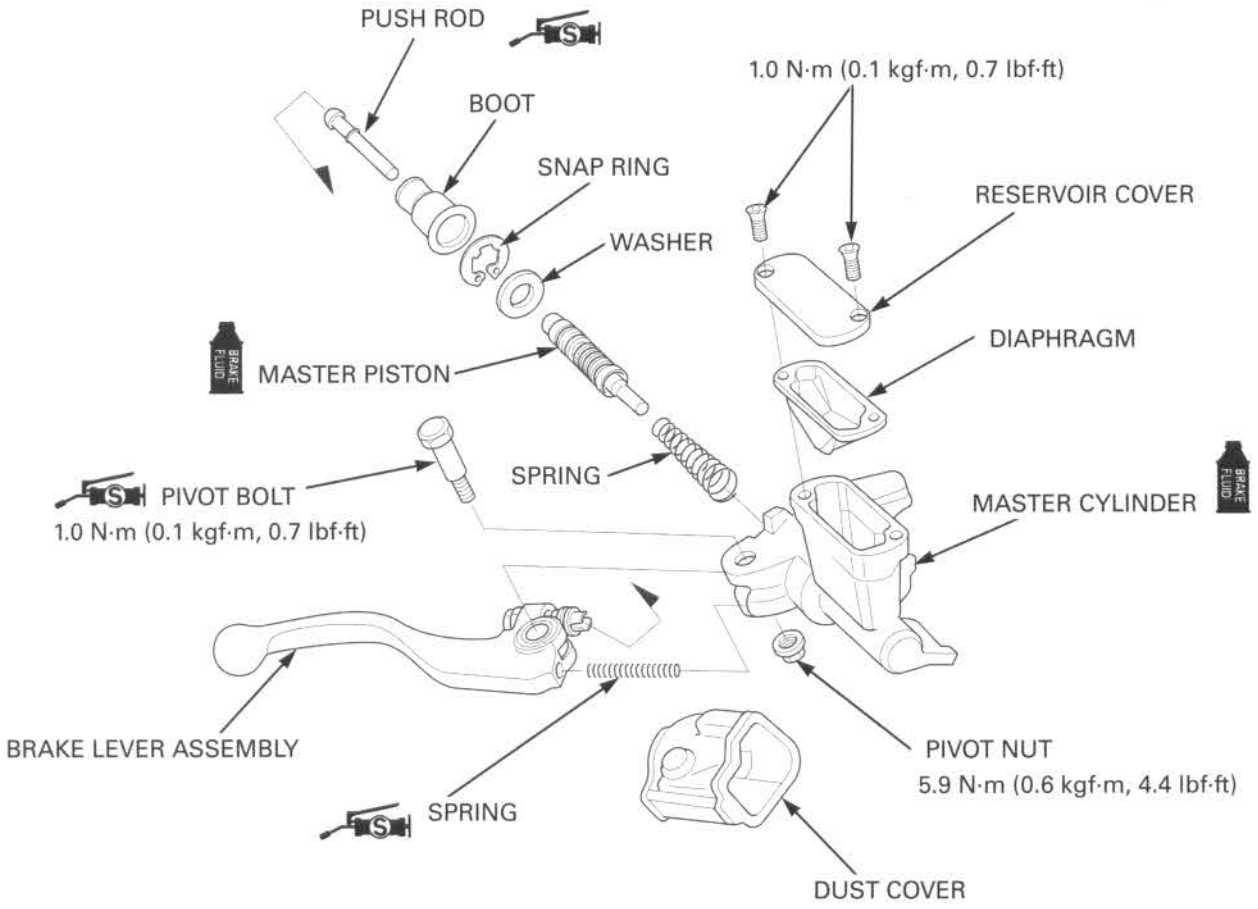
Check the brake lever for bent or damage.

Measure the knocker arm with your finger.
The knocker arm should move smoothly and freely without excessive play.

Replace the brake lever and knocker arm as an assembly if necessary.



ASSEMBLY

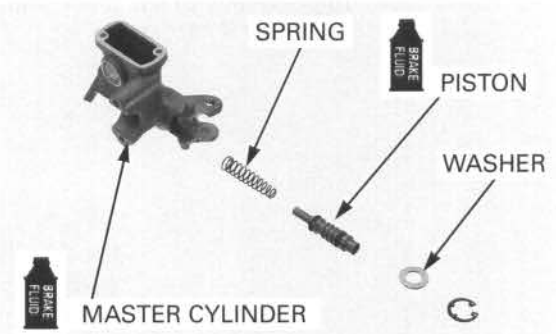


Replace the piston, cups, spring and snap ring, boot and push rod as a set; do not substitute individual parts.

Apply clean brake fluid to the master piston outer surface and master cylinder inner surface.

When installing the cups, do not allow the lips to turn inside out.

Install the spring to the master piston.
Install the master piston assembly into the master cylinder.
Install the washer.

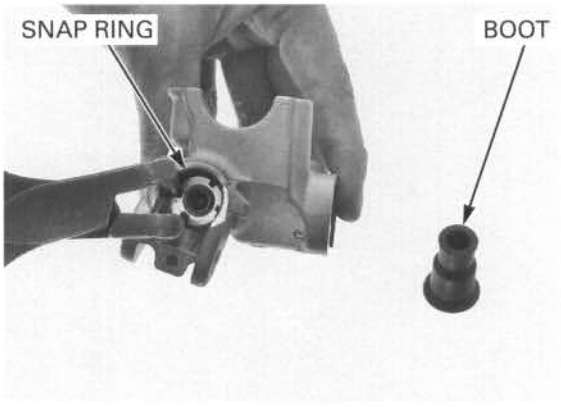


Be certain the snap ring is firmly seated in the groove

Install the snap ring to the master cylinder using the special tool.

TOOL:
Snap ring pliers **07914-SA50001**

Install the boot to the master cylinder until it is full seated.



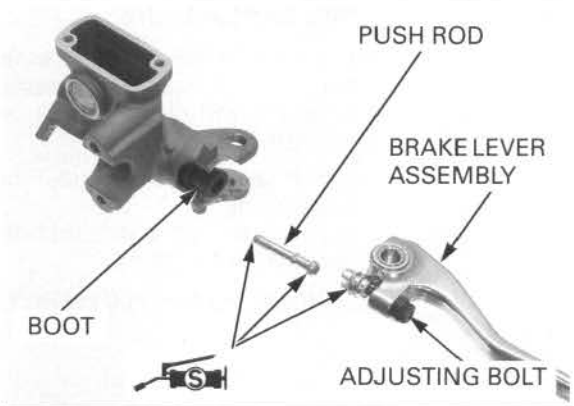
Apply silicone grease to the contact area of the push rod and brake lever adjusting bolt tip.

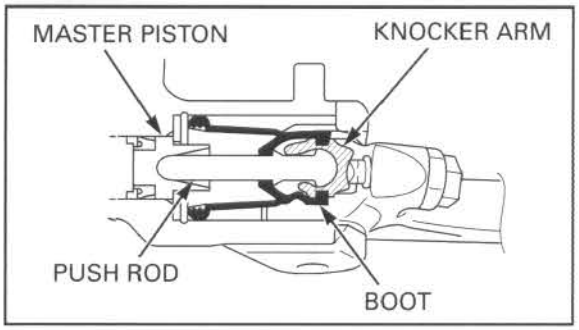
Note the direction of the push rod. Make sure the tub on the push rod is seated on the boot.

Install the push rod to the hollow of the master piston securely.

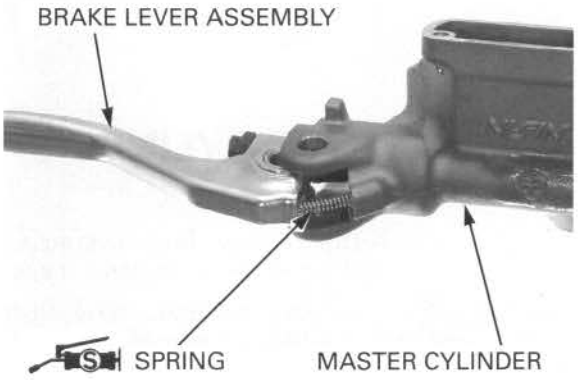
Install the brake lever assembly while aligning the push rod end with the knocker arm.

Set the boot to the knocker arm groove securely.





Apply silicone grease to the spring both ends, and install it between the master cylinder and brake lever assembly.



Apply silicone grease to the pivot bolt sliding surface.

Install and tighten the pivot bolt to the specified torque.

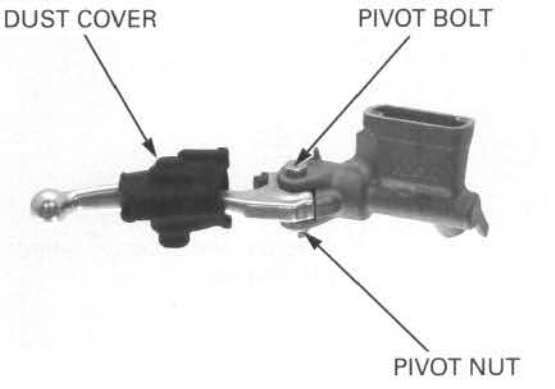
TORQUE: 1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)

Tighten the pivot nut to the specified torque while holding the pivot bolt.

TORQUE: 5.9 N·m (0.6 kgf·m, 4.4 lbf·ft)

Check for smooth brake lever operation.

Install the dust cover.

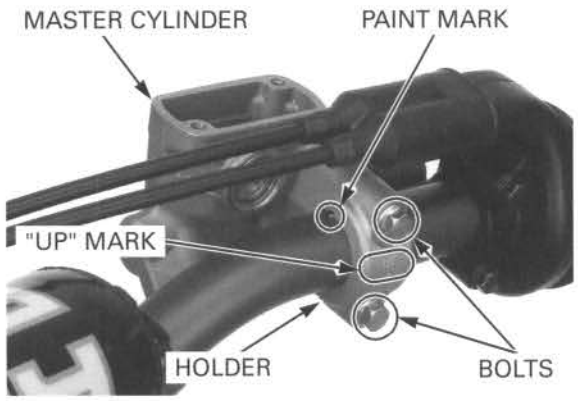


INSTALLATION

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 to the specified torque.

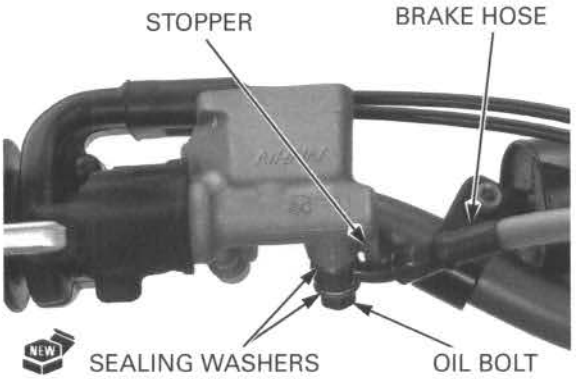
TORQUE: 9.9 N·m (1.0 kgf·m, 7.3 lbf·ft)



Install the brake hose eyelet with the oil bolt and new sealing washers.
Push the brake hose 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)

Fill the reservoir to the upper level and bleed the front brake system (page 15-7).



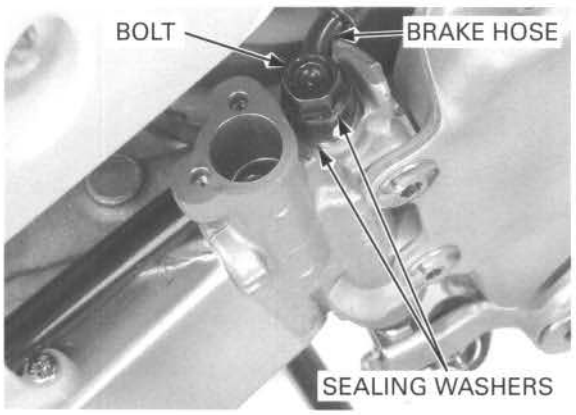
REAR MASTER CYLINDER

REMOVAL

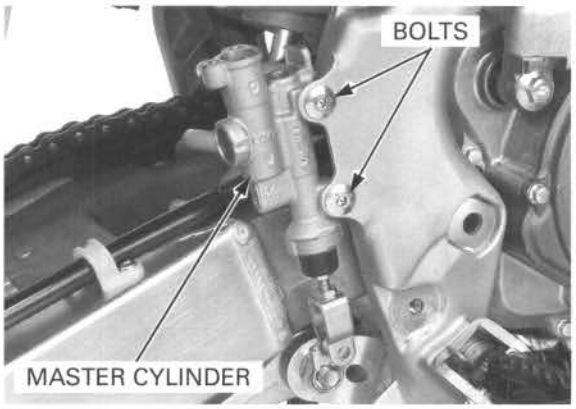
Drain the rear brake hydraulic system (page 15-6).
Remove the brake pedal (page 15-32).

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.

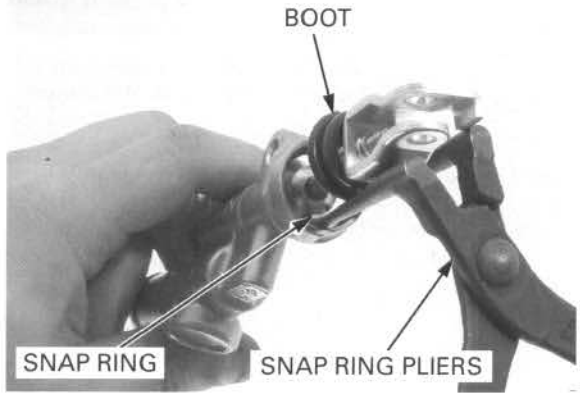


DISASSEMBLY

Remove the boot.

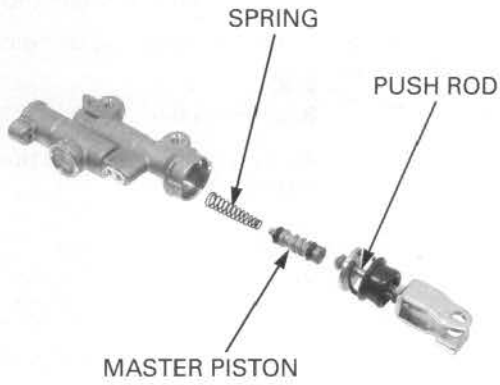
Remove the snap ring from the master cylinder body using the special tool as shown.

TOOL:
Snap ring pliers **07914-SA50001**



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.

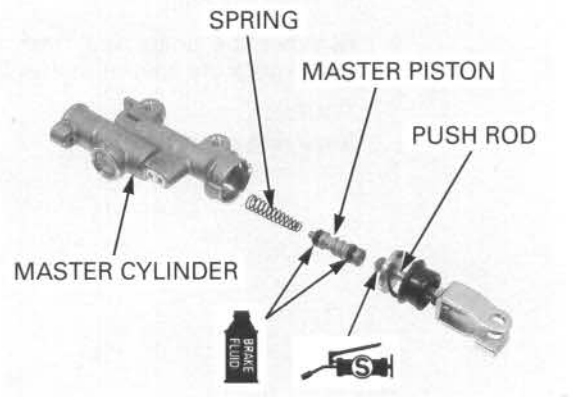
SERVICE LIMIT: 9.465 mm (0.3726 in)

ASSEMBLY

Replace the piston, cups, spring, snap ring and boot as a set; do not substitute individual parts.

Coat all 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.

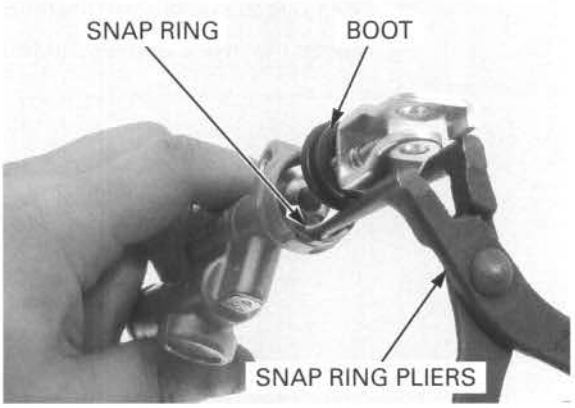
Install the push rod into the master cylinder.

Be certain the snap ring is firmly seated in the groove

Install the snap ring using the special tool.

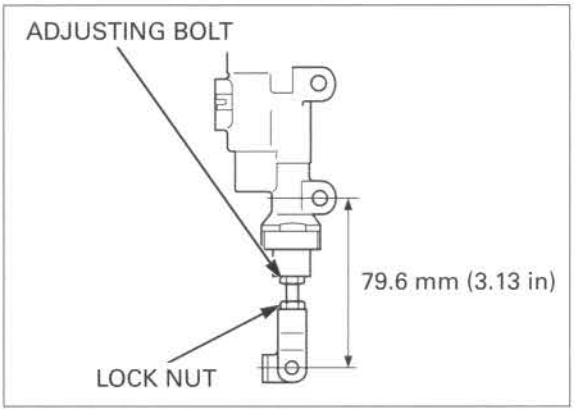
TOOL:
Snap ring plier **07914-SA50001**

Apply silicone grease to the boot inside surface.
Install the boot.



Adjust the brake pedal to the desired height by loosening the lock nut and turning the pedal height adjusting bolt.
Tighten the lock nut to the specified torque.

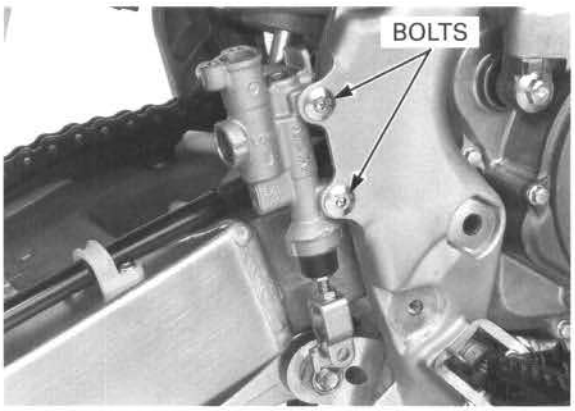
TORQUE: 5.9 N·m (0.6 kgf·m, 4.4 lbf·ft)



INSTALLATION

Install the master cylinder and tighten the mounting bolts to the specified torque.

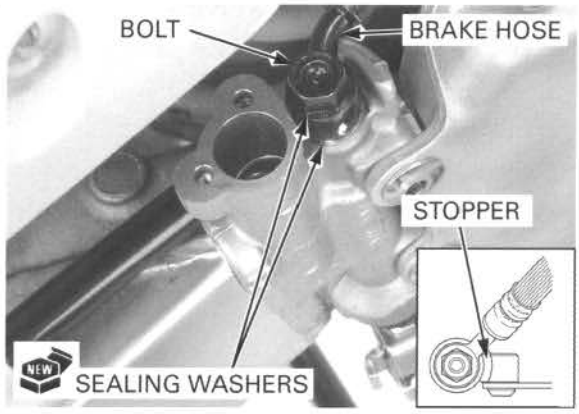
TORQUE: 13 N·m (1.3 kgf·m, 10 lbf·ft)



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 15-32).
Fill the reservoir to the upper level and bleed the brake system (page 15-7).

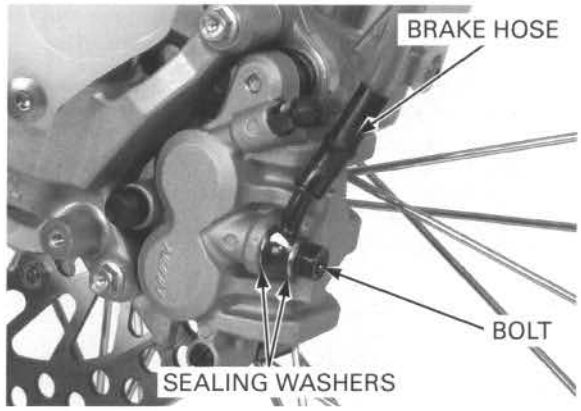


FRONT BRAKE CALIPER

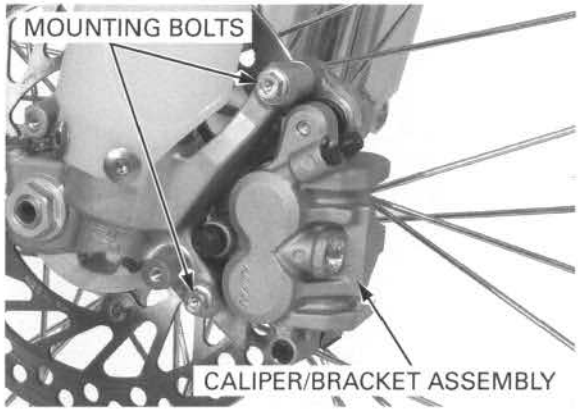
REMOVAL: '04 – '08

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.

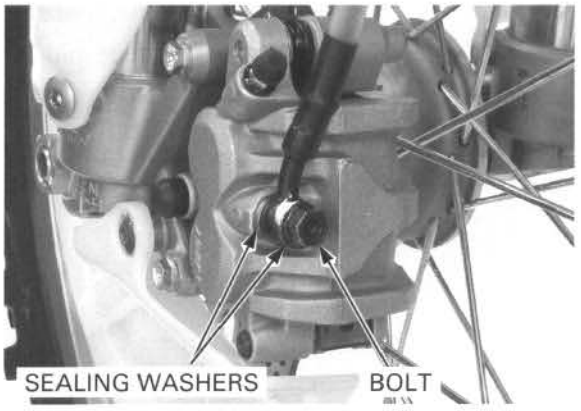


REMOVAL: After '08

Drain the front brake hydraulic system (page 15-6).

Remove the brake hose oil bolt, sealing washers and brake hose eyelet.

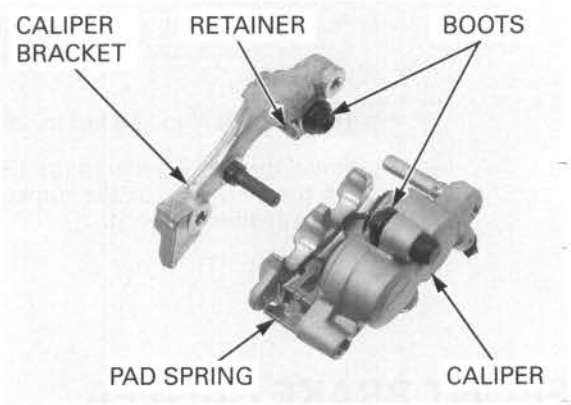
Remove the front brake pads and front caliper/bracket assembly (page 15-12).



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.

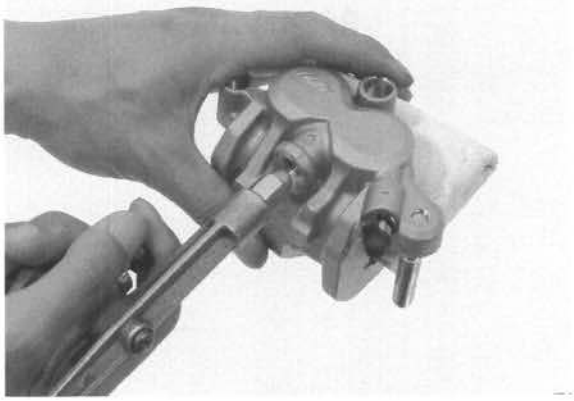


If necessary, lightly apply compressed air to the caliper fluid inlet to get the piston out.

Place a shop rag under the caliper to cushion the piston when it is expelled.

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.

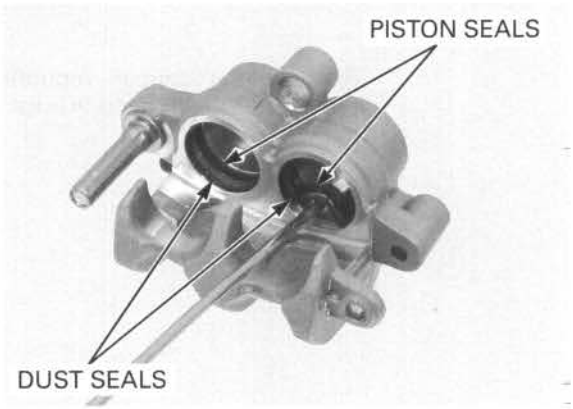
Use the air in short spurts.



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.

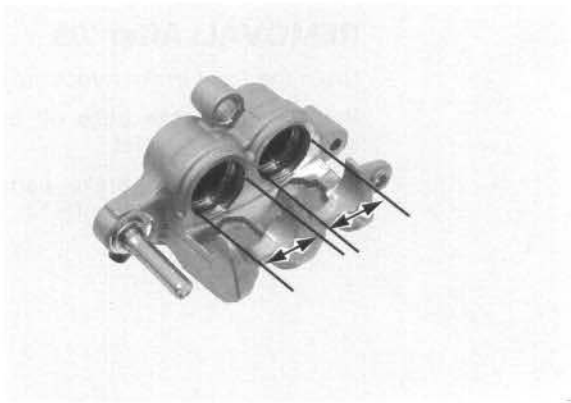


INSPECTION

Check the caliper cylinder and pistons for scoring, scratches or damage.

Measure the caliper 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)

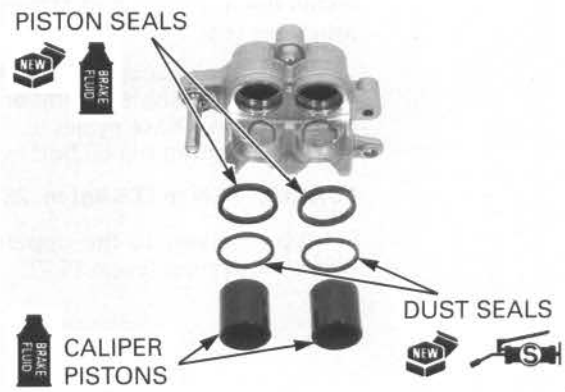
ASSEMBLY

Coat new piston seals with clean brake fluid.
Coat 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.



Install the brake pad retainer onto the caliper bracket.

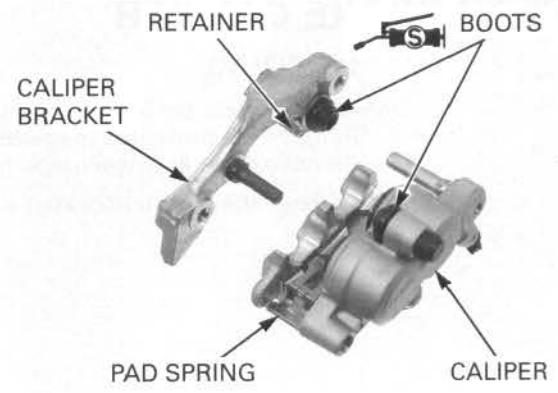
Note the installation direction of the pad spring.

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.

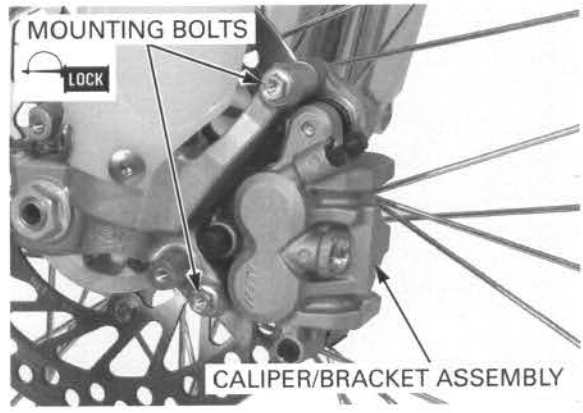
Assemble the caliper and bracket.



INSTALLATION: '04 – '08

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.

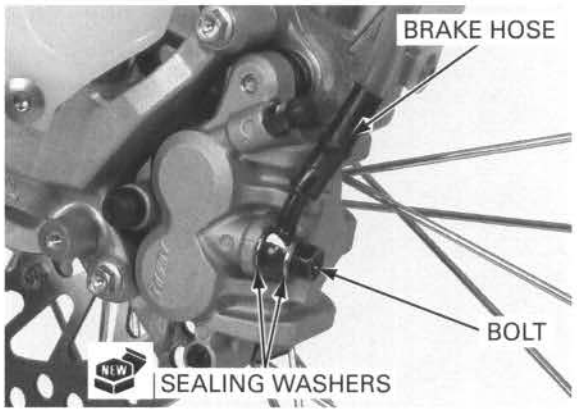
TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)



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 pads (page 15-10).
Fill the reservoir to the upper level and bleed the hydraulic system (page 15-7).



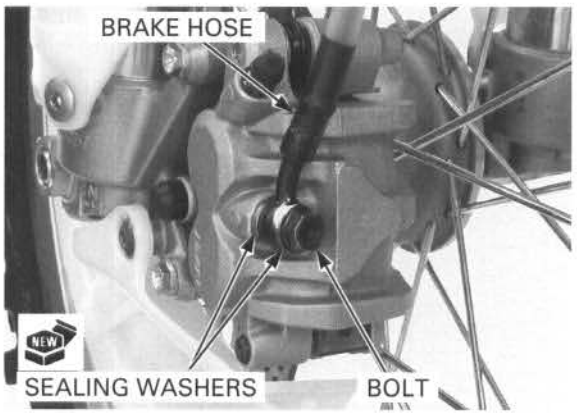
INSTALLATION: After '08

Install the front brake pads and front caliper/bracket assembly (page 15-12).

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)

Fill the reservoir to the upper level and bleed the hydraulic system (page 15-7).

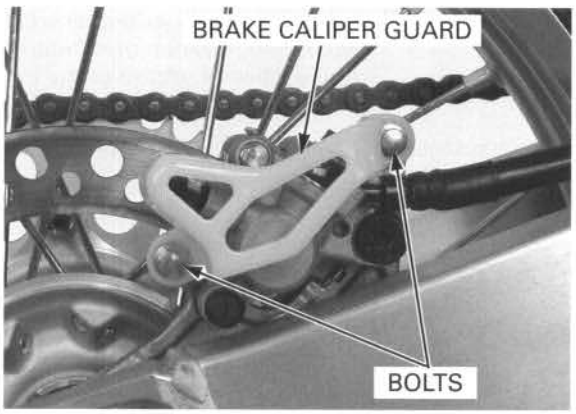


REAR BRAKE CALIPER

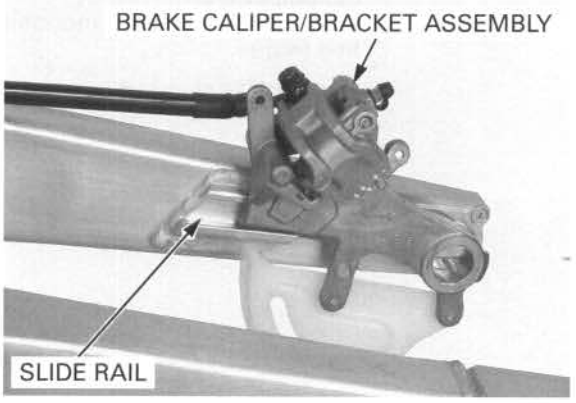
REMOVAL

Drain the rear brake hydraulic system (page 15-6).
Remove the brake pad (page 15-10).
Remove the rear wheel (page 14-8).

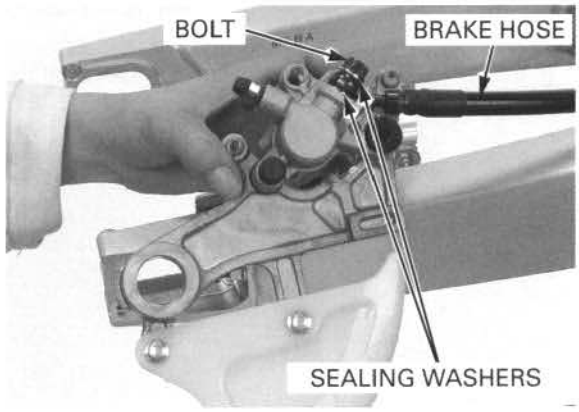
Remove the bolts and brake caliper guard.



Slide the brake caliper and bracket assembly backward and pull it off of the slide rail on the swingarm.



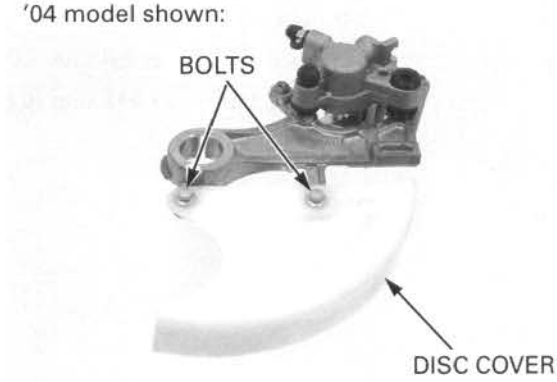
Remove the brake hose oil bolts, sealing washers and brake hose eyelet.



DISASSEMBLY

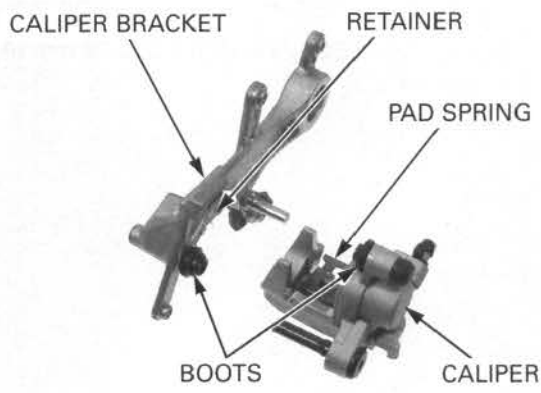
Remove the bolts and brake disc cover.

'04 model shown:



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.

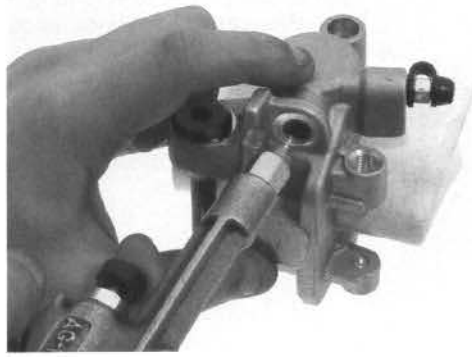


If necessary, lightly apply compressed air to the caliper fluid inlet to get piston out.

Place a shop rag under the caliper to cushion the piston when it is expelled.

Use the air in short spurts.

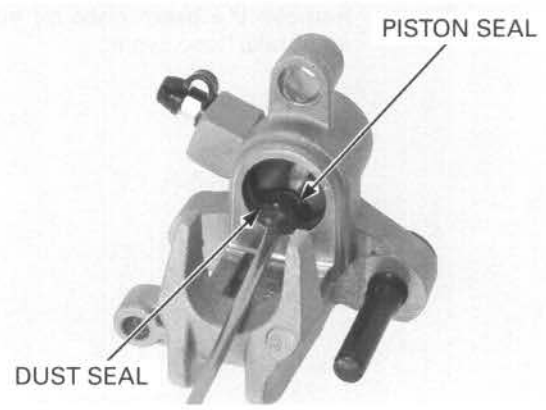
Do not bring the air nozzle too close to the inlet or the pistons may be forced out with excessive force that could cause injury.



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.

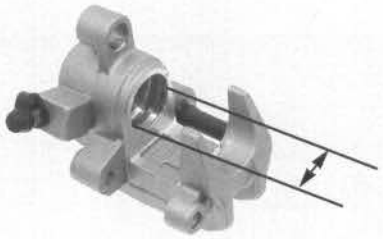


INSPECTION

Check the caliper cylinder and pistons for scoring, scratches or damage.

Measure the caliper 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)

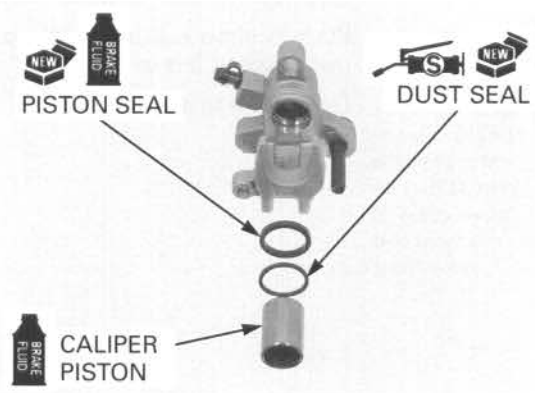
ASSEMBLY

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.

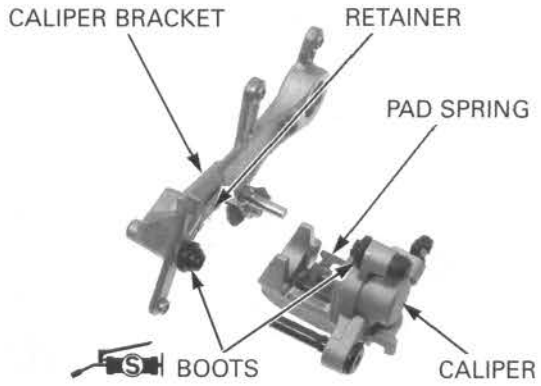
Note the installation direction of the pad spring.

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.

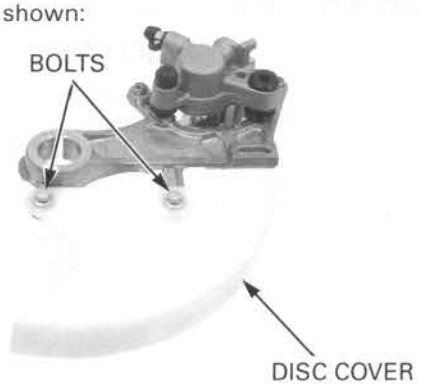
When assembling the caliper and bracket, set the boot into the side pin groove.

Assemble the caliper and bracket.



Install the brake disc cover and tighten the bolts securely.

'04 model shown:

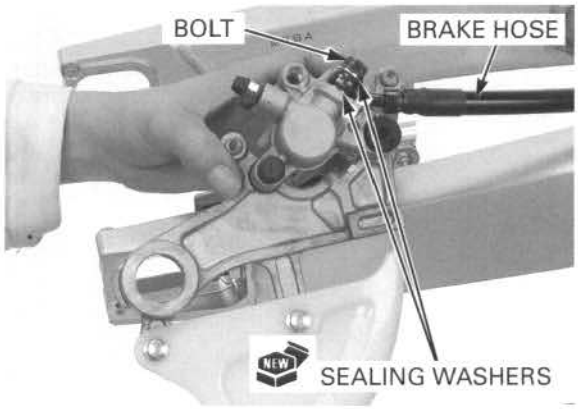


INSTALLATION

Install the brake hose eyelets to the caliper body with new sealing washers and oil bolt.

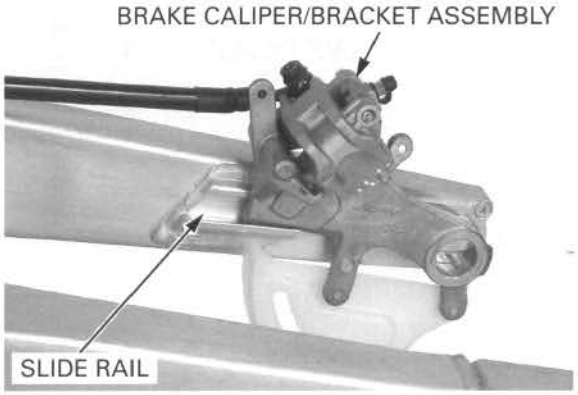
Push the brake hose eyelet to the stopper on the caliper, then tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

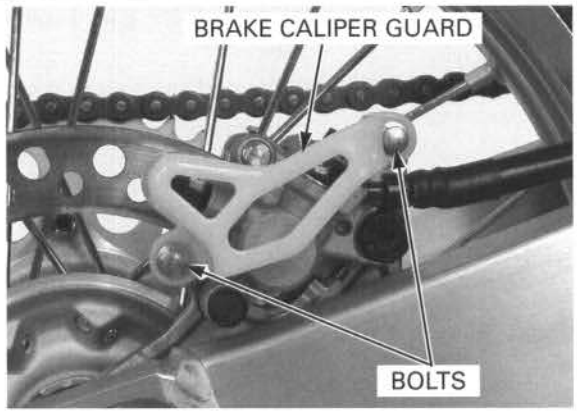


Install the brake caliper/bracket assembly onto the swingarm by aligning the bracket tab with the slide rail on the swingarm.

Install the rear wheel (page 14-13).
Install the brake pad (page 15-10).
Fill the reservoir to the upper level and bleed the hydraulic system (page 15-7).



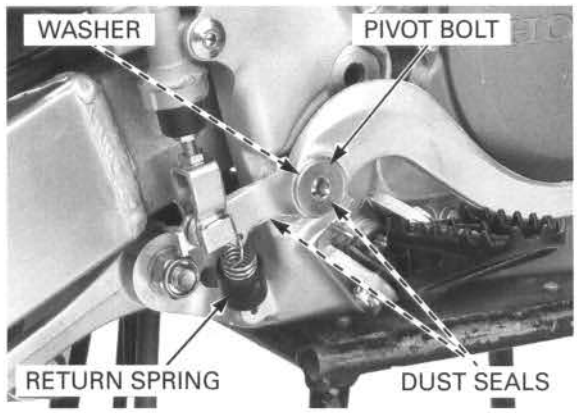
Install the caliper guard and tighten the bolts securely.



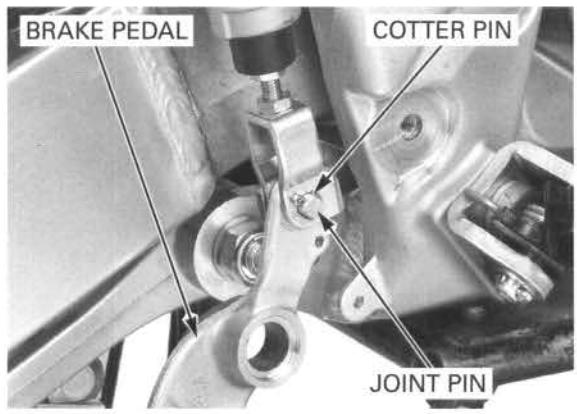
BRAKE PEDAL

REMOVAL

Remove the rear brake pedal pivot bolt, washer and dust seals.
Remove the return spring.



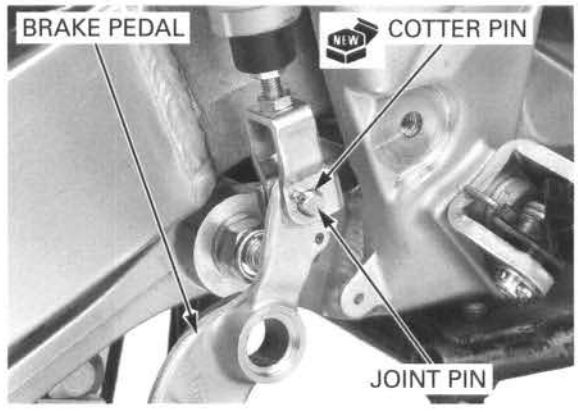
Remove and discard the cotter pin.
Remove the joint pin and brake pedal.



INSTALLATION

Connect the brake pedal to the push rod.

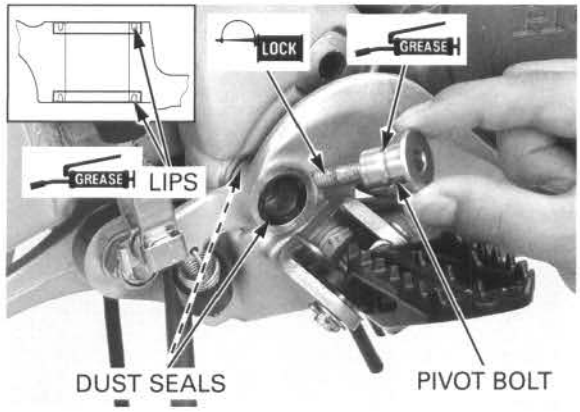
Install the joint pin and a new cotter pin.



Apply grease to the dust seal lips.
Install the dust seals with the lips facing out of the brake pedal.

Apply grease to the sliding surface of the brake pedal and pivot bolt.

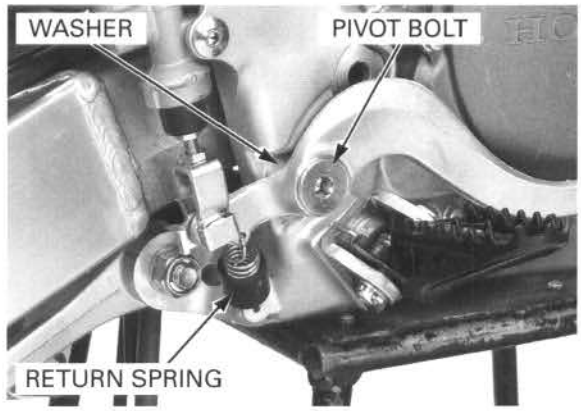
Clean and apply a locking agent to the threads of the brake pedal pivot bolt.



Install the washer and pivot bolt.
Tighten the brake pedal pivot bolt to the specified torque.

TORQUE: '04: 25 N·m (2.6 kgf·m, 19 lbf·ft)
After '04: 36 N·m (3.7 kgf·m, 27 lbf·ft)

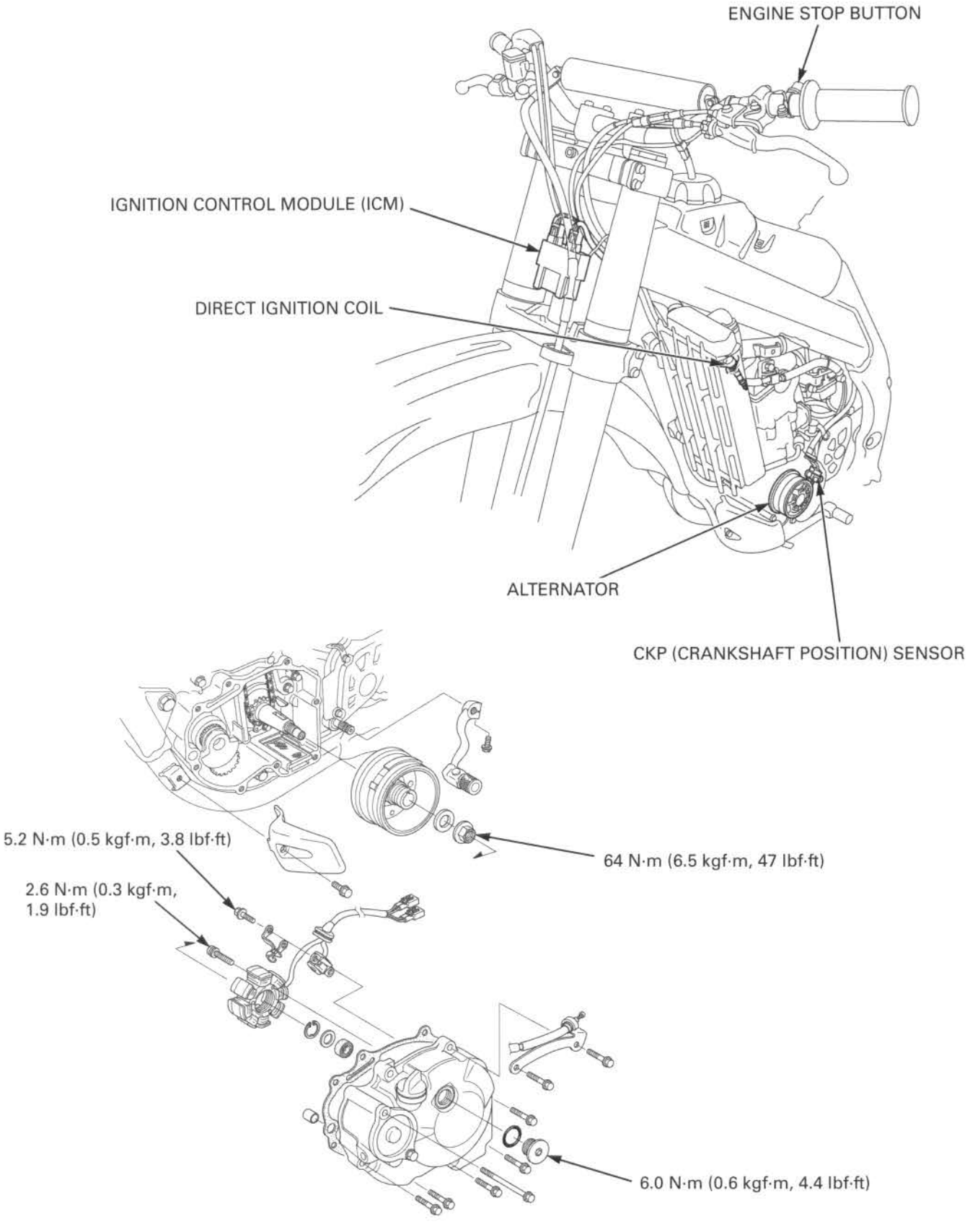
Install the return spring.



MEMO

16. ELECTRICAL SYSTEM

SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

- When servicing the ignition system, always follow the steps in the troubleshooting sequence on page 16-5.
- The ignition timing cannot be adjusted since the Ignition Control Module (ICM) is factory preset.
- The 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

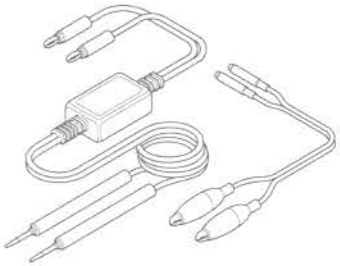
ITEM				SPECIFICATION
Spark plug	Standard	(NGK)	'04	IMR8C9H
			After '04	R0409 B-8
		(DENSO)	'04 only	VUH24D
	Optional	(NGK)	'04	IMR9C9H
			After '04	R0409 B-9
		(DENSO)	'04 only	VUH27D
Spark plug gap			'04	0.8 – 0.9 mm (0.032 – 0.035 in)
			After '04	0.6 – 0.7 mm (0.024 – 0.028 in)
Direct ignition coil resistance (at 20 °C/68 °F)		Primary		0.07 – 0.10 Ω
		Secondary		4.6 – 6.8 kΩ
Direct ignition coil input voltage				100 V minimum
CKP sensor peak voltage				0.7 V minimum
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

Flywheel nut	64 N·m (6.5 kgf·m, 47 lbf·ft)	Apply oil to the threads
Timing hole cap	6.0 N·m (0.6 kgf·m, 4.4 lbf·ft)	Apply grease to the threads
CKP sensor mounting bolt	5.2 N·m (0.5 kgf·m, 3.8 lbf·ft)	Apply locking agent to the threads
Stator mounting screw	2.6 N·m (0.3 kgf·m, 1.9 lbf·ft)	Apply locking agent to the threads

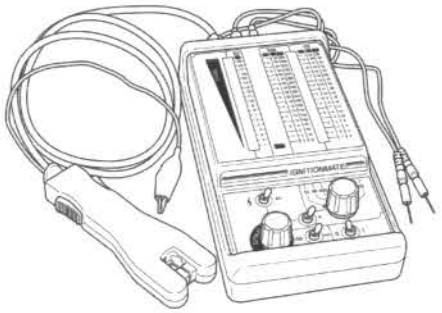
TOOLS

Peak voltage adaptor
07HGJ-0020100



with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

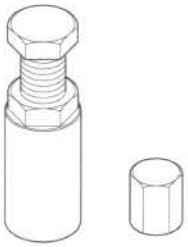
IgnitionMate peak voltage tester
MTP07-0286 (U.S.A. only)



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

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

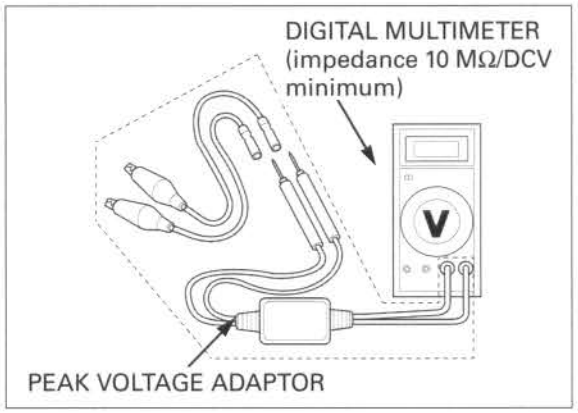
	Unusual condition	Probable cause (check in numerical order)
Ignition coil primary voltage	Low peak voltage.	1. Incorrect peak voltage adaptor connections (System is normal if measured voltage is over the specifications with reverse connection). 2. The multimeter impedance is too low; below 10MΩ/DCV. 3. Cranking speed too slow. – Kickstarter is weak 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). 5. Poorly connected connectors or an open circuit in the ignition system. 6. Faulty exciter coil (measure the peak voltage). 7. Faulty direct ignition coil. 8. Faulty ICM (When above No. 1 – 7 are normal).
	No peak voltage.	1. Incorrect peak voltage adaptor connections (System is normal if measured voltage is over the specifications with reverse connection). 2. Short circuit in engine stop button wire. 3. Faulty engine stop button wire. 4. Loose or poorly connected ICM connectors. 5. An open circuit or loose direct ignition coil connector. 6. Faulty exciter coil (measure the peak voltage). 7. Faulty CKP sensor (measure the peak voltage). 8. Faulty ICM (When above No. 1 – 7 are normal).
	Peak voltage is normal, but no spark jumps at the plug.	1. Faulty spark plug or leaking direct ignition coil secondary current ampere. 2. Faulty direct ignition coil.
Exciter coil	Low peak voltage.	1. The multimeter impedance is too low; below 10MΩ/DCV. 2. Cranking speed is too low. – Kickstarter is weak 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). 4. Faulty ICM (when above No. 1 – 3 are normal).
	No peak voltage.	1. Faulty peak voltage adaptor. 2. Faulty exciter coil.
CKP sensor	Low peak voltage.	1. The multimeter impedance is too low; below 10MΩ/DCV. 2. Cranking speed is too low. – Kickstarter is weak 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). 4. Faulty ICM (when above No. 1 – 3 are normal).
	No peak voltage.	1. Faulty peak voltage adaptor. 2. Faulty CKP sensor.

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 10MΩ/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
with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

IGNITION COIL PRIMARY PEAK VOLTAGE

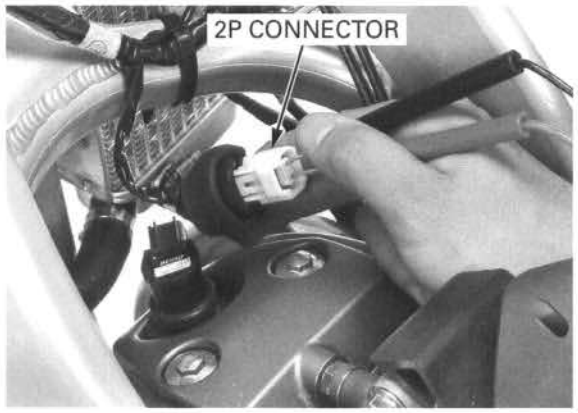
Check all system connections before inspection.

Check cylinder compression and check that the spark plug is installed correctly.

Remove the fuel tank (page 3-7).

Shift the transmission into neutral.

Disconnect the direct ignition coil 2P connector and connect the peak voltage adaptor 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 MΩ/DCV minimum)

CONNECTION: Green (+) – Black/yellow (–)

Crank the engine with the kickstarter and read the voltage.

STANDARD: 100 V minimum

If the voltage cannot be measured, follow the checks described in the troubleshooting chart on page 16-5.

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: A – C
STANDARD: 4.6 – 6.8 kΩ (20 °C/68 °F)

If resistance is out of specification, replace the ignition coil.

EXCITER COIL PEAK VOLTAGE

'04 - '07: Remove the number plate (page 3-5).

After '07: Remove the left radiator shroud (page 3-4).

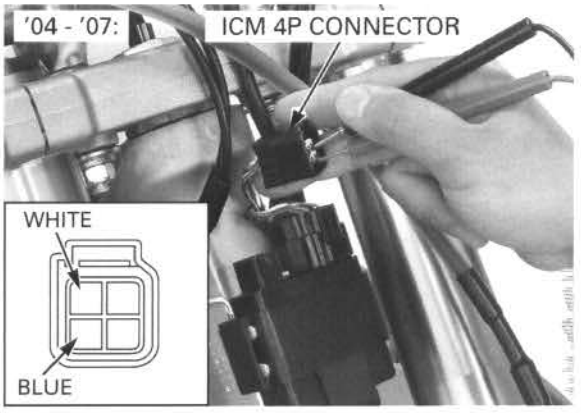
Disconnect the ICM 4P connector.
Connect the peak voltage adaptor probes to the wire harness side connector terminals.

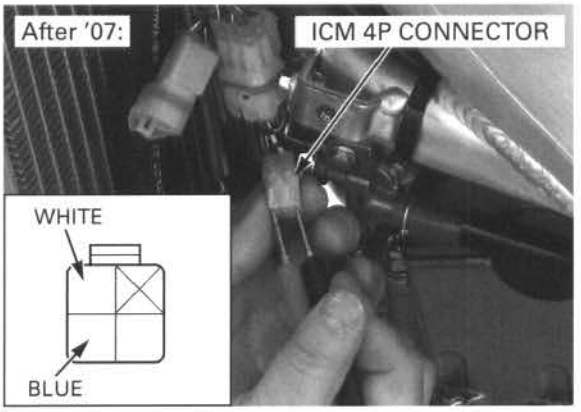
TOOLS:
IgnitionMate peak voltage tester MTP07-0286 (U.S.A. only) or
Peak voltage adaptor 07HGJ-0020100
with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

CONNECTION: Blue (+) – White (–)

Shift the transmission into neutral.
Crank the engine with the kickstarter and read the peak voltage.

PEAK VOLTAGE: 50 V minimum





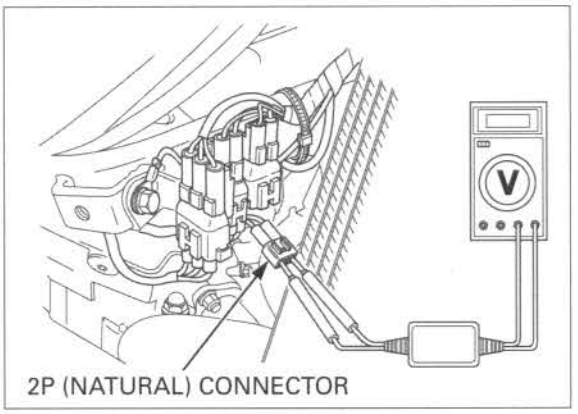
If the peak voltage is abnormal, recheck the peak voltage at the exciter coil 2P (Natural) connector as following:

Remove the fuel tank (page 3-7).

Disconnect the exciter coil 2P (Natural) connector. Connect the peak voltage adapter to the connector terminals of exciter coil side, recheck the peak voltage.

If the peak voltage at the ICM connector is abnormal and peak voltage at the exciter coil connector is normal, check for poorly connected connectors or a broken wire harness.

If the peak voltage is abnormal at both connectors, follow the checks described in the troubleshooting chart on page 16-5.



CKP (CRANKSHAFT POSITION) SENSOR PEAK VOLTAGE

'04 - '07: Remove the number plate (page 3-5).

After '07: Remove the left radiator shroud (page 3-4).

Disconnect the ICM 6P connector.

Connect the peak voltage adaptor probes to the connector terminals of the wire harness side.

TOOLS:

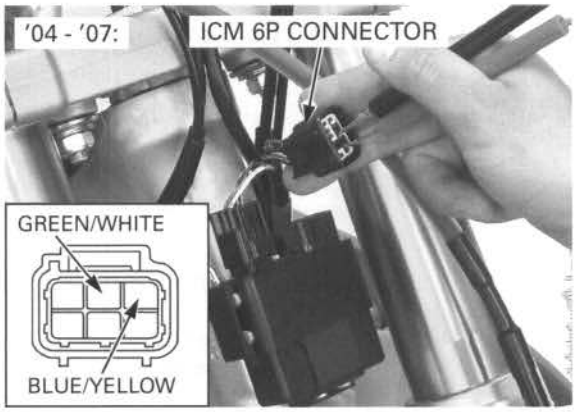
IgnitionMate peak voltage tester	**MTP07-0286 (U.S.A.only) or**
Peak voltage adaptor	**07HGJ-0020100**

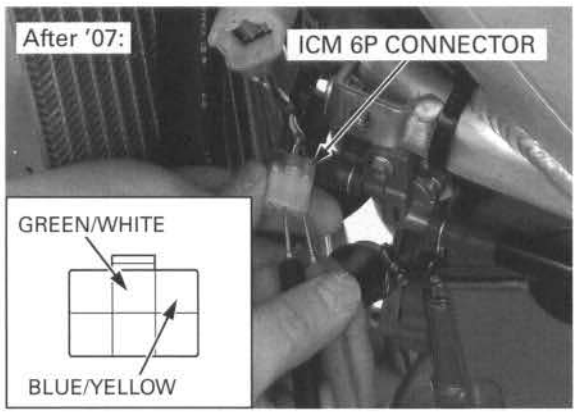
with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

CONNECTION: Blue/yellow (+) – Green/white (–)

Crank the engine with the kickstarter and read the peak voltage.

PEAK VOLTAGE: 0.7 V minimum





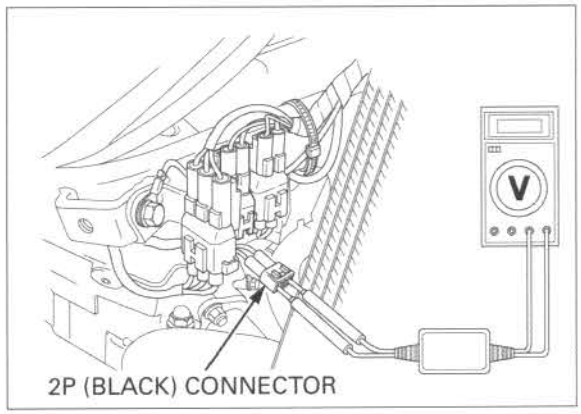
If the peak voltage measured is abnormal, recheck the peak voltage at the CKP sensor 2P (Black) connector as following:

Remove the fuel tank (page 3-7).

Disconnect the CKP sensor 2P (Black) connector.
Connect the peak voltage adapter to the connector terminals of the CKP sensor side and recheck the peak voltage.

If the peak voltage at the ICM connector is abnormal and peak voltage at the CKP sensor connector is normal, check for poorly connected connectors or a broken wire harness.

If the peak voltage is abnormal at both connectors, follow the checks described in the troubleshooting chart on page 16-5.



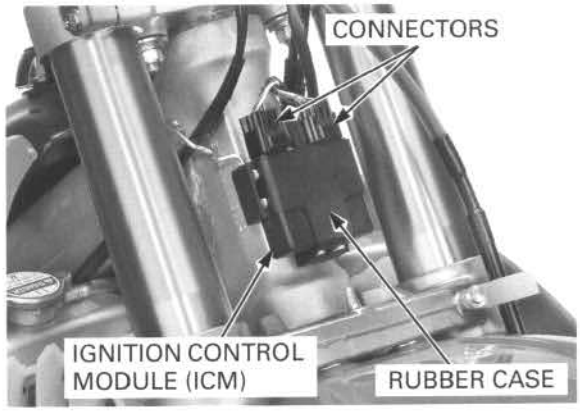
IGNITION CONTROL MODULE (ICM)

REMOVAL/INSTALLATION: '04 - '07

Remove the number plate (page 3-5).

Disconnect the ICM connectors.
Remove the ICM from the rubber case.

Installation is in the reverse order of removal.

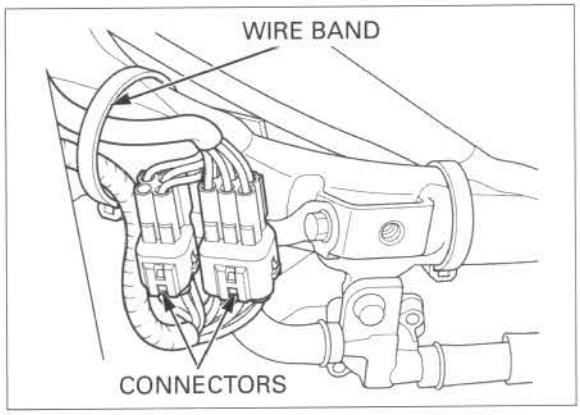


REMOVAL/INSTALLATION: After '07

Remove the following:

- left radiator shroud (page 3-4)
- number plate (page 3-5)

Remove the wire band.
Disconnect the ICM connectors.

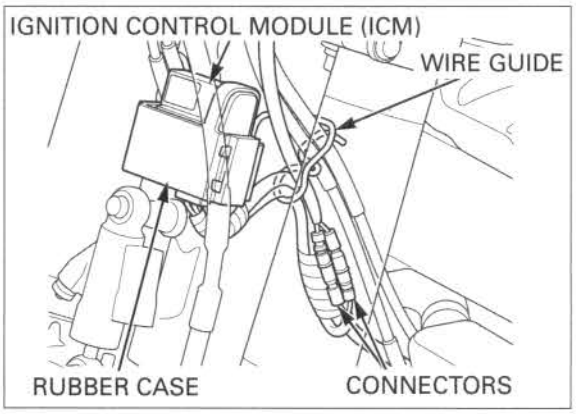


Disconnect the engine stop button connectors.
Release the ICM wire from the wire guide.

Pull out the rubber case with the ICM from the stay.
Remove the ICM from the rubber case.

Route the wire harness properly (page 1-22).

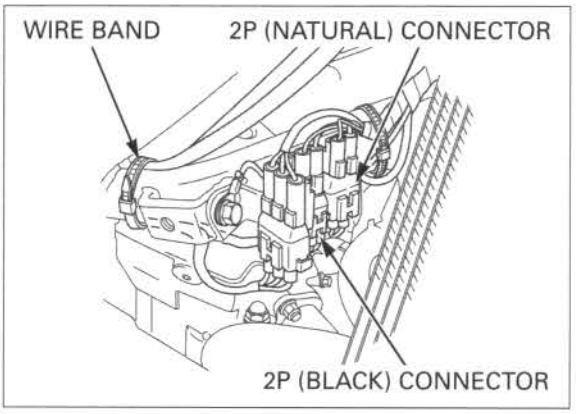
Installation is in the reverse order of removal.



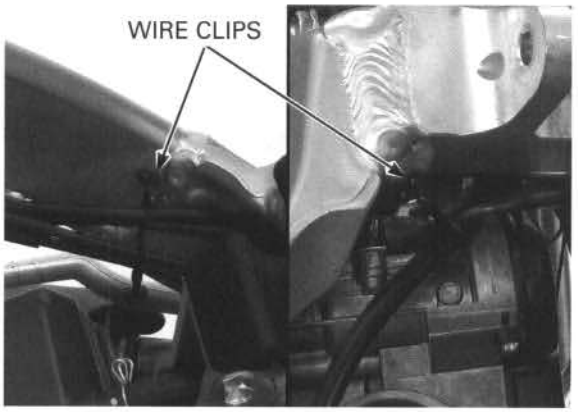
LEFT CRANKCASE COVER REMOVAL

Remove the fuel tank (page 3-7).
Remove the engine guard (page 3-4).
Remove the gearshift pedal (page 11-19).
Drain the engine oil (page 4-14).

Remove the wire band.
Disconnect the exciter coil 2P (Natural) connector and CKP sensor 2P (Black) connector.

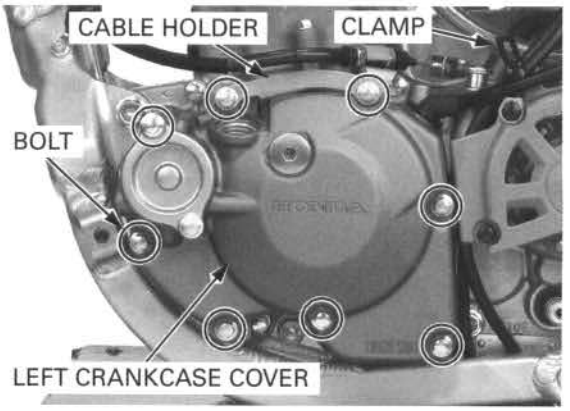


Release the CKP sensor/stator wire from the wire clips.

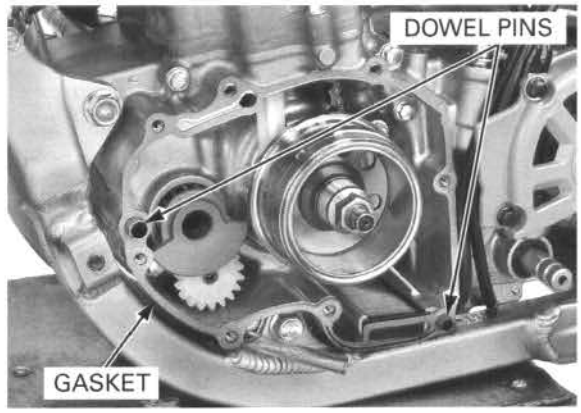


Release the CKP sensor/stator wire from the clamp.

Remove the bolts, cable holder and left crankcase cover.



Remove the gasket and dowel pins.



FLYWHEEL

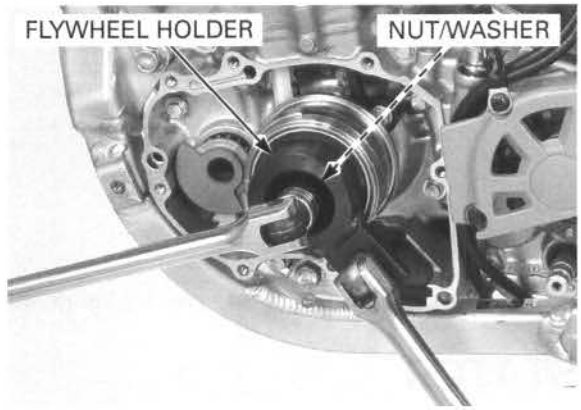
REMOVAL

Remove the left crankcase cover (page 16-10).

Hold the flywheel with the special tool and remove the nut and washer.

TOOL:

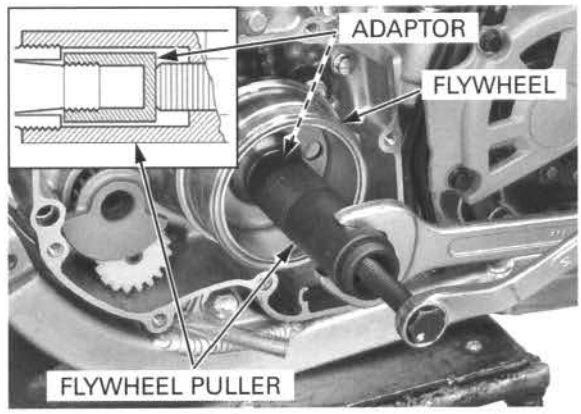
Flywheel holder	**070MB-KRN0100 or 07AMB-KRNA100 (U.S.A. only)**



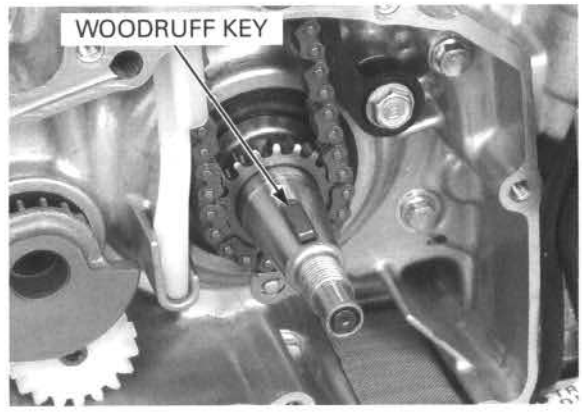
Remove the flywheel using the special tools.

TOOLS:

Flywheel puller	**07AMC-MEBA100 (U.S.A. only) or 07933-1480000 and 070MG-KSE0100**



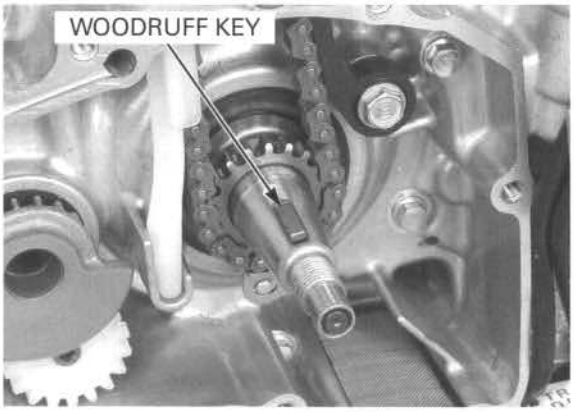
Remove the woodruff key.



INSTALLATION

Wipe any oil off the mating surface of the flywheel.

Install the woodruff key into the groove in the crankshaft.



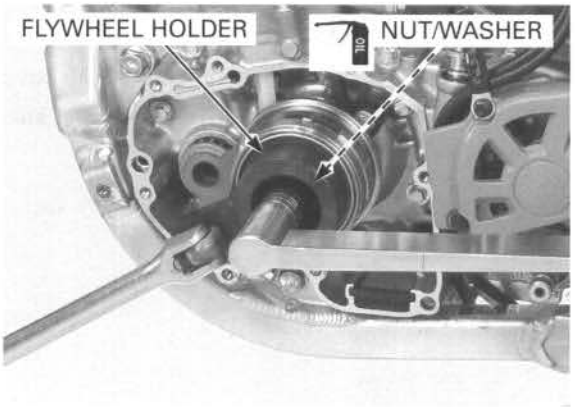
Install the flywheel to the crankshaft by aligning the groove in the flywheel with the woodruff key.

Apply engine 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)



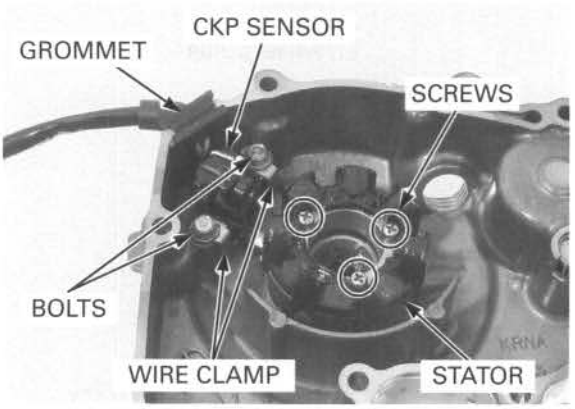
STATOR

REMOVAL

Remove the left crankcase cover (page 16-10).

Remove the bolts and wire clamp.
Remove the CKP sensor and grommet from the left crankcase cover.

Remove the screws and stator.

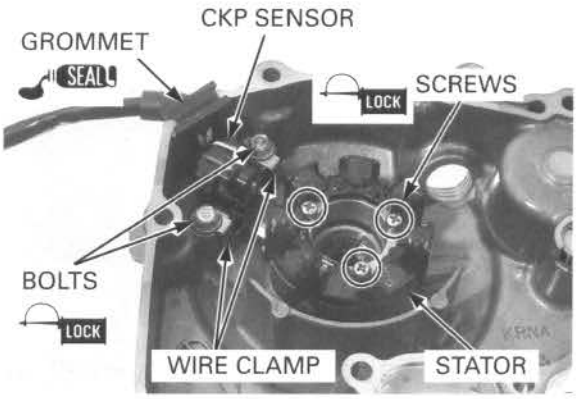


INSTALLATION

Place the stator/CKP sensor 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.

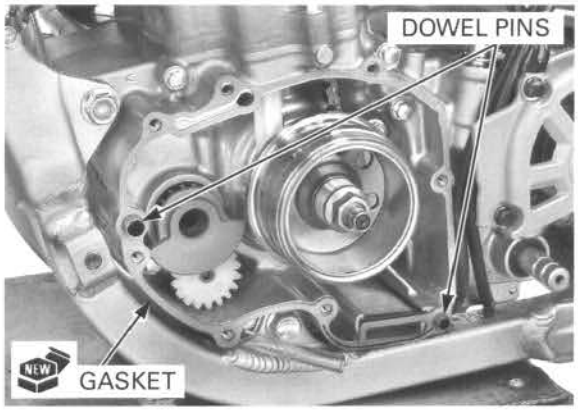
Apply locking agent to the CKP sensor mounting bolt and stator mounting screw threads.
Install the wire clamp and tighten the CKP sensor mounting bolts and stator mounting screws to the specified torque.

TORQUE:
CKP sensor mounting bolt:
5.2 N·m (0.5 kgf·m, 3.8 lbf·ft)
Stator mounting screw:
2.6 N·m (0.3 kgf·m, 1.9 lbf·ft)



LEFT CRANKCASE COVER INSTALLATION

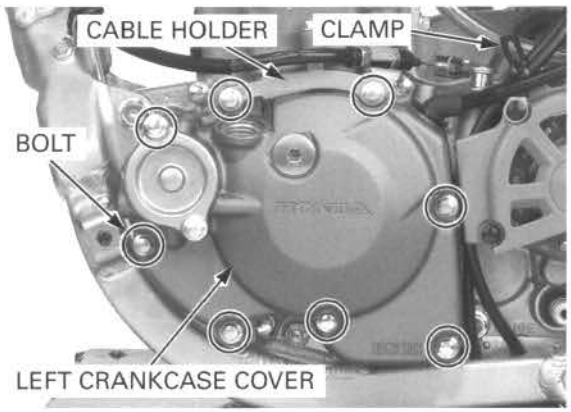
Install a new gasket and dowel pins on the crankcase.



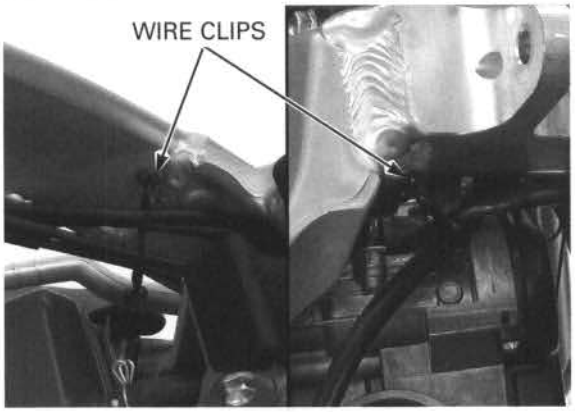
Install the left crankcase cover, cable holder and the bolts.

Tighten the left crankcase cover bolts securely.

Secure the CKP sensor/stator wire with the clamp.



Route the CKP sensor/stator wire properly and secure it with the wire clips.



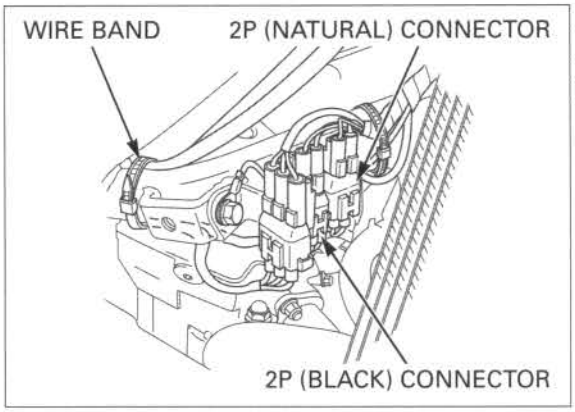
Connect the exciter coil 2P (Natural) connector and CKP sensor 2P (Black) connector.

Clamp the wire with wire band.

Route the wires properly (page 1-22).

Install the gearshift pedal (page 11-22).
Install the engine guard (page 3-4).
Install the fuel tank (page 3-7).

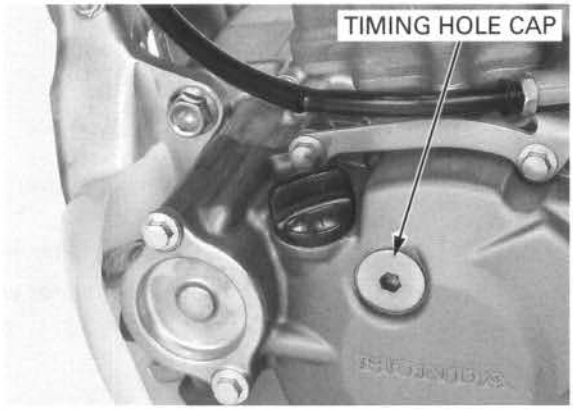
Fill the engine with the recommended oil (page 4-13).



IGNITION TIMING

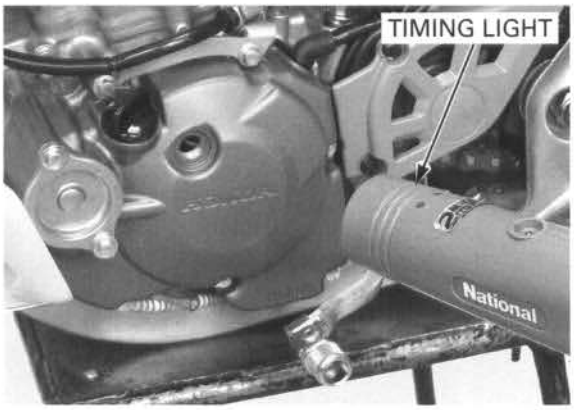
The ignition timing is factory preset and only needs to be checked when an electrical system component is replaced.

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.

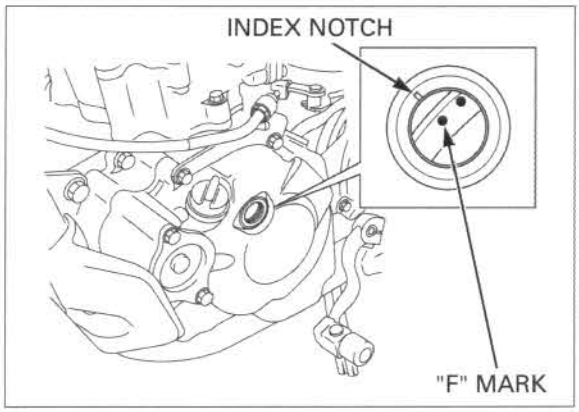


Connect a tachometer.

Read the instruction for timing light operation.
Start the engine and hold it at 1,700 ± 100 rpm while pointing the timing light towards the index mark.

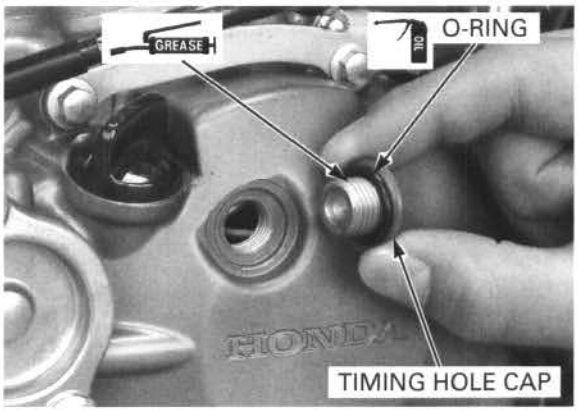


The ignition timing is correct if the "F" mark on the flywheel aligns with the index notch in the left crankcase cover.



Check that the O-ring is in good condition, replace if necessary.
Apply oil to the O-ring and install the O-ring onto timing hole cap.
Apply grease to the timing hole cap threads.
Install the timing hole cap and tighten it to the specified torque.

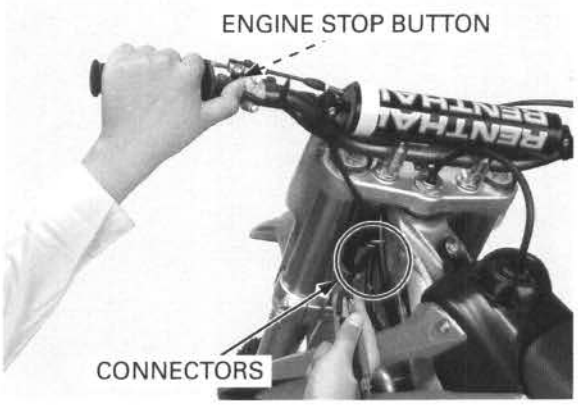
TORQUE: 6.0 N·m (0.6 kgf·m, 4.4 lbf·ft)



ENGINE STOP BUTTON

INSPECTION

Disconnect the engine stop button connectors.
Check the engine stop button continuity with the button. There should be continuity when the button is pushed.



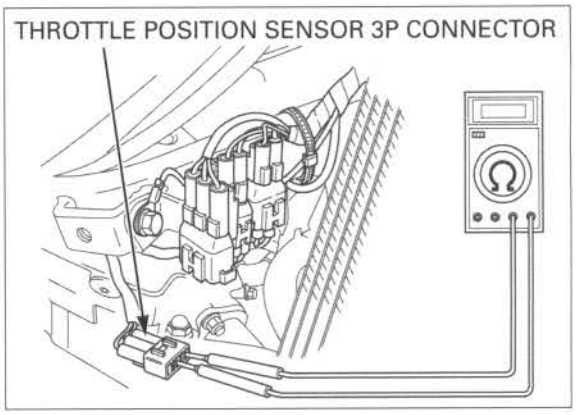
THROTTLE POSITION SENSOR INSPECTION

INSPECTION

Disconnect the throttle position sensor 3P connector.

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

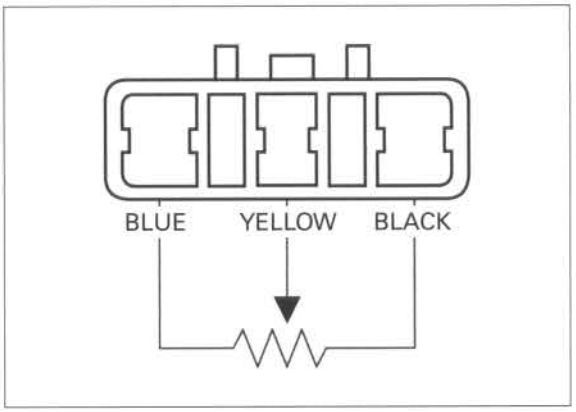
STANDARD: 4 – 6 kΩ (20 °C/68 °F)



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

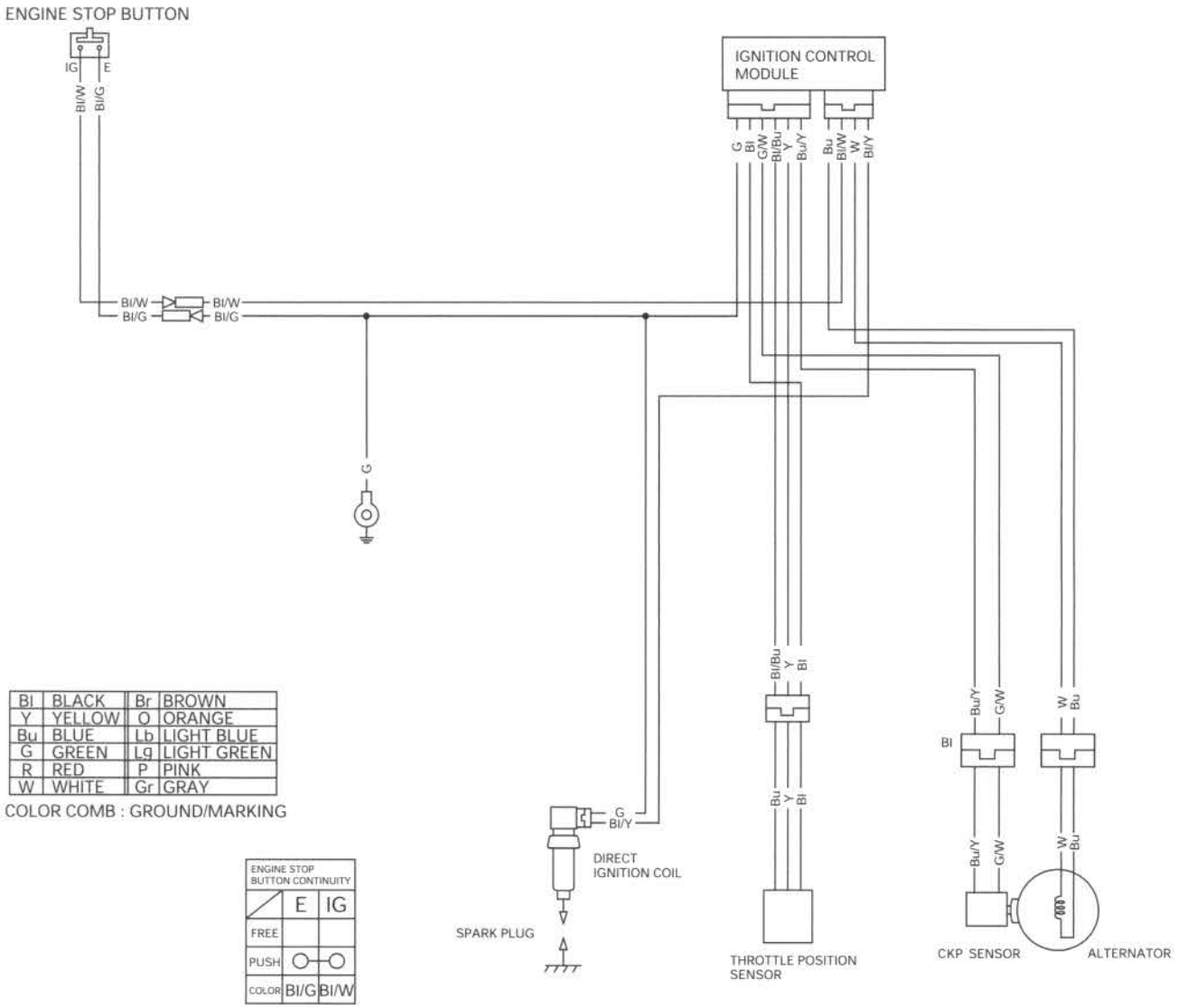
If both measurements are abnormal, replace the throttle position sensor (page 6-32).



17. WIRING DIAGRAM

WIRING DIAGRAM

'04 - '07:

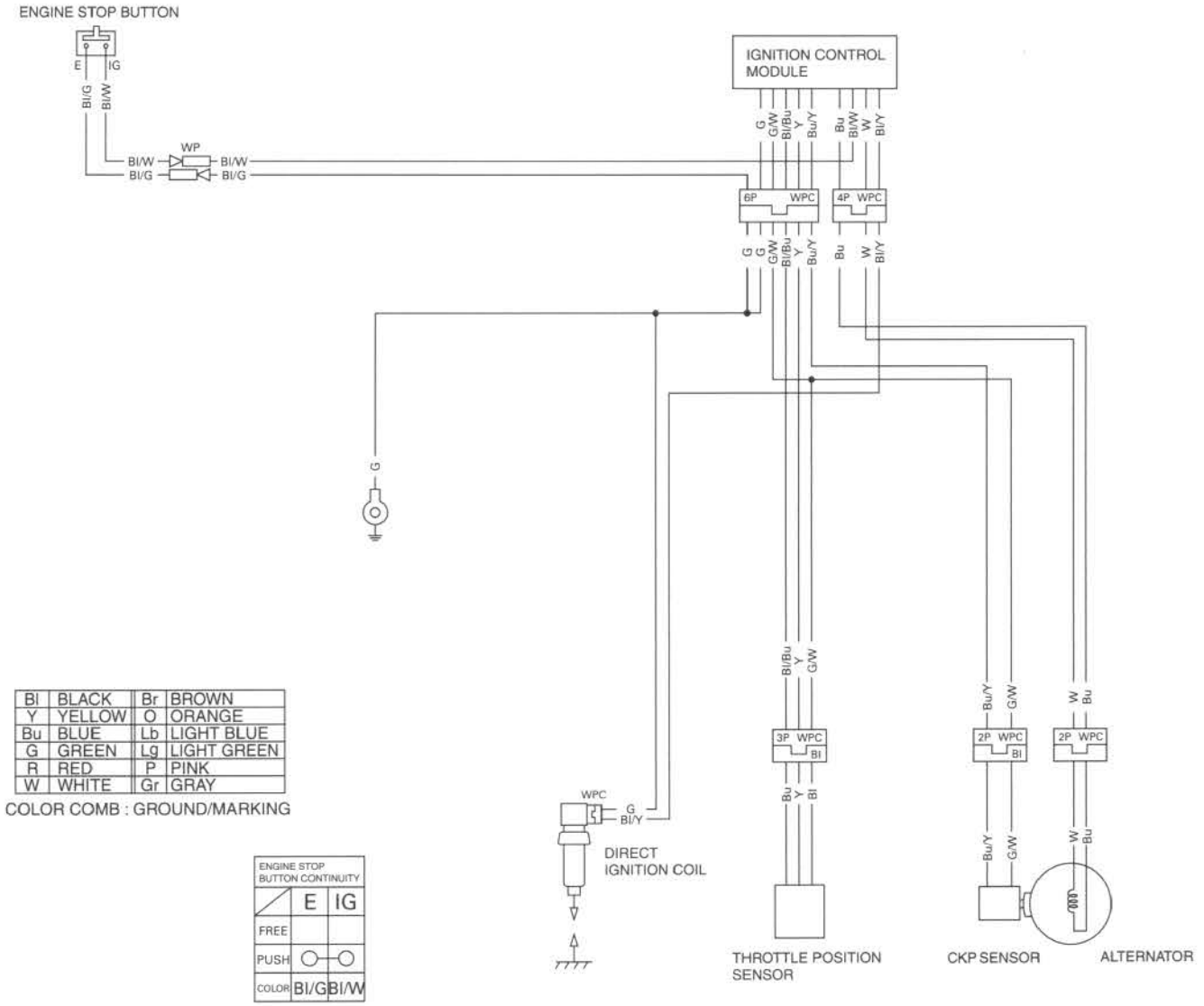


Bl	BLACK	Br	BROWN
Y	YELLOW	O	ORANGE
Bu	BLUE	Lb	LIGHT BLUE
G	GREEN	Lg	LIGHT GREEN
R	RED	P	PINK
W	WHITE	Gr	GRAY

COLOR COMB : GROUND/MARKING

ENGINE STOP BUTTON CONTINUITY		
	E	IG
FREE		
PUSH	○—○	
COLOR	Bl/G	Bl/W

After '07:



Bl	BLACK	Br	BROWN
Y	YELLOW	O	ORANGE
Bu	BLUE	Lb	LIGHT BLUE
G	GREEN	Lg	LIGHT GREEN
R	RED	P	PINK
W	WHITE	Gr	GRAY

COLOR COMB : GROUND/MARKING

ENGINE STOP BUTTON CONTINUITY

	E	IG
FREE		
PUSH	○	○
COLOR	Bl/G	Bl/W

18. 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 CKP (crankshaft position) sensor
   • 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 CKP sensor)
   • 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 engine 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 Condition 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 CKP sensor

   YES – GO TO STEP 7.

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 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 used

   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. **Lubrication Inspection**

    Remove cylinder head cover and inspect lubrication.

    Is the valve train lubricated properly?

    NO – • Faulty oil pump
    • Faulty pressure regulator valve
    • Clogged oil passage
    • Clogged oil strainer filter

    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 6-33

   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 CKP sensor
   • 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 CKP sensor

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 CKP sensor

   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 bearing adjusting nut too tight
- Damaged steering head bearings
- Faulty HPSD (After '07)

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:
- Following recommendations to be most 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 980 kPa (10.0 kg/cm^2, 142 psi), compression and rebound damping standard position, and spring preload adjusted so the bikes sags with rider seated - see Owner's manual for spring preload adjustment
- Make only one change are given in the preferred sequence of adjustment

Front End Oversteers; 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 pre load

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

Read End Gets Poor Traction While Accelerating Away From A Corner
- Decrease shock preload
- Decrease shock compression damping

19. INDEX