

2004-2009



HONDA

SERVICE MANUAL

TRX450R/ER

A Few Words About Safety

Service Information

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

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

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

For Your Customer's Safety

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

For Your Safety

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

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

Important Safety Precautions

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

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

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

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

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

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

⚠ WARNING

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

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

⚠ WARNING

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

Follow the procedures and precautions in this manual carefully.

HOW TO USE THIS MANUAL

This service manual describes the service procedures for the TRX450R/ER.

Follow the Maintenance Schedule (Section 4) recommendations to ensure that the vehicle is in peak operating condition and the emission levels are within the standards set by the U.S. Environmental Protection Agency (EPA) and California Air Resources Board (CARB).

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

Sections 1 and 4 apply to the whole vehicle. Section 3 illustrates procedures for removal/installation of components that may be required to perform service described in the following sections. Sections 5 through 25 describe parts of the vehicle, 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 vehicle, read Technical Features in Section 2.

If you don't know the source of the trouble, go to section 26 Troubleshooting.

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

You must use your own good judgement.

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

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

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

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

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

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

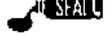
As you read this manual, you will find information that is preceded by a **NOTICE** symbol. The purpose of this message is to help prevent damage to your vehicle, other property, or the environment.

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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

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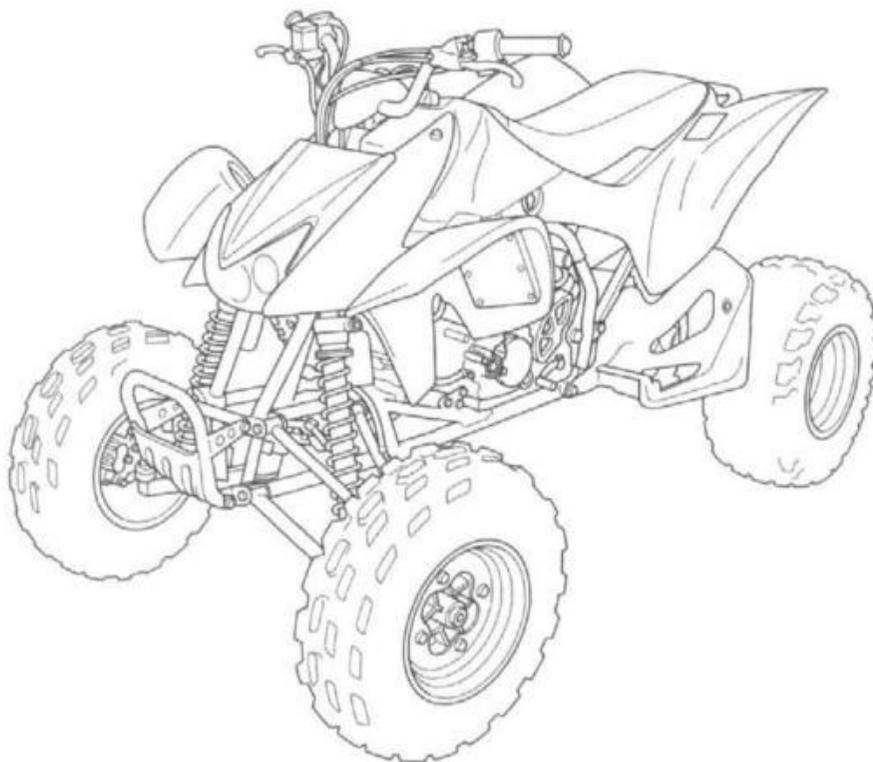
GENERAL INFORMATION

SERVICE RULES

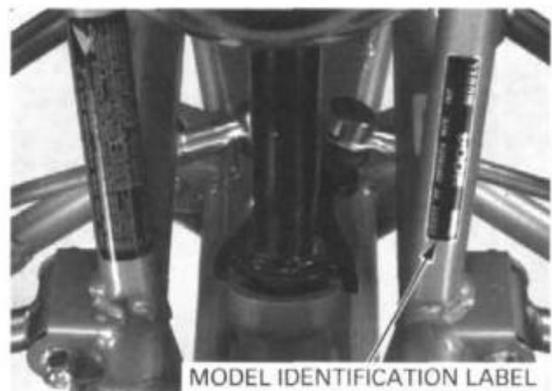
1. Use genuine Honda or Honda-recommended parts and lubricants or their equivalents. Parts that do not meet Honda's design specifications may cause damage to the vehicle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the vehicle. Metric bolts, nuts and screws are not interchangeable with English fasteners.
4. Install new gaskets, O-rings, cotter pins, and lock plates when reassembling.
5. When tightening bolts or nuts, begin with the larger diameter or inner bolt first. Then tighten to the specified torque diagonally in incremental steps unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all electrical wires as shown in the Cable and Harness Routing (page 1-24).

MODEL IDENTIFICATION

'04 - '05 model shown; After '05 similar

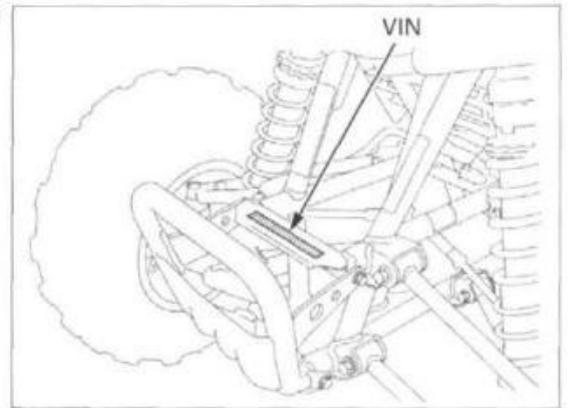


The model identification label is located on the left front frame pipe.

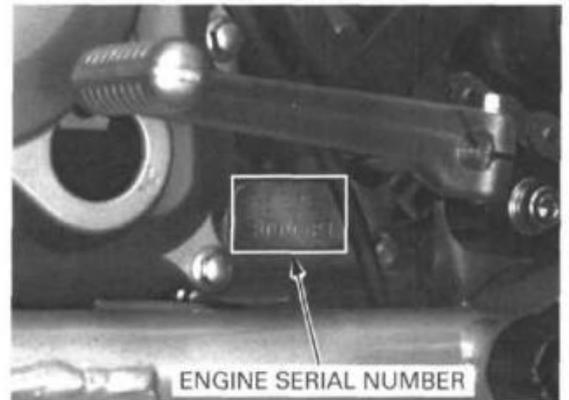


GENERAL INFORMATION

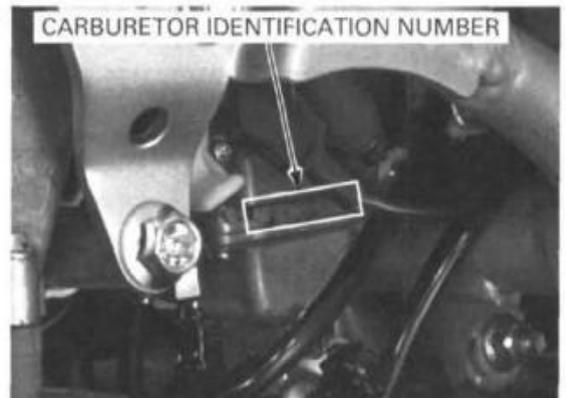
The vehicle identification number (VIN) is stamped on the front side of the frame.



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



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

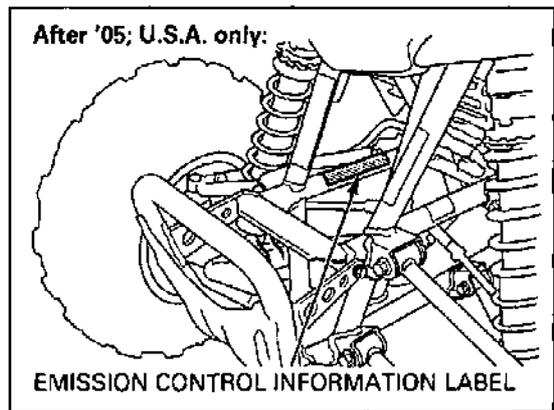


'04 - '05; The Vehicle Emission Control Information Label is attached on the right front frame pipe (U.S.A. only).

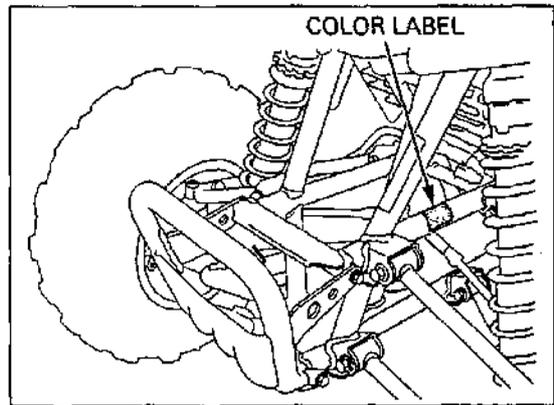


GENERAL INFORMATION

After '05; The Vehicle Emission Control Information Label is attached on the right side of front frame pipe.



The color label is attached on the left side of the front frame pipe. When ordering color coded parts, always specify the designated color code.



GENERAL SPECIFICATIONS ('04 – '05)

	ITEM	SPECIFICATIONS	
DIMENSIONS	Overall length	1,846 mm (72.6 in)	
	Overall width	1,177 mm (46.3 in)	
	Overall height	1,108 mm (43.6 in)	
	Wheelbase	1,251 mm (49.2 in)	
	Front tread	937 mm (36.8 in)	
	Rear tread	920 mm (36.2 in)	
	Seat height	829 mm (32.6 in)	
	Footpeg height	361 mm (14.2 in)	
	Ground clearance	114 mm (4.5 in)	
	Curb weight	176 kg (388 lbs)	
	Maximum weight capacity	110 kg (243 lbs)	
	FRAME	Frame type	Double cradle
		Front suspension	Double wish-bone
Front wheel travel		215 mm (8.5 in)	
Rear suspension		Swingarm	
Rear wheel travel		230 mm (9.1 in)	
Rear damper		Single tube	
Front tire size		AT22 x 7R10 ★ ★	
Rear tire size		AT20 x 10R9 ★ ★	
Front rim size		10 x 5.5 AT	
Rear rim size		9 x 8.0 AT	
Front tire brand		DUNLOP KT371	
Rear tire brand		DUNLOP KT335H	
Front brake		Hydraulic disc brake	
Rear brake		Hydraulic/mechanical disc brake	
Caster angle		5.87°	
Trail length	25.58 mm (1.007 in)		
Camber angle	0°		
Fuel tank capacity	12.0 liters (3.17 US gal, 2.64 Imp gal)		
Fuel tank reserve capacity	1.9 liters (0.50 US gal, 0.42 Imp gal)		
ENGINE	Cylinder arrangement	Single cylinder, transversely installed	
	Bore and stroke	94 x 64.8 mm (3.70 x 2.55 in)	
	Displacement	449.7 cm ³ (27.44 cu-in)	
	Compression ratio	10.5 : 1	
	Valve train	Chain drive and OHC with rocker arm	
	Intake valve opens at 1 mm (0.04 in) lift	10° BTDC	
	Intake valve closes at 1 mm (0.04 in) lift	40° ABDC	
	Exhaust valve opens at 1 mm (0.04 in) lift	40° BBDC	
	Exhaust valve closes at 1 mm (0.04 in) lift	10° ATDC	
	Lubrication system	Forced pressure (wet sump)	
	Oil pump type	Trochoid	
Cooling system	Liquid cooled		
Air filtration	Oiled urethane foam		
Engine dry weight	34.7 kg (76.8 lbs)		
CARBURETOR	Carburetor type	Piston valve	
	Throttle bore	42 mm (1.65 in)	

GENERAL INFORMATION

ITEM		SPECIFICATIONS
DRIVE TRAIN	Clutch system	Multi-plate, wet
	Clutch operation system	Cable operated
	Transmission	Constant mesh, 5-speed
	Primary reduction	2.739 (63/23)
	Final reduction	2.714 (38/14)
	Gear ratio	1st
		2nd
		3rd
		4th
		5th
	Gearshift pattern	Left foot operated return system, 1-N-2-3-4-5
ELECTRICAL	Ignition system	AC-CDI
	Charging system	Triple phase output alternator
	Regulator/rectifier	Triple phase full wave rectification
	Lighting system	12 V DC output

GENERAL SPECIFICATIONS (After '05)

ITEM		SPECIFICATIONS	
DIMENSIONS	Overall length	1,862 mm (73.3 in)	
	Overall width	1,177 mm (46.3 in)	
	Overall height	1,100 mm (43.3 in)	
	Wheelbase	1,275 mm (50.2 in)	
	Front tread	967 mm (38.1 in)	
	Rear tread	920 mm (36.2 in)	
	Seat height	833 mm (32.8 in)	
	Footpeg height	349 mm (13.7 in)	
	Ground clearance	111 mm (4.4 in)	
	Curb weight	TRX450ER	178 kg (392 lbs)
		TRX450R	175 kg (386 lbs)
		Maximum weight capacity	110 kg (243 lbs)
FRAME	Frame type	Double cradle	
	Front suspension	Double wish-bone	
	Front wheel travel	215 mm (8.5 in)	
	Rear suspension	Swingarm	
	Rear wheel travel	237 mm (9.3 in)	
	Rear damper	Single tube	
	Front tire size	AT22 x 7R10 ★ ★	
	Rear tire size	AT20 x 10R9 ★ ★	
	Front rim size	10 x 5.5 AT	
	Rear rim size	9 x 8.0 AT	
	Front tire brand	DUNLOP KT371	
	Rear tire brand	DUNLOP KT335H	
	Front brake	Hydraulic disc brake	
	Rear brake	Hydraulic/mechanical disc brake	
	Caster angle	5°	
	Trail length	23 mm (0.9 in)	
	Camber angle	- 1.9°	
	Fuel tank capacity	11.7 liters (3.09 US gal, 2.57 Imp gal)	
	Fuel tank reserve capacity	2.9 liters (0.77 US gal, 0.64 Imp gal)	

GENERAL INFORMATION

ITEM	SPECIFICATIONS
ENGINE Cylinder arrangement Bore and stroke Displacement Compression ratio Valve train Intake valve opens at 1 mm (0.04 in) lift Intake valve closes at 1 mm (0.04 in) lift Exhaust valve opens at 1 mm (0.04 in) lift Exhaust valve closes at 1 mm (0.04 in) lift Lubrication system Oil pump type Cooling system Air filtration Engine dry weight TRX450ER TRX450R	Single cylinder, transversely installed 96.0 x 62.1 mm (3.78 x 2.44 in) 449.4 cm ³ (27.42 cu-in) 12.0 : 1 Chain drive and OHC with rocker arm 10° BTDC 40° ABDC 40° BBDC 10° ATDC Forced pressure (wet sump) Trochoid Liquid cooled Oiled urethane foam 34.3 kg (75.6 lbs) 33.4 kg (73.6 lbs)
CARBURETOR Carburetor type Venturi diameter	Piston valve 40 mm (1.6 in)
DRIVE TRAIN Clutch system Clutch operation system Transmission Primary reduction Final reduction Gear ratio 1st 2nd 3rd 4th 5th Gearshift pattern	Multi-plate, wet Cable operated Constant mesh, 5-speed 2.739 (63/23) 2.923 (38/13) 2.230 (29/13) 1.785 (25/14) 1.437 (23/16) 1.181 (26/22) 0.962 (26/27) Left foot operated return system, 1-N-2-3-4-5
ELECTRICAL Ignition system Starting system Charging system Regulator/rectifier Lighting system	AC-CDI Electric starter motor (TRX450ER) Kickstarter (TRX450R) Triple phase output alternator Triple phase full wave rectification Battery (TRX450ER) 12 V DC output (TRX450R)

GENERAL INFORMATION

LUBRICATION SYSTEM SPECIFICATIONS

ITEM		STANDARD		SERVICE LIMIT
Engine oil capacity	'04 - '05	After draining	0.78 liter (0.82 US qt, 0.67 Imp qt)	-
		After filter change	0.82 liter (0.87 US qt, 0.72 Imp qt)	-
		After disassembly	1.20 liter (1.27 US qt, 1.06 Imp qt)	-
	After '05	After draining	0.65 liter (0.69 US qt, 0.57 Imp qt)	-
		After filter change	0.69 liter (0.73 US qt, 0.61 Imp qt)	-
	After disassembly	0.85 liter (0.90 US qt, 0.75 Imp qt)	-	
Recommended engine oil		Pro Honda GN4, HP4 (without molybdenum additives) 4-stroke oil or HP4M (with molybdenum additives) 4-stroke oil, or equivalent motor oil API service classification: SG or Higher JASO T 903 standard: MA or MB Viscosity: SAE 10W-40, 5W-30		-
Transmission oil capacity	'04 - '05	After draining	0.55 liter (0.58 US qt, 0.48 Imp qt)	-
		After disassembly	0.65 liter (0.69 US qt, 0.57 Imp qt)	-
	After '05	After draining	0.68 liter (0.72 US qt, 0.60 Imp qt)	-
		After disassembly	0.80 liter (0.85 US qt, 0.70 Imp qt)	-
Recommended transmission oil		Pro Honda GN4 or HP4 (without molybdenum additives) 4-stroke oil or equivalent motor oil API service classification: SG or Higher JASO T 903 standard: MA Viscosity: SAE 10W-40, 5W-30		-
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)	
	Body clearance	0.15 - 0.21 (0.006 - 0.008)	-	
	Side clearance	0.04 - 0.13 (0.002 - 0.005)	-	

FUEL SYSTEM SPECIFICATIONS ('04 - '05)

ITEM	SPECIFICATIONS
Carburetor identification number	OA16A
Main jet	#118
Slow jet	#48
Pilot screw opening	See page 7-23
Float level	15.9 mm (0.63 in)
Idle speed	1,600 ± 100 rpm
Throttle grip free play	3 - 8 mm (1/8 - 5/16 in)
Hot starter lever free play	2 - 3 mm (1/16 - 1/8 in)

FUEL SYSTEM SPECIFICATIONS (After '05)

ITEM	SPECIFICATIONS
Carburetor identification number	TRX450ER FCR10A TRX450R FCR11A
Main jet	#120
Slow jet	#42
Starter jet	#75
Jet needle	NHHU
Pilot screw initial opening	2-3/8 turns out
Float level	8.0 mm (0.31 in)
Idle speed	1,700 ± 100 rpm
Throttle grip free play	5 - 10 mm (7/32 - 3/8 in)
Hot starter lever free play (TRX450R)	2 - 3 mm (1/16 - 1/8 in)

COOLING SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	1.5 liters (1.6 US qt, 1.3 Imp qt)
	Reserve tank	0.34 liter (0.36 US qt, 0.30 Imp qt)
Radiator cap relief pressure		108 - 137 kPa (1.1 - 1.4 kgf/cm ² , 16 - 20 psi)
Thermostat	Begin to open	80 - 84°C (176 - 183°F)
	Fully open	95°C (203°F)
	Valve lift	8 mm (0.3 in) minimum
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/VALVE/CAMSHAFT SPECIFICATIONS ('04 - '05)

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT		
Cylinder compression		745 kPa (7.6 kgf/cm ² , 108 psi)	-		
Valve clearance	IN	0.16 ± 0.03 (0.006 ± 0.001)	-		
	EX	0.28 ± 0.03 (0.011 ± 0.001)	-		
Decompressor clearance		Right side exhaust valve clearance + 0.15 ± 0.02 mm (0.006 ± 0.001 in)	-		
Valve, valve guide	Valve stem O.D.	IN	5.475 - 5.490 (0.2156 - 0.2161)	5.46 (0.215)	
		EX	5.455 - 5.470 (0.2148 - 0.2154)	5.44 (0.214)	
	Valve guide I.D.		IN/EX	5.500 - 5.512 (0.2165 - 0.2170)	5.52 (0.217)
	Stem-to-guide clearance	IN	0.010 - 0.037 (0.0004 - 0.0015)	0.12 (0.005)	
		EX	0.030 - 0.057 (0.0012 - 0.0022)	0.14 (0.006)	
	Valve guide projection above cylinder head	IN	16.8 - 17.2 (0.66 - 0.68)	-	
		EX	17.9 - 18.3 (0.70 - 0.72)	-	
	Valve seat width	IN	1.1 - 1.3 (0.043 - 0.051)	2.0 (0.08)	
EX		1.3 - 1.5 (0.051 - 0.059)	2.0 (0.08)		
Valve spring	Free length	IN	40.68 (1.602)	39.7 (1.56)	
		EX	43.16 (1.699)	42.2 (1.66)	
Exhaust rocker arm	Arm I.D.		12.000 - 12.018 (0.4724 - 0.4731)	12.05 (0.474)	
	Shaft O.D.		11.967 - 11.975 (0.4711 - 0.4715)	11.92 (0.469)	
	Arm-to-shaft clearance		0.025 - 0.051 (0.0010 - 0.0020)	0.10 (0.004)	
Camshaft	Cam lobe height	IN	36.630 - 36.790 (1.4421 - 1.4484)	36.48 (1.436)	
		EX	34.753 - 34.913 (1.3682 - 1.3745)	34.60 (1.362)	
Valve lifter O.D.		25.978 - 25.993 (1.0228 - 1.0233)	25.97 (1.022)		
Valve lifter bore I.D.		26.010 - 26.026 (1.0240 - 1.0246)	26.04 (1.025)		
Cylinder head warpage		-	0.05 (0.002)		

GENERAL INFORMATION

CYLINDER HEAD/VALVE/CAMSHAFT SPECIFICATIONS (After '05)

Unit: mm (in)

ITEM		STANDARD		SERVICE LIMIT
Cylinder compression		TRX450ER	343 – 382 kPa (3.5 – 3.9 kgf/cm ² , 50 – 56 psi)	-
		TRX450R	961 – 1000 kPa (9.8 – 10.2 kgf/cm ² , 139 – 145 psi)	-
Valve clearance		IN	0.16 ± 0.03 (0.006 ± 0.001)	-
		EX	0.28 ± 0.03 (0.011 ± 0.001)	-
Decompressor clearance		Right side exhaust valve clearance + 0.25 ± 0.02 mm (0.010 ± 0.001 in)		-
Valve, valve guide	Valve stem O.D.	IN	5.475 – 5.490 (0.2156 – 0.2161)	5.46 (0.215)
		EX	4.965 – 4.980 (0.1955 – 0.1961)	4.96 (0.195)
	Valve guide I.D.	IN	5.500 – 5.512 (0.2165 – 0.2170)	5.52 (0.217)
		EX	5.000 – 5.012 (0.1969 – 0.1973)	5.052 (0.1989)
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)	0.12 (0.005)
		EX	0.020 – 0.047 (0.0008 – 0.0019)	0.13 (0.005)
	Valve guide projection above cylinder head	IN	16.1 – 16.3 (0.63 – 0.64)	-
		EX	17.9 – 18.1 (0.70 – 0.71)	-
Valve seat width	IN	1.1 – 1.3 (0.043 – 0.051)	2.0 (0.08)	
	EX	1.3 – 1.5 (0.051 – 0.059)	2.0 (0.08)	
Valve spring	Free length	IN	40.68 (1.602)	39.7 (1.56)
		EX	42.82 (1.686)	42.2 (1.66)
Exhaust rocker arm	Arm I.D.	12.000 – 12.018 (0.4724 – 0.4731)		12.05 (0.474)
	Shaft O.D.	11.967 – 11.975 (0.4711 – 0.4715)		11.92 (0.469)
	Arm-to-shaft clearance	0.025 – 0.051 (0.0010 – 0.0020)		0.10 (0.004)
Camshaft	Cam lobe height	IN	35.040 – 35.280 (1.3795 – 1.3890)	34.89 (1.374)
		EX	34.214 – 34.454 (1.3470 – 1.3565)	34.06 (1.341)
Valve lifter O.D.		25.978 – 25.993 (1.0228 – 1.0233)		25.97 (1.022)
Valve lifter bore I.D.		26.010 – 26.026 (1.0240 – 1.0246)		26.04 (1.025)
Cylinder head warpage		-		0.05 (0.002)

CYLINDER/PISTON SPECIFICATIONS ('04 – '05)

Unit: mm (in)

ITEM		STANDARD		SERVICE LIMIT	
Cylinder	I.D.	94.000 – 94.015 (3.7008 – 3.7014)		94.05 (3.703)	
	Out-of-round	-		0.05 (0.002)	
	Taper	-		0.05 (0.002)	
	Warpage	-		0.05 (0.002)	
Piston, piston pin, piston ring	Piston O.D. at 20 (0.8) from bottom		93.960 – 93.990 (3.6992 – 3.7004)		93.86 (3.695)
	Piston pin hole I.D.		21.002 – 21.008 (0.8268 – 0.8271)		21.03 (0.828)
	Piston pin O.D.		20.994 – 21.000 (0.8265 – 0.8268)		20.98 (0.826)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)		0.04 (0.002)
	Piston ring end gap	Top	0.20 – 0.35 (0.008 – 0.014)		0.50 (0.020)
		Second	0.35 – 0.50 (0.014 – 0.020)		0.65 (0.026)
		Oil (side rail)	0.20 – 0.70 (0.008 – 0.028)		0.9 (0.04)
	Piston ring-to-ring groove clearance	Top	0.065 – 0.100 (0.0026 – 0.0039)		0.115 (0.0045)
Second		0.030 – 0.060 (0.0012 – 0.0024)		0.075 (0.0030)	
Cylinder-to-piston clearance		0.010 – 0.055 (0.0004 – 0.0022)		0.19 (0.007)	
Connecting rod small end I.D.		21.016 – 21.034 (0.8274 – 0.8281)		21.04 (0.828)	
Connecting rod-to-piston pin clearance		0.016 – 0.040 (0.0006 – 0.0016)		0.06 (0.002)	

CYLINDER/PISTON SPECIFICATIONS (After '05)

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Cylinder	I.D.	96.000 - 96.015 (3.7795 - 3.7801)	96.05 (3.781)	
	Out-of-round	-	0.05 (0.002)	
	Taper	-	0.05 (0.002)	
	Warpage	-	0.05 (0.002)	
Piston, piston pin, piston ring	Piston O.D. at 10 (0.4) from bottom	95.970 - 95.980 (3.7783 - 3.7787)	95.87 (3.774)	
	Piston pin hole I.D.	19.002 - 19.008 (0.7481 - 0.7483)	19.03 (0.749)	
	Piston pin O.D.	18.994 - 19.000 (0.7478 - 0.7480)	18.98 (0.747)	
	Piston-to-piston pin clearance	0.002 - 0.014 (0.0001 - 0.0006)	0.04 (0.002)	
	Piston ring end gap	Top	0.25 - 0.31 (0.010 - 0.012)	0.45 (0.018)
		Second	0.23 - 0.33 (0.009 - 0.013)	0.48 (0.019)
		Oil (side rail)	0.20 - 0.70 (0.008 - 0.028)	0.90 (0.035)
	Piston ring-to-ring groove clearance	Top	0.065 - 0.100 (0.0026 - 0.0039)	0.115 (0.0045)
Second		0.065 - 0.100 (0.0026 - 0.0039)	0.115 (0.0045)	
Cylinder-to-piston clearance		0.020 - 0.045 (0.0008 - 0.0018)	0.18 (0.007)	
Connecting rod small end I.D.		19.016 - 19.034 (0.7487 - 0.7494)	19.04 (0.750)	
Connecting rod-to-piston pin clearance		0.016 - 0.040 (0.0006 - 0.0016)	0.06 (0.002)	

CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE SPECIFICATIONS ('04 - '05)

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Clutch	Lever free play	10 - 20 (3/8 - 3/4)	-	
	Spring free length	45.7 (1.80)	44.7 (1.76)	
	Disc A thickness	2.92 - 3.08 (0.115 - 0.121)	2.85 (0.112)	
	Disc B thickness	3.22 - 3.38 (0.127 - 0.133)	3.15 (0.124)	
	Plate warpage	-	0.15 (0.006)	
Kickstarter	Pinion gear I.D.	22.007 - 22.028 (0.8664 - 0.8672)	22.05 (0.868)	
	Spindle O.D.	21.959 - 21.980 (0.8645 - 0.8654)	21.95 (0.864)	
	Idle gear I.D.	21.020 - 21.041 (0.8276 - 0.8284)	21.07 (0.830)	
	Idle gear bushing	I.D.	17.000 - 17.018 (0.6693 - 0.6700)	17.04 (0.671)
		O.D.	20.979 - 21.000 (0.8259 - 0.8268)	20.96 (0.825)
Countershaft O.D. at kickstarter idle gear		16.966 - 16.984 (0.6680 - 0.6687)	16.95 (0.667)	

CLUTCH/STARTER CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE SPECIFICATIONS (After '05)

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Clutch	Lever free play	10 - 20 (3/8 - 3/4)	-	
	Spring free length	45.7 (1.80)	44.7 (1.76)	
	Disc A thickness	2.92 - 3.08 (0.115 - 0.121)	2.85 (0.112)	
	Disc B thickness	3.22 - 3.38 (0.127 - 0.133)	3.15 (0.124)	
	Plate warpage	-	0.15 (0.006)	
Driven gear boss (TRX450ER)	I.D.	36.009 - 36.034 (1.4177 - 1.4189)	36.034 (1.4189)	
	O.D.	45.660 - 45.673 (1.7976 - 1.7981)	45.660 (1.7976)	
Reduction gear A I.D. (TRX450ER)		12.010 - 12.050 (0.4728 - 0.4744)	12.050 (0.4744)	
Reduction gear B I.D. (TRX450ER)		10.045 - 10.085 (0.3955 - 0.3970)	10.085 (0.3970)	
Idle gear I.D. (TRX450ER)		12.010 - 12.050 (0.4728 - 0.4744)	12.050 (0.4744)	
Gear holder shafts O.D. (TRX450ER)		11.989 - 12.000 (0.4720 - 0.4724)	11.989 (0.4720)	
Reduction gear shaft O.D. (TRX450ER)		9.980 - 9.995 (0.3929 - 0.3935)	9.980 (0.3929)	
Kickstarter (TRX450R)	Pinion gear I.D.	22.007 - 22.028 (0.8664 - 0.8672)	22.05 (0.868)	
	Spindle O.D.	21.959 - 21.980 (0.8645 - 0.8654)	21.95 (0.864)	
	Idle gear I.D.	21.020 - 21.041 (0.8276 - 0.8284)	21.07 (0.830)	
	Idle gear bushing	I.D.	17.000 - 17.018 (0.6693 - 0.6700)	17.04 (0.671)
		O.D.	20.979 - 21.000 (0.8259 - 0.8268)	20.96 (0.825)
Countershaft O.D. at kickstarter idle gear (TRX450R)		16.966 - 16.984 (0.6680 - 0.6687)	16.95 (0.667)	

GENERAL INFORMATION

CRANKCASE/TRANSMISSION/CRANKSHAFT SPECIFICATIONS ('04 - '05)

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Shift fork, shaft	Fork I.D.	Left, right	12.003 - 12.024 (0.4726 - 0.4733)
		Center	11.003 - 11.024 (0.4332 - 0.4340)
	Shaft O.D.	Left/right	11.983 - 11.994 (0.4718 - 0.4722)
		Center	10.983 - 10.994 (0.4324 - 0.4328)
Fork claw thickness		4.93 - 5.00 (0.194 - 0.197)	4.8 (0.19)
Transmission	Gear I.D.	M4	28.007 - 28.028 (1.1026 - 1.1035)
		M5	28.020 - 28.033 (1.1031 - 1.1037)
		C1	22.020 - 22.041 (0.8669 - 0.8678)
		C2	30.020 - 30.041 (1.1819 - 1.1827)
		C3	28.020 - 28.041 (1.1031 - 1.1040)
	Gear bushing O.D.	M4, M5	27.959 - 27.980 (1.1007 - 1.1016)
		C1	21.959 - 21.980 (0.8645 - 0.8654)
		C2	29.959 - 29.980 (1.1795 - 1.1803)
		C3	27.959 - 27.980 (1.1007 - 1.1016)
	Gear bushing I.D.	M5	25.020 - 25.041 (0.9850 - 0.9859)
		C1	19.020 - 19.041 (0.7488 - 0.7496)
		C2	27.020 - 27.041 (1.0638 - 1.0646)
		C3	25.020 - 25.041 (0.9850 - 0.9859)
	Mainshaft O.D.	at M5	24.967 - 24.980 (0.9830 - 0.9835)
	Countershaft O.D.	at C1	18.959 - 18.980 (0.7464 - 0.7472)
at C2		26.959 - 26.980 (1.0614 - 1.0622)	
at C3		24.959 - 24.980 (0.9826 - 0.9835)	
Crankshaft	Runout	Left	-
		Right	-
	Big end side clearance		0.05 - 0.60 (0.002 - 0.024)
	Big end radial clearance		0.006 - 0.018 (0.0002 - 0.0007)

CRANKCASE/TRANSMISSION/CRANKSHAFT SPECIFICATIONS (After '05)

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Shift fork, shaft	Fork I.D.	Left	12.035 - 12.056 (0.4738 - 0.4746)
		Right	12.003 - 12.024 (0.4726 - 0.4734)
		Center	11.003 - 11.024 (0.4332 - 0.4340)
	Shaft O.D.	Left/right	11.966 - 11.984 (0.4711 - 0.4718)
		Center	10.969 - 10.980 (0.4319 - 0.4323)
Fork claw thickness		4.93 - 5.00 (0.194 - 0.197)	4.8 (0.19)
Transmission	Gear I.D.	M4	28.007 - 28.028 (1.1026 - 1.1035)
		M5	28.020 - 28.033 (1.1031 - 1.1037)
		C1	22.020 - 22.041 (0.8669 - 0.8678)
		C2	30.020 - 30.041 (1.1819 - 1.1827)
		C3	28.020 - 28.041 (1.1031 - 1.1040)
	Gear bushing O.D.	M4, M5	27.959 - 27.980 (1.1007 - 1.1016)
		C1	21.959 - 21.980 (0.8645 - 0.8654)
		C2	29.959 - 29.980 (1.1795 - 1.1803)
		C3	27.959 - 27.980 (1.1007 - 1.1016)
	Gear bushing I.D.	M5	25.020 - 25.041 (0.9850 - 0.9859)
		C1	19.020 - 19.041 (0.7488 - 0.7496)
		C2	27.020 - 27.041 (1.0638 - 1.0646)
		C3	25.020 - 25.041 (0.9850 - 0.9859)
	Mainshaft O.D.	at M5	24.967 - 24.980 (0.9830 - 0.9835)
Countershaft O.D.	at C1	18.959 - 18.980 (0.7464 - 0.7472)	
	at C2	26.959 - 26.980 (1.0614 - 1.0622)	
	at C3	24.959 - 24.980 (0.9826 - 0.9835)	
Crankshaft	Runout	Left	-
		Right	-
	Big end side clearance		0.30 - 0.75 (0.012 - 0.030)
	Big end radial clearance		0.006 - 0.018 (0.0002 - 0.0007)

FRONT WHEEL/SUSPENSION/STEERING SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		-	4.0 (0.16)
Cold tire pressure ('04 - '05)	Standard	27.5 kPa (0.275 kgf/cm ² , 4.0 psi)	-
	Minimum	23.5 kPa (0.235 kgf/cm ² , 3.4psi)	-
	Maximum	31.5 kPa (0.315 kgf/cm ² , 4.6 psi)	-
Cold tire pressure (After '05)	Standard	27.5 kPa (0.275 kgf/cm ² , 4.0 psi)	-
	Minimum	25.0 kPa (0.250 kgf/cm ² , 3.6psi)	-
	Maximum	30.0 kPa (0.300 kgf/cm ² , 4.4 psi)	-
Compression damping adjuster standard position	'04 - '05	1-7/8 turns out from full in	-
	After '05	1/2 ± 1/8 turns out from full in	-
Rebound damping adjuster standard position	'04 - '05	1-3/8 turns out from full in	-
	After '05	7/8 ± 1/8 turns out from full in	-
Tie-rod distance between the ball joints	'04 - '05	409.5 (16.12)	-
	After '05	398.0 (15.67)	-
Toe	'04 - '05	Toe-in: 11.4 ± 15 (0.45 ± 0.6)	-
	After '05	Toe-in: 14 ± 15 (0.6 ± 0.6)	-

GENERAL INFORMATION

REAR WHEEL/SUSPENSION SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Minimum tire tread depth		-	4.0 (0.16)	
Cold tire pressure ('04 - '05)	Standard	32.5 kPa (0.325 kgf/cm ² , 4.7 psi)	-	
	Minimum	28.5 kPa (0.285 kgf/cm ² , 4.1 psi)	-	
	Maximum	36.5 kPa (0.365 kgf/cm ² , 5.3 psi)	-	
Cold tire pressure (After '05)	Standard	32.5 kPa (0.325 kgf/cm ² , 4.7 psi)	-	
	Minimum	30.0 kPa (0.300 kgf/cm ² , 4.3 psi)	-	
	Maximum	35.0 kPa (0.350 kgf/cm ² , 5.1 psi)	-	
Axle runout		-	3.0 (0.12)	
Drive chain	Stack	25 - 35 (1 - 1-7/16)	-	
	Size/link ('04 - '05)	DID	DID520V6/94	-
		RK	RK520SMOZ10S/94	-
	Size/link (After '05)	DID	DID520V6/96	-
RK		RK520SMOZ10S/96	-	
Compression damping adjuster standard position	'04 - '05	26 ± 1 clicks out from full in	-	
	After '05	8 ± 1 clicks out from full in	-	
Rebound damping adjuster standard position	'04 - '05	1-3/4 turns out from full in	-	
	After '05	1-1/8 ± 1/8 turns out from full in	-	

HYDRAULIC BRAKE SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Recommended brake fluid		DOT 4 brake fluid	-
Front brake	Disc thickness	2.8 - 3.2 (0.11 - 0.13)	2.5 (0.10)
	Disc runout	-	0.30 (0.012)
	Master cylinder I.D.	12.7 (0.55)	-
	Caliper cylinder I.D.	25.4 (1.00)	-
Rear brake	Brake disc thickness	3.8 - 4.2 (0.15 - 0.17)	3.5 (0.14)
	Brake disc runout	-	0.30 (0.012)
	Master cylinder I.D.	12.7 (0.55)	-
	Caliper cylinder I.D.	32.0 (1.26)	-

ELECTRICAL SPECIFICATIONS ('04 - '05)

ITEM		SPECIFICATIONS
Alternator	Capacity	214 W/5,000 rpm
	Charging coil resistance (20°C/68°F)	0.1 - 1.0 Ω
Spark plug	Standard	IFR8H11 (NGK) VK24PRZ11 (DENSO)
	For extended high speed riding	IFR9H11 (NGK) VK27PRZ11 (DENSO)
Spark plug gap		1.0 - 1.1 mm (0.039 - 0.043 in)
Ignition coil peak voltage		100 V minimum
Exciter coil peak voltage	High	80 V minimum
	Low	30 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Ignition timing ("F" mark)		12° BTDC at idle
Bulb	Headlight	12 V - 30 W/30 W x 2
	Taillight	LED
	Coolant temperature indicator	12 V - 3.4 W
Carburetor heater resistance (20°C/68°F)		13 - 15 Ω
Throttle position sensor resistance (20°C/68°F)		4 - 6 kΩ
ECT sensor resistance	at 80°C (176°F)	47.5 - 56.8 Ω
	at 120°C (248°F)	14.9 - 17.3 Ω

BATTERY/CHARGING SYSTEM SPECIFICATIONS (TRX450ER)

ITEM		SPECIFICATIONS	
Battery	Capacity	12V - 6 Ah	
	Voltage (20°C/68°F)	Fully charged	13.0 - 13.2 V
		Needs charging	Below 12.3 V
	Charging current	Normal	0.6 A/5 - 10 h
Quick		3.0 A/1 h	
Current leakage		0.01 mA max.	
Alternator	Capacity	200 W/5,000 rpm (min ⁻¹)	
	Charging coil resistance (20°C/68°F)	0.1 - 1.0 Ω	

IGNITION SYSTEM SPECIFICATIONS (After '05)

ITEM		SPECIFICATIONS
Spark plug	Standard	IFR7L11 (NGK) VK22PRZ11 (DENSO)
	For extended high speed riding	IFR8H11 (NGK) VK24PRZ11 (DENSO)
Spark plug gap		1.0 - 1.1 mm (0.039 - 0.043 in)
Ignition coil peak voltage		100 V minimum
Exciter coil peak voltage	High	45 V minimum
	Low	15 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Ignition timing ("F" mark)		11.4° BTDC at idle
Throttle position sensor resistance (20°C/68°F)		4 - 6 kΩ

ELECTRIC STARTER SPECIFICATIONS (TRX450ER)

Unit: mm (in)

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

LIGHTS/SWITCH SPECIFICATIONS (After '05)

ITEM		SPECIFICATIONS
Bulbs	Headlight (High/low beam)	12 V - 30/30 W
	Brake/taillight	LED
	Neutral indicator (TRX450ER)	12 V - 3 W
	Coolant temperature indicator	12 V - 3.4 W
Fuse	Main fuse (TRX450ER)	15 A
ECT sensor resistance	at 80°C (176°F)	47.5 - 56.8 Ω
	at 120°C (248°F)	14.9 - 17.3 Ω

GENERAL INFORMATION

STANDARD TORQUE VALUES

FASTENER TYPE	TORQUE		FASTENER TYPE	TORQUE	
	N-m (kgf-m, lbf-ft)			N-m (kgf-m, lbf-ft)	
5 mm bolt and nut	5 (0.5, 3.6)		5 mm screw	4 (0.4, 2.9)	
6 mm bolt and nut	9.8 (1.0, 7)		6 mm screw	9 (0.9, 6.5)	
8 mm bolt and nut	22 (2.2, 16)		6 mm flange bolt (8 mm head; small flange)	9.8 (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	26 (2.7, 20)	
			10 mm flange bolt and nut	39 (4.0, 29)	

ENGINE & FRAME TORQUE VALUES

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

NOTE:

1. Apply engine oil to the threads and seating surface.
2. Apply grease to the threads and seating surface.
3. Apply locking agent to the threads.
4. Replace with a new one and stake.
5. Apply sealant to the threads.
6. ALOC bolt: replace with a new one.
7. Castle nut: tighten to the specified torque and further tighten until its grooves aligns with the cotter pin hole.

ENGINE

MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Spark plug	1	14	23 (2.3, 17)	
Decompressor arm adjusting screw lock nut	1	5	9.8 (1.0, 7)	NOTE 1
Crankshaft hofe cap	1	30	15 (1.5, 11)	NOTE 2
Engine oil drain bolt ('04 - '05)	1	8	22 (2.2, 16)	NOTE 1
Engine oil drain bolt (After '05)	1	12	25 (2.5, 18)	NOTE 1
Transmission oil drain bolt	1	8	22 (2.2, 16)	NOTE 1

FUEL SYSTEM ('04 - '05)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Carburetor insulator band screw	2	5	-	page 7-21
Starting enrichment (SE) valve nut	1	-	3 (0.3, 2.2)	
Hot start valve nut	1	-	3 (0.3, 2.2)	

FUEL SYSTEM (After '05)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Slow air jet	1	-	0.9 (0.1, 0.7)	
Slow jet	1	-	1.5 (0.2, 1.1)	
Starter jet	1	-	1.5 (0.2, 1.1)	
Needle jet	1	-	1.8 (0.2, 1.3)	
Main jet	1	-	1.5 (0.2, 1.1)	
Float chamber screw	1	-	2.1 (0.2, 1.5)	
Accelerator pump cover screw	1	-	2.1 (0.2, 1.5)	
Choke valve lock nut	1	-	2.1 (0.2, 1.5)	
Throttle shaft screw	1	-	2.1 (0.2, 1.5)	NOTE 3
Needle holder	1	-	2.1 (0.2, 1.5)	
Top cover bolt	1	-	2.1 (0.2, 1.5)	
Throttle drum cover bolt	1	-	3.4 (0.3, 2.5)	
Carburetor insulator band screw	2	5	-	page 8-23
Hot start valve nut (TRX450R)	1	-	2.1 (0.2, 1.5)	

GENERAL INFORMATION

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)	

ENGINE REMOVAL/INSTALLATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Drive sprocket bolt	1	8	31 (3.2, 23)	

CYLINDER HEAD/VALVE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Cylinder head nut	4	10	54 (5.5, 40)	NOTE 1
Cylinder head cover bolt	3	6	9.8 (1.0, 7)	
Camshaft holder bolt	4	6	14 (1.4, 10)	NOTE 1
Decompressor lifter arm nut	1	8	22 (2.2, 16)	NOTE 1
Decompressor cam bolt	1	8	25 (2.5, 18)	NOTE 3
Cam sprocket bolt	2	7	20 (2.0, 14)	NOTE 3

CYLINDER/PISTON

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Cylinder stud bolt	4	10	-	page 12-9
Cam chain tensioner lifter bolt (After '05)	2	6	12 (1.2, 9)	NOTE 3

CLUTCH/STARTER CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Clutch spring bolt	6	6	12 (1.2, 9)	
Clutch center lock nut	1	18	108 (11.0, 80)	NOTE 1
Shift drum center pin bolt	1	8	22 (2.2, 16)	NOTE 3
Shift drum stopper arm bolt	1	6	12 (1.2, 9)	
Start gear holder bolt (TRX450ER)	2	7	18 (1.8, 13)	NOTE 1
Start gear holder bolt (TRX450ER)	1	7	18 (1.8, 13)	NOTE 3
Primary drive gear bolt (TRX450ER)	1	12	108 (11.0, 80)	NOTE 1
Start gear holder hole plug bolt (After '05;TRX450R)	3	7	18 (1.8, 13)	NOTE 1
Kickstarter pedal bolt (TRX450R)	1	8	38 (3.9, 28)	
Gearshift return spring pin	1	8	22 (2.2, 16)	

CRANKCASE/TRANSMISSION/CRANKSHAFT

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N-m (kgf-m, lbf-ft)	REMARKS
Balancer shaft lock nut ('04 - '05)	1	16	64 (6.5, 47)	NOTE 1, 4
Balancer shaft lock nut (After '05)	1	14	54 (5.5, 40)	NOTE 1, 4
Cam chain tensioner bolt	1	6	12 (1.2, 9)	NOTE 3
Primary drive gear bolt	1	12	108 (11.0, 80)	NOTE 1
Bearing set plate bolt	6	6	12 (1.2, 9)	NOTE 3
Crankshaft bearing set plate bolt (After '05)	2	6	16 (1.6, 12)	NOTE 3
Countershaft bearing set plate torx screw (After '05)	2	6	12 (1.2, 9)	NOTE 3
Neutral switch hole plug bolt (After '05;TRX450R)	1	10	12 (1.2, 9)	
Oil jet ('04 - '05)	1	5	2 (0.2, 1.4)	NOTE 3
Piston jet mounting bolt (After '05)	1	6	10 (1.0, 7)	NOTE 3

GENERAL INFORMATION

ELECTRICAL

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Engine coolant temperature (ECT) sensor	1	PT 1/8	9.8 (1.0, 7)	NOTE 5
Timing hole cap	1	14	9.8 (1.0, 7)	NOTE 2
Flywheel nut ('04 - '05)	1	14	74 (7.5, 54)	NOTE 1
Flywheel nut (After '05)	1	12	64 (6.5, 47)	NOTE 1
Ignition pulse generator bolt ('04 - '05)	2	5	5 (0.5, 3.6)	
Ignition pulse generator bolt (After '05)	4	5	5 (0.5, 3.6)	
Alternator stator bolt	3	6	9.8 (1.0, 7)	

IGNITION SYSTEM (AFTER '05)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Throttle position sensor screw	1	5	3.4 (0.3, 2.5)	NOTE 3

LIGHTS/SWITCHES (AFTER '05)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Neutral switch (TRX450ER)	1	10	12 (1.2, 9)	

FRAME

FRAME/BODY PANELS/EXHAUST SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Footpeg bracket bolt	4	10	42 (4.3, 31)	NOTE 6
Skid plate bolt	6	8	30 (3.1, 22)	
Muffler mounting nut	2	8	32 (3.3, 24)	
Exhaust pipe band bolt ('04 - '05)	2	8	23 (2.3, 17)	
Exhaust pipe band bolt (After '05)	1	8	23 (2.3, 17)	
Rear frame upper mounting bolt	2	8	32 (3.3, 24)	
Rear frame lower mounting bolt	2	10	54 (5.5, 40)	

MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Axle bearing holder pinch bolt	4	8	21 (2.1, 15)	
Front master cylinder reservoir cap screw	2	4	2 (0.2, 1.4)	
Parking brake arm lock nut	1	8	18 (1.8, 13)	
Rear master cylinder push rod lock nut	1	8	18 (1.8, 13)	
Tie-rod lock nut	4	12	54 (5.5, 40)	

ENGINE REMOVAL/INSTALLATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Upper engine hanger nut	1	10	54 (5.5, 40)	
Upper engine hanger plate bolt	4	8	26 (2.7, 20)	
Front engine hanger nut	1	10	54 (5.5, 40)	
Front engine hanger plate bolt	4	8	26 (2.7, 20)	
Lower engine hanger nut	1	10	74 (7.5, 54)	

FRONT WHEEL/SUSPENSION/STEERING

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Throttle housing cover screw ('04 - '05)	3	4	4 (0.4, 2.9)	
Throttle housing cover screw (After '05)	3	4	3.4 (0.4, 2.5)	
Throttle lever switch screw (After '05)	2	3	1 (0.1, 0.7)	
Handlebar grip end bolt	2	6	12 (1.2, 9)	
Handlebar switch housing screw	2	5	2 (0.2, 1.4)	
Clutch lever pivot bolt	1	6	1 (0.1, 0.7)	
Clutch lever pivot nut	1	6	5.9 (0.6, 4.3)	
Parking brake lever pivot screw ('04 - '05)	1	6	9 (0.9, 6.5)	
Parking brake lever pivot screw (After '05)	1	6	9 (0.9, 6.5)	NOTE 3
Front wheel nut	8	10	64 (6.5, 47)	
Front wheel hub nut	2	14	69 (7.0, 51)	NOTE 7
Front brake disc bolt	6	8	42 (4.3, 31)	NOTE 6
Shock absorber mounting nut	4	10	39 (4.0, 29)	
Front brake hose clamp bolt	5	6	12 (1.2, 9)	NOTE 6
Upper and lower arm pivot nut	8	10	39 (4.0, 29)	
Upper and lower arm ball joint nut	4	12	32 (3.3, 24)	NOTE 7
Tie-rod ball joint nut	4	10	44 (4.5, 33)	
Handlebar lower holder nut	2	10	39 (4.0, 29)	
Steering shaft end nut	1	14	69 (7.0, 51)	
Steering shaft holder bolt	2	8	32 (3.3, 24)	

GENERAL INFORMATION

REAR WHEEL/SUSPENSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear wheel nut	8	10	64 (6.5, 47)	
Rear wheel hub nut	2	18	147 (15.0, 108)	NOTE 2, 7
Rear brake caliper bracket mounting bolt	2	8	30 (3.1, 22)	NOTE 6
Drive chain guard bolt	2	6	9.8 (1.0, 7)	NOTE 6
Rear axle inner lock nut	1	48	128 (13.0, 94)	NOTE 3
Rear axle outer lock nut	1	48	88 (9.0, 65)	NOTE 3
Rear brake disc bolt	3	8	42 (4.3, 31)	NOTE 6
Final driven sprocket nut	4	10	59 (6.0, 43)	
Rear shock absorber mounting nut	2	10	59 (6.0, 43)	
Shock link-to-swingarm nut	1	10	44 (4.5, 33)	
Shock arm-to-frame nut	1	10	59 (6.0, 43)	
Shock arm-to-shock link nut	1	10	59 (6.0, 43)	
Rear brake hose clamp bolt	2	6	9.8 (1.0, 7)	NOTE 6
Rear brake hose guide bolt	1	6	9.8 (1.0, 7)	NOTE 6
Parking brake cable clamp bolt	1	6	9.8 (1.0, 7)	NOTE 6
Chain slider bolt	2	6	9.8 (1.0, 7)	NOTE 6
Swingarm pivot nut	1	14	108 (11.0, 80)	NOTE 2
Rear brake caliper stay stopper bolt	1	12	59 (6.0, 43)	NOTE 3

HYDRAULIC BRAKE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Brake caliper bleed valve	3	8	6 (0.6, 4.3)	
Rear brake reservoir mounting bolt	1	6	12 (1.2, 9)	
Front brake disc cover bolt	2	6	12 (1.2, 9)	NOTE 6
Front brake pad pin	2	10	18 (1.8, 13)	
Rear brake caliper pin bolt	1	8	23 (2.3, 17)	
Brake hose oil bolt	5	10	34 (3.2, 25)	
Front brake lever pivot bolt	2	6	1 (0.1, 0.7)	
Front brake lever pivot nut	2	6	6 (0.6, 4.3)	
Front brake light switch screw	1	4	1 (0.1, 0.7)	
Front brake caliper bracket mounting bolt	2	8	30 (3.1, 22)	NOTE 6
Rear brake reservoir hose joint screw	1	4	2 (0.2, 1.4)	NOTE 3
Rear master cylinder mounting bolt	2	6	12 (1.2, 9)	
Parking brake base bolt	2	8	23 (2.3, 17)	
Brake pedal pivot bolt	1	8	26 (2.7, 20)	
Front brake pipe joint bolt	3	10	17 (1.7, 12)	
Front brake 3-way joint mounting bolt	1	6	12 (1.2, 9)	

LUBRICATION & SEAL POINTS**ENGINE**

LOCATION	MATERIAL	REMARKS
Camshaft cam lobe Rocker arm pivot and slipper surface Decompressor lifter arm roller surface Valve stem sliding surface Valve stem end Valve lifter outer surface Clutch outer guide sliding surface Clutch lifter arm cam (lifter rod contact area) Shift fork guide pin and shifter (gear guide groove) Shift fork shaft sliding surface Kickstarter spindle gear and ratchet sliding surface (TRX450R) Kickstarter pinion gear inner surface (TRX450R) Starter gear holder rotating surfaces (TRX450ER) Piston pin outer surface Connecting rod small end inner surface Connecting rod big end thrust surface Balancer shaft needle bearing and ball bearing Mainshaft gear and shifter sliding surface Countershaft gear and shifter sliding surface Each gear sliding surface	Molybdenum oil solution (a mixture of engine oil and molybdenum disulfide grease in a ratio of 1:1)	
Oil pump rotor sliding surface Oil pipe seal ring ('04 - '05) Decompressor arm adjusting screw lock nut threads Camshaft holder bolt threads Decompressor lifter arm nut threads and seating surface Decompressor arm pivot surface Cylinder head nut threads and seating surface Piston outer surface and piston pin hole Piston rings Clutch outer sliding surface Clutch disc lining surface Clutch center lock nut threads and seating surface Clutch lifter piece needle bearing Gearshift spindle serration area (TRX450R) Kickstarter idle gear B bearing area (TRX450R) Kickstarter spindle bearing area (TRX450R) One-way clutch outer surfaces (TRX450ER) Starter clutch outer sliding surfaces (TRX450ER) Starter driven gear sliding surfaces (TRX450ER) Balancer shaft lock nut threads Primary drive gear bolt threads Crankshaft oil seal contacting surface Shift drum guide groove Shift spindle serration area (After '05) Flywheel nut threads and seating surface Each bearing rotating area Each O-ring	Engine oil	
Crankshaft hole cap threads Timing hole cap threads Each oil seal lip	Multi purpose grease	

GENERAL INFORMATION

LOCATION	MATERIAL	REMARKS
Cam sprocket bolt threads	Locking agent	Coating width: 6.5 ± 1 mm (0.26 ± 0.04 in)
Decompressor cam bolt threads		Coating width: 6.5 ± 1 mm (0.26 ± 0.04 in)
Shift drum center bolt threads		Coating width: 6.5 ± 1 mm (0.26 ± 0.04 in)
Cam chain tensioner bolt threads		Coating width: 6.5 ± 1 mm (0.26 ± 0.04 in)
Bearing set plate bolt threads		Coating width: 6.5 ± 1 mm (0.26 ± 0.04 in)
Bearing set plate screw threads		Coating width: 6.5 ± 1 mm (0.26 ± 0.04 in)
Starter gear holder mounting bolt (TRX450ER)		Coating width: 6.5 ± 1 mm (0.26 ± 0.04 in)
Oil jet threads ('04 - '05)		Coating width: 2.5 ± 1 mm (0.10 ± 0.04 in)
Piston jet threads (After '05)		Coating width: 6.5 ± 1 mm (0.26 ± 0.04 in)
Cylinder head cover breather plate bolt threads		Coating width: 6.5 ± 1 mm (0.26 ± 0.04 in)
Crankcase bolt threads		Coating width: 6.5 ± 1 mm (0.26 ± 0.04 in) '04 - '05: (page 15-26) After '05: (page 16-26)
Parking brake cable clasper bolt threads		
Engine coolant temperature (ECT) sensor threads		Sealant

FRAME

LOCATION	MATERIAL	REMARKS
Throttle cable end	Multi purpose grease (NLGI #2)	Fill up 3 g per each bearing
Throttle cable adjuster threads		
Throttle lever pivot and dust seal lip		
Clutch lever pivot		
Parking lock arm pivot (screw)		
Parking brake cable end		
Kickstarter pedal joint sliding area (TRX450R)		
Steering shaft bearing dust seal lip		
Front wheel hub dust seal lip		
Upper and lower arm pivot bearings		
Upper and lower arm pivot bearing dust seal lips		
Front shock absorber lower bearing		
Front shock absorber lower bearing dust seal lip		
Shock arm and link bearings		
Shock arm and link bearing dust seal lips		
Rear shock absorber upper bearing		
Rear shock absorber upper bearing dust seal lip		
Swingarm pivot bearing		
Swingarm pivot bearing dust seal lip		
Rear axle bearing holder dust seal lip		
Rear axle bearing holder sliding surface		
Shock link-to-swingarm bolt pivot surface		
Rear wheel hub nut threads and seating surface		
Rear axle splines		
Swingarm pivot nut threads and seating surface		
Brake pedal pivot bolt sliding surface		
Steering shaft bushing sliding surface	Shell Alvania EP-LF-2 or equivalent	
Rear axle outer lock nut clip contacting area	Molybdenum disulfide grease	
Rear axle bearing holder pinch bolt seating surface		
Throttle cable outer inside	Cable lubricant	
Clutch cable outer inside		
Hot start cable inside (TRX450R)		

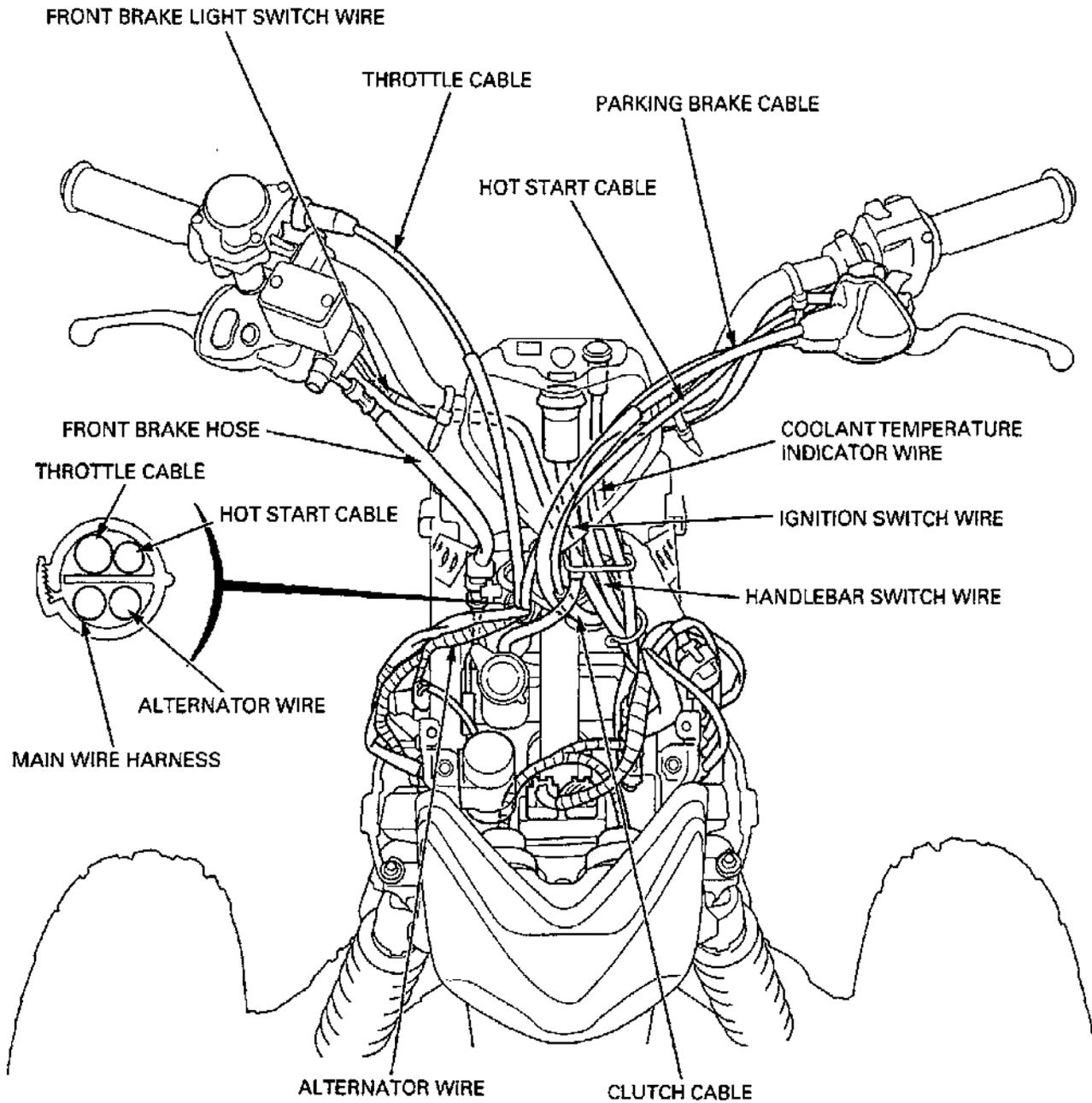
GENERAL INFORMATION

LOCATION	MATERIAL	REMARKS
Handlebar grip rubber inside	Honda bond A or Pro Honda Hand Grip Cement (U.S.A. only) or equivalent	
Front brake lever-to-master piston contacting area Front brake lever pivot Front brake caliper pin sliding surface Front brake caliper bracket pin sliding surface Rear brake caliper stay sliding surface Rear brake master piston-to-push rod contacting area Rear brake caliper pin sliding surfaces Rear brake caliper parking brake shaft sliding surface	Silicone grease	
Brake master piston and cup Brake caliper piston and seal Rear brake reservoir hose joint O-ring	DOT4 brake fluid	
Rear axle inner and outer lock nut threads Rear caliper stay stopper bolt threads Rear brake reservoir hose joint screw threads	Locking agent	

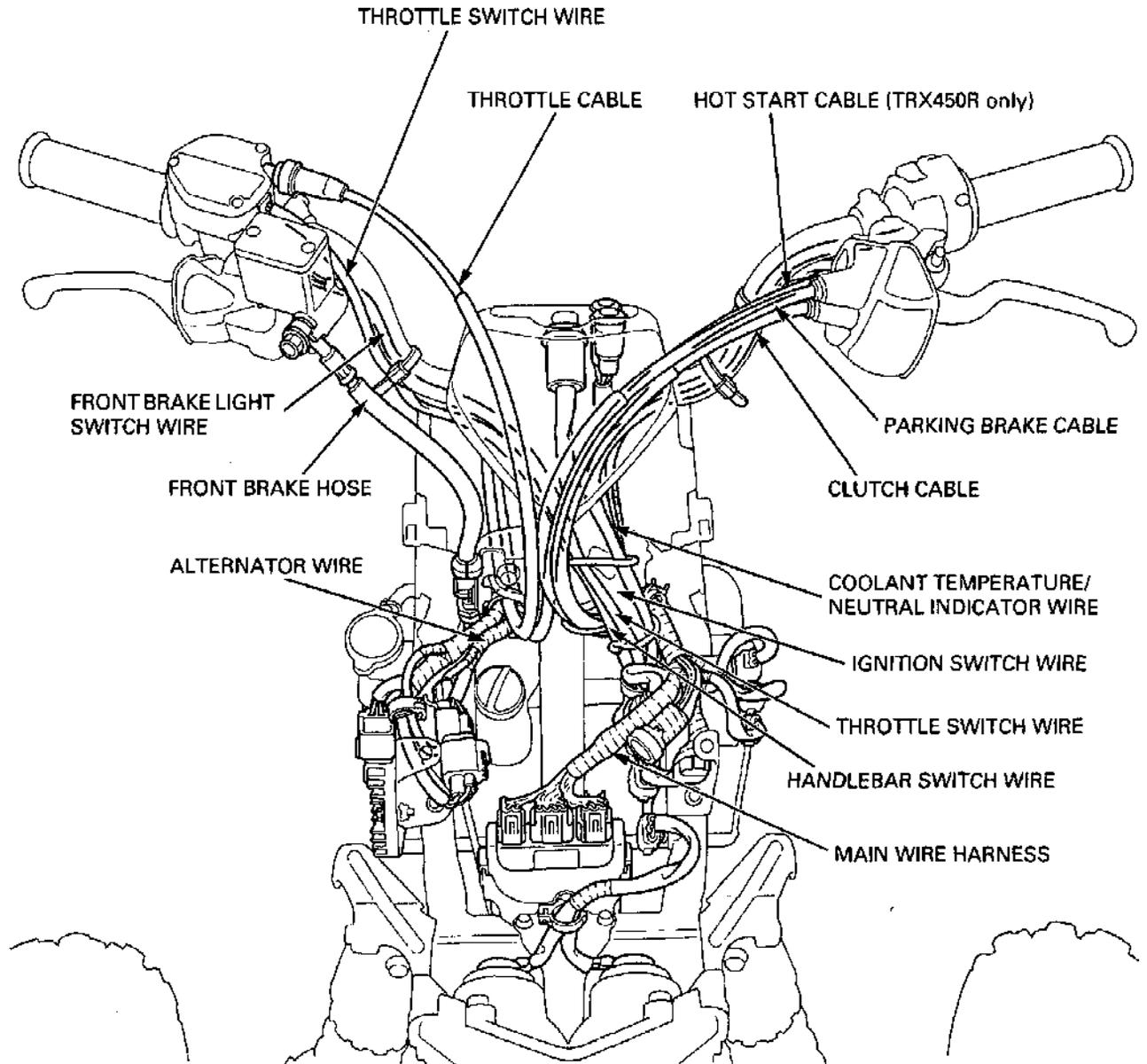
GENERAL INFORMATION

CABLE & HARNESS ROUTING

'04 - '05:

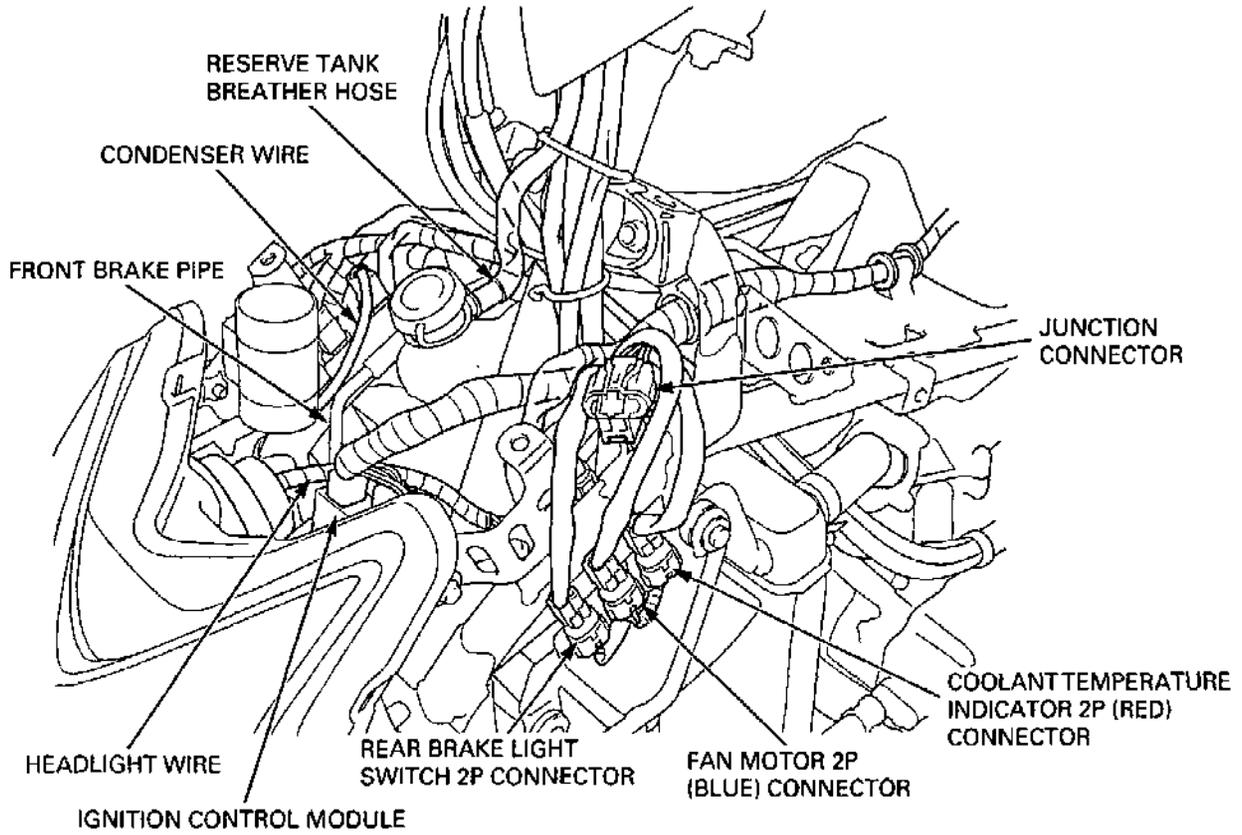


After '05:

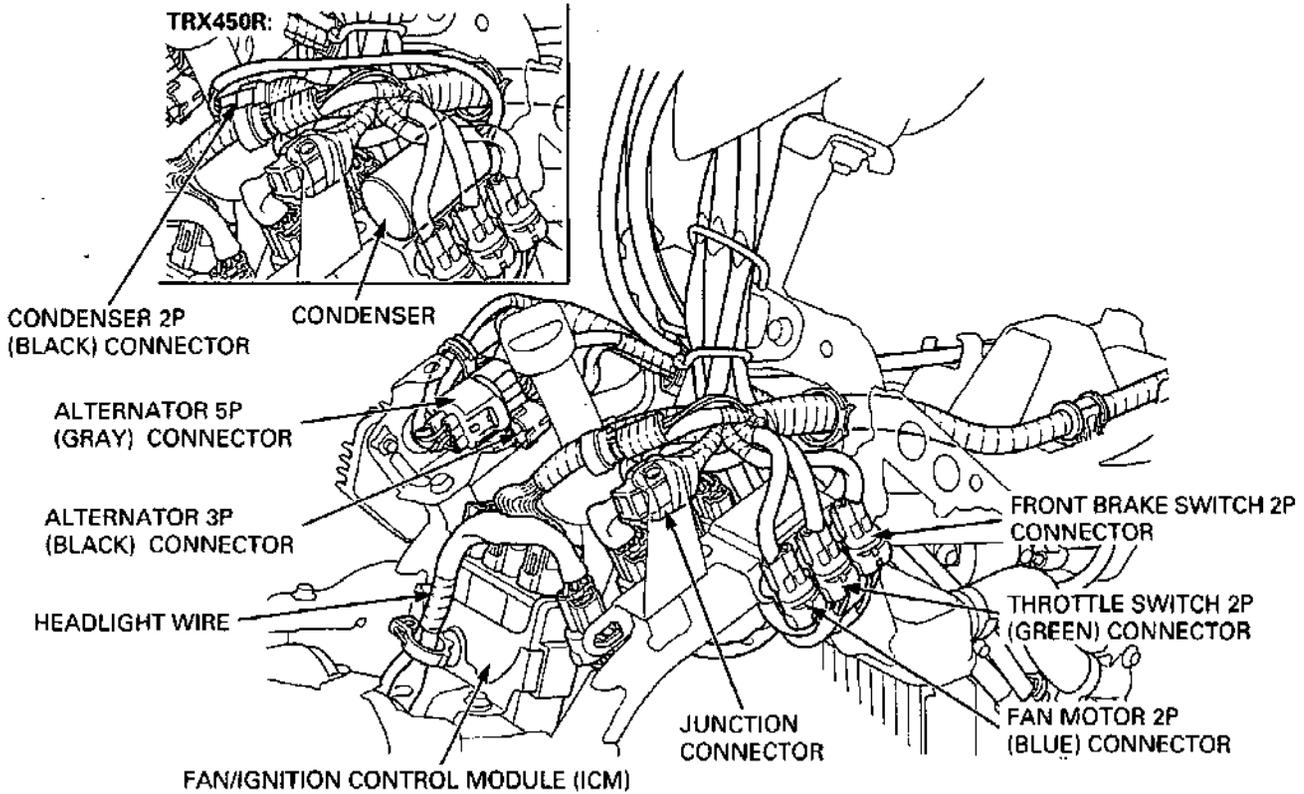


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'04 - '05:

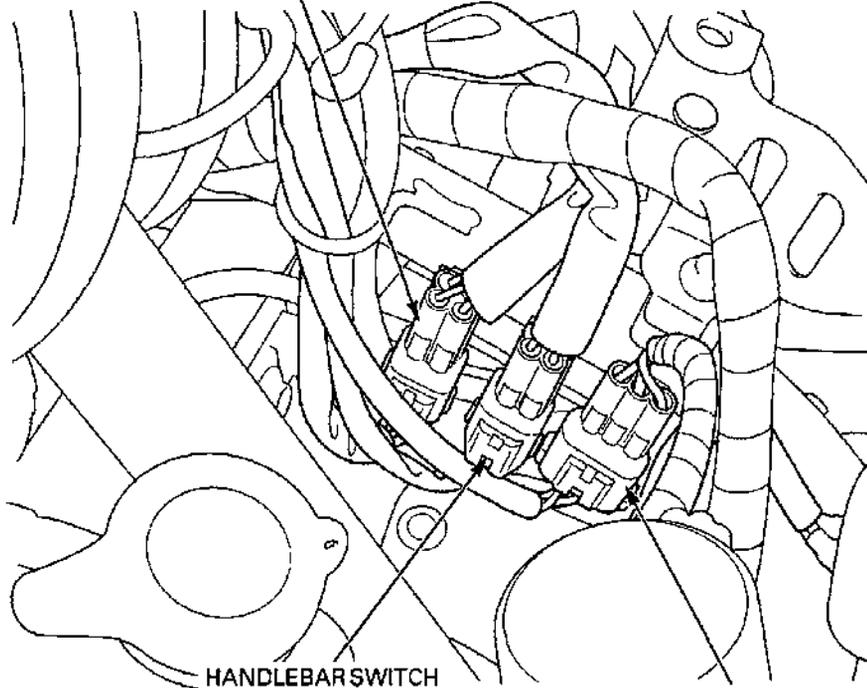


After '05:



'04 - '05:

IGNITION SWITCH 4P
(BLACK) CONNECTOR



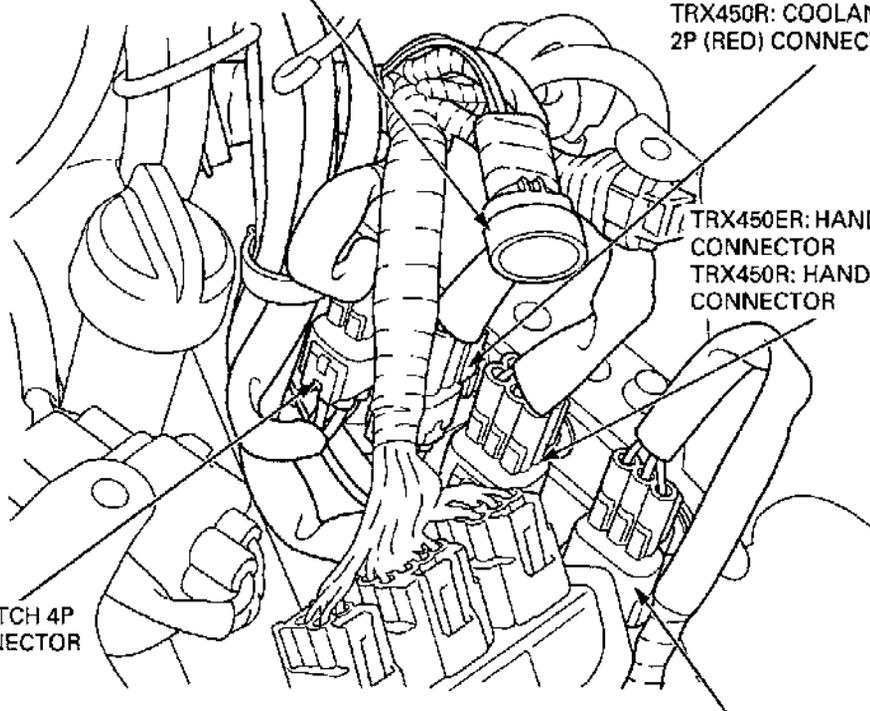
HANDLEBAR SWITCH
4P CONNECTOR

HEADLIGHT 3P CONNECTOR

After '05:

DIODE (TRX450ER only)

TRX450ER: COOLANT TEMPERATURE/
NEUTRAL INDICATOR 4P CONNECTOR
TRX450R: COOLANT TEMPERATURE
2P (RED) CONNECTOR



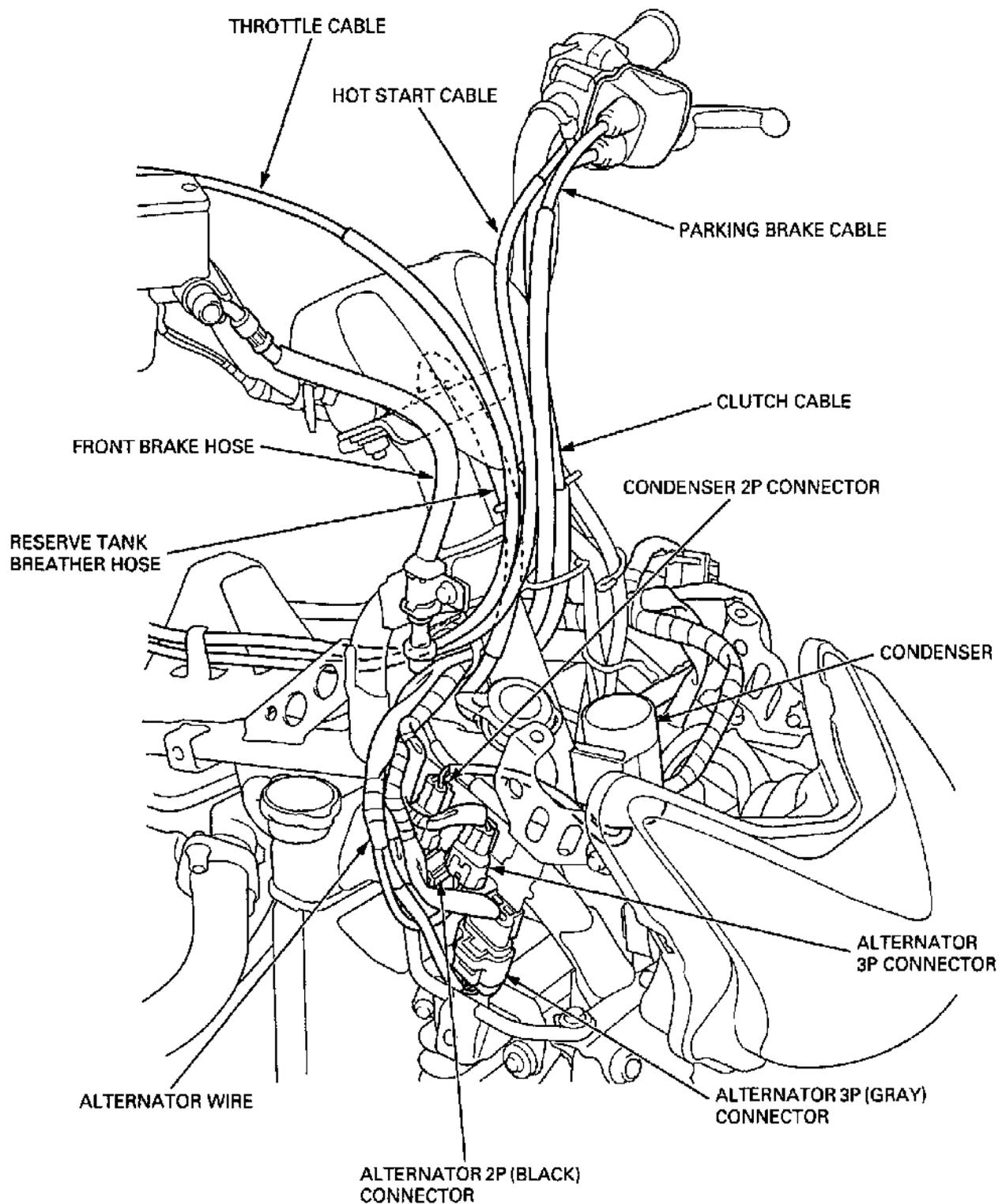
IGNITION SWITCH 4P
(BLACK) CONNECTOR

TRX450ER: HANDLEBAR SWITCH 6P
CONNECTOR
TRX450R: HANDLEBAR SWITCH 4P
CONNECTOR

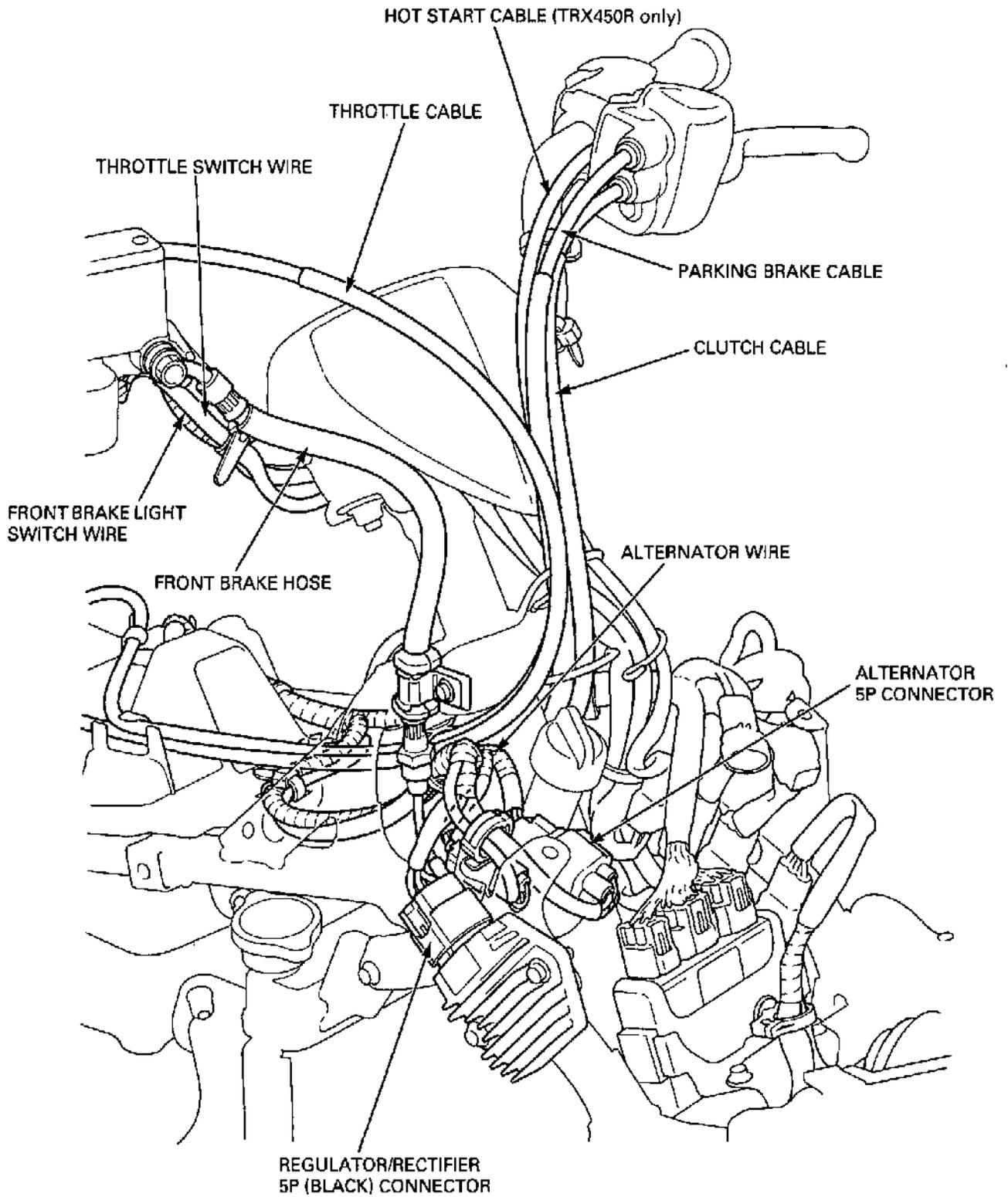
HEADLIGHT 3P(BLACK) CONNECTOR

GENERAL INFORMATION

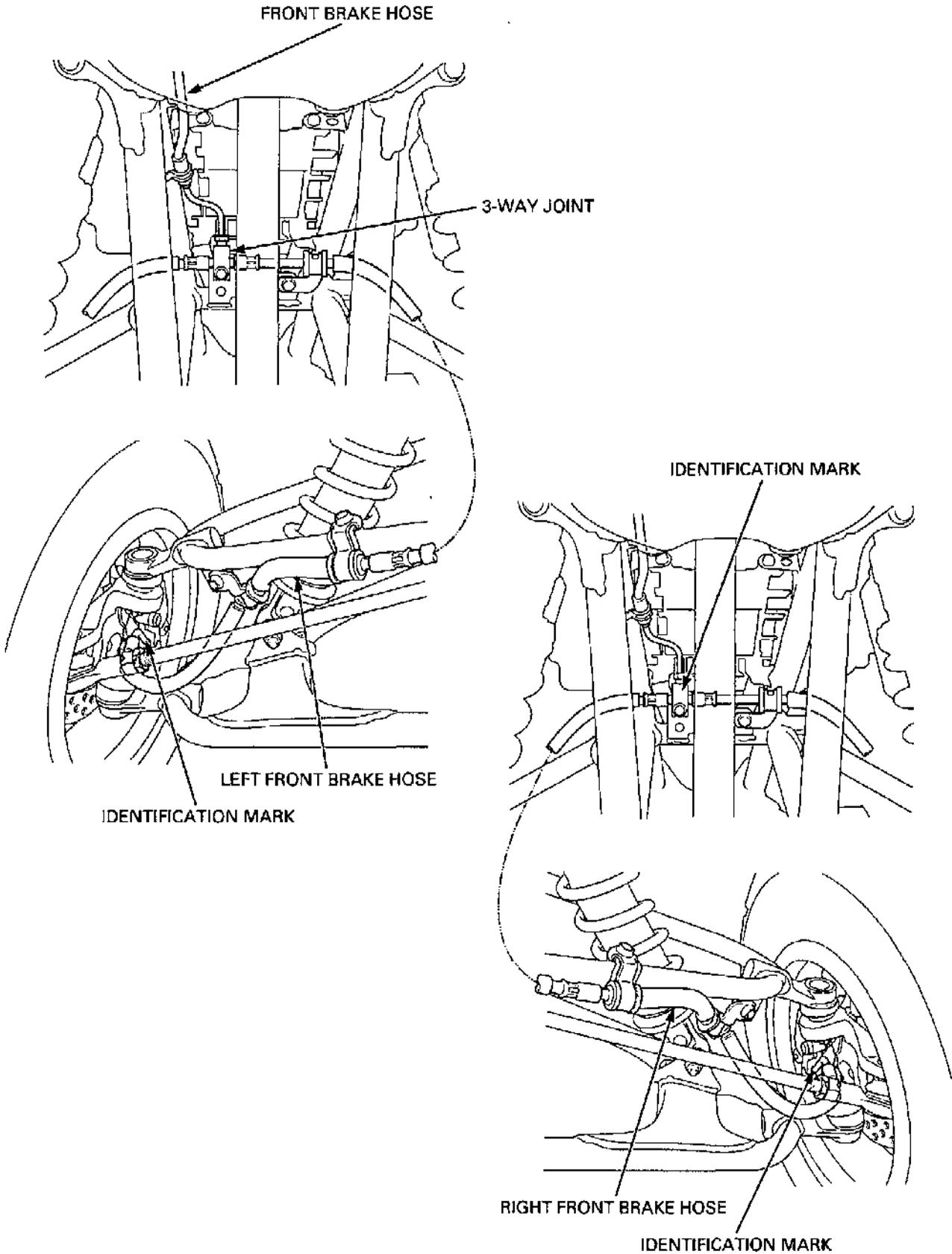
'04 - '05:



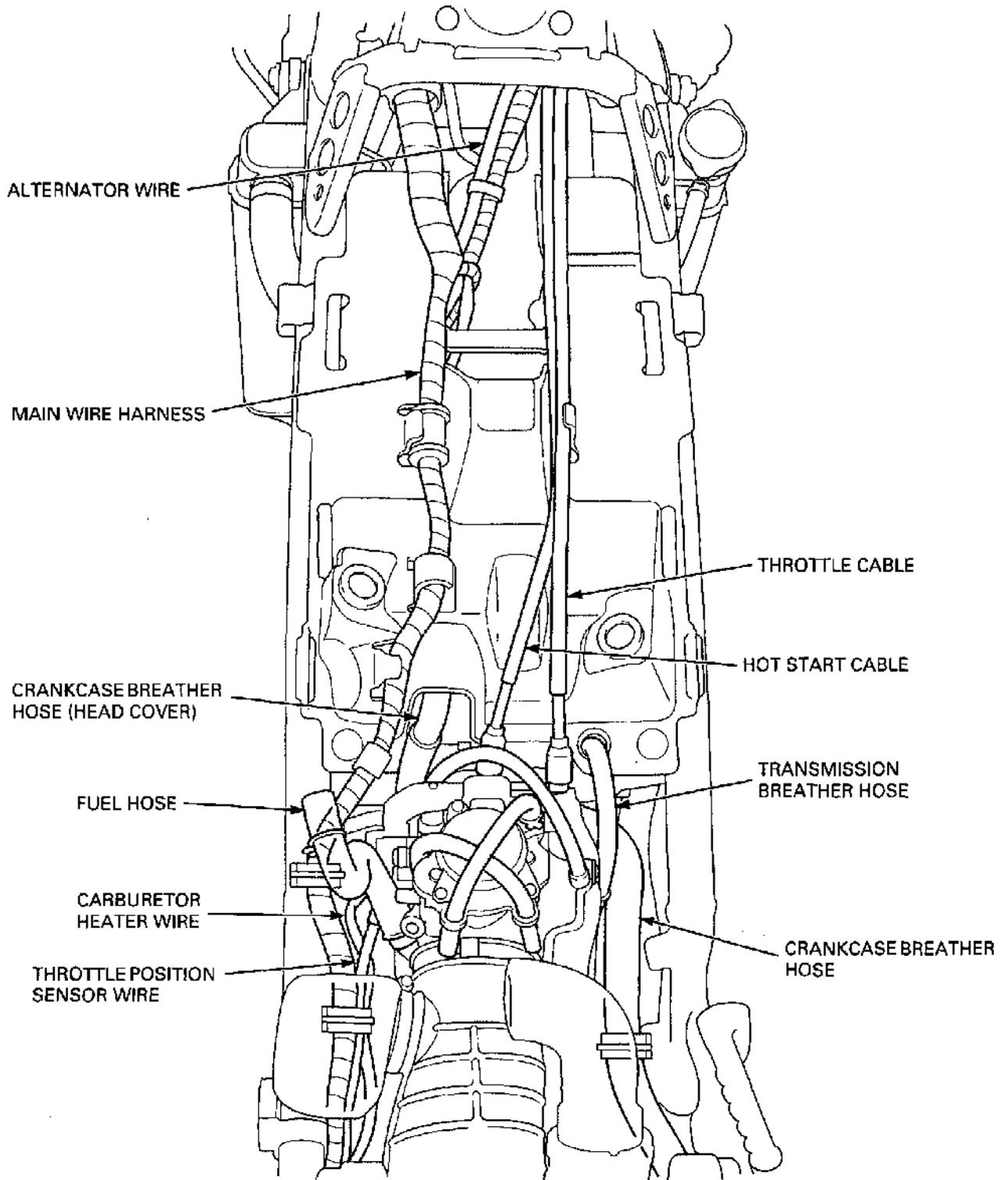
After '05:



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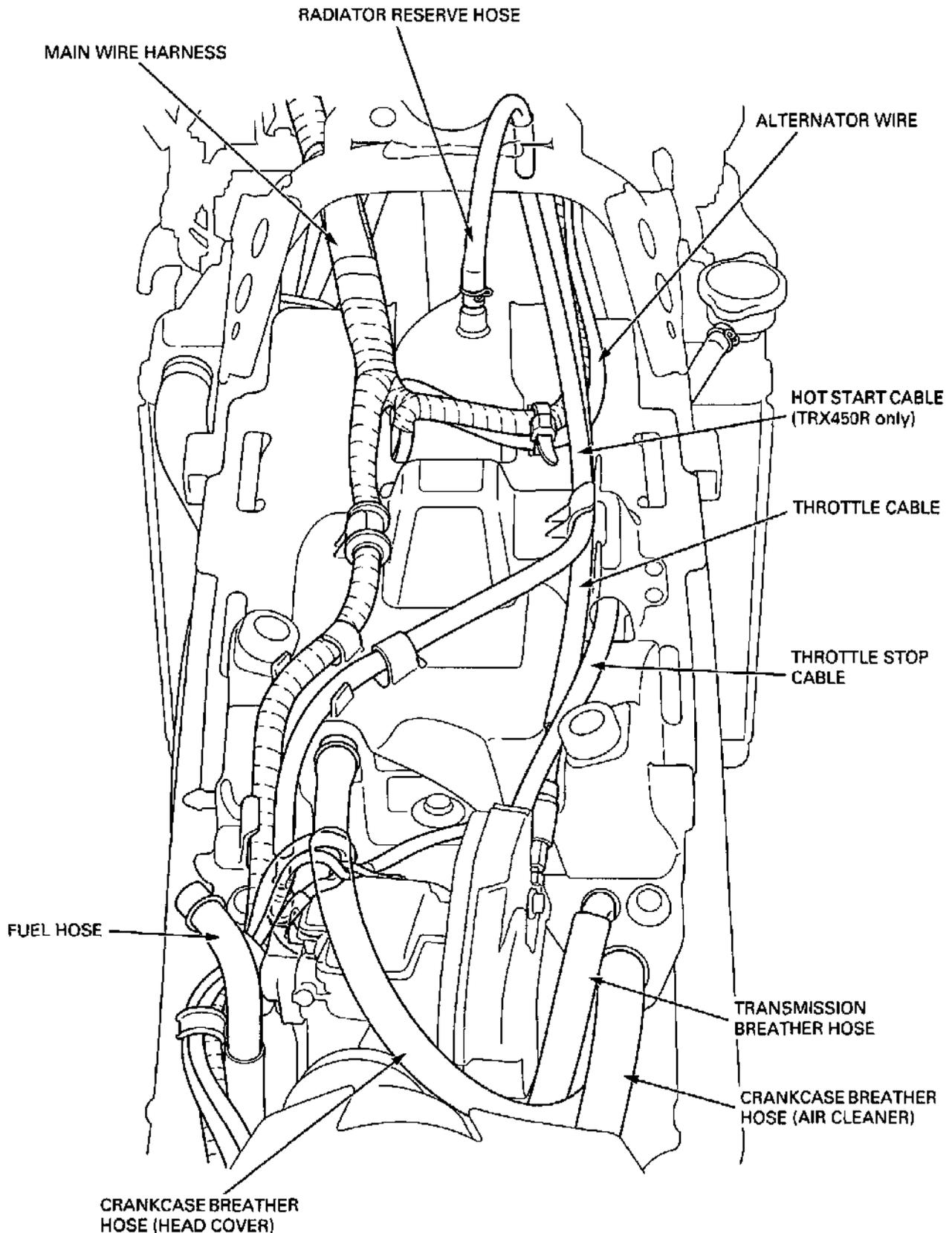


'04 - '05:

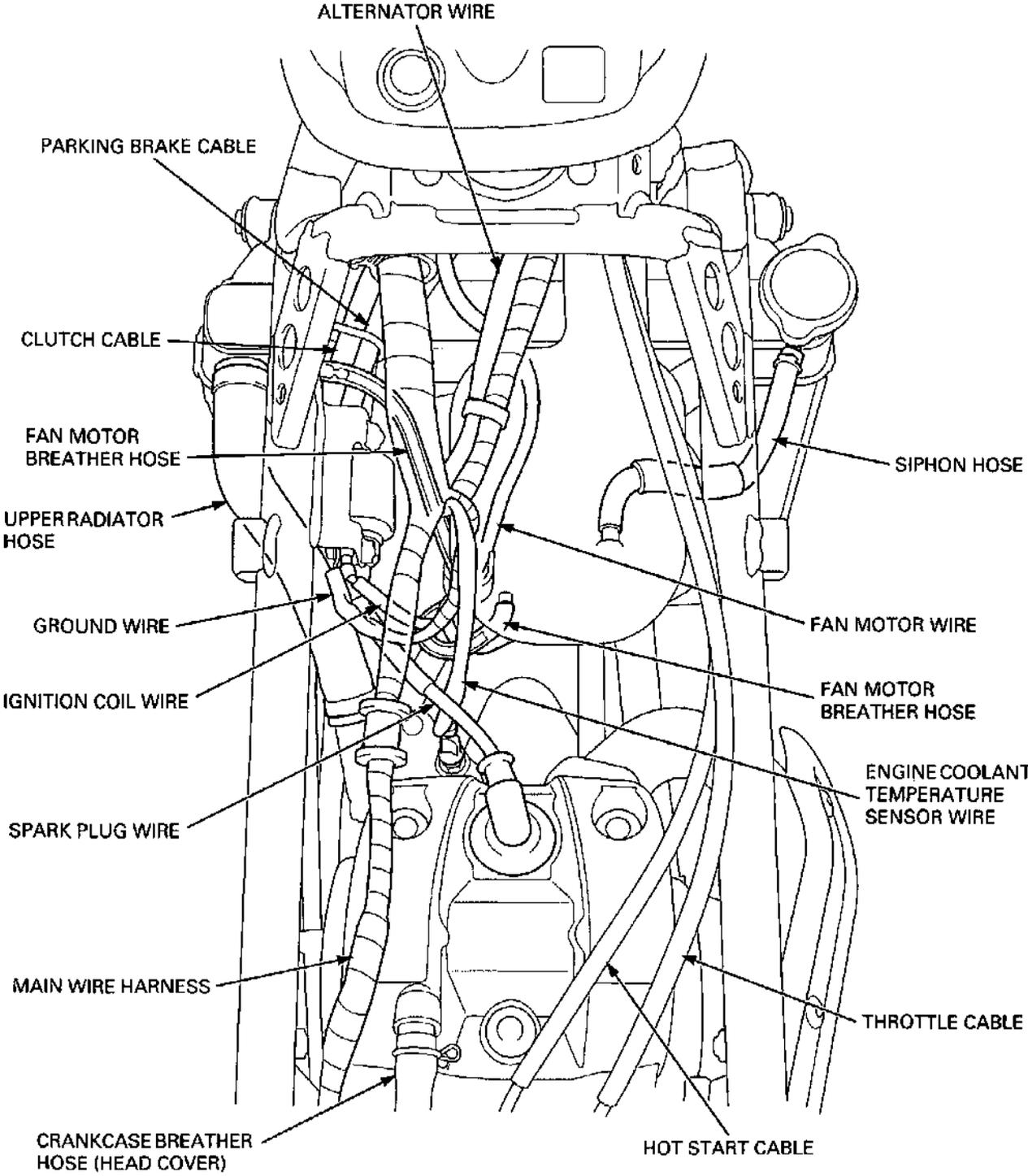


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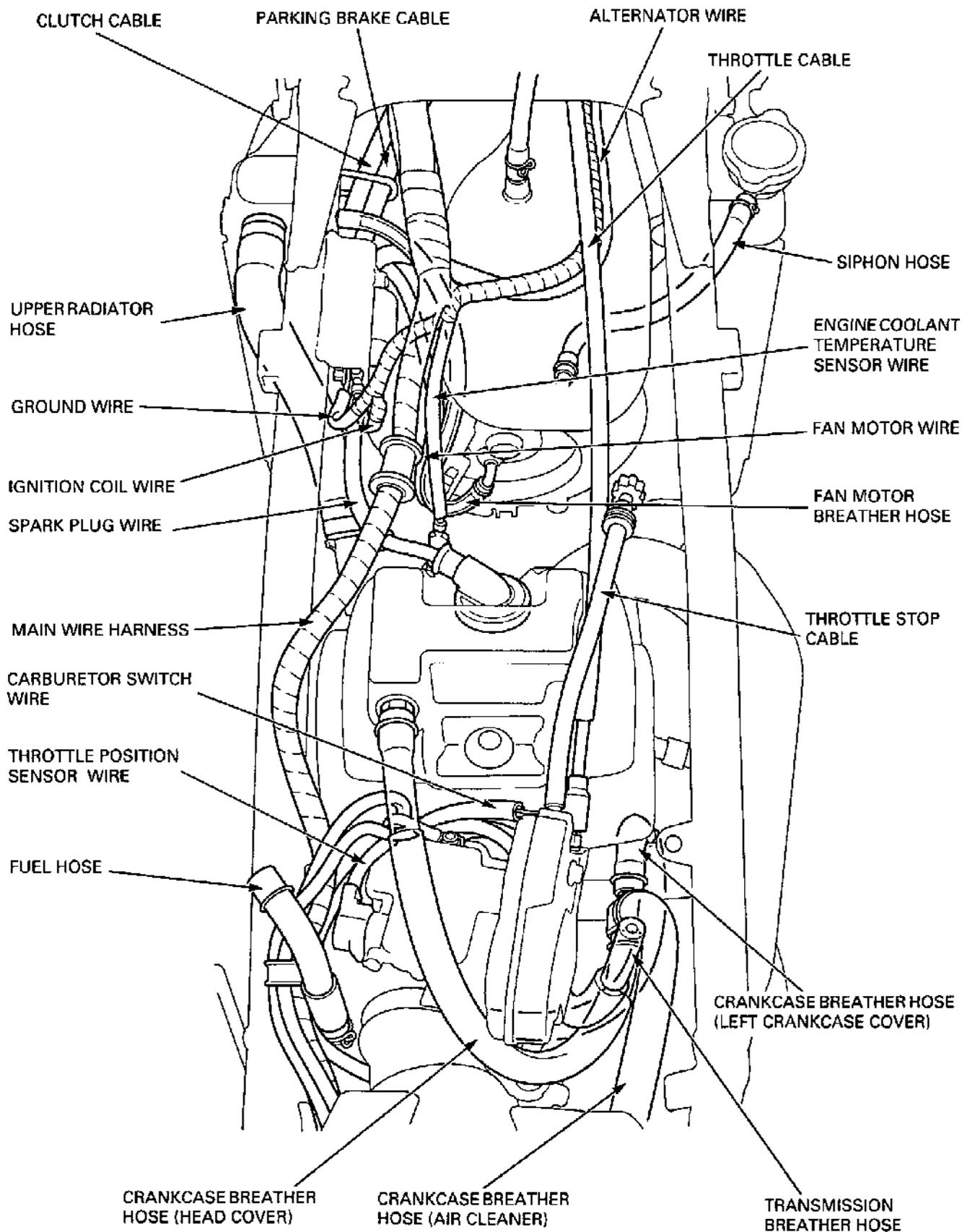


'04 - '05:

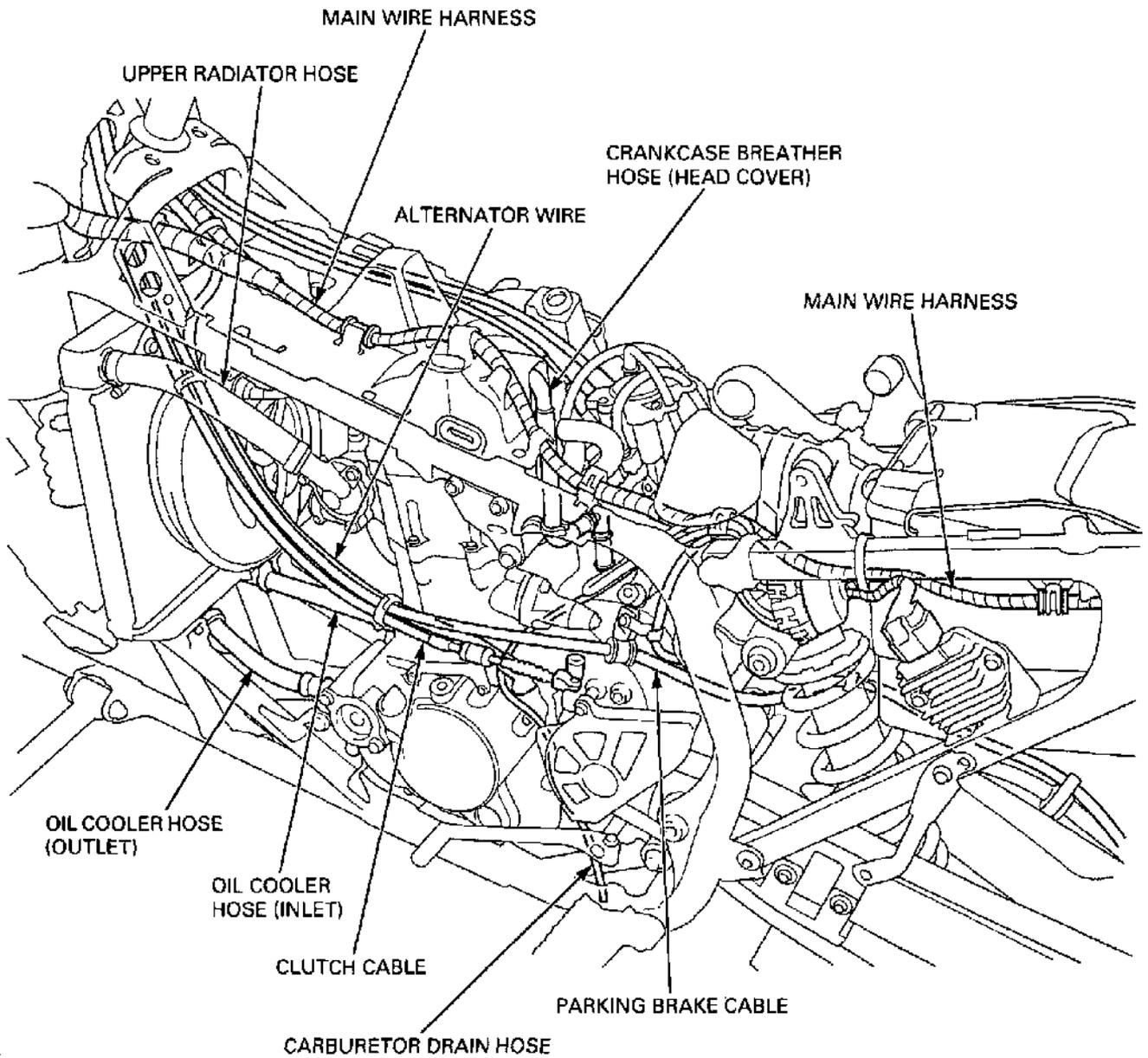


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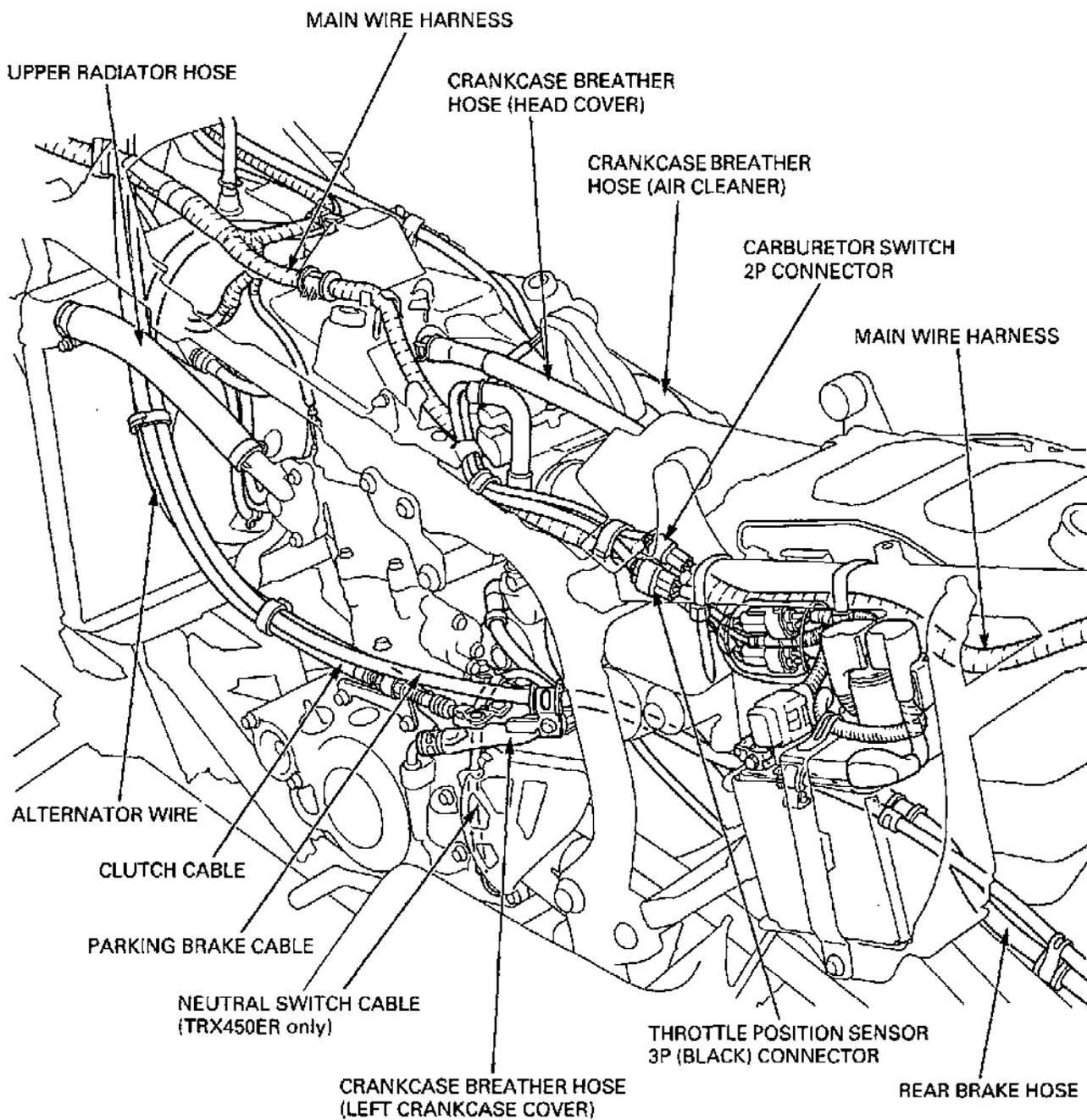


'04 - '05:

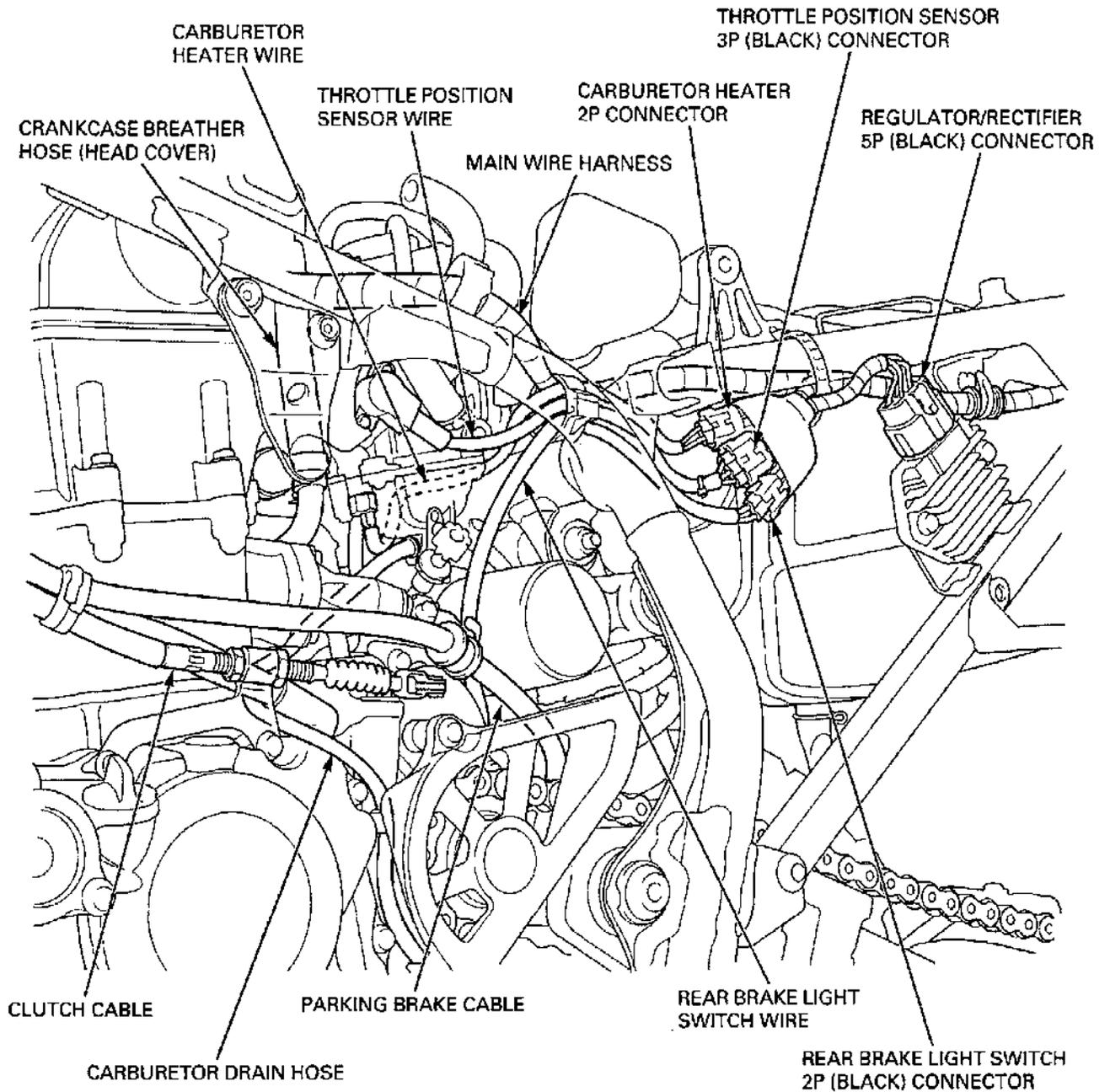


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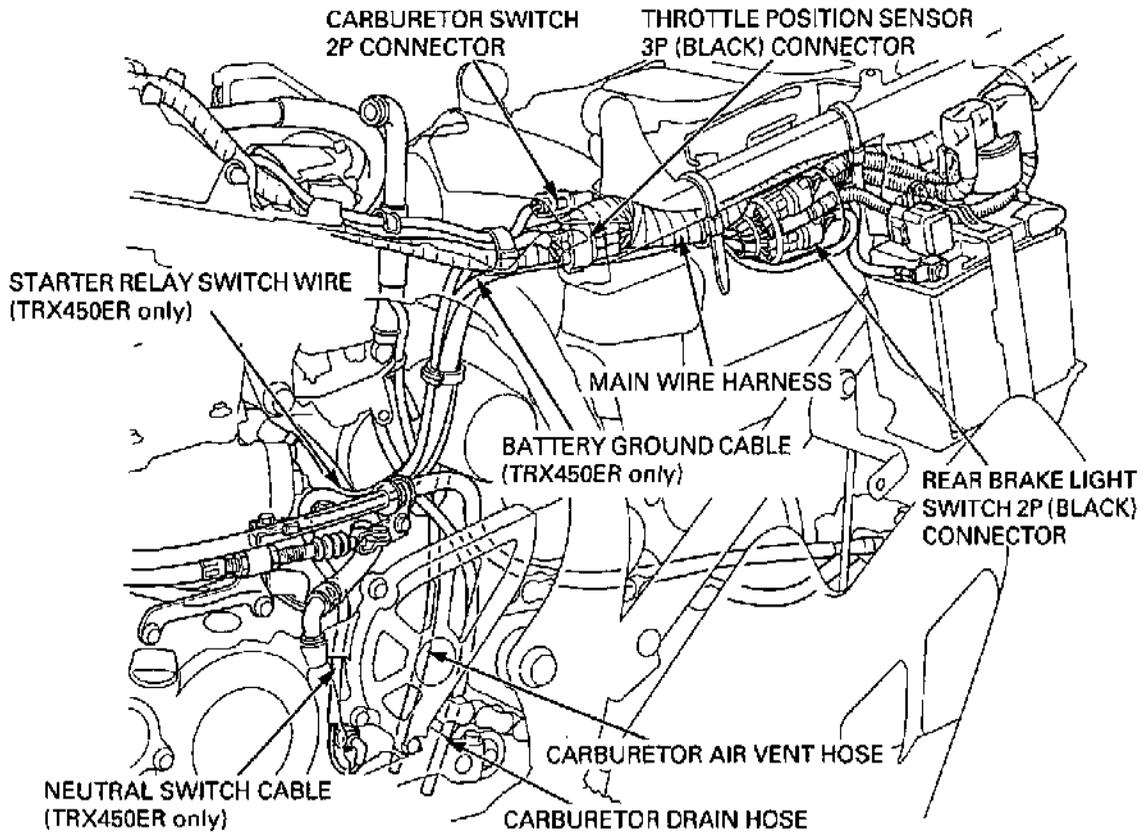


'04 - '05:

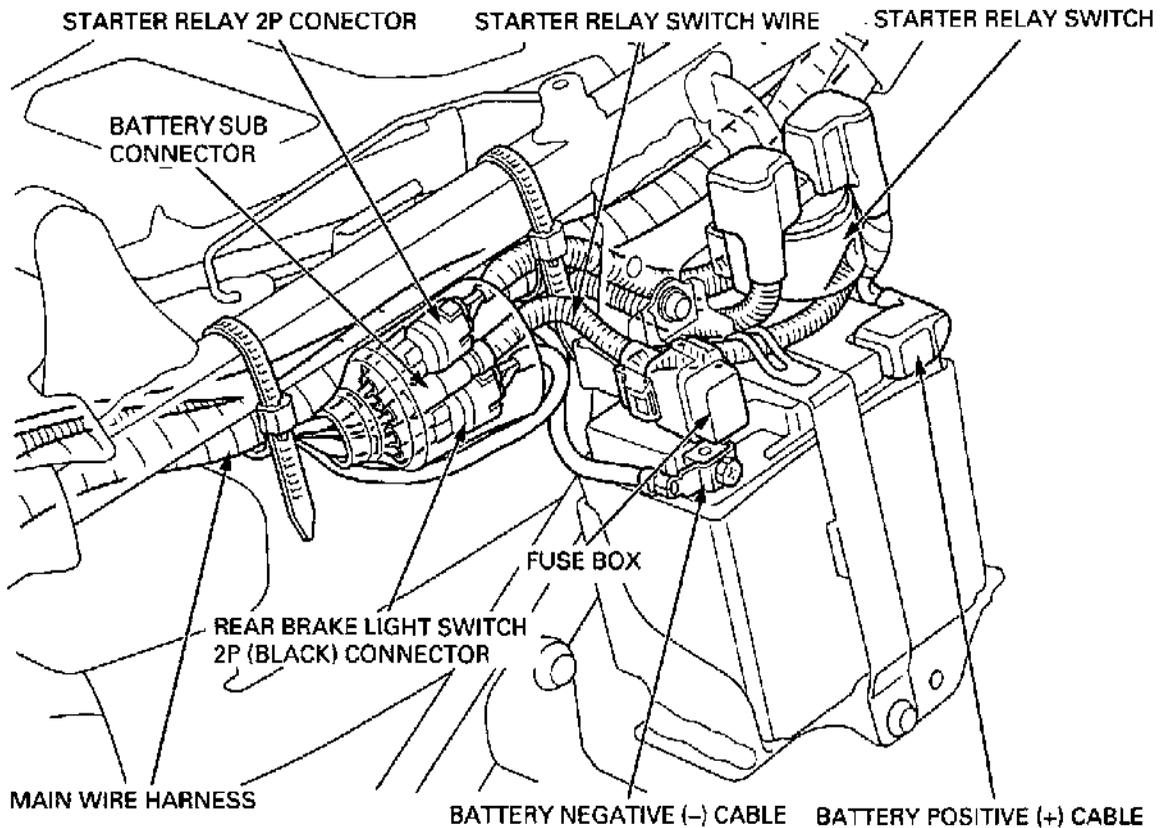


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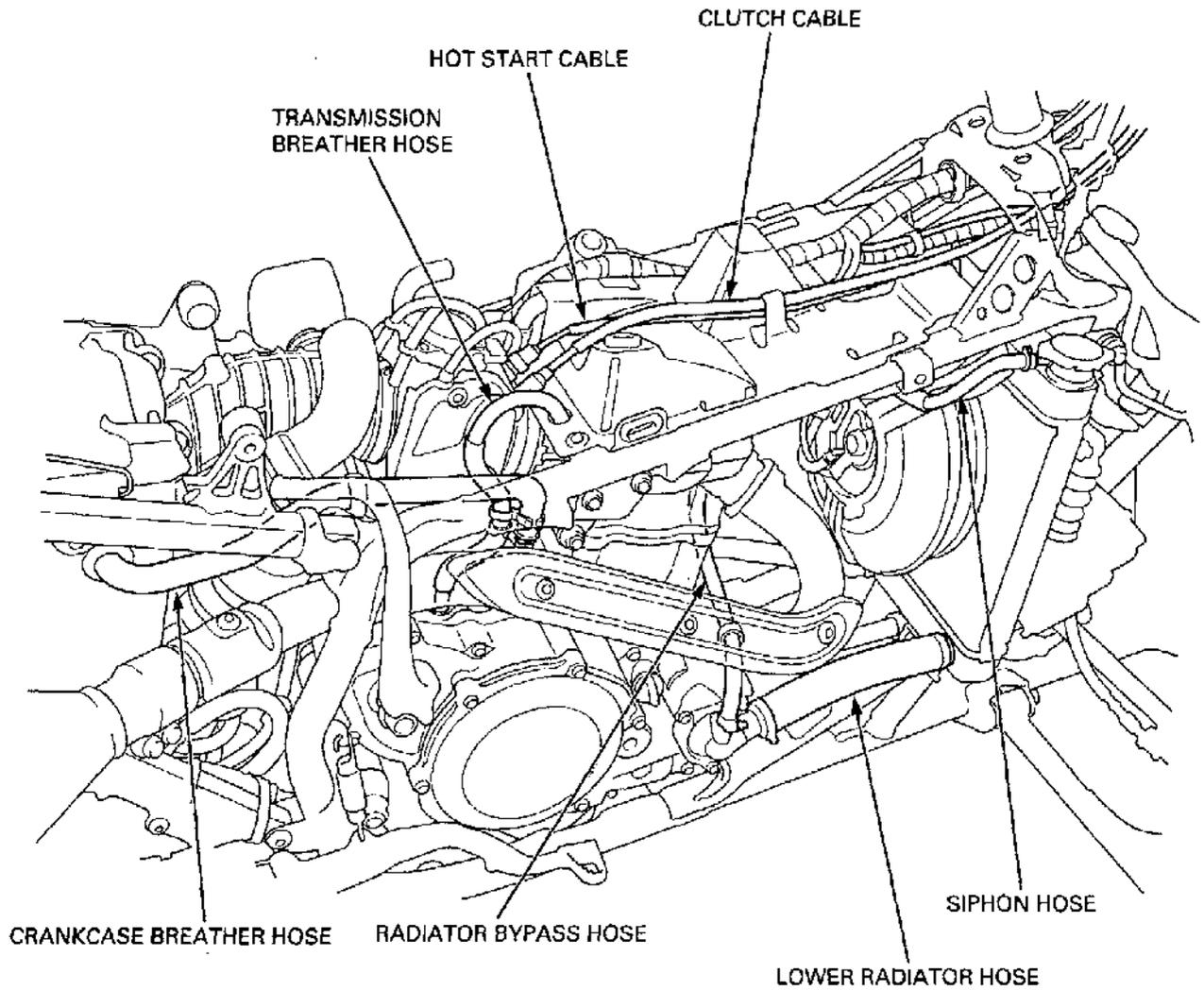
After '05:



TRX450ER:

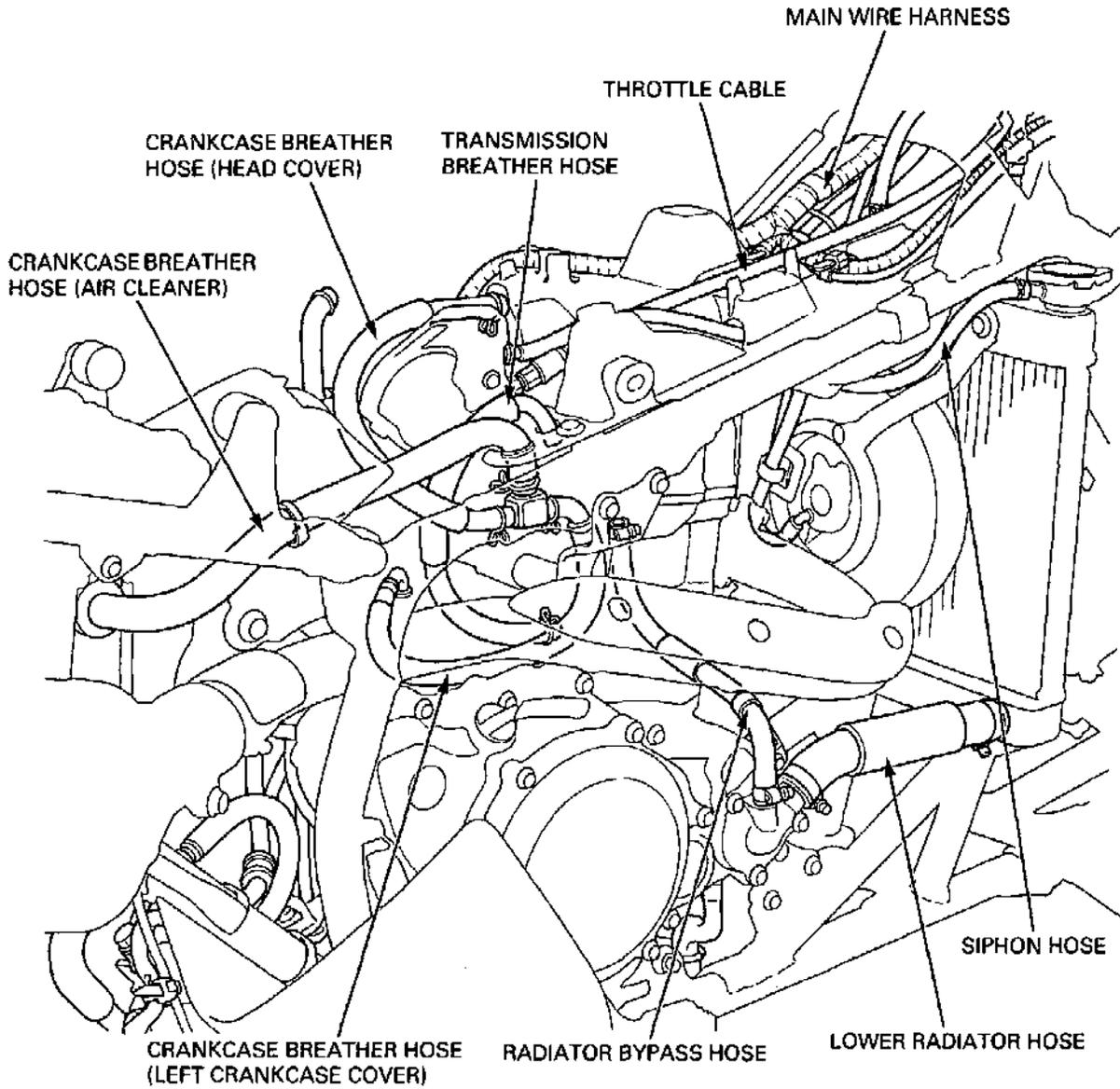


'04 - '05:

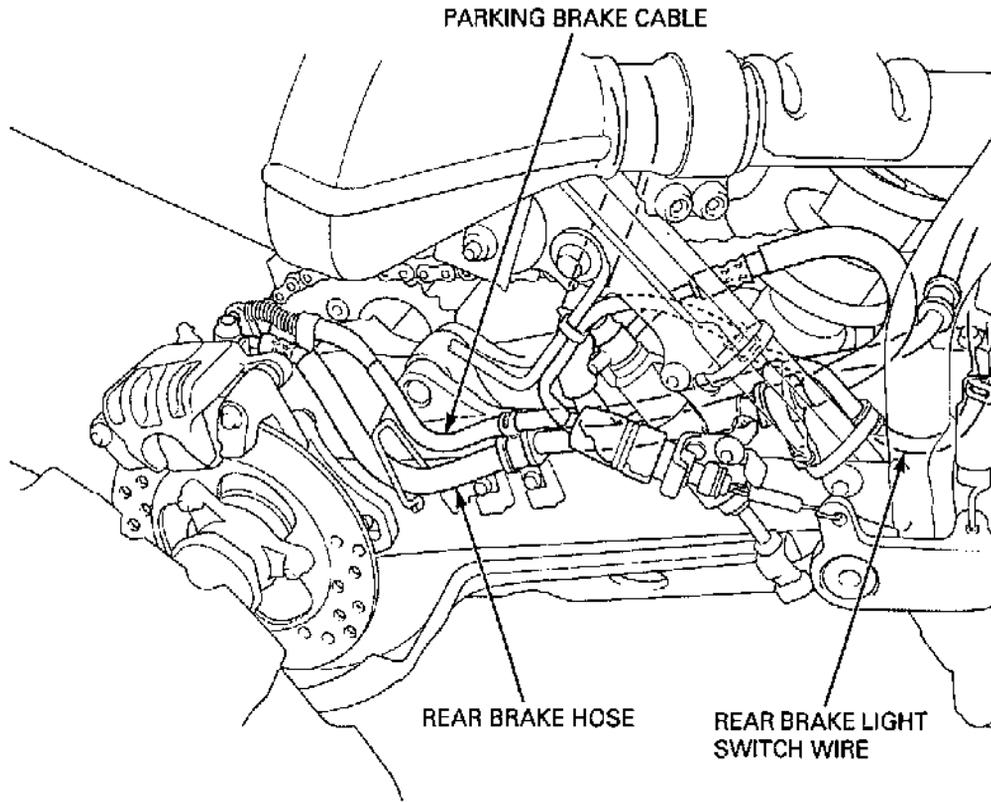


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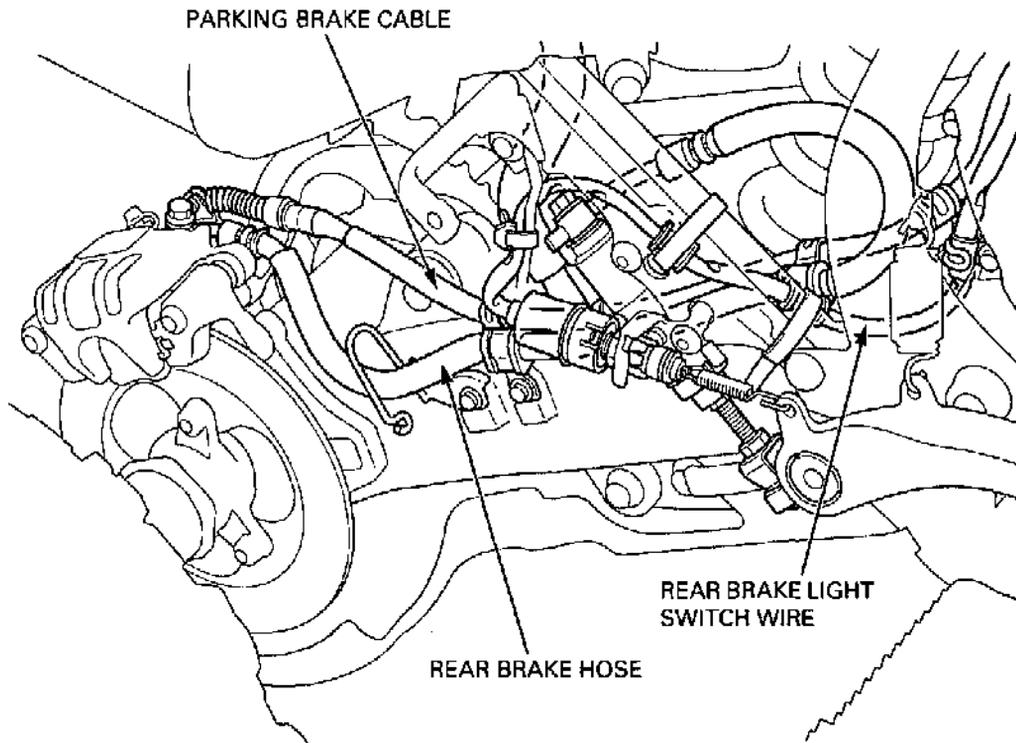
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'04 - '05:

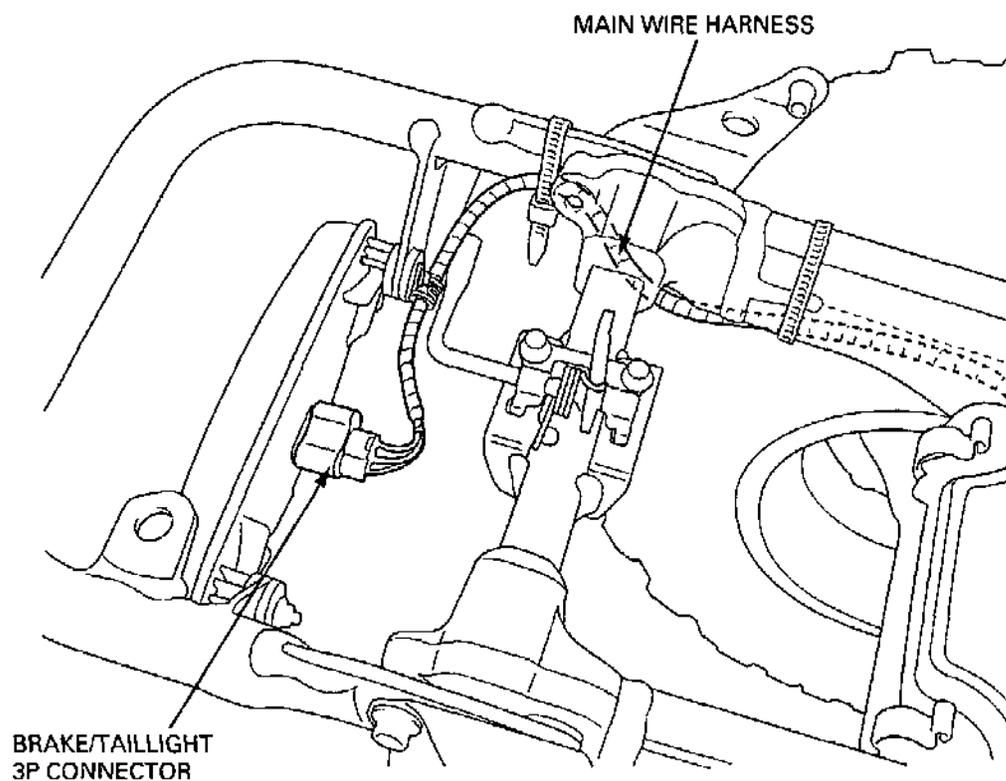


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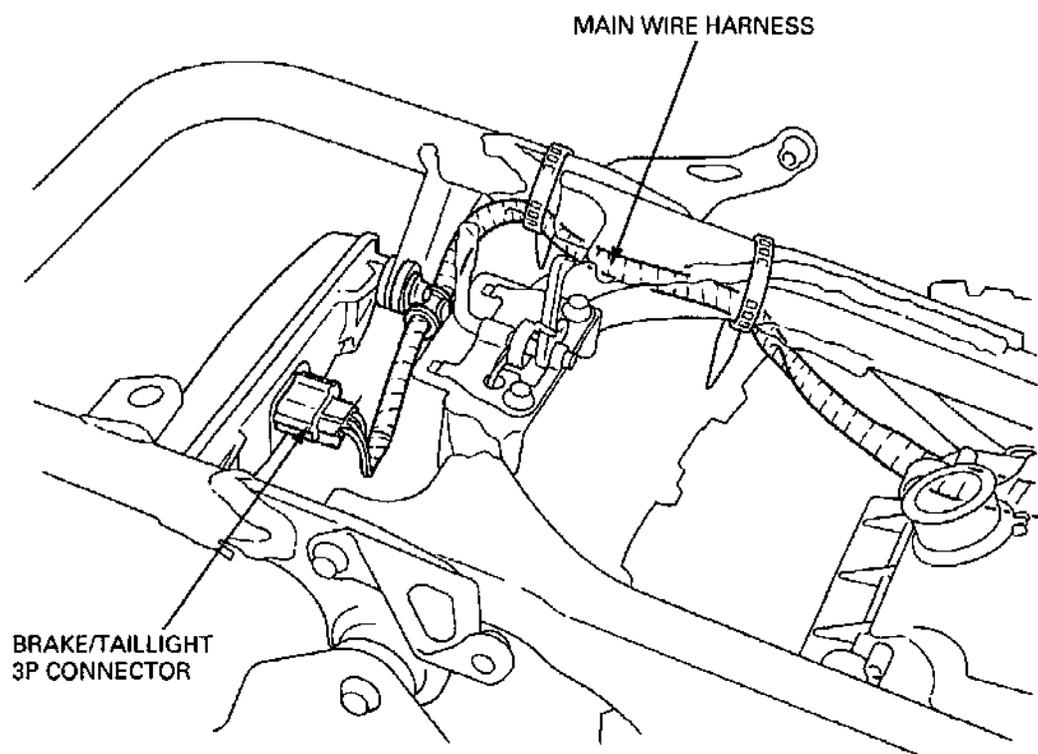


GENERAL INFORMATION

'04 - '05:



After '05:



EMISSION CONTROL SYSTEMS

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

SOURCE OF EMISSIONS

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

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

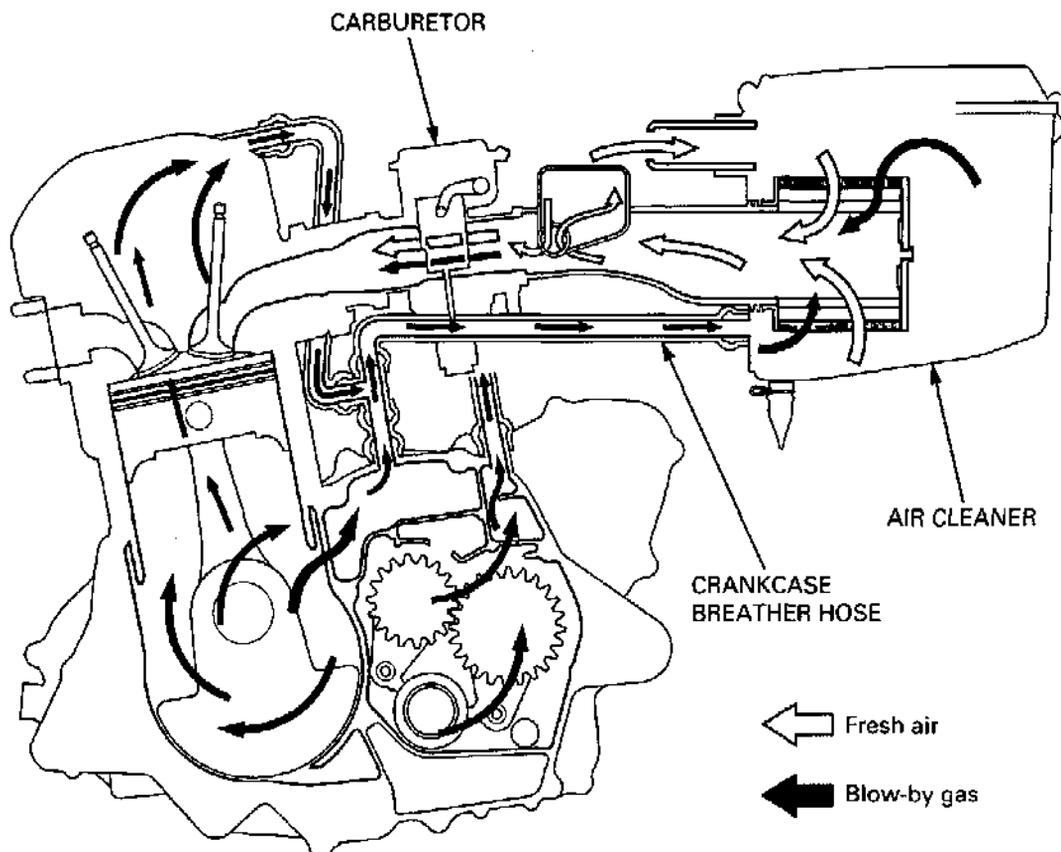
EXHAUST EMISSION CONTROL SYSTEM

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

CRANKCASE EMISSION CONTROL SYSTEM

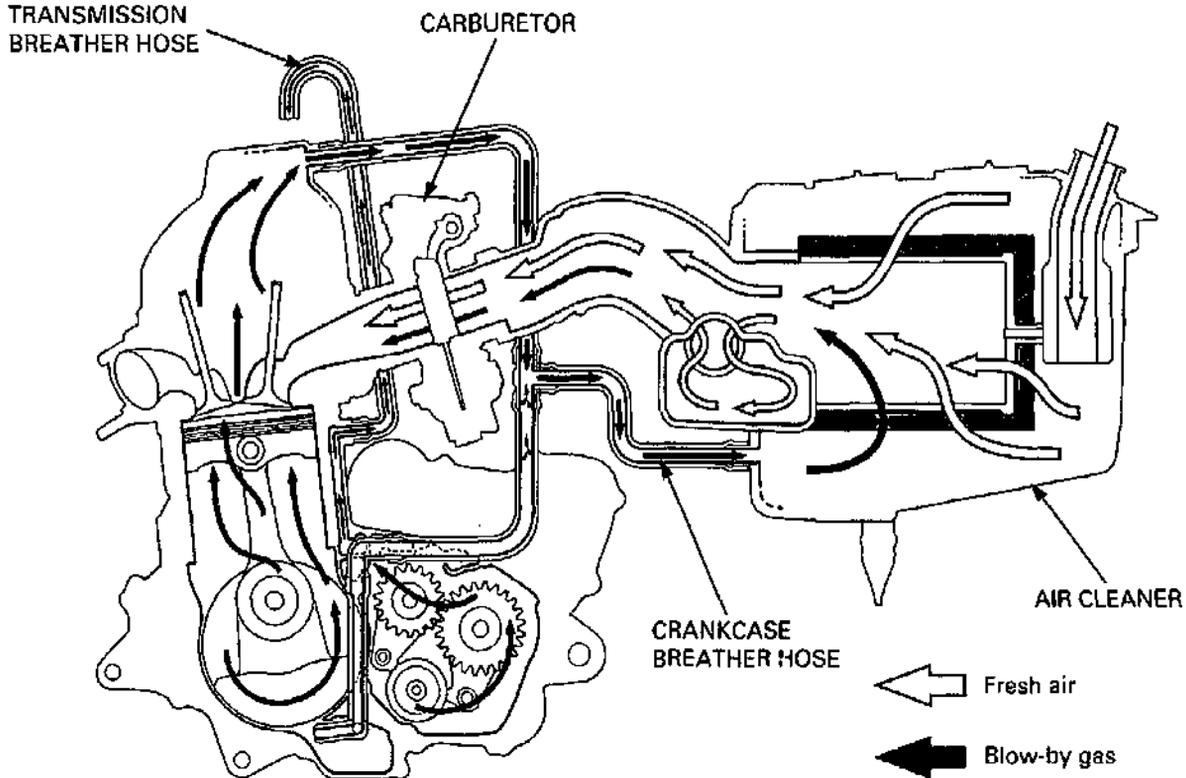
The engine is equipped with a closed crankcase system to prevent discharging crankcase emissions into the atmosphere. Blow-by gas is returned to the combustion chamber through the air cleaner and carburetor.

'04 - '05:



GENERAL INFORMATION

After '05:



SERVICING THE HONDA

U.S.A. Only

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

PROHIBITED ACTIONS

The following prohibitions apply to everyone with respect to the engine's emission control system.

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

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

NOISE EMISSION CONTROL SYSTEM

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

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

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

REBUILT ENGINE

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

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

2. TECHNICAL FEATURES

UNICAM SYSTEM.....	2-2	TWIN SUMP LUBRICATION SYSTEM.....	2-3
HOT START SYSTEM (TRX450R only)	2-3		

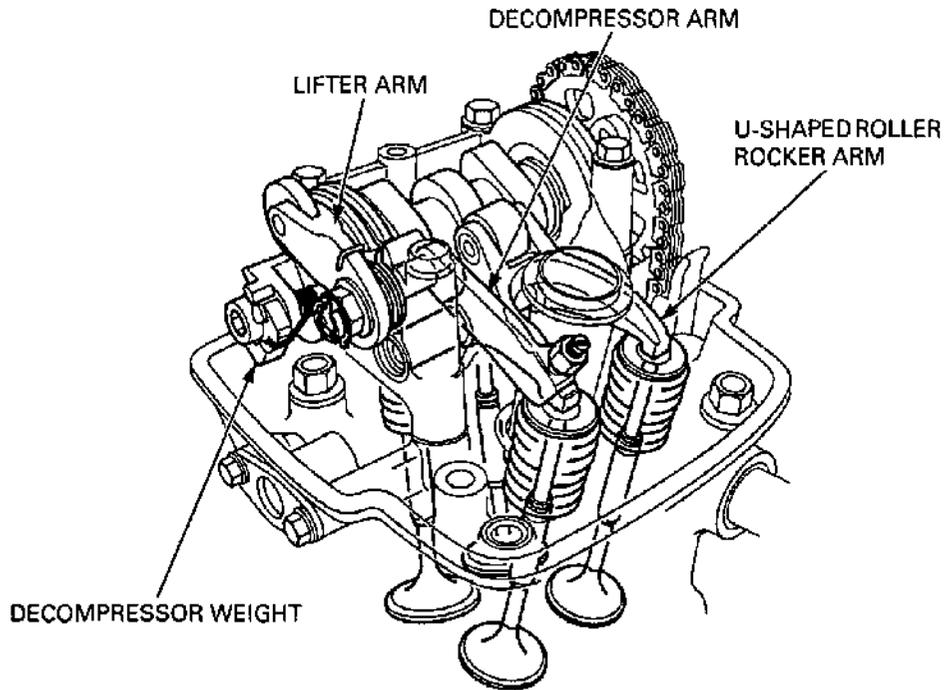
TECHNICAL FEATURES

UNICAM SYSTEM

OUTLINE

The Honda Unicam has a single overhead camshaft (SOHC) and one-piece camshaft holder. The camshaft acts directly on the intake valves while the exhaust valves are activated by a U-shaped roller rocker arm.

This Unicam design is lighter and more compact than a dual overhead camshaft (DOHC) cylinder head design. The Unicam cylinder head incorporates a narrow and 22 degree valve angle.



U-SHAPED ROLLER ROCKER ARM

The exhaust roller rocker arm is U-shaped to fit around the centrally located spark plug.

AUTO-DECOMPRESSION SYSTEM

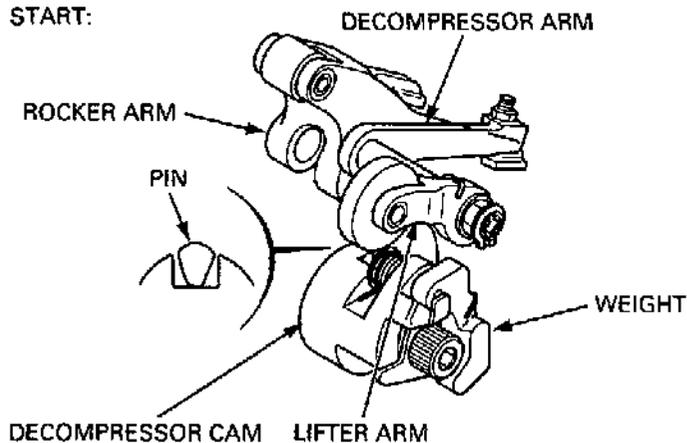
DURING START-UP (OR WHEN ENGINE IS OFF)

The lifter arm is raised slightly by the rounded side of the decompressor weight's pin. The raised lifter arm causes the decompressor arm to push against the rocker arm, opening the exhaust valve slightly.

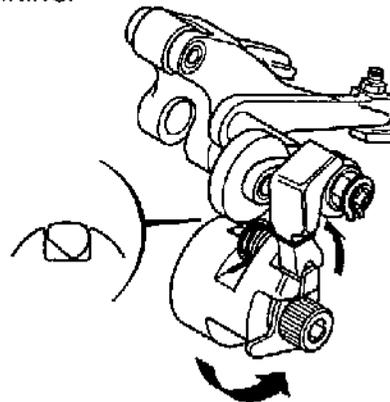
AFTER START-UP

Centrifugal force of the spinning camshaft causes the decompressor weight to swing out. As the weight swings out, its pin rotates so the flat side is facing up. This allows the decompressor cam to be flush with the camshaft surface, releasing pressure on the rocker arm and closing the exhaust valve.

START:

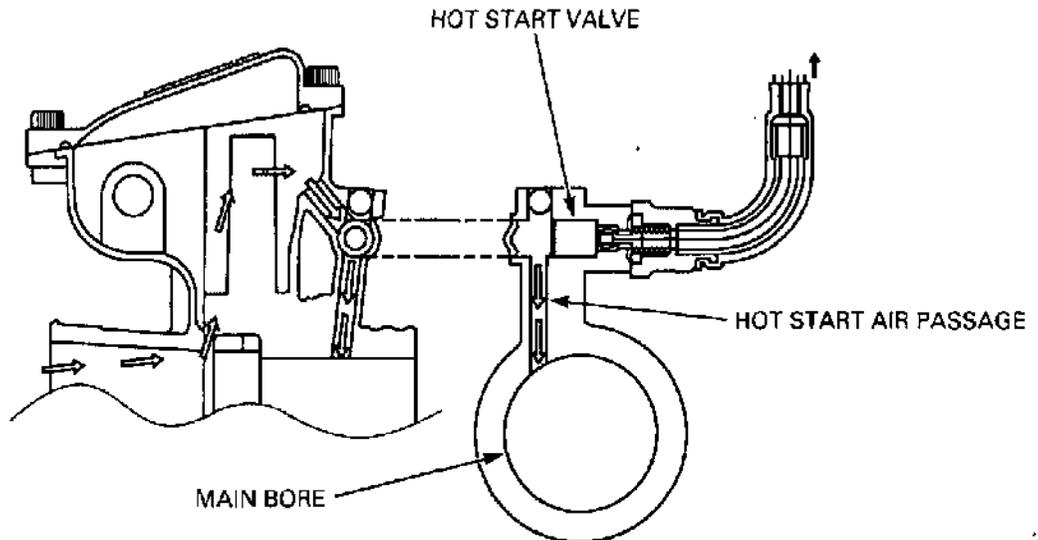


RUNNING:



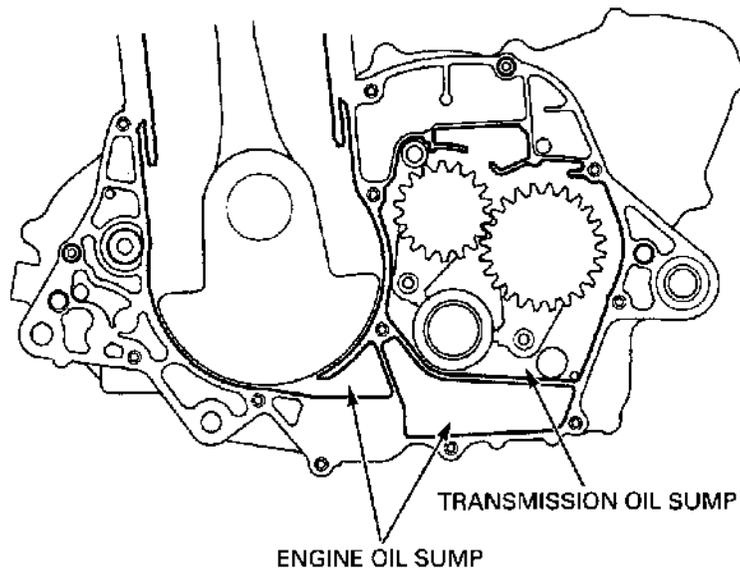
HOT START SYSTEM (TRX450R only)

The hot start system creates a lean air/fuel mixture that enables a hot engine to be started easily. When the hot-start lever (located on the left side of the handlebar) is pushed away from the rider, the hot start valve in the carburetor opens, supplying air to the main bore through the hot start air passage. This extra air blends with the air/fuel mixture from the slow circuit resulting in a lean condition.



TWIN SUMP LUBRICATION SYSTEM

The Honda twin-sump lubrication system separates the oil supply for the crankshaft, piston and valve train from the clutch and transmission. This ensures a cool supply of oil to the clutch, eliminates clutch and transmission material contamination of the engine oil, and reduces the amount of circulating oil and required size of the oil pump. This design allows for an oil cooler and no external oil tank is needed. Because there are separate oil supplies the crankcase oil level and transmission oil level are checked independently. Make sure to review both oil level check procedures in section 4, "Maintenance".



3. FRAME/BODY PANELS/EXHAUST SYSTEM

SERVICE INFORMATION.....	3-2	REAR FENDER (After '05)	3-7
TROUBLESHOOTING.....	3-2	ENGINE GUARD ('04 - '05).....	3-8
SEAT.....	3-3	ENGINE GUARD (After '05).....	3-8
MUD GUARD/FOOTPEG.....	3-3	SKID PLATE	3-8
TOP COVER ('04 - '05).....	3-5	FUEL TANK.....	3-9
TOP COVER (After '05).....	3-5	HEAT GUARD PLATE ('04 - '05).....	3-9
FRONT FENDER ('04 - '05).....	3-6	HEAT GUARD PLATE (After '05).....	3-9
FRONT FENDER (After '05).....	3-6	EXHAUST SYSTEM	3-10
REAR FENDER ('04 - '05).....	3-7		

SERVICE INFORMATION

GENERAL

- This section covers removal and installation of the body panels, fuel tank and exhaust system.
- Always replace the gaskets after removing the exhaust system.
- Always inspect the exhaust system for leaks after installation.

TORQUE VALUES

Footpeg bracket bolt	42 N·m (4.3 kgf·m, 31 lbf·ft)	
Skid plate bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	ALOC bolt: replace with a new one.
Muffler mounting nut	32 N·m (3.3 kgf·m, 24 lbf·ft)	
Exhaust pipe band bolt	23 N·m (2.3 kgf·m, 17 lbf·ft)	

TROUBLESHOOTING

Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leak

Poor performance

- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

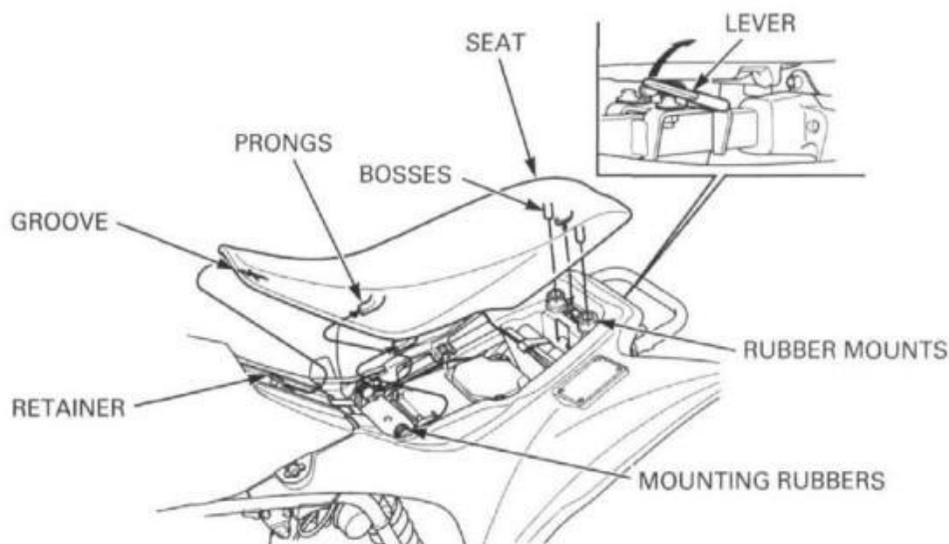
SEAT

REMOVAL

Unlock the seat by pulling the release lever up.
Pull the seat back and remove it.

INSTALLATION

Install the seat by inserting the groove under the retainer, and the prongs under the mounting rubbers.
Push the seat forward and align the mounting bosses with the rubber mounts, then press down to lock it.



MUD GUARD/FOOTPEG

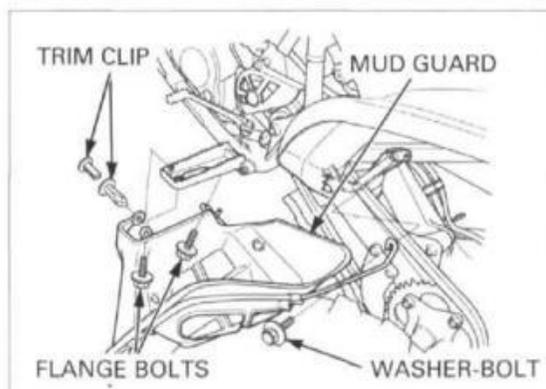
REMOVAL

After '05: Remove the brake light switch wire band from the right mud guard stay.



Remove the following:

- trim clip
- washer-bolt
- flange bolts
- mud guard



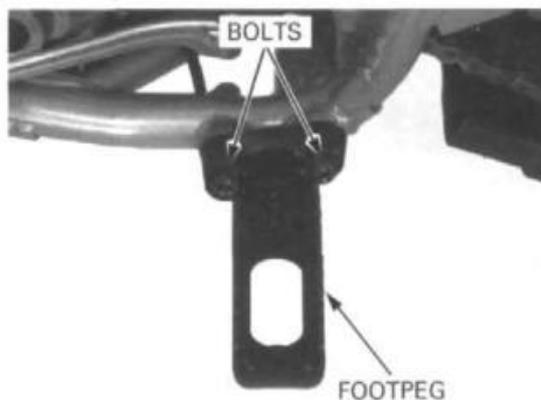
FRAME/BODY PANELS/EXHAUST SYSTEM

Remove the two bolts and footpeg.

INSTALLATION

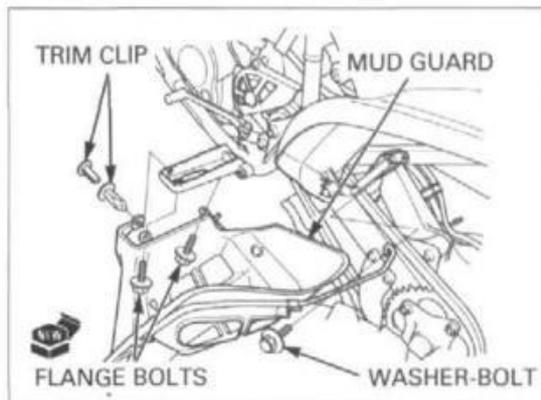
Install the footpeg and tighten the two bolts.

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

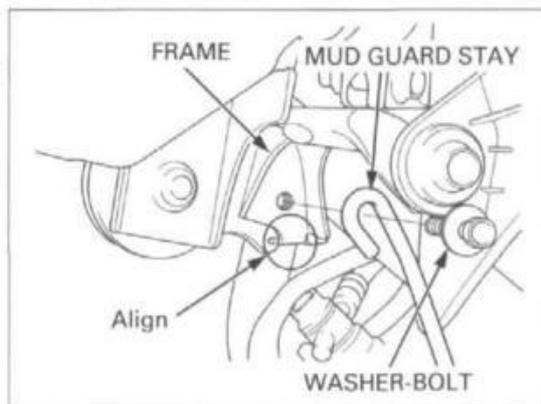


Install the following:

- mud guard
- new flange bolts
- washer-bolt
- trim clip



When installing the washer-bolt for right side mud guard, align the mud guard stay with the groove in the frame as shown, then install and tighten the washer-bolt.



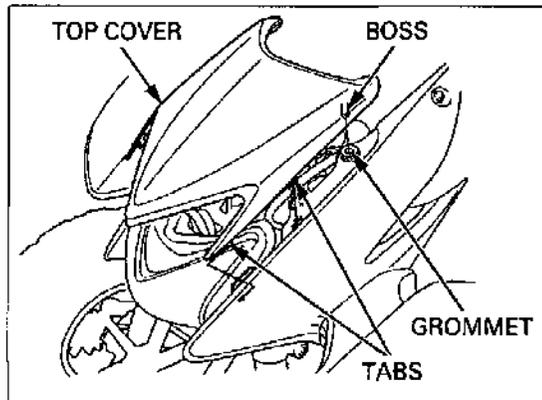
After '05: Secure the brake light switch wire to the right mud guard stay with the wire band.



TOP COVER ('04 – '05)

Remove the two bosses from the grommets and remove the top cover by releasing the four tabs.

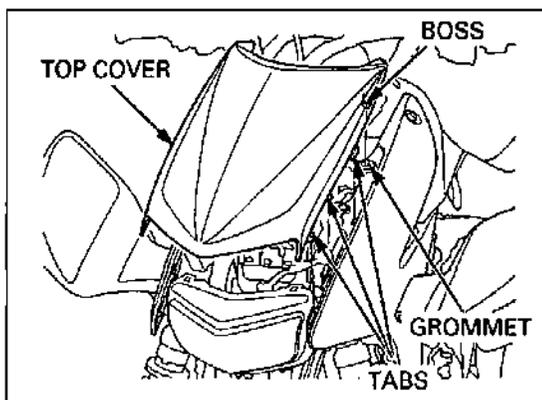
Install the top cover in the reverse order of removal.



TOP COVER (After '05)

Remove the two bosses from the grommets and remove the top cover by releasing the six tabs.

Install the top cover in the reverse order of removal.

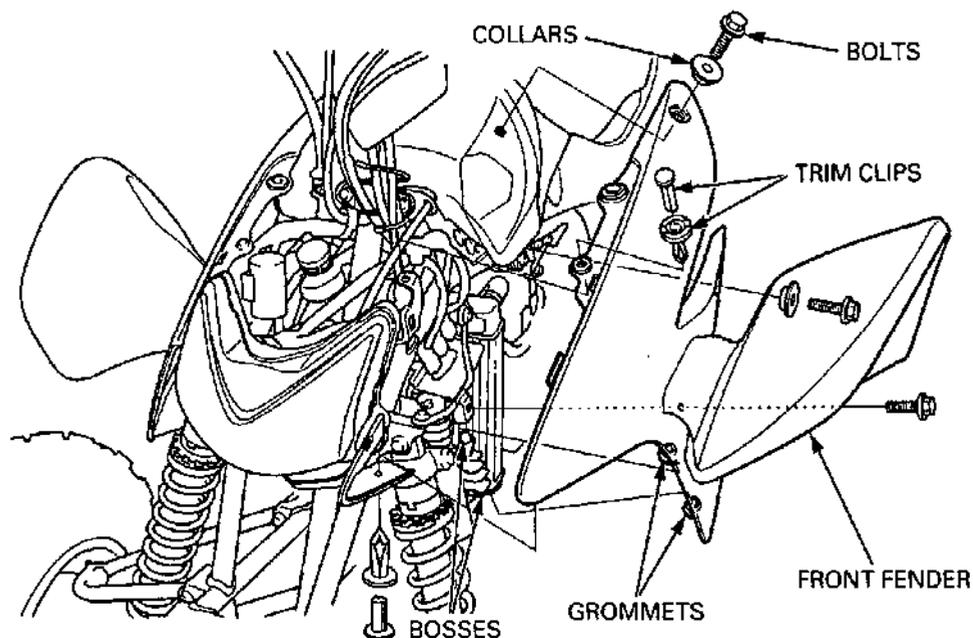


FRONT FENDER ('04 - '05)

Remove the following:

- top cover (page 3-5)
- two trim clips
- three bolts and two collars
- front fender by releasing the grommets from the bosses of the radiator grille.

Install the front fender in the reverse order of removal.

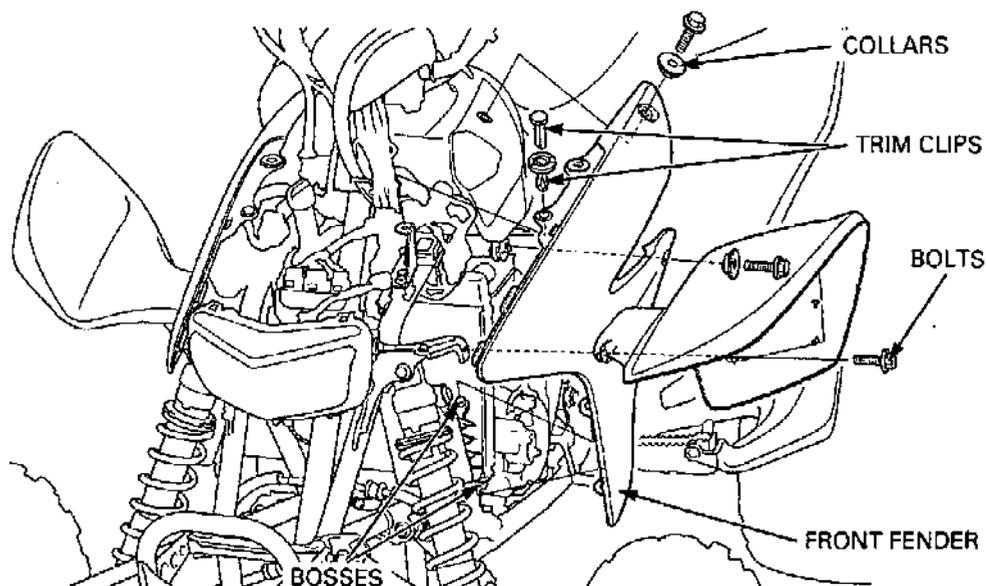


FRONT FENDER (After '05)

Remove the following:

- top cover (page 3-5)
- trim clip
- three bolts and two collars
- front fender by releasing the bosses of the radiator grille.

Install the front fender in the reverse order of removal.

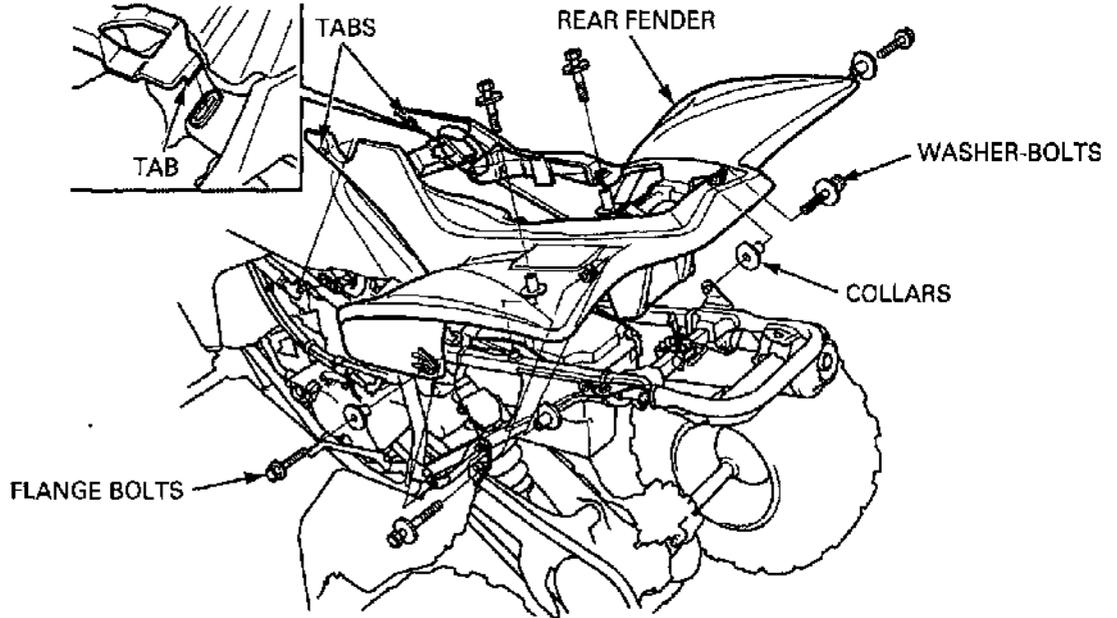


REAR FENDER ('04 - '05)

Remove the seat (page 3-3).

Release the three tabs from the grommets.
Remove the two flange bolts, four washer-bolts, six collars and the rear fender.

Install the rear fender in the reverse order of removal.

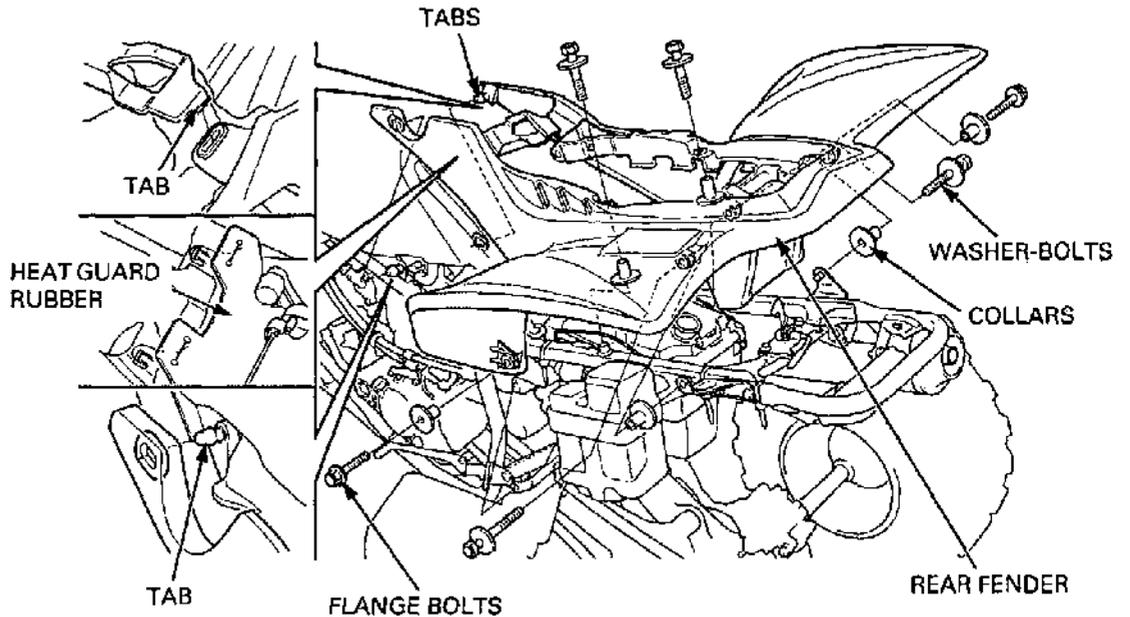


REAR FENDER (After '05)

Remove the seat (page 3-3).

Unhook the heat guard rubber.
Release the three tabs from the grommets.
Remove the two flange bolts, four washer-bolts, six collars and the rear fender.

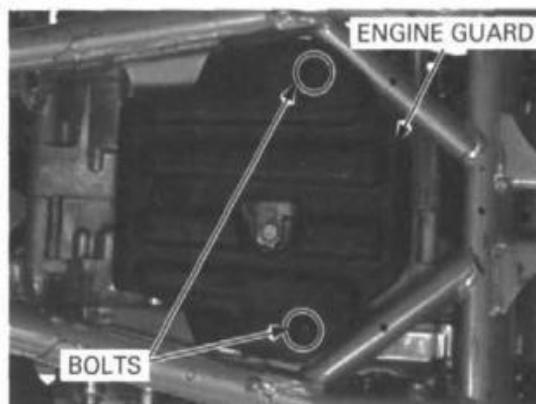
Install the rear fender in the reverse order of removal.



ENGINE GUARD ('04 – '05)

Remove the two bolts and engine guard.

Install the engine guard and tighten the two bolts securely.

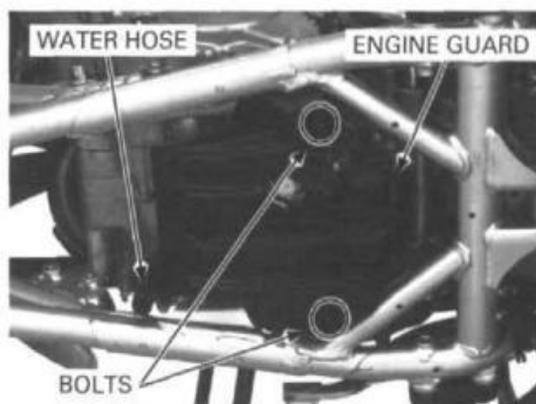


ENGINE GUARD (After '05)

Release the water hose from the engine guard groove.

Remove the two bolts and engine guard.

Install the engine guard and tighten the two bolts and water hose securely.

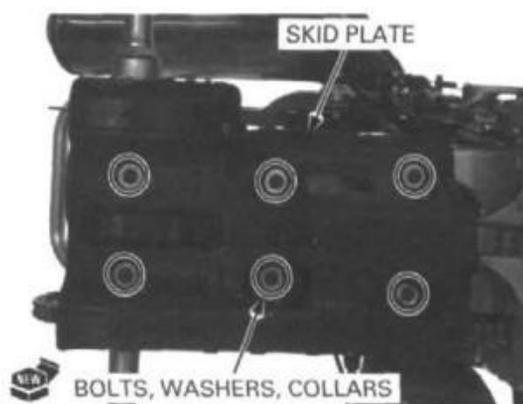


SKID PLATE

Remove the six bolts, washers, collars and the skid plate.

Install the skid plate with the six collars, washers and new bolts, and tighten the bolts.

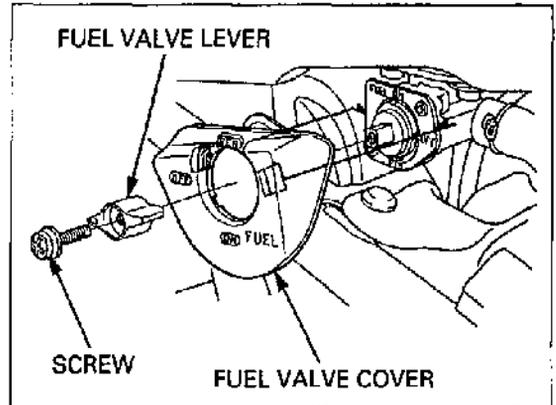
TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)



FUEL TANK

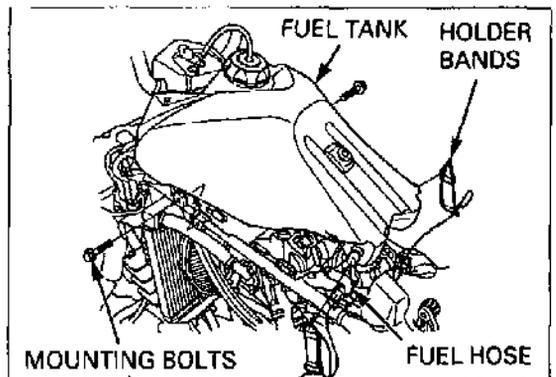
Remove the following:

- seat (page 3-3)
- front fender
'04 - '05: (page 3-6)
After '05: (page 3-6)
- rear fender
'04 - '05: (page 3-7)
After '05: (page 3-7)
- screw and fuel valve lever
- fuel valve cover



Disconnect the fuel hose from the fuel valve.
Remove the holder bands, mounting bolts and the fuel tank.

Install the fuel tank in the reverse order of removal.

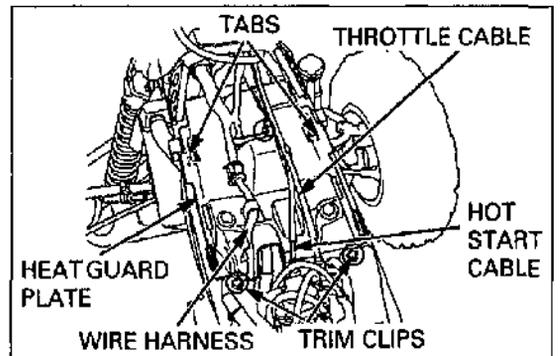


HEAT GUARD PLATE ('04 - '05)

Remove the throttle cable, hot start cable and main wire harness from the clamps of the heat guard plate.

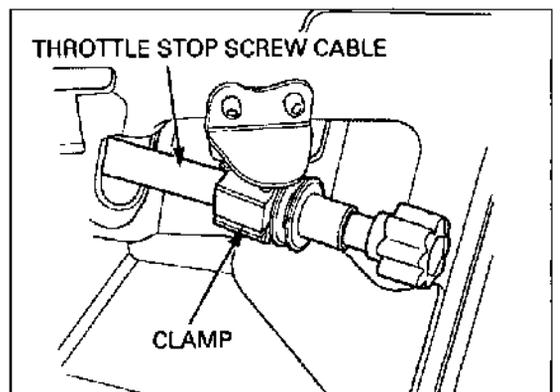
Remove the two trim clips and the heat guard plate by releasing the two tabs.

Install the heat guard plate in the reverse order of removal.



HEAT GUARD PLATE (After '05)

Remove the throttle stop screw cable from the clamp of the heat guard plate.



FRAME/BODY PANELS/EXHAUST SYSTEM

Remove the wire band that secured the wire harness and alternator wire.

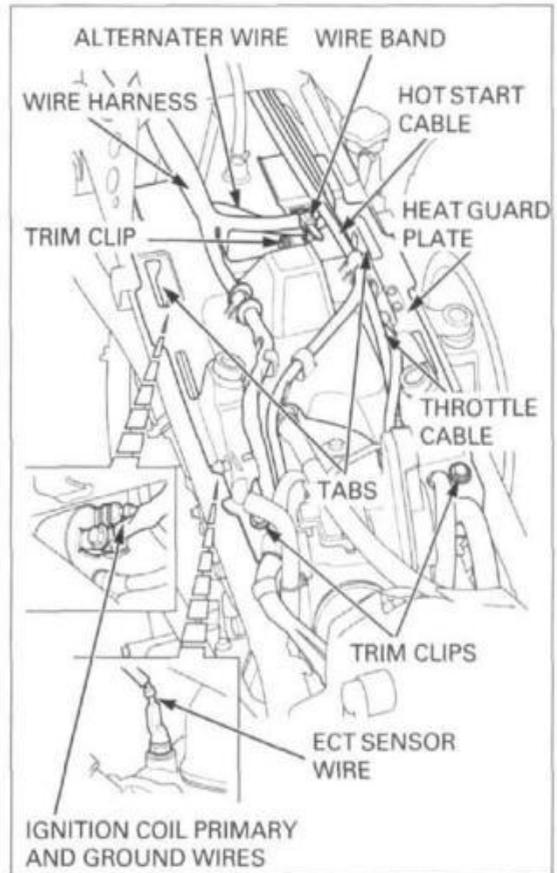
Disconnect the ignition coil primary wire, ground wire and ECT sensor wire.

Remove the throttle cable and main wire harness from the clamps of the heat guard plate.

TRX450R only: Remove the hot start cable from the clamp of the heat guard plate.

Remove the three trim clips and the heat guard plate by releasing the two tabs.

Install the heat guard plate in the reverse order of removal.

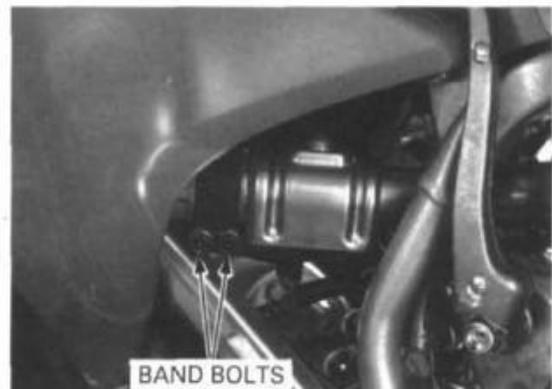


EXHAUST SYSTEM

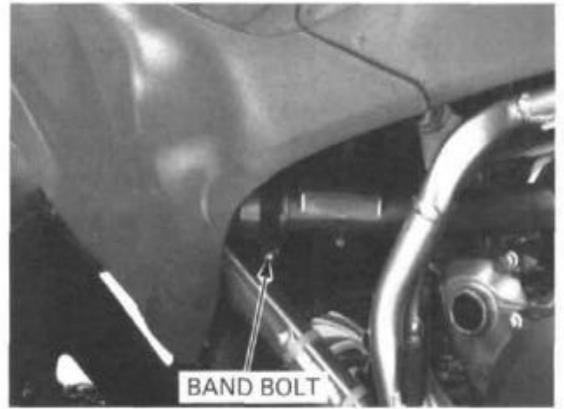
REMOVAL

Remove the two mounting nuts, bolts, washers and collars.

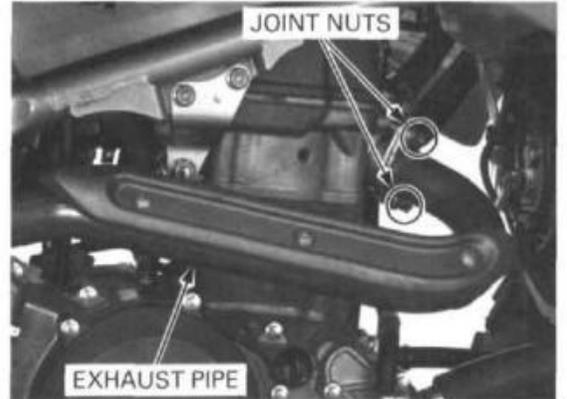
'04-'05: Loosen the two muffler band bolts, and remove the muffler and gasket.



After '05: Loosen the muffler band bolt, and remove the muffler and gasket.



Remove the two joint nuts, exhaust pipe and gasket.

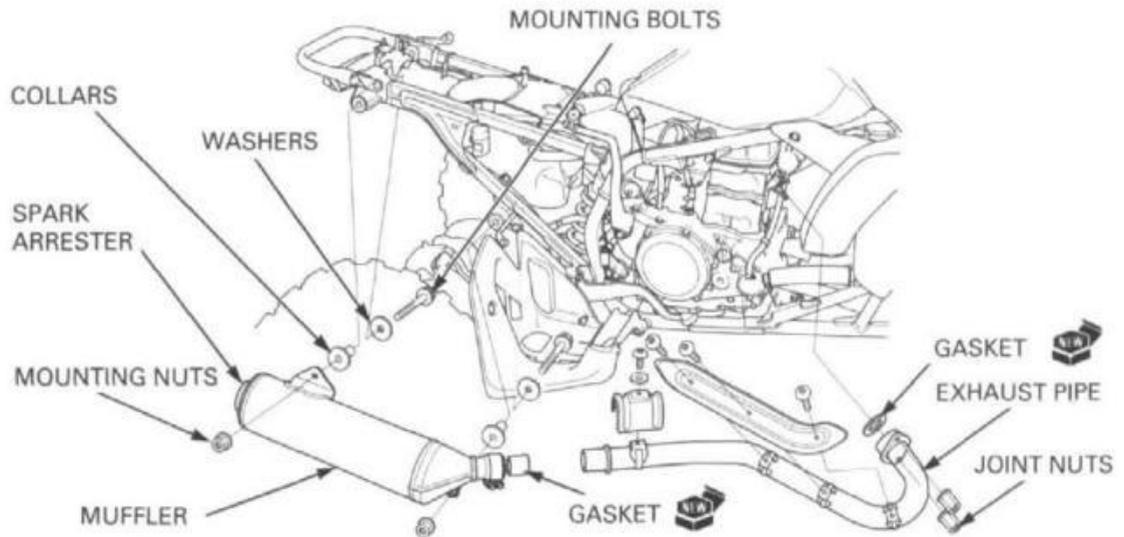


INSTALLATION

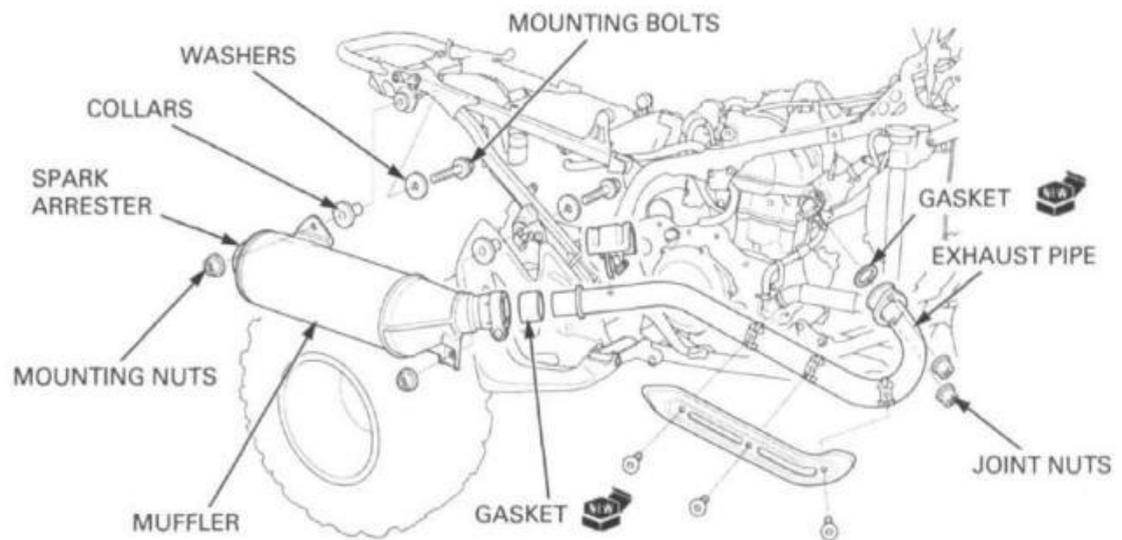
Loosely install the following:

- new gasket
- exhaust pipe
- two joint nuts
- new gasket
- muffler
- two collars, washers, mounting bolts and nuts

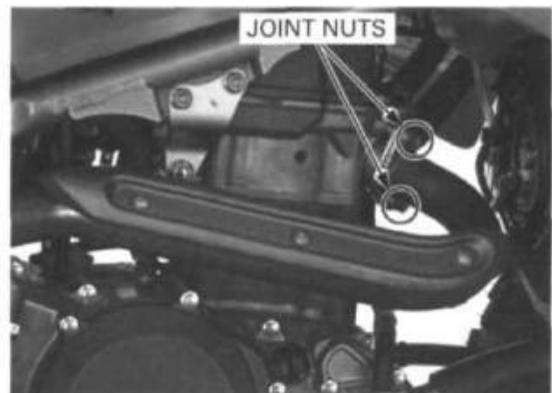
'04-'05:



After '05:

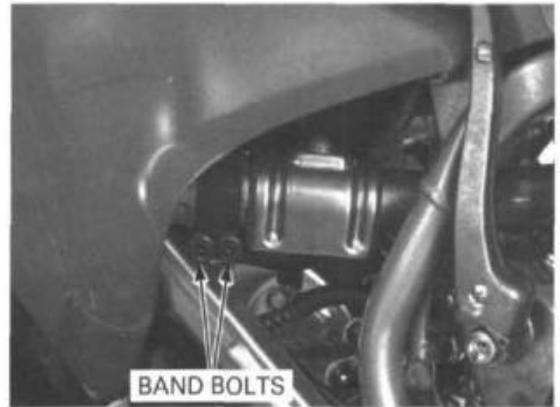


Tighten the exhaust pipe joint nuts securely.



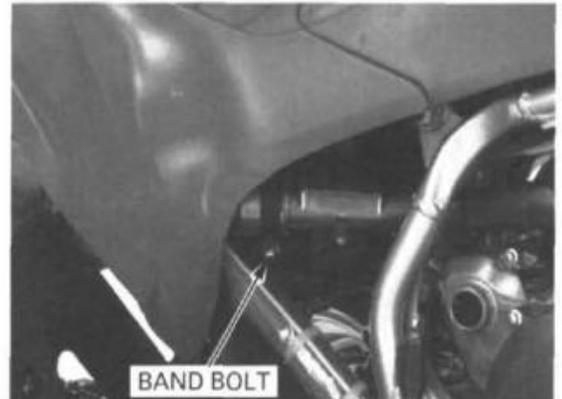
'04-'05: Tighten the exhaust pipe band bolts.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)



After '05: Tighten the exhaust pipe band bolt.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)



Tighten the muffler mounting nuts.

TORQUE: 32 N·m (3.3 kgf·m, 24 lbf·ft)



SERVICE INFORMATION	4-2	DRIVE CHAIN SLIDER	4-25
MAINTENANCE SCHEDULE ('04 – '05).....	4-4	BRAKE FLUID.....	4-25
MAINTENANCE SCHEDULE (After '05).....	4-5	BRAKE PADS WEAR	4-26
FUEL LINE	4-6	BRAKE LIGHT SWITCH	4-27
THROTTLE OPERATION.....	4-6	BRAKE SYSTEM.....	4-27
AIR CLEANER.....	4-7	SKID PLATE, ENGINE GUARD	4-29
SPARK PLUG	4-9	CLUTCH SYSTEM.....	4-29
VALVE CLEARANCE/DECOMPRESSOR SYSTEM	4-10	SUSPENSION	4-30
ENGINE OIL/FILTER.....	4-14	SPARK ARRESTER	4-31
TRANSMISSION OIL	4-17	NUTS, BOLTS, FASTENERS.....	4-31
ENGINE IDLE SPEED	4-20	WHEELS/TIRES	4-32
RADIATOR COOLANT	4-20	STEERING HEAD BEARING.....	4-32
COOLING SYSTEM.....	4-21	STEERING SHAFT HOLDER BEARING	4-32
DRIVE CHAIN.....	4-21	STEERING SYSTEM	4-33

MAINTENANCE

SERVICE INFORMATION

GENERAL

- Place the vehicle on a level ground before starting any work.

SPECIFICATIONS

ITEM		SPECIFICATIONS	
Throttle lever free play	'04 - '05		3 - 8 mm (1/8 - 5/16 in)
	After '05		5 - 10 mm (7/32 - 3/8 in)
Spark plug ('04 - '05)	Standard		IFR8H11 (NGK), VK24PRZ11 (DENSO)
	For extended high speed riding		IFR9H11 (NGK), VK27PRZ11 (DENSO)
Spark plug (After '05)	Standard		IFR7L11 (NGK), VK22PRZ11 (DENSO)
	For extended high speed riding		IFR8H11 (NGK), VK24PRZ11 (DENSO)
Spark plug gap			1.0 - 1.1 mm (0.039 - 0.043 in)
Valve clearance	IN		0.16 ± 0.03 mm (0.006 ± 0.001 in)
	EX		0.28 ± 0.03 mm (0.011 ± 0.001 in)
Decompressor clearance	'04 - '05		Right side exhaust valve clearance + 0.15 ± 0.02 mm (0.006 ± 0.001 in)
	After '05		Right side exhaust valve clearance + 0.25 ± 0.02 mm (0.010 ± 0.001 in)
Recommended engine oil			Pro Honda GN4, HP4 (without molybdenum additives) 4-stroke oil or HP4M (with molybdenum additives) 4-stroke oil, or equivalent motor oil API service classification: SG or Higher JASO T 903 standard: MA or MB Viscosity: SAE 10W-40, 5W-30
Engine oil capacity	'04 - '05	After draining	0.78 liter (0.82 US qt, 0.67 Imp qt)
		After draining/filter change	0.82 liter (0.87 US qt, 0.72 Imp qt)
		After disassembly	1.20 liter (1.27 US qt, 1.06 Imp qt)
	After '05	After draining	0.65 liter (0.69 US qt, 0.57 Imp qt)
		After draining/filter change	0.69 liter (0.73 US qt, 0.61 Imp qt)
		After disassembly	0.85 liter (0.90 US qt, 0.75 Imp qt)
Recommended transmission oil			Pro Honda GN4 or HP4 (without molybdenum additives) 4-stroke oil or equivalent motor oil API service classification: SG or Higher JASO T 903 standard: MA Viscosity: SAE 10W-40, 5W-30
Transmission oil capacity	'04 - '05	After draining	0.55 liter (0.58 US qt, 0.48 Imp qt)
		After disassembly	0.65 liter (0.69 US qt, 0.57 Imp qt)
	After '05	After draining	0.68 liter (0.72 US qt, 0.60 Imp qt)
		After disassembly	0.80 liter (0.85 US qt, 0.70 Imp qt)
Engine idle speed	'04 - '05		1,600 ± 100 rpm
	After '05		1,700 ± 100 rpm
Drive chain slack			25 - 35 mm (1 - 1-7/16 in)
Recommended brake fluid			DOT 4 brake fluid
Parking brake lever free play			25 - 30 mm (1 - 1-1/4 in)
Clutch lever free play			10 - 20 mm (3/8 - 3/4 in)
Cold tire pressure ('04 - '05)	Front	Standard	275 kPa (0.275 kgf/cm ² , 4.0 psi)
		Minimum	23.5 kPa (0.235 kgf/cm ² , 3.4 psi)
		Maximum	31.5 kPa (0.315 kgf/cm ² , 4.6 psi)
	Rear	Standard	32.5 kPa (0.325 kgf/cm ² , 4.7 psi)
		Minimum	28.5 kPa (0.285 kgf/cm ² , 4.1 psi)
		Maximum	36.5 kPa (0.365 kgf/cm ² , 5.3 psi)

ITEM		SPECIFICATIONS	
Cold tire pressure (After '05)	Front	Standard	27.5 kPa (0.275 kgf/cm ² , 4.0 psi)
		Minimum	25.0 kPa (0.250 kgf/cm ² , 3.6 psi)
		Maximum	30.0 kPa (0.300 kgf/cm ² , 4.4 psi)
	Rear	Standard	32.5 kPa (0.325 kgf/cm ² , 4.7 psi)
		Minimum	30.0 kPa (0.300 kgf/cm ² , 4.3 psi)
		Maximum	35.0 kPa (0.350 kgf/cm ² , 5.1 psi)
Tire size	Front	AT22 x 7R10 ★ ★	
	Rear	AT20 x 10R9 ★ ★	
Tire brand	Front	DUNLOP KT371	
	Rear	DUNLOP KT335H	
Minimum tire tread depth (Front/Rear)		4.0 mm (0.16 in)	
Toe	'04 - '05	Toe-in: 11.4 ± 15 mm (0.45 ± 0.6 in)	
	After '05	Toe-in: 14 ± 15 mm (0.6 ± 0.6 in)	

TORQUE VALUES

Spark plug	23 N·m (2.3 kgf·m, 17 lbf·ft)	
Decompressor arm adjusting screw lock nut	9.8 N·m (1.0 kgf·m, 7 lbf·ft)	Apply engine oil to the threads and seating surface.
Crankshaft hole cap	15 N·m (1.5 kgf·m, 11 lbf·ft)	Apply grease to the threads and seating surface.
Engine oil drain bolt ('04 - '05)	22 N·m (2.2 kgf·m, 16 lbf·ft)	Apply engine oil to the threads and seating surface.
Engine oil drain bolt (After '05)	25 N·m (2.5 kgf·m, 18 lbf·ft)	Apply engine oil to the threads and seating surface.
Transmission oil drain bolt	22 N·m (2.2 kgf·m, 16 lbf·ft)	Apply engine oil to the threads and seating surface.
Axle bearing holder pinch bolt	21 N·m (2.1 kgf·m, 15 lbf·ft)	
Front master cylinder reservoir cap screw	2 N·m (0.2 kgf·m, 1.4 lbf·ft)	
Rear brake reservoir mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Parking brake arm lock nut	18 N·m (1.8 kgf·m, 13 lbf·ft)	
Rear master cylinder push rod lock nut	18 N·m (1.8 kgf·m, 13 lbf·ft)	
Tie-rod lock nut	54 N·m (5.5 kgf·m, 40 lbf·ft)	

MAINTENANCE

MAINTENANCE SCHEDULE ('04 - '05)

Perform the PRE-RIDE INSPECTION in the Owner's Manual at each scheduled maintenance period.

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

ITEMS	FREQUENCY	WHICHEVER COMES FIRST	REGULAR MAINTENANCE INTERVAL			REFER TO PAGE
			INITIAL MAINTENANCE			
			mi	600	1,200	
	km	1,000	2,000			
		HOURS	20	100	200	
EMISSION RELATED ITEMS	* FUEL LINE				I	4-6
	* THROTTLE OPERATION				I	4-6
	AIR CLEANER	NOTE 1		C	C	4-7
	SPARK PLUG				I	4-9
	* VALVE CLEARANCE/DECOMPRESSOR SYSTEM				I	4-10
	ENGINE OIL		R	R	R	4-14
	ENGINE OIL FILTER		R	R	R	4-14
	* TRANSMISSION OIL			R	R	4-17
	* ENGINE IDLE SPEED			I	I	4-20
	RADIATOR COOLANT	NOTE 3			I	4-20
* COOLING SYSTEM	NOTE 2			I	4-21	
NON-EMISSION RELATED ITEMS	DRIVE CHAIN	NOTE 1, 2	I, L	(I, L EVERY 300 mi (500 km) or 50 operating hours)		4-21
	DRIVE CHAIN SLIDER			I	I	4-25
	* BRAKE FLUID	NOTE 3			I	4-25
	* BRAKE PADS WEAR	NOTE 1, 2			I	4-26
	* BRAKE LIGHT SWITCH			I	I	4-27
	BRAKE SYSTEM			I	I	4-27
	SKID PLATE, ENGINE GUARD				I	4-29
	* CLUTCH SYSTEM				I	4-29
	* SUSPENSION				I	4-30
	* SPARK ARRESTER			C	C	4-31
	* NUTS, BOLTS, FASTENERS				I	4-31
	** WHEELS/TIRES				I	4-32
	** STEERING HEAD BEARINGS				I	4-32
** STEERING SHAFT HOLDER BEARING				I	4-32	
** STEERING SYSTEM				I	4-33	

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

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

NOTES:

1. Service more frequently when riding in dusty areas, sand or snow.
2. Service more frequently after riding in very wet or muddy conditions.
3. Replace every 2 years. Replacement requires mechanical skill.

MAINTENANCE SCHEDULE (After '05)

Perform the PRE-RIDE INSPECTION in the Owner's Manual at each scheduled maintenance period.

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

ITEMS	FREQUENCY	WHICHEVER COMES FIRST	INITIAL MAINTENANCE		REGULAR MAINTENANCE INTERVAL		REFER TO PAGE
			mi	100	600	1,200	
			km	150	1,000	2,000	
		HOURS	20	100	200		
* FUEL LINE						I	4-6
* THROTTLE OPERATION						I	4-6
AIR CLEANER		NOTE 1				C	4-7
SPARK PLUG						I	4-9
* VALVE CLEARANCE/DECOMPRESSOR SYSTEM				I	I	I	4-10
ENGINE OIL			INITIAL = 100 mi (150 km), 20 operating hours or 1 month : R REGULAR = EVERY 600 mi (1000 km), 100 operating hours or 12 month : R				4-14
ENGINE OIL FILTER			R	R	R	R	4-14
* TRANSMISSION OIL				R	R	R	4-17
* ENGINE IDLE SPEED			I	I	I	I	4-20
RADIATOR COOLANT		NOTE 3		I	I	I	4-20
* COOLING SYSTEM		NOTE 2		I	I	I	4-21
DRIVE CHAIN		NOTE 1, 2	I, L	(I, L EVERY 300 mi (500 km) or 50 operating hours)		I	4-21
DRIVE CHAIN SLIDER				I	I	I	4-25
* BRAKE FLUID		NOTE 3		I	I	I	4-25
* BRAKE PADS WEAR		NOTE 1, 2		I	I	I	4-26
* BRAKE LIGHT SWITCH			I	I	I	I	4-27
BRAKE SYSTEM			I	I	I	I	4-27
SKID PLATE, ENGINE GUARD				I	I	I	4-29
* CLUTCH SYSTEM			I	I	I	I	4-29
* SUSPENSION				I	I	I	4-30
* SPARK ARRESTER				C	C	C	4-31
* NUTS, BOLTS, FASTENERS			I	I	I	I	4-31
** WHEELS/TIRES			I	I	I	I	4-32
** STEERING HEAD BEARINGS				I	I	I	4-32
** STEERING SHAFT HOLDER BEARING				I	I	I	4-32
** STEERING SYSTEM				I	I	I	4-33

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

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

NOTES:

1. Service more frequently when riding in dusty areas, sand or snow.
2. Service more frequently after riding in very wet or muddy conditions.
3. Replace every 2 years. Replacement requires mechanical skill.

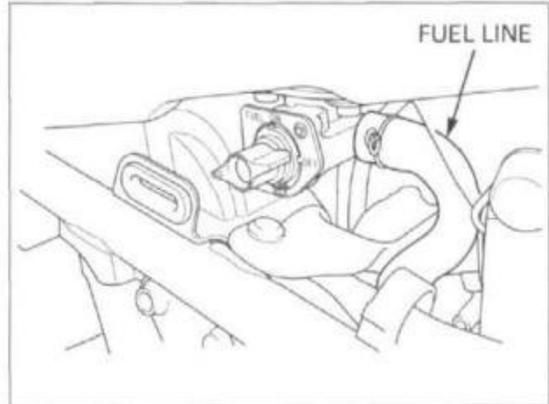
MAINTENANCE

FUEL LINE

Remove the rear fender ('04 - '05: page 3-7, After '05: page 3-7).

Check the fuel line for deterioration, damage or leakage.

Replace the fuel line if necessary.



THROTTLE OPERATION

Check for any deterioration or damage to the throttle cable. Check the throttle lever for smooth operation.

Check that the throttle opens and automatically closes in all steering positions.

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

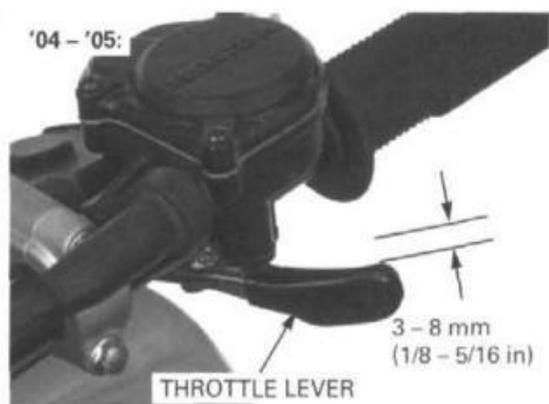
If the throttle lever still does not return properly, replace the throttle cable.

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

'04 - '05: Measure the throttle lever free play at the tip of the throttle lever.

THROTTLE LEVER FREE PLAY:
3 - 8 mm (1/8 - 5/16 in)

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



After '05: Measure the throttle lever free play at the tip of the throttle lever.

THROTTLE LEVER FREE PLAY:
5 - 10 mm (7/32 - 3/8 in)

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

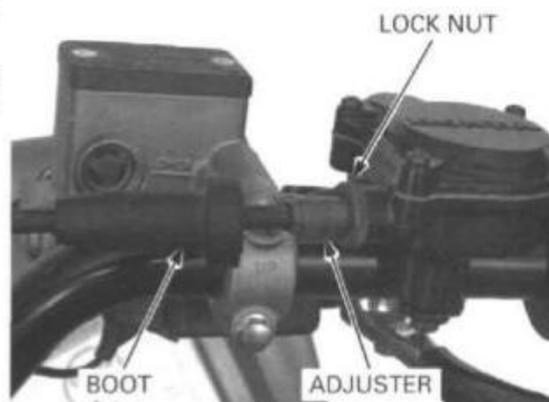
After throttle lever free play adjustment, make sure the engine started normally.



Minor adjustments are made with the upper adjuster.

Slide the rubber boot off the adjuster. Loosen the lock nut, turn the adjuster as required and tighten the lock nut.

Install the rubber boot securely.



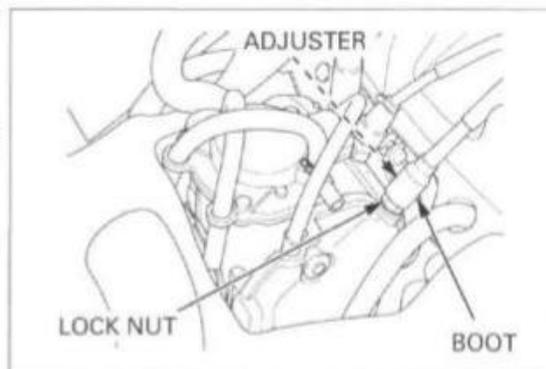
Major adjustments are made with the lower adjuster.

Remove the fuel tank (page 3-9).

Slide the rubber boot off the adjuster. Loosen the lock nut, turn the adjuster as required and tighten the lock nut.

Install the rubber boot securely.

Recheck the throttle operation and install the fuel tank (page 3-9).



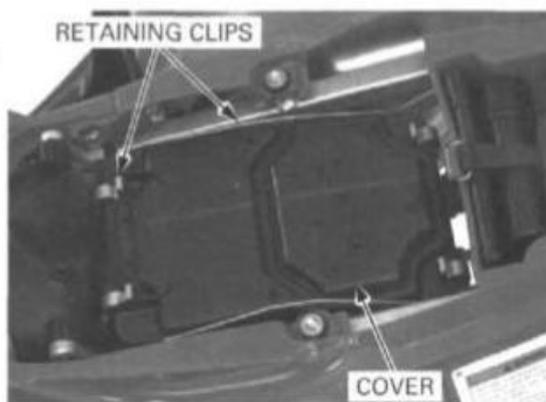
AIR CLEANER

NOTE:

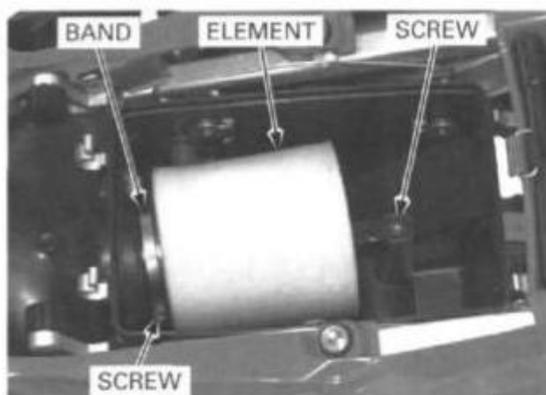
- If the vehicle is used in dusty areas, sand or snow, more frequent inspections are required.

Remove the seat (page 3-3).

Release the retaining clips from the air cleaner housing cover and remove the cover.

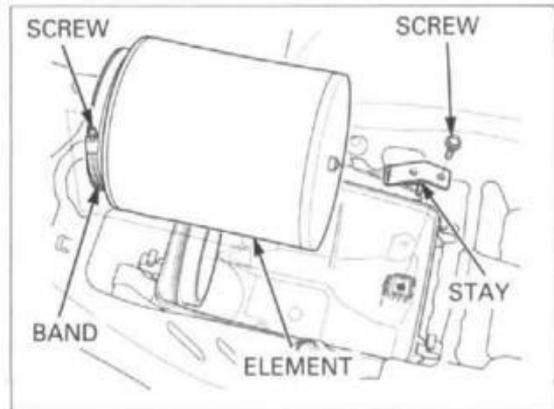


'04 - '05: Loosen the air cleaner element band screw, and remove the mounting screw and air cleaner element assembly.

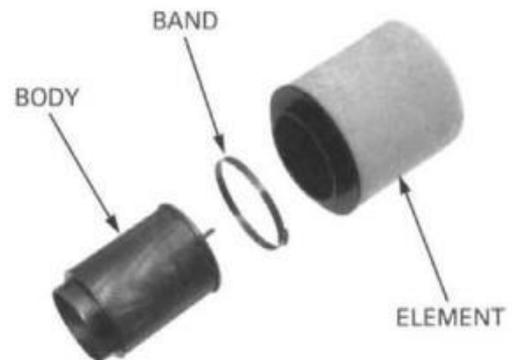


MAINTENANCE

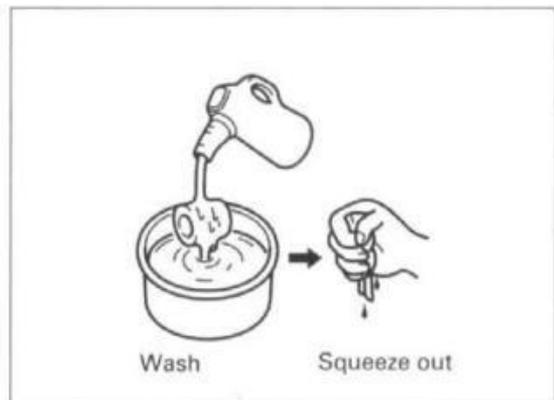
After '05: Loosen the air cleaner element band screw, and remove the mounting screw and pull up the stay. Remove air cleaner element assembly.



Remove the element band and air cleaner element from the element body.



Wash the element in non-flammable or high flash point solvent. Squeeze out the solvent thoroughly, and allow the element to dry.



Apply approximately 20 g (0.7 oz) of Pro Honda Form Filter Oil or equivalent oil from the inside of the element. Place the element into a plastic bag and spread the oil evenly by hand.



'04 - '05: Install the air cleaner element and band onto the element body properly.

Install the element assembly over the connecting hose flange and boss of the air cleaner housing properly.

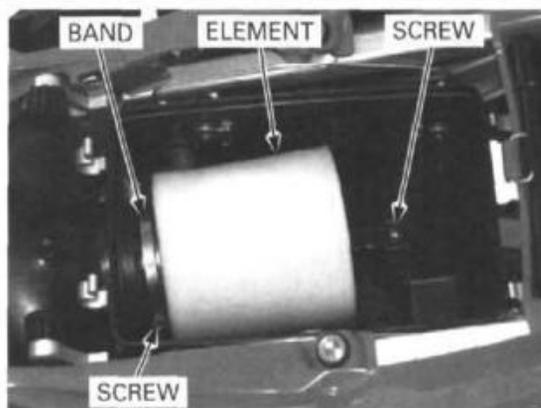
Install and tighten the mounting screw.
Tighten the band screw.

NOTE:

- Failure to properly tighten the band screw will allow the air cleaner element to fall off and engine damage could result.

Install the air cleaner element housing cover and secure it with the retaining clips.

Install the seat (page 3-3).



After '05: Install the air cleaner element and band onto the element body properly.

Install the element assembly over the connecting hose flange and boss of the air cleaner housing properly.

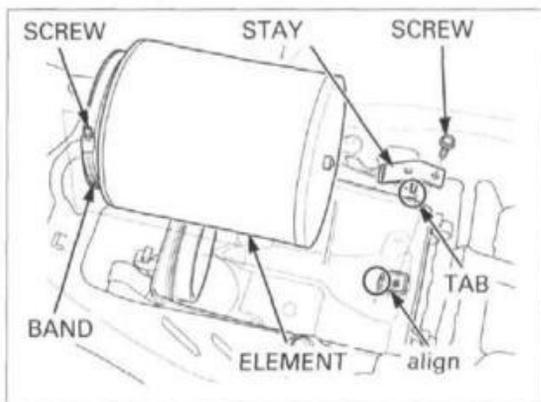
Install the stay by aligning its tab with the groove of air cleaner housing and tighten the mounting screw.
Tighten the band screw.

NOTE:

- Failure to properly tighten the band screw will allow the air cleaner element to fall off and engine damage could result.

Install the air cleaner element housing cover and secure it with the retaining clips.

Install the seat (page 3-3).

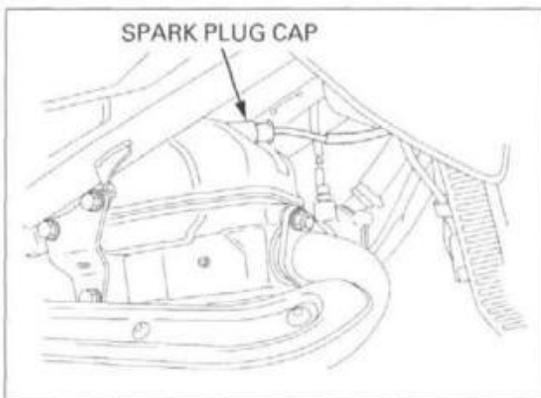


SPARK PLUG

Disconnect the spark plug cap and clean around the spark plug base with compressed air.

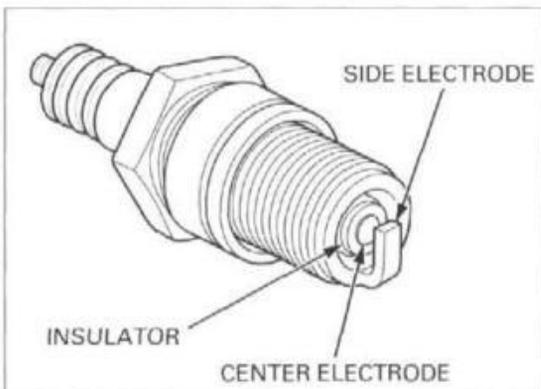
Be sure that no debris is allowed to enter the combustion chamber.

Remove the spark plug.



This vehicle's spark plug is equipped with an iridium type center electrode. Do not clean the electrodes.

Check the insulator for cracks or damage, and the electrodes for wear, fouling or discoloration. Replace the plug if necessary.



MAINTENANCE

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

'04 - '05:

Always use the specified spark plug on this vehicle.

SPECIFIED SPARK PLUG:

Standard:

IFR8H11 (NGK), VK24PRZ11 (DENSO)

For extended high speed riding

IFR9H11 (NGK), VK27PRZ11 (DENSO)

After '05:

Always use the specified spark plug on this vehicle.

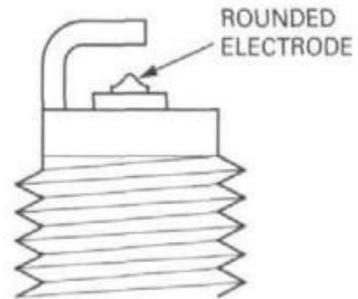
SPECIFIED SPARK PLUG:

Standard:

IFR7L11 (NGK), VK22PRZ11 (DENSO)

For extended high speed riding

IFR8H11 (NGK), VK24PRZ11 (DENSO)



To prevent damaging the iridium coating of the center electrode, use a wire-type feeler gauge to check the spark plug gap. Do not adjust the spark plug gap. If the gap is out of specification, replace the plug with a new one.

Measure the spark plug gap between the center and side electrodes with a wire-type feeler gauge.

Make sure the 1.20 mm (0.047 in) wire-type feeler gauge cannot be inserted into the gap.

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

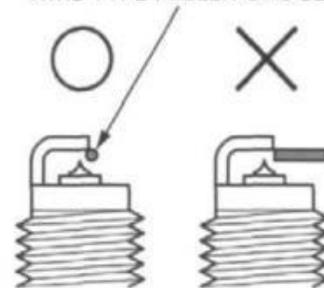
Screw the spark plug into the cylinder head by hand to prevent cross-threading.

Tighten the spark plug.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)

Install the spark plug cap.

WIRE TYPE FEELER GAUGE



VALVE CLEARANCE/DECOMPRESSOR SYSTEM

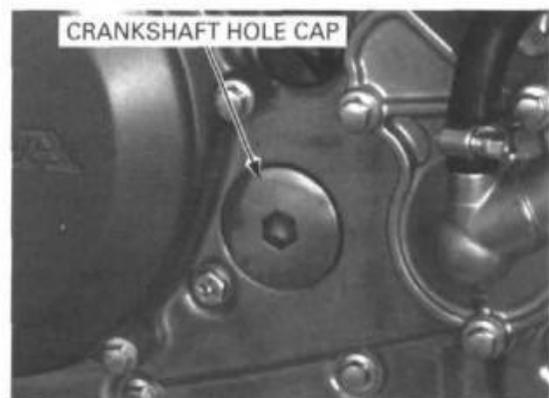
NOTE:

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

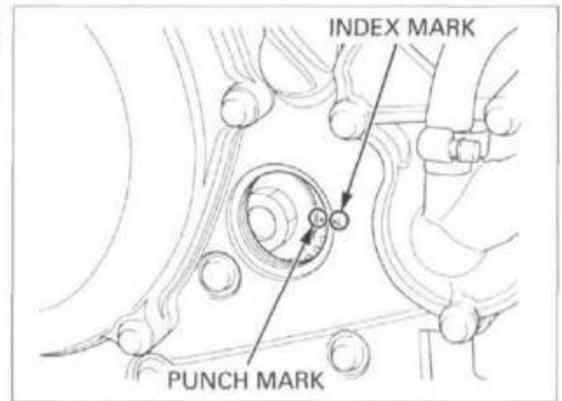
VALVE CLEARANCE INSPECTION

Remove the cylinder head cover (page 11-8).

Remove the crankshaft hole cap.



Rotate the crankshaft clockwise and align the punch mark on the primary drive gear with the index mark on the right crankcase cover. Make sure the piston is at TDC (Top Dead Center) on the compression stroke.



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

Measure the clearance of each intake valve by inserting a feeler gauge between the valve lifter and cam lobe.

INTAKE VALVE CLEARANCE:
 $0.16 \pm 0.03 \text{ mm (} 0.006 \pm 0.001 \text{ in)}$



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

Measure the clearance of each exhaust valve by inserting a feeler gauge between the rocker arm and shim.

EXHAUST VALVE CLEARANCE:
 $0.28 \pm 0.03 \text{ mm (} 0.011 \pm 0.001 \text{ in)}$



VALVE CLEARANCE ADJUSTMENT

Remove the camshaft holder assembly and valve lifters (page 11-8).

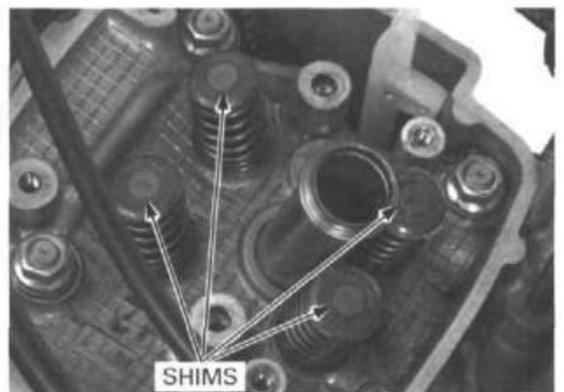
NOTE:

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

The shims can be easily removed with tweezers or a magnet.

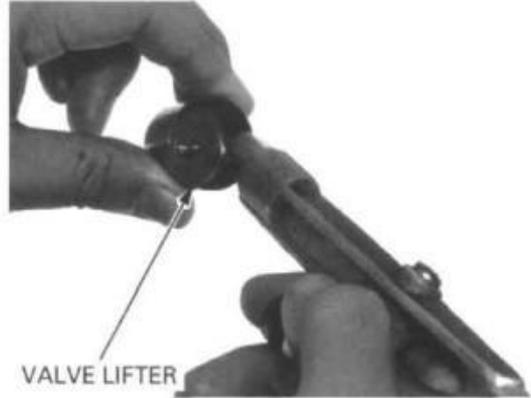
Remove the shims.

Mark all valve lifters and shims to ensure correct reassembly in their original locations.

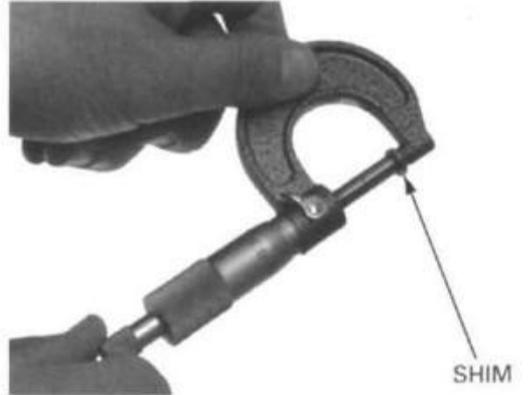


MAINTENANCE

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



Measure the shim thickness and record it.



Seventy-three different shim sizes are available from 1.200 mm to 3.000 mm in intervals of 0.025 mm.

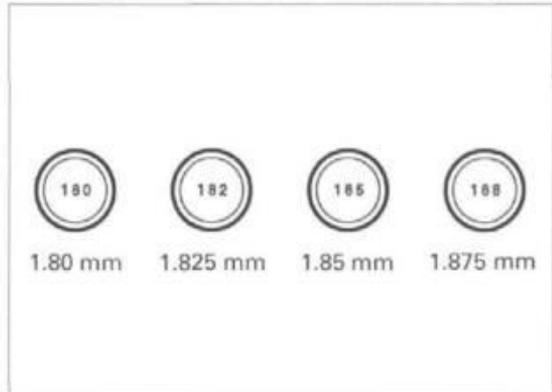
Calculate the new shim thickness using the equation below.

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

A: New shim thickness
B: recorded valve clearance
C: Specified valve clearance
D: Old shim thickness

NOTE:

- 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 3.000 mm

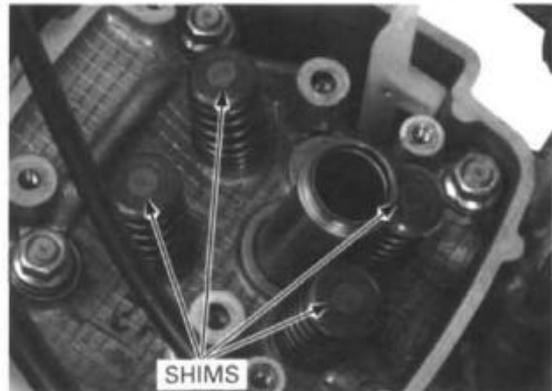


Install the shims in their original locations.

Install the newly selected shims on the valve retainers.

Install the camshaft holder assembly (page 11-29).

Inspect the decompressor clearance and adjust it if necessary (page 4-13).



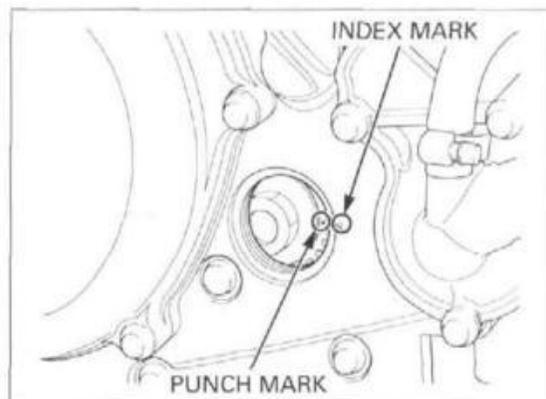
DECOMPRESSOR CLEARANCE INSPECTION/ADJUSTMENT

NOTE:

- Always inspect and adjust the decompressor clearance after inspecting and adjusting the valve clearance (page 4-10).

Rotate the crankshaft clockwise and align the punch mark on the primary drive gear with the index mark on the right crankcase cover.

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



Measure the decompressor clearance by inserting a feeler gauge between the decompressor arm adjusting screw and right side rocker arm.

'04 - '05: **DECOMPRESSOR CLEARANCE:**
Right side exhaust valve clearance + 0.15 ± 0.02 mm (0.006 ± 0.001 in)

After '05: **DECOMPRESSOR CLEARANCE:**
Right side exhaust valve clearance + 0.25 ± 0.02 mm (0.010 ± 0.001 in)

For example, if the measured right side exhaust valve clearance is 0.28 mm (0.011 in), decompressor clearance is:
 0.28 mm (0.011 in) + 0.15 mm (0.006 in) = 0.43 ± 0.02 mm (0.017 ± 0.001 in)

If the decompressor clearance is out of specification, adjust as follows:

Measure the right exhaust valve clearance by inserting a feeler gauge between the right side rocker arm and shim.

EXHAUST VALVE CLEARANCE:
0.28 ± 0.03 mm (0.011 ± 0.001 in)

Remove the feeler gauge inserted between the right side rocker arm and shim.



MAINTENANCE

'04 - '05: Insert a feeler gauge equivalent to; right exhaust valve clearance + 0.15 mm (0.006 in), between the adjusting screw and rocker arm.

After '05: Insert a feeler gauge equivalent to; right exhaust valve clearance + 0.25 mm (0.010 in), between the adjusting screw and rocker arm.

Loosen the lock nut and turn the adjusting screw until there is a slight drag on the feeler gauge.

Hold the adjusting screw and tighten the lock nut.

TORQUE: 9.8 N·m (1.0 kgf·m, 7 lbf·ft)

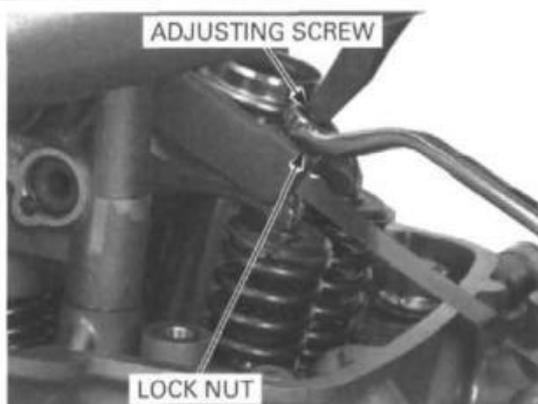
Recheck the decompressor clearance.

Coat a new O-ring with oil and install it onto the crankshaft hole cap.

Apply grease to the crankshaft hole cap threads. Install the crankshaft hole cap and tighten it.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)

Install the cylinder head cover (page 11-31).



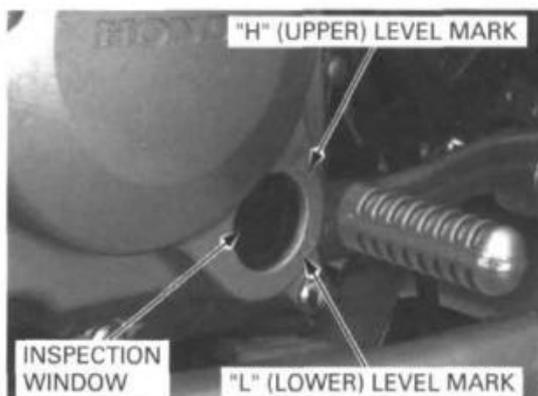
ENGINE OIL/FILTER

OIL LEVEL CHECK

Start the engine and let it idle for a few minutes. Stop the engine and place the vehicle on a level surface.

Wait three minutes after stopping the engine.

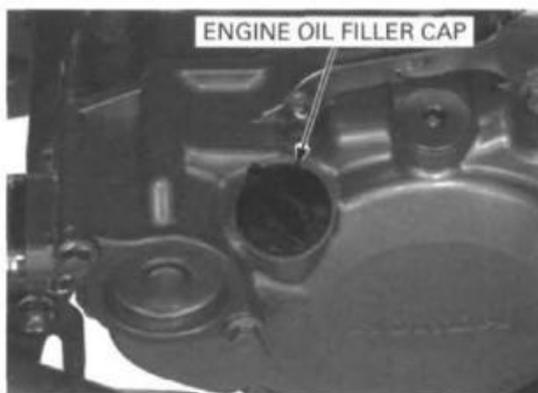
Check the oil level through the inspection window. The oil level should be between the "H" (upper) and "L" (lower) level marks.



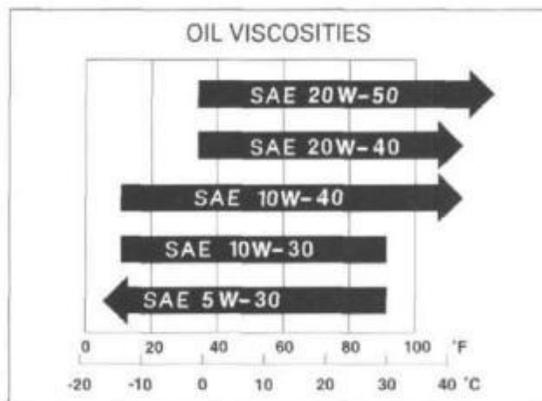
If the oil level is near or below the "L" (lower) level mark, remove the engine oil filler cap, and add the recommended engine oil up to the "H" (upper) level mark.

RECOMMENDED ENGINE OIL:

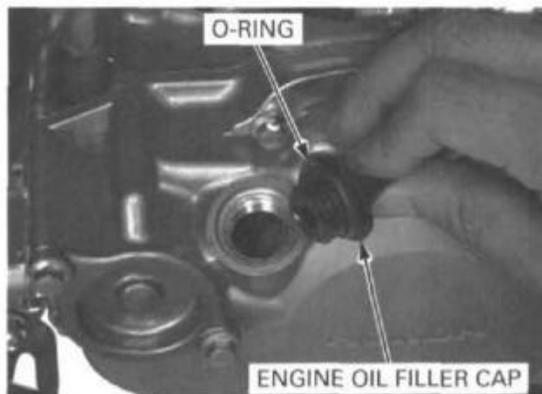
Pro Honda GN4, HP4 (without molybdenum additives) or HP4M (with molybdenum additives) 4-stroke oil, or equivalent motor oil
API service classification: SG or higher
JASO T 903 standard: MA or MB
Viscosity: SAE 10W-40, 5W-30



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



Make sure that the O-ring on the engine oil filler cap is in good condition and replace it with a new one if necessary.
Reinstall the engine oil filler cap.



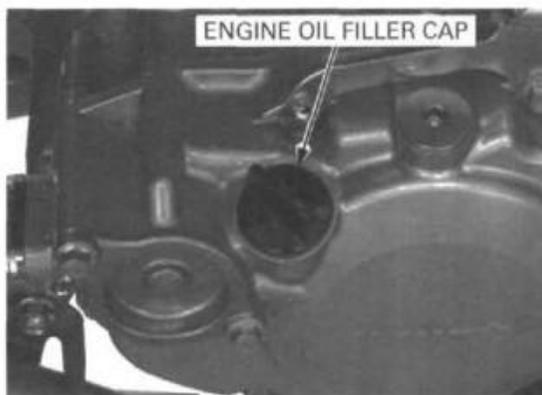
OIL AND FILTER CHANGE

NOTE:

- Change the engine oil with the engine warm and the vehicle on a level surface to assure complete and rapid draining.

Warm up the engine.

Stop the engine and remove the engine oil filler cap.



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

TRX450ER only:

With the engine stop switch in the OFF position, press the start button several times to crank the engine and distribute the oil.

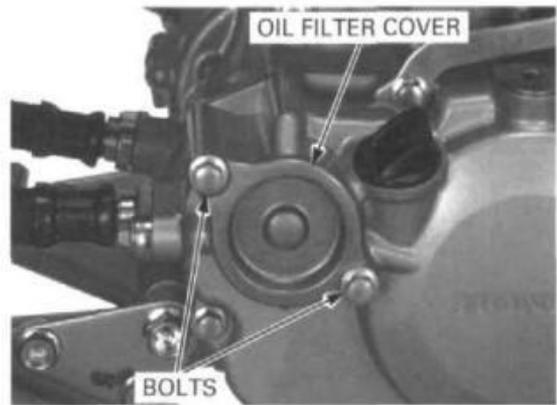
TRX450R only:

Operate the kickstarter pedal several times to assure the complete oil draining.



MAINTENANCE

Remove the two bolts and oil filter cover.



Remove the oil filter and spring.



Apply engine oil to the drain bolt threads.

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

'04 - '05: **TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)**

After '05: **TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)**



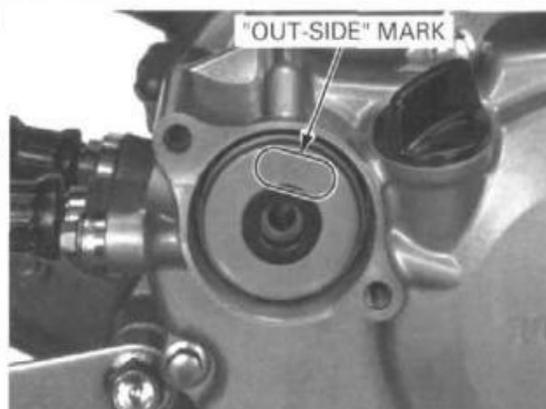
Apply grease to the filter side of the spring end.
Install the spring into a new oil filter.



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

NOTICE

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



Coat a new O-ring with oil and install it into the oil filter cover groove.

Install the oil filter cover and tighten the two bolts securely.



Fill the crankcase with the recommended engine oil (page 4-14).

'04 - '05: **ENGINE OIL CAPACITY:**
0.82 liter (0.87 US qt, 0.72 Imp qt) after draining/
filter change

After '05: **ENGINE OIL CAPACITY:**
0.69 liter (0.73 US qt, 0.61 Imp qt) after draining/
filter change

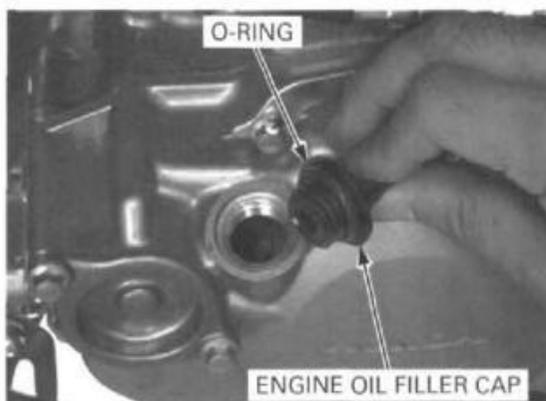
Make sure that the O-ring on the engine oil filler cap is in good condition and replace it with a new one if necessary.

Reinstall the engine oil filler cap.

Start the engine and let it idle for a few minutes.

Make sure there are no oil leaks.

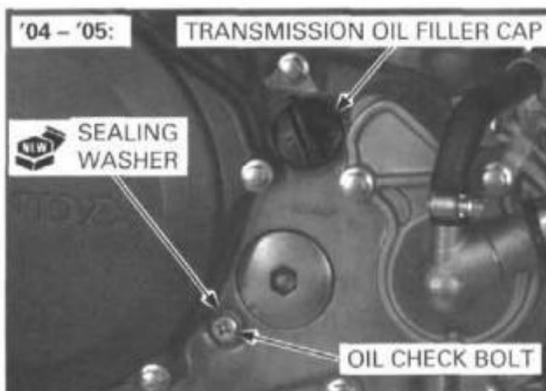
Stop the engine and check the oil level (page 4-14).



TRANSMISSION OIL

OIL LEVEL CHECK

1. Start the engine and let it idle for 2 to 3 minutes.
2. Stop the engine and wait three minutes.
3. Place the vehicle on a level surface.
4. Remove the transmission oil filler cap and check bolt. 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 the recommended transmission oil slowly through the oil filler hole until oil starts to flow out of the check bolt hole. Install the transmission oil filler cap and check bolt.



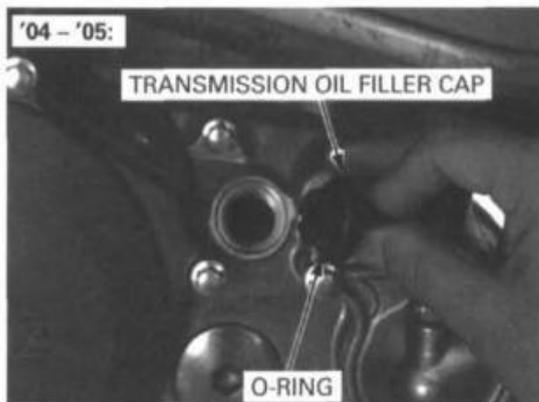
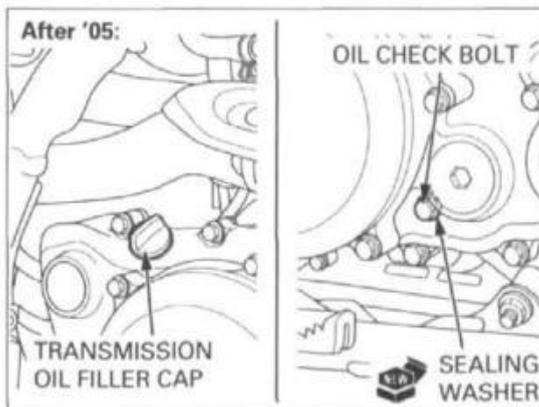
MAINTENANCE

RECOMMENDED TRANSMISSION OIL:

Pro Honda GN4 or HP4 (without molybdenum additives) 4-stroke oil or equivalent motor oil
API service classification: SG or higher
JASO T 903 standard: MA
Viscosity: SAE 10W-40, 5W-30

6. Repeat steps 1 through 4.
7. Install the oil check bolt with a new sealing washer and tighten it securely.

8. Make sure that the O-ring on the transmission oil filler cap is in good condition and replace it with a new one if necessary.



Install the transmission oil filler cap.

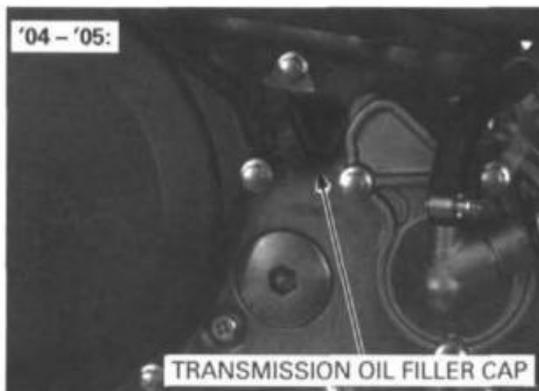


OIL CHANGE

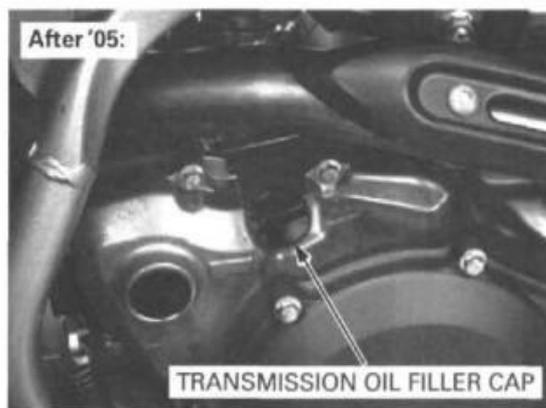
NOTE:

- Change the transmission oil with the engine warm and the vehicle on a level surface to assure complete and rapid draining.

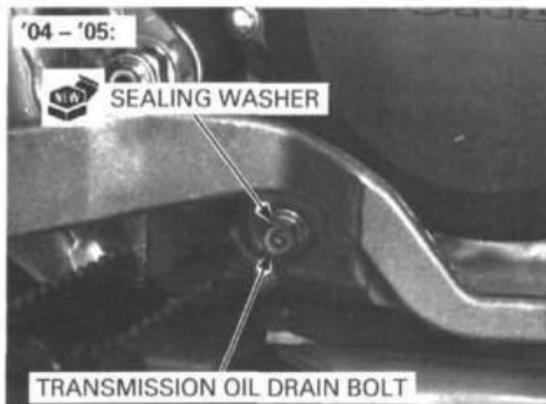
Start the engine and let it idle for 2 to 3 minutes. Stop the engine and place the vehicle on a level surface.



Remove the transmission oil filler cap.



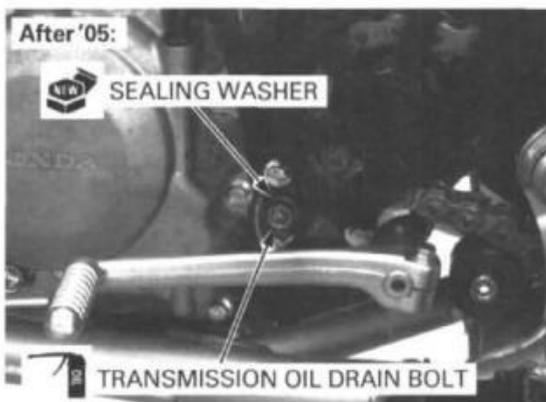
Remove the transmission oil drain bolt and sealing washer, and drain the transmission oil.



Apply engine oil to the drain bolt threads.

Install the transmission oil drain bolt with a new sealing washer and tighten it.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)



Fill the transmission case with the recommended transmission oil.

'04 - '05: **TRANSMISSION OIL CAPACITY:**
0.55 liter (0.58 US qt, 0.48 Imp qt) after draining

After '05: **TRANSMISSION OIL CAPACITY:**
0.68 liter (0.72 US qt, 0.60 Imp qt) after draining

Make sure that the O-ring on the transmission oil filler cap is in good condition and replace it with a new one if necessary.



MAINTENANCE

- Install the transmission oil filler cap.
- Check the transmission oil level (page 4-17).



ENGINE IDLE SPEED

NOTE:

- Inspect and adjust idle speed after all other engine maintenance items have been performed and are within specifications.
- The engine must be warm for accurate idle speed inspection and adjustment.

Warm up the engine, shift the transmission into neutral and place the vehicle on a level surface.

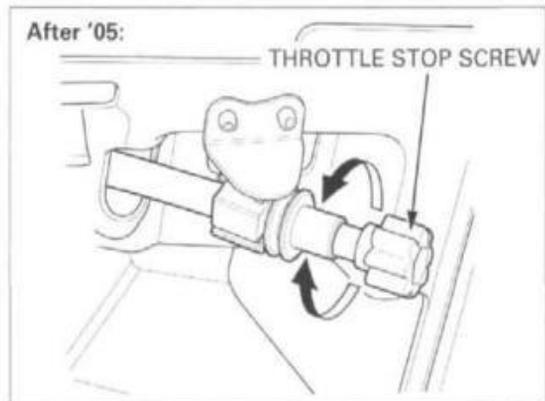
Connect a tachometer.

Check the idle speed and adjust by turning the throttle stop screw as required.

'04 - '05: **IDLE SPEED: 1,600 ± 100 rpm**

After '05: **IDLE SPEED: 1,700 ± 100 rpm**

Remove the tachometer.

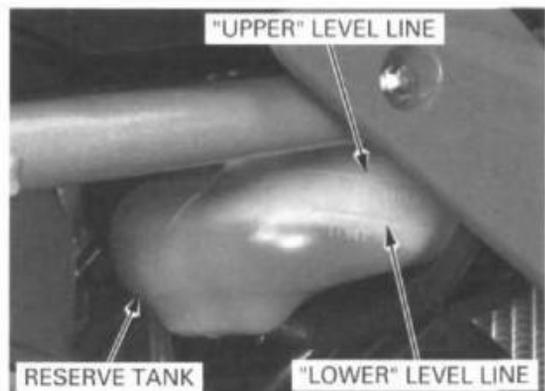


RADIATOR COOLANT

Check the coolant level of the reserve tank with the engine running at normal operating temperature. The level should be between the "UPPER" and "LOWER" level lines with the vehicle upright on a level surface.

If the level is low, remove the top cover (page 3-5) and reserve tank cap, and fill the tank up to the "UPPER" level line with a 1:1 mixture of distilled water and antifreeze (coolant preparation: page 9-6).

If the reserve tank becomes completely empty, there is a possibility of air getting into the cooling system.



RECOMMENDED ANTIFREEZE:

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

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.

If the reserve tank becomes completely empty, there is a possibility of air getting into the cooling system.

Be sure to remove any air from the cooling system (page 9-7).

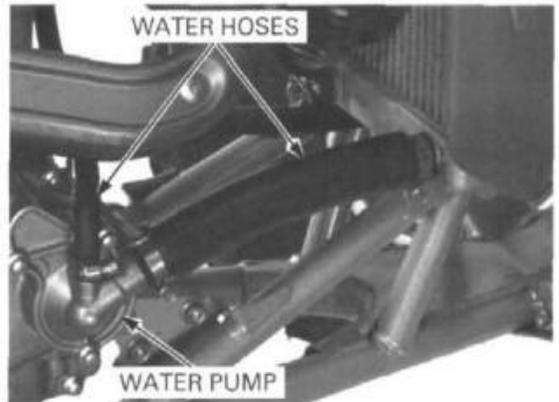


COOLING SYSTEM

Check for any coolant leakage from the water pump, water hoses (radiator and by-pass hoses) and hose joints.

Check the water hoses for cracks or deterioration and replace if necessary.

Check that all hose clamps are tight.



Remove both front fenders ('04 - '05: page 3-6, After '05: page 3-6).

Check the radiator air passage for clogs or damage. Straighten bent fins with a small, flat blade screwdriver and remove insects, mud or other obstructions with compressed air or low pressure water. Replace the radiator if the air flow is restricted over more than 20% of the radiating surface.

Install both front fenders ('04 - '05: page 3-6, After '05: page 3-6).



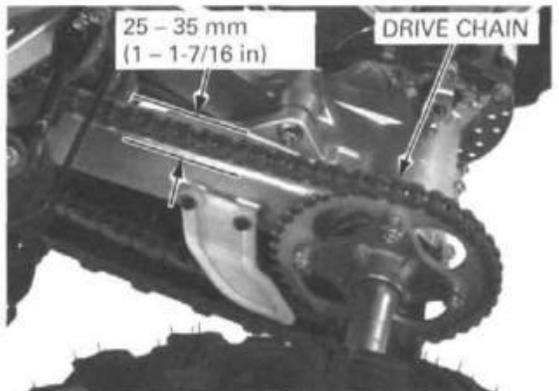
DRIVE CHAIN

CHAIN SLACK INSPECTION

Turn the ignition switch to "OFF" and shift the transmission into neutral.

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

CHAIN SLACK: 25 - 35 mm (1 - 1-7/16 in)



ADJUSTMENT

Loosen the axle bearing holder pinch bolts. Turn the bearing holder until the correct drive chain slack is obtained, using the hex wrench in the tool kit.

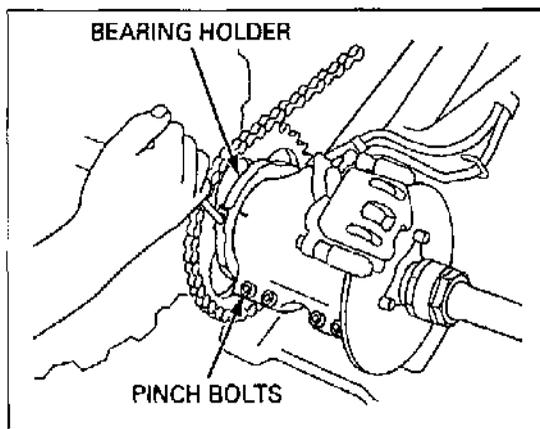
Tighten the axle bearing holder pinch bolts.

TORQUE: 21 N·m (2.1 kgf·m, 15 lbf·ft)

Recheck the drive chain slack and free wheel rotation.

If the chain slack is excessive when the bearing holder is turned fully rearward (the correct slack cannot be obtained), replace the drive chain with a new one.

To replace the drive chain, remove the drive sprocket cover (page 10-7) and swingarm (page 18-20).

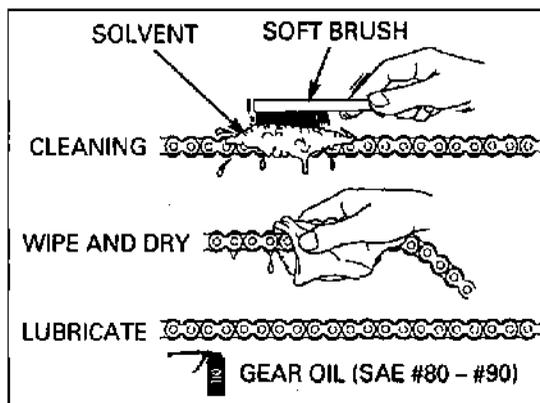


CLEANING, LUBRICATION AND INSPECTION

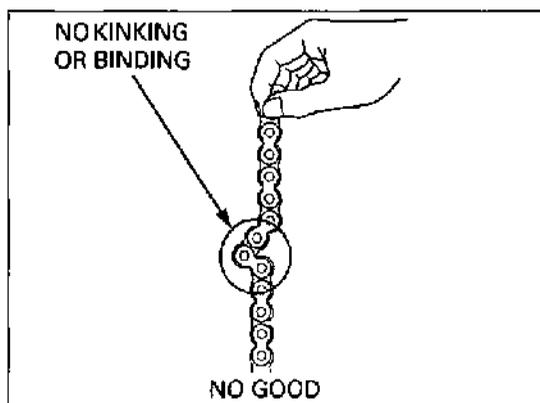
Clean the chain with a soft brush using a non-flammable or high flash point solvent and wipe it dry. Be sure the chain has dried completely before lubricating.

Lubricate the drive chain with #80 - #90 gear oil or equivalent chain lubricant designed for specifically for use on O-ring chains.

Some commercially available chain lubricants may contain solvents which could damage the O-rings. Wipe off the excess oil.



Inspect the drive chain for possible damage or wear. Replace any chain that has damaged rollers, loose fitting links, or otherwise appears unserviceable.

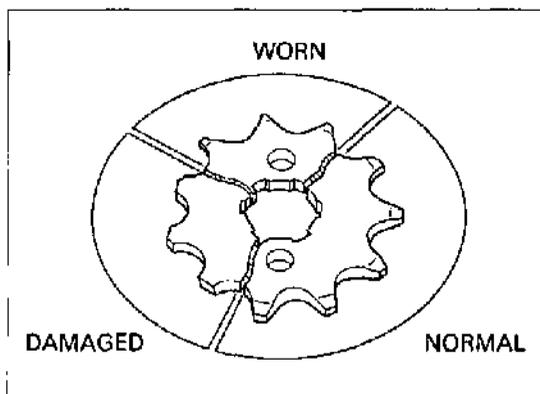


Inspect the drive and driven sprocket teeth for wear or damage, and replace if necessary.

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

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

If any are loose, tighten them to the specified torque.



REPLACEMENT

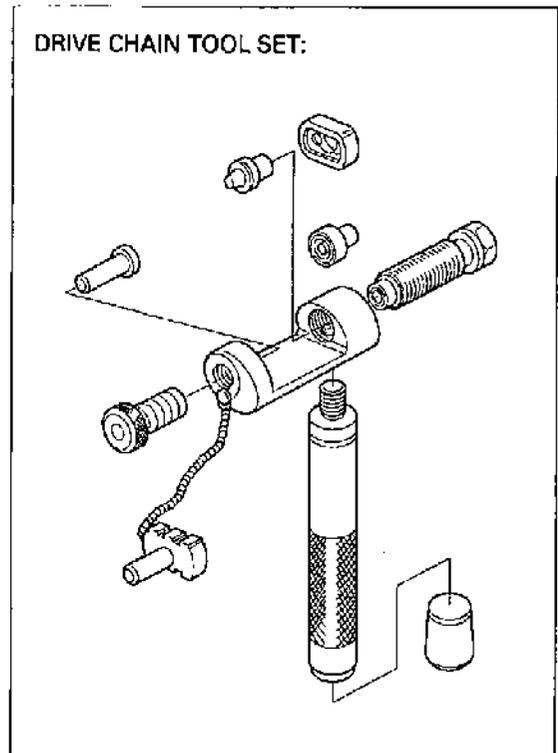
This motorcycle uses a drive chain with a staked master link.

Loosen the drive chain (page 4-22).

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

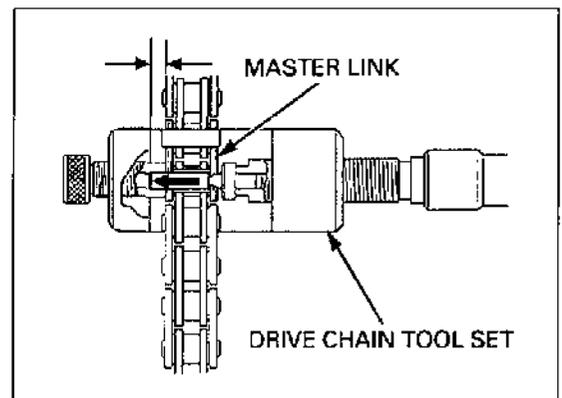
Assemble the special tool as shown.

TOOL:
Drive chain tool set **07HMH-MR10103 or**
 07HMH-MR1010C (U.S.A.
 only)



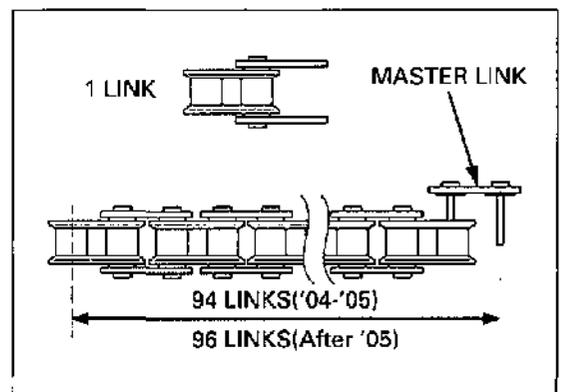
Locate the crimped pin ends of the master link from the outside of the chain and remove the link with the drive chain tool set.

Remove the drive chain.



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

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



'04 - '05: **SPECIFIED LINKS: 94 links**

After '05: **SPECIFIED LINKS: 96 links**

REPLACEMENT CHAIN: DID: DID 520V6
RK: RK520SMOZ10S

MAINTENANCE

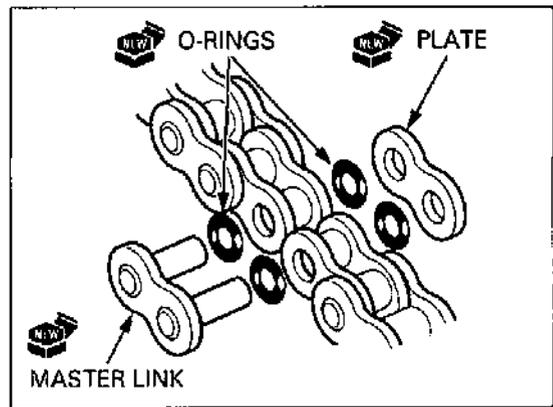
Install the new drive chain over the sprocket.

NOTICE

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

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

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



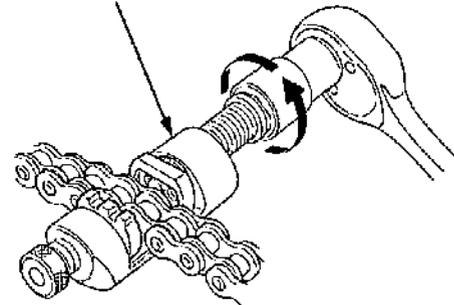
Assemble the part with the drive chain tool set.

TOOL:

Drive chain tool set

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

DRIVE CHAIN TOOL SET



Make sure the master link pins are installed properly.

Measure the master link pin length projected from the plate.

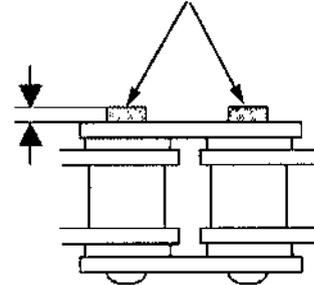
STANDARD LENGTH:

DID: 1.15 – 1.55 mm (0.045 – 0.061 in)

RK: 1.2 – 1.4 mm (0.05 – 0.06 in)

Stake the master link pins with the drive chain tool set.

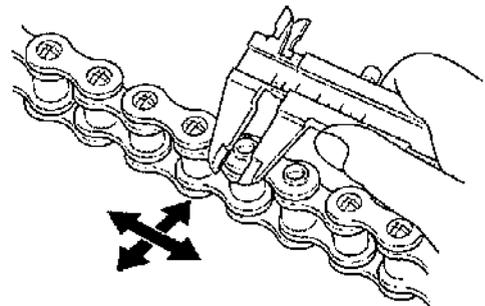
MASTER LINK PINS



Make sure the pins are staked properly by measuring the diameter of the staked area.

DIAMETER OF THE STAKED AREA:

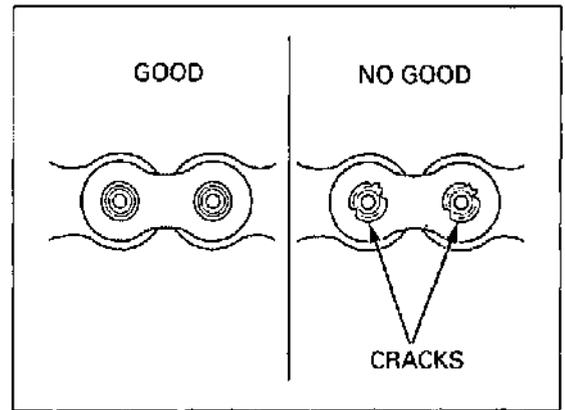
5.5 – 5.8 mm (0.22 – 0.23 in)



After staking, check the staked area of the master link for cracks.

A drive chain with a clip-type master link must not be used.

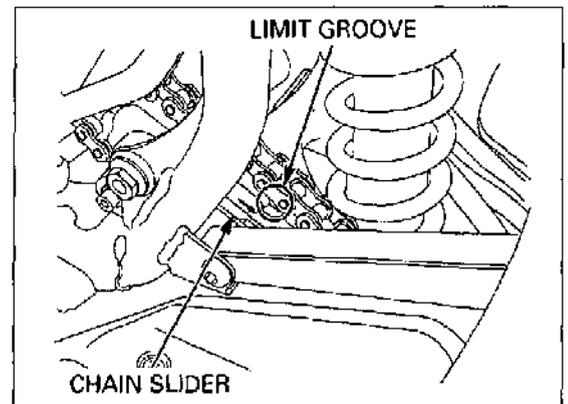
If there is any cracking, replace the master link, O-rings and plate.



DRIVE CHAIN SLIDER

Check the drive chain slider for wear. Replace the chain slider if it is worn to the bottom of the wear limit groove.

Refer to section 14 for drive chain slider replacement.



BRAKE FLUID

NOTICE

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

NOTE:

- Do not mix different types of fluid, as they may not be compatible with each other.
- Do not allow foreign material to enter the system when filling the reservoir.
- When the fluid level is low, check the brake pads for wear (page 4-26). A low fluid level may be due to wear of the brake pads. If the brake pads are worn and the caliper pistons are pushed out, 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 4-27).

FRONT BRAKE

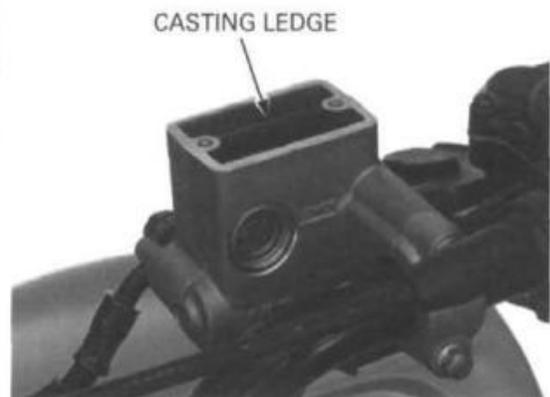
Turn the handlebar to the left side so the reservoir is level and check the fluid level through the sight glass.



If the level is near the "LOWER" level mark, remove the reservoir cap, set plate and diaphragm and fill the reservoir with DOT 4 brake fluid from a sealed container to the casting ledge.

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

TORQUE: 2 N·m (0.2 kgf·m, 1.4 lbf·ft)



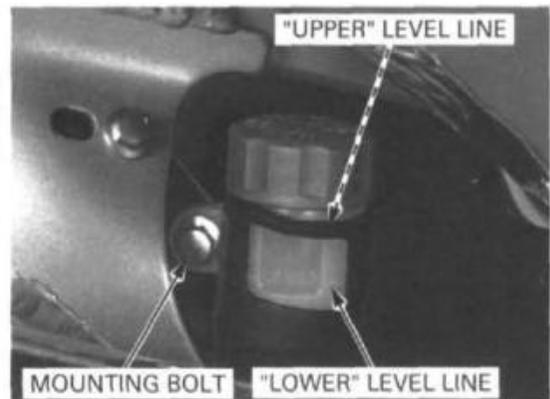
REAR BRAKE

Place the vehicle on a level surface.

Check the fluid level in the rear brake reservoir. If the level is near the "LOWER" level line, remove the reservoir mounting bolt, reservoir cap, set plate and diaphragm and fill the reservoir with DOT 4 brake fluid from a sealed container to the "UPPER" level line.

Install the diaphragm, set plate, reservoir cap and mounting bolt, and tighten the bolt.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

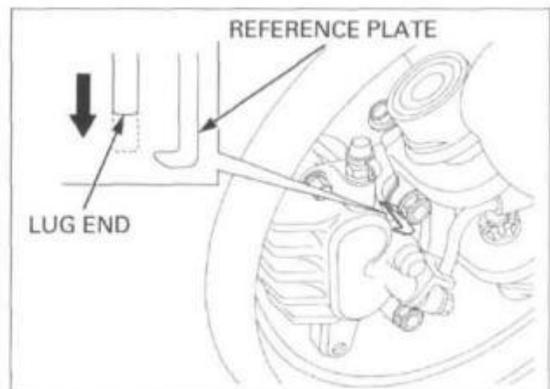


BRAKE PADS WEAR

FRONT BRAKE

Check the front brake pads for wear. Replace the brake pads if the wear limit indicator mark (lug end) on the caliper aligns with the reference plate on the caliper bracket when the front brake is applied.

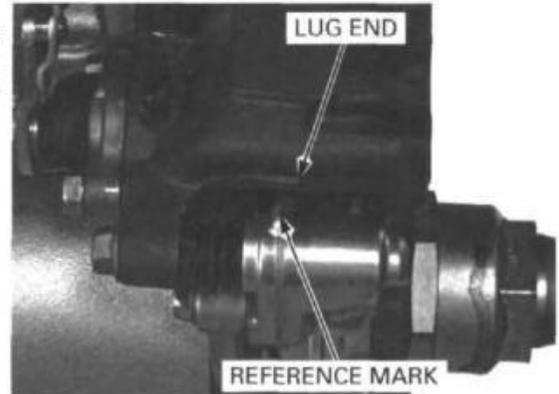
Refer to page 19-8 for front brake pad replacement.



REAR BRAKE

Check the rear brake pads for wear. Replace the brake pads if the wear limit indicator mark (lug end) on the caliper aligns with the reference mark on the caliper bracket when the rear brake is applied.

Refer to page 19-9 for rear brake pad replacement.



BRAKE LIGHT SWITCH

NOTE:

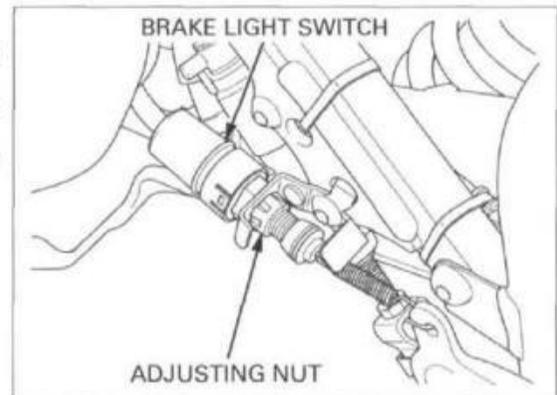
- The front brake light switch cannot be adjusted. If the front brake light switch actuation and brake engagement are off, either replace the switch unit or the malfunctioning parts of the system.

Remove the right mud guard (page 3-3).

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

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

Hold the switch body and turn the adjusting nut. Do not turn the switch body.



BRAKE SYSTEM

HYDRAULIC SYSTEM INSPECTION

Firmly apply the brake lever or pedal and check that no air has entered the system.

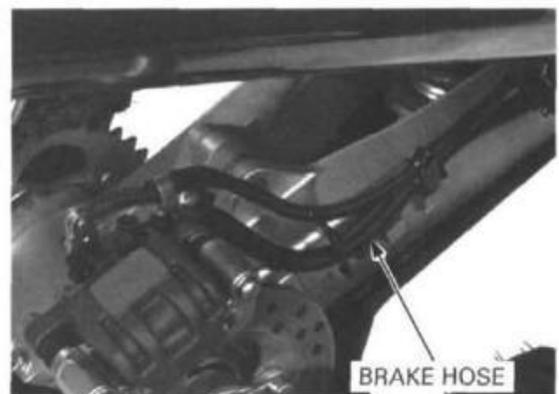
If the brake lever or pedal feels soft or spongy when operated, bleed the system.

Refer to page 19-6 for air bleeding procedures.

Inspect the brake hoses and fittings for deterioration, cracks, damage or signs of leakage.

Tighten any loose fittings.

Replace hoses, pipes and fittings as required.



PARKING BRAKE ADJUSTMENT

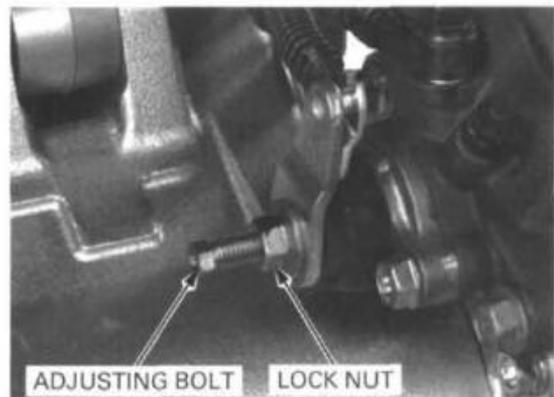
Slide the dust cover off the lever bracket.

To adjust the clutch lever free play to more than 30 mm (1-1/4 in), loosen the lock nut at the clutch lever and turn the adjuster all the way in.



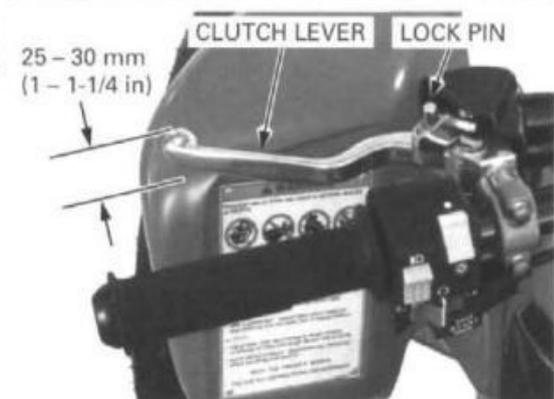
Loosen the lock nut at the parking brake arm and turn the adjusting bolt clockwise until bolt resistance is felt. Then turn the adjusting bolt 1/8 turn counterclockwise and tighten the lock nut while holding the adjusting bolt.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)



Squeeze the clutch lever while pushing the brake lock pin down until firm resistance is felt and measure the parking brake cable free play at the end of the clutch lever.

FREE PLAY: 25 – 30 mm (1 – 1-1/4 in)



To adjust the free play, loosen the lock nut and turn the adjuster at the parking brake arm on the clutch lever bracket.

Tighten the lock nut securely while holding the adjuster.

Adjust the clutch lever free play (page 4-29).

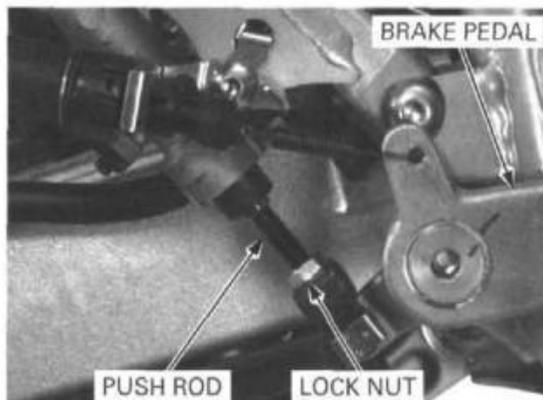


BRAKE PEDAL HEIGHT ADJUSTMENT

Remove the right mud guard (page 3-3).

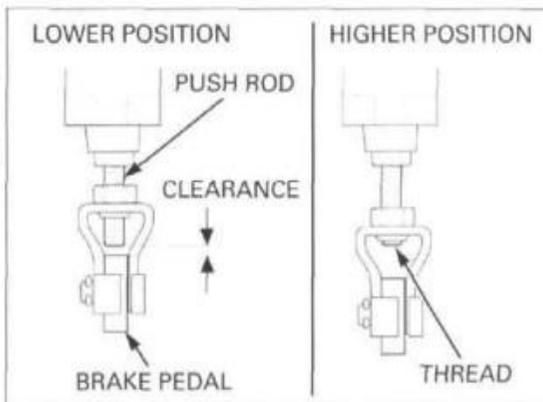
Loosen the lock nut and turn the rear master cylinder push rod to obtain the desired pedal height. Tighten the lock nut after adjustment.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)



If the brake pedal is adjusted to the lower position, make sure that the clearance between the lower end of the push rod and the brake pedal does not fall below 1 mm (0.04 in).

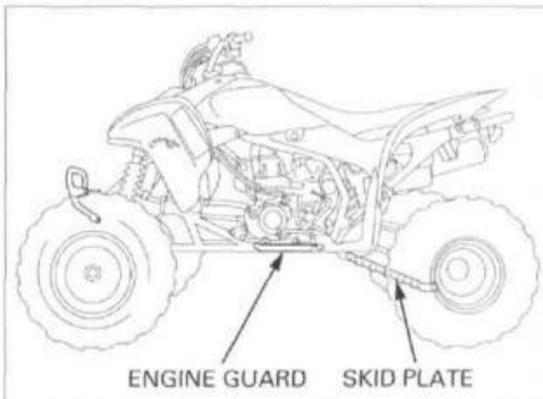
If the brake pedal is adjusted to the higher position, make sure that the lower end of the push rod thread is visible inside the joint.



SKID PLATE, ENGINE GUARD

Check the skid plate and engine guard for cracks, damage or looseness.

Tighten any loose fasteners. Replace the skid plate and engine guard as required.

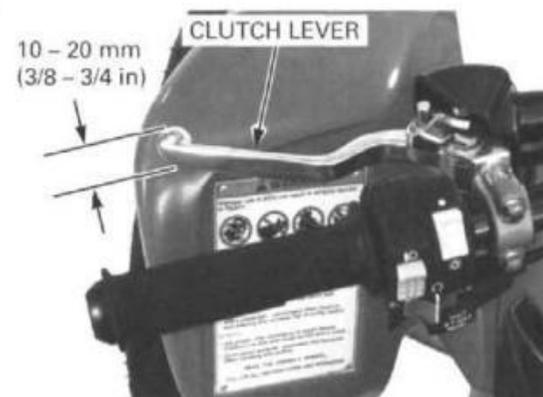


CLUTCH SYSTEM

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

Measure the clutch lever free play at the lever end.

FREE PLAY: 10 – 20 mm (3/8 – 3/4 in)



MAINTENANCE

Minor adjustments are made at the clutch lever. Slide the dust cover off the lever bracket, loosen the lock nut and turn the adjuster. Tighten the lock nut securely.

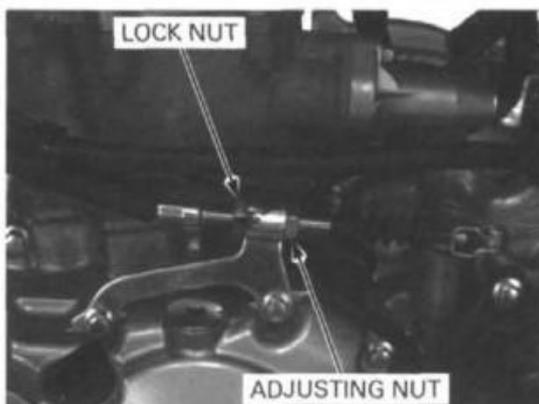
If the adjuster is threaded out near its limit and the correct free play cannot be obtained, turn the adjuster all the way in and back out one turn. Tighten the lock nut securely, install the dust cover and make a major adjustment described below.



Major adjustments are made with the lower adjusting nut at the engine. Loosen the lock nut and turn the adjusting nut. Tighten the lock nut securely while holding the adjusting nut.

Check the clutch operation.

If the correct free play cannot be obtained or the clutch slips during test ride, disassemble and inspect the clutch ('04 - '05: page 13-5, After '05: page 14-6).



SUSPENSION

FRONT SUSPENSION INSPECTION

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

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

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

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.



REAR SUSPENSION INSPECTION

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

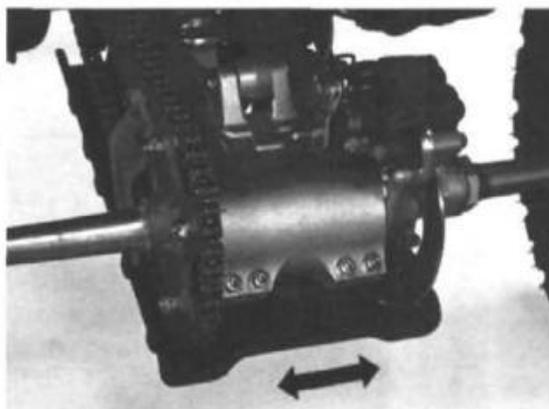
Check the entire shock absorber assembly for signs of leaks, damage or loose fasteners.

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

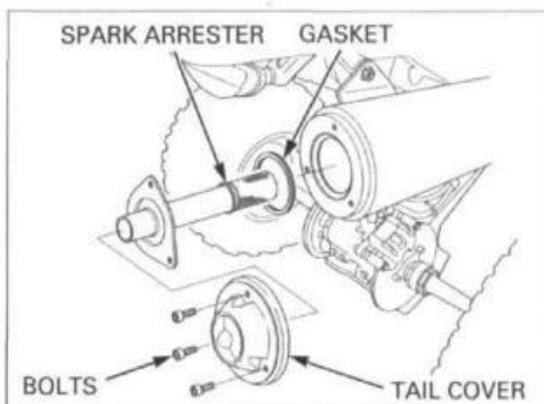


Raise the rear wheels off the ground and support the vehicle securely.
 Check for worn swingarm bearings by grabbing the swingarm and attempting to move it to side to side.
 Replace the bearings if any looseness is noted (page 18-7).



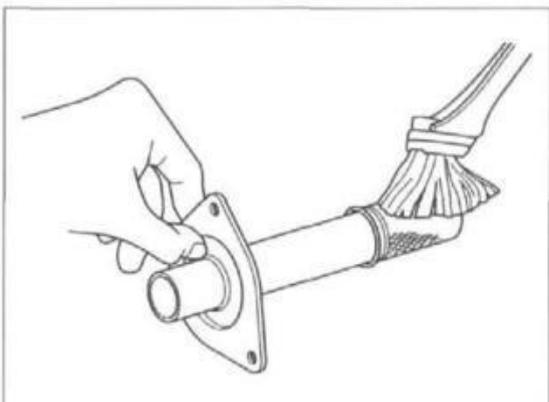
SPARK ARRESTER

Remove the three bolts, muffler tail cover and the spark arrester with the gasket.



Use a brush to remove carbon deposits from the screen mesh, being careful not to damage the screen mesh.
 The screen mesh must be free of breaks and holes.
 Replace the spark arrester if necessary.

Install a new gasket onto the spark arrester.
 Install the spark arrester and muffler tail cover, and tighten the bolts securely.



NUTS, BOLTS, FASTENERS

Check that all chassis nuts and bolts are tightened to their correct torque values (page 1-16).
 Check that all cotter pins, safety clips, hose clamps and cable stays are in place and properly secured.

WHEELS/TIRES

Tire pressure should be checked when the tires are cold. Check the tire pressure with the tire pressure gauge.

'04 - '05: **RECOMMENDED TIRE PRESSURE:**

Front: Standard: 27.5 kPa (0.275 kg/cm², 4.0 psi)
Minimum: 23.5 kPa (0.235 kg/cm², 3.4 psi)
Maximum: 31.5 kPa (0.315 kg/cm², 4.6 psi)
Rear: Standard: 32.5 kPa (0.325 kg/cm², 4.7 psi)
Minimum: 28.5 kPa (0.285 kg/cm², 4.1 psi)
Maximum: 36.5 kPa (0.365 kg/cm², 5.3 psi)

After '05: **RECOMMENDED TIRE PRESSURE:**

Front: Standard: 27.5 kPa (0.275 kg/cm², 4.0 psi)
Minimum: 25.0 kPa (0.250 kg/cm², 3.6 psi)
Maximum: 30.0 kPa (0.300 kg/cm², 4.4 psi)
Rear: Standard: 32.5 kPa (0.325 kg/cm², 4.7 psi)
Minimum: 30.0 kPa (0.300 kg/cm², 4.3 psi)
Maximum: 35.0 kPa (0.350 kg/cm², 5.1 psi)

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

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

MINIMUM TREAD DEPTH (Front/rear):
4.0 mm (0.16 in)



STEERING HEAD BEARING

Raise the front wheels off the ground and support the vehicle securely.

Check that the handlebar moves freely from side to side.

If the handlebar moves unevenly, binds, or has horizontal movement, inspect the steering shaft bearing (page 17-24).



STEERING SHAFT HOLDER BEARING

Raise the front wheels off the ground and support the vehicle securely.

Check that the handlebar moves freely from side to side.

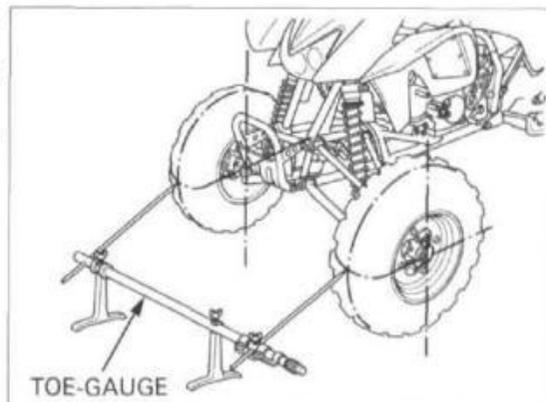
If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering shaft holder bushing (page 17-24).



STEERING SYSTEM

Place the vehicle on a level surface with the front wheels facing straight ahead.
Mark the centers of the tires with chalk to indicate the axle center height.

Align the gauge with the marks on the tires as shown.



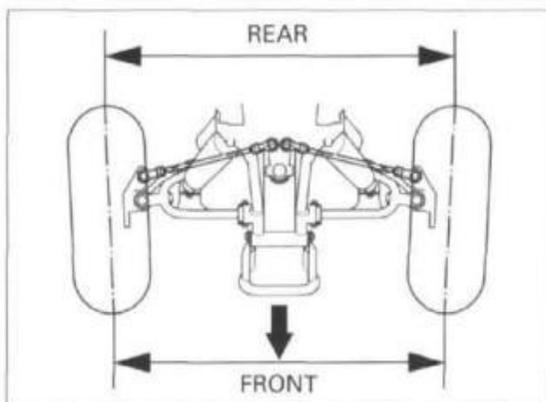
Slowly move the vehicle back until the wheels have turned 180° so the marks on the tires are aligned with the gauge height on the rear side.
Measure the toe on the rear part of the tires at the same points with no load on the vehicle.

'04 - '05: **Toe-in: 11.4 ± 15 mm (0.45 ± 0.6 in)**

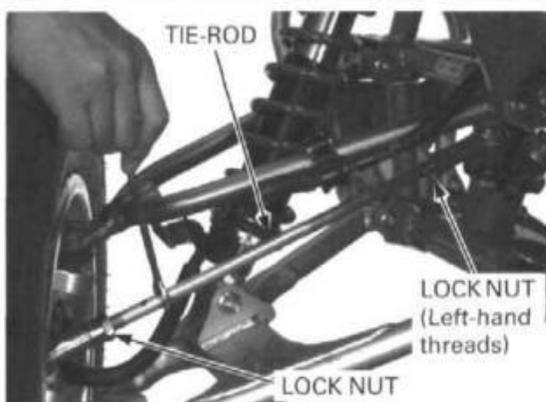
After '05: **Toe-in: 14 ± 15 mm (0.6 ± 0.6 in)**

NOTE:

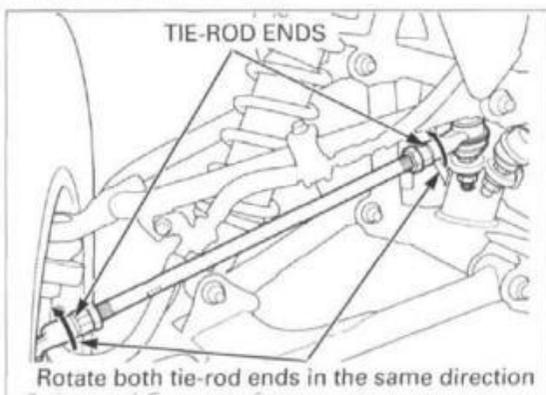
- Toe-in means the rear measurement is greater than the front measurement.



When the toe is out of specification, adjust it by changing the length of the tie-rods equally by loosening the lock nuts and turning the tie-rods while holding the ball joints.



After adjusting each tie-rod, rotate both tie-rod ends in the same direction, along the tie-rod axis, until they stop against the ball joint stud.



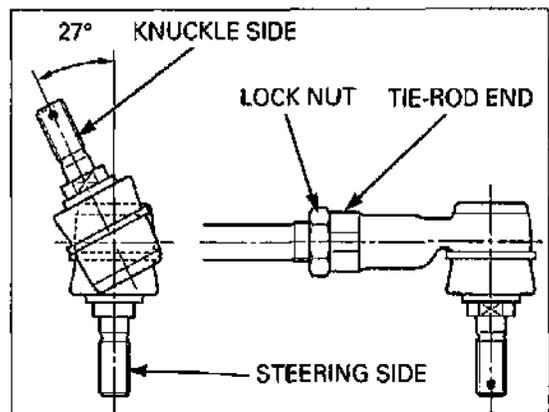
MAINTENANCE

Using a 17 mm wrench, hold the tie-rod ends so that the relative angle of both tie-rods may turn into 27 degrees. Then, using a suitable torque wrench, tighten the tie-rod lock nuts, making sure not to force the tie-rod ends against the ball joint studs.

TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)

After tightening the lock nuts, rotate the tie-rods to make sure the ball joints have operate properly and have an equal range of movement.

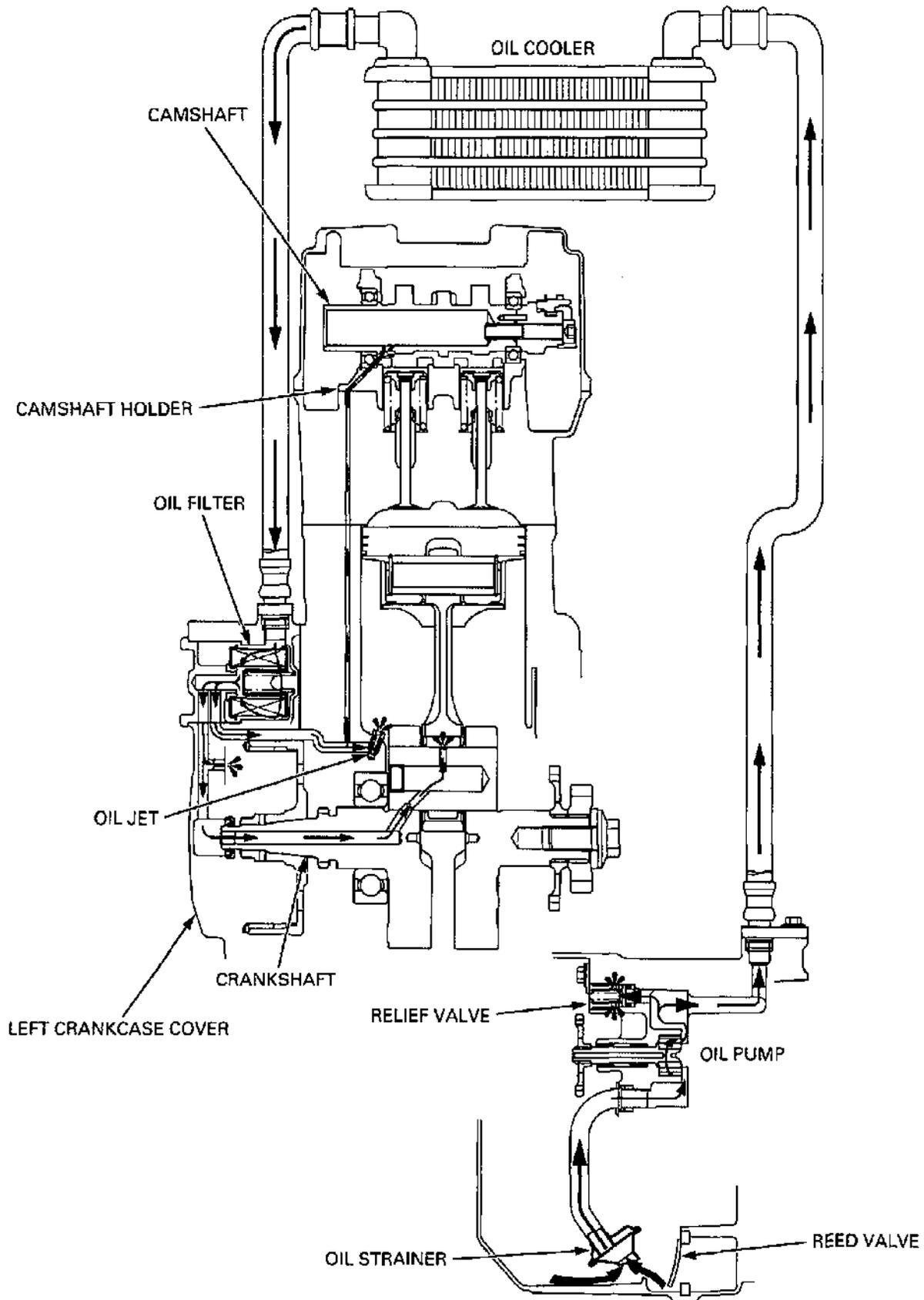
Raise the wheel off the ground and check the hub, knuckle bearings or tie-rod ball joints for excessive play or abnormal noise.



5. LUBRICATION SYSTEM ('04 – '05)

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

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.

- This section covers service of the oil pump and oil cooler.
- The crankcase must be separated to service the oil pump (page 15-11).
- For engine oil level check, oil change and filter replacement (page 4-14).
- For transmission oil level check and oil change (page 4-17).

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	0.78 liter (0.82 US qt, 0.67 Imp qt)	-
	After filter change	0.82 liter (0.87 US qt, 0.72 Imp qt)	-
	After disassembly	1.20 liter (1.27 US qt, 1.06 Imp qt)	-
Recommended engine oil		Pro Honda GN4, HP4 (without molybdenum additives) 4-stroke oil or HP4M (with molybdenum additives) 4-stroke oil, or equivalent motor oil API service classification: SG or Higher JASO T 903 standard: MA or MB Viscosity: SAE 10W-40, 5W-30	-
Transmission oil capacity	After draining	0.55 liter (0.58 US qt, 0.48 Imp qt)	-
	After disassembly	0.65 liter (0.69 US qt, 0.57 Imp qt)	-
Recommended transmission oil		Pro Honda GN4 or HP4 (without molybdenum additives) 4-stroke oil or equivalent motor oil API service classification: SG or Higher JASO T 903 standard: MA Viscosity: SAE 10W-40, 5W-30	-
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 - 0.21 (0.006 - 0.008)	-
	Side clearance	0.05 - 0.13 (0.002 - 0.005)	-

TORQUE VALUES

Front brake 3-way joint mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Front brake pipe clamp mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)

ALOC bolt: replace with a new one.

TROUBLESHOOTING

Engine oil level too low

- Normal oil consumption
- External oil leak
- Worn piston rings or incorrect piston ring installation
- Worn cylinder
- Worn valve guides or stem seals

Engine oil contamination

- Oil or filter not changed often enough
- Worn piston rings or incorrect piston ring installation
- Worn valve guides or stem seals
- Clogged oil strainer screen

Engine oil emulsification

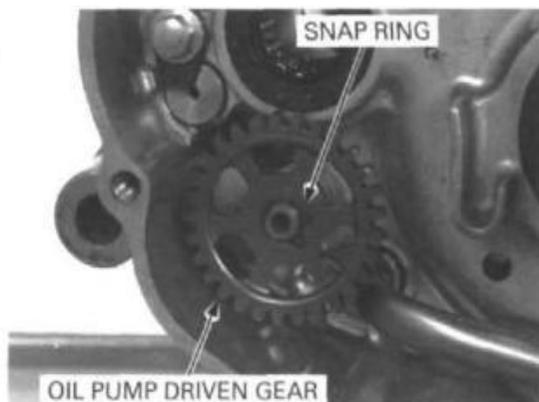
- Blown cylinder head gasket
- Leaky coolant passage
- Water entry

OIL STRAINER/PRESSURE RELIEF VALVE

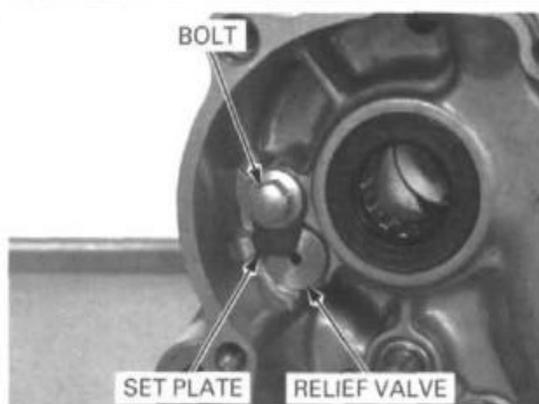
REMOVAL

Remove the balancer shaft (page 15-7).

Remove the snap ring and oil pump driven gear from the oil pump shaft.



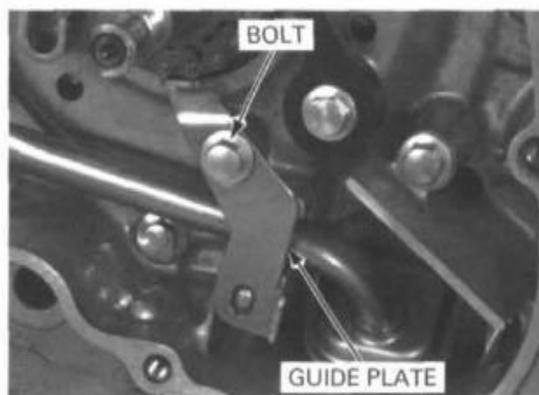
Remove the bolt, set plate and the engine oil pressure relief valve.



Check the operation of the pressure relief valve by pushing on the piston.

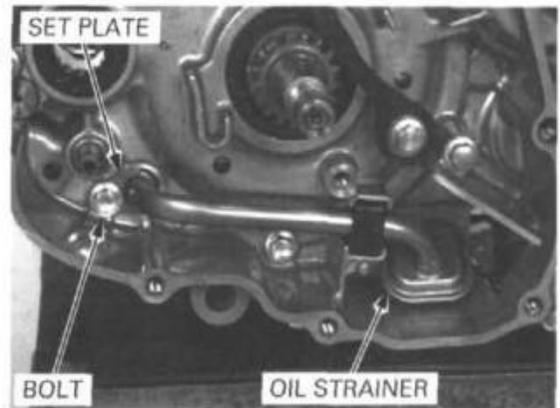


Remove the bolt and guide plate.



Remove the bolt, set plate and the oil strainer.

Remove the grommet and seal ring from the oil pipe of the strainer.

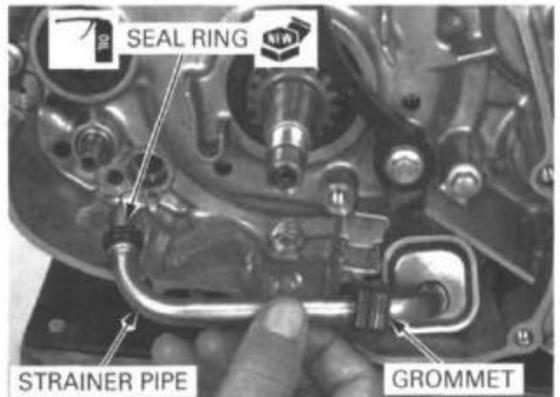


Clean the oil strainer screen.
Check the oil strainer screen for damage.

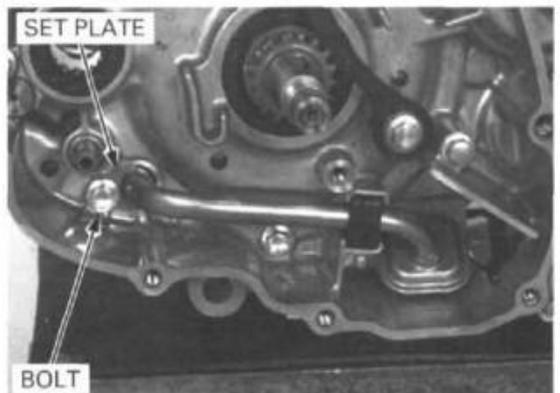


INSTALLATION

Install the grommet onto the oil strainer pipe.
Coat a new seal ring with oil and install it onto the oil pipe.

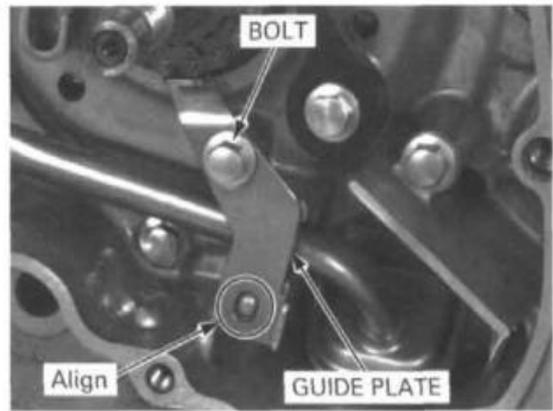


Install the oil strainer onto the left crankcase.
Install the set plate and tighten the bolt securely.



LUBRICATION SYSTEM ('04 - '05)

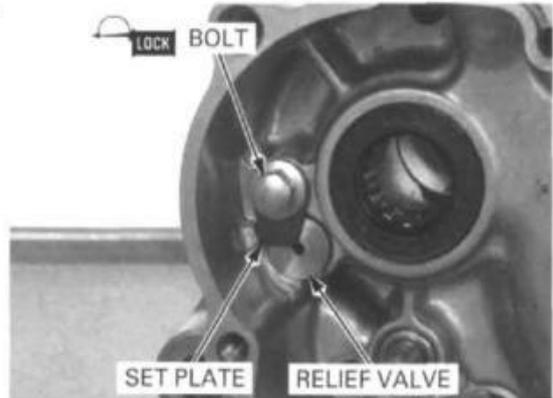
Install the guide plate by aligning the hole with the boss and tighten the bolt securely.



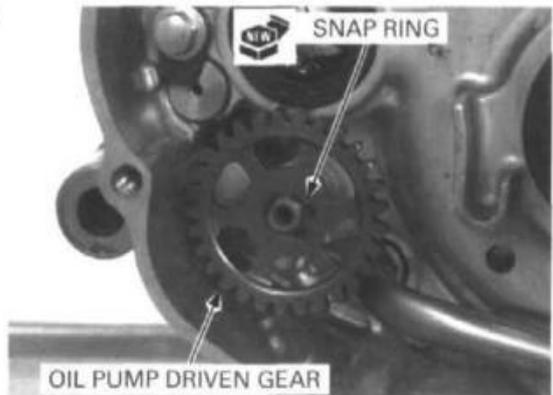
Coat a new O-ring with oil and install it into the pressure relief valve groove.



Install the pressure relief valve into the left crankcase.
Apply locking agent to the bolt threads.
Install the set plate and tighten the bolt securely.



Install the oil pump driven gear and new snap ring onto the oil pump shaft.
Install the balancer (page 15-9).



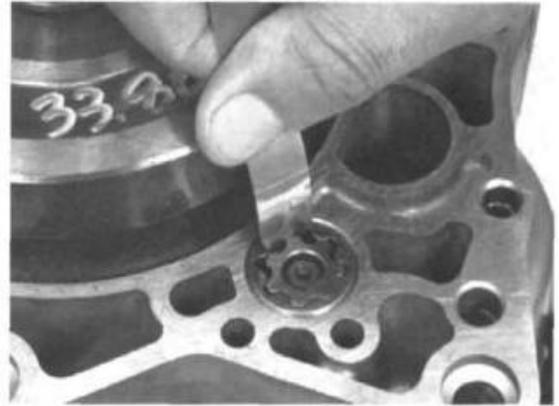
OIL PUMP

INSPECTION

Separate the crankcase (page 15-11).

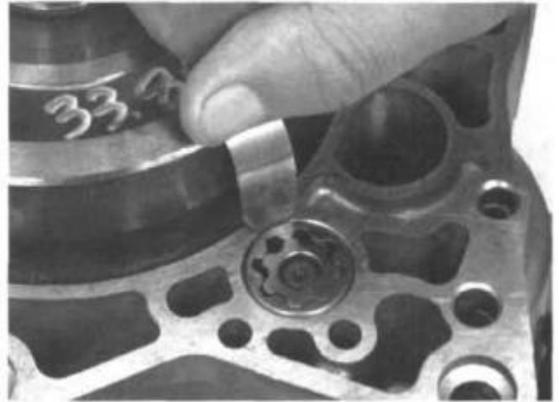
Measure the rotor tip clearance.

SERVICE LIMIT: 0.20 mm (0.008 in)



Measure the pump body clearance.

STANDARD: 0.15 - 0.21 mm (0.006 - 0.008 in)



Measure the oil pump side clearance.

STANDARD: 0.05 - 0.13 mm (0.002 - 0.005 in)

Assemble the crankcase (page 15-25).

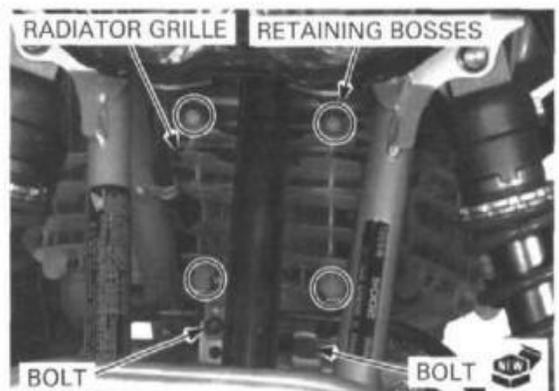


OIL COOLER

INSPECTION

Remove the front brake 3-way joint and hose clamp mounting bolts.

Remove the radiator grille by releasing the four retaining bosses from the grommets in the frame.



LUBRICATION SYSTEM ('04 - '05)

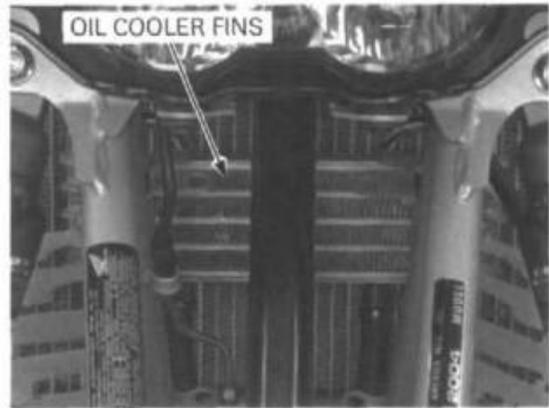
Check the oil cooler hose joints and seams for leaks. Check the oil cooler air passage for clogging or damage.

Straighten bent fins using a small flat blade screwdriver and remove insects, mud or other obstructions with compressed air or low pressure water.

Replace the brake hose clamp bolt with a new one.

Install the removed parts in the reverse order of removal.

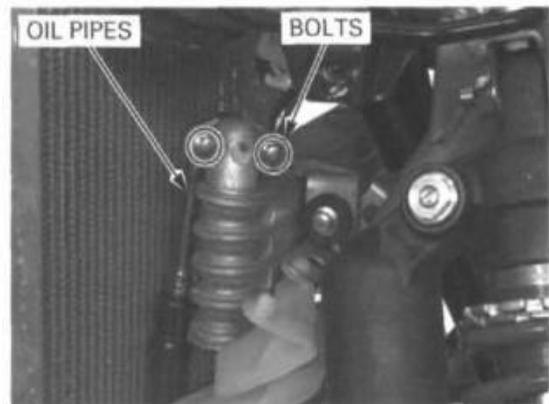
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



REMOVAL

Remove both front fenders (page 3-6).

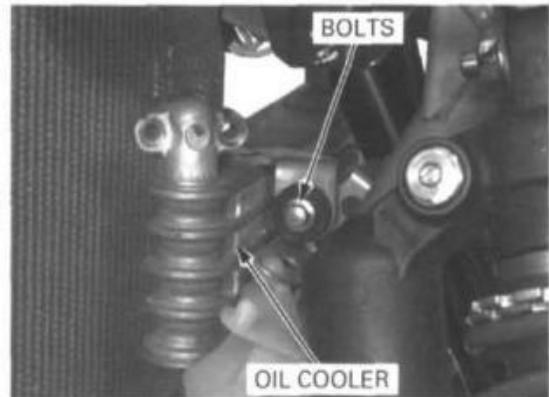
Remove the four bolts, oil pipe joints and O-rings from the oil cooler.



Remove the two mounting bolts and the oil cooler from the frame by releasing the mounting boss from the grommet.

INSTALLATION

Install the oil cooler onto the frame by aligning the mounting boss with the grommet and tighten the mounting bolts securely.



Coat new O-rings with oil and install them onto the oil pipe joints.

Install the oil pipe joints onto the oil cooler and tighten the bolts securely.

Install the removed parts in the reverse order of removal.

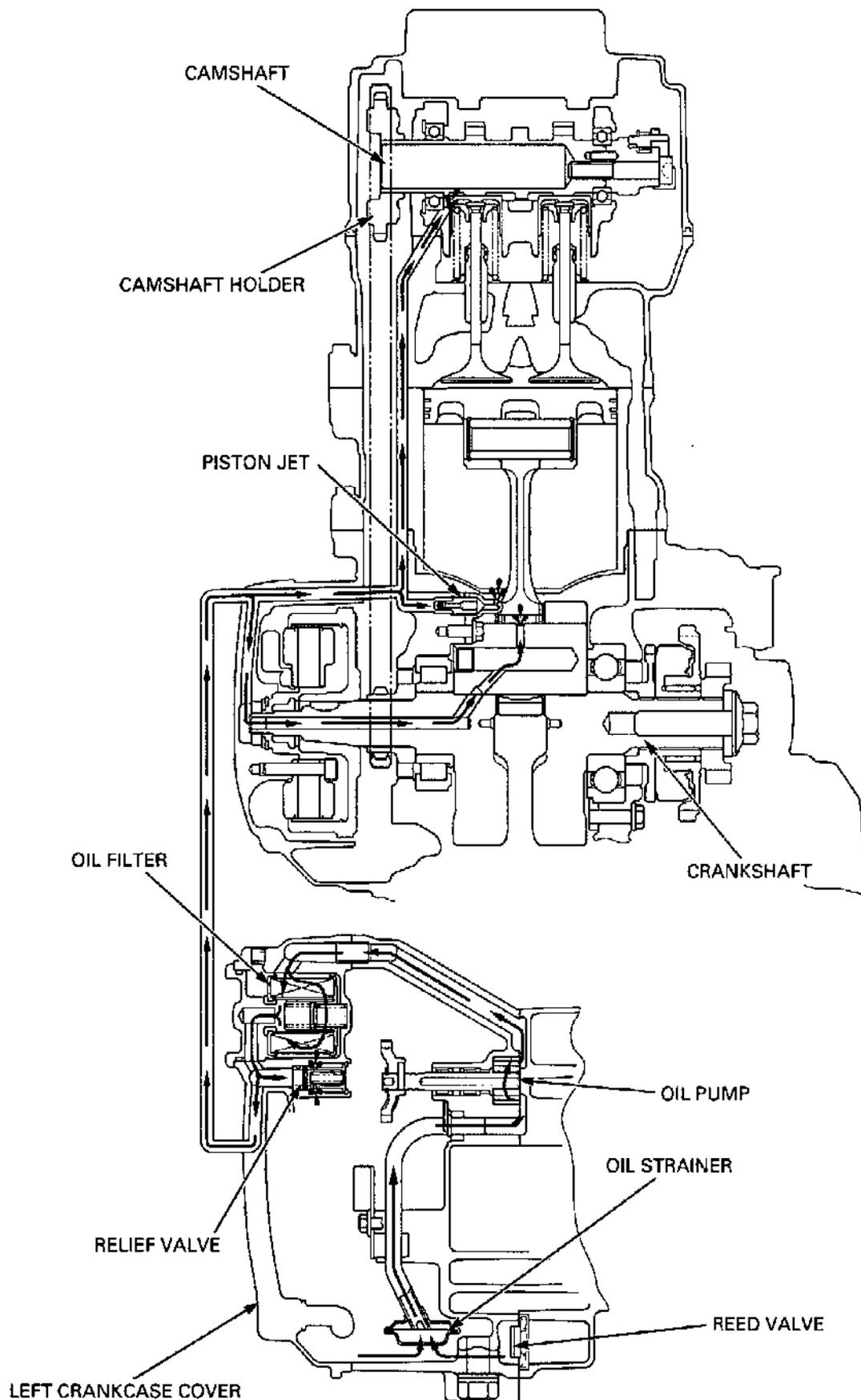
Check the oil level and add the recommended oil if the level is low (page 4-14).



6. LUBRICATION SYSTEM (After '05)

LUBRICATION SYSTEM DIAGRAM	6-2	PRESSURE RELIEF VALVE	6-7
SERVICE INFORMATION	6-3	PISTON JET	6-8
TROUBLESHOOTING	6-4	OIL PUMP.....	6-9
OIL STRAINER	6-5		

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.

- This section covers service of the oil pump.
- The crankcase must be separated to service the oil pump (page 16-11).
- For engine oil level check, oil change and filter replacement (page 4-14).
- For transmission oil level check and oil change (page 4-17).

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	0.65 liter (0.69 US qt, 0.57 Imp qt)	-
	After filter change	0.69 liter (0.73 US qt, 0.61 Imp qt)	-
	After disassembly	0.85 liter (0.90 US qt, 0.75 Imp qt)	-
Recommended engine oil		Pro Honda GN4, HP4 (without molybdenum additives) 4-stroke oil or HP4M (with molybdenum additives) 4-stroke oil, or equivalent motor oil API service classification: SG or Higher JASO T 903 standard: MA or MB Viscosity: SAE 10W-40, 5W-30	-
Transmission oil capacity	After draining	0.68 liter (0.72 US qt, 0.60 Imp qt)	-
	After disassembly	0.80 liter (0.85 US qt, 0.70 Imp qt)	-
Recommended transmission oil		Pro Honda GN4 or HP4 (without molybdenum additives) 4-stroke oil or equivalent motor oil API service classification: SG or Higher JASO T 903 standard: MA Viscosity: SAE 10W-40, 5W-30	-
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 - 0.21 (0.006 - 0.008)	-
	Side clearance	0.04 - 0.13 (0.002 - 0.005)	-

TORQUE VALUES

Piston jet mounting bolt

10 N·m (1.0 kgf·m, 7 lbf·ft)

Apply locking agent to the threads.

TROUBLESHOOTING

Engine oil level too low

- Normal oil consumption
- External oil leak
- Worn piston rings or incorrect piston ring installation
- Worn cylinder
- Worn valve guides or stem seals

Engine oil contamination

- Oil or filter not changed often enough
- Worn piston rings or incorrect piston ring installation
- Worn valve guides or stem seals
- Clogged oil strainer screen

Engine oil emulsification

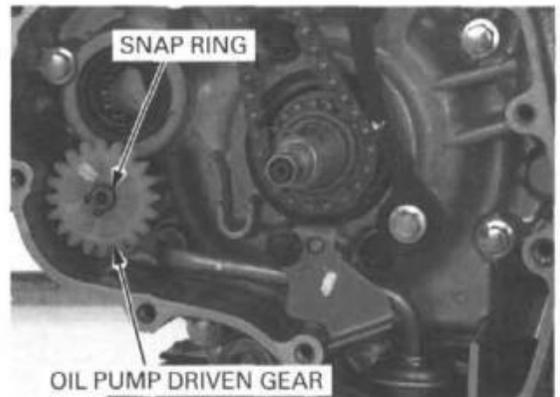
- Blown cylinder head gasket
- Leaky coolant passage
- Water entry

OIL STRAINER

REMOVAL

Remove the balancer shaft (page 16-7).

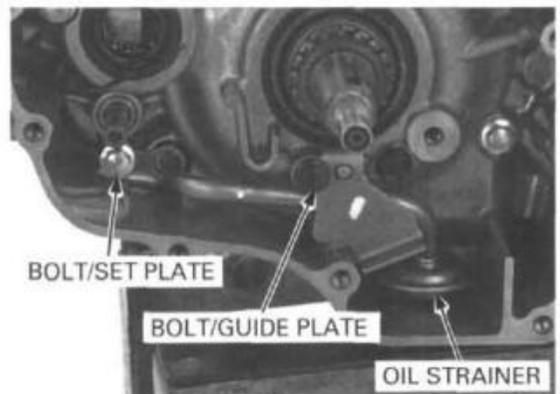
Remove the snap ring from the oil pump driven gear.



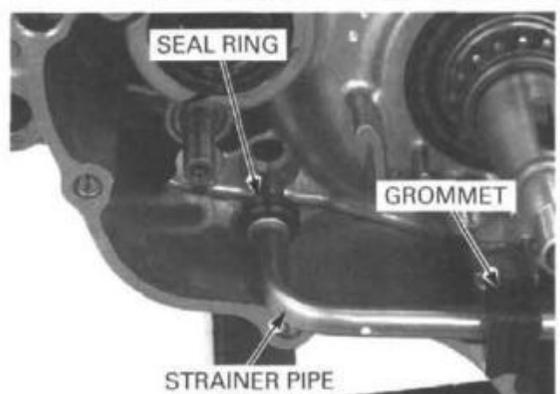
Remove the oil pump driven gear and drive pin.



Remove the bolts, guide plate, set plate and the oil strainer.

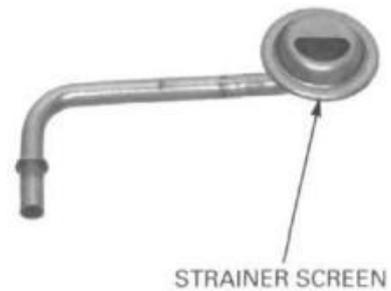


Remove the grommet and seal ring from the oil pipe of the strainer.



LUBRICATION SYSTEM (After '05)

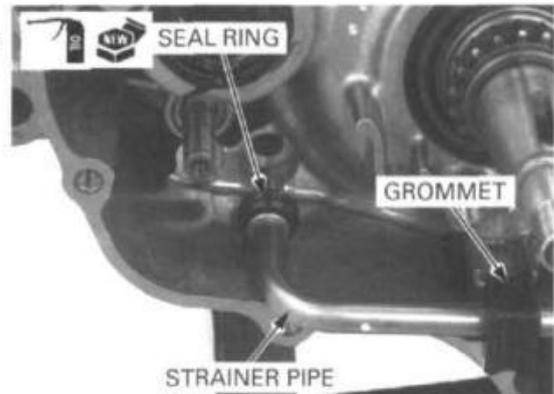
Clean the oil strainer screen.
Check the oil strainer screen for damage.



INSTALLATION

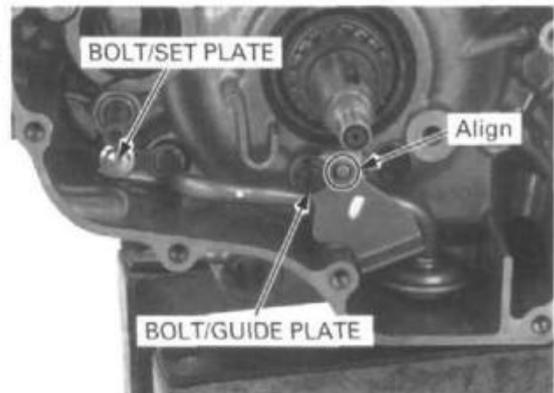
Install the grommet onto the oil strainer pipe.
Coat a new seal ring with oil and install it onto the oil pipe.

Install the oil strainer onto the left crankcase.

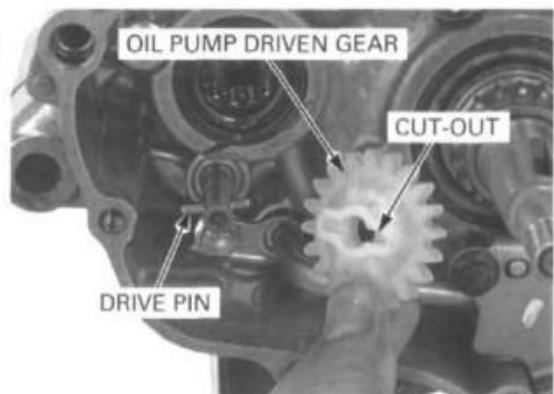


Install the set plate and tighten the bolt securely.

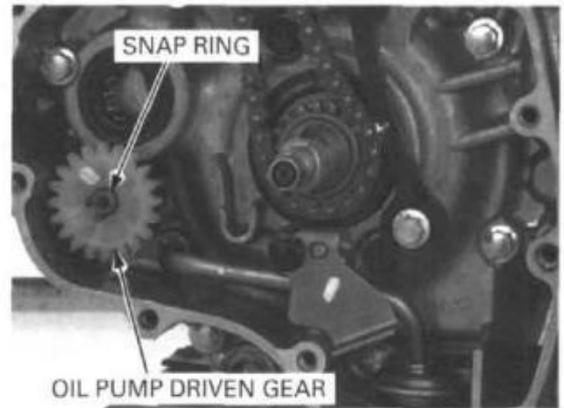
Install the guide plate by aligning the hole with the boss and tighten the bolt securely.



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



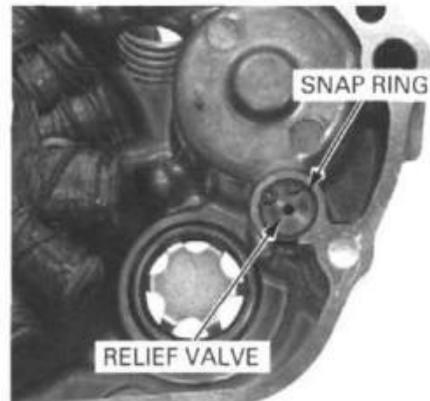
Install a new snap ring onto the oil pump shaft.
Install the balancer (page 16-8).



PRESSURE RELIEF VALVE

REMOVAL/INSPECTION

Remove the left crankcase cover (page 21-11).
Remove the snap ring and pressure relief valve from the left crankcase cover.



Check the pressure relief valve for damage or clogs.



INSTALLATION

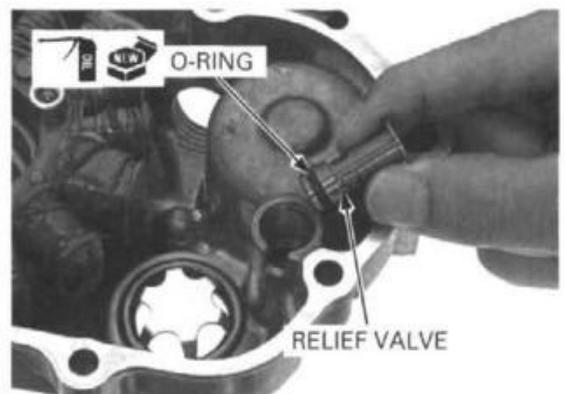
Apply oil to a new O-ring and install it onto the pressure relief valve.

Install the pressure relief valve into the left crankcase cover.

Install the snap ring securely.

Install the left crankcase cover (page 21-13).

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



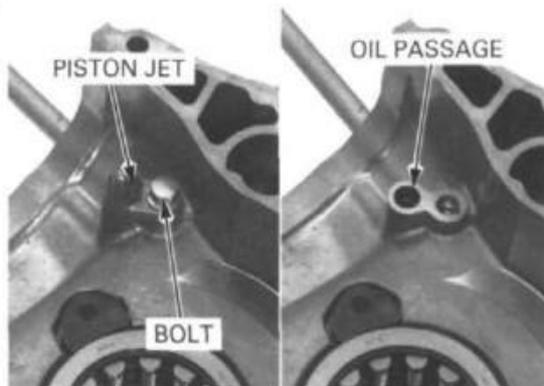
PISTON JET

REMOVAL/INSPECTION

Separate the left and right crankcase halves (page 16-11).

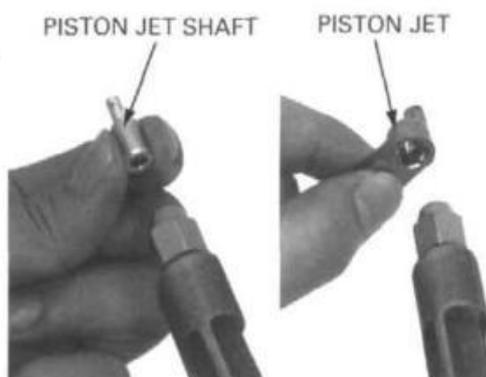
Remove the bolt and piston jet from the left crankcase.

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



Remove the piston jet shaft from the piston jet.

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



INSTALLATION

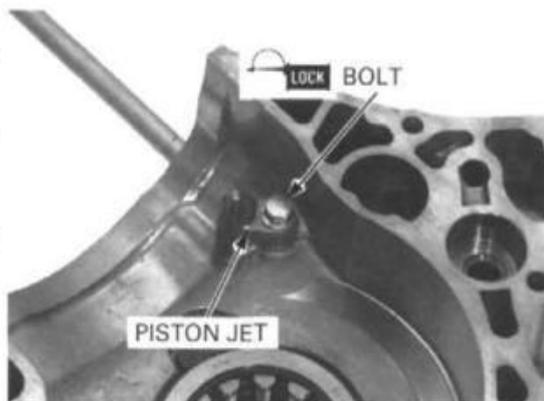
Install the piston jet shaft to the piston jet.

Install the piston jet onto the left crankcase and tighten the bolt.

Apply locking agent to the piston 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 halves (page 16-25).



OIL PUMP

INSPECTION

Separate the left and right crankcase halves (page 16-11).

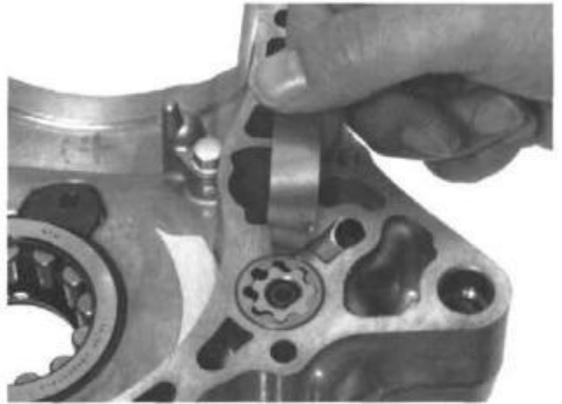
Measure the rotor tip clearance.

SERVICE LIMIT: 0.20 mm (0.008 in)



Measure the pump body clearance.

STANDARD: 0.15 – 0.21 mm (0.006 – 0.008 in)

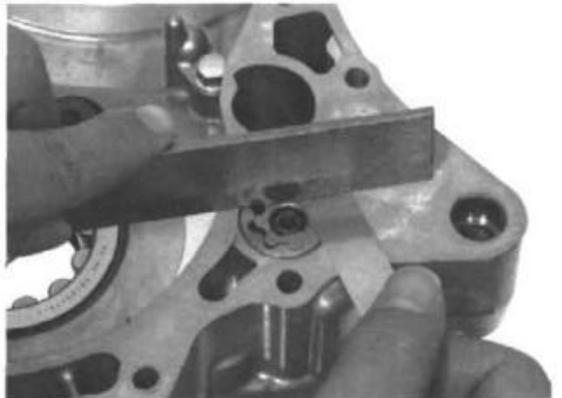


Measure the clearance with the gasket installed.

Measure the oil pump side clearance.

STANDARD: 0.04 – 0.13 mm (0.002 – 0.005 in)

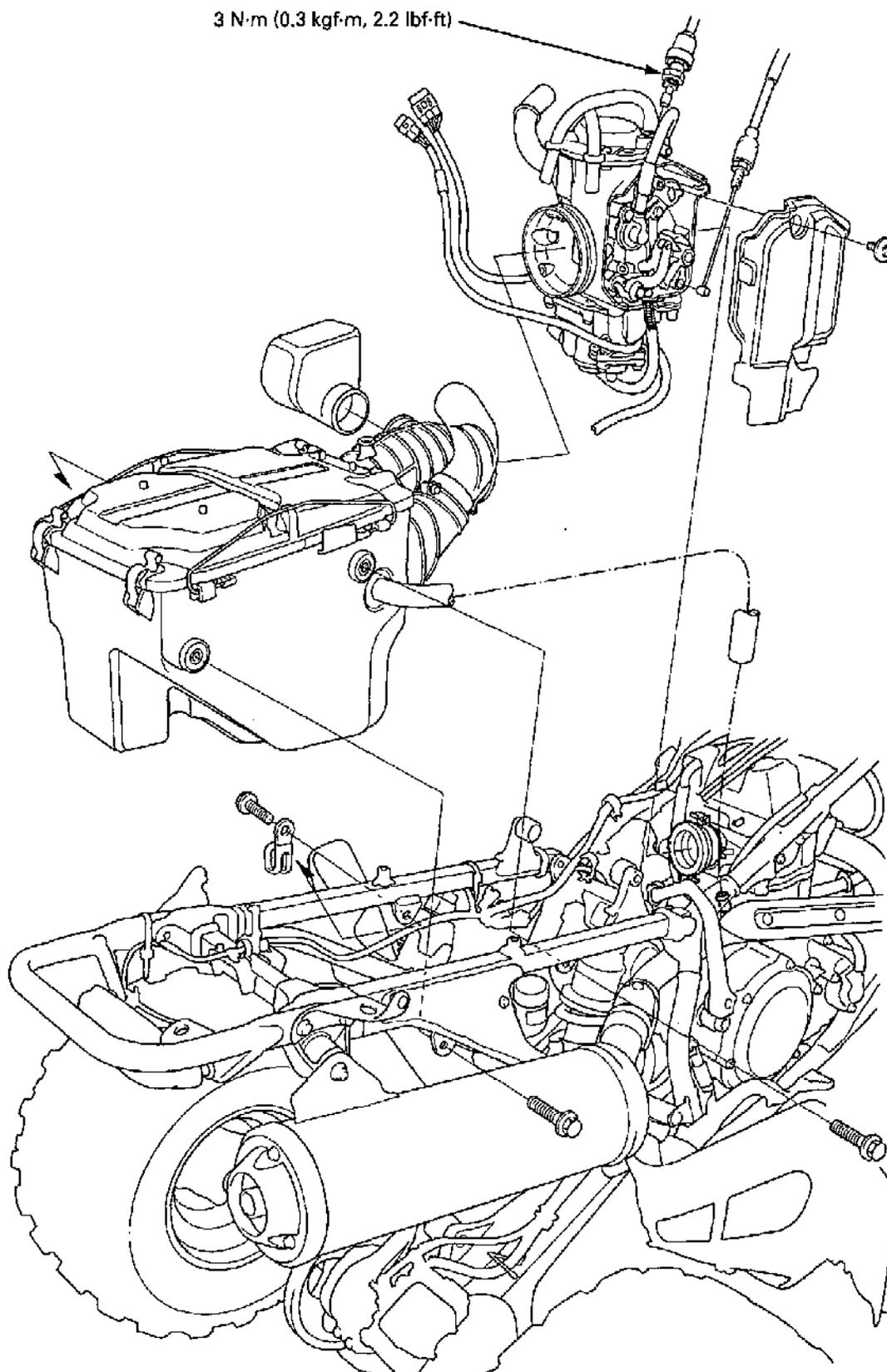
Assemble the left and right crankcase halves (page 16-25).



7. FUEL SYSTEM ('04 – '05)

SYSTEM COMPONENTS	7-2	CARBURETOR DISASSEMBLY.....	7-8
SERVICE INFORMATION	7-3	CARBURETOR ASSEMBLY.....	7-14
TROUBLESHOOTING	7-4	CARBURETOR INSTALLATION	7-21
AIR CLEANER HOUSING	7-5	PILOT SCREW ADJUSTMENT.....	7-23
CARBURETOR REMOVAL.....	7-6		

SYSTEM COMPONENTS



SERVICE INFORMATION

GENERAL

- Bending or twisting the control cable will impair smooth operation and could cause the cable to stick or bind, resulting in loss of vehicle control.
- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.
- When disassembling the fuel system parts, note the locations of the O-rings. Replace them with new ones on reassembly.
- Before removing the carburetor, place an approved gasoline container under the carburetor drain hose, loosen the drain screw and drain the carburetor.
- After removing the carburetor, wrap the intake port of the engine with a shop towel or cover it with pieces of tape to prevent any foreign material from dropping into the engine.
- If the vehicle is to be stored for more than one month, drain the float chamber. Fuel left in the float chamber may cause clogged jets, resulting in hard starting or poor driveability.
- For fuel tank removal and installation (page 3-9).
- For throttle position sensor service (page 20-20).

SPECIFICATIONS

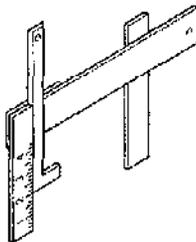
ITEM	SPECIFICATIONS
Carburetor identification number	QA16A
Main jet	#118
Slow jet	#48
Pilot screw opening	See page 7-23
Float level	15.9 mm (0.63 in)
Idle speed	1,600 ± 100 rpm
Throttle grip free play	3 - 8 mm (1/8 - 5/16 in)
Hot starter lever free play	2 - 3 mm (1/16 - 1/8 in)

TORQUE VALUES

Starting enrichment (SE) valve nut	3 N·m (0.3 kgf·m, 2.2 lbf·ft)
Hot start valve nut	3 N·m (0.3 kgf·m, 2.2 lbf·ft)

TOOL

Carburetor float level gauge
07401-0010000



TROUBLESHOOTING

Engine cranks but won't start

- No fuel in tank
- No fuel to carburetor
 - Clogged fuel strainer
 - Clogged fuel line
 - Clogged fuel tank breather hose
- Too much fuel getting to the engine
 - Clogged air cleaner
 - Flooded carburetor
- Intake air leak
- Contaminated/deteriorated fuel
 - Clogged jets
- Clogged starting enrichment (SE) valve circuit
- Improper choke operation
- Improper throttle operation
- No spark at plug (faulty ignition system – page 20-5)

Lean mixture

- Clogged fuel jets
- Faulty float valve
- Float level too low
- Restricted fuel line
- Clogged carburetor air vent hose
- Restricted fuel tank breather hose
- Intake air leak
- Faulty throttle valve

Rich mixture

- SE valve open
- Clogged air jets
- Faulty float valve
- Float level too high
- Dirty air cleaner
- Worn jet needle or needle jet

Engine stalls, hard to start, rough idling

- Restricted fuel line
- Fuel mixture too lean/rich
- Contaminated/deteriorated fuel
 - Clogged jets
- Intake air leak
- Misadjusted idle speed
- Restricted fuel tank breather hose
- Dirty air cleaner
- Misadjusted pilot screw
- Clogged slow circuit or SE valve circuit
- Faulty ignition system (page 20-5)

Afterburn when engine braking is used

- Lean mixture in slow circuit
- Faulty ignition system (page 20-5)

Backfiring or misfiring during acceleration

- Lean mixture
- Faulty ignition system (page 20-5)

Poor performance (driveability) and poor fuel economy

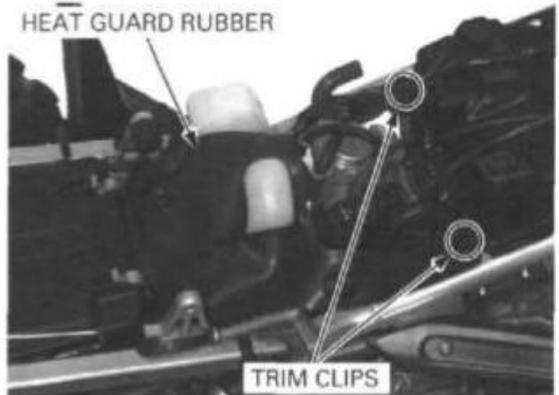
- Clogged fuel system
- Faulty ignition system (page 20-5)

AIR CLEANER HOUSING

REMOVAL/INSTALLATION

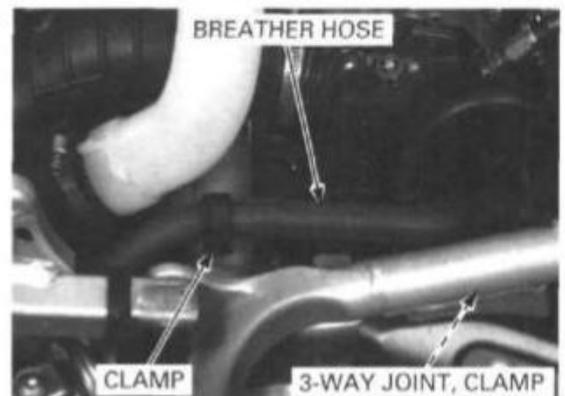
Remove the fuel tank (page 3-9).

Remove the two trim clips and heat guard rubber.

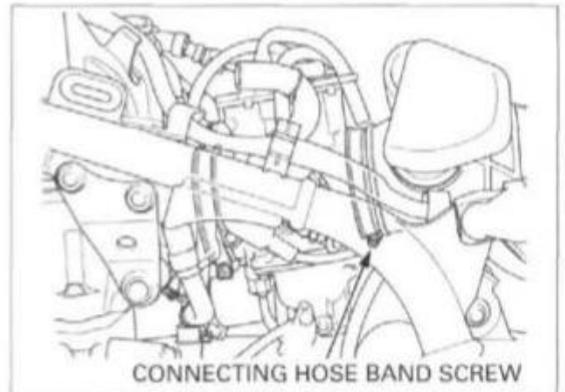


Disconnect the crankcase breather hose from the 3-way joint.

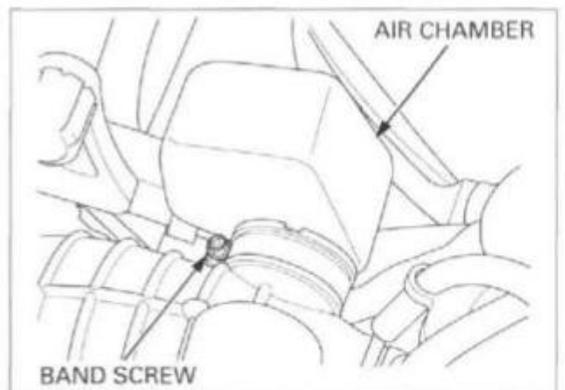
Remove the breather hose from the clamps.



Loosen the connecting hose band screw.



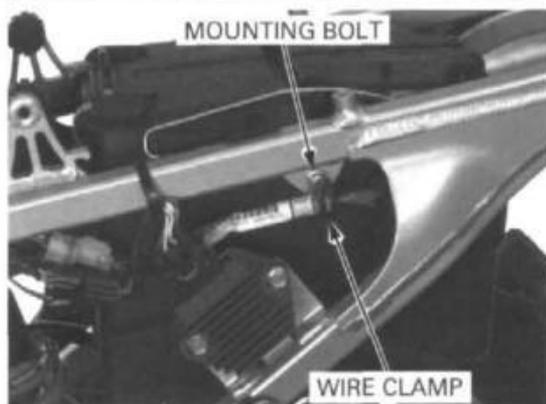
Loosen the band screw and remove the air chamber from the connecting hose.



FUEL SYSTEM ('04 – '05)

Remove the three mounting bolts, wire clamp and the air cleaner housing from the frame.

Installation is in the reverse order of removal.



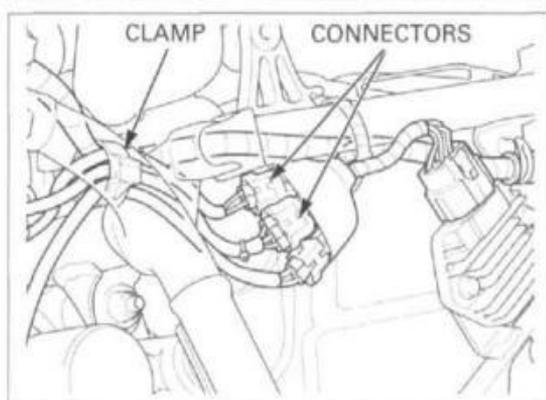
CARBURETOR REMOVAL

Remove the fuel tank (page 3-9).

Disconnect the drain hose from the carburetor.



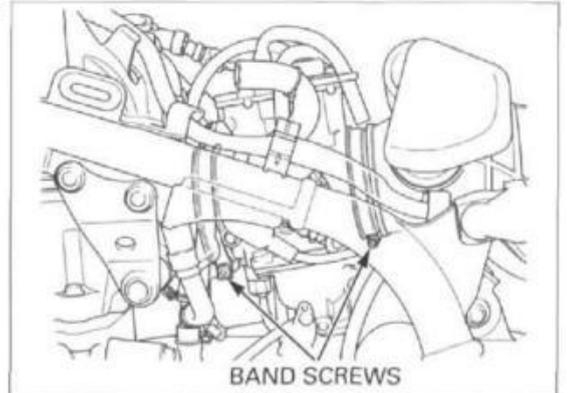
Disconnect the carburetor heater 2P and throttle position sensor 3P connectors, and remove their wires from the clamp.



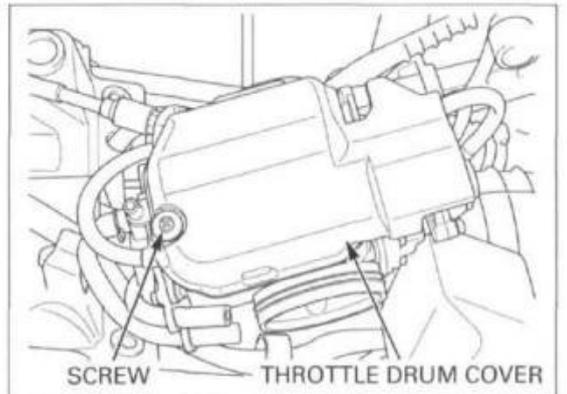
Slide the rubber cap off the hot start valve nut. Loosen the hot start valve nut and remove the hot start valve from the carburetor.



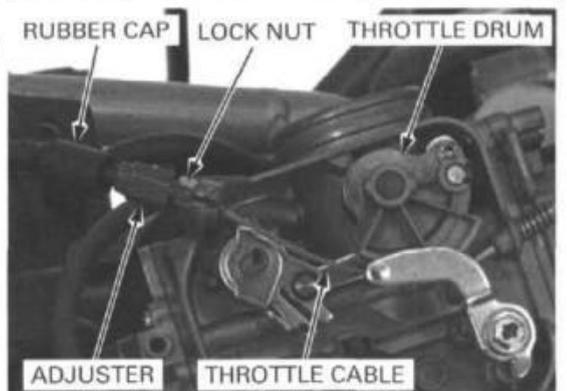
Loosen the band screws and remove carburetor from the insulator and connecting hose.



Remove the screw and throttle drum cover from the carburetor.



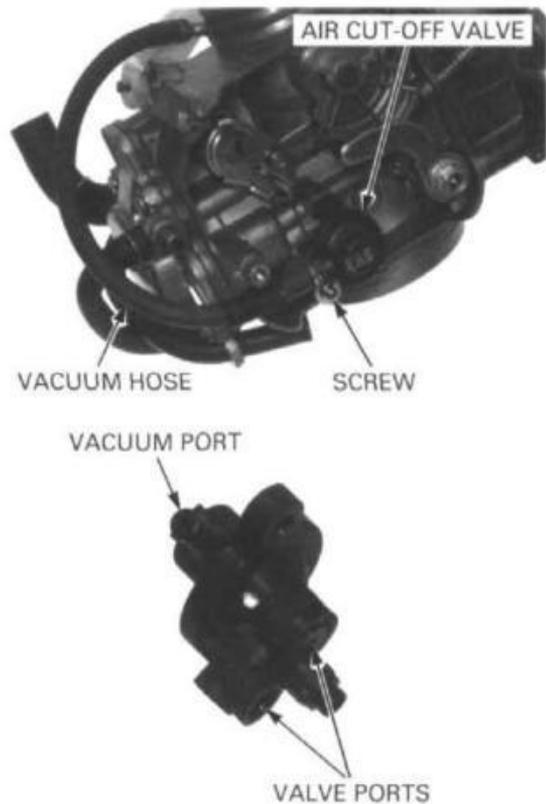
Slide the rubber cap off the throttle cable adjuster. Loosen the lock nut and remove the throttle cable adjuster from the carburetor. Disconnect the throttle cable from the throttle drum and remove the carburetor.



CARBURETOR DISASSEMBLY

AIR CUT-OFF VALVE

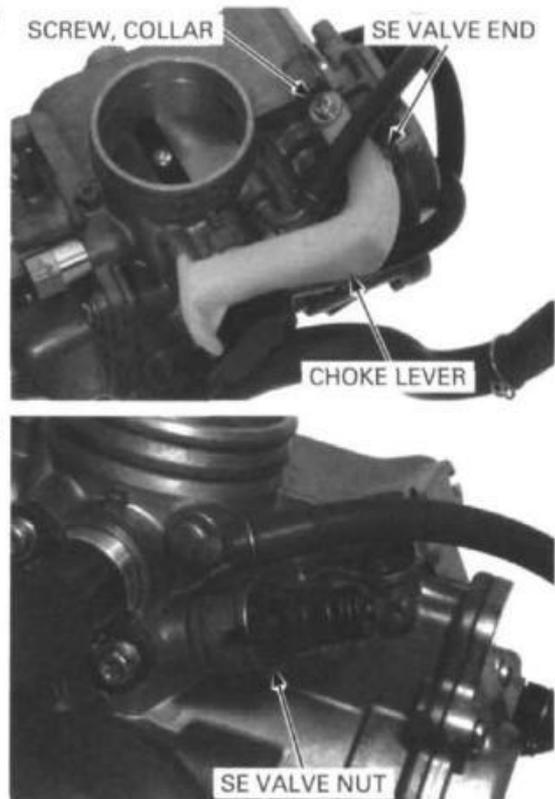
Disconnect the vacuum hose from the air cut-off valve.
Remove the screw and air cut-off valve.
Remove the O-rings and slow air jet.



Apply vacuum to the vacuum port.
The vacuum should be maintained.
Air should not flow through the valve ports when the vacuum is applied, and should flow when the vacuum is not applied.

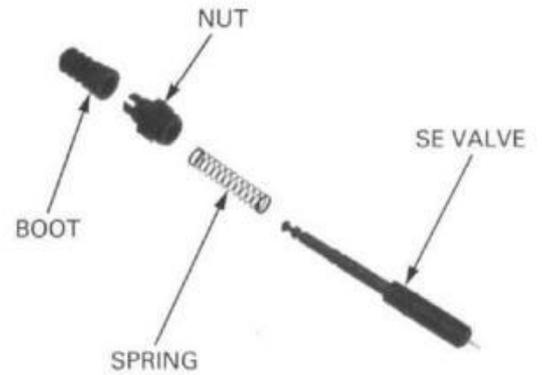
STARTING ENRICHMENT (SE) VALVE

Remove the screw, collar and choke lever while unhooking it from the SE valve end.



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

Remove the boot, nut and spring from the SE valve.
 Check the SE valve face for scores, scratches or wear.
 Check the SE valve seat at the tip of the valve for stepped wear.
 Check the seal ring for deterioration, wear or damage.

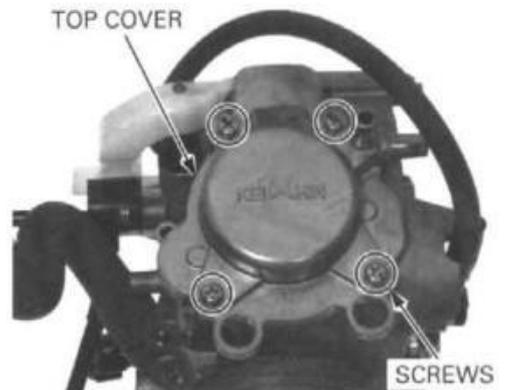


THROTTLE VALVE

Remove the air vent hoses.

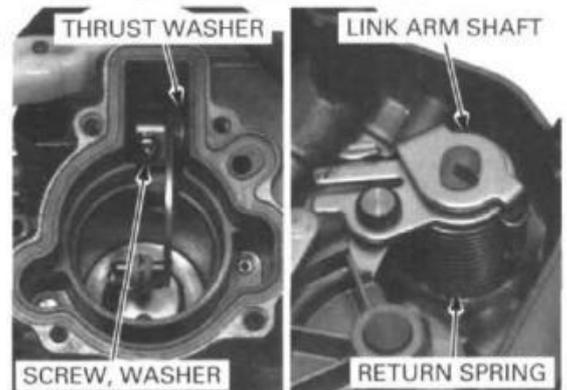


Remove the four screws, top cover and O-ring.



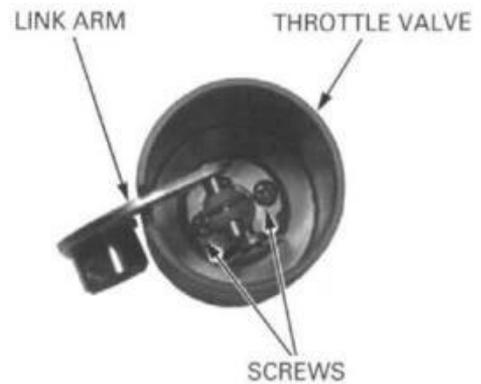
Remove the setting screw and spring washer.
 Pull out the link arm shaft and remove the thrust washer and return spring.

Remove the throttle valve assembly from the carburetor body.

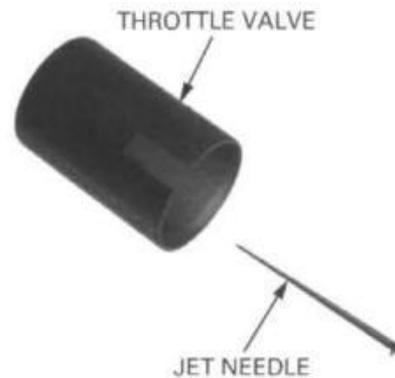


FUEL SYSTEM ('04 - '05)

Remove the two screws and the link arm with the spring from the throttle valve.



Remove the jet needle from the throttle valve.
Check the jet needle for stepped wear or damage.
Check the throttle valve for scoring, scratches or damage.

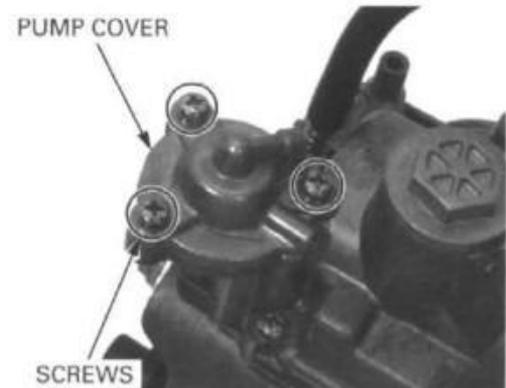


ACCELERATOR PUMP

Remove the bolt, collar, accelerator pump link arm, plastic washer, plain washer and spring washer if necessary.



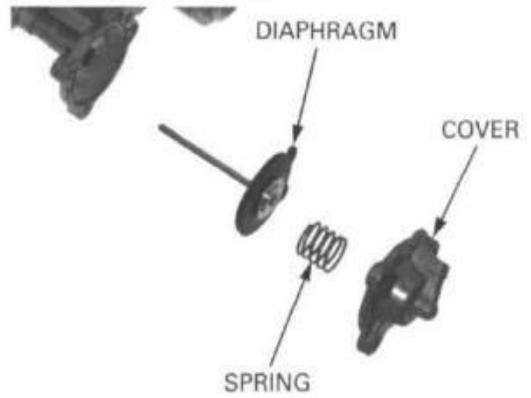
Remove the three screws while holding the accelerator pump cover.



Remove the pump cover, spring and diaphragm.

Visually inspect the following:

- diaphragm for deterioration or pin holes
- spring for damage
- diaphragm shaft for excessive wear or damage
- orifice in the cover for clogging or restriction



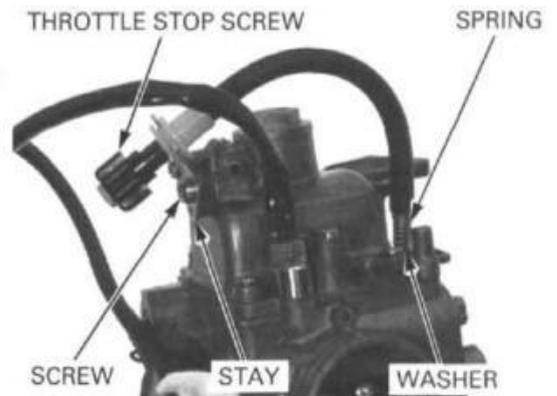
FLOAT AND JETS

NOTE:

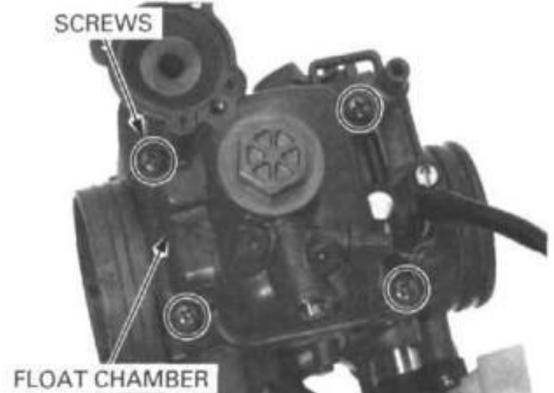
- The carburetor heater and spacer can be removed after removing the float chamber.

Remove the accelerator pump (page 7-10).

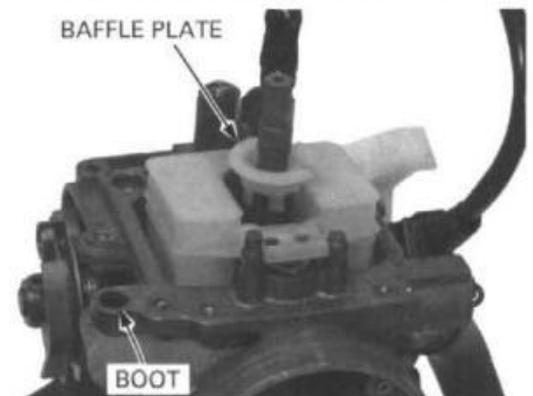
Remove the screw and throttle stop screw stay.
Remove the throttle stop screw, washer and spring from the carburetor body.



Remove the four screws, float chamber and O-ring.

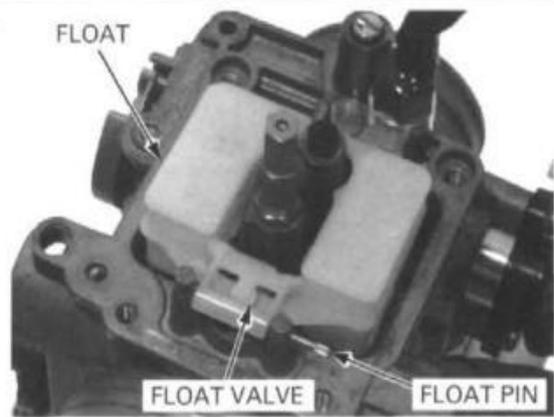


Remove the baffle plate and diaphragm shaft boot.

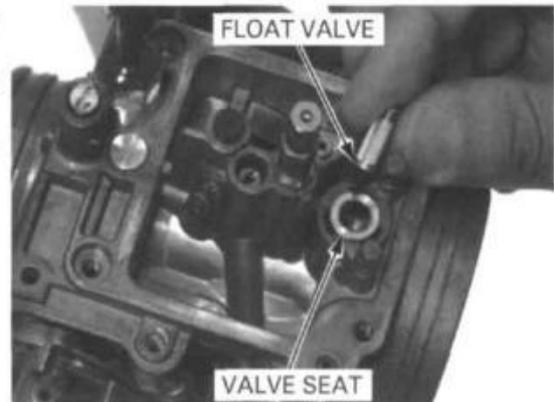


FUEL SYSTEM ('04 – '05)

Remove the float pin by gently tapping it with a suitable driver (O.D.: 2 mm).
Remove the float and float valve.
Check the float for damage.

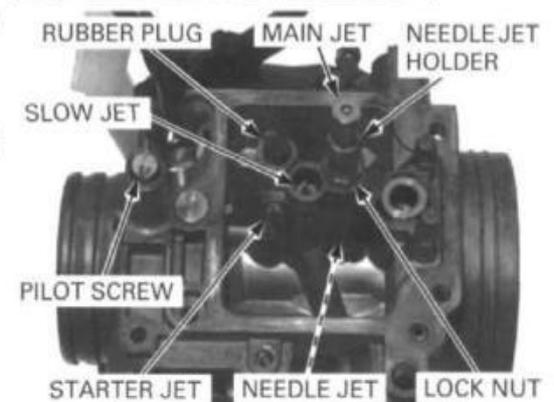


Inspect the float valve seat for scores, scratches, clogging and damage.
Check the tip of the float valve where it contacts the valve seat for stepped wear or contamination.
Replace the float valve if the tip is worn or contaminated.
Check the operation of the float valve.



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

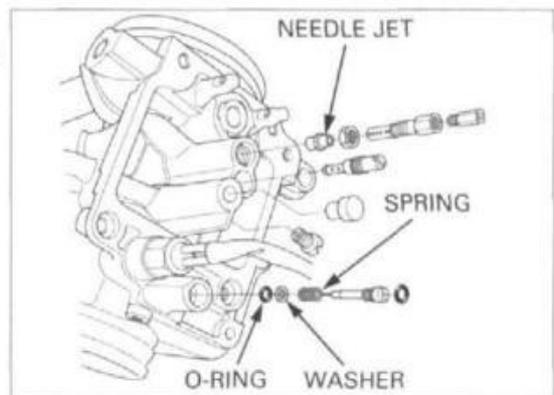
Remove the main jet, loosen the lock nut and remove the needle jet holder and needle jet.
Remove the slow jet.
Rubber plug and starter jet.



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

Turn the pilot screw in and record the number of turns it takes before it seats lightly.
Remove the pilot screw, spring, washer and O-ring.

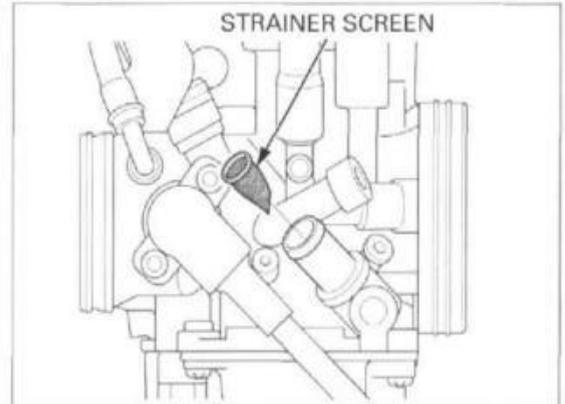
Inspect each jet for wear or damage.
Clean all jets with non-flammable or high flash point solvent and blow them open with compressed air.
Check the pilot screw for stepped wear or damage.



CARBURETOR CLEANING

Remove the fuel hose and strainer screen from the carburetor body.

Clean the strainer screen with compressed air.



Remove the following:

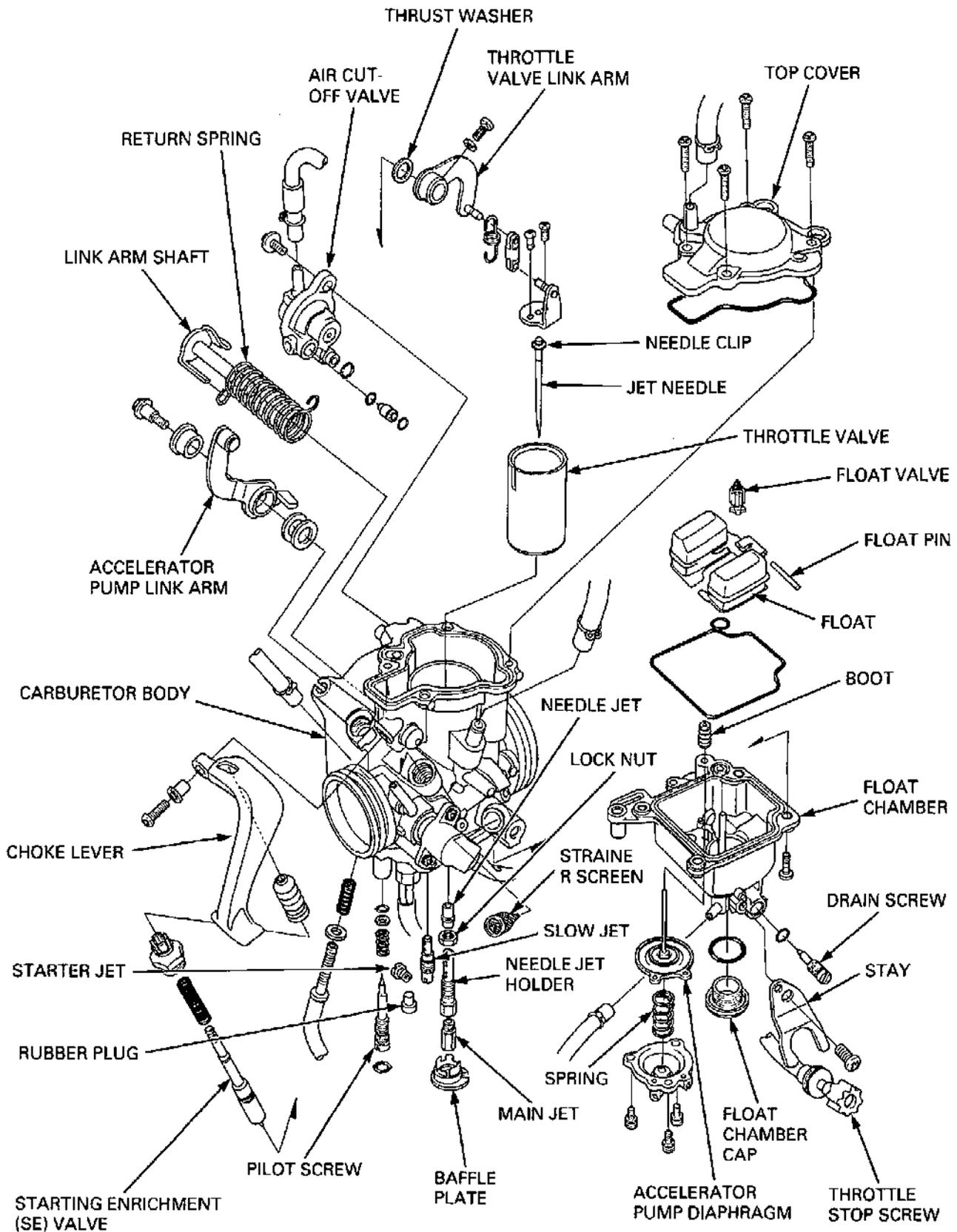
- air cut-off valve (page 7-8)
- starting enrichment (SE) valve (page 7-8)
- throttle valve (page 7-9)
- float, all jets and pilot screw (page 7-11)

Cleaning the air and fuel passages with a piece of wire will damage the carburetor body.

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



CARBURETOR ASSEMBLY



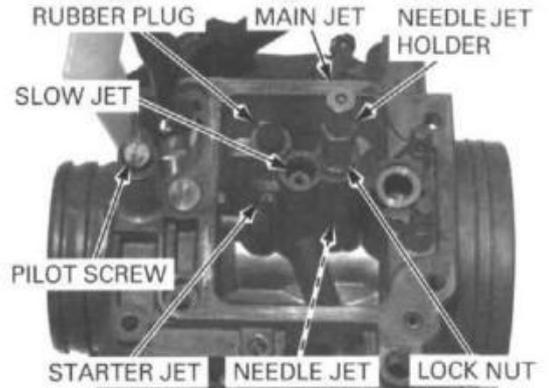
JETS AND FLOAT

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

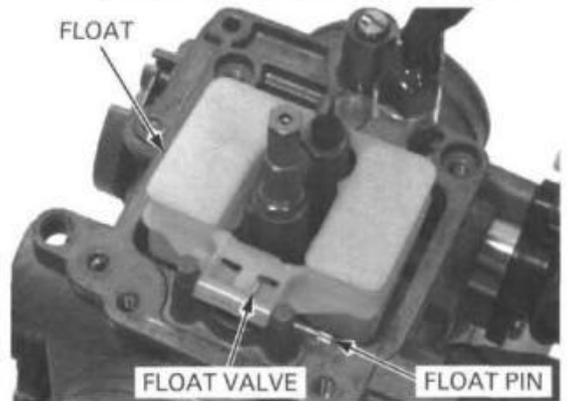
Install the pilot screw with the spring, washer and a new O-ring and return it to its original position as noted during removal. Perform the pilot screw adjustment if a new pilot screw is installed (page 7-23).

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

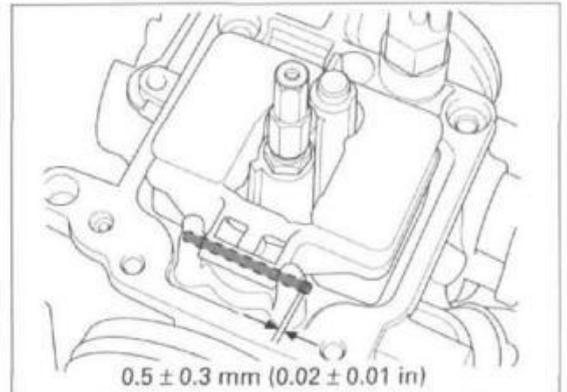
Install the needle jet and needle jet holder, tighten the lock nut and install the main jet. Install the slow jet. Install the starter jet and rubber plug.



Hang the float valve onto the float arm lip. Install the float with the float valve and insert the float pin.



Install the float pin in position as shown by tapping it with a suitable driver (O.D.: 2 mm).

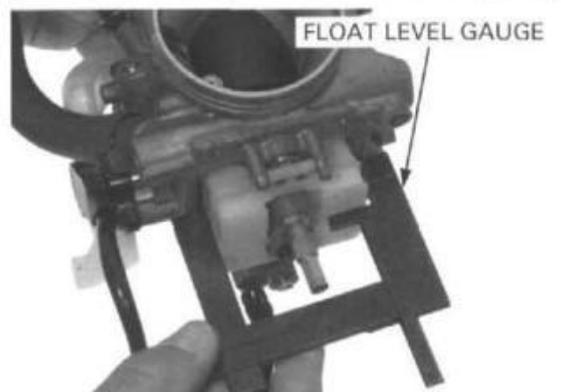


Set the carburetor so that the float valve end just contacts the float arm lip, and measure the float level with the special tool.

TOOL:
Carburetor float level gauge 07401-0010000

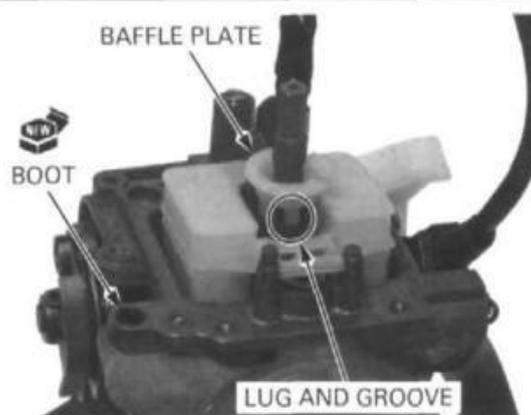
Float level: 15.9 mm (0.63 in)

If the float level is out of specification, replace the float assembly.

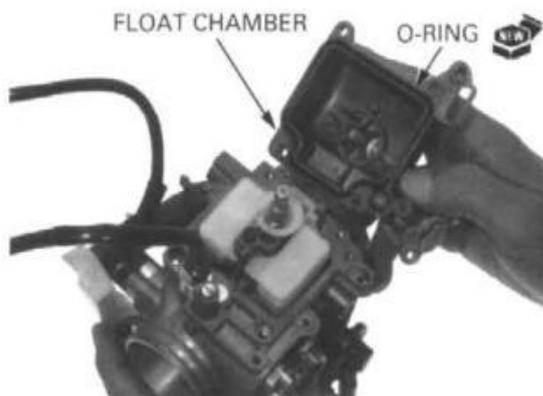


FUEL SYSTEM ('04 - '05)

Install the baffle plate by aligning the groove with the lug on the carburetor body as shown. Install a new diaphragm shaft boot.



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



Install the four screws and tighten them.

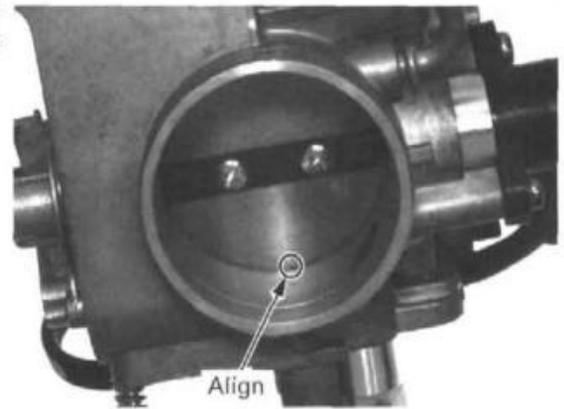


Install the throttle stop screw into the carburetor body with the spring and washer. Install the stay by aligning the hole with the pin and tighten the screw securely.



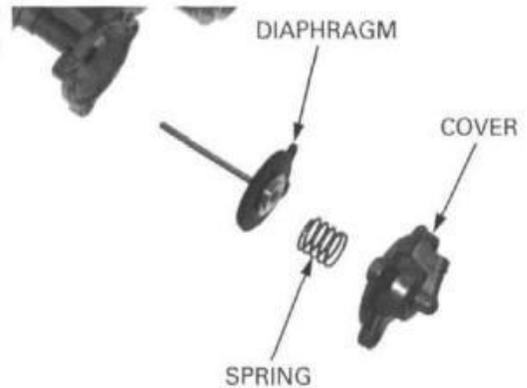
Turn the throttle stop screw to align the butterfly throttle valve with the edge of the outside by-pass hole in the carburetor.

Install the accelerator pump (page 7-17)

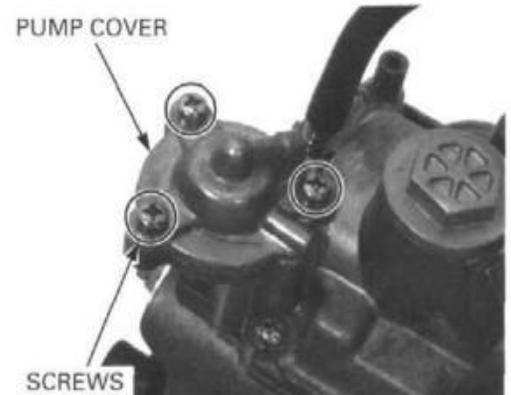


ACCELERATOR PUMP

Install the diaphragm shaft into the float chamber through the boot while slowly turn it to prevent the boot from damaging.
Set the diaphragm rib into the groove properly.
Install the spring and accelerator pump cover.



Install the three screws and tighten them securely being careful not to pinch the diaphragm.



Install the spring washer, plain washer, plastic washer, accelerator pump link arm and collar, and tighten the bolt securely if they were removed.

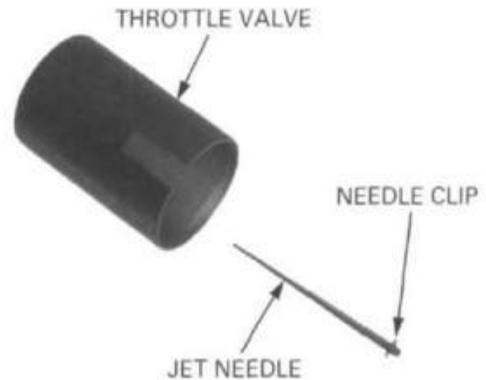


THROTTLE VALVE

Install the needle clip on the jet needle.

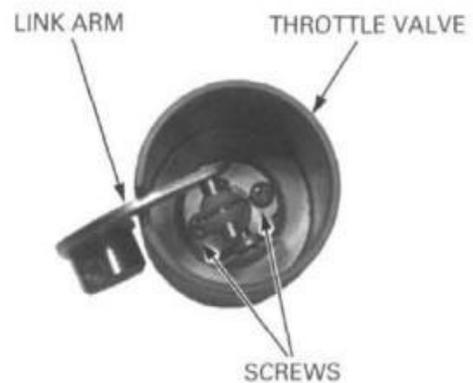
STANDARD CLIP POSITION: 3rd groove from top

Install the jet needle into the throttle valve.



Install the link arm into the throttle valve and tighten the two screws.

Install the throttle valve assembly into the carburetor body, being careful not to damage the jet needle.

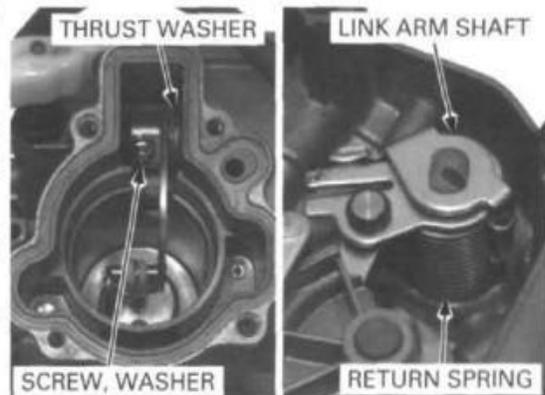


Set the thrust washer between the throttle valve link arm and carburetor body (throttle drum side). Install the return spring between the carburetor body and throttle drum link arm.

Insert the link arm shaft through the drum link arm, return spring, carburetor body, thrust washer and valve link arm while hanging the spring ends as shown.

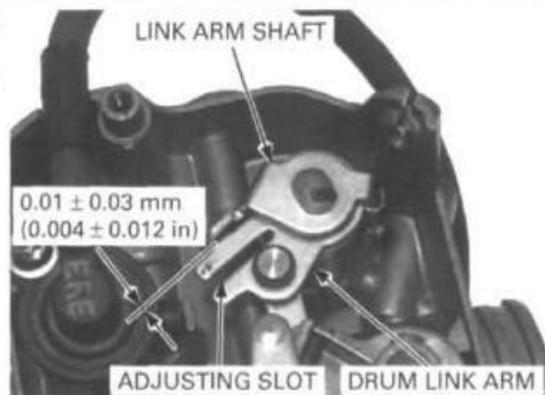
Align the screw holes in the link arm and shaft, install the spring washer and screw, and tighten the screw securely.

Turn the throttle drum and check for smooth operation.

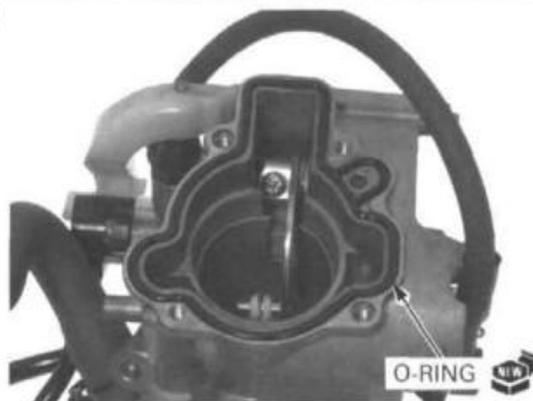


Make sure that the clearance between the drum link arm and shaft is 0.1 - 0.3 mm (0.004 - 0.012 in).

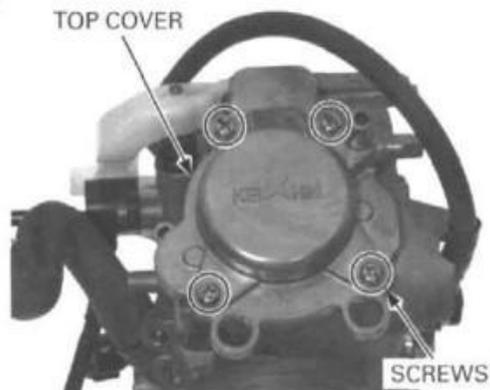
Adjust the clearance by opening or closing the slot in the drum link arm.



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



Install the top cover and tighten the four screws securely.

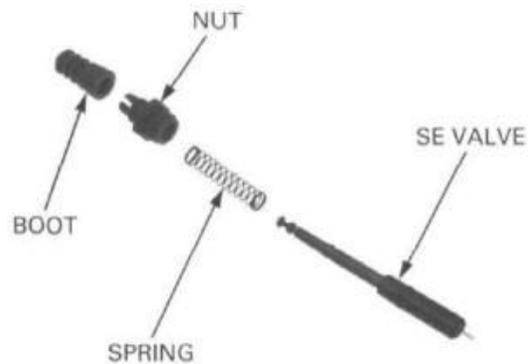


Install the air vent hoses.



STARTING ENRICHMENT (SE) VALVE

Install the spring, nut and boot onto the SE valve.



FUEL SYSTEM ('04 - '05)

Install the SE valve into the carburetor body and tighten the valve nut.

TORQUE: 3 N-m (0.3 kgf-m, 2.2 lbf-ft)

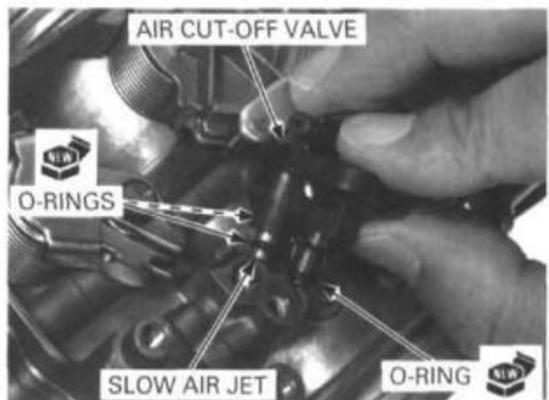


Hook the choke lever to the SE valve end and install it onto the carburetor body with the collar and screw. Tighten the screw securely.

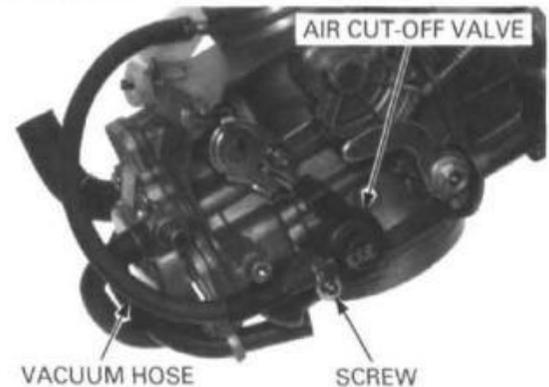


AIR CUT-OFF VALVE

Install new O-rings onto the slow air jet. Install the slow air jet into the air cut-off valve with the stepped side facing the valve side. Install a new O-ring onto the air cut-off valve and install the valve onto the carburetor body.

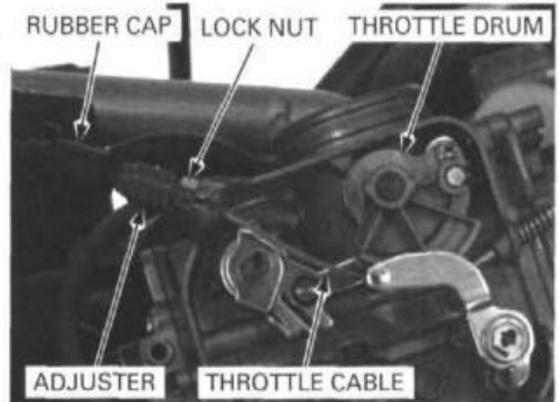


Install the screw and tighten it securely. Connect the vacuum hose to the air cut-off valve.

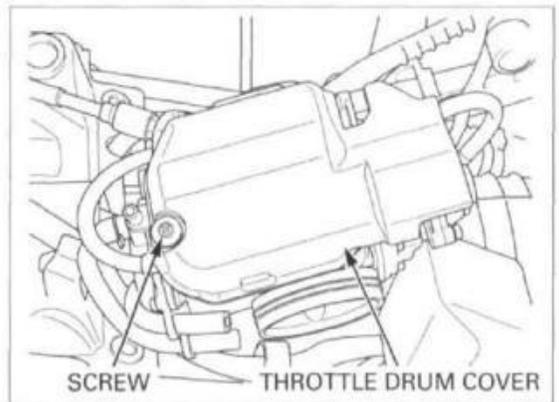


CARBURETOR INSTALLATION

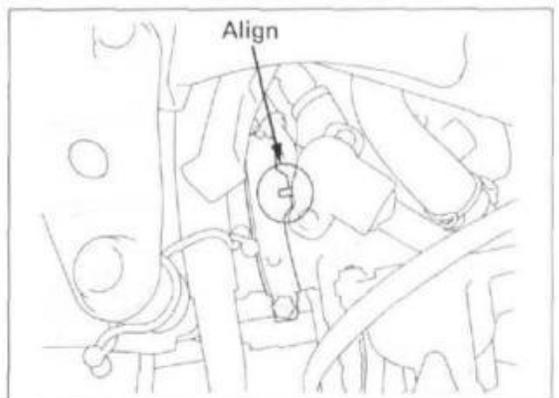
Connect the throttle cable to the throttle drum.
Install the throttle cable adjuster into the carburetor and temporarily tighten the lock nut.



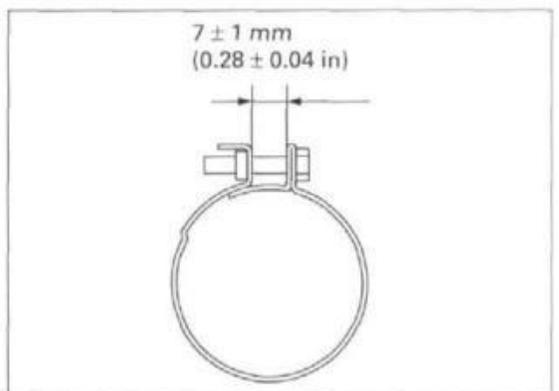
Install the throttle drum cover onto the carburetor and tighten the screw securely.



Install the carburetor into the insulator and connecting hose, and align the boss of the carburetor with the groove in the insulator.

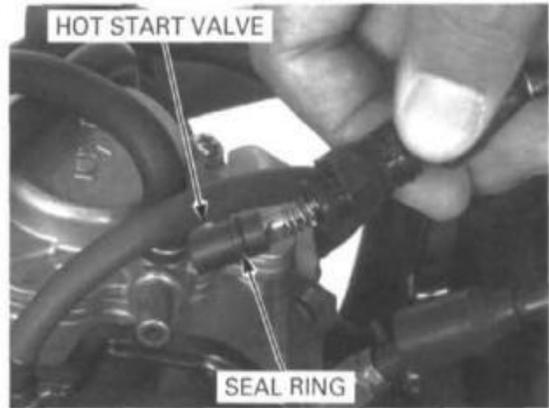


Tighten the carburetor insulator and connecting hose band screws as shown.



FUEL SYSTEM ('04 – '05)

Check the hot start valve face for scores, scratches or wear.
Check the seal ring for deterioration, wear or damage.
Replace the hot start valve set if necessary.



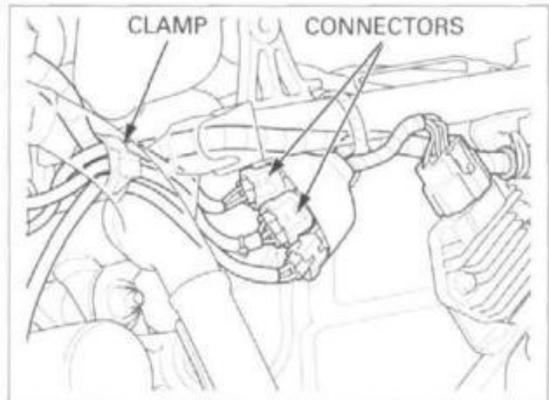
Install the hot start valve into the carburetor and tighten the valve nut.

TORQUE: 3 N·m (0.3 kgf·m, 2.2 lbf·ft)

Install the rubber cap onto the hot start valve nut properly.



Connect the carburetor heater 2P and throttle position sensor 3P connectors, and clamp their wires properly.



Connect the drain hose to the carburetor.
Install the fuel tank (page 3-9).



PILOT SCREW ADJUSTMENT

IDLE DROP PROCEDURE

NOTE:

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

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

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

INITIAL OPENING: 1-3/4 turns out

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

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

IDLE SPEED: 1,600 ± 100 rpm

5. Turn the pilot screw in or out slowly to obtain the highest engine speed.
6. Readjust the idle speed with the throttle stop screw.
7. Turn the pilot screw out gradually until the engine speed drops 100 rpm.
8. Turn the pilot screw in to the final opening from the position obtained in step 7.

FINAL OPENING: 1 turn in

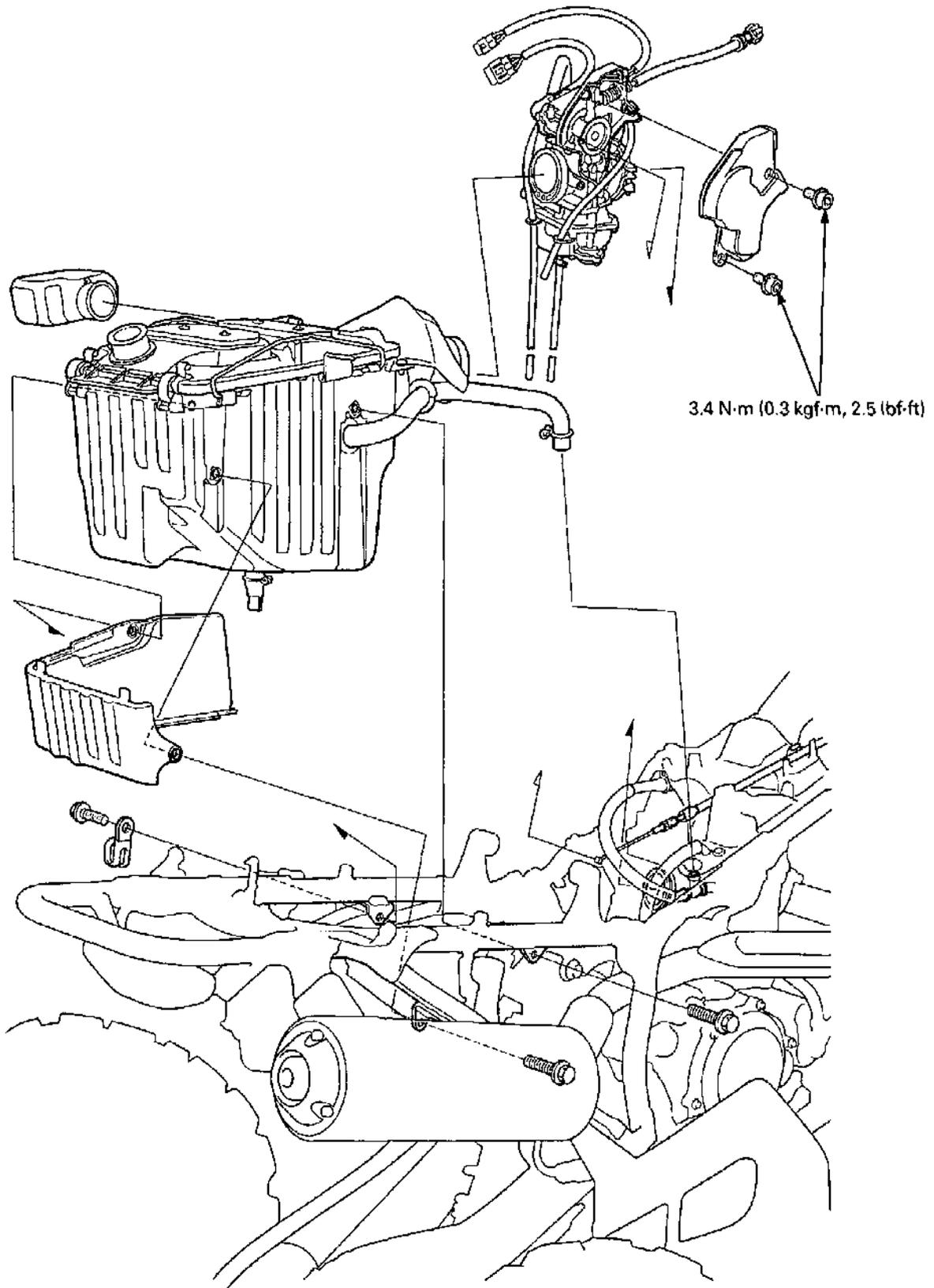
9. Readjust the idle speed with the throttle stop screw.



8. FUEL SYSTEM (After '05)

SYSTEM COMPONENTS	8-2	CARBURETOR DISASSEMBLY.....	8-9
SERVICE INFORMATION	8-3	CARBURETOR ASSEMBLY.....	8-16
TROUBLESHOOTING	8-5	CARBURETOR INSTALLATION	8-22
AIR CLEANER HOUSING	8-6	PILOT SCREW ADJUSTMENT.....	8-24
CARBURETOR REMOVAL.....	8-7	HIGH ALTITUDE ADJUSTMENT	8-25

SYSTEM COMPONENTS



SERVICE INFORMATION

GENERAL

- Bending or twisting the control cable will impair smooth operation and could cause the cable to stick or bind, resulting in loss of vehicle control.
- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.
- When disassembling the fuel system parts, note the locations of the O-rings. Replace them with new ones on reassembly.
- Before removing the carburetor, place an approved gasoline container under the carburetor drain hose, loosen the drain screw and drain the carburetor.
- After removing the carburetor, wrap the intake port of the engine with a shop towel or cover it with pieces of tape to prevent any foreign material from dropping into the engine.
- If the vehicle is to be stored for more than one month, drain the float chamber. Fuel left in the float chamber may cause clogged jets, resulting in hard starting or poor driveability.
- For fuel tank removal and installation (page 3-9).
- For throttle position sensor service (page 22-10).

SPECIFICATIONS

ITEM		SPECIFICATIONS
Carburetor identification number	TRX450ER	FCR10A
	TRX450R	FCR11A
Main jet		#120
Slow jet		#42
Starter jet		#75
Jet needle		NHHU
Pilot screw initial opening		2-3/8 turns out
Float level		8.0 mm (0.31 in)
Idle speed		1,700 ± 100 rpm
Throttle grip free play		5 – 10 mm (9/32 – 3/8 in)
Hot starter lever free play (TRX450R)		2 – 3 mm (1/16 – 1/8 in)

TORQUE VALUES

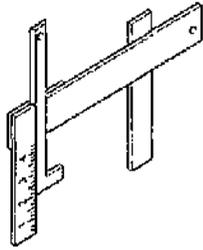
Slow air jet	0.9 N·m (0.1 kgf·m, 0.7 lbf·ft)
Slow jet	1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)
Starter jet	1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)
Needle jet	1.8 N·m (0.2 kgf·m, 1.3 lbf·ft)
Main jet	1.5 N·m (0.2 kgf·m, 1.1 lbf·ft)
Float chamber screw	2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)
Accelerator pump cover screw	2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)
Choke valve lock nut	2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)
Throttle shaft screw	2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)
Needle holder	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)
Throttle drum cover bolt	3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)
Hot start valve nut (TRX450R)	2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)

Apply locking agent to the threads

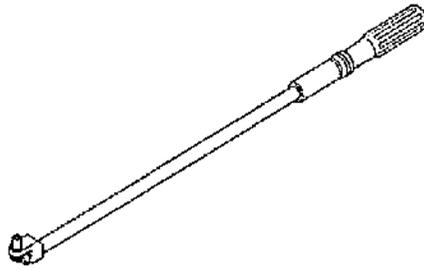
FUEL SYSTEM (After '05)

TOOL

Carburetor float level gauge
07401-0010000



Pilot screw wrench
07KMA-MN90101



TROUBLESHOOTING

Engine cranks but won't start

- No fuel in tank
- No fuel to carburetor
 - Clogged fuel strainer
 - Clogged fuel line
 - Stuck fuel valve
 - Misadjusted float level
 - Clogged fuel tank breather hose
- Too much fuel getting to the engine
 - Clogged air cleaner
 - Flooded carburetor
- Intake air leak
- Contaminated/deteriorated fuel
 - Clogged jets
- Improper choke operation
- Improper throttle operation
- No spark at plug (faulty ignition system – page 22-6)

Lean mixture

- Clogged fuel jets
- Faulty float valve
- Float level too low
- Restricted fuel line
- Clogged carburetor air vent hose
- Restricted fuel tank breather hose
- Intake air leak
- Faulty throttle valve

Rich mixture

- Improper choke operation
- Clogged air jets
- Faulty float valve
- Float level too high
- Dirty air cleaner
- Worn jet needle or needle jet

Engine stalls, hard to start, rough idling

- Restricted fuel line
- Fuel mixture too lean/rich
- Contaminated/deteriorated fuel
 - Clogged jets
- Intake air leak
- Misadjusted idle speed
- Restricted fuel tank breather hose
- Dirty air cleaner
- Misadjusted pilot screw
- Clogged slow circuit
- Faulty ignition system (page 22-6)

Afterburn when engine braking is used

- Lean mixture in slow circuit
- Accelerator pump faulty
- Faulty ignition system (page 22-6)

Backfiring or misfiring during acceleration

- Lean mixture
- Faulty ignition system (page 22-6)

Poor performance (driveability) and poor fuel economy

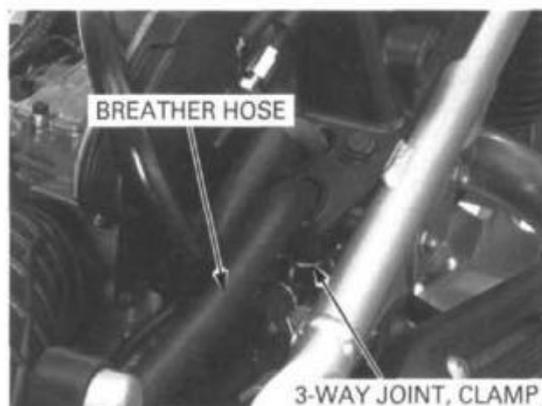
- Clogged fuel system
- Faulty ignition system (page 22-6)

AIR CLEANER HOUSING

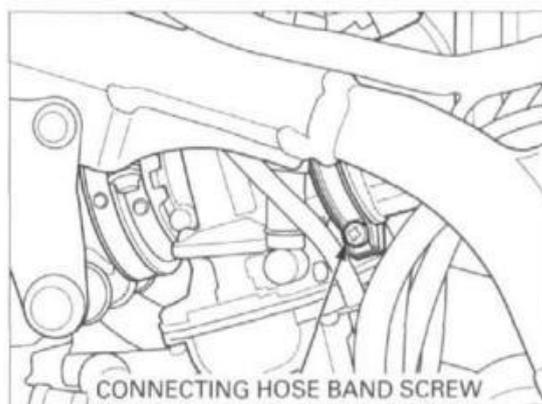
REMOVAL

Remove the fuel tank (page 3-9).

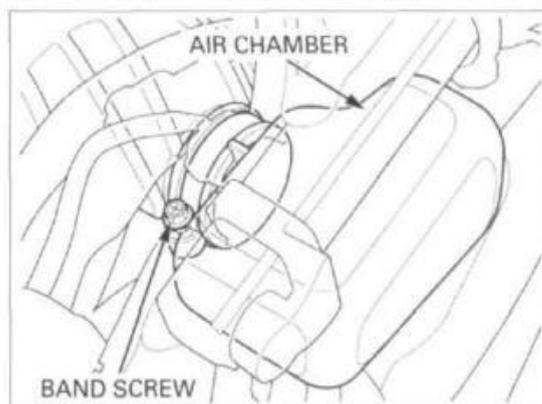
Disconnect the crankcase breather hose from the 3-way joint.



Loosen the connecting hose band screw.

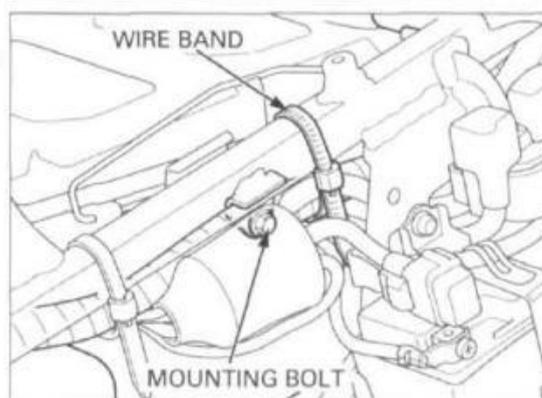


Loosen the band screw and remove the air chamber from the connecting hose.

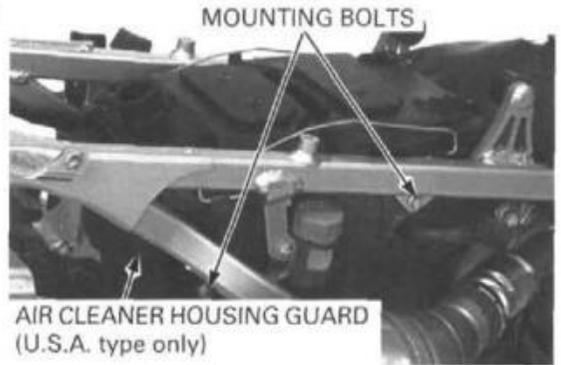


Remove the battery cover (page 21-6).

Remove the wire band, then remove the mounting bolt.



Remove the mounting bolts, air cleaner housing guard (U.S.A. type only) and the air cleaner housing from the frame.



INSTALLATION

Installation is in the reverse order of removal.

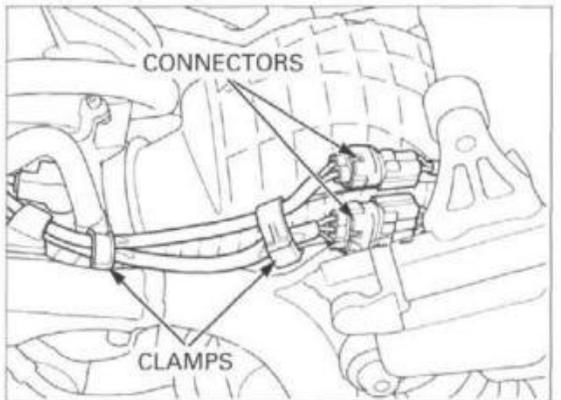
- U.S.A. type only:*
- Install the air cleaner housing guard by aligning its tabs with the housing grooves.



CARBURETOR REMOVAL

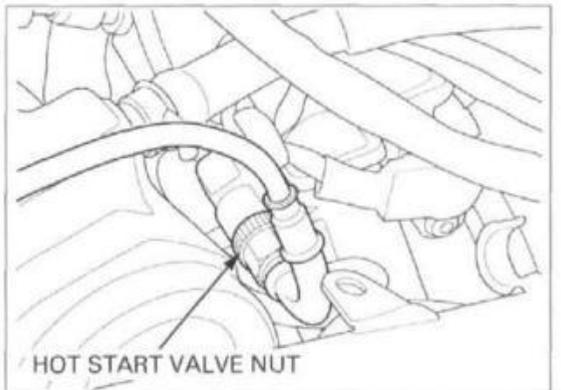
Remove the fuel tank (page 3-9).

Disconnect the carburetor switch 2P (Neutral) and throttle position sensor 3P (Black) connectors, and remove their wires from the clamps.



- TRX450R only:* Remove the heat guard plate (page 3-9).

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

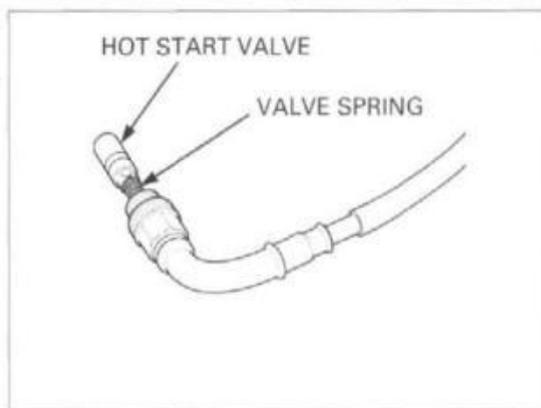


FUEL SYSTEM (After '05)

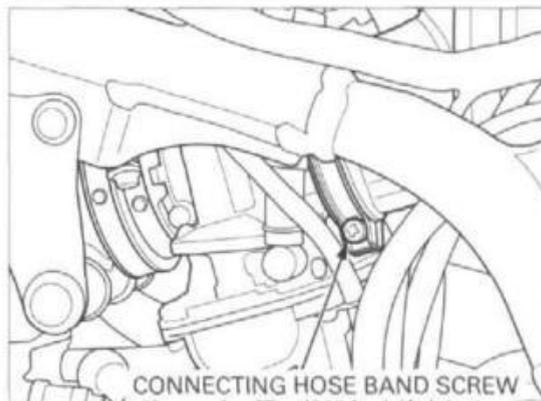
TRX450R only: Disconnect the hot start cable end from the hot start valve and remove the valve spring.

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

Check the hot start valve seat for wear.



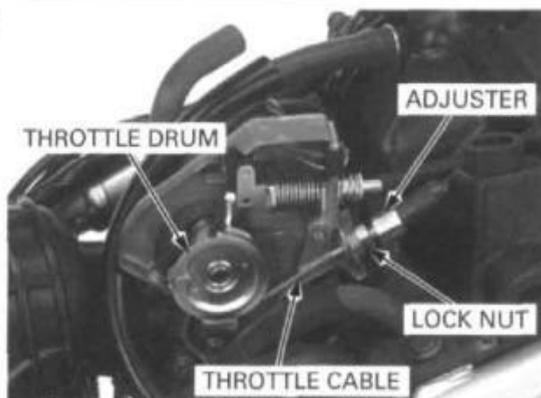
Loosen the air cleaner connecting hose band screw.



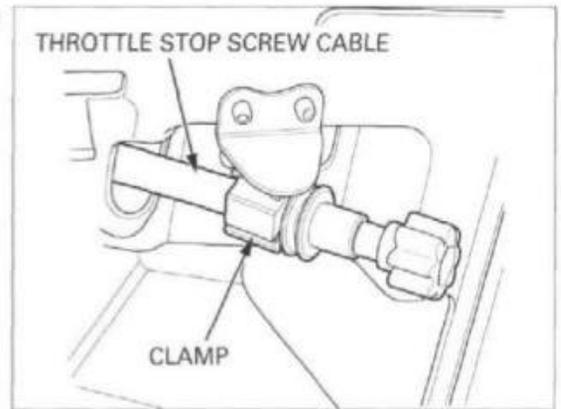
Remove the bolts and throttle drum cover from the carburetor.



Loosen the lock nut, adjuster and disconnect the throttle cable from the throttle drum.



Release the throttle stop screw cable from the clamp.



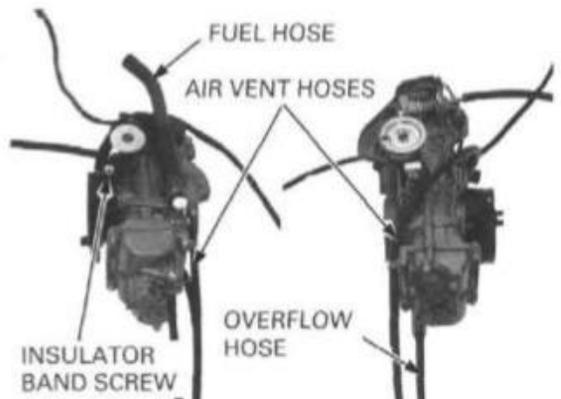
Loosen the insulator band screw.
Remove the carburetor to the rear.



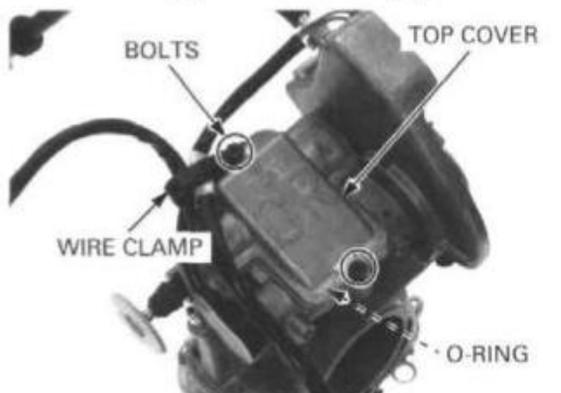
CARBURETOR DISASSEMBLY

JET NEEDLE/THROTTLE VALVE

Loosen the screw and remove the insulator band.
Remove the fuel hose, air vent hose and overflow hose.

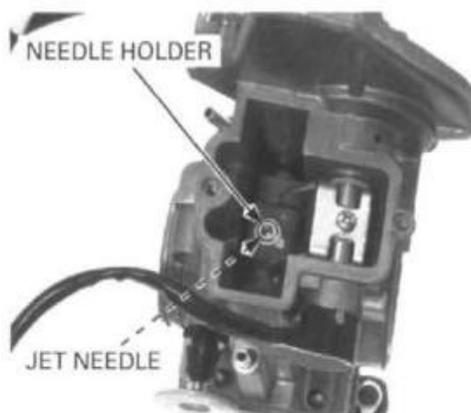


Release the carburetor switch wire and throttle position sensor wire from the clamp.
Remove the bolts, wire clamp, top cover and O-ring.

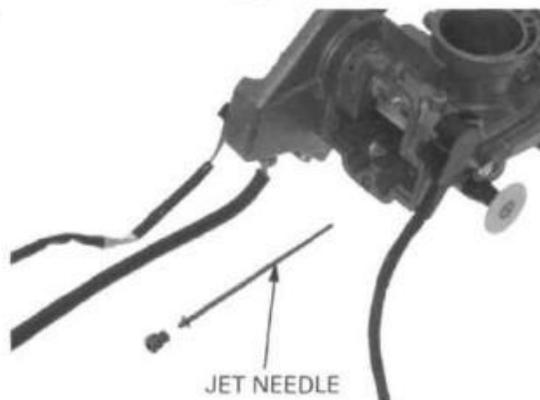


FUEL SYSTEM (After '05)

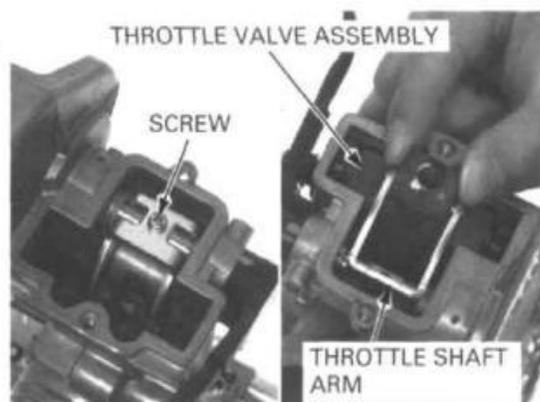
Remove the needle holder and jet needle.



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

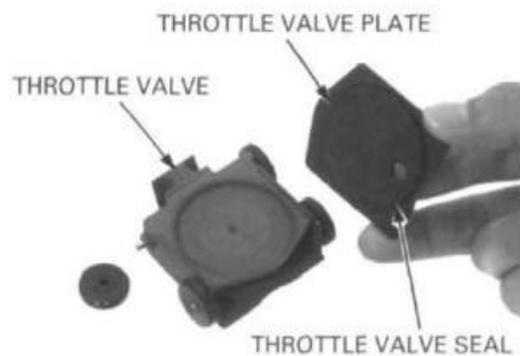


Remove the throttle shaft screw.
Lift up the throttle shaft arm and remove the throttle valve assembly.



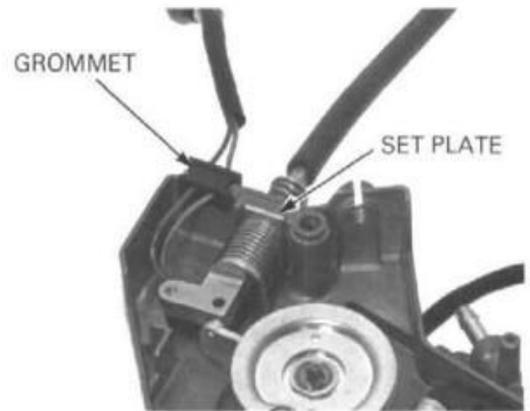
Remove the throttle valve plate from the throttle valve.

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



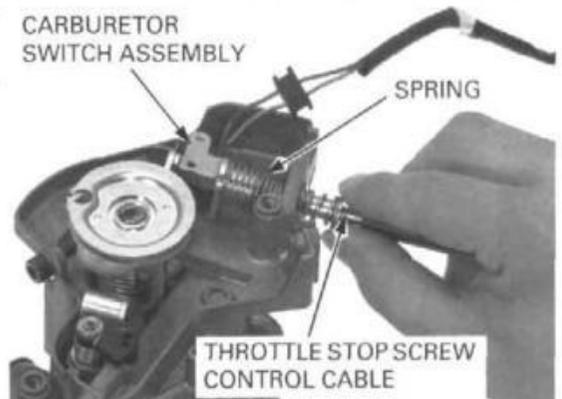
**THROTTLE STOP SCREW/
CARBURETOR SWITCH/THROTTLE
DRUM ASSEMBLY**

Remove the spring set plate and carburetor switch wire grommet from carburetor body.

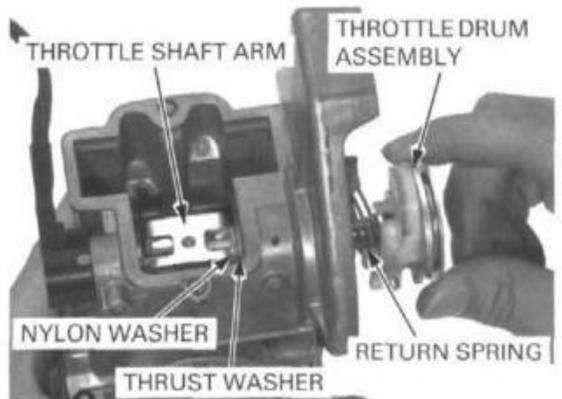


Remove the throttle stop screw and spring by turning the control cable to clockwise.

Remove the carburetor switch assembly from carburetor body.



Pull the throttle drum assembly out and remove the throttle shaft arm, thrust washer, nylon washer and return spring.



CHOKE KNOB

Loosen the lock nut and remove the choke knob.



FUEL SYSTEM (After '05)

Check the valve for damage or stepped wear.

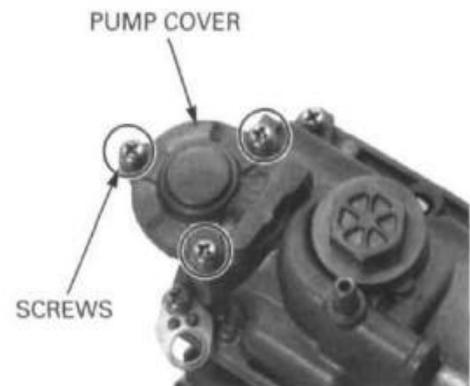


ACCELERATOR PUMP/FLOT/JETS

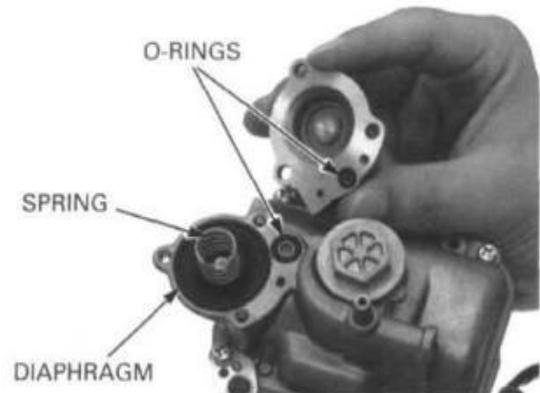
Remove the screws and accelerator pump cover.

NOTE:

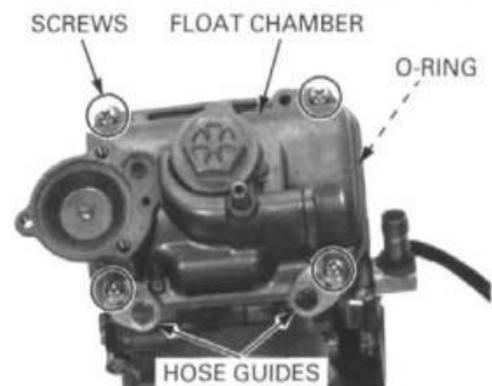
- The accelerator pump cover is under spring pressure.
- Do not lose the screws and O-ring.



Remove the spring, diaphragm and O-rings.

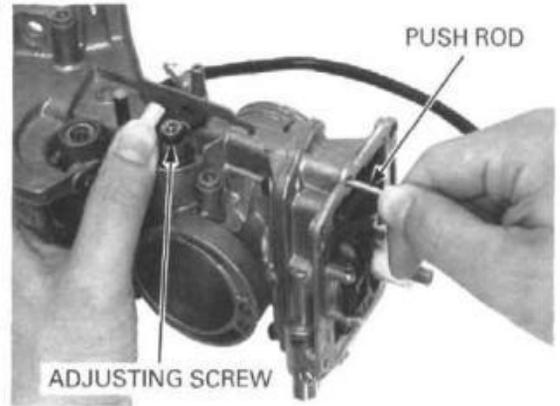


Remove the screws, hose guides and float chamber.
Remove the O-ring from the float chamber.

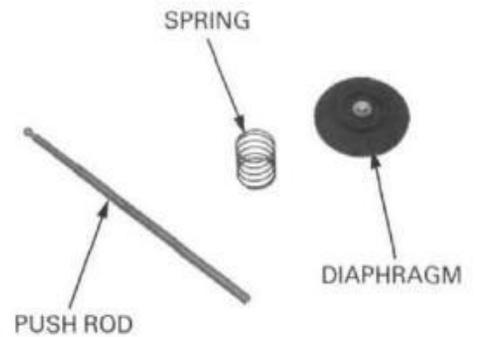


The push rod link lever adjusting screw is factory pre-set. Adjustment and disassembly are not necessary.

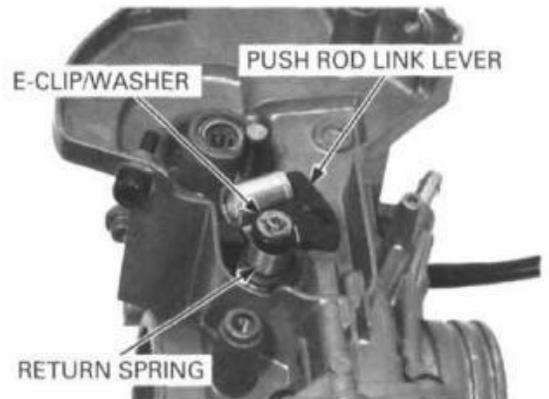
Pull out the push rod while pushing the push rod link lever.



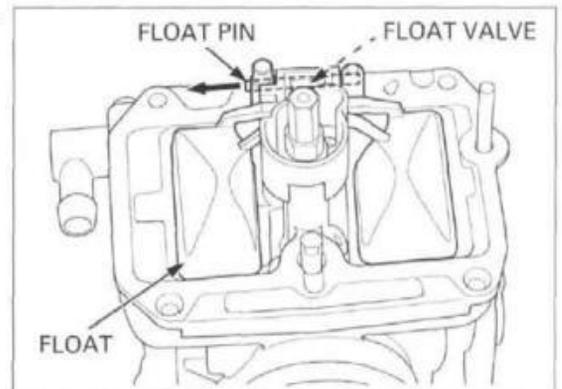
Check the diaphragm for deterioration or pin hole.
Check the spring for damage or fatigue.
Check the push rod for wear, bent and damage.



Remove the E-clip, washer, return spring and push rod link lever.



Remove the float pin by gently tapping it with a suitable driver (O.D.: 2 mm).
Remove the float and float valve.
Check the float for damage or fuel in the float.
Replace the float if necessary.



FUEL SYSTEM (After '05)

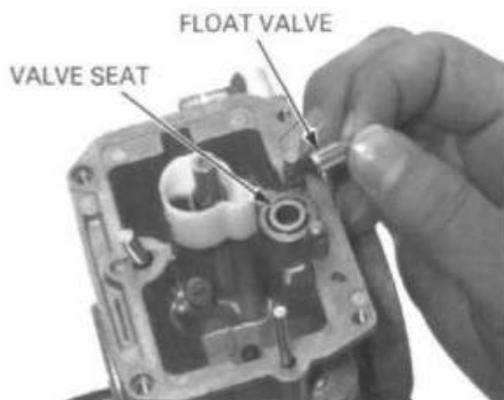
Check the float valve and valve seat for scoring, scratches, clogs or damage.

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.

Clean or replace them if necessary.



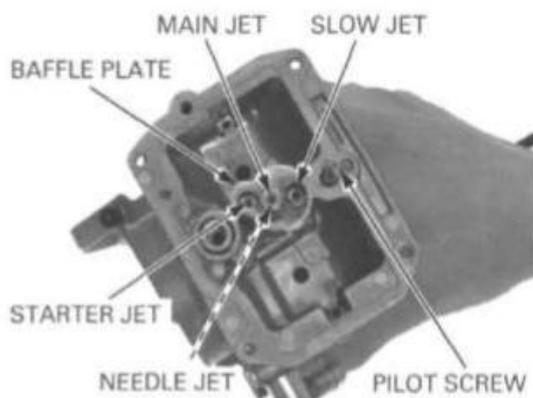
Remove the following:

- main jet
- needle jet
- baffle plate
- starter jet
- slow jet

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

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.

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



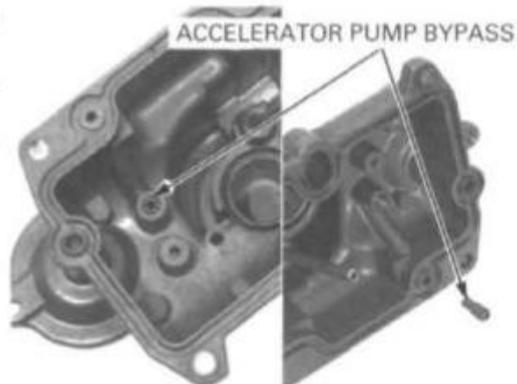
Remove the slow air jet.



Remove the accelerator pump bypass from the float chamber.

Blow open the accelerator pump bypass with compressed air.

Check the accelerator pump bypass for clogs or damage.



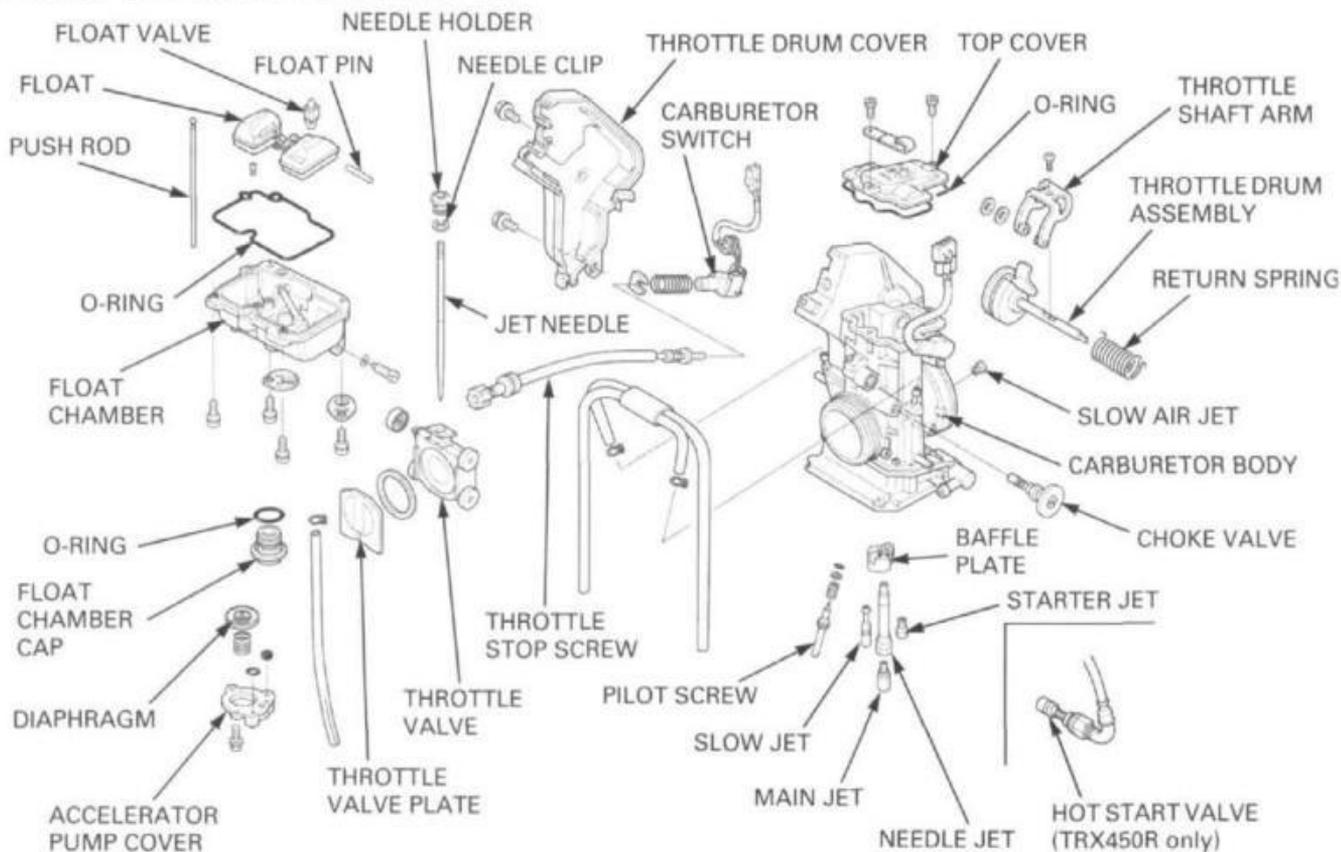
Blow open all jets with compressed air.
Inspect each jet for clogs, wear or damage and replace them if necessary.
Check the pilot screw for stepped wear or damage.
Check the spring for fatigue or damage.
Replace them if necessary.



Blow open all carburetor body openings with compressed air.



CARBURETOR ASSEMBLY



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

TORQUE: 0.9 N·m (0.1 kgf·m, 0.7 lbf·ft)



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

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

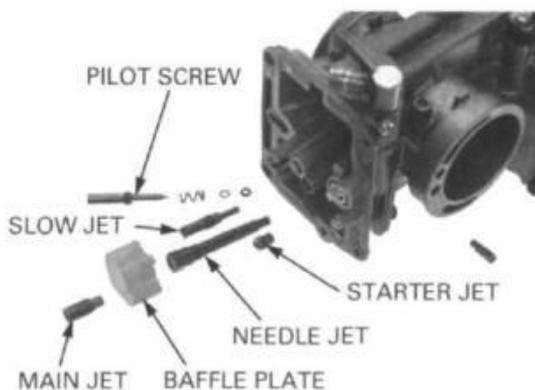
Perform pilot screw adjustment if a new pilot screw is installed (page 8-24).

- 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.

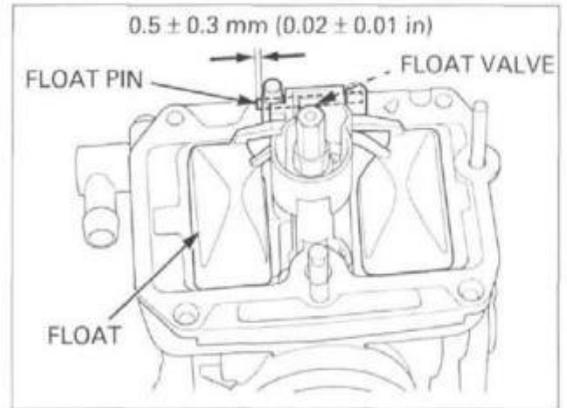
TORQUE:

- 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)



Hang the float valve onto the float arm lip.
Install the float with the float valve and insert the float pin.

Install the float pin in position as shown by tapping it with a suitable driver (O.D.: 2 mm).



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

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

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

TOOL:

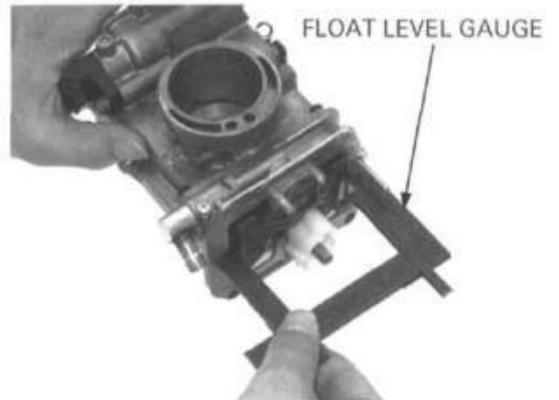
Carburetor float level gauge 07401-0010000

Float level: 8.0 mm (0.31 in)

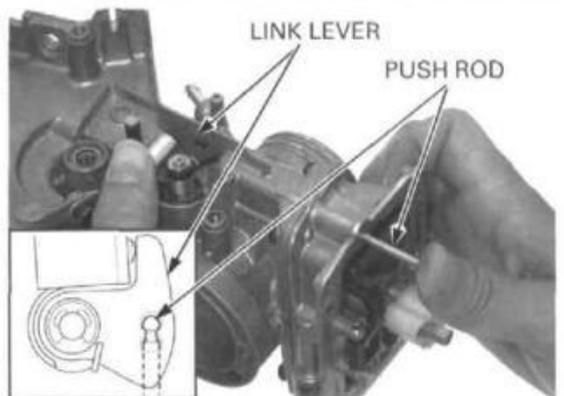
If the float level is out of specification, adjust it by bending the lip.

Set the return spring to the push rod link lever.
Install the push rod link lever, washer and E-clip.

Turn the push rod link lever and check for smooth operation.

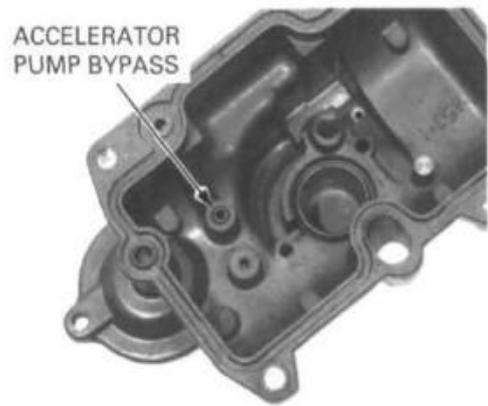


Install the push rod while pushing the push rod link lever.

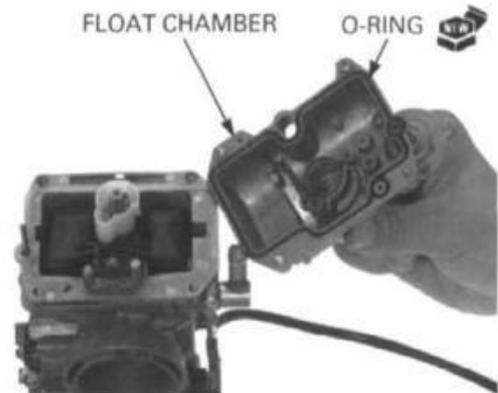


FUEL SYSTEM (After '05)

Install the accelerator pump bypass into the float chamber.

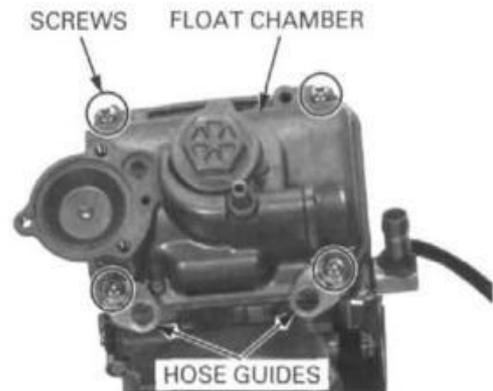


Install a new O-ring in the float chamber groove. Install the float chamber onto the carburetor body.



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

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

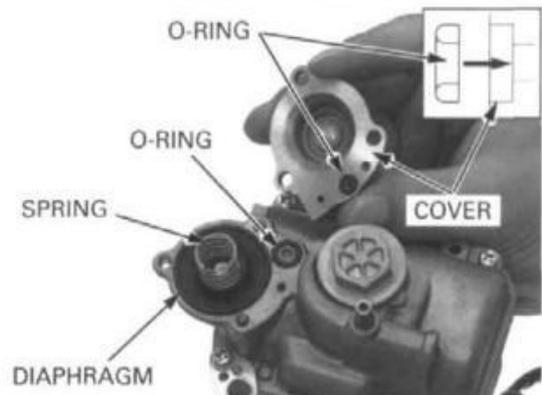


Note the installation direction of the O-ring.

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

Install and tighten the screws to the specified torque.

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



Set the return spring to the throttle drum assembly.

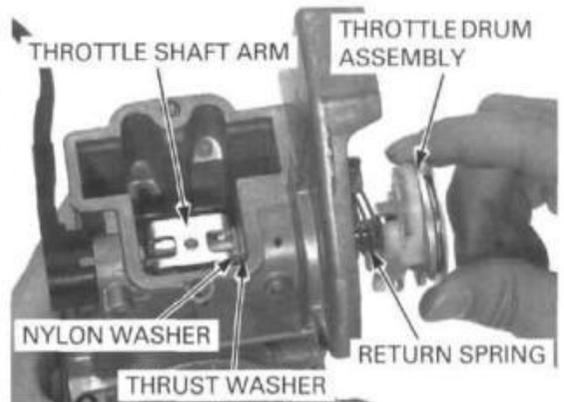


Set the thrust washer, nylon washer and throttle shift arm.

Align the flat side of the throttle shaft tip with the throttle position sensor tabs.

Insert the throttle shaft through the thrust washer, nylon washer and throttle shift arm.

Turn the throttle drum and check for smooth operation.



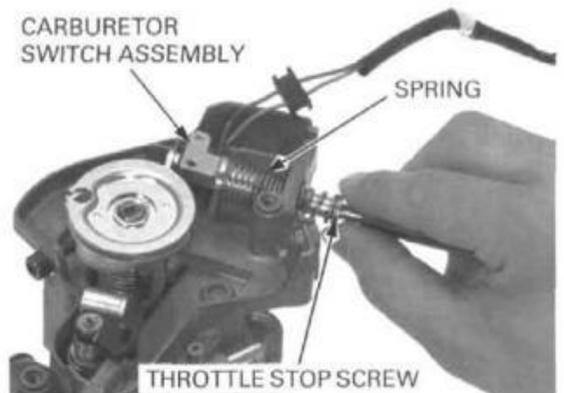
Install the choke knob and tighten the lock nut to the specified torque.

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



Install the carburetor switch assembly to the carburetor body.

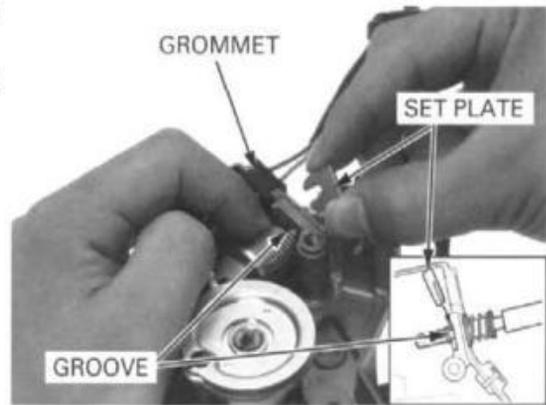
Install the spring and throttle stop screw by turning the control cable counterclockwise.



FUEL SYSTEM (After '05)

Install the spring set plate to the throttle stop screw groove while pressing the spring.

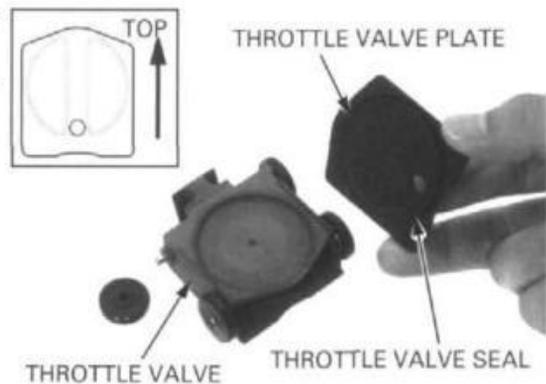
Install the carburetor switch wire grommet to the carburetor body.



Note the installation direction of the throttle valve plate.

Assemble the throttle valve plate on the throttle valve.

- Install the throttle valve plate with the seal side facing toward the throttle valve.



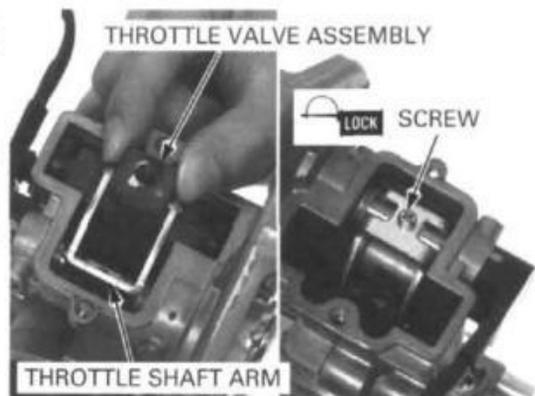
Install the throttle valve assembly into the carburetor with the valve plate facing towards the engine side.

- Make sure the throttle valve moves smoothly.

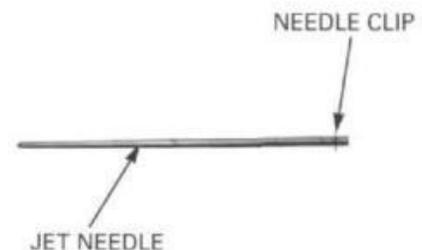
Align the holes in the throttle shaft arm and throttle drum shaft.

Apply a locking agent to the screw threads. Install and tighten the throttle drum shaft screw to the specified torque.

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

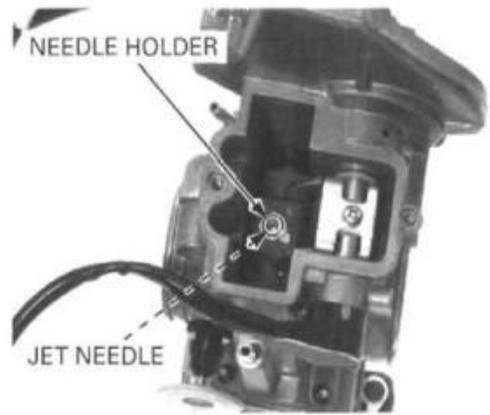


Install the needle clip on the jet needle.

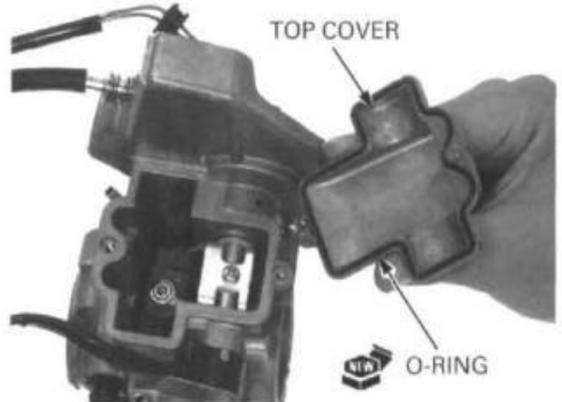


Install the jet needle into the throttle valve.
Tighten the needle holder to the specified torque.

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



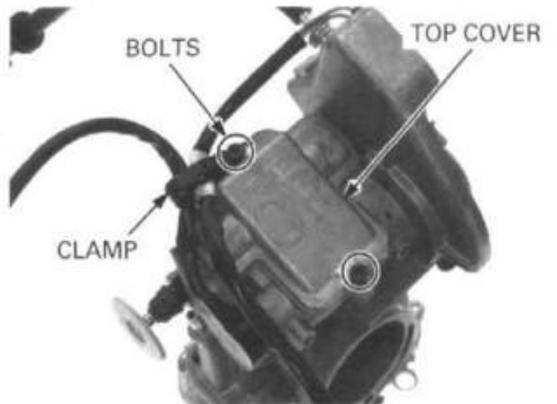
Install a new O-ring and top cover.



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

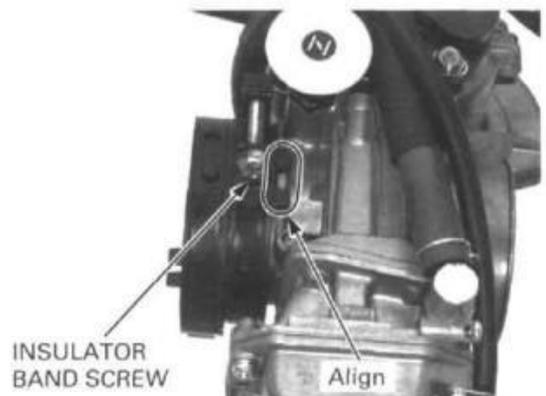
TORQUE: 2.1 N·m (0.2 kgf·m, 1.5 lbf·ft)

Clamp the throttle position sensor wire and carburetor switch wire at white tape point.



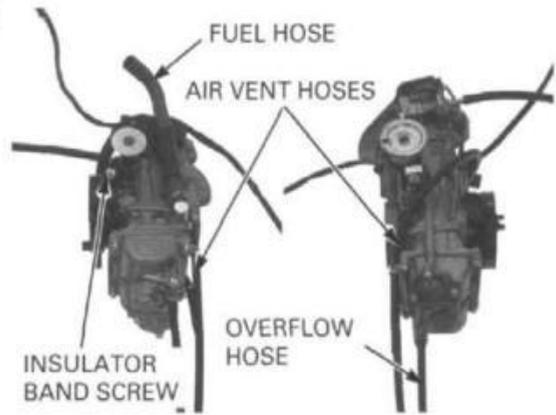
Install the carburetor insulator and align the lug on the carburetor with the groove in the insulator.

Tighten the insulator band screw securely.



FUEL SYSTEM (After '05)

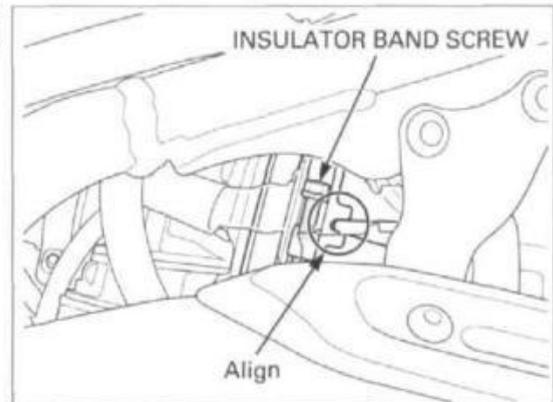
Route the hoses properly (page 1-24). Install the overflow hose, air vent hose and fuel hose.



CARBURETOR INSTALLATION

Install the carburetor into the cylinder head and align the lug of the cylinder head with the groove in the insulator.

Tighten the insulator band screw securely.

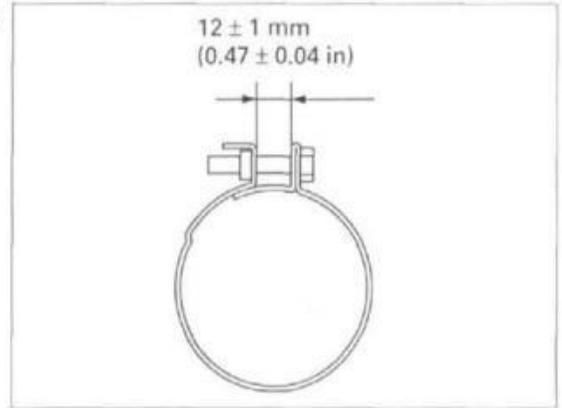


Install the carburetor into air cleaner connecting hose band.

Tighten the connecting hose band screw securely.



Tighten the carburetor insulator and connecting hose band screws as shown.

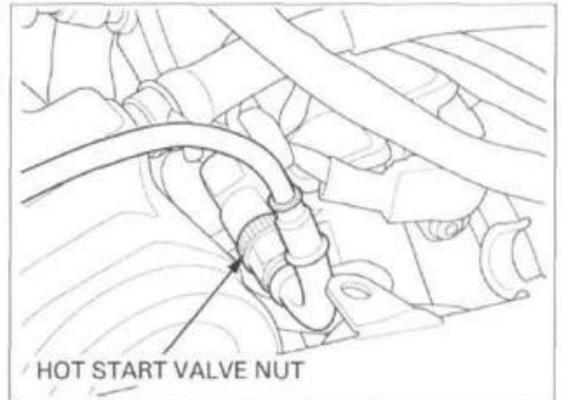


TRX450R only: Install the valve spring over the starter cable and connect the cable end to the hot start valve.

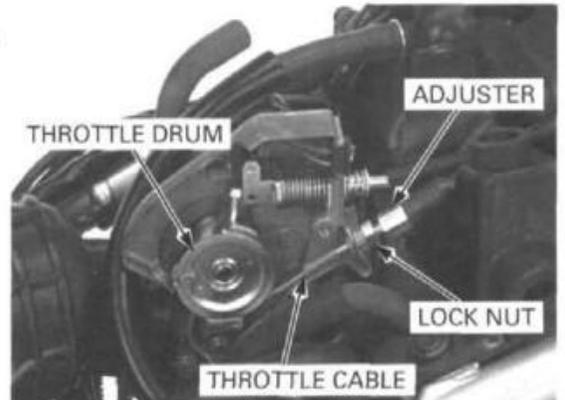
Install the hot start valve to the carburetor body, and tighten the lock nut to the specified torque.

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

Install the heat guard plate (page 3-9).



Connect the throttle cable to the throttle drum. Install the throttle cable adjuster into the carburetor and temporarily tighten the lock nut.



Install the throttle drum cover and bolts.

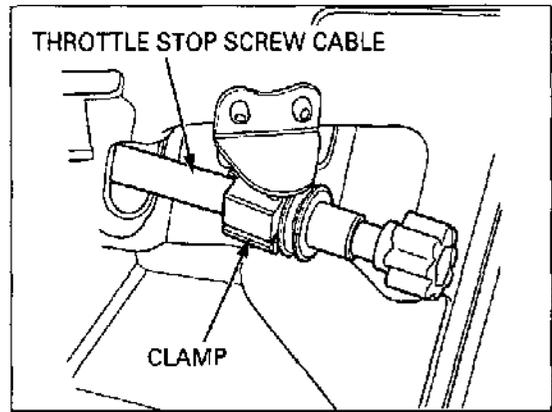
Tighten the bolts to the specified torque.

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



FUEL SYSTEM (After '05)

Clamp the throttle stop screw cable.

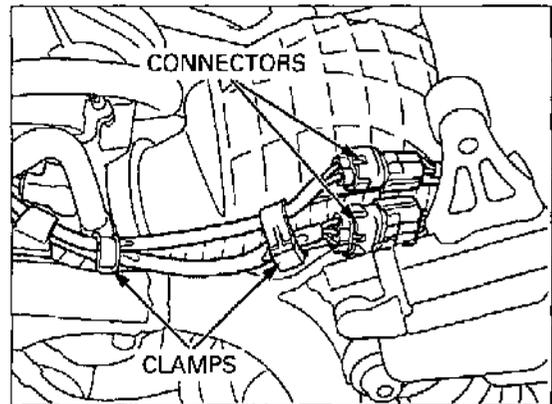


Connect the carburetor switch 2P (Neutral) and throttle position sensor 3P (Black) connectors, and clamp their wires properly.

Install the fuel tank (page 3-9).

Perform the following inspections and adjustments:

- Throttle operation (page 4-6)
- Engine idle speed (page 4-20)
- Pilot screw (page 8-24)



PILOT SCREW ADJUSTMENT

IDLE DROP PROCEDURE

NOTE:

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

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

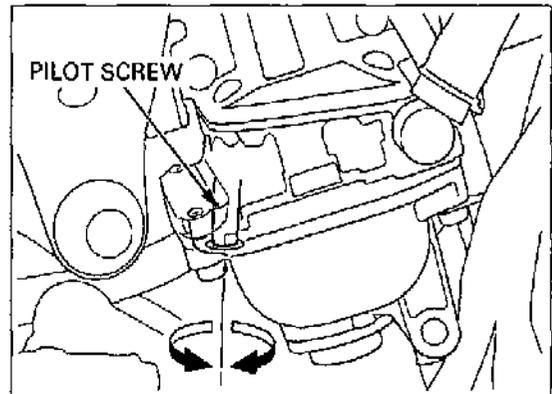
1. Turn the pilot screw clockwise until it seats lightly, then back it out to specification given. This is an initial setting prior to the final pilot screw adjustment.

TOOL:

Pilot screw wrench 07KMA-MN90101

INITIAL OPENING: 2-3/8 turns out

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



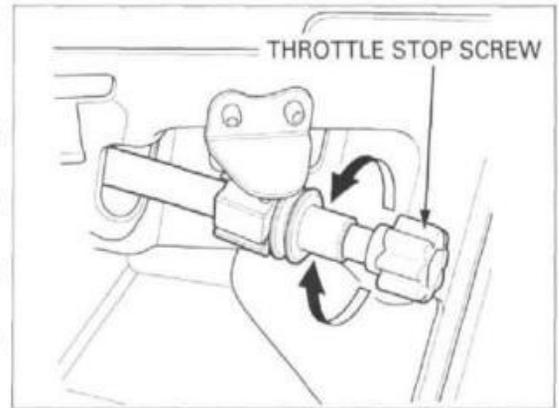
4. Start the engine and adjust the idle speed with the throttle stop screw.

IDLE SPEED: 1,700 ± 100 rpm

5. Turn the pilot screw in or out slowly to obtain the highest engine speed.
6. Readjust the idle speed with the throttle stop screw.
7. Turn the pilot screw in gradually until the engine speed drops 100 rpm.
8. Turn the pilot screw out to the final opening from the position obtained in step 7.

FINAL OPENING: 1-1/4 turn out

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



HIGH ALTITUDE ADJUSTMENT

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

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

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

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

The high altitude carburetor adjustment is performed as follows:

Remove the carburetor (page 8-7) and the float chamber (page 8-12).

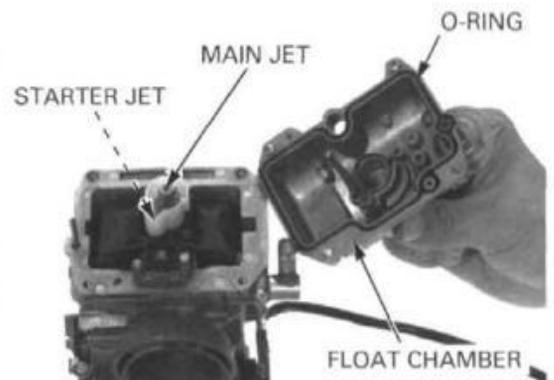
Replace the standard main jet and starter jet with the high altitude type.

HIGH ALTITUDE MAIN JET: #115

HIGH ALTITUDE STARTER JET: #72

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

Install the float chamber (page 8-18) and carburetor (page 8-22).

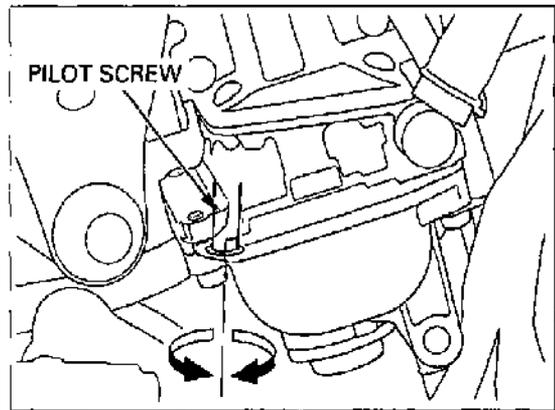


FUEL SYSTEM (After '05)

Screw the pilot screw in the specified number of turns from the factory preset position using the special tool.

HIGH ALTITUDE PILOT SCREW OPENING:
1/4 turn in from the factory preset position

TOOL:
Pilot screw wrench 07KMA-MN90101



Start the engine and warm it up.
Adjust the idle speed at high altitude with the throttle stop screw to ensure proper high altitude operation.

IDLE SPEED: 1,700 ± 100 rpm

NOTICE

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

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

Replace the main jet and starter jet with the standard jets.

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

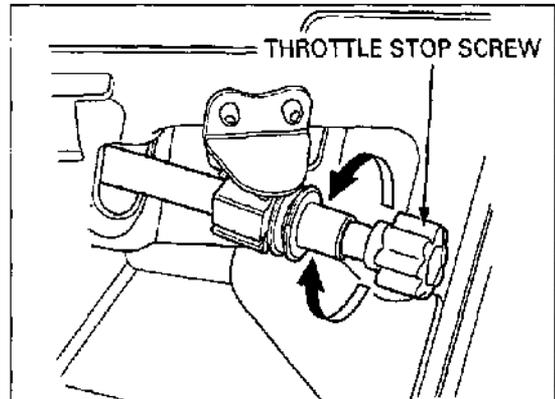
STANDARD MAIN JET: #120
STANDARD STARTER JET: #75

LOW ALTITUDE PILOT SCREW OPENING:
1/4 turn out from the high altitude setting

TOOL:
Pilot screw wrench 07KMA-MN90101

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

IDLE SPEED: 1,700 ± 100 rpm



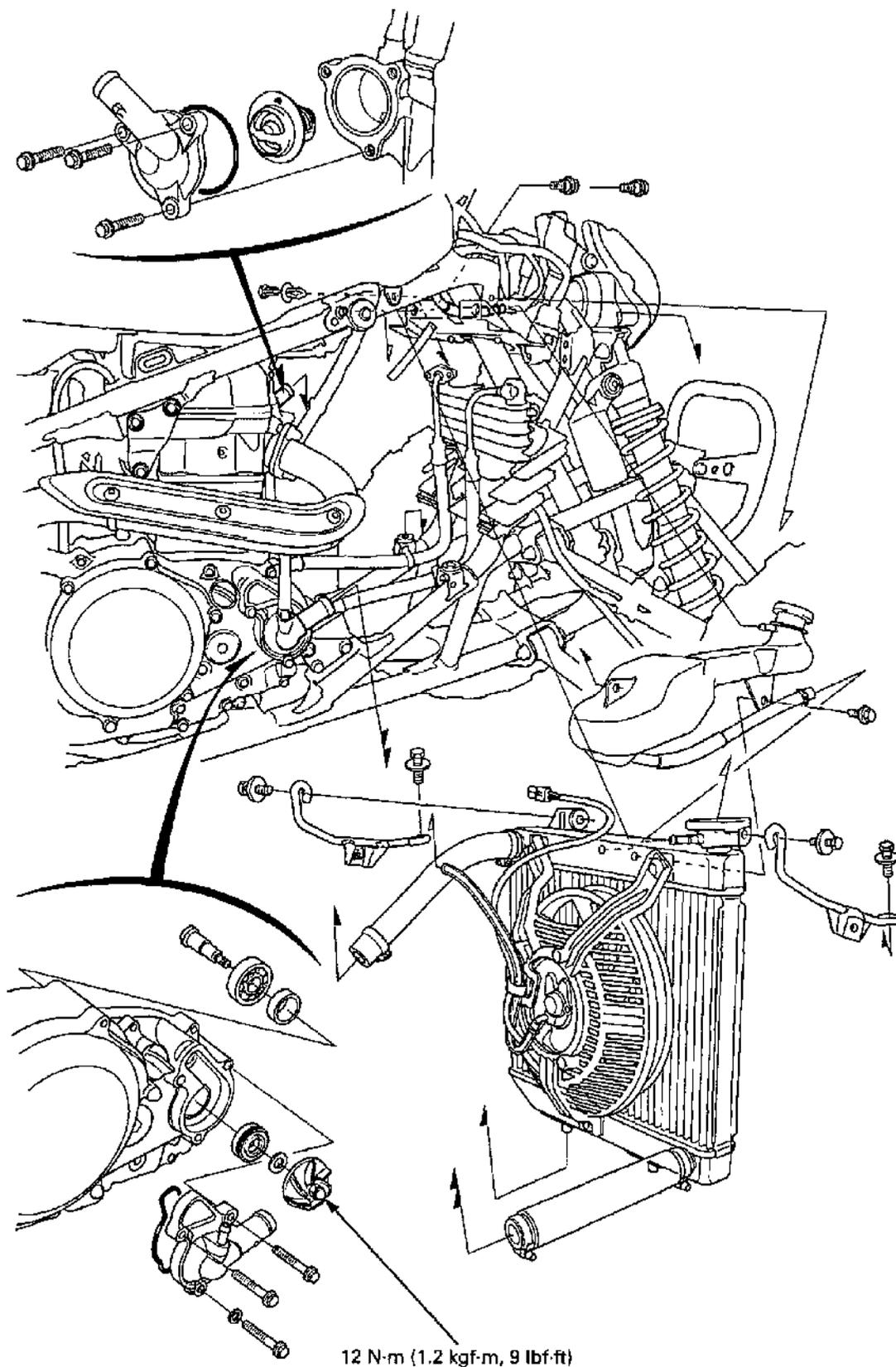
9. COOLING SYSTEM

SYSTEM COMPONENTS	9-2	COOLANT REPLACEMENT	9-6
SERVICE INFORMATION	9-3	THERMOSTAT	9-8
TROUBLESHOOTING	9-4	RADIATOR/COOLING FAN	9-9
SYSTEM TESTING	9-5	WATER PUMP	9-14

COOLING SYSTEM

SYSTEM COMPONENTS

'04 - '05 model shown; After '05 similar



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.

▲ CAUTION

Radiator coolant is toxic. Keep it away from eyes and mouth.

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

NOTICE

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

- Add coolant to the system at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system service 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.
- For coolant temperature indicator inspection ('04 - '05: page 20-22, After '05: page 24-11).
- For engine coolant temperature sensor inspection ('04 - '05: page 20-24, After '05: page 24-13).

SPECIFICATIONS

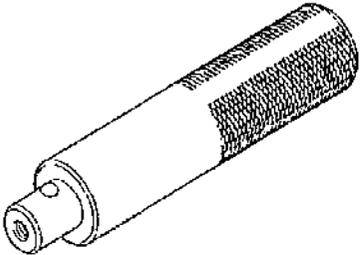
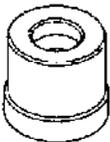
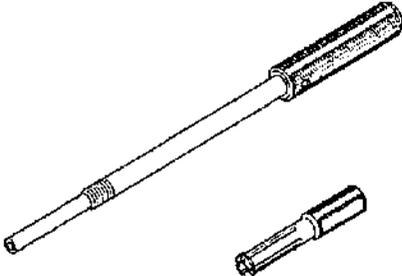
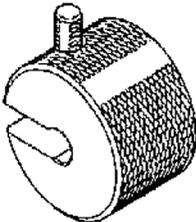
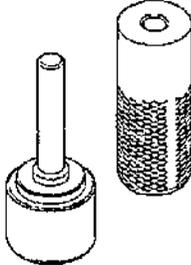
ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	1.5 liters (1.6 US qt, 1.3 Imp qt)
	Reserve tank	0.34 liter (0.36 US qt, 0.30 Imp qt)
Radiator cap relief pressure		108 - 137 kPa (1.1 - 1.4 kgf/cm ² , 16 - 20 psi)
Thermostat	Begin to open	80 - 84°C (176 - 183°F)
	Fully open	95°C (203°F)
	Valve lift	8 mm (0.3 in) minimum
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)

COOLING SYSTEM

TOOLS

<p>Driver 07749-0010000</p> 	<p>Attachment, 28 x 30 mm 07946-1870100</p> 	<p>Pilot, 12 mm 07746-0040200</p> 
<p>Bearing remover set, 12 mm 07936-1660101</p>  <p>or 07936-166010A and 07936-3710100 (U.S.A. only)</p>	<p>Bearing remover weight 07741-0010201</p>  <p>or 07936-371020A or 07936-3710200 (U.S.A. only)</p>	<p>Oil seal driver 07945-KA30000</p>  <p>or 07965-415000A (U.S.A. only)</p>

TROUBLESHOOTING

Engine temperature too high

- Thermostat stuck closed
- Faulty radiator cap
- Insufficient coolant
- Passage blocked in radiator, hoses or water jacket
- Air in system
- Faulty cooling fan motor
- Faulty cooling fan motor drive circuit ('04 - '05: page 20-23, After '05: page 24-12)
- Faulty water pump

Coolant leaks

- Faulty water pump mechanical seal
- Deteriorated O-ring
- Faulty radiator cap
- Damaged or deteriorated cylinder head gasket
- Loose hose connection or clamp
- Damaged or deteriorated hose

SYSTEM TESTING

COOLANT (HYDROMETER TEST)

Remove the right front fender ('04 - '05: page 3-6, After '05: page 3-6).

Remove the radiator cap.



Test the coolant gravity using a hydrometer. (See "coolant gravity chart" below.)

For maximum corrosion protection, a 50 – 50% solution of ethylene glycol and distilled water is recommended (page 9-6).

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	

COOLING SYSTEM

RADIATOR CAP/SYSTEM PRESSURE INSPECTION

Remove the radiator cap (page 9-5).

Wet the sealing surfaces of the cap, then install the cap onto tester.

TOOLS:

Cooling system pressure tester SVTS4AH
Cooling system adaptor OTCJ33984A

Pressurize the radiator cap using the tester.
Replace the radiator cap if it does not hold pressure, or if relief pressure is too high or too low. It must hold the specified pressure for at least 6 seconds.

RADIATOR CAP RELIEF PRESSURE:

108 – 137 kPa (1.1 – 1.4 kgf/cm², 16 – 20 psi)

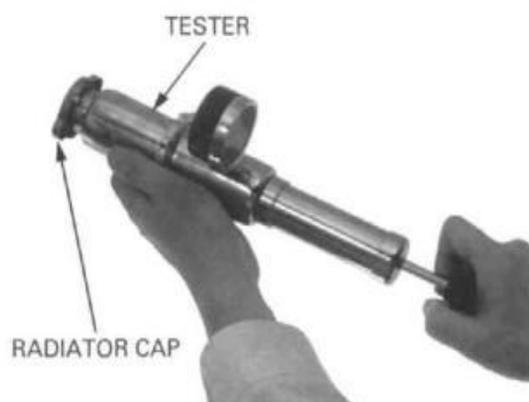
Excessive pressure can damage the cooling system components. Do not exceed 137 kPa (1.4 kgf/cm², 20 psi).

Pressure test the radiator, engine and hoses, and check for leaks.

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

Remove the tester and install the radiator cap.

Install the right front fender ('04 – '05: page 3-6, After '05: page 3-6).



COOLANT REPLACEMENT

PREPARATION

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.

NOTE:

- The effectiveness of coolant decreases with the accumulation of rust 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.

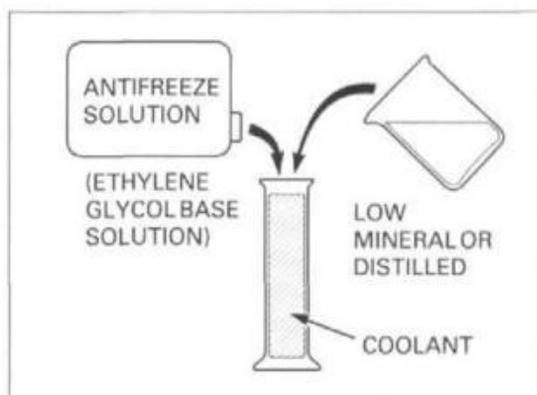
Mix only distilled, low mineral water with the recommended antifreeze.

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 the recommended antifreeze)



REPLACEMENT/AIR BLEEDING

NOTE:

- When filling the system or reserve tank with a coolant, place the vehicle on a flat, level surface.

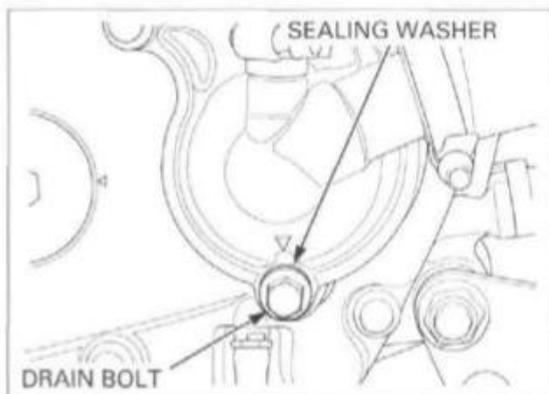
Remove the right front fender ('04 - '05: page 3-6, After '05: page 3-6).

Remove the radiator cap.



Remove the drain bolt and sealing washer, and drain the coolant from the system.

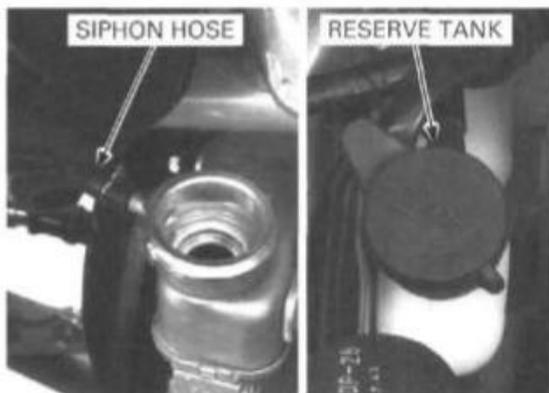
Reinstall the drain bolt with a new sealing washer and tighten it securely.



Disconnect the siphon hose from the radiator filler neck and drain the coolant from the reserve tank.

Empty the coolant, remove the reserve tank cap and rinse the inside of the reserve tank with water.

Reconnect the siphon hose.



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

Bleed air from the system as follows:

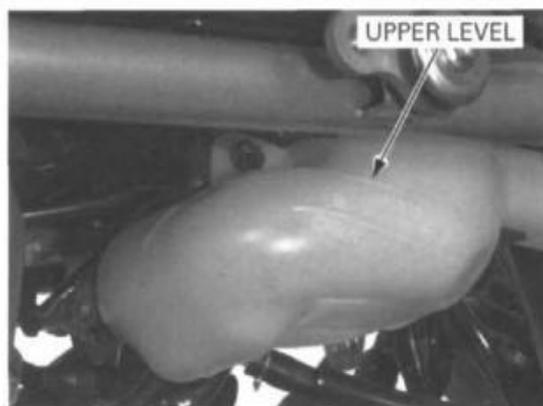
1. Shift the transmission into neutral. Start the engine and let it idle for 2 - 3 minutes.
2. Snap the throttle 3 - 4 times to bleed air from the system.
3. Stop the engine and add coolant up to the filler neck.
4. Install the radiator cap.



COOLING SYSTEM

Fill the reserve tank to the upper level line and install the tank cap.

Install the right front fender ('04 - '05: page 3-6, After '05: page 3-6).

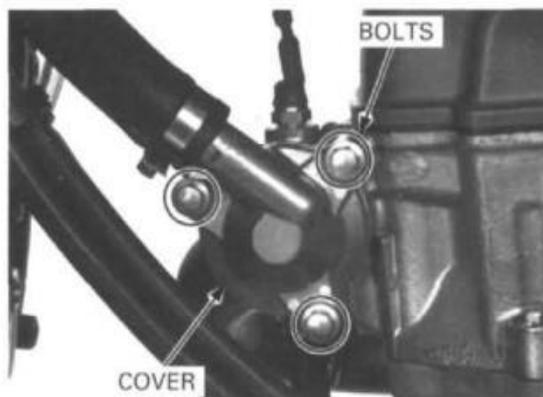


THERMOSTAT

REMOVAL

Drain the coolant from the system (page 9-7).

Remove the three bolts and thermostat cover.



Remove the thermostat from the cylinder head.



INSPECTION

Visually inspect the thermostat for damage. Replace the thermostat if the valve stays open at room temperature.

Wear insulated gloves and adequate eye protection.

Do not let the thermostat or thermometer touch the pan, or you will get a false reading.

Heat a container of water with an electric heating element for 5 minutes.

Suspend the thermostat in heated water to check its operation.

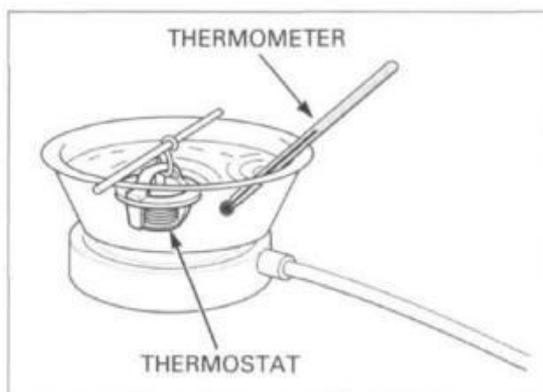
THERMOSTAT BEGIN TO OPEN:

80 - 84°C (176 - 183°F)

VALVE LIFT:

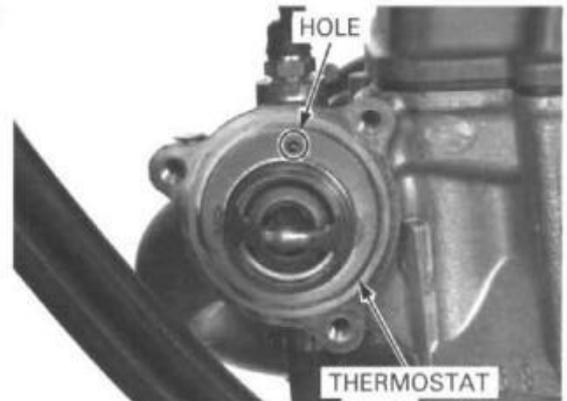
8 mm (0.3 in) minimum at 95°C (203°F)

Replace the thermostat if the valve opens at a temperature other than those specified.



INSTALLATION

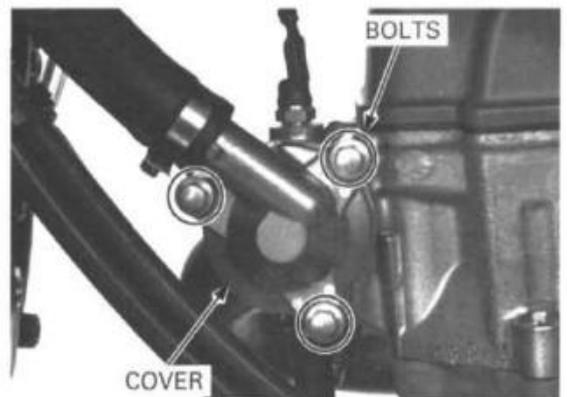
Install the thermostat into the cylinder head with the bleed hole facing up.



Install a new O-ring into the groove in the thermostat cover.



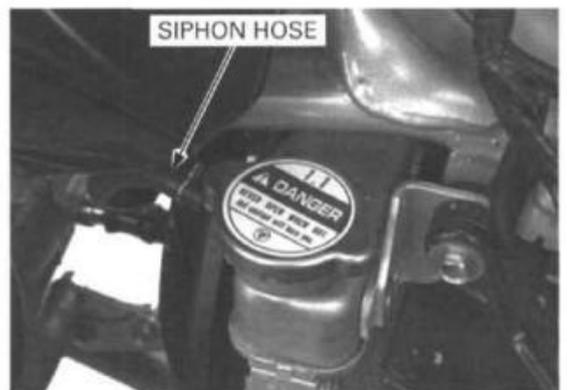
Install the thermostat cover onto the cylinder head and tighten the three bolts securely.
Fill and bleed the cooling system (page 9-7).

**RADIATOR/COOLING FAN****REMOVAL**

Remove both front fenders ('04 - '05: page 3-6, After '05: page 3-6).

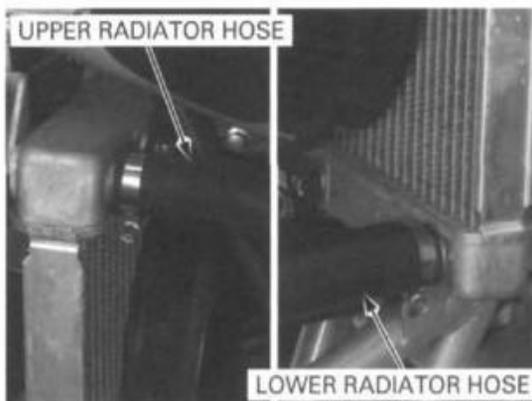
Drain the coolant from the system (page 9-7).

Disconnect the siphon hose from the radiator filler neck.

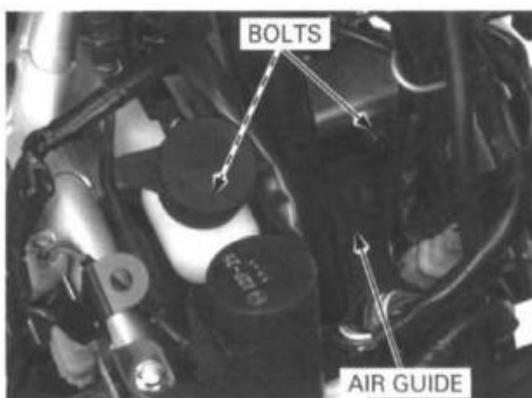


COOLING SYSTEM

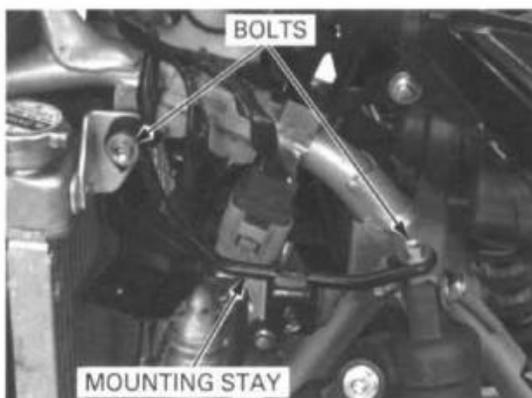
Loosen the band screws and disconnect the upper and lower radiator hoses from the radiator.



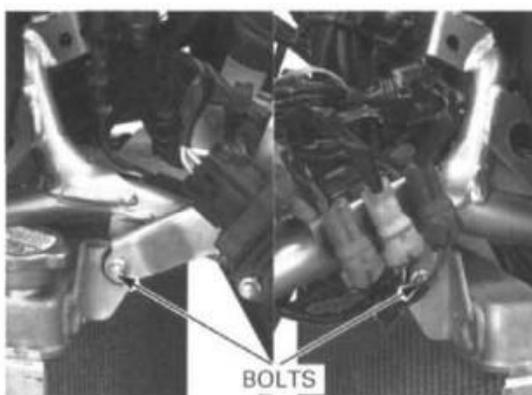
'04 - '05: Remove the handlebar switch 3P and 4P connectors from the stays on the frame. Remove the two bolts and air guide from the radiator.



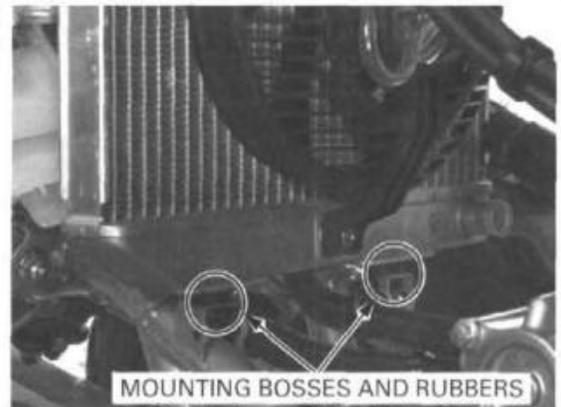
'04 - '05: Remove the four bolts and two fender mounting stays from both sides.



After '05: Remove the mounting bolt from both sides.

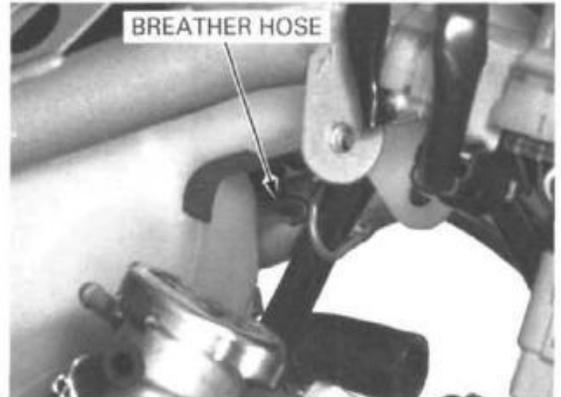


Remove the radiator mounting bosses from the mounting rubbers and slide the lower side of the radiator rearward.



Disconnect the fan motor breather hose from the joint pipe of the frame.

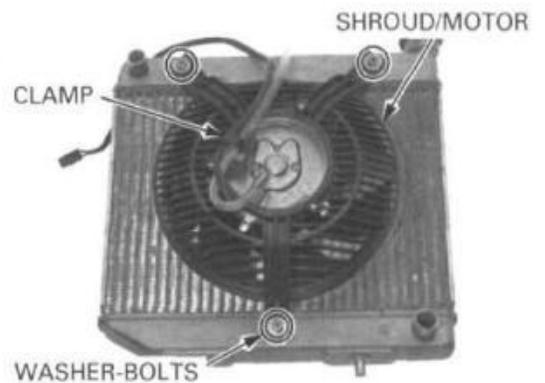
Remove the radiator out of the frame to the right side.



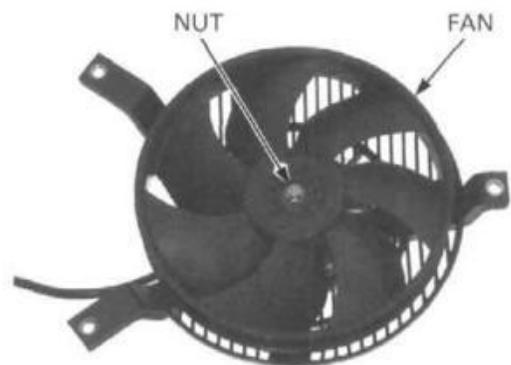
DISASSEMBLY

Release the fan motor wire and breather hose from the clamp of the shroud.

Remove the three washer-bolts and shroud/motor assembly from the radiator.

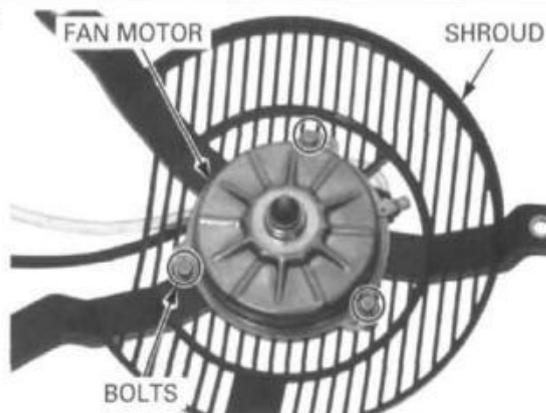


Remove the nut and cooling fan.



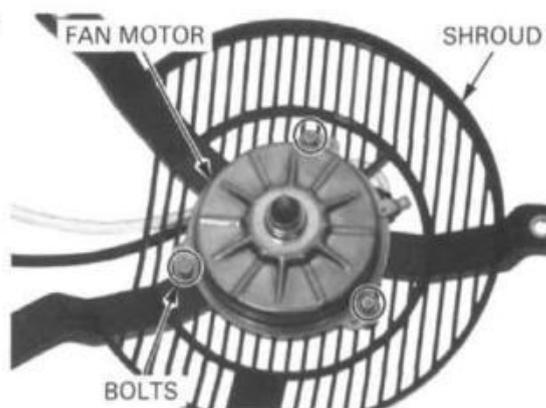
COOLING SYSTEM

Remove the three bolts and fan motor from the shroud.

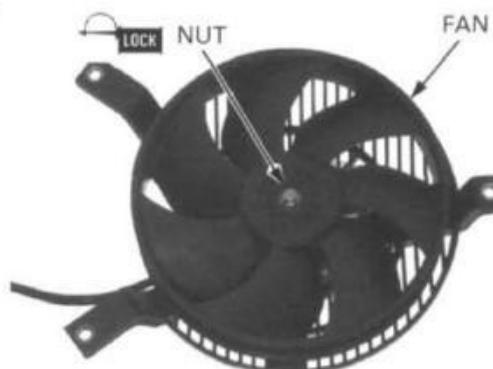


ASSEMBLY

Install the fan motor on the shroud in the direction as shown and tighten the three bolts securely.

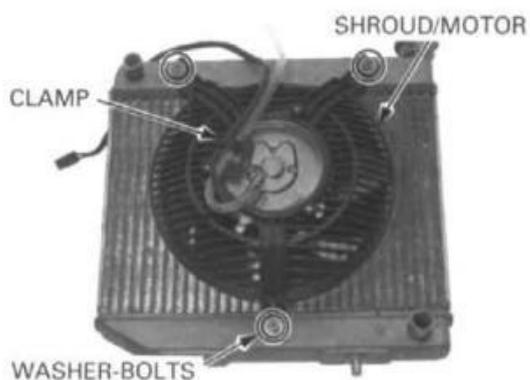


Install the cooling fan on the fan motor shaft, aligning the flat surfaces. Apply locking agent to the motor nut threads. Install the nut and tighten it.



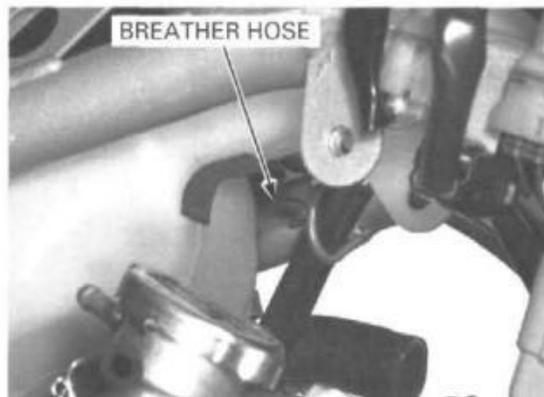
Install the shroud/motor assembly onto the radiator and tighten the three washer-bolts securely.

Route the fan motor wire and breather hose through the clamp as shown.

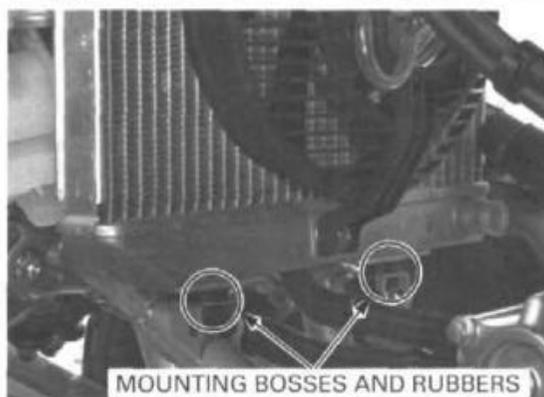


INSTALLATION

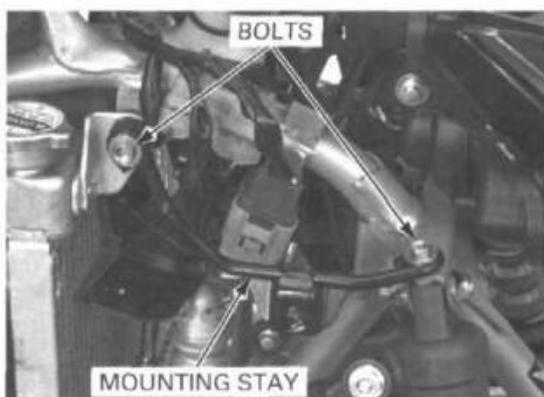
Install the radiator in the frame from the right side.
Connect the fan motor breather hose to the joint pipe of the frame.



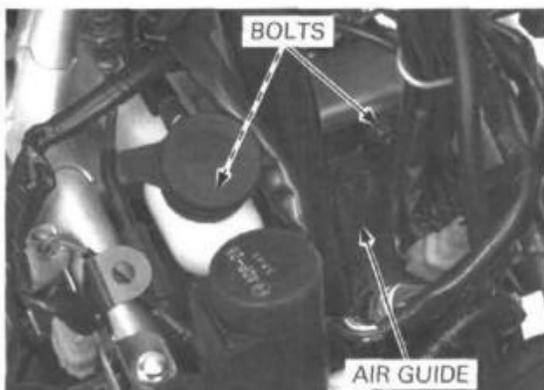
Insert the radiator mounting bosses into the mounting rubbers.



'04 - '05: Set the radiator onto the frame properly, install the two fender mounting stays and tighten the four bolts securely.

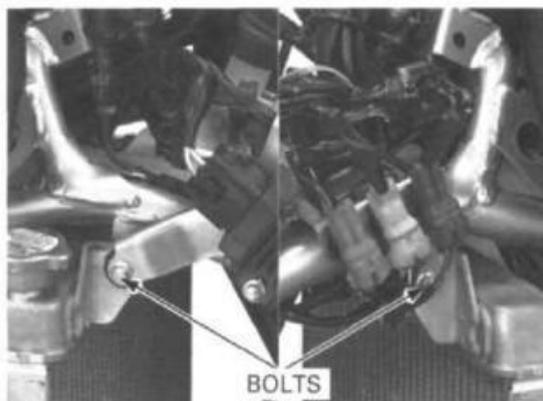


'04 - '05: Install the air guide onto the radiator and tighten the two bolt securely.
Install the handlebar switch 3P and 4P connectors onto the stays on the frame.

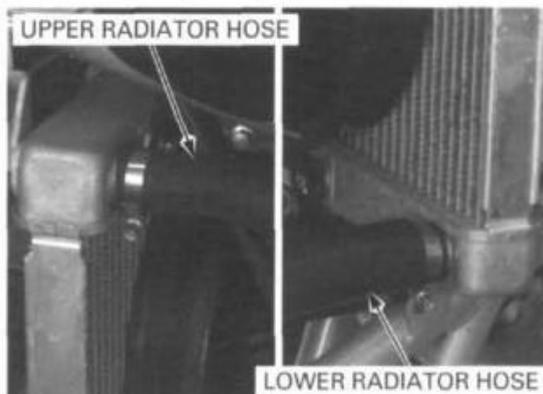


COOLING SYSTEM

After '05: Set the radiator onto the frame and tighten the mounting bolt from both sides.



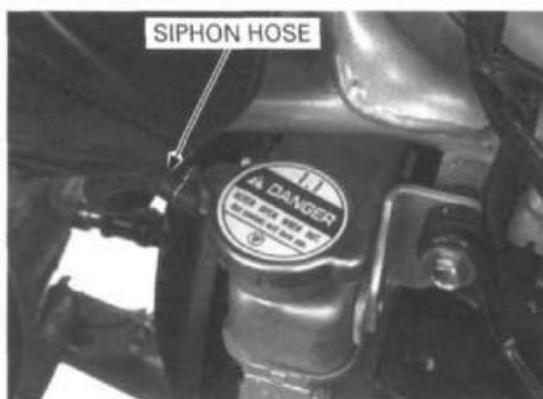
Connect the upper and lower radiator hoses to the radiator and tighten the hose band screws.



Connect the siphon hose to the radiator filler neck.

Fill and bleed the cooling system (page 9-7).

After bleeding, install both front fenders ('04 - '05: page 3-6, After '05: page 3-6).

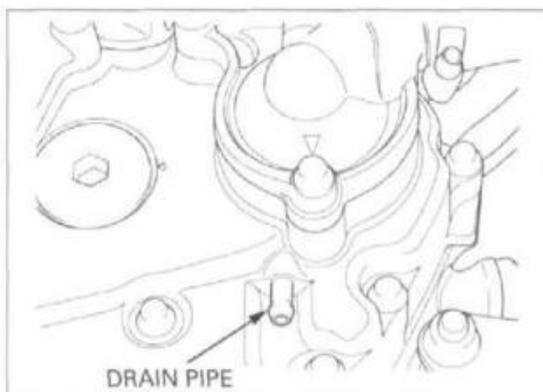


WATER PUMP

MECHANICAL SEAL INSPECTION

Disconnect the drain hose from the drain pipe of the right crankcase cover.

Check the drain pipe for signs of coolant leakage. If there is leakage, the mechanical seal is defective and it must be replaced.



REMOVAL

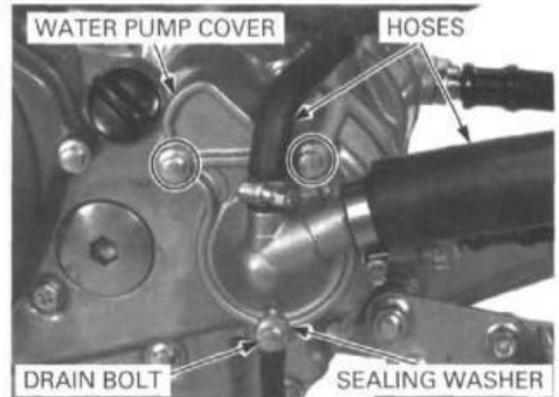
Remove the radiator cap.



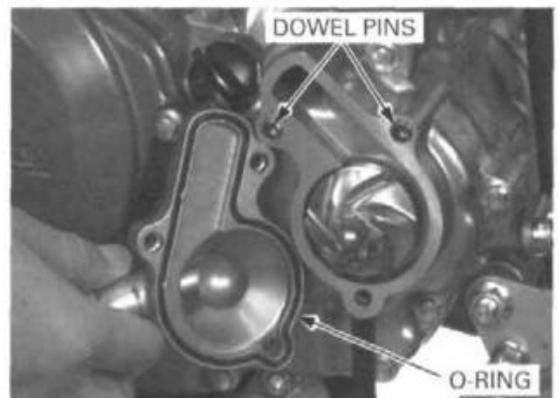
Remove the drain bolt and sealing washer, and drain the coolant from the system.

Loosen the hose band screws and disconnect the bypass hose and radiator lower hose from the water pump cover.

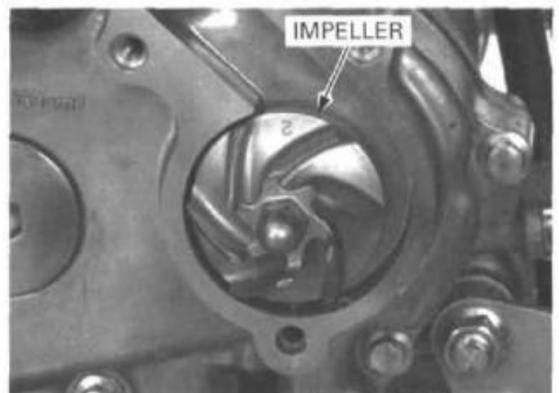
Remove the two bolts and water pump cover.



Remove the dowel pins and O-ring.



Loosen the water pump impeller.



COOLING SYSTEM

Remove the right crankcase cover ('04 - '05: page 13-5, After '05: page 14-5).

Remove the impeller and washer from the water pump shaft.

Remove the water pump shaft from the right crankcase cover.



MECHANICAL SEAL REPLACEMENT

Remove the water pump shaft bearing using the special tools.

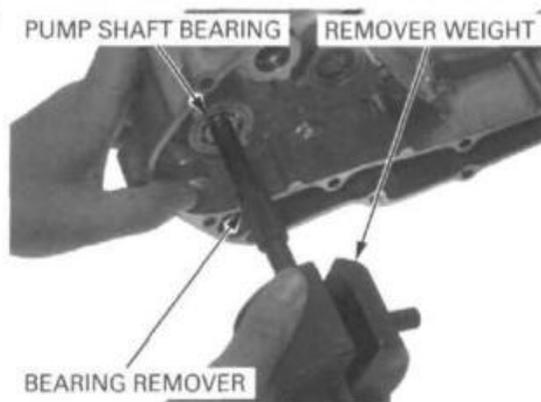
TOOLS:

Bearing remover set, 12 mm	07936-1660101
- Remover head, 12 mm	07936-1660110
- Remover shaft	07936-1660120
Remover weight	07741-0010201

(not available in U.S.A)

U.S.A only:

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



Remove the oil seal.



Remove the mechanical seal.



Drive in a new mechanical seal using the special tool until it is fully seated.

TOOL:

Oil seal driver attachment 07945-KA30000 or
07965-415000A
(U.S.A. only)



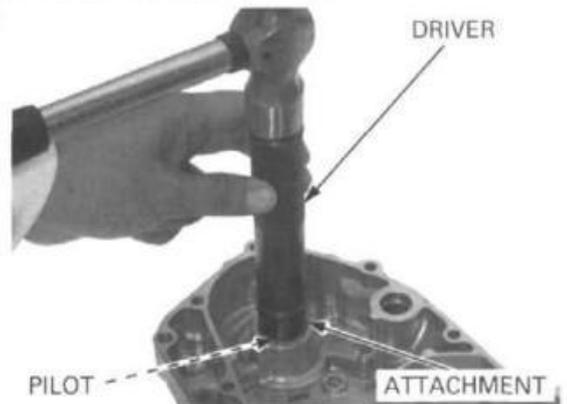
Apply oil to a new oil seal lip and install it until it is flush with the right crankcase cover.



Drive in a new water pump shaft bearing until it is fully seated using the special tools.

TOOL:

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

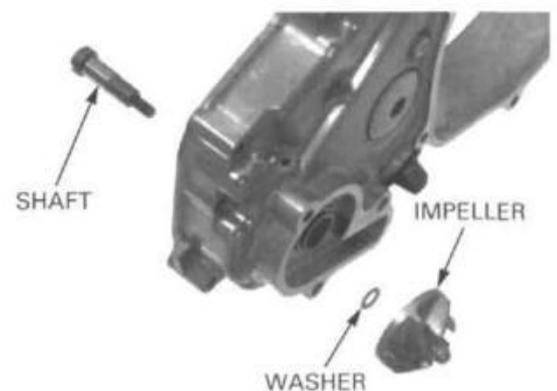


INSTALLATION

Install the water pump shaft into the right crankcase cover.

Install the washer and impeller onto the water pump shaft.

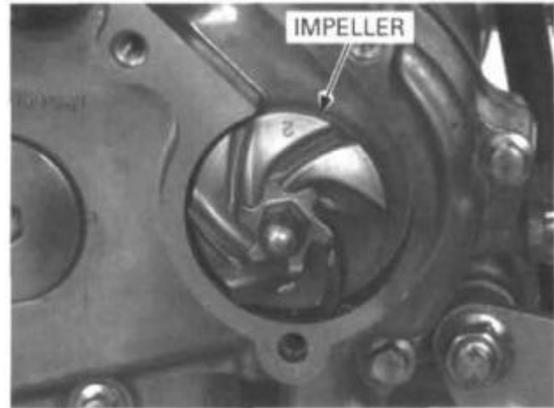
Install the right crankcase cover ('04 - '05: page 13-22, After '05: page 14-28).



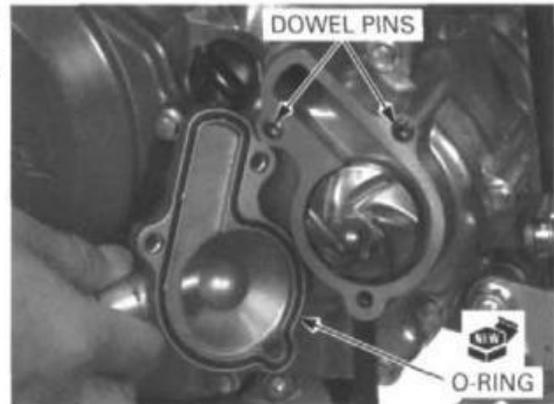
COOLING SYSTEM

Tighten the water pump impeller.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

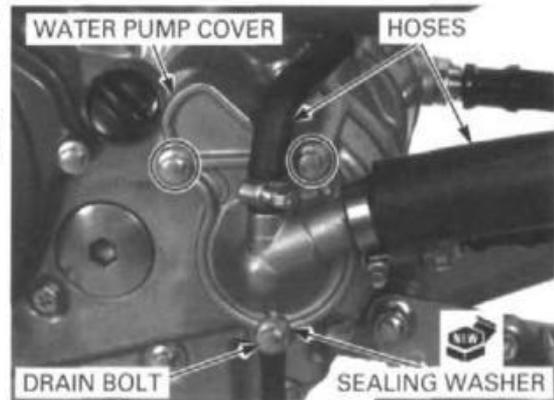


Install a new O-ring into the water pump cover groove.
Remove the dowel pins into the right crankcase cover.



Install the water pump cover and tighten the two bolt securely.
Install the drain bolt with a new sealing washer and tighten it securely.
Connect the bypass hose and radiator lower hose to the water pump cover, and tighten the hose band screws securely.

Fill and bleed the cooling system (page 9-7).



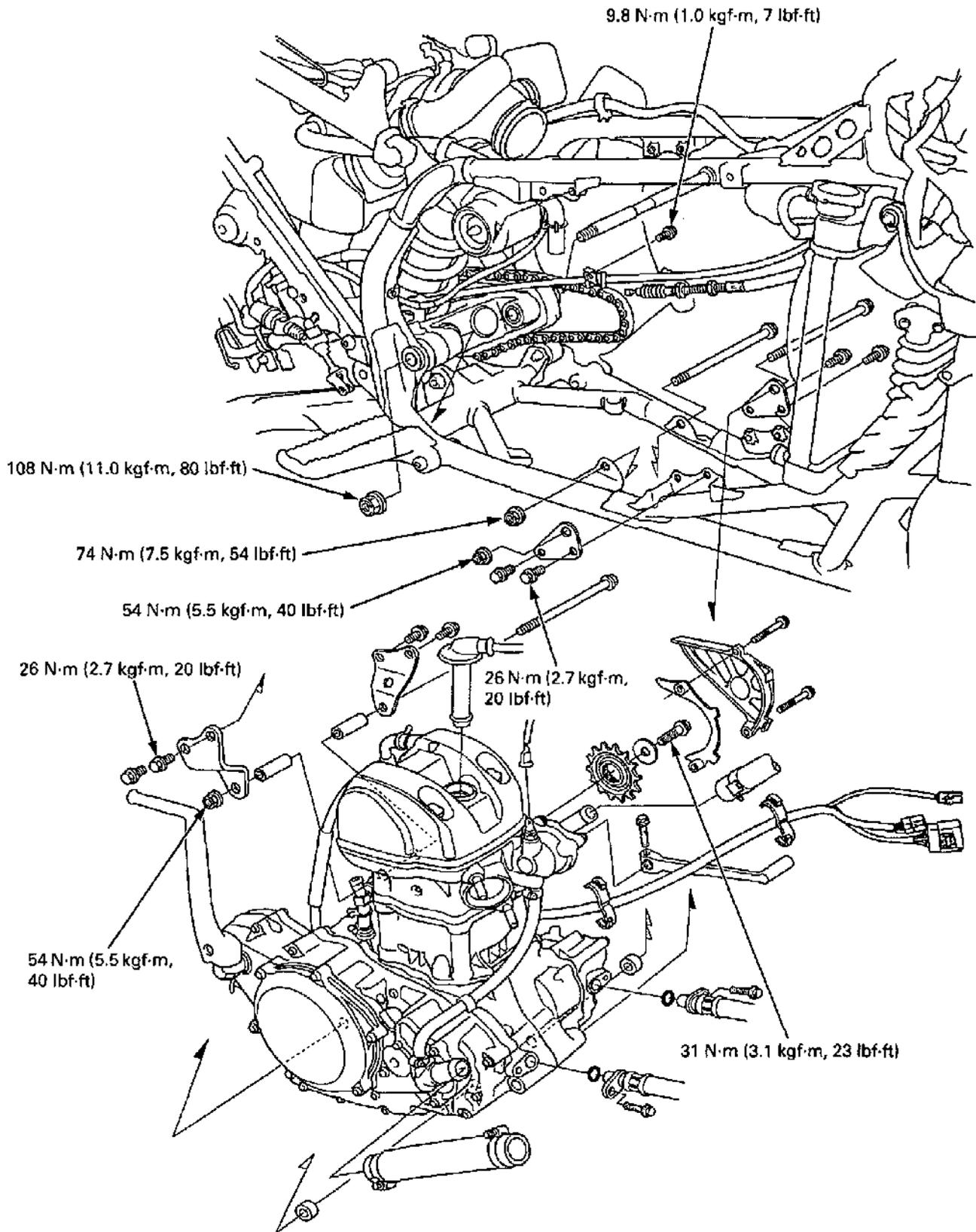
10. ENGINE REMOVAL/INSTALLATION

SYSTEM COMPONENTS	10-2	ENGINE REMOVAL	10-5
SERVICE INFORMATION	10-4	ENGINE INSTALLATION	10-9

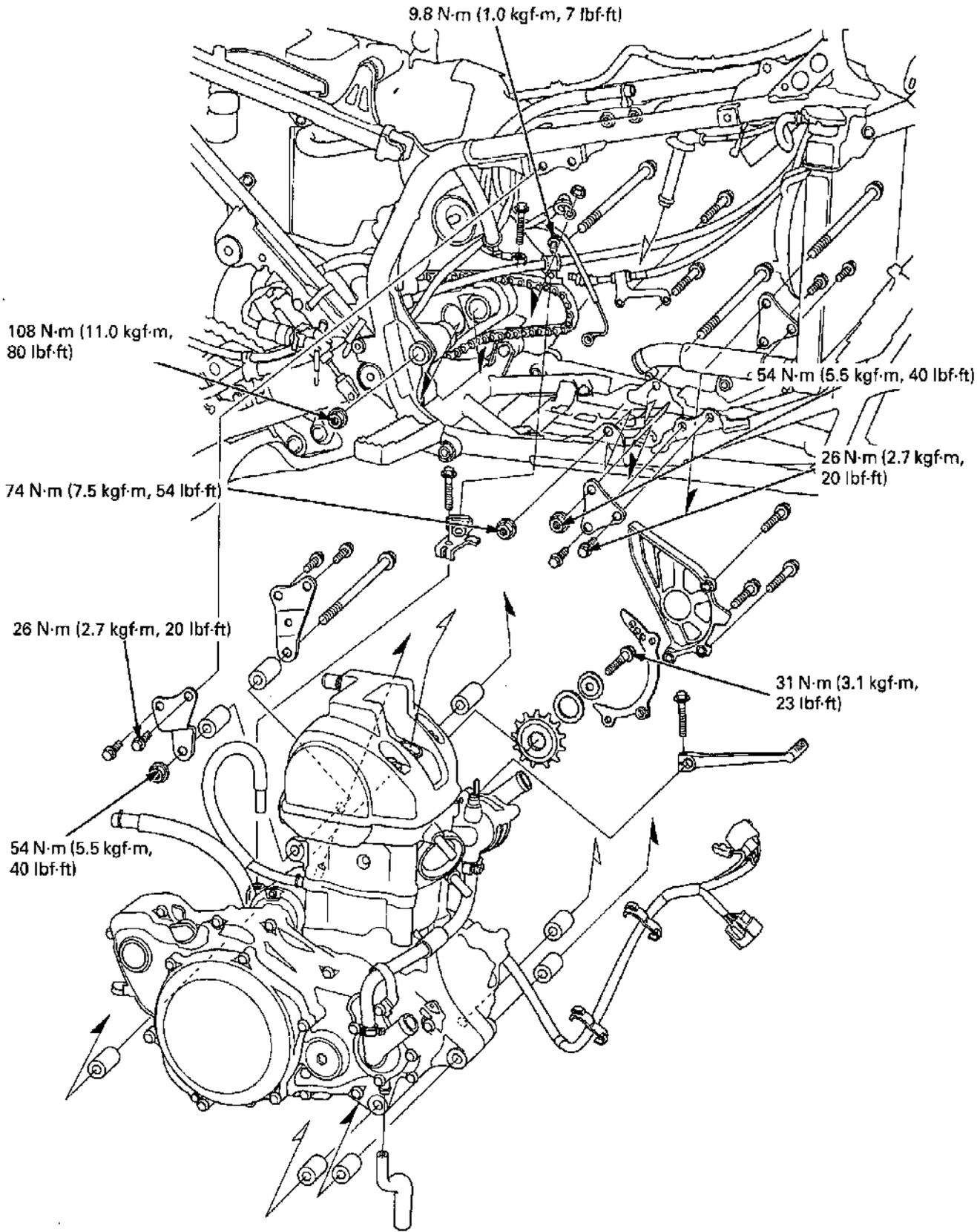
ENGINE REMOVAL/INSTALLATION

SYSTEM COMPONENTS

'04 - '05:



After '05:



ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION

GENERAL

- When removing/installing the engine, tape the frame around the engine beforehand for frame protection.
- The following components require engine removal for service:

'04 - '05:

- oil pump (page 5-7)
- transmission (page 15-13)
- crankshaft (page 15-18)

After '05:

- oil pump (page 6-9)
- transmission (page 16-13)
- crankshaft (page 16-17)

SPECIFICATIONS

	ITEM	SPECIFICATIONS	
Engine dry weight	'04 - '05	34.7 kg (76.8 lbs)	
	After '05	TRX450ER	34.3 kg (75.6 lbs)
		TRX450R	33.4 kg (73.6 lbs)
Engine oil capacity	'04 - '05	After draining	0.78 liter (0.82 US qt, 0.67 Imp qt)
		After filter change	0.82 liter (0.87 US qt, 0.72 Imp qt)
		After disassembly	1.20 liter (1.27 US qt, 1.06 Imp qt)
	After '05	After draining	0.65 liter (0.69 US qt, 0.57 Imp qt)
		After filter change	0.69 liter (0.73 US qt, 0.61 Imp qt)
		After disassembly	0.85 liter (0.90 US qt, 0.75 Imp qt)
Transmission oil capacity	'04 - '05	After draining	0.55 liter (0.58 US qt, 0.48 Imp qt)
		After disassembly	0.65 liter (0.69 US qt, 0.57 Imp qt)
	After '05	After draining	0.68 liter (0.72 US qt, 0.60 Imp qt)
		After disassembly	0.80 liter (0.85 US qt, 0.70 Imp qt)
Coolant capacity (radiator and engine)		1.5 liters (1.6 US qt, 1.3 Imp qt)	

TORQUE VALUES

Drive sprocket bolt	31 N·m (3.2 kgf·m, 23 lbf·ft)	
Upper engine hanger nut	54 N·m (5.5 kgf·m, 40 lbf·ft)	
Upper engine hanger plate bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)	
Front engine hanger nut	54 N·m (5.5 kgf·m, 40 lbf·ft)	
Front engine hanger plate bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)	
Lower engine hanger nut	74 N·m (7.5 kgf·m, 54 lbf·ft)	
Swingarm pivot nut	108 N·m (11.0 kgf·m, 80 lbf·ft)	Apply grease to the threads and seating surfaces.
Parking brake cable clamp bolt ('04 - '05)	9.8 N·m (1.0 kgf·m, 7 lbf·ft)	ALOC bolt: replace with a new one.
Parking brake cable clamp bolt (After '05)	9.8 N·m (1.0 kgf·m, 7 lbf·ft)	Apply locking agent to the threads.

ENGINE REMOVAL

'04 - '05: Drain the engine oil (page 4-15).
 Drain the transmission oil (page 4-18).
 Drain the coolant (page 9-7).

- Remove the following:
- exhaust system (page 3-10)
 - carburetor (page 7-6)
 - heat guard plate (page 3-9)
 - brake pedal (page 19-28)

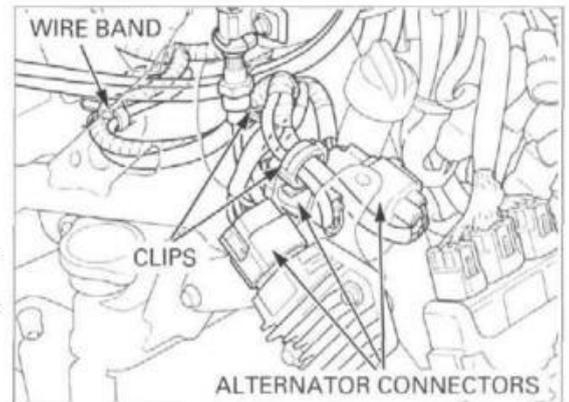
Disconnect the alternator connectors.



After '05: Drain the engine oil (page 4-15).
 Drain the transmission oil (page 4-18).
 Drain the coolant (page 9-7).

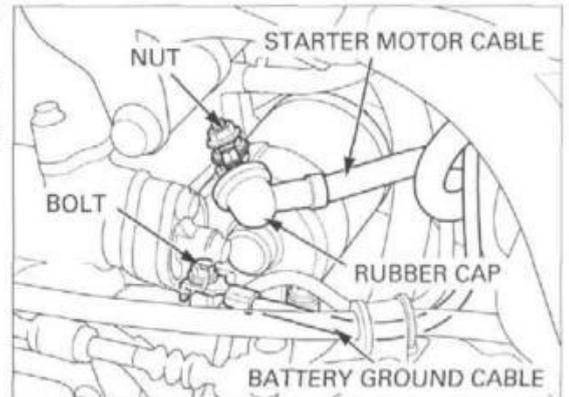
- Remove the following:
- exhaust system (page 3-10)
 - carburetor (page 8-7)
 - heat guard plate (page 3-9)
 - brake pedal (page 19-28)

Remove the wire band that secured the wire harness and alternator wire.
 Disconnect the alternator connectors and remove the clips.

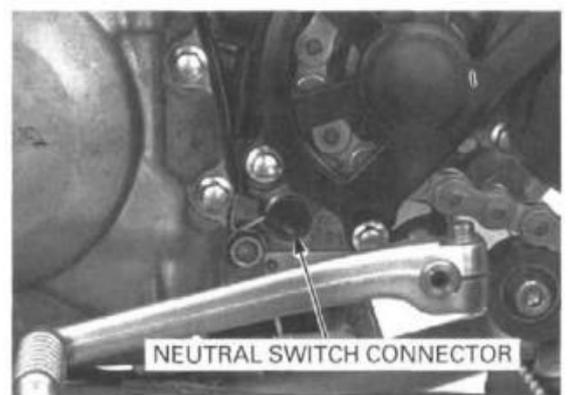


TRX450ER only: Remove the bolt and disconnect the battery ground cable.

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

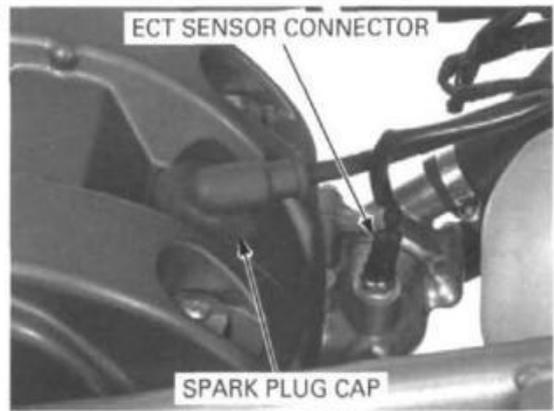


TRX450ER only: Disconnect the neutral switch connector.



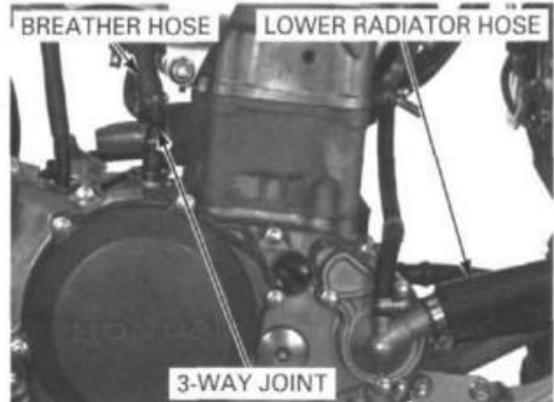
ENGINE REMOVAL/INSTALLATION

Disconnect the spark plug cap and engine coolant temperature (ECT) sensor connector.

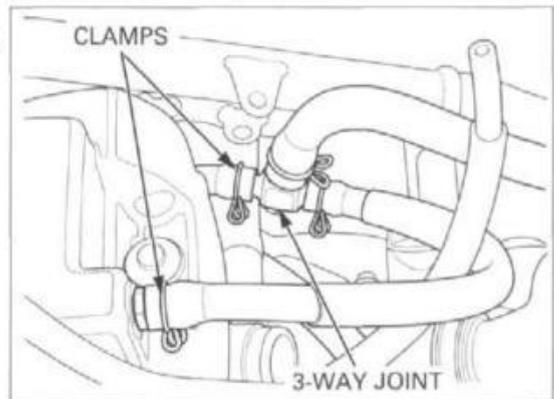


'04 - '05: Remove the hose clamp from the breather hoses. Disconnect the crankcase breather hose from the 3-way joint.

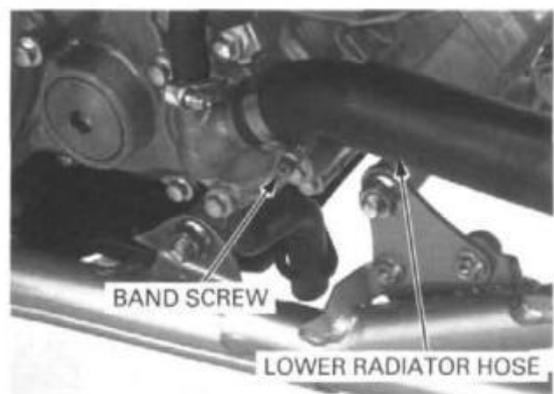
Loosen the hose band screw and disconnect the lower radiator hose from the water pump cover.



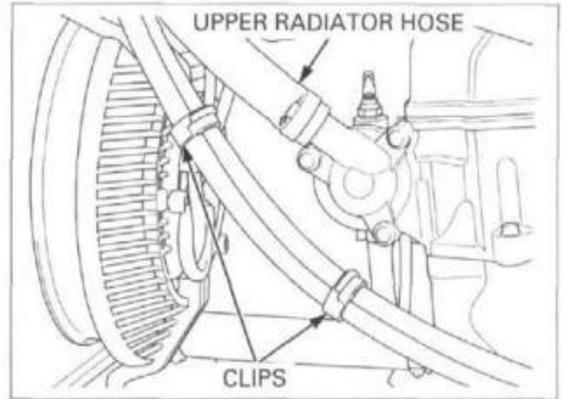
After '05: Remove the hose clamps from the breather hoses. Disconnect the crankcase breather hoses from the 3-way joint.



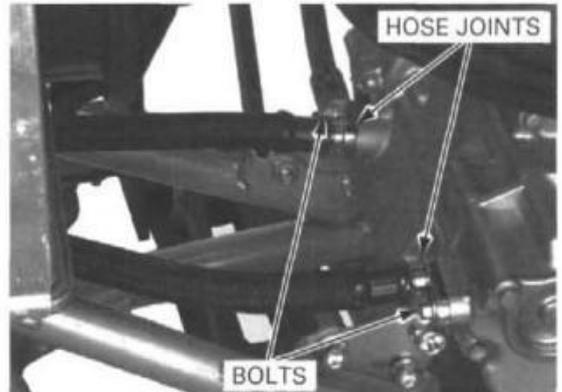
After '05: Loosen the hose band screw and disconnect the lower radiator hose from the water pump cover.



Loosen the hose band screw and disconnect the upper radiator hose from the thermostat cover.
Remove the two cable clips.

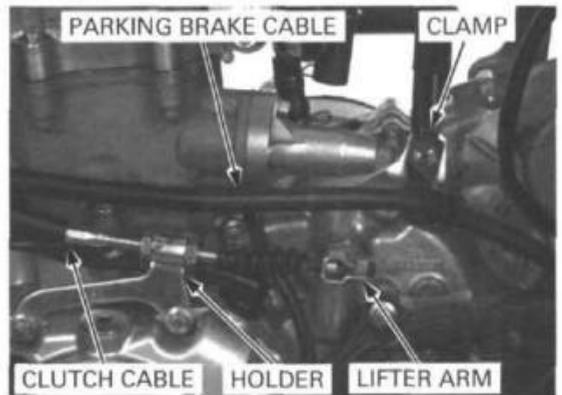


'04 - '05: Remove the two bolts, oil cooler hose joints and O-rings.



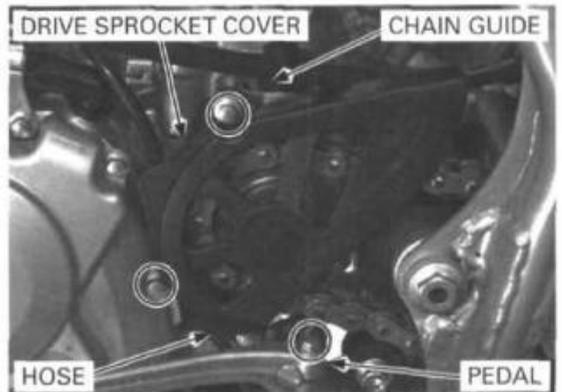
Remove the bolt and parking brake cable clamp from the stay.

Loosen the clutch cable lock nut and disconnect the clutch cable from the lifter arm.
Remove the clutch cable adjusting nut and the clutch cable from the cable holder.



Remove the pinch bolt and gearshift pedal from the gearshift spindle.

Remove the two bolts, drive sprocket cover with the carburetor drain hose, and the drive chain guide.

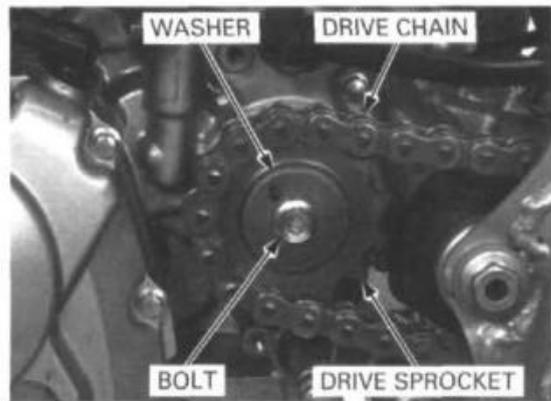


ENGINE REMOVAL/INSTALLATION

Turn the rear axle bearing holder to obtain maximum drive chain slack (page 4-22).

Remove the bolt, washer and drive sprocket from the countershaft.

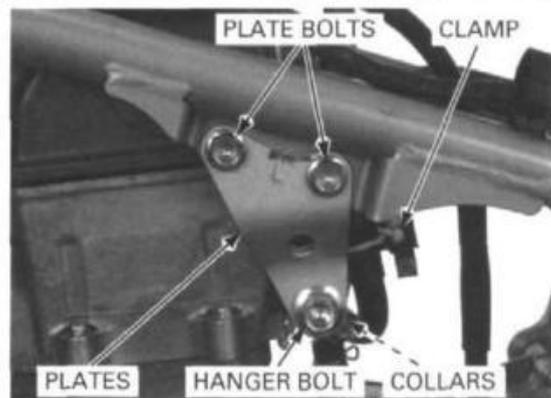
Remove the drive sprocket from the drive chain.



Remove the crankcase breather hose clamp. ('04 - '05 model only)

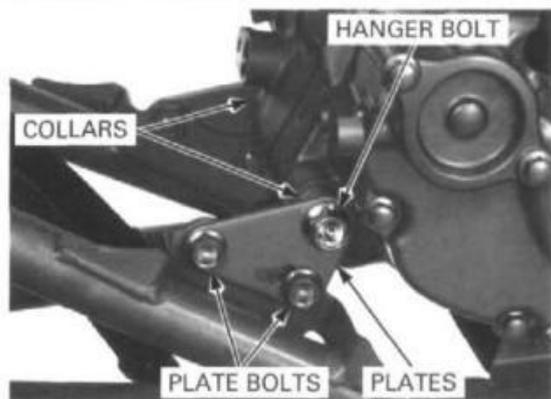
Remove the upper engine hanger nut, bolt, two collars.

Remove the engine hanger plate bolts and hanger plates.

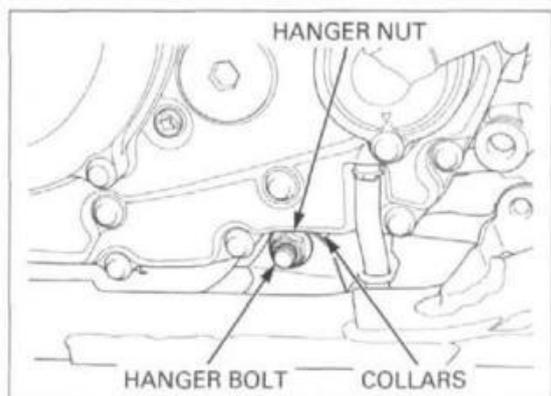


Remove the front engine hanger nut, bolt and two collars.

Remove the engine hanger plate bolts and hanger plates.



Remove the lower engine hanger nut, bolt and two collars.



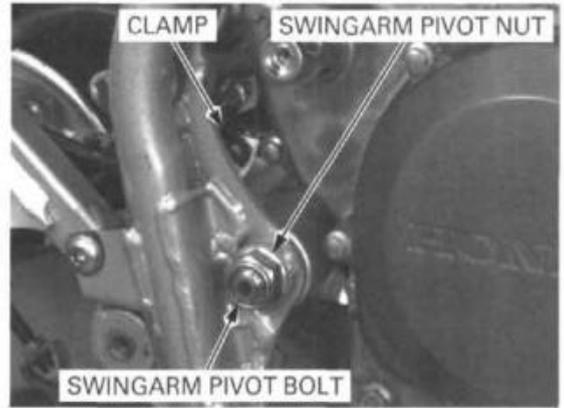
Support the frame with a floor jack or other suitable support.

Remove the rear brake light switch wire from the clamp.

Remove the swingarm pivot nut and bolt.

Remove the engine out of the frame to the right side.

Reinstall the swingarm pivot bolt and nut so the chassis can be moved and stored safely.



ENGINE INSTALLATION

NOTE:

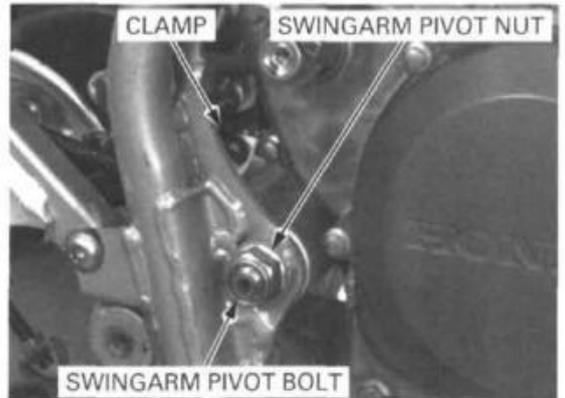
- Route the wires, cables and hoses properly (page 1-24).

Before installing the engine, make sure that the pivot collars are installed into the swingarm pivots.

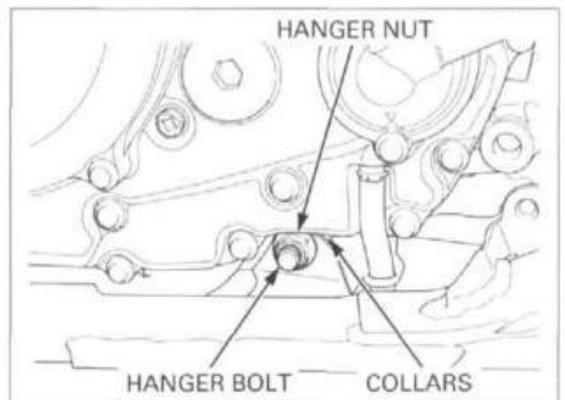
Install the engine into the frame from the right side.

Install the swingarm pivot bolt and nut.

Install the rear brake light switch wire into the clamp.

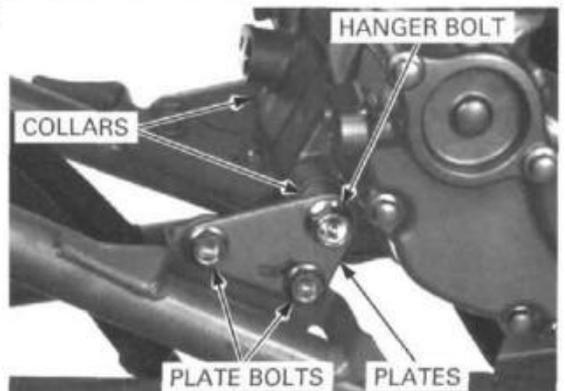


Install the two collars, lower engine hanger bolt and nut.



Install the front engine hanger plates and loosely install the bolts.

Install the collars, front engine hanger bolt and nut.



ENGINE REMOVAL/INSTALLATION

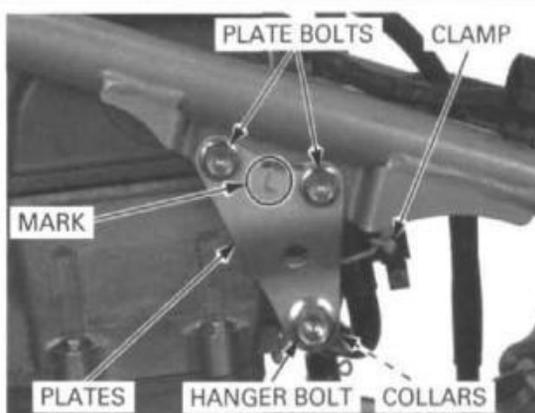
Install the crankcase breather hose clamp. ('04 - '05 model only)

The upper engine hanger plates are identified by the "L" (left) and "R" (right) marks on them.

Install the upper engine hanger plates and loosely install the bolts.
Install the collars, upper engine hanger bolt and nut.

NOTE:

The identified marks of after '05 model are inside of the hanger plates.



Tighten the swingarm pivot nut, engine hanger nuts and hanger plate bolts.

TORQUE:

Swingarm pivot nut:

108 N-m (11.0 kgf-m, 80 lbf-ft)

Lower engine hanger nut:

74 N-m (7.5 kgf-m, 54 lbf-ft)

Front engine hanger nut:

54 N-m (5.5 kgf-m, 40 lbf-ft)

Front engine hanger plate bolt:

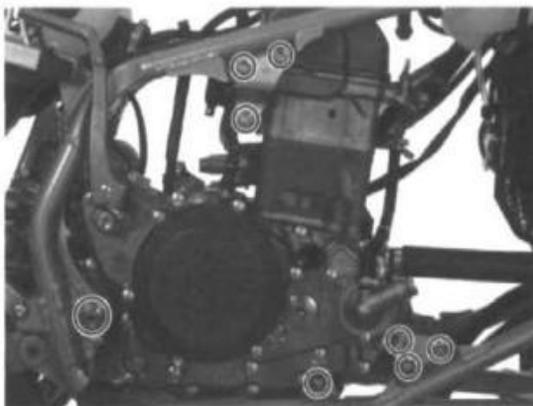
26 N-m (2.7 kgf-m, 20 lbf-ft)

Upper engine hanger nut:

54 N-m (5.5 kgf-m, 40 lbf-ft)

Upper engine hanger plate bolt:

26 N-m (2.7 kgf-m, 20 lbf-ft)

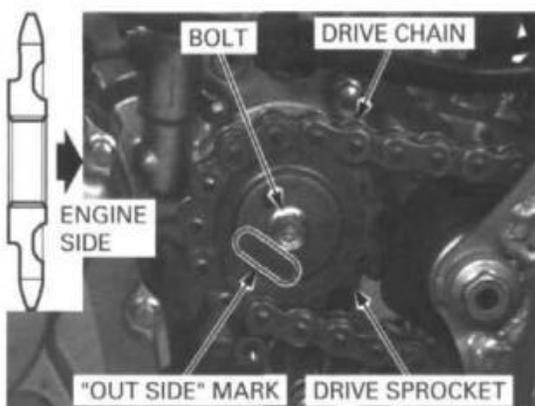


Note the direction of the drive sprocket as shown.

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

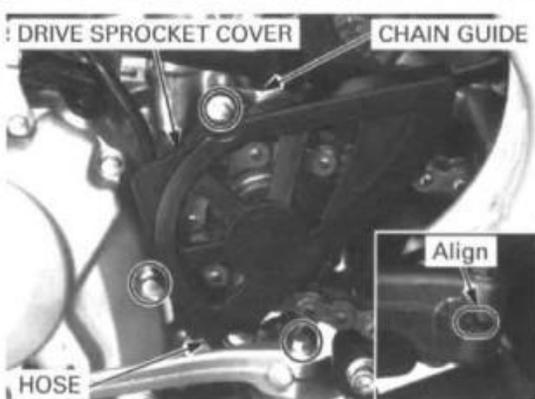
Install the washer with the "OUT SIDE" mark facing out and tighten the bolt.

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



Install the drive chain guide and drive sprocket cover with the carburetor drain hose, and tighten the two bolt securely.

Install gearshift pedal onto the gearshift spindle by aligning the slit with the punch mark.
Install the pinch bolt and tighten it securely.



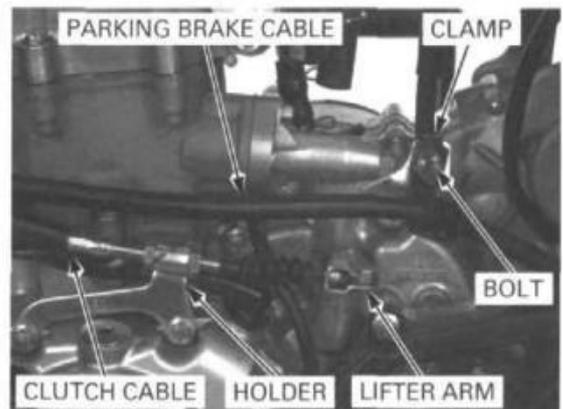
Install the clutch cable into the cable holder.
Install the clutch cable adjusting nut onto the cable.
Connect the clutch cable to the lifter arm.

'04 - '05: Install parking brake cable clamp onto the stay with a new bolt and tighten the bolt.

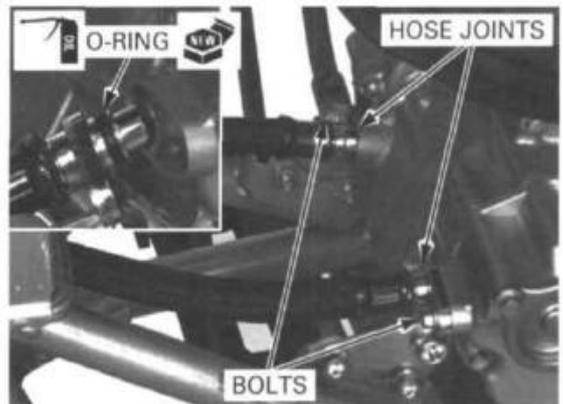
TORQUE: 9.8 N·m (1.0 kgf·m, 7 lbf·ft)

After '05: Apply a locking agent to the parking brake cable clamp bolt threads.
Install parking brake cable clamp onto the stay with the bolt and tighten the bolt.

TORQUE: 9.8 N·m (1.0 kgf·m, 7 lbf·ft)

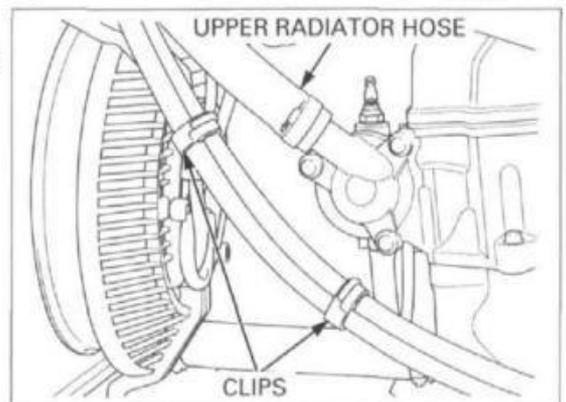


'04 - '05: Coat new O-rings with oil and install them onto the oil cooler hose joints.
Install the oil cooler hose joints onto the engine and tighten the bolts securely.



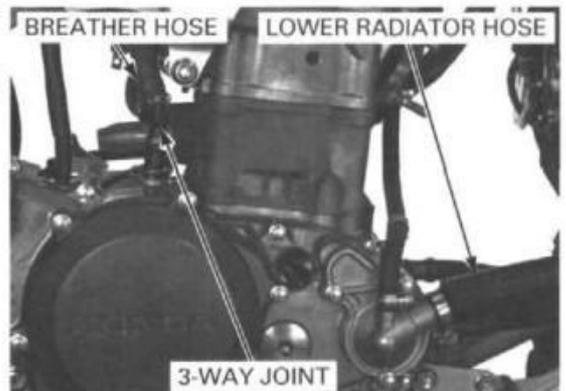
Install the two cable clips.

Connect the upper radiator hose to the thermostat cover and tighten the hose band screw securely.



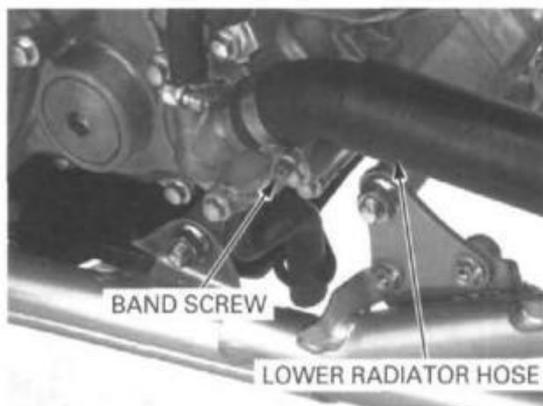
'04 - '05: Connect the lower radiator hose to the water pump cover and tighten the hose band screw securely.

Connect the crankcase breather hose to the 3-way joint.
Install the hose clamp onto the breather hoses.

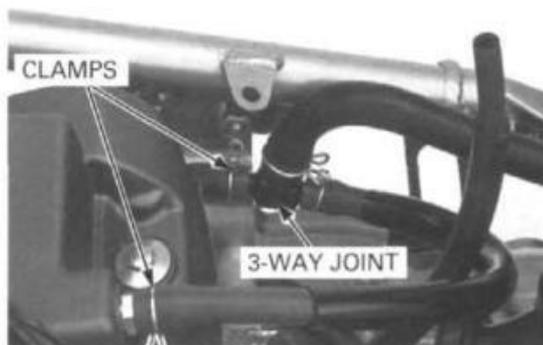


ENGINE REMOVAL/INSTALLATION

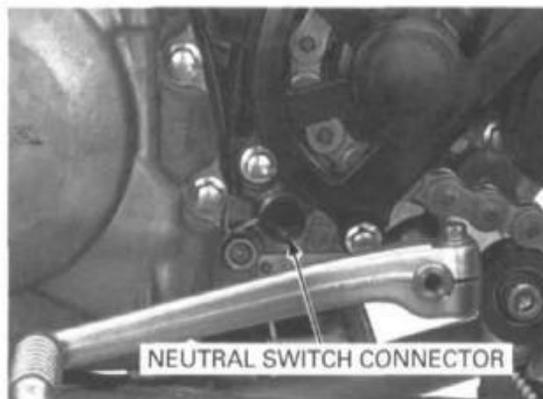
After '05: Connect the lower radiator hose to the water pump cover and tighten the hose band screw securely.



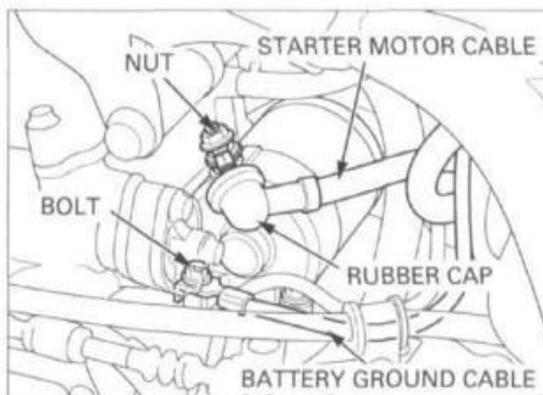
After '05: Connect the crankcase breather hoses to the 3-way joint. Install the hose clamps onto the breather hoses.



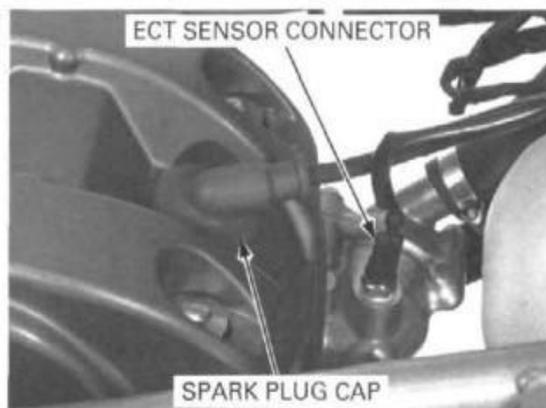
TRX450ER only: Connect the neutral switch connector.



TRX450ER only: Install the starter motor cable and terminal nut onto motor terminal. Tighten the nut securely. Install the rubber cap over the motor terminal properly. Install the battery ground cable and tighten the bolt.



Install the spark plug cap onto the plug and connect the connector to the engine coolant temperature (ECT) sensor.



'04 - '05: Connect the alternator connectors.

Install the following:

- brake pedal (page 19-28)
- heat guard plate (page 3-9)
- carburetor (page 7-21)
- exhaust system (page 3-12)

Fill the crankcase with the recommended engine oil (page 4-15).

Fill the transmission with the recommended transmission oil (page 4-18).

Fill and bleed the cooling system (page 9-7).

Adjust the following:

- drive chain slack (page 4-22)
- parking brake lever free play (page 4-28)
- clutch lever free play (page 4-29)



After '05: Secure the wire harness and alternator wire with the wire band.

Connect the alternator connectors and install the clips.

Install the following:

- brake pedal (page 19-28)
- heat guard plate (page 3-9)
- carburetor (page 8-22)
- exhaust system (page 3-12)

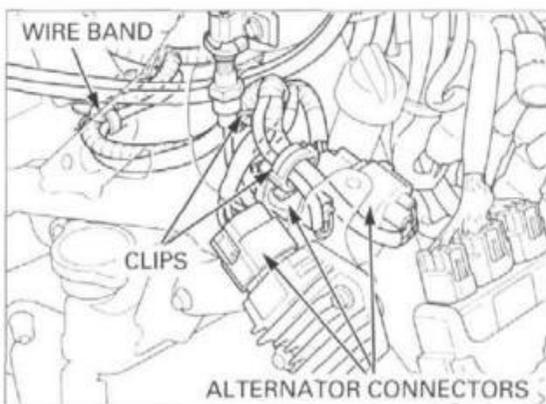
Fill the crankcase with the recommended engine oil (page 4-15).

Fill the transmission with the recommended transmission oil (page 4-18).

Fill and bleed the cooling system (page 9-7).

Adjust the following:

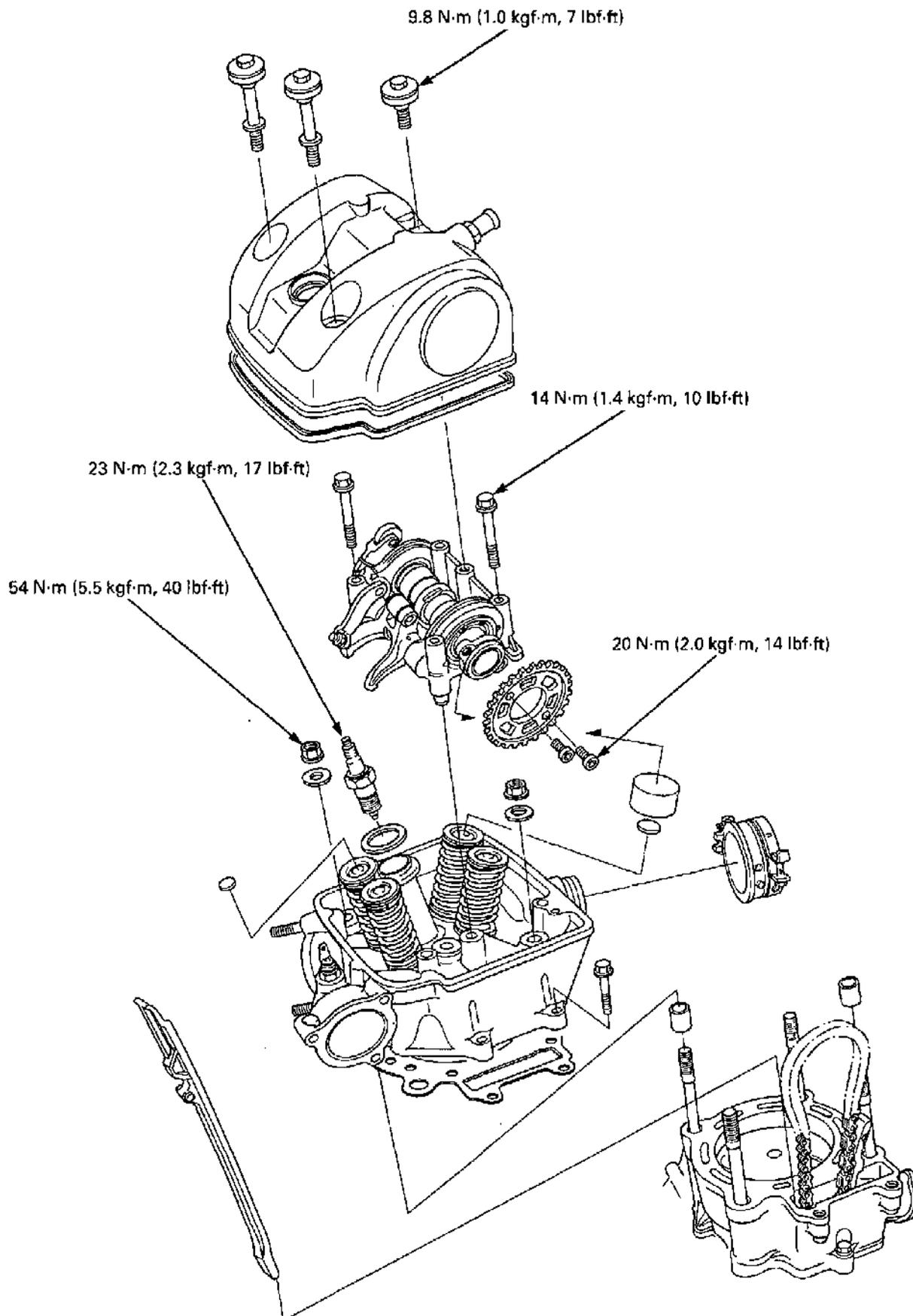
- drive chain slack (page 4-22)
- parking brake lever free play (page 4-28)
- clutch lever free play (page 4-29)



11. CYLINDER HEAD/VALVE

SYSTEM COMPONENTS	11-2	CYLINDER HEAD DISASSEMBLY	11-16
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CAMSHAFT HOLDER REMOVAL	11-8	CAMSHAFT/DECOMPRESSOR ASSEMBLY	11-27
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CYLINDER HEAD/VALVE SYSTEM COMPONENTS



SERVICE INFORMATION

GENERAL

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

SPECIFICATIONS

'04 - '05:

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			745 kPa (7.6 kgf/cm ² , 108 psi)	-
Valve clearance		IN	0.16 ± 0.03 (0.006 ± 0.001)	-
		EX	0.28 ± 0.03 (0.011 ± 0.001)	-
Decompressor clearance			Right side exhaust valve clearance + 0.15 ± 0.02 mm (0.006 ± 0.001 in)	-
Valve, valve guide	Valve stem O.D.	IN	5.475 - 5.490 (0.2156 - 0.2161)	5.46 (0.215)
		EX	5.455 - 5.470 (0.2148 - 0.2154)	5.44 (0.214)
	Valve guide I.D.	IN/EX	5.500 - 5.512 (0.2165 - 0.2170)	5.52 (0.217)
	Stem-to-guide clearance	IN	0.010 - 0.037 (0.0004 - 0.0015)	0.12 (0.005)
		EX	0.030 - 0.057 (0.0012 - 0.0022)	0.14 (0.006)
	Valve guide projection above cylinder head	IN	16.8 - 17.2 (0.66 - 0.68)	-
		EX	17.9 - 18.3 (0.70 - 0.72)	-
	Valve seat width	IN	1.1 - 1.3 (0.043 - 0.051)	2.0 (0.08)
EX		1.3 - 1.5 (0.051 - 0.059)	2.0 (0.08)	
Valve spring	Free length	IN	40.68 (1.602)	39.7 (1.56)
		EX	43.16 (1.699)	42.2 (1.66)
Exhaust rocker arm	Arm I.D.		12.000 - 12.018 (0.4724 - 0.4731)	12.05 (0.474)
	Shaft O.D.		11.967 - 11.975 (0.4711 - 0.4715)	11.92 (0.469)
	Arm-to-shaft clearance		0.025 - 0.051 (0.0010 - 0.0020)	0.10 (0.004)
Camshaft	Cam lobe height	IN	36.630 - 36.790 (1.4421 - 1.4484)	36.48 (1.436)
		EX	34.753 - 34.913 (1.3682 - 1.3745)	34.60 (1.362)
Valve lifter O.D.			25.978 - 25.993 (1.0228 - 1.0233)	25.97 (1.022)
Valve lifter bore I.D.			26.010 - 26.026 (1.0240 - 1.0246)	26.04 (1.025)
Cylinder head warpage			-	0.05 (0.002)

CYLINDER HEAD/VALVE

After '05:

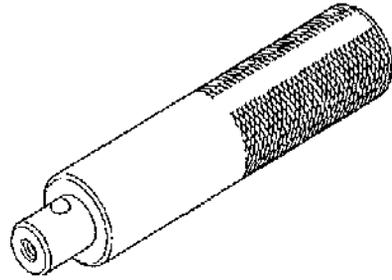
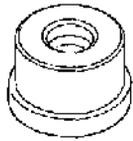
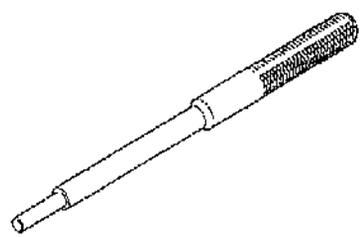
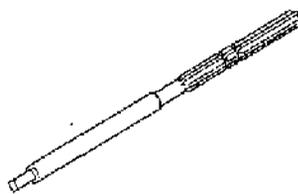
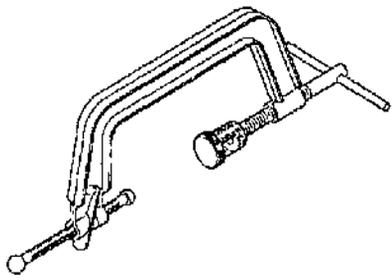
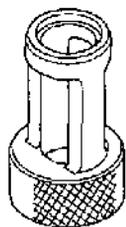
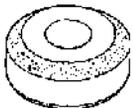
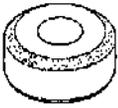
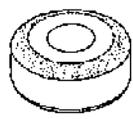
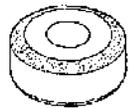
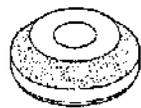
Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression	TRX450ER		343 – 382 kPa (3.5 – 3.9 kgf/cm ² , 50 – 56 psi)	–
	TRX450R		961 – 1000 kPa (9.8 – 10.2 kgf/cm ² , 139 – 145 psi)	–
Valve clearance	IN		0.16 ± 0.03 (0.006 ± 0.001)	–
	EX		0.28 ± 0.03 (0.011 ± 0.001)	–
Decompressor clearance			Right side exhaust valve clearance + 0.25 ± 0.02 mm (0.010 ± 0.001 in)	–
Valve, valve guide	Valve stem O.D.	IN	5.475 – 5.490 (0.2156 – 0.2161)	5.46 (0.215)
		EX	4.965 – 4.980 (0.1955 – 0.1961)	4.96 (0.195)
	Valve guide I.D.	IN	5.500 – 5.512 (0.2165 – 0.2170)	5.52 (0.217)
		EX	5.000 – 5.012 (0.1969 – 0.1973)	5.052 (0.1989)
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)	0.12 (0.005)
		EX	0.020 – 0.047 (0.0008 – 0.0019)	0.13 (0.005)
	Valve guide projection above cylinder head	IN	16.1 – 16.3 (0.63 – 0.64)	–
		EX	17.9 – 18.1 (0.70 – 0.71)	–
Valve seat width	IN	1.1 – 1.3 (0.043 – 0.051)	2.0 (0.08)	
	EX	1.3 – 1.5 (0.051 – 0.059)	2.0 (0.08)	
Valve spring	Free length	IN	40.68 (1.602)	39.7 (1.56)
		EX	42.82 (1.686)	42.2 (1.66)
Exhaust rocker arm	Arm I.D.		12.000 – 12.018 (0.4724 – 0.4731)	12.05 (0.474)
	Shaft O.D.		11.967 – 11.975 (0.4711 – 0.4715)	11.92 (0.469)
	Arm-to-shaft clearance		0.025 – 0.051 (0.0010 – 0.0020)	0.10 (0.004)
Camshaft	Cam lobe height	IN	35.040 – 35.280 (1.3795 – 1.3890)	34.89 (1.374)
		EX	34.214 – 34.454 (1.3470 – 1.3565)	34.06 (1.341)
Valve lifter O.D.			25.978 – 25.993 (1.0228 – 1.0233)	25.97 (1.022)
Valve lifter bore I.D.			26.010 – 26.026 (1.0240 – 1.0246)	26.04 (1.025)
Cylinder head warpage			–	0.05 (0.002)

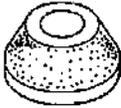
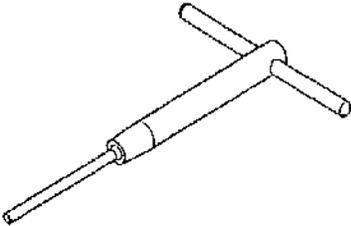
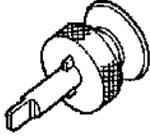
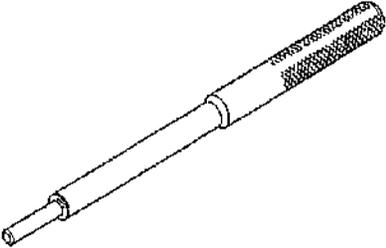
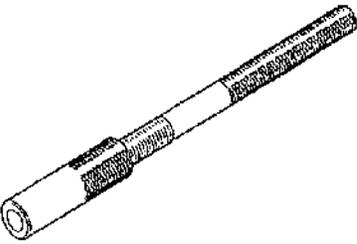
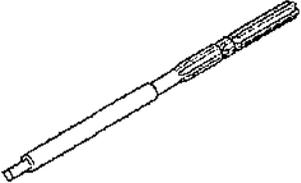
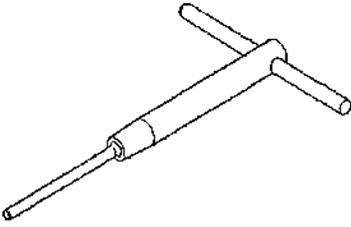
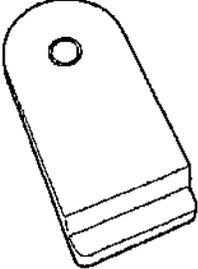
TORQUE VALUES

Cylinder head nut	54 N·m (5.5 kgf·m, 40 lbf·ft)	Apply engine oil to the threads and seating surface.
Cylinder head cover bolt	9.8 N·m (1.0 kgf·m, 7 lbf·ft)	
Camshaft holder bolt	14 N·m (1.4 kgf·m, 10 lbf·ft)	Apply engine oil to the threads and seating surface.
Decompressor lifter arm nut	22 N·m (2.2 kgf·m, 16 lbf·ft)	Apply engine oil to the threads and seating surface.
Decompressor cam bolt	25 N·m (2.5 kgf·m, 18 lbf·ft)	Apply locking agent to the threads.
Cam sprocket bolt	20 N·m (2.0 kgf·m, 14 lbf·ft)	Apply locking agent to the threads.
Upper engine hanger nut	54 N·m (5.5 kgf·m, 40 lbf·ft)	
Upper engine hanger plate bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)	
Carburetor insulator band screw	See page 11-24	

TOOLS

<p>Driver 07749-0010000</p> 	<p>Attachment, 32 x 35 mm 07746-0010100</p> 	<p>Pilot, 20 mm 07746-0040500</p> 
<p>Valve guide driver, 5.5 mm 07742-0010100</p> 	<p>Valve guide reamer, 5.5 mm 07984-2000001 or 07984-200000D (U.S.A. only)</p> 	<p>Valve spring compressor 07757-0010000</p> 
<p>Spring compressor attachment 07959-KM30101</p> 	<p>Valve seat cutter, 36 mm (45° IN) 07780-0010400 or equivalent commercially available in U.S.A.</p> 	<p>Valve seat cutter, 33 mm (45° EX) 07780-0010800 or equivalent commercially available in U.S.A.</p> 
<p>Flat cutter, 36 mm (32° IN) 07780-0013500 or equivalent commercially available in U.S.A.</p> 	<p>Flat cutter, 33 mm (32° EX) 07780-0012900 or equivalent commercially available in U.S.A.</p> 	<p>Interior cutter, 37.5 mm (60° IN) 07780-0014100 or equivalent commercially available in U.S.A.</p> 

CYLINDER HEAD/VALVE

<p>Interior cutter, 34 mm (60° EX) 07780-0014700</p>  <p>or equivalent commercially available in U.S.A.</p>	<p>Cutter holder, 5.5 mm 07781-0010101</p>  <p>or equivalent commercially available in U.S.A.</p>	<p>Cam chain tensioner holder 07ZMG-MCAA400 (U.S.A. only)</p> 
<p>Tensioner stopper 070MG-0010100</p>  <p>or 07AMG-001A100 (U.S.A. only)</p>	<p>Valve guide driver, 5.0 mm 07942-MA60000</p> 	<p>Valve guide driver 07743-0020000</p>  <p>not available in U.S.A.</p>
<p>Valve guide reamer, 5.0 mm 07984-MA60001 or</p>  <p>07984-MA6000D (U.S.A. only)</p>	<p>Cutter holder, 5.0 mm 07781-0010400</p>  <p>or equivalent commercially available in U.S.A.</p>	<p>Cam sprocket holder 07AMB-MEBA100 (U.S.A. only)</p> 

TROUBLESHOOTING

- Engine top-end problems usually affect engine performance. These problems can be diagnosed by a compression test, or by tracing top-end noise with a sounding rod or stethoscope.
- If the performance is poor at low speeds, check for white smoke in the crankcase breather hose. If the hose is smoky, check for a seized piston ring (page 12-7).

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

- Valves
 - Incorrect valve adjustment
 - Burned or bent valve
 - Incorrect valve timing
 - Weak valve spring
 - Uneven valve seating
 - Valve stuck open
- Cylinder head
 - Leaking or damaged cylinder head gasket
 - Warped or cracked cylinder head
 - Loose spark plug
- Cylinder/piston problem (page 12-4).

Compression too high

- Excessive carbon build-up on piston head or combustion chamber
- Worn or damaged decompressor system

Excessive smoke

- Worn valve stem or valve guide
- Damaged stem seal
- Cylinder/piston problem (page 12-4).

Excessive noise

- Incorrect valve adjustment
- Sticking valve or broken valve spring
- Excessive worn valve seat
- Worn or damaged camshaft
- Worn rocker arm and/or shaft
- Worn rocker arm follower and valve stem end
- Worn or damaged valve lifter
- Worn cam sprocket teeth
- Worn cam chain
- Worn or damaged cam chain tensioner
- Cylinder/piston problem (page 12-4).

Rough idle

- Low cylinder compression

CYLINDER COMPRESSION

Warm the engine to normal operating temperature.

Stop the engine and remove the spark plug (page 4-9).

Install the compression gauge into the spark plug hole.

Shift the transmission in neutral.

Open the throttle all the way and operate the kickstarter forcefully several times until the gauge reading stops rising.

The cylinder compression specification is comparatively low because the camshaft has a decompression device installed.

COMPRESSION PRESSURE:

'04 - '05:

745 kPa (7.6 kgf/cm², 108 psi)

After '05:

TRX450ER;

343 - 382 kPa (3.5 - 3.9 kgf/cm², 50 - 56 psi)

TRX450R;

961 - 1000 kPa (9.8 - 10.2 kgf/cm², 139 - 145 psi)

Low compression can be caused by:

- blown cylinder head gasket
- improper valve adjustment
- valve leakage
- worn piston ring or cylinder

High compression can be caused by:

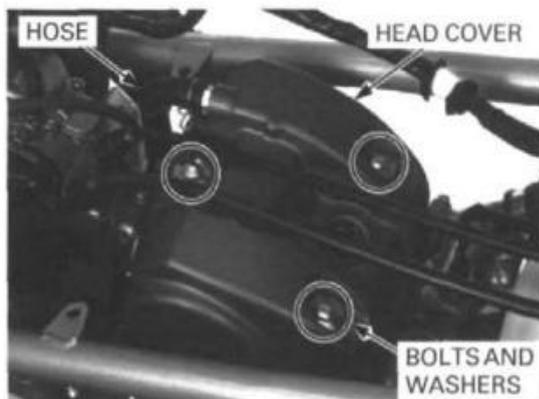
- carbon deposits in combustion chamber or on piston head



CYLINDER HEAD COVER REMOVAL

Remove the following:

- fuel tank (page 3-9)
- heat guard plate ('04 - '05: page 3-9, After '05: page 3-9)
- spark plug cap (page 4-9)
- crankcase breather hose
- three bolts and special washers
- cylinder head cover

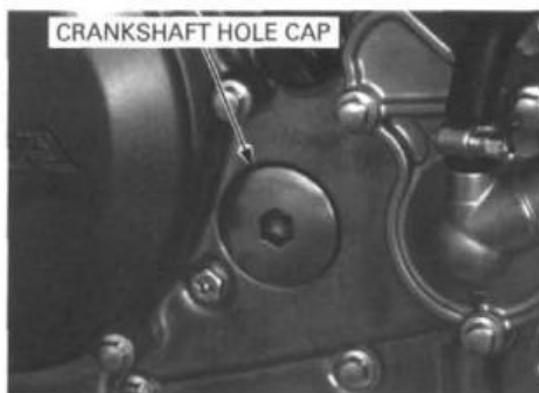


CAMSHAFT HOLDER REMOVAL

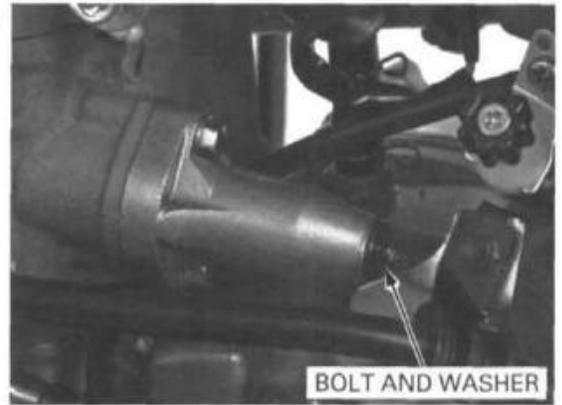
Remove the following:

- cylinder head cover (page 11-8)
- spark plug (page 4-9)

Remove the crankshaft hole cap and set the piston position to Top Dead Center on the compression stroke (page 4-10).

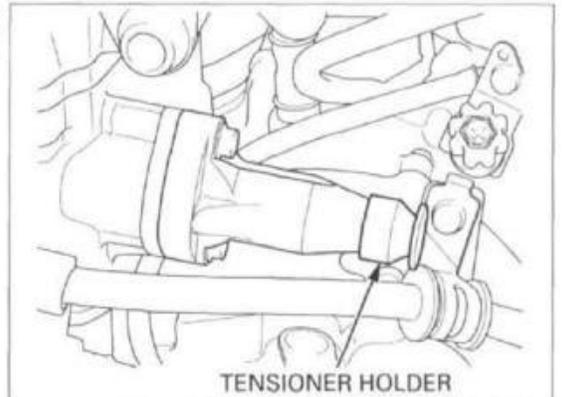


Remove the tensioner lifter sealing bolt and washer.



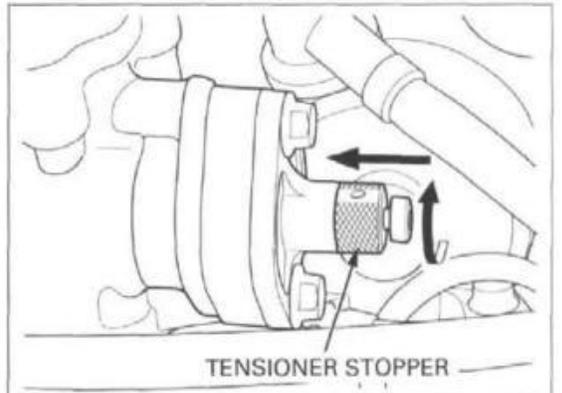
'04 - '05: Turn the cam chain tensioner lifter shaft clockwise fully and secure it with the special tool to loosen the tensioner lifter.

TOOL:
Cam chain tensioner holder 07ZMG-MCAA400 or
 07AMG-001A100
 (U.S.A only)

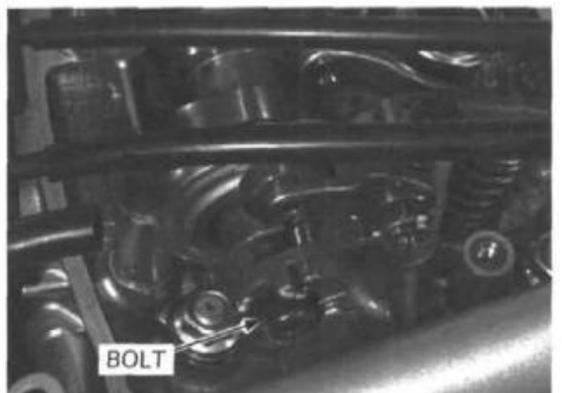


After '05: Turn the cam chain tensioner lifter shaft clockwise fully and secure it with the special tool to loosen the tensioner lifter.

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



Loosen the decompressor cam bolt while holding the crankshaft. If the decompressor cam will be removed.



CYLINDER HEAD/VALVE

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

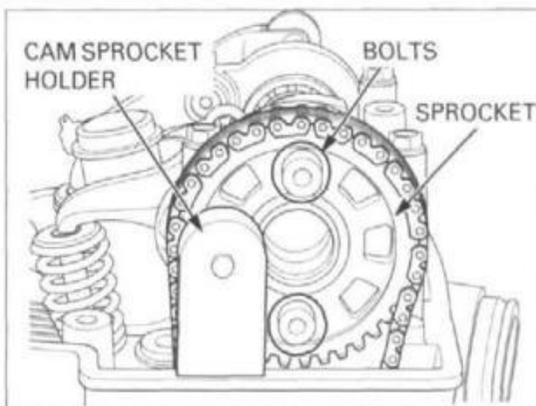
Remove the following:

- two sprocket bolts (while holding the camshaft with the special tool)
- cam sprocket with the cam chain (off the camshaft)

TOOL:

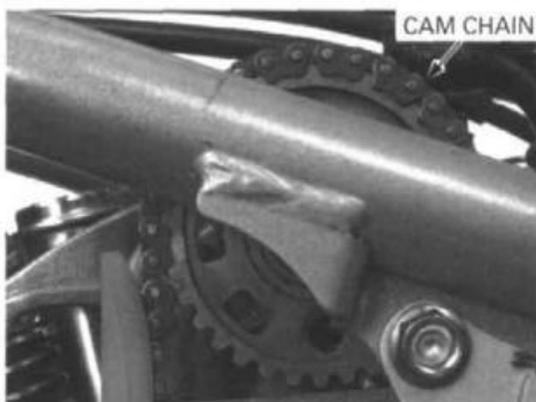
Cam sprocket holder

**07AMB-MEBA100
(U.S.A only)**



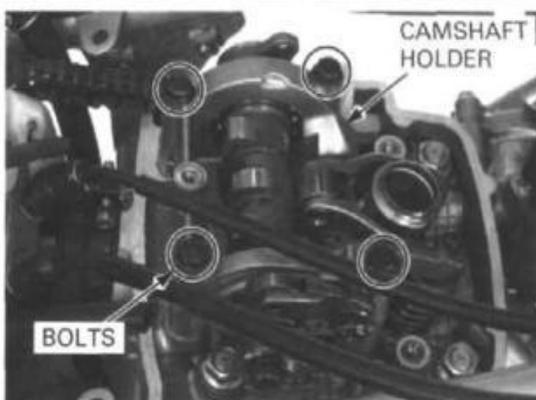
Attach a piece of wire to the cam chain to prevent it from falling into the crankcase.

- cam sprocket (from the cam chain)



Shims may stick to the inside of the valve lifters in the camshaft holder. Do not allow the shims to fall into the crankcase.

- four bolts (by loosening them in a crisscross pattern in several steps)
- camshaft holder assembly

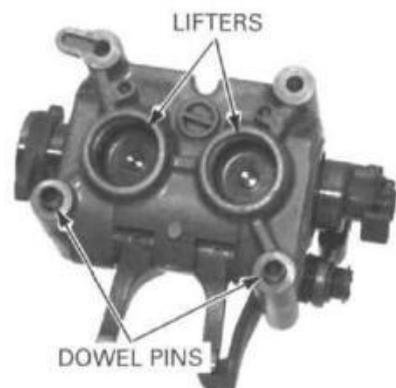
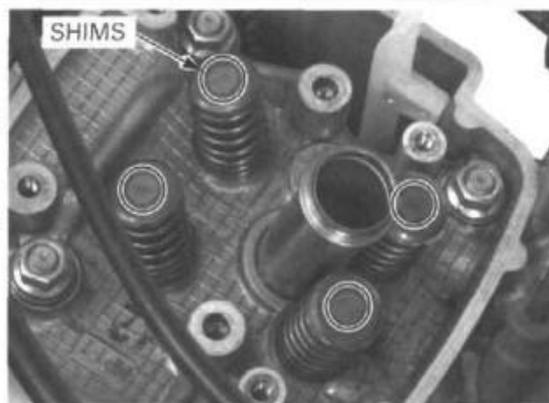


Be careful not to damage the valve lifter bore.

- shims
- valve lifters

NOTE:

- The shims can be easily removed with tweezers or a magnet.
- Mark each valve lifter and shim to ensure correct reassembly in their original locations.
- Do not forcibly remove the dowel pins from the camshaft holder.

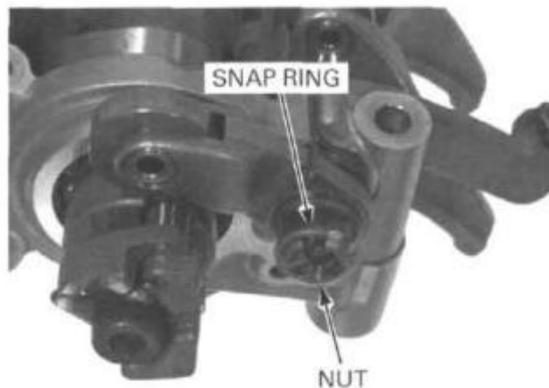


CAMSHAFT/DECOMPRESSOR DISASSEMBLY

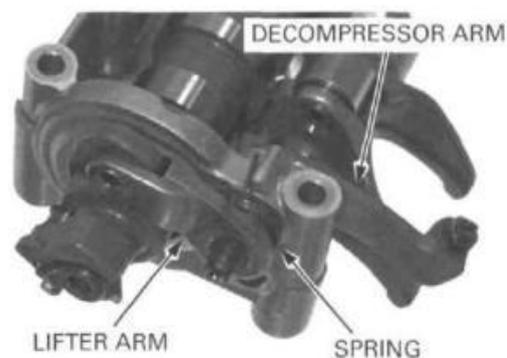
Remove the camshaft holder assembly (page 11-8).

Remove the following:

- snap ring
- nut

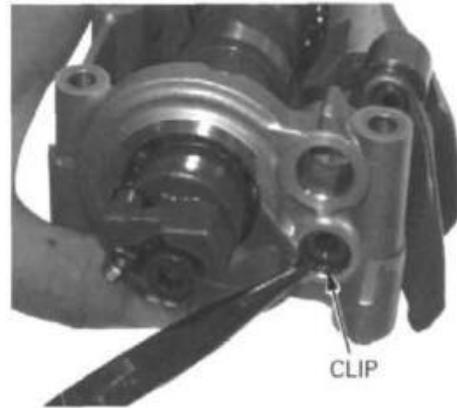


- lifter arm
- return spring
- decompressor arm

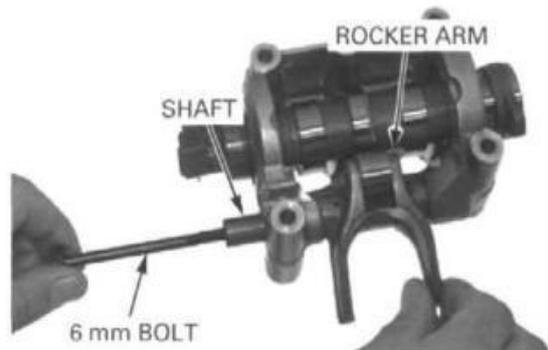


CYLINDER HEAD/VALVE

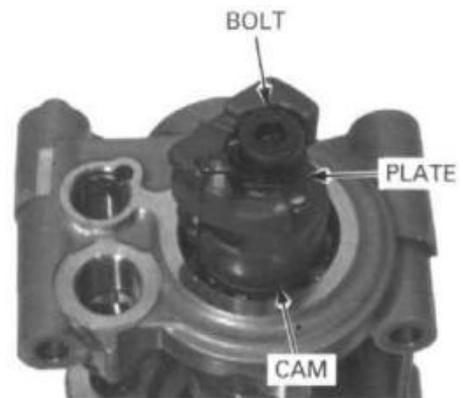
- stopper clip



- rocker arm shaft (by screwing a 6-mm bolt and pull it out)
- rocker arm



- bolt
- setting plate
- decompressor cam assembly



- snap ring
- camshaft



For cam chain tensioner lifter inspection, see page 12-9.

INSPECTION

CAMSHAFT

Check the sprocket teeth for wear or damage.

Turn the camshaft bearings with your finger. The bearings should turn smoothly and quietly.

For bearing replacement in the camshaft holder, see page 11-14.



Check the cam surfaces for scoring, scratches or evidence of insufficient lubrication.

Measure each cam lobe height.

SERVICE LIMITS:

'04 - '05;

IN: 36.48 mm (1.436 in)

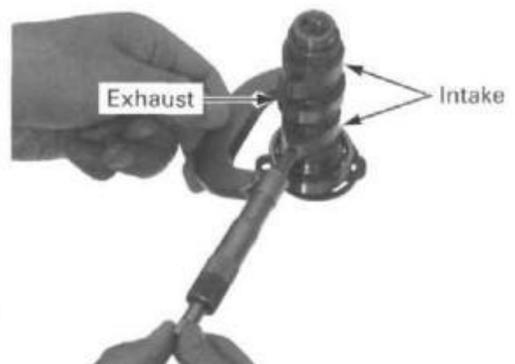
EX: 34.60 mm (1.362 in)

After '05;

IN: 34.89 mm (1.374 in)

EX: 34.06 mm (1.341 in)

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



EXHAUST ROCKER ARM/SHAFT

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

If the roller is excessive worn or damaged, inspect the cam lobe and oil passage.

Measure each rocker arm I.D.

SERVICE LIMIT: 12.05 mm (0.474 in)

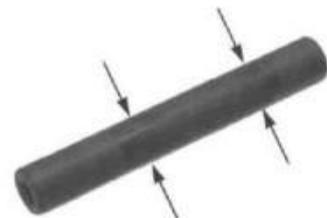


Measure the shaft O.D. at the rocker arm sliding areas.

SERVICE LIMIT: 11.92 mm (0.469 in)

Calculate the rocker arm-to-shaft clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)



CYLINDER HEAD/VALVE

INTAKE VALVE LIFTER

Check the valve lifter for scoring, scratches or abnormal wear.

Measure each valve lifter O.D.

SERVICE LIMIT: 25.97 mm (1.022 in)



Check the valve lifter bore for scoring, scratches or abnormal wear.

Measure each valve lifter bore I.D.

SERVICE LIMIT: 26.04 mm (1.025 in)



DECOMPRESSOR CAM

Check the cam and weight for excessive wear or damage.

Check the weight spring for damage.



CAMSHAFT BEARING REPLACEMENT

Drive the bearing out of the camshaft holder.

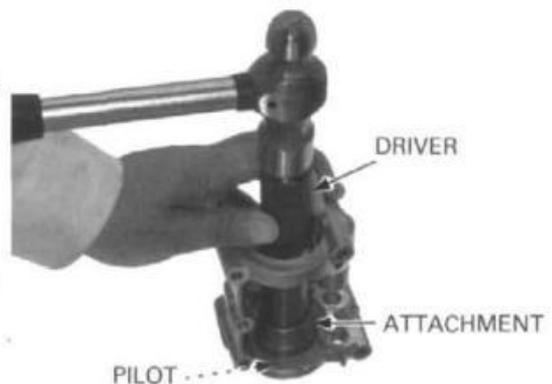
Apply engine oil to a new bearing.

Drive in the bearing squarely with the marked side facing up until it is fully seated.

TOOLS:

Driver	07749-0010000
Attachment, 32 x 35 mm	07746-0010100
Pilot, 20 mm	07746-0040500

See page 11-27 for camshaft/decompressor assembly.

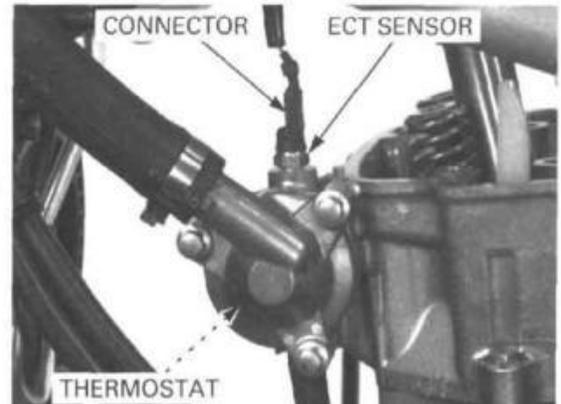


CYLINDER HEAD REMOVAL

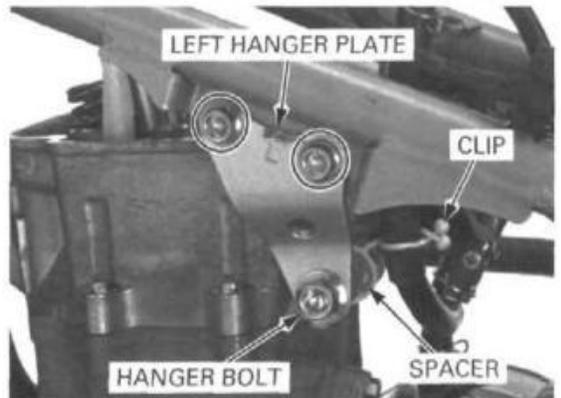
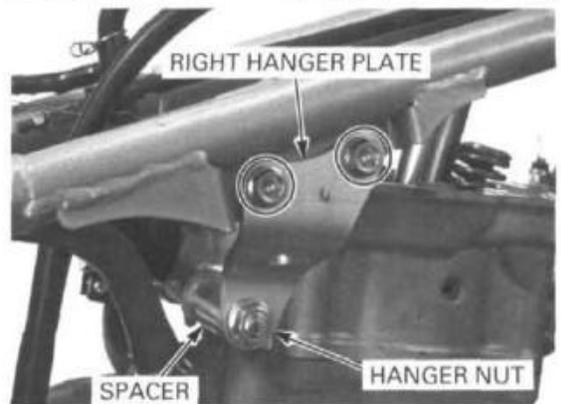
Remove the camshaft holder (page 11-8).

Remove the following:

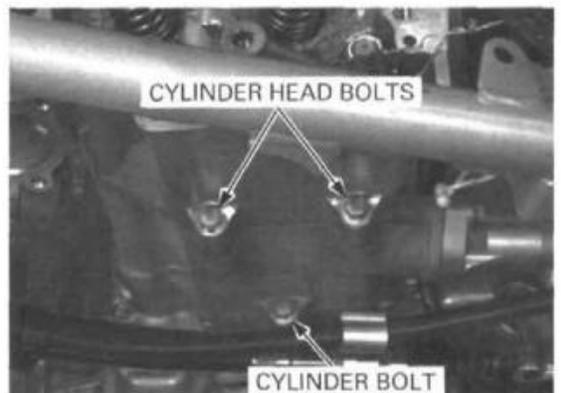
- exhaust system (page 3-10)
- carburetor ('04 - '05: page 7-6, After '05: page 8-7)
- thermostat (page 9-8)
- engine coolant temperature (ECT) sensor connector
- ECT sensor



- hose clip ('04 - '05 model only)
- engine hanger nut
- hanger bolt and spacers
- hanger plate bolts
- hanger plates



- two cylinder head bolts
- cylinder bolt (loosen)



CYLINDER HEAD/VALVE

Take care not to drop the nuts and washers into the crankcase.

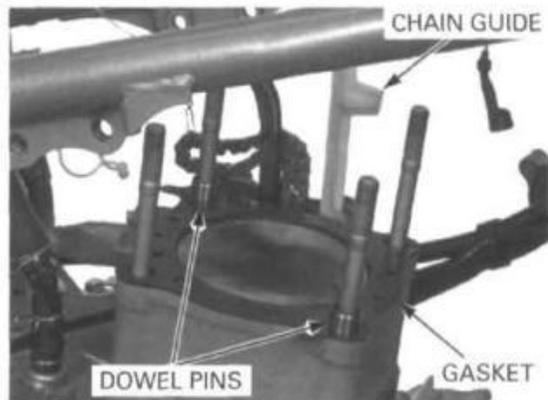
- four nuts and washers (by loosening them in a crisscross pattern in several steps)
- cylinder head

NOTE:

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

- gasket
- dowel pins
- cam chain guide

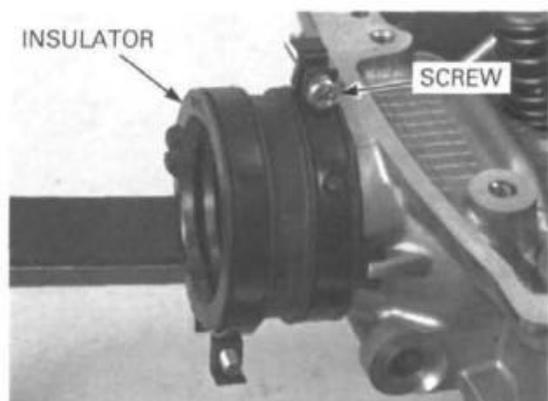
NUTS AND WASHERS



CYLINDER HEAD DISASSEMBLY

Remove the cylinder head (page 11-15).

- '04 - '05: Loosen the band screw and remove the carburetor insulator.



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

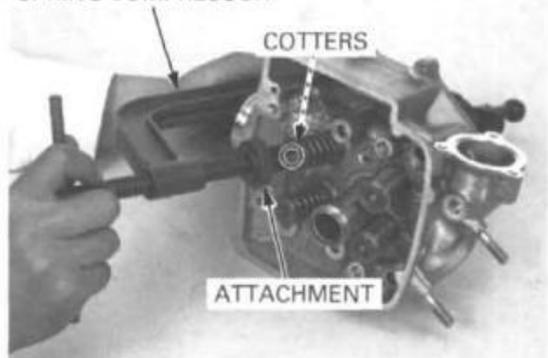
Remove the valve spring cotters using the valve spring compressor.

TOOLS:

Valve spring compressor
Compressor attachment

07757-0010000
07959-KM30101

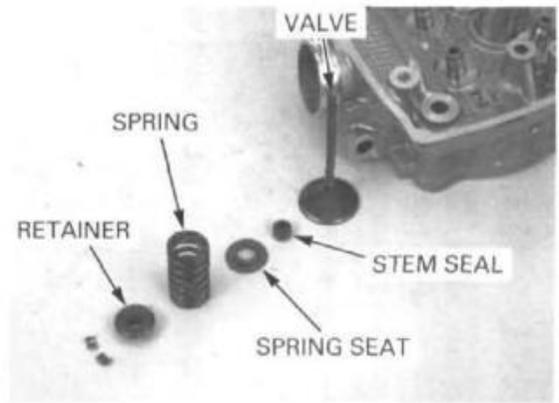
SPRING COMPRESSOR



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

Remove the following:

- spring retainer
- valve spring
- valve
- stem seal
- spring seat



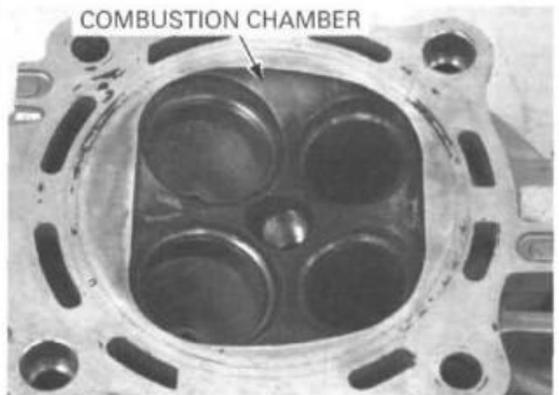
INSPECTION

CYLINDER HEAD

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

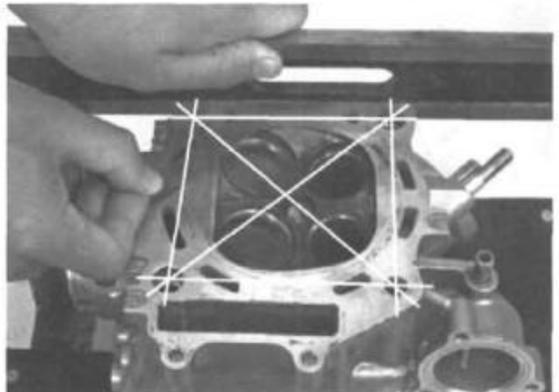
Remove the carbon deposits from the combustion chamber.

Check the spark plug hole and valve areas for cracks.



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

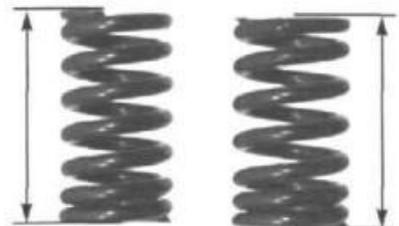
SERVICE LIMIT: 0.05 mm (0.002 in)



VALVE SPRING

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

SERVICE LIMITS: IN: 39.7 mm (1.56 in)
EX: 42.2 mm (1.66 in)



CYLINDER HEAD/VALVE

VALVE/VALVE GUIDE

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

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

SERVICE LIMITS: IN: 5.46 mm (0.215 in)

EX: '04 - '05;

5.44 mm (0.214 in)

After '05;

4.96 mm (0.195 in)



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

TOOL:

Valve guide reamer, 5.5 mm 07984-2000001 or
07984-200000D
(U.S.A. only)

After '05; EX:

Valve guide reamer, 5.0 mm 07984-MA60001 or
07984-MA6000D
(U.S.A. only)



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

SERVICE LIMIT: IN/EX: 5.52 mm (0.217 in)

After '05; EX:

SERVICE LIMIT: 5.052 mm (0.1989 in)

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

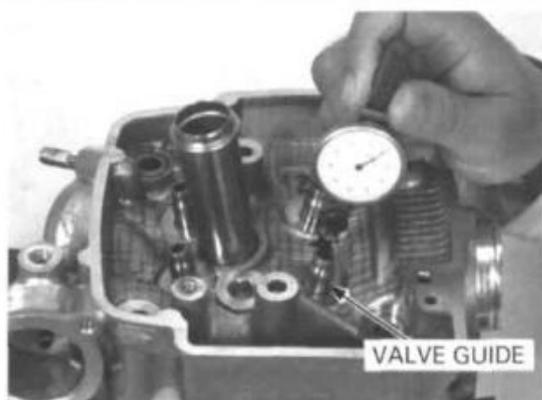
SERVICE LIMITS: IN: 0.12 mm (0.005 in)

EX: '04 - '05;

0.14 mm (0.006 in)

After '05;

0.13 mm (0.005 in)



Inspect and reface the valve seats whenever the valve guides are replaced (page 11-20).

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

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

VALVE GUIDE REPLACEMENT

Mark new valve guides at the specified height indicated on the next page, using a marker. Chill the new valve guides in a freezer for about an hour.

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

NOTICE

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 using the special tool.

TOOL:

Valve guide driver, 5.5 mm 07742-0010100

After '05; EX:

Valve guide driver, 5.0 mm 07942-MA60000



Remove the guides from the freezer.

While the cylinder head is still heated, drive new valve guides into the cylinder head from the camshaft side until the exposed height is at the specified value (at the mark).

TOOL:

Valve guide driver, 5.5 mm 07742-0010100

After '05; EX:

Valve guide driver 07743-0020000
not available in U.S.A



VALVE GUIDE PROJECTION:

'04 - '05;

IN: 16.8 - 17.2 mm (0.66 - 0.68 in)

EX: 17.9 - 18.3 mm (0.70 - 0.72 in)

After '05;

IN: 16.1 - 16.3 mm (0.63 - 0.64 in)

EX: 17.9 - 18.1 mm (0.70 - 0.71 in)

Let the cylinder head cool to room temperature.

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

Ream the new valve guides.

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

TOOL:

Valve guide reamer, 5.5 mm 07984-2000001 or 07984-200000D (U.S.A. only)

After '05; EX:

Valve guide reamer, 5.0 mm 07984-MA60001 or 07984-MA6000D (U.S.A. only)



Clean the cylinder head thoroughly to remove any metal particles after reaming and reface the valve seat (page 11-20).

VALVE SEAT INSPECTION/REFACING

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

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

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

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

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

STANDARD: IN: 1.1 – 1.3 mm (0.043 – 0.051 in)

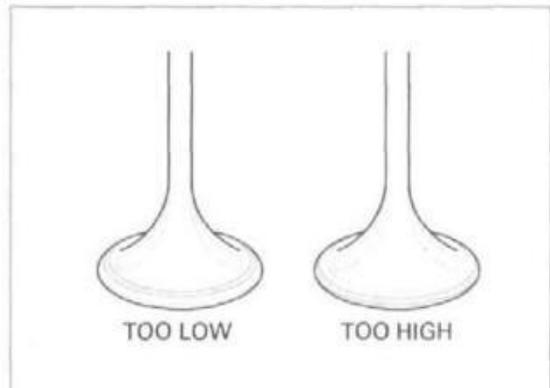
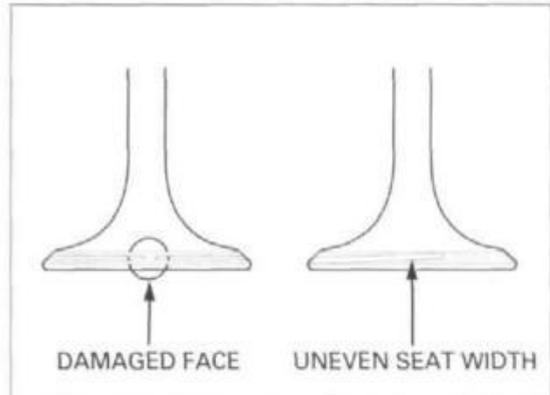
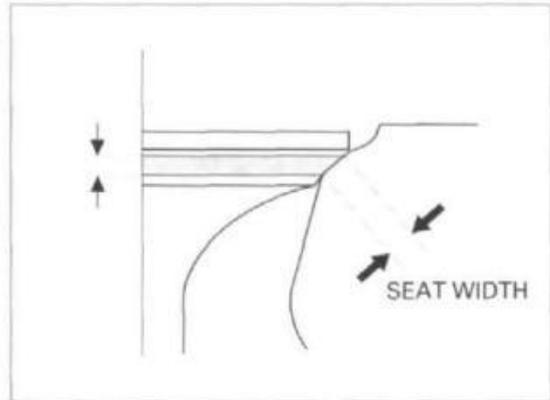
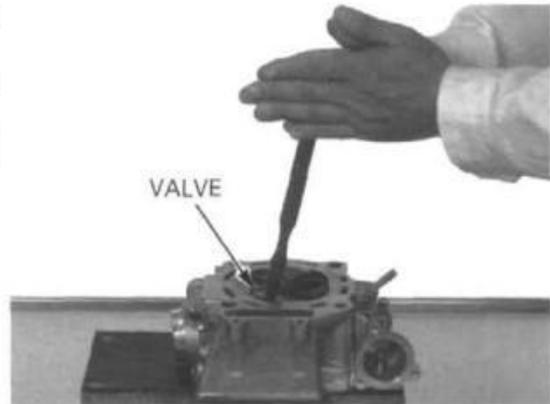
EX: 1.3 – 1.5 mm (0.051 – 0.059 in)

SERVICE LIMIT: IN/EX: 2.0 mm (0.08 in)

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

Inspect the valve seat face for:

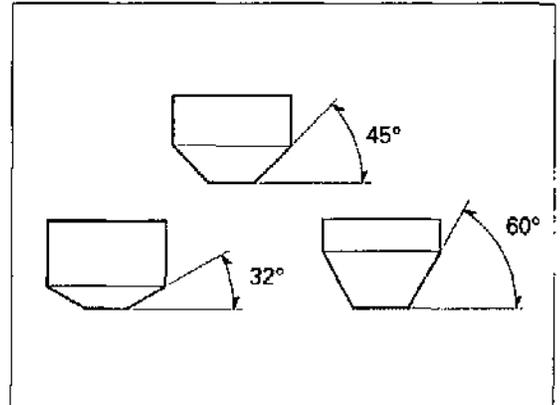
- Damaged face:
 - Replace the valve and reface the valve seat.
- Uneven seat width:
 - Replace the valve and reface the valve seat.
- Contact area (too high or too low)
 - Reface the valve seat.



REFACING

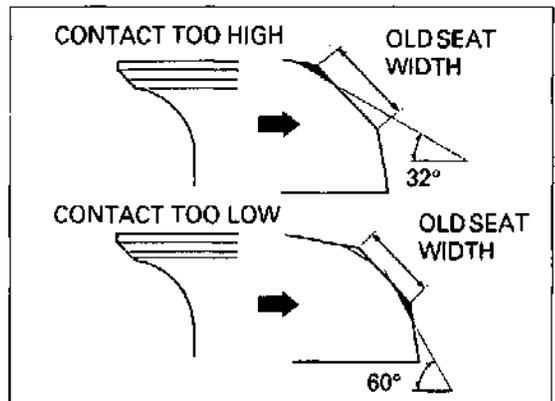
NOTE:

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



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

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

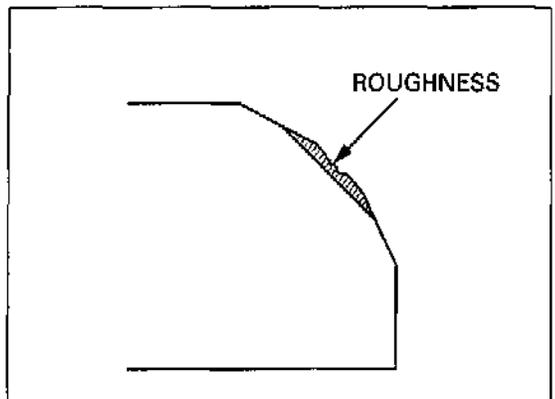


Use a 45° seat cutter to remove any roughness or irregularities from the seat.

TOOLS:

- Seat cutter, 35 mm (45° IN) 07780-0010400
- Seat cutter, 33 mm (45° EX) 07780-0010800
- Cutter holder, 5.5 mm (IN) 07781-0010101
- Cutter holder, 5.0 mm (After '05; EX) 07781-0010400

or equivalent commercially available in U.S.A.

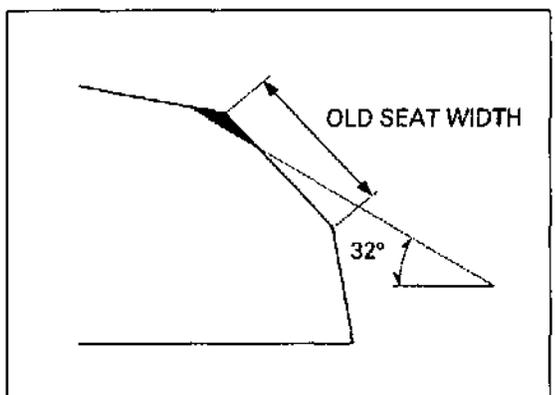


Using a 32° flat cutter, remove 1/4 of the existing valve seat material.

TOOLS:

- Flat cutter, 36 mm (32° IN) 07780-0013500
- Flat cutter, 33 mm (32° EX) 07780-0012900
- Cutter holder, 5.5 mm (IN) 07781-0010101
- Cutter holder, 5.0 mm (After '05; EX) 07781-0010400

or equivalent commercially available in U.S.A.



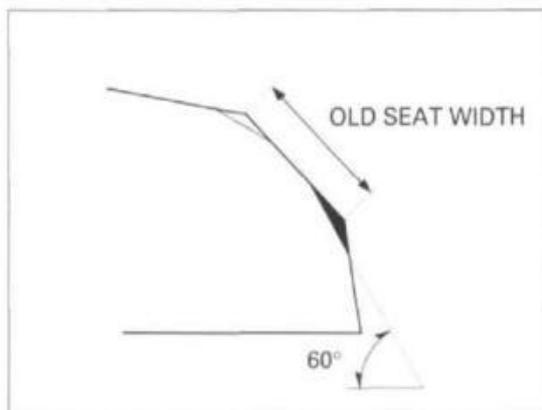
CYLINDER HEAD/VALVE

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

TOOLS:

Interior cutter, 37.5 mm (60° IN) 07780-0014100
Interior cutter, 34 mm (60° EX) 07780-0014700
Cutter holder, 5.5 mm 07781-0010101
Cutter holder, 5.0 mm (After '05; EX) 07781-0010400

or equivalent commercially available in U.S.A.

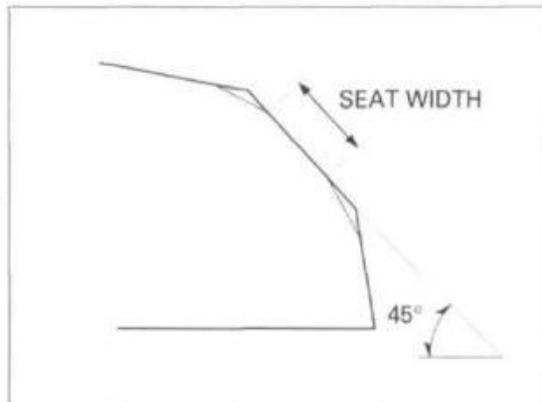


Using a 45° seat cutter, cut the seat to the proper width.

VALVE SEAT WIDTH:

IN: 1.1 – 1.3 mm (0.043 – 0.051 in)
EX: 1.3 – 1.5 mm (0.051 – 0.059 in)

Make sure that all pitting and irregularities are removed.



'04 – '05; INTAKE & EXHAUST SIDE and After '05; EXHAUST SIDE:

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

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

NOTICE

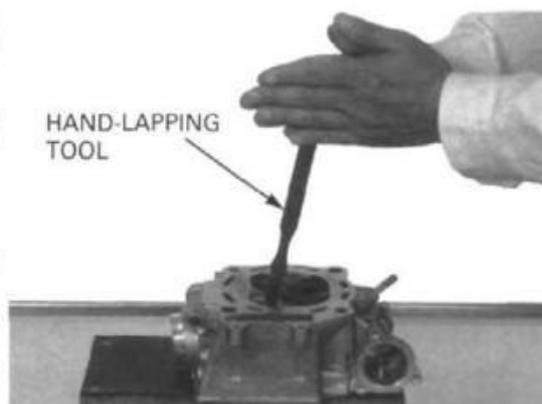
- Excessive lapping pressure may deform or damage the seat.
- Change the angle of lapping tool frequently to prevent uneven seat wear.
- Do not allow lapping compound to enter the guides.

After '05; INTAKE SIDE:

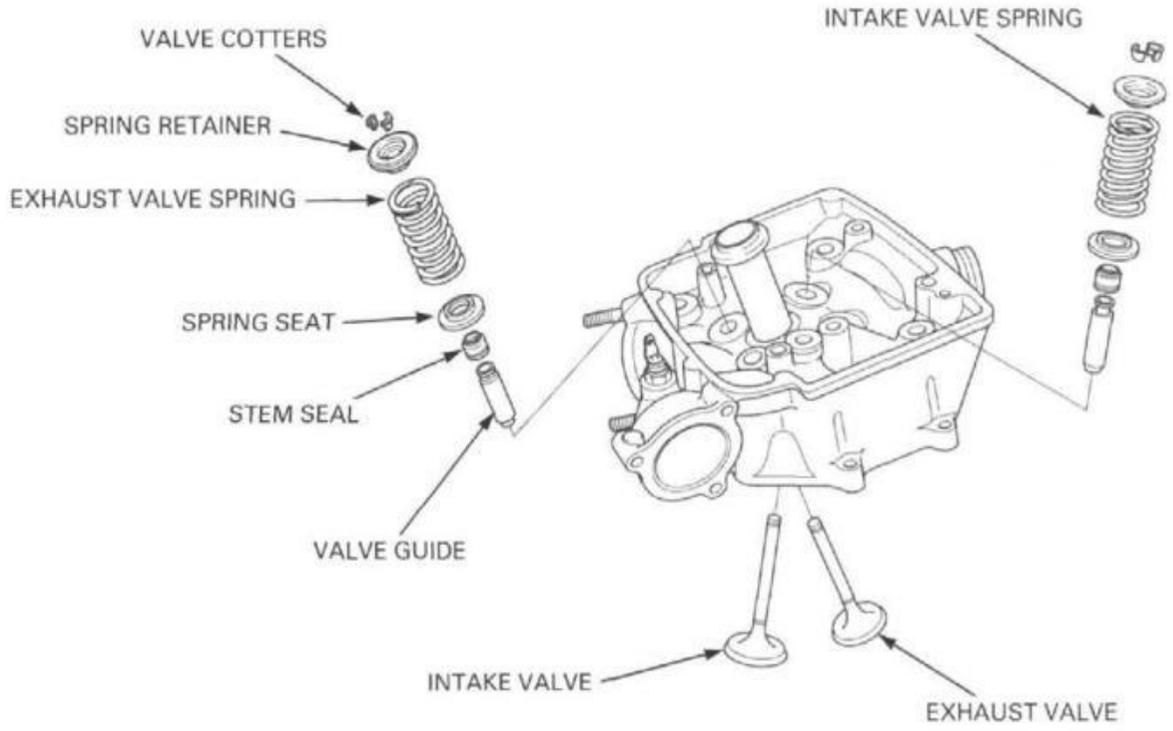
After refacing, wash the cylinder head and valve.

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.



CYLINDER HEAD ASSEMBLY

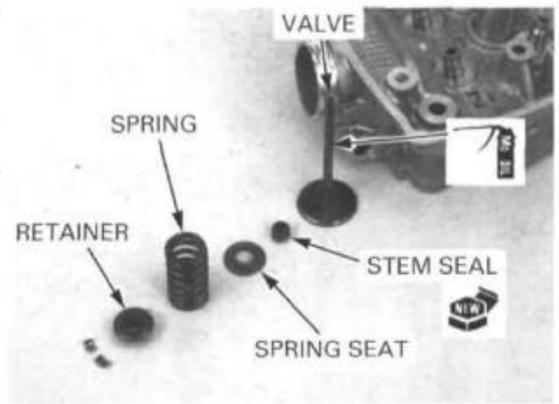


Blow through the oil passage in the cylinder head with compressed air.

Install the spring seats and new stem seals.

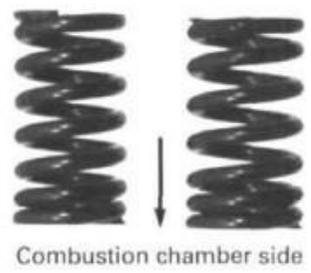
Lubricate the valve stem sliding surface with molybdenum oil solution.

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



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

Install the spring retainer.



CYLINDER HEAD/VALVE

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

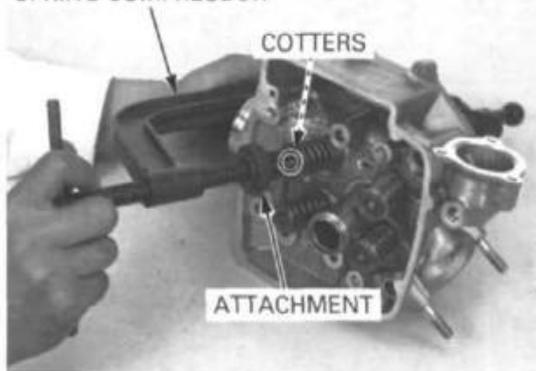
Install the valve cotters using the valve spring compressor.

TOOLS:

Valve spring compressor
Compressor attachment

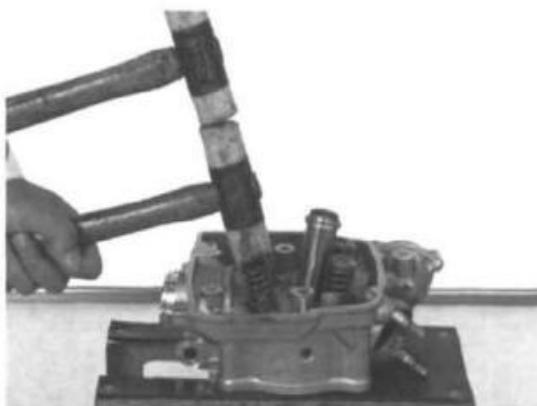
07757-0010000
07959-KM30101

SPRING COMPRESSOR



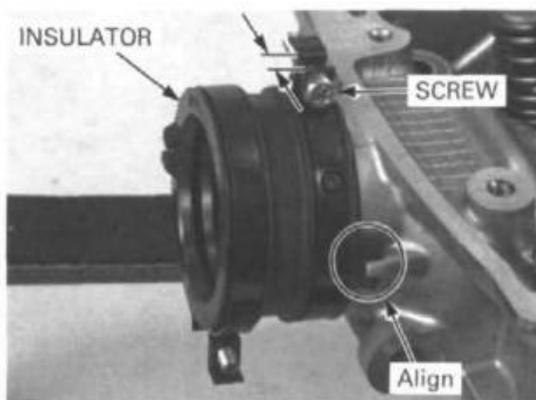
Support the cylinder head so the valve heads will not contact anything that cause damage.

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



'04 - '05: Install the carburetor insulator, aligning the groove with the lug on the cylinder head. Tighten the band screw until the ends clearance is 7 ± 1 mm (0.28 ± 0.04 in).

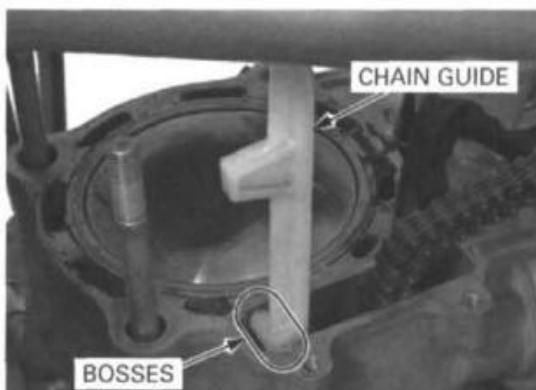
Install the cylinder head (page 11-24).



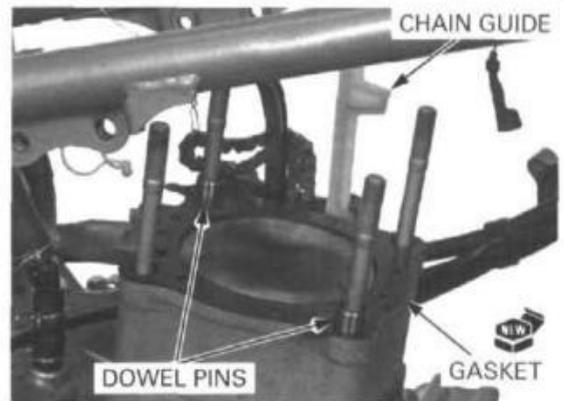
CYLINDER HEAD INSTALLATION

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

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



Install the two dowel pins and a new gasket.

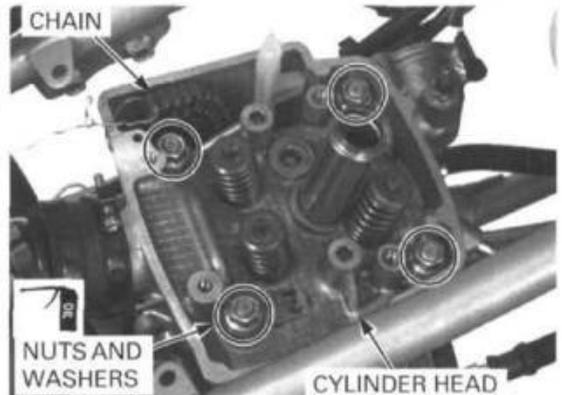


Route the cam chain through the cylinder head and install the cylinder head.

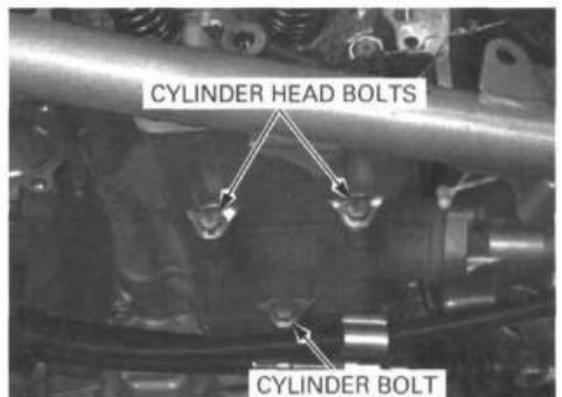
Apply engine oil to the threads and seating surfaces of the cylinder head nuts and install them with the washers.

Tighten the four nuts in a crisscross pattern in several steps.

TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)



Install the two cylinder head bolts. Tighten the cylinder bolt and head bolts alternately.



CYLINDER HEAD/VALVE

Install the following:

- The hanger plates are identified by the marks;
- L: left side
 - R: right side
- engine hanger plates with the two bolts
 - engine hanger bolt (from the left side), spacers and nut
 - hose clip ('04 - '05 model only)

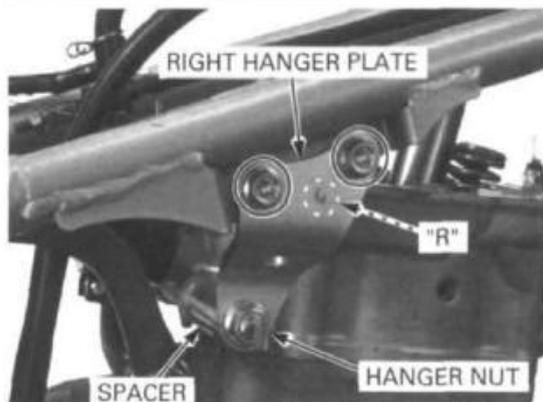
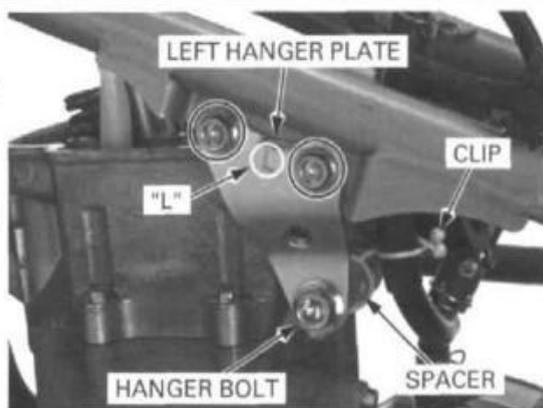
NOTE:

The identified marks of after '05 model are inside of the hanger plates.

Tighten the fasteners in order as follows.

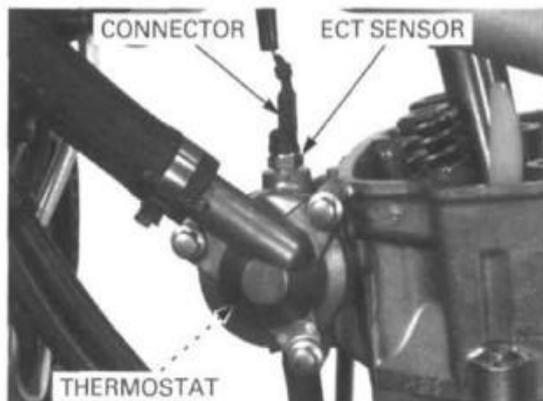
TORQUE:

- Hanger plate bolt: 26 N-m (2.7 kgf-m, 20 lbf-ft)
- Engine hanger nut: 54 N-m (5.5 kgf-m, 40 lbf-ft)

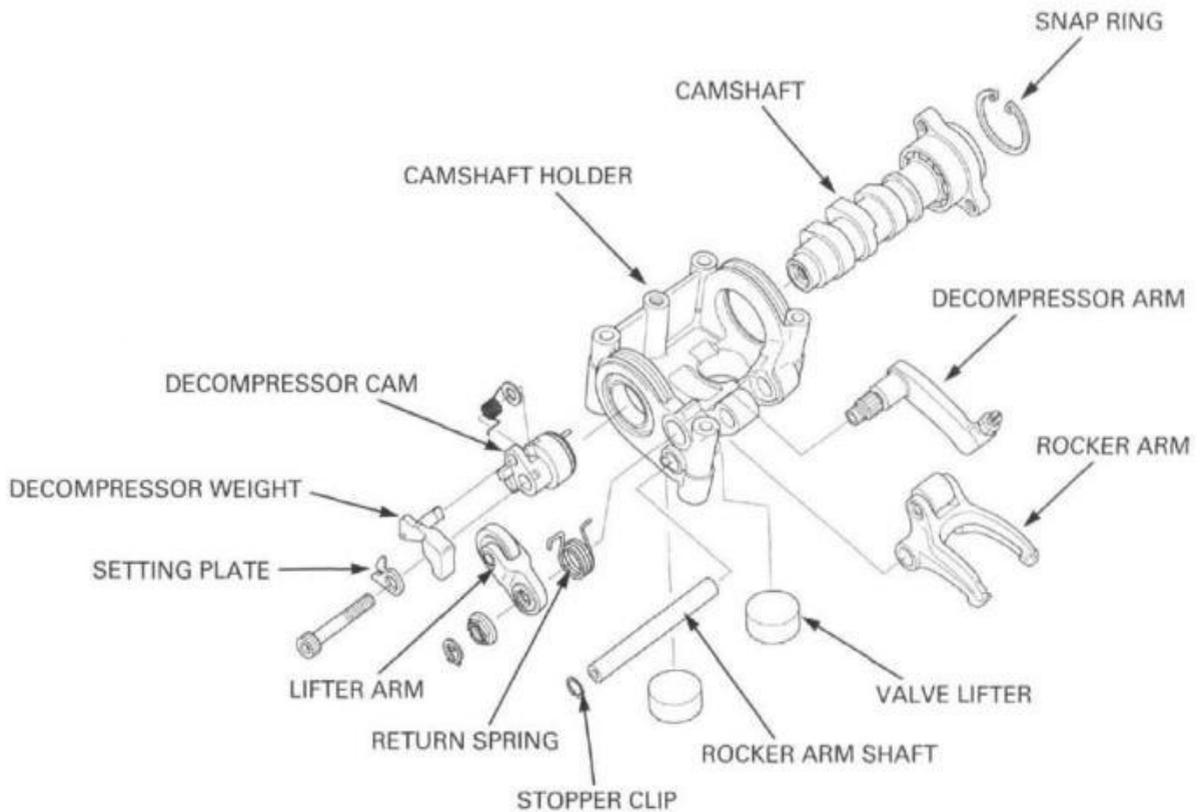


Install the following:

- engine coolant temperature (ECT) sensor ('04 - '05: page 20-24, After '05: page 24-11).
- ECT sensor connector
- thermostat (page 9-9)
- carburetor ('04 - '05: page 7-21, After '05: page 8-22)
- exhaust system (page 3-12)
- camshaft holder assembly (page 11-29)



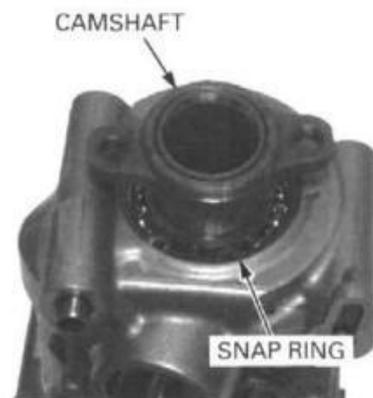
CAMSHAFT/DECOMPRESSOR ASSEMBLY



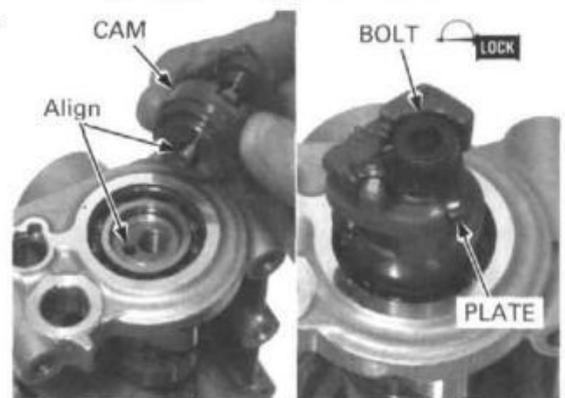
Blow through the oil passage in the camshaft holder with compressed air.

Install the following:

- camshaft
- snap ring (into the groove properly)

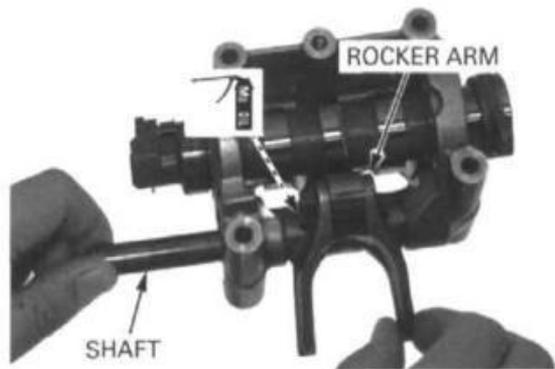


- Tighten the bolt after installing the camshaft holder onto the engine.*
- decompressor cam assembly (by aligning the dowel pin with the hole in the camshaft)
 - setting plate
 - bolt (apply locking agent to the threads)



CYLINDER HEAD/VALVE

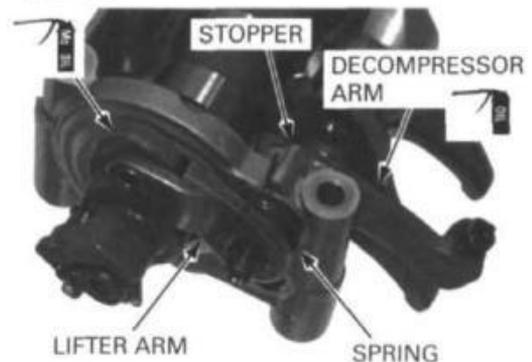
- rocker arm (apply molybdenum oil solution to the pivot)
- rocker arm shaft



- new stopper clip



- decompressor arm (apply engine oil to the pivot surface)
- return spring (hang the bent end over the lifter arm and set the straight end against the stopper)
- lifter arm (so the arms are lined up straight, and apply molybdenum oil solution to the roller surface)

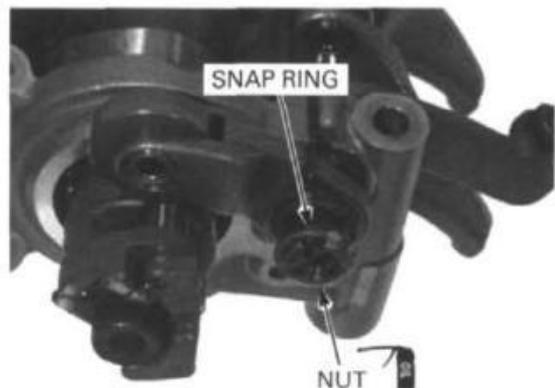


- nut (apply engine oil to the threads and seating surface)

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

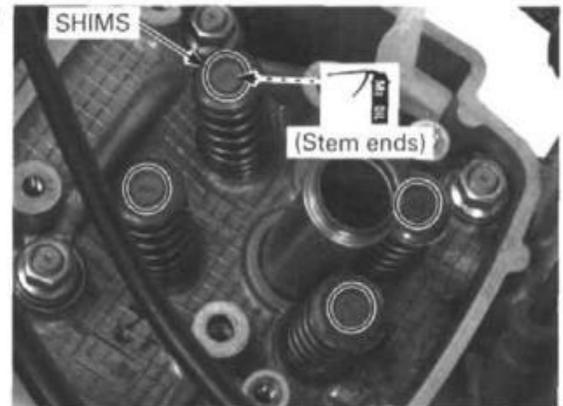
- snap ring

Install the camshaft holder assembly (page 11-29).



CAMSHAFT HOLDER INSTALLATION

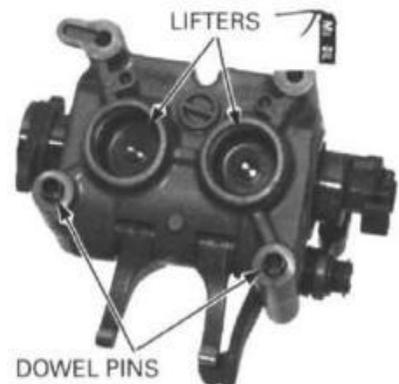
Apply molybdenum oil solution to the valve stem ends.
Install the valve shims in their original locations.



Be careful not to damage the sliding surfaces of the lifters and bores.

Coat the outer surfaces of the valve lifters with molybdenum oil solution.
Install the valve lifters in their original lifter bores in the camshaft holder.

Install the dowel pins.



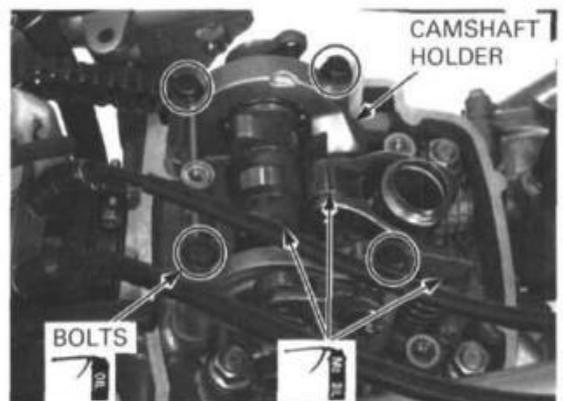
Lubricate the cam lobes, roller and shim contact areas of the rocker arms with molybdenum oil solution.

Install the camshaft assembly onto the cylinder head with the cam lobes facing up.

Apply engine oil to the holder bolt threads and seating surface.

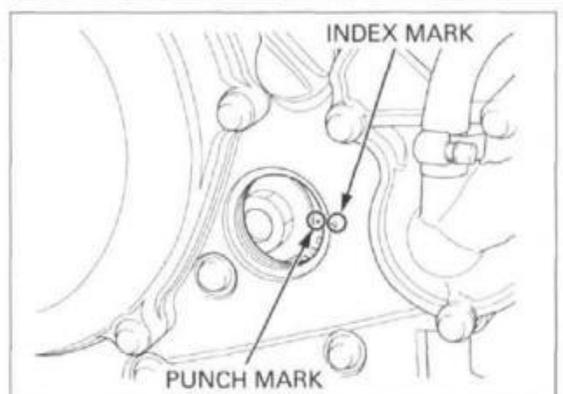
Install the four bolts and tighten them.

TORQUE: 14 N·m (1.4 kgf·m, 10 lbf·ft)



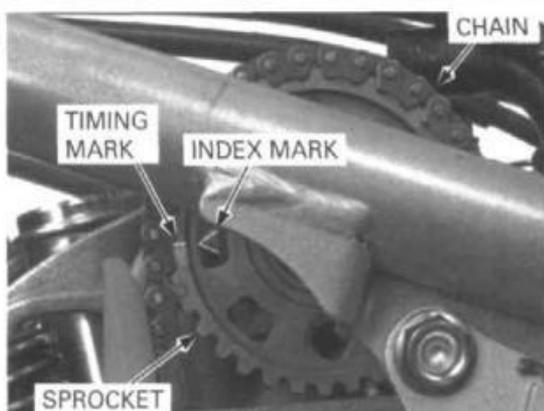
Take care not to jam the cam chain at the crankshaft when turning.

Turn the crankshaft clockwise and align the punch mark on the primary drive gear with the index mark on the right crankcase cover.



CYLINDER HEAD/VALVE

Carefully set the cam sprocket onto the cam chain so the timing marks on the sprocket are aligned with the index marks on the camshaft holder. Install the cam sprocket onto the camshaft.



Make sure the timing marks on the sprocket align with the index marks when the punch mark on the primary drive gear is aligned with the index mark.

Apply locking agent to the sprocket bolt threads. Align the bolt holes in the sprocket and camshaft flange. Install the sprocket bolts, being careful not to let them fall into the crankcase.

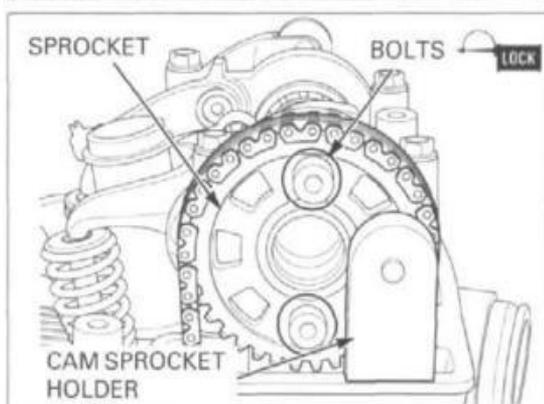
Tighten the sprocket bolts while holding the camshaft with the special tool.

TOOL:

Cam sprocket holder

07AMB-MEBA100
(U.S.A only)

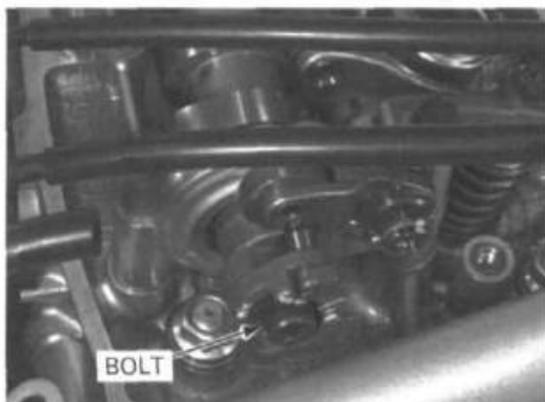
TORQUE: 20 N·m (2.0 kgf·m, 14 lbf·ft)



If the decompressor cam was removed, tighten the socket bolt while holding the crankshaft.

TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)

Check the valve clearances and adjust if necessary (page 4-10).

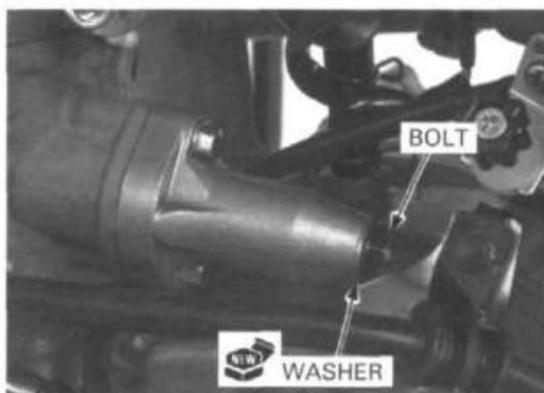


Remove the stopper tool (tensioner holder) from the tensioner lifter.

Install the sealing bolt with a new sealing washer and tighten it.

Install the following:

- crankshaft hole cap (page 4-14)
- spark plug (page 4-9)
- cylinder head cover (page 11-31)



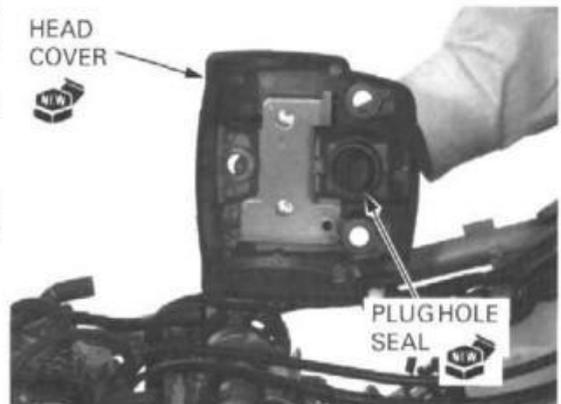
CYLINDER HEAD COVER INSTALLATION

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

Apply adhesive to the gasket groove in the cylinder head cover and install a new gasket.

Install a new rubber seal into spark plug hole.

Install the head cover by aligning the plug hole with the plug sleeve, being careful not to damage the rubber seal.



Install the washer with the "UP" mark facing the bolt head.

Install the cover bolts with the special washers.



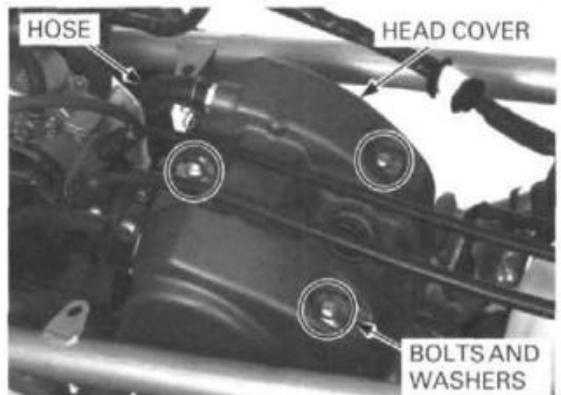
Tighten the three cover bolts in several steps.

TORQUE: 9.8 N·m (1.0 kgf·m, 7 lbf·ft)

Connect the crankcase breather hose.

Install the following:

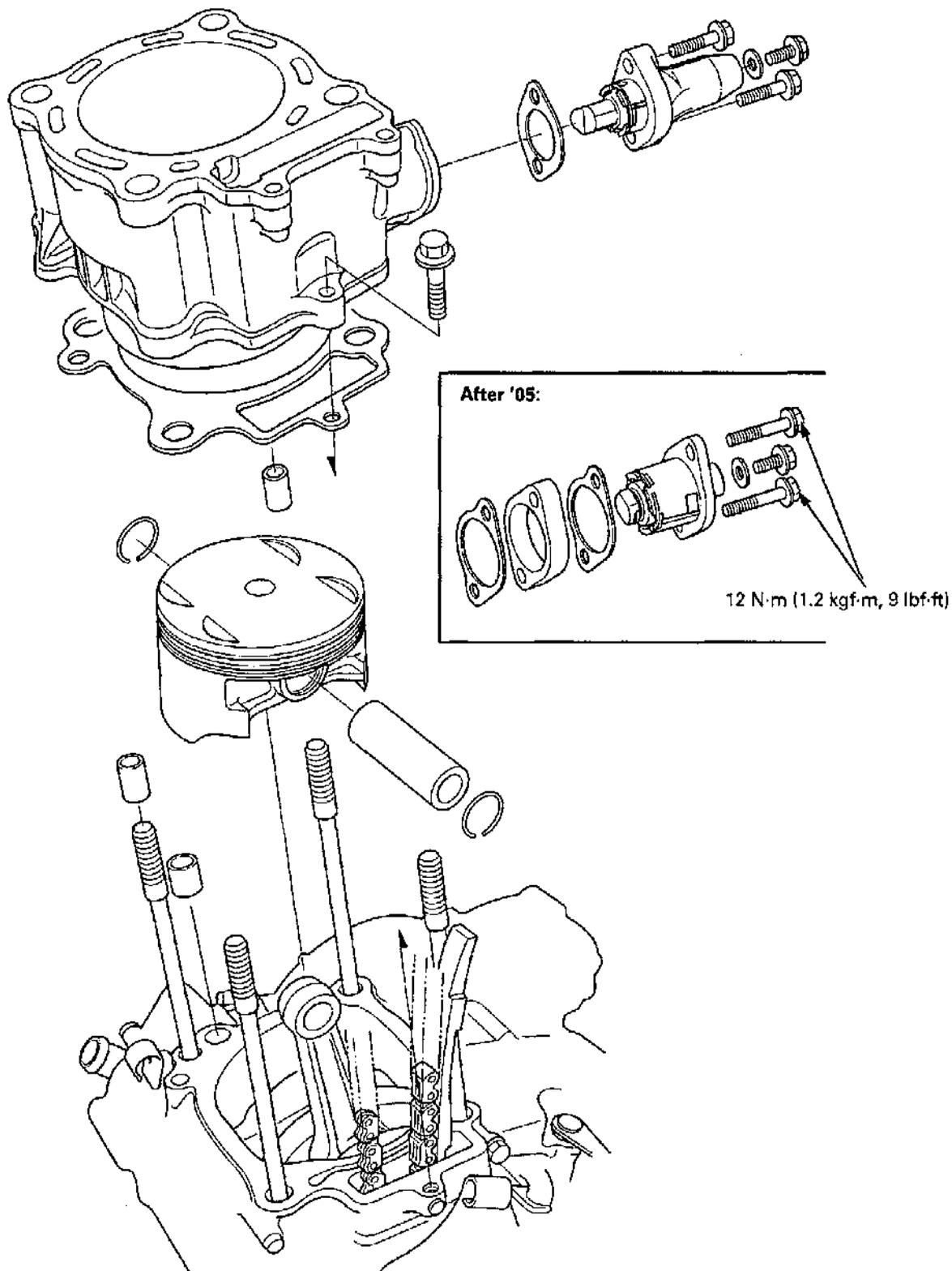
- spark plug cap
- heat guard plate ('04 - '05: page 3-9, After '05: page 3-9)
- fuel tank (page 3-9)



12. CYLINDER/PISTON

SYSTEM COMPONENTS	12-2	CYLINDER/PISTON REMOVAL	12-5
SERVICE INFORMATION	12-3	CYLINDER/PISTON INSTALLATION	12-10
TROUBLESHOOTING	12-4		

SYSTEM COMPONENTS



SERVICE INFORMATION

GENERAL

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

SPECIFICATIONS

'04 - '05:

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Cylinder	I.D.	94.000 – 94.015 (3.7008 – 3.7014)	94.05 (3.703)	
	Out-of-round	-	0.05 (0.002)	
	Taper	-	0.05 (0.002)	
	Warpage	-	0.05 (0.002)	
Piston, piston pin, piston ring	Piston O.D. at 20 (0.8) from bottom	93.960 – 93.990 (3.6992 – 3.7004)	93.86 (3.695)	
	Piston pin hole I.D.	21.002 – 21.008 (0.8268 – 0.8271)	21.03 (0.828)	
	Piston pin O.D.	20.994 – 21.000 (0.8265 – 0.8268)	20.98 (0.826)	
	Piston-to-piston pin clearance	0.002 – 0.014 (0.0001 – 0.0006)	0.04 (0.002)	
	Piston ring end gap	Top	0.20 – 0.35 (0.008 – 0.014)	0.50 (0.020)
		Second	0.35 – 0.50 (0.014 – 0.020)	0.65 (0.026)
		Oil (side rail)	0.20 – 0.70 (0.008 – 0.028)	0.9 (0.04)
	Piston ring-to-ring groove clearance	Top	0.065 – 0.100 (0.0026 – 0.0039)	0.115 (0.0045)
Second		0.030 – 0.060 (0.0012 – 0.0024)	0.075 (0.0030)	
Cylinder-to-piston clearance		0.010 – 0.055 (0.0004 – 0.0022)	0.19 (0.007)	
Connecting rod small end I.D.		21.016 – 21.034 (0.8274 – 0.8281)	21.04 (0.828)	
Connecting rod-to-piston pin clearance		0.016 – 0.040 (0.0006 – 0.0016)	0.06 (0.002)	

After '05:

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Cylinder	I.D.	96.000 – 96.015 (3.7795 – 3.7801)	96.05 (3.781)	
	Out-of-round	-	0.05 (0.002)	
	Taper	-	0.05 (0.002)	
	Warpage	-	0.05 (0.002)	
Piston, piston pin, piston ring	Piston O.D. at 10 (0.4) from bottom	95.970 – 95.980 (3.7783 – 3.7787)	95.87 (3.774)	
	Piston pin hole I.D.	19.002 – 19.008 (0.7481 – 0.7483)	19.03 (0.749)	
	Piston pin O.D.	18.994 – 19.000 (0.7478 – 0.7480)	18.98 (0.747)	
	Piston-to-piston pin clearance	0.002 – 0.014 (0.0001 – 0.0006)	0.04 (0.002)	
	Piston ring end gap	Top	0.25 – 0.31 (0.010 – 0.012)	0.45 (0.018)
		Second	0.23 – 0.33 (0.009 – 0.013)	0.48 (0.019)
		Oil (side rail)	0.20 – 0.70 (0.008 – 0.028)	0.90 (0.035)
	Piston ring-to-ring groove clearance	Top	0.065 – 0.100 (0.0026 – 0.0039)	0.115 (0.0045)
Second		0.065 – 0.100 (0.0026 – 0.0039)	0.115 (0.0045)	
Cylinder-to-piston clearance		0.020 – 0.045 (0.0008 – 0.0018)	0.18 (0.007)	
Connecting rod small end I.D.		19.016 – 19.034 (0.7487 – 0.7494)	19.04 (0.750)	
Connecting rod-to-piston pin clearance		0.016 – 0.040 (0.0006 – 0.0016)	0.06 (0.002)	

TORQUE VALUES

Cylinder stud bolt

See page 12-9

Cam chain tensioner lifter bolt (After '05)

12 N·m (1.2 kgf·m, 9 lbf·ft)

Apply locking agent to the threads.

TROUBLESHOOTING

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

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

Compression too high, overheating or knocking

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

Excessive smoke

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

Abnormal noise

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

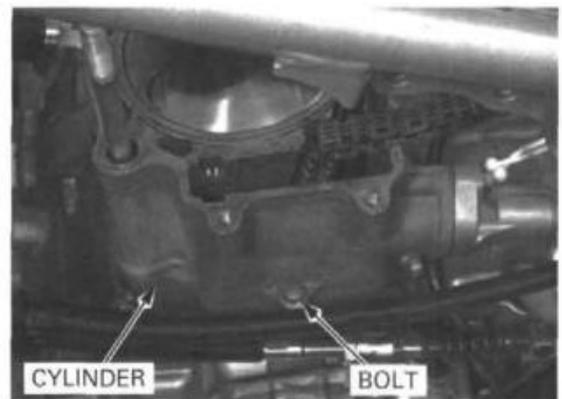
CYLINDER/PISTON REMOVAL

CYLINDER REMOVAL

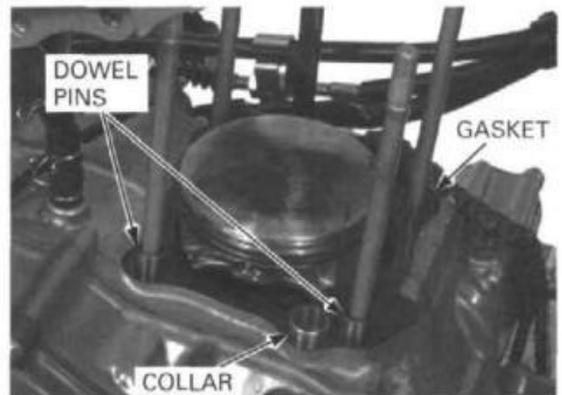
Remove the cylinder head (page 11-15).

Remove the following:

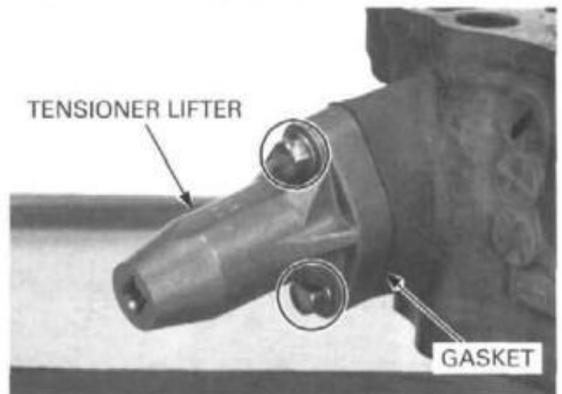
- bolt
- cylinder (being careful not to damage the piston with the stud bolts)



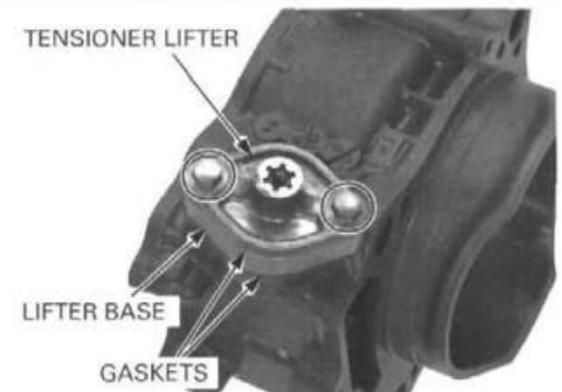
- joint collar
- dowel pins
- gasket



- '04 - '05:
- two bolts
 - cam chain tensioner lifter
 - gasket

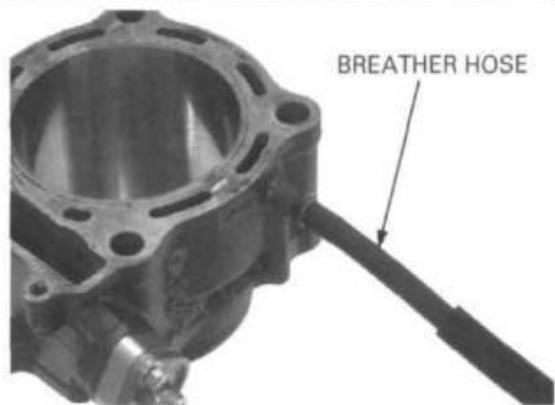


- After '05:
- two bolts
 - cam chain tensioner lifter
 - gaskets
 - lifter base



CYLINDER/PISTON

After '05: Disconnect the breather hose from cylinder.

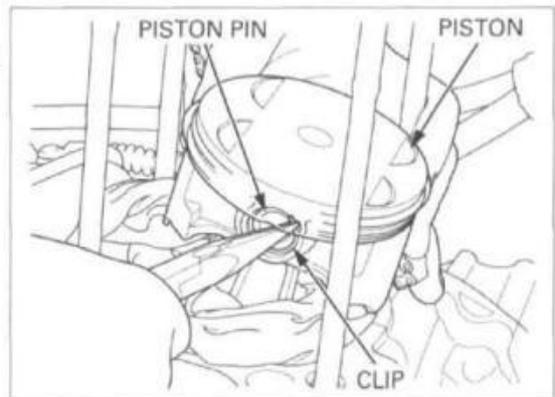


PISTON REMOVAL

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

Remove the piston pin clip with pliers.

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



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

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



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

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



INSPECTION**CYLINDER**

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

SERVICE LIMITS:

'04 - '05; 94.05 mm (3.703 in)

After '05; 96.05 mm (3.781 in)

Calculate the cylinder-to-piston clearance.
Refer to page 12-8 for measurement of the piston O.D.

SERVICE LIMITS:

'04 - '05; 0.19 mm (0.007 in)

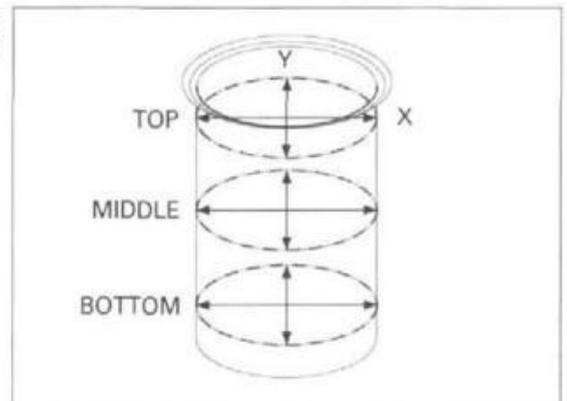
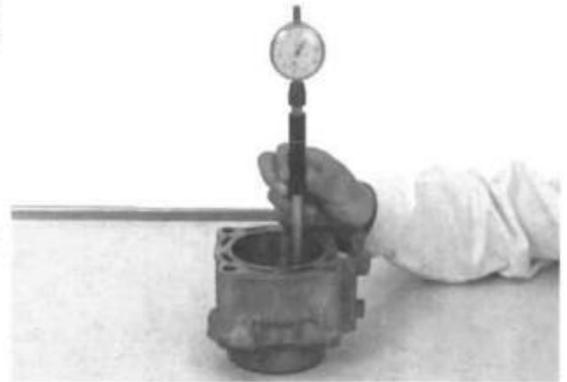
After '05; 0.18 mm (0.007 in)

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

SERVICE LIMITS:

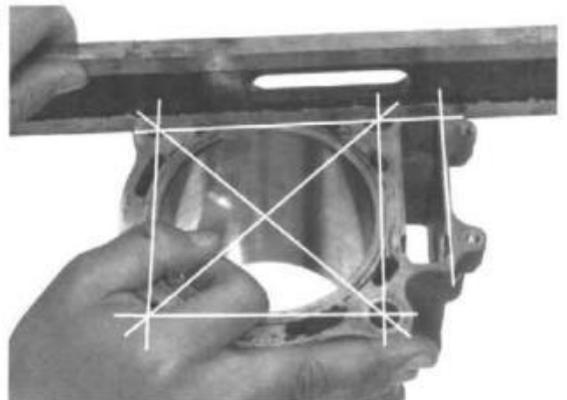
Taper: 0.05 mm (0.002 in)

Out-of-round: 0.05 mm (0.002 in)



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

SERVICE LIMIT: 0.05 mm (0.002 in)

**PISTON/PISTON RING**

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

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

SERVICE LIMITS:

'04 - '05;

Top: 0.115 mm (0.0045 in)

Second: 0.075 mm (0.0030 in)

After '05;

Top: 0.115 mm (0.0045 in)

Second: 0.115 mm (0.0045 in)



CYLINDER/PISTON

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

Measure the ring end gap.

SERVICE LIMITS:

'04 - '05:

Top: 0.50 mm (0.020 in)

Second: 0.65 mm (0.026 in)

Oil (side rail): 0.9 mm (0.04 in)

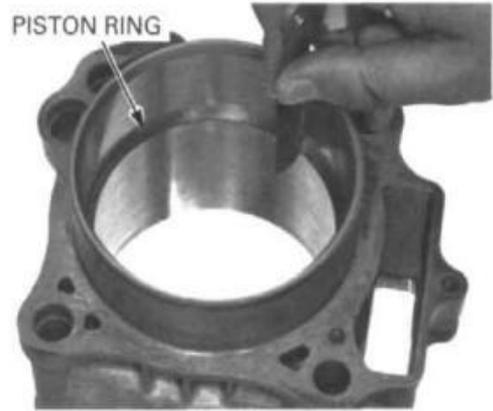
After '05:

Top: 0.45 mm (0.018 in)

Second: 0.48 mm (0.019 in)

Oil (side rail): 0.90 mm (0.035 in)

PISTON RING



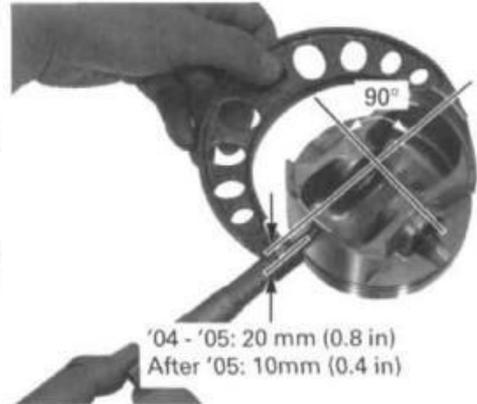
'04 - '05: Measure the piston O.D. at a point 20 mm (0.8 in) from the bottom and 90° to the piston pin hole.

SERVICE LIMIT: 93.86 mm (3.695 in)

After '05: Measure the piston O.D. at a point 10 mm (0.4 in) from the bottom and 90° to the piston pin hole.

SERVICE LIMIT: 95.87 mm (3.774 in)

Compare this measurement against the maximum cylinder I.D. measurement and calculate the cylinder-to-piston clearance (page 12-7).



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

SERVICE LIMITS:

'04 - '05: 21.03 mm (0.828 in)

After '05: 19.03 mm (0.749 in)

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

SERVICE LIMITS:

'04 - '05: 20.98 mm (0.826 in)

After '05: 18.98 mm (0.747 in)

Calculate the piston-to-piston pin clearance.

SERVICE LIMIT: 0.04 mm (0.002 in)

CONNECTING ROD

Measure the connecting rod small end I.D.

SERVICE LIMITS:

'04 - '05: 21.04 mm (0.828 in)

After '05: 19.04 mm (0.750 in)

Calculate the connecting rod-to-piston pin clearance.

SERVICE LIMIT: 0.06 mm (0.002 in)



CAM CHAIN TENSIONER LIFTER

The lifter shaft should not go into the lifter body when it is pushed.

When the shaft (inside of the body) is turned clockwise with a screwdriver, the lifter shaft should be pulled into the lifter body. The shaft should spring out of the body as soon as the screwdriver is released.

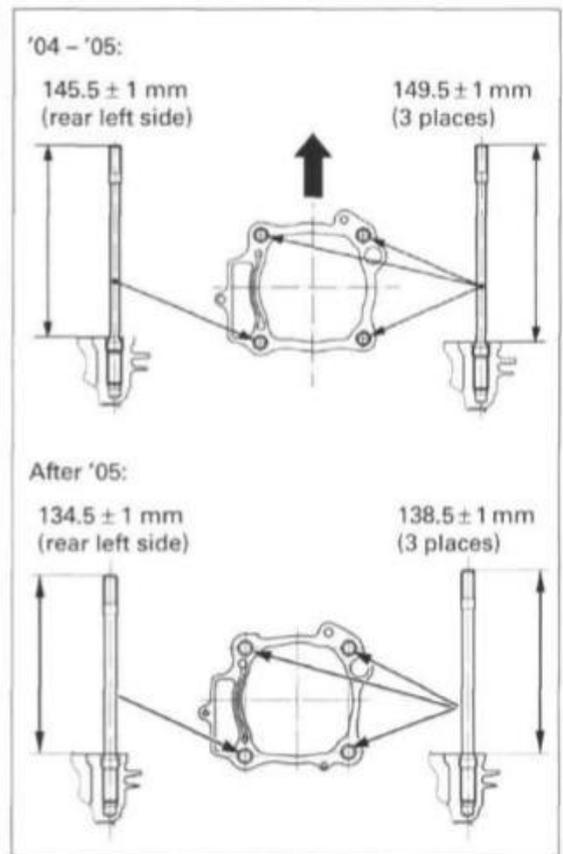
**CYLINDER STUD BOLT REPLACEMENT**

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

Install new stud bolts in the direction as shown.

Be sure to verify the stud height from the crankcase surface.

Adjust the height if necessary.



CYLINDER/PISTON INSTALLATION

PISTON RING INSTALLATION

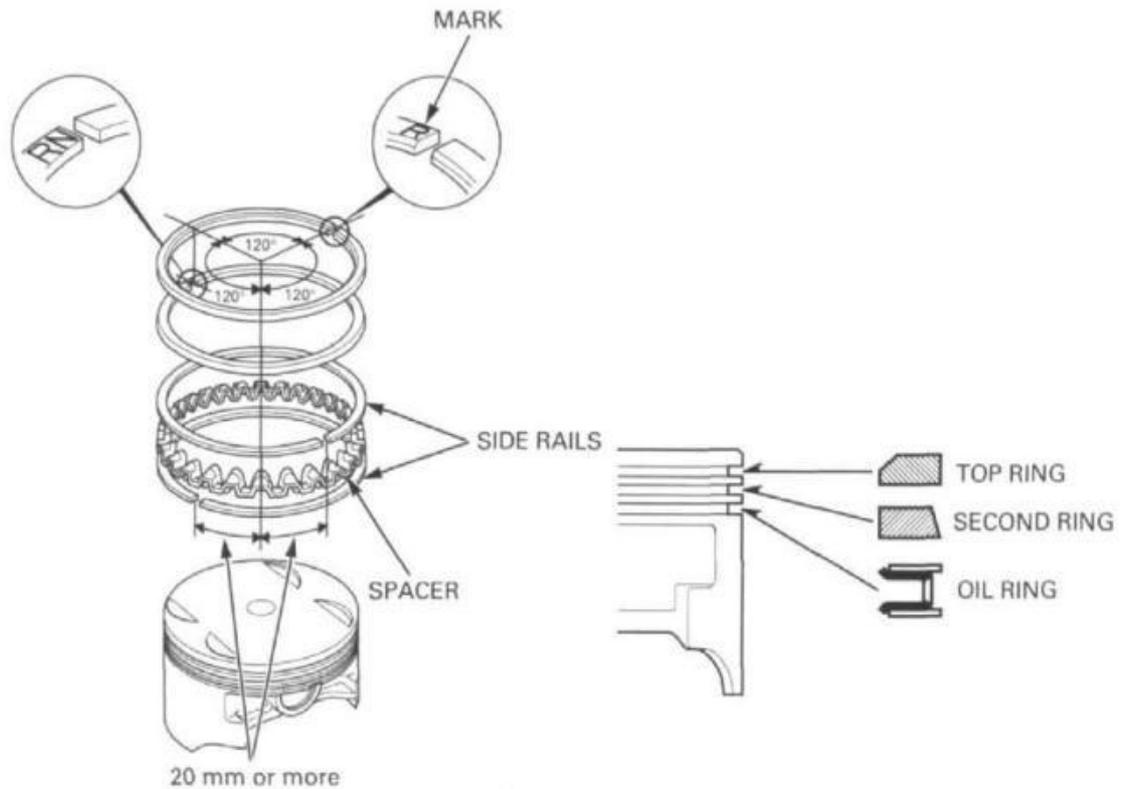
Carefully install the piston rings into the piston ring grooves with the marks facing up.

NOTE:

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

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

Stagger the side rail end gaps as shown.



PISTON INSTALLATION

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

Apply molybdenum oil solution to the connecting rod small end inner surface and piston pin outer surface.



Apply engine oil to the piston pin holes.

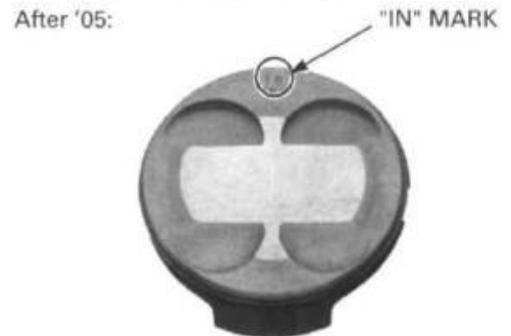
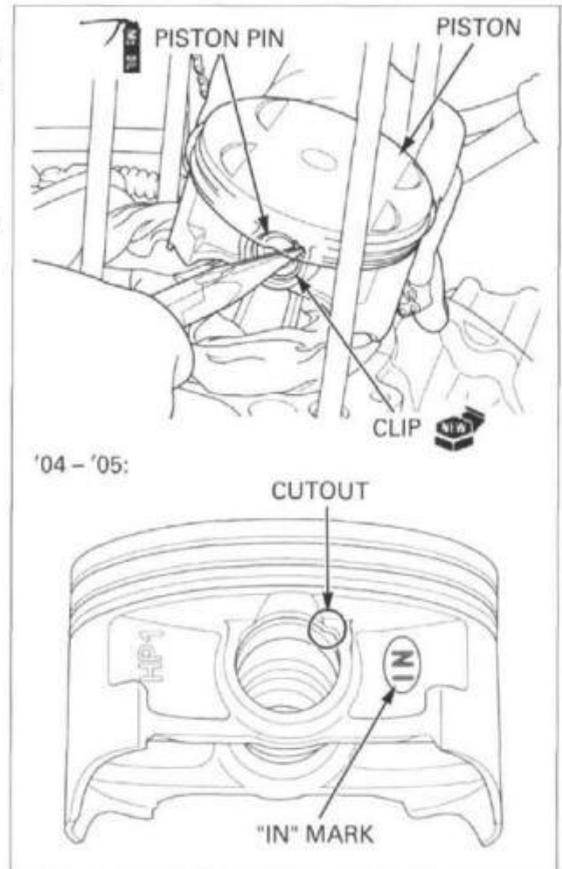
Install the piston with the "IN" mark toward the intake side and insert the piston pin through the piston and connecting rod.

Do not align the clip end gap with the piston cutout.

Install new piston pin clips.

NOTE:

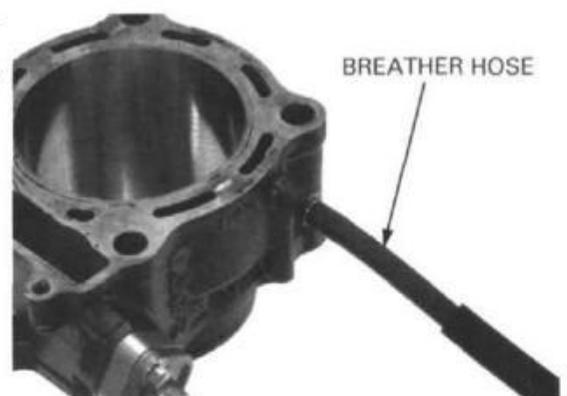
- Make sure the piston pin clips are seated securely.



CYLINDER INSTALLATION

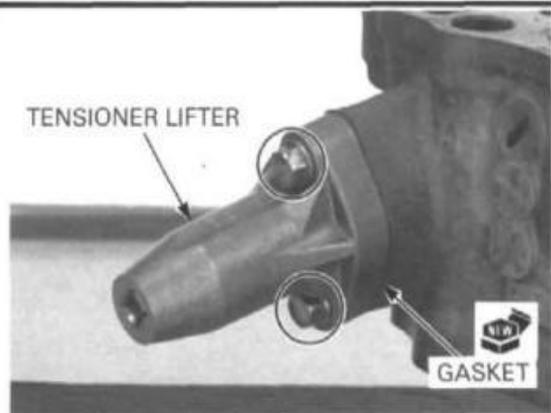
Clean the gasket surface of the crankcase and cylinder thoroughly, being careful not to damage them. Blow through the oil passage in the cylinder with compressed air.

After '05: Connect the breather hose to the cylinder.

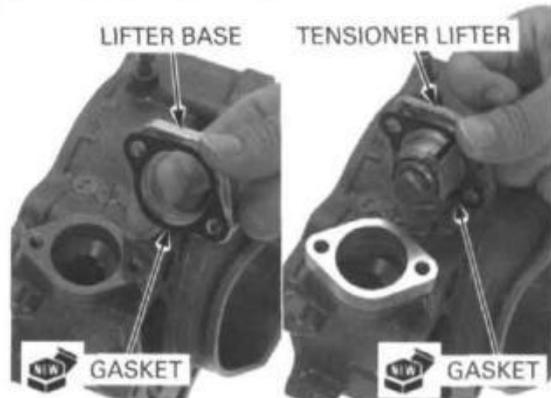


CYLINDER/PISTON

'04 - '05: Install the cam chain tensioner lifter with a new gasket. Tighten the two socket bolts.

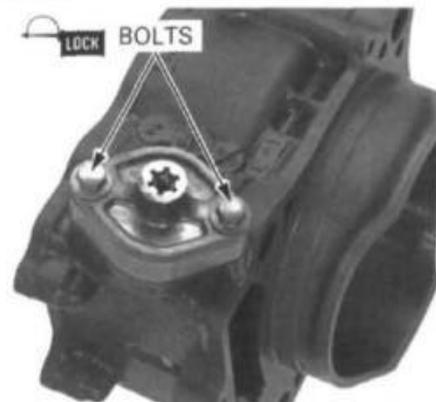


After '05: Install the cam chain tensioner lifter with the lifter base, new gaskets.



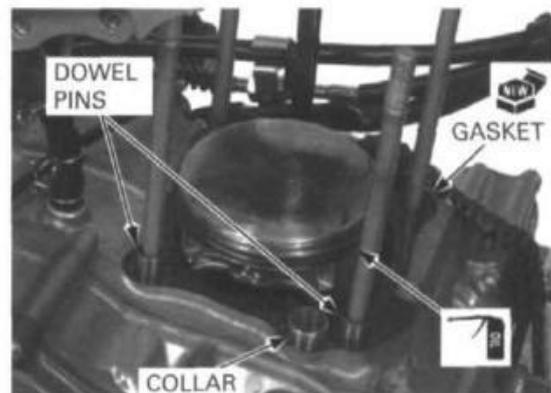
After '05: Apply locking agent to the cam chain tensioner lifter bolt threads. Install the bolts and tighten the bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

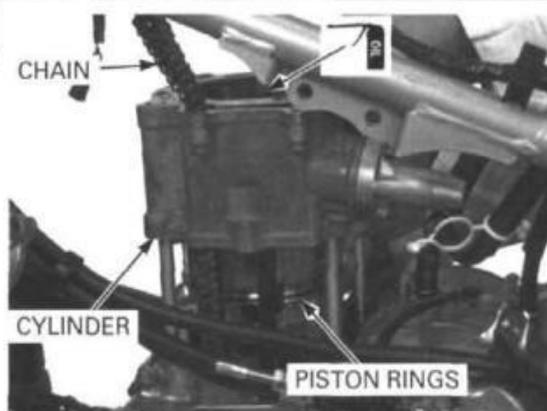


Install the joint collar, two dowel pins and a new gasket.

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



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



Tighten the cylinder bolt after installing the cylinder head.

Make sure that the cylinder touches the crankcase evenly. Install the cylinder bolt.

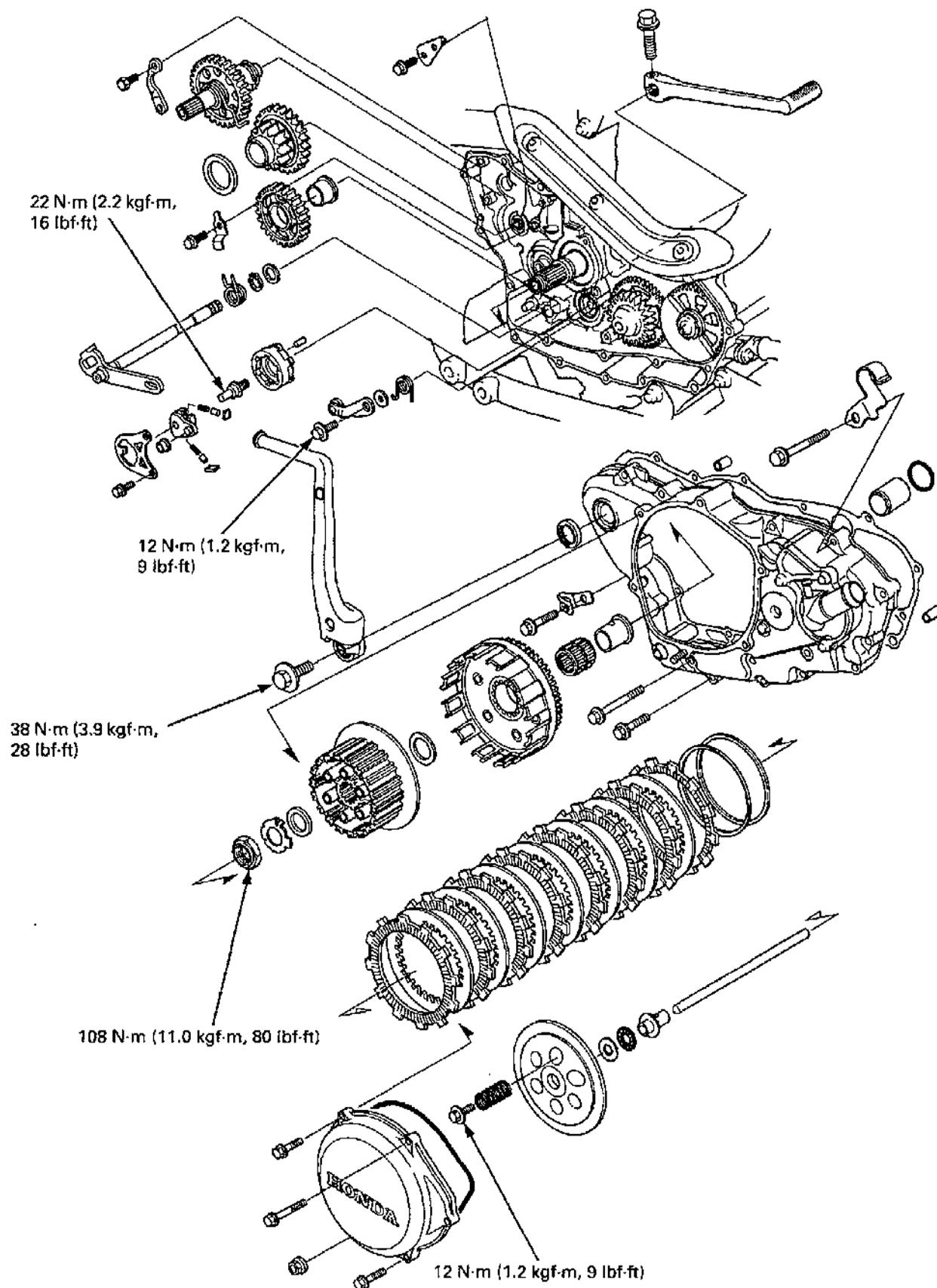
Install the cylinder head (page 11-24).



13. CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE ('04 – '05)

SYSTEM COMPONENTS	13-2	CLUTCH	13-5
SERVICE INFORMATION	13-3	KICKSTARTER	13-15
TROUBLESHOOTING	13-4	GEARSHIFT LINKAGE	13-18
RIGHT CRANKCASE COVER REMOVAL	13-5	RIGHT CRANKCASE COVER INSTALLATION	13-22

SYSTEM COMPONENTS



SERVICE INFORMATION

GENERAL

- This section covers service of the clutch, kickstarter and gearshift linkage. These services can be performed with the engine installed in the frame.
- Transmission oil viscosity and level and the use of oil additives have an effect on clutch disengagement. Oil additives of any kind are specifically not recommended. When the clutch does not disengage or the vehicle creeps with the clutch disengaged, inspect the transmission oil viscosity and level before servicing the clutch system.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Clutch	Lever free play	10 - 20 (3/8 - 3/4)	-	
	Spring free length	45.7 (1.80)	44.7 (1.76)	
	Disc A thickness	2.92 - 3.08 (0.115 - 0.121)	2.85 (0.112)	
	Disc B thickness	3.22 - 3.38 (0.127 - 0.133)	3.15 (0.124)	
	Plate warpage	-	0.15 (0.006)	
Kickstarter	Pinion gear I.D.	22.007 - 22.028 (0.8664 - 0.8672)	22.05 (0.868)	
	Spindle I.D.	21.959 - 21.980 (0.8645 - 0.8654)	21.95 (0.864)	
	Idle gear I.D.	21.020 - 21.041 (0.8276 - 0.8284)	21.07 (0.830)	
	Idle gear bushing	I.D.	17.000 - 17.018 (0.6693 - 0.6700)	17.04 (0.671)
		O.D.	20.979 - 21.000 (0.8259 - 0.8268)	20.96 (0.825)
Countershaft O.D. at kickstarter idle gear		16.966 - 16.984 (0.6680 - 0.6687)	16.95 (0.667)	

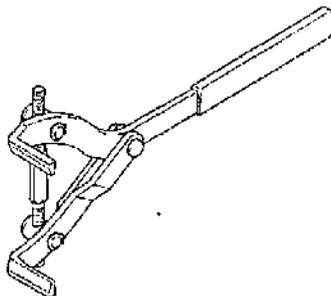
TORQUE VALUES

Clutch spring bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Clutch center lock nut	108 N·m (11.0 kgf·m, 80 lbf·ft)
Gearshift drum center pin bolt	22 N·m (2.2 kgf·m, 16 lbf·ft)
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)

Apply oil to the threads and seating surface.
Apply locking agent to the threads.

TOOLS

Clutch center holder
07724-0050002



or 07724-0050001 or equivalent
commercially available in U.S.A.

TROUBLESHOOTING

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

Clutch lever difficult to pull in

- Damaged, kinked or dirty clutch cable
- Improperly routed clutch cable
- Damaged clutch lifter arm/shaft

Clutch will not disengage or vehicle creeps with clutch disengaged

- Excessive clutch lever free play
- Warped clutch plate
- Transmission oil level too high, improper oil viscosity, or additive used

Clutch slips

- Worn clutch discs
- Weak clutch springs
- No clutch lever free play
- Transmission oil additive used

Hard to shift

- Misadjusted clutch lever free play
- Damaged or bent shift fork
- Bent shift fork shaft
- Incorrect transmission oil viscosity
- Damaged gearshift spindle assembly
- Damaged shift drum guide grooves

Transmission jumps out of gear

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

Gearshift pedal will not return

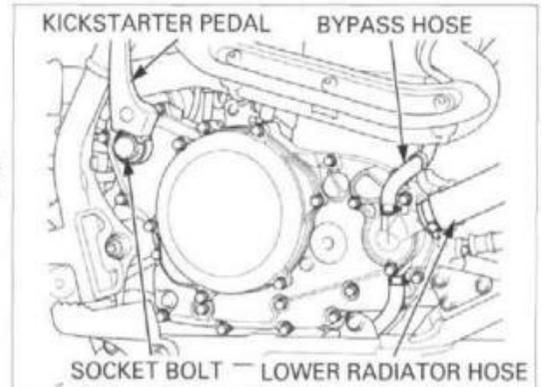
- Weak or broken gearshift spindle return spring
- Bent gearshift spindle

RIGHT CRANKCASE COVER REMOVAL

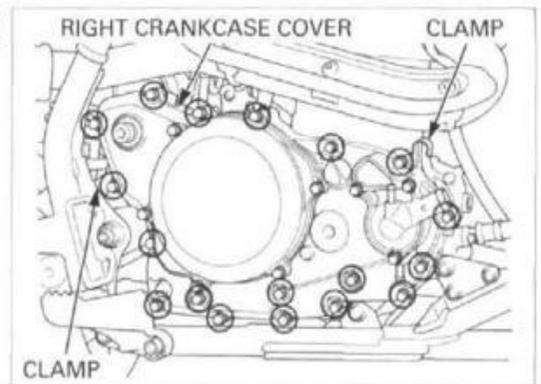
Drain the coolant (page 9-7).
 Drain the engine oil (page 4-15).
 Drain the transmission oil (page 4-18).
 Remove the brake pedal (page 19-28).

Remove the socket bolt and kickstarter pedal.

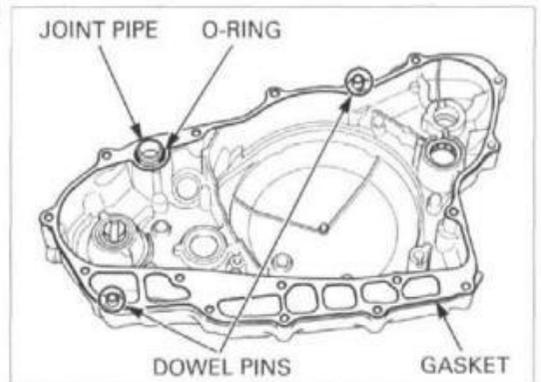
Loosen the hose band screws and disconnect the lower radiator hose and bypass hose from the water pump cover.



Loosen the eighteen bolts in a crisscross pattern in 2 or 3 steps, and remove the bolts, clamps and right crankcase cover.



Remove the dowel pins, water joint pipe, O-ring and gasket.



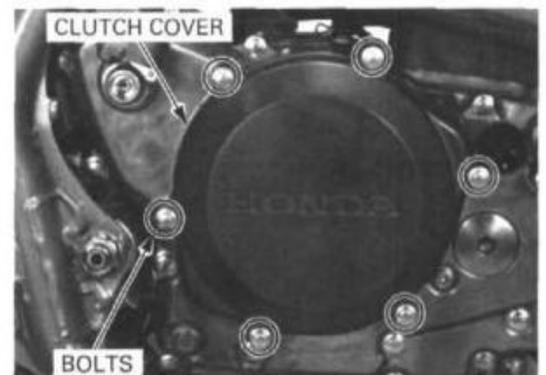
CLUTCH

DISASSEMBLY

Drain the transmission oil (page 4-18).

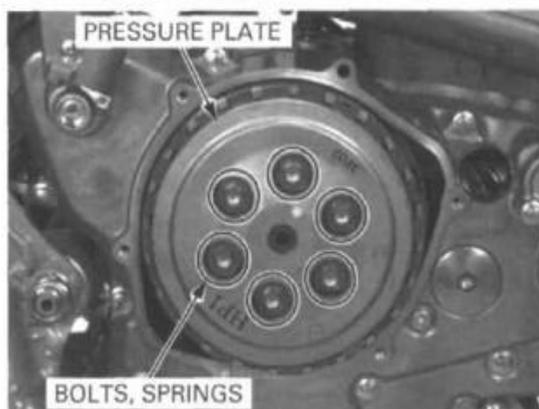
Remove the following:

- brake pedal (page 19-28)
- six bolts
- clutch cover
- O-ring

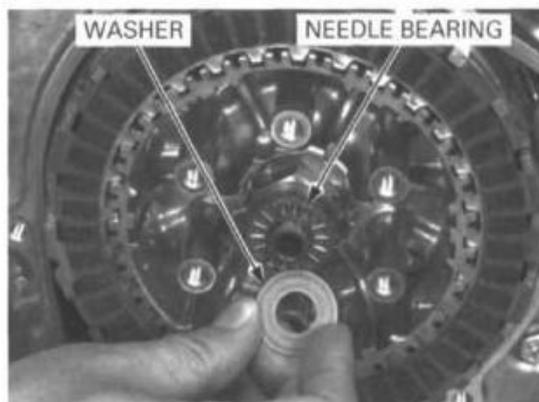


CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE ('04 - '05)

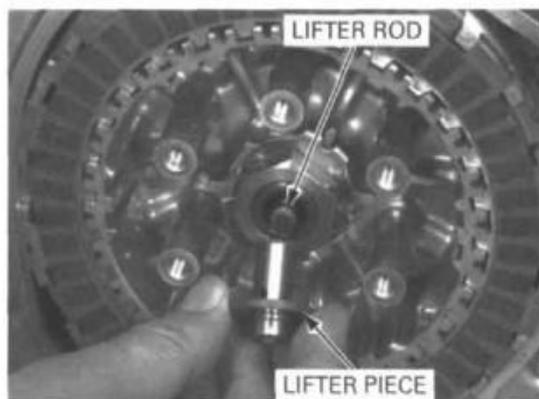
- six bolts and springs
- clutch pressure plate



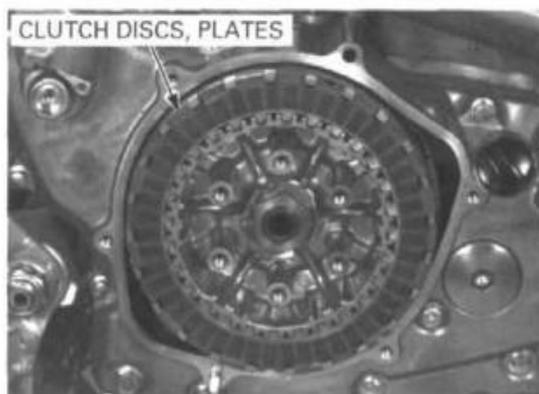
- washer
- needle bearing



- clutch lifter piece
- clutch lifter rod



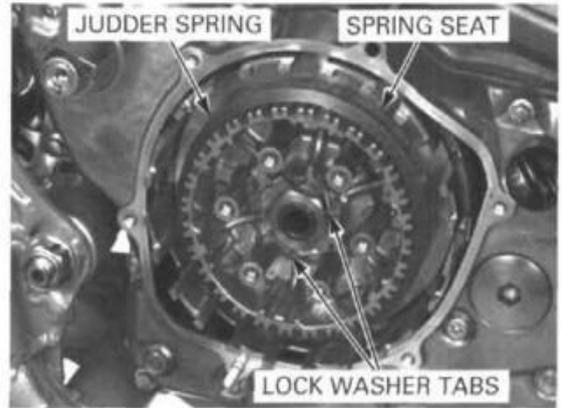
- seven clutch discs A and plates
- clutch disc B



CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE ('04 - '05)

- judder spring
- spring seat

Straighten the lock washer tabs.



Hold the clutch center using the special tool and loosen the clutch center lock nut.

TOOL:

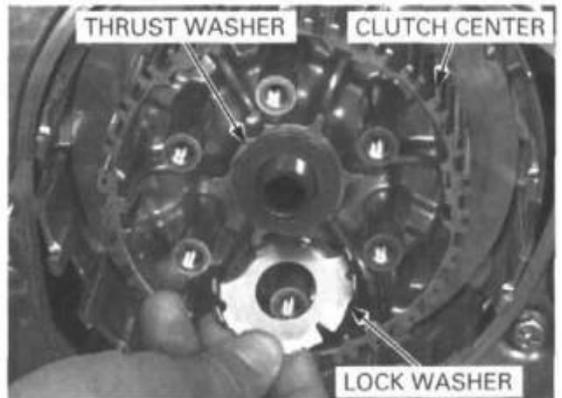
Clutch center holder 07724-0050002 or
07724-0050001 or
equivalent commercially
available in U.S.A.

Remove the following:

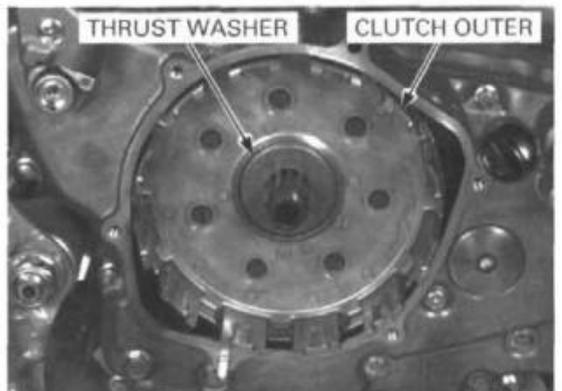
- lock nut



- lock washer
- thrust washer
- clutch center



- thrust washer
- right crankcase cover (page 13-5)
- clutch outer



CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE ('04 - '05)

- needle bearing
- clutch outer guide



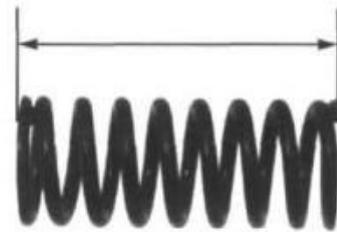
INSPECTION

Clutch spring

Replace the clutch springs as a set.

Measure the clutch spring free length.

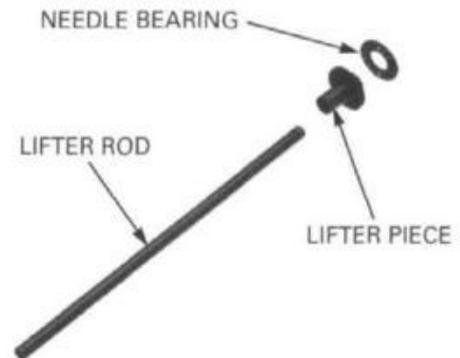
SERVICE LIMIT: 44.7 mm (1.76 in)



Clutch lifter piece/bearing/rod

Check the clutch lifter piece and needle bearing for wear or damage.

Check the clutch lifter rod for bends or damage.



Clutch disc

Replace the clutch discs and plates as a set.

Check the clutch discs for signs of scoring or discoloration.

Measure the thickness of each disc.

SERVICE LIMITS: Disc A: 2.85 mm (0.112 in)
Disc B: 3.15 mm (0.124 in)

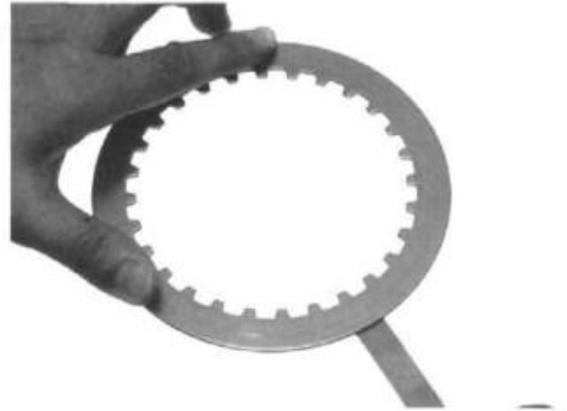


Clutch plate

Replace the clutch discs and plates as a set.

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

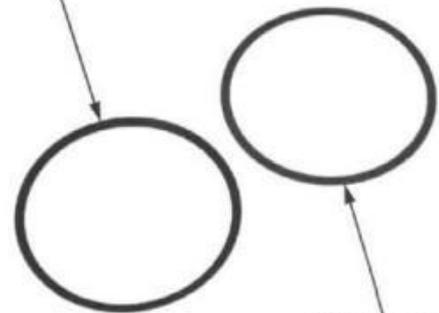
SERVICE LIMIT: 0.15 mm (0.006 in)



Judder spring/spring seat

Check the judder spring and seat for damage or warpage.

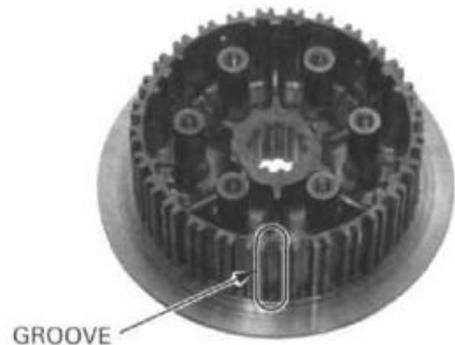
JUDDER SPRING



SPRING SEAT

Clutch center

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



Clutch outer

Check the slots in the clutch outer for nicks, cuts or indentations made by the clutch discs.
Check the primary driven gear teeth for wear or damage.



CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE ('04 - '05)

Clutch outer guide/bearing

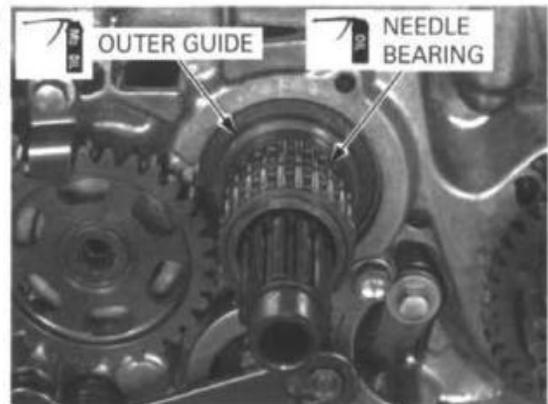
Check the clutch outer guide and needle bearing for wear or damage.



ASSEMBLY

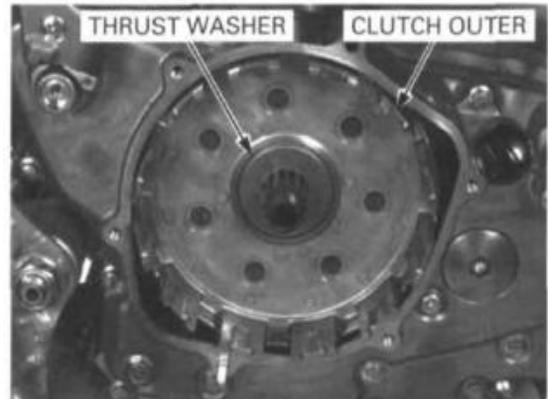
Apply molybdenum oil solution to the sliding surface of the clutch outer guide and install it onto the mainshaft.

Apply transmission oil to the needle bearing and install it onto the clutch outer guide.



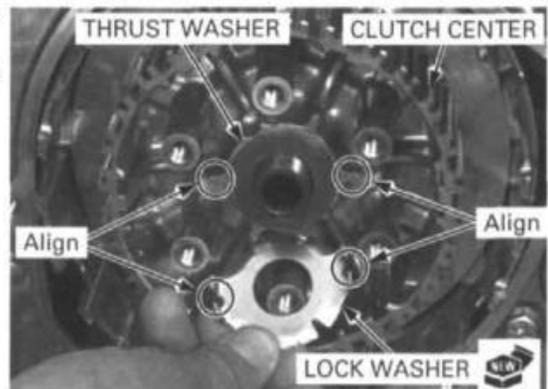
Install the clutch outer and thrust washer.

Install the right crankcase cover (page 13-22).



Install the clutch center and thrust washer onto the mainshaft.

Install a new lock washer by aligning the grooves with the ribs of the clutch center.



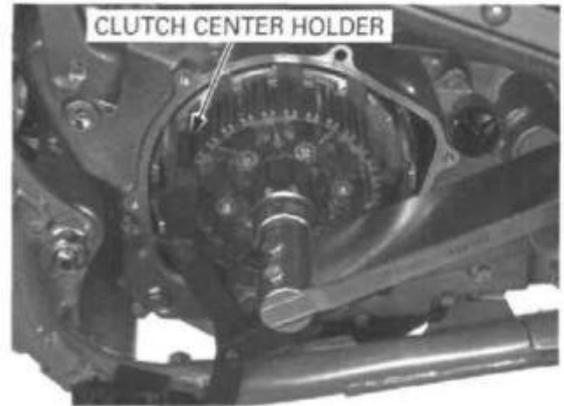
CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE ('04 - '05)

Install the clutch center lock nut.
Hold the clutch center using the special tool and tighten the lock nut.

TOOL:

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

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

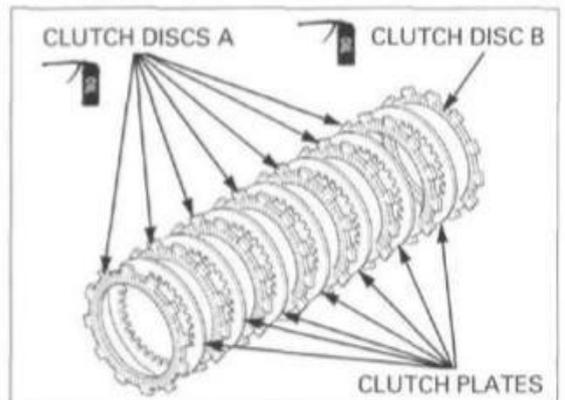


Bend the lock washer tabs against the clutch center lock nut.

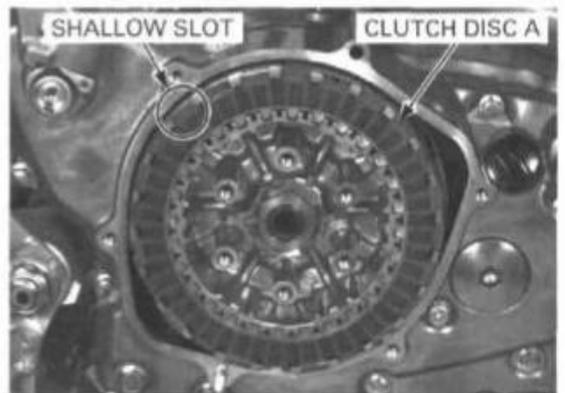
Install the spring seat.
Install the judder spring with the concaved side facing out.



Coat the clutch discs with transmission oil.
Install the clutch disc B.
Install the seven clutch plate and six clutch discs A alternately, starting with plate.

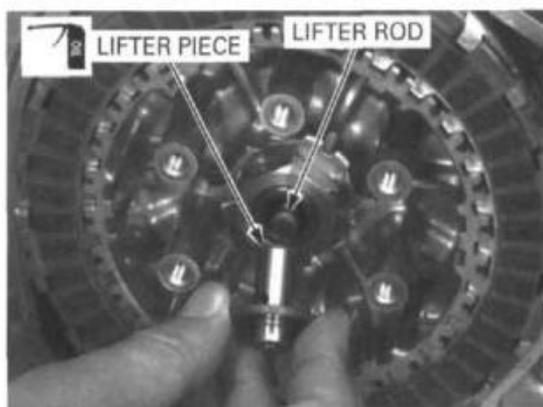


Install clutch disc A into the shallow slots in the clutch outer.



CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE ('04 - '05)

Install the clutch lifter rod into the mainshaft.
Coat the clutch lifter piece with transmission oil and install it into the mainshaft.

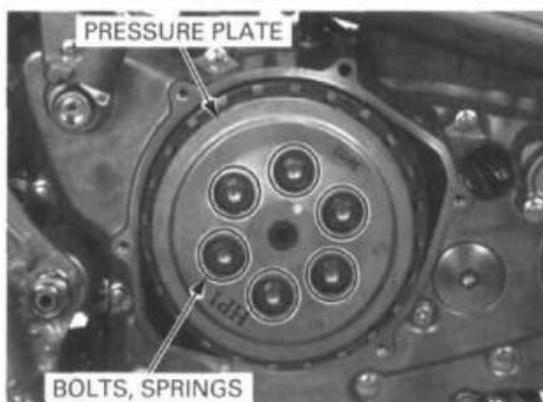


Coat the needle bearing and washer with transmission oil and install them onto the clutch lifter piece.

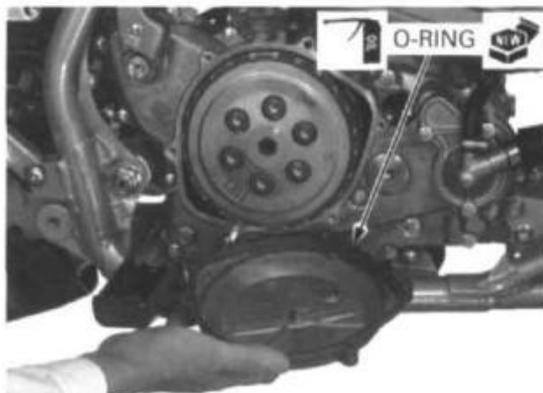


Install the clutch pressure plate.
Install the six clutch springs and bolts, and tighten the bolts.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



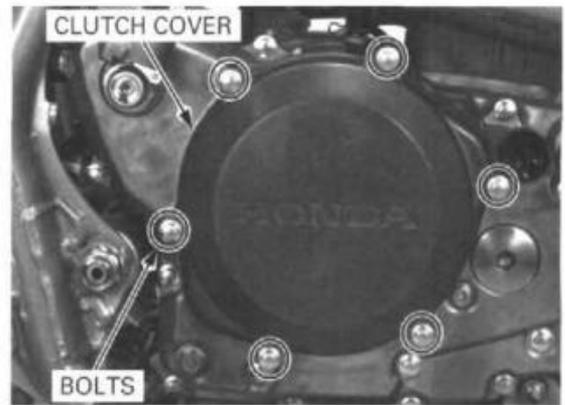
Coat a new O-ring with oil and install it into the clutch cover groove.



Install the clutch cover, and tighten the six bolts securely.

Install the brake pedal (page 19-28).

Fill the crankcase with the recommended transmission oil (page 4-18).



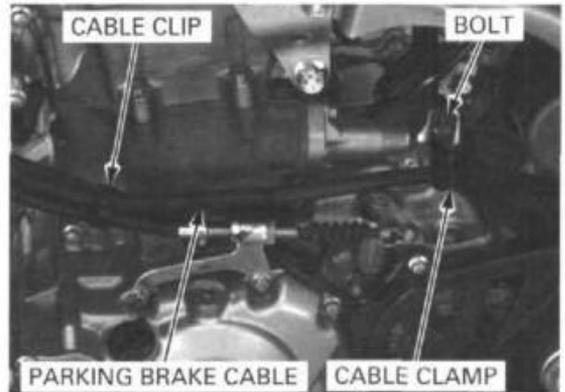
CLUTCH LIFTER ARM

REMOVAL

Remove the clutch lifter rod (page 13-5).

Remove the bolt and parking brake cable clamp from the stay.

Remove the cable clip.



Remove the sealing bolt and washer.

Retract the cam chain tensioner lifter and hold it with a stopper tool.

Remove the two bolts, tensioner lifter and gasket.

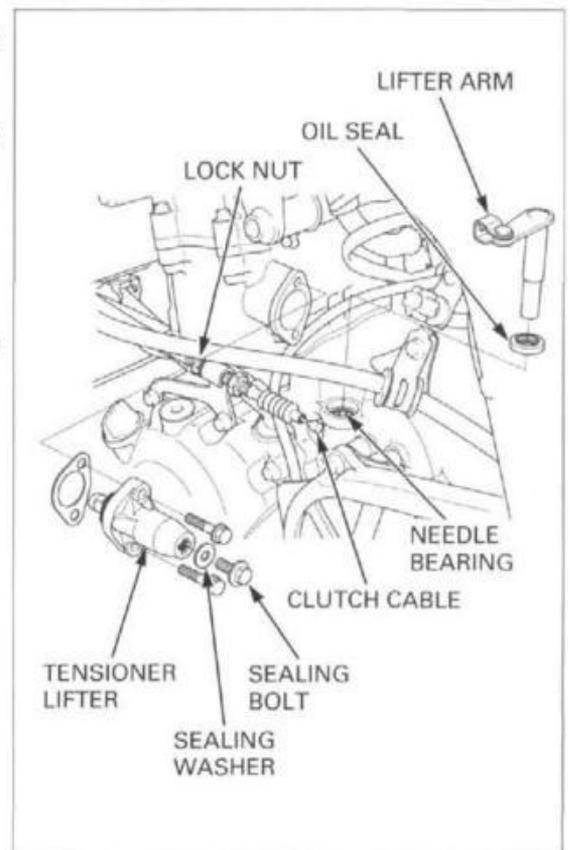
Loosen the clutch cable lock nut and disconnect the cable from the clutch lifter arm.

Remove the clutch lifter arm.

Remove the oil seal.

INSPECTION

Check the needle bearings for wear or damage and replace them if necessary.



CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE ('04 - '05)

Check the clutch lifter arm cam (rod contact area) for wear or damage.



INSTALLATION

Apply oil to the needle bearings.

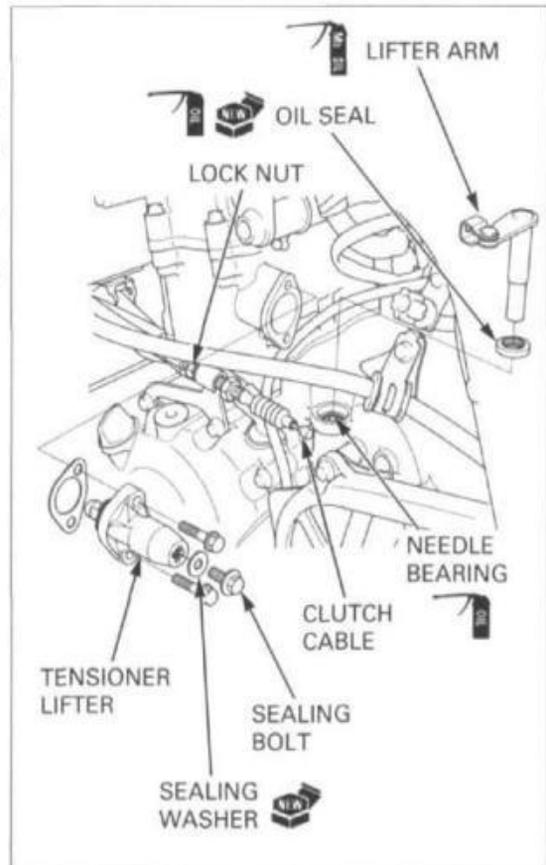
Apply oil to a new oil seal lip and install the seal.

Apply molybdenum oil solution to the clutch lifter arm cam (rod contact area) and install the lifter arm.

Connect the clutch cable to the clutch lifter arm and loosely tighten the lock nut.

Install the cam chain tensioner lifter with a new gasket and tighten the two bolts securely.

Remove the stopper tool, install the sealing bolt with a new sealing washer and tighten it securely.



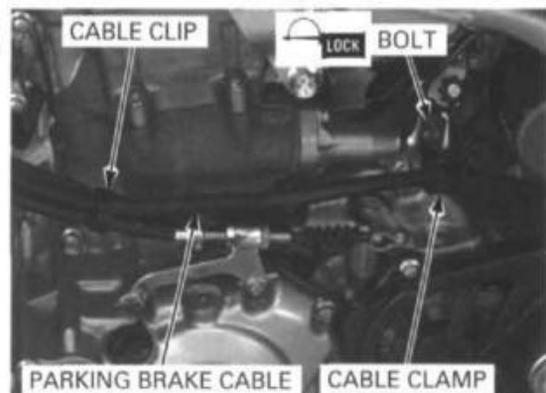
Apply locking agent to the cable clamp bolt threads. Install parking brake cable clamp onto the stay and tighten the bolt.

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

Install the cable clip.

Install the clutch lifter rod (page 13-10).

Adjust the clutch lever free play (page 4-29).



KICKSTARTER

REMOVAL

Remove the right crankcase cover (page 13-5).

Remove the thrust washer from the kickstarter first idle gear.

Unhook the kickstarter return spring end from the hole in the crankcase, and remove the kickstarter assembly.

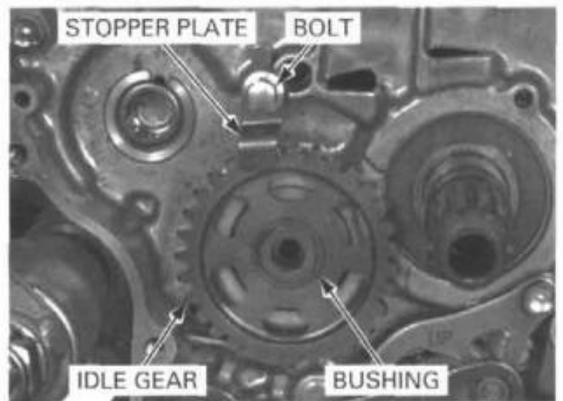


Remove the kickstarter first idle gear assembly.



Remove the clutch outer (page 13-5).

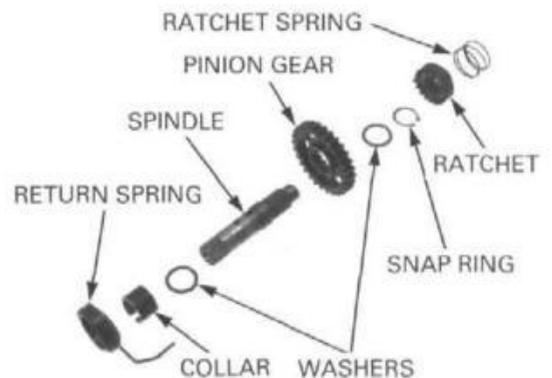
Remove the bolt and idle gear stopper plate.
Remove the kickstarter idle gear and bushing.



DISASSEMBLY

Remove the following from the kickstarter spindle:

- ratchet spring
- ratchet
- snap ring
- thrust washer
- pinion gear
- spring collar
- return spring
- thrust washer



INSPECTION

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

Check the starter ratchet for wear or damage.

CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE ('04 - '05)

Check the kickstarter pinion gear and spindle for damage.

Measure the kickstarter pinion gear I.D.

SERVICE LIMIT: 22.05 mm (0.868 in)

Measure the kickstarter spindle O.D.

SERVICE LIMIT: 21.95 mm (0.864 in)



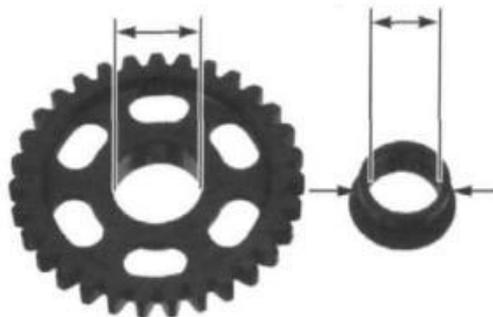
Check the kickstarter idle gear and bushing for damage.

Measure the starter idle gear I.D.

SERVICE LIMIT: 21.07 mm (0.830 in)

Measure the kickstarter idle gear bushing I.D. and O.D.

**SERVICE LIMITS: I.D.: 17.04 mm (0.671 in)
O.D.: 20.96 mm (0.825 in)**



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

SERVICE LIMIT: 16.95 mm (0.667 in)



Check the kickstarter first idle gear assembly for wear or damage.

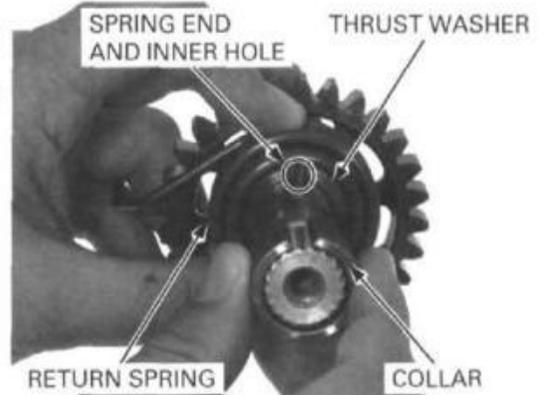


ASSEMBLY

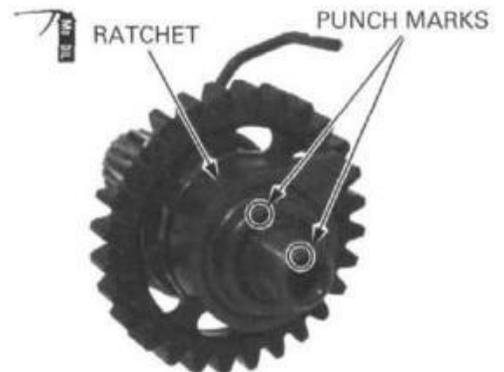
Apply molybdenum oil solution to the pinion gear inner surface.
 Install the pinion gear and thrust washer onto the spindle.
 Install the snap ring into the spindle groove with the chamfered (rolled) edge facing to the pinion gear.



Install the thrust washer onto the spindle.
 Install the return spring and insert the spring end into the inner hole in the spindle.
 Install the collar by aligning the groove with the return spring end.

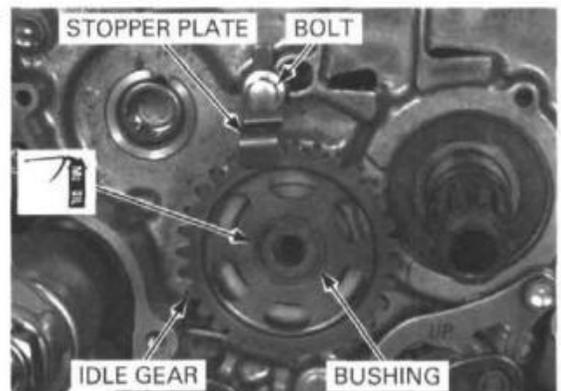


Apply molybdenum oil solution to the ratchet sliding surface.
 Install the ratchet onto the spindle by aligning the punch marks on the ratchet and spindle.
 Install the ratchet spring.



INSTALLATION

Apply molybdenum oil solution to the kickstarter idle gear inner surface and bushing whole surface.
 Install the kickstarter idle gear bushing and gear.
 Install idle gear stopper plate and tighten the bolt securely.
 Install the clutch (page 13-10).



CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE ('04 - '05)

Apply oil to the kickstarter first idle gear bearing.
Install the kickstarter first idle gear assembly.



Apply oil to the kickstarter spindle bearing area.
Install the kickstarter assembly into the crankcase.



Hook the kickstarter return spring end to the hole in the crankcase as shown.
Install the thrust washer onto the kickstarter first idle gear.

Install the right crankcase cover (page 13-22).

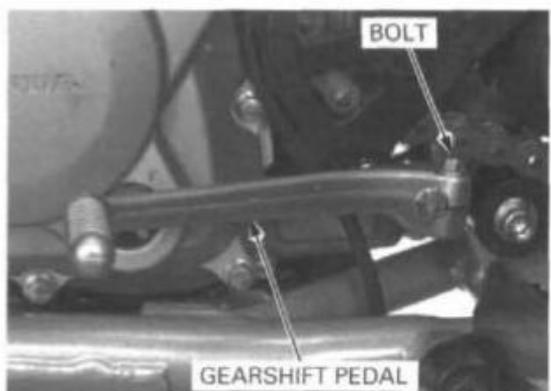


GEARSHIFT LINKAGE

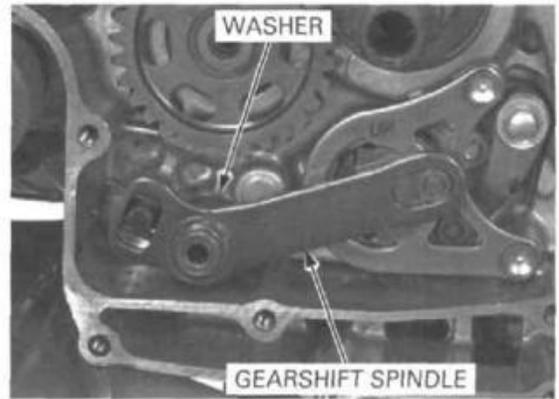
REMOVAL

Remove the following:

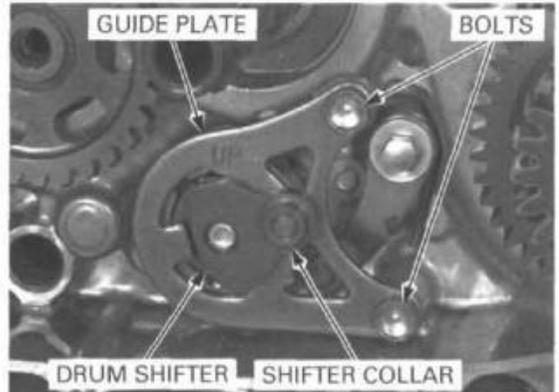
- bolt and gearshift pedal
- right crankcase cover (page 13-5)
- clutch assembly (page 13-5)



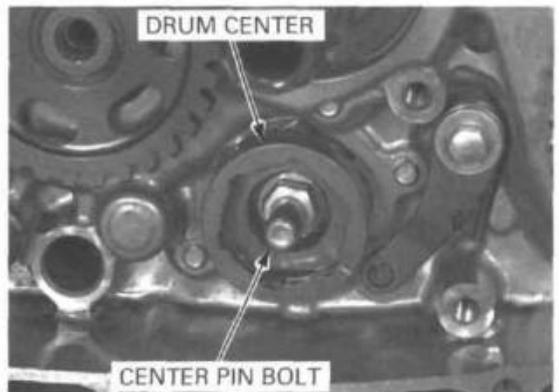
- gearshift spindle and thrust washer



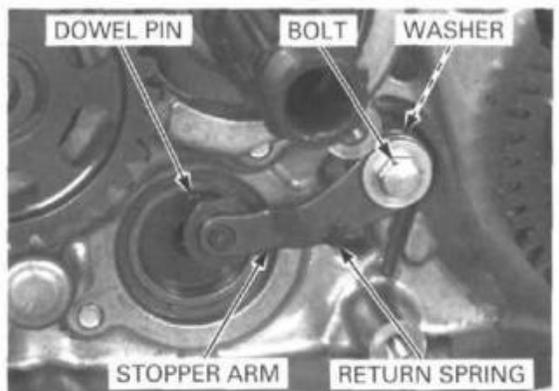
- shifter collar
- two bolts
- guide plate and drum shifter as an assembly



- center pin bolt
- gearshift drum center



- bolt
- stopper arm
- washer
- return spring
- dowel pin



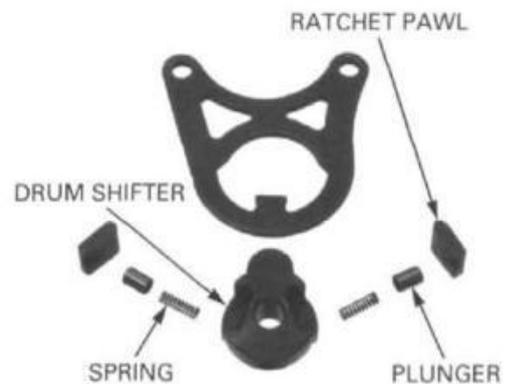
CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE ('04 - '05)

INSPECTION

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



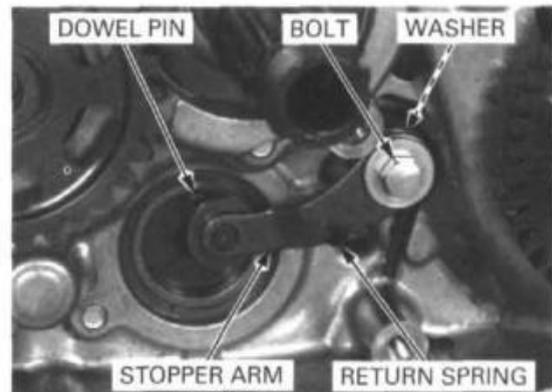
Check the ratchet pawls, plungers and drum shifter for wear or damage.
Check the plunger spring for fatigue or damage.



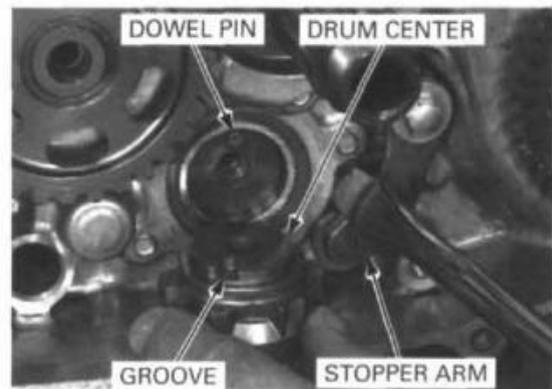
INSTALLATION

Install the dowel pin into the shift drum hole.
Install the return spring, washer, stopper arm and bolt, and tighten the bolt.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



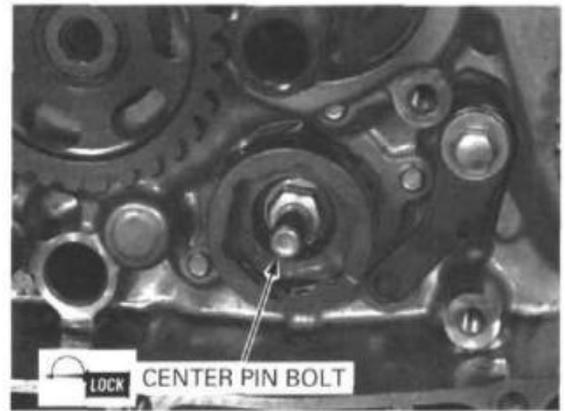
Hold the stopper arm using a screwdriver and install the gearshift drum center by aligning the pin groove with the dowel pin.



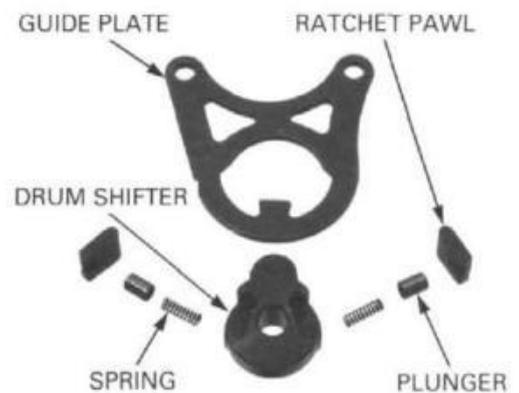
CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE ('04 - '05)

Apply locking agent to the center pin bolt threads.
Install the center pin bolt and tighten it.

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

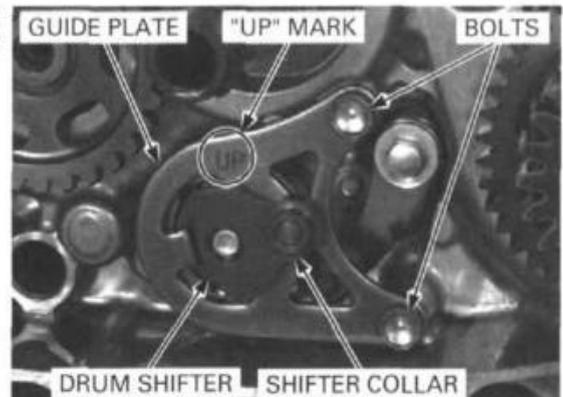


Install the plunger springs, plungers and ratchet pawls into the drum shifter, and set them into the guide plate.



Install the guide plate/drum shifter assembly with the "UP" mark facing up and tighten the two bolts securely.

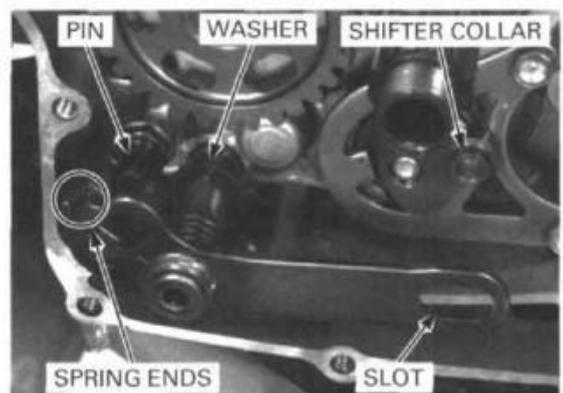
Install the shifter collar onto the drum shifter.



Install the thrust washer onto the gearshift spindle. Insert the spindle into the crankcase while aligning the return spring ends with the spring pin, and the slot with the shifter collar.

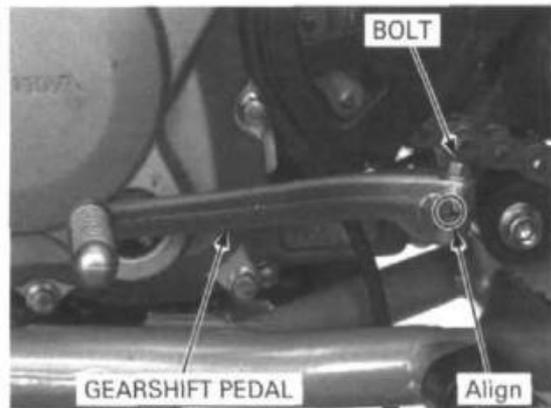
Install the clutch assembly (page 13-10).

Install the right crankcase cover (page 13-22).



CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE ('04 - '05)

Install the gearshift pedal by aligning the slit with the punch mark on the gearshift spindle.
Install the pedal pinch bolt and tighten it securely.

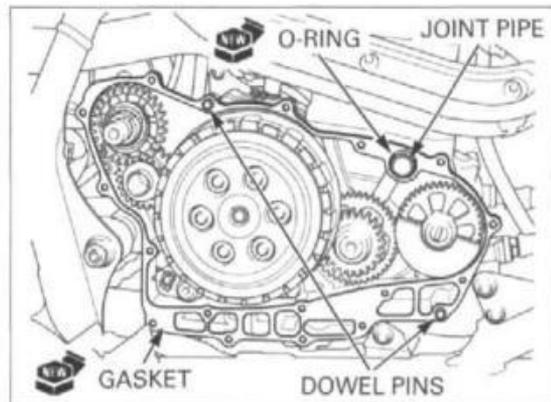


RIGHT CRANKCASE COVER INSTALLATION

Be careful not to damage the mating surfaces.

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

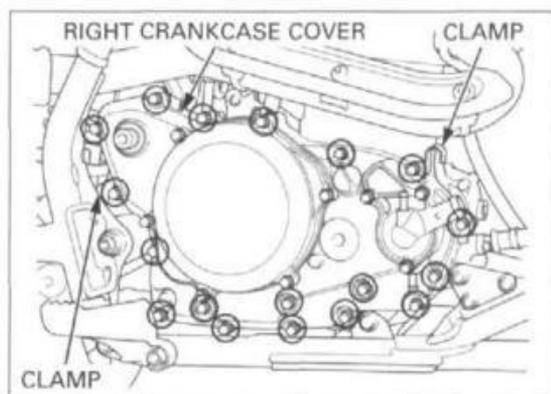
Install the water joint pipe, a new O-ring, dowel pins and a new gasket.



Apply grease to the kickstarter spindle oil seal lip.
Apply oil to the kickstarter first idle gear bearing.

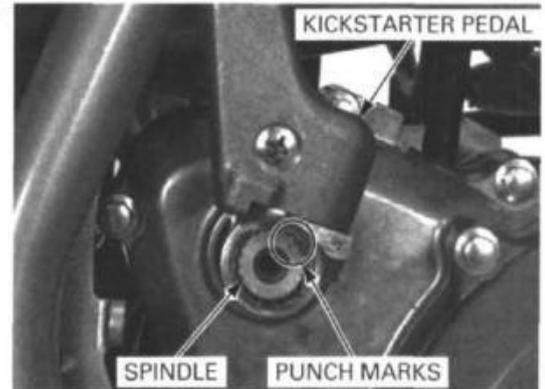


Install the right crankcase cover while engaging the water pump shaft with the balancer shaft.
Install the wire clamp, hose clamp and eleven bolts, and tighten the bolts in a crisscross pattern in 2 or 3 steps.



CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE ('04 - '05)

Install the kickstarter pedal onto the kickstarter spindle by aligning the punch marks.



Install the socket bolt and tighten it.

TORQUE: 38 N·m (3.9 kgf·m, 28 lbf·ft)

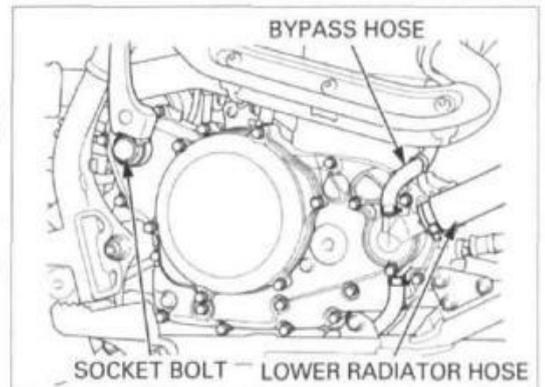
Connect the lower radiator hose and bypass hose to the water pump cover, and tighten the hose band screws.

Install the brake pedal (page 19-28).

Fill the transmission with the recommended transmission oil (page 4-18).

Fill the crankcase with the recommended engine oil (page 4-17).

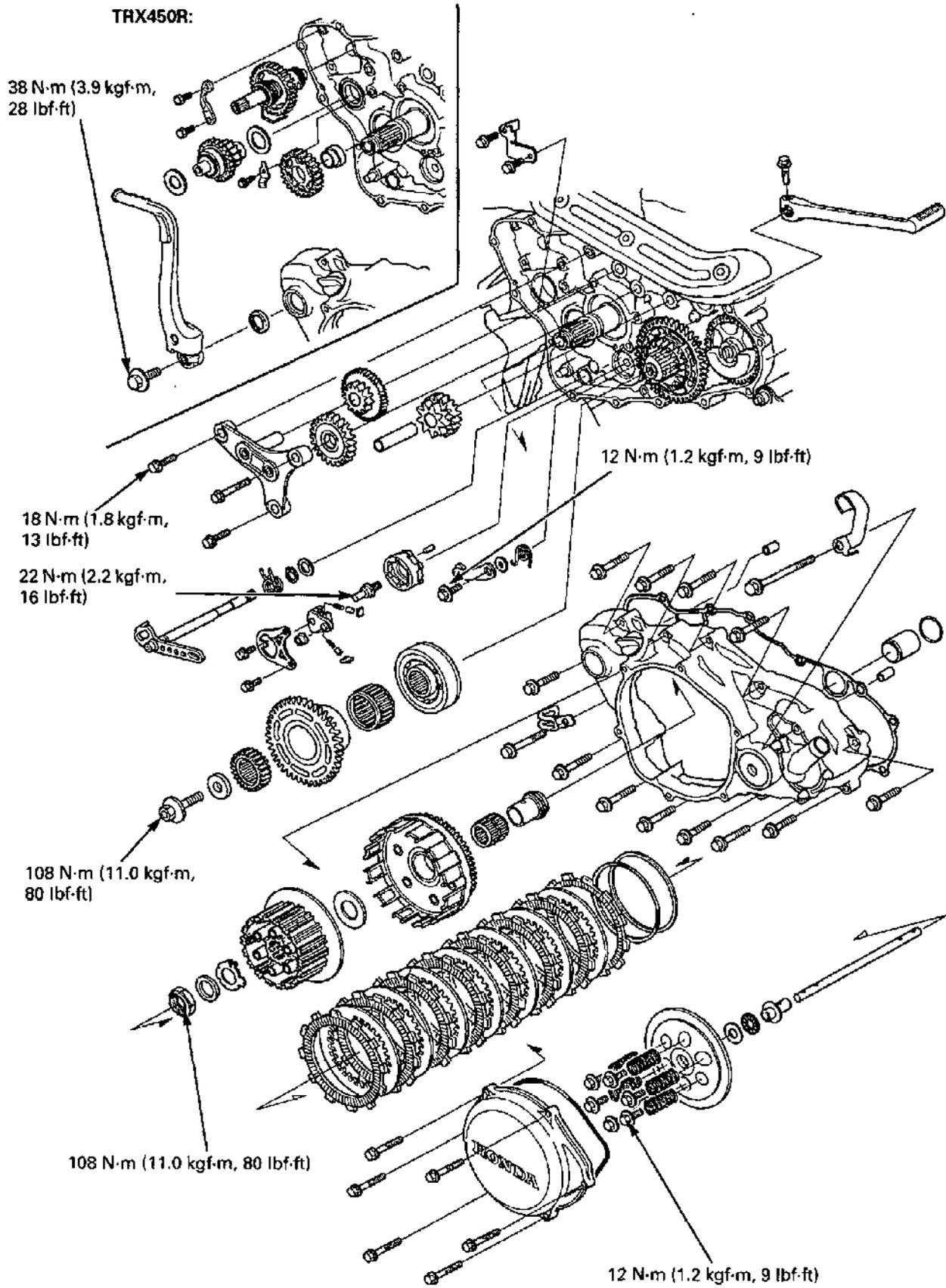
Fill and bleed the cooling system (page 9-7).



14. CLUTCH/STARTER CLUTCH/KICK STARTER/GEARSHIFT LINKAGE (After '05)

SYSTEM COMPONENTS	14-2	STARTER CLUTCH (TRX450ER)	14-15
SERVICE INFORMATION	14-3	KICKSTARTER (TRX450R)	14-20
TROUBLESHOOTING	14-4	GEARSHIFT LINKAGE	14-24
RIGHT CRANKCASE COVER REMOVAL	14-5	RIGHT CRANKCASE COVER INSTALLATION	14-28
CLUTCH	14-6		

SYSTEM COMPONENTS



SERVICE INFORMATION

GENERAL

- This section covers service of the clutch, starter clutch, kickstarter and gearshift linkage. These services can be performed with the engine installed in the frame.
- Transmission oil viscosity and level and the use of oil additives have an effect on clutch disengagement. Oil additives of any kind are specifically not recommended. When the clutch does not disengage or the vehicle creeps with the clutch disengaged, inspect the transmission oil viscosity and level before servicing the clutch system.

SPECIFICATIONS

Unit: mm (in)

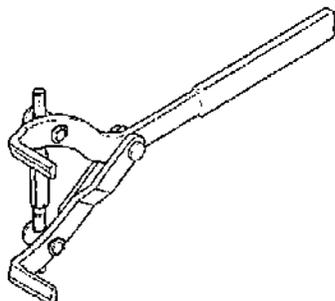
ITEM		STANDARD	SERVICE LIMIT	
Clutch	Lever free play	10 – 20 (3/8 – 3/4)	–	
	Spring free length	45.7 (1.80)	44.7 (1.76)	
	Disc A thickness	2.92 – 3.08 (0.115 – 0.121)	2.85 (0.112)	
	Disc B thickness	3.22 – 3.38 (0.127 – 0.133)	3.15 (0.124)	
	Plata warpage	–	0.15 (0.006)	
Driven gear boss (TRX450ER)	I.D.	36.009 – 36.034 (1.4177 – 1.4189)	36.034 (1.4189)	
	O.D.	45.660 – 45.673 (1.7976 – 1.7981)	45.660 (1.7976)	
Reduction gear A I.D. (TRX450ER)		12.010 – 12.050 (0.4728 – 0.4744)	12.050 (0.4744)	
Reduction gear B I.D. (TRX450ER)		10.045 – 10.085 (0.3955 – 0.3970)	10.085 (0.3970)	
Idle gear I.D. (TRX450ER)		12.010 – 12.050 (0.4728 – 0.4744)	12.050 (0.4744)	
Gear holder shafts O.D. (TRX450ER)		11.989 – 12.000 (0.4720 – 0.4724)	11.989 (0.4720)	
Reduction gear shaft O.D. (TRX450ER)		9.980 – 9.995 (0.3929 – 0.3935)	9.980 (0.3929)	
Kickstarter (TRX450R)	Pinion gear I.D.	22.007 – 22.028 (0.8664 – 0.8672)	22.05 (0.868)	
	Spindle O.D.	21.959 – 21.980 (0.8645 – 0.8654)	21.95 (0.864)	
	Idle gear I.D.	21.020 – 21.041 (0.8276 – 0.8284)	21.07 (0.830)	
	Idle gear bushing	I.D.	17.000 – 17.018 (0.6693 – 0.6700)	17.04 (0.671)
		O.D.	20.979 – 21.000 (0.8259 – 0.8268)	20.96 (0.825)
Countershaft O.D. at kickstarter idle gear (TRX450R)		16.966 – 16.984 (0.6680 – 0.6687)	16.95 (0.667)	

TORQUE VALUES

Clutch spring bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Clutch center lock nut	108 N·m (11.0 kgf·m, 80 lbf·ft)	Apply oil to the threads and seating surface.
Shift drum center pin bolt	22 N·m (2.2 kgf·m, 16 lbf·ft)	Apply locking agent to the threads.
Shift drum stopper arm bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Start gear holder bolt (TRX450ER)	18 N·m (1.8 kgf·m, 13 lbf·ft)	Apply oil to the threads and seating surface.
Start gear holder bolt (TRX450ER)	18 N·m (1.8 kgf·m, 13 lbf·ft)	Apply locking agent to the threads.
Primary drive gear bolt (TRX450ER)	108 N·m (11.0 kgf·m, 80 lbf·ft)	Apply oil to the threads and seating surface.
Start gear holder hole plug bolt (TRX450R)	18 N·m (1.8 kgf·m, 13 lbf·ft)	Apply oil to the threads and seating surface.
Kickstarter pedal bolt (TRX450R)	38 N·m (3.9 kgf·m, 28 lbf·ft)	
Gearshift return spring pin	22 N·m (2.2 kgf·m, 16 lbf·ft)	

TOOL

Clutch center holder
07724-0050002



or 07724-0050001 or equivalent
commercially available in U.S.A.

TROUBLESHOOTING

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

Clutch lever difficult to pull in

- Damaged, kinked or dirty clutch cable
- Improperly routed clutch cable
- Damaged clutch lifter arm/shaft

Clutch will not disengage or vehicle creeps with clutch disengaged

- Excessive clutch lever free play
- Warped clutch plate
- Transmission oil level too high, improper oil viscosity, or additive used

Clutch slips

- Worn clutch discs
- Weak clutch springs
- No clutch lever free play
- Transmission oil additive used

Hard to shift

- Misadjusted clutch lever free play
- Damaged or bent shift fork
- Bent shift fork shaft
- Incorrect transmission oil viscosity
- Damaged gearshift spindle assembly
- Damaged shift drum guide grooves

Transmission jumps out of gear

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

Gearshift pedal will not return

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

Starter motor turns, but engine does not turn (TRX450ER)

- Faulty starter clutch
- Damaged or faulty starter motor idle gear, reduction gears or starter driven gear

RIGHT CRANKCASE COVER REMOVAL

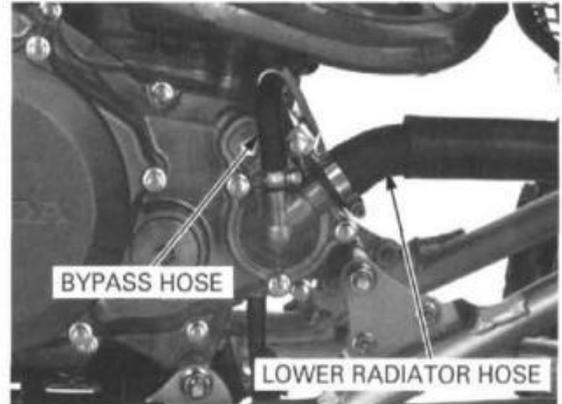
Drain the coolant (page 9-7).

Drain the transmission oil (page 4-18).

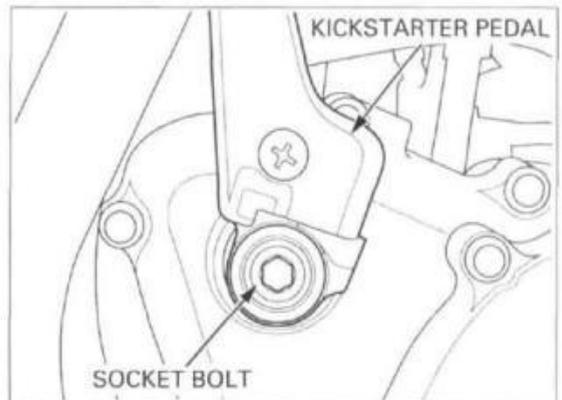
Remove the brake pedal (page 19-28).

Loosen the hose band screws and disconnect the lower radiator hose and bypass hose from the water pump cover.

Remove the water pump cover (page 9-15).



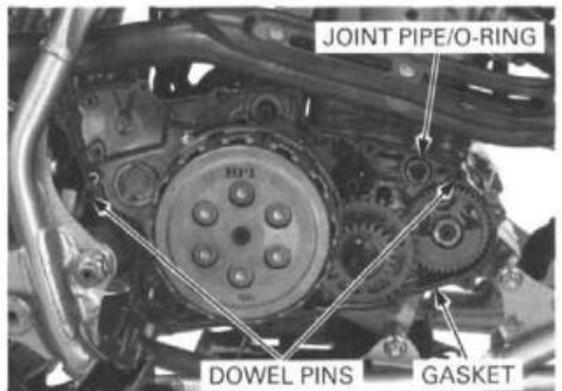
TRX450R only: Remove the socket bolt and kickstarter pedal.



Loosen the right crankcase bolts in a crisscross pattern in 2 or 3 steps, and remove the bolts, clamp and right crankcase cover.



Remove the dowel pins, water joint pipe and O-ring.



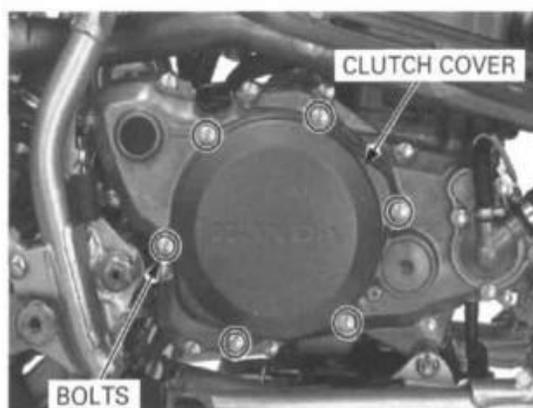
CLUTCH

DISASSEMBLY

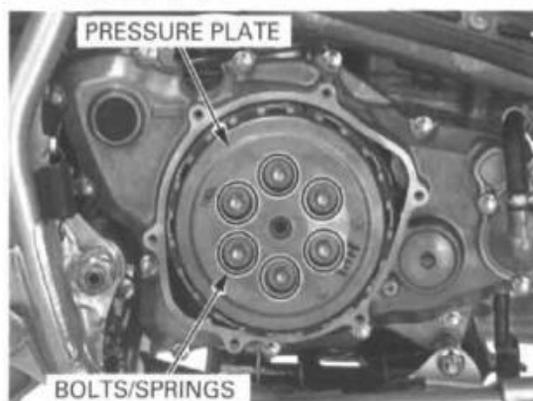
Drain the transmission oil (page 4-18).

Remove the following:

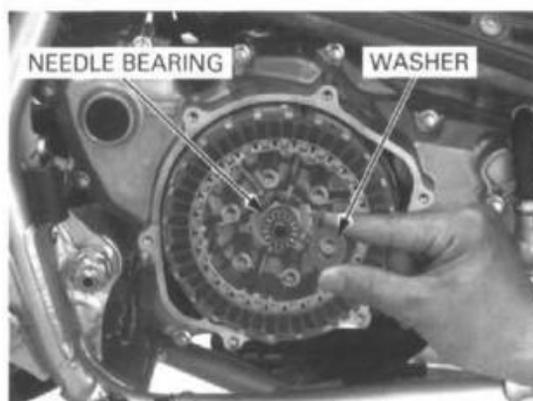
- brake pedal (page 19-28)
- bolts
- clutch cover
- O-ring



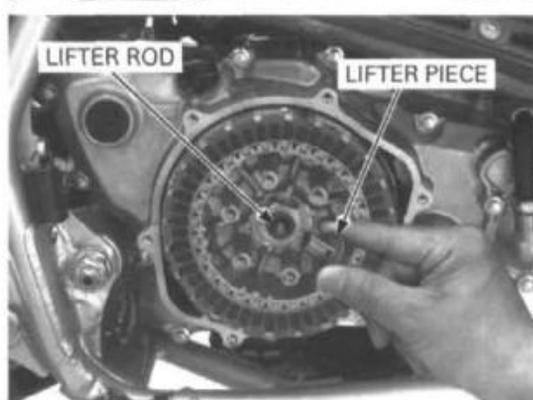
- six bolts and springs
- clutch pressure plate



- washer
- needle bearing

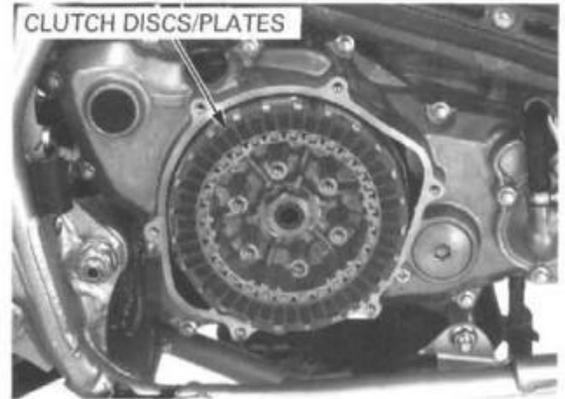


- clutch lifter piece
- clutch lifter rod

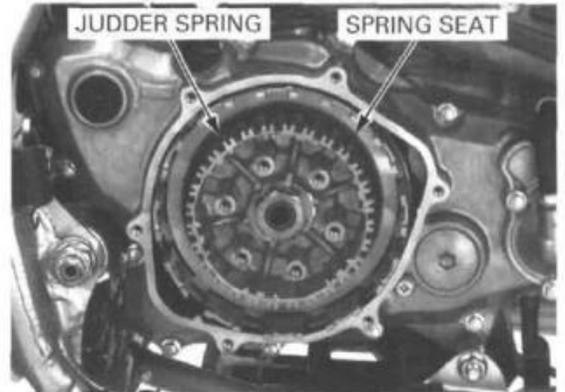


CLUTCH/STARTER CLUTCH/KICK STARTER/GEARSHIFT LINKAGE (After '05)

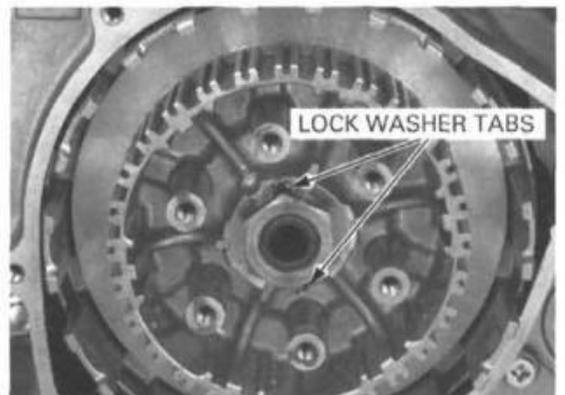
- seven clutch discs A and plates
- clutch disc B



- judder spring
- spring seat



Straighten the lock washer tabs.



Hold the clutch center using the special tool and loosen the clutch center lock nut.

TOOL:

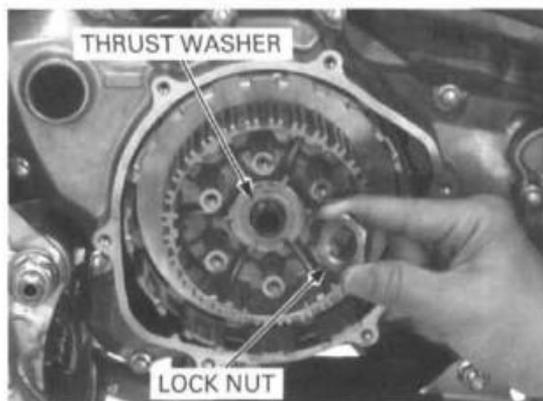
Clutch center holder 07724-0050002 or
07724-0050001 or
equivalent commercially
available in U.S.A.



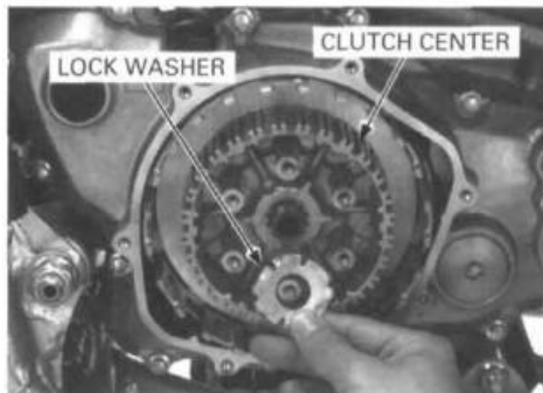
CLUTCH/STARTER CLUTCH/KICK STARTER/GEARSHIFT LINKAGE (After '05)

Remove the following:

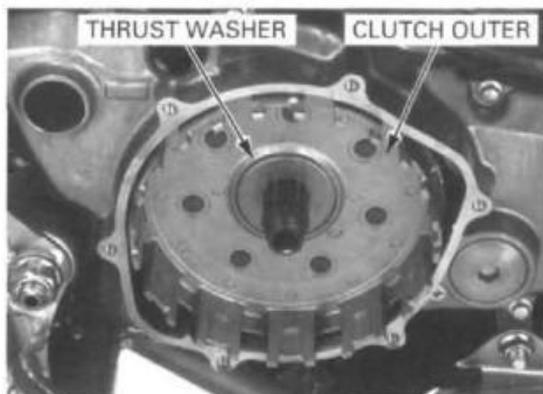
- lock nut
- thrust washer



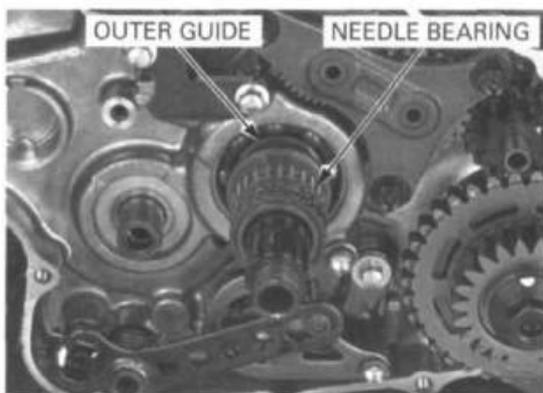
- lock washer
- clutch center



- thrust washer
- right crankcase cover (page 14-5)
- clutch outer



- needle bearing
- clutch outer guide



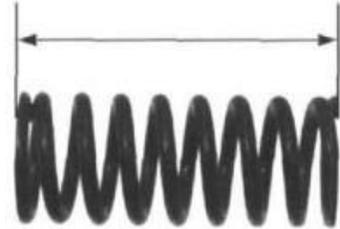
INSPECTION

Clutch spring

Replace the clutch springs as a set.

Measure the clutch spring free length.

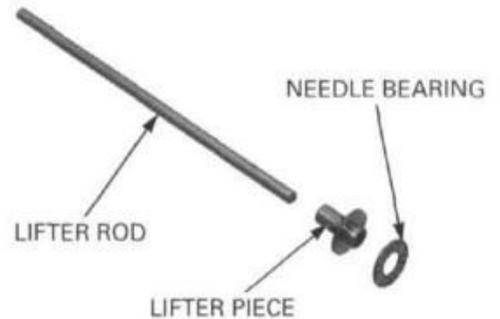
SERVICE LIMIT: 44.7 mm (1.76 in)



Clutch lifter piece/bearing/rod

Check the clutch lifter piece and needle bearing for wear or damage.

Check the clutch lifter rod for bends or damage.



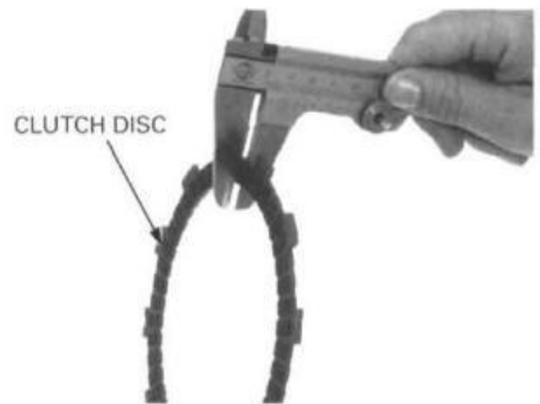
Clutch disc

Replace the clutch discs and plates as a set.

Check the clutch discs for signs of scoring or discoloration.

Measure the thickness of each disc.

**SERVICE LIMITS: Disc A: 2.85 mm (0.112 in)
Disc B: 3.15 mm (0.124 in)**



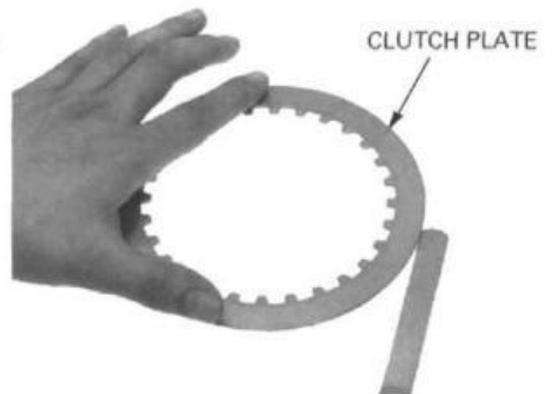
Clutch plate

Replace the clutch discs and plates as a set.

Check the plate for discoloration.

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

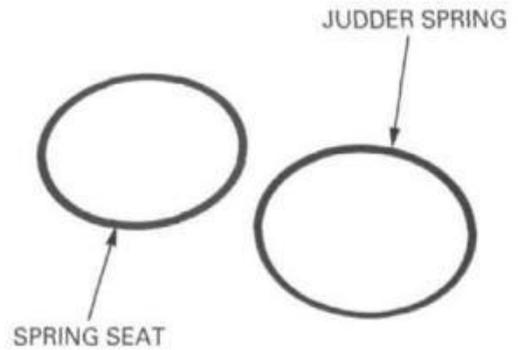
SERVICE LIMIT: 0.15 mm (0.006 in)



CLUTCH/STARTER CLUTCH/KICK STARTER/GEARSHIFT LINKAGE (After '05)

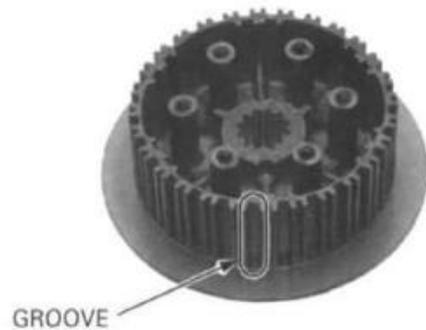
Judder spring/spring seat

Check the judder spring and seat for damage or warpage.



Clutch center

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



Clutch outer

Check the slots in the clutch outer for nicks, cuts or indentations made by the clutch discs. Check the primary driven gear teeth for wear or damage.



Clutch outer guide/bearing

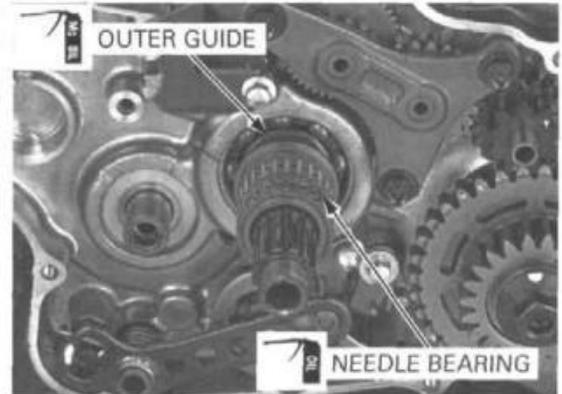
Check the clutch outer guide and needle bearing for wear or damage.



ASSEMBLY

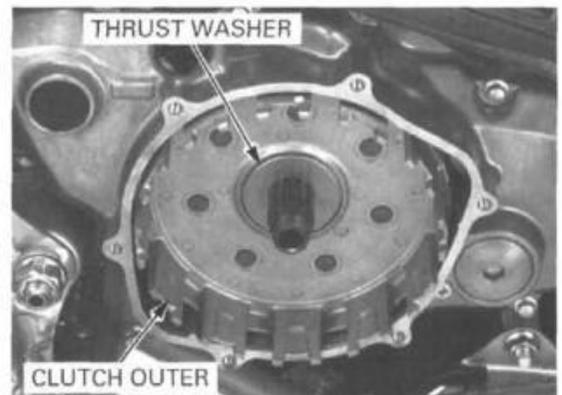
Apply molybdenum oil solution to the sliding surface of the clutch outer guide and install it onto the mainshaft.

Apply transmission oil to the needle bearing and install it onto the clutch outer guide.

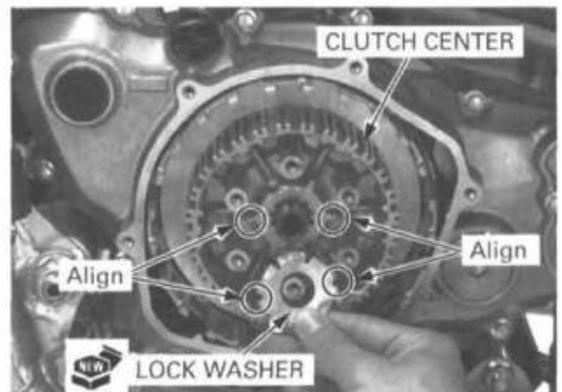


Install the clutch outer and thrust washer.

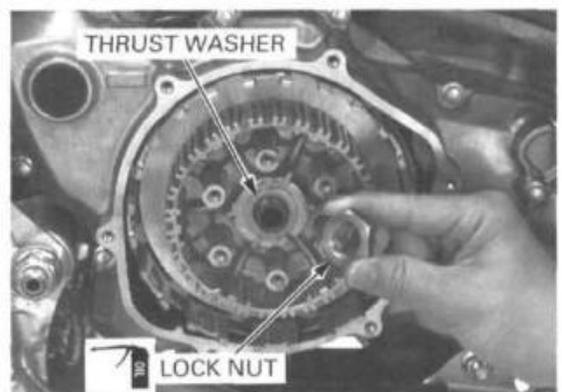
Install the right crankcase cover (page 14-28).



Install the clutch center onto the mainshaft.
Install a new lock washer by aligning the grooves with the ribs of the clutch center.



Apply transmission oil to the threads and sealing surface of the clutch center lock nut.
Install the thrust washer and lock nut.



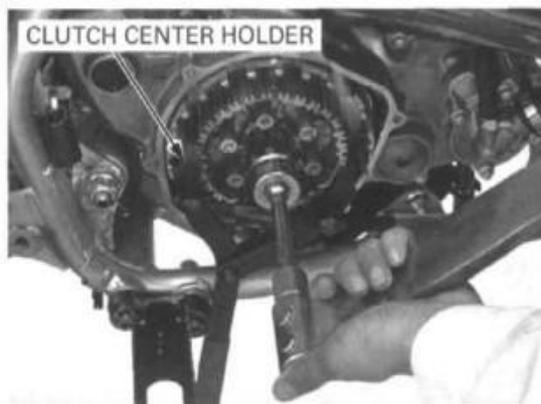
CLUTCH/STARTER CLUTCH/KICK STARTER/GEARSHIFT LINKAGE (After '05)

Hold the clutch center using the special tool and tighten the lock nut.

TOOL:

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

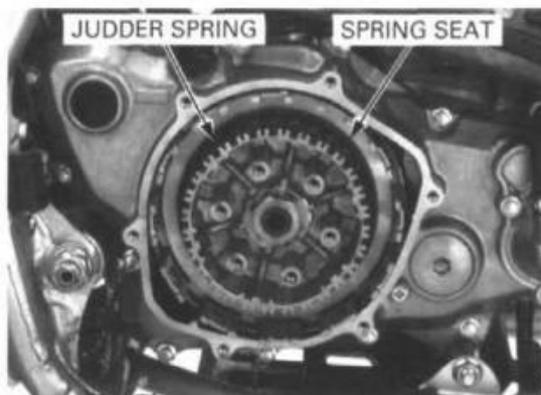
TORQUE: 108 N·m (11.0 kgf·m, 80 lbf·ft)



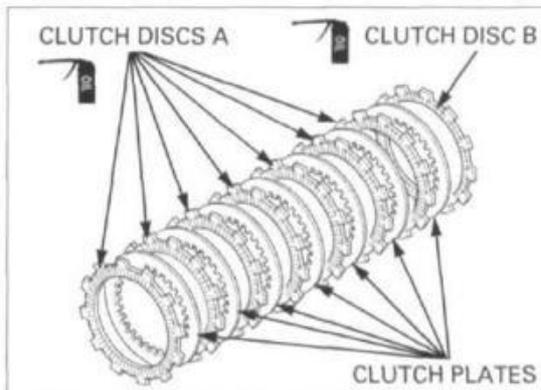
Bend the lock washer tabs against the clutch center lock nut.



Install the spring seat.
Install the judder spring with the concaved side facing out.

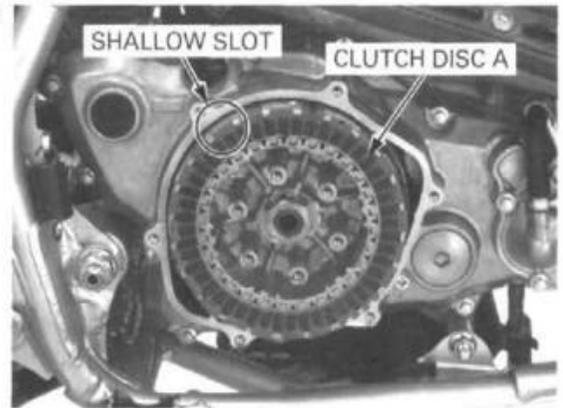


Coat the clutch discs with transmission oil.
Install the clutch disc B.
Install the seven clutch plate and six clutch discs A alternately, starting with a plate.

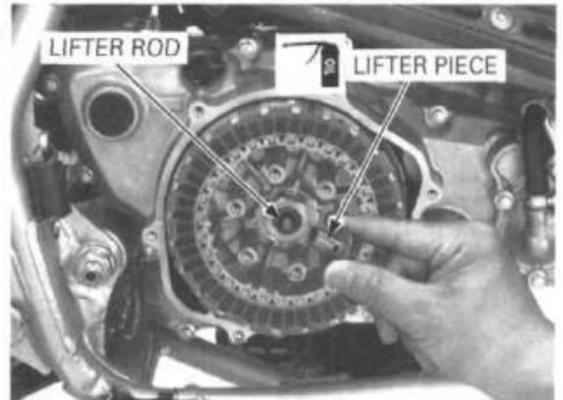


CLUTCH/STARTER CLUTCH/KICK STARTER/GEARSHIFT LINKAGE (After '05)

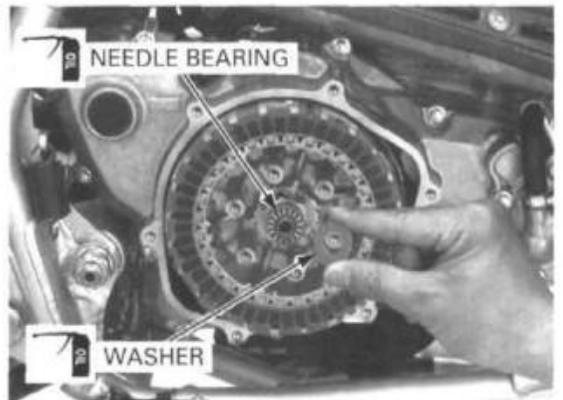
Install clutch disc A into the shallow slots in the clutch outer.



Install the clutch lifter rod into the mainshaft. Coat the clutch lifter piece with transmission oil and install it into the mainshaft.

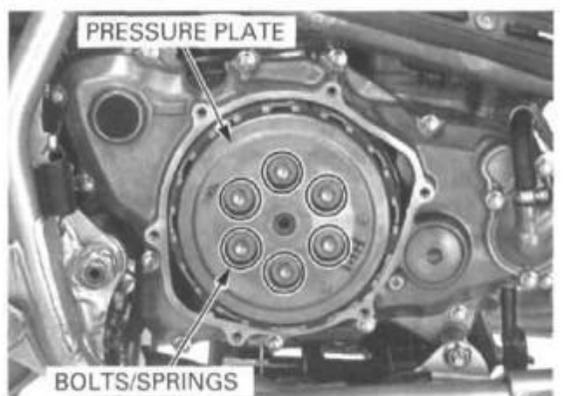


Coat the needle bearing and washer with transmission oil and install them onto the clutch lifter piece.



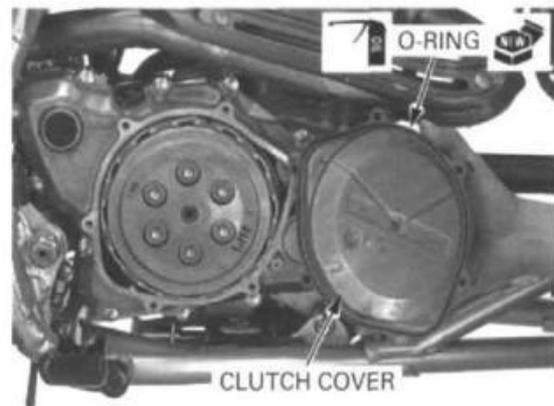
Install the clutch pressure plate. Install the six clutch springs and bolts, and tighten the bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



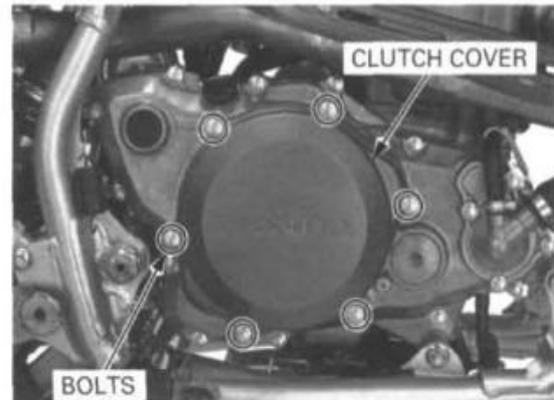
CLUTCH/STARTER CLUTCH/KICK STARTER/GEARSHIFT LINKAGE (After '05)

Coat a new O-ring with oil and install it into the clutch cover groove.



Install the clutch cover, and tighten the six bolts securely.

Install the brake pedal (page 19-28).
Fill the crankcase with the recommended transmission oil (page 4-18).



CLUTCH LIFTER ARM

REMOVAL

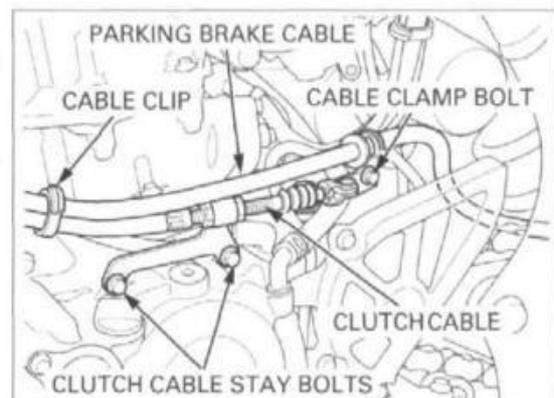
Remove the clutch lifter rod (page 14-6).

Remove the bolt and parking brake cable clamp from the stay.

Remove the mounting bolts and clutch cable stay.

Remove the cable clip.

Disconnect the clutch cable from the clutch lifter arm.

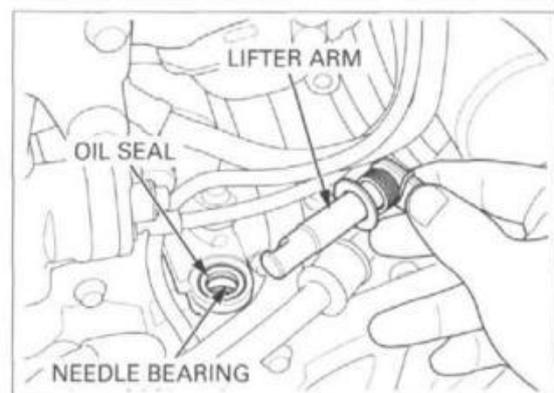


Remove the clutch lifter arm.

Remove the oil seal.

INSPECTION

Check the needle bearing, oil seal for wear or damage and replace them if necessary.



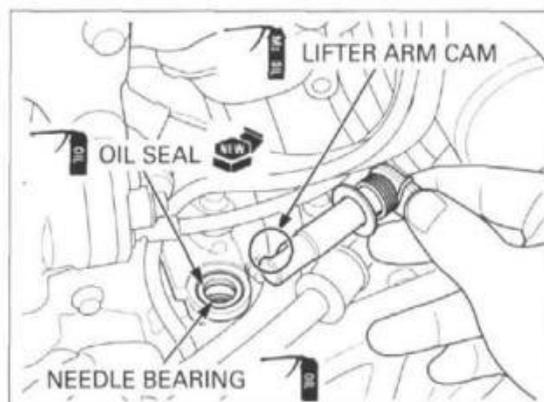
CLUTCH/STARTER CLUTCH/KICK STARTER/GEARSHIFT LINKAGE (After '05)

Check the clutch lifter arm cam (rod contact area) for wear or damage.



INSTALLATION

Apply oil to the needle bearing.
Apply oil to a new oil seal lip and install the seal.
Apply molybdenum oil solution to the clutch lifter arm cam (rod contact area) and install the lifter arm.



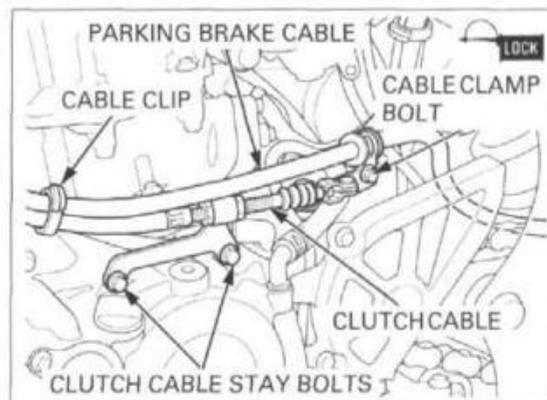
Connect the clutch cable to the clutch lifter arm.
Install the clutch cable stay and tighten the mounting bolts.

Apply locking agent to the cable clamp bolt threads.
Install parking brake cable clamp onto the stay and tighten the bolt.

TORQUE: 9.8 N·m (1.0 kgf·m, 7 lbf·ft)

Install the cable clip.

Install the clutch lifter rod (page 14-11).
Adjust the clutch lever free play (page 4-29).



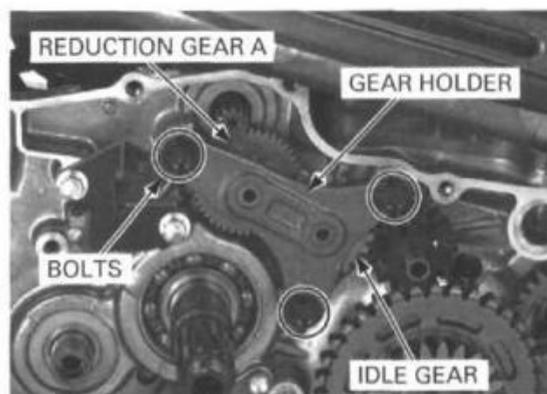
STARTER CLUTCH (TRX450ER)

REMOVAL

Remove the following:

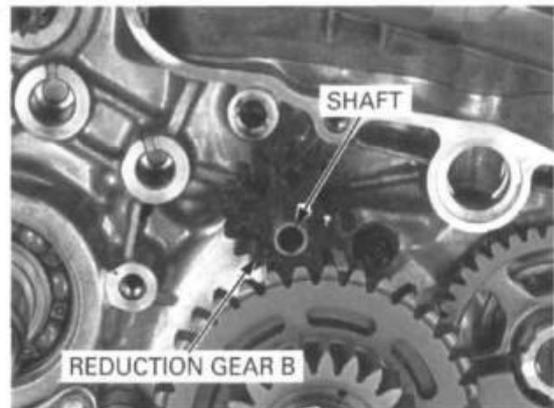
- right crankcase cover (page 14-5).
- clutch assembly (page 14-6).

Remove the bolts, gear holder, reduction gear A and idle gear.



CLUTCH/STARTER CLUTCH/KICK STARTER/GEARSHIFT LINKAGE (After '05)

Remove the reduction gear shaft and reduction gear B.



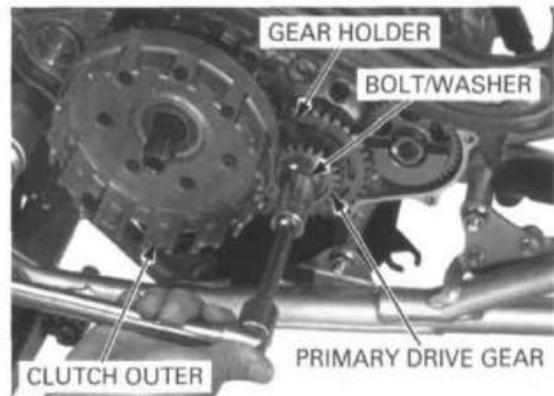
Temporarily install the clutch outer guide, needle bearing and clutch outer onto the mainshaft. Install the special tool between the primary drive and driven gears as shown, and loosen the primary drive gear bolt.

TOOL:

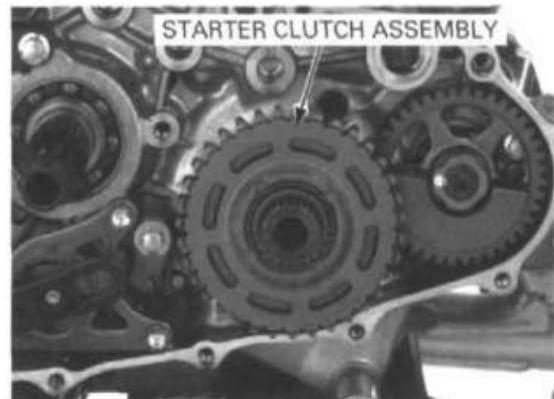
Gear holder, M2.5

07724-0010100 or
07724-001A100
(U.S.A. only)

Remove the clutch outer, needle bearing and clutch outer guide.
Remove the primary drive gear bolt, washer and gear.



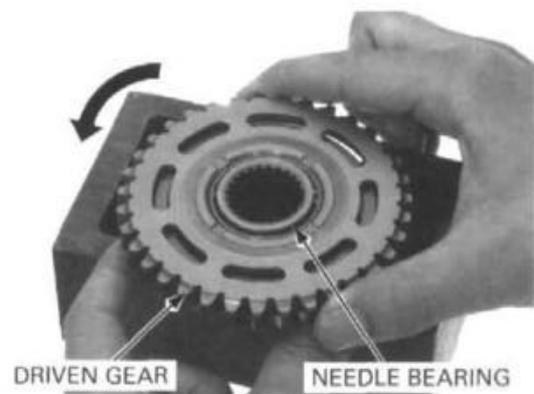
Remove the starter clutch assembly.



DISASSEMBLY/INSPECTION

Check that the starter driven gear turns counter-clockwise smoothly and does not turn clockwise.

Remove the driven gear and needle bearing from starter clutch outer while turning the driven gear counterclockwise.

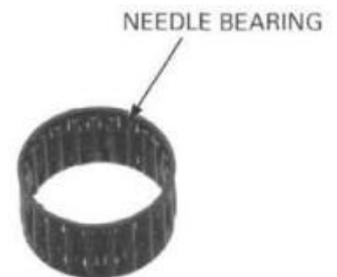


CLUTCH/STARTER CLUTCH/KICK STARTER/GEARSHIFT LINKAGE (After '05)

Remove the snap ring and one-way clutch from clutch outer.



Check the needle bearing for abnormal wear or damage.



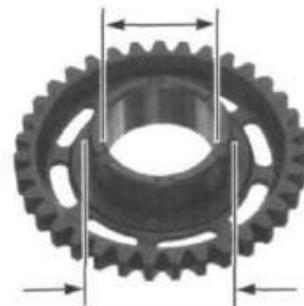
Check the starter driven gear for abnormal wear or damage.

Measure the driven gear boss O.D.

SERVICE LIMIT: 45.660 mm (1.7976 in)

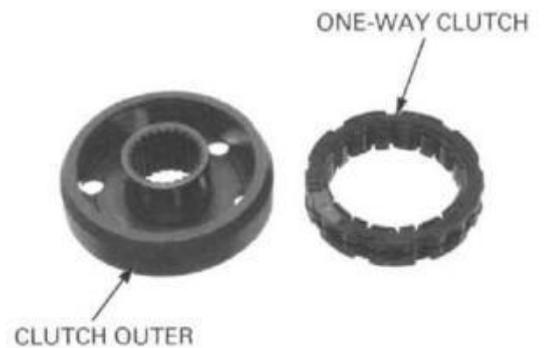
Measure the driven gear boss I.D.

SERVICE LIMIT: 36.034 mm (1.4189 in)



Check the one-way clutch sprang for abnormal wear or damage.

Check the starter clutch outer sliding surface for wear or damage.



CLUTCH/STARTER CLUTCH/KICK STARTER/GEARSHIFT LINKAGE (After '05)

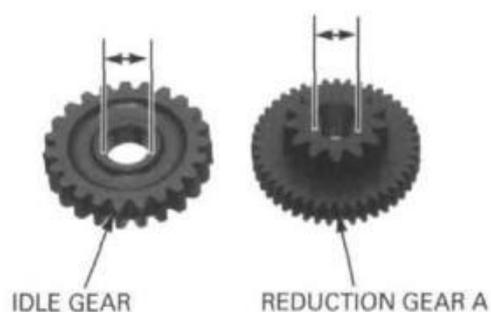
Check the reduction gear A and idle gear for wear or damage.

Measure the reduction gear A I.D.

SERVICE LIMIT: 12.050 mm (0.4744 in)

Measure the idle gear I.D.

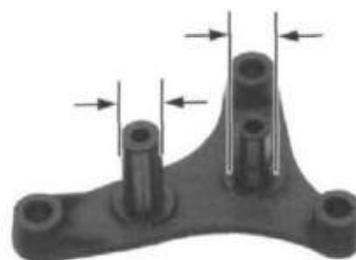
SERVICE LIMIT: 12.050 mm (0.4744 in)



Check the gear holder shafts sliding surface for wear or damage.

Measure the gear holder shafts O.D.

SERVICE LIMIT: 11.989 mm (0.4720 in)



Check the reduction gear B and reduction gear shaft for wear or damage.

Measure the reduction gear B I.D.

SERVICE LIMIT: 10.085 mm (0.3970 in)

Measure the reduction gear shaft O.D.

SERVICE LIMIT: 9.980 mm (0.3929 in)



ASSEMBLY

Apply transmission oil to the clutch outer sliding surface.

Install the one-way clutch into starter clutch outer with the blue paint facing out.

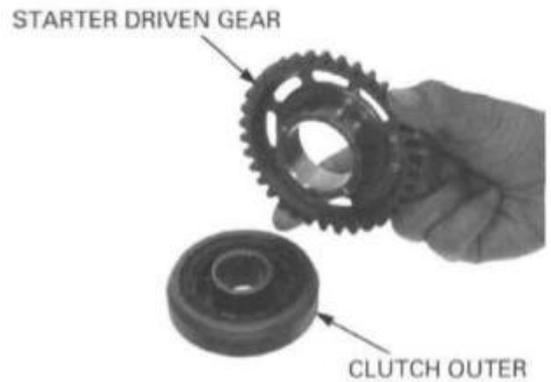


CLUTCH/STARTER CLUTCH/KICK STARTER/GEARSHIFT LINKAGE (After '05)

Install the snap ring securely.



Install the starter driven gear into the clutch outer while turning it counterclockwise.



Install the needle bearing.

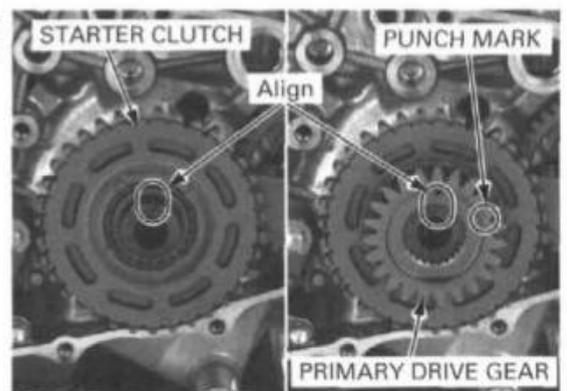
Check that the starter driven gear turns counterclockwise smoothly and does not turn clockwise.



INSTALLATION

Install the primary drive gear with the punch mark facing out.

Install the starter clutch and primary drive gear while aligning its wide cut-out in the splines with the punch mark on the mainshaft.



CLUTCH/STARTER CLUTCH/KICK STARTER/GEARSHIFT LINKAGE (After '05)

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

Install the special tool between the primary drive and driven gears as shown.

TOOL:

Gear holder, M2.5 07724-0010100 or
 07724-001A100

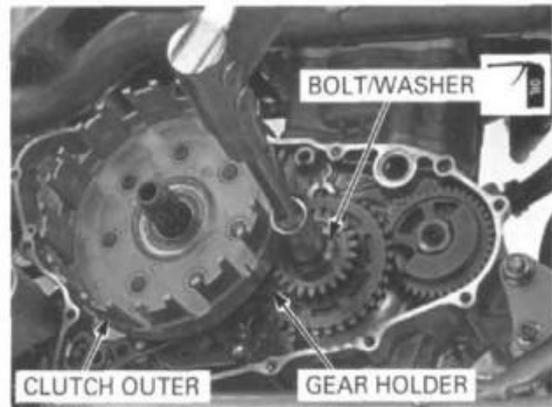
Apply transmission oil to the primary drive gear bolt threads and seating surface.

Install the washer, primary drive gear bolt and tighten the bolt to the specified torque.

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

Remove the clutch outer, needle bearings and clutch outer guide.

Install the reduction gear B and reduction gear shaft securely.



Apply molybdenum oil solution to the gear holder sliding surface.

Install the idle gear and reduction gear A onto the gear holder.

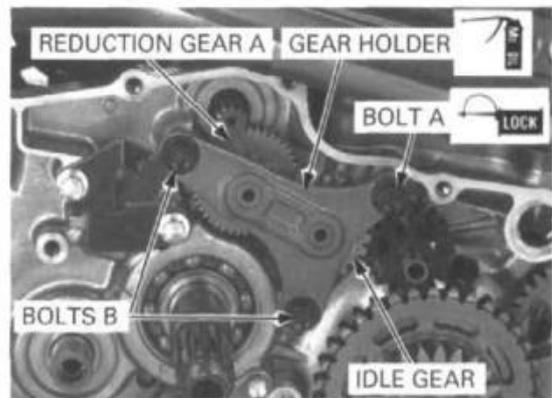
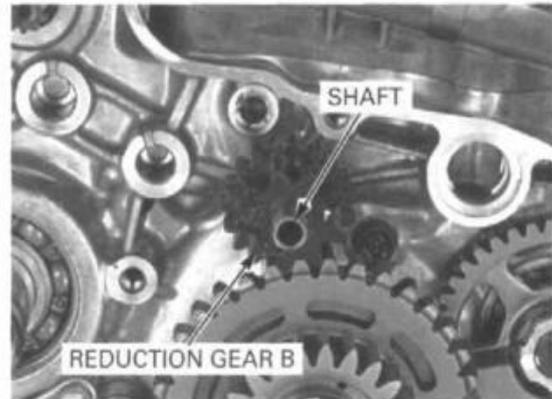
Apply a locking agent to the gear holder bolt A.

Install the gear holder assembly and tighten the gear holder bolts A, B to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Install the following:

- clutch assembly (page 14-11)
- right crankcase cover (page 14-28)



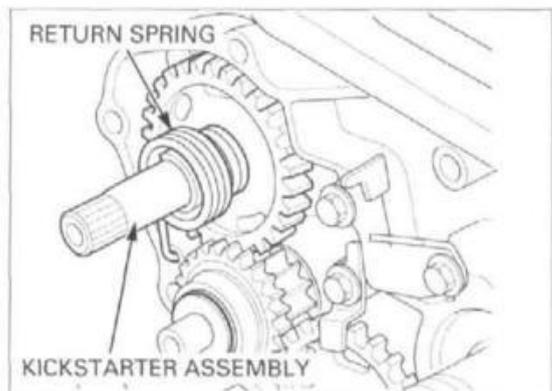
KICKSTARTER (TRX450R)

REMOVAL

Remove the following:

- right crankcase cover (page 14-5).
- clutch assembly (page 14-6)

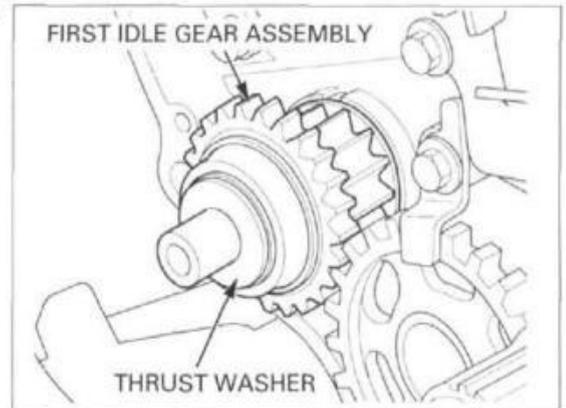
Unhook the kickstarter return spring end from the hole in the crankcase, and remove the kickstarter assembly.



CLUTCH/STARTER CLUTCH/KICK STARTER/GEARSHIFT LINKAGE (After '05)

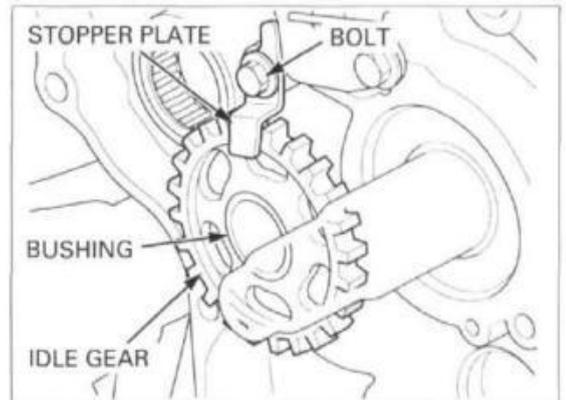
Remove the thrust washer from the kickstarter first idle gear.

Remove the kickstarter first idle gear assembly.



Remove the bolt and idle gear stopper plate.

Remove the kickstarter idle gear and bushing.



DISASSEMBLY

Remove the following from the kickstarter spindle:

- ratchet spring
- ratchet
- snap ring
- thrust washer
- pinion gear
- spring collar
- return spring
- thrust washer

INSPECTION

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

Check the starter ratchet for wear or damage.

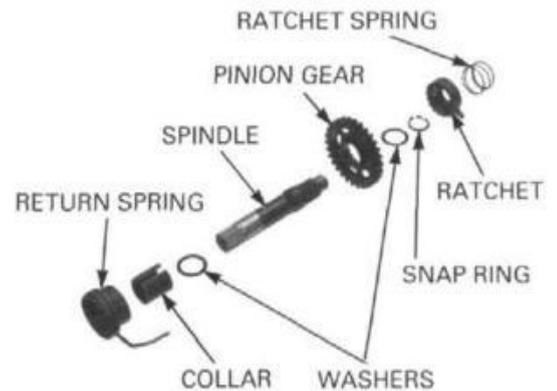
Check the kickstarter pinion gear and spindle for damage.

Measure the kickstarter pinion gear I.D.

SERVICE LIMIT: 22.05 mm (0.868 in)

Measure the kickstarter spindle O.D.

SERVICE LIMIT: 21.95 mm (0.864 in)



CLUTCH/STARTER CLUTCH/KICK STARTER/GEARSHIFT LINKAGE (After '05)

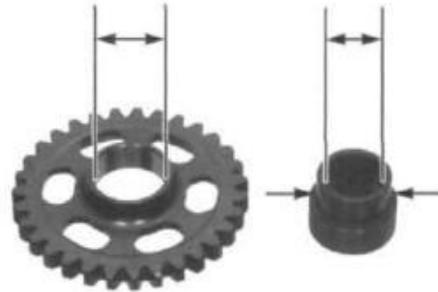
Check the kickstarter idle gear and bushing for damage.

Measure the starter idle gear I.D.

SERVICE LIMIT: 21.07 mm (0.830 in)

Measure the kickstarter idle gear bushing I.D. and O.D.

**SERVICE LIMITS: I.D.: 17.04 mm (0.671 in)
O.D.: 20.96 mm (0.825 in)**



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

SERVICE LIMIT: 16.95 mm (0.667 in)



Check the kickstarter first idle gear assembly for wear or damage.



ASSEMBLY

Apply molybdenum oil solution to the pinion gear inner surface.

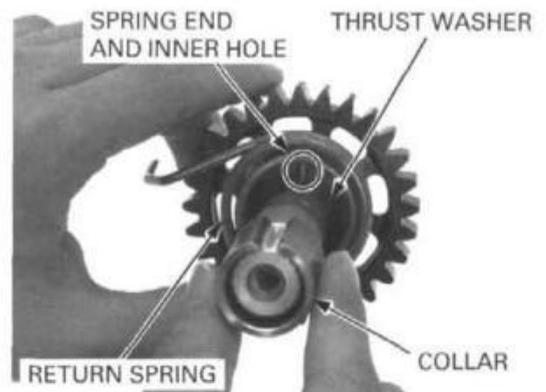
Install the pinion gear and thrust washer onto the spindle.

Install the snap ring into the spindle groove with the chamfered (rolled) edge facing to the pinion gear.



CLUTCH/STARTER CLUTCH/KICK STARTER/GEARSHIFT LINKAGE (After '05)

Install the thrust washer onto the spindle.
Install the return spring and insert the spring end into the inner hole in the spindle.
Install the collar by aligning the groove with the return spring end.



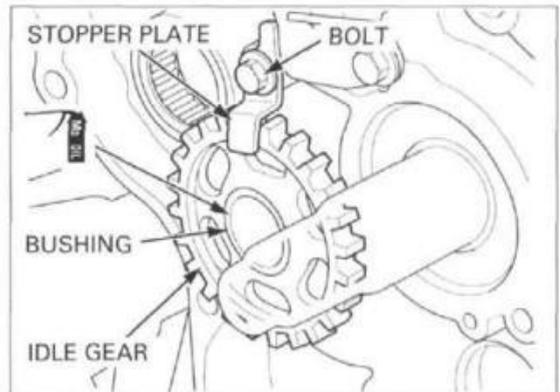
Apply molybdenum oil solution to the ratchet sliding surface.
Install the ratchet onto the spindle by aligning the punch marks on the ratchet and spindle.
Install the ratchet spring.



INSTALLATION

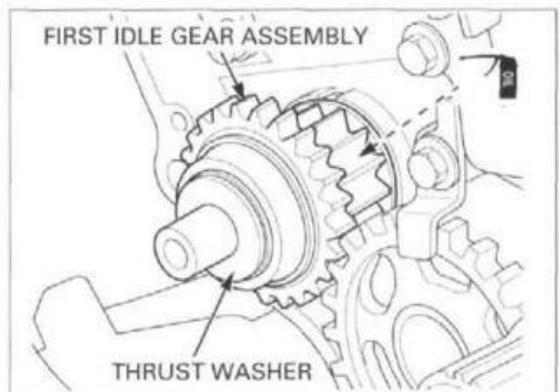
Apply molybdenum oil solution to the kickstarter idle gear inner surface and bushing whole surface.
Install the kickstarter idle gear bushing and gear.
Install idle gear stopper plate and tighten the bolt securely.

Install the clutch (page 14-11).



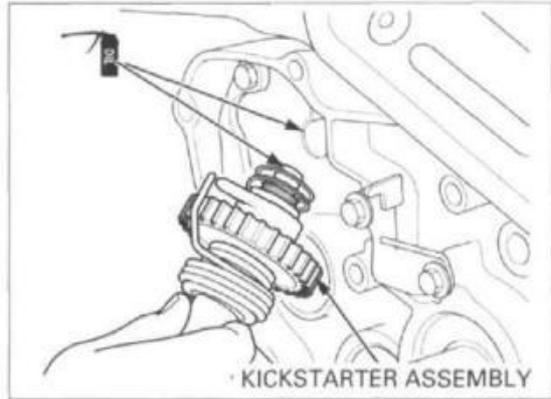
Apply oil to the kickstarter first idle gear bearing.
Install the kickstarter first idle gear assembly.

Install the thrust washer onto the kickstarter first idle gear.



CLUTCH/STARTER CLUTCH/KICK STARTER/GEARSHIFT LINKAGE (After '05)

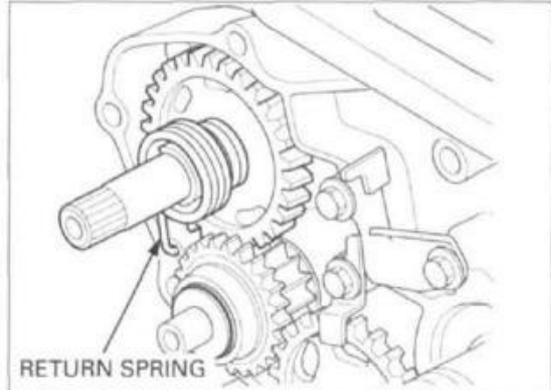
Apply oil to the kickstarter spindle bearing area.
Install the kickstarter assembly into the crankcase.



Hook the kickstarter return spring end to the hole in the crankcase as shown.

Install the following:

- clutch assembly (page 14-11)
- right crankcase cover (page 14-28)

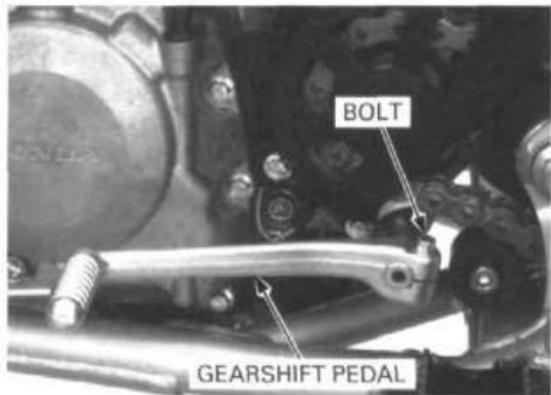


GEARSHIFT LINKAGE

REMOVAL

Remove the following:

- bolt and gearshift pedal
- right crankcase cover (page 14-5)
- clutch assembly (page 14-6)
- right mud guard and foot peg (page 3-3)

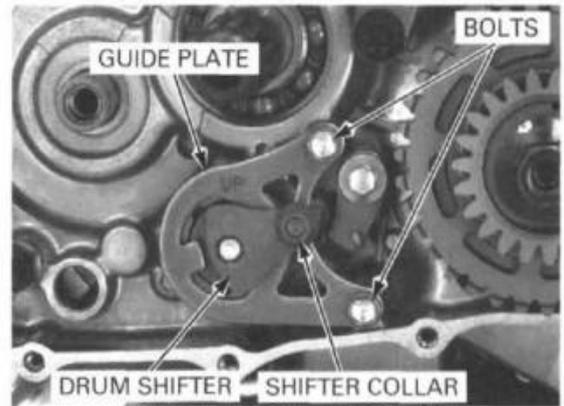


- gearshift spindle and thrust washer

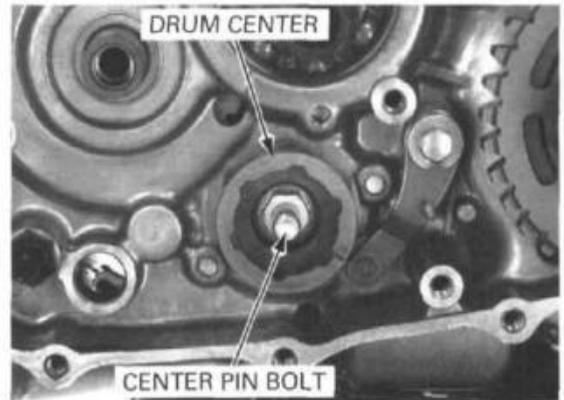


CLUTCH/STARTER CLUTCH/KICK STARTER/GEARSHIFT LINKAGE (After '05)

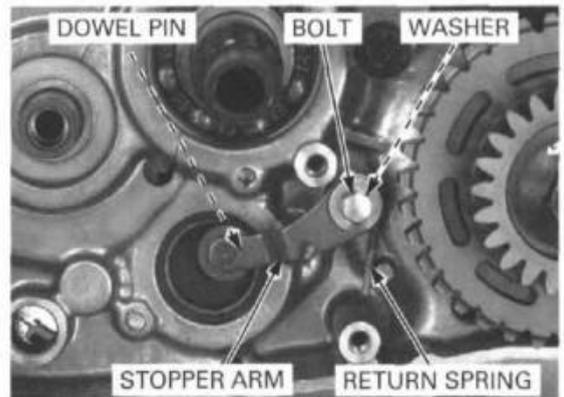
- shifter collar
- two bolts
- guide plate and drum shifter as an assembly



- center pin bolt
- gearshift drum center

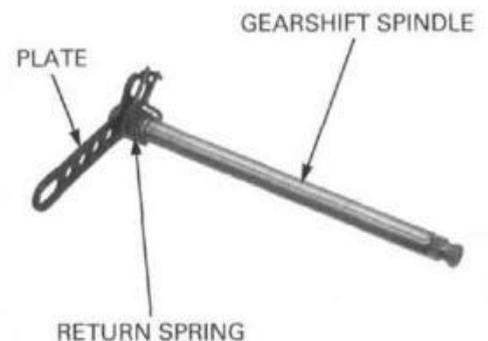


- bolt
- stopper arm
- washer
- return spring
- dowel pin



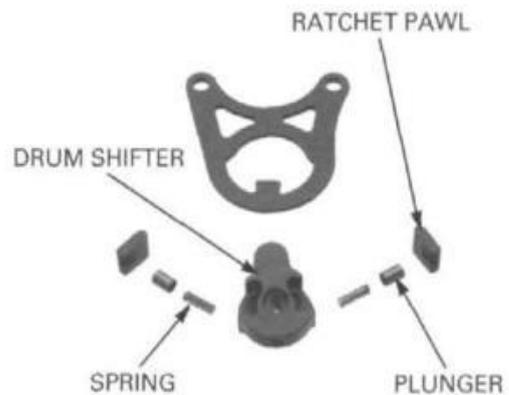
INSPECTION

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



CLUTCH/STARTER CLUTCH/KICK STARTER/GEARSHIFT LINKAGE (After '05)

Check the ratchet pawls, plungers and drum shifter for wear or damage.
Check the plunger spring for fatigue or damage.

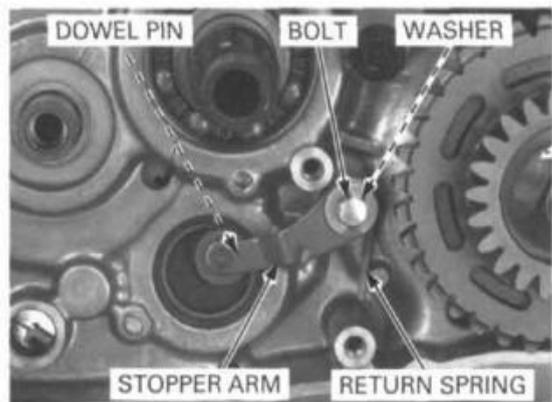


INSTALLATION

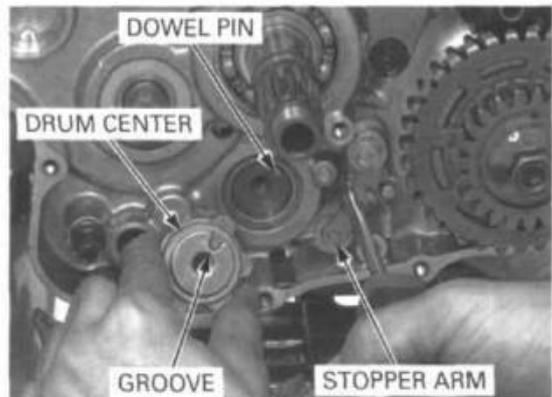
Install the dowel pin into the shift drum hole.

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

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

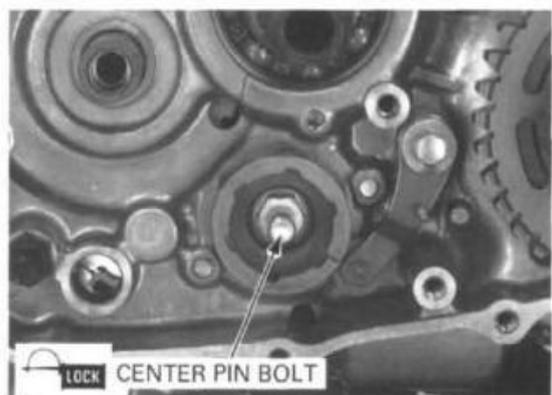


Hold the stopper arm using a screwdriver and install the gearshift drum center by aligning the pin groove with the dowel pin.



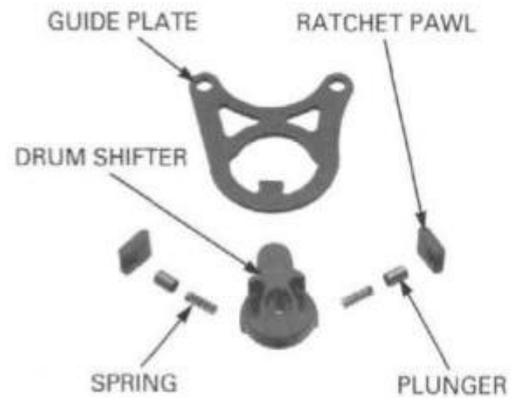
Apply locking agent to the center pin bolt threads. Install the center pin bolt and tighten it.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)



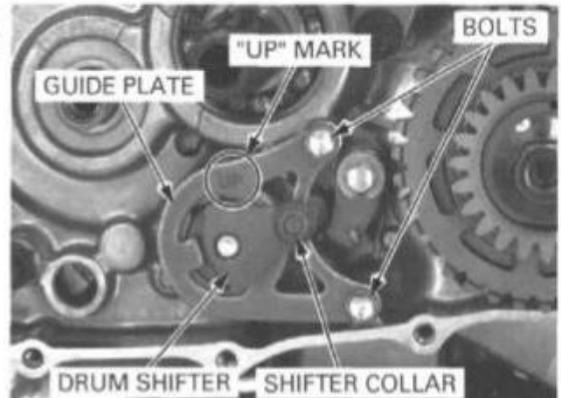
CLUTCH/STARTER CLUTCH/KICK STARTER/GEARSHIFT LINKAGE (After '05)

Install the plunger springs, plungers and ratchet pawls into the drum shifter, and set them into the guide plate.



Install the guide plate/drum shifter assembly with the "UP" mark facing up and tighten the two bolts securely.

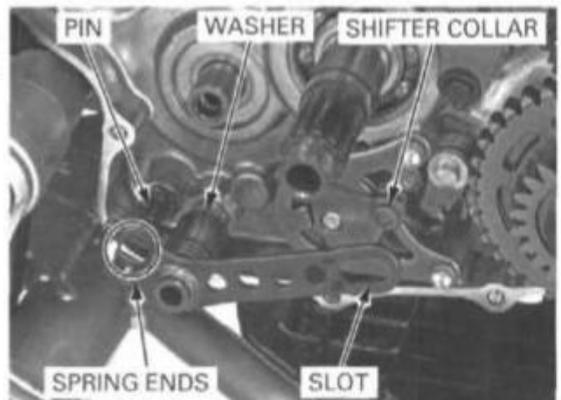
Install the shifter collar onto the drum shifter.



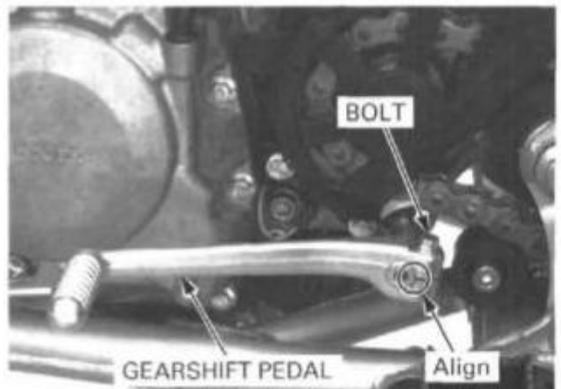
Install the thrust washer onto the gearshift spindle. Insert the spindle into the crankcase while aligning the return spring ends with the spring pin, and the slot with the shifter collar.

Install the clutch assembly (page 14-6).

Install the right crankcase cover (page 14-28).

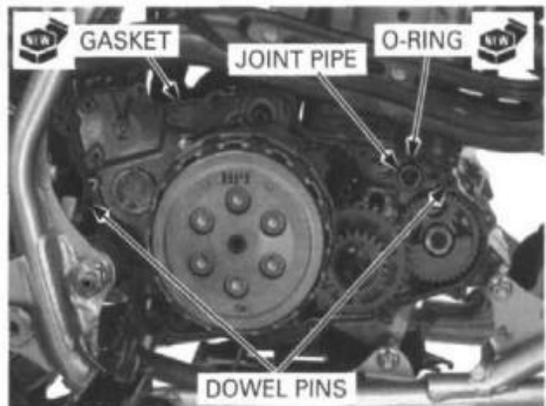


Install the gearshift pedal by aligning the slit with the punch mark on the gearshift spindle. Install the pedal pinch bolt and tighten it securely.

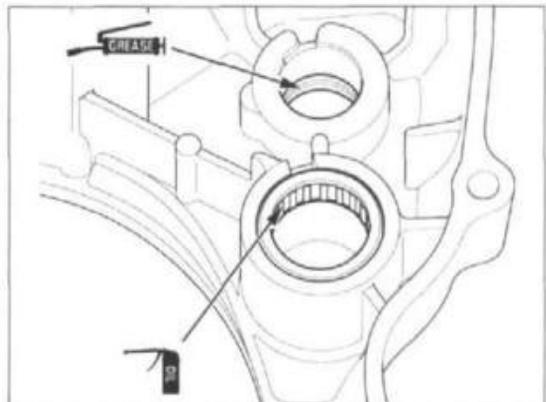


RIGHT CRANKCASE COVER INSTALLATION

Install the water joint pipe, a new O-ring, dowel pins and a new gasket.



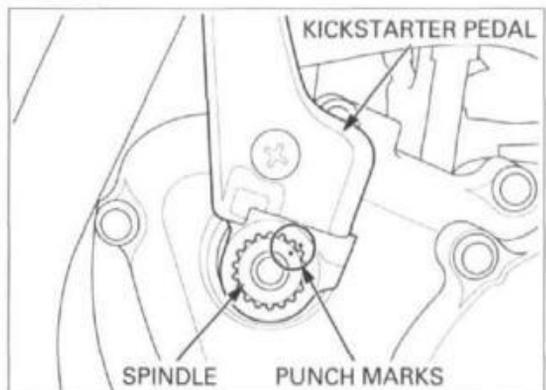
TRX450R only: Apply grease to the kickstarter spindle oil seal lip. Apply oil to the kickstarter first idle gear bearing.



Install the right crankcase cover while engaging the water pump shaft with the balancer shaft. Install the wire clamp, hose clamp and right crankcase bolts, and tighten the bolts in a crisscross pattern in 2 or 3 steps.



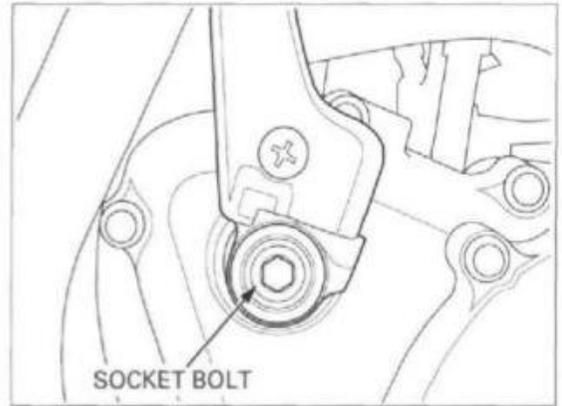
TRX450R only: Install the kickstarter pedal onto the kickstarter spindle by aligning the punch marks.



CLUTCH/STARTER CLUTCH/KICK STARTER/GEARSHIFT LINKAGE (After '05)

TRX450R only: Install the socket bolt and tighten it.

TORQUE: 38 N·m (3.9 kgf·m, 28 lbf·ft)



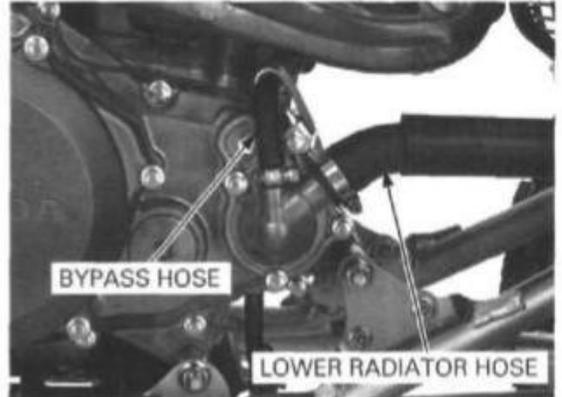
Install the water pump cover (page 9-17).

Connect the lower radiator hose and bypass hose to the water pump cover, and tighten the hose band screws.

Install the brake pedal (page 19-28).

Fill the crankcase with the recommended transmission oil (page 4-18).

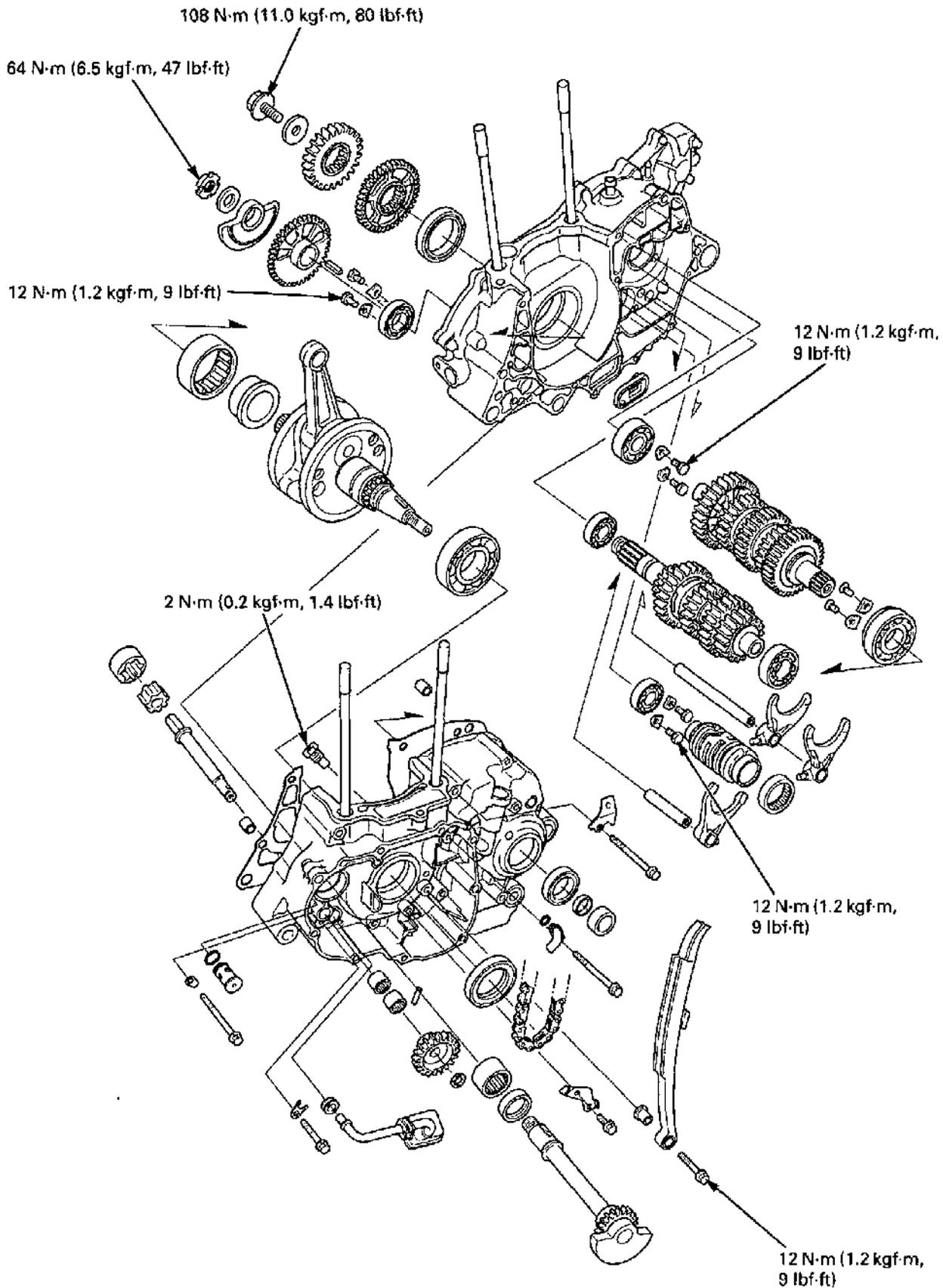
Fill and bleed the cooling system (page 9-7).



15. CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER ('04 - '05)

SYSTEM COMPONENTS	15-2	TRANSMISSION	15-13
SERVICE INFORMATION	15-3	CRANKSHAFT	15-18
TROUBLESHOOTING	15-6	CRANKCASE BEARING	15-20
BALANCER GEAR/BALANCER	15-7	CRANKCASE ASSEMBLY	15-25
CRANKCASE SEPARATION	15-11		

SYSTEM COMPONENTS



SERVICE INFORMATION

GENERAL

- The crankcase halves must be separated to service the transmission and crankshaft. To service these parts, the engine must be removed from the frame (page 10-5).
- Be careful not to damage the crankcase mating surfaces when servicing.

SPECIFICATIONS

Unit: mm (in)

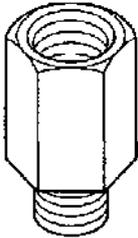
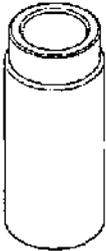
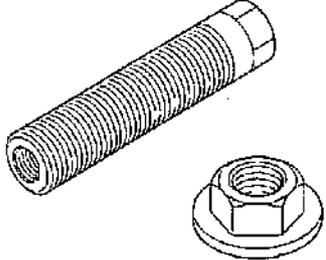
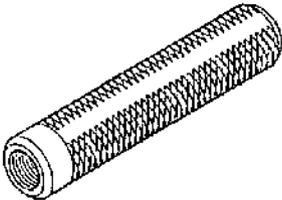
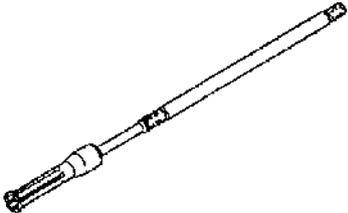
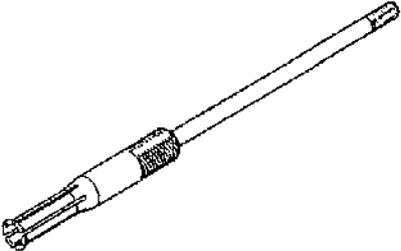
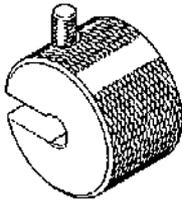
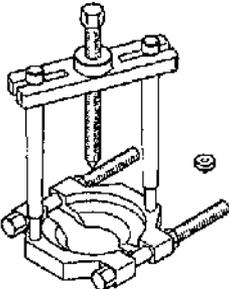
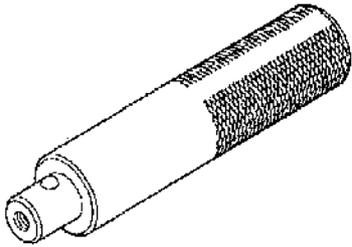
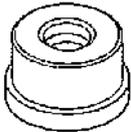
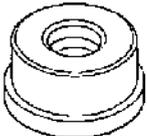
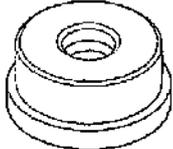
ITEM		STANDARD	SERVICE LIMIT	
Shift fork, shaft	Fork I.D.	Left, right	12.003 – 12.024 (0.4726 – 0.4733)	
		Center	11.003 – 11.024 (0.4332 – 0.4340)	
	Shaft O.D.	Left/right	11.983 – 11.994 (0.4718 – 0.4722)	
Center		10.983 – 10.994 (0.4324 – 0.4328)		
Transmission	Fork claw thickness	4.93 – 5.00 (0.194 – 0.197)	4.8 (0.19)	
	Gear I.D.	M4	28.007 – 28.028 (1.1026 – 1.1035)	28.05 (1.104)
		M5	28.020 – 28.033 (1.1031 – 1.1037)	28.06 (1.105)
		C1	22.020 – 22.041 (0.8669 – 0.8678)	22.07 (0.869)
		C2	30.020 – 30.041 (1.1819 – 1.1827)	30.07 (1.184)
		C3	28.020 – 28.041 (1.1031 – 1.1040)	28.07 (1.105)
	Gear bushing O.D.	M4, M5	27.959 – 27.980 (1.1007 – 1.1016)	27.94 (1.100)
		C1	21.959 – 21.980 (0.8645 – 0.8654)	21.94 (0.864)
		C2	29.959 – 29.980 (1.1795 – 1.1803)	29.94 (1.179)
		C3	27.959 – 27.980 (1.1007 – 1.1016)	27.94 (1.100)
	Gear bushing I.D.	M5	25.020 – 25.041 (0.9850 – 0.9859)	25.06 (0.987)
		C1	19.020 – 19.041 (0.7488 – 0.7496)	19.06 (0.750)
		C2	27.020 – 27.041 (1.0638 – 1.0646)	27.06 (1.065)
		C3	25.020 – 25.041 (0.9850 – 0.9859)	25.06 (0.987)
	Mainshaft O.D.	at M5	24.967 – 24.980 (0.9830 – 0.9835)	24.95 (0.982)
Countershaft O.D.	at C1	18.959 – 18.980 (0.7464 – 0.7472)	18.94 (0.746)	
	at C2	26.959 – 26.980 (1.0614 – 1.0622)	26.94 (1.061)	
	at C3	24.959 – 24.980 (0.9826 – 0.9835)	24.94 (0.982)	
Crankshaft	Runout	Left	-	
		Right	-	
	Big end side clearance	0.05 – 0.60 (0.002 – 0.024)	0.75 (0.030)	
	Big end radial clearance	0.006 – 0.018 (0.0002 – 0.0007)	0.05 (0.002)	

TORQUE VALUE

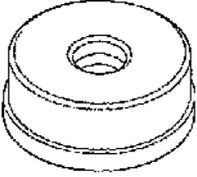
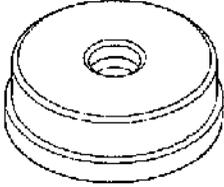
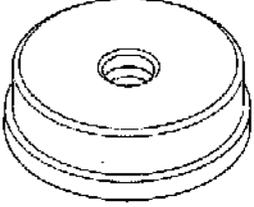
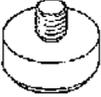
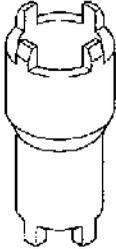
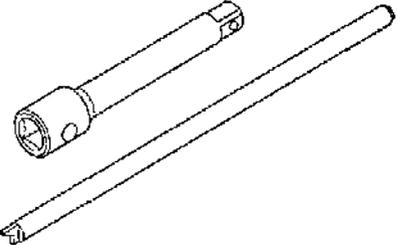
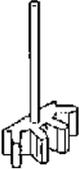
Balancer shaft lock nut	64 N·m (6.5 kgf·m, 47 lbf·ft)	Apply oil to the threads and seating surface. Replace with a new one and stake.
Cam chain tensioner bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply locking agent to the threads.
Primary drive gear bolt	108 N·m (11.0 kgf·m, 80 lbf·ft)	Apply oil to the threads and seating surface.
Bearing set plate bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply locking agent to the threads.
Oil jet	2 N·m (0.2 kgf·m, 1.4 lbf·ft)	Apply locking agent to the threads.

CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER ('04 - '05)

TOOLS

<p>Threaded adapter 07WMF-KFF0300</p>  <p>or 07AMF-HP1A100 (U.S.A. only)</p>	<p>Assembly collar 07965-VM00100</p> 	<p>Threaded shaft 07965-VM00200</p>  <p>or 07931-ME4010B and 07931-HB3020A (U.S.A. only)</p>
<p>Bearing remover handle 07936-3710100</p> 	<p>Bearing remover, 17 mm 07936-3710300</p> 	<p>Bearing remover, 20 mm 07936-3710600</p> 
<p>Remover weight 07741-0010201</p>  <p>or 07936-3710200 or 07936-371020A (U.S.A. only)</p>	<p>Universal bearing puller 07631-0010000</p>  <p>or equivalent commercially available in U.S.A.</p>	<p>Driver 07749-0010000</p> 
<p>Attachment, 32 x 35 mm 07746-0010100</p> 	<p>Attachment, 37 x 40 mm 07746-0010200</p> 	<p>Attachment, 42 x 47 mm 07746-0010300</p> 

CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER ('04 - '05)

<p>Attachment, 52 x 55 mm 07746-0010400</p> 	<p>Attachment, 62 x 68 mm 07746-0010500</p> 	<p>Attachment, 72 x 75 mm 07746-0010600</p> 
<p>Pilot, 17 mm 07746-0040400</p> 	<p>Pilot, 20 mm 07746-0040500</p> 	<p>Pilot, 25 mm 07746-0040600</p> 
<p>Pilot, 30 mm 07746-0040700</p> 	<p>Lock nut wrench, 20 x 24 mm 07716-0020100</p> 	<p>Extension bar 07716-0020500</p>  <p>or commercially available equivalent</p>
<p>Gear holder, M2.5 07724-0010100</p>  <p>or 07724-001A100 (U.S.A. only)</p>	<p>Gear holder, M1.5 07724-0010200</p>  <p>or 07724-001A200 (U.S.A. only)</p>	

TROUBLESHOOTING

Excessive engine noise

- Worn connecting rod big end bearing
- Worn crankshaft main journal bearing
- Worn balancer bearing
- Improper balancer installation
- Worn transmission gears
- Worn transmission bearings

Transmission jumps out of gear

- Worn gear dogs or dog holes
- Worn shift drum guide groove
- Worn shift fork guide pin
- Worn gear shifter groove
- Worn shift fork
- Bent shift fork shaft

Hard to shift

- Incorrect clutch adjustment
- Bent shift fork
- Bent shift fork shaft
- Bent shift fork claw
- Damaged shift drum guide grooves
- Damaged shift fork guide pin

Engine vibration

- Excessive crankshaft runout
- Improper balancer timing

BALANCER GEAR/BALANCER

REMOVAL

Remove the following:

- flywheel (page 20-9)
- right crankcase cover (page 13-5)
- clutch (page 13-5)

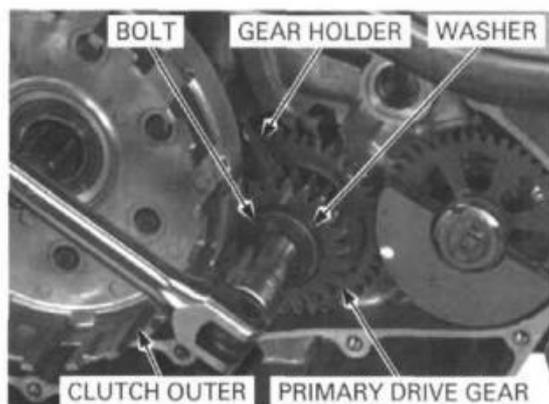
Temporarily install the clutch outer guide, needle bearing and clutch outer onto the mainshaft.

Install the special tool between the primary drive and driven gears as shown, and loosen the primary drive gear bolt.

TOOL:

Gear holder, M2.5

07724-0010100 or
07724-001A100
(U.S.A. only)



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

Remove the primary drive gear bolt, washer and gear.

Be careful not to damage the balancer shaft threads.

Unstake the balancer shaft lock nut.



Install the special tool between the balancer drive and driven gears as shown, and loosen the balancer shaft lock nut using the special tool.

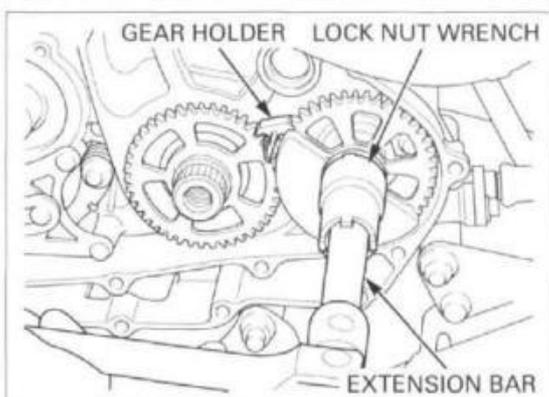
TOOLS:

Gear holder, M1.5

07724-0010200 or
07724-001A200
(U.S.A. only)

Lock nut wrench, 20 x 24 mm
Extension bar

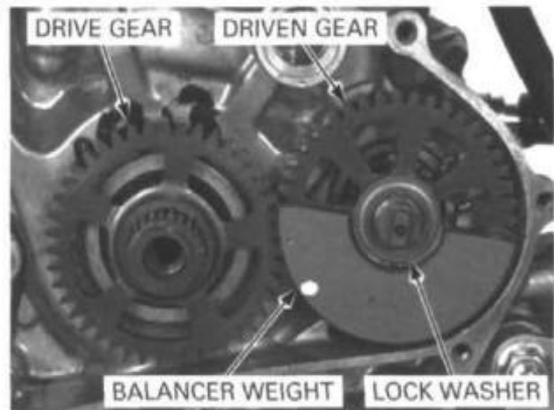
07716-0020100
07716-0020500 or
commercially
available
equivalent



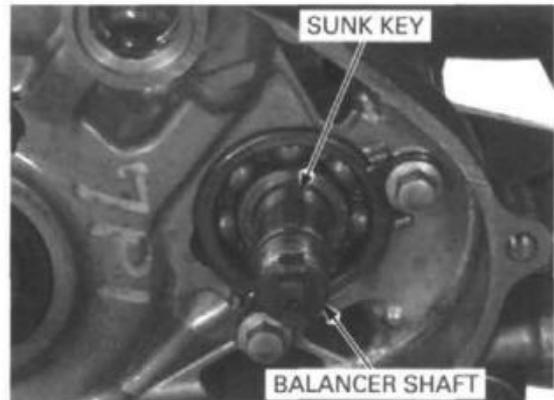
Remove the lock nut.

CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER ('04 - '05)

Remove the lock washer, balancer weight, balancer drive and driven gears.



Remove the sunk key from the balancer shaft.



Position the balancer shaft as shown and remove it.



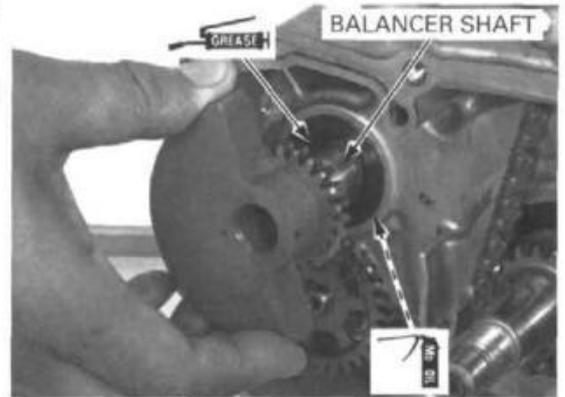
INSPECTION

Check the balancer shaft for wear, damage or scratches.

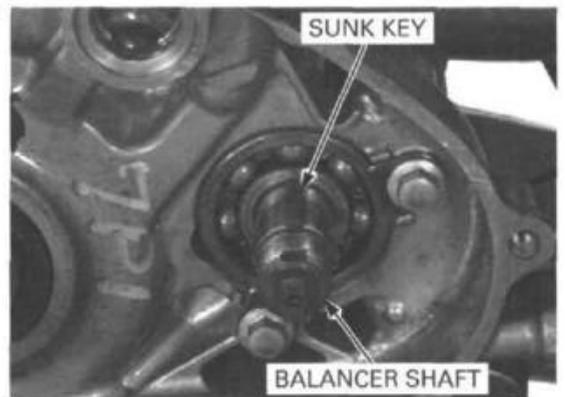


INSTALLATION

Apply molybdenum oil solution to the balancer shaft ball bearing and needle bearing.
Apply grease to the balancer shaft oil seal lip.
Install the balancer shaft into the crankcase at the angle as shown.



Install the sunk key into the key groove in the balancer shaft.



Install the balancer driven gear onto the balancer shaft by aligning the key groove with the key.



Install the balancer drive gear onto the crankshaft by aligning the wide groove with the flat tooth (punch mark).



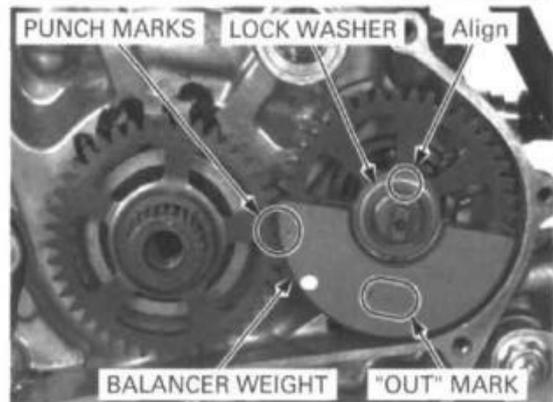
CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER ('04 - '05)

Mesh the balancer drive and driven gears while aligning the punch marks as shown.



The punch marks on the balancer weight and drive gear should align.

Install the balancer weight onto the balancer shaft with the "OUT" mark facing out and by aligning the key groove with the key. Install the lock washer.



Apply oil to a new balancer shaft lock nut threads and seating surface, and install it onto the balancer shaft.

Install the special tool between the balancer drive and driven gears as shown, and tighten the balancer shaft lock nut using the special tool.

TOOLS:

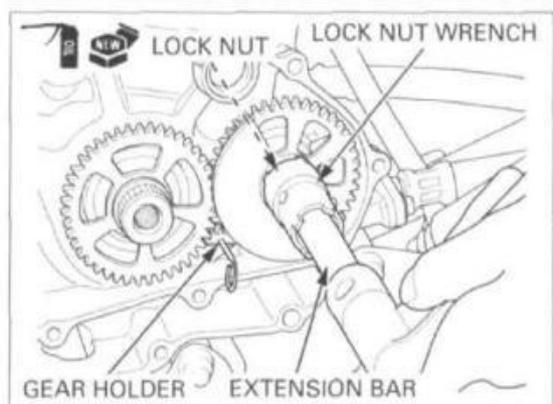
Gear holder, M1.5

07724-0010200 or
07724-001A200
(U.S.A. only)

Lock nut wrench, 20 x 24 mm

07716-0020100
07716-0020500 or
commercially
available
equivalent

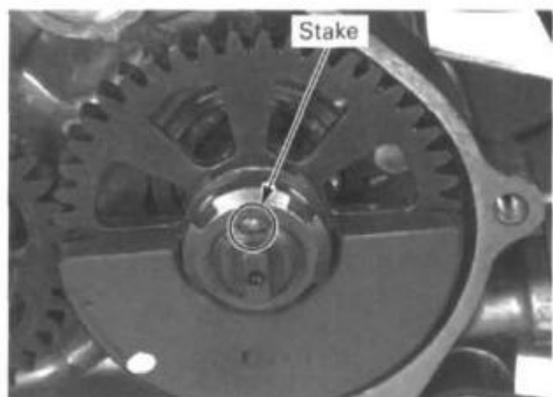
Extension bar



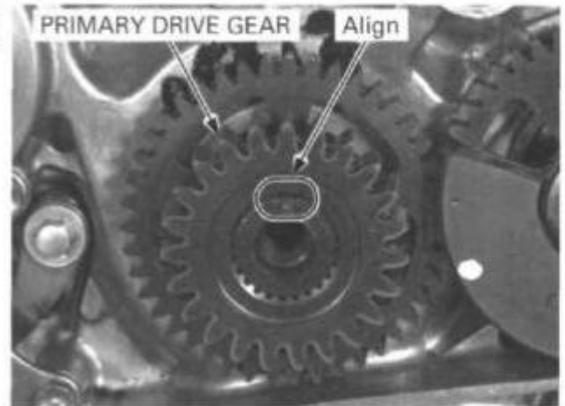
TORQUE: 64 N-m (6.5 kgf-m, 47 lbf-ft)

Be careful not to damage the balancer shaft threads.

Stake the balancer shaft lock nut into the balancer shaft groove.



Install the primary drive gear onto the crankshaft by aligning the wide groove with the flat tooth (punch mark).



Temporarily install the clutch outer guide, needle bearing and clutch outer onto the mainshaft. Apply oil to the primary drive gear bolt threads and seating surface, and install the washer and bolt. Install the special tool between the primary drive and driven gears as shown, and tighten the primary drive gear bolt.

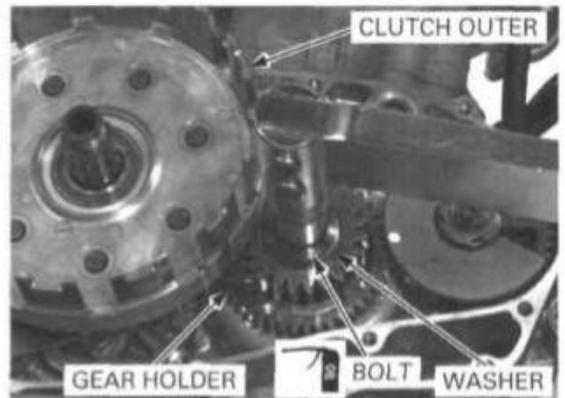
TOOL:

Gear holder, M2.5

**07724-0010100 or
07724-001A100
(U.S.A. only)**

Install the following:

- clutch (page 13-10)
- right crankcase cover (page 13-22)
- flywheel (page 20-9)

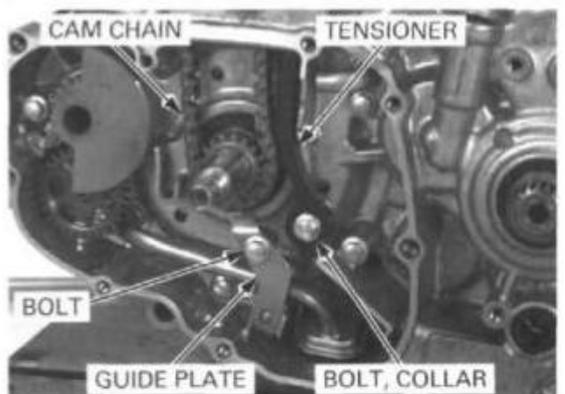


CRANKCASE SEPARATION

Remove the following:

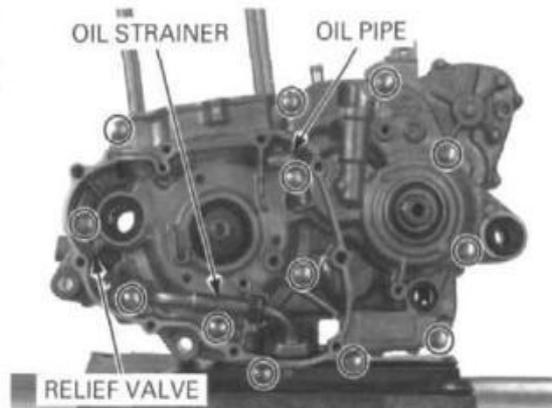
- engine (page 10-5)
- cylinder head (page 11-15)
- cylinder, piston (page 12-5)
- clutch (page 13-5)
- gearshift linkage (page 13-18)
- flywheel (page 20-9)
- breather hoses

- balancer shaft (page 15-7)
- oil pump driven gear (page 5-4)
- bolt and guide plate
- cam chain
- bolt, cam chain tensioner and collar

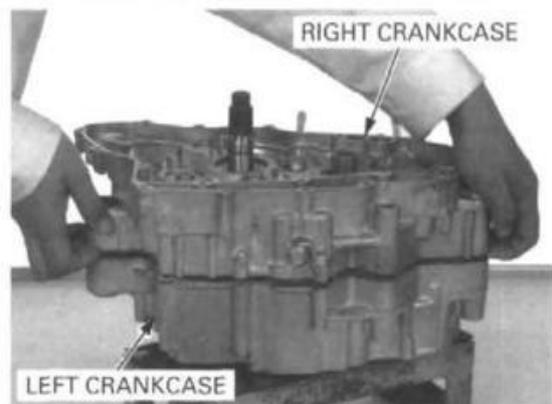


CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER ('04 - '05)

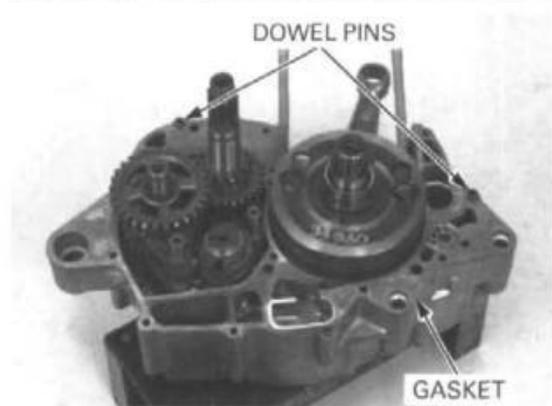
Loosen the thirteen crankcase bolts in a crisscross pattern in 2 or 3 steps.
Remove the bolts, relief valve set plate and oil strainer pipe set plate.
Remove the relief valve, oil strainer and oil pipe.



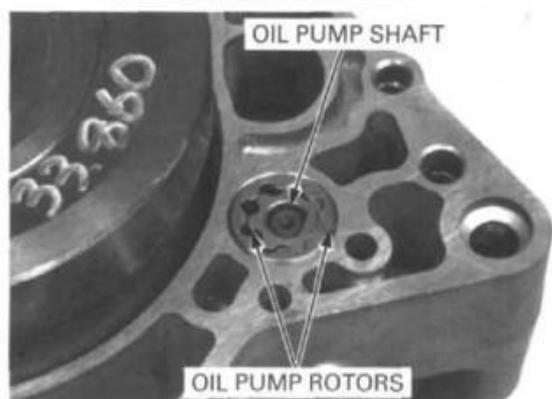
Place the left crankcase down, separate the right crankcase from the left crankcase.



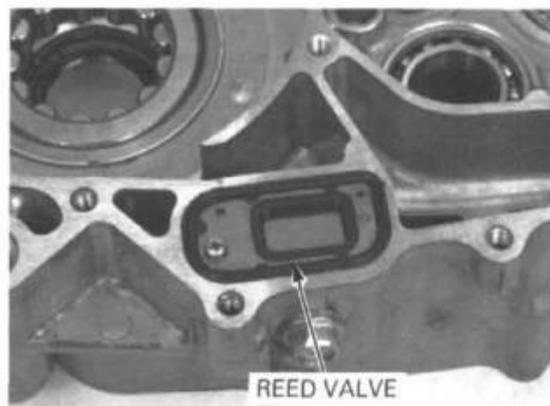
Remove the dowel pins and gasket.



Remove the oil pump shaft, inner and outer rotors from the left crankcase if necessary.

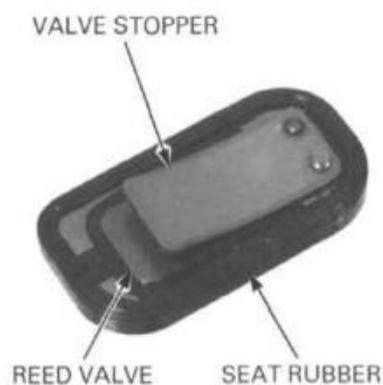


Remove the reed valve from the right crankcase.



REED VALVE INSPECTION

Check the reed valve for fatigue or damage.
Check the reed valve stopper for cracks, damage or deformation.
Check the seat rubber for deterioration or damage.



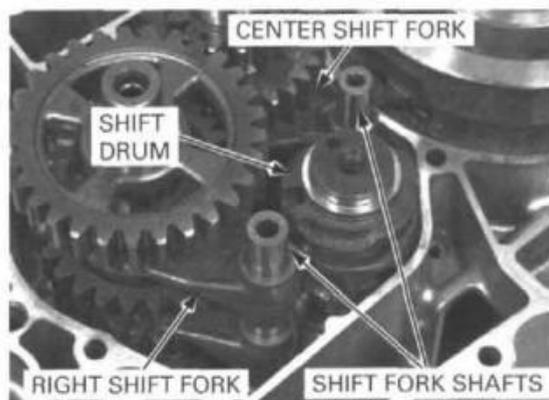
TRANSMISSION

DISASSEMBLY

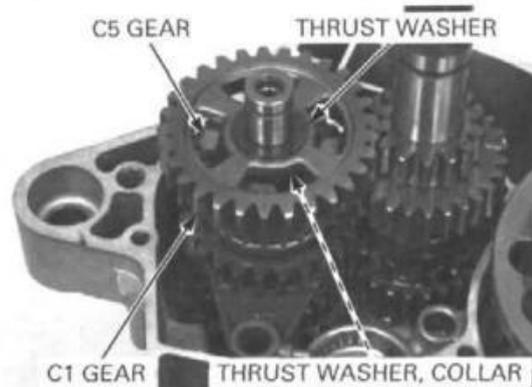
Separate the crankcase halves (page 15-11).

Pull out the shift fork shafts.

Remove the right shift fork, center shift fork and shift drum.



Remove the thrust washer, C1 gear, collar, thrust washer and C5 gear from the countershaft.



CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER ('04 - '05)

Remove the mainshaft, countershaft and left shift fork as an assembly.

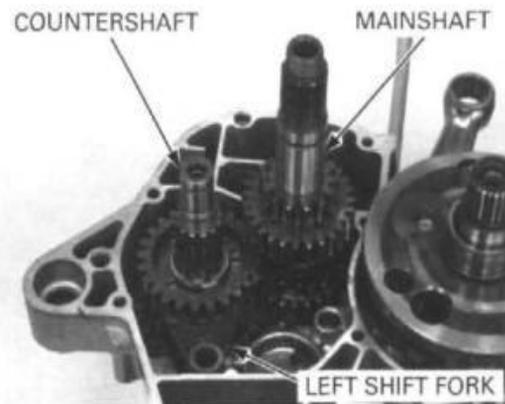
Remove the left shift fork from the C4 gear.

Disassemble the mainshaft and countershaft.

Do not expand the snap ring more than necessary for removal.

NOTE:

- Keep track of the disassembled parts (gears, bushings, washers and rings) by sliding them onto a tool or slipping them onto a piece of wire.



INSPECTION

Check the gear shifter groove, dogs, dog holes and teeth for abnormal wear or damage.

Measure the I.D. of each gear.

SERVICE LIMITS: M4: 28.05 mm (1.104 in)
M5: 28.06 mm (1.105 in)
C1: 22.07 mm (0.869 in)
C2: 30.07 mm (1.184 in)
C3: 28.07 mm (1.105 in)

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

SERVICE LIMITS: M4, M5: 27.94 mm (1.100 in)
C1: 21.94 mm (0.864 in)
C2: 29.94 mm (1.179 in)
C3: 27.94 mm (1.100 in)

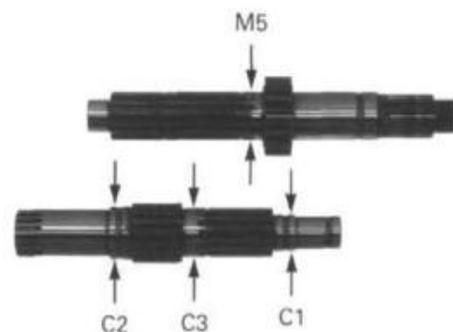
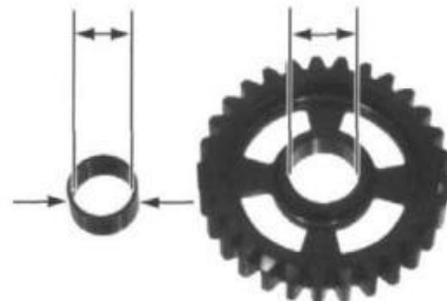
Measure the I.D. of each bushing.

SERVICE LIMITS: M5: 25.06 mm (0.987 in)
C1: 19.06 mm (0.750 in)
C2: 27.06 mm (1.065 in)
C3: 25.06 mm (0.987 in)

Check the spline grooves and sliding surfaces of the mainshaft and countershaft for abnormal wear or damage.

Measure the O.D. of the mainshaft and countershaft.

SERVICE LIMITS: at M5: 24.95 mm (0.982 in)
at C1: 18.94 mm (0.746 in)
at C2: 29.94 mm (1.061 in)
at C3: 24.94 mm (0.982 in)



Inspect the shift drum journals for scoring, scratches or evidence of insufficient lubrication.

Check the shift drum guide grooves for abnormal wear or damage.

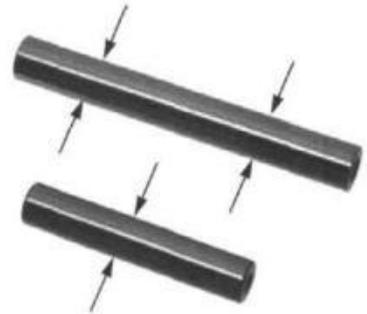


Check the shift fork shafts for abnormal wear or damage.

Measure each shift fork shaft O.D.

SERVICE LIMITS:

Left and right: 11.97 mm (0.471 in)
Center: 10.97 mm (0.432 in)



Check the shift forks for abnormal wear or damage.

Measure the I.D. of each shift fork.

SERVICE LIMITS:

Left and right: 12.04 mm (0.474 in)
Center: 11.04 mm (0.435 in)

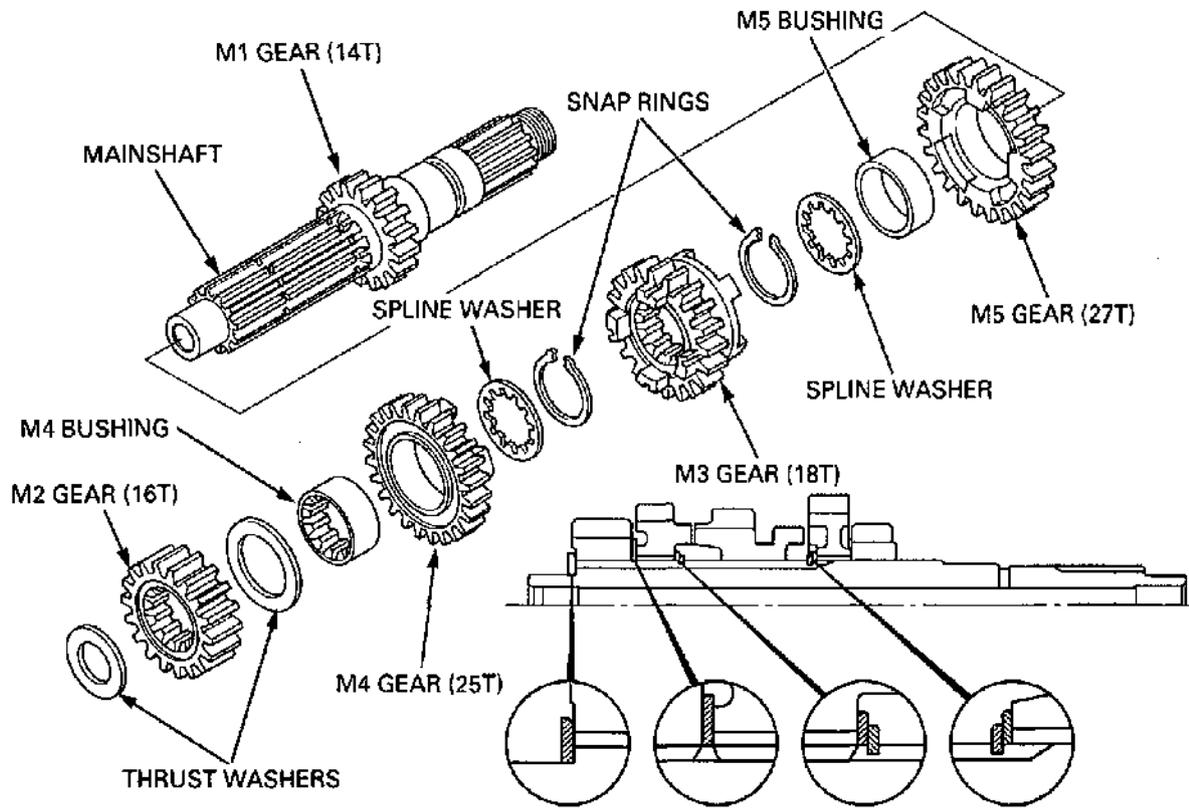
Measure claw thickness of each shift fork.

SERVICE LIMIT: 4.8 mm (0.19 in)

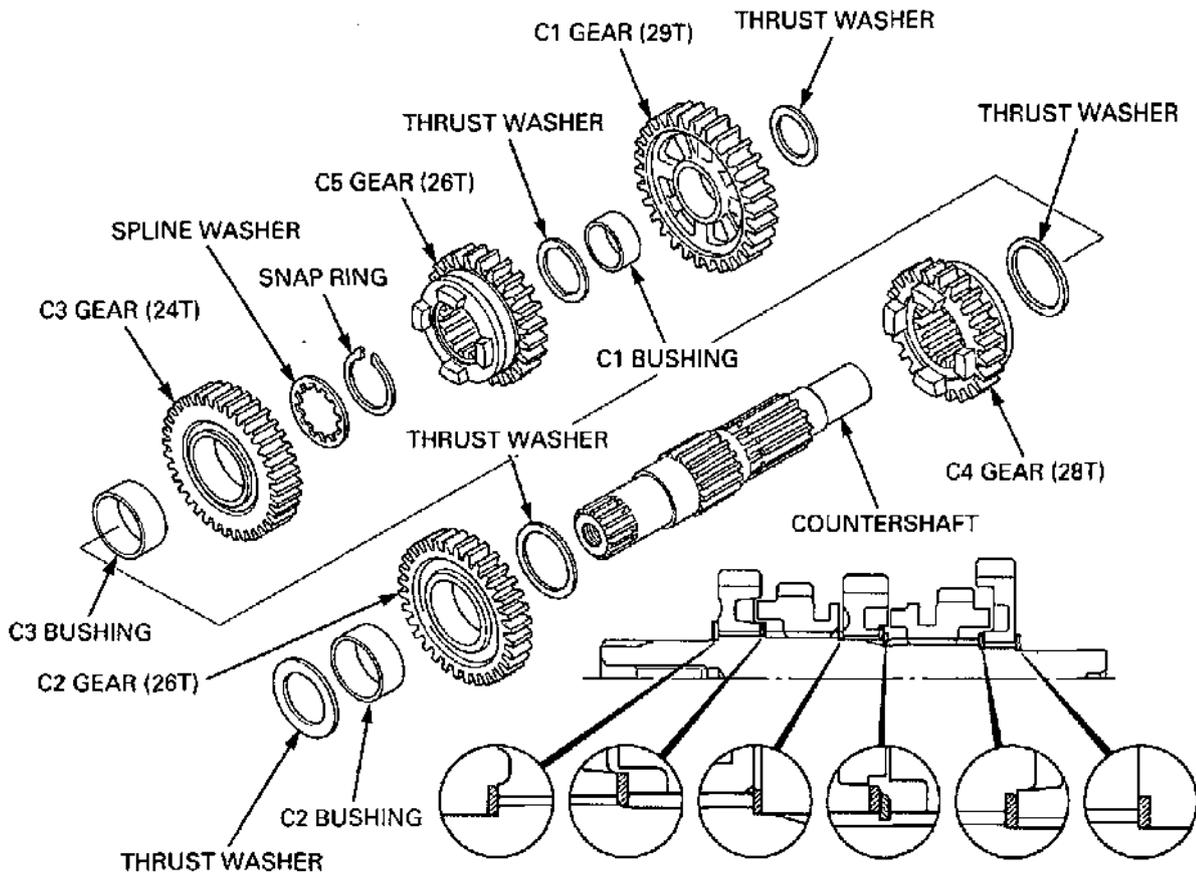


ASSEMBLY

MAINSHAFT



COUNTERSHAFT



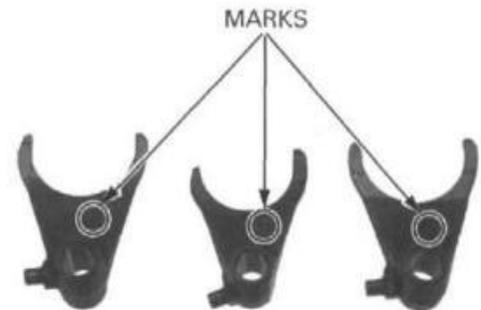
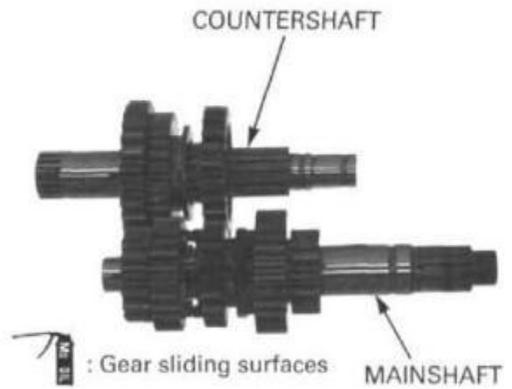
Apply molybdenum oil solution to the sliding surfaces of the transmission gears.

Assemble the mainshaft and countershaft except C5 gear, thrust washer, C1 gear, collar and thrust washer.

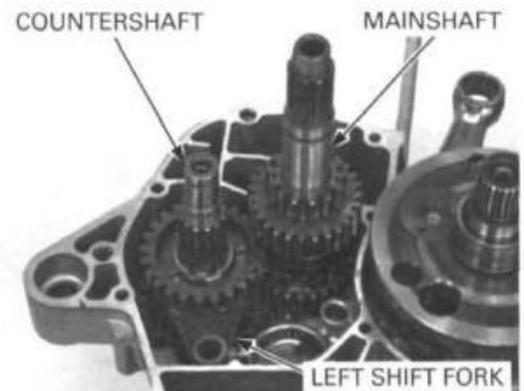
NOTE:

- Always install the washer and snap ring with the chamfered (rolled) edge facing away from the thrust load.
- Do not reuse worn snap ring which could easily spin in the groove.
- Install the snap ring so that its end gap aligns with the groove in the splines.
- Make sure that the snap ring is fully seated in the shaft groove after installing it.

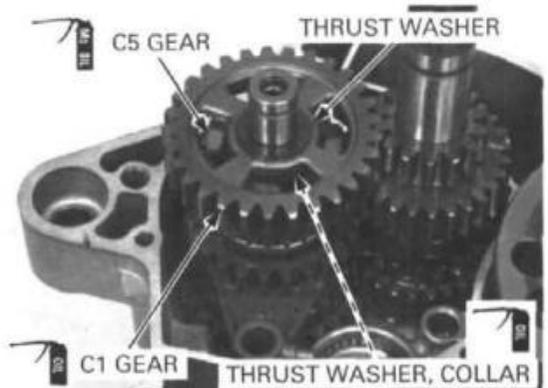
Make sure the shift fork identification marks. The left shift fork has an "L" (Left) mark, the center shift fork has a "C" (Center) mark and the right shift fork has an "R" (Right) mark.



Apply molybdenum oil solution to the claw and guide pin of the left shift fork. Install the left shift fork into the C4 gear shifter groove so that the identification mark faces to the left crankcase. Install the mainshaft, countershaft and left shift fork as an assembly into the left crankcase.



Apply molybdenum oil solution to the C5 gear sliding surface and install it onto the countershaft. Apply oil to the C1 gear and bushing sliding surfaces, and install the thrust washer, C1 gear, bushing and thrust washer onto the countershaft.



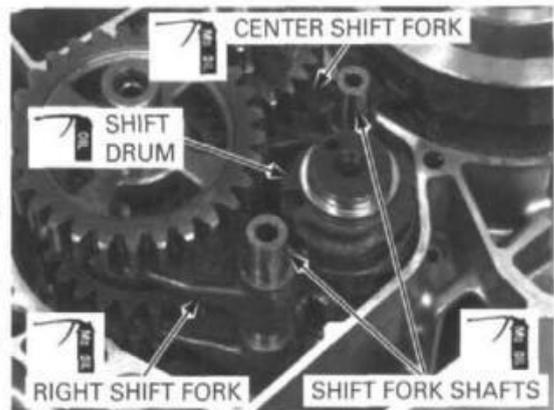
CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER ('04 - '05)

Apply molybdenum oil solution to the claws and guide pins of the center and right shift forks. Install the center shift fork into the M3 gear shifter groove with the identification mark facing up. Install the right shift fork into the C5 gear shifter groove with the identification mark facing down.

Apply molybdenum oil solution to the shift fork shafts and install them through the shift forks and into the left crankcase.

Apply oil to the shift drum guide grooves and install it into the left crankcase. Install the shift fork guide pins into the shift drum guide grooves.

Assemble the crankcase halves (page 15-25).



CRANKSHAFT

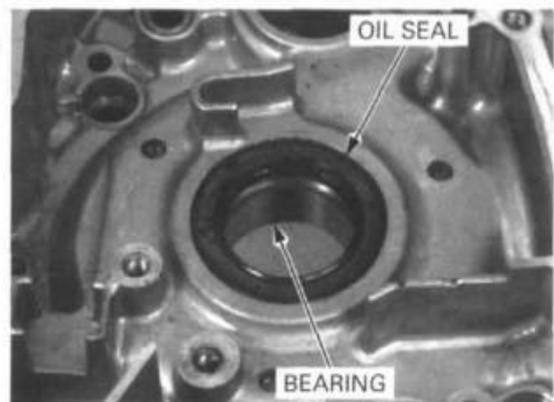
REMOVAL

Separate the crankcase halves and remove the oil pump (page 15-11). Remove the transmission (page 15-13).

Remove the crankshaft from the left crankcase using a hydraulic press while holding it.

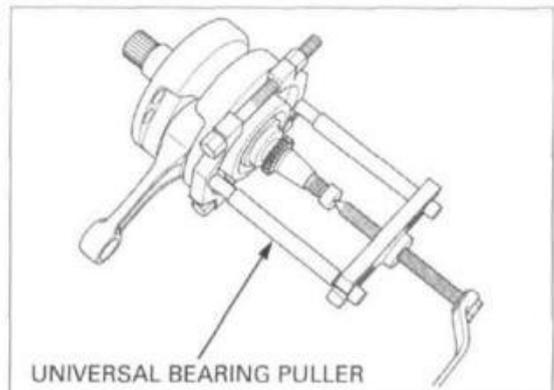


Remove the oil seal from the left crankcase. Drive the crankshaft bearing out of the left crankcase.



Remove the left crankshaft bearing using the special tool if it comes out with the crankshaft. Discard the bearing.

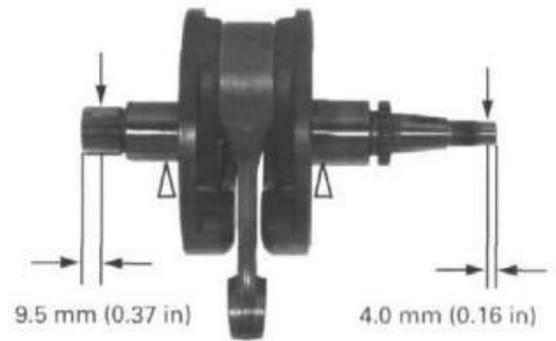
TOOL:
Universal bearing puller 07631-0010000 or equivalent commercially available in U.S.A.



INSPECTION

Set the crankshaft on a stand or V-blocks and measure the runout using a dial indicator.

SERVICE LIMIT: 0.03 mm (0.001 in)



Measure the connecting rod big end side clearance.

SERVICE LIMIT: 0.75 mm (0.030 in)



Measure the connecting rod big end radial clearance.

SERVICE LIMIT: 0.05 mm (0.002 in)



INSTALLATION

Drive a new left crankshaft bearing into the left crankcase.

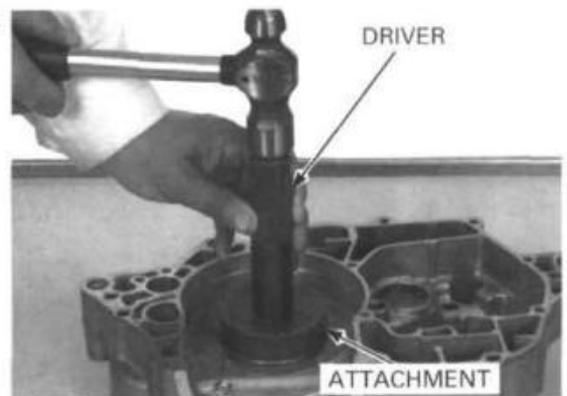
TOOLS:

Driver

07749-0010000

Attachment, 72 x 75 mm

07746-0010600



CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER ('04 - '05)

Install the special tool onto the crankshaft end.

TOOL:

Threaded adapter

07WMF-KFF0300 or
07AMF-HP1A100
(U.S.A. only)



Set the special tools onto the crankshaft and left crankshaft bearing.

TOOLS:

Assembly collar

07965-VM00100

Threaded shaft

07965-VM00200

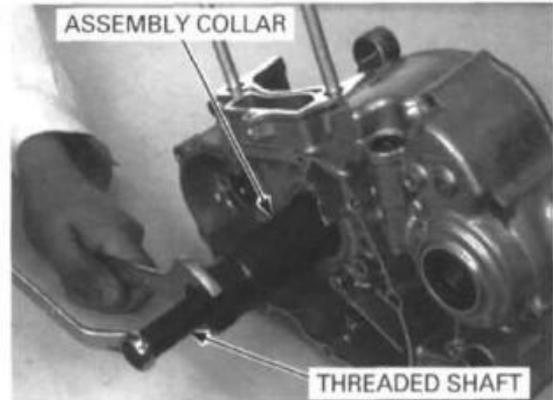
U.S.A. TOOLS:

Assembly collar

07931-ME4010B and

Threaded shaft

07931-HB3020A



Be careful not to bend the connecting rod by letting it press against the crankcase mating surface.

Draw the crankshaft into the left crankshaft bearing inner race (left crankcase).

Coat the oil seal contacting surface of the crankshaft with oil.

Apply grease to a new crankshaft oil seal lip and install it into the left crankcase.

Install the transmission (page 15-16).

Assemble the crankcase halves (page 15-25).

CRANKCASE BEARING

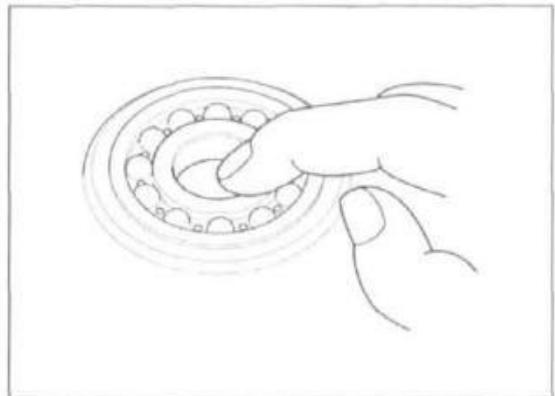
INSPECTION

Remove the crankshaft (page 15-18).

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

Also check that the bearing outer race fits tightly in the crankcase.

Replace any bearing if the inner race does not turn smoothly, quietly or if the outer race fits loosely in the crankcase.



LEFT CRANKCASE BEARING REPLACEMENT

Before removing the bearings, heat the crankcase evenly using a heat gun.

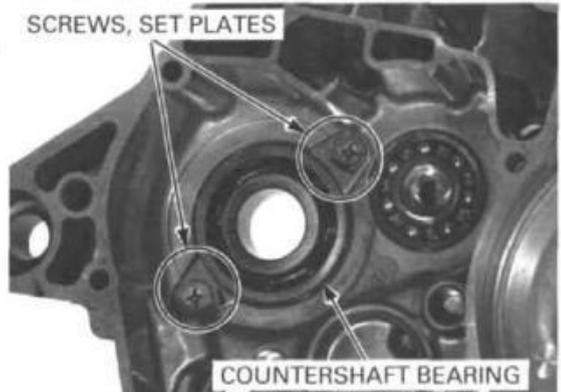
Remove the countershaft collar.

Remove the left countershaft oil seal.



Remove the screws and set plates.

Drive the countershaft bearing out of the left crankcase.



Remove the mainshaft bearing using the special tools.

TOOLS:

Remover handle
Bearing remover, 17 mm
Remover weight

07936-3710100
07936-3710300
07741-0010201 or
07936-3710200 or
07936-371020A
(U.S.A. only)



Remove the balancer shaft oil seal.

Remove the balancer shaft needle bearing using the special tools.

TOOLS:

Remover handle
Bearing remover, 20 mm
Remover weight

07936-3710100
07936-3710600
07741-0010201 or
07936-3710200 or
07936-371020A
(U.S.A. only)

BALANCER SHAFT NEEDLE BEARING



CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER ('04 - '05)

Drive new mainshaft and countershaft bearings into the left crankcase with the markings facing up, using the special tools.

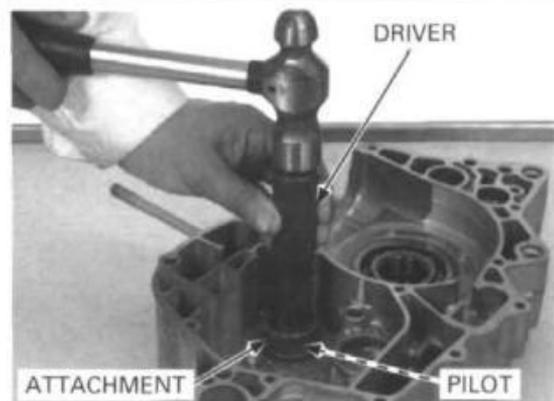
TOOLS:

Mainshaft bearing:

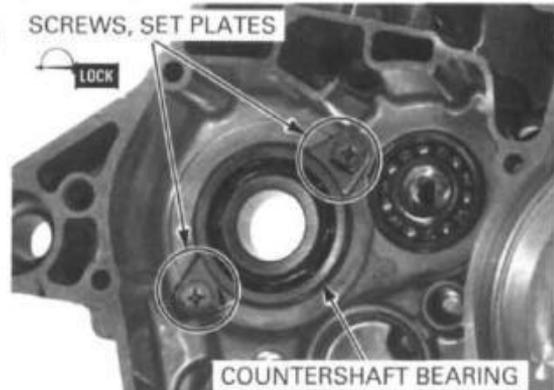
Driver	07749-0010000
Attachment, 37 x 40 mm	07746-0010200
Pilot, 17 mm	07746-0040400

Countershaft bearing:

Driver	07749-0010000
Attachment, 52 x 55 mm	07746-0010400



Apply locking agent to the set plate screw threads. Install the countershaft bearing set plates and tighten the screws securely.



Apply grease to a new countershaft oil seal lip and install it into the left crankcase.



Press a new balancer shaft needle bearing into the left crankcase using the special tools.

TOOLS:

Driver	07749-0010000
Attachment, 32 x 35 mm	07746-0010100
Pilot, 20 mm	07746-0040500

Apply grease to a new balancer shaft oil seal lip and install it into the left crankcase.



RIGHT CRANKCASE BEARING REPLACEMENT

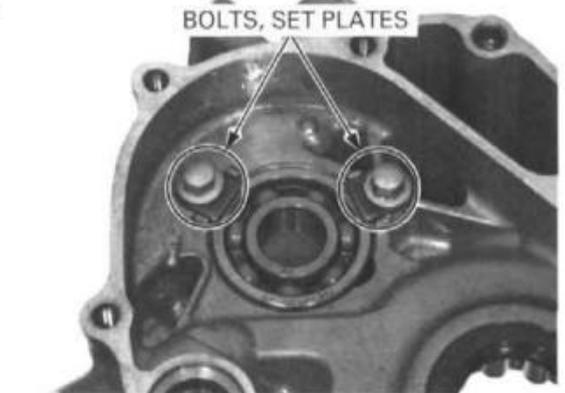
Always wear insulated gloves when handling a heated crankcase.

Before removing the bearings, heat the crankcase evenly using a heat gun.

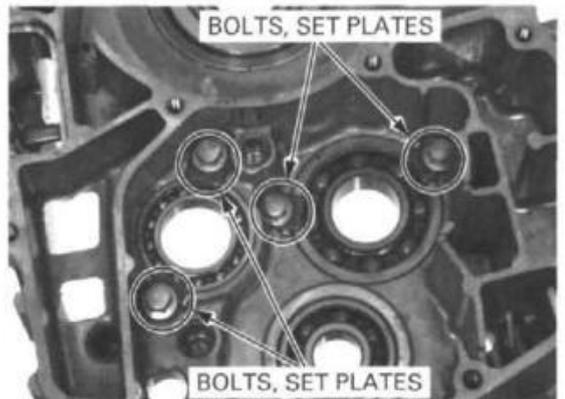
Remove the crankshaft oil seal.



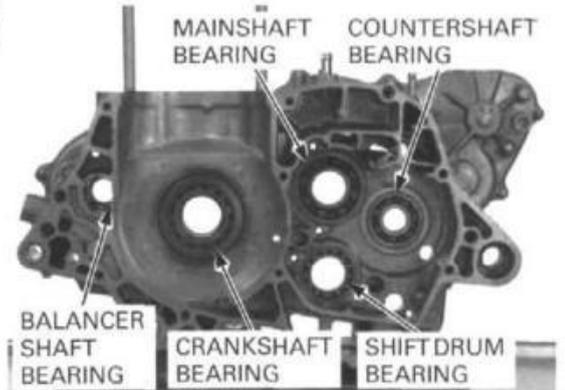
Remove the bolts and balancer shaft bearing set plates.



Remove the bolts and, mainshaft and shift drum bearing set plates.



Drive the crankshaft, mainshaft, countershaft, shift drum and balancer shaft bearings out of the right crankcase.



CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER ('04 - '05)

Drive new bearings into the right crankcase with the markings facing up, using the special tools.

TOOLS:

Crankshaft bearing:

Driver	07749-0010000
Attachment, 62 x 68 mm	07746-0010500
Pilot, 30 mm	07746-0040700

Mainshaft bearing:

Driver	07749-0010000
Attachment, 52 x 55 mm	07746-0010400
Pilot, 25 mm	07746-0040600

Countershaft bearing:

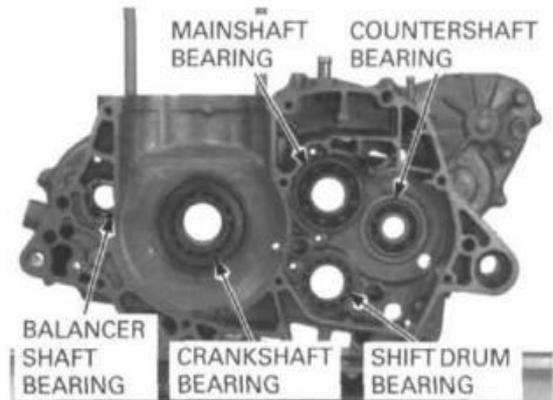
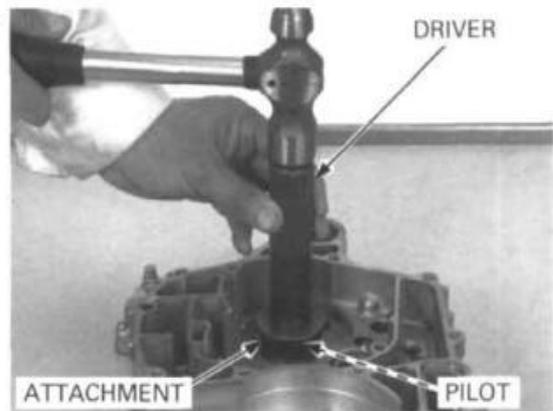
Driver	07749-0010000
Attachment, 42 x 47 mm	07746-0010300
Pilot, 17 mm	07746-0040400

Shift drum bearing:

Driver	07749-0010000
Attachment, 42 x 47 mm	07746-0010300
Pilot, 25 mm	07746-0040600

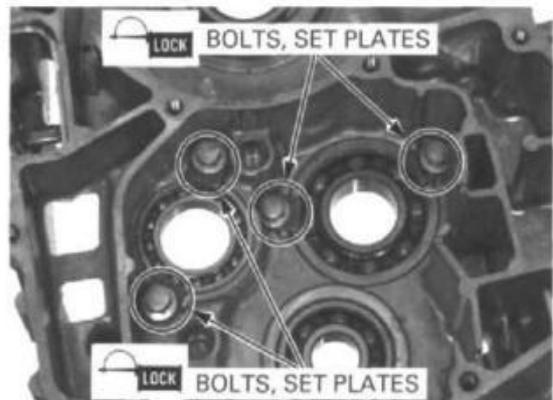
Balancer shaft bearing:

Driver	07749-0010000
Attachment, 42 x 47 mm	07746-0010300
Pilot, 17 mm	07746-0040400



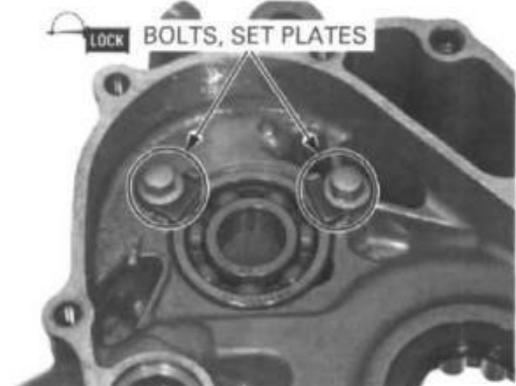
Apply locking agent to the set plate bolt threads. Install the mainshaft and shift drum bearing set plates, and tighten the bolts.

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



Apply locking agent to the set plate bolt threads. Install the balancer shaft bearing set plates and tighten the bolts.

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

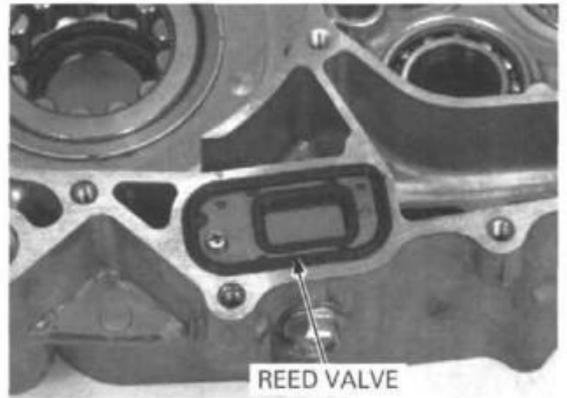


Apply grease to a new crankshaft oil seal lip and install it into the right crankcase.
Install the crankshaft (page 15-19).

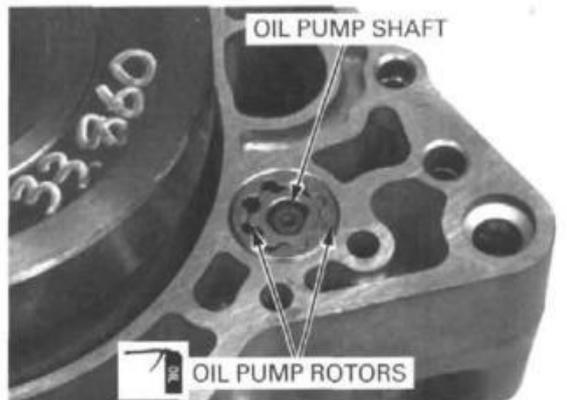


CRANKCASE ASSEMBLY

Install the reed valve into the right crankcase.



Dip oil pump inner and outer rotors in clean engine oil.
Install the oil pump shaft, inner and outer rotors into the left crankcase.

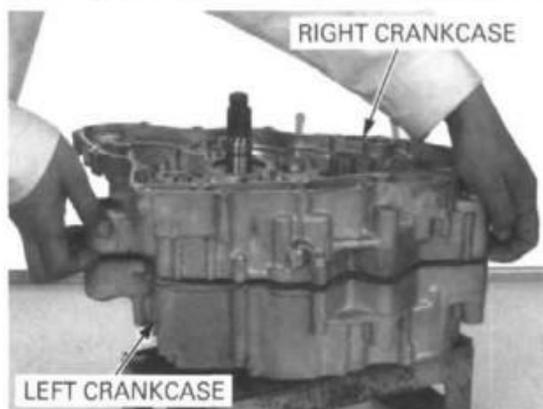


Install the dowel pins and a new gasket onto the left crankcase.
Coat the oil seal contact surface of the crankshaft with oil.



CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER ('04 - '05)

Install the right crankcase onto the left crankcase.

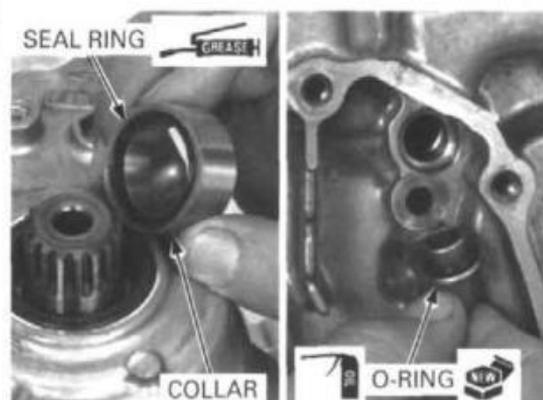


Coat the countershaft seal ring with grease and install the countershaft collar onto the countershaft.

Coat a new O-ring with oil and install it onto the oil pipe.

Install the oil pipe into the right crankcase.

Install the relief valve and oil strainer (page 5-5).



Apply locking agent to the threads of the crankcase bolt attaching the relief valve set plate.

Install the relief valve set plate, oil strainer pipe set plate and thirteen crankcase bolts.

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

Carefully trim the protruding gasket material from the cylinder gasket surface.

NOTICE

- Do not let the gasket material fall into the crankcase.
- Do not damage the cylinder gasket surface.

Apply locking agent to the cam chain tensioner bolt threads.

Install the cam chain tensioner and collar, and tighten the bolt.

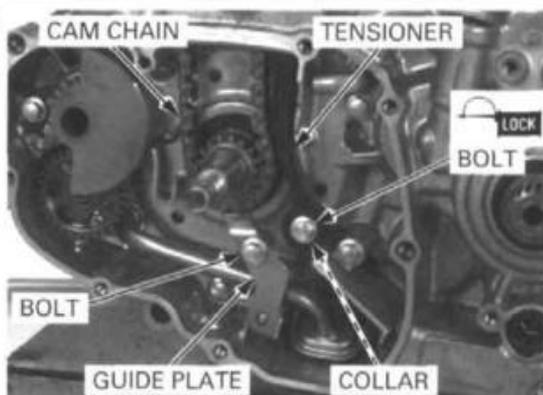
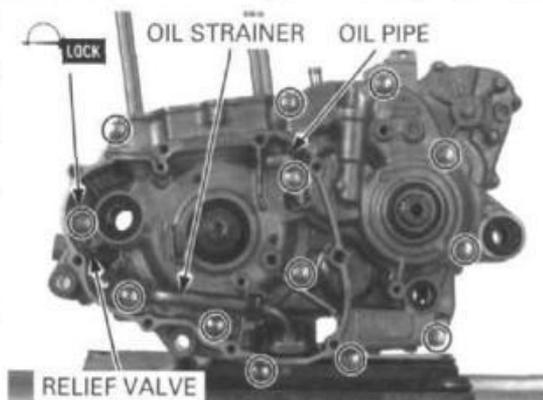
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the cam chain.

Install the guide plate by aligning the hole with the boss and tighten the bolt securely.

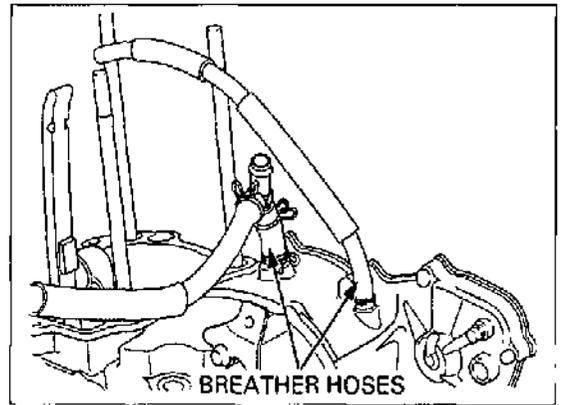
Install the following:

- oil pump driven gear (page 5-6)
- balancer shaft (page 15-9)



CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER ('04 - '05)

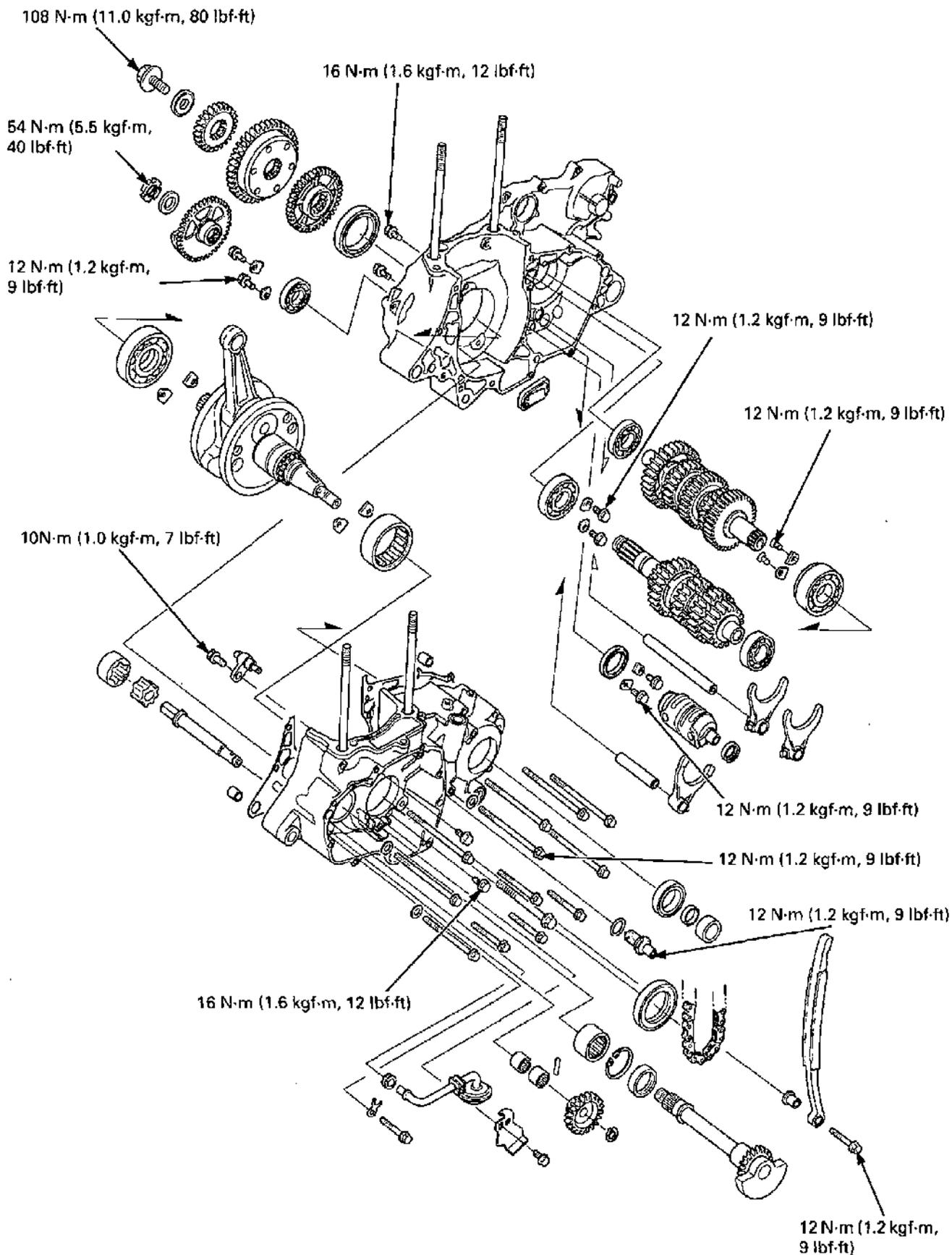
- breather hoses
- flywheel (page 20-9)
- gearshift linkage (page 13-20)
- clutch (page 13-10)
- cylinder, piston (page 12-10)
- cylinder head (page 11-24)
- engine (page 10-9)



16. CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER (After '05)

SYSTEM COMPONENTS	16-2	TRANSMISSION	16-13
SERVICE INFORMATION	16-3	CRANKSHAFT	16-17
TROUBLESHOOTING	16-6	CRANKCASE BEARING	16-19
BALANCER GEAR/BALANCER	16-7	CRANKCASE ASSEMBLY	16-25
CRANKCASE SEPARATION	16-11		

SYSTEM COMPONENTS



SERVICE INFORMATION

GENERAL

- The crankcase halves must be separated to service the transmission, crankshaft and oil pump. To service these parts, the engine must be removed from the frame (page 10-5).
- Be careful not to damage the crankcase mating surfaces when servicing.

SPECIFICATIONS

Unit: mm (in)

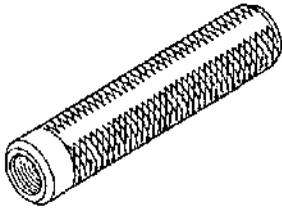
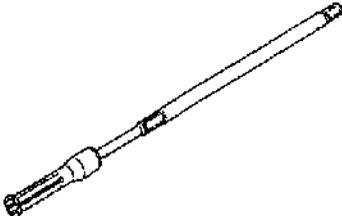
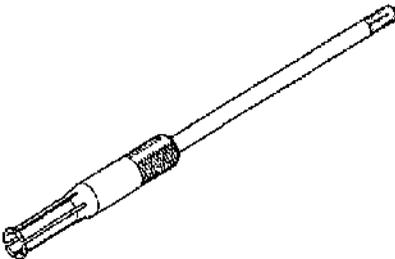
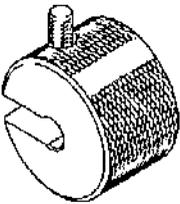
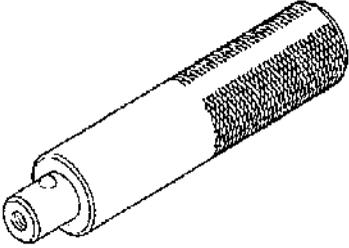
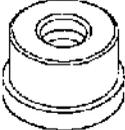
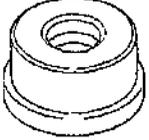
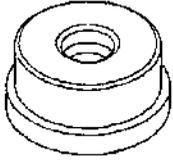
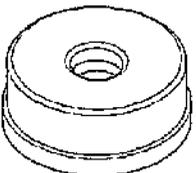
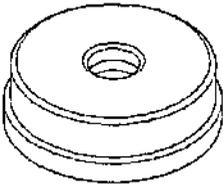
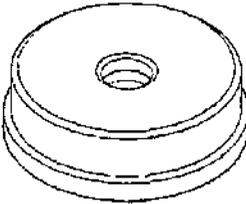
ITEM		STANDARD	SERVICE LIMIT	
Shift fork, shaft	Fork I.D.	Left	12.035 - 12.056 (0.4738 - 0.4746)	
		Right	12.003 - 12.024 (0.4726 - 0.4734)	
		Center	11.003 - 11.024 (0.4332 - 0.4340)	
	Shaft O.D.	Left/right	11.966 - 11.984 (0.4711 - 0.4718)	
		Center	10.969 - 10.980 (0.4319 - 0.4323)	
Transmission	Fork claw thickness	4.93 - 5.00 (0.194 - 0.197)	4.8 (0.19)	
	Gear I.D.	M4	28.007 - 28.028 (1.1026 - 1.1035)	28.05 (1.104)
		M5	28.020 - 28.033 (1.1031 - 1.1037)	28.06 (1.105)
		C1	22.020 - 22.041 (0.8669 - 0.8678)	22.07 (0.869)
		C2	30.020 - 30.041 (1.1819 - 1.1827)	30.07 (1.184)
		C3	28.020 - 28.041 (1.1031 - 1.1040)	28.07 (1.105)
	Gear bushing O.D.	M4, M5	27.959 - 27.980 (1.1007 - 1.1016)	27.94 (1.100)
		C1	21.959 - 21.980 (0.8645 - 0.8654)	21.94 (0.864)
		C2	29.959 - 29.980 (1.1795 - 1.1803)	29.94 (1.179)
		C3	27.959 - 27.980 (1.1007 - 1.1016)	27.94 (1.100)
	Gear bushing I.D.	M5	25.020 - 25.041 (0.9850 - 0.9859)	25.06 (0.987)
		C1	19.020 - 19.041 (0.7488 - 0.7496)	19.06 (0.750)
		C2	27.020 - 27.041 (1.0638 - 1.0646)	27.06 (1.065)
		C3	25.020 - 25.041 (0.9850 - 0.9859)	25.06 (0.987)
	Mainshaft O.D.	at M5	24.967 - 24.980 (0.9830 - 0.9835)	24.95 (0.982)
Countershaft O.D.	at C1	18.959 - 18.980 (0.7464 - 0.7472)	18.94 (0.746)	
	at C2	26.959 - 26.980 (1.0614 - 1.0622)	26.94 (1.061)	
	at C3	24.959 - 24.980 (0.9826 - 0.9835)	24.94 (0.982)	
Crankshaft	Runout	Left	-	
		Right	-	
	Big end side clearance	0.30 - 0.75 (0.012 - 0.030)	0.75 (0.030)	
	Big end radial clearance	0.006 - 0.018 (0.0002 - 0.0007)	0.05 (0.002)	

TORQUE VALUE

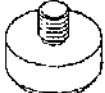
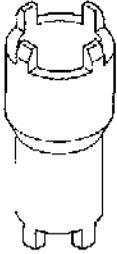
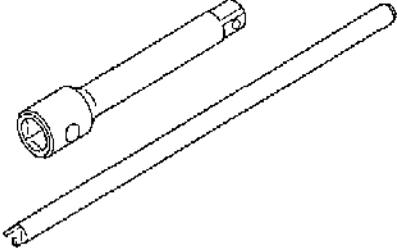
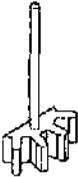
Balancer shaft lock nut	54 N·m (5.5 kgf·m, 40 lbf·ft)	Apply oil to the threads and seating surface. Replace with a new one and stake.
Cam chain tensioner bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply locking agent to the threads.
Primary drive gear bolt	108 N·m (11.0 kgf·m, 80 lbf·ft)	Apply oil to the threads and seating surface.
Bearing set plate bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply locking agent to the threads.
Crankshaft Bearing set plate bolt	16 N·m (1.6 kgf·m, 12 lbf·ft)	Apply locking agent to the threads.
Countershaft Bearing set plate torx screw	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply locking agent to the threads.
Transmission oil drain bolt	22 N·m (2.2 kgf·m, 16 lbf·ft)	Apply oil to the threads and seating surface.
Neutral switch (hole plug bolt)	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Piston jet mounting bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	Apply locking agent to the threads.

CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER (After '05)

TOOLS

<p>Bearing remover handle 07936-3710100</p> 	<p>Bearing remover, 17 mm 07936-3710300</p> 	<p>Bearing remover, 20 mm 07936-3710600</p> 
<p>Remover weight 07741-0010201</p>  <p>or 07936-3710200 or 07936-371020A (U.S.A. only)</p>	<p>Driver 07749-0010000</p> 	<p>Attachment, 32 x 35 mm 07746-0010100</p> 
<p>Attachment, 37 x 40 mm 07746-0010200</p> 	<p>Attachment, 42 x 47 mm 07746-0010300</p> 	<p>Attachment, 52 x 55 mm 07746-0010400</p> 
<p>Attachment, 62 x 68 mm 07746-0010500</p> 	<p>Attachment, 72 x 75 mm 07746-0010600</p> 	<p>Pilot, 17 mm 07746-0040400</p> 

CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER (After '05)

<p>Pilot, 20 mm 07746-0040500</p> 	<p>Pilot, 25 mm 07746-0040600</p> 	<p>Pilot, 30 mm 07746-0040700</p> 
<p>Lock nut wrench, 20 x 24 mm 07716-0020100</p> 	<p>Extension bar 07716-0020500</p>  <p>or commercially available equivalent</p>	<p>Gear holder, M2.5 07724-0010100</p>  <p>or 07724-001A100 (U.S.A. only)</p>
<p>Gear holder, M1.5 07724-0010200</p>  <p>or 07724-001A200 (U.S.A. only)</p>		

TROUBLESHOOTING

Excessive engine noise

- Worn connecting rod big end bearing
- Worn crankshaft main journal bearing
- Worn balancer bearing
- Improper balancer installation
- Worn transmission gears
- Worn transmission bearings

Transmission jumps out of gear

- Worn gear dogs or dog holes
- Worn shift drum guide groove
- Worn shift fork guide pin
- Worn gear shifter groove
- Worn shift fork
- Bent shift fork shaft

Hard to shift

- Incorrect clutch adjustment
- Bent shift fork
- Bent shift fork shaft
- Bent shift fork claw
- Damaged shift drum guide grooves
- Damaged shift fork guide pin

Engine vibration

- Excessive crankshaft runout
- Improper balancer timing

BALANCER GEAR/BALANCER

REMOVAL

Remove the following:

- right crankcase cover (page 14-5)
- flywheel (page 21-12)
- clutch assembly (page 14-6)

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

Install the special tool between the primary drive and driven gears as shown, and loosen the primary drive gear bolt.

TOOL:

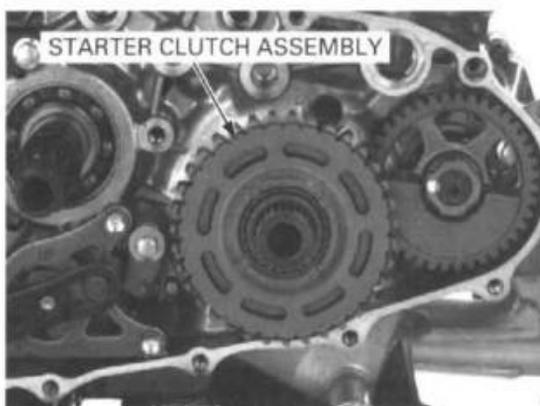
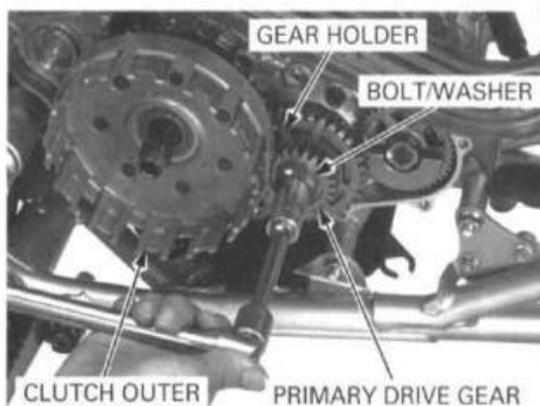
Gear holder, M2.5

07724-0010100 or
07724-001A100
(U.S.A. only)

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

Remove the primary drive gear bolt, washer and gear.

TRX450ER only: Remove the starter clutch assembly.



Install the special tool between the balancer drive and driven gears as shown, and loosen the balancer shaft lock nut using the special tool.

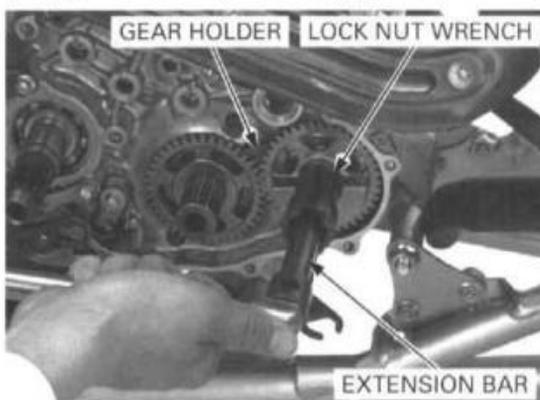
TOOLS:

Gear holder, M1.5

07724-0010200 or
07724-001A200
(U.S.A. only)

Lock nut wrench, 20 x 24 mm
Extension bar

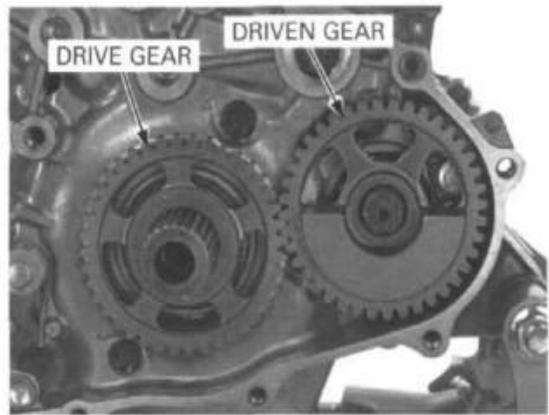
07716-0020100
07716-0020500 or
commercially
available
equivalent



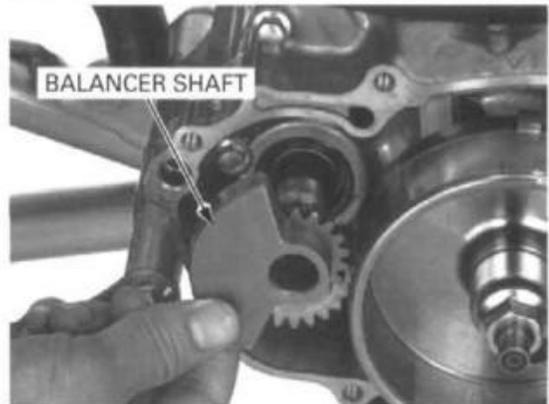
Remove the lock nut and washer.

CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER (After '05)

Remove the balancer drive and driven gears.



Position the balancer weight as shown and remove the balancer shaft.



INSPECTION

Check the balancer shaft for wear, damage or scratches.

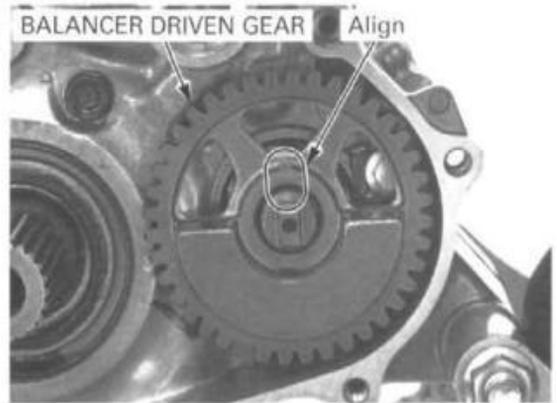


INSTALLATION

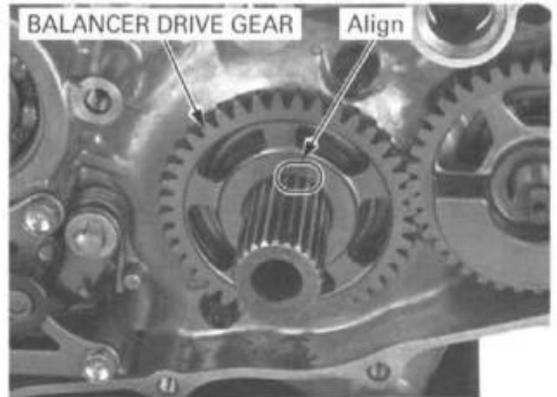
Apply molybdenum oil solution to the balancer shaft ball bearing and needle bearing. Apply grease to the balancer shaft oil seal lip. Position the balancer weight as shown, install the balancer shaft into the crankcase.



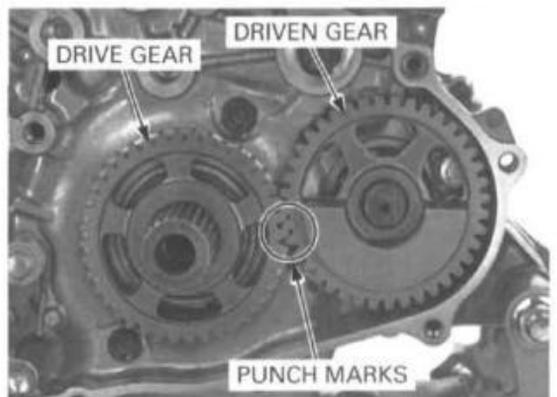
Install the balancer driven gear to the balancer shaft while aligning its tab with the clinched tooth of the balancer shaft.



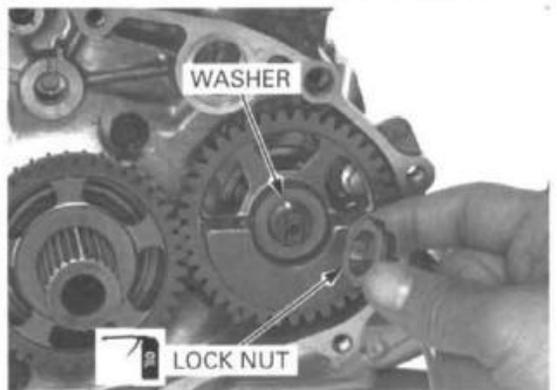
Install the balancer drive gear onto the crankshaft by aligning the wide groove with the flat tooth (punch mark).



Mesh the balancer drive and driven gears while aligning the punch marks (balancer timing marks) as shown.



Install the washer.
Apply oil to a new balancer shaft lock nut threads and seating surface, and install it onto the balancer shaft.



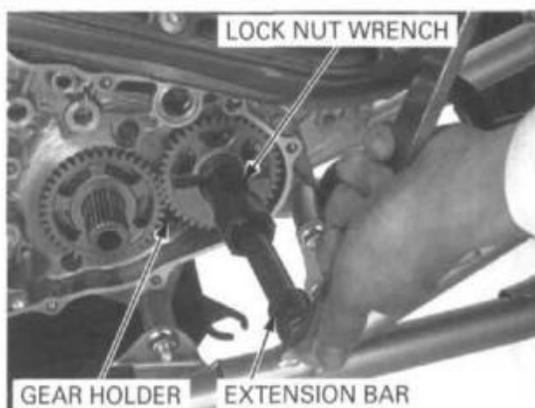
CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER (After '05)

Install the special tool between the balancer drive and driven gears as shown, and tighten the balancer shaft lock nut using the special tool.

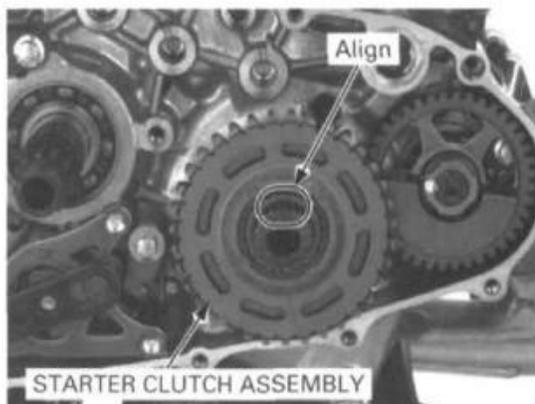
TOOLS:

Gear holder, M1.5	07724-0010200 or 07724-001A200 (U.S.A. only)
Lock nut wrench, 20 x 24 mm	07716-0020100
Extension bar	07716-0020500 or commercially available equivalent

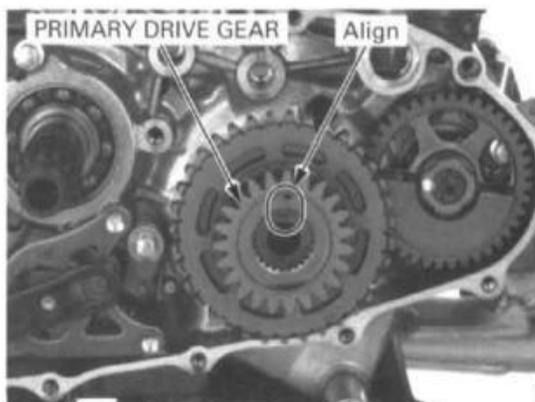
TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)



TRX450ER only: Install the starter clutch assembly while aligning its wide cut-out in the splines with the punch mark on the mainshaft.



Install the primary drive gear with the punch mark facing out Install the primary drive gear onto the crankshaft by aligning the wide groove with the flat tooth (punch mark).



Temporarily install the clutch outer guide, needle bearing and clutch outer onto the mainshaft. Install the special tool between the primary drive and driven gears as shown.

TOOL:

Gear holder, M2.5	07724-0010100 or 07724-001A100 (U.S.A. only)
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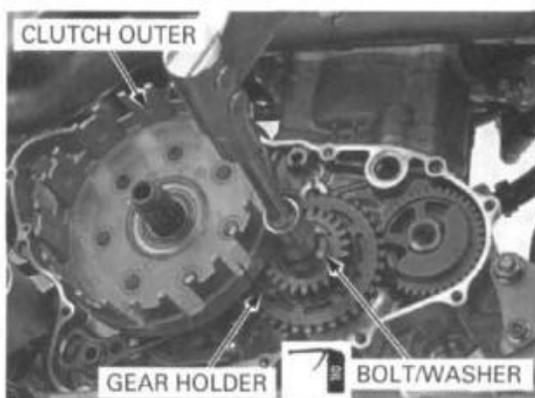
Apply transmission oil to the primary drive gear bolt threads and seating surface.

Install the washer and tighten the primary drive gear bolt to the specified torque.

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

Install the following:

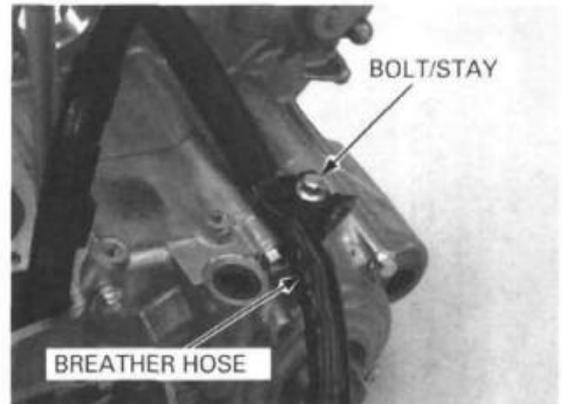
- clutch assembly (page 14-11)
- right crankcase cover (page 14-28)
- flywheel (page 21-12)



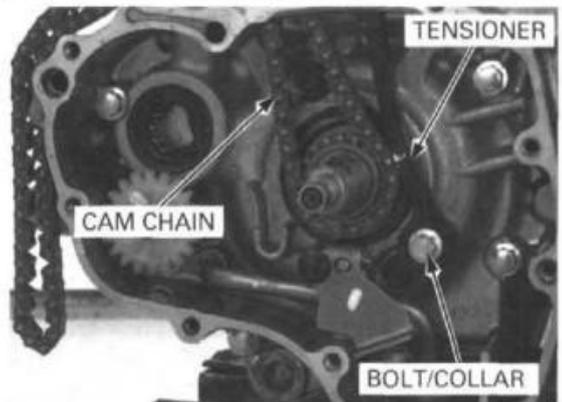
CRANKCASE SEPARATION

Remove the following:

- engine (page 10-5)
- cylinder head (page 11-15)
- cylinder, piston (page 12-5)
- clutch assembly (page 14-6)
- starter clutch (TRX450ER) (page 14-15)
- gearshift linkage (page 14-24)
- flywheel (page 21-12)
- balancer shaft (page 16-7)
- starter motor (TRX450ER) (page 23-6)
- kickstarter (TRX450R) (page 14-20)
- drive sprocket (page 10-5)
- bolt, stay and breather hose



- cam chain
- bolt, cam chain tensioner and pivot collar
- oil pump driven gear/drive pin (page 6-5)
- oil strainer (page 6-5)



Remove the countershaft collar and seal ring.

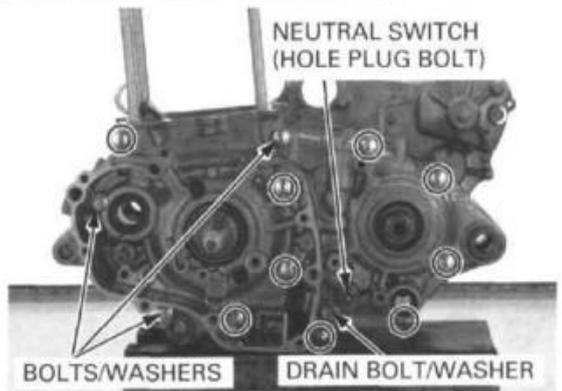


Remove the transmission oil drain bolt and sealing washer.

Remove the neutral switch (TRX450ER) or hole plug bolt (TRX450R).

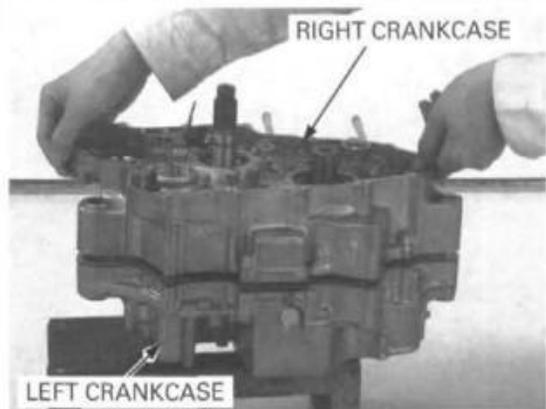
Loosen the crankcase bolts in a crisscross pattern in 2 or 3 steps.

Remove the crankcase bolts and washers.

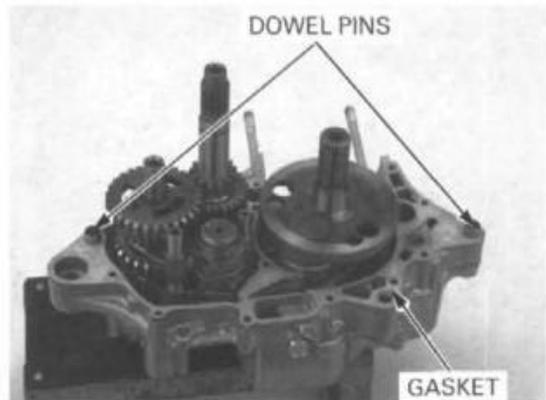


CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER (After '05)

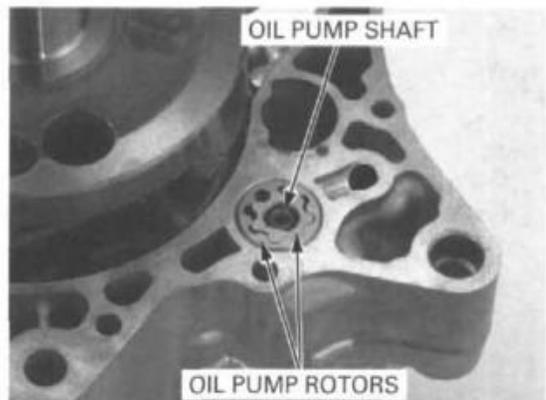
Place the left crankcase down, separate the right crankcase from the left crankcase.



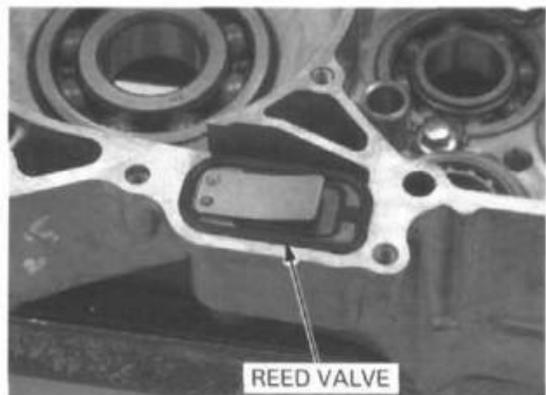
Remove the dowel pins and gasket.



Remove the oil pump shaft, inner and outer rotors from the left crankcase if necessary.

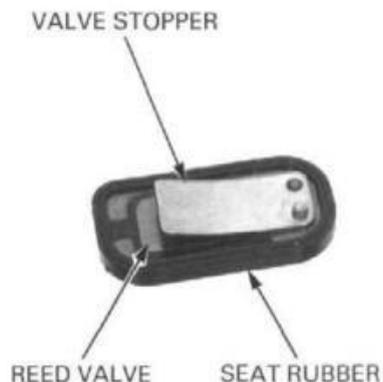


Remove the reed valve from the right crankcase.



REED VALVE INSPECTION

Check the reed valve for fatigue or damage.
 Check the reed valve stopper for cracks, damage or deformation.
 Check the seat rubber for deterioration or damage.



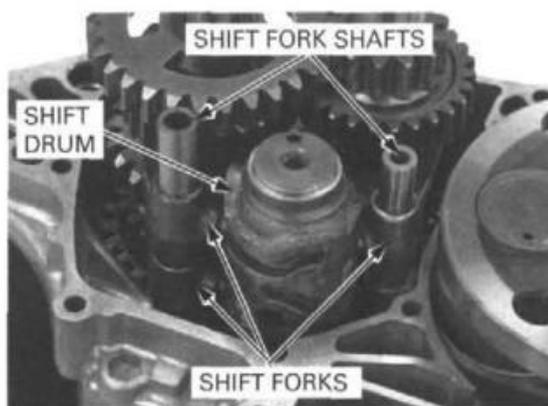
TRANSMISSION

DISASSEMBLY

Separate the crankcase halves (page 16-11).

Pull out the shift fork shafts.

Remove the right shift fork, left shift fork, center shift fork and shift drum.



Remove the mainshaft, countershaft as an assembly from left crankcase.

Disassemble the mainshaft and countershaft.

NOTE:

- Keep track of the disassembled parts (gears, bushings, washers and rings) by sliding them onto a tool or slipping them onto a piece of wire.

Do not expand the snap ring more than necessary for removal.



INSPECTION

Check the gear shifter groove, dogs, dog holes and teeth for abnormal wear or damage.

Measure the I.D. of each gear.

SERVICE LIMITS: M4: 28.05 mm (1.104 in)
M5: 28.06 mm (1.105 in)
C1: 22.07 mm (0.869 in)
C2: 30.07 mm (1.184 in)
C3: 28.07 mm (1.105 in)

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

SERVICE LIMITS: M4, M5: 27.94 mm (1.100 in)
C1: 21.94 mm (0.864 in)
C2: 29.94 mm (1.179 in)
C3: 27.94 mm (1.100 in)

Measure the I.D. of each bushing.

SERVICE LIMITS: M5: 25.06 mm (0.987 in)
C1: 19.06 mm (0.750 in)
C2: 27.06 mm (1.065 in)
C3: 25.06 mm (0.987 in)

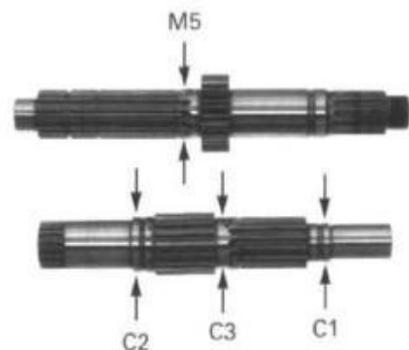
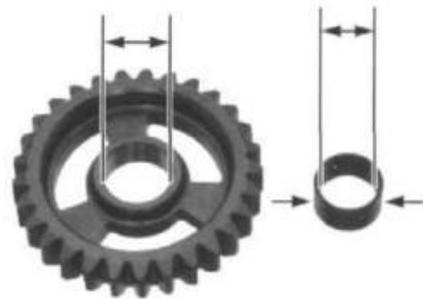
Check the spline grooves and sliding surfaces of the mainshaft and countershaft for abnormal wear or damage.

Measure the O.D. of the mainshaft and countershaft.

SERVICE LIMITS: at M5: 24.95 mm (0.982 in)
at C1: 18.94 mm (0.746 in)
at C2: 26.94 mm (1.061 in)
at C3: 24.94 mm (0.982 in)

Inspect the shift drum journals for scoring, scratches or evidence of insufficient lubrication.

Check the shift drum guide grooves for abnormal wear or damage.



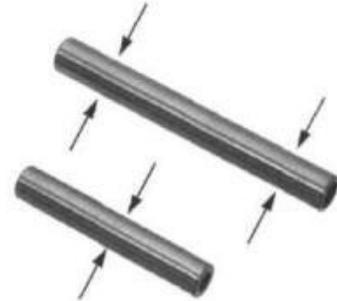
CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER (After '05)

Check the shift fork shafts for abnormal wear or damage.

Measure each shift fork shaft O.D.

SERVICE LIMITS:

Left and right: 11.950 mm (0.4700 in)
Center: 10.969 mm (0.4319 in)



Check the shift forks for abnormal wear or damage.

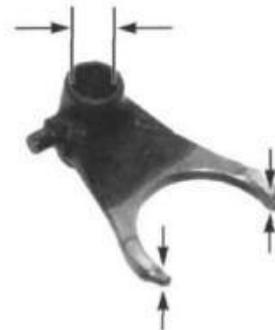
Measure the I.D. of each shift fork.

SERVICE LIMITS:

Left: 12.07 mm (0.475 in)
Right: 12.04 mm (0.474 in)
Center: 11.04 mm (0.435 in)

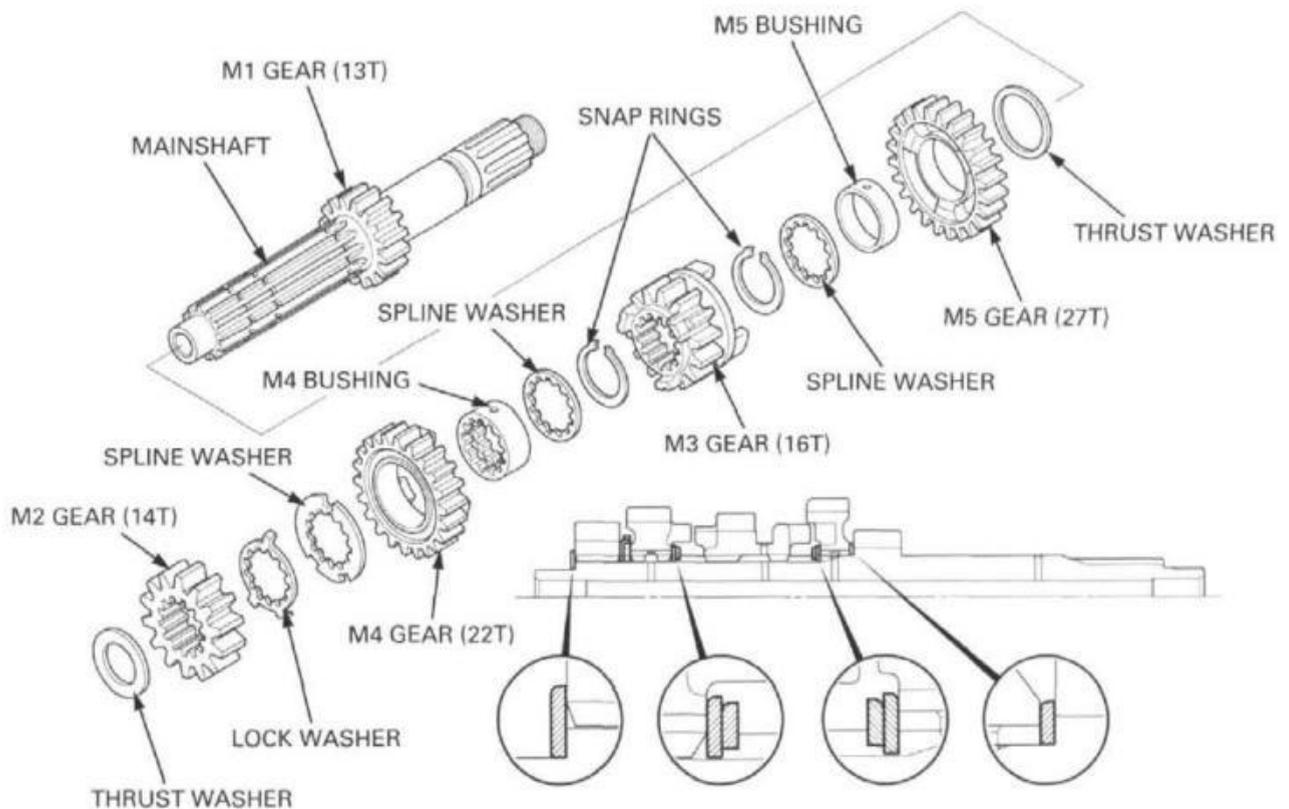
Measure claw thickness of each shift fork.

SERVICE LIMIT: 4.8 mm (0.19 in)

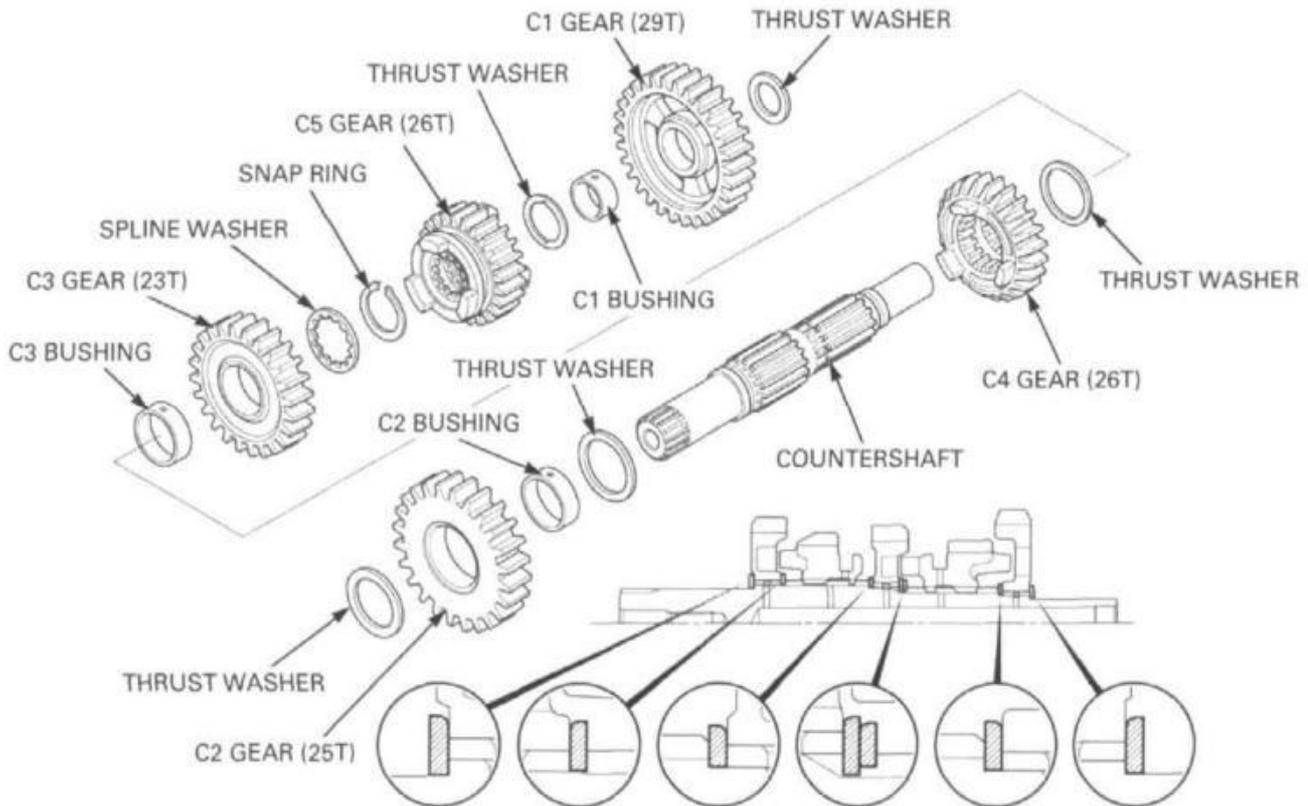


ASSEMBLY

MAINSHAFT



COUNTERSHAFT



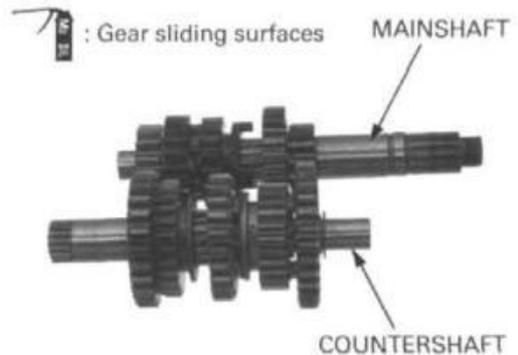
Apply molybdenum oil solution to the sliding surfaces of the transmission gears.

Assemble the mainshaft and countershaft.

NOTE:

- Always install the washer and snap ring with the chamfered (rolled) edge facing away from the thrust load.
- Do not reuse worn snap ring which could easily spin in the groove.
- Install the snap ring so that its end gap aligns with the groove in the splines.
- Make sure that the snap ring is fully seated in the shaft groove after installing it.

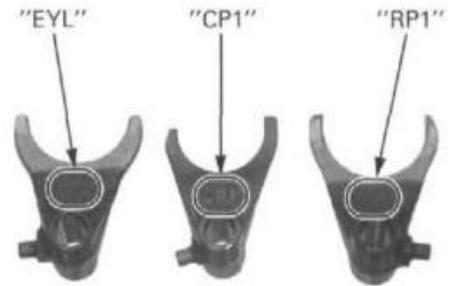
Install the mainshaft and countershaft as an assembly into the left crankcase.



Make sure the shift fork identification marks.
The left shift fork has an "EYL" mark, the center shift fork has a "CP1" mark and the right shift fork has an "RP1" mark.

Face the shift fork marks as follows:

- Left shift fork mark to the left crankcase
- Center and right shift fork marks to the right crankcase

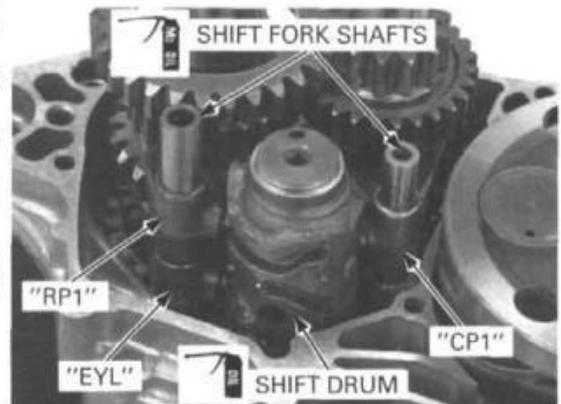


Apply molybdenum oil solution to the claws and guide pins of the left, center and right shift forks.
Install the shift forks to the grooves in the sliding gears.

Apply oil to the shift drum guide grooves and install it into the left crankcase.
Install the shift fork guide pins into the shift drum guide grooves.

Apply molybdenum oil solution to the shift fork shafts and install them through the shift forks and into the left crankcase.

Assemble the crankcase halves (page 16-25).



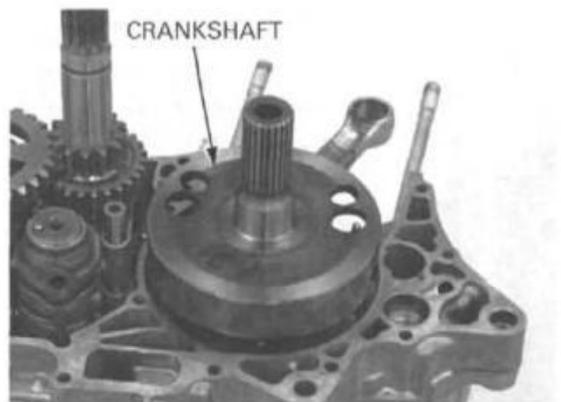
CRANKSHAFT

REMOVAL

Separate the crankcase halves (page 16-11).

Remove the transmission (page 16-13).

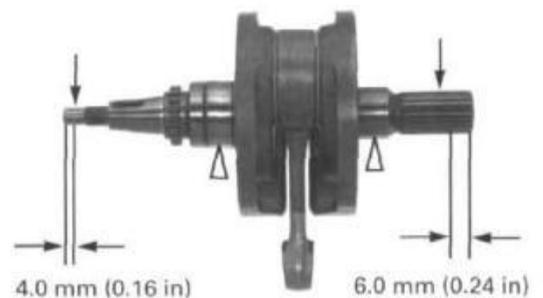
Remove the crankshaft from the left crankcase.



INSPECTION

Set the crankshaft on a stand or V-blocks and measure the runout using a dial indicator.

SERVICE LIMITS: L: 0.05 mm (0.002 in)
R: 0.03 mm (0.001 in)

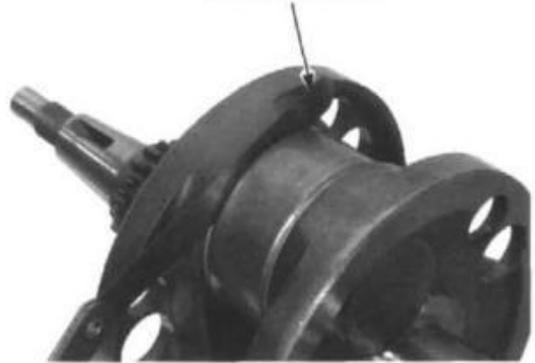


CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER (After '05)

Measure the connecting rod big end side clearance.

SERVICE LIMIT: 0.75 mm (0.030 in)

FEELER GAUGE



Measure the connecting rod big end radial clearance.

SERVICE LIMIT: 0.05 mm (0.002 in)



INSTALLATION

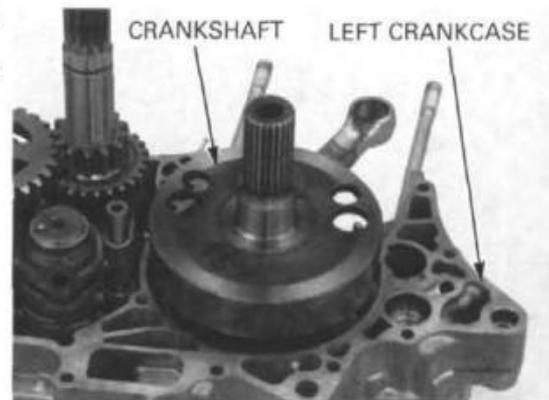
Coat the oil seal contacting surface of the crankshaft with oil.

Apply grease to a new crankshaft oil seal lip and install it into the left crankcase.

Install the crankshaft into the left crankcase.

Install the transmission (page 16-15).

Assemble the crankcase halves (page 16-25).

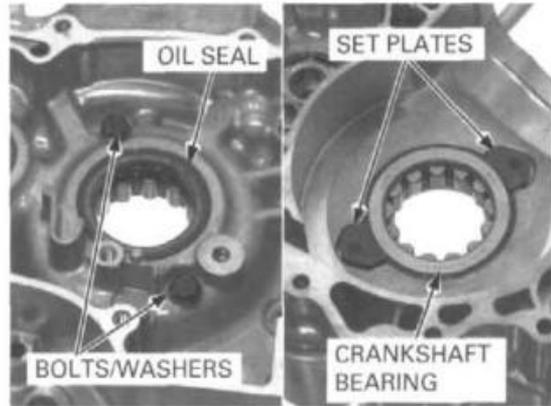


LEFT CRANKCASE BEARING REPLACEMENT

Remove the crankshaft oil seal.

Remove the set plate bolts, washers and set plates from the left crankcase.

Drive the crankshaft bearing out of the left crankcase.

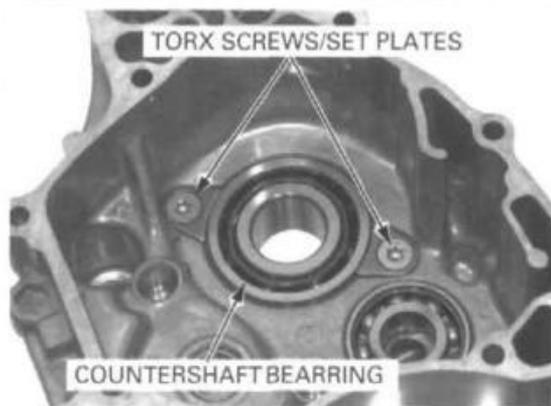


Remove the countershaft and balancer shaft oil seals.

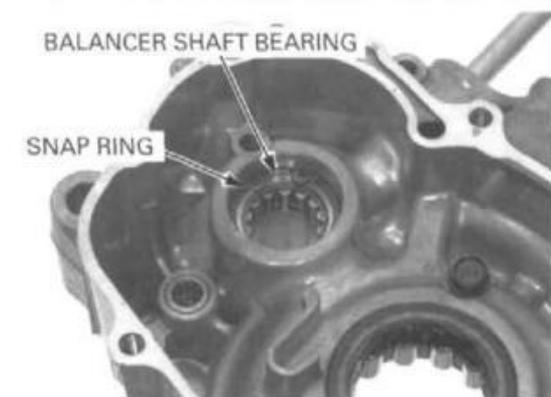


Remove the torx screws and countershaft bearing set plates.

Drive the countershaft bearing out of the left crankcase.

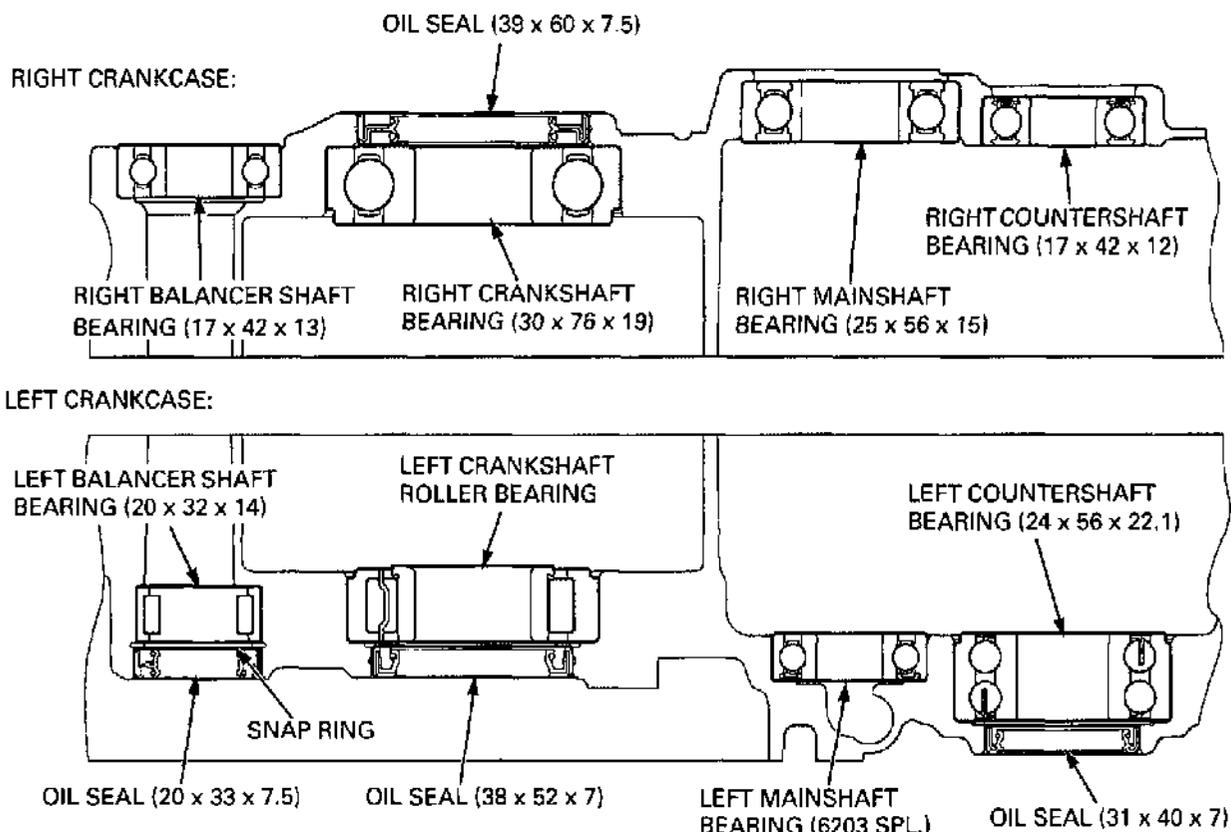


Remove the snap ring from left crankcase.



CRANKCASE BEARING

CRANKCASE BEARING/OIL SEAL LOCATION

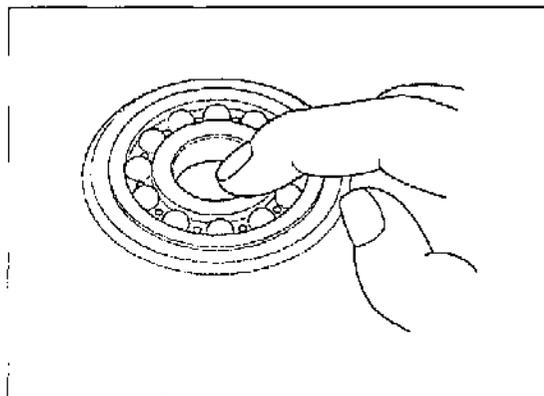


INSPECTION

Remove the crankshaft (page 16-17).

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

Replace any bearing if the inner race does not turn smoothly, quietly or if the outer race fits loosely in the crankcase.



CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER (After '05)

Remove the mainshaft bearing and balancer shaft bearing using the special tools.

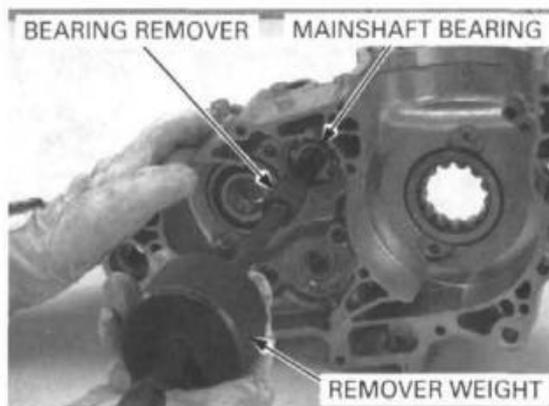
TOOLS:

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:

Bearing remover, 20 mm	07936-3710600
Remover handle	07936-3710100
Remover weight	07741-0010201 or 07936-3710200 or 07936-371020A (U.S.A. only)



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

Drive new bearings into the left crankcase with the markings facing up, using the special tools.

TOOLS:

Crankshaft bearing:

Driver	07749-0010000
Attachment, 62 x 68 mm	07746-0010500

Countershaft bearing:

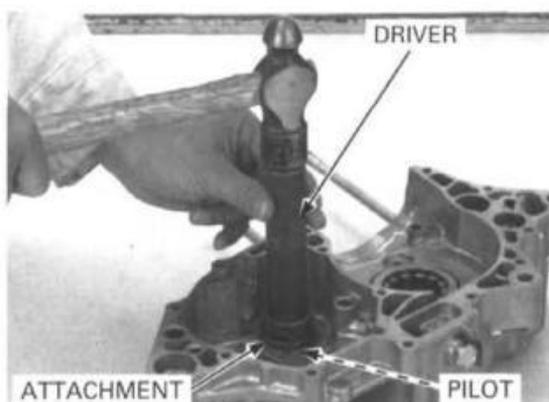
Driver	07749-0010000
Attachment, 52 x 55 mm	07746-0010400

Mainshaft bearing:

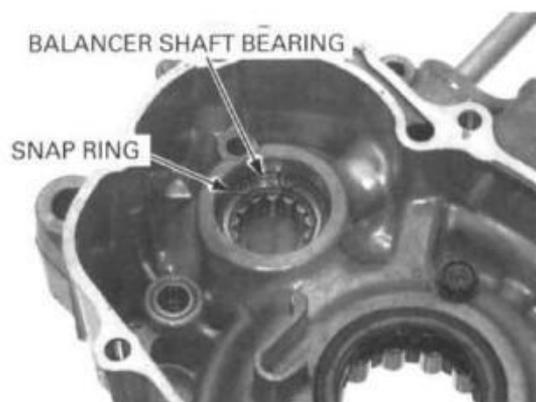
Driver	07749-0010000
Attachment, 37 x 40 mm	07746-0010200
Pilot, 17 mm	07746-0040400

Balancer shaft bearing:

Driver	07749-0010000
Attachment, 32 x 35 mm	07746-0010100
Pilot, 20 mm	07746-0040500



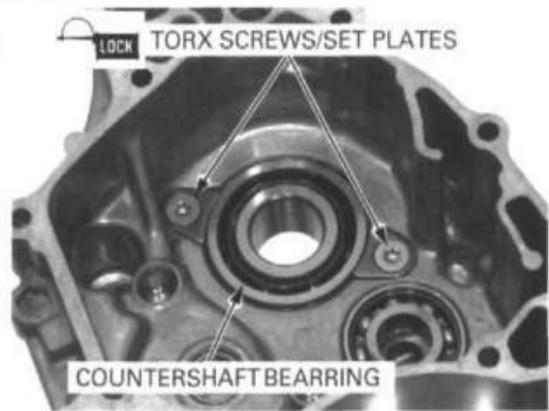
Install the snap ring into the left crankcase securely.



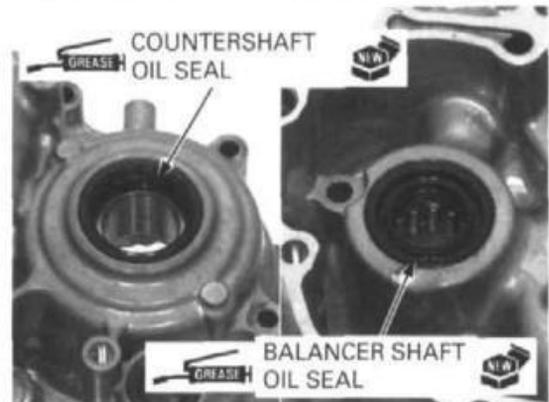
CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER (After '05)

Apply locking agent to the torx screw threads.
Install the countershaft bearing set plates and
tighten the torx screws to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



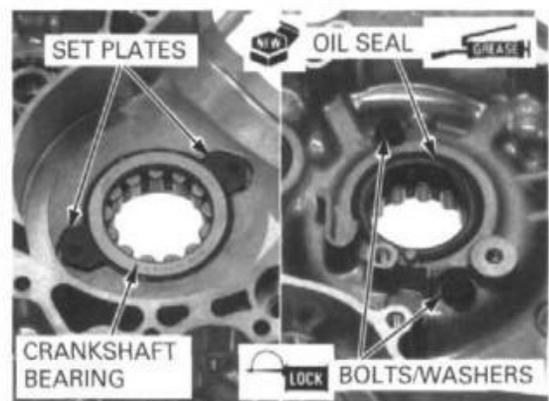
Apply grease to a new countershaft and balancer shaft oil seal lips.
Install the oil seals to the crankcase until it is flush
with the crankcase surface.



Apply a locking agent to the set plate bolt threads.
Install the set plates, washers and bolts to the left
crankcase.
Tighten the set plate bolts to the specified torque.

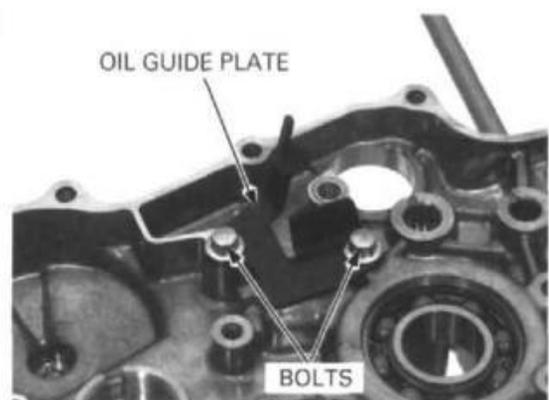
TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)

Apply grease to a new crankshaft oil seal lip.
Install the oil seal to the crankcase until it is flush
with the crankcase surface.



RIGHT CRANKCASE

Remove the bolts and oil guide plate from the right
crankcase.

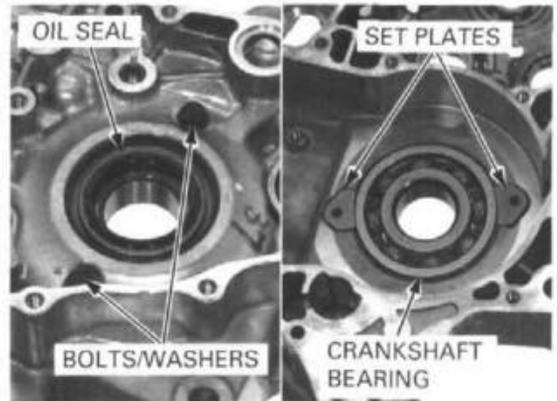


CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER (After '05)

Remove the crankshaft oil seal.

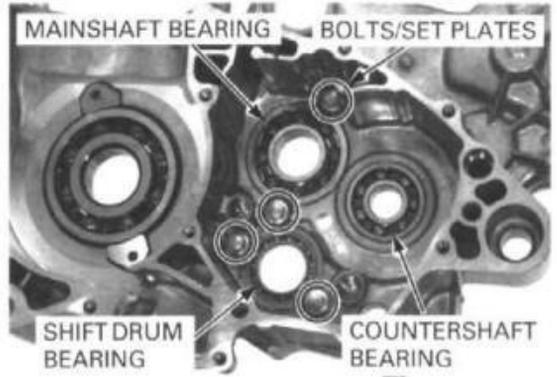
Remove the set plate bolts, washers and set plates from the right crankcase.

Drive the crankshaft bearing out of the right crankcase.



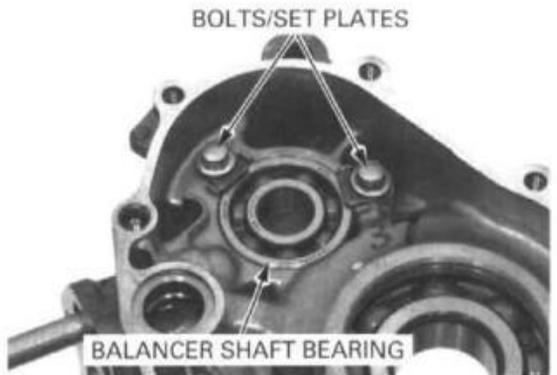
Remove the bolts and set plates.

Drive the countershaft bearing, mainshaft bearing and shift drum bearing out of the right crankcase.



Remove the bolts and set plates.

Drive the balancer shaft bearing out of the right crankcase.



CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER (After '05)

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

Drive in new bearings into the right crankcase using the special tools.

TOOLS:

Crankshaft bearing:

Driver	07749-0010000
Attachment, 72 x 75 mm	07746-0010600
Pilot, 30 mm	07746-0040700

Countershaft bearing:

Driver	07749-0010000
Attachment, 42 x 47 mm	07746-0010300
Pilot, 17 mm	07746-0040400

Mainshaft bearing:

Driver	07749-0010000
Attachment, 52 x 55 mm	07746-0010400
Pilot, 25 mm	07746-0040600

Shift drum bearing:

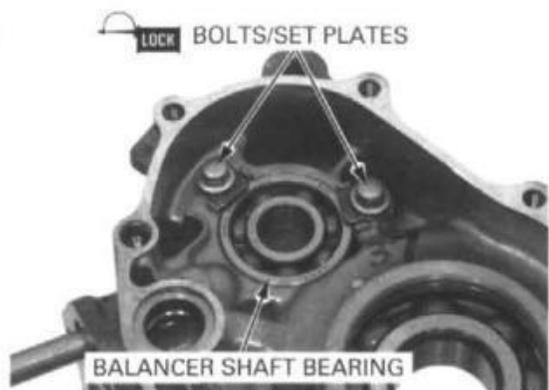
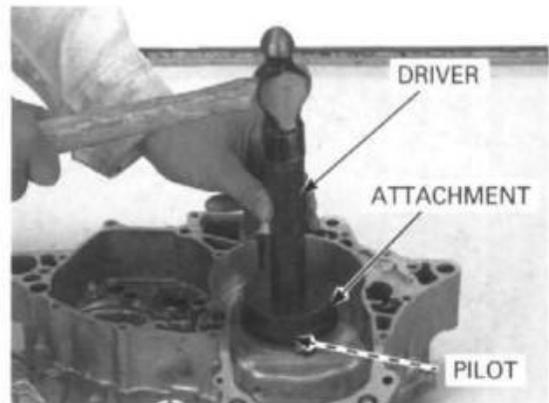
Driver	07749-0010000
Attachment, 42 x 47 mm	07746-0010300
Pilot, 25 mm	07746-0040600

Balancer shaft bearing:

Driver	07749-0010000
Attachment, 42 x 47 mm	07746-0010300
Pilot, 17 mm	07746-0040400

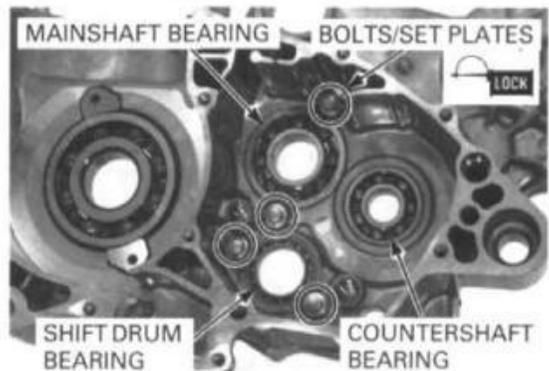
Apply locking agent to the set plate bolt threads. Install the balancer shaft bearing set plates and tighten the bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Apply locking agent to the set plate bolt threads. Install the mainshaft and shift drum bearing set plates, and tighten the bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

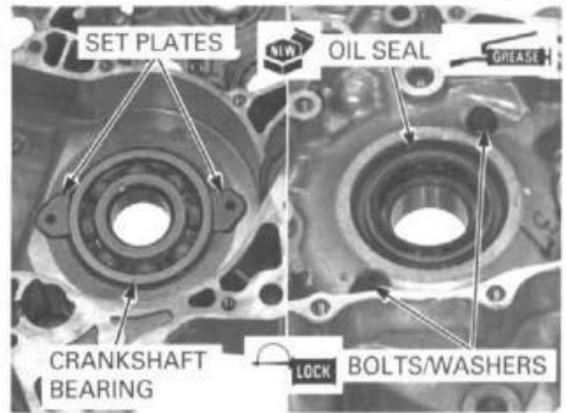


Apply a locking agent to the set plate bolt threads.
Install the set plates, washer and bolts to the right crankcase.

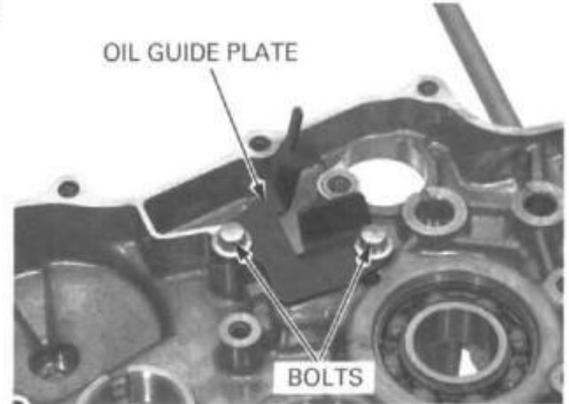
Tighten the set plate bolts to the specified torque.

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)

Apply grease to a new crankshaft oil seal lip.
Install the oil seal to the crankcase until it is flush with the crankcase surface.

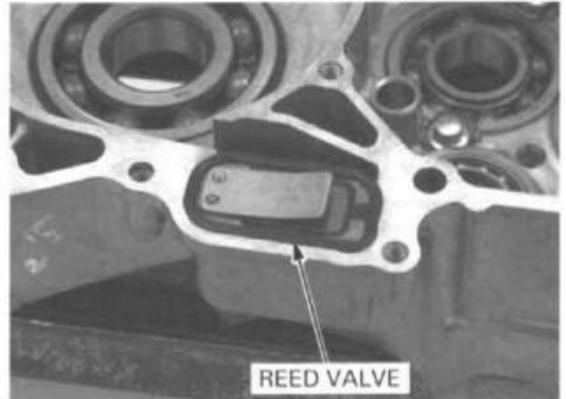


Install the oil guide plate to the right crankcase and tighten the bolts.



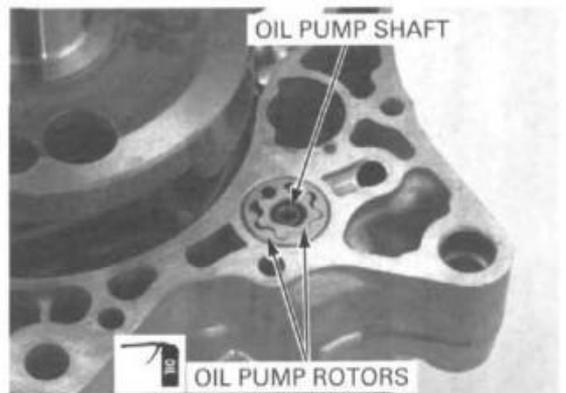
CRANKCASE ASSEMBLY

Install the reed valve into the right crankcase.



Dip oil pump inner and outer rotors in clean engine oil.

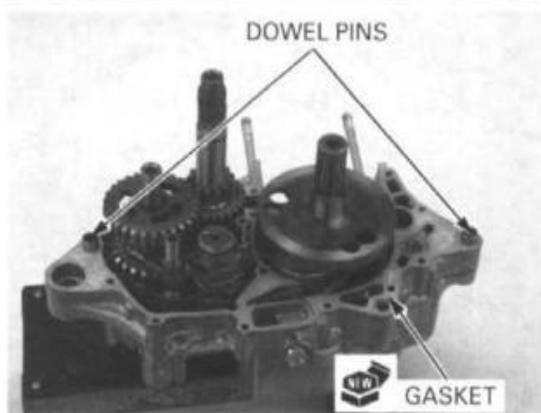
Install the oil pump shaft, inner and outer rotors into the left crankcase.



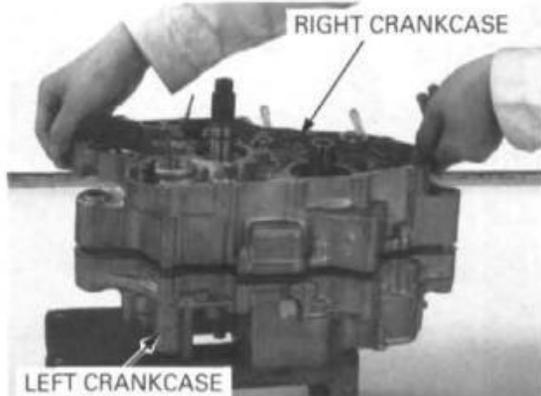
CRANKCASE/TRANSMISSION/CRANKSHAFT/BALANCER (After '05)

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

Coat the oil seal contacting surface of the crankshaft with oil.



Install the right crankcase onto the left crankcase.



Apply locking agent to the crankcase bolt threads.
Install the crankcase bolts and washers.

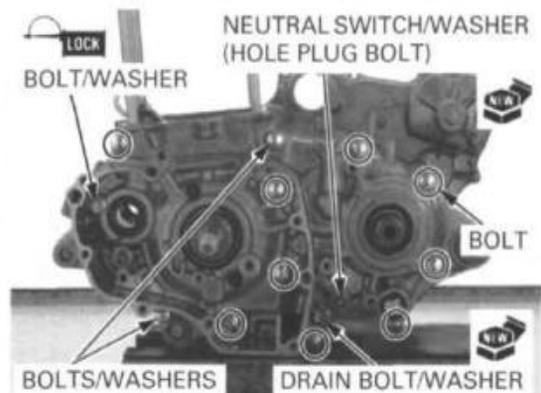
Tighten the bolts in a crisscross pattern in 2 or 3 steps.

Apply oil to the drain bolt threads and seating surface.

Install a new washer and tighten the drain bolt to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Carefully trim the protruding gasket material from the cylinder gasket surface.



NOTICE

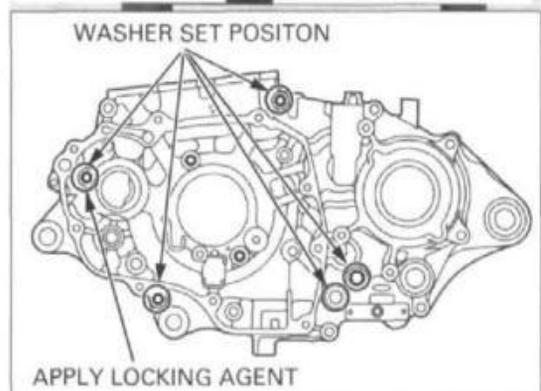
- Do not let the gasket material fall into the crankcase.
- Do not damage the cylinder gasket surface.

TRX450ER: Install a new washer and tighten the neutral switch to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

TRX450R: Install a new washer and tighten the neutral switch hole plug bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Coat the countershaft seal ring with grease and install the countershaft collar onto the countershaft.



Apply locking agent to the cam chain tensioner bolt threads.

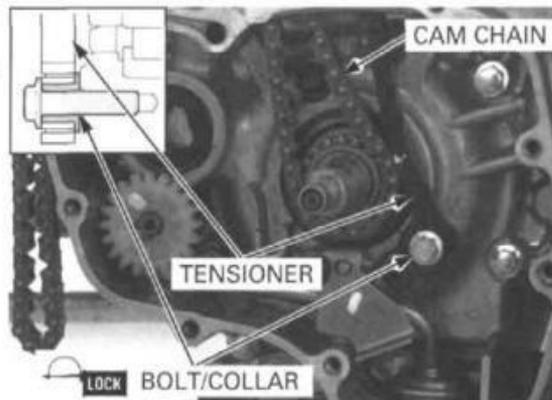
Install the cam chain tensioner and collar, and tighten the bolt.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

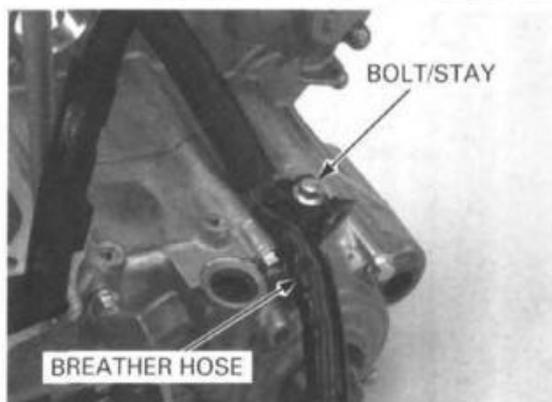
Install the cam chain.

Install the following:

- oil strainer (page 6-6)
- oil pump driven gear/drive pin (page 6-6)



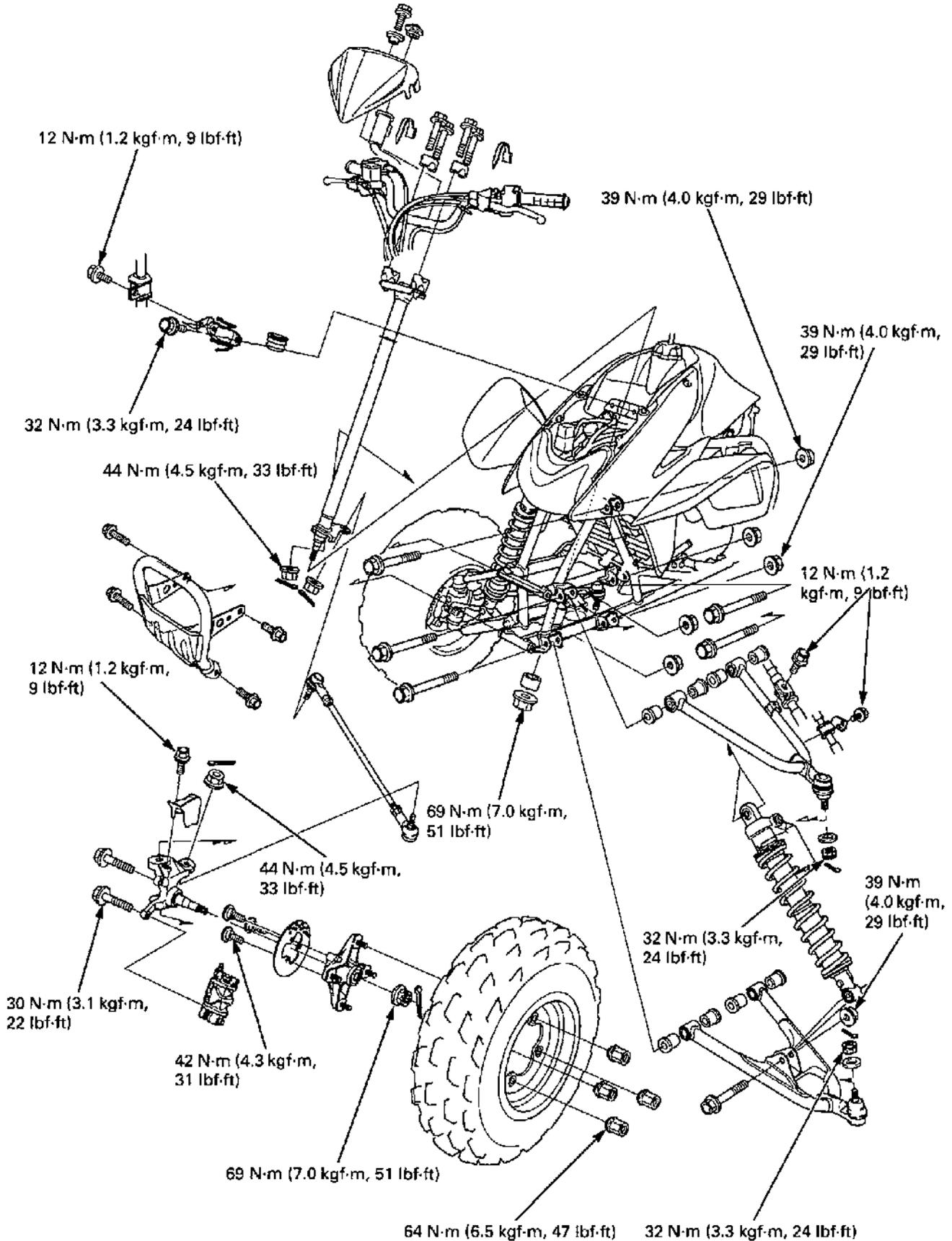
- breather hoses
- drive sprocket (page 10-9)
- kickstarter (TRX450R) (page 14-23)
- starter motor (TRX450ER) (page 23-12)
- balancer shaft (page 16-8)
- flywheel (page 21-12)
- gearshift linkage (page 14-26)
- starter clutch (TRX450ER) (page 14-19)
- clutch assembly (page 14-11)
- cylinder, piston (page 12-10)
- cylinder head (page 11-24)
- engine (page 10-9)



17. FRONT WHEEL/SUSPENSION/STEERING

SYSTEM COMPONENTS	17-2	TIRES.....	17-11
SERVICE INFORMATION	17-3	FRONT WHEEL HUB	17-15
TROUBLESHOOTING	17-5	FRONT SHOCK ABSORBER.....	17-17
HANDLEBAR	17-6	SUSPENSION ARM.....	17-19
THROTTLE HOUSING	17-9	STEERING SHAFT	17-24
FRONT WHEEL	17-11	TIE-ROD.....	17-30

FRONT WHEEL/SUSPENSION/STEERING SYSTEM COMPONENTS



SERVICE INFORMATION

GENERAL

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- A jack or other support is required to support the vehicle.
- Adjust toe whenever the tie-rod, knuckle or steering shaft are replaced or removed (page 4-33).
- Do not twist or bend the brake hose and pipe when servicing.
- Use genuine Honda replacement bolts and nuts for all suspension pivots and mounting points.
- For brake system information (page 19-2).
- For handlebar switch inspection ('04 - '05: page 20-19, After '05: page 24-7).

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		-	4.0 (0.16)
Cold tire pressure ('04 - '05)	Standard	27.5 kPa (0.275 kgf/cm ² , 4.0 psi)	-
	Minimum	23.5 kPa (0.235 kgf/cm ² , 3.4psi)	-
	Maximum	31.5 kPa (0.315 kgf/cm ² , 4.6 psi)	-
Cold tire pressure (After '05)	Standard	27.5 kPa (0.275 kgf/cm ² , 4.0 psi)	-
	Minimum	25.0 kPa (0.250 kgf/cm ² , 3.6psi)	-
	Maximum	30.0 kPa (0.300 kgf/cm ² , 4.4 psi)	-
Compression damping adjuster standard position	'04 - '05	1-7/8 turns out from full in	-
	After '05	1/2 ± 1/8 turns out from full in	-
Rebound damping adjuster standard position	'04 - '05	1-3/8 turns out from full in	-
	After '05	7/8 ± 1/8 turns out from full in	-
Tie-rod distance between the ball joints	'04 - '05	409.5 (16.12)	-
	After '05	398.0 (15.67)	-
Toe	'04 - '05	Toe-in: 11.4 ± 15 (0.45 ± 0.6)	-
	After '05	Toe-in: 14 ± 15 (0.6 ± 0.6)	-

TORQUE VALUES

Handlebar grip end bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Throttle housing cover screw ('04 - '05)	4 N·m (0.4 kgf·m, 2.9 lbf·ft)
Throttle housing cover screw (After '05)	3.4 N·m (0.4 kgf·m, 2.5 lbf·ft)
Throttle lever switch screw (After '05)	1 N·m (0.1 kgf·m, 0.7 lbf·ft)
Handlebar switch housing screw	2 N·m (0.2 kgf·m, 1.4 lbf·ft)
Clutch lever pivot bolt	1 N·m (0.1 kgf·m, 0.7 lbf·ft)
Clutch lever pivot nut	5.9 N·m (0.6 kgf·m, 4.3 lbf·ft)
Parking brake lever pivot screw ('04 - '05)	9 N·m (0.9 kgf·m, 6.5 lbf·ft)
Parking brake lever pivot screw (After '05)	9 N·m (0.9 kgf·m, 6.5 lbf·ft)
Front wheel nut	64 N·m (6.5 kgf·m, 47 lbf·ft)
Front wheel hub nut	69 N·m (7.0 kgf·m, 51 lbf·ft)
Front brake disc bolt	42 N·m (4.3 kgf·m, 31 lbf·ft)
Front brake disc cover bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Caliper bracket mounting bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)
Shock absorber mounting nut	39 N·m (4.0 kgf·m, 29 lbf·ft)
Front brake hose clamp bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Upper and lower arm pivot nut	39 N·m (4.0 kgf·m, 29 lbf·ft)
Upper and lower arm ball joint nut	32 N·m (3.3 kgf·m, 24 lbf·ft)
Tie-rod ball joint nut	44 N·m (4.5 kgf·m, 33 lbf·ft)
Handlebar lower holder nut	39 N·m (4.0 kgf·m, 29 lbf·ft)
Steering shaft end nut	69 N·m (7.0 kgf·m, 51 lbf·ft)
Steering shaft holder bolt	32 N·m (3.3 kgf·m, 24 lbf·ft)

Apply locking agent to the threads.

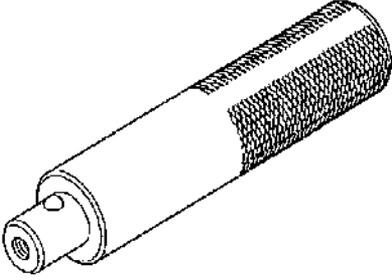
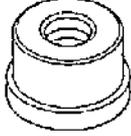
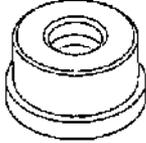
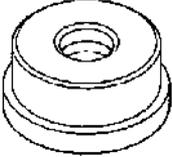
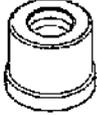
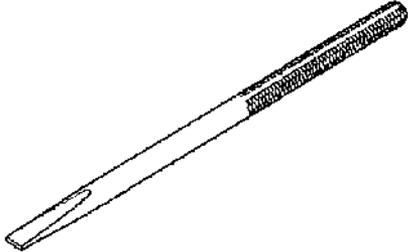
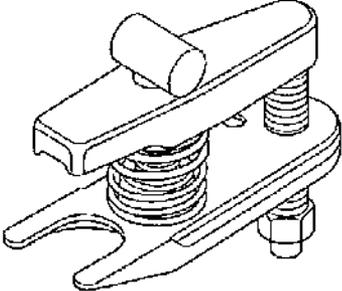
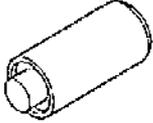
Castle nut: tighten to the specified torque and further tighten until its grooves aligns with the cotter pin hole.
ALOC bolt: replace with a new one.
ALOC bolt: replace with a new one.
ALOC bolt: replace with a new one.

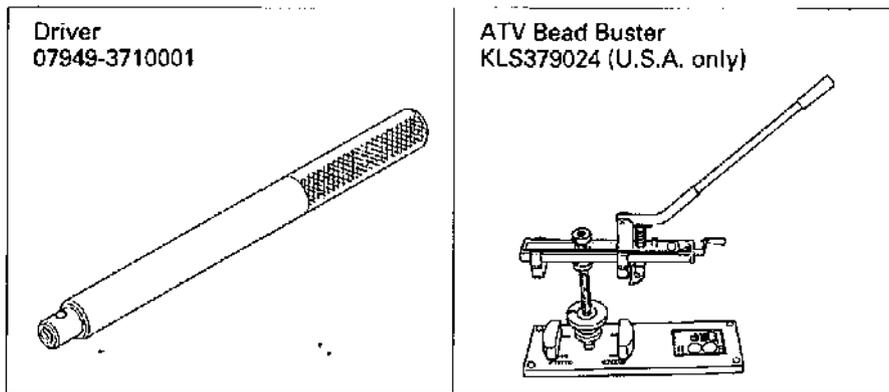
ALOC bolt: replace with a new one.

Castle nut: tighten to the specified torque and further tighten until its grooves aligns with the cotter pin hole.

FRONT WHEEL/SUSPENSION/STEERING

TOOLS

<p>Driver 07749-0010000</p> 	<p>Attachment, 32 x 35 mm 07746-0010100</p> 	<p>Attachment, 37 x 40 mm 07746-0010200</p> 
<p>Attachment, 42 x 47 mm 07746-0010300</p> 	<p>Attachment, 24 x 26 mm 07746-0010700</p> 	<p>Pilot, 15 mm 07746-0040300</p> 
<p>Pilot, 17 mm 07746-0040400</p> 	<p>Pilot, 20 mm 07746-0040500</p> 	<p>Bearing remover shaft 07746-0050100</p> 
<p>Bearing remover head, 15 mm 07746-0050400</p> 	<p>Ball joint remover, 28 mm 07MAC-SL00200</p> 	<p>Spherical bearing driver 07HMF-HC00100</p> 



TROUBLESHOOTING

Hard steering

- Steering shaft holder too tight
- Damaged steering shaft bearing/bushing
- Insufficient tire pressure

Steers to one side or does not track straight

- Incorrect wheel alignment
- Unequal tire pressure
- Bent tie-rod, suspension arm or frame
- Worn or damaged wheel hub bearing
- Weak shock absorber

Front wheel wobbling

- Bent rim
- Worn or damaged wheel hub bearing
- Faulty tire
- Loose wheel hub nut

Soft suspension

- Weak shock absorber spring
- Faulty shock absorber damper

Stiff suspension

- Bent shock absorber damper rod
- Improperly installed suspension arms
- Faulty suspension arm spherical bearings

Front suspension noise

- Binding suspension link
- Loose front suspension fasteners

HANDLEBAR

REMOVAL

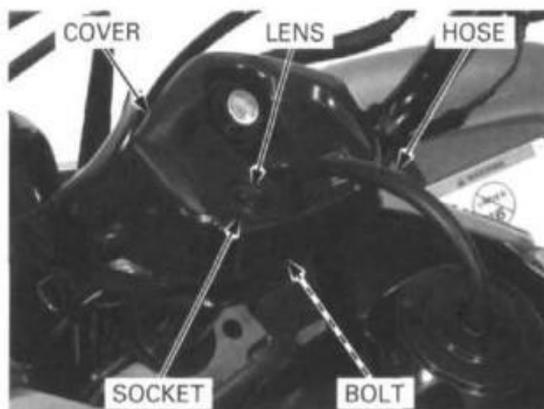
Remove the fuel tank breather hose from the steering shaft.

Be careful not to let the bolt fall into the steering shaft.

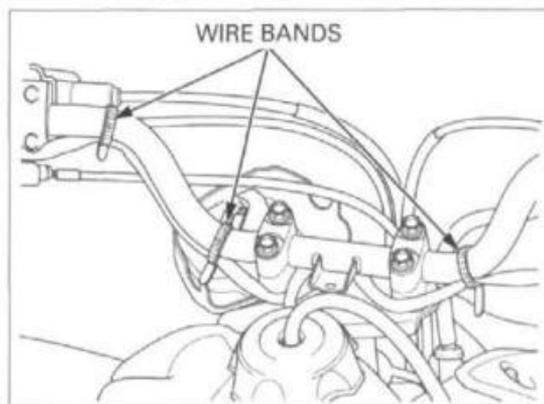
Remove the handlebar cover attaching bolt. Remove the coolant temperature indicator lens and neutral indicator lens (TRX450ER only) from the socket, then remove the socket from the handlebar cover.

Remove the following:

- handlebar cover from the handlebar

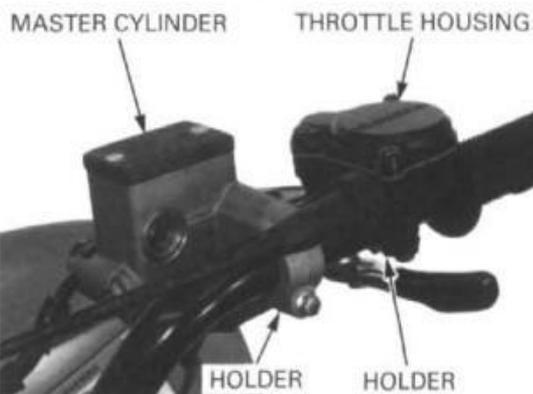


- three wire bands

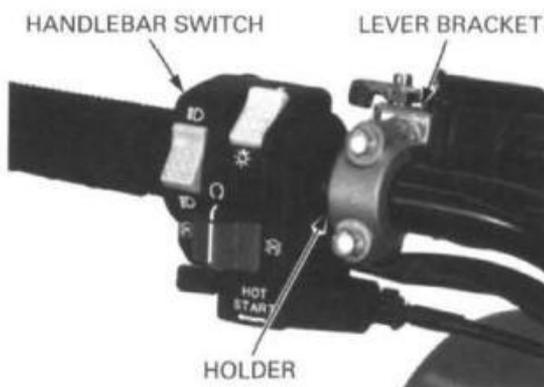


Keep the master cylinder upright to prevent air from entering the hydraulic system.

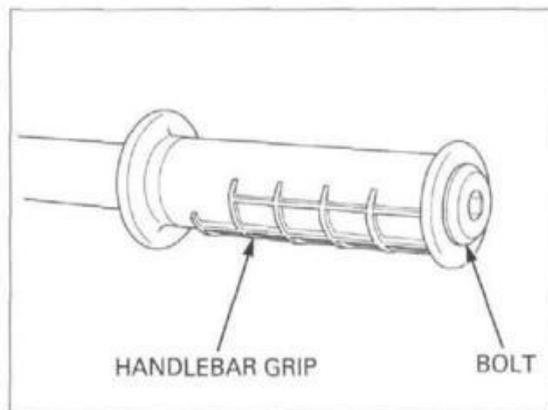
- two screws
- throttle housing holder
- throttle housing
- connectors
- two bolts
- master cylinder holder
- front brake master cylinder



- two bolts
- bracket holder
- clutch lever bracket
- two screws
- handlebar switch



- grip end bolts
- handlebar grips

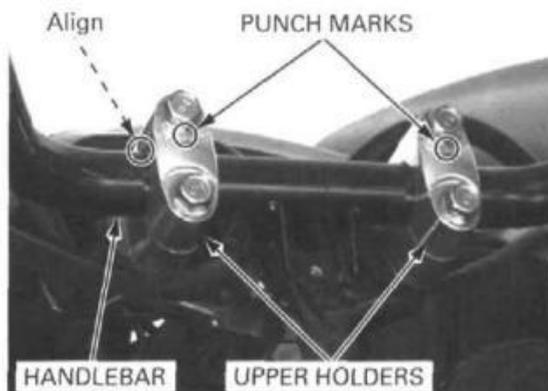


- four bolts
- upper holders
- handlebar

INSTALLATION

Align the punch mark on the handlebar with the top edge of the lower holder.

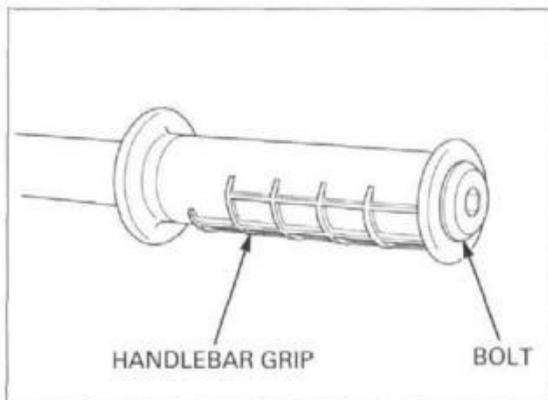
Install the handlebar and upper holders with the punch marks facing forward. Tighten the front bolts first, then tighten the rear bolts.



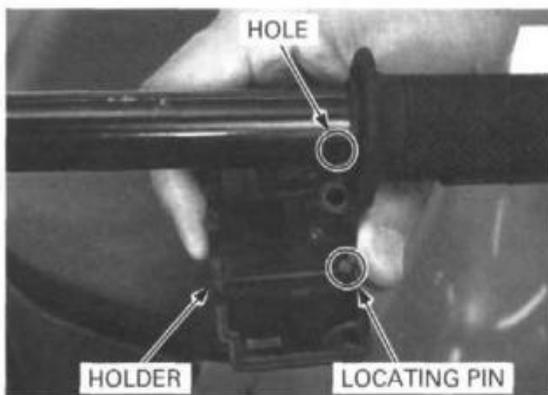
Apply Honda Bond A, Pro Honda Hand Grip Cement or equivalent to the inside surface of each handlebar grip and to the clean surfaces of the handlebar. Wait 3 - 5 minutes and install the grips. Rotate the grips for even application of the adhesive.

Install the grip end bolts and tighten them.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



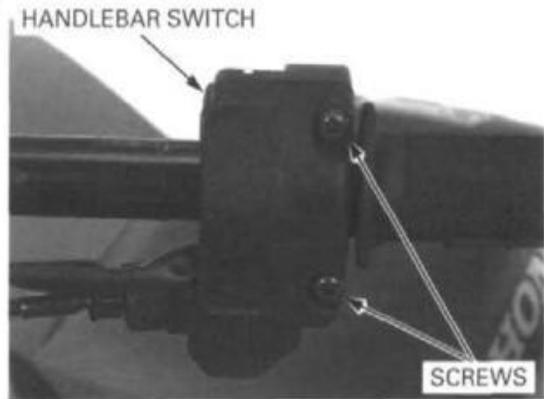
Install the handlebar switch holder by aligning the locating pin with the hole in the handlebar.



FRONT WHEEL/SUSPENSION/STEERING

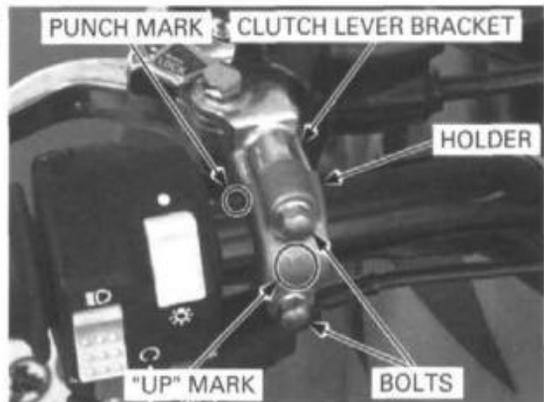
Install the handlebar switch onto the handlebar and holder, and tighten the upper screw first, then tighten the lower screw.

TORQUE: 2 N·m (0.2 kgf·m, 1.4 lbf·ft)



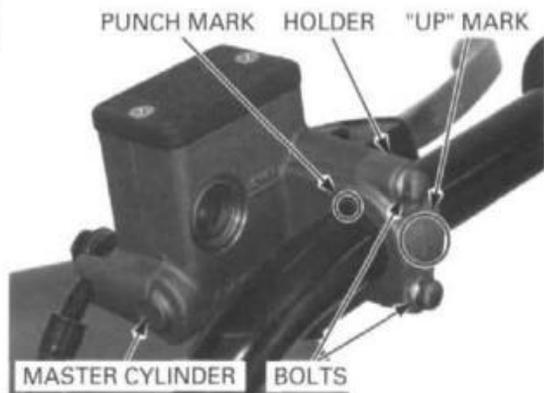
Align the edge of the clutch lever bracket with the punch mark on the handlebar.

Install the clutch lever bracket and holder with the "UP" mark facing up. Tighten the upper bolt first, then tighten the lower bolt.



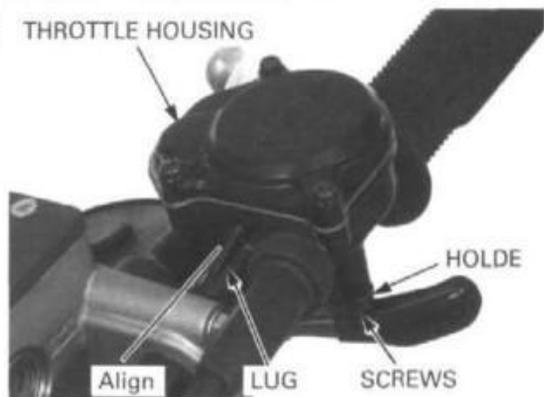
Align the edge of the master cylinder with the punch mark on the handlebar.

Install the front brake master cylinder and holder with the "UP" mark facing up. Tighten the upper bolt first, then tighten the lower bolt.

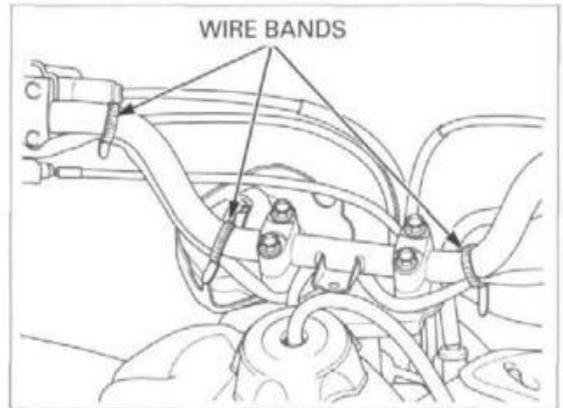


Align the lug on the throttle housing with the mating line of the master cylinder.

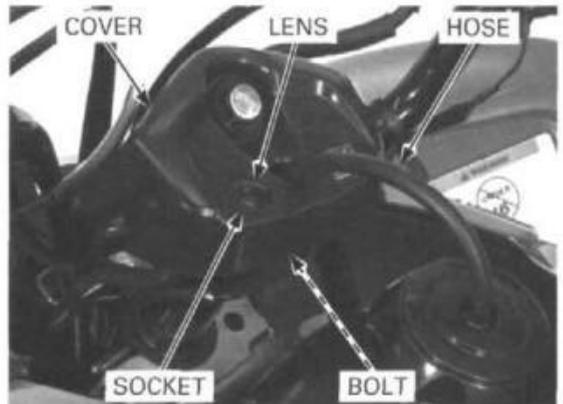
Install the throttle housing and holder against the master cylinder. Tighten the front screw first, then tighten the rear screw.



Secure the switch wires with the three wire bands.



Install the handlebar cover onto the handlebar.
 Install the coolant temperature indicator socket and neutral indicator socket (TRX450ER only) into the handlebar cover.
 Install the indicator lens into the socket and set the socket into the cover.
 Install the handlebar cover attaching bolt.
 Insert the fuel tank breather hose into the steering shaft.

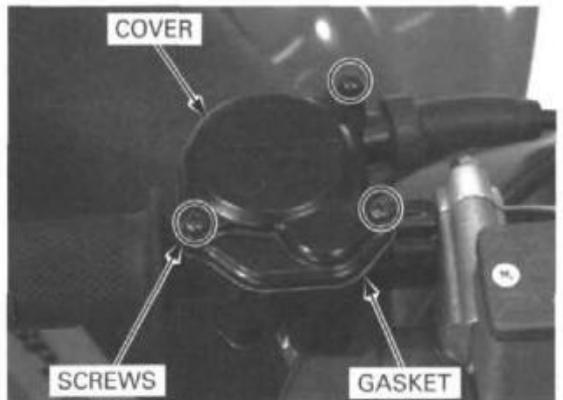


THROTTLE HOUSING

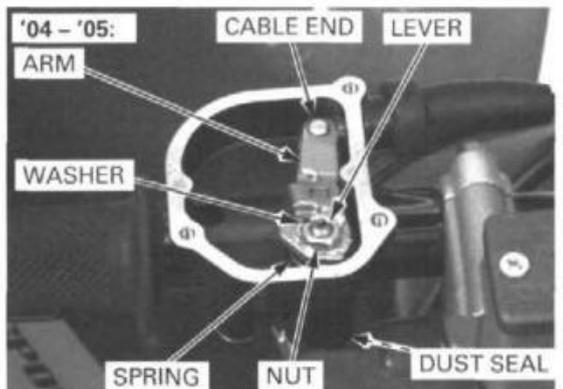
DISASSEMBLY

Remove the following:

- three screws
- throttle housing cover
- gasket



- '04 - '05: Bend down the lock washer tab.
 Remove the nut and lock washer.
 Pull the throttle lever out of the throttle arm and housing.
 Remove the plastic washer.
 Disconnect the throttle cable end from the throttle arm and remove the throttle arm and return spring.
 Remove the dust seal from the throttle housing.



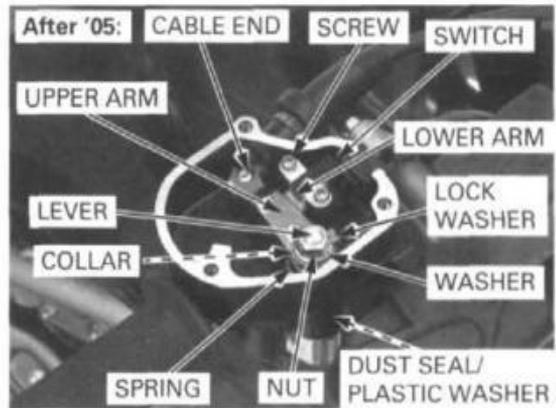
FRONT WHEEL/SUSPENSION/STEERING

After '05: Bend down the lock washer tab.
Remove the nut, lock washer and washer.

Disconnect the throttle cable end from the throttle upper arm and remove the throttle upper arm, collar, throttle lower arm and return spring.

Pull the throttle lever out of the throttle housing.
Remove the plastic washer.
Remove the dust seal from the throttle housing.

Remove the mounting screws and throttle lever switch assembly.



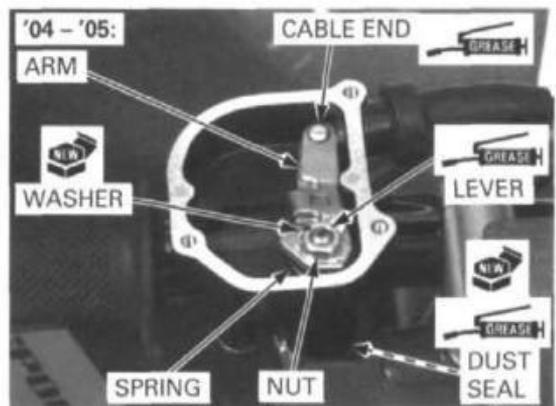
ASSEMBLY

'04 - '05: Apply grease to a new dust seal lip and install it into the throttle housing.

Apply grease to the throttle cable end and connect it to the throttle arm.
Install the return spring onto the throttle arm.

Install the plastic washer onto the throttle lever.
Apply grease to the throttle lever pivot and insert it into the throttle housing and throttle arm.

Install a new lock washer and the nut, and tighten the nut.
Bend the lock washer tab against the nut.

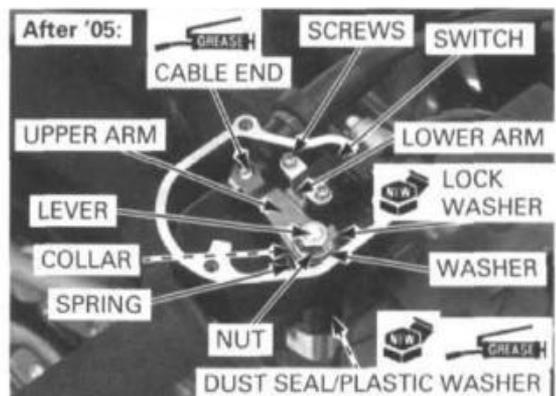


After '05: Apply grease to a new dust seal lip and install it into the throttle housing.

Install the plastic washer onto the throttle lever.
Insert the throttle lever into throttle housing.

Install the return spring onto the throttle lower arm.
Install the throttle lower arm, collar and throttle upper arm.

Apply grease to the throttle cable end and connect it to the throttle upper arm.

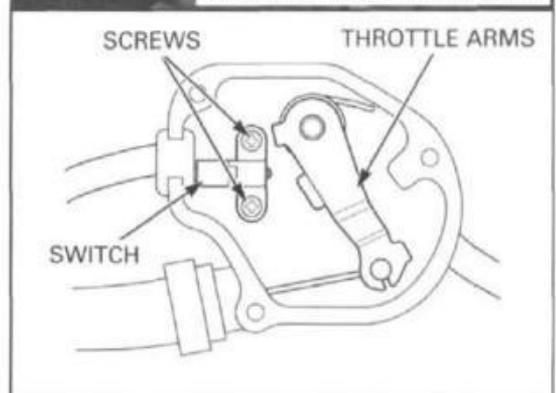


Be careful not to damage the throttle lever switch.

Install throttle lever switch assembly and tighten the mounting screws while holding the throttle arms at the full open as shown.

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

Install the washer, a new lock washer and the nut, and tighten the nut.
Bend the lock washer tab against the nut.

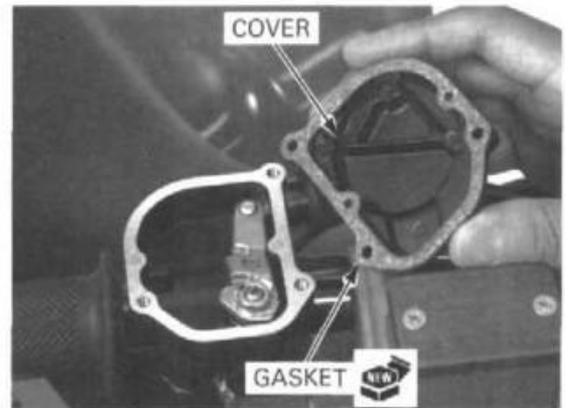


Install the throttle housing cover with a new gasket and tighten the three screws.

'04 - '05: **TORQUE: 4 N·m (0.4 kgf·m, 2.9 lbf·ft)**

After '05: **TORQUE: 3.4 N·m (0.4 kgf·m, 2.5 lbf·ft)**

Adjust the throttle lever free play (page 4-6).



FRONT WHEEL

REMOVAL

Loosen the wheel nuts.

Support the vehicle using a hoist or equivalent and raise the front wheels off the ground.

Remove the wheel nuts and front wheel.

INSTALLATION

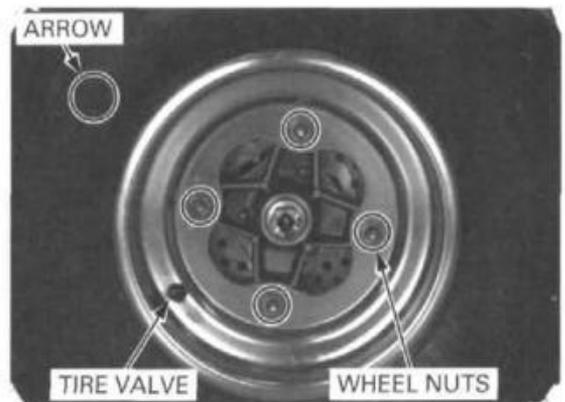
NOTE:

- Do not interchange the left and right tires.

Install the front wheel with the tire valve facing out and the arrow mark facing in the normal rotating direction.

Install the wheel nuts with the tapered side facing inward and tighten them.

TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)



TIRES

REMOVAL

NOTE:

- This service requires the ATV Bead Buster (KLS379024).
- Remove and install the tire from the rim side opposite the valve stem.

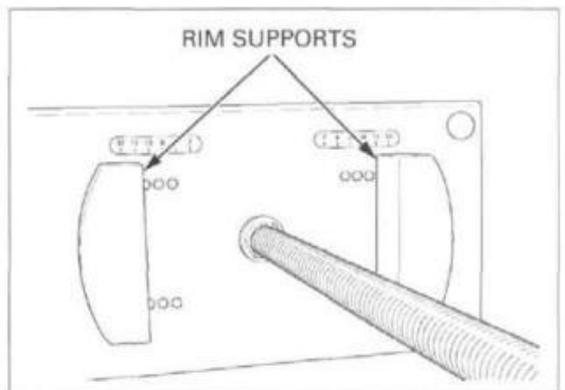
Remove the core from the valve stem.

Use a pneumatic tire changer or equivalent to remove the tire from the rim. If a tire changer is not available, rim protectors and tire irons may be used.

Adjust the bottom rim supports to the proper rim size. Align the flat side of the support with the corresponding rim size indicator.

Lube the bead area of the tire with water, pressing down on the tire sidewall/bead area in several places to allow the water to run into and around the bead.

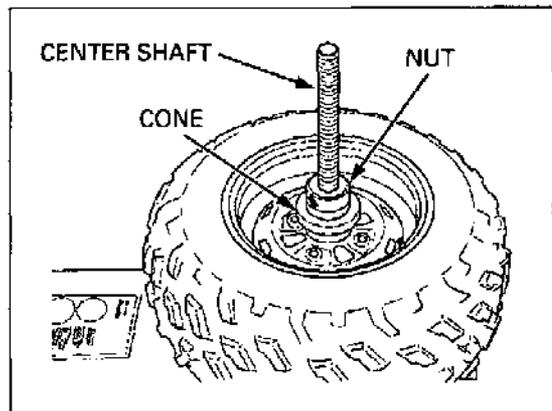
Use only water as a lubricant when removing or mounting tires. Soap or some mounting lubricants may leave a slippery residue which can cause the tire to shift on the rim and lose tire pressure during riding.



FRONT WHEEL/SUSPENSION/STEERING

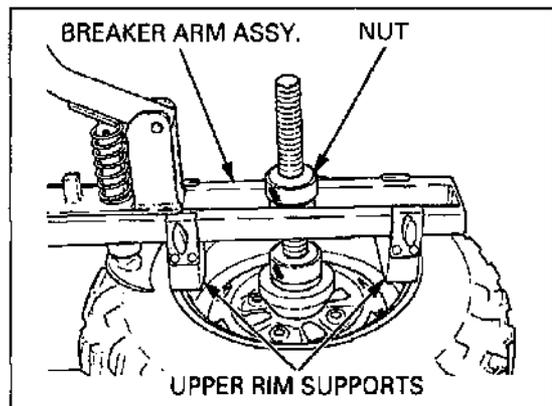
Place the wheel assembly over the center shaft and use the correct size cone to keep the wheel centered during operation.

Install the bottom hold down nut, bearing side down, and finger tighten it so the wheel can rotate freely during operation.



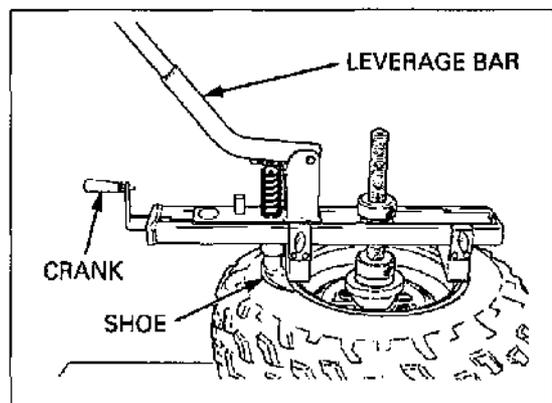
Install the breaker arm assembly over the center shaft and adjust the upper rim supports to fit the outside rim diameter.

Install the top hold down nut and tighten it finger tight.



Failure to back out the breaker shoe two turns will cause the shoe to scratch the bead lock, which may cause the tire to leak.

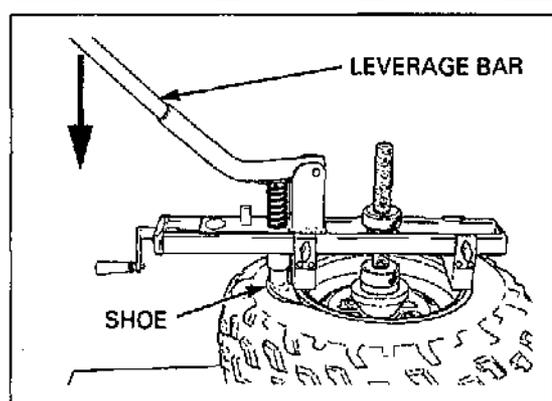
Pull the leverage bar down so the breaker shoe is just below the rim lip. Turn the crank to fully push the breaker shoe between the tire bead and rim. Once the shoe contacts the rim, back the crank out two turns to allow the shoe to clear the rim's bead lock.



Push down on the leverage bar to push the tire bead over the bead lock. Use only short strokes on the handle. While the shoe is still engaged, turn the wheel as far as it will go between strokes as you break the bead around the rim.

Remove the breaker arm assembly and flip the wheel over. Install the breaker arm assembly, adjust the shoe properly and break the other bead by following the above procedures.

Remove the tire from the rim using a tire changing machine or tire irons and rim protectors.



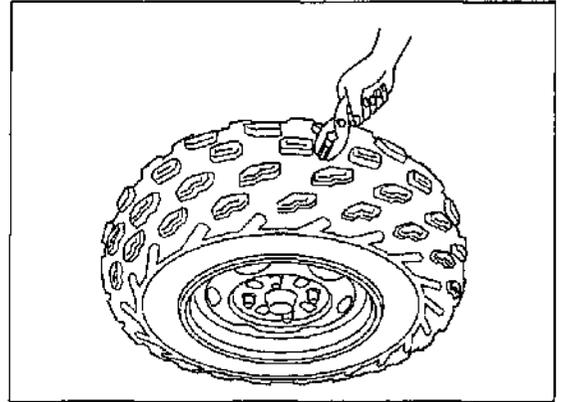
TIRE REPAIR

NOTE:

- Use the manufacturer's instructions for the tire repair kit you are using. If your kit does not have instructions, use the procedures described below.

Check the tire for puncturing objects.
Chalk mark the punctured area and remove the puncturing objects.

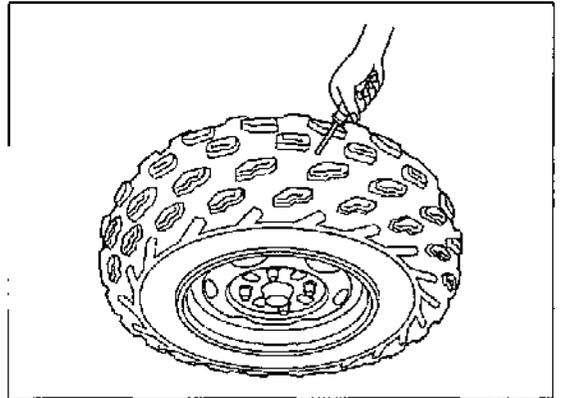
Inspect and measure the injury.
Tire repairs for injuries larger than 15 mm (5/8 in) should be a section repair.
Section repairs should be done by a professional tire repair shop.
If the injury is smaller than 15 mm (5/8 in), proceed with the repair as described here.



Install a rubber plug into the injury as follows:
Apply a cement to a plug inserting needle and work the needle into the injury to clean and lubricate it.
Do this three times.
Do not let the cement dry.

Insert and center a rubber plug through the eye of the inserting needle.

Apply cement to rubber plug.
Push the inserting needle with plug into the injury until the plug is slightly above the tire.



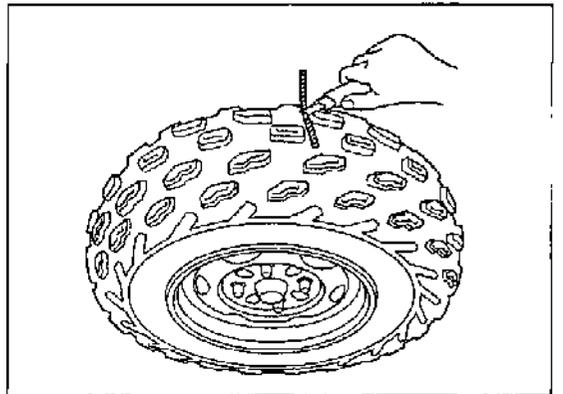
Be careful not to push the plug all the way into the tire to prevent from falling inside.

Twist the needle and remove it from the tire; the plug will stay in the tire.

Trim the plug 6 mm (1/4 in) above the tire surface.
Repeat the above procedure if the puncture is large.
Do not use more than two plugs per injury.

Allow the repair to dry. Drying time will vary with air temperature. Refer to the tire repair kit manufacturer's recommendations.

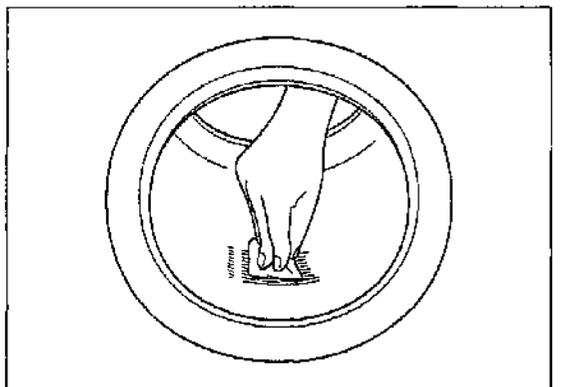
Inflate the tire and test the seal by dabbing a small amount of cement around the plug. Escaping air will cause a bubble in the cement. If there is leakage, remove the tire (page 17-11) and apply a cold patch to the inside of the tire.



If a plug has been inserted, trim it even with the inner tire surface.

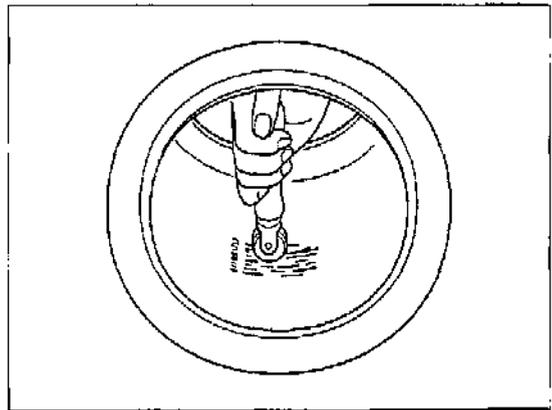
Temporarily place a rubber patch that is at least twice the size of the puncture over the injury. Make a mark around the patch, slightly larger than the patch itself.

Rough the area marked inside the tire with a tire buffer or a wire brush. Clean the rubber dust from the buffed area.



FRONT WHEEL/SUSPENSION/STEERING

Apply cement over the area marked and allow it to dry until tacky.
Do not touch the cement with dirty or greasy hands.
Remove the lining from the patch and center over the injury.
Press the patch against the injury using a special roller.



ASSEMBLY

Install the tire onto the rim, where the rim shoulder width is the narrowest, to simplify installation.

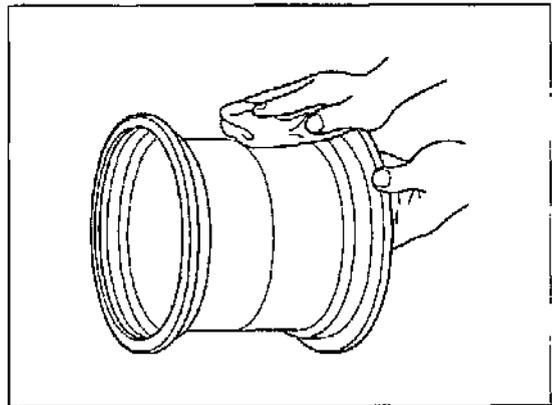
Clean the rim bead seat and flanges.

Use only water as a lubricant when removing or mounting tires. Apply clean water to the rim flanges, bead seat and base.

Soap or some mounting lubricants may leave a slippery residue which can cause the tire to shift on the rim and lose air pressure during riding. Install the valve core in the valve stem.
Install the tire with the arrow mark facing in the normal rotating direction.

Inflate the tire to seat the tire bead.

Deflate the tire. Wait 1 hour and inflate the tire to the specified pressure.



RECOMMENDED TIRE PRESSURE:

'04 - '05;

FRONT:

Standard: 27.5 kPa (0.275 kgf/cm, 4.0 psi)

Minimum: 23.5 kPa (0.235 kgf/cm, 3.4 psi)

Maximum: 31.5 kPa (0.315 kgf/cm, 4.6 psi)

REAR:

Standard: 32.5 kPa (0.325 kgf/cm, 4.7 psi)

Minimum: 28.5 kPa (0.285 kgf/cm, 4.1 psi)

Maximum: 36.5 kPa (0.365 kgf/cm, 5.3 psi)

After '05;

FRONT:

Standard: 27.5 kPa (0.275 kgf/cm, 4.0 psi)

Minimum: 25.0 kPa (0.250 kgf/cm, 3.6 psi)

Maximum: 30.0 kPa (0.300 kgf/cm, 4.4 psi)

REAR:

Standard: 32.5 kPa (0.325 kgf/cm, 4.7 psi)

Minimum: 30.0 kPa (0.300 kgf/cm, 4.3 psi)

Maximum: 35.0 kPa (0.350 kgf/cm, 5.1 psi)

Check for air leaks and install the valve cap.

FRONT WHEEL HUB

REMOVAL

Remove the front wheel (page 17-11).

Remove the bolt and disc cover.

Support the caliper so that it does not hang from the brake hose. Do not twist or bend the brake hose.

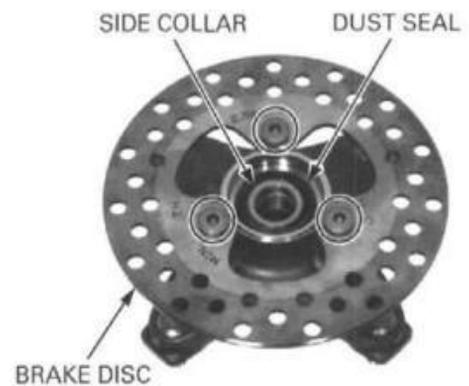
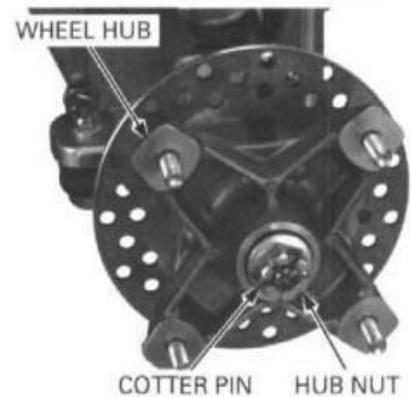
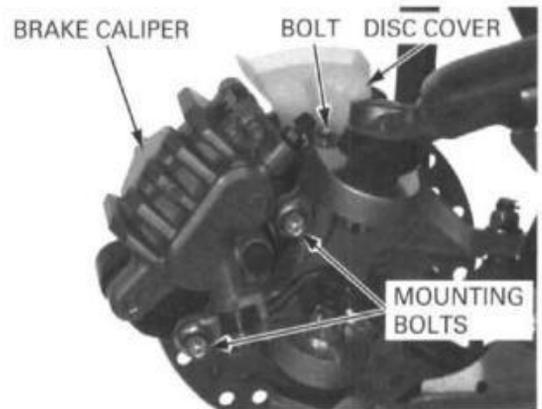
Remove the two mounting bolts and the front brake caliper assembly.

Remove the cotter pin, hub nut and wheel hub.

DISASSEMBLY

Remove the following:

- three bolts and brake disc
- side collars
- dust seals



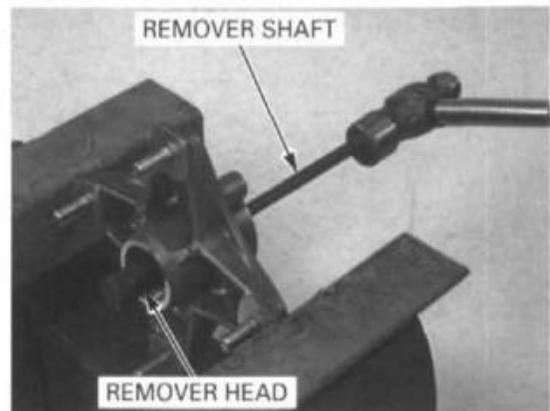
FRONT WHEEL/SUSPENSION/STEERING

Replace the bearings in pairs.

Install the bearing remover head into the bearing. From opposite side, install the bearing remover shaft and drive the bearing out of the wheel hub. Remove the distance collar and drive out the other bearing.

TOOLS:

Bearing remover shaft 07746-0050100
 Bearing remover head, 15 mm 07746-0050400



ASSEMBLY

Drive a new inner (disc side) bearing in the hub squarely with the markings facing up until it is fully seated.

Install the distance collar with the large diameter side facing the inner bearing.

Drive a new outer bearing in the hub squarely with the marking facing up until it is fully seated.

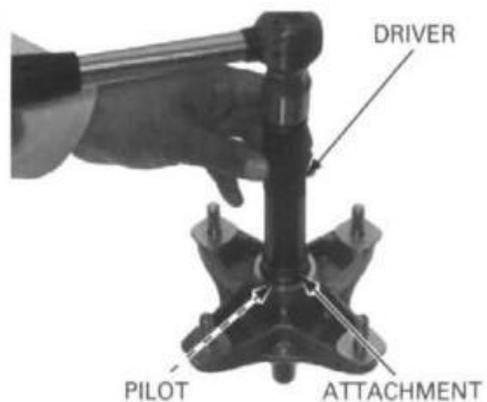
TOOLS:

Inner bearing:

Driver 07749-0010000
 Attachment, 42 x 47 mm 07746-0010300
 Pilot, 20 mm 07746-0040500

Outer bearing:

Driver 07749-0010000
 Attachment, 32 x 35 mm 07746-0010100
 Pilot, 15 mm 07746-0040300



Apply grease to new dust seal lips.

Install the dust seals into the wheel hub until they are flush with the hub surface.

Install the side collars.

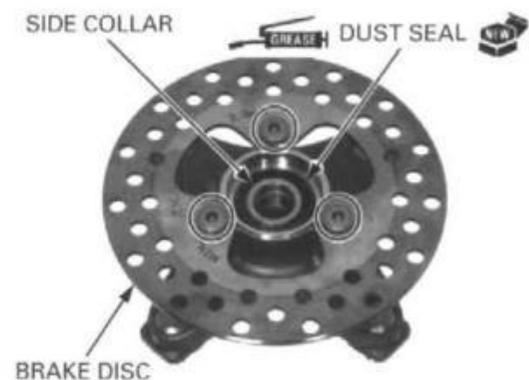


Do not get grease on the brake disc or stopping power will be reduced.

Install the brake disc onto the wheel hub with the markings facing up.

Install new disc bolts and tighten them.

TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)



INSTALLATION

Install the wheel hub and hub nut onto the knuckle. Tighten the hub nut to the specified torque and further tighten it until its grooves align with the cotter pin hole.

TORQUE: 69 N·m (7.0 kgf·m, 51 lbf·ft)

Install a new cotter pin.

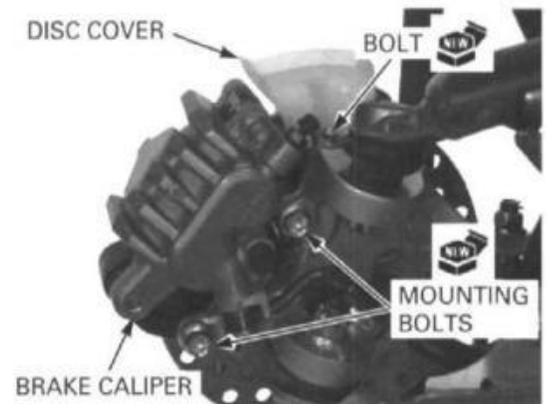
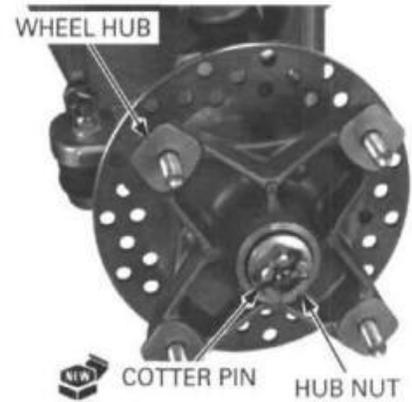
Install the front brake caliper assembly with new mounting bolts, and tighten the bolts.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

Install the disc cover with a new bolt and tighten the bolt.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the front wheel (page 17-11).



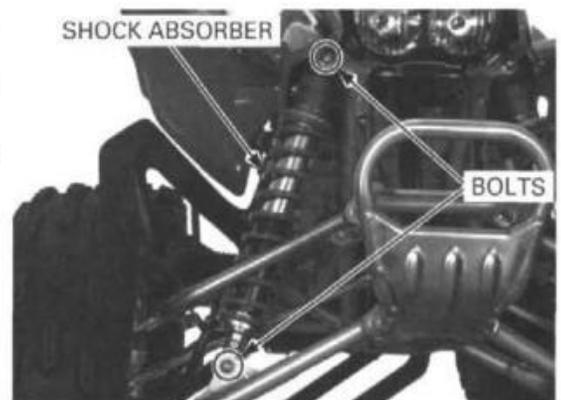
FRONT SHOCK ABSORBER

REMOVAL

Remove the four trim clips and the headlight under cover.

Support the vehicle using a hoist or equivalent and raise the front wheel off the ground.

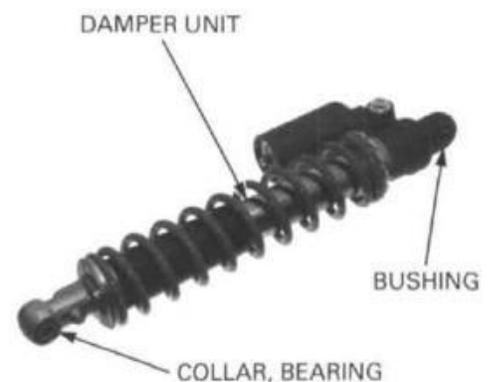
Support the lower arm. Remove the mounting nuts, bolts and shock absorber.



INSPECTION

Remove the lower pivot collar and check the needle bearing for wear or damage. Replace the bearing if necessary.

Check the upper pivot bushing for wear or damage. Check the damper unit for leaks or other damage. Replace the shock absorber assembly if necessary.



FRONT WHEEL/SUSPENSION/STEERING

BEARING REPLACEMENT

Remove the pivot collar and dust seals.



Press the needle bearing out of the shock absorber lower pivot using the special tool.

TOOLS:

Driver 07949-3710001

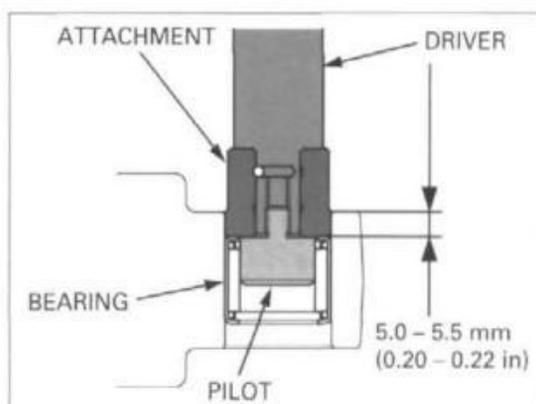
Attachment, 24 x 26 mm 07746-0010700

Pilot, 17 mm 07746-0040400

Apply grease to new needle bearing rollers.

Press in the bearing with the marked side facing up.

Press the needle bearing into the lower pivot until the depth from the outer surface is 5.0 – 5.5 mm (0.20 – 0.22 in), using the same special tools.



Apply grease to new dust seal lips and install them into the lower pivot until they are flush with the pivot surfaces.
Install the pivot collar.



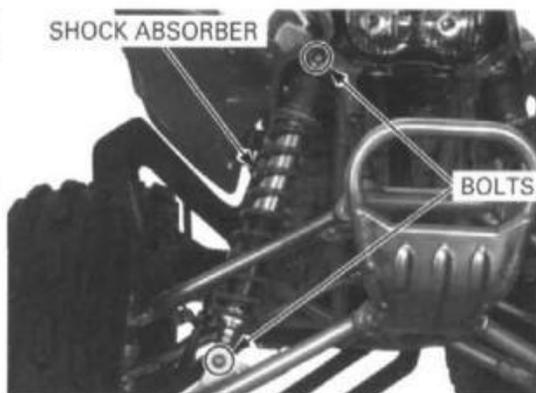
INSTALLATION

Install the shock absorber in the frame and lower arm, and insert the mounting bolts from the front side.

Install the mounting nuts and tighten them.

TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)

Install the headlight under cover with the four trim clips.



SUSPENSION ARM

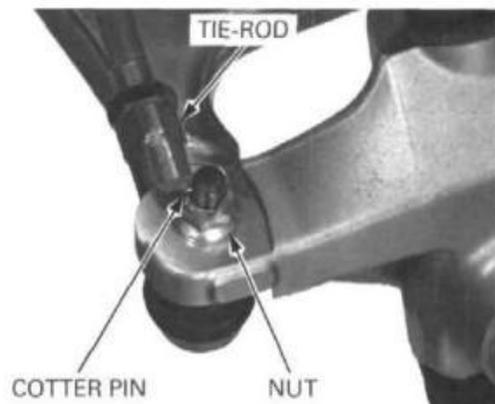
REMOVAL

Remove the wheel hub (page 17-15).

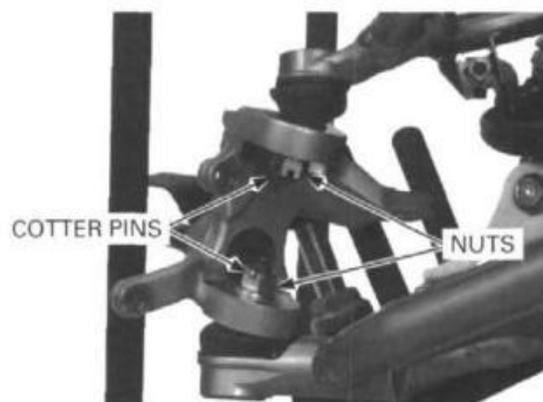
Remove the cotter pin from the tie-rod ball joint stud.

Remove the ball joint nut while holding the joint stud flat surfaces with an open end wrench.

Remove the tie-rod from the knuckle.



Remove the cotter pins and loosen the castle nuts, but do not remove them yet.

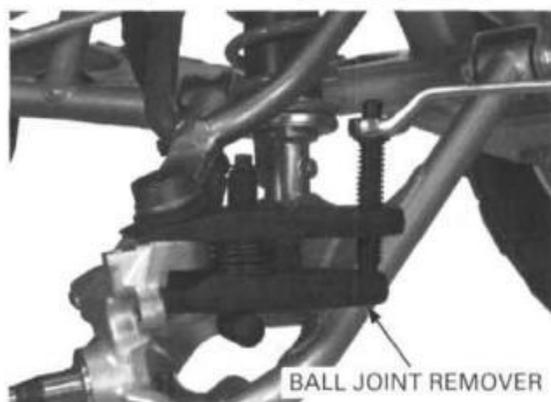


Release the ball joints, using the special tool according to the instructions described below.

TOOL:

Ball joint remover

07MAC-SL00200



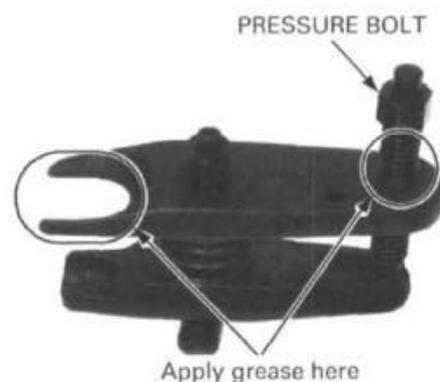
Apply grease to the ball joint remover at the point shown.

This will ease installation of the tool and prevent damage to the pressure bolt threads.

Insert the jaws carefully, making sure that you do not damage the ball joint boot.

Adjust the jaw spacing by turning the pressure bolt.

If necessary, apply penetrating type lubricant to loosen the ball joint.

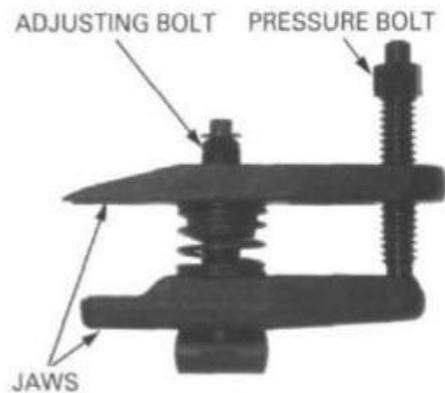


FRONT WHEEL/SUSPENSION/STEERING

Once the tool is in place, turn the adjusting bolt as necessary to make the jaws parallel. Then hand-tighten the pressure bolt and recheck the jaws to make sure they are still parallel.

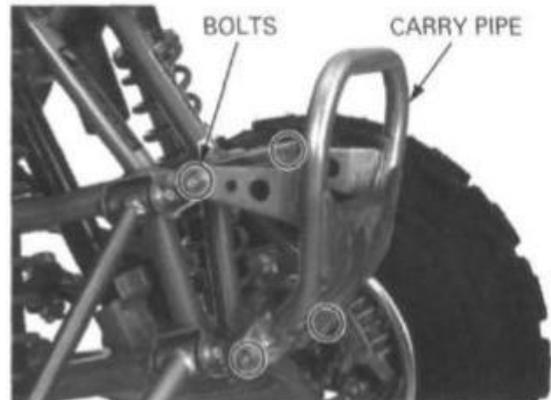
Tighten the pressure bolt with a wrench until the ball joint stud pops loose.

Remove the ball joint nuts, washers and knuckle from the upper and lower arms.

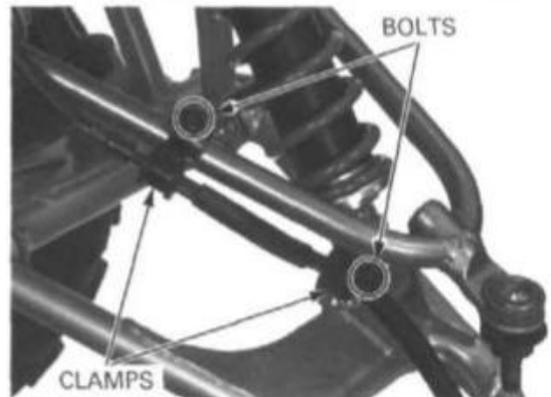


Remove the following:

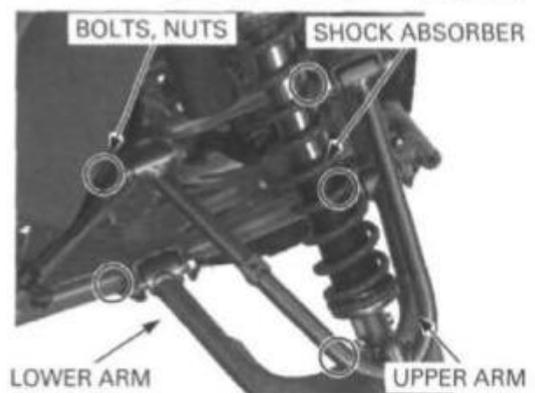
- four bolts and carry pipe



- bolts and brake hose clamps



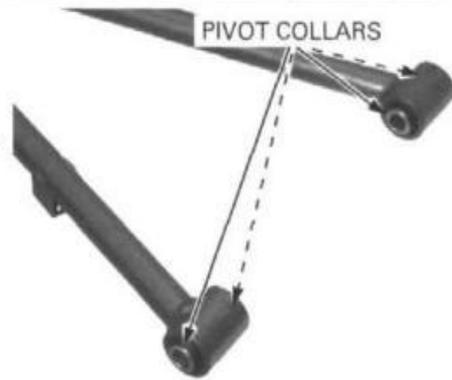
- pivot nuts, bolt and upper arm
- shock absorber lower mounting nut and bolt
- pivot nuts, bolt and lower arm



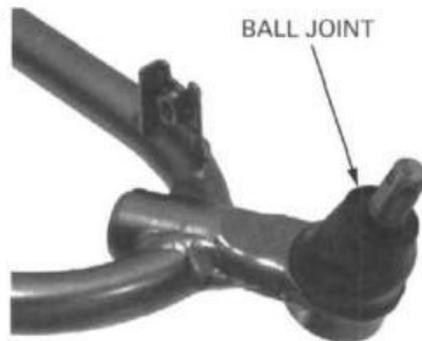
- pivot collars from the arm pivots

INSPECTION

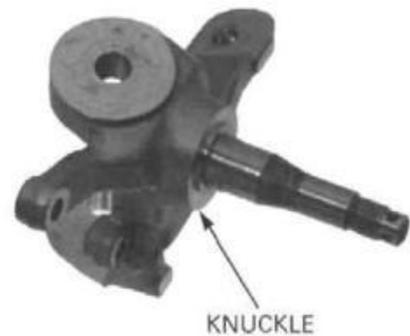
Check the spherical bearings in the arm pivots for wear or damage.



Inspect the ball joint boot for tears or other damage by moving the ball joint stud. It should moves freely and smoothly.



Inspect the knuckle for damage or cracks.



PIVOT BEARING REPLACEMENT

Remove the dust seals.

Remove the stopper rings.



FRONT WHEEL/SUSPENSION/STEERING

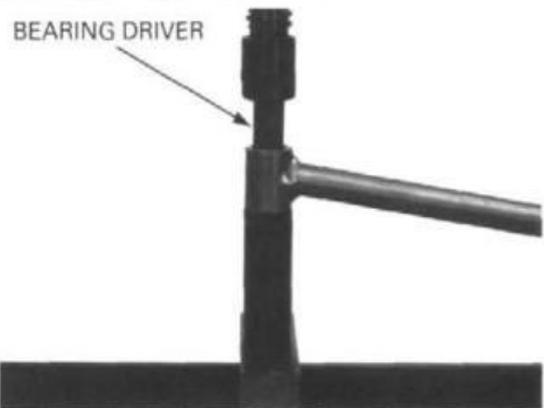
Press the spherical bearing out of the arm using the special tool.

TOOL:
Spherical bearing driver **07HMF-HC00100**

Install a new stopper ring into the arm pivot groove properly.

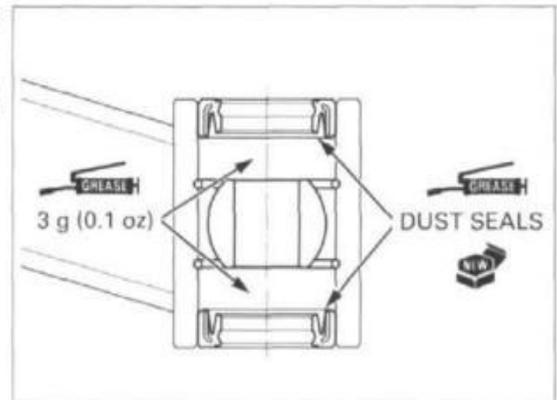
Press a new bearing into the arm pivot until it contacts the stopper ring, using the same tool.

Install a new stopper ring into the opposite side groove.



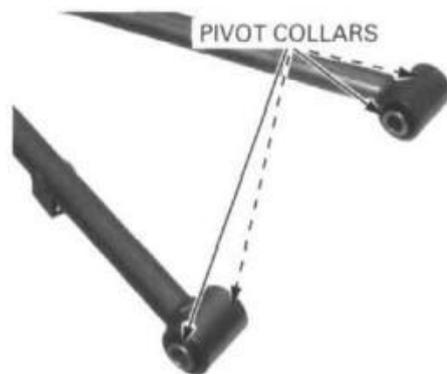
Pack 3 g (0.1 oz) of grease into the arm pivot as shown.

Apply grease to new dust seal lips and install them into the arm pivot until they are flush with the pivot ends.



INSTALLATION

Install the pivot collars into the arm pivots.



Install the lower arm into the frame, insert the pivot bolts from the front side and tighten the pivot nuts.

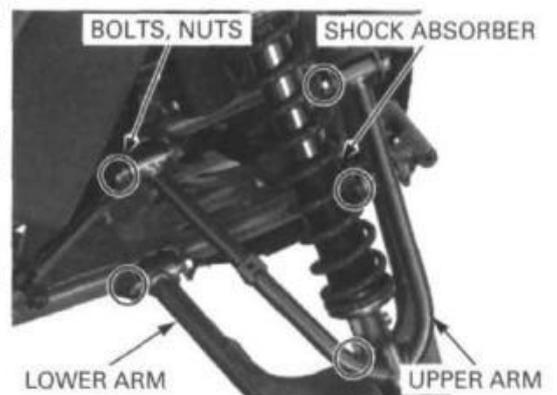
TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)

Install the shock absorber lower mount into the lower arm, insert the bolt from the front side and tighten the pivot nut.

TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)

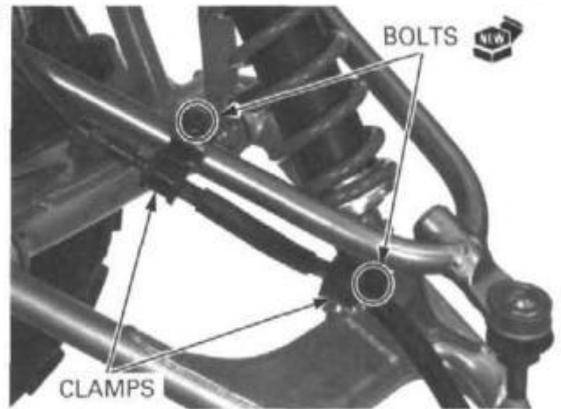
Install the upper arm into the frame, insert the pivot bolts from the front side and tighten the pivot nuts.

TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)

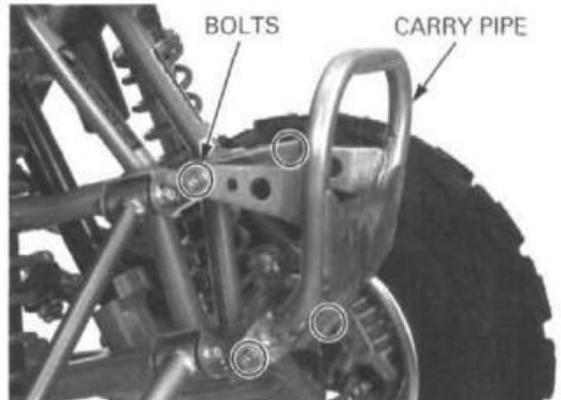


Install the brake hose clamps with new bolts and tighten the bolts.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



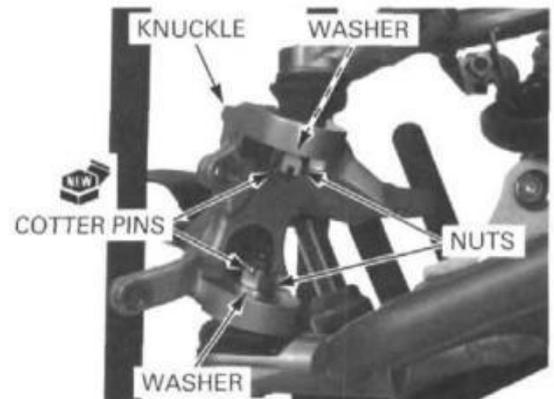
Install the carry pipe and tighten the four bolts securely.



Install the knuckle onto the upper and lower arms with the washers and castle nuts. Tighten the nuts to the specified torque and further tighten them until the grooves align with the cotter pin holes.

TORQUE: 32 N·m (3.3 kgf·m, 24 lbf·ft)

Install new cotter pins.

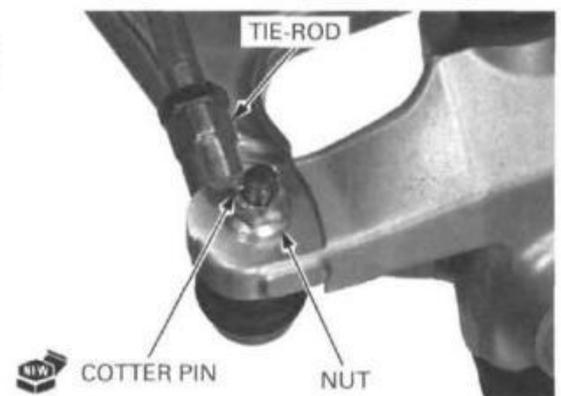


Install the tie-rod onto the knuckle. Install and tighten the ball joint nut while holding the joint stud flat surfaces with an open end wrench.

TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)

Install new cotter pin.

Install the wheel hub (page 17-17).
Adjust the toe (page 4-33).



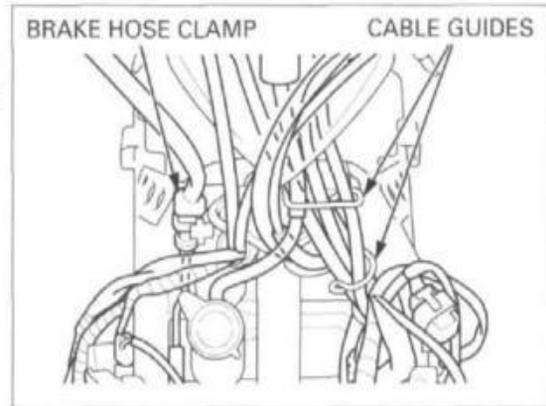
STEERING SHAFT

REMOVAL

Remove the top cover (page 3-5).

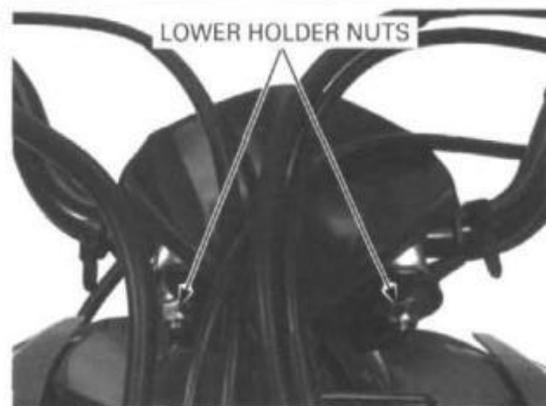
Release the cables and wires from the cable guides.

Remove the bolt and brake hose clamp from the steering shaft holder.

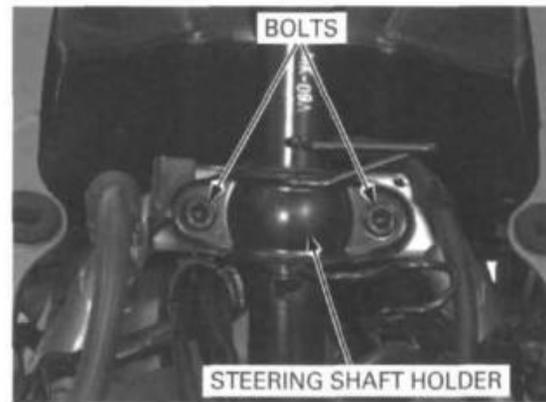


Do not twist or bend the brake hose and pipe.

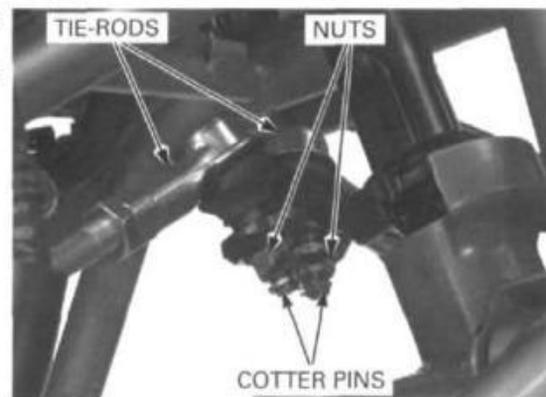
Remove the handlebar lower holder nuts, washers and the handlebar assembly from the steering shaft.



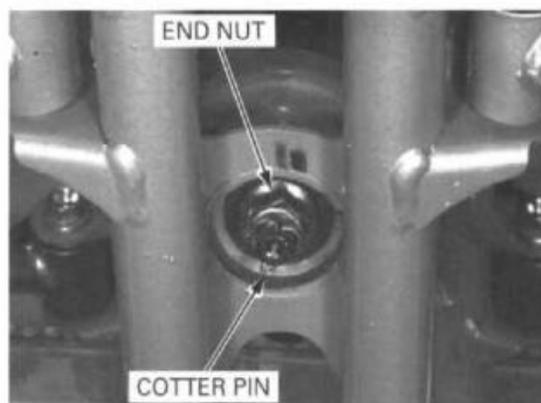
Remove the two bolts and steering shaft holder.



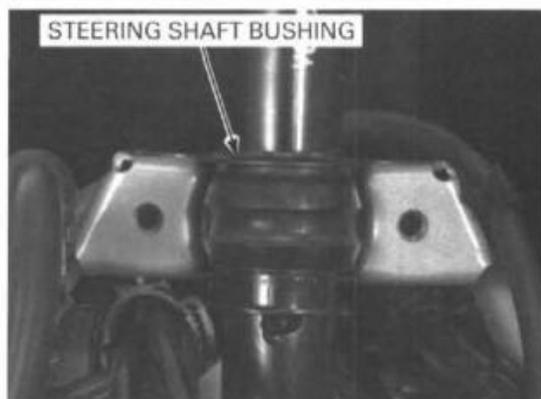
Remove the cotter pins from the tie-rod ball joint studs.
Remove the ball joint nuts while holding the joint stud flat surfaces with an open end wrench.
Remove the tie-rods from the steering shaft.



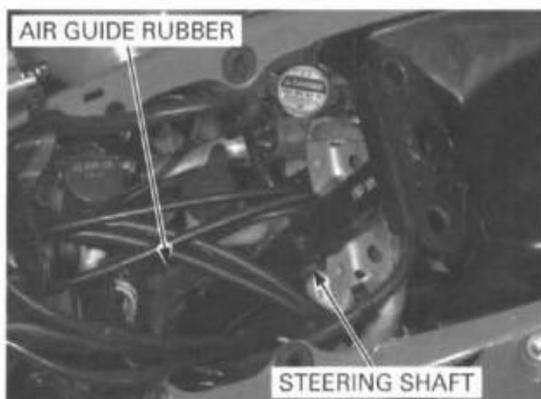
Remove the cotter pin and steering shaft end nut.



Remove the steering shaft bushing from the shaft.



'04 - '05: Remove the steering shaft from the frame through the air guide rubber.
Be careful not to damage the air guide rubber.



After '05: Remove the steering shaft from the frame.

Remove the steering shaft collar.



FRONT WHEEL/SUSPENSION/STEERING

INSPECTION

Check the steering shaft bushing for wear or damage.

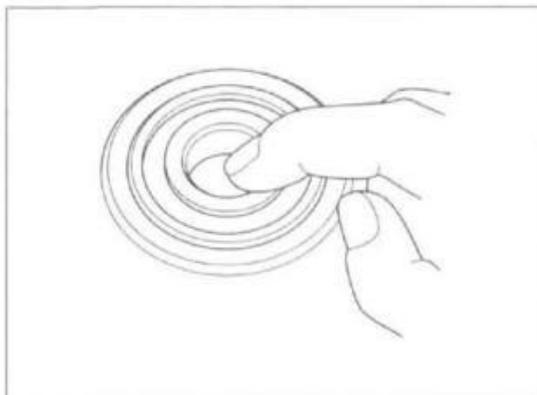


Check the steering shaft for distortion or damage.



Turn the inner race of the steering shaft bearing with your finger. The bearing should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the frame.

Replace the bearing if the inner race does not turn smoothly and quietly, or if the outer race fits loosely in the frame.

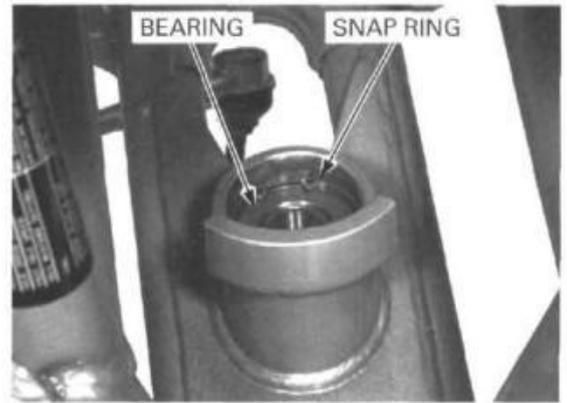


BEARING REPLACEMENT

Remove the upper and lower dust seals.



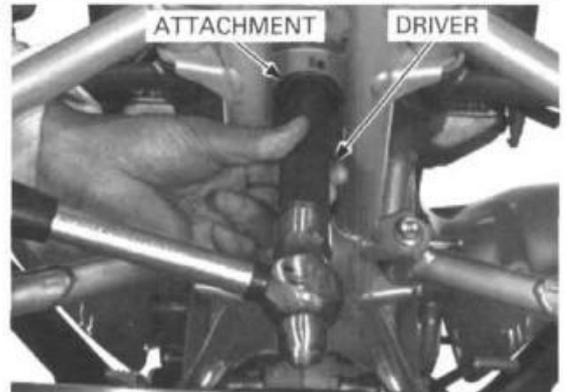
Remove the snap ring.



Drive the steering shaft bearing out of the frame using the special tools.

TOOLS:

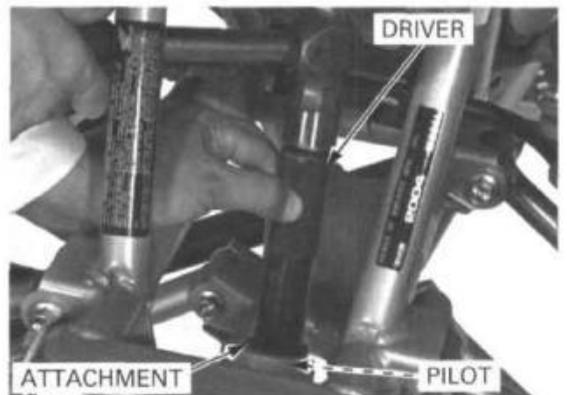
Driver	07749-0010000
Attachment, 32 x 35 mm	07746-0010100



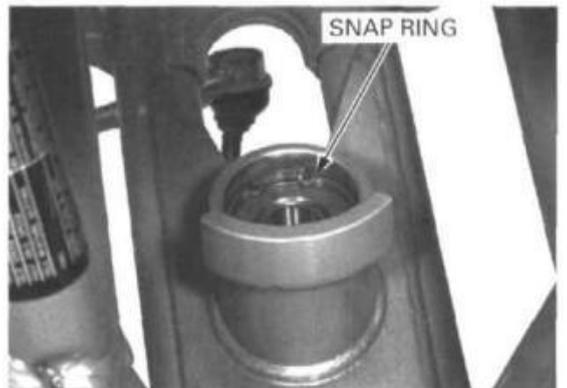
Drive a new bearing squarely into the frame with the marks facing up until it is fully seated.

TOOLS:

Driver	07749-0010000
Attachment, 37 x 40 mm	07746-0010200
Pilot, 17 mm	07746-0040400



Install the snap ring into the frame groove properly.



FRONT WHEEL/SUSPENSION/STEERING

Apply grease to new dust seal lips and install them into the frame.



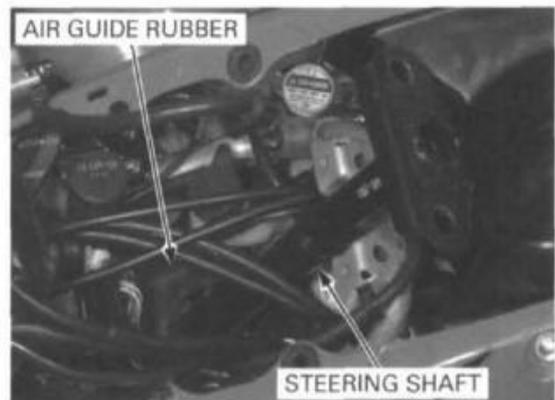
INSTALLATION

NOTE:

- Route the wires, hose and cables properly (page 1-24).

'04 - '05: Install the steering shaft in the frame through the air guide rubber.
Be careful not to damage the air guide rubber.

After '05: Install the steering shaft in the frame.



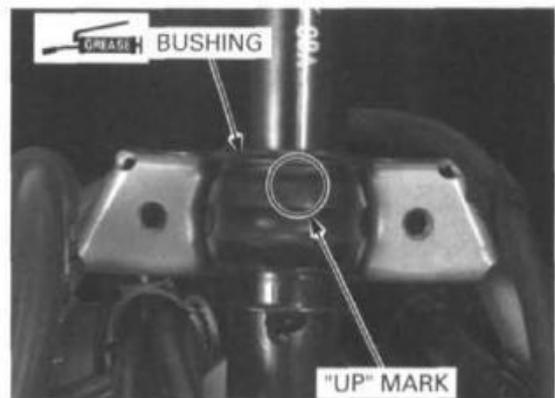
Apply grease to the steering shaft bushing inner surface.

NOTE:

- Use Shell Alvania EP-LF-2 or equivalent for steering shaft bushing.

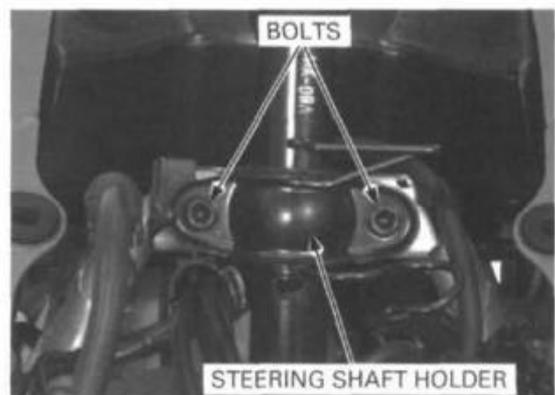
Install the bushing onto the steering shaft with the "UP" mark facing up.

Install the steering shaft end into the steering shaft bearing.

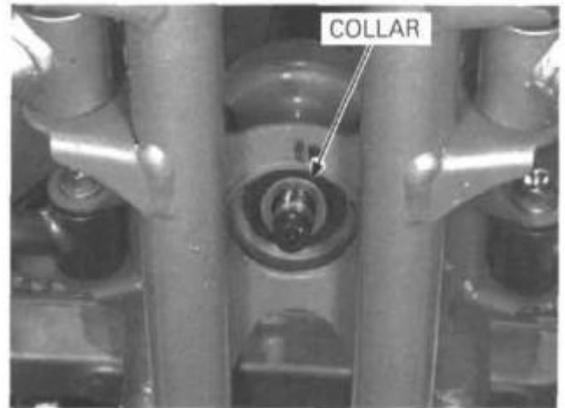


Install the steering shaft holder and tighten the two bolts alternately.

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



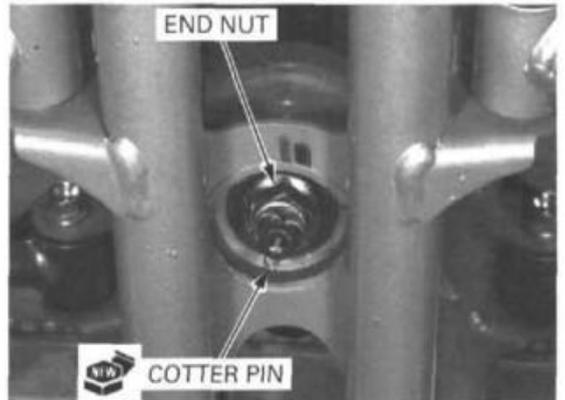
Install the steering shaft collar.



Install the steering shaft end nut and tighten it.

TORQUE: 69 N·m (7.0 kgf·m, 51 lbf·ft)

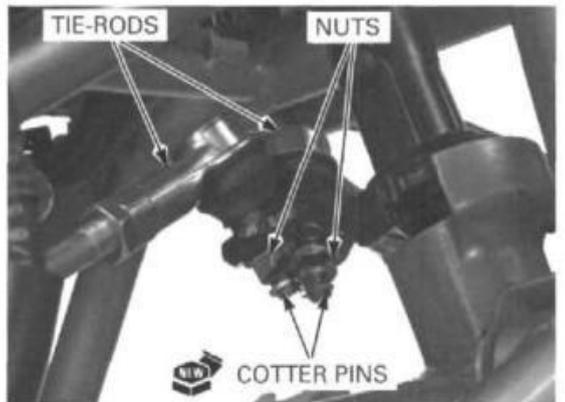
Install a new cotter pin.



Install the tie-rods onto the steering shaft.
Install the ball joint nuts and tighten them while holding the ball joint stud flats with an open end wrench.

TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)

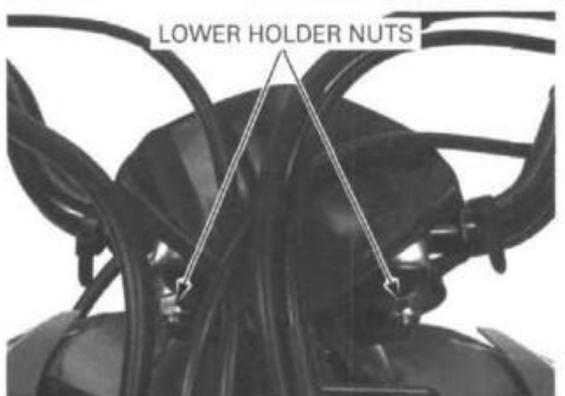
Install new cotter pins.



Do not twist or bend the brake hose and pipe.

Install the handlebar assembly onto the steering shaft with the washers and lower holder nuts. Tighten the nuts.

TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)



FRONT WHEEL/SUSPENSION/STEERING

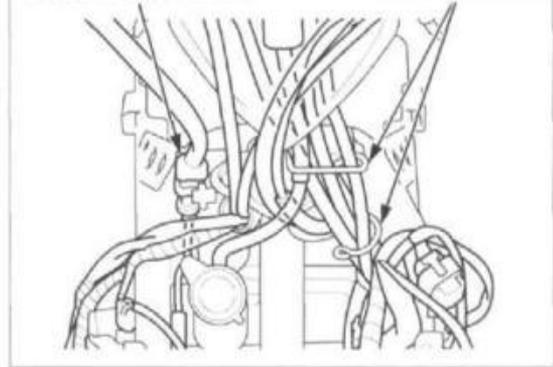
Install the brake hose clamp onto the steering shaft holder with a new bolt and tighten the bolt.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the cables and wires into the cable guides properly (page 1-24).

Install the top cover (page 3-5).
Adjust the toe (page 4-33).

BRAKE HOSE CLAMP CABLE GUIDES



TIE-ROD

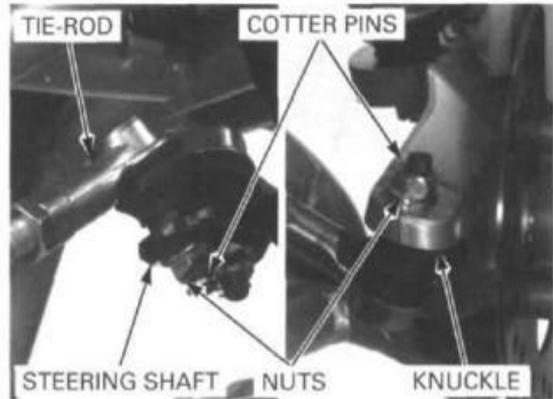
REMOVAL

Remove the front wheel (page 17-11).

Remove the cotter pins.

Remove the ball joint nuts while holding the joint stud flats with an open end wrench.

Remove the tie-rod from the knuckle and steering shaft arm.



INSPECTION

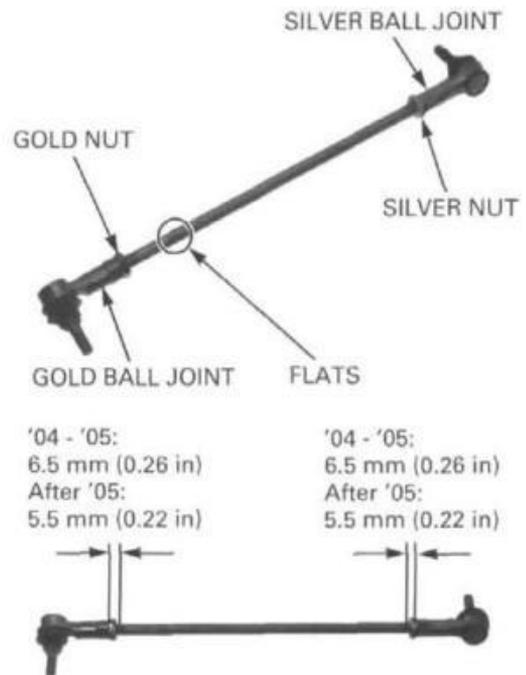
Inspect the tie-rod for distortion or damage.
Inspect the ball joint boots for tears or other damage by moving the ball joint studs. They should move freely and smoothly.

Replace the ball joint if necessary.

DISASSEMBLY/ASSEMBLY

Loosen the lock nuts and remove the ball joints and lock nuts from the tie-rod.

Install the gold ball joint and nut on the flat (wrench holding area) side of the tie-rod, and the silver ball joint and nut on the opposite side.



'04 - '05: Adjust the tie-rod length so that the distance between each lock nut and thread end is 6.5 mm (0.26 in).
A difference of both distances should be 3.0 mm (0.12 in) or less.

After '05: Adjust the tie-rod length so that the distance between each lock nut and thread end is 5.5 mm (0.22 in).
A difference of both distances should be 3.0 mm (0.12 in) or less.

The ball joint positions are 180° from each other. Tighten these nuts after installing the tie-rod.
Hand-tighten the ball joint lock nuts.

INSTALLATION

Install the tie-rod onto the steering shaft and knuckle with the flat side of the rod toward the knuckle.

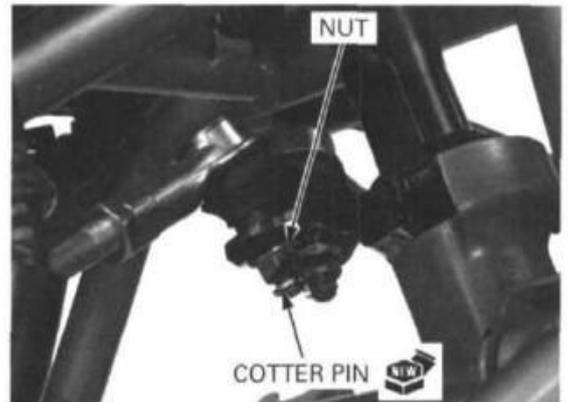
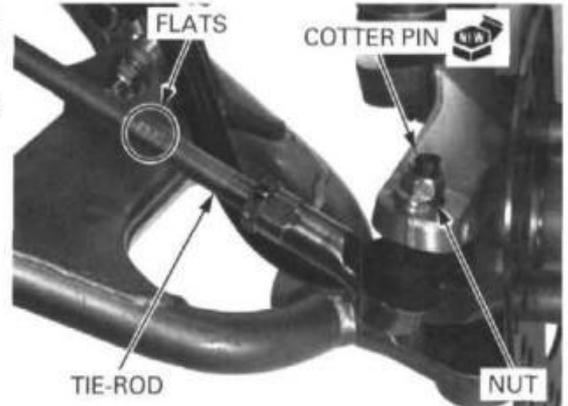
Install and tighten the joint nuts while holding the ball joint stud flats with an open end wrench.

TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)

Install new cotter pins.

Install the front wheel (page 17-11).

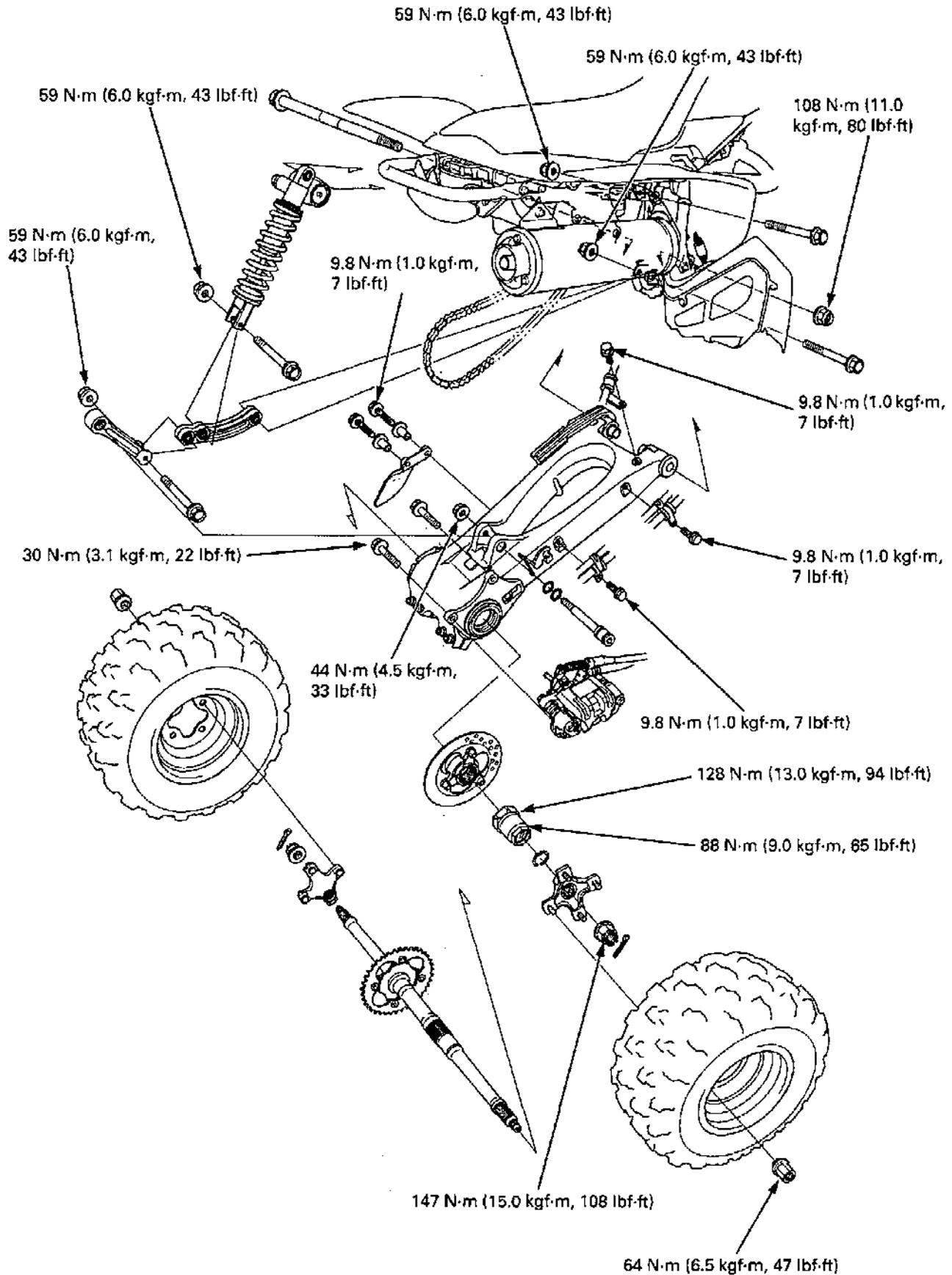
Adjust the toe and ball joint angle (page 4-33).



18. REAR WHEEL/SUSPENSION

SYSTEM COMPONENTS	18-2	REAR AXLE/BEARING HOLDER.....	18-7
SERVICE INFORMATION	18-3	REAR SHOCK ABSORBER	18-16
TROUBLESHOOTING	18-6	SHOCK LINKAGE.....	18-18
REAR WHEEL	18-7	SWINGARM	18-20

REAR WHEEL/SUSPENSION SYSTEM COMPONENTS



SERVICE INFORMATION

GENERAL

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- A jack or other support is required to support the vehicle.
- When using the lock nut wrench for the axle lock nuts, use a deflecting beam type torque wrench 20 inches long. 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 lock nut. The specification given is the actual torque applied to the lock nut, not the reading on the torque wrench. Do not over tighten the lock nut. The specification later in the text gives both actual and indicated.
- Use genuine Honda replacement bolts and nuts for all suspension pivots and mounting points.
- For tire information (page 17-11).
- For brake system service (page 19-2).

SPECIFICATIONS

Unit: mm (in)

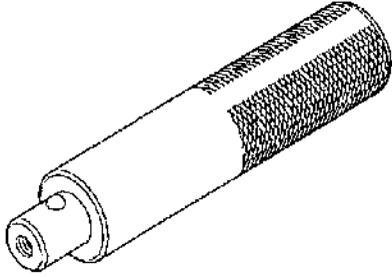
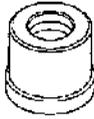
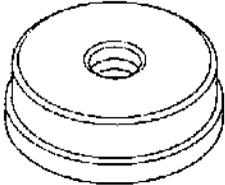
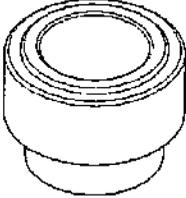
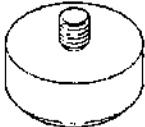
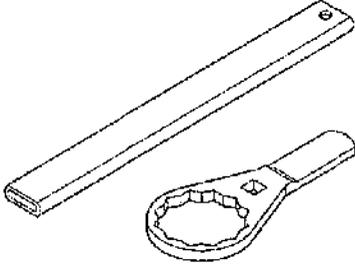
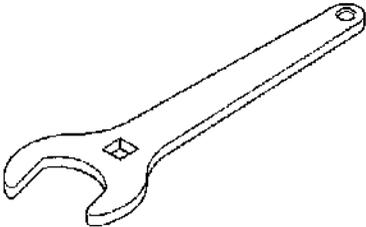
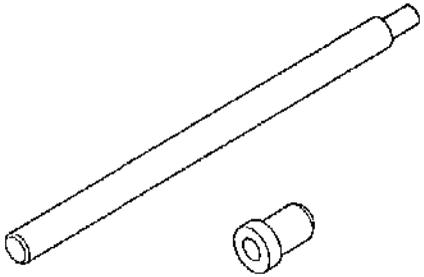
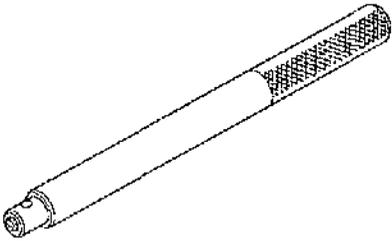
ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		-	4.0 (0.16)
Cold tire pressure ('04 - '05)	Standard	32.5 kPa (0.325 kgf/cm ² , 4.7 psi)	-
	Minimum	28.5 kPa (0.285 kgf/cm ² , 4.1 psi)	-
	Maximum	36.5 kPa (0.365 kgf/cm ² , 5.3 psi)	-
Cold tire pressure (After '05)	Standard	32.5 kPa (0.325 kgf/cm ² , 4.7 psi)	-
	Minimum	30.0 kPa (0.300 kgf/cm ² , 4.3 psi)	-
	Maximum	35.0 kPa (0.350 kgf/cm ² , 5.1 psi)	-
Axle runout		-	3.0 (0.12)
Drive chain	Slack	25 - 35 (1 - 1-7/16)	-
	Size/link ('04 - '05)	DID	DID520V6/94
		RK	RK520SMOZ10S/94
	Size/link (After '05)	DID	DID520V6/96
RK		RK520SMOZ10S/96	
Compression damping adjuster standard position	'04 - '05	26 ± 1 clicks out from full in	-
	After '05	8 ± 1 clicks out from full in	-
Rebound damping adjuster standard position	'04 - '05	1-3/4 turns out from full in	-
	After '05	1-1/8 ± 1/8 turns out from full in	-

REAR WHEEL/SUSPENSION

TORQUE VALUES

Rear wheel nut	64 N·m (6.5 kgf·m, 47 lbf·ft)	
Rear wheel hub nut	147 N·m (15.0 kgf·m, 108 lbf·ft)	Apply grease to the threads and seating surface. Castle nut: tighten to the specified torque and further tighten until its grooves aligns with the cotter pin hole.
Rear brake caliper bracket mounting bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	ALOC bolt: replace with a new one.
Drive chain guard bolt	9.8 N·m (1.0 kgf·m, 7 lbf·ft)	ALOC bolt: replace with a new one.
Axle inner lock nut	128 N·m (13.0 kgf·m, 94 lbf·ft)	Apply locking agent to the threads.
Axle outer lock nut	88 N·m (9.0 kgf·m, 65 lbf·ft)	Apply locking agent to the threads.
Rear brake disc bolt	42 N·m (4.3 kgf·m, 31 lbf·ft)	ALOC bolt: replace with a new one.
Final driven sprocket nut	59 N·m (6.0 kgf·m, 43 lbf·ft)	
Rear shock absorber mounting nut	59 N·m (6.0 kgf·m, 43 lbf·ft)	
Shock link-to-swingarm nut	44 N·m (4.5 kgf·m, 33 lbf·ft)	
Shock arm-to-frame nut	59 N·m (6.0 kgf·m, 43 lbf·ft)	
Shock arm-to-shock link nut	59 N·m (6.0 kgf·m, 43 lbf·ft)	
Rear brake hose clamp bolt	9.8 N·m (1.0 kgf·m, 7 lbf·ft)	ALOC bolt: replace with a new one.
Rear brake hose guide bolt	9.8 N·m (1.0 kgf·m, 7 lbf·ft)	ALOC bolt: replace with a new one.
Parking brake cable clamp bolt	9.8 N·m (1.0 kgf·m, 7 lbf·ft)	ALOC bolt: replace with a new one.
Chain slider bolt	9.8 N·m (1.0 kgf·m, 7 lbf·ft)	ALOC bolt: replace with a new one.
Swingarm pivot nut	108 N·m (11.0 kgf·m, 80 lbf·ft)	Apply grease to the threads and seating surface.
Rear brake caliper stay stopper bolt	59 N·m (6.0 kgf·m, 43 lbf·ft)	Apply locking agent to the threads.

TOOLS

<p>Driver 07749-0010000</p> 	<p>Attachment, 24 x 26 mm 07746-0010700</p> 	<p>Attachment, 62 x 68 mm 07746-0010500</p> 
<p>Attachment, 35 mm I.D. 07746-0030400</p> 	<p>Pilot, 17 mm 07746-0040400</p> 	<p>Pilot, 40 mm 07746-0040900</p> 
<p>Lock nut wrench, 56 mm 07916-HA20000</p>  <p>or 07916-HA2010A (U.S.A. only)</p>	<p>Lock nut wrench, 45.5 mm 07916-1870101</p>  <p>or commercially available equivalent</p>	<p>Needle bearing remover 07946-KA50000</p> 
<p>Driver 07949-3710001</p> 		

REAR WHEEL/SUSPENSION

TROUBLESHOOTING

Rear wheel wobbling

- Bent rim
- Worn or damaged rear axle bearings
- Faulty rear tire
- Rear wheel hub nut not tightened properly
- Faulty swingarm pivot bearings

Rear wheel hard to turn

- Faulty rear axle bearings
- Bent rear axle
- Rear brake drag
- Drive chain too tight

Soft suspension

- Weak shock absorber spring
- Faulty shock absorber damper
- Incorrect suspension adjustment

Stiff suspension

- Bent shock absorber damper rod
- Damaged rear suspension pivot bearings
- Incorrect suspension adjustment

Rear suspension noise

- Faulty rear shock absorber
- Loose rear suspension fasteners
- Worn rear suspension pivot bearings

REAR WHEEL

REMOVAL

Loosen the wheel nuts.

Support the vehicle using a hoist or equivalent and raise the rear wheels off the ground.

Remove the wheel nuts and rear wheel.

For tire removal/installation and repair, refer to page 17-11.

INSTALLATION

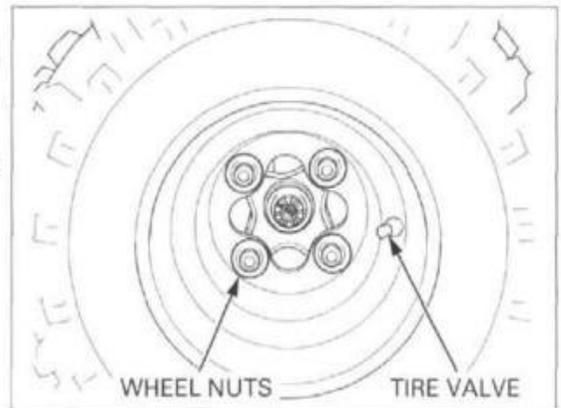
NOTE:

- Do not interchange the left and right tires.

Install the rear wheel with the tire valve facing out.

Install the wheel nuts with the tapered side facing inward and tighten them.

TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)



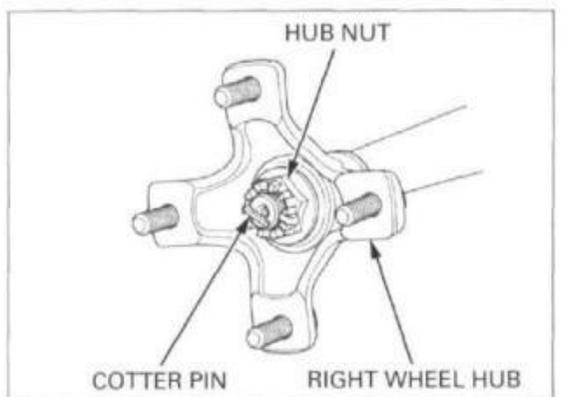
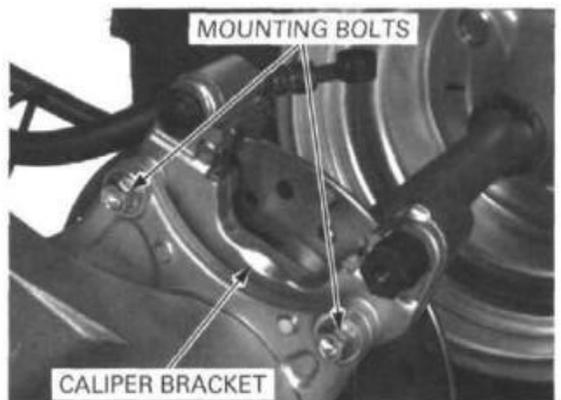
REAR AXLE/BEARING HOLDER

REMOVAL

Remove the following:

- rear brake caliper (page 19-22)
- two mounting bolts and caliper bracket

- right rear wheel (page 18-7).
- cotter pin
- hub nut
- right rear wheel hub



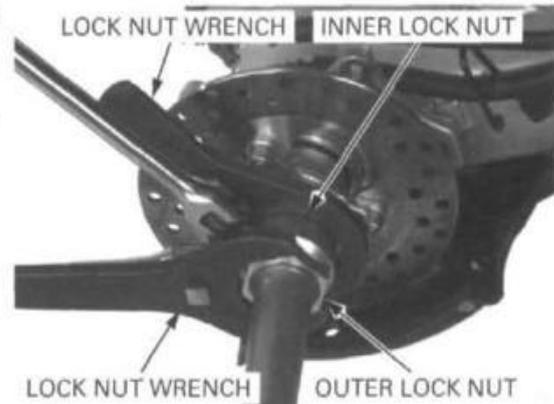
REAR WHEEL/SUSPENSION

The lock nut has left hand threads.

Loosen the axle inner lock nut while holding the outer lock nut, using the special tools.

TOOLS:

Lock nut wrench, 56 mm 07916-HA20000 or 07916-HA2010A (U.S.A. only)
Lock nut wrench, 45.5 mm 07916-1870101 or commercially available equivalent

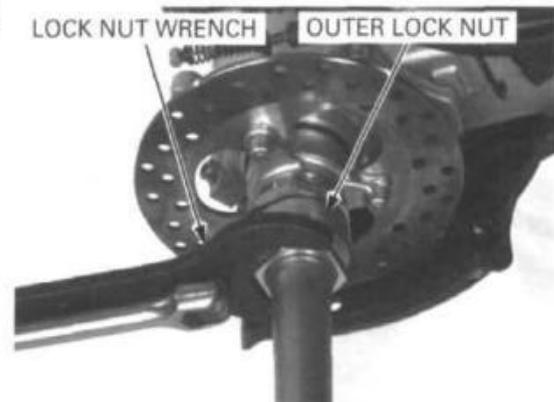


The lock nut has left hand threads.

Loosen the axle outer lock nut until the stopper ring can be removed, using the special tool.

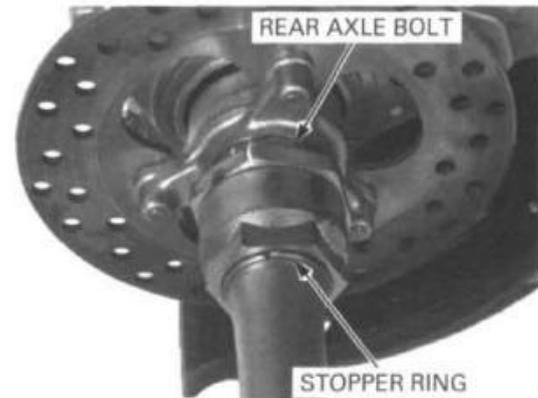
TOOL:

Lock nut wrench, 45.5 mm 07916-1870101 or commercially available equivalent

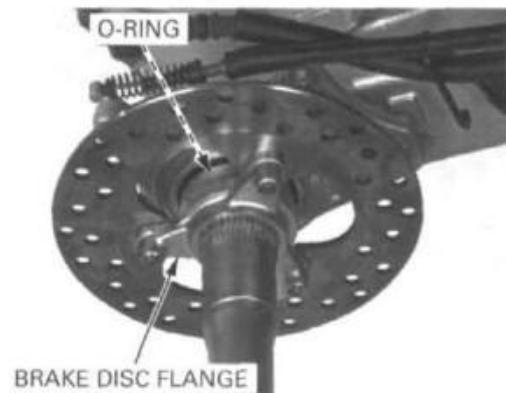


Remove the following:

- stopper ring
- rear axle bolt with the inner and outer lock nuts
- skid plate (page 3-8)



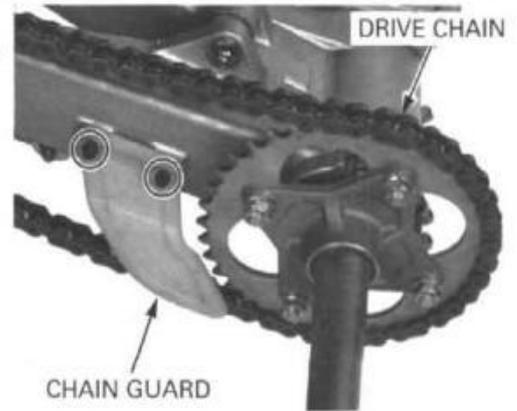
- brake disc flange with disc
- O-ring from the inside of the disc flange



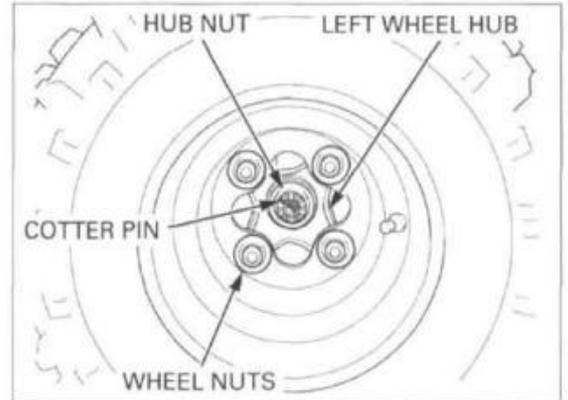
- two bolts, collars and drive chain guard

Turn the rear axle bearing holder to obtain maximum drive chain slack (page 4-22).

Remove the drive chain from the driven sprocket.



Remove the cotter pin from the left wheel hub nut. Loosen the hub nut. Remove the wheel nuts and left rear wheel. Remove the hub nut and left wheel hub.

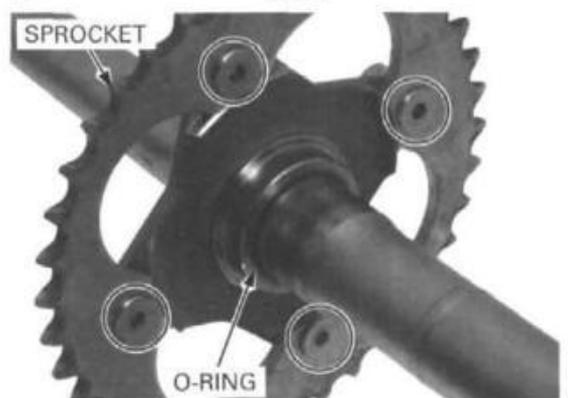


Remove the rear axle from the axle bearing holder in the swingarm by driving it from the right side with a rubber mallet.



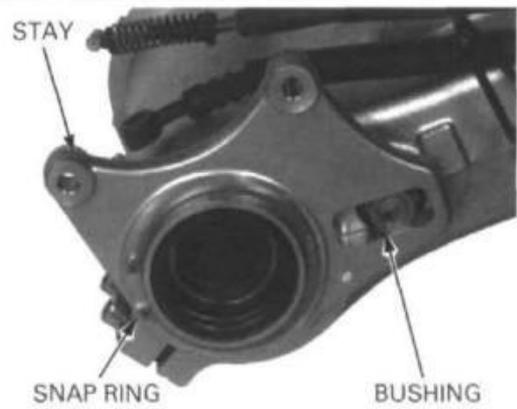
Remove the following:

- O-ring
- four nuts, washers, bolts and driven sprocket

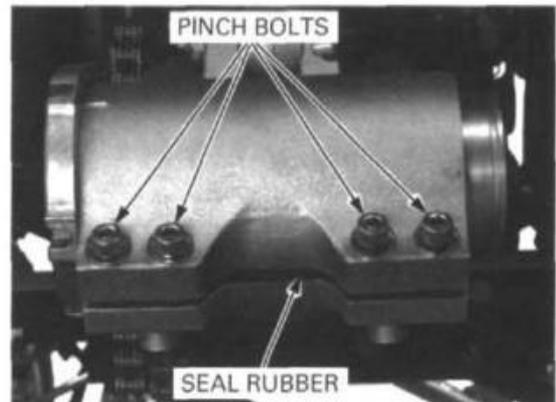


REAR WHEEL/SUSPENSION

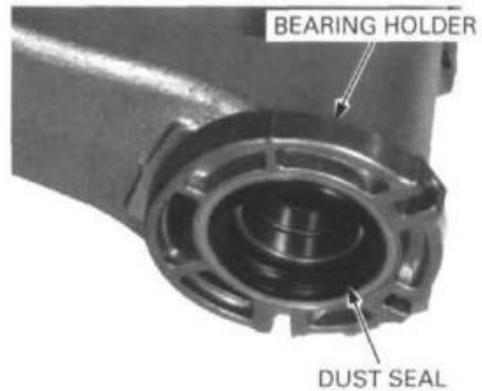
- snap ring
- caliper stay
- stopper bushing
- O-rings from the bearing holder and stay groove



- bearing holder pinch bolts
- seal rubber



- bearing holder
- O-rings from the bearing holder grooves
- dust seals

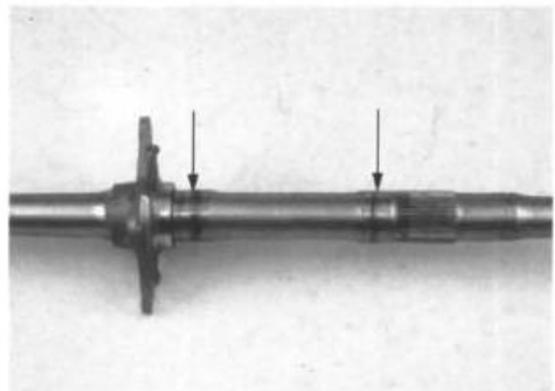


INSPECTION

Set the axle in v-blocks and measure the axle runout with a dial indicator.

Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 3.0 mm (0.12 in)



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

Replace the bearings in pairs.

Replace the bearings if the races do not turn smoothly and quietly or if they fit loosely in the holder.

BEARING REPLACEMENT

Drive the right (brake disc side) bearing out of the holder.

Remove the distance collar.

Drive the left bearings out of the holder.

Drive in a new right (brake disc side) bearing squarely with the markings facing up until it is fully seated.

Install the distance collar.

Drive in new left bearings squarely with the marks facing up until they are fully seated.

TOOLS:

Driver

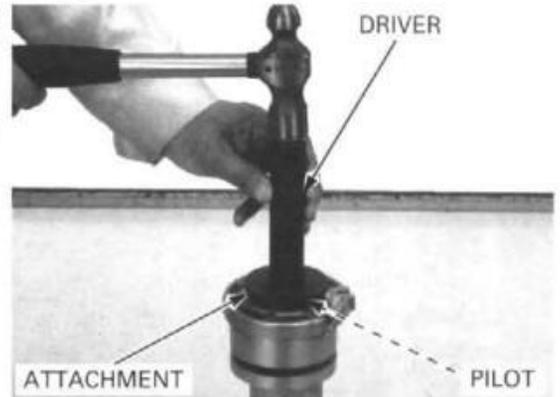
07749-0010000

Attachment, 62 x 68 mm

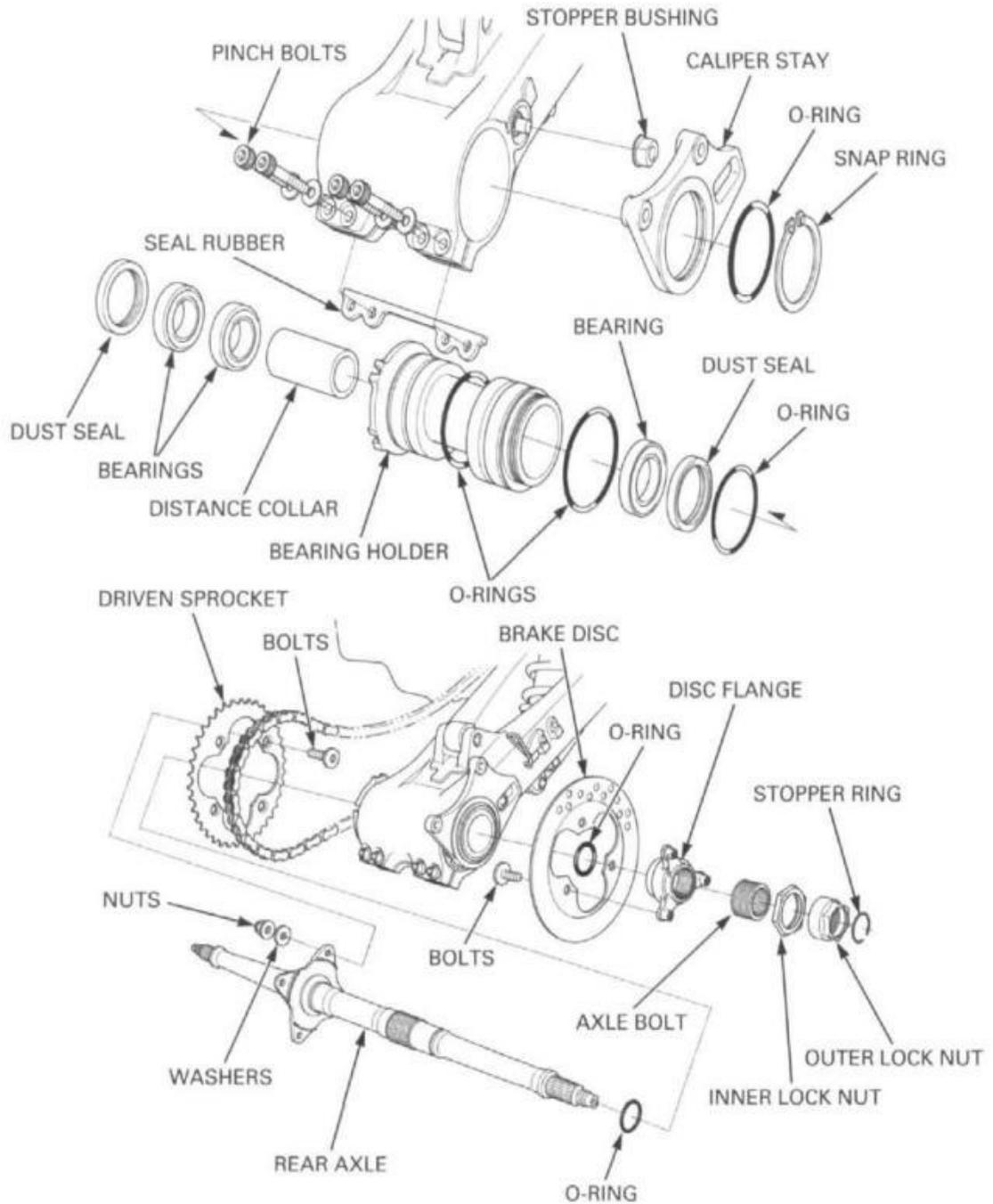
07746-0010500

Pilot, 40 mm

07746-0040900



REAR WHEEL/SUSPENSION INSTALLATION



Apply grease to new dust seal lips and install them into the bearing holder until they are flush with the holder end surfaces.



Clean the bearing holder outer surface and the swingarm inner surface.

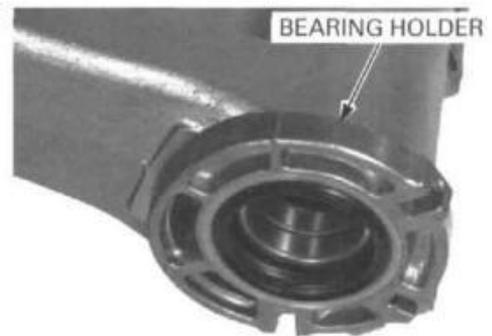
Coat new O-rings with oil and install them into the bearing holder grooves.

Apply grease to the bearing holder outer surface.



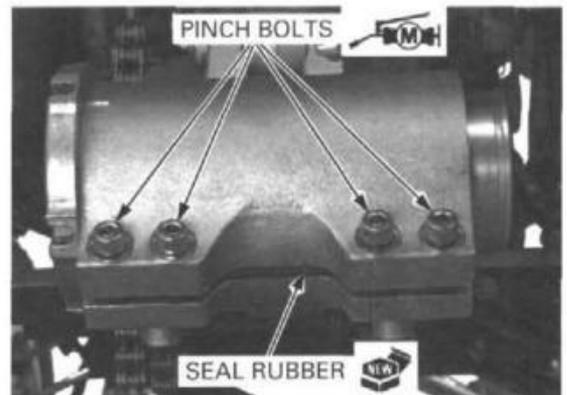
Be careful not to damage the O-rings.

Install the bearing holder into the swingarm until it is fully seated.



Install a new seal rubber into the swingarm.

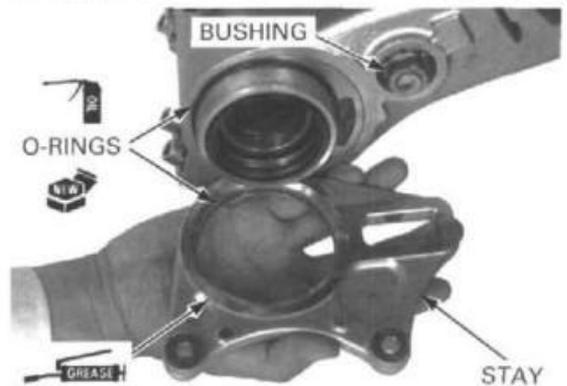
Apply molybdenum disulfide grease to the bearing holder pinch bolts and loosely install the pinch bolts.



Coat new O-rings with oil and install them into the caliper stay groove and onto the bearing holder.

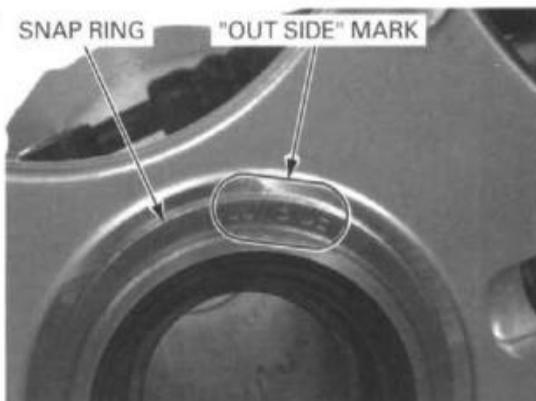
Install the bushing onto the stopper bolt.

Apply grease to the inner surface of the caliper stay and install it onto the bearing holder and bushing.



REAR WHEEL/SUSPENSION

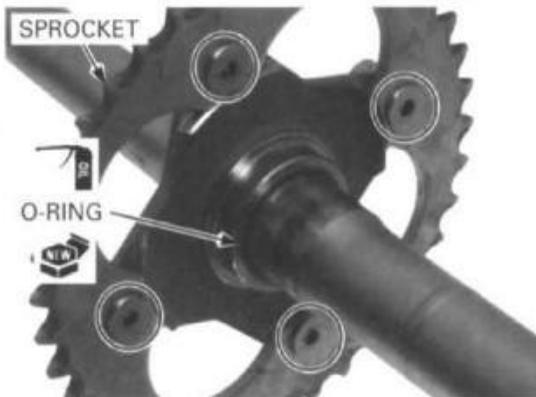
Install the snap ring into the bearing holder groove with the "OUT SIDE" mark facing out.



Install the driven sprocket with the four socket bolts, washers and nuts, and tighten the nuts.

TORQUE: 59 N-m (6.0 kgf-m, 43 lbf-ft)

Coat a new O-ring with oil and install it between the driven sprocket flange and axle.

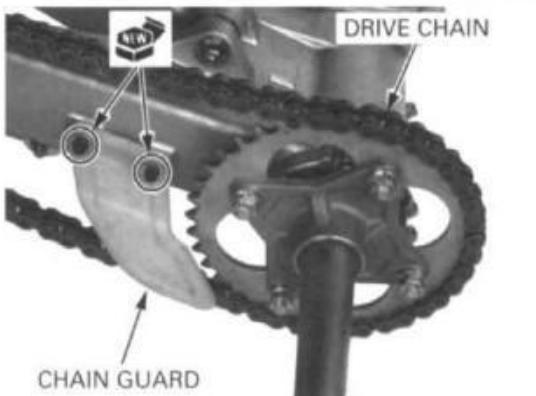


Install the rear axle into the bearing holder through the drive chain until it is fully seated.

Install the drive chain over the driven sprocket.

Install the drive chain guard with the collars and new bolts, and tighten the bolts.

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



Apply grease to the hub nut threads and seating surface.

Install the left wheel hub and hub nut.

Install the left rear wheel with the tire valve facing out.

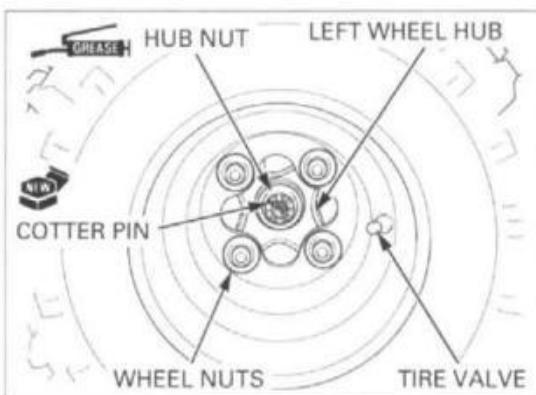
Install the wheel nuts with the tapered side facing inward and tighten them.

TORQUE: 64 N-m (6.5 kgf-m, 47 lbf-ft)

Tighten the hub nut to the specified torque and further tighten it until its grooves align with the cotter pin hole.

TORQUE: 147 N-m (15.0 kgf-m, 108 lbf-ft)

Install a new cotter pin.



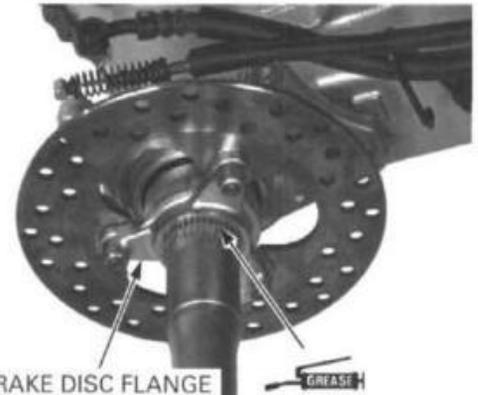
Coat a new O-ring with oil and install it into the brake disc flange groove.

Install the brake disc onto the flange with new bolts if it was removed.

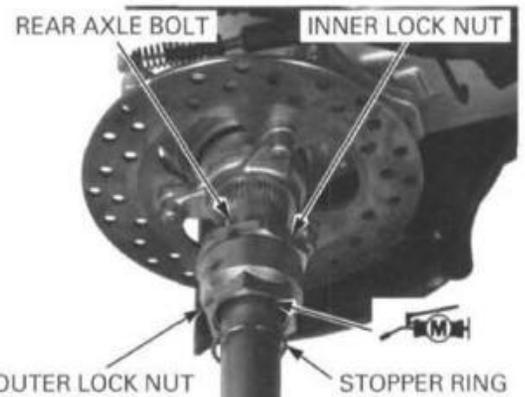
TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)



Apply grease to the rear axle splines.
Install the brake disc flange onto the rear axle.
Install the skid plate (page 3-8).



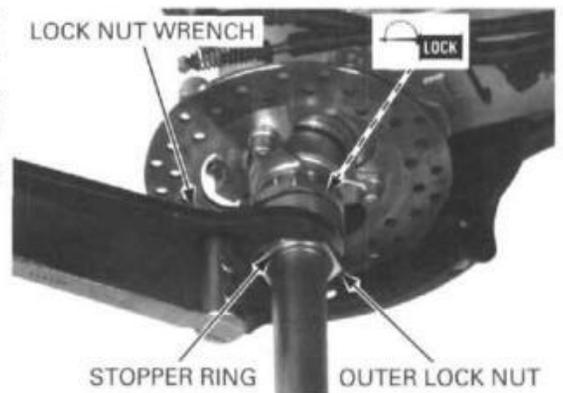
Apply molybdenum disulfide grease to the clip contacting area of the outer lock nut on the rear axle bolt.
Install the rear axle bolt with the inner and outer lock nuts.
Install the stopper ring but do not install it into the ring groove yet.



The lock nuts have left hand threads.

Turn the outer lock nut clockwise until the stopper ring groove is covered with the outer lock nut and apply locking agent to the axle bolt threads.
Turn the outer lock nut counterclockwise until the ring groove is visible and install the stopper ring into the groove.
Turn the outer lock nut clockwise to seat it against the stopper ring.
Tighten the outer lock nut using the special tool.

TOOL:
Lock nut wrench, 45.5 mm 07916-1870101 or commercially available equivalent



Refer to page 18-3 for torque wrench reading information.

TORQUE: Actual: 88 N·m (9.0 kgf·m, 65 lbf·ft)
Indicated: 79 N·m (8.1 kgf·m, 59 lbf·ft)

REAR WHEEL/SUSPENSION

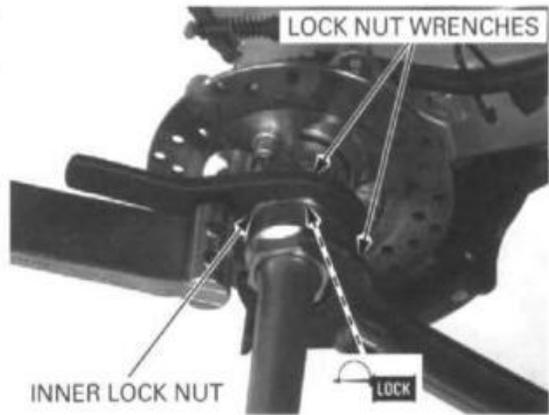
Apply locking agent to the inner lock nut area of the axle bolt threads.
Tighten the inner lock nut while holding the outer lock nut, using the special tools.

TOOLS:

Lock nut wrench, 56 mm 07916-HA20000 or 07916-HA2010A (U.S.A. only)
Lock nut wrench, 45.5 mm 07916-1870101 or commercially available equivalent

Refer to page 18-3 for torque wrench reading information.

TORQUE: Actual: 128 N·m (13.0 kgf·m, 94 lbf·ft)
Indicated: 115 N·m (11.7 kgf·m, 85 lbf·ft)

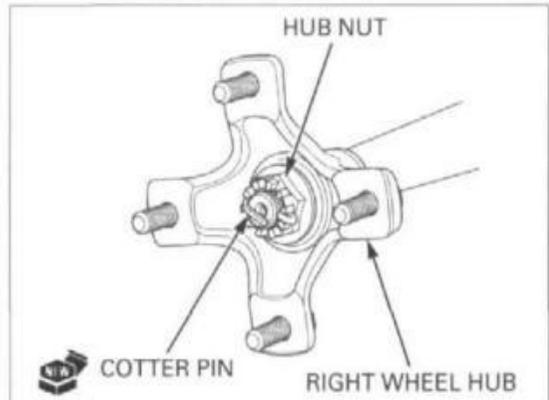


Apply grease to the hub nut threads and seating surface.
Install the right wheel hub and hub nut.
Tighten the hub nut to the specified torque and further tighten it until its grooves align with the cotter pin hole.

TORQUE: 147 N·m (15.0 kgf·m, 108 lbf·ft)

Install a new cotter pin.

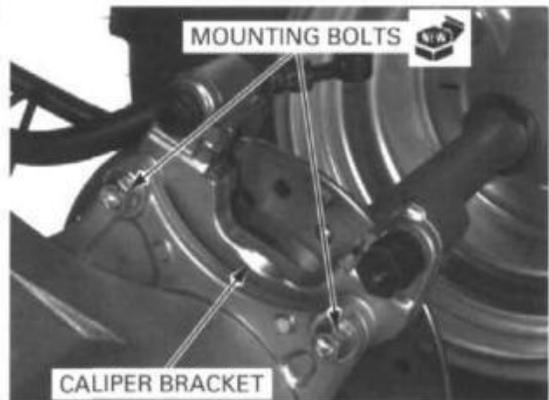
Install the right rear wheel (page 18-7).



Install the rear brake caliper bracket with new bolts and tighten the bolts.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

Install the rear brake caliper (page 19-25).



REAR SHOCK ABSORBER

REMOVAL

Support the vehicle with a support block to raise the rear wheels off the ground.

Support the swingarm and remove the mounting nuts, bolts and the rear shock absorber.



INSPECTION

Remove the upper pivot collar and check the needle bearing for wear or damage.
 Replace the bearing if necessary.

Check the damper unit for leaks or other damage.
 Replace the shock absorber assembly if necessary.



BEARING REPLACEMENT

Remove the pivot collar and dust seals.

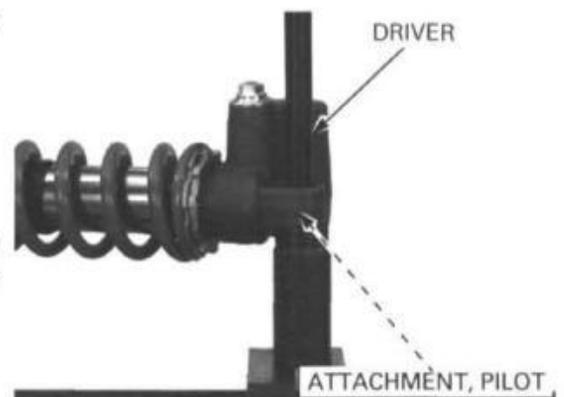


Press the needle bearing out of the shock absorber upper pivot using the special tool.

TOOLS:

Driver	07949-3710001
Attachment, 24 x 26 mm	07746-0010700
Pilot, 17 mm	07746-0040400

Apply grease to new needle bearing rollers.
 Press the needle bearing into the upper pivot until the depth from the outer surface is 5.0 – 5.5 mm (0.20 – 0.22 in), using the same special tools.



Apply grease to new dust seal lips and install them into the upper pivot until they are seated to the bearing.
 Install the pivot collar.



INSTALLATION

Set the shock absorber onto the shock arm and into the frame, and install the mounting bolts from the right side.

Install the mounting nuts and tighten them.

TORQUE: 59 N·m (6.0 kgf·m, 43 lbf·ft)



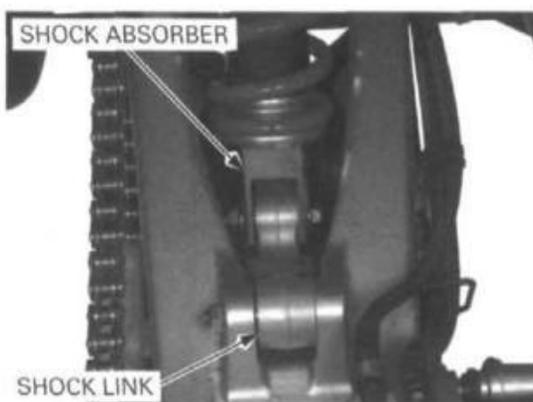
SHOCK LINKAGE

REMOVAL

Support the vehicle with a support block to raise the rear wheels off the ground.

Support the swingarm and remove the following:

- shock absorber lower mounting nut and bolt
- shock link-to-swingarm nut, bolt and O-rings
- shock link-to-shock arm nut and bolt
- shock link
- shock arm-to-frame bolt
- shock arm

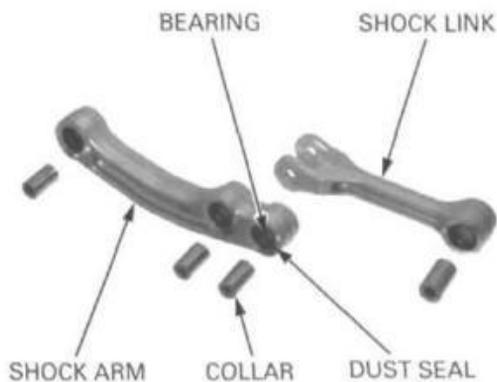


Remove the pivot collars from the shock arm and shock link.

Check the needle bearings for wear or damage.

BEARING REPLACEMENT

Remove the dust seals from the shock arm and shock link pivots



Press the needle bearings out of the shock arm pivots.

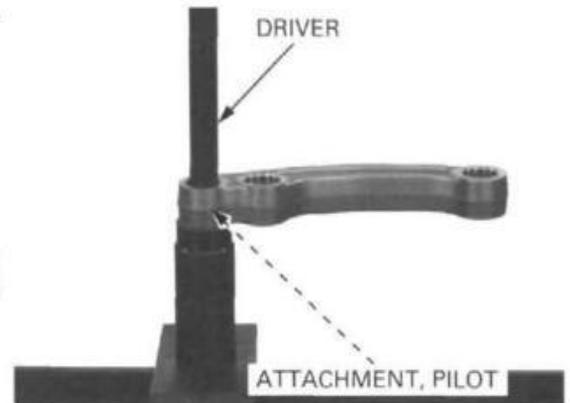
TOOLS:

Driver	07949-3710001
Attachment, 24 x 26 mm	07746-0010700
Pilot, 17 mm	07746-0040400

Apply grease to new needle bearing rollers.

Press in the bearing with the marked side facing up.

Press the needle bearing into the shock arm until the depth from the outer surface is 5.3 – 5.7 mm (0.21 – 0.22 in), using the same special tools.



Press the needle bearings out of the shock link pivot.

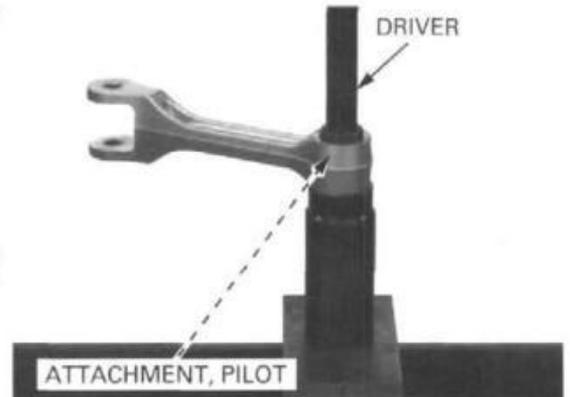
TOOLS:

Driver	07949-3710001
Attachment, 24 x 26 mm	07746-0010700
Pilot, 20 mm	07746-0040500

Apply grease to new needle bearing rollers.

Press in the bearing with the marked side facing up.

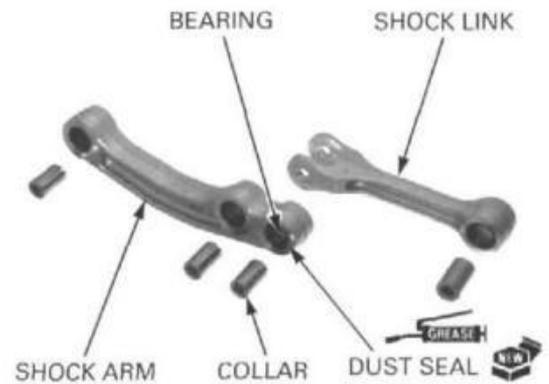
Press the needle bearing into the shock link until the depth from the outer surface is 5.3 – 5.7 mm (0.21 – 0.22 in), using the same special tools.



Apply grease to new dust seal lips and install them into the shock arm and shock link pivots until they are seated to the bearings.

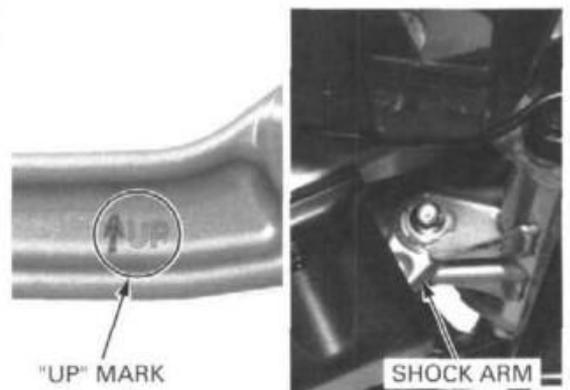
INSTALLATION

Install the pivot collars into the shock arm and shock link.



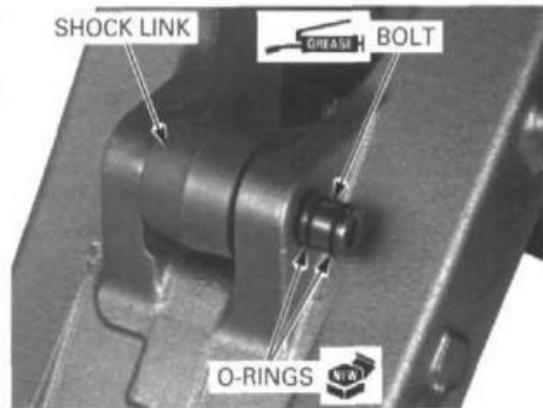
Note the installation direction of the shock linkage bolts. All bolts are installed from the right side.

Install the shock arm into the frame with the "UP" mark facing up and to the left side with the bolt and nut.



REAR WHEEL/SUSPENSION

Install new O-rings into the grooves in the shock link-to-swingarm bolt.
Apply grease to the pivot surface of the bolt.
Install the shock link into the swingarm with the bolt and nut.



Install the shock link onto the shock arm with the bolt and nut.
Install the shock absorber onto the shock arm with the bolt and nut.

Tighten the shock linkage and shock absorber mounting nuts.

TORQUE:

Rear shock absorber lower mounting nut:

59 N·m (6.0 kgf·m, 43 lbf·ft)

Shock link-to-swingarm nut:

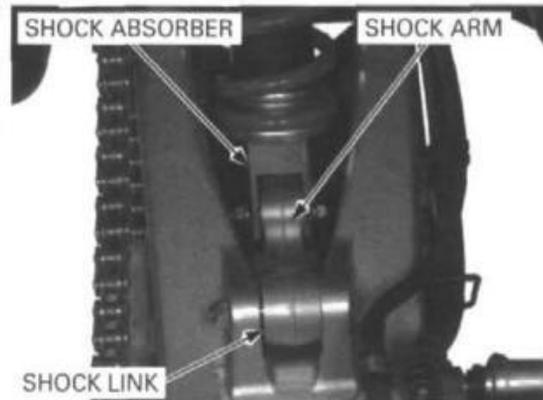
44 N·m (4.5 kgf·m, 33 lbf·ft)

Shock arm-to-frame nut:

59 N·m (6.0 kgf·m, 43 lbf·ft)

Shock arm-to-shock link nut:

59 N·m (6.0 kgf·m, 43 lbf·ft)

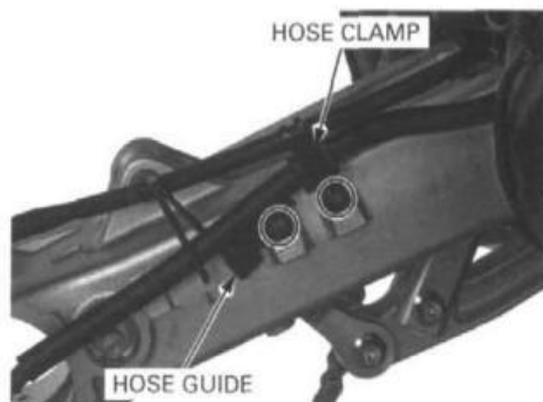


SWINGARM

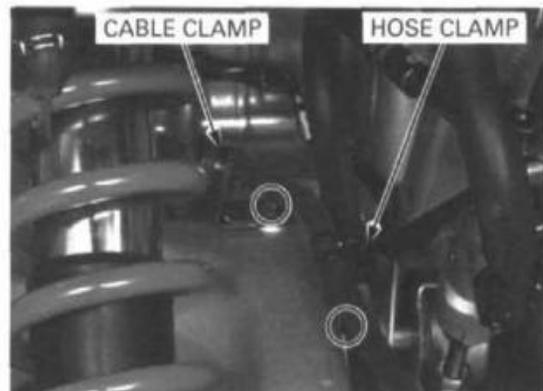
REMOVAL

Remove the following:

- rear axle and bearing holder (page 18-7)
- bolt and rear brake hose guide
- bolt and rear brake hose clamp



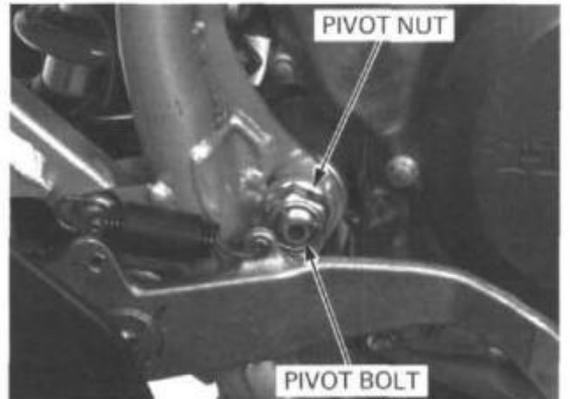
- bolt and rear brake hose clamp
- bolt and parking brake cable clamp



- shock absorber lower mounting nut and bolt
- shock link-to-swingarm nut and bolt

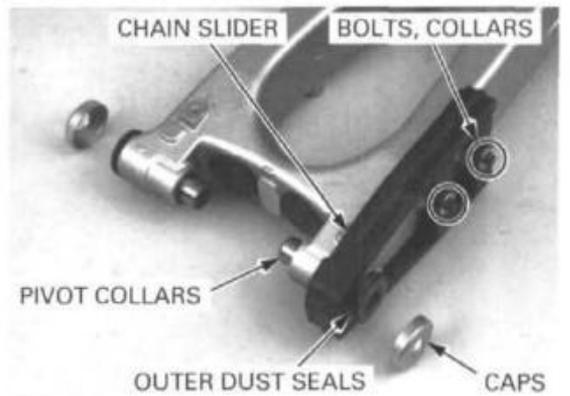


- rear brake pedal return spring from the upper hook
- swingarm pivot nut and bolt
- swingarm from the frame



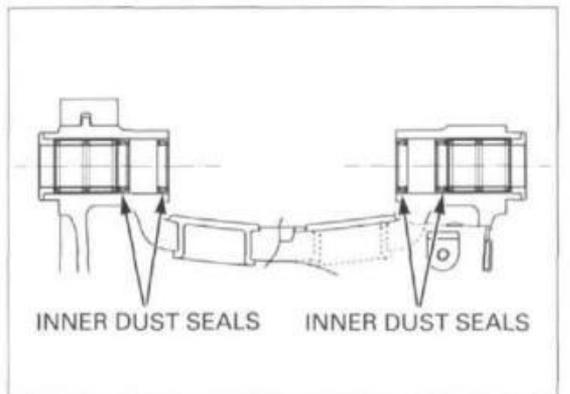
- dust seal caps
- outer dust seals
- pivot collars
- two bolts, collars and chain slider if necessary

Check the needle bearings for wear or damage.



BEARING REPLACEMENT

Remove the inner dust seals from the swingarm pivots.

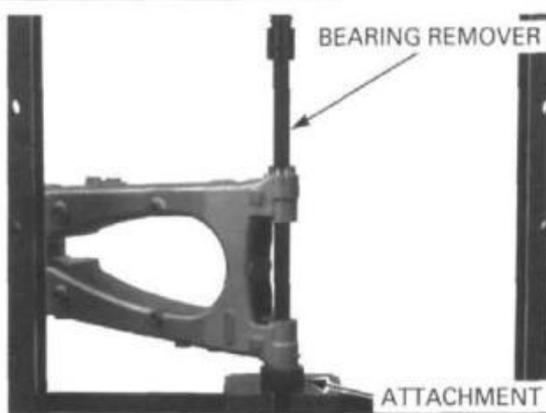


REAR WHEEL/SUSPENSION

Press the needle bearing and thrust bushing out of the swingarm pivot using the special tools.

TOOLS:

Needle bearing remover 07946-KA50000
Attachment, 35 mm I.D. 07746-0030400



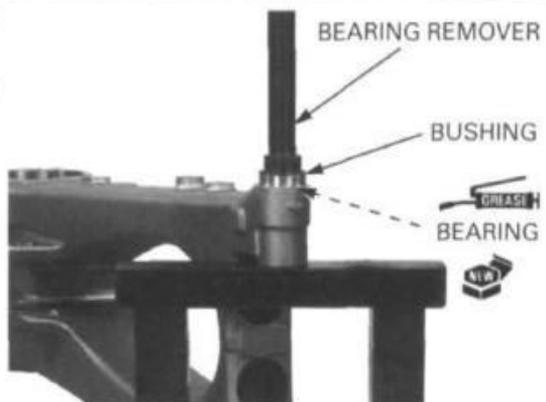
Apply 3 g (0.1 oz) of grease to each new needle bearing.

Press in the bearing with the marked side facing up.

Press the needle bearing and thrust bushing into the swingarm pivot until the bushing is fully seated.

TOOL:

Needle bearing remover 07946-KA50000

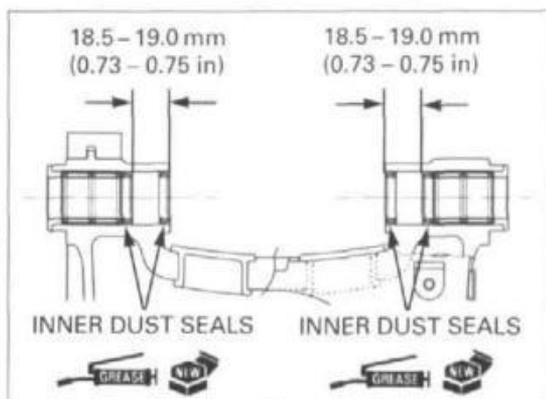


Apply grease to new inner dust seal lips. Install the inner dust seals (inside) into the swingarm pivots until the depth from the pivot surface is 18.5 – 19.0 mm (0.73 – 0.75 in) using the special tool.

TOOL:

Needle bearing remover 07946-KA50000

Install the inner dust seals (outside) into the swingarm pivots until they are flush with the pivot surfaces.



INSTALLATION

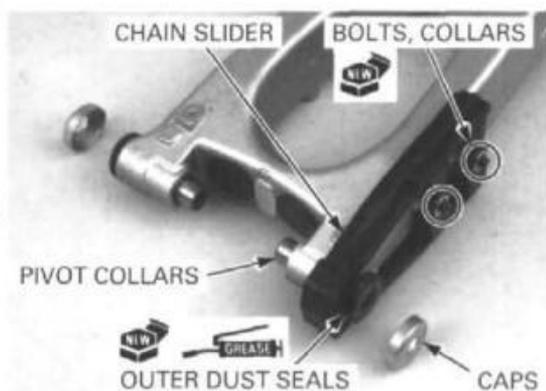
Install the chain slider with the collars and new bolts, and tighten the bolts if they were removed.

TORQUE: 9.8 N·m (1.0 kgf·m, 7 lbf·ft)

Install the pivot collars.

Apply grease to new outer dust seal lips.

Install the outer dust seals onto the swingarm pivots with the lips side facing out, and install the seal caps onto the dust seals.

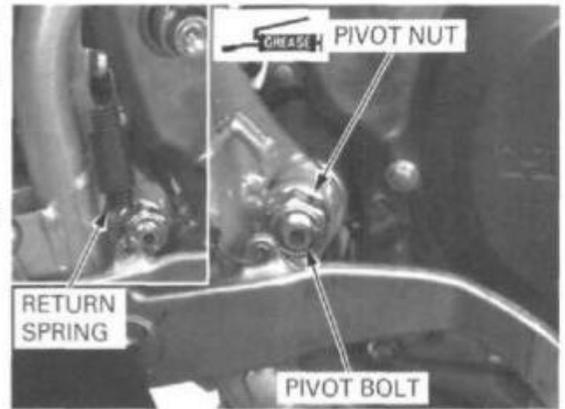


Be careful not to drop the dust seal caps.

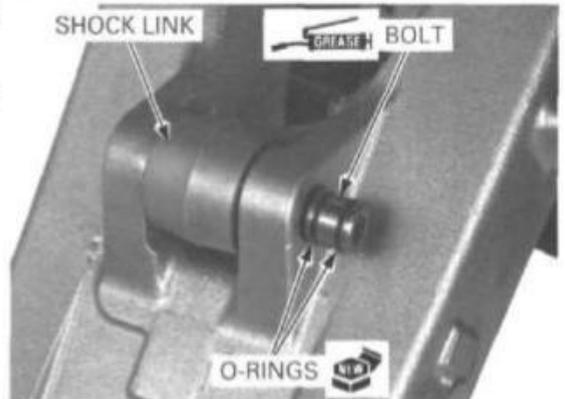
Install the swingarm between the frame and engine, and insert the pivot bolt from the left side. Apply grease to the pivot nut threads and seating surface. Install the pivot nut and tighten it.

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

Hook the brake pedal return spring properly as shown.



Install new O-rings into the grooves in the shock link-to-swingarm bolt. Apply grease to the pivot surface of the bolt. Install the shock link into the swingarm with the bolt and nut.



Install the shock absorber onto the shock arm with the bolt and nut.

Tighten the shock absorber lower mounting nut and shock link-to-swingarm nut.

TORQUE:

Shock absorber lower mounting nut:

59 N·m (6.0 kgf·m, 43 lbf·ft)

Shock link-to-swingarm nut:

44 N·m (4.5 kgf·m, 33 lbf·ft)

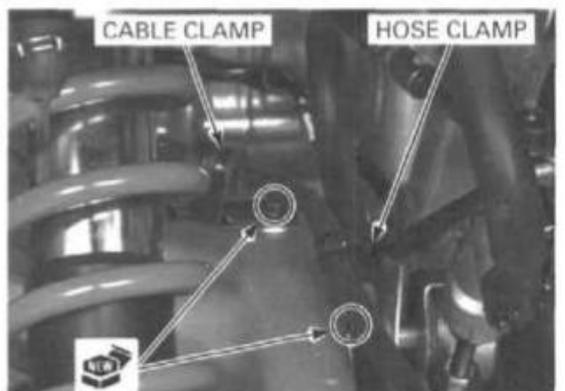


Install the parking brake cable clamp with a new bolt and tighten the bolt.

TORQUE: 9.8 N·m (1.0 kgf·m, 7 lbf·ft)

Install the rear brake hose clamp with a new bolt and tighten the bolt.

TORQUE: 9.8 N·m (1.0 kgf·m, 7 lbf·ft)



REAR WHEEL/SUSPENSION

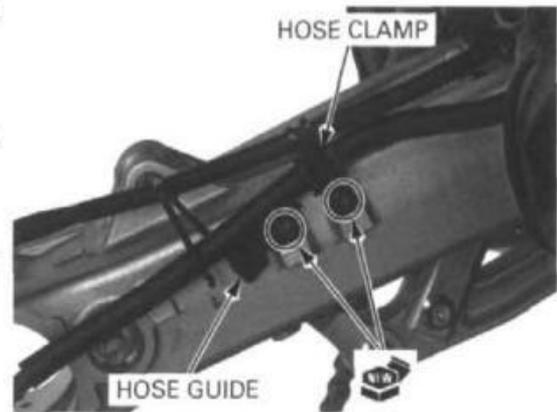
Install the rear brake hose clamp with a new bolt and tighten the bolt.

TORQUE: 9.8 N·m (1.0 kgf·m, 7 lbf·ft)

Install the rear brake hose guide with a new bolt and tighten the bolt.

TORQUE: 9.8 N·m (1.0 kgf·m, 7 lbf·ft)

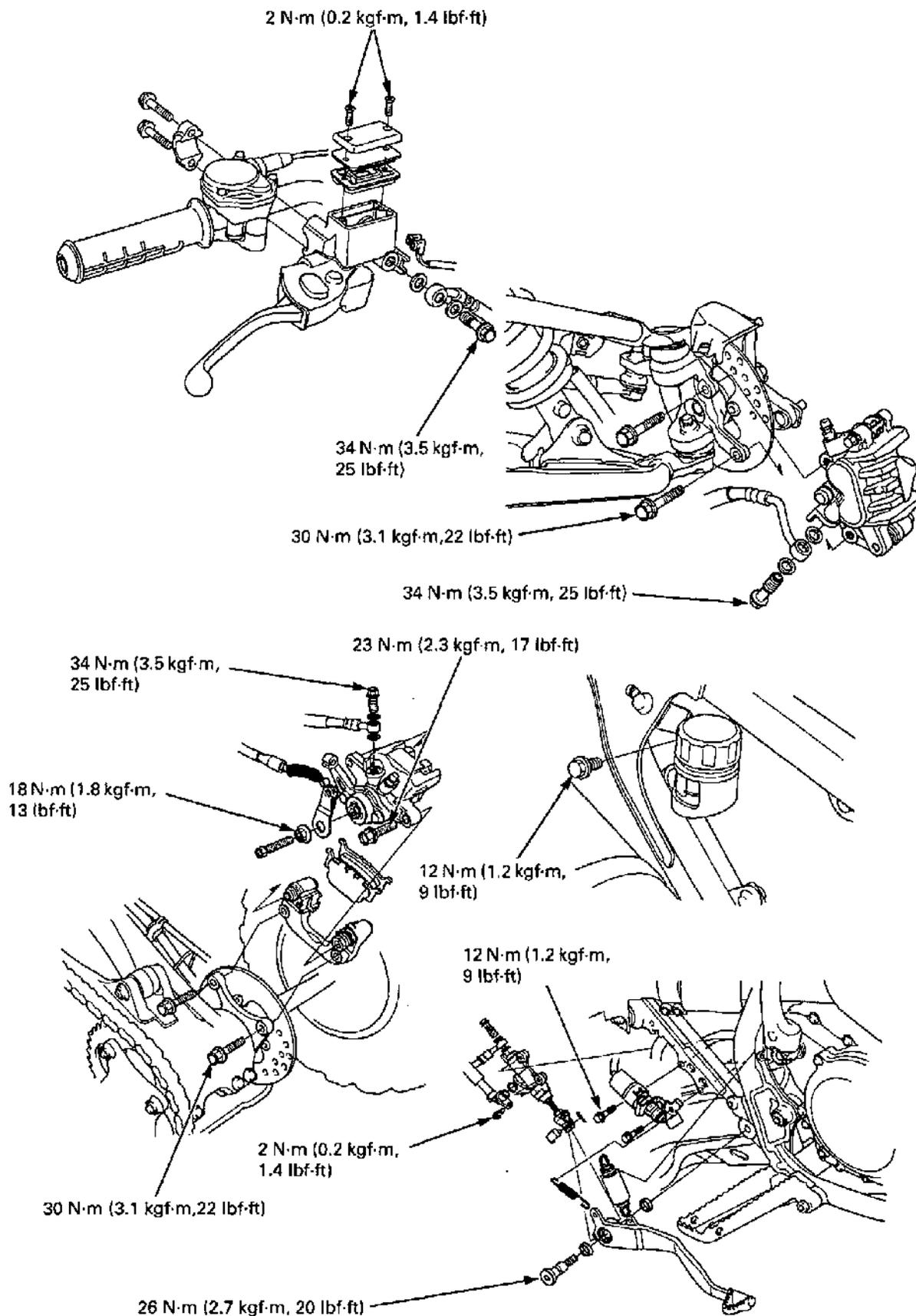
Install the rear axle bearing holder and rear axle (page 18-12).



19. HYDRAULIC BRAKE

SYSTEM COMPONENTS	19-2	FRONT MASTER CYLINDER.....	19-10
SERVICE INFORMATION	19-3	FRONT BRAKE CALIPER.....	19-15
TROUBLESHOOTING	19-4	REAR MASTER CYLINDER	19-18
BRAKE FLUID REPLACEMENT/ AIR BLEEDING	19-5	REAR BRAKE CALIPER.....	19-22
BRAKE PAD/DISC.....	19-8	BRAKE PEDAL	19-28

SYSTEM COMPONENTS



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 the plastic parts and painted surfaces. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap; make sure the reservoir is horizontal first.*
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- Never allow contaminants (e.g., dirt, water) to enter 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 as they may not be compatible.
- Always check brake operation before riding the vehicle.

SPECIFICATION

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Recommended brake fluid		DOT 4 brake fluid	-
Front brake	Disc thickness	2.8 – 3.2 (0.11 – 0.13)	2.5 (0.10)
	Disc runout	-	0.30 (0.012)
	Master cylinder I.D.	12.7 (0.55)	-
	Caliper cylinder I.D.	25.4 (1.00)	-
Rear brake	Brake disc thickness	3.8 – 4.2 (0.15 – 0.17)	3.5 (0.14)
	Brake disc runout	-	0.30 (0.012)
	Master cylinder I.D.	12.7 (0.55)	-
	Caliper cylinder I.D.	32.0 (1.26)	-

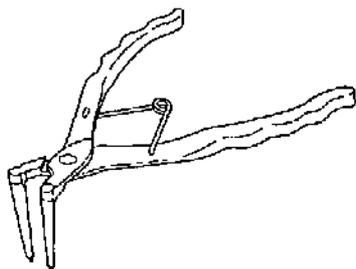
TORQUE VALUES

Brake caliper bleed valve	6 N·m (0.6 kgf·m, 4.3 lbf·ft)	
Front master cylinder reservoir cap screw	2 N·m (0.2 kgf·m, 1.4 lbf·ft)	
Rear brake reservoir mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Front brake disc cover bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	ALOC bolt; replace with a new one.
Front brake pad pin	18 N·m (1.8 kgf·m, 13 lbf·ft)	
Rear brake caliper pin bolt	23 N·m (2.3 kgf·m, 17 lbf·ft)	
Brake hose oil bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)	
Front brake lever pivot bolt	1 N·m (0.1 kgf·m, 0.7 lbf·ft)	
Front brake lever pivot nut	6 N·m (0.6 kgf·m, 4.3 lbf·ft)	
Front brake light switch screw	1 N·m (0.1 kgf·m, 0.7 lbf·ft)	
Front brake caliper bracket mounting bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	ALOC bolt; replace with a new one.
Rear brake reservoir hose joint screw	2 N·m (0.2 kgf·m, 1.4 lbf·ft)	Apply locking agent to the threads.
Rear master cylinder mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Rear brake caliper mounting bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	ALOC bolt; replace with a new one.
Parking brake base bolt	23 N·m (2.3 kgf·m, 17 lbf·ft)	
Brake pedal pivot bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)	

HYDRAULIC BRAKE

TOOLS

Snap ring pliers
07914-SA50001



TROUBLESHOOTING

Brake lever/pedal soft or spongy

- Air in hydraulic system
- Leaking hydraulic system
- Contaminated brake pad/disc
- Worn caliper piston seal
- Worn master cylinder piston cups
- Worn brake pad/disc
- Contaminated caliper
- Contaminated master cylinder
- Caliper not sliding properly
- Low brake fluid level
- Clogged fluid passage
- Warped/deformed brake disc
- Sticking/worn caliper piston
- Sticking/worn master cylinder piston
- Bent brake lever/pedal

Brake lever/pedal hard

- Clogged/restricted brake system
- Sticking/worn caliper piston
- Sticking/worn master cylinder piston
- Caliper not sliding properly
- Bent brake lever/pedal

Brake drags

- Contaminated brake pad/disc
- Badly worn brake pad/disc
- Warped/deformed brake disc
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Sticking caliper piston

BRAKE FLUID REPLACEMENT/AIR BLEEDING

BRAKE FLUID DRAINING

FRONT BRAKE

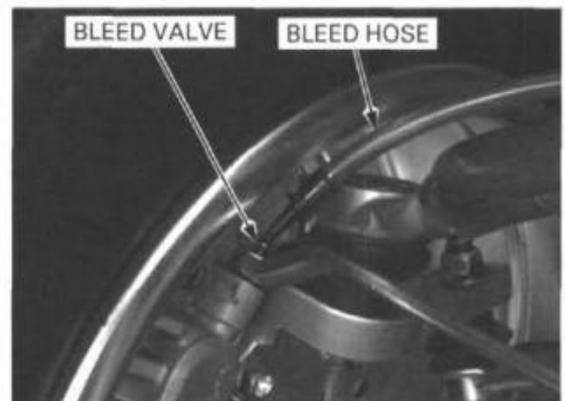
Turn the handlebar to the left until the reservoir is level before removing the reservoir cap.

Remove the screws, reservoir cap, set plate and diaphragm.



Connect a bleed hose to the front brake caliper bleed valve.

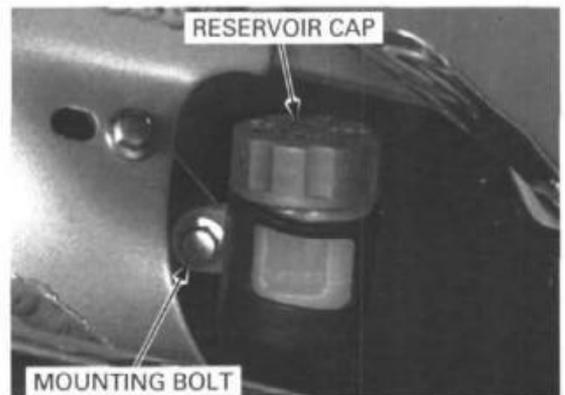
Loosen the bleed valve and pump the front brake lever until no more fluid flows out of the bleed valve.



REAR BRAKE

Remove the rear brake reservoir mounting bolt from the stay.

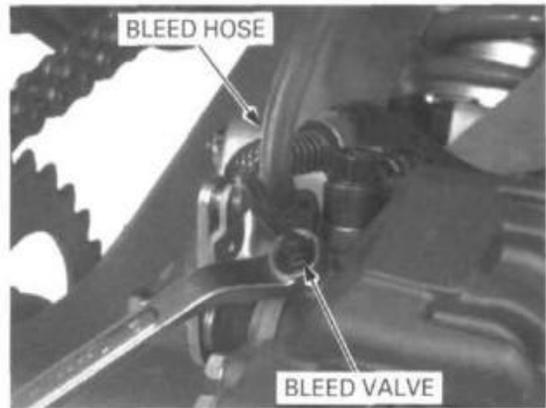
Remove the reservoir cap, set plate and diaphragm.



HYDRAULIC BRAKE

Connect a bleed hose to the rear brake caliper bleed valve.

Loosen the bleed valve and pump the brake pedal until no more fluid flows out of the bleed valve.



BRAKE FLUID FILLING/AIR BLEEDING

FRONT BRAKE

Close the front brake caliper bleed valve.

Fill the front master cylinder reservoir with DOT 4 brake fluid from a sealed container.

Follow the manufacturer's operating instructions.

Connect a commercially available brake bleeder to the bleed valve.

Operate the brake bleeder and loosen the bleed valve.

Check the fluid level often while bleeding the brake to prevent air from being pumped into the system.

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.

Tighten the bleed valve.

TORQUE: 6 N-m (0.6 kgf-m, 4.3 lbf-ft)

Perform air bleeding for the other side bleed valve.



If the brake bleeder is not available, perform the following procedure:

Pump up the system pressure with the front brake lever until the lever resistance is felt.

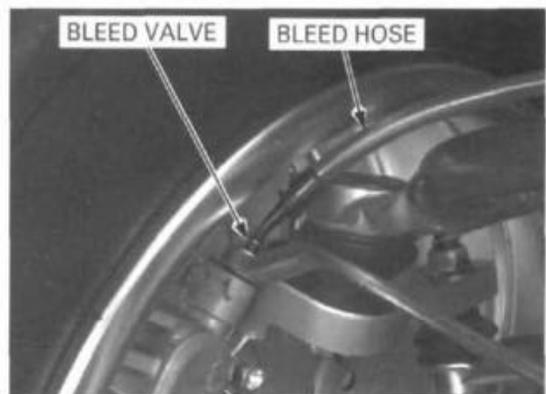
Connect a bleed hose to the front brake caliper bleed valve and bleed the system as follows:

Do not release the brake lever until the bleed valve has been closed.

1. Squeeze the brake lever all the way and loosen the bleed valve 1/2 of a turn. Wait several seconds and then close the bleed valve.
2. Release the brake lever slowly and wait several seconds after it reaches the end of its travel.
3. Repeat the steps 1 and 2 until there are no air bubbles in the bleed hose.

Tighten the bleed valve.

TORQUE: 6 N-m (0.6 kgf-m, 4.3 lbf-ft)



Perform air bleeding for the other side bleed valve.
 After bleeding air, operate the front brake lever. If it still feels spongy, bleed the system again.
 Fill the front master cylinder reservoir to the casting ledge with DOT 4 brake fluid from a sealed container.
 Install the diaphragm, set plate and reservoir cap, and tighten the screws.

TORQUE: 2 N-m (0.2 kgf-m, 1.4 lbf-ft)



REAR BRAKE

Close the rear brake caliper bleed valve.
 Fill the rear brake reservoir with DOT 4 brake fluid from a sealed container.

Follow the manufacturer's operating instructions.

Connect a commercially available brake bleeder to the bleed valve.
 Operate the brake bleeder and loosen the bleed valve.

Check the fluid level often while bleeding the brake to prevent air from being pumped into the system.

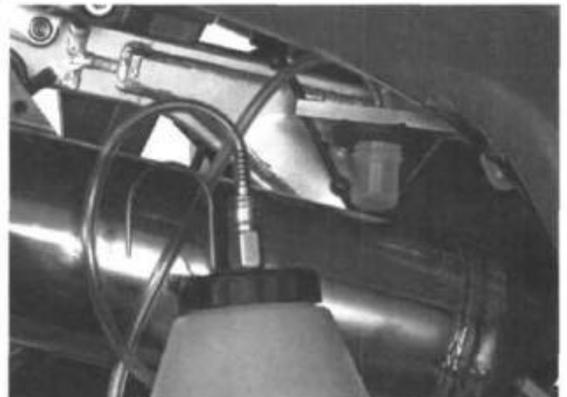
If an automatic refill system is not used, add fluid when the fluid level in the reservoir is low.

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.
 Tighten the bleed valve.

TORQUE: 6 N-m (0.6 kgf-m, 4.3 lbf-ft)

Perform air bleeding for the other side bleed valve.



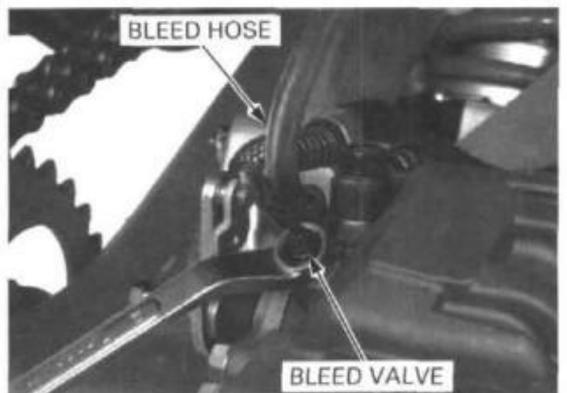
If the brake bleeder is not available, perform the following procedure:

Pump up the system pressure with the brake pedal until the pedal resistance is felt.

Connect a bleed hose to the rear brake caliper bleed valve and bleed the system as follows:

Do not release the brake pedal until the bleed valve has been closed.

1. Depress the brake pedal all the way and loosen the bleed valve 1/2 of a turn. Wait several seconds and then close the bleed valve.
2. Release the brake pedal slowly and wait several seconds after it reaches the end of its travel.
3. Repeat the steps 1 and 2 until there are no air bubbles in the bleed hose.



HYDRAULIC BRAKE

Tighten the bleed valve.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)

Perform air bleeding for the other side bleed valve.

After bleeding air, operate the brake pedal. If it still feels spongy, bleed the system again.

Fill the rear brake reservoir to the "UPPER" level line with DOT 4 brake fluid from a sealed container.

Install the diaphragm, set plate and reservoir cap. Install the rear brake reservoir onto the stay and tighten the mounting bolt.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



BRAKE PAD/DISC

FRONT BRAKE PAD REPLACEMENT

Remove the front wheel (page 17-11).

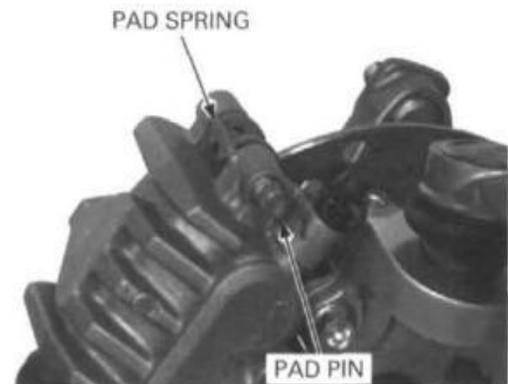
Check the fluid level in the master cylinder reservoir as this operation causes the fluid level to rise.

Push the caliper pistons all the way in by pushing the caliper body against the disc to allow installation of new brake pads.

Remove the bolt and disc cover.



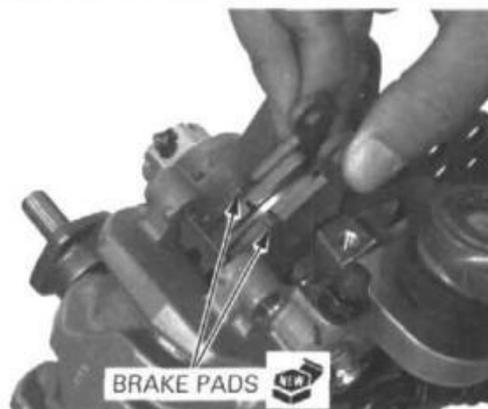
Loosen the pad pin and remove it while pushing the brake pads against the pad spring.



Remove the brake pads from the caliper body.

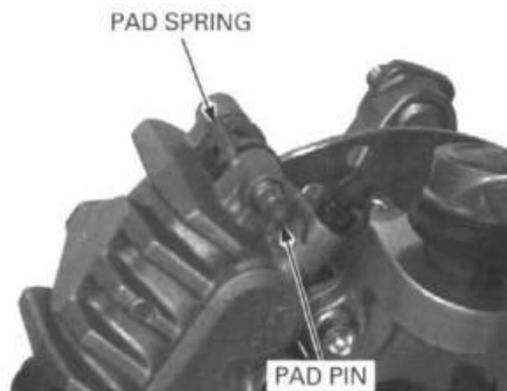
Always replace the brake pads in pairs to ensure even disc pressure.

Install new brake pads into the caliper body so their ends rest on the retainer properly.



Install the pad pin while pushing the brake pads against the pad spring and tighten it.

TORQUE: 18 N-m (1.8 kgf-m, 13 lbf-ft)



Install the disc cover with a new bolt and tighten the bolt.

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

Install the front wheel (page 17-11).

Squeeze the front brake lever to seat the caliper pistons against the pad.

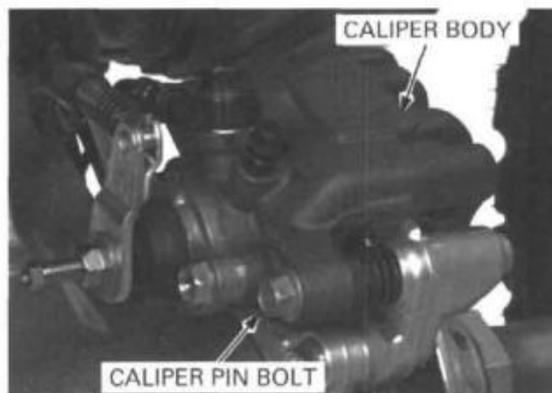


REAR BRAKE PAD REPLACEMENT

Check the fluid level in the rear brake reservoir as this operation causes the fluid level to rise.

Push the caliper pistons all the way in by pushing the caliper body against the disc to allow installation of new brake pads.

Remove the caliper pin bolt.



HYDRAULIC BRAKE

Always replace the brake pads in pairs to ensure even disc pressure.

Pivot the caliper body up and remove the brake pads from the caliper bracket.

Install new brake pads into the caliper bracket with the shim facing toward the piston side.

Lower the caliper body, install the caliper pin bolt and tighten it.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)

Depress the brake pedal to seat the caliper piston against the pad.



BRAKE DISC INSPECTION

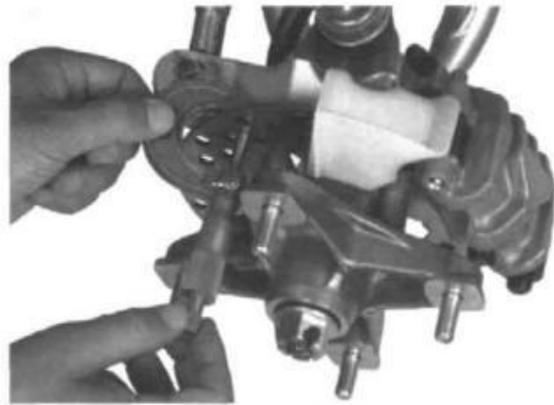
For front brake disc, remove the front wheel (page 17-11).

Visually inspect the brake disc for damage or crack.

Measure the brake disc thickness at several points.

**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 service limit.

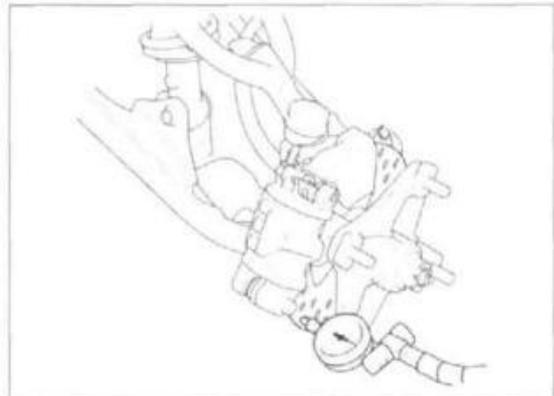


Check the brake disc for warp.

SERVICE LIMIT: 0.30 mm (0.012 in)

Check the front wheel hub bearings or rear axle bearings for excessive play, if the warp exceeds the service limit.

Replace the brake disc if the bearings are normal.

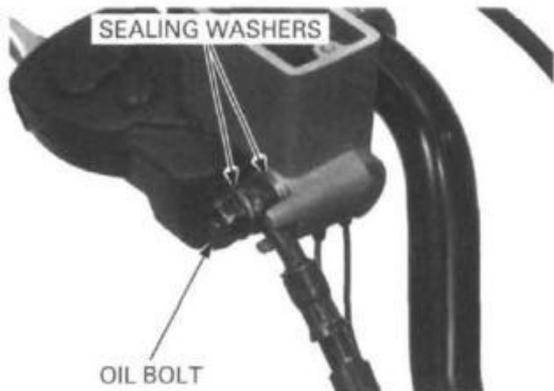


FRONT MASTER CYLINDER

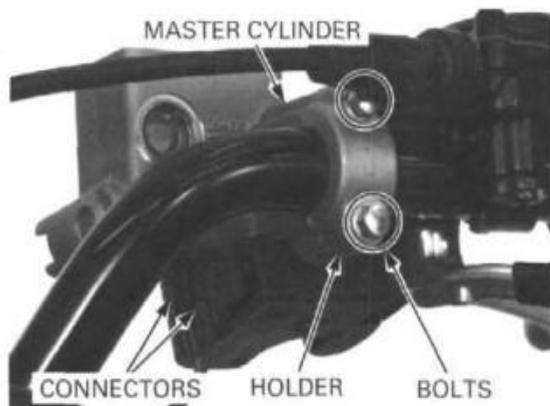
DISASSEMBLY

Drain the brake fluid from the front brake hydraulic system (page 19-5).

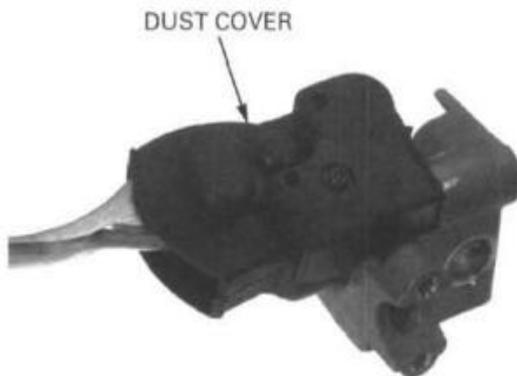
Disconnect the brake hose by removing the oil bolt and sealing washers.



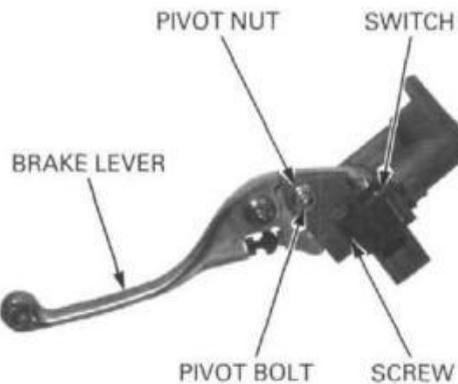
Disconnect the front brake light switch connectors.
Remove the master cylinder holder bolts, holder and master cylinder.



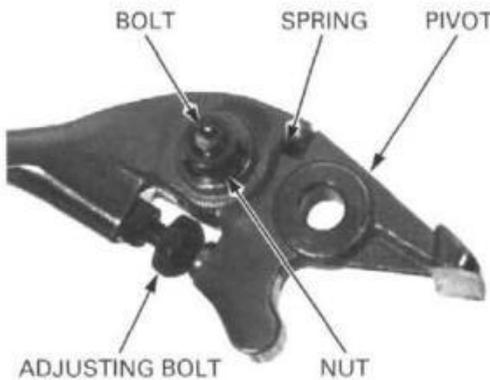
Remove the dust cover from the brake lever.



Remove the pivot nut, bolt and brake lever.
Remove the screw and brake light switch.



Remove the nut, bolt, pivot, spring and adjusting bolt from the lever if necessary.



HYDRAULIC BRAKE

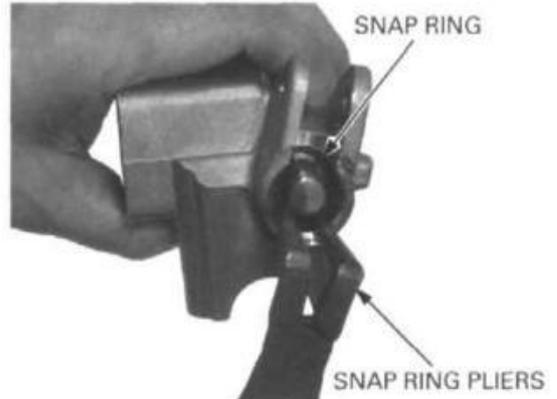
Remove the boot from the master cylinder and master piston.



Remove the snap ring using the special tool.

TOOL:
Snap ring pliers

07914-SA50001



Remove the master piston and spring.

Clean the master cylinder, reservoir and master piston in clean brake fluid.

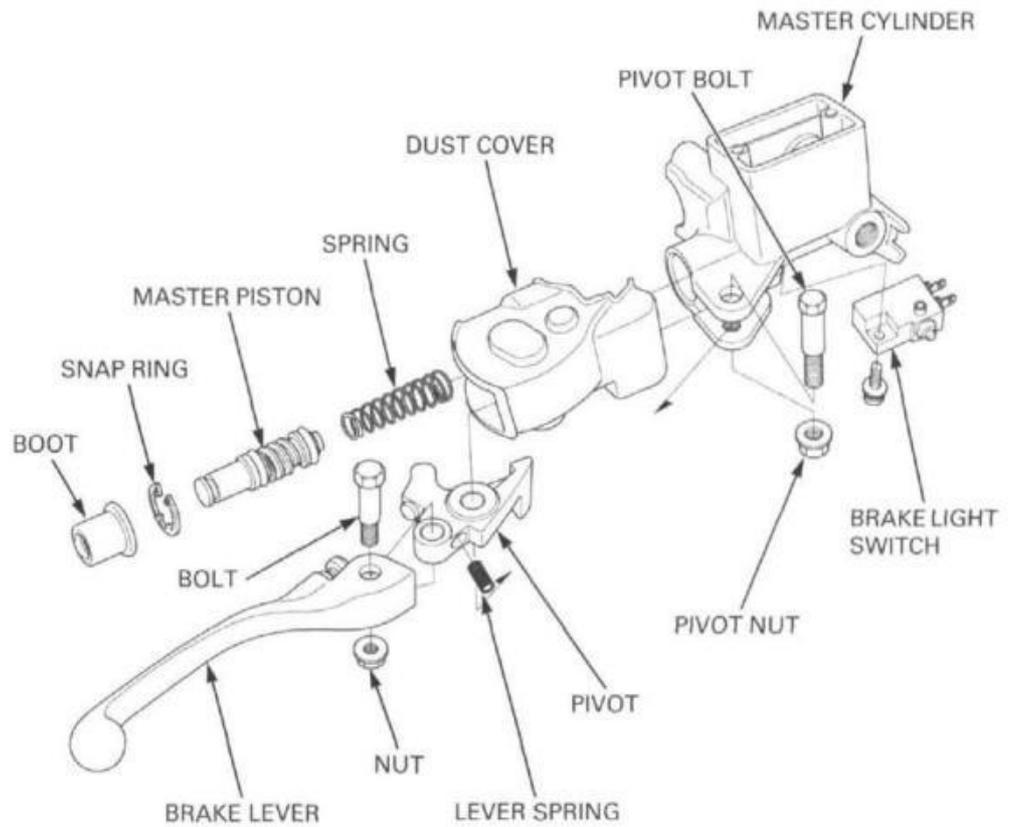
INSPECTION

Check the master cylinder and master piston for scoring, scratches or damage.

Check the piston cups for wear, deterioration or damage.



ASSEMBLY

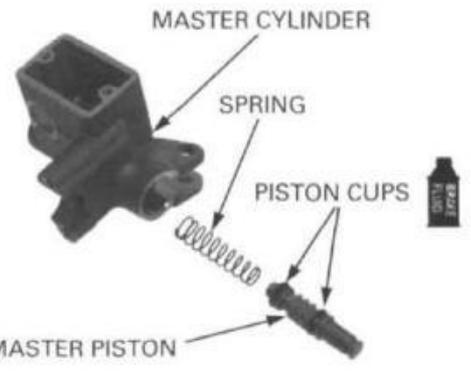


Coat the master piston and piston cups with clean DOT 4 brake fluid.

Install the spring onto the piston end.

Do not allow the piston cup lips to turn inside out.

Install the spring and master piston into the master cylinder.

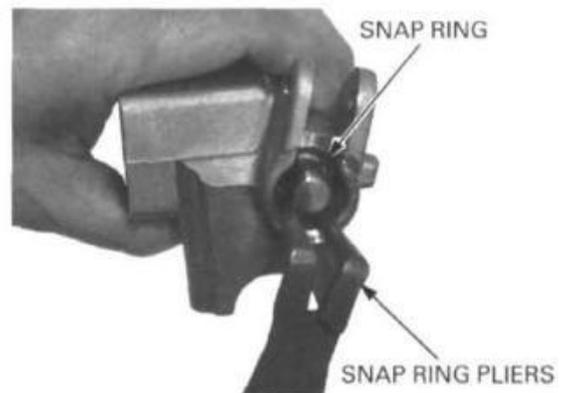


Be certain the snap ring is firmly seated in the groove.

Install the snap ring into the groove in the master cylinder using the special tool.

TOOL:
Snap ring pliers

07914-SA50001



HYDRAULIC BRAKE

Install the boot into the master cylinder and the groove in the piston.
Apply silicone grease to the brake lever pivot-to-master piston contact area.

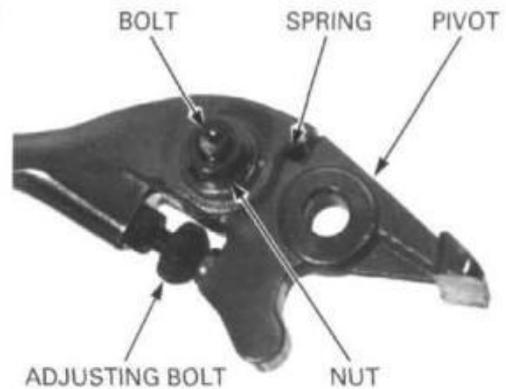


Assemble the adjusting bolt, spring, pivot and bolt, and tighten the bolt.

TORQUE: 1 N·m (0.1 kgf·m, 0.7 lbf·ft)

Install the nut and tighten it.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)



Apply silicone grease to the brake lever pivot bolt sliding surface.

Install the pivot nut and tighten it.

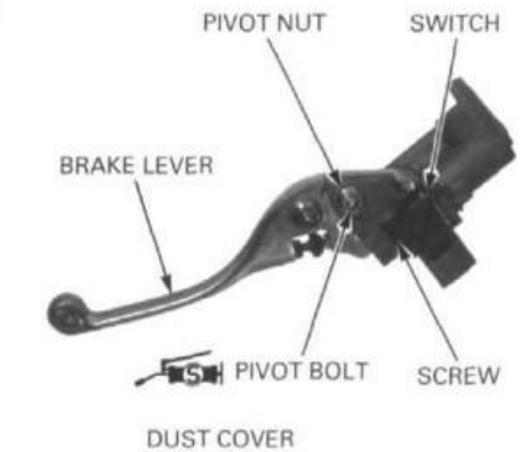
TORQUE: 1 N·m (0.1 kgf·m, 0.7 lbf·ft)

Install the pivot nut and tighten it.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)

Install the brake light switch and tighten the screw.

TORQUE: 1 N·m (0.1 kgf·m, 0.7 lbf·ft)



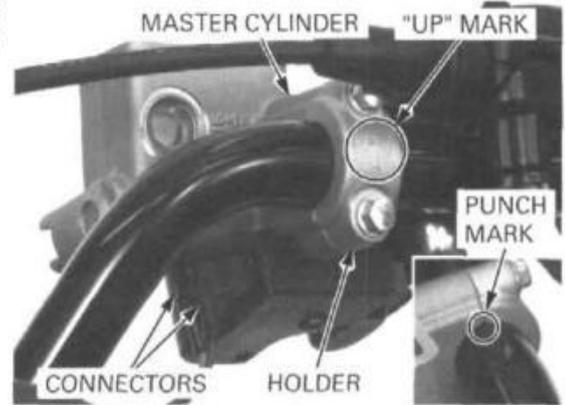
Install the dust cover onto the brake lever.



Align the edge of the master cylinder with the punch mark on the handlebar.

Install the front brake master cylinder and holder with the "UP" mark facing up. Tighten the upper bolt first, then tighten the lower bolt.

Connect the front brake light switch connectors.



Rest the brake hose joint between the stoppers on the master cylinder.

Connect the brake hose with the oil bolt and new sealing washers, and tighten the oil bolt.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the hydraulic system (page 19-6).



FRONT BRAKE CALIPER

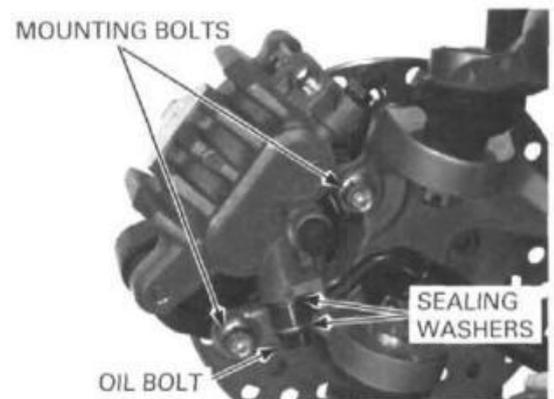
DISASSEMBLY

Drain the brake fluid from the hydraulic system (page 19-5).

Remove the front brake pads (page 19-8).

Disconnect the brake hose from the brake caliper by removing the oil bolt and sealing washer.

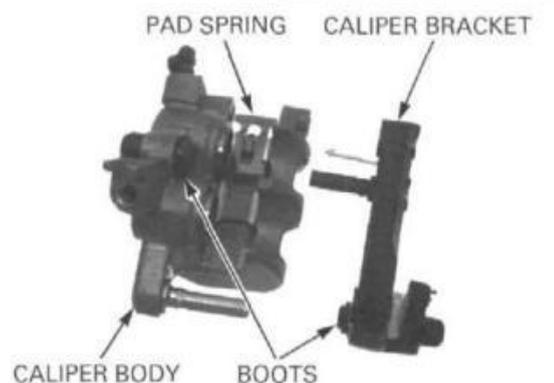
Remove the two mounting bolts and brake caliper assembly.



Remove the caliper bracket from the caliper body.

Remove the caliper pin boot and pad retainer from the caliper bracket.

Remove the pad spring and bracket pin boot from the caliper body.



HYDRAULIC BRAKE

Place a shop towel over the pistons.

Do not use high pressure air or bring the nozzle too close to the inlet.

Position the caliper body with the pistons down and apply small squirts of air pressure to the fluid inlet to remove the pistons.



Be careful not to damage the piston sliding surface.

Push the dust and piston seals in and lift them out.

Clean the seal grooves, caliper cylinders and pistons with clean brake fluid.

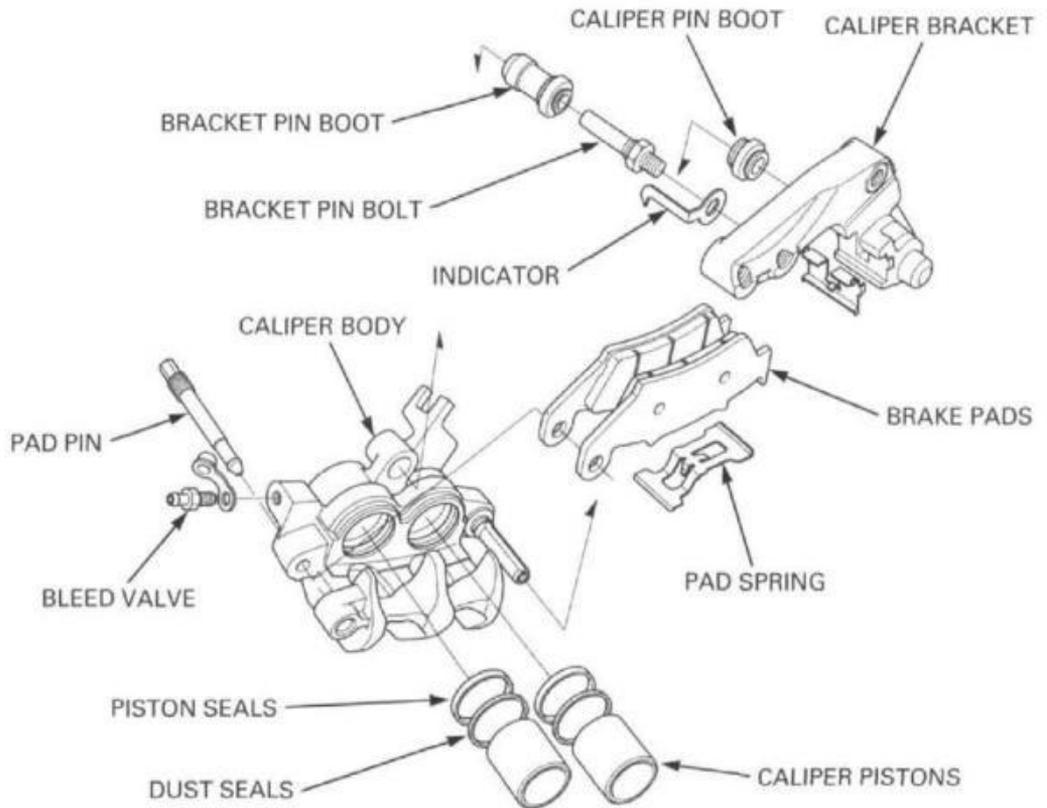


INSPECTION

Check the caliper cylinders and pistons for scoring, scratches or damage.

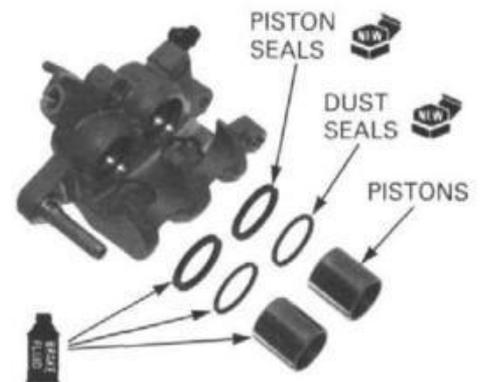


ASSEMBLY



Coat new piston and dust seals with clean brake fluid and install them into the seal grooves in the caliper cylinders.

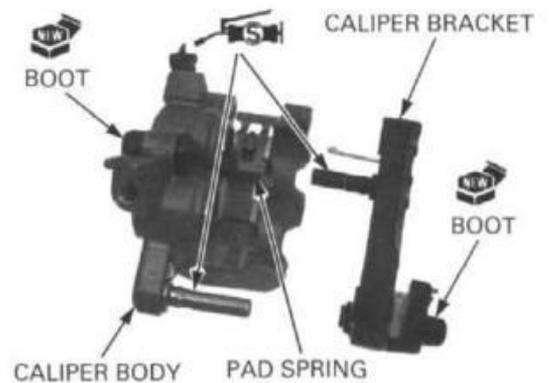
Coat the caliper pistons with clean brake fluid and install them into the caliper cylinders with the open sides toward the pads.



Install the pad spring onto the caliper body as shown.

Install new pin boots into the caliper body and bracket.

Apply silicone grease to the sliding surfaces of the caliper and bracket pins, and install the caliper bracket over the caliper body.



HYDRAULIC BRAKE

Install the brake caliper assembly onto the knuckle with new mounting bolts, and tighten the bolts.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

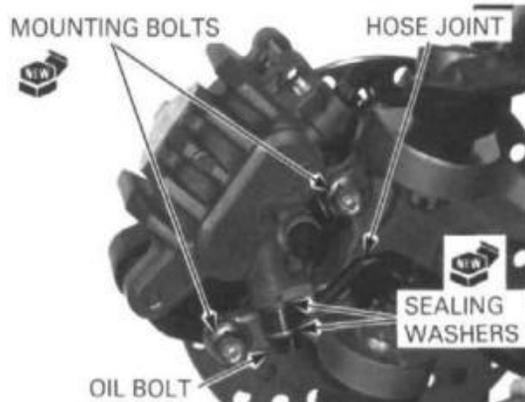
Rest the brake hose joint between the stoppers on the caliper.

Connect the brake hose with the oil bolt and new sealing washers, and tighten the oil bolt.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Install the brake pads (page 19-8).

Fill and bleed the front brake hydraulic system (page 19-6).



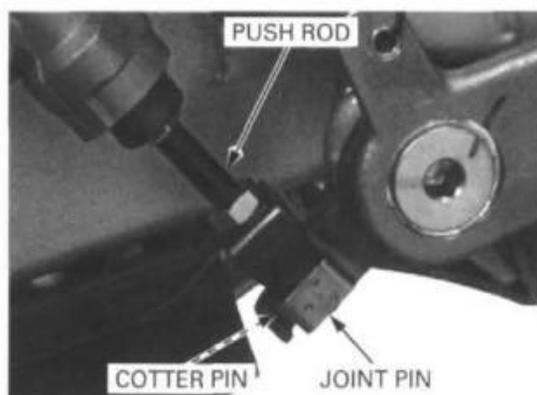
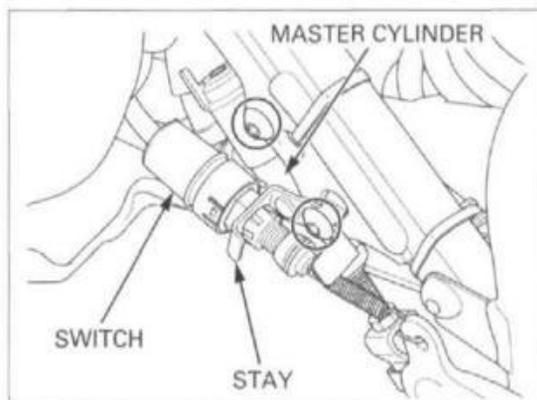
REAR MASTER CYLINDER

DISASSEMBLY

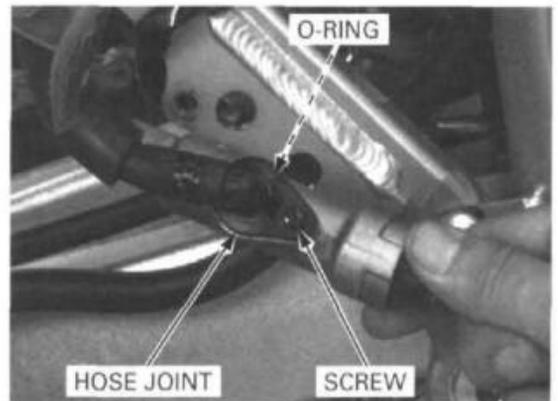
Drain the brake fluid from the rear brake hydraulic system (page 19-5).

Remove the following:

- right mud guard (page 3-3)
 - oil bolt
 - sealing washers
 - brake hose joint
-
- two mounting bolts
 - rear brake light switch with stay
 - master cylinder from the frame
-
- cotter pin
 - joint pin
 - master cylinder push rod from the brake pedal



- screw
- reservoir hose joint
- O-ring



- boot

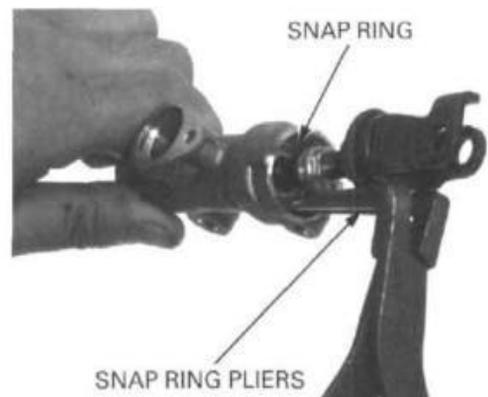


- snap ring using the special tool

TOOL:

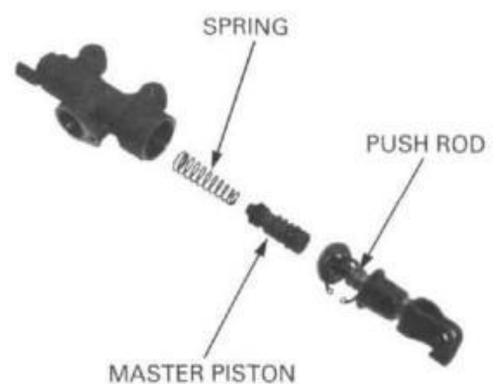
Snap ring pliers

07914-SA50001



- push rod
- master piston
- spring

Clean master cylinder and master piston in clean brake fluid.



HYDRAULIC BRAKE

INSPECTION

Check the master cylinder and master piston for scoring, scratches or damage.

Check the piston cups for wear, deterioration or damage.



ASSEMBLY

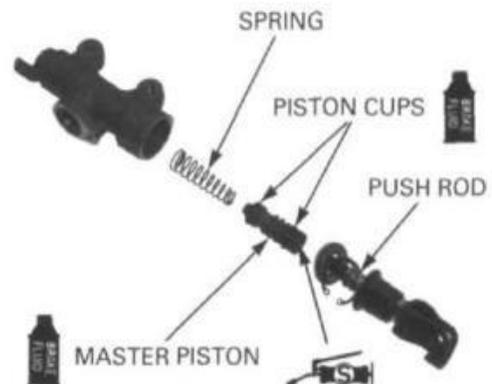
Coat the master piston and piston cups with clean DOT 4 brake fluid.

Install the spring onto the piston end.

Do not allow the piston cup lips to turn inside out.

Install the spring and master piston into the master cylinder.

Install the push rod into the master cylinder.



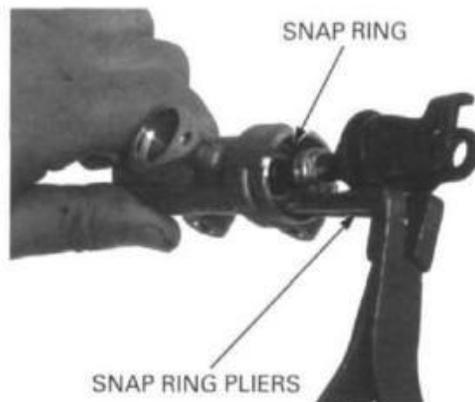
Be certain the snap ring is firmly seated in the groove.

Install the snap ring into the groove in the master cylinder using the special tool.

TOOL:

Snap ring pliers

07914-SA50001



Install the boot into the master cylinder and push rod groove.

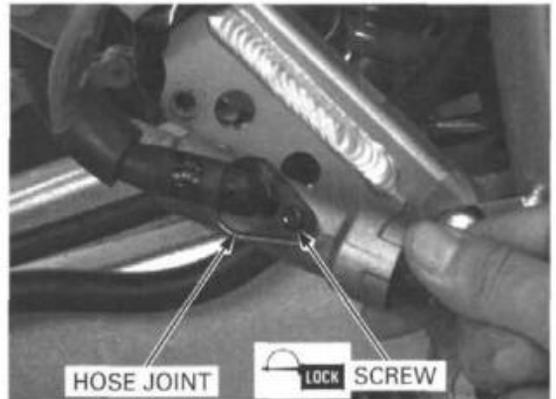


Coat a new O-ring with DOT 4 brake fluid and install it onto the reservoir hose joint.

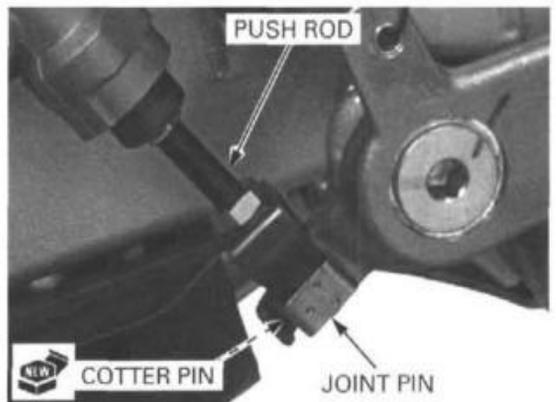


Apply locking agent to the joint screw threads. Install the reservoir hose joint into the master cylinder and tighten the screw.

TORQUE: 2 N·m (0.2 kgf·m, 1.4 lbf·ft)



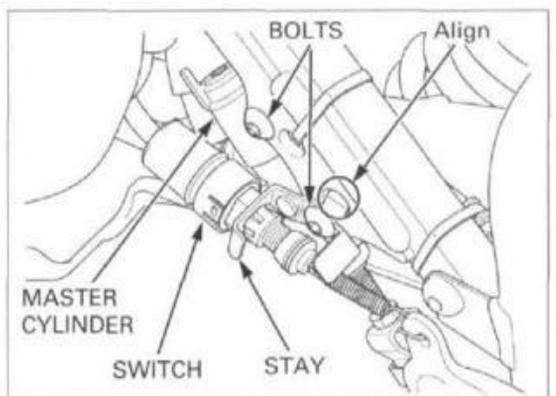
Connect the master cylinder push rod to the brake pedal with the joint pin and a new cotter pin.



Align the switch stay tab with the hole in the frame.

Install the master cylinder and rear brake light switch with stay, and tighten the two mounting bolts.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



HYDRAULIC BRAKE

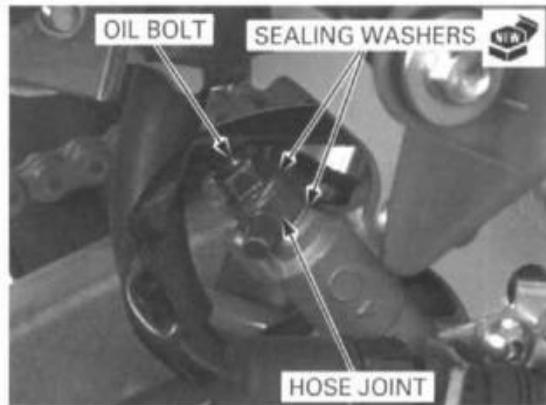
Connect the brake hose with the oil bolt and new sealing washers.

Rest the hose joint onto the stopper of the master cylinder and tighten the oil bolt.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Install the right mud guard (page 3-4).

Fill and bleed the rear brake hydraulic system (page 19-7).



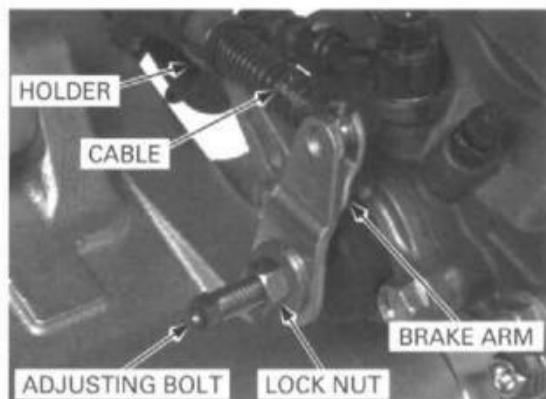
REAR BRAKE CALIPER

DISASSEMBLY

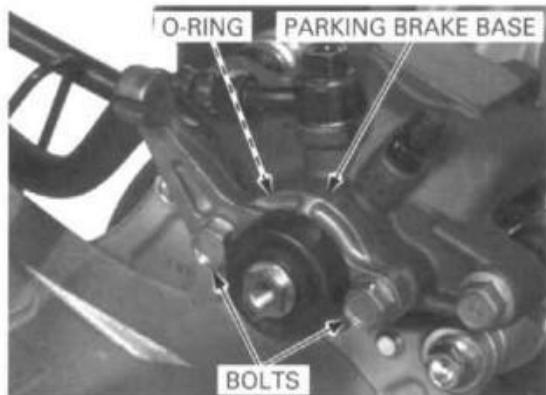
Drain the brake fluid from the rear brake hydraulic system (page 19-5).

Loosen the lock nut, and remove the adjusting bolt and brake arm.

Disconnect the parking brake cable from the brake arm and remove it from the cable holder.



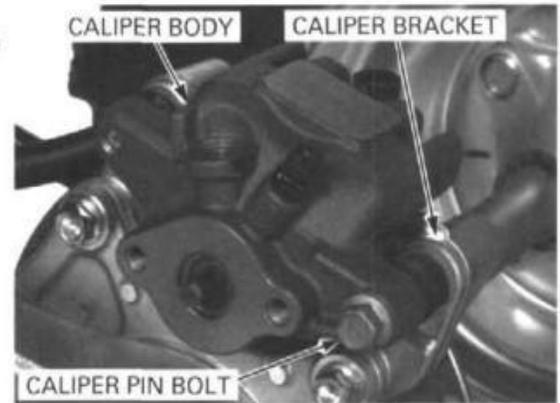
Remove the two bolts and parking brake base. Remove the O-ring.



Disconnect the brake hose from the brake caliper by removing the oil bolt and sealing washer.



Remove the caliper pin bolt.
Pivot the caliper body up and remove it from the bracket.
Remove the brake pads.



Remove the pad spring and caliper piston.



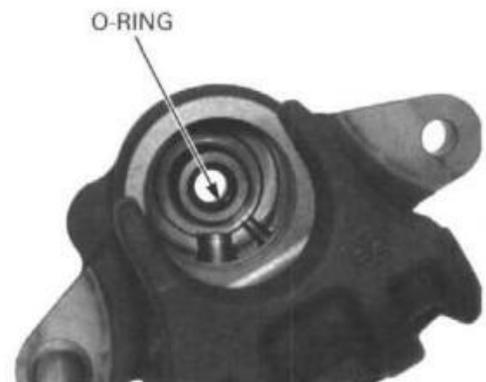
Be careful not to damage the piston sliding surface.

Push the dust and piston seals in and lift them out.



Remove the O-ring.

Clean the seal grooves, caliper cylinder and piston with clean brake fluid.

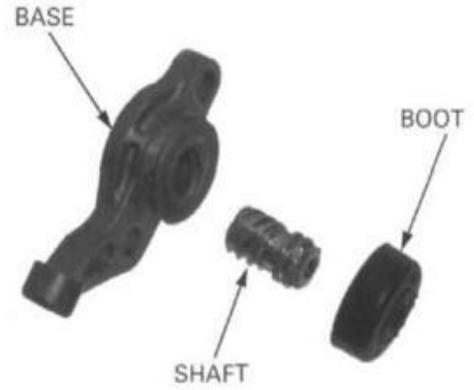


HYDRAULIC BRAKE

INSPECTION

Remove the boot and shaft from the parking brake base.

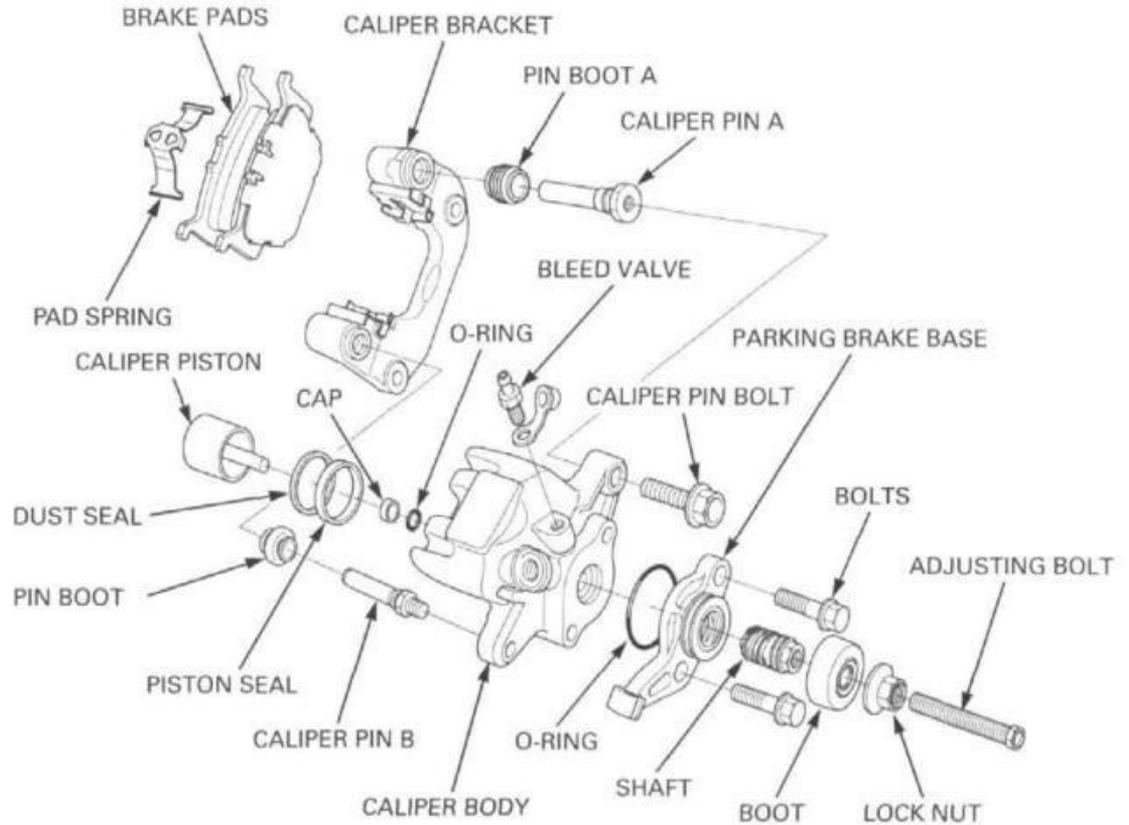
Check the shaft and base threads for wear or damage.



Check the caliper cylinders and pistons for scoring, scratches or damage.



ASSEMBLY



Coat a new O-ring with DOT 4 brake fluid and install it into the caliper hole.



Coat new piston and dust seals with clean brake fluid and install them into the seal grooves in the caliper cylinder.

Coat the caliper piston with clean brake fluid and install it into the caliper cylinder with the opening sides toward the pads.



HYDRAULIC BRAKE

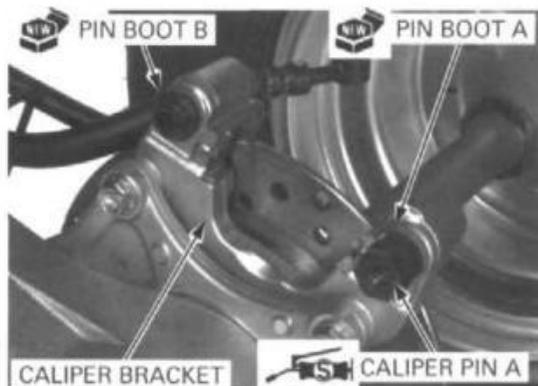
Install the pad spring as shown.



Install new pin boots A and B into the caliper bracket.

Apply silicone grease to the sliding surface of caliper pin A and install it into pin boot A.

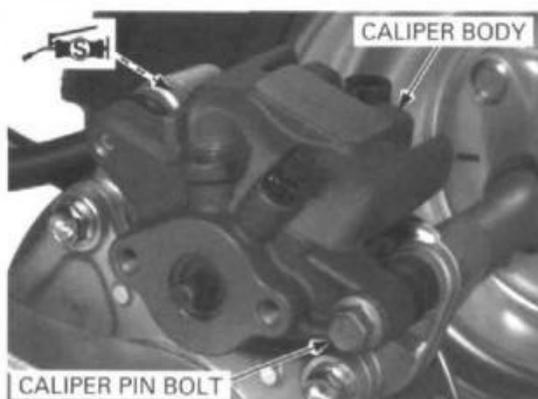
Install the brake pads onto the caliper bracket.



Apply silicone grease to the sliding surface of caliper pin B and install the caliper body onto the bracket.

Install the caliper pin bolt and tighten it.

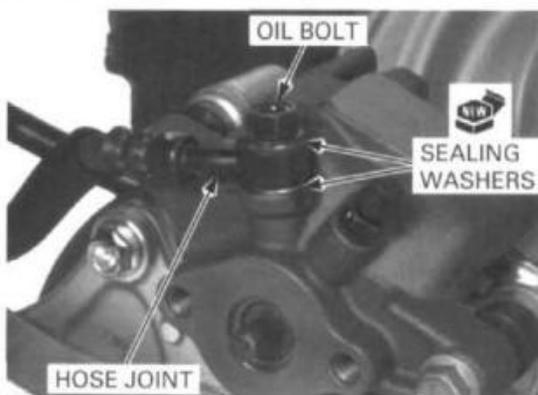
TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)



Connect the brake hose with the oil bolt and new sealing washers.

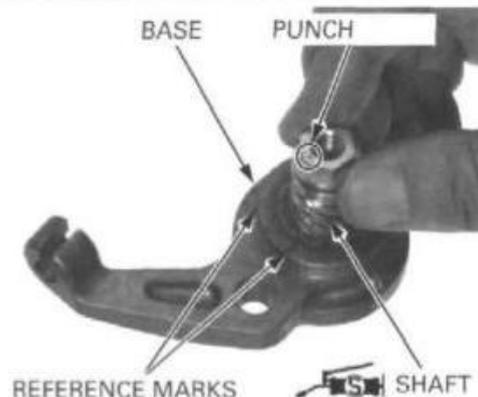
Rest the hose joint onto the stopper of the caliper body and tighten the oil bolt.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)



The parking brake shaft has left-hand threads.

Apply silicone grease to the parking brake shaft sliding surface.
Position the shaft so that the punch mark is within the reference marks on the base, and thread it. Screw the shaft in fully and make sure that the punch mark is within the reference marks.



Install a new boot into the parking brake base and shaft grooves properly.

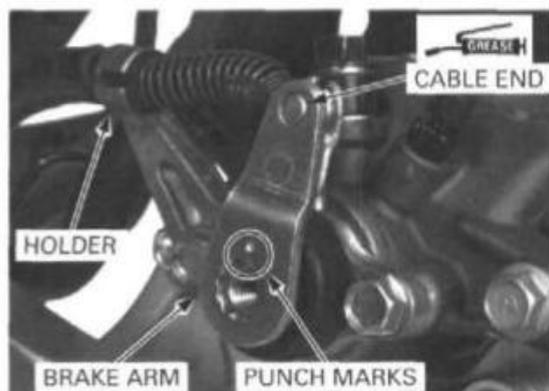


Install a new O-ring into the parking brake base. Install the base onto the caliper body and tighten the two bolts.

TORQUE: 23 N-m (2.3 kgf-m, 17 lbf-ft)



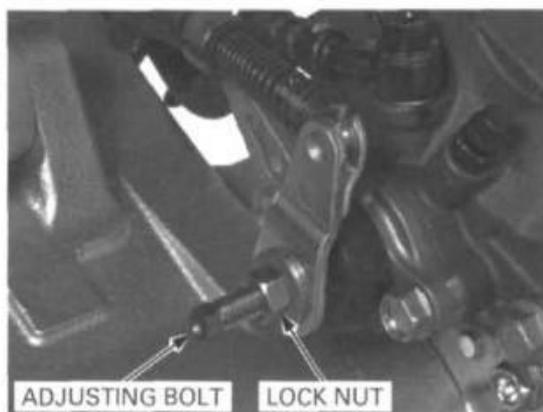
Apply grease to the parking brake cable end. Install the cable into the cable holder and connect it to the brake arm. Turn the parking brake shaft clockwise approximately 90° from fully seated position and install the brake arm on to the shaft by aligning the punch marks.



HYDRAULIC BRAKE

Loosely install the adjusting bolt and lock nut.

Adjust the parking brake cable free play (page 4-28).
Fill and bleed the rear brake hydraulic system (page 19-7).



BRAKE PEDAL

REMOVAL

Remove the following:

- right mud guard (page 3-3)
- brake pedal pivot bolt
- return spring
- brake light switch spring

- cotter pin
- joint pin
- brake pedal
- dust seals

INSTALLATION

Install the brake pedal into the master cylinder push rod joint with the joint pin and a new cotter pin.

Apply grease to the new dust seal lips and install them into the brake pedal pivot.

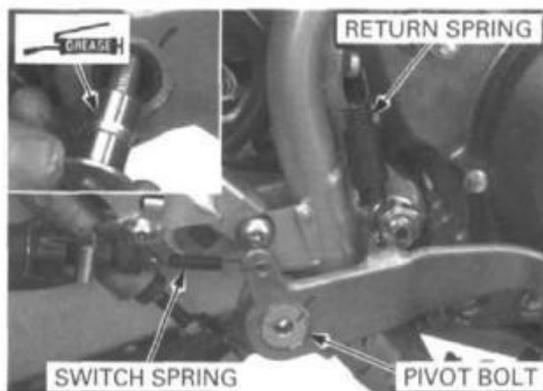
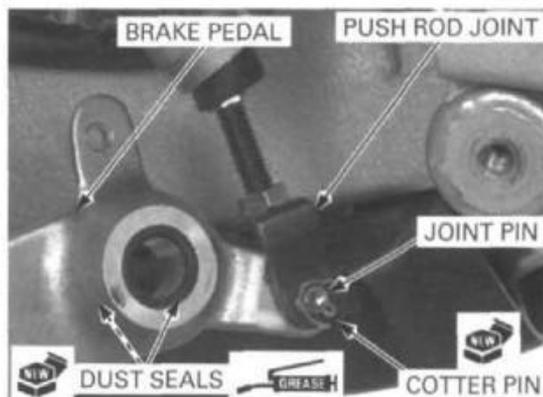
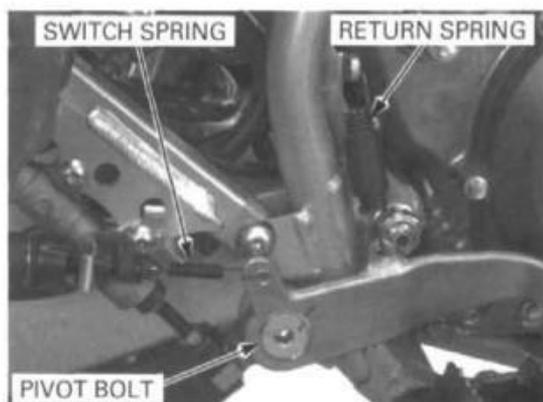
Hook the brake light switch spring ends to the brake pedal and switch as shown.

Hook the return spring to the brake pedal and frame as shown.

Apply grease to the pivot bolt sliding surface.
Install the pivot bolt and tighten it.

TORQUE: 26 N·m (2.7 kgf·m, 20 lbf·ft)

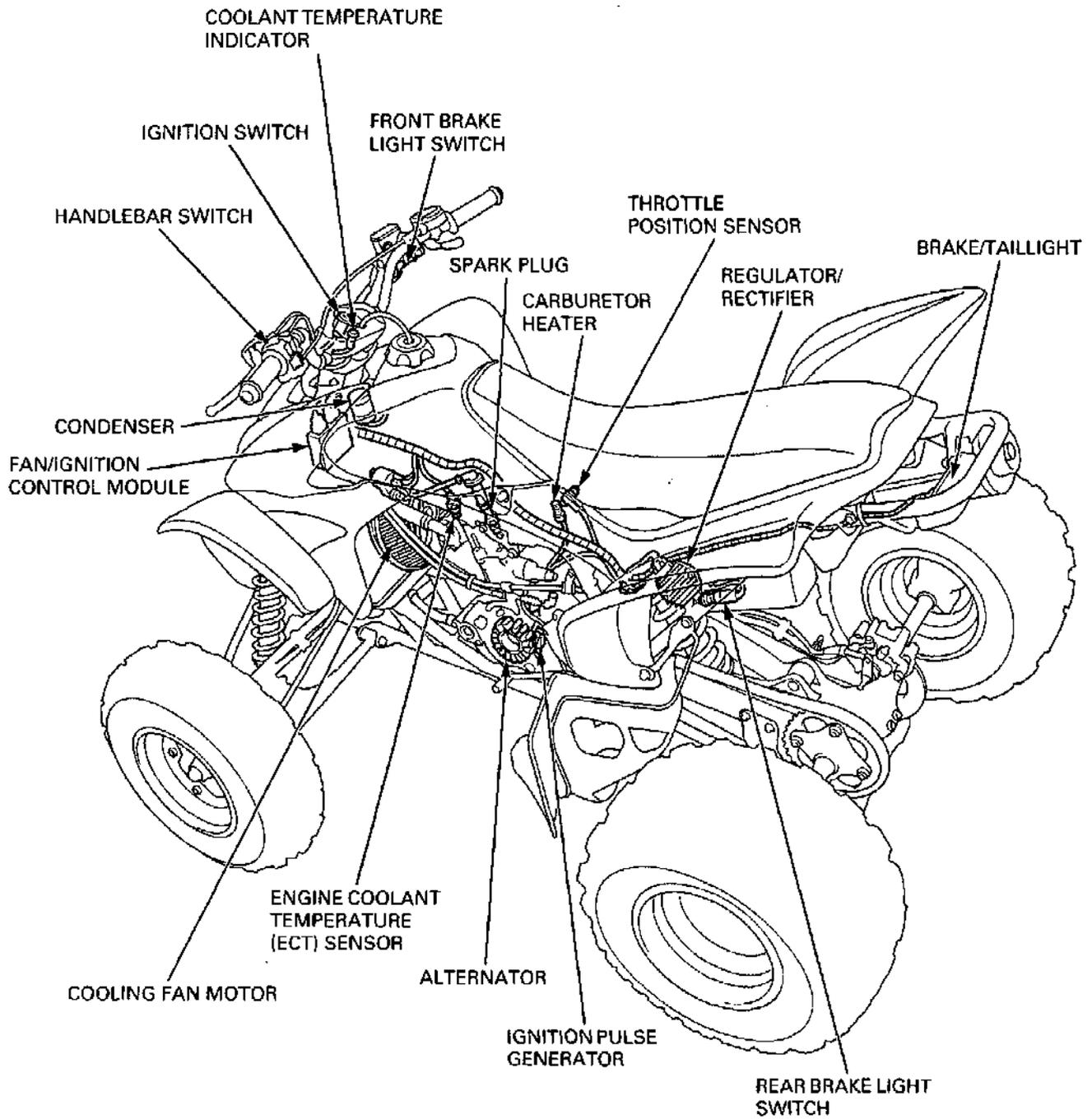
Install the right mud guard (page 3-4).



20. ELECTRICAL ('04 – '05)

COMPONENT LOCATION	20-2	HEADLIGHT	20-16
SERVICE INFORMATION	20-3	BRAKE/TAILLIGHT	20-18
TROUBLESHOOTING	20-5	IGNITION SWITCH	20-18
GENERATING SYSTEM	20-6	HANDLEBAR SWITCH.....	20-19
ALTERNATOR	20-7	BRAKE LIGHT SWITCH	20-19
REGULATOR/RECTIFIER.....	20-11	CARBURETOR HEATER	20-20
IGNITION SYSTEM INSPECTION	20-12	THROTTLE POSITION SENSOR	20-20
IGNITION TIMING.....	20-14	COOLANT TEMPERATURE INDICATOR...	20-22
IGNITION COIL.....	20-15	COOLING FAN MOTOR	20-23
ICM (IGNITION CONTROL MODULE)	20-16	ENGINE COOLANT TEMPERATURE (ECT) SENSOR	20-24

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- When servicing the ignition system, always follow the steps in the troubleshooting sequence on page 20-5.
- 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 ICM.
- A faulty ignition system is often related to poor connections. Check those 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.
- Use an electric heating element to heat the water/coolant mixture for the engine coolant temperature (ECT) sensor inspection. Keep all flammable materials away from the electric heating element. Wear protective clothing, insulated gloves and eye protection.
- A continuity test can be made with the switches installed on the vehicle.
- The following color codes are used throughout this section.

Bu: Blue	G: Green	Lg: Light Green	R: Red
Bl: Black	Gr: Gray	O: Orange	W: White
Br: Brown	Lb: Light Blue	P: Pink	Y: Yellow

SPECIFICATION

ITEM		SPECIFICATIONS
Alternator	Capacity	214 W/5,000 rpm
	Charging coil resistance (20°C/68°F)	0.1 - 1.0 Ω
Spark plug	Standard	IFR8H11 (NGK) VK24PRZ11 (DENSO)
	For extended high speed riding	IFR9H11 (NGK) VK27PRZ11 (DENSO)
Spark plug gap		1.0 - 1.1 mm (0.039 - 0.043 in)
Ignition coil peak voltage		100 V minimum
Exciter coil peak voltage	High	80 V minimum
	Low	30 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Ignition timing ("F" mark)		12° BTDC at idle
Bulb	Headlight	12 V - 30 W/30 W x 2
	Taillight	LED
	Coolant temperature indicator	12 V - 3.4 W
Carburetor heater resistance (20°C/68°F)		13 - 15 Ω
Throttle position sensor resistance (20°C/68°F)		4 - 6 kΩ
ECT sensor resistance	at 80°C (176°F)	47.5 - 56.8 Ω
	at 120°C (248°F)	14.9 - 17.3 Ω

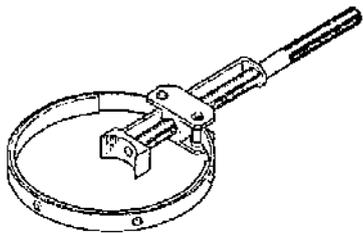
TORQUE VALUES

Spark plug	23 N·m (2.3 kgf·m, 17 lbf·ft)	
Engine coolant temperature (ECT) sensor	9.8 N·m (1.0 kgf·m, 7 lbf·ft)	Apply sealant to the threads.
Timing hole cap	9.8 N·m (1.0 kgf·m, 7 lbf·ft)	Apply grease to the threads and seating surface.
Flywheel nut	74 N·m (7.5 kgf·m, 54 lbf·ft)	Apply oil to the threads and seating surface.
Ignition pulse generator bolt	5 N·m (0.5 kgf·m, 3.6 lbf·ft)	
Alternator stator bolt	9.8 N·m (1.0 kgf·m, 7 lbf·ft)	

ELECTRICAL ('04 - '05)

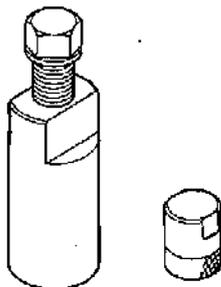
TOOLS

Flywheel holder
07725-0040000



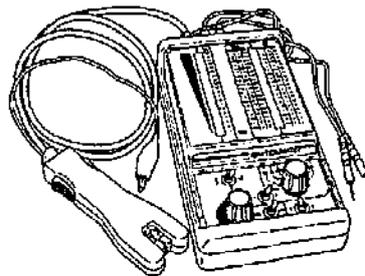
or commercially available equivalent

Flywheel puller
070MC-HP10100

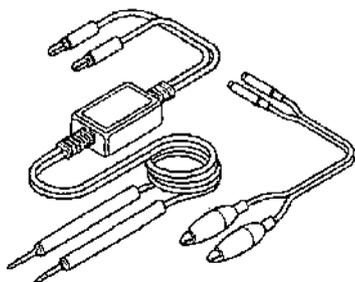


or 070MC-HP1A100 (U.S.A. only)

IgnitionMate peak voltage tester
MTP07-0286 (U.S.A. only)



Peak voltage adaptor
07HGJ-0020100



(not available in U.S.A.)
with commercially available digital
multimeter (impedance 10 M Ω /DCV
minimum)

TROUBLESHOOTING

IGNITION SYSTEM

- Inspect the following before diagnosing the system.
 - Faulty spark plug
 - Loose spark plug cap or spark plug wire connection
 - Water in the spark plug cap (leaking ignition coil secondary voltage)

No spark at plug

	Unusual condition	Probable cause (check in numerical order)
Ignition coil primary voltage	Low peak voltage.	<ol style="list-style-type: none"> 1. The multimeter impedance is too low; below 10 MΩ DCV. 2. Cranking speed is too slow. (Operating force of the kickstarter is weak.) 3. The sampling time of the tester and measured pulse were not synchronized. (System is normal if measured voltage is over the standard voltage at least once.) 4. Poorly connected connectors or an open circuit in ignition system. 5. Faulty exciter coil. (Measure the peak voltage.) 6. Faulty ignition control module (ICM) (in case when above No. 1 – 5 are normal).
	No peak voltage.	<ol style="list-style-type: none"> 1. Incorrect peak voltage adaptor connections. 2. Short circuit in the engine stop switch (black/white) wire. 3. Faulty ignition switch and/or engine stop switch. 4. Loose or poorly connected ICM connectors. 5. Open circuit or poor connection in ground wire of the ICM. 6. Faulty peak voltage adaptor. 7. Faulty exciter coil. (Measure the peak voltage.) 8. Faulty ignition pulse generator. (Measure the peak voltage.) 9. Faulty ICM (in case when above No.1 – 8 are normal).
	Peak voltage is normal, but no spark jumps at the plug.	<ol style="list-style-type: none"> 1. Faulty spark plug or leaking ignition coil secondary current. 2. Faulty ignition coil.
Exciter coil	Low peak voltage.	<ol style="list-style-type: none"> 1. The multimeter impedance is too low. 2. Cranking speed is too slow. (Operating force of the kickstarter is weak.) 3. The sampling time of the tester and measured pulse were not synchronized. (System is normal if measured voltage is over the standard voltage at least once.) 4. Faulty exciter coil (in case when above No.1 – 3 are normal).
	No peak voltage.	<ol style="list-style-type: none"> 1. Faulty peak voltage adaptor. 2. Faulty exciter coil.
Ignition pulse generator	Low peak voltage.	<ol style="list-style-type: none"> 1. The multimeter impedance is too low. 2. Cranking speed is too slow. (Operating force of the kickstarter is weak.) 3. The sampling time of the tester and measured pulse were not synchronized. (System is normal if measured voltage is over the standard voltage at least once.) 4. Faulty ignition pulse generator (in case when above No.1 – 3 are normal).
	No peak voltage.	<ol style="list-style-type: none"> 1. Faulty peak voltage adaptor. 2. Faulty ignition pulse generator.

GENERATING SYSTEM

GENERATING VOLTAGE INSPECTION

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

Stop the engine.

Remove the top cover (page 3-5).

Disconnect the handlebar switch 4P connector.
Connect the voltmeter positive (+) probe to the Black wire terminal and negative (-) probe to the Green wire terminal of the wire harness side 4P connector.

Restart the engine.

Measure the generating voltage when the engine runs at 5,000 rpm.

STANDARD: 13 – 16 V

Connect the handlebar switch 4P connector.

Install the top cover (page 3-5).



The voltage will drop about 1 V when the fan motor is running.

ALTERNATOR CHARGING COIL INSPECTION

Remove the right front fender (page 3-6).

Disconnect the alternator 3P gray connector.



Measure the resistance between the Yellow wire terminals of the alternator side connector.

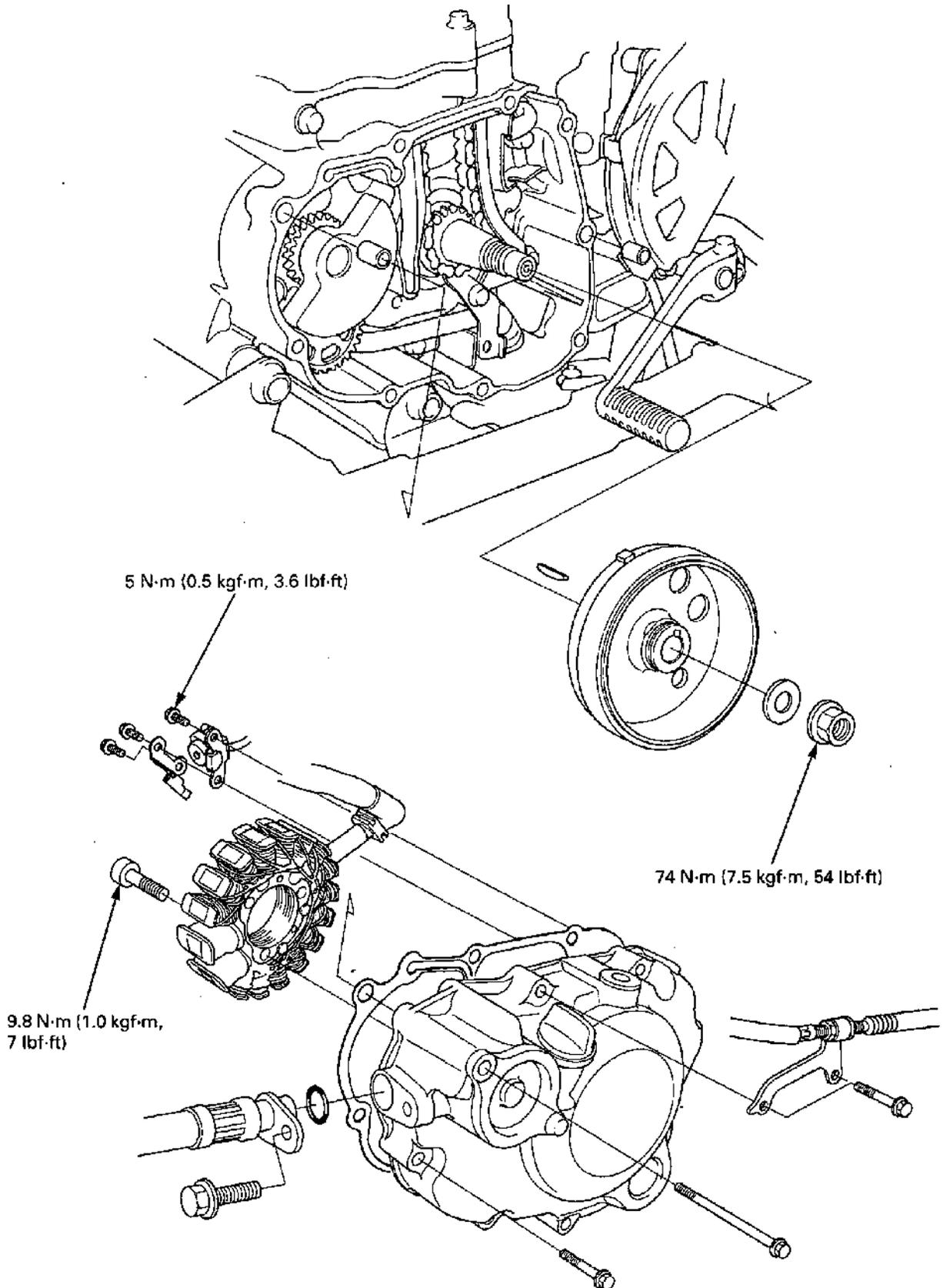
STANDARD: 0.1 – 1.0 Ω at 20°C (68°F)

Check for continuity between each wire terminal of the alternator side connector and ground. There should be no continuity.

Replace the alternator stator if resistance is out of specification, or if any wire has continuity to ground.



ALTERNATOR



LEFT CRANKCASE COVER REMOVAL

Drain the engine oil (page 4-15).

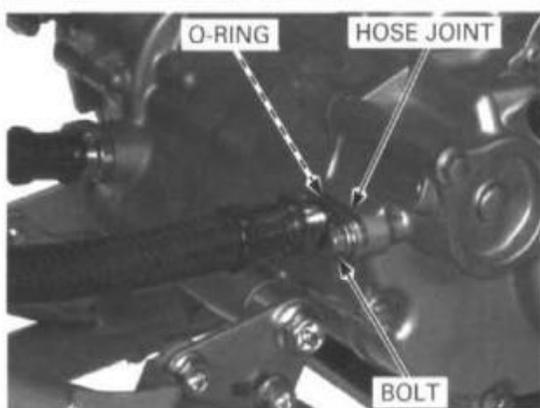
Remove both front fenders (page 3-6).

Disconnect the alternator connectors.

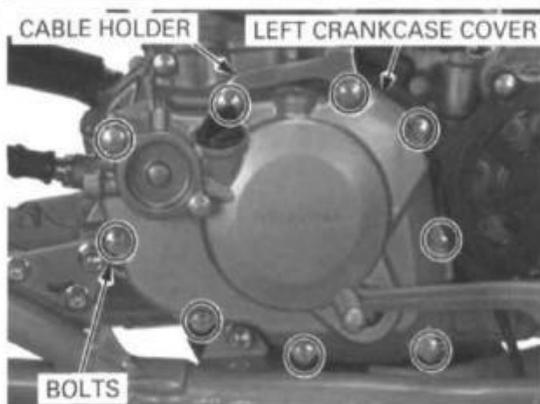
Remove the wire bands and free the alternator wire from the frame.



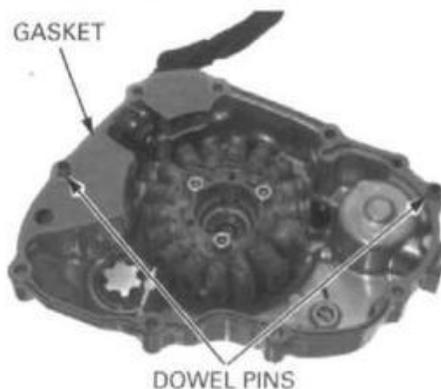
Remove the bolt, oil cooler hose joint and O-ring from the left crankcase cover.



Remove the nine bolts, cable holder and left crankcase cover.



Remove the dowel pins and gasket.



STATOR REPLACEMENT

Remove the left crankcase cover (page 20-8).

Remove the three bolts, wire clamp and ignition pulse generator.

Remove the three socket bolts, wire grommet and alternator stator from the left crankcase cover.

Install the alternator stator into the left crankcase cover and tighten the three socket bolts.

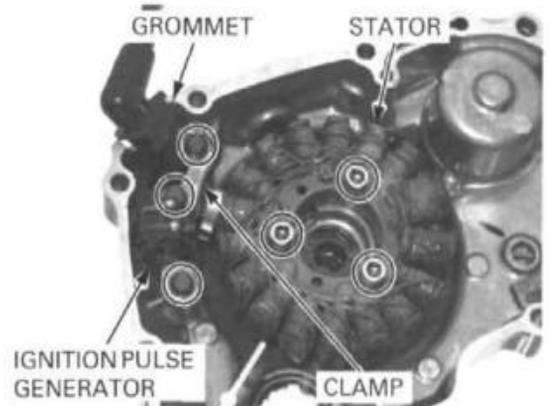
TORQUE: 9.8 N·m (1.0 kgf·m, 7 lbf·ft)

Install the wire grommet into the left crankcase cover groove properly.

Install the ignition pulse generator and wire clamp and tighten the three bolts.

TORQUE: 5 N·m (0.5 kgf·m, 3.6 lbf·ft)

Install the left crankcase cover (page 20-10).



FLYWHEEL REMOVAL

Remove the left crankcase cover (page 20-8).

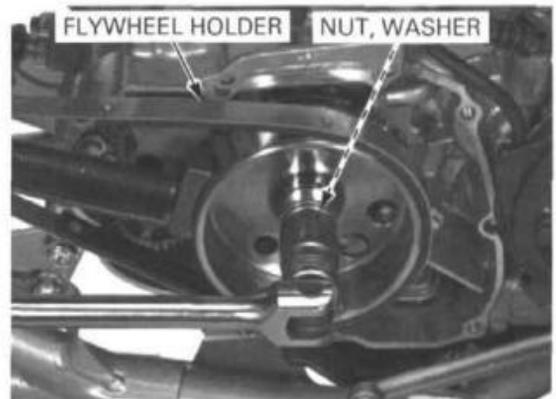
Hold the flywheel using the special tool and loosen the flywheel nut.

TOOL:

Flywheel holder

**07725-0040000 or
commercially
available
equivalent**

Remove the flywheel nut and washer.

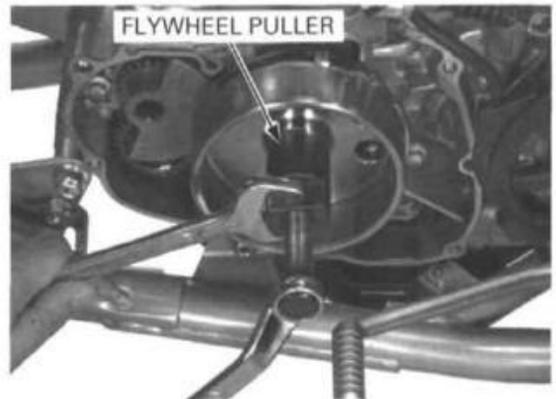


Remove the flywheel using the special tool.

TOOL:

Flywheel puller

**070MC-HP10100 or
070MC-HP1A100
(U.S.A. only)**

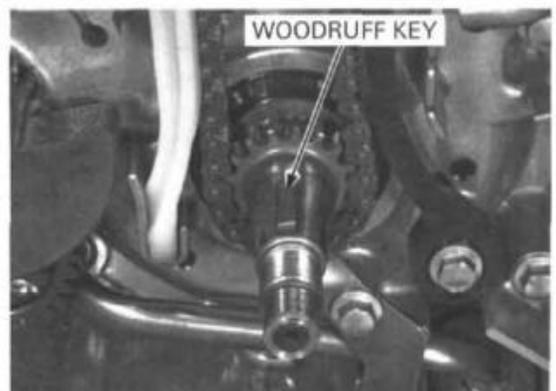


Remove the woodruff key from the crankshaft.

FLYWHEEL INSTALLATION

Clean any oil from the tapered portion of the crankshaft and flywheel.

Install the woodruff key into the crankshaft key groove.



ELECTRICAL ('04 – '05)

Install the flywheel onto the crankshaft by aligning the key way with the woodruff key.

Apply oil to the flywheel nut threads and seating surface.

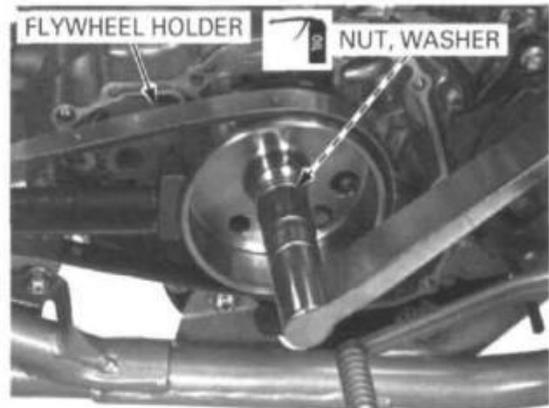
Install the washer and flywheel nut.

Hold the flywheel using the special tool and tighten the flywheel nut.

TOOL:

Flywheel holder

07725-0040000 or
commercially
available
equivalent



TORQUE: 74 N·m (7.5 kgf·m, 54 lbf·ft)

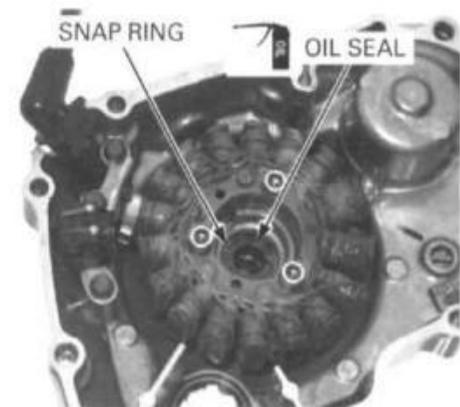
Install the left crankcase cover (page 20-10).

LEFT CRANKCASE COVER INSTALLATION

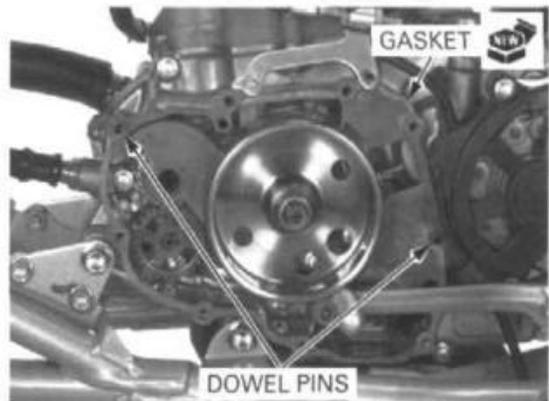
Check the oil seal in the left crankcase cover for wear or damage.

Remove the snap ring and replace the oil seal with a new one if necessary.

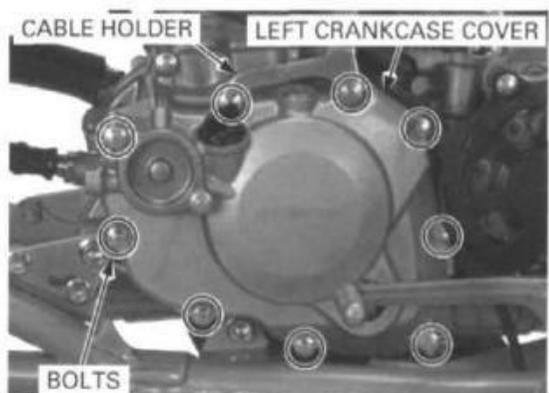
Apply oil to the oil seal lip.



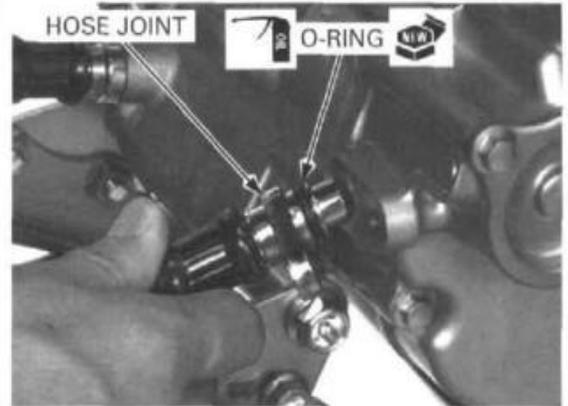
Install the dowel pins and a new gasket.



Install the left crankcase cover and cable holder, and tighten the nine bolts in a crisscross pattern in 2 or 3 steps.



Coat a new O-ring with oil and install it onto the oil cooler hose joint.
Install the oil cooler hose joint onto the left crankcase cover and tighten the bolt securely.



Route the alternator wire properly and install the wire bands (page 1-24).

Connect the alternator connectors.

Fill the crankcase with the recommended engine oil (page 4-15).

Install both front fenders (page 3-6).



REGULATOR/RECTIFIER

WIRE HARNESS INSPECTION

Remove the rear fender (page 3-7).

Disconnect the 5P black connector from the regulator/rectifier.

Check the connector for loose contacts or corroded terminals.

IGNITION SWITCH LINE

Check the Red wire for continuity between the regulator/rectifier and ignition switch connectors.
There should be continuity.

GROUND LINE

Check for continuity between the Green wire terminal and ground.
There should be continuity.

GENERATING COIL LINE

Measure the resistance between the Yellow wire terminals.

STANDARD: 0.1 – 1.0 Ω at 20°C (68°F)

Check for continuity between each Yellow wire terminal and ground.
There should be no continuity.



IGNITION SYSTEM INSPECTION

NOTE:

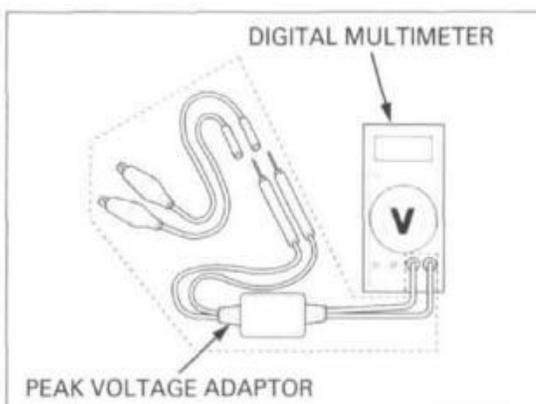
- If there is no spark at the spark plug, check all connections for loose or poor contact before measuring each peak voltage.
- If using the peak voltage adaptor, use a commercially available digital multimeter with an impedance of 10 M Ω /DCV minimum.
- The display value differs depending upon the internal impedance of the multimeter.

Connect the peak voltage adaptor to the digital multimeter, or use the peak voltage tester (U.S.A. only).

If using the peak voltage tester (U.S.A. only), follow the manufacturer's instruction.

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 M Ω /DCV minimum)



IGNITION COIL PRIMARY PEAK VOLTAGE

NOTE:

- Check all system connections before inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check the cylinder compression and check that the spark plug is installed correctly.

Remove the right front fender (page 3-6).

Disconnect the spark plug cap from the spark plug. Connect a known good spark plug to the spark plug cap and ground it to the cylinder head as done in a spark test.



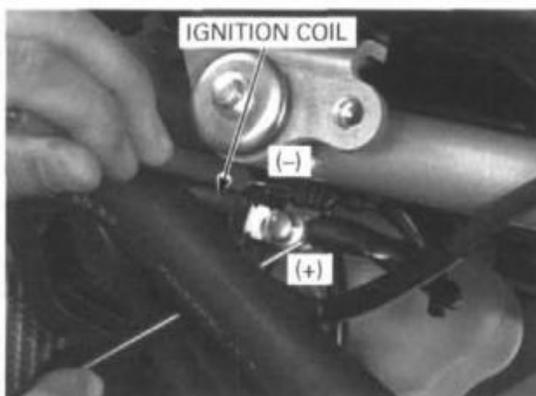
With the ignition coil primary wire connected, connect the peak voltage tester or adaptor probes to the ignition coil primary terminal and body ground.

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 M Ω /DCV minimum)

CONNECTION:

Black/yellow terminal (-) - Body ground (+)



Shift the transmission into neutral.
Turn the ignition switch to "ON".
Crank the engine with kickstarter and read ignition coil primary peak voltage.

PEAK VOLTAGE: 100 V minimum

If the peak voltage is lower than the standard value, follow the checks described in the troubleshooting chart (page 20-5).

ALTERNATOR EXCITER COIL PEAK VOLTAGE

NOTE:

- Check the cylinder compression and check that the spark plug is installed correctly.

Disconnect the 6P black connector from the ignition control module (ICM).

Connect the peak voltage tester or adaptor probes to the exciter coil wire terminals of the 6P black connector.

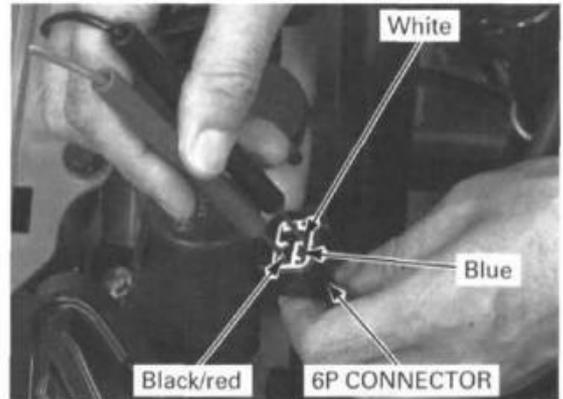
TOOLS:

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 M Ω /DCV minimum)



CONNECTIONS:

High: Black/red terminal (+) – White terminal (-)

Low: Blue terminal (+) – White terminal (-)

Shift the transmission into neutral.
Crank the engine with the kickstarter and read the exciter coil peak voltage.

**PEAK VOLTAGE: High: 80 V minimum
Low: 30 V minimum**

If the peak voltage measured at the ICM connector is abnormal, measure the peak voltage at the alternator exciter coil connector.

Remove the right front fender (page 3-6).

Disconnect the alternator exciter coil 3P connector and connect the tester probes to the wire terminals of the exciter coil side 3P connector.

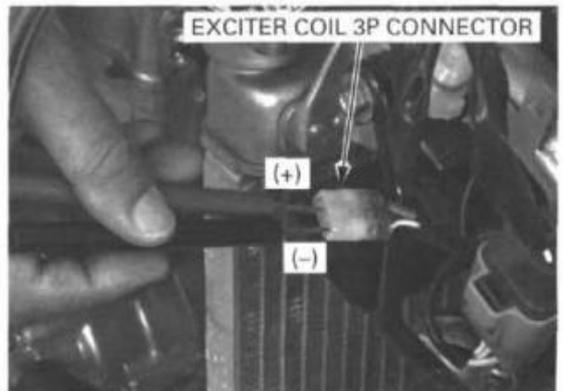
CONNECTIONS:

High: Black/red terminal (+) – White terminal (-)

Low: Blue terminal (+) – White terminal (-)

In the same manner as at the ICM connector, measure the peak voltage and compare it to the voltage measured at the ICM connector.

- If the peak voltage measured at the ICM is abnormal and the one measured at the alternator exciter coil is normal, the wire harness has an open or short circuit, or loose connection.
- If both peak voltages are abnormal, follow the checks described in the troubleshooting chart (page 20-5).



IGNITION PULSE GENERATOR PEAK VOLTAGE

NOTE:

- Check the cylinder compression and check that the spark plug is installed correctly.

Disconnect the 8P black connector from the ICM. Connect the peak voltage tester or adaptor probes to the ignition pulse generator wire terminals of the 8P black connector.

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 M Ω /DCV minimum)

CONNECTION:

Blue/yellow terminal (+) – Green terminal (-)

Shift the transmission into neutral.

Crank the engine with the kickstarter and read the ignition pulse generator peak voltage.

PEAK VOLTAGE: 0.7 V minimum

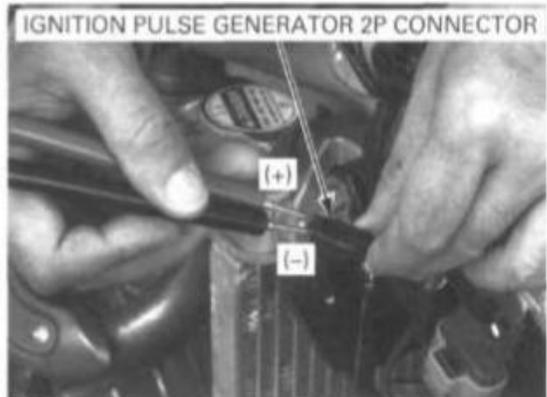
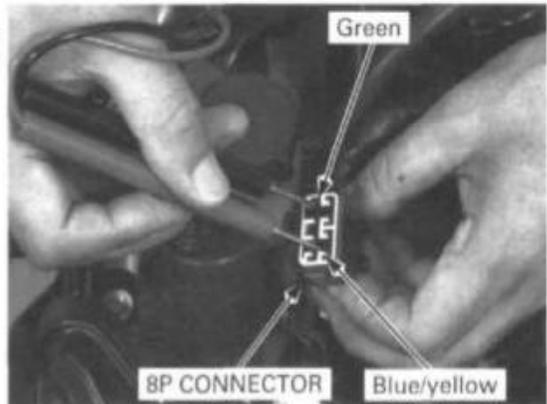
If the peak voltage measured at the ICM connector is abnormal, measure the peak voltage at the ignition pulse generator connector.

Remove the right front fender (page 3-6).

Disconnect the ignition pulse generator 2P connector and connect the tester probes to the Blue/yellow (+) and Green (-) wire terminals of the ignition pulse generator side 2P connector.

In the same manner as at the ICM connector, measure the peak voltage and compare it to the voltage measured at the ICM connector.

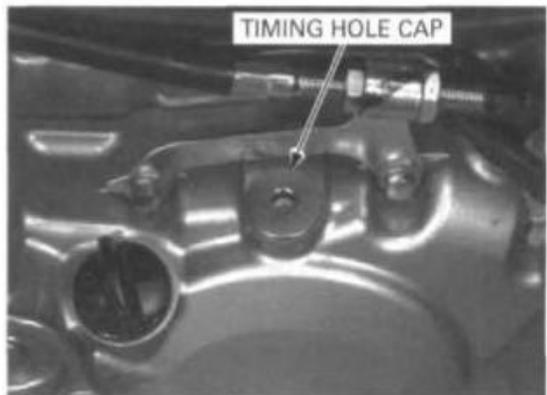
- If the peak voltage measured at the ICM is abnormal and the one measured at the ignition pulse generator is normal, the wire harness has an open or short circuit, or loose connection.
- If both peak voltages are abnormal, follow the checks described in the troubleshooting chart (page 20-5).



IGNITION TIMING

Warm up the engine.

Stop the engine and remove the timing hole cap.



Read the manufacturer's instructions for timing light operation.

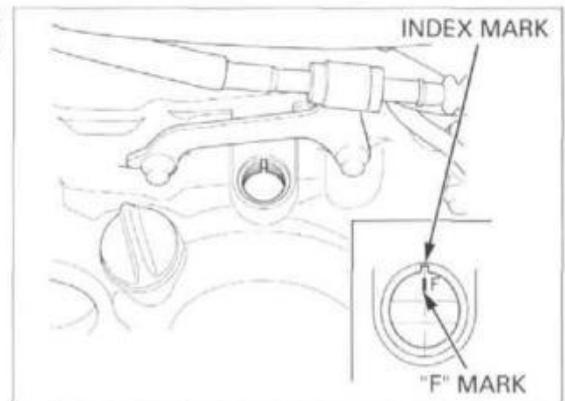
Connect a timing light to the spark plug wire.

Start the engine and let it idle.

IDLE SPEED: 1,600 ± 100 rpm



The ignition timing is correct if the "F" mark on the flywheel aligns with the index mark on the left crankcase cover.



Coat a new O-ring with oil and install it onto the timing hole cap.

Apply grease to the timing hole cap threads and seating surface.

Install the timing hole cap and tighten it.

TORQUE: 9.8 N·m (1.0 kgf·m, 7 lbf·ft)



IGNITION COIL

REMOVAL/INSTALLATION

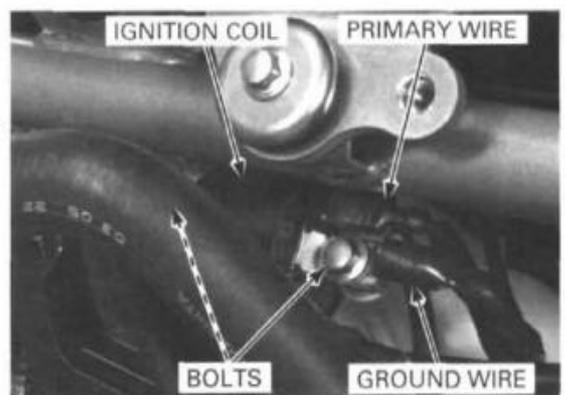
Remove the right front fender (page 3-6).

Remove the spark plug cap from the spark plug.

Disconnect the primary wire connector.

Remove the bolts, ground terminal and ignition coil.

Installation is in the reverse order of removal.



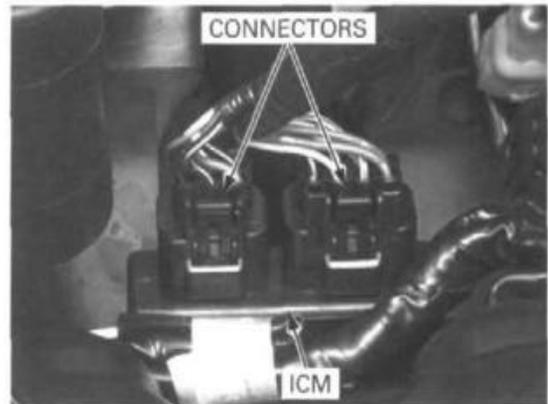
ICM (IGNITION CONTROL MODULE)

REMOVAL/INSTALLATION

Remove the top cover (page 3-5).

Disconnect the ICM 6P and 8P connectors.
Remove the ICM from the holder.

Installation is in the reverse order of removal.



HEADLIGHT

BULB REPLACEMENT

Remove the top cover (page 3-5).

Remove the dust cover from the headlight.



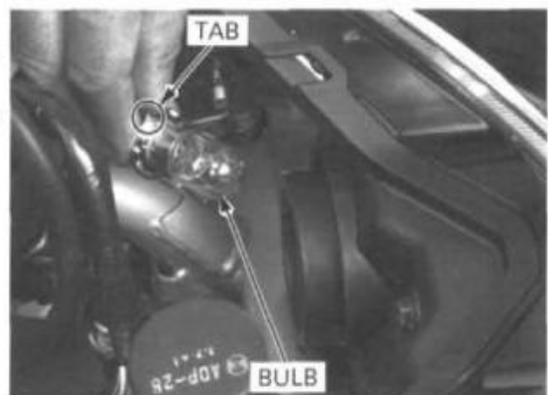
Remove the bulb socket by turning it counterclockwise while pushing it in.



Remove the bulb from the headlight.

Install a new bulb by aligning the tab with the groove in the headlight.

Install the removed parts in the reverse order of removal.

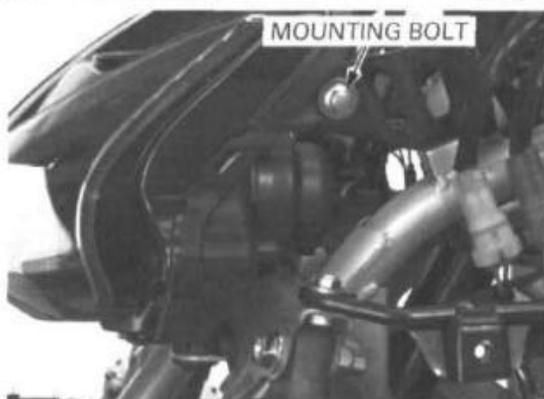


REMOVAL/INSTALLATION

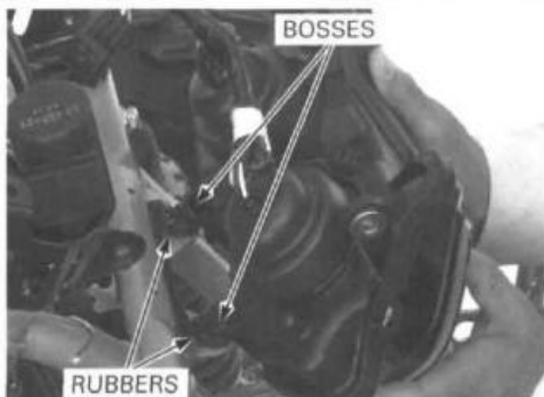
Remove both front fenders (page 3-6).
Disconnect the headlight 3P black connector.



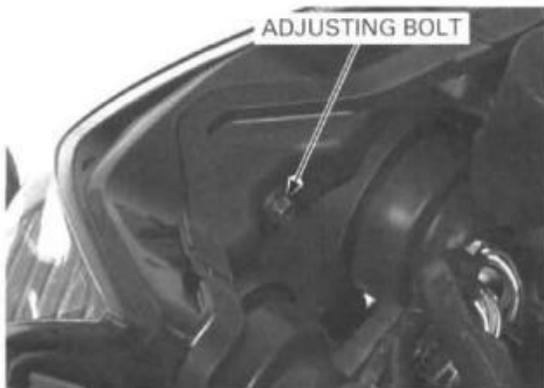
Remove the two headlight mounting bolts.



Tilt the headlight forward and remove it by releasing the two bosses from the mounting rubbers.
Install the headlight in the reverse order of removal.

**AIMING**

Remove the top cover (page 3-5).
Adjust the headlight beam vertically by turning the adjusting bolt.
Install the top cover (page 3-5).

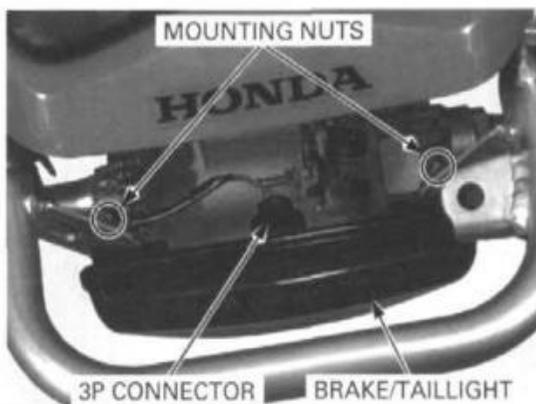


BRAKE/TAILLIGHT

REMOVAL/INSTALLATION

Disconnect the brake/taillight 3P connector. Remove the two mounting nuts and the brake/taillight.

Install the brake/taillight in the reverse order of removal.

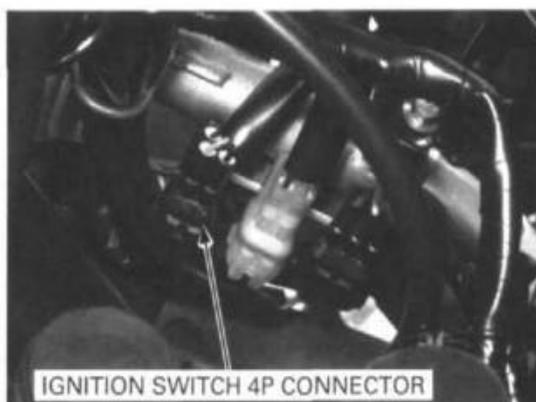


IGNITION SWITCH

INSPECTION

Remove the top cover (page 3-5).

Disconnect the ignition switch 4P black connector.



Check for continuity between the switch side connector terminals in each switch position. Continuity should exist between the color coded wires as shown below:

COLOR	Black/white	Green	Red	Black
OFF	○	○	○	○
ON				

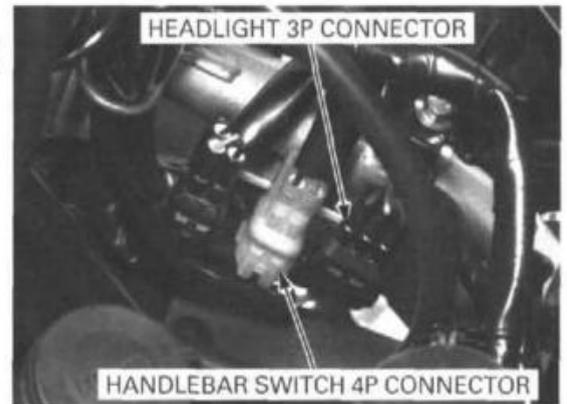


HANDLEBAR SWITCH

INSPECTION

Remove the top cover (page 3-5).

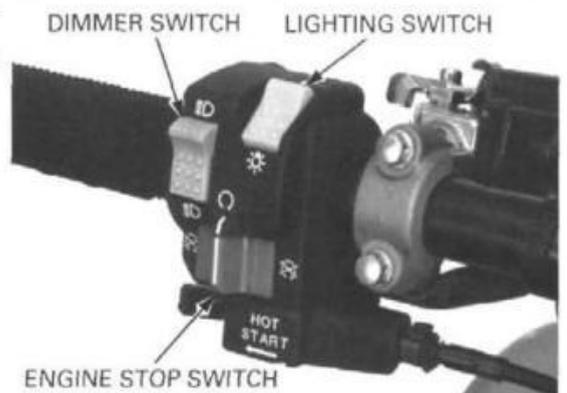
Disconnect the handlebar switch 4P connector and headlight 3P black connector.



Check for continuity between the switch side connector terminals in each switch position. Continuity should exist between the color coded wires as shown below:

ENGINE STOP SWITCH

COLOR	Black/white	Green
⊗	○	○
○		
⊗	○	○



LIGHTING SWITCH/DIMMER SWITCH

COLOR	Black	Brown	●
ON	○	○	○
OFF		(○ — ○)	

COLOR	Black/white	●	Green
HIGH	○	○	
(N)	○	○	○
LOW		○	○

BRAKE LIGHT SWITCH

FRONT BRAKE LIGHT SWITCH

Disconnect the front brake light switch connectors and check for continuity between the switch terminals.

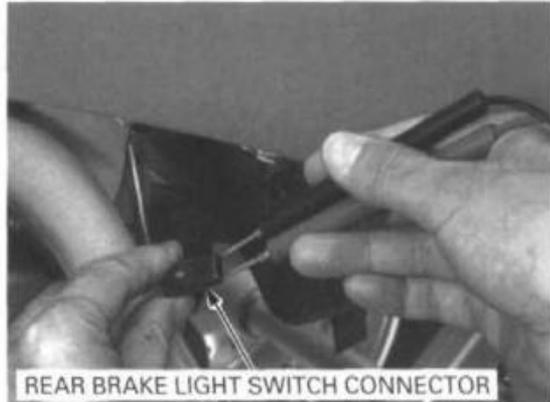
There should be continuity with the front brake lever squeezed and no continuity with the lever released.



REAR BRAKE LIGHT SWITCH

Disconnect the rear brake light switch 2P black connector and check for continuity between the switch side connector terminals.

There should be continuity with the rear brake pedal depressed and no continuity with the pedal released.



REAR BRAKE LIGHT SWITCH CONNECTOR

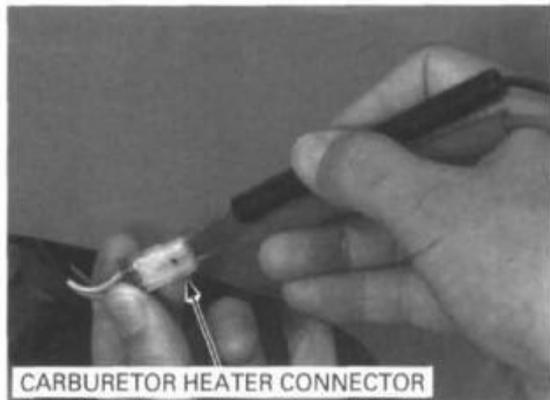
CARBURETOR HEATER

INSPECTION

Disconnect the carburetor heater 2P connector and measure the resistance between the heater side connector terminals.

STANDARD: 13 – 15 Ω at 20°C (68°F)

If the resistance is out of above range, replace the carburetor heater.



CARBURETOR HEATER CONNECTOR

THROTTLE POSITION SENSOR

INSPECTION

Disconnect the throttle position sensor 3P connector.

Measure the resistance between the Pink and Green/yellow wire terminal of the sensor side connector.

STANDARD: 4 – 6 k Ω at 20°C (68°F)

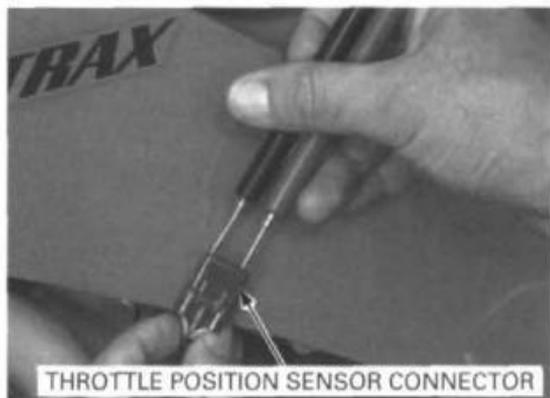
Check that the resistance between the Light green and Green/yellow wire terminals varies with the throttle position while operating the throttle lever.

From fully closed position to fully open position:

Resistance increases

From fully open position to fully closed position:

Resistance decreases



THROTTLE POSITION SENSOR CONNECTOR

REPLACEMENT

Remove the carburetor from the insulator and connecting hose (page 7-6).

Remove the following:

- two torx screws and washers
- throttle position sensor
- O-ring
- joint
- collar
- O-ring

Install a new O-ring and the collar onto the carburetor body.

Install a new O-ring into the throttle position sensor groove.

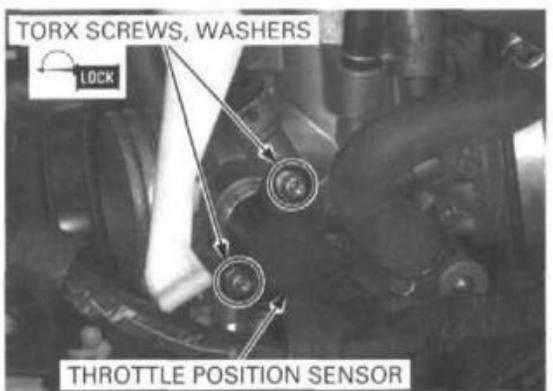
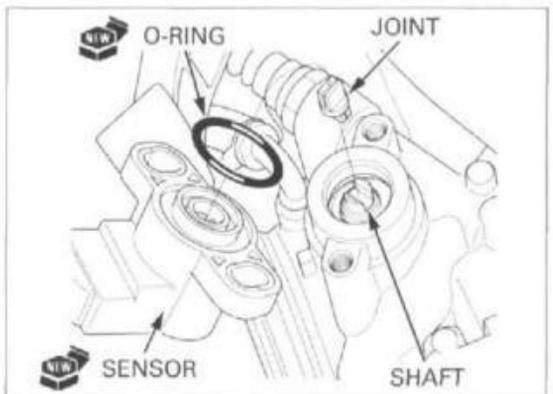
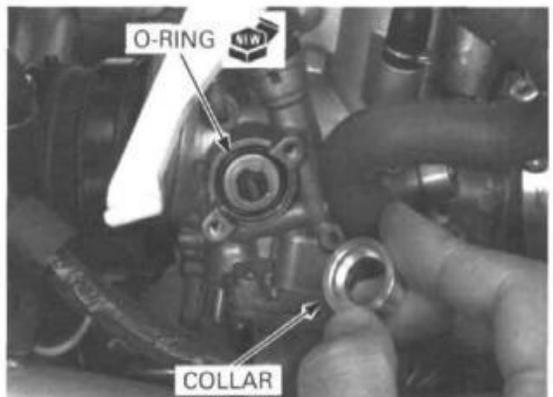
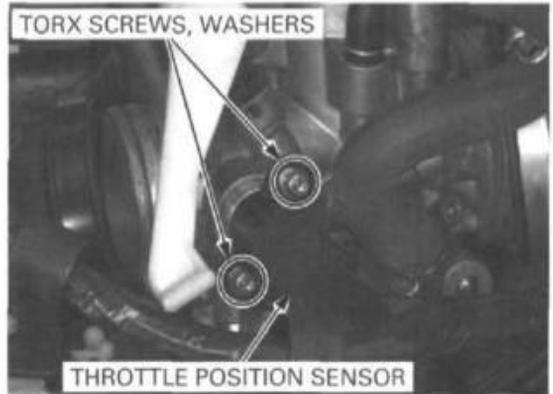
Install the joint into the throttle valve shaft by aligning the joint tab with the shaft groove.

Install a new throttle position sensor by aligning the sensor shaft tab with the joint tab groove.

Apply locking agent to the torx screw threads and loosely install them with the washers.

Adjust the sensor position so that the resistance between the Light green and Green/yellow wire terminals is 490 - 510 Ω and tighten the torx screws.

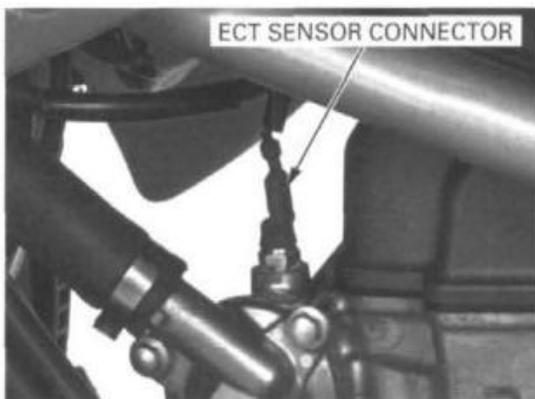
Install the carburetor (page 7-21).



COOLANT TEMPERATURE INDICATOR

SYSTEM INSPECTION

Disconnect the engine coolant temperature (ECT) sensor connector.



Start the engine and check the indicator.

- If the indicator lights for 3 seconds then goes off, go to next step.
- If the indicator lights and stays on, check for a short circuit in the following wire:
 - Yellow/blue wire between the ECT sensor and fan/ignition control module (ICM) connectors
 - Gray wire between the fan/ICM and indicator connectors

If the wires are OK, replace the fan/ICM.



Ground the ECT sensor connector with a jumper wire.

Start the engine and check the indicator.

- If the indicator lights, the system is OK.
- If the indicator does not light or lights for 3 seconds then goes off, check for an open circuit in the following wire:
 - Yellow/blue wire between the ECT sensor and fan/ICM connectors
 - Gray wire between the fan/ICM and indicator connectors



If the wire is OK, disconnect the indicator 2P red connector.

Start the engine and measure the voltage between the Black wire terminal (+) and Gray wire terminal (-) of the wire harness side connector.

- If there is generating voltage, check for blown indicator bulb.
- If there is no voltage, check for an open circuit in the black wire between the indicator and ignition switch connectors. If the black wire is OK, replace the fan/ICM.



COOLING FAN MOTOR

INSPECTION

NOTE:

- Make sure that the coolant temperature indicator system functions properly before checking the fan motor system.

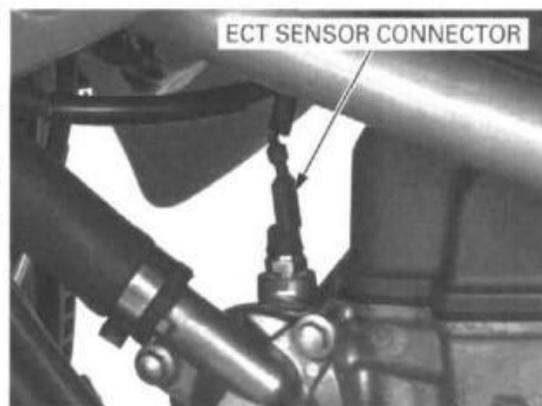
Fan motor does not stop when the engine is running

Disconnect the engine coolant temperature (ECT) sensor connector.

Start the engine and check the fan motor.

- If the fan motor does not start, check the ECT sensor (page 20-24).
- If the fan motor starts, check for a short circuit in the following wire:
 - Green wire between the fan/ICM and fan motor connectors
 - Green wire of the fan motor

If the wires are OK, replace the fan/ICM.



Fan motor does not start

Disconnect the ECT sensor connector and ground it with a jumper wire.

Start the engine and check the fan motor.

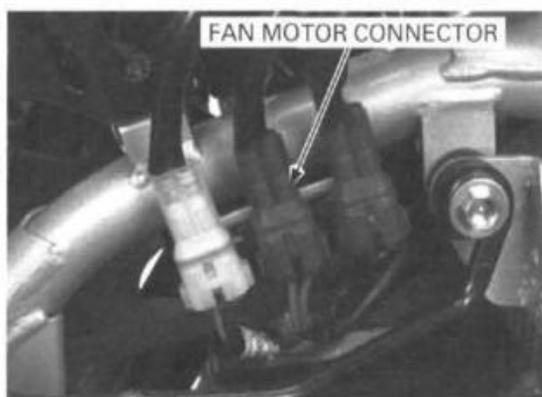
- If the fan motor starts, check the ECT sensor (page 20-24).
- If the fan motor does not start, check for an open circuit in the following wire:
 - Green wire between the fan/ICM and fan motor connectors
 - Green wire of the fan motor



If the wire is OK, disconnect the fan motor 2P blue connector.

Start the engine and measure the voltage between the Black wire terminal (+) and Green wire terminal (-) of the wire harness side connector.

- If there is generating voltage, replace the fan motor.
- If there is no voltage, check for an open circuit in the black wire between the fan motor and ignition switch connectors. If the black wire is OK, replace the fan/ICM.

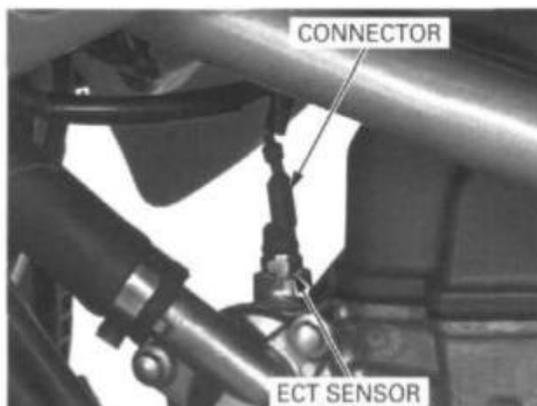


ENGINE COOLANT TEMPERATURE (ECT) SENSOR

INSPECTION

Drain the coolant (page 9-7).

Disconnect the ECT sensor connector and remove the ECT sensor.



Suspend the ECT sensor in a pan of coolant (50 - 50 mixture) on an electric heating element and measure the resistance through the sensor as the coolant heats up.

NOTE:

- Soak the ECT sensor in coolant up to its threads with at least 40 mm (1.57 in) from the bottom of the pan to the bottom of the sensor.
- Keep the temperature constant for 3 minutes before testing. A sudden change of temperature will result in incorrect readings. Do not let the thermometer or ECT sensor touch the pan.

Resistance: 47.5 - 57 Ω at 80°C (176°F)
14.8 - 17.3 Ω at 120°C (248°F)

Replace the ECT sensor if it is out of specifications by more than 10% at any temperature listed.

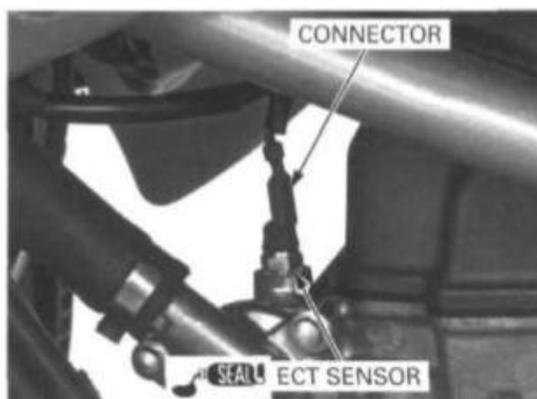
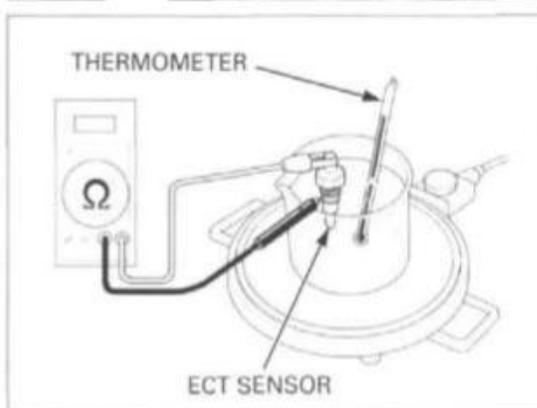
Apply sealant to the ECT sensor threads. Do not apply to the sensor head.

Install the ECT sensor and tighten it.

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

Connect the ECT sensor connector.

Fill and bleed the cooling system (page 9-7).

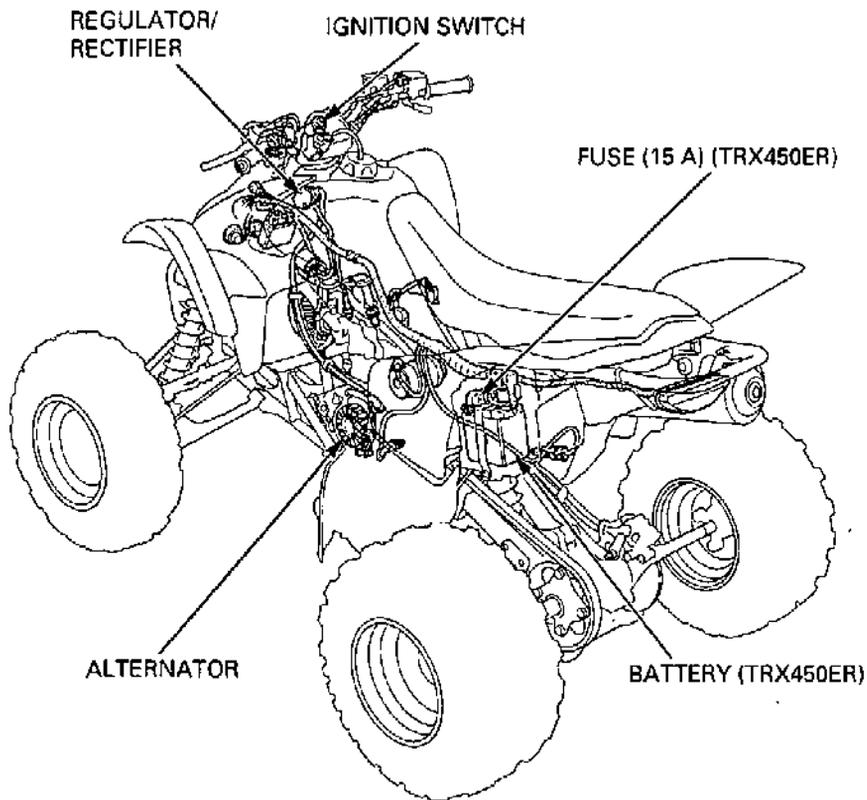


21. BATTERY/CHARGING SYSTEM (After '05)

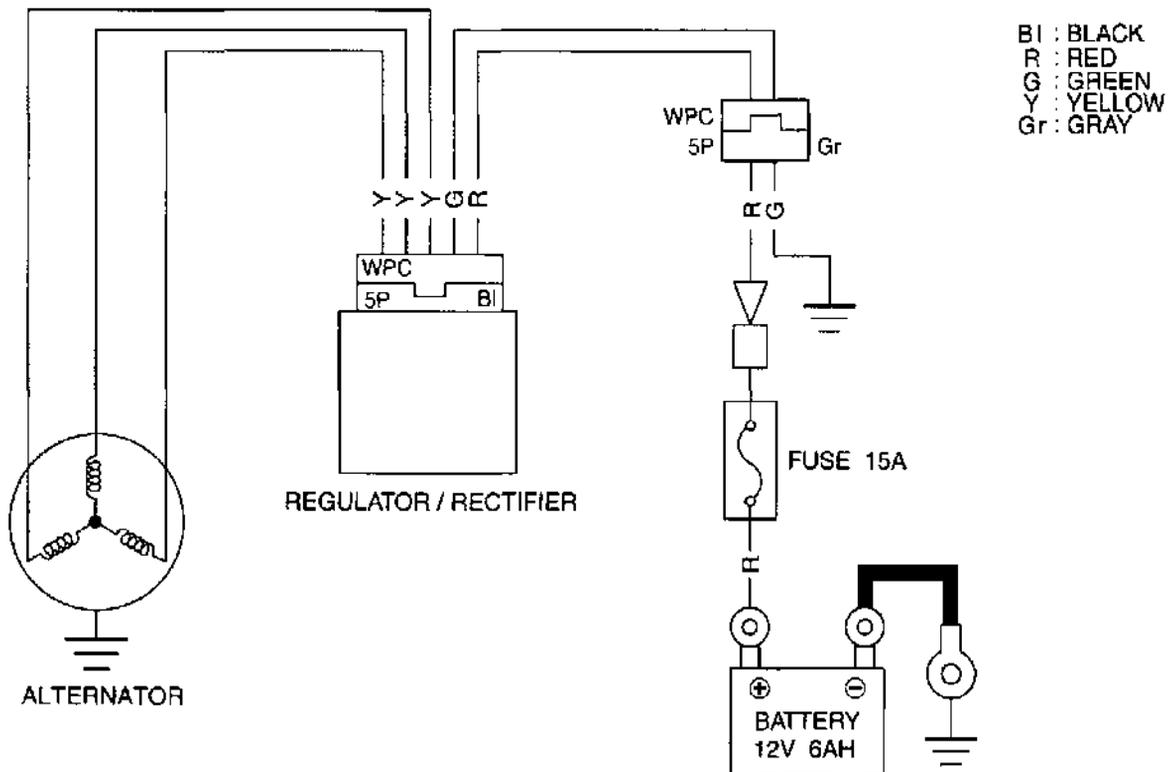
COMPONENT LOCATION	21-2	CHARGING SYSTEM	
SYSTEM DIAGRAM (TRX450ER)	21-2	INSPECTION (TRX450ER)	21-7
SERVICE INFORMATION	21-3	REGULATOR/RECTIFIER	21-8
TROUBLESHOOTING	21-5	GENERATING SYSTEM	21-9
BATTERY (TRX450ER)	21-6	ALTERNATOR	21-10

BATTERY/CHARGING SYSTEM (After '05)

COMPONENT LOCATION



SYSTEM DIAGRAM (TRX450ER)



SERVICE INFORMATION

GENERAL

▲ WARNING

- The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.
 - The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.
 - If electrolyte gets on your skin, flush with water.
 - If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.
 - Electrolyte is poisonous.
 - If swallowed, drink large quantities of water or milk and call your local Poison Control Center or a physician immediately.
-
- Always turn the ignition switch to OFF before disconnecting any electrical component.
 - Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is turned to ON and current is present.
 - For extended storage, remove the battery, give it a full charge, and store it in a cool, dry space.
 - For a battery remaining in a stored vehicle, disconnect the negative battery cable from the battery terminal.
 - The battery sealing caps should not be removed. Attempting to remove the sealing caps from the cells may damage the battery.
 - The maintenance free (MF) battery must be replaced when it reaches the end of its service life.
 - The battery can be damaged if overcharged or undercharged, or if left to discharge for long period. These same conditions contribute to shortening the "life span" of the battery. Even under normal use, the performance of the battery deteriorates after 2 – 3 years.
 - Battery voltage may recover after battery charging, but under heavy load, the battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected as the problem. Battery overcharge often results from problems in the battery itself, which may appear to be an overcharging symptom. If one of the battery cells is shorted and battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level goes down quickly.
 - Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under heavy load, such as having the headlight and taillight on for long periods of time without riding the vehicle.
 - The battery will self-discharge when the vehicle is not in use. For this reason, charge the battery every 2 weeks to prevent sulfation from occurring.
 - Filling a new battery with electrolyte will produce some voltage, but in order to achieve its maximum performance, always charge the battery. Also, the battery life is lengthened when it is initially charged.
 - When checking the charging system, always follow the steps in the troubleshooting (page 21-5).
 - For alternator removal/installation, see (page 21-12)

BATTERY CHARGING

- Turn power ON/OFF at the charger, not at the battery terminal.
- For battery charging, do not exceed the charging current and time specified on the battery. Using excessive current or extending the charging time may damage the battery.
- Quick charging should only be done in an emergency; slow charging is preferred.

BATTERY TESTING

Refer to the instructions in the Operation Manual for the recommended battery tester for details about battery testing. The recommended battery tester puts a "load" on the battery so that the actual battery condition can be measured.

Recommended battery tester: BM-210-AH (U.S.A. only), BM-210, BATTERY MATE (MTP08-0192, U.S.A. only) or equivalent

BATTERY/CHARGING SYSTEM (After '05)

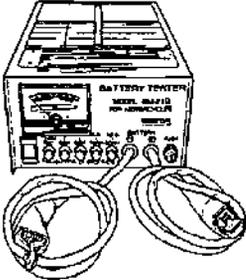
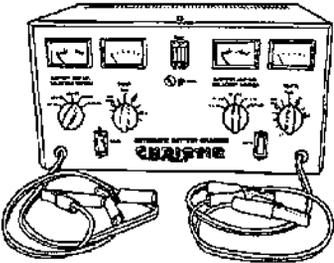
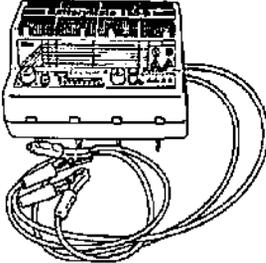
SPECIFICATIONS

ITEM		SPECIFICATIONS	
Battery	Capacity	12V - 6 Ah	
	Voltage (20°C/68°F)	Fully charged	13.0 - 13.2 V
		Needs charging	Below 12.3 V
	Charging current	Normal	0.6 A/5 - 10 h
Quick		3.0 A/1 h	
Current leakage		0.01 mA max.	
Alternator	Capacity	200 W/5,000 rpm (min ⁻¹)	
	Charging coil resistance (20°C/68°F)	0.1 - 1.0 Ω	

TORQUE VALUES

Alternator stator bolt	9.8 N-m (1.0 kgf-m, 7 lbf-ft)
Ignition pulse generator bolt	5 N-m (0.5 kgf-m, 3.6 lbf-ft)
Flywheel nut	64 N-m (6.5 kgf-m, 4.7 lbf-ft)

TOOLS

<p>Battery tester BM-210-AH (U.S.A. only)</p> 	<p>Christie battery charger MC1012/2 (U.S.A. only)</p> 	<p>Battery Mate tester/charger MTP08-0192 (U.S.A. only)</p> 
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TROUBLESHOOTING

Battery is Damaged or Weak

1. Battery Test

Remove the battery (page 21-6).

Check the battery condition using the recommended battery tester.

RECOMMENDED BATTERY TESTER: BM-210-AH (U.S.A. only), BM-210, BATTERY MATE (MTP08-0192, U.S.A. only) or equivalent

Is the battery in good condition?

NO – Faulty battery

YES – GO TO STEP 2.

2. Current Leakage Test

Install the battery (page 21-6).

Check the battery current leakage test (Leak test: page 21-7).

Is the current leakage below 0.01 mA?

YES – GO TO STEP 4.

NO – GO TO STEP 3.

3. Current Leakage Test without Regulator/Rectifier

Disconnect the regulator/rectifier connector and recheck the battery current leakage.

Is the current leakage below 0.01 mA?

YES – Faulty regulator/rectifier

NO – • Shorted wire harness
• Faulty ignition switch

4. Alternator Charging Coil Inspection

Check the alternator charging coil (page 21-8).

Is the alternator charging coil resistance within 0.1 – 1.0Ω (20°C/68°F)?

YES – Faulty charging coil

NO – GO TO STEP 5.

5. Charging Voltage Inspection

Measure and record the battery voltage using a digital multimeter (page 21-6).

Start the engine.

Measure the charging voltage (page 21-7).

Compare the measurements to the results of the following calculation.

STANDARD: Measured BV < Measured CV < 15.5 V

- **BV = Battery voltage**
- **CV = Charging voltage**

Is the measured charging voltage within the standard voltage?

YES – Faulty battery

NO – GO TO STEP 6.

6. Regulator/Rectifier System Inspection

Check the voltage and resistance at the regulator/rectifier connector (page 21-8).

Are the measurements correct?

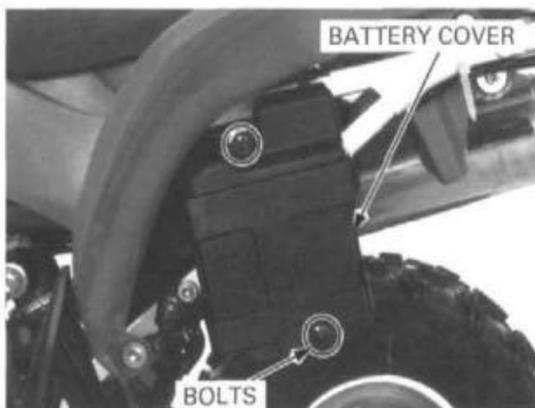
YES – Faulty regulator/rectifier

NO – • Open circuit in related wire
• Loose or poor contacts of related terminal
• Shorted wire harness

BATTERY (TRX450ER)

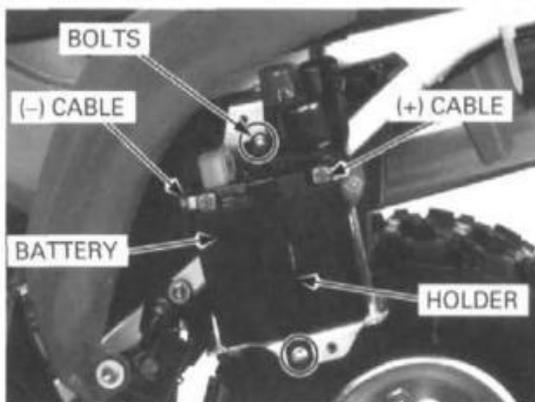
REMOVAL/INSTALLATION

With the ignition switch OFF, remove the two bolts and battery cover.



Disconnect the negative (-) cable first, then disconnect the positive (+) cable by removing each terminal bolt.

Remove the two bolts and battery holder. Remove the battery from the battery box.



Install the battery in the reverse order of removal.

After installing the battery, coat the terminals with clean dielectric grease.

Connect the positive (+) cable first and then the negative (-) cable.

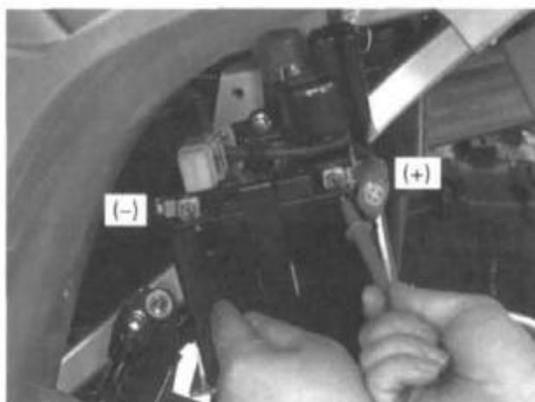
VOLTAGE INSPECTION

Measure the battery voltage using a commercially available digital multimeter.

VOLTAGE (20°C/68°F):

Fully charged: 13.0 – 13.2 V

Under charged: Below 12.3 V



BATTERY TESTING

Remove the battery (page 21-6).

Refer to the instructions that are appropriate to the battery testing equipment available to you.

TOOL:

Battery tester BM-210-AH (U.S.A. only), BM-210, BATTERY MATE (MTP08-0192, U.S.A. only) or equivalent

BATTERY CHARGING (U.S.A. only)

Remove the battery (page 21-6).

Refer to the instructions that are appropriate to the battery charging equipment available to you.

TOOL:

Battery charger Christie battery charger (MC1012/2, U.S.A. only), BATTERY MATE (MTP08-0192, U.S.A. only) or equivalent

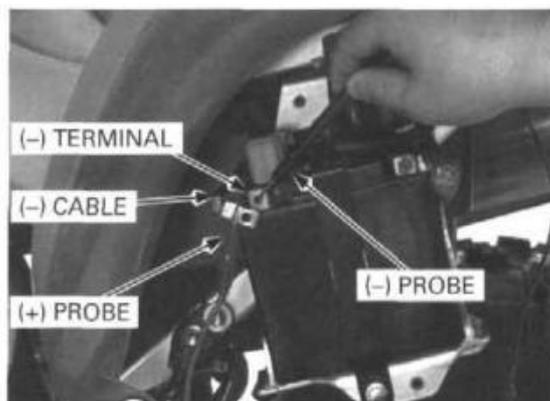
CHARGING SYSTEM INSPECTION (TRX450ER)**CURRENT LEAKAGE INSPECTION**

Turn the ignition switch to OFF and disconnect the negative (-) cable from the battery.

Connect the ammeter (+) probe to the negative (-) cable and the ammeter (-) probe to the battery (-) terminal.

With the ignition switch turned to OFF, check for current leakage.

- When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher than the range selected may blow out the fuse in the tester.
- While measuring current, do not turn the ignition switch ON. A sudden surge of current may blow out the fuse in the tester.

**SPECIFIED CURRENT LEAKAGE: 0.01 mA maximum**

If current leakage exceeds the specified value, a shorted circuit is likely.

Locate the short by disconnecting connections one by one and measuring the current.

CHARGING VOLTAGE INSPECTION

Be sure the battery is in good condition before performing this test.

Warm up the engine to normal operating temperature.

Connect the multimeter between the battery positive (+) and negative (-) terminals.

NOTICE

- To prevent a short, make absolutely certain which are the positive (+) and negative (-) terminals or cables.
- Do not disconnect the battery or any cable in the charging system without first switching off the ignition switch. Failure to follow this precaution can damage the tester or electrical components.

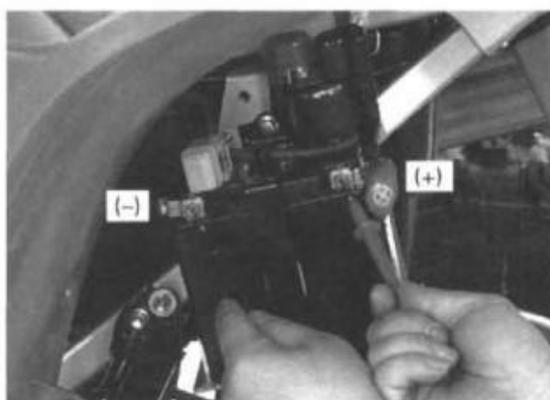
Connect the tachometer.

With the headlight on, measure the voltage on the multimeter when the engine runs at 5,000 rpm (min^{-1}).

STANDARD: Measured BV < Measured CV < 15.5 V

BV = Battery voltage (page 21-6)

CV = Charging voltage



REGULATOR/RECTIFIER

WIRE HARNESS INSPECTION

Disconnect the regulator/rectifier 5P black connector.

Check the connector for loose contacts or corroded terminals.

BATTERY LINE (TRX450ER)

Measure the voltage between the Red wire terminal and ground.

There should be battery voltage at all times.

IGNITION SWITCH LINE (TRX450R)

Check the Red wire for continuity between the regulator/rectifier and ignition switch connectors. There should be continuity.

CHARGING COIL LINE (TRX450ER/R)

Measure the resistance between the Yellow wire terminal.

STANDARD: 0.1 – 1.0 Ω (at 20°C/68°F)

Check for continuity between each Yellow wire terminal and ground.

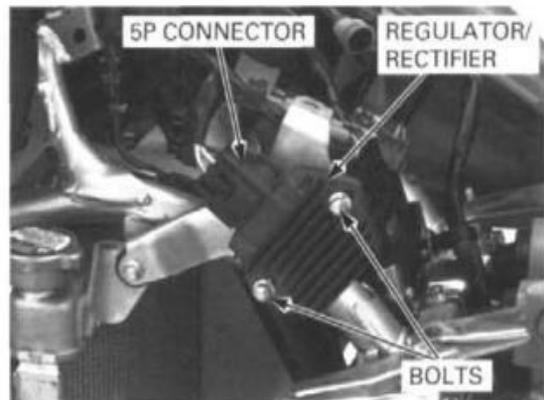
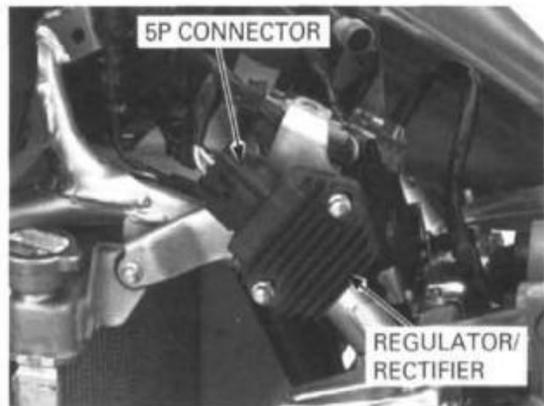
There should be no continuity.

REMOVAL/INSTALLATION

Disconnect the 5P black connector.

Remove the two bolts and regulator/rectifier from the frame.

Installation is in the reverse order of removal.



GENERATING SYSTEM

GENERATING VOLTAGE INSPECTION

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

Remove the top cover (page 3-5).

TRX450ER: Disconnect the handlebar switch 6P natural connector.

TRX450R: Disconnect the handlebar switch 4P natural connector.

Connect the voltmeter positive (+) probe to the Black wire terminal and negative (-) probe to the Green wire terminal of the wire harness side handlebar switch connector.

Restart the engine.

Measure the generating voltage when the engine runs at 5,000 rpm.

The voltage will drop about 1 V when the cooling fan motor is running.

STANDARD: 13 – 16 V

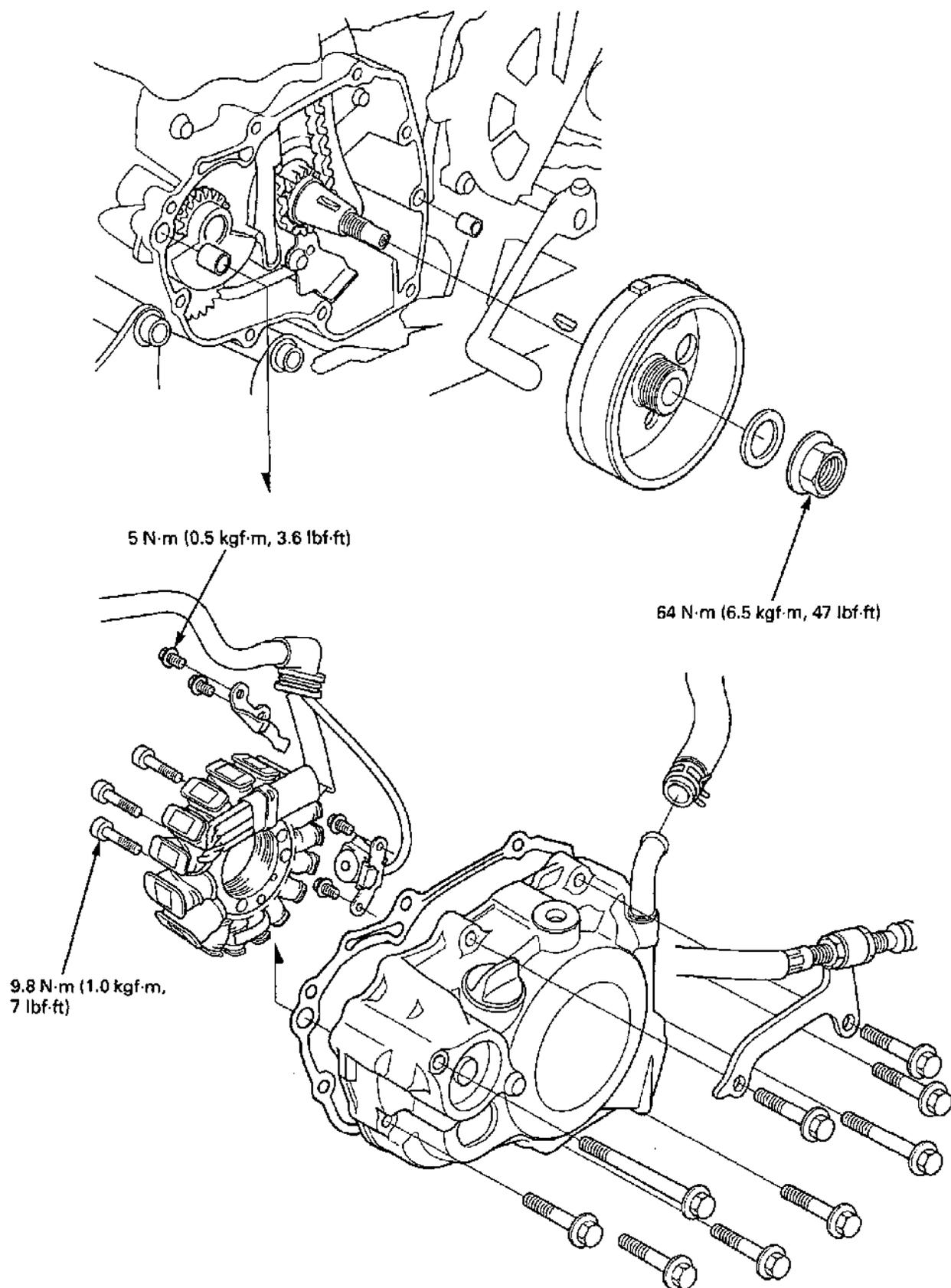
Connect the handlebar switch 6P (TRX450ER) or 4P (TRX450R) natural connector.

Install the top cover (page 3-5).



HANDLEBAR SWITCH 6P (TRX450ER) or 4P (TRX450R) CONNECTOR

ALTERNATOR



LEFT CRANKCASE COVER REMOVAL

Drain the engine oil (page 4-15).

Remove both front fenders (page 3-6).

Disconnect the alternator connectors and regulator/rectifier connector.

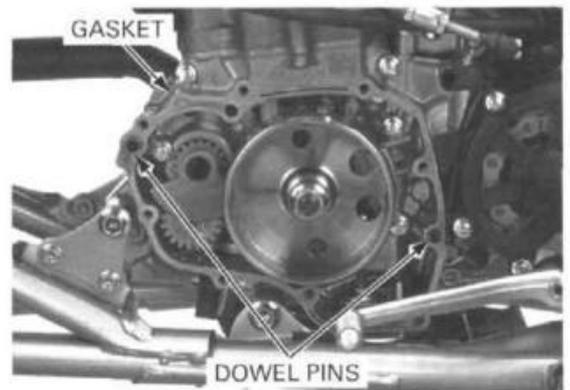
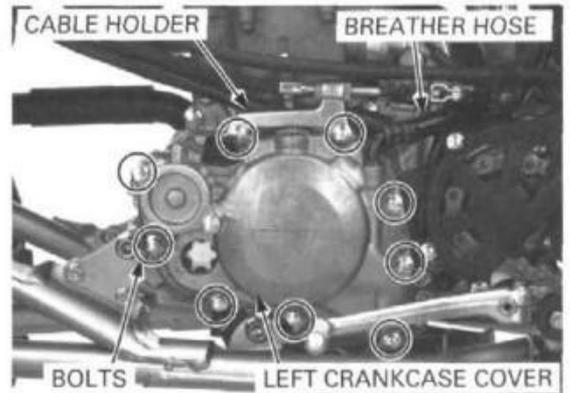
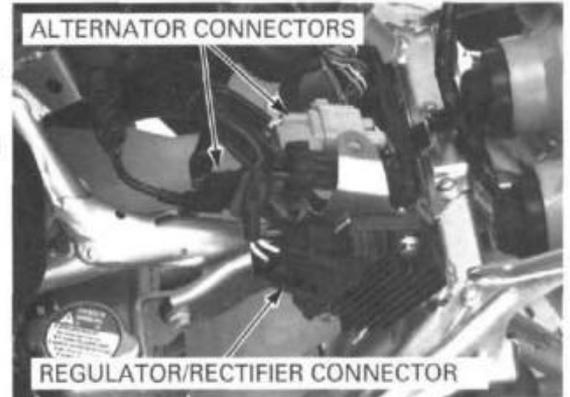
Remove the wire bands and free the alternator wire from the frame.

Remove the wire bands.

Remove the breather hose.

Remove the nine bolts, cable holder and left crankcase cover.

Remove the dowel pins and gasket.



STATOR REPLACEMENT

Remove the left crankcase cover (page 21-11).

Remove the four bolts, wire clamp and ignition pulse generator.

Remove the three socket bolts, wire grommet and alternator stator from the left crankcase cover.

Install the alternator stator into the left crankcase cover and tighten the three socket bolts to the specified torque.

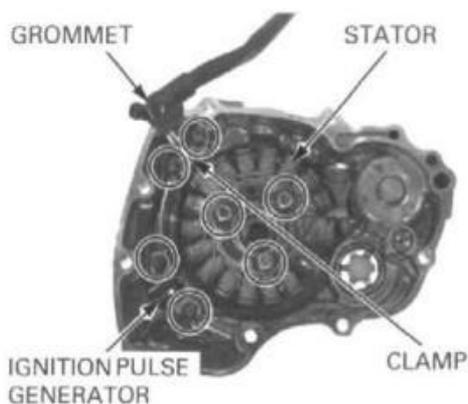
TORQUE: 9.8 N·m (1.0 kgf·m, 7 lbf·ft)

Install the wire grommet into the left crankcase cover groove properly.

Install the ignition pulse generator and wire clamp and tighten the four bolts to the specified torque.

TORQUE: 5 N·m (0.5 kgf·m, 3.6 lbf·ft)

Install the left crankcase cover (page 21-13).



FLYWHEEL REMOVAL

Remove the left crankcase cover (page 21-11).

Hold the flywheel using the special tool and loosen the flywheel nut.

TOOL:

Flywheel holder

07725-0040000 or equivalent commercially available

Remove the flywheel nut and washer.

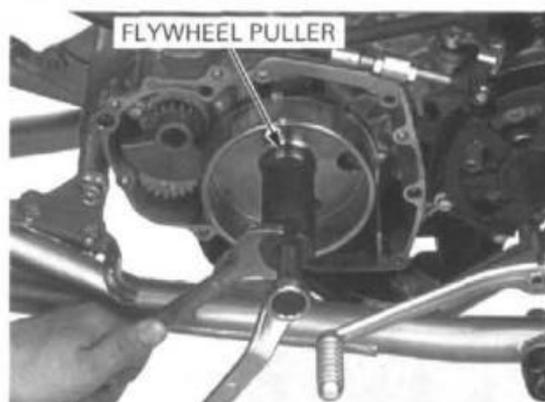


Remove the flywheel using the special tool.

TOOL:

Flywheel puller

070MC-HP10100 or 070MC-HP1A100 (U.S.A. only)



Remove the woodruff key from the crankshaft.



FLYWHEEL INSTALLATION

Clean any oil from the tapered portion of the crankshaft and flywheel.

Install the woodruff key into the crankshaft key groove.

Install the flywheel onto the crankshaft by aligning the key way with the woodruff key.

Apply oil to the flywheel nut threads and seating surface.

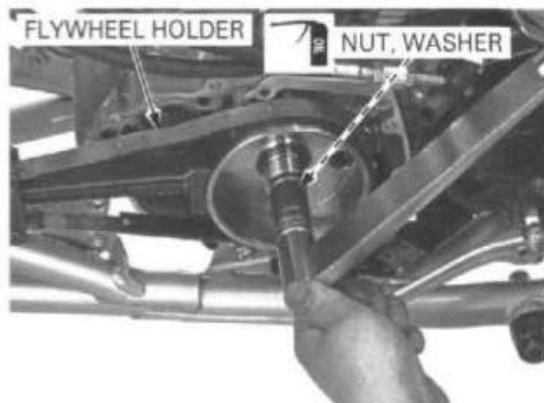
Install the washer and flywheel nut.

Hold the flywheel using the special tool and tighten the flywheel nut to the specified.

TOOL:

Flywheel holder

07725-0040000 or equivalent commercially available



TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)

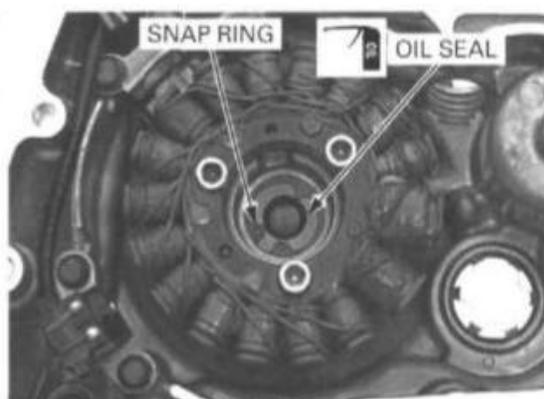
Install the left crankcase cover (page 21-13).

LEFT CRANKCASE COVER INSTALLATION

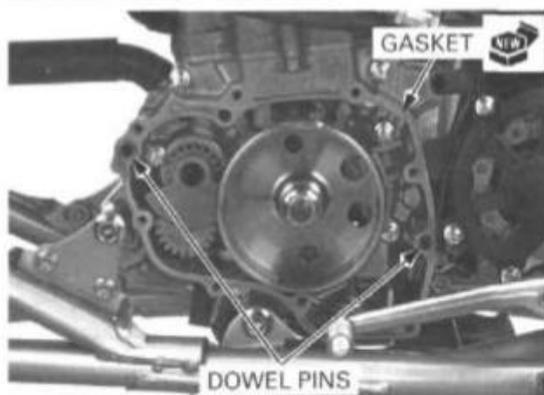
Check the oil seal in the left crankcase cover for wear or damage.

Remove the snap ring and replace the oil seal with a new one if necessary.

Apply oil to the oil seal lip.

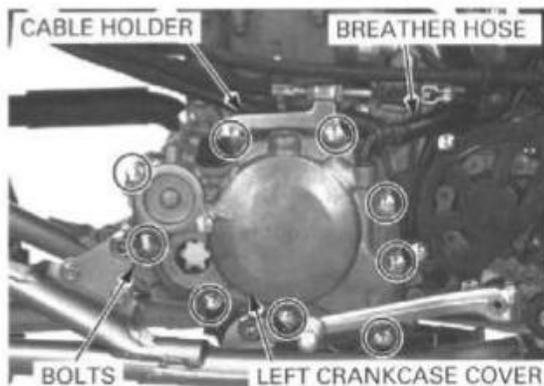


Install the dowel pins and new gasket.



Install the left crankcase cover, cable holder and bolts.

Connect the breather hose.



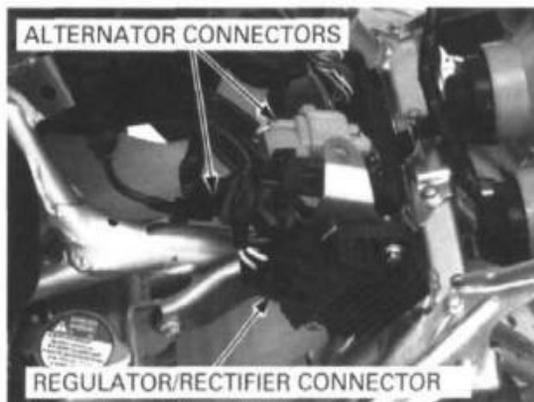
BATTERY/CHARGING SYSTEM (After '05)

Install the wire bands.



Route the alternator wire properly and install the wire bands (page 1-24).
Connect the alternator and regulator/rectifier connectors.

Fill the crankcase with the recommended engine oil.
Install both front fender (page 3-6).

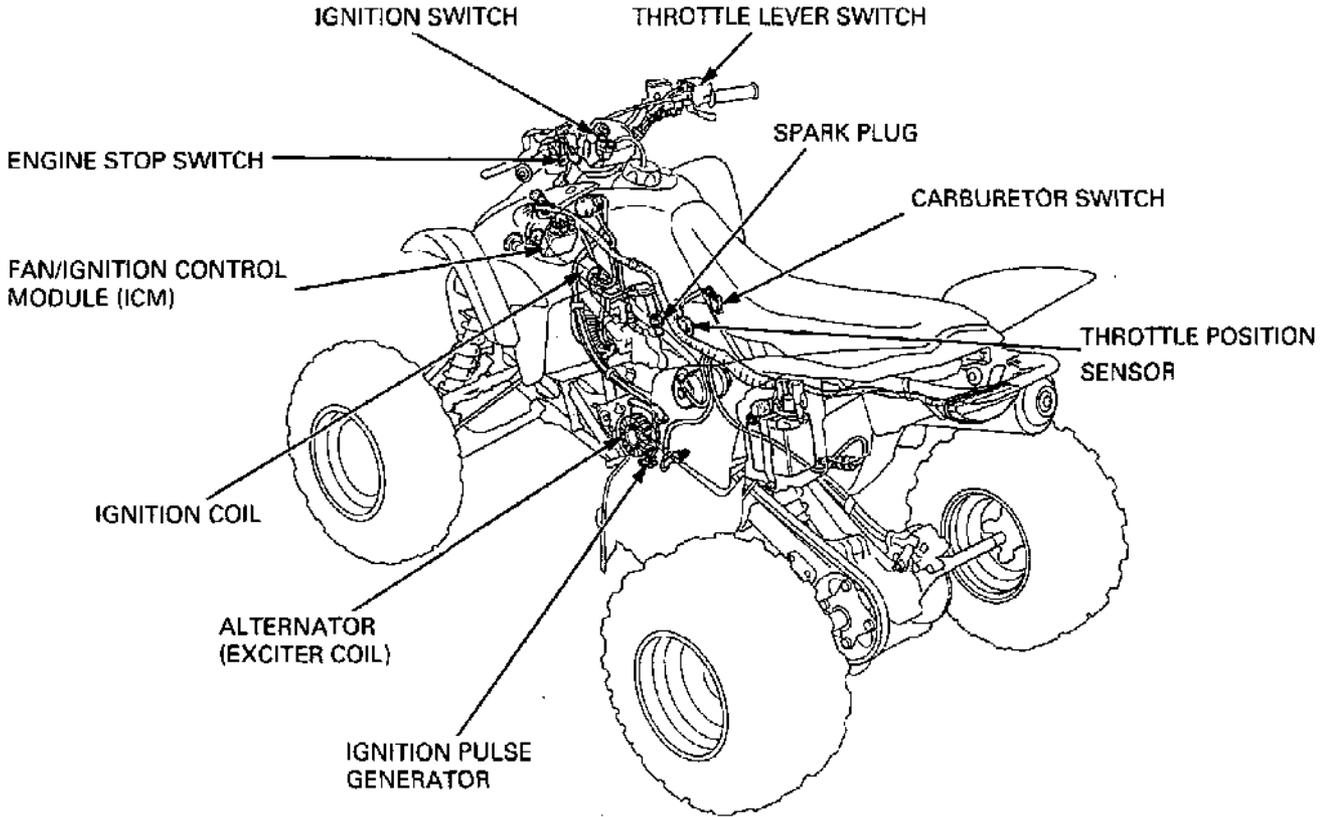


22. IGNITION SYSTEM (After '05)

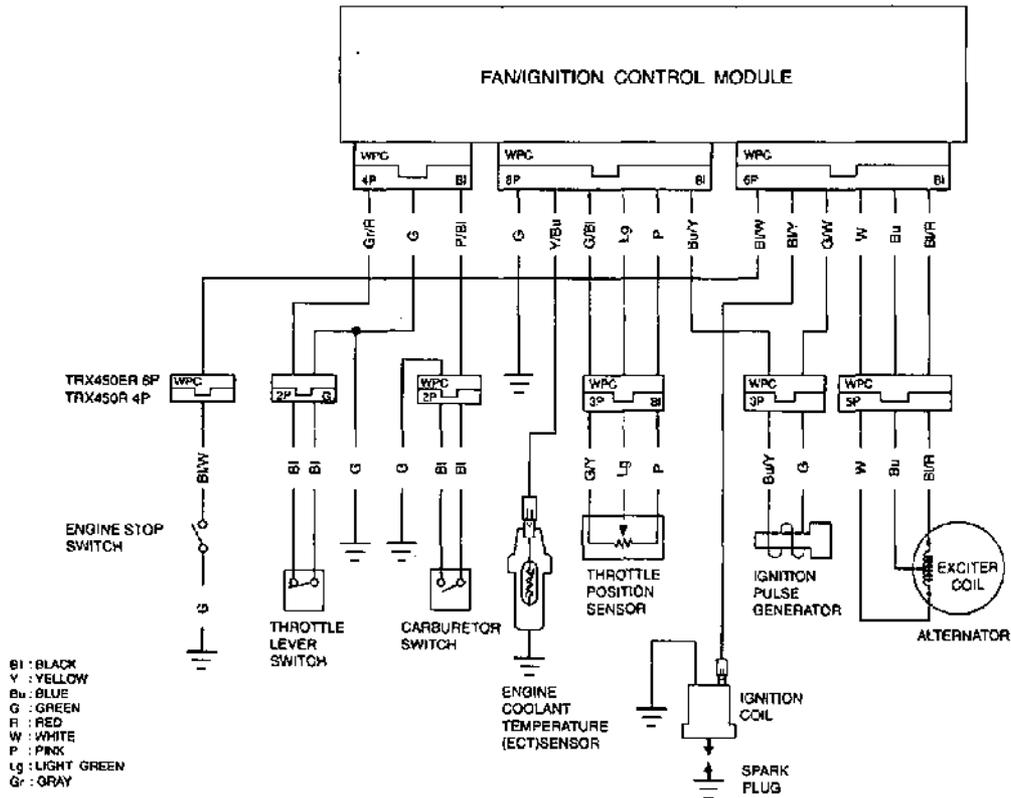
COMPONENT LOCATION.....	22-2	IGNITION TIMING	22-9
SYSTEM DIAGRAM.....	22-2	IGNITION COIL	22-10
SERVICE INFORMATION	22-3	ICM (IGNITION CONTROL MODULE)	22-10
TROUBLESHOOTING	22-4	THROTTLE POSITION SENSOR	22-10
IGNITION SYSTEM INSPECTION.....	22-6	CLOSED THROTTLE POSITION DETECTION SYSTEM	22-12

IGNITION SYSTEM (After '05)

COMPONENT LOCATION



SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is turned to ON and current is present.
- When servicing the ignition system, always follow the steps in the troubleshooting table on page 22-4.
- 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 ICM. Always turn the ignition switch to OFF before servicing.
- A faulty ignition system is often related to poor connections. Check those connections before proceeding.
- Make sure the battery is adequately charged. Using the starter motor with a weak battery results in a slower engine cranking speed as well as no spark at the spark plug (TRX450ER only).
- Use spark plug with the correct heat range. Using spark plug with an incorrect heat range can damage the engine.
- For ignition pulse generator removal/installation, see page 21-11.
- For ignition switch inspection, see page 24-7.
- For engine stop switch inspection, see page 24-7.

SPECIFICATIONS

ITEM		SPECIFICATIONS
Spark plug	Standard	IFR7L11 (NGK), VK22PRZ11 (DENSO)
	For extended high speed riding	IFR8H11 (NGK), VK24PRZ11 (DENSO)
Spark plug gap		1.0 - 1.1 mm (0.039 - 0.043 in)
Ignition coil primary peak voltage		100 V minimum
Exciter coil peak voltage	High	45 V minimum
	Low	15 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Ignition timing ("F"mark)		11.4° BTDC at idle
Throttle position sensor resistance (20°C/68°F)		4 - 6 kΩ

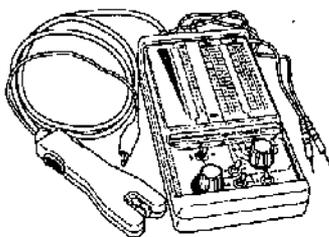
TORQUE VALUE

Timing hole cap	9.8 N·m (1.0 kgf·m, 7 lbf·ft)
Throttle position sensor screw	3.4 N·m (0.3 kgf·m, 2.5 lbf·ft)

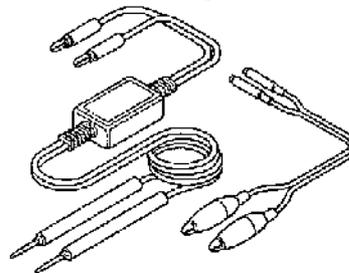
Apply locking agent to the threads

TOOLS

IgnitionMate peak voltage tester
MTP07-0286 (U.S.A. only)



Peak voltage adaptor
07HGJ-0020100



(not available in U.S.A.) with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

IGNITION SYSTEM (After '05)

TROUBLESHOOTING

- The ICM cut-off the ignition if the throttle lever is closed (throttle switch is off) and the throttle drum open (carburetor switch is off), also the ICM cut-off the ignition when the throttle lever free play less than 5 mm (3/16 in).
- Inspect the following before diagnosing the system:
 - Faulty spark plug
 - Loose spark plug cap or spark plug wire connection
 - Water got into the spark plug cap (leaking the ignition coil secondary voltage)

No Spark at Spark Plug

Unusual Condition		Probable Cause (Check in numerical order)
Ignition coil primary voltage	Low peak voltage.	<ol style="list-style-type: none"> 1. Incorrect peak voltage adaptor connections. (System is normal if measured voltage is over the specifications with reverse connections). 2. The multimeter impedance is too low. 3. Cranking speed is too slow. <ul style="list-style-type: none"> - operating force of the kickstarter is weak. - battery is under charged. 4. 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) 5. Poorly connected connectors or an open circuit in the ignition system. 6. Faulty exciter coil. (Measure peak voltage) 7. Faulty ignition coil. 8. Faulty ignition control module (ICM) (when above No.1 through 7 are normal).
	No peak voltage.	<ol style="list-style-type: none"> 1. Incorrect peak voltage adaptor connections. (System is normal if measured voltage is over the specifications with reverse connections). 2. Short circuit in Black/white wire of the ignition switch and engine stop switch. 3. Faulty ignition switch, engine stop switch. 4. Loose or poorly connected ICM connector(s). 5. Open circuit or poor connection in the Green wire (ground) of the ICM. 6. Faulty peak voltage adaptor. 7. Faulty exciter coil. (Measure peak voltage) 8. Faulty ignition pulse generator. (Measure peak voltage) 9. Faulty ICM (when above No. 1 through 8 are normal).
	Peak voltage is normal, but no spark jumps at the plug.	<ol style="list-style-type: none"> 1. Faulty spark plug or leaking ignition coil secondary current. 2. Faulty ignition coil.
Exciter coil	Low peak voltage	<ol style="list-style-type: none"> 1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too slow. <ul style="list-style-type: none"> - operating force of the kickstarter is weak. - battery is under charged. 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 exciter coil (when above No.1 through 3 are normal).
	No peak voltage	<ol style="list-style-type: none"> 1. Faulty peak voltage adaptor. 2. Faulty exciter coil.
Ignition pulse generator	Low peak voltage.	<ol style="list-style-type: none"> 1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too slow. <ul style="list-style-type: none"> - operating force of the kickstarter is weak. - battery is under charged. 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 ignition pulse generator (when above No. 1 through 3 are normal).
	No peak voltage.	<ol style="list-style-type: none"> 1. Faulty peak voltage adaptor. 2. Faulty ignition pulse generator.

Engine does not start

- Throttle cable stick
- Faulty throttle lever switch
- Faulty carburetor switch

IGNITION SYSTEM INSPECTION

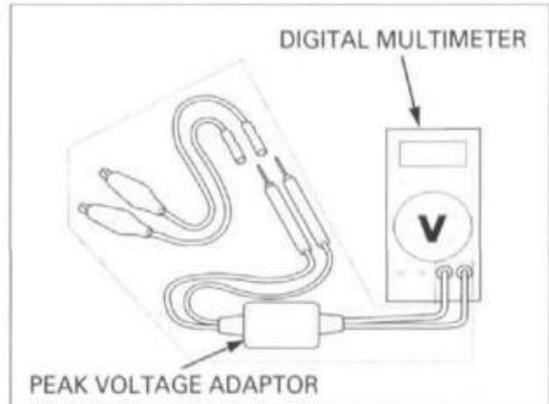
NOTE:

- If there is no spark at the plug, check all connections for loose or poor contact before measuring the peak voltage.
- Use the recommended digital multimeter or a commercially available digital multimeter with an impedance of 10 M Ω /DCV minimum.
- The display value differs depending upon the internal impedance of the multimeter.

Use the peak voltage tester or connect the peak voltage adaptor to the digital multimeter.

TOOLS:

IgnitionMate peak voltage tester	MTP07-0286 (U.S.A. only) or
Peak voltage adaptor with commercially available digital multimeter (impedance 10 M Ω /DCV minimum)	07HGJ-0020100 (not available in U.S.A.)



IGNITION COIL PRIMARY PEAK VOLTAGE

NOTE:

- Check all system connections before inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check the cylinder compression and check that the spark plug is installed correctly.

Remove the right front fender (page 3-6).

Disconnect the spark plug cap from the spark plug. Connect a known good spark plug to the spark plug cap and ground it to the cylinder head as done in a spark test.



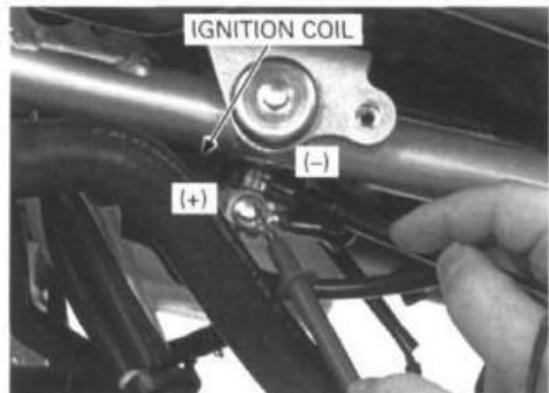
With the ignition coil primary wire connected, connect the peak voltage tester or adaptor probes to the ignition coil primary terminal and body ground.

TOOLS:

IgnitionMate peak voltage tester	MTP07-0286 (U.S.A. only) or
Peak voltage adaptor with commercially available digital multimeter (impedance 10 M Ω /DCV minimum)	07HGJ-0020100 (Not available in U.S.A.)

CONNECTION:

Black/yellow terminal (-) – Body ground (+)



Shift the transmission into neutral.
Turn the ignition switch to "ON".
Crank the engine with starter motor (TRX450ER) or kickstarter (TRX450R) and read ignition coil primary peak voltage.

PEAK VOLTAGE: 100 V minimum

If the peak voltage is lower than the standard value, follow the checks described in the troubleshooting chart (page 22-4).

ALTERNATOR EXCITER COIL PEAK VOLTAGE

NOTE:

- Check the cylinder compression and check that the spark plug is installed correctly.

Disconnect the 6P black connector from the ignition control module (ICM).

Connect the peak voltage tester or adaptor probes to the exciter coil wire terminals of the 6P black connector.

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 M Ω /DCV minimum)

CONNECTIONS:

High: Black/red terminal (+) – White terminal (-)

Low: Blue terminal (+) – White terminal (-)

Shift the transmission into neutral.

Crank the engine with starter motor (TRX450ER) or kickstarter (TRX450R) and read the exciter coil peak voltage.

**PEAK VOLTAGE: High: 45 V minimum
Low: 15 V minimum**

If the peak voltage measured at the ICM connector is abnormal, measure the peak voltage at the alternator exciter coil 5P connector.

Remove the right front fender (page 3-6).

Disconnect the alternator exciter coil 5P connector and connect the tester probes to the wire terminals of the exciter coil side 5P connector.

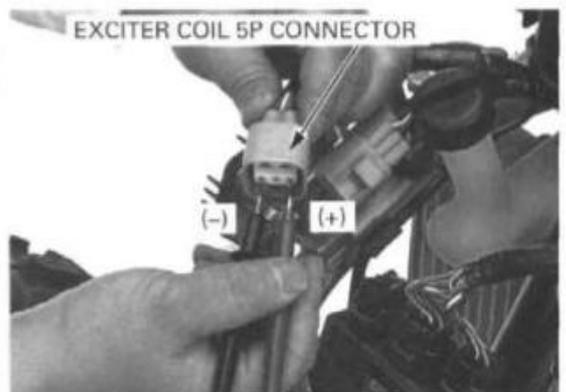
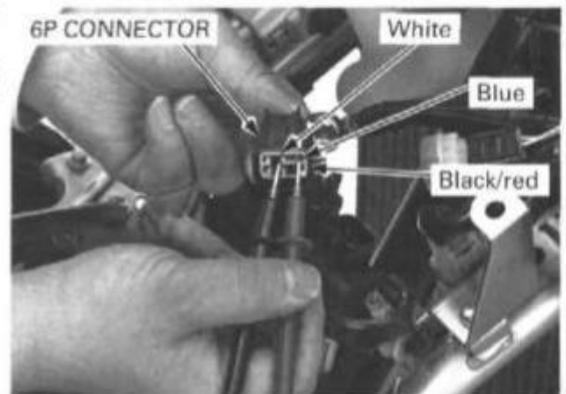
CONNECTIONS:

High: Black/red terminal (+) – White terminal (-)

Low: Blue terminal (+) – White terminal (-)

In the same manner as at the ICM connector, measure the peak voltage and compare it to the voltage measured at the ICM connector.

- If the peak voltage measured at the ICM is abnormal and the one measured at the alternator exciter coil is normal, the wire harness has an open or short circuit, or loose connection.
- If both peak voltages are abnormal, follow the checks described in the troubleshooting chart (page 22-4).



IGNITION PULSE GENERATOR PEAK VOLTAGE

NOTE:

- Check the cylinder compression and check that the spark plug is installed correctly.

Disconnect the 8P and 6P black connector from the ICM.

Connect the peak voltage tester or adaptor probes to the ignition pulse generator wire terminals of the 8P and 6P black connector.

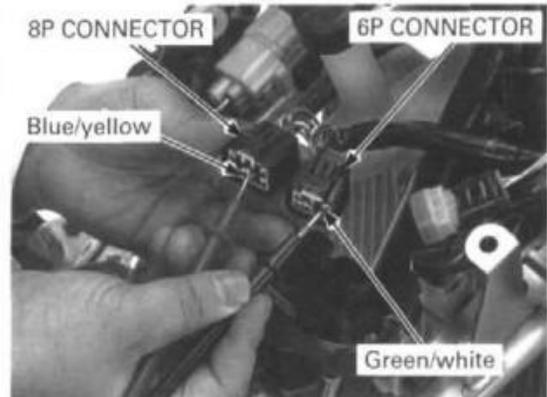
TOOLS:

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 M Ω /DCV minimum)



CONNECTION:

Blue/yellow terminal (+) – Green/white terminal (-)

Shift the transmission into neutral.

TRX450ER: Crank the engine with the starter motor and read the ignition pulse generator peak voltage.

TRX450R: Crank the engine with the kickstarter and read the ignition pulse generator peak voltage.

PEAK VOLTAGE: 0.7 V minimum

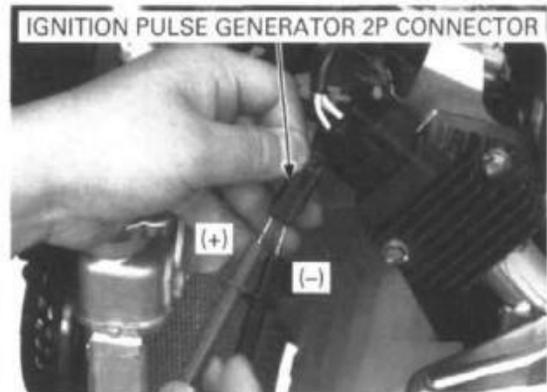
If the peak voltage measured at the ICM connector is abnormal, measure the peak voltage at the ignition pulse generator connector.

Remove the right front fender (page 3-6).

Disconnect the ignition pulse generator 2P black connector and connect the tester probes to the Blue/yellow (+) and Green (-) wire terminals of the ignition pulse generator side 2P black connector.

In the same manner as at the ICM connector, measure the peak voltage and compare it to the voltage measured at the ICM connector.

- If the peak voltage measured at the ICM is abnormal and the one measured at the ignition pulse generator is normal, the wire harness has an open or short circuit, or loose connection.
- If both peak voltages are abnormal, follow the checks described in the troubleshooting chart (page 22-4).



IGNITION TIMING

Warm up the engine.

Stop the engine and remove the timing hole cap.

Read the manufacturer's instructions for timing light operation.

Connect a timing light to the spark plug wire.

Start the engine and let it idle.

IDLE SPEED: 1,700 ± 100 rpm

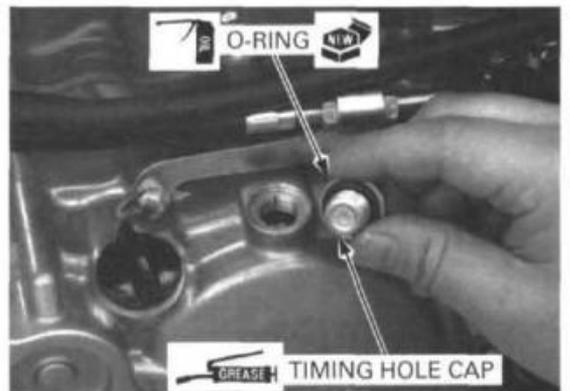
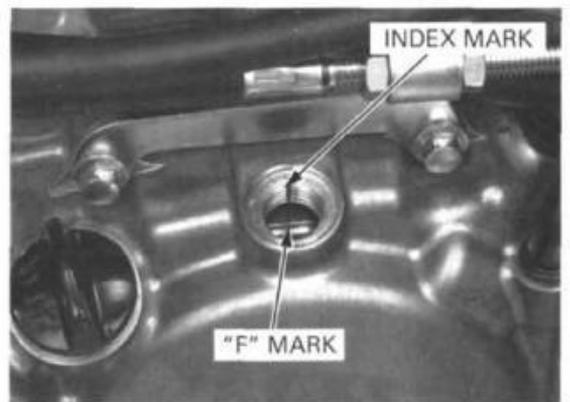
The ignition timing is correct if the "F" mark on the flywheel aligns with the index mark on the left crankcase cover.

Coat a new O-ring with oil and install it onto the timing hole cap.

Apply grease to the timing hole cap threads and seating surface.

Install the timing hole cap and tighten it.

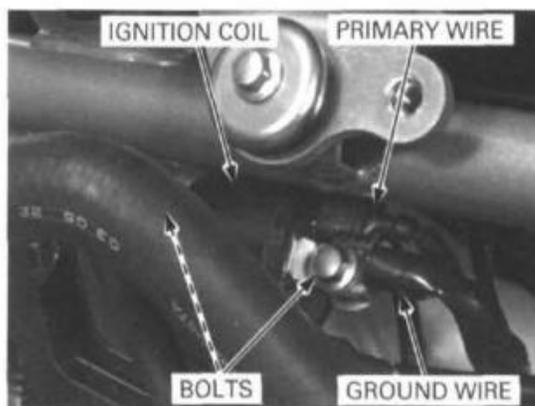
TORQUE: 9.8 N·m (1.0 kgf·m, 7 lbf·ft)



IGNITION COIL

REMOVAL/INSTALLATION

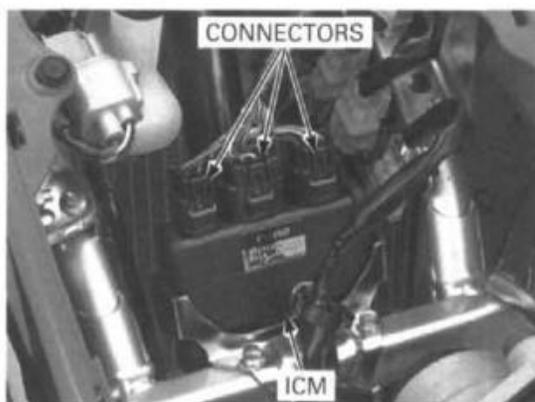
Remove the right front fender (page 3-6).
Remove the spark plug cap from the spark plug.
Disconnect the primary wire connector.
Remove the bolts, ground terminal and ignition coil.
Installation is in the reverse order of removal.



ICM (IGNITION CONTROL MODULE)

REMOVAL/INSTALLATION

Remove the top cover (page 3-5).
Disconnect the ICM 4P, 8P and 6P black connectors.
Remove the ICM from the holder.
Installation is in the reverse order of removal.



THROTTLE POSITION SENSOR

INSPECTION

Disconnect the throttle position sensor 3P black connector.
Measure the resistance between the Pink and Green/yellow wire terminal of the sensor side connector.

STANDARD: 4 – 6 kΩ at 20°C (68°F)

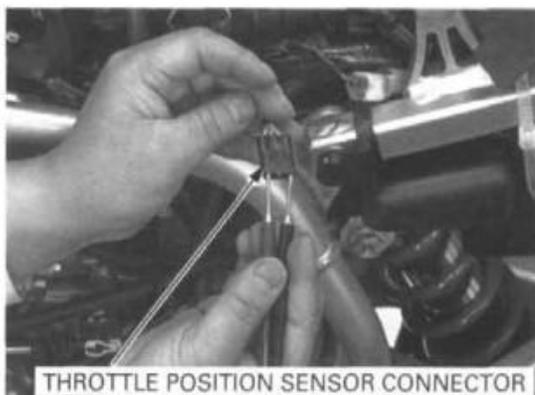
Check that the resistance between the Light green and Green/yellow wire terminals varies with the throttle position while operating the throttle lever.

From fully closed position to fully open position:

Resistance increases

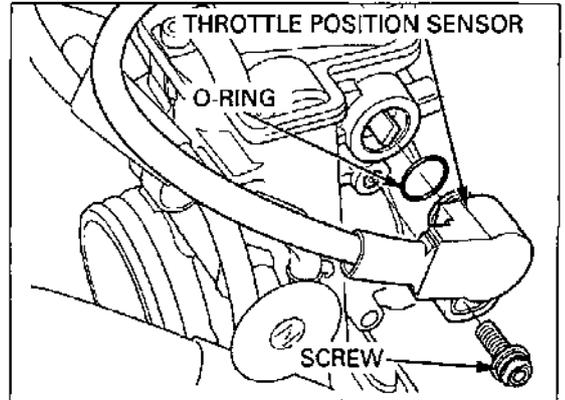
From fully open position to fully closed position:

Resistance decreases

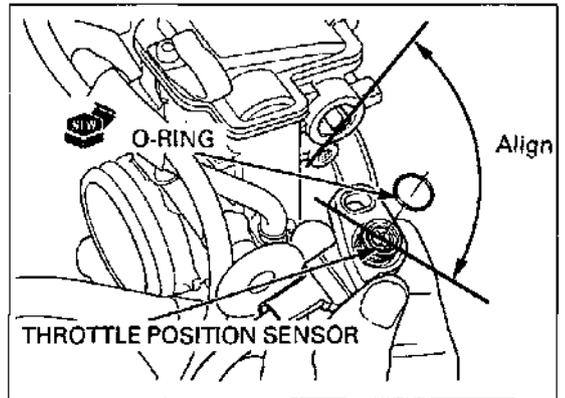


REPLACEMENT

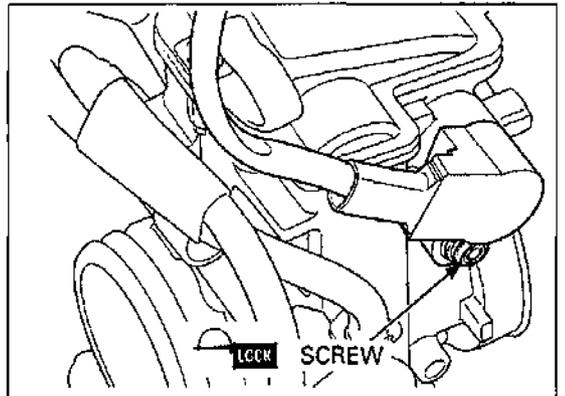
Remove the carburetor from the engine (page 8-7) .
Remove the screw, throttle position sensor and O-ring.



Install a new O-ring and 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 screw threads and loosely install the screw.



Measure the resistance between the Pink and Green/yellow wire terminal of the sensor side connector.

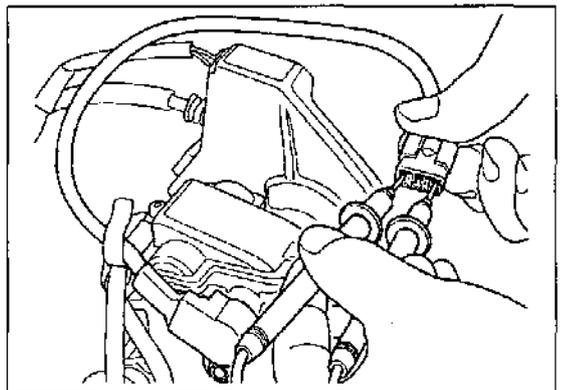
STANDARD: 4 – 6 kΩ at 20°C (68°F)

Calculated the throttle position sensor resistance at idle speed using the equation below.
 $A \times (0.13 - 0.15) = B$

A: Pink and Green/yellow wire terminals resistance.
B: Throttle position sensor (Light green – Green/yellow) resistance at idle speed.

(Ex.)

If the Pink and Green/yellow wire terminal resistance is 5kΩ, then throttle position sensor (Light green – Green/yellow) resistance at idle speed is :
 $5k\Omega \times (0.13 - 0.15) = 650 - 750 \Omega$

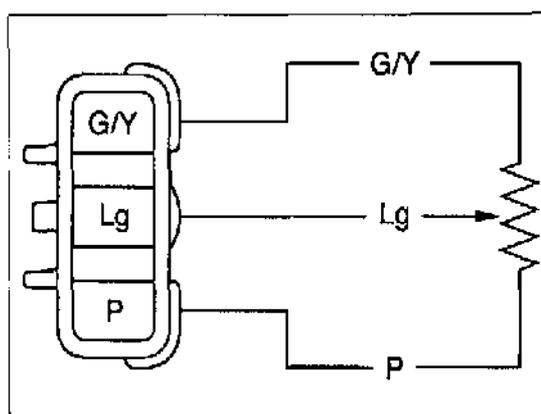


IGNITION SYSTEM (After '05)

Adjust the throttle position sensor position so the resistance between the terminals (Light green - Green/yellow) is calculated, and tighten the screw to the specified torque.

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

Install the removed parts in the reverse order of removal.



CLOSED THROTTLE POSITION DETECTION SYSTEM

OUTLINE (OPERATING PRINCIPLE)

The closed throttle position detection system is an ignition cut-off system that will prevent the engine from running at any speed beyond idle while the throttle lever is fully closed.

Both the throttle lever and carburetor throttle drum have a position switch to detect their fully closed position.

If the throttle drum "sticks" in an open position (carburetor switch OFF) and the throttle lever is fully closed (throttle lever switch OFF) the ICM will cut off the ignition to prevent engine damage or an accident.

Based upon the throttle lever and the throttle drum positions, and their corresponding switch status, the ICM will stop the engine from running (see following chart).

Throttle Lever Position	Throttle Lever Switch Status	Throttle Drum Position	Carburetor Switch Status	Ignition Status
Closed	OFF	Open	OFF	OFF (fail mode)
Open	ON	Open	OFF	ON (cruise, accelerate)
Closed	OFF	Closed	ON	ON (starting, idle)
Open	ON	Closed	ON	ON (initial takeup of throttle lever free play)

OPERATION INSPECTION

If the engine does not start, check for the following.

Remove the throttle housing cover (page 17-9).

Remove the throttle drum cover (page 8-7).

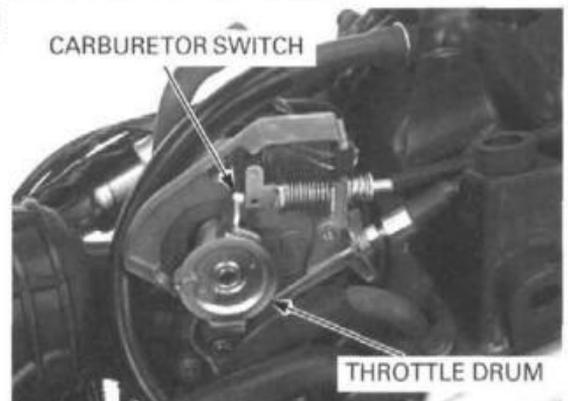
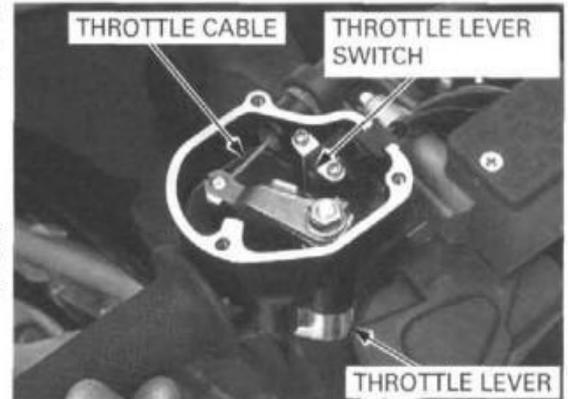
Operate the throttle lever and check for smooth operation of the throttle drum in all steering position. If the throttle drum operation is not smooth, lubricate or replace the throttle cable.

Check the throttle lever free play (page 4-6).

NOTICE

The ICM will cut-off the ignition when the throttle lever free play is adjusted to less than 5 mm (7/32 in). If the engine does not start, check the throttle lever free play and readjust it.

If the throttle drum operation is normal and the engine still does not start, check the throttle lever switch and carburetor switch (page 22-13).



SYSTEM INSPECTION

Check the throttle cable operation.

THROTTLE LEVER SWITCH

Remove the front fender (page 3-6).

Disconnect the ICM 4P black connector.

Check for continuity between the terminals of the connector.

TERMINALS:

Gray/red terminal (+) – Green terminal (-)

There should be no continuity when the throttle lever is fully closed and continuity when the throttle lever is open.

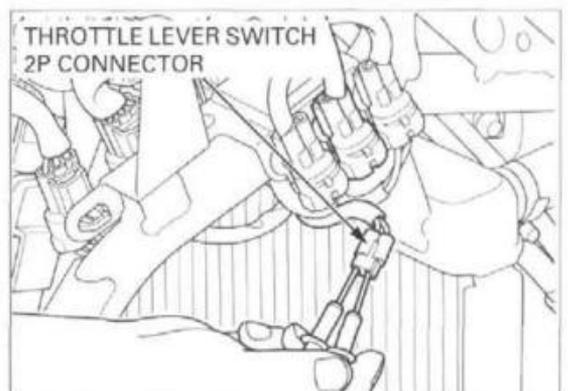
If the throttle lever switch operation is incorrect, disconnect the throttle lever switch 2P green connector and check for continuity between the terminals of the switch side.

THROTTLE LEVER CLOSED: NO CONTINUITY
THROTTLE LEVER OPEN: CONTINUITY

If the throttle lever switch operation is still incorrect, replace the throttle lever switch assembly (page 17-9).

If the throttle lever switch is OK, check for open or short circuit in wire harness.

If both the throttle lever switch and wire harness are normal, replace the ICM and inspect again.



IGNITION SYSTEM (After '05)

CARBURETOR SWITCH

Remove the top cover (page 3-5).
Remove the rear fender (page 3-7).

Disconnect the ICM 4P black connector.
Check for continuity between the terminals of the connector.

TERMINALS:

Pink/black terminal (+) – Green terminal (-)

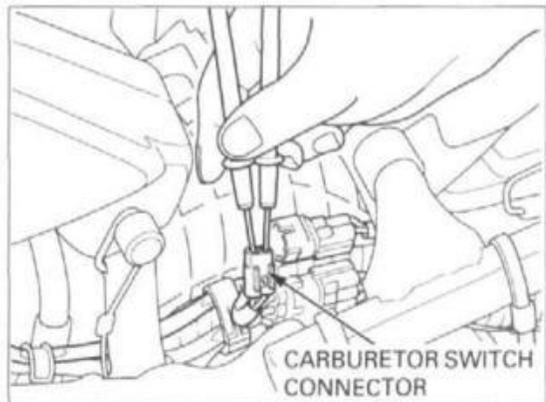
There should be continuity when the throttle drum is fully closed and no continuity when the throttle drum is open.



If the carburetor switch operation is incorrect, disconnect the carburetor switch 2P natural connector and check for continuity between the terminals of the switch side.

THROTTLE DRUM CLOSED: CONTINUITY
THROTTLE DRUM OPEN: NO CONTINUITY

If the carburetor switch operation is still incorrect, replace the carburetor switch assembly (page 8-11).
If the carburetor switch is OK, check for open or short circuit in wire harness.
If both the carburetor switch and wire harness are normal, replace the ICM and inspect again.

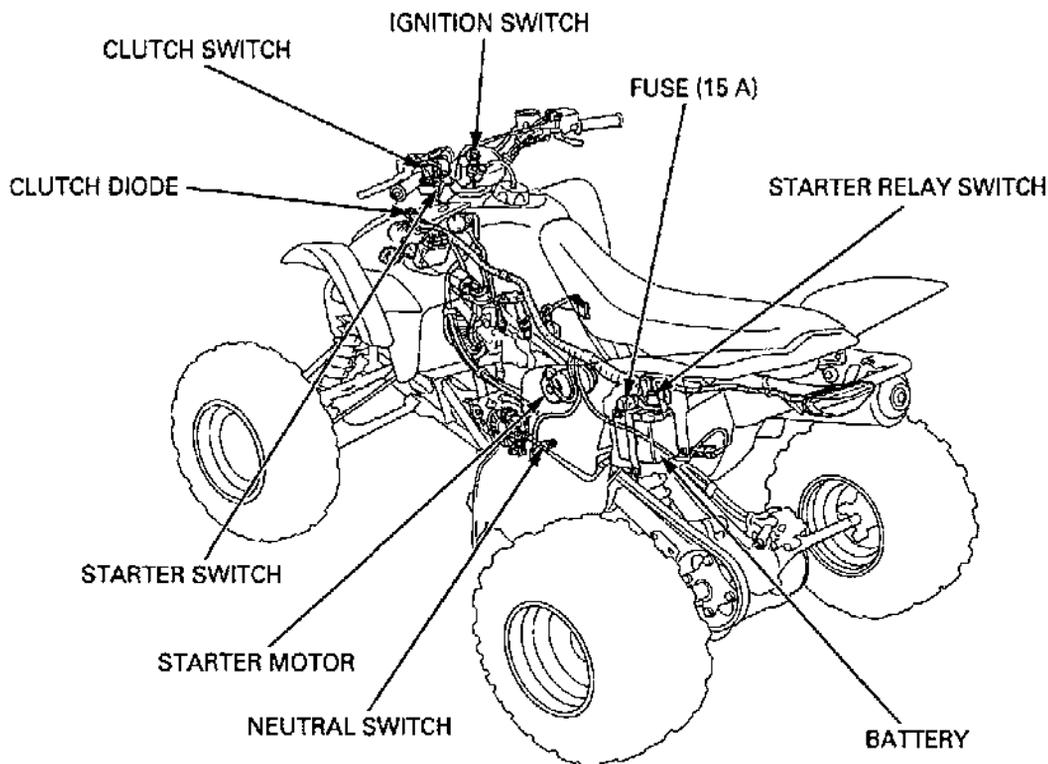


23. ELECTRIC STARTER (TRX450ER)

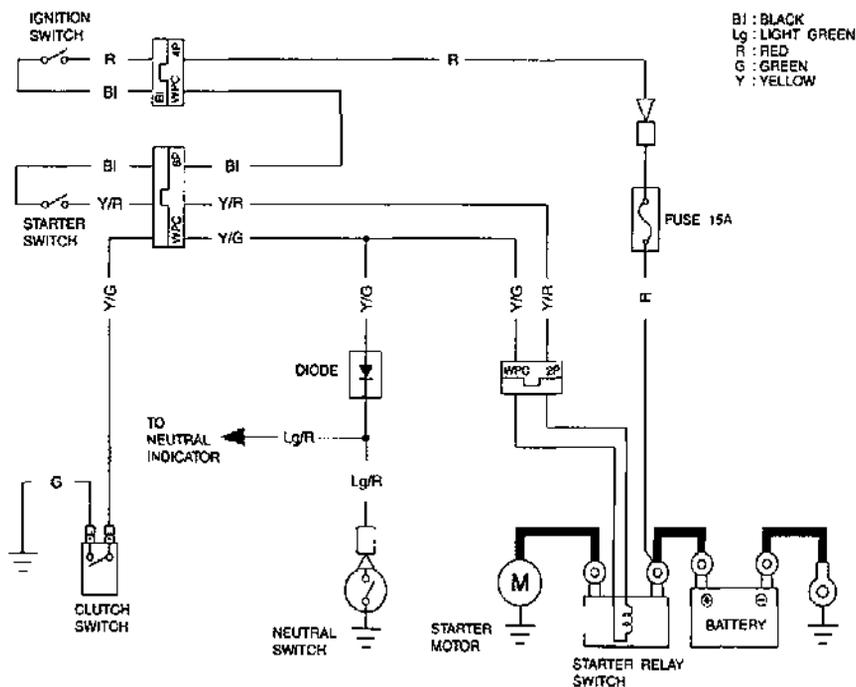
COMPONENT LOCATION	23-2	STARTER MOTOR	23-6
SYSTEM DIAGRAM	23-2	STARTER RELAY SWITCH	23-13
SERVICE INFORMATION	23-3	CLUTCH DIODE	23-14
TROUBLESHOOTING	23-4		

ELECTRIC STARTER (TRX450ER)

COMPONENT LOCATION



SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

- Always turn the ignition switch to OFF before servicing the starter motor. The motor could suddenly start, causing serious injury.
- The starter motor can be serviced with the engine in the frame.
- When checking the starter system, always follow the steps in the troubleshooting (page 23-4).
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- If the current is kept flowing through the starter motor to turn it while the engine is not cranking over, the starter motor may be damaged.
- For starter clutch service, See page 14-15.
- See section 24 for following component inspections:
 - ignition switch (page 24-7)
 - starter switch (page 24-7)
 - neutral switch (page 24-10)
 - clutch switch (page 24-8)

SPECIFICATIONS

Unit: mm (in)

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

TROUBLESHOOTING

NOTE:

- The starter motor should operate when the transmission is in neutral or when the transmission is into gear and the clutch lever is squeezed.

Starter Motor Does Not Turn

1. Fuse Inspection

Check for blown main fuse (15 A).

Is the fuse blown?

YES – Replace the fuse.

NO – GO TO STEP 2.

2. Battery Inspection

Check that the battery is fully charged and in good condition.

Is the battery in good condition?

YES – GO TO STEP 3.

NO – Charge the battery (page 21-7).

3. Starter Relay Switch Operation Inspection

Check the operation of the starter relay switch (page 23-13).

Does the starter relay switch click?

YES – GO TO STEP 4.

NO – GO TO STEP 5.

4. Starter Motor Inspection

Turn the ignition switch to OFF.

Apply battery voltage to the starter motor directly.

Does the starter motor turn?

YES –

- Poorly connected starter motor cable.
- Faulty starter relay switch (page 23-13).

NO – Faulty starter motor (page 23-6).

5. Relay Coil Ground Line Inspection

Turn the ignition switch to OFF.

Check the ground line of the starter relay switch (page 23-13).

Is the ground line normal?

NO –

- Faulty clutch switch (page 24-8).
- Faulty neutral switch (page 24-10).
- Faulty diode (page 23-14).
- Loose or poor contact of the related connector terminal.
- Open circuit in the wire harness.

YES – GO TO STEP 6.

6. Relay Coil Power Input Line Inspection

Check the power input line of the starter relay switch (page 23-13).

Is the power input line normal?

NO –

- Faulty ignition switch (page 24-7).
- Faulty starter switch (page 24-7).
- Loose or poor contact of the related connector terminal.
- Open circuit in the wire harness.

YES – GO TO STEP 7.

7. Starter Relay Switch Inspection

Check the function of the starter relay switch (page 23-13).

Does the starter relay switch function properly?

NO – Faulty starter relay switch.

YES – Loose or poor contact of the starter relay switch connector terminal.

Starter Motor Turns Slowly

- Low battery voltage
- Poorly connected battery cable
- Poorly connected starter motor cable
- Faulty starter motor
- Poorly connected ground cable terminal

Starter Motor Turns, but Engine Does Not Start

- Faulty starter clutch or starter gear train (page 14-15)
- Faulty ignition system (page 22-6)

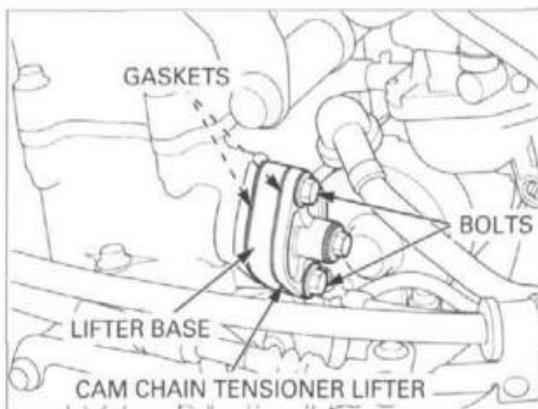
Starter Relay Switch Clicks, but Engine Does Not Turn Over

- Crankshaft does not turn due to engine problems

STARTER MOTOR

REMOVAL

Remove the bolts, cam chain tensioner lifter, lifter base and gaskets.



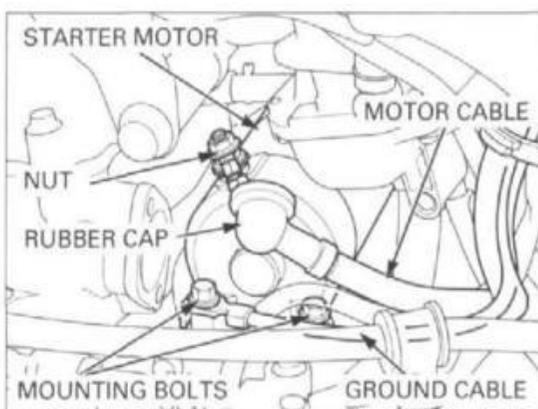
Remove the negative cable at the battery before servicing the starter motor.

Remove the rubber cap from the starter motor terminal.

Remove the nut and disconnect the starter motor cable.

Remove the mounting bolts and ground cable.

Remove the starter motor from the crankcase.



DISASSEMBLY/INSPECTION

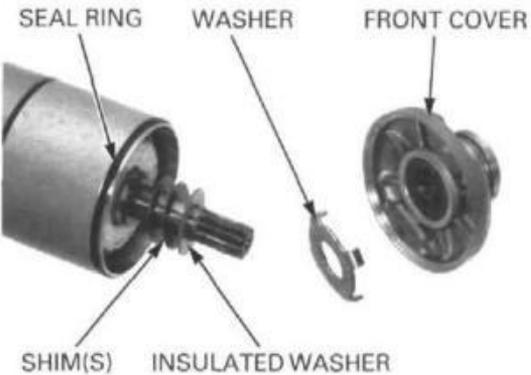
Remove the following:

- O-ring
- two motor case bolts (with the O-rings)

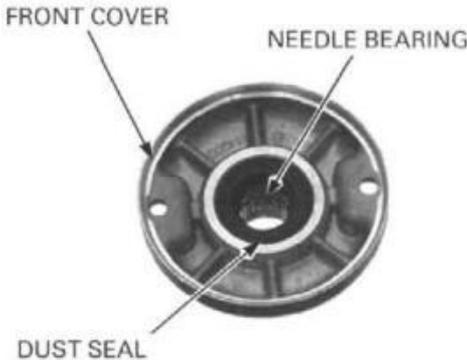


ELECTRIC STARTER (TRX450ER)

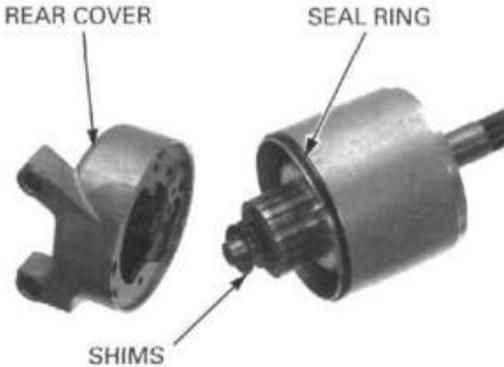
- Record the location and number of shims:
- front cover
 - washer
 - insulated washer
 - shims
 - seal ring



Check the dust seal and needle bearing for wear of damage.
 Replace the front cover if necessary.



- Record the location and number of shims:
- Remove the following:
- rear cover
 - shims
 - seal ring



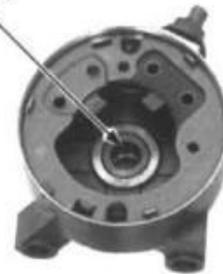
- armature



ELECTRIC STARTER (TRX450ER)

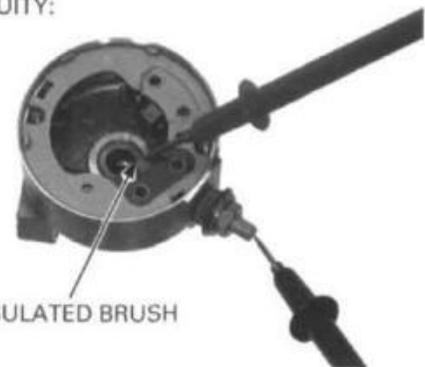
Check the bushing in the rear cover for wear or damage.

BUSHING



Check for continuity between the insulated brush and cable terminal.
There should be continuity.

CONTINUITY:



Check for continuity between the cable terminal and rear cover.
There should be no continuity.

NO CONTINUITY:



Do not use emery or sand paper on the commutator.

Check the commutator bars of the armature for discoloration.

COMMUTATOR BARS



Check for continuity between pairs of commutator bars.
There should be continuity.

CONTINUITY:



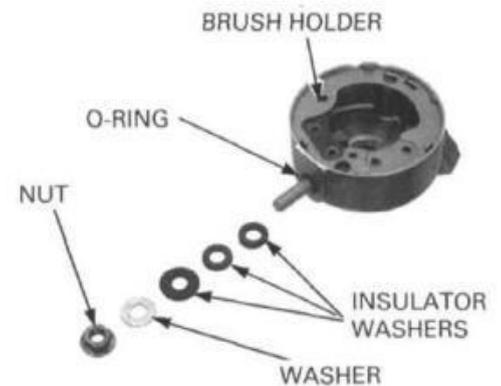
Check for continuity between each commutator bar and the armature shaft.
There should be no continuity.

NO CONTINUITY:



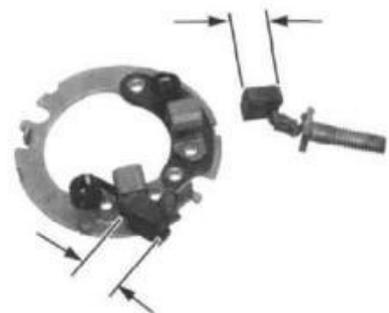
Remove the following:

- nut
- washer
- insulator washers
- brush holder
- O-ring
- brushes



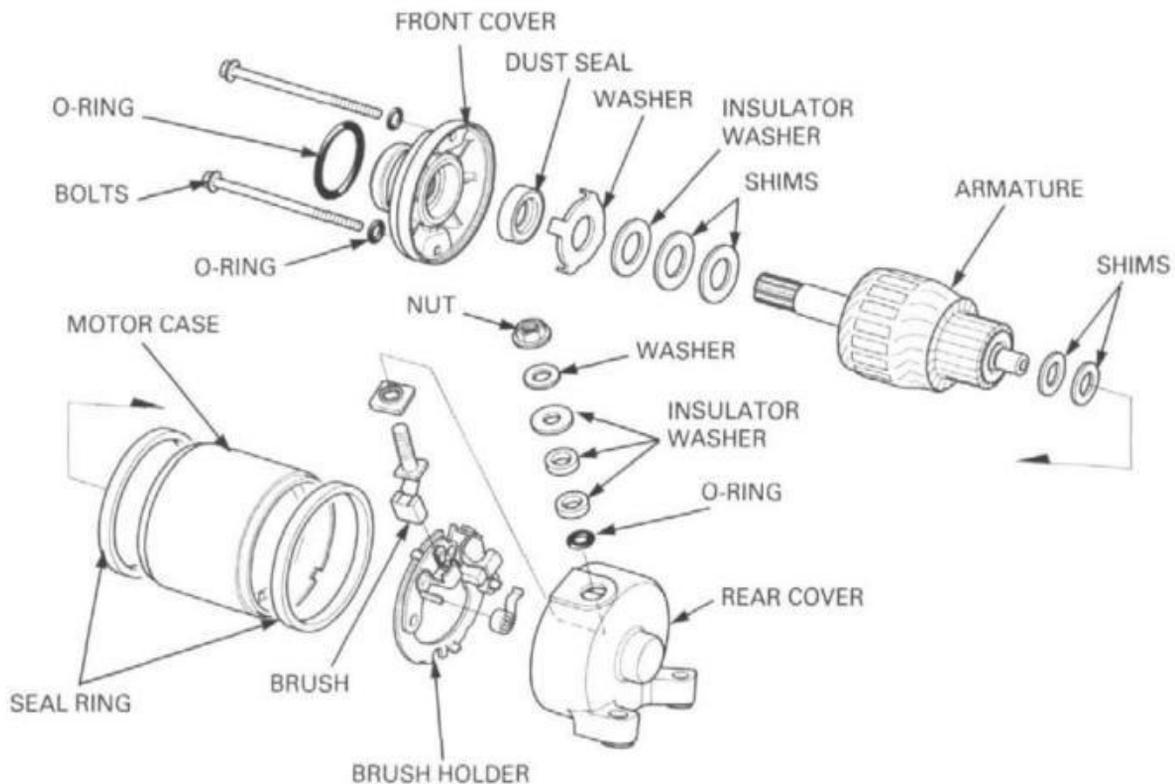
Measure the brush length.

SERVICE LIMIT: 6.75 mm (0.266 in)



ELECTRIC STARTER (TRX450ER)

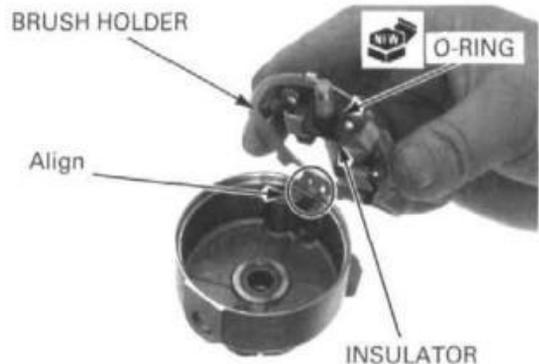
ASSEMBLY



Install the brushes into the brush holder.

Be careful not to damage the O-ring.

Install the insulator and a new O-ring onto the cable terminal, and the brush holder into the rear cover. Align the holder tab with the case groove.



Install the following and tighten the nut:

- insulator washers
- washer
- nut



NOTICE

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

With the commutator bar facing the groove in the motor case, install the armature while holding the armature tightly to keep the magnet of the case from pulling the armature against it.

Install the same number of shims in the same locations as noted during disassembly.

Install a new seal ring onto the motor case.

Apply thin coat of grease to the armature shaft end. Install the rear cover while pushing the brushes into the brush holder and aligning the brush holder tab with the case groove (index marks).

Install the same number of shims in the same locations as noted during disassembly.

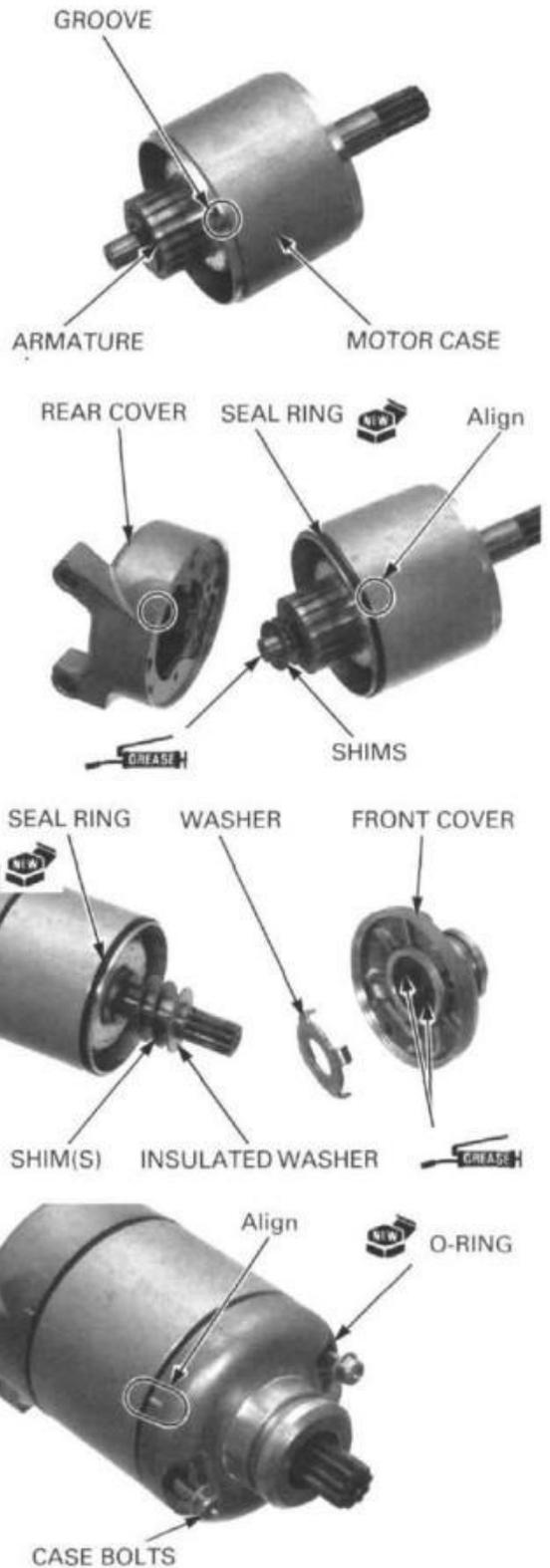
Install a new seal ring onto the motor case.

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

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

Align the index marks on the front cover and case.

Install the motor case bolts with the new O-rings. Tighten the bolts.



ELECTRIC STARTER (TRX450ER)

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



INSTALLATION

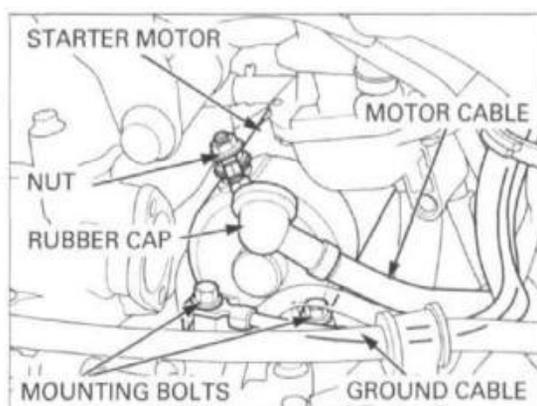
Install the starter motor onto the crankcase.

Install the ground cable and mounting bolts.

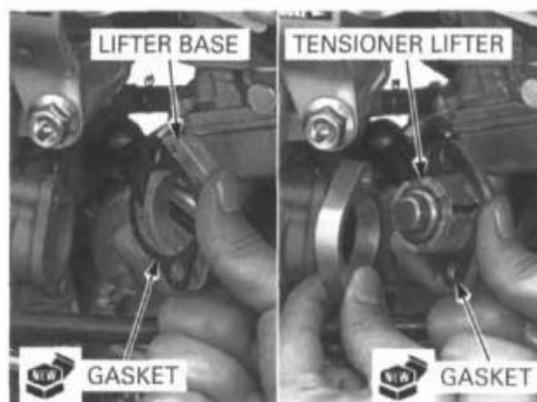
Install the starter motor cable and terminal nut onto the motor terminal.

Tighten the nut securely.

Install the rubber cap over the motor terminal properly.

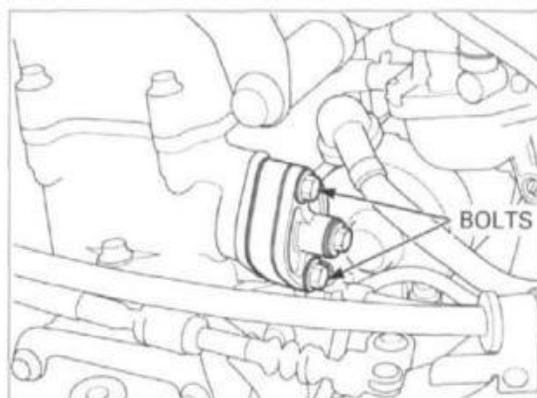


Install the cam chain tensioner lifter with the lifter base, new gaskets.



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

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



STARTER RELAY SWITCH

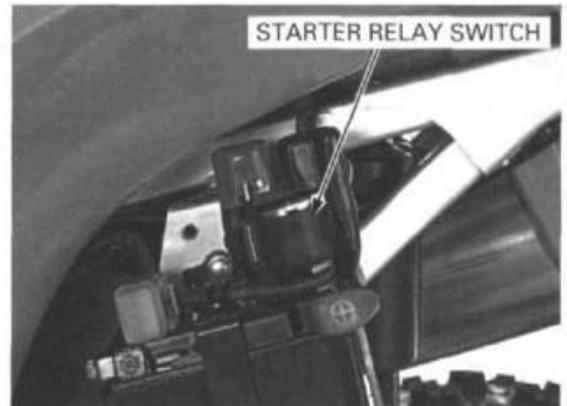
OPERATION INSPECTION

Shift the transmission into neutral.

Turn the ignition switch to ON and push the starter switch.

The coil is normal if the starter relay switch clicks.

If you don't hear the switch click, and inspect the relay switch circuits (page 23-13).



CIRCUIT INSPECTION

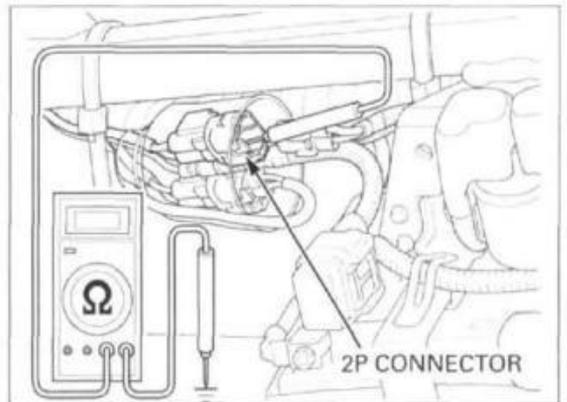
Release the connector boot from the clamp remove it off of the connectors.

GROUND LINE

Disconnect the starter relay switch 2P natural connector.

Check for continuity between the Yellow/green wire harness side connector terminal and ground.

If there is continuity when the transmission is in neutral or when the transmission is in gear and the clutch lever is squeezed, the ground circuit is normal. (In neutral, there is a slight resistance due to the diode)

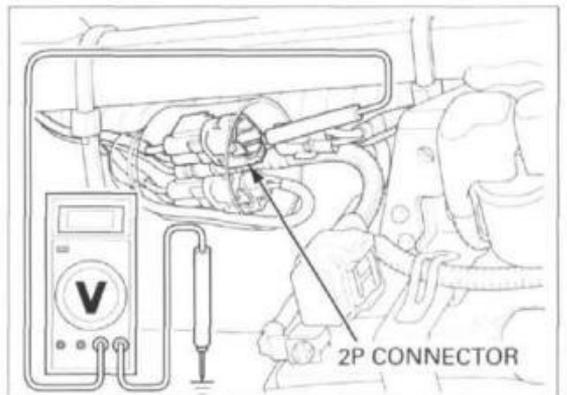


POWER INPUT LINE

Turn the ignition switch to ON.

Measure the voltage between the Yellow/red wire terminal (+) of the wire harness side connector and ground (-).

If the battery voltage appears only when the starter switch is pushed, the circuit is normal.

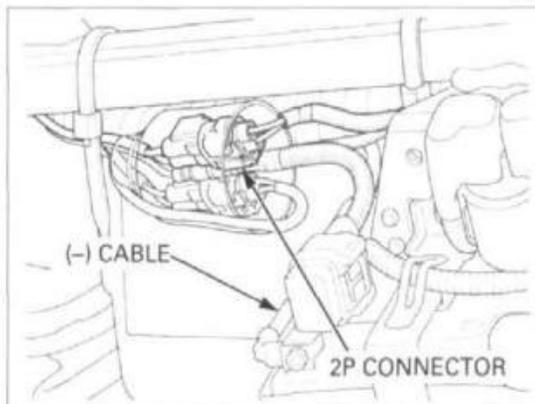


ELECTRIC STARTER (TRX450ER)

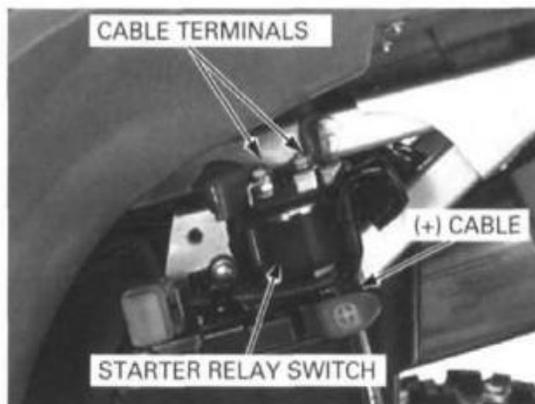
FUNCTION INSPECTION

Disconnect the battery negative (-) cable by removing the terminal bolt.

Disconnect the starter relay switch 2P natural connector.

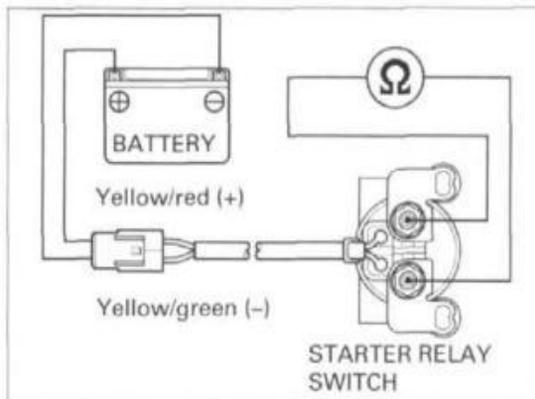


Disconnect the battery positive (+) cable and starter motor cable from the starter relay switch .



Connect a fully charged 12 V battery positive (+) terminal to the Yellow/red wire terminal and negative (-) terminal to the Yellow/green wire terminal of the starter relay switch.

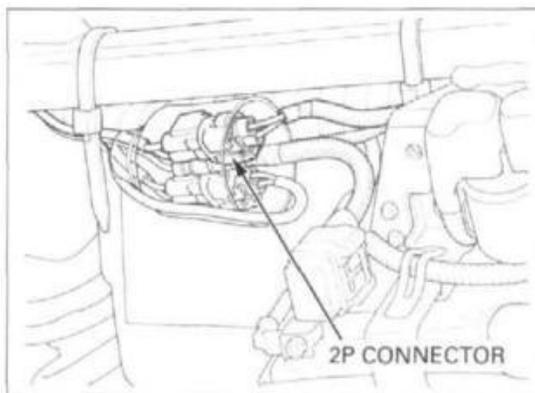
There should be continuity between the cable terminals while the battery is connected, and no continuity when the battery is disconnected.



CLUTCH DIODE

INSPECTION

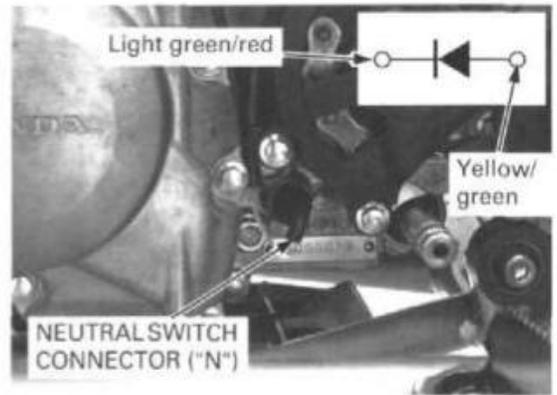
Disconnect the starter relay switch 2P natural connector.



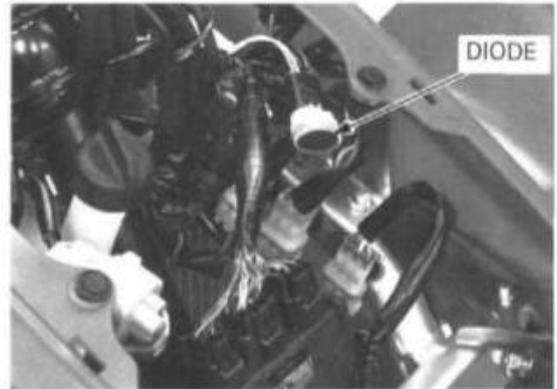
Disconnect the neutral switch connector (page 24-10).

Check for continuity between the Yellow/green wire harness side connector and Light green/red wire harness side connector.

When there is continuity, a small resistance value will register.



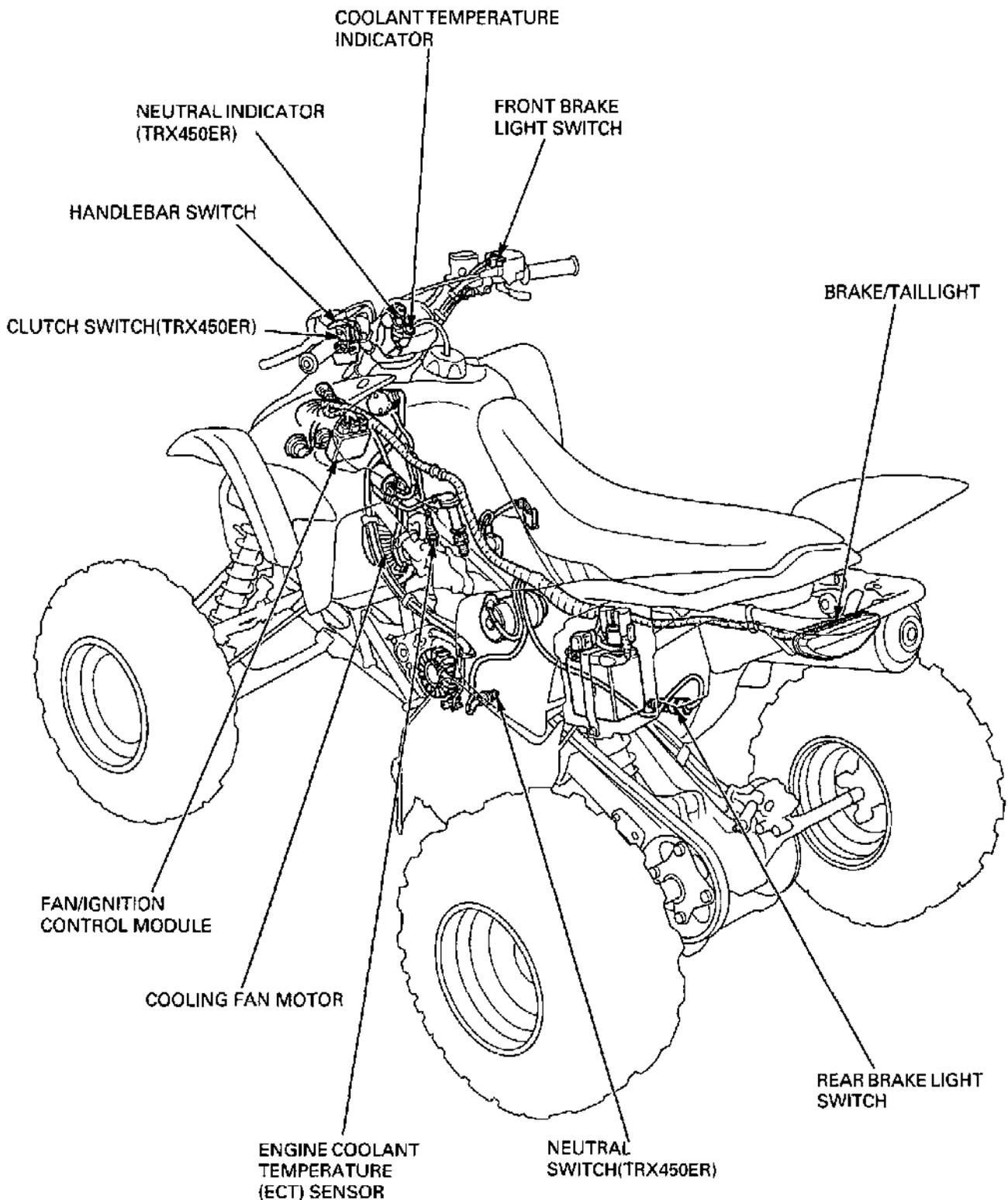
If there is continuity in one direction, the diode is normal.



24. LIGHTS/SWITCHES (After '05)

COMPONENT LOCATION	24-2	CLUTCH SWITCH (TRX450ER only).....	24-8
SERVICE INFORMATION	24-3	BRAKE LIGHT SWITCH	24-9
BULB REPLACEMENT	24-4	NEUTRAL SWITCHES (TRX450ER only)...	24-10
BRAKE/TAILLIGHT	24-6	COOLANT TEMPERATURE INDICATOR...	24-11
IGNITION SWITCH.....	24-7	COOLING FAN MOTOR	24-12
HANDLEBAR SWITCH.....	24-7	ENGINE COOLANT TEMPERATURE (ECT) SENSOR.....	24-13

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- All plastic connectors have locking tabs that must be released before disconnecting, and must be aligned when reconnecting.
- To isolate an electrical failure, check the continuity of the electrical path through the part. A continuity check can usually be made without removing the part from the vehicle. Simply disconnect the connectors and connect a continuity tester to the terminals or connections.
- Check the battery condition before performing any inspection that requires proper battery voltage (TRX450ER only).
- The following color codes are used throughout this section.

Bu: Blue	G: Green	Lg: Light Green	R: Red
Bl: Black	Gr: Gray	O: Orange	W: White
Br: Brown	Lb: Light Blue	P: Pink	Y: Yellow

SPECIFICATIONS

ITEM		SPECIFICATIONS
Bulbs	Headlight (High/low beam)	12 V - 30/30 W
	Brake/taillight	LED
	Neutral indicator	12 V - 3 W
	Coolant temperature indicator	12 V - 3.4 W
Fuse	Main fuse (TRX450ER)	15 A
Ect senser resistancee	at 80°C (176°F)	47.5 – 56.8 Ω
	at 120°C (248°F)	14.9 – 17.3 Ω

TORQUE VALUES

Neutral switch (TRX450ER only)	12 N·m (1.2 kgf·m, 9 lbf·ft)
Engine coolant temperature (ECT) senser	9.8 N·m (1.0 kgf·m, 7 lbf·ft)

BULB REPLACEMENT

HEADLIGHT

Remove the top cover (page 3-5).

Remove the dust cover from the headlight.



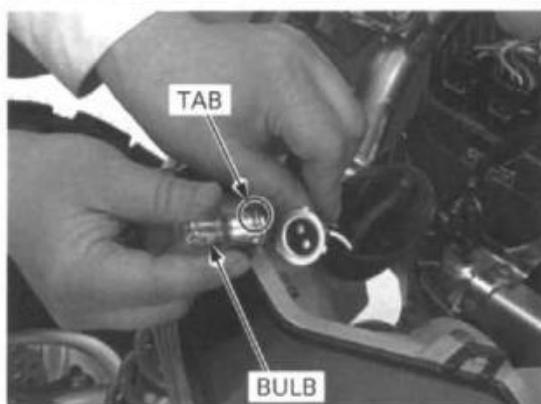
Remove the bulb socket by turning it counterclockwise while pushing it in.



Remove the bulb from the headlight.

Install a new bulb by aligning the tab with the groove in the headlight.

Install the removed parts in the reverse order of removal.



INDICATORS

Be careful not to let the screw fall into the steering shaft.

- Remove the following:
- fuel fill cap breather hose (from the cover)
 - indicator lenses (by prying them, using a small flat-blade screwdriver)
 - cover attaching bolt
 - handlebar cover (by releasing its ends off the handlebar)
 - bulb sockets (from the cover)

Carefully turn the bulb socket inside out and pull the bulb out of the socket.
Install a new bulb into the socket.

Install the bulb sockets into the handlebar cover in the direction as shown.

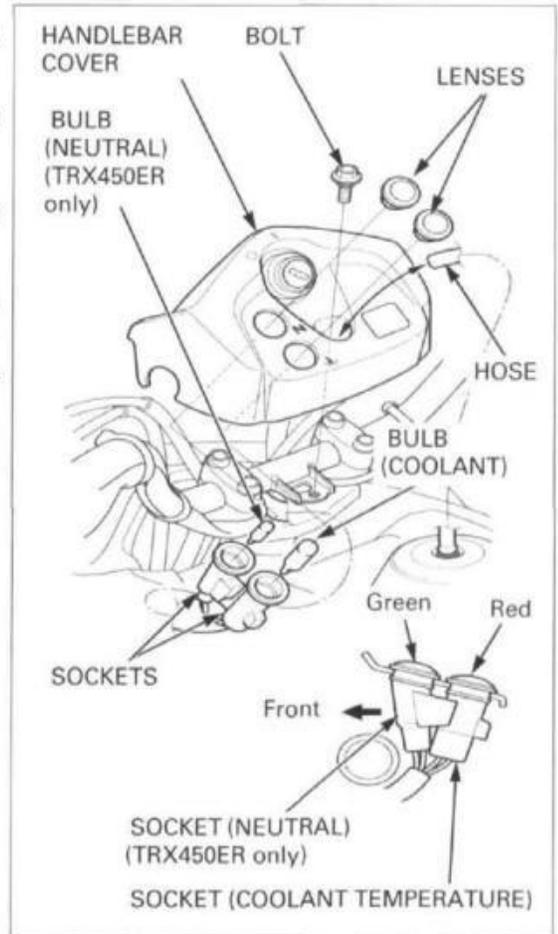
Take care not to drop the screw.

Install the cover onto the handlebar. Install the cover screw and tighten it securely.

Do not interchange the neutral and reverse indicator lenses.

Install the indicator lenses into the socket properly.

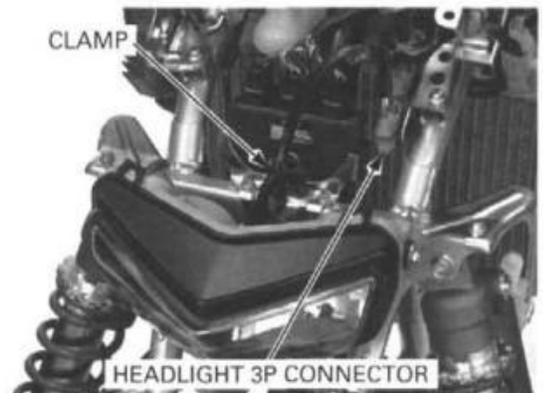
Install the breather hose into the cover.



REMOVAL/INSTALLATION

Remove both front fenders (page 3-6).

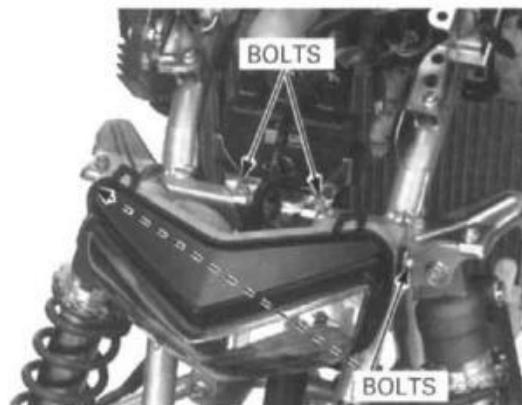
Disconnect the headlight 3P connector and remove the clamp.



LIGHTS/SWITCHES (After '05)

Remove the bolts.

Install the headlight in the reverse order of removal.



AIMING

Remove the top cover (page 3-5).

Adjust the headlight beam vertically by turning the adjusting bolt.

Install the top cover (page 3-5).



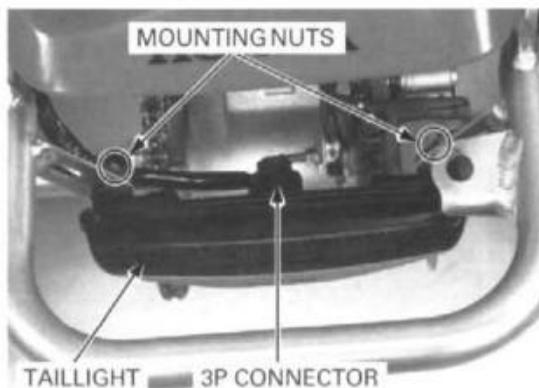
BRAKE/TAILLIGHT

REMOVAL/INSTALLATION

Disconnect the 3P connector.

Remove the two mounting nuts and the brake/tail-light.

Installation is in the reverse order of removal.



IGNITION SWITCH

INSPECTION

Remove the top cover (page 3-5).

Disconnect the ignition switch 4P black connector.

Check for continuity between the switch side connector terminals in each switch position.

Continuity should exist between the color coded wires as shown below:

Color Position	Black/ white	Green	Red	Black
OFF	○—○			
ON			○—○	



REPLACEMENT

Remove the following:

- top cover (page 3-5)
- handlebar cover (page 24-5)

Remove the 4P (black) connector from the stay and disconnect it.

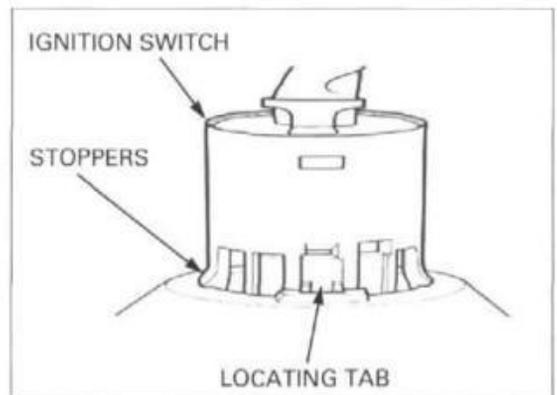
Release the switch wire from the clips on the frame.

Remove the ignition switch from the handlebar cover by pushing in the two stoppers.

Install a new ignition switch by aligning the locating tab with the cover groove.

Route the ignition switch wire properly (page 1-24).

Install the removed parts in the reverse order of removal.



HANDLEBAR SWITCH

INSPECTION

Remove the top cover (page 3-5).

TRX450ER: Remove the handlebar switch 6P natural connector from the stay and disconnect it.

TRX450R: Remove the handlebar switch 4P natural connector from the stay and disconnect it.



LIGHTS/SWITCHES (After '05)

See page 24-8 for clutch switch inspection.

Check for continuity between the switch side connector terminals in each switch position. Continuity should exist between the color coded wires as shown below:

ENGINE STOP SWITCH

COLOR	Green	Black/white
	○	○
○		
	○	○

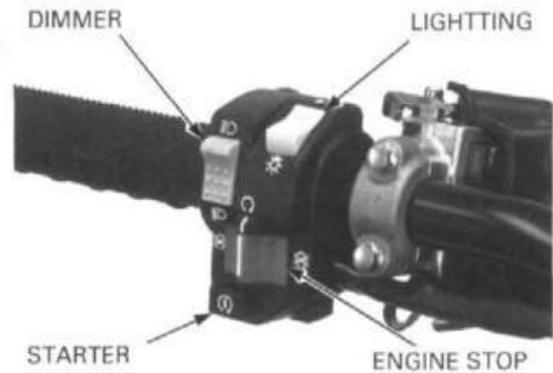
LIGHTING SWITCH/DIMMER SWITCH

COLOR	Black	Brown
●		
	○	○

COLOR	Blue	White
	○	○
(N)	○	○
		○

STARTER SWITCH

COLOR	Black	Yellow/red
Free		
Push	○	○



CLUTCH SWITCH (TRX450ER only)

REMOVAL/INSTALLATION

Remove the dust cover off of the clutch lever bracket.

Remove the screw and retainer.

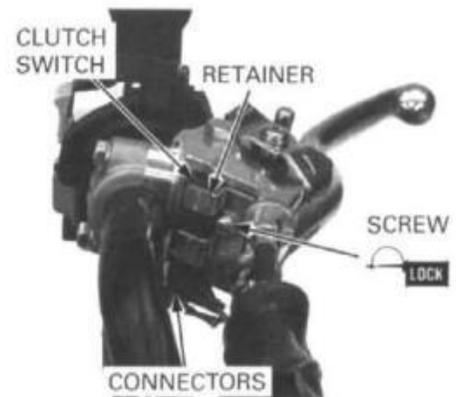
Disconnect the connectors to remove the clutch switch.

Apply locking agent to the threads of the clutch switch retainer screw.

Connect the clutch switch to the connectors and install it into the lever bracket.

Secure the switch with the retainer and screw.

Install the dust cover over the lever bracket.



INSPECTION

Remove the clutch switch .(page 24-8)

Check for continuity between the switch terminals.

There should be no continuity with the switch plunger pushed, and continuity with the plunger released.

**BRAKE LIGHT SWITCH****FRONT**

Disconnect the brake light switch connectors and check for continuity between the switch terminals.

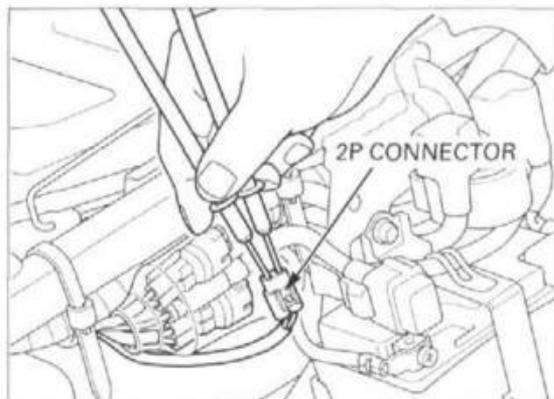
There should be continuity with the front brake lever squeezed and no continuity with the lever released.

**REAR**

Remove the seat/rear fender (page 3-3).

Disconnect the brake light switch 2P black connector and check for continuity between the switch side connector terminals.

There should be continuity with the brake pedal depressed and no continuity with the pedal released.



NEUTRAL SWITCHES (TRX450ER only)

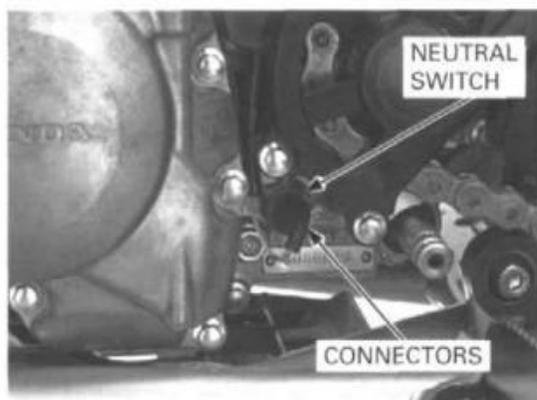
INSPECTION

Remove the bolt and gearshift pedal.



Disconnect neutral switch connector.

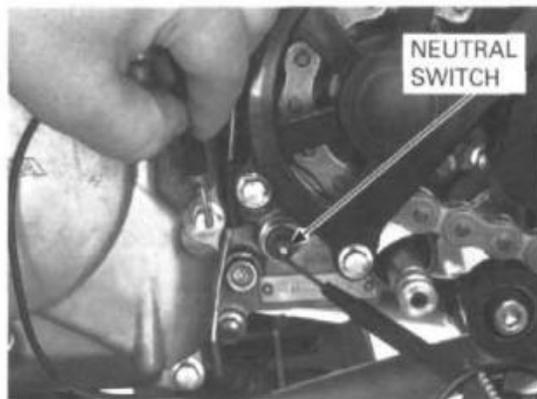
Check for continuity between the switch terminal and engine ground.



Check for continuity between the switch terminal and engine ground.

There should be continuity when the transmission is in neutral, and no continuity when the transmission is in any gear except neutral.

Install the removed parts as described below.



REPLACEMENT

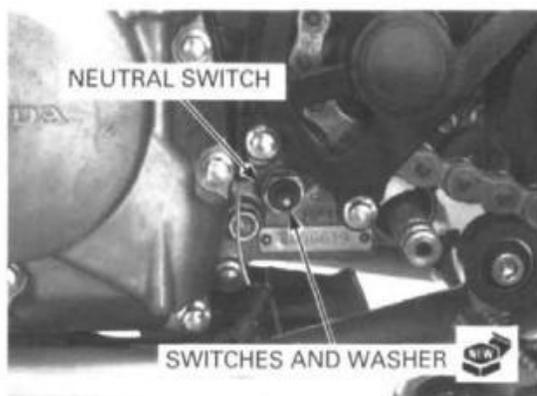
Disconnect the neutral switch connector (page 24-10).

Remove the switch from the crankcase.

Install the switch with a new sealing washer and tighten it.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Connect each switch connector.

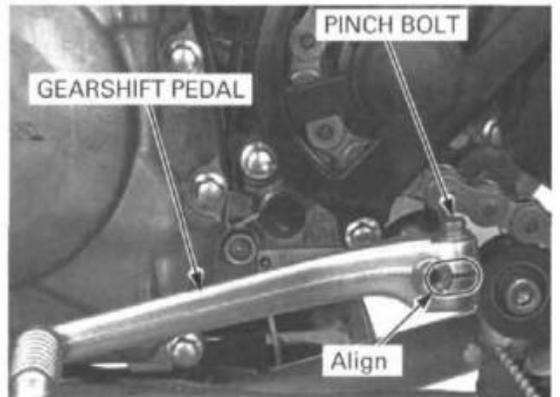


Connect each switch connector.



Install the gearshift pedal onto the spindle by aligning the punch marks.

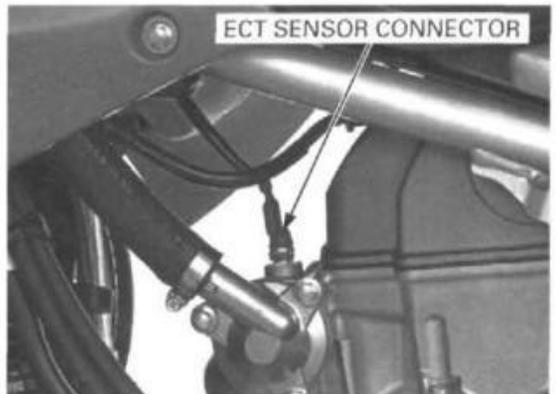
Install the pinch bolt and tighten it securely.



COOLANT TEMPERATURE INDICATOR

SYSTEM INSPECTION

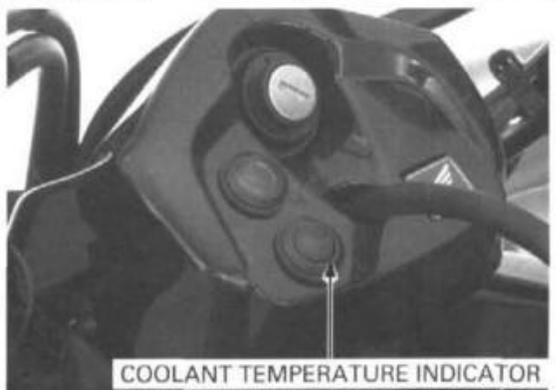
Disconnect the engine coolant temperature (ECT) sensor connector.



Start the engine and check the indicator.

- If the indicator lights for 3 seconds then goes off, go to next step.
- If the indicator lights and stays on, check for a short circuit in the following wire:
 - Yellow/blue wire between the ECT sensor and fan/ignition control module (ICM) connectors
 - Gray wire between the fan/ICM and indicator connectors

If the wires are OK, replace the fan/ICM.



LIGHTS/SWITCHES (After '05)

Ground the ECT sensor connector with a jumper wire.

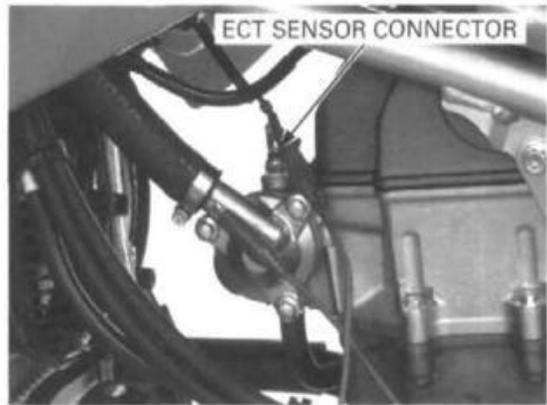
Start the engine and check the indicator.

- If the indicator lights, the system is OK.
- If the indicator does not light or lights for 3 seconds then goes off, check for an open circuit in the following wire:
 - Yellow/blue wire between the ECT sensor and fan/ICM connectors
 - Gray wire between the fan/ICM and indicator connectors

If the wire is OK, disconnect the indicator 4P natural (TRX450ER) or 2P red (TRX450R) connector.

Start the engine and measure the voltage between the Black wire terminal (+) and Gray wire terminal (-) of the wire harness side connector.

- If there is generating voltage, check for blown indicator bulb.
- If there is no voltage, check for an open circuit in the black wire between the indicator and ignition switch connectors. If the black wire is OK, replace the fan/ICM.



COOLING FAN MOTOR

INSPECTION

NOTE:

- Make sure that the coolant temperature indicator system functions properly before checking the fan motor system.

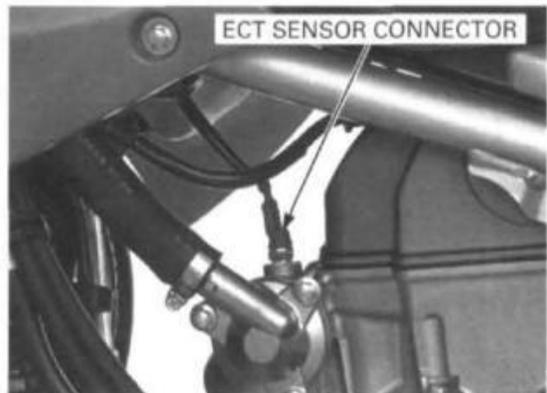
Fan motor does not stop when the engine is running

Disconnect the engine coolant temperature (ECT) sensor connector.

Start the engine and check the fan motor.

- If the fan motor does not start, check the ECT sensor (page 24-13).
- If the fan motor starts, check for a short circuit in the following wire:
 - Green wire between the fan/ICM and fan motor connectors
 - Green wire of the fan motor

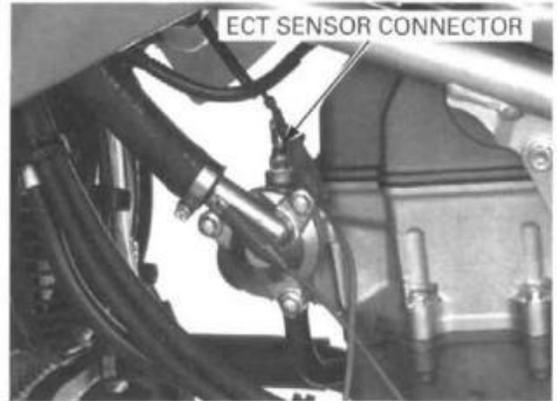
If the wires are OK, replace the fan/ICM.



Fan motor does not start

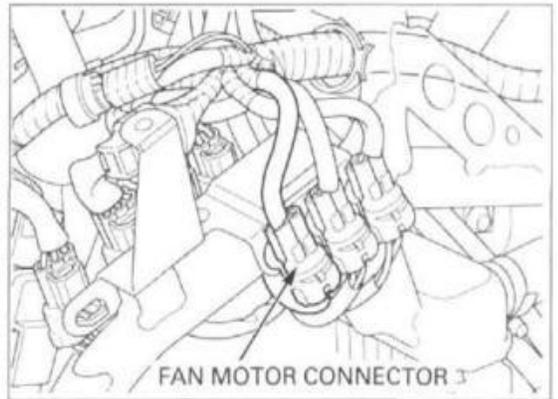
Disconnect the ECT sensor connector and ground it with a jumper wire.
Start the engine and check the fan motor.

- If the fan motor starts, check the ECT sensor (page 24-13).
- If the fan motor does not start, check for an open circuit in the following wire:
 - Green wire between the fan/ICM and fan motor connectors
 - Green wire of the fan motor



If the wire is OK, disconnect the fan motor 2P blue connector.
Start the engine and measure the voltage between the Black wire terminal (+) and Green wire terminal (-) of the wire harness side connector.

- If there is generating voltage, replace the fan motor.
- If there is no voltage, check for an open circuit in the black wire between the fan motor and ignition switch connectors. If the black wire is OK, replace the fan/ICM.

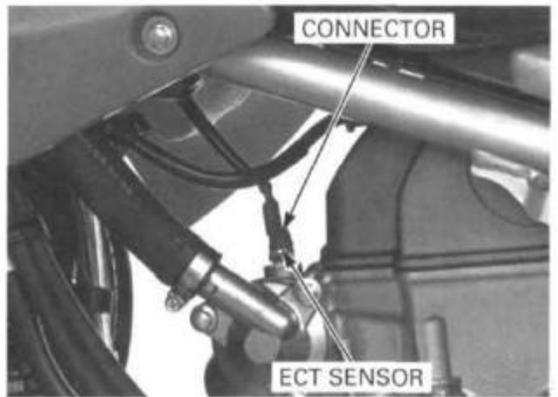


ENGINE COOLANT TEMPERATURE (ECT) SENSOR

INSPECTION

Drain the coolant (page 9-7).

Disconnect the ECT sensor connector and remove the ECT sensor.

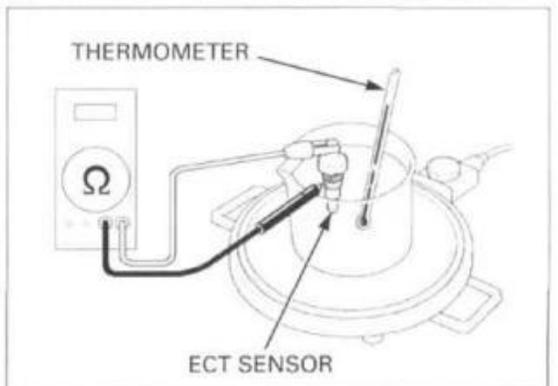


Suspend the ECT sensor in a pan of coolant (50 – 50 mixture) on an electric heating element and measure the resistance through the sensor as the coolant heats up.

NOTE:

- Soak the ECT sensor in coolant up to its threads with at least 40 mm (1.57 in) from the bottom of the pan to the bottom of the sensor.
- Keep the temperature constant for 3 minutes before testing. A sudden change of temperature will result in incorrect readings. Do not let the thermometer or ECT sensor touch the pan.

Resistance: 47.5 – 56.8 Ω at 80°C (176°F)
14.9 – 17.3 Ω at 120°C (248°F)



LIGHTS/SWITCHES (After '05)

Replace the ECT sensor if it is out of specifications by more than 10% at any temperature listed.

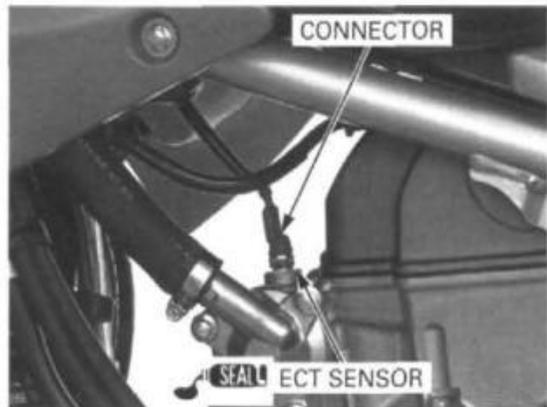
Apply sealant to the ECT sensor threads. Do not apply to the sensor head.

Install the ECT sensor and tighten it.

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

Connect the ECT sensor connector.

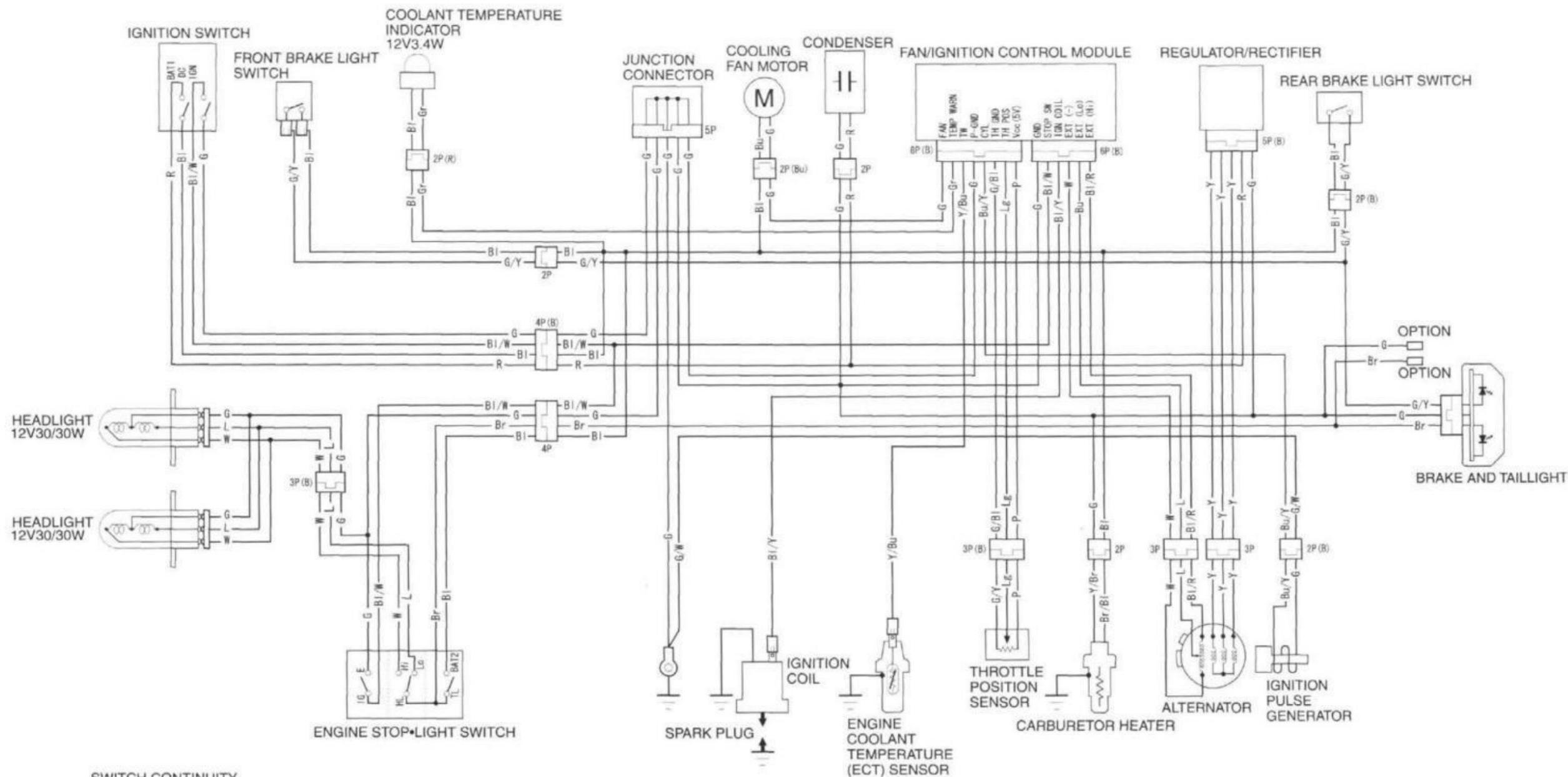
Fill and bleed the cooling system (page 9-7).



25. WIRING DIAGRAMS

'04 – '05; TRX450R.....	25-3	After '05; TRX450R.....	25-5
After '05; TRX450ER.....	25-4		

'04 - '05; TRX450R



SWITCH CONTINUITY

	IG	E	BAT1	DC
OFF	○	○		
ON			○	○
COLOR	Bl/W	G	R	R/W

	BAT2	TL	(HL)
●	○	○	○
	○	○	○
COLOR	Bl	Br	

	HI	(HL)	LO
●	○	○	○
(N)	○	○	○
●	○	○	○
COLOR	Bu		W

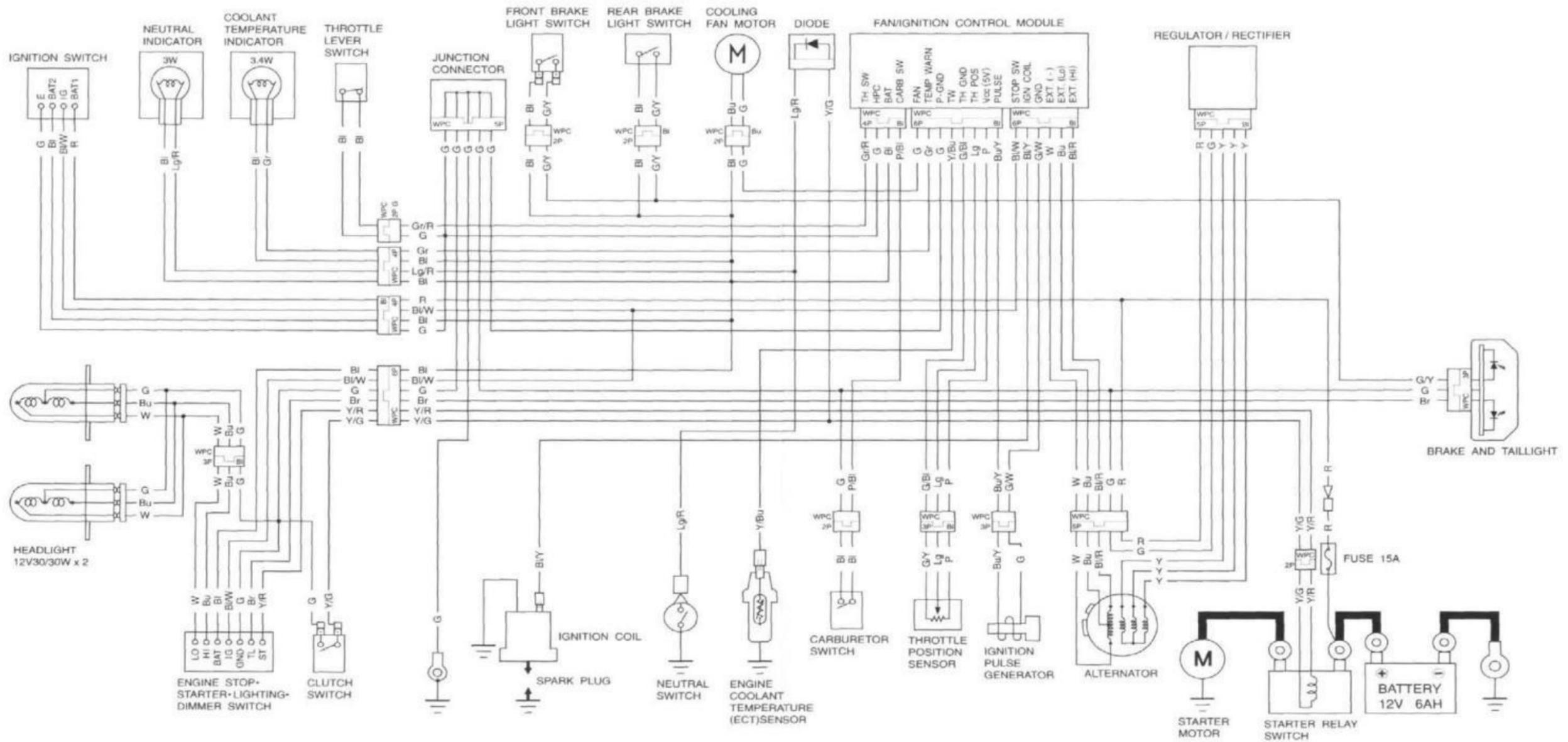
	IG	E
○	○	
○	○	
○	○	
COLOR	Bl/W	G

Bl: BLACK Br: BROWN
 Y: YELLOW Bu: BLUE
 G: GREEN Lg: LIGHT GREEN
 R: RED P: PINK
 W: WHITE Gr: GRAY

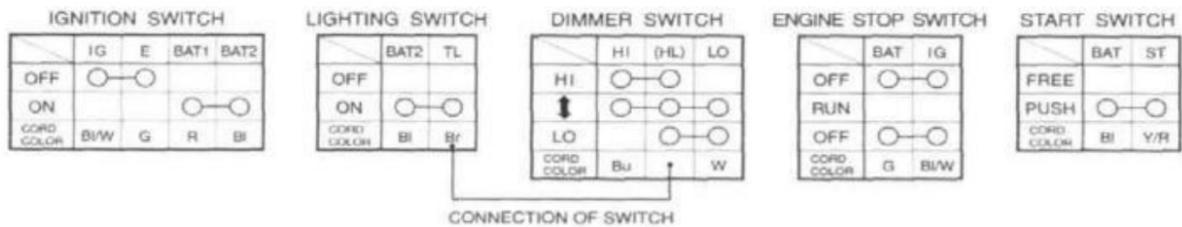
0030Z-HP1-0000

WIRING DIAGRAMS

After '05; TRX450ER



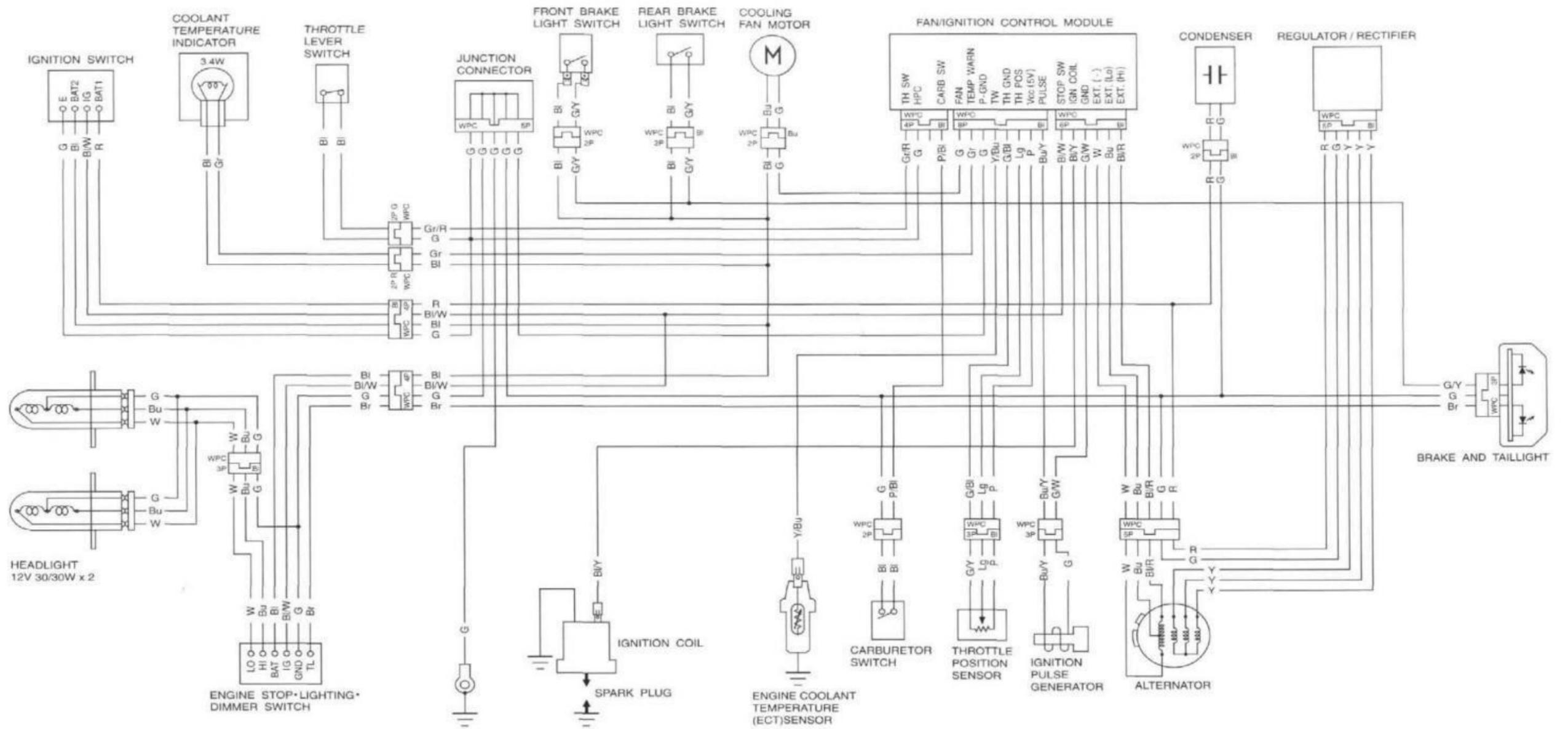
SWITCH CONTINUITY



- BI : BLACK
- Y : YELLOW
- Bu : BLUE
- G : GREEN
- R : RED
- W : WHITE
- Br : BROWN
- O : ORANGE
- Lb : LIGHT BLUE
- Lg : LIGHT GREEN
- P : PINK
- Gr : GRAY

0030Z-HP1-6000

After '05; TRX450R



SWITCH CONTINUITY

IGNITION SWITCH

	IG	E	BAT1	BAT2
OFF	○	○		
ON			○	○
CORD COLOR	Bl/W	G	R	Bl

LIGHTING SWITCH

	BAT2	TL
OFF	○	○
ON	○	○
CORD COLOR	Bl	Br

DIMMER SWITCH

	HI	(HL)	LO
HI	○	○	○
LO	○	○	○
CORD COLOR	Bu		W

ENGINE STOP SWITCH

	BAT	IG
OFF	○	○
RUN	○	○
OFF	○	○
CORD COLOR	G	Bl/W

CONNECTION OF SWITCH

- Bl : BLACK
- Y : YELLOW
- Bu : BLUE
- G : GREEN
- R : RED
- W : WHITE
- Br : BROWN
- O : ORANGE
- Lb : LIGHT BLUE
- Lg : LIGHT GREEN
- P : PINK
- Gr : GRAY

0030Z-HP1-8400

26. TROUBLESHOOTING

ENGINE DOES NOT START OR IS HARD TO START	26-2	POOR PERFORMANCE AT LOW AND IDLE SPEED	26-6
ENGINE LACKS POWER	26-4	POOR PERFORMANCE AT HIGH SPEED	26-7
		POOR HANDLING.....	26-7

ENGINE DOES NOT START OR IS HARD TO START

1. Fuel Line Inspection

Check the fuel flow to the carburetor.

Does the fuel reach the carburetor?

YES - GO TO STEP 4. ('04 - '05)
GO TO STEP 2. (After '05)

NO -

- Clogged fuel line or strainer
- Clogged fuel valve
- Clogged fuel fill cap breather hose

2. Throttle Cable Condition Inspection (After '05 only)

Operate the throttle lever.

Do the throttle lever and throttle drum operate smoothly?

YES - GO TO STEP 3.

No -

- Improper throttle lever free play adjustment
- Stuck throttle cable

3. Closed Throttle Position Detection System Inspection (After '05 only)

Check the throttle lever and carburetor switches.

Are the throttle lever and/or carburetor switches correct?

Yes - GO TO STEP 4.

No -

- Faulty throttle lever switch
- Faulty carburetor switch

4. Spark Plug Inspection

Remove and inspect the spark plug.

Is the spark plug wet?

YES -

- Flooded carburetor
- Throttle valve open
- Dirty air cleaner
- Improperly adjusted pilot screw
- Starting enrichment (SE) valve stuck open or damaged ('04 - '05)

NO - GO TO STEP 5.

5. Spark Test

Perform spark test.

Is there weak or no spark?

YES -

- Faulty spark plug
- Fouled spark plug
- Loose or disconnected ignition system wires
- Broken or shorted spark plug wire
- Faulty ignition coil
- Faulty exciter coil
- Faulty ignition pulse generator
- Faulty engine stop switch
- Faulty ignition switch
- Faulty ignition control module (ICM)

NO - GO TO STEP 6.

6. Engine Starting Condition

Start the engine by the following normal procedure.

Does the engine start then stops?

Yes -

- Improper choke operation
- Incorrectly adjusted carburetor
- Leaking carburetor insulator
- Improper ignition timing (Faulty ICM or ignition pulse generator)
- Contaminated fuel
- Improper hot start operation (TRX450R)

NO - GO TO STEP 7.

7. 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 it by hand.

Does the wheel spin freely?

YES – GO TO STEP 2.

- NO** –
- Brake dragging
 - Worn or damaged wheel hub or axle bearing
 - Drive chain too tight

2. Tire Pressure Inspection

Check tire pressure.

Are the tire pressures low?

- YES** –
- Faulty tire valve
 - Punctured tire

NO – GO TO STEP 3.

3. Clutch Inspection

Accelerate rapidly from low to second.

Does the engine speed change accordingly when clutch is engaged?

YES – GO TO STEP 4.

- NO** –
- Clutch slipping
 - Worn clutch discs
 - Warped clutch plates
 - Weak clutch springs
 - Damaged clutch lifter arm
 - Additive in engine oil

4. Engine Condition Inspection

Accelerate lightly.

Does the engine speed increase?

YES – GO TO STEP 5.

- NO** –
- Starting enrichment (SE) valve stuck open ('04 – '05)
 - Carburetor choke is on (After '05)
 - Fuel/air mixture too rich or lean
 - Clogged air cleaner
 - Restricted fuel flow
 - Clogged muffler
 - Restricted fuel fill cap breather hose
 - Excessive carbon build-up in combustion chamber

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 ignition control module (ICM) or ignition pulse generator)
 - Lean fuel mixture

NO – GO TO STEP 6.

6. Ignition Timing Inspection

Check the ignition timing.

Is the ignition timing correct?

YES – GO TO STEP 7.

- NO** –
- Faulty ICM
 - Faulty ignition pulse generator

7. Cylinder Compression Inspection

Test cylinder compression.

Is the compression low?

- YES** – • Valve clearance too small
• Valve stuck open
• Worn cylinder and piston rings
• Damaged cylinder head gasket
• Seized valve
• Improper valve timing
• Faulty decompressor cam

NO – GO TO STEP 8.

8. Carburetor Inspection

Check carburetor for clogging.

Is the carburetor 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?

- YES** – • Plug not serviced frequently enough
• Incorrect spark plug used
• Incorrect spark plug gap

NO – GO TO STEP 10.

10. Engine Oil Inspection

Check oil level and condition.

Is the oil level correct and in good condition?

YES – GO TO STEP 11.

- NO** – • Oil level too high
• Oil level too low
• Contaminated oil

11. Lubrication Inspection

Remove cylinder head cover and inspect lubrication.

Is the valve train lubricated properly?

- NO** – • Faulty oil pump
• Faulty pressure relief valve
• Clogged oil passage
• Clogged oil strainer

POOR PERFORMANCE AT LOW AND IDLE SPEED

1. Pilot Screw Inspection

Check the carburetor pilot screw adjustment.

Is the adjustment correct?

YES - GO TO STEP 3. ('04 - '05)
GO TO STEP 2. (After '05)

NO - See page 7-23. ('04 - '05)
See page 8-24. (After '05)

2. Accelerator Pump Inspection (After '05)

Check accelerator pump for operation.

Is the accelerator pump operation correct?

YES - Faulty accelerator pump

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 spark plug wire
• Faulty ignition coil
• Faulty exciter coil
• Faulty ignition pulse generator
• Faulty engine stop switch
• Faulty ignition switch
• Faulty ignition control module (ICM)

NO - GO TO STEP 5.

5. Ignition Timing Inspection

Check the ignition timing.

Is the ignition timing correct?

NO - • Faulty ignition control module (ICM)
• Faulty ignition pulse generator

POOR PERFORMANCE AT HIGH SPEED

1. Fuel Line Inspection

Disconnect the fuel line at the carburetor.

Does fuel flow freely?

YES – GO TO STEP 2.

NO –

- Clogged fuel line
- Clogged fuel fill cap breather hose
- Faulty fuel valve
- Clogged fuel strainer

2. Carburetor Inspection

Check carburetor for clogging.

Is the carburetor clogged?

YES – Carburetor not serviced frequently enough

NO – GO TO STEP 3.

3. Valve Timing Inspection

Check valve timing.

Is the valve timing correct?

NO – Camshaft not installed properly

YES – GO TO STEP 4.

4. Ignition Timing Inspection

Check ignition timing.

Is the ignition timing correct?

NO –

- Faulty ignition control module (ICM)
- Faulty ignition pulse generator

YES – GO TO STEP 5.

5. Valve Spring Inspection

Check valve springs.

Are the valve springs weak?

YES – Faulty valve springs

POOR HANDLING

Steering is heavy

- Steering shaft holder bolts too tight
- Damaged steering shaft bushing
- Damaged steering shaft bearing

Any wheel is wobbling

- Excessive wheel bearing play
- Bent rim
- Improperly installed wheel hub
- Excessively worn swingarm pivot bearings
- Bent frame

Vehicle pulls to one side

- Tire air pressure incorrect
- Faulty shock absorber
- Bent tie-rod
- Incorrect tie-rod adjustment
- Bent swingarm
- Bent frame
- Improper wheel alignment

AIR CLEANER	4-7	COOLING FAN MOTOR	
AIR CLEANER HOUSING		'04 - '05	20-23
'04 - '05	7-5	After '05	24-12
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