2004-2015

HONDA

SERVICE MANUAL

CRF50F

A Few Words About Safety

Service Information

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

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

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

For Your Customer's Safety

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

⚠WARNING

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

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

For Your Safety

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

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

⚠WARNING

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

Follow the procedures and precautions in this manual carefully.

Important Safety Precautions

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

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

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

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

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

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

HOW TO USE THIS MANUAL

This service manual describes the service procedures for the CRF50F.

Follow the Maintenance Schedule (Section 3) recommendations to ensure that the vehicle is in peak operating condition and the emission levels are within the standard set by the U.S. Enviromental Protection Agency (EPA) and California Air Resources Board (CARB).

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

Sections 1 and 3 apply to the whole motorcycle. Section 2 illustrates procedures for removal/installation of components that may be required to perform service described in the following sections.
Section 4 through 14 describe parts of the motorcycle, grouped according to location.

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

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

If you don't know the source of the trouble, go to Section 16 Troubleshooting.

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

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

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

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

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

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

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

CONTENTS

SYMBOLS

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

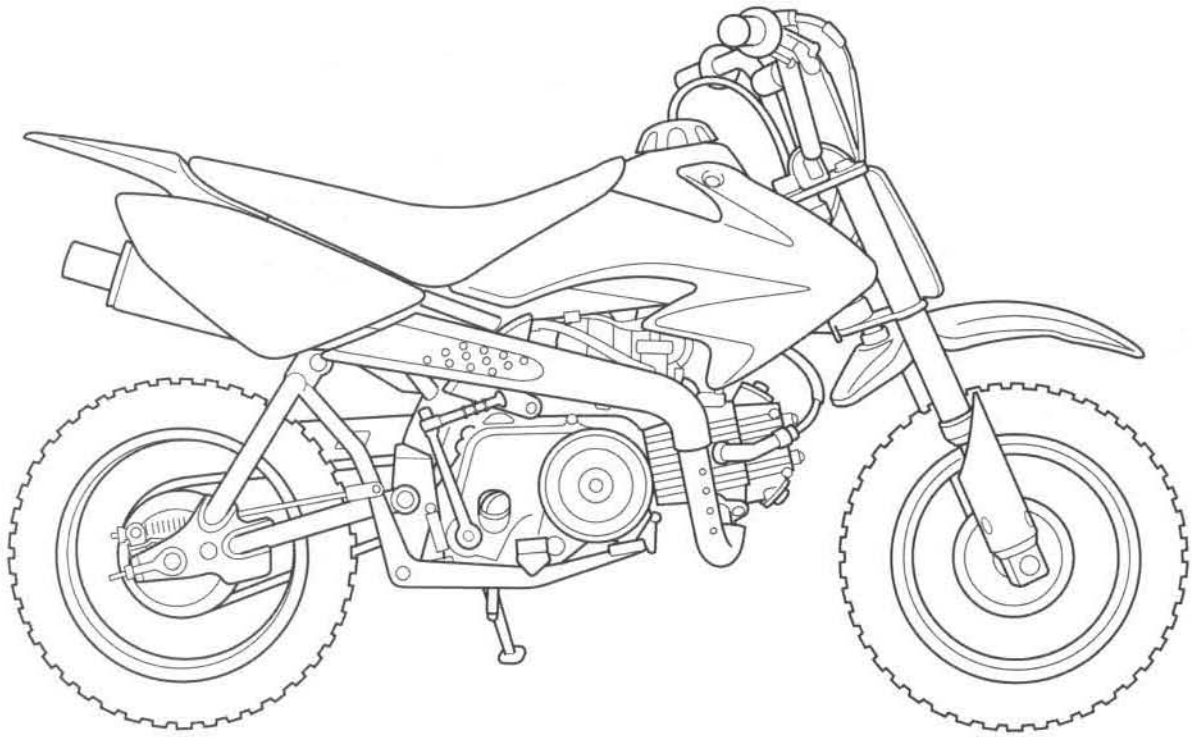
	Replace the part(s) with new one(s) before assembly.
	Use recommended engine oil, unless otherwise specified.
	Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1 : 1).
	Use multi-purpose grease (Lithium based multi-purpose grease NLGI #2 or equivalent).
	Use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

1. GENERAL INFORMATION

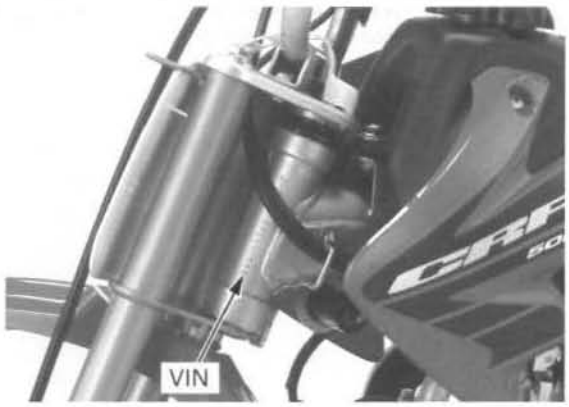
SERVICE RULES

1. Use genuine Honda or Honda-recommended parts and lubricants or their equivalents. Parts that don't meet Honda's design specifications may cause damage to the motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the motorcycle. Metric bolts, nuts and screws are not interchangeable with English fasteners.
4. Install new gaskets, O-rings, cotter pins, and lock plates when reassembling.
5. When tightening bolts or nuts, begin with the larger diameter or inner bolt first. Then tighten to the specified torque diagonally in incremental steps unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all electrical wires as shown on page 1-14, Cable and Harness Routing.

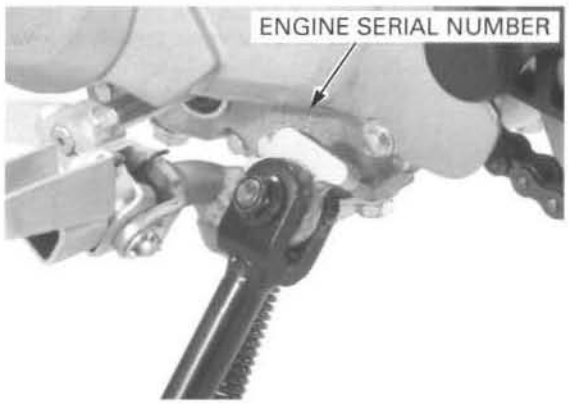
MODEL IDENTIFICATION



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

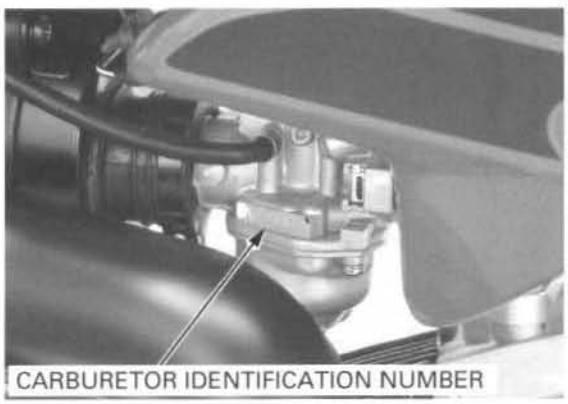


The engine serial number is stamped on the lower left side of the crankcase.



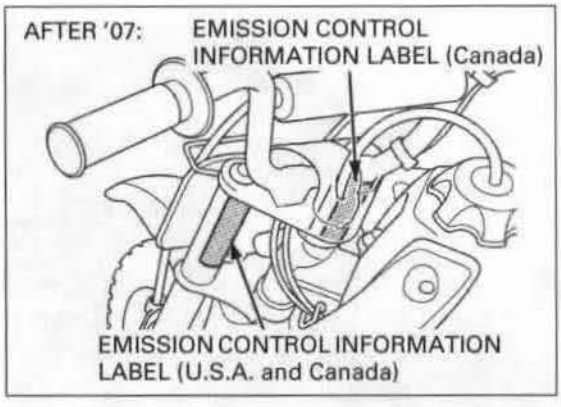
The model identification label (U.S.A.) or the safety Certification label (Canada) is located on right side of the steering head.

The carburetor identification number is stamped on the right side of the carburetor body as shown.

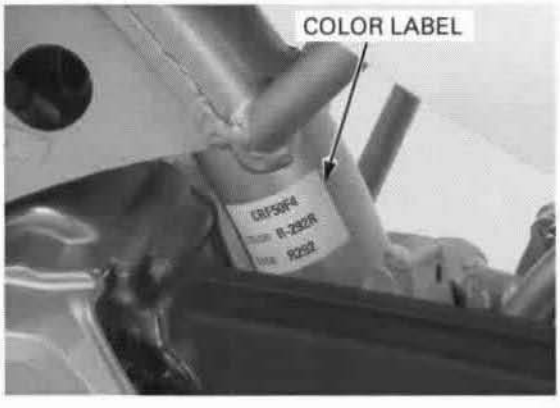


'04 – '07: The Vehicle Emission Control Information Label is attached on the reverse side of the left side cover.

After '07: The Vehicle Emission Control Information Label is attached to the left front fork (U.S.A.) or both front forks (Canada).



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



GENERAL SPECIFICATIONS

ITEM				SPECIFICATION
DIMENSIONS	Overall length			1,302 mm (51.2 in)
	Overall width			581 mm (22.9 in)
	Overall height			774 mm (30.5 in)
	Wheelbase			911 mm (35.9 in)
	Seat height			548 mm (21.6 in)
	Footpeg height			209 mm (8.2 in)
	Ground clearance			146 mm (5.8 in)
	Curb weight			50 kg (110 lbs)
	Maximum weight capacity			40 kg (88 lbs)
FRAME	Frame type			Back bone
	Front suspension			Telescopic fork
	Front wheel travel			87 mm (3.4 in)
	Rear suspension			Swingarm
	Rear wheel travel			70 mm (2.8 in)
	Rear damper			Conventional type oil damper
	Front tire size			2.50–10 33J
	Rear tire size			2.50–10 33J
	Tire brand (CHENG SHIN)			Front/Rear: C-183A
	Front brake			Internal expanding shoe
	Rear brake			Internal expanding shoe
	Caster angle			25° 00′
	Trail length			32 mm (1.3 in)
	Fuel tank capacity		('04 – '07)	3.0 liter (0.79 US gal, 0.66 Imp gal)
			(After '07)	2.6 liter (0.69 US gal, 0.57 Imp gal)
	Fuel tank reserve capacity		('04 – '07)	0.9 liter (0.24 US gal, 0.20 Imp gal)
			(After '07)	0.7 liter (0.18 US gal, 0.15 Imp gal)
ENGINE	Bore and stroke			39.0 x 41.4 mm (1.54 x 1.63 in)
	Displacement			49 cm^3 (3.0 cu-in)
	Compression ratio			10.0 : 1
	Valve train			Chain driven, OHC with rocker arm
	Intake valve	opens	at 1 mm (0.04 in) lift	7.5° BTDC
		closes	at 1 mm (0.04 in) lift	12.5° ABDC
	Exhaust valve	opens	at 1 mm (0.04 in) lift	22.5° BBDC
		closes	at 1 mm (0.04 in) lift	2.5° BTDC
	Lubrication system			Forced pressure and wet sump
	Oil pump type			Trochoid
	Cooling system			Air cooled
	Air filtration			Oiled polyurethane foam
	Crankshaft type			Assembled type
	Engine dry weight			17.2 kg (37.9 lbs)
	Cylinder arrangement			Single cylinder inclined 80° from vertical
CARBURETOR	Carburetor type			Piston valve
	Throttle bore			13 mm (0.5 in)
DRIVE TRAIN	Clutch system			Multi-plate, wet
	Clutch operation system			Automatic centrifugal
	Transmission			3-speed
	Primary reduction			4.058 (69/17)
	Final reduction			2.642 (37/14)
	Gear ratio		1st	3.272 (36/11)
			2nd	1.667 (25/15)
			3rd	1.190 (25/21)
	Gearshift pattern			Left foot operated return system, N –1 –2–3

LUBRICATION SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	At draining	0.6 liter (0.6 US qt, 0.5 Imp qt)	–
	At disassembly	0.8 liter (0.8 US qt, 0.7 Imp qt)	–
Recommended engine oil		Pro Honda GN4 4-stroke oil (U.S.A. and Canada) or equivalent motor oil API service classification: SG or higher JASO T 903 standard: MA Viscosity: SAE 10W-30	–
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.02 – 0.07 (0.001 – 0.003)	0.12 (0.005)
	Side clearance	0.10 – 0.15 (0.004 – 0.006)	0.20 (0.008)

FUEL SYSTEM SPECIFICATIONS

ITEM		SPECIFICATIONS
Carburetor identification number	'04 and '05 U.S.A., '04 – '07 Canada:	PA42A
	'06 and '07 U.S.A:	PA42B
	After '07:	PA42C
Main jet		#58
Slow jet		#35 x #35
Jet needle clip position ('04 and '05 U.S.A., '04 – '07 Canada)		2rd groove from top
Air screw initial opening		1-1/2 turns out
Float level		12.7 mm (0.50 in)
Idle speed		1,700 ± 100 rpm
Throttle grip free play		2.0 – 4.0 mm (1/16 – 3/16 in)

CYLINDER HEAD/VALVES SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			981 – 1,177 kPa (10.0 – 12.0 kgf/cm^2, 142 – 171 psi) at 1,000 rpm	–
Cylinder head warpage			–	0.05 (0.002)
Valve and valve guide	Valve clearance	IN/EX	0.05 ± 0.02 (0.002 ± 0.001)	–
	Valve stem O.D.	IN	4.970 – 4.985 (0.1957 – 0.1963)	4.92 (0.194)
		EX	4.955 – 4.970 (0.1951 – 0.1957)	4.92 (0.194)
	Valve guide I.D.	IN/EX	5.000 – 5.012 (0.1969 – 0.1973)	5.03 (0.198)
	Stem-to-guide clearance	IN	0.015 – 0.042 (0.0006 – 0.0017)	0.08 (0.003)
		EX	0.030 – 0.057 (0.0012 – 0.0022)	0.10 (0.004)
	Valve seat width	IN/EX	1.0 – 1.3 (0.04 – 0.05)	2.0 (0.08)
Valve spring free length		IN/EX	33.34 (1.313)	31.8 (1.25)
Rocker arm/ shaft	Rocker arm I.D.	IN/EX	10.000 – 10.015 (0.3937 – 0.3943)	10.10 (0.398)
	Rocker arm shaft O.D.	IN/EX	9.978 – 9.987 (0.3928 – 0.3932)	9.91 (0.390)
Camshaft	Cam lobe height	IN	20.003 – 20.123 (0.7875 – 0.7922)	19.66 (0.774)
		EX	19.994 – 20.114 (0.7872 – 0.7919)	19.65 (0.774)

CYLINDER/PISTON SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		39.005 – 39.015 (1.5356 – 1.5360)	39.05 (1.537)
	Out of round		–	0.10 (0.004)
	Taper		–	0.10 (0.004)
	Warpage		–	0.05 (0.002)
Piston, piston ring	Piston mark direction		"IN" mark facing toward the intake side	–
	Piston O.D.		38.975 – 38.995 (1.5344 – 1.5352)	38.90 (1.531)
	Piston O.D. measurement point		8 mm (0.3 in) from bottom of skirt	–
	Piston pin bore I.D.		13.002 – 13.008 (0.5119 – 0.5121)	13.06 (0.514)
	Piston pin O.D.		12.994 – 13.000 (0.5116 – 0.5118)	12.98 (0.511)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.08 (0.003)
	Piston ring-to-ring groove clearance	Top/Second	0.015 – 0.050 (0.0006 – 0.0020)	0.12 (0.005)
	Piston ring end gap	Top	0.05 – 0.15 (0.002 – 0.006)	0.5 (0.02)
		Second	0.05 – 0.20 (0.002 – 0.008)	0.5 (0.02)
		Oil (side rail)	0.3 – 0.9 (0.01 – 0.04)	1.1 (0.04)
Cylinder-to-piston clearance			0.010 – 0.040 (0.0004 – 0.0016)	0.15 (0.006)
Connecting rod small end I.D.			13.016 – 13.034 (0.5124 – 0.5131)	13.08 (0.515)
Connecting rod-to-piston pin clearance			0.016 – 0.040 (0.0006 – 0.0016)	0.12 (0.005)

CLUTCH/GEARSHIFT LINKAGE SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Clutch disc thickness	A	2.52 – 2.68 (0.099 – 0.106)	2.3 (0.09)
	B	3.32 – 3.48 (0.131 – 0.137)	3.0 (0.12)
Clutch plate warpage		–	0.20 (0.008)
Centrifugal clutch spring free length		22.4 (0.88)	19.4 (0.76)
Primary drive gear I.D.		21.000 – 21.021 (0.8268 – 0.8276)	21.05 (0.829)
Clutch center guide	I.D.	16.988 – 17.006 (0.6688 – 0.6695)	17.04 (0.671)
	O.D.	20.930 – 20.950 (0.8240 – 0.8248)	20.90 (0.823)
Crankshaft O.D. at clutch center guide		16.966 – 16.984 (0.6680 – 0.6687)	16.90 (0.665)

ALTERNATOR/CAM CHAIN TENSIONER SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Cam chain tensioner	Push rod O.D.	11.985 – 12.000 (0.4718 – 0.4724)	11.94 (0.470)
	Spring free length	111.3 (4.38)	100 (3.9)

CRANKSHAFT/TRANSMISSION/KICKSTARTER SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Side clearance		0.010 – 0.350 (0.0004 – 0.0138)	0.60 (0.024)
	Radial clearance		0 – 0.012 (0 – 0.0005)	0.05 (0.002)
	Runout		–	0.10 (0.004)
Transmission	Gear I.D.	M2	17.016 – 17.043 (0.6699 – 0.6710)	17.10 (0.673)
		C1	23.020 – 23.053 (0.9063 – 0.9076)	23.10 (0.909)
		C3	20.020 – 20.053 (0.7882 – 0.7895)	20.10 (0.791)
	Busing O.D.	C1	22.979 – 23.000 (0.9047 – 0.9055)	22.93 (0.903)
	Busing I.D.	C1	20.000 – 20.021 (0.7874 – 0.7882)	20.08 (0.791)
	Gear-to-bushing clearance	C1	0.020 – 0.074 (0.0008 – 0.0029)	0.10 (0.004)
	Mainshaft O.D.	M2	16.966 – 16.984 (0.6680 – 0.6687)	16.95 (0.667)
	Countershaft O.D.	C1	19.959 – 19.980 (0.7858 – 0.7866)	19.94 (0.785)
	Gear-to-shaft clearance	M2	0.032 – 0.077 (0.0013 – 0.0030)	0.10 (0.004)
	Gear bushing-to-shaft clearance	C1	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
Shift fork	I.D.		34.075 – 34.100 (1.3415 – 1.3425)	34.14 (1.344)
	Claw thickness		4.86 – 4.94 (0.191 – 0.194)	4.60 (0.181)
	Shift drum O.D.		33.950 – 33.975 (1.3366 – 1.3376)	33.93 (1.336)

FRONT WHEEL/BRAKE/SUSPENSION/STEERING SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	3.0 (0.12)
Cold tire pressure		100 kPa (1.00 kgf/cm^2, 15 psi)	–
Axle runout		–	0.20 (0.008)
Wheel rim-to-hub distance		6.3 ± 1.0 (0.25 ± 0.04)	–
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Brake	Brake lever free play	10 – 20 (3/8 – 13/16)	–
	Brake drum I.D.	80 (3.1)	80.5 (3.17)
	Brake lining thickness	3.5 (0.14)	2.0 (0.08)
Fork	Spring free length	160.8 (6.33)	158.3 (6.23)

REAR WHEEL/BRAKE/SUSPENSION SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	3.0 (0.12)
Cold tire pressure		125 kPa (1.25 kgf/cm^2, 18 psi)	–
Axle runout		–	0.20 (0.008)
Wheel rim-to-hub distance		25 ± 1.0 (1.0 ± 0.04)	–
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Drive chain	Size/link	DID420MBK1/78	–
	Slack	15 – 25 (9/16 – 1)	–
Brake	Brake pedal free play	10 – 20 (3/8 – 13/16)	–
	Brake drum I.D.	80 (3.1)	80.5 (3.17)
	Brake lining thickness	3.5 (0.14)	2.0 (0.08)

IGNITION SYSTEM SPECIFICATIONS

ITEM		SPECIFICATION	
Spark plug	Standard	CR6HSA (NGK)	U20FSR-U (DENSO)
	For cold climate (below 41°F/5°C)	CR5HSA (NGK)	U16FSR-U (DENSO)
	For extended high speed riding	CR7HSA (NGK)	U22FSR-U (DENSO)
Spark plug gap		0.60 – 0.70 mm (0.024 – 0.028 in)	
Ignition coil peak voltage		100 V minimum	
Ignition pulse generator peak voltage		0.7 V minimum	
Alternator exciter coil peak voltage		100 V minimum	
Ignition timing ("F" mark)		27° BTDC at idle	

TORQUE VALUES

STANDARD

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

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

NOTES:

1. Apply oil to the threads.
2. Apply grease to the seating surface.
3. U-nut
4. ALOC bolt; replace with a new one.

ENGINE

MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Spark plug ('04 and '05)	1	10	12 (1.2, 9)	
Spark plug (After '05)	1	10	16 (1.6, 12)	
Oil drain bolt	1	12	25 (2.5, 18)	
Valve adjuster hole cap	2	30	12 (1.2, 9)	NOTE 1
Valve adjuster lock nut	2	5	8.8 (0.9, 6.5)	
Clutch adjuster lock nut	1	8	12 (1.2, 9)	

LUBRICATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Oil pump mounting screw	3	6	7.4 (0.75, 5.5)	
Oil pump cover screw	3	5	4.7 (0.48, 3.5)	

ENGINE REMOVAL/INSTALLATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Drive sprocket fixing plate bolt	2	6	12 (1.2, 9)	

CYLINDER HEAD/VALVES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder head cover nut/cap nut	1/3	6	11 (1.1, 8)	
Cylinder head right side cover bolt	2	6	9.8 (1.0, 7)	
Cam sprocket bolt	2	5	8.8 (0.9, 6.5)	

CYLINDER/PISTON

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cam chain guide roller pin bolt	1	8	9.8 (1.0, 7)	

CLUTCH/GEARSHIFT LINKAGE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Clutch outer cover screw	4	5	4.4 (0.45, 3.3)	
Clutch lock nut	1	14	42 (4.3, 31)	
Clutch assembly screw	4	5	5.9 (0.6, 4.3)	
Shift drum stopper arm bolt	1	6	13 (1.3, 9)	
Shift return spring pin bolt	1	8	29 (3.0, 22)	
Gearshift cam plate bolt	1	6	17 (1.7, 12)	

ALTERNATOR/CAM CHAIN TENSIONER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Flywheel nut	1	10	41 (4.2, 30)	
Cam chain tensioner sealing bolt	1	14	23 (2.3, 17)	
Cam chain tensioner pivot bolt	1	8	16 (1.6, 12)	

CRANKSHAFT/TRANSMISSION/KICKSTARTER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Shift drum bolt	1	6	12 (1.2, 9)	

FRAME

FRAME/BODY PANELS/EXHAUST SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Side stand pivot bolt	1	10	–	page 2-7
Muffler mounting bolt	1	8	26 (2.7, 20)	
Exhaust pipe protector bolt	3	6	15 (1.5, 11)	
Exhaust pipe cover screw	4	5	5.9 (0.6, 4.3)	

MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Fuel valve mounting bolt	2	6	9.8 (10, 7)	
			NEW	

FUEL SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Connecting boot band screw	1	4	1.0 (0.1, 0.7)	

ENGINE REMOVAL/INSTALLATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Engine hanger nut	2	8	31 (3.2, 23)	

FRONT WHEEL/BRAKE/SUSPENSION/STEERING

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Handlebar mounting nut	2	8	20 (2.0, 14)	
Engine stop switch holder screw	2	5	2.9 (0.3, 2.2)	
Brake lever pivot bolt	1	5	2.9 (0.3, 2.2)	
Brake lever pivot nut	1	5	2.9 (0.3, 2.2)	
Spoke nipple	28	B.C 23	2.0 (0.2, 1.4)	
Front axle nut	1	12	47 (4.8, 35)	NOTE 3
Front brake arm nut	1	5	5.9 (0.6, 4.3)	NOTE 4
Fork protector bolt	4	6	9.8 (1.0, 7)	
Steering stem nut	1	22	74 (7.5, 54)	
Steering stem top thread	1	22	–	page 12-20

REAR WHEEL/BRAKE/SUSPENSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Spoke nipple	28	BC 2.3	2.0 (0.2, 1.4)	
Rear axle nut	1	12	47 (4.8, 35)	NOTE 3
Driven sprocket nut	4	8	32 (3.3, 24)	NOTE 3
Rear brake arm nut	1	5	5.9 (0.6, 4.3)	NOTE 4
Swingarm pivot nut	1	10	39 (4.0, 29)	NOTE 2,3
Shock absorber mounting nut	2	10	34 (3.5, 25)	NOTE 3
Drive chain slider nut	1	6	12 (1.2, 9)	NOTE 3

IGNITION SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Ignition coil mounting bolt	1	5	5.9 (0.6, 4.3)	

LUBRICATION & SEAL POINTS

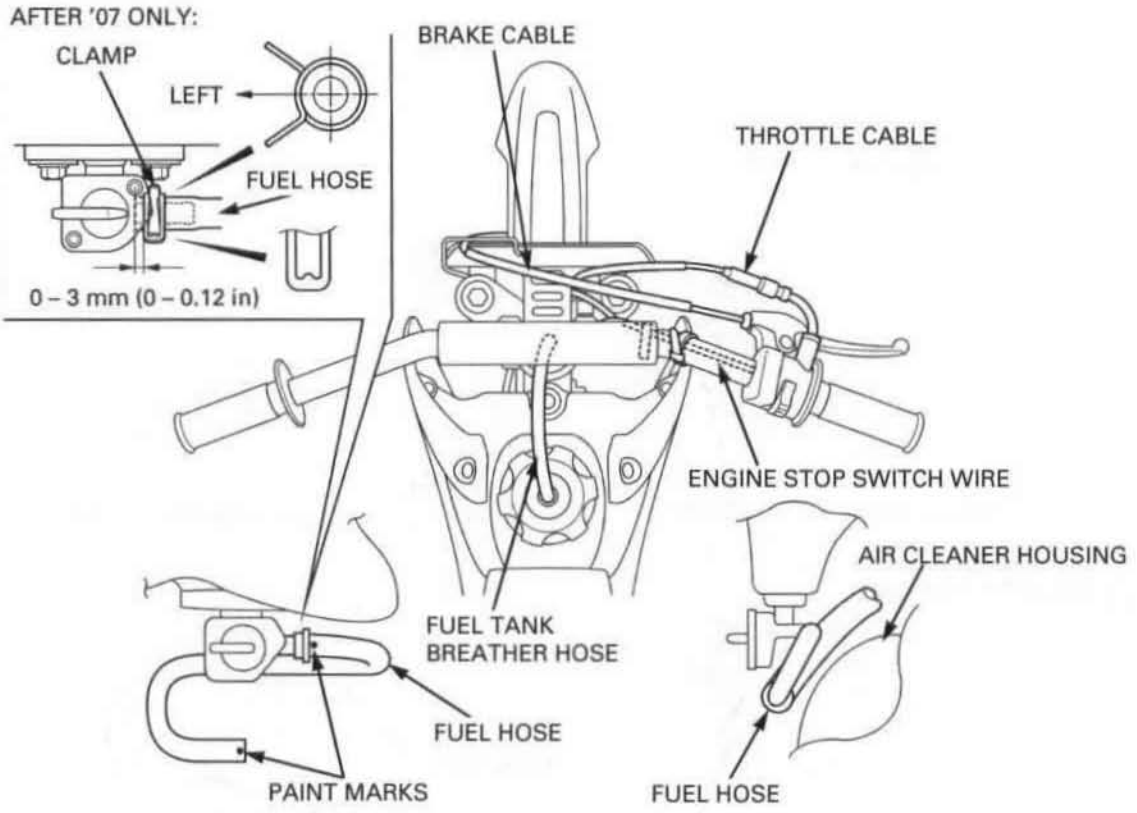
ENGINE

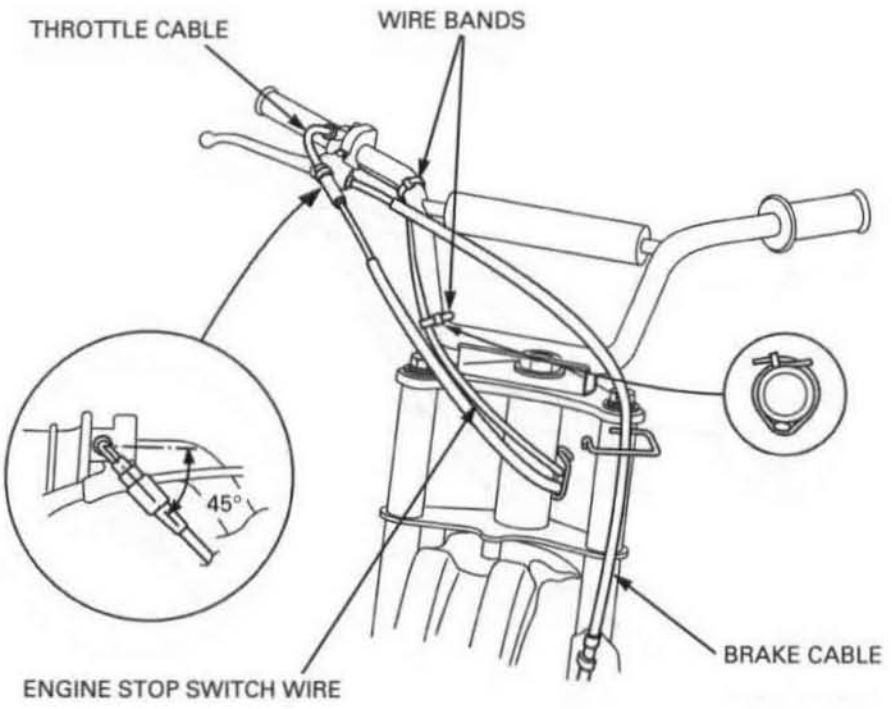
LOCATION	MATERIAL	REMARKS
Cylinder bore surface	Engine oil	
Valve adjuster hole cap threads		
Connecting rod big end bearing		pour 1 – 2 cm^3
Connecting rod small end inner surface		
Piston outer surface, piston pin hole and ring grooves		
Piston pin outer surface		
Piston ring (whole surface)		
Valve stem sliding surface		
Camshaft lobes		
Cam chain		
Cam chain guide roller inner surface		
Rocker arm inner and slipper surfaces		
Cam chain tensioner push rod (inside)		Fill with 1 – 2 cm^3 (page 10-7)
Oil pump rotors		Fill with 0.5 – 1 cm^3
Clutch center guide (whole surface)		
Clutch discs		
Primary drive gear teeth and inner surface		
Primary driven gear teeth		
Mainshaft sliding surface		
Countershaft sliding surface		
Transmission gear sliding surface, gear teeth and shifter groove		
Shift drum outer surface		
Kickstarter spindle sliding surface		
Other rotating and sliding area		
Each bearing rotating area		
Each oil seal lips		
Each O-ring		

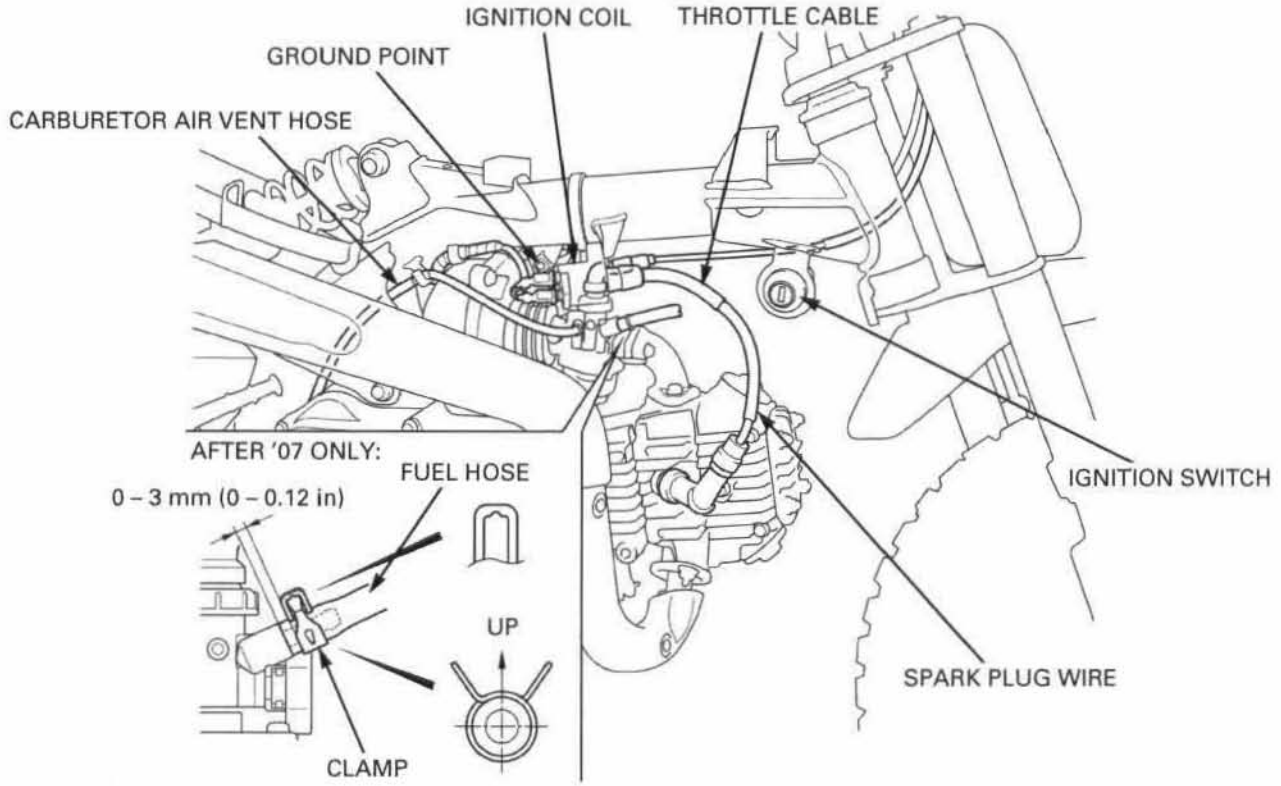
FRAME

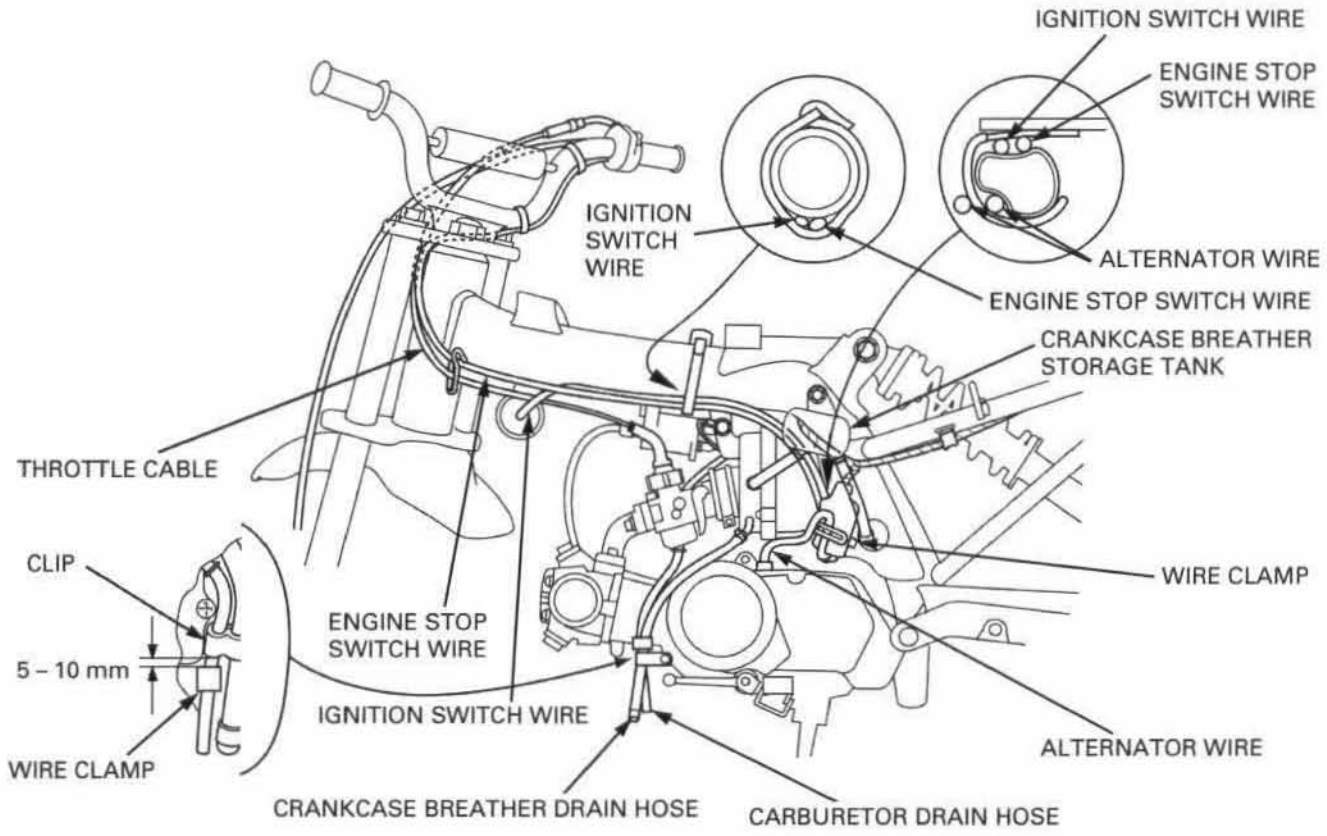
LOCATION	MATERIAL	REMARKS
Air cleaner housing cover mating groove	Multi-purpose grease	
Throttle grip pipe flange		
Steering head bearing and race sliding surface		
Wheel hub dust seal lips		
Wheel bearing cavities		
Brake panel anchor pin sliding surface		
Brake cam spindle and sliding surface		
Brake pedal pivot		
Fork dust seal lips		
Fork slider outer surface (slider guide sliding surface)		Apply 5 – 6 g
Fork slider guide outer groove		Apply 5 – 6 g
Fork spring whole surface		Apply 14 g
Swingarm pivot nut seating surface		
Side stand pivot and sliding surface		
Brake cam dust seal	Engine oil	
Throttle cable outer inside	Cable lubricant	
Brake cable outer inside		
Handlebar grip rubber inside	Honda bond A or equiva-lent	
Air cleaner connecting boot-to-housing mating area		

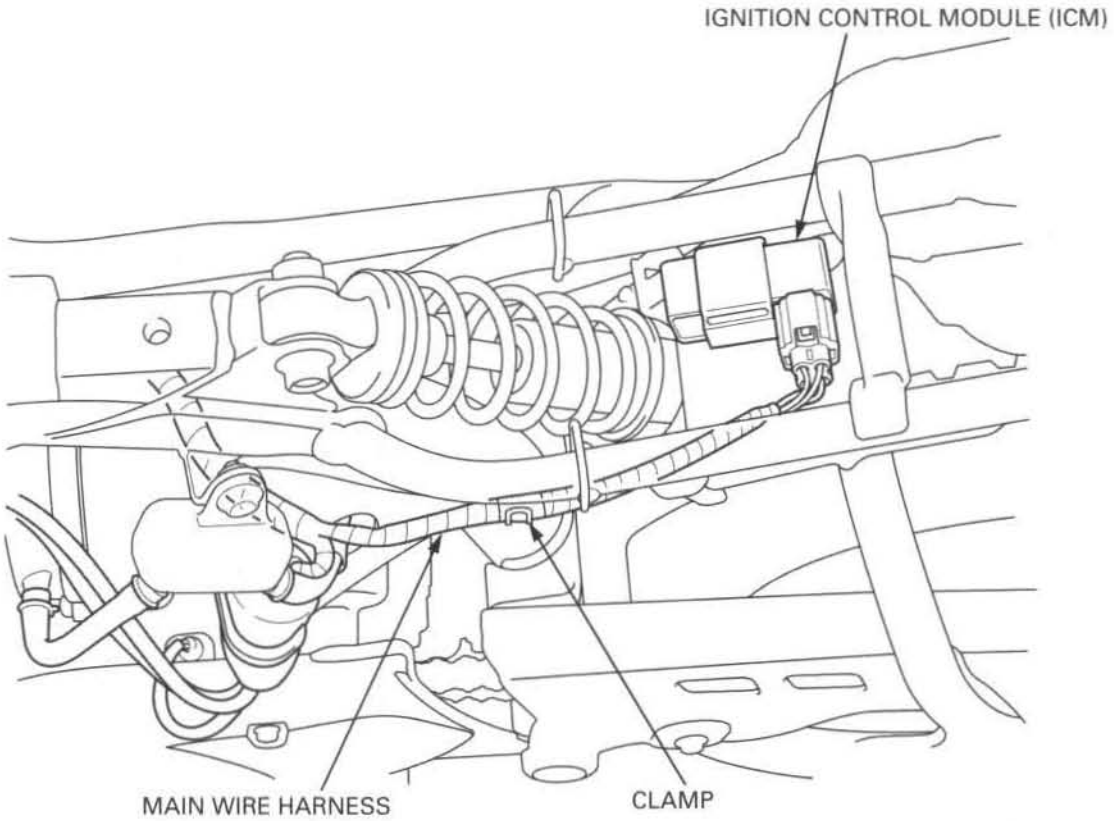
CABLE & HARNESS ROUTING






IGNITION COIL
THROTTLE CABLE
GROUND POINT
CARBURETOR AIR VENT HOSE
AFTER '07 ONLY:
FUEL HOSE
0 – 3 mm (0 – 0.12 in)
UP
CLAMP
IGNITION SWITCH
SPARK PLUG WIRE


IGNITION SWITCH WIRE
ENGINE STOP SWITCH WIRE
IGNITION SWITCH WIRE
ALTERNATOR WIRE
ENGINE STOP SWITCH WIRE
CRANKCASE BREATHER STORAGE TANK
THROTTLE CABLE
CLIP
5 – 10 mm
WIRE CLAMP
ENGINE STOP SWITCH WIRE
IGNITION SWITCH WIRE
WIRE CLAMP
ALTERNATOR WIRE
CRANKCASE BREATHER DRAIN HOSE
CARBURETOR DRAIN HOSE


IGNITION CONTROL MODULE (ICM)
MAIN WIRE HARNESS
CLAMP

EMISSION CONTROL SYSTEMS

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

SOURCE OF EMISSIONS

The combustion process produces carbon monoxide, oxides of nitrogen, and hydrocarbons. Controlling 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.

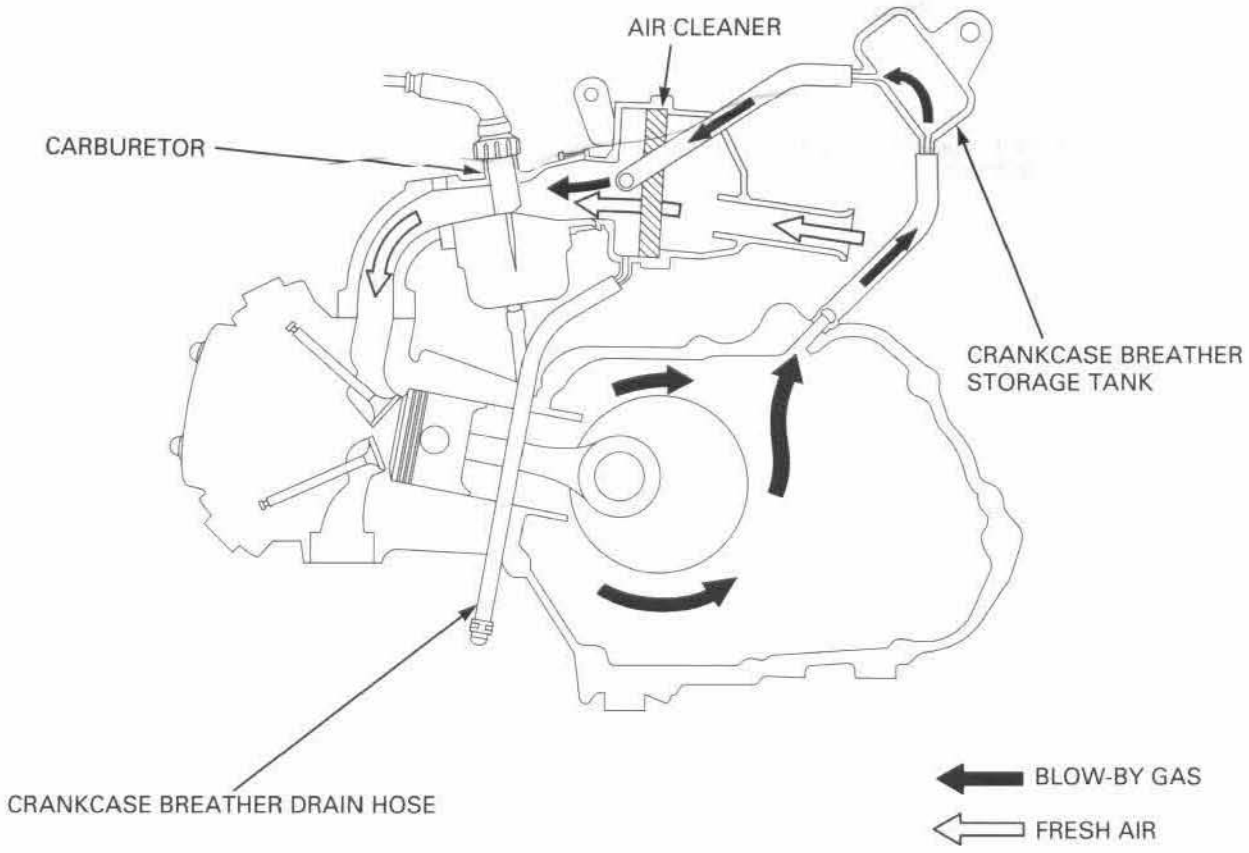
Honda Motor Co., Ltd. utilizes various systems to reduce carbon monoxide, oxides of nitrogen, and hydrocarbons.

EXHAUST EMISSION CONTROL SYSTEM

The exhaust emission control system is composed of appropriate 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.



SERVICING THE HONDA

U.S.A. Only

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

PROHIBITED ACTIONS

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

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

NOISE EMISSION CONTROL SYSTEM

TAMPERING WITH THE NOISE CONTROL SYSTEM IS PROHIBITED: U.S. Federal law prohibits, or Canadian provincial laws may prohibit the following acts or the causing there of: (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; (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 of 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 then those specified by the manufacturer.

FUEL PERMEATION EMISSION CONTROL SYSTEM (AFTER '07)

This motorcycle complies with the Fuel Permeation Emission Control regulations of the U.S. Environmental Protection Agency (EPA), California Air Resources Board (CARB), and Environment Canada (EC). The fuel tank and fuel hoses used on the motorcycle incorporate fuel permeation control technologies. Tampering with the fuel tank or fuel hoses to reduce or defeat the effectiveness of the fuel permeation technologies is prohibited by federal regulations.

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. FRAME/BODY PANELS/EXHAUST SYSTEM

SERVICE INFORMATION

GENERAL

- 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.
- This section covers removal and installation of the body panels, fuel tank and exhaust system.
- Always replace the exhaust pipe gasket after removing the exhaust system from the engine.
- When installing the exhaust system, loosely install all of fasteners. Always tighten the exhaust pipe joint nuts first, then tighten the mounting fastener. If you tighten the mounting fasteners first, the exhaust pipe may not seat properly.
- Always inspect the exhaust system for leaks after installation.

TORQUE VALUES

Side stand pivot bolt	See page 2-7
Muffler mounting bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)
Exhaust pipe protector bolt	15 N·m (1.5 kgf·m, 11 lbf·ft)
Exhaust pipe cover screw	5.9 N·m (0.6 kgf·m, 4.3 lbf·ft)

TROUBLESHOOTING

Excessive exhaust noise
- Broken exhaust system
- Exhaust gas leak

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

SEAT

REMOVAL

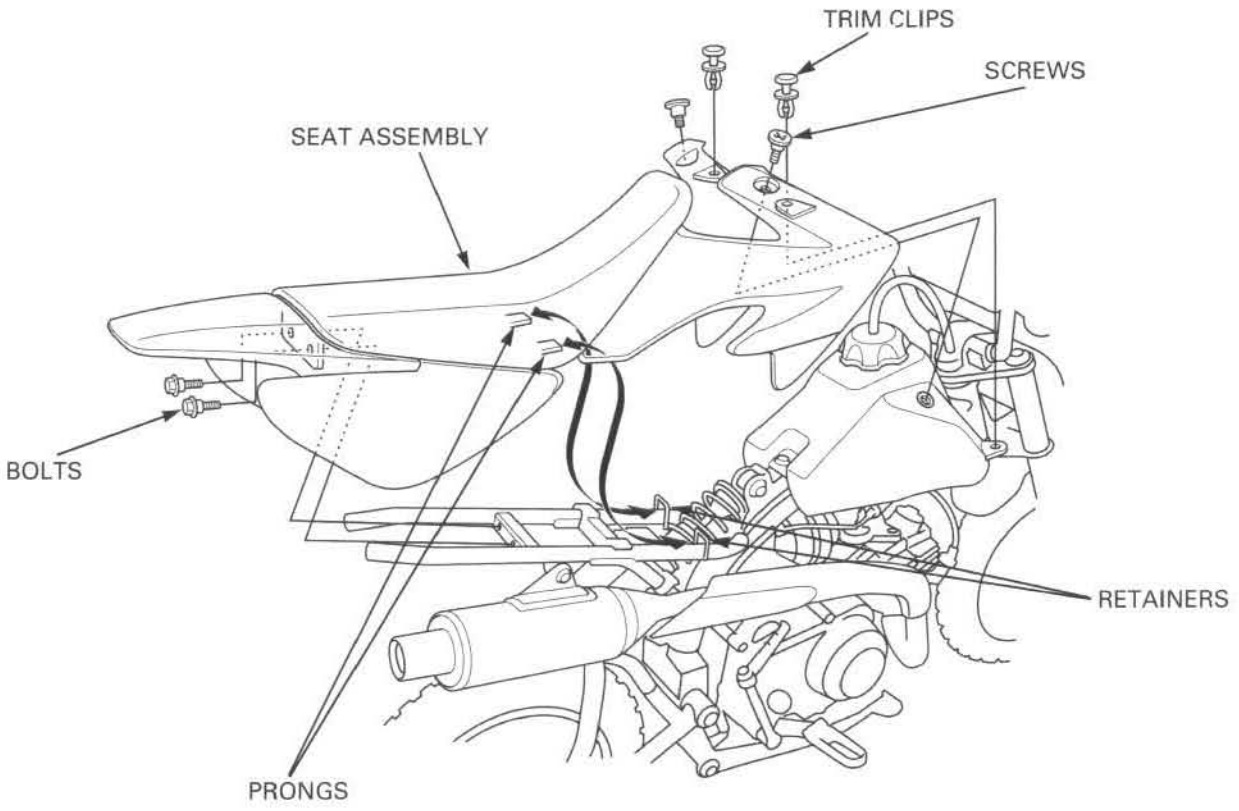
Remove the two trim clips.
Remove the two screws and bolts.

Pull the seat assembly back and remove it.

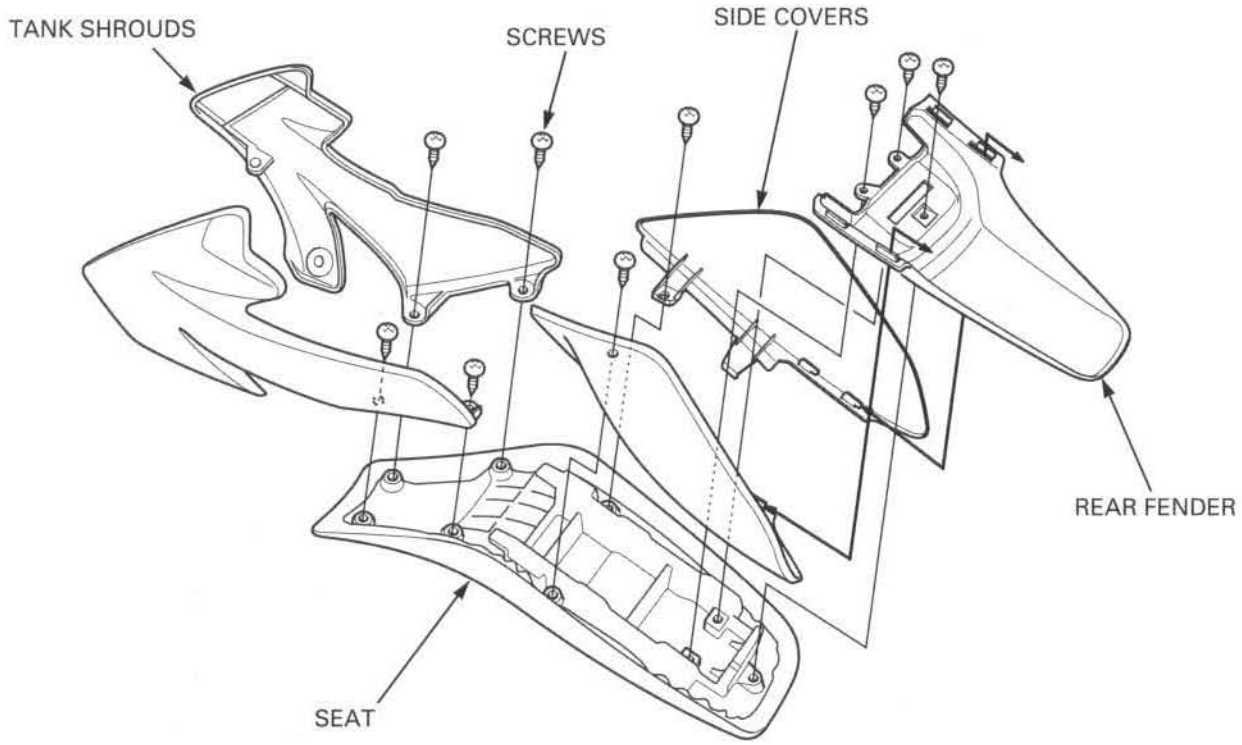
INSTALLATION

Install the seat assembly by inserting the prongs into the retainers on the frame.

Install the bolts and screws and tighten them.
Install the trim clips and lock them by pushing the center pin flush.



DISASSEMBLY/ASSEMBLY



FUEL TANK

Remove the seat assembly (page 2-3).

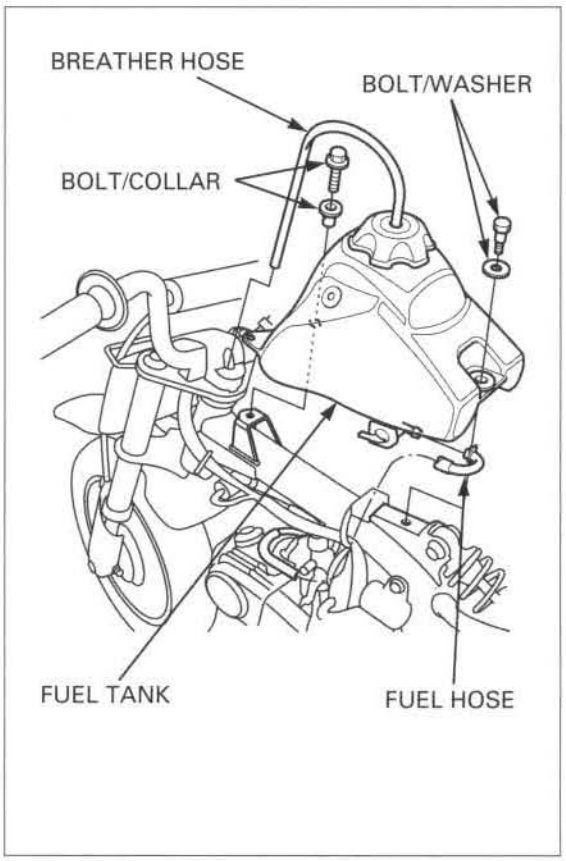
Remove the breather hose from the number plate. Turn the fuel valve OFF and disconnect the fuel hose from the fuel valve.

Remove the two bolts, washer and collar.

For fuel strainer service, see page 3-4

Remove the fuel tank.

Installation is in the reverse order of removal.

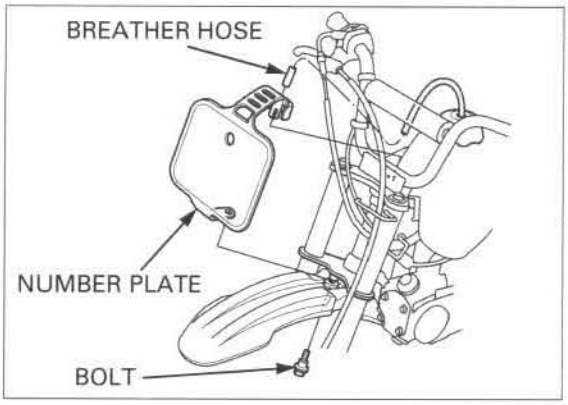


NUMBER PLATE

Remove the breather hose from the number plate.
Remove the fender mounting bolt.

Remove the number plate from the steering stem nut and front fender.

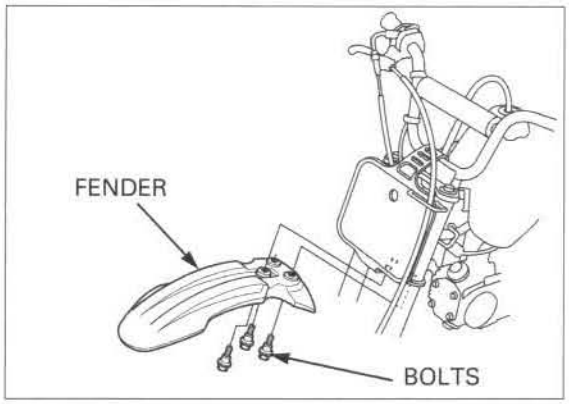
Installation is in the reverse order of removal.



FRONT FENDER

Remove the three bolts and the front fender.

Installation is in the reverse order of removal.



EXHAUST SYSTEM

REMOVAL

For spark arrester maintenance, refer to page 3-19

Remove the seat assembly (page 2-3).

Remove the exhaust pipe joint nuts.
Remove the mounting bolt and the muffler.
Remove the exhaust pipe joint gasket.

INSTALLATION

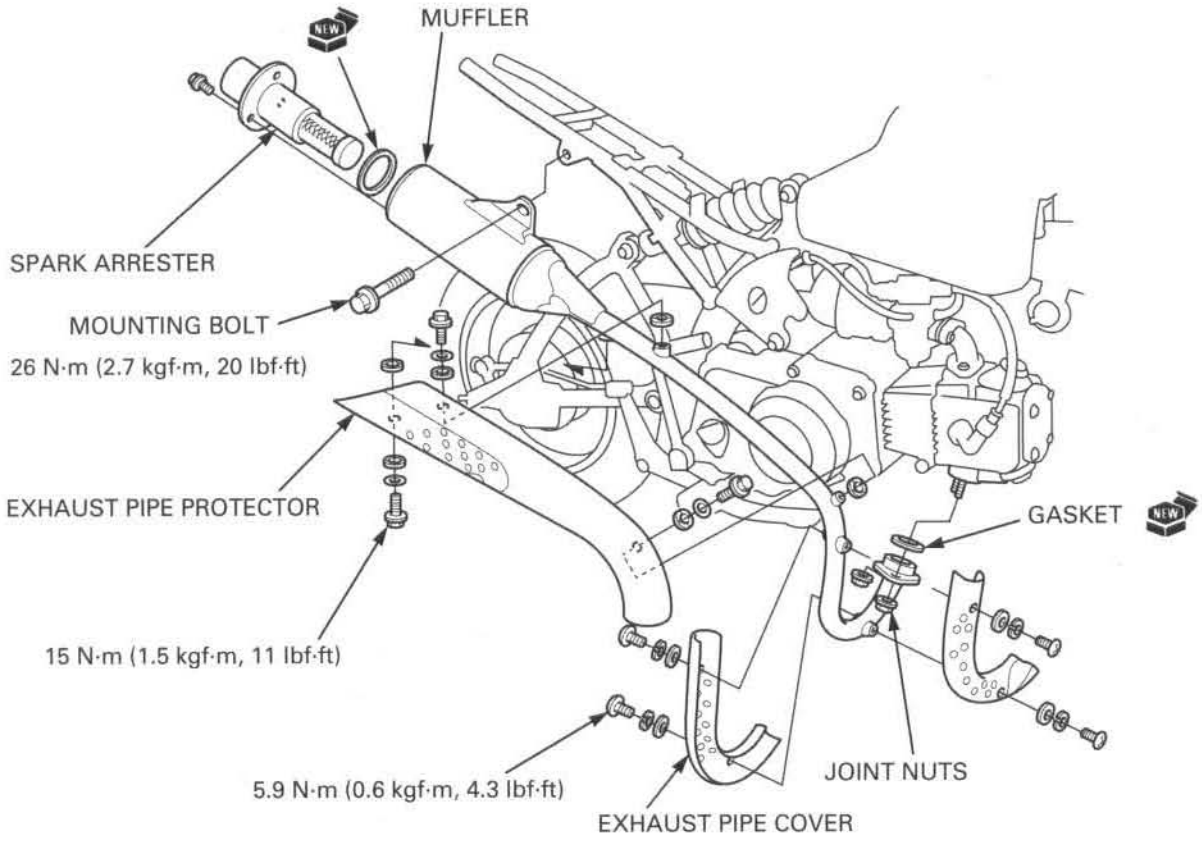
Install a new joint gasket into the exhaust port.
Set the exhaust pipe onto the engine by aligning the exhaust pipe flange with the cylinder head studs, then install the joint nuts and the mounting bolt.

Tighten the joint nuts.

Tighten the mounting bolt.

TORQUE: 26 N·m (2.7 kgf·m, 20 lbf·ft)

Install the seat assembly (page 2-3)



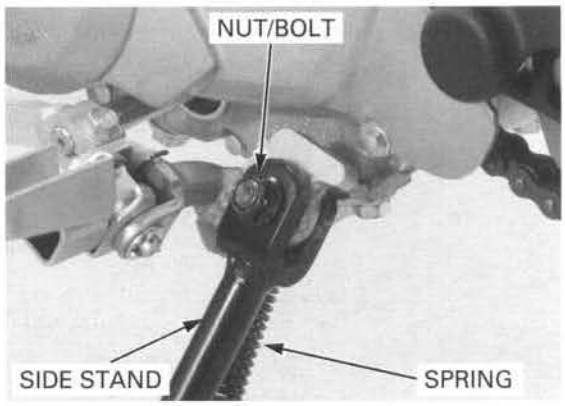
SIDE STAND

REMOVAL

Support the motorcycle securely with a hoist or equivalent.

Retract the side stand and remove the following:

- Return spring
- Pivot nut
- Pivot bolt
- Side stand



INSTALLATION

Apply grease to the side stand pivot and sliding surfaces.
Install the side stand with the pivot bolt.

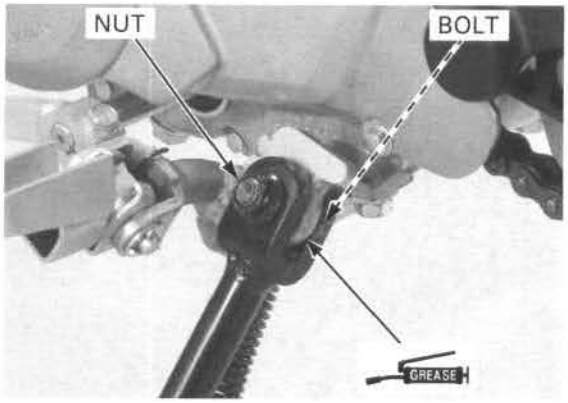
Tighten the pivot bolt

TORQUE: 9.8 N·m (1.0 kgf·m, 7 lbf·ft)

Loosen the pivot bolt 45 – 90°.
Install the pivot nut and tighten it while holding the pivot bolt.

Install the return spring.

Check the side stand operation for freedom of movement.



3. MAINTENANCE

SERVICE INFORMATION

GENERAL

- Place the motorcycle on a level surface before starting any work.
- Gasoline is extremely flammable and is explosive under certain conditions. Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where the gasoline is stored can cause a fire or explosion.
- The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and may lead to death. Run the engine in an open area or with an exhaust evacuation system in an enclosed area.

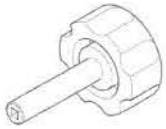
SPECIFICATIONS

ITEM		SPECIFICATIONS	
Spark plug	Standard	CR6HSA (NGK)	U20FSR-U (DENSO)
	For cold climate (below 41°F/5°C)	CR5HSA (NGK)	U16FSR-U (DENSO)
	For extended high speed riding	CR7HSA (NGK)	U22FSR-U (DENSO)
Spark plug gap		0.60 – 0.70 mm (0.024 – 0.028 in)	
Engine oil capacity	At draining	0.6 liter (0.6 US qt, 0.5 Imp qt)	
	At disassembly	0.8 liter (0.8 US qt, 0.7 Imp qt)	
Recommended engine oil		Pro Honda GN4 4-stroke oil (U.S.A. and Canada) or equivalent motor oil API service classification: SG or higher JASO T 903 standard: MA Viscosity: SAE 10W-30	
Engine idle speed		1,700 ± 100 rpm	
Throttle grip freeplay		2.0 – 4.0 mm (1/16 – 3/16 in)	
Valve clearance	IN	0.05 ± 0.02 mm (0.002 ± 0.001 in)	
	EX	0.05 ± 0.02 mm (0.002 ± 0.001 in)	
Drive chain slack		15 – 25 mm (9/16 – 1 in)	
Drive chain size/link	DID	DID420MBK1/78	
Brake lever freeplay		10 – 20 mm (3/8 – 13/16 in)	
Brake pedal freeplay		10 – 20 mm (3/8 – 13/16 in)	
Tire size	Front	2.50-10 33J	
	Rear	2.50-10 33J	
Tire brand	Front	C-183A	
	Rear	C-183A	
Tire air pressure	Front	100 kPa (1.00 kgf/cm², 15 psi)	
	Rear	125 kPa (1.25 kgf/cm², 18 psi)	
Minimum tire tread depth	Front	3.0 mm (0.12 in)	
	Rear	3.0 mm (0.12 in)	

TORQUE VALUES

Fuel valve mounting bolt	NEW 9.8 N·m (10 kgf·m, 7 lbf·ft)	
Spark plug ('04 and '05)	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Spark plug (After '05)	16 N·m (1.6 kgf·m, 12 lbf·ft)	
Valve adjuster hole cap	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply engine oil to the threads
Valve adjuster lock nut	8.8 N·m (0.9 kgf·m, 6.5 lbf·ft)	
Oil drain bolt	25 N·m (2.5 kgf·m, 18 lbf·ft)	
Clutch adjuster lock nut	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Rear axle nut	47 N·m (4.8 kgf·m, 35 lbf·ft)	U-nut
Spoke nipple	2.0 N·m (0.2 kgf·m, 1.4 lbf·ft)	

TOOLS

Spoke wrench, 4.1 x 4.5 mm 07701-0020100  or equivalent commercially available in U.S.A.	Valve adjusting wrench, 8 x 9 mm 07708-0030100  or equivalent commercially available in U.S.A.	Valve adjuster B 07708-0030400  or 07908-KE90200 (U.S.A. only)

MAINTENANCE SCHEDULE

'04 AND '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 MAINTE-NANCE	REGULAR MAINTENANCE INTERVAL				REFER TO PAGE
				mi	100	600	1,200	1,800	2,400	
				km	150	1,000	2,000	3,000	4,000	
			NOTE	MONTH	1	6	12	18	24	
EMSSION RELATED ITEMS	*	FUEL LINE					I		I	3-6
	*	THROTTLE OPERATION					I		I	3-6
		AIR CLEANER	NOTE 1			C	C	C	C	3-7
		SPARK PLUG				I	I	I	I	3-8
	*	VALVE CLEARANCE			I	I	I	I	I	3-9
		ENGINE OIL			R	R	R	R	R	3-10
	**	ENGINE OIL STRAINER SCREEN					C		C	3-12
	**	ENGINE OIL CENTRIFUGAL FILTER					C		C	3-12
	**	ENGINE IDLE SPEED			I	I	I	I	I	3-13
NON-EMSSION RELATED ITEMS		DRIVE CHAIN	NOTE 1		I, L	I, L: Every 300 mi (500 km) or 3 months				3-13
		DRIVE CHAIN SLIDER				I	I	I	I	3-15
		BRAKE SHOE WEAR				I	I	I	I	3-15
		BRAKE SYSTEM			I	I	I	I	I	3-16
		CLUTCH SYSTEM			I	I	I	I	I	3-17
		SIDE STAND					I		I	3-17
	*	SUSPENSION					I		I	3-18
	*	SPARK ARRESTER			C: Every 1,000 mi (1,600 km) or every 100 operating hours					3-19
	*	NUTS, BOLTS, FASTENERS			I		I		I	3-19
	**	WHEELS/TIRES			I	I	I	I	I	3-20
	**	STEERING HEAD BEARINGS			I		I		I	3-20

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

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

NOTES:

1. Service more frequently when ridden in wet or dusty conditions.

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 MAINTE-NANCE	REGULAR MAINTENANCE INTERVAL				REFER TO PAGE
			mi	100	600	1,200	1,800	2,400	
			km	150	1,000	2,000	3,000	4,000	
		NOTE	MONTH	1	6	12	18	24	
*	FUEL LINE					I		I	3-6
*	THROTTLE OPERATION					I		I	3-6
	AIR CLEANER	NOTE 1			C	C	C	C	3-7
	SPARK PLUG				I	I	I	I	3-8
*	VALVE CLEARANCE			I	I	I	I	I	3-9
	ENGINE OIL			R	R	R	R	R	3-10
**	ENGINE OIL STRAINER SCREEN					C		C	3-12
**	ENGINE OIL CENTRIFUGAL FILTER					C		C	3-12
**	ENGINE IDLE SPEED			I	I	I	I	I	3-13
	DRIVE CHAIN	NOTE 1		I, L	I, L: Every 300 mi (500 km) or 3 months				3-13
	DRIVE CHAIN SLIDER				I	I	I	I	3-15
	BRAKE SHOE WEAR				I	I	I	I	3-15
	BRAKE SYSTEM			I	I	I	I	I	3-16
	CLUTCH SYSTEM			I	I	I	I	I	3-17
	SIDE STAND					I		I	3-17
*	SUSPENSION					I		I	3-18
*	SPARK ARRESTER			C: Every 1,000 mi (1,600 km) or every 100 operating hours					3-19
*	NUTS, BOLTS, FASTENERS			I		I		I	3-19
**	WHEELS/TIRES			I	I	I	I	I	3-20
**	STEERING HEAD BEARINGS			I		I		I	3-20

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

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

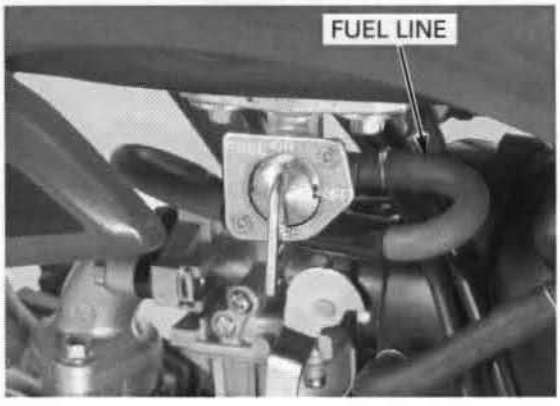
NOTES:

2. Service more frequently when ridden in wet or dusty conditions.

FUEL LINE

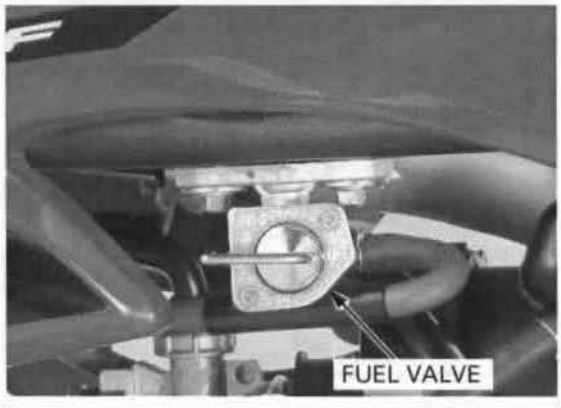
Check the fuel line for deterioration, damage or leakage.

Replace the fuel line if necessary.



FUEL STRAINER SCREEN

Turn the fuel valve OFF and disconnect the fuel hose.
Place a drain pan under the fuel hose and turn the fuel valve ON to drain the fuel tank.



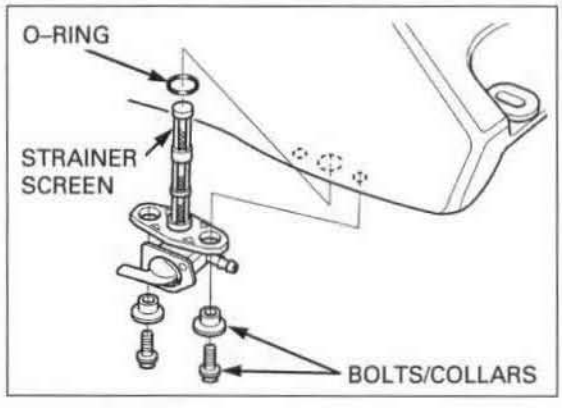
After the tank has drained completely, remove the two bolts and collars, and remove the fuel valve and strainer screen.

Wash the fuel strainer screen in non-flammable or high flash solvent.

Check the O-ring is in good condition, reinstall the fuel valve.
Tighten the fuel valve mounting bolts to the specified torque.

NEW **TORQUE: 9.8 N·m (10 kgf·m, 7 lbf·ft)**

After installation, check for fuel leaks.

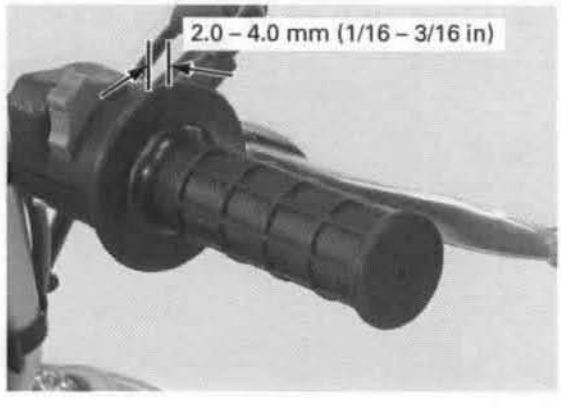


THROTTLE OPERATION

Check for smooth throttle grip full opening and automatic full closing in all steering positions.
Check the throttle cable and replace it if it is deteriorated, kinked or damaged.
Lubricate the throttle cable, if throttle operation is not smooth.

Measure the free play at the throttle grip flange.

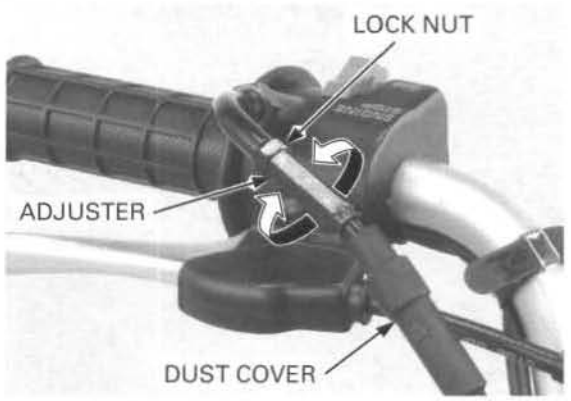
FREE PLAY: 2.0 – 4.0 mm (1/16 – 3/16 in)



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

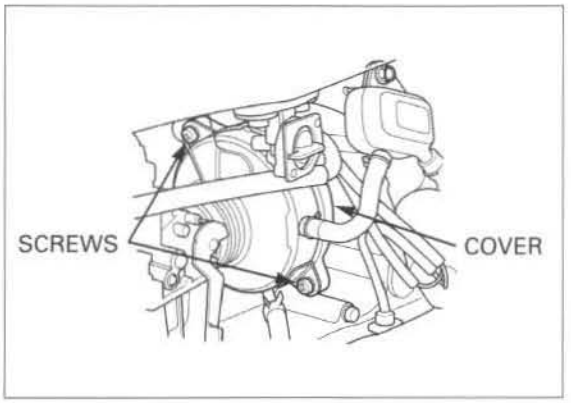
Remove the dust cover from the adjuster.
Adjust the free play by loosening the lock nut and turning the adjuster.
Tighten the lock nut and install the dust cover properly.

Recheck the throttle operation.

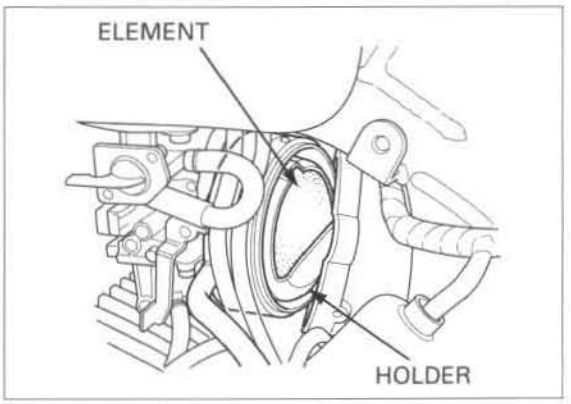


AIR CLEANER

Remove the two screws and the air cleaner housing cover.

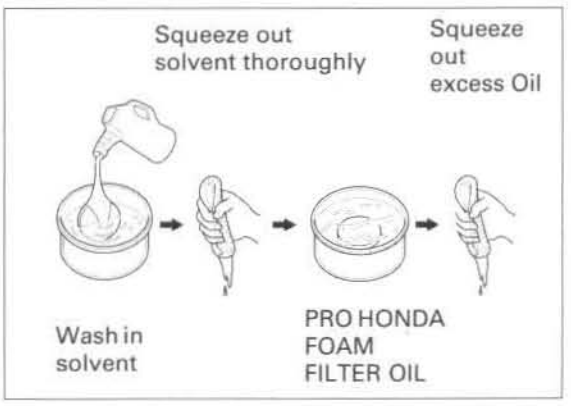


Remove the air cleaner element holder and element from the housing.



Wash the element in non-flammable or high flash point solvent, and let it dry thoroughly.

Soak the element in Pro Honda Foam Filter Oil or equivalent, and squeeze out any excess oil.

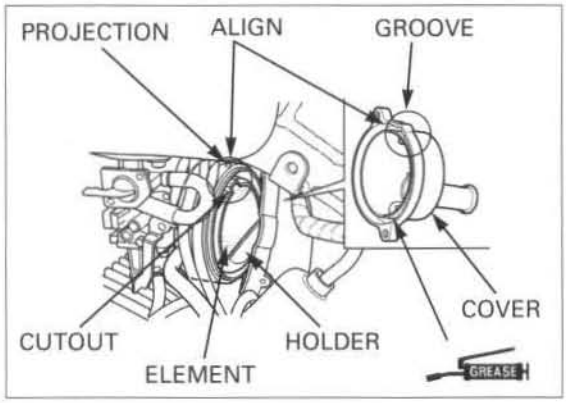


Reinstall the air cleaner element and the element holder by aligning the cutout with the projection on the housing.

Apply grease into the mating groove in the air cleaner housing cover.

Align the groove in the cover with the projection on the housing.

Install the housing cover and tighten the screws.



SPARK PLUG

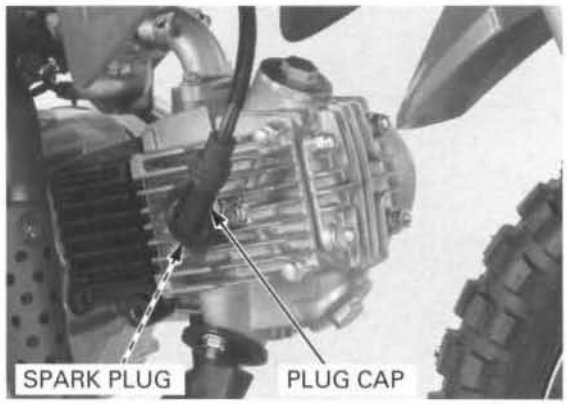
REMOVAL

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

Disconnect the spark plug cap.

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

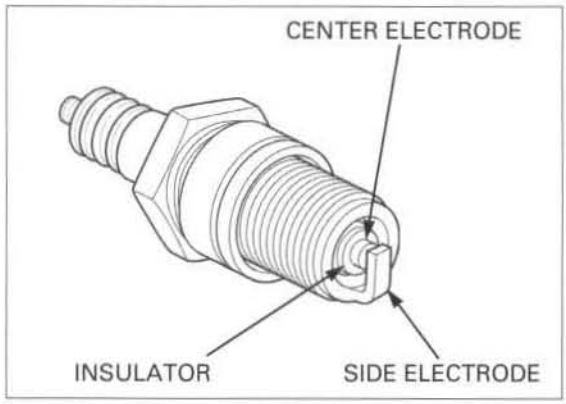
Inspect or replace as described in the maintenance schedule (page 3-4).



INSPECTION

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

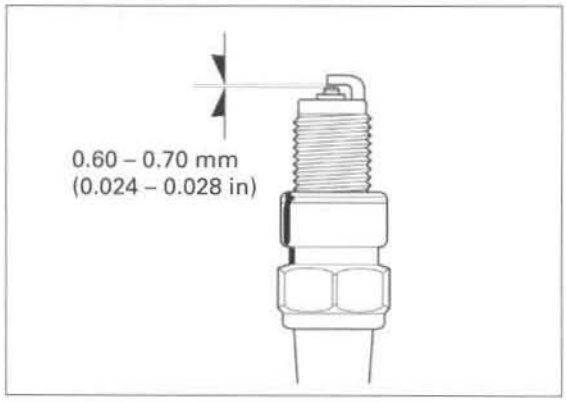
- Insulator for damage
- Electrodes for wear
- Burning condition, coloration;
  - Dark to light brown indicates good condition.
  - Excessive lightness indicates malfunctioning ignition system or lean mixture.
  - Wet or black sooty deposit indicates over-rich mixture.



Clean the spark plug electrodes with a wire brush or special plug cleaner.
Check the gap between the center and side electrodes with a wire-type feeler gauge.

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

SPARK PLUG GAP: 0.60 – 0.70 mm (0.024 – 0.028 in)

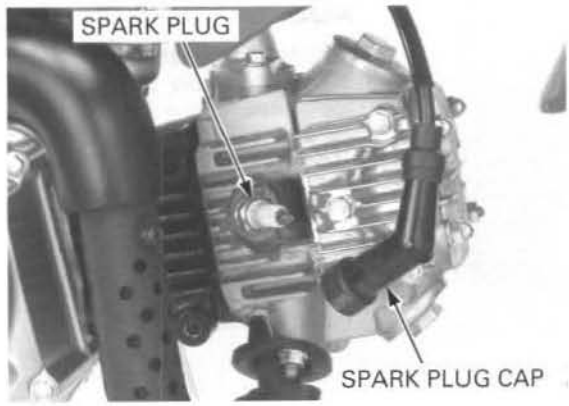


To prevent damage to the cylinder head, handtighten the spark plug before using a wrench to tighten to the specified torque.

Install the spark plug in the cylinder head and hand tighten, then torque it using a spark plug wrench.

TORQUE:
'04 and '05: 12 N·m (1.2 kgf·m, 9 lbf·ft)
After '05: 16 N·m (1.6 kgf·m, 12 lbf·ft)

Install the spark plug cap to the spark plug.



VALVE CLEARANCE

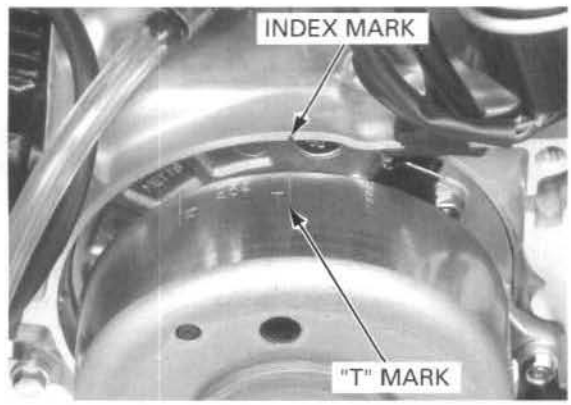
INSPECTION

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

Remove the valve adjuster hole caps.

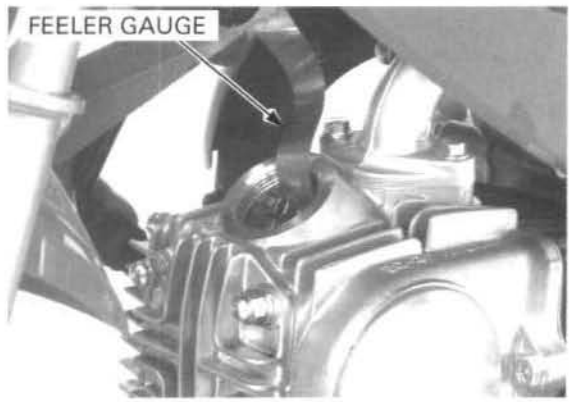
Remove the left crankcase cover (page 10-4).

Turn the crankshaft counterclockwise and align the "T" mark on the flywheel with the index notch on the left crankcase.
Make sure the piston at TDC (Top Dead Center) on the compression stroke.
This position can be obtained by confirming that there is slack in the rocker arm.
If there is no slack, rotate the crankshaft one full turn counterclockwise and match up the "T" mark again.



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

VALVE CLEARANCE:
IN/EX: 0.05 ± 0.02 mm (0.002 ± 0.001 in)

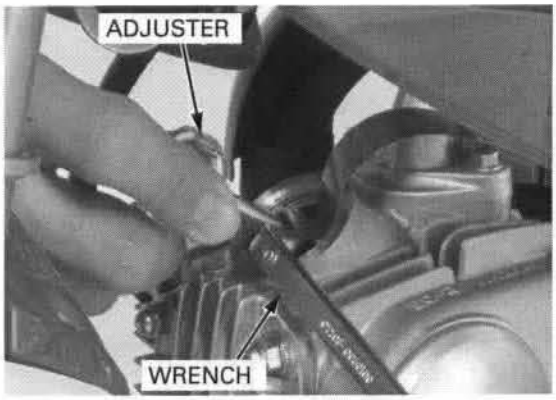


ADJUSTMENT

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

TOOLS:

Valve adjusting wrench, 8 x 9 mm	**07708-0030100 (Equivalent commercially available in U.S.A.)**
Valve adjuster B	**07708-0030400 or 07908-KE90200 (U.S.A. only)**



TORQUE: 8.8 N·m (0.9 kgf·m, 6.5 lbf·ft)

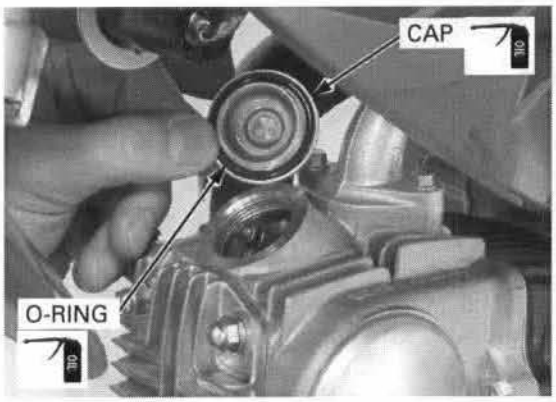
Recheck the valve clearance.

Check that valve adjuster hole cap O-ring is in good condition, replace if necessary.
Coat the O-rings with clean engine oil and install them in the valve adjuster hole caps.

Apply clean engine oil to the threads, install and tighten the valve adjuster hole caps to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the left crankcase cover (page 10-8)

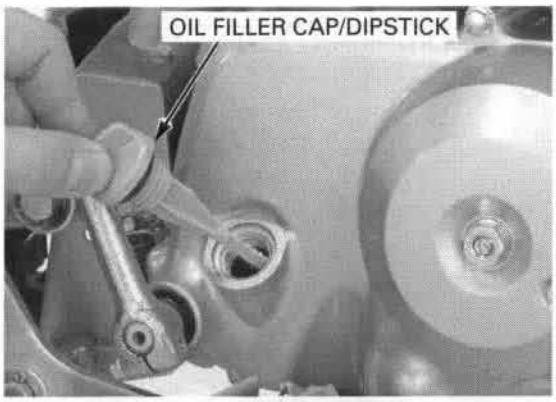


ENGINE OIL

OIL LEVEL INSPECTION

Support the motorcycle in an upright position on level ground.

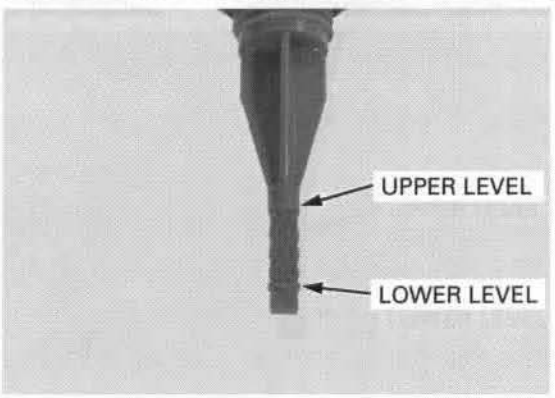
Start the engine and let it idle for 3 – 5 minutes.
Stop the engine and wait 2 – 3minutes.
Hold the motorcycle in an upright position.
Remove the oil filler cap/dipstick and wipe it clean.
Check the oil level by inserting the oil filler cap/dipstick into the oil filler hole without screwing it in.



The engine contains a sufficient amount of oil if the oil level is between the upper and lower level marks on the dipstick.

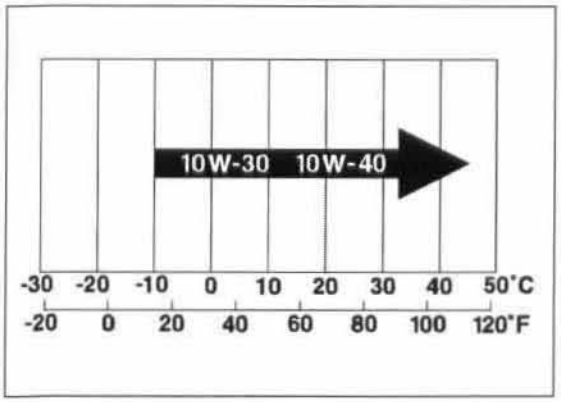
If the level is near or below the lower level mark, add the recommended oil up to the upper level mark.

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



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

Reinstall the filler cap/dipstick.

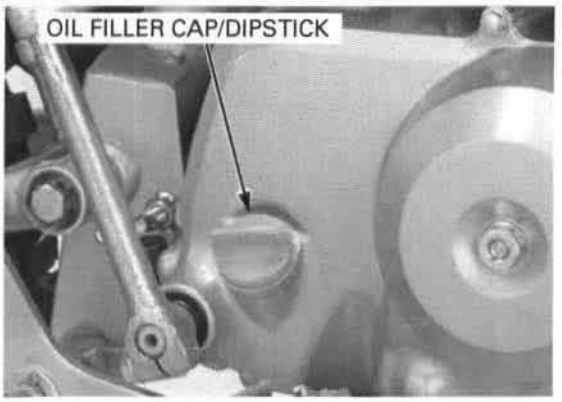


ENGINE OIL CHANGE

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

Warm up the engine.

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

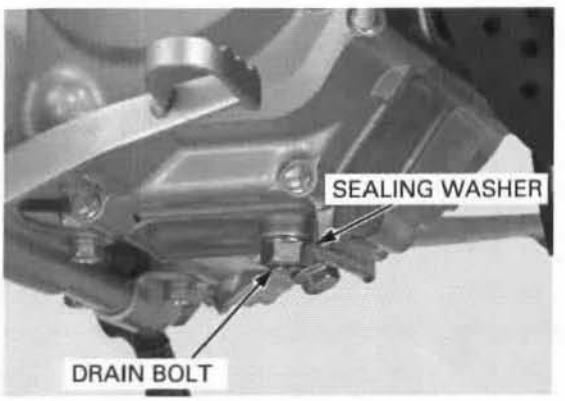


Remove the drain bolt and sealing washer.

Drain the oil completely.

Check that the sealing washer on the drain bolt is in good condition, replace if necessary.
Install and tighten the drain bolt.

TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)



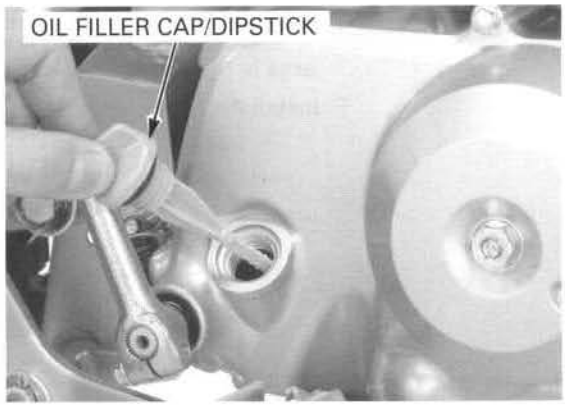
Fill the crankcase with the recommended engine oil.

OIL CAPACITY:
0.6 litter (0.6 US qt, 0.5 Imp qt) at draining
0.8 litter (0.8 US qt, 0.7 Imp qt) at disassembly

Install the oil filler cap/dipstick.

Start the engine and let it idle for 3 – 5 minutes.
Stop the engine and wait 2 – 3minutes.
Hold the motorcycle in an upright position.
Remove the oil filler cap/dipstick and wipe it clean.
Check the oil level by inserting the oil filler cap/dipstick into the oil filler hole without screwing it in.

Make sure there are no oil leaks.



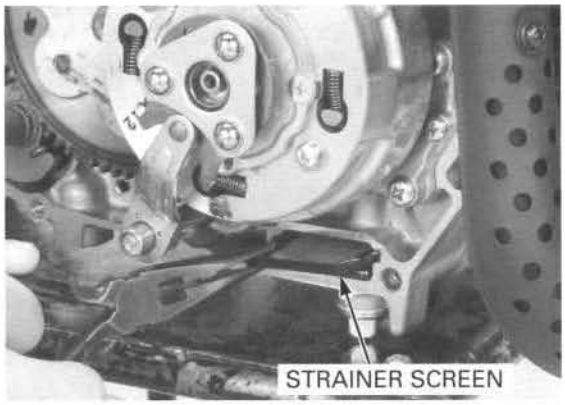
ENGINE OIL STRAINER SCREEN

CLEANING

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

Remove the oil strainer screen and clean it.
Check the screen for damage and the sealing rubber for damage or deterioration.

Reinstall the oil strainer screen and right crankcase cover (page 9-19).

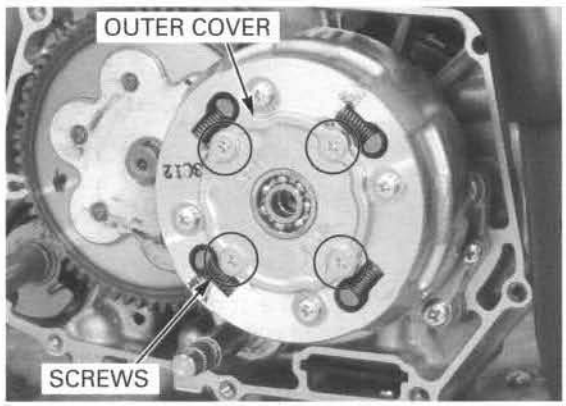


ENGINE OIL CENTRIFUGAL FILTER

CLEANING

Remove the right crankcase cover, ball retainer and clutch lifter lever (page 9-5).

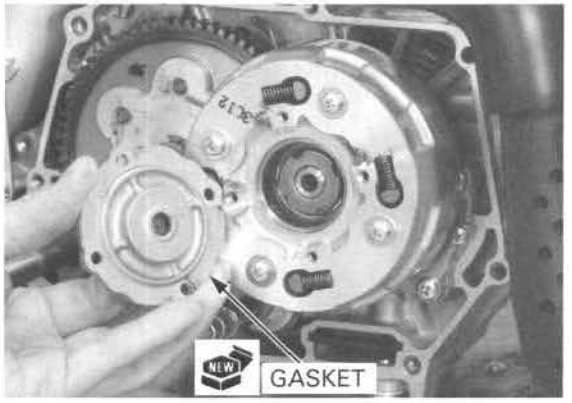
Remove the four screws and clutch outer cover.



Do not allow dust and dirt to enter the crankshaft oil passage. Do not use compressed air.

Clean the clutch outer cover and inside of the clutch outer using a clean lint-free cloth.

Reinstall the clutch outer cover with a new gasket (page 9-14).



ENGINE IDLE SPEED

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

Warm up the engine for about ten minutes.
Connect a tachometer.
Turn the throttle stop screw as required to obtain the specified idle speed.

IDLE SPEED: 1,700 ± 100 rpm

DRIVE CHAIN

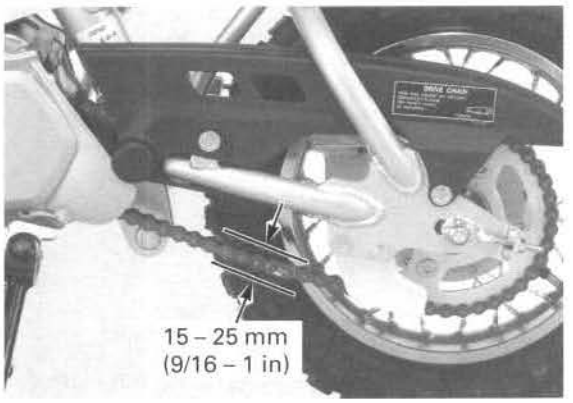
DRIVE CHAIN SLACK INSPECTION

Turn off the engine, place the motorcycle on its side stand and shift the transmission into neutral.
Check the slack in the drive chain lower run midway between the sprockets.

CHAIN SLACK: 15 – 25 mm (9/16 – 1 in)

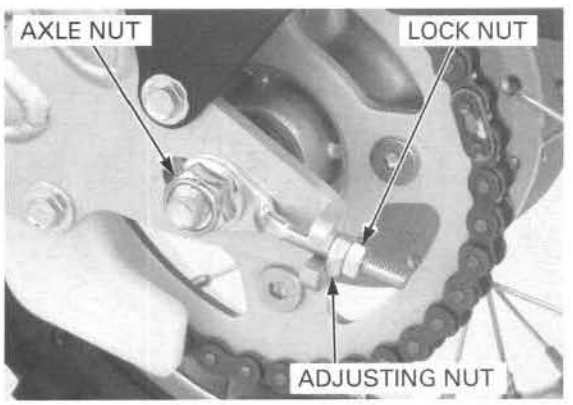
NOTICE

Excessive chain slack, 40 mm (1-1/2 in) or more, may damage the frame.



ADJUSTMENT

Loosen the rear axle nut.
Loosen the adjuster lock nuts and turn both adjusting nuts an equal number of turn until the correct drive chain slack is obtained.

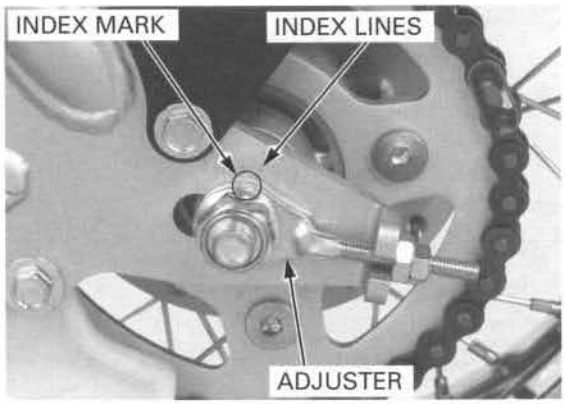


Make sure the index marks on both adjusters are aligned with the index lines on the swingarm.
Tighten the rear axle nut to the specified torque.

TORQUE: 47 N·m (4.8 kgf·m, 35 lbf·ft)

Tighten both lock nuts.

Recheck the drive chain slack and free wheel rotation.
Check the rear brake pedal free play (page 3-16), adjust if necessary.
Lubricate the drive chain with # 80 – 90 gear oil.
Wipe off the excess oil.

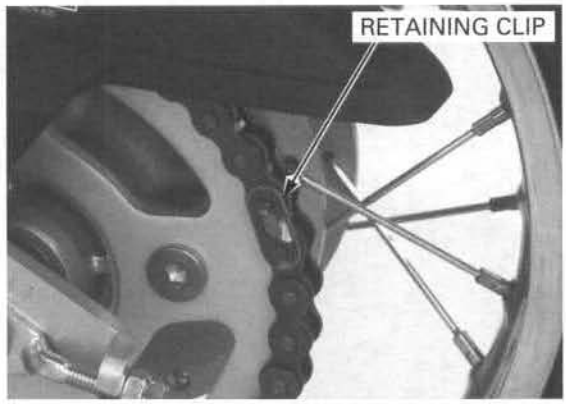


CLEANING INSPECTION AND LUBRICATION

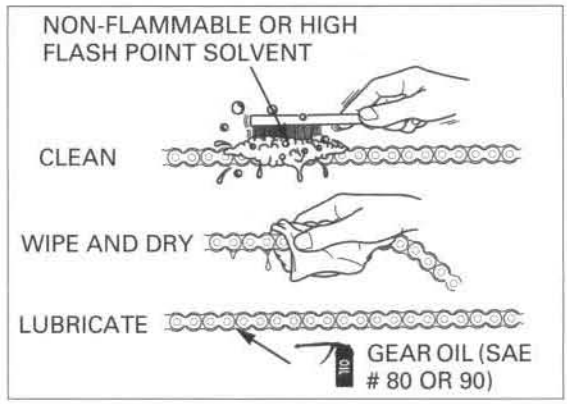
If the drive chain becomes extremely dirty, it should be removed and cleaned prior to lubrication.

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

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



Clean the chain with non-flammable or high flash point solvent and wipe it dry.
Be sure the chain has dried completely before lubricanting.
Lubricate the drive chain with # 80 – 90 gear oil.
Wipe off the excess gear oil.

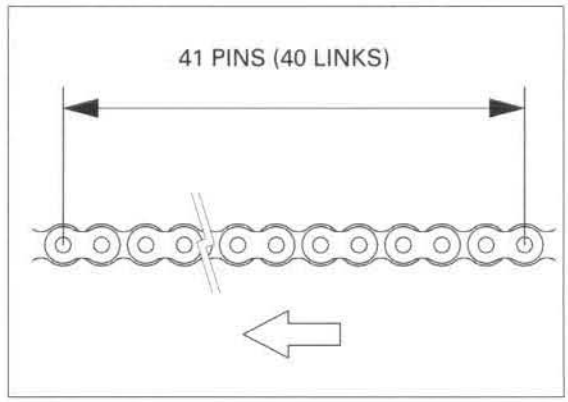


Inspect the drive chain for possible damage or wear.

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

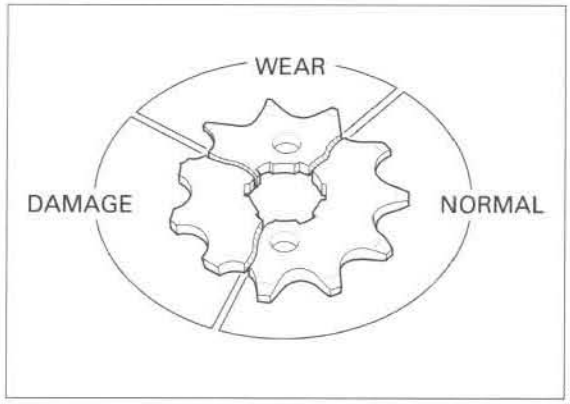
Measure the drive chain length between a span of 41 pins (40 links) from pin center to pin center with the chain held taut and any kinked joint straightened.

SERVICE LIMIT: 511 mm (20.1 in)

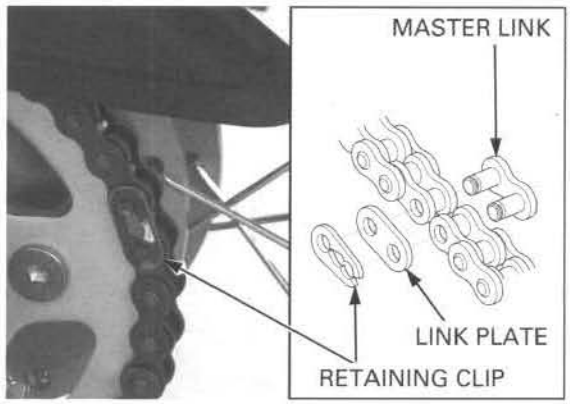


Installing a new chain on badly worn sprockets will cause the new chain to wear quickly.
Inspect the drive and driven sprocket teeth for wear or damage. Replace if necessary.
Never use a new drive chain on worn sprockets.
Both chain and sprockets must be in good condition, or the new replacement parts will wear rapidly.

Check the attaching bolts and nuts on the drive and driven sprockets.
If any are loose, torque them.



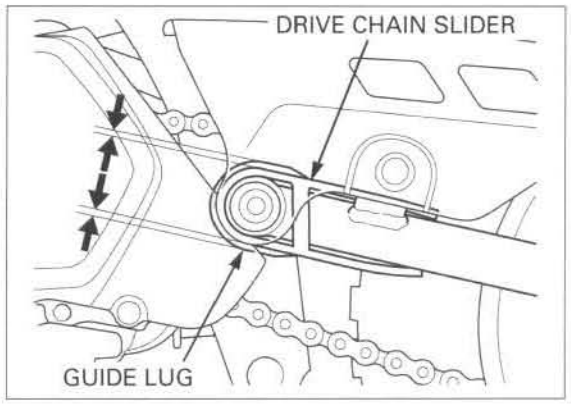
Install the drive chain onto the sprockets.
Install the master link and link plate.
Install the retaining clip so that its open end is opposite the normal rotation of the chain.



DRIVE CHAIN SLIDER

Check the drive chain slider for wear or damage.

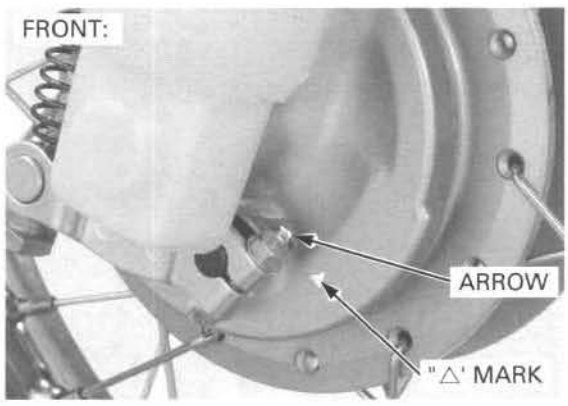
Replace the drive chain slider if the wear limit guide lug is worn out or it has been damaged.

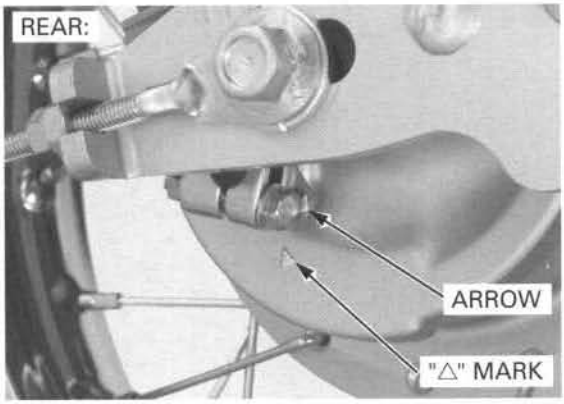


BRAKE SHOE WEAR

Check the brake shoes and brake drum if the arrow on the indicator plate aligns with the " △ " mark on the brake panel when the brake lever is applied.

Refer to page 12-13 or page 13-10 for brake shoe and brake drum inspection.



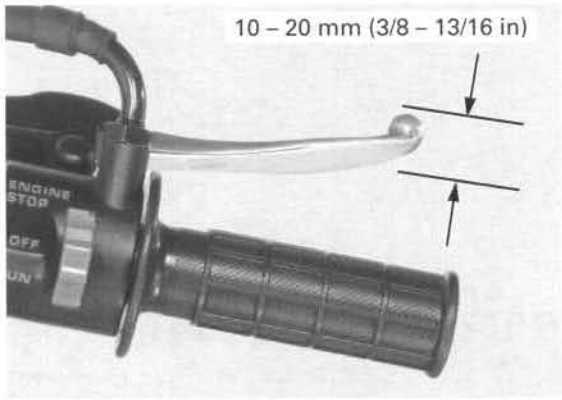


BRAKE SYSTEM

FRONT BRAKE

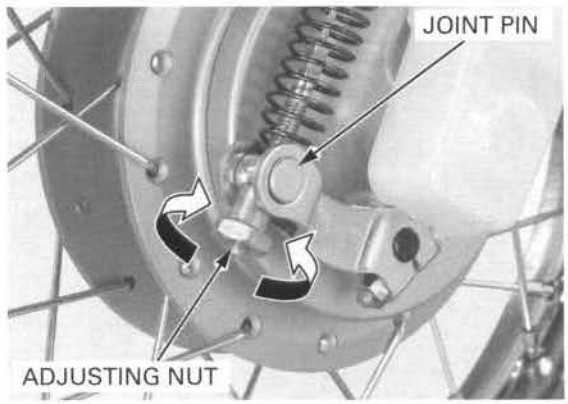
Measure the front brake lever free play at the tip of the lever.

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



Make sure the cut-out on the adjusting nut is seated on the joint pin.

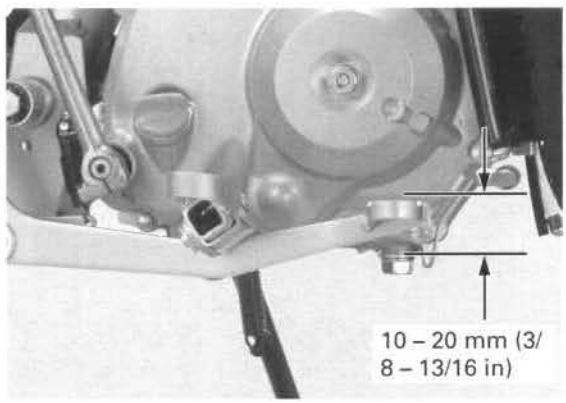
Adjust the brake lever free play by turning the adjusting nut.



REAR BRAKE

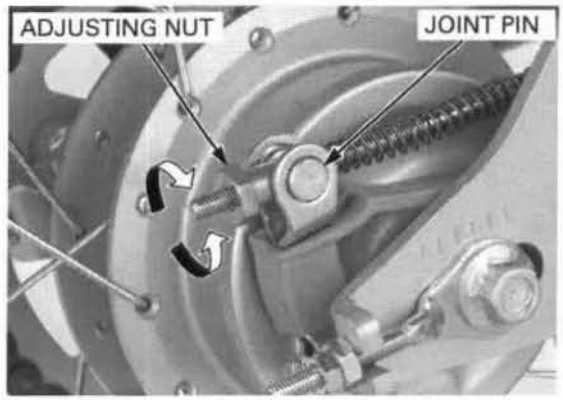
Check the brake pedal free play.

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



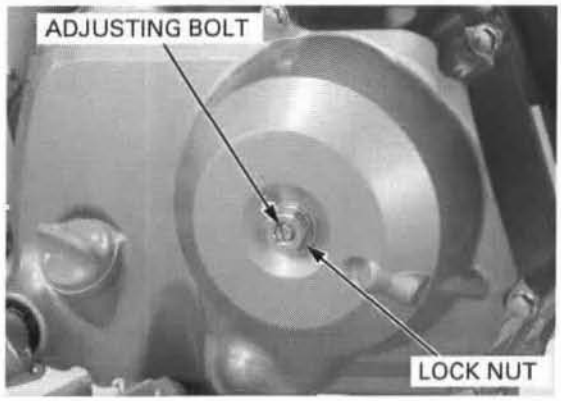
Make sure the cut-out on the adjusting nut is seated on the joint pin.

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



CLUTCH SYSTEM

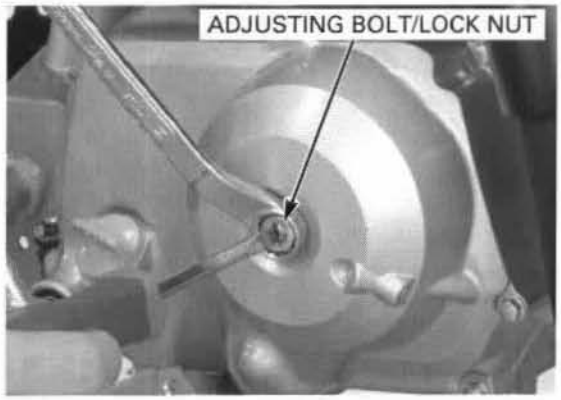
If the clutch does not operate properly, adjust the following:
Loosen the clutch adjuster lock nut and turn the adjusting bolt one full turn clockwise.



Slowly turn the adjusting bolt counterclockwise until resistance is felt.
Turn the adjusting bolt 1/8 turn clockwise from this position, and tighten the lock nut while holding the adjusting bolt.

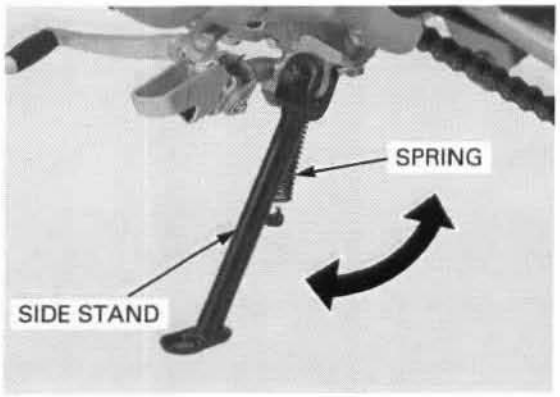
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Check that the clutch is not slipping and is properly disengaging by operating gearshift pedal.



SIDE STAND

Support the motorcycle on a level surface.
Check the side stand spring for damage or loss of tension.
Check the side stand assembly for freedom of movement and lubricate the side stand pivot if necessary.



SUSPENSION

FRONT SUSPENSION INSPECTION

Check the action of the fork legs by operating the front brake and compressing the front suspension several times.
Check the entire assembly for signs of leaks, damage or loose fasteners.
Replace damaged components which cannot be repaired.
Tighten all nuts and bolts.

Refer to page 12-15 for fork service.

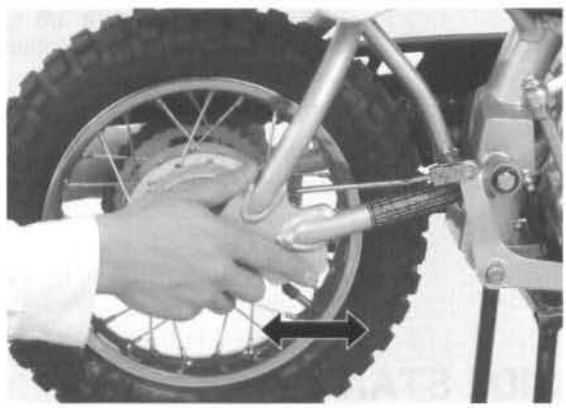
REAR SUSPENSION INSPECTION

Support the motorcycle on safety stand or box and raise the rear wheel off the ground.

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

Check for worn or loose suspension pivot components by grabbing the swingarm and attempting to move the swingarm back-and-forth.
Check each fastener of the swingarm and shock absorber, if any are looseness is noted.

Also, check the pivot bushings for wear or damage.

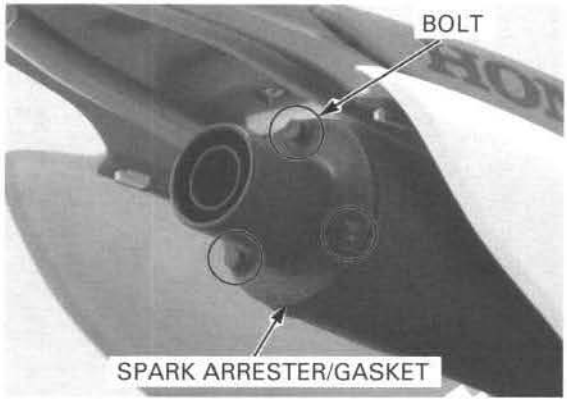


Check the action of the shock absorber by compressing it several times.
Check the entire shock absorber assembly for signs of leaks, damage or loose fasteners.
Replace damaged components which cannot be repaired.
Tighten all nuts and bolts.

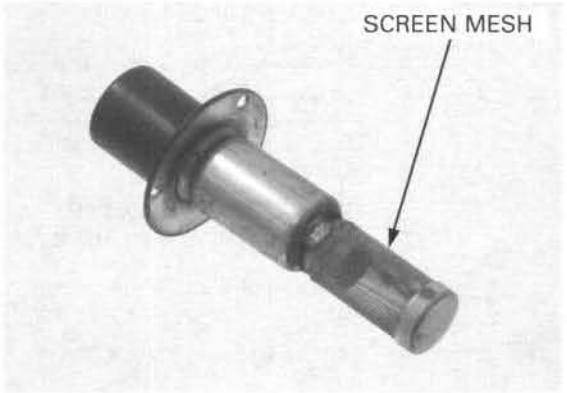
Refer to page 13-12 for shock absorber and to page 13-14 swingarm service.

SPARK ARRESTER

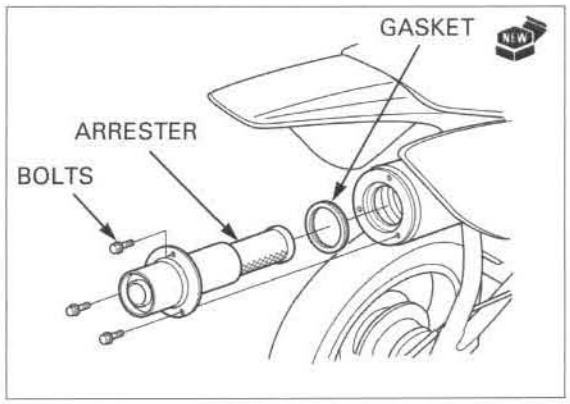
Remove the three bolts, spark arrester and gasket from the muffler.



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



Install the spark arrester with a new gasket into the muffler.
Tighten the three bolts securely.



NUTS, BOLTS, FASTENERS

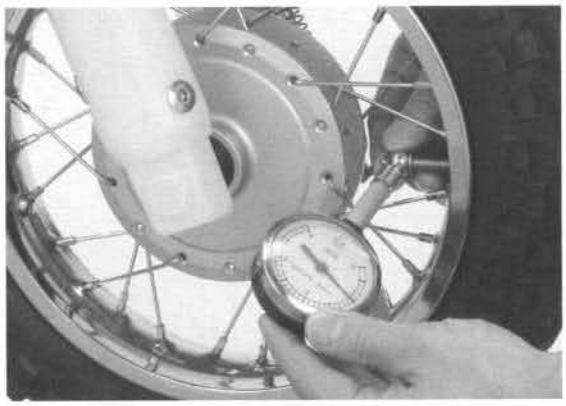
Check that all chassis nuts and bolts are tightened to their correct torque values (page 1-10).
Check that all safety clips, clamps and cable stays are in place and properly secured.

WHEELS/TIRES

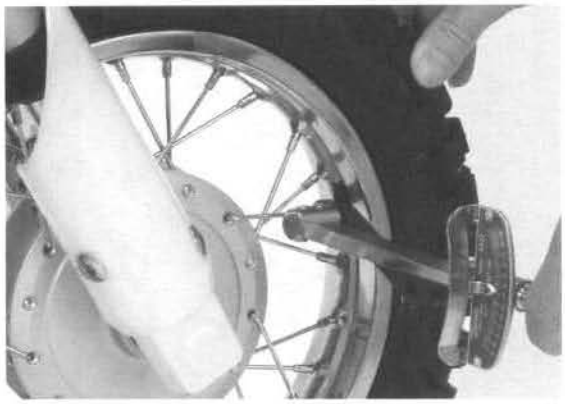
Tire pressure should be checked when the tires are COLD.

RECOMMENDED TIRE PRESSURE AND TIRE SIZE:

	FRONT	REAR
TIRE PRESSURE kPa (kgf/cm², psi)	100 (1.00, 15)	125 (1.25, 18)
TIRE SIZE	2.50-10 33J	2.50-10 33J
TIRE BLAND (CHENG SHIN)	C-183A	C-183A



Check the tires for cuts, embedded nails, or other damage.
Check the front and rear wheels for trueness (refer to page 12-3 and page 13-3)
Measure the tread depth at the center of the tires.
Replace the tires when the tread depth reaches the following limits.



MINIMUM TREAD DEPTH:
FRONT/REAR: 3.0 mm (0.12 in)

Tighten any loose spokes to the specified torque.

TOOL:
Spoke wrench, 4.1 x 4.5 mm — **07701 – 0020100 (Equivalent commercially available in U.S.A.)**

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

STEERING HEAD BEARINGS

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

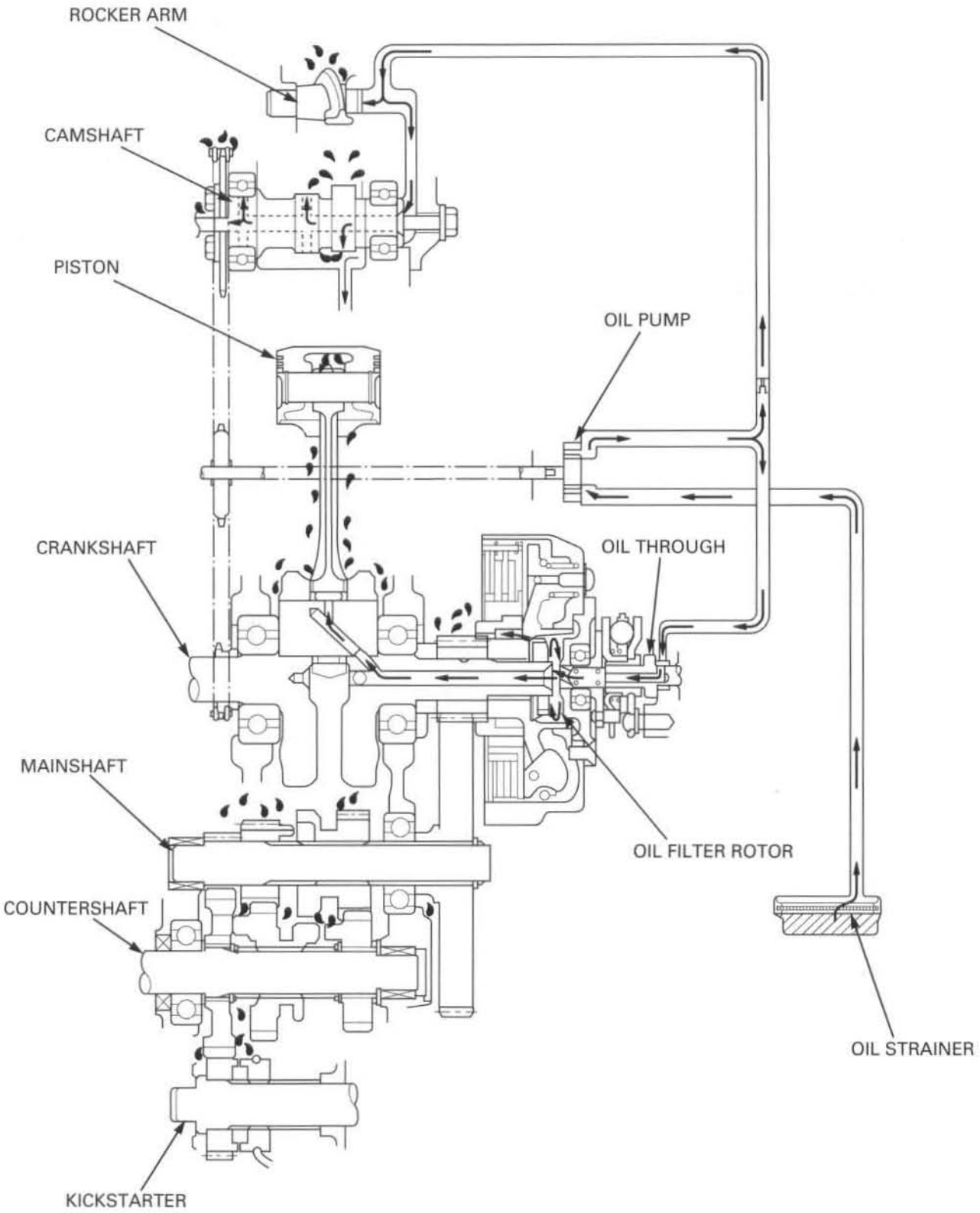
Support the motorcycle securely and raise the front wheel off the ground.

Check that the handlebar moves freely from side to side.

If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (page 12-18).

4. LUBRICATION SYSTEM

LUBRICATION SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

⚠CAUTION

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

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

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	At draining	0.6 liter (0.6 US qt, 0.5 Imp qt)	–
	At disassembly	0.8 liter (0.8 US qt, 0.7 Imp qt)	–
Recommended engine oil		Pro Honda GN4 4-stroke oil (U.S.A. and Canada) or equivalent motor oil API service classification: SG or higher JASO T 903 Standard: MA Viscosity: SAE 10W-30	–
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.02 – 0.07 (0.001 – 0.003)	0.12 (0.005)
	Side clearance	0.10 – 0.15 (0.004 – 0.006)	0.20 (0.008)

TORQUE VALUES

Oil pump mounting screw	7.4 N·m (0.75 kgf·m, 5.5 lbf·ft)
Oil pump cover screw	4.7 N·m (0.48 kgf·m, 3.5 lbf·ft)

TROUBLESHOOTING

Engine oil level too low, high oil consumption
- Normal oil consumption
- External oil leak
- Worn piston ring or incorrect piston ring installation
- Worn cylinder
- Worn valve guide or stem seal
- Oil pump worn or damaged

Oil contamination
- Oil not changed often enough
- Worn piston ring or incorrect piston ring installation
- Worn valve guide or stem seal
- Clogged oil strainer screen

OIL PUMP

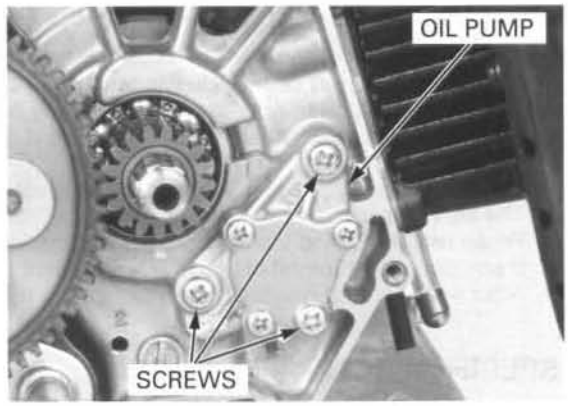
REMOVAL

Remove the clutch assembly (page 9-6).

When the oil pump is ready to be disassembled, loosen the pump cover screws.

Remove the three screws and oil pump assembly.

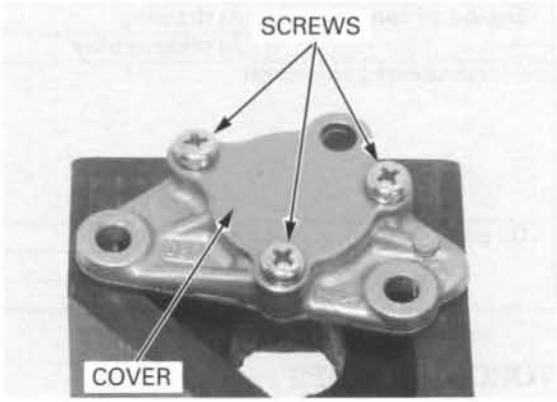
Remove the rotor shaft collar from the crankcase.



DISASSEMBLY

Remove the three screws and oil pump cover.

Remove the oil pump shaft, then remove the inner and outer rotors from the oil pump body.



INSPECTION

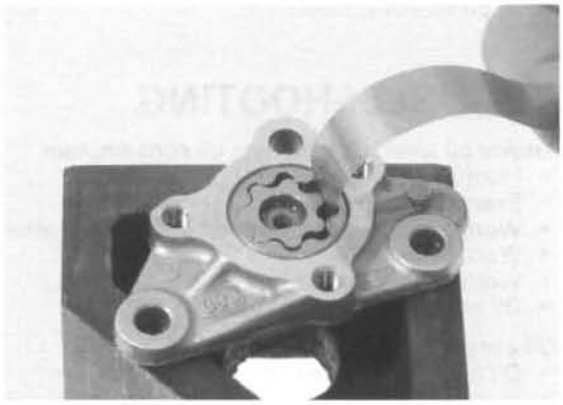
If any portion of the oil pump is worn beyond the specified service limit, replace the oil pump as an assembly.

Temporarily install the outer and inner rotors into the oil pump body.

Install the oil pump shaft.

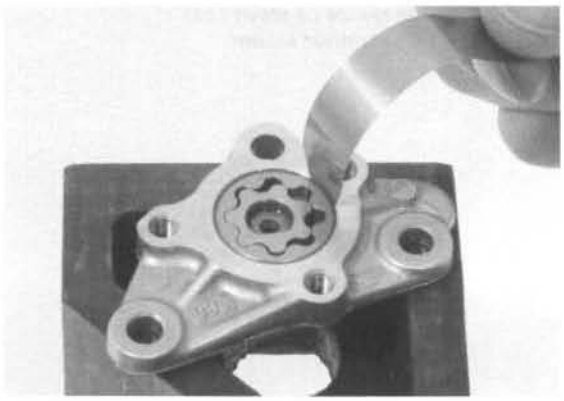
Measure the tip clearance between the inner and outer rotors.

SERVICE LIMIT: 0.20 mm (0.008 in)



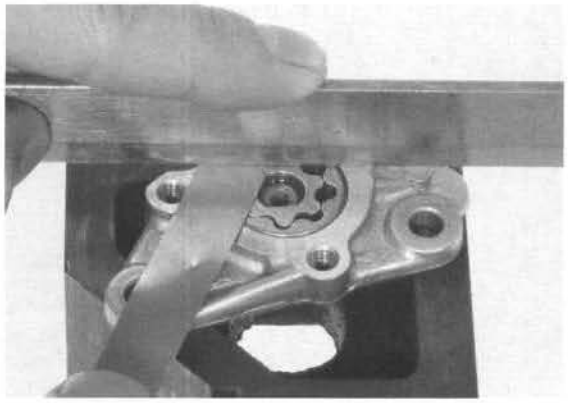
Measure the pump body clearance between the outer rotor and pump body.

SERVICE LIMIT: 0.12 mm (0.005 in)

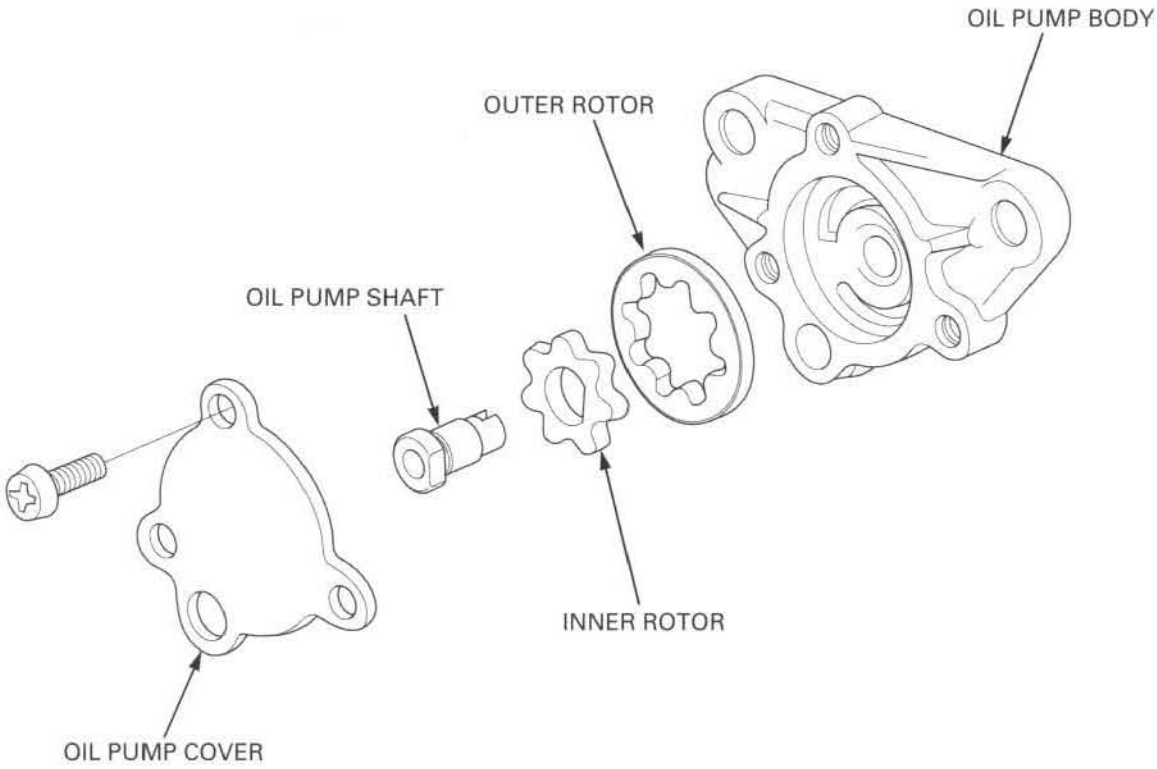


Measure the side clearance using a straight edge and feeler gauge.

SERVICE LIMIT: 0.20 mm (0.008 in)



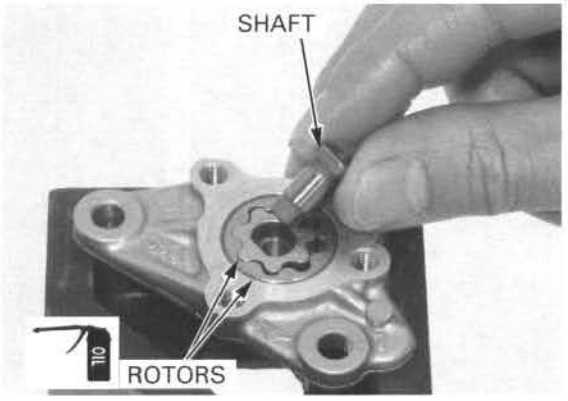
ASSEMBLY



Install the inner and outer rotors into the oil pump body.

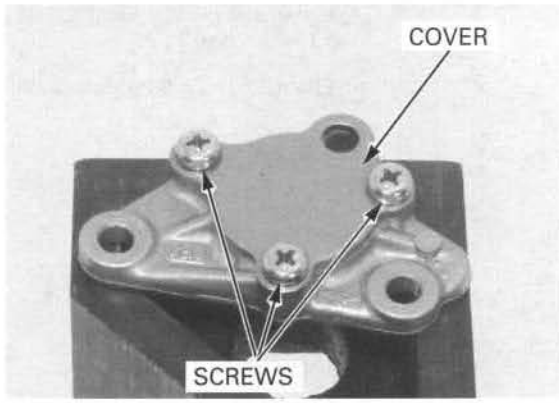
Install the oil pump shaft aligning the flat surfaces of the shaft and inner rotor.

Fill the oil pump with 0.5–1 cm^3 of engine oil.



Install the oil pump cover and tighten the screws to the specified torque.

TORQUE: 4.7 N·m (0.48 kgf·m, 3.5 lbf·ft)

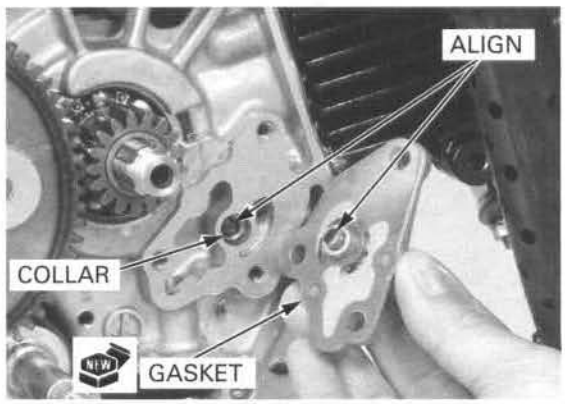


INSTALLATION

Install the rotor shaft collar into the crankcase.

Install a new gasket onto the oil pump body.

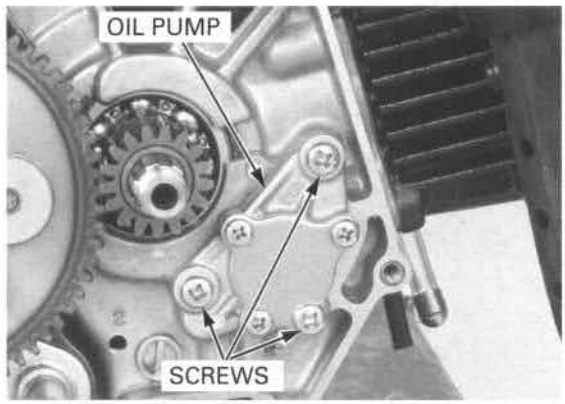
Install the oil pump into the crankcase while aligning the pump shaft groove with the cam chain guide spindle lug.



Install and tighten the three screws to the specified torque.

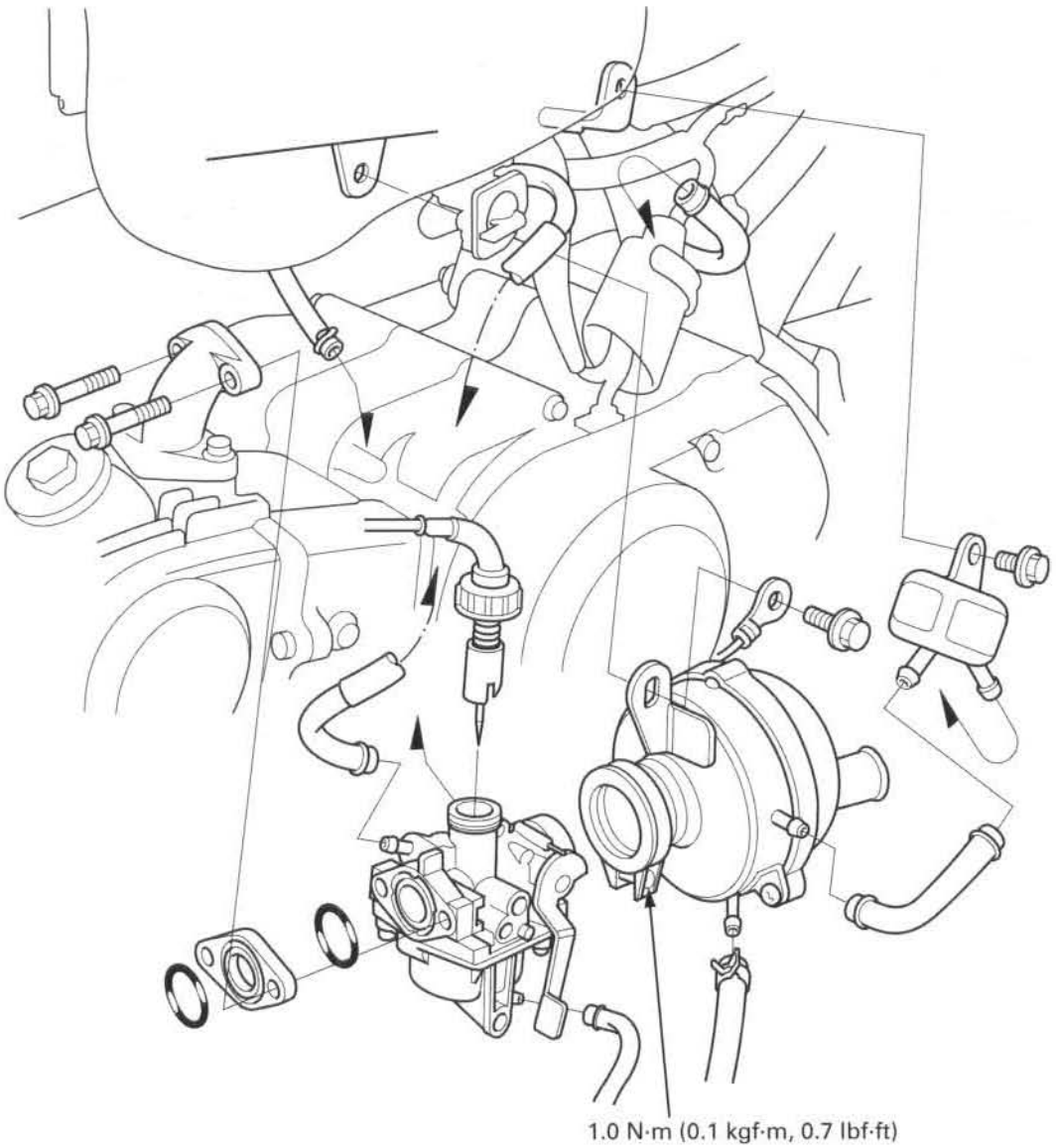
TORQUE: 7.4 N·m (0.75 kgf·m, 5.5 lbf·ft)

Install the clutch assembly (page 9-14).



5. FUEL SYSTEM

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- 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.
- Refer to page 2-4 for fuel tank removal and installation.
- When disassembling fuel system parts, note the location of the O-rings. Replace them with new ones on reassembly.
- Before disassembling the carburetor, place the suitable container under the carburetor drain hose. Loosen the screw and drain the carburetor.
- After removing the carburetor, wrap the intake port of the engine with a shop towel or cover it with piece of tape to prevent any foreign material from dropping into the engine.

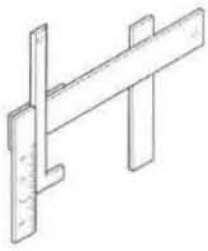
SPECIFICATIONS

ITEM		SPECIFICATIONS
Carburetor identification number	'04 and '05 U.S.A., '04 – '07 Canada:	PA42A
	'06 and '07 U.S.A:	PA42B
	After '07:	PA42C
Main jet		#58
Slow jet		#35 x #35
Jet needle clip position ('04 and '05 U.S.A., '04 – '07 Canada)		2rd groove from top
Air screw initial opening		1-1/2 turns out
Float level		12.7 mm (0.50 in)
Idle speed		1,700 ± 100 rpm
Throttle grip freeplay		2.0 – 4.0 mm (1/16 – 3/16 in)

TORQUE VALUES

Connecting boot band screw	1.0 N·m (0.1 kgf·m, 0.7 lbf·ft)

TOOL

Carburetor float level gauge 07401-0010000 	Pilot screw wrench (D type) 07KMA-MS60101  or 07KMA-MN9A100 (U.S.A. only)	Pilot screw wrench guide 07PMA-MZ20110 

TROUBLESHOOTING

Engine cranks but won't start
- Too much fuel getting to the engine
  - Air cleaner clogged
  - Flooded carburetor
- Intake air leak
- Fuel contaminated/deteriorated
- No fuel to carburetor
  - Fuel strainer clogged
  - Fuel hose clogged
  - Float level misadjusted
  - Fuel tank breather hose clogged

Lean mixture
- Fuel jets clogged
- Float valve faulty
- Float level too low
- Fuel line restricted
- Carburetor air vent hose clogged
- Clogged fuel strainer screen
- Intake air leak
- Throttle valve faulty

Rich mixture
- Choke lever in CLOSE position
- Float valve faulty
- Float level too high
- Air jets clogged
- Air cleaner element contaminated
- Flooded carburetor

Engine stalls, hard to start, idles roughly
- Fuel line restricted
- Ignition malfunction
- Fuel mixture too lean/rich
- Fuel contaminated/deteriorated
- Intake air leak
- Idle speed misadjusted
- Float level misadjusted
- Fuel tank breather hose clogged
- Air screw misadjusted
- Slow circuit clogged

Afterburn when engine braking is used
- Lean mixture in slow circuit

Backfiring or misfiring during acceleration
- Ignition system malfunction
- Fuel mixture too lean

Poor performance (driveability) and poor fuel economy
- Fuel system clogged
- Ignition system malfunction

AIR CLEANER HOUSING

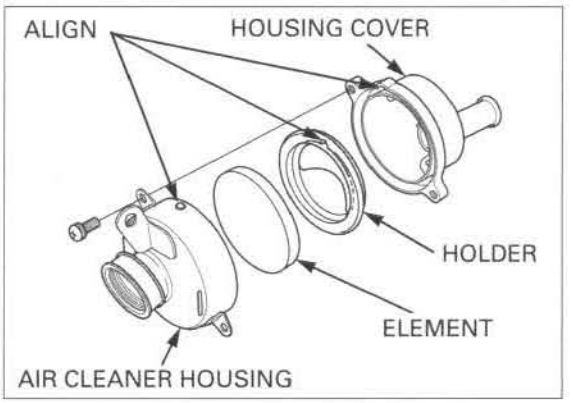
REMOVAL/INSTALLATION

- Refer to page 3-7 for air cleaner element service.

Disconnect the crankcase breather hoses.
Loosen the connecting boot band screw.
Remove the bolt and the air cleaner housing assembly.

At installation, secure the ground eyelet with the air cleaner housing mounting bolt.

Installation is in the reverse order of removal.



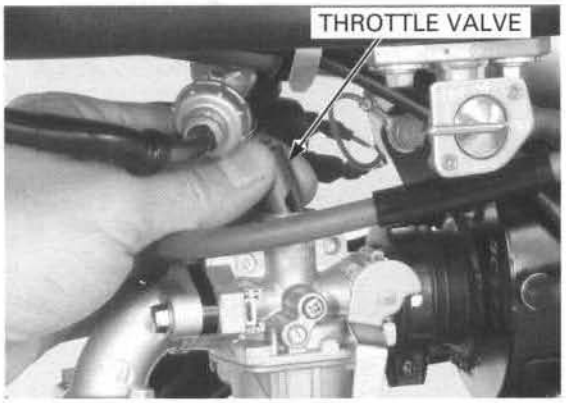
CARBURETOR REMOVAL

THROTTLE VALVE

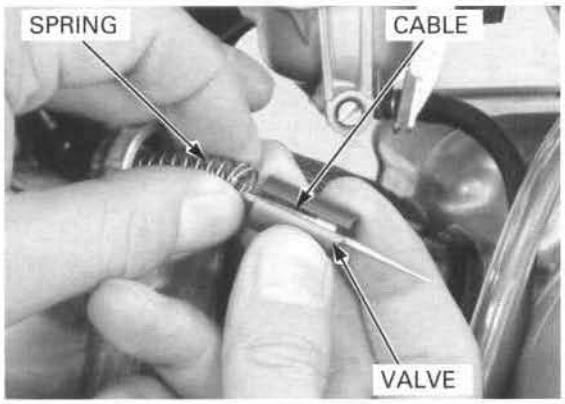
Remove the seat/shrouds/side cover/rear fender assembly (page 2-3).

Loosen the carburetor top.

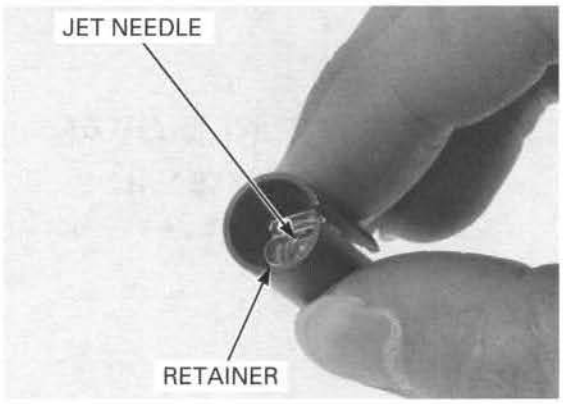
Remove the carburetor top and throttle valve from the carburetor.



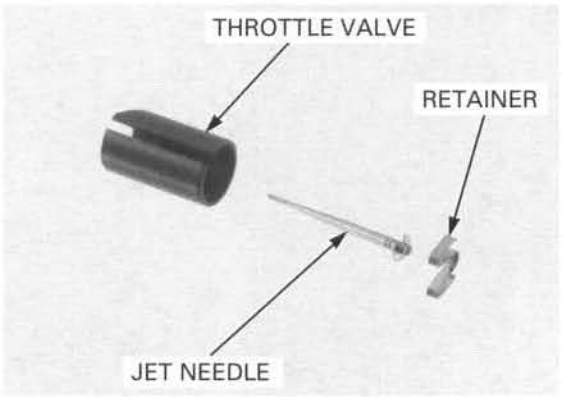
Remove the throttle cable from the throttle valve while compressing the throttle valve spring.



Remove the jet needle retainer and jet needle.



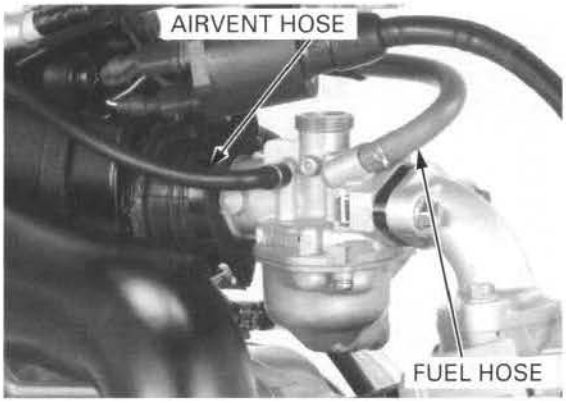
Check the throttle valve and jet needle for scratches, wear or damage.



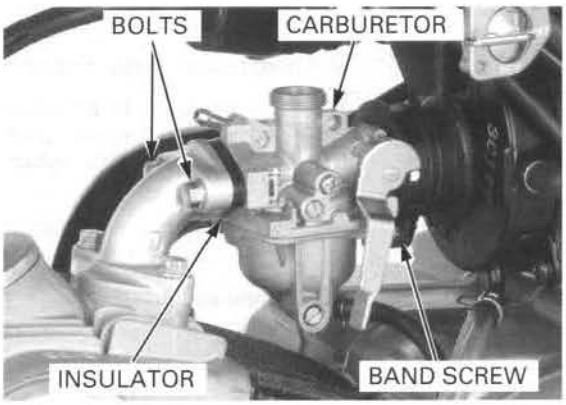
CARBURETOR BODY

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

Disconnect the fuel hose, air vent hose and from the carburetor body.



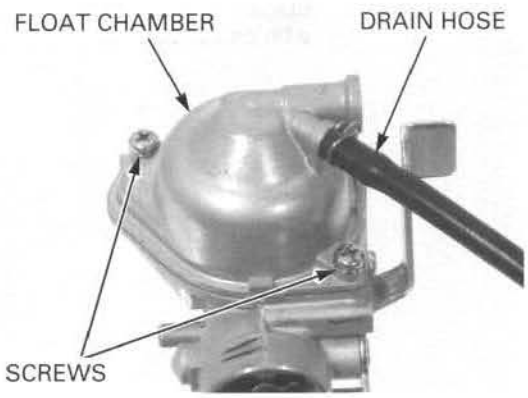
Loosen the carburetor connecting boot band screw. Remove the carburetor mounting bolts, carburetor and insulator.



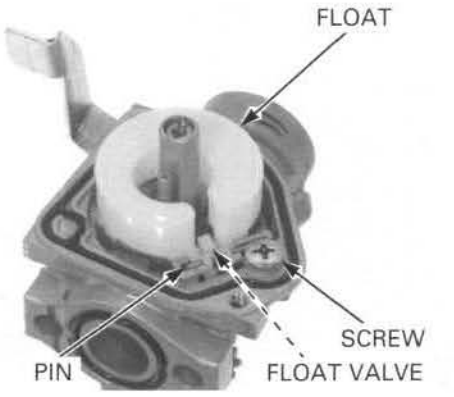
CARBURETOR DISASSEMBLY

Remove the drain hose.

Remove the screws and float chamber.



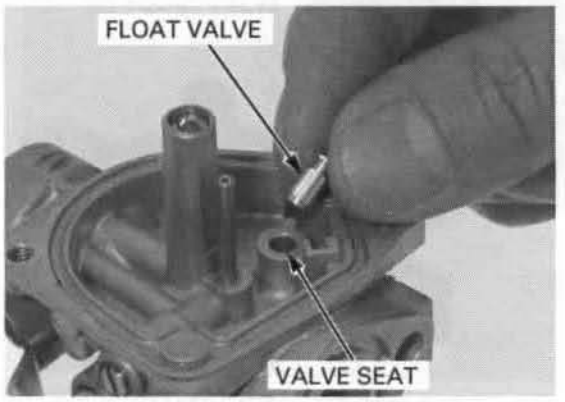
Remove the screw.
Remove the float pin, float and float valve.
Inspect the float for deformation or damage.



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 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.

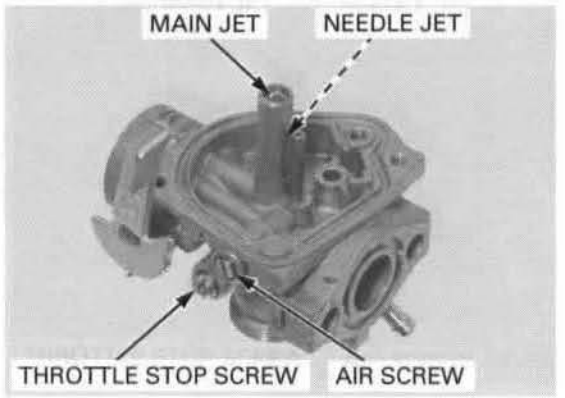
Remove the following:

- Main jet
- Needle jet
- Throttle stop screw and spring

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

Turn the air screw in and carefully count the number of turns until it seats lightly. Make a note of this to use as a reference when reinstalling the air screw.

Remove the air screw and spring.



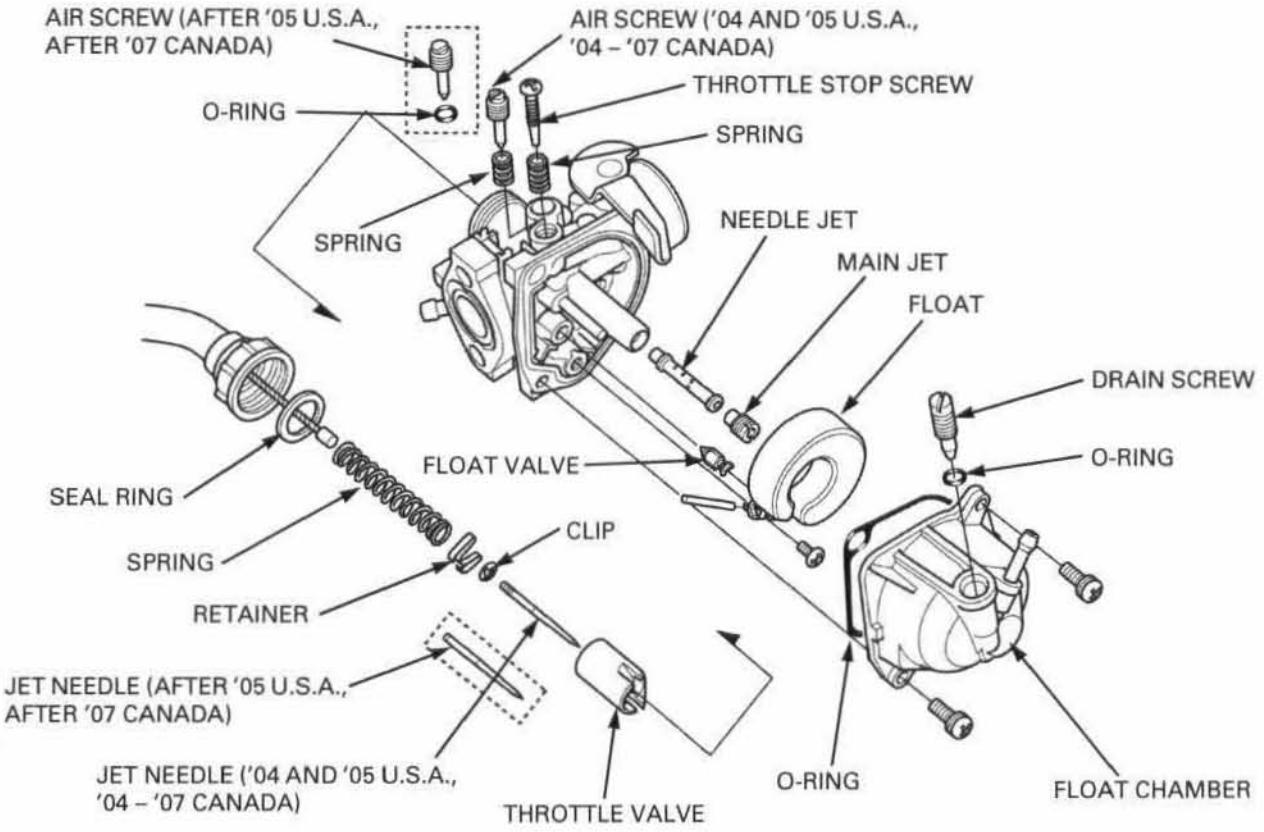
After '05 U.S.A., After '07 Canada:

TOOLS:

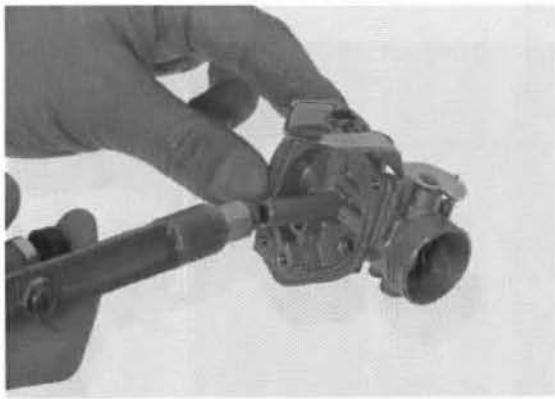
Pilot screw wrench (D type)	**07KMA-MS60101 or 07KMA-MN9A100 (U.S.A. only)**
Pilot screw wrench guide	**07PMA-MZ20110**

Inspect each jet for wear or damage and replace if necessary.
Clean the jets with cleaning solvent and blow open with compressed air.

CARBURETOR ASSEMBLY



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

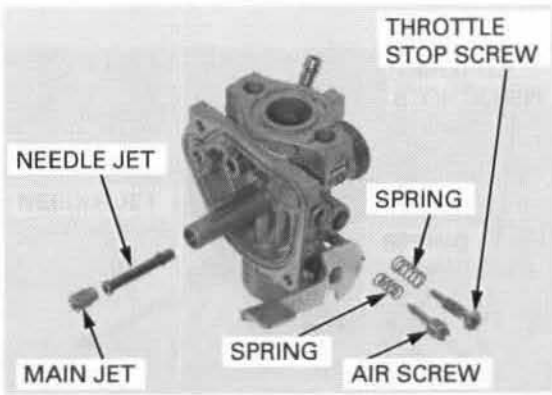


Handle all jets with care. They can easily be scored or scratched.

Install the following:

- Throttle stop screw and spring
- Needle jet
- Main jet

Install the air screw with the spring and return it to its original position as noted during removal.



After '05 U.S.A., After '07 Canada:

TOOLS:

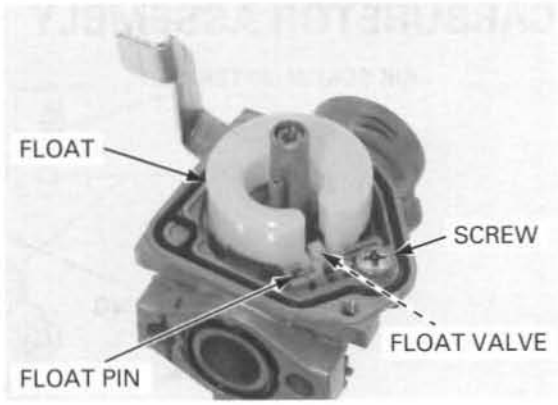
Pilot screw wrench (D type)	**07KMA-MS60101 or 07KMA-MN9A100 (U.S.A. only)**
Pilot screw wrench guide	**07PMA-MZ20110**

Perform the air screw adjustment procedure if a new air screw is installed (page 5-13).

Hang the float valve onto the float arm lip.

Install the float pin through the float, then install the float/float pin to the groove on the carburetor body.

Install and tighten the screw.



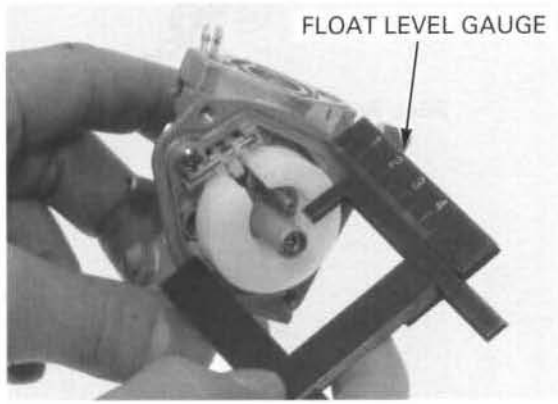
FLOAT LEVEL INSPECTION

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

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

TOOL:
Carburetor float level gauge 07401-0010000

FLOAT LEVEL: 12.7 mm (0.50 in)



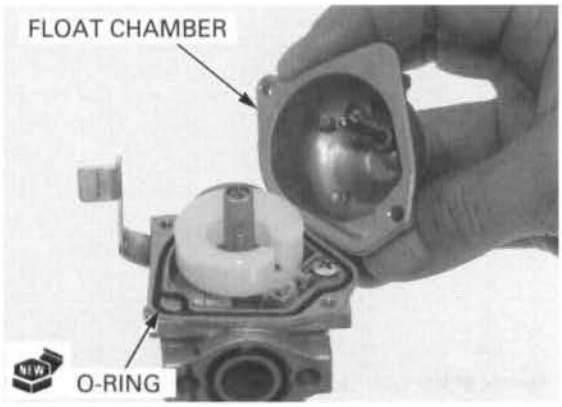
The float cannot be adjusted.

If the float level is out of specification, Inspect the float valve and valve seat.

If the float valve and valve seat are normal, replace the float assembly.

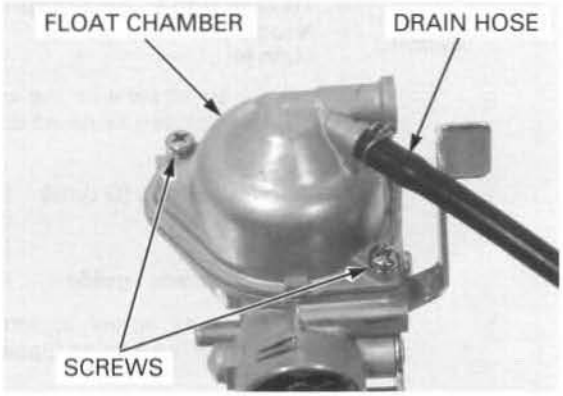
If the float valve and valve seat are abnormal, replace them and recheck the float level.

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



Install and tighten the float chamber screws.

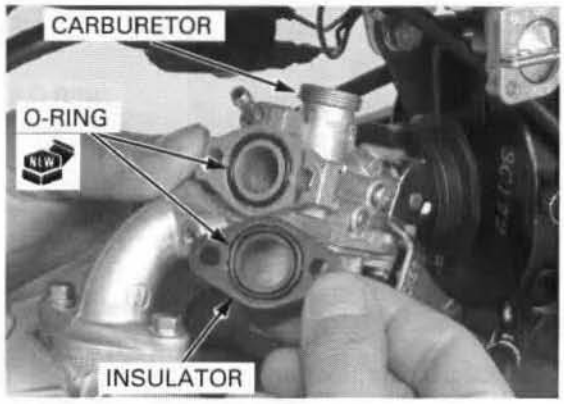
Install the drain hose.



CARBURETOR INSTALLATION

CARBURETOR BODY

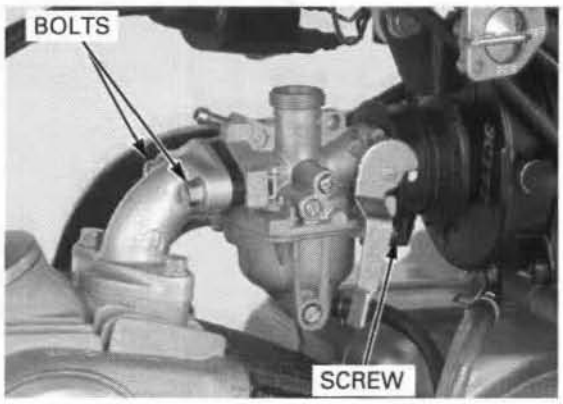
Install the new O-rings into the insulator and carburetor body grooves.



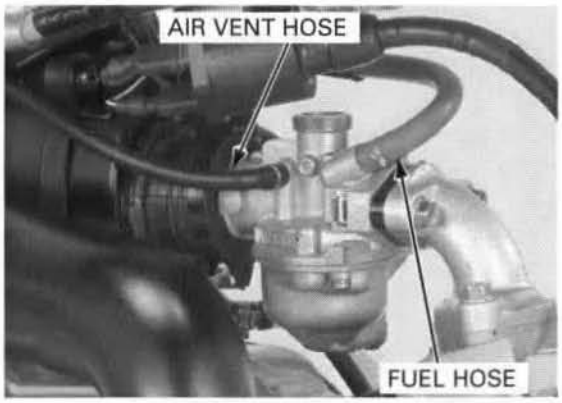
Install the carburetor body to the air cleaner connecting boot and the insulator between the manifold and carburetor, then install the mounting bolts. Tighten the connecting boot band screw.

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

Tighten the mounting bolts.



Connect the fuel hose and air vent hose.



THROTTLE VALVE

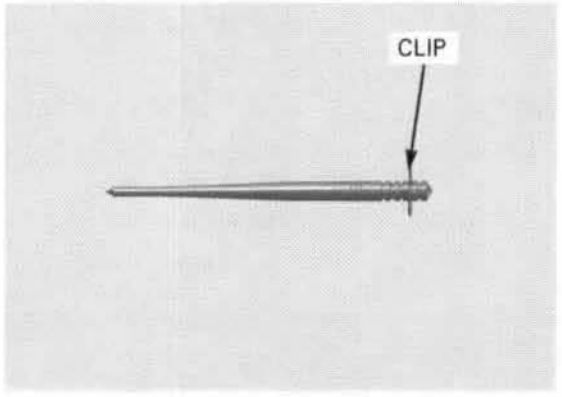
Install the needle clip on the jet needle.

'04 and '05 U.S.A., '04 – '07 Canada:

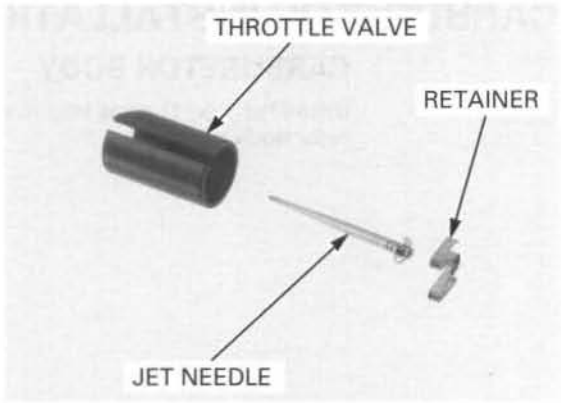
STANDARD POSITION: 2rd groove from top

After '05 U.S.A., After '07 Canada:

After '05 U.S.A. and After '07 Canada models can not adjust the needle clip position.

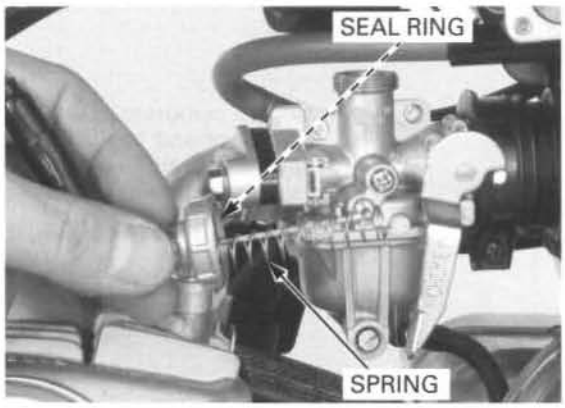


Install the jet needle into the throttle valve and secure it with the needle retainer.

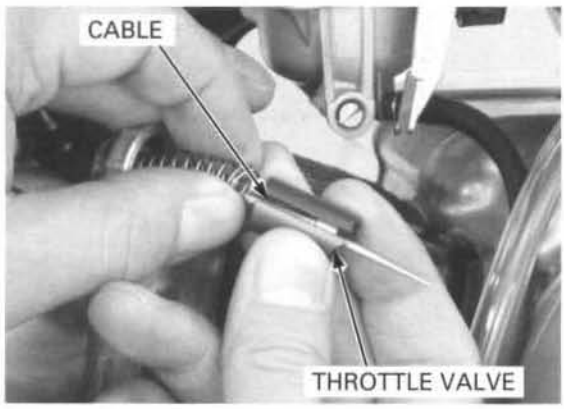


Check the seal ring is in good condition, replace if necessary.

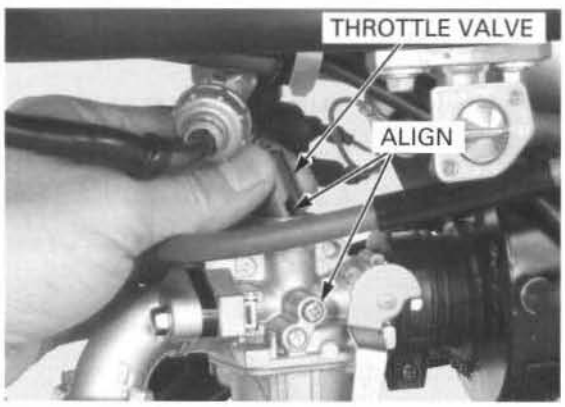
Install the throttle valve spring onto the throttle cable.



Connect the throttle cable to the throttle valve while compressing the throttle valve spring.



Install the throttle valve into the carburetor body, aligning its cut-out with the throttle stop screw.



Tighten the carburetor top securely.

After installing the carburetor, check for the following:

- Engine idle speed (page 3-13)
- Throttle grip free play (page 3-6)

AIR SCREW ADJUSTMENT

IDLE DROP PROCEDURE

- The air screw is factory pre-set. Adjustment is not necessary unless the carburetor is overhauled or new air screw is installed.
- The engine must be warm for accurate adjustment. Ten minutes of stop-and-go riding is sufficient.
- Use a tachometer with graduations of 50 rpm or smaller that will accurately indicate 50 rpm change.

After '05 U.S.A., After '07 Canada:

Adjust the air screw using the following tools.

TOOLS:

Pilot screw wrench (D type)	**07KMA-MS60101 or 07KMA-MN9A100 (U.S.A. only)**
Pilot screw wrench guide	**07PMA-MZ20110**

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

1. Turn the air screw clockwise until it seats lightly, and then back it out to the specification given.
   INITIAL OPENING: 1-1/2 turns out
2. Warm the engine up to operating temperature.
3. Stop the engine and connect a tachometer according to the tachometer 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 air screw in or out slowly to obtain the highest engine speed.

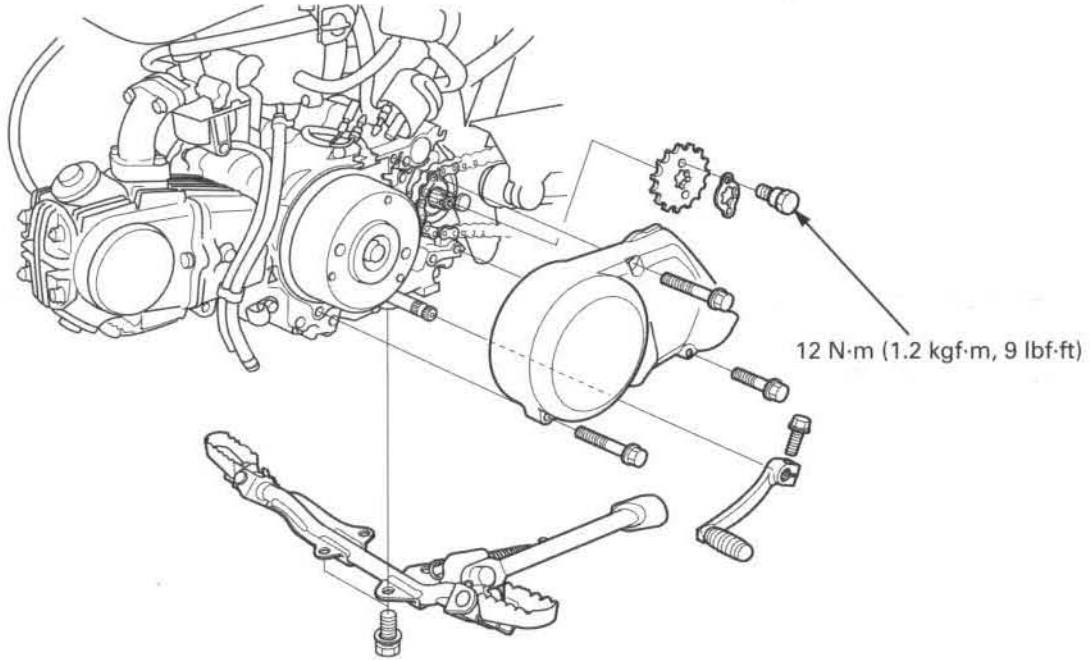
CRANKCASE BREATHER

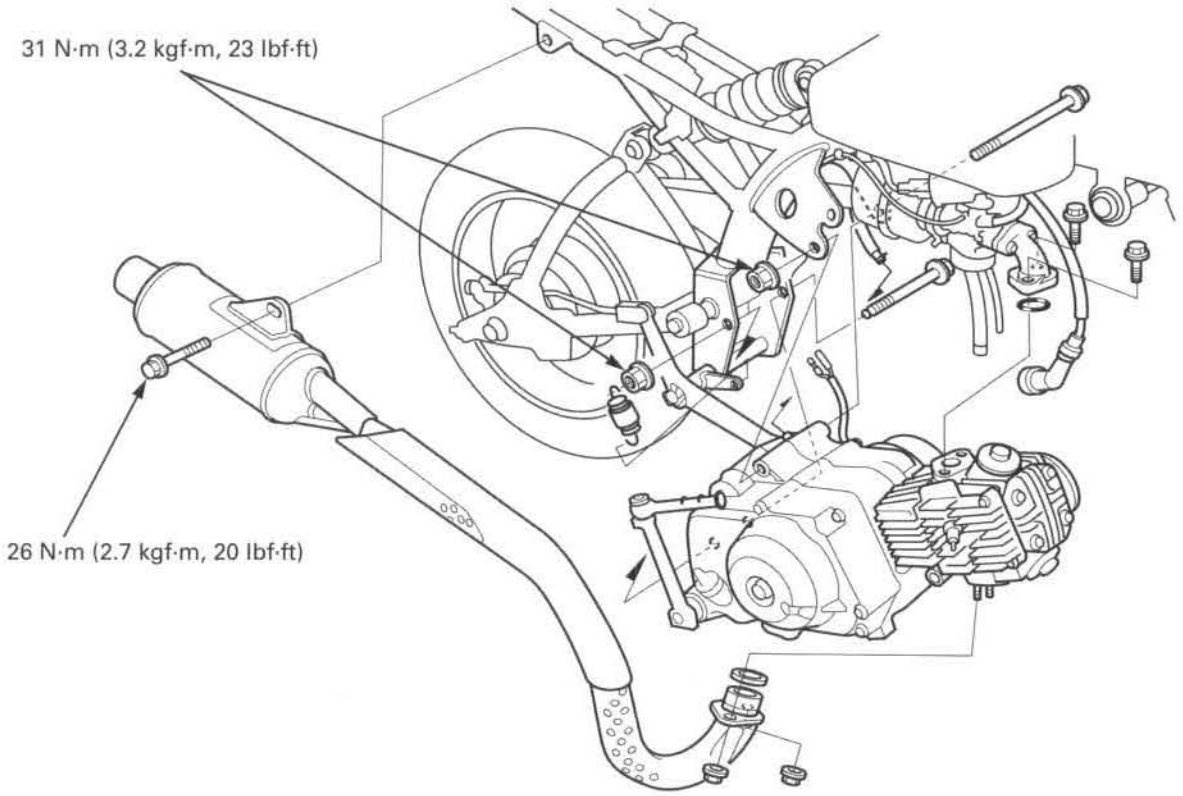
Remove the crankcase breather hose plug and empty any deposits if the deposit level can be seen in the breather hose.

Install the crankcase breather hose plug and secure it with the clip securely.

6. ENGINE REMOVAL/INSTALLATION

COMPONENT LOCATION





SERVICE INFORMATION

GENERAL

- During engine removal and installation, support the motorcycle securely using a hoist or equivalent.
- Support the engine using a jack or other adjustable support to ease of engine hanger bolts removal.
- The following components can be serviced with the engine installed in the frame.
  - Alternator/cam chain tensioner (page 10-3)
  - Clutch (page 9-6)
  - Cylinder/piston (page 8-3)
  - Cylinder head/valves (page 7-3)
  - Gearshift linkage (page 9-16)
  - Oil pump (page 4-4)
- The crankshaft, transmission and kickstarter require engine removal for service (page 11-3).

SPECIFICATIONS

ITEM	SPECIFICATIONS
Engine dry weight	17.2 kg (37.9 lbs)
Engine oil capacity at disassembly	0.8 liter (0.8 US qt, 0.7 Imp qt)

TORQUE VALUES

Drive sprocket fixing plate bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Engine hanger nut	31 N·m (3.2 kgf·m, 23 lbf·ft)
Muffler mounting bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)

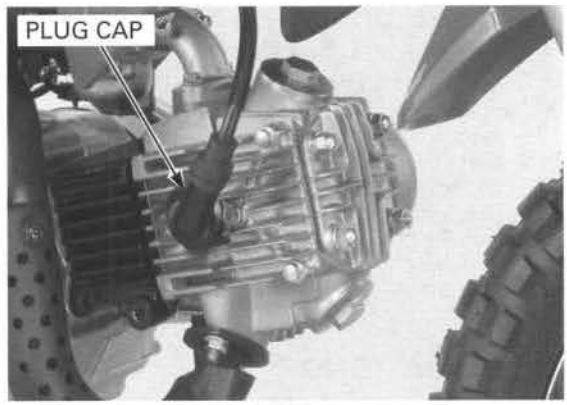
ENGINE REMOVAL

Drain the engine oil (page 3-11).

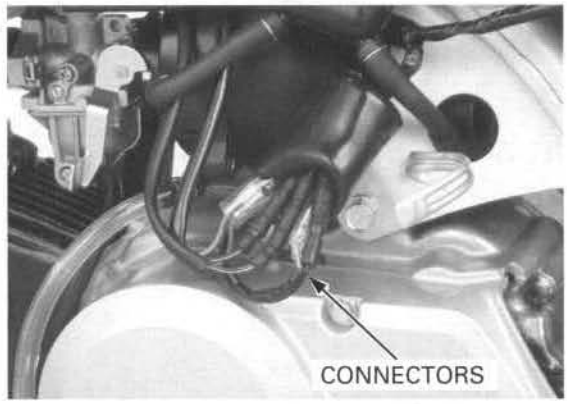
Remove the following:

- Exhaust system (page 2-5)
- Left crankcase cover (page 10-4)

Disconnect the spark plug cap from the spark plug.



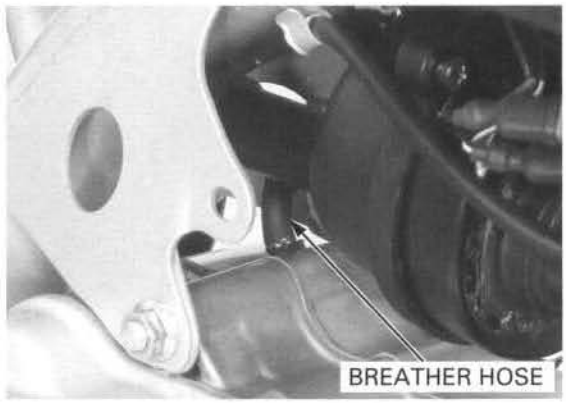
Disconnect the ignition pulse generator and alternator connectors.



Disconnect the crankcase breather hose from the crankcase.

Remove the following from the clamp:

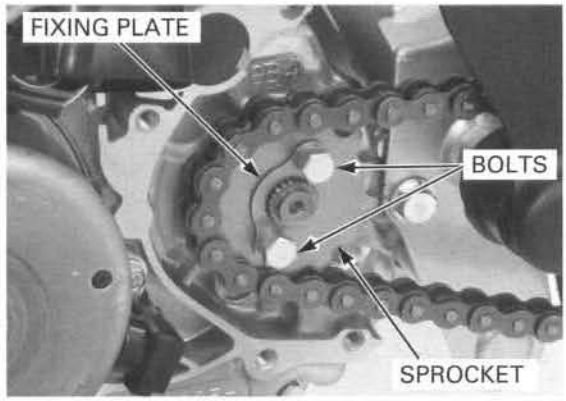
- Carburetor drain hose
- Crankcase breather hose



Loosen the rear axle nut and drive chain adjusters to loosen the drive chain (page 3-13)

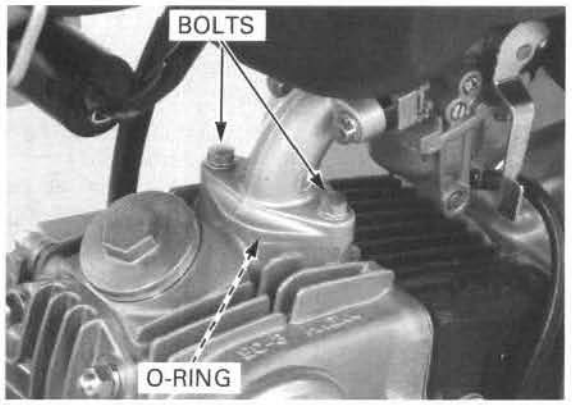
Remove the following:

- Fixing plate bolts
- Fixing plate
- Drive sprocket

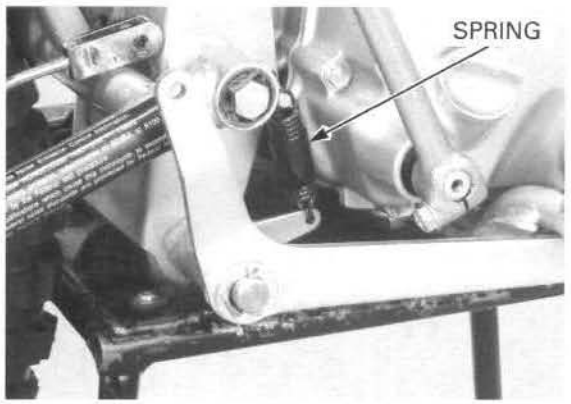


Remove the following:

- Intake manifold bolts
- O-ring

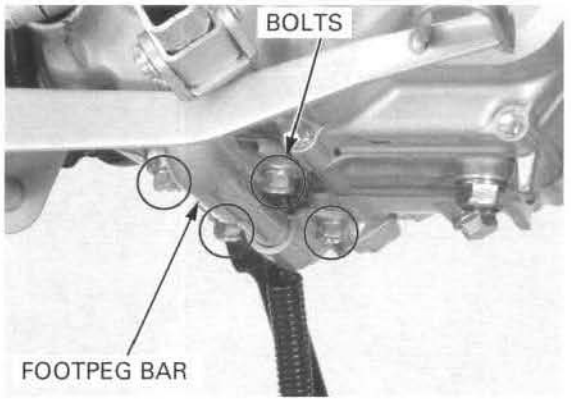


- Brake pedal return spring



Support the motorcycle securely.

- Four bolts and footpeg bar

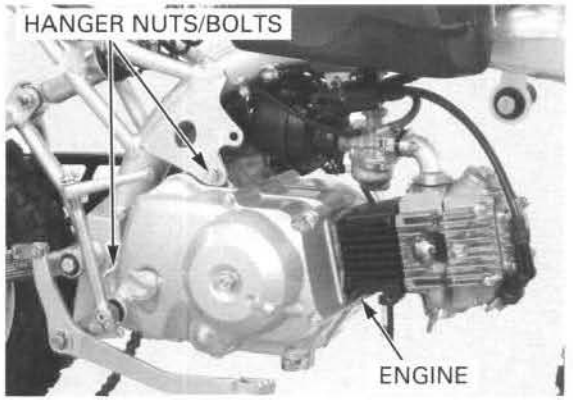


Remove the engine hanger nuts.

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

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

Remove the hanger bolts and the engine from the frame.



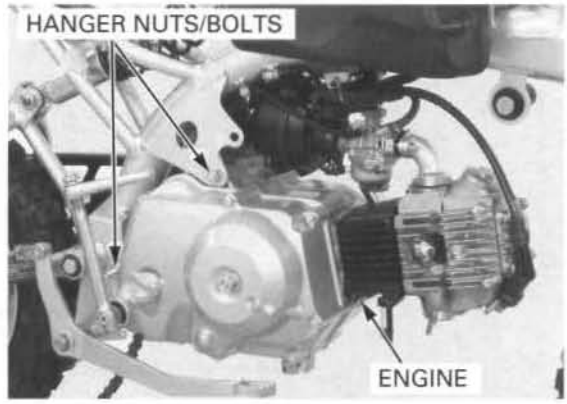
ENGINE INSTALLATION

Install the engine onto the frame in the reverse order of removal.

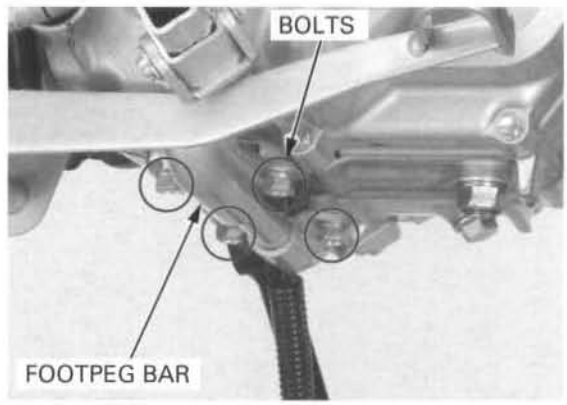
- Note the installation of the hanger bolts. All bolts are installed from left side.
- The jack height must be continually adjusted to relieve stress from the hanger bolts.

Tighten the hanger nuts to the specified torque.

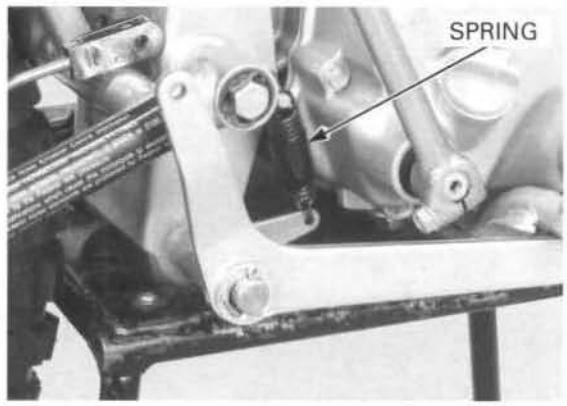
TORQUE: 31 N·m (3.2 kgf·m, 23 lbf·ft)



Install the four bolts and footpeg bar.

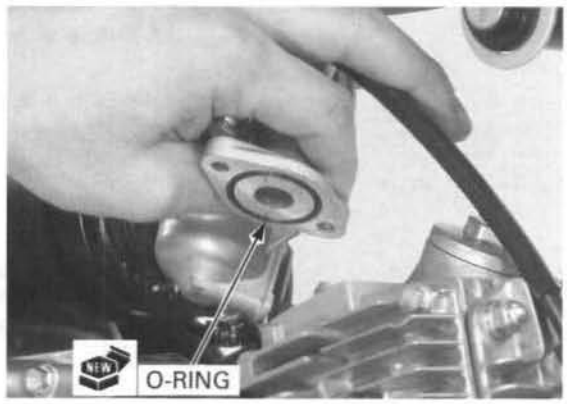


Install the brake pedal return spring.



Replace the intake manifold O-ring with a new one.

Install and tighten the intake manifold bolts.

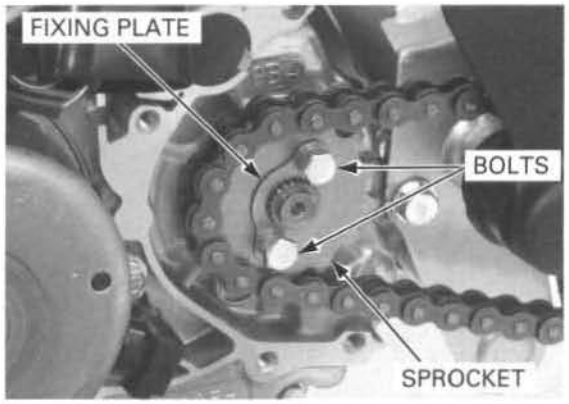


Install the following.

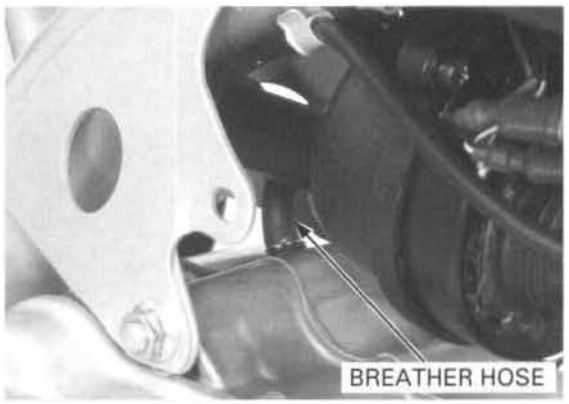
- Drive sprocket
- Fixing plate
- Fixing plate bolts

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Adjust the drive chain slack (page 3-13).



Connect the crankcase breather hose to the crankcase.



Connect the ignition pulse generator and alternator connectors.

Connect the spark plug cap to the spark plug.

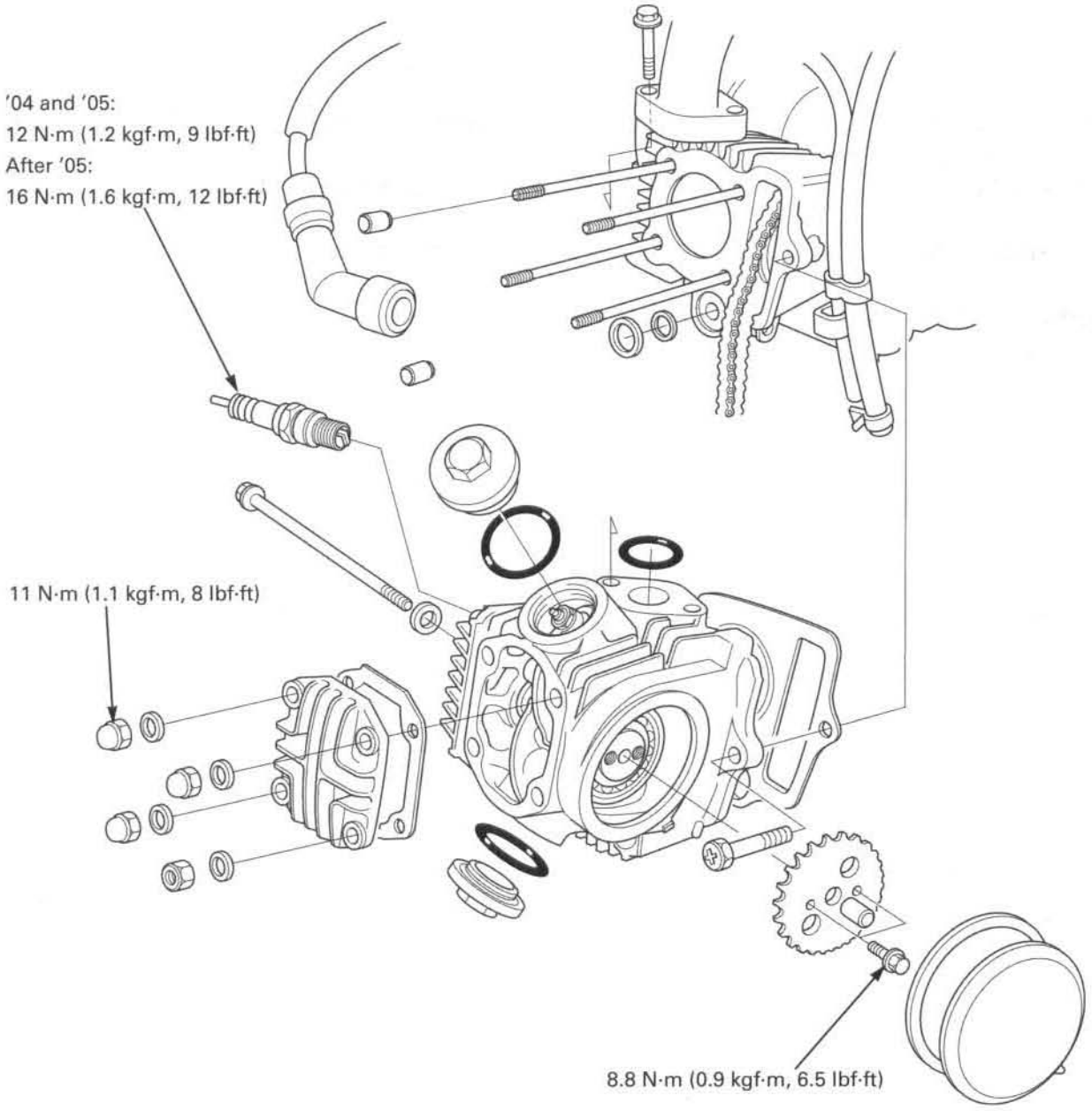
Install the following.

- Exhaust system (page 2-5)
- Left crankcase cover (page 10-8)

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

7. CYLINDER HEAD/VALVES

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- This section covers service of the cylinder head, valves and camshaft.
- The cylinder head, valves and camshaft 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 lubricating oil is fed through oil passages in the cylinder head. Clean the oil passages before assembling cylinder head.
- Be careful not to damage the mating surfaces when removing the cylinder head cover and cylinder head.
- Refer to page 10-6 for cam chain tensioner service.

SPECIFICATIONS

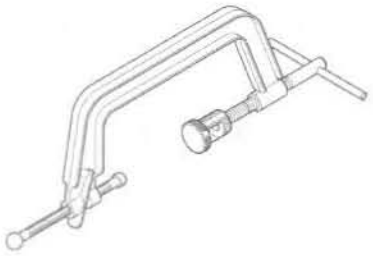
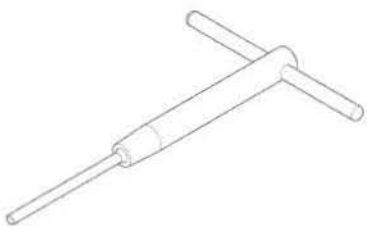
Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			981 – 1,177 kPa (10.0 – 12.0 kgf/cm^2, 142 – 171 psi) at 1,000 rpm	–
Cylinder head warpage			–	0.05 (0.002)
Valve and valve guide	Valve clearance	IN/EX	0.05 ± 0.02 (0.002 ± 0.001)	–
	Valve stem O.D.	IN	4.970 – 4.985 (0.1957 – 0.1963)	4.92 (0.194)
		EX	4.955 – 4.970 (0.1951 – 0.1957)	4.92 (0.194)
	Valve guide I.D.	IN/EX	5.000 – 5.012 (0.1969 – 0.1973)	5.03 (0.198)
	Stem-to-guide clearance	IN	0.015 – 0.042 (0.0006 – 0.0017)	0.08 (0.003)
		EX	0.030 – 0.057 (0.0012 – 0.0022)	0.10 (0.004)
	Valve seat width	IN/EX	1.0 – 1.3 (0.04 – 0.05)	2.0 (0.08)
Valve spring free length		IN/EX	33.34 (1.313)	31.8 (1.25)
Rocker arm/ shaft	Rocker arm I.D.	IN/EX	10.000 – 10.015 (0.3937 – 0.3943)	10.10 (0.398)
	Rocker arm shaft O.D.	IN/EX	9.978 – 9.987 (0.3928 – 0.3932)	9.91 (0.390)
Camshaft	Cam lobe height	IN	20.003 – 20.123 (0.7875 – 0.7922)	19.66 (0.774)
		EX	19.994 – 20.114 (0.7872 – 0.7919)	19.65 (0.774)

TORQUE VALUES

Cylinder head cover nut/cap nut	11 N·m (1.1 kgf·m, 8 lbf·ft)
Cylinder head right side cover bolt	9.8 N·m (1.0 kgf·m, 7 lbf·ft)
Cam sprocket bolt	8.8 N·m (0.9 kgf·m, 6.5 lbf·ft)

TOOLS

Valve spring compressor 07757-0010000 	Valve spring compressor attachment 07959-KM30101 	Valve guide reamer, 5.0 mm 07984-MA60001  or 07984-MA6000D (U.S.A only)
Valve guide driver, 5.0 mm 07942-MA60000 	Valve seat cutter, 24 mm (45°IN) 07780-0010600  or equivalent commercially available in U.S.A.	Valve seat cutter, 20.5 mm (45°EX) 07780-0011000  or equivalent commercially available in U.S.A.
Flat cutter, 21.5 mm (32°EX) 07780-0012800  or equivalent commercially available in U.S.A.	Flat cutter, 24 mm (32°IN) 07780-0012500  or equivalent commercially available in U.S.A.	Interior cutter, 22 mm (60°IN/EX) 07780-0014202  or equivalent commercially available in U.S.A.
Cutter holder, 5 mm 07781-0010400  or equivalent commercially available in U.S.A.		

TROUBLESHOOTING

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

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

- Valves:
  - Incorrect valve clearance
  - Burned or bent valve
  - Incorrect valve timing
  - Broken valve spring
  - Uneven valve seating
- Cylinder head:
  - Leaking or damaged head gasket
  - Warped or cracked cylinder head
- Worn cylinder, piston or piston rings (page 8-5)

Compression too high, overheating or knocking

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

Excessive smoke

- Cylinder head:
  - Worn valve stem or valve guide
  - Damaged stem seal
- Worn cylinder, piston or piston rings (page 8-5)

Excessive noise

- Cylinder head:
  - Incorrect valve clearance
  - Sticking valve or broken valve spring
  - Damaged or worn camshaft
  - Loose or worn cam chain
  - Worn or damaged cam chain
  - Worn or damaged cam chain tensioner (page 10-7)
  - Worn cam sprocket teeth
  - Worn rocker arm and/or shaft
- Worn cylinder, piston or piston rings (page 8-5)

Rough idle

- Low cylinder compression

CYLINDER COMPRESSION

Warm up the engine to normal operating temperature.
Stop the engine and remove the spark plug (page 3-8).
Install a compression gauge.
Shift the transmission in neutral and open the choke lever.
Open the throttle all the way and crank the engine with the kickstarter until the gauge reading stops rising.

COMPRESSION PRESSURE:
981 – 1,177 kPa (10.0 – 12.0 kgf/cm², 142 – 171 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

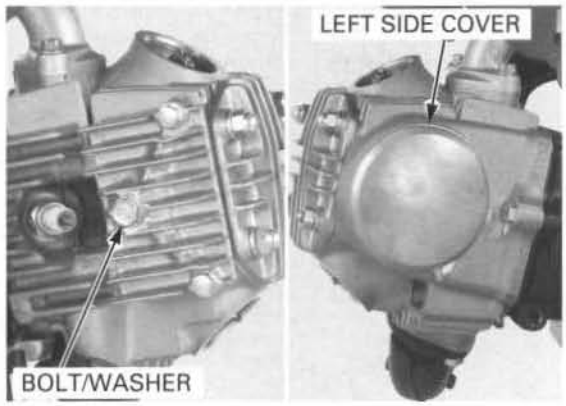
CAMSHAFT REMOVAL

Drain the engine oil (page 3-11)

Remove the following:

- Valve adjuster hole caps (page 3-9)
- Left crankcase cover (page 10-4)
- Sealing bolt, tensioner spring and tensioner push rod to loosen the cam chain tensioner (page 10-6)

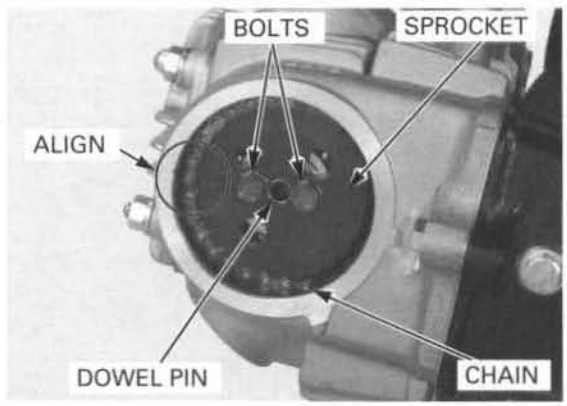
Disconnect the spark plug cap.
Loosen the cylinder head side cover 6 mm bolt.
Tap the head of the 6 mm bolt and release the cylinder head left side cover from the cylinder head.
Remove the 6 mm bolt, sealing washer and cylinder head left side cover.



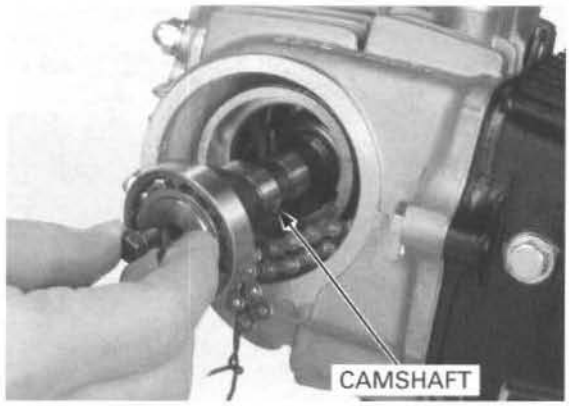
Turn the crankshaft counterclockwise, and align the "O" mark on the cam sprocket with the index notch on the cylinder head.

Secure the cam chain with a piece of wire to prevent it from falling into the cylinder.

Remove the bolts, cam sprocket and dowel pin.

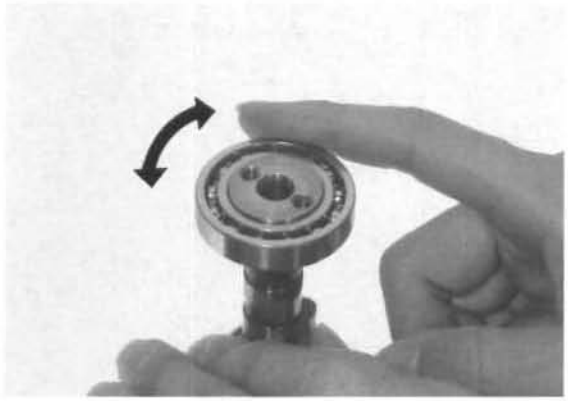


Loosen the valve adjusting screw fully to make a valve clearance maximum (page 3-10).
Temporarily install the cam sprocket bolts into the camshaft and remove the camshaft from the cylinder head while holding the rocker arms.



INSPECTION

Turn the outer races of the each camshaft bearing with your finger.
The outer race should turn smoothly and quietly.
Also check that the bearing inner race fits tightly on the camshaft.
Replace the camshaft assembly if the outer race does not turn smoothly and quietly, or if it fits loosely on the camshaft.



Using a micrometer, measure each cam lobe height.

SERVICE LIMITS:
IN: 19.66 mm (0.774 in)
EX: 19.65 mm (0.774 in)

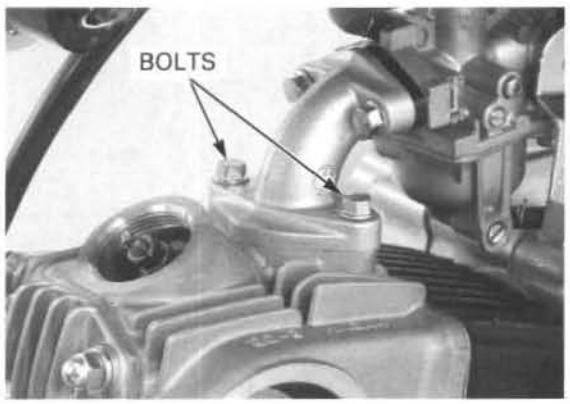
CYLINDER HEAD

REMOVAL

Remove the following:

- Muffler (page 2-5)
- Camshaft (page 7-6)

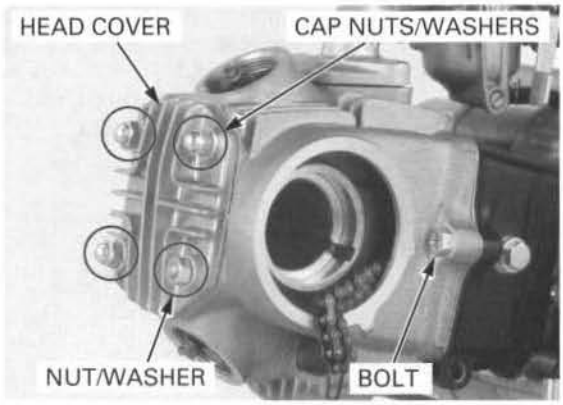
Remove the intake manifold bolts.
Remove the O-ring.



Remove the following:

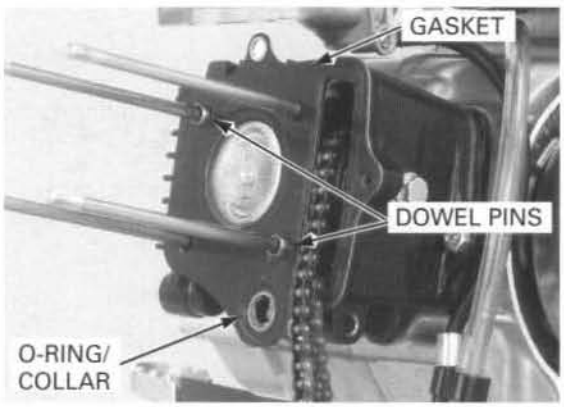
- Cap nuts/sealing washers
- Nut/sealing washers
- Cylinder head cover
- Gasket

Remove the cylinder head mounting bolt and cylinder head.



Remove the following:

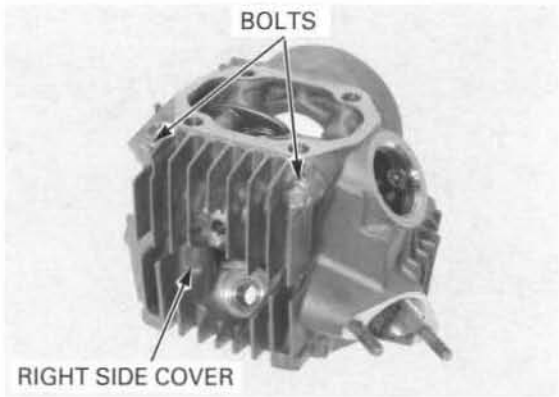
- Gasket
- Dowel pins
- Collar
- O-ring



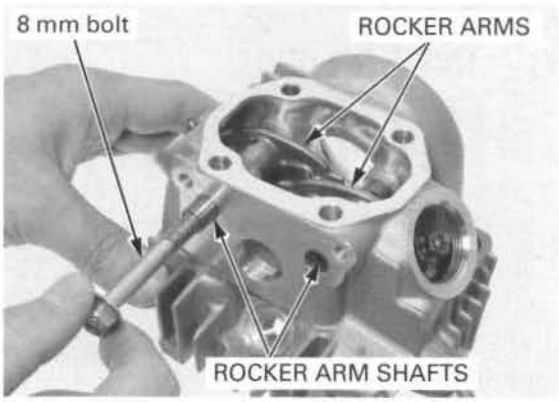
DISASSEMBLY

Remove the spark plug (page 3-8).

Remove the bolts and cylinder head right side cover.



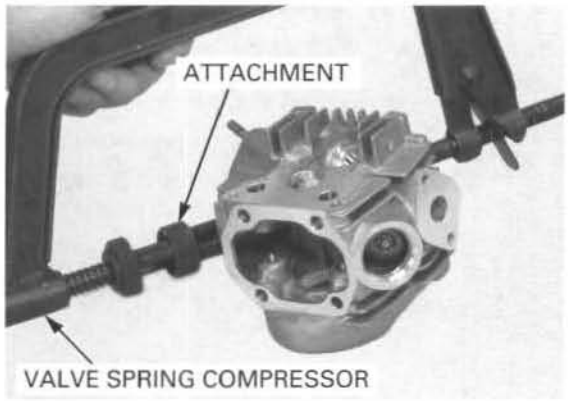
Temporarily install a 8 mm bolt to the rocker arm shaft and remove the rocker arm shafts and rocker arms.



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

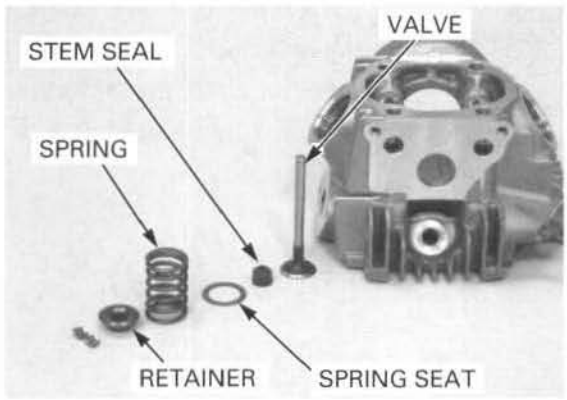
Remove the valve spring cotters using the special tools as shown.

TOOLS:
Valve spring compressor 07757-0010000
Valve spring compressor attachment 07959-KM30101



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

Remove the following:
- Spring retainer
- Valve spring
- Valve
- Valve spring seat
- Stem seal



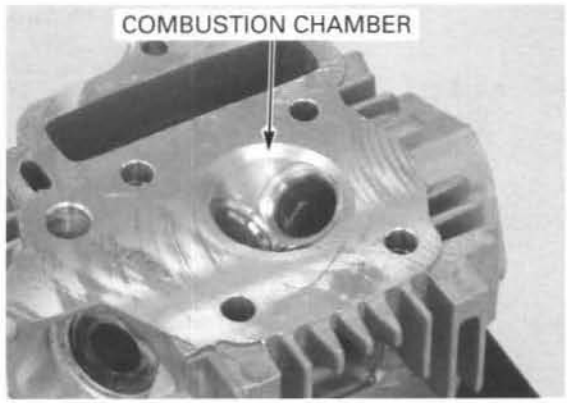
INSPECTION

CYLINDER HEAD

Remove carbon deposits from the combustion chamber.

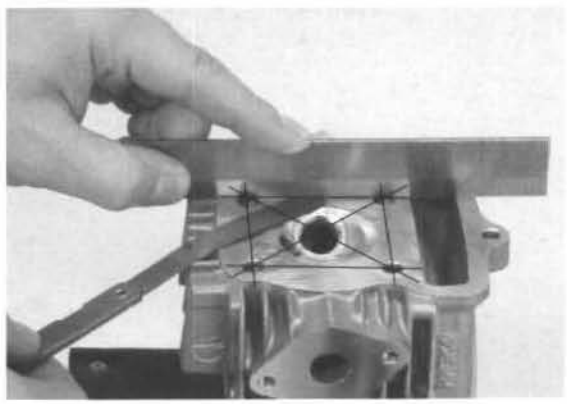
Avoid damaging the gasket surface.

Check the spark plug hole and valve areas for cracks.



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

SERVICE LIMIT: 0.05 mm (0.002 in)



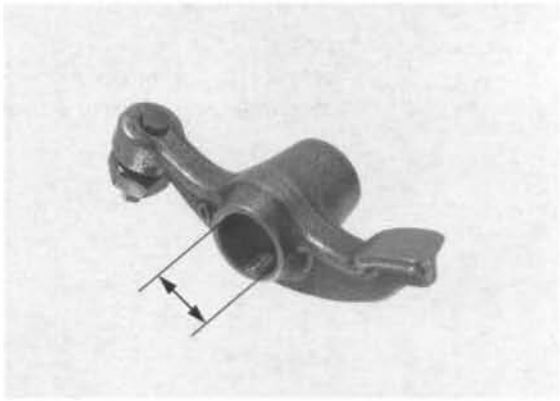
ROCKER ARM/SHAFT

If either rocker arm requires service or replacement, inspect the cam lobes for scoring, chipping or flat spots.

Inspect the rocker arm slipper surfaces for wear or damage.
Also check that the oil holes are not clogged.

Measure the rocker arm I.D.

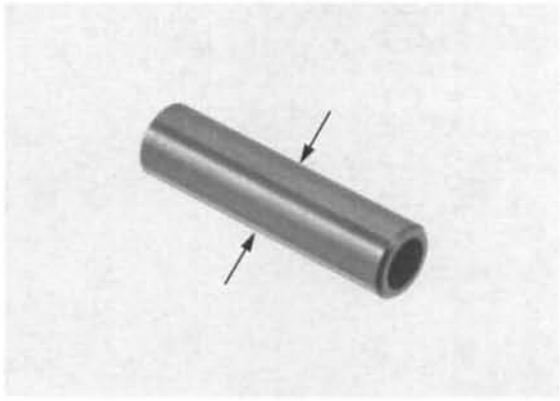
SERVICE LIMIT: IN/EX: 10.10 mm (0.398 in)



Inspect the rocker arm shaft for wear or damage.

Measure the O.D.of the rocker arm shaft.

SERVICE LIMIT: IN/EX: 9.91 mm (0.390 in)

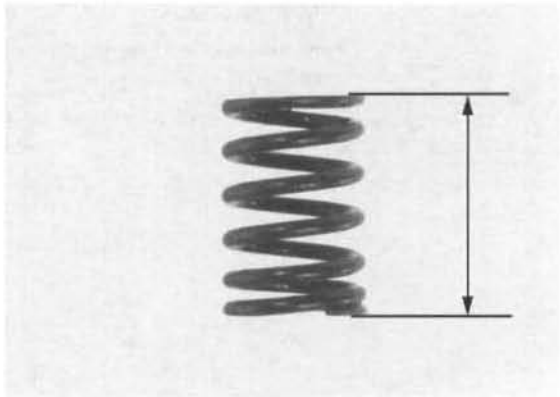


VALVE SPRING

Measure the free length of the valve springs.

SERVICE LIMIT: IN/EX: 31.8 mm (1.25 in)

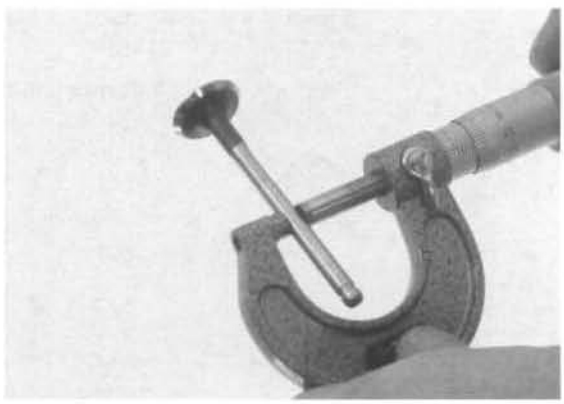
Replace the springs if they are shorter than the service limit.



VALVE

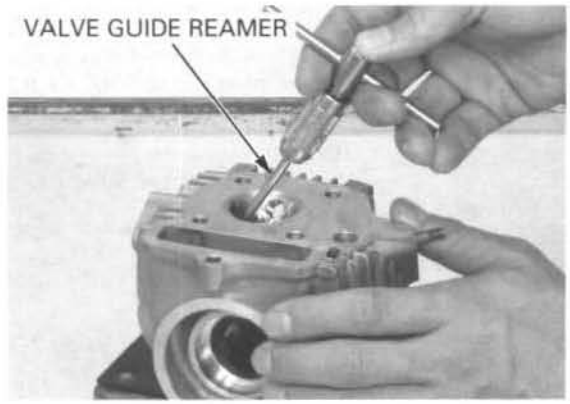
Inspect each valve for bending, burning or abnormal stem wear.
Check valve movement in the guide.
Measure and record each valve stem O.D.

SERVICE LIMIT: IN/EX: 4.92 mm (0.194 in)



Ream the guides to remove any carbon deposits before measuring the guide.
Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise.

TOOL:
Valve guide reamer, 5.0 mm **07984-MA60001 or 07984-MA6000D (U.S.A. only)**



Measure and record each valve guide I.D.

SERVICE LIMIT: IN/EX: 5.03 mm (0.198 in)

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

SERVICE LIMITS:
IN: 0.08 mm (0.003 in)
EX: 0.10 mm (0.004 in)

Reface the valve seats whenever the valve guides are replaced (page 7-12)

If the stem-to-guide clearance is out of specification, 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 is out of specification with a new guide, also replace the valve.

VALVE GUIDE REPLACEMENT

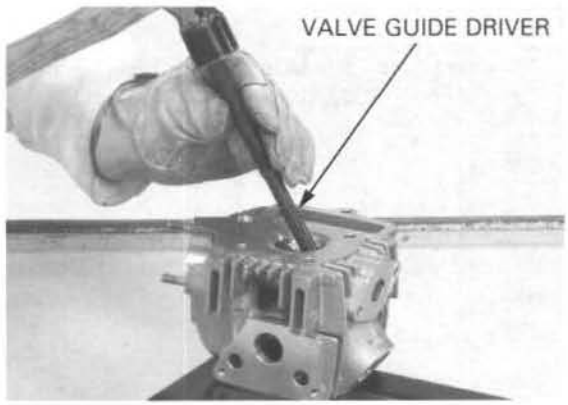
Chill new valve guides in the freezer section of a refrigerator for about an hour.

Do not use a torch to heat the cylinder head; it may cause warping.

Heat the cylinder head to 212 – 302 °F (100 – 150 °C) with a hot plate or oven.

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

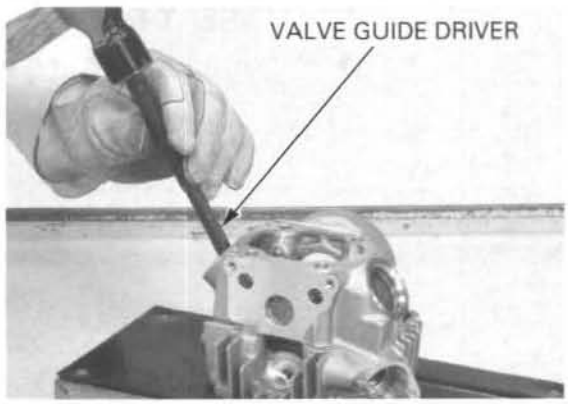
TOOL:
Valve guide driver, 5.0 mm **07942-MA60000**



Coat new O-rings with engine oil and install them onto new valve guides.
While the cylinder is still heated, drive the new guides in the cylinder head from the camshaft side until they are fully seated.

TOOL:
Valve guide driver, 5.0 mm **07942-MA60000**

Let the cylinder head cool to room temperature.

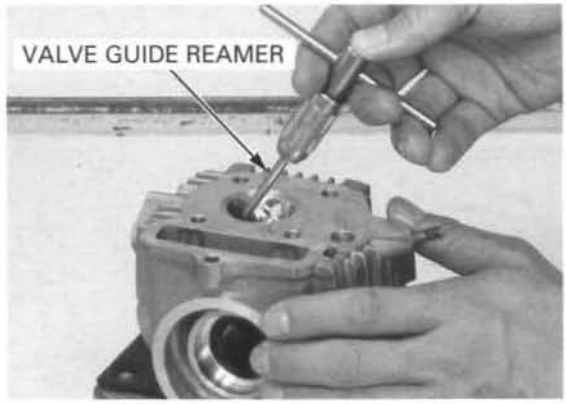


Ream the new valve guide after installation.

Use cutting oil on the reamer during this operation.

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

TOOL:
Valve guide reamer, 5.0 mm **07984-MA60001 or 07984-MA6000D (U.S.A. only)**



Clean the cylinder head thoroughly to remove any metal particles.

Reface the valve seat (page 7-12).

VALVE SEAT INSPECTION/REFACING

Clean the intake and exhaust valves thoroughly to remove carbon deposits.
Apply a light coating of Prussian Blue to the valve seat. Lap the valves and seats using a rubber hose or other hand-lapping tool.

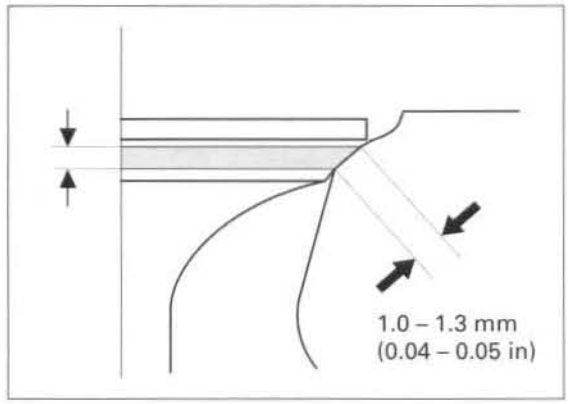
The valves cannot be ground. if a valve face is burned or badly worn or if it contacts the seat unevenly, replace the valve.

Remove and inspect the valves.

Inspect the width of each valve seat.

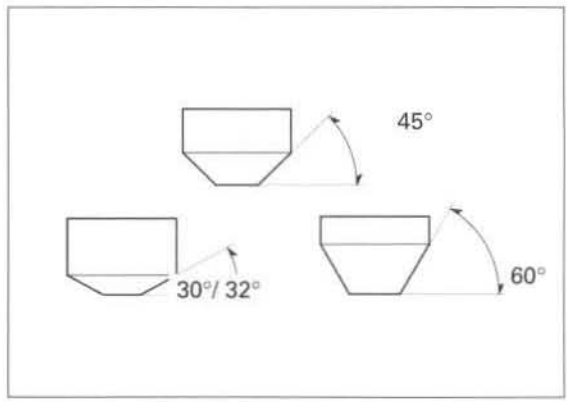
STANDARD: 1.0 – 1.3 mm (0.04 – 0.05 in)
SERVICE LIMIT: 2.0 mm (0.08 in)

If the seat is too wide, too narrow or has low spots, the seat must be ground.



VALVE SEAT REFACING

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

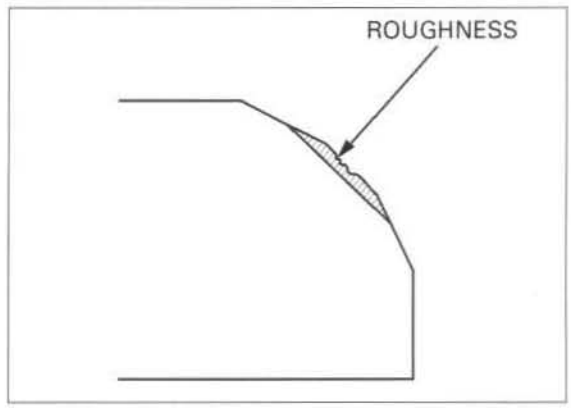


Use a 45° seat cutter to remove any roughness or irregularities from the seat.

TOOLS:

Seat cutter, 24 mm (45° IN)	**07780-0010600**
Seat cutter, 20.5 mm (45° EX)	**07780-0011000**
Cutter holder, 5 mm	**07781-0010400**

or equivalent commercially available in U.S.A.

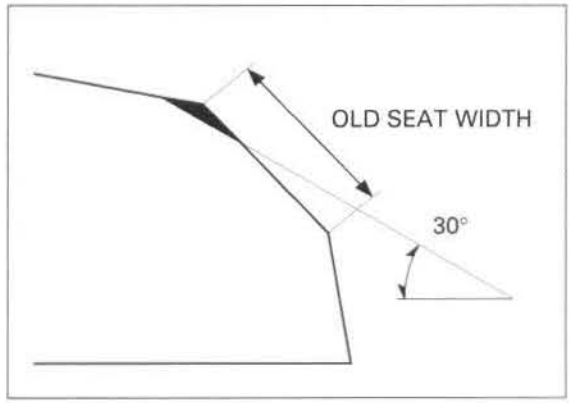


Use a 32° or 30° cutter to remove the top 1/4 of the existing valve seat material.

TOOLS:

Flat cutter, 24 mm (32° IN)	**07780-0012500**
Flat cutter, 21.5 mm (32° EX)	**07780-0012800**
Cutter holder, 5mm	**07781-0010400**

or equivalent commercially available in U.S.A.

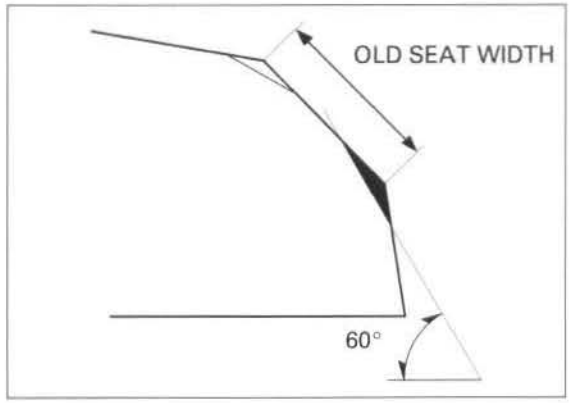


Use a 60° cutter, remove 1/4 of the existing valve seat material.

TOOLS:

Interior cutter, 22 mm (60° IN/EX)	**07780-0014202**
Cutter holder, 5 mm	**07781-0010400**

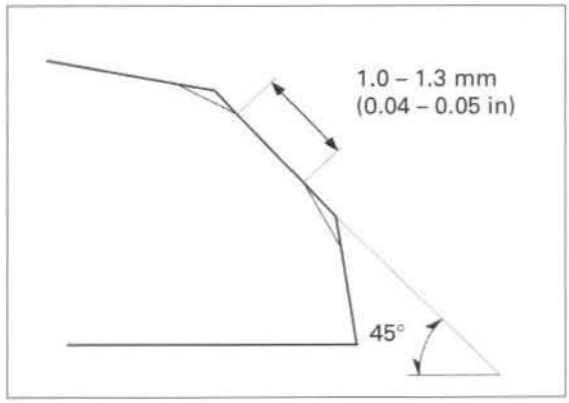
or equivalent commercially available in U.S.A.



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

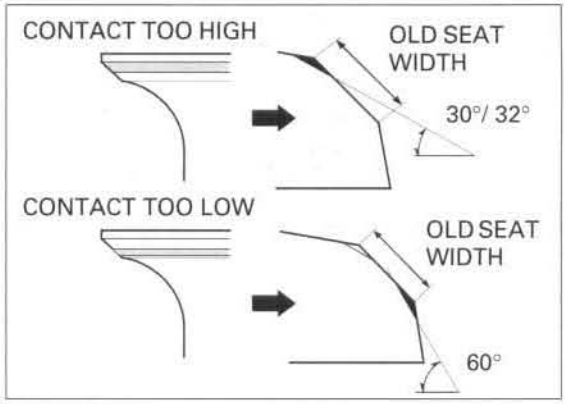
VALVE SEAT WIDTH: 1.0 – 1.3 mm (0.04 – 0.05 in)

Make sure that all pitting and irregularities are removed.



If the contact area is too high on the valve, the seat must be lowered using a 32°or 30° flat cutter.

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

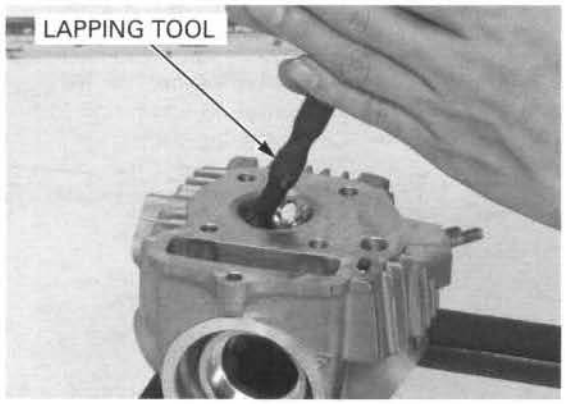


Excessive lapping pressure may deform or damage the seat. Do not allow lapping compound to enter the guides.

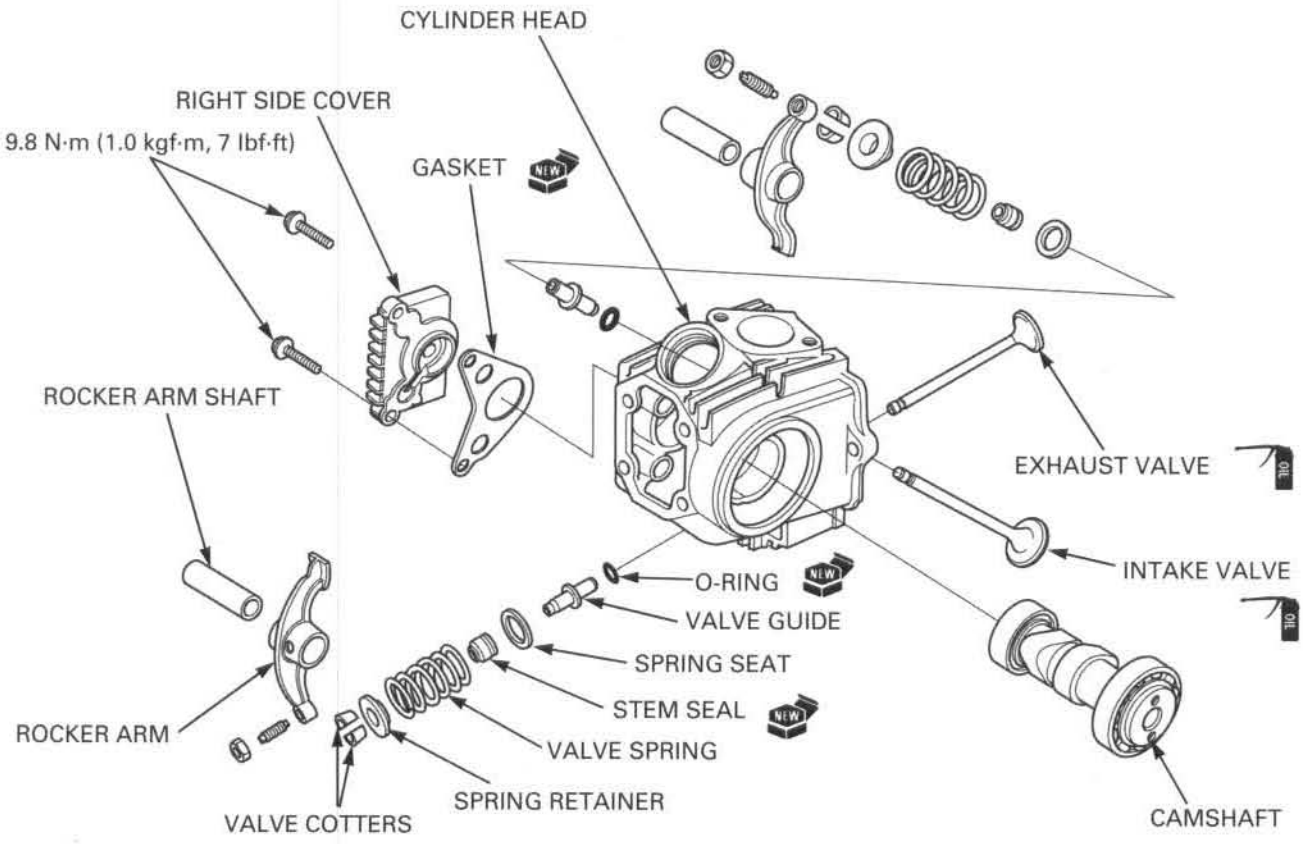
After cutting the seat, apply lapping compound and engine oil to the valve face, and lap the valve using light pressure.

Change the angle of lapping tool frequently to prevent uneven seat wear.

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



ASSEMBLY

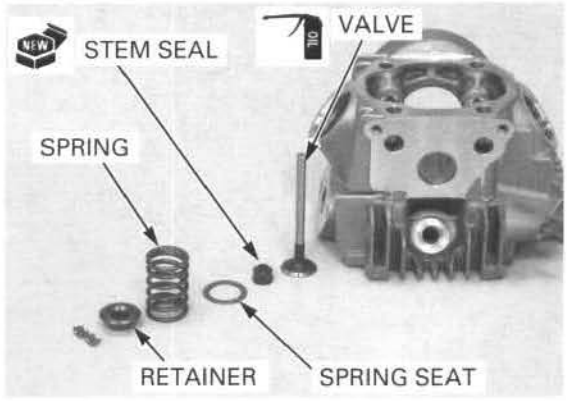


Clean the cylinder head assembly with solvent and blow through all oil passages with compressed air.

Install the valve spring seats.
Install new stem seals.

Lubricate the valve stems with engine oil and insert the valve into the valve guide.
To avoid damage to the stem seal, turn the valve slowly when inserting.

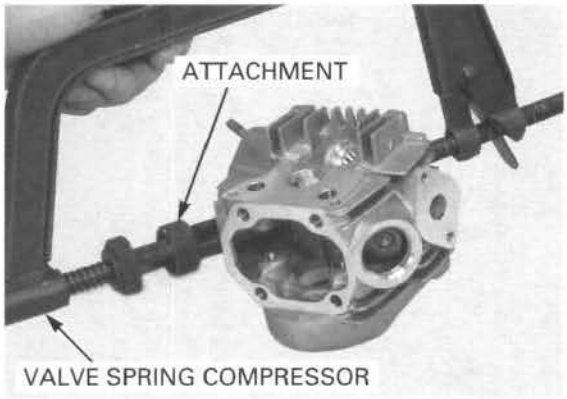
Install the valve springs with the tightly wound coils facing the combustion chamber.
Install the valve spring retainers.



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

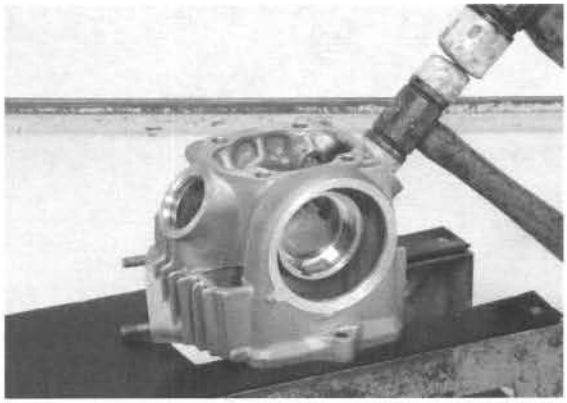
Install the valve cotters using the special tool as shown.

TOOLS:
Valve spring compressor 07757-0010000
Valve spring compressor attachment 07959-KM30101



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

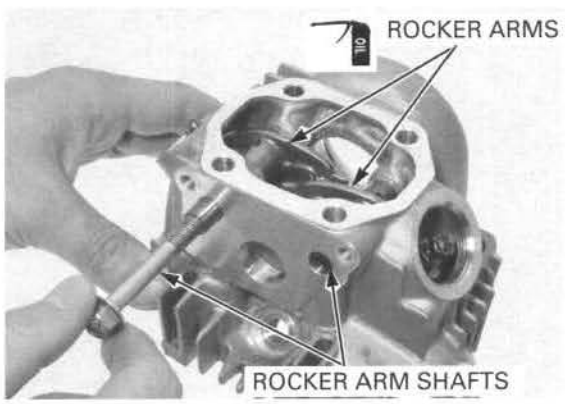
Tap the valve stems gently with two plastic hammers as shown to seat the valve cotters firmly.



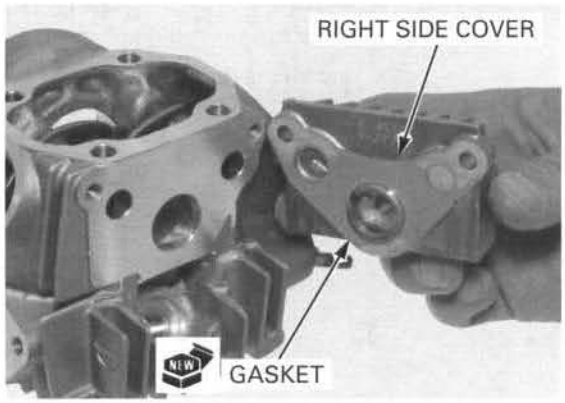
Apply engine oil to the rocker arm inner and slipper surfaces.

Install the rocker arm shaft with its threaded end facing the right side.

Install the rocker arms and rocker arm shafts.

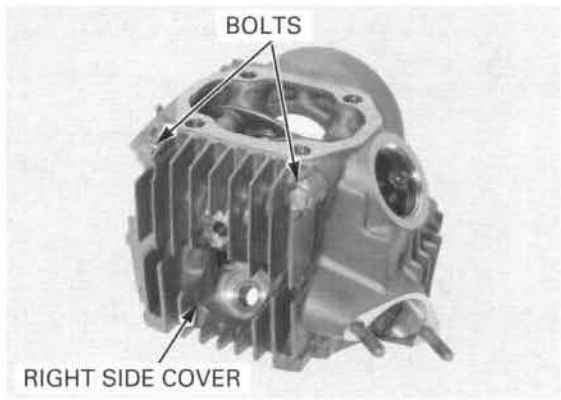


Install a new gasket onto the cylinder head right side cover.
Install the right side cover onto the cylinder head.



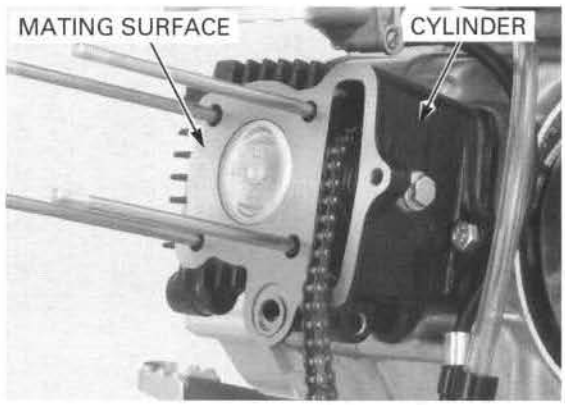
Install the right side cover bolts to the specified torque.

TORQUE: 9.8 N·m (1.0 kgf·m, 7 lbf·ft)



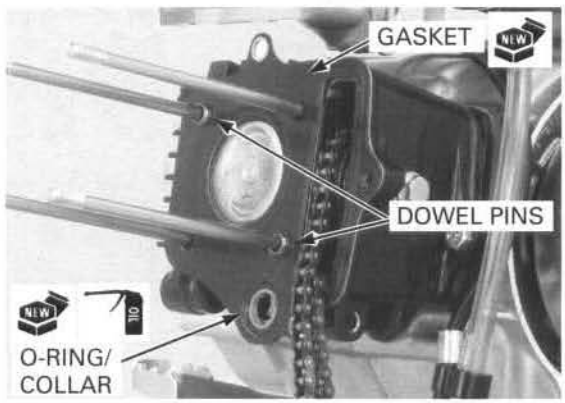
INSTALLATION

Clean off the gasket material from the cylinder surface.



Install the following:

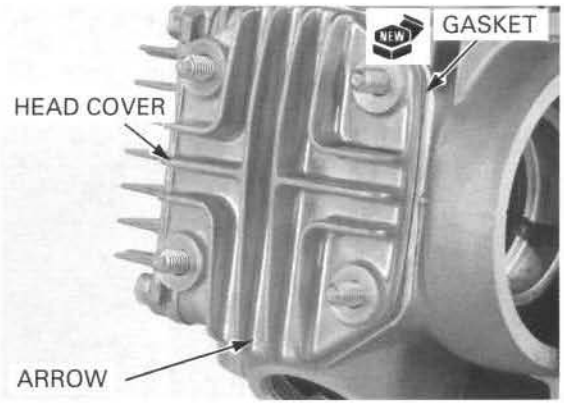
- New O-ring
- Collar
- Dowel pins
- New gasket



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

Install the cylinder head cover with its arrow mark facing down.

Install a new gasket onto the cylinder head and then install the cylinder head cover.



Install the following:

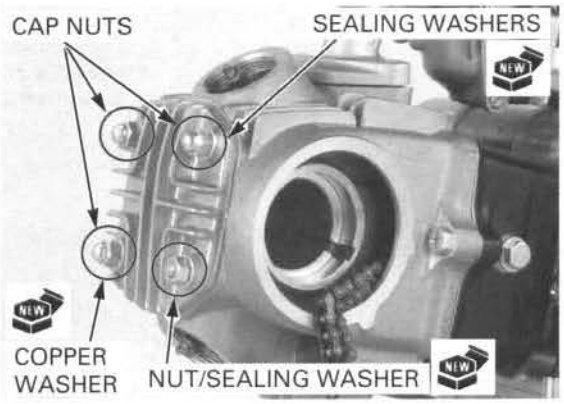
- Cap nuts/new sealing washers
- Nut/new sealing washer

• Note the position of the washers and nuts.

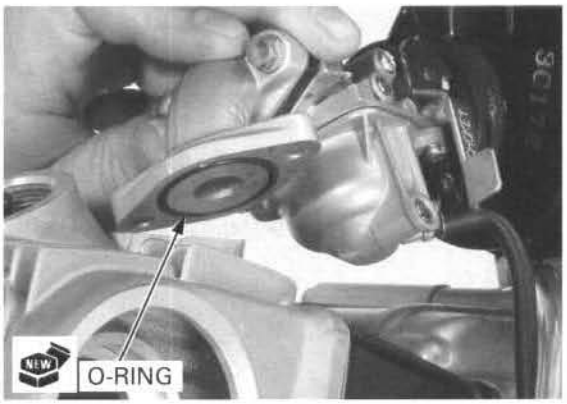
Tighten the cylinder head cover nuts to the specified torque.

TORQUE: 11 N·m (1.1 kgf·m, 8 lbf·ft)

Install and tighten the cylinder head mounting bolt. If the cylinder was removed, tighten the cylinder mounting bolt.



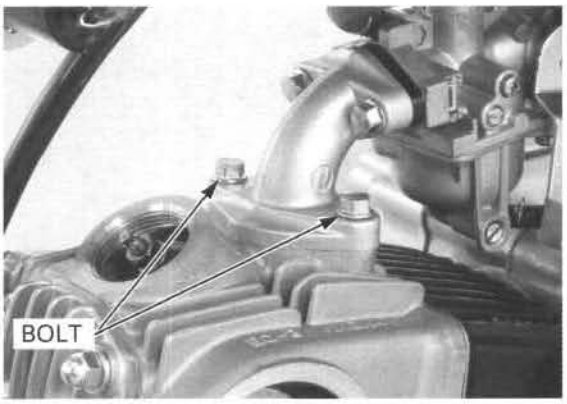
Install a new O-ring into the groove in the intake manifold.



Install and tighten the intake manifold bolts.

Install the following:

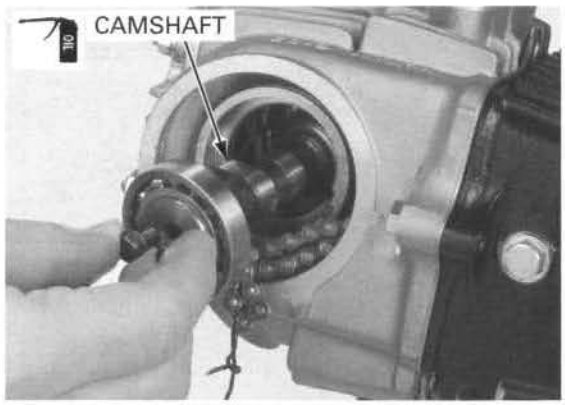
- Spark plug (page 3-8)
- Muffler (page 2-5)
- Camshaft (page 7-18)



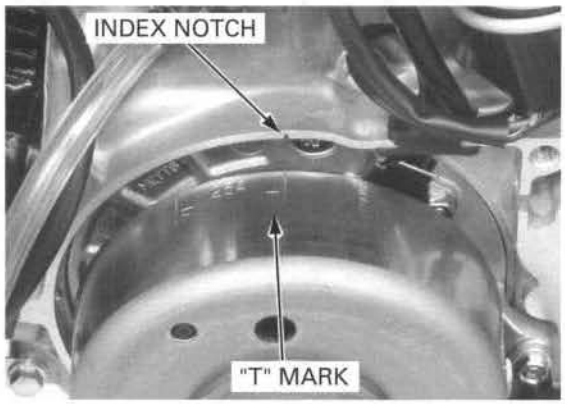
CAMSHAFT INSTALLATION

Apply clean engine oil to the camshaft lobes and bearings.

Install the camshaft into the cylinder head with its cam lobes facing the combustion chamber while holding the rocker arms.



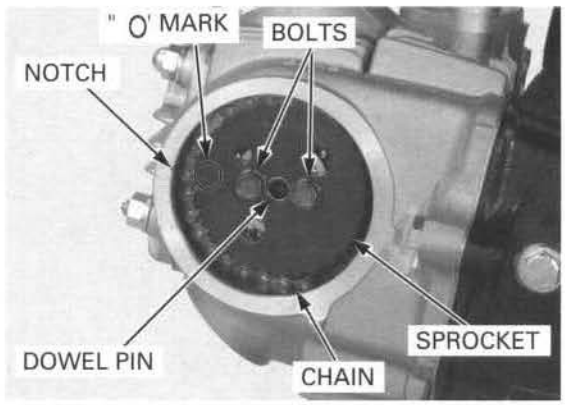
Turn the crankshaft counterclockwise and align the "T" mark on the flywheel with the index notch on the left crankcase.



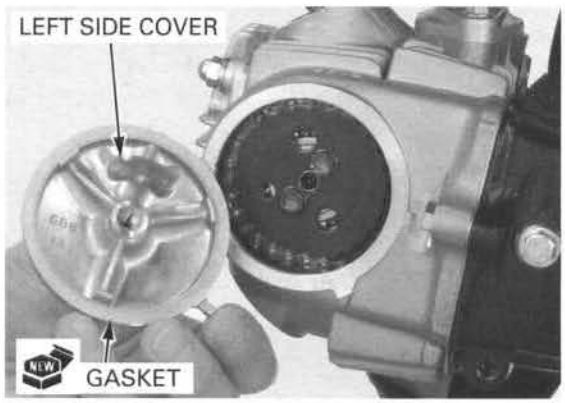
Install the dowel pin and cam sprocket.
Install the cam sprocket with its " O " mark with the index notch on the cylinder head.

Install and tighten the cam sprocket bolts to the specified torque.

TORQUE: 8.8 N·m (0.9 kgf·m, 6.5 lbf·ft)



Install the cylinder head left side cover onto the cylinder head with a new gasket.



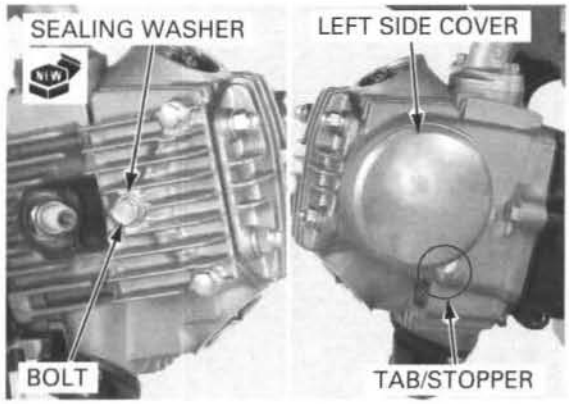
Set the tab on the side cover against the left side of the stopper on the cylinder head.

Install the 6 mm bolt with a new sealing washer into the cylinder head and tighten it.

Tighten the two right side cover bolts if the cylinder head was disassembled.

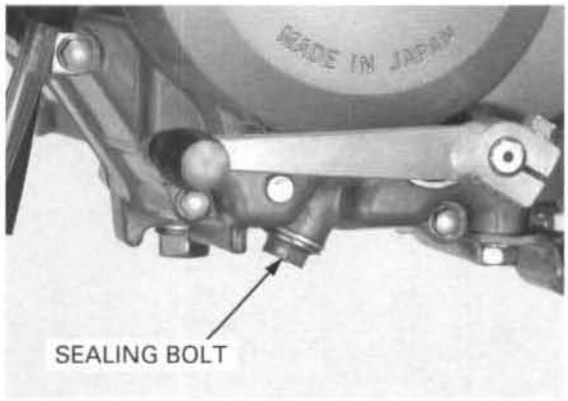
TORQUE: 9.8 N·m (1.0 kgf·m, 7 lbf·ft)

Install the spark plug cap.



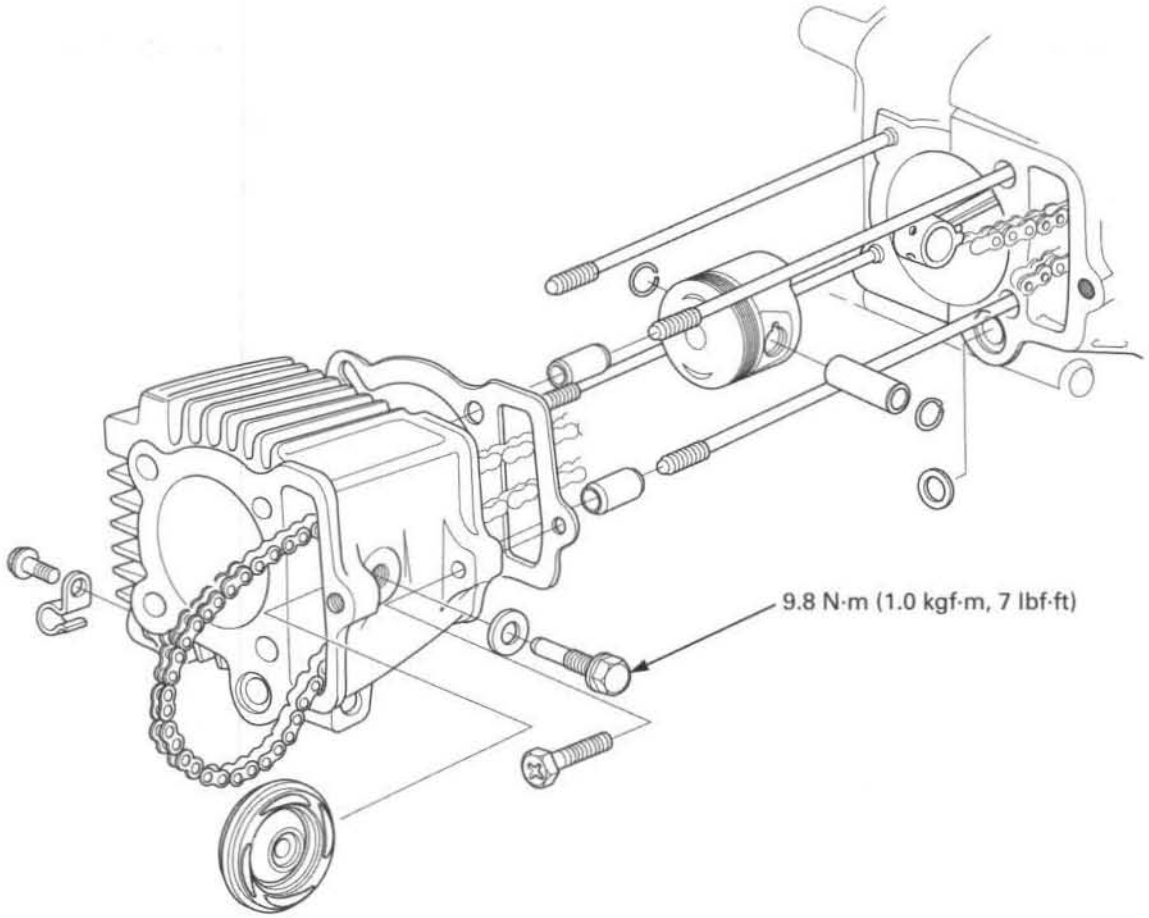
Install the tensioner push rod, spring and sealing bolt (page 10-7).

Adjust the valve clearance (page 3-10).
Pour the recommended engine oil (page 3-11).



8. CYLINDER/PISTON

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- The cylinder and piston service can be done with the engine installed in the frame.
- Camshaft lubrication oil is fed to the cylinder head through an orifice in the cylinder head, cylinder and crankcase. Be sure that this orifice is not clogged and that the O-rings and dowel pins are in place before installing the cylinder.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		39.005 – 39.015 (1.5356 – 1.5360)	39.05 (1.537)
	Out of round		–	0.10 (0.004)
	Taper		–	0.10 (0.004)
	Warpage		–	0.05 (0.002)
Piston, piston rings	Piston mark direction		"IN" mark facing toward the intake side	–
	Piston O.D.		38.975 – 38.995 (1.5344 – 1.5352)	38.90 (1.531)
	Piston O.D. measurement point		8 mm (0.3 in) from bottom of skirt	–
	Piston pin bore I.D.		13.002 – 13.008 (0.5119 – 0.5121)	13.06 (0.514)
	Piston pin O.D.		12.994 – 13.000 (0.5116 – 0.5118)	12.98 (0.511)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.08 (0.003)
	Piston ring-to-ring groove clearance	Top/Second	0.015 – 0.050 (0.0006 – 0.0020)	0.12 (0.005)
	Piston ring end gap	Top	0.05 – 0.15 (0.002 – 0.006)	0.5 (0.02)
		Second	0.05 – 0.20 (0.002 – 0.008)	0.5 (0.02)
		Oil (side rail)	0.3 – 0.9 (0.01 – 0.04)	1.1 (0.04)
Cylinder-to-piston clearance			0.010 – 0.040 (0.0004 – 0.0016)	0.15 (0.006)
Connecting rod small end I.D.			13.016 – 13.034 (0.5124 – 0.5131)	13.08 (0.515)
Connecting rod-to-piston pin clearance			0.016 – 0.040 (0.0006 – 0.0016)	0.12 (0.005)

TORQUE VALUE

Cam chain guide roller pin bolt	9.8 N·m (1.0 kgf·m, 7 lbf·ft)

TROUBLESHOOTING

- 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.

Cylinder compression is too low, or engine is hard to start
- Blown cylinder head gasket
- Worn, stuck or broken piston ring
- Worn or damaged cylinder or piston

Cylinder compression is too high, or engine overheats or knocks
- Carbon deposits on the cylinder head and/or piston crown

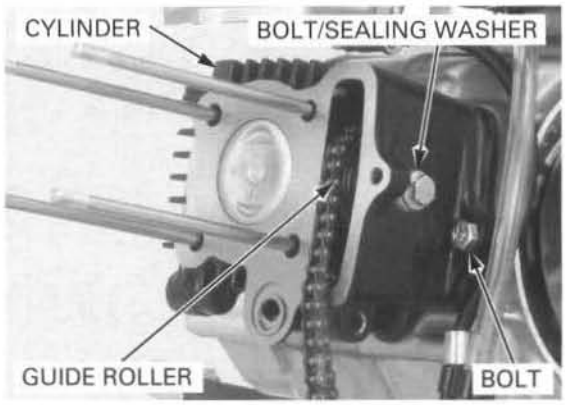
Piston sounds
- Worn cylinder, piston and/or piston ring
- Worn piston pin hole and piston pin
- Worn connecting rod small end

Excessive smoke
- Worn, stuck or broken piston ring

CYLINDER REMOVAL

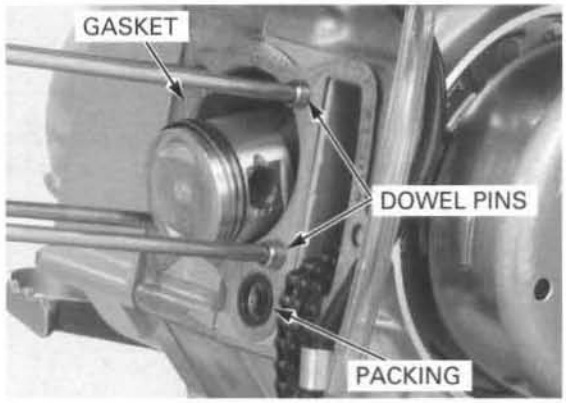
Remove the cylinder head (page 7-7).

Remove the cam chain guide roller pin bolt, sealing washer and guide roller.
Remove the mounting bolt and cylinder.



Remove the following:

- Rubber packing
- Gasket
- Dowel pins

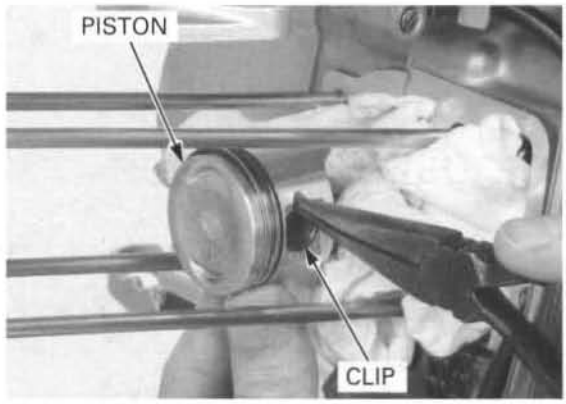


PISTON REMOVAL

Do not let the piston pin clips fall into the crankcase.

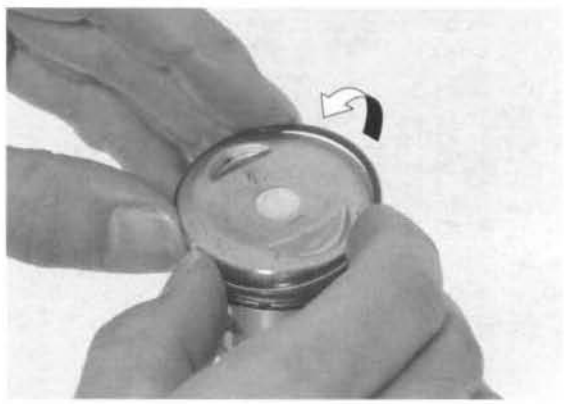
Remove the piston pin clip with pliers.

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



Do not damage the piston rings during removal.

Remove the piston rings.



CYLINDER/PISTON INSPECTION

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

SERVICE LIMIT: 39.05 mm (1.537 in)

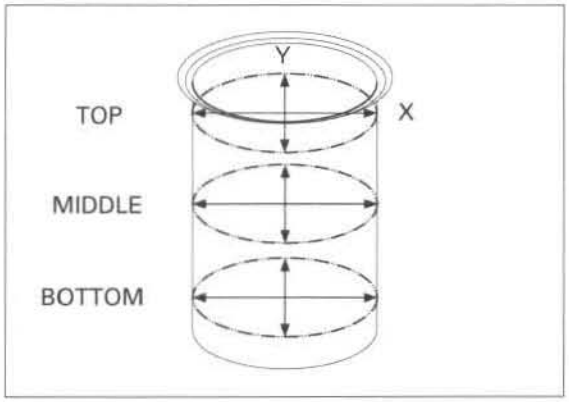
Calculate the piston-to-cylinder clearance.
Take a maximum reading to determine the clearance.
Refer to page 8-6 for measurement of the piston O.D.

SERVICE LIMIT: 0.15 mm (0.006 in)

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

SERVICE LIMITS:

Taper:	**0.10 mm (0.004 in)**
Out of round:	**0.10 mm (0.004 in)**



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

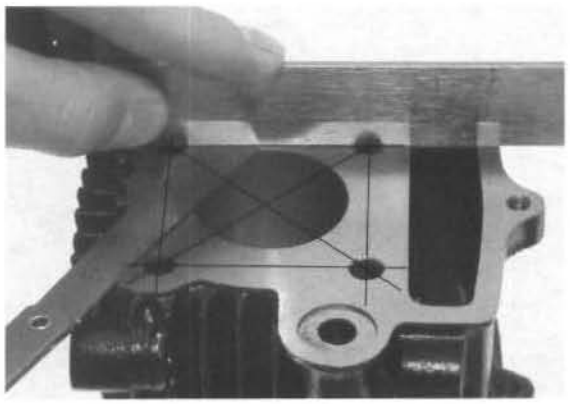
The following oversize pistons are available:

0.25 mm (0.010 in)
0.50 mm (0.020 in)

The piston to cylinder clearance for the oversize piston must be: 0.010 – 0.040 mm (0.0004 – 0.0016 in).

Inspect the top of the cylinder for warpage.

SERVICE LIMIT: 0.05 mm (0.002 in)

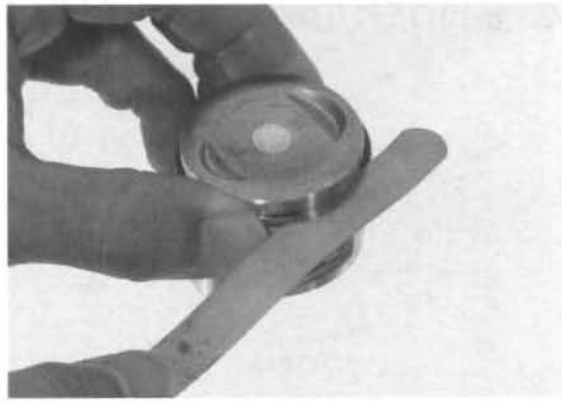


Remove any carbon deposits from the piston ring grooves, using an old piston ring as shown.

Temporarily install the piston rings to their proper position with the mark facing up.

Measure the piston ring-to-ring groove clearance with the rings pushed into the grooves.

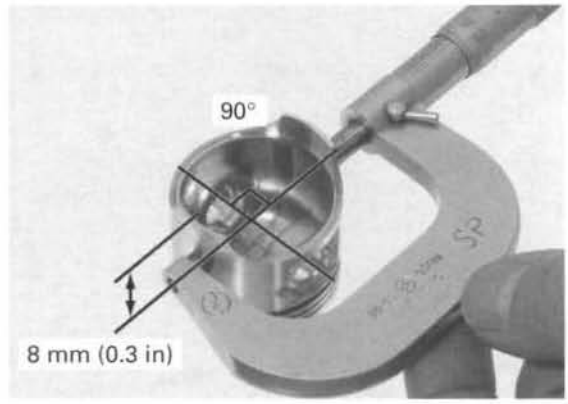
SERVICE LIMITS:
Top: 0.12 mm (0.005 in)
Second: 0.12 mm (0.005 in)



Inspect the piston for wear or damage.

Measure the diameter of the piston at 8 mm (0.3 in) from the bottom of skirt and 90 degrees to the piston pin hole.

SERVICE LIMIT: 38.90 mm (1.531 in)



Measure the piston pin bore.

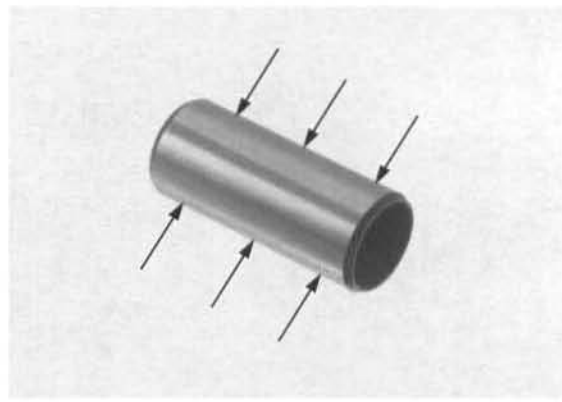
SERVICE LIMIT: 13.06 mm (0.514 in)

Measure the O.D. of the piston pin.

SERVICE LIMIT: 12.98 mm (0.511 in)

Calculate the piston-to-piston pin clearance.

SERVICE LIMIT: 0.08 mm (0.003 in)

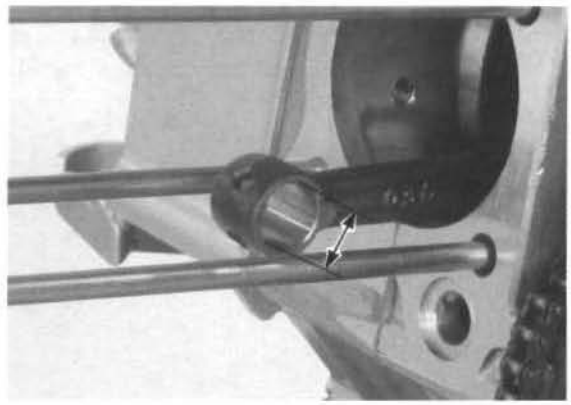


Measure the connecting rod small end I.D.

SERVICE LIMIT: 13.08 mm (0.515 in)

Calculate the connecting rod-to-piston pin clearance.

SERVICE LIMIT: 0.12 mm (0.005 in)

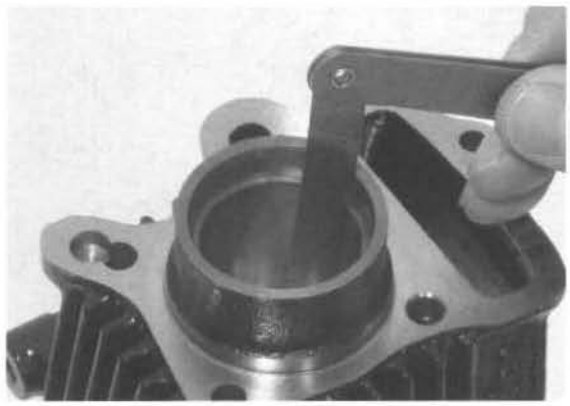


Push the rings into the cylinder with the top of the piston to be sure they are squarely in the cylinder.

Insert the piston ring squarely into the bottom of the cylinder and measure the ring end gap.

SERVICE LIMITS:

Top:	**0.5 mm (0.02 in)**
Second:	**0.5 mm (0.02 in)**
Oil (side rail):	**1.1 mm (0.04 in)**



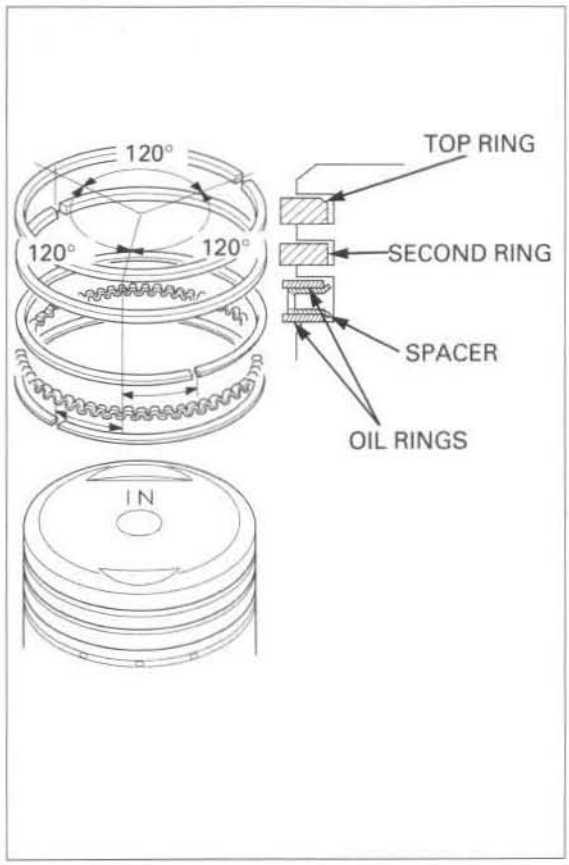
PISTON RING INSTALLATION

Clean the piston ring grooves thoroughly and install the piston rings.

- Apply oil to the piston rings.
- Avoid piston and piston ring damage during installation.
- Install the piston rings with their marking facing up.
- Do not confuse the top and second rings.

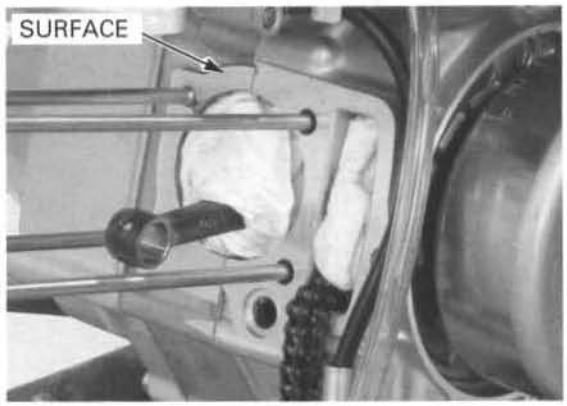
Space the piston ring end gaps 120 degrees apart. Do not align the gaps in the oil rings (side rails).

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



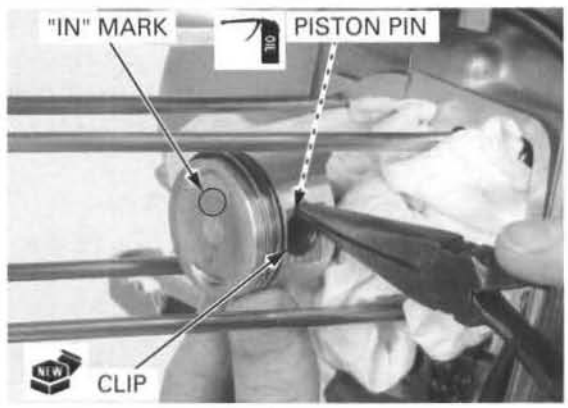
PISTON INSTALLATION

Clean off any gasket materials from the crankcase surface.



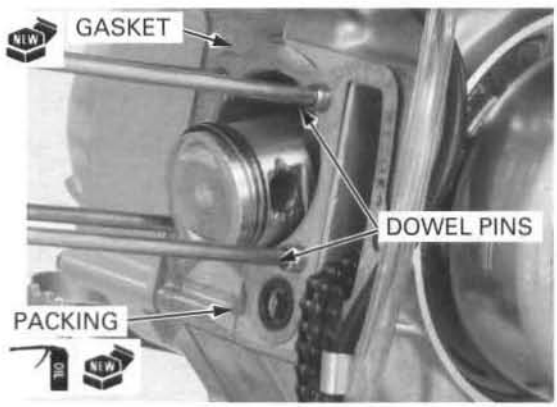
Apply oil to the piston pin outer surface.
Install the piston with its "IN" mark facing the intake side.
Install the piston pin and secure it with new piston pin clips.

- Do not align the piston pin clips end gap with the piston cut-out.
- Do not let the piston pin clips fall into the cankcase.



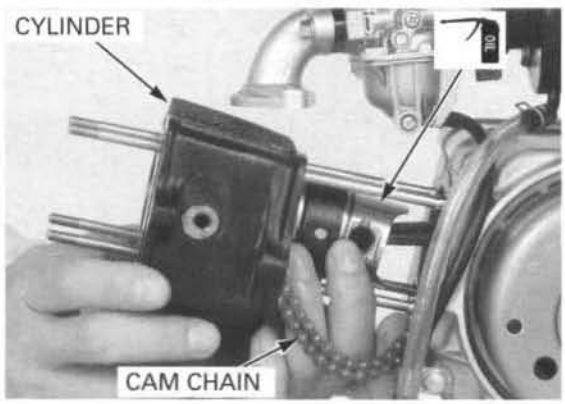
CYLINDER INSTALLATION

Apply engine oil to a rubber packing.
Install the dowel pins, new gasket and new rubber packing.



Coat the cylinder bore, piston outer surface and piston ring grooves with clean engine oil.
Route the cam chain through the cylinder and install the cylinder while compressing the piston rings.

- Avoid piston ring damage during installation.
- Do not let the cam chain fall into the crankcase.



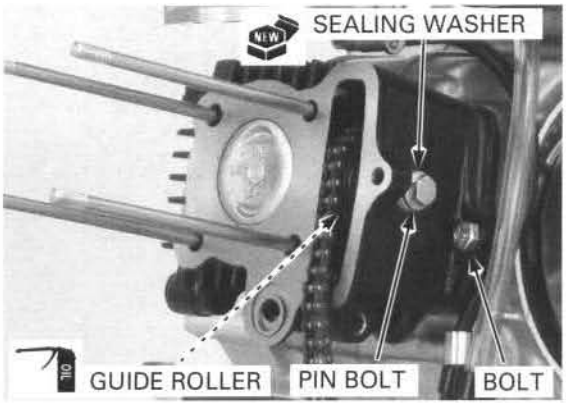
Apply engine oil to the guide roller inner surface.
Install the cam chain guide roller, new sealing washer and pin bolt.
Tighten the cam chain guide roller pin bolt to the specified torque.

TORQUE: 9.8 N·m (1.0 kgf·m, 7 lbf·ft)

Install the cylinder mounting bolt but do not tighten it yet.

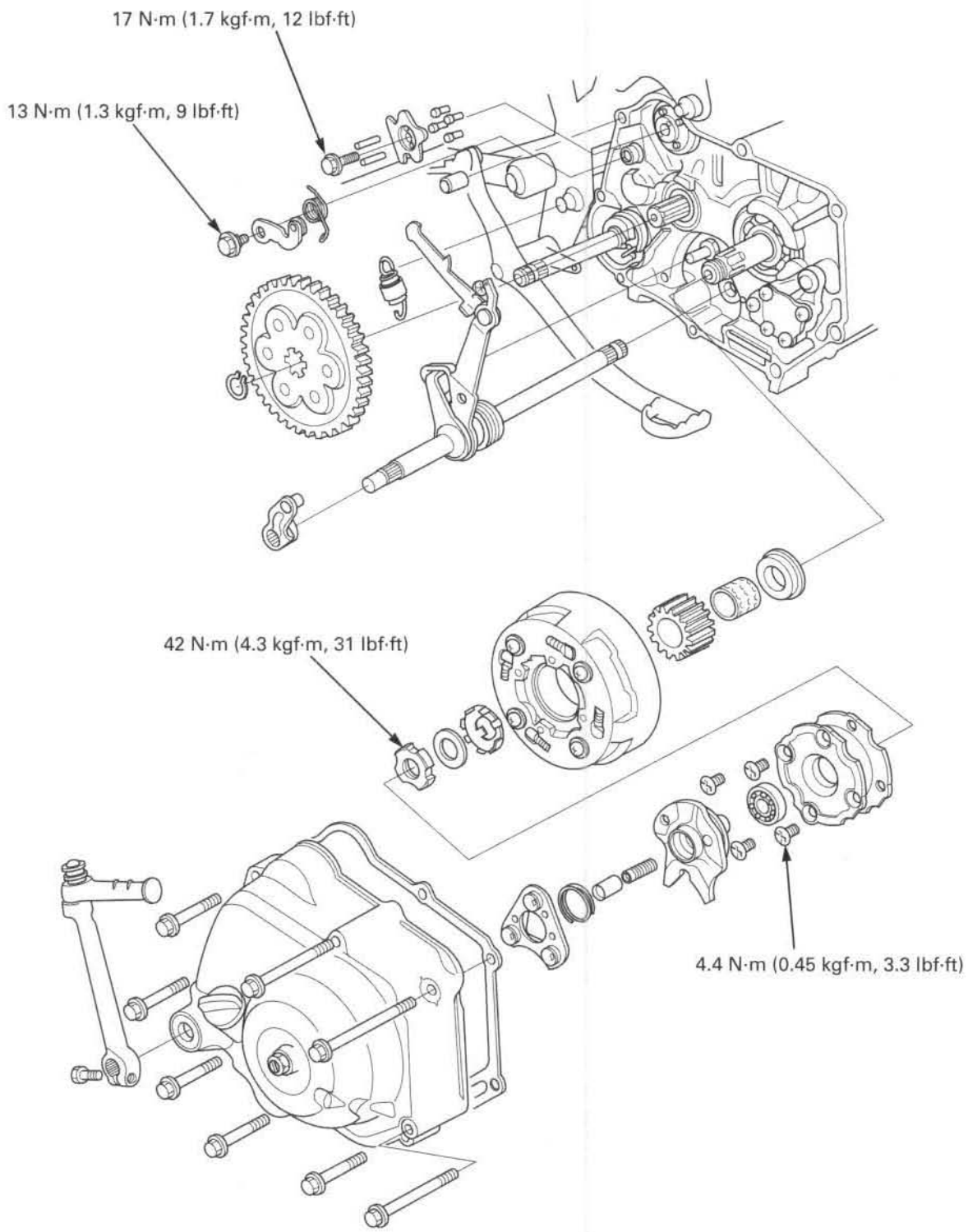
Install the cylinder head (page 7-16).

Tighten the cylinder mounting bolt after installing the cylinder head.



9. CLUTCH/GEARSHIFT LINKAGE

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- This section covers service of the clutch and gearshift linkage. All service can be done with the engine installed in the frame.
- Use care not to allow dust or dirt to enter the engine.

SPECIFICATIONS

Unit: mm (in)

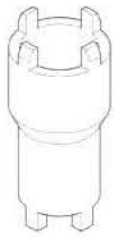
ITEM		STANDARD	SERVICE LIMIT
Clutch disc thickness	A	2.52 – 2.68 (0.099 – 0.106)	2.3 (0.09)
	B	3.32 – 3.48 (0.131 – 0.137)	3.0 (0.12)
Clutch plate warpage		–	0.20 (0.008)
Centrifugal clutch spring free length		22.4 (0.88)	19.4 (0.76)
Primary drive gear I.D.		21.000 – 21.021 (0.8268 – 0.8276)	21.05 (0.829)
Clutch center guide	I.D.	16.988 – 17.006 (0.6688 – 0.6695)	17.04 (0.671)
	O.D.	20.930 – 20.950 (0.8240 – 0.8248)	20.90 (0.823)
Crankshaft O.D. at clutch center guide		16.966 – 16.984 (0.6680 – 0.6687)	16.90 (0.665)

TORQUE VALUES

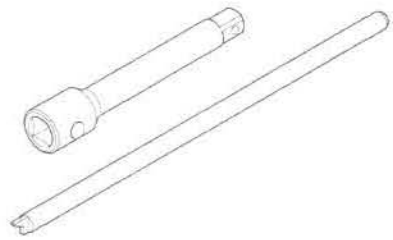
Clutch outer cover screw	4.4 N·m (0.45 kgf·m, 3.3 lbf·ft)
Clutch lock nut	42 N·m (4.3 kgf·m, 31 lbf·ft)
Clutch assembly screw	5.9 N·m (0.6 kgf·m, 4.3 lbf·ft)
Shift drum stopper arm bolt	13 N·m (1.3 kgf·m, 9 lbf·ft)
Shift return spring pin bolt	29 N·m (3.0 kgf·m, 22 lbf·ft)
Gearshift cam plate bolt	17 N·m (1.7 kgf·m, 12 lbf·ft)

TOOLS

Lock nut wrench, 20 x 24 mm
07716-0020100

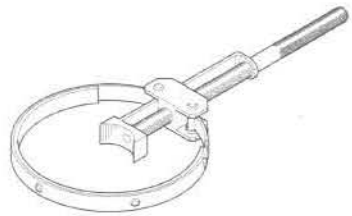


Extension bar
07716-0020500



or equivalent commercially available in U.S.A.

Flywheel holder
07725-0040000



or equivalent commercially available in U.S.A.

TROUBLESHOOTING

Clutch slips when accelerating
- Incorrect clutch adjustment
- Worn clutch disc
- Weak clutch springs
- Faulty clutch weight
- Transmission oil mixed with molybdenum or graphite additive

Motorcycle creeps with clutch disengaged
- Incorrect clutch adjustment
- Clutch plate warped
- Faulty clutch lifter
- Faulty clutch weight
- Incorrect engine oil weight

Hard to shift
- Incorrect clutch adjustment
- Loose stopper plate bolt
- Damaged stopper plate and pin
- Damaged gearshift spindle

Transmission jumps out of gear
- Worn shift drum stopper arm
- Weak or broken shift arm return spring
- Loose stopper plate bolt

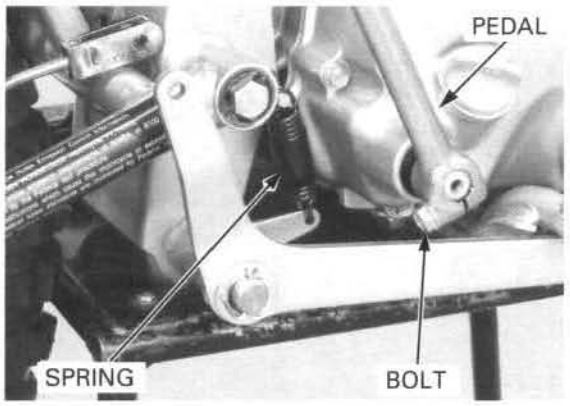
Gearshift pedal will not return
- Weak or broken gearshift spindle return spring
- Bent gearshift spindle

RIGHT CRANKCASE COVER REMOVAL

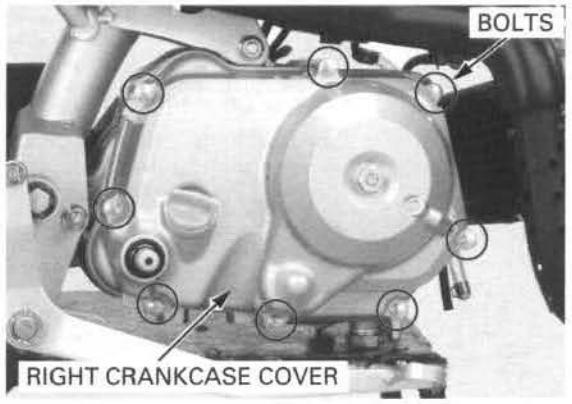
Drain the engine oil (page 3-11).
Remove the footpeg bar (page 6-4).

Remove the bolt and kickstarter pedal.

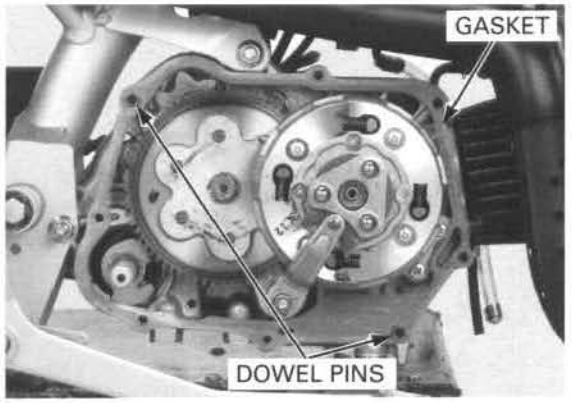
Unhook the brake pedal return spring.
Loosen the rear brake pedal adjusting nut and lower the brake pedal.



Remove the eight bolts and right crankcase cover.

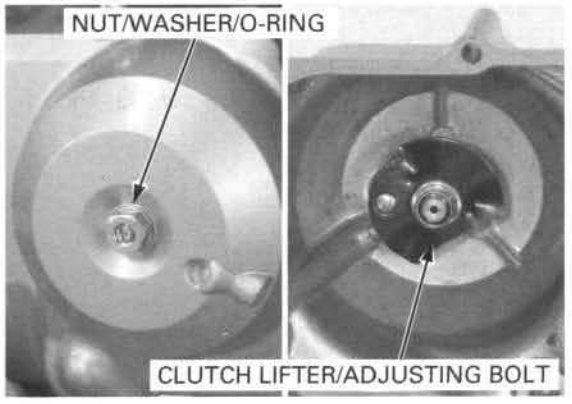


Remove the gasket and dowel pins.

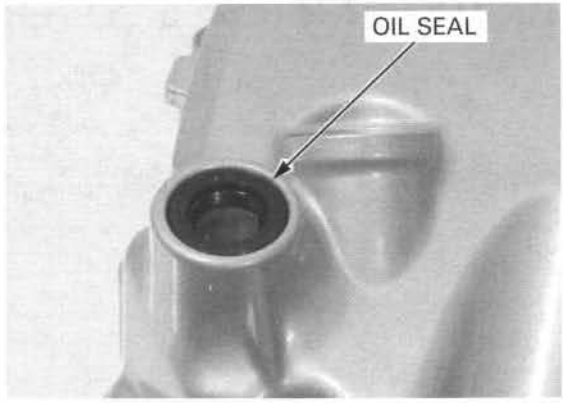


Remove the clutch adjusting nut, washer and O-ring.

Remove the clutch lifter/adjusting bolt assembly.



Check the kickstarter oil seal for damage, replace if necessary.

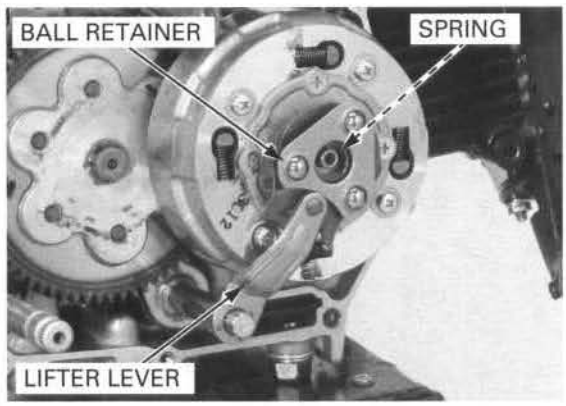


CLUTCH

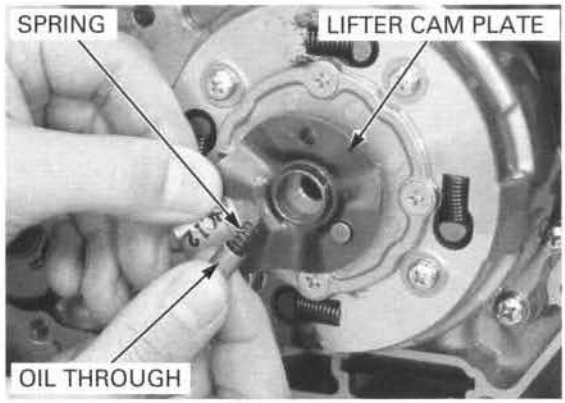
REMOVAL

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

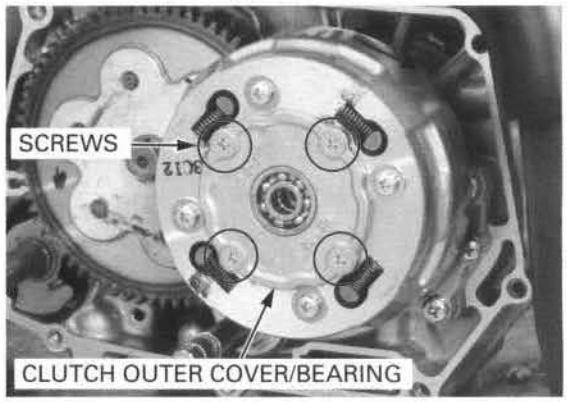
Remove the ball retainer and spring.
Remove the clutch lifter lever.



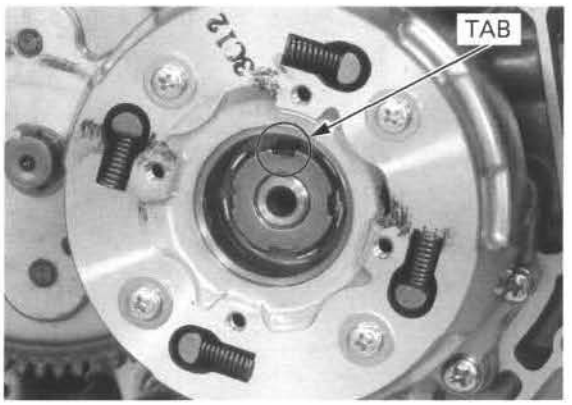
Remove the oil through and sprig.
Remove the clutch lifter cam plate.



Remove the screws and clutch outer cover and bearing.



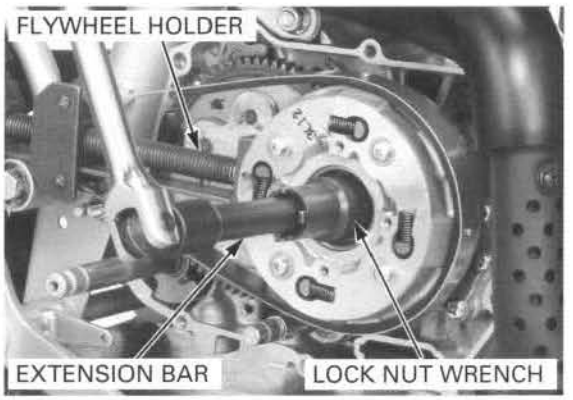
Straighten the tab of the lock washer.



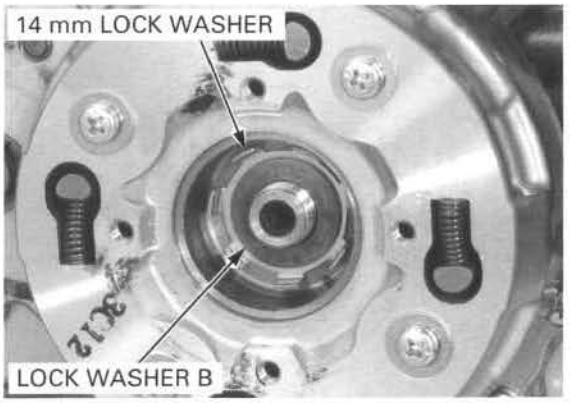
Hold the clutch outer with the flywheel holder and remove the lock nut using the special tools as shown.

TOOLS:

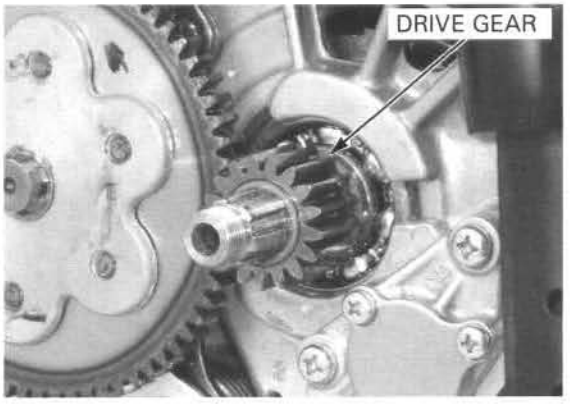
Flywheel holder	**07725-0040000 (Equivalent commercially available in U.S.A.)**
Lock nut wrench, 20 x 24 mm	**07716-0020100**
Extension bar	**07716-0020500 (Equivalent commercially available in U.S.A.)**



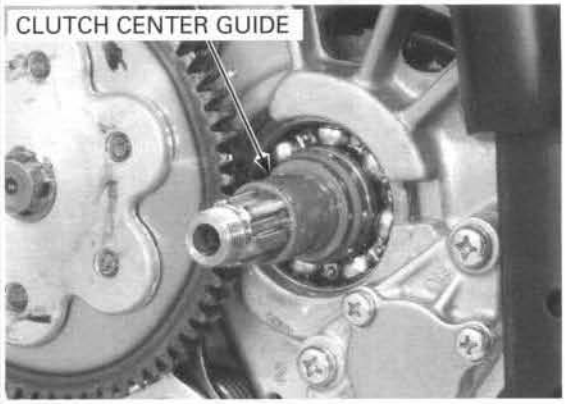
Remove the lock washer B, 14 mm lock washer and clutch assembly.



Remove the primary drive gear.

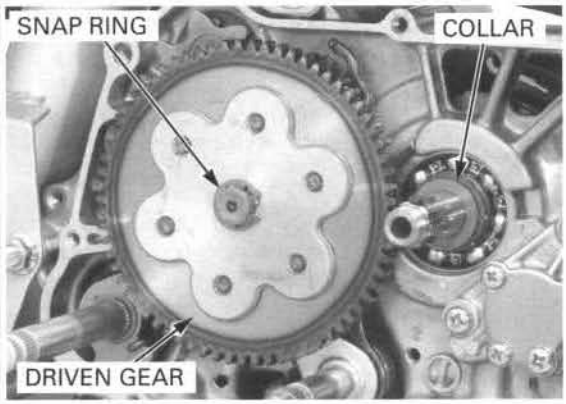


Remove the clutch center guide.



Remove the snap ring and primary driven gear from the mainshaft.

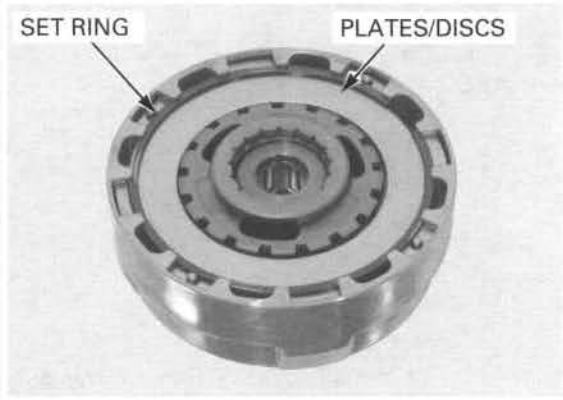
Remove the collar from the crankshaft.



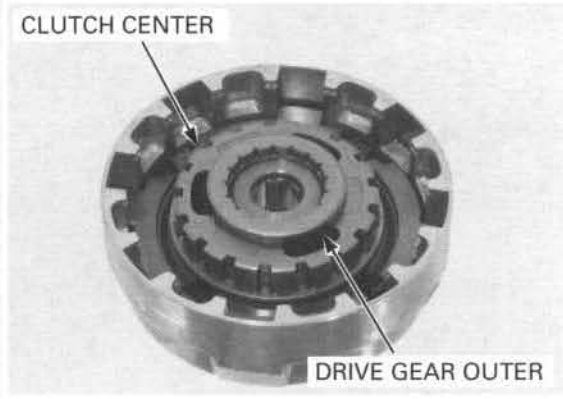
DISASSEMBLY

Remove the following:

- Set ring
- Clutch plate B
- Clutch disc A
- Clutch disc B
- Clutch disc A
- Free springs
- Clutch plate A

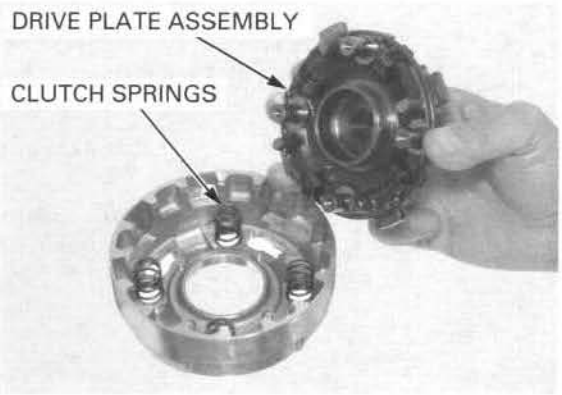


Remove the clutch center and drive gear outer.

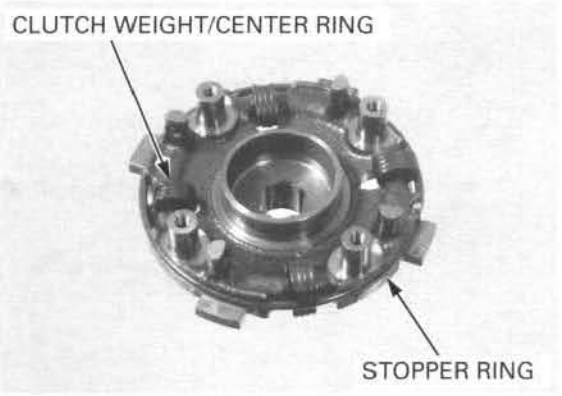


Remove the four damper springs.
Remove the four screws and plain washers.

Remove the drive plate assembly and clutch springs.



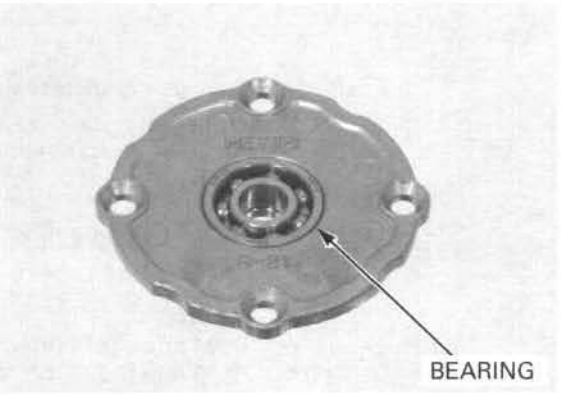
Remove the clutch weight stopper ring.
Remove the clutch weight/center ring.



INSPECTION

Clutch lifter bearing

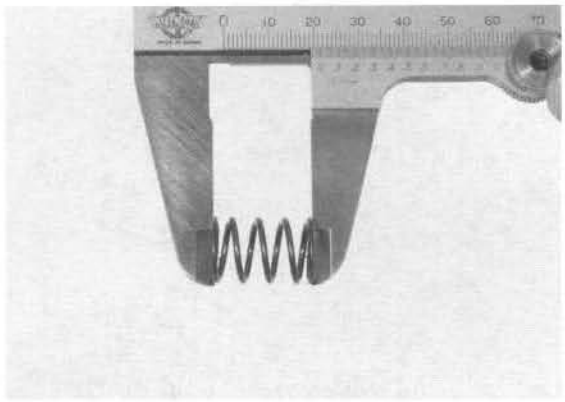
Turn the inner race of the lifter bearing with your finger.
The bearing should turn smoothly and freely without excessive play.
Also check that the bearing fits tightly in the clutch outer cover.
Replace the bearing if necessary.



Clutch spring

Measure the clutch spring free length.

SERVICE LIMIT: 19.4 mm (0.76 in)



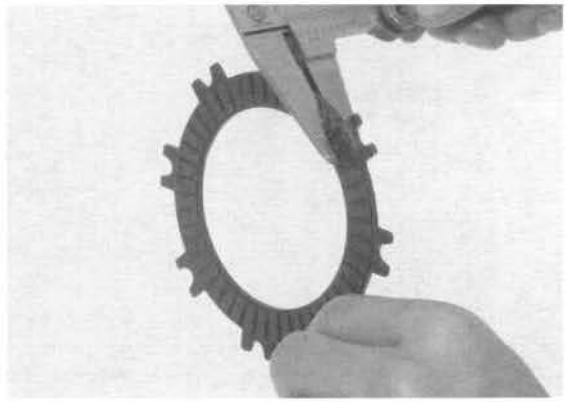
Clutch disc

Replace the clutch discs if they show signs of scoring or discoloration.

Measure the disc thickness of each disc.

SERVICE LIMITS:

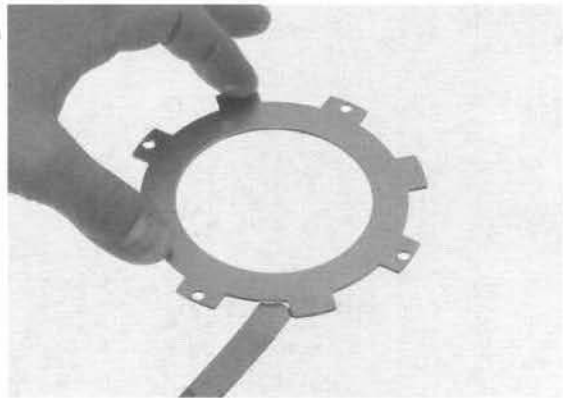
Clutch disc A:	**2.3 mm (0.09 in)**
Clutch disc B:	**3.0 mm (0.12 in)**



Clutch plate

Check each disc plate for warpage on a surface plate using a feeler gauge.

SERVICE LIMIT: 0.20 mm (0.008 in)



Primary drive gear/clutch center guide

Check the primary drive gear and clutch center guide for excessive wear or damage.

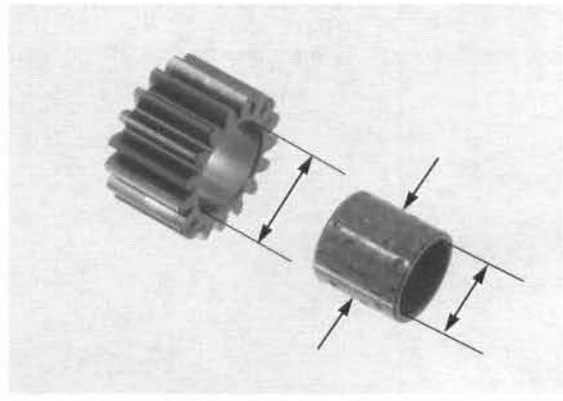
Measure the I.D.of the primary drive gear.

SERVICE LIMIT: 21.05 mm (0.829 in)

Measure the O.D. and I.D. of the clutch center guide.

SERVICE LIMITS:

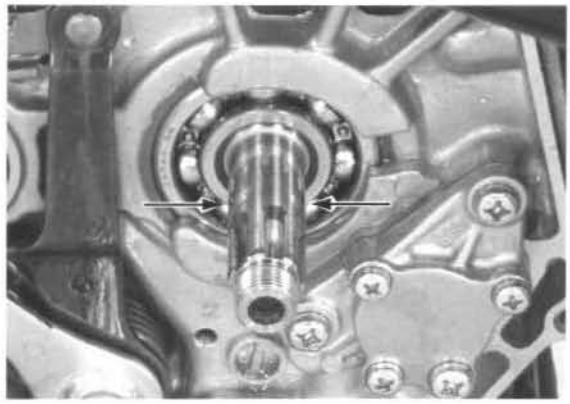
I.D.:	**17.04 mm (0.671 in)**
O.D.:	**20.90 mm (0.823 in)**



Crankshaft

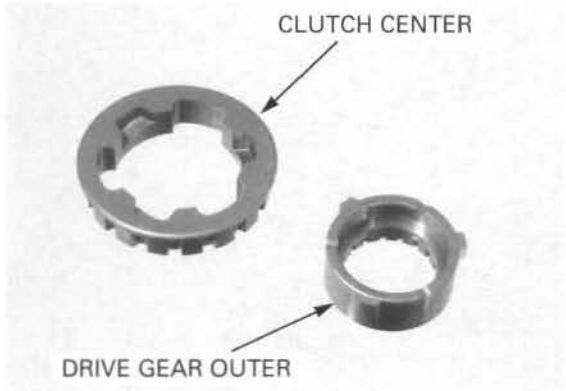
Measure the crankshaft O.D. at clutch center guide.

SERVICE LIMIT: 16.90 mm (0.665 in)

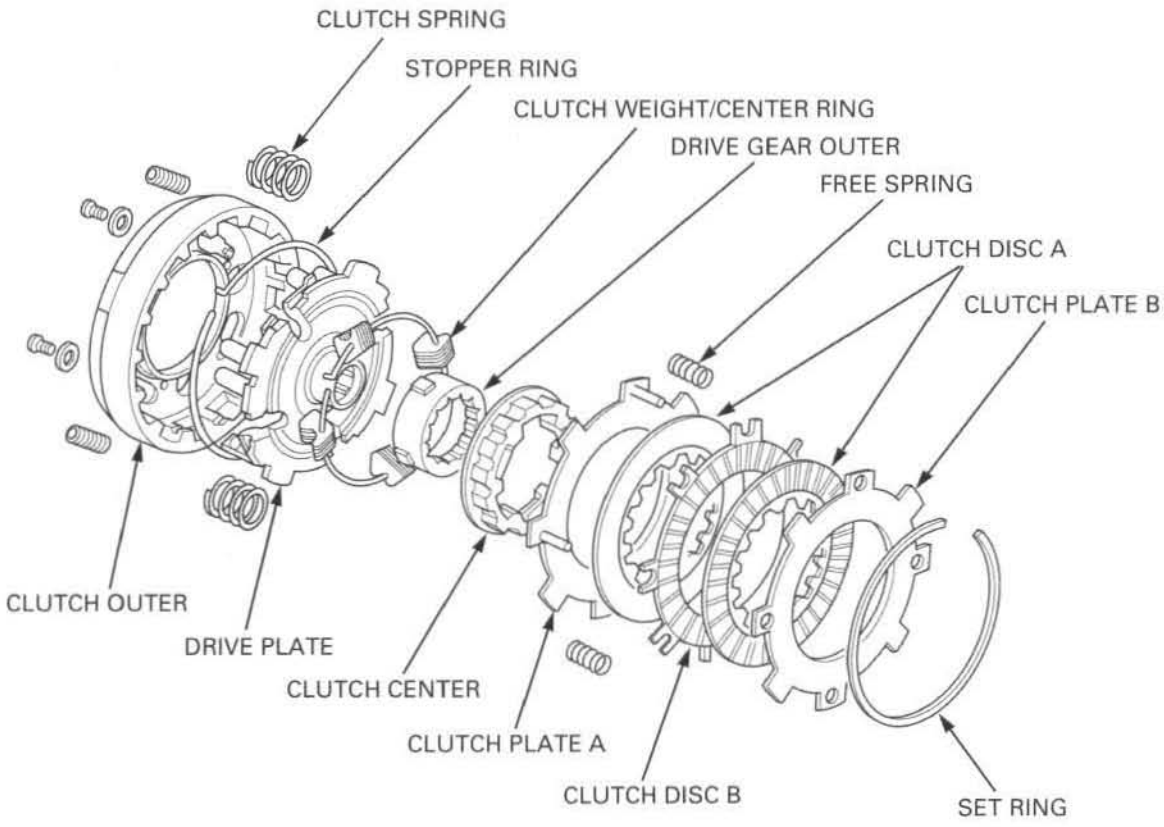


Drive gear outer/clutch center

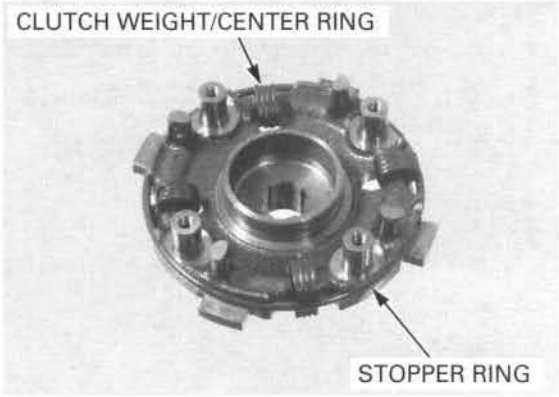
Check the drive gear outer and clutch center for excessive wear or damage.



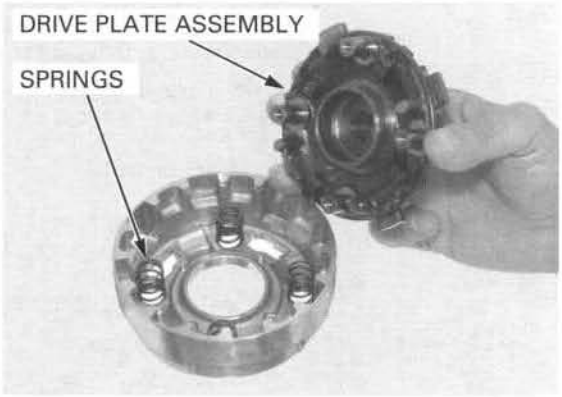
ASSEMBLY



Install the clutch weight/center ring onto the drive plate by aligning the ring end with the plate hole.
Install the stopper ring by aligning the ring end with the plate groove.



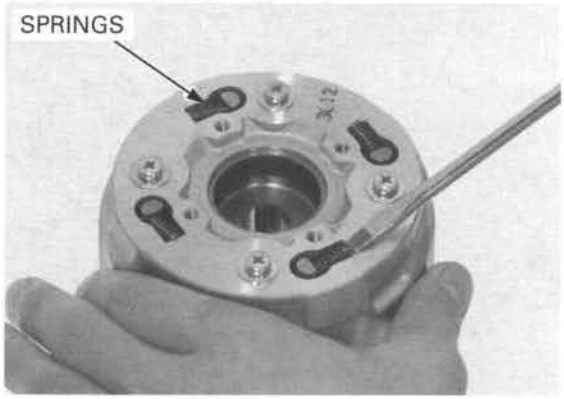
Install the clutch springs onto the clutch outer holes.
Install the drive plate assembly into the clutch outer aligning its bosses with the clutch springs.



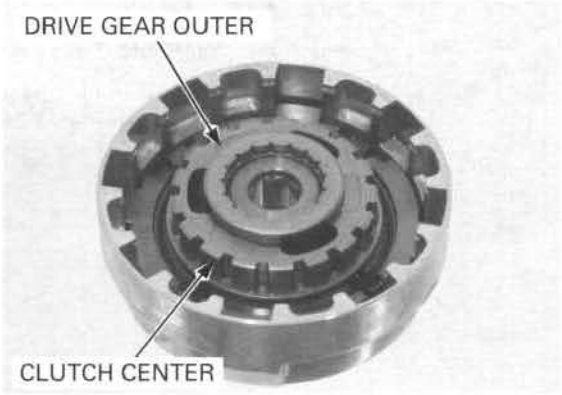
Install the plain washers and screws.
Tighten the screws in a crisscross pattern in 2–3 steps.

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

Install the damper springs as shown.

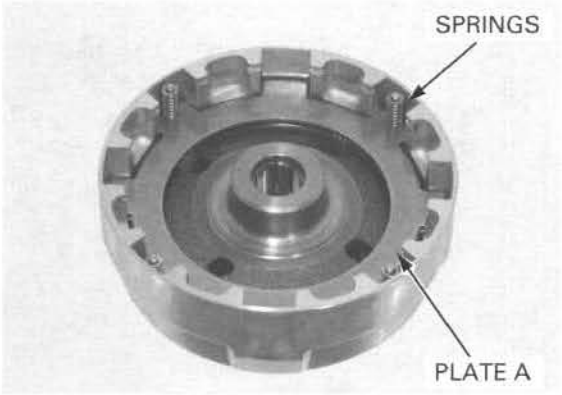


Install the drive gear outer and clutch center.



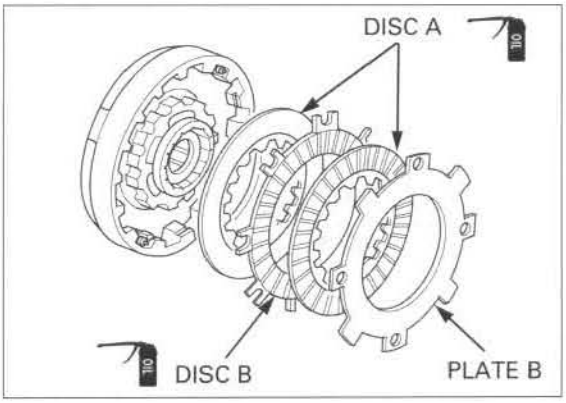
Install the following:

- Clutch plate A
- Free springs

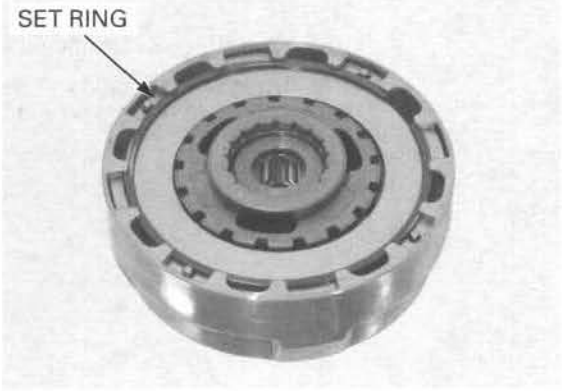


- Clutch disc A
- Clutch disc B
- Clutch disc A
- Clutch plate B

- Install the clutch disc A with its flat surface facing the clutch disc B.
- Install the clutch plate B with its chamfered side facing the clutch disc A.



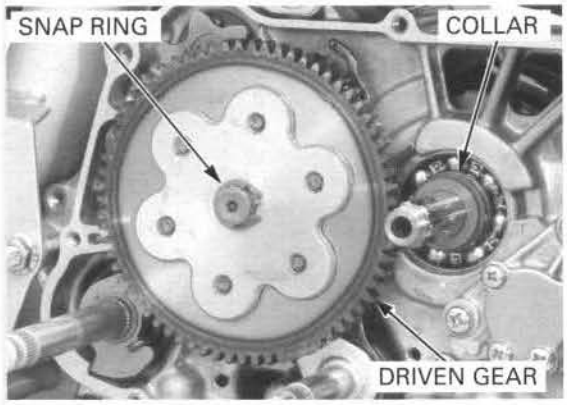
Install the clutch set ring with its chamfered side facing the clutch plate B.



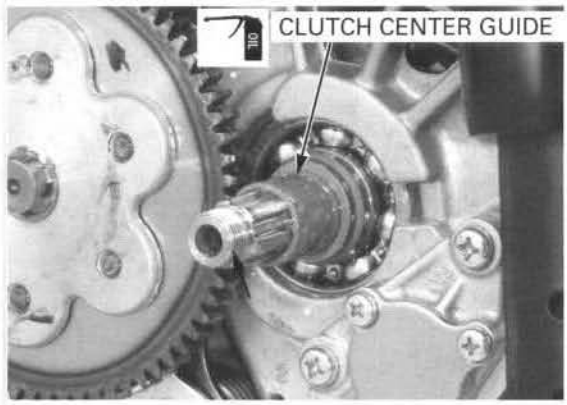
INSTALLATION

Install the collar onto the crankshaft.

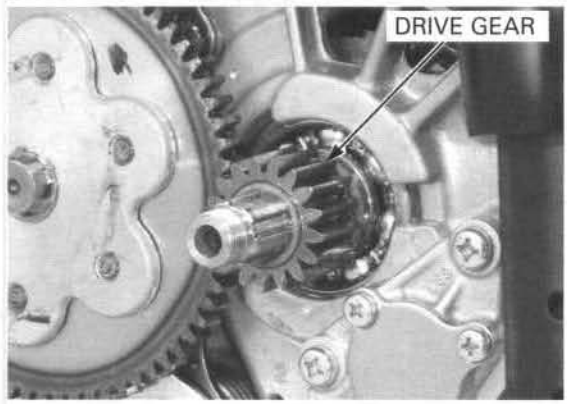
Install the primary driven gear onto the mainshaft and secure it with the snap ring.



Apply engine oil to the clutch center guide and install it onto the crankshaft.

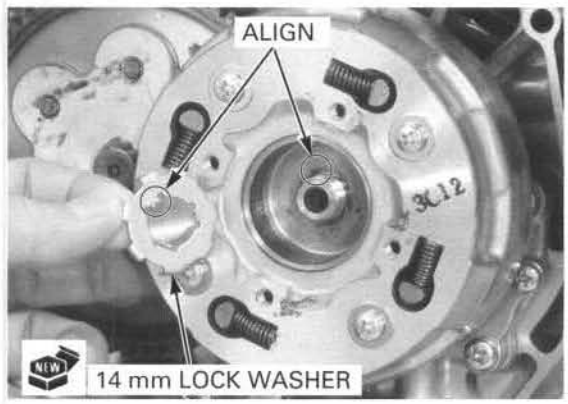


Install the primary drive gear.

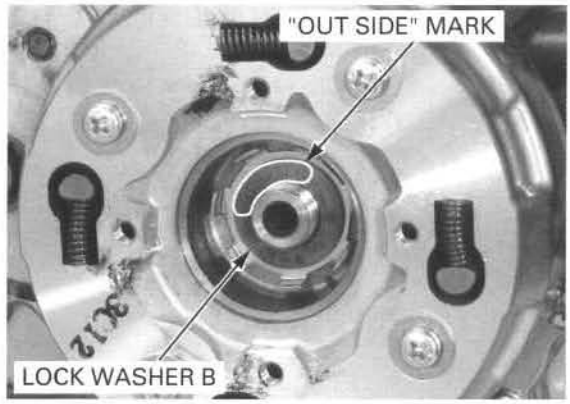


Install the clutch assembly onto the crankshaft.

Install a new 14 mm lock washer by aligning its short tabs with the grooves in the drive plate.



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

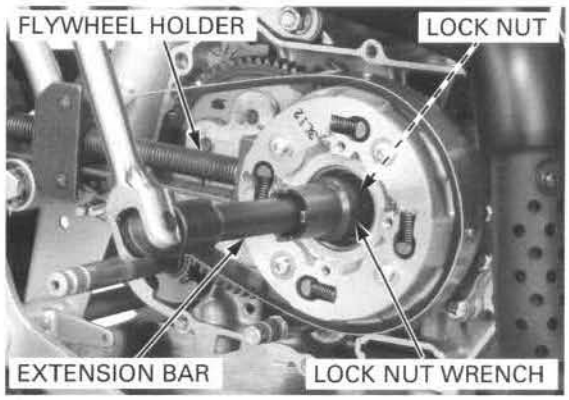


Install the lock nut.

Hold the clutch outer with the flywheel holder and tighten the lock nut to the specified torque using the special tools as shown.

TOOLS:

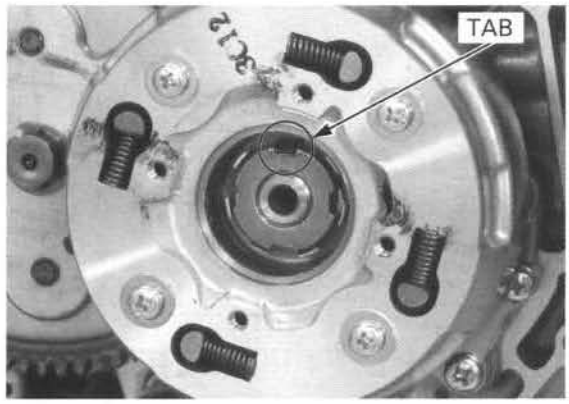
Flywheel holder	**07725-0040000 (Equivalent commercially available in U.S.A.)**
Lock nut wrench, 20 x 24 mm	**07716-0020100**
Extension bar	**07716-0020500 (Equivalent commercially available in U.S.A.)**



TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)

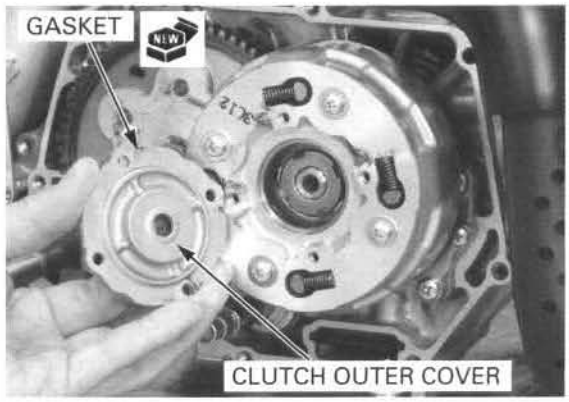
If the lock nut groove does not align with the lock washer tab, further tighten the lock nut and align.

Bent up the tab of the 14 mm lock washer into the groove of the lock nut.



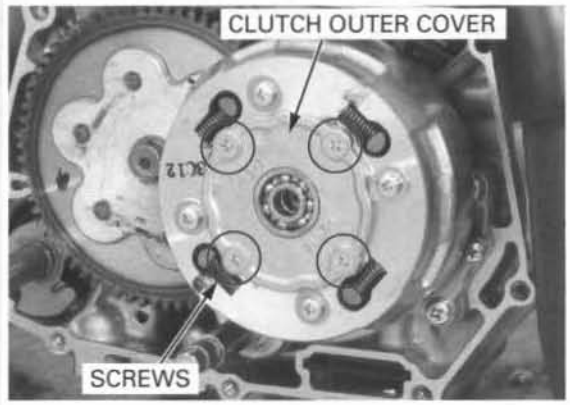
Clean the inside of the clutch outer and outer cover (page 3-12).

Install the bearing and a new gasket onto the clutch outer cover.

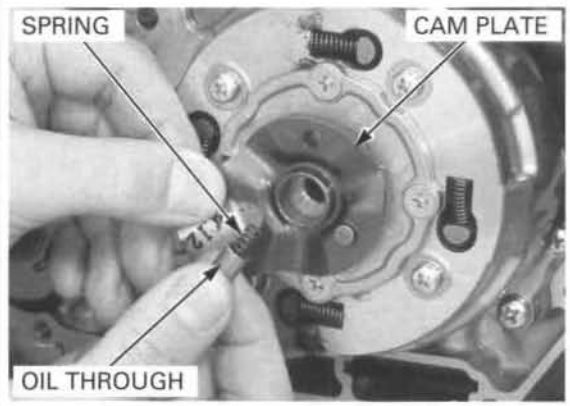


Install the clutch outer and tighten the screws to the specified torque.

TORQUE: 4.4 N·m (0.45 kgf·m,3.3 lbf·ft)

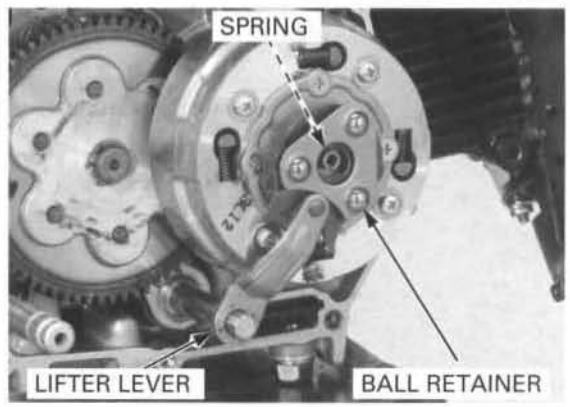


Install the clutch lifter cam plate.
Install the oil through spring and oil through.



Install the spring, ball retainer and clutch lifter lever.

Install the right crankcase cover (page 9-19).



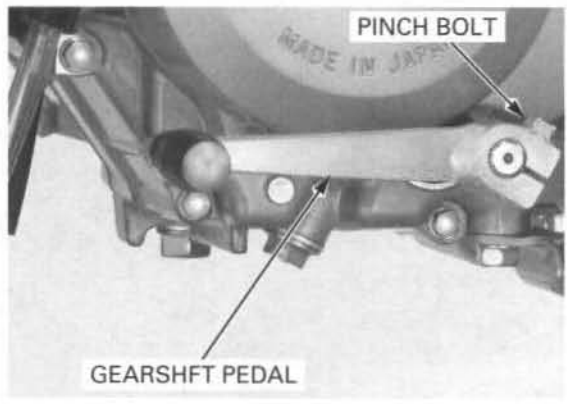
GEARSHIFT LINKAGE

REMOVAL

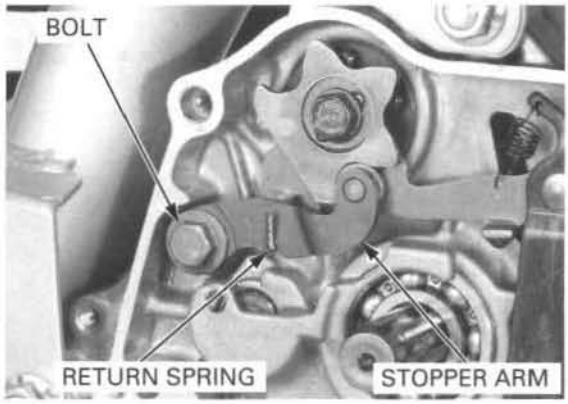
Remove the clutch and primary driven gear (page 9-6).

Clean the gearshift spindle end to prevent dirt from entering the crankcase.

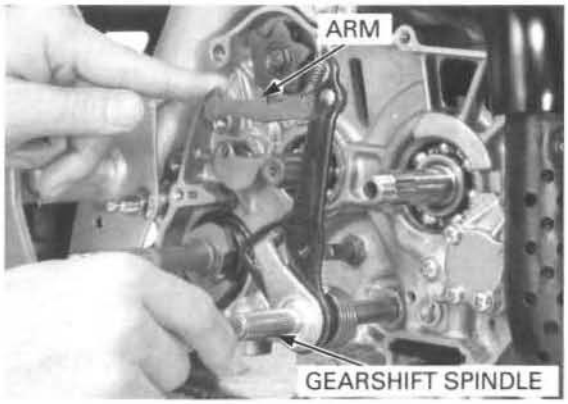
Remove the pinch bolt and gearshift pedal.



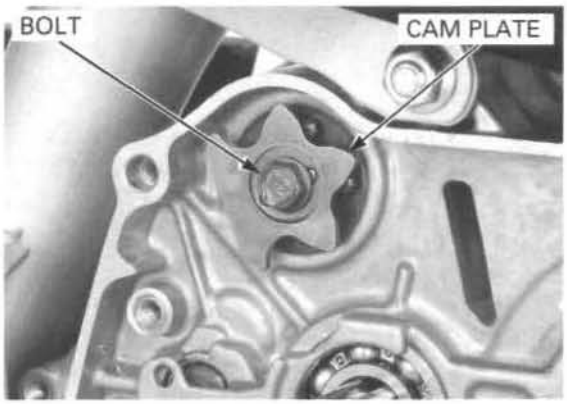
Remove the bolt, stopper arm and return spring.



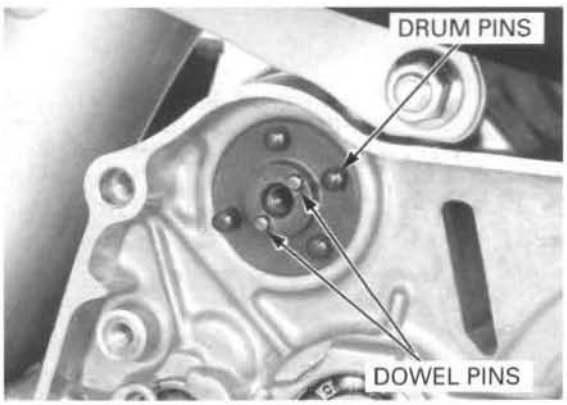
Pull down the gearshift arm, then pull out the gearshift spindle from the crankcase.



Remove the bolt and shift cam plate.

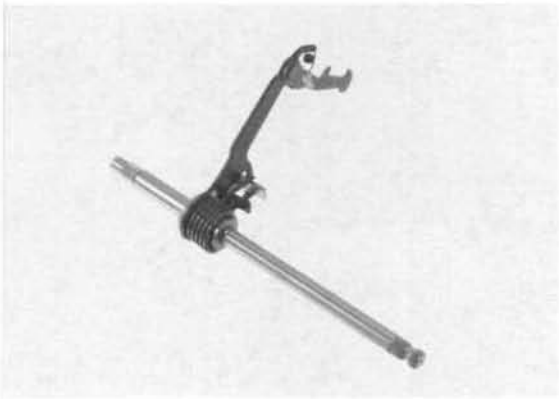


Remove the dowel pins and gearshift drum pins.



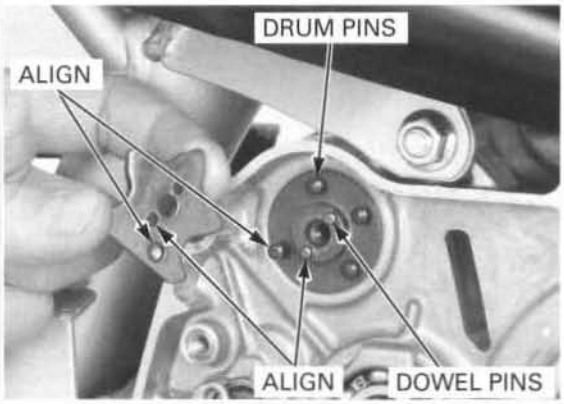
INSPECTION

Check the gearshift spindle for bends or other damage.



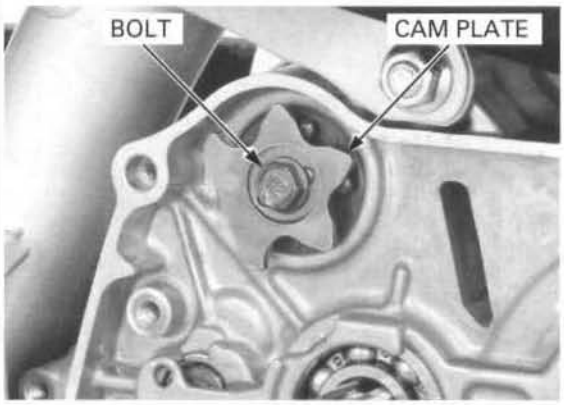
INSTALLATION

Install the four gearshift drum pins and two dowel pins.
Install the cam plate by aligning the pin hole with the dowel pins and aligning the drum pin with the dent.

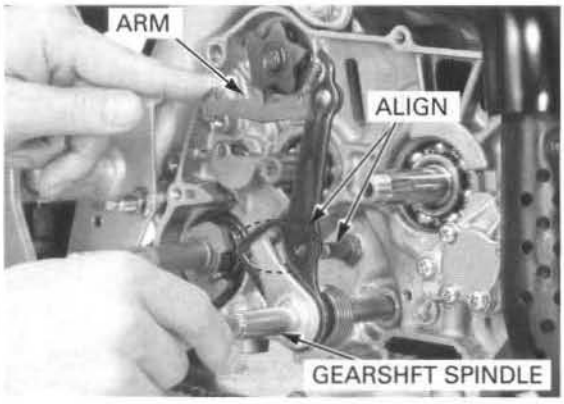


Install the cam plate and tighten the bolt to the specified torque.

TORQUE: 17 N·m (1.7 kgf·m,12 lbf·ft)

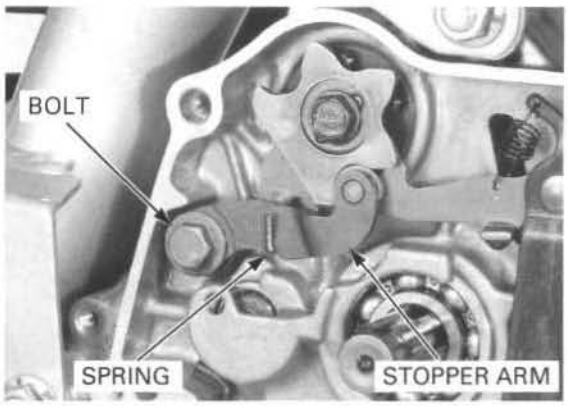


Install the gearshift spindle into the crankcase by aligning the return spring ends with the spring pin while pushing down the gearshift arm and set the gearshift arm to the shift drum pins.



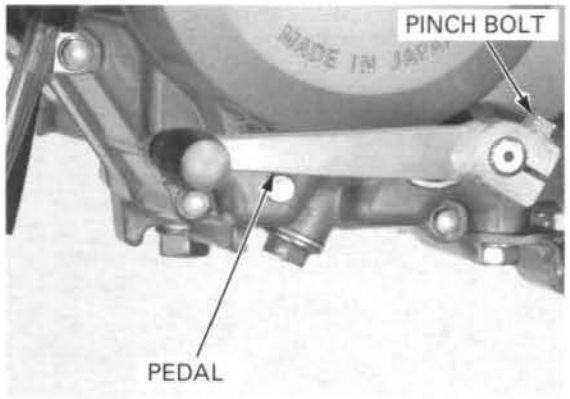
Install the return spring and stopper arm as shown and tighten the bolt to the specified torque.

TORQUE: 13 N·m (1.3 kgf·m,9 lbf·ft)



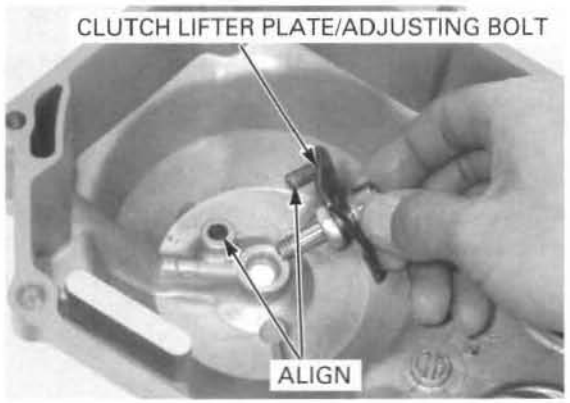
Install the gearshift pedal so that it is same height as the footpeg.
Install the pinch bolt and tighten it.

Install the primary driven gear and clutch assembly (page 9-14)

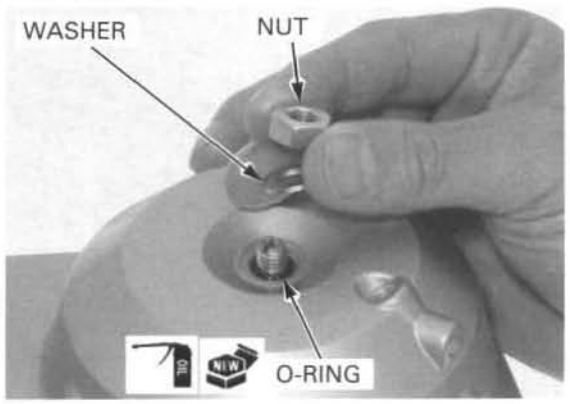


RIGHT CRANKCASE COVER INSTALLATION

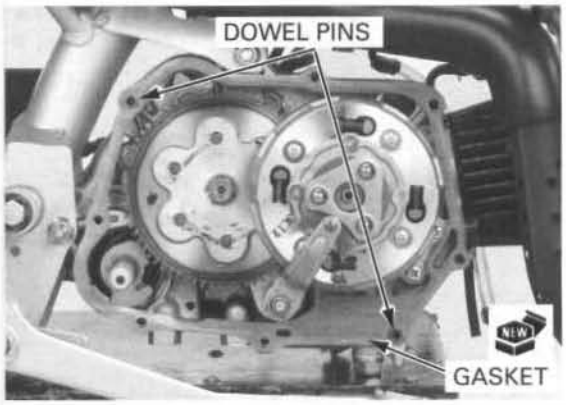
Install the clutch lifter plate/adjusting bolt into the right crankcase cover by aligning its pin with the hole in the crankcase cover.



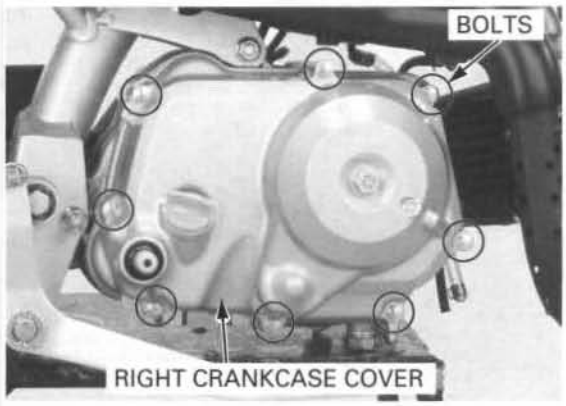
Coat a new O-ring with engine oil and install it into the cover groove properly.
Install the washer and lock nut.



Install the dowel pins and a new gasket.



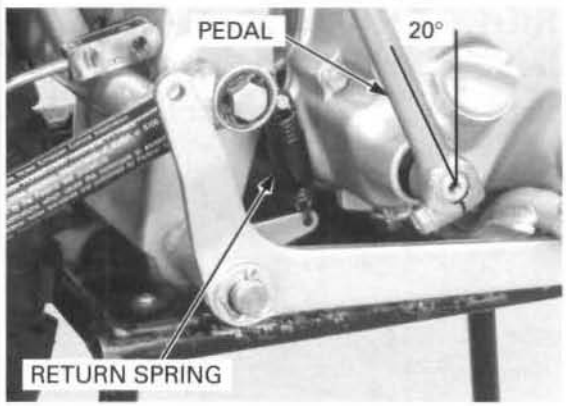
Install the right crankcase cover.
Install and tighten the eight cover bolts in a criss-cross pattern several steps.



Install the kickstarter pedal as shown and tighten the bolt.
Hook the return spring to the brake pedal and spring holding pin as shown.

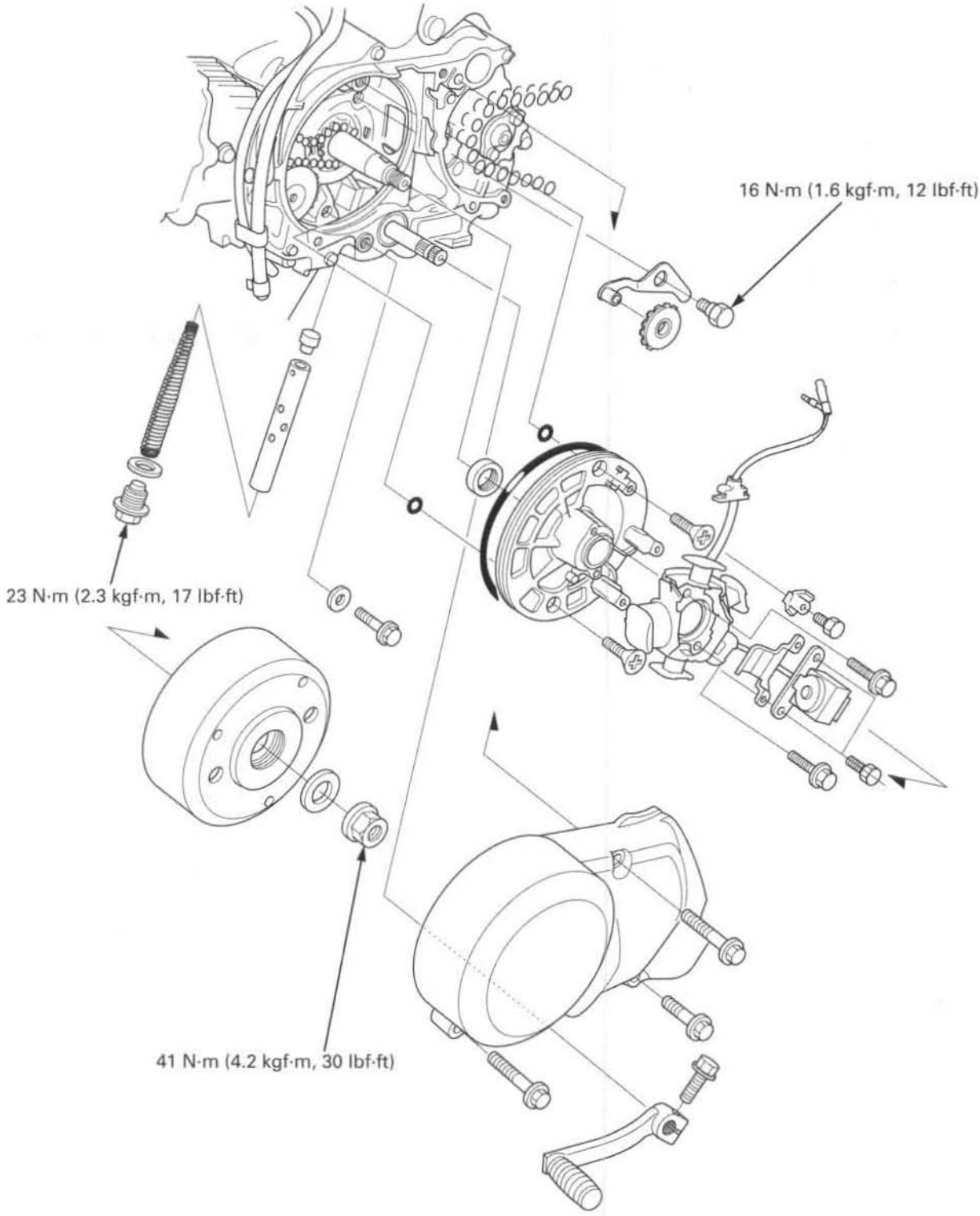
Install the footpeg bar (page 6-6).
Adjust the brake pedal free play (page 3-16).

Pour the recommended engine oil (page 3-11).
Adjust the clutch (page 3-17).



10. ALTERNATOR/CAM CHAIN TENSIONER

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- This section covers service of the flywheel, alternator and cam chain tensioner. All service can be done with the engine installed in the frame.
- Refer to 14-3 for alternator stator inspection.

SPECIFICATIONS

Unit: mm (in)

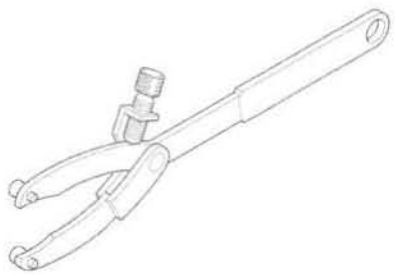
ITEM		STANDARD	SERVICE LIMIT
Cam chain tensioner	Push rod O.D.	11.985 – 12.000 (0.4718 – 0.4724)	11.94 (0.470)
	Spring free length	111.3 (4.38)	100 (3.9)

TORQUE VALUES

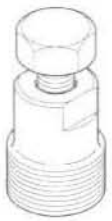
Flywheel nut	41 N·m (4.2 kgf·m, 30 lbf·ft)
Cam chain tensioner sealing bolt	23 N·m (2.3 kgf·m, 17 lbf·ft)
Cam chain tensioner pivot bolt	16 N·m (1.6 kgf·m, 12 lbf·ft)

TOOLS

Universal holder
07725-0030000



Flywheel puller
07933-GE00000
(Not available in U.S.A.)



or 07933-0010000 U.S.A. only

TROUBLESHOOTING

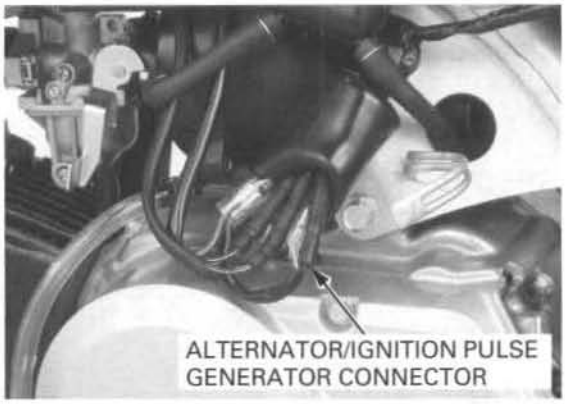
Excessive engine noise
- Worn or damaged cam chain tensioner
- Weak or damaged cam chain tensioner spring

Loose cam chain
- Weak or damaged cam chain tensioner spring
- Improper push rod operation

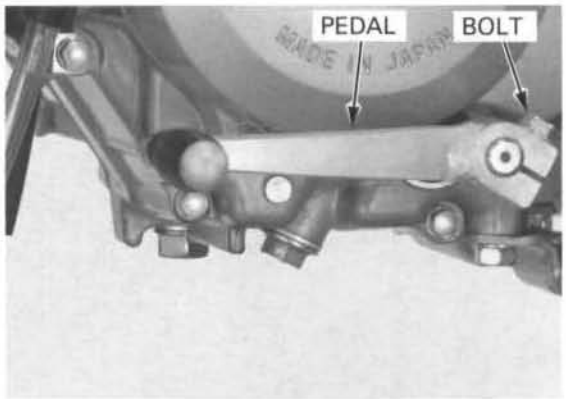
FLYWHEEL/STATOR REMOVAL

Drain the engine oil (page 3-11).

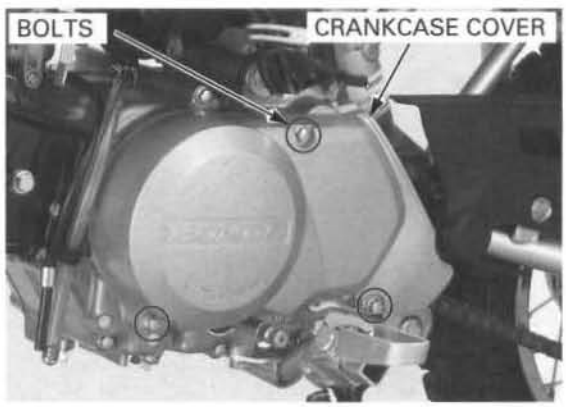
Disconnect the alternator and ignition pulse generator connectors.



Remove the bolt and gearshift pedal.



Remove the three bolts and left crankcase cover.

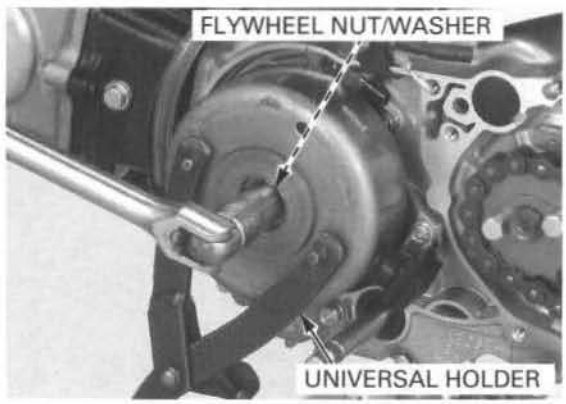


Hold the flywheel using the universal holder and remove the flywheel nut.

TOOL:

Universal holder	**07725-0030000**

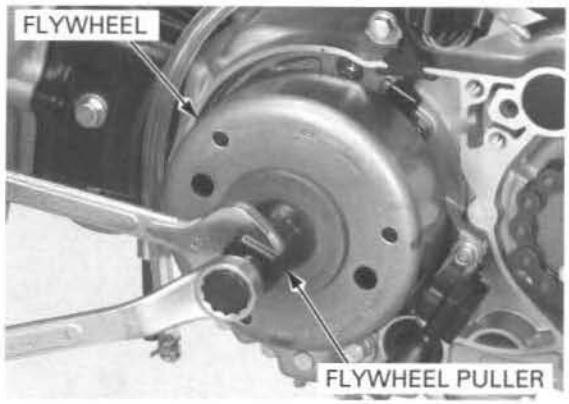
Remove the washer.



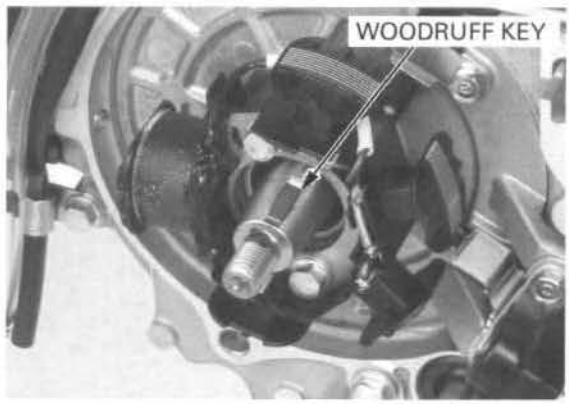
Remove the flywheel using the special tool.

TOOL:

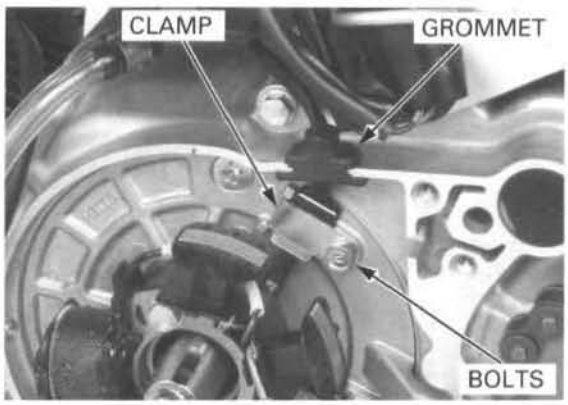
Flywheel puller	**07933-GE00000 (Not available in U.S.A.) or**
Flywheel puller	**07933-0010000 (U.S.A. ONLY)**



Remove the woodruff key.

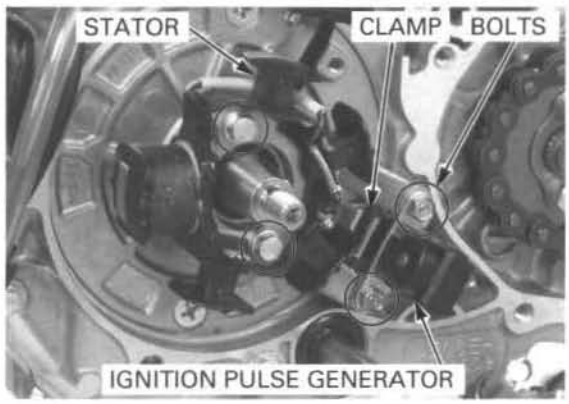


Remove the bolt and wire clamp.
Release the wire grommet from the crankcase groove.

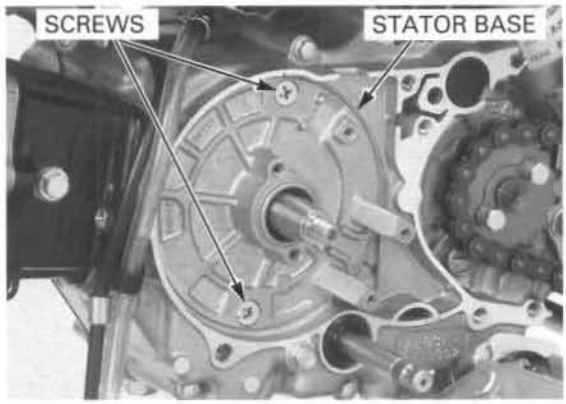


Remove the ignition pulse generator mounting bolts and wire clamp.
Remove the stator mounting bolts.

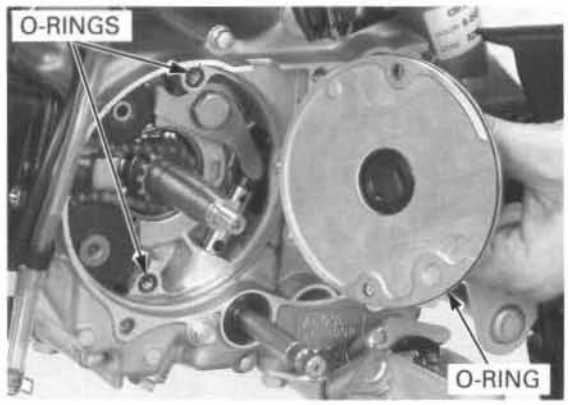
Remove the ignition pulse generator and stator as an assembly.



Remove the screws and stator base.



Remove the O-rings from the crankcase.
Remove the O-rings from the stator base.

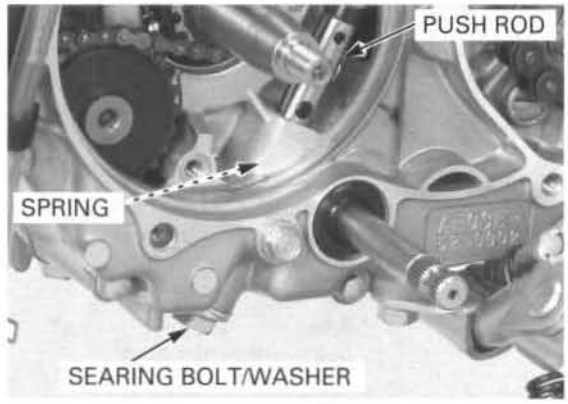


CAM CHAIN TENSIONER

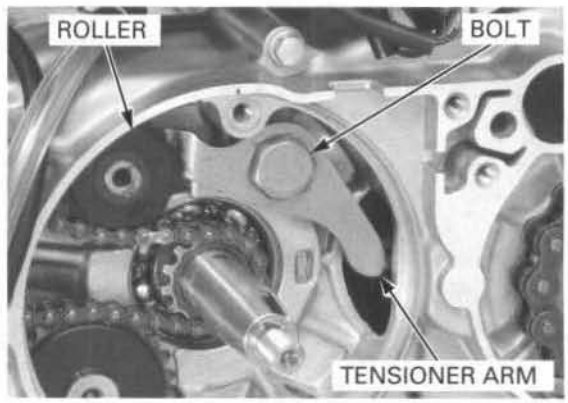
REMOVAL

Remove the stator base (page 10-4).

Remove the sealing bolt washer, tensioner spring and push rod.



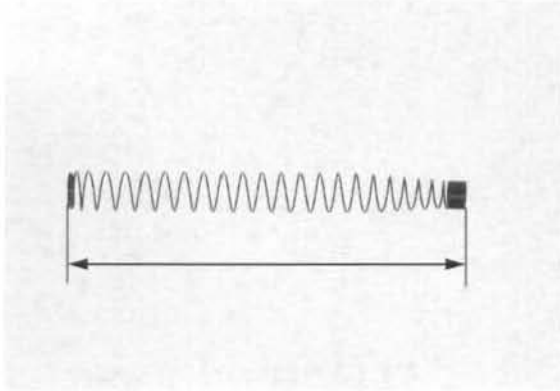
Remove the pivot bolt, tensioner arm and tensioner roller.



INSPECTION

Measure the tensioner spring free length.

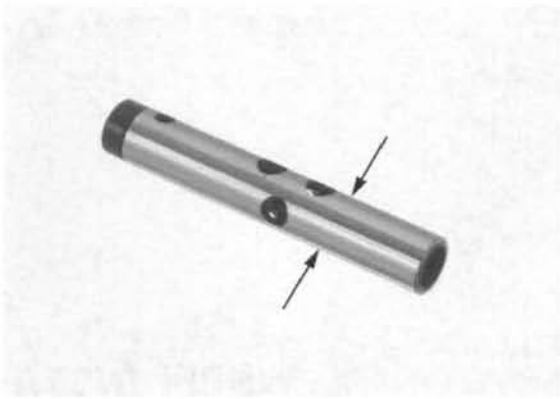
SERVICE LIMIT: 100 mm (3.9 in)



Check the push rod for wear or damage.

Measure the push rod O.D.

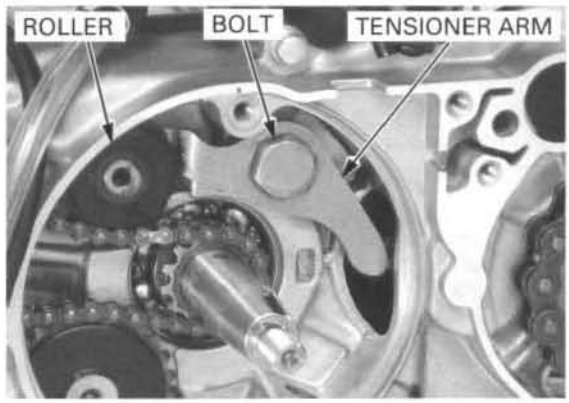
SERVICE LIMIT: 11.94 mm (0.470 in)



INSTALLATION

Install the cam chain tensioner roller, tensioner arm and pivot bolt.
Tighten the pivot bolt to the specified torque.

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)

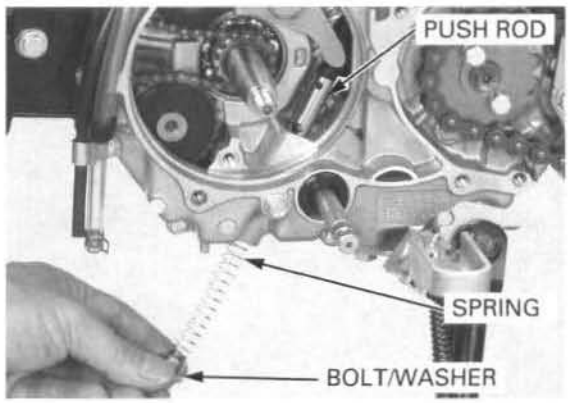


Check the sealing washer is in good condition, replace if necessary.

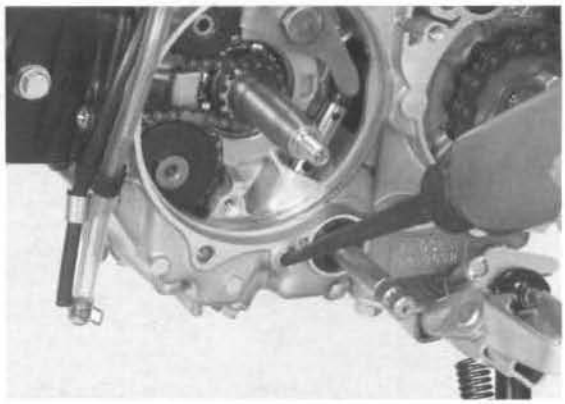
Install the spring with the tapered side facing the push rod.

Install the push rod, spring, washer and sealing bolt.
Tighten the sealing bolt to the specified torque.

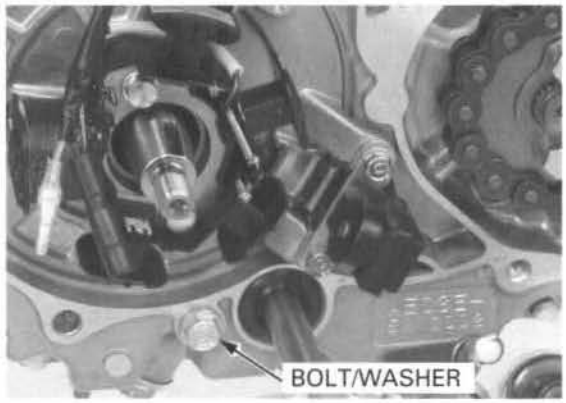
TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)



Remove the crankcase sealing bolt and washer.
Fill the push rod with 1 – 2 cm^3 of engine oil through the filler hole.



Check the sealing washer is in good condition and install the sealing washer and bolt.
Tighten the bolt securely.



STATOR/FLYWHEEL INSTALLATION

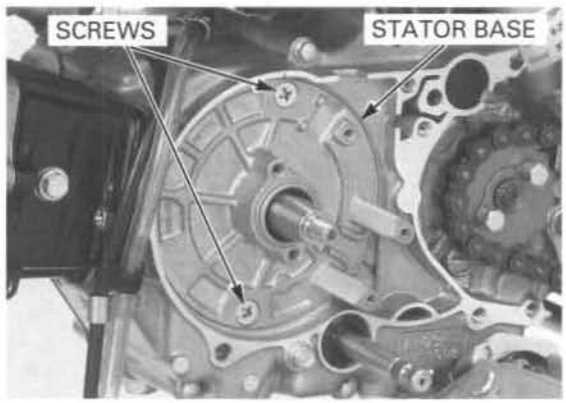
Check the stator base oil seal for damage, replace if necessary.
Apply engine oil to the lip of the oil seal.

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

Apply engine oil to new O-ring, install it into the stator base groove.

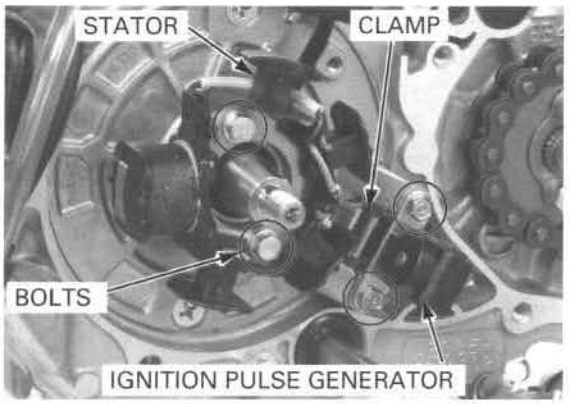
Be careful not to damage the oil seal lips

Install the stator base and tighten the screws securely.

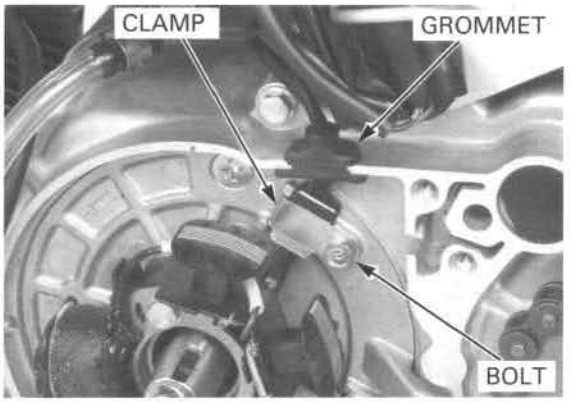


Install the ignition pulse generator and stator as an assembly.

Install the ignition pulse generator mounting bolts and wire clamp.
Install the stator mounting bolts.

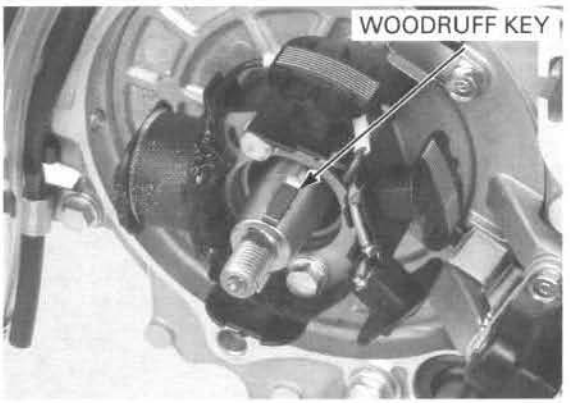


Set the wire grommet into the crankcase groove.
Install the wire clamp and tighten the bolt.



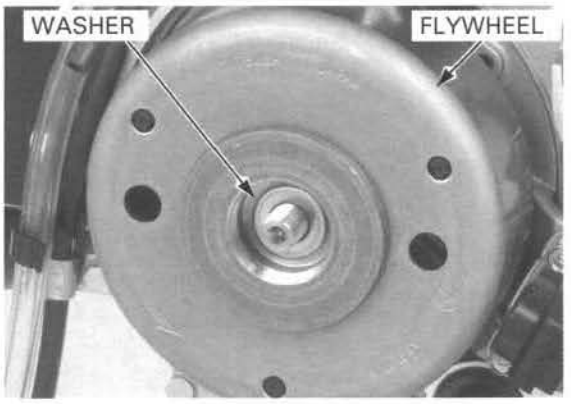
Clean any oil from the tapered portion of the crankshaft and flywheel.

Install the woodruff key into the crankshaft groove.



Install the flywheel by aligning the key way in the flywheel with the woodruff key on the crankshaft.

Install the washer.

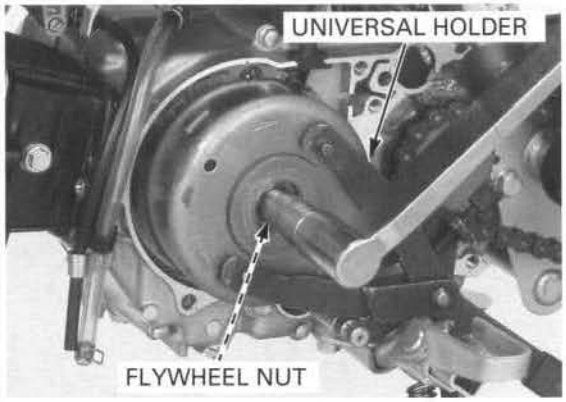


Install the flywheel nut.

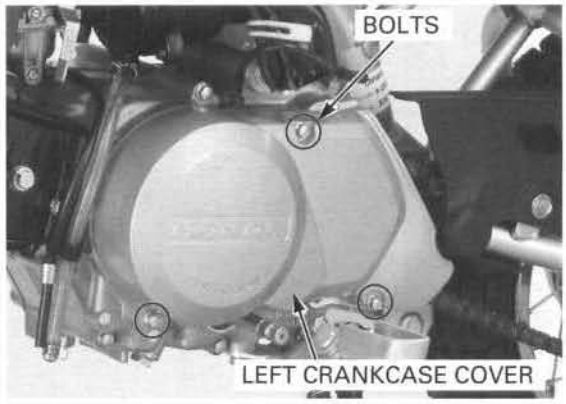
Hold the flywheel using the universal holder and tighten the nut to the specified torque.

TOOL:
Universal holder **07725-0030000**

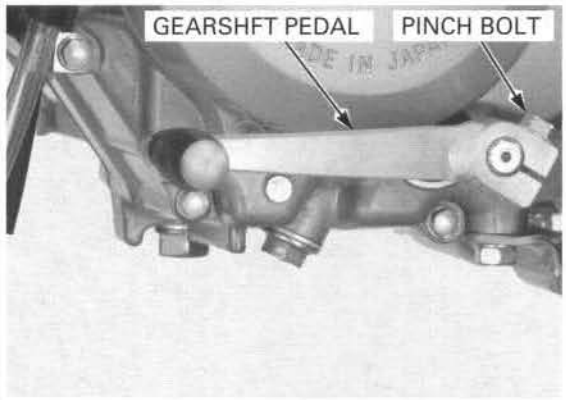
TORQUE: 41 N·m (4.2 kgf·m, 30 lbf·ft)



Install the left crankcase cover and tighten the three bolts.



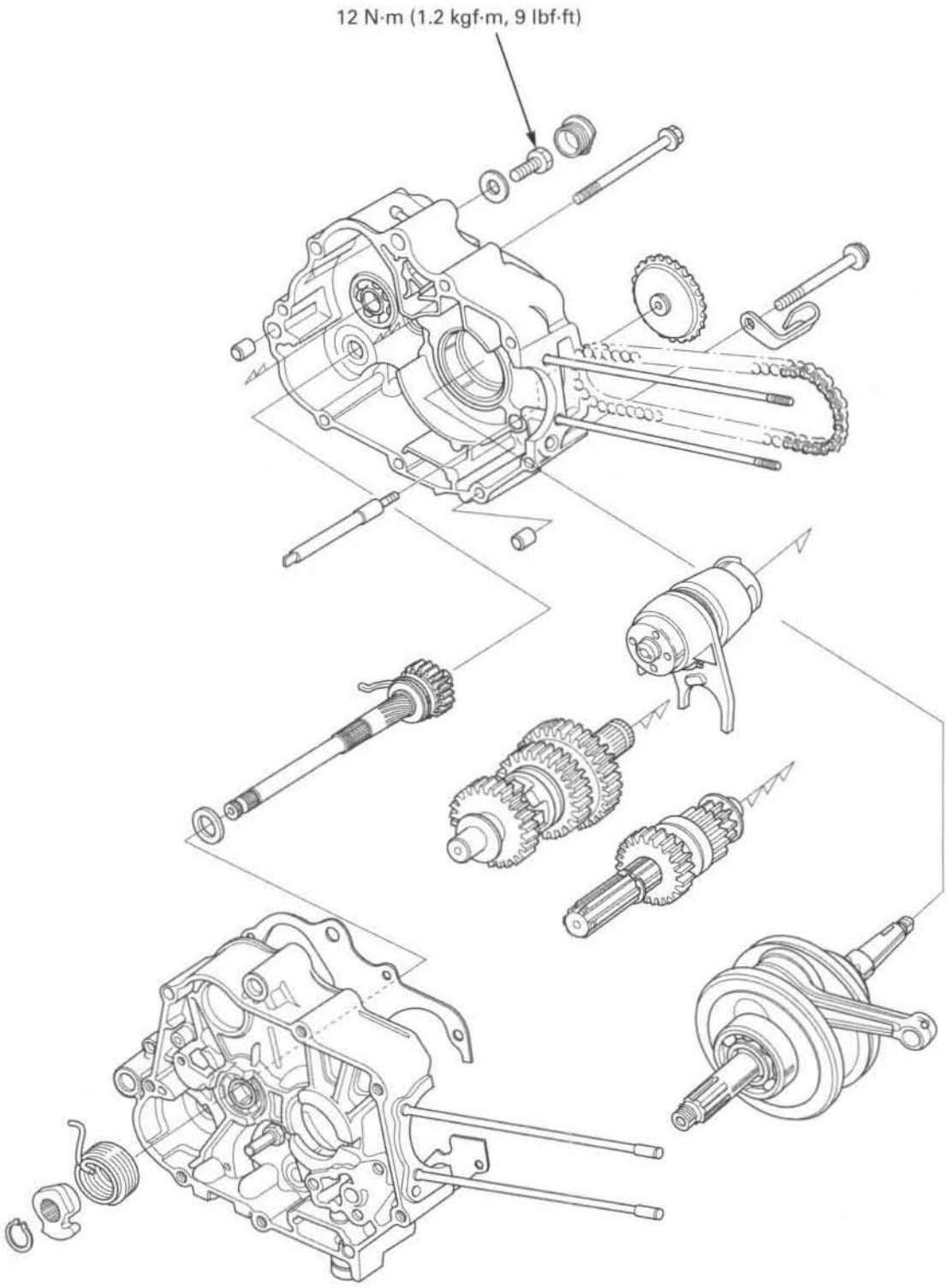
Install the gearshift pedal so that it is same height as the footpeg.
Install the pinch bolt and tighten it.



Connect the ignition pulse generator and alternator connectors.

11. CRANKSHAFT/TRANSMISSION/KICKSTARTER

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- The crankcase must be separated to service the crankshaft, transmission and kickstarter.
- The following parts must be removed before separating the crankcase.
  - Alternator/cam chain tensioner (page 10-4)
  - Clutch/gearshift linkage (page 9-6)
  - Cylinder head (page 7-7)
  - Cylinder/piston (page 8-4)
  - Engine (page 6-4)
  - Oil pump (page 4-4)

SPECIFICATIONS

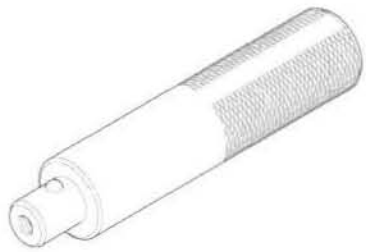
Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Side clearance		0.010 – 0.350 (0.0004 – 0.0138)	0.60 (0.024)
	Radial clearance		0 – 0.012 (0 – 0.0005)	0.05 (0.002)
	Runout		–	0.10 (0.004)
Transmission	Gear I.D.	M2	17.016 – 17.043 (0.6699 – 0.6710)	17.10 (0.673)
		C1	23.020 – 23.053 (0.9063 – 0.9076)	23.10 (0.909)
		C3	20.020 – 20.053 (0.7882 – 0.7895)	20.10 (0.791)
	Busing O.D.	C1	22.979 – 23.000 (0.9047 – 0.9055)	22.93 (0.903)
	Busing I.D.	C1	20.000 – 20.021 (0.7874 – 0.7882)	20.08 (0.791)
	Gear -to-bushing clearance	C1	0.020 – 0.074 (0.0008 – 0.0029)	0.10 (0.004)
	Mainshaft O.D.	M2	16.966 – 16.984 (0.6680 – 0.6687)	16.95 (0.667)
	Countershaft O.D.	C1	19.959 – 19.980 (0.7858 – 0.7866)	19.94 (0.785)
	Gear -to-shaft clearance	M2	0.032 – 0.077 (0.0013 – 0.0030)	0.10 (0.004)
	Gear bushing-to-shaft clearance	C1	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
Shift fork	I.D.		34.075 – 34.100 (1.3415 – 1.3425)	34.14 (1.344)
	Claw thickness		4.86 – 4.94 (0.191 – 0.194)	4.60 (0.181)
	Shift drum O.D.		33.950 – 33.975 (1.3366 – 1.3376)	33.93 (1.336)

TORQUE VALUE

Shift drum bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)

TOOLS

Driver 07749-0010000	Attachment 37 x 40 mm 07746-0010200	Pilot, 17 mm 07746-0040400
		

TROUBLESHOOTING

Hard to shift
- Incorrect clutch adjustment
- Bent shift fork
- Bent fork claw
- Damaged shift drum cam groove
- Incorrect transmission oil weight

Transmission jumps out of gear
- Worn gear dogs or slots
- Bent shift fork
- Broken shift drum stopper

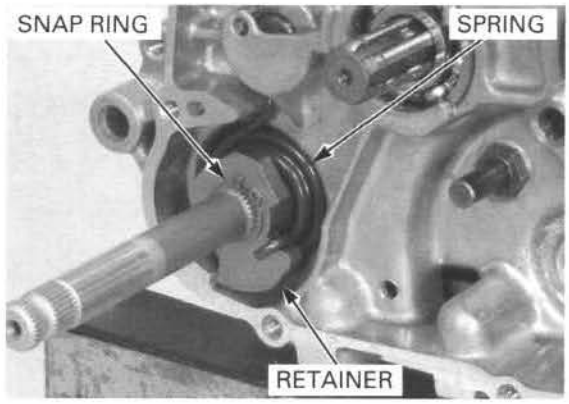
Excessive noise
- Worn crankshaft big end bearing
- Worn crankshaft journal bearing

CRANKCASE SEPARATION

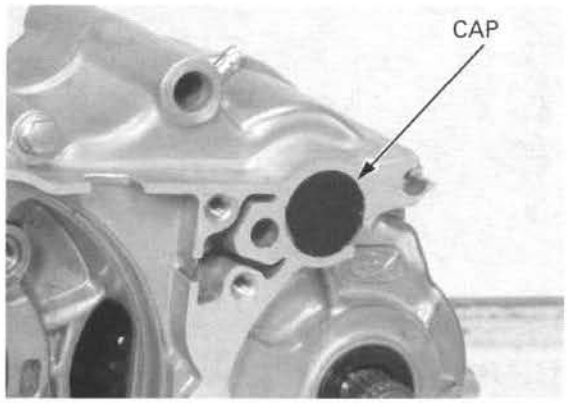
Refer to Service Information (page 11-3) for removal of necessary parts before separating the crankcase.

Remove the snap ring from the kickstarter spindle.

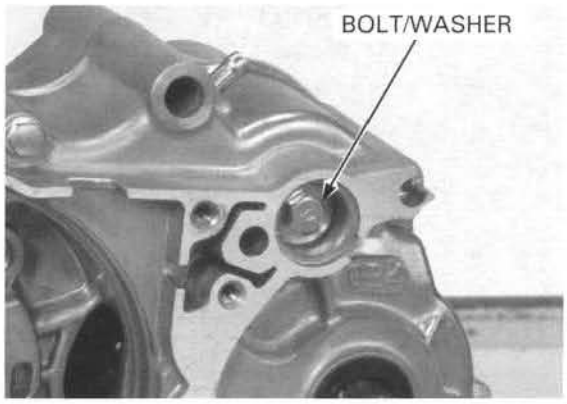
Unhook the return spring and remove the retainer and return spring.



Remove the rubber cap.



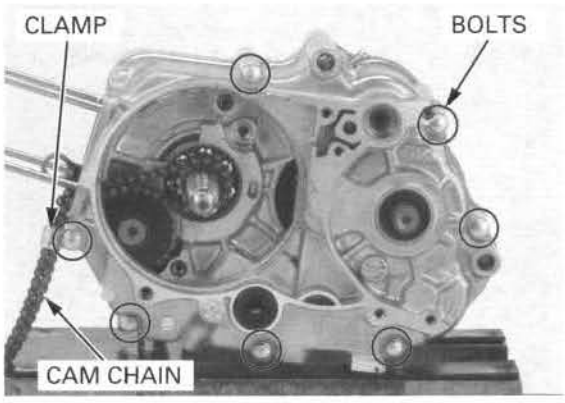
Remove the shift drum bolt and washer.



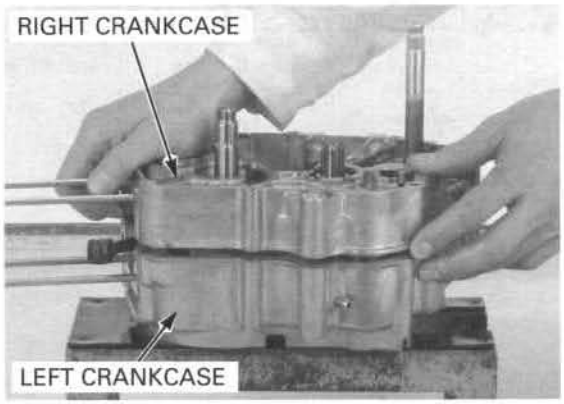
Remove the cam chain.

Loosen the seven crankcase bolts in a crisscross pattern in 2 – 3 steps and remove them.

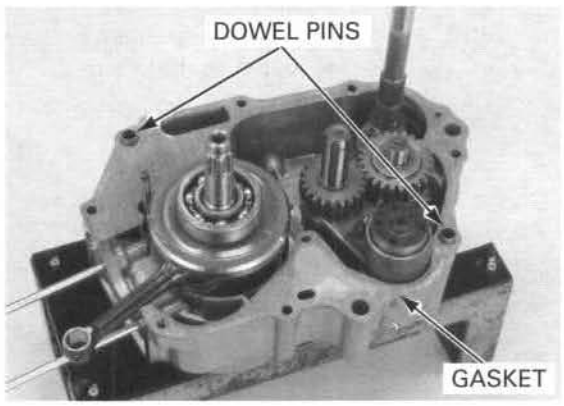
Remove the clamp.



Place the crankcase with the left side down.
Separate the right and left crankcase halves.



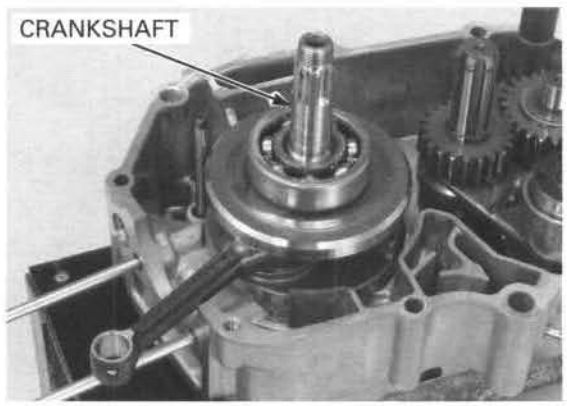
Remove the gasket and dowel pins.



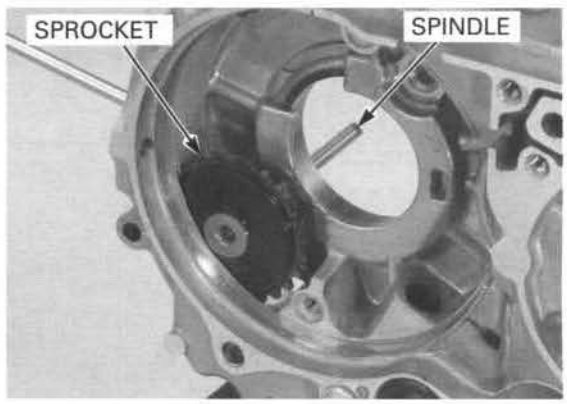
CRANKSHAFT

REMOVAL

Remove the crankshaft from the left crankcase.



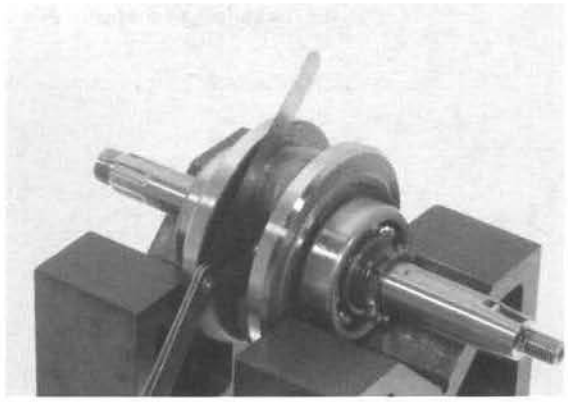
If necessary, remove the cam chain guide spindle and guide sprocket.



INSPECTION

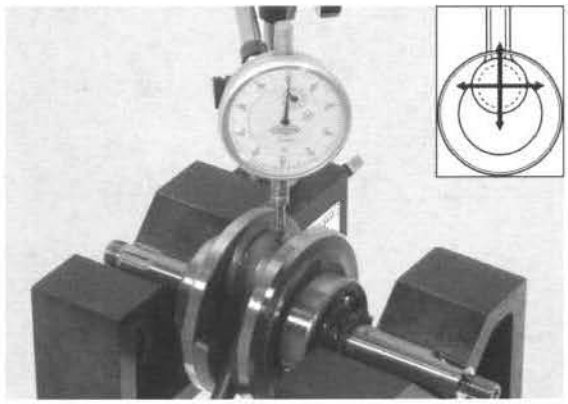
Measure the connecting rod big end side clearance with a feeler gauge.

SERVICE LIMIT: 0.60 mm (0.024 in)

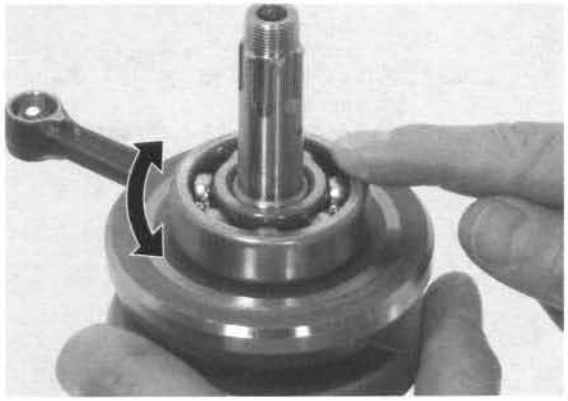


Measure the connecting rod big end radial clearance at symmetrical points as shown.

SERVICE LIMIT: 0.05 mm (0.002 in)

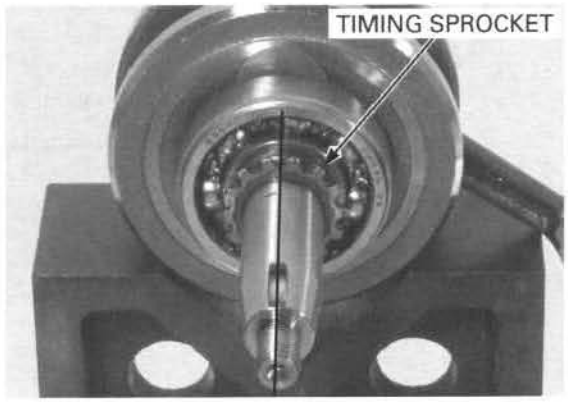


Turn the outer race of the crankshaft bearing with your finger.
The bearing should turn smoothly and quietly.
Also check that the inner race of the bearing fits tightly on the crankshaft.



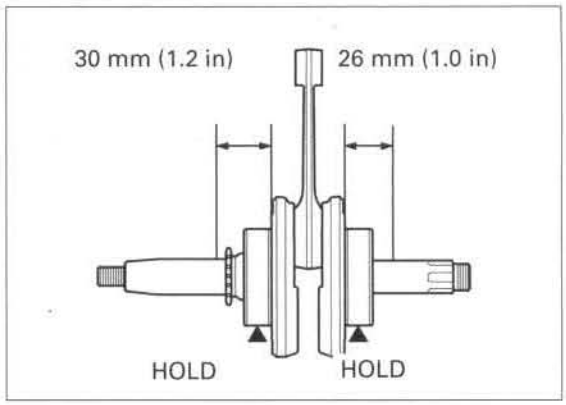
Check the timing sprocket for wear or damage.

If you are replacing the timing sprocket, align the valley of the sprocket teeth with the center of woodruff key groove as shown.



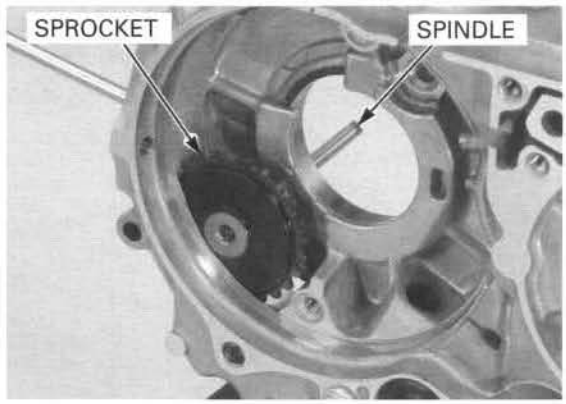
Place the crankshaft on a stand or V-blocks and measure the runout using a dial gauge.
The measuring locations are shown in the illustration.

SERVICE LIMIT: 0.10 mm (0.004 in)

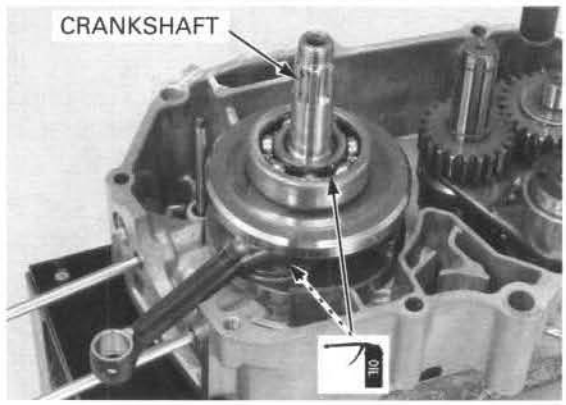


INSTALLATION

Install the guide sprocket and guide spindle.



Pour 1 – 2 cm^3 of engine oil into the connecting rod big end bearing.
Install the crankshaft into the left crankcase, being careful not to interfere the connecting rod with the crankcase.
Assemble the crankcase halves (page 11-16).

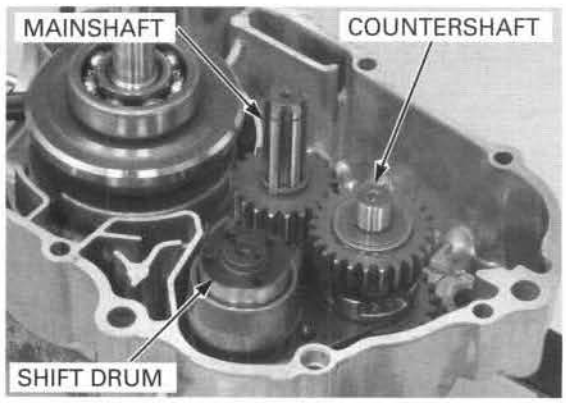


TRANSMISSION

REMOVAL

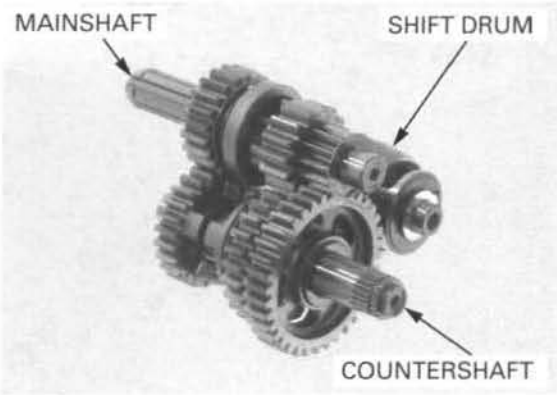
Remove the kickstarter spindle (page 11-14).

Remove the mainshaft, countershaft and shift drum as an assembly.



TRANSMISSION DISASSEMBLY

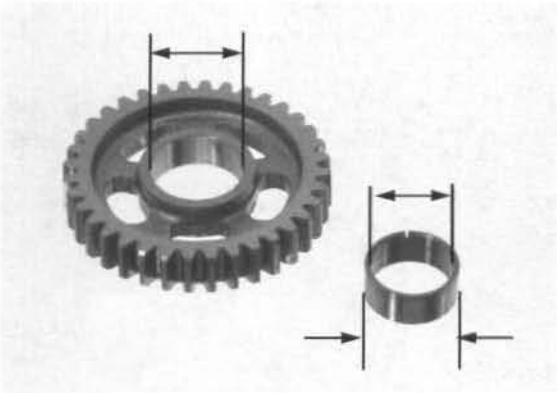
Disassemble the mainshaft, countershaft and shift drum.



TRANSMISSION INSPECTION

Check the gear dogs, dog holes and teeth for abnormal wear or lack of lubrication.
Measure the I.D. of each gear.

SERVICE LIMITS:
M2: 17.10 mm (0.673 in)
C1: 23.10 mm (0.909 in)
C3: 20.10 mm (0.791 in)



Measure the I.D. and O.D. of C1 gear bushing.

SERVICE LIMITS:
O.D.: 22.93 mm (0.903 in)
I.D.: 20.08 mm (0.791 in)

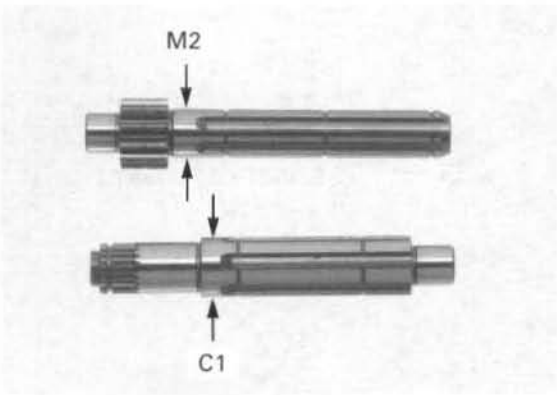
Calculate the C1 gear-to-bushing clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)

Check the shifter groove of the shifter gear for excessive wear or damage.

Measure the O.D. of the mainshaft and countershaft.

SERVICE LIMITS:
AT M2 gear: 16.95 mm (0.667 in)
AT C1 gear: 19.94 mm (0.785 in)



Calculate the M2 gear-to-shaft clearance.

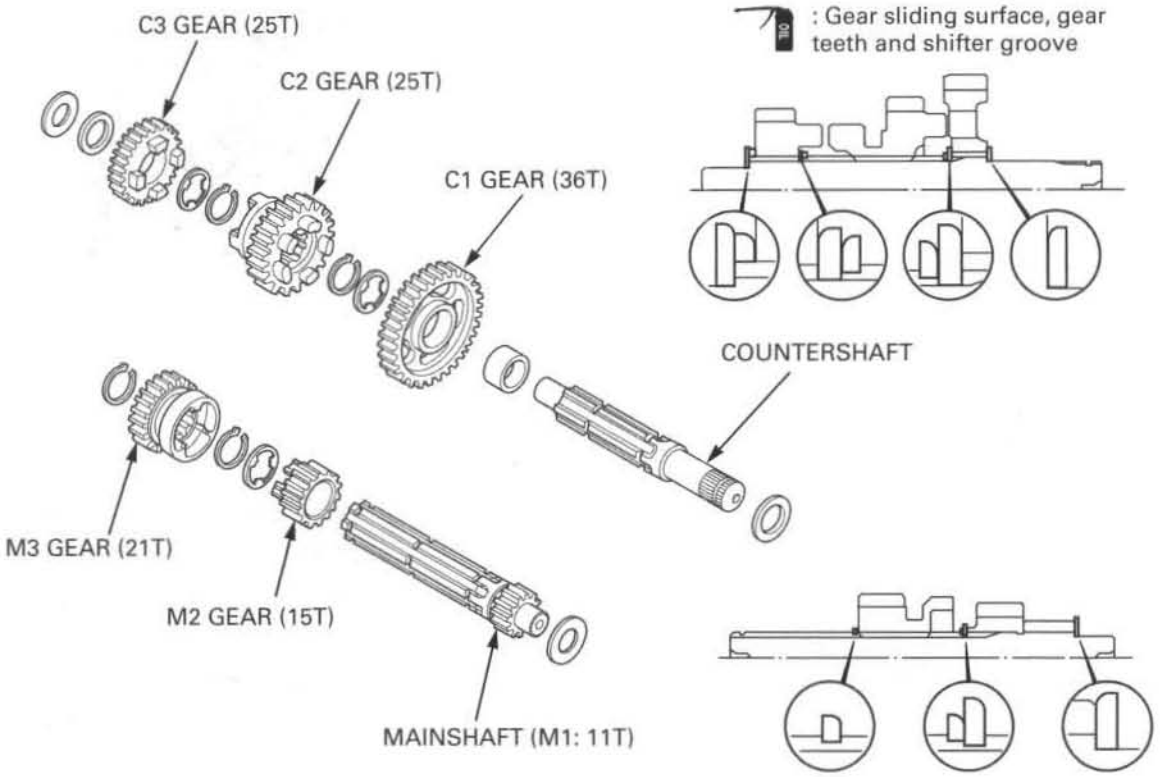
SERVICE LIMIT: 0.10 mm (0.004 in)

Calculate the C1 gear bushing-to-shaft clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)

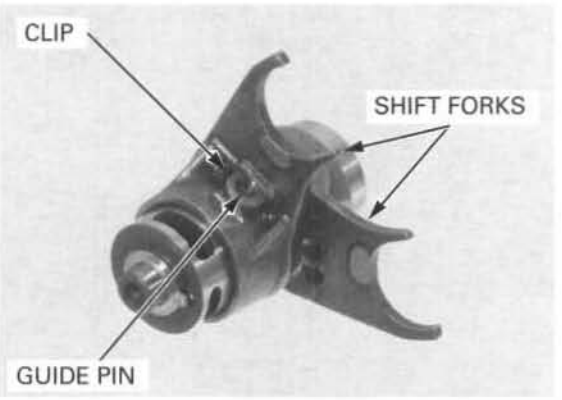
TRANSMISSION ASSEMBLY

Assembly is in the reverse order of disassembly.



GEARSHFT DRUM DISASSEMBLY

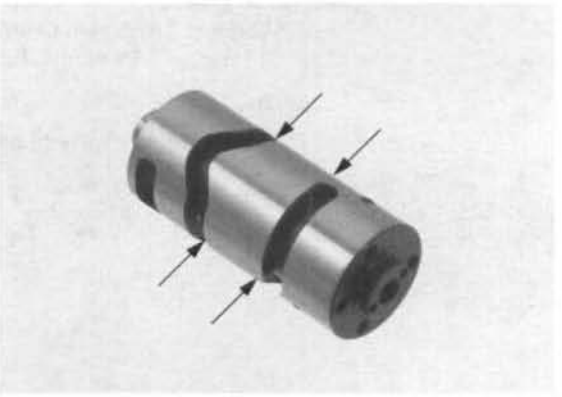
Remove the guide pin clips.
Remove the guide pins, then remove the shift forks.



Inspect the shift drum grooves for wear or damage.

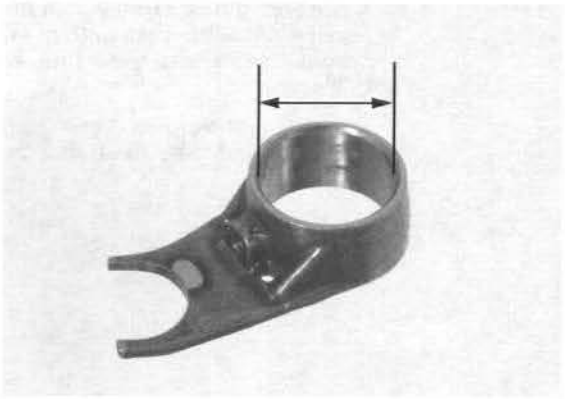
Measure the O.D. of the shift drum.

SERVICE LIMIT: 33.93 mm (1.336 in)



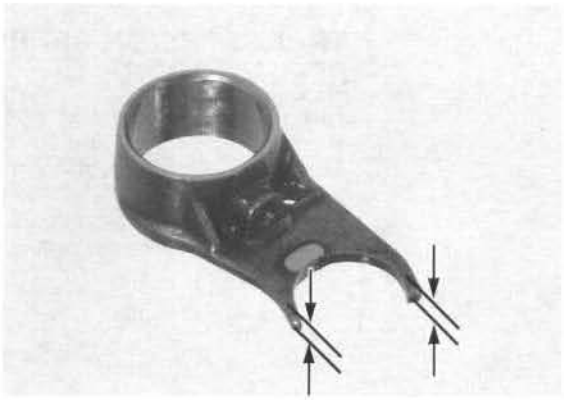
Measure the shift fork I.D.

SERVICE LIMIT: 34.14 mm (1.344 in)

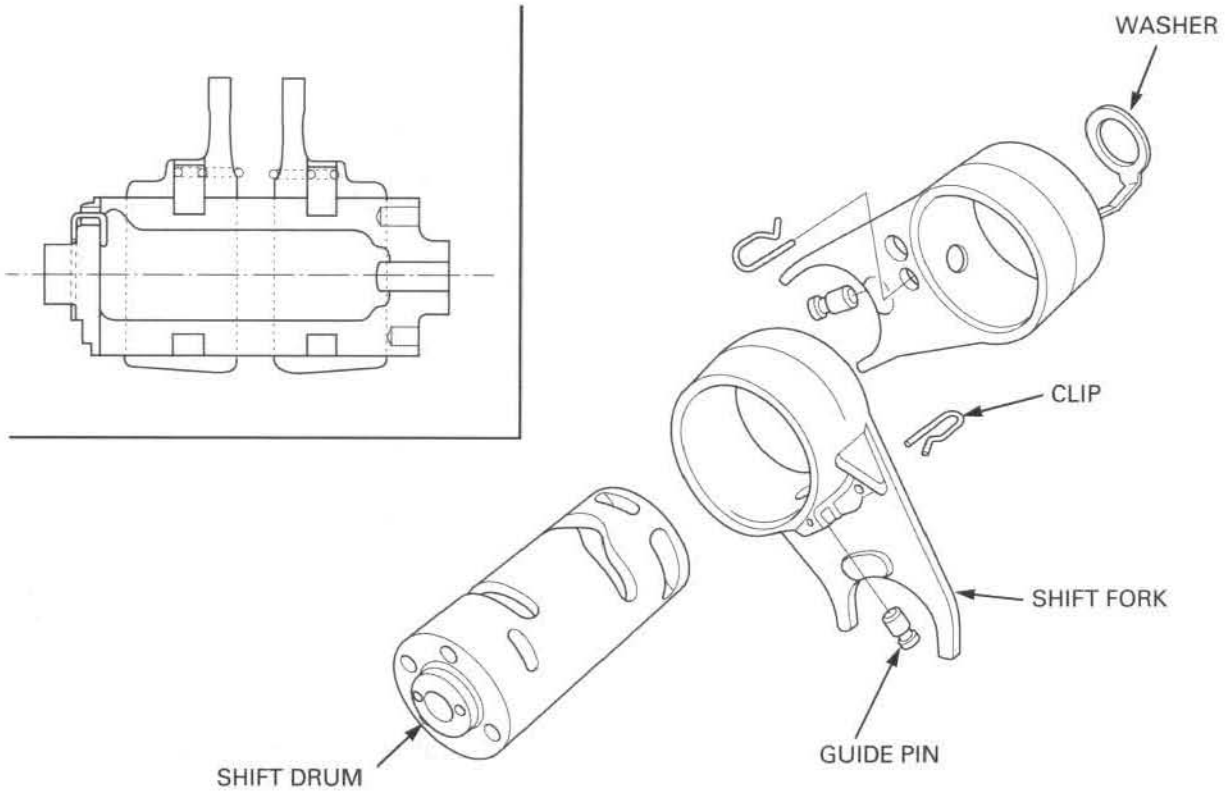


Measure the shift fork claw thickness.

SERVICE LIMIT: 4.60 mm (0.181 in)

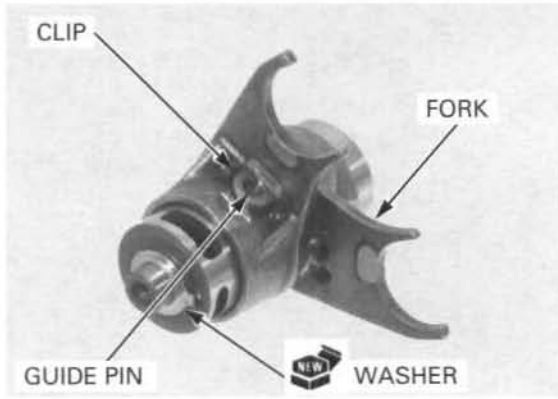


SHFT DRUM ASSEMBLY



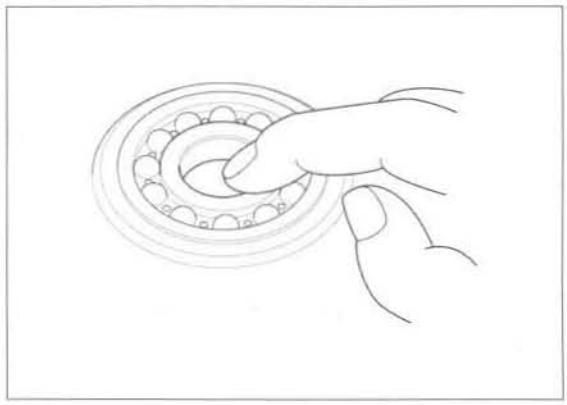
Apply engine oil to the shift drum outer surface.
Install the shift forks onto the gearshift drum.
Install the guide pins and secure them with the clips.

If the washer has been removed, install a new washer and bend the tab to lock the washer.

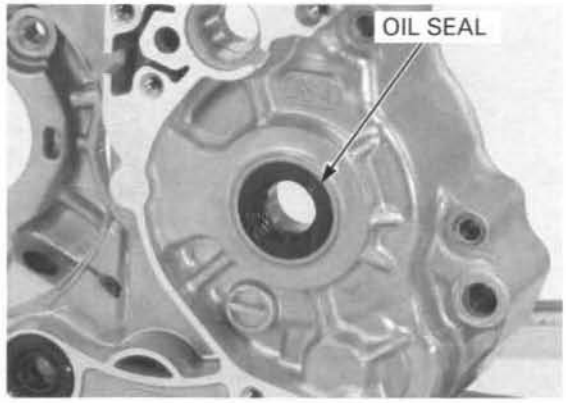


TRANSMISSION BEARING REPLACEMENT

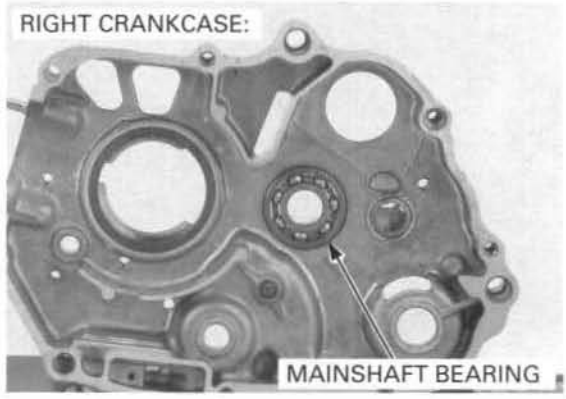
Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly.
Also check that the bearing outer race fits tightly in the crankcase.
Remove and discard the bearing if the race does not turn smoothly, quietly, or fits loosely in the crankcase.



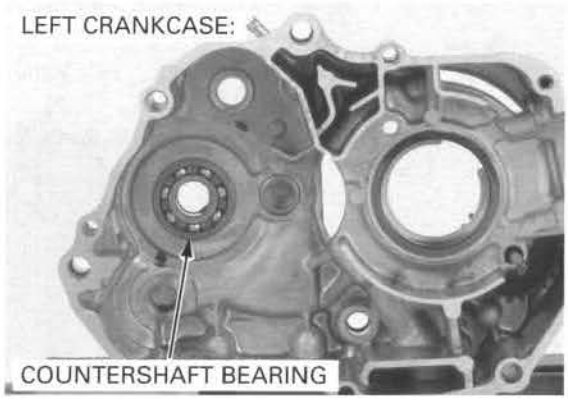
Remove the countershaft oil seal.



Drive the mainshaft bearing out of the right crankcase.



Drive the countershaft bearing out of the left crankcase.

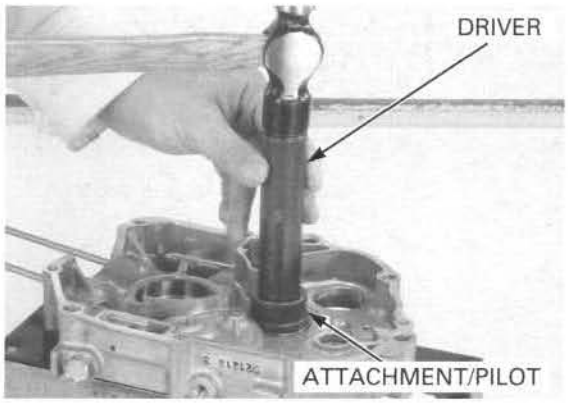


Drive new mainshaft bearing into the crankcases using the special tools as shown.

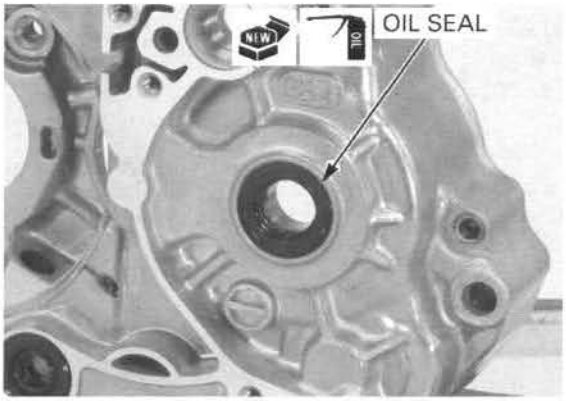
TOOLS:

Driver:	**07749-0010000**
Attachment, 37 x 40 mm:	**07746-0010200**
Pilot, 17 mm:	**07746-0040400**

Drive new countershaft bearing into the crankcases using the same tools.

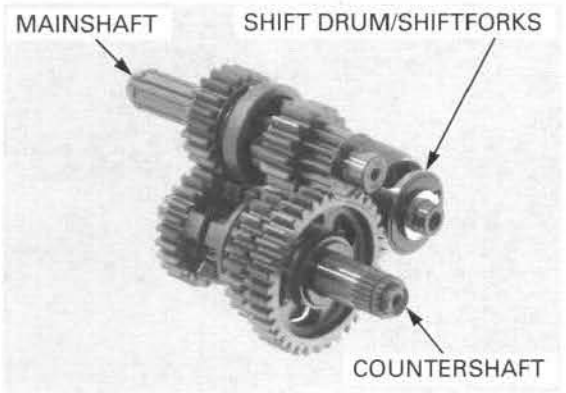


Apply engine oil to a new countershaft oil seal lip. Install the countershaft oil seal.



TRANSMISSION INSTALLATION

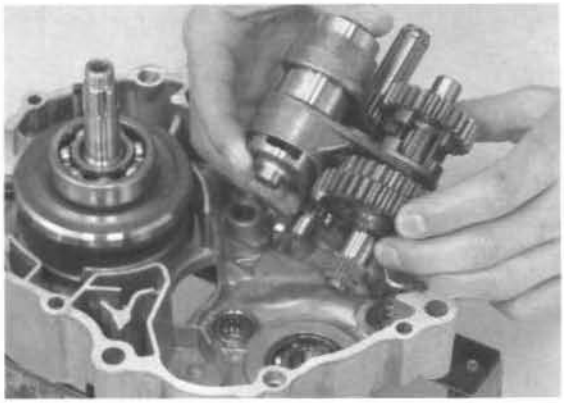
Apply clean engine oil to the transmission gears and shift drum.
Set the right fork into the M3 gear and the left fork into the C2 gear to assemble the mainshaft, countershaft and shift drum as shown.



Install the mainshaft, countershaft and shift drum as an assembly into the left crankcase.

Rotate the shift drum to check the transmission operation.

Install the kickstarter spindle (page 11-15).



KICKSTARTER

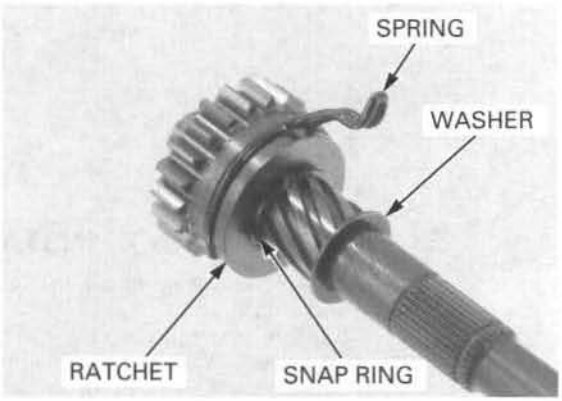
REMOVAL

Separate the right and left crankcase (page 11-5)

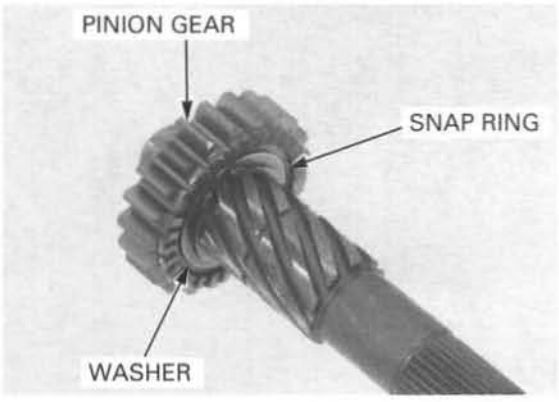
Remove the kickstarter spindle from the right crankcase.

DISASSEMBLY

Remove the washer.
Remove the snap ring and starter ratchet/spring.



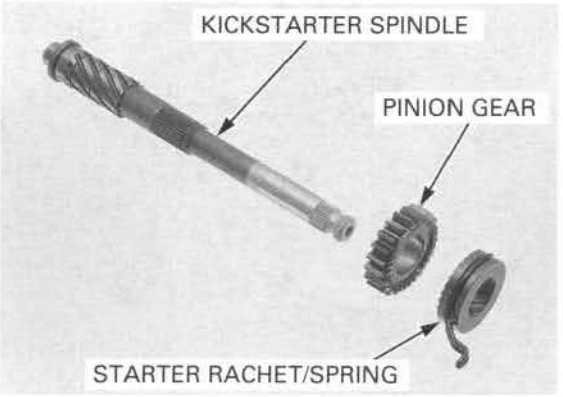
Remove the snap ring, washer and starter pinion gear.



INSPECTION

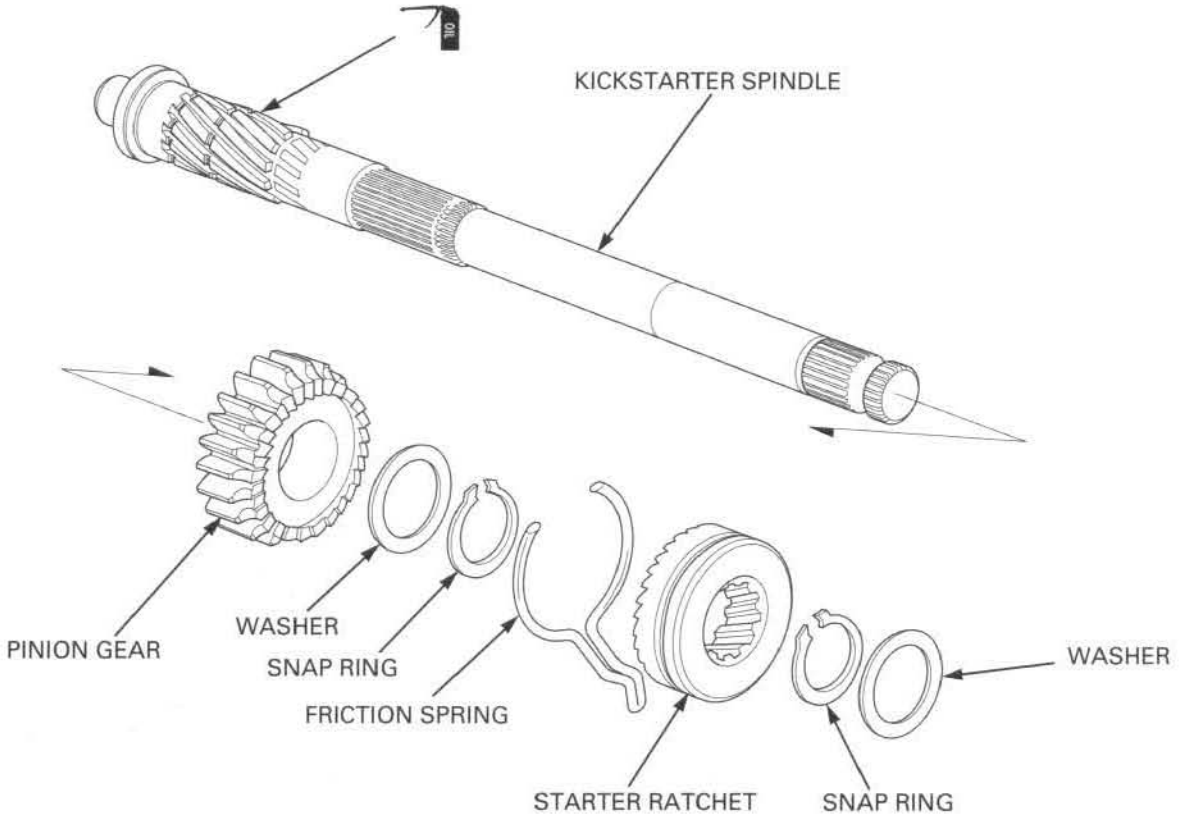
Check the kickstarter spindle for bending.
Check the friction spring for fatigue.

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



ASSEMBLY

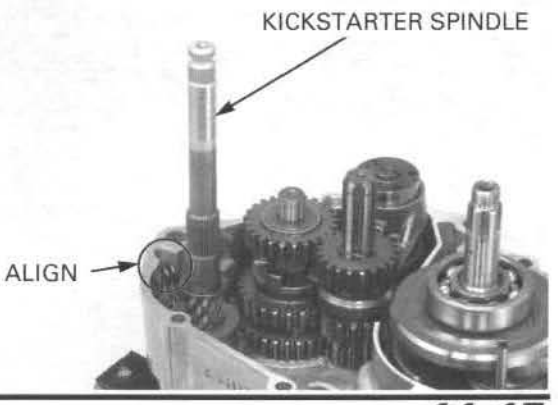
Assembly is in the reverse order of disassembly.



INSTALLATION

Install the kickstarter spindle by aligning its friction spring with the groove in the left crankcase as shown.

Assemble the crankcase halves.

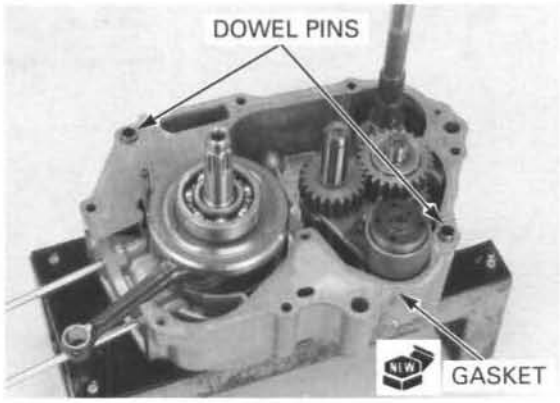


CRANKCASE ASSEMBLY

Dress the mating surfaces with an oil stone if necessary to correct any minor roughness or irregularities.

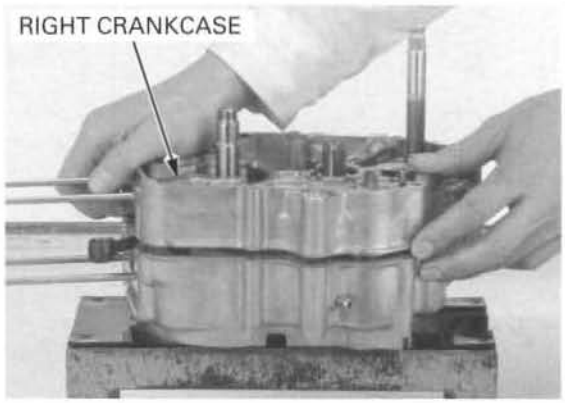
Clean the crankcase mating surfaces before assembling.

Install the dowel pins and a new gasket onto the left crankcase.



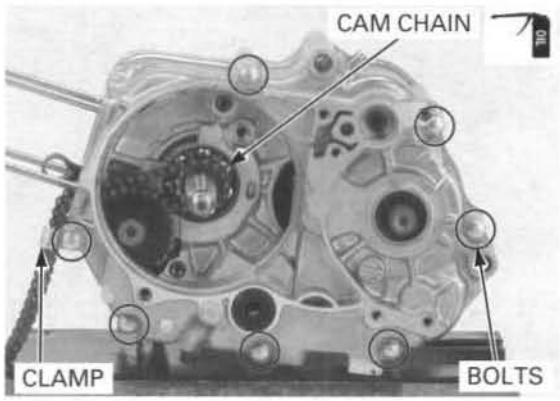
Make sure that the gasket stays in place.

Install the right crankcase over the left crankcase.



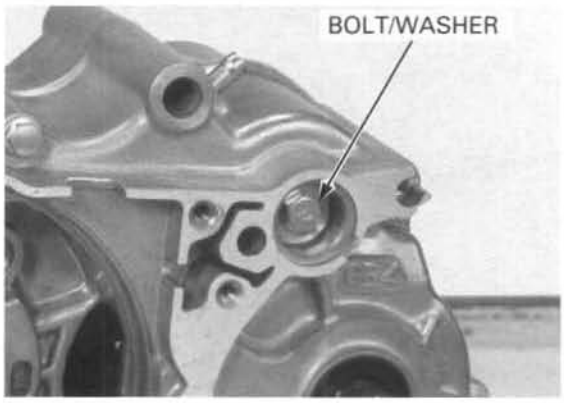
Install the seven bolts with the clamp and tighten them in a crisscross pattern in 2 – 3 steps.

Apply engine oil to the cam chain and install it.

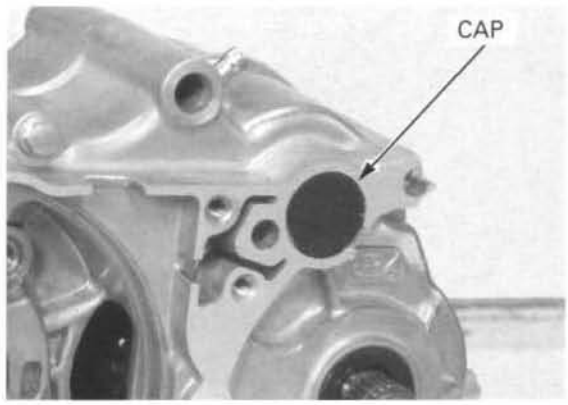


Install the washer and bolt to the shift drum, then tighten the bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

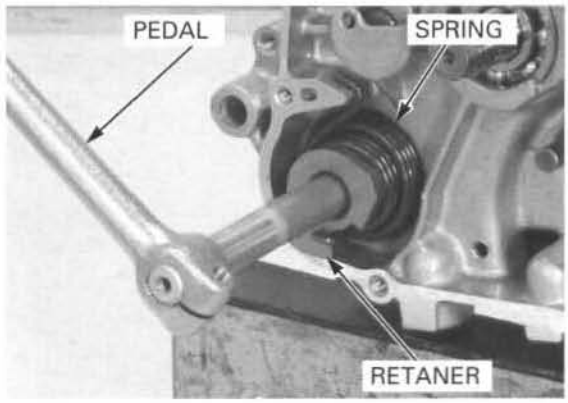


Install the rubber cap.

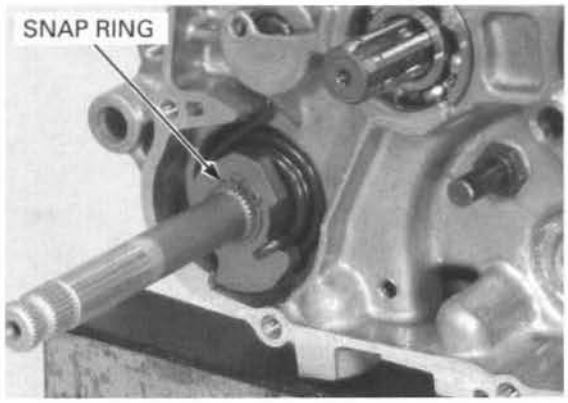


Install the return spring and retainer onto the kickstarter spindle.
Temporarily install the kickstarter pedal.

Install the spring ends onto the retainer and crankcase lug as shown and press the retainer to set its edge against the stepped part of the crankcase while turning the pedal counterclockwise.

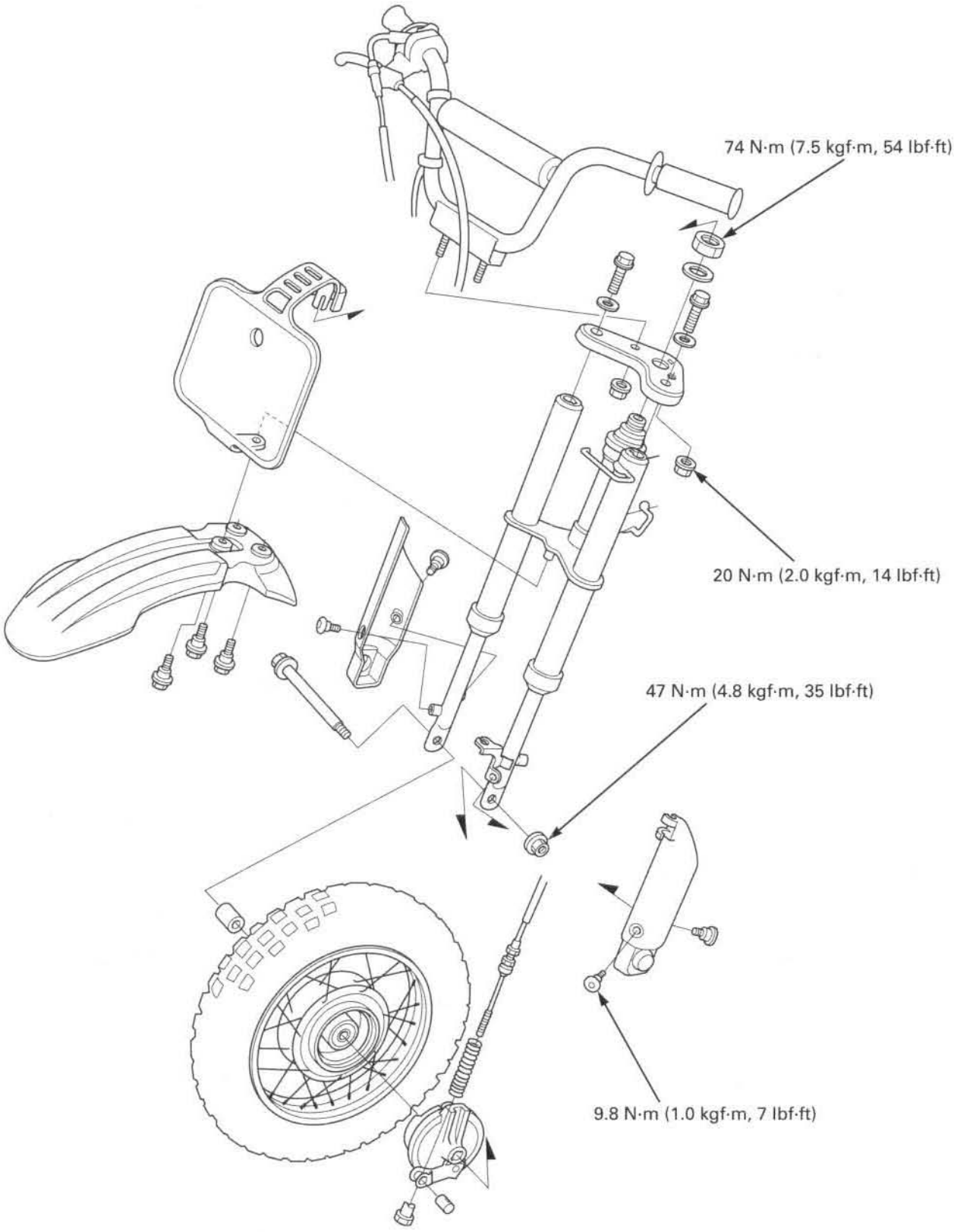


Install the snap ring into the groove in the kickstarter spindle securely.



12. FRONT WHEEL/BRAKE/SUSPENSION/STEERING

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

⚠CAUTION

Frequent inhalation of brake shoe dust, regardless of material composition could be hazardous to your health.
- Avoid breathing dust particles
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

- A contaminated brake drum or shoe reduces stopping power. Discard contaminated shoes and clean a contaminated drum with a high quality brake degreasing agent.
- When servicing the front wheel, brake, fork or steering stem, support the motorcycle using a safety stand or hoist.

SPECIFICATIONS

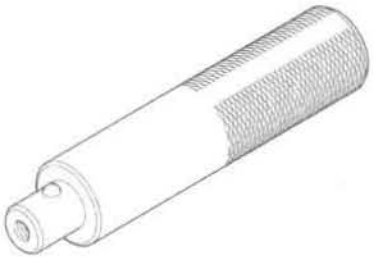
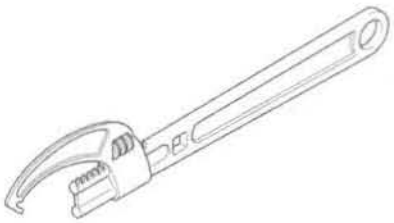
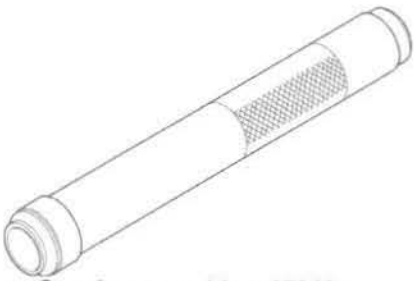
Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	3.0 (0.12)
Cold tire pressure		100 kPa (1.00 kgf/cm², 15 psi)	–
Axle runout		–	0.20 (0.008)
Wheel rim-to-hub distance		6.3 ± 1.0 (0.25 ± 0.04)	–
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Brake	Brake lever free play	10 – 20 (3/8 – 13/16)	–
	Brake drum I.D.	80 (3.1)	80.5 (3.17)
	Brake lining thickness	3.5 (0.14)	2.0 (0.08)
Fork	Spring free length	160.8 (6.33)	158.3 (6.23)

TORQUE VALUES

Handlebar mounting nut	20 N·m (2.0 kgf·m, 14 lbf·ft)	
Engine stop switch holder screw	2.9 N·m (0.3 kgf·m, 2.2 lbf·ft)	
Brake lever pivot bolt	2.9 N·m (0.3 kgf·m, 2.2 lbf·ft)	
Brake lever pivot nut	2.9 N·m (0.3 kgf·m, 2.2 lbf·ft)	
Spoke nipple	2.0 N·m (0.2 kgf·m, 1.4 lbf·ft)	
Front axle nut	47 N·m (4.8 kgf·m, 35 lbf·ft)	U-nut
Front brake arm nut	5.9 N·m (0.6 kgf·m, 4.3 lbf·ft)	ALOC bolt: replace with a new one
Fork protector bolt	9.8 N·m (1.0 kgf·m, 7 lbf·ft)	
Steering stem nut	74 N·m (7.5 kgf·m, 54 lbf·ft)	
Steering stem top thread	See page 12-20	

TOOLS

Spoke wrench, 4.1 x 4.5 mm 07701-0020100  or equivalent commercially available in U.S.A.	Bearing remover shaft 07746-0050100 	Bearing remover head, 12 mm 07746-0050300 
Driver 07749-0010000 	Attachment, 32 x 35 mm 07746-0010100 	Pilot, 12 mm 07746-0040200 
Pin spanner 07702-0020001 	Ball race remover 07944-1150001 	Attachment, 37 x 40 mm 07746-0010200 
Steering stem driver 07946-GC40000  or Steering stem driver 07946-MB00000 with Steering stem driver attachment 07946-GC4000A (U.S.A.only)		

TROUBLESHOOTING

Hard steering
- Faulty or damaged steering head bearings
- Insufficient tire pressure
- Steering stem top thread too tight

Steers to one side or does not track straight
- Bent fork
- Bent axle
- Wheel installed incorrectly
- Faulty steering head bearings
- Bent frame
- Worn wheel bearing
- Worn swingarm pivot components

Front wheel wobbling
- Bent rim
- Worn front wheel bearings
- Faulty tire
- Unbalanced tire and wheel

Wheel turns hard
- Faulty wheel bearings
- Bent front axle
- Brake drag

Soft suspension
- Weak fork springs
- Tire pressure too low

Stiff suspension
- Bent fork sliders

Front Suspension noisy
- Damaged or bent fork sliders
- Loose fork fasteners

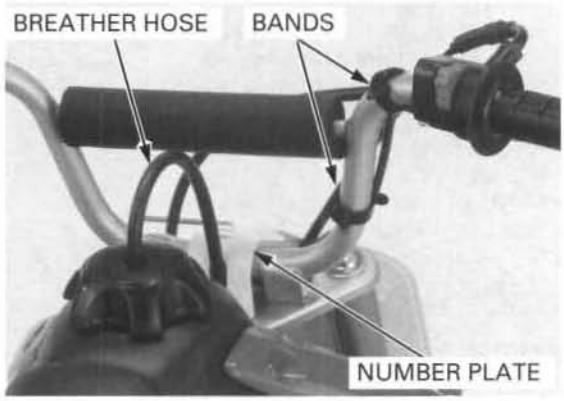
Improper brake performance
- Incorrect adjustment of lever
- Contaminated brake shoes
- Worn brake shoes
- Worn brake cam
- Worn brake drum
- Improperly engaged brake arm serrations

HANDLEBAR

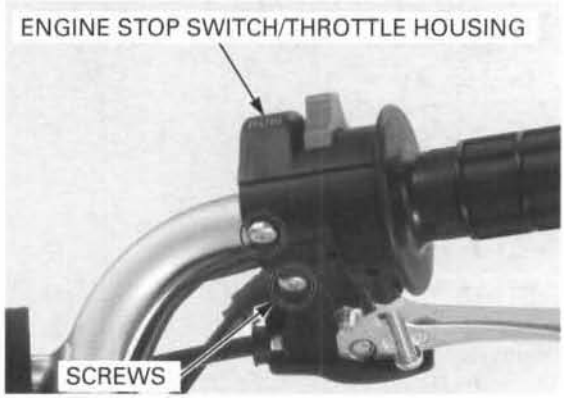
REMOVAL

Remove the fuel tank breather hose from the number plate and the number plate from the steering stem nut.

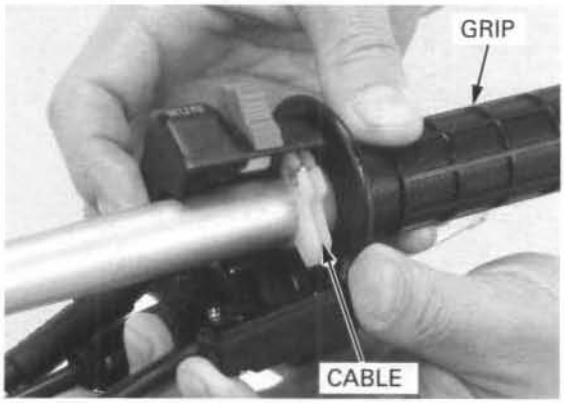
Remove the wire bands.



Remove the two screws and engine stop switch/throttle housing from the handlebar.

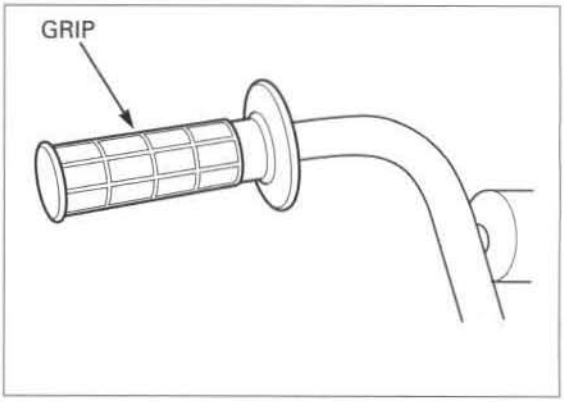


Disconnect the throttle cable and remove the throttle grip.



Remove the left handlebar grip.

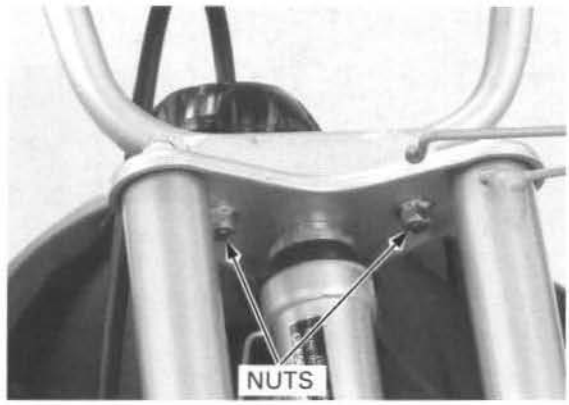
Remove the two nuts and handlebar.



INSTALLATION

Install the handlebar into the fork top bridge and tighten the mounting nuts.

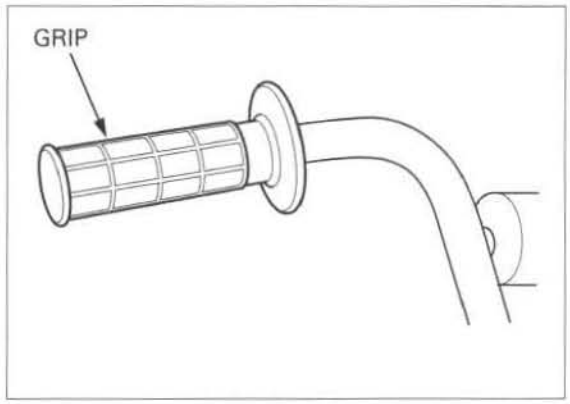
TORQUE: 20 N·m (2.0 kgf·m, 14 lbf·ft)



Clean the inside surface of the left handlebar grip and the outside surface of the left handlebar.
Apply Honda Bond A or equivalent to the inside surface of the left handlebar grip and to the outside surface of the left handlebar.Wait 3 – 5 minutes and install the grip.

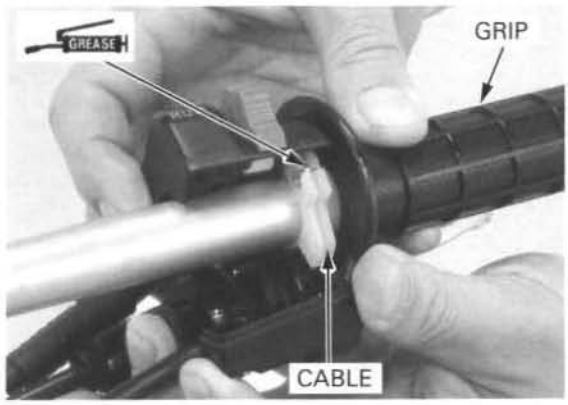
Allow the adhesive to dry for an hour before using.

Rotate the grip for even application of the adhesive.



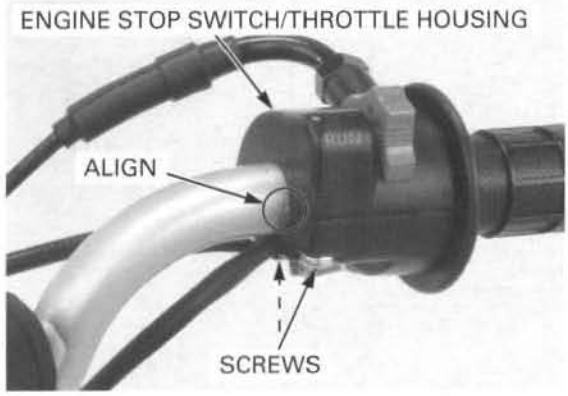
Apply grease to the throttle grip pipe flange and install the throttle grip onto the right handlebar.

Connect the throttle cable to the throttle grip pipe flange.



Install the engine stop switch/throttle housing onto the handlebar, aligning the mating surface with the punch mark on the handlebar.
Tighten the forward screw first, then the rear screw.

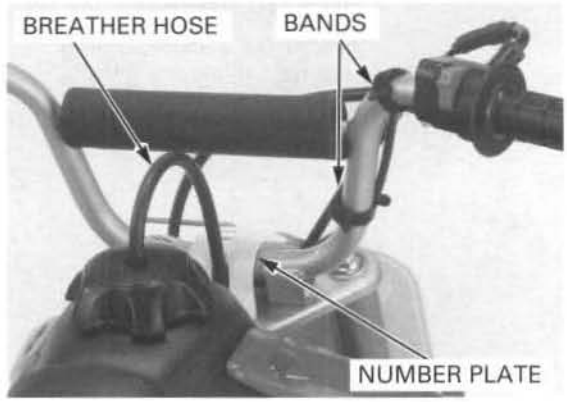
TORQUE: 2.9 N·m (0.3 kgf·m, 2.2 lbf·ft)



Secure the engine stop switch wire with the wire bands properly.

Install the number plate over the steering stem nut and insert the breather hose into the hole in the number plate.

Check the throttle grip operation and free play (page 3-6).

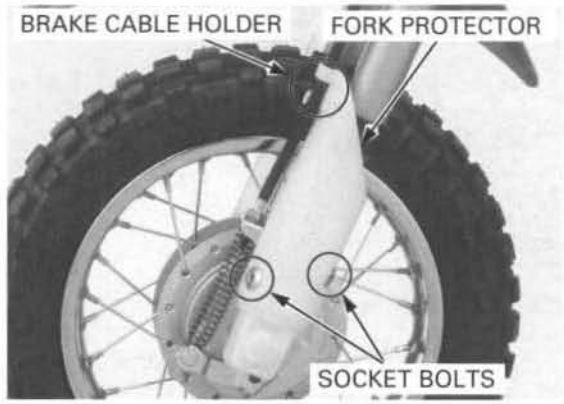


FRONT WHEEL

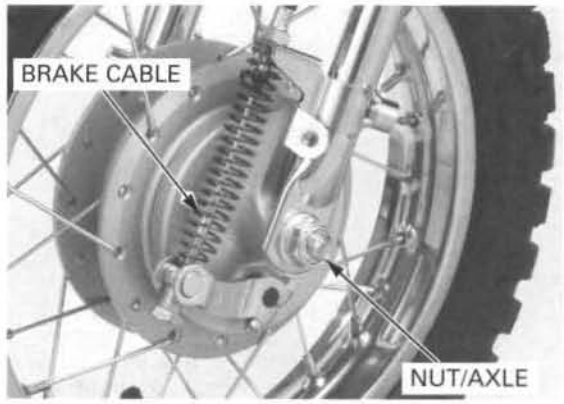
REMOVAL

Support the motorcycle securely using a safety stand or a hoist.

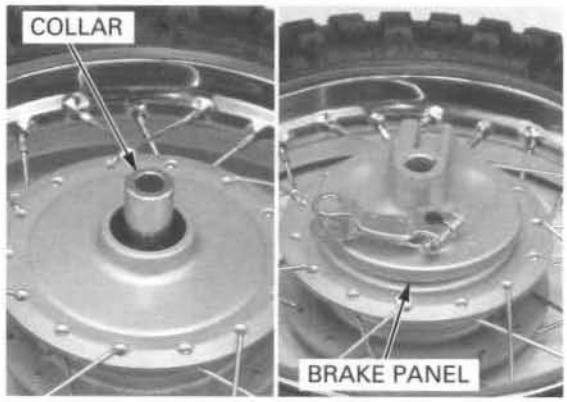
Remove the brake cable from the cable holder on the fork protector.
Remove the two socket bolts and fork protector.



Disconnect the brake cable from the brake arm.
Remove the axle nut, axle and front wheel.



Remove the side collar from the right side wheel hub and the brake panel from the left side wheel hub.

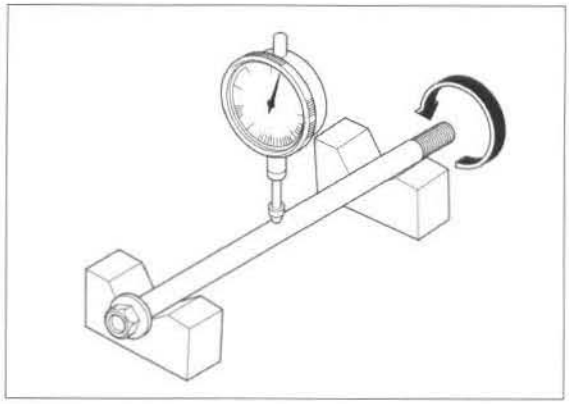


INSPECTION

Axle

Set the axle in V-blocks and measure the runout.
Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.20 mm (0.008 in)

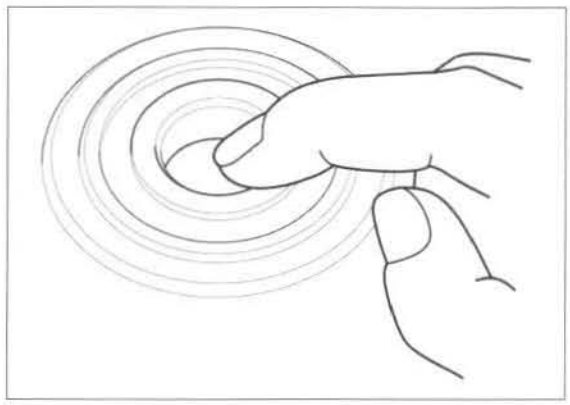


Wheel bearing

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

Always replace the bearings in pairs.

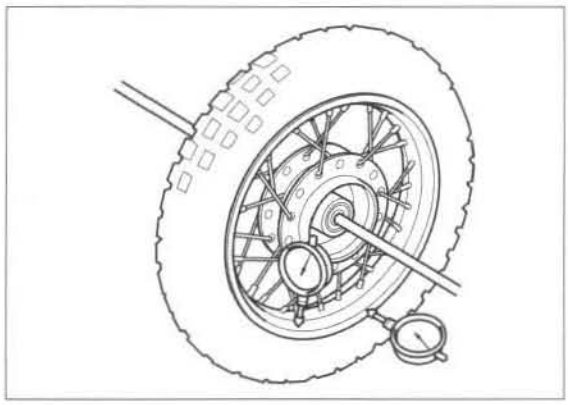
Remove and discard the bearings if they do not turn smoothly, quietly, or if they fit loosely in the hub.



Wheel rim runout

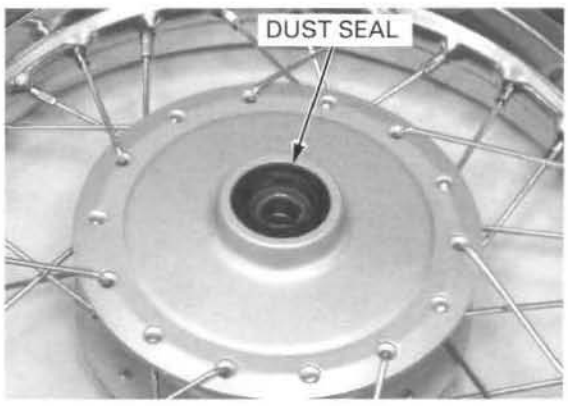
Check the rim runout by placing the wheel in a turning stand.
Spin the wheel by hand, and read the runout using a dial indicator.
Actual runout is 1/2 the total indicator reading.

SERVICE LIMITS:
Radial: 2.0 mm (0.08 in)
Axial: 2.0 mm (0.08 in)



DISASSEMBLY

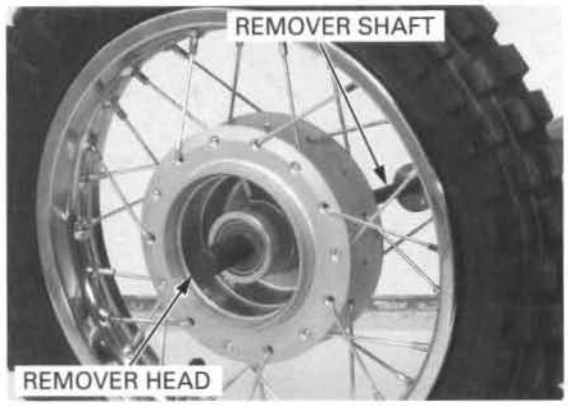
Remove the dust seal from the right side wheel hub.



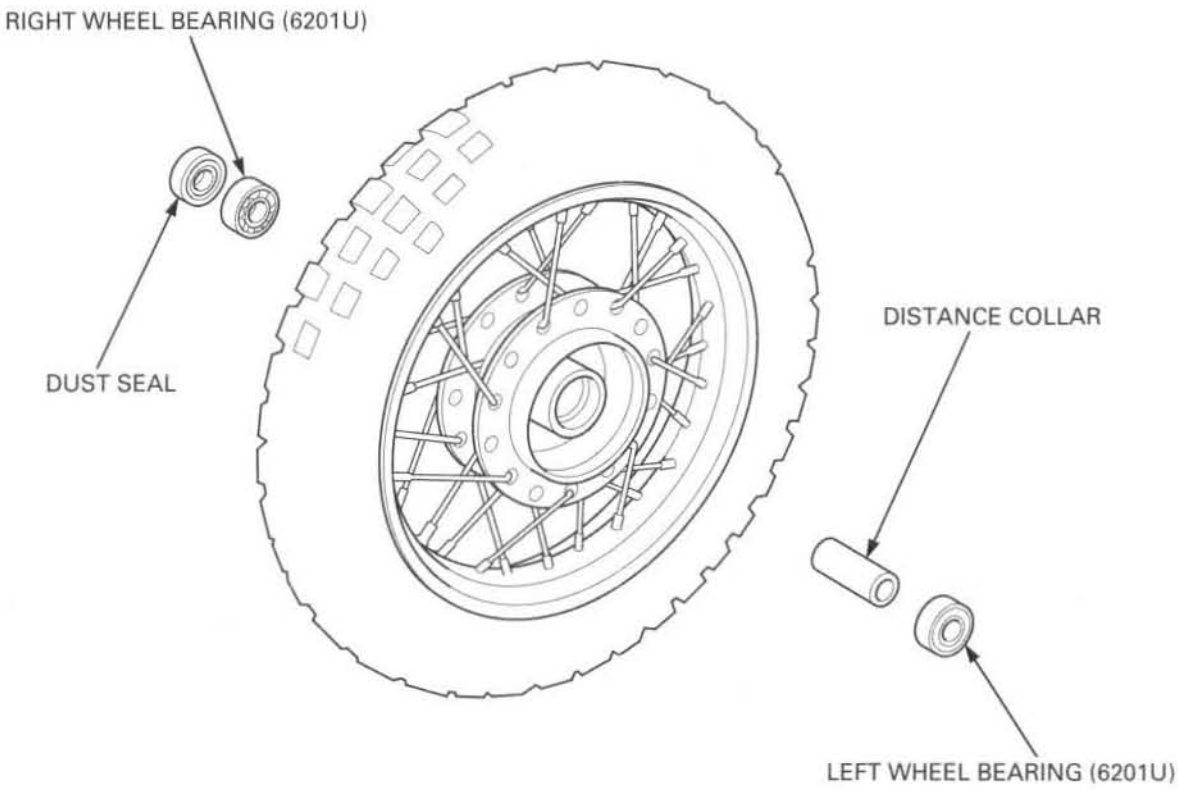
Install the bearing remover head into the bearing. From the opposite side, install the bearing remover shaft and drive the bearing out of the wheel hub. Remove the distance collar and drive out the other bearing.

TOOLS:

Bearing remover head, 12 mm	**07746-0050300**
Bearing remover shaft	**07746-0050100**



ASSEMBLY

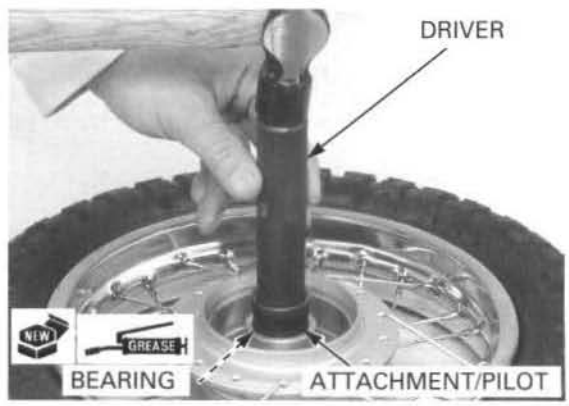


Never install the old bearings. Once the bearings have been removed, the bearings must be replaced with new ones.

Pack each wheel bearing cavity with grease.
Drive in a new left bearing squarely with its sealed side facing out.
Install the distance collar and drive in a new right bearing using the same tools.

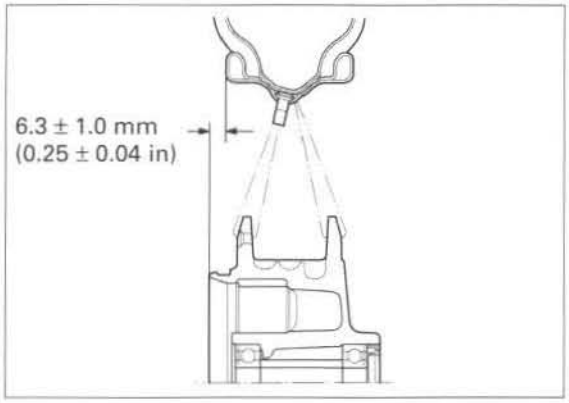
TOOLS:

Driver	**07749-0010000**
Attachment, 32 x 35 mm	**07746-0010100**
Pilot, 12 mm	**07746-0040200**



Wheel center adjustment

Place the rim on the work bench.
Place the hub with the right side down and begin lacing with new spokes.
Adjust the hub position so that the distance from the hub left end surface to the side of rim is 6.3 ± 10 mm (0.25 ± 0.04 in) as shown.



TOOL:

Spoke wrench, 4.1 x 4.5 mm	**07701-0020100 (Equivalent commercially available in U.S.A.)**

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

Check the rim runout (page 12-9).

Apply grease to a new dust seal lips, then install it into the right wheel hub.

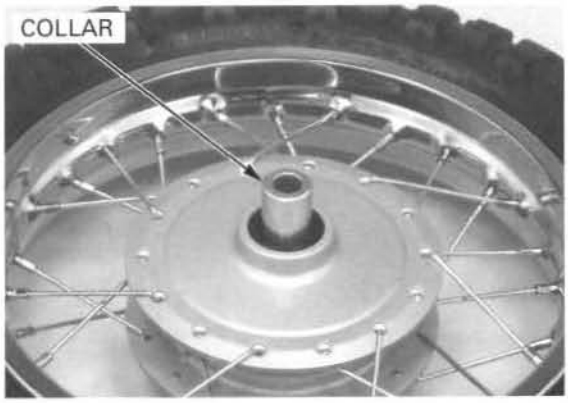
INSTALLATION

Do not get grease onto the inner surface of the brake drum. keep grease off the drum.

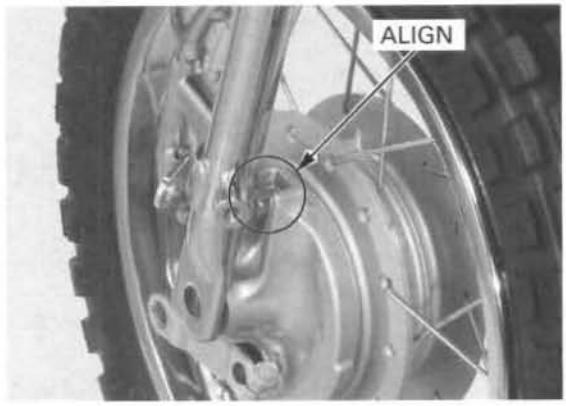
Make sure any grease is cleaned off the inside of the brake drum and brake shoes.

Install the brake panel into the left wheel hub.

Install the side collar into the right wheel hub.



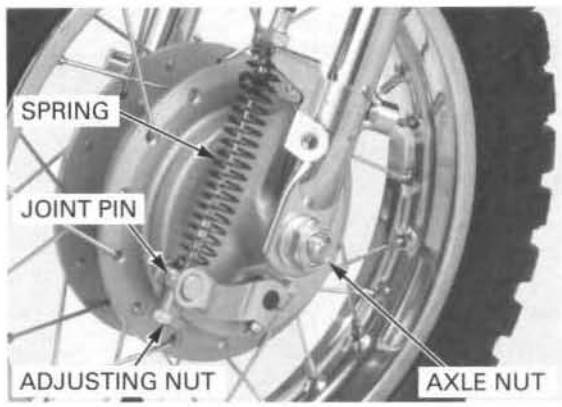
Install the front wheel between the fork legs while aligning the brake panel groove with the boss on the left fork slider.



Apply a thin layer of grease to the front axle surface.
Install the front axle from the right side.
Hold the axle and temporarily tighten the axle nut.

Install the spring and joint pin and connect the brake cable.
Install the adjusting nut.

Adjust the front brake lever free play (page 3-16).



With the front brake applied, pump the fork up and down several times to seat the axle and check brake operation.

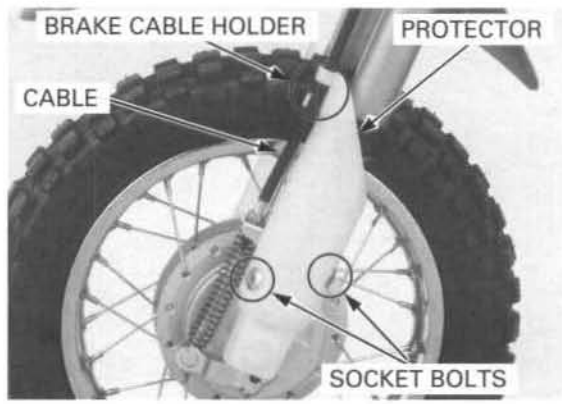
Tighten the axle nut to the specified torque.

TORQUE: 47 N·m (4.8 kgf·m, 35 lbf·ft)

Install the fork protector and tighten the socket bolts.

TORQUE: 9.8 N·m (1.0 kgf·m, 7 lbf·ft)

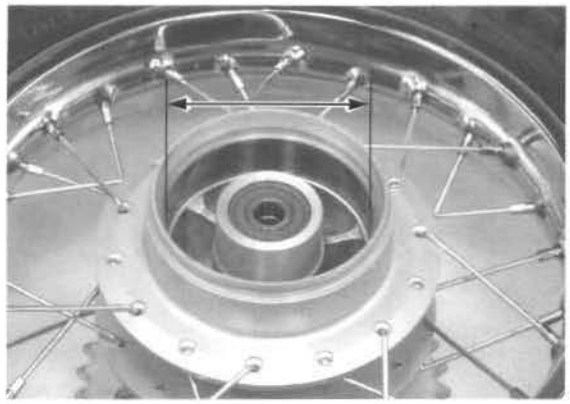
Install the brake cable into the cable holder.



FRONT BRAKE

REMOVAL

Remove the brake panel from the front wheel (page 12-8).



INSPECTION

Measure the front brake drum I.D.

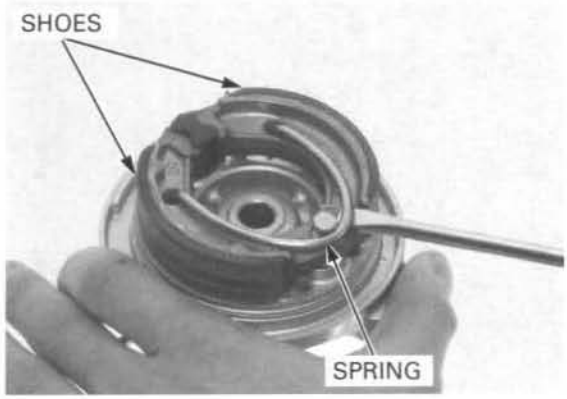
SERVICE LIMIT: 80.5 mm (3.17 in)

Measure the brake lining thickness.

SERVICE LIMIT: 2.0 mm (0.08 in)

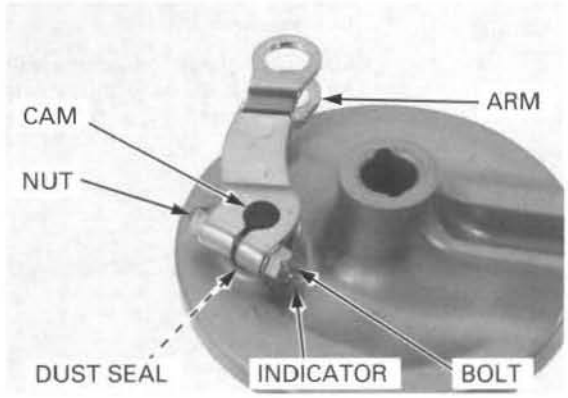
DISASSEMBLY

Remove the spring and brake shoes.

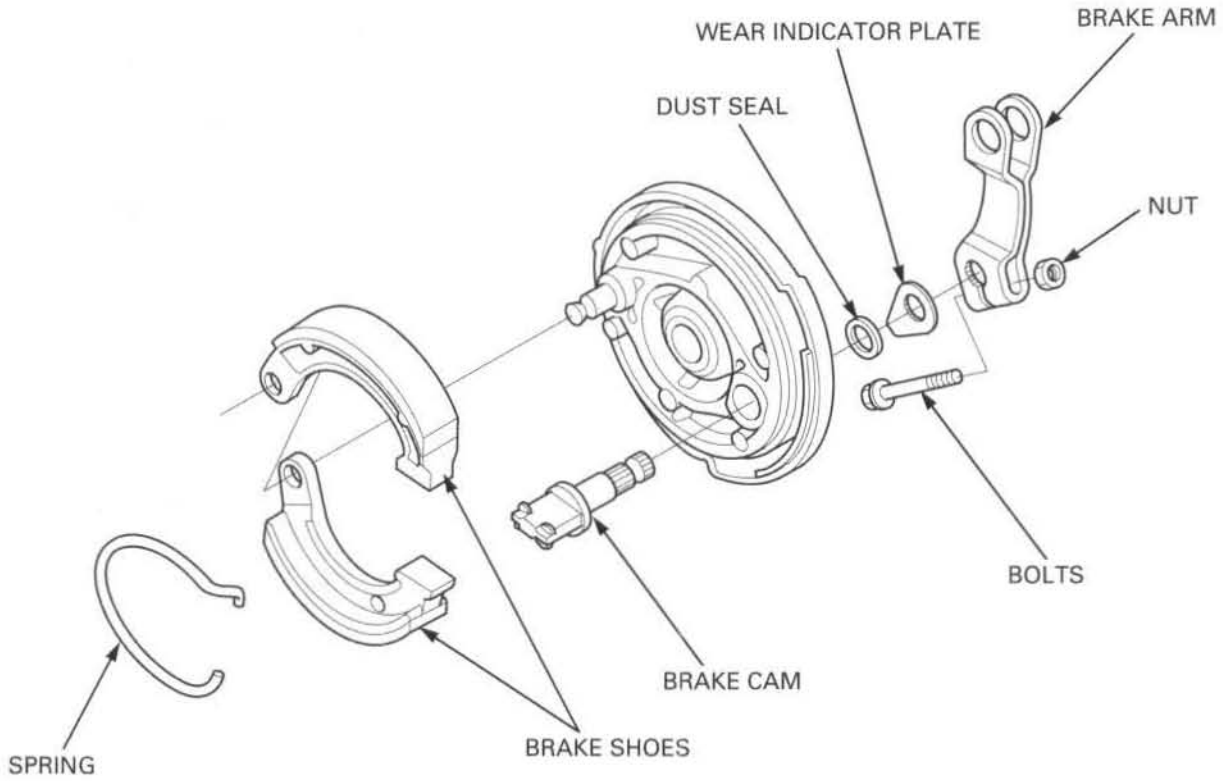


Remove the nut, bolt and brake arm.

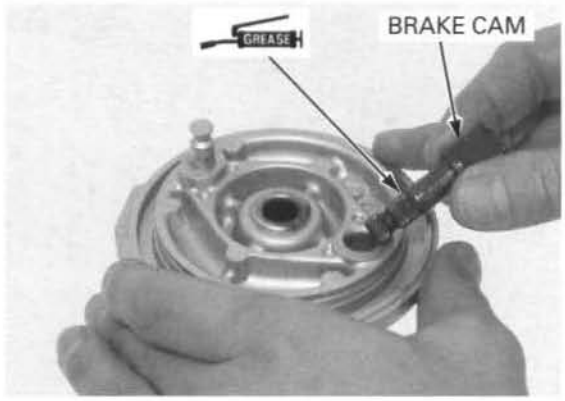
Remove the wear indicator, dust seal and brake cam.



ASSEMBLY

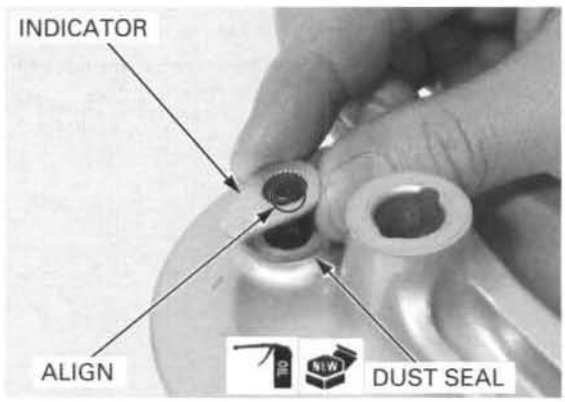


Apply grease to the brake cam spindle.
Install the brake cam into the brake panel.



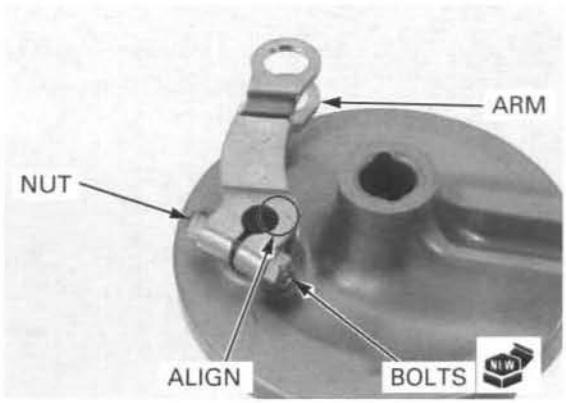
Apply oil to a new dust seal and install it onto the brake panel.

Install the wear indicator plate onto the brake cam by aligning its wide tooth with the wide groove in the brake cam

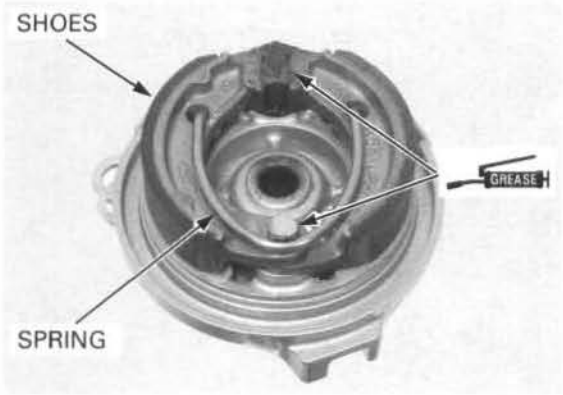


Install the brake arm by aligning the punch marks on the arm and brake cam.
Install a new brake arm pinch bolt and nut as shown and tighten it to the specified torque.

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



Apply grease to the anchor pin and brake cam sliding surfaces.
Install the brake shoes and spring as shown.
Wipe any excess grease of the brake cam and anchor pin.



INSTALLATION

Install the front wheel (page 12-11)

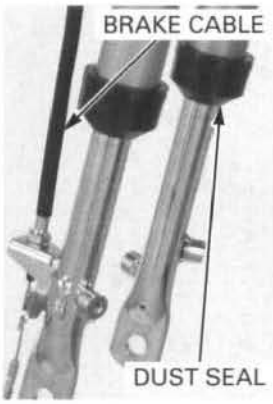
FORK

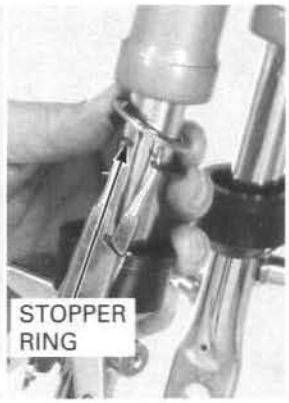
DISASSEMBLY

Remove the front wheel (page 12-8).

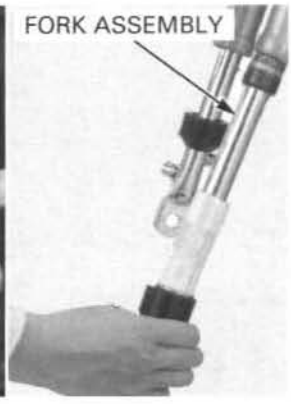
Loosen the brake cable nut and remove the brake cable from the fork slider.

Remove the dust seal from the fork outer tube by sliding it down.
Remove the stopper ring.





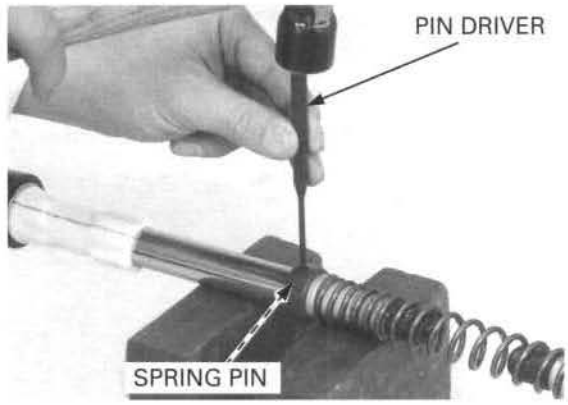
Remove the fork top bolt and washer and pull the fork slider down to remove the fork assembly.



Drive out the spring pin, using a 4 mm pin driver.

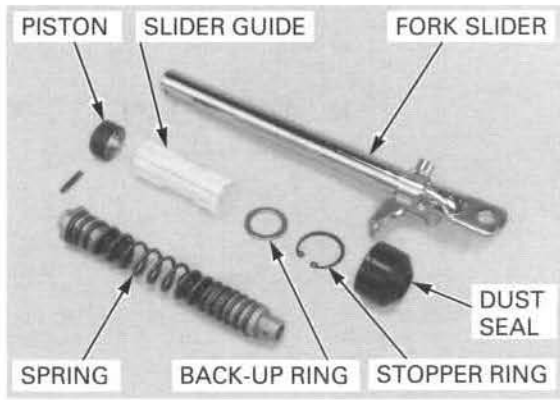
Remove the following from the fork slider:

- Fork spring/spring holders
- Slider piston
- Slider guide
- Back up ring
- Stopper ring
- Dust seal



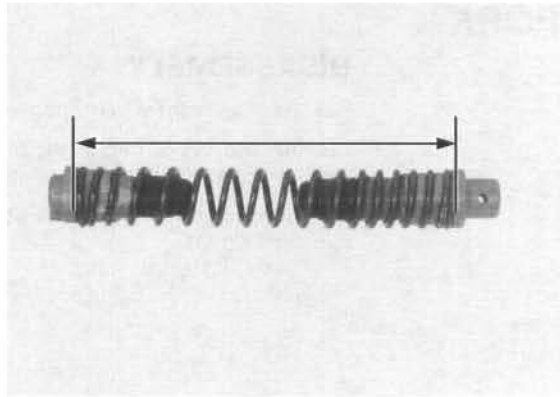
INSPECTION

Visually inspect each part for excessive wear or damage.

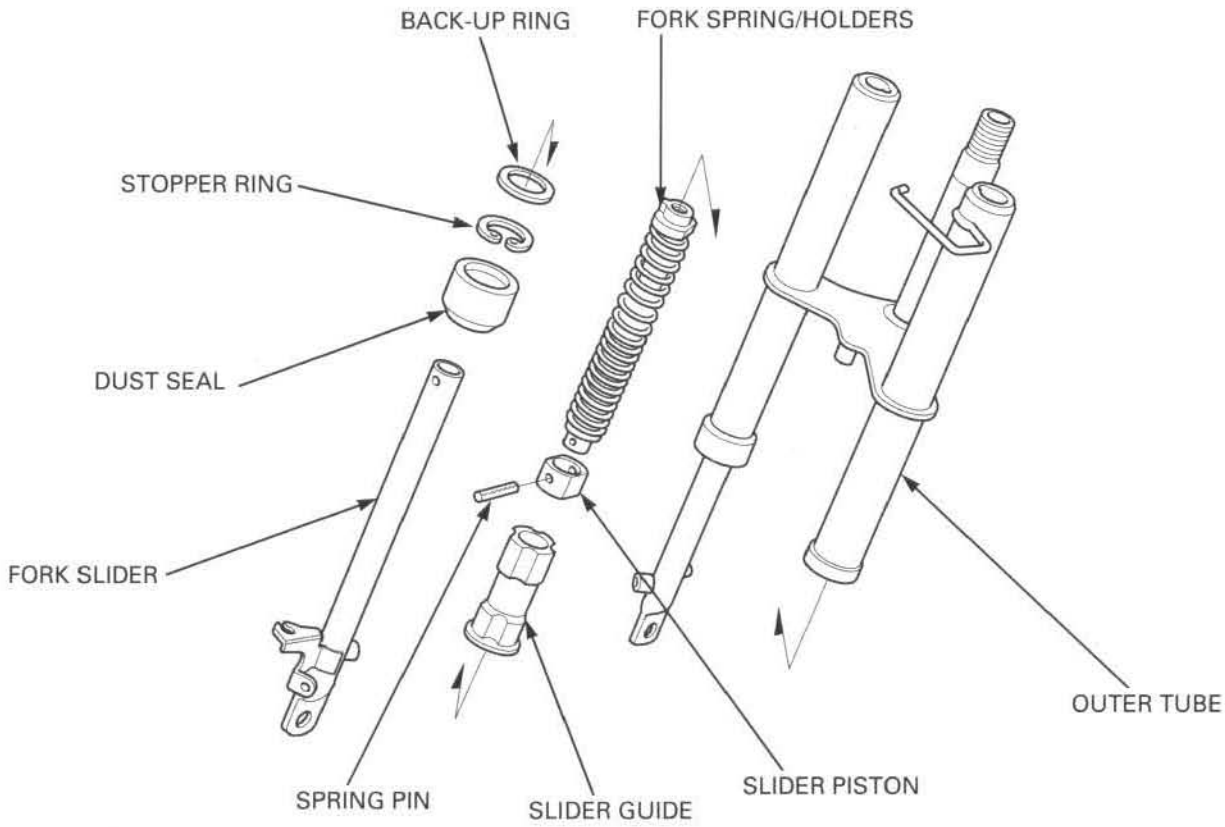


Measure the fork spring free length.

SERVICE LIMIT: 158.3 mm (6.23 in)

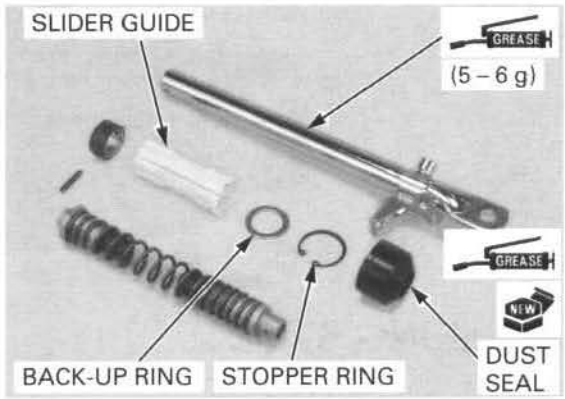


ASSEMBLY



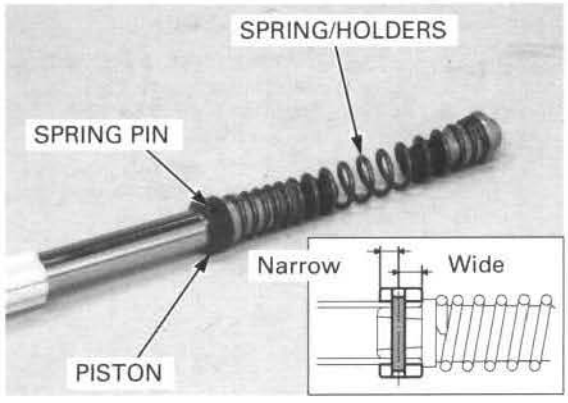
Install the following onto the fork slider:

- New dust seal (apply grease to the seal lips)
- Stopper ring (with the chamfered side facing up)
- Back up ring
- Slider guide (apply 5 – 6 g of grease to the slider guide sliding surface of the fork slider)



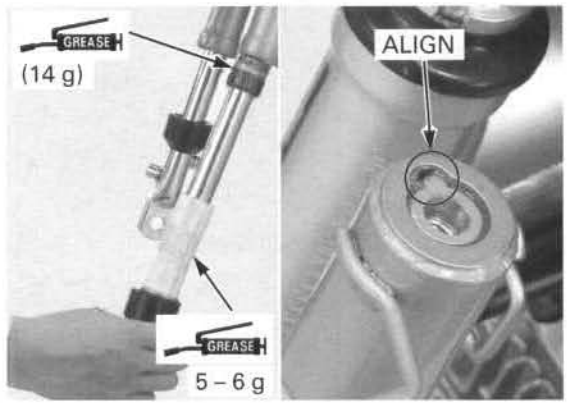
Install the slider piston and fork spring/holders as shown.
Align the pin holes in the piston, fork slider and spring holder so that the locating pin on the upper spring holder is facing inside of the fork slider and drive the spring pin to secure them, using a 4 mm pin driver.

Be sure that the spring pin does not project out of the piston outer surface.



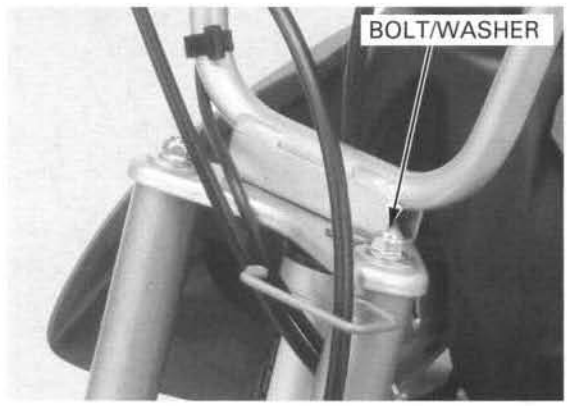
Apply 5 – 6 g of grease to the slider guide outer groove.
Pack the fork spring with 14 g of grease.

Install the fork assembly by aligning the locating pin with the groove in the outer tube.



Install the fork top bolt and washer and tighten it.

Wipe any excess grease of the outer tube.

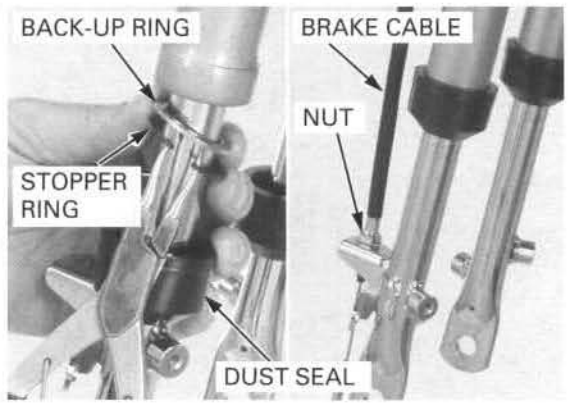


Install the stopper ring into the groove in the outer tube properly.
Install the dust seal over the outer tube.

Wipe any excess grease of the fork slider.

Install the brake cable onto the fork slider and secure it by tightening the cable nut.

Install the front wheel (page 12-11).

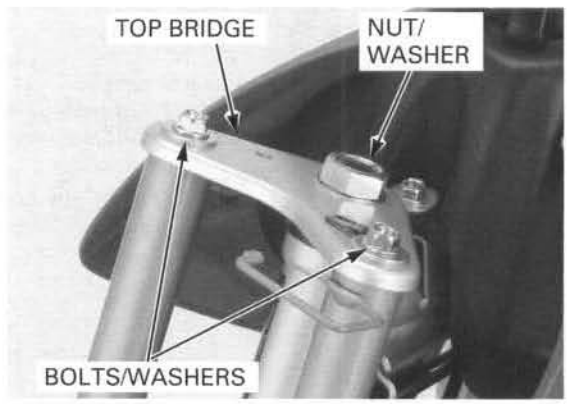


STEERING STEM

REMOVAL

Remove the following:

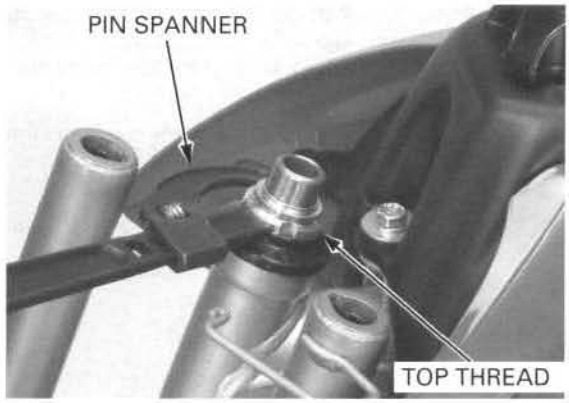
- Number plate (page 2-5)
- Handlebar (page 12-6)
- Front wheel (page 12-8)
- Front fender (page 2-5)
- Steering stem nut and washer.
- Front top bolts and washer.
- Top bridge.



Remove the steering stem top thread using the special tool.

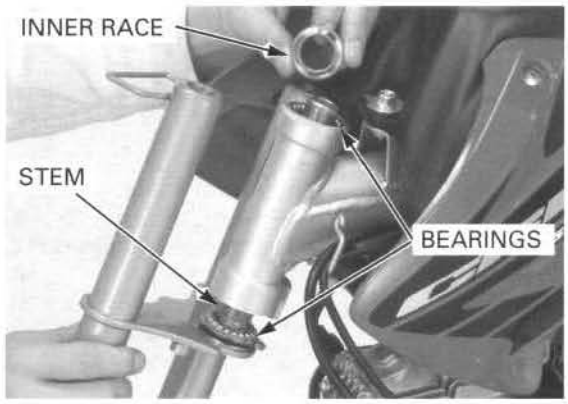
TOOL:

Pin spanner	**07702-0020001**



Remove the following:

- Upper bearing inner race
- Upper bearing
- Steering stem
- Lower bearing



BEARING REPLACEMENT

Always replace the bearings and races as a set.

Drive out the upper and lower bearing outer races using the special tool.

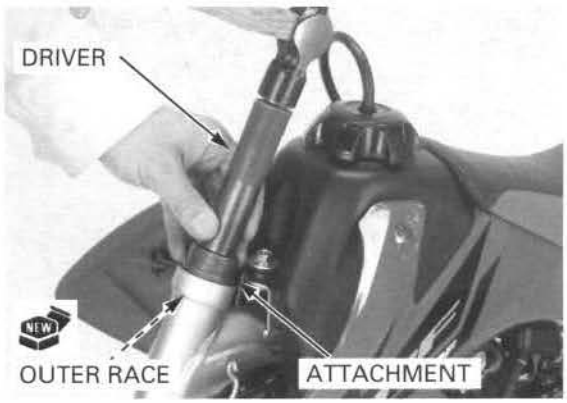
TOOL:

Ball race remover	**07944-1150001**

Drive new upper and lower bearing outer races into the steering head pipe using the special tool as shown.

TOOLS:

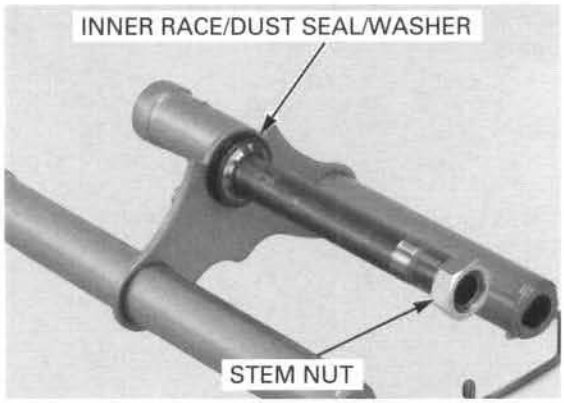
Driver	**07749-0010000**
Attachment, 37 x 40 mm	**07746-0010200**



Temporarily install the steering stem nut onto the stem to prevent the threads from being damaged when removing the lower bearing inner race from the stem.

Remove the lower bearing inner race with a chisel or equivalent tool, being careful not to damage the stem.

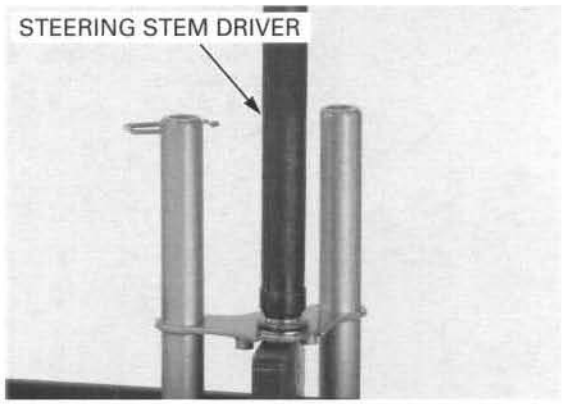
Remove the dust seal and washer.



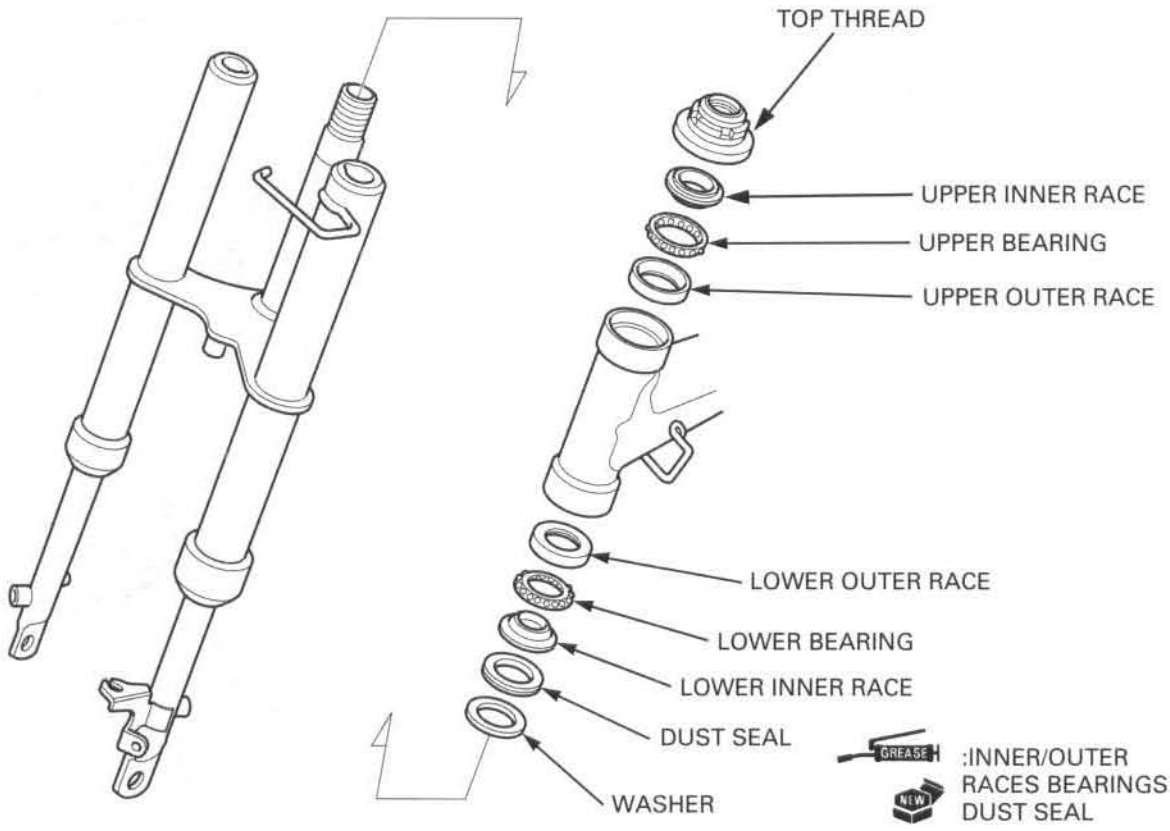
Install the washer over the steering stem.
Apply grease to a new dust seal lips and install it over the steering stem.
Install a new lower bearing inner race using a special tool and a hydraulic press.

TOOLS:

Steering stem driver	**07946-GC40000 or**
Steering stem driver	**07946-MB00000 with**
Steering stem driver attachment	**07946-GC4000A (U.S.A. only)**



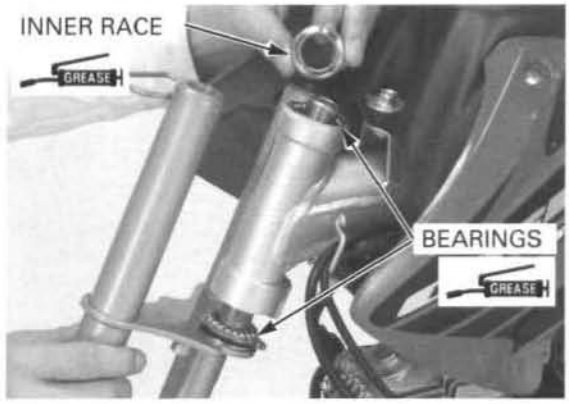
INSTALLATION



Apply grease to upper and lower bearings and races.
Insert the lower bearing onto the lower bearing race.

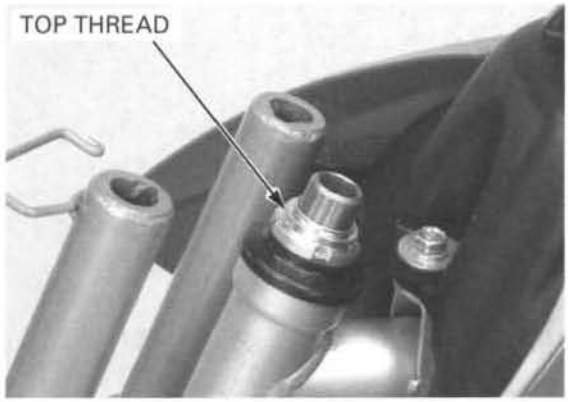
Insert the steering stem into the steering head pipe.

Install upper bearing, inner race and top thread.



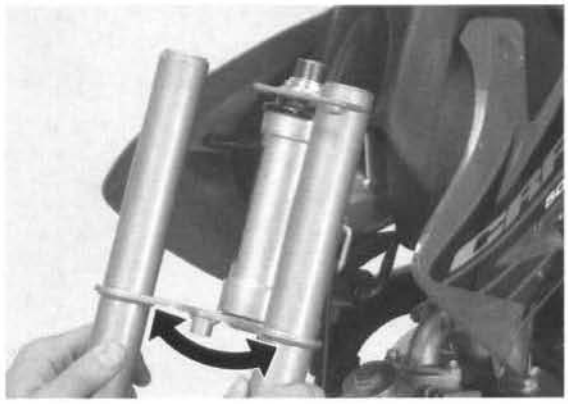
Hold the steering stem and tighten the stem top thread to the initial torque.

TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)



Move the steering stem right and left, lock-to-lock several times to seat the bearings.
Loosen the top thread.
Retighten the top thread to the specified torque.

TORQUE: 2.9 N·m (0.3 kgf·m, 2.2 lbf·ft)



Install the top bridge.

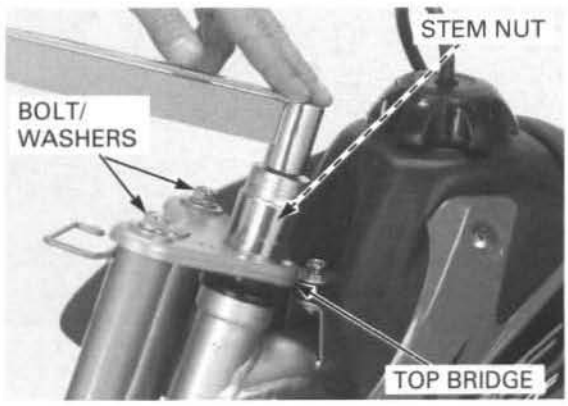
Install the stem nut and fork top bolts with the washers and tighten them.

TORQUE: 74 N·m (7.5 kgf·m, 54 lbf·ft)

Make sure that the steering stem moves smoothly, without play or binding.

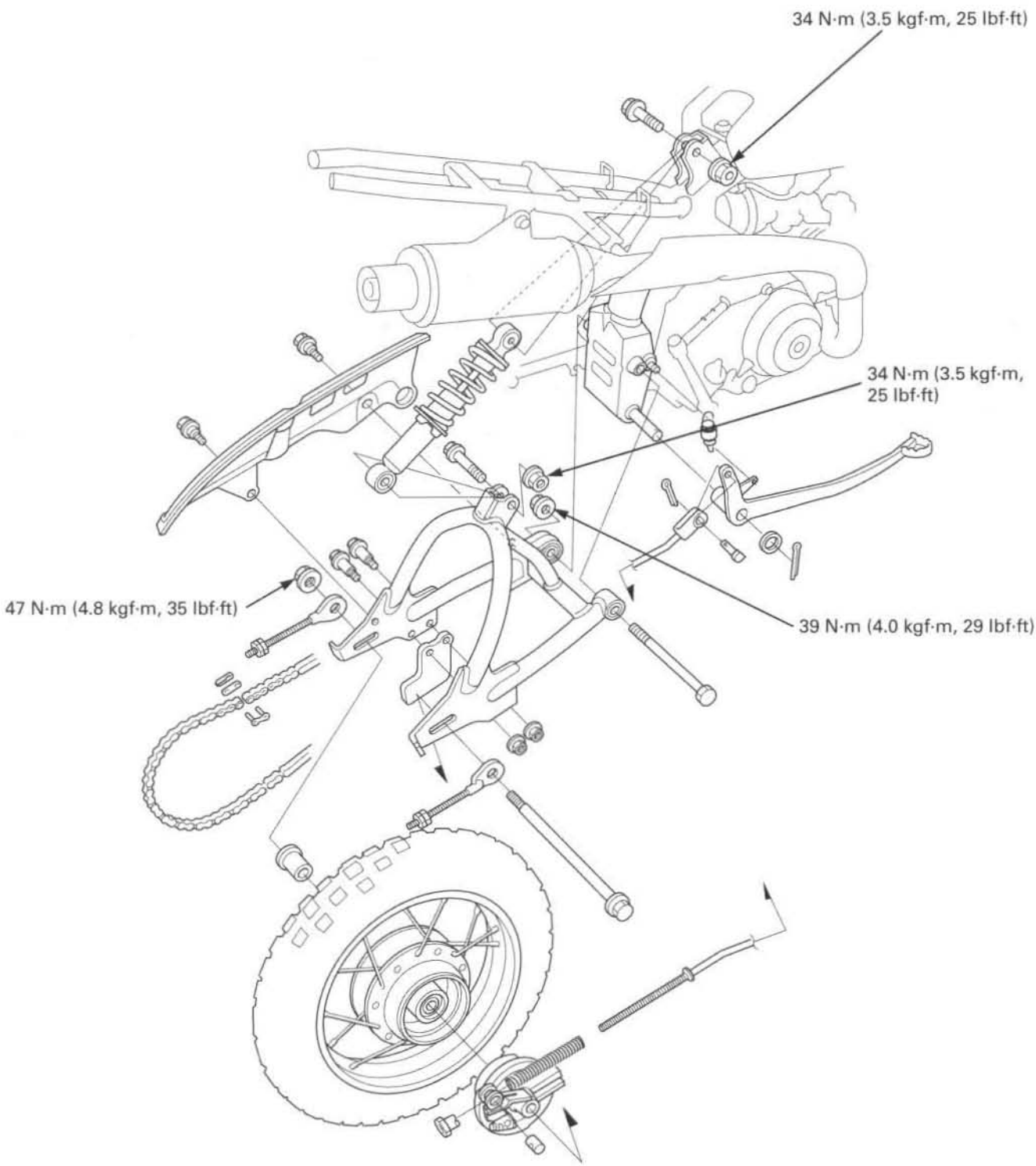
Install the following:

- Front fender (page 2-5)
- Front wheel (page 12-11)
- Handlebar (page 12-7)
- Number plate (page 2-5)



13. REAR WHEEL/BRAKE/SUSPENSION

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

⚠ CAUTION

Frequent inhalation of brake shoe dust, regardless of material composition could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

- A contaminated brake drum or shoe reduces stopping power. Discard contaminated shoes and clean a contaminated drum with a high quality brake degreasing agent.
- When servicing the rear wheel, support the motorcycle using a safety stand or hoist.
- Use genuine Honda replacement bolts and nuts for all suspension pivots and mounting points.

SPECIFICATIONS

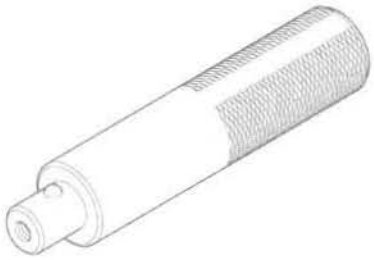
Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		–	3.0 (0.12)
Cold tire pressure		125 kPa (1.25 kgf/cm^2, 18 psi)	–
Axle runout		–	0.20 (0.008)
Wheel rim-to-hub distance		25 ± 1.0 (1.0 ± 0.04)	–
Wheel rim runout	Radial	–	2.0 (0.08)
	Axial	–	2.0 (0.08)
Drive chain	Size/link	DID420MBK1/78	–
	Slack	15 – 25 (9/16 – 1)	
Brake	Brake pedal free play	10 – 20 (3/8 – 13/16)	–
	Brake drum I.D.	80 (3.1)	80.5 (3.17)
	Brake lining thickness	3.5 (0.14)	2.0 (0.08)

TORQUE VALUES

Spoke nipple	2.0 N·m (0.2 kgf·m, 1.4 lbf·ft)	
Rear axle nut	47 N·m (4.8 kgf·m, 35 lbf·ft)	U-nut
Driven sprocket nut	32 N·m (3.3 kgf·m, 24 lbf·ft)	U-nut
Rear brake arm nut	5.9 N·m (0.6 kgf·m, 4.3 lbf·ft)	ALOC bolt: replace with a new one
Swingarm pivot nut	39 N·m (4.0 kgf·m, 29 lbf·ft)	Apply grease to the seating surface/U-nut
Shock absorber mounting nut	34 N·m (3.5 kgf·m, 25 lbf·ft)	U-nut
Drive chain slider nut	12 N·m (1.2 kgf·m, 9 lbf·ft)	U-nut

TOOLS

Spoke wrench, 4.1 x 4.5 mm 07701-0020100  or equivalent commercially available in U.S.A.	Bearing remover shaft 07746-0050100 	Bearing remover head, 12 mm 07746-0050300 
Driver 07749-0010000 	Attachment, 32 x 35 mm 07746-0010100 	Pilot, 12 mm 07746-0040200 

TROUBLESHOOTING

Soft suspension
- Weak shock absorber spring
- Oil leakage from damper unit
- Tire pressure too low

Stiff suspension
- Bent damper rod
- Damaged swingarm pivot bushings
- Bent swingarm pivot
- Tire pressure too high

Steers to one side or does not track straight
- Bent rear axle
- Axle alignment/chain adjustment not equal on both sides

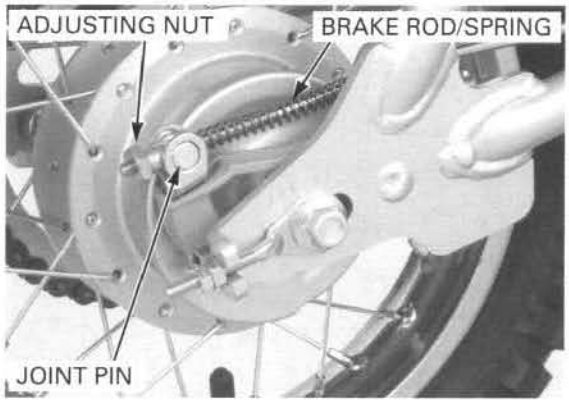
Rear wheel wobbling
- Bent rim
- Worn rear wheel bearings
- Faulty tire
- Unbalanced tire and wheel
- Tire pressure too low
- Faulty swingarm pivot bushings

REAR WHEEL

REMOVAL

Support the motorcycle securely using a hoist or equivalent and raise the rear wheel off the ground.

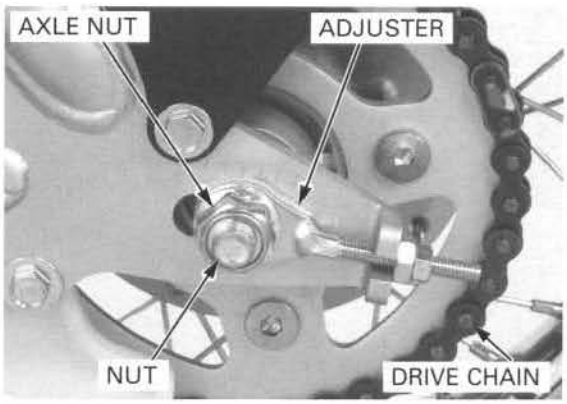
Remove the rear brake adjusting nut and disconnect the rear brake rod from the brake arm, and remove the joint pin and spring.



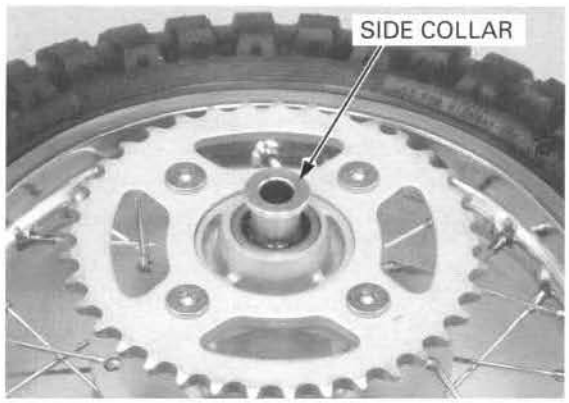
Loosen the drive chain adjuster lock nuts and adjusting nuts.
Remove the axle nut and left chain adjuster.

Push the rear wheel forward and derail the drive chain from the driven sprocket.

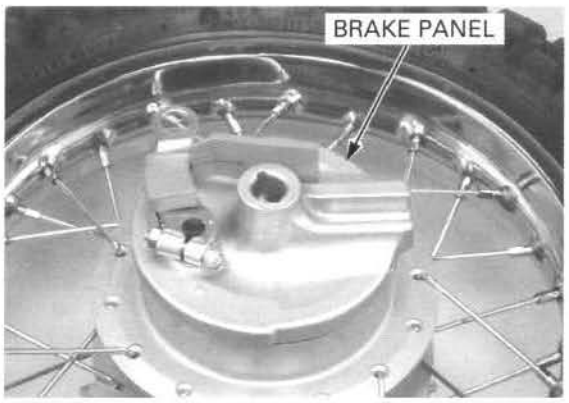
Remove the axle from the right side and remove the rear wheel.



Remove the left side collar from the left wheel hub.



Remove the brake panel from the right wheel hub.

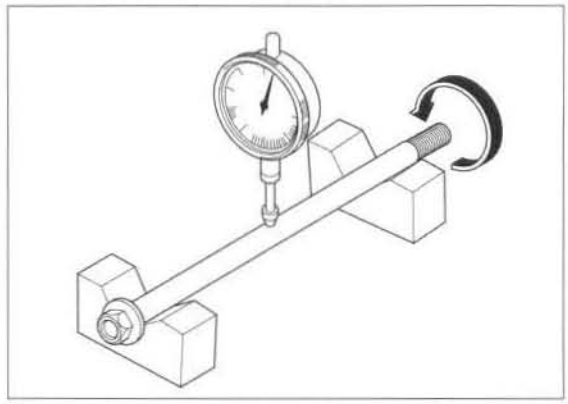


INSPECTION

Axle

Place the axle in V-blocks and measure the runout.
Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.20 mm (0.008 in)

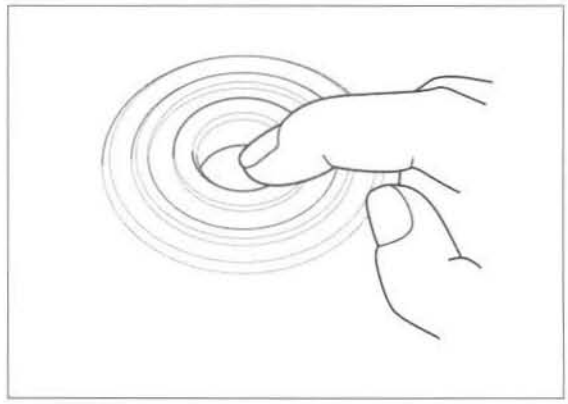


Wheel bearing

Turn the inner race of each bearing with your finger.
Bearings should turn smoothly and quietly.
Also check that the bearing outer race fits tightly in the hub.

Replace the wheel bearings in pairs.

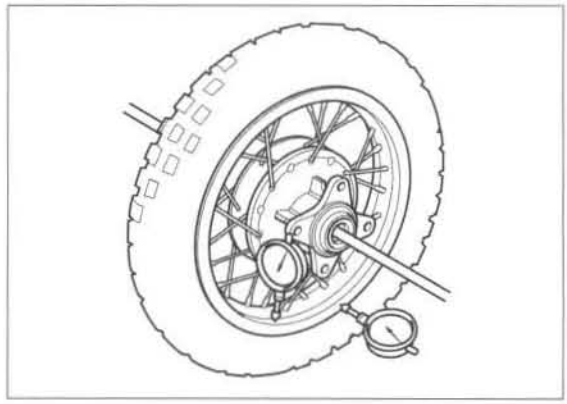
Remove and discard the bearings if the races do not turn smoothly and quietly, or if they fit loosely in the hub.



Wheel rim runout

Check the rim runout by placing the wheel in a turning stand.
Spin the wheel slowly and read the runout using a dial indicator.
Actual runout is 1/2 the total indicator reading.

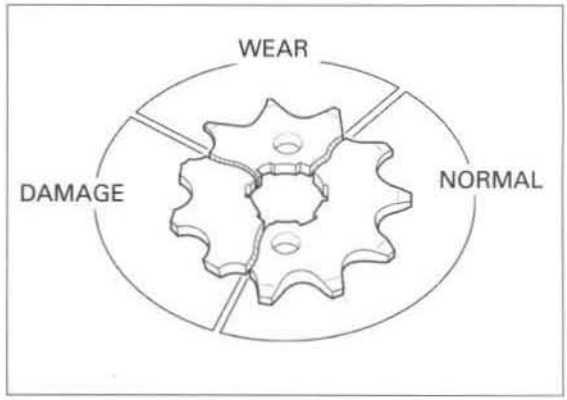
SERVICE LIMITS: Radial: 2.0 mm (0.08 in)
Axial: 2.0 mm (0.08 in)



Driven sprocket

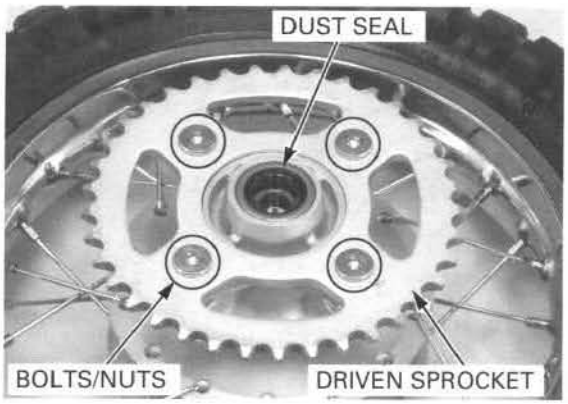
Check the condition of the final driven sprocket teeth.
Replace the sprocket if worn or damaged.

- If the final driven sprocket requires replacement, inspect the drive chain and drive sprocket.
- Never install a new drive chain on a worn sprocket or a worn chain on new sprockets. Both chain and sprockets must be in good condition or the replacement chain or sprocket will wear rapidly.



DISASSEMBLY

Remove the nuts, bolts and driven sprocket.
Remove the left dust seal.



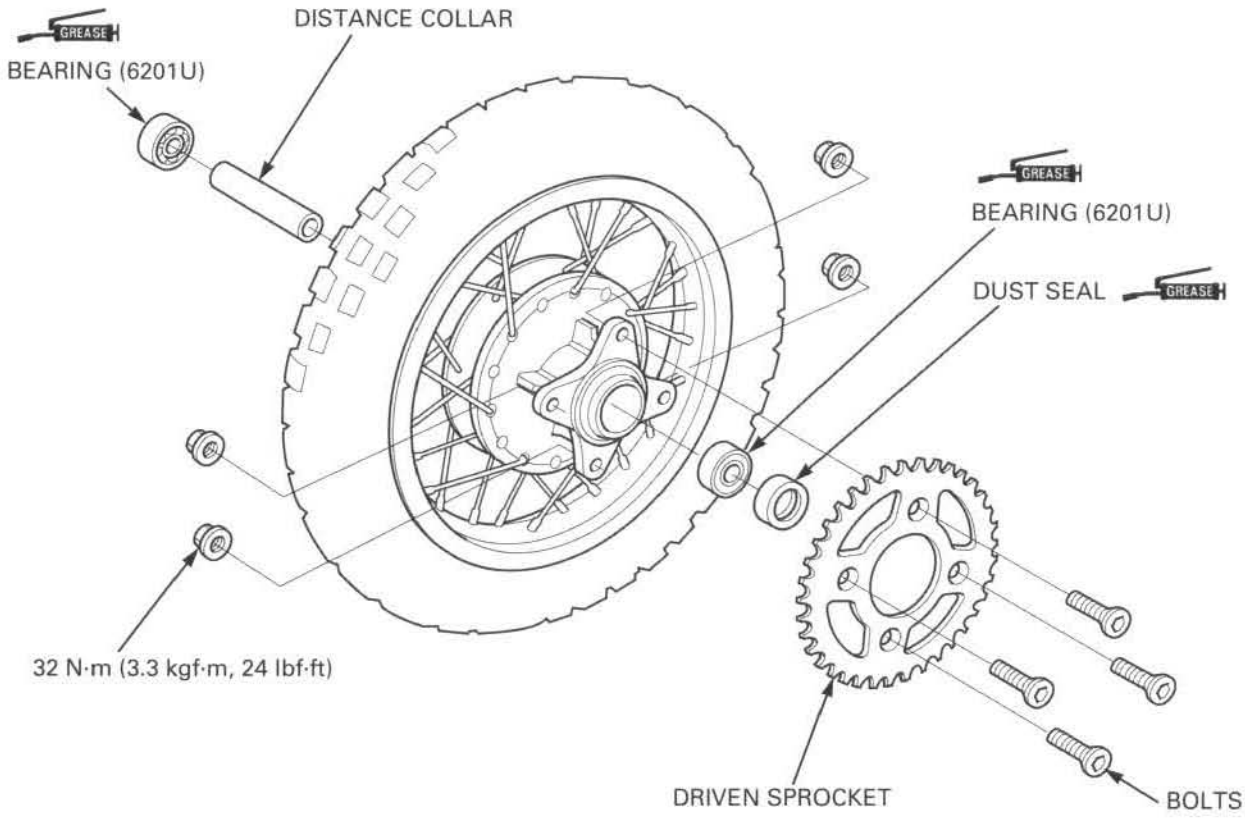
Wheel bearing removal

Install the bearing remover head into the bearing. From the opposite side install the bearing remover shaft and drive the bearing out of the wheel hub. Remove the distance collar and drive out the other bearing.

TOOLS:

Bearing remover head, 12 mm	**07746-0050300**
Bearing remover shaft	**07746-0050100**

ASSEMBLY



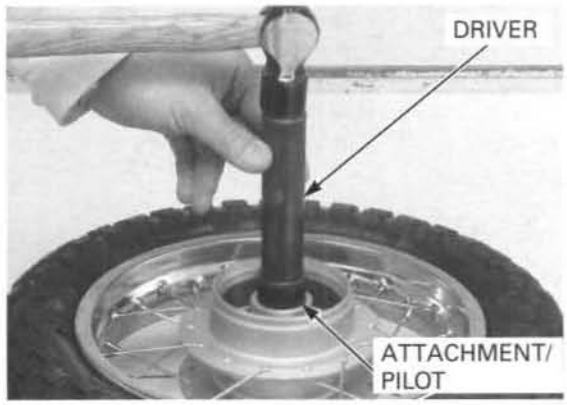
Wheel bearing installation

Never install the old bearings, once the bearings have been removed, the bearing must be replaced with new ones.

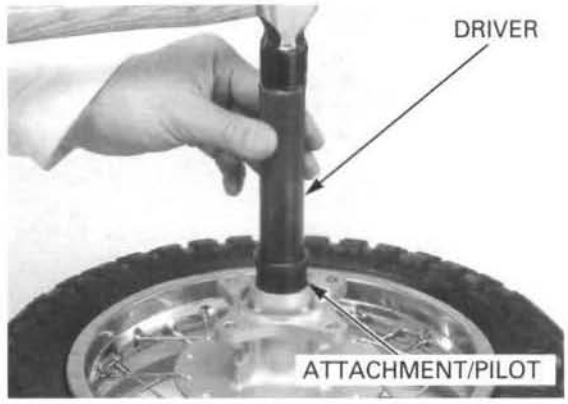
Pack each wheel bearing cavity with grease.
Drive in a new right bearing squarely with the sealed side facing up using the special tools as shown.

TOOLS:

Driver	**07749-0010000**
Attachment, 32 x 35 mm	**07746-0010100**
Pilot, 12 mm	**07746-0040200**



Install the distance collar and drive in a new left bearing using the same tools.

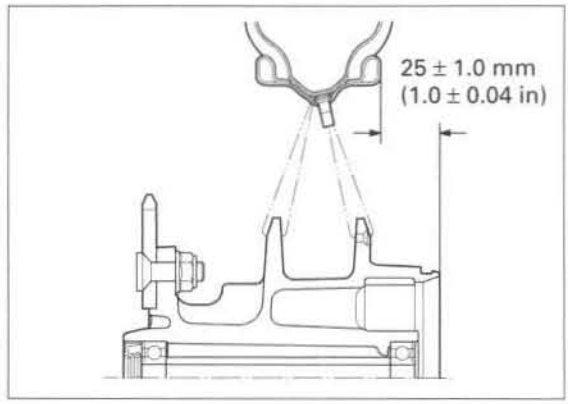


Wheel center adjustment

Place the rim on the work bench.
Place the hub with the left side down and begin lacing with new spokes.
Adjust the hub position so that the distance from the hub right end surface to the side of rim is 25 ± 10 mm (1.0 ± 0.04 in) as shown.

TOOL:

Spoke wrench, 4.1 x 4.5 mm	**07701-0020100 (Equivalent commercially available in U.S.A.)**



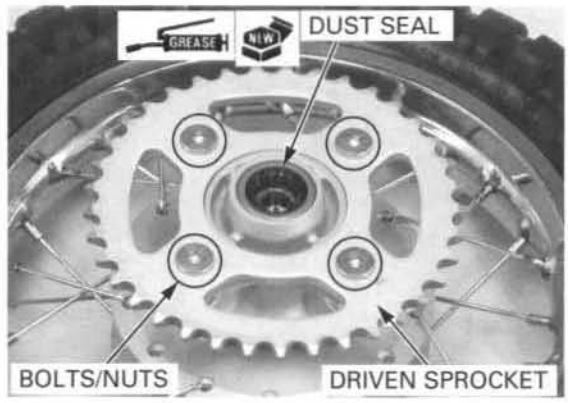
TORQUE: 2.0 N·m (0.2 kgf·m, 1.4 lbf·ft)

Check the rim runout (page 13-6).

Apply grease to a new dust seal lips and install it into the left wheel hub.

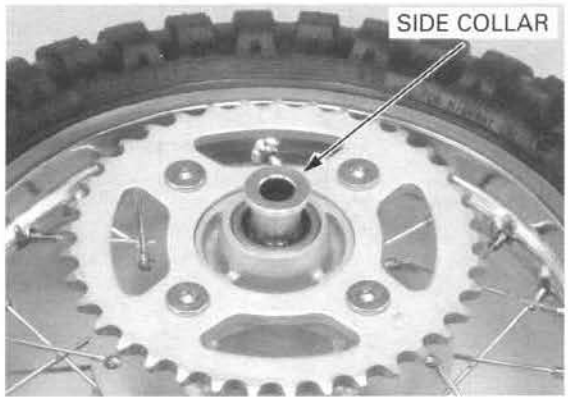
Install the driven sprocket, bolts and nuts and tighten the nuts to the specified torque.

TORQUE: 32 N·m (3.3 kgf·m, 24 lbf·ft)

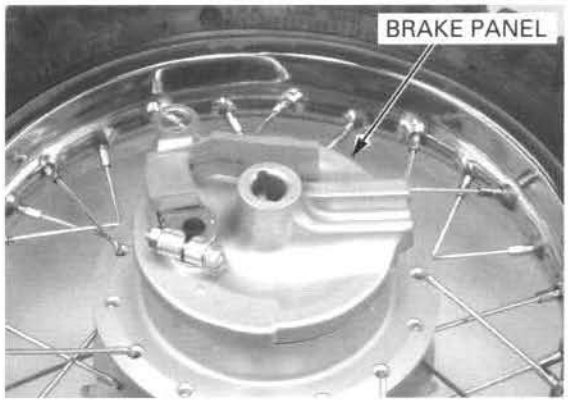


INSTALLATION

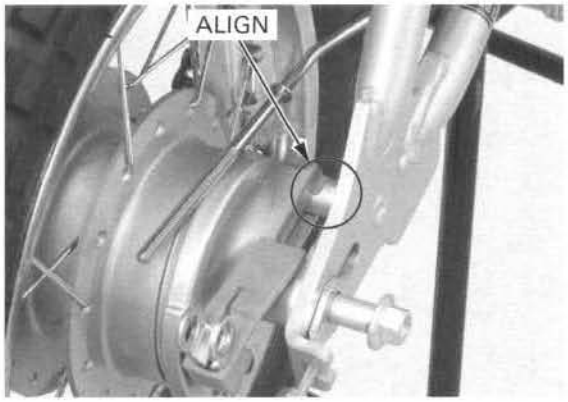
Install the left side collar into the left wheel hub.



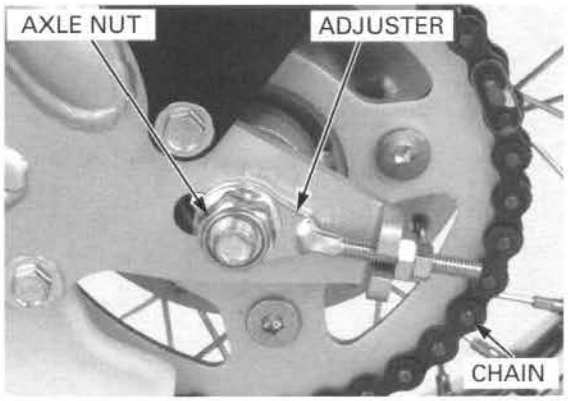
Install the brake panel into the right wheel hub.



Place the rear wheel into the swingarm by aligning the brake panel groove with the swingarm boss.



Install the drive chain over the driven sprocket.
Apply thin layer of grease to the axle.
Install the axle with the right drive chain adjuster from the right side.
Install the left drive chain adjuster and axle nut.

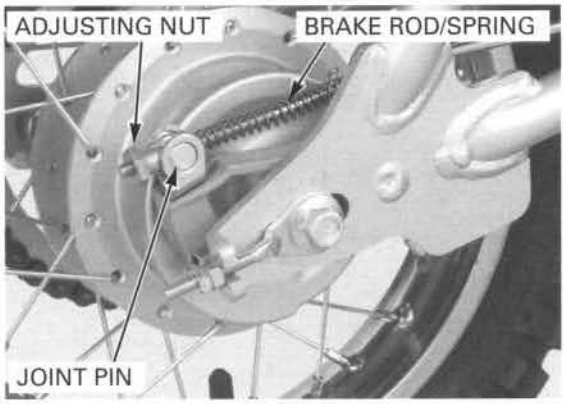


Install the spring onto the brake rod and the joint pin into the brake arm.
Connect the brake rod and install the adjusting nut.

Adjust the drive chain slack (page 3-13).

Tighten the axle nut to the specified torque.

TORQUE: 47 N·m (4.8 kgf·m, 35 lbf·ft)



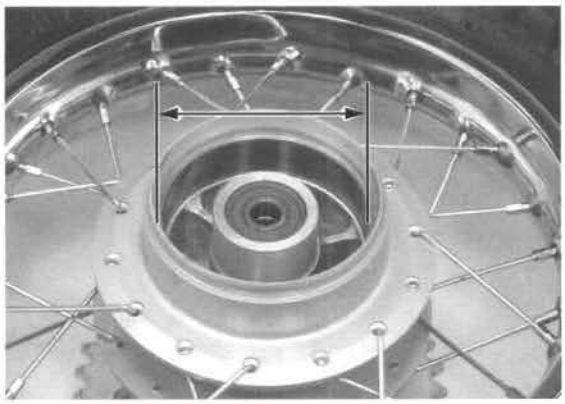
REAR BRAKE

INSPECTION

Remove the brake panel from the rear wheel (page 13-5).

Measure the rear brake drum I.D.

SERVICE LIMIT: 80.5 mm (3.17 in)

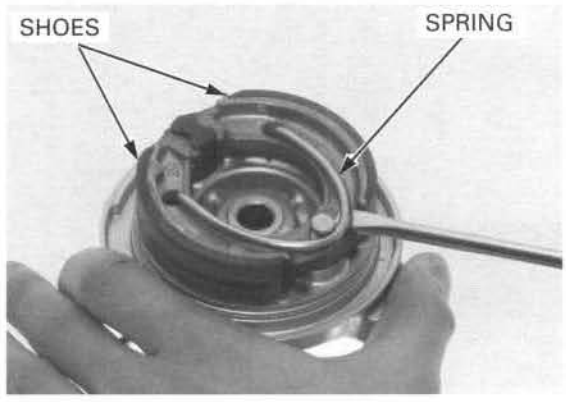


Measure the brake lining thickness.

SERVICE LIMIT: 2.0 mm (0.08 in)

DISASSEMBLY

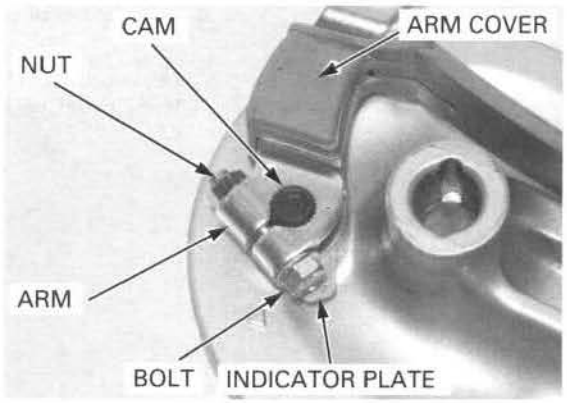
Remove the brake shoes and spring.



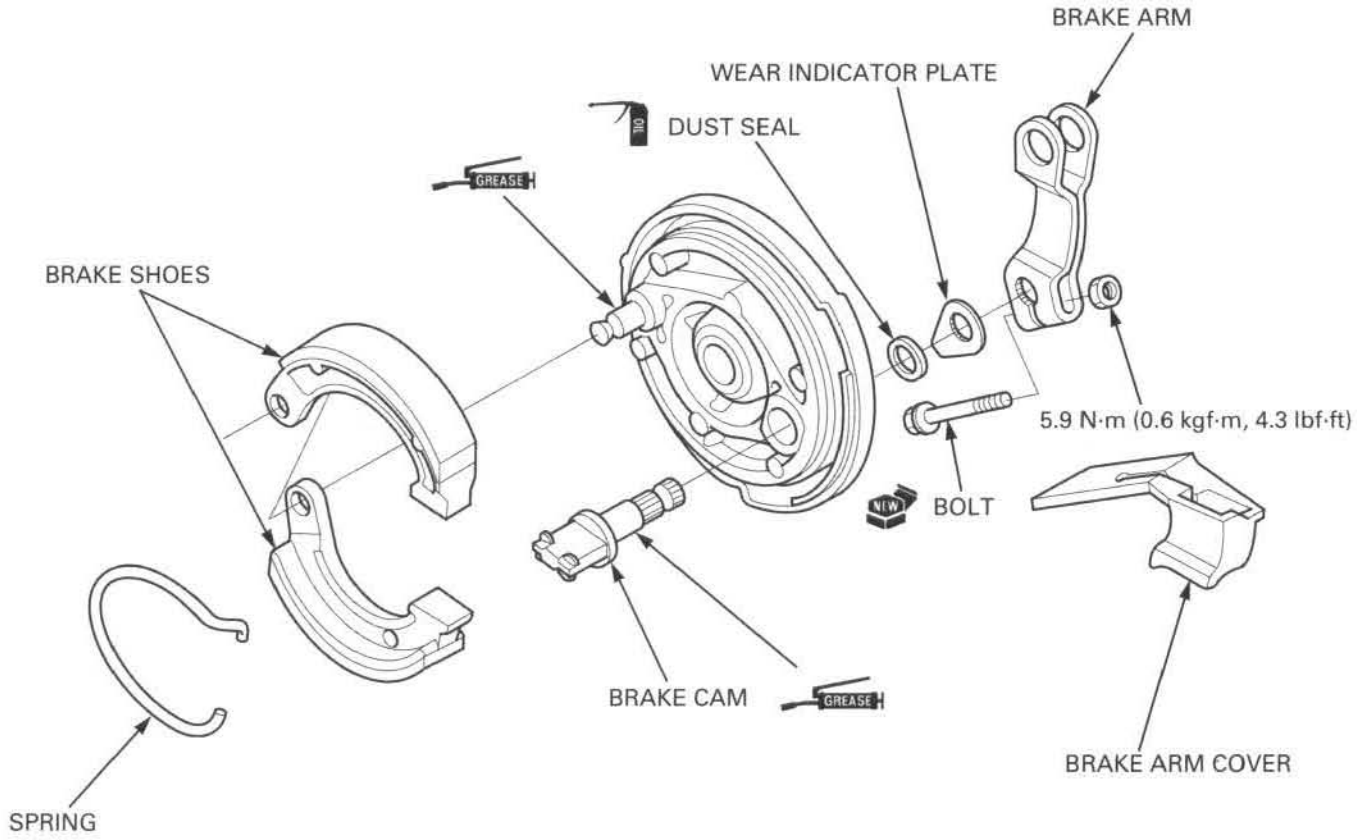
Remove the brake arm cover if necessary.

Remove the nut, bolt and brake arm.

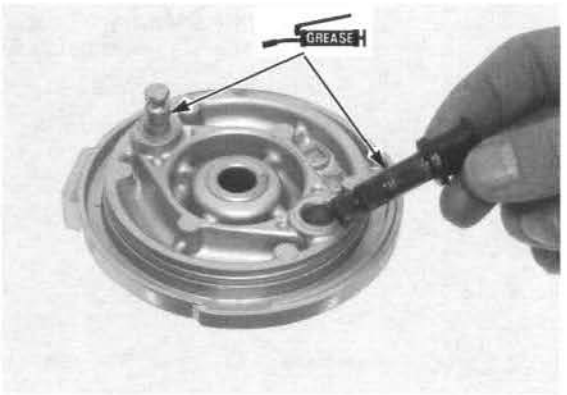
Remove the indicator plate, dust seal and brake cam.



ASSEMBLY

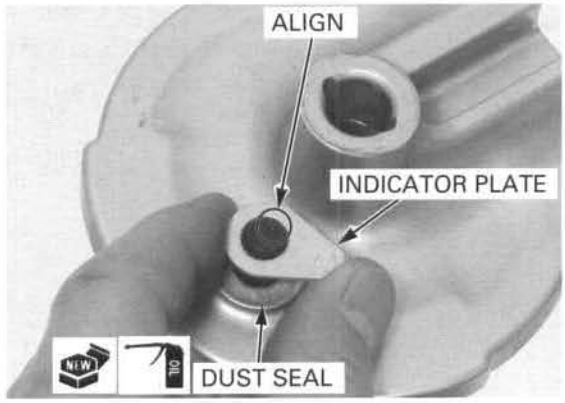


Apply grease to the brake cam spindle.
Install the brake cam into the brake panel.



Apply oil to a new dust seal and install it onto the brake panel.

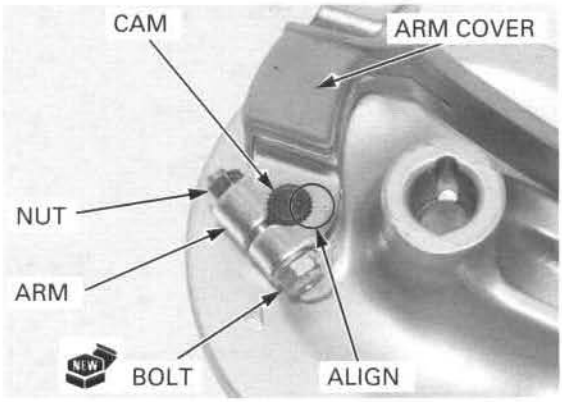
Install the wear indicator plate onto the brake cam by aligning its wide tooth with the wide groove in the brake cam.



Install the brake arm by aligning the punch marks on the arm and brake cam.
Install a new brake arm pinch bolt and nut as shown and tighten it to the specified torque.

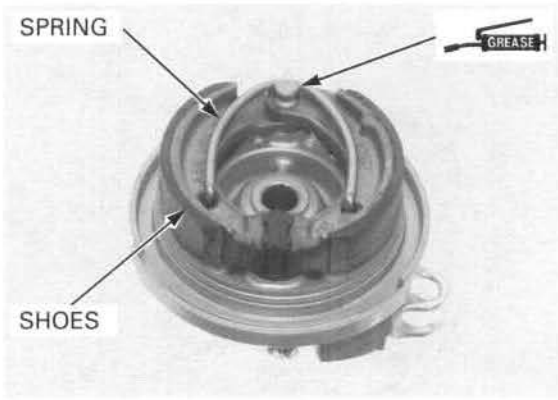
TORQUE: 5.9 N·m (0.6 kgf·m, 4.3 lbf·ft)

Install the brake arm cover onto the arm.



Assemble the brake shoes and spring as shown and install them onto the brake panel.
Wipe any excess grease off the brake cam and anchor pin.

Install the rear wheel (page 13-9).



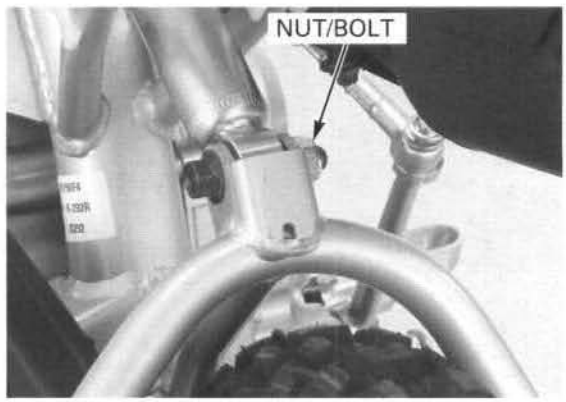
SHOCK ABSORBER

REMOVAL

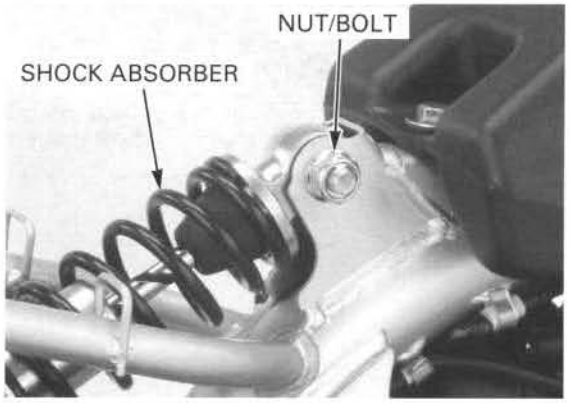
Support the motorcycle securely using a hoist or equivalent and raise the rear wheel off the ground.

Remove the seat (page 2-3).

Remove the shock absorber lower mounting nut and bolt.



Remove the upper mounting nut and bolt and the shock absorber.

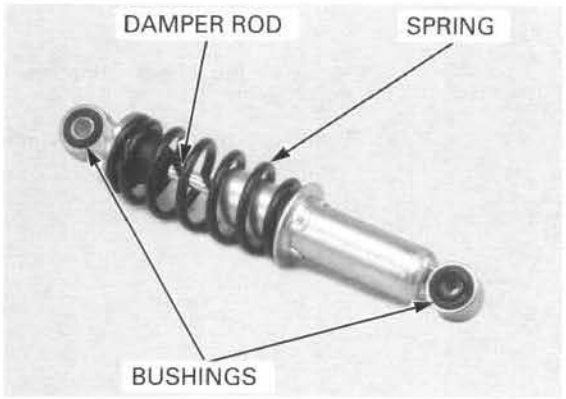


INSPECTION

Visually inspect the for following:

- Spring for fatigue or damage.
- Damper rod for bend or damage.
- Damper unit for deformation or oil leaks.
- Bump rubber for wear or damage.
- Mounting bushings for damage.

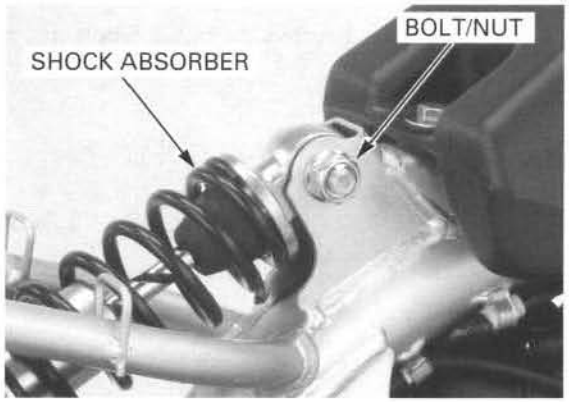
Replace the shock absorber assembly if necessary.



INSTALLATION

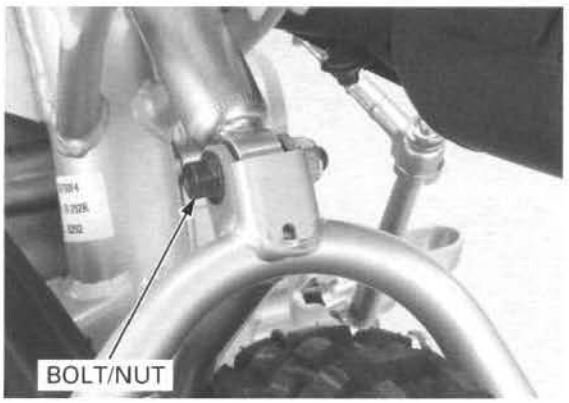
Install the shock absorber into the frame and swingarm.

Install the upper and lower mounting bolts from the left side.



Install the nuts and tighten them to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)



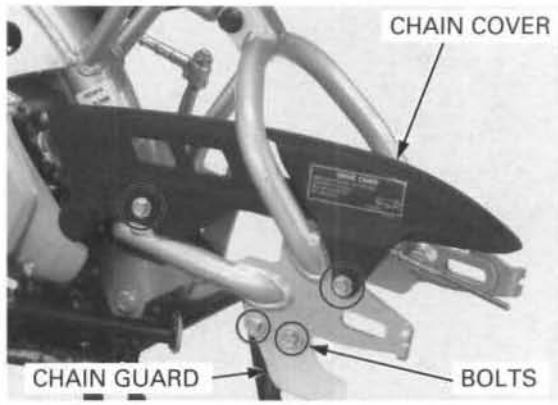
SWINGARM

REMOVAL

Remove the drive chain (page 3-14).
Remove the rear wheel (page 13-5).

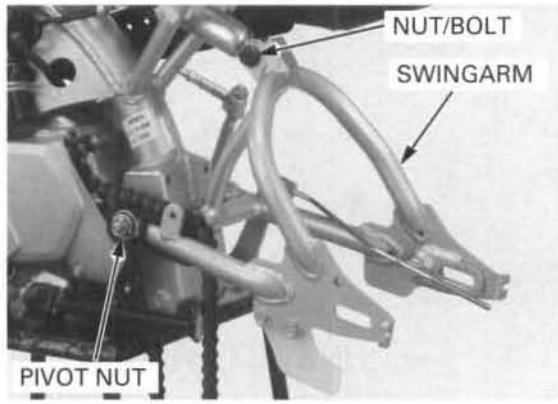
Remove the bolts and drive chain cover.

Remove the bolts and drive chain guard.

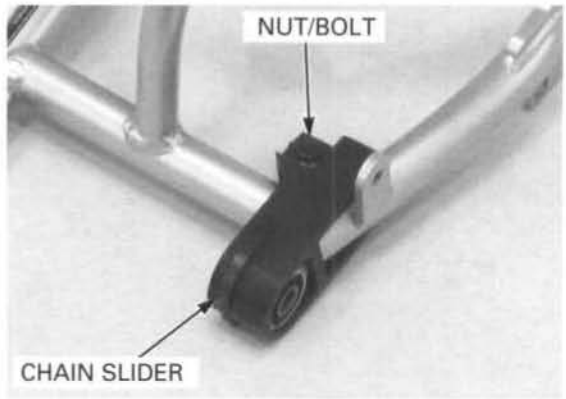


Remove the shock absorber lower mounting nut and bolt.

Remove the swingarm pivot nut, bolt and swingarm.

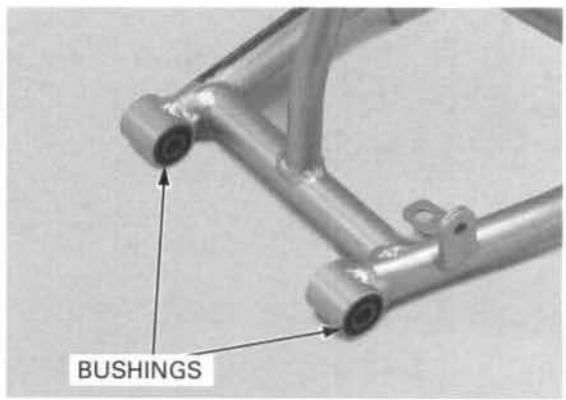


Remove the nut and bolt and the drive chain slider.



INSPECTION

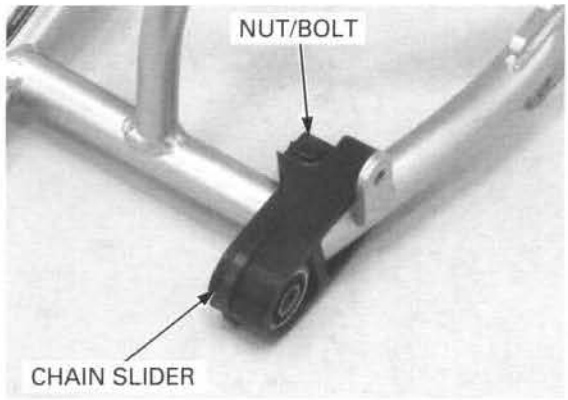
Inspect the swingarm for wear or damage.
Inspect the pivot bushings for wear or damage.



INSTALLATION

Install the drive chain slider and tighten the nut to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



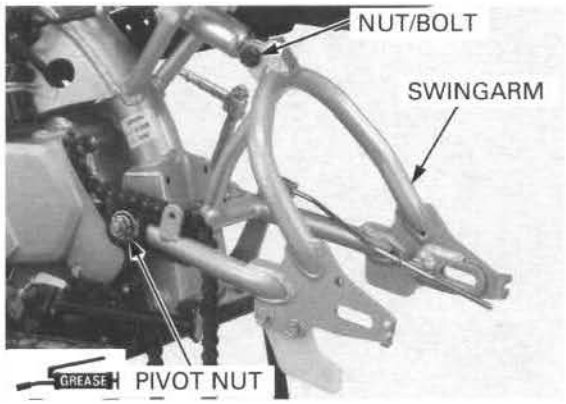
Install the swingarm over the frame, then install the pivot bolt from the right side and the shock absorber lower mounting bolt from the left side.

Apply grease to the seating surface of the swingarm pivot nut.
Install and tighten the swingarm pivot nut to the specified torque.

TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)

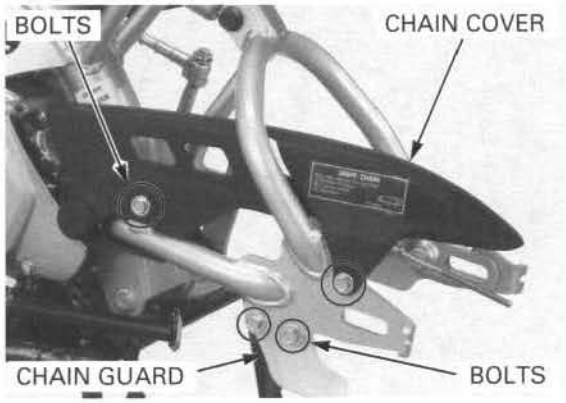
Tighten the shock absorber lower mounting nut to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m,25 lbf·ft)



Install the drive chain guard and tighten the bolts.
Install the drive chain cover and tighten the bolts.

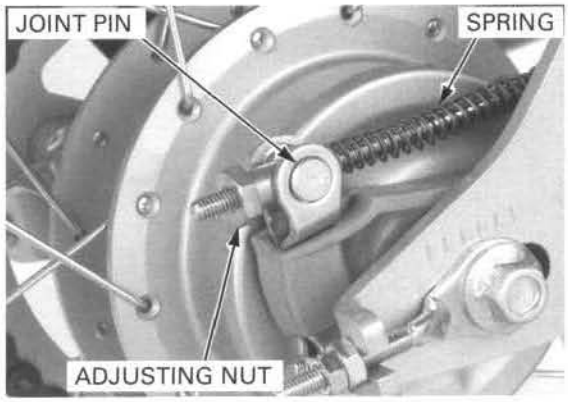
Install the rear wheel (page 13-9).
Install the drive chain (page 3-15).



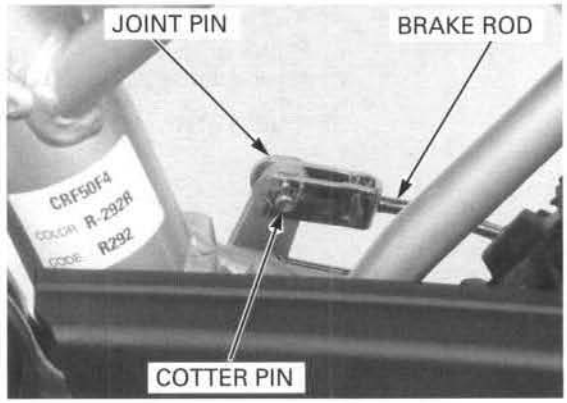
BRAKE PEDAL

REMOVAL

Remove the rear brake adjusting nut and disconnect the rear brake rod from the brake arm, and remove the joint pin and spring.

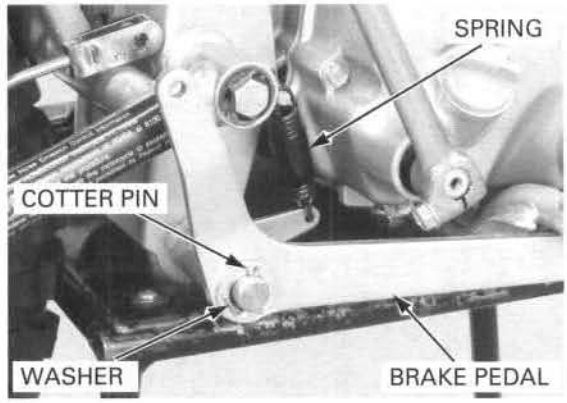


Remove the cotter pin, joint pin and brake rod.



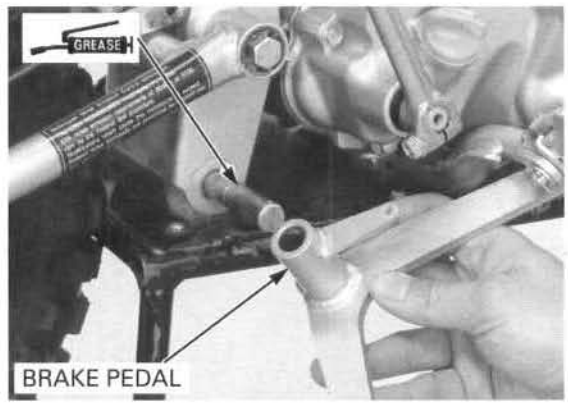
Unhook the brake pedal return spring from the brake pedal.

Remove the cotter pin, washer and brake pedal.

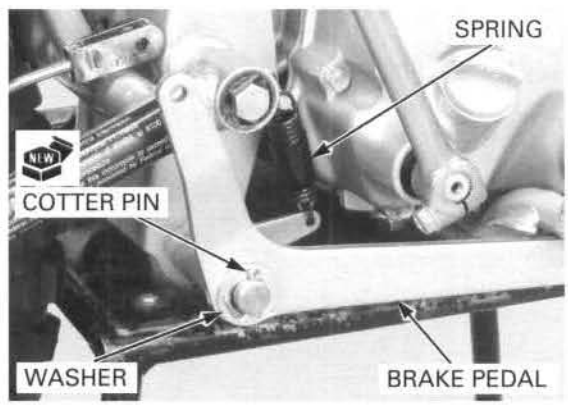


INSTALLATION

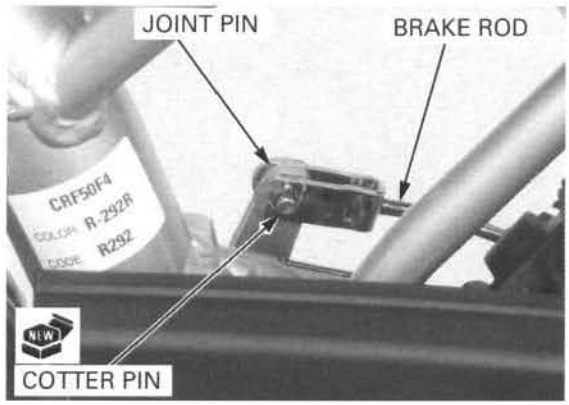
Apply grease to the pivot surface and install the brake pedal.



Install the washer and a new cotter pin to secure the brake pedal.
Install the return spring as shown.

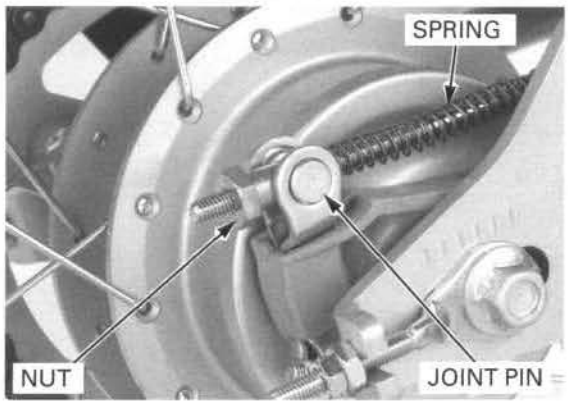


Connect the brake rod to the pedal with the joint pin and secure it with a new cotter pin.



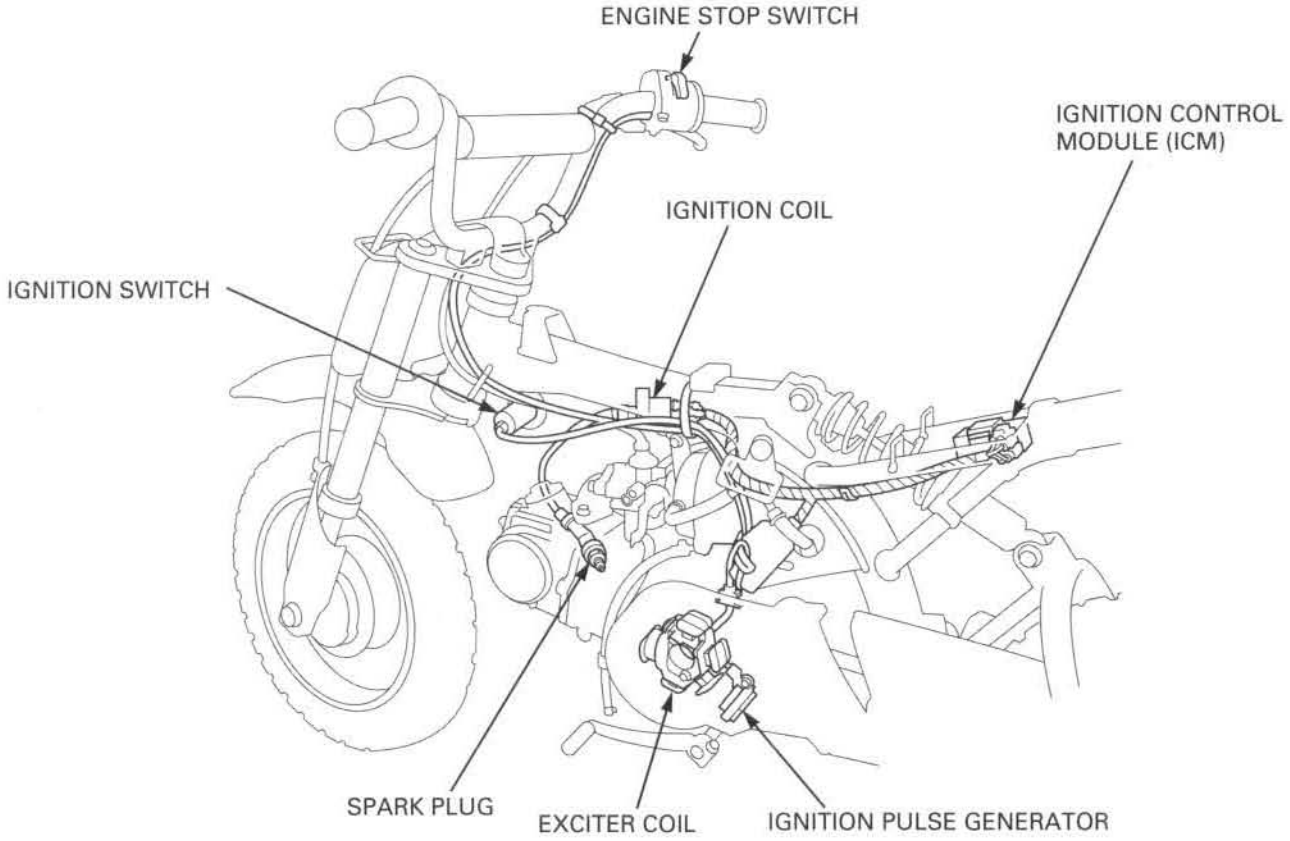
Install the spring onto the brake rod and the joint pin into the brake arm.
Install the rod to the joint pin with the adjusting nut.

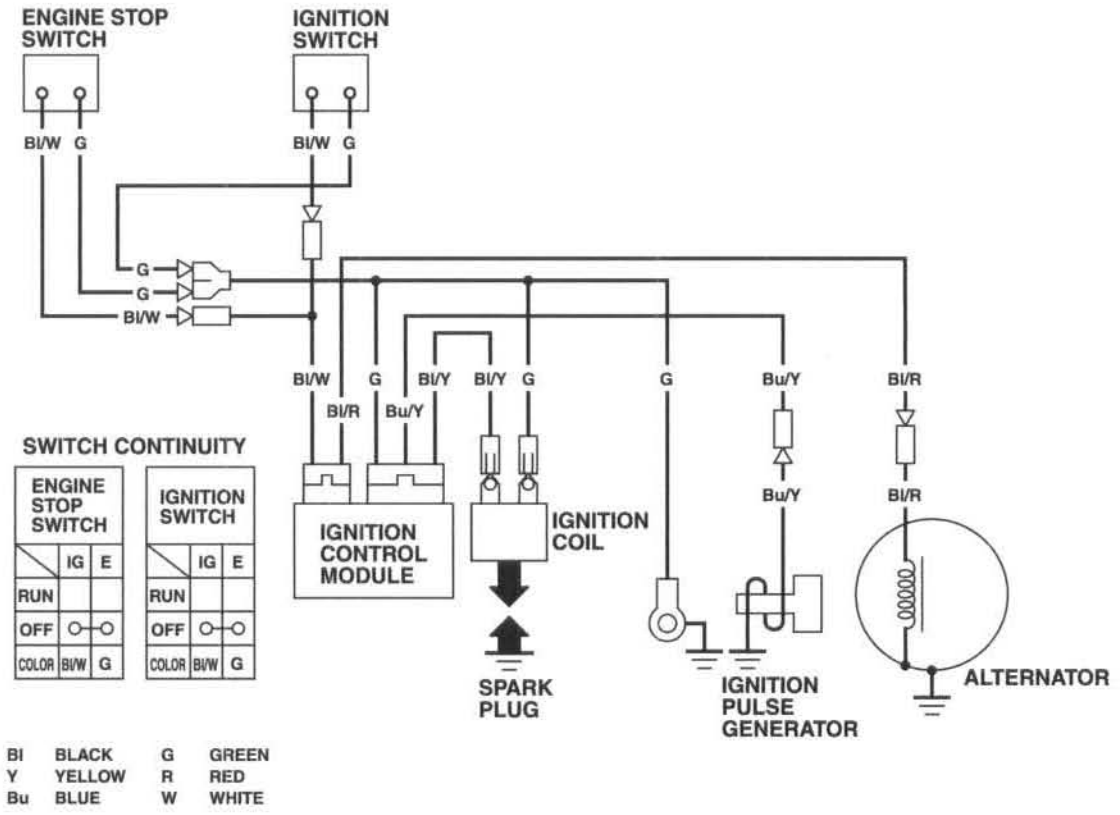
Adjust the brake pedal free play (page 3-16).



14. IGNITION SYSTEM

SYSTEM DIAGRAM





SWITCH CONTINUITY

ENGINE STOP SWITCH		
	IG	E
RUN		
OFF	○—○	
COLOR	Bl/W	G

IGNITION SWITCH		
	IG	E
RUN		
OFF	○—○	
COLOR	Bl/W	G

Bl	BLACK	G	GREEN
Y	YELLOW	R	RED
Bu	BLUE	W	WHITE

SERVICE INFORMATION

GENERAL

- When servicing the ignition system, always follow the steps in the troubleshooting sequence on page 14-4.
- The CDI ignition system uses an electrically controlled ignition timing system. No adjustments can be made to the ignition timing.
- The ICM may be damaged if dropped. Also if the connector is disconnected when current is flowing, the excessive voltage may damage the module.
- A faulty ignition system is often related to poor connections. Check those connections before proceeding.
- Use spark plug of the correct heat range. Using spark plug with an incorrect heat range can damage the engine.
- For alternator and ignition pulse generator removal and installation, See page 10-3.

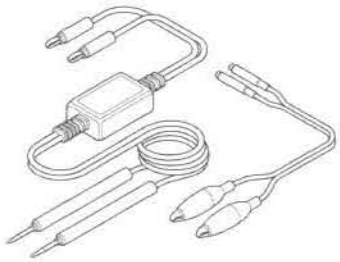
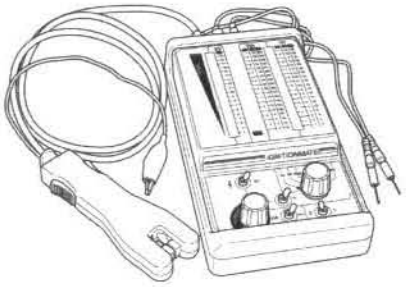
SPECIFICATION

ITEM		SPECIFICATION	
Spark plug	Standard	CR6HSA (NGK)	U20FSR-U (DENSO)
	For cold climate (below 41°F/5°C)	CR5HSA (NGK)	U16FSR-U (DENSO)
	For extended high speed riding	CR7HSA (NGK)	U22FSR-U (DENSO)
Spark plug gap		0.60 – 0.70 mm (0.024 – 0.028 in)	
Ignition coil peak voltage		100 V minimum	
Ignition pulse generator peak voltage		0.7 V minimum	
Alternator exciter coil peak voltage		100 V minimum	
Ignition timing ("F" mark)		27° BTDC at idle	

TORQUE VALUES

Ignition coil mounting bolt	5.9 N·m (0.6 kgf·m, 4.3 lbf·ft)

TOOLS

Peak voltage adaptor with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)  07HGJ-0020100 (not available in U.S.A.)	Ignition Mate peak voltage tester MTP07-0286 (U.S.A. only) 

TROUBLESHOOTING

- Inspect the following before diagnosing the system.
  - Faulty spark plug
  - Loose spark plug cap or spark plug wire connections
  - Water got into the spark plug cap (leaking the ignition coil secondary voltage)

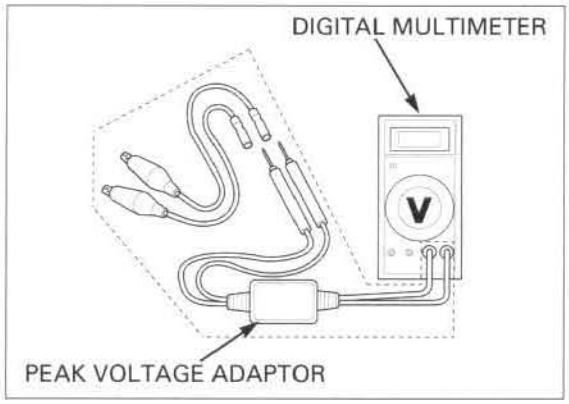
No spark at spark plug

Unusual condition		Probable cause (check in numerical order)
Ignition coil primary voltage	Low peak voltage.	1. 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; 10 MΩ/DCV. 3. Cranking speed is too low (Operating force of the kick-starter is weak.) 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 ignition system. 6. Faulty exciter coil (Measure peak voltage). 7. Faulty ignition coil. 8. Faulty ICM (in case when above No. 1 – 7 are normal).
	No peak voltage.	1. Incorrect peak voltage adaptor connections (System is normal if measured voltage is over the specifications with reverse connections). 2. Short circuit in ignition switch wire or engine stop switch wire (Black/white). 3. Faulty ignition switch or engine stop switch. 4. Loose or poorly connected ICM connectors. 5. Open circuit or poor connection in ground wire (Green) 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 (in case when above No.1 – 8 are normal).
	Peak voltage is normal, but no spark jumps at plug.	1. Faulty spark plug or leaking ignition coil secondary current ampere. 2. Faulty ignition coil.
Exciter coil	Low peak voltage.	1. The multimeter impedance is too low; 10 MΩ/DCV. 2. Cranking speed is too slow (Operating force of the kick-starter is weak.) 3. The sampling timing of the tester and measured pulse were not synchronized. (System is normal if measured voltage is over the standard voltage at least once.) 4. Faulty exciter coil (in case when above No.1 – 3 are normal).
	No peak voltage.	1. Faulty peak voltage adaptor. 2. Faulty exciter coil.
Ignition pulse generator	Low peak voltage.	1. The multimeter impedance is too low; 10 MΩ/DCV. 2. Cranking speed is too slow (Operating force of the kick-starter is weak.) 3. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once). 4. Faulty ignition pulse generator (in case when above No.1 – 3 are normal).
	No peak voltage.	1. Faulty peak voltage adaptor. 2. Faulty ignition pulse generator.

IGNITION SYSTEM INSPECTION

- If there is no spark at plug, check all connections for loose or poor contact before measuring each peak voltage.
- Use recommended digital multimeter or commercially available digital multimeter with an impedance of 10 MΩ/DCV minimum.
- The display value differs depending upon the internal impedance of the multimeter.
- If using peak voltage tester (U.S.A. only), follow the manufacturer's operating instructions.

Connect the peak voltage adaptor to the digital multimeter, or use the peak voltage tester (U.S.A. only).



TOOLS:

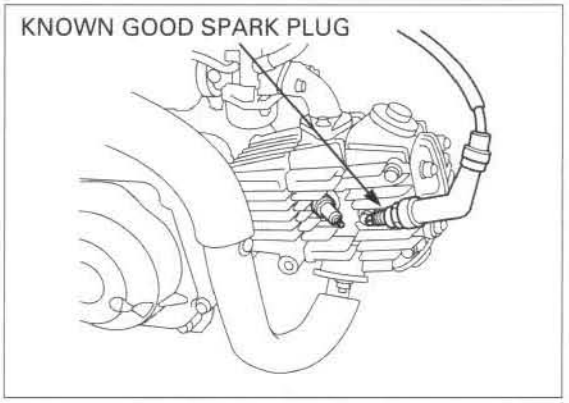
Peak voltage tester	**MTP07-0286 (U.S.A. only) or**
Peak voltage adaptor	**07HGJ-0020100 (Not available in U.S.A.)**

with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

IGNITION COIL PRIMARY PEAK VOLTAGE

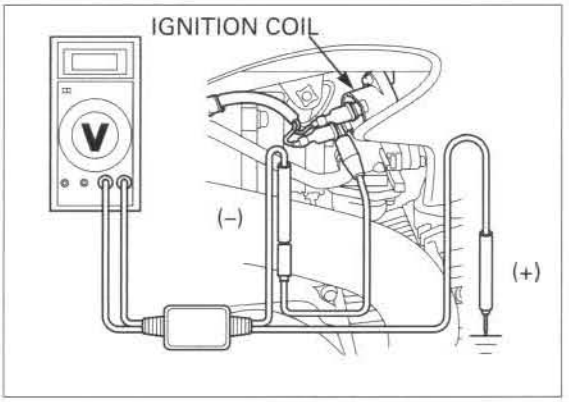
- Check all system connections before inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check cylinder compression and check that the spark plug is installed correctly.

Disconnect the spark plug cap from the spark plug. Connect a known good spark plug to the spark plug cap and ground the spark plug to the cylinder head as done in a spark test.



With the ignition coil primary wire connected, connect the peak voltage adaptor or peak voltage tester to probes to the ignition coil primary wire terminal and ground.

CONNECTION:
Black/yellow terminal (–) – Body ground (+)



Turn the ignition switch ON and engine stop switch to "RUN".

Shift the transmission into neutral.
Crank the engine with kickstarter and read ignition coil primary peak voltage.

PEAK VOLTAGE: 100 V minimum

If the peak voltage is abnormal, follow the checks described in the troubleshooting chart (page 14-4).

IGNITION PULSE GENERATOR PEAK VOLTAGE

- Check cylinder compression and check that the spark plug is installed correctly.

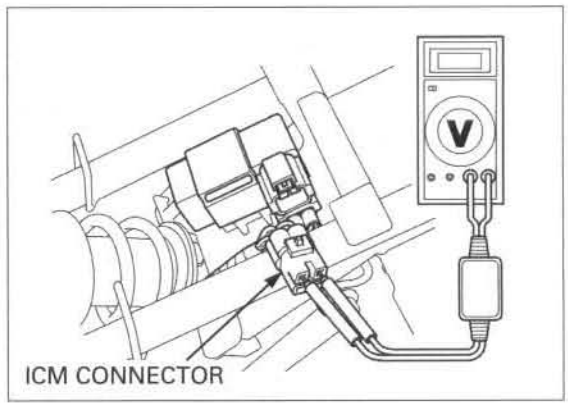
Remove the seat assembly (page 2-3).

Disconnect the 4P connector from the ICM.
Connect the peak voltage adaptor or peak voltage tester probes to the connector terminals of the wire harness side.

TOOLS:

Peak voltage tester	**MTP07-0286 (U.S.A. only) or**
Peak voltage adaptor	**07HGJ-0020100 (Not available in U.S.A.)**

with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

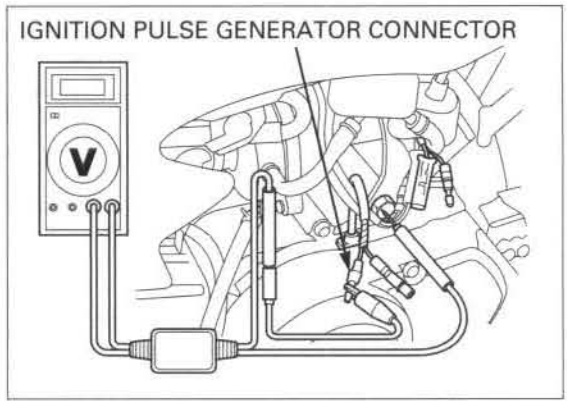


CONNECTION:
Blue/yellow terminal (+) – Green (–)

Shift the transmission into neutral.
Crank the engine with the kickstarter and read the peak voltage.

PEAK VOLTAGE: 0.7 V minimum

If the peak voltage measured at ICM connector is abnormal, measure the peak voltage at the pulse generator connector.
Disconnect the ignition pulse generator connector (Blue/yellow) and connect the peak voltage adaptor or tester probes to the connector terminal of the ignition pulse generator side and ground.
In the same manner as at the ICM connector, measure the peak voltage and compare it to the voltage measured at the ICM connector.



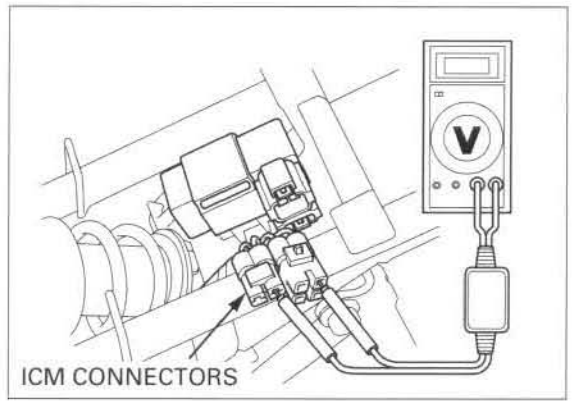
- If the peak voltage measured at the ICM is abnormal and the one measured at the ignition pulse generator is normal, the wire harness has an open circuit, or loose connection.
- If both peak voltages are abnormal, follow the checks described in the troubleshooting chart (page 14-4).

ALTERNATOR EXCITER COIL PEAK VOLTAGE

- Check cylinder compression and check that the spark plug is installed correctly.

Remove the seat assembly (page 2-3).

Disconnect the 4P and 2P connectors from the ICM. Connect the peak voltage adaptor or peak voltage tester probes to the connector terminals of the wire harness side.



TOOLS:

Peak voltage tester	**MTP07-0286 (U.S.A. only) or**
Peak voltage adaptor	**07HGJ-0020100 (Not available in U.S.A.)**

with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

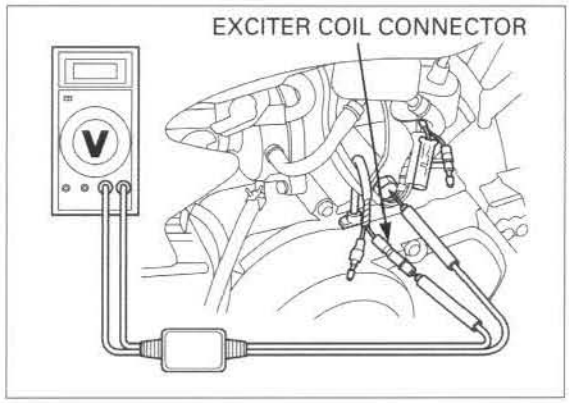
CONNECTION:
Black/red terminal (+) – Green (–)

Shift the transmission into neutral.

Crank the engine with kickstarter and read the peak voltage.

PEAK VOLTAGE: 100 V minimum

If the peak voltage measured at ICM connector is abnormal, measure the peak voltage at the alternator exciter coil connector.



Disconnect the alternator exciter coil connector (Black/red) and connect the peak voltage adaptor or tester probes to the connector terminal of the exciter coil side and ground.
In the same manner as at the ICM connector, measure the peak voltage and compare it to the voltage measured at the ICM connector.

- If the peak voltage measured at the ICM is abnormal and the one measured at the alternator exciter coil is normal, the wire harness has an open circuit, or loose connection.
- If both peak voltages are abnormal, follow the checks described in the troubleshooting chart (page 14-4).

IGNITION COIL

REMOVAL/INSTALLATION

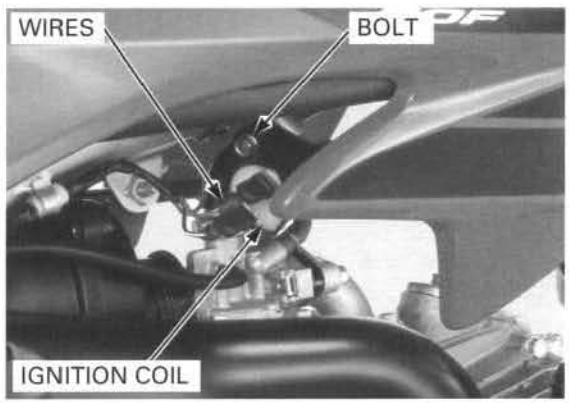
Disconnect the spark plug cap from the plug.
Disconnect the primary wires from the ignition coil.

Remove the bolt and ignition coil.

Installation is in the reverse order of removal.

Tighten the ignition coil mounting bolt to the specified torque.

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



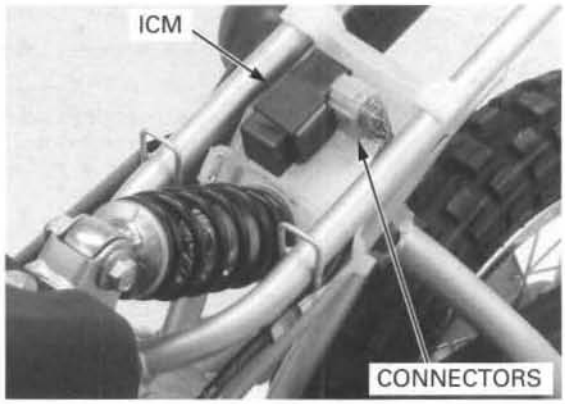
IGNITION CONTROL MODULE

REMOVAL/INSTALLATION

Remove the seat assembly (page 2-3).

Disconnect the Ignition Control Module (ICM) 4P and 2P connectors.
Remove the ICM from the frame.

Installation is in the reverse order of removal.

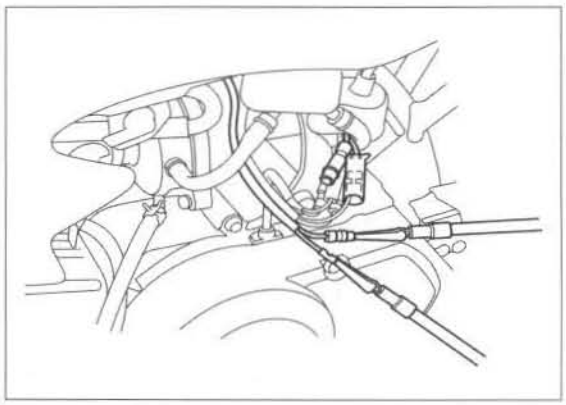


ENGINE STOP SWITCH

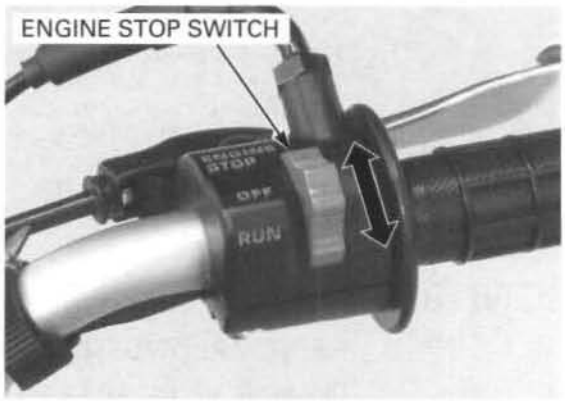
INSPECTION

Disconnect the engine stop switch connectors.

Check for continuity between the terminals.



There should be no continuity when the engine stop switch is in the "OFF" position and there should be continuity when the engine stop switch is in the "RUN" position.



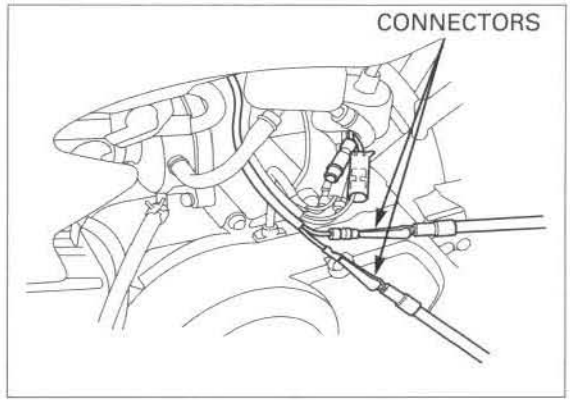
IGNITION SWITCH

INSPECTION

Disconnect the ignition switch connectors.

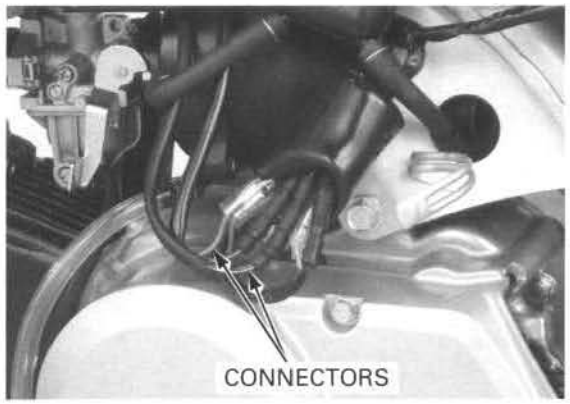
Check for continuity at the connectors on the ignition switch side.

There should be no continuity when the ignition switch is in the "ON" position and continuity when the ignition switch is in the "OFF" position.

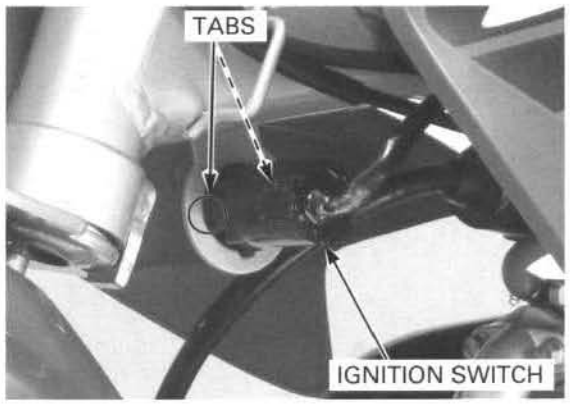


REMOVAL/INSTALLATION

Disconnect the ignition switch connectors.

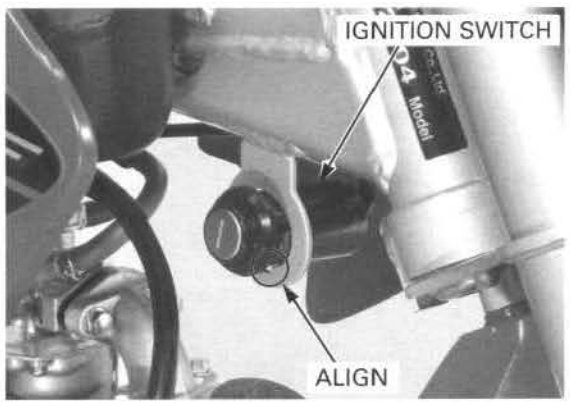


Release the tabs on the ignition switch body and remove the ignition switch.



At installation, align the guide on the ignition switch and groove on the frame.

Installation is in the reverse order of removal.



IGNITION TIMING

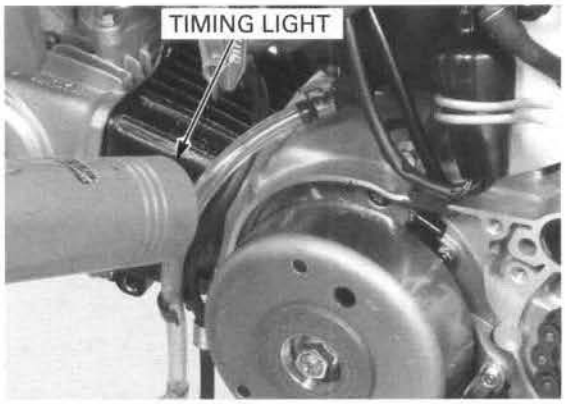
Warm up the engine.
Stop the engine and remove the left crankcase cover (page 10-4).

Read the instructions for timing light operation.

Connect the timing light to the spark plug wire.

Start the engine and let it idle.

IDLE SPEED: 1,700 ± 100 rpm



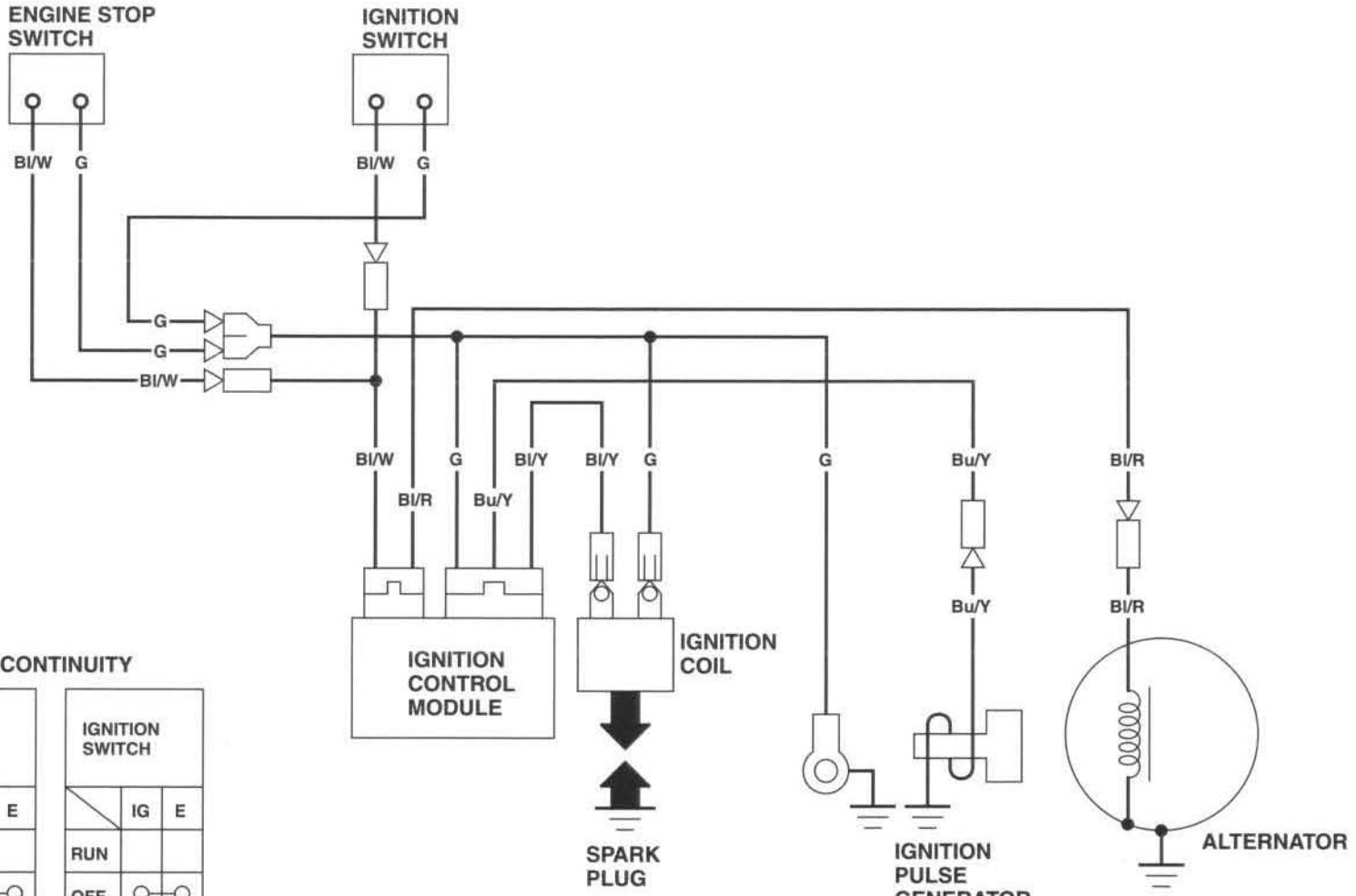
The ignition timing is correct if the "F" mark on flywheel aligns with the index notch on the left crankcase.

Increase the engine speed by turning the throttle stop screw and make sure the "F" mark begins to move clockwise.

Install the left crankcase cover (page 10-8).

15. WIRING DIAGRAM

WIRING DIAGRAM



SWITCH CONTINUITY

ENGINE STOP SWITCH	IG	E
RUN		
OFF	○	○
COLOR	Bl/W	G

IGNITION SWITCH	IG	E
RUN		
OFF	○	○
COLOR	Bl/W	G

Bl	BLACK	G	GREEN
Y	YELLOW	R	RED
Bu	BLUE	W	WHITE

0030Z-GEL-7000

16. TROUBLESHOOTING

ENGINE DOES NOT START OR IS HARD TO START

1. **Carburetor Inspection**

   Check the fuel flow to carburetor.

   Is fuel reaching the carburetor?

   NO – • Clogged fuel line and strainer
   • Clogged fuel tank breather hose

   YES – GO TO STEP 2.

2. **Spark Test**

   Perform a spark test.

   Is there a good spark?

   NO – • Faulty spark plug
   • Fouled spark plug
   • Faulty ignition control module
   • Broken or shorted spark plug wire
   • Faulty igniting pulse generator
   • Faulty engine stop switch or ignition switch
   • Loose or disconnected ignition system wires

   YES – GO TO STEP 3.

3. **Spark Plug Inspection**

   Remove and inspect spark plug.

   Is the spark plug in good condition?

   NO – • Flooded carburetor
   • Choke valve closed
   • Air cleaner dirty

   YES – GO TO STEP 4.

4. **Engine Start Condition**

   Start by following the normal procedure.

   Does the engine start but then stop?

   YES – • Improper choke operation
   • Carburetor incorrectly adjusted
   • Intake pipe leaking
   • Improper ignition timing (faulty ignition coil or ignition pulse generator)
   • Fuel contaminated

   NO – GO TO STEP 5.

5. **Cylinder Compression Inspection**

   Test cylinder compression.

   Is the compression normal?

   NO – • Valve clearance too small
   • Valve stuck open
   • Worn cylinder and piston ring
   • Damaged cylinder head gasket
   • Seized valve
   • Improper valve timing

ENGINE LACKS POWER

1. **Drive Train Inspection**

   Raise wheel off the ground and spin by hand.

   Does the wheel spin freely?

   NO – • Brake dragging
   • Worn or damaged wheel bearings

   YES – GO TO STEP 2.

2. **Tire Pressure Inspection**

   Check the tire pressure.

   Is the tire pressure correct?

   NO – • Faulty tire valve
   • Punctured tire

   YES – GO TO STEP 3.

3. **Clutch Inspection**

   Accelerate rapidly from low to second.

   Does the engine speed change accordingly when clutch is released?

   NO – • Clutch slipping
   • Worn clutch discs/plates
   • Warped clutch discs/plates
   • Weak clutch spring
   • Additive in engine oil

   YES – GO TO STEP 4.

4. **Engine Performance Inspection**

   Accelerate lightly.

   Does the engine speed increase?

   NO – • Choke valve closed
   • Clogged air cleaner
   • Restricted fuel flow
   • Clogged muffler
   • Pinched fuel tank breather hose

   YES – GO TO STEP 5.

5. **Ignition Timing Inspection**

   Check the ignition timing.

   Is the ignition timing normal?

   NO – • Faulty ignition control module
   • Faulty ignition pulse generator

   YES – GO TO STEP 6.

6. **Cylinder Compression Inspection**

   Test cylinder compression.

   Is the compression normal?

   NO – • Valve clearance too small
   • Worn cylinder and piston ring
   • Leaking head gasket
   • Seized valve
   • Improper valve timing

   YES – GO TO STEP 7.

7. **Carburetor Inspection**

   Check the carburetor for clogs.

   Is the carburetor clogged?

   YES – Carburetor not serviced frequently enough

   NO – GO TO STEP 8.

8. **Spark Plug Inspection**

   Remove and inspect the spark plug.

   Is the spark plug in good condition?

   NO – • Plug not serviced frequently enough
   • Incorrect spark plug heat range

   YES – GO TO STEP 9.

9. **Engine Oil Inspection**

   Check the oil level and condition.

   Is the engine oil in good condition?

   NO – • Oil level too high
   • Oil level too low
   • Contaminated oil

   YES – GO TO STEP 10.

10. **Lubrication Inspection**

    Remove cylinder head cover and inspect lubrication.

    Is the valve train lubricated properly?

    NO – • Clogged oil passage
    • Clogged oil control orifice

    YES – GO TO STEP 11.

11. **Over Heating Inspection**

    Check for engine over heating.

    Is the engine over heating?

    YES – • Excessive carbon build-up in combustion chamber
    • Use of poor quality fuel
    • Clutch slipping
    • Lean fuel mixture
    • Wrong type of fuel

    NO – GO TO STEP 12.

12. **Engine Knocking Inspection**

    Accelerate or run at high speed.

    Does the engine knock?

    YES – • Worn piston and cylinder
    • Wrong type of fuel
    • Excessive carbon build-up in combustion chamber
    • Ignition timing too advanced (faulty ignition control module)
    • Lean fuel mixture

POOR PERFORMANCE AT LOW AND IDLE SPEED

1. **Carburetor Air Screw Inspection**

   Check the carburetor air screw adjustment.

   Is the air screw correct?

   NO – (page 5-13)

   YES – GO TO STEP 2.

2. **Intake Manifold Leaking Inspection**

   Check for leaks in the intake Manifold.

   Is there leaking?

   YES – • Loose carburetor mounting bolts
   • Damaged insulator

   NO – GO TO STEP 3.

3. **Spark Test**

   Perform a spark test.

   Is there a good spark?

   NO – • Faulty or fouled spark plug
   • Faulty ignition control module
   • Faulty ignition coil
   • Broken or shorted spark plug wire
   • Faulty engine stop switch or ignition switch
   • Faulty ignition pulse generator
   • Loose or disconnected ignition system wires

   YES – GO TO STEP 4.

4. **Ignition Timing Inspection**

   Check the ignition timing.

   Is the ignition timing normal?

   NO – Improper ignition timing (Faulty ignition control module)

POOR PERFORMANCE AT HIGH SPEED

1. **Fuel Line Inspection**

   Disconnect the fuel hose at the carburetor.

   Does the fuel flow freely?

   NO – • Clogged fuel line
   • Clogged fuel tank breather hose
   • Faulty fuel valve
   • Clogged fuel strainer

   YES – GO TO STEP 2.

2. **Carburetor Inspection**

   Remove the carburetor and check for clogged jets.

   Are the jets clogged?

   YES – Clean

   NO – GO TO STEP 3.

3. **Valve Timing Inspection**

   Check the valve timing.

   Is the valve timing correct?

   NO – Cam sprocket not installed properly

   YES – GO TO STEP 5.

4. **Ignition Timing Inspection**

   Check the ignition timing.

Is the ignition timing normal?

NO – • Faulty ignition control module
• Faulty ignition pulse generator

YES – GO TO STEP 5.

5. **Valve Spring Inspection**

Check the valve springs.

Is the valve spring free length normal?

NO – Faulty spring

YES – Not weak

POOR HANDLING

Steering is heavy
- Steering stem adjusting nut too tight
- Damaged steering head bearings

Either wheel is wobbling
- Excessive wheel bearing play
- Bent rim
- Improper installed wheel hub
- Swingarm pivot bearing excessively worn
- Bent frame

The motorcycle pulls to one side
- Faulty shock absorber
- Front and rear wheel not aligned
- Bent fork
- Bent swingarm
- Bent axle

17. INDEX