

# ***IMPORTANT NOTICE***

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The background of the cover features a large, stylized gear mechanism. A prominent gear is in the foreground, with a smaller gear above it. To the left, a portion of a motorcycle's front wheel and chain drive is visible. The Honda logo, a red winged emblem, is positioned to the left of the brand name. The text 'HONDA' is written in a large, bold, red, sans-serif font. The text 'SERVICE MANUAL' is in a smaller, white, bold, sans-serif font. The text 'XR250R' is in a red, bold, sans-serif font. The overall color scheme is dark, with highlights on the metallic parts of the gears and the motorcycle components.

 **HONDA**

**SERVICE MANUAL**

**XR250R**



## HOW TO USE THIS MANUAL

Follow the Maintenance Schedule (Section 3) recommendations to ensure that the vehicle is in peak operating condition and the emission levels are within the standards set by the California Air Resources Board. 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.

Sections 4 through 18 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 that section.

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














If you don't know the source of the trouble, go to section 18 Troubleshooting.

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# SYMBOLS

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

	<p>Replace the part(s) with new one(s) before assembly.</p>
	<p>Use special tool.</p>
	<p>Use optional tool. Use the same procedure you use to order parts.</p>
	<p>Use recommended engine oil, unless otherwise specified.</p>
	<p>Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1 : 1).</p>
	<p>Use multi-purpose grease (Lithium based multi-purpose grease NLGI #2 or equivalent).</p>
	<p>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</p>
	<p>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</p>
	<p>Use silicone grease.</p>
	<p>Apply a locking agent. Use a middle strength locking agent unless otherwise specified.</p>
	<p>Apply sealant.</p>
	<p>Use brake fluid, DOT 4. Use the recommended brake fluid, unless otherwise specified.</p>
	<p>Use Fork or Suspension Fluid.</p>

# 1. GENERAL INFORMATION

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## GENERAL SAFETY

### Carbon monoxide

If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in an enclosed area.

#### ▲ WARNING

- *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.

### Gasoline

Work in a well ventilated area. Keep cigarettes, flames or sparks away from the work area or where gasoline is stored.

#### ▲ WARNING

- *Gasoline is extremely flammable and is explosive under certain conditions. KEEP OUT OF REACH OF CHILDREN.*

### Hot components

#### ▲ WARNING

- *Engine and exhaust system parts become very hot and remain hot for some time after the engine is run. Wear insulated gloves or wait until the engine and exhaust system have cooled before handling these parts.*

### Used engine oil

#### ▲ WARNING

- *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 bases, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil. KEEP OUT OF REACH OF CHILDREN.*

### Brake dust

Never use an air hose or dry brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner or alternate method approved by OSHA, designed to minimize the hazard cause by airborne asbestos fibers.

#### ▲ WARNING

- *Inhaled asbestos fibers have been found to cause respiratory disease and cancer.*

### Brake fluid

#### CAUTION

- *Spilling fluid on painted, plastic or rubber parts will damage them. Place a clean shop towel over these parts whenever the system is serviced. KEEP OUT OF REACH OF CHILDREN.*



## GENERAL INFORMATION

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### Nitrogen Pressure

For shock absorber with a gas-filled reservoir:

#### **▲ WARNING**

- *Use only nitrogen to pressurize the shock absorber. The use of an unstable gas can cause a fire or explosion resulting in serious injury.*
  - *The shock absorber contains nitrogen under high pressure. Allowing fire or heat near the shock absorber could lead to an explosion that could result in serious injury.*
  - *Failure to release the pressure from a shock absorber before disposing of it may lead to a possible explosion and serious injury if it is heated or pierced.*
- 

To prevent the possibility of an explosion, release the nitrogen by pressing the valve core. Then remove the valve stem from the shock absorber reservoir. Dispose of the oil in a manner acceptable to the Environmental Protection Agency (EPA).

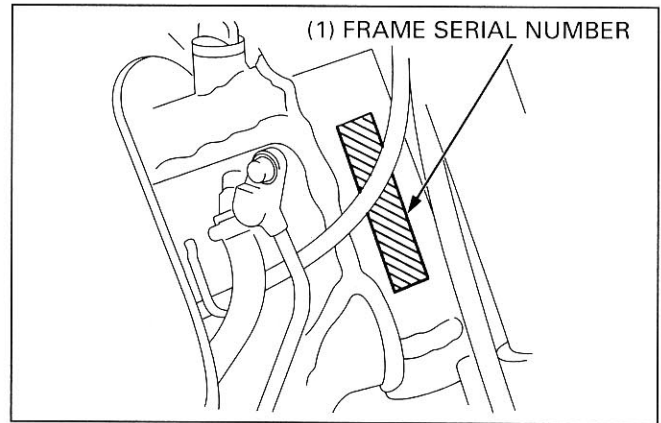
Before disposal of the shock absorber, release the nitrogen by pressing the valve core. Then remove the valve stem from the shock absorber.

## SERVICE RULES

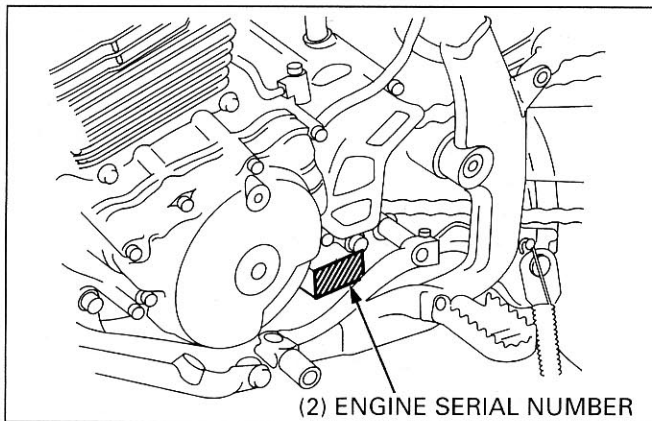
1. Use genuine HONDA or HONDA-recommended parts and lubricants or their equivalents. Parts that do not meet HONDA's design specifications may damage the motorcycle.
2. Use the special tools designed for this product.
3. Use only metric tools when servicing this motorcycle. Metric bolts, nuts, and screws are not interchangeable with English fasteners. The use of incorrect tools and fasteners may damage the motorcycle.
4. Install new gaskets, O-rings, cotter pins, lock plates, etc. when reassembling.
5. When tightening a series of bolts or nuts, begin with the larger-diameter of inner bolts first, and tighten to 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 assembly, check all parts for proper installation and operation.
8. Route all electrical wires as shown on pages 1-21 through 1-22, Cable and Harness Routing.

# MODEL IDENTIFICATION

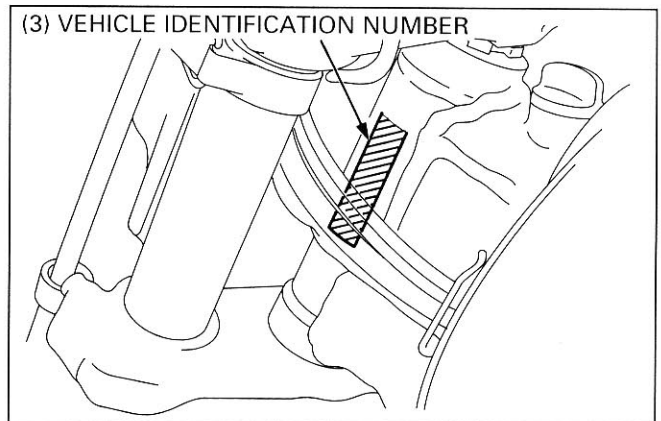
'96 shown; After '96 similar:



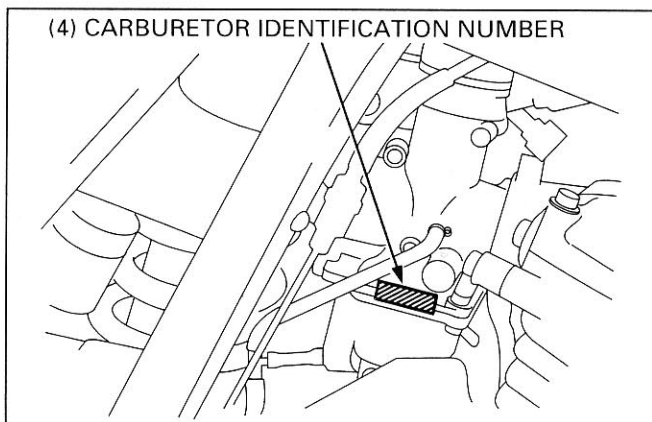
(1) FRAME SERIAL NUMBER  
The frame serial number is stamped on the right side of the steering head.



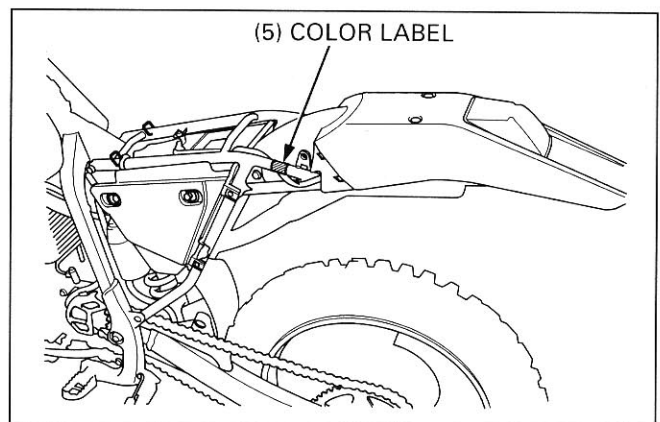
(2) ENGINE SERIAL NUMBER  
The engine serial number is stamped on the lower left side of the crankcase.



(3) VEHICLE IDENTIFICATION NUMBER  
The Vehicle Identification Number (VIN) is attached on the left side of the steering head.



(4) CARBURETOR IDENTIFICATION NUMBER  
The carburetor identification number is stamped on the right side of the carburetor body.



(5) COLOR LABEL  
The color label is attached on the left frame tube under the seat.

## GENERAL INFORMATION

# SPECIFICATIONS

### GENERAL

GENERAL		
	ITEM	SPECIFICATION
DIMENSIONS	Overall length Overall width Overall height Wheelbase Seat height Ground clearance Dry weight Curb weight Maximum weight capacity	2,120 mm (83.5 in) 830 mm (32.7 in) 1,225 mm (48.2 in) 1,400 mm (55.1 in) 915 mm (36.0 in) 305 mm (12.0 in) 104 kg (229.3 lbs) 112 kg (246.9 lbs) 100 kg (220.5 lbs)
FRAME	Frame type Front suspension Front wheel travel Rear suspension Rear wheel travel Rear damper Front tire size Rear tire size Tire brand (Bridgestone)  (Dunlop)  Front brake Rear brake Caster Trail Fuel tank capacity Fuel tank reserve capacity	Semi double cradle Telescopic fork 270 mm (10.6 in) Pro-link 270 mm (10.6 in) Nitrogen gas filled damper with reserve tank 80/100-21 51M 100/100-18 59M Front M23 Rear M22 Front K490G Rear K695 Hydraulic single disc Hydraulic single disc 24°55' 92.0 mm (3.6 in) 9.0 ℓ (2.38 US gal, 1.98 Imp gal) 2.0 ℓ (0.53 US gal, 0.44 Imp gal)
ENGINE	Type Cylinder arrangement Bore x Stroke Displacement Compression ratio Valve train Intake valve opens at 1 mm (0.04 in) lift Intake valve closes at 1 mm (0.04 in) lift Exhaust valve opens at 1 mm (0.04 in) lift Exhaust valve closes at 1 mm (0.04 in) lift Lubrication system Oil pump type Cooling system Air filtration Engine dry weight	Gasoline, air cooled 4-stroke SOHC Single cylinder inclined 15° 73.0 x 59.5 mm (2.87 x 2.34 in) 249 cm <sup>3</sup> (15.2 cu-in) 10.2 : 1 4-valve, single chain driven SOHC 10° BTDC 40° ABDC 40° BBDC 10° ATDC Forced pressure dry sump Trochoid Air cooled Oiled polyurethane foam 33.7 kg (74.3 lbs)
CARBURETOR	Carburetor type Venturi diameter	Piston valve 30 mm (1.18 in)



**GENERAL (cont'd)**

GENERAL (cont'd)		SPECIFICATION
	ITEM	
DRIVE TRAIN	Clutch System Clutch operating system Transmission Primary reduction Gear ratio 1st Gear ratio 2nd Gear ratio 3rd Gear ratio 4th Gear ratio 5th Gear ratio 6th Final reduction Gear shift pattern	Multi-plate, wet Cable operating 6-speed 3.100 (20/62) 2.769 (13/36) 1.941 (17/33) 1.450 (20/29) 1.173 (23/27) 0.960 (25/24) 0.814 (27/22) 3.692 (13/48) Left foot operated return system, 1 - N - 2 - 3 - 4 - 5 - 6
ELECTRICAL	Ignition system	CDI (Capacitive Discharge Ignition)

## GENERAL INFORMATION

Unit: mm (in)

### LUBRICATION

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	at draining	1.3 liter (1.37 US qt, 1.14 Imp qt)	——
	at disassembly	1.7 liter (1.79 US qt, 1.50 Imp qt)	——
	at oil filter change	1.4 liter (1.47 US qt, 1.23 Imp qt)	——
Recommended engine oil		Use Pro Honda GN4 or HP4 4-stroke Oil or equivalent API Service Classification: SF or SG Viscosity: SAE 10W-40 or 20W-50	——
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.22 (0.006 – 0.009)	0.25 (0.010)
	End clearance	0.02 – 0.09 (0.001 – 0.004)	0.12 (0.005)

### FUEL SYSTEM

ITEM	SPECIFICATIONS	
Carburetor identification number	'96 – '97	PDG1A
	After '97/Except California type	PDG1A
	After '97/California type	PDG1C
Main jet	'96 – '97	#132
	After '97/Except California type	#132
	After '97/California type	#122
Slow jet	#45	
Jet needle clip position	3rd groove from top	
Pilot screw initial opening	see page 5-11	
Float level	12.5 mm (0.49 in)	
Idle speed	1,300 ± 100 rpm	
Throttle grip free play	2 – 6 mm (1/12 – 1/4 in)	

Unit: mm (in)

**CYLINDER HEAD/VALVES**

ITEM			STANDARD	SERVICE LIMIT	
Cylinder compression	Valve clearance at standard (decompressor effected)		637 – 735 kPa (6.5 – 7.5 kgf/cm <sup>2</sup> , 92 – 107 psi) at 600 rpm	—	
	Valve clearance at 1 mm (0.04 in) (decompressor not effected)		1,177 – 1,275 kPa (12.0 – 13.0 kgf/cm <sup>2</sup> , 171 – 185 psi)	—	
Cylinder head warpage			—	0.10 (0.004)	
Valve and valve guide	Valve clearance	IN	0.10 ± 0.02 (0.004 ± 0.001)	—	
		EX	0.12 ± 0.02 (0.005 ± 0.001)	—	
	Valve stem O.D.	IN	4.975 – 4.990 (0.1959 – 0.1965)	4.96 (0.195)	
		EX	4.955 – 4.970 (0.1951 – 0.1957)	4.94 (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	0.010 – 0.037 (0.0004 – 0.0015)	0.07 (0.003)	
		EX	0.030 – 0.057 (0.0012 – 0.0022)	0.09 (0.004)	
Valve seat width	IN/EX	1.1 – 1.2 (0.04 – 0.05)	2.0 (0.8)		
Valve spring	Free length	Inner	IN/EX	43.44 (1.710)	42.51 (1.673)
		Outer	IN/EX	44.03 (1.733)	42.83 (1.686)
Rocker arm	Rocker arm I.D.	IN/EX	11.500 – 11.518 (0.4528 – 0.4535)	11.53 (0.454)	
	Rocker arm shaft O.D.	IN/EX	11.466 – 11.484 (0.4632 – 0.4521)	11.41 (0.449)	
	Rocker arm-to-shaft clearance	IN/EX	0.016 – 0.052 (0.0006 – 0.0020)	0.10 (0.004)	
Sub-rocker arm	Sub-rocker arm I.D.	IN/EX	7.000 – 7.015 (0.2756 – 0.2762)	7.05 (0.278)	
	Sub-rocker arm shaft O.D.	IN/EX	6.972 – 6.987 (0.2745 – 0.2751)	6.92 (0.272)	
	Sub-rocker arm-to-shaft clearance	IN/EX	0.013 – 0.043 (0.0005 – 0.0017)	0.10 (0.004)	
Camshaft	Cam lobe height	IN	30.772 (1.2115)	30.583 (1.2041)	
		EX	30.819 (1.2133)	30.629 (1.2059)	
	Runout		—	0.03 (0.001)	



## GENERAL INFORMATION

Unit: mm (in)

CYLINDER/PISTON		STANDARD	SERVICE LIMIT	
ITEM				
Cylinder	I.D.	73.000 – 73.010 (2.8740 – 2.8744)	73.11 (2.878)	
	Taper	————	0.05 (0.002)	
	Out of round	————	0.05 (0.002)	
	Warpage	————	0.10 (0.004)	
Piston, piston ring and piston pin	Piston mark direction	“IN” mark facing to the intake side	————	
	Piston O.D.	72.965 – 72.985 (2.8726 – 2.8734) at 19 mm (0.7 in) from bottom of skirt	72.88 (2.869)	
	Piston pin hole I.D.	17.002 – 17.008 (0.6694 – 0.6696)	17.07 (0.672)	
	Cylinder-to-piston clearance	0.015 – 0.045 (0.0006 – 0.0018)	0.10 (0.004)	
	Piston pin O.D.	16.994 – 17.000 (0.6691 – 0.6693)	16.97 (0.668)	
	Piston-to-piston pin clearance	0.002 – 0.014 (0.0001 – 0.0006)	0.07 (0.003)	
	Piston ring-to-ring groove clearance	Top	0.015 – 0.050 (0.0006 – 0.0020)	0.12 (0.005)
		Second	0.015 – 0.050 (0.0006 – 0.0020)	0.12 (0.005)
	Piston ring end gap	Top	0.15 – 0.30 (0.006 – 0.012)	0.40 (0.016)
		Second	0.30 – 0.45 (0.012 – 0.018)	0.55 (0.022)
		Oil (side rail)	0.2 – 0.7 (0.01 – 0.03)	0.86 (0.034)
	Piston ring mark	Top	mark facing up	————
		Second	mark facing up	————
	Connecting rod small end I.D.	17.016 – 17.034 (0.6699 – 0.6706)	17.06 (0.672)	
Connecting rod-to-piston pin clearance	0.016 – 0.040 (0.0006 – 0.0016)	0.09 (0.004)		

Unit: mm (in)

<b>CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE</b>		<b>STANDARD</b>	<b>SERVICE LIMIT</b>	
<b>ITEM</b>				
Clutch	Lever free play	10 – 20 (3/8 – 3/4)	——	
	Spring free length	37.2 (1.46)	33.5 (1.32)	
	Disc thickness	2.92 – 3.08 (0.115 – 0.121)	2.69 (0.106)	
	Plate warpage	——	0.30 (0.012)	
	Clutch outer I.D.	25.000 – 25.021 (0.9843 – 0.9851)	25.04 (0.986)	
	Outer guide	I.D.	19.990 – 20.010 (0.7870 – 0.7878)	20.03 (0.789)
		O.D.	24.959 – 24.980 (0.9826 – 0.9835)	24.17 (0.952)
	Mainshaft O.D. at clutch outer guide	19.959 – 19.980 (0.7858 – 0.7866)	19.91 (0.784)	
Kickstarter	Starter idle gear I.D.	19.010 – 19.034 (0.7484 – 0.7494)	19.13 (0.753)	
	Starter idle gear bushing	I.D.	15.000 – 15.018 (0.5906 – 0.5913)	15.04 (0.592)
		O.D.	18.959 – 18.980 (0.7464 – 0.7472)	18.92 (0.745)
	Kickstarter gear I.D.	25.020 – 25.041 (0.9850 – 0.9859)	25.12 (0.989)	
	Kickstarter gear bushing	I.D.	22.000 – 22.021 (0.8661 – 0.8670)	22.10 (0.870)
		O.D.	24.979 – 25.000 (0.9834 – 0.9843)	24.90 (0.980)
	Kickstarter spindle O.D.	21.959 – 21.980 (0.8645 – 0.8654)	21.91 (0.863)	
	Countershaft O.D. at starter idle gear	14.966 – 14.984 (0.5892 – 0.5899)	14.91 (0.587)	

## GENERAL INFORMATION

Unit: mm (in)

CRANKSHAFT/TRANSMISSION				STANDARD	SERVICE LIMIT	
ITEM						
Crankshaft, Connecting rod	Connecting rod big end side clearance			0.050 – 0.500 (0.0019 – 0.0197)	0.80 (0.031)	
	Connecting rod big end radial clearance			0.000 – 0.008 (0.0000 – 0.0003)	0.05 (0.002)	
	Crankshaft runout			—	0.05 (0.002)	
Transmission	Gear I.D.	M5		20.000 – 20.021 (0.7874 – 0.7882)	20.08 (0.791)	
		M6		23.000 – 23.021 (0.9055 – 0.9063)	23.07 (0.908)	
		C1		23.000 – 23.021 (0.9055 – 0.9063)	23.07 (0.908)	
		C2		25.020 – 25.041 (0.9850 – 0.9859)	25.09 (0.988)	
		C3		25.000 – 25.021 (0.9843 – 0.9851)	25.07 (0.987)	
		C4		22.000 – 22.021 (0.8661 – 0.8670)	22.07 (0.869)	
	Gear bushing	M6	O.D.	22.959 – 22.980 (0.9039 – 0.9047)	22.92 (0.902)	
			I.D.	18.000 – 18.018 (0.7087 – 0.7094)	18.08 (0.712)	
		C2	O.D.	22.959 – 22.980 (0.9039 – 0.9047)	22.90 (0.902)	
			I.D.	22.000 – 22.021 (0.8661 – 0.8670)	22.10 (0.870)	
		C3	O.D.	24.979 – 25.000 (0.9834 – 0.9843)	24.90 (0.980)	
			O.D.	24.959 – 24.980 (0.9826 – 0.9835)	24.90 (0.980)	
	Mainshaft O.D.	M5		19.959 – 19.980 (0.7858 – 0.7866)	19.91 (0.784)	
		Clutch outer guide		19.959 – 19.980 (0.7858 – 0.7866)	19.91 (0.784)	
	Countershaft O.D.	Starter idle gear		14.966 – 14.984 (0.5892 – 0.5899)	14.91 (0.587)	
		C1		17.966 – 17.984 (0.7073 – 0.7080)	17.91 (0.705)	
		C2, C4		21.959 – 21.980 (0.8645 – 0.8654)	21.91 (0.863)	
	Shift drum O.D. at right crankcase bearing portion				19.959 – 19.980 (0.7858 – 0.7866)	19.90 (0.783)
	Gear-to-bushing clearance	M6		0.020 – 0.062 (0.0008 – 0.0022)	0.10 (0.004)	
		C1		0.020 – 0.062 (0.0008 – 0.0022)	0.10 (0.004)	
		C2		0.020 – 0.062 (0.0008 – 0.0022)	0.10 (0.004)	
C3		0.020 – 0.062 (0.0008 – 0.0022)	0.10 (0.004)			
Gear-to-shaft clearance	M5, C4		0.020 – 0.062 (0.0008 – 0.0022)	0.15 (0.006)		
Bush-to-shaft clearance	C1		0.016 – 0.052 (0.0006 – 0.0020)	0.10 (0.004)		
	C2		0.020 – 0.062 (0.0008 – 0.0022)	0.10 (0.004)		
Shift fork, Shaft	Shift fork	I.D.		13.000 – 13.021 (0.5118 – 0.5126)	13.05 (0.514)	
		Operation area thickness	R, L	4.93 – 5.00 (0.194 – 0.197)	4.50 (0.177)	
			C	4.90 – 5.00 (0.193 – 0.197)	4.50 (0.177)	
	Shift fork shaft O.D.			12.966 – 12.984 (0.5105 – 0.5112)	12.90 (0.508)	



Unit: mm (in)

<b>FRONT WHEEL/SUSPENSION/STEERING</b>			
<b>ITEM</b>		<b>STANDARD</b>	<b>SERVICE LIMIT</b>
Cold tire pressure		98 kPa (1.0 kgf/cm <sup>2</sup> , 15 psi)	—
Axle runout		—	0.2 (0.01)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Wheel rim-to-hub distance		20.25 (0.797)	—
Fork spring free length		442.5 (17.42)	438.1 (17.25)
Fork tube runout		—	2.0 (0.08)
Recommended fork oil		Pro Honda Suspension Fluid SS-7 or equivalent	—
Fork oil level		82 (3.2)	77 – 108 (3.0 – 4.2)
Fork oil capacity		477 cm <sup>3</sup> (16.13 US oz, 16.79 Imp oz)	—

Unit: mm (in)

<b>REAR WHEEL/SUSPENSION</b>			
<b>ITEM</b>		<b>STANDARD</b>	<b>SERVICE LIMIT</b>
Cold tire pressure		98 kPa (1.0 kgf/cm <sup>2</sup> , 15 psi)	—
Axle runout		—	0.2 (0.01)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Wheel rim-to-hub distance		22.75 (0.896)	—
Drive chain slack		30 – 40 (1-1/4 – 1-5/8)	—
Drive chain length		—	1,659 (65.3)
Replacement drive chain		D.I.D. 520VC5 or RK 520MOZ9	—
Drive chain guide slider thickness		—	To the indicator
Drive chain slider thickness		—	4.0 (0.15)
Recommended shock oil		Pro Honda Suspension Fluid SS-7 or equivalent	—
Damper gas pressure/compressed gas		981 kPa (10.0 kgf/cm <sup>2</sup> , 142 psi)/Nitrogen	—
Shock absorber spring free length		190.0 (7.5)	186.2 (7.33)
Shock absorber spring preload length		181.5 (7.15)	173.5 – 185.5 (6.83 – 7.30)

**GENERAL INFORMATION**

Unit: mm (in)

<b>BRAKE SYSTEM</b>		<b>STANDARD</b>	<b>SERVICE LIMIT</b>
<b>ITEM</b>			
Specified brake fluid		DOT 4 brake fluid	——
Brake pad wear		——	To the groove
Brake disc thickness	FR	3.0 (0.12)	2.5 (0.10)
	RR	4.5 (0.18)	4.0 (0.16)
Brake disc runout		——	0.25 (0.010)
Master cylinder I.D.	FR	11.000 – 11.043 (0.4331 – 0.4348)	11.05 (0.435)
	RR	14.000 – 14.043 (0.5512 – 0.5529)	14.06 (0.554)
Master piston O.D.	FR	10.957 – 10.984 (0.4314 – 0.4324)	10.84 (0.427)
	RR	13.957 – 13.984 (0.5495 – 0.5506)	13.95 (0.549)
Caliper cylinder I.D.	FR	27.000 – 27.050 (1.0630 – 1.0650)	27.06 (1.065)
	RR	27.000 – 27.050 (1.0630 – 1.0650)	27.06 (1.065)
Caliper piston O.D.	FR	26.900 – 26.950 (1.0591 – 1.0610)	26.89 (1.059)
	RR	26.935 – 26.968 (1.0604 – 1.0617)	26.89 (1.059)

<b>ELECTRICAL SYSTEM</b>		<b>SPECIFICATIONS</b>	
<b>ITEM</b>			
Spark plug		NGK	DENSO
	Standard	CR9EH-9	U27FER9
	For cold climate (Below 5°C/41°F)	CR8EH-9	U24FER9
Ignition timing	Initial	8° BTDC at 1,900 ± 200 rpm	
	Full advance	28° ± 2° BTDC at 4,300 rpm	
Spark plug gap		0.8 – 0.9 mm (0.031 – 0.035 in)	
Ignition coil primary peak voltage		100 V minimum	
Ignition pulse generator peak voltage		0.7 V minimum	
Exciter coil peak voltage		100 V minimum	
Lighting coil resistance (At 20°C/68°F)		0.2 – 1.2 Ω	
Headlight		12 V 35 W	
Taillight		12 V 5 W	
Alternator/output		0.075 kW/5,000 rpm	
AC regulator specific voltage		12.0 – 14.0 V/3,000 rpm	

## GENERAL INFORMATION

# TORQUE VALUES

<b>STANDARD</b>			
Fasteners Type	Torque N·m (kgf·m, lbf·ft)	Fasteners Type	Torque N·m (kgf·m, lbf·ft)
5 mm hex bolt and nut	5 (0.5, 3.6)	5 mm screw	4 (0.4, 2.9)
6 mm hex bolt and nut	10 (1.0, 7)	6 mm screw	9 (0.9, 6.5)
8 mm hex bolt and nut	22 (2.2, 16)	6 mm flange bolt (8 mm head)	9 (0.9, 6.5)
10 mm hex bolt and nut	34 (3.5, 25)	6 mm flange bolt (10 mm head)	12 (1.2, 9)
12 mm hex bolt and nut	54 (5.5, 40)	and nut	
		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 important fasteners. Others should be tightened to standard torque values listed above.

- Notes:
1. Apply a locking agent to the threads.
  2. Stake.
  3. Apply oil to the threads and flange surface.
  4. Apply clean engine oil to the O-ring.
  5. Apply grease to the threads and flange surface.
  6. U-nut.
  7. ALOC bolt; Replace with a new one.

<b>ENGINE</b>				
Item	Q'ty	Thread dia. (mm)	Torque N·m (kgf·m, lbf·ft)	Remarks
<b>Maintenance:</b>				
Crankcase oil drain bolt	1	12	25 (2.5, 18)	
Oil filter cover bolt	2	6	12 (1.2, 9)	
Timing hole cap	1	14	10 (1.0, 7)	Note 5
Crankshaft hole cap	1	30	8 (0.8, 5.8)	Note 5
Valve hole cap	4	36	15 (1.5, 11)	Note 4
Valve adjust lock nut (IN)	2	7	24 (2.4, 17)	
(EX)	2	8	26 (2.6, 19)	
Spark plug	1	10	12 (1.2, 9)	
<b>Lubrication:</b>				
Oil pass pipe bolt (7 mm)	2	7	12 (1.2, 9)	
(8 mm)	1	8	12 (1.2, 9)	
<b>Cylinder Head/Valves:</b>				
Cylinder head cover bolt (6 mm)	13	6	12 (1.2, 9)	
(8 mm)	1	8	24 (2.4, 17)	
Rocker arm shaft	2	14	27 (2.8, 20)	Note 1
Sub-rocker arm shaft	4	12	23 (2.3, 17)	Note 1
Cam sprocket bolt	2	7	20 (2.0, 14)	Note 1
Cylinder head bolt (10 mm)	4	10	39 (4.0, 29)	Note 3
(6 mm)	2	6	10 (1.0, 7)	
Cam chain tensioner set plate bolt	2	6	10 (1.0, 7)	
<b>Engine Removal/Installation:</b>				
Drive sprocket cover bolt	2	6	12 (1.2, 9)	
Drive sprocket bolt	2	6	10 (1.0, 7)	

<b>ENGINE (Cont'd)</b>				
Item	Q'ty	Thread dia. (mm)	Torque N-m (kgf-m, lbf-ft)	Remarks
<b>Cylinder/Piston:</b>				
Cylinder bolt (10 mm)	4	10	39 (4.0, 29)	Note 3
(6 mm SH)	2	6	10 (1.0, 7)	
<b>Clutch/Kickstarter/Gearshift Linkage:</b>				
Right crankcase cover bolt	11	6	12 (1.2, 9)	Note 1 Note 2, 3 Note 3
Stopper arm pivot bolt	1	6	12 (1.2, 9)	
Gearshift cam bolt	1	10	24 (2.4, 17)	
Clutch center lock nut	1	16	108 (11.0, 80)	
Primary drive gear lock nut	1	18	88 (9.0, 65)	
Kickstarter pedal bolt	1	8	26 (2.7, 20)	
<b>Alternator:</b>				
Left crankcase cover bolt	8	6	12 (1.2, 9)	Note 3 Note 1
Flywheel bolt	1	12	103 (10.5, 76)	
Stator bolt	3	6	10 (1.0, 7)	
Ignition pulse generator bolt	2	5	5 (0.5, 3.6)	Note 1
Alternator wire clamp bolt	1	5	5 (0.5, 3.6)	Note 1
Gearshift pedal bolt	1	6	12 (1.2, 9)	
<b>Crankcase/Crank Shaft/Balancer:</b>				
Crankcase bolt	11	6	12 (1.2, 9)	Note 1
Cam chain tensioner bolt	1	6	12 (1.2, 9)	
<b>Others:</b>				
NSHF bolt	-	6	12 (1.2, 9)	
SH bolt	-	6	10 (1.0, 7)	

<b>FRAME</b>					
Item	Q'ty	Thread dia. (mm)	Torque N-m (kgf-m, lbf-ft)	Remarks	
<b>Frame Body Panels/Exhaust System:</b>					
Muffler mounting bolt	1	8	32 (3.3, 24)	Note 6	
Muffler clamp bolt	1	8	20 (2.0, 14)		
Exhaust pipe protector mounting bolt	2	6	12 (1.2, 9)		
Exhaust pipe joint nut	4	6	10 (1.0, 7)		
<b>Maintenance:</b>					
Fuel valve mounting bolt	2	6	9 (0.9, 6.5)		
Down tube oil drain bolt	1	10	39 (4.0, 29)		
Front brake lever adjust lock nut	1		6 (0.6, 4.3)		
Side stand pivot bolt	1	10	10 (1.0, 7)		
nut	1	10	39 (4.0, 29)		
Spoke nipple	68	BC3.2	3.8 (0.38, 2.7)		
Rim lock	2	8	15 (1.5, 11)		
<b>Lubrication System:</b>					
Down tube oil strainer	1	27	54 (5.5, 40)		
Oil pipe bolt (12 mm)	1	12	37 (3.8, 27)		
<b>Engine Removal/Installation:</b>					
Right foot peg mounting bolt	2	10	42 (4.3, 31)		
Engine hanger plate bolt (10 mm)	4	10	64 (6.5, 47)		
(8 mm)	6	8	26 (2.7, 20)		



## GENERAL INFORMATION

FRAME (cont'd)				
Item	Q'ty	Thread dia. (mm)	Torque N·m (kgf·m, lbf·ft)	Remarks
<b>Fuel system:</b>				
Rear frame upper mounting bolt	1	8	26 (2.7, 20)	
Rear frame lower side mounting bolt	2	8	42 (4.3, 31)	
<b>Front Wheel/Suspension/Steering:</b>				
Handlebar holder bolt	4	8	26 (2.7, 20)	
Steering stem nut	1	24	98 (10.0, 72)	
Steering stem adjusting nut	1	26	5 (0.5, 3.6)	
Top bridge pinch bolt	4	8	32 (3.3, 24)	
Bottom bridge pinch bolt	4	8	26 (2.7, 20)	
Front axle	1	12	74 (7.5, 54)	
Front axle holder nut	4	6	12 (1.2, 9)	Note 6
Front brake disc plate bolt	4	6	20 (2.0, 14)	Note 7
<b>Rear Wheel/Suspension:</b>				
Rear axle nut	1	16	93 (9.5, 69)	Note 6
Driven sprocket nut	6	8	32 (3.3, 24)	Note 6
Rear brake disc plate bolt	4	8	42 (4.3, 31)	Note 7
Rear brake hose guide screw	2	5	4.3 (0.43, 3.1)	Note 1
Swingarm pivot nut	1	14	88 (9.0, 65)	Note 6
Rear shock absorber mounting bolt (upper)	1	10	44 (4.5, 33)	
(lower)	1	10	44 (4.5, 33)	Note 6
Shock arm-to-swing arm bolt/nut	1	12	69 (7.0, 51)	Note 6
Shock link-to-frame bolt/nut	1	10	49 (5.0, 36)	Note 6
Shock link-to-shock arm bolt/nut	1	10	44 (4.5, 33)	Note 6
Damper rod end nut	1	12	37 (3.8, 27)	Note 6
Damping adjuster	1	19	20 (2.0, 14)	
<b>Brake System:</b>				
Front master cylinder holder bolt	2	6	9 (0.9, 6.5)	
Front reservoir tank cover screw	2	4	2 (0.2, 1.4)	
Front brake lever pivot bolt	1	6	6 (0.6, 4.3)	
nut	1	6	6 (0.6, 4.3)	
Front brake caliper pad pin	1	10	18 (1.8, 13)	
Front brake caliper pin bolt A	1	8	23 (2.3, 17)	Note 1
B	1	8	13 (1.3, 9)	Note 1
Front brake caliper bracket bolt	2	8	30 (3.1, 22)	Note 1
Rear brake master cylinder holder bolt	2	6	14 (1.4, 10)	Note 1
Push rod lock nut	1	8	18 (1.8, 13)	
Rear brake caliper pad pin	1	10	10 (1.0, 7)	
Rear brake caliper pin bolt	1	12	27 (2.8, 20)	
Rear brake caliper bracket pin bolt	1	8	13 (1.3, 9)	Note 1
Pad pin plug	2	10	2.5 (0.25, 1.8)	
Bleed valve	2	8	6 (0.6, 4.3)	
Brake hose bolt	4	10	34 (3.5, 25)	

## TOOLS

- NOTES: 1. Newly designed tool.  
 2. Equivalent commercially available in U.S.A.  
 3. Not available in U.S.A.  
 4. Alternate tool

DESCRIPTION	TOOL NUMBER	REMARKS	REF. SEC.
Carburetor float level gauge	07401 – 0010000		5
Universal bearing puller	07631 – 0010000		11
Spoke nipple wrench	07701 – 0020300	Note 2	3, 13, 14
Gear holder	07724 – 0010100		9
Flywheel holder	07725 – 0040000	Note 2	10
Flywheel puller	07733 – 0020001	or 07933 – 3950001	10
Attachment, 32 x 35 mm	07746 – 0010100		11, 13
Attachment, 37 x 40 mm	07746 – 0010200		11, 14
Attachment, 42 x 47 mm	07746 – 0010300		11, 13, 14
Attachment, 52 x 55 mm	07746 – 0010400		11
Attachment, 72 x 75 mm	07746 – 0010600		11
Attachment, 24 x 26 mm	07746 – 0010700		14
Driver, 22 mm I.D.	07746 – 0020100		11
Pilot, 15 mm	07746 – 0040300		11, 13
Pilot, 17 mm	07746 – 0040400		11, 14
Pilot, 20 mm	07746 – 0040500		11
Pilot, 22 mm	07746 – 0041000		11
Pilot, 28 mm	07746 – 0041100		11
Bearing remover shaft	07746 – 0050100	Note 2	13, 14
Bearing remover head, 15 mm	07746 – 0050400	Note 2	13
Bearing remover head, 17 mm	07746 – 0050500		14
Driver	07749 – 0010000		11, 13, 14
Valve spring compressor	07757 – 0010000		7
Valve seat cutter			7
— Seat cutter, 27.5 mm (45° EX)	07780 – 0010200	Note 2	7
— Seat cutter, 33 mm (45° IN)	07780 – 0010800	Note 2	7
— Flat cutter, 25 mm (32° EX)	07780 – 0012000	Note 2	7
— Flat cutter, 30 mm (32° IN)	07780 – 0012200	Note 2	7
— Interior cutter, 30 mm (60° IN/EX)	07780 – 0014000	Note 2	7
Cutter holder, 5 mm	07781 – 0010400		7
Compression gauge attachment	07908 – KK60000	Note 2	3
Snap ring pliers	07914 – 3230001		15
Steering stem socket	07916 – KA50100		13
Clutch center holder	07923 – KE10000	or 07HGB – 001000A or 07HGB – 001010A or B and 07HGB – 001020A or B (U.S.A. only)	9
Needle bearing remover	07931 – MA70000	or 07936 – 3710600 and 07936 – 3710200 (U.S.A. only)	14
Remover weight	07936 – 3710200		7
Bearing remover shaft	07936 – 1660120		11
Bearing remover set, 15 mm	07936 – KC10000	Note 3	11
— remover weight	07741 – 0010201	or 07936 – KC10500 (U.S.A. only)	
— remover shaft, 15 mm	07936 – KC10100		
— remover head, 15 mm	07936 – KC10200		
Pin puller	07936 – MA70100		11
Valve guide driver, 5.0 mm	07942 – MA60000		7

## GENERAL INFORMATION

DESCRIPTION	TOOL NUMBER	REMARKS	REF. SEC.
Steering stem driver	07946 – 4300101	or 07946 – MB00000 and 07946 – KA6000A or GN – MT – 54 (U.S.A. only)	13
Needle bearing remover	07946 – KA50000		14
Fork seal driver body	07947 – KA50100		13
Fork seal driver attachment, 41 mm I.D.	07947 – KF00100		13
Oil seal remover	07948 – 4630100	or 07953 – MJ1000B or 07953 – MJ1000A and 07GMD – KS40100 (U.S.A. only)	13
Crankcase assembly tool	07965 – VM00000	Note 3	11
— assembly collar	07965 – VM00100		
— assembly shaft	07965 – VM00200	or 07931 – ME4010B and 07931 – HB3020A	
— thread adapter	07965 – VM00300	or 07931 – KF00200	
Slider guide, 14 mm	07974 – KA40001		14
Slider guide attachment	07974 – KA50102		14
Valve guide reamer, 5.0 mm	07984 – MA60001	or 07984 – MA6000D (U.S.A. only)	7
Bushing driver pin	07GMD – KT80100	or 07949 – 3710001 and 07746 – 0041000 (U.S.A. only)	14
Spherical bearing driver	07HMF – KS60100	or 07965 – GM00100 and 07965 – VM00100 (U.S.A. only)	14
Peak voltage adapter	07HGJ – 0020100		16
Bearing remover head, 13 mm	07LMC – KZ10100		11
Fork rod holder	07PMB – KZ40101		13

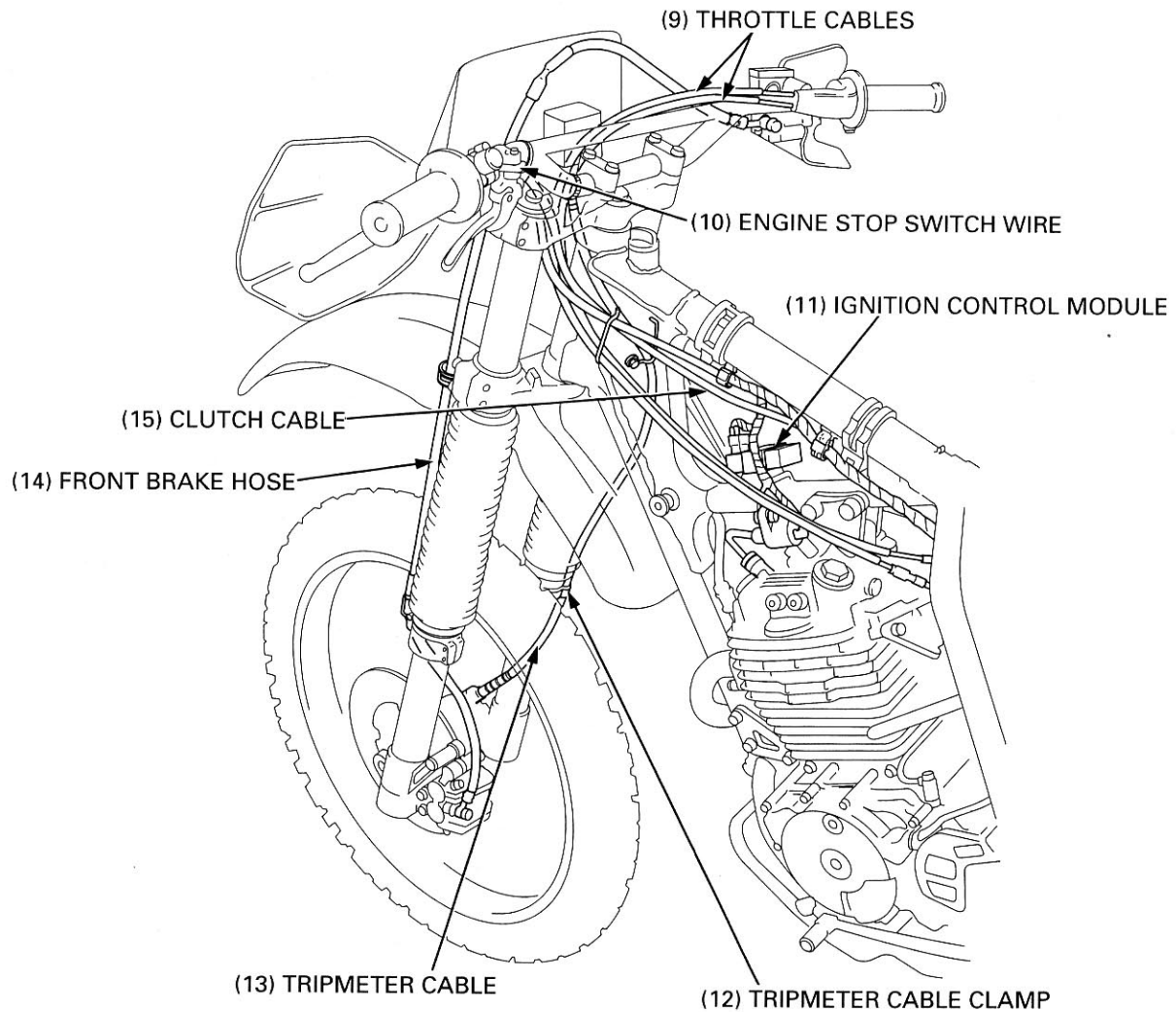
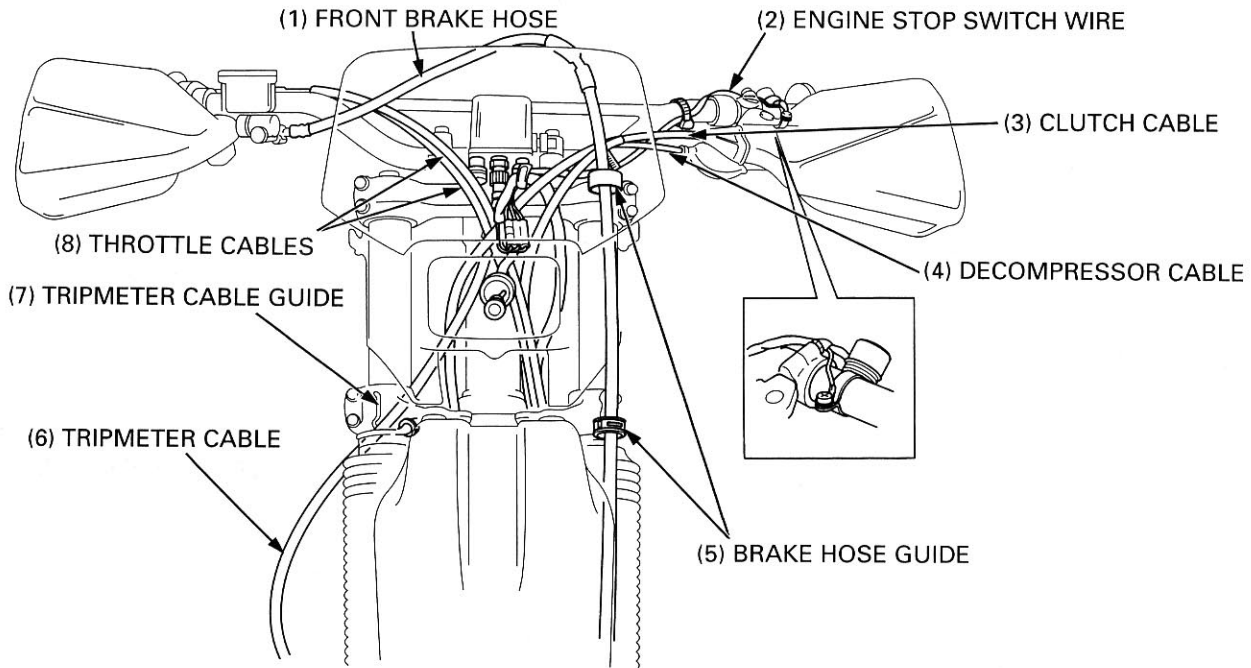
## LUBRICATION & SEAL POINTS

ENGINE	Location	Material	Remarks
	Cylinder inner surface Cylinder 10 mm bolt threads and seating surface Cylinder head 10 mm bolt threads and seating surface Piston outer surface Piston ring Cam chain Rocker arm shaft (rocker arm sliding surface) Sub-rocker arm shaft (sub rocker arm sliding surface) Valve adjust screw threads and lock nut seating surface Clutch disc Clutch center lock nut threads and seating surface Primary drive gear lock nut threads and seating surface Shift fork shaft Transmission gear teeth Kickstarter spindle bushing Each bearings rolling area Each O-rings surface Each oil seal lips and surface Flywheel bolt threads and seating surface	Engine oil	
	Piston pin Connecting rod piston pin hole Camshaft lobes and center journal Rocker arm slipper surface Sub-rocker arm slipper surface and adjusting screw contact area Valve guide sliding surface Valve stem sliding surface Clutch outer guide outer surface Transmission gear bearing surface M3/4, C5, C6 gear shift fork groove	Molybdenum disulfide oil (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease)	
	Cam chain tensioner set plate bolt threads Cam sprocket bolt threads Rocker arm shaft threads Sub-rocker arm shaft threads Gearshift cam bolt threads Stator mounting bolt threads Ignition pulse generator mounting bolt and wire clamper bolt threads	Locking agent	Coating width $6.5 \pm 1$ mm from tip Coating width $5.0 \pm 1$ mm from tip (page 7-19) (page 7-20) Coating width $6.5 \pm 1$ mm from tip
	Clutch lifter arm pivot Each oil seal lips	Multi-purpose grease	

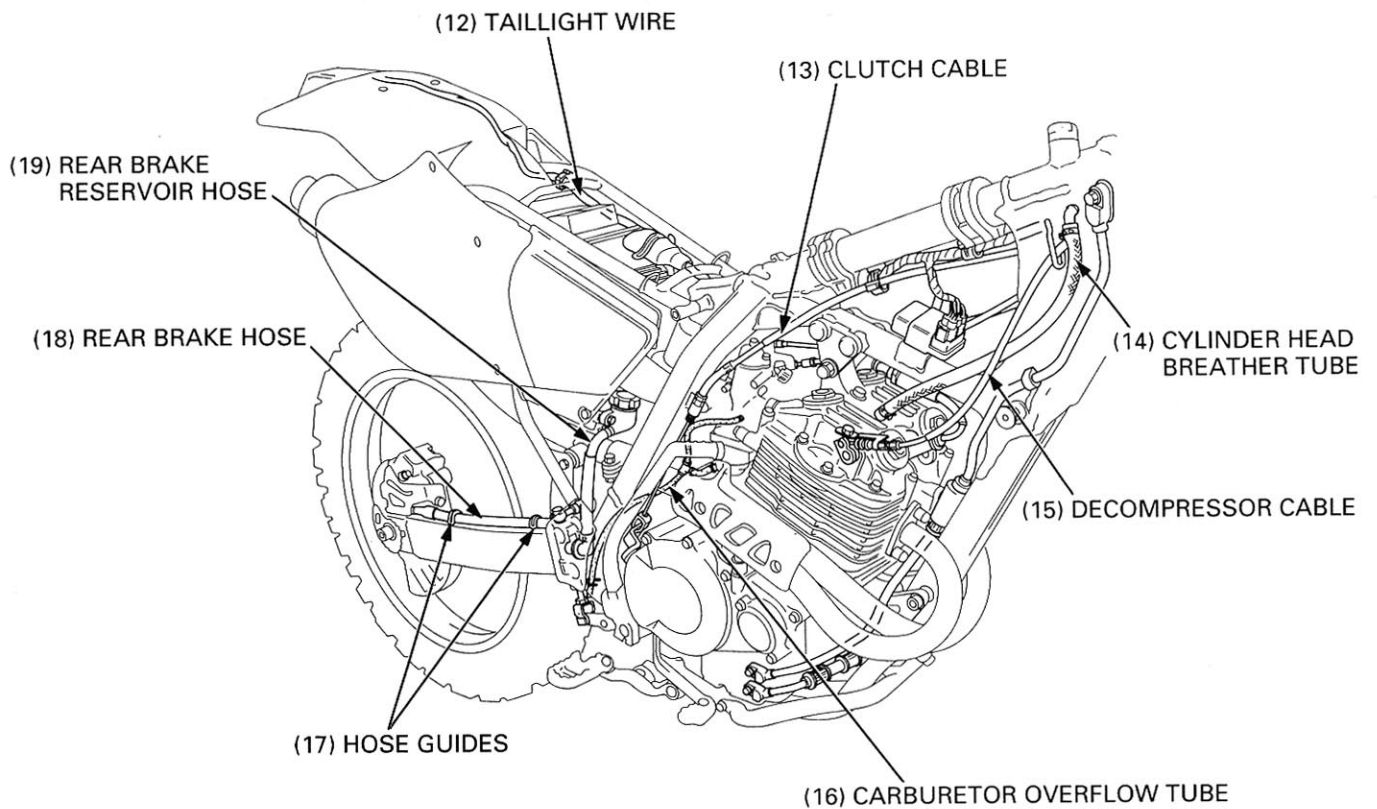
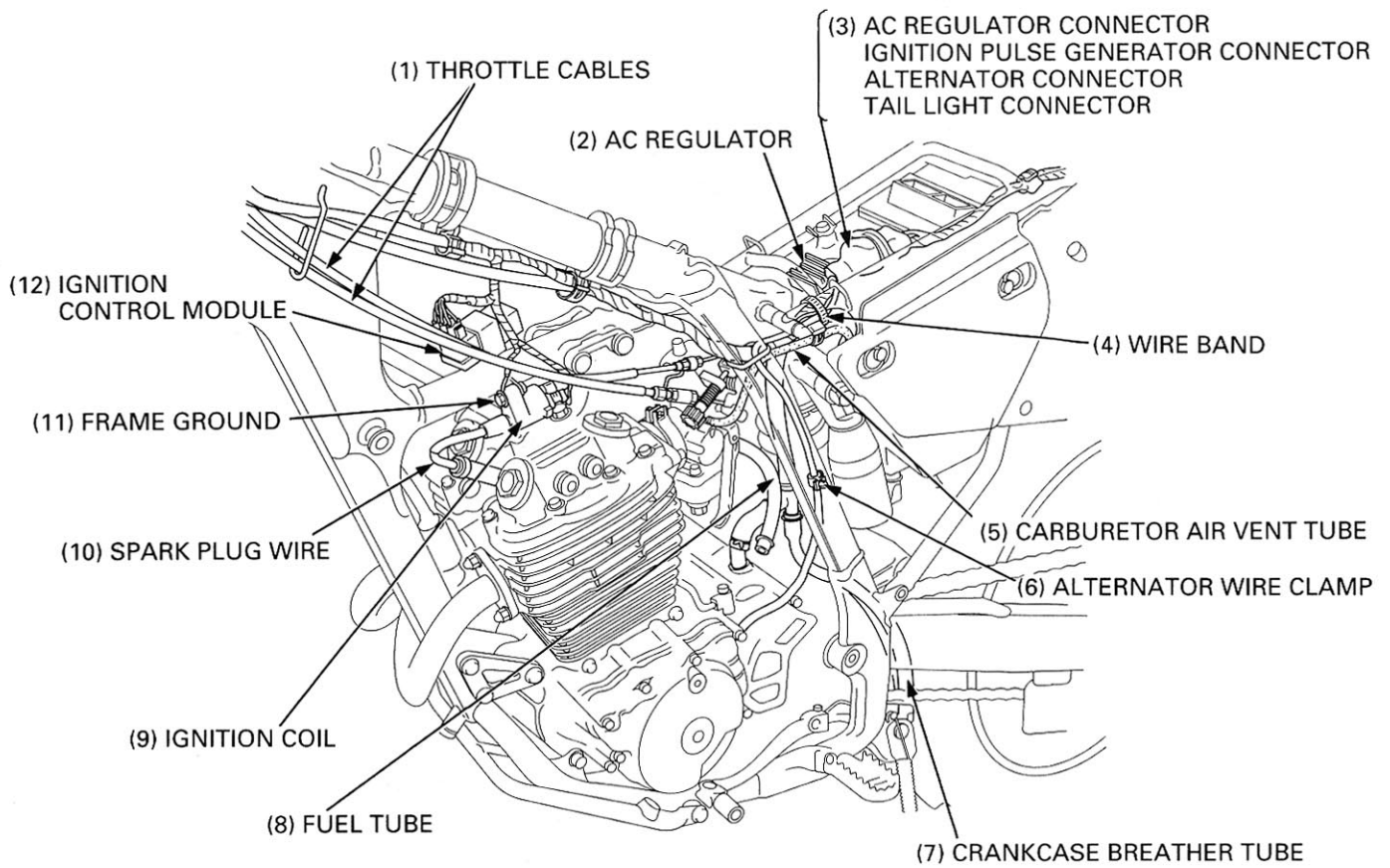
## GENERAL INFORMATION

FRAME		
Location	Material	Remarks
Clutch lever pivot sliding surface Decompressor lever pivot sliding surface Throttle grip sliding surface and cable rolling area Throttle slider cable groove Steering stem bearing rolling area Steering stem bearing dust seal lip Wheel bearing dust seal lip Gearshift pedal movable area Kickstarter pedal movable area Shock arm pivot dust seal lip, spherical bearing rolling area and needle bearing rolling area Shock link pivot dust seal lip, needle bearing rolling area Shock link to frame bolt/nut threads Side stand pivot bolt sliding surface Brake pedal pivot sliding surface Swingarm pivot needle bearing rolling area and dust seal lip Rear shock absorber spherical bearing rolling area	Multi-purpose grease	Apply 5 g of grease
Fork tube bushing surface Guide bushing surface	Fork oil	
Brake master cylinder Brake caliper seals Caliper cylinder bore and pistons Master cylinder piston cups Master cylinder bore and piston	DOT 4 brake fluid	
Front brake master cylinder to brake lever adjusting bolt Brake lever pivot bolt sliding surface Brake caliper bracket pin boot Brake caliper pin boot Brake master cylinder boot Rear brake master cylinder piston to push rod contact area	Silicone grease	
Handlebar grip rubber inside	Honda bond A or Cemedine #540	
Drive chain slider mounting screw threads Rear brake hose guide mounting screw threads Rear brake master cylinder holder bolt threads	Locking agent	

# CABLE & HARNESS ROUTING

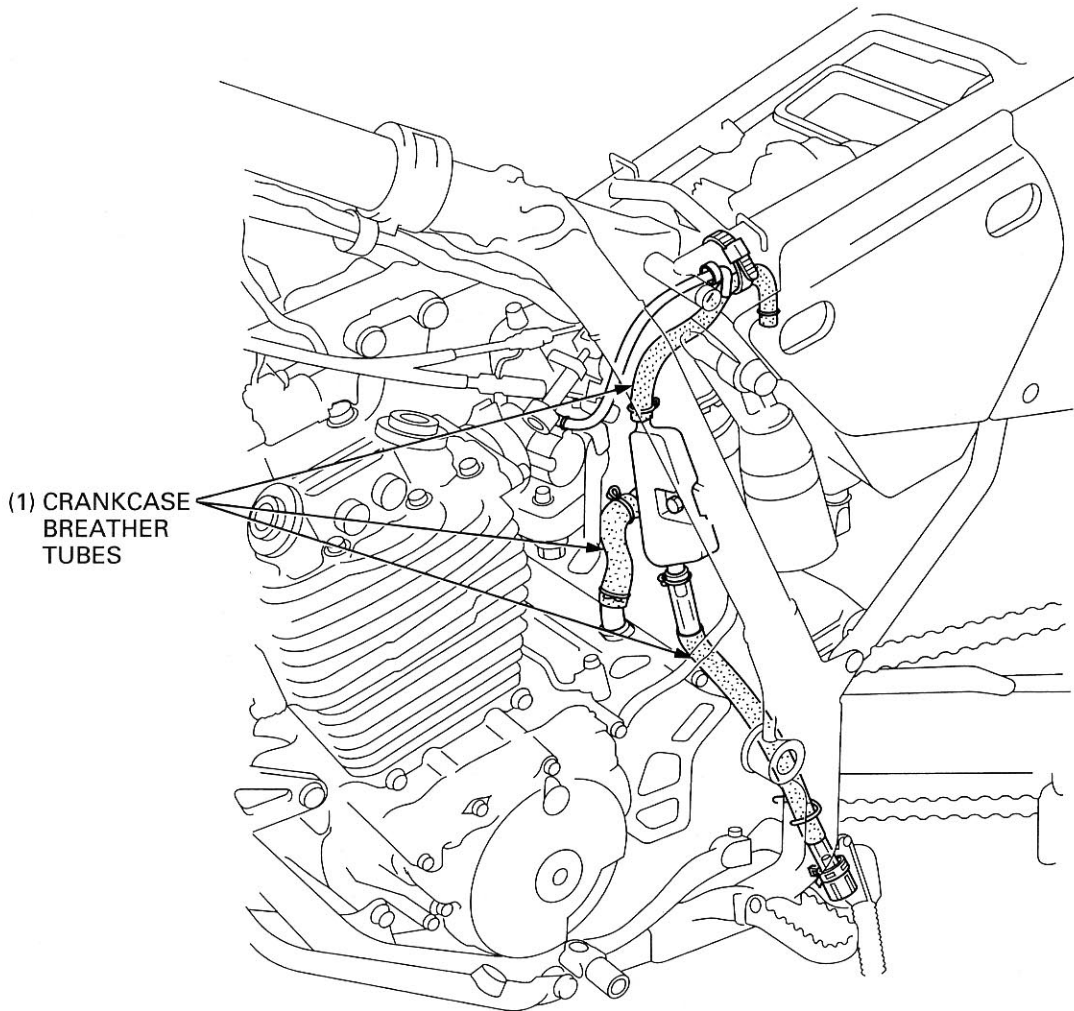


# GENERAL INFORMATION





After '97/California type:



## GENERAL INFORMATION

# EMISSION CONTROL SYSTEMS (AFTER '97/CALIFORNIA TYPE ONLY)

The California Air Resources Board (CARB) requires manufacturers to certify that their motorcycles comply with applicable exhaust emissions standards during their useful life, when operated and maintained according to the instructions provided (California type only).

## SOURCE OF EMISSIONS

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

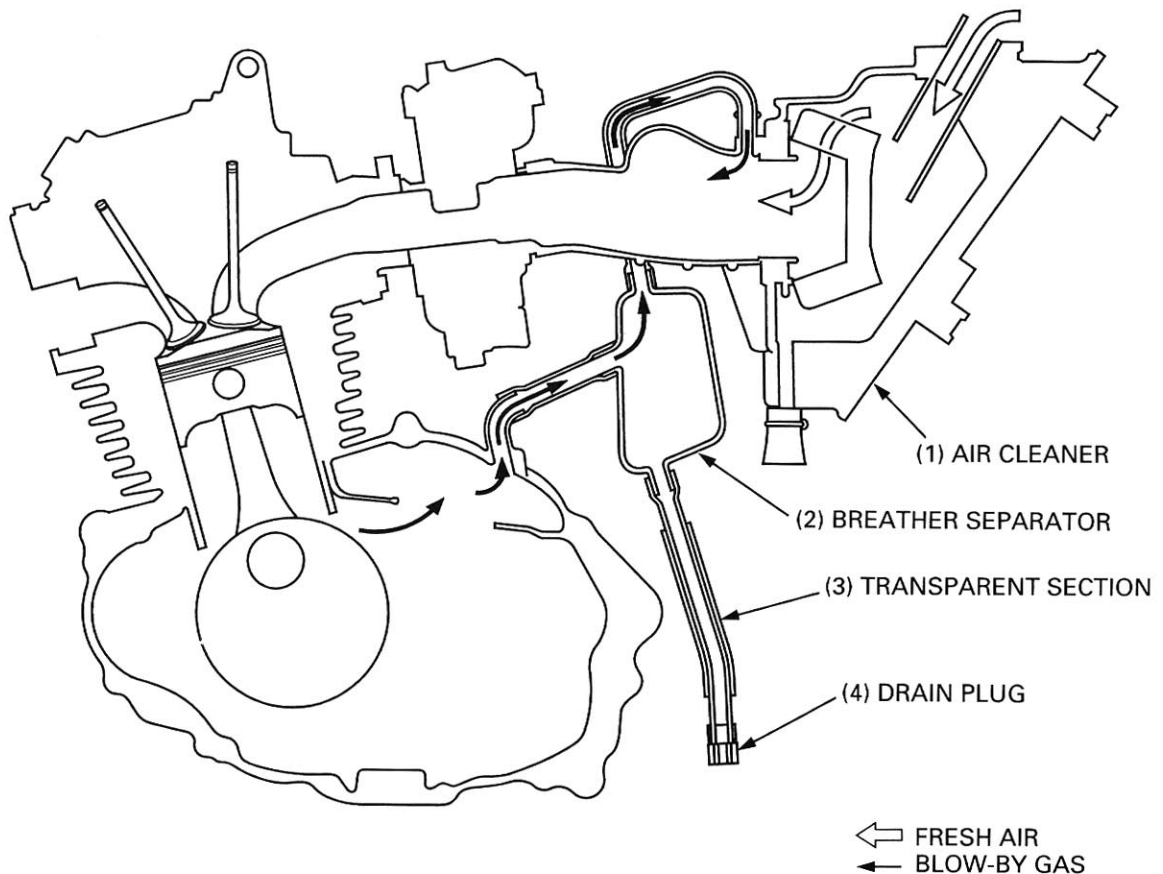
Honda Motor Co., Ltd. utilizes lean carburetor settings as well as other systems, to reduce carbon monoxide and hydrocarbons.

## EXHAUST EMISSION CONTROL SYSTEM (CALIFORNIA TYPE ONLY)

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

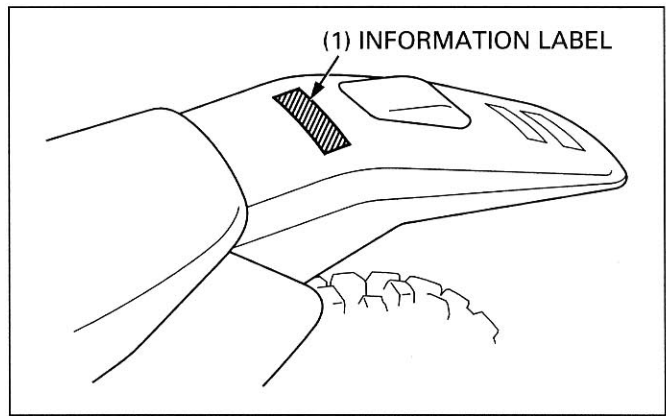
## CRANKCASE EMISSION CONTROL SYSTEM (CALIFORNIA TYPE ONLY)

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.



# VEHICLE EMISSION CONTROL INFORMATION LABEL (AFTER '97/CALIFORNIA TYPE ONLY)

A Vehicle Emission Information Label is located on the rear fender as shown. It gives basic tune-up specifications.



VEHICLE EMISSION CONTROL INFORMATION-HONDA MOTOR CO.,LTD.		DISPLACEMENT: <input type="text"/> cm <sup>3</sup>		
ENGINE FAMILY IDENTIFICATION- TUNE UP SPECIFICATIONS (READ OWNER'S MANUAL FOR MORE DETAILS)				
FAST IDLE SPEED	r.p.m. AT NORMAL OPERATING TEMPERATURE		IGNITION TIMING	
IDLE MIXTURE SETTING	NO ADJUSTMENT	VALVE LASH		
FUEL	GASOLINE		RON MIN. ,SEE OWNER'S MANUAL FOR GASOLINES	
	CONTAINING ALCOHOL.   LUBRICANT		SAE 10W-40 SF or SG GRADE	
SPARK PLUG & GAP	PLUG TYPE: NGK		. ND	OR EQUIVALENT
THIS VEHICLE MEETS		CALIFORNIA REGULATIONS FOR OFF-ROAD MOTORCYCLES AND ATVS.		

# 2. FRAME/BODY PANELS/EXHAUST SYSTEM

SERVICE INFORMATION	2-1	SEAT	2-2
TROUBLESHOOTING	2-1	REAR FENDER	2-3
FRONT FENDER	2-2	UNDER GUARD	2-3
SIDE COVER	2-2	EXHAUST PIPE/MUFFLER	2-3

## SERVICE INFORMATION

### GENERAL

#### ▲ WARNING

- *Gasoline is extremely flammable and is explosive under certain conditions. KEEP OUT OF REACH OF CHILDREN.*
- *Serious burns may result if the exhaust system is not allowed to cool before components are removed or serviced.*

- Work in a well ventilated area. Smoking or allowing flames or sparks in the working area or where gasoline is stored can cause a fire or explosion.
- This section covers removal and installation of the frame body panels and exhaust system.
- Always replace the exhaust pipe gaskets when removing the exhaust pipe from the engine.
- When installing the exhaust system, loosely install all of the exhaust pipe fasteners. Always tighten the exhaust pipe joint nuts at the engine first, then tighten the exhaust clamps, then the mounting fasteners. 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

Muffler mounting bolt	32 N·m (3.3 kgf·m, 24 lbf·ft)
Muffler clamp bolt	20 N·m (2.0 kgf·m, 14 lbf·ft)
Exhaust pipe protector mounting bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Exhaust pipe joint nut	10 N·m (1.0 kgf·m, 7 lbf·ft)

## TROUBLESHOOTING

#### Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leak

#### Poor performance

- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

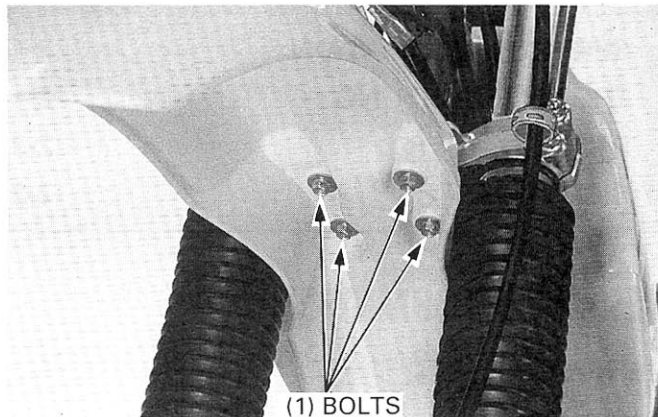
## **FRONT FENDER**

### **REMOVAL**

Remove the bolts, washers and collars.  
Remove the front fender.

### **INSTALLATION**

Installation is in the reverse order of removal.



## **SIDE COVER**

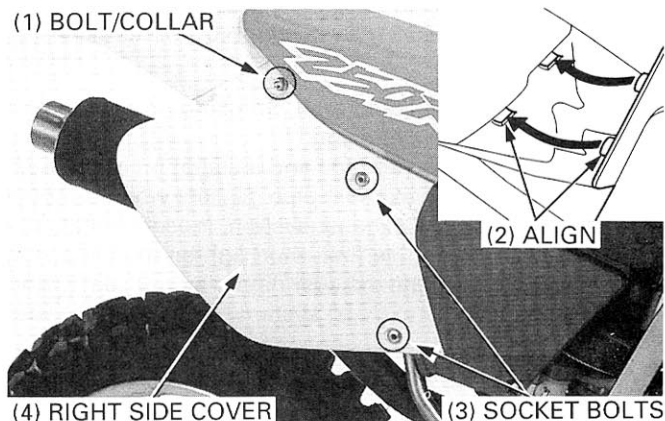
### **REMOVAL**

Remove the bolt/collar and socket bolts.  
Remove the side cover.

### **INSTALLATION**

Install the side cover aligning its tabs with the grooves on the rear fender.

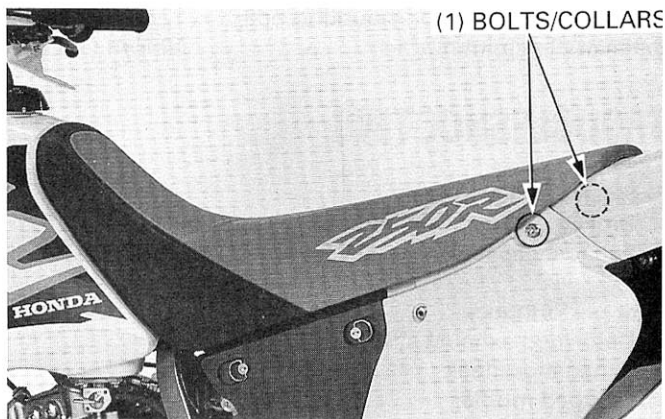
Install and tighten the bolts and socket bolts.



## **SEAT**

### **REMOVAL/INSTALLATION**

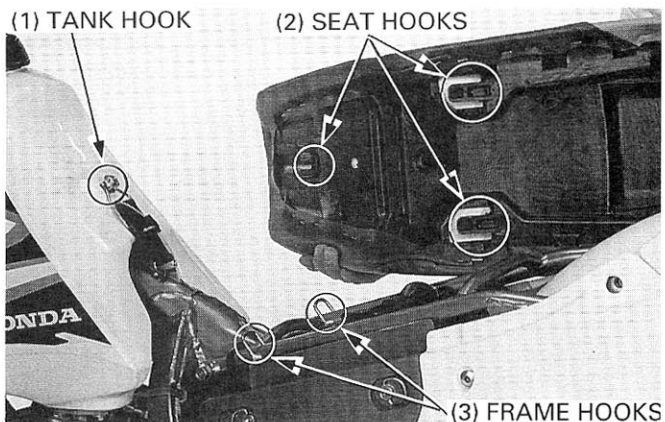
Remove the bolts/collars.  
Remove the seat.



Installation is in the reverse order of removal.

### **NOTE**

- At installation, align the front hook of the seat with the fuel tank boss and both side hooks with the frame hooks.

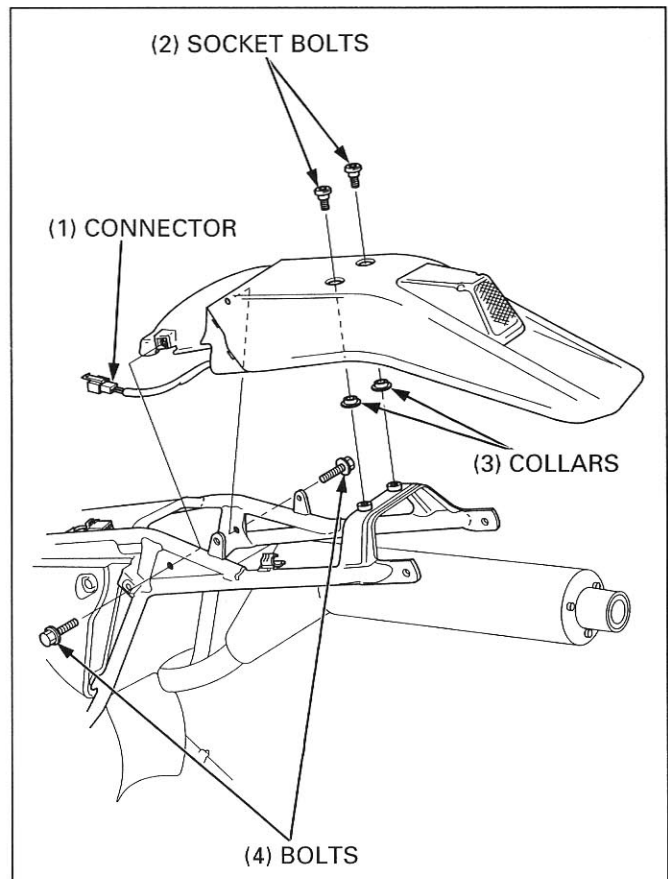


## REAR FENDER

### REMOVAL/INSTALLATION

Remove the seat and side covers (page 2-2).  
 Disconnect the taillight 2P (BI) connector.  
 Remove the bolts, collars and rear fender.

Installation is in the reverse order of removal.



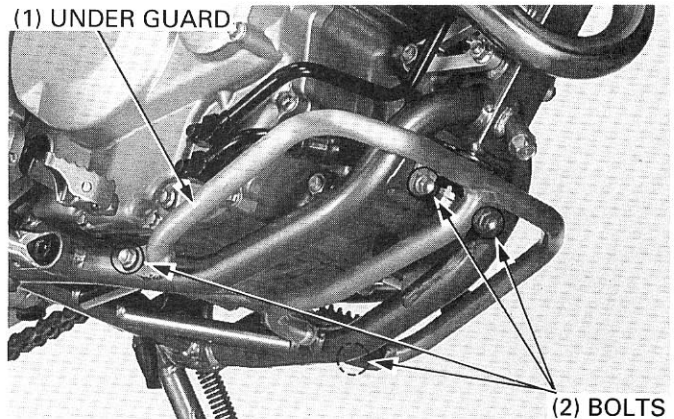
## UNDER GUARD

### REMOVAL

Remove the bolts and under guard.

### INSTALLATION

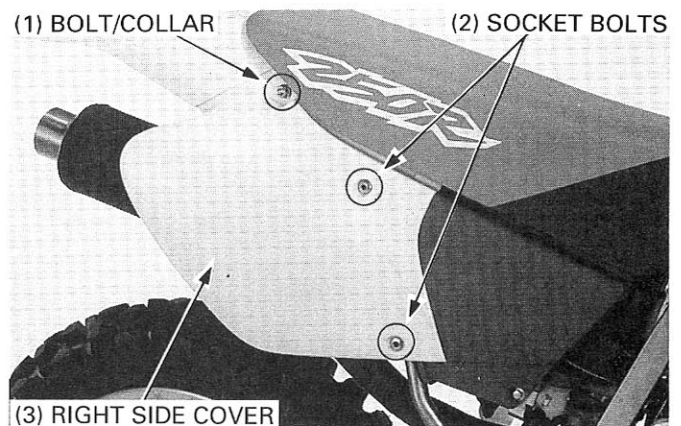
Installation is in the reverse order of removal.



## EXHAUST PIPE/MUFFLER

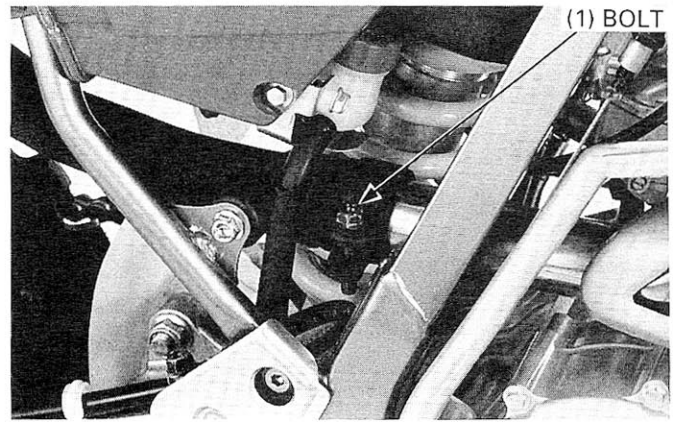
### REMOVAL

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

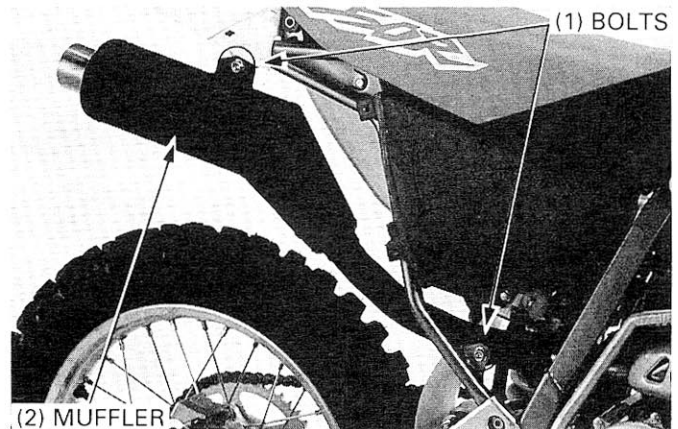


## FRAME/BODY PANELS/EXHAUST SYSTEM

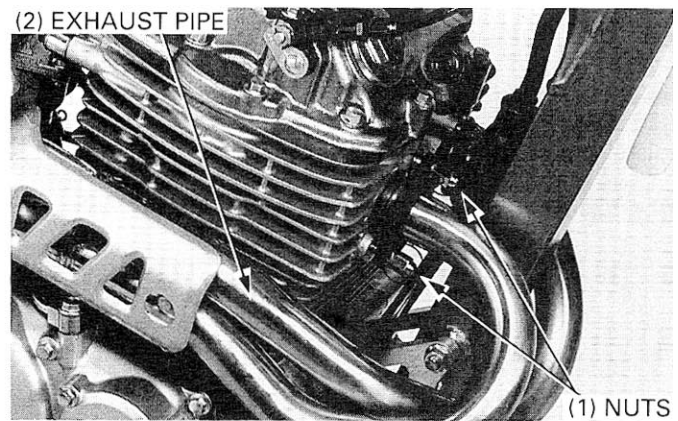
Loosen the muffler clamp bolt.



Remove the muffler mounting bolts and muffler.

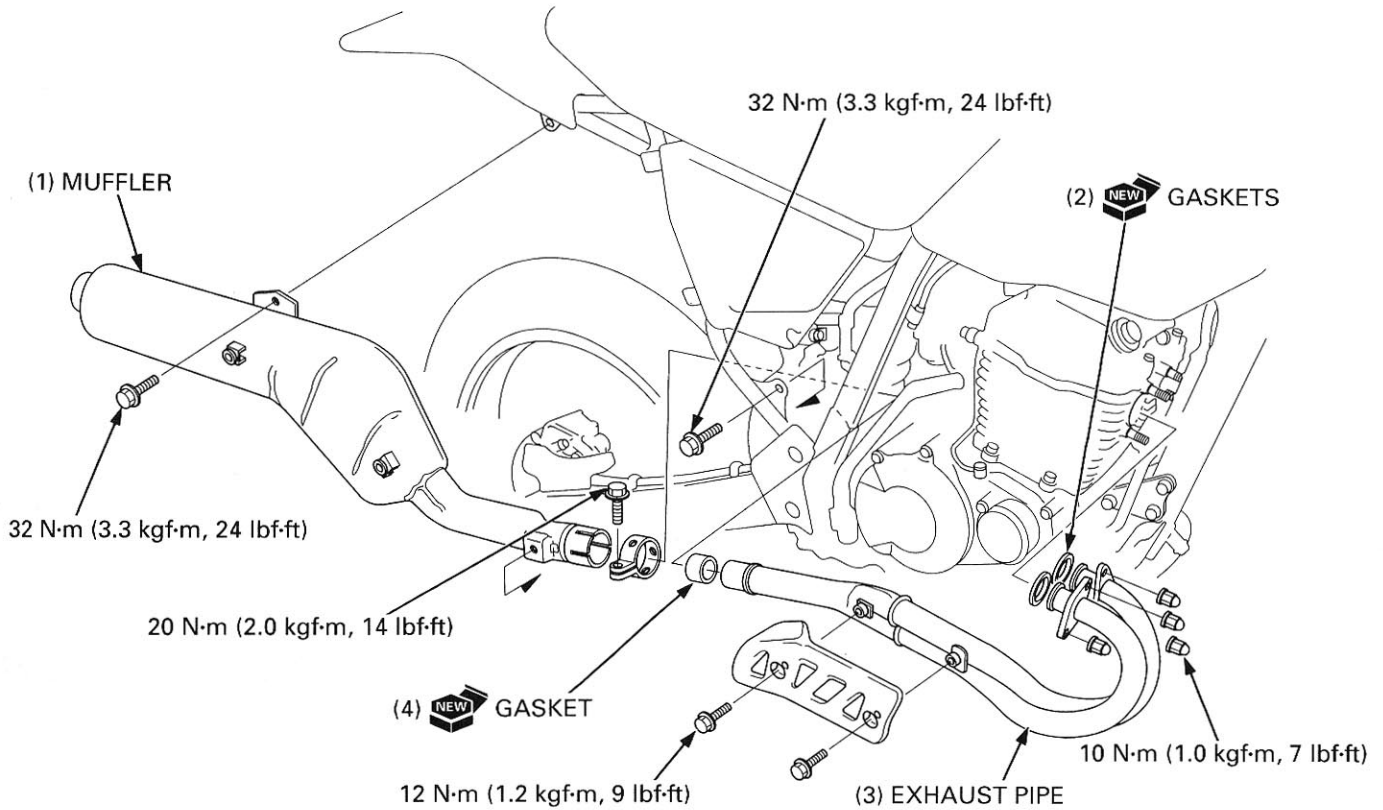


Remove the exhaust pipe joint nuts and exhaust pipe.





INSTALLATION



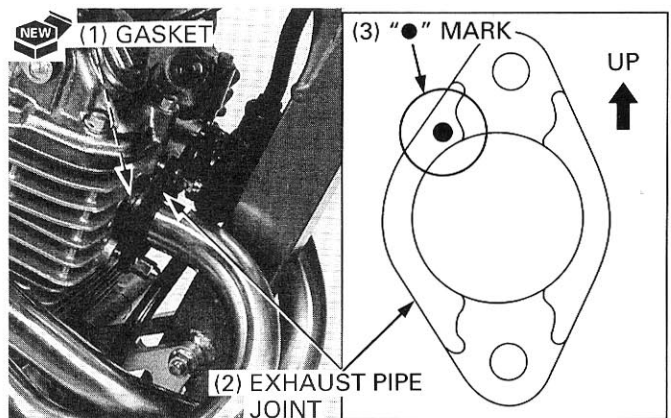
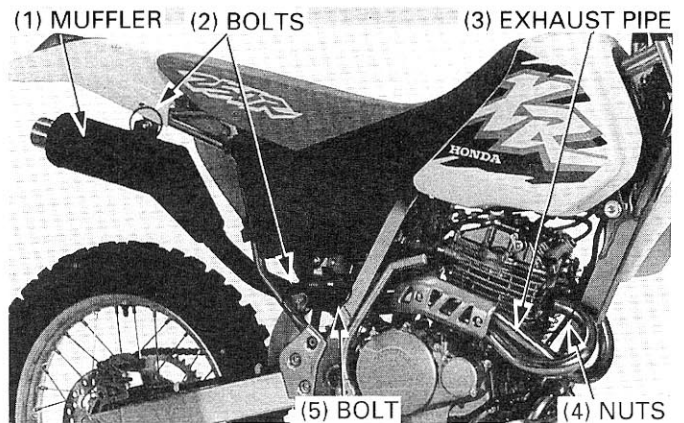
Installation is in the reverse order of removal.

**TORQUE:**

- Exhaust pipe joint nut: 10 N·m (1.0 kgf·m, 7 lbf·ft)
- Muffler clamp bolt: 20 N·m (2.0 kgf·m, 14 lbf·ft)
- Muffler mounting bolt: 32 N·m (3.3 kgf·m, 24 lbf·ft)

**NOTE**

- Always replace the gaskets with new ones.
- Install the exhaust pipe joint with the "●" mark facing up.
- Loosely install all of the exhaust pipe fasteners. Always tighten the exhaust pipe joint nuts first, then tighten the mounting fasteners. If you tighten the mounting fasteners first, the exhaust pipe may not seat properly.



# 3. MAINTENANCE

<b>SERVICE INFORMATION</b>	<b>3-1</b>	<b>DRIVE CHAIN/SPROCKET</b>	<b>3-13</b>
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<b>VALVE CLEARANCE</b>	<b>3-8</b>	<b>SPARK ARRESTER</b>	<b>3-19</b>
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<b>ENGINE IDLE SPEED</b>	<b>3-13</b>	<b>CYLINDER COMPRESSION</b>	<b>3-21</b>

## SERVICE INFORMATION

### SPECIFICATION

ITEM		SPECIFICATIONS		SERVICE LIMIT
Throttle grip free play		2 – 6 mm (1/12 – 1/4 in)		—
Spark plug		NGK	NIPPONDENSO	—
	Standard	CR9EH-9	U27FER9	—
	For cold climate (below 5°C/41°F)	CR8EH-9	U24FER9	—
Spark plug gap		0.8 – 0.9 (0.031 – 0.035)		—
Valve clearance	IN	0.10 ± 0.02 (0.004 ± 0.001)		—
	EX	0.12 ± 0.02 (0.005 ± 0.001)		—
Engine oil capacity	at draining	1.3 liter (1.37 US qt, 1.14 Imp qt)		—
	at disassembly	1.7 liter (1.79 US qt, 1.50 Imp qt)		—
	at oil filter change	1.4 liter (1.47 US qt, 1.23 Imp qt)		—
Recommended engine oil		Use Pro Honda GN4 or HP4 4-stroke Oil or equivalent API service Classification: SF or SG Viscosity: SAE 10W – 40 or 20W – 50		—
Decompressor lever free play		5 – 8 mm (3/16 – 5/16 in)		—
Carburetor idle speed		1,300 ± 100 rpm		—
Drive chain slack		30 – 40 mm (1-1/4 – 1-5/8 in)		—
Drive chain length		—		1,659 mm (65.3 in)
Replacement drive chain		D.I.D. 520VC5 or RK 520MOZ9		—

## MAINTENANCE

ITEM		SPECIFICATIONS	SERVICE LIMIT
Drive chain guide slider thickness		——	To the indicator
Drive chain slider thickness		——	4.0 mm (0.15 in)
Recommended brake fluid		DOT 4	——
Rear brake pedal height		75 mm (3.0 in)	——
Clutch lever free play		10 – 20 mm (3/8 – 3/4 in)	——
Tire size		Front	80/100 – 21 51M
		Rear	100/100 – 18 59M
Tire brand	Bridgestone	Front	M23
		Rear	M22
	Dunlop	Front	K490G
		Rear	K695
Cold tire pressure		98 kPa (1.0 kgf/cm <sup>2</sup> , 15 psi)	——
Tire cleat depth		——	3 mm (0.8 in)
Cylinder compression	Valve clearance at standard (decompressor effected)	637 – 735 kPa (6.5 – 7.5 kgf/cm <sup>2</sup> , 92 – 107 psi) at 600 rpm	——
	Valve clearance at 1 mm (0.04 in) (decompressor not effected)	1,177 – 1,275 kPa (12.0 – 13.0 kgf/cm <sup>2</sup> , 171 – 185 psi)	——

## TORQUE VALUES

Fuel valve mounting bolt	9 N·m (0.9 kgf·m, 6.5 lbf·ft)
Spark plug	12 N·m (1.2 kgf·m, 9 lbf·ft)
Valve adjust lock nut (IN)	24 N·m (2.4 kgf·m, 17 lbf·ft)
(EX)	26 N·m (2.6 kgf·m, 19 lbf·ft)
Crankshaft hole cap	8 N·m (0.8 kgf·m, 5.8 lbf·ft) Apply grease to the threads and flange surface.
Valve hole cap	15 N·m (1.5 kgf·m, 11 lbf·ft) Apply clean engine oil to the O-ring.
Timing hole cap	10 N·m (1.0 kgf·m, 7 lbf·ft) Apply grease to the threads and flange surface.
Crankcase oil drain bolt	25 N·m (2.5 kgf·m, 18 lbf·ft)
Down tube oil drain bolt	39 N·m (4.0 kgf·m, 29 lbf·ft)
Oil filter cover bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Rear axle nut	93 N·m (9.5 kgf·m, 69 lbf·ft) U-nut.
Front brake lever adjust lock nut	6 N·m (0.6 kgf·m, 4.3 lbf·ft)
Side stand pivot bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)
nut	39 N·m (4.0 kgf·m, 29 lbf·ft) U-nut.
Spoke nipple	3.8 N·m (0.38 kgf·m, 2.7 lbf·ft)
Rim lock	15 N·m (1.5 kgf·m, 11 lbf·ft)

## TOOLS

### Special

Compression gauge attachment	07908 – KK60000	] or equivalent commercially available in U.S.A.
Spoke nipple wrench	07701 – 0020300	

# MAINTENANCE SCHEDULE

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

I: Inspect and clean, Adjust, Lubricate, or Replace if necessary.

R: Replace, C: Clean, L: Lubricate, A: Adjust

The following items require some mechanical knowledge. Certain items (particularly those marked \* and \*\*) may require more technical information and tools. Consult an authorized Honda dealer.

ITEM	FREQUENCY	NOTE	BREAK-IN MAINTENANCE	REGULAR SERVICE INTERVAL	Refer to page
			First week of operation- about 200 mi (350 km)	Every 30 operating days- about 1,000 mi (1,600 km)	
* FUEL LINE				I	3-6
** FUEL STRAINER SCREEN				C	3-6
* THROTTLE OPERATION				I	3-6
AIR CLEANER		NOTE 1	I	C	3-7
SPARK PLUG				I	3-8
* VALVE CLEARANCE			I	I	3-9
ENGINE OIL			R	R	3-10
ENGINE OIL FILTER			R	R	3-12
* ENGINE OIL STRAINER SCREEN IN DOWN TUBE				C	4-2
* DECOMPRESSOR SYSTEM			I	I	3-13
* ENGINE IDLE SPEED			I	I	3-14
DRIVE CHAIN		NOTE 1	I, L	NOTE 3	3-14
DRIVE CHAIN SLIDER			I	I	3-16
BRAKE FLUID		NOTE 2		I	3-16
BRAKE PAD WEAR				I	3-17
BRAKE SYSTEM			I	I	3-17
* HEADLIGHT AIM				I	3-18
CLUTCH SYSTEM			I	I	3-18
SIDE STAND				I	3-19
* SUSPENSION				I	3-20
* SPARK ARRESTER				NOTE 4	3-20
* NUTS, BOLTS, FASTENERS			I	I	3-21
** WHEELS/TIRES			I	I	3-21
** STEERING HEAD BEARINGS			I	I	3-22

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

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

- Notes:
1. Service more frequently when riding in unusually wet or dusty area.
  2. Replace every 2 years, or at indicated odometer interval, whichever comes first. Replacement requires mechanical skill.
  3. Every 10 operating days-about 300 mi (500 km) : I, L
  4. 1,000 mi (1,600 km) or every 100 operating hours: C

# MAINTENANCE

## After '97:

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

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

The following items require some mechanical knowledge. Certain items (particularly those marked \* and \*\*) may require more technical information and tools. Consult their authorized HONDA dealer.

ITEMS	FREQUENCY	WHICHEVER COMES FIRST ➔	INITIAL MAINTENANCE		REGULAR MAINTENANCE INTERVAL				REFER TO PAGE		
			mi	100	600	1,200	1,800	2,400			
			km	150	1,000	2,000	3,000	4,000			
		NOTE	MONTH	1	6	12	18	24			
EMISSION RELATED ITEMS	* FUEL LINE					I			I	3-6	
	** FUEL STRAINER SCREEN					C			C	3-6	
	* THROTTLE OPERATION					I			I	3-6	
	AIR CLEANER	NOTE 1			C	C	C	C		3-7	
	CRANKCASE BREATHER	NOTE 2			I	I	I	I		3-8	
	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 FILTER			R	R	R	R	R		3-12	
	* ENGINE OIL STRAINER SCREEN IN DOWN TUBE					C			C	4-2	
	* DECOMPRESSOR SYSTEM			I	I	I	I	I		3-13	
	** ENGINE IDLE SPEED			I	I	I	I	I		3-14	
NON-EMISSION RELATED ITEMS	DRIVE CHAIN	NOTE 1		I, L	I, L: Every 300 mi (500 km) or 3 months					3-14	
	DRIVE CHAIN SLIDER				I	I	I	I		3-16	
	BRAKE FLUID	NOTE 3			I	I	I	I		3-16	
	BRAKE PAD WEAR				I	I	I	I		3-17	
	BRAKE SYSTEM			I	I	I	I	I		3-17	
	* HEADLIGHT AIM					I			I	3-18	
	CLUTCH SYSTEM			I	I	I	I	I		3-18	
	SIDE STAND					I			I	3-19	
	* SUSPENSION					I			I	3-20	
	* SPARK ARRESTER					C: Every 1,000 mi (1,600 km) or every 100 operating hours					3-20
	* NUTS, BOLTS, FASTENERS			I		I			I	3-21	
** WHEELS/TIRES			I	I	I	I	I		3-21		
** STEERING HEAD BEARINGS			I		I			I	3-22		

\* 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 recommend these items be serviced only by an authorized HONDA dealer.

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

2. California type only.

3. Replace every 2 years. Replacement requires mechanical skill.

# COMPETITION MAINTENANCE SCHEDULE

Check all items before each race.

Refer to the REGULAR MAINTENANCE SCHEDULE (page 3-3, 4) for regular (non-competition use) service intervals.

ITEM	INSPECT FOR	ACTION AS REQUIRED	REFER TO PAGE
ENGINE OIL	Oil level, leakage	Supply or change	3-10
FUEL TANK	Damage, leakage	Replace	3-6
BRAKE SYSTEM	Brake lever free play, brake pedal height, braking efficiency and wear beyond service limit	Adjust or replace	3-17
BRAKE FLUID	Fluid level, leakage	Supply or change	3-16
WHEELS/TIRES	Tire pressure, wear or damage, Spoke tightness and Rim lock tightness	Adjust, tighten or replace	3-21
DRIVE CHAIN	Slack, lubricate, retainer clip security Length: 1,691 mm (66.6 in) /107 pins max	Adjust, tighten or replace	3-14
SPROCKETS	Wear and secure installation	Tighten or replace	3-14
SEAT	Security	Tighten	2-2
CLUTCH DISCS	Proper operation, wear (Note 1)	Replace	3-18
AIR CLEANER ELEMENT	Contamination or tears	Clean or replace	3-7
ENGINE STOP SWITCH	Proper operation	Correct or replace	16-8
NUTS, BOLTS, FASTENERS	Tightness	Tighten	3-21
FUEL LINE	Deterioration, damage or leakage	Replace	3-6
VALVE CLEARANCE	Correct clearance	Adjust	3-9
CAM CHAIN	Excessive noise	Replace	11-3
ENGINE IDLE SPEED	Correct idle speed	Adjust	3-14
DECOMPRESSOR SYSTEM	Proper operation, lever free play	Adjust	3-13
SPARK PLUG	Tightness, proper heat range, spark plug wire looseness and damage	Tighten or replace	3-8
STEERING HEAD	Free rotation of handlebars and steering stem nut tightness	Adjust or tighten	3-22
FRONT SUSPENSION	Smooth operation, no oil leaks, good boot condition and proper oil volume	Adjust or Replace	3-20
REAR SUSPENSION	Smooth operation, oil leaks and spring length	Adjust or replace	3-20
SWINGARM BEARINGS	Smooth operation	Lubricate or replace	3-20
REAR SUSPENSION LINKAGE BEARINGS	Smooth operation	Lubricate or replace	3-20
CONTROL CABLES	Smooth operation, inner cable damage, kinks and correct routing	Lubricate or replace	1-21
ENGINE MOUNTING BOLTS	Tightness	Tighten	6-5
SPARK ARRESTER	Clogged	Clean	3-20

Note 1. Competition use necessitates more frequent service.

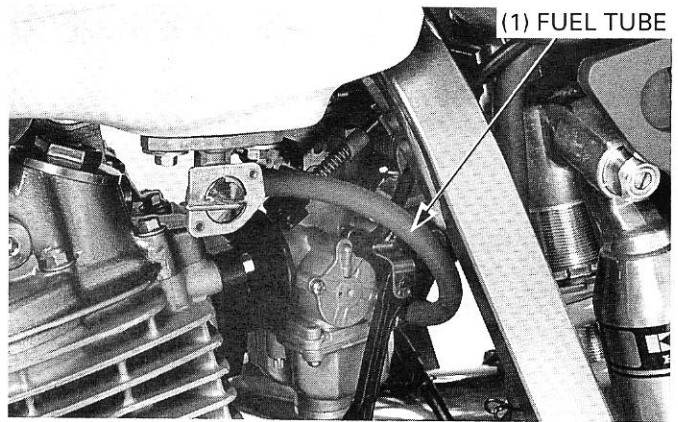


## MAINTENANCE

### FUEL TANK

#### FUEL LINE

Check the fuel lines for deterioration, damage or leakage. Replace the fuel lines if necessary.



#### FUEL STRAINER SCREEN

##### ▲ WARNING

- *Gasoline is extremely flammable and is explosive under certain conditions. Work in a well ventilated area with the engine stopped. Do not smoke or allow flames or sparks in the work area or where gasoline is stored.*
- *Wipe up spilled gasoline at once.*

Turn the fuel valve OFF, disconnect the fuel line from the carburetor.

Turn the fuel valve to RES and drain the fuel into an approved gasoline container.

Remove the fuel tank (page 5-3).

Remove the two bolts attaching the fuel valve to the fuel tank, then remove the fuel valve with its strainer screen.

Clean the fuel strainer screen.

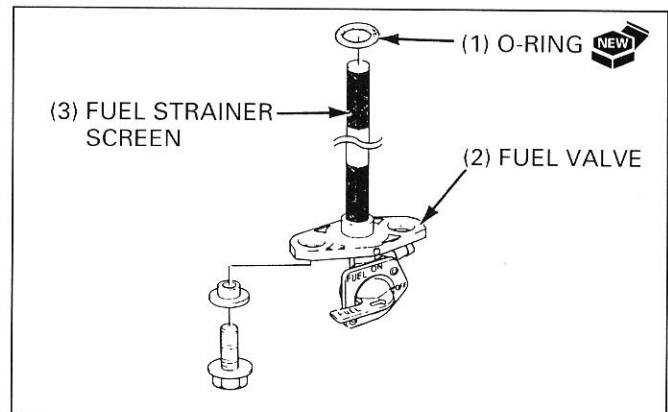
Install a new O-ring to the fuel valve.

Tighten the bolts to the specified torque.

**TORQUE: 9 N·m (0.9 kgf·m, 6.5 lbf·ft)**

Install the fuel tank and connect the fuel line.

After filling the fuel tank, check for fuel leaks.



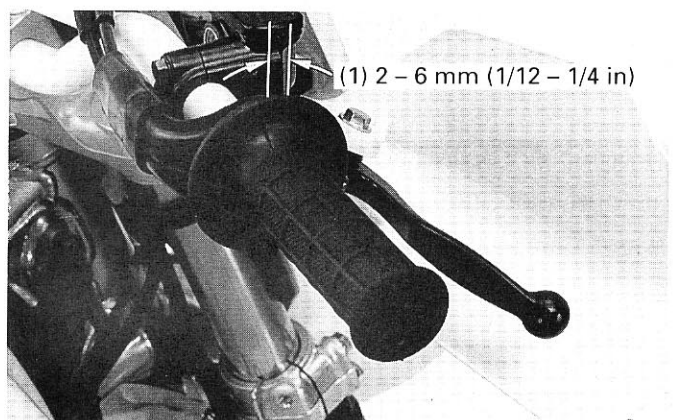
### THROTTLE OPERATION

Check that the throttle grip opens smoothly to full throttle and fully closes, automatically, in all steering positions.

Make sure there is no deterioration, damage, or kinking in the throttle cables, and that the throttle grip free play is 2 – 6 mm (1/12 – 1/4 in) at the throttle grip flange.

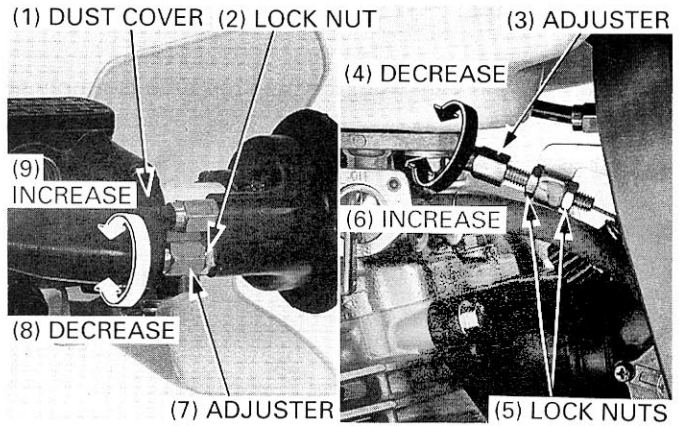
Throttle grip free play can be adjusted at either end of the throttle cable. Replace any damaged parts before beginning this adjustment.

Minor adjustments are made with the upper adjuster. Adjust the free play by sliding the rubber cover off, loosening the lock nut and turning the adjuster. Tighten the lock nut and put the rubber cover back. Recheck for proper throttle operation.





Major adjustments are made with the lower adjuster on the carburetor.  
 Adjust free play by loosening the lock nut and turning the adjuster.  
 Tighten the lock nut.  
 Recheck throttle operation. Replace any damaged parts.



## AIR CLEANER

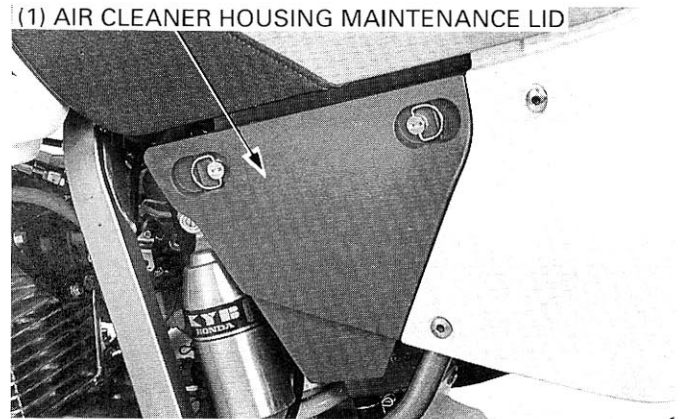
Open the air cleaner housing maintenance lid.  
 Release the air cleaner element clamp and remove the element with the holder.  
 Separate the element from the holder.

**⚠ WARNING**

- *Never use gasoline or low flash point solvents for cleaning the air cleaner. A fire or explosion could result.*

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

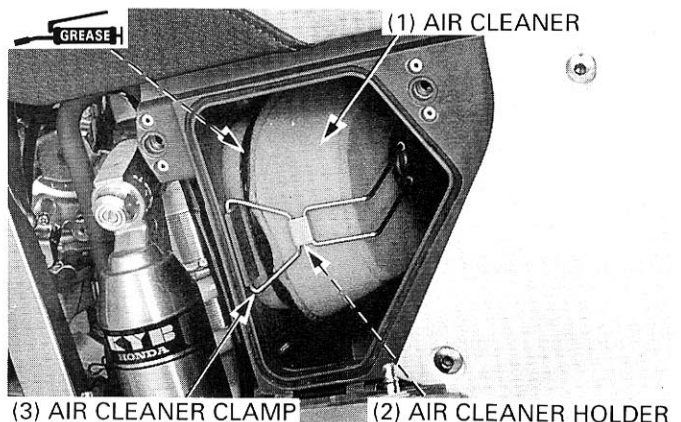
Apply approximately 32 – 37 cc (1.1 – 1.3 oz) of Pro Honda Form Filter Oil or an equivalent oil from the inside of the element.  
 Place the element into a plastic bag and spread the oil evenly by hand.



**CAUTION**

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

Install the air cleaner element to the element holder.  
 Apply grease to the air cleaner element to air cleaner housing contact area.



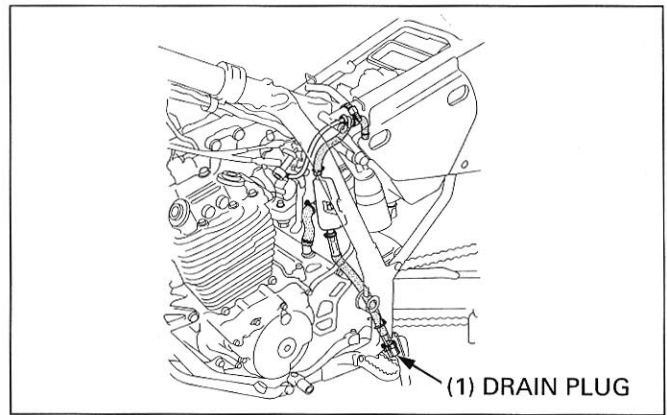
## CRANKCASE BREATHER

Remove the drain plug from the breather tube to empty any deposits.

Reinstall the drain plug and clip.

**NOTE**

- Service more frequently when riding in rain or at full throttle.



## SPARK PLUG

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

**INSPECTION**

Visually inspect the spark plug. Discard it if the insulator is cracked or chipped.

**RECOMMENDED SPARK PLUG:**

	NGK	DENSO
Standard	CR9EH-9	U27FER9
For cold climate (bellow 5°C/41°F)	CR8EH-9	U24FER9

Measure the spark plug gap with a wire-type feeler gauge. Adjust the gap by bending the side electrode carefully.

**SPARK PLUG GAP: 0.8 – 0.9 mm (0.031 – 0.035 in)**

Check the following and replace the spark plug if necessary.

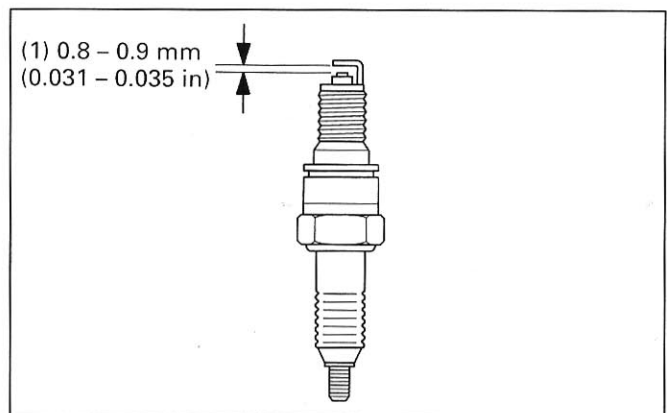
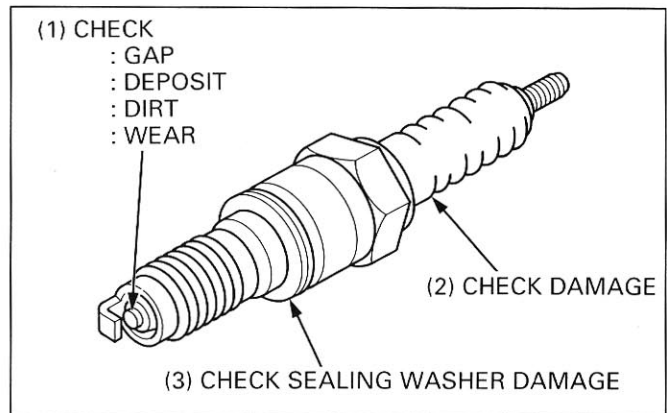
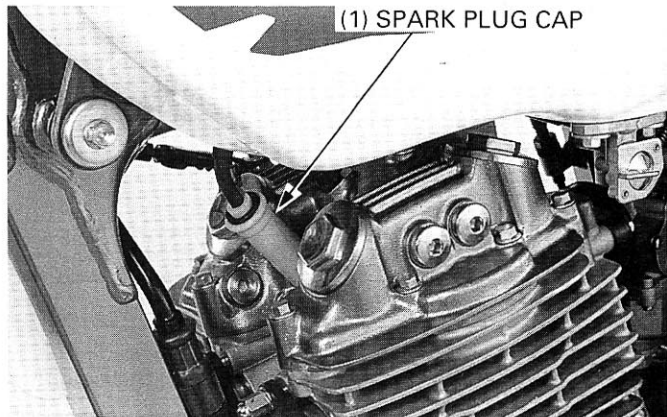
- Insulator for damage
- Electrodes for wear
- Electrodes burning condition, coloration;
  - dark to light brown indicates good condition.
  - excessive lightness indicates malfunctioning ignition system or lean mixture.
  - wet or black sooty deposit indicates over-rich mixture.

**REUSING A SPARK PLUG**

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

Reinstall the spark plug in the cylinder head and hand tighten, then torque to specification.

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



## REPLACING A SPARK PLUG

Set the plug gap to specification with a wire-type feeler gauge.

### CAUTION

- Do not overtighten the spark plug.

Install and hand tighten the new spark plug, then tighten it about 1/8 – 1/4 of a turn after the sealing washer contacts the seat of the plug hole.

## VALVE CLEARANCE

### NOTE

- Inspect and adjust valve clearance while the engine is cold (below 35°C/95°F).
- Make sure the decompressor valve lifters have some free play during this maintenance.

Remove the crankshaft hole cap and timing hole cap. Remove the valve hole caps.

Rotate the flywheel counterclockwise 2 – 3 turn to align the "T" mark with the index notch on the left crankcase cover. Make sure the piston is at TDC (Top Dead Center) on the compression stroke.

### NOTE

- If the crankshaft passed the "T" mark (aligning mark), rotate the crankshaft counterclockwise twice again and align it with the "T" mark. This must be done to prevent the one-way decompressor system from functioning and to obtain the correct valve clearance.

Check the clearance of all four valves by inserting a feeler gauge between the adjusting screw and the sub-rocker arm.

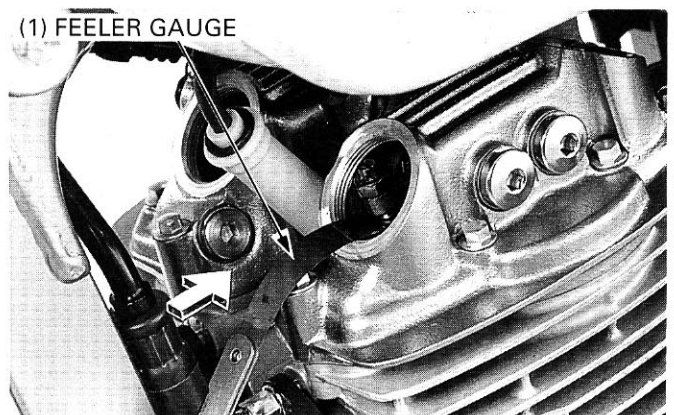
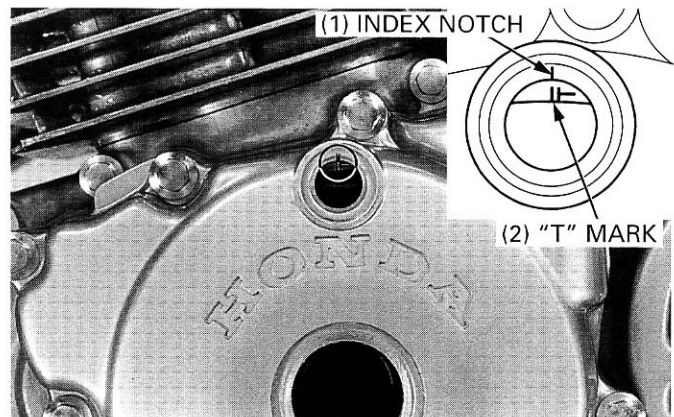
### NOTE

- When checking the clearance, slide the feeler gauge from the inside out in the direction of the arrow.

### VALVE CLEARANCE:

IN:  $0.10 \pm 0.02$  mm ( $0.004 \pm 0.001$  in)

EX:  $0.12 \pm 0.02$  mm ( $0.005 \pm 0.001$  in)



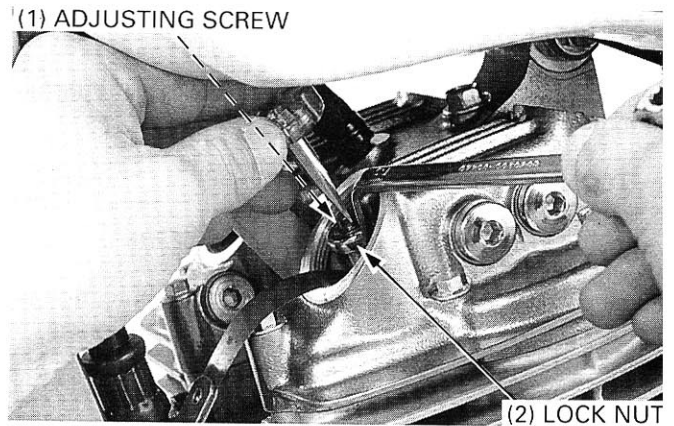
## MAINTENANCE

Adjust by loosening the lock nut and turning the adjusting screw until there is a slight drag on the feeler gauge. After tightening the valve adjuster lock nut, recheck the valve clearance.

Hold the adjusting screw and tighten the lock nut.

**TORQUE: IN: 24 N·m (2.4 kgf·m, 17 lbf·ft)**  
**EX: 26 N·m (2.6 kgf·m, 19 lbf·ft)**

Adjust the decompressor lever free play (page 3-12).



Check that O-rings are in good condition, replace it if necessary.

Apply oil to the O-rings.

Install the valve hole caps and tighten to the specified torque.

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

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

**TORQUE: 8 N·m (0.8 kgf·m, 5.8 lbf·ft)**

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

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



## ENGINE OIL

### ⚠ WARNING

- *If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and lead to death.*

## INSPECTION

### At oil filler cap/dipstick

Support the motorcycle upright on level ground.

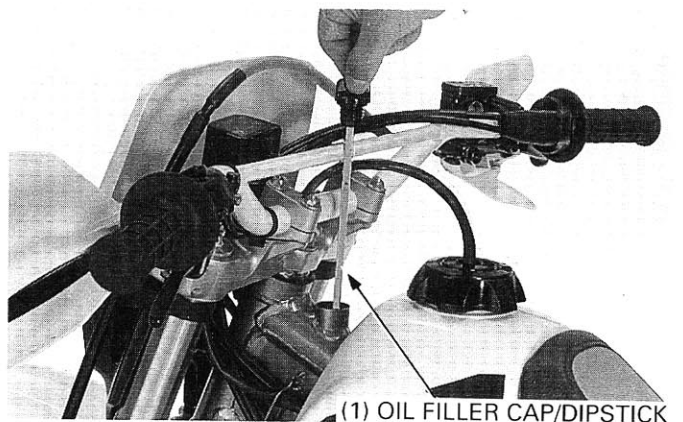
Clean around the oil filler cap/dipstick and nearby surfaces.

Start the engine and let it idle for 5 minutes.

If the air temperature is below 10°C (50°F), let the engine idle for an additional 5 minutes (a total of 10 minutes).

An engine that is not warmed sufficiently may give an inaccurate (low) oil level reading.

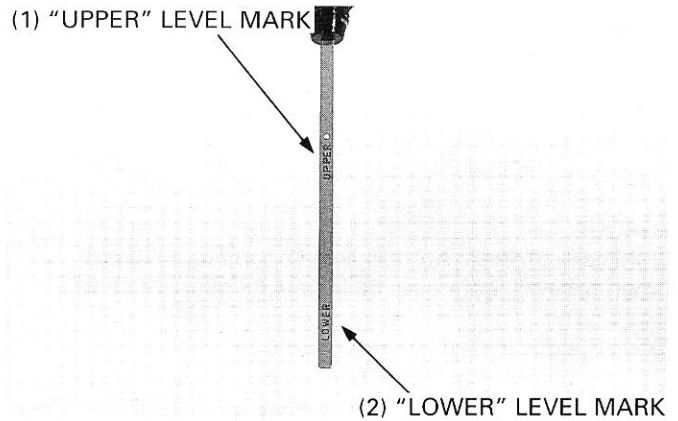
During idling, make sure your motorcycle is supported in an upright position to assure an accurate oil level reading. Stop the engine.





Remove the oil filler cap/dipstick.  
 Check the oil level with the oil filler cap/dipstick by inserting it until the threads touch the filler neck.  
 Do not screw the cap in when making this check.  
 If the oil level is below the lower mark on the dipstick, fill to the upper level mark with the recommended oil.

Check the engine oil for contamination. Change the engine oil if it is contaminated.

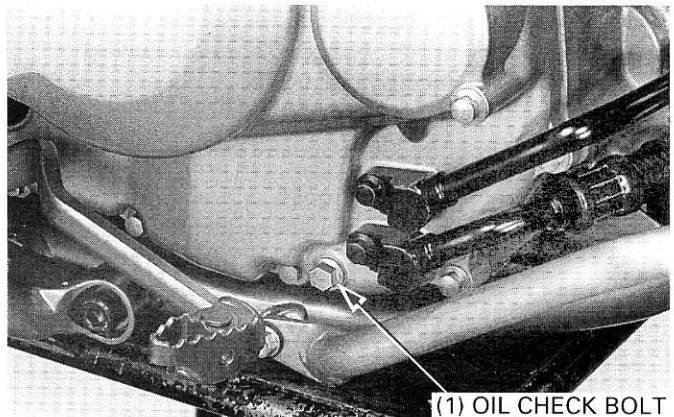


**At crankcase oil check bolt**

Remove the crankcase oil check bolt and sealing washer.  
 Reinstall the bolt and washer.

If there is oil flow, start the engine and check the oil level with the oil filler cap/dipstick (page 3-10).

If there is no oil flow, fill to the upper level mark with the recommended oil.  
 Start the engine and recheck the oil level.



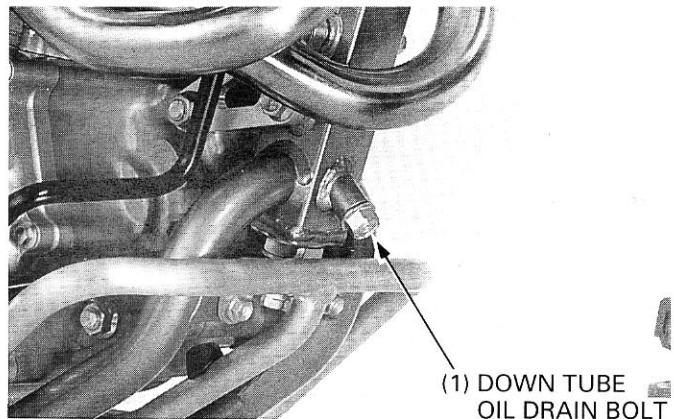
**OIL CHANGE**

**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.*

**NOTE**

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



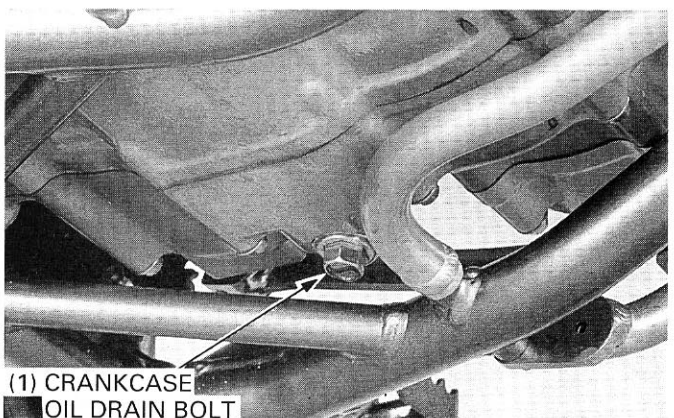
Start the engine and let it idle for a few minutes.  
 Stop the engine and remove the oil filler cap/dipstick (page 3-10).

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

**NOTE**

- When draining the oil, avoid spilling oil on the front tire.

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



## MAINTENANCE

Check the sealing washers for damage.  
Replace if necessary.

Install the down tube oil drain bolt/sealing washer and crankcase oil drain bolt/sealing washer.  
Tighten to the specified torque.

### TORQUE:

**Crankcase oil drain bolt: 25 N·m (2.5 kgf·m, 18 lbf·ft)**  
**Down tube oil drain bolt: 39 N·m (4.0 kgf·m, 29 lbf·ft)**

Clean the oil strainer screen (page 4-2).

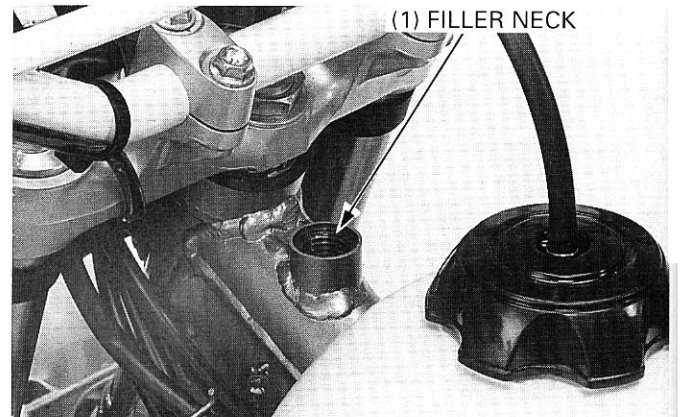
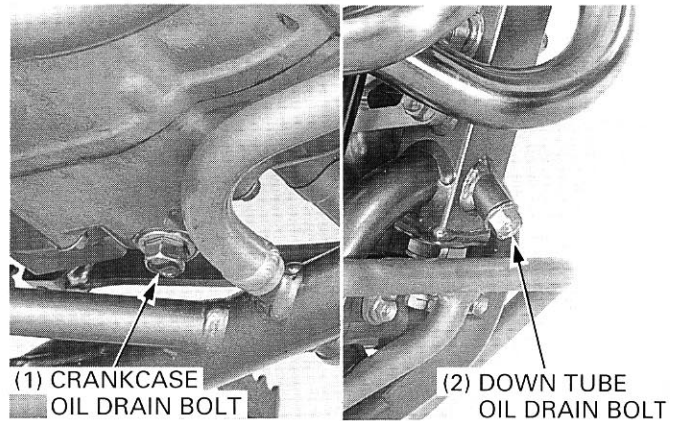
Fill to the filler neck with the correct quantity of the recommended engine oil.

### RECOMMENDED ENGINE OIL:

**Pro Honda GN4 or HP4 4-stroke Oil or equivalent**  
**API service classification: SF or SG**  
**Viscosity: 10W - 40 or 20W - 50**

### OIL CAPACITY:

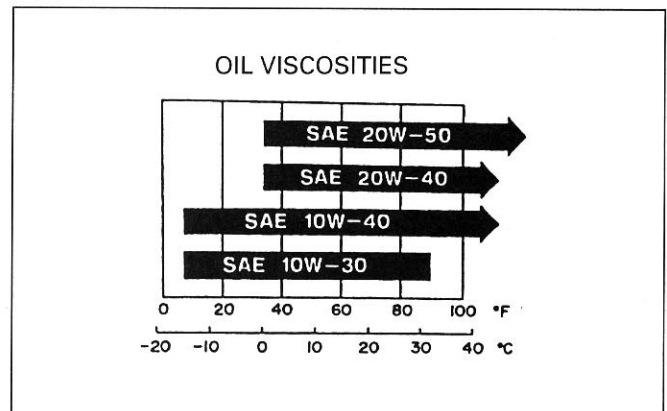
**1.3 liter (1.37 US qt, 1.14 Imp qt) at draining**  
**1.4 liter (1.47 US qt, 1.23 Imp qt) at oil filter change**  
**1.7 liter (1.79 US qt, 1.50 Imp qt) at disassembly**



### NOTE

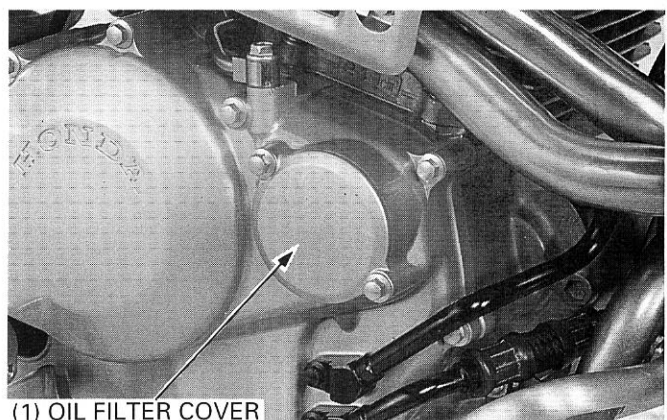
- Other viscosities shown in the chart may be used when the average temperature in your riding area is within the indicated range.

Start the engine and check that there are no oil leaks.  
Stop the engine and check the oil level (page 3-10).



## ENGINE OIL FILTER

Drain the engine oil (page 3-11).  
Remove the oil filter cover bolts.  
Remove the oil filter cover, oil filter, spring.  
Remove the O-ring from the oil filter cover.



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

Install the following:

- Spring
- New oil filter with its "OUT SIDE" mark facing out

**CAUTION**

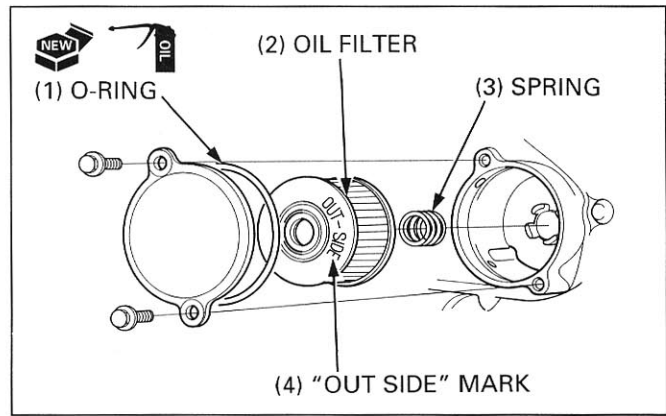
- *Installing the oil filter backwards will result in severe engine damage.*

Install the oil filter cover and tighten the bolts to the specified torque.

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

Fill to the filler neck with the correct quantity of the recommended engine oil.

Start the engine and check that there are no oil leaks. Stop the engine and check the oil level (page 3-10).



**DECOMPRESSOR SYSTEM**

**NOTE**

- Always adjust the decompressor linkage after adjusting the valve clearance (page 3-8).

Remove the crankshaft hole cap and timing hole cap.

Rotate the flywheel counterclockwise to align the "T" mark with the index notch. Make sure that the piston is at TDC (Top Dead Center) on the compression stroke.

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

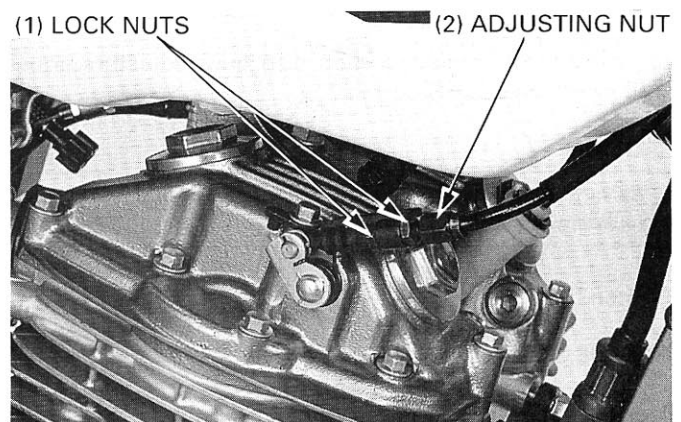
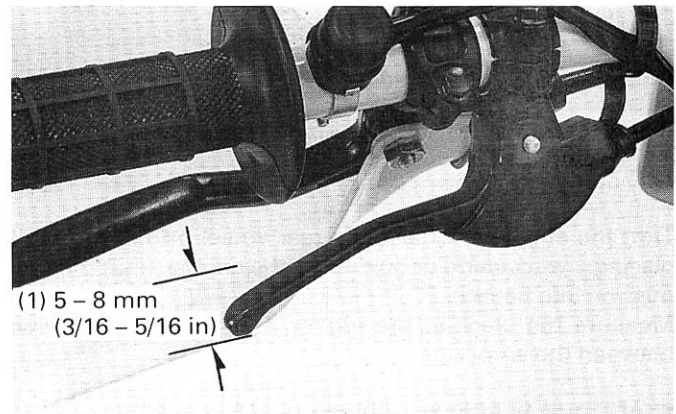
**FREE PLAY: 5 – 8 mm (3/16 – 5/16 in)**

To adjust, loosen the lock nuts.

Adjust by turning the decompressor adjusting nut at the engine.

After adjusting, tighten the lock nuts.

Recheck the free play at the lever.



## MAINTENANCE

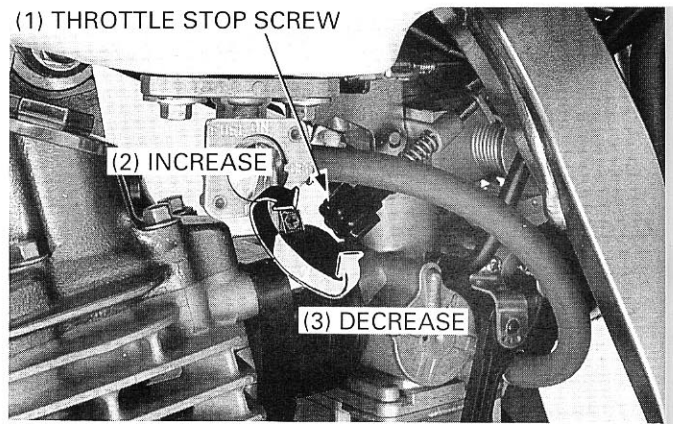
### ENGINE IDLE SPEED

#### NOTE

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

Warm up the engine, shift the transmission into NEUTRAL, and hold the motorcycle upright. Connect a tachometer. Turn the throttle stop screw to obtain the specified idle speed.

**IDLE SPEED: 1,300 ± 100 rpm**



### DRIVE CHAIN/SPROCKET

#### ⚠ WARNING

- *Take care to prevent catching your fingers between the chain and sprocket.*

Turn the engine off. Raise the rear wheel off the ground by placing a work stand or box under the engine. Shift the transmission into neutral.

Measure the slack in the higher drive chain run midway between the sprockets.

**STANDARD SLACK: 30 – 40 mm (1-1/4 – 1-5/8 in)**

Adjust as follows:

Loosen the rear axle nut, then turn both adjusters equally until the chain slack is correct.

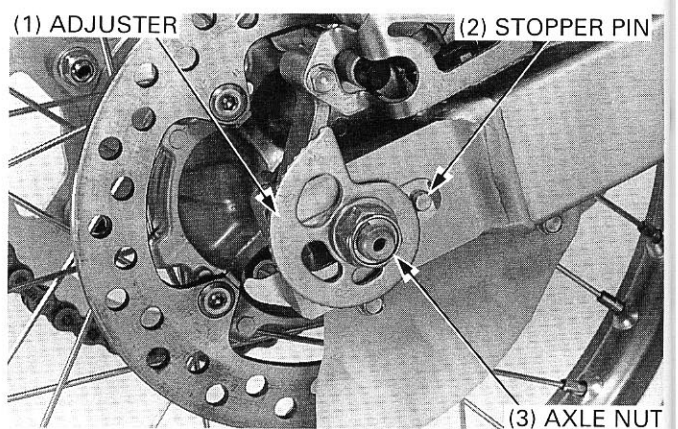
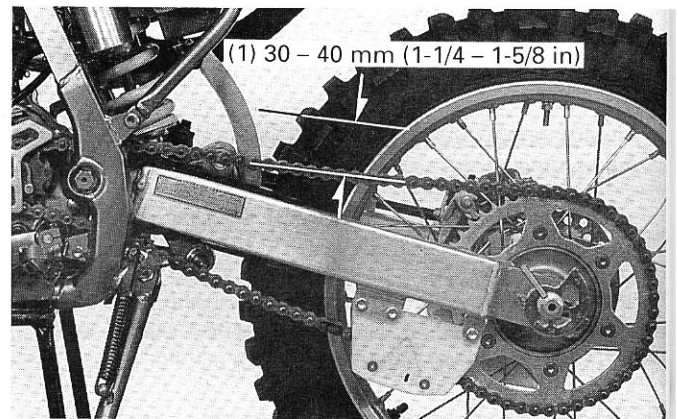
#### CAUTION

- *Be sure the same adjuster index marks align with the stopper pins on both sides of the swingarm.*

Tighten the axle nut.

**TORQUE: 93 N·m (9.5 kgf·m, 69 lbf·ft)**

Recheck chain slack and free wheel rotation.

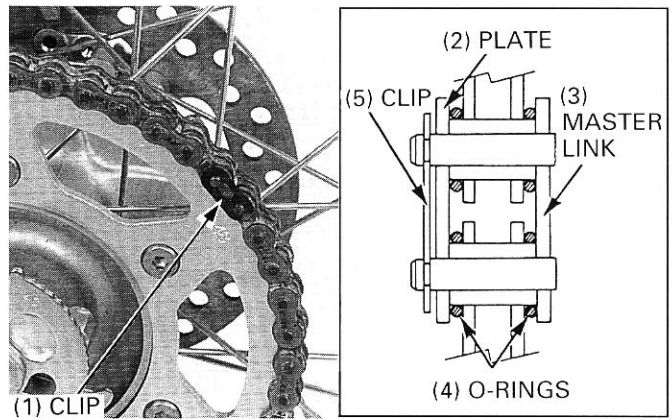




When the drive chain becomes extremely dirty, it should be removed and cleaned prior to lubrication.  
 Remove the drive sprocket cover.  
 Remove the chain retainer clip carefully.  
 Remove the master link and drive chain.

**CAUTION**

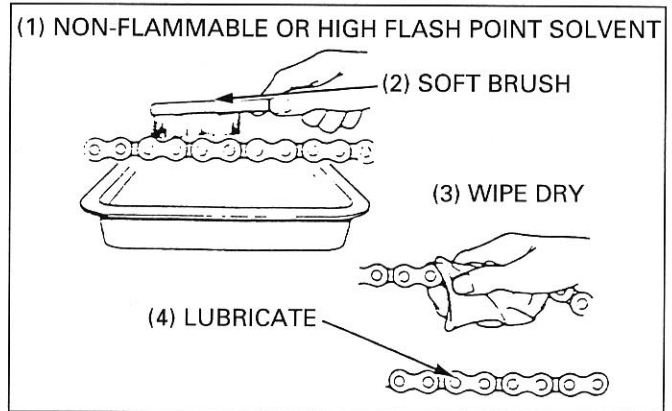
- *Be careful not to lose the O-rings when the clip and master link are removed.*



Clean the drive chain with a non-flammable or high flash point solvent or kerosene that will not damage the O-rings; wipe dry.

**CAUTION**

- *Do not use a steam cleaner or high pressure washer because these will damage the O-rings.*

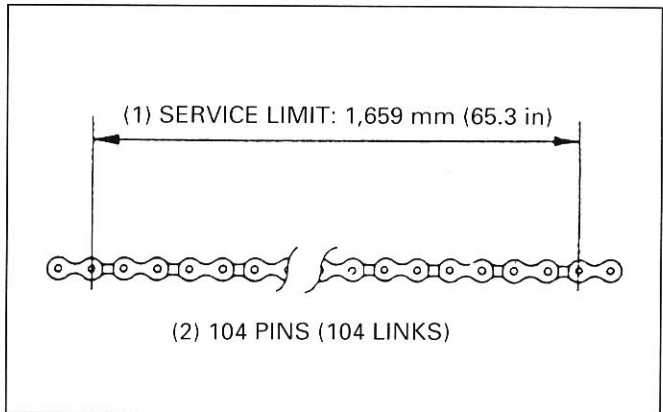


Inspect the drive chain and O-rings for possible wear or damage. Replace the chain if it is worn excessively or damaged.

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

**SERVICE LIMIT: 1,659 mm (65.3 in) at 104 pins**  
**REPLACEMENT DRIVE CHAIN: D.I.D. 520VC5 or RK 520MOZ9**

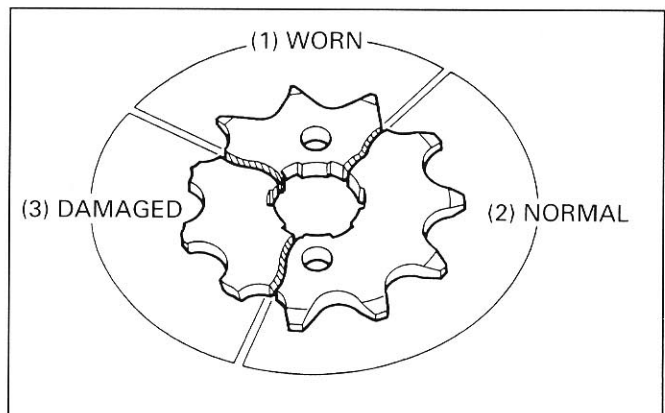
Lubricate the drive chain with SAE #80 – #90 gear oil.



Inspect the sprocket teeth for excessive wear or damage. Replace if necessary.

**NOTE**

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

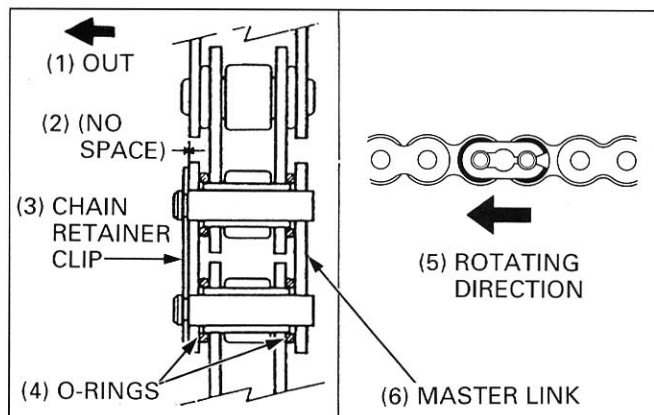


## MAINTENANCE

Install a new drive chain.  
Install the master link with O-rings and a chain retaining clip.  
Install the drive sprocket cover.  
Adjust the drive chain (page 3-14).

### CAUTION

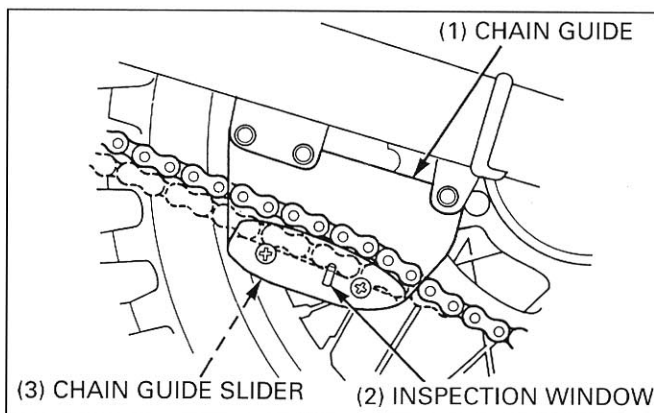
- Do not assemble the drive chain without the four master link O-rings.
- Be sure that there is no space between the master link and the chain retaining clip.



## DRIVE CHAIN SLIDER

### CHAIN GUIDE SLIDER

Inspect the chain guide slider for wear and replace it if you can see the chain through the wear limit opening.



### CHAIN SLIDER

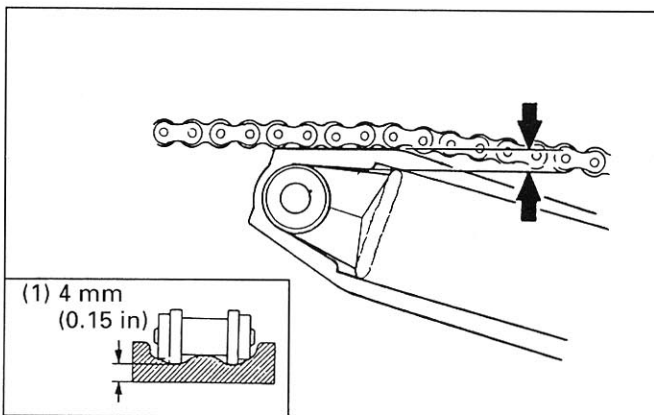
Check the chain slider for wear.

#### SERVICE LIMIT:

**Chain slider (from upper surface): 4.0 mm (0.15 in)**

#### CAUTION

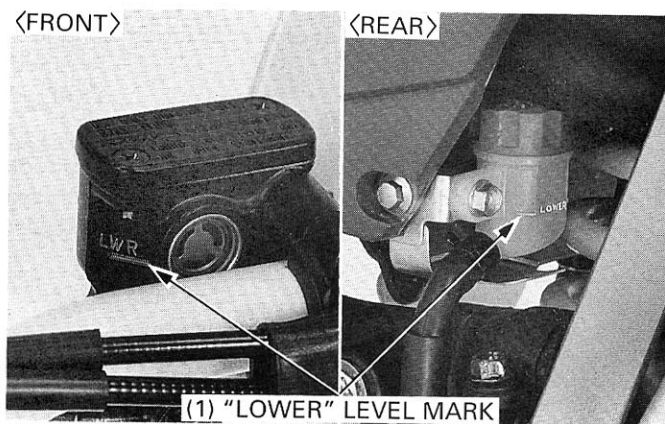
- If the chain slider becomes worn through to the swingarm, the chain will wear against the swingarm.



## BRAKE SYSTEM

### BRAKE FLUID

Check the brake fluid reservoir level for the front and rear brakes. If the level is near the lower level mark, check the brake pad wear and add brake fluid.



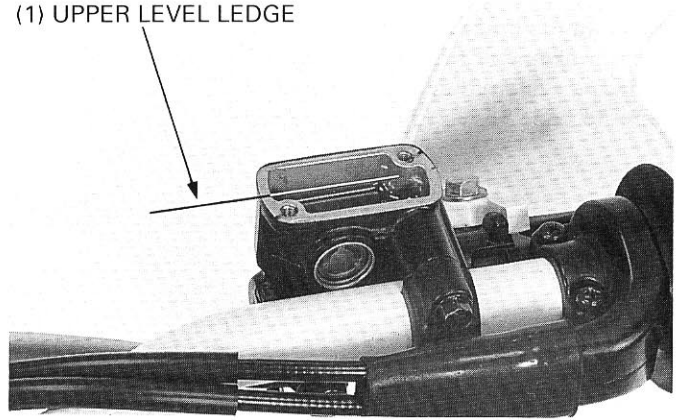
**Front brake:**

Remove the reservoir cover and diaphragm.  
Fill the reservoir with DOT4 Brake Fluid to the casting ledge.

**Rear brake:**

Remove the bolt and reservoir.  
Remove the reservoir cap and diaphragm.  
Fill the reservoir with DOT4 Brake Fluid to the upper level mark.

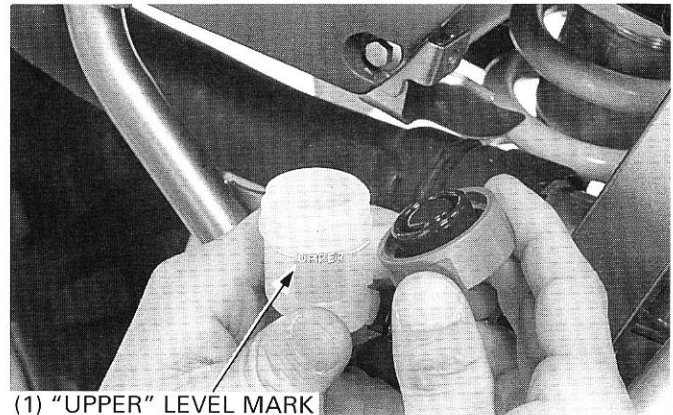
(1) UPPER LEVEL LEDGE



**CAUTION**

- Do not remove the cover until the handlebar has been turned so that the reservoir is level.
- Avoid operating the brake lever with the cap removed. Brake fluid will squirt out if the lever is pulled.
- Do not mix different fluid types, as they are not compatible.
- Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.

Refer to section 15, for brake bleeding procedure.



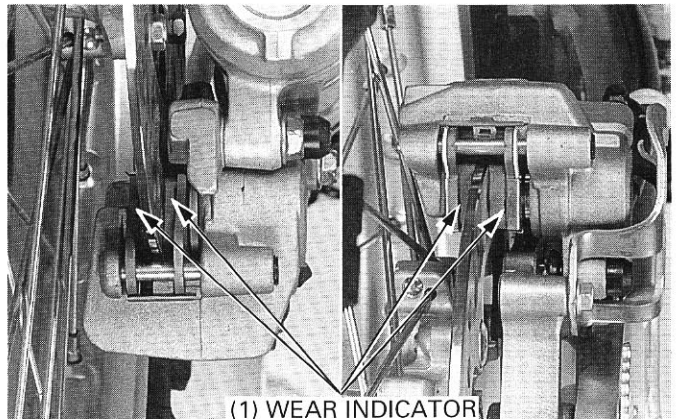
**BRAKE PAD WEAR**

**Front brake:**

Inspect the pads visually from under the caliper to determine the pad wear.  
Replace the brake pad if the wear line on the pads reaches the edge of the brake disc (page 15-5).

**Rear brake:**

Inspect the pads visually from the rear of the caliper to determine the pad wear.  
Replace the brake pad if the wear line on the pads reaches the edge of the brake disc (page 15-5).



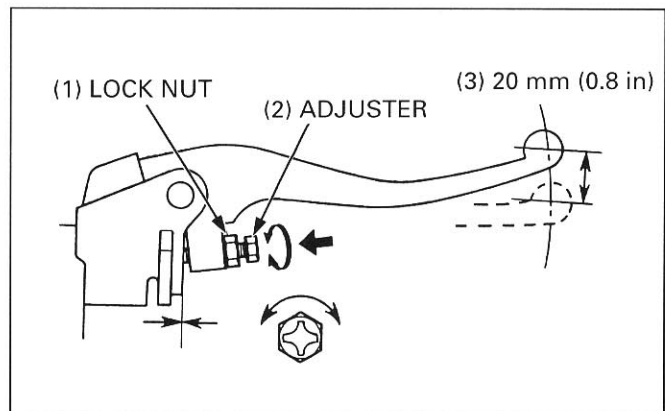
**LEVER POSITION ADJUSTMENT**

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

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

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

**TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)**



## MAINTENANCE

Measure the brake lever free play at the lever end.  
If the brake lever free play exceeds 20 mm (0.8 in), there is air in the system that must be bled.  
Refer to page 15-4 for brake system bleeding.

### NOTE

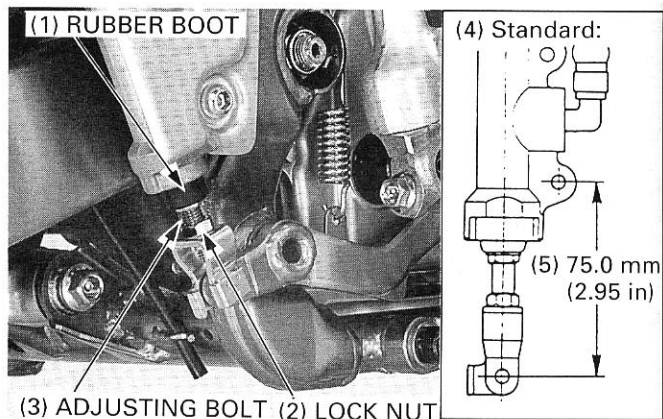
- Apply silicone grease to the contact faces of the adjuster bolt and piston.

## BRAKE PEDAL HEIGHT

Adjust the brake pedal to the desired height by loosening the lock nut and turning the pedal height adjusting bolt.

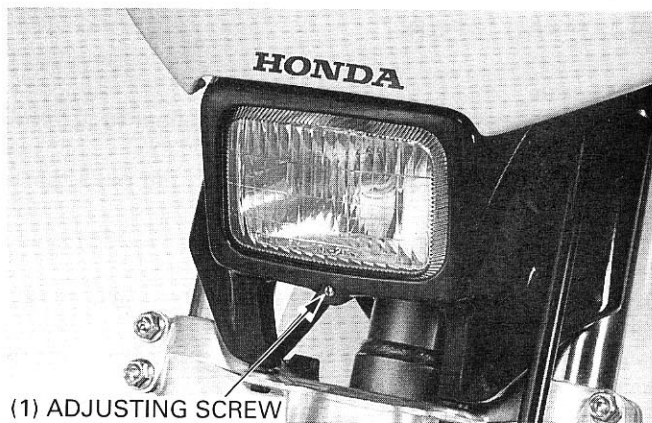
**STANDARD: 75.0 mm (2.95 in)**

Tighten the lock nut.



## HEADLIGHT AIM

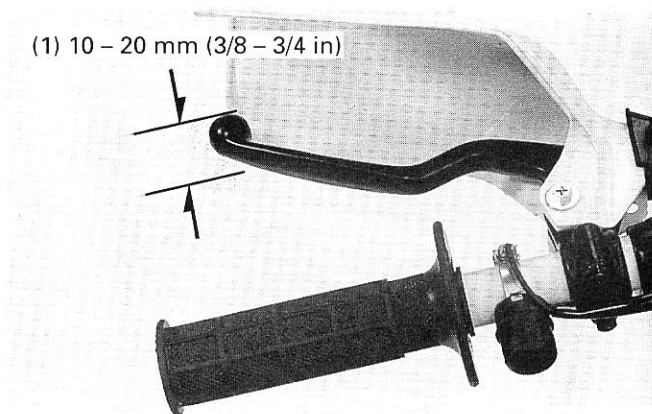
Adjust the headlight beam vertically by turning the adjusting screw on the headlight case.



## CLUTCH SYSTEM

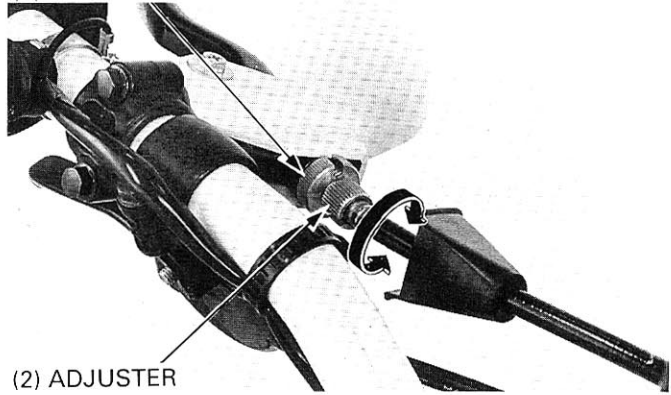
Measure the clutch lever free play at the lever end.

**FREE PLAY: 10 – 20 mm (3/8 – 3/4 in)**



Minor adjustments are made with the upper adjuster.  
 Pull the cover back.  
 Loosen the lock nut and turn the adjuster.  
 Tighten the lock nut and install the cover.

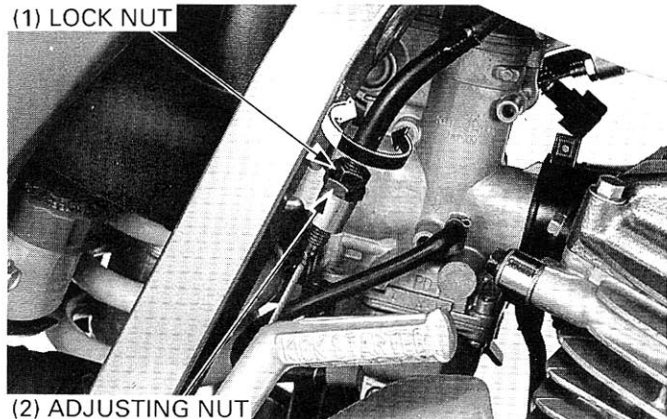
(1) LOCK NUT



(2) ADJUSTER

Adjust as follows:  
 Major adjustments are made with the lower adjuster.  
 If major adjustment is required, turn the upper adjuster all the way in and back out 1 turn.  
 Loosen the lower lock nut and turn the adjusting nut.  
 Tighten the lock nuts.  
 Check the clutch operation.

(1) LOCK NUT



(2) ADJUSTING NUT

## SIDE STAND

Check the side stand spring for damage and/or loss of tension.  
 Check that the side stand assembly is not bent and that it moves freely.  
 Lubricate the side stand pivot.

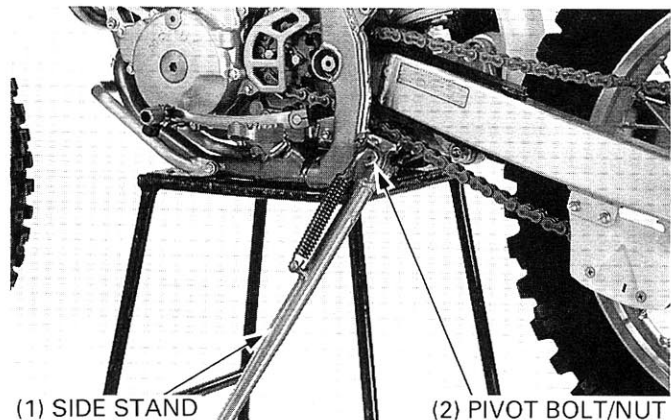
Check that the side stand pivot bolt and nut are tightened to their correct torque values.

Tighten the pivot bolt to the specified torque.

**TORQUE: 10 N·m (1.0 kgf·m, 7.2 lbf·ft)**

Then back it off 45 – 90° (1/8 to 1/4) turn.  
 Tighten the pivot nut to the specified torque.

**TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)**



(1) SIDE STAND

(2) PIVOT BOLT/NUT



## SUSPENSION

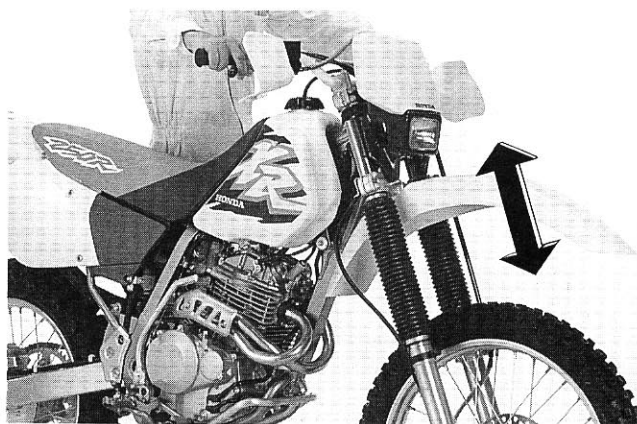
**▲ WARNING**

- *Do not ride a vehicle with faulty suspension. Loose, worn, or damaged suspension parts may affect stability and rider control.*

### FRONT SUSPENSION

Check the action of the front forks by compressing them several times.

Check the entire fork assembly for signs of leaks or damage. Replace any components which are unrepairable. Torque all nuts and bolts.



### REAR SUSPENSION

Bounce the rear of the motorcycle up and down to check for proper operation.

Check the entire rear suspension being sure everything is securely mounted and not damaged or distorted.

Torque all nuts and bolts to their specified values (pages 1-14 – 16).

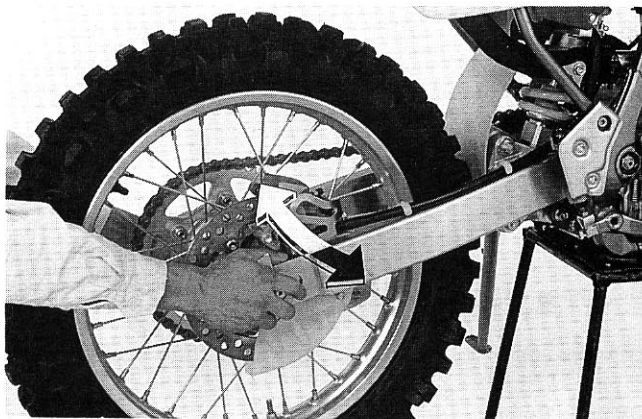


Place the motorcycle on a work stand or box to raise the rear wheel off the ground.

Move the rear wheel sideways with force to see if the swingarm bearings are worn.

Replace if excessively worn (page 14-28).

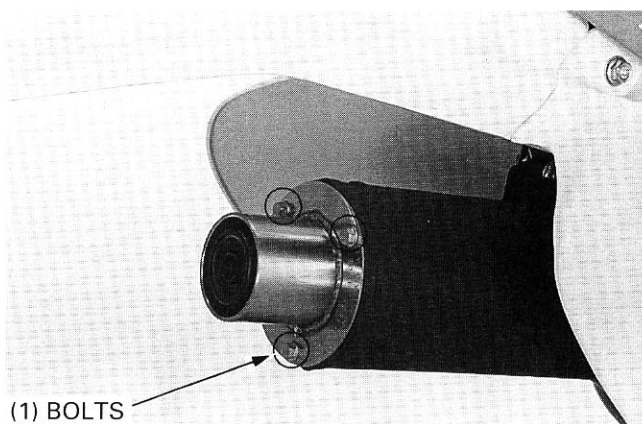
Check that the shock linkage, spherical bearing and needle bearings are damaged.



## SPARK ARRESTER

### INSPECTION

Remove the bolts and spark arrester.



Check that the screen mesh and gasket is in good condition, and replace if necessary.

Installation is in the reverse order of removal.

**CLEANING**

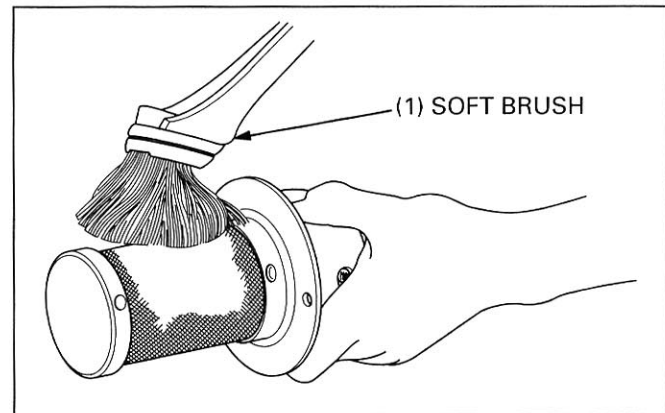
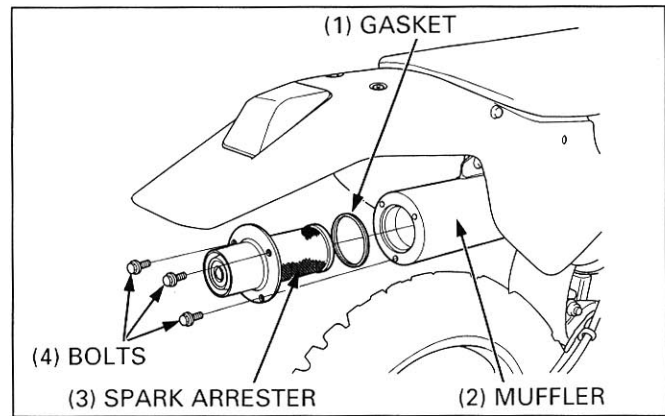
**▲ WARNING**

- *Do not touch exhaust components while the exhaust system is hot.*

Remove the spark arrester (page 3-20).

Use a soft brush to remove carbon deposits from the spark arrester screen. Be careful to avoid damaging the spark arrester screen. The spark arrester must be free of breaks and holes. Replace if necessary.

Install the spark arrester.



**NUTS, BOLTS, FASTENERS**

Check that all chassis nuts and bolts are tightened to their correct torque values.

Check that all cotter pins and clips are in place and properly secured.

**WHEELS/TIRES**

Check the tire pressure.

**NOTE**

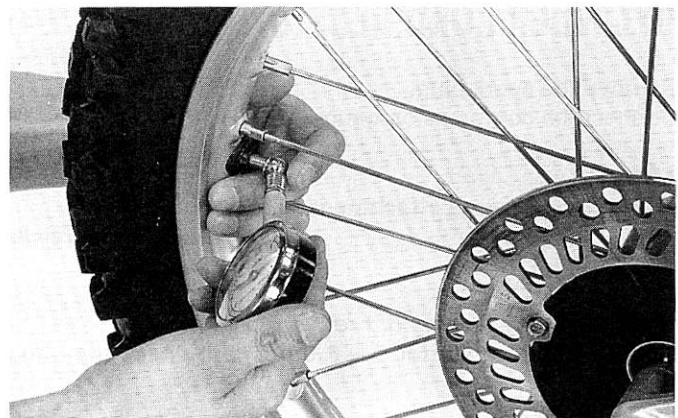
- The pressure should be checked when the tires are **COLD**.

**STANDARD PRESSURE:**

Front: 98 kPa (1.0 kgf/cm<sup>2</sup>, 15 psi)  
 Rear: 98 kPa (1.0 kgf/cm<sup>2</sup>, 15 psi)

**TIRE SIZE:**

Front: 80/100-21 51M  
 Rear: 100/100-18 59M





## MAINTENANCE

Check the tires for cuts, embedded nails or other sharp objects.

Check the tire tread depth.

**SERVICE LIMIT: 3 mm (1/8 in)**

Tighten the spoke nipples and rim locks.

### TORQUE:

**Spoke nipple: 3.8 N·m (0.38 kgf·m, 2.7 lbf·ft)**

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

### TOOL:

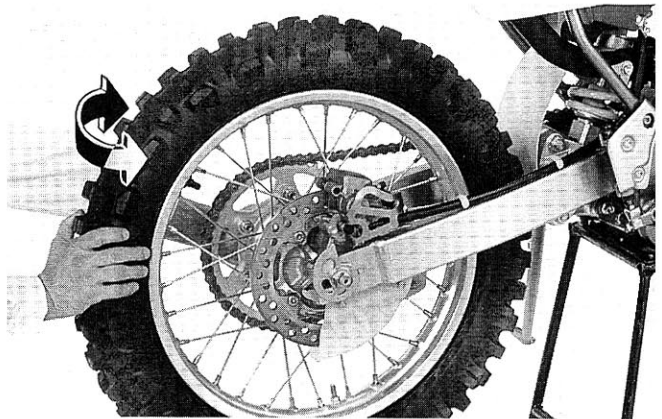
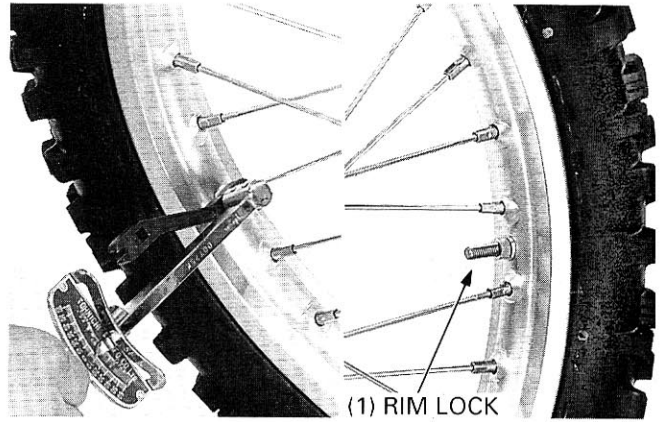
**Spoke nipple wrench**

**07701 – 0020300 or  
equivalent commercially  
available in U.S.A.**

Push and pull the rear wheel side ways (in alignment with the axle) to check for play in the swingarm.

Check the tires for wear or damage.

Check the wheel rims for corrosion or damage (page 13-3, 14-4).

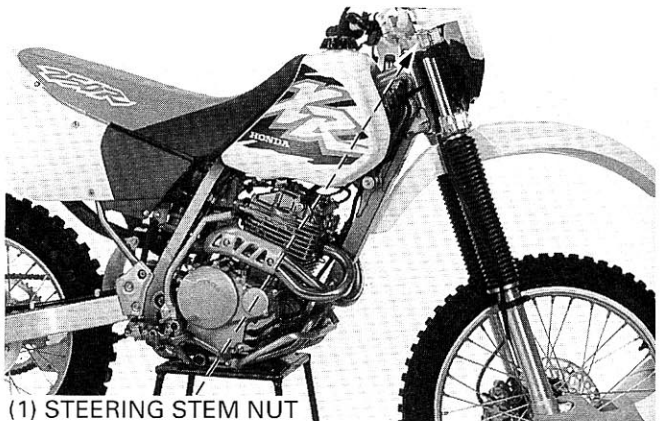


## STEERING HEAD BEARINGS

Raise the front wheel off the ground and check that the fork rotates freely.

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

If the fork moves unevenly, binds or has vertical movement, check and adjust the steering head bearings by turning the steering stem nut (page 13-25).



## CYLINDER COMPRESSION

Remove the spark plug.

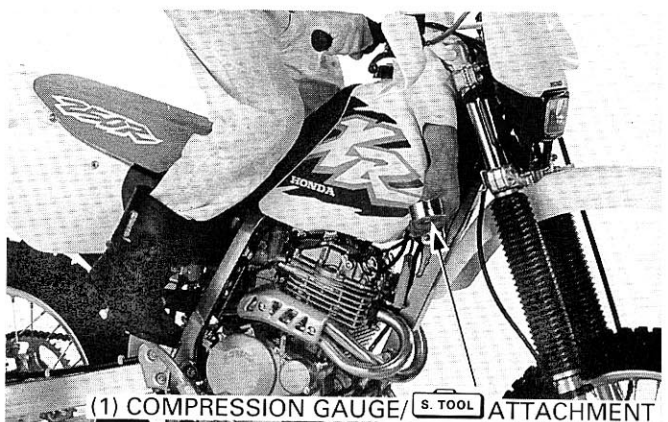
Connect the compression gauge.

### TOOL:

**Compression gauge attachment 07908 – KK60000 or  
equivalent commercially  
available in U.S.A.**

Open the choke lever and throttle grip all the way.

Operate the kick starter 5 – 6 times and check the gauge reading.



**NOTE**

- 
- Check that there are no leaks at the gauge connection.
- 

**CYLINDER COMPRESSION (with decompressor effected):**  
**637 – 735 kPa (6.5 – 7.5 kgf/cm<sup>2</sup>, 92 – 107 psi) at 600 rpm**

If compression is not within specification, recheck the following:

Loosen the exhaust valve lock nut and adjust the exhaust valve to a valve clearance of approximately 1 mm (0.04 in).

Warm up the engine.

Stop the engine and recheck the compression.

**CYLINDER COMPRESSION (with decompressor not effected):**  
**1,177 – 1,275 kPa (12.0 – 13.0 kgf/cm<sup>2</sup>, 171 – 185 psi)**

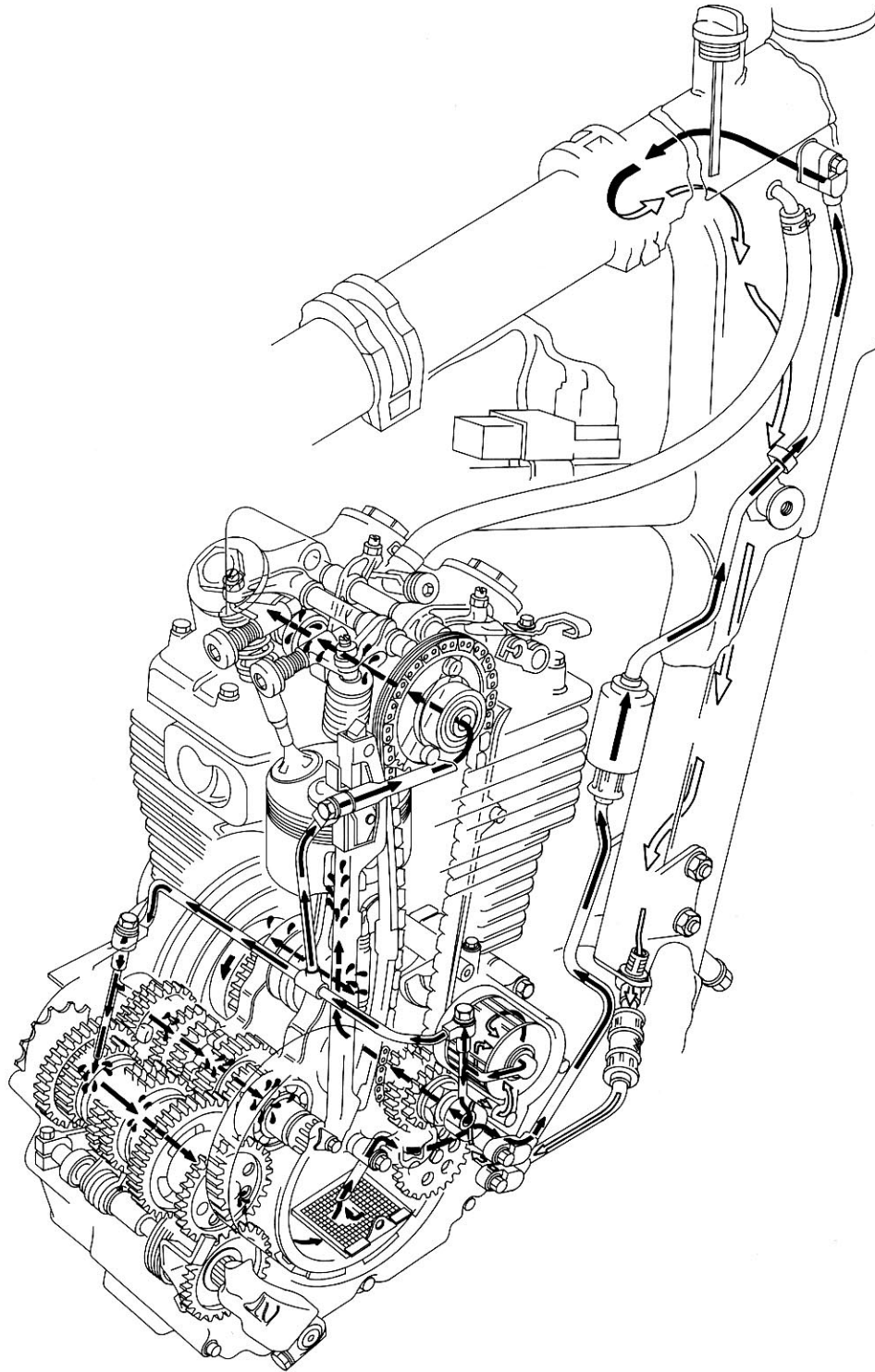
If the compression reading is not standard, the decompressor system did not work properly.

Low compression can be caused by:

- Improper valve adjustment
- Valve leakage
- Leakage cylinder head gasket
- Worn piston ring or cylinder
- Improper decompressor adjustment

High compression can be caused by:

- Carbon deposits in combustion chamber, or on the piston crown



# 4. LUBRICATION

SERVICE INFORMATION	4-1	OIL PUMP	4-3
TROUBLESHOOTING	4-1	OIL PASS PIPE	4-8
OIL STRAINER SCREEN CLEANING	4-2	OIL PIPES	4-9

## SERVICE INFORMATION

### GENERAL

#### ▲ WARNING

- *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.*

### SPECIFICATIONS

ITEM		SPECIFICATIONS	SERVICE LIMIT
Engine oil capacity	at draining	1.3 liter (1.37 US qt, 1.14 Imp qt)	——
	at disassembly	1.7 liter (1.79 US qt, 1.50 Imp qt)	——
	at oil filter change	1.4 liter (1.47 US qt, 1.23 Imp qt)	——
Recommended engine oil		Use Pro Honda GN4 or HP4 4-stroke Oil or equivalent API service Classification: SF or SG Viscosity: SAE 10W – 40 or 20W – 50	——
Oil pump rotor	Tip clearance	0.15 mm (0.006 in)	0.20 mm (0.008 in)
	Body clearance	0.15 – 0.22 mm (0.006 – 0.009 in)	0.25 mm (0.010 in)
	End clearance	0.02 – 0.09 mm (0.001 – 0.004 in)	0.12 mm (0.005 in)

### TORQUE VALUES

Crankcase oil drain bolt	25 N·m (2.5 kgf·m, 18 lbf·ft)
Down tube oil drain bolt	39 N·m (4.0 kgf·m, 29 lbf·ft)
Down tube oil strainer	54 N·m (5.5 kgf·m, 40 lbf·ft)
Oil pipe bolt (12 mm)	37 N·m (3.8 kgf·m, 27 lbf·ft)
Oil pass pipe joint bolt (7 mm)	12 N·m (1.2 kgf·m, 9 lbf·ft)
(8 mm)	12 N·m (1.2 kgf·m, 9 lbf·ft)

## TROUBLESHOOTING

#### Engine oil level too low – high oil consumption

- External oil leaks
- Worn piston rings
- Oil not changed often enough
- Faulty head gasket

#### Engine oil contamination

- Oil not changed often enough
- Head gasket faulty
- Worn piston rings

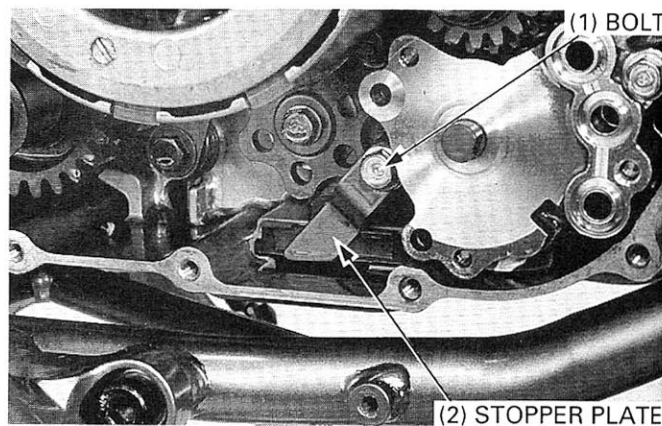
## OIL STRAINER SCREEN CLEANING

### At inside of right crankcase cover

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

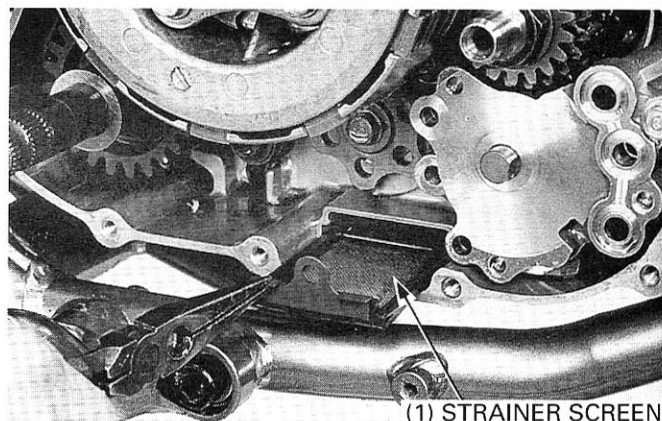
Remove the oil pump driven gear and O-ring (page 4-3).

Remove the bolt and stopper plate.



Remove the oil strainer screen and clean it.  
Install the oil strainer screen.

Install the right crankcase cover.



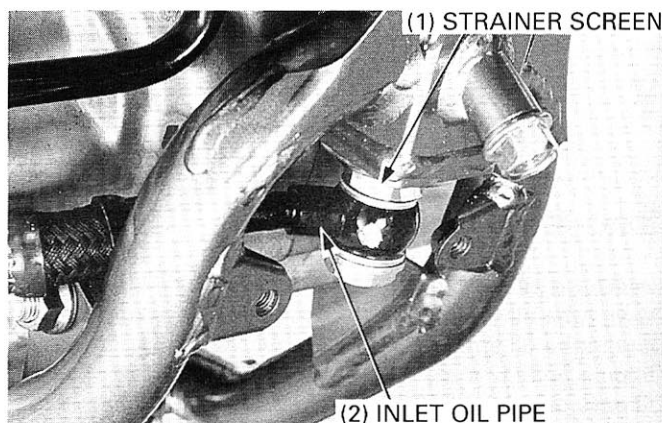
### At inside of down tube

#### NOTE

- Always clean the strainer screen at inside of down tube before adding engine oil.

Remove the inlet oil pipe (page 4-9).

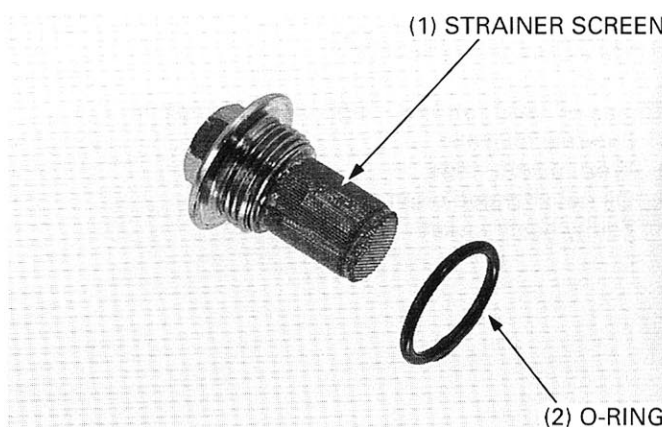
Remove the oil strainer screen and clean it.



Check the O-ring for damage, and replace if necessary.  
Install the oil strainer screen and tighten it to the specified torque.

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

Install the oil inlet pipe (page 4-11).

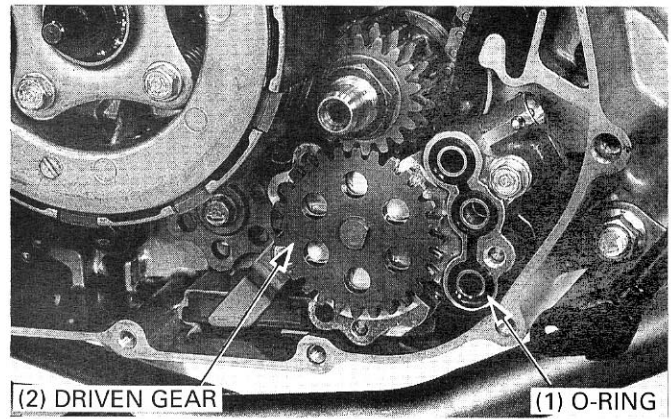


# OIL PUMP

## REMOVAL

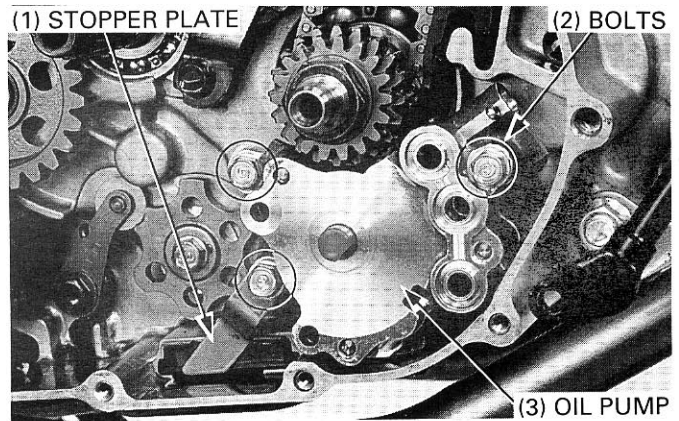
Remove the right crankcase cover (page 9-3).

Remove the O-ring.  
Remove the oil pump driven gear.

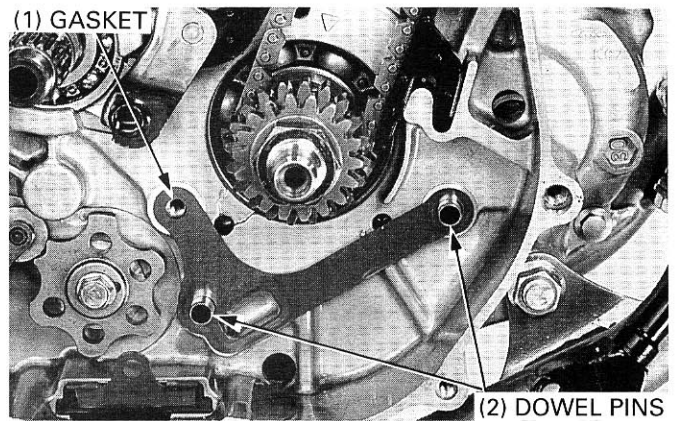


Remove the clutch (page 9-5).

Remove the oil pump bolts.  
Remove the stopper plate and oil pump.

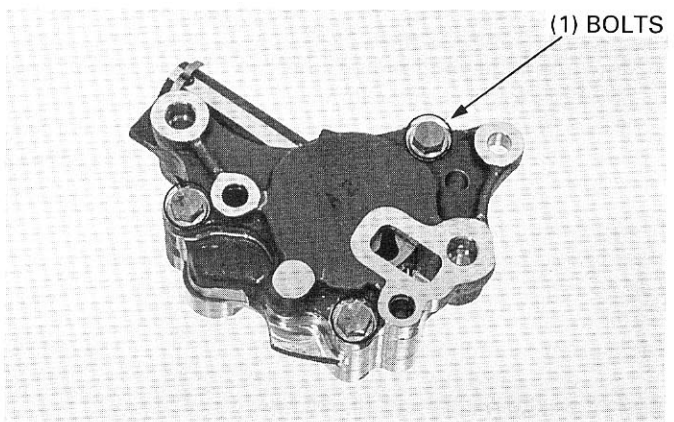


Remove the gasket and dowel pins.



## DISASSEMBLY

Remove the bolts.





## LUBRICATION

Remove the following:

### NOTE

- Note the location of all parts during disassembly so you can reinstall the parts in their same positions.

- Pump cover B
- Drive pin
- Spacer
- Outer rotor B
- Inner rotor B

- Pump cover A
- Outer rotor A
- Inner rotor A
- Drive pin
- Dowel pins
- Pump shaft

- Cotter pin
- Collar
- Spring
- Oil check valve
- Pump body

## INSPECTION

### NOTE

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

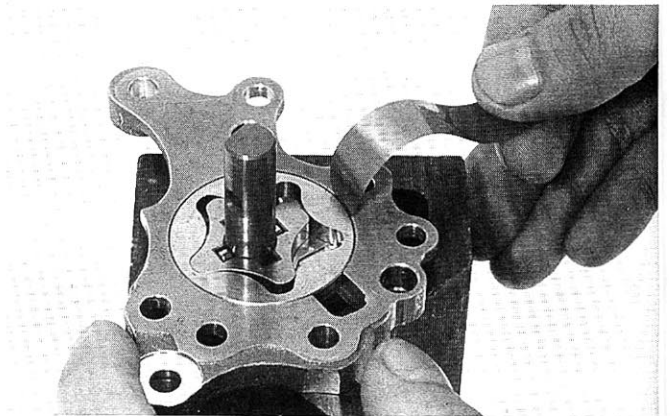
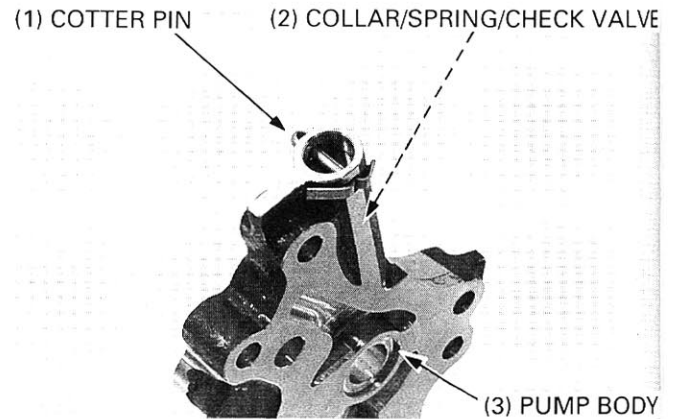
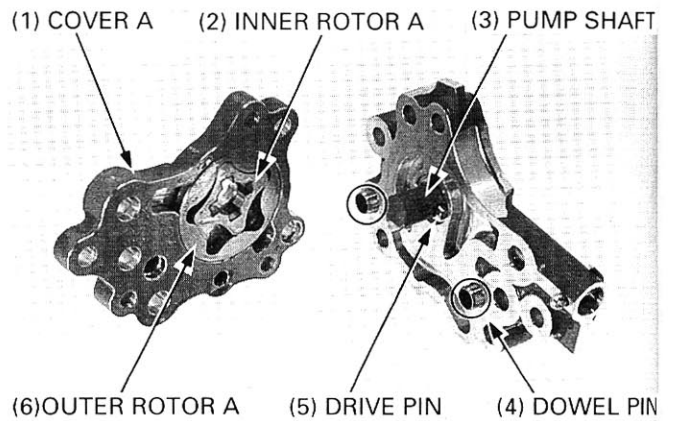
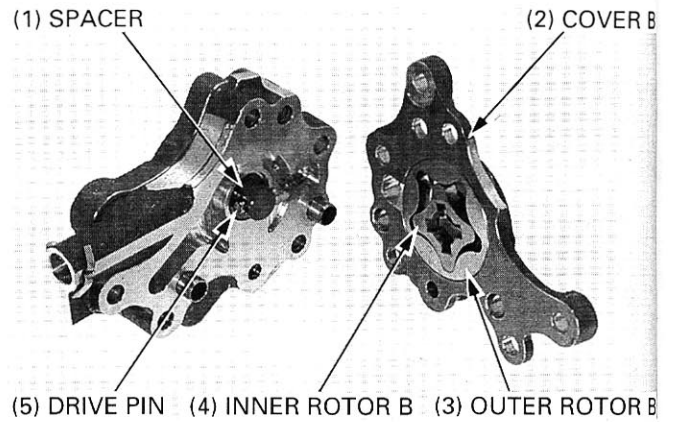
### Pump A

Install the inner rotor A and outer rotor A into the pump cover A.

Install the pump shaft securely.

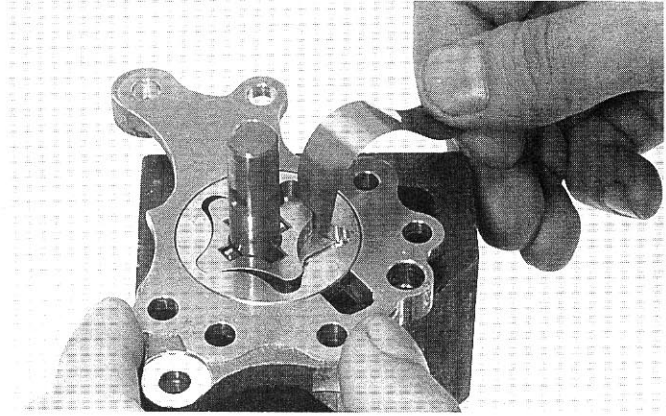
Measure the body clearance.

**SERVICE LIMIT: 0.25 mm (0.010 in)**



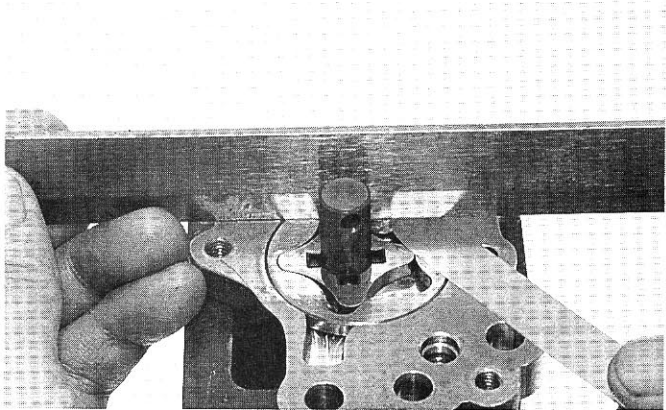
Install the inner rotor A and outer rotor A into the pump cover A.  
 Install the pump shaft securely.  
 Measure the tip clearance.

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



Install the inner rotor A and outer rotor A into the pump cover A.  
 Install the pump shaft securely.  
 Measure the end clearance.

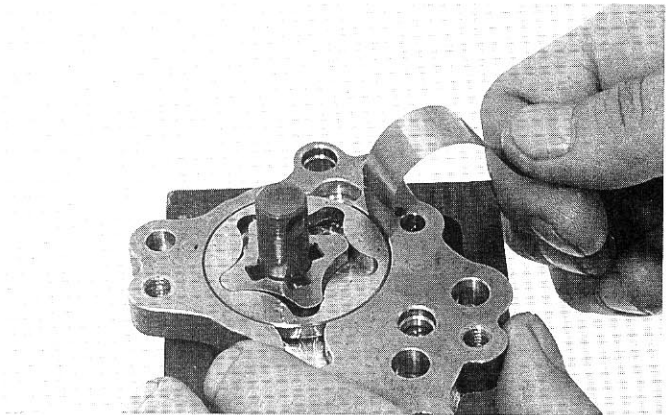
**SERVICE LIMIT: 0.12 mm (0.005 in)**



**Pump B**

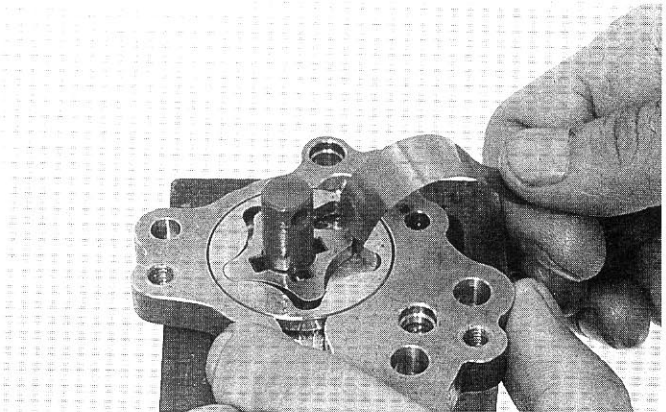
Install the inner rotor B and outer rotor B into the pump cover B.  
 Install the pump shaft securely.  
 Measure the body clearance.

**SERVICE LIMIT: 0.25 mm (0.010 in)**



Install the inner rotor B and outer rotor B into the pump cover B.  
 Install the pump shaft securely.  
 Measure the tip clearance.

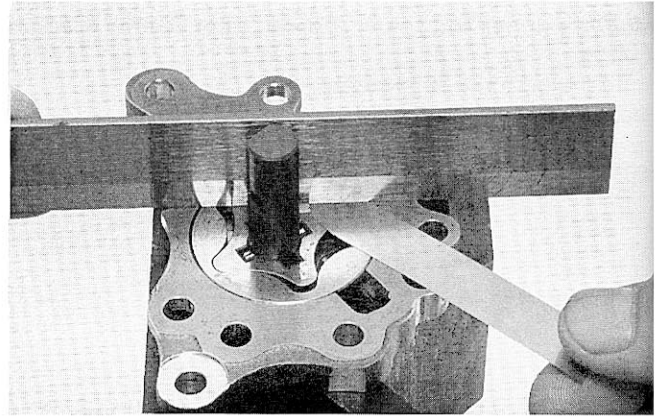
**SERVICE LIMIT: 0.20 mm (0.008 in)**



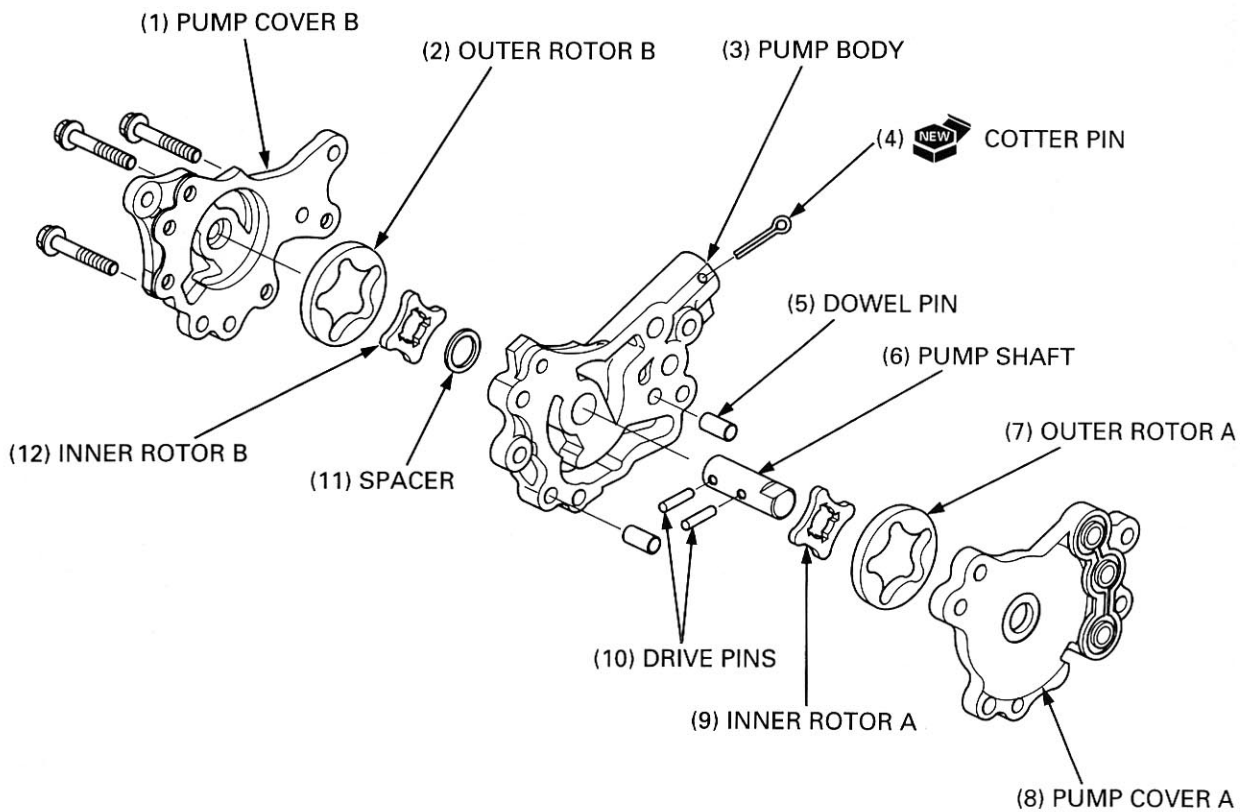
## LUBRICATION

Install the inner rotor B and outer rotor B into the pump cover B.  
Install the pump shaft securely.  
Measure the end clearance.

**SERVICE LIMIT: 0.12 mm (0.005 in)**

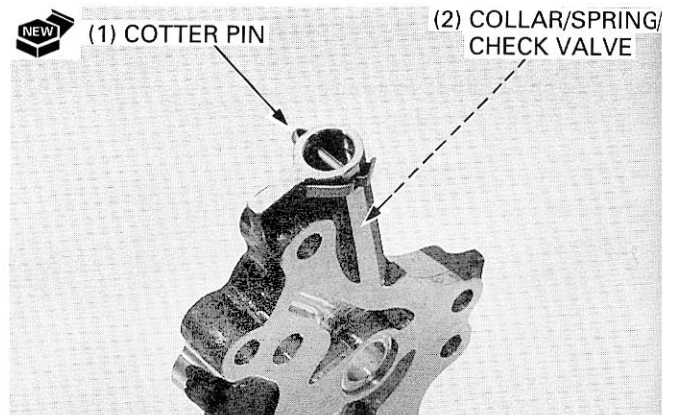


## ASSEMBLY



Install the following to the pump body.

- Oil check valve
- Spring
- Collar
- New cotter pin

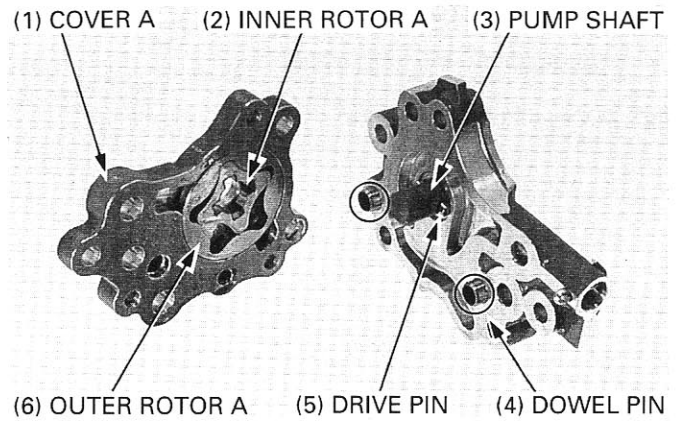


Install the following. Reinstall the parts in the same positions they were in.  
 — Pump shaft

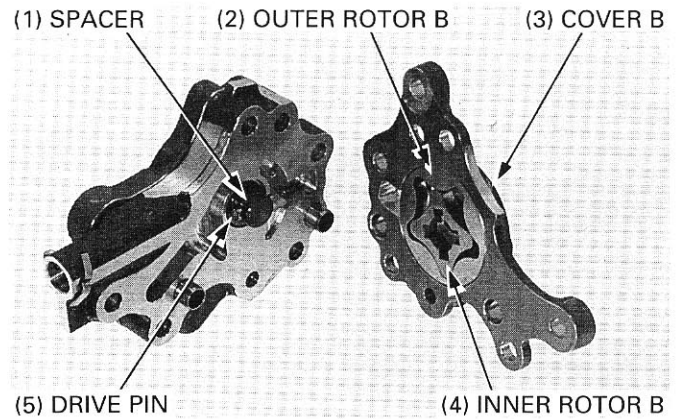
**NOTE**

- Install the pump shaft with the cutout side toward pump cover A.

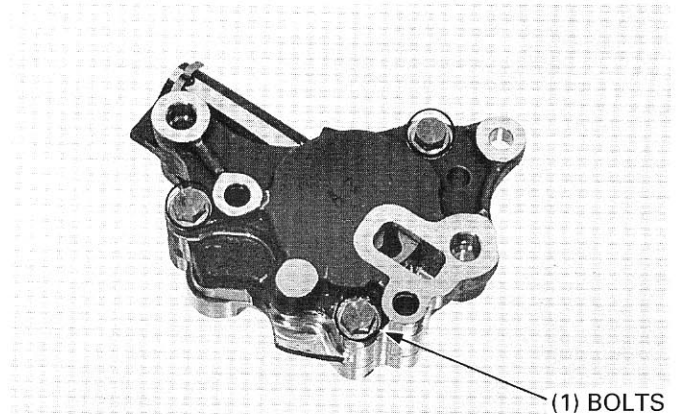
- Dowel pins
- Drive pin
- Inner rotor A
- Outer rotor A



- Inner rotor B
- Outer rotor B
- Spacer
- Drive pin
- Pump cover B

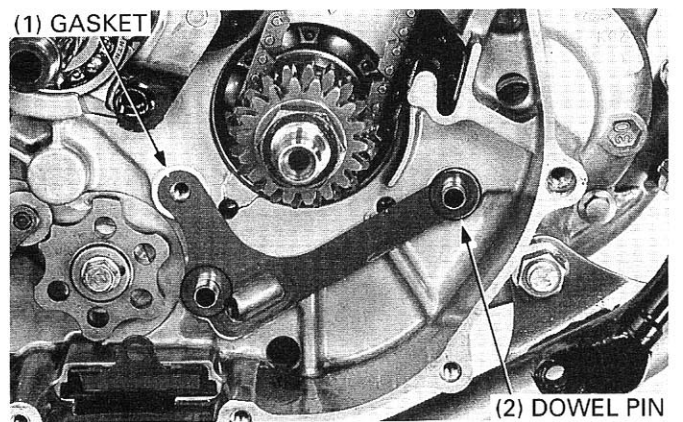


Tighten the bolts securely.



**INSTALLATION**

Install the gasket and dowel pins.

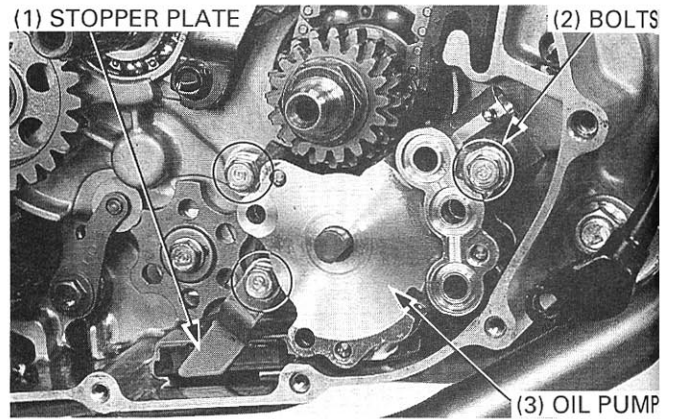




## LUBRICATION

Install the stopper plate and oil pump.  
Install and tighten the bolts securely.

Install the clutch (page 9-10).



Apply engine oil to a new O-ring and install it.  
Install the oil pump driven gear.

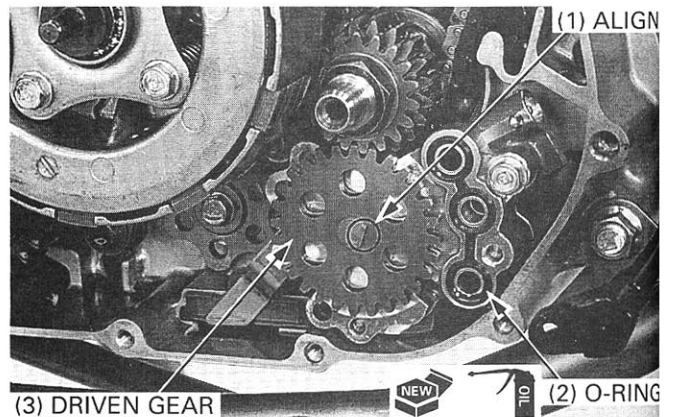
### NOTE

- Align the cutout of the oil pump driven gear shaft hole with the cutout of the pump shaft.

Install the right crankcase cover (page 9-17).

### NOTE

- Be careful not to let the O-ring fall.



## OIL PASS PIPE

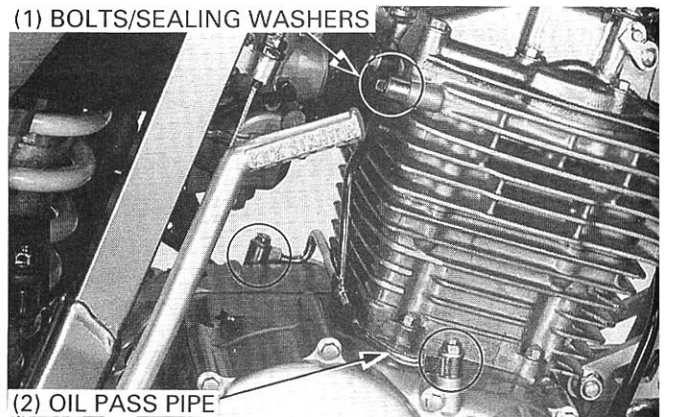
### REMOVAL

Remove the exhaust pipe (page 2-3).

Remove the oil pass pipe bolts and sealing washers.  
Remove the oil pass pipe.

### NOTE

- Do not bend the oil pass pipe.



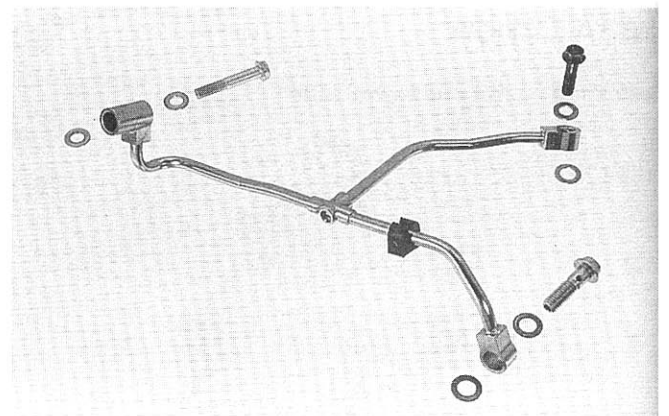
### INSPECTION

Check the oil pass pipe and pipe bolts for damage or bends and replace if necessary.

If clogged, clean with non-flammable or high flash point solvent.

### ⚠ WARNING

- Never use gasoline or low flash point solvents for cleaning the oil pass pipe. A fire or explosion could result.

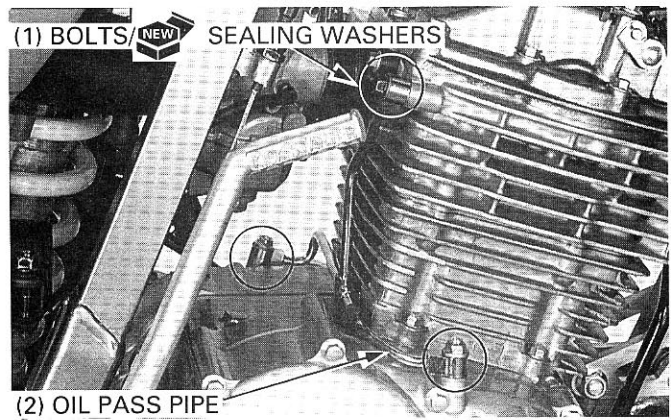


## INSTALLATION

Install the oil pass pipe.  
Install new sealing washers and the oil pass pipe bolts.  
Tighten the bolts to the specified torque.

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

Install the exhaust pipe (page 2-4).



## OIL PIPES

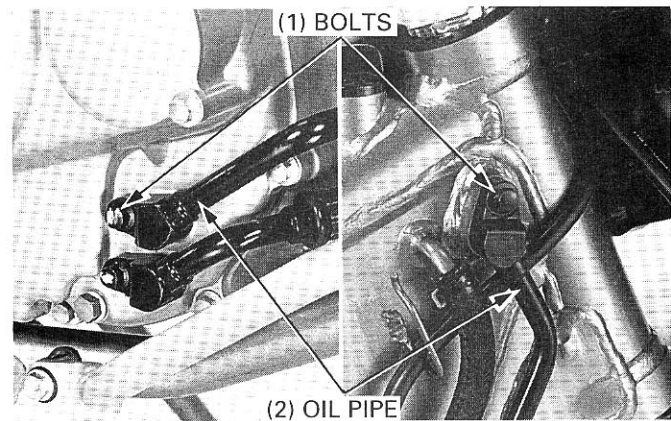
### REMOVAL

#### Outlet pipe

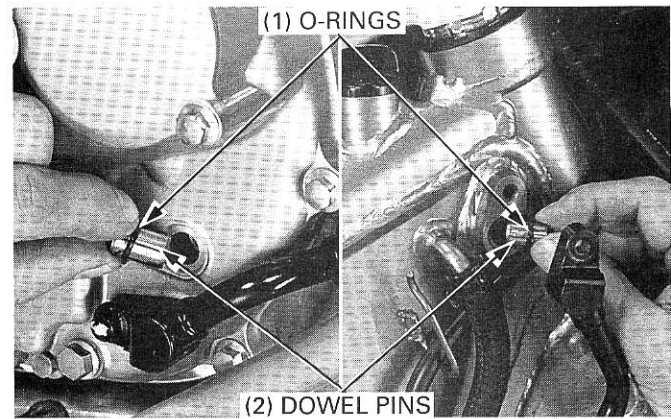
Remove the oil outlet pipe bolts and oil pass pipe.

#### NOTE

- Do not bend the oil outlet pipe.



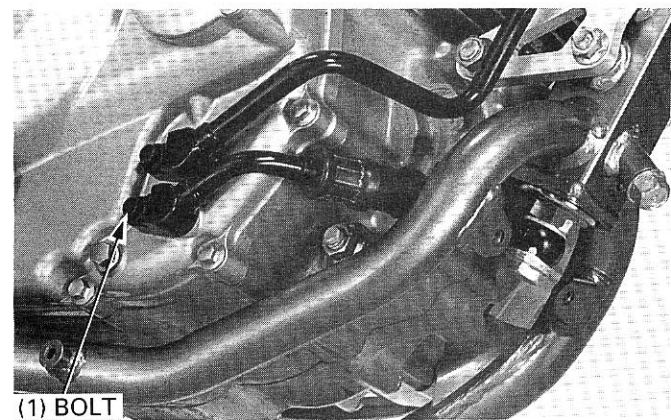
Remove the dowel pins and O-rings.



#### Inlet pipe

Remove the under guard (page 2-3).

Remove the oil inlet pipe bolt at the engine.





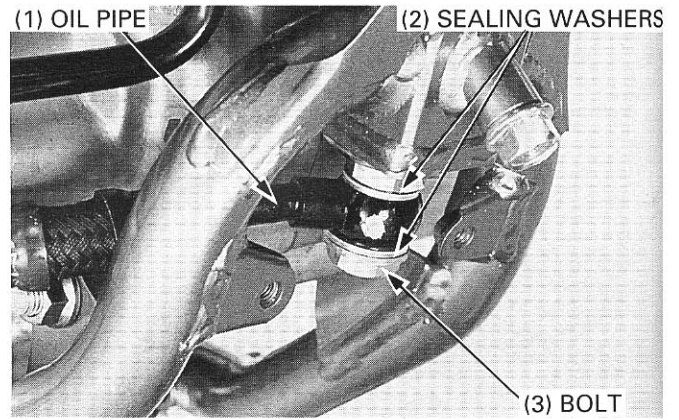
## LUBRICATION

Remove the oil inlet pipe bolt and sealing washers at the frame.

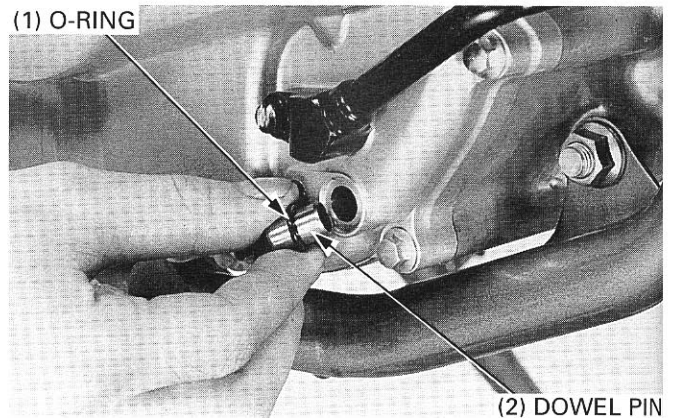
Remove the oil inlet pipe.

### NOTE

- Do not bend the oil inlet pipe.



Remove the dowel pin and O-ring.



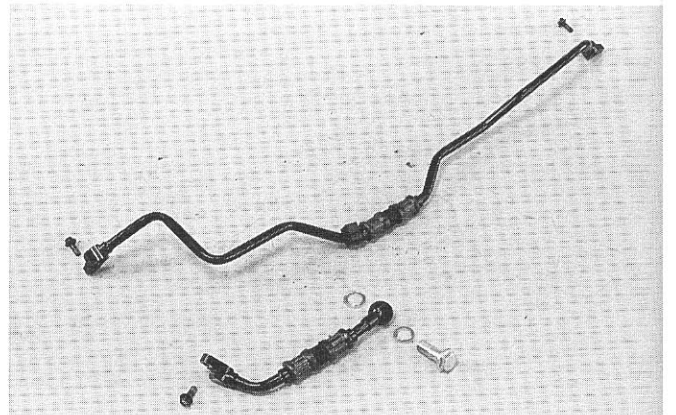
## INSPECTION

Check the oil pipe and pipe bolts for damage or bends and replace if necessary.

If clogged, clean with non-flammable or high flash point solvent.

### ⚠ WARNING

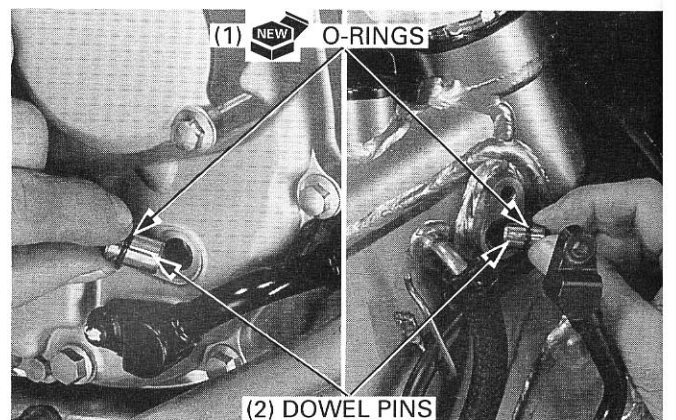
- *Never use gasoline or low flash point solvents for cleaning the oil pass pipe. A fire or explosion could result.*



## INSTALLATION

### Outlet pipe

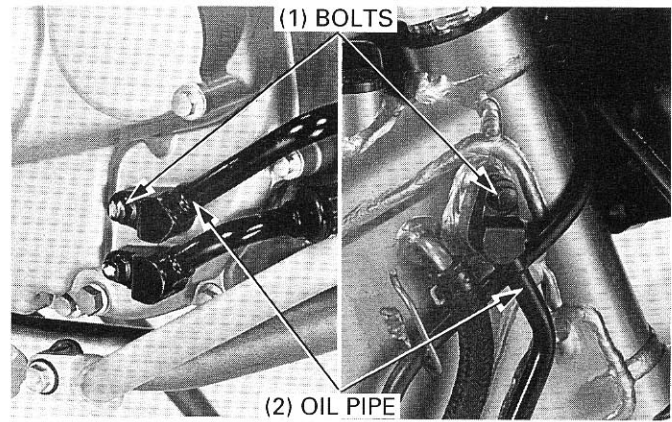
install the dowel pins and new O-rings.



Install the oil outlet pipe and oil pipe bolts.  
Tighten the bolts securely.

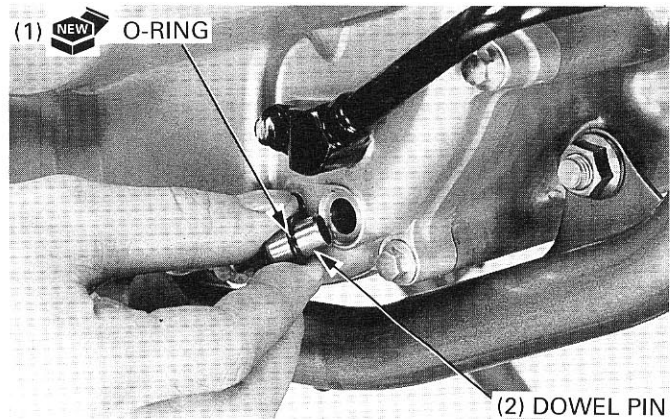
NOTE

- Do not bend the oil outlet pipe.



**Inlet pipe**

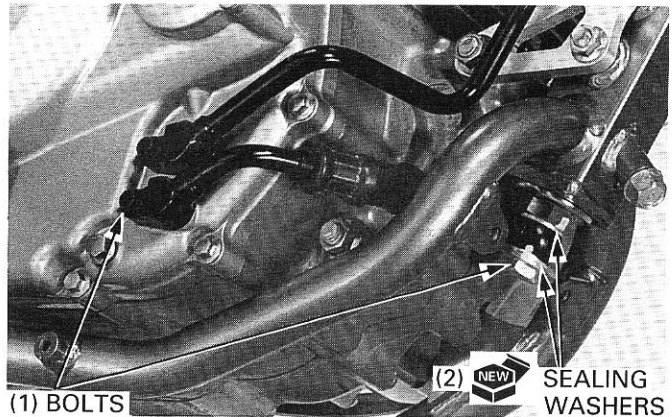
Install the dowel pin and a new O-ring.



Install the oil inlet pipe, new sealing washers and oil pipe bolts.  
Tighten both bolts securely.

NOTE

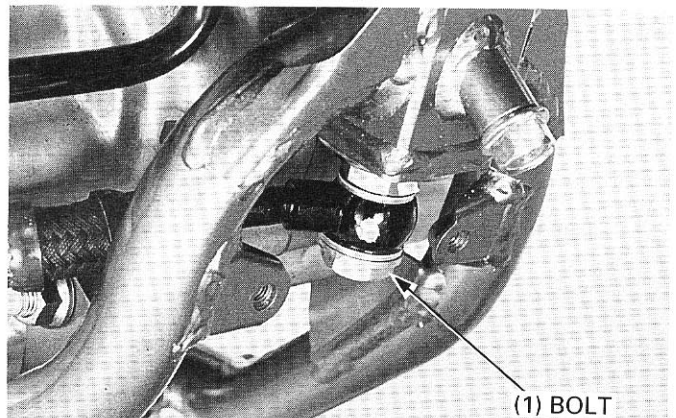
- Do not bend the oil inlet pipe.



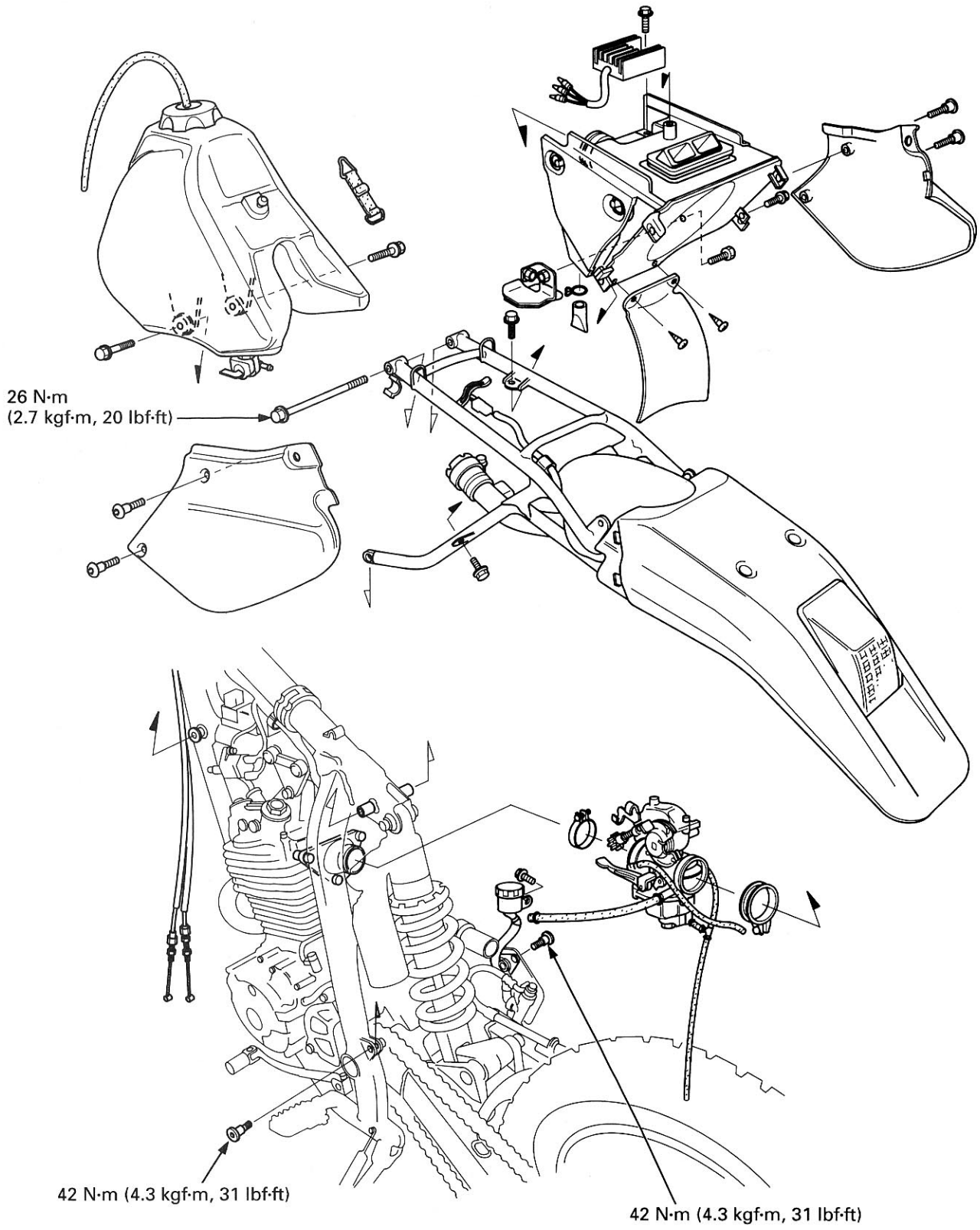
Tighten the oil inlet pipe bolt at the frame to the specified torque.

**TORQUE: 37 N·m (3.8 kgf·m, 27 lbf·ft)**

Install the under guard (page 2-3).



# FUEL SYSTEM



# 5. FUEL SYSTEM

SERVICE INFORMATION	5-1	CARBURETOR REMOVAL/ DISASSEMBLY	5-5
TROUBLESHOOTING	5-2	CARBURETOR ASSEMBLY/ INSTALLATION	5-8
FUEL TANK REMOVAL/ INSTALLATION	5-3	PILOT SCREW ADJUSTMENT	5-11
AIR CLEANER HOUSING REMOVAL/ INSTALLATION	5-3	TEMPERATURE AND ALTITUDE ADJUSTMENT	5-12
CRANKCASE BREATHER	5-5		

## SERVICE INFORMATION

### GENERAL

#### ▲ WARNING

- Gasoline is extremely flammable and is explosive under certain conditions. **KEEP OUT OF REACH CHILDREN.**
- If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that can 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.
- Bending or twisting the control cables will impair smooth operation and could cause the cables to stick or bind, resulting in loss of vehicle control.

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.

#### NOTE

- If the vehicle is to be stored more than one month, drain the float chamber. Fuel left in the float chamber may cause clogged jets, resulting in hard starting or poor driveability.
- Before disassembling the carburetor, place an approved gasoline container under the carburetor drain tube, loosen the screw and drain the carburetor.
- When disassembling the fuel system parts, note the locations of the O-rings. Replace them with new ones during reassembly.
- After removing the carburetor, wrap the intake port of the engine with a shop towel or cover it with a piece of tape to prevent any foreign material from dropping into the engine. Be sure to remove the cover when reinstalling the carburetor.

# FUEL SYSTEM

## SPECIFICATIONS

ITEM		SPECIFICATIONS
Carburetor identification number	'96 – '97	PDG1A
	After '97/Except California type	PDG1A
	After '97/California type	PDG1C
Main jet	'96 – '97	#132
	After '97/Except California type	#132
	After '97/California type	#122
Slow jet		#45
Jet needle clip position		3rd groove from top
Pilot screw initial opening		see page 5-11
Float level		12.5 mm (0.49 in)
Idle speed		1,300 ± 100 rpm
Throttle grip free play		2 – 6 mm (1/12 – 1/4 in)

## TORQUE VALUES

Rear frame upper mounting bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)
lower side mounting bolt	42 N·m (4.3 kgf·m, 31 lbf·ft)

## TOOL

### Common

Carburetor float level gauge	07401 – 0010000
------------------------------	-----------------

## TROUBLESHOOTING

### Engine cranks but won't start

- No fuel to carburetor
- Engine flooded with fuel
- No spark at plug (ignition system faulty)
- Clogged air cleaner
- Intake air leak
- Improper choke operation
- Improper throttle operation

### Engine idles roughly, runs poorly or stalls

- Improper choke operation
- Ignition malfunction
- Fuel contaminated
- Intake air leak
- Incorrect idle speed
- Incorrect pilot screw adjustment
- Low cylinder compression
- Choke stuck open
- Rich mixture
- Lean mixture
- Clogged carburetor

### Misfiring during acceleration

- Ignition system faulty
- Lean mixture

### Afterburn during acceleration

- Ignition system faulty
- Lean mixture

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

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

### Afterfiring

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

### Lean mixture

- Clogged fuel jets
- Faulty float valve
- Float level too low
- Blocked fuel fill cap air vent hole
- Clogged fuel strainer screen
- Restricted fuel line
- Clogged air vent tube
- Intake air leak

### Rich mixture

- Clogged air cleaner
- Worn jet needle or needle jet
- Faulty float valve
- Float level too high
- Choke stuck open

### Incorrect fast idle speed

- Choke stuck open
- Worn piston rings



## FUEL TANK REMOVAL/INSTALLATION

### REMOVAL

**▲ WARNING**

- Gasoline is extremely flammable and is explosive under certain conditions. Work in a well ventilated area with the engine stopped. Do not allow flames or sparks in your working area or where gasoline is stored.
- Wipe up spilled gasoline at once.

Remove the seat (page 2-2).  
Turn the fuel valve OFF and disconnect the fuel line.  
Remove the mounting strap, bolts and fuel tank.

Check that fuel flows out of the fuel valve freely.  
If flow is restricted, clean the fuel strainer (page 3-6).

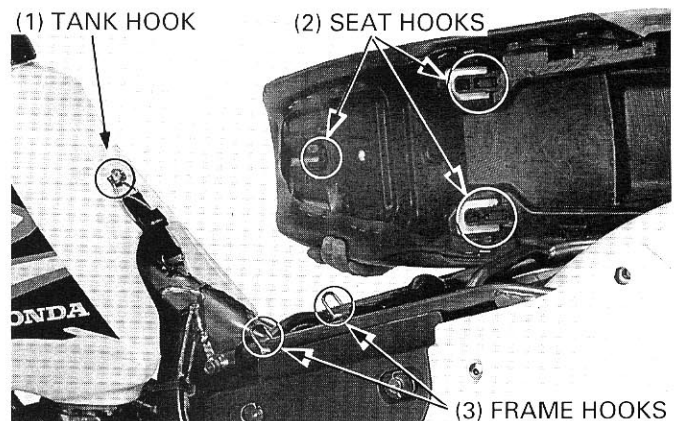
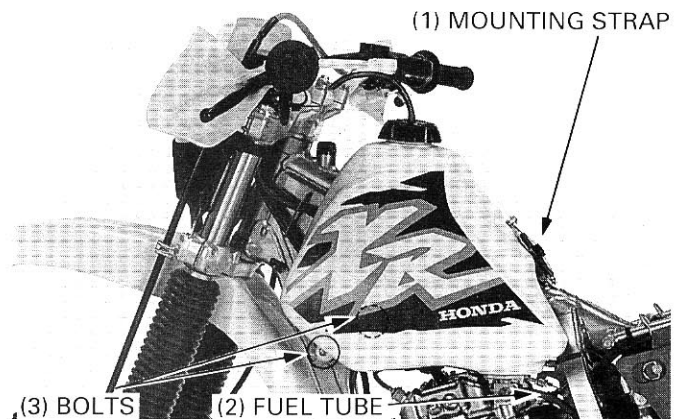
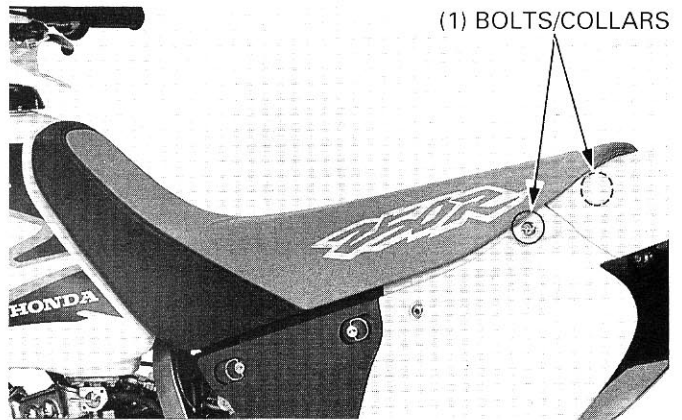
### INSTALLATION

Install the fuel tank with the two mounting bolts and strap.  
Connect the fuel line.

**NOTE**

- Do not overtighten the fuel valve screws.
- After assembling, make sure there are no fuel leaks.

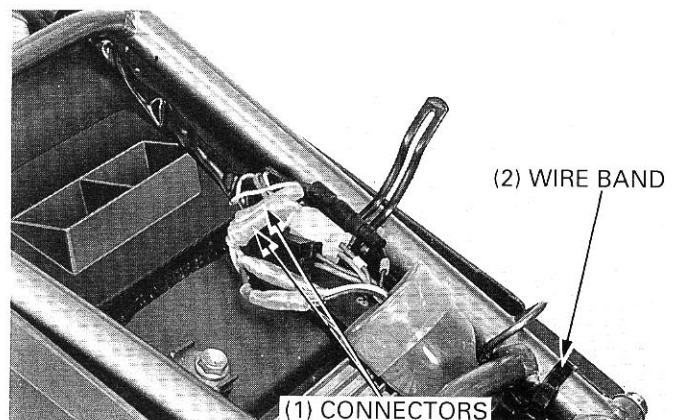
Install the seat (page 2-2).



## AIR CLEANER HOUSING REMOVAL/INSTALLATION

### REMOVAL

Disconnect the alternator connector.  
Disconnect the ignition pulse generator 2P connector.  
Disconnect the AC regulator connector.  
Remove the wire band.





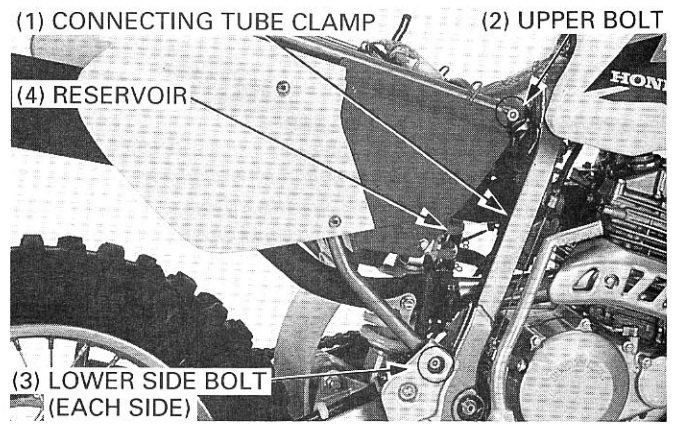
## FUEL SYSTEM

Remove the rear brake reservoir mounting bolt.

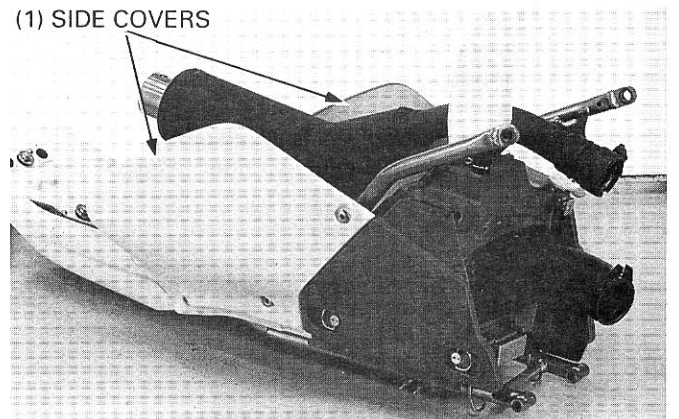
### NOTE

- Be sure the reservoir is level before removing the reservoir, so the fluid doesn't spill.

Loosen the connecting tube clamp and remove the connecting tube from the carburetor.  
Remove the rear frame upper and lower side mounting bolts.  
Remove the air cleaner housing and rear frame assembly.

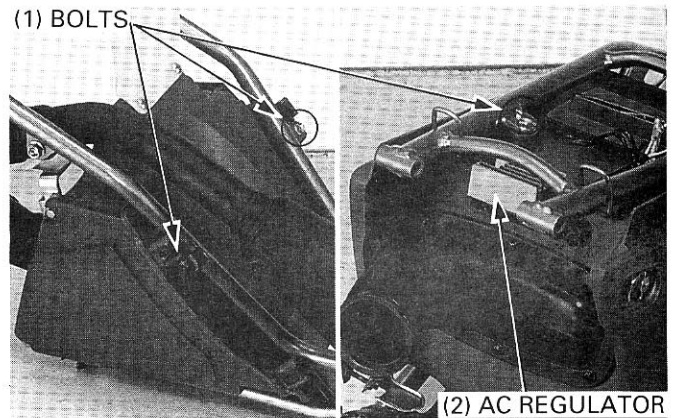


Remove the right and left side covers.



Remove the bolts and air cleaner housing from the sub-frame.

- Remove the following:  
— AC regulator



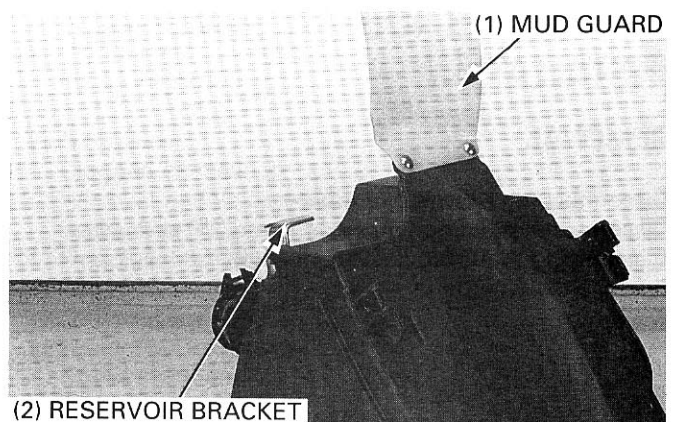
- Mud guard
- Rear brake reservoir bracket

## INSTALLATION

Installation is in the reverse order of removal.

### TORQUE:

- Rear frame lower side mounting bolt:  
42 N·m (4.3 kgf·m, 31 lbf·ft)  
upper mounting bolt:  
26 N·m (2.7 kgf·m, 20 lbf·ft)



# CRANKCASE BREATHER

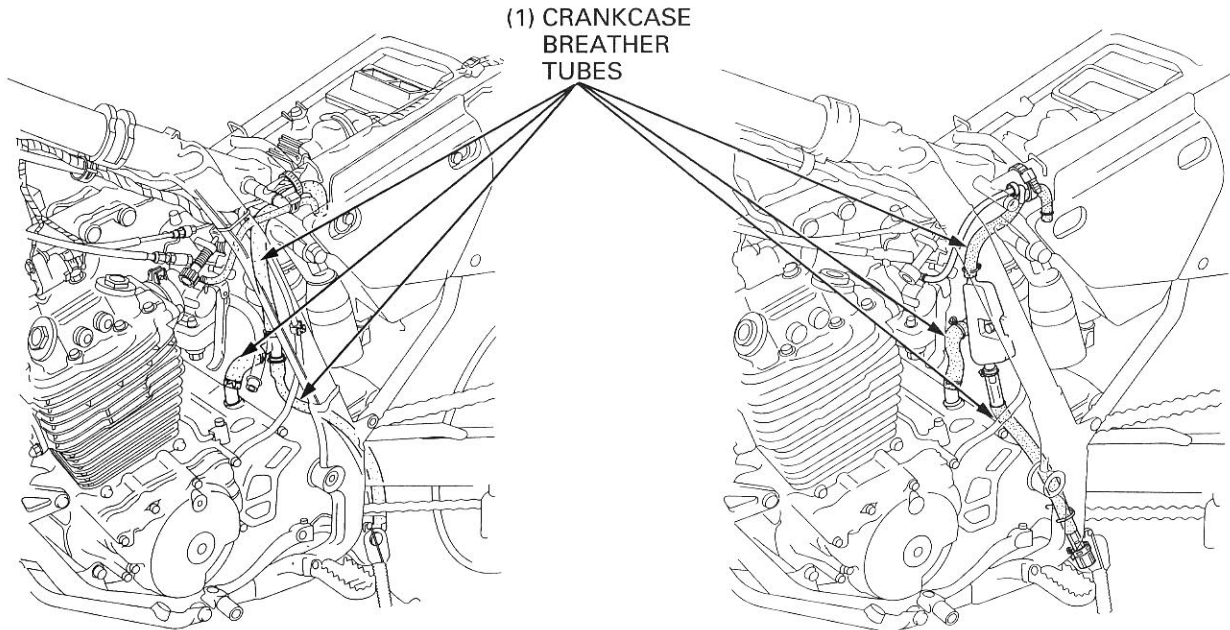
## INSPECTION

Route the crankcase breather tube as shown.  
Check the crankcase breather tube for kinks or clogs.

'96 - '97:

After '97/Except California type:

After '97/California type:



# CARBURETOR REMOVAL/DISASSEMBLY

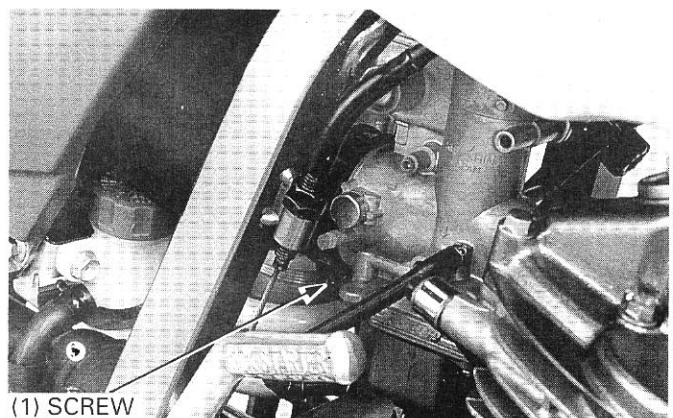
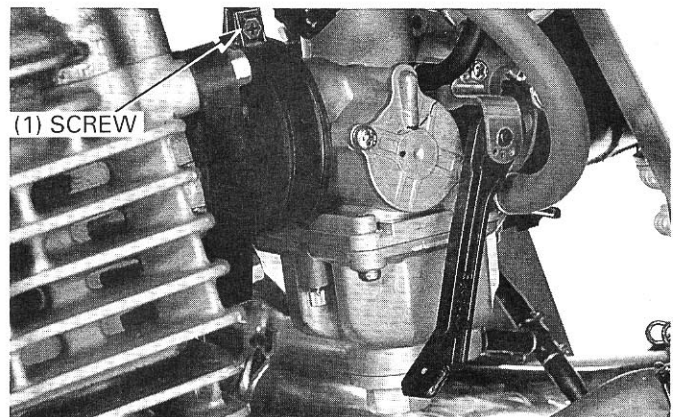
## REMOVAL

**⚠ WARNING**

- Gasoline is extremely flammable and is explosive under certain conditions. Work in a well ventilated area with the engine stopped. Do not allow flames or sparks in your working area or where gasoline is stored.
- Wipe up spilled gasoline at once.

Turn the fuel valve OFF.  
Place a suitable gasoline container under the drain tube and loosen the drain screw to drain the fuel.  
Loosen the carburetor insulator clamp screw and connecting tube clamp screw.

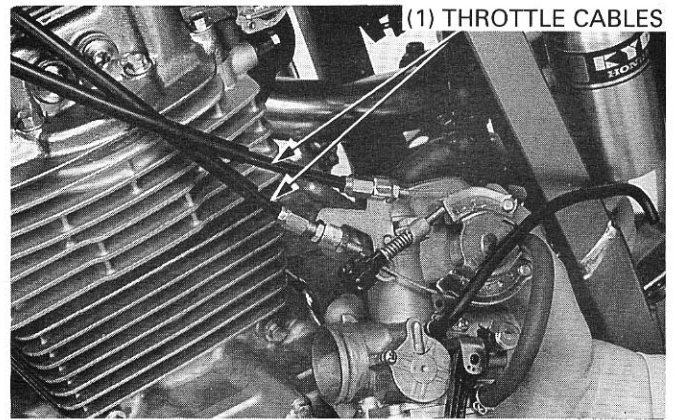
Remove the carburetor to the left.



## FUEL SYSTEM

Remove the over flow/drain tube, air vent tubes and fuel line from the carburetor.

Remove the throttle cables from the carburetor.



### DISASSEMBLY

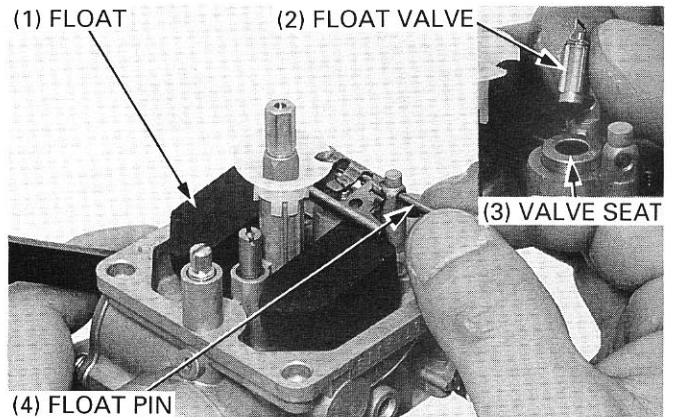
Remove the following:

- Float chamber screws
- Float chamber
- Float pin
- Float
- Float valve

Check the float for damage.

Check the float valve and its seat for grooves, nicks, or contamination.

Check the operation of the float valve.



Remove the following:

- Baffle plate
- Main jet
- Needle jet holder
- Needle jet

### NOTE

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

### CAUTION

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

- Slow jet
- Pilot screw
- Spring, washer and O-ring

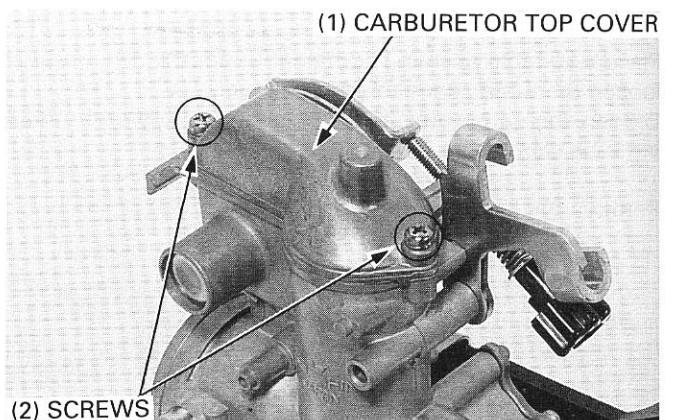
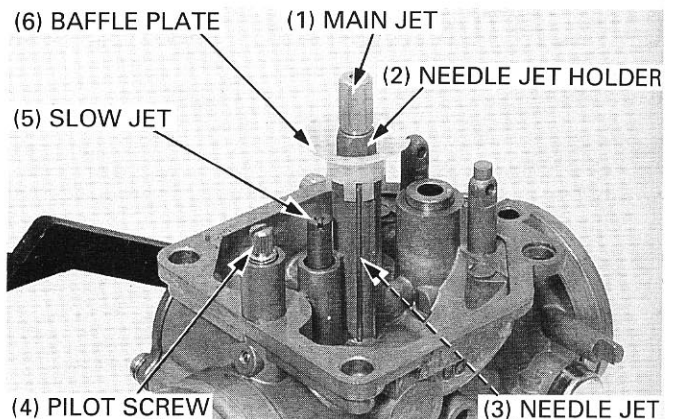
Inspect the following:

Check the main jet and slow jet for clogs.  
Check the pilot screw for damage.

Blow open all jets with compressed air.

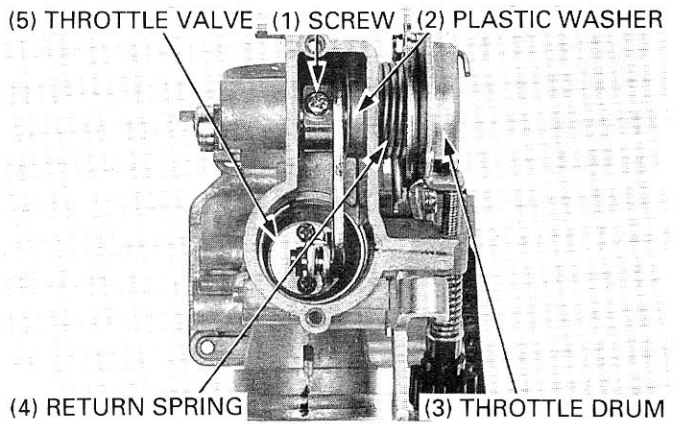
Remove the following:

- Carburetor top cover screws
- Carburetor top cover

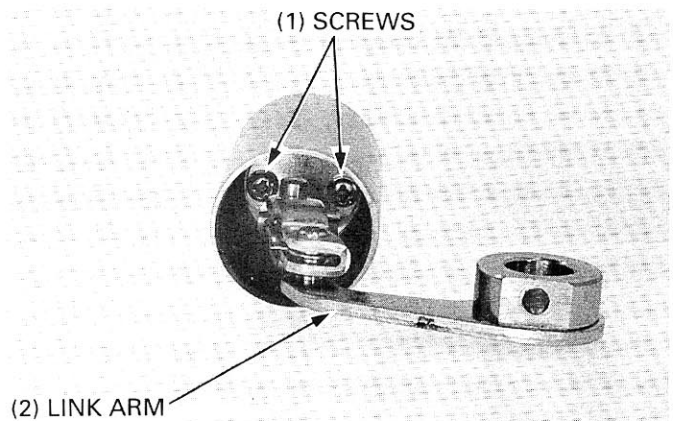


Remove the following:

- Link arm set screw
- Throttle drum assembly
- Return spring
- Plastic washer
- Throttle valve assembly

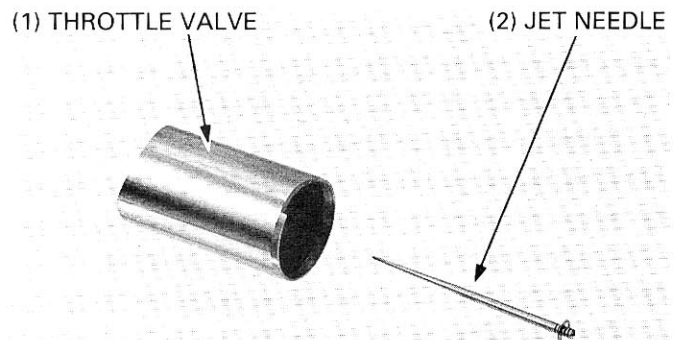


Remove the two screws attaching the link arm to the throttle valve and separate the link arm from the throttle valve.



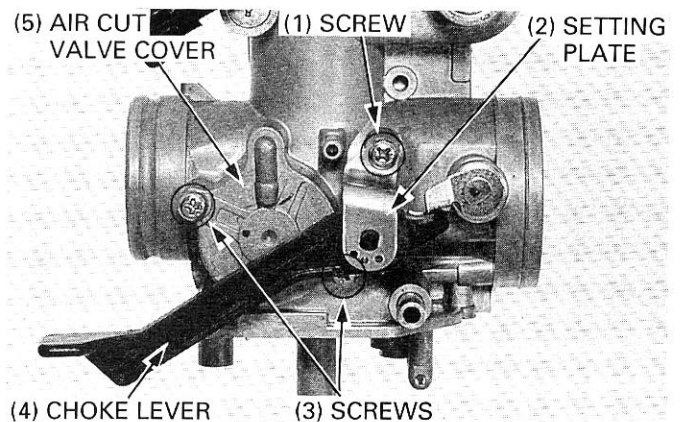
Remove the jet needle.

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



Remove the following:

- Choke lever setting plate screw
- Choke lever setting plate
- Choke lever
- Air cut-off valve cover setting screws
- Air cut-off valve cover
- Spring
- Diaphragm and U-ring

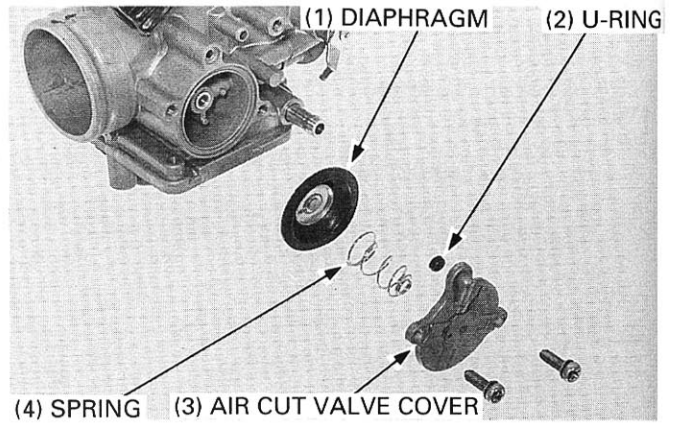




## FUEL SYSTEM

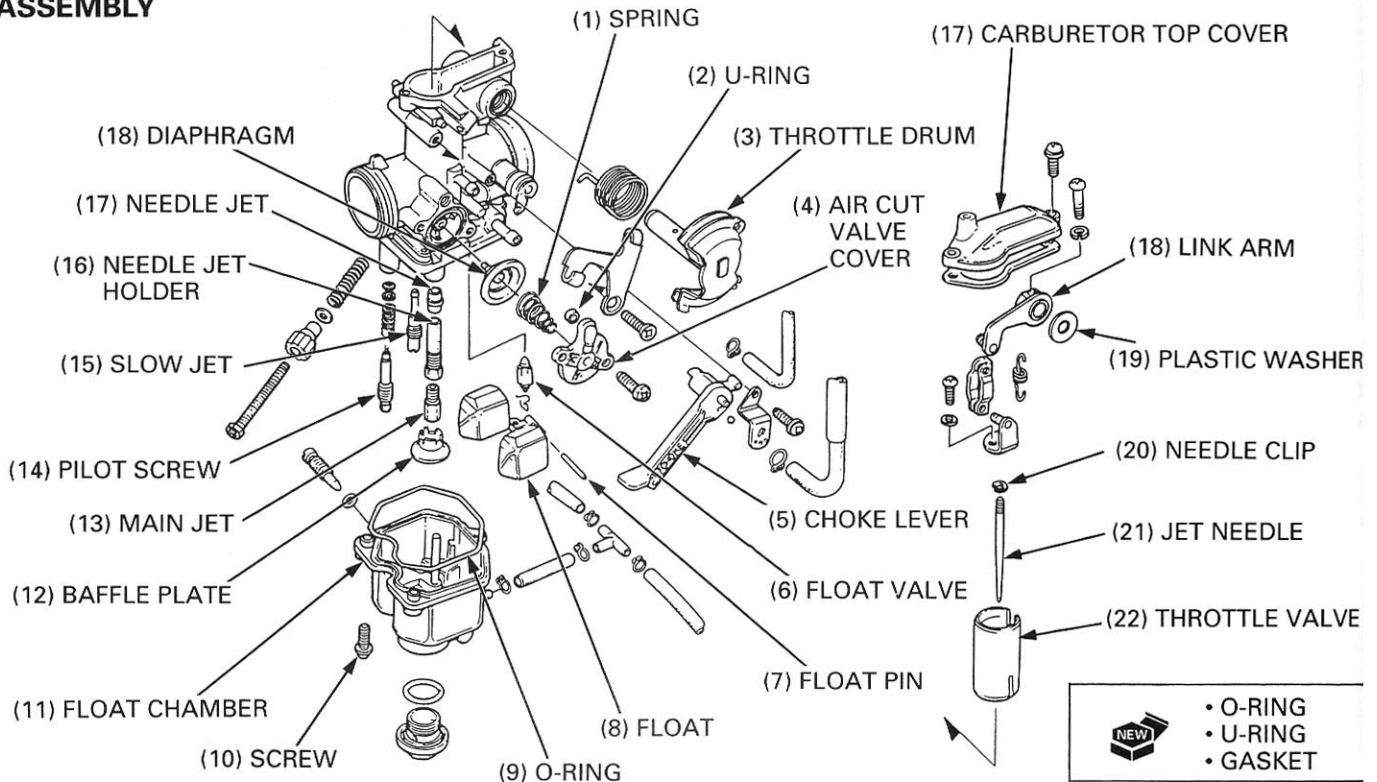
Check the diaphragm for damage.

Blow open all passages with compressed air before installing jets and valves.



## CARBURETOR ASSEMBLY/ INSTALLATION

### ASSEMBLY

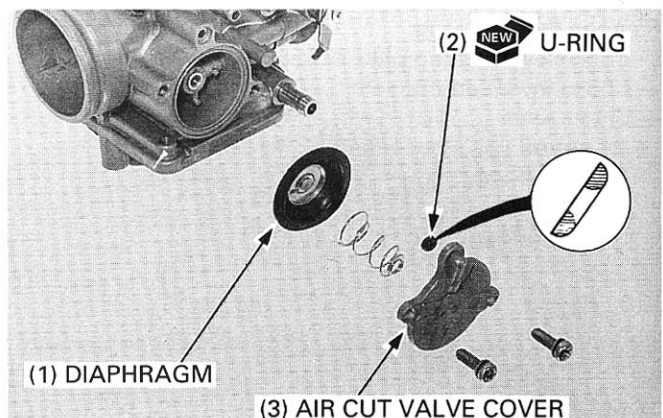


Install the following:  
— Diaphragm and U-ring

### NOTE

- Install the U-ring with its flat side toward the carburetor body as shown.

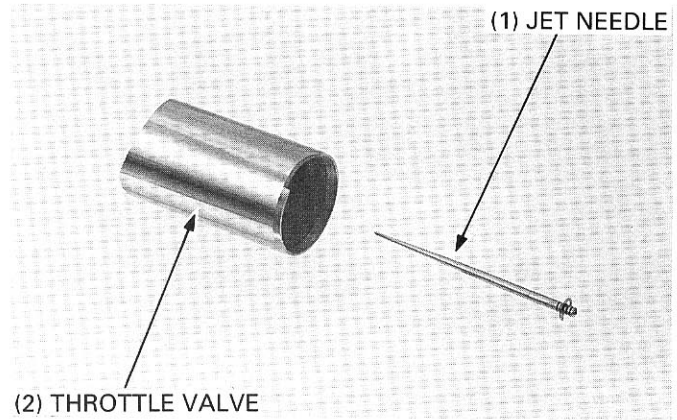
- Spring
- Air cut-off valve cover and screws
- Choke lever
- Setting plate and screw



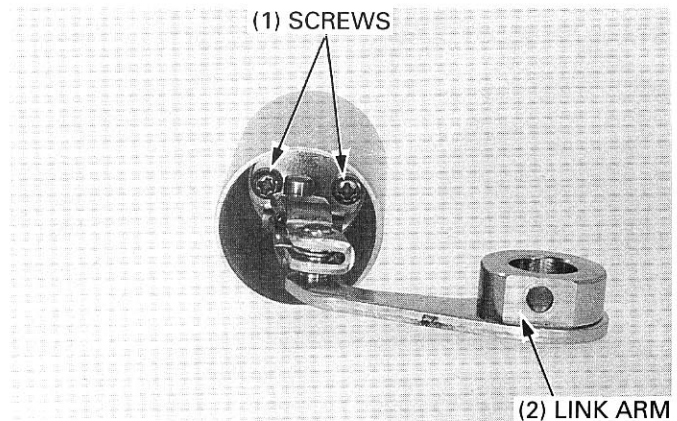
Install the needle clip on the jet needle.

**STANDARD: 3rd groove from top**

Install the jet needle in the throttle valve.



Assemble link arm to the throttle valve.  
Tighten the two screws securely.

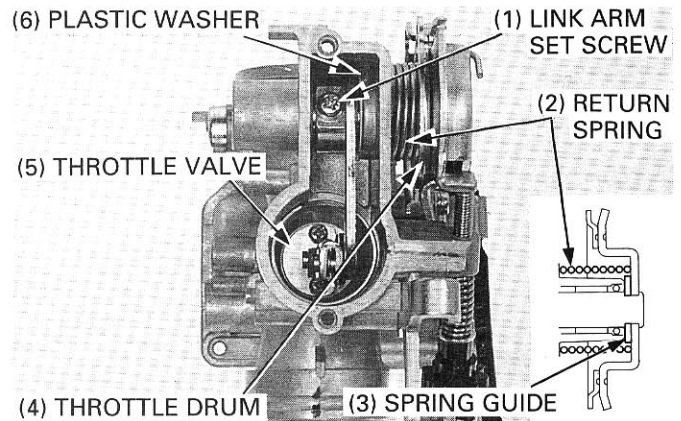


Install the following:

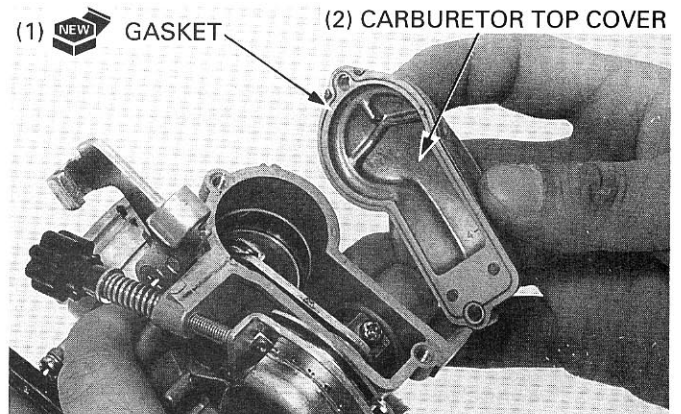
- Throttle valve assembly
- Plastic washer
- Return spring
- Throttle drum assembly
- Link arm set screw

**NOTE**

- Return spring shall not hang over spring guide on the throttle drum.
- Align the hole in the link arm with the threaded hole in the link arm shaft and install the set screw.



Install a new gasket and carburetor top cover.





## FUEL SYSTEM

Install the following:

- Slow jet
- Needle jet
- Needle jet holder
- Main jet
- New O-ring
- Washer
- Spring
- Pilot screw
- Baffle plate

### NOTE

- Return the pilot screw to its original position as noted during removal.

### STANDARD PILOT SCREW INITIAL OPENING: 1-3/4 turns out

Install the following:

- Float valve
- Float
- Float pin

### Float level inspection

### NOTE

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

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

Make sure the float level with the float level gauge.

**FLOAT LEVEL: 12.5 mm (0.49 in)**

### TOOL:

**Carburetor float level gauge      07401 – 0010000**

If the level is out of specification, adjust the float level by carefully bending the float tang.

Install a new O-ring.

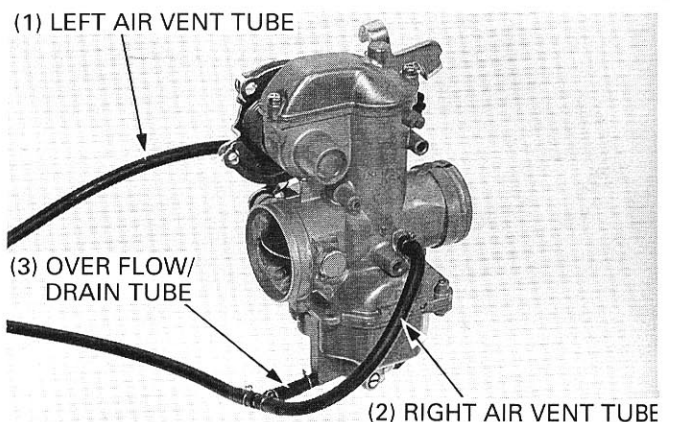
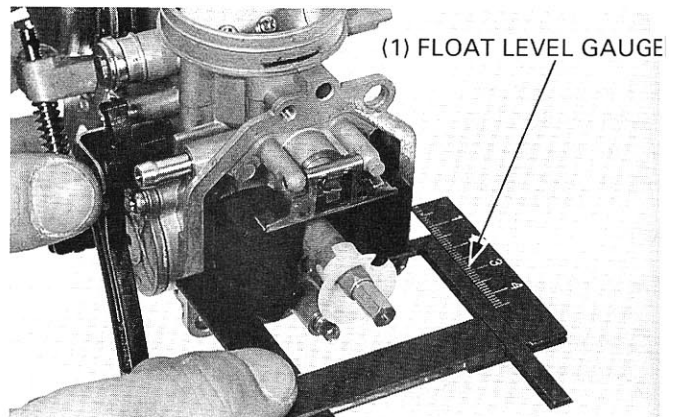
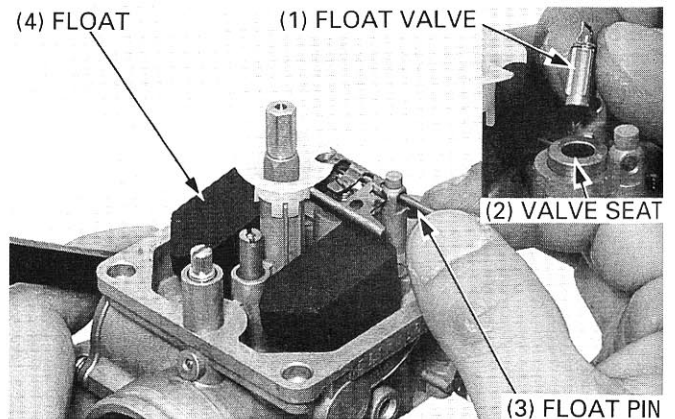
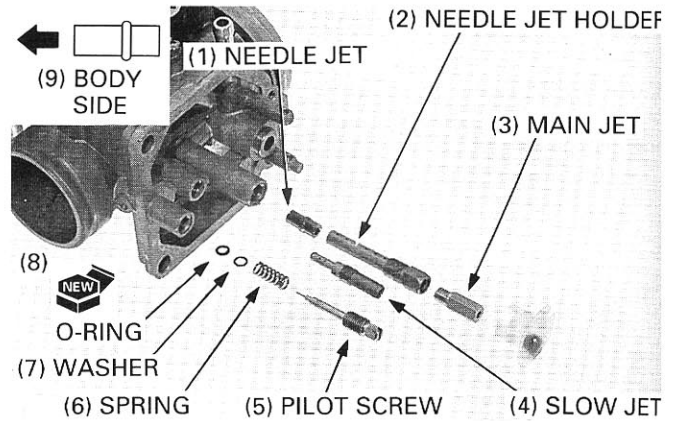
Install the float chamber with four screws and tighten it.

## INSTALLATION

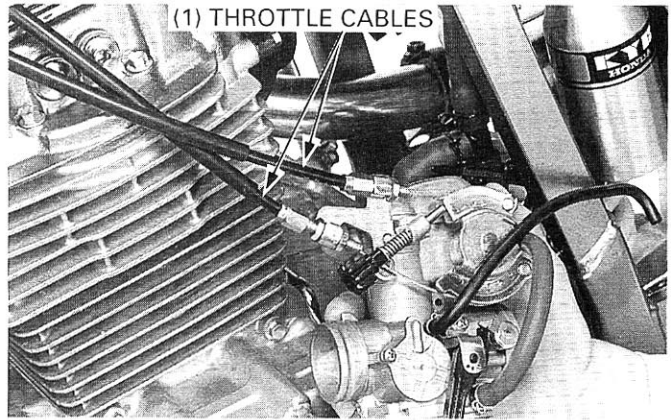
Install the over flow/drain tube, air vent tubes and fuel line. Connect the throttle cables to the carburetor.

### NOTE

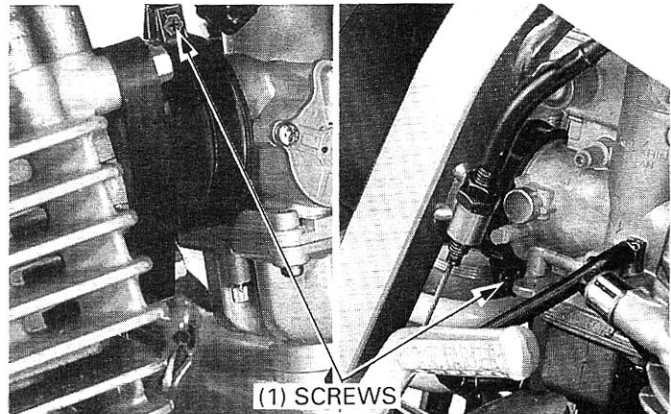
- Route the cables and tubes properly (page 1-21).



Install the carburetor from the left side of the engine. Tighten the carburetor insulator clamp screw and connecting tube clamp screw.



Perform the following inspections and adjustments.  
 — Throttle operation (page 3-6)  
 — Pilot screw adjustment (below)



## PILOT SCREW ADJUSTMENT

### BEST IDLE PROCEDURE ('96 – '97)

#### NOTE

- The pilot screw is factory pre-set. Adjustment is not necessary unless the carburetor is overhauled or a new pilot screw is installed.

#### CAUTION

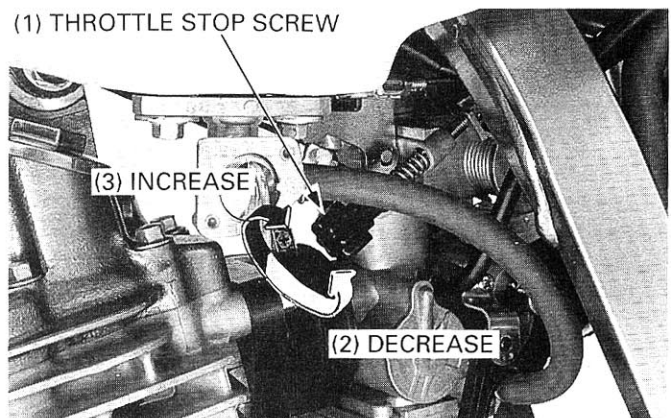
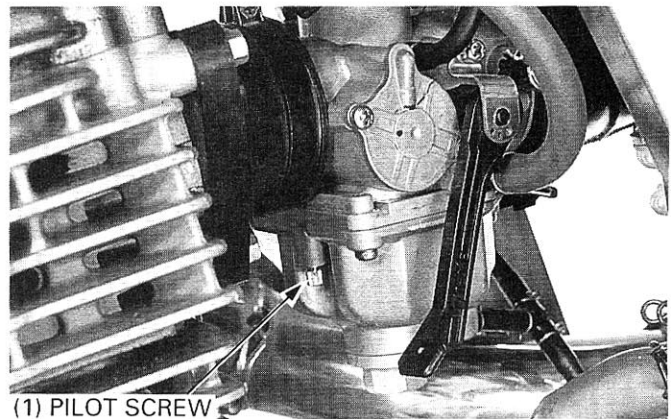
- *Tightening the pilot screw hard against its seat will damage the seat.*

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

#### PILOT SCREW OPENING: 1-3/4 turns out

2. Warm up the engine to operating temperature. Ten minutes of stop and go driving is sufficient.
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: 1,300 ± 100 rpm**



## FUEL SYSTEM

5. Turn the pilot screw in or out slowly to obtain the highest engine speed.
6. Readjust the idle speed to the specified value with the throttle stop screw.
7. Make sure that the engine does not miss or run erratically. Repeat steps 5 and 6 until engine speed increases smoothly.

### IDLE DROP PROCEDURE (AFTER '97)

#### ⚠ WARNING

- *If the engine must be running some work, make sure the area is well-ventilated. Never run the engine in an enclosed area.*
- *The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and may lead to death.*

#### NOTE

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

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

**INITIAL OPENING: Except California type: 1-3/4 turns out**  
**California type: 1-3/8 turns out**

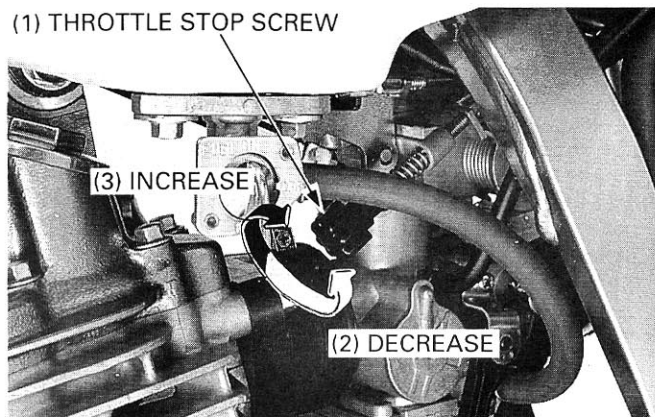
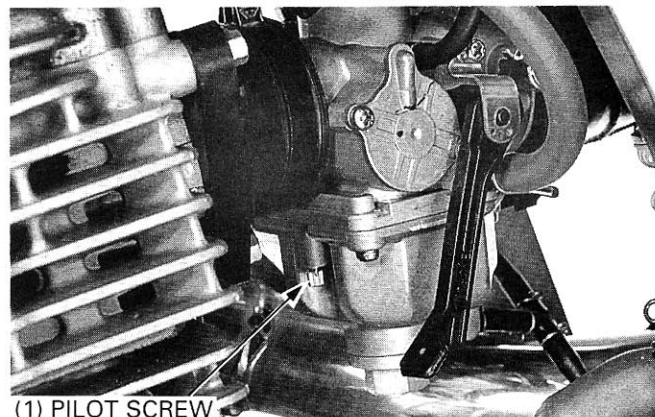
#### CAUTION

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

2. Warm up the engine to operating temperature. Stop and go riding for 10 minutes is sufficient.
3. Attach a tachometer according to its manufacturer's instructions.
4. Start the engine and adjust the engine idle speed to the specified rpm with the throttle stop screw.

**IDLE SPEED: 1,300 ± 100 rpm**

5. Turn the pilot screw in or out slowly to obtain the highest engine speed.
6. Readjust the idle speed with the throttle stop screw.
7. Lightly open the throttle 2 – 3 times, then adjust the idle speed with the throttle stop screw.



8. Turn the pilot screw in gradually until the engine speed drops 100 rpm.
9. Turn the pilot screw counterclockwise the number of turns to the specification given.

**FINAL OPENING: Except California type: 3/4 turn out**  
**California type: 1/4 turn out**

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

## TEMPERATURE AND ALTITUDE ADJUSTMENT

Use the chart on the right to determine if carburetor adjustments are necessary because of changes in temperature and altitude.

Draw a line straight up from your temperature to your altitude.

Where those lines intersect, draw a horizontal line straight to the left. Where that line meets the left edge of the chart is your correction factor.

To adjust the main jet size, multiply the standard main jet size by your correction factor.

If the correction factor is 0.95, or below, raise the jet needle clip by one position and turn in the pilot screw 1/2 turn.

If the correction factor is above 0.95, adjustments to the jet needle and pilot screw are not necessary.

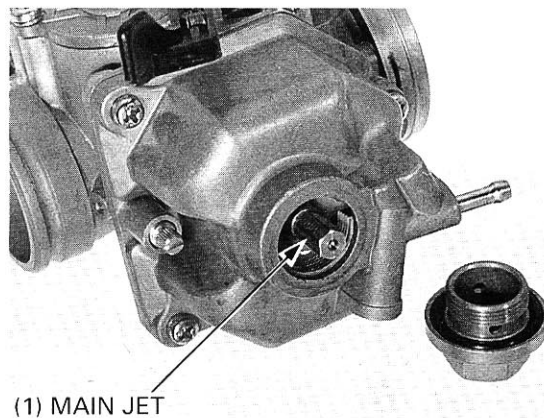
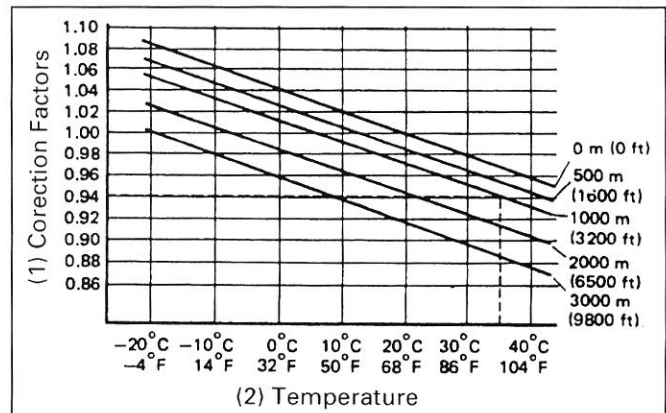
### For example

At a temperature of 35°C (95°F) and an altitude of 1,000 m (3,200 ft), carburetor recommendations are as follows:

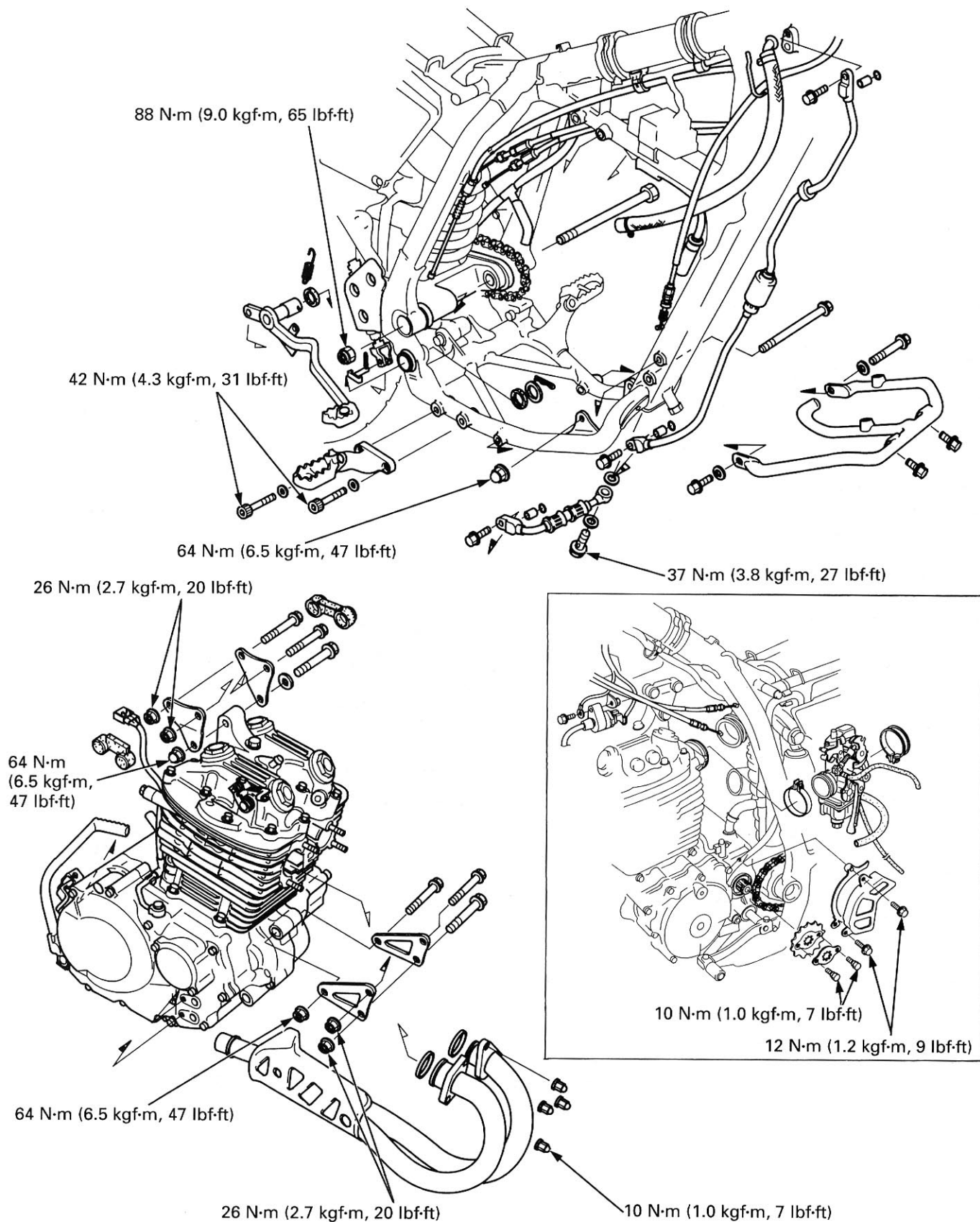
- **Correction factor = 0.94**
- **Main jet**  
 $132 \times 0.94 = \#124$
- **Jet needle clip position**  
 3rd groove from top minus 1 = 2nd groove from top
- **Pilot screw opening**  
 $1\text{-}3/4$  minus  $1/2 = 1\text{-}1/4$  turns out

### Standard carburetor settings:

- |                                   |               |
|-----------------------------------|---------------|
| Main jet: '96 - '97:              | #132          |
| After '97/Except California type: | #132          |
| After '97/California type:        | #122          |
| Jet needle clip position:         | 3rd groove    |
| Pilot screw opening:              | see page 5-11 |



# ENGINE REMOVAL/INSTALLATION





# 6. ENGINE REMOVAL/INSTALLATION

<b>SERVICE INFORMATION</b>	<b>6-1</b>	<b>ENGINE INSTALLATION</b>	<b>6-5</b>
<b>DRIVE SPROCKET REMOVAL</b>	<b>6-2</b>	<b>DRIVE SPROCKET INSTALLATION</b>	<b>6-6</b>
<b>ENGINE REMOVAL</b>	<b>6-3</b>		

## SERVICE INFORMATION

### GENERAL

- During removal and installation, support the motorcycle with a work stand or box.
- A jack or adjustable support is required to maneuver the engine.
- The following components can be serviced with the engine installed in the frame.
  - Oil pump (Section 4)
  - Cylinder head/valves (Section 7)
  - Cylinder/piston (Section 8)
  - Clutch/kickstarter/gearshift linkage (Section 9)
  - Alternator (Section 10)
- The following components require engine removal for service.
  - Crankshaft/balancer (Section 11)
  - Transmission/shift forks/shift drum (Section 12)

### SPECIFICATIONS

ITEM		SPECIFICATIONS
Engine oil capacity	at draining	1.3 liter (1.37 US qt, 1.14 Imp qt)
	at disassembly	1.7 liter (1.79 US qt, 1.50 Imp qt)
	at oil filter change	1.4 liter (1.47 US qt, 1.23 Imp qt)
Engine dry weight		33.7 kg (74.3 lbs)

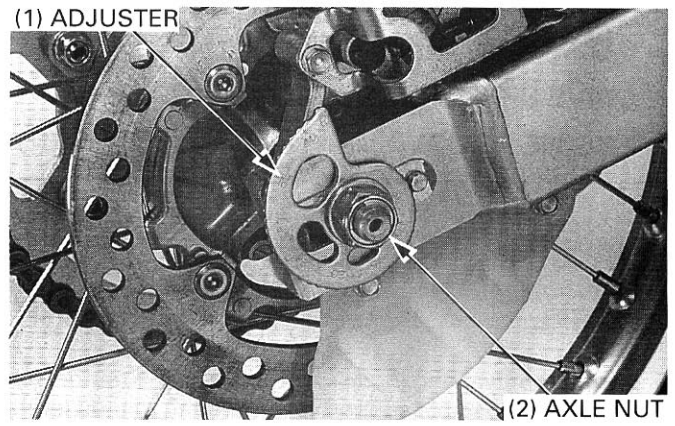
### TORQUE VALUES

Swingarm pivot nut	88 N·m (9.0 kgf·m, 65 lbf·ft)
Engine hanger plate bolt (10 mm)	64 N·m (6.5 kgf·m, 47 lbf·ft)
(8 mm)	26 N·m (2.7 kgf·m, 20 lbf·ft)
Right foot peg mounting bolt	42 N·m (4.3 kgf·m, 31 lbf·ft)
Drive sprocket bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)
Drive sprocket cover bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)

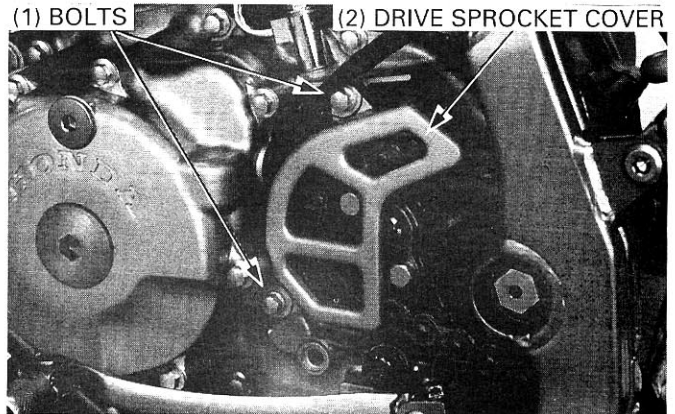


## **DRIVE SPROCKET REMOVAL**

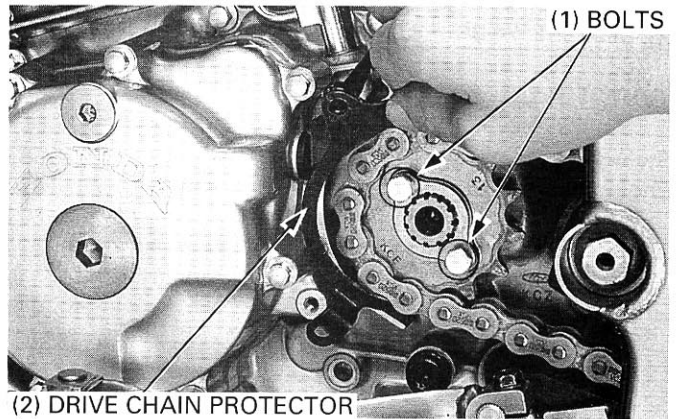
Loosen the rear axle nut and turn the drive chain adjusters to loosen the drive chain.



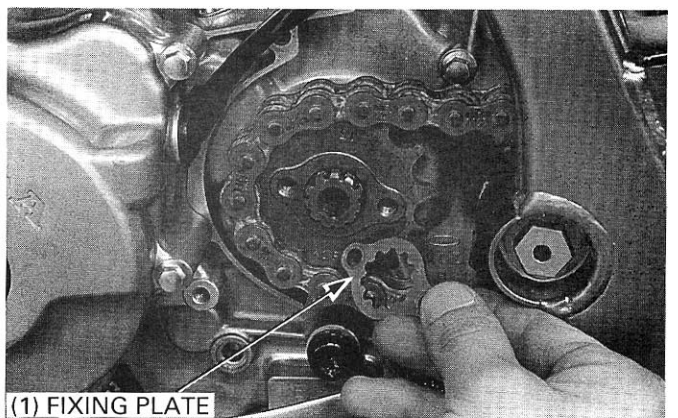
- Remove the following:
- Drive sprocket cover bolts
  - Drive sprocket cover



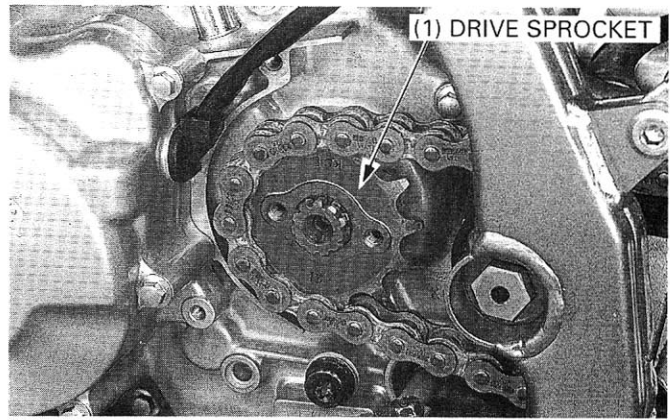
- Drive chain protector
- Drive sprocket bolts



- Fixing plate



- Drive sprocket

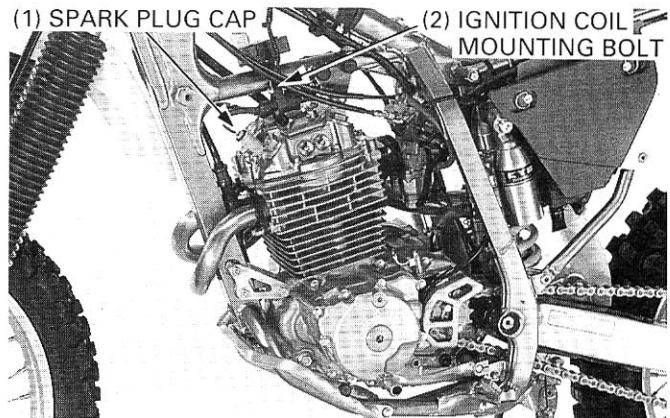


## ENGINE REMOVAL

Drain the engine oil (page 3-11).

Remove the following:

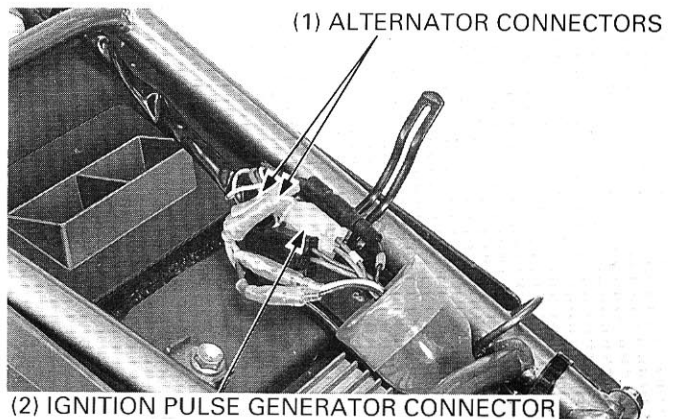
- Seat (page 2-3)
- Fuel tank (page 5-3)
- Drive sprocket (page 6-2)
- Carburetor (page 5-5)
- Spark plug cap
- Clutch cable (page 9-3)
- Decompressor cable (page 7-3)
- Ignition coil mounting bolt/ground cable



Disconnect the following:

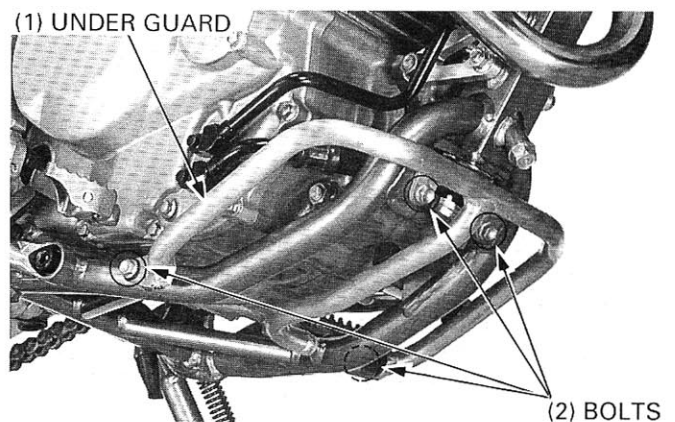
- Alternator connectors (P and Y wires)
- Ignition pulse generator 2P connector
- Exciter coil connector (BI/R wire)

Remove the wire band and unhook the harness clip from the frame down tube.



Remove the following:

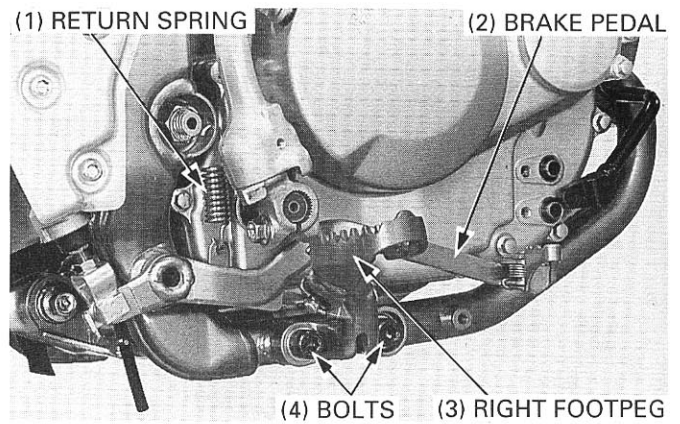
- Under guard bolts
- Under guard



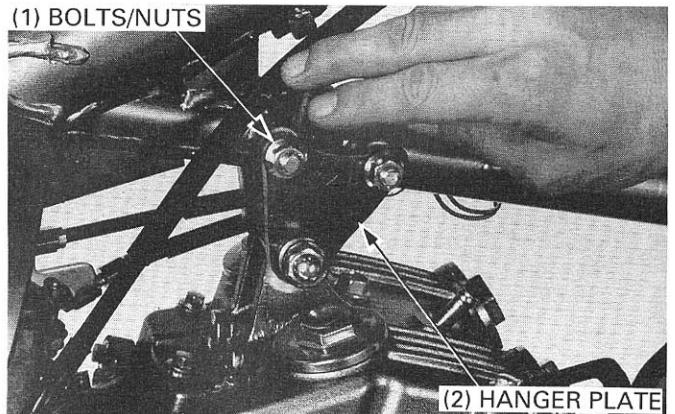
## ENGINE REMOVAL/INSTALLATION

Remove the following:

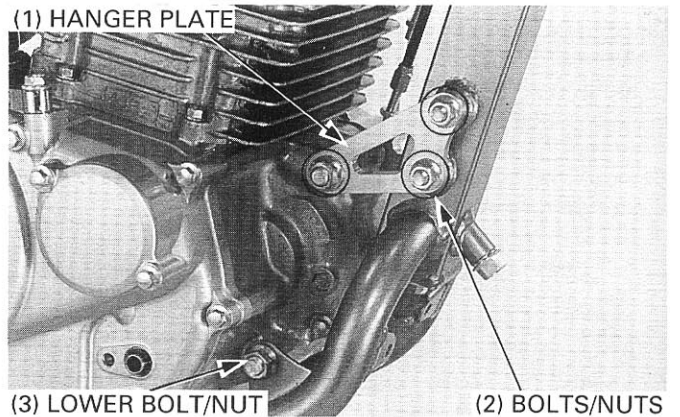
- Oil pipes (page 4-9)
- Brake pedal return spring
- Brake pedal (page 15-26)
- Right foot peg mounting bolts/washers
- Right foot peg



- Exhaust pipe (page 2-3)
- Breather tube (disconnect from crankcase)
- Rubber cap
- Upper engine hanger bolt/nut
- Upper engine hanger plate bolts/nuts
- Upper engine hanger plates

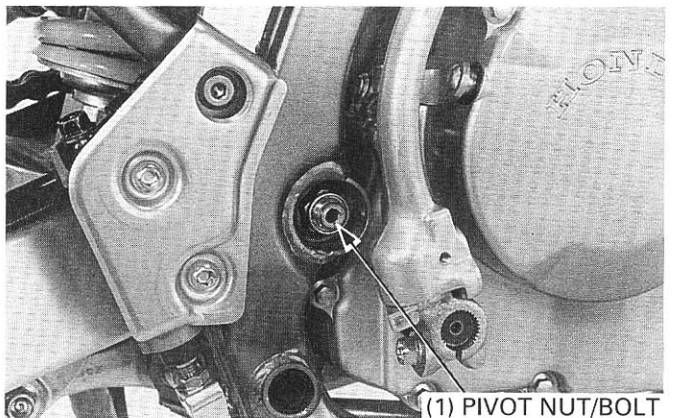


- Front engine hanger bolt/nut
- Front engine hanger plate bolts/nuts
- Front engine hanger plates
- Lower engine mounting bolt/nut



- Swingarm pivot nut/bolt

Pull the swingarm back.  
Remove the engine to the right.



## ENGINE INSTALLATION

Install the engine from the right side.

Apply a thin coat of grease to the swingarm pivot bolt sliding surface.

Install the swingarm pivot bolt from the left side. Install the nut.

Install the upper and front engine hanger plates.

### NOTE

- Install the upper engine hanger plates with the marks facing out.
  - Right side: KCZ-R
  - Left side: KCZ-L

Install the three 10 mm bolts from the left side.

Tighten the bolts/nuts to the specified torque.

### TORQUE:

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

**Engine hanger plate bolt/nut (10 mm):**

**64 N·m (6.5 kgf·m, 47 lbf·ft)**

**Engine hanger plate bolt/nut (8 mm):**

**26 N·m (2.7 kgf·m, 20 lbf·ft)**

Install the rubber cap.

Install the following:

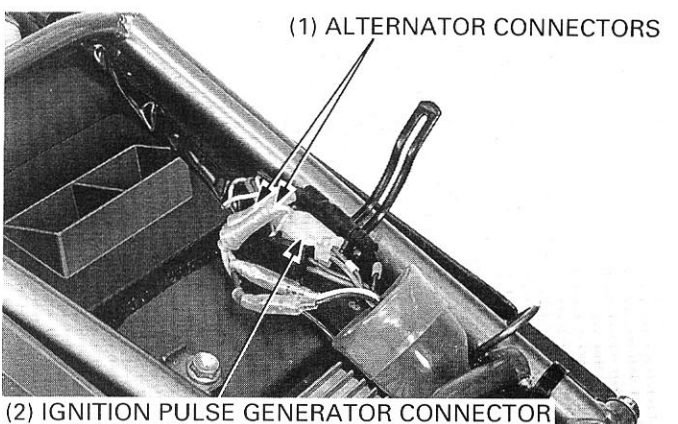
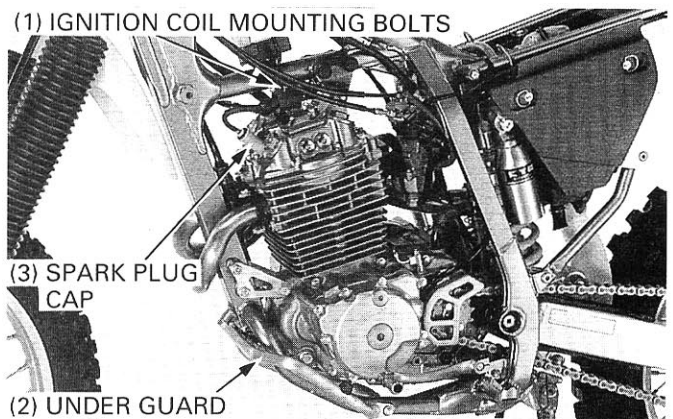
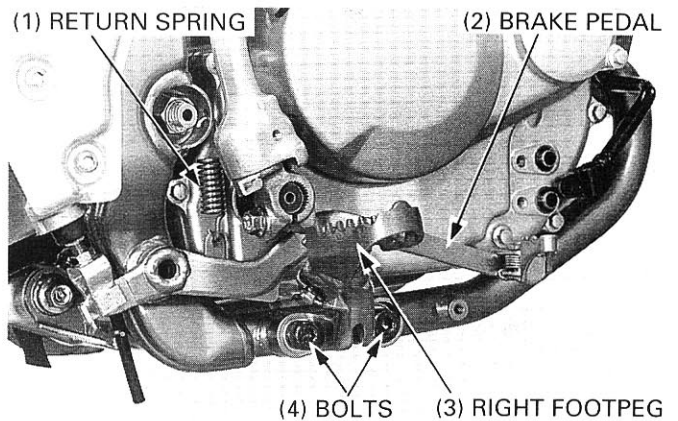
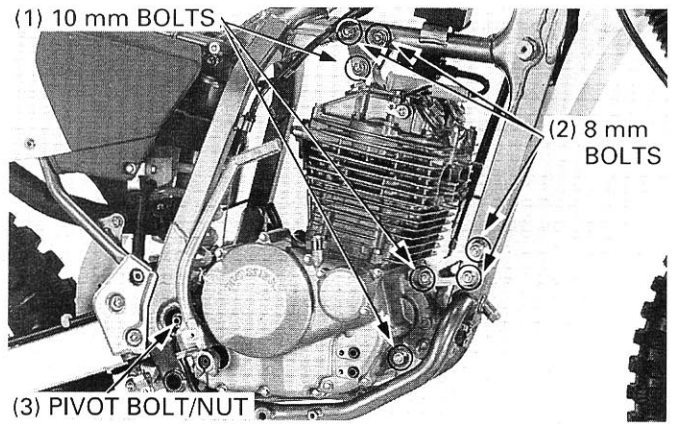
- Breather tube (page 7-22)
- Exhaust pipe (page 2-5)
- Right foot peg
- Right foot peg mounting bolts/washers

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

- Brake pedal (page 15-27)
- Brake pedal return spring
- Oil pipe (page 4-10)
- Under guard
- Under guard bolts
- Ignition coil mounting bolt/ground cable
- Decompressor cable (page 7-22)
- Clutch cable (page 9-18)
- Spark plug cap

- Carburetor (page 5-10)
- Alternator connectors (P and Y wires)
- Ignition pulse generator 2P connector
- Exciter coil connector (BI/R wire)

Fill to the filler neck with the correct quantity of the recommended engine oil (page 3-12).





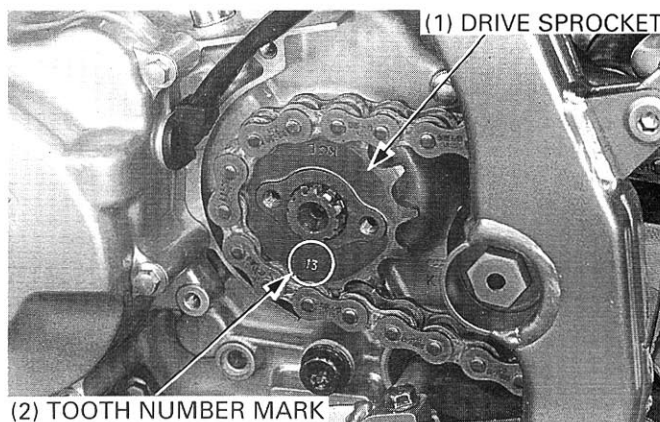
## ENGINE REMOVAL/INSTALLATION

### DRIVE SPROCKET INSTALLATION

Install the drive chain to the drive sprocket.  
Install the drive sprocket to the countershaft.

#### NOTE

- Install the drive sprocket with the tooth number mark facing out.



Install the following:

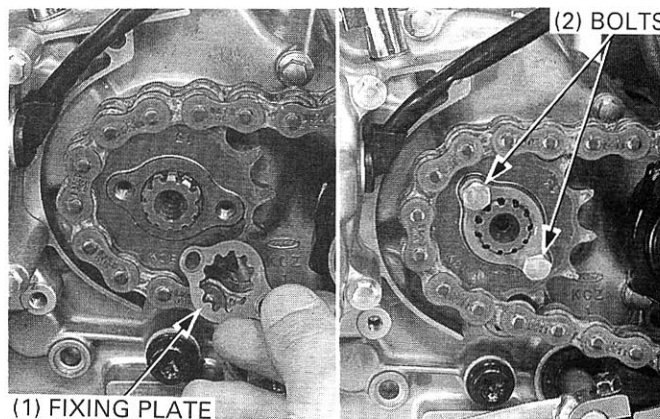
- Fixing plate

#### NOTE

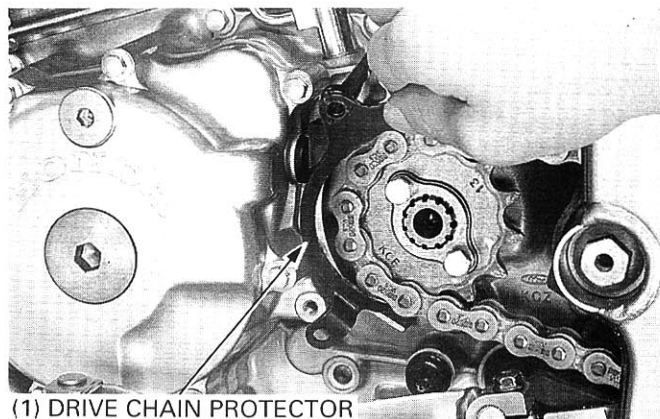
- Install the fixing plate onto the countershaft and align the bolt holes on the plate with the holes of the sprocket.

- Drive sprocket bolts

**TORQUE: 10 N·m (1.0 kgf·m, 7.2 lbf·ft)**



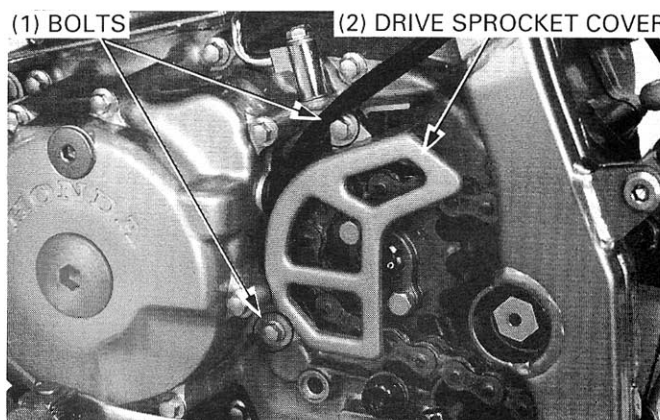
- Drive chain protector



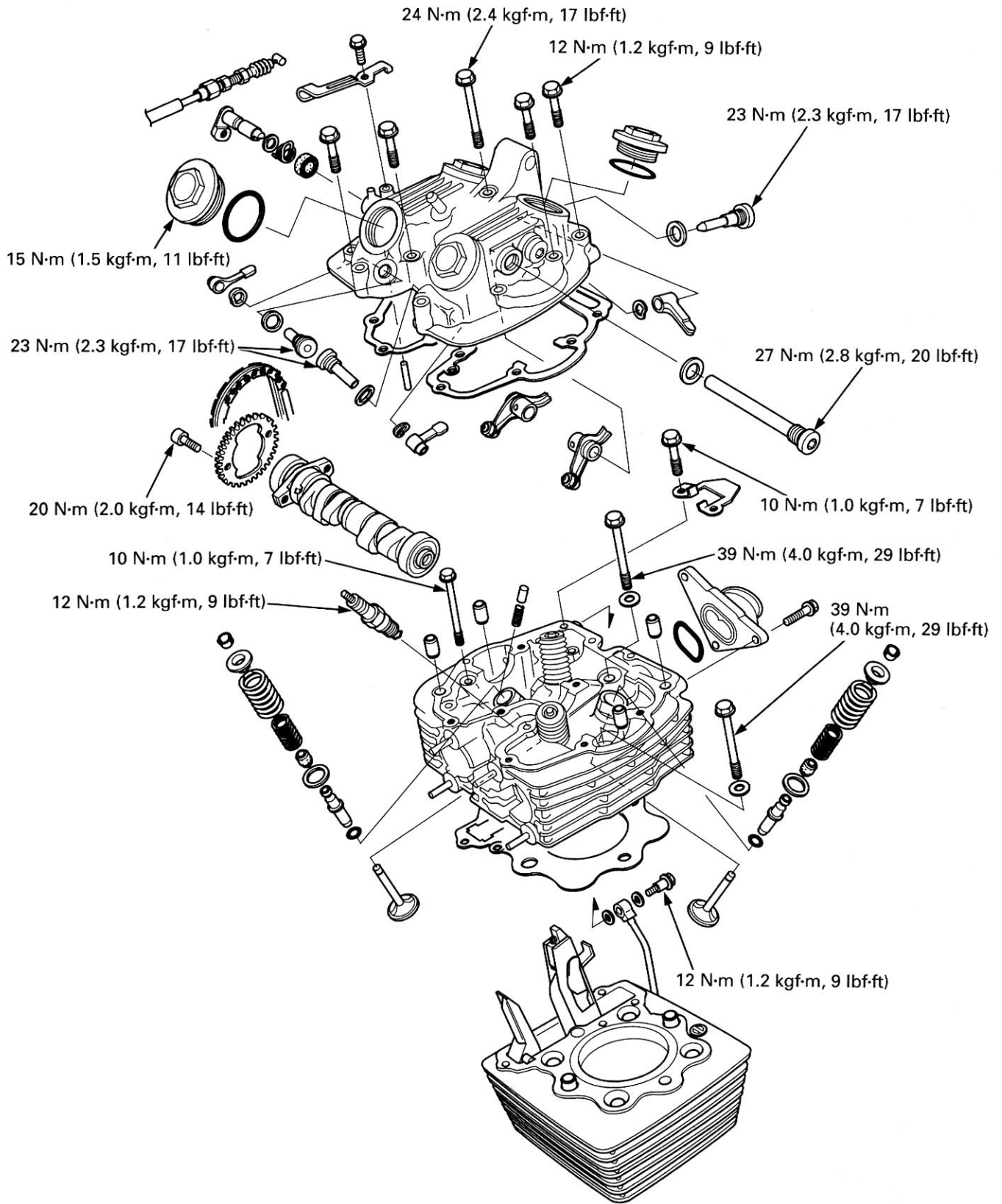
- Drive sprocket cover
- Bolts

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

After installation, adjust the drive chain slack (page 3-14).



# CYLINDER HEAD/VALVES





# 7. CYLINDER HEAD/VALVES

<b>SERVICE INFORMATION</b>	<b>7-1</b>	<b>VALVE GUIDE REPLACEMENT</b>	<b>7-10</b>
<b>TROUBLESHOOTING</b>	<b>7-2</b>	<b>VALVE SEAT INSPECTION AND REFACING</b>	<b>7-11</b>
<b>CYLINDER HEAD COVER REMOVAL</b>	<b>7-3</b>	<b>CYLINDER HEAD ASSEMBLY</b>	<b>7-14</b>
<b>CYLINDER HEAD COVER DISASSEMBLY</b>	<b>7-3</b>	<b>CYLINDER HEAD INSTALLATION</b>	<b>7-15</b>
<b>CAMSHAFT REMOVAL</b>	<b>7-5</b>	<b>CAMSHAFT INSTALLATION</b>	<b>7-16</b>
<b>CYLINDER HEAD REMOVAL</b>	<b>7-7</b>	<b>CYLINDER HEAD COVER ASSEMBLY</b>	<b>7-18</b>
<b>CYLINDER HEAD DISASSEMBLY</b>	<b>7-8</b>	<b>CYLINDER HEAD COVER INSTALLATION</b>	<b>7-20</b>

## SERVICE INFORMATION

### GENERAL

- This section covers maintenance of the cylinder head, valves and camshaft. These services can be done with the engine installed in the frame.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.
- Be careful not to damage the mating surfaces when removing the cylinder head cover and cylinder head.

### SPECIFICATIONS

Unit: mm (in)

ITEM			SPECIFICATIONS	SERVICE LIMIT
Cylinder compression	Valve clearance at standard (decompressor effected)		637 – 735 kPa (6.5 – 7.5 kgf/cm <sup>2</sup> , 92 – 107 psi) at 600 rpm	—
	Valve clearance at 1 mm (0.04 in) (decompressor not effected)		1,177 – 1,275 kPa (12.0 – 13.0 kgf/cm <sup>2</sup> , 171 – 185 psi)	—
Cylinder head warpage			—	0.10 (0.004)
Valve and valve guide	Valve clearance	IN	0.10 ± 0.02 (0.004 ± 0.001)	—
		EX	0.12 ± 0.02 (0.005 ± 0.001)	—
	Valve stem O.D.	IN	4.975 – 4.990 (0.1959 – 0.1965)	4.96 (0.195)
		EX	4.955 – 4.970 (0.1951 – 0.1957)	4.94 (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	0.010 – 0.037 (0.0004 – 0.0015)	0.07 (0.003)
EX		0.030 – 0.057 (0.0012 – 0.0022)	0.09 (0.004)	
Valve seat width		IN/EX	1.1 – 1.2 (0.04 – 0.05)	2.0 (0.08)
Valve spring	Free length	Inner	43.44 (1.710)	42.51 (1.673)
		Outer	44.03 (1.733)	42.83 (1.686)
Rocker arm	Rocker arm I.D.	IN/EX	11.500 – 11.518 (0.4528 – 0.4535)	11.53 (0.454)
	Rocker arm shaft O.D.	IN/EX	11.466 – 11.484 (0.4632 – 0.4521)	11.41 (0.449)
	Rocker arm-to-shaft clearance	IN/EX	0.016 – 0.052 (0.0006 – 0.0020)	0.10 (0.004)
Sub rocker arm	Sub-rocker arm I.D.	IN/EX	7.000 – 7.015 (0.2756 – 0.2762)	7.05 (0.278)
	Sub-rocker arm shaft O.D.	IN/EX	6.972 – 6.987 (0.2745 – 0.2751)	6.92 (0.272)
	Sub-rocker arm-to-shaft clearance	IN/EX	0.013 – 0.043 (0.0005 – 0.0017)	0.10 (0.004)
Camshaft	Cam lobe height	IN	30.772 (1.2115)	30.583 (1.2041)
		EX	30.819 (1.2133)	30.629 (1.2059)
	Runout		—	0.03 (0.001)

## CYLINDER HEAD/VALVES

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### TORQUE VALUES

Cylinder head cover bolt (6 mm)	12 N·m (1.2 kgf·m, 9 lbf·ft)
(8 mm)	24 N·m (2.4 kgf·m, 17 lbf·ft)
Rocker arm shaft	27 N·m (2.8 kgf·m, 20 lbf·ft) Apply a locking agent to the threads.
Sub-rocker arm shaft	23 N·m (2.3 kgf·m, 17 lbf·ft) Apply a locking agent to the threads.
Cam sprocket bolt	20 N·m (2.0 kgf·m, 14 lbf·ft) Apply a locking agent to the threads.
Cylinder head bolt (10 mm)	39 N·m (4.0 kgf·m, 29 lbf·ft) Apply oil to the threads and flange surface.
(6 mm)	10 N·m (1.0 kgf·m, 7 lbf·ft)
Cam chain tensioner set plate bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)
Oil pass pipe bolt (7 mm)	12 N·m (1.2 kgf·m, 9 lbf·ft)
Valve hole cap	15 N·m (1.5 kgf·m, 11 lbf·ft) Apply clean engine oil to the O-ring.
Engine hanger plate bolt (10 mm)	64 N·m (6.5 kgf·m, 47 lbf·ft)
(8 mm)	26 N·m (2.7 kgf·m, 20 lbf·ft)

### TOOLS

#### Special

Remover weight	07936 – 3710200
Pin puller	07936 – MA70100
Valve guide driver, 5.0 mm	07942 – MA60000
Valve guide reamer, 5.0 mm	07984 – MA60001 or 07984 – MA6000D (U.S.A. only)

#### Common

Valve spring compressor	07757 – 0010000
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#### Optional

Cutter holder, 5 mm	07781 – 0010400	or equivalent commercially available in U.S.A.
Valve seat cutter		
— Flat cutter, 25 mm (32° EX)	07780 – 0012000	
— Flat cutter, 30 mm (32° IN)	07780 – 0012200	
— Interior cutter, 30 mm (60° IN/EX)	07780 – 0014000	
— Seat cutter, 27.5 mm (45° EX)	07780 – 0010200	
— Seat cutter, 33 mm (45° IN)	07780 – 0010800	

## 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 tube. If the tube is smokey, check for a seized piston ring (Section 8)

#### Low compression

- Valves:
  - Incorrect valve adjustment
  - Burned or bent valve
  - Incorrect valve timing
  - Weak valve spring
- Cylinder head:
  - Leaking or damaged head gasket
  - Warped or cracked cylinder head
- Decompressor system
  - Decompressor out of adjustment

#### Excessive smoke

- Worn valve stem or valve guide
- Damaged stem seal

#### Excessive noise

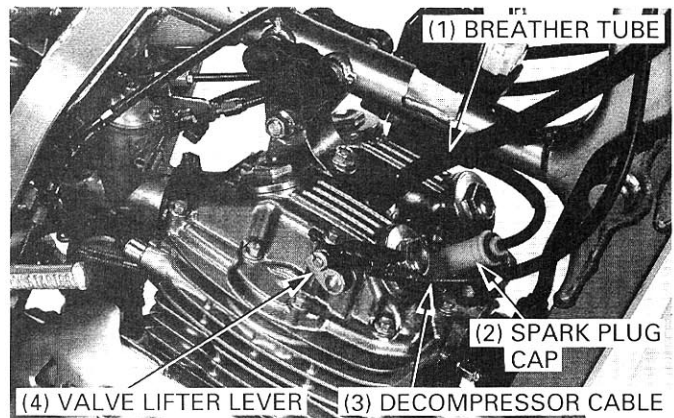
- Incorrect valve adjustment
- Sticking valve or broken valve spring
- Worn or damaged rocker arm or camshaft
- Loose or worn cam chain
- Worn or damaged cam chain tensioner
- Worn cam sprocket teeth

#### Rough idle

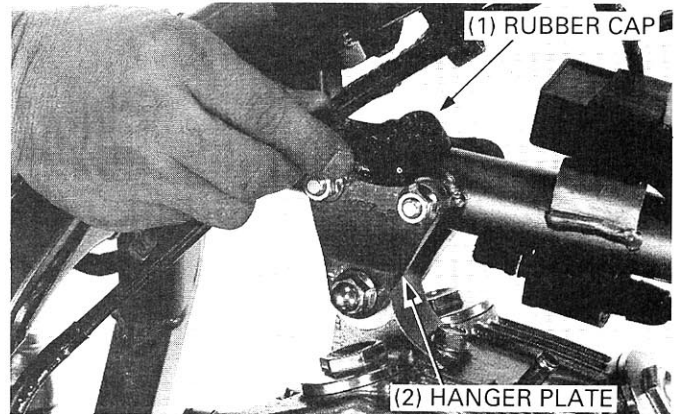
- Low cylinder compression
- Intake air leak
- Decompressor out of adjustment

## CYLINDER HEAD COVER REMOVAL

Remove the seat (page 2-2).  
 Remove the fuel tank (page 5-3).  
 Remove the decompressor cable from the valve lifter lever.  
 Remove the breather tube.  
 Remove the spark plug cap.



Remove the rubber caps and upper hanger plates.

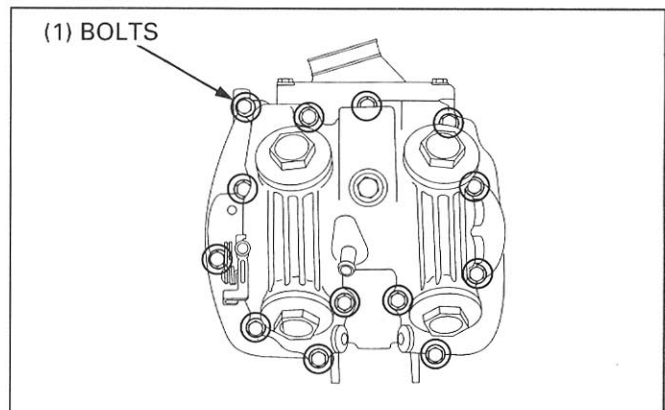


Remove the crankshaft hole cap and timing hole cap.  
 Rotate the flywheel counterclockwise to align the "T" mark with the index notch. Make sure that the piston is at TDC (Top Dead Center) on the compression stroke.  
 Remove the cylinder head cover bolts and cylinder head cover.

### NOTE

- Loosen the bolts in a crisscross pattern in two or more steps.

Remove the gasket and dowel pins.



## CYLINDER HEAD COVER DISASSEMBLY

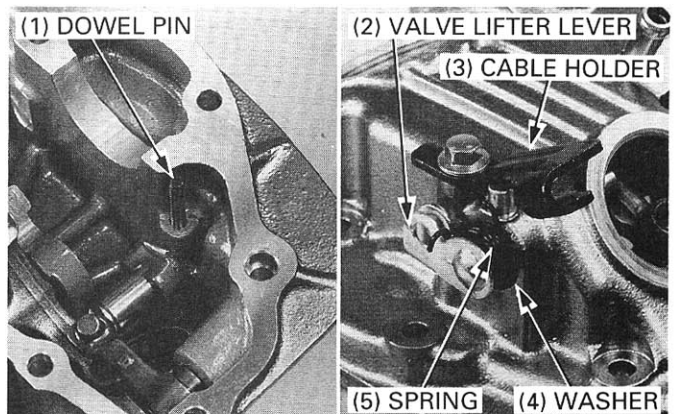
Remove the valve hole caps.  
 Cut a groove in the dowel pin with a grinder and remove the dowel pin using the special tools.

### TOOLS:

**Pin puller** 07936 - MA70100  
**Remover weight** 07936 - 3710200

Remove the following:

- Valve lifter lever
- Spring
- Washer
- Seal
- Decompressor cable holder



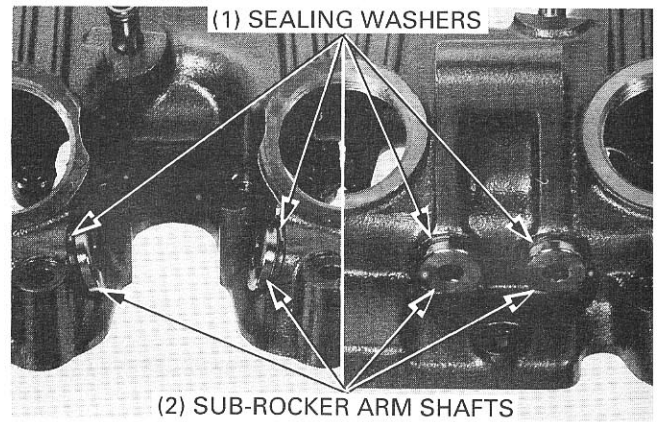
## CYLINDER HEAD/VALVES

Remove the following:

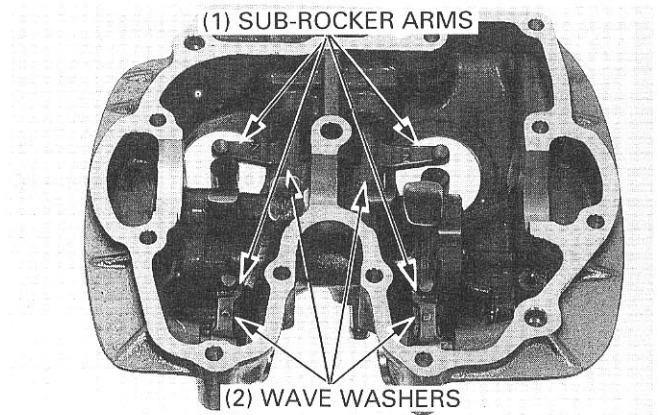
- Sub-rocker arm shafts
- Sealing washers

### NOTE

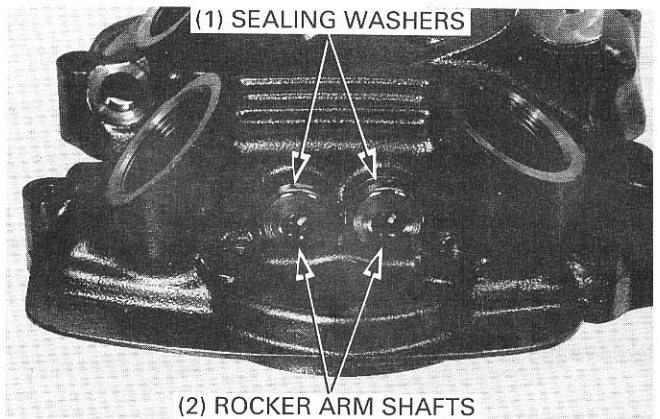
- Note the location of all parts during disassembly so you can reinstall the parts in their same positions.



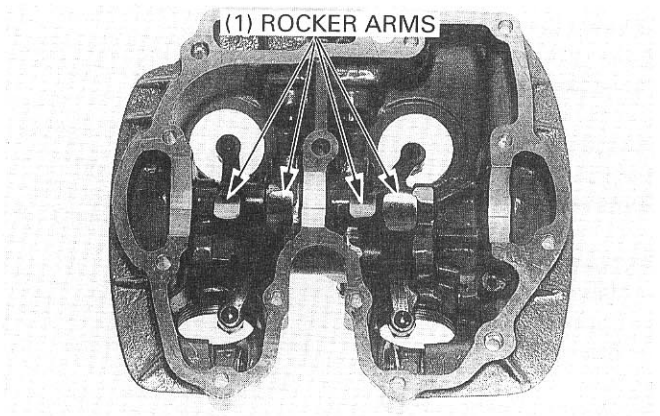
- Sub-rocker arms
- Wave washers



- Rocker arm shafts
- Sealing washers



Remove the rocker arms from the cylinder head cover.



## ROCKER ARM AND SUB-ROCKER ARM INSPECTION

Inspect the rocker arms and sub-rocker arms for wear or damage.

### NOTE

- Inspect the cam lobe if the rocker arm sliding surface is worn or damaged.

Measure the I.D. of the rocker arms and sub-rocker arms.

### SERVICE LIMITS:

Rocker arm (IN/EX): 11.53 mm (0.454 in)  
Sub-rocker arm (IN/EX): 7.05 mm (0.278 in)

## ROCKER ARM SHAFT AND SUB-ROCKER ARM SHAFT INSPECTION

Inspect the rocker arm shafts and sub-rocker arm shafts for wear or damage.

Measure the O.D. of the rocker arm shafts and sub-rocker arm shafts.

### SERVICE LIMITS:

Rocker arm shaft (IN/EX): 11.41 mm (0.449 in)  
Sub-rocker arm shaft (IN/EX): 6.92 mm (0.272 in)

Calculate the rocker arm-to-shaft and sub-rocker arm to shaft clearance.

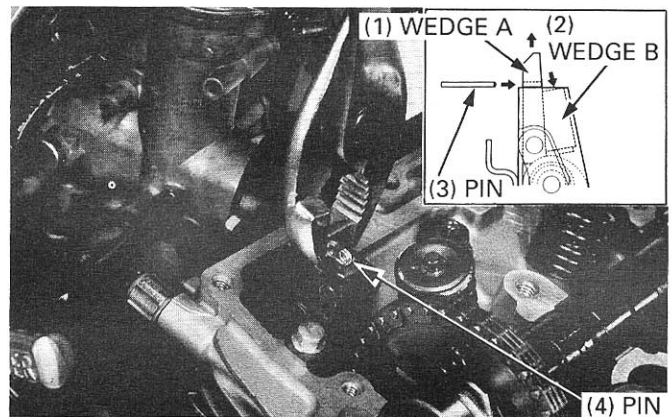
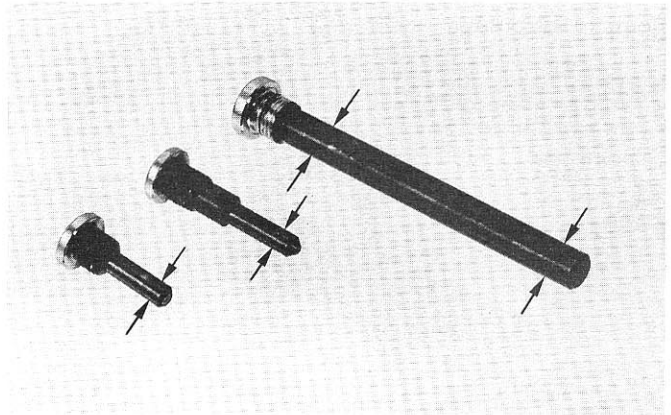
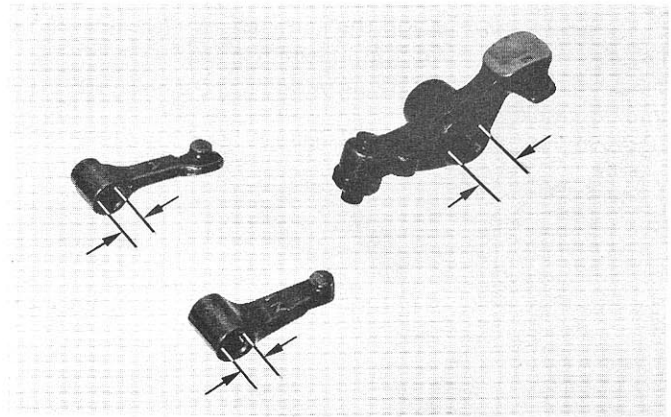
**SERVICE LIMIT: 0.10 mm (0.004 in)**

## CAMSHAFT REMOVAL

Remove the cylinder head cover (page 7-3).

To release the cam chain tensioner, push down wedge B, then pull up on wedge A with pliers.

Insert a pin (or paper clip) into the hole in wedge A, as shown.



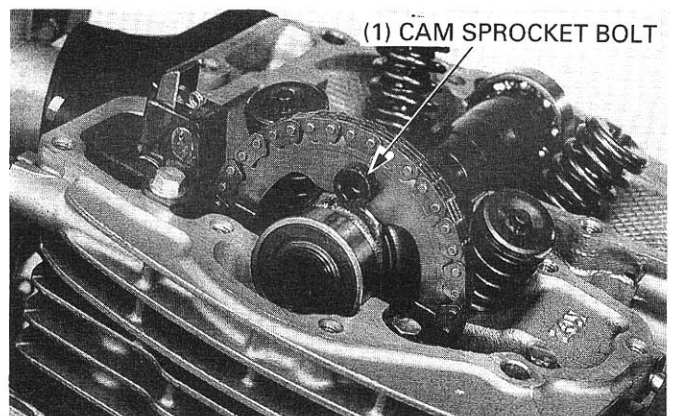
Remove the crankshaft hole cap.

Turn the crankshaft and remove a cam sprocket bolt.

Rotate the crankshaft, then remove the other cam sprocket bolt.

### NOTE

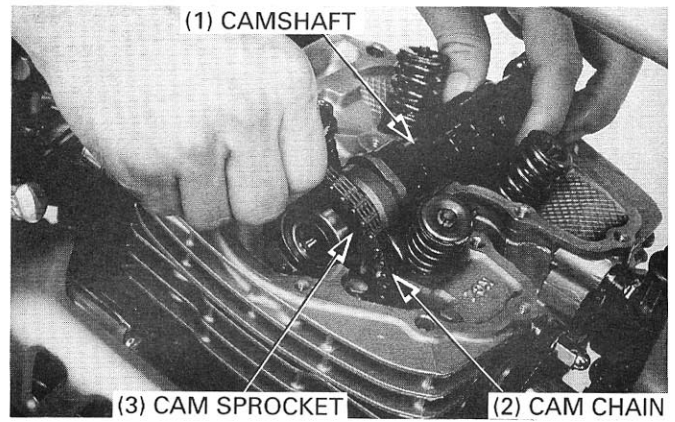
- Be careful not to drop the bolts into the crankcase.





## CYLINDER HEAD/VALVES

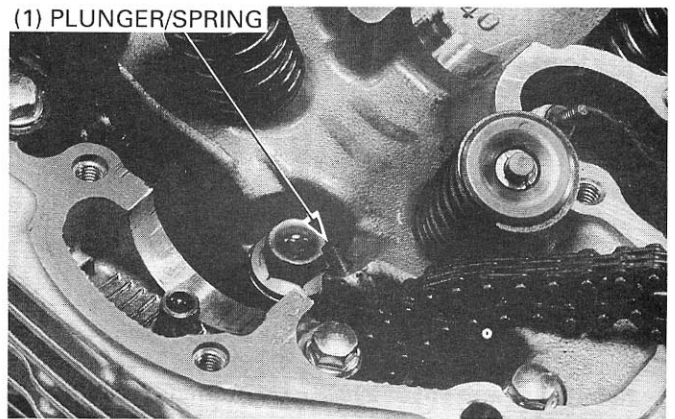
Pull the cam sprocket off the camshaft flange shoulder and remove the cam chain from the cam sprocket.  
Suspend the cam chain with a piece wire to keep it from falling into the crankcase.  
Remove the camshaft and sprocket.



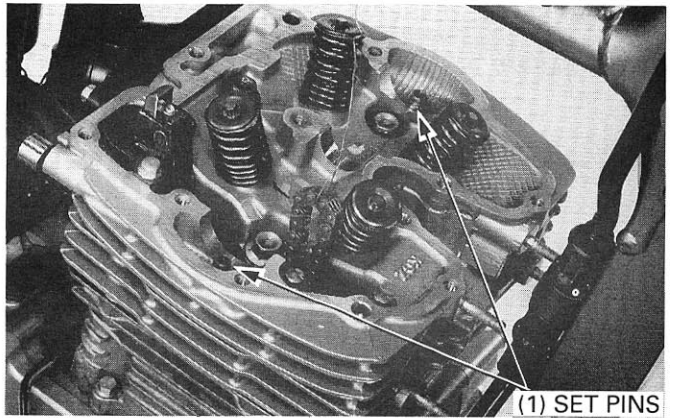
Remove the plunger and spring.

### NOTE

- Be careful not to drop the plunger and spring into the crankcase.

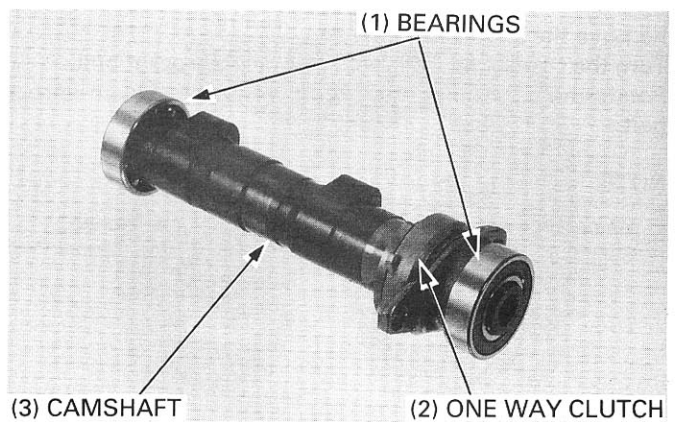


Remove the camshaft bearing set pins.



## CAMSHAFT INSPECTION

Turn the outer race of the bearings with your finger.  
The bearings should turn smoothly and quietly.  
Remove the bearings, if they need replacement.  
Be sure the one way clutch outer rotates in one direction only.





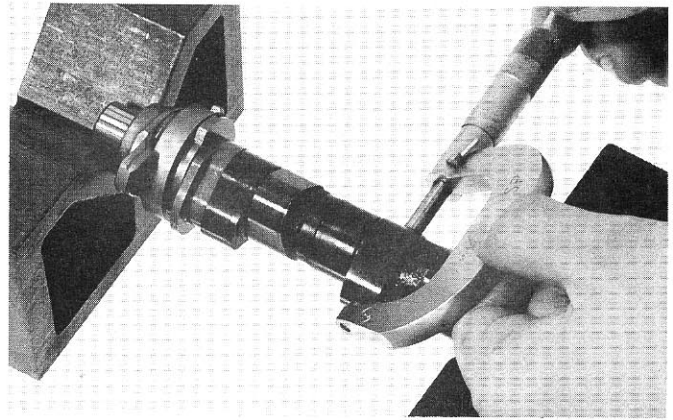
Remove the bearings from the camshaft.  
Check each cam lobe for wear or damage.

**NOTE**

- Inspect the rocker arm sliding surface if the cam lobe is worn or damaged.

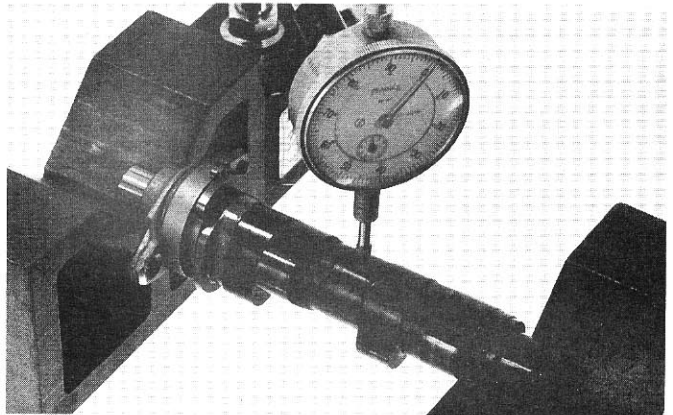
Measure the cam lobe height.

**SERVICE LIMITS: INTAKE: 30.583 mm (1.2041 in)**  
**EXHAUST: 30.629 mm (1.2059 in)**



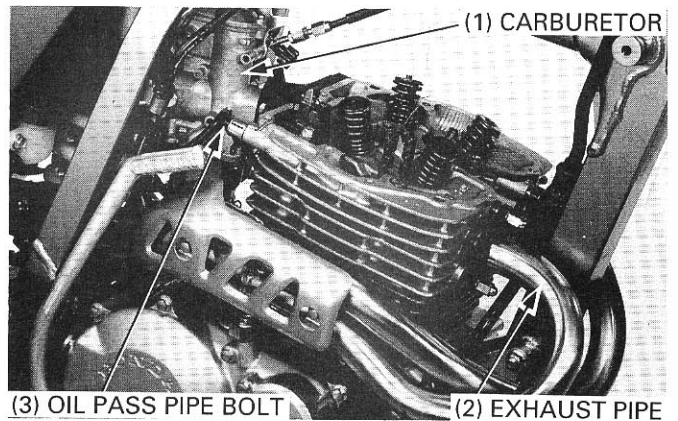
Check the camshaft runout with a dial indicator.  
Support both ends of the camshaft with V-blocks.  
Actual runout is 1/2 of the total indicator reading.

**SERVICE LIMIT: 0.03 mm (0.001 in)**

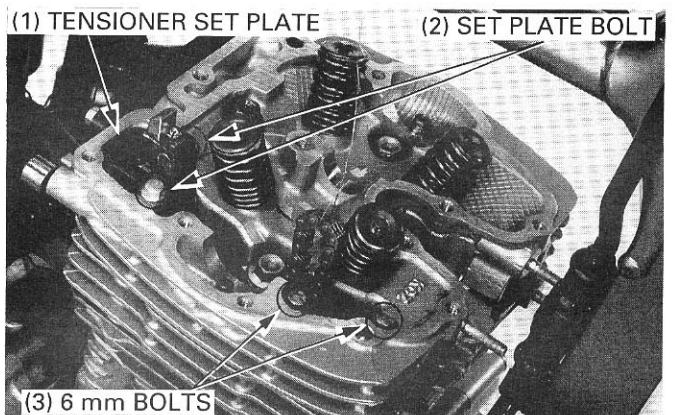


## CYLINDER HEAD REMOVAL

Remove the cylinder head cover (page 7-3).  
Remove the cam shaft and cam sprocket (page 7-5).  
Remove the exhaust pipe (page 2-3).  
Remove the oil pass pipe joint bolts and two sealing washers from the cylinder head.  
Remove the carburetor from the insulator (page 5-5).



Remove the two cam chain tensioner set plate bolts.  
Remove the set plate.  
Remove the cylinder head 6 mm bolts.

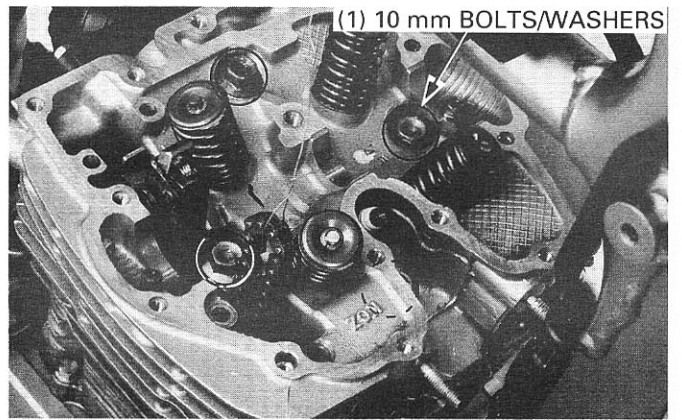


## CYLINDER HEAD/VALVES

Remove the cylinder head 10 mm bolts and washers.

### NOTE

- Loosen the bolts in a crisscross pattern in two or more steps.
- Be careful not to drop the washers into the crankcase.

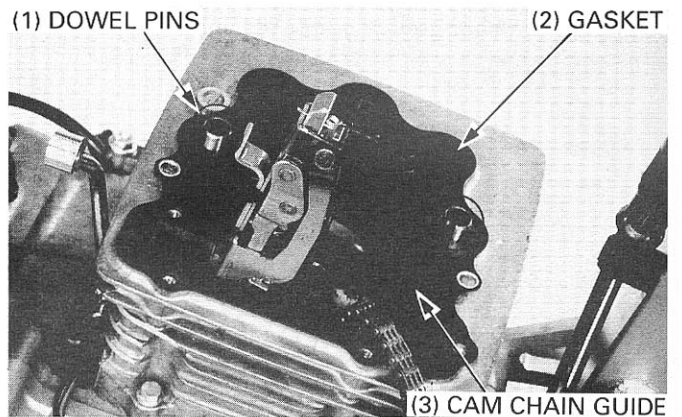


Remove the cylinder head.

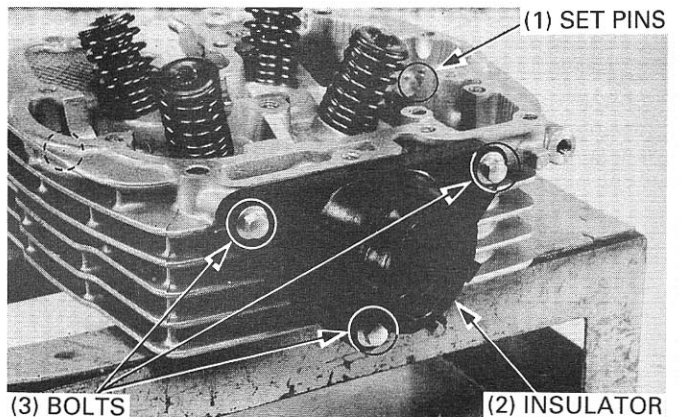
### CAUTION

- *Be careful not to damage the cylinder head mating surfaces.*

Remove the gasket and dowel pins.  
Remove the cam chain guide.



Remove the bolts and insulator from the cylinder head.  
Remove the camshaft bearing set pins.



## CYLINDER HEAD DISASSEMBLY

Remove the valve spring cotters, retainers, springs, valves and spring seats with a valve spring compressor.

### TOOL:

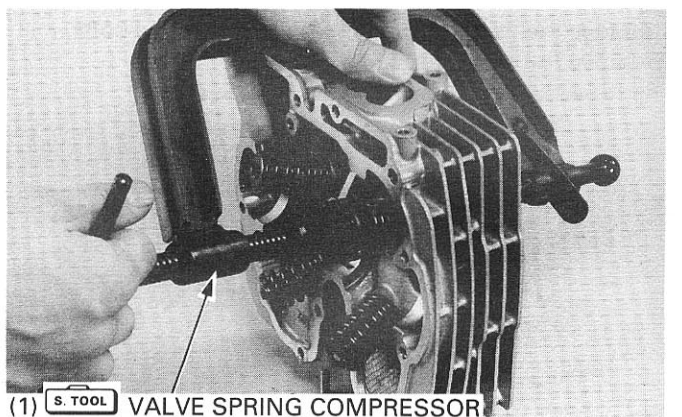
Valve spring compressor 07757 - 0010000

### CAUTION

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

### NOTE

- Mark all parts to ensure that they are reassembled in their original locations.
- Whenever the stem seals are removed, replace them with new ones.



## CYLINDER HEAD INSPECTION

Remove the carbon deposits from the combustion chamber or exhaust port.  
Clean the head gasket surface of any gasket material.

### CAUTION

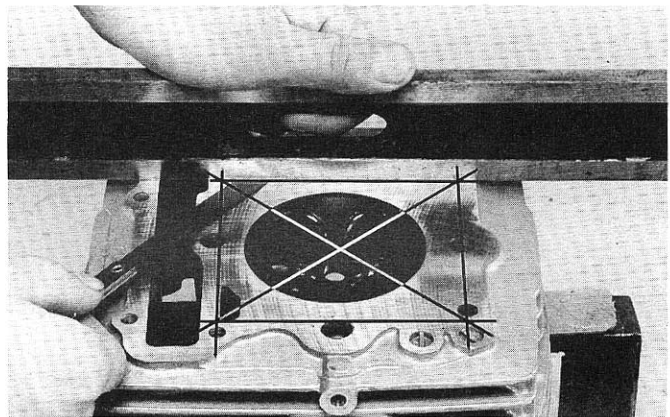
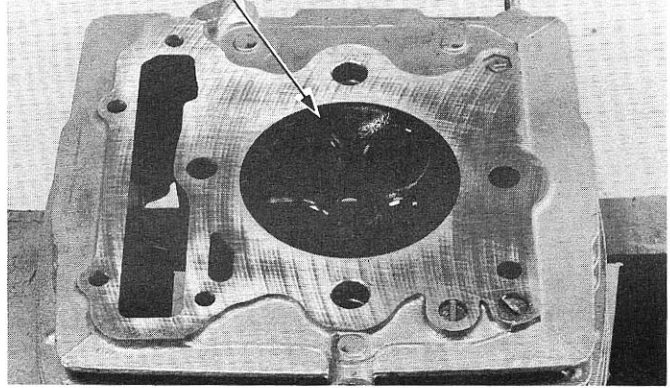
- *Use care not to scratch the combustion chamber or the head gasket surface.*

Check the spark plug hole and valve areas for cracks.

Check the cylinder head diagonally two ways for warp with a straight edge and a feeler gauge.

**SERVICE LIMIT: 0.10 mm (0.004 in)**

(1) COMBUSTION CHAMBER



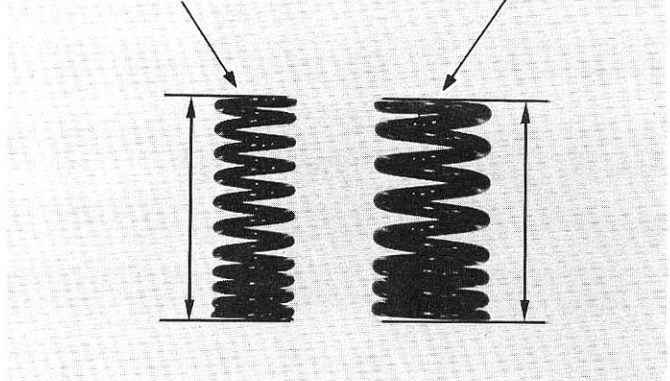
## VALVE SPRING INSPECTION

Measure the free length of the inner and outer valve springs.

**SERVICE LIMITS: INNER: 42.51 mm (1.673 in)**  
**OUTER: 42.83 mm (1.686 in)**

(1) INNER SPRING

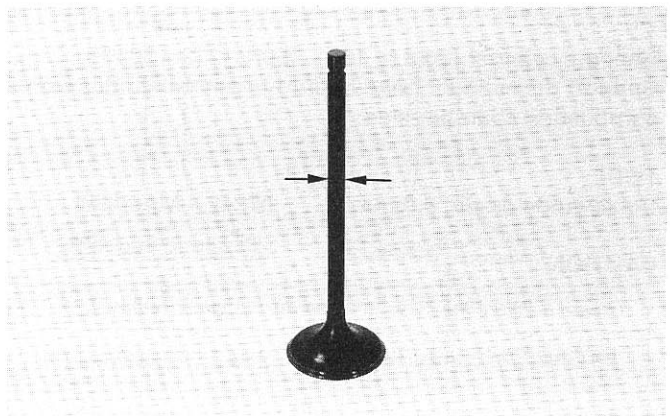
(2) OUTER SPRING



## VALVE INSPECTION

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

**SERVICE LIMITS: INTAKE: 4.96 mm (0.195 in)**  
**EXHAUST: 4.94 mm (0.194 in)**





## CYLINDER HEAD/VALVES

### VALVE GUIDE INSPECTION

Ream the guides to remove the carbon build-up before checking the valve guide I.D.. Insert the reamer from the combustion chamber side and always rotate it clockwise.

#### TOOL:

Valve guide reamer, 5.0 mm      07984 – MA60001 or  
07984 – MA6000D  
(U.S.A. only)

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

#### SERVICE LIMITS:

INTAKE/EXHAUST: 5.03 mm (0.198 in)

Calculate the stem-to-guide clearance.

SERVICE LIMITS: INTAKE: 0.07 mm (0.003 in)  
EXHAUST: 0.09 mm (0.004 in)

#### NOTE

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

If stem-to-guide clearance still exceeds the service limit after the new guides are installed, replace the valves.

#### NOTE

- Reface valve seats whenever new valve guides are installed.

### VALVE GUIDE REPLACEMENT

#### ⚠ WARNING

- *To avoid burns, wear heavy gloves when handling the heated cylinder head.*

#### CAUTION

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

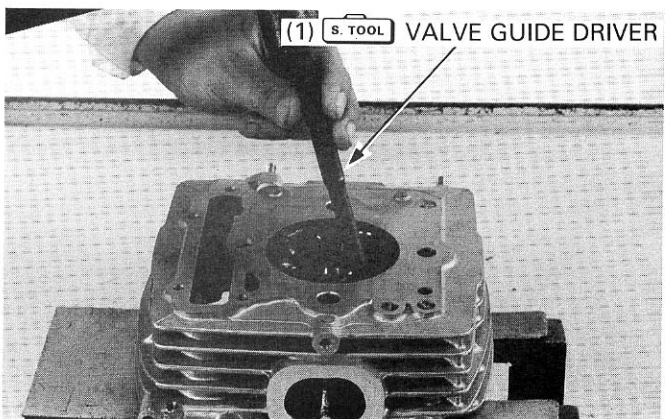
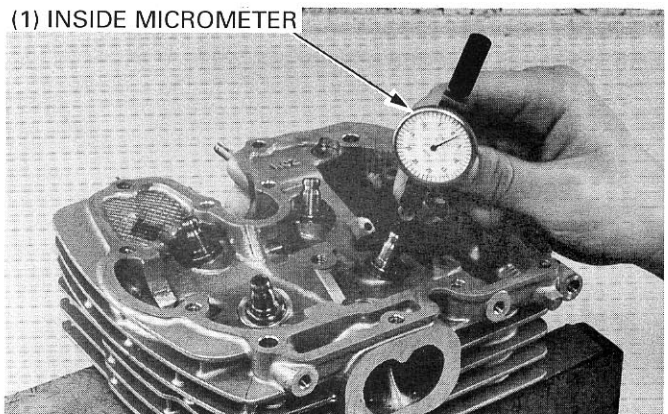
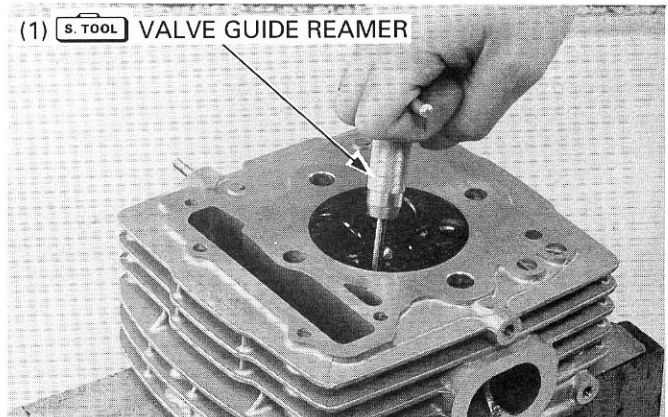
Heat the cylinder head to 100 – 150°C (212 – 300°F). Support the cylinder head and drive out the guides from the combustion chamber side.

#### TOOL:

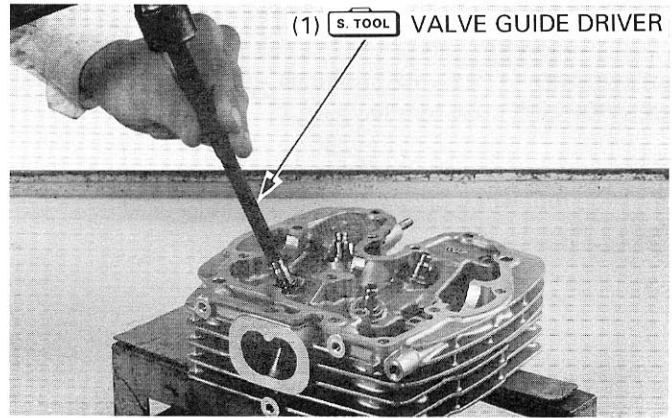
Valve guide driver, 5.0 mm      07942 – MA60000

#### CAUTION

- *Do not damage the cylinder head during guide removal.*



Install a new O-ring on a new valve guide.  
Install a new valve guide from the top of the head, then check that it was not damaged during installation.

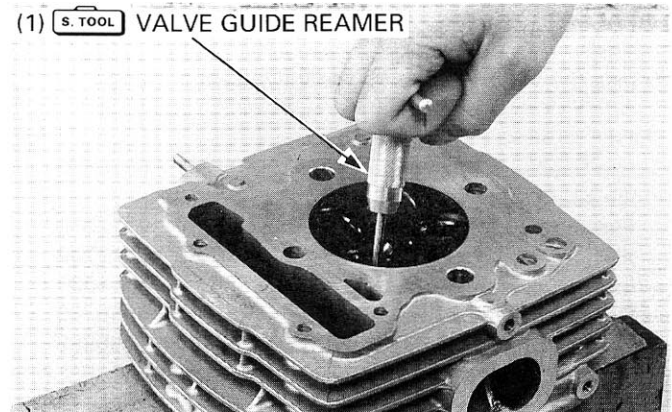


Ream the new valve guides after installation.  
Insert the reamer from the combustion chamber side and always rotate the reamer clockwise.

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

**NOTE**

- Use cutting oil on the reamer during this operation.
- Rotate the reamer while inserting and removing it.



Clean the cylinder head thoroughly to remove any metal particles.  
Reface the valve seats (page 7-11).

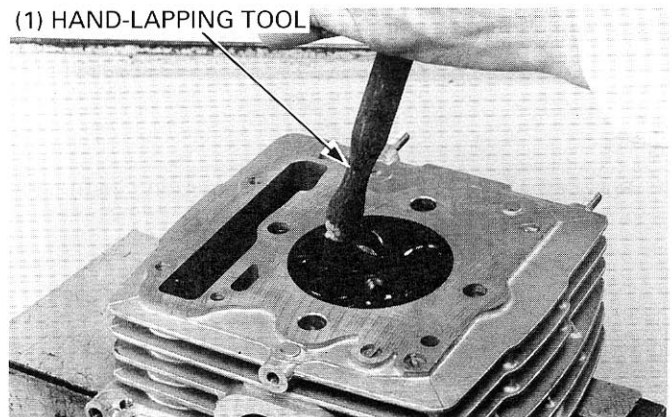
## VALVE SEAT INSPECTION AND REFACING

### INSPECTION

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

**NOTE**

- Valves cannot be ground. If the valve face is burned or badly worn or if it contacts the seat unevenly, replace the valve.

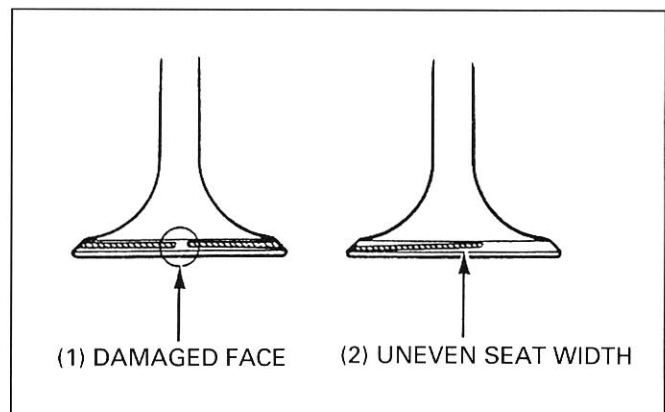


Remove the valve and inspect the face.

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

Measure the valve seat width.

**SERVICE LIMIT: 2.0 mm (0.08 in)**



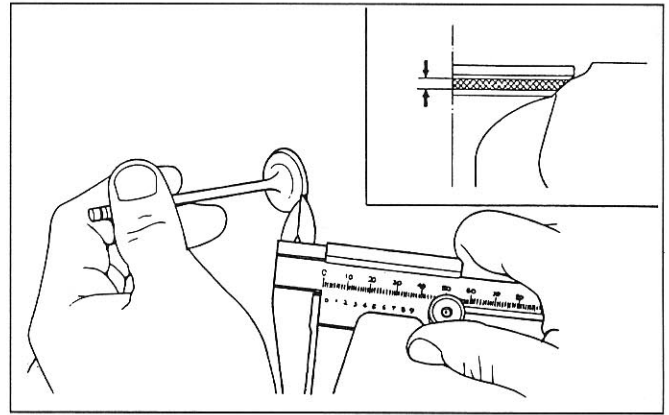
## CYLINDER HEAD/VALVES

Measure the valve seat width.

**STANDARD:** 1.1 – 1.2 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 refinished for good sealing.



### REFACING

Reface the valve seats with the valve seat cutters.

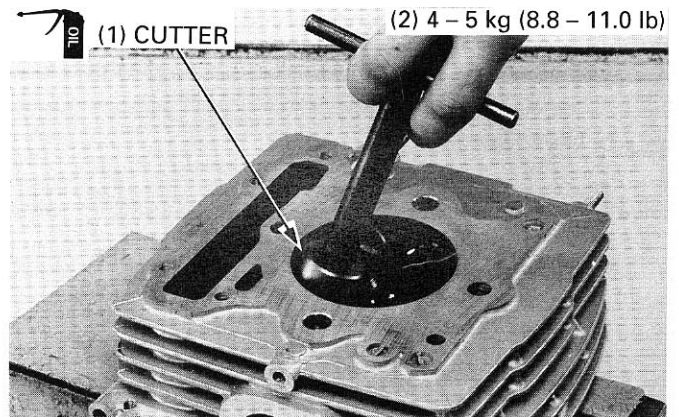
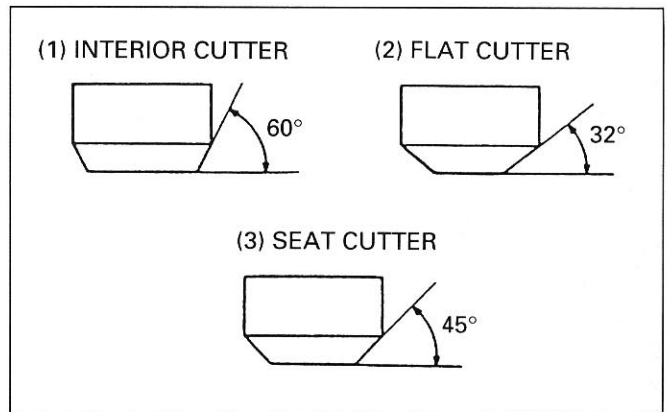
#### TOOL:

Cutter holder, 5 mm	07781 – 0010400	} or equivalent commercially available in U.S.A.
Valve seat cutter		
— Flat cutter, 25 mm (32° EX)	07780 – 0012000	
— Flat cutter, 30 mm (32° IN)	07780 – 0012200	
— Interior cutter, 30 mm (60° IN/EX)	07780 – 0014000	
— Seat cutter, 27.5 mm (45° EX)	07780 – 0010200	
— Seat cutter, 33 mm (45° IN)	07780 – 0010800	

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

#### NOTE

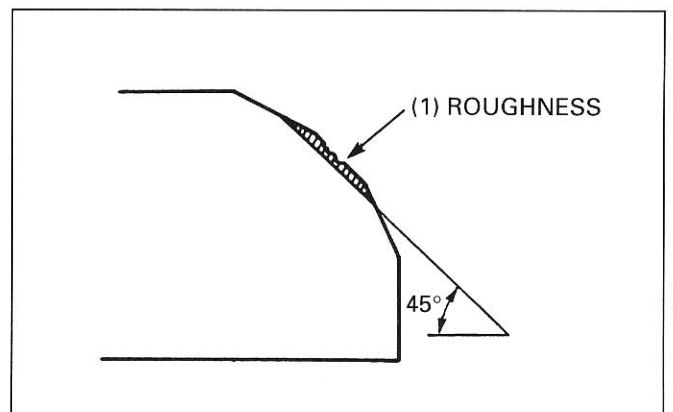
- Follow the refacing manufacturer's operating instructions.



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

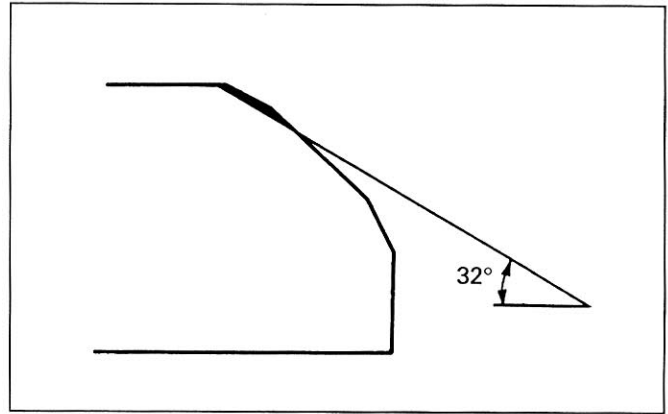
#### NOTE

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

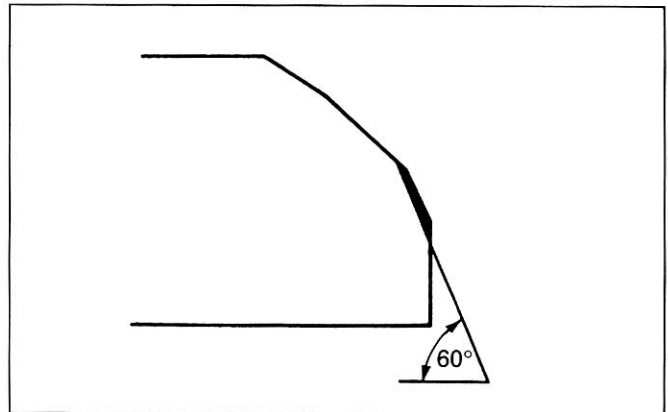




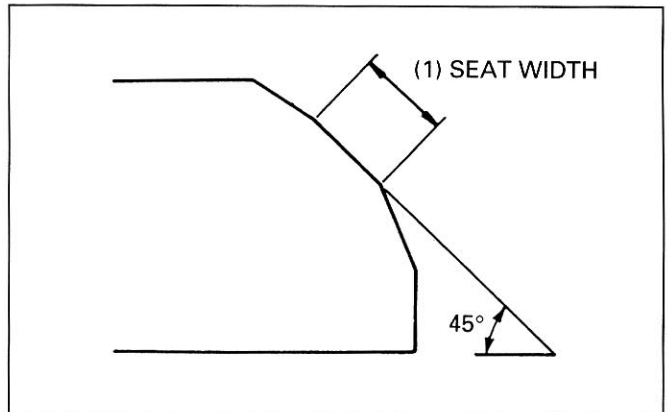
Use a 32 degrees cutter to remove the top 1/4 of the existing valve seat material.



Use a 60 degree cutter to remove the bottom 1/4 of the old seat. Remove the cutter and inspect the area you have refaced.



Install a 45 degree finish cutter and cut the seat to the proper width. Make sure that all pitting and irregularities are removed. Refinish if necessary.



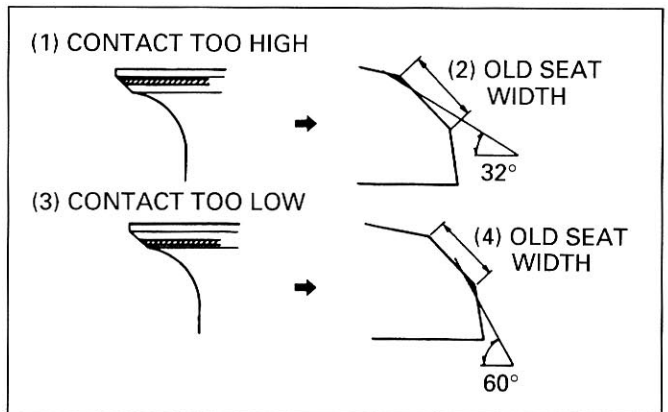
Apply a thin coating a Prussian Blue to the valve seat. Press the valve through the valve guide and onto the seat to make a clear pattern.

NOTE

- The location of the valve seat in relation to the valve face is very important for good sealing.

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

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



## CYLINDER HEAD/VALVES

Refinish the seat to specifications, using a 45 degree finish cutter.

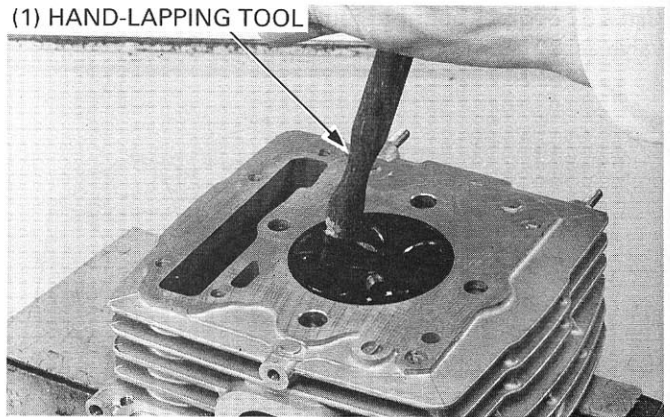
After cutting the seat apply lapping compound to the valve face, and lap the valve using light pressure.

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

### NOTE

- Do not allow lapping compound to enter the guides.

(1) HAND-LAPPING TOOL

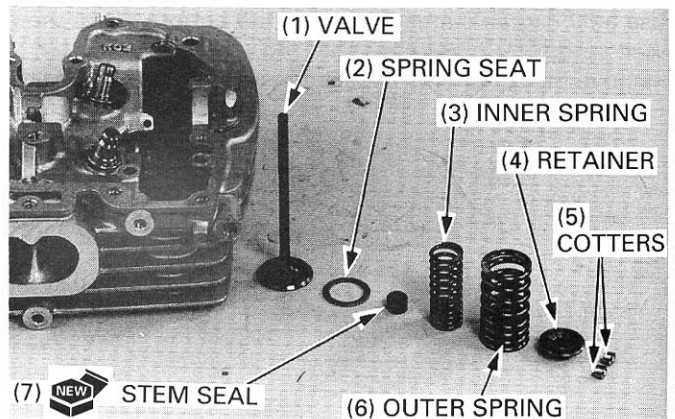


## CYLINDER HEAD ASSEMBLY

Install the spring seats and new stem seals in the cylinder head.

Lubricate each valve stem and valve guide inner surface with molybdenum disulfide 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 and install the retainers.



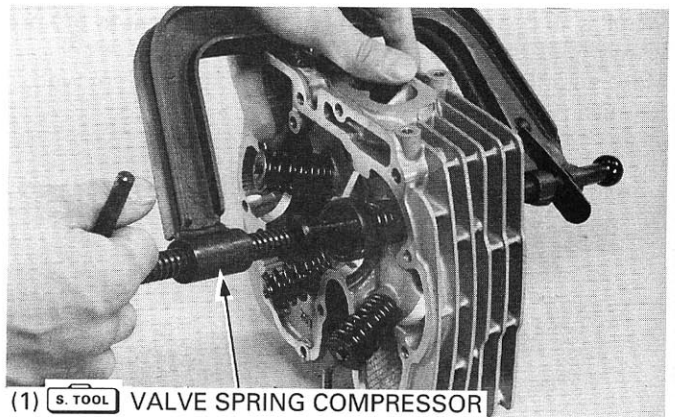
Compress the valve springs using the valve spring compressor, then install the valve cotters.

### TOOL:

Valve spring compressor                      07757 - 0010000

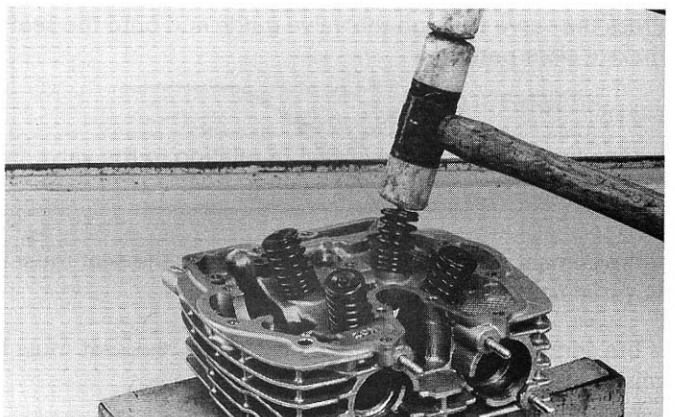
### CAUTION

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

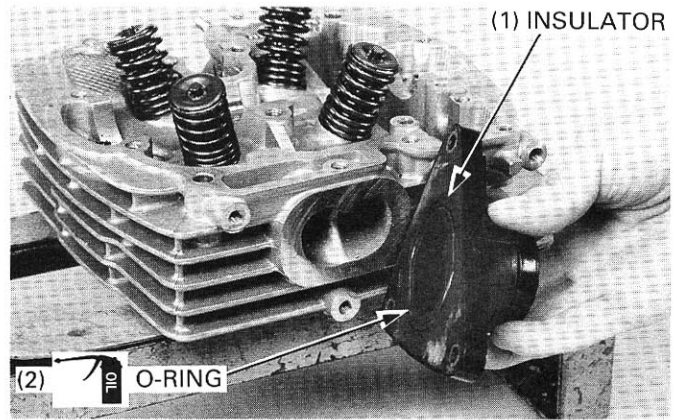


(1) S. TOOL VALVE SPRING COMPRESSOR

Support the cylinder head above the working bench surface to prevent possible valve damage, then gently tap the valve stems with two plastic hammers as shown to seat the cotters.



Check the O-ring in the insulator for wear or fatigue. Apply oil to the O-ring and install the carburetor insulator to the cylinder head.



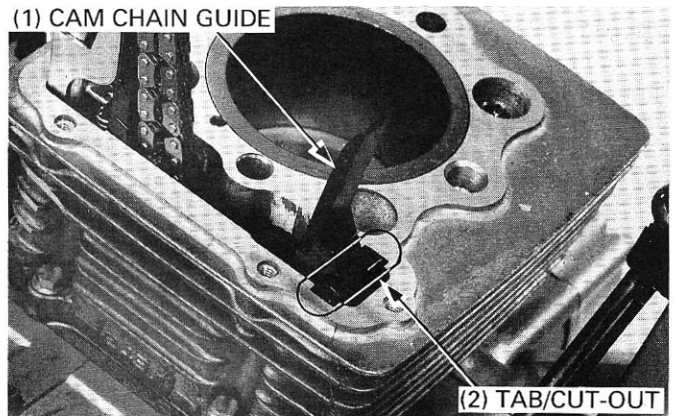
## CYLINDER HEAD INSTALLATION

Remove the cylinder gasket and thoroughly clean the gasket surface.

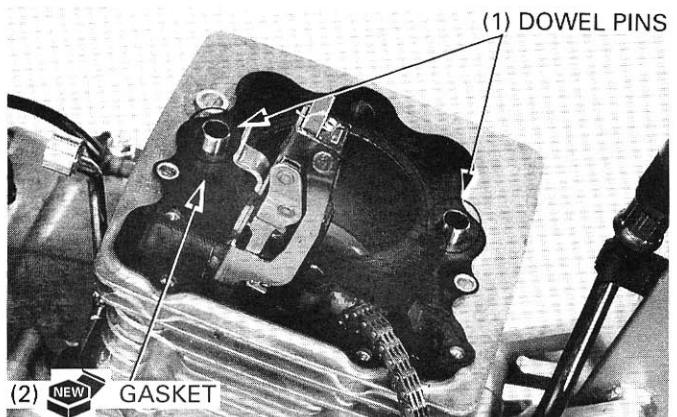
Install the cam chain guide.

### NOTE

- Fit the cam chain guide tab in the cylinder cut-out as shown. Push the guide in until it bottoms in the crankcase guide hole.



Install the dowel pins and new cylinder head gasket.



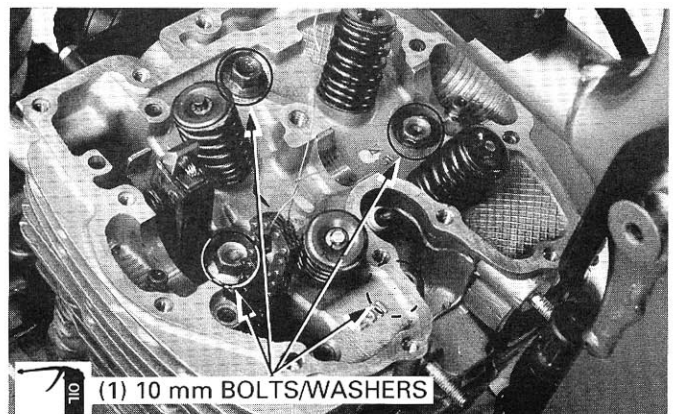
Install the cylinder head.

### CAUTION

- *Be careful not to damage the cylinder head mating surfaces.*

Apply engine oil to all cylinder head bolts and tighten the four 10 mm cylinder head bolts in a crisscross pattern in two or more steps.

**TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)**

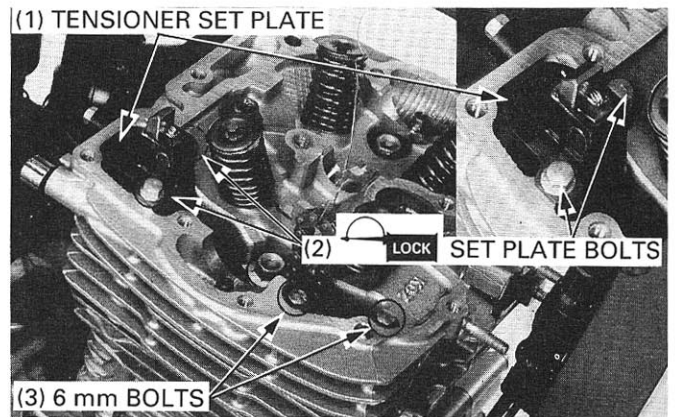


## CYLINDER HEAD/VALVES

Install the cam chain tensioner set plate. Apply thread lock to the set plate bolts.

Install and tighten the two set plate bolts and two 6 mm cylinder head bolts to the specified torque.

**TORQUE: 10 N·m (1.0 kgf·m, 7.2 lbf·ft)**

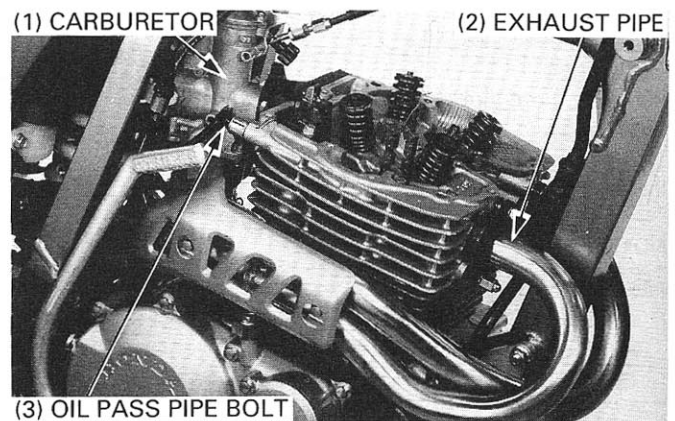


Install the carburetor (page 5-10).

Install the oil pass pipe with the two 7 mm bolts and two new sealing washers.

Install the exhaust pipe (page 2-5).

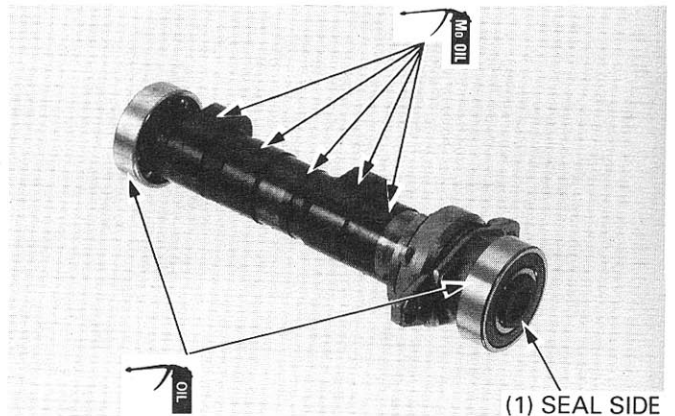
**TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)**



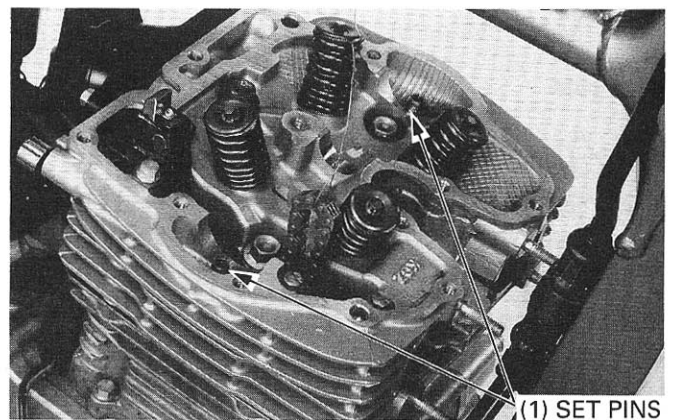
## CAMSHAFT INSTALLATION

Apply oil to the camshaft bearings and install them onto the camshaft.

Apply molybdenum disulfide oil to the cam lobes and journals.



Install the camshaft bearing set pins.

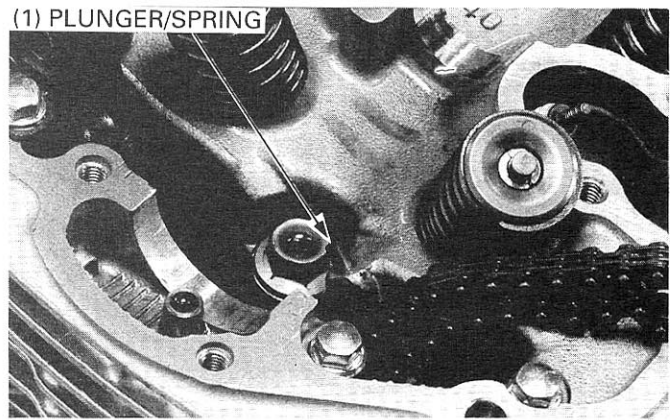




Install the plunger and spring.

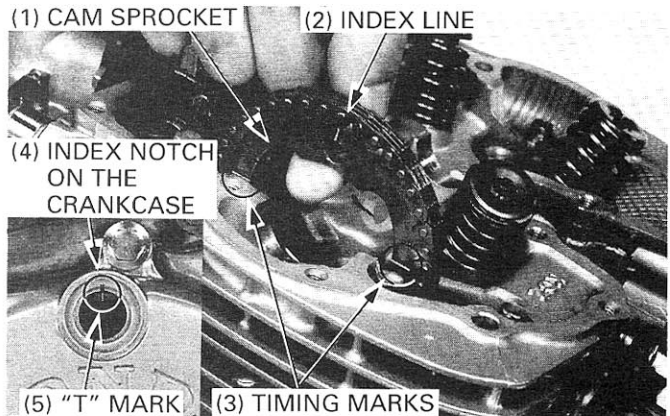
NOTE

- Be careful not to drop the plunger or spring into the crankcase.



Rotate the flywheel counterclockwise to align the "T" mark with the index notch on the left crankcase cover to the correct.

Place the cam sprocket with its groove facing up; align the timing marks on the cam sprocket with the upper surface of the cylinder head and install the cam chain over the sprocket without rotating the sprocket.

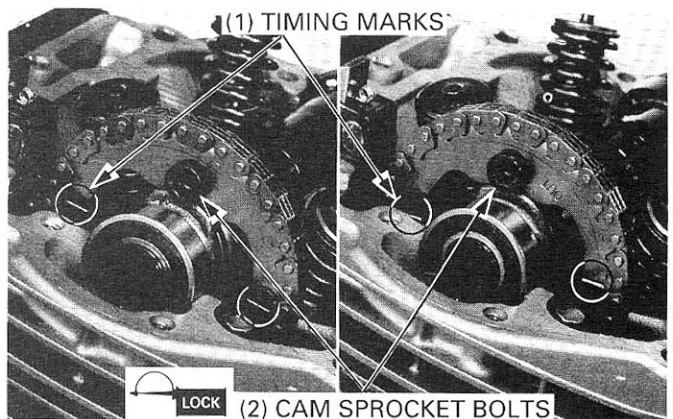


Install the camshaft through the sprocket. Apply thread lock to the cam sprocket bolts. Position the cam sprocket onto the shoulder of the camshaft and install a cam sprocket bolt.

Rotate the flywheel counterclockwise. Install the other sprocket bolt.

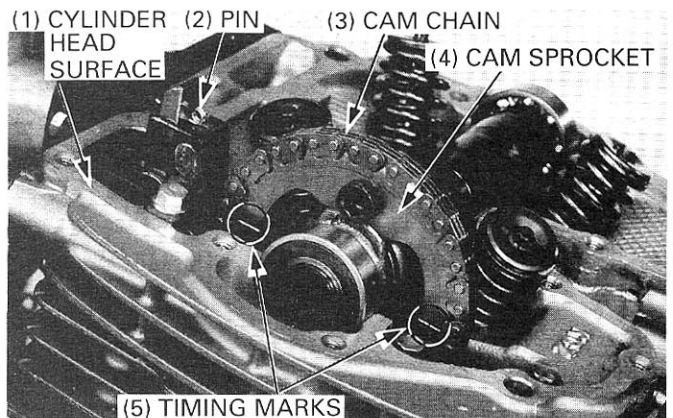
Tighten the cam sprocket bolt on the groove side, then tighten the other sprocket bolt, to the specified torque.

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



Rotate the flywheel counterclockwise to align the "T" mark with the index notch and make sure that the timing marks on the sprocket align with the upper surface of the cylinder head.

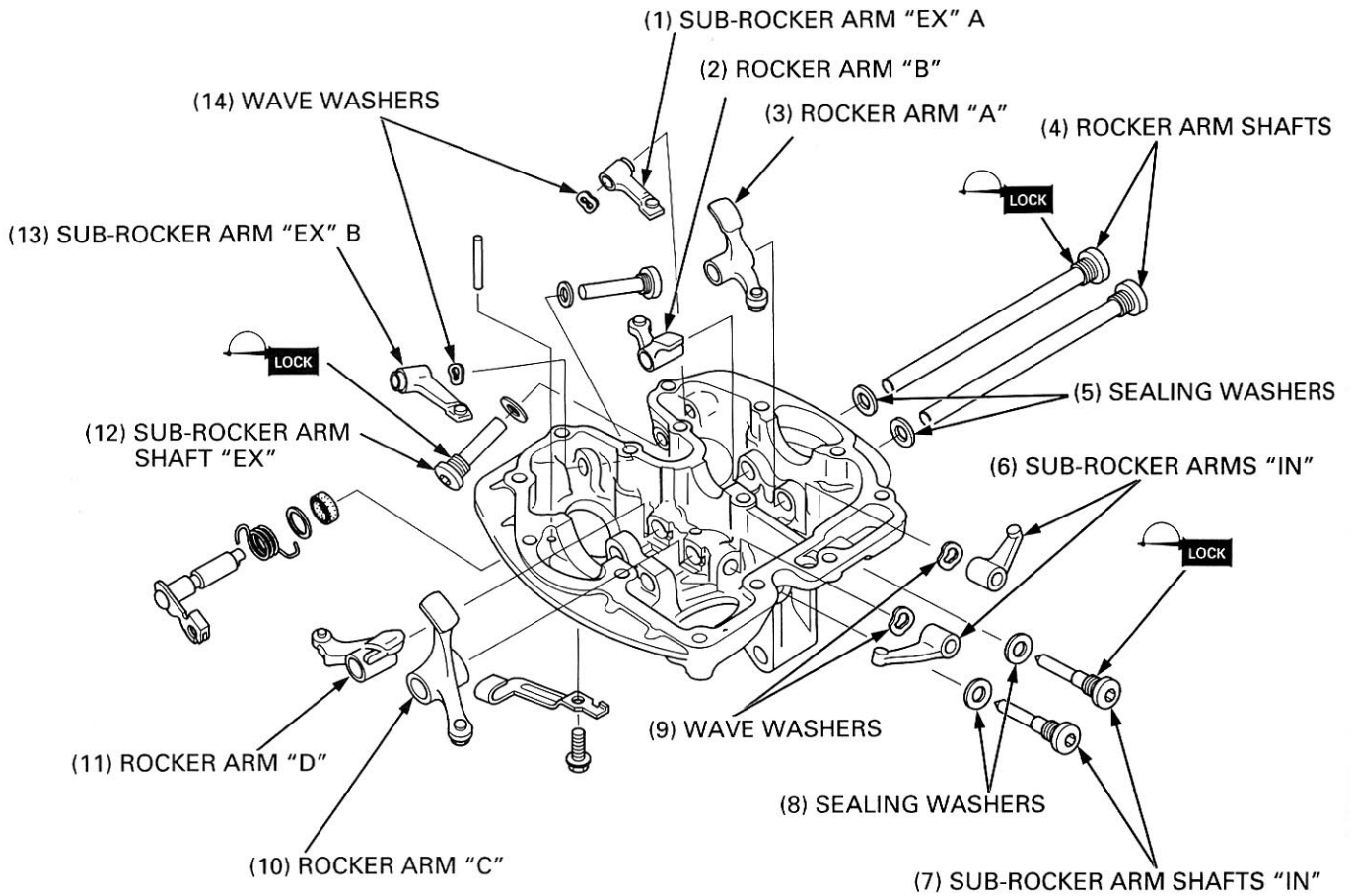
Remove the pin from the cam chain tensioner.




# CYLINDER HEAD COVER ASSEMBLY

Apply oil to the rocker arm-to-shaft sliding surface and sub-rocker arm-to-shaft sliding surface.

Apply molybdenum disulfide oil to the rocker arm slipper, sub-rocker arm slipper and adjusting screw contact points.



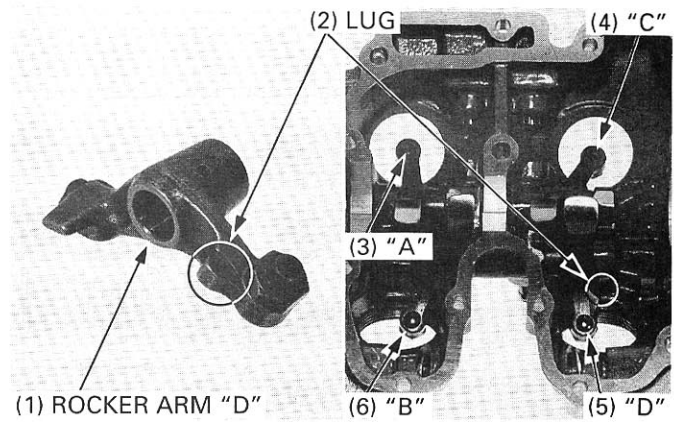
 : SEALING WASHERS



Install the rocker arms.

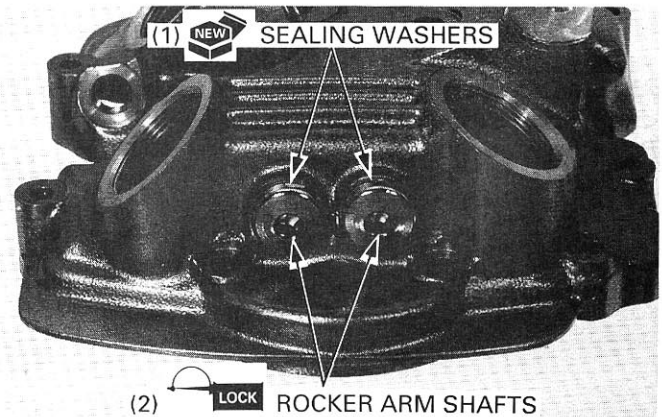
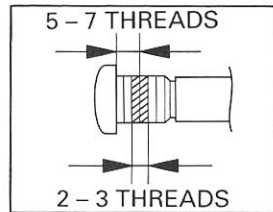
NOTE

- Note the location of the rocker arm with a decompression lug.

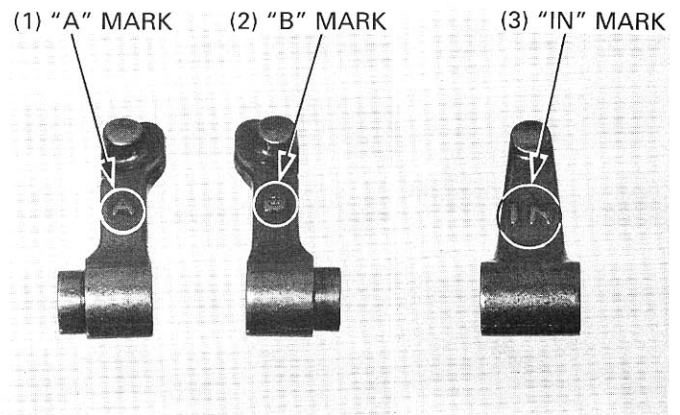


Apply locking agent to the rocker arm shaft threads as shown. Install the rocker arm shafts and new sealing washers and tighten them.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

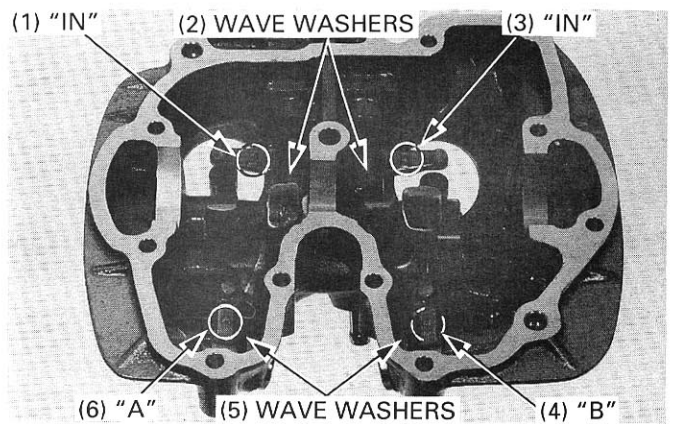


Install the sub-rocker arms and wave washers.



NOTE

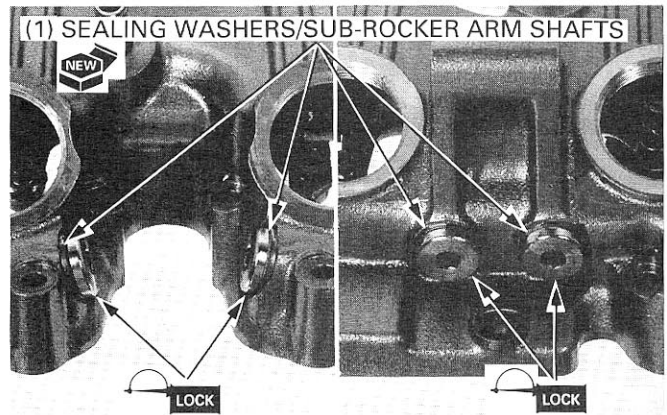
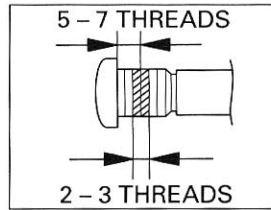
- Install the intake sub-rocker arm with the "IN" marks facing the valve.
- Install the exhaust sub-rocker arm with the "A" mark to the left, "B" mark to the right.



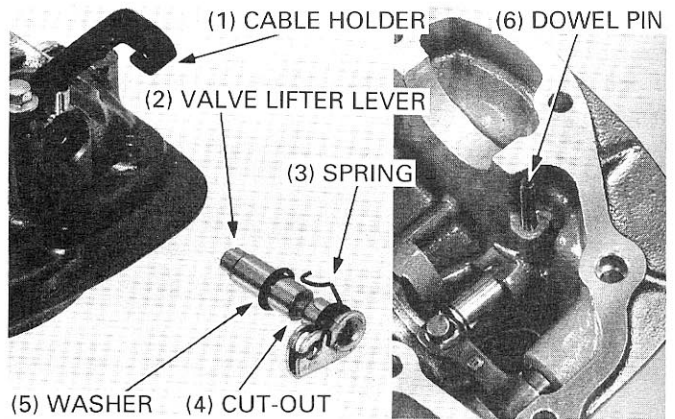
## CYLINDER HEAD/VALVES

Apply locking agent to the sub-rocker arm shaft threads as shown.  
Install the sub-rocker arm shafts and new sealing washers and tighten them.

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

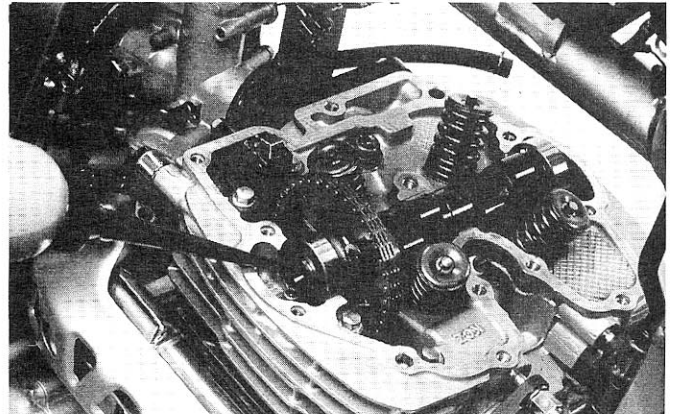


Install the decompressor cable holder, washer, spring and valve lifter lever into the cylinder head cover.  
Align the cut-out of the lever shaft with the hole in the cylinder head cover.  
Press the dowel pin into the cylinder head cover.



## CYLINDER HEAD COVER INSTALLATION

Pour clean engine oil into the cylinder head.

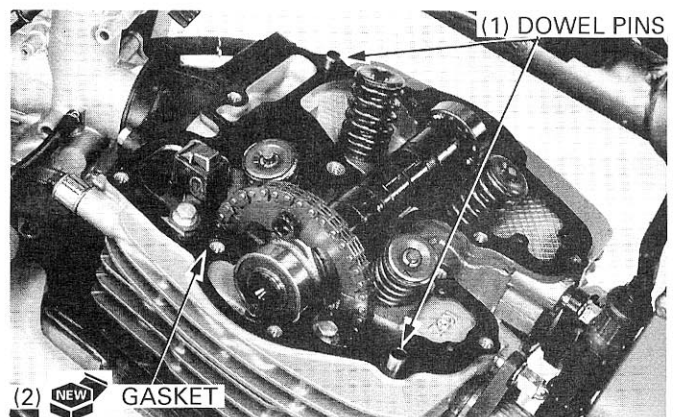


Install a new cylinder head cover gasket and dowel pins.

### NOTE

- Be careful not to damage the silicone coating on the gasket surfaces.

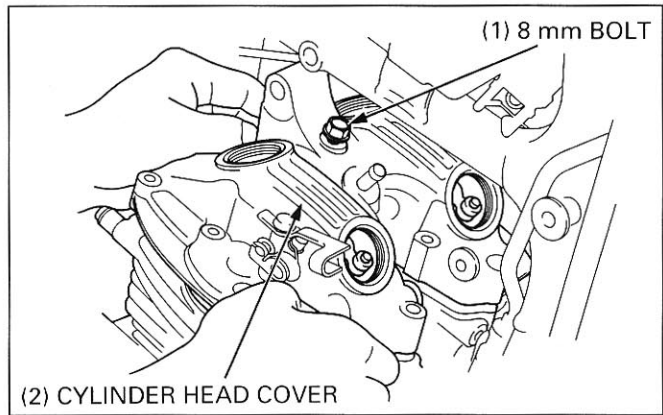
Rotate the crankshaft until all the cam lobes are facing down.



Loosen all valve adjusting screws.  
Install the cylinder head cover and 8 mm bolt.

**NOTE**

- Make sure all the sub-rocker arms are properly positioned between the valve stem tops and the rocker arm adjusting screws.

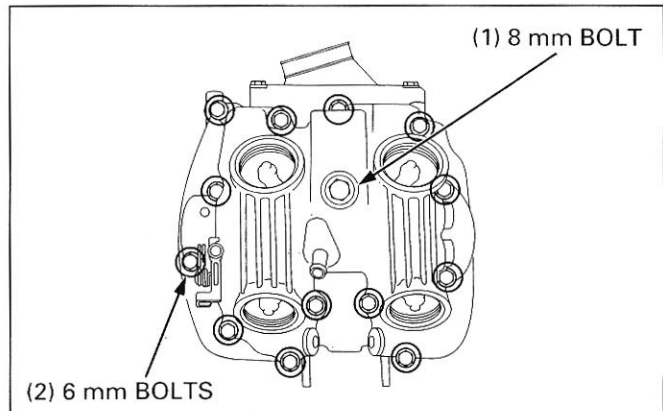


Install all cylinder head cover bolts.  
Tighten the 8 mm cylinder head cover bolt, then tighten the 6 mm cylinder head cover bolts, to the specified torque.

**TORQUE: 8 mm bolt: 24 N·m (2.4 kgf·m, 17 lbf·ft)**  
**6 mm bolt: 12 N·m (1.2 kgf·m, 9 lbf·ft)**

**NOTE**

- Tighten the 6 mm head cover bolts in a crisscross pattern in two or more steps.



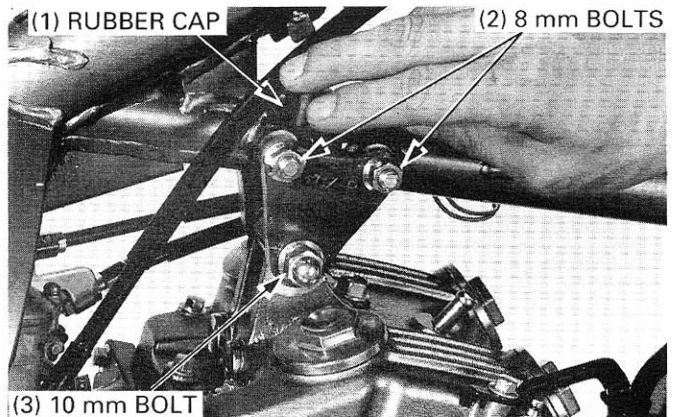
Adjust the valve clearance (page 3-9).

Install the upper hanger plates and bolts, tighten the nuts to the specified torque.

**TORQUE: 8 mm bolt: 26 N·m (2.7 kgf·m, 20 lbf·ft)**  
**10 mm bolt: 64 N·m (6.5 kgf·m, 47 lbf·ft)**

**NOTE**

- Install the hanger plates with the marks facing out.

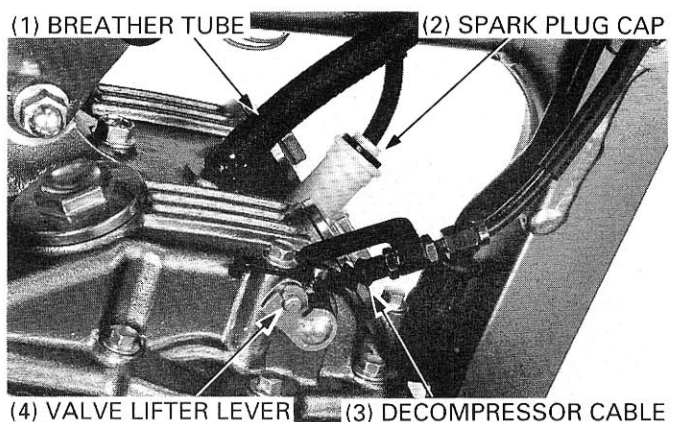


Install the rubber caps.

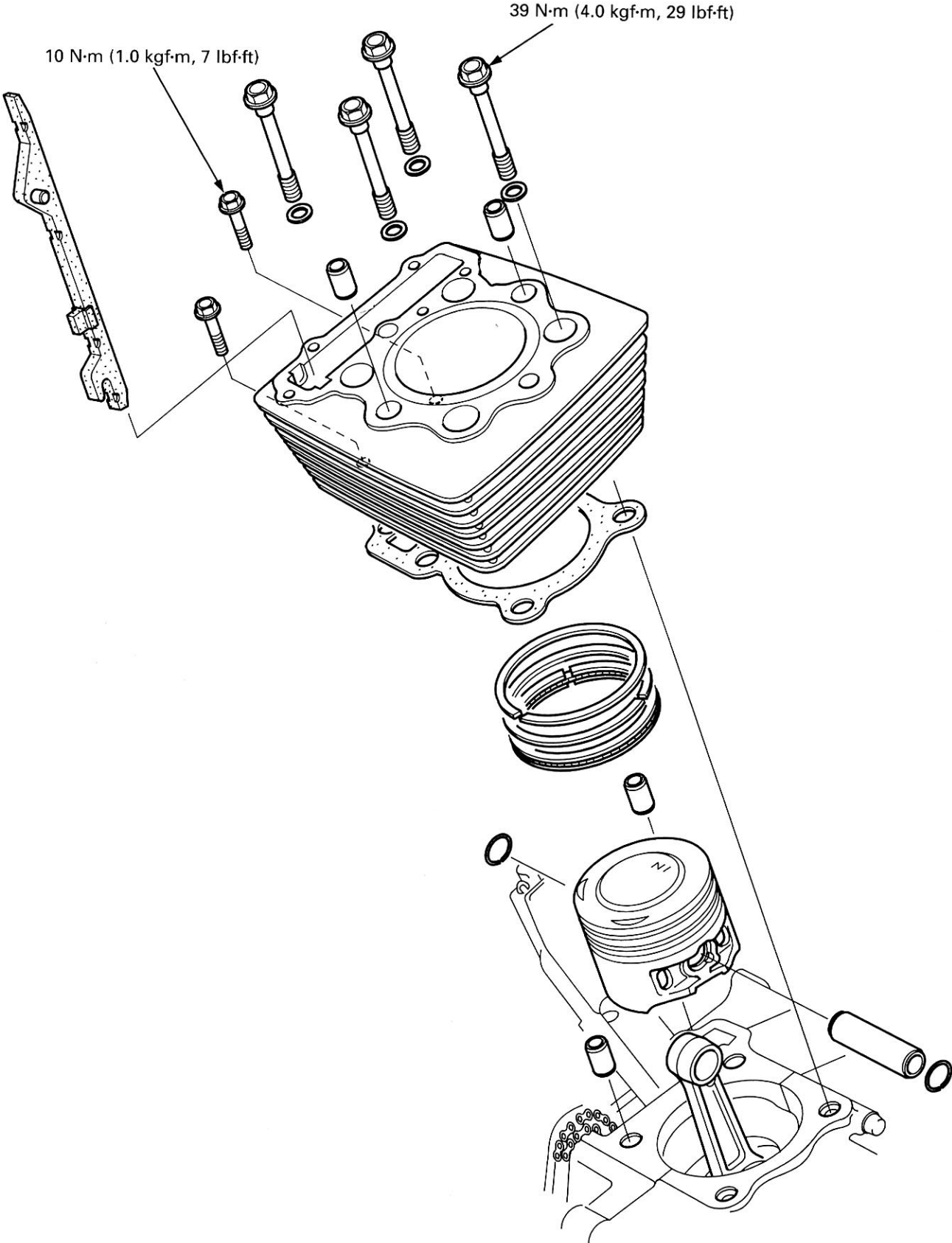
Install the breather tube.  
Install the decompressor cable to the valve lifter lever.  
Install the spark plug cap.

After installing, adjust the decompressor system (page 3-13).

Install the fuel tank (page 5-3).  
Install the seat (page 2-2).



CYLINDER/PISTON



# 8. CYLINDER/PISTON

<b>SERVICE INFORMATION</b>	<b>8-1</b>	<b>PISTON REMOVAL</b>	<b>8-4</b>
<b>TROUBLESHOOTING</b>	<b>8-2</b>	<b>PISTON INSTALLATION</b>	<b>8-6</b>
<b>CYLINDER REMOVAL</b>	<b>8-3</b>	<b>CYLINDER INSTALLATION</b>	<b>8-7</b>

## SERVICE INFORMATION

### GENERAL

- This section covers maintenance of the cylinder and piston. These services can be done with the engine installed in the frame.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.
- Be careful not to damage the mating surfaces when removing the cylinder from the crankcase.

### SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Cylinder	I.D.	73.000 – 73.010 (2.8740 – 2.8744)	73.11 (2.878)	
	Taper	—	0.05 (0.002)	
	Out of round	—	0.05 (0.002)	
	Warpage	—	0.10 (0.004)	
Piston, piston ring and piston pin	Piston mark direction		"IN" mark facing to the intake side	
	Piston O.D.		72.965 – 72.985 (2.8726 – 2.8734) at 19 mm (0.7 in) from bottom of skirt	
	Piston pin hole I.D.		17.002 – 17.008 (0.6694 – 0.6696)	
	Cylinder-to-piston clearance		0.015 – 0.045 (0.0006 – 0.0018)	
	Piston pin O.D.		16.994 – 17.000 (0.6691 – 0.6693)	
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	
	Piston ring-to-ring groove clearance	Top	0.015 – 0.050 (0.0006 – 0.0020)	0.12 (0.005)
		Second	0.015 – 0.050 (0.0006 – 0.0020)	0.12 (0.005)
	Piston ring end gap	Top	0.15 – 0.30 (0.006 – 0.012)	0.40 (0.016)
		Second	0.30 – 0.45 (0.012 – 0.018)	0.55 (0.022)
		Oil (side rail)	0.2 – 0.7 (0.01 – 0.03)	0.86 (0.034)
	Piston ring mark	Top	mark facing up	—
		Second	mark facing up	—
	Connecting rod small end I.D.		17.016 – 17.034 (0.6699 – 0.6706)	17.06 (0.672)
Connecting rod-to-piston pin clearance		0.016 – 0.040 (0.0006 – 0.0016)	0.09 (0.004)	



## CYLINDER/PISTON

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### TORQUE VALUES

Cylinder bolt (10 mm) (6 mm SH)	39 N·m (4.0 kgf·m, 29 lbf·ft) Apply oil to the thread and flange surface. 10 N·m (1.0 kgf·m, 7 lbf·ft)
------------------------------------	---

### 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 tube. If the tube is smokey, check for a seized piston ring.

#### Low compression

- Worn cylinder or piston ring

#### High compression

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

#### Excessive smoke

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

#### Rough idle

- Low cylinder compression

#### Over heating

- Excessive carbon build-up on the piston head or combustion chamber

#### Knocking or abnormal noise

- Worn piston and cylinder
- Excessive carbon build-up

## CYLINDER REMOVAL

Remove the cylinder head (page 7-7).  
 Remove the cam chain guide.  
 Remove the cylinder 6 mm bolts.  
 Remove the cylinder 10 mm flange bolts and washers.

### NOTE

- Loosen the bolts in a crisscross pattern in two or more steps.

Remove the cylinder.

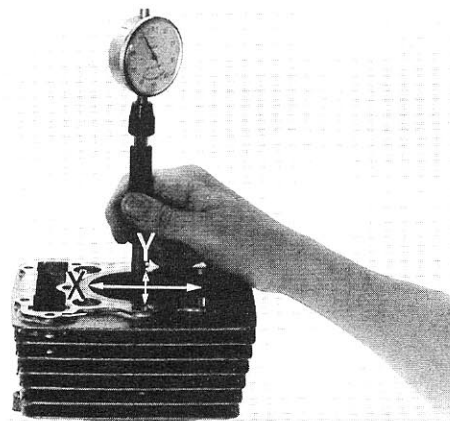
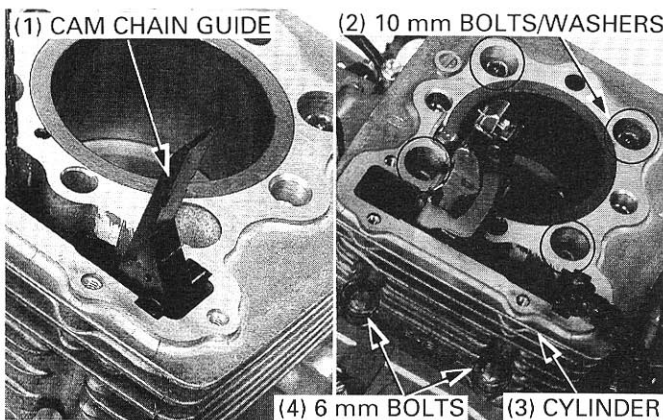
Remove the gasket and dowel pins.

## CYLINDER INSPECTION

Inspect the cylinder walls for scratches and wear.

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

**SERVICE LIMIT: 73.11 mm (2.878 in)**

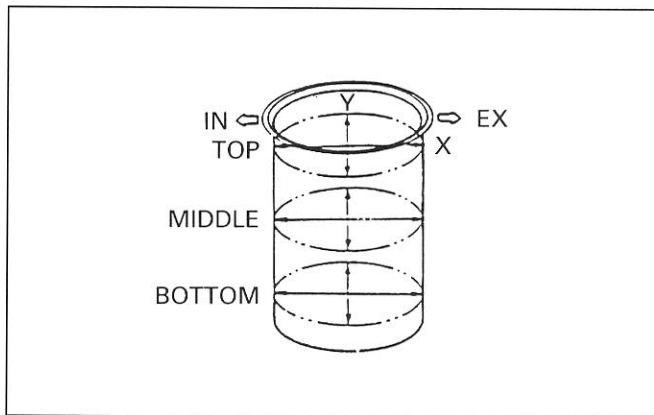


Calculate the cylinder for taper at three levels in an X and Y axis.  
 Take the maximum reading to determine the taper.

**SERVICE LIMIT: 0.05 mm (0.002 in)**

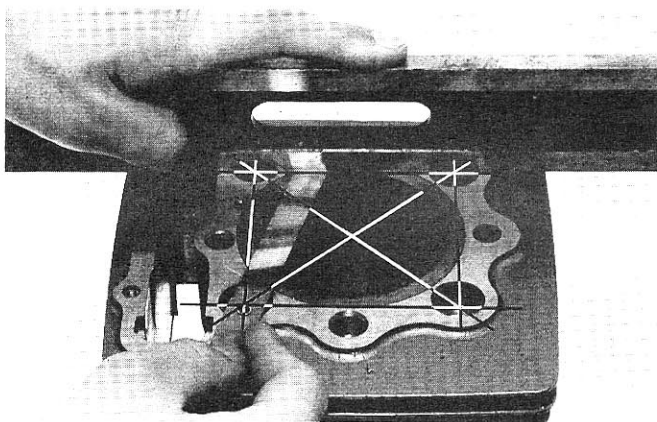
Calculate the cylinder for out-of-round at three levels in an X and Y axis.  
 Take the maximum reading to determine the out-of-round.

**SERVICE LIMIT: 0.05 mm (0.002 in)**



Inspect the top of the cylinder for warpage.

**SERVICE LIMIT: 0.10 mm (0.004 in)**



## CYLINDER/PISTON

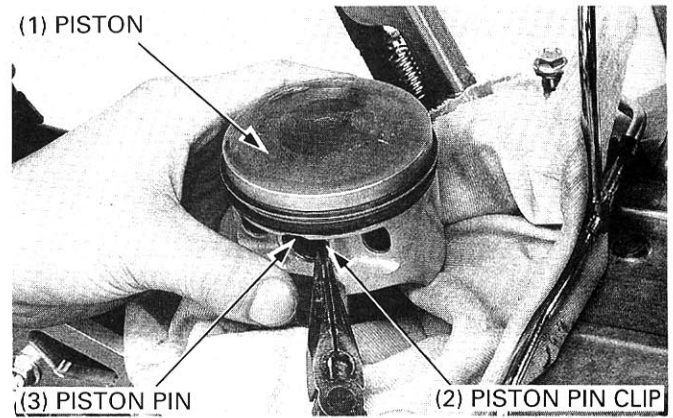
### PISTON REMOVAL

Place clean shop towels in the crankcase to keep the piston pin clips, or other parts, from falling into the crankcase.

Remove the piston pin clips with pliers.

Press the piston pin out of the piston.

Remove the piston pin and piston.



### PISTON/PISTON RING INSPECTION

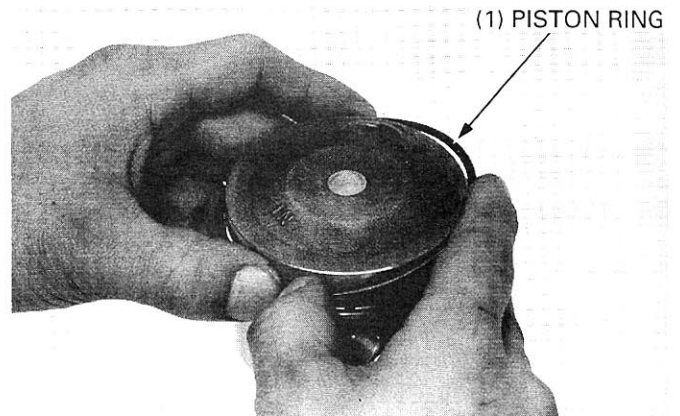
Remove the piston rings.

Remove the carbon or deposits from the piston head or piston ring grooves.

Inspect the piston for damage and the ring grooves for wear.

#### CAUTION

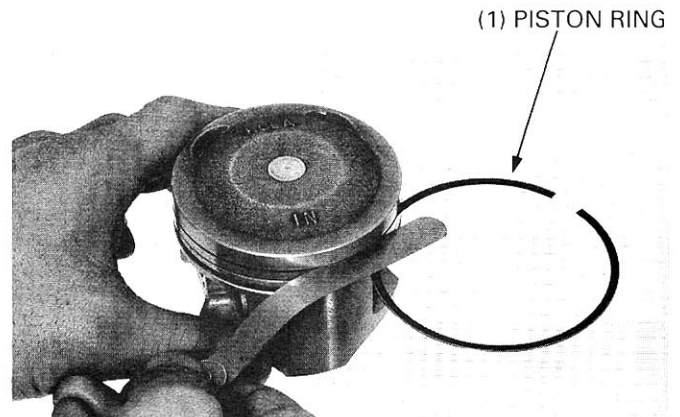
- *Piston rings are easily broken; take care not to damage them during removal.*



Install the piston ring as shown.

Measure the piston ring-to-groove clearance.

**SERVICE LIMITS: TOP: 0.12 mm (0.005 in)**  
**2nd: 0.12 mm (0.005 in)**

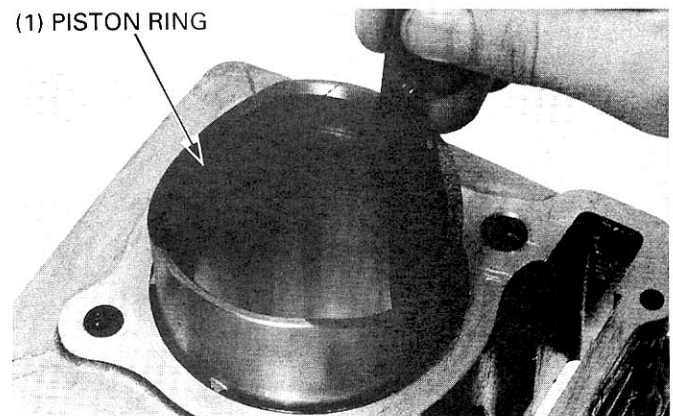


Insert each piston rings into the cylinder, about 20 mm (0.75 in) in from the bottom.

To ensure that it's square in the bore, use a piston to push it in.

Measure the ring end gap.

**SERVICE LIMITS: TOP: 0.40 mm (0.016 in)**  
**2nd: 0.55 mm (0.022 in)**  
**OIL: 0.86 mm (0.034 in)**

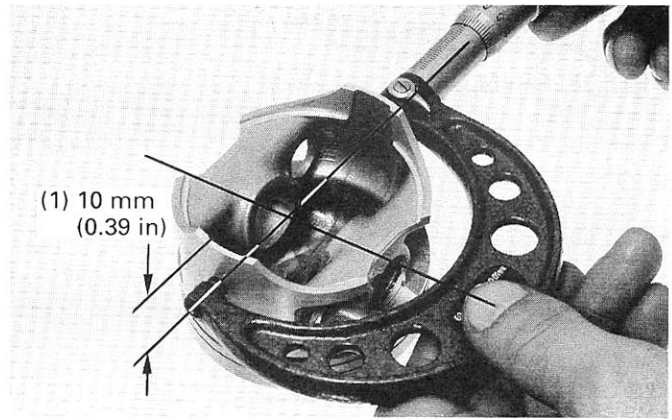


Measure the piston diameter 10 mm (0.39 in) from the bottom of the skirt and at a right angle to the piston hole.

**SERVICE LIMIT: 72.88 mm (2.869 in)**

Calculate the piston-to-cylinder clearance, by subtracting the piston O.D. from the maximum cylinder I.D. measurement.

**SERVICE LIMIT: 0.10 mm (0.004 in)**



Measure the piston pin bore.

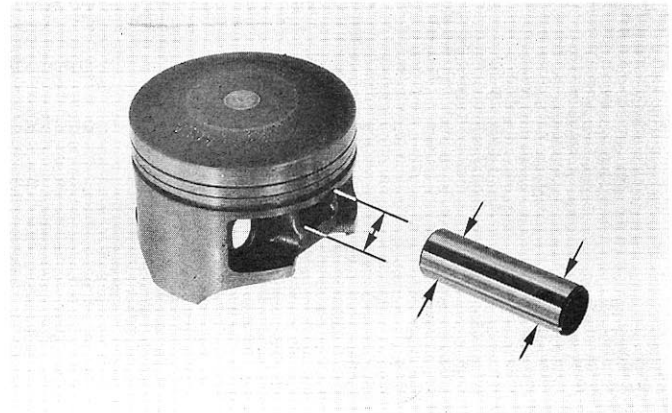
**SERVICE LIMIT: 17.07 mm (0.672 in)**

Measure the piston pin O.D..

**SERVICE LIMIT: 16.97 mm (0.668 in)**

Calculate the piston-to-piston pin clearance.

**SERVICE LIMIT: 0.07 mm (0.003 in)**



### CONNECTING ROD SMALL END INSPECTION

Measure the connecting rod small end I.D..

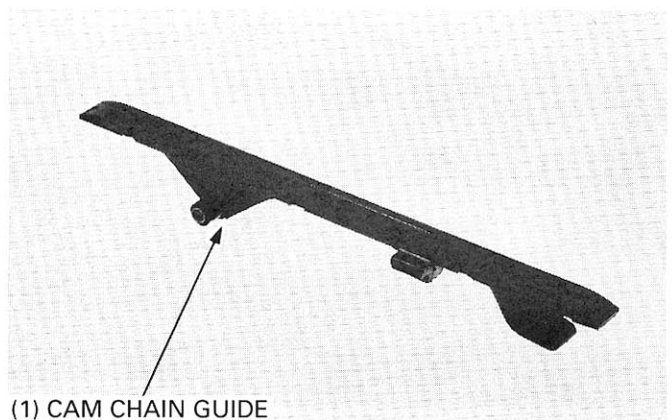
**SERVICE LIMIT: 17.06 mm (0.672 in)**

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

**SERVICE LIMIT: 0.09 mm (0.004 in)**



Inspect the cam chain guide for wear or damage.



# PISTON INSTALLATION

## PISTON RING INSTALLATION

Clean the piston grooves thoroughly by holding a ring in the grooves while turning the piston.

### CAUTION

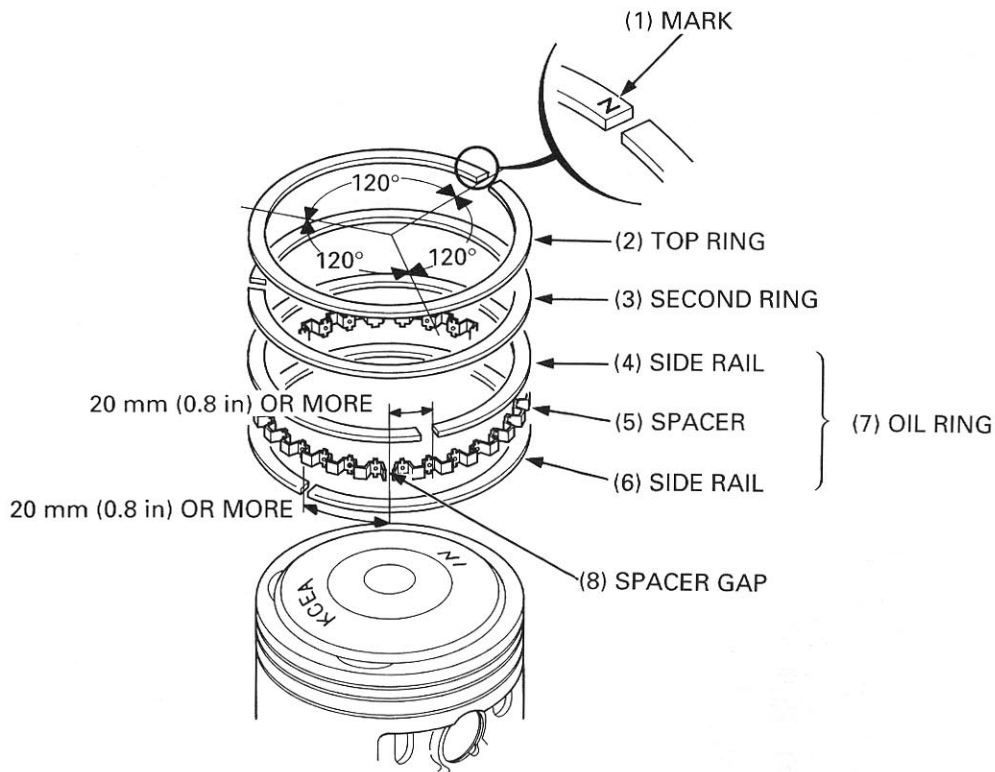
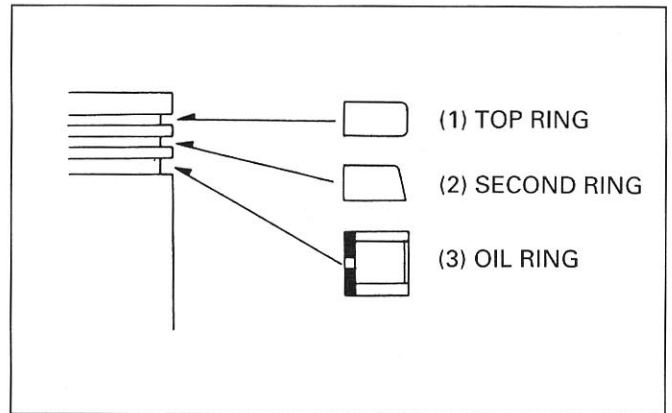
- Do not use a wire brush to clean ring lands, or cut lands deeper with a cleaning tool.

Apply engine oil to the piston rings.

Install the piston rings.

### NOTE

- Be careful not to damage the piston and piston rings during assembly.
- Install the piston ring on the piston with the mark facing up.
- After installing the rings they should rotate freely, without sticking.
- Space the ring end gaps 120 degrees apart.
- Do not align the piston ring end gap with the piston pin hole or 90 degrees to the piston pin hole.
- Space the side rail gaps 40 mm (1.6 in) or more apart as shown.





Apply molybdenum disulfide oil to the connecting rod small end and piston pin.

**NOTE**

- Place a shop towel around the piston skirt and in the crankcase to prevent the piston pin clips from falling into the crankcase.

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

Install the piston pin.

**NOTE**

- Do not align the piston pin clip end gap with the piston cut-out.
- Be careful not to drop the piston pin clip into the crankcase.

Remove the shop towel.

**CYLINDER INSTALLATION**

Carefully clean any gasket material from the crankcase mating surface.

**CAUTION**

- *Be careful not to damage the cylinder mating surface.*

Apply liquid sealant to the crankcase mating area to prevent oil leaks.  
Install the dowel pins and new gasket.

Coat the cylinder bore and piston with fresh engine oil.  
Install the cylinder.

Apply engine oil to the cylinder 10 mm flange bolts threads and flange surface and washers.  
Install the bolts and washers.  
Tighten the bolts to the specified torque.

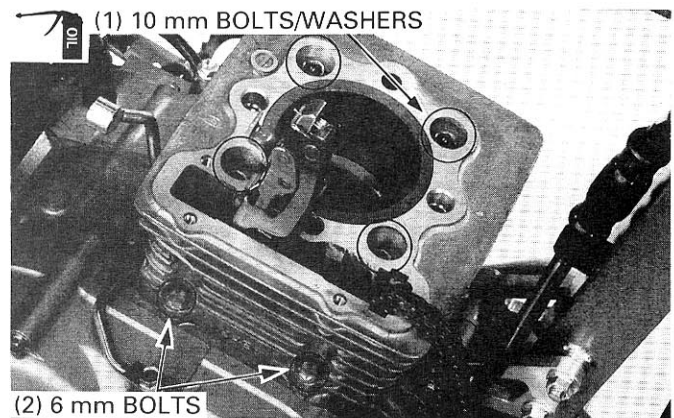
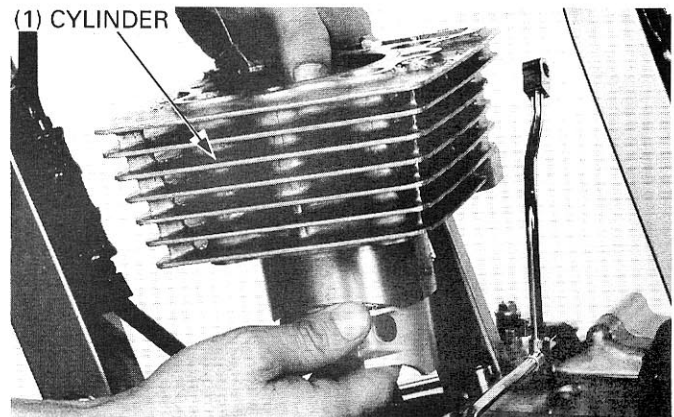
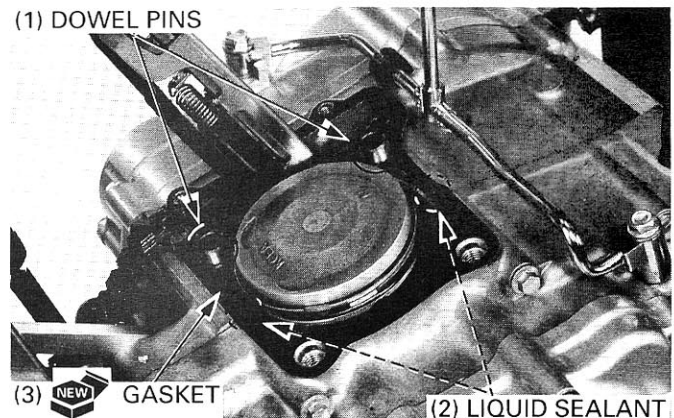
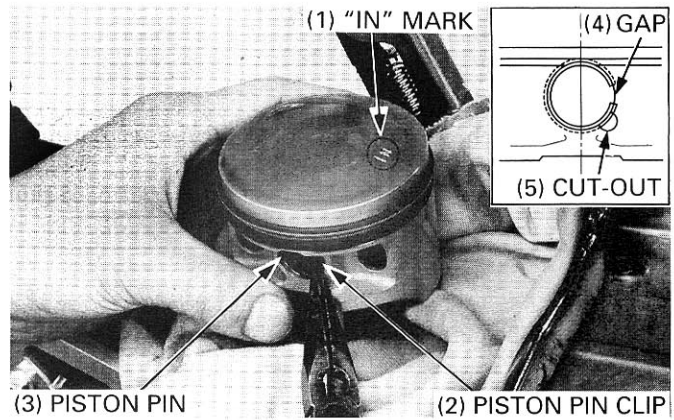
**TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)**

**NOTE**

- Tighten the bolts in a crisscross pattern in two or more steps.

Install the cylinder 6 mm bolts and tighten them.

**TORQUE: 10 N·m (1.0 kgf·m, 7.2 lb·ft)**



## CYLINDER/PISTON

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Install the cam chain guide.

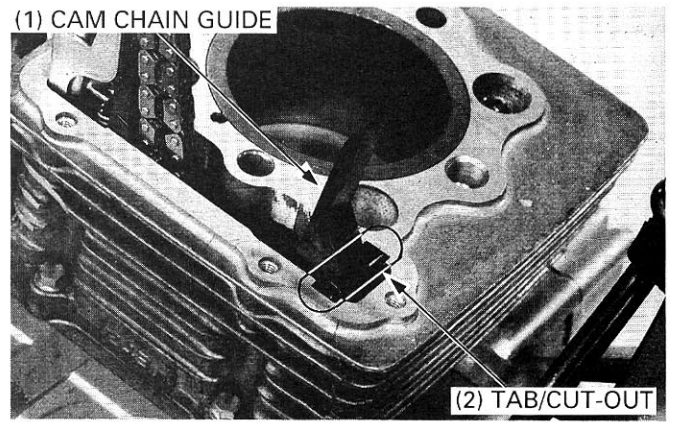
### NOTE

- Fit the cam chain guide tab in the cylinder cut-out as shown.
- Push the guide in until it bottoms in the crankcase guide hole.

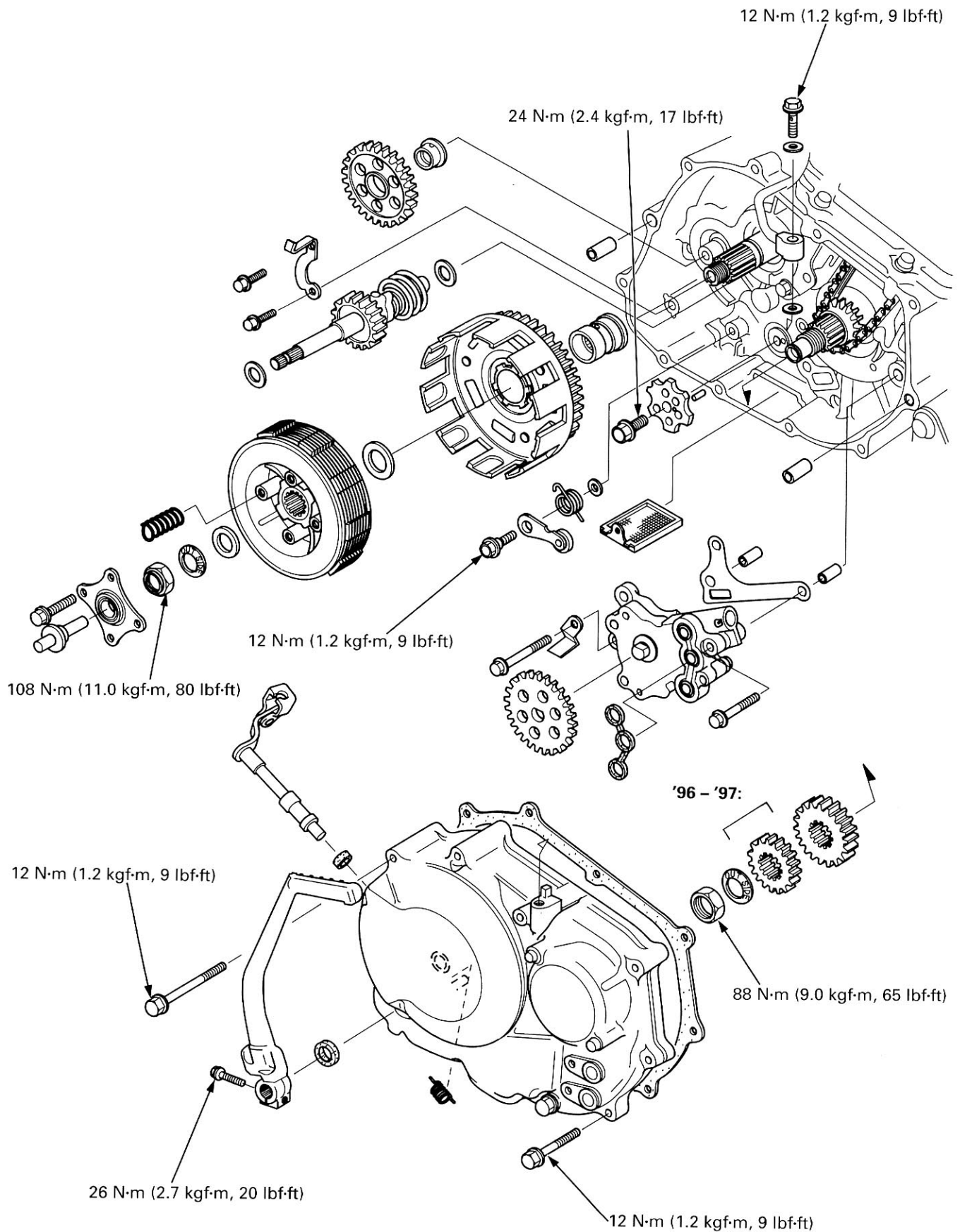
Install the cylinder head (page 7-15).

Install the camshaft (page 7-16).

Install the cylinder head cover (page 7-20).



# CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE



# 9. CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

<b>SERVICE INFORMATION</b>	<b>9-1</b>	<b>KICKSTARTER REMOVAL/ DISASSEMBLY</b>	<b>9-12</b>
<b>TROUBLESHOOTING</b>	<b>9-2</b>	<b>KICKSTARTER ASSEMBLY/ INSTALLATION</b>	<b>9-14</b>
<b>RIGHT CRANKCASE COVER REMOVAL</b>	<b>9-3</b>	<b>GEARSHIFT CAM</b>	<b>9-16</b>
<b>CLUTCH REMOVAL</b>	<b>9-5</b>	<b>RIGHT CRANKCASE COVER INSTALLATION</b>	<b>9-17</b>
<b>PRIMARY DRIVE GEAR</b>	<b>9-8</b>		
<b>CLUTCH INSTALLATION</b>	<b>9-10</b>		

## SERVICE INFORMATION

### GENERAL

- This section covers maintenance of the clutch, kickstarter, gearshift linkage and right crankcase cover. These services can be done with the engine installed in the frame.
- When the existing clutch discs are replaced, coat the new discs with engine oil prior to assembly.

### SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Clutch	Lever free play	10 – 20 (3/8 – 3/4)	—	
	Spring free length	37.2 (1.46)	33.5 (1.32)	
	Disc thickness	2.92 – 3.08 (0.115 – 0.121)	2.69 (0.106)	
	Plate warpage	—	0.30 (0.012)	
	Clutch outer I.D.	25.000 – 25.021 (0.9843 – 0.9851)	25.04 (0.986)	
	Outer guide	I.D.	19.990 – 20.010 (0.7870 – 0.7878)	20.03 (0.789)
		O.D.	24.959 – 24.980 (0.9826 – 0.9835)	24.17 (0.952)
	Mainshaft O.D. at clutch outer guide		19.959 – 19.980 (0.7858 – 0.7866)	19.91 (0.784)
Kickstarter	Starter idle gear I.D.	19.010 – 19.034 (0.7484 – 0.7494)	19.13 (0.753)	
	Starter idle gear bushing	I.D.	15.000 – 15.018 (0.5906 – 0.5913)	15.04 (0.592)
		O.D.	18.959 – 18.980 (0.7464 – 0.7472)	18.92 (0.745)
	Kickstarter gear I.D.	25.020 – 25.041 (0.9850 – 0.9859)	25.12 (0.989)	
	Kickstarter gear bushing	I.D.	22.000 – 22.021 (0.8661 – 0.8670)	22.10 (0.870)
		O.D.	24.979 – 25.000 (0.9834 – 0.9843)	24.90 (0.980)
	Kickstarter spindle O.D.		21.959 – 21.980 (0.8645 – 0.8654)	21.91 (0.863)
	Countershaft O.D. at starter idle gear		14.966 – 14.984 (0.5892 – 0.5899)	14.91 (0.587)

## CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

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### TORQUE VALUES

Right crankcase cover bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Stopper arm pivot bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Gearshift cam bolt	24 N·m (2.4 kgf·m, 17 lbf·ft) Apply a locking agent to the threads.
Clutch center lock nut	108 N·m (11.0 kgf·m, 80 lbf·ft) Stake and apply oil to the threads and flange surface.
Primary drive gear lock nut	88 N·m (9.0 kgf·m, 65 lbf·ft) Apply oil to the threads and flange surface
Kickstarter pedal bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)

### TOOLS

#### Special

Clutch center holder 07923 – KE10000 or 07HGB – 001000A or 07HGB – 001010A or B  
and 07HGB – 001020A or B (U.S.A. only)

#### Common

Gear holder 07724 – 0010100

## TROUBLESHOOTING

- Faulty clutch operation can usually be corrected by adjusting the clutch lever free play.

#### Clutch slips when accelerating

- No free play
- Discs worn
- Springs weak

#### Clutch will not disengage

- Too much free play
- Plates warped

#### Motorcycle creeps with clutch disengaged

- Too much free play
- Plates warped

#### Excessive lever pressure

- Clutch cable kinked, damaged or dirty
- Lifter mechanism damaged

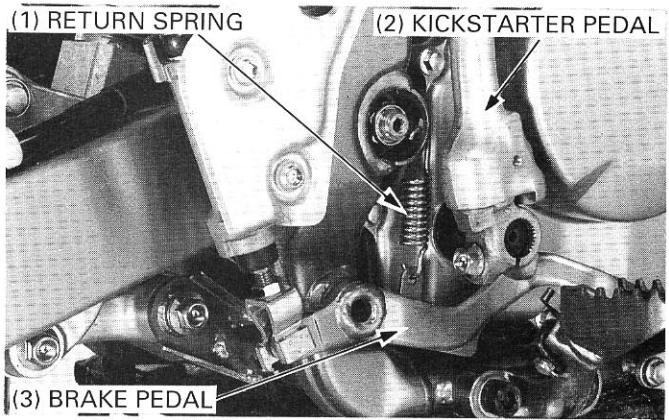
#### Clutch operation feels rough

- Outer drum slots rough
- Dirty clutch cable

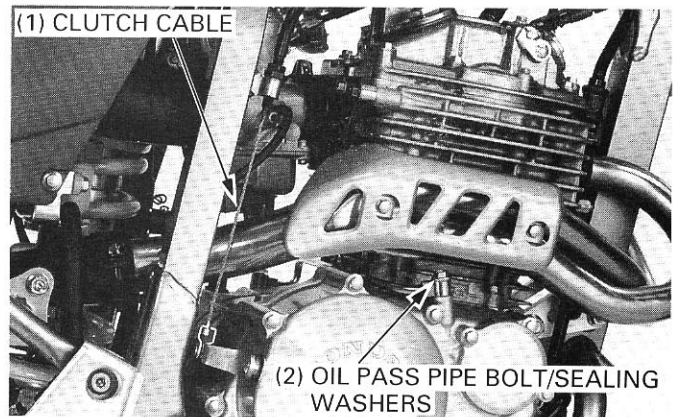


## RIGHT CRANKCASE COVER REMOVAL

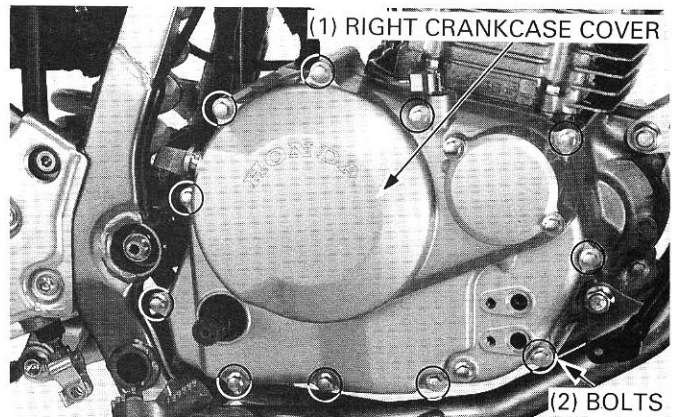
Drain the engine oil (page 3-11).  
 Remove the under guard (page 2-3).  
 Remove the oil pipes (page 4-9).  
 Remove the kickstarter pedal.  
 Remove the brake pedal return spring and brake pedal (page 15-26).  
 Remove the exhaust pipe (page 2-3).  
 Loosen the oil pass pipe joint bolt.  
 Remove the oil pass pipe joint bolt (right crankcase cover side) and sealing washers.



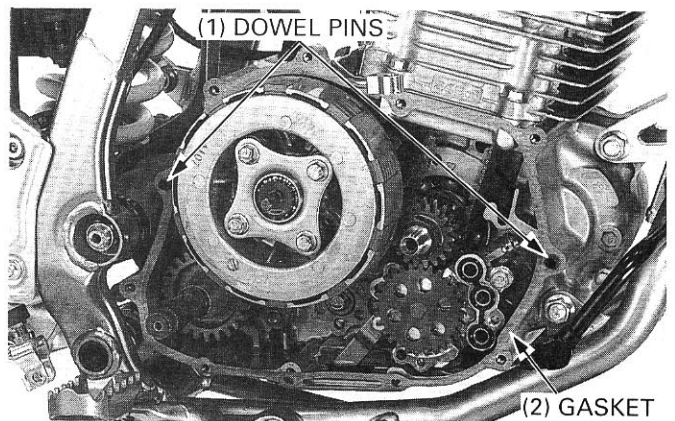
Loosen the clutch cable lock nut and adjusting nut.  
 Remove the clutch cable from the clutch arm.



Remove the bolts and right crankcase cover.



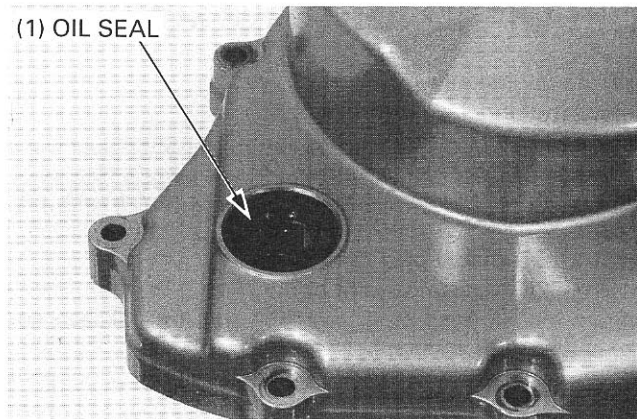
Remove the gasket and dowel pins.



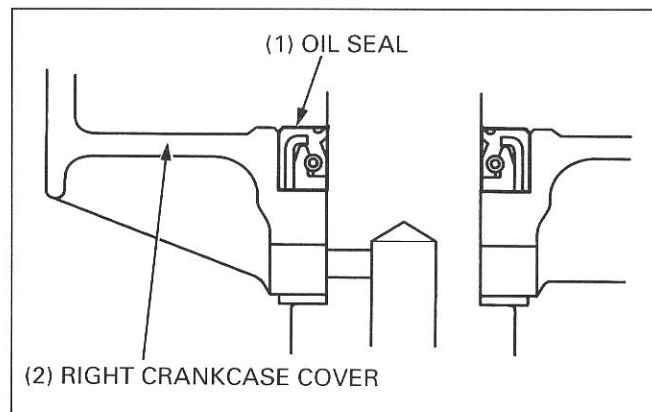
## CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

### RIGHT CRANKCASE COVER INSPECTION

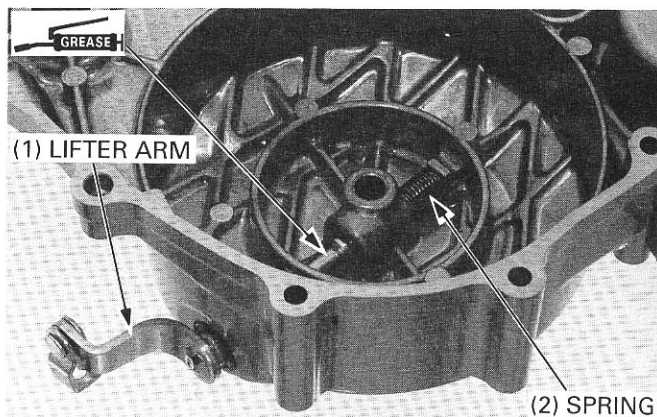
Inspect the oil seal and replace if necessary.



Install the new oil seal with the mark facing out. Press the oil seal into the crankcase even with the case surface as shown.

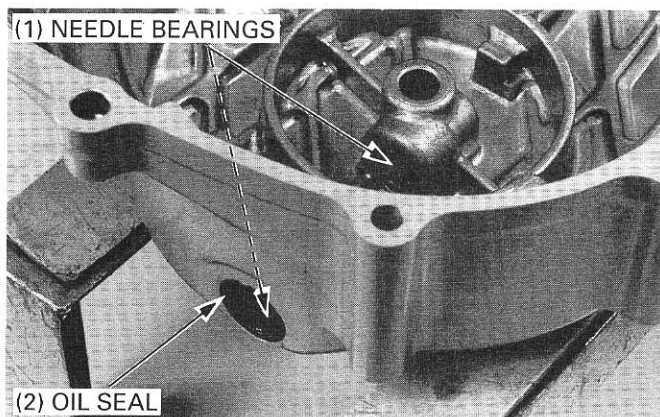


Remove the spring and clutch lifter arm. Inspect the lifter arm and replace if worn or damaged. Apply grease to the clutch lifter arm sliding surface.



Inspect the oil seal and replace if worn or damaged. Inspect the needle bearing and replace if worn or damaged.

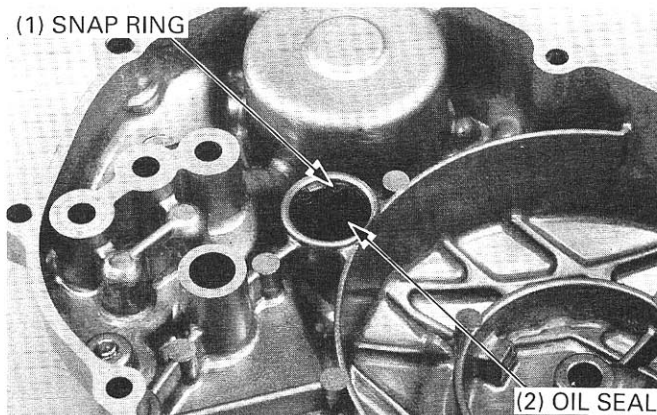
Press the oil seal into the crankcase even with the case surface.



Remove the snap ring and oil seal.  
Inspect the oil seal and replace if worn or damaged.

Press the oil seal into the crankcase below the snap ring groove.

Install the snap ring.

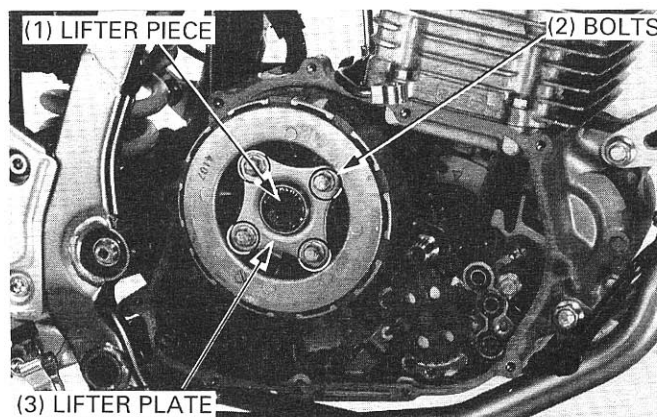


## CLUTCH REMOVAL

Remove the right crankcase cover (page 9-3).  
Remove the clutch lifter piece.  
Remove the clutch lifter plate bolts, clutch lifter plate, lifter bearing and clutch springs.

### NOTE

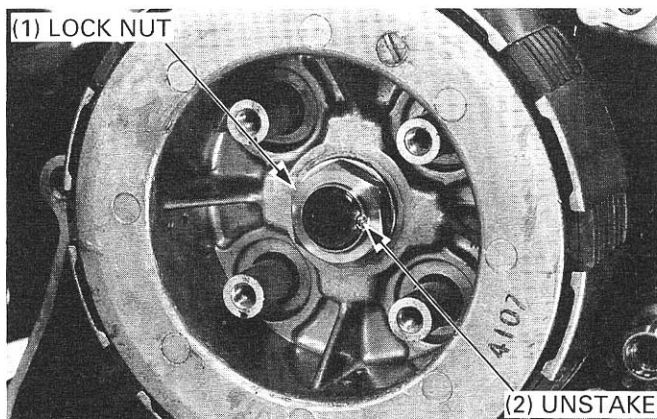
- Loosen the bolts in a crisscross pattern in 2-3 steps.



Unstake the lock nut with a drill or grinder.

### NOTE

- Be careful that the threads on the main shaft are not damaged.
- Clean any metal shavings.

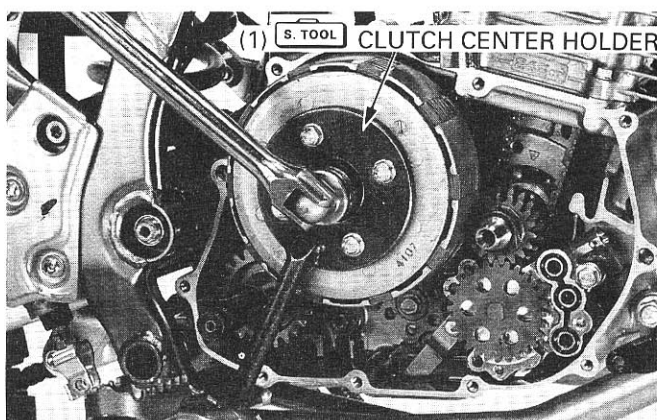


Attach the clutch center holder to the pressure plate with four clutch bolts and remove the lock nut, lock washer and thrust washer.

### TOOL:

**Clutch center holder**

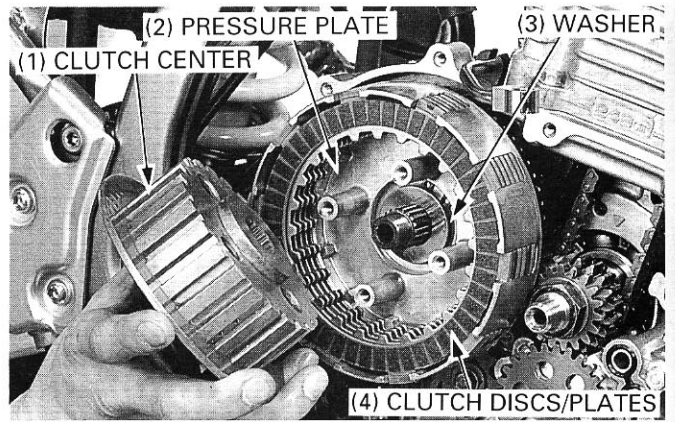
07923 - KE10000 or  
07HGB - 001000A or  
07HGB - 001010A or B  
and  
07HGB - 001020A or B  
(U.S.A. only)



## CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

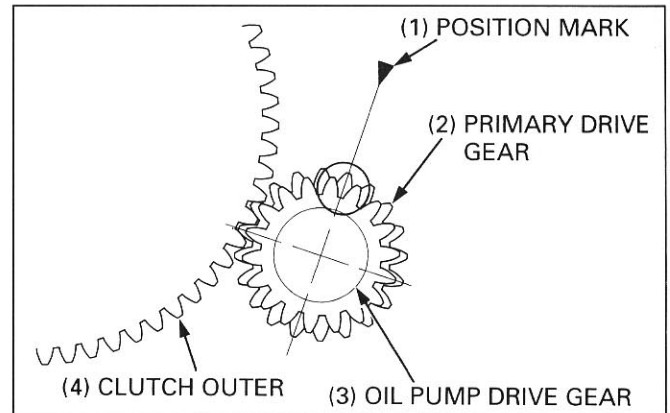
Remove the following:

- Clutch center
- Washer
- Six clutch plates
- Five friction discs
- Pressure plate

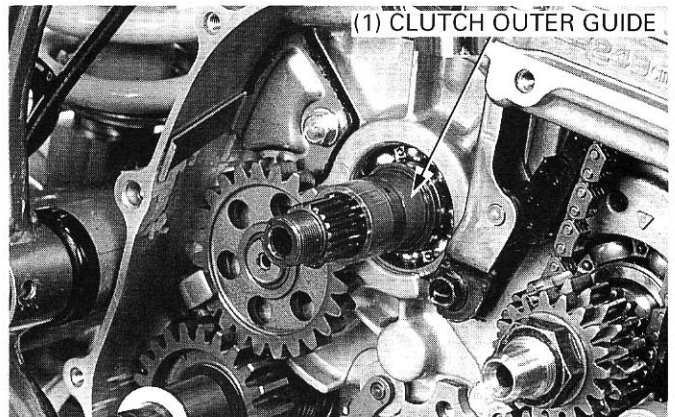


'96 - '97:

Align the oil pump drive gear teeth and primary drive gear teeth with the position mark on the crankcase as shown. Remove the clutch outer.



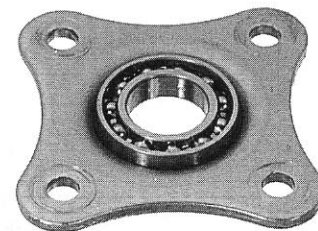
Remove the clutch outer guide.



## CLUTCH INSPECTION

### Lifter plate bearing inspection

Check the bearing for wear, excessive play or damage and replace it if necessary.





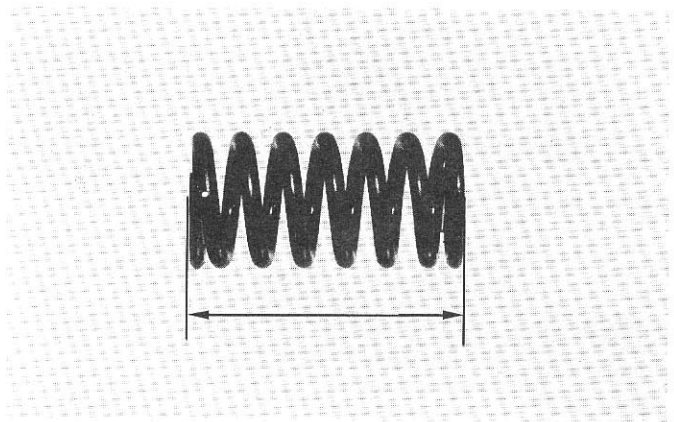
## Clutch spring inspection

Measure the free length of each spring.

**SERVICE LIMIT: 33.5 mm (1.32 in)**

### NOTE

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



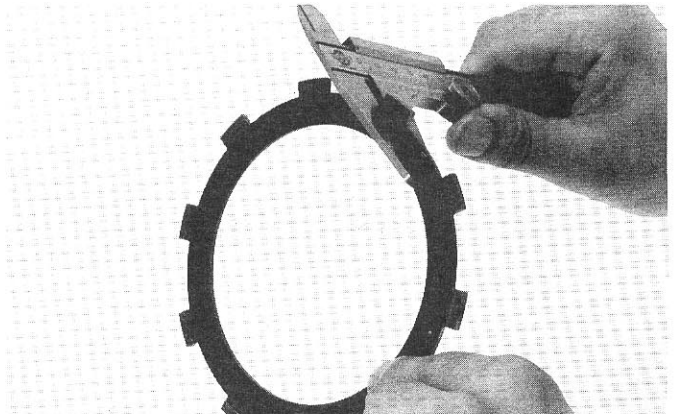
## Clutch disc inspection

Replace the discs if they show signs of scoring or discoloration. Measure the disc thickness.

**SERVICE LIMIT: 2.69 mm (0.106 in)**

### NOTE

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



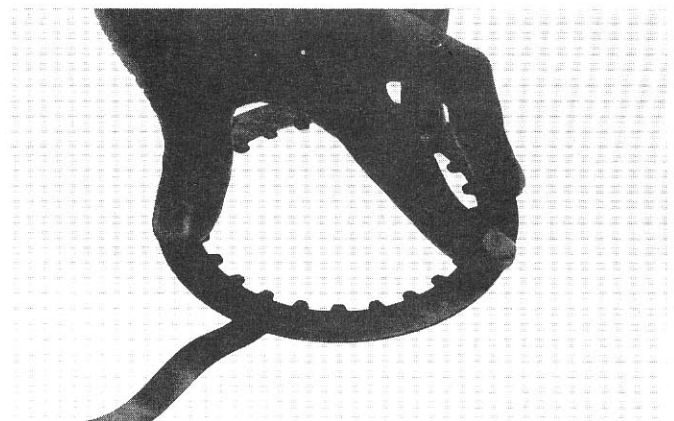
## Friction plate inspection

Check for plate warpage on a surface plate, using a feeler gauge.

**SERVICE LIMIT: 0.30 mm (0.012 in)**

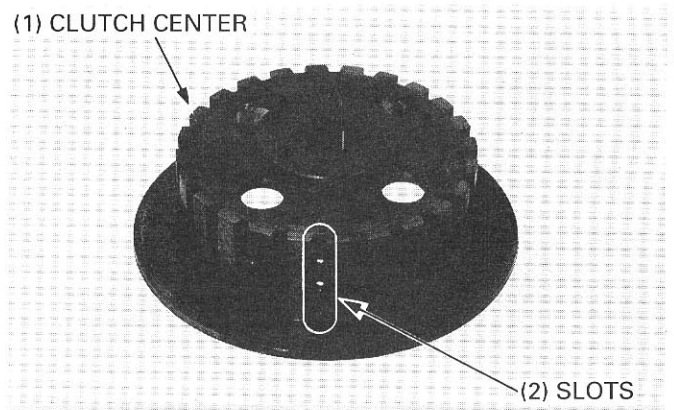
### NOTE

- Warped friction plates prevents the clutch from disengaging properly.



## Clutch center inspection

Check the slots of the clutch center for wear, damage or cracks.





## CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

### Clutch outer and outer guide inspection

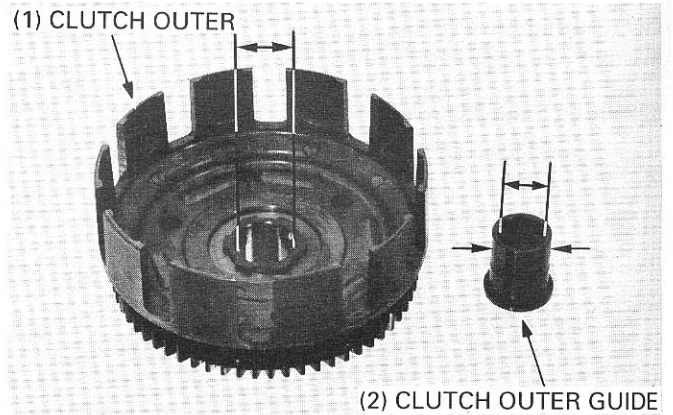
Check the slots in the outer drum for nicks, cuts or indentations made by the clutch discs.

Measure the I.D. of the clutch outer.

**SERVICE LIMIT: 25.04 mm (0.986 in)**

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

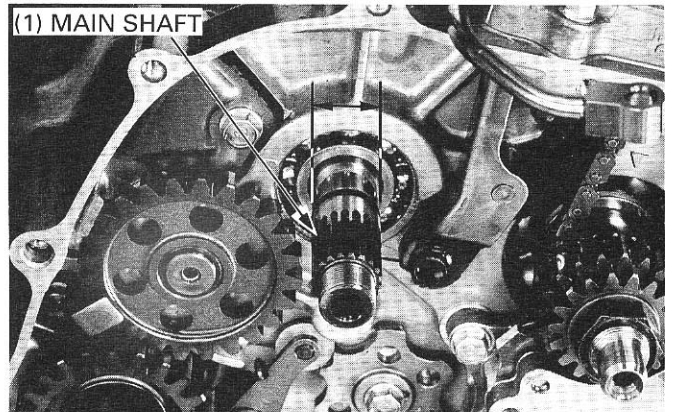
**SERVICE LIMIT: I.D.: 20.03 mm (0.789 in)**  
**O.D.: 24.17 mm (0.952 in)**



### Mainshaft inspection

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

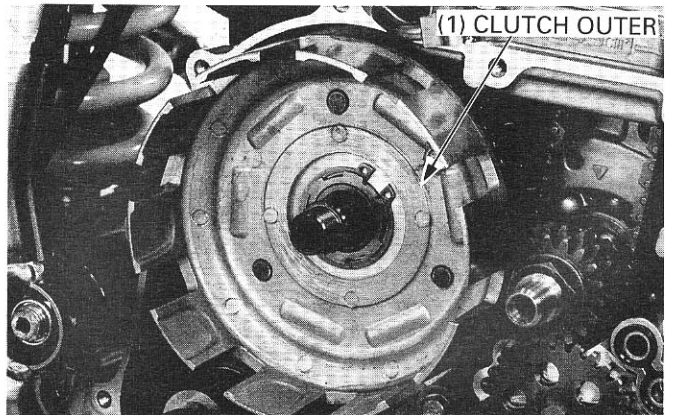
**SERVICE LIMIT: 19.91 mm (0.784 in)**



## PRIMARY DRIVE GEAR

### REMOVAL

Remove the clutch (page 9-5).  
Remove the oil pump (page 4-3).  
Install the clutch outer guide and clutch outer to the mainshaft.

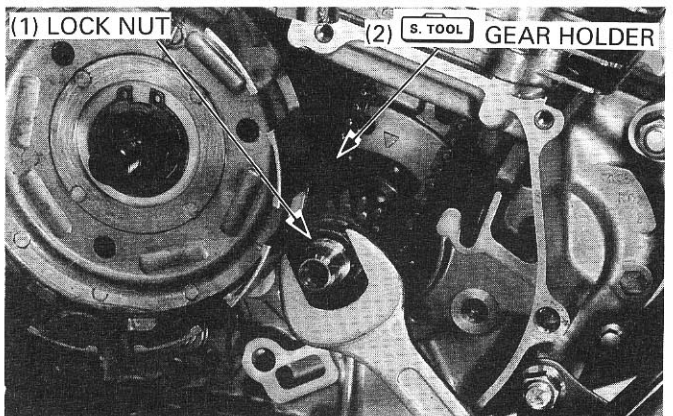


Place the gear holder between the primary drive gear and driven gear.  
Remove the primary drive gear lock nut.

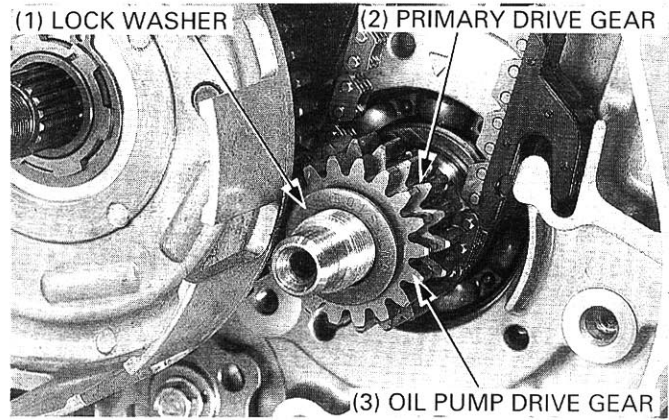
### TOOL:

**Gear holder** 07724 - 0010100

Remove the gear holder.



Remove the lock washer.  
Remove the clutch outer and outer guide.  
Remove the oil pump drive gear. (: '96 - '97)  
Remove the primary drive gear.

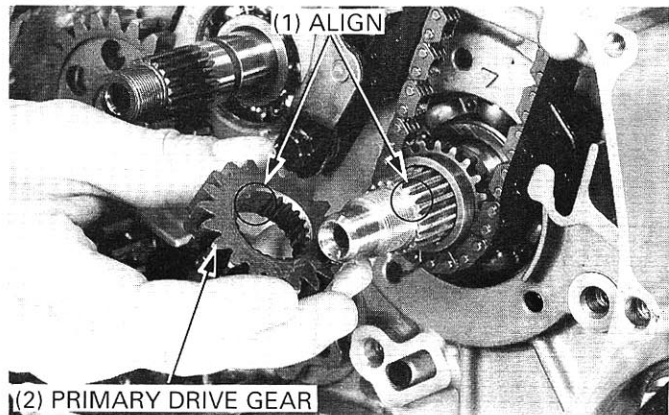


### INSTALLATION

Install the primary drive gear.

#### NOTE

- Install the drive gear aligning the wide cutout with the crankshaft spindle.

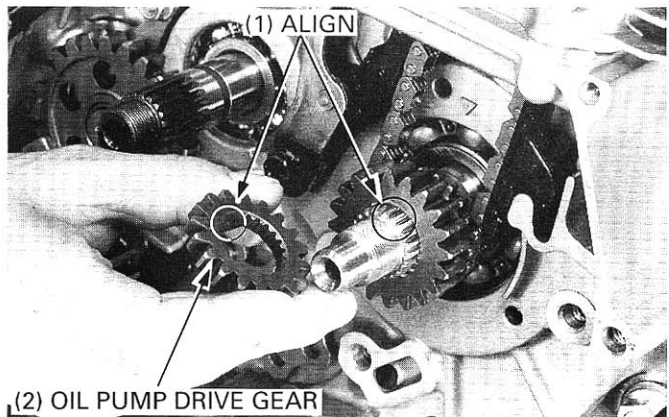


'96 - '97:

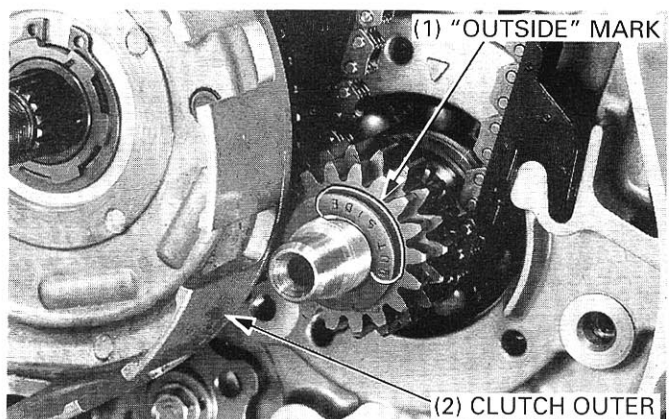
Install the oil pump drive gear.

#### NOTE

- Install the drive gear aligning the wide cut-out with the crankshaft spindle.



Install the clutch outer guide and clutch outer.  
Install the lock washer with the "OUT SIDE" mark facing out.



## CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

Place the gear holder between the drive gear and driven gear.

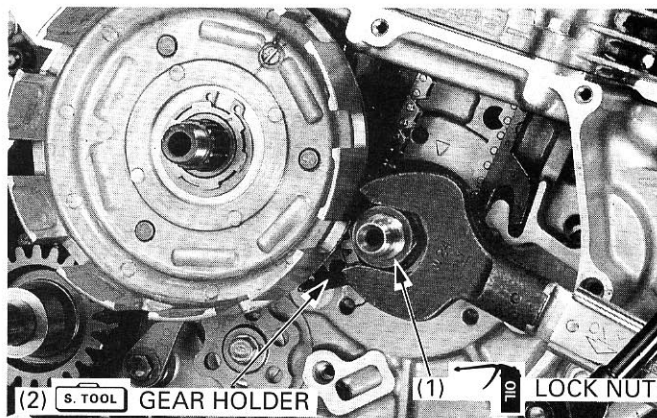
### TOOL:

**Gear holder** 07724 - 0010100

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

Install and tighten the primary drive gear lock nut.

**TORQUE: 88 N·m (9.0 kgf·m, 65 lbf·ft)**

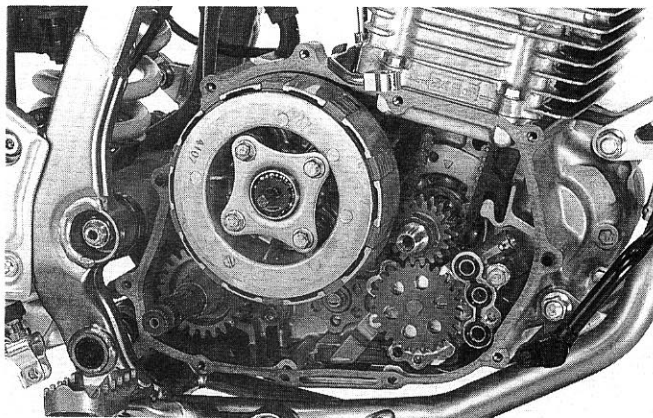


Remove the gear holder, clutch outer and outer guide.

Install the oil pump (page 4-7).

Install the clutch (page 9-10).

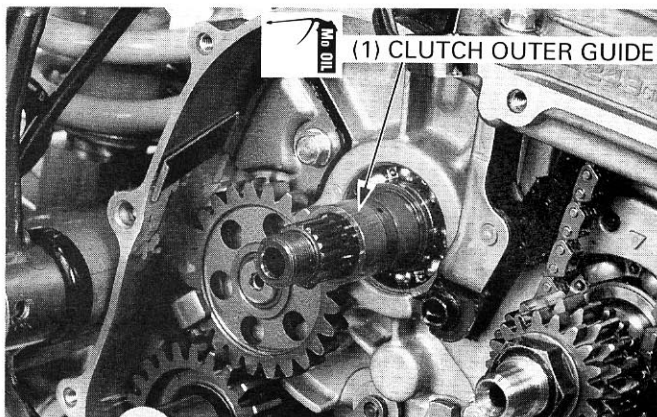
Install the right crankcase cover (page 9-17).



## CLUTCH INSTALLATION

Apply molybdenum disulfide oil to the outer surface of the clutch outer guide.

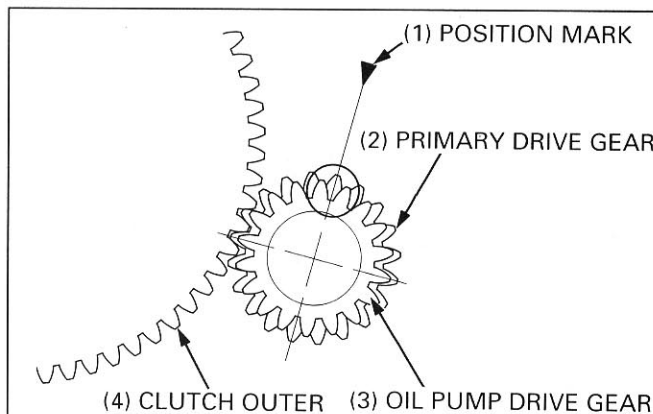
Install the clutch outer guide to the mainshaft.



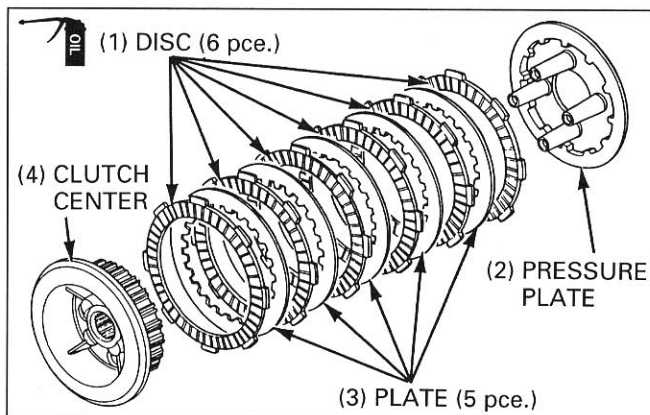
'96 - '97:

Align the oil pump drive gear teeth and primary drive gear teeth with the position mark on the crankcase as shown.

Install the clutch outer.



Install the thrust washer.  
 Coat the clutch discs with engine oil.  
 Install the pressure plate in the clutch outer.  
 Install the six friction discs and five clutch plates alternately.  
 Install the discs and plates alternately, starting with a disc.  
 Install the clutch center.

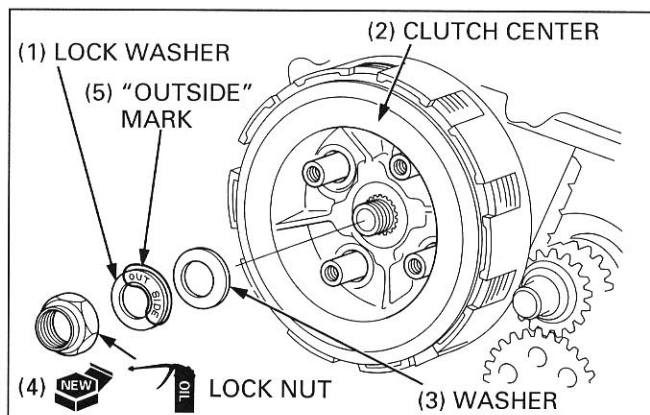


Install the thrust washer and lock washer.

**NOTE**

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

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



Install the clutch center holder to the clutch center.

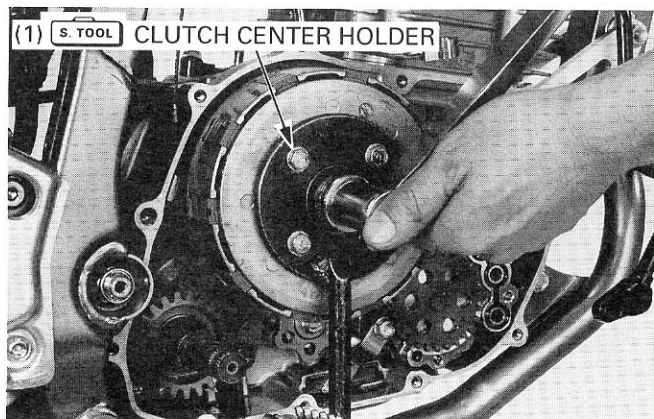
**TOOL:**

**Clutch center holder**

07923 - KE10000 or  
 07HGB - 001000A or  
 07HGB - 001010A or B  
 and  
 07HGB - 001020A or B  
 (U.S.A. only)

Tighten the clutch center lock nut to the specified torque.

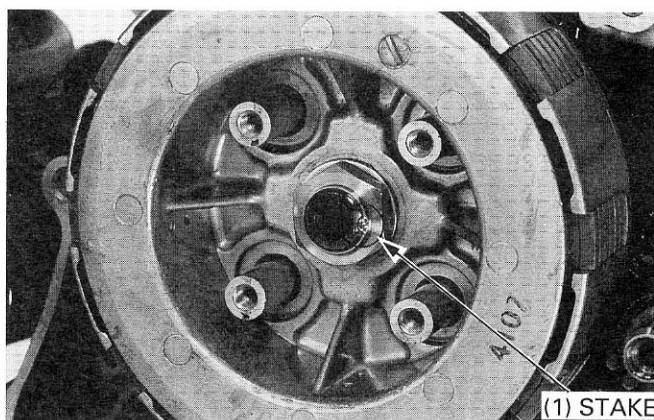
**TORQUE: 108 N·m (11.0 kgf·m, 80 lbf·ft)**



Remove the clutch center holder and stake the lock nut.

**NOTE**

- Be careful that the threads on the mainshaft are not damaged.





## CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

Install the following:

- Clutch springs
- Clutch lifter plate
- Clutch lifter plate bolts

### NOTE

- Tighten the bolts in a crisscross pattern in 2-3 steps.

- Clutch lifter piece

### NOTE

- After installation, check that the clutch lifter piece turns freely.

- Right crankcase cover (page 9-17).

## KICKSTARTER REMOVAL/DISASSEMBLY

Remove the clutch (page 9-5).

Remove the thrust washer from the kickstarter spindle.

Install the kickstarter pedal to the kickstarter spindle.

Pull the pedal out while rotating it counterclockwise until the tab on the kickstarter ratchet is released from behind the stopper plate. Turn the spindle clockwise until it will no longer go.

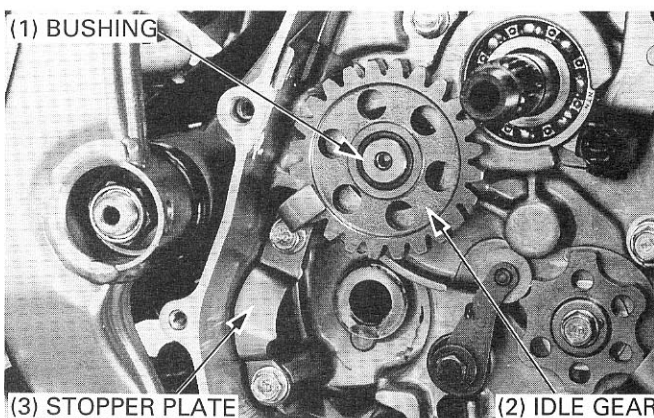
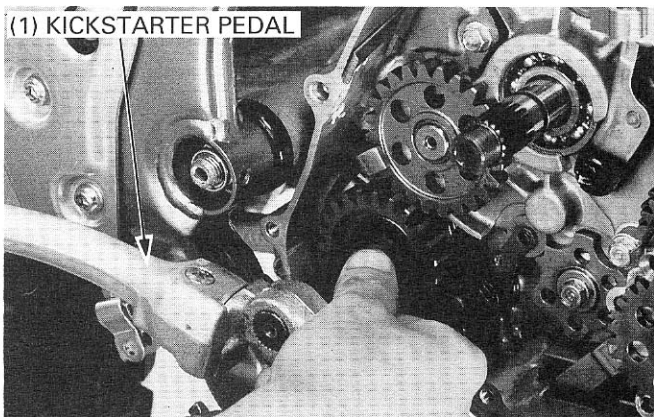
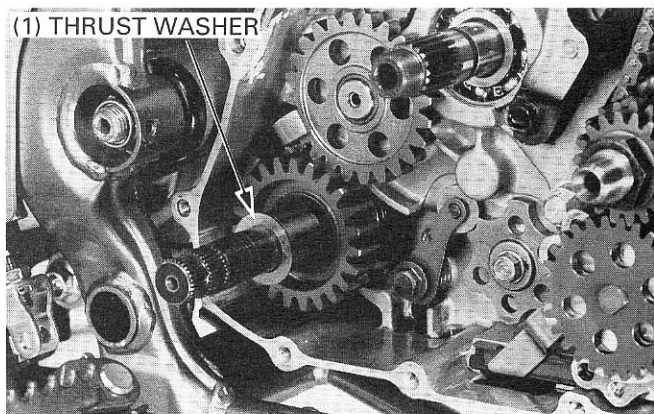
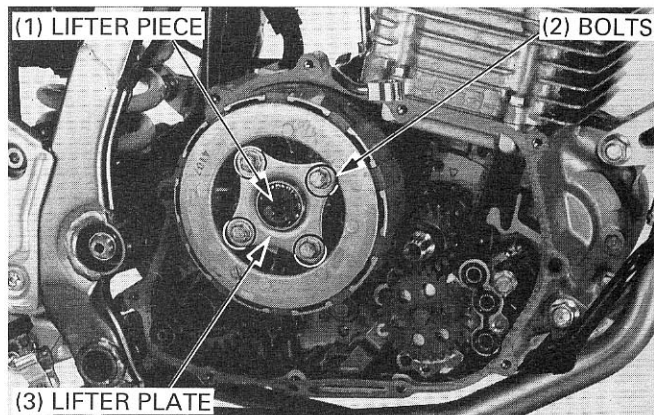
Release the hook end of the return spring from the crankcase groove; remove the kickstarter spindle.

Remove the washer.

Remove the kickstarter pedal.

Remove the following from the countershaft:

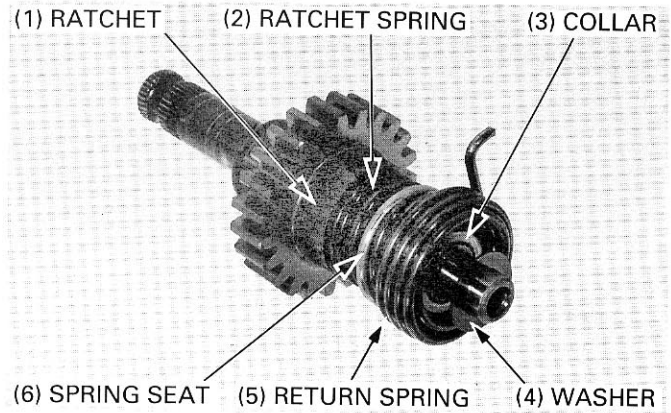
- Stopper plate
- Starter idle gear
- Idle gear bushing



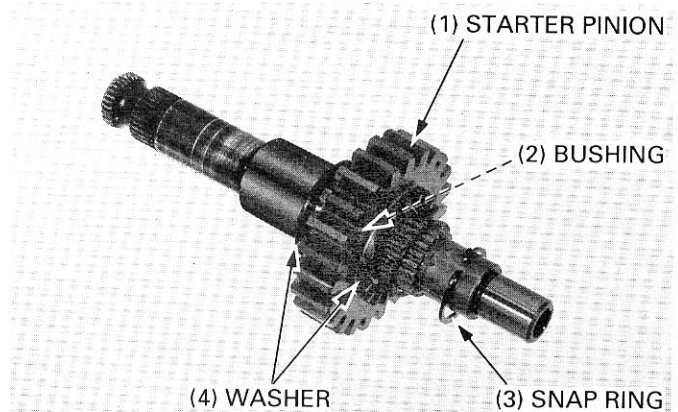


Remove the following from the spindle:

- Thrust washer
- Spring collar
- Return spring
- Spring seat
- Ratchet spring
- Starter ratchet



Remove the snap ring, washer and starter pinion and bushing from the spindle.



## KICKSTARTER INSPECTION

Measure the starter pinion gear I.D..

**SERVICE LIMIT: 25.12 mm (0.989 in)**

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

**SERVICE LIMITS: I.D.: 22.10 mm (0.870 in)**  
**O.D.: 24.90 mm (0.980 in)**

Measure the kickstarter spindle O.D..

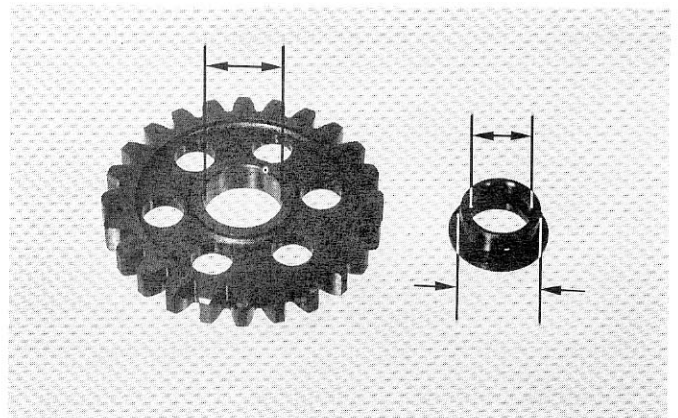
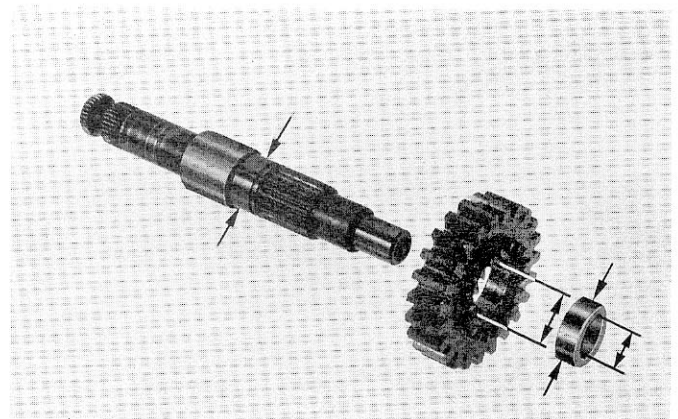
**SERVICE LIMIT: 21.91 mm (0.863 in)**

Measure the starter idle gear I.D..

**SERVICE LIMIT: 19.13 mm (0.753 in)**

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

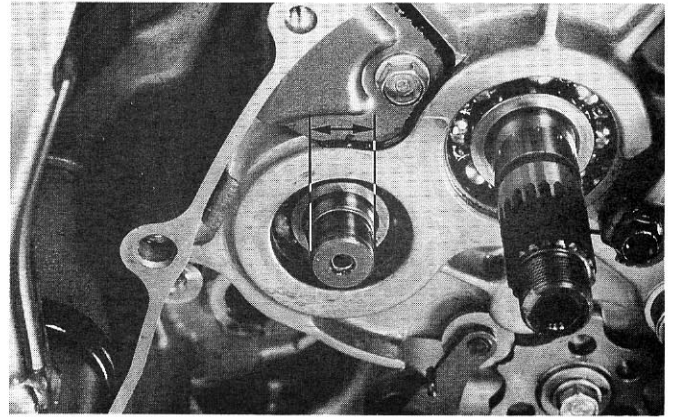
**SERVICE LIMITS: I.D.: 15.04 mm (0.592 in)**  
**O.D.: 18.92 mm (0.745 in)**



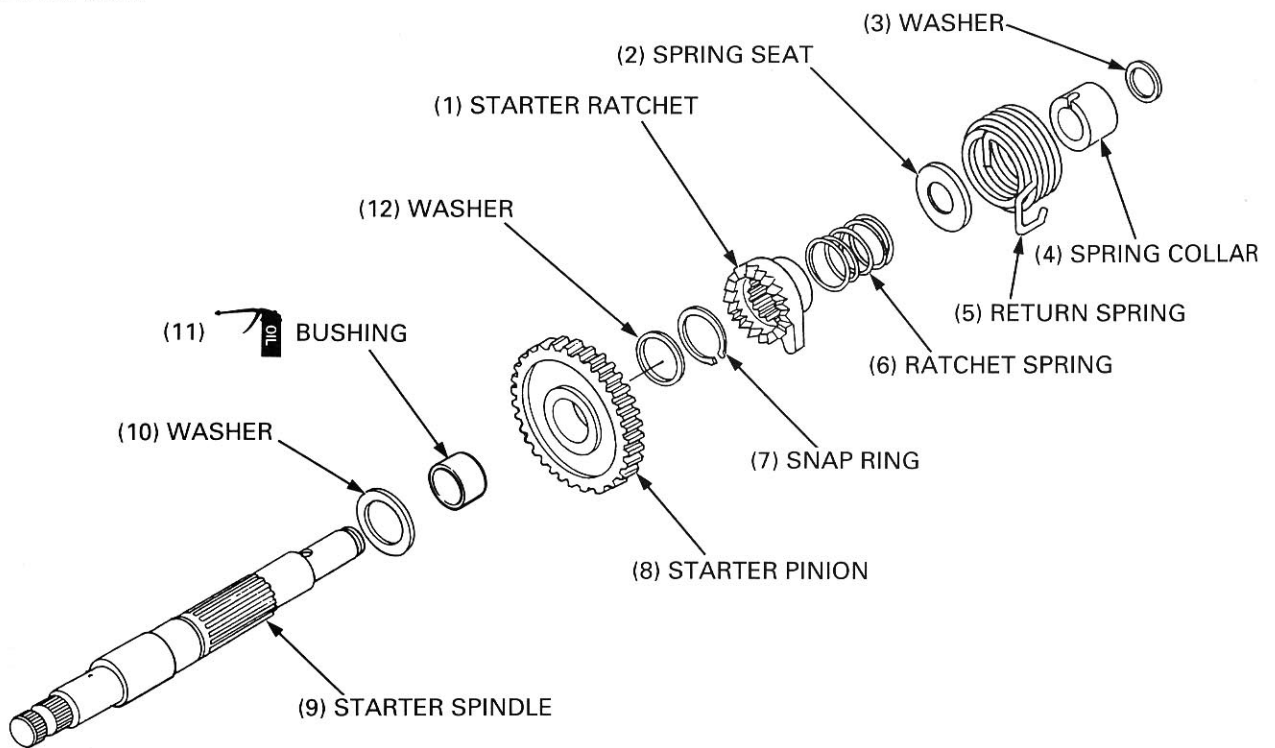
## CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

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

**SERVICE LIMIT: 14.91 mm (0.587 in)**

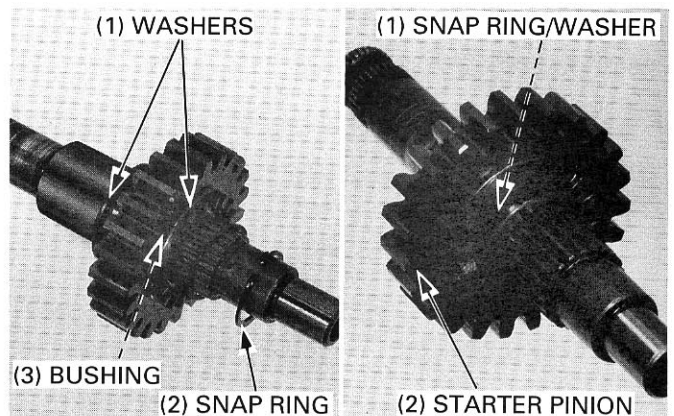


## KICKSTARTER ASSEMBLY/ INSTALLATION



Coat the engine oil to the starter spindle bushing.  
Install the following to the starter spindle:

- Thrust washer
- Bushing
- Starter pinion
- Thrust washer
- Snap ring



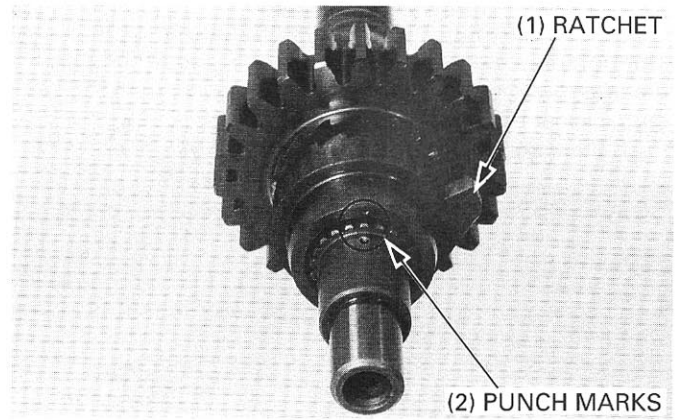
## CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

Install the following:

- Starter ratchet

### NOTE

- Align the punch marks on the spindle and ratchet.



- Ratchet spring
- Spring seat
- Return spring

### NOTE

- Insert the spring end into the hole in the spindle.

- Spring collar

### NOTE

- Align the cut-out on the collar with the spring end.

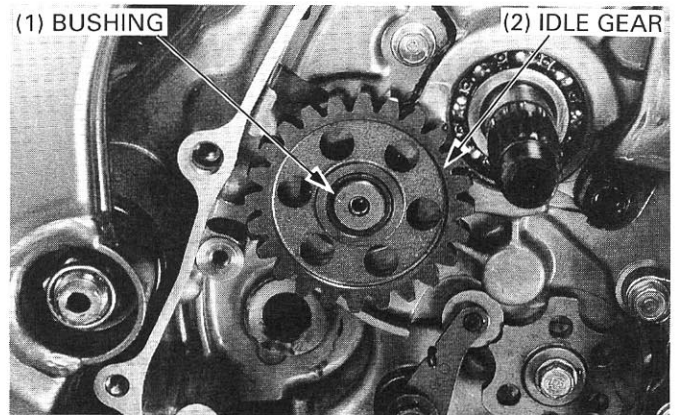
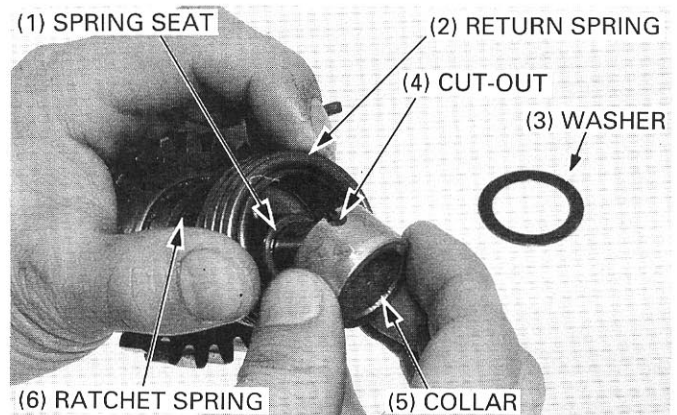
- Thrust washer

Install the following to the countershaft:

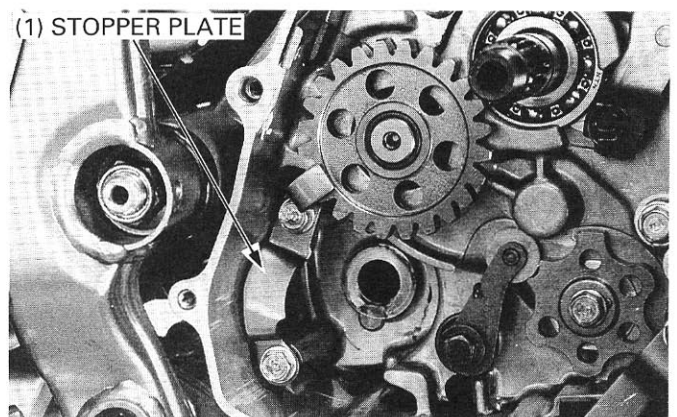
- Idle gear bushing
- Starter idle gear

### NOTE

- Coat the bushing with engine oil and install it with the flange side facing toward the crankcase.



- Stopper plate



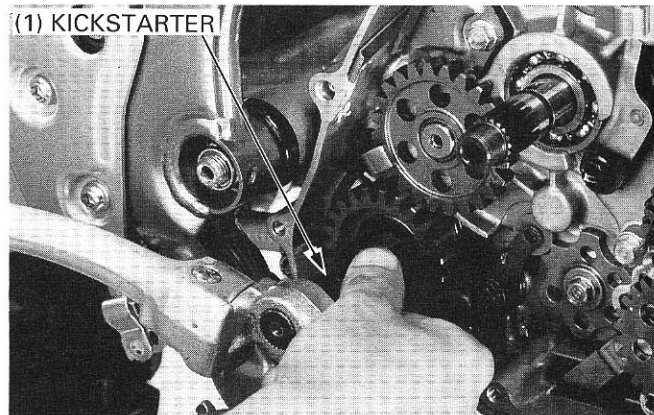
## CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

Hook the kickstarter return spring on the crankcase.  
Temporarily install the kickstarter pedal on the starter spindle and rotate the spindle counterclockwise until the ratchet stub is clear of the stopper plate.  
Push the kickstarter assembly into the crankcase.

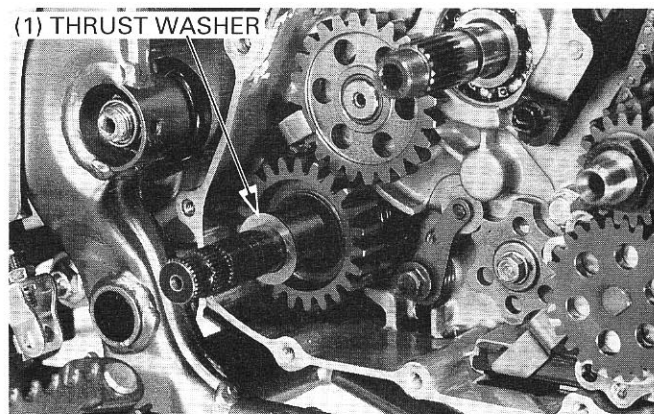
Remove the kickstarter pedal.

### NOTE

- Be sure the rear thrust washer did not fall off the spindle during installation.



Install the thrust washer on the spindle.  
Install the clutch (page 9-10).  
Install the right crankcase cover (page 9-17).



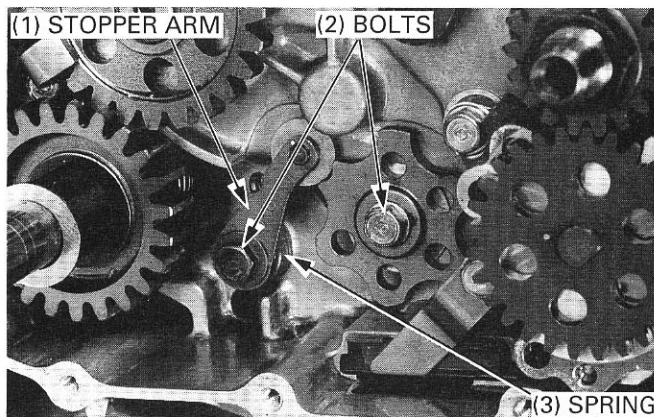
## GEARSHIFT CAM

### REMOVAL

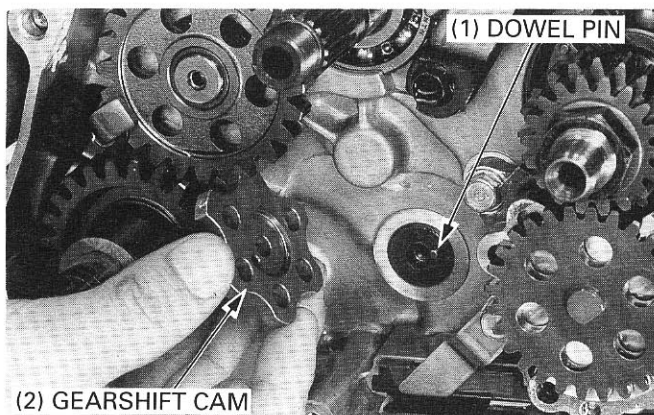
Remove the clutch (page 9-5).

Remove the following:

- Center bolt
- Stopper arm pivot bolt
- Stopper arm
- Washer
- Spring



- Gearshift cam
- Dowel pin





## INSTALLATION

Install the dowel pin into the gearshift drum.  
Align the hole in the gearshift cam with the dowel pin on the gearshift drum and install the cam plate.

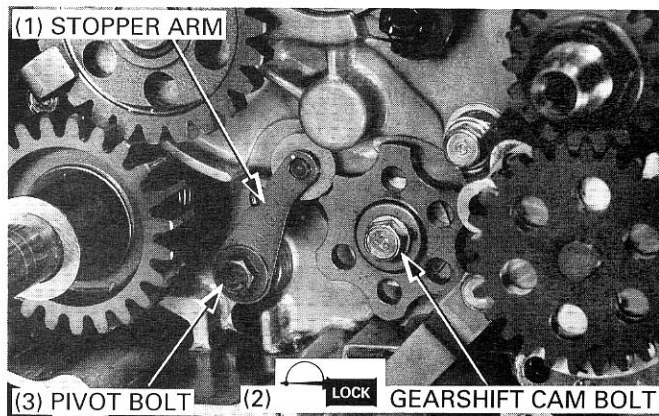
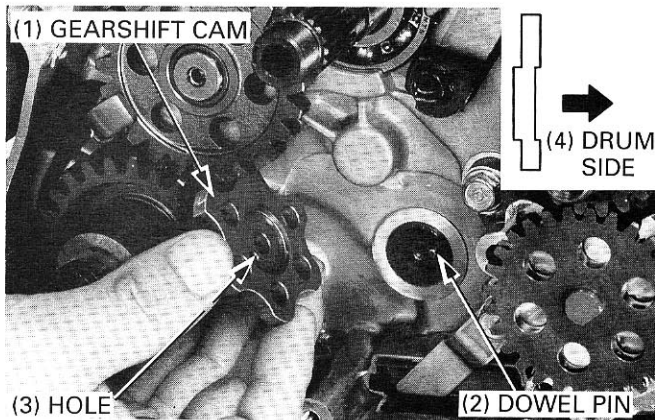
Apply the locking agent on the gearshift cam bolt threads,  $6.5 \pm 1.0$  mm ( $0.26 \pm 0.04$  in) from the tip.  
Install and tighten the gearshift cam bolt.

**TORQUE: 24 N·m (2.4 kgf·m, 17 lbf·ft)**

Install the spring, washer, stopper arm and pivot bolt.  
Tighten the pivot bolt to the specified torque.

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

Install the clutch (page 9-10).  
Install the right crankcase cover (page 9-17).



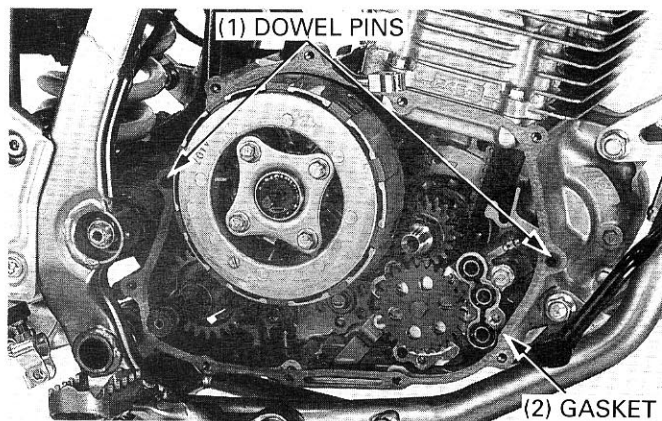
## RIGHT CRANKCASE COVER INSTALLATION

Install the gasket and dowel pins.

Install the right crankcase cover.

### NOTE

- Be careful not to damage the oil pass pipe when installing the cover.
- Be careful not to drop the oil pump O-ring when installing the cover.
- Be careful not to turn over the kickstarter spindle oil seal lip when installing the cover.

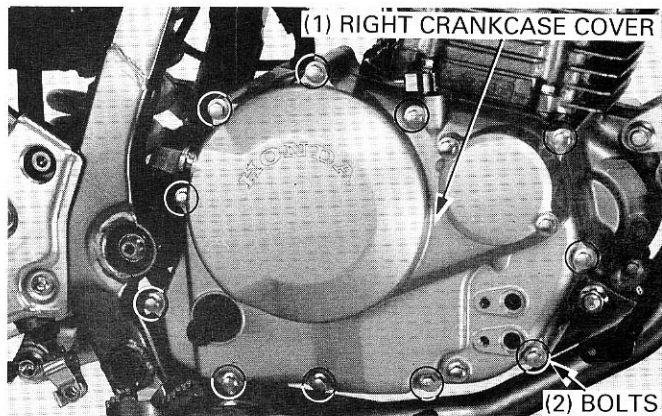


Install the right crankcase cover bolts.  
Tighten the bolts to the specified torque.

### NOTE

- Tighten the bolts in a crisscross pattern in 2-3 steps.

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



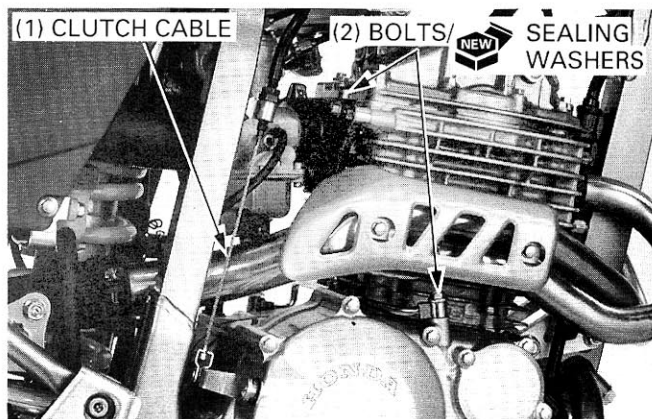


## CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

Install the clutch cable to the clutch arm.  
Install new sealing washers and the oil pass pipe bolt (right crankcase side).  
Tighten the bolts to the specified torque.

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

Install the exhaust pipe (page 2-5).



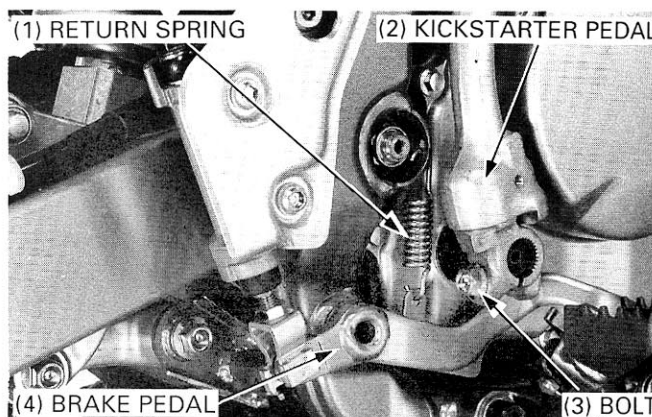
Install the brake pedal and return spring (page 14-25).  
Install the kickstarter pedal and bolt.  
Tighten the bolt to the specified torque.

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

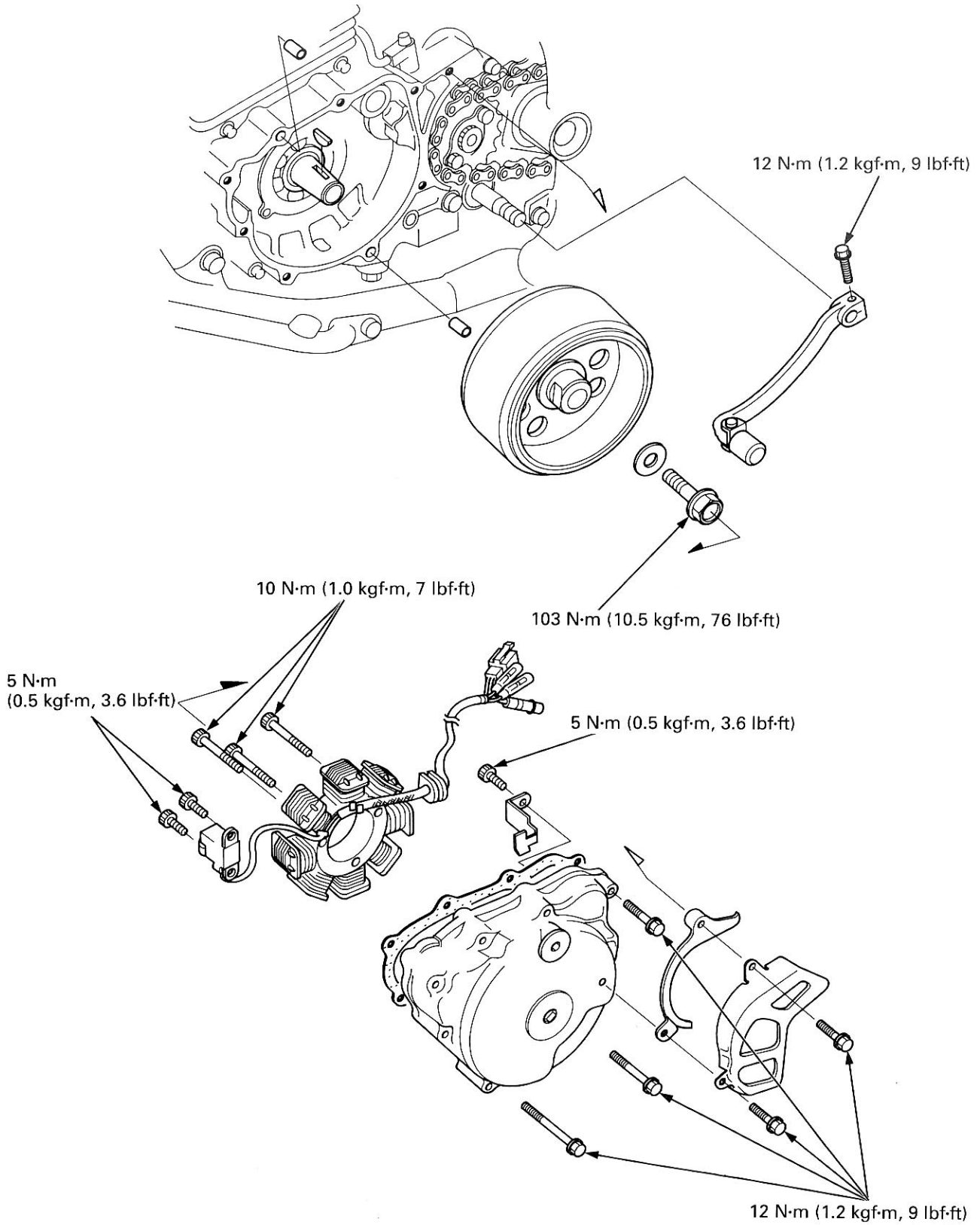
Install the oil pipes (page 4-10).  
Install the under guard (page 2-3).  
Fill the engine with the recommended engine oil (page 3-12).

Perform the following inspection and adjustments.

- Clutch lever free play (page 3-18)
- Brake pedal height (page 3-18)



# ALTERNATOR



# 10. ALTERNATOR

<b>SERVICE INFORMATION</b>	<b>10-1</b>	<b>FLYWHEEL INSTALLATION</b>	<b>10-3</b>
<b>LEFT CRANKCASE COVER REMOVAL</b>	<b>10-2</b>	<b>LEFT CRANKCASE COVER INSTALLATION</b>	<b>10-4</b>
<b>FLYWHEEL REMOVAL</b>	<b>10-3</b>		

## SERVICE INFORMATION

### GENERAL

- This section covers maintenance of the alternator. This service can be done with the engine installed in the frame.
- For alternator inspection, refer to section 16.

### TORQUE VALUES

Left crankcase cover bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Flywheel bolt	103 N·m (10.5 kgf·m, 76 lbf·ft) Apply oil to the threads and flange surface.
Stator bolt	10 N·m (1.0 kgf·m, 7 lbf·ft) Apply a locking agent to the threads.
Ignition pulse generator bolt	5 N·m (0.5 kgf·m, 3.6 lbf·ft) Apply a locking agent to the threads.
Alternator wire clamp bolt	5 N·m (0.5 kgf·m, 3.6 lbf·ft) Apply a locking agent to the threads.
Drive sprocket cover bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Gearshift pedal bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)

### TOOLS

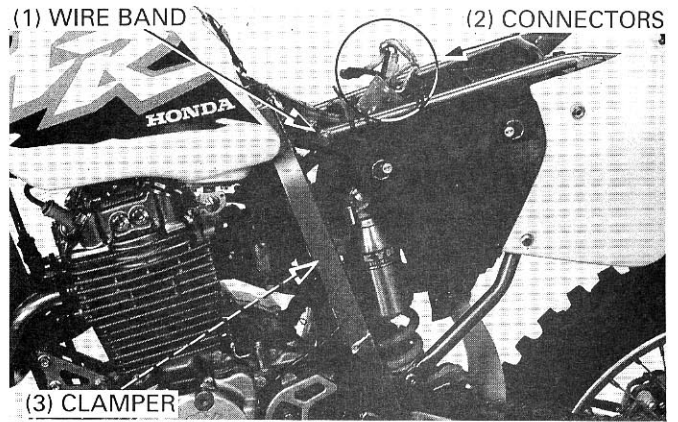
#### Common

Flywheel holder	07725 – 0040000 or equivalent commercially available in U.S.A.
Flywheel puller	07733 – 0020001 or 07933 – 3950001

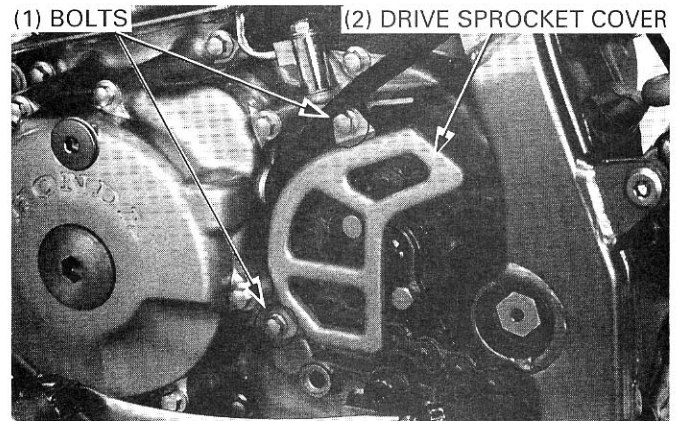
## ALTERNATOR

### LEFT CRANKCASE COVER REMOVAL

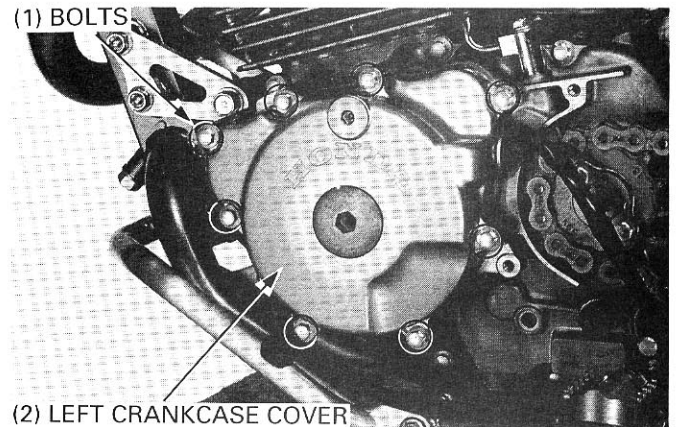
Remove the seat (page 2-2).  
Disconnect the alternator connectors and ignition pulse generator connector.  
Remove the wire from the wire clamp and wire band.



Remove the following:  
— Gearshift pedal  
— Drive sprocket cover  
— Drive chain protector

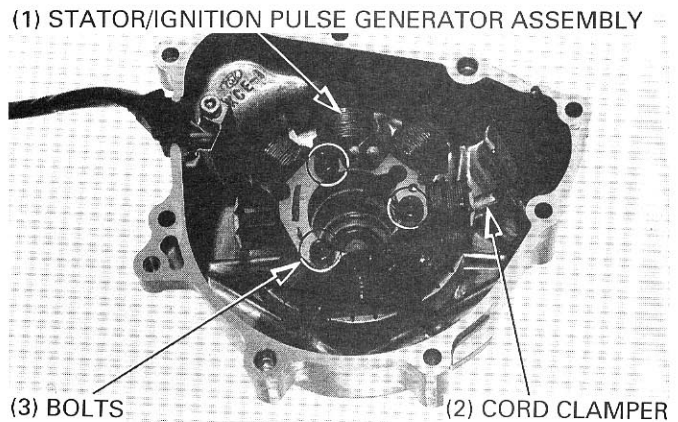


— Left crankcase cover bolts  
— Left crankcase cover  
— Dowel pins  
— Gasket



### STATOR/IGNITION PULSE GENERATOR REMOVAL

Remove the following:  
— Stator bolts  
— Ignition pulse generator bolts  
— Wire clamp  
— Stator/ignition pulse generator assembly



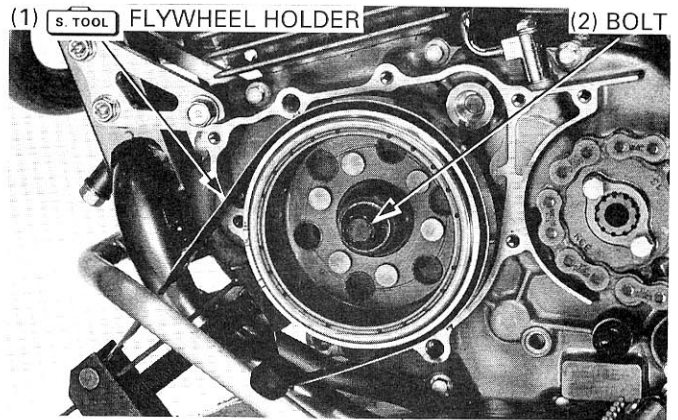
## FLYWHEEL REMOVAL

Hold the flywheel with the flywheel holder.  
Remove the flywheel bolt.

**TOOL:**

Flywheel holder

**07725 – 0040000 or  
equivalent commercially  
available in U.S.A.**



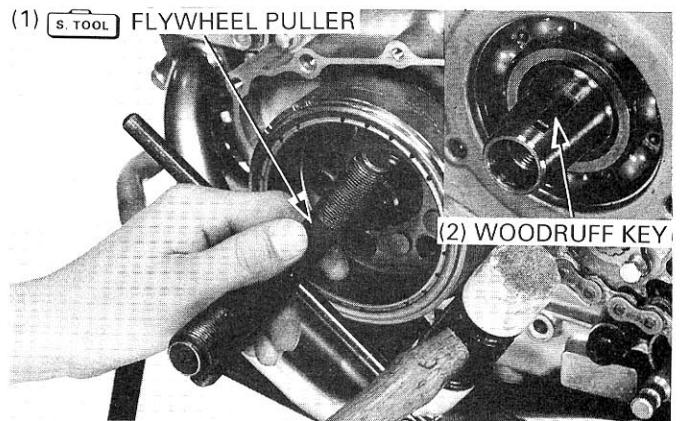
Remove the flywheel using the flywheel puller.

**TOOL:**

Flywheel puller

**07733 – 0020001 or  
07933 – 3950000**

Remove the woodruff key from the crankshaft.



## FLYWHEEL INSTALLATION

Clean the crankshaft tapered area.  
Install the woodruff key on the crankshaft.

Install the flywheel by aligning the woodruff key on the  
crankshaft with the flywheel keyway.

Apply the engine oil to the flywheel bolt threads and seat-  
ing surface.

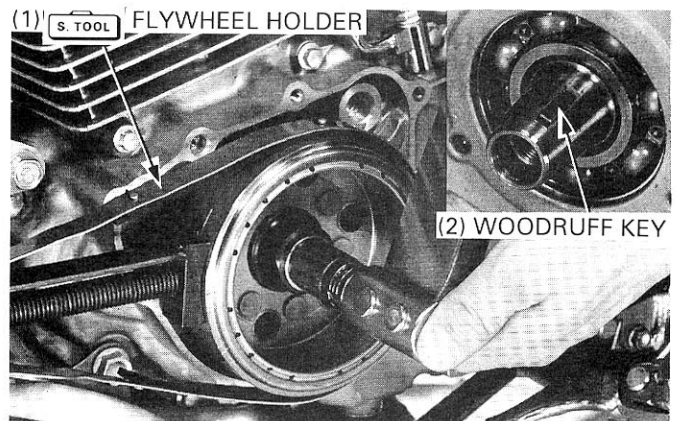
Hold the flywheel with the flywheel holder and tighten the  
flywheel bolt.

**TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)**

**TOOL:**

Flywheel holder

**07725 – 0040000 or  
equivalent commercially  
available in U.S.A.**





## ALTERNATOR

### LEFT CRANKCASE COVER INSTALLATION

Apply locking agent to the bolt threads of the stator bolts, ignition pulse generator bolt and alternator wire clamp bolt.

Install the following to the left crankcase cover:

- Stator/ignition pulse generator assembly
- Wire clamp/bolt

**TORQUE: 5 N·m (0.5 kgf·m, 3.6 lbf·ft)**

- Ignition pulse generator bolts

**TORQUE: 5 N·m (0.5 kgf·m, 3.6 lbf·ft)**

- Stator bolts

**TORQUE: 10 N·m (1.0 kgf·m, 7.2 lbf·ft)**

- Grommet

Install the following to the left crankcase:

- Dowel pins
- New gasket

- Left crankcase cover
- Left crankcase cover bolts

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

#### NOTE

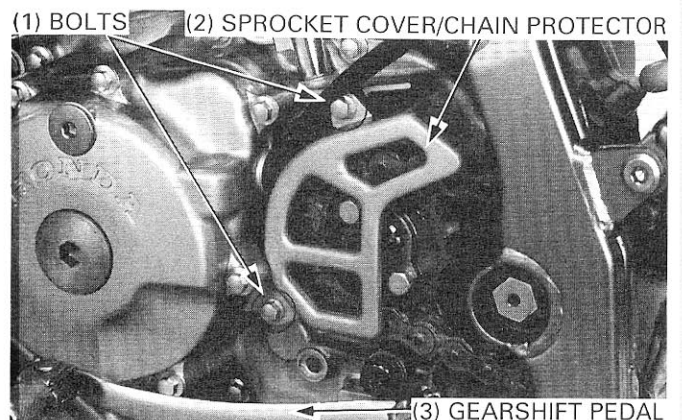
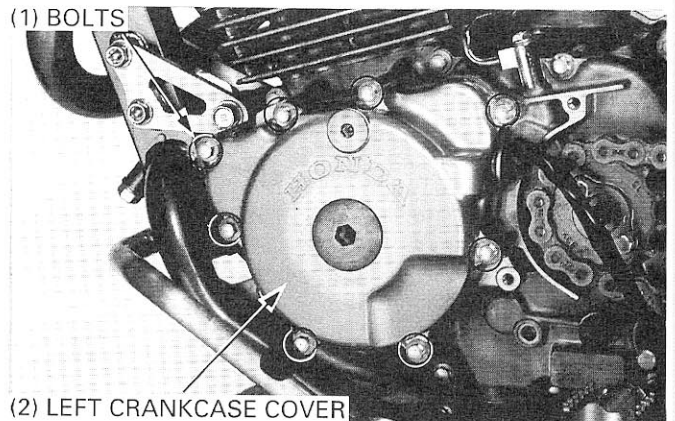
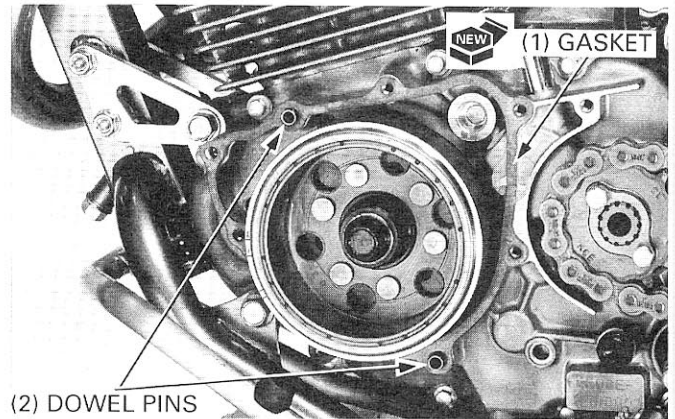
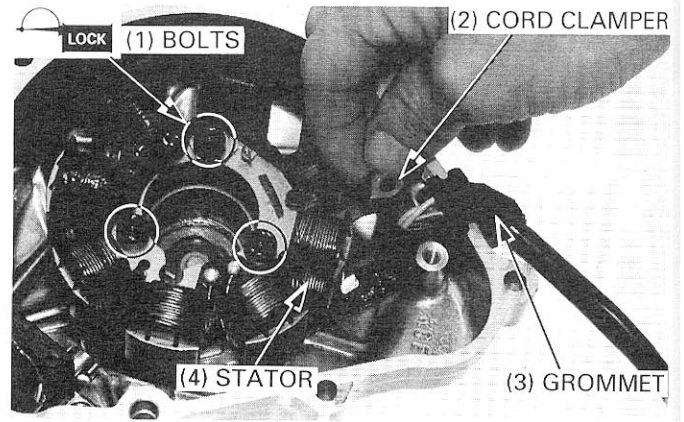
- Tighten the bolts in a crisscross pattern in 2-3 steps.

- Drive chain protector
- Drive sprocket cover
- Drive sprocket cover bolts

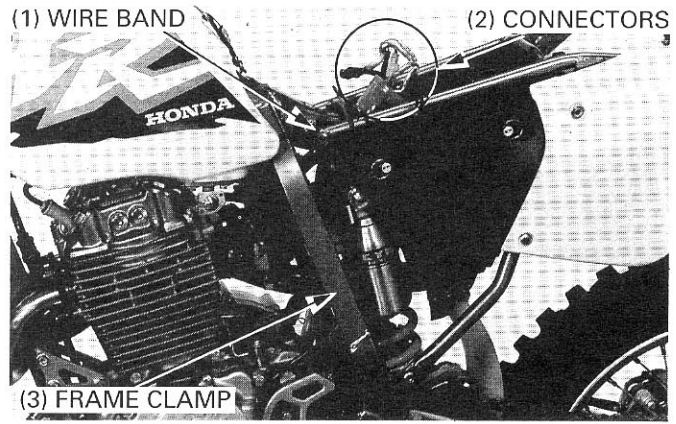
**TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)**

- Gearshift pedal
- Gearshift pedal bolt

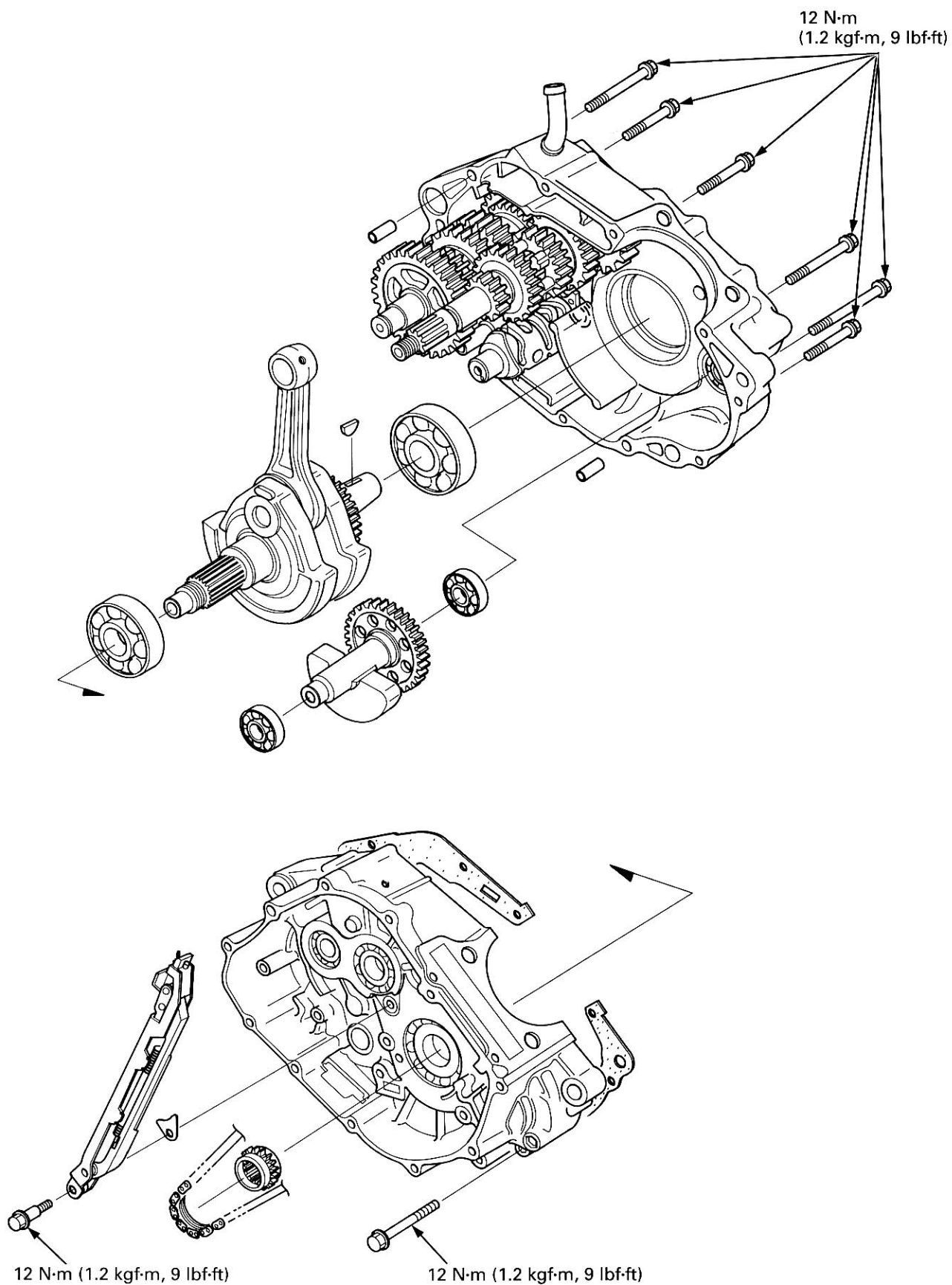
**TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)**



Connect the alternator connectors and ignition pulse generator connector.  
Secure the wire with the frame clamp and wire band.



# CRANKCASE/CRANKSHAFT/BALANCER



# 11. CRANKCASE/CRANKSHAFT/BALANCER

<b>SERVICE INFORMATION</b>	<b>11-1</b>	<b>CRANKCASE BEARING REPLACEMENT</b>	<b>11-6</b>
<b>TROUBLESHOOTING</b>	<b>11-2</b>	<b>BALANCER/CRANKSHAFT INSTALLATION</b>	<b>11-9</b>
<b>CRANKCASE SEPARATION</b>	<b>11-3</b>	<b>CRANKCASE ASSEMBLY</b>	<b>11-11</b>
<b>BALANCER/CRANKSHAFT REMOVAL</b>	<b>11-4</b>		

## SERVICE INFORMATION

### GENERAL

- The crankcase must be separated to repair the crankshaft, connecting rod, transmission and balancer.
- Remove the following parts before separating the crankcase.
  - ENGINE REMOVAL Section 6
  - CYLINDER HEAD Section 7
  - CYLINDER/PISTON Section 8
  - CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE Section 9
  - OIL PUMP Section 4
  - ALTERNATOR Section 10

### SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Crankshaft, Connecting rod	Connecting rod big end side clearance	0.050 – 0.500 (0.0019 – 0.0197)	0.80 (0.031)
	Crankshaft runout	—	0.05 (0.002)

### TORQUE VALUES

- Crankcase bolt 12 N·m (1.2 kgf·m, 9 lbf·ft)  
 Cam chain tensioner bolt 12 N·m (1.2 kgf·m, 9 lbf·ft) Apply a locking agent to the threads.

# CRANKCASE/CRANKSHAFT/BALANCER

## TOOLS

### Special

Bearing remover head, 13 mm	07LMC – KZ10100			
Bearing remover set, 15 mm	07936 – KC10000	} (Not available in U.S.A.)		
— remover head, 15 mm	07936 – KC10200		Bearing remover, 15 mm	07936 – KC10500
— remover shaft, 15 mm	07936 – KC10100		— remover head, 15 mm	07936 – KC10200
— remover weight	07741 – 0010201		— remover shaft, 15 mm	07936 – KC10100
		— remover weight	07949 – 0010000 (U.S.A. only)	
Bearing remover shaft	07936 – 1660120	Not available in U.S.A.		
Remover weight	07949 – 0010000			
Crankcase assembly tool	07965 – VM00000			
— assembly collar	07965 – VM00100			
— assembly shaft	07965 – VM00200	or 07931 – ME4010B and 07931 – HB3020A (U.S.A. only)		
— thread adapter	07965 – VM00300	or 07931 – KF00200		

### Common

Attachment, 32 x 35 mm	07746 – 0010100
Attachment, 37 x 40 mm	07746 – 0010200
Attachment, 42 x 47 mm	07746 – 0010300
Attachment, 52 x 55 mm	07746 – 0010400
Attachment, 72 x 75 mm	07746 – 0010600
Driver, 22 mm I.D.	07746 – 0020100
Driver	07749 – 0010000
Pilot, 15 mm	07746 – 0040300
Pilot, 17 mm	07746 – 0040400
Pilot, 20 mm	07746 – 0040500
Pilot, 22 mm	07746 – 0041000
Pilot, 28 mm	07746 – 0041100
Universal bearing puller	07631 – 0010000

## TROUBLESHOOTING

### Excessive noise

- Crankshaft
  - Worn connecting rod bearings
  - Bent connecting rod
  - Worn crankshaft bearings
- Balancer
  - Improper installation

### Abnormal vibration

- Improper balancer timing

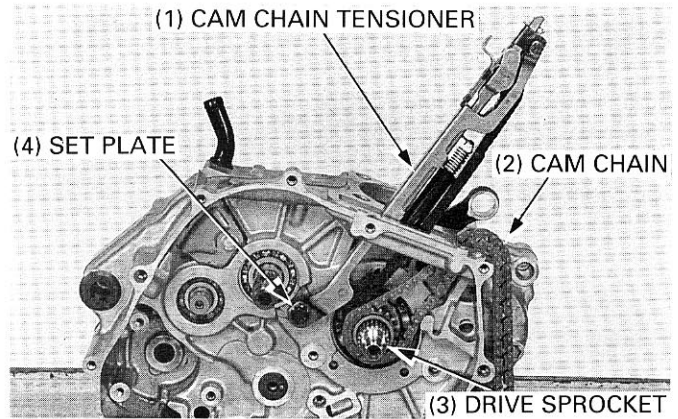


## CRANKCASE SEPARATION

Remove the engine from the frame (page 6-3).

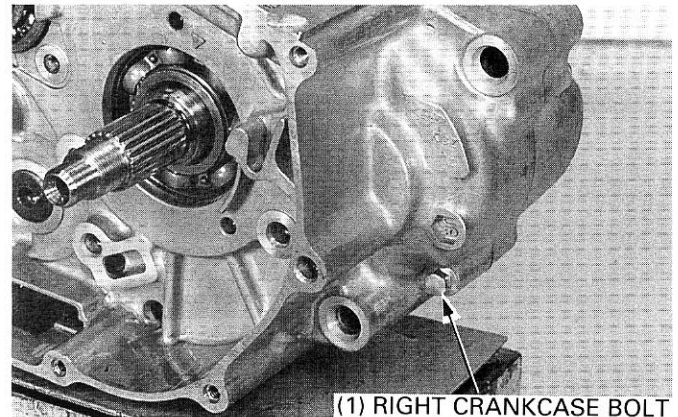
Remove the following from the engine.

- Cylinder head (page 7-7)
- Cylinder (page 8-3)
- Piston (page 8-4)
- Alternator (page 10-2)
- Clutch (page 9-5)
- Kickstarter (page 9-12)
- Oil pump (page 4-3)
- Gearshift cam (page 9-16)
- Primary drive gear (page 9-8)



Remove the cam chain tensioner bolt.  
Remove the cam chain tensioner and bearing set plate.  
Remove the cam chain and cam chain drive sprocket.

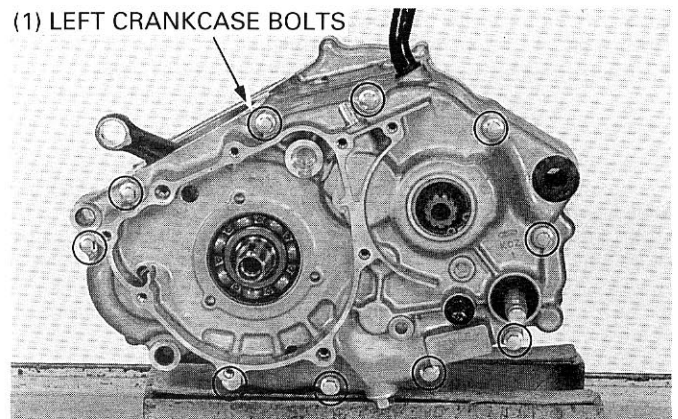
Remove the right crankcase bolt.



Remove the left crankcase bolts.

### NOTE

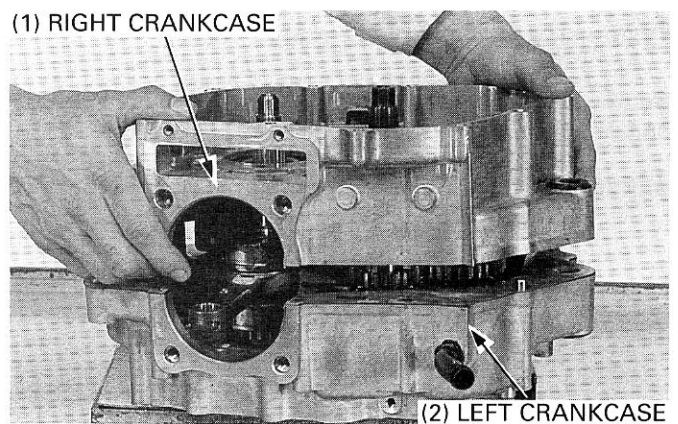
- Loosen the bolts in a crisscross pattern in 2-3 steps.



Place the left crankcase side down and separate the right crankcase from the left crankcase while tapping them at several locations with a soft hammer.

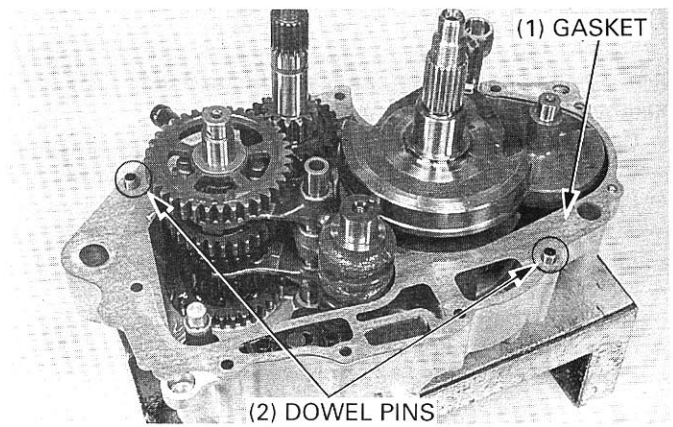
### CAUTION

- Do not pry the left and right crankcase apart.



## **BALANCER/CRANKSHAFT REMOVAL**

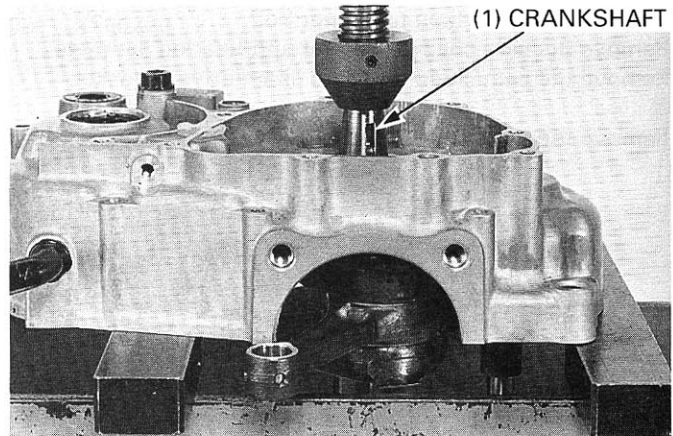
Remove the gasket and dowel pins.  
Remove the transmission (page 12-3).



Remove the crankshaft and balancer from the left crankcase with a press.

### **CAUTION**

- *Be careful not to damage the crankcase gasket surface.*



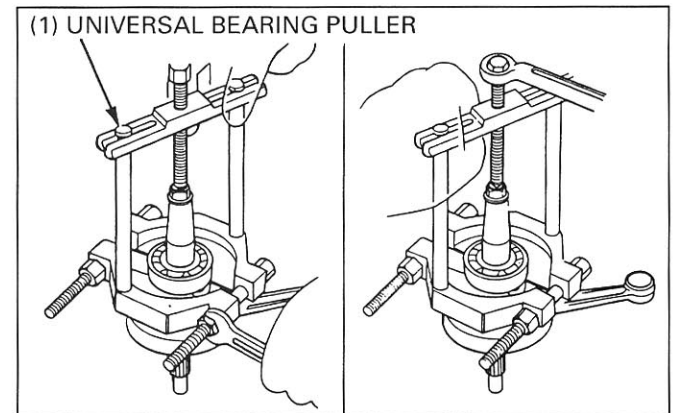
Remove the left crankshaft bearing with a bearing puller if it comes out with the crankshaft. Discard the bearing.

### **TOOL:**

**Universal bearing puller**                      **07631 - 0010000**

### **CAUTION**

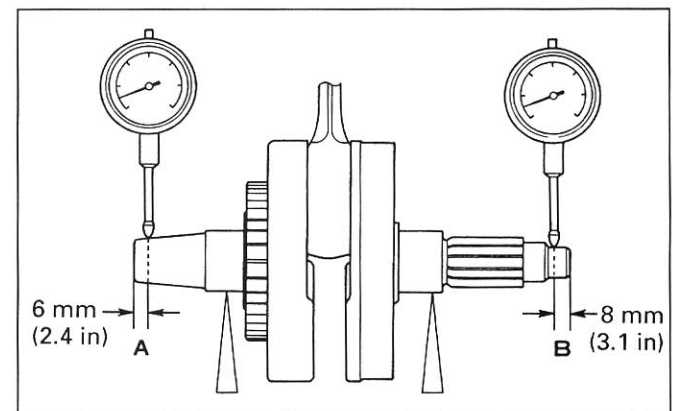
- *Always replace the left bearing with a new one if it comes out with the crankshaft.*



## **CRANKSHAFT INSPECTION**

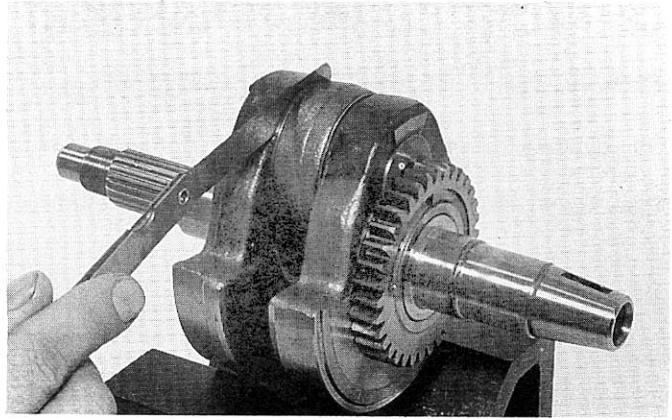
Set the crankshaft on a turning stand or V blocks and measure the runout using a dial indicator.

**SERVICE LIMIT: 0.05 mm (0.002 in)**



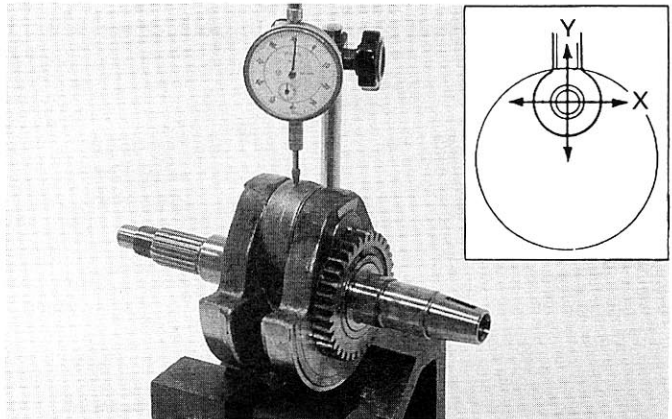
Measure the connecting rod big end side clearance with a feeler gauge.

**SERVICE LIMIT: 0.08 mm (0.031 in)**



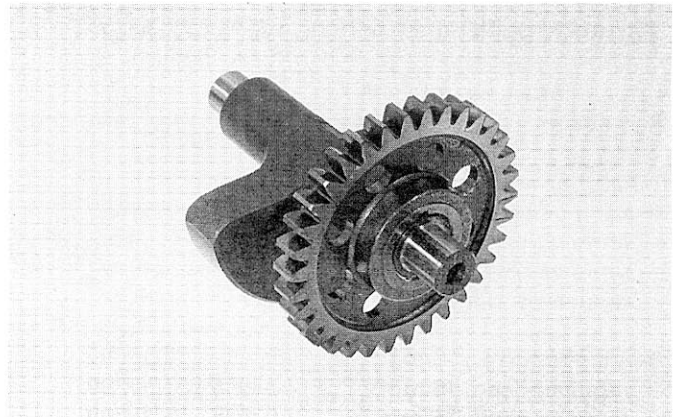
Measure the connecting rod big end radial clearance.

**SERVICE LIMIT: 0.05 mm (0.002 in)**



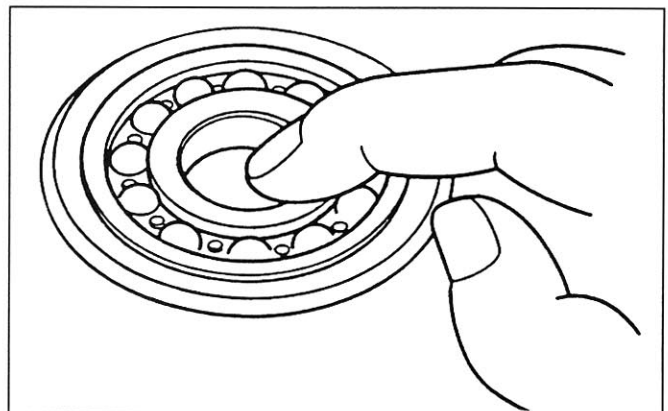
### BALANCER GEAR INSPECTION

Check the balancer gear for wear or damage.



### CRANKSHAFT BEARING/TRANSMISSION BEARING INSPECTION

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



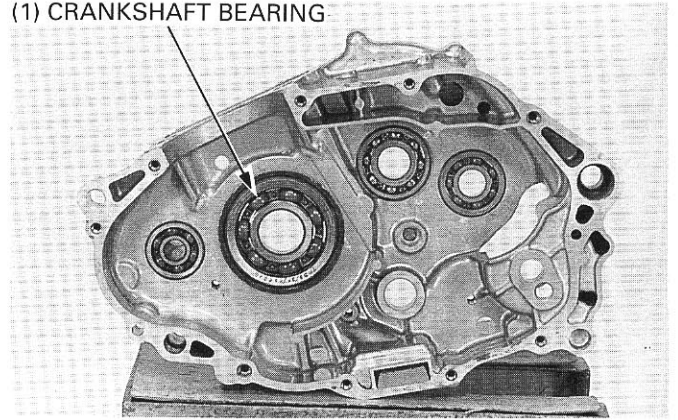
# CRANKCASE BEARING REPLACEMENT

## CRANKSHAFT BEARING REPLACEMENT

Remove the crankshaft bearing from the right crankcase.

Remove the left crankshaft bearing if it is left in the crankcase.

(1) CRANKSHAFT BEARING



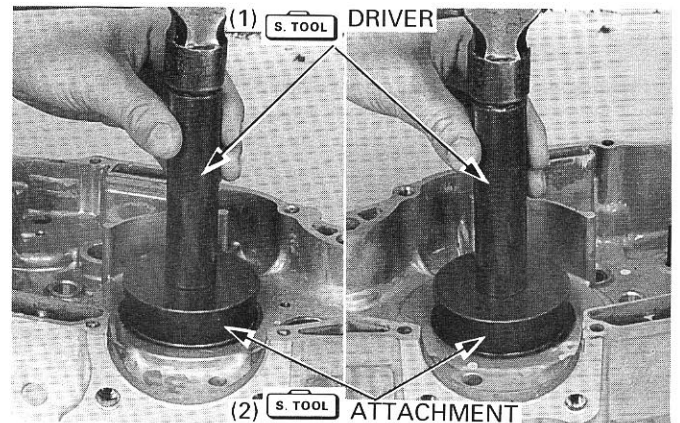
Drive new crankshaft bearings into both cases using the special tools.

**TOOL:**

<b>Attachment, 72 x 75 mm</b>	<b>07746 - 0010600</b>
<b>Driver</b>	<b>07749 - 0010000</b>
<b>Pilot, 28 mm</b>	<b>07746 - 0041100</b>

**NOTE**

- Install the bearings with the seal side facing toward the outside of the crankcase.



## TRANSMISSION BEARING REPLACEMENT

**Left crankcase bearings**

Remove the left mainshaft bearing using the special tools.

**TOOL:**

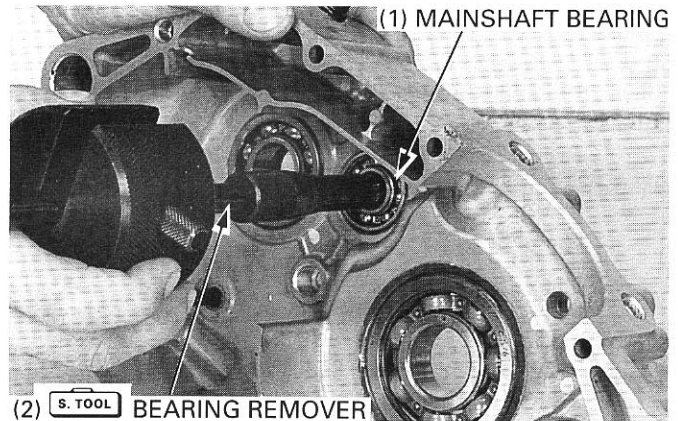
<b>Bearing remover set, 15 mm</b>	<b>07936 - KC10000</b>
— remover head, 15 mm	<b>07936 - KC10200</b>
— remover shaft, 15 mm	<b>07936 - KC10100</b>
— remover weight	<b>07741 - 0010201</b>
	<b>(not available in U.S.A.) or</b>
<b>Bearing remover, 15 mm</b>	<b>07936 - KC10500</b>
— remover head, 15 mm	<b>07936 - KC10200</b>
— remover shaft, 15 mm	<b>07936 - KC10100</b>
— remover weight	<b>07949 - 0010000</b>
	<b>(U.S.A. only)</b>

Remove the balancer bearing.

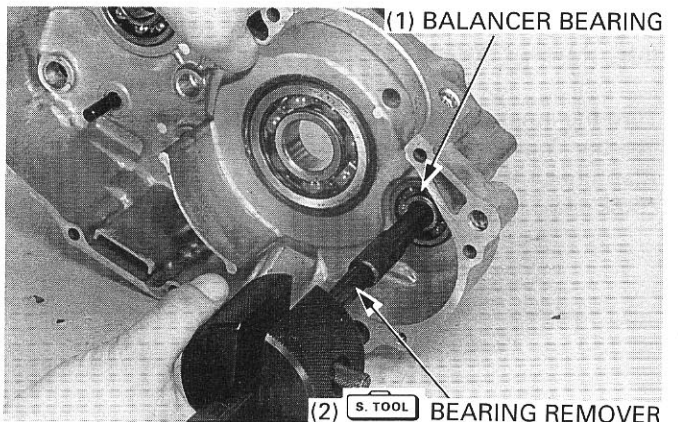
**TOOL:**

<b>Bearing remover head, 13 mm</b>	<b>07LMC - KZ10100</b>
<b>Bearing remover shaft</b>	<b>07936 - 1660120</b>
<b>Remover weight</b>	<b>07949 - 0010000</b>

(1) MAINSHAFT BEARING



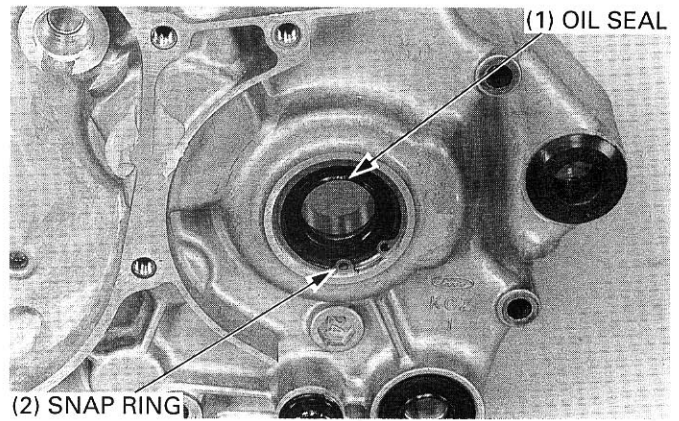
(1) BALANCER BEARING



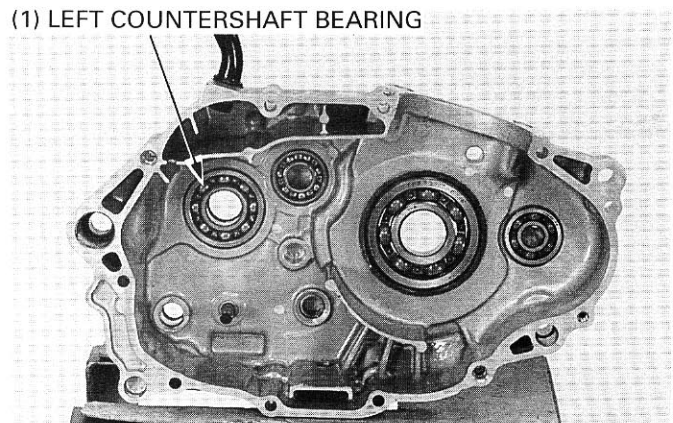


## CRANKCASE/CRANKSHAFT/BALANCER

Remove the snap ring.  
Remove the countershaft oil seal.



Remove the left countershaft bearing.



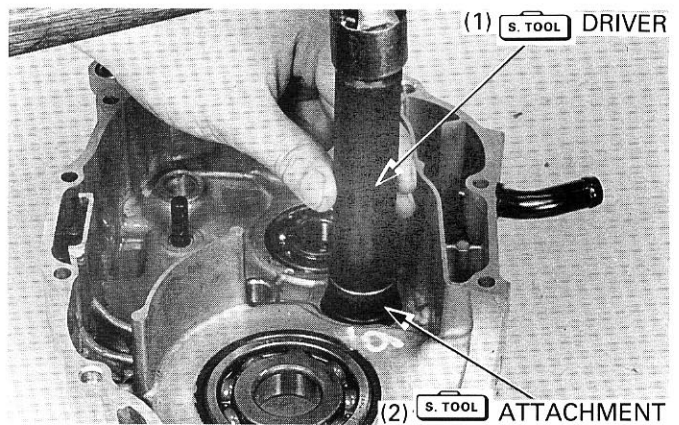
Install a new left main shaft bearing.

### NOTE

- Install the bearing with the seal side facing toward the outside of the crankcase.

### TOOL:

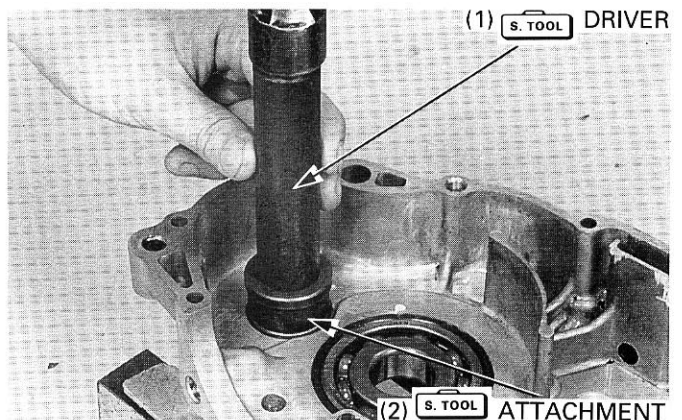
Attachment, 32 x 35 mm	07746 - 0010100
Driver	07749 - 0010000
Pilot, 15 mm	07746 - 0040300



Install a new left balancer shaft bearing.

### TOOL:

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



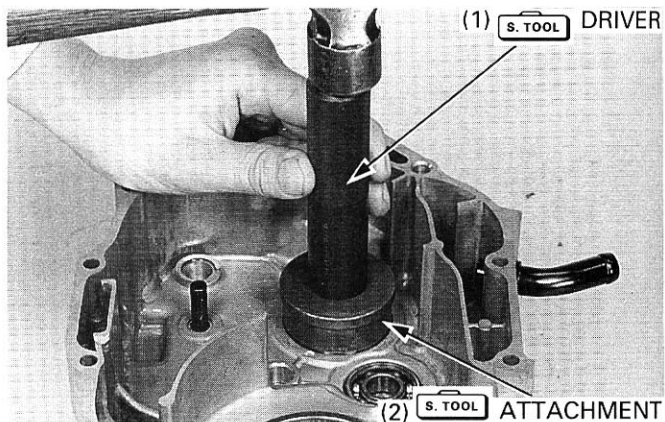


## CRANKCASE/CRANKSHAFT/BALANCER

Install a new countershaft bearing.

**TOOL:**

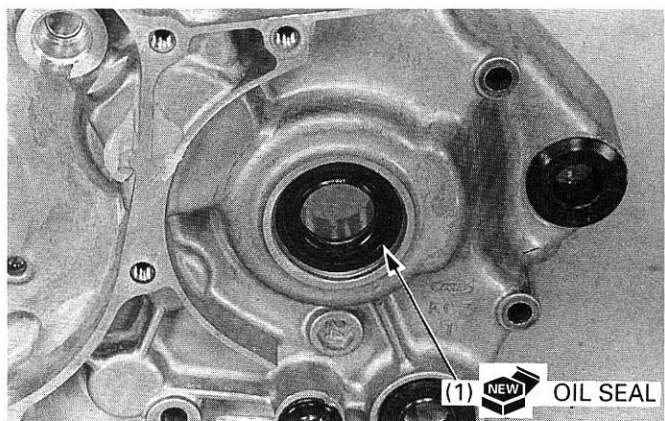
Attachment, 52 x 55 mm	07746 - 0010400
Driver	07749 - 0010000
Pilot, 22 mm	07746 - 0041000



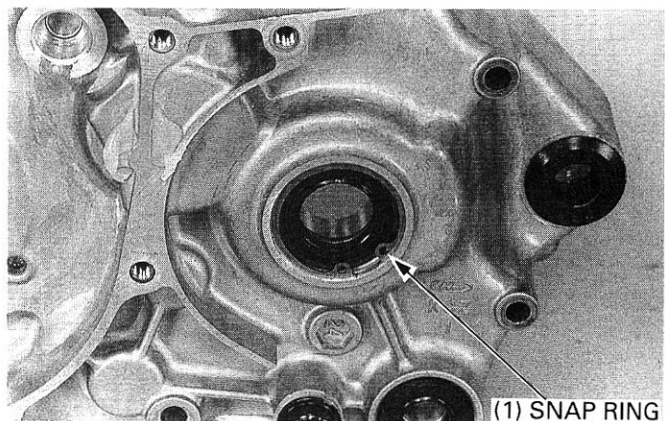
Install a new left countershaft oil seal using the special tool.

**TOOL:**

Driver, 22 mm I.D.	07746 - 0020100
--------------------	-----------------

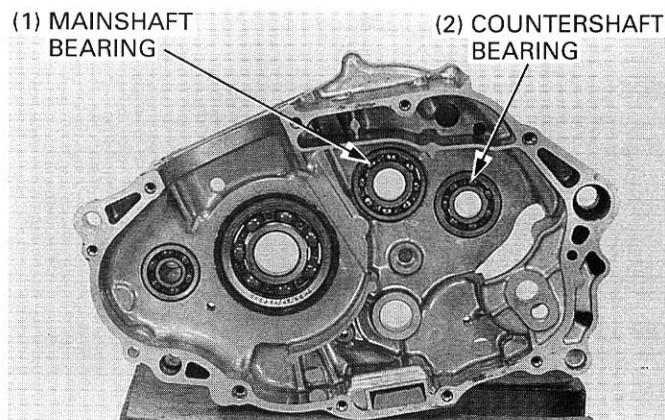


Install the snap ring.



**Right crankcase bearings**

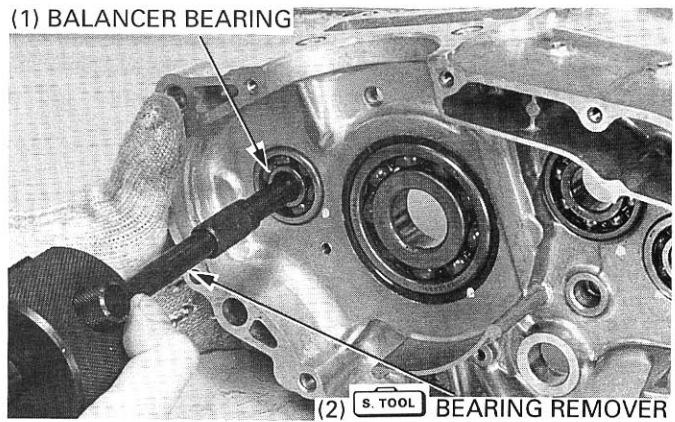
Remove the countershaft bearing and mainshaft bearing.



Remove the balancer bearing.

**TOOL:**

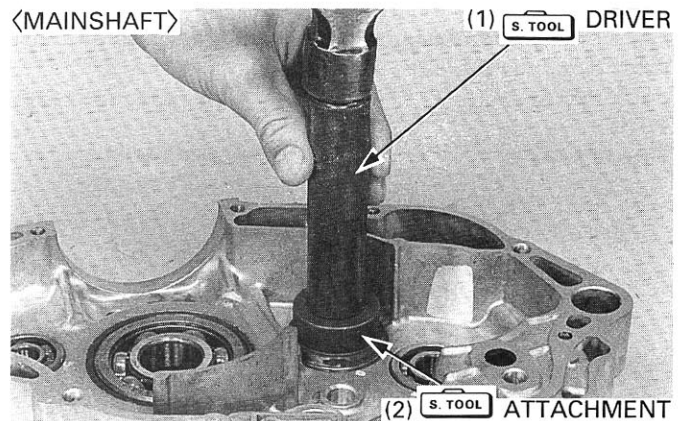
- Bearing remover head, 13 mm**      07LMC – KZ10100
- Bearing remover shaft**            07936 – 1660120
- Bearing remover weight**          07741 – 0010201



Install a new right countershaft bearing.

**TOOL:**

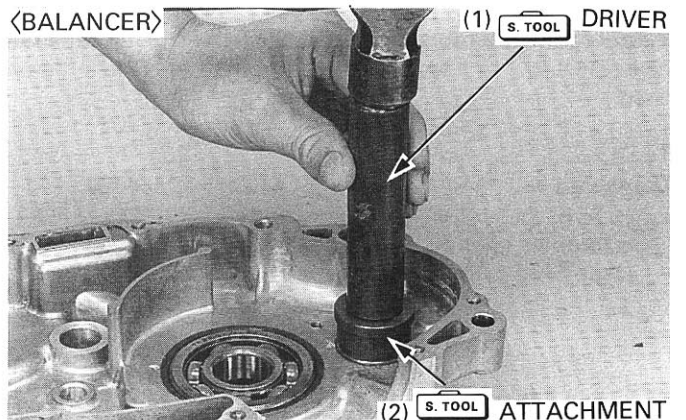
- Attachment, 42 x 47 mm**            07746 – 0010300
- Driver**                                    07749 – 0010000
- Pilot, 17 mm**                         07746 – 0040400



Install a new right mainshaft bearing.

**TOOL:**

- Attachment, 42 x 47 mm**            07746 – 0010300
- Driver**                                    07749 – 0010000
- Pilot, 20 mm**                         07746 – 0040500



Install a new left balancer bearing.

**TOOL:**

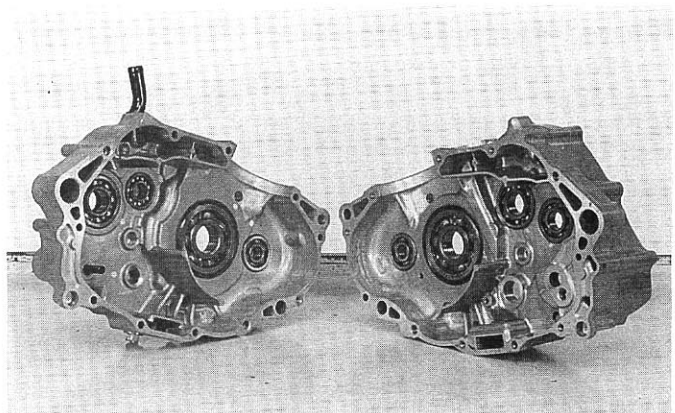
- Attachment, 37 x 40 mm**            07746 – 0010200
- Driver**                                    07749 – 0010000

## **BALANCER/CRANKSHAFT INSTALLATION**

Clean the crankcase mating surfaces before assembling and check for wear or damage.

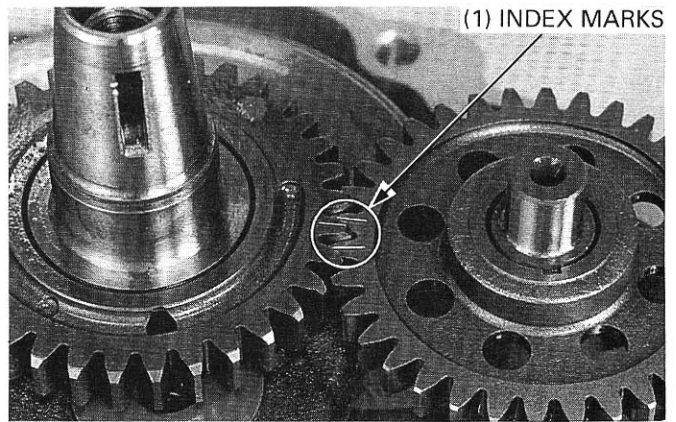
**NOTE**

- If there is minor roughness or irregularities on the crankcase mating surfaces, dress them with an oil stone.
- After cleaning, lubricate the crankshaft bearings, balancer bearings and connecting rod big end with clean engine oil.



## CRANKCASE/CRANKSHAFT/BALANCER

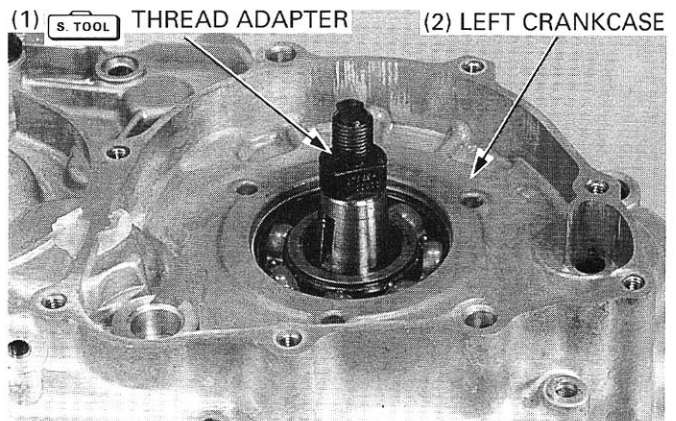
Align the index mark on the crankshaft gear with the index marks on the balancer gear as shown.  
Temporarily install the crankshaft with the balancer into the right crankcase.



Place the left crankcase onto the right crankcase and install the thread adapter onto the crankshaft.

**TOOL:**  
Thread adapter

07965 - VM00300 or  
07931 - KF00200

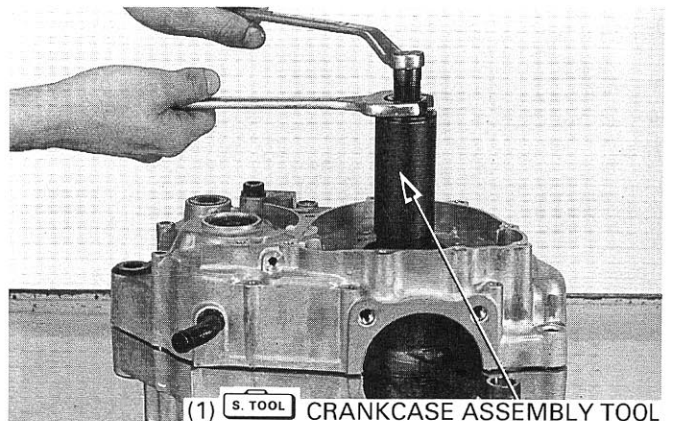


Temporarily assemble the crankcase halves using the crankcase assembly tool to draw the crankshaft into the left crankcase.

**TOOL:**  
Crankcase assembly tool

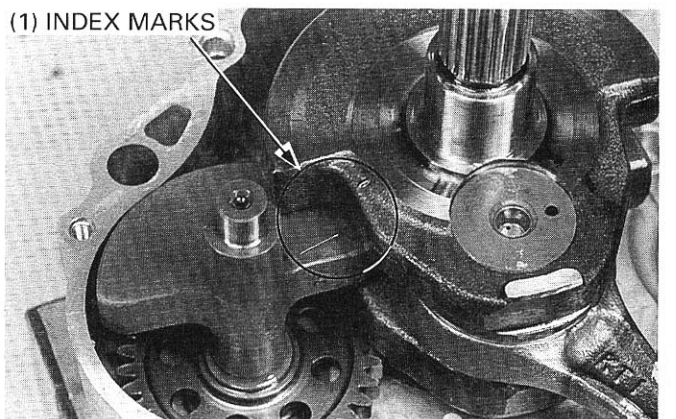
- assembly collar
- assembly shaft
  
- thread adapter

07965 - VM00000  
(not available in U.S.A.)  
07965 - VM00100  
07965 - VM00200 or  
07931 - ME4010B and  
07931 - HB3020A  
(U.S.A. only)  
07965 - VM00300 or  
07931 - KF00200



Remove the tool and attachment.  
Remove the right crankcase.

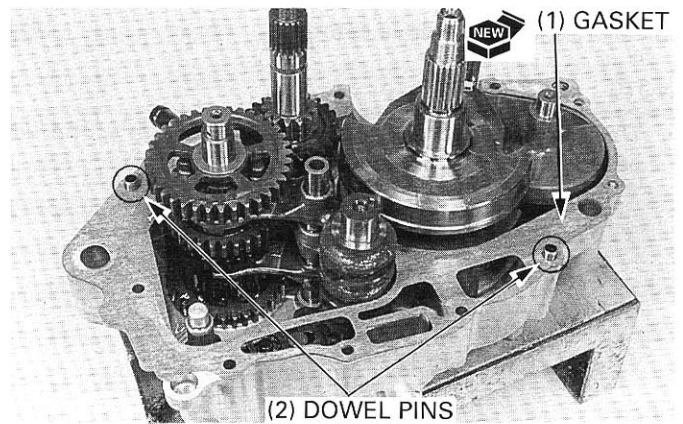
Make sure that the line on the crankshaft weight is aligned with the balancer shaft weight line.





## CRANKCASE ASSEMBLY

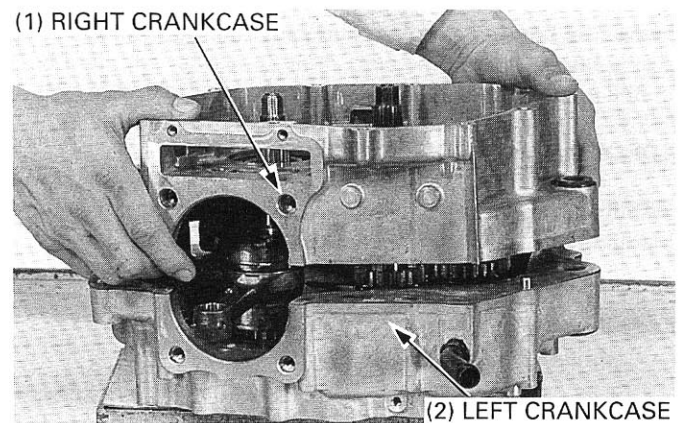
Install the transmission (page 12-6).  
Install the dowel pins and new gasket.



Assemble the right and left crankcase being careful to align the dowel pins and shafts.

### CAUTION

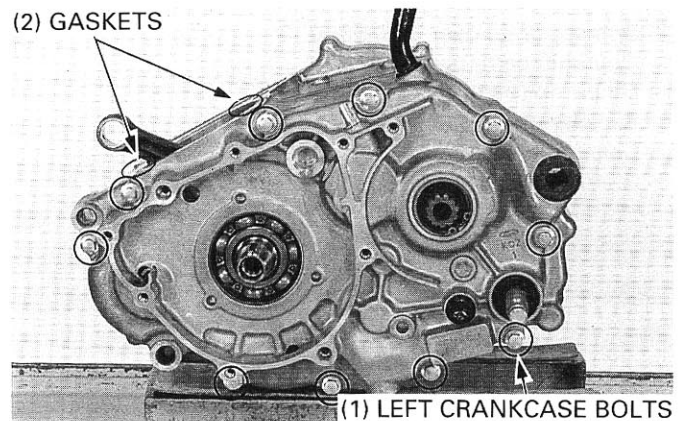
- *Do not force the crankcase halves together; if there is excessive force required, something is wrong. Remove the right crankcase and check for misaligned parts.*



Install and tighten the left crankcase bolts in a crisscross pattern in 2-3 steps.

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

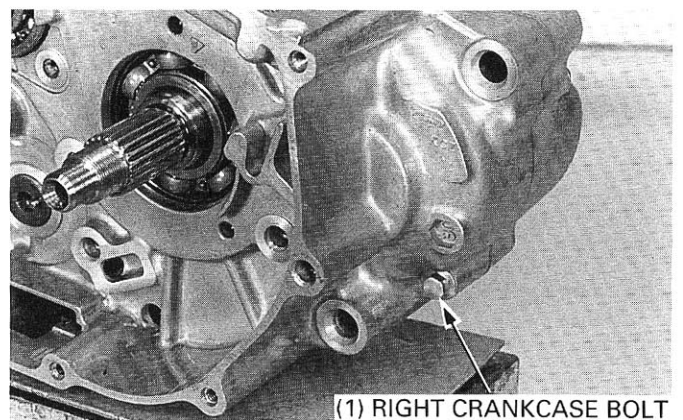
Cut the gaskets along the cylinder mating surfaces.



Install and tighten the right crankcase bolt.

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

After installation, check the rotation of the crankshaft, mainshaft and countershaft.

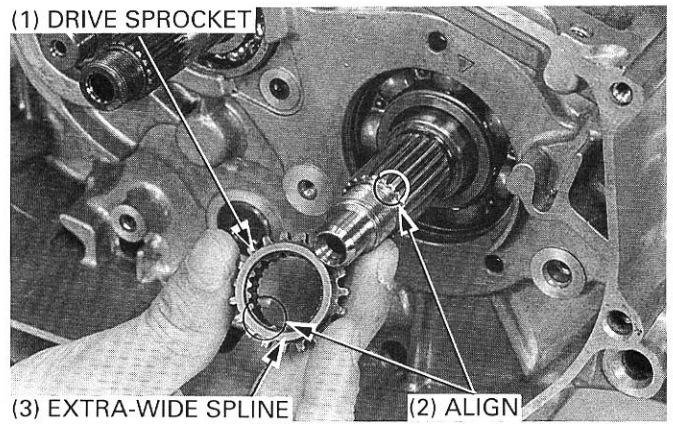


## CRANKCASE/CRANKSHAFT/BALANCER

Install the cam chain drive sprocket.

### NOTE

- The cam chain drive sprocket goes on only one way because of an extra-wide aligning spline.



Install the bearing set plate and cam chain tensioner. Apply thread lock to the cam chain tensioner set plate bolt. Install and tighten the cam chain tensioner set plate bolt.

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

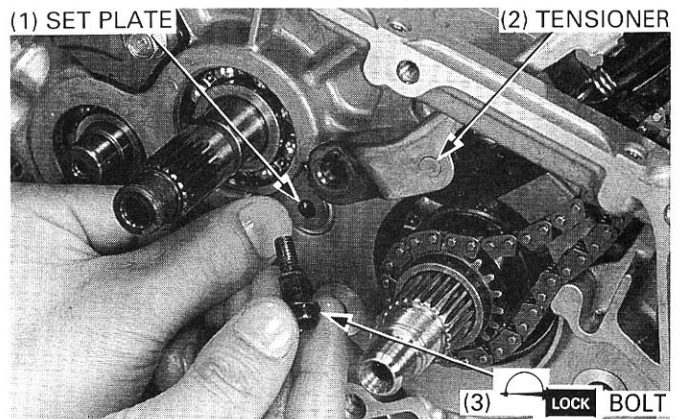
Install and tighten the cam chain tensioner bolt. Install the cam chain to the cam chain drive sprocket. Install the following:

- Piston (page 8-6)
- Cylinder (page 8-7)
- Cylinder head (page 7-15)

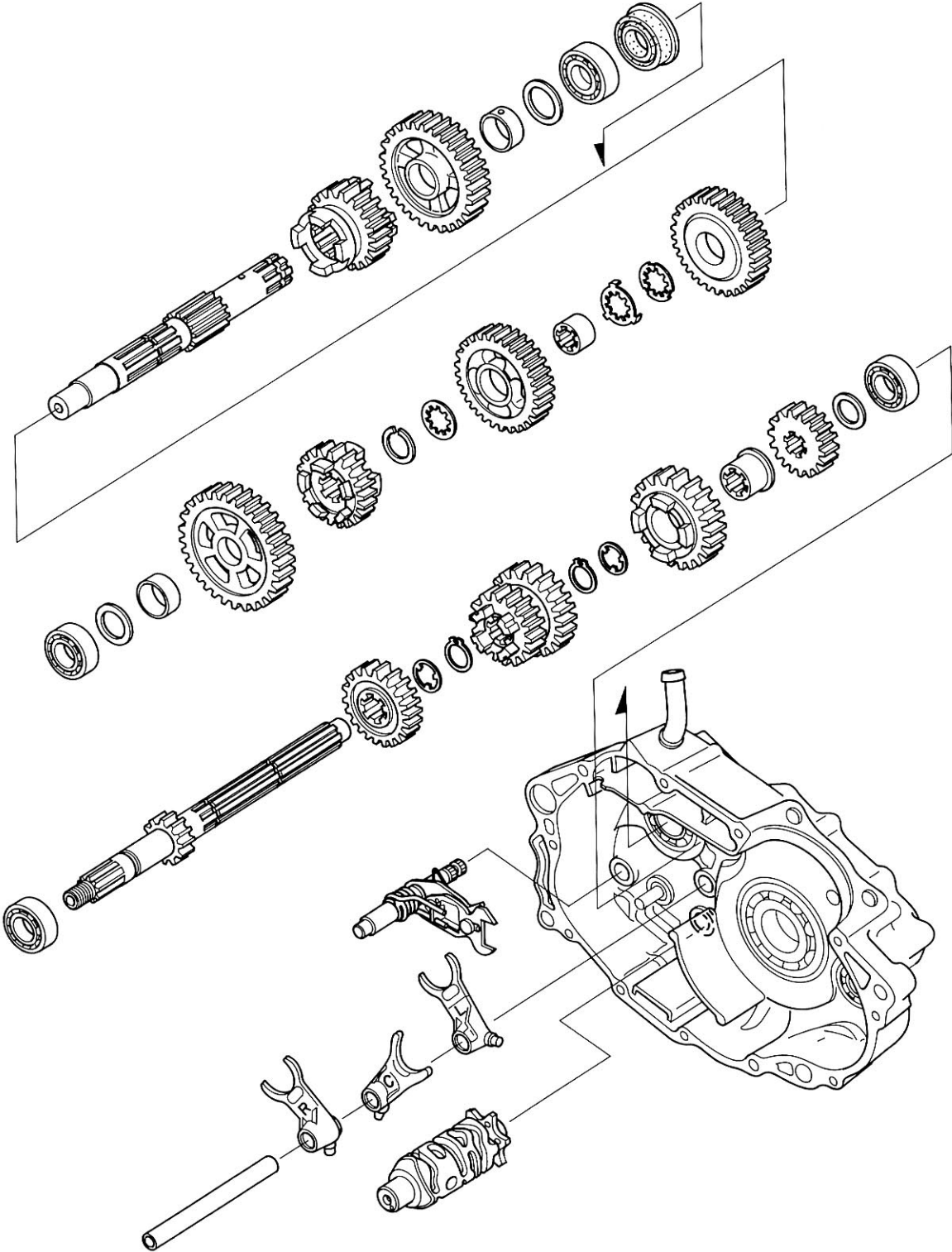
Install the engine into the frame (page 6-5).

Reinstall the following:

- Primary drive gear (page 9-9)
- Gearshift cam (page 9-17)
- Oil pump (page 4-7)
- Kickstarter (page 9-14)
- Clutch (page 9-10)
- Alternator (page 10-4)







# 12. TRANSMISSION

<b>SERVICE INFORMATION</b>	<b>12-1</b>	<b>TRANSMISSION INSPECTION</b>	<b>12-3</b>
<b>TROUBLESHOOTING</b>	<b>12-2</b>	<b>TRANSMISSION ASSEMBLY/ INSTALLATION</b>	<b>12-6</b>
<b>TRANSMISSION REMOVAL/ DISASSEMBLY</b>	<b>12-3</b>		

## SERVICE INFORMATION

### GENERAL

- The crankcase must be separated to service the transmission.
- The gearshift cam plate can be serviced with the engine installed in the frame (Section 9).

### SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT	
Transmission	Gear I.D.	M5	20.000 – 20.021 (0.7874 – 0.7882)	20.08 (0.791)	
		M6	23.000 – 23.021 (0.9055 – 0.9063)	23.07 (0.908)	
		C1	23.000 – 23.021 (0.9055 – 0.9063)	23.07 (0.908)	
		C2	25.020 – 25.041 (0.9850 – 0.9859)	25.09 (0.988)	
		C3	25.000 – 25.021 (0.9843 – 0.9851)	25.07 (0.987)	
		C4	22.000 – 22.021 (0.8661 – 0.8670)	22.07 (0.869)	
	Gear bushing	M6	O.D.	22.959 – 22.980 (0.9039 – 0.9047)	22.92 (0.902)
			C1	I.D.	18.000 – 18.018 (0.7087 – 0.7094)
			O.D.	22.959 – 22.980 (0.9039 – 0.9047)	22.90 (0.902)
		C2	I.D.	22.000 – 22.021 (0.8661 – 0.8670)	22.10 (0.870)
			O.D.	24.979 – 25.000 (0.9834 – 0.9843)	24.90 (0.980)
	C3	O.D.	24.959 – 24.980 (0.9826 – 0.9835)	24.90 (0.980)	
	Mainshaft O.D.	M5		19.959 – 19.980 (0.7858 – 0.7866)	19.91 (0.784)
		Clutch outer guide		19.959 – 19.980 (0.7858 – 0.7866)	19.91 (0.784)
	Countershaft O.D.	Starter idle gear		14.966 – 14.984 (0.5892 – 0.5899)	14.91 (0.587)
		C1		17.966 – 17.984 (0.7073 – 0.7080)	17.91 (0.705)
		C2, C4		21.959 – 21.980 (0.8645 – 0.8654)	21.91 (0.863)
	Shift drum O.D. at right crankcase bearing portion			19.959 – 19.980 (0.7858 – 0.7866)	19.90 (0.783)
	Gear-to-bushing clearance		M6, C1, C2, C3	0.020 – 0.062 (0.0008 – 0.0022)	0.10 (0.004)
	Gear-to-shaft clearance		M5, C4	0.020 – 0.062 (0.0008 – 0.0022)	0.15 (0.006)
Bushing-to-shaft clearance	C1		0.016 – 0.052 (0.0006 – 0.0020)	0.10 (0.004)	
	C2		0.020 – 0.062 (0.0008 – 0.0022)	0.10 (0.004)	
Shift fork, Shaft	Shift fork	I.D.		13.000 – 13.021 (0.5118 – 0.5126)	13.05 (0.514)
		Operation area thickness	R, L	4.93 – 5.00 (0.194 – 0.197)	4.50 (0.177)
			C	4.90 – 5.00 (0.193 – 0.197)	4.50 (0.177)
	Shift fork shaft O.D.			12.966 – 12.984 (0.5105 – 0.5112)	12.90 (0.508)

## **TROUBLESHOOTING**

### **Hard to shift**

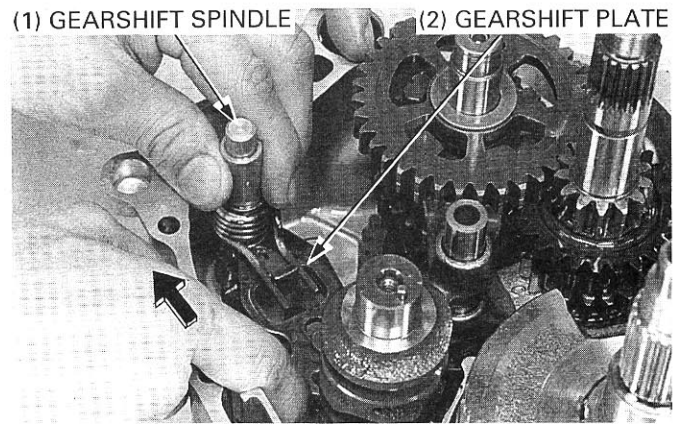
- Improper clutch adjustment; too much free play
- Shift forks bent
- Shift shaft bent
- Shift drum cam groove damaged

### **Transmission jumps out of gear**

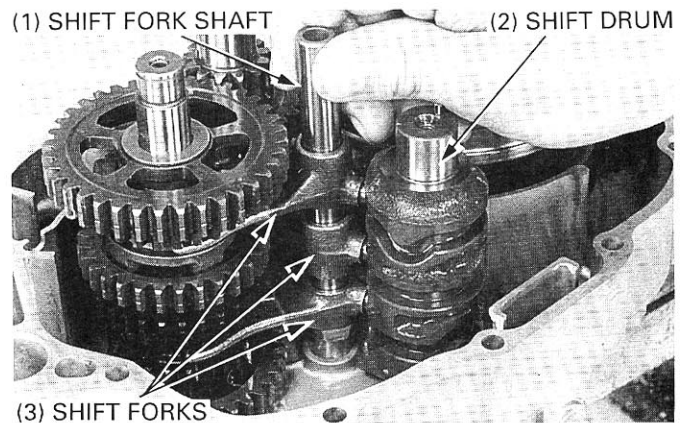
- Gear dogs worn
- Shift shaft bent
- Shift drum stopper broken
- Shift forks bent

## TRANSMISSION REMOVAL/ DISASSEMBLY

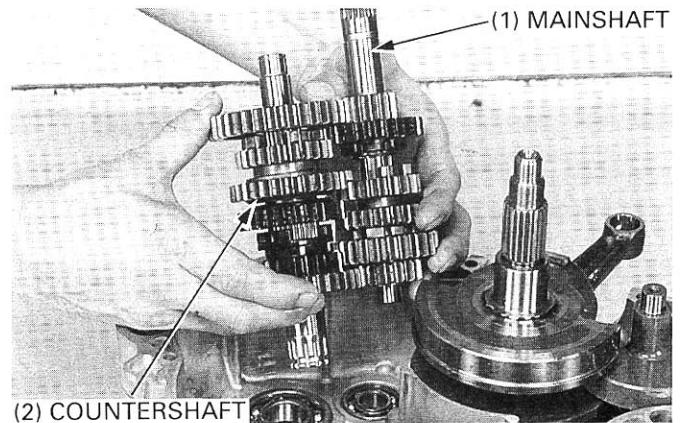
Separate the crankcase (Section 11).  
Pull the gearshift plate toward the spindle and remove the gearshift spindle.



Remove the shift fork shaft.  
Remove the shift drum and shift forks.

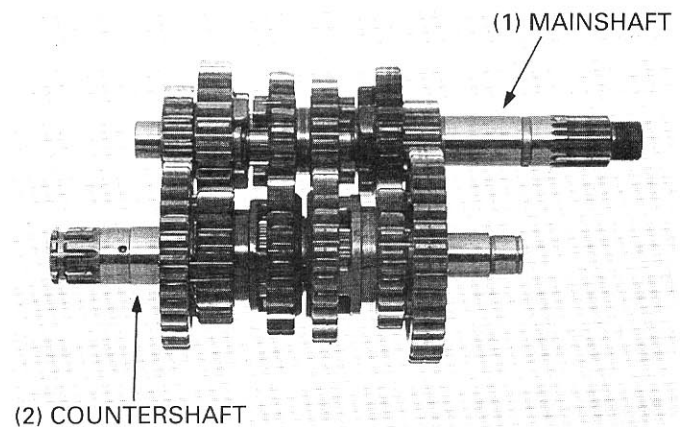


Remove the mainshaft and countershaft as an assembly.



## TRANSMISSION INSPECTION

Disassemble the mainshaft and countershaft.  
Inspect each gear for wear or damage and replace if necessary. Check the gear teeth and engagement dogs for wear or damage. Check the mainshaft and countershaft splines and sliding surfaces for wear or damage.

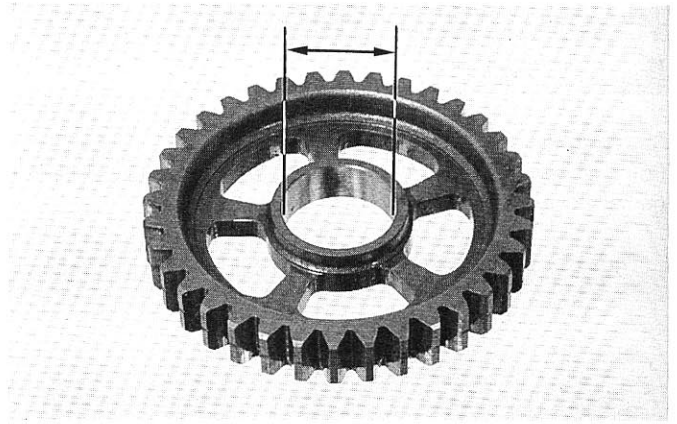


## TRANSMISSION

Measure the I.D. of each spinning gear.

### SERVICE LIMITS:

- M5: 20.08 mm (0.791 in)
- M6: 23.07 mm (0.908 in)
- C1: 23.07 mm (0.908 in)
- C2: 25.09 mm (0.988 in)
- C3: 25.07 mm (0.987 in)
- C4: 22.07 mm (0.869 in)



Measure the I.D. and O.D. of the gear bushings.

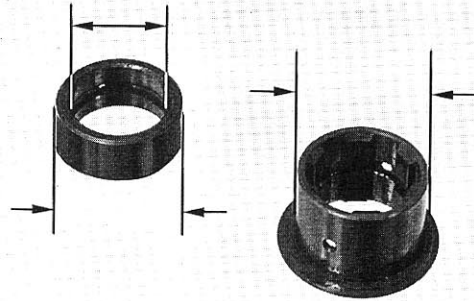
### SERVICE LIMITS:

- I.D.: C1: 18.08 mm (0.712 in)
- C2: 22.10 mm (0.870 in)
- O.D.: M6: 22.92 mm (0.902 in)
- C1: 22.90 mm (0.902 in)
- C2: 24.90 mm (0.980 in)
- C3: 24.90 mm (0.980 in)

Calculate the clearances between the gears and bushings.

### SERVICE LIMITS:

- M6, C1, C2, C3: 0.10 mm (0.004 in)



Measure the O.D. of the mainshaft and countershaft in the locations shown.

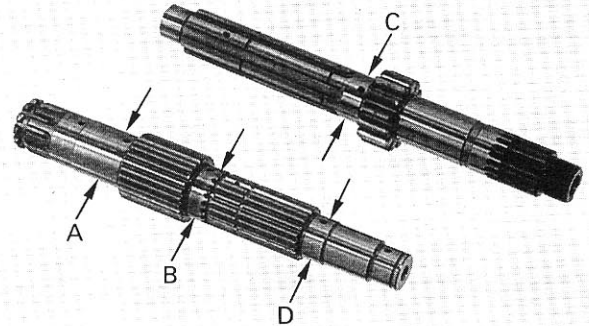
### SERVICE LIMITS:

- A: C2 bushing: 21.91 mm (0.863 in)
- B: C4 gear: 21.91 mm (0.863 in)
- C: M5 gear: 19.91 mm (0.784 in)
- D: C1 bushing: 17.91 mm (0.705 in)

Calculate the clearance between the shaft and gears or bushings.

### SERVICE LIMITS:

- M5 gear: 0.15 mm (0.006 in)
- C4 gear: 0.15 mm (0.006 in)
- C1 bushing: 0.10 mm (0.004 in)
- C2 bushing: 0.10 mm (0.004 in)



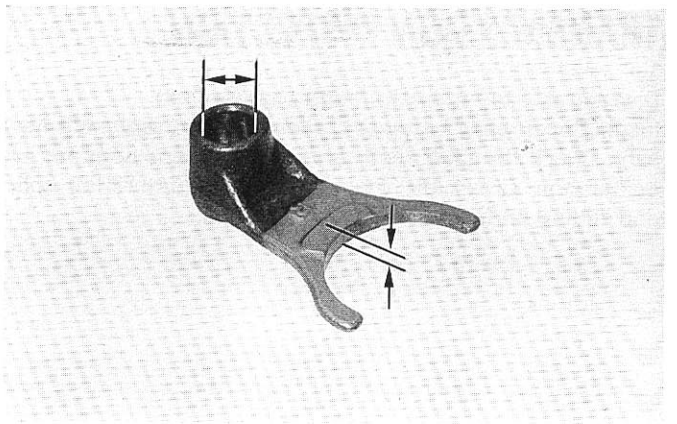
Inspect the shift forks and replace any shift fork if it is bent or damaged.

Measure the I.D. of the shift fork.

### SERVICE LIMIT: 13.05 mm (0.514 in)

Measure the thickness of the shift fork contact area.

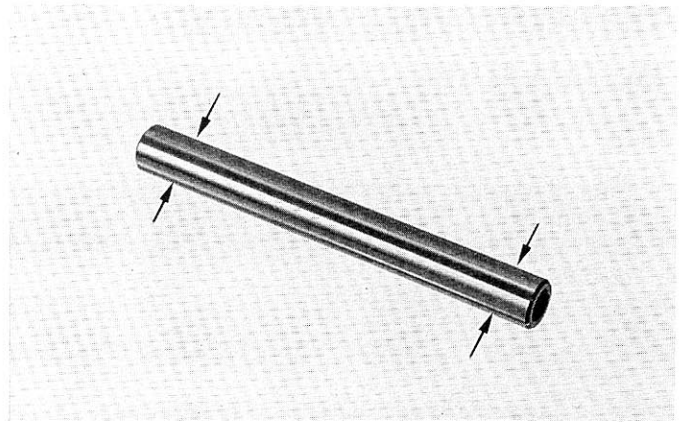
### SERVICE LIMIT: 4.50 mm (0.177 in)





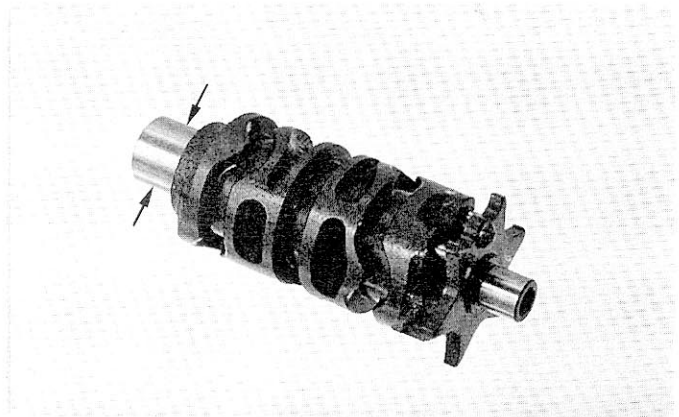
Inspect the shift fork shaft and replace the shift fork shaft if it is bent or damaged.  
Measure the O.D. of the shift fork.

**SERVICE LIMIT: 12.90 mm (0.508 in)**



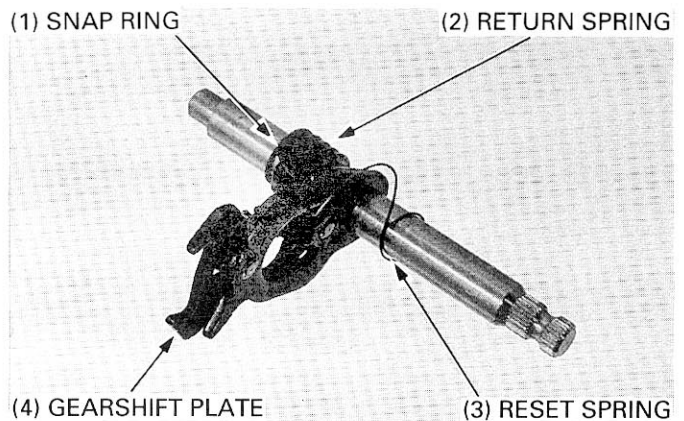
Inspect the shift drum grooves and replace the drum if they are damaged or worn.  
Measure the O.D. of the shift drum right crankcase bearing surface.

**SERVICE LIMIT: 19.90 mm (0.783 in)**



**GEARSHIFT SPINDLE INSPECTION**

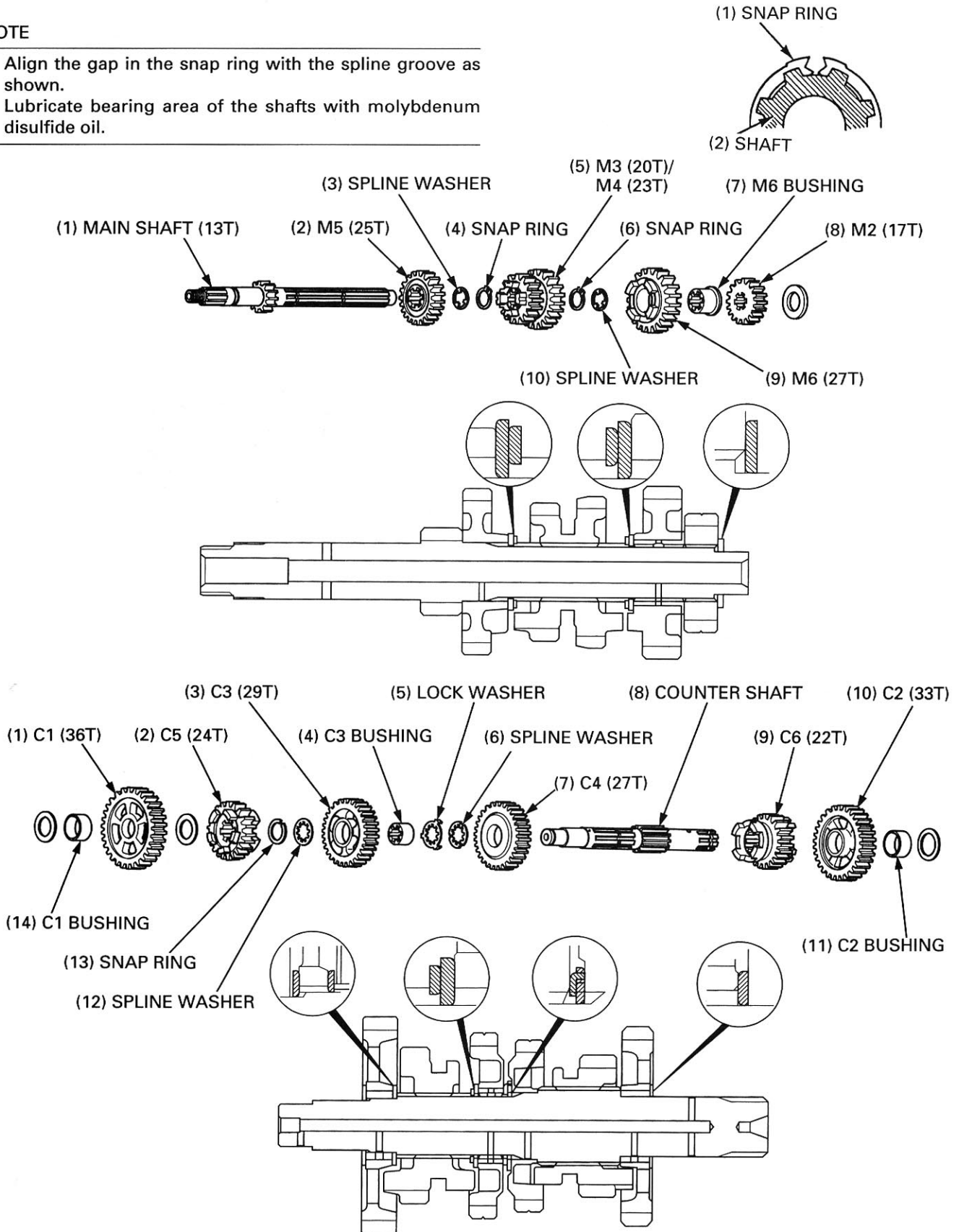
Remove the snap ring and spring.  
Inspect the gearshift spindle and gearshift plate claw wear or damage.  
Replace if it's worn and damaged.  
Inspect the return spring and replace if it's damaged.  
Inspect the reset spring and replace if it's damaged.



**TRANSMISSION ASSEMBLY/  
INSTALLATION**

**NOTE**

- Align the gap in the snap ring with the spline groove as shown.
- Lubricate bearing area of the shafts with molybdenum disulfide oil.



Apply engine oil to the following:

- All gear teeth
- Mainshaft bearing
- Countershaft bearing
- Shift drum bearing

Apply molybdenum disulfide oil to the shift fork grooves of the M3/4, C5, C6 gear.

Assemble the transmission.

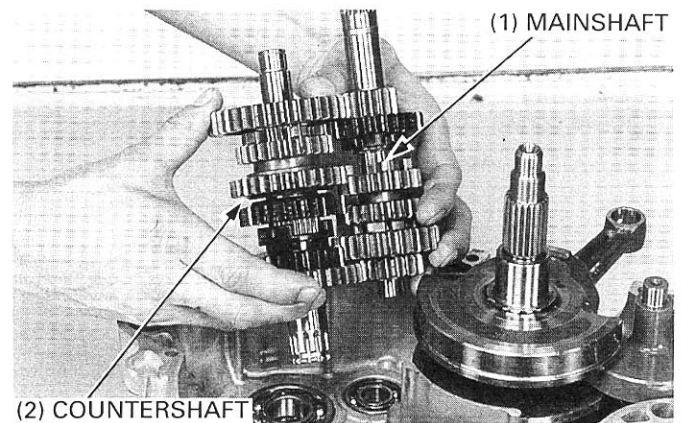
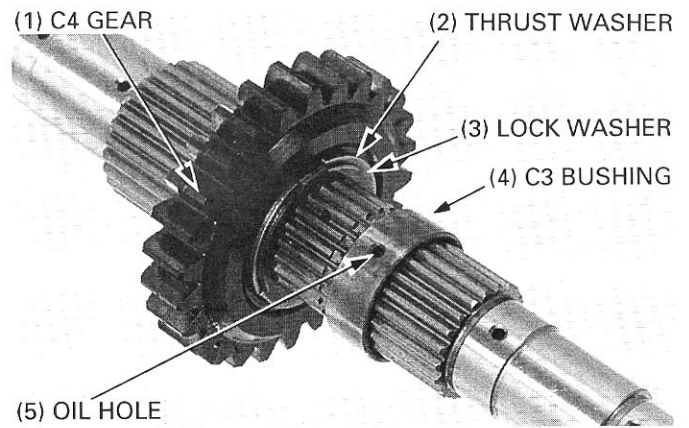
**NOTE**

- Align the cut-outs of the C4 gear splined washer with the tabs of the C4 gear thrust washer lock plate.
- Install the C3 gear bushing with its oil hole aligning with the hole in the countershaft.
- Install the M6 gear bushing with its oil hole aligning with the hole in the mainshaft.

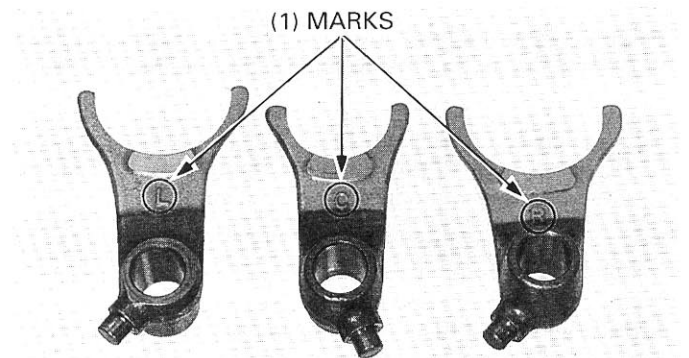
Install the mainshaft and countershaft into the left crankcase as an assembly.

**NOTE**

- Be careful not to turn over the countershaft oil seal lip in the left crankcase when installing the countershaft.



Each shift fork has an identification mark; "R" (Right), "C" (Center) or "L" (Left).



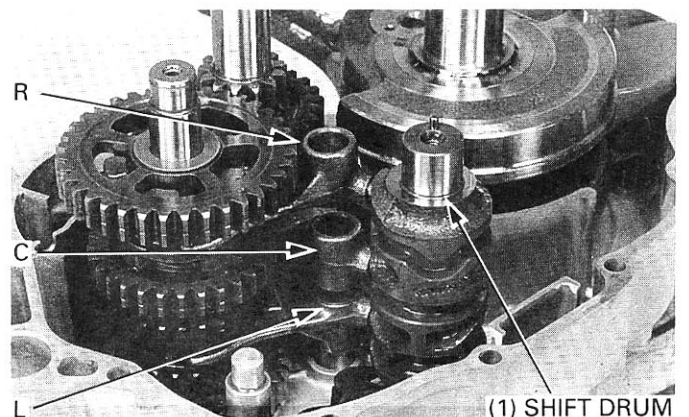
Apply engine oil to the following:

- Shift drum guide groove
- Shift fork claws
- Shift fork guide pin
- Shift fork I.D.
- Shift fork shaft

Install the following:

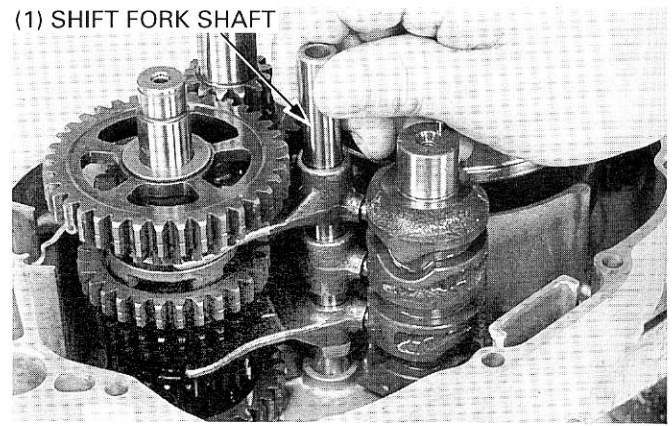
- Shift drum
- Shift forks

Install the shift forks in the correct position with their marks facing up.



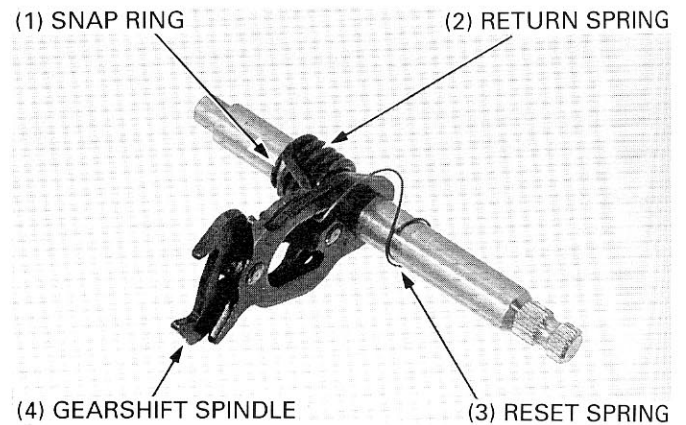
## TRANSMISSION

Install the shift fork shaft.



Install the following onto the gearshift spindle:

- Return spring
- Snap ring
- Reset spring



Align the return spring with the pin bolt and install the shift spindle while pulling the shift plate toward the spindle.

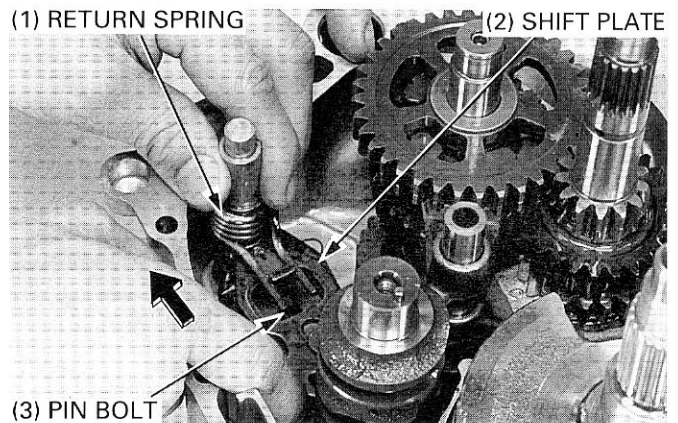
### NOTE

- Be careful not to turn over the spindle oil seal lip in the left crankcase when installing shift spindle.

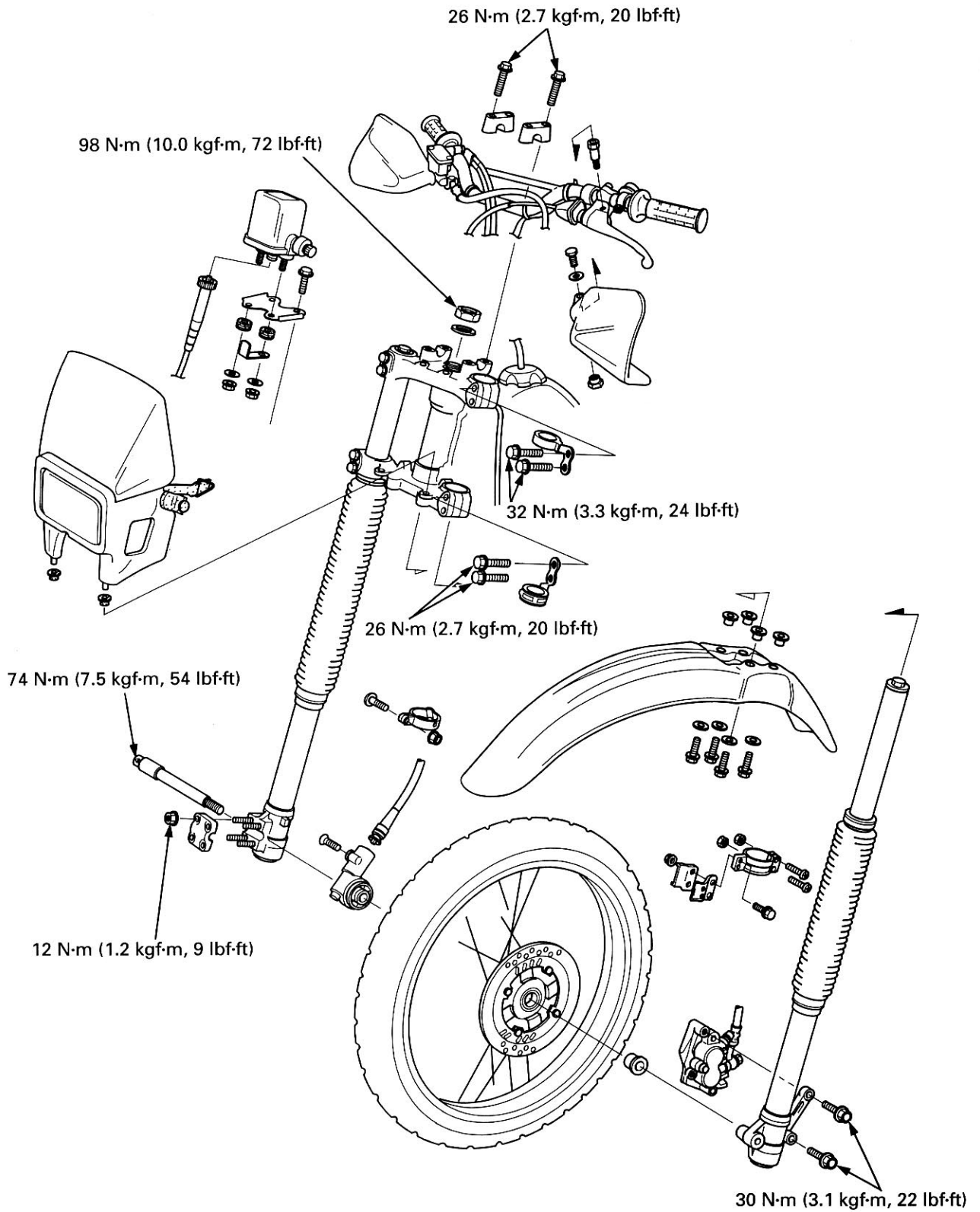
Install the right crankcase (page 11-11).

Install the shift cam and stopper arm (page 9-17).

Install the gearshift pedal and check the transmission for smooth shifting.



# FRONT WHEEL/SUSPENSION/STEERING





# 13. FRONT WHEEL/SUSPENSION/STEERING

SERVICE INFORMATION	13-1	FORK	13-7
TROUBLESHOOTING	13-2	TRIPMETER	13-19
FRONT WHEEL	13-3	STEERING	13-20

## SERVICE INFORMATION

### GENERAL

- Keep grease off of brake pads and disc.

#### ⚠ WARNING

- *A contaminated brake disc or pads reduce stopping power. Discard contaminated pads and clean a contaminated disc with Pro Honda Contact/Brake Cleaner or an equivalent high quality brake degreasing agent.*

- This section covers maintenance of the front wheel, fork and steering stem.
- A box or work stand is required to support the motorcycle.
- Refer to section 15 for brake system information.

### SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Cold tire pressure		98 kPa (1.0 kgf/cm <sup>2</sup> , 15 psi)	—
Axle runout		—	0.2 (0.01)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Wheel rim-to-hub distance		20.25 (0.797)	—
Fork spring free length		442.5 (17.42)	438.1 (17.25)
Fork tube runout		—	2.0 (0.08)
Recommended fork oil		Pro Honda Suspension Fluid SS-7 or equivalent	—
Fork oil level		82 (3.2)	77 – 108 (3.0 – 4.2)
Fork oil capacity		477 cm <sup>3</sup> (16.13 US oz, 16.79 Imp oz)	—

### TORQUE VALUES

Handlebar holder bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)
Steering stem nut	98 N·m (10.0 kgf·m, 72 lbf·ft)
Steering top thread	5 N·m (0.5 kgf·m, 3.6 lbf·ft)
Top bridge pinch bolt	32 N·m (3.3 kgf·m, 24 lbf·ft)
Bottom bridge pinch bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)
Front axle	74 N·m (7.5 kgf·m, 54 lbf·ft)
Front axle holder nut	12 N·m (1.2 kgf·m, 9 lbf·ft) U-nut.
Front brake caliper bracket bolt	30 N·m (3.1 kgf·m, 22 lbf·ft) Apply a locking agent to the threads.
Front brake disc plate bolt	20 N·m (2.0 kgf·m, 14 lbf·ft) ALOC bolt; Replace with a new one.
Master cylinder holder bolt	9 N·m (0.9 kgf·m, 6.5 lbf·ft)
Spoke nipple	3.8 N·m (0.38 kgf·m, 2.7 lbf·ft)
Rim lock	15 N·m (1.5 kgf·m, 11 lbf·ft)

## FRONT WHEEL/SUSPENSION/STEERING

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### TOOLS

#### Special

Fork rod holder	07PMB – KZ40101
Fork seal driver body	07947 – KA50100
Fork seal driver attachment, 41 mm ID	07947 – KF00100
Oil seal remover	07948 – 4630100 or 07953 – MJ1000B or 07953 – MJ1000A and 07GMD – KS40100 (U.S.A. only)
Steering stem driver	07946 – 4300101 or 07946 – MB00000 and 07946 – KA6000A or GN – MT – 54 (U.S.A. only)
Steering stem socket	07916 – KA50100

#### Common

Attachment, 32 x 35 mm	07746 – 0010100
Attachment, 42 x 47 mm	07746 – 0010300
Bearing remover head, 15 mm	07746 – 0050400
Bearing remover shaft	07746 – 0050100
Driver	07749 – 0010000
Spoke nipple wrench	07701 – 0020300
Pilot, 15 mm	07746 – 0040300

or equivalent commercially available in U.S.A.

## TROUBLESHOOTING

#### Hard steering

- Steering stem nut too tight
- Faulty steering stem bearings
- Insufficient air in front tire

#### Steers to one side or does not track straight

- Bent front forks
- Bent front axle
- Wheel installed incorrectly

#### Front wheel wobbling

- Distorted rim
- Worn front bearings
- Loose or broken spokes
- Faulty tire
- Axle not tightened properly

#### Soft suspension

- Weak fork springs
- Insufficient fluid in front forks

#### Hard suspension

- Incorrect fluid weight in front forks
- Fork tube bent

#### Front suspension noise

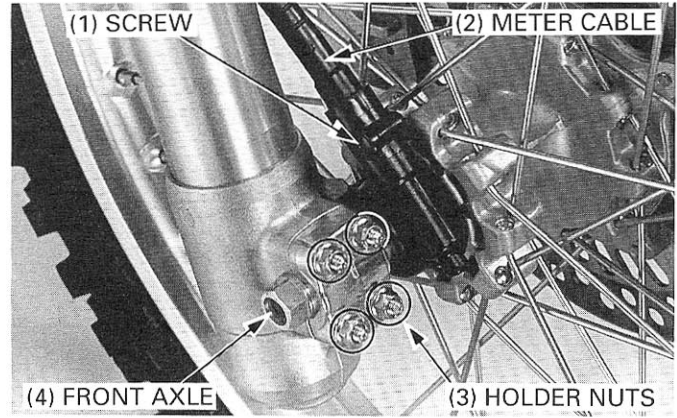
- Slider binding
- Insufficient fluid in forks
- Loose front fork fasteners

## FRONT WHEEL

### REMOVAL

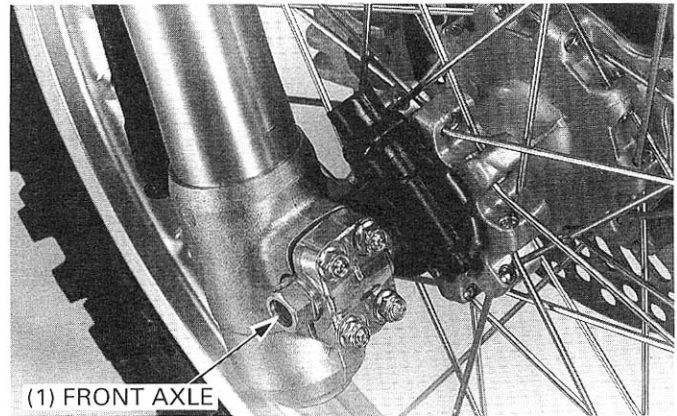
Remove the screw and disconnect the tripmeter cable from the tripmeter gearbox.  
Loosen the front axle holder nuts.  
Loosen the front axle.

Raise the front wheel off the ground by placing a box or work stand under the engine.  
Remove the front axle and front wheel.



### NOTE

- Do not depress the brake lever after the front wheel is removed. The caliper piston will move out and make reassembly difficult.

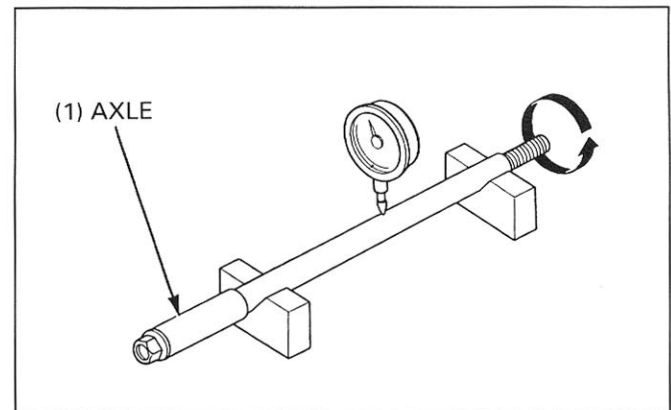


### INSPECTION

#### Axle

Set the axle in V blocks and measure the runout.  
The actual runout is 1/2 of the total indicator reading.

**SERVICE LIMIT: 0.2 mm (0.01 in)**

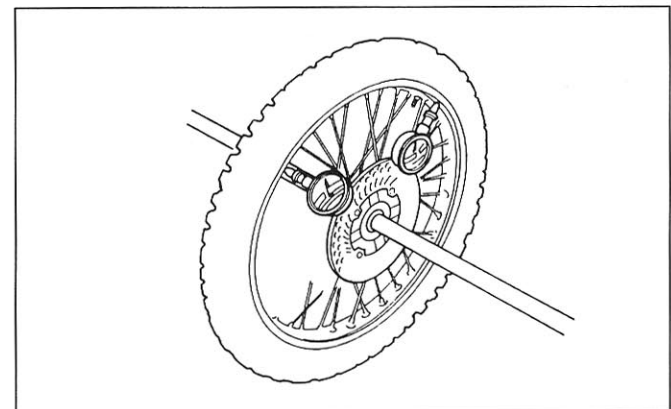


#### Wheel

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

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

Check the spokes and tighten any that are loose.



## FRONT WHEEL/SUSPENSION/STEERING

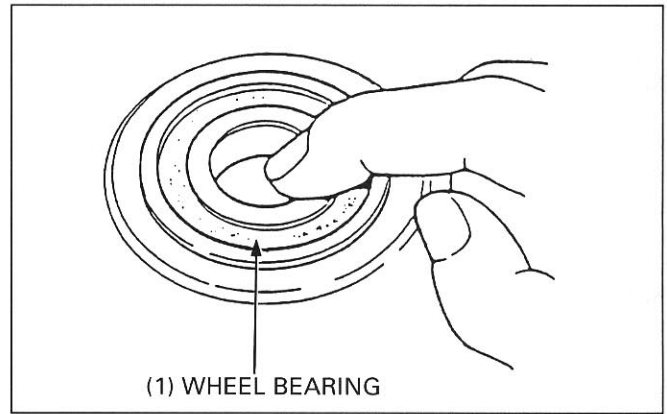
### Wheel bearing

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

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

### NOTE

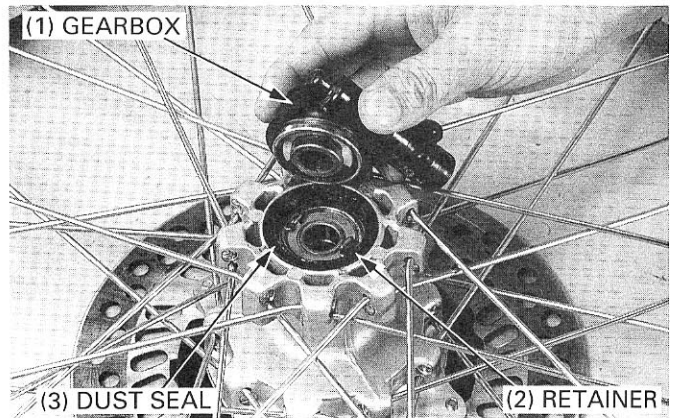
- Replace the wheel bearings in pairs.



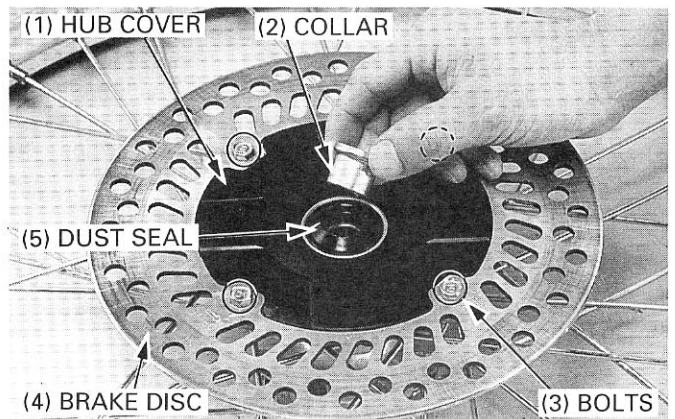
### DISASSEMBLY

Remove the following:

- Tripmeter gearbox
- Right dust seal
- Tripmeter gear retainer



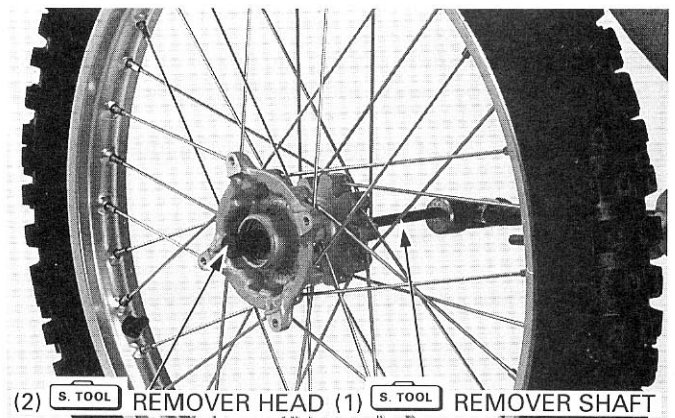
- Left wheel collar
- Front brake disc bolt
- Front brake disc
- Hub cover
- Left dust seal



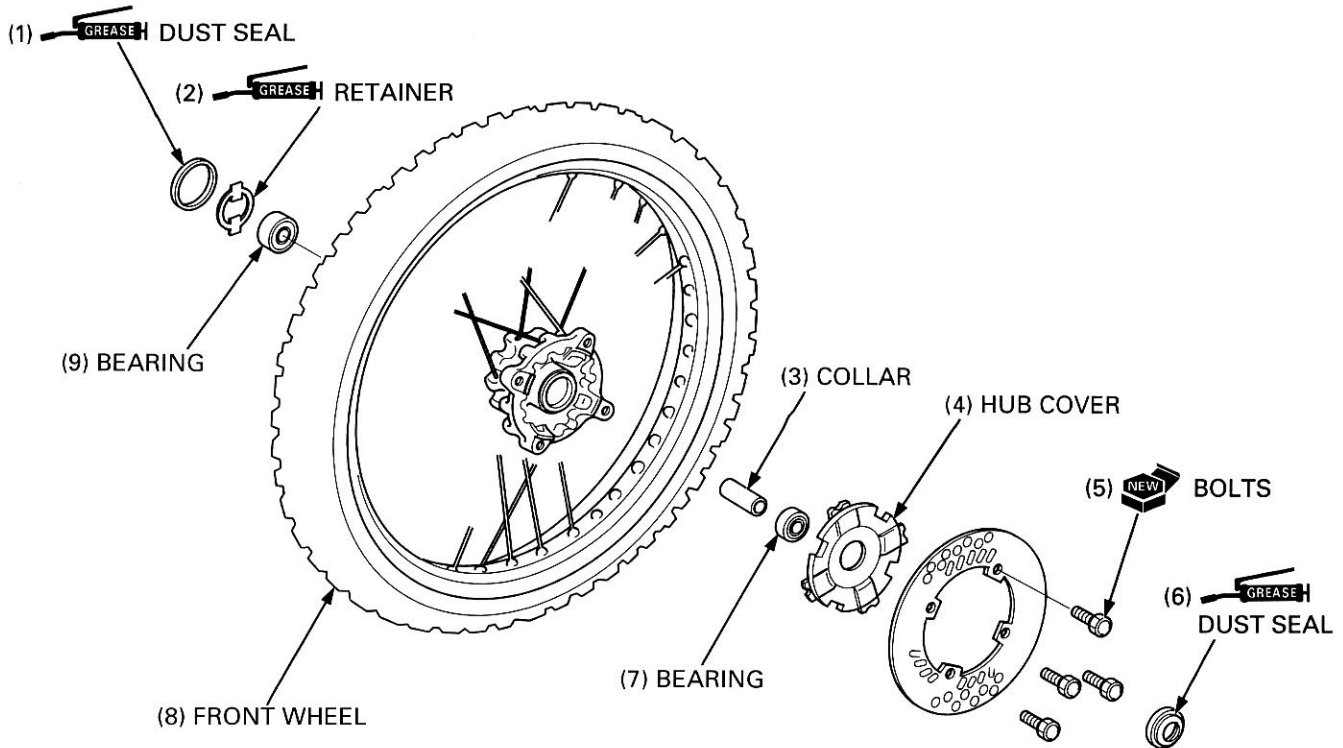
Remove the bearing and distance collar.

### TOOL:

- Bearing remover head, 15 mm** 07746 - 0050400  
**Bearing remover shaft** 07746 - 0050100 or  
equivalent commercially  
available in U.S.A.



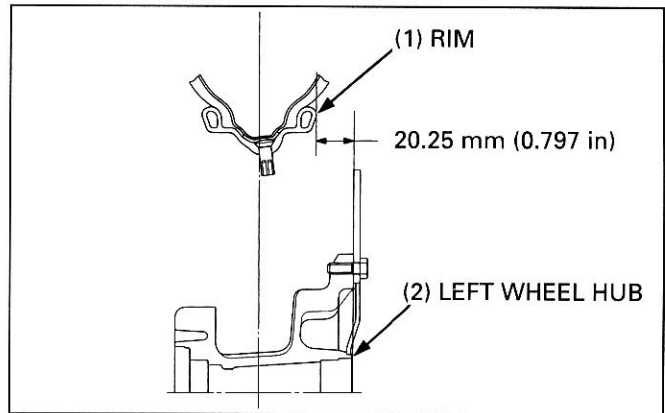
**ASSEMBLY**



Place the rim on a work bench.

Clean the spoke and nipple threads.  
Adjust the hub position to set the distance from the hub left end surface to the side of rims as shown.

**WHEEL RIM-TO-HUB STANDARD DISTANCE:**  
**20.25 mm (0.797 in)**



Torque the spokes in 2 or 3 progressive steps.

**TOOL:**  
**Spoke nipple wrench**                      **07701 – 0020300**

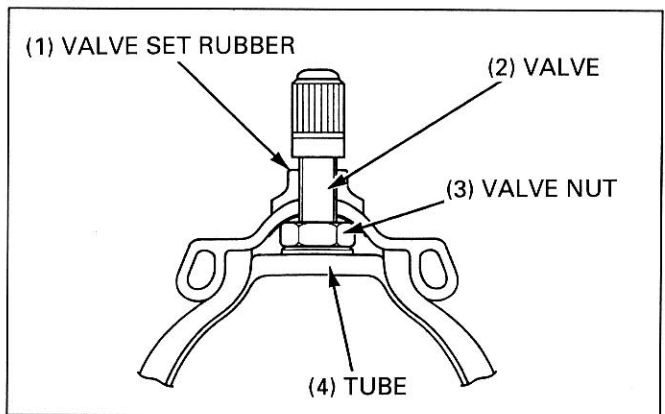
**TORQUE: 3.8 N·m (0.38 kgf·m, 2.7 lbf·ft)**

Install the valve nut to the valve.  
Install the valve to the wheel rim with the valve setting rubber.

Install and tighten the rim lock nut.

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

Pack all bearing cavities with grease.





## FRONT WHEEL/SUSPENSION/STEERING

Drive the new right wheel bearing into the hub using the special tools as shown.  
Install the distance collar.  
Drive the new left wheel bearing into the hub using the special tools as shown.

### TOOL:

**Attachment, 32 x 35 mm**

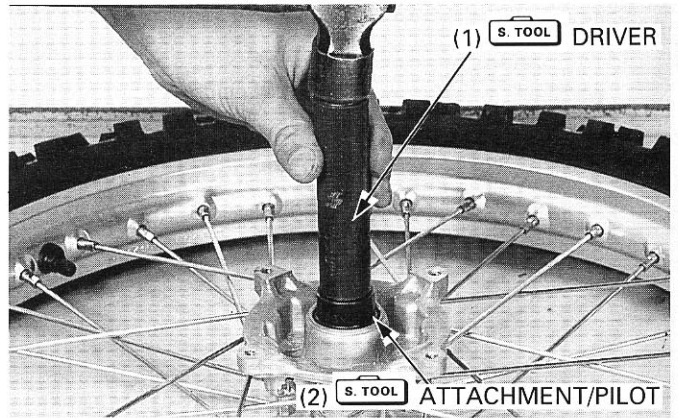
**07746 - 0010100**

**Driver**

**07749 - 0010000**

**Pilot, 15 mm**

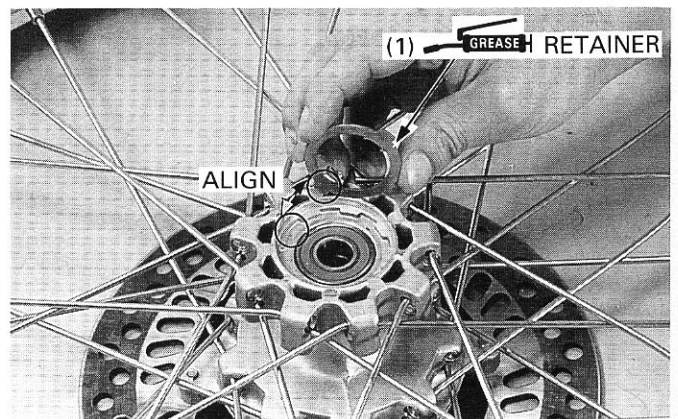
**07746 - 0040300**



### NOTE

- Install the bearing with the seal side facing out.

Apply grease to the tripmeter gear retainer.  
Install the tripmeter gear retainer into the wheel hub, align the tangs with the slots.



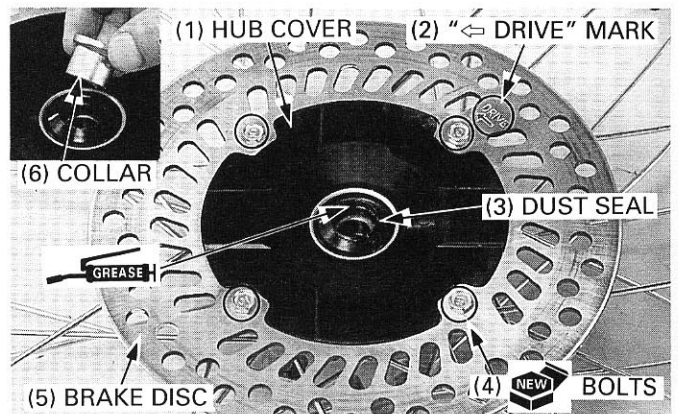
Apply grease to the left dust seal lip.  
Install the left dust seal and hub cover.  
Install the front brake disc.

### NOTE

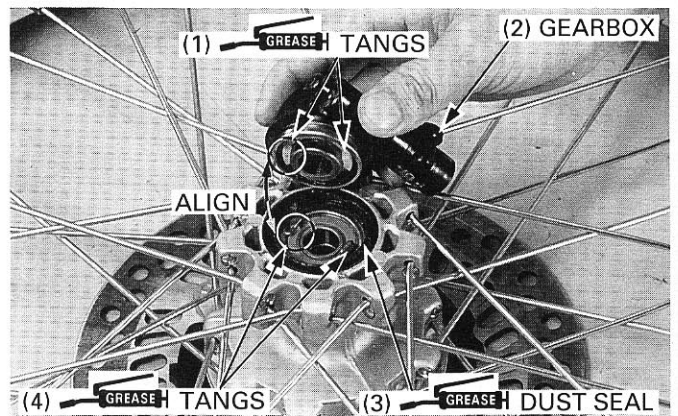
- Install the brake disc with the "←DRIVE" mark facing out.

Install and tighten the new brake disc bolts.

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



Install the left wheel collar.  
Apply grease to the right dust seal lip and install the front wheel.  
Apply grease to the tripmeter gearbox tangs and retainer tangs.  
Install the tripmeter gearbox into the wheel hub, aligning the gearbox tangs and retainer tangs.



**INSTALLATION**

Install the front wheel.

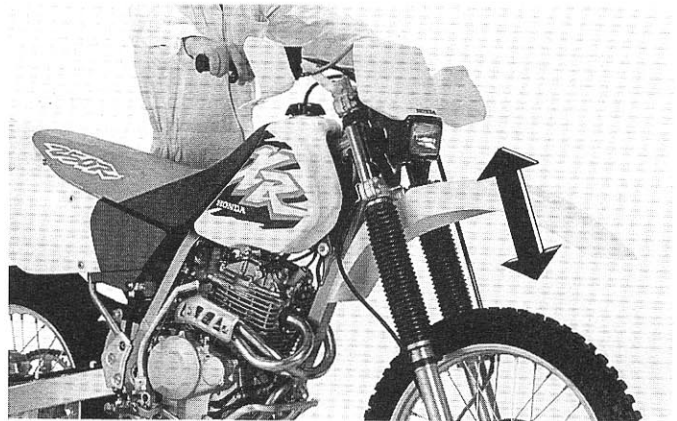
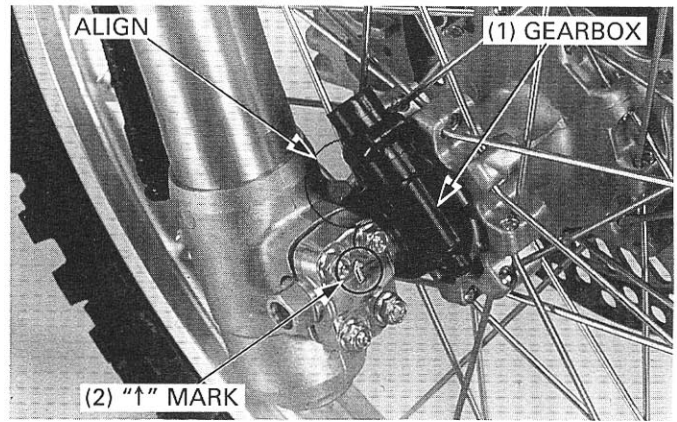
**NOTE**

- If you removed the axle holder, install it with the "↑" mark facing upwards.

Install the front axle.  
Align the speedometer gearbox with the tang on the right fork leg as shown.  
Tighten the axle to the specified torque.

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

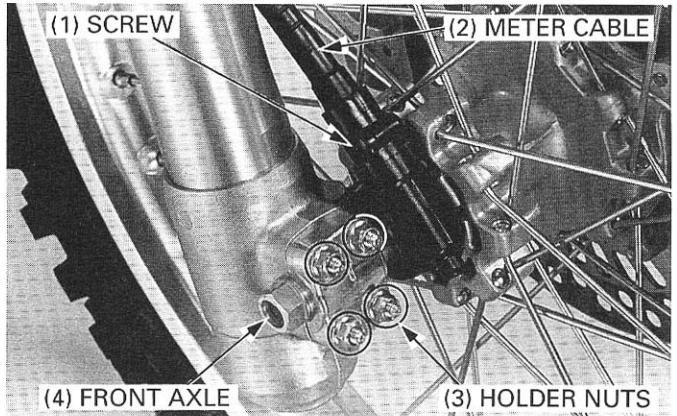
With the front brake applied, pump the front forks up and down several times to seat the axle and check front brake operation.



Tighten the axle holder nuts: the upper nuts first, then the lower nuts.

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

Connect the tripmeter cable to the gearbox.

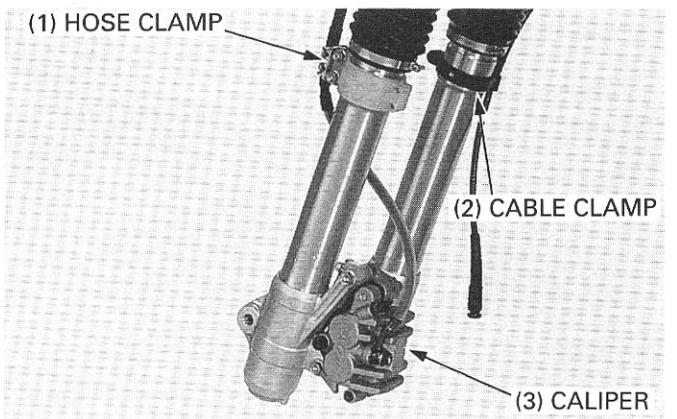


**FORK**

**REMOVAL**

Remove the following:

- Headlight case (page 16-10)
- Front wheel (page 13-3)
- Brake hose clamp (left side)
- Front brake caliper (page 15-7)
- Tripmeter cable clamp (right side)



## FRONT WHEEL/SUSPENSION/STEERING

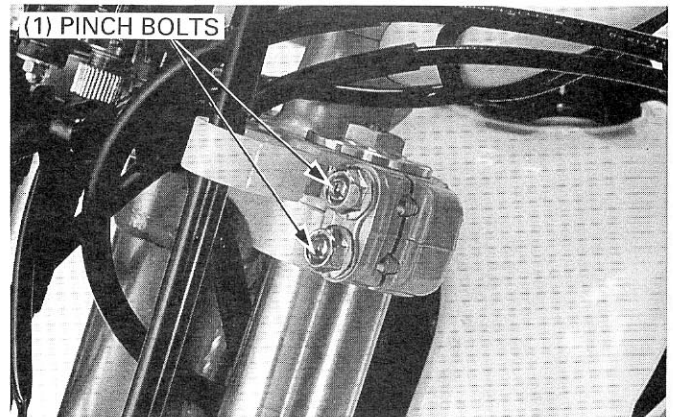
### NOTE

- Do not hang the brake caliper by the brake hose.
- It is not necessary to disconnect the brake hose.

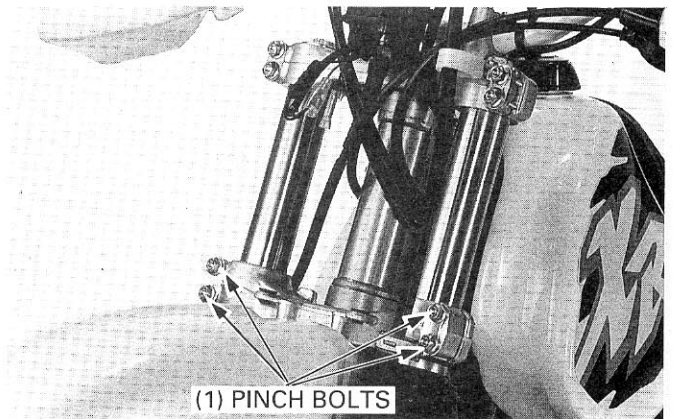
Loosen the top bridge pinch bolts.

### NOTE

- If the fork legs will be disassembled, loosen the fork caps, lower socket bolts and upper fork boot screws before loosening the fork pinch bolts.

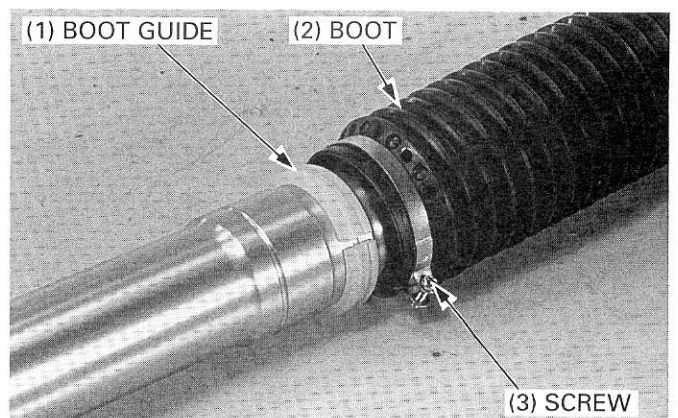


Loosen the bottom bridge pinch bolts.  
Remove the front fork.



### DISASSEMBLY

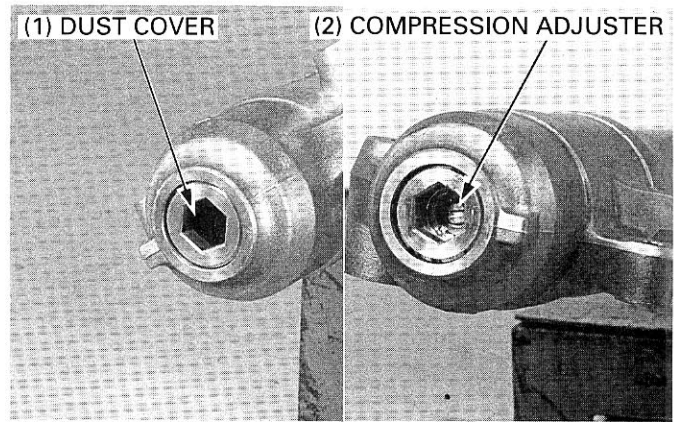
Loosen the lower fork boot screw.  
Remove the fork boot and fork boot guide.



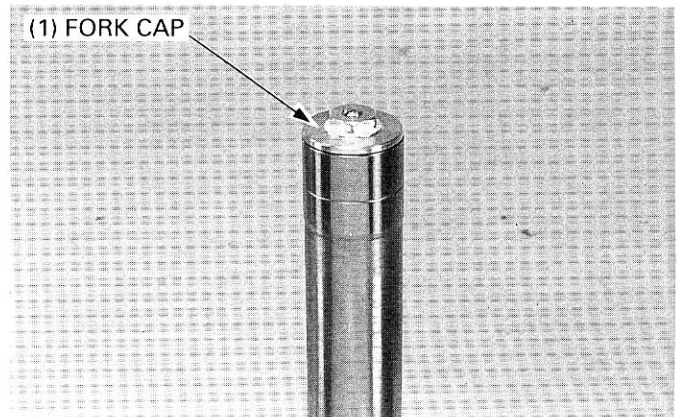
Remove the compression adjuster dust cover.  
Turn the adjuster counterclockwise to the softest position.

### NOTE

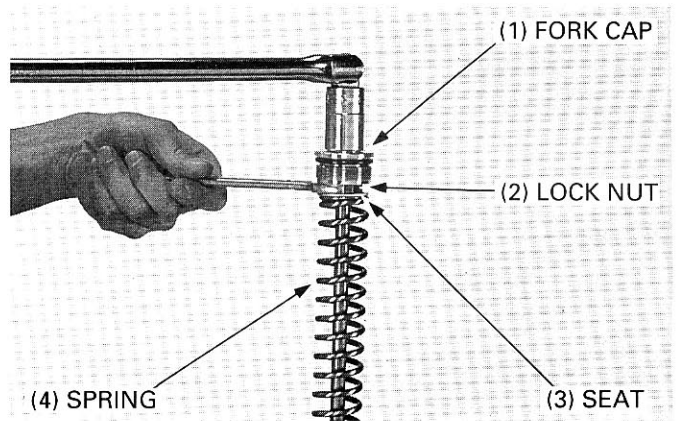
- Record the number of clicks to the softest position.



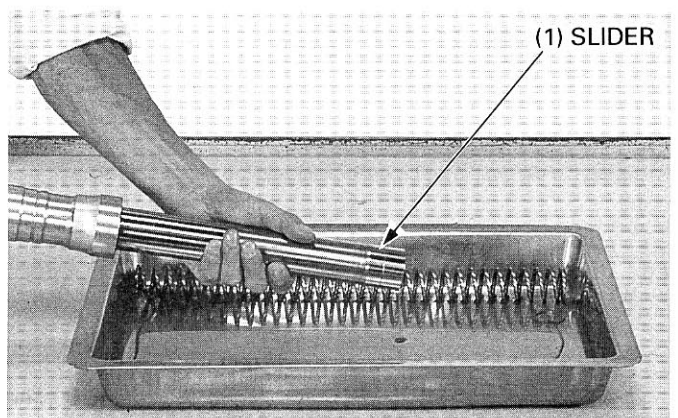
Remove the fork cap from the fork tube.



Hold the lock nut and remove the fork cap from the piston rod.  
Remove the spring seat and spring.



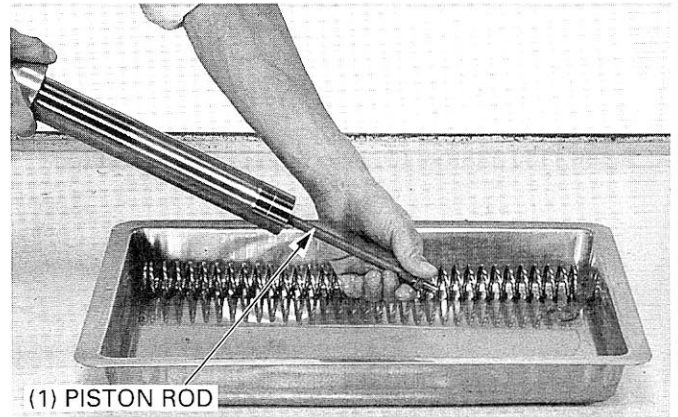
Empty the fork oil from the fork by pumping the slider 8 – 10 times.





## FRONT WHEEL/SUSPENSION/STEERING

Empty the fork oil from the fork cylinder by pumping the piston rod 8 – 10 times.



Hold the caliper bracket of the outer tube in a vise protected with a piece of wood or soft jaws.

### CAUTION

- Do not overtighten the caliper bracket.

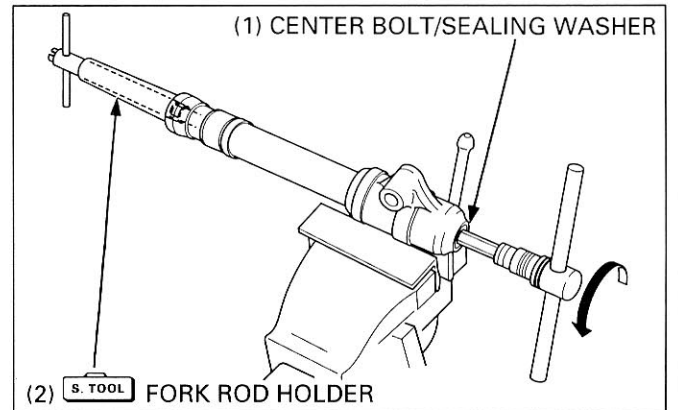
Loosen the center bolt using the special tool as shown.

### TOOL:

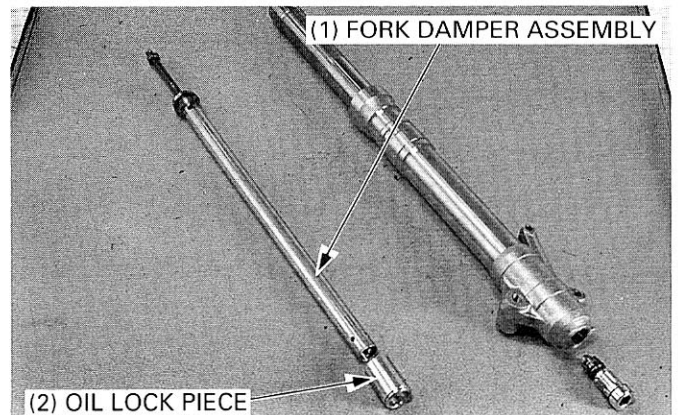
Fork rod holder

07PMB – KZ40101

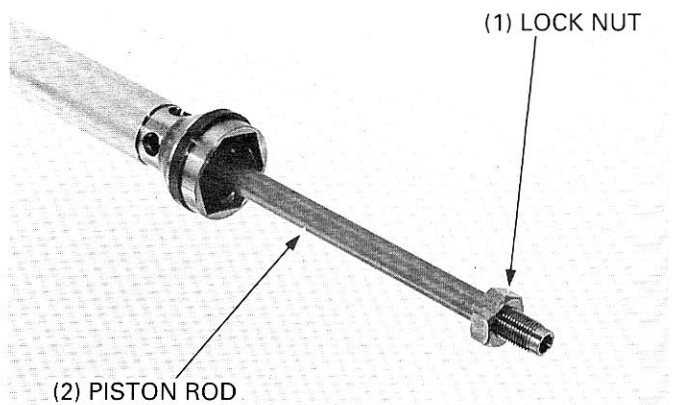
Remove the center bolt and sealing washer.



Remove the fork damper assembly and oil lock piece from the fork assembly.

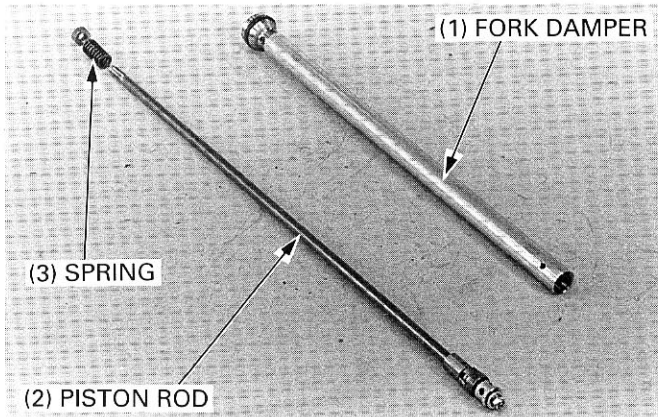


Remove the lock nut from the piston rod.





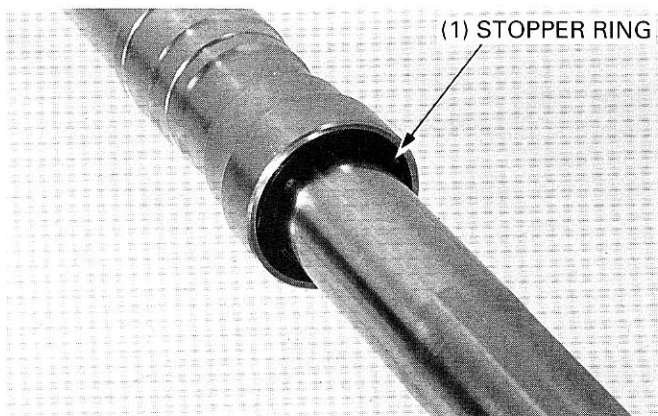
Remove the piston rod and spring from the fork damper.



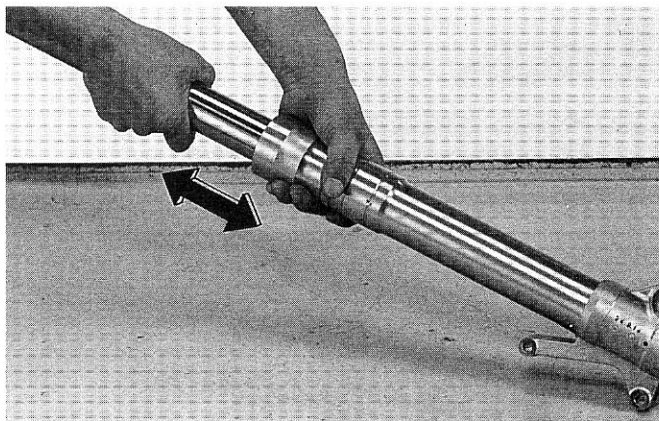
Remove the stop ring from the outer tube.

### CAUTION

- *Be careful not to scratch the slider.*

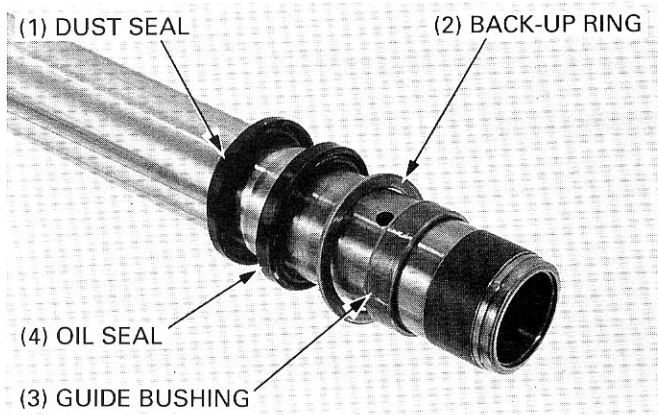


In quick successive motions, pull the slider and guide bushing out of the outer tube.



Remove the following:

- Dust seal
- Oil seal
- Back-up ring
- Guide bushing

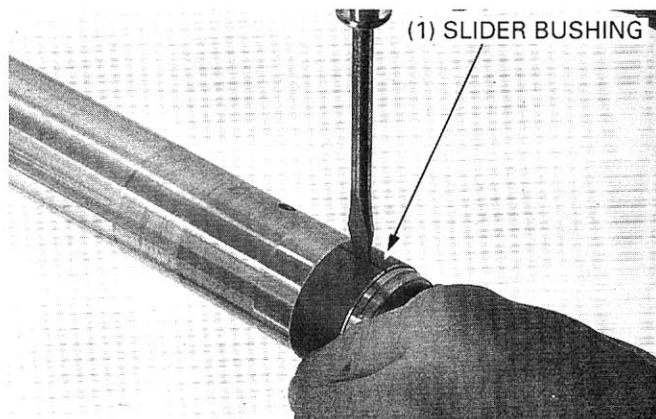


## FRONT WHEEL/SUSPENSION/STEERING

Carefully remove the slider bushing by prying the slot with a screwdriver until the bushing can be pulled off by hand.

### CAUTION

- Do not damage the slider bushing, especially the sliding surface.
- To prevent loss of tension, do not open the bushing more than necessary.

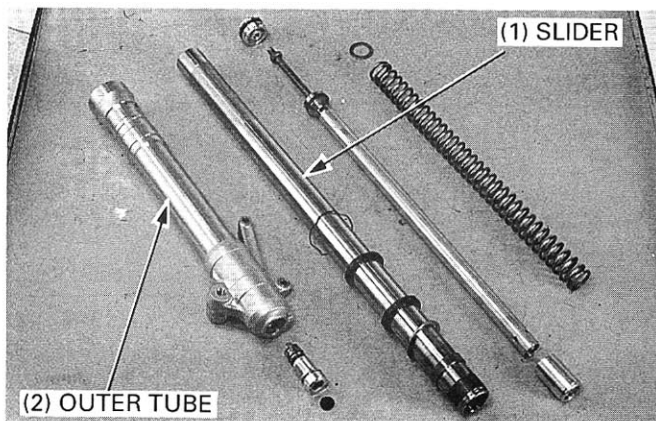


### INSPECTION

#### Slider/Outer tube

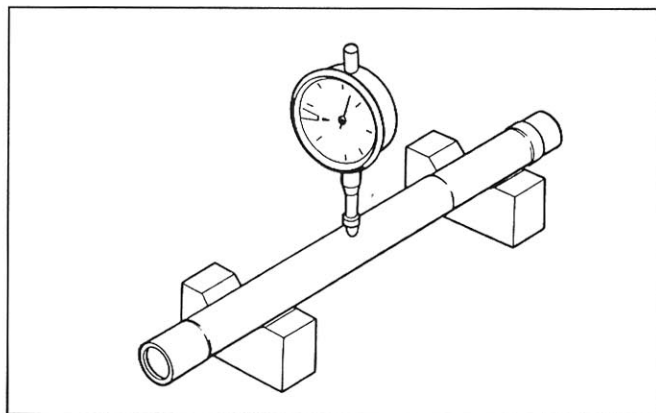
Check the slider for score marks, scratches and excessive or abnormal wear.

Check the outer tube for damage or deformation.



Set the slider in V blocks and read the runout.  
The actual runout is 1/2 of the total indicator reading.

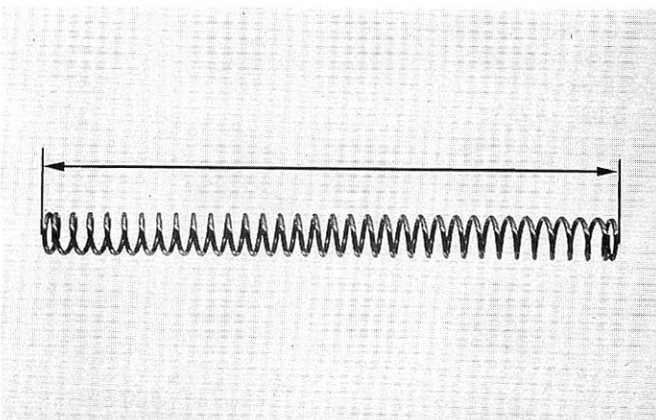
**SERVICE LIMIT: 0.2 mm (0.01 in)**



#### Fork spring

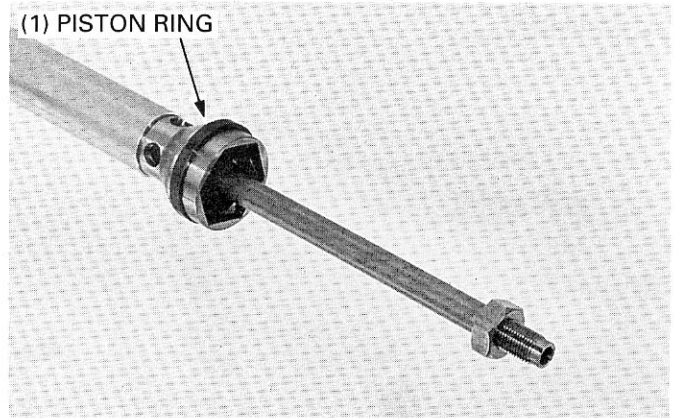
Measure the fork spring free length.

**SERVICE LIMIT: 438.1 mm (17.25 in)**

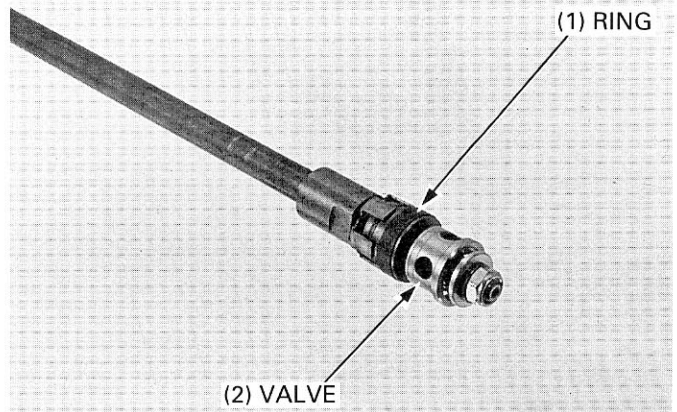


**Fork damper/Piston rod/Spring**

Check the piston ring for wear or damage.

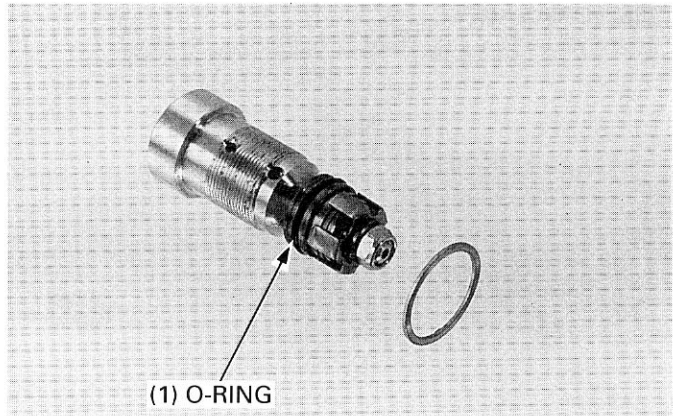


Check the ring and valve of the piston rod for damage.  
Check the oil lock valve for wear or damage.  
Replace the piston rod assembly if there is abnormal wear or damage.



**Fork center bolt**

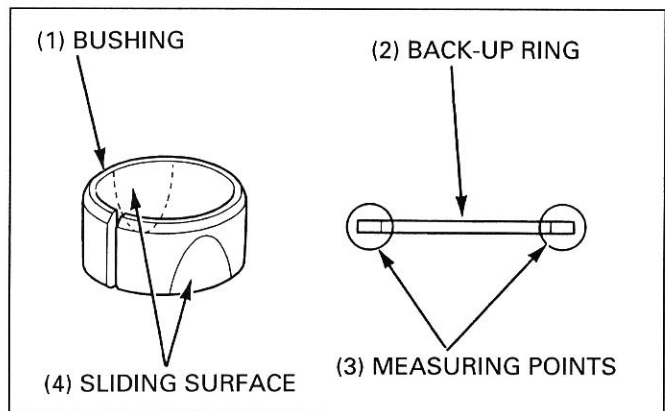
Check the O-ring of the fork center bolt for damage.



**Slider bushing/Guide bushing/Back-up ring**

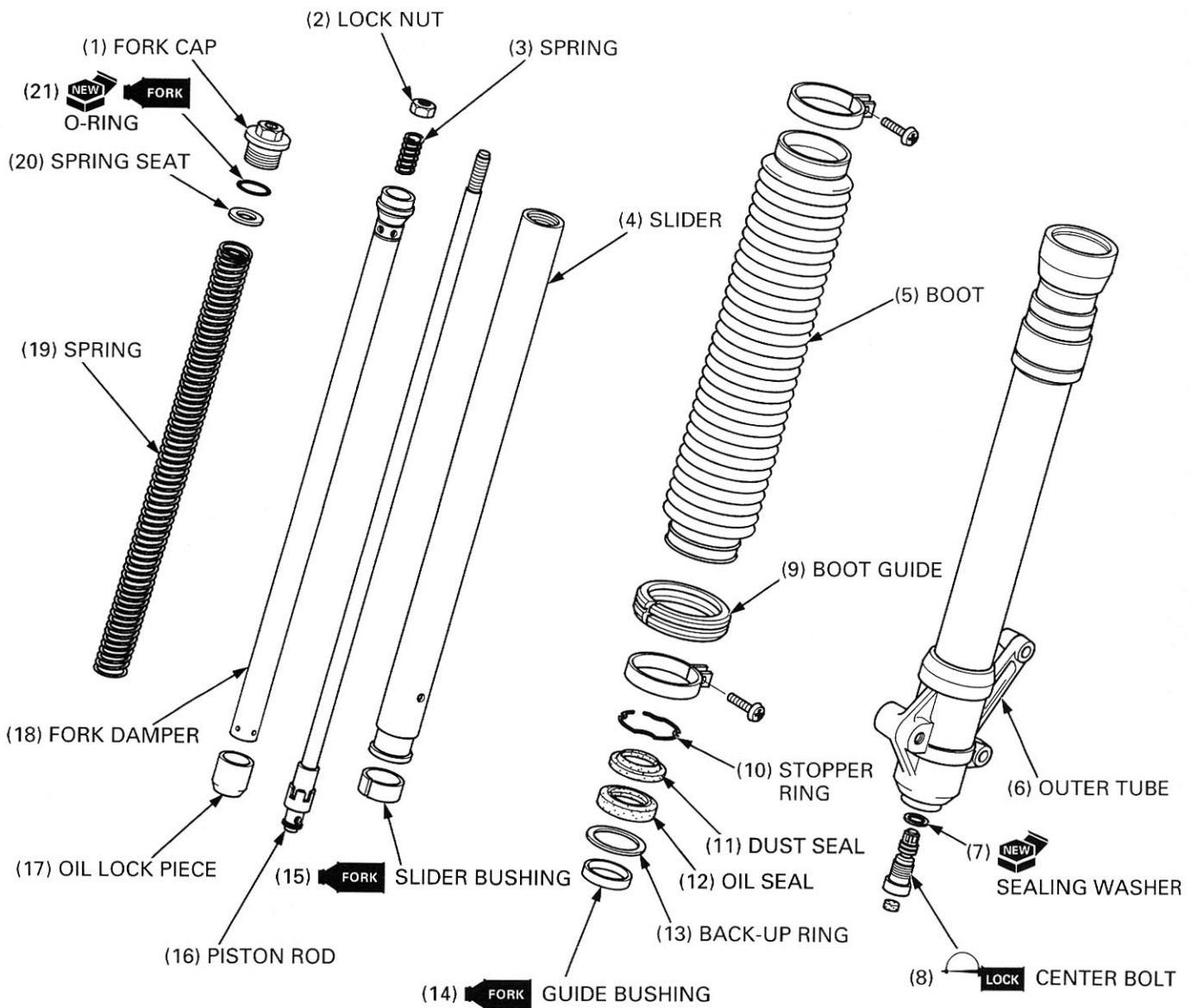
Check the bushings for excessive wear or scratches. If copper appears on the entire surface, replace the bushings. Replace the back-up ring if there is distortion at the points shown.

Remove any metal power from the slider and guide bushings with a nylon brush and fork oil.



# FRONT WHEEL/SUSPENSION/STEERING

## ASSEMBLY



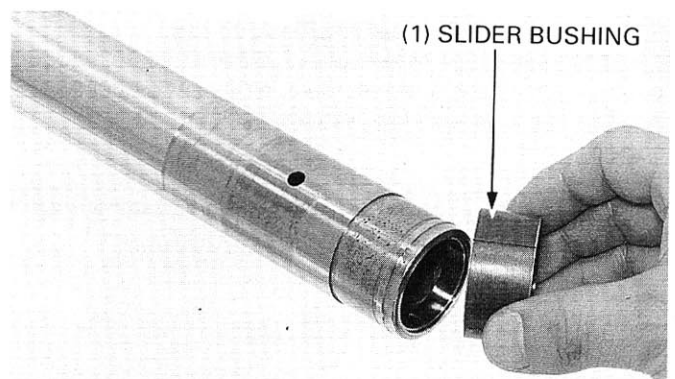
### NOTE

- Clean the disassembled parts thoroughly with nonflammable or high flash point solvent before assembly.

Install the slider bushing.

### NOTE

- Remove any burrs from the bushing, taking care not to peel off its coating.



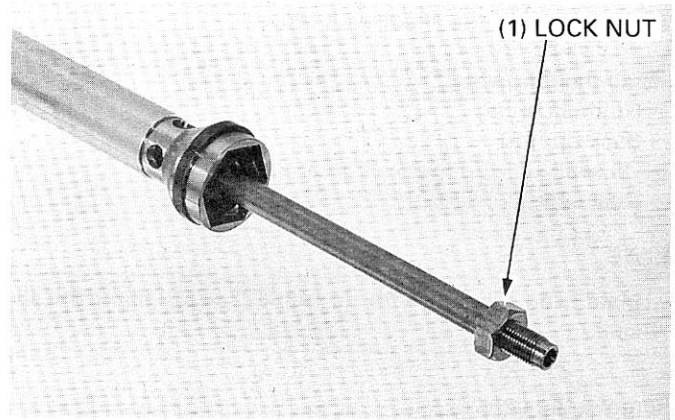




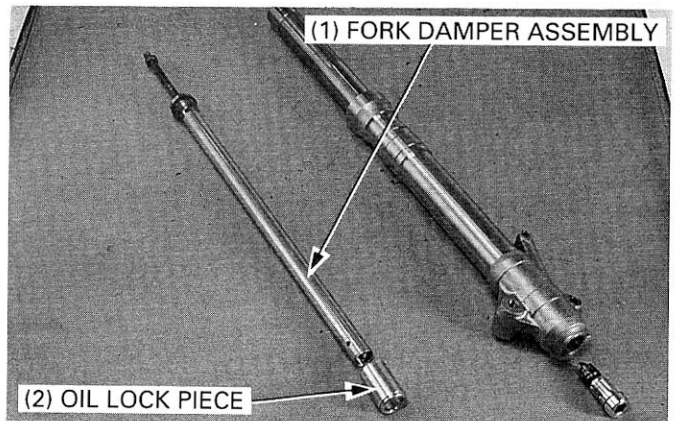


## FRONT WHEEL/SUSPENSION/STEERING

Install the lock nut onto the piston rod.



Install the fork damper assembly and oil lock piece into the fork assembly.



Hold the caliper bracket of the outer tube in a vise protected with a piece of wood or soft jaws.

### CAUTION

- Do not overtighten the caliper bracket.

Apply locking agent to the center bolt threads. Install a new sealing washer and install the center bolt.

Tighten the center bolt using the special tool as shown.

### TOOL:

Fork rod holder

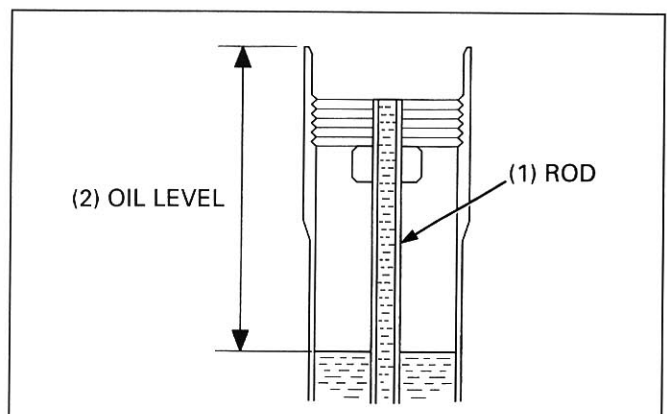
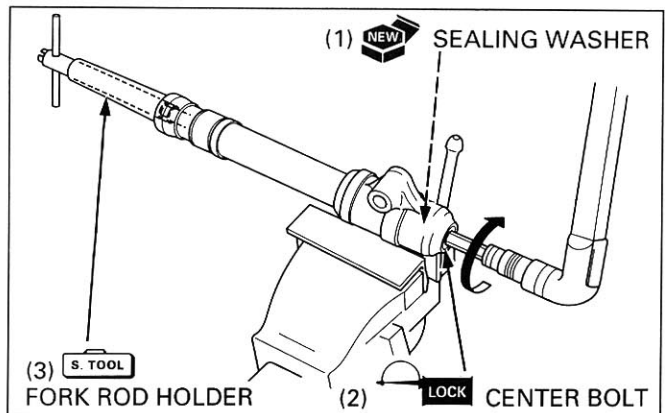
07PMB – KZ40101

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

Compress the piston rod all the way and pour the recommended fork oil into the piston rod until the oil flows out of the damper rod end.

Pour half of the amount of the recommended fork oil into the fork leg.

Pump the slider and piston rod slowly 8 – 10 times and leave it for 5 minutes to let the oil level settle.



Compress the front fork and piston rod all the way and measure the oil level from the top of the tube. Add oil as necessary.

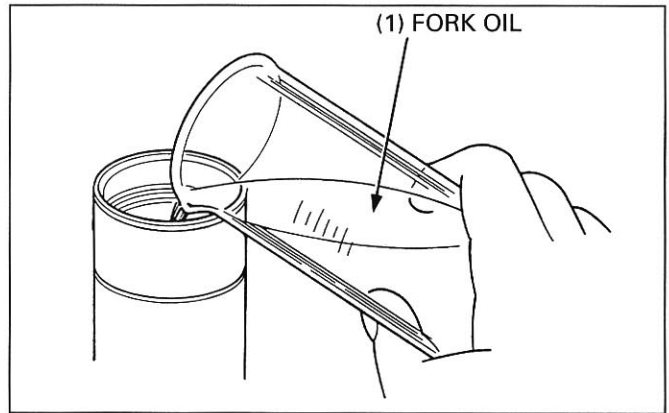
**RECOMMENDED OIL:** Pro Honda Suspension Fluid SS-7 or equivalent

**STANDARD OIL CAPACITY:** 477 cm<sup>3</sup> (16.13 US oz, 16.79 Imp oz)

**STANDARD OIL LEVEL:** 82 mm (3.2 in)

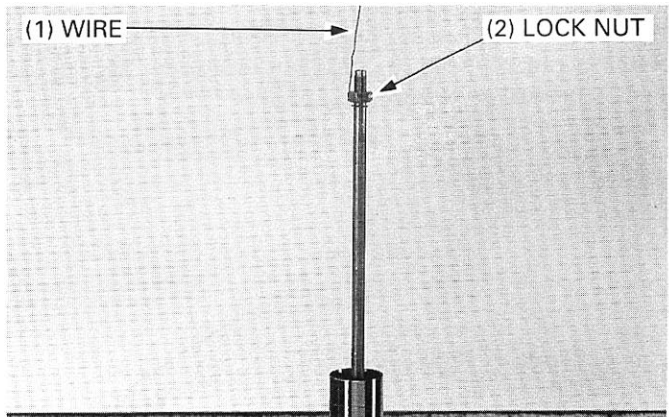
**NOTE**

- Be sure the oil level is the same in both fork legs.

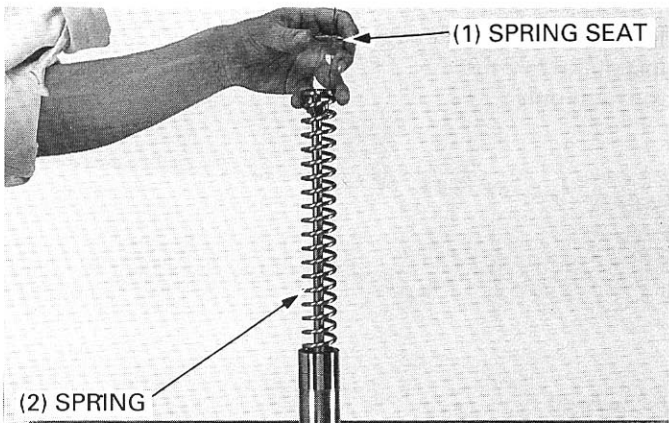


Screw the lock nut onto the piston rod by hand, to the end of the threads.

Attach a 600 mm (2 feet) length of mechanic's wire to the lock nut on the piston rod.

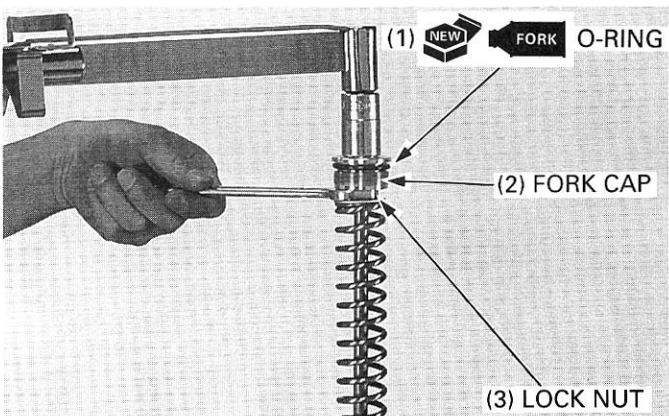


Install the fork spring and spring seat.



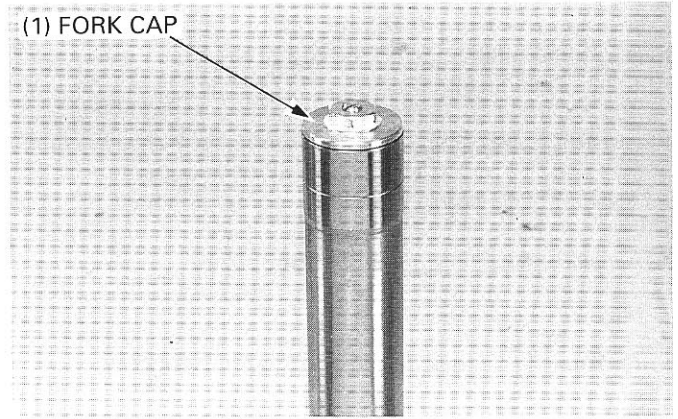
Remove the mechanic's wire while holding the lock nut. Coat a new fork cap O-ring with fork oil and install it. Hold the lock nut and tighten the fork cap to the specified torque.

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

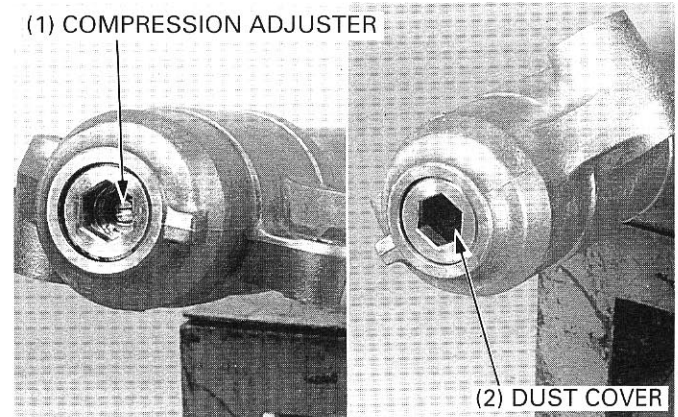


## FRONT WHEEL/SUSPENSION/STEERING

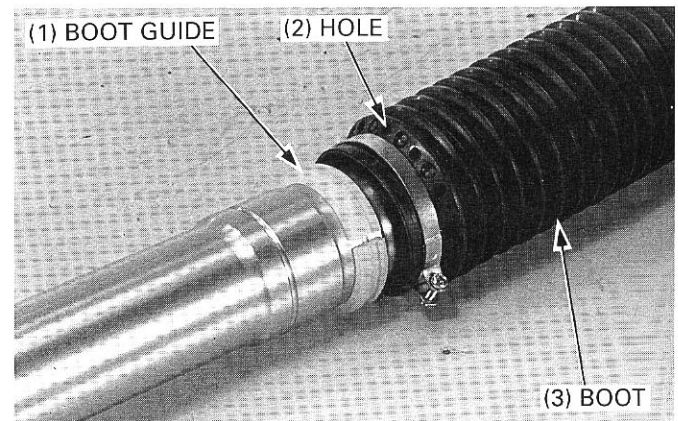
Install the fork cap into the fork tube.



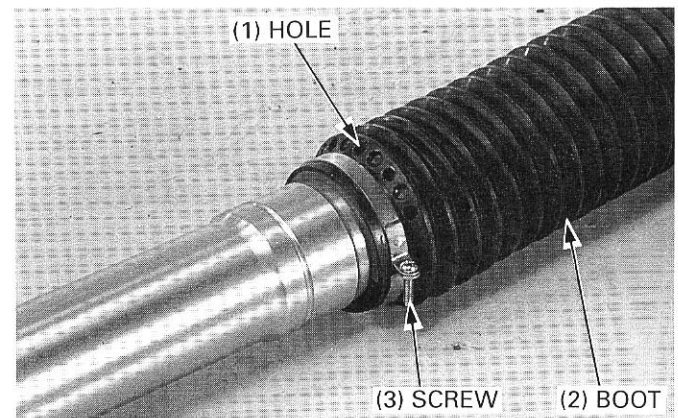
Return the compression adjuster to its original position as noted during removal.  
Install the dust cover.



Install the fork boot guide.  
Install the fork boot with the breather holes towards the bottom and outside.



Install the fork boot on the boot guide.  
Tighten the lower screw.



### INSTALLATION

Install the front fork.

Tighten the bottom bridge pinch bolts to the specified torque.

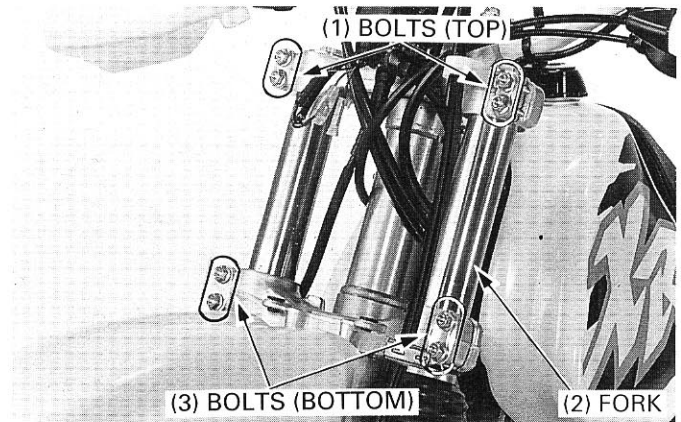
**TORQUE: 26 N·m (2.7 kgf·m, 20 lbf·ft)**

Tighten the fork cap to the specified torque.

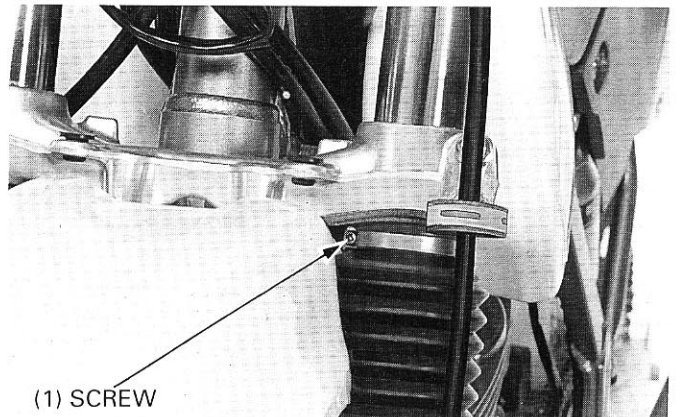
**TORQUE: 29 N·m (3.0 kgf·m, 22 lbf·ft)**

Tighten the top bridge pinch bolts to the specified torque.

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

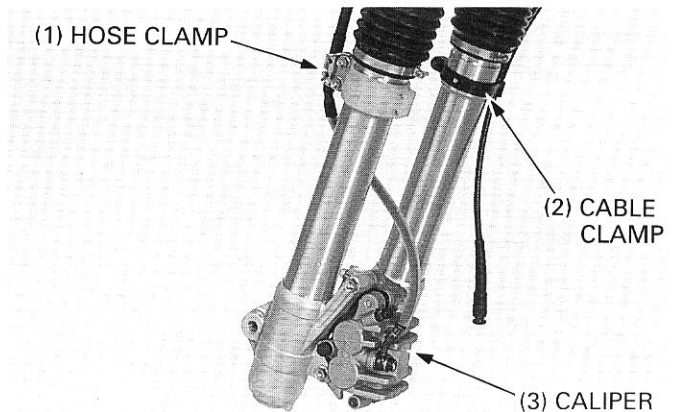


Push the fork boots up until they just touch the steering stem and tighten the boot clamps, with the clamp screws.



Install the following:

- Tripmeter cable clamp (right side)
- Brake hose clamp (left side)
- Front brake caliper (page 15-11)
- Front wheel (page 13-7)
- Headlight case (page 16-10)



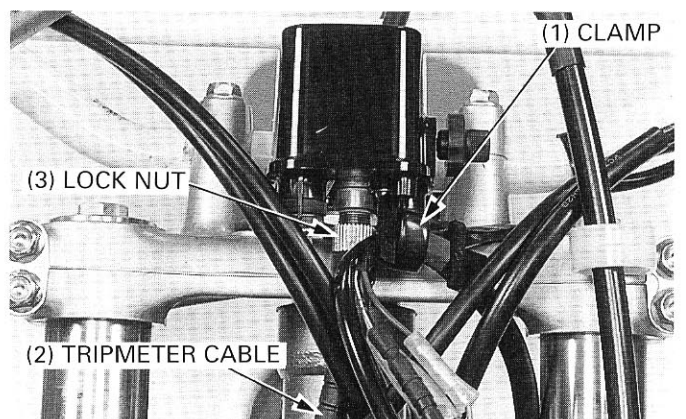
### TRIPMETER

#### REMOVAL

Remove the headlight case (page 16-10).

Loosen the lock nut and disconnect the cable from the tripmeter.

Remove the wire harness from the clamp.



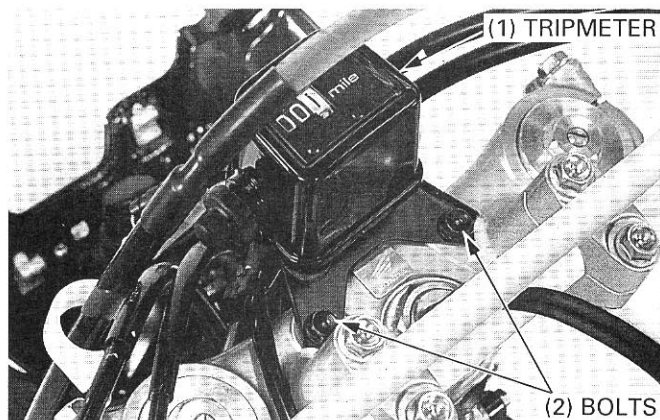


## FRONT WHEEL/SUSPENSION/STEERING

Remove the two bolts and tripmeter.

### INSTALLATION

Installation is in the reverse order of removal.

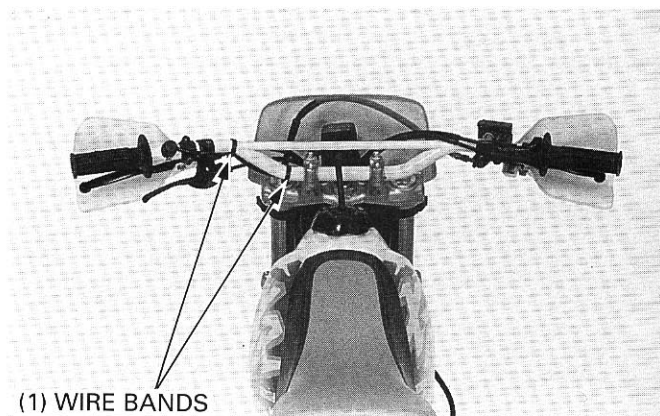


## STEERING

### HANDLEBAR REMOVAL

Remove the following:

- Wire bands

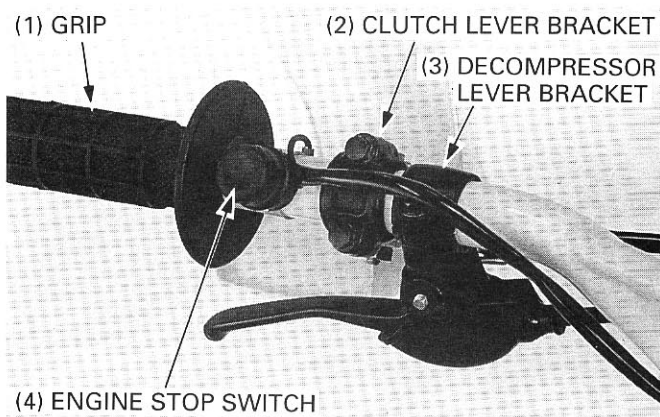


- Engine stop switch
- Clutch lever bracket

Loosen the decompressor lever bracket bolts.

Remove the following:

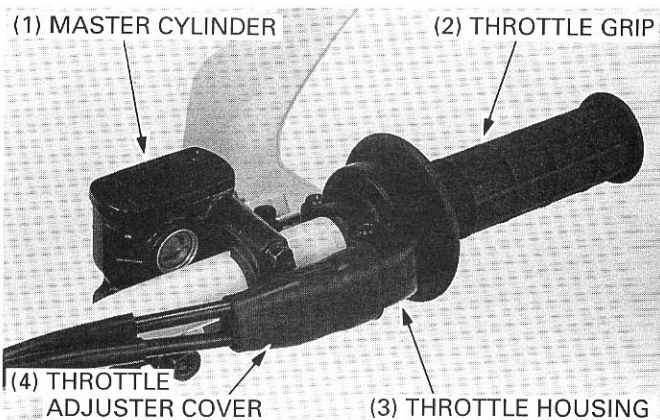
- Decompressor cable
- Left handle grip
- Decompressor bracket



Slide the throttle adjuster cover down.  
Remove the screws and throttle housing.  
Disconnect the throttle cable and remove the throttle grip.  
Remove the front master cylinder from the handlebar.

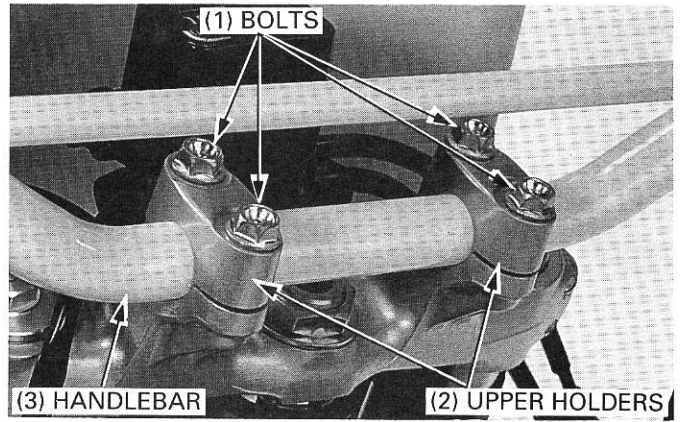
### NOTE

- Do not hang the brake master cylinder by the brake hose.
- It is not necessary to disconnect the brake hose.





Remove the handlebar holder bolts, upper holders and handlebar.



**HANDLEBAR INSTALLATION**

Install the handlebar.  
Align the punch mark on the handlebar with the top of the lower holder.  
Place the upper holder on the handlebar with the punch marks facing forward.

Install and tighten the front handlebar holder bolts first, then tighten the rear bolts.

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

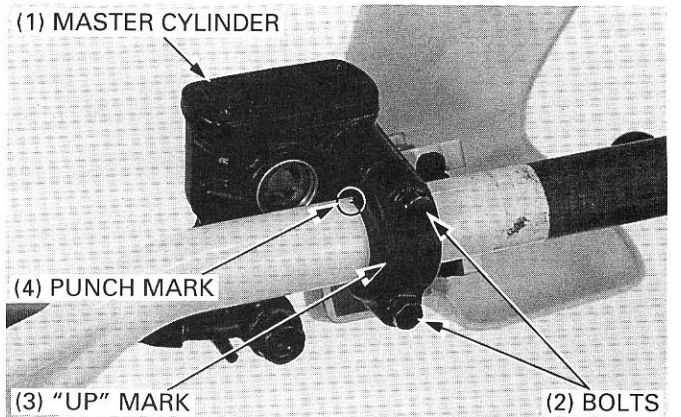
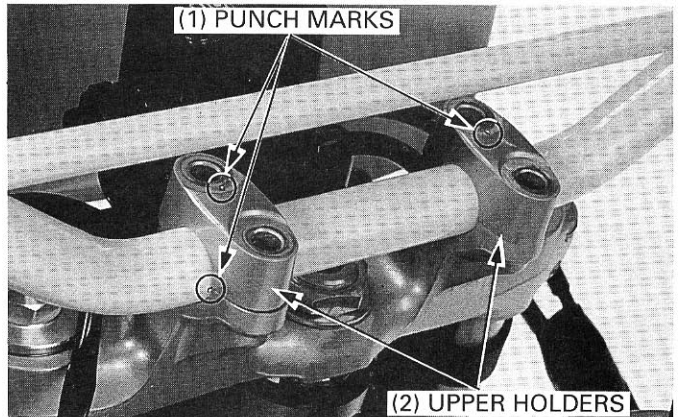
Position the brake master cylinder on the handlebar.  
Install the master cylinder holder with the "UP" mark up, and align the end of the holder with the punch mark on the handlebar.

Tighten the master cylinder holder bolts.

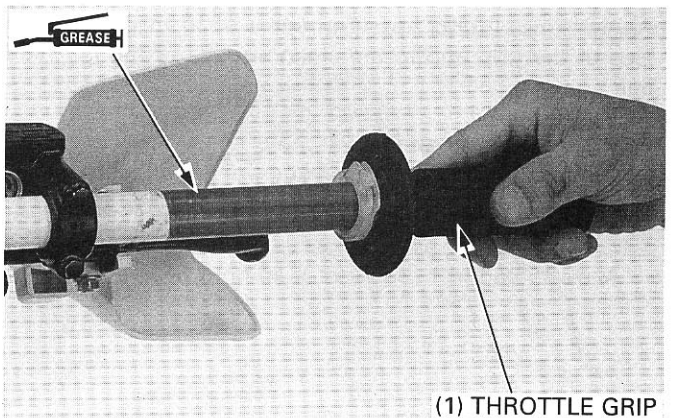
**NOTE**

- Tighten the upper bolt first, then the lower bolt.

**TORQUE: 9 N·m (0.9 kgf·m, 6.5 lbf·ft)**



Apply a thin coat of grease to the sliding surfaces the throttle grip.  
Install the throttle grip.



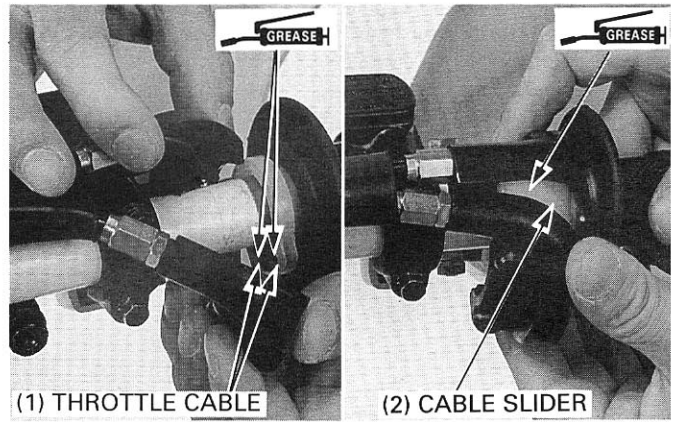
## FRONT WHEEL/SUSPENSION/STEERING

Apply grease to the sliding area of the throttle cable end and cable slider.

Connect the throttle cable to the throttle grip.

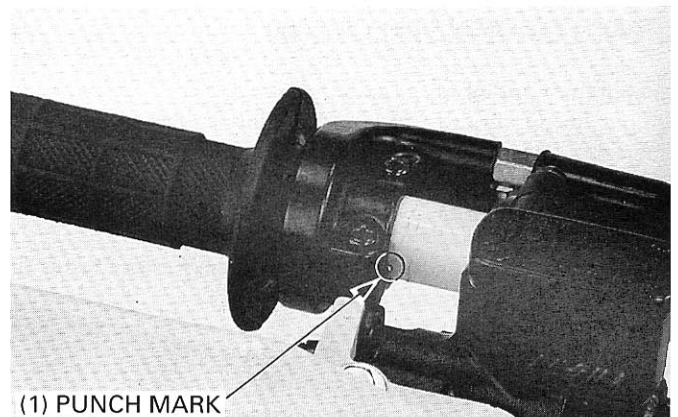
### NOTE

- Make sure that the cable slider is in place.

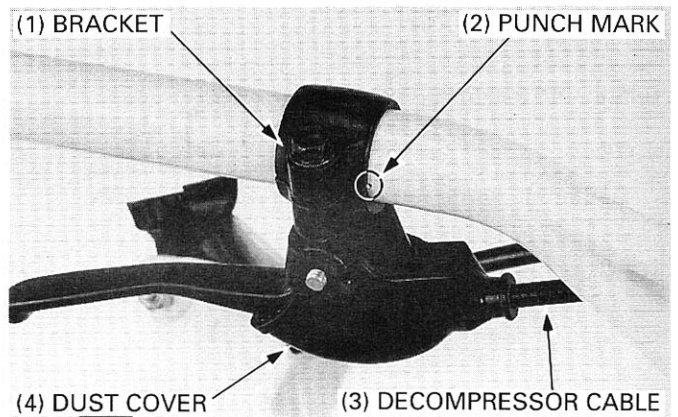


Align the split line of the throttle grip with the punch mark on the handlebar.

Tighten the forward screw first, then the rear screw.



Install the decompressor bracket to the handlebar.  
Connect the decompressor cable and install the dust cover.  
Align the split line of the decompressor bracket with the punch mark on the handlebar and tighten the pinch screw securely.

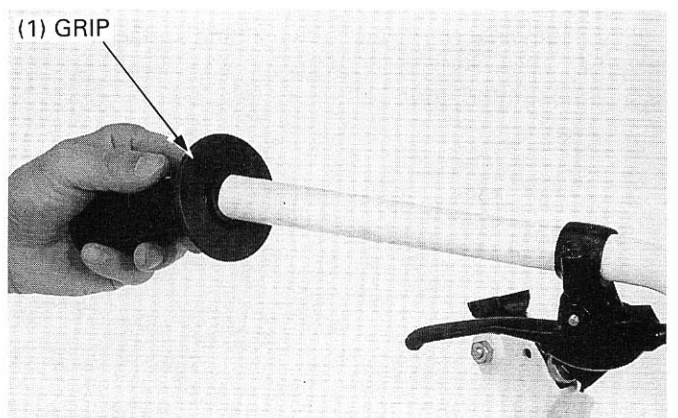


Apply Honda Bond A or Cemedine #540 to the inside surface of the grip and to the clean surface of the left handlebar.

Wait 3 – 5 minutes and install the grip.  
Rotate the grip for even application of the adhesive.

### NOTE

- Allow the adhesive to dry for an hour before using.

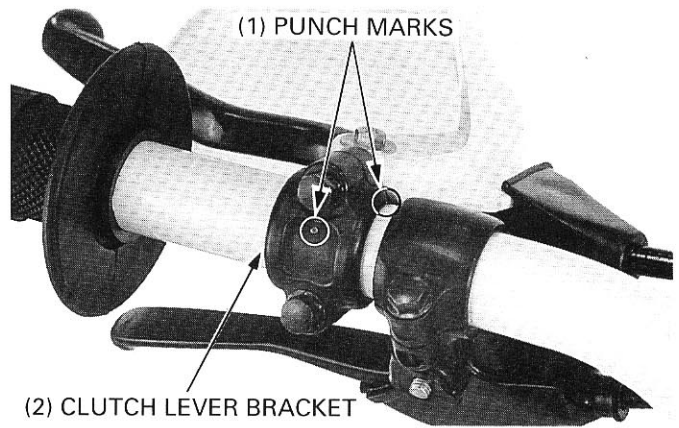


## FRONT WHEEL SUSPENSION/STEERING

Install the clutch lever bracket and holder with the punch mark on the holder up, and the end of the holder aligned with the punch mark on the handlebar.

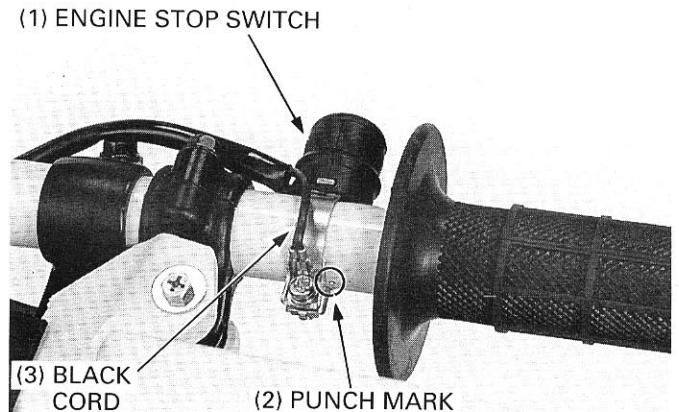
### NOTE

- Tighten the upper bolt first, then the lower bolt.



Align the split line of the engine stop switch with the punch mark on the handlebar.  
Install and tighten the screw with the black cord.  
Install the wire bands (page 1-21).

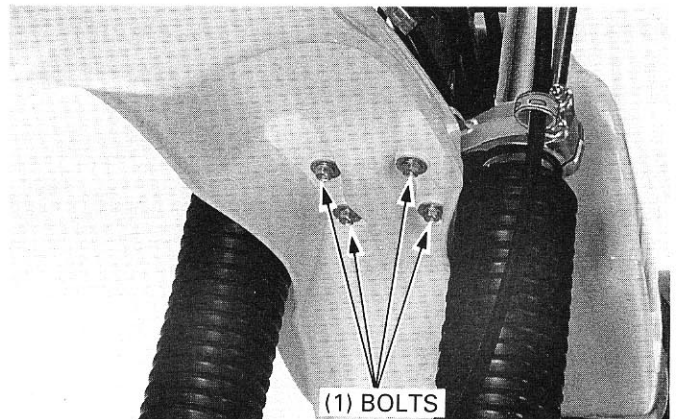
Adjust the decompressor cable free play (page 3-13).  
Adjust the throttle cable free play (page 3-6).



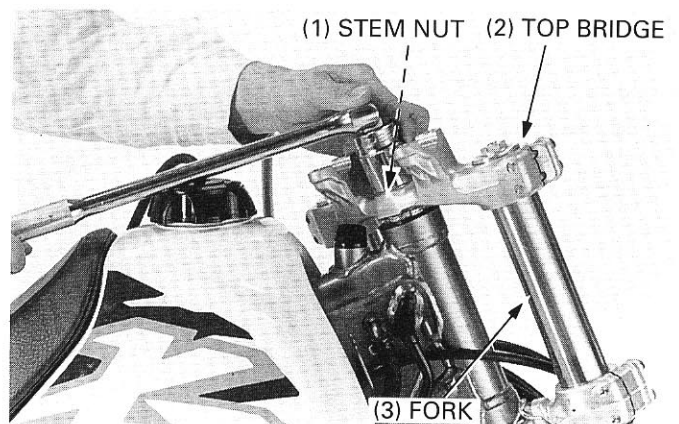
## STEERING STEM REMOVAL

Remove the following:

- Front wheel (page 13-3)
- Front brake caliper (page 15-7)
- Headlight case (page 16-10)
- Tripmeter (page 13-19)
- Handlebar (page 13-20)
- Bolts, washers
- Front fender



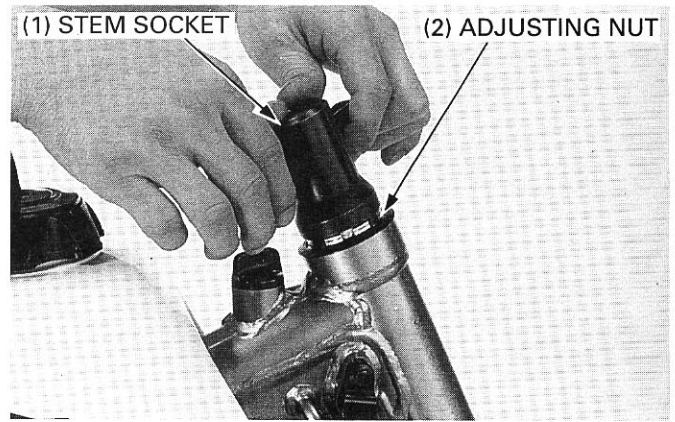
- Steering stem nut
- Washer
- Front fork (page 13-7)
- Top bridge



## FRONT WHEEL/SUSPENSION/STEERING

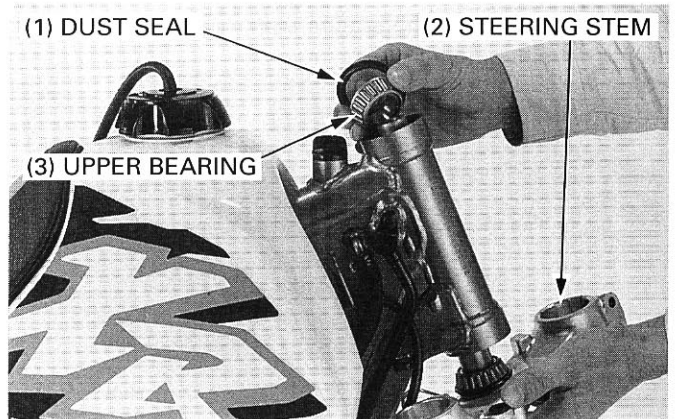
Remove the following:  
— Steering stem adjusting nut

**TOOL:**  
**Steering stem socket**                    07916 – KA50100



— Upper dust seal  
— Upper bearing  
— Steering stem

Check the upper and lower bearings for damage.  
Check the bearing outer race in the head pipe for damage.



## STEERING STEM BEARING REPLACEMENT

### NOTE

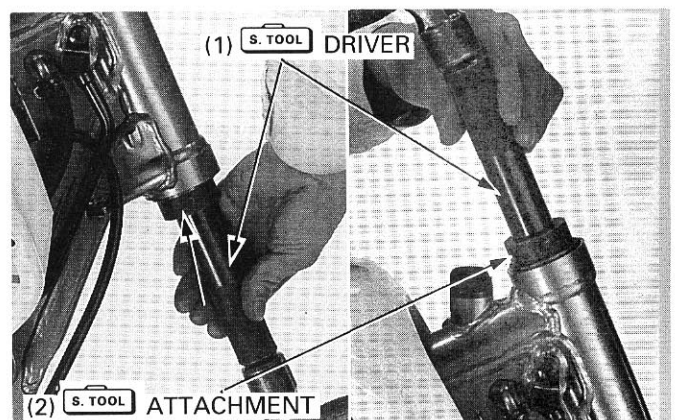
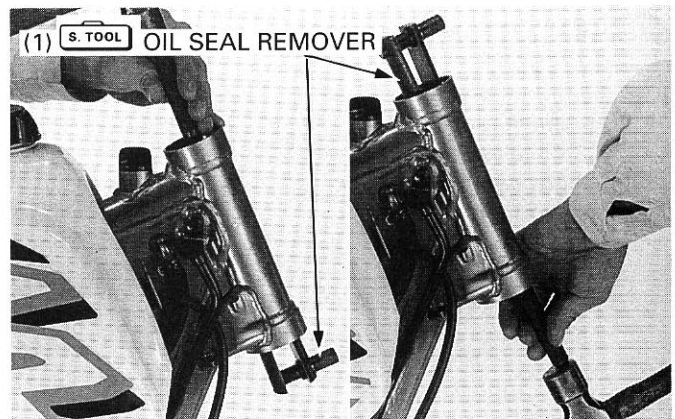
- Always replace the bearing and bearing races as a set.

Remove the upper and lower bearing outer races from the head pipe.

**TOOL:**  
**Oil seal remover**                    07948 – 4630100 or  
**Race remover attachment**        07953 – MJ1000B or  
    07953 – MJ1000A and  
**Ball race remover**                    07GMD – KS40100  
    (U.S.A. only)

Install new bearing races.

**TOOL:**  
**Attachment, 42 x 47 mm**            07746 – 0010300  
**Driver**                                    07749 – 0010000

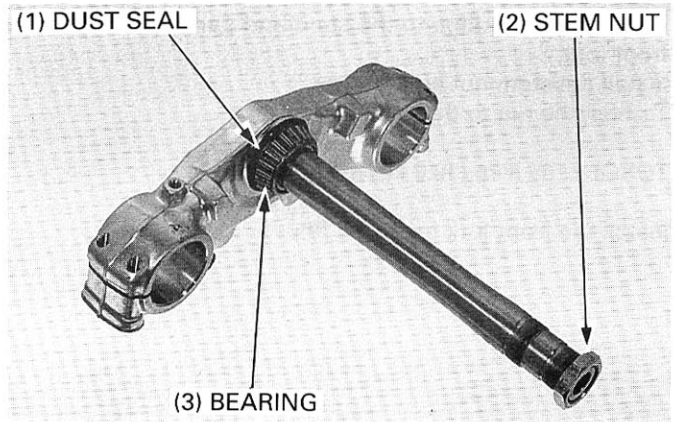




Remove the lower tapered roller bearing and dust seal from the steering stem.

**NOTE**

- To avoid damaging the steering stem threads, temporarily install the stem nut.



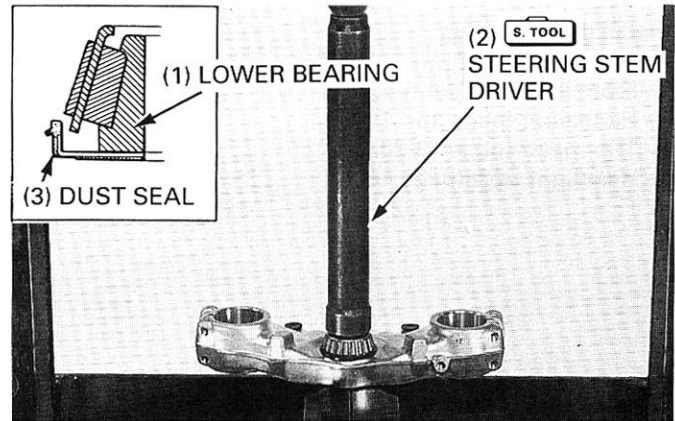
Install a new dust seal and lower bearing.

**TOOL:**

**Steering stem driver**

07946 - 4300101 or  
07946 - MB00000 and  
07940 - KA6000A or  
GN - MT - 54  
(U.S.A. only)

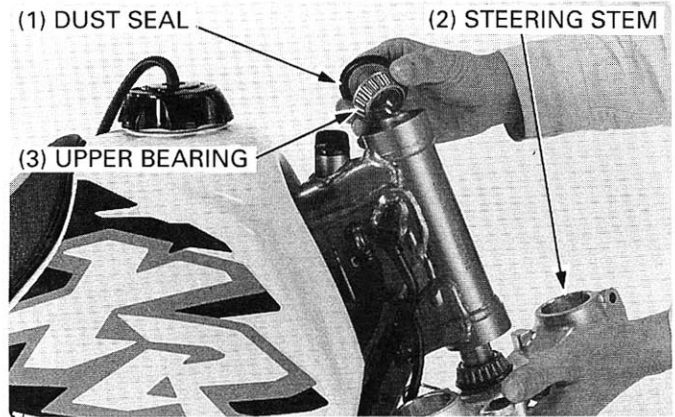
**Steering bearing attachment**



**STEERING STEM INSTALLATION**

Install the following:

- Steering stem
- Upper bearing
- Upper dust seal



- Steering stem adjusting nut

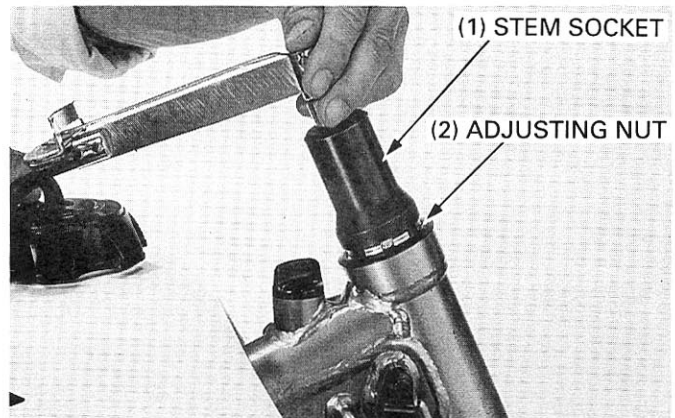
**TORQUE: 5 N-m (0.5 kgf-m, 3.6 lbf-ft)**

**TOOL:**

**Steering stem socket**

07916 - KA50100

Turn the steering stem lock-to-lock 5 times to seat the bearings and tighten the adjusting nut again.





## FRONT WHEEL/SUSPENSION/STEERING

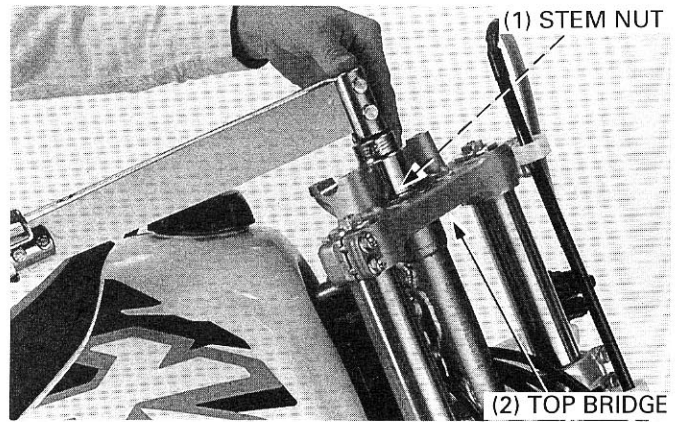
Install the top bridge to the stem and temporarily install the front fork.

Install the stem nut and washer.

Tighten the nut to the specified torque.

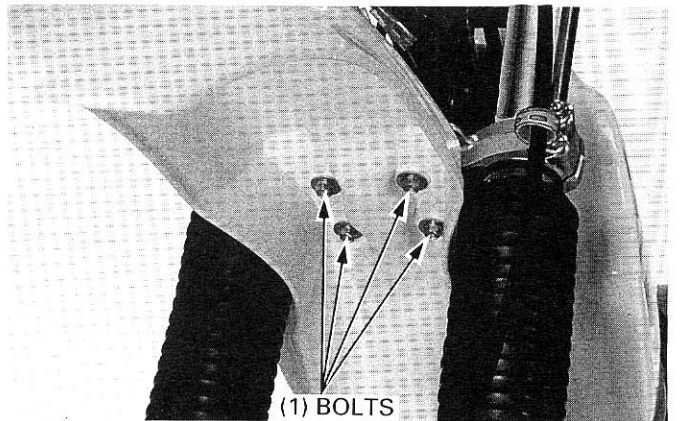
**TORQUE: 98 N·m (10.0 kgf·m, 72 lbf·ft)**

Install the front fork (page 13-19).

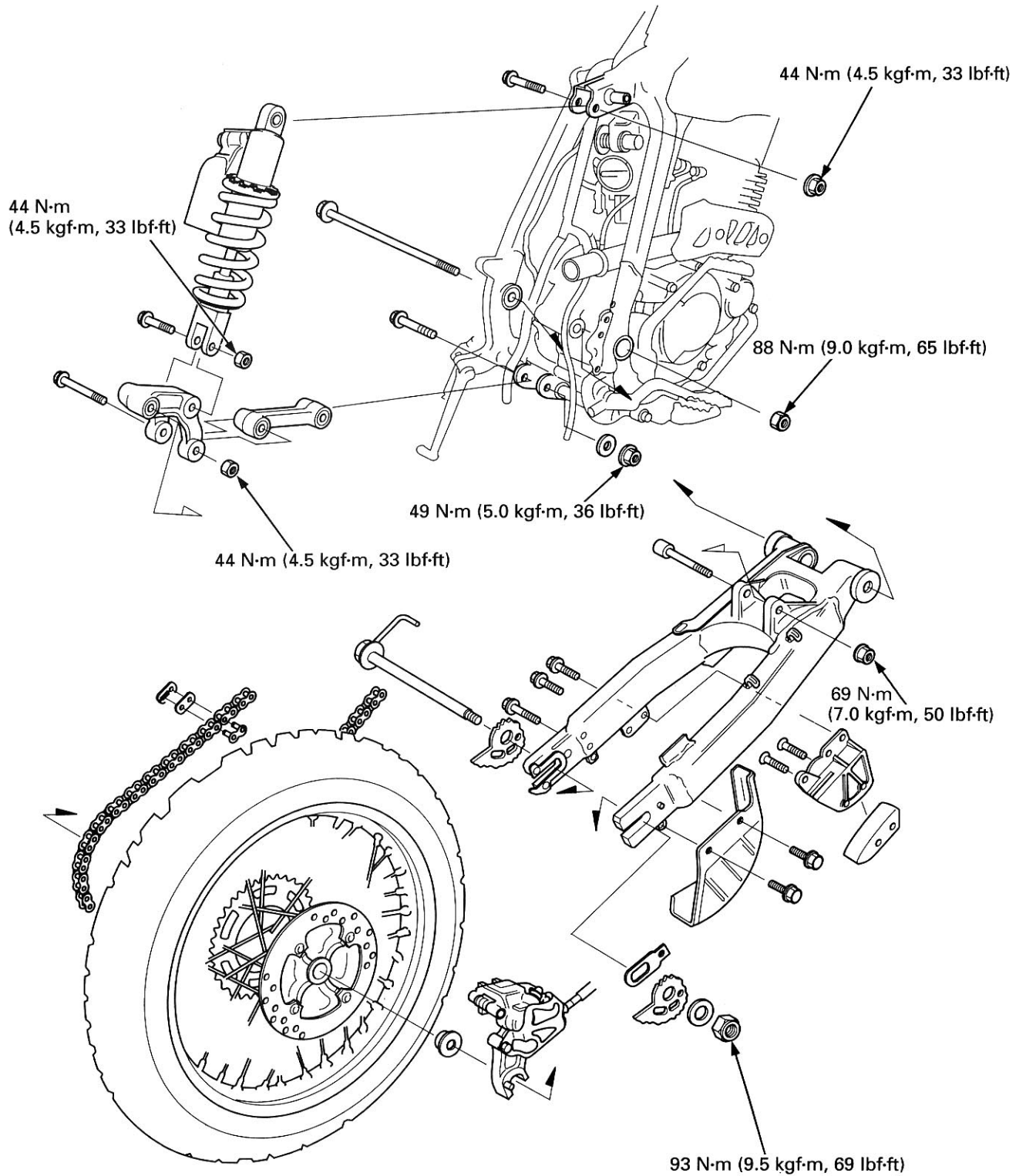


Install the following:

- Front fender
- Front brake caliper (page 15-11)
- Handlebar (page 13-21)
- Trip meter (page 13-20)
- Headlight case (page 16-10)



# REAR WHEEL/SUSPENSION



# 14. REAR WHEEL/SUSPENSION

SERVICE INFORMATION	14-1	SHOCK ABSORBER	14-9
TROUBLESHOOTING	14-2	SHOCK LINKAGE	14-24
REAR WHEEL	14-3	SWINGARM	14-28

## SERVICE INFORMATION

### GENERAL

#### ▲ WARNING

- Use only nitrogen to pressurize the shock absorber. The use of an unstable gas can cause a fire or explosion resulting in serious injury.
- The shock absorber contains nitrogen under high pressure. Do not allow fire or heat near the shock absorber.
- Before disposal of the shock absorber, release the nitrogen by pressing the valve core. Then remove the valve from the shock absorber.

- Keep grease off of brake pads and disc.

#### ▲ WARNING

- A contaminated brake disc or pads reduce stopping power. Discard contaminated pads and clean a contaminated disc with Pro Honda Contact/Brake Cleaner or an equivalent high quality brake degreasing agent.

- Use genuine Honda bolts for the rear suspension linkage and shock absorber pivot and mounting; ordinary bolts lack adequate strength for these applications. Also take note of the installation direction of these bolts since they must be installed correctly.
- A box or work stand is required to support the motorcycle.
- Refer to section 15 for brake system information.

### SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Cold tire pressure		98 kPa (1.0 kgf/cm <sup>2</sup> , 15 psi)	—
Axle runout		—	0.2 (0.01)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Wheel rim-to-hub distance		22.75 (0.896)	—
Drive chain slack		30 – 40 (1-1/4 – 1-5/8)	—
Drive chain length		—	1,659 (65.3)
Replacement drive chain		D.I.D. 520 VC5 or RK520MOZ9	—
Drive chain guide slider thickness		—	To the indicator
Drive chain slider thickness		—	4.0 (0.15)
Recommended shock oil		Pro Honda Suspension Fluid SS-7 or equivalent	—
Damper gas pressure/compressed gas		981 kPa (10.0 kgf/cm <sup>2</sup> , 142 psi)/Nitrogen	—
Shock absorber spring free length		190.0 (7.5)	186.2 (7.33)
Shock absorber spring preload length		181.5 (7.15)	173.5 – 185.5 (6.83 – 7.30)

## REAR WHEEL/SUSPENSION

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### TORQUE VALUES

Rear axle nut	93 N·m (9.5 kgf·m, 69 lbf·ft) U-nut.
Driven sprocket nut	32 N·m (3.3 kgf·m, 24 lbf·ft) U-nut.
Rear brake disc plate bolt	42 N·m (4.3 kgf·m, 31 lbf·ft) ALOC bolt., Replace with a new one.
Rear brake hose guide screw	4.3 N·m (0.43 kgf·m, 3.1 lbf·ft) Apply a locking agent to the threads.
Swingarm pivot nut	88 N·m (9.0 kgf·m, 65 lbf·ft) U-nut.
Rear shock absorber mounting bolt (upper)	44 N·m (4.5 kgf·m, 33 lbf·ft)
(lower)	44 N·m (4.5 kgf·m, 33 lbf·ft) U-nut.
Shock arm-to-swingarm bolt/nut	69 N·m (7.0 kgf·m, 51 lbf·ft) U-nut.
Shock link-to-frame bolt/nut	49 N·m (5.0 kgf·m, 36 lbf·ft) U-nut.
Shock link-to-shock arm bolt/nut	44 N·m (4.5 kgf·m, 33 lbf·ft) U-nut.
Damper rod end nut	37 N·m (3.8 kgf·m, 27 lbf·ft) U-nut.
Damping adjuster	20 N·m (2.0 kgf·m, 14 lbf·ft)
Spoke nipple	3.8 N·m (0.38 kgf·m, 2.7 lbf·ft)
Rim lock	15 N·m (1.5 kgf·m, 11 lbf·ft)

### TOOLS

#### Special

Bushing driver pin assembly	07GMD – KT80100 or 07949 – 3710001 and 07746 – 0041000 (U.S.A. only)
Needle bearing remover	07946 – KA50000
Needle bearing remover	07931 – MA70000 or 07936 – 3710600 and 07936 – 3710200 (U.S.A. only)
Slider guide attachment	07974 – KA50102
Slider guide, 14 mm	07974 – KA40001
Spherical bearing driver	07HMF – KS60100 or 07965 – GM00100 and 07965 – VM00100 (U.S.A. only)

#### Common

Attachment, 24 x 26 mm	07746 – 0010700
Attachment, 37 x 40 mm	07746 – 0010200
Attachment, 42 x 47 mm	07746 – 0010300
Bearing remover head, 17 mm	07746 – 0050500 equivalent commercially available in U.S.A.
Bearing remover shaft	07746 – 0050100
Driver	07749 – 0010000
Spoke nipple wrench	07701 – 0020300
Pilot, 17 mm	07746 – 0040400

## TROUBLESHOOTING

#### Soft suspension

- Weak spring
- Oil leakage from damper unit

#### Hard suspension

- Incorrectly mounted suspension components
- Bent swingarm pivot
- Damaged swingarm bushings
- Damaged shock absorber

#### Steers to one side or does not track straight

- Bent rear axle
- Axle alignment/chain adjustment not equal both sides

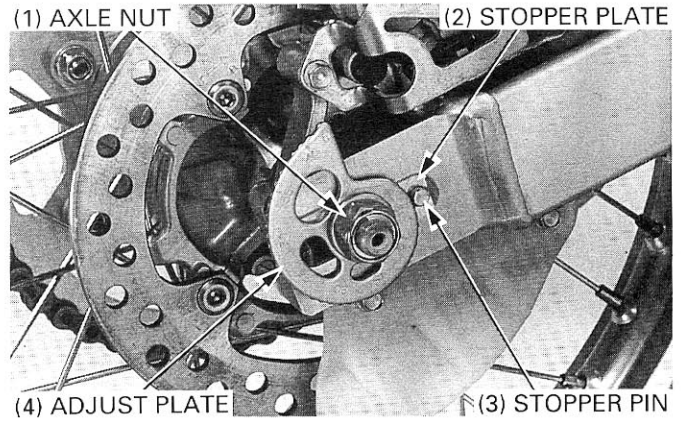
#### Rear wheel wobbling

- Bent rim
- Worn rear wheel bearings
- Faulty tire

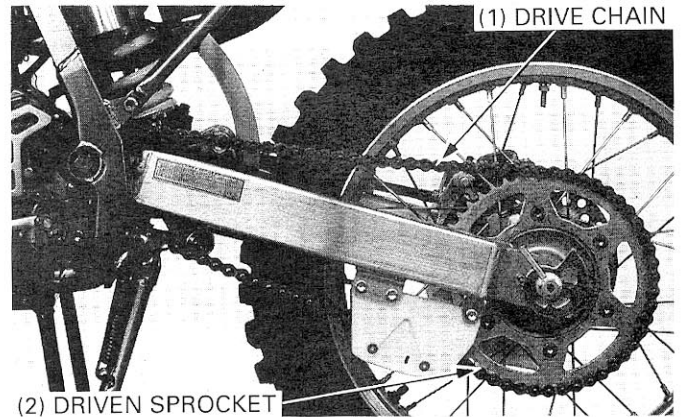
## REAR WHEEL

### REMOVAL

Loosen the rear axle and turn the adjusters so the rear wheel can be moved all the way forward.  
 Raise the rear wheel off the ground with a box or work stand under the engine.  
 Remove the stopper plate from the stopper pin.



Move the rear wheel forward for maximum drive chain slack.  
 Remove the drive chain from the driven sprocket.



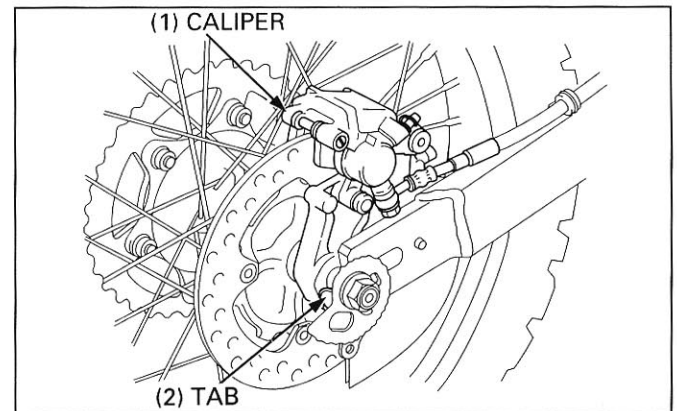
Move the rear wheel back to free the tab from the swingarm.  
 Remove the brake caliper.

### CAUTION

- When removing the rear wheel, be careful not to damage the brake pads with the disc.

### NOTE

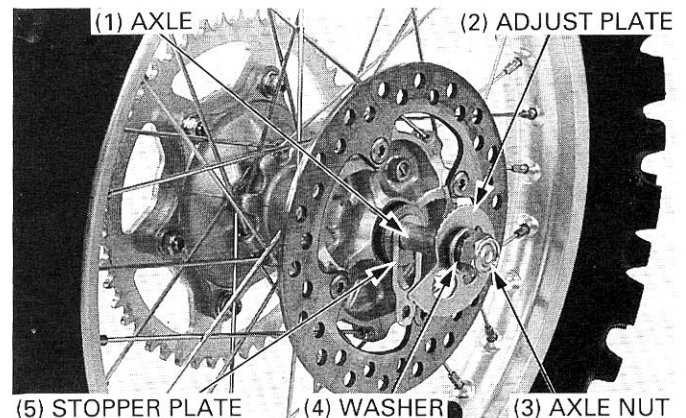
- Do not depress the brake pedal after the rear wheel is removed. The caliper piston will move out and make reassembly difficult.



Remove the rear wheel.

If you plan to disassemble the rear wheel, remove the following.

- Axle nut
- Washer
- Right adjust plate
- Stopper plate
- Axle shaft/left adjust plate





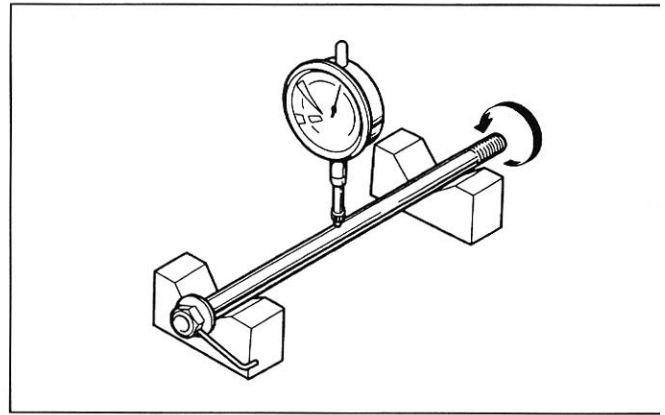
## REAR WHEEL/SUSPENSION

### INSPECTION

#### Axle

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

**SERVICE LIMIT: 0.2 mm (0.01 in)**



#### Wheel rim

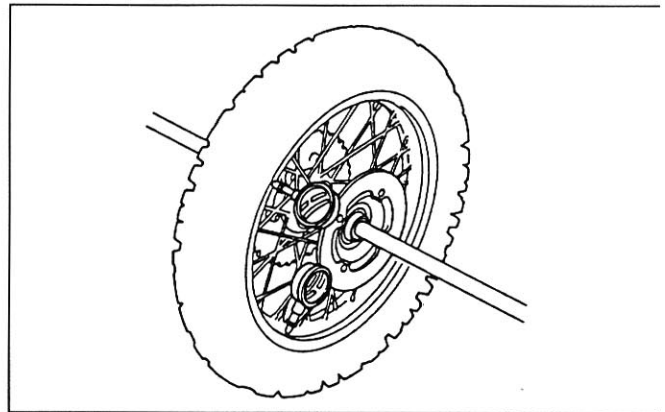
Check the rim runout by placing the wheel on a truing stand.

Spin the wheel by hand, and read the runout using a dial indicator.

Actual runout is 1/2 of the total indicator reading.

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

Check the spokes and tighten any that are loose.



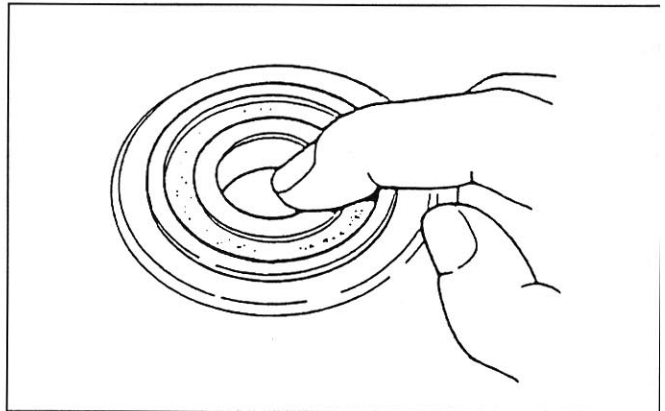
#### Wheel bearings

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

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

#### NOTE

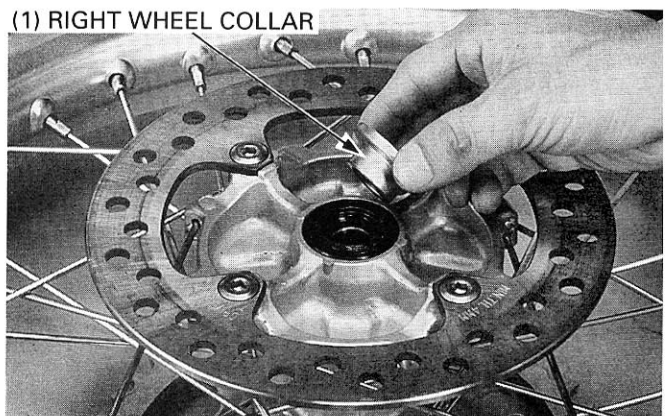
- Replace the wheel bearings in pairs.



### DISASSEMBLY

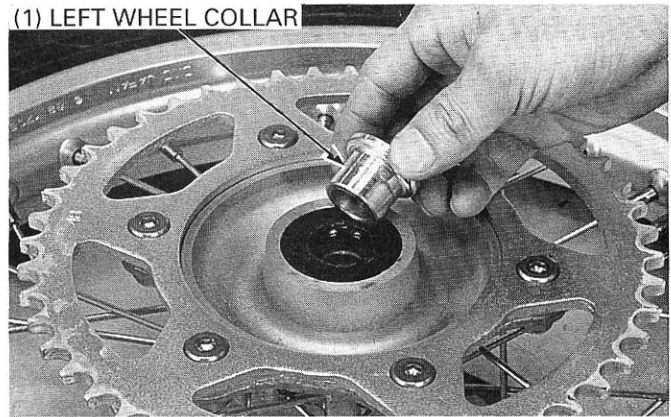
Remove the following:

- Right wheel collar

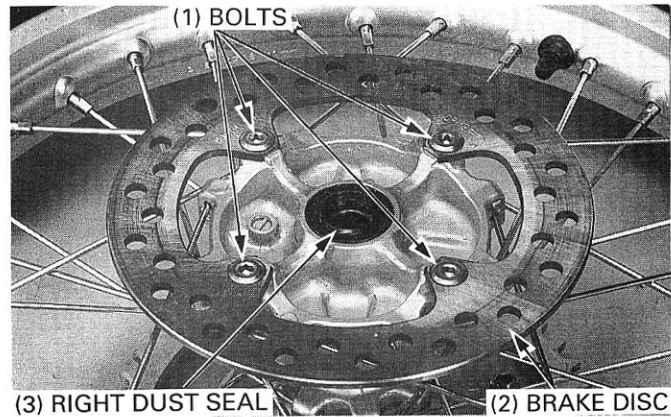


Remove the following:

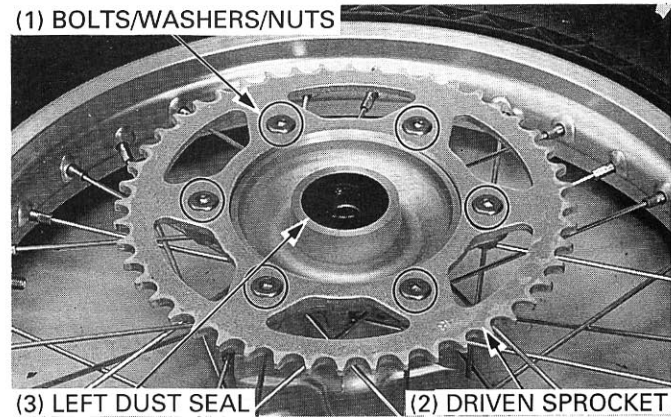
- Left wheel collar



- Rear brake disc bolts
- Rear brake disc
- Right dust seal



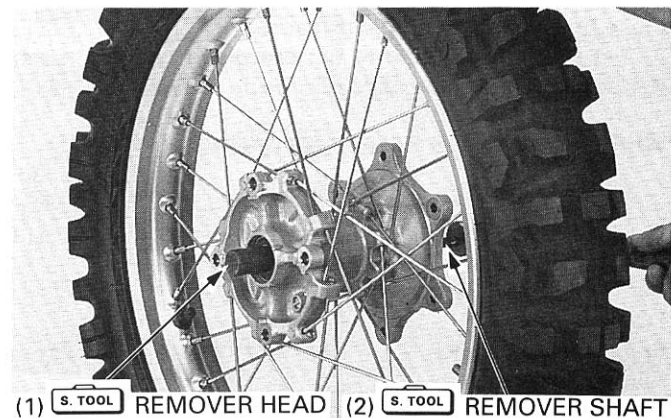
- Driven sprocket bolts/washers/nuts
- Driven sprocket
- Left dust seal



Remove the bearing and distance collar using the following tools.

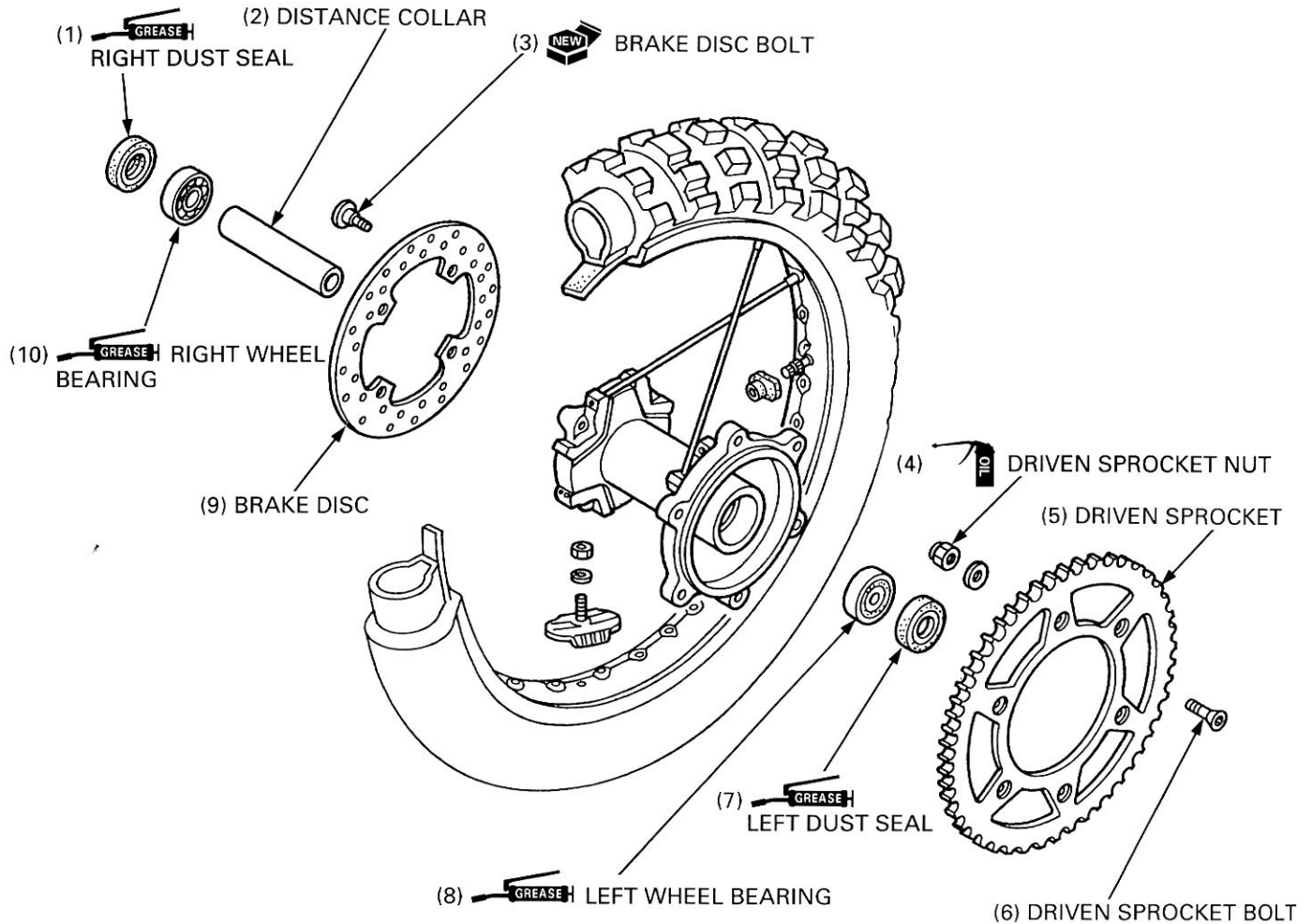
**TOOL:**

- Bearing remover head, 17 mm 07746 - 0050500
- Bearing remover shaft 07746 - 0050100 or equivalent commercially available in U.S.A



# REAR WHEEL/SUSPENSION

## ASSEMBLY



Place the rim on a work bench.

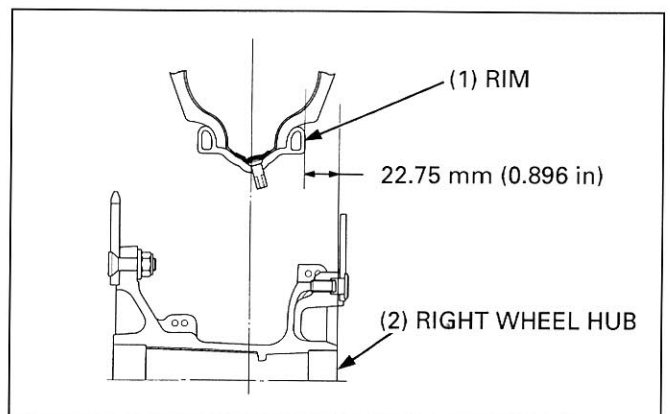
Clean the spoke and nipple threads.  
Adjust the hub position to set the distance from the hub right end surface to the side of rims as shown.

**WHEEL RIM-TO-HUB STANDARD DISTANCE:**  
22.75 mm (0.896 in)

Torque the spokes in 2 or 3 progressive steps and adjust the wheel rim runout.

**TOOL:**  
Spoke nipple wrench                      07701 - 0020300

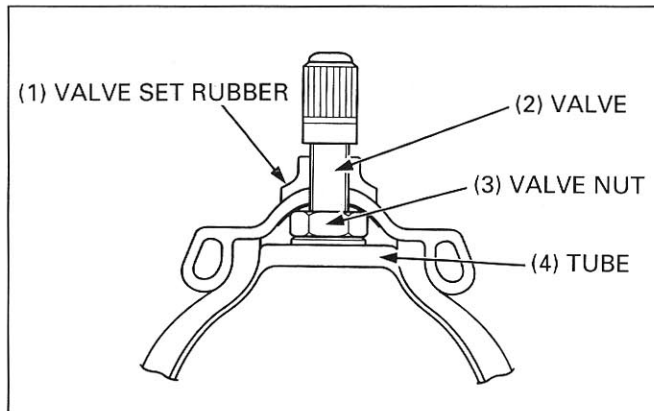
**TORQUE:** 3.8 N·m (0.38 kgf·m, 2.7 lbf·ft)



Install the valve nut on the valve.  
Install the valve into the wheel rim with the valve setting rubber.

Install and tighten the rim lock nut.

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



Apply grease to the wheel bearings.

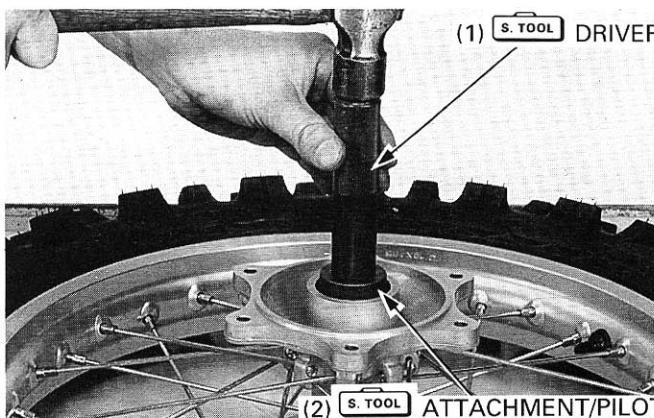
Drive in the left wheel bearing using the following tools.

**TOOL:**

<b>Driver</b>	<b>07749 - 0010000</b>
<b>Attachment, 42 x 47 mm</b>	<b>07746 - 0010300</b>
<b>Pilot, 17 mm</b>	<b>07746 - 0040400</b>

**NOTE**

- Drive the bearing in squarely, with the sealed sides facing out.

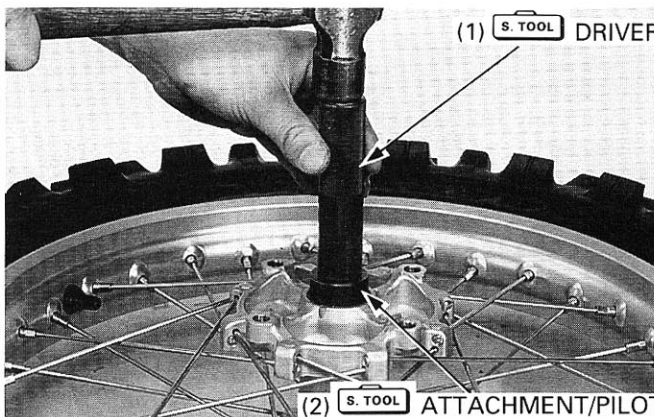


Install the distance collar.

Drive in the right wheel bearing using the following tools.

**TOOL:**

<b>Driver</b>	<b>07749 - 0010000</b>
<b>Attachment, 37 x 40 mm</b>	<b>07746 - 0010200</b>
<b>Pilot, 17 mm</b>	<b>07746 - 0040400</b>



Apply grease to the left dust seal lip.

Install the left dust seal.

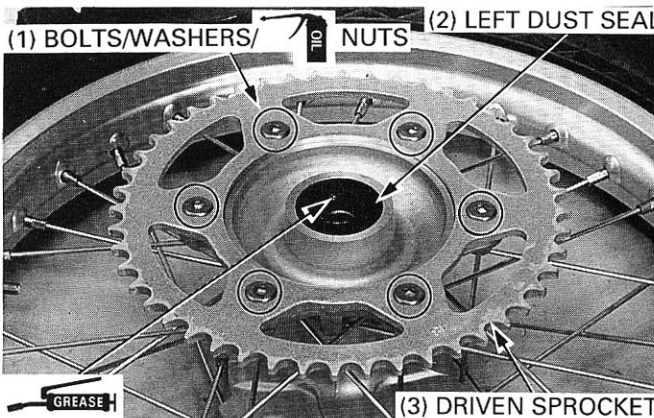
Install the driven sprocket and six bolts.

Apply engine oil to the threads and seating surfaces of the driven sprocket nuts.

Install the washers and nuts.

Tighten the nuts to the specified torque.

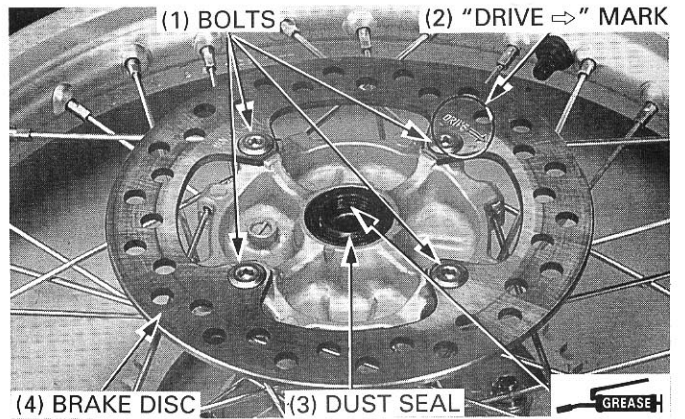
**TORQUE: 32 N·m (3.3 kgf·m, 24 lbf·ft)**



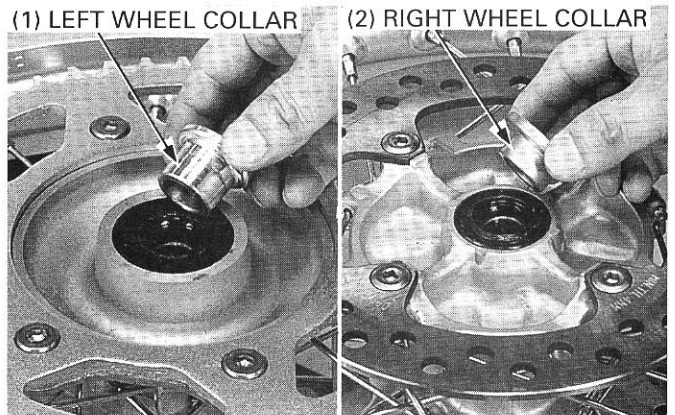
## REAR WHEEL/SUSPENSION

Apply grease to the right dust seal lip.  
Install the right dust seal.  
Install the rear brake disc with the "DRIVE ⇌" mark facing out.  
Install and tighten the disc bolts to the specified torque.

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



Install the right wheel collar.  
Install the left wheel collar.

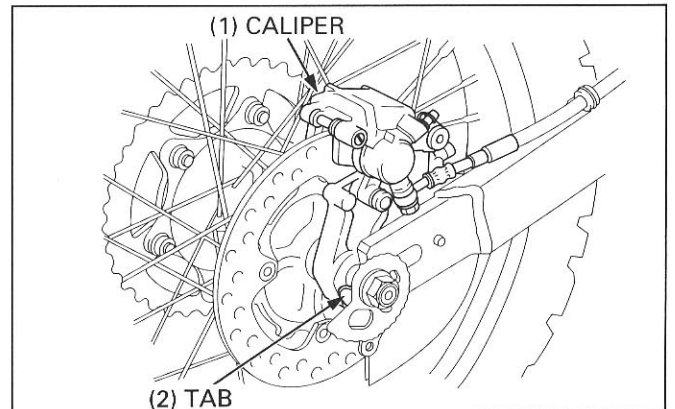


## INSTALLATION

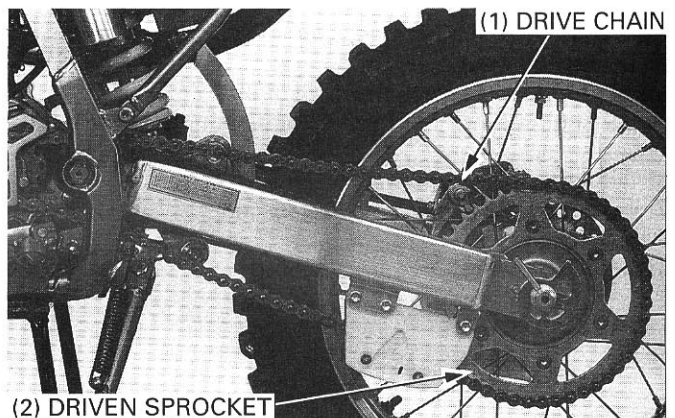
If you disassembled the rear wheel, install the following.

- Axle shaft (from the left side)/Left adjuster plates
- Washer
- Right adjuster plates
- Stopper plate
- Axle nut

Install the rear wheel, hooking the tab on the swingarm.  
Install the rear brake caliper to the axle shaft.  
Align the bracket with the slide rail on the swingarm.



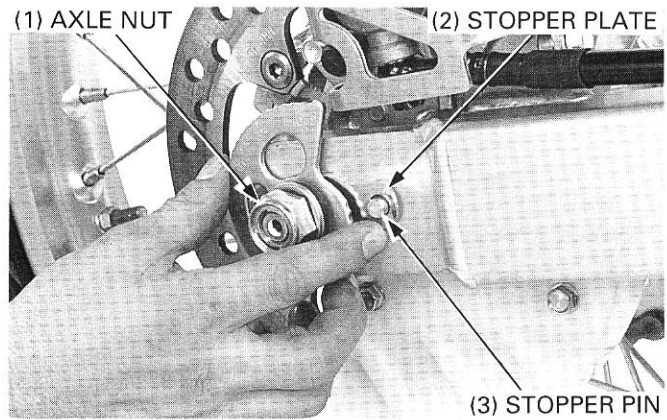
Install the drive chain to the driven sprocket.





Push the rear wheel forward, then slip the stopper plate over the pin on the swingarm.  
Adjust the drive chain slack (page 3-14).  
Tighten the rear axle nut to the specified torque.

**TORQUE: 93 N·m (9.5 kgf·m, 69 lbf·ft)**

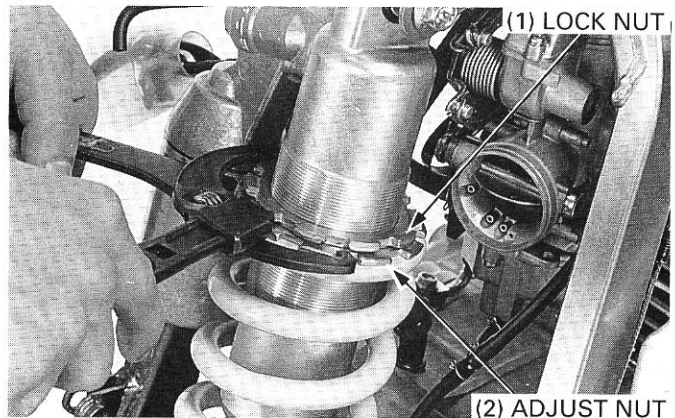


## SHOCK ABSORBER

### REMOVAL

**⚠ WARNING**

- Use only nitrogen gas to pressurize the shock absorber. The use of an unstable gas can cause a fire or explosion resulting in serious injury.
- The shock absorber contains nitrogen under high pressure. Do not allow fire or heat near the shock absorber.
- Before disposal of the shock absorber, release the nitrogen by pressing the valve core. Then remove the valve from the shock absorber.



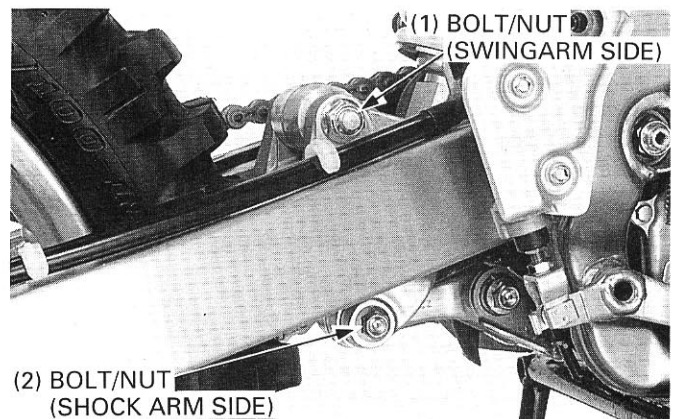
Remove the air cleaner housing (page 5-3).  
Raise the rear wheel off the ground by placing a work stand or box under the engine.

### NOTE

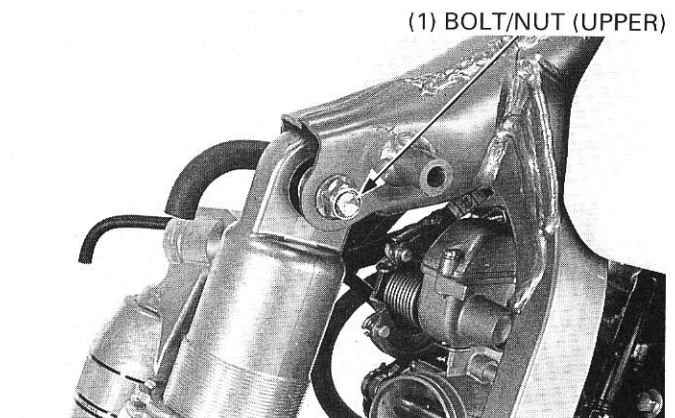
- If you plan to disassemble the shock absorber, loosen the spring lock nut and adjusting nut.

Remove the following:

- Shock arm bolt/nut (swingarm side)
- Shock link bolt/nut (shock arm side)

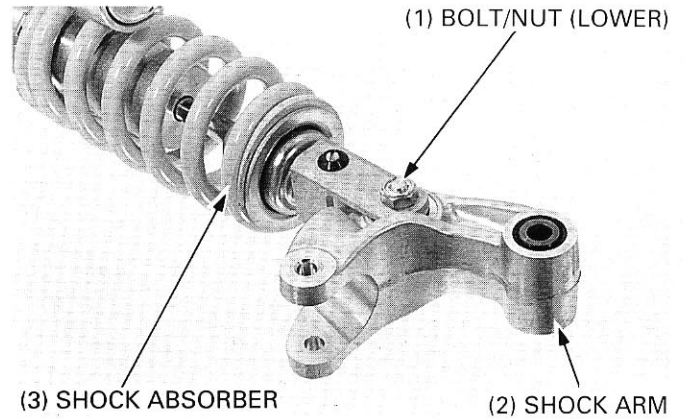


- Shock absorber bolt/nut (upper)
- Shock absorber/shock arm



## REAR WHEEL/SUSPENSION

— Shock absorber bolt/nut (lower)  
Separate the shock arm from the shock absorber.

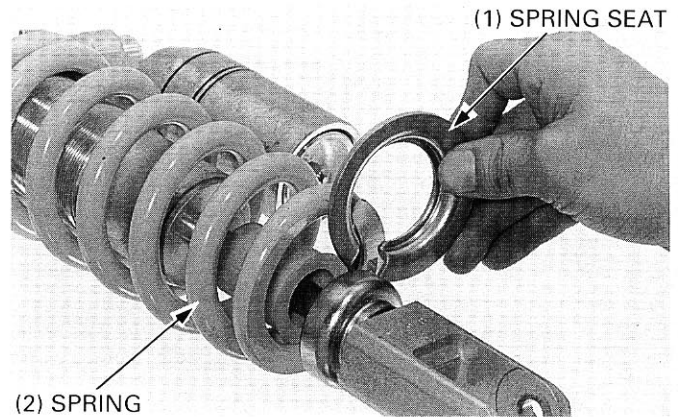


## DISASSEMBLY

Measure the record the spring length to use during assembly.  
Loosen the lock nut and adjusting nut.

Remove the following from the damper unit:

- Spring seat
- Spring
- Adjusting nut
- Lock nut



## BLADDER REPLACEMENT

### NOTE

- Replace the bladder if oil leaks around the chamber cap or oil spills out when releasing the nitrogen from the reservoir.
- Perform this procedure before draining the oil from the damper.

Depress the valve core to release the nitrogen from the reservoir.

### ⚠ WARNING

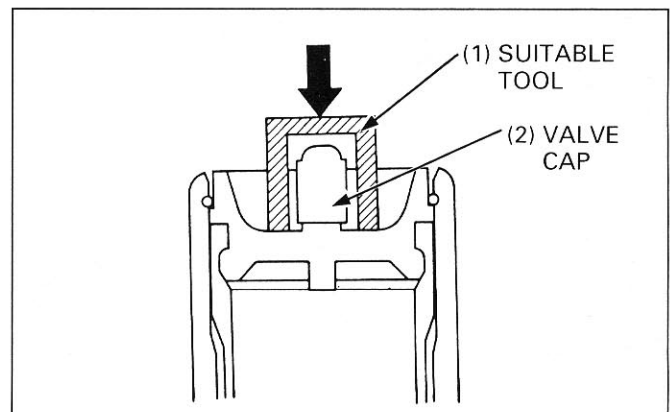
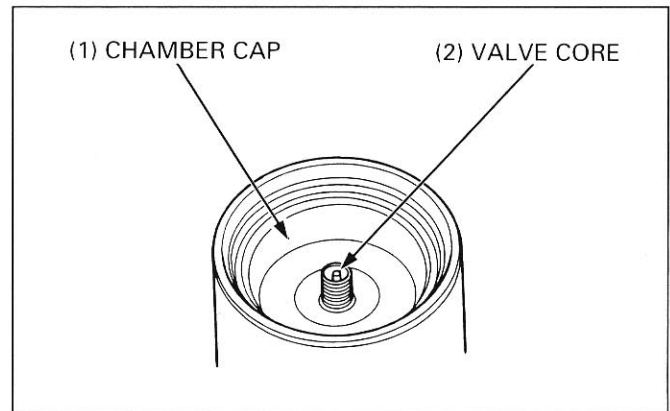
- *Release all nitrogen pressure before disassembly: otherwise the chamber cap will be under significant pressure and could cause severe injury or death.*
- *Wear protective clothing and adequate eye protection to protect against injury and prevent debris from getting in your eyes.*
- *Point the valve away from you to prevent debris from getting in your eyes.*

Remove the valve core.

Put a suitable tool on the chamber cap and push it in by lightly tapping on the tool with a plastic hammer until you have good access to the stopper ring.

### CAUTION

- *To avoid damaging the threads of the gas valve, install the cap before depressing the chamber cap.*

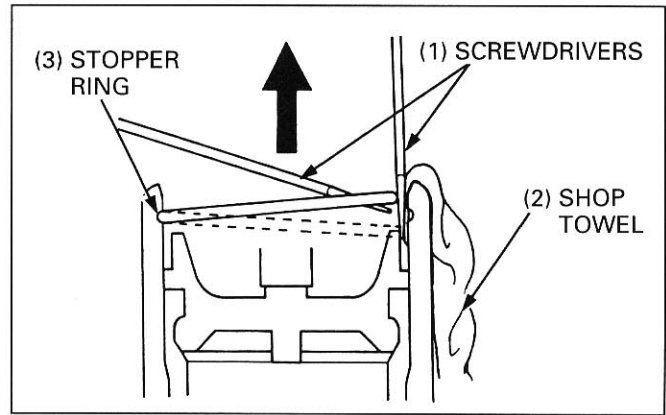


NOTE

- Depress the chamber cap just the minimum amount necessary for stopper ring access.

You'll need two small screwdrivers and a shop towel to remove the stopper ring.

The stopper ring groove in the reservoir is ramped toward the inside to give the stopper ring a square shoulder on which to seat securely.



CAUTION

- To avoid damaging the inside surfaces of the reservoir, cover the screwdriver with shop towel.

To remove the stopper ring, first push one end of the stopper ring out of its groove, then slip the second screwdriver between the stopper ring and the reservoir to act as a ramp.

Now use the other screwdriver to pull the stopper ring completely out.

NOTE

- Check the stopper ring groove for damage. Remove any burrs with fine emery cloth before pulling the damper rod out of the case.

Hold the shock absorber in a vise with shop towel or soft jaws.

Using a suitable squeeze bottle, fill the reservoir with the recommended shock oil.

**RECOMMENDED SHOCK OIL: Pro Honda Suspension Fluid SS-7 or equivalent**

Slowly pump the damper rod until no air bubbles appear in the valve core hole, then pull the damper rod all the way. Install the valve core securely.

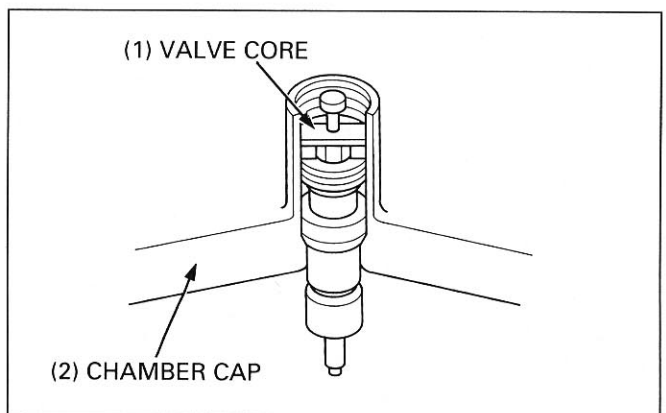
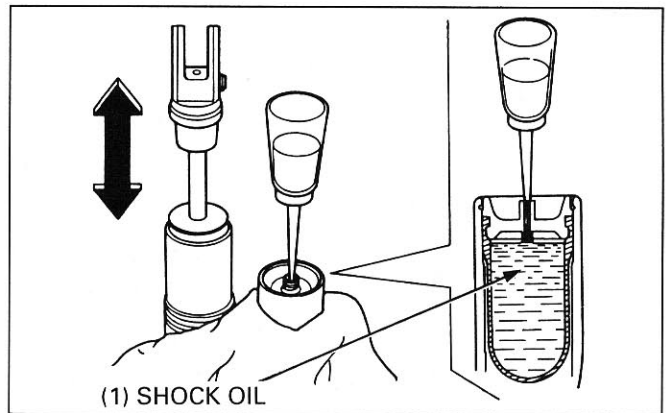
Remove the chamber cap and bladder following the procedure below:

Wrap a shop towel around the chamber cap.

1. Compress the damper rod slowly, to force the chamber cap out.

**WARNING**

- The chamber cap will be removed with hydraulic pressure so its force can be significant considering the air in the bladder. Wear protective clothing and a face guard to protect your eyes and face in a case the chamber cap pops out quickly and forcibly.



## REAR WHEEL/SUSPENSION

- Place the damper in a vice with soft jaws with the damping adjuster facing up. Be careful not to distort the damper body.

### CAUTION

- Do not overtighten the vise. Damage to the shock body will result.

Remove the damping adjuster.

- Fill the damper with shock oil through the damping adjuster hole, while slowly pulling the damper rod out.
- Reinstall the damping adjuster after filling the damper.

### NOTE

- The damper must be kept upright to prevent oil from leaking out.

- Place the damper with the reservoir chamber cap facing up.
- Repeat steps 1 to 5 until the chamber cap is removed from the reservoir.

Remove the bladder from the chamber cap.

### CAUTION

- Do not use any sort of tool to remove the bladder, because it may damage the chamber cap.
- Replace the bladder with a new one. Do not reuse the removed one.

Attach a new bladder to the chamber cap.

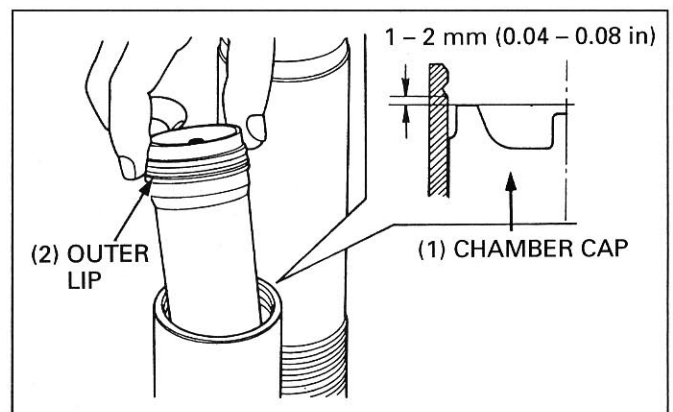
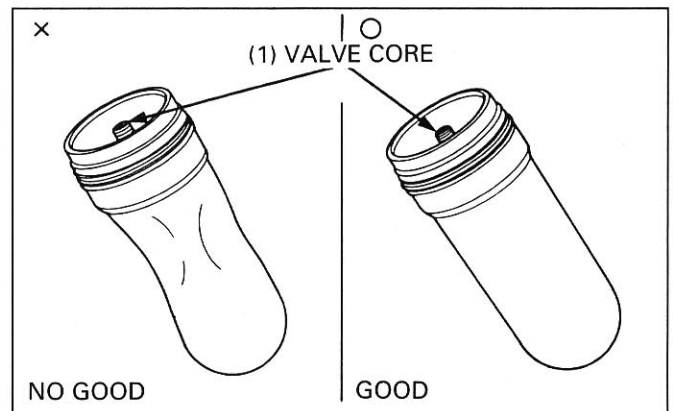
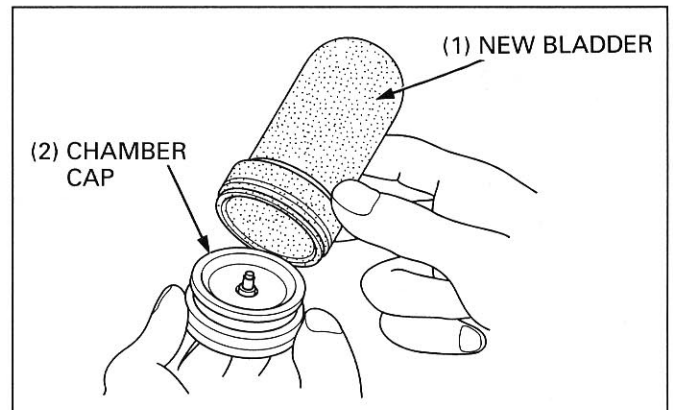
If the bladder becomes distorted during installation, depress the valve core to reform it.

Clean the inside of the reservoir and fill it with the recommended shock oil.

### RECOMMENDED SHOCK OIL: Pro Honda Suspension Fluid SS-7 or equivalent

Apply a light coating of shock oil to the lip of the bladder, and press the chamber cap in the reservoir to about 1 – 2 mm (0.04 – 0.08 in) below the stop ring groove.

Install the stop ring in the groove of the reservoir securely. Temporarily fill the reservoir with 7.1 psi (49 kPa) of air slowly until the chamber cap seats against the stop ring.





**▲ WARNING**

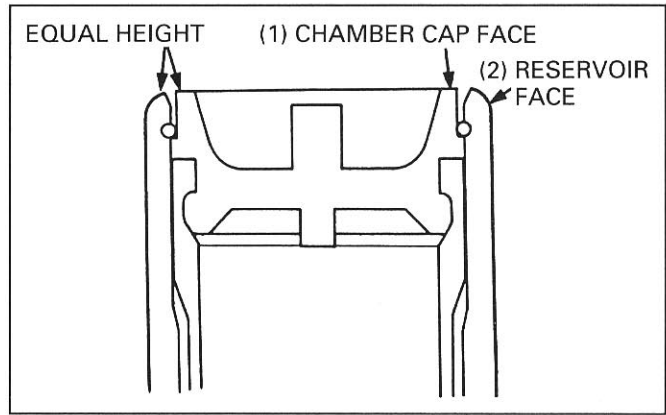
- *Be sure the stop ring is seated in the ring groove all the way around or the chamber cap can come apart when riding the motorcycle.*

Make sure that chamber cap face is level with the reservoir face.

**▲ WARNING**

- *If the chamber cap does not seat fully, it may fly out when filling the reservoir with nitrogen.*

Release the air from the reservoir by depressing the valve core. Bleed the air from the shock absorber (page 14-20). Fill the reservoir with nitrogen to the specified pressure (page 14-21).



**DAMPER DISASSEMBLY**

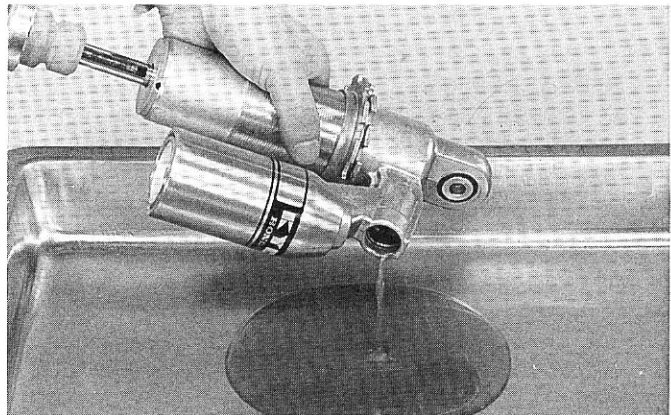
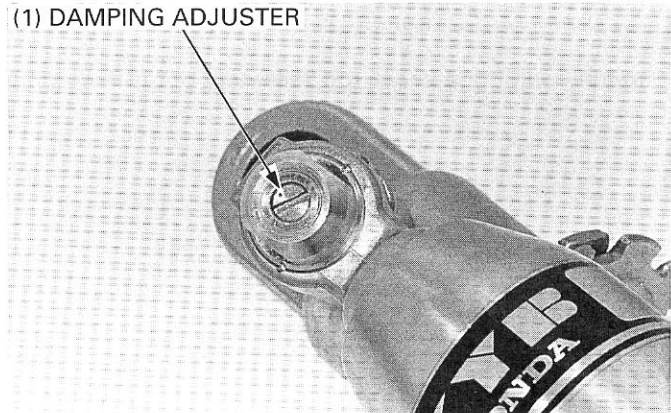
Depress the valve core to release nitrogen from the reservoir.

**▲ WARNING**

- *Point the valve away from you to prevent debris getting in your eyes.*
- *Before disposal of the shock absorber, release the nitrogen by pressing the valve core. Then remove the valve from the shock absorber.*

Remove the damping adjuster.

Drain most of the shock oil from the damper and reservoir by pumping the damper rod in and out several times.

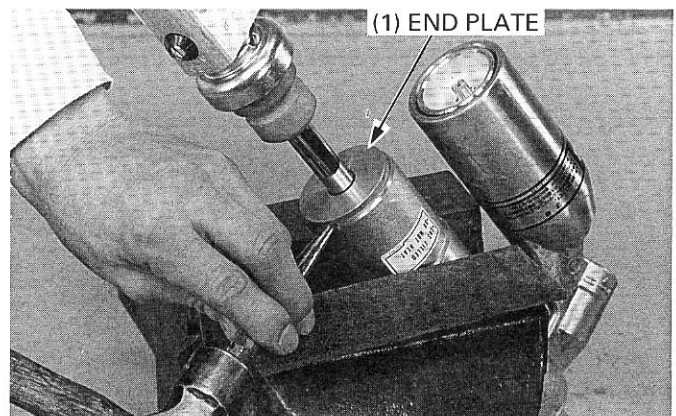


Clamp the shock absorber in a vise at the damper case, protected on both sides by pieces of wood.

Remove the end plate and tape or tie it to the bump rubber so it won't get in the way.

Push in the damper seal until you have good access to the stopper ring.

You'll need two small screwdrivers to remove the stopper ring. The stopper ring groove in the damper case is ramped towards the inside to give the stopper ring a square shoulder on which to seat securely.





## REAR WHEEL/SUSPENSION

To protect the case from gouges or nicks, cover the area where the screwdriver will be prying. To remove the stopper ring, first push one end of the stopper ring out of its groove, then slip the second screwdriver between the stopper ring and the damper case to act as a ramp.

Now, use the other screwdriver to pull the stopper ring completely out.

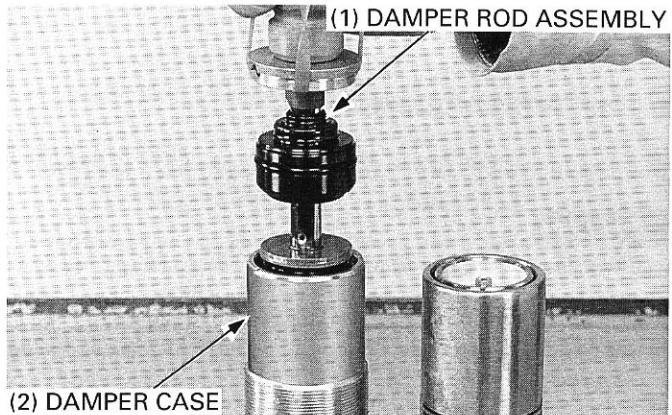
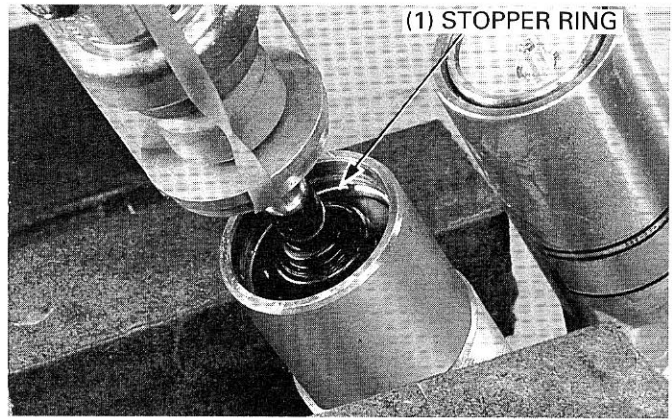
### NOTE

- Check the stopper ring groove for burrs. Remove any burrs with fine emery cloth before pulling the damper rod out of the case.

### CAUTION

- *Burrs will damage the damper rod piston ring.*

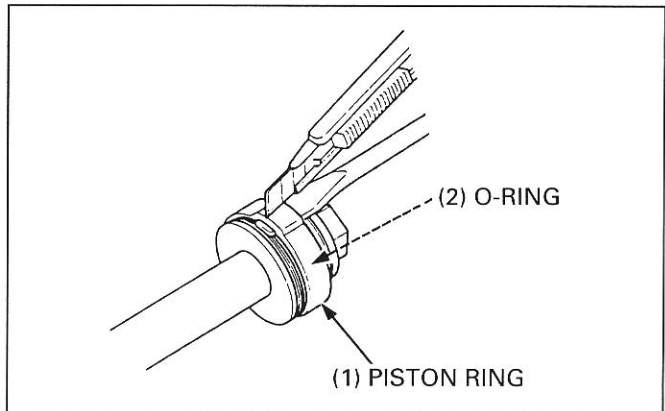
Carefully pull the damper rod assembly out of the damper case.



## PISTON RING REPLACEMENT

Inspect the piston ring.

If the piston ring is damaged, cut the piston ring as shown. Replace it and the O-ring with new parts as shown below.

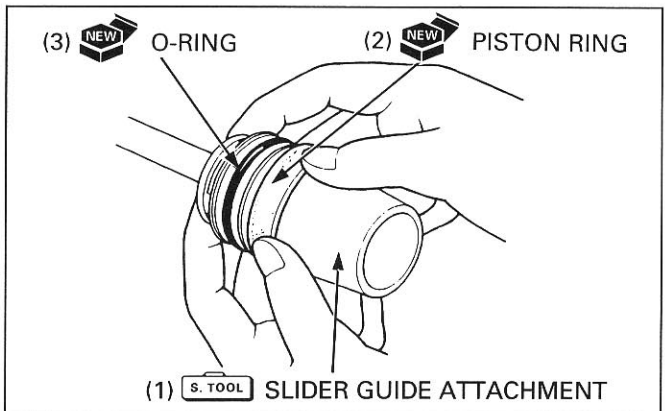


Place the slider guide attachment over the piston and install a new O-ring and piston ring into place with your finger.

### TOOL:

**Slider guide attachment**                      **07974 – KA50102**

Compress the piston ring against the ring groove, and seat the piston ring into the ring groove.

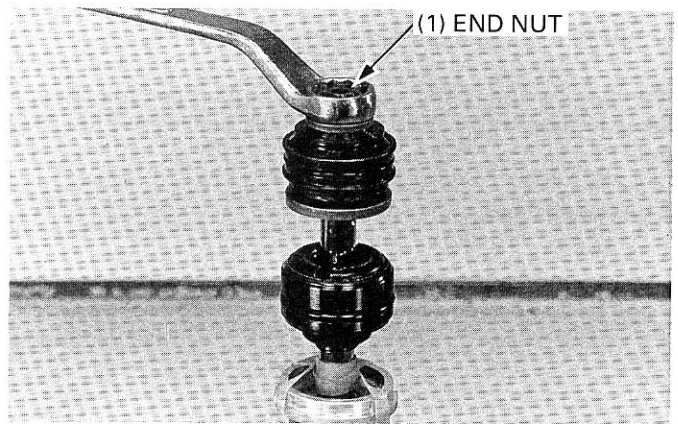


## DAMPER ROD DISASSEMBLY

### CAUTION

- To keep lint or dirt from getting onto damper rod parts, do not wear gloves while working on the damper rod.

Place the damper in a vise with soft jaws or a shop towel, being careful not to distort the lower mount. Remove the end nut and discard it.



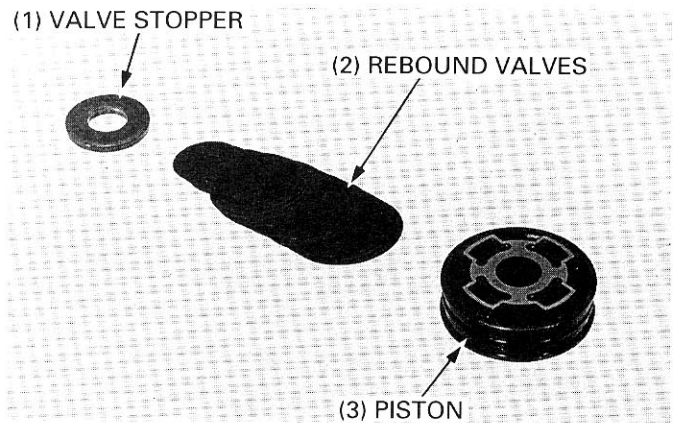
### NOTE

- If the damper rod is cracked or damaged when removing the end nut, replace the damper rod assembly with a new one.
- Remove all burrs from the end of the damper rod.

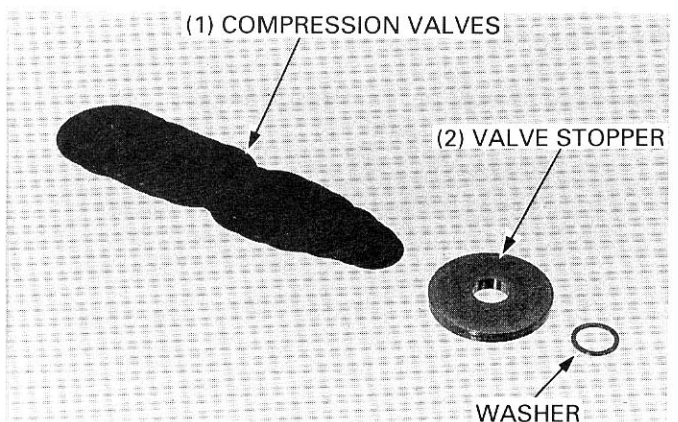
Remove the valve stopper, rebound valves and piston from the damper rod.

### NOTE

- Pass a piece of thin wire through the removed valves to ensure correct reassembly.
- Keep dust and abrasives away from all damper rod parts.
- Thoroughly clean the valves in solvent and blow them dry with compressed air, if they have been disassembled and separated.
- Be careful not to get solvent on the O-ring and piston ring.
- The valve arrangement and number of valves shown is typical and may not represent this model exactly.



Remove the compression valves, valve stopper and washer.

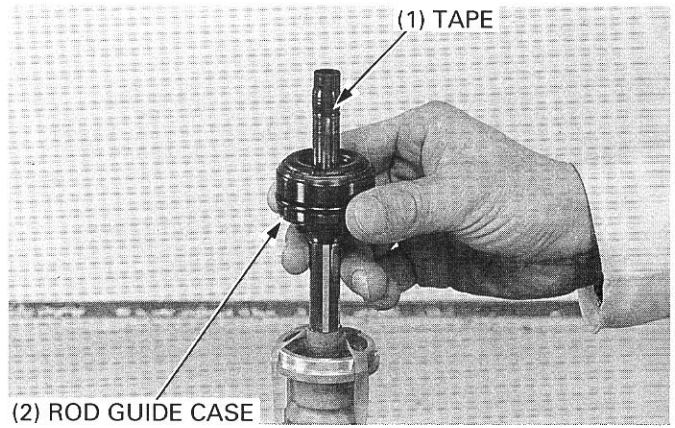


## REAR WHEEL/SUSPENSION

Wrap the top threads of the damper rod with tape.

Remove the rod guide case from the damper rod. Remove the end plate, bump rubber and rubber seat from the damper rod.

Remove the tape.

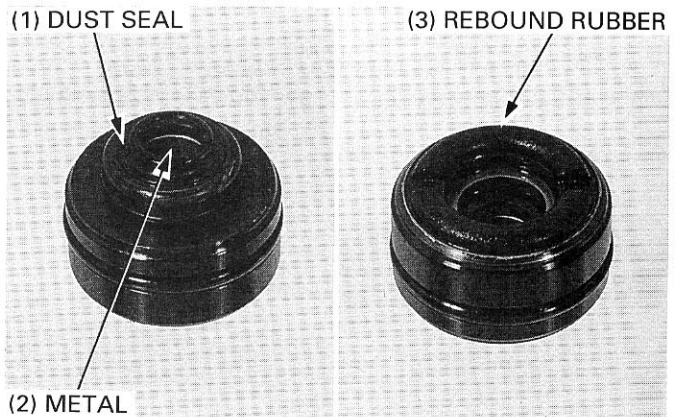


### ROD GUIDE CASE INSPECTION

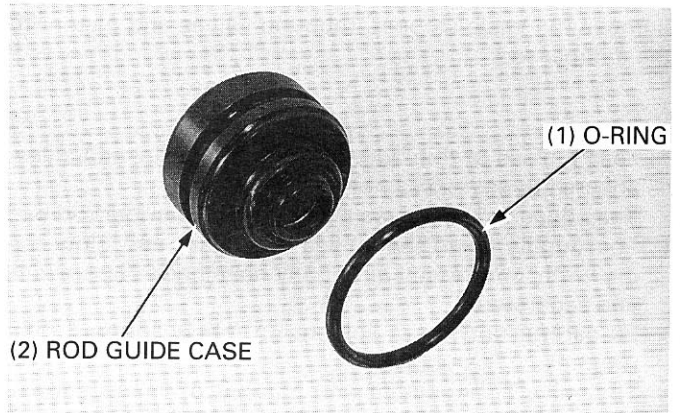
Inspect the rebound rubber for wear or damage and replace the rod guide case with a new one if necessary.

Inspect the dust seal lips for wear, scratches or damage and replace the rod guide case with a new one if necessary.

Visually inspect the rod guide case metal. If the metal is worn so that the copper surface appears, replace the rod guide case with a new one.

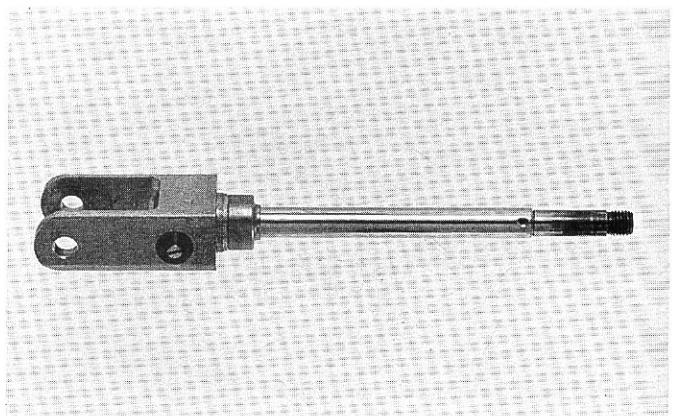


Remove the O-ring from the rod guide case and replace it with a new one.



### DAMPER ROD INSPECTION

Inspect the damper rod for damage or distortion.



**DAMPER ASSEMBLY**

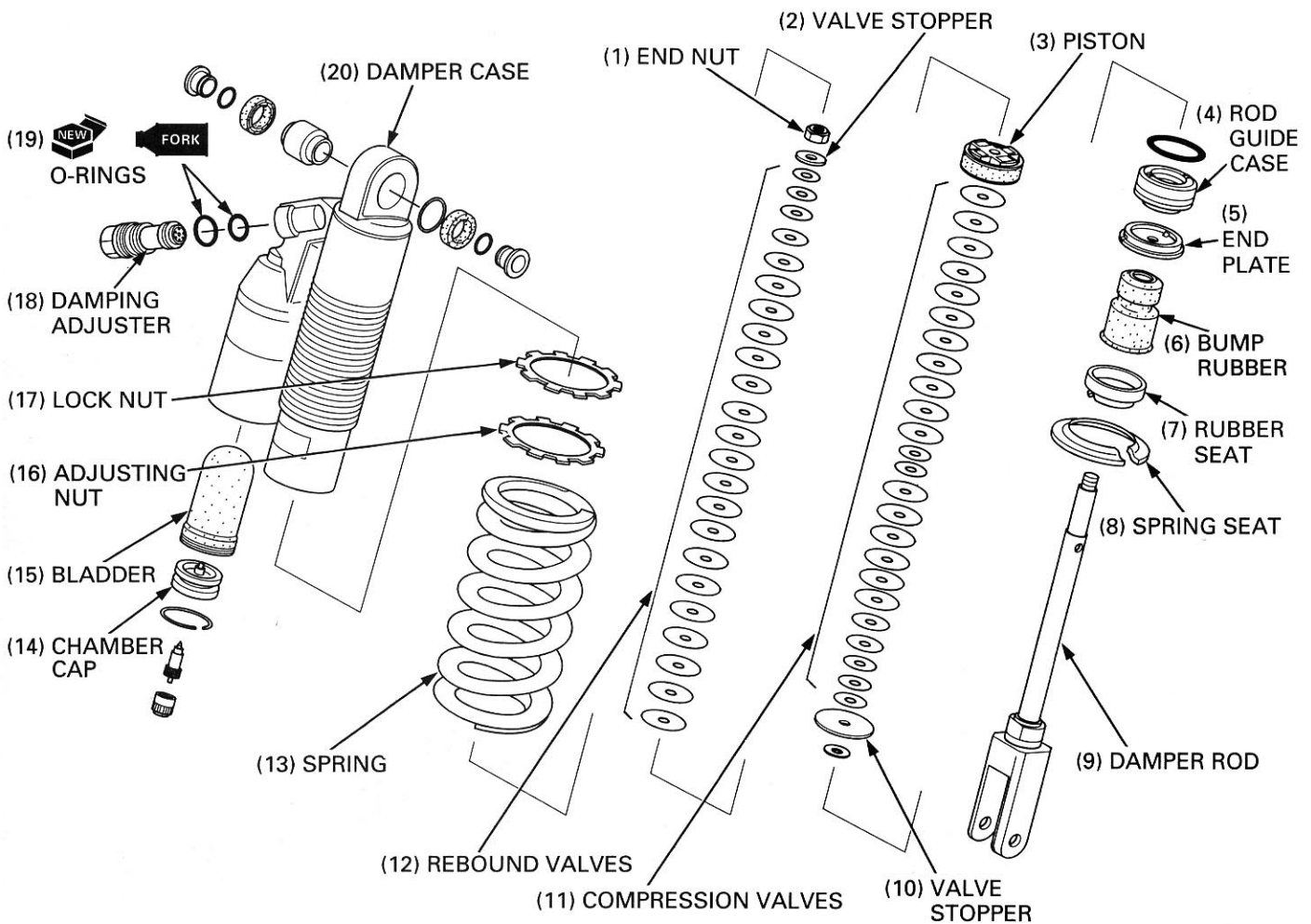
Before assembly, wash all parts with solvent and blow them dry with compressed air.  
Be sure that there is no dust or lint on any of the parts.

**CAUTION**

- Do not get solvent on the piston ring or O-ring.
- The exact valve arrangement and number of valves may differ from those shown.

**NOTE**

- Never assemble valves which might have gotten dusty or otherwise contaminated during the disassembly process. Disassemble them, thoroughly clean with solvent and blow them dry with compressed air before assembly.





## REAR WHEEL/SUSPENSION

Hold the lower shock mount in a vise with soft jaws or a shop towel.

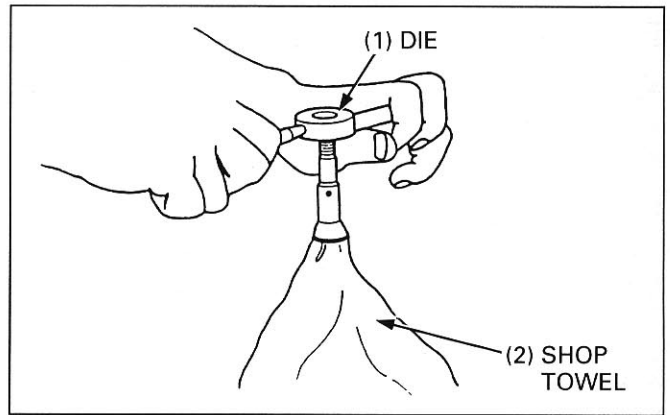
Remove the burrs from the damper rod end with a file and correct the threads with a die.

**DIE: 12 x 1.5 mm**

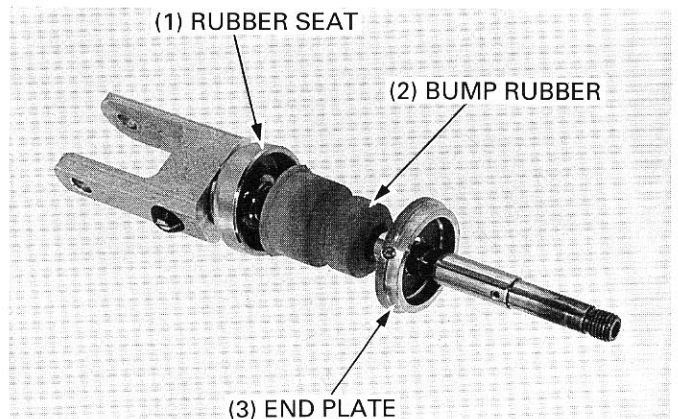
Clean the damper rod with solvent after correcting the threads.

### NOTE

- Make sure that burrs are not stuck in the damper rod I.D..



Install the rubber seat, bump rubber and end plate.



Install the special tool onto the damper rod.

### TOOL:

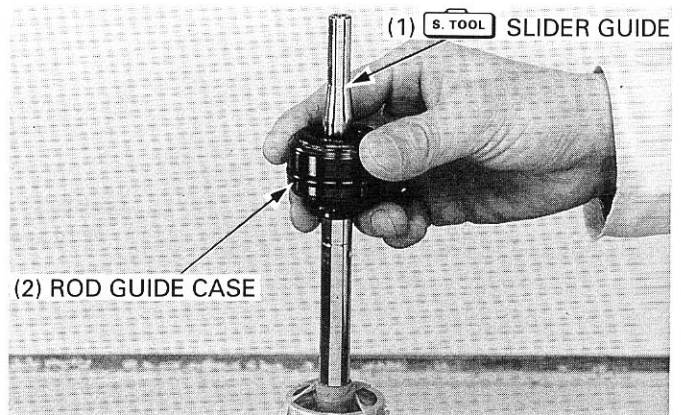
**Slider guide, 14 mm**

**07974 - KA40001**

Carefully install the rod guide case, with the rebound rubber facing up, over the damper rod.

### NOTE

- The rod guide case oil seal is filled with grease.
- Be careful not to remove grease from the seal.
- Be careful not to damage the dust seal lip or turn it inside out.

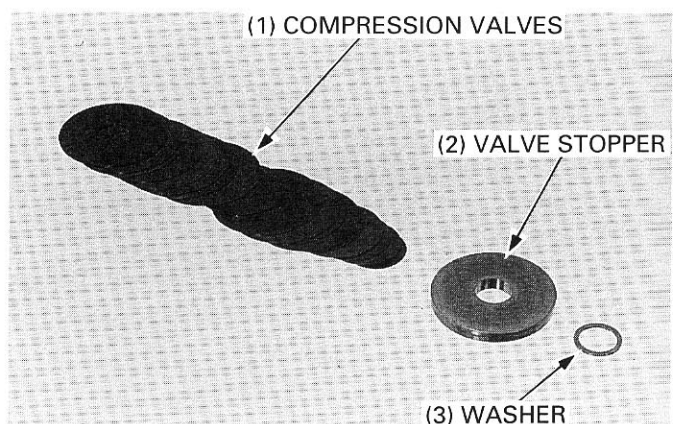


Remove the special tool.

Install the washer, valve stopper and compression valves onto the damper rod.

### NOTE

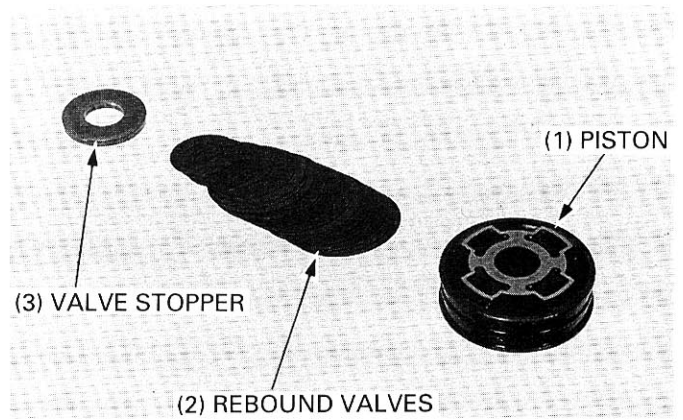
- The valve arrangement and number of valves may vary from those shown.





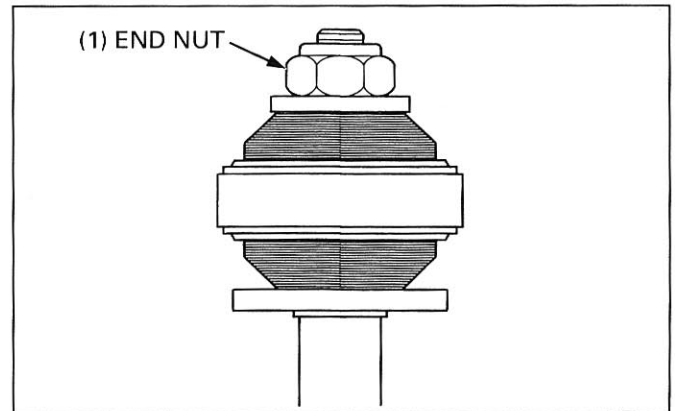
Install the piston onto the damper rod.

Install the rebound valves with their polished surfaces facing down.  
Install the valve stopper.



NOTE

- Note the installation direction of the piston and valves.
- Be careful not to bind the valves when installing the piston onto the damper rod. Also, check that they are concentric with the damper rod.

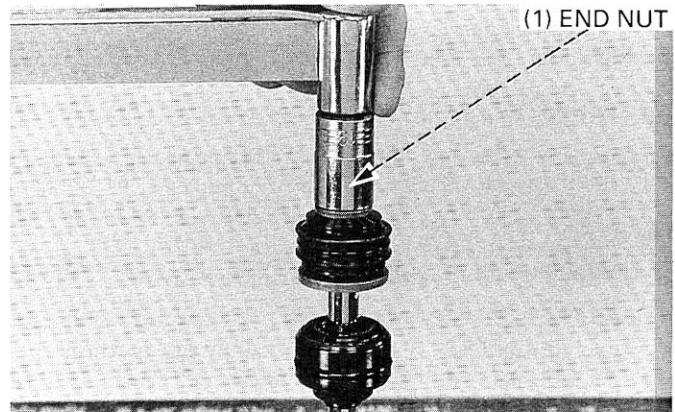


Install and tighten a new end nut to the specified torque.

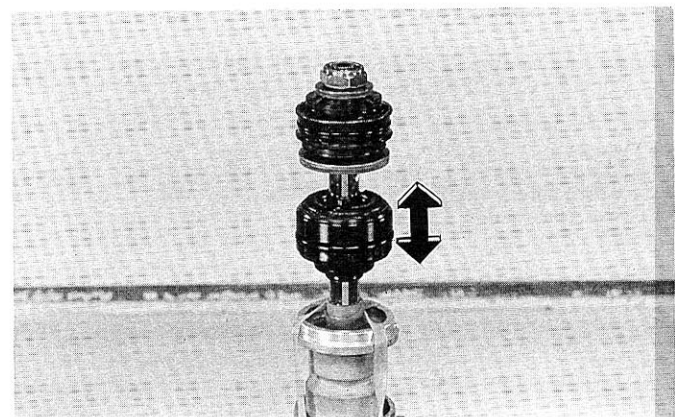
**TORQUE: 37 N·m (3.8 kgf·m, 27 lbf·ft)**

NOTE

- To prevent damage to the lower mount, use a shop towel or vise with soft jaws.



Coat the damper rod with Pro Honda Suspension Fluid SS-7 or equivalent. Check the rod guide case by sliding it up and down fully to be sure there is no restriction.

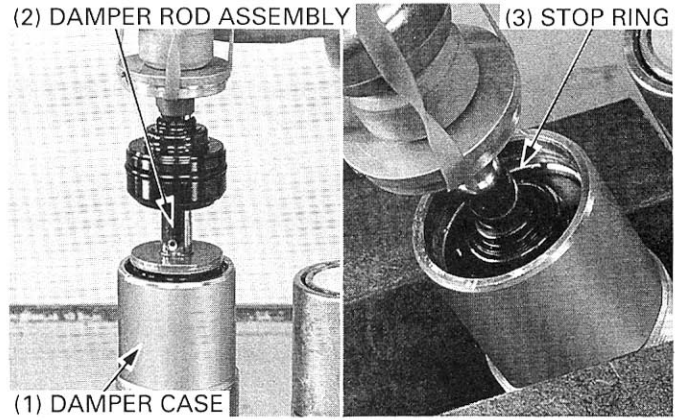


## REAR WHEEL/SUSPENSION

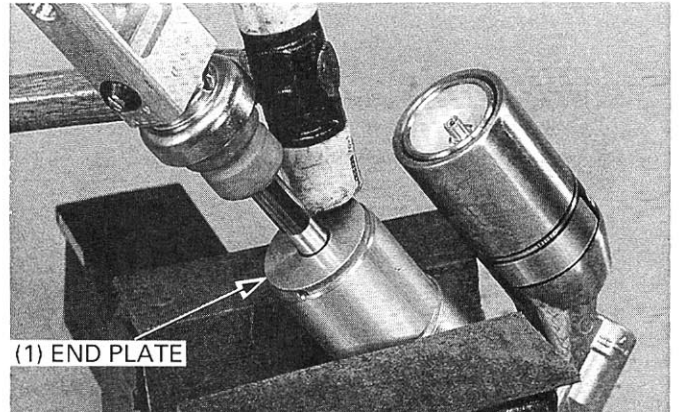
Coat the damper case inner surface, piston and O-ring with Pro Honda Suspension Fluid SS-7 or equivalent, and insert the damper rod assembly carefully. Install the stop ring into the groove in the damper case.

### NOTE

- After assembling, check that the stop ring is seated in the groove of the damper case completely. You should not be able to pull it out of the damper case.



Drive the end plate squarely and evenly into the damper case, with a plastic hammer.



Hold the shock absorber gently in a vise by the damper case protected on both side by pieces of wood.

### CAUTION

- Do not overtighten the vise and distort the damper case.

### NOTE

- Hold the shock absorber at the angle shown.

Fill the damper case and reservoir with the recommended oil through the damping adjuster hole.

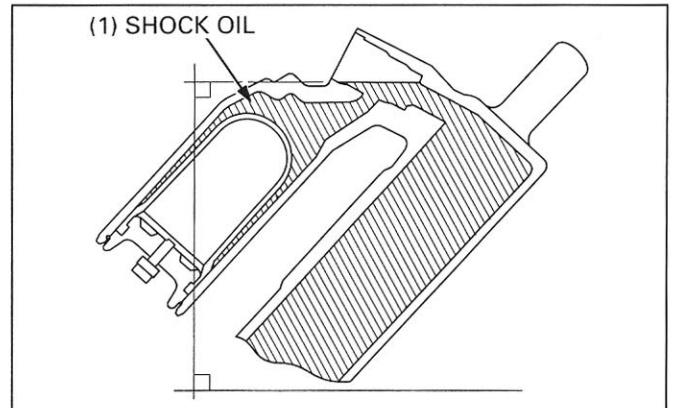
### RECOMMENDED SHOCK OIL:

**Pro Honda Suspension Fluid SS-7 or equivalent**

Slowly pump the damper rod until there are no bubbles in the oil that overflows from the damper case.

### NOTE

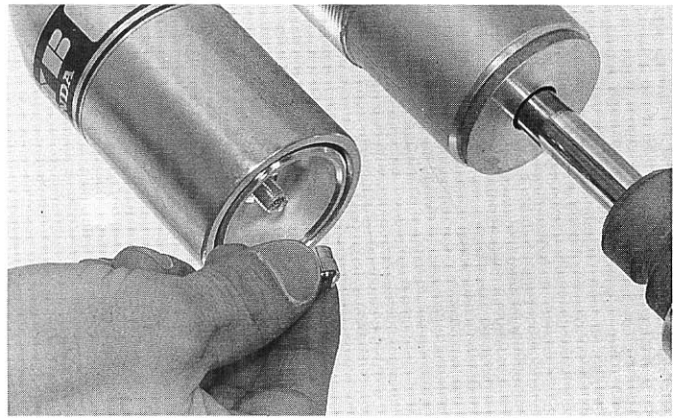
- Do not allow oil to flow out of the reservoir.



Temporarily charge the reservoir with 49 kPa (0.5 kgf/cm<sup>2</sup>, 7.1 psi) of air slowly to inflate the bladder inside.

### NOTE

- Check for any oil that may leak out of the valve while pressurizing. Replenish oil as necessary. Be sure that the reservoir pressure is correct with an accurate pressure gauge.



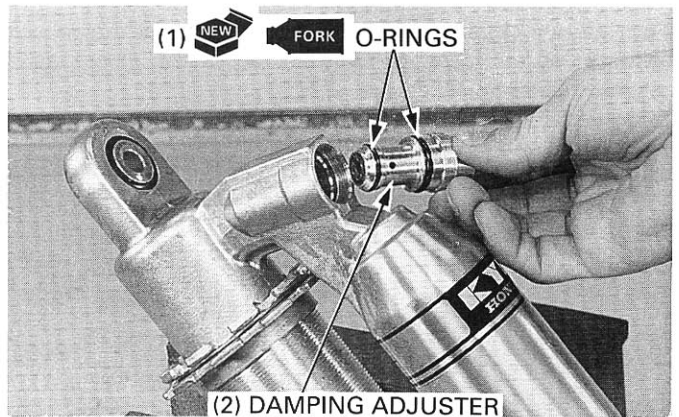
Fill the damper with the recommended shock oil up to the damping adjuster hole neck.

Apply oil to the new O-rings and install them on the damping adjuster.

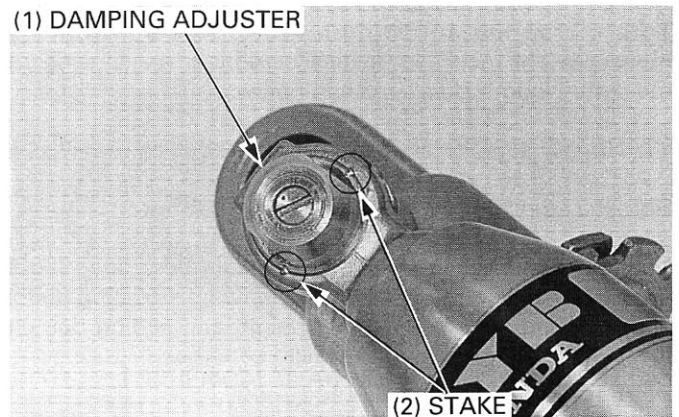
Dip the damping adjuster in clean shock oil.

Slowly install the damping adjuster, and tighten it to the specified torque.

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



Stake the damping adjuster as shown.



Wipe off all oil from the damper rod; oil left on the damper rod can lead to premature failure of the oil seal.

Check for oil leaks.

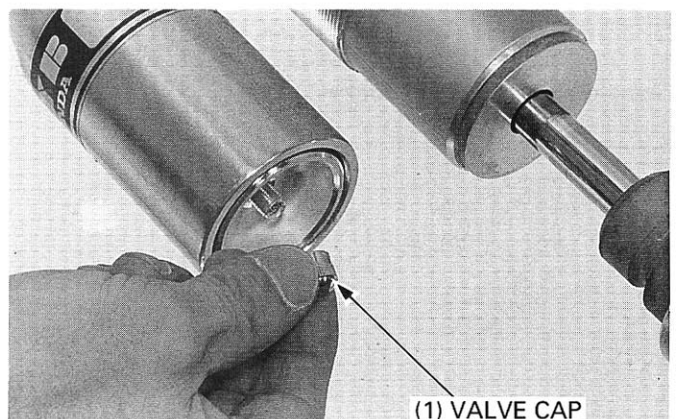
Release the 49 kPa (0.5 kgf/cm<sup>2</sup>, 7.1 psi) of air that was in the reservoir at precompression.

Fill the reservoir with 981 kPa (10.0 kgf/cm<sup>2</sup>, 142 psi) of nitrogen gas.

### ⚠ WARNING

- *The shock absorber is fitted with a gas-filled reservoir.*
- *Use only nitrogen gas to pressurize the shock absorber.*
- *The use of an unstable gas can cause a fire or explosion resulting in serious injury.*

Install the valve cap.

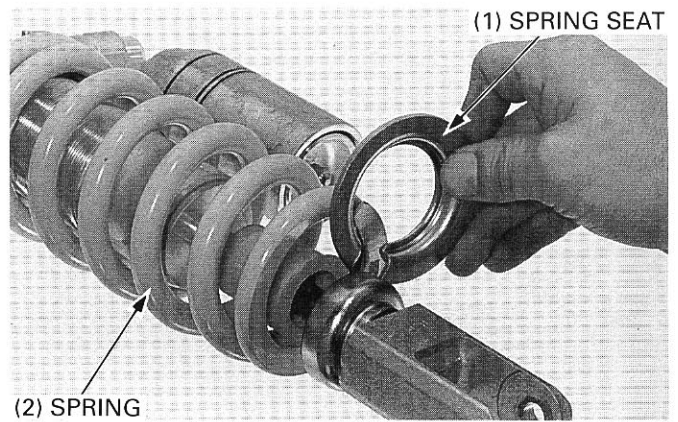


## REAR WHEEL/SUSPENSION

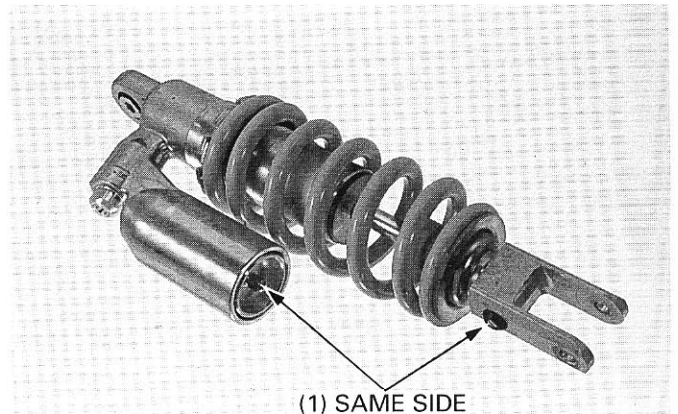
Install the shock spring with its narrow wound end facing down.

Install the spring seat.

Temporarily tighten the adjusting nut and lock nut.



Turn the shock absorber lower mount so that the rebound adjuster screw is on the same side of the shock as the reservoir as shown.

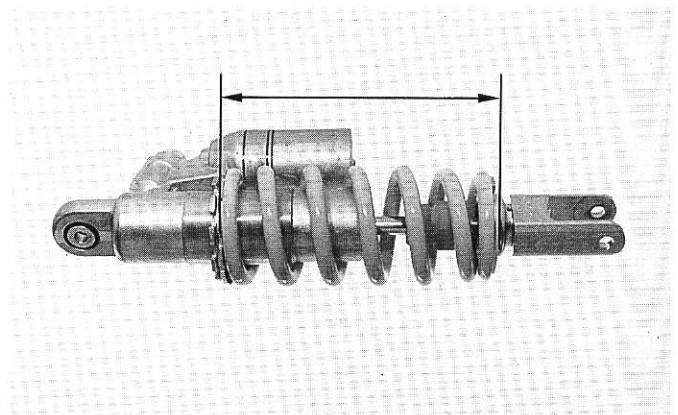


Turn the spring adjusting nut until the spring length measurement recorded at disassembly is reached or until the spring length is as specified below.

**STANDARD SPRING INSTALLED LENGTH: 181.5 mm (7.15 in)**

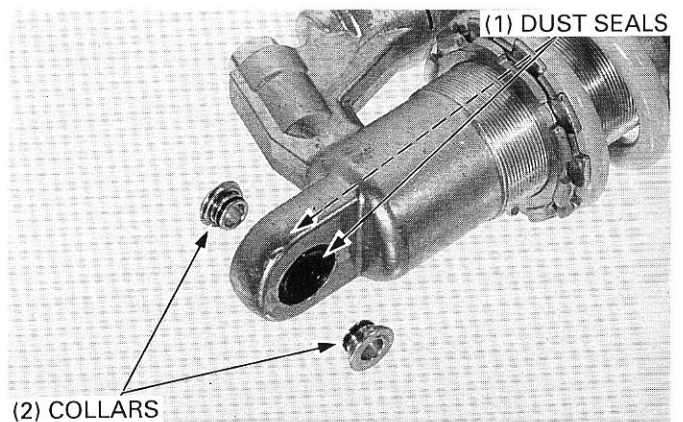
Hold the adjusting nut and tighten the lock nut.

Use this standard spring length just as a base line. See the owner's manual for detailed instructions on adjusting preload and damping settings for rider weight and setting damping for riding conditions and rider skill.



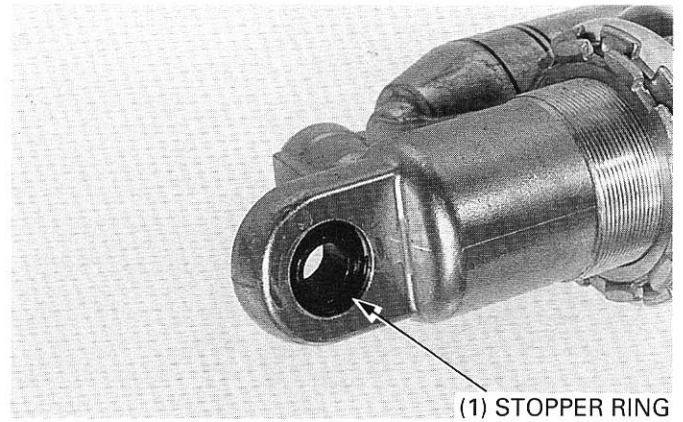
## SPHERICAL BEARING REPLACEMENT

Remove the collars and dust seals.





Remove the stop ring.

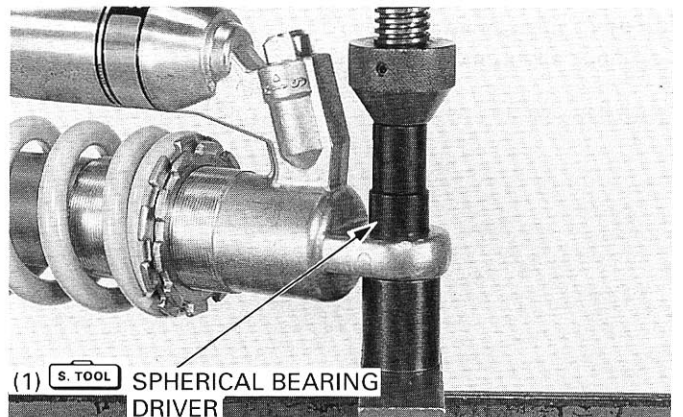


Remove the spherical bearing with using the special tool and a hydraulic press.

**TOOL:**

**Spherical bearing driver  
Assembly collar**

07HMF - KS60100 or  
07965 - GM00100 or  
07965 - VM00100  
(U.S.A. only)

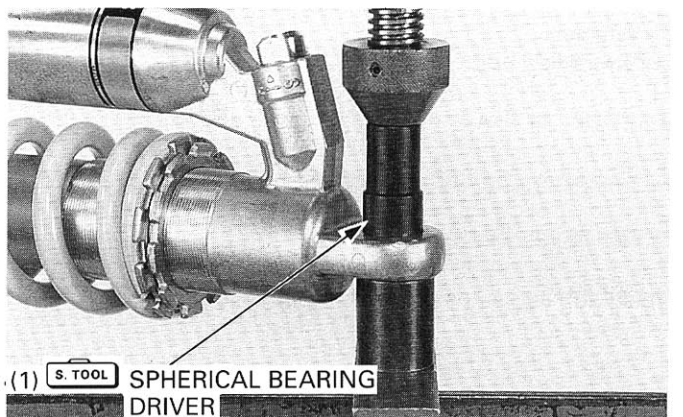


Apply grease to the new spherical bearing.  
Install the stop ring into the groove of the upper mount securely.  
Press the spherical bearing into the upper mount until it seats against the stop ring end, using the special tool and a hydraulic press.

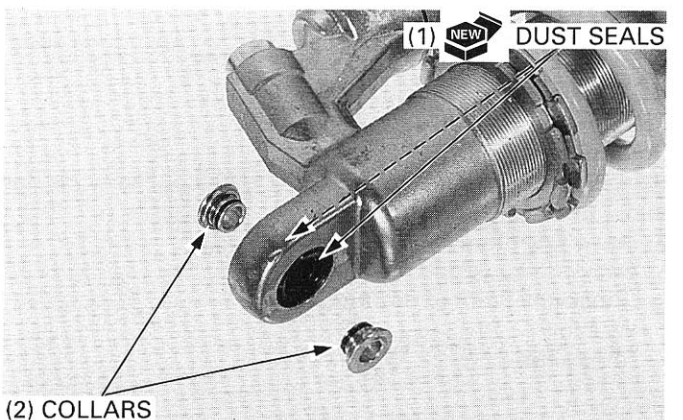
**TOOL:**

**Spherical bearing driver  
Assembly collar**

07HMF - KS60100 or  
07965 - GM00100 or  
07965 - VM00100  
(U.S.A. only)



Install new dust seals.  
Install the collars.





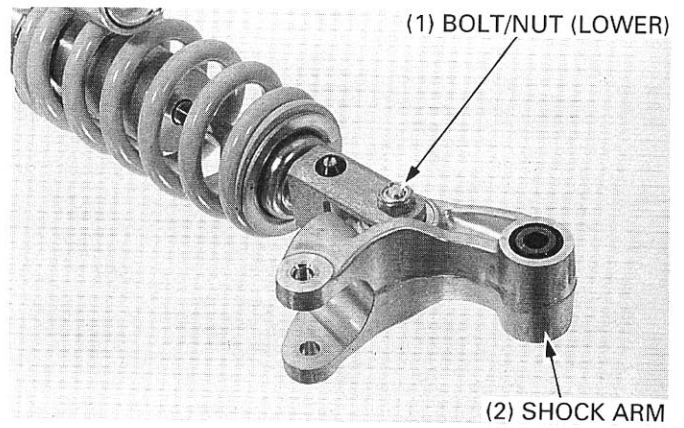
## REAR WHEEL/SUSPENSION

### INSTALLATION

Install the following:

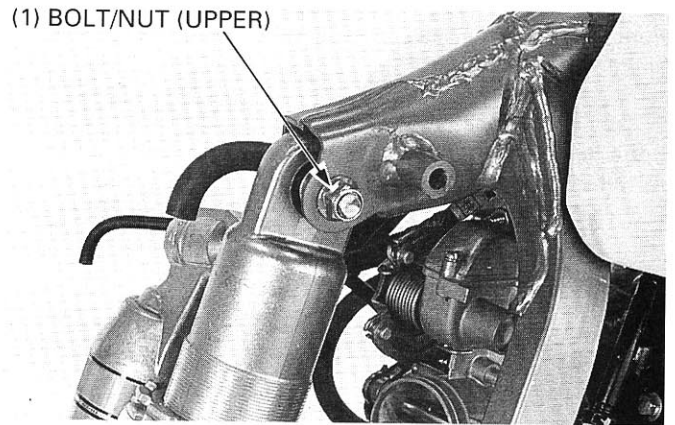
- Shock arm
- Shock absorber bolt/nut (lower)

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



- Shock absorber/shock arm
- Shock absorber bolt/nut (upper)

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



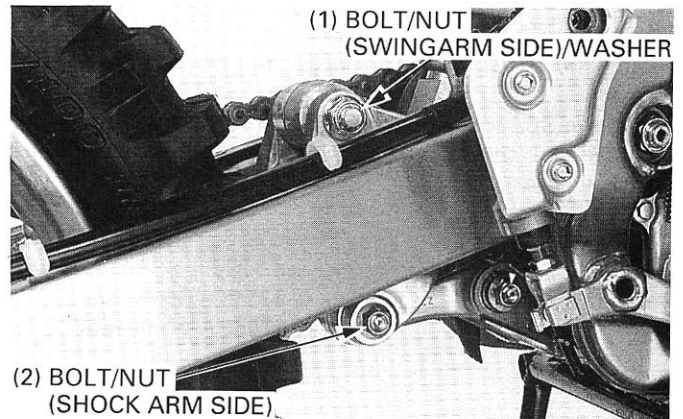
- Washer
- Shock link bolt/nut (shock arm side)

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

- Shock arm bolt/nut (swingarm side)

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

Install the air cleaner housing (page 5-4).



## SHOCK LINKAGE

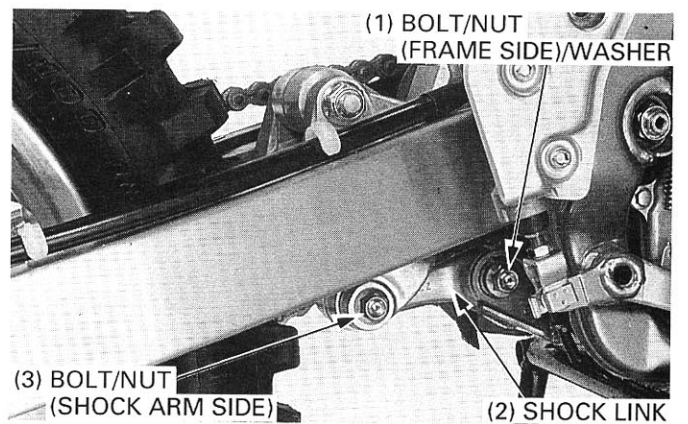
### REMOVAL

#### Shock link

Raise the rear wheel off the ground with a box or work stand under the engine.

Remove the following:

- Shock link bolt/nut (shock arm side)
- Shock link bolt/nut (frame side)
- Washer
- Shock link

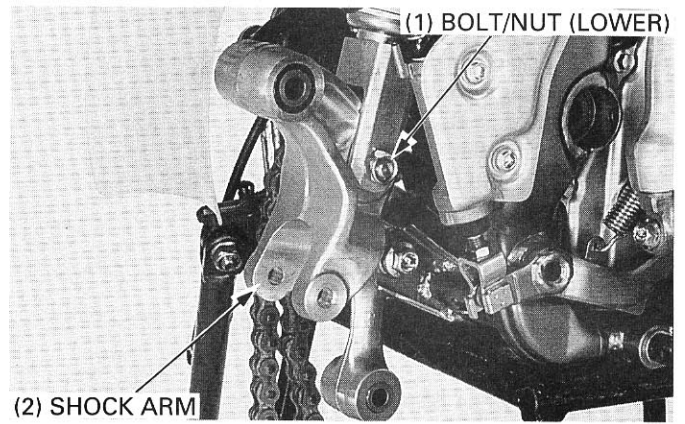


**Shock arm**

Raise the rear wheel off the ground with a box or work stand under the engine.

Remove the following:

- Swingarm (page 14-28)
- Shock absorber bolt/nut (lower)
- Shock arm

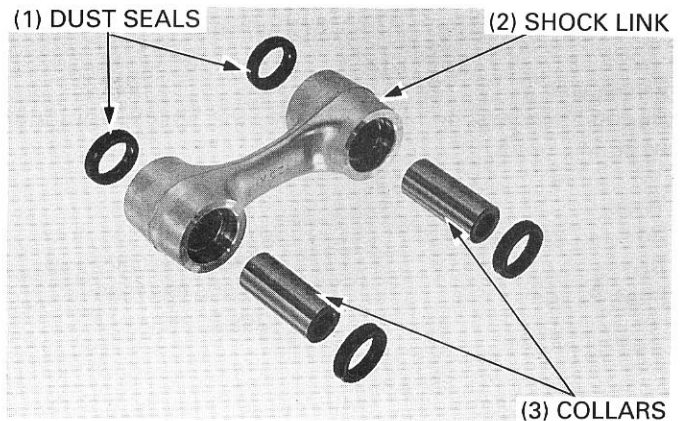


**DISASSEMBLY**

**Shock link**

Remove the following:

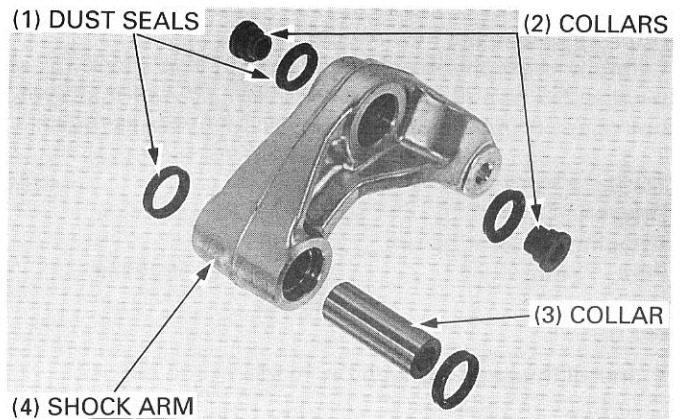
- Dust seals
- Collars
- Shock link



**Shock arm**

Remove the following:

- Dust seals
- Collar
- Spherical bearing collars
- Shock arm



**INSPECTION**

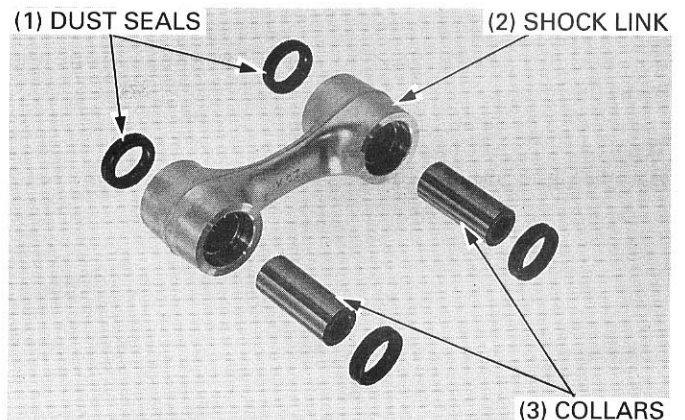
**Shock link**

Shock link crack or damage → Replace

Dust seal wear or damage → Replace

Collar damage → Replace

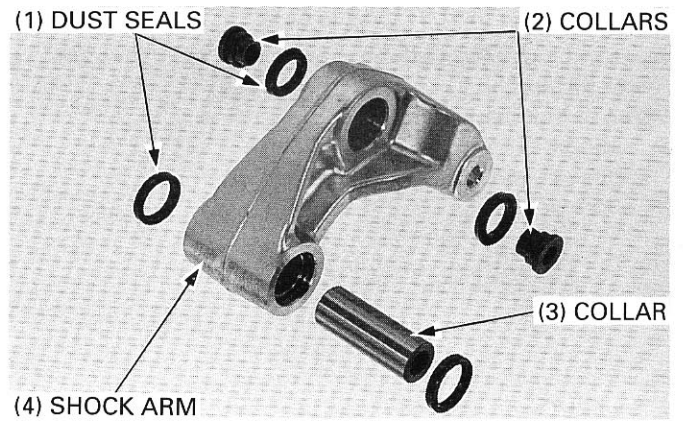
Needle bearing damage → Replace



## REAR WHEEL/SUSPENSION

### Shock arm

Shock arm crack or damage → Replace  
 Dust seal wear or damage → Replace  
 Collar damage → Replace  
 Needle bearing damage → Replace  
 Spherical bearing damage → Replace  
 Spherical bearing collar damage → Replace



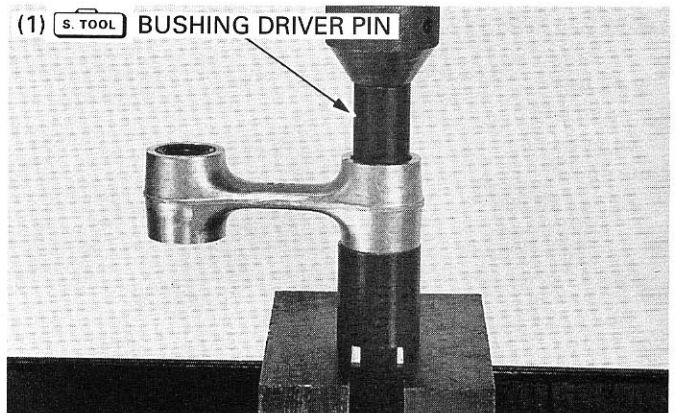
### NEEDLE BEARING REPLACEMENT

#### Shock link

Remove the needle bearing using the special tool and a hydraulic press.

#### TOOL:

**Bushing driver pin** 07GMD – KT80100 or  
**Driver** 07949 – 3710001 and  
**Pilot, 22 mm** 07746 – 0041000  
 (U.S.A. only)



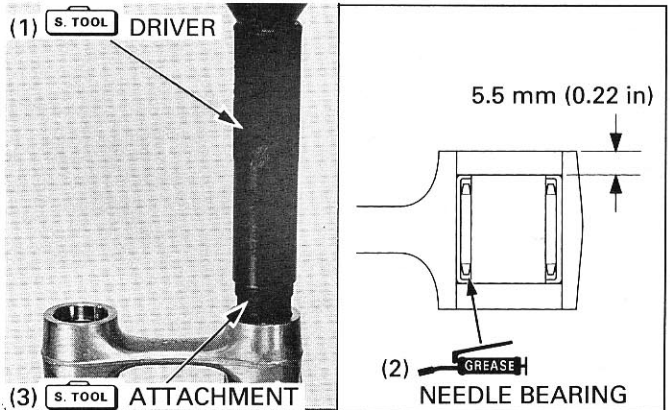
Apply grease to the new needle bearing.  
 Carefully press the needle bearings into the shock link side pivot to 5.5 mm (0.22 in) below the surface of the pivot on both sides using the special tools and a hydraulic press.

#### TOOL:

**Driver** 07749 – 0010000  
**Attachment, 24 x 26 mm** 07746 – 0010700  
**Pilot, 17 mm** 07746 – 0040400

#### NOTE

- Install the bearings with the marks facing out.

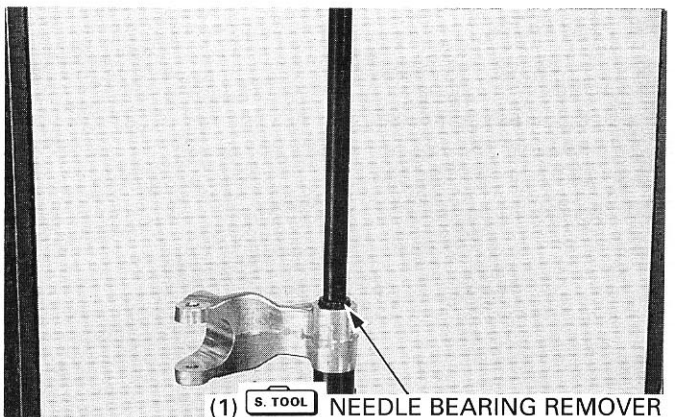


### Shock arm

Remove the needle bearing using the special tool and a hydraulic press.

#### TOOL:

**Needle bearing remover** 07946 – KA50000





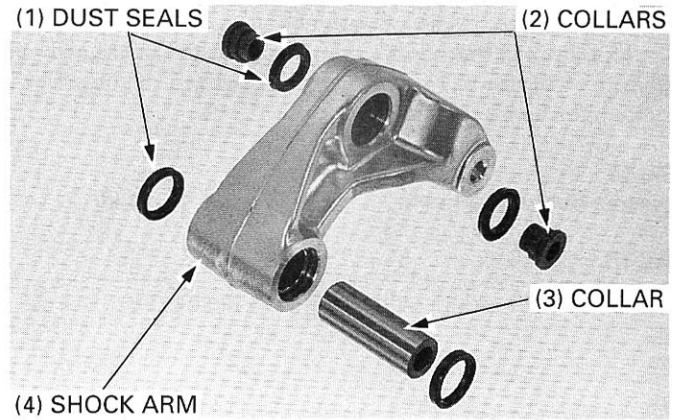


## REAR WHEEL/SUSPENSION

### Shock arm

Assemble the following:

- Shock arm
- Spherical bearing collars
- Collar
- Dust seals



### INSTALLATION

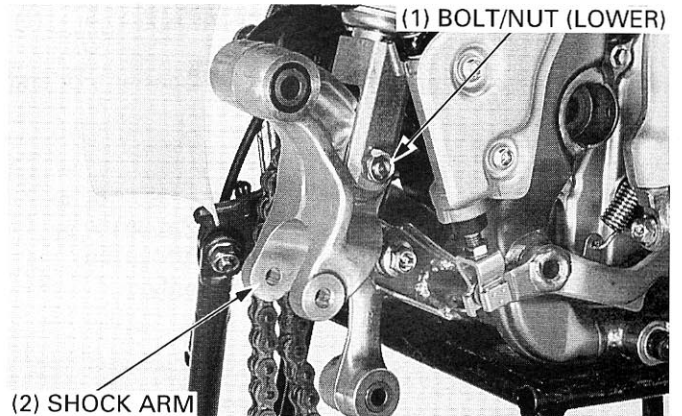
#### Shock arm

Install the following:

- Shock arm
- Shock absorber bolt/nut (lower)

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

- Swingarm (page 14-33)



#### Shock link

Apply grease to the shock link nut (frame side) threads.

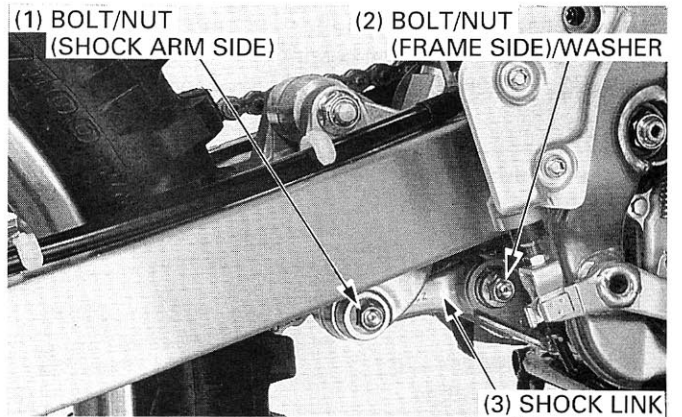
Install the following:

- Shock link
- Shock link bolt (frame side)
- Washer
- Nut

**TORQUE: 49 N·m (5.0 kgf·m, 36 lbf·ft)**

- Shock link bolt/nut (shock arm side)

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

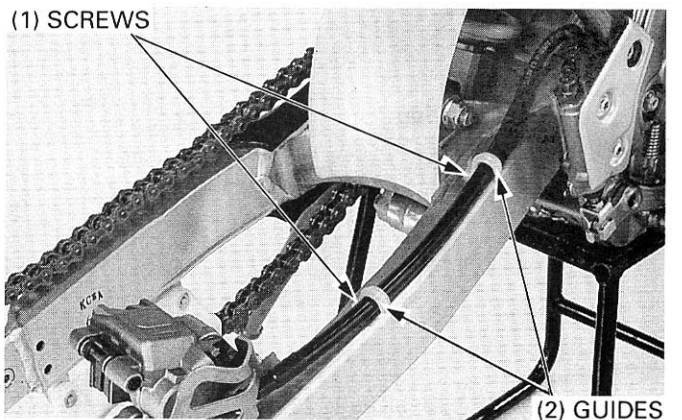


## SWINGARM

### REMOVAL

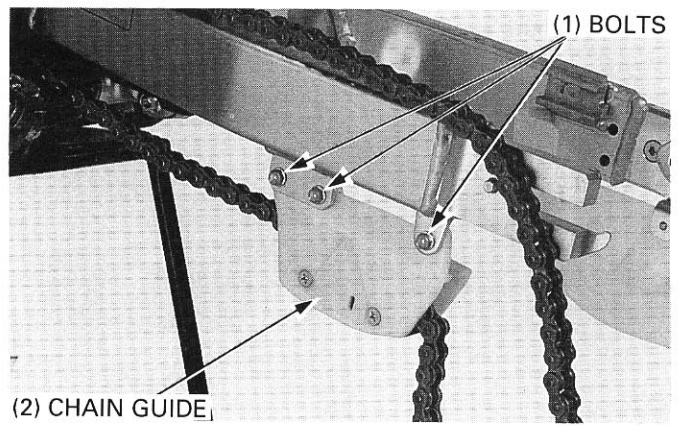
Remove the following:

- Rear wheel (page 14-3)
- Screws
- Brake hose guides

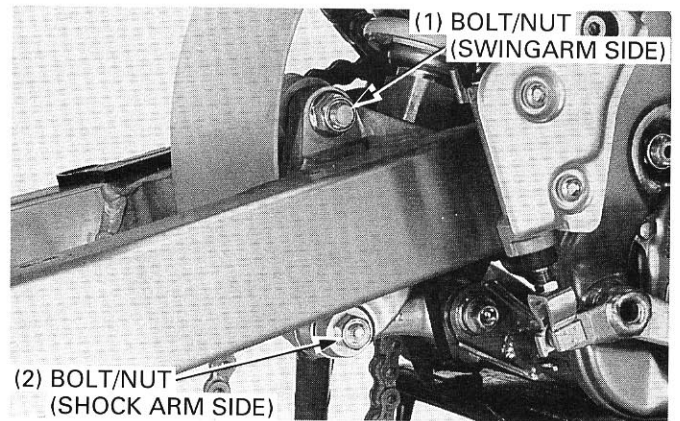




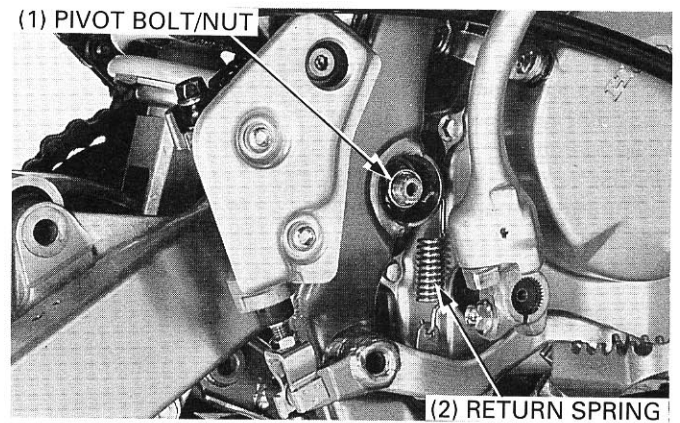
- Chain guide bolts
- Chain guide



- Shock link bolt/nut (shock arm side)
- Shock arm bolt/nut (swingarm side)



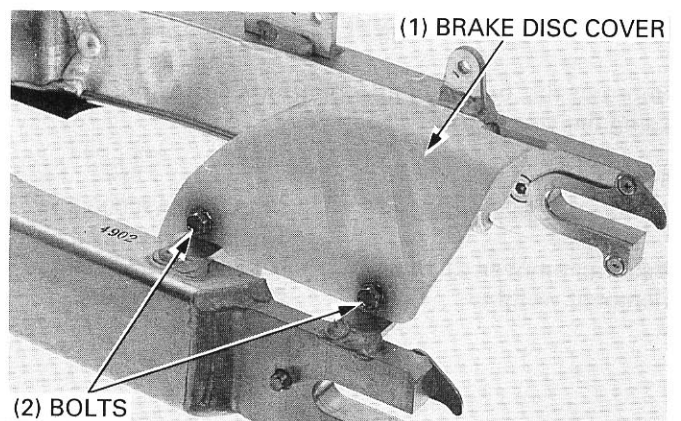
- Brake pedal return spring
- Swingarm pivot bolt/nut
- Swingarm



**DISASSEMBLY**

Remove the following:

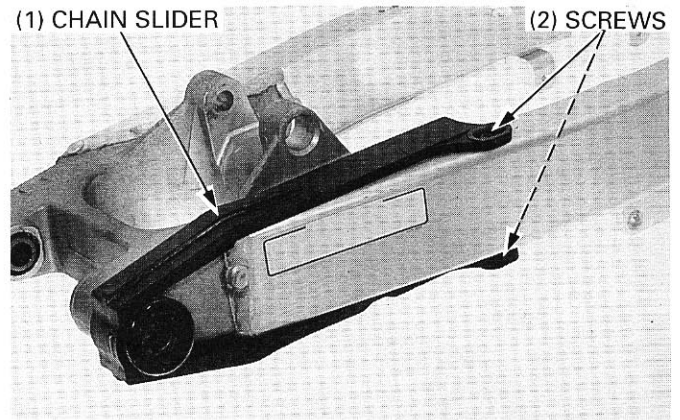
- Bolts
- Brake disc cover



## REAR WHEEL/SUSPENSION

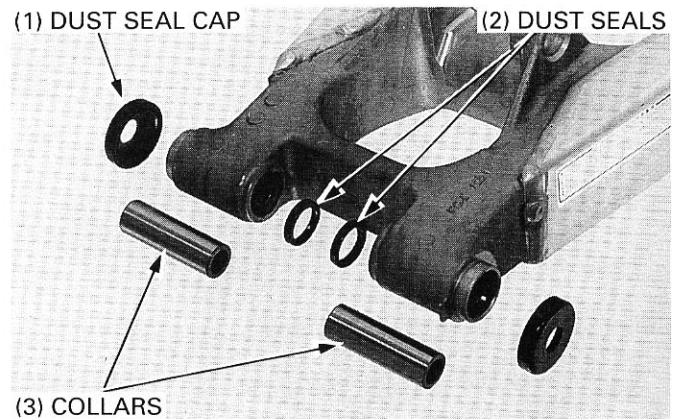
- Chain slider screws
- Chain slider

Inspect the chain slider and replace if excessive worn or damaged.



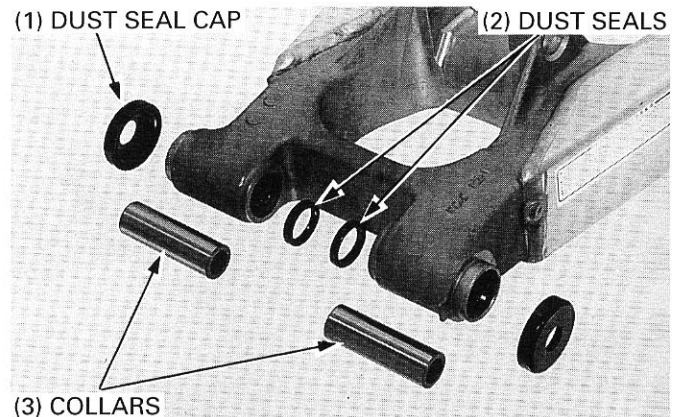
Remove the following:

- Dust seal caps
- Dust seals
- Collars



## INSPECTION

- Dust seal cap damage → Replace
- Dust seal damage → Replace
- Collar damage → Replace
- Needle bearing damage → Replace
- Swingarm damage → Replace



## NEEDLE BEARING REPLACEMENT

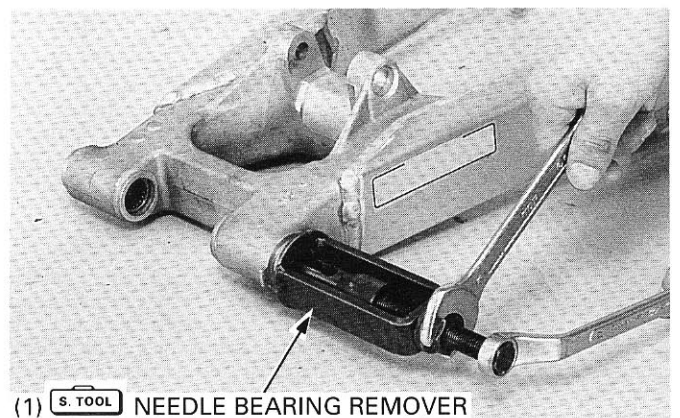
Remove the outer needle bearings from the swingarm using the special tool.

### TOOL:

Needle bearing remover

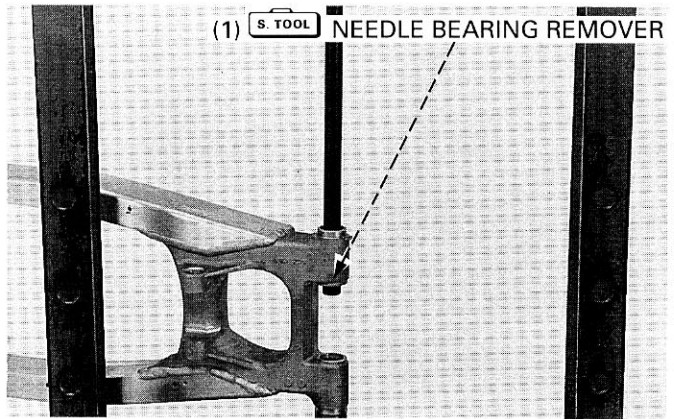
07931 – MA70000 (not available in U.S.A.) or  
07936 – 3710600 and  
07936 – 3710200

Bearing remover, 20 mm  
Remover weight



Remove the inner needle bearings from the swingarm using the special tool and a hydraulic press.

**TOOL:**  
**Needle bearing remover**                    **07946 – KA50000**

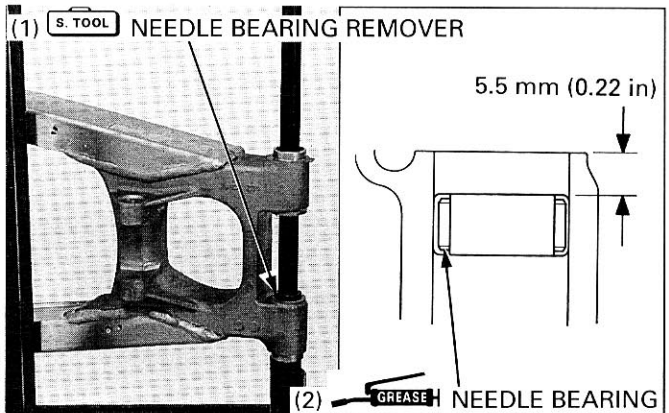


Apply grease to the new needle bearings. Carefully press the inner needle bearings into the shock arm side pivot to 5.5 mm (0.22 in) below the surface of the pivot on both sides.

**TOOL:**  
**Needle bearing remover**                    **07946 – KA50000**

**NOTE**

- Install the bearing with the marks facing out.

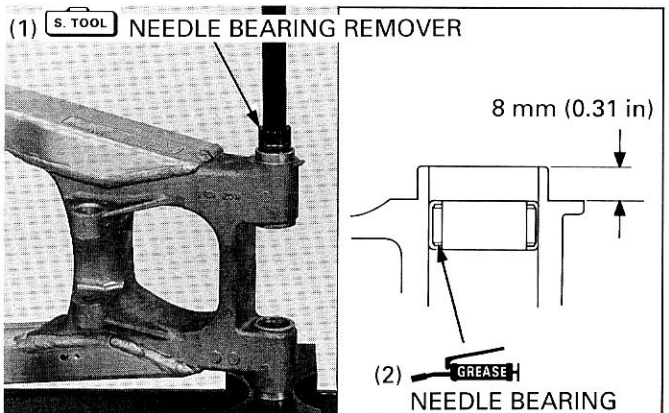


Apply grease to the new needle bearings. Carefully press the outer needle bearings into the frame side of the pivot to 8.0 mm (0.31 in) below the surface of the pivot on both sides.

**TOOL:**  
**Needle bearing remover**                    **07946 – KA50000**

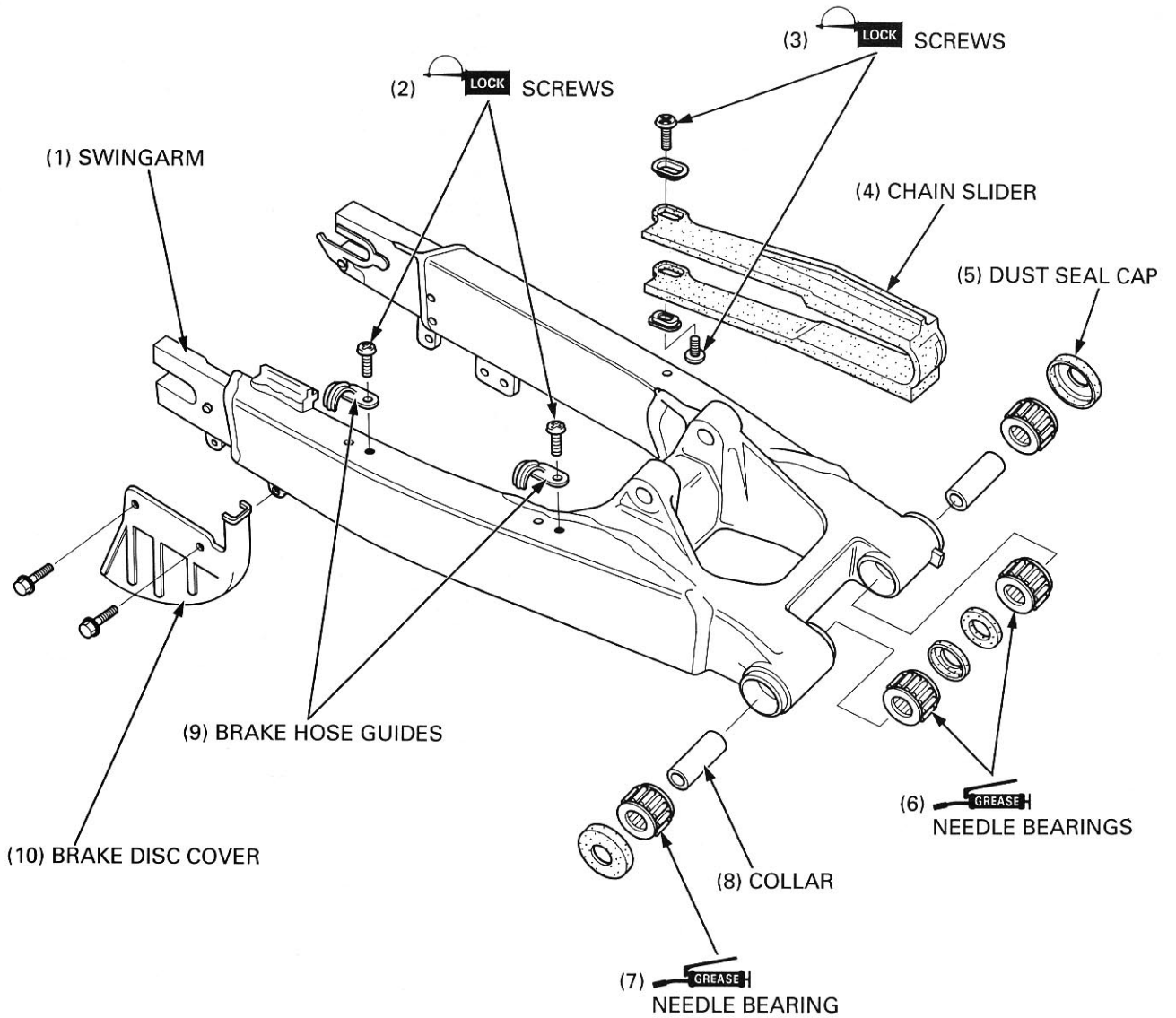
**NOTE**

- Install the bearings with the marks facing out.



# REAR WHEEL/SUSPENSION

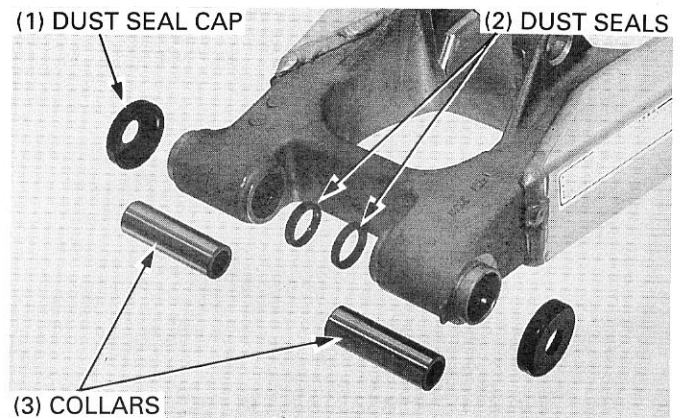
## ASSEMBLY



Apply grease to the dust seal lip and dust seal cap lip.

Install the following:

- Collars
- Dust seals
- Dust seal caps



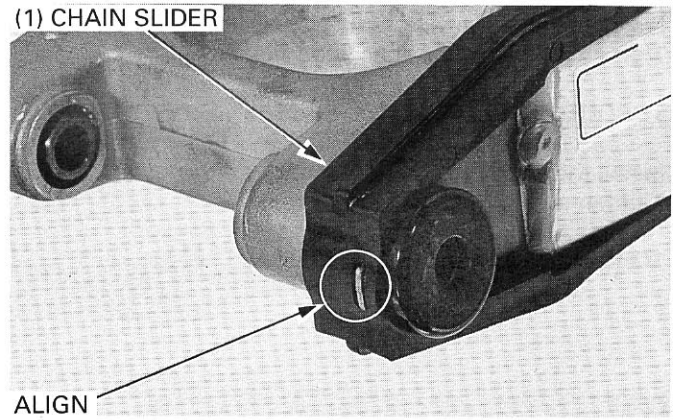


Install the following:

- Drive chain slider

**NOTE**

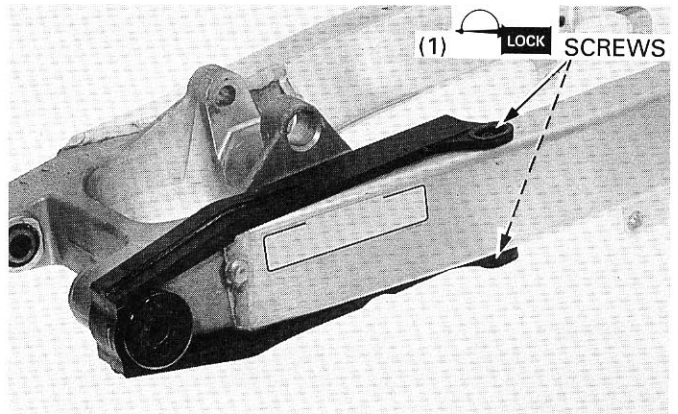
- Align the chain slider hole with the tang on the swingarm.



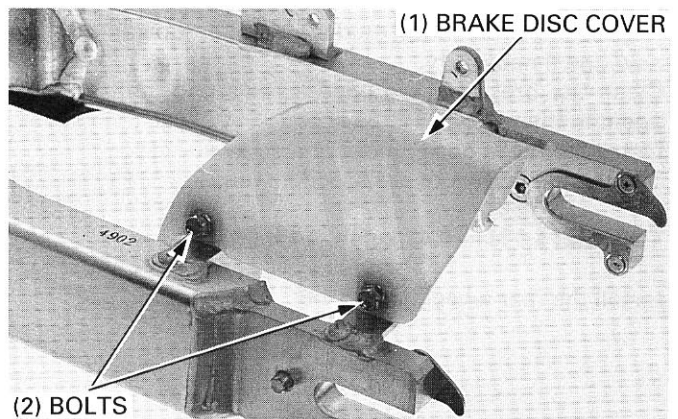
- Drive chain slider screws

**NOTE**

- Clean the screws and apply locking agent to the them.



- Brake disc cover
- Bolts



**INSTALLATION**

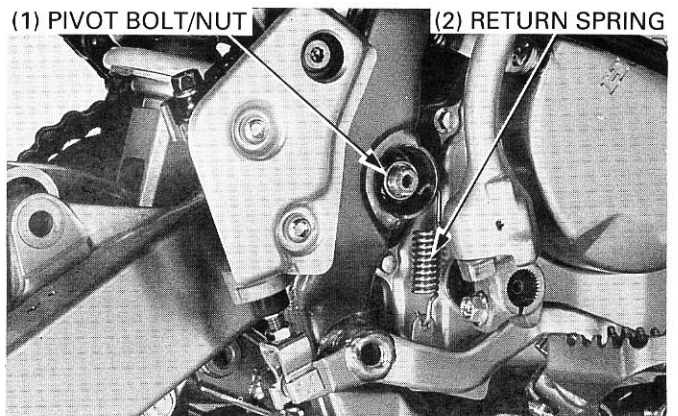
Apply a thin coat of grease to the swingarm pivot bolt sliding surface.

Install the swingarm and pivot bolt.

Install and tighten the pivot nut.

**TORQUE: 88 N·m (9.0 kgf·m, 65 lbf·ft)**

Install the brake pedal return spring.





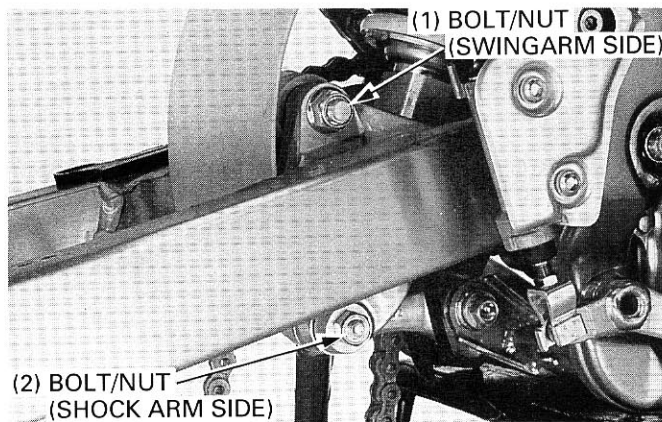
## REAR WHEEL/SUSPENSION

Install the shock arm bolt/nut (swingarm side).  
Tighten the nut to the specified torque.

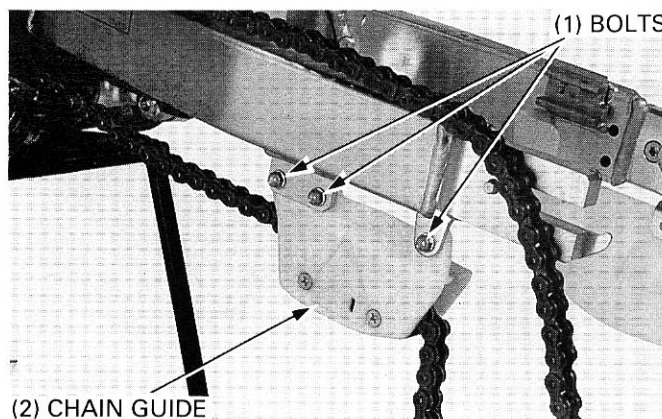
**TORQUE: 69 N·m (7.0 kgf·m, 51 lbf·ft)**

Install the shock link bolt/nut (shock arm side).  
Tighten the nut to the specified torque.

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



Install the drive chain guide.  
Install and tighten the bolts.



Inspect the brake hose guides damage and replace with a new one if necessary.

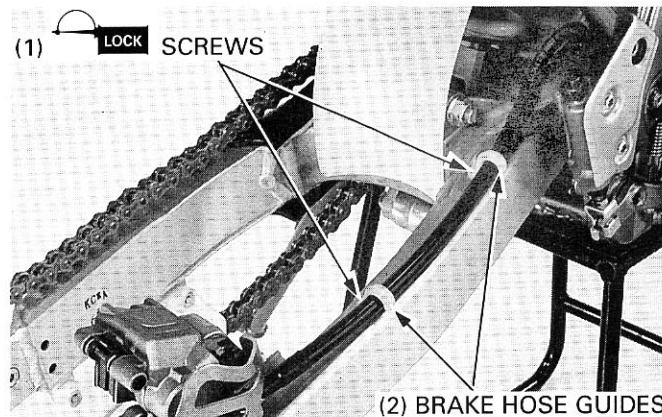
Clean the brake hose guides screws and apply a locking agent to them.

Install the brake hose guides and screws.

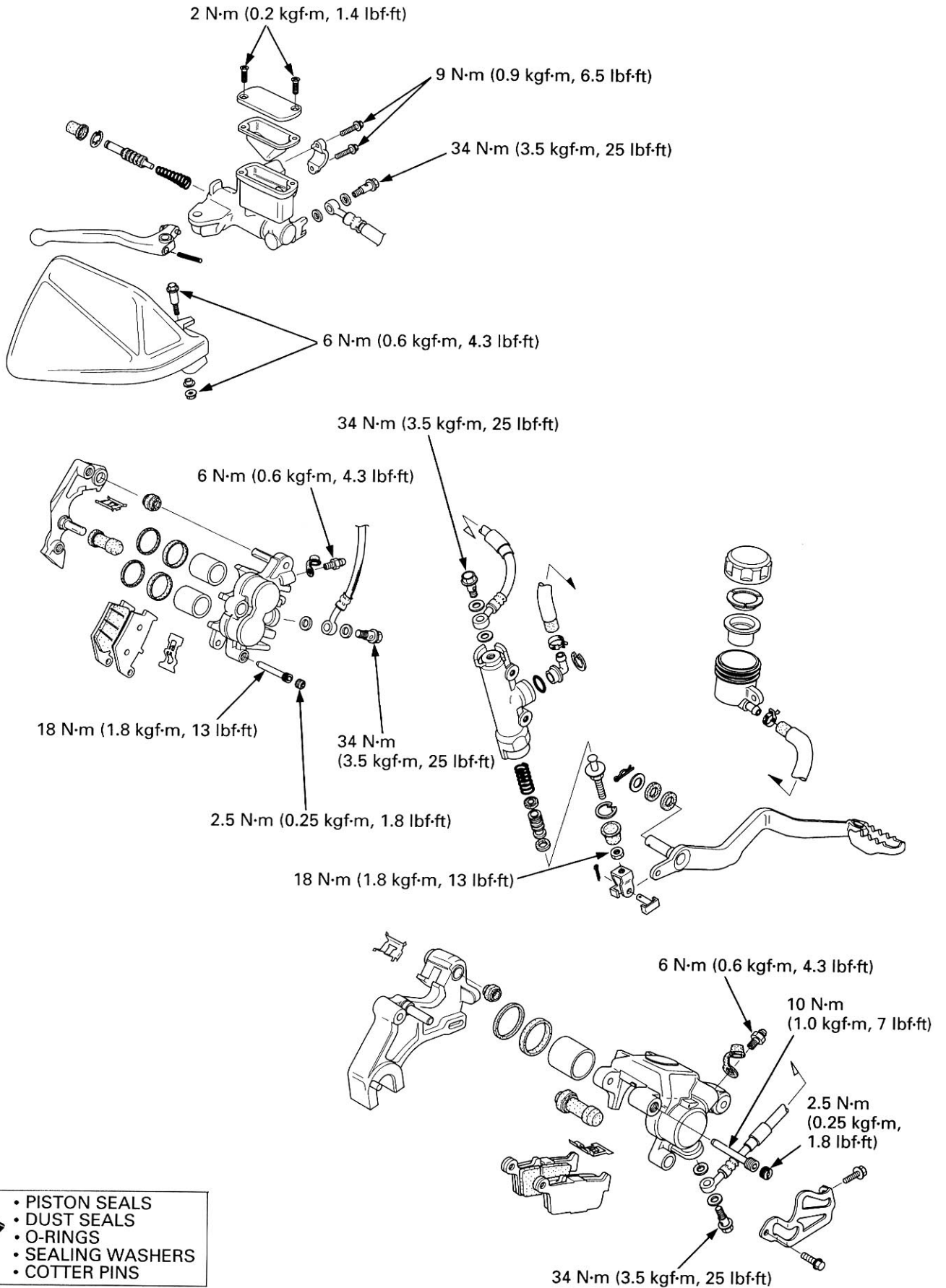
Tighten the screws to the specified torque.

**TORQUE: 4.3 Nm (0.43 kgf·m, 3.1 lbf·ft)**

Install the rear wheel (page 14-8).



# BRAKE SYSTEM



# 15. BRAKE SYSTEM

<b>SERVICE INFORMATION</b>	<b>15-1</b>	<b>FRONT MASTER CYLINDER</b>	<b>15-12</b>
<b>TROUBLESHOOTING</b>	<b>15-2</b>	<b>REAR BRAKE CALIPER</b>	<b>15-16</b>
<b>BRAKE FLUID REPLACEMENT/ AIR BLEEDING</b>	<b>15-3</b>	<b>REAR MASTER CYLINDER</b>	<b>15-21</b>
<b>BRAKE PAD REPLACEMENT</b>	<b>15-5</b>	<b>BRAKE LEVER</b>	<b>15-25</b>
<b>FRONT BRAKE CALIPER</b>	<b>15-7</b>	<b>BRAKE PEDAL</b>	<b>15-26</b>

## SERVICE INFORMATION

### GENERAL

- Keep grease off of brake pads and disc.

#### ⚠ WARNING

- *A contaminated brake disc or pads reduce stopping power. Discard contaminated pads and clean a contaminated disc with Pro Honda Contact/Brake Cleaner or an equivalent high quality brake degreasing agent.*

- Bleed the hydraulic system if it has been disassembled or if the brake feels spongy.
- Do not allow foreign material to enter the system when filling the reservoir.
- Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag or shop towel over these parts whenever the system is serviced.
- Do not mix different types of fluid since they are not compatible.

### CAUTION

- *Spilling fluid on painted, plastic or rubber parts will damage them. Place a clean shop towel over these parts whenever the system is serviced.*
- **KEEP BRAKE FLUID OUT OF REACH OR CHILDREN.**

- Always check brake operation before riding the motorcycle.

## SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Specified brake fluid		DOT 4 brake fluid	—
Brake pad wear		—	To the groove
Brake disc thickness	FR	3.0 (0.12)	2.5 (0.10)
	RR	4.5 (0.18)	4.0 (0.16)
Brake disc runout		—	0.25 (0.010)
Master cylinder I.D.	FR	11.000 – 11.043 (0.4331 – 0.4348)	11.05 (0.435)
	RR	14.000 – 14.043 (0.5512 – 0.5529)	14.06 (0.554)
Master piston O.D.	FR	10.957 – 10.984 (0.4314 – 0.4324)	10.84 (0.427)
	RR	13.957 – 13.984 (0.5495 – 0.5506)	13.95 (0.549)
Caliper cylinder I.D.	FR	27.000 – 27.050 (1.0630 – 1.0650)	27.06 (1.065)
	RR	27.000 – 27.050 (1.0630 – 1.0650)	27.06 (1.065)
Caliper piston O.D.	FR	26.900 – 26.950 (1.0591 – 1.0610)	26.89 (1.059)
	RR	26.935 – 26.968 (1.0604 – 1.0617)	26.89 (1.059)

## BRAKE SYSTEM

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### TORQUE VALUES

Front master cylinder holder bolt	9 N·m (0.9 kgf·m, 6.5 lbf·ft)	
Front reservoir tank cover screw	2 N·m (0.2 kgf·m, 1.4 lbf·ft)	
Front brake lever pivot bolt	6 N·m (0.6 kgf·m, 4.3 lbf·ft)	
nut	6 N·m (0.6 kgf·m, 4.3 lbf·ft)	
Front brake caliper pad pin	18 N·m (1.8 kgf·m, 13 lbf·ft)	
Front brake caliper pin bolt A	23 N·m (2.3 kgf·m, 17 lbf·ft)	Apply a locking agent to the threads.
B	13 N·m (1.3 kgf·m, 9 lbf·ft)	Apply a locking agent to the threads.
Front brake caliper bracket bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	Apply a locking agent to the threads.
Rear brake master cylinder holder bolt	14 N·m (1.4 kgf·m, 10 lbf·ft)	Apply a locking agent to the threads.
Push rod lock nut	18 N·m (1.8 kgf·m, 13 lbf·ft)	
Rear brake caliper pad pin	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Rear brake caliper pin bolt	27 N·m (2.8 kgf·m, 20 lbf·ft)	
Rear brake caliper bracket pin bolt	13 N·m (1.3 kgf·m, 9 lbf·ft)	Apply a locking agent to the threads.
Rear brake hose guide screw	4.3 N·m (0.43 kgf·m, 3.1 lbf·ft)	Apply a locking agent to the threads.
Pad pin plug	2.5 N·m (0.25 kgf·m, 1.8 lbf·ft)	
Bleed valve	6 N·m (0.6 kgf·m, 4.3 lbf·ft)	
Brake hose bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)	

### TOOLS

#### Special

Snap ring pliers 07914 – 3230001

## TROUBLESHOOTING

#### Brake lever (pedal) soft or spongy

- Air bubbles in the hydraulic system
- Leaking hydraulic system
- Contaminated brake pads/disc
- Worn caliper piston seal
- Worn master cylinder piston seal
- Worn brake pads/disc
- Contaminated caliper
- Caliper not sliding properly
- Contaminated brake pads/disc
- Low fluid level
- Clogged fluid passage
- Warped/deformed brake disc
- Sticking/worn caliper piston
- Sticking/worn master cylinder piston
- Contaminated master cylinder
- Bent brake lever

#### Brake lever (pedal) hard

- Clogged/restricted brake system
- Sticking/worn caliper piston
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Worn caliper piston seal
- Sticking/worn master cylinder piston
- Bent brake lever

#### Brake drag

- Contaminated brake pads/disc
- Misaligned wheel
- Worn brake pads/disc
- Warped/deformed brake disc
- Caliper not sliding properly

## BRAKE FLUID REPLACEMENT/ AIR BLEEDING

### BRAKE FLUID REPLACEMENT

#### Front

Turn the handlebar until the master cylinder is level.  
Remove the screws, reservoir cover and diaphragm.

#### Rear

Remove the reservoir tank bracket bolt.  
Hold the reservoir level.  
Remove the reservoir cap, diaphragm plate and diaphragm.

#### CAUTION

- Avoid spilling fluid on painted, plastic or rubber parts. Place a shop towel over these parts whenever the system is serviced.
- Do not mix different types of fluid since they are not compatible.
- Do not mix brake fluid types and never reuse the contaminated fluid which has been pumped out during brake bleeding, because this will impair the efficiency of the brake system.

Connect a bleed hose to the bleed valve.  
Loosen the caliper bleed valve and pump the brake lever or pedal.  
Stop operating the brake when fluid stops flowing out of the bleed valve.  
Tighten the bleed valve.

#### ⚠ WARNING

- A contaminated brake disc or pads reduce stopping power. Discard contaminated pads and clean a contaminated disc with Pro Honda Contact/Brake Cleaner or an equivalent high quality brake degreasing agent.

#### Front

Fill the master cylinder reservoir with DOT4 brake fluid from a sealed container to the top of the casting ledge.

#### Rear

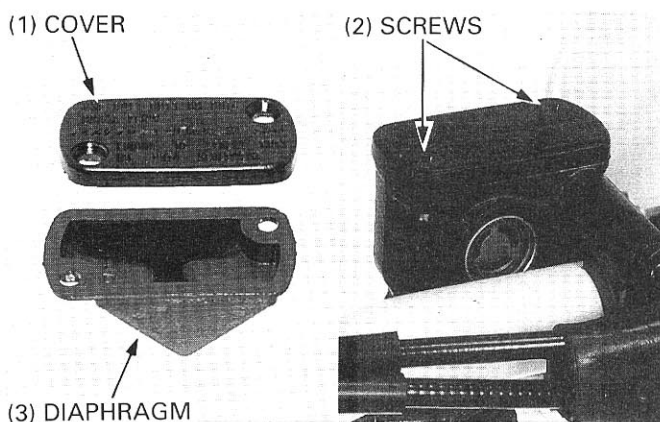
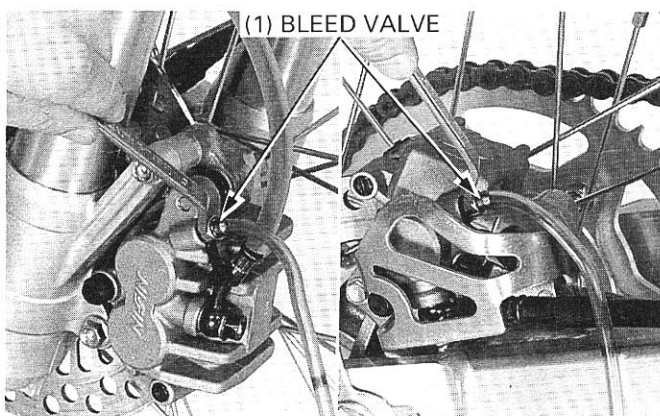
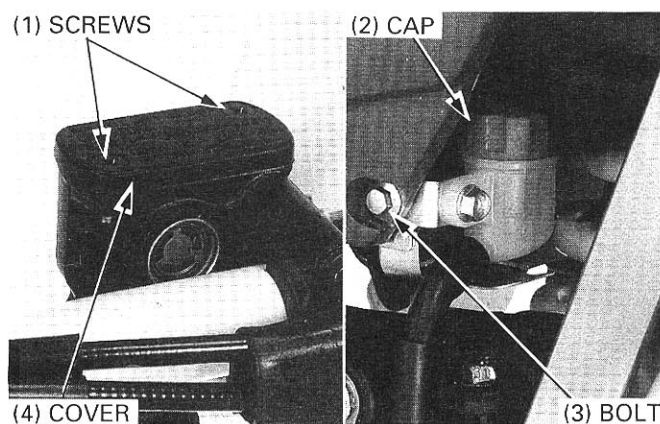
Fill the reservoir to the upper level line with DOT4 brake fluid from a sealed container.

Bleed the brake system (page 15-4).

#### Front

Install the diaphragm and reservoir cover.  
Install and tighten the screws.

**TORQUE: 2 N·m (0.2 kgf·m, 1.4 lbf·ft)**

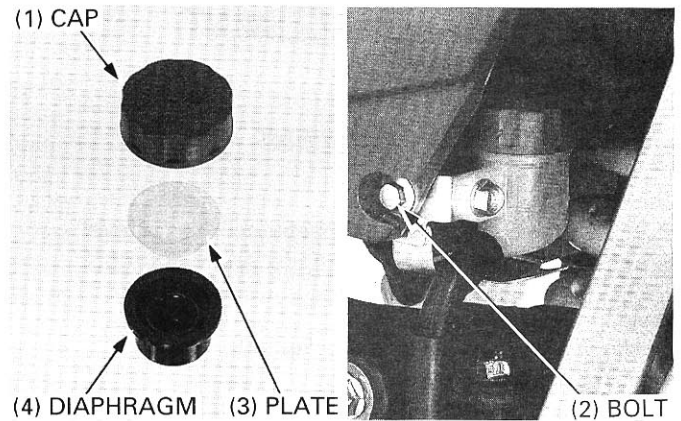




## BRAKE SYSTEM

### Rear

Install the diaphragm, diaphragm plate and reservoir cap.  
Install the reservoir tank and bolt.  
Tighten the bolt securely.



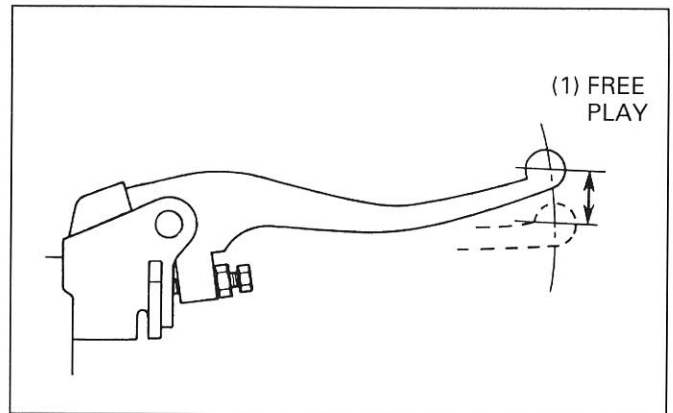
### AIR BLEEDING

Bleed the brake system for any of the following reasons:

- Replaced master cylinder, brake hose or brake caliper.
- Brake lever free play exceeds 30 mm (1.2 in)
- Brake pedal free play exceeds 30 mm (1.2 in)

### Front

Turn the handlebar until the master cylinder is level.  
Remove the screws, reservoir cover, and diaphragm.  
Fill the master cylinder reservoir with DOT4 brake fluid from a sealed container to the top of the casting ledge.



### Rear

Remove the reservoir tank mounting bolt.  
Hold the reservoir level.  
Remove the reservoir cap, diaphragm plate and diaphragm.  
Fill the reservoir to the upper level line with DOT4 brake fluid from a sealed container.

Connect the Mityvac Brake Bleeder No. 6860 or equivalent to the bleed valve.

### NOTE

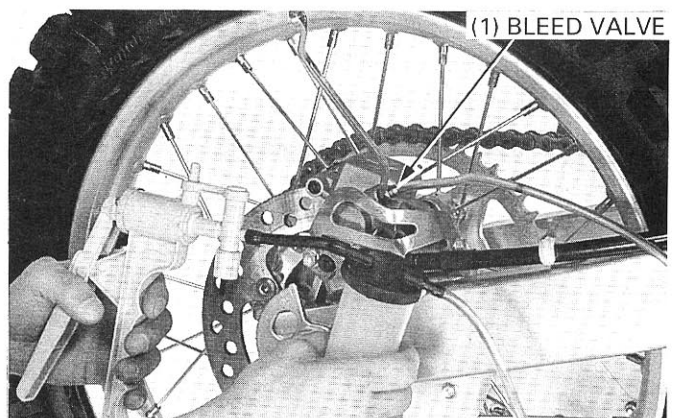
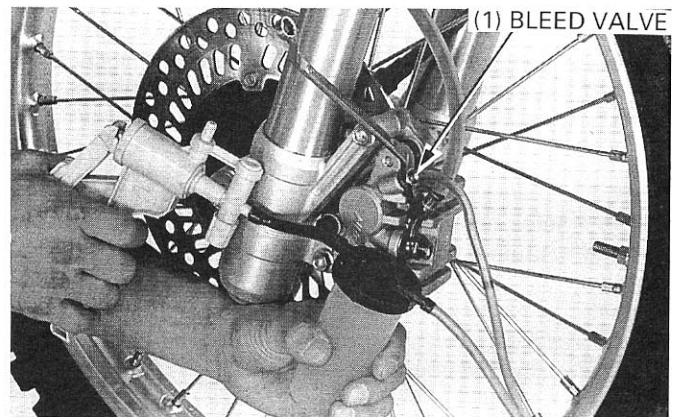
- Check the fluid level often while bleeding the brakes to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.

Pump the brake bleeder and loosen the bleed valve. Add fluid when the fluid level in the master cylinder or reservoir is low, to prevent drawing air into the system. Repeat the above procedures until no air bubbles appear in the plastic hose.

### NOTE

- If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

If a brake bleeder is not available, perform the following procedure.



- 1) Attach a clear plastic hose to the bleed valve.
- 2) Operate the brake lever or pedal several times, then open the bleed valve 1/2 turn and close the valve.

**NOTE**

- Do not release the brake lever or pedal until the bleed valve has been closed.

- 3) Release the brake lever or pedal slowly and wait several seconds after it reaches the end of its travel.

- 4) Add fluid when the fluid level in the master cylinder or reservoir is low, to prevent drawing air into the system.

Repeat step 2, 3 and 4 until bubbles cease to appear in the fluid entering the hose.

Tighten the bleed valve to the specified torque.

**TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)**

**Front**

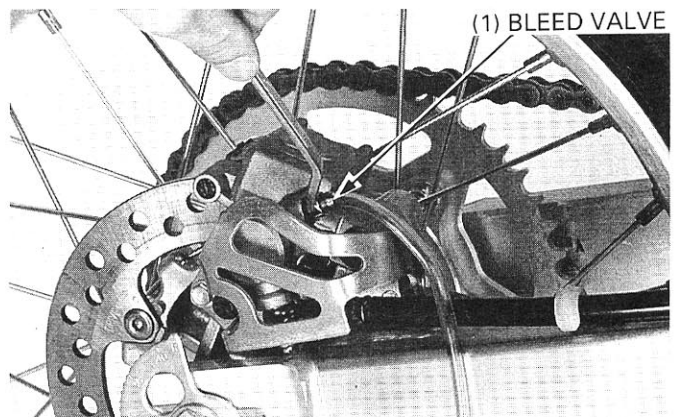
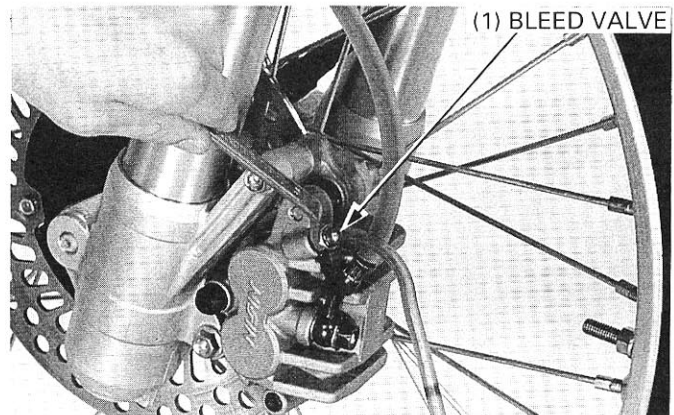
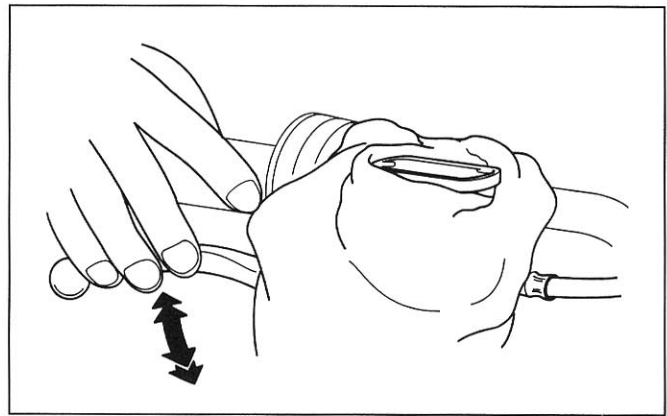
Fill the master cylinder reservoir with DOT4 brake fluid from a sealed container to the top of the casting ledge. Install the diaphragm and master cylinder cover. Tighten the screws securely.

**Rear**

Fill the reservoir to the upper level line with DOT4 brake fluid from a sealed container. Install the diaphragm, diaphragm plate and reservoir cap. Install the reservoir tank and bolt. Tighten the bolt securely.

**▲ WARNING**

- *A contaminated brake disc or pads reduce stopping power. Discard contaminated pads and clean a contaminated disc with Pro Honda Contact/Brake Cleaner or an equivalent high quality brake degreasing agent.*



**BRAKE PAD REPLACEMENT**

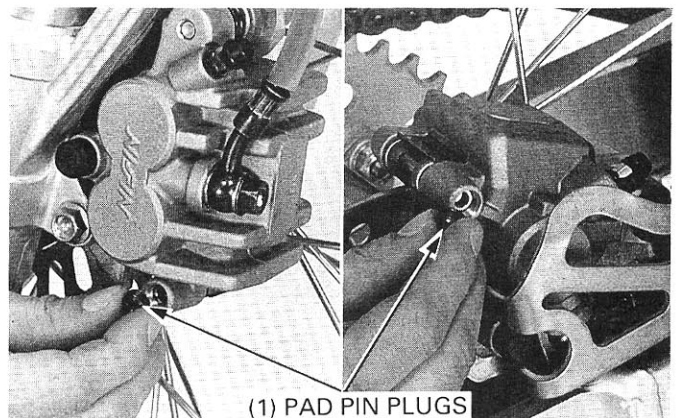
**▲ WARNING**

- *A contaminated brake disc or pads reduce stopping power. Discard contaminated pads and clean a contaminated disc with Pro Honda Contact/Brake Cleaner or an equivalent high quality brake degreasing agent.*

**NOTE**

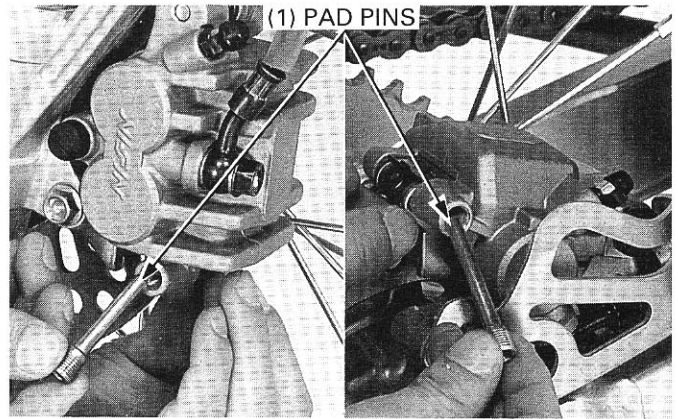
- Always replace the brake pads in pairs to assure even disc pressure.

Remove the pad pin plug.

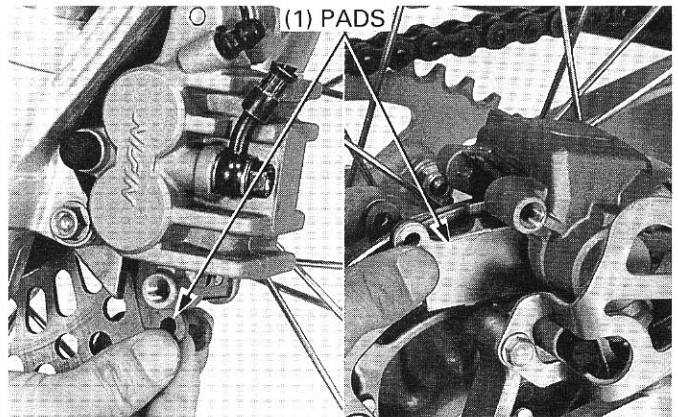


## BRAKE SYSTEM

Remove the pad pin.

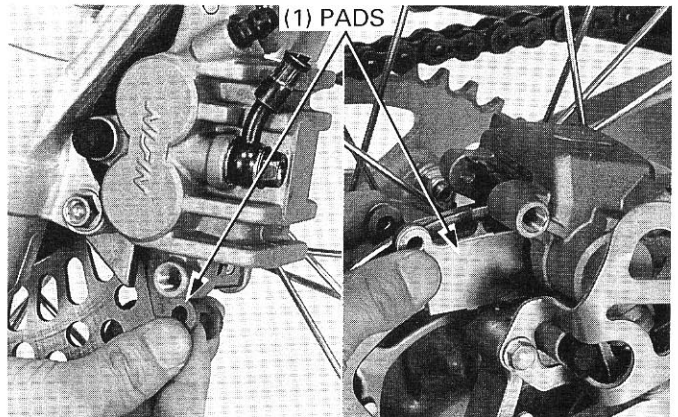


Remove the brake pads.



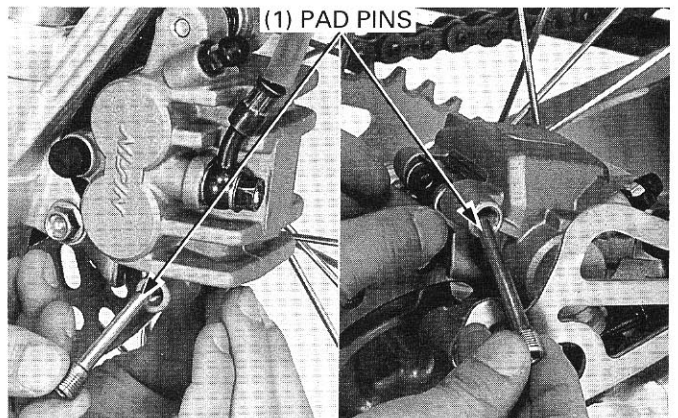
Insert new right side pad and push the caliper piston to allow clearance for that installation of the left side new pad.

Install the left side pad.



Install the pad pin by pushing the pads against the caliper to depress the pad spring.  
Tighten the pad pin to the specified torque.

**TORQUE: Front: 18 N·m (1.8 kgf·m, 13 lbf·ft)**  
**Rear: 10 N·m (1.0 kgf·m, 7 lbf·ft)**

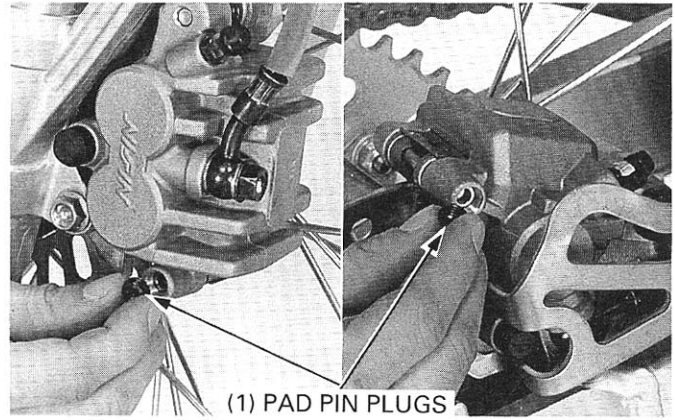


Install and tighten the pad pin plug to the specified torque.

**TORQUE: 2.5 N·m (0.25 kgf·m, 1.8 lbf·ft)**

**⚠ WARNING**

- *Check the brake system by applying the brake lever or pedal after pad replacement.*

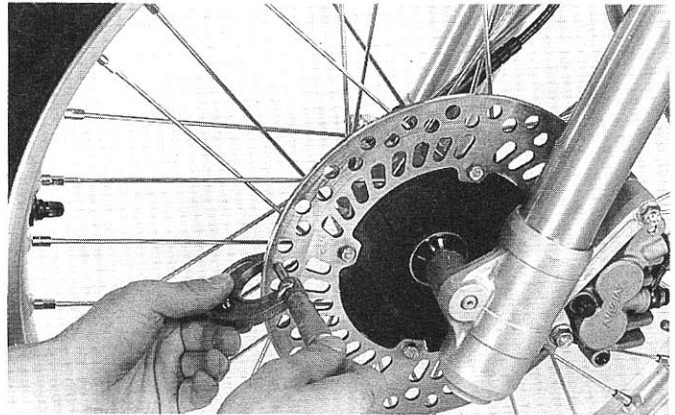


(1) PAD PIN PLUGS

**BRAKE DISC INSPECTION**

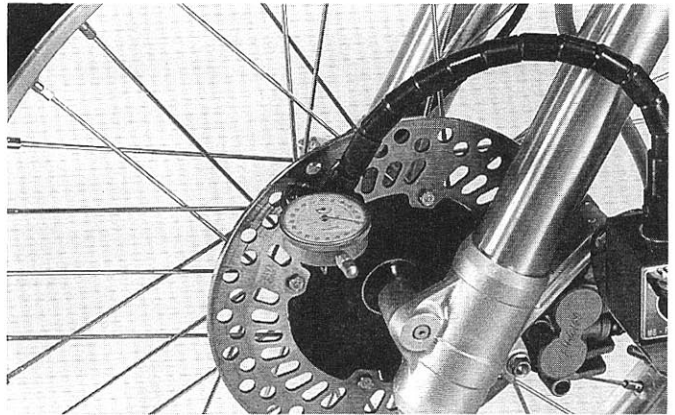
Measure the brake disc thickness.

**SERVICE LIMITS: Front: 2.5 mm (0.10 in)  
Rear: 4.0 mm (0.16 in)**



Measure the brake disc warpage.

**SERVICE LIMIT: 0.25 mm (0.010 in)**

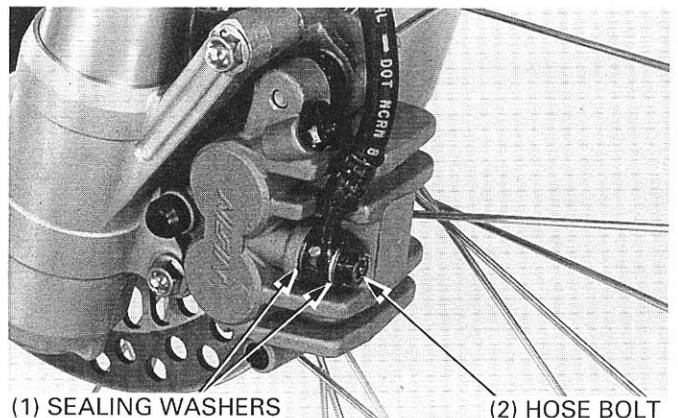


**FRONT BRAKE CALIPER**

**REMOVAL**

**CAUTION**

- *Avoid spilling fluid on painted, plastic or rubber parts. Place a shop towel over these parts whenever the system is serviced.*



(1) SEALING WASHERS

(2) HOSE BOLT

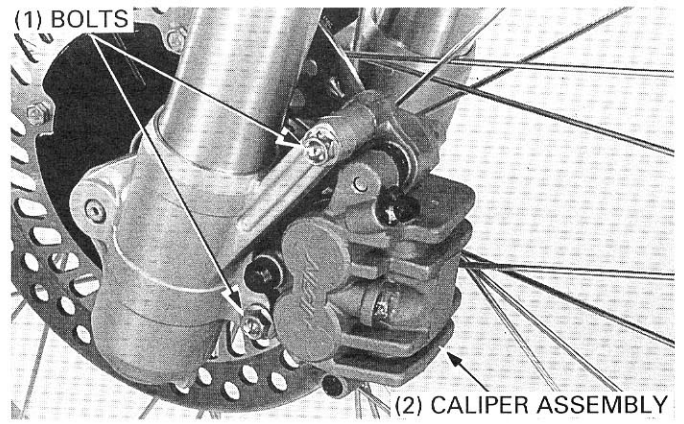


## BRAKE SYSTEM

Drain the brake fluid (page 15-3).

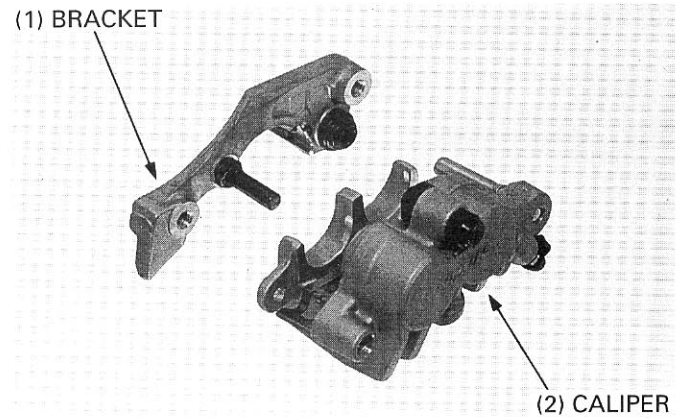
Remove the following:

- Brake hose bolt
- Sealing washers
- Front brake caliper bracket bolts
- Front brake caliper assembly



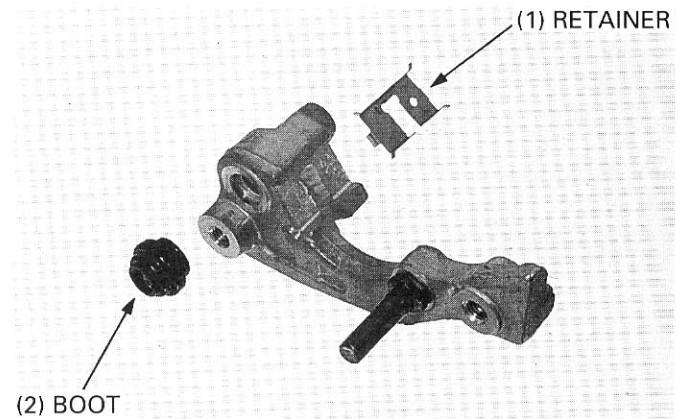
## DISASSEMBLY

Remove the caliper bracket from the caliper.

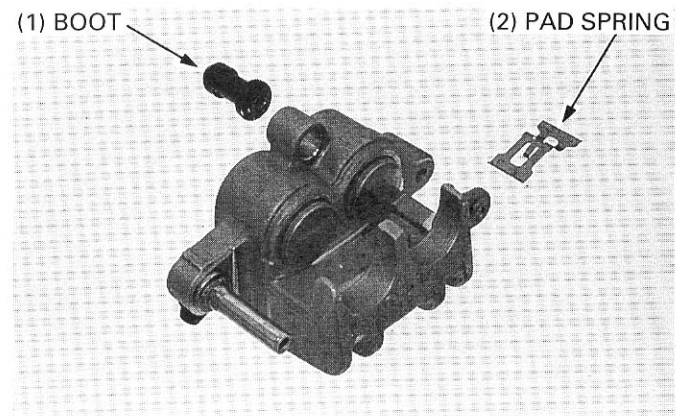


Remove the following:

- Caliper pin boot
- Retainer



- Bracket boot
- Pad spring





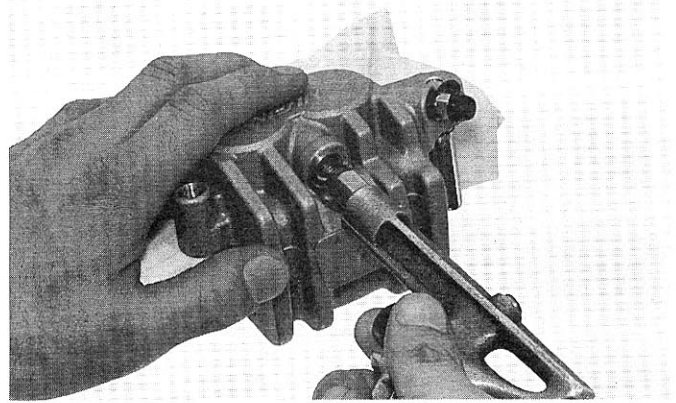
If necessary, lightly apply compressed air to the caliper fluid inlet to get the piston out.

Place a shop rag under the caliper to cushion the piston when it is expelled.

Use the air in short spurts.

**▲ WARNING**

- *Do not bring the air nozzle too close to the inlet or the pistons may be forced out with excessive force that could cause injury.*



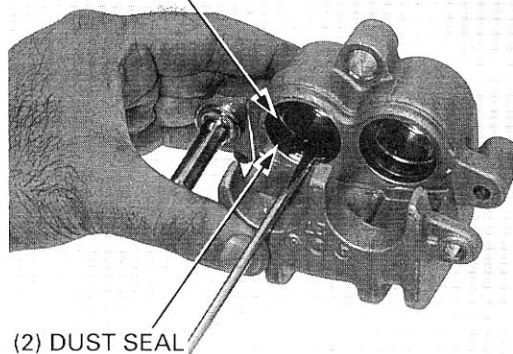
Remove the piston seals and dust seals.

**CAUTION**

- *Be careful not to damage the piston sliding surfaces when removing the seals.*

Clean the piston and caliper cylinder with fresh brake fluid.

(1) PISTON SEAL



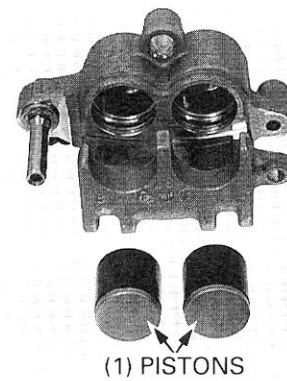
(2) DUST SEAL



**INSPECTION**

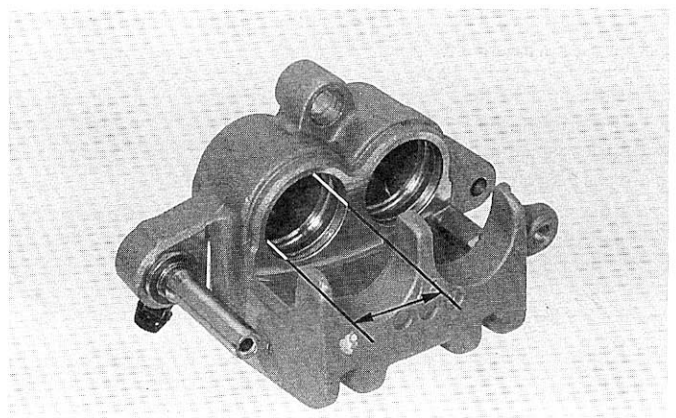
Check the cylinder and pistons for scoring, scratches or other damage.

Replace if necessary.



Measure the I.D. of the cylinder bores.

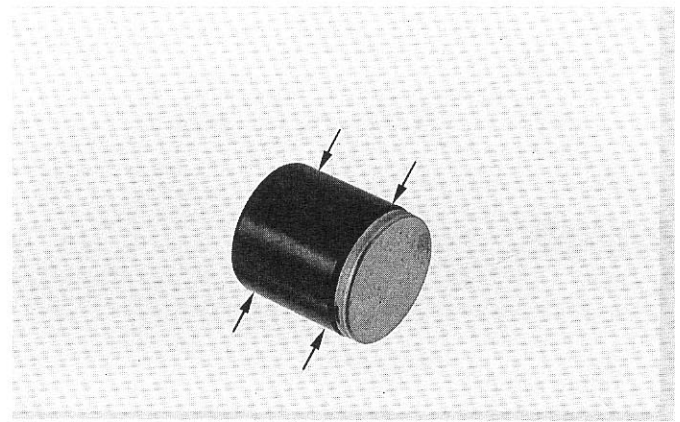
**SERVICE LIMIT: 27.06 mm (1.065 in)**



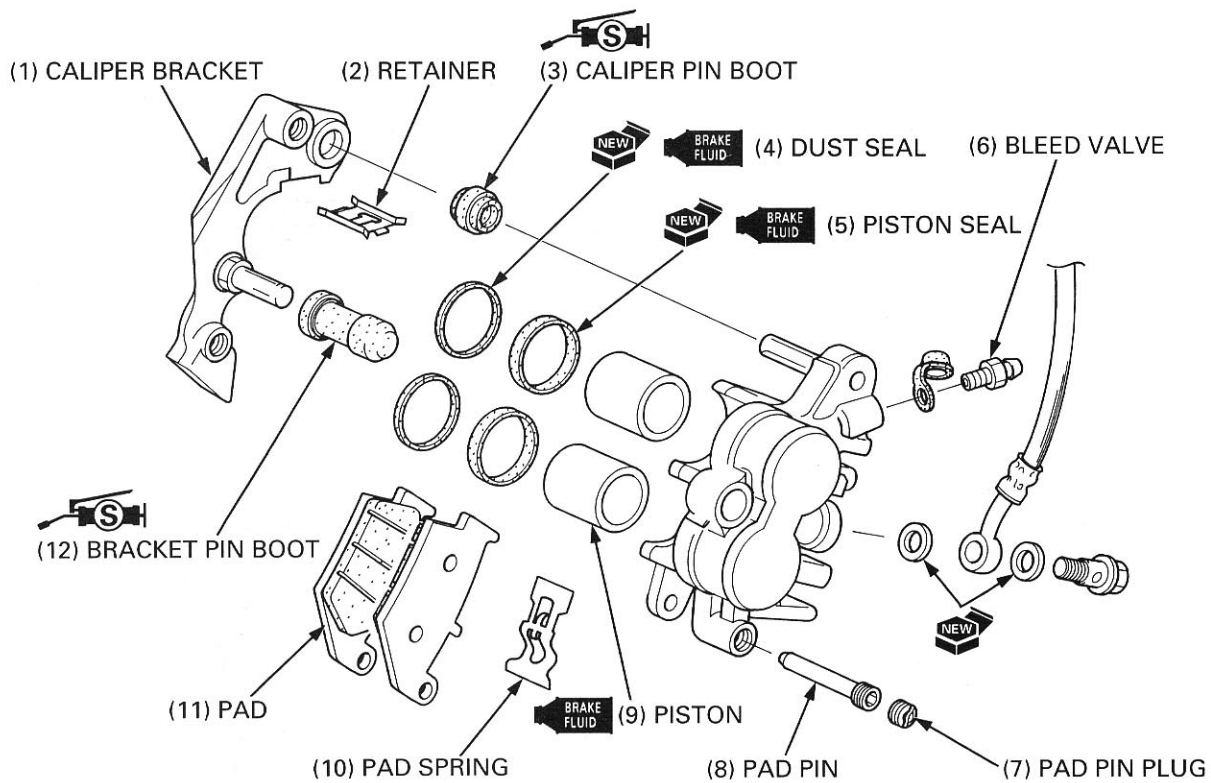
# BRAKE SYSTEM

Measure the O.D. of the pistons.

**SERVICE LIMIT: 26.89 mm (1.059 in)**



## ASSEMBLY



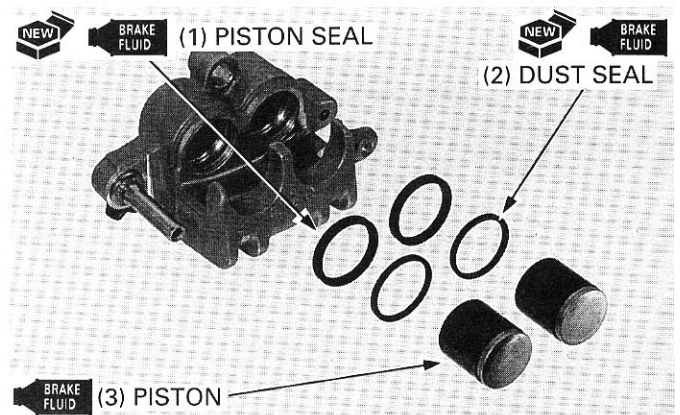
### CAUTION

- Reusing drained fluids can impair braking efficiency. Do not reuse fluid.

### NOTE

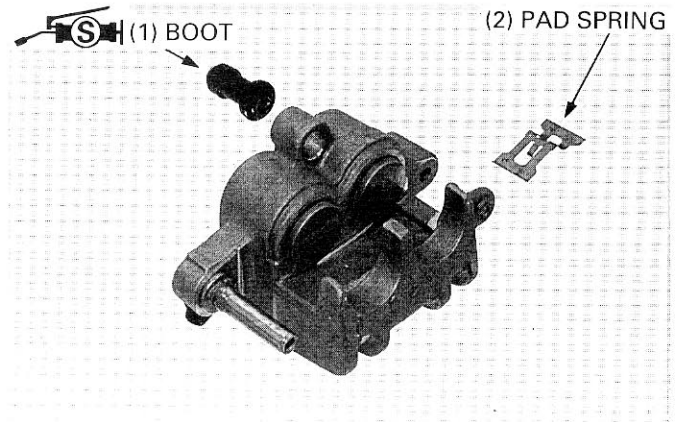
- Replace the piston seals and dust seals as a set whenever they are removed.
- Replace the boots, if damaged.
- Apply silicone grease inside the boots.
- Make sure that each part is free from dust or dirt before reassembly.

Coat the pistons, piston seals and dust seals with the recommended brake fluid.

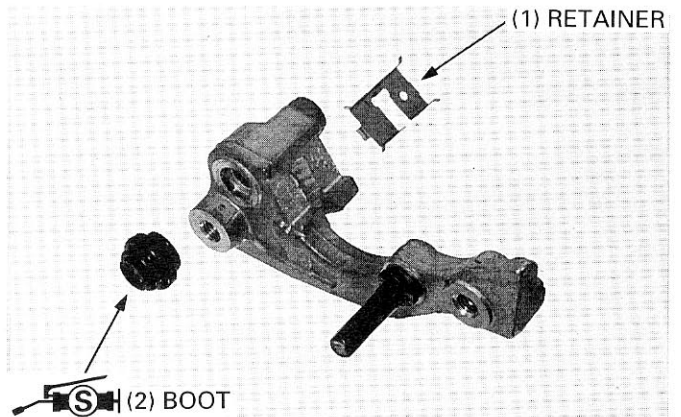


Install the following:

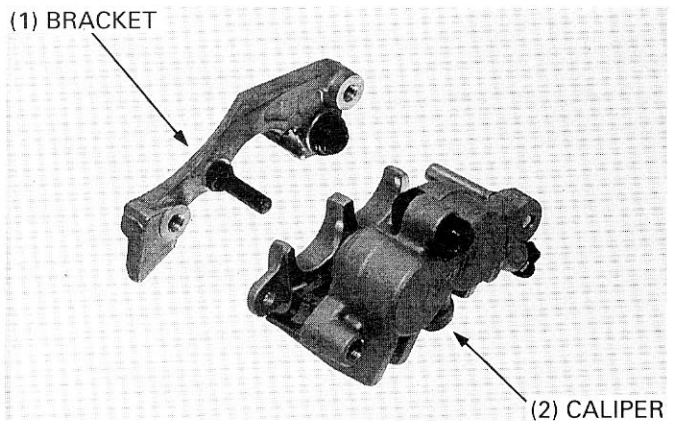
- Piston seals
- Dust seals
- Pistons
- Pad spring
- Bracket pin boot



- Retainer
- Caliper pin boot



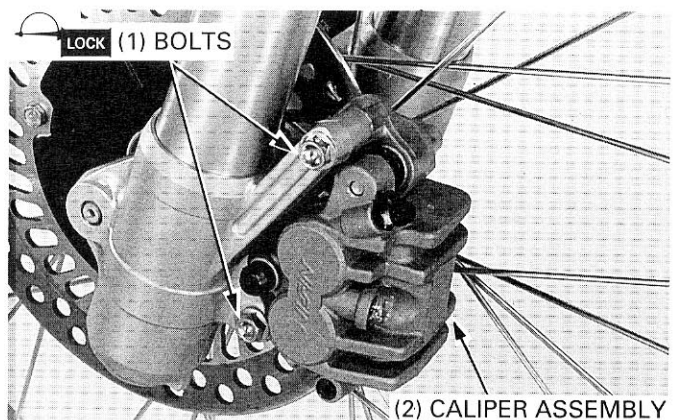
Install the caliper bracket to the brake caliper.



**INSTALLATION**

Install the front brake caliper assembly.  
 Clean the brake caliper bracket bolts and apply a locking agent.  
 Install and tighten the bracket bolts to the specified torque.

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



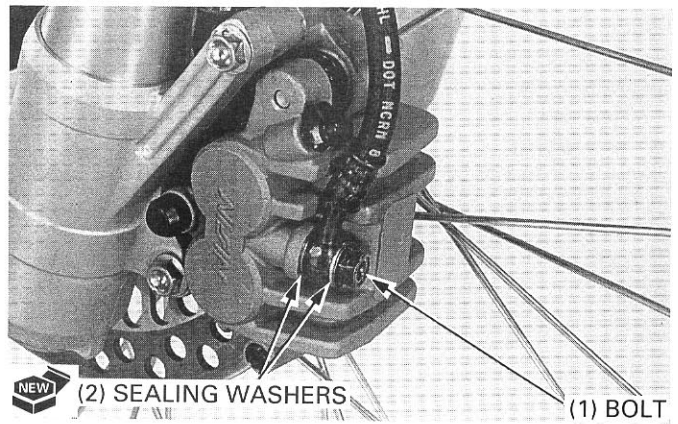
## BRAKE SYSTEM

Connect the brake hose eyelet joint with two new sealing washers, then tighten the oil bolt.

**TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)**

Fill the master cylinder with DOT4 brake fluid from a sealed container and bleed any air from the front brake system (page 15-4).

Install the brake pads (page 15-6).



## FRONT MASTER CYLINDER

### REMOVAL

#### CAUTION

- Avoid spilling fluid on painted, plastic or rubber parts.
- Place a shop towel over these parts whenever the system is serviced.

#### NOTE

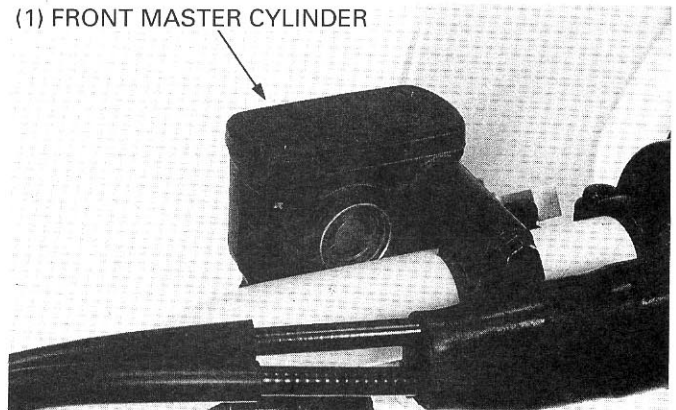
- When removing the brake hose bolt, cover the end of the hose to prevent contamination.
- Secure the hose to prevent fluid from leaking out.

Drain the brake fluid (page 15-3).

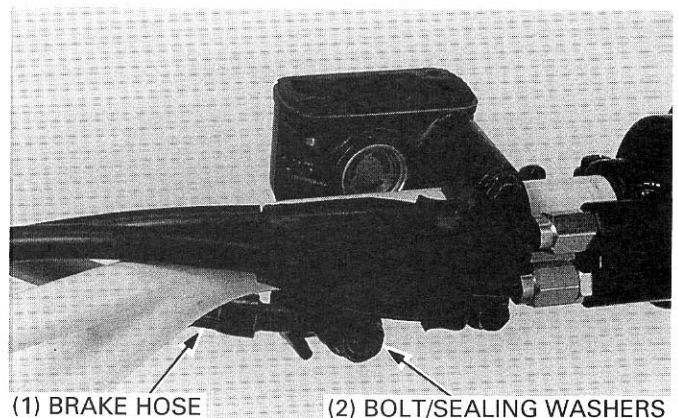
Remove the following:

— Brake lever/knuckle guard (page 15-25)

(1) FRONT MASTER CYLINDER



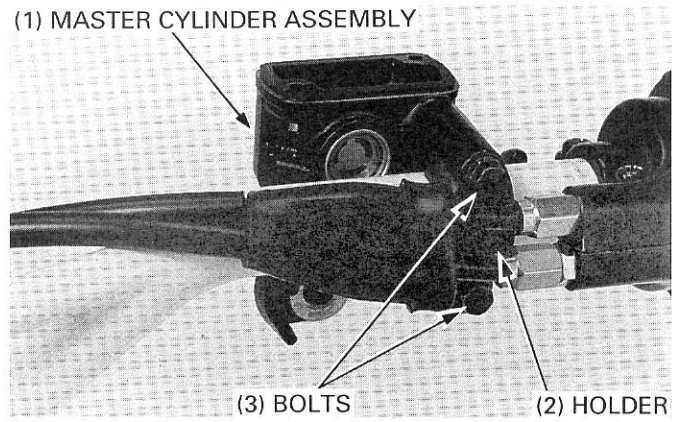
- Brake hose bolt
- Sealing washers
- Brake hose





Remove the following:

- Front master cylinder holder bolts
- Front master cylinder holder
- Front master cylinder



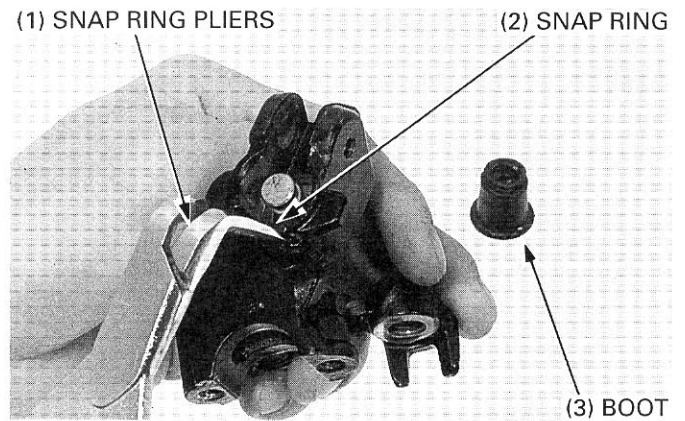
**DISASSEMBLY**

Remove the boot and snap ring using the special tool.

**TOOL:**

**Snap ring pliers**

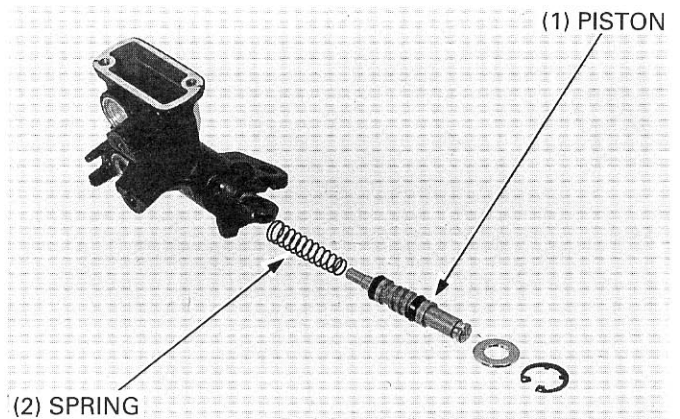
**07914 - 3230001**



Remove the following:

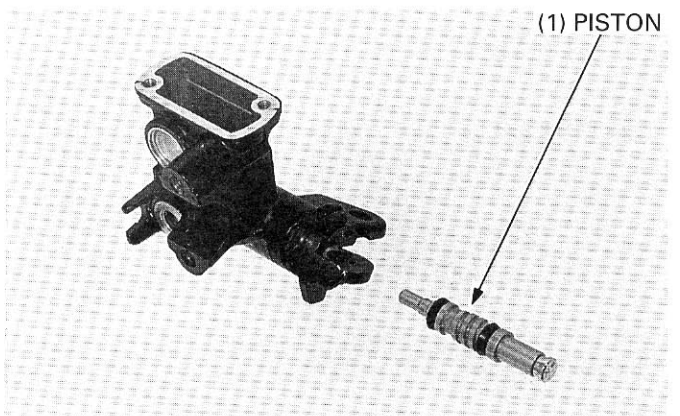
- Piston assembly
- Spring

Check the spring and replace if necessary.



**INSPECTION**

Check the cylinder and pistons for scoring, scratches or other damage.  
Replace if necessary.

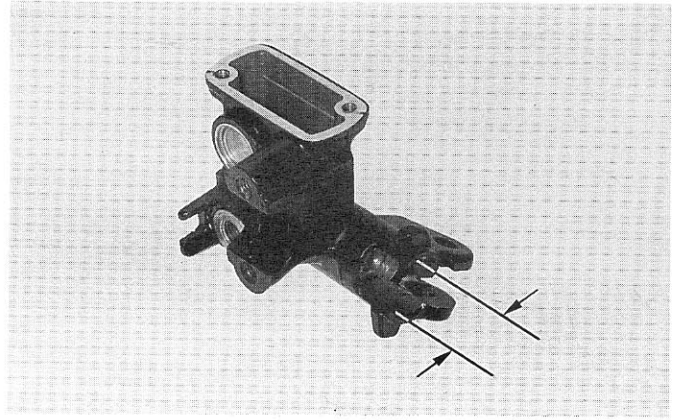




## BRAKE SYSTEM

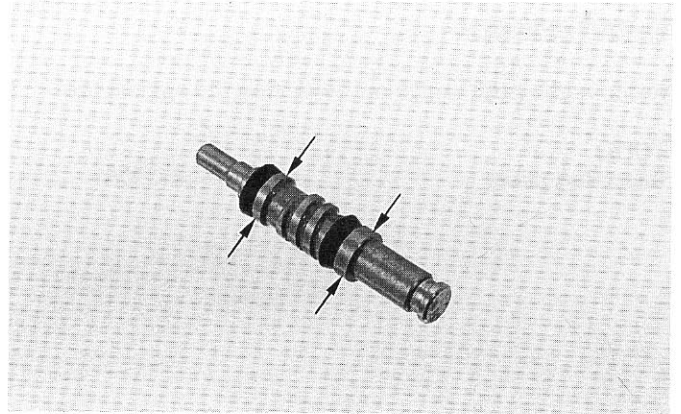
Measure the I.D. of the cylinder bores.

**SERVICE LIMIT: 11.05 mm (0.435 in)**

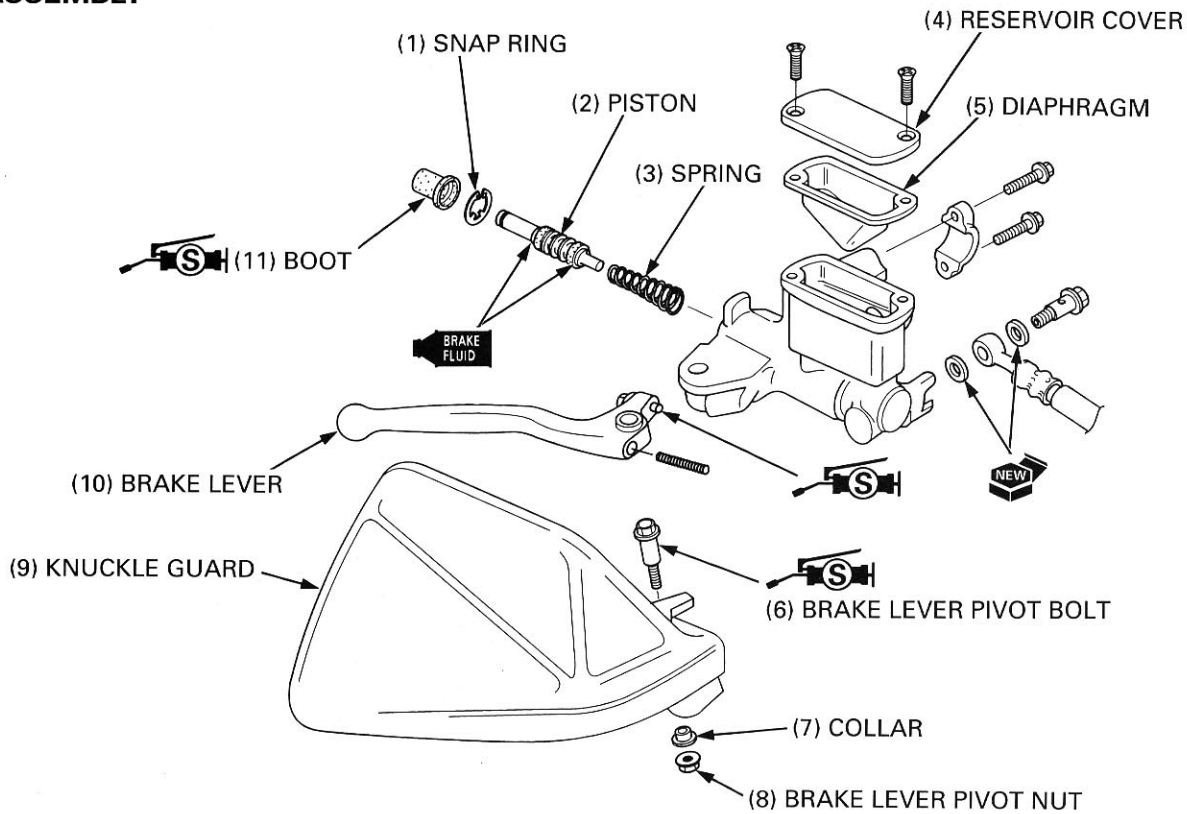


Measure the O.D. of the piston.

**SERVICE LIMIT: 10.84 mm (0.427 in)**



## ASSEMBLY





## BRAKE SYSTEM

Connect the brake hose eyelet joint with new sealing washers.  
Tighten the bolt.

**TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)**

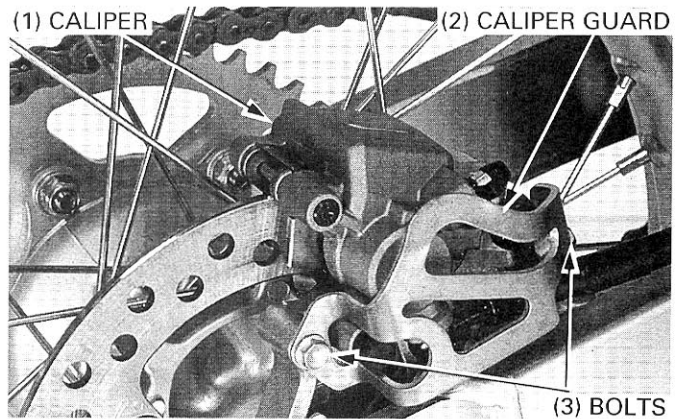
Install the brake lever/knuckle guard (page 15-26).  
Fill the master cylinder with DOT4 brake fluid from a sealed container and bleed any air from the front brake system (page 15-4).



## REAR BRAKE CALIPER

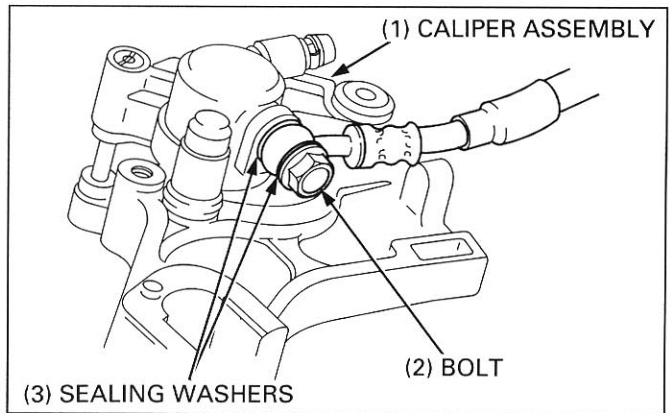
### REMOVAL

Drain the brake fluid (page 15-3).  
Remove the caliper guard mounting bolts and caliper guard.  
Move the rear wheel back to free the tab from the swingarm (page 14-3).  
Remove the rear brake caliper.



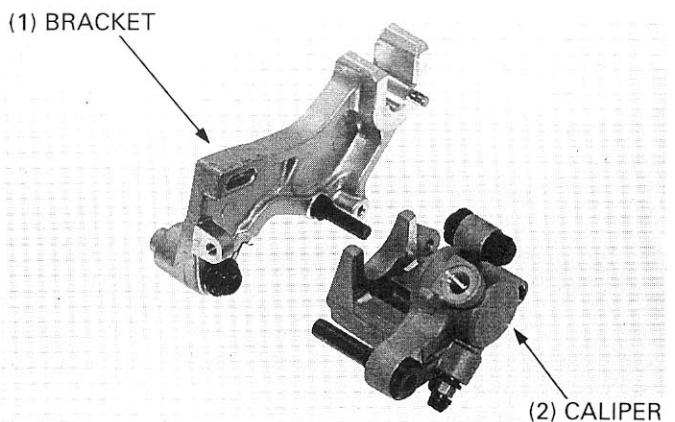
Remove the following:

- Brake hose bolt
- Sealing washers
- Rear brake caliper assembly



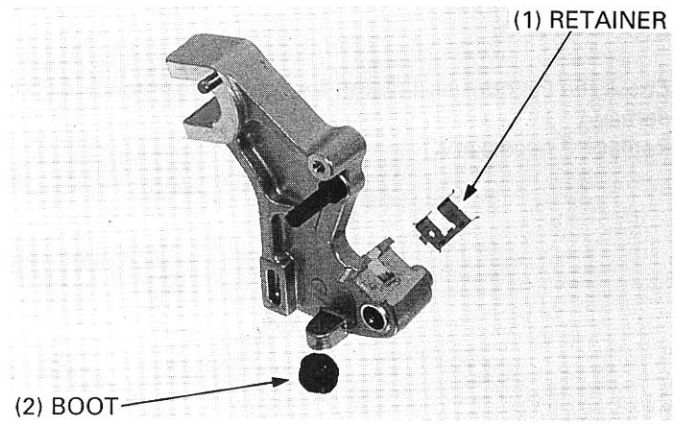
### DISASSEMBLY

Remove the caliper bracket from the caliper.

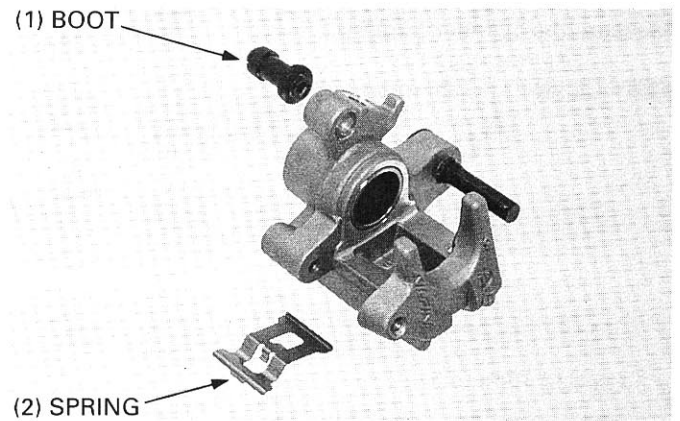


Remove the following:

- Caliper pin boot
- Retainer



- Bracket boot
- Pad spring

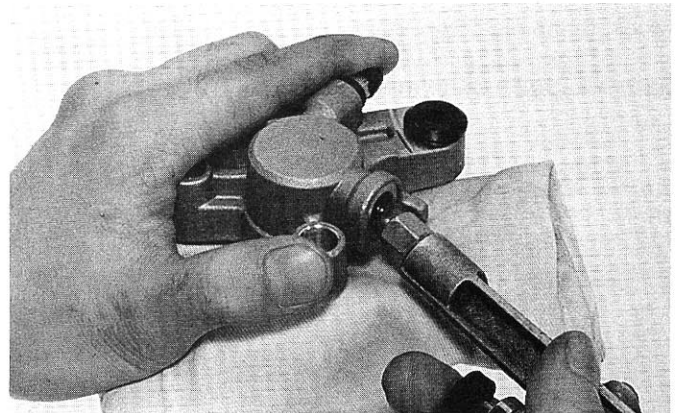


If necessary, lightly apply compressed air to the caliper fluid inlet to get the piston out.

Place a shop rag under the caliper to cushion the piston when it is expelled. Use the air in short spurts.

**▲ WARNING**

- *Do not bring the air nozzle too close to the inlet or the pistons may be forced out with excessive force that could cause injury.*

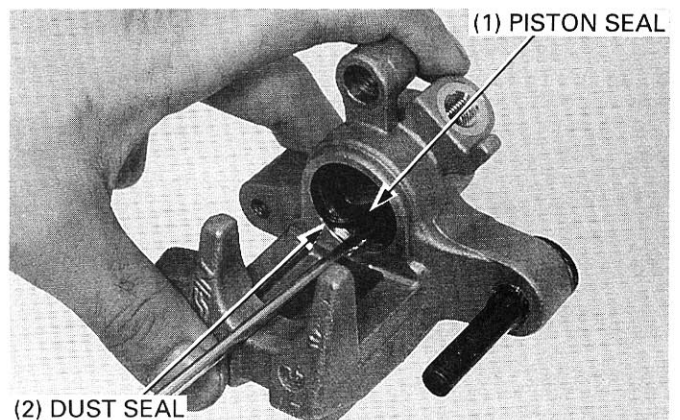


Remove the piston seal and dust seal.

**CAUTION**

- *Be careful not to damage the piston sliding surfaces when removing the seals.*

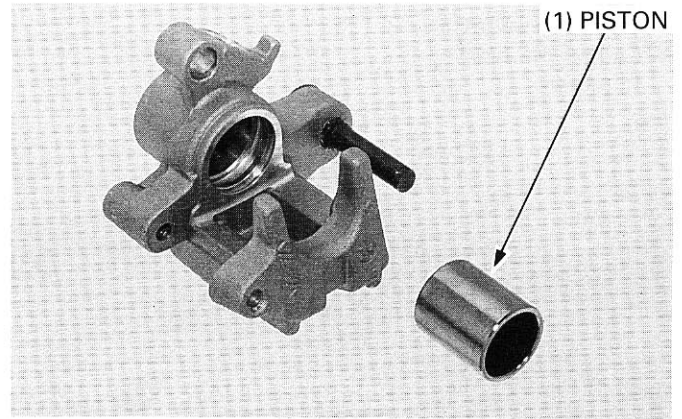
Clean the piston and caliper cylinder with fresh brake fluid.



## BRAKE SYSTEM

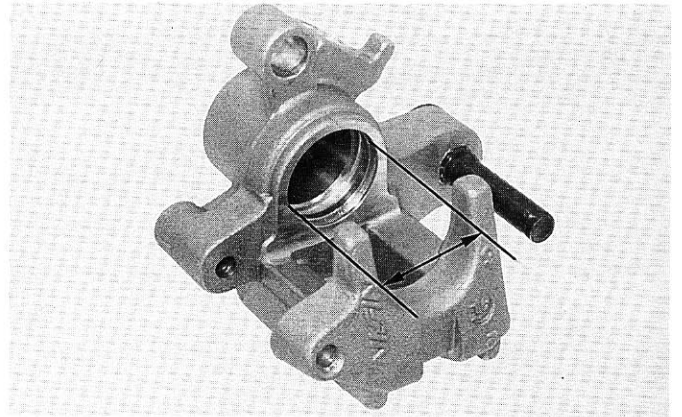
### INSPECTION

Check the cylinder and piston for scoring, scratches or other damage.  
Replace if necessary.



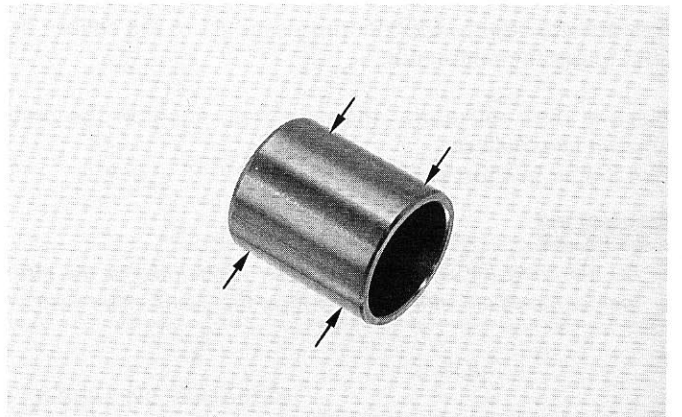
Measure the cylinder bore I.D..

**SERVICE LIMIT: 27.06 mm (1.065 in)**



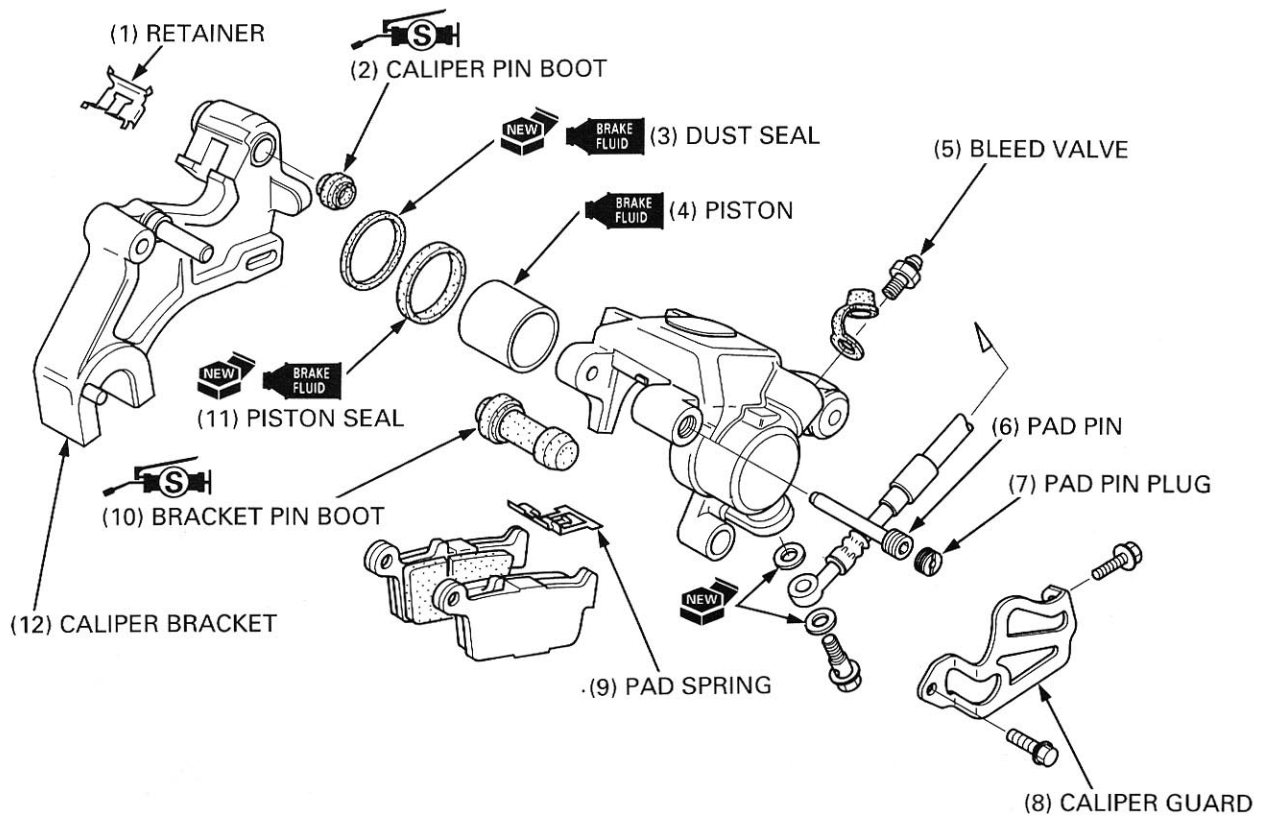
Measure the piston O.D..

**SERVICE LIMIT: 26.89 mm (1.059 in)**





**ASSEMBLY**



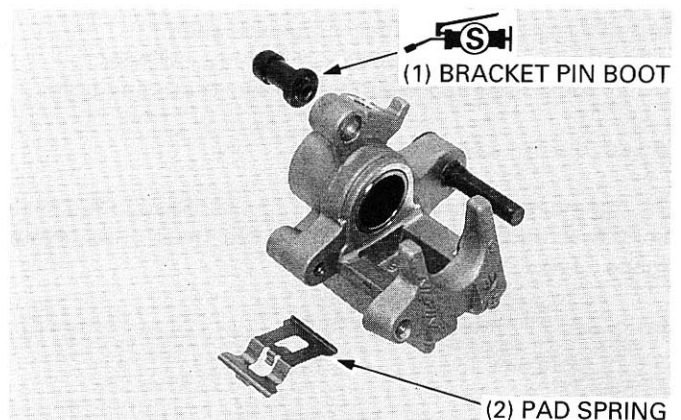
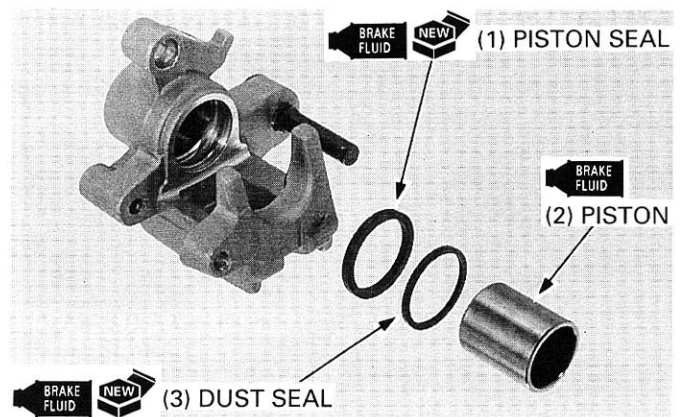
**NOTE**

- Replace the piston assembly and spring as a set if damaged.
- Replace the boot, if damaged.
- Apply silicone grease to the inside of the boot.
- Make sure that each part is free from dust or dirt before reassembly.

Coat the piston, piston seal and dust seal with the recommended brake fluid.

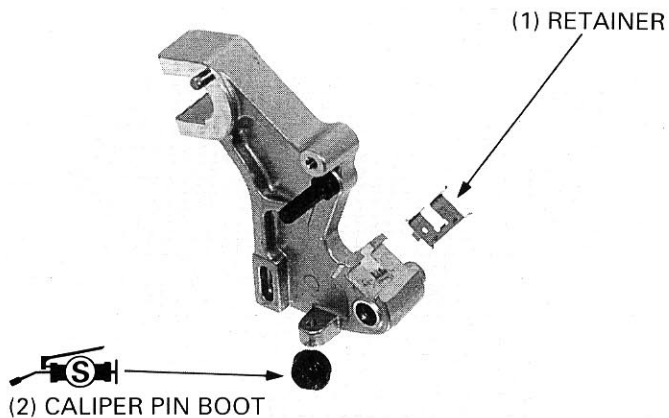
Install the following:

- Piston seal
- Dust seal
- Piston
- Pad spring
- Bracket pin boot

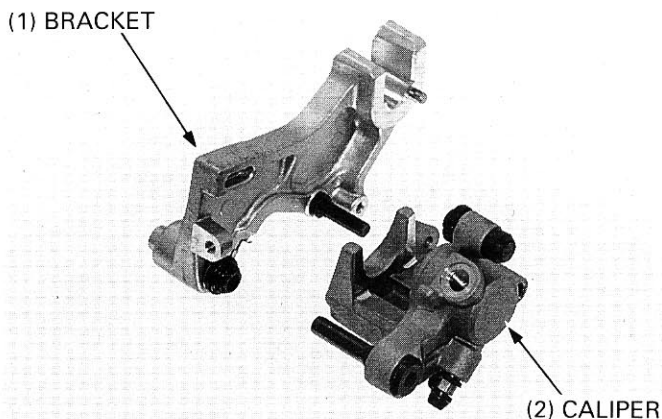


## BRAKE SYSTEM

- Retainer
- Caliper pin boot



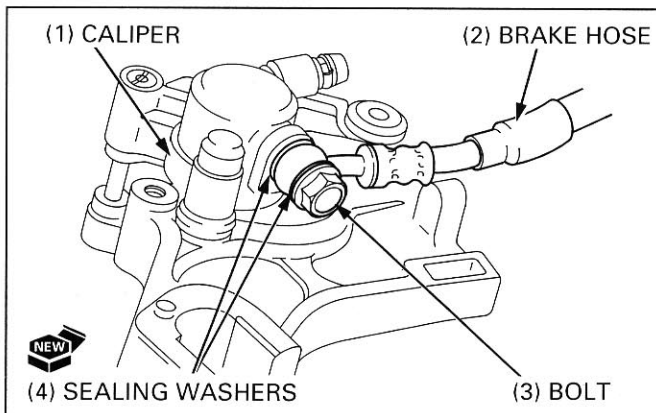
Install the caliper bracket to the brake caliper.



### INSTALLATION

Connect the brake hose eyelet joint with two new sealing washers, then tighten the oil bolt.

**TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)**

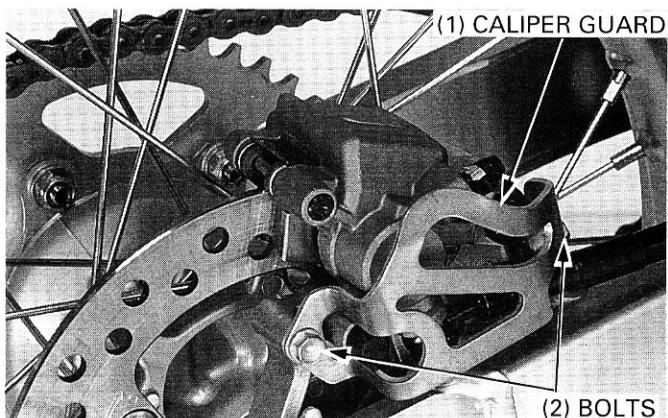


Install the rear brake caliper to the axle shaft.  
Align the bracket with the slide rail on the swingarm.  
Install the caliper guard and tighten the mounting bolts.

Adjust the drive chain slack (page 3-14).

Fill the master cylinder with DOT4 brake fluid from a sealed container and bleed any air from the front brake system (page 15-4).

Install the brake pads (page 15-6).



## REAR MASTER CYLINDER

### REMOVAL

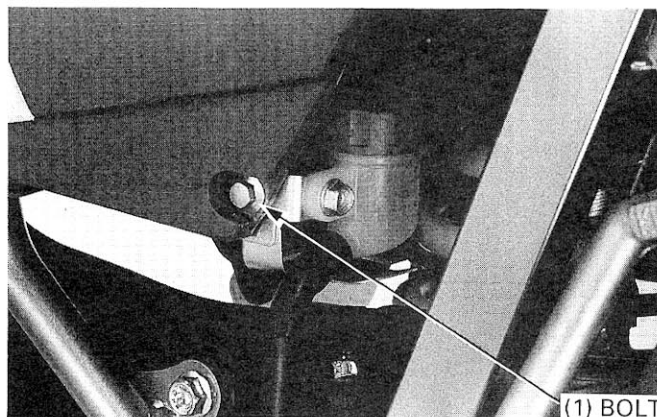
#### CAUTION

- *Avoid spilling fluid on painted, plastic or rubber parts.*
- *Place a shop towel over these parts whenever the system is serviced.*

#### NOTE

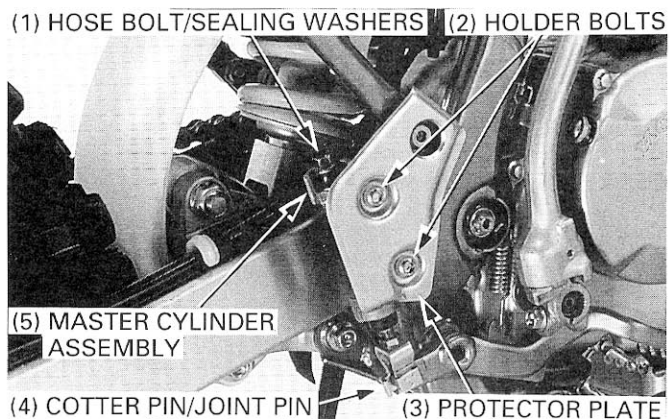
- When removing the brake hose bolt, cover the end of the hose to prevent contamination.  
Secure the hose to prevent fluid from leaking out.

Drain the brake fluid (page 15-3).  
Remove the reservoir tank bracket bolt.



Remove the following:

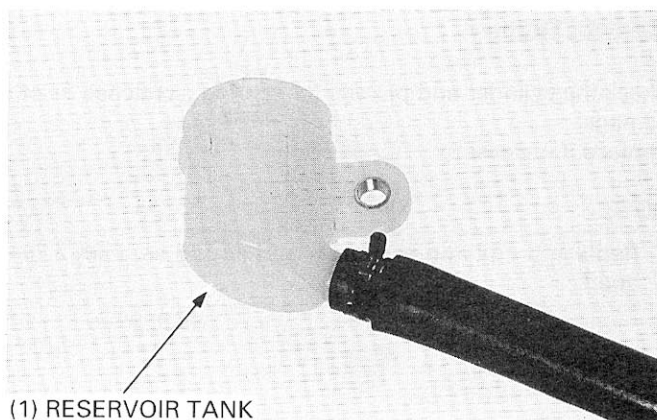
- Cotter pin/joint pin
- Brake hose bolt
- Sealing washers
- Brake hose
- Rear master cylinder holder bolts
- Rear master cylinder protector plate
- Rear master cylinder



### DISASSEMBLY

Remove the following:

- Reservoir tank



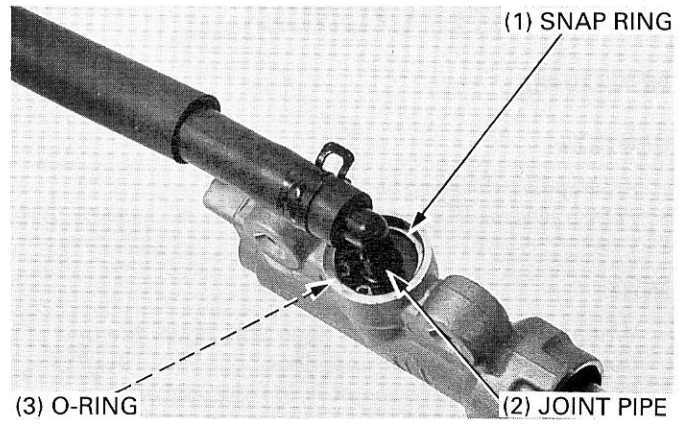
## BRAKE SYSTEM

- Snap ring (use special tool)
- Joint pipe
- O-ring

**TOOL:**

**Snap ring pliers**

**07914 - 3230001**

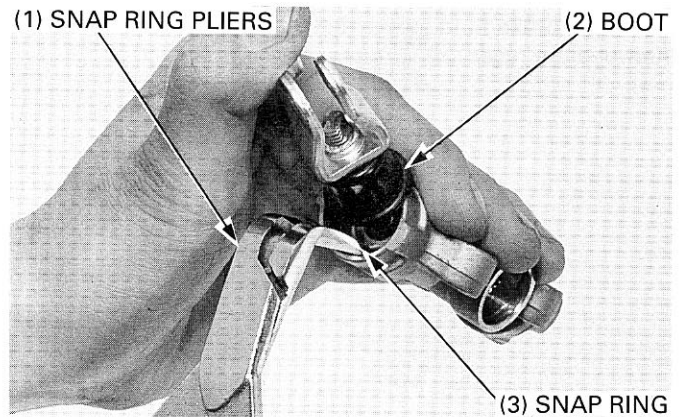


- Boot
- Snap ring

**TOOL:**

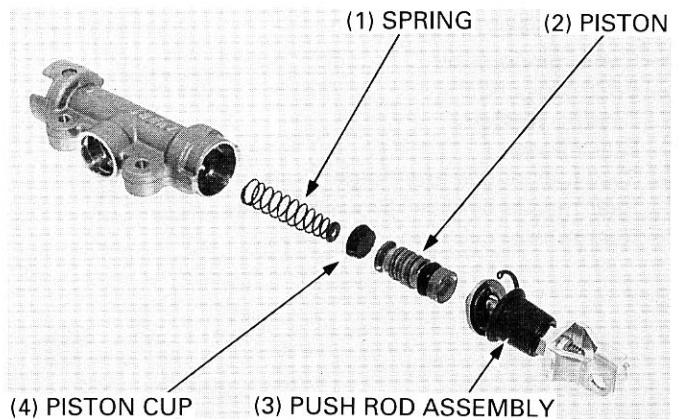
**Snap ring pliers**

**07914 - 3230001**



- Push rod assembly
- Piston assembly
- Piston cup
- Spring

Check the spring and replace if necessary.



## INSPECTION

Check the cylinder and pistons for scoring, scratches or other damage.  
Replace if necessary.

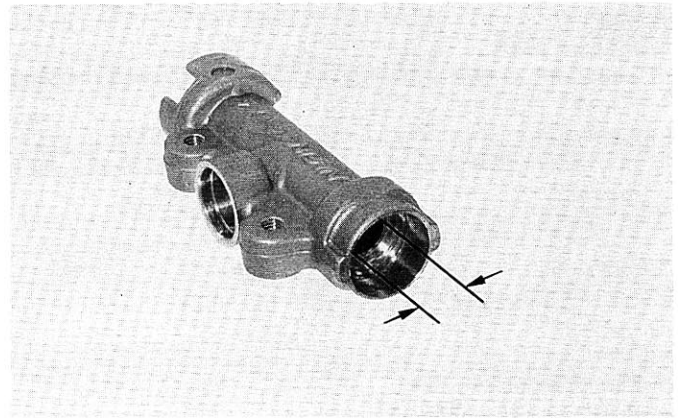
**NOTE**

- Replace the piston assembly and spring as a set if damaged.



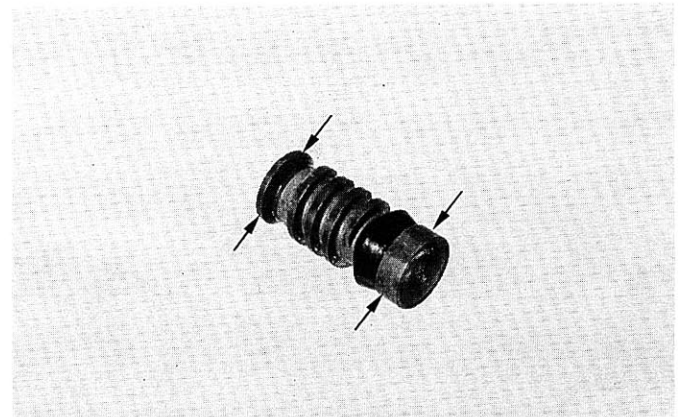
Measure the cylinder bore I.D..

**SERVICE LIMIT: 14.06 mm (0.554 in)**

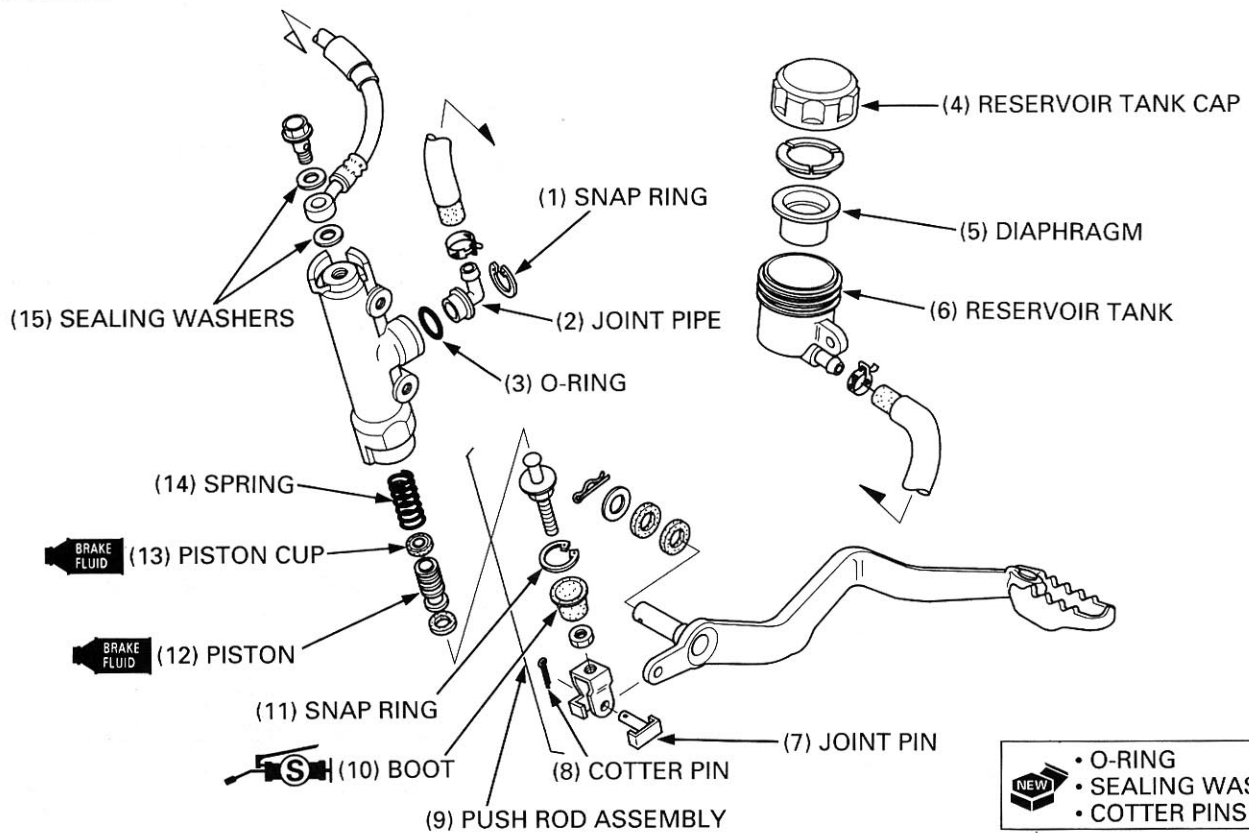


Measure the piston O.D..

**SERVICE LIMIT: 13.95 mm (0.549 in)**



**ASSEMBLY**





## BRAKE SYSTEM

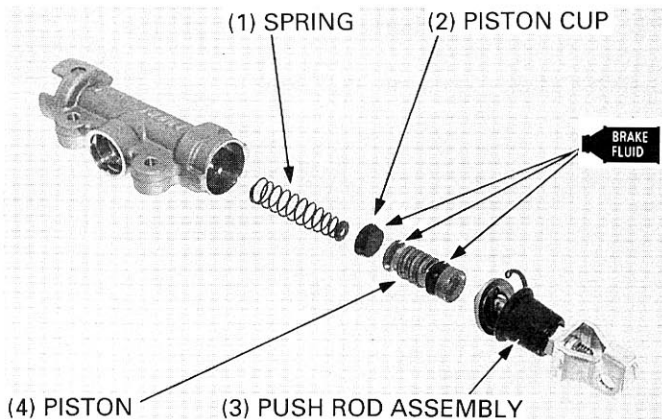
### NOTE

- Repair the piston assembly and spring as a set if damaged.
- Replace the boot, if damaged.
- Apply silicone grease to the inside of the boot.
- Make sure that each part is free from dust or dirt before reassembly.

Coat the piston cup with the recommended brake fluid.

Install the following:

- Spring
- Piston cup
- Piston assembly
- Push rod assembly



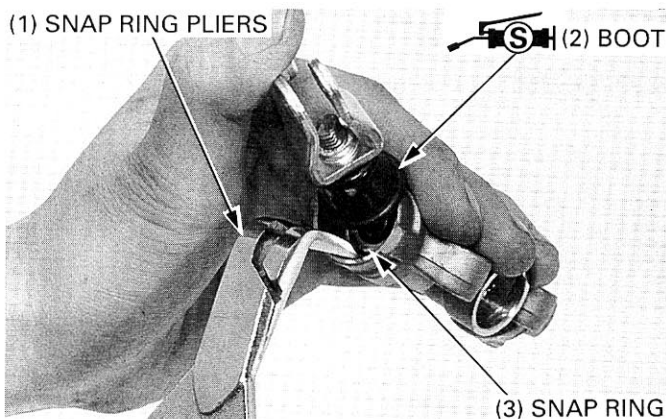
Install the snap ring.

### TOOL:

**Snap ring pliers**

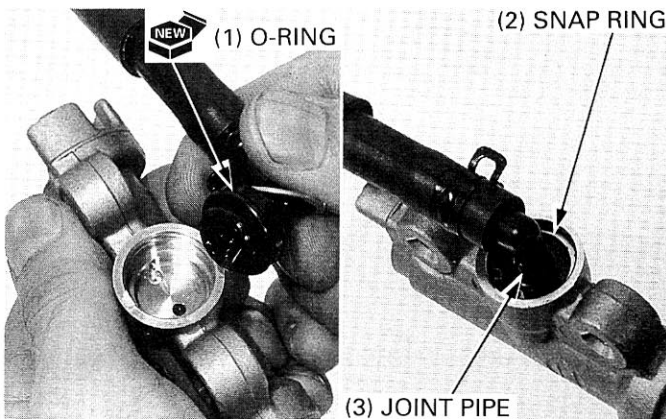
**07914 - 3230001**

Install the boot.

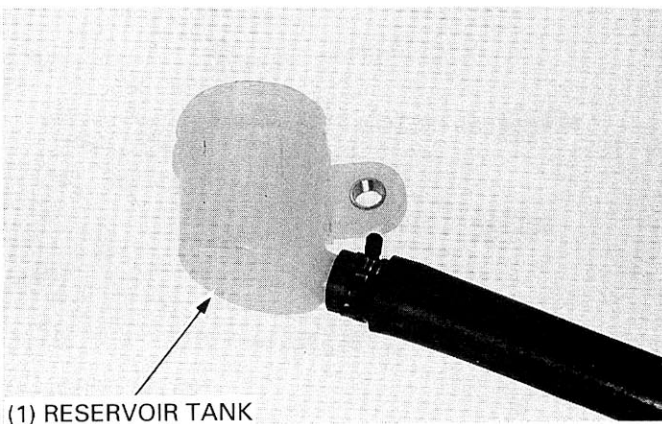


Install the following:

- New O-ring
- Joint pipe
- Snap ring (use special tool)



— Reservoir tank



**INSTALLATION**

Apply locking agent to the threads of the master cylinder holder bolts.

Install the following:

- Rear master cylinder assembly
- Master cylinder protector plate
- Master cylinder holder bolt

**TORQUE: 14 N·m (1.4 kgf·m, 10 lbf·ft)**

- Brake hose

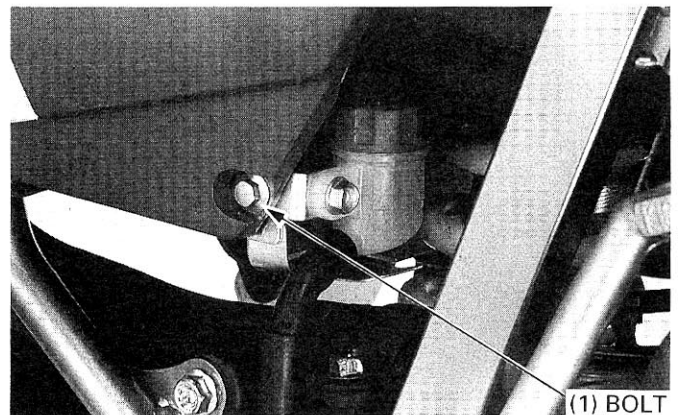
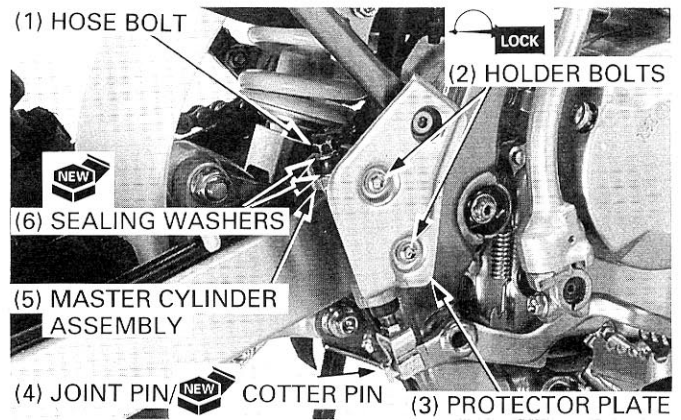
**CAUTION**

- *Align the eyelet joint with the notch in the master cylinder first, then tighten the bolt.*
- *After installing the brake hose to the master cylinder, make sure it does not interfere with the movement of the shock absorber.*

- New sealing washers
- Brake hose bolt

**TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)**

- Joint pin
- New cotter pin
- Reservoir tank bracket bolt

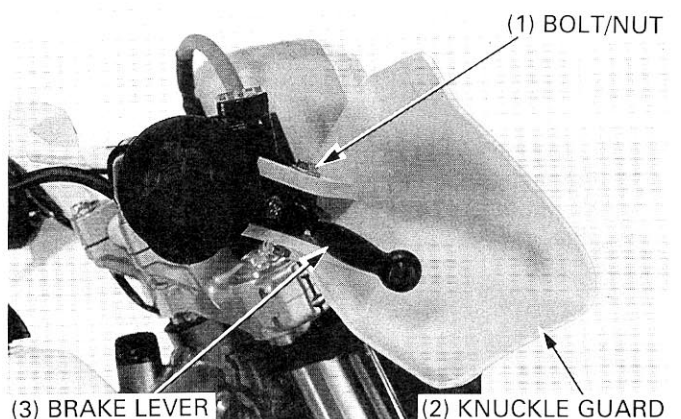


Fill the master cylinder with DOT4 brake fluid from a sealed container and bleed any air from the rear brake system (page 15-3).

**BRAKE LEVER**

**REMOVAL**

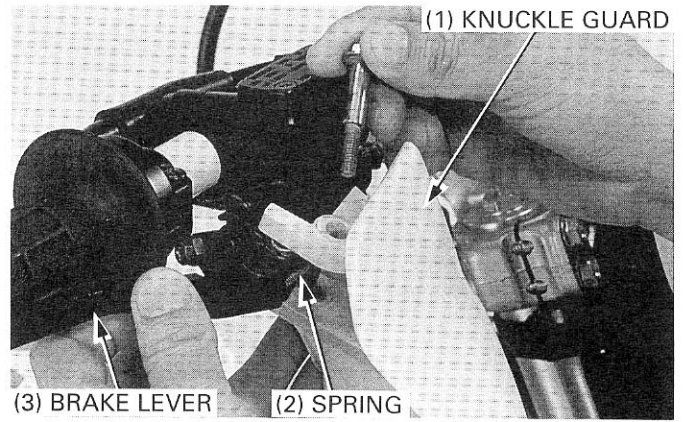
Remove the brake lever pivot bolt/nut



## BRAKE SYSTEM

Remove the following:

- Knuckle guard
- Brake lever
- Return spring



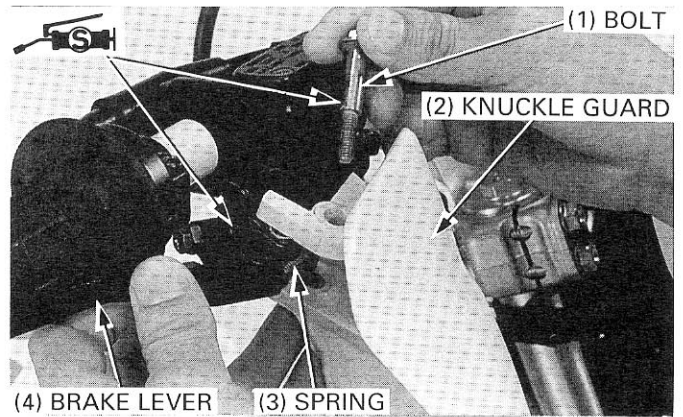
## INSTALLATION

Apply silicone grease to the following parts:

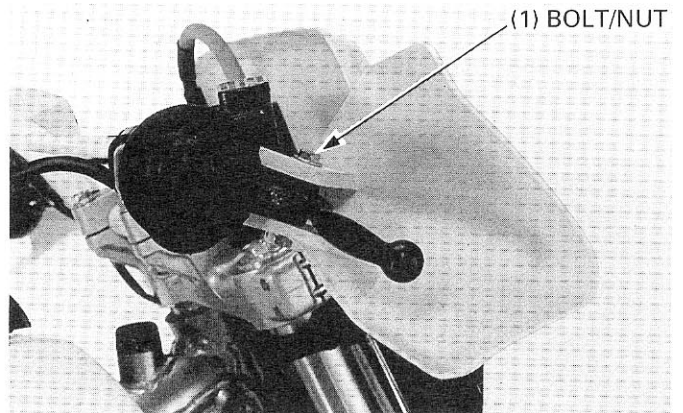
- Brake lever adjuster bolt tip
- Brake lever pivot bolt sliding surface

Install the following:

- Return spring
- Brake lever
- Knuckle guard



- Brake lever pivot bolt/nut

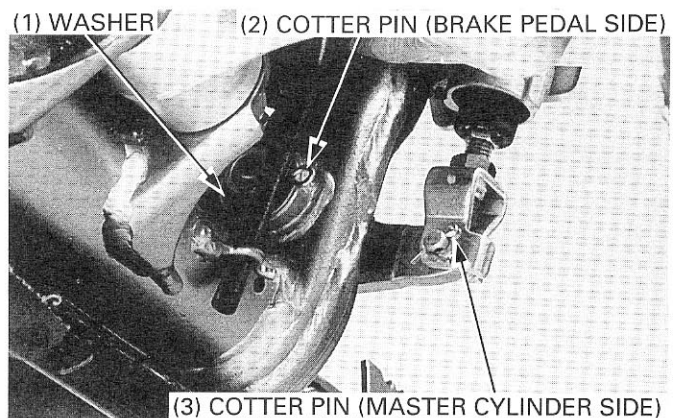


## BRAKE PEDAL

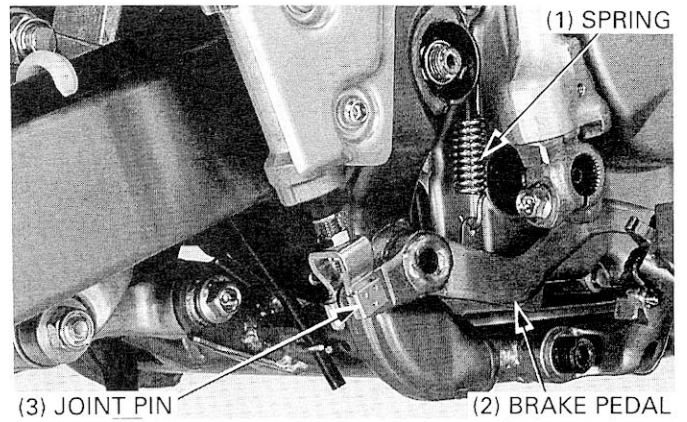
### REMOVAL

Remove the following:

- Cotter pin (master cylinder side)
- Cotter pin (brake pedal side)
- Washer



- Joint pin
- Brake pedal return spring
- Brake pedal

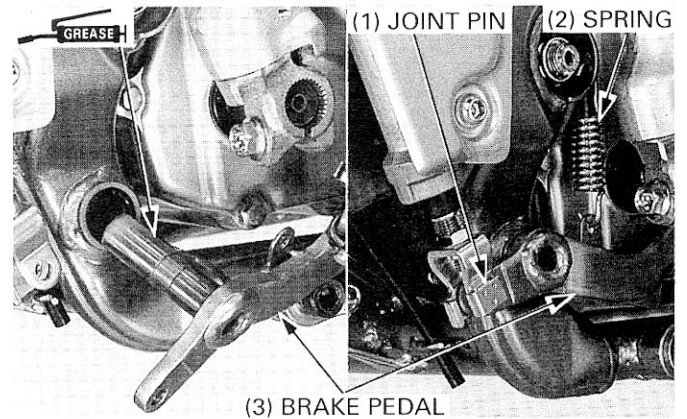


**INSTALLATION**

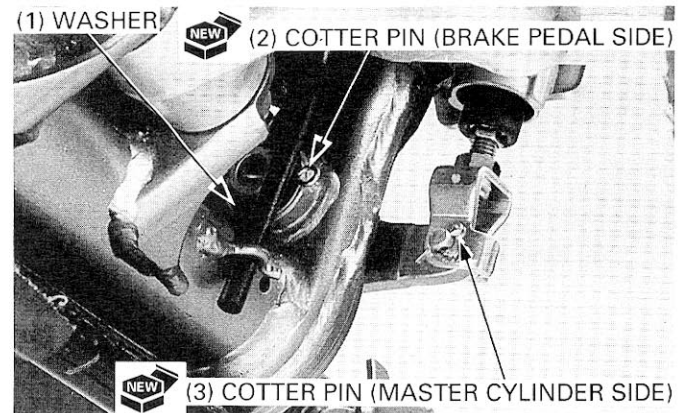
Apply grease to the brake pedal pivot.

Install the following:

- Brake pedal
- Brake pedal return spring
- Joint pin

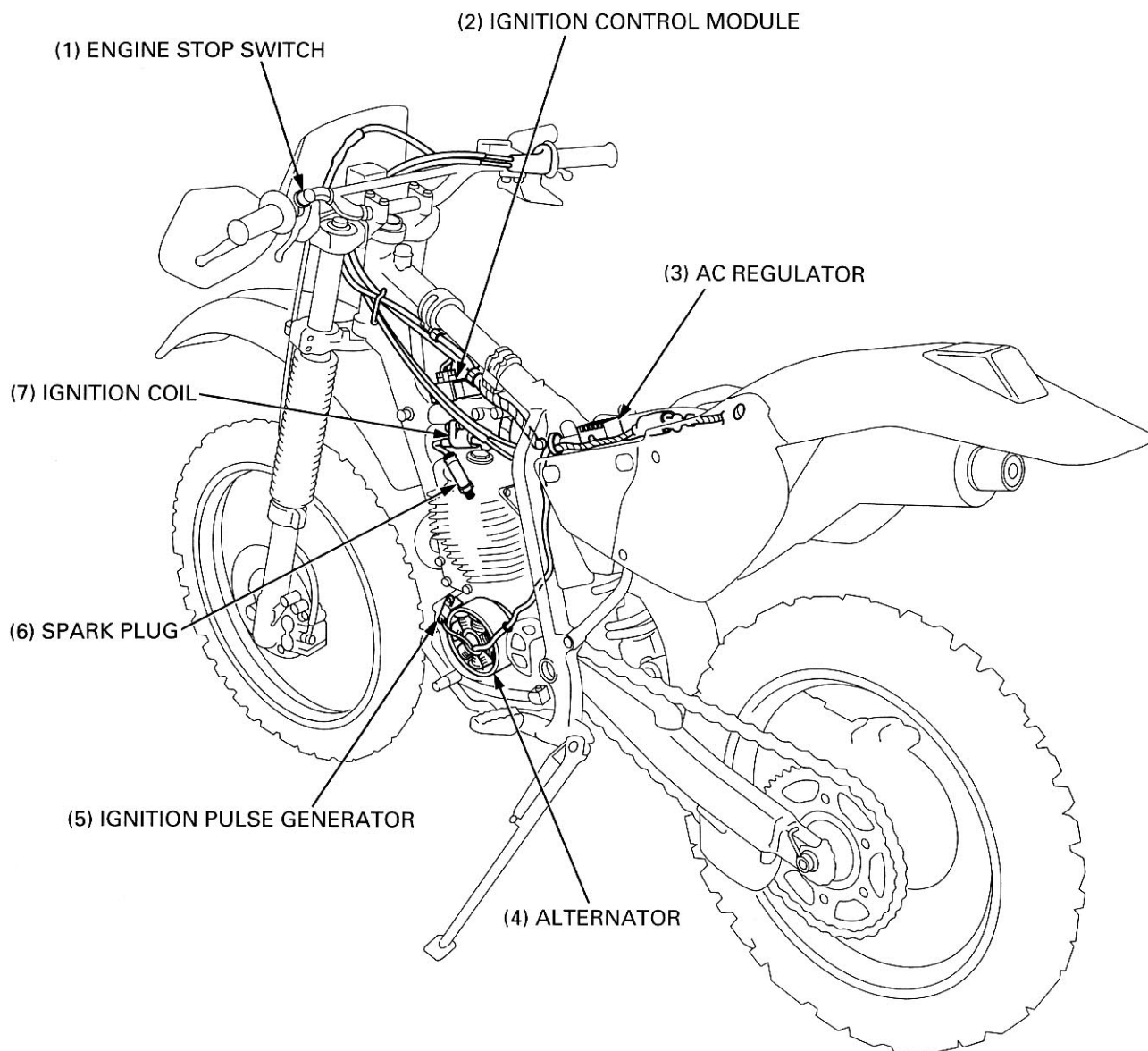


- Washer
- New cotter pin (brake pedal side)
- New cotter pin (master cylinder side)



## ELECTRICAL SYSTEM

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# 16. ELECTRICAL SYSTEM

SERVICE INFORMATION	16-1	ALTERNATOR LIGHTING COIL	16-9
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IGNITION SYSTEM INSPECTION	16-5	HEADLIGHT	16-10
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## SERVICE INFORMATION

### GENERAL

#### **▲ WARNING**

- *If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and lead to death.*
- When servicing the electrical system, always follow the steps in the troubleshooting sequence on page 16-3.
- The ignition control module (ICM) may be damaged if dropped. Also, if the connector is disconnected when current is present, the excessive voltage may damage the ignition control module (ICM).
- Ignition timing cannot be adjusted since the ignition control module (ICM) is non-adjustable. If ignition timing is incorrect, check the system components and replace any faulty parts.
- A faulty ignition system is often related to poorly connected or corroded connectors. Check those connections before proceeding.
- Use a spark plug of the correct heat range. Using a spark plug with an incorrect heat range can damage the engine.
- For alternator removal and installation, see section 10.

## ELECTRICAL SYSTEM

### SPECIFICATIONS

ITEM		SPECIFICATIONS	
Spark plug		NGK	DENSO
	Standard	CR9EH-9	U27FER9
	For cold climate (Below 5°C/41°F)	CR8EH-9	U24FER9
Ignition timing	Initial	8° BTDC at 1,900 ± 200 rpm	
	Full advance	28° ± 2° BTDC at 4,300 rpm	
Spark plug gap		0.8 – 0.9 mm (0.031 – 0.035 in)	
Ignition coil primary peak voltage		100 V minimum	
Ignition pulse generator peak voltage		0.7 V minimum	
Exciter coil peak voltage		100 V minimum	
Lighting coil resistance (At 20°C/68°F)		0.2 – 1.2 Ω	
Headlight		12 V 35 W	
Taillight		12 V 5 W	
Alternator/output		0.075 kW/5,000 rpm	
AC regulator specific voltage		12.0 – 14.0 V/3,000 rpm	

### TORQUE VALUES

Timing hole cap	10 N·m (1.0 kgf·m, 7.2 lbf·ft) Apply grease to the threads and flange surface.
Crankshaft hole cap	8 N·m (0.8 kgf·m, 5.8 lbf·ft) Apply grease to the threads and flange surface.
Spark plug	12 N·m (1.2 kgf·m, 9 lbf·ft)

### TOOLS

#### Special

Imrie diagnostic tester (model 625) or  
Peak voltage adapter

07HGJ – 0020100 with  
Commercially available digital multimeter  
(impedance 10 MΩ/DCV minimum)

## TROUBLESHOOTING

- Inspect the following before diagnosing the system.
  - Faulty spark plug
  - Loose spark plug cap or spark plug wire connection
  - Water got into the spark plug cap (Leaking the ignition coil secondary voltage)
- Temporarily exchange the ignition coil with a known good one and perform the spark test. If there spark, the exchanged ignition coil is faulty.

### IGNITION SYSTEM

#### No spark at plug

Unusual condition		Probable cause (Check in numerical order)
Ignition coil primary voltage	Low peak voltage.	<ol style="list-style-type: none"> <li>1. The multimeter impedance is too low.</li> <li>2. Cranking speed is too low.</li> <li>3. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once).</li> <li>4. Poorly connected connectors or an open circuit in ignition system.</li> <li>5. Faulty exciter coil (Measure the peak voltage).</li> <li>6. Faulty ICM (in case when above No.1 – 5 are normal).</li> </ol>
	No peak voltage.	<ol style="list-style-type: none"> <li>1. Incorrect peak voltage adapter connections.</li> <li>2. Short circuit in engine stop switch wire.</li> <li>3. Faulty engine stop switch.</li> <li>4. Loose or poor connected ICM connectors.</li> <li>5. Open circuit or poor condition in ground wire of the ICM.</li> <li>6. Faulty peak voltage adapter.</li> <li>7. Faulty exciter coil (Measure the peak voltage).</li> <li>8. Faulty ignition pulse generator.</li> <li>9. Faulty ICM (in case when above No. 1 – 8 are normal).</li> </ol>
	Peak voltage is normal, but no spark jumps at plug.	<ol style="list-style-type: none"> <li>1. Faulty spark plug or leaking ignition coil secondary current.</li> <li>2. Faulty ignition coil.</li> </ol>
Exciter coil	Low peak voltage.	<ol style="list-style-type: none"> <li>1. The multimeter impedance is too low.</li> <li>2. Cranking speed is too low.</li> <li>3. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once).</li> <li>4. Faulty exciter coil (in case when above No.1 – 3 are normal).</li> </ol>
	No peak voltage.	<ol style="list-style-type: none"> <li>1. Faulty peak voltage adapter.</li> <li>2. Faulty exciter coil.</li> </ol>
Ignition pulse generator	Low peak voltage.	<ol style="list-style-type: none"> <li>1. The multimeter impedance is too low.</li> <li>2. Cranking speed is too low.</li> <li>3. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once).</li> <li>4. Faulty ignition pulse generator (in case when above No. 1 – 3 are normal).</li> </ol>
	Low peak voltage.	<ol style="list-style-type: none"> <li>1. Faulty peak voltage adapter.</li> <li>2. Faulty ignition pulse generator.</li> </ol>

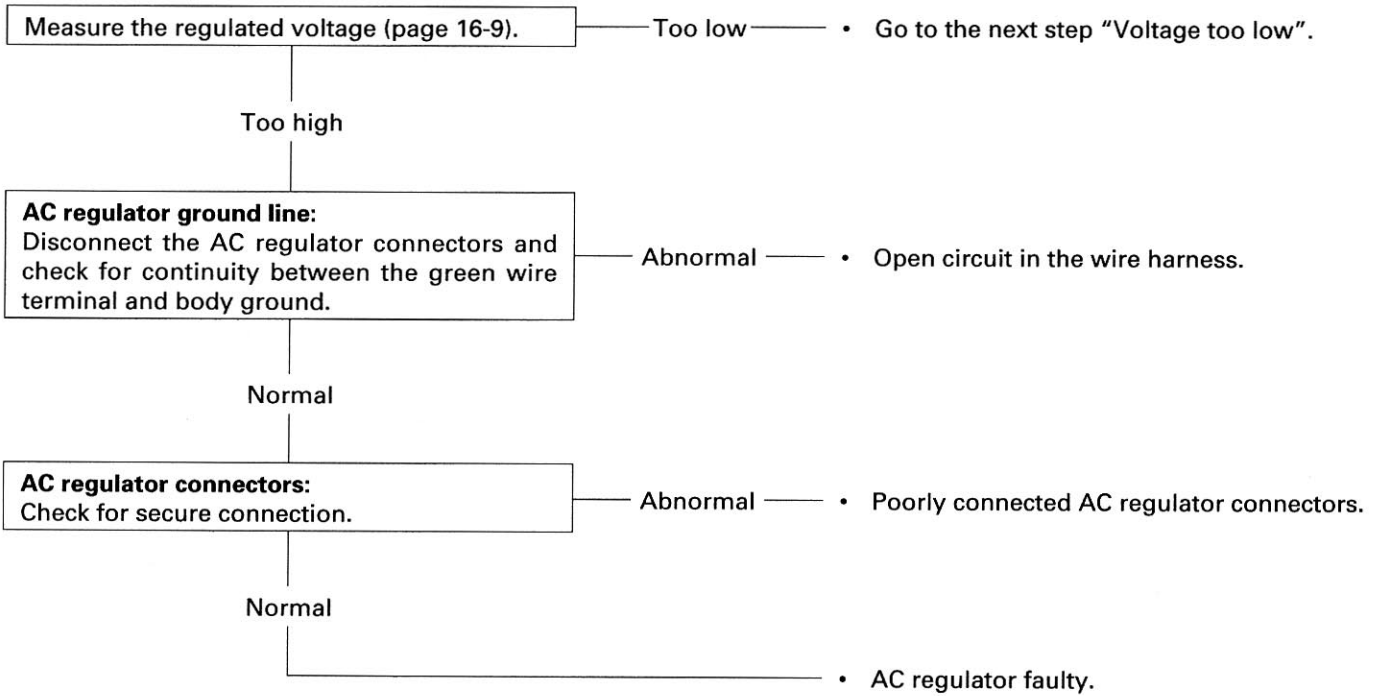
#### Light does not come on when engine is running

- Bulb burned out
- Wiring to that component has an open circuit
- Faulty ignition coil

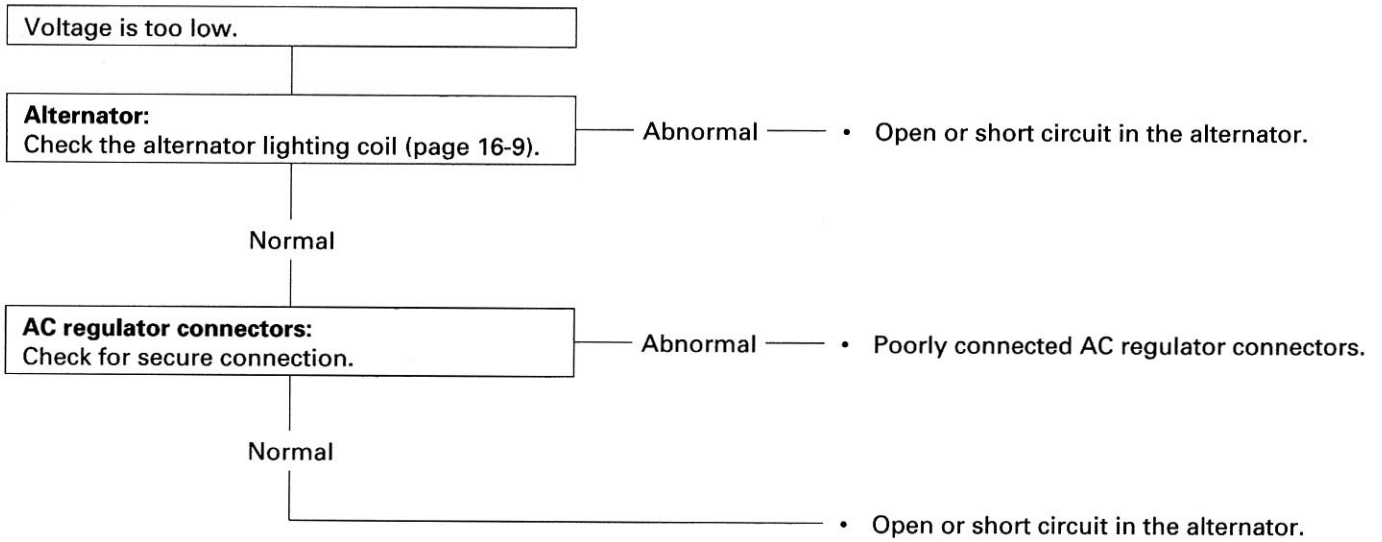
# ELECTRICAL SYSTEM

## LIGHTING SYSTEM

Before inspecting, check the headlight and taillight for brown bulbs for improper rating.



### Voltage too low



## IGNITION SYSTEM INSPECTION

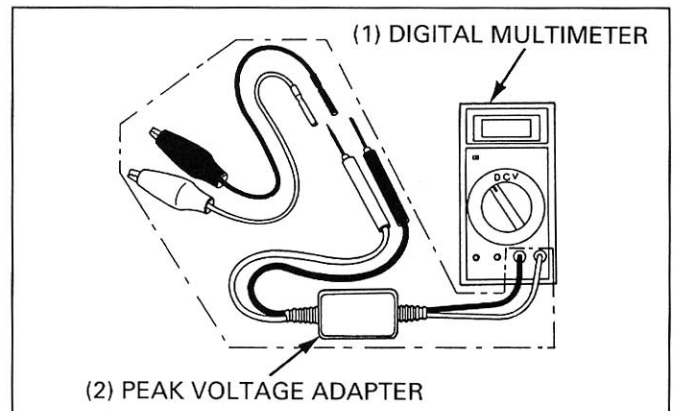
### NOTE

- 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 M $\Omega$ /DCV minimum if you are using the peak voltage adapter. The display value differs depending upon the internal impedance of the multimeter.
- If using Imrie diagnostic tester (model 625), follow the manufacture's instructions.

Connect the peak voltage adapter to the digital multimeter, or use the Imrie diagnostic tester.

### TOOL:

**Imrie diagnostic tester (model 625) or  
Peak voltage adapter 07HGJ – 0020100 with  
Commercially available digital multimeter  
(impedance 10 M $\Omega$ /DCV minimum)**



## IGNITION PRIMARY PEAK VOLTAGE

### NOTE

- Check all 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.

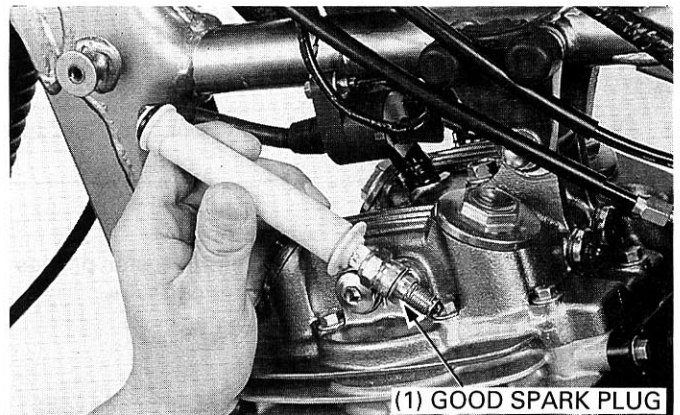
Remove the fuel tank (page 5-3).

Shift the transmission into neutral. Disconnect the spark plug cap from the spark plug. Connect a good known spark plug to the spark plug cap and ground the spark plug to the cylinder as done in a spark test.

Connect the peak voltage adapter or Imrie tester to the ignition coil.

### NOTE

- Do not disconnect the ignition coil primary wires.





## ELECTRICAL SYSTEM

### TOOL:

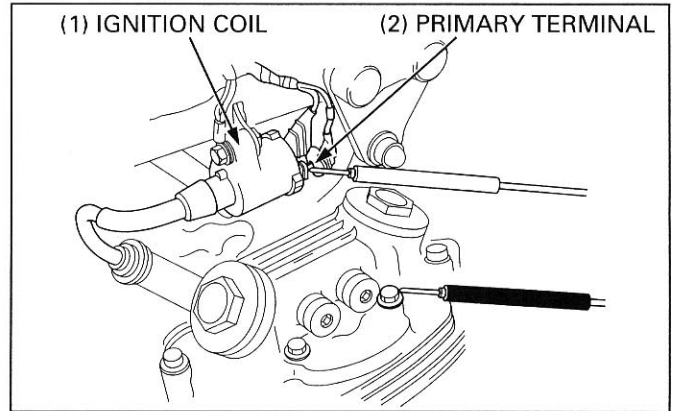
Imrie diagnostic tester (model 625) or  
Peak voltage adapter 07HGJ – 0020100 with  
Commercially available digital multimeter  
(impedance 10 M $\Omega$ /DCV minimum)

### CONNECTION:

Black/Yellow terminal (+) – Body ground (–)

Crank the engine with the kickstarter and read ignition coil primary peak voltage.

**PEAK VOLTAGE: 100 V minimum**



### ⚠ WARNING

- *Avoid touching the spark plug and tester probes to prevent electric shock.*

If the peak voltage is lower than standard value, follow the checks described in the troubleshooting on page 16-3.

## EXCITER COIL PEAK VOLTAGE

### NOTE

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

Disconnect the ICM 4P and 2P connectors.  
Connect the peak voltage adapter or Imrie tester probes to the 2P connector terminals of the exciter coil wire.

### TOOL:

Imrie diagnostic tester (model 625) or  
Peak voltage adapter 07HGJ – 0020100 with  
Commercially available digital multimeter  
(impedance 10 M $\Omega$ /DCV minimum)

### CONNECTION:

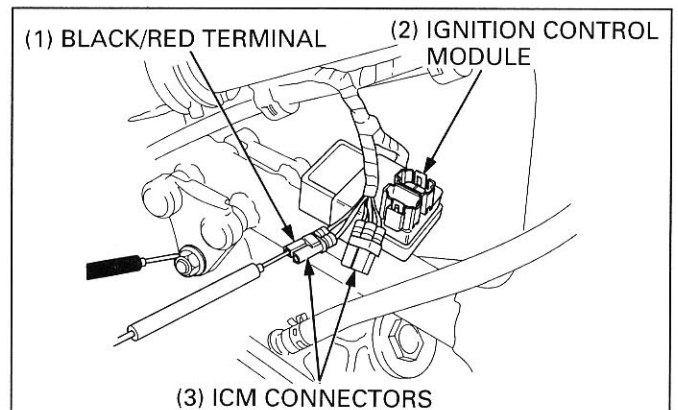
Black/Red terminal (+) – Body ground (–)

Crank the engine with the kickstarter and read exciter coil peak voltage.

**PEAK VOLTAGE: 100 V minimum**

### ⚠ WARNING

- *Avoid touching the spark plug and tester probes to prevent electric shock.*

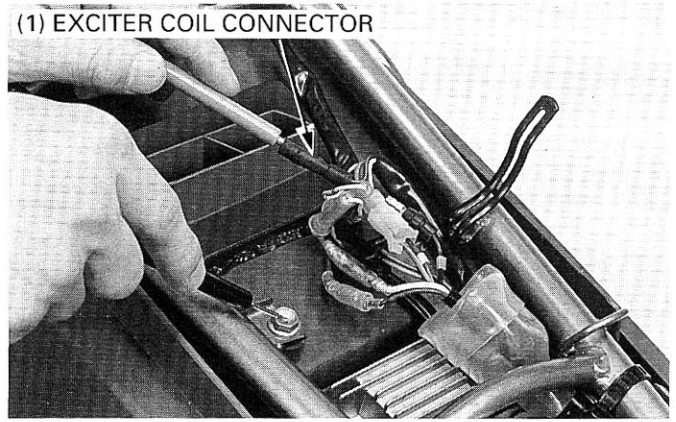


If the peak voltage is lower than standard value, recheck the following:

Remove the seat (page 2-2).  
Disconnect the exciter coil black connector.  
Connect the peak voltage adapter or Imrie tester probes to the connector terminal of the exciter coil side and recheck the peak voltage.

If the peak voltage at the ICM connector is abnormal and peak voltage at the exciter coil connector is normal, check for poorly connected connectors or a broken wire harness.  
If the peak voltage is abnormal at both connectors, follow the checks described in the troubleshooting on page 16-3.

(1) EXCITER COIL CONNECTOR



## IGNITION PULSE GENERATOR PEAK VOLTAGE

### NOTE

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

Disconnect the ICM 4P and 2P connectors.  
Connect the peak voltage adapter or Imrie tester probes to the 4P connector terminals of the ignition pulse generator wires.

### TOOL:

**Imrie diagnostic tester (model 625) or  
Peak voltage adapter 07HGJ – 0020100 with  
Commercially available digital multimeter  
(impedance 10 M $\Omega$ /DCV minimum)**

### CONNECTION:

**Blue/Yellow terminal (+) – Green/White terminal (-)**

Crank the engine with the kickstarter and read ignition pulse generator peak voltage.

**PEAK VOLTAGE: 0.7 V minimum**

### ⚠ WARNING

- *Avoid touching the spark plug and tester probes to prevent electric shock.*

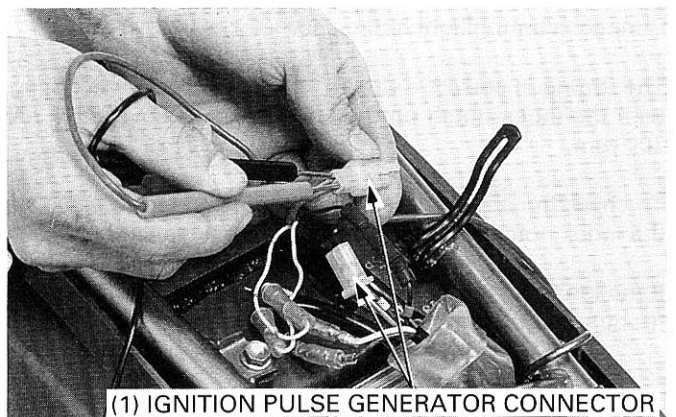
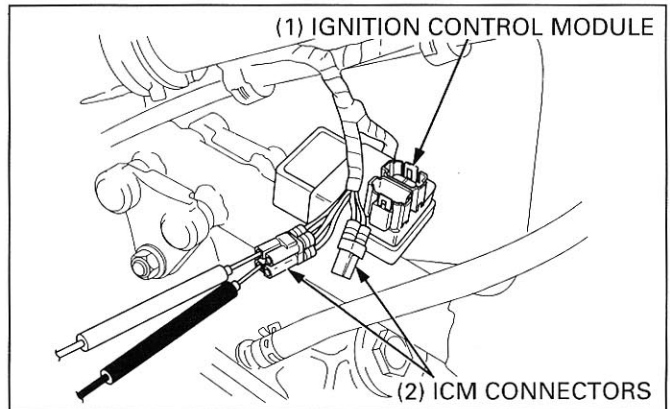
If the peak voltage is lower than standard value, recheck the following:

Remove the seat (page 2-2).  
Disconnect the ignition pulse generator 2P connector.  
Connect the peak voltage adapter or Imrie tester probes to the connector terminal of the ignition pulse generator side and recheck the peak voltage.

If the peak voltage at the ICM connector is abnormal and peak voltage at the ignition pulse generator connector is normal, check for poorly connected connectors or a broken wire harness.

If the peak voltage is abnormal, follow the checks described in the troubleshooting on page 16-3.

(1) IGNITION CONTROL MODULE



(1) IGNITION PULSE GENERATOR CONNECTOR

## IGNITION COIL REMOVAL/INSTALLATION

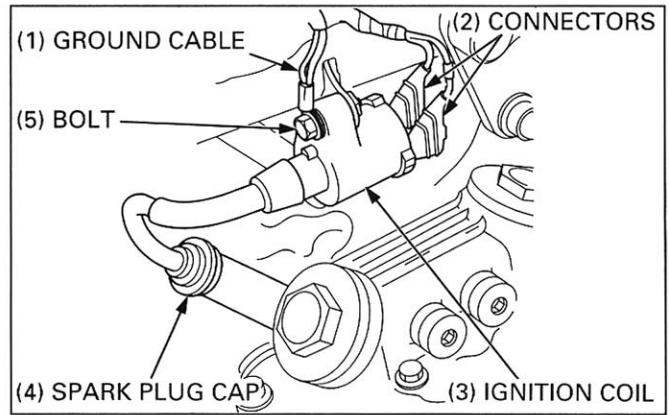
### REMOVAL/INSTALLATION

Remove the fuel tank (page 5-3).  
Disconnect the ignition coil primary connectors.  
Disconnect the spark plug cap.  
Remove the bolt and ground cable.  
Remove the ignition coil.

Installation is in the reverse order of removal.

#### NOTE

- Install the bolt with the ground cable and tighten it.



## ENGINE STOP SWITCH

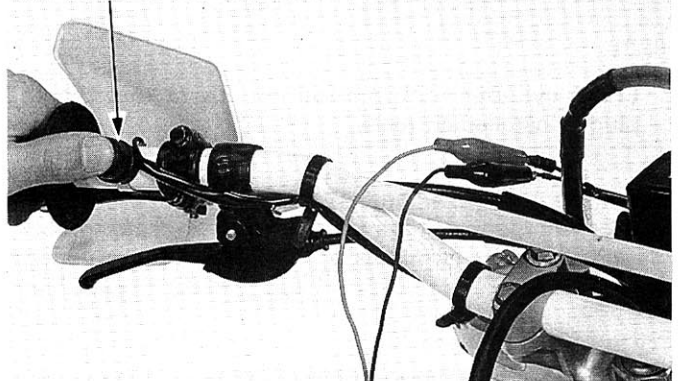
### INSPECTION

Unhook the headlight straps and disconnect the engine stop switch terminals.  
Check the switch for continuity between the Black/White and Black terminals.

**PUSH: Continuity**

**FREE: No continuity**

(1) ENGINE STOP SWITCH



## IGNITION TIMING

#### ⚠ WARNING

- *If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and lead to death.*

#### NOTE

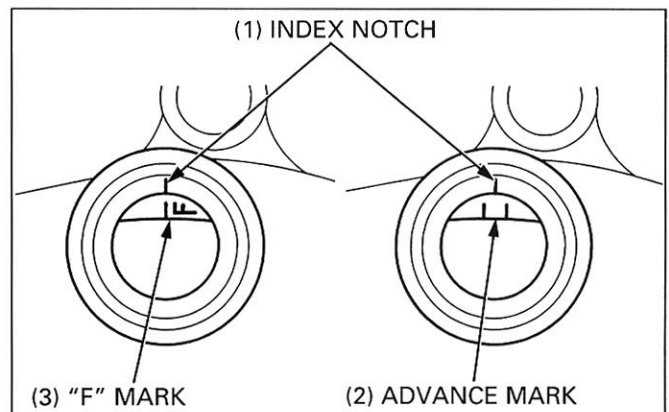
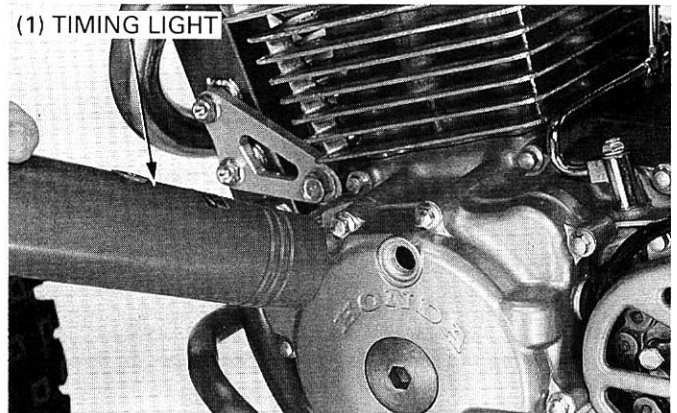
- The capacitor discharge ignition system is factory preset and need only be checked when an electrical system component is replaced.

Warm up the engine and remove the timing hole cap.  
Connect a timing light and tachometer.

The timing is correct if the "F" mark on the flywheel aligns with the index notch on the left crankcase cover at 1,300 ± 100 rpm.

To check the advance, raise the engine speed to 4,300 rpm; the index notch should be between the advance marks.

If the ignition timing is incorrect, inspect the ignition control module (ICM) and ignition pulse generator.



## ALTERNATOR LIGHTING COIL

### INSPECTION

Remove the seat (page 2-2).

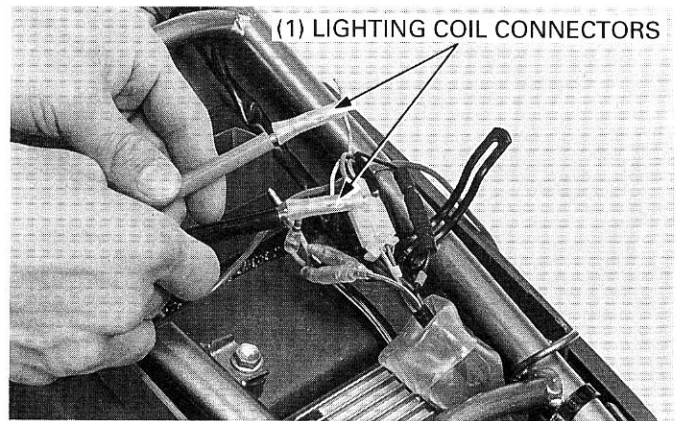
#### NOTE

- It is not necessary to remove the stator coil to make this test.

Disconnect the lighting coil wire connectors (Yellow and Pink).

Measure the lighting coil resistance between the Yellow wire and Pink wire.

**Standard: 0.2 – 1.2  $\Omega$  (20°C/68°F)**



## AC REGULATOR

### VOLTAGE TEST

#### ⚠ WARNING

- *If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and lead to death.*

Warm up the engine.

Stop the engine and remove the headlight (page 16-10).

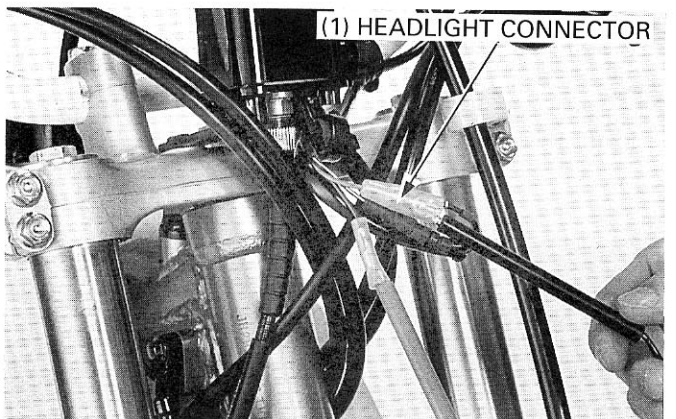
Connect a voltmeter between the Blue wire terminal and (+) probe, Green wire terminal and (-) probe.

Connect a tachometer.

Start the engine and check the meter reading while increasing engine speed slowly.

**Specific voltage: 12.0 – 14.0 V/3,000 rpm**

If the regulated voltage is out of the specifications, follow the checks described of the lighting system troubleshooting on page 16-4.

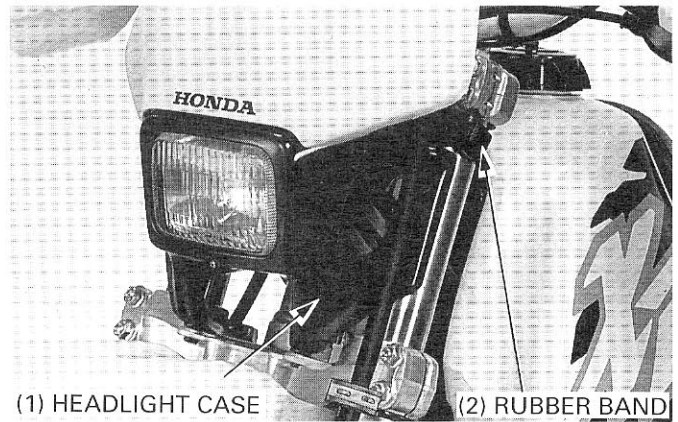


## ELECTRICAL SYSTEM

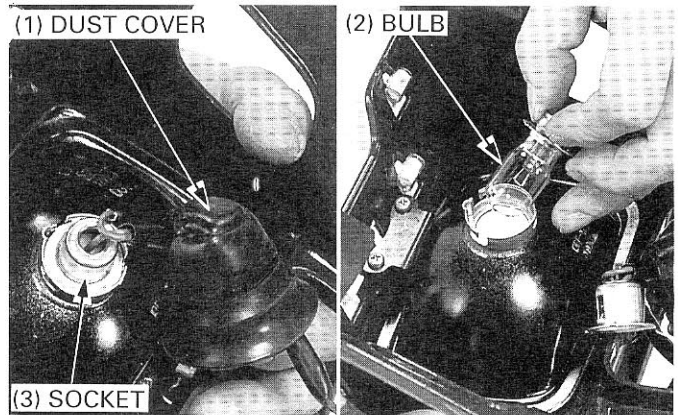
# HEADLIGHT

## BULB REPLACEMENT

Unhook the rubber band and remove the headlight case.



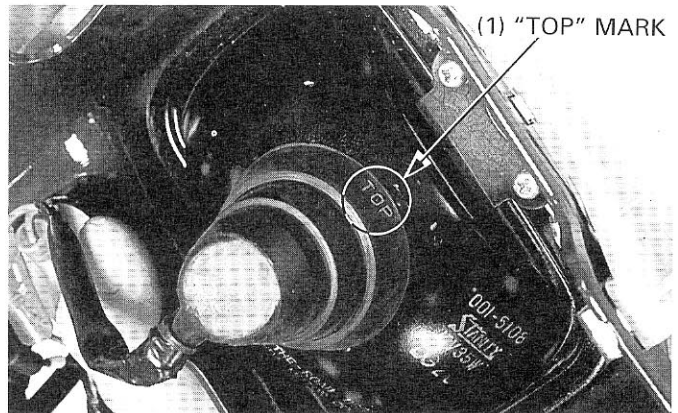
Remove the dust cover and bulb socket.  
Replace the headlight bulb.



Installation is in the reverse order of removal.

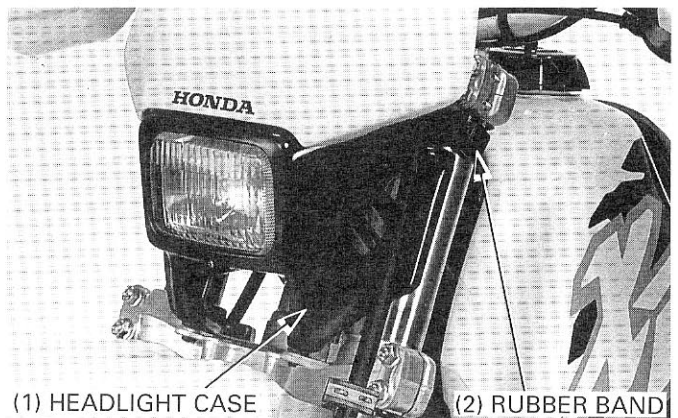
### NOTE

- Install with the "TOP" mark facing up.



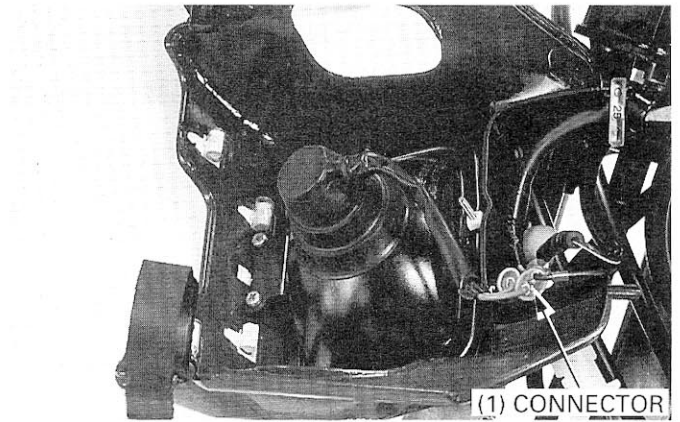
## DISASSEMBLY/ASSEMBLY

Unhook the rubber band and remove the headlight case.





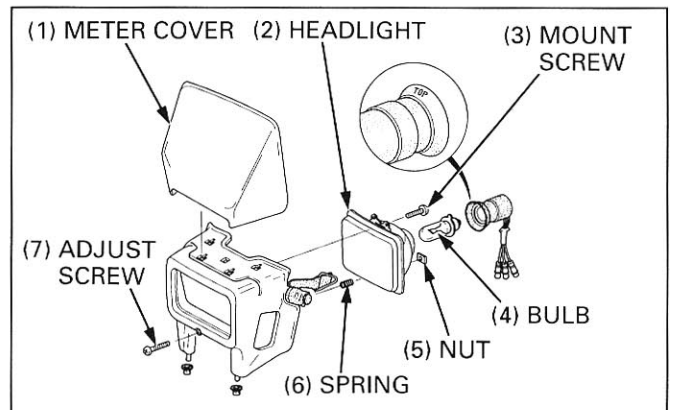
Disconnect the headlight connector.



Remove the following:

- Trip meter cover
- Bulb
- Adjust screw/nut
- Spring
- Headlight mount screws
- Headlight

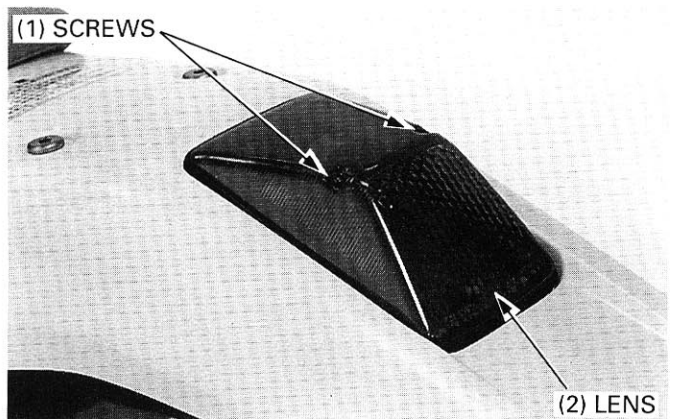
Assembly is in the reverse order of disassembly.



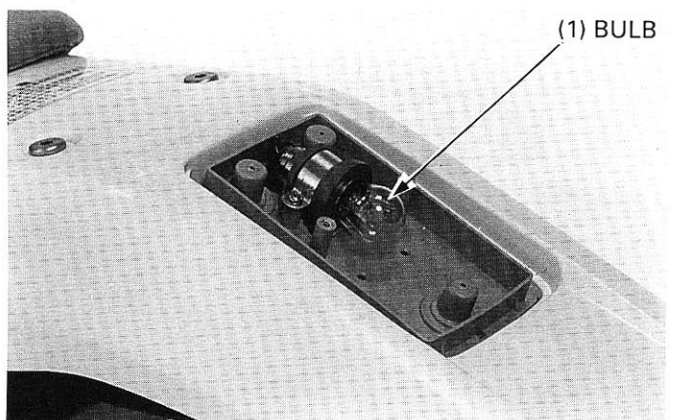
## TAILLIGHT

### BULB REPLACEMENT

Remove the two screws and taillight lens.



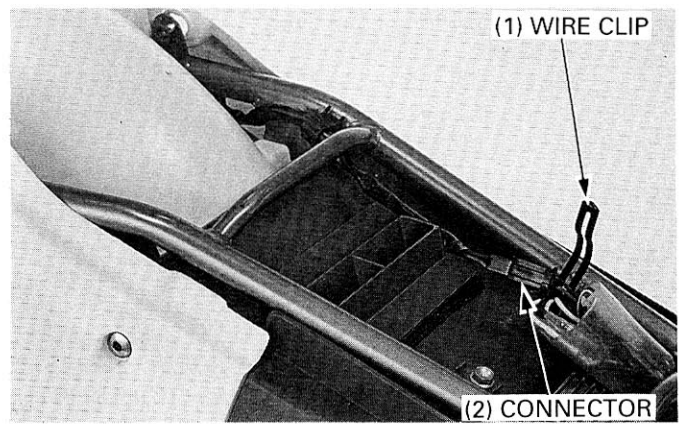
Replace the taillight bulb.



## ELECTRICAL SYSTEM

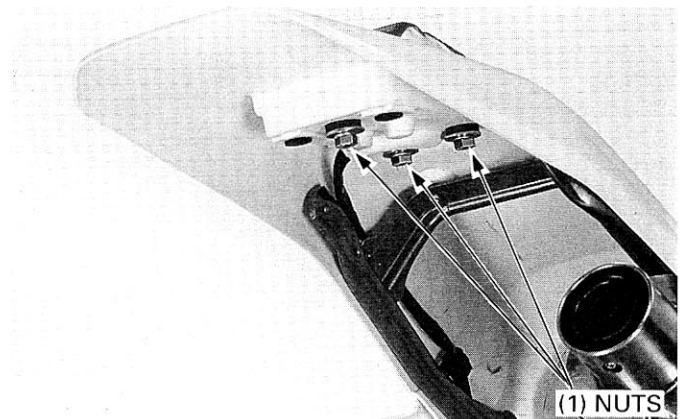
### REMOVAL/INSTALLATION

Disconnect the taillight connector and unhook the wire from the wire band.

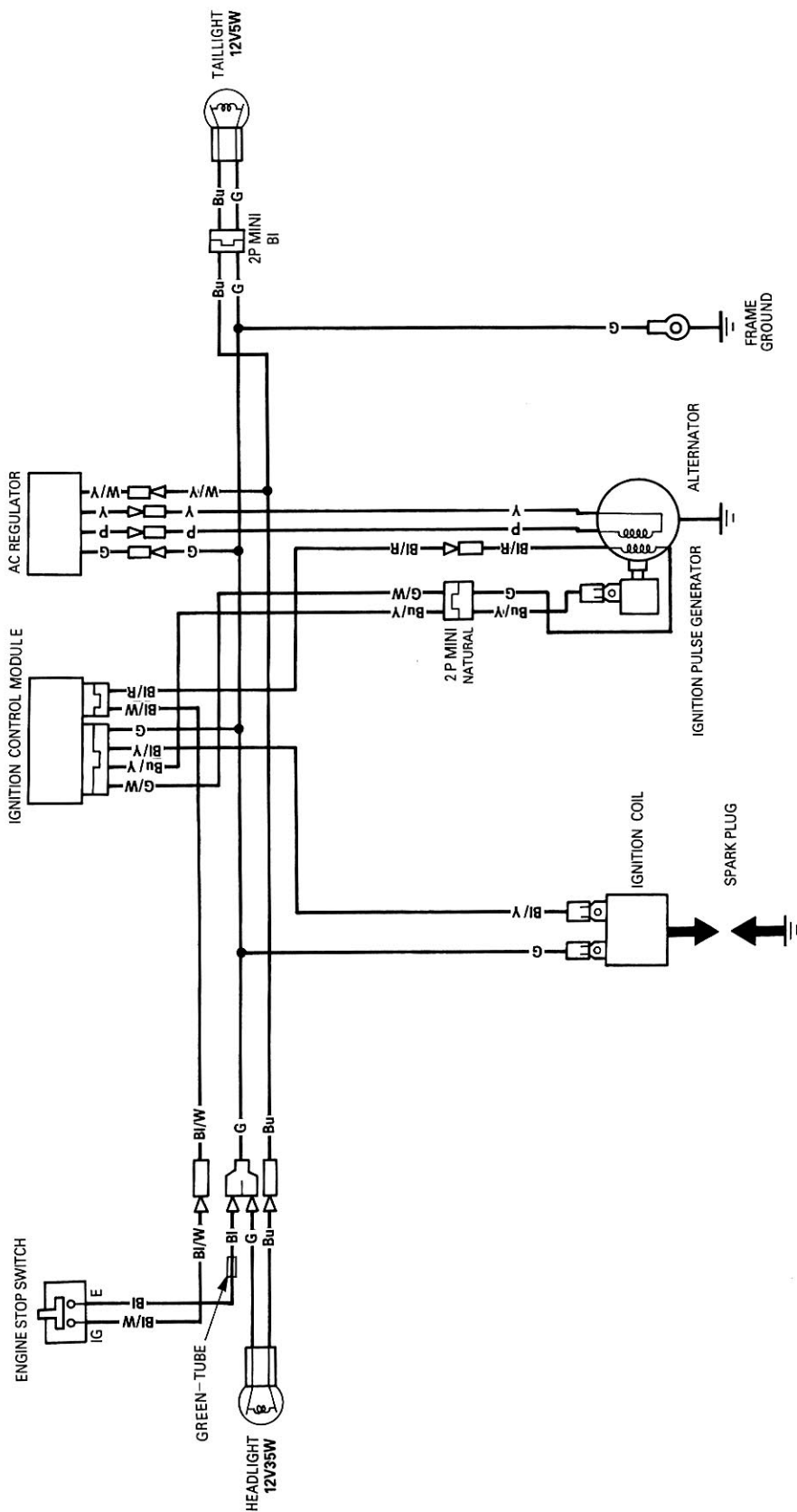


Remove the nuts and taillight assembly.

Installation is in the reverse order of removal.



# 17. WIRING DIAGRAM



BI	BLACK	Br	BROWN
Y	YELLOW	O	ORANGE
Bu	BLUE	Lb	LIGHT BLUE
G	GREEN	Lg	LIGHT GREEN
R	RED	P	PINK
W	WHITE	Gr	GRAY

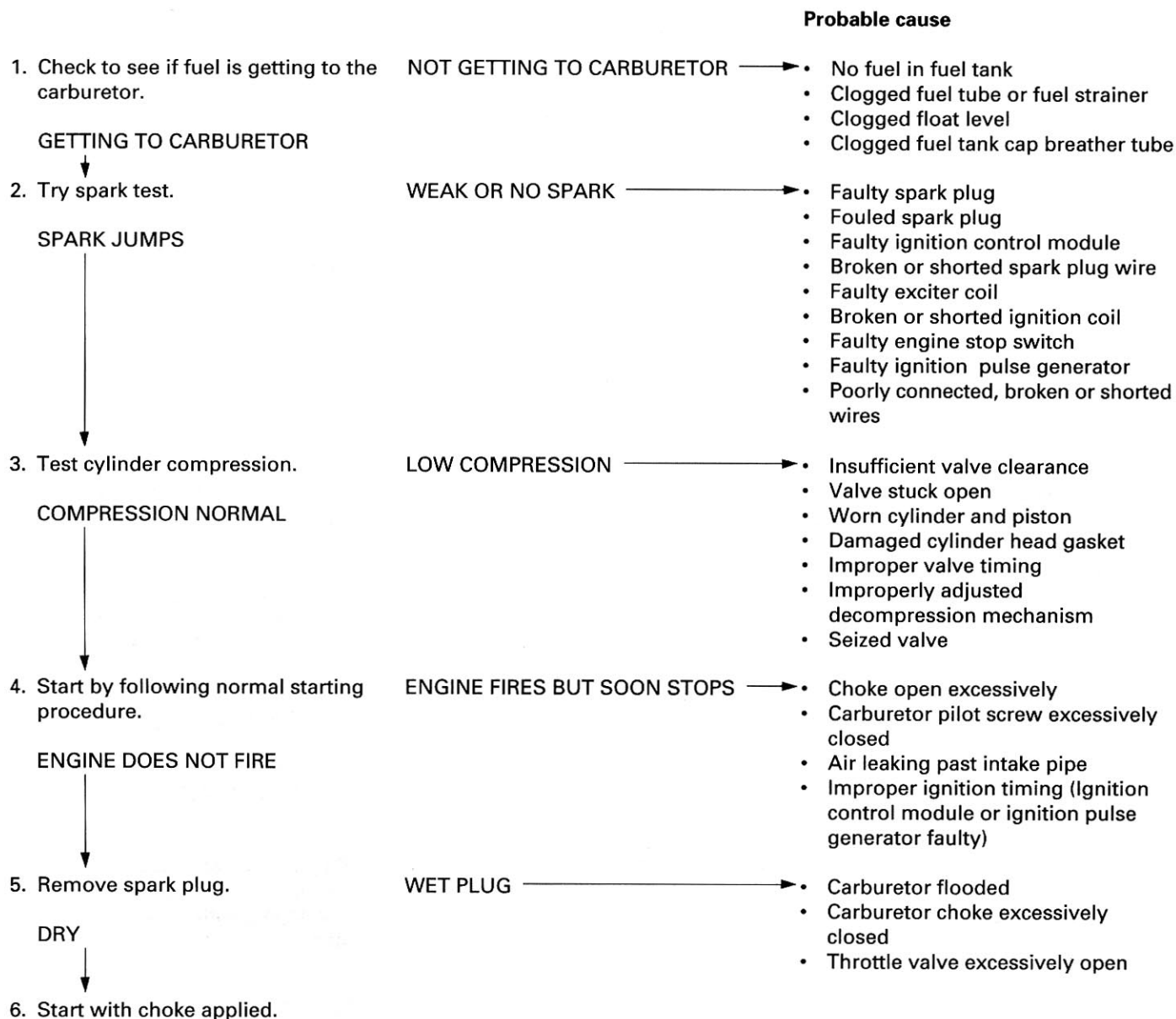
ENGINE STOP SWITCH	
E	IG
FREE	
PUSH	
CORD COLOR	BI (G) BI/W

0030Z — KCE — 0000

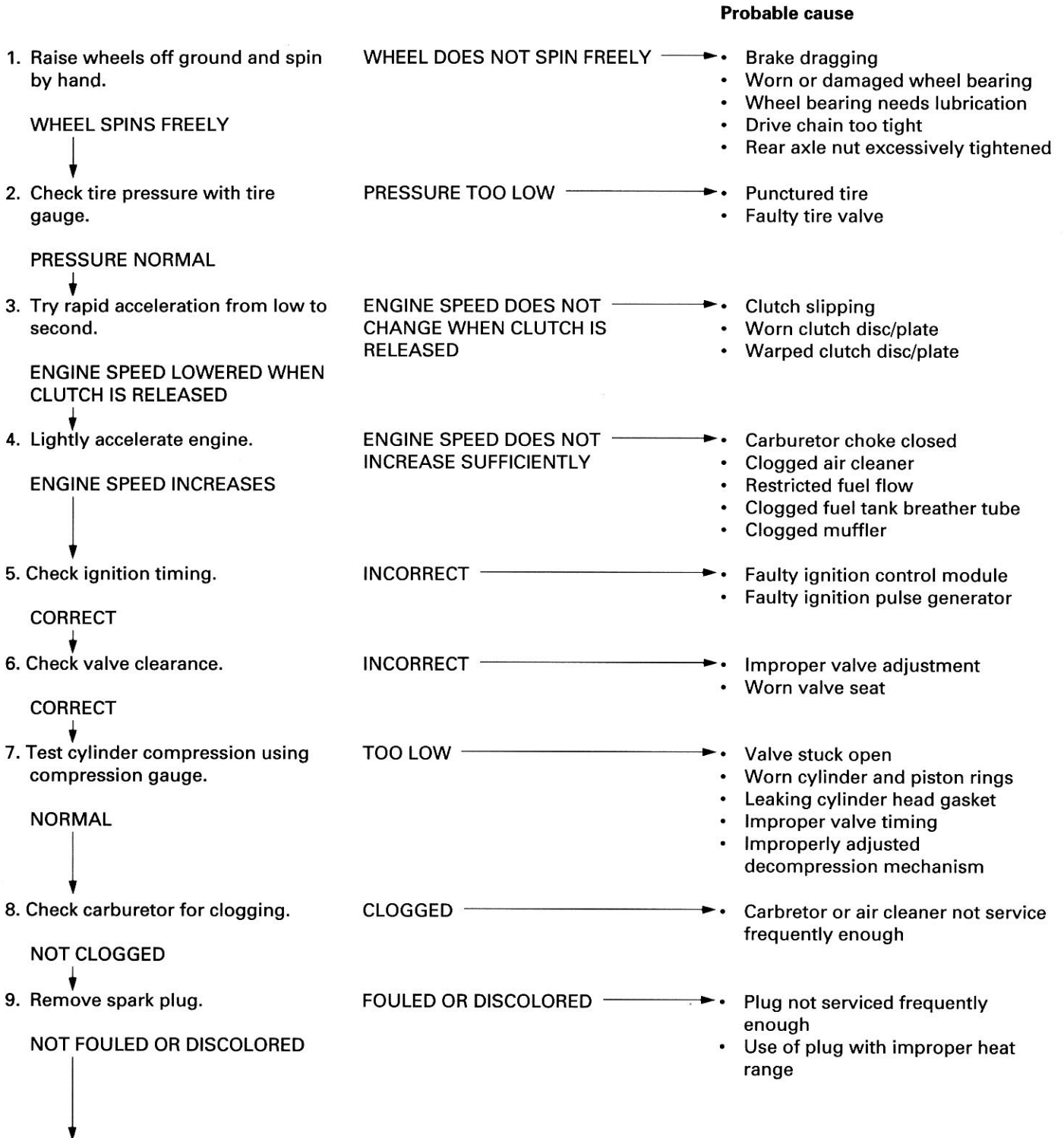
# 18. TROUBLESHOOTING

<b>ENGINE DOES NOT START OR IS HARD TO START</b>	<b>18-1</b>	<b>POOR PERFORMANCE AT HIGH SPEED</b>	<b>18-4</b>
<b>ENGINE LACKS POWER</b>	<b>18-2</b>	<b>POOR HANDLING</b>	<b>18-4</b>
<b>POOR PERFORMANCE AT LOW AND IDLE SPEED</b>	<b>18-3</b>		

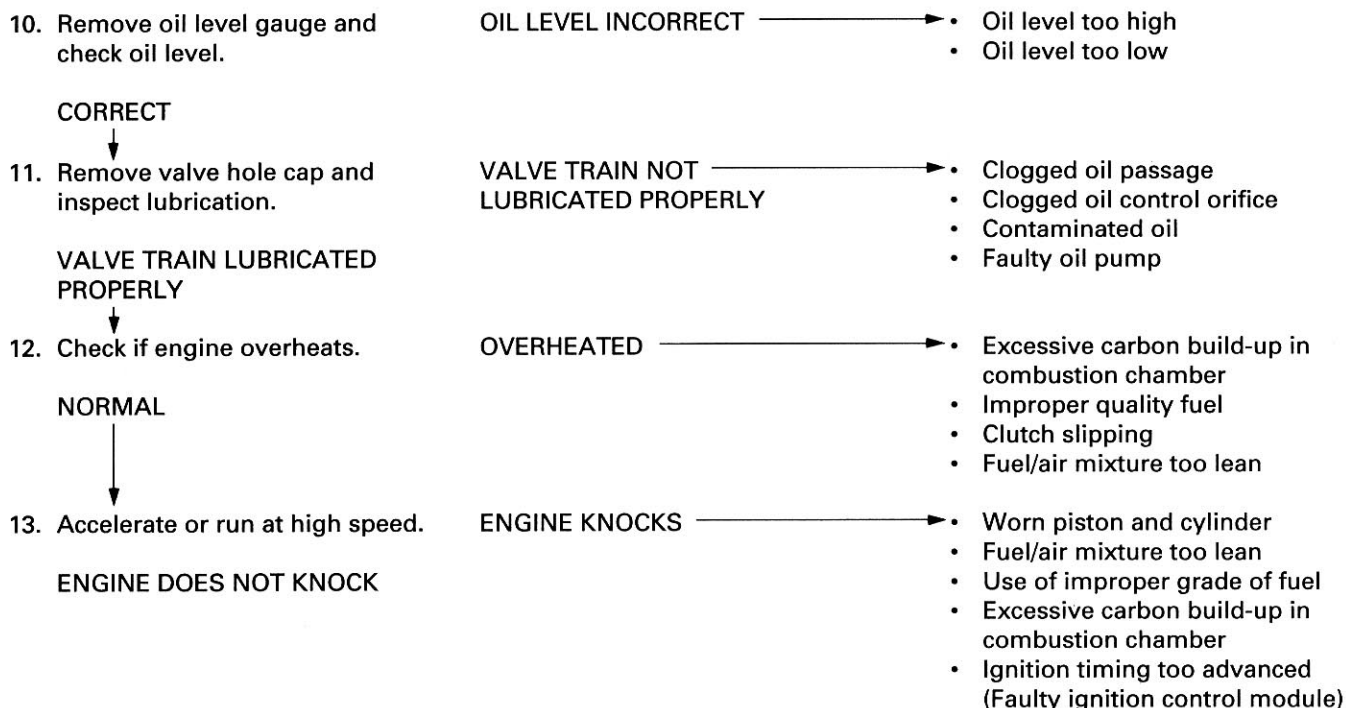
## ENGINE DOES NOT TO START OR IS HARD TO START



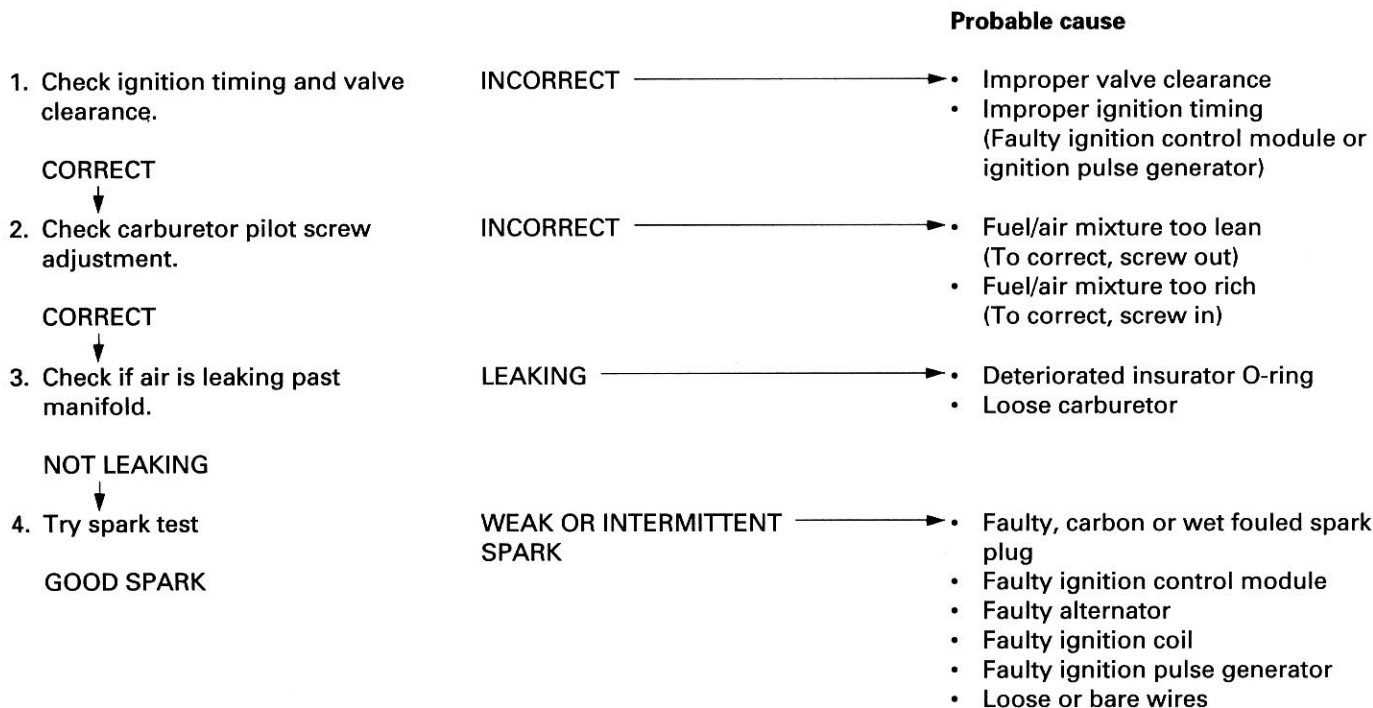
**ENGINE LACKS POWER**







## POOR PERFORMANCE AT LOW AND IDLE SPEED



## TROUBLESHOOTING

### POOR PERFORMANCE AT HIGH SPEED

		Probable cause
1. Check ignition timing and valve clearance.	INCORRECT	• Improper valve clearance • Improper ignition timing (Faulty ignition control module or ignition pulse generator)
CORRECT		
2. Disconnect fuel line at carburetor.	FUEL FLOW RESTRICTED	• Lack of fuel in fuel tank • Clogged fuel line • Clogged fuel tank breather tube • Clogged fuel valve • Clogged fuel strainer
FUEL FLOWS FREELY		
3. Remove carburetor and check for clogged jet(s).	CLOGGED	• Clean
NOT CLOGGED		
4. Check valve timing.	INCORRECT	• Cam sprocket not installed properly
CORRECT		
5. Check valve spring tension	WEAK	• Faulty spring
NOT WEAKENED		
6. Check muffler plate for clogging	CLOGGED	• Remove and clean

### POOR HANDLING ————— Check tire pressure.

	Probable cause
1. If steering is heavy. —————	• Steering bearing adjustment too tight • Damaged steering bearing(s)
2. If either wheel is wobbling —————	• Excessive wheel bearing play • Bent rim • Improperly installed wheel hub • Swingarm pivot bearing excessive play • Bent frame • Loose swingarm pivot bolt
3. If the motorcycle pulls to one side —————	• Front and rear wheels not aligned • Bent front suspension or axle • Bent swingarm • Bent frame

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