



HONDA



SERVICE MANUAL

XR400R

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. Section 4 through 16 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 pages give detailed procedures.

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

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HONDA MOTOR CO., LTD.
SERVICE PUBLICATION OFFICE

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IMPORTANT SAFETY NOTICE



WARNING *Indicates a strong possibility of severe personal injury or death if instructions are not followed.*












CAUTION: *Indicates a possibility of equipment damage if instructions are not followed.*

NOTE: Gives helpful information.

Detailed descriptions of standard workshop procedures, safety principles and service operations are not included. It is important to note that this manual contains some warnings and cautions against some specific service methods which could cause **PERSONAL INJURY** to service personnel or could damage a vehicle or render it unsafe. Please understand that those warnings could not cover all conceivable ways in which service, whether or not recommended by Honda might be done or of the possible hazardous consequences of each conceivable way, nor could Honda investigate all such ways. Anyone using service procedures or tools, whether or not recommended by Honda *must satisfy himself thoroughly* that neither personal safety nor vehicle safety will be jeopardized by the service method or tools selected.

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 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 gease 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 Mitsubsihi Oil Japan</p>
	<p>Use molybdenum disulfide paste (containing more than 40% molybdenum disulfide, NLG1 #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 basis, 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 caused by airborne asbestos fibers.

WARNING

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

Brake fluid

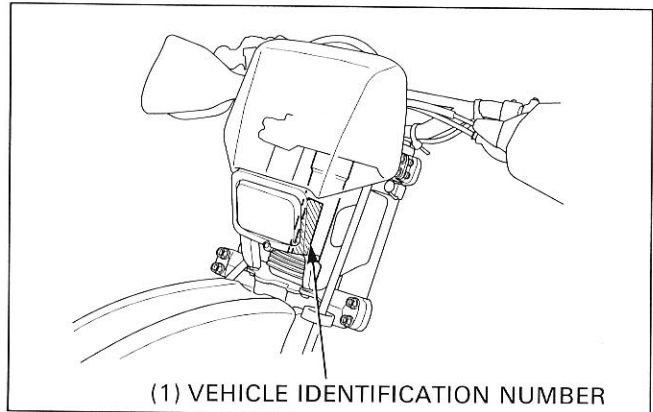
CAUTION

- *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.*

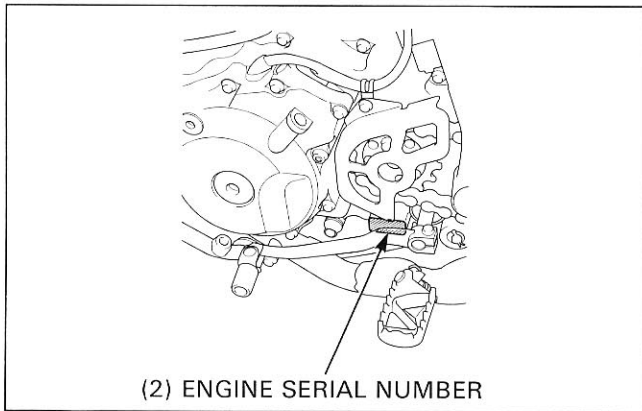
SERVICE RULES

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 the specified torque diagonally, in incremental steps unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After assembly, check all parts for proper installation and operation.
8. Route all electrical wires as show on pages 1-19 through 1-24, Cable and Harness Routing.

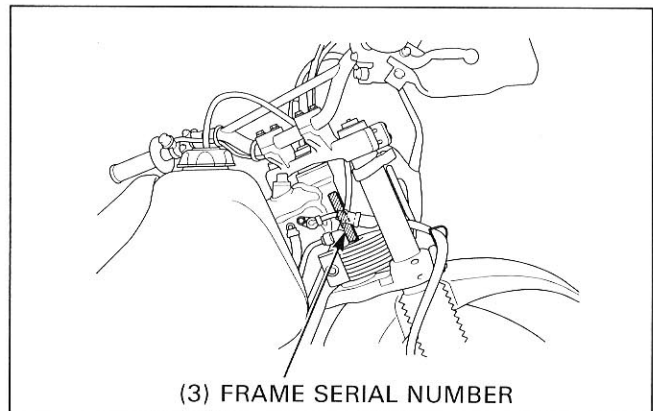
MODEL IDENTIFICATION



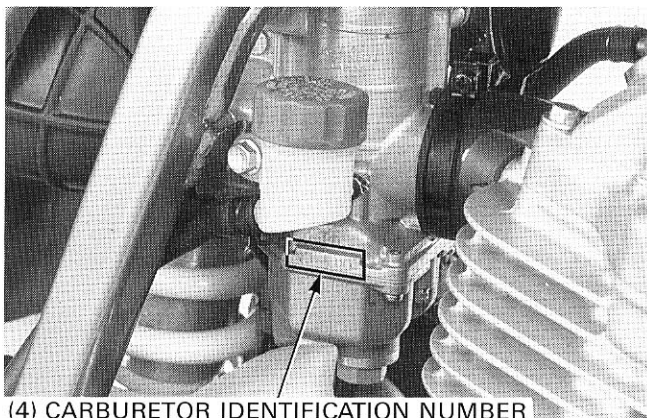
(1) VEHICLE IDENTIFICATION NUMBER
The Vehicle Identification Number (VIN) is located on the front side of the steering head.



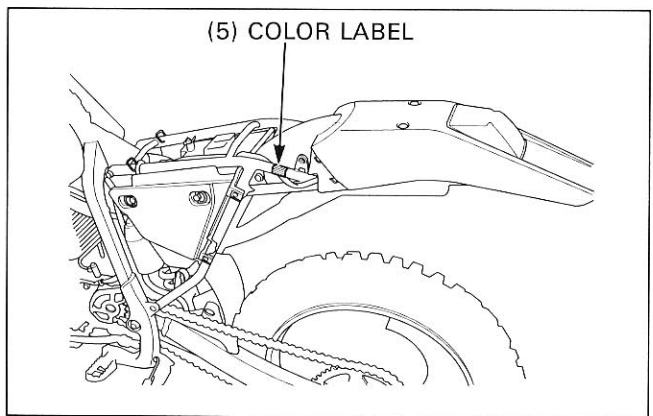
(2) ENGINE SERIAL NUMBER
The engine serial number is stamped on the lower left of the crankcase.



(3) FRAME SERIAL NUMBER
The frame serial number is stamped on the right 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 to the left rear frame tube under the seat. When ordering color-coded parts, always specify the designated color code.

GENERAL INFORMATION

SPECIFICATIONS

GENERAL		
	ITEM	SPECIFICATION
DIMENSIONS	Overall length Overall width Overall height Wheelbase Seat height Ground clearance Dry weight Curb weight Maximum weight capacity	2,130 mm (83.9 in) 840 mm (33.1 in) 1,240 mm (48.8 in) 1,425 mm (56.1 in) 930 mm (36.6 in) 310 mm (12.2 in) 116.5 kg (257 lbs) 125 kg (276 lbs) 100 kg (220 lbs)
FRAME	Frame type Front suspension Front wheel travel Rear suspension Rear wheel travel Front tire size Rear tire size Tire brand (Dunlop) FR/RR Front brake Rear brake Caster angle Trail length Fuel tank capacity Fuel tank reserve capacity	Semi-double cradle Telescopic fork 280 mm (11.0 in) Swingarm 300 mm (11.8 in) 80/100-21 51M 110/100-18 64M K490G/K695 Hydraulic single disc Hydraulic single disc 25° 15' 94 mm (3.7 in) 9.5 ℓ (2.5 US gal, 2.1 Imp gal) 1.5 ℓ (0.4 US gal, 0.3 Imp gal)
ENGINE	Cylinder arrangement Bore and stroke Displacement Compression ratio Valve train Intake valve opens at 1 mm lift Intake valve closes at 1 mm lift Exhaust valve opens at 1 mm lift Exhaust valve closes at 1 mm lift Lubrication system Oil pump type Cooling system Air filtration Engine weight	Gasoline, air cooled 4-stroke SOHC 85.0 X 70.0 mm (3.35 X 2.76 in) 397 cm ³ (24.2 cu-in) 9.3 : 1 Silent multi-link chain driven SOHC with rocker arms 11° BTDC 41.5° ABDC 40° BBDC 10° ATDC Forced pressure (dry sump) Trochoid Air cooled Oiled polyurethane foam 38.5 kg (85 lbs)

GENERAL (cont'd)		
	ITEM	SPECIFICATION
CARBURETOR	Carburetor type Throttle bore	Piston valve 38 mm (1.5 in)
DRIVE TRAIN	Clutch system Clutch operation system Transmission Primary reduction Final reduction Gear ratio 1st Gear ratio 2nd Gear ratio 3rd Gear ratio 4th Gear ratio 5th Gearshift pattern	Multi-plate, wet Cable operating 5 speeds 2.826 (65/23) 3.000 (45/15) 2.615 (34/13) 1.842 (35/19) 1.400 (28/20) 1.120 (28/25) 0.926 (25/27) Left foot operated return system 1- N - 2 - 3 - 4 - 5
ELECTRICAL	Ignition system	CDI (Capacitive Discharge Ignition)

GENERAL INFORMATION

Unit: mm (in)

LUBRICATION SYSTEM		STANDARD	SERVICE LIMIT
ITEM			
Engine oil capacity	at draining	1.7 ℓ (1.8 US qt, 1.5 Imp qt)	—
	at disassembly	2.2 ℓ (2.3 US qt, 1.9 Imp qt)	—
	at filter change	1.8 ℓ (1.9 US qt, 1.6 Imp qt)	—
Recommended engine oil		HONDA GN4 or HP4 4-stroke oil or equivalent motor oil 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		SPECIFICATION
ITEM		
Carburetor identification number	'96, '97 :	PDK 1A
	After '97: 49 state type	PDK 1C
	After '97: California type	PDK 1E
Main jet	'96, '97:	#162*, #158**
	After '97:	#142
Slow jet	'96, '97:	#62*, #60**
	After '97:	#52
Jet needle clip position	'96, '97:	3rd groove from top*, 2nd groove from top**
	After '97:	3rd groove from top
Pilot screw opening		See page 5-11
Float level		14.5 mm (0.57 in)
Idle speed		1,300 ± 100 rpm
Throttle grip free play		2 – 6 mm (1/8 – 1/4 in)

* Standard settings (as delivered)

** Suggested settings for trail riding (noise suppressor and exhaust diffuser installed)

Unit: mm (in)

CYLINDER HEAD/VALVES				STANDARD	SERVICE LIMIT
ITEM					
Decompressor lever free play				5 – 8 mm (3/16 – 5/16 in)	—
Cylinder compression				686 – 980 kPa (7.0 – 10.0 kgf/cm ² , 100 – 142 psi) / 450 rpm	—
Cylinder head	Warpage			—	0.10 (0.004)
Camshaft	Cam lobe height	IN		30.925 – 31.025 (1.2175 – 1.2215)	30.82 (1.213)
		EX		30.827 – 30.927 (1.2137 – 1.2176)	30.72 (1.209)
	Runout			—	0.03 (0.001)
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 (0.4514 – 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)	—
Valve and valve guide	Valve clearance	IN		0.10 ± 0.02 (0.004 ± 0.0008)	—
		EX		0.12 ± 0.02 (0.005 ± 0.0008)	—
	Valve stem O.D.	IN		5.475 – 5.490 (0.2156 – 0.2161)	5.46 (0.215)
		EX		5.455 – 5.470 (0.2148 – 0.2154)	5.44 (0.214)
	Valve guide I.D.	IN/EX		5.500 – 5.512 (0.2165 – 0.2170)	5.52 (0.217)
	Stem-to-guide clearance	IN		0.010 – 0.037 (0.0004 – 0.0015)	0.12 (0.005)
		EX		0.030 – 0.057 (0.0012 – 0.0022)	0.14 (0.006)
	Valve seat width	IN/EX		1.0 – 1.1 (0.039 – 0.043)	2.0 (0.08)
Valve spring	Free length	Inner	IN/EX	37.19 (1.464)	36.3 (1.43)
		Outer	IN/EX	44.20 (1.740)	43.1 (1.70)

GENERAL INFORMATION

Unit: mm (in)

CYLINDER/PISTON		STANDARD	SERVICE LIMIT	
ITEM				
Cylinder	I.D.	85.000 – 85.010 (3.3465 – 3.3468)	85.10 (3.350)	
	Out of round	—	0.05 (0.002)	
	Taper	—	0.05 (0.002)	
	Warpage	—	0.10 (0.004)	
Piston, piston ring and piston pin	Piston mark direction	"IN" mark toward the intake side	—	
	Piston O.D.	84.960 – 84.985 (3.3449 – 3.3459) at 15 (0.6) from the bottom	84.880 (3.3417)	
	Piston pin hole I.D.	20.002 – 20.008 (0.7875 – 0.7877)	20.060 (0.7898)	
	Piston pin O.D.	19.994 – 20.000 (0.7872 – 0.7874)	19.964 (0.7860)	
	Connecting rod small end I.D.	20.020 – 20.041 (0.7882 – 0.7890)	20.067 (0.7900)	
	Cylinder-to-piston clearance	0.015 – 0.050 (0.0006 – 0.0020)	0.10 (0.004)	
	Piston-to-piston pin clearance	0.002 – 0.014 (0.0001 – 0.0006)	0.096 (0.0038)	
	Connecting rod-to-piston pin clearance	0.020 – 0.047 (0.0008 – 0.0019)	0.103 (0.0041)	
	Piston ring-to-ring groove clearance	Top	0.030 – 0.065 (0.0012 – 0.0026)	0.14 (0.006)
		Second	0.015 – 0.050 (0.006 – 0.0020)	0.12 (0.005)
	Piston ring end gap	Top	0.20 – 0.35 (0.008 – 0.014)	0.50 (0.020)
		Second	0.35 – 0.50 (0.014 – 0.020)	0.65 (0.026)
		Oil (side rail)	0.2 – 0.7 (0.01 – 0.03)	0.9 (0.04)
Piston ring mark direction	Top/second	Marking facing up	—	

Unit: mm (in)

CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE			STANDARD	SERVICE LIMIT
ITEM				
Clutch	Clutch lever free play		10 – 20 (3/8 – 3/4)	—
	Clutch spring free length	'96:	45.5 (1.79)	44.5 (1.75)
		After '96:	43.2 (1.70)	41.6 (1.64)
	Clutch disc thickness		2.92 – 3.08 (0.115 – 0.121)	2.69 (0.106)
	Clutch plate warpage		—	0.30 (0.012)
	Clutch outer I.D.		28.000 – 28.021 (1.1024 – 1.1032)	28.04 (1.104)
	Clutch outer guide	I.D.	22.010 – 22.035 (0.8665 – 0.8675)	22.05 (0.868)
		O.D.	27.959 – 27.980 (1.1007 – 1.1016)	27.90 (1.098)
Mainshaft O.D. at clutch outer guide		21.959 – 21.980 (0.8645 – 0.8654)	21.91 (0.863)	
Kickstarter	Kickstarter pinion gear I.D.		22.020 – 22.041 (0.8669 – 0.8678)	22.12 (0.871)
	Kickstarter spindle O.D.		21.959 – 21.980 (0.8645 – 0.8654)	21.91 (0.863)
	Kickstarter idle gear I.D.		19.010 – 19.034 (0.7484 – 0.7494)	19.13 (0.753)
	Idle gear bushing	I.D.	14.000 – 14.018 (0.5512 – 0.5519)	14.05 (0.553)
		O.D.	18.959 – 18.980 (0.7464 – 0.7472)	18.92 (0.745)
Countershaft O.D. at idle gear		13.966 – 13.984 (0.5498 – 0.5506)	13.93 (0.548)	

Unit: mm (in)

TRANSMISSION

ITEM		STANDARD	SERVICE LIIMIT	
Transmission	Gear I.D.	M4	25.020 – 25.041 (0.9850 – 0.9859)	25.08 (0.987)
		M5	25.000 – 25.021 (0.9843 – 0.9851)	25.06 (0.987)
		C1	23.000 – 23.021 (0.9055 – 0.9063)	23.07 (0.908)
		C2, C3	28.020 – 28.041 (1.1031 – 1.1040)	28.08 (1.106)
	Gear bushing O.D.	M4	24.979 – 25.000 (0.9834 – 0.9843)	24.90 (0.980)
		M5	24.959 – 24.980 (0.9826 – 0.9835)	24.90 (0.980)
		C1	22.959 – 22.980 (0.9039 – 0.9047)	22.90 (0.902)
		C2, C3	27.979 – 28.000 (1.1015 – 1.1024)	27.94 (1.100)
	Gear bushing I.D.	M4	22.000 – 22.021 (0.8661 – 0.8670)	22.10 (0.870)
		C1	20.020 – 20.041 (0.7882 – 0.7890)	20.08 (0.791)
		C2, C3	25.000 – 25.021 (0.9843 – 0.9851)	25.06 (0.987)
	Mainshaft O.D.	at M4	21.959 – 21.980 (0.8645 – 0.8654)	21.92 (0.863)
	Countershaft O.D.	at C1	19.979 – 20.000 (0.7866 – 0.7874)	19.94 (0.785)
		at C2, C3	24.959 – 24.980 (0.9826 – 0.9835)	24.92 (0.981)
Gear-to-bushing clearance		0.020 – 0.062 (0.0008 – 0.0022)	0.10 (0.004)	
Gear bushing-to-shaft clearance		0.020 – 0.062 (0.0008 – 0.0022)	0.10 (0.004)	
Shift fork, fork shaft and drum	Shift fork I.D.		13.000 – 13.021 (0.5118 – 0.5126)	13.05 (0.514)
	Shift fork claw thickness		5.93 – 6.00 (0.233 – 0.236)	5.5 (0.22)
	Shift fork shaft O.D.		12.966 – 12.984 (0.5105 – 0.5112)	12.90 (0.508)
	Drum O.D. at right end		19.959 – 19.980 (0.7858 – 0.7866)	19.90 (0.783)
	Drum journal (R. crankcase)		20.000 – 20.033 (0.7874 – 0.7887)	20.07(0.790)

Unit: mm (in)

CRANKSHAFT/BALANCER

ITEM		STANDARD	SERVICE LIIMIT
Connecting rod	Big end side clearance	0.05 – 0.45 (0.002 – 0.018)	0.6 (0.02)
	Big end radial clearance	0.006 – 0.018 (0.0002 – 0.0007)	0.05 (0.002)
Crankshaft runout		—	0.12 (0.005)

GENERAL INFORMATION

Unit: mm (in)

FRONT WHEEL/SUSPENSION/STEERING			STANDARD	SERVICE LIMIT
ITEM			STANDARD	SERVICE LIMIT
Tire and wheel	Cold tire pressure		100 kPa (1.0 kgf/cm ² , 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	Fork spring free length	'96, '97:	510.4 (20.09)	505.3 (19.89)
		After '97:	536.1 (21.11)	528 (20.8)
	Fork spring direction		Narrow end facing down	—
	Fork tube runout		—	0.20 (0.008)
	Fork air pressure		0 kPa	—
	Recommended fork oil		Pro Honda Suspension Fluid SS – 7	—
	Fork oil level	'96, '97:	100 (3.9)	—
		After '97:	116 (4.6)	—
	Fork oil capacity	'96, '97:	570 cm ³ (19.2 US gal, 20.0 Imp gal)	—
After '97:		559 cm ³ (18.9 US gal, 19.7 Imp gal)	—	

Unit: mm (in)



REAR WHEEL/SUSPENSION			STANDARD	SERVICE LIMIT
ITEM			STANDARD	SERVICE LIMIT
Tire and wheel	Cold tire pressure		100 kPa (1.0 kgf/cm ² , 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		19 (0.7)	—	
Drive chain	Drive chain slack		35 – 45 (1-1/3 – 1-3/4)	—
	Drive chain length (at 41 pins/40 links)		—	638 (25.1)
	Drive chain size / link		DID 520V8/108 or RK 520M0Z6/108	—
	Chain slider depth		—	4.0 (0.15)
Shock absorber	Shock absorber spring free length		217.3 (8.56)	213.0 (8.39)
	Shock absorber spring direction		Narrow end facing down	—
	Shock absorber spring installed length	Standard	212.3 (8.36)	—
		Adjustable range	205.3 – 216.3 (8.08 – 8.52)	—
	Damper rod compressed force at 10 mm (0.4 in) compressed		15.4 kg (34.0 lbs)	—
	Damper gas pressure/compressed gas		980 kPa (10.0 kgf/cm ² , 142 psi) / Nitrogen	—
Recommended shock absorber oil		Pro Honda Suspension Fluid SS-8	—	

Unit: mm (in)

HYDRAULIC DISC BRAKE		STANDARD	SERVICE LIIMIT
ITEM			
Specified brake fluid		DOT 4	—
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)	11.06 (0.435)
	RR	12.700 – 12.743 (0.5000 – 0.5017)	12.76 (0.502)
Master piston O.D.	FR	10.957 – 10.984 (0.4314 – 0.4324)	10.84 (0.427)
	RR	12.657 – 12.684 (0.4983 – 0.4994)	12.64 (0.498)
Caliper cylinder I.D.		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)	26.91 (1.059)

ELECTRICAL SYSTEM		SPECIFICATION		
ITEM				
Lighting system	AC regulator regulated voltage	12.5 – 13.5 V / 3,000 rpm		
	Lighting coil resistance (at 20°C/68° F)	0.1 – 1.0 Ω		
Ignition system	Spark plug	NGK	DENSO	
		Standard	DPR8Z	X24GPR-U
		For extended high speed riding	DPR9Z	X27GPR-U
	Spark plug gap	0.6 – 0.7 mm (0.023 – 0.028 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		
Ignition timing F mark	8° BTDC at idle			
Bulb	Headlight	12 V 35 W		
	Taillight	12 V 5 W		

TORQUE VALUES

STANDARD			
FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)	FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)
5 mm bolt and nut	5 (0.5, 3.6)	5 mm screw	4 (0.4, 2.9)
6 mm bolt and nut	10 (1.0, 7)	6 mm screw	9 (0.9, 6.5)
8 mm bolt and nut	22 (2.2, 16)	6 mm flange bolt (8 mm head: Small flange)	9 (0.9, 6.5)
10 mm bolt and nut	34 (3.5, 25)		
12 mm bolt and nut	54 (5.5, 40)	6 mm flange bolt (8 mm head: Large flange—engine only)	12 (1.2, 9)
			
		6 mm flange bolt (10 mm head) and nut	12 (1.2, 9)
		8 mm flange bolt and nut	26 (2.7, 20)
		10 mm flange bolt and nut	39 (4.0, 29)

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

- NOTES: 1. Apply locking agent to the threads.
 2. Apply oil to the threads and seating surface.
 3. ALOC bolt. Do not reuse.
 4. Stake.
 5. Loosen the bolt 1/8 to 1/4 turns after tightening it to the specified torque, then tighten the pivot nut.

ENGINE				
ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Lubrication System:				
Oil drain bolt (at crankcase)	1	12	25 (2.5, 18)	
Oil drain bolt (at frame down tube)	1	10	39 (4.0, 29)	
Frame down tube oil strainer screen	1	27	54 (5.5, 40)	
Oil pipe bolt (at oil strainer)	1	12	37 (3.8, 27)	
Oil cooler joint flare nut (left side)	1	16	20 (2.0, 14)	
(right side)	1	18	20 (2.0, 14)	
Oil pump assembly bolt	2	6	13 (1.3, 9)	
Fuel System:				
Fuel valve mounting bolt	2	6	9 (0.9, 6.5)	
Cylinder Head/Valves:				
Spark plug	1	12	18 (1.8, 13)	
Valve hole cap	4	36	15 (1.5, 11)	
Valve adjusting lock nut	4	7	24 (2.4, 17)	
Head cover bolt	1	8	26 (2.7, 20)	
Rocker arm shaft	2	14	27 (2.8, 20)	NOTE 1
Intake sub-rocker arm shaft	2	14	27 (2.8, 20)	NOTE 1
Exhaust sub-rocker arm shaft	2	12	27 (2.8, 20)	NOTE 1
Cam sprocket bolt	2	7	20 (2.0, 14)	NOTE 1
Cam chain tensioner plug	1	6	4 (0.4, 2.9)	
Cylinder head nut	4	10	44 (4.5, 33)	NOTE 2
Cylinder/Piston:				
Cylinder bolt	4	10	44 (4.5, 33)	NOTE 2

ENGINE (cont'd)				
ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Clutch/Kickstarter/Gearshift Linkage:				
Kickstarter pedal pinch bolt	1	8	26 (2.7, 20)	
Clutch center lock nut	1	18	108 (11.0, 80)	NOTE 2, 4
Gearshift drum stopper arm pivot bolt	1	6	12 (1.2, 9)	
Primary drive gear nut	1	18	88 (9.0, 65)	NOTE 2
Alternator:				
Timing hole cap	1	14	10 (1.0, 7)	
Crankshaft hole cap	1	30	8 (0.8, 5.8)	
Flywheel bolt	1	12	127 (13.0, 94)	NOTE 2
Left crankcase cover stud bolt	1	6	10 (1.0, 7)	NOTE 1
Transmission:				
Mainshaft bearing setting plate bolt	2	6	12 (1.2, 9)	NOTE 1
Gearshift return spring pin	1	8	24 (2.4, 17)	

FRAME				
ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Frame/Body Panels/Exhaust System:				
Sub-frame upper mounting nut	1	8	26 (2.7, 20)	
Sub-frame lower mounting bolt	2	8	42 (4.3, 31)	
Exhaust pipe joint nut	4	8	18 (1.8, 13)	
Muffler mounting bolt	2	8	32 (3.3, 24)	
Muffler band bolt	1	8	20 (2.0, 14)	
Engine Removal/Installation:				
Right foot peg mounting bolt	2	10	42 (4.3, 31)	
Gearshift pedal pinch bolt	1	6	12 (1.2, 9)	
Upper engine hanger bracket nut (engine)	1	10	54 (5.5, 40)	
(frame)	2	8	26 (2.7, 20)	
Front engine hanger bracket nut (engine)	1	10	54 (5.5, 40)	
(frame)	2	8	26 (2.7, 20)	
Lower engine mounting nut	1	10	54 (5.5, 40)	
Front Wheel/Suspension/Steering:				
Front axle holder nut	8	6	12 (1.2, 9)	
Front axle	1	16	88 (9.0, 65)	
Front brake disc bolt	4	6	20 (2.0, 14)	NOTE 1
Spoke nipple	36	BC3.5	3.7 (0.38, 2.7)	
Rim lock	1	8	13 (1.3, 9)	
Fork center bolt	2	22	34 (3.5, 25)	NOTE 1
Piston rod lock nut	2	10	20 (2.0, 14)	
Fork cap	2	39	23 (2.3, 17)	
Rebound damping adjuster	2	—	27 (2.8, 20)	
Steering stem nut	1	24	98 (10.0, 72)	
Steering bearing adjustment nut	1	24	—	See page 13-26
Throttle pulley pivot screw	1	5	4 (0.4, 2.9)	

GENERAL INFORMATION

FRAME (cont'd)				
ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N•m (kgf•m, lb•ft)	REMARKS
Rear Wheel/Suspension:				
Rear axle nut	1	16	88 (9.0, 65)	
Rear brake disc bolt	4	8	42 (4.3, 31)	NOTE 3
Driven sprocket bolt	6	8	32 (3.3, 24)	
Spoke nipple	32	BC3.5	3.7 (0.38, 2.7)	
Rim lock nut	1	8	13 (1.3, 9)	
Shock absorber damper rod end nut	1	12	30 (3.1, 22)	
Shock absorber compression damping adjuster	1	—	18 (1.8, 13)	
Shock absorber spring lock nut	1	—	88 (9.0, 65)	
Shock absorber upper mounting nut	1	10	44 (4.5, 33)	
Shock absorber lower mounting nut	1	10	44 (4.5, 33)	
Shock arm-to-swingarm nut	1	12	69 (7.0, 51)	
Shock link-to-frame nut	1	10	49 (5.0, 36)	
Shock link-to-shock arm nut	1	10	44 (4.5, 33)	
Swingarm pivot nut	1	14	88 (9.0, 65)	
Rear brake hose guide screw	2	5	4.2 (0.43, 3.1)	NOTE 3
Chain slider screw	2	5	4.2 (0.43, 3.1)	NOTE 3
Chain adjuster stopper pin	2	10	34 (3.5, 25)	NOTE 1
Wheel setting plate fixing screw	4	5	4.2 (0.43, 3.1)	NOTE 3
Hydraulic Disc Brake:				
Brake hose oil bolt	4	10	34 (3.5, 25)	
Pad pin	2	10	18 (1.8, 13)	
Pad pin plug	2	10	2.5 (0.25, 1.8)	
Caliper bleed valve	2	8	5.5 (0.55, 4.0)	
Front caliper mounting bolt	2	8	30 (3.1, 22)	NOTE 3
Front caliper pin bolt	1	8	23 (2.3, 17)	NOTE 1
Front caliper bracket pin bolt	1	8	13 (1.3, 9)	NOTE 1
Front master cylinder reservoir cap screw	2	4	1.5 (0.15, 1.1)	
Front brake lever pivot bolt	1	6	6 (0.6, 4.3)	
nut	1	6	6 (0.6, 4.3)	
Front brake lever adjusting bolt	1	5	6 (0.6, 4.3)	
Rear caliper pin bolt	1	12	27 (2.8, 20)	
Rear caliper bracket pin bolt	1	8	13 (1.3, 9)	NOTE 1
Rear master cylinder mounting bolt	2	6	14 (1.4, 10)	NOTE 3
Rear master cylinder push rod lock nut	1	8	18 (1.8, 13)	
Others:				
Side stand pivot bolt	1	10	10 (1.0, 7)	NOTE 5
nut	1	10	39 (4.0, 29)	

TOOLS

- NOTES: 1. Equivalent commercially available in U. S. A.
 2. Not available in U. S. A.
 3. Alternative tool.

DESCRIPTION	TOOL NUMBER	REMARKS	REF. SEC.
Carburetor float level gauge	07401-0010000		5
Universal bearing puller	07631-0010000	NOTE 1	12
Spoke wrench C, 5.8 x 6.1 mm	07701-0020300	NOTE 1	3, 13, 14
Gear holder	07724-0010100	NOTE 2	9
Clutch center holder	07724-0050002	NOTE 1	9
Flywheel holder	07725-0040000	NOTE 1	10
Flywheel puller	07733-0020001	NOTE 3: 07933-3950000	10
Remover weight	07741-0010201	NOTE 3: 07936-371020 A or 07936-3710200	11, 12
Valve guide driver, 5.5 mm	07742-0010100		7
Attachment, 32 x 35 mm	07746-0010100		9, 12, 13
Attachment, 37 x 40 mm	07746-0010200		11, 12, 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		12
Attachment, 24 x 26 mm	07746-0010700		14
Pilot, 12 mm	07746-0040200		12
Pilot, 15 mm	07746-0040300		12
Pilot, 17 mm	07746-0040400		9, 11, 13, 14
Pilot, 25 mm	07746-0040600		11
Pilot, 30 mm	07746-0040700		12
Pilot, 22 mm	07746-0041000		11
Bearing remover shaft	07746-0050100		13, 14
Bearing remover head, 17 mm	07746-0050500		13, 14
Driver	07749-0010000		9, 11, 12, 13, 14
Valve spring compressor	07757-0010000		7
Valve seat cutter, 29 mm (45° EX)	07780-0010300	NOTE 1	7
Valve seat cutter, 35 mm (45° IN)	07780-0010400	NOTE 1	7
Valve seat cutter, 30 mm (32° EX)	07780-0012200	NOTE 1	7
Valve seat cutter, 35 mm (32° IN)	07780-0012300	NOTE 1	7
Valve seat cutter, 30 mm (60° IN/EX)	07780-0014000	NOTE 1	7
Valve seat cutter holder, 5.5 mm	07781-0010101	NOTE 1	7
Compression gauge attachment	07908-KK60000	NOTE 1	7
Snap ring pliers	07914-3230001		15
Steering stem socket	07916-KA50100		13
Needle bearing remover	07931-MA70000	NOTE 3: 07936-3710600 and 07936-3710100 and 07936-3710200	14
Remover shaft	07936-1660120		12
Remover handle	07936-3710100		11
Bearing remover, 17 mm	07936-3710300		11
Bearing remover set, 15 mm	07936-KC10000	NOTE 2	12
- bearing remover, 15 mm	07936-KC10500		12
- remover shaft	07936-KC10100	NOTE 2	12
- bearing remover	07936-KC10200	NOTE 2	12
- remover weight	07741-0010201	NOTE 3: 07936-371020A or 07936-3710200	12

GENERAL INFORMATION

DESCRIPTION	TOOL NUMBER	REMARKS	REF. SEC.
Steering stem driver	07946-4300101	NOTE 3: 07946-MB00000 and 07946-KA6000A or GN HT-51	13
Needle bearing remover	07946-KA50000		14
Driver head (After '97)	07946-KM40701	NOTE 2	14
Driver shaft (After '97)	07946-MJ00100		14
Fork seal driver attachment	07947-KA40200		13
Fork seal driver weight	07947-KA50100		13
Oil seal remover	07948-4630100	NOTE 3: M9360-277-91774 and 07953-MJ1000B or 07953-MJ1000A	13
Crankcase assembly tool	07965-VM00000	NOTE 2	12
– assembly collar	07965-VM00100		12
– assembly shaft	07965-VM00200	NOTE 3: 07931-ME4010B and 07931-HB3020A	12
– threaded adaptor	07965-VM00300	NOTE 3: 07931-KF00200	12
Slider guide, 14 mm	07974-KA40000	NOTE 2	14
Slider guide attachment	07974-KA50102	NOTE 2	14
Valve guide reamer, 5.5 mm	07984-2000001	NOTE 3: 07984-200000D	7
Pin driver	07GMD-KT80100	NOTE 2	14
Peak voltage adaptor	07HGJ-0020100	NOTE 3: Peak voltage tester (U.S.A. only)	16
Spherical bearing driver ('96, '97)	07HMF-KS60100	NOTE 3: 07965-GM00100 or 07965-VM00100	14
Bearing remover, 13 mm	07LMC-KZ10100	NOTE 2	12
Fork damper holder	07WMB-KCY0100	NOTE 3: 07TMB-KCY010A and 07TMB-001010A	13

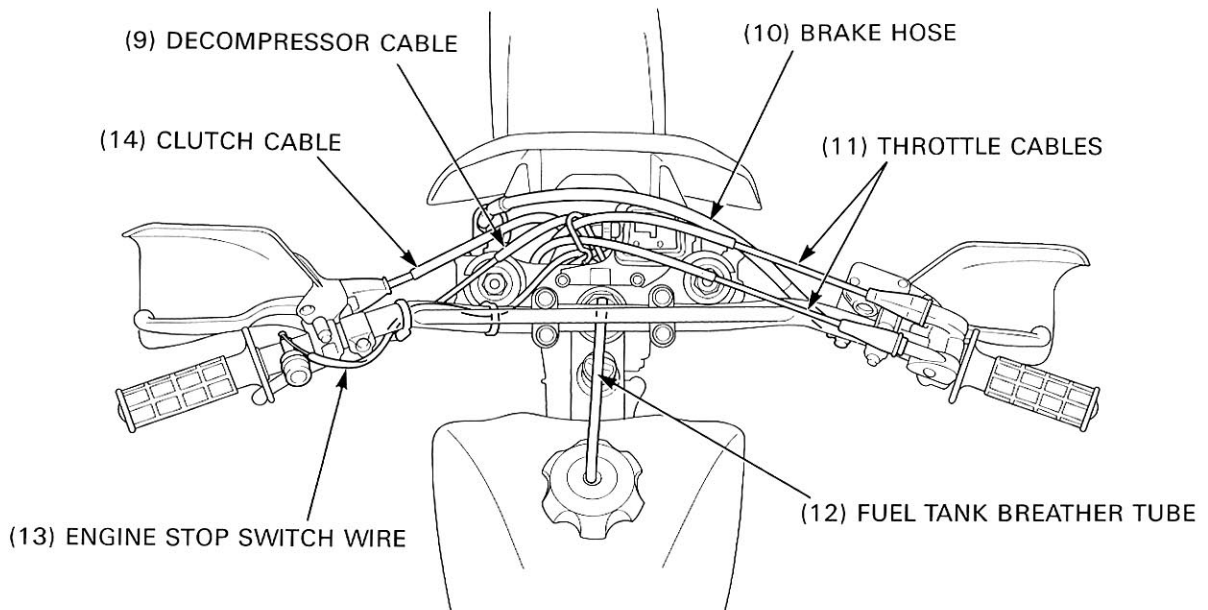
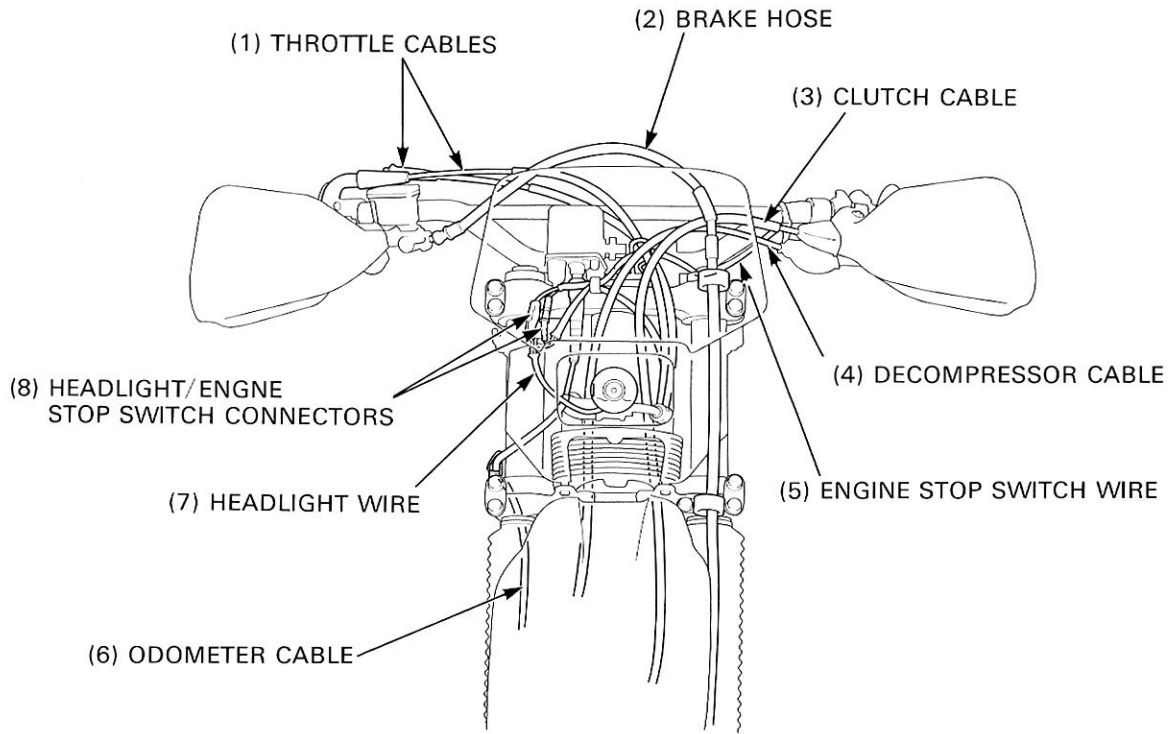
LUBRICATION & SEAL POINTS

ENGINE	LOCATION	MATERIAL	REMARKS
	Camshaft journal and lobes Rocker arm slipper surfaces Sub-rocker arm slipper surfaces Valve stem (valve guide sliding surfaces) Clutch outer guide sliding surfaces Kickstarter spindle spline Piston pin outer surface Connecting rod small end inner surface Transmission gear and sliding surfaces Transmission gear shift fork grooves	Molybdenum oil solution (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease)	
	Rocker arm shaft sliding surface Sub-rocker arm shaft sliding surface Cam chain Cylinder head nut threads and seating surfaces Piston outer surface and piston pin hole Piston rings Cylinder bore Cylinder bolt threads and seating surfaces (10 mm only) Clutch arm shaft Clutch lifter piece Clutch disc lining Clutch center lock nut threads and seating surfaces Primary drive gear lock nut threads and seating surfaces Flywheel bolt threads and seating surfaces Transmission gear teeth Gearshift fork shaft Gearshift fork pins and inner surfaces Shift drum grooves Connecting rod big end side surfaces Oil pump rotors Bearings O-rings	Engine oil	
	Oil seal lips	Multi-purpose grease	
	Rocker arm shaft threads Sub-rocker arm shaft threads Gearshift cam plate bolt threads Left crankcase cover stud bolt threads Alternator wire clamp bolt threads (inside the left crankcase cover) Stator bolt threads Mainshaft bearing setting plate bolt threads Cam chain tensioner guide bolt threads Cam sprocket bolt threads	Locking agent	Coating area (page 7-24) Coating area (page 7-24) Coating width: 6.5 mm (0.26 in) from tip Coating width: 5 mm (0.2 in) from tip
	Alternator wire grommet seating surface	Liquid sealant	

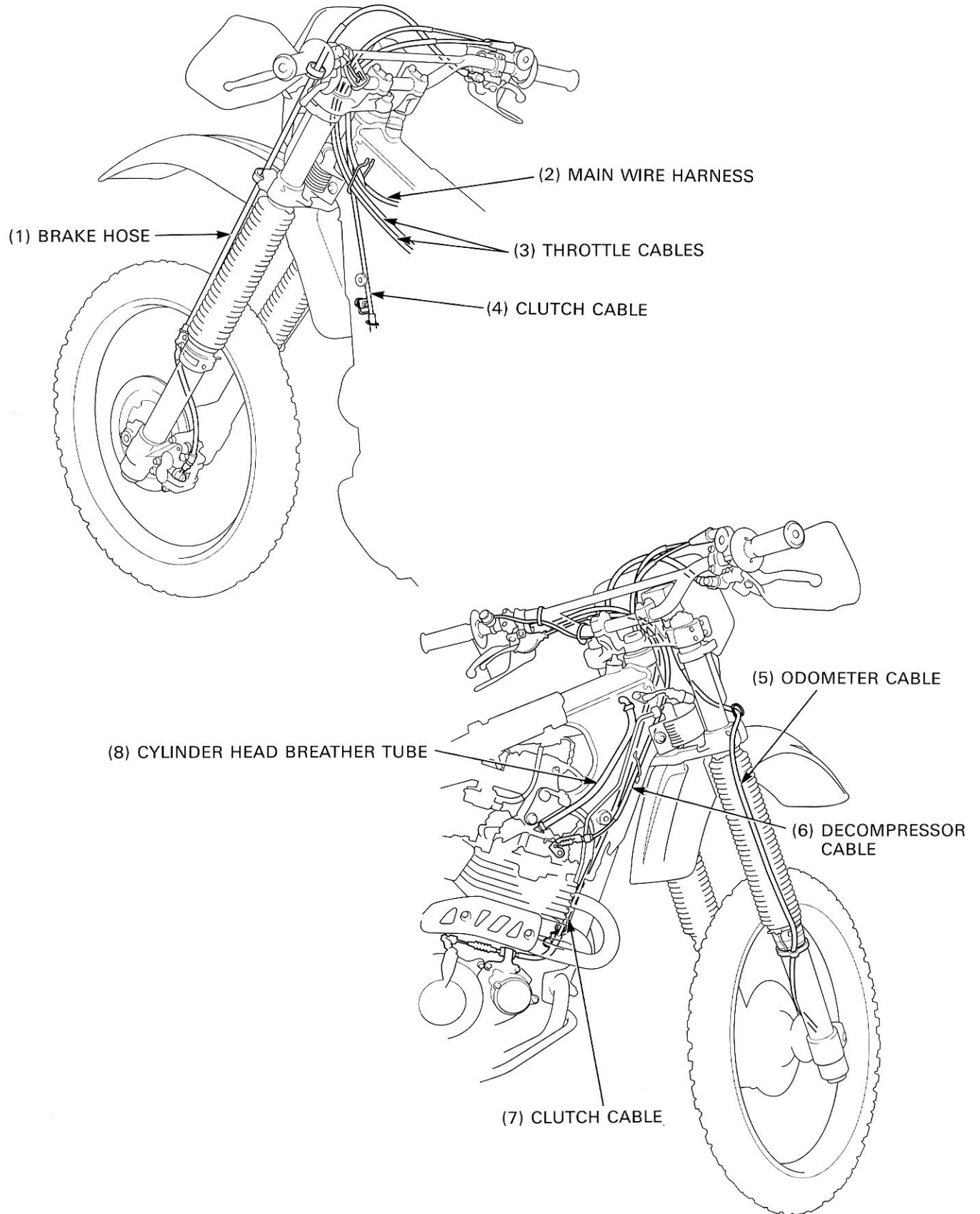
GENERAL INFORMATION

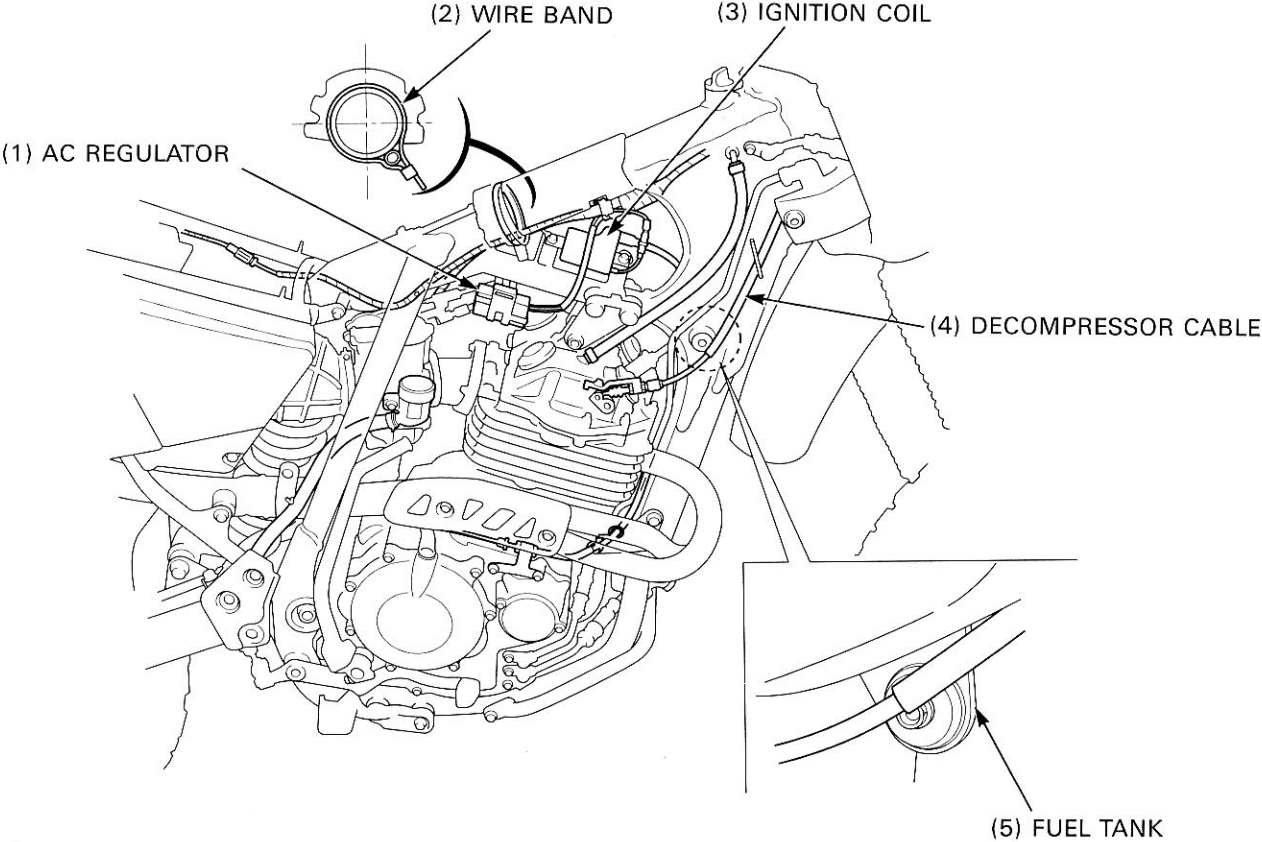
FRAME	LOCATION	MATERIAL	REMARKS
	Clutch lever pivot sliding surface Decompressor lever pivot sliding surface Throttle grip pipe flange groove and sliding surface Throttle cable slider groove Throttle cable pulley groove Side stand pivot sliding surface Wheel bearings Odometer gear teeth and sliding surface Steering head bearing rollers Shock link/arm bearings Swingarm pivot bearings Rear brake pedal pivot sliding surface Each dust seal lips and dust seal cap lips	Multi-purpose grease	Fill up 3 g (0.1 oz) to each bearing.
	Shock absorber upper mounting bearing (spherical)	Molybdenum disulfide paste	
	Brake master pistons and cups Caliper pistons Rear master cylinder reservoir joint O-ring	DOT 4 brake fluid	
	Front brake lever pivot sliding surface Front brake lever adjusting bolt tip Rear master cylinder push rod tip and boot groove Caliper piston seals Caliper pin sliding surfaces Caliper bracket pin sliding surfaces	Silicone grease	
	Fork oil seal lips Fork dust seal lips Fork cap O-ring Rear damper rod guide case oil seal/O-ring Rear damper piston ring/ O-ring	Pro Honda Suspension Fluid SS-8 or equivalent	
	Handlebar grip rubber inside surfaces Air cleaner connecting tube-housing mating surface Air cleaner inlet duct seat rubber and inlet duct seating surface	Honda bond A, Honda Hand Grip Cement (U.S.A. only) or Cemedine #540	
	Front brake disc bolt threads Chain adjuster stopper pin threads Swingarm wheel setting plate screw threads Front caliper mounting bolt threads Front caliper pin bolt and bracket pin bolt threads Rear caliper bracket pin bolt threads	Locking agent	

CABLE & HARNESS ROUTING



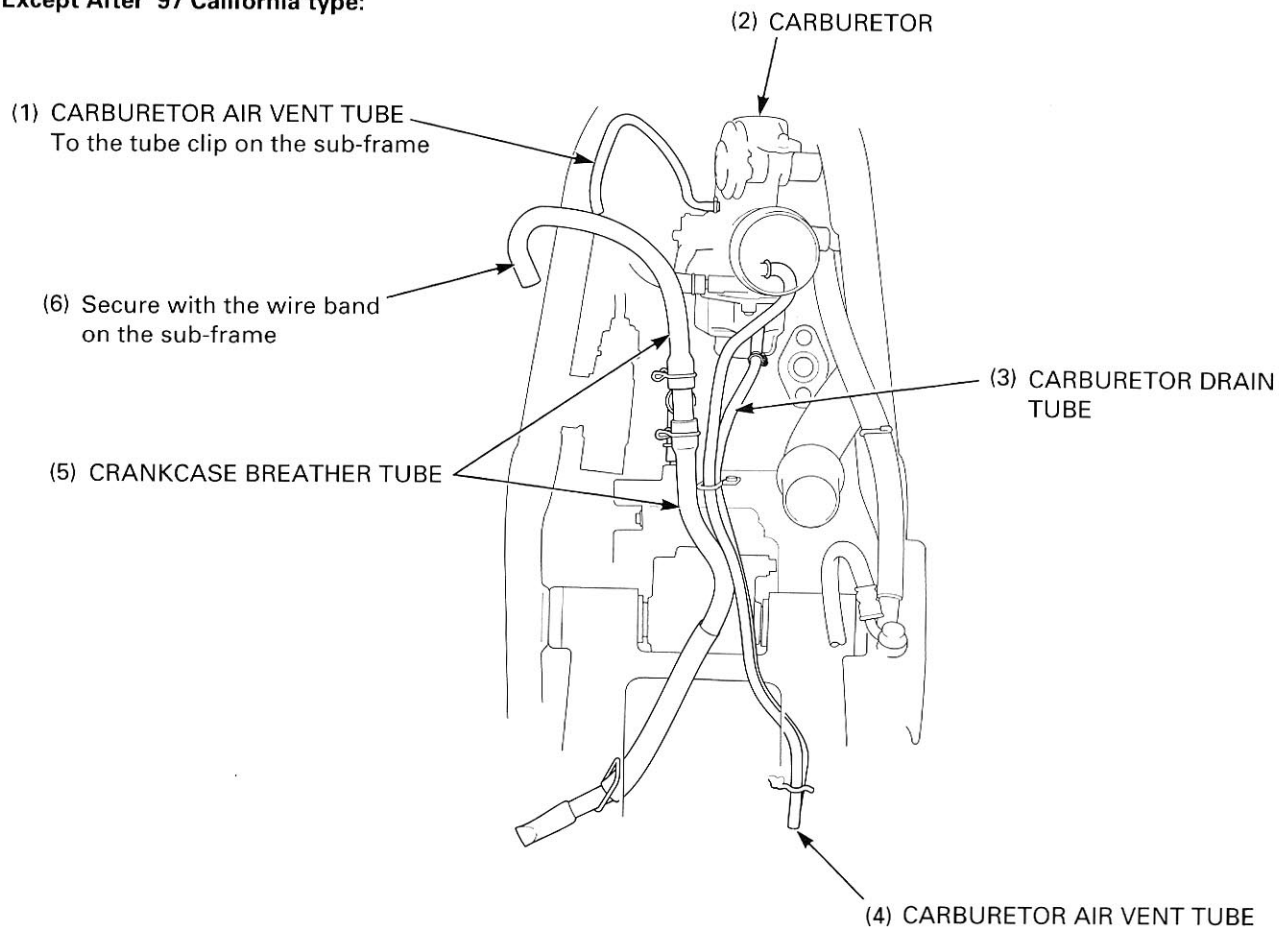
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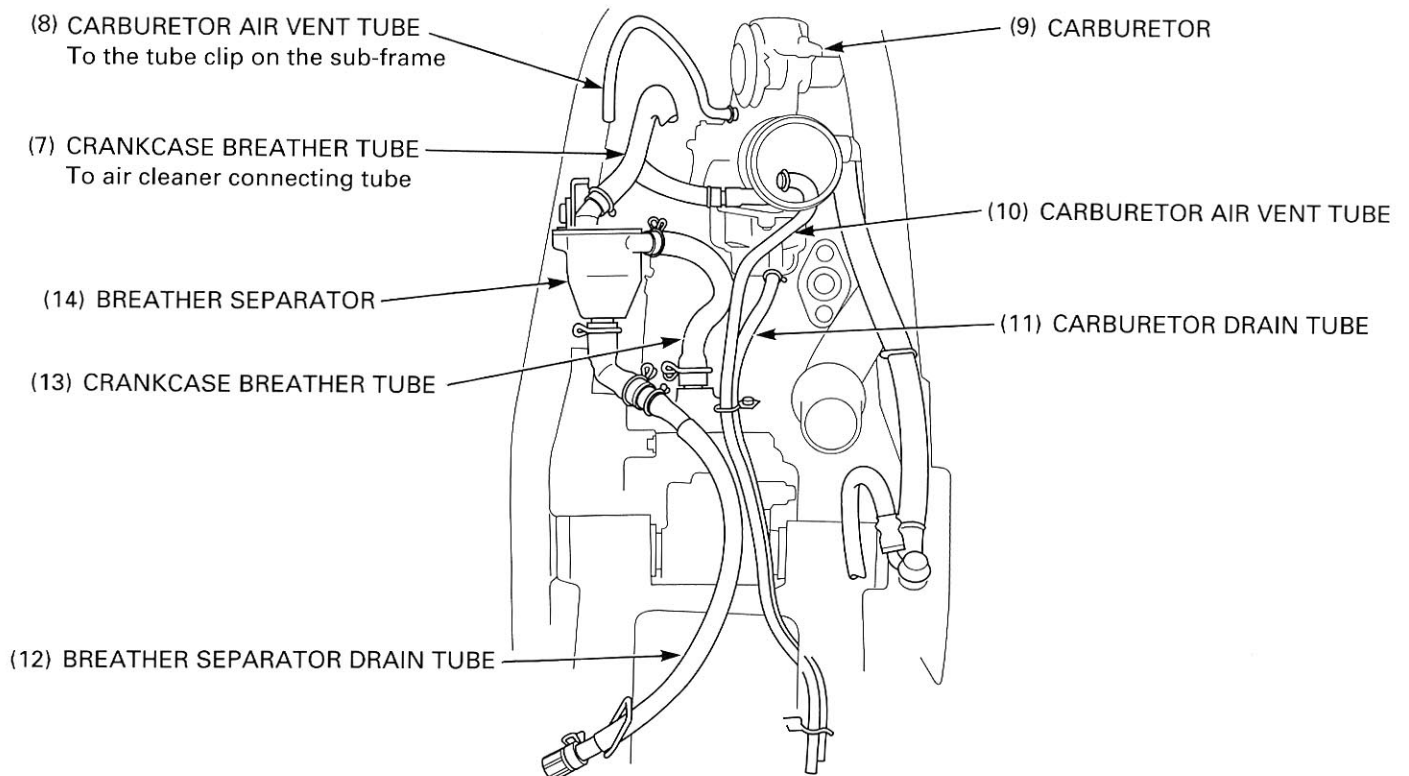


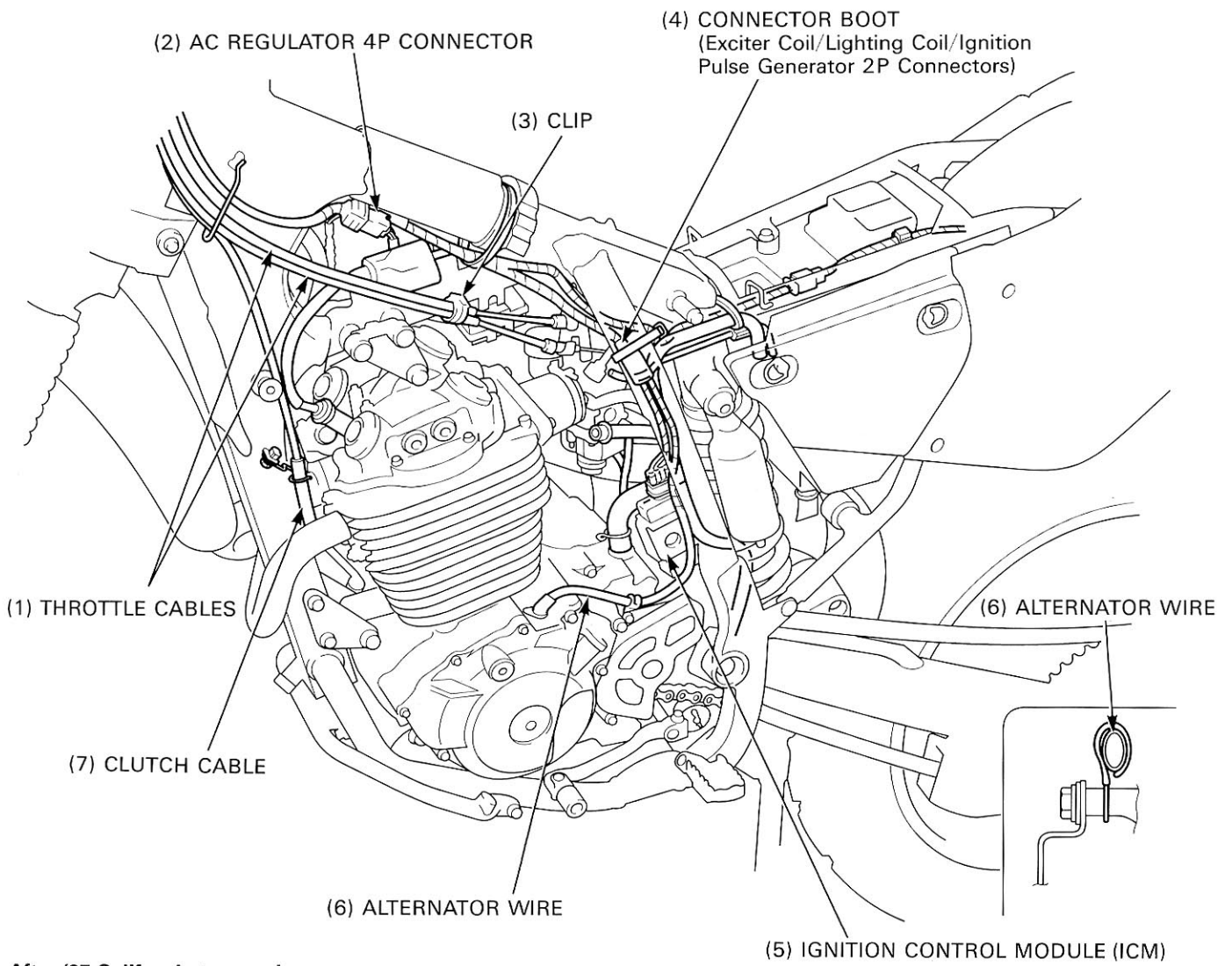
GENERAL INFORMATION

Except After '97 California type:

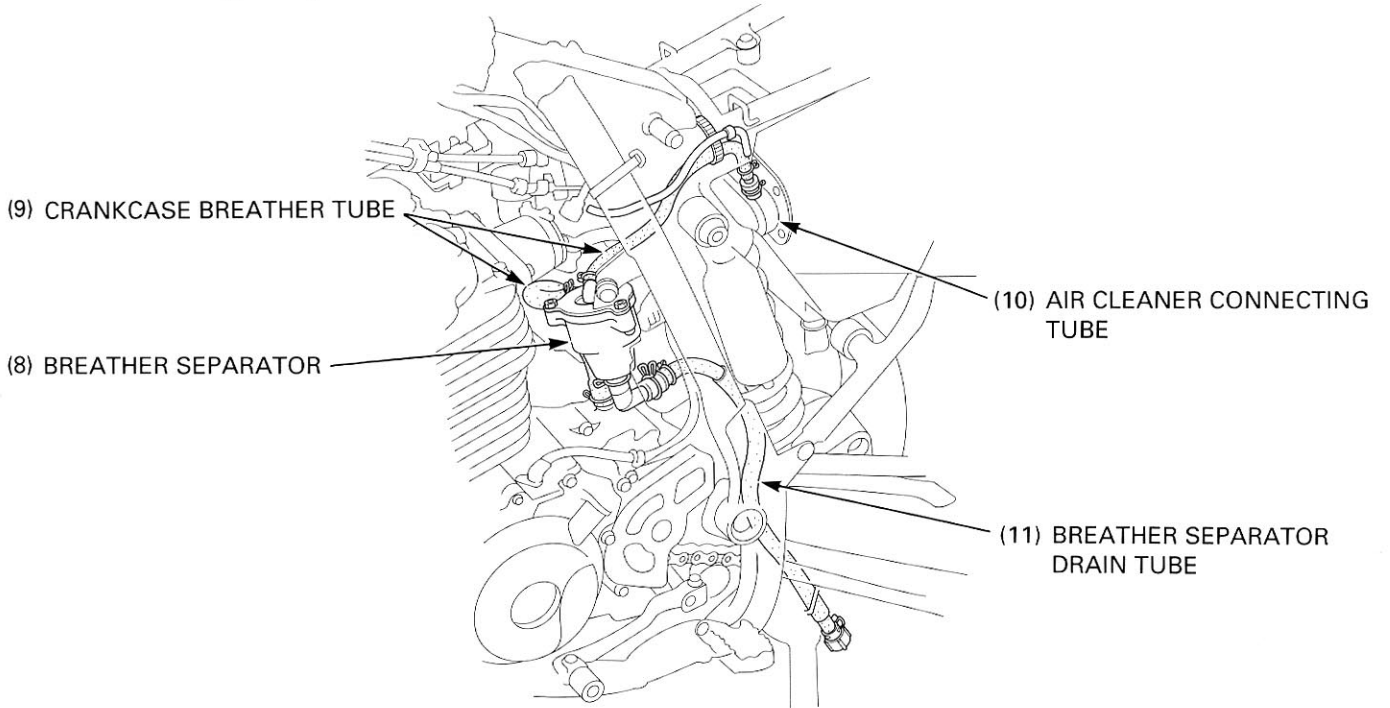


After '97 California type:

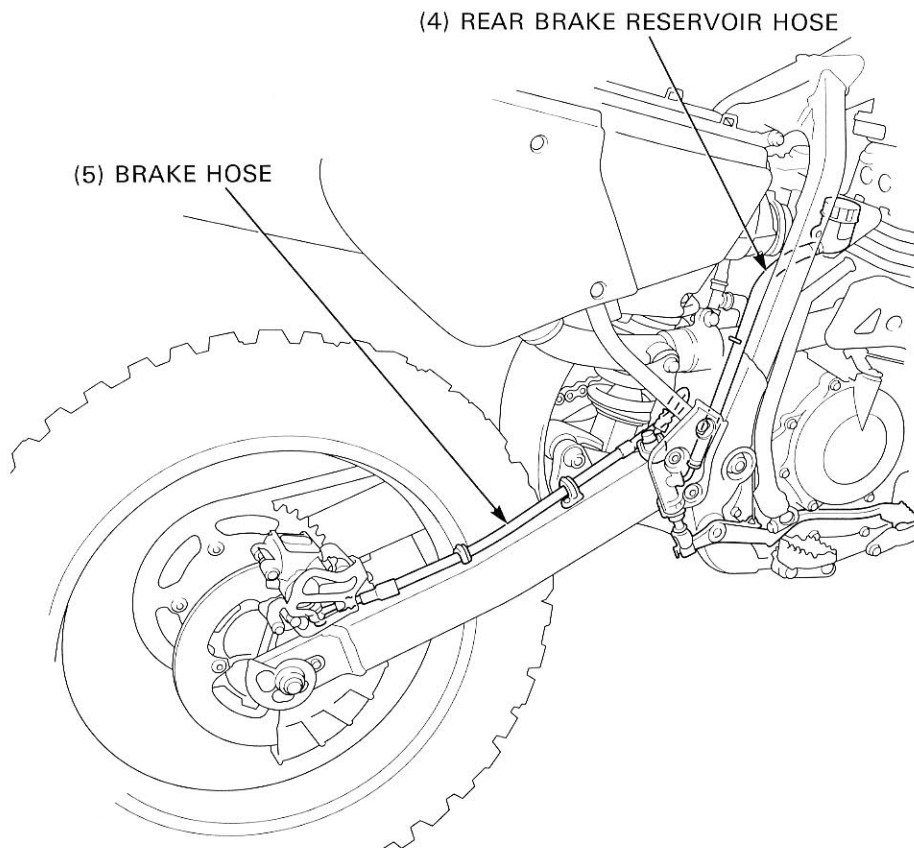
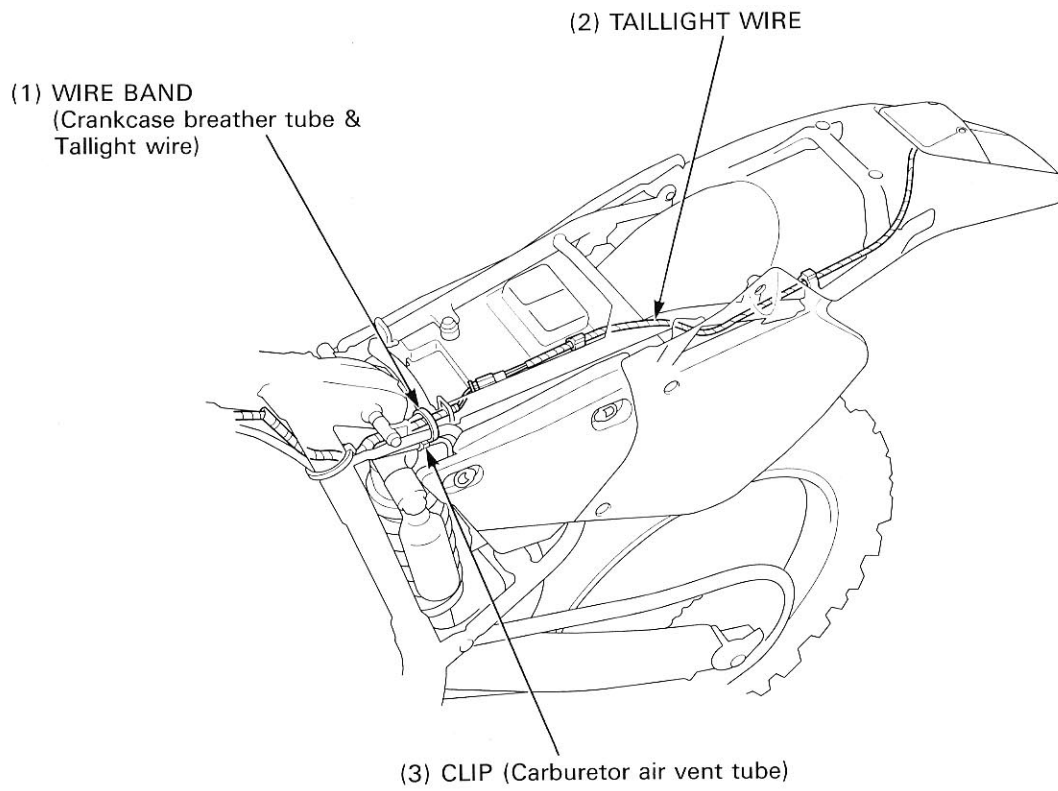




After '97 California type only:



GENERAL INFORMATION



EMISSION CONTROL SYSTEMS (After '97)

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.

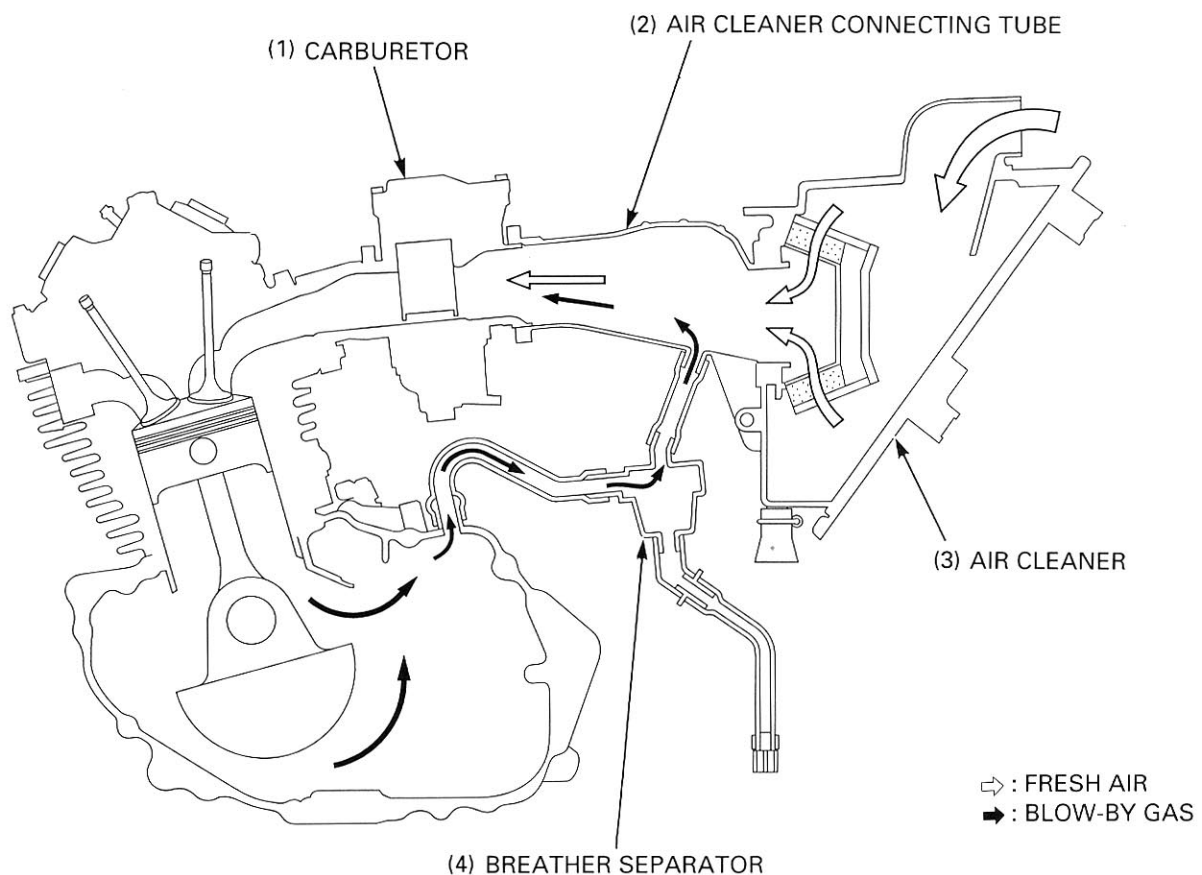
Honda motor Co., Ltd. utilizes lean carburetor settings as well as other systems, to reduce carbon monoxide and hydrocarbons.

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)

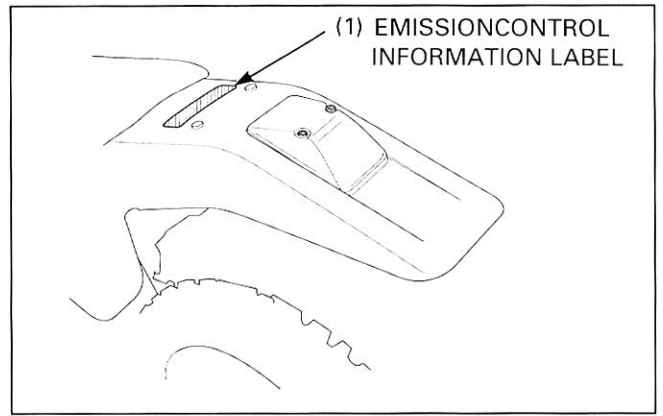
The engine is equipped with a closed crankcase system to prevent discharging crankcase emissions into the atmosphere. Blow-by gas is returned to the combustion chamber through the air cleaner connecting tube and carburetor.



GENERAL INFORMATION

**EMISSION CONTROL INFORMATION LABEL
(After '97 California type only)**

The Emission Control Information Label is located on the rear fender.



2. FRAME/BODY PANELS/EXHAUST SYSTEM

SERVICE INFORMATION	2-1	FRONT VISOR	2-4
TROUBLESHOOTING	2-1	FRONT FENDER	2-4
SEAT	2-2	REAR FENDER	2-5
FUEL TANK	2-2	UNDER GUARD	2-5
SIDE COVERS	2-3	EXHAUST SYSTEM	2-6
SUB-FRAME	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 service.

- This section covers removal and installation of the frame body panels, fuel tank and exhaust system.
- Work in a well ventilated area. Smoking or allow flames or sparks in the working area or where gasoline is stored can cause a fire or explosion.
- Always replace the exhaust pipe and muffler gaskets when removing the exhaust system from the engine.
- When installing the exhaust system, loosely install all of the 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.
- Always inspect the exhaust system for leaks after installation.

TORQUE VALUES

Exhaust pipe joint nut	18 N·m (1.8 kgf·m, 13 lbf·ft)
Muffler mounting bolt	32 N·m (3.3 kgf·m, 24 lbf·ft)
Muffler band bolt	20 N·m (2.0 kgf·m, 14 lbf·ft)
Sub-frame upper mounting nut	26 N·m (2.7 kgf·m, 20 lbf·ft)
Sub-frame lower mounting bolt	42 N·m (4.3 kgf·m, 31 lbf·ft)

TROUBLESHOOTING

Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leaks

Poor performance

- Deformed exhaust system
- Exhaust gas leaks
- Clogged muffler

SEAT

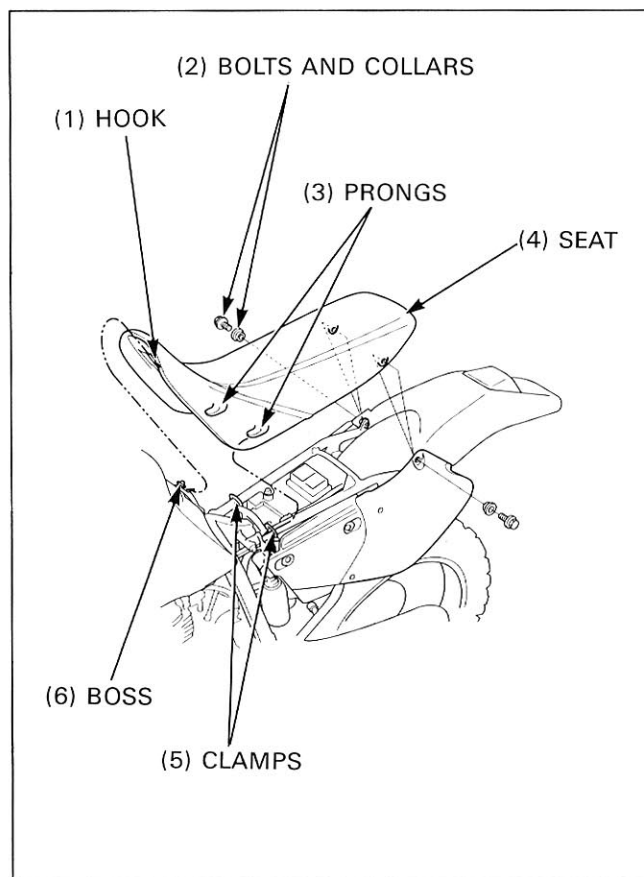
REMOVAL

Remove the two mounting bolts and collars.
Remove the seat.

INSTALLATION

Align the hook of the seat with the mounting boss on the fuel tank.

Also align the seat side prongs with the sub-frame clamps. Align the bolt holes and tighten the mounting bolts with the collars.



FUEL TANK

⚠ WARNING

- Gasoline is extremely flammable and is explosive under certain conditions.

Remove the seat (see above).

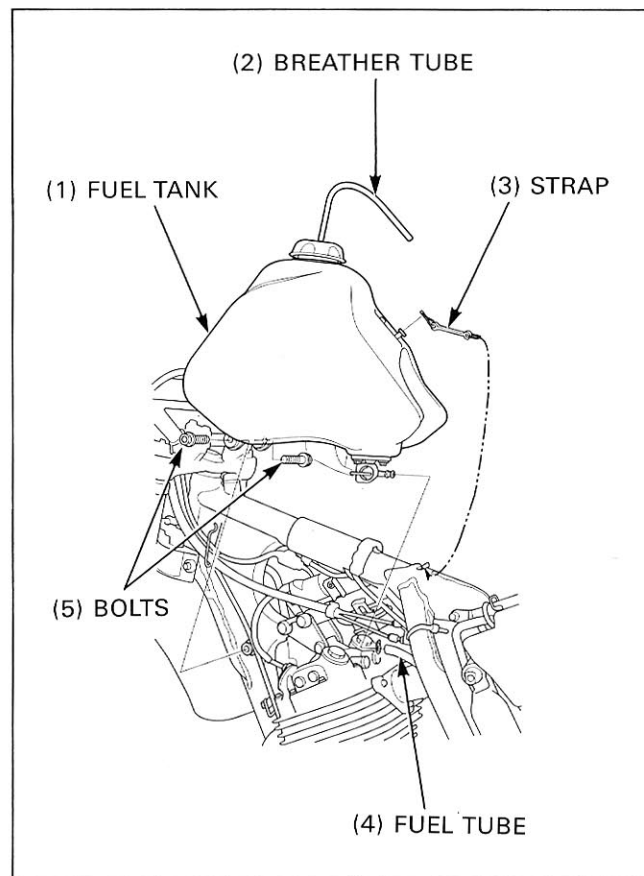
Remove the fuel tank breather tube from the stem nut. Turn the fuel valve OFF, and disconnect the fuel tube. Unhook the mounting strap. Remove the two mounting bolts and the fuel tank from the frame.

Installation is in the reverse order of removal.

After installation, turn the fuel valve ON and check the fuel line for leakage.

NOTE

- After installation, route the cables and tube properly (page 1-19).
- For fuel filter maintenance, see section 3.



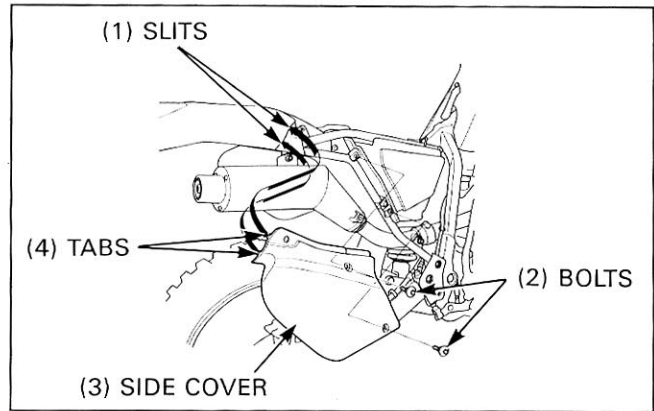
SIDE COVERS

REMOVAL

Remove the two socket bolts.
Remove the side cover.

INSTALLATION

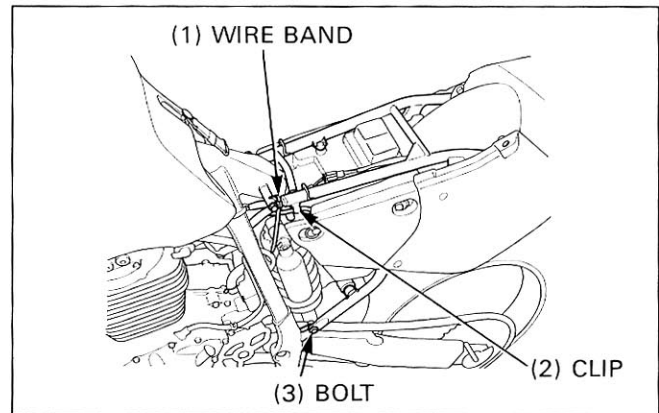
Install the side cover aligning its tabs with the slits in the rear fender.
Install and tighten the socket bolts and the hex bolt with the collars.



SUB-FRAME

Remove the seat (page 2-2).
Remove the muffler (page 2-6).

Release the wire band and tube clip to remove the taillight wire, crankcase breather tube and carburetor air vent tube.



Disconnect the taillight 2P connector.
Loosen the air clear connecting tube band screw.

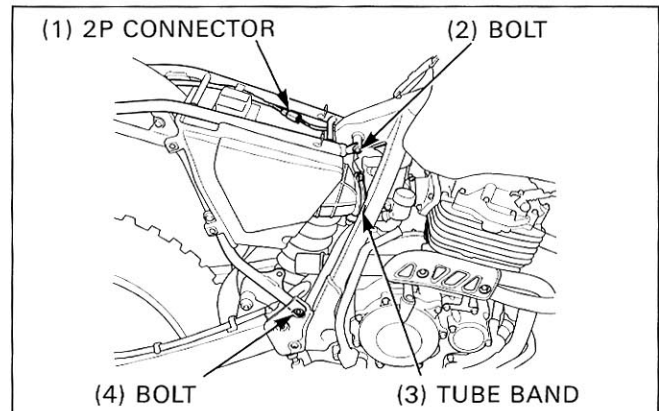
Remove the lower sub-frame mounting bolts.
Remove the upper mounting bolt then remove the sub-frame from the carburetor and frame.

Installation is in the reverse order of removal.

Torque: Upper mounting nut: 26 N·m (2.7 kgf·m, 20 lbf·ft)
Lower mounting bolt: 42 N·m (4.3 kgf·m, 31 lbf·ft)

NOTE

- After installation, route the wire and tubes properly (page 1-19).
- For rear fender removal, see page 2-5.
- For air cleaner housing removal/installation see section 5.



FRONT VISOR

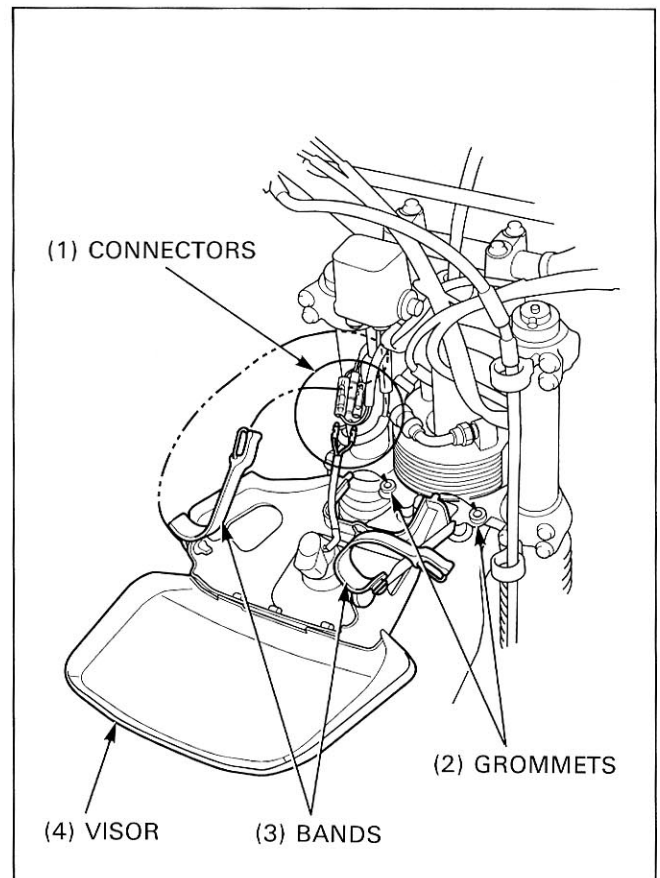
Unhook the mounting bands.
Disconnect the headlight and engine stop switch connectors.
Remove the front visor assembly from the steering stem.

Be sure to install the mounting grommets in the steering stem before installing the visor.

Installation is in the reverse order of removal.

NOTE

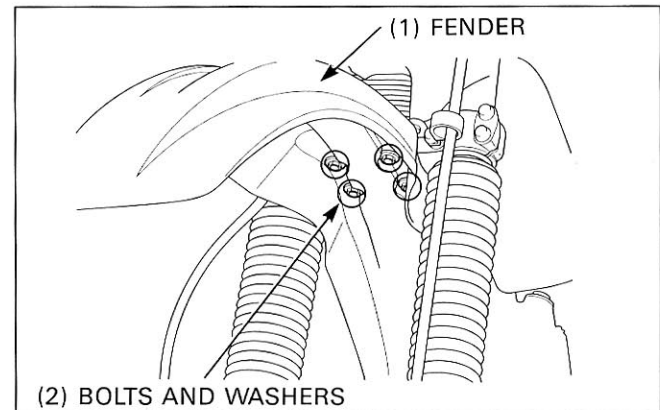
- For headlight bulb replacement and headlight removal/installation, see section 16.



FRONT FENDER

Remove the four bolts and washers.
Remove the fender and the collars.

Installation is in the reverse order of removal.



REAR FENDER

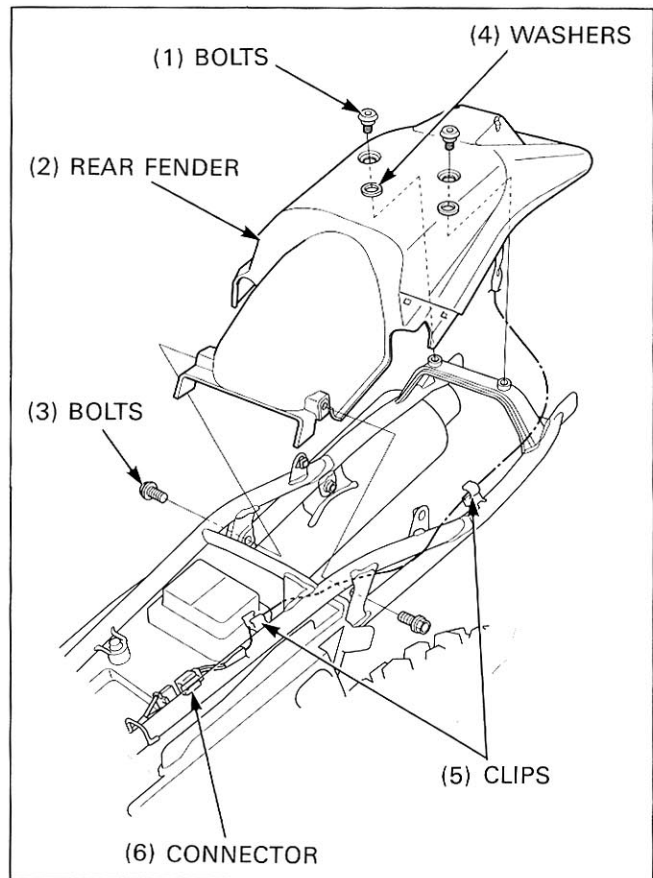
Remove the seat and side covers (page 2-2 and 2-3).

Release the two wire harness clips located on the sub-frame, and disconnect the taillight 2P (Black) connector. Remove the four bolts and the rear fender.

Installation is in the reverse order of removal.

NOTE

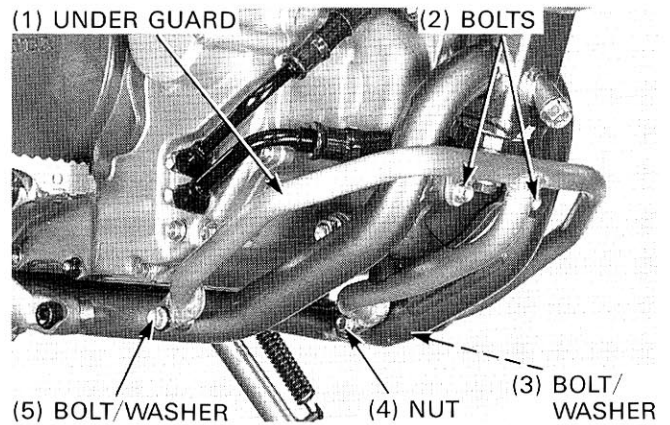
- When installing, route the wire harness properly (page 1-19).
- For taillight bulb replacement and taillight removal/installation, see section 16.



UNDER GUARD

Remove the four bolts, two washers, nut and the under guard.

Installation is in the reverse order of removal.



EXHAUST SYSTEM

⚠ WARNING

- Do not service the exhaust system while it is hot.

REMOVAL

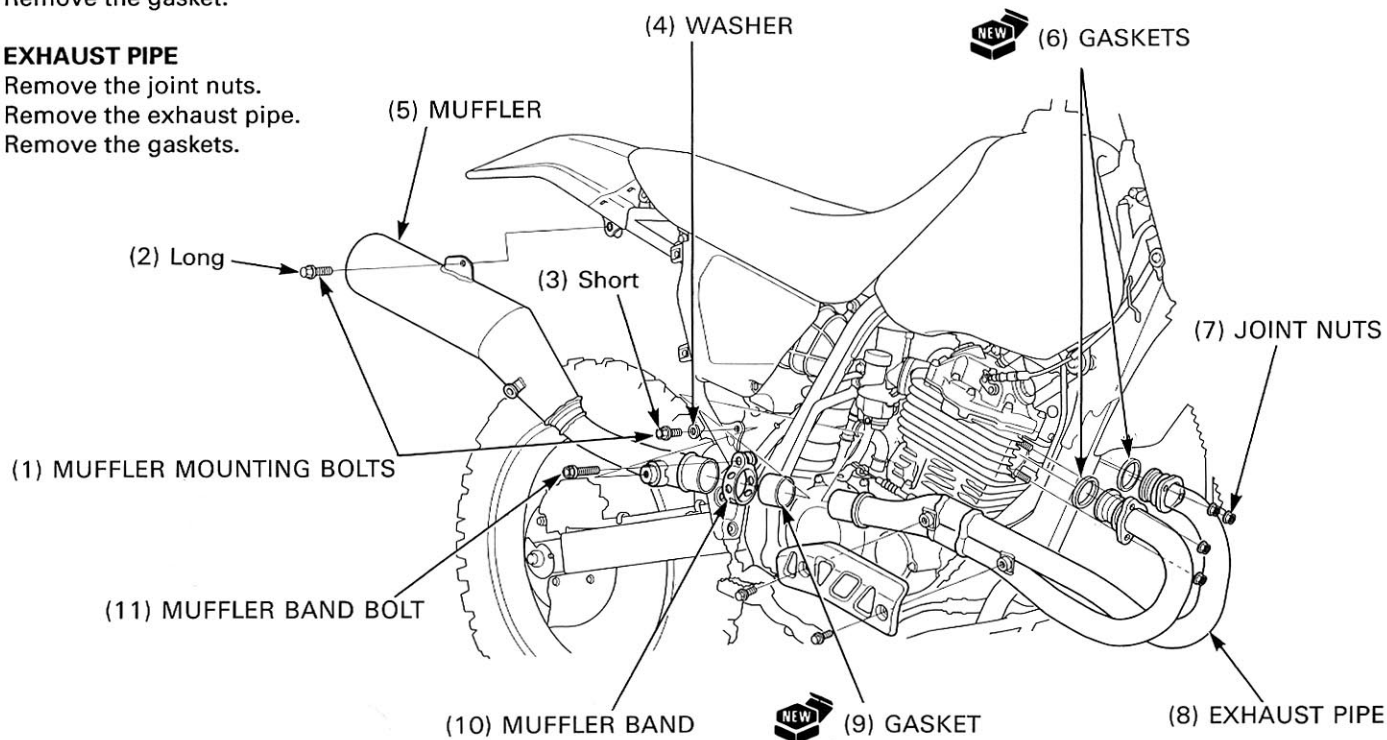
Remove the right side cover (page 2-3).

MUFFLER

Loosen the muffler band bolt.
Remove the mounting bolts.
Remove the muffler.
Remove the gasket.

EXHAUST PIPE

Remove the joint nuts.
Remove the exhaust pipe.
Remove the gaskets.



INSTALLATION

Temporarily install the exhaust pipe and muffler in the reverse order of removal by loosely installing all the fasteners.

Tighten the joint nuts first, then tighten the mounting bolts and the band bolt, If you tighten the mounting bolts first, the exhaust pipe may not seat properly.

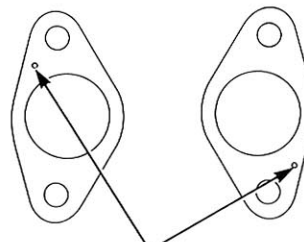
Torque:

- Exhaust pipe joint nut: 18 N·m (1.8 kgf·m, 13 lbf·ft)
- Muffler mounting bolt: 32 N·m (3.3 kgf·m, 24 lbf·ft)
- Muffler band bolt: 20 N·m (2.0 kgf·m, 14 lbf·ft)

After installation, inspect the exhaust system for leaks.

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

(12) PIPE JOINTS:
View from front side



(13) PUNCH MARKS

3. MAINTENANCE

SERVICE INFORMATION	3-1	ENGINE IDLE SPEED	3-15
MAINTENANCE SCHEDULE	3-3	DRIVE CHAIN	3-15
COMPETITION MAINTENANCE SCHEDULE	3-5	DRIVE CHAIN SLIDER	3-18
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SERVICE INFORMATION

SPECIFICATIONS

ITEM		SPECIFICATION	SERVICE LIMIT
Engine oil capacity	at draining	1.7 ℓ (1.8 US qt, 1.5 Imp qt)	—
	at disassembly	2.2 ℓ (2.3 US qt, 1.9 Imp qt)	—
	at oil filter change	1.8 ℓ (1.9 US qt, 1.6 Imp qt)	—
Recommended engine oil		Use Honda GN4 or HP4 4-stroke oil or equivalent API service classification: SF or SG Viscosity: SAE 10W-40 or 20W-50	—
Engine idle speed		1,300 ± 100 rpm	—
Throttle grip free play		2 – 6 mm (1/8 – 1/4 in)	—
Clutch lever free play		10 – 20 mm (3/8 – 3/4 in)	—
Decompressor lever free play		5 – 8 mm (3/16 – 5/16 in)	—
Spark plug	Standard	DPR8Z (NGK) X24GPR-U (DENSO)	—
	For extended high speed riding	DPR9Z (NGK) X27GPR-U (DENSO)	—
Spark plug gap		0.6 – 0.7 mm (0.023 – 0.028 in)	—
Valve clearance	IN	0.10 ± 0.02 mm (0.004 ± 0.0008 in)	—
	EX	0.12 ± 0.02 mm (0.005 ± 0.0008 in)	—

MAINTENANCE

(cont'd)		ITEM	SPECIFICATION	SERVICE LIMIT
		Recommended brake fluid	DOT4	—
		Drive chain slack	35 – 45 mm (1-1/3 – 1-3/4 in)	—
		Drive chain length (at 41 pins/40 links)	—	638 mm (25.1 in)
		Replacement drive chain size/link	DID 520V8/108 or RK 520MOZ6/108	—
		Drive chain slider depth	—	4.0 mm (0.15 in)
Cold tire pressure	Front/Rear		100 kPa (1.0 kgf/cm ² , 15 psi)	—
Tire size	Front		80/100-21 51M	—
	Rear		110/100-18 64M	—
Tire brand (Dunlop)	Front		K490G	—
	Rear		K695	—
		Minimum tire thread depth	—	3 mm (1/8 in)

TORQUE VALUES

Fuel valve mounting bolt	9 N·m (0.9 kgf·m, 6.5 lbf·ft)
Spark plug	18 N·m (1.8 kgf·m, 13 lbf·ft)
Valve adjusting lock nut	24 N·m (2.4 kgf·m, 17 lbf·ft)
Valve hole cap	15 N·m (1.5 kgf·m, 11 lbf·ft)
Timing hole cap	10 N·m (1.0 kgf·m, 7 lbf·ft)
Crankshaft hole cap	8 N·m (0.8 kgf·m, 5.8 lbf·ft)
Crankcase oil drain bolt	25 N·m (2.5 kgf·m, 18 lbf·ft)
Frame down tube oil drain bolt	39 N·m (4.0 kgf·m, 29 lbf·ft)
Oil strainer screen	54 N·m (5.5 kgf·m, 40 lbf·ft)
Oil pipe bolt (oil strainer)	37 N·m (3.8 kgf·m, 27 lbf·ft)
Rear axle nut	88 N·m (9.0 kgf·m, 65 lbf·ft)
Driven sprocket	32 N·m (3.3 kgf·m, 24 lbf·ft)
Brake lever adjuster 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) After tightening the pivot bolt, loosen it 1/8 to 1/4 turns
Side stand pivot nut	39 N·m (4.0 kgf·m, 29 lbf·ft)
Spoke nipple	3.7 N·m (0.38 kgf·m, 2.7 lbf·ft)
Rim lock	13 N·m (1.3 kgf·m, 9 lbf·ft)

TOOLS

Spoke wrench C, 5.8 × 6.1 mm	07701-0020300 or equivalent commercially available in U.S.A.
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MAINTENANCE SCHEDULE

'96, '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.

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 MAINTENANCE 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		C	3-7
	SPARK PLUG			I	3-9
*	VALVE CLEARANCE		I	I	3-10
	ENGINE OIL		R	R	3-11
	ENGINE OIL FILTER		R	R	3-13
*	ENGINE OIL STRAINER SCREEN IN DOWN TUBE			C	3-14
*	DECOMPRESSOR SYSTEM		I	I	3-14
*	ENGINE IDLE SPEED		I	I	3-15
	DRIVE CHAIN	NOTE 1	I, L	NOTE 3	3-15
	DRIVE CHAIN SLIDER		I	I	3-18
	BRAKE FLUID	NOTE 2		I	3-18
	BRAKE PAD WEAR			I	3-19
	BRAKE SYSTEM		I	I	3-19
*	HEADLIGHT AIM			I	3-20
	CLUTCH SYSTEM		I	I	3-20
	SIDE STAND			I	3-21
*	SUSPENSION			I	3-22
*	SPARK ARRESTER			NOTE 4	3-23
*	NUTS, BOLTS, FASTENERS		I	I	3-23
**	WHEELS/TIRES		I	I	3-24
**	STEERING HEAD BEARINGS		I	I	3-24

* Should be serviced by a 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 ridden in wet or dusty conditions.
 2. Replace every 2 years. Replacement requires mechanical skill.
 3. Every 10 operating days-about 300 mi (500 km) : I, L
 4. Every 100 operating hours, about 1,000 mi (1,600 km): 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

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	3-9		
	* VALVE CLEARANCE		I	I	I	I	I	3-10		
	ENGINE OIL		R	R	R	R	R	3-11		
	ENGINE OIL FILTER		R	R	R	R	R	3-13		
	* ENGINE OIL STRAINER SCREEN IN DOWN TUBE				C		C	3-14		
	* DECOMPRESSOR SYSTEM		I	I	I	I	I	3-14		
	** ENGINE IDLE SPEED		I	I	I	I	I	3-15		
NON-EMISSION RELATED ITEMS	DRIVE CHAIN	NOTE 1	I, L	I, L : EVERY 300 mi (500 km) or 3 month				3-15		
	DRIVE CHAIN SLIDER			I	I	I	I	3-18		
	BRAKE FLUID	NOTE 3		I	I	I	I	3-18		
	BRAKE PAD WEAR			I	I	I	I	3-19		
	BRAKE SYSTEM		I	I	I	I	I	3-19		
	* HEADLIGHT AIM				I		I	3-20		
	CLUTCH SYSTEM		I	I	I	I	I	3-20		
	SIDE STAND				I		I	3-21		
	* SUSPENSION				I		I	3-22		
	* SPARK ARRESER				C : Every 1,000 mi (1,600 km) or Every 100 operating hours				3-23	
	* NUTS, BOLTS, FASTENRS		I		I		I	3-23		
	** WHEELS/TIRES		I	I	I	I	I	3-24		
** STEERING HEAD BEARINGS		I		I		I	3-24			

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

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

NOTES: 1. Service more frequently when riding in 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) for regular (non-competition use) service intervals.

ITEM	INSPECT FOR	ACTION AS REQUIRED	REFER TO PAGE
ENGINE OIL	Oil level, leakage	Supply or change	3-11
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	3-19
BRAKE FLUID	Fluid level, leakage	Supply or change	3-18
WHEELS	Tire pressure, wear or damage, Spoke tightness and Rim lock tightness	Adjust, tighten or replace	3-24
DRIVE CHAIN	Slack, lubrication, retainer clip security Length: 638 mm (25.1 in) at 41 pins/40 links	Adjust, tighten or replace	3-15
SPROCKETS	Wear and secure installation	Tighten or replace	3-15
SEAT	Security	Tighten	2-2
CLUTCH DISCS	Proper operation, wear (NOTE 1)	Replace	3-20
ENGINE STOP SWITCH	Proper operation	Correct or replace	16-11
NUTS, BOLTS, FASTENERS	Tightness	Tighten	3-23
FUEL LINE	Deterioration, damage or leakage	Replace	3-6
VALVE CLEARANCE	Correct clearance	Adjust	3-10
CAM CHAIN	Excessive noise	Replace	11-3
ENGINE IDLE SPEED	Correct idle speed	Adjust	3-15
DECOMPRESSOR SYSTEM	Proper operation, lever free play	Adjust	3-14
SPARK PLUG	Tightness, proper heat range, spark plug wire looseness and damage	Tighten or replace	3-9
STEERING HEAD	Free rotation of handlebars and steering stem nut tightness	Adjust or tighten	3-24
FRONT SUSPENSION	Smooth operation, no oil leaks, good boot condition and proper oil volume	Adjust or Replace	3-22
REAR SUSPENSION	Smooth operation, oil leaks and spring length	Adjust or replace	3-22
SWINGARM BEARINGS	Smooth operation	Lubricate or replace	3-22
REAR SUSPENSION LINKAGE BEARINGS	Smooth operation	Lubricate or replace	3-22
CONTROL CABLES	Smooth operation, inner cable damage, kinks and correct routing	Lubricate or replace	1-19
ENGINE MOUNTING BOLTS	Tightness	Tighten	6-4
SPARK ARRESTER	Clogged	Clean	3-23

Note1: Competition use requires more frequent service.

FUEL LINE

Check the fuel line for deterioration, damage or leakage.
Replace the fuel line 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 allow flames or sparks in the working area or where gasoline is drained or stored and where the fuel tank is refueled.*

Remove the fuel tank (page 2-2).
Drain the gasoline from the fuel tank.

Remove the two bolts and collars, and the fuel valve from the fuel tank. Remove the O-ring.
Clean the fuel strainer screen on the fuel valve with non-flammable or high flash point solvent.

Install a new O-ring onto the fuel valve.
Install the fuel valve into the fuel tank and tighten the mounting bolts with the collars.

TORQUE: 9 N·m (0.9 kgf·m, 6.5 lbf·ft)

Install the fuel tank (page 2-2).

After filling the fuel tank, turn the fuel valve ON and check that there are no leaks.

THROTTLE OPERATION

Check for any deterioration or damage to the throttle cables. Check the throttle grip for smooth operation. Check that the throttle opens and automatically closes in all steering positions.

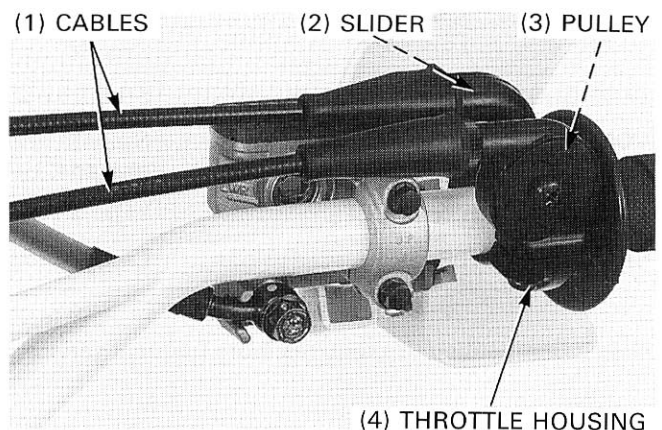
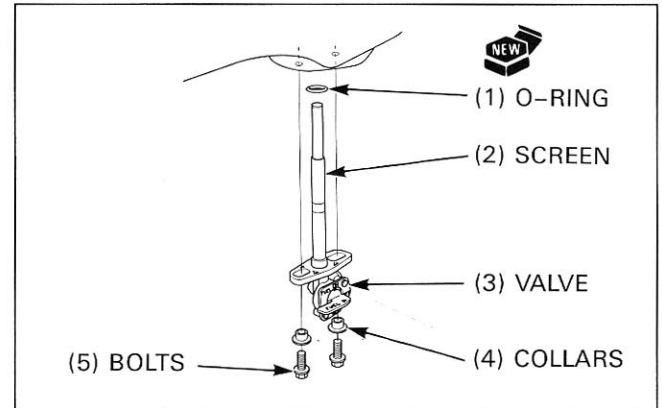
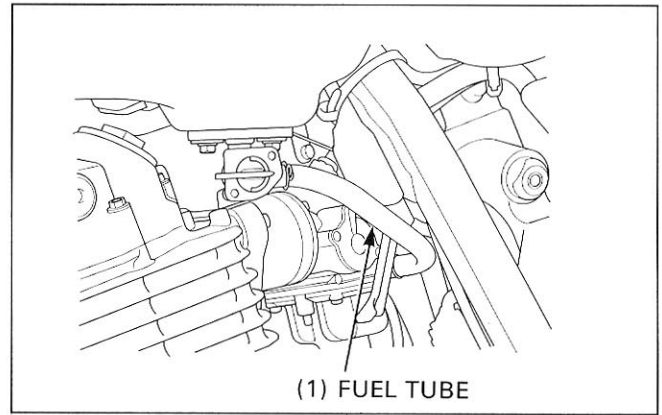
If the throttle grip does not return properly, lubricate the throttle cables and overhaul and lubricate the throttle grip housing.

For cable lubrication; Disconnect the throttle cables at their upper ends (page 13-19). Thoroughly lubricate the cables and their pivot points with a commercially available cable lubricant or a light weight oil, and the cable pulley and slider with grease.

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

⚠ WARNING

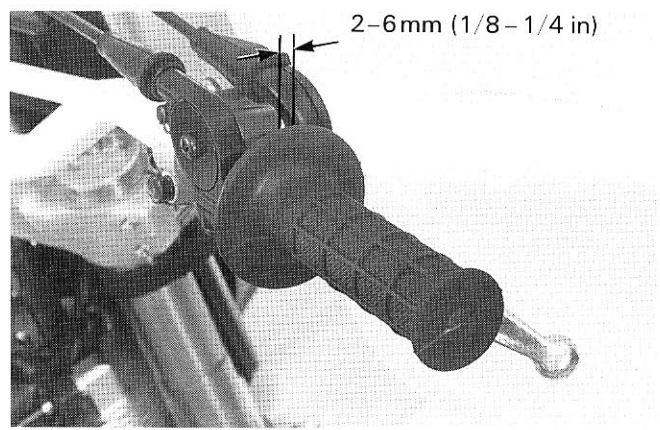
- *Reusing a damaged or abnormally bent or kinked throttle cable can prevent proper throttle slide operation and may lead to a loss of throttle control while riding.*



With the engine idling, turn the handlebar all the way to the right and left to ensure that the idle speed does not change.

Measure the throttle grip free play at the throttle grip flange.

FREE PLAY: 2 – 6 mm (1/8 – 1/4 in)

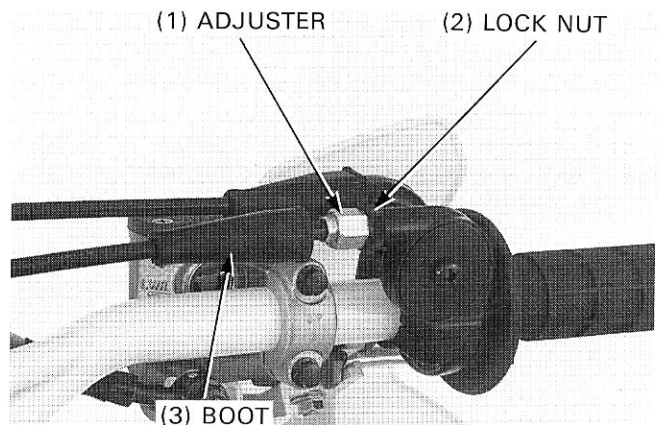


Throttle free play can be adjusted at either end of the throttle cable.

Minor adjustments are made with the upper adjuster.

Slide the rubber boot off, loosen the lock nut and turn the adjuster to obtain the free play.

Tighten the lock nut and reposition the rubber boot properly after the adjustment has been made.

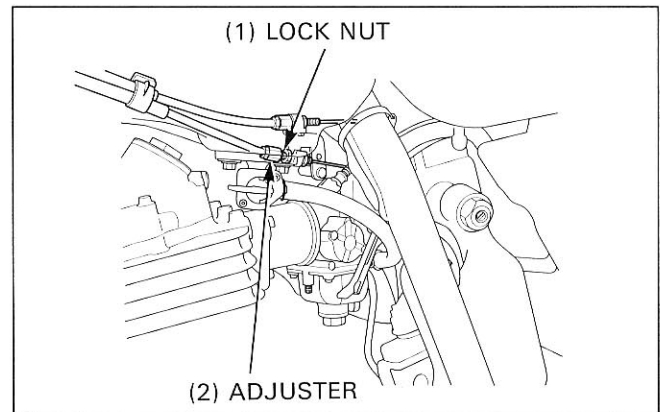


Major adjustments are made with the lower adjuster.

Loosen the lock nut and turn the adjuster to obtain the free play.

Tighten the lock nuts after the adjustment has been made.

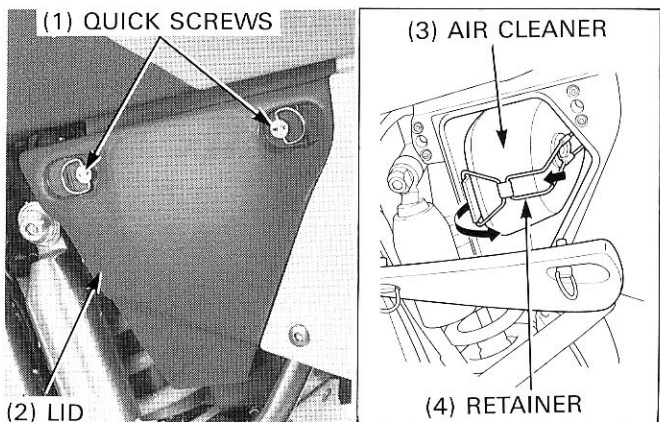
Recheck the throttle operation and the free play.



AIR CLEANER

Release the quick screws by turning them counterclockwise and open the air cleaner maintenance lid.

Release the air cleaner retainer and remove the air cleaner with the holder. Separate the air cleaner and holder.



MAINTENANCE

⚠ WARNING

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

Thoroughly wash the air cleaner in non-flammable or high flash point solvent. Then wash the air cleaner in hot, soapy water and allow it to dry.
Clean the inside of the air cleaner housing.

After drying, soak the air cleaner in Pro Honda Air Filter Oil or an equivalent.

Apply foam filter oil to the entire surface of the air cleaner and rub it with both hands to saturate the air cleaner with oil. Gently squeeze out excess oil. (To keep your hands dry, place the air cleaner in a clean plastic bag before rubbing the oil into the air cleaner.)

Assemble the air cleaner and holder.

Install the assembly into the air cleaner housing while aligning the boss on the retainer with the setting hole in the air cleaner and secure the retainer to the housing correctly.

CAUTION

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

Close the air cleaner maintenance lid and turn the quick screws clockwise to lock them securely.

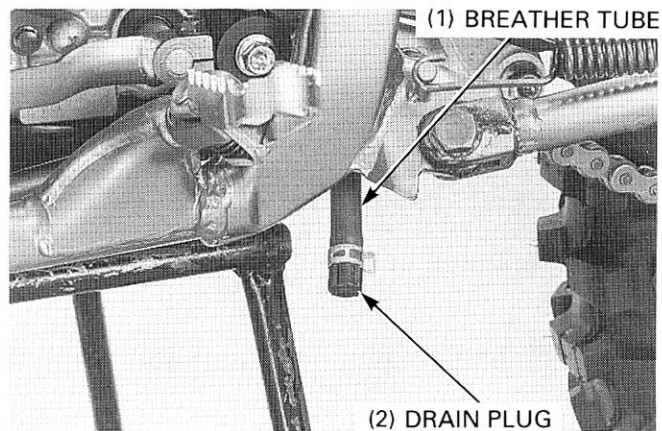
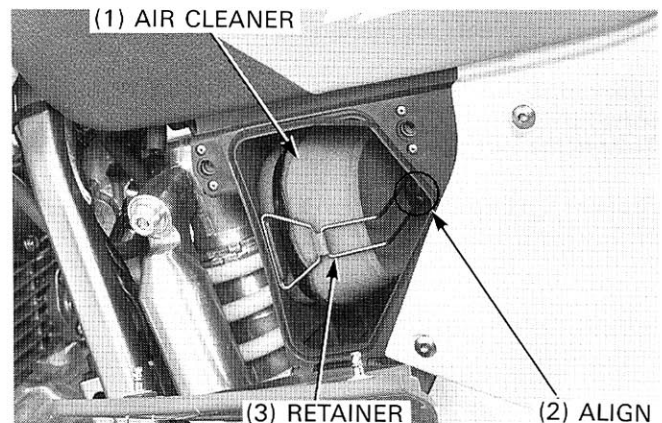
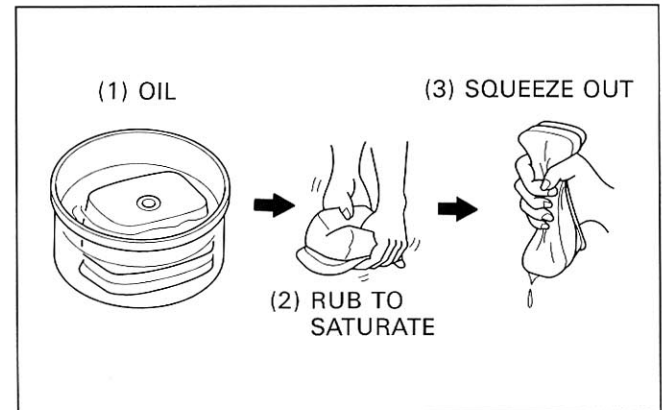
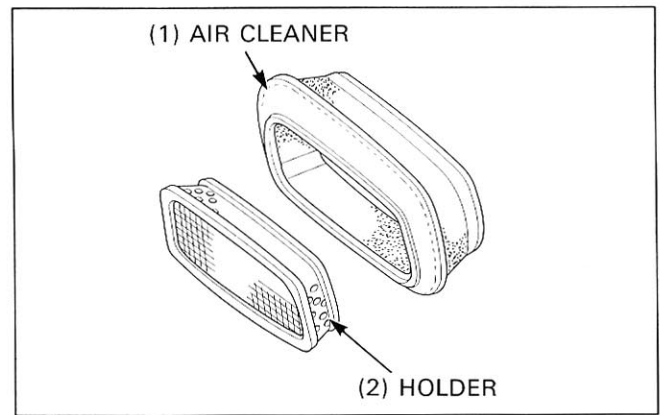
CRANKCASE BREATHER (After '97 California type only)

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

Install the drain plug and clip.

NOTE:

Service more frequently when riding in wet or muddy areas.

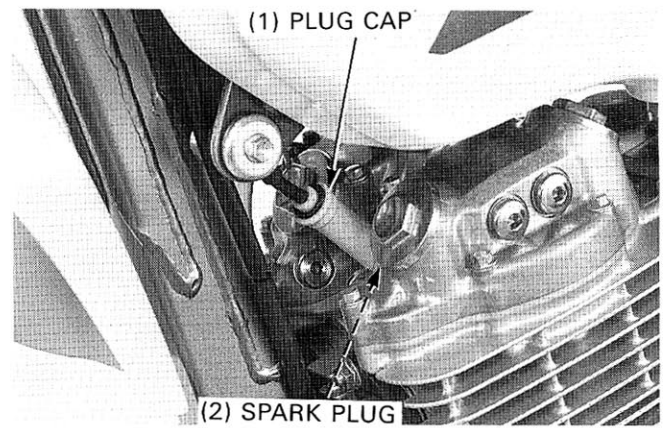


SPARK PLUG

NOTE

- Clean around the spark plug base with compressed air before removing the plug.

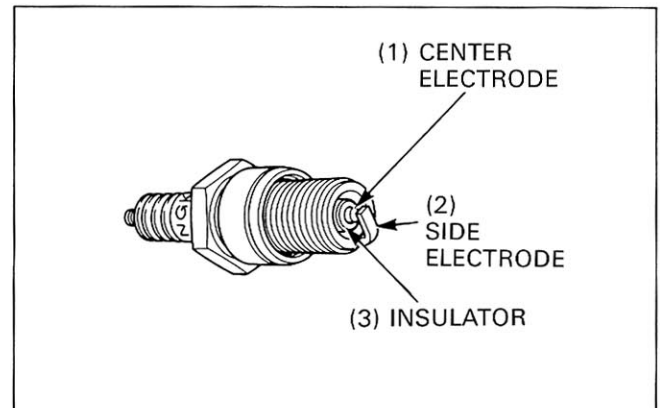
Disconnect the spark plug cap and remove the spark plug.



INSPECTION

Check the following and replace if necessary (recommended spark plugs: see page 3-1).

- insulator for damage
- electrodes for wear
- burning condition, coloration;
 - dark to light brown indicates good condition
 - excessive lightness indicates improper spark plug heating value, lean mixture or malfunctioning ignition system
 - wet or black sooty deposit indicates improper spark plug heat range or over-rich mixture.



REUSING A SPARK PLUG

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

Check the gap between the center and side electrodes with a wire-type feeler gauge. If necessary, adjust the gap by bending the side electrode carefully.

SPARK PLUG GAP: 0.6 – 0.7 mm (0.023 – 0.028 in)

CAUTION

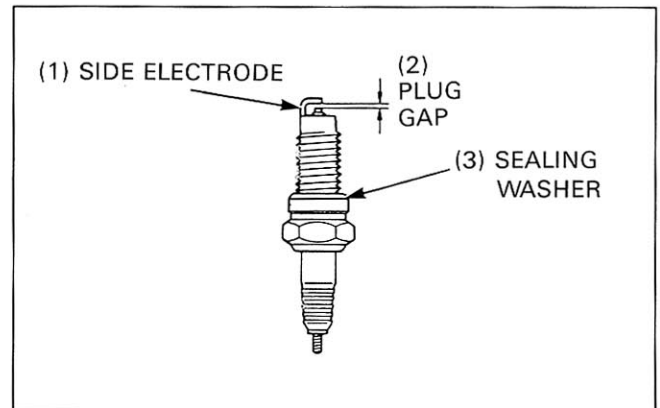
- To prevent damage to the cylinder head, hand-tighten the spark plug before using a wrench.

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

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

REPLACING A SPARK PLUG

Set the plug gap to specification (see above). Install and hand-tighten it about 1/4 of a turn after the sealing washer contacts the seat of the plug hole. Do not overtighten the spark plug.



VALVE CLEARANCE

NOTE:

- Inspect and adjust valve clearance while the engine is cold (below 35°C/95°F).
- Make sure that the decompressor lever free play is correct before performing this maintenance (page 3-14.)

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

Rotate the crankshaft only counterclockwise to align the T mark with the index notch in the left crankcase cover. Make sure the piston is at TDC (Top Dead Center) on the compression stroke.

This position can be obtained by confirming that there is slack in the sub-rocker arm. If there is no slack, it is because the piston is moving through the exhaust stroke to TDC. Rotate the crankshaft one full turn only counterclockwise and match up the T mark again.

CAUTION

- If the "T" mark is passed when trying to align it with the index notch, rotate the crankshaft counterclockwise again and align the T mark with the index notch. 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 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 ± 0.02 mm (0.004 ± 0.0008 in)
EX: 0.12 ± 0.02 mm (0.005 ± 0.0008 in)

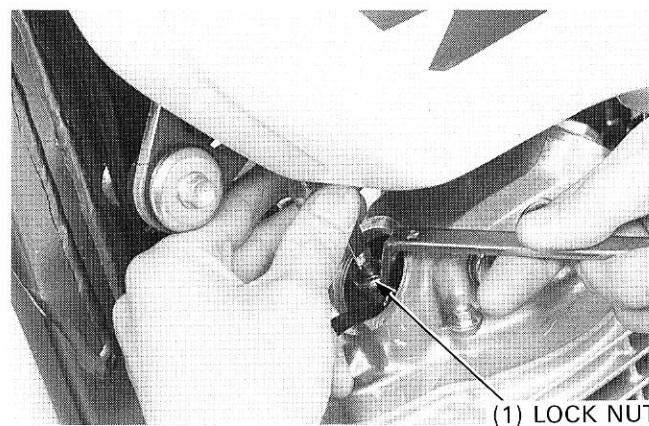
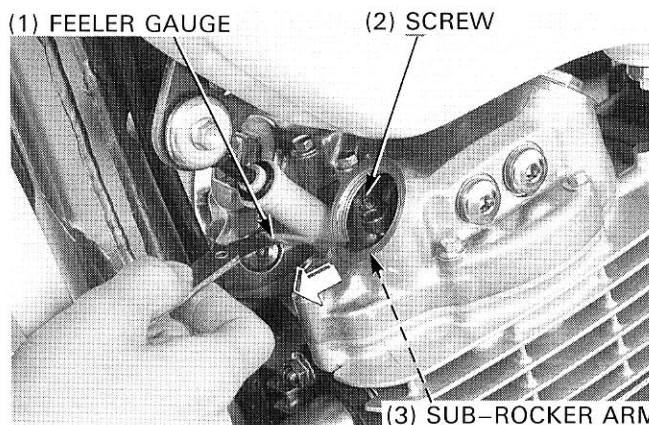
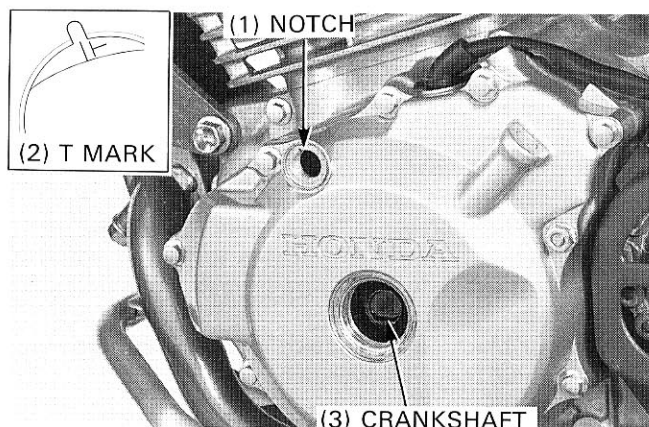
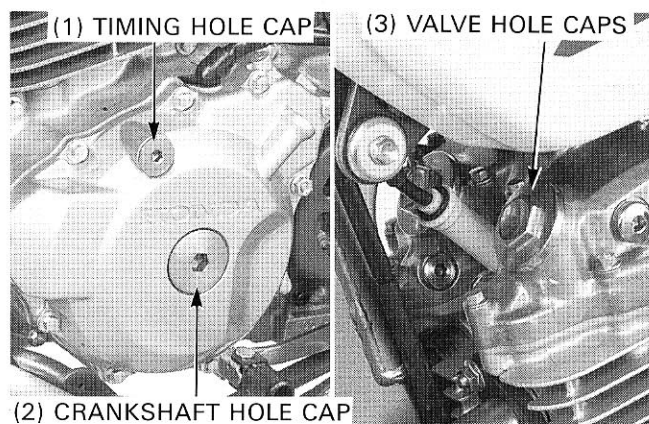
Adjust by loosening the lock nut and turning the adjusting screw until there is a slight drag on the feeler gauge.

Hold the adjusting screw and tighten the lock nut securely.

TORQUE: 24 N·m (2.4 kgf·m, 17 lbf·ft)

After tightening the lock nut, recheck the valve clearance.

Adjust the decompressor lever free play (page 3-14).

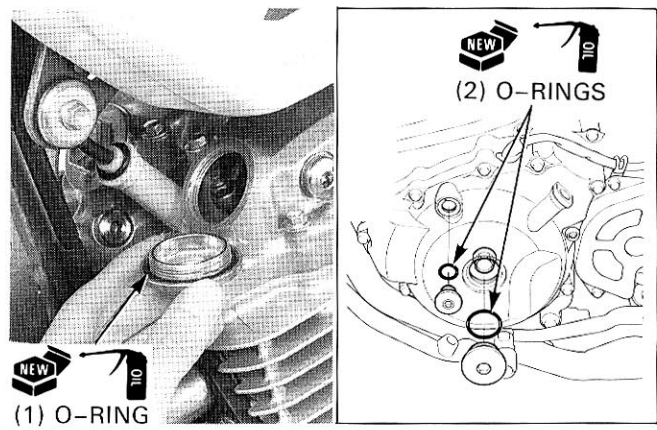


Apply oil to a new valve hole cap O-rings and install them into grooves in the valve hole caps. Install the valve hole caps and tighten them.

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

Apply oil to a new crankshaft hole and timing hole cap O-rings and install them onto the caps. Install the caps and tighten them.

TORQUE: Crankshaft hole cap: 8 N·m (0.8 kgf·m, 5.8 lbf·ft)
Timing hole cap: 10 N·m (1.0 kgf·m, 7 lbf·ft)



ENGINE OIL

LEVEL CHECK

NOTE

- Check the oil level after starting the engine and allowing the oil to circulate through the engine thoroughly. It is especially important on the dry sump engine, due to the comparatively large volume of oil.
- Do not snap the throttle while idling or the oil level reading will be inaccurate.

Support the motorcycle upright on level ground. 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). Stop the engine. Remove the oil filler cap/dipstick immediately and wipe it clean. Check the oil level by inserting the oil filler cap/dipstick into the oil filler hole without screwing it in.

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

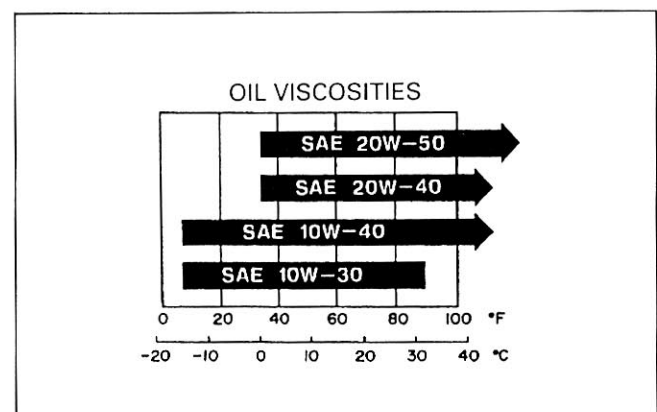
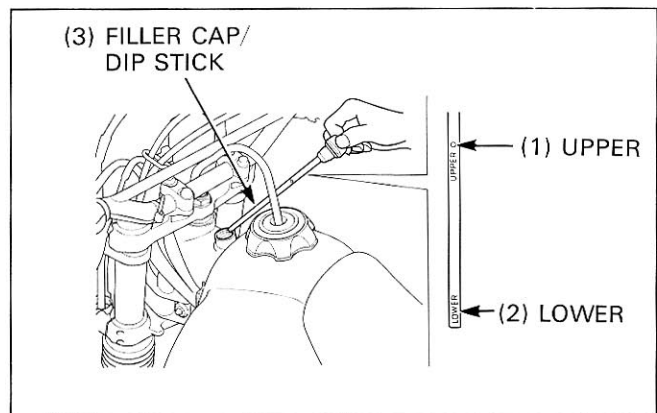
If the oil level is near or below the lower level mark, and the recommended engine oil up to the upper mark.

RECOMMENDED ENGINE OIL:
Honda GN4 or HP 4 4-stroke oil or equivalent motor oil certified to meet API service classification: SF or SG
Viscosity: SAE 10W-40 or 20W-50

NOTE:

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

Reinstall the dipstick.



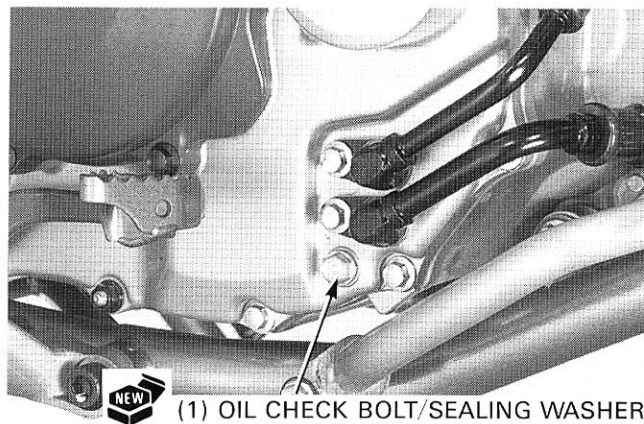
MAINTENANCE

At Crankcase Oil Check Bolt

NOTE

- The crankcase oil level check bolt is useful when checking the lubrication; the oil pump adjusts the oil level so that the crankcase is always kept at the proper level. If this check shows otherwise, some portion of the lubrication system is not working properly.
- Do not check the oil level immediately after the engine has been operated at high speeds. Make sure that motorcycle is standing upright on firm level ground while idling. Allow the engine to idle for a few minutes to stabilize the oil levels.

The crankcase oil level is correct if the oil is flush with the bottom of the check bolt hole.



(1) OIL CHECK BOLT/SEALING WASHER

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 motorcycle on its side stand to assure complete and rapid draining.

Start the engine and let it idle for few minutes.
Stop the engine and remove the oil filler cap/dipstick.

Remove the down tube and crankcase drain bolts with sealing washers and drain the engine oil.

NOTE

- When draining at the frame down tube, cover the front tire to avoid spilling oil on the tire.

After the oil has drained, install the drain bolts with new sealing washers.

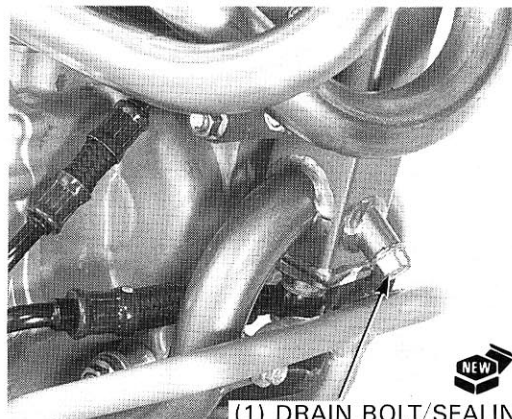
TORQUE:

Crankcase drain bolt: 25 N·m (2.5 kgf·m, 18 lbf·ft)

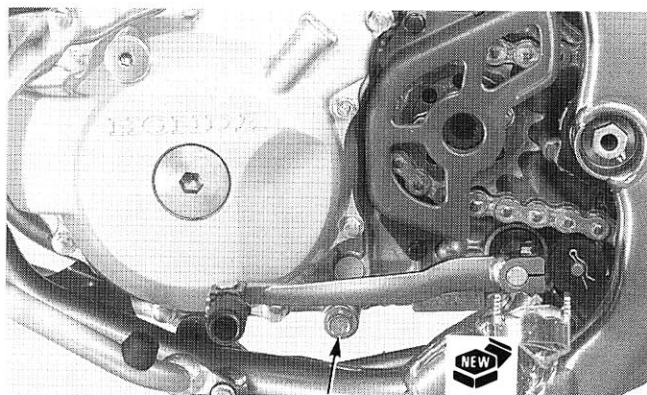
Down tube drain bolt: 39 N·m (4.0 kgf·m, 29 lbf·ft)

NOTE

- If maintenance is scheduled for the down tube oil strainer screen, do this before filling the frame oil tank (page 3-14).
- Pour the engine oil in after replacing the oil filter (page 3-13).



(1) DRAIN BOLT/SEALING WASHER



(1) DRAIN BOLT/SEALING WASHER

Pour the recommended oil (see previous page) into the frame oil tank up to the upper level mark.

NOTE

- The engine takes about 1.8 liters (1.9 US qt, 1.6 Imp qt) at oil and filter change. But since only a portion of that oil is held in the frame's oil tank you cannot add the full amount initially.

OIL CAPACITY:

- 1.7 liter (1.8 US qt, 1.5 Imp qt) at draining
- 1.8 liter (1.9 US qt, 1.6 Imp qt) at oil filter change
- 2.2 liter (2.3 US qt, 1.9 Imp qt) at disassembly

Install the oil filler cap/dipstick.

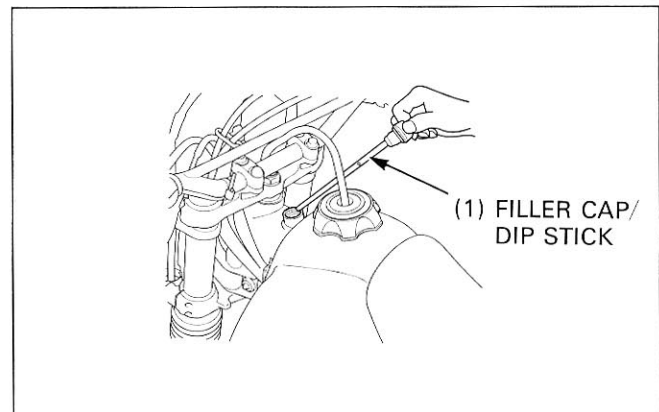
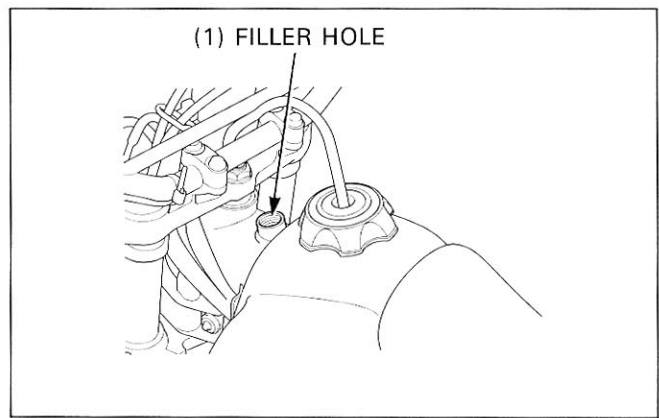
Support the motorcycle upright on firm level ground. Start the engine and let it idle for a few minutes without snapping the throttle.

Stop the engine and add the recommended oil up to the upper level mark on the dipstick with the motorcycle upright.

Install the oil filler cap/dipstick.

Start the engine and recheck the oil level (page 3-11).

After replacing, make sure there are no oil leaks.

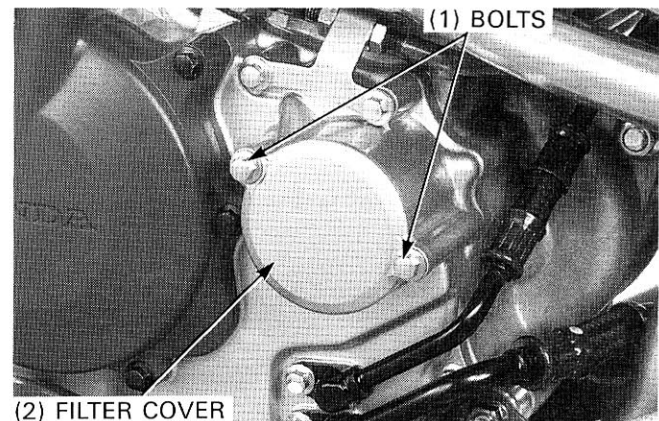


ENGINE OIL FILTER

Drain the engine oil (see previous page).

Remove the following:

- cover bolts with O-ring
- filter cover
- oil filter
- spring.



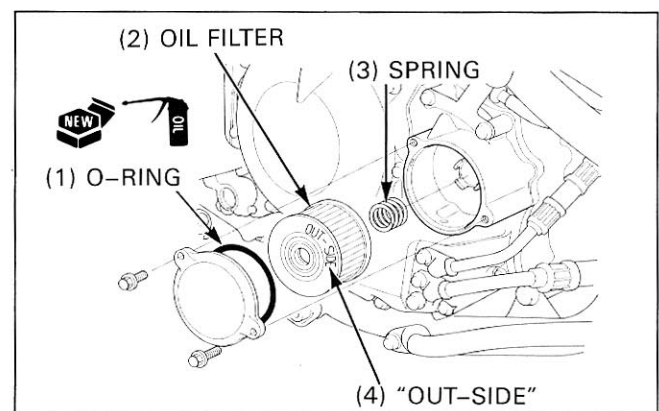
Apply engine oil to a new O-ring and install it in the filter cover groove.

Install the spring between the lugs and a new oil filter with the "OUT-SIDE" mark facing out, and set the filter cover onto filter and tighten the two bolts securely.

CAUTION

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

Fill the engine and frame oil tank with the engine oil.



ENGINE OIL STRAINER SCREEN IN DOWN TUBE

Drain the engine oil (page 3-12).
Remove the under guard (page 2-5).

Remove the oil pipe bolt and sealing washers and disconnect the inlet oil pipe from the frame.

Remove the oil strainer screen.

Wash the strainer screen thoroughly in high flash point solvent until all accumulated dirt has been removed.
Blow the screen dry with compressed air, or leave it in a well ventilated place until the solvent has evaporated.

Before installing the strainer screen, it should be examined closely for damage.

Install the oil strainer screen with a new O-ring and tighten it.

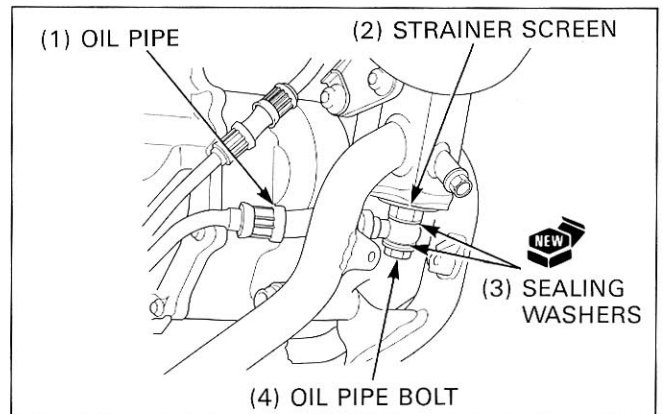
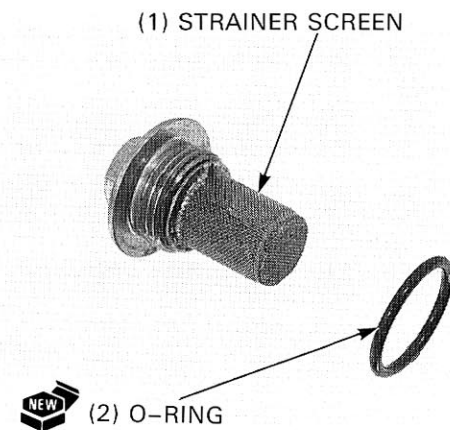
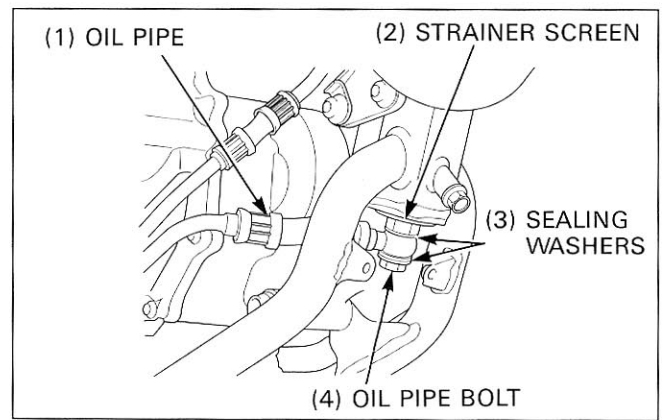
TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)

Connect the oil pipe to the oil strainer by installing the oil pipe bolt with new sealing washers.
Tighten the oil pipe bolt.

TORQUE: 37 N·m (3.8 kgf·m, 27 lbf·ft)

Fill the engine and frame oil tank with the engine oil (page 3-13).

Install the under guard (page 2-5).



DECOMPRESSOR SYSTEM

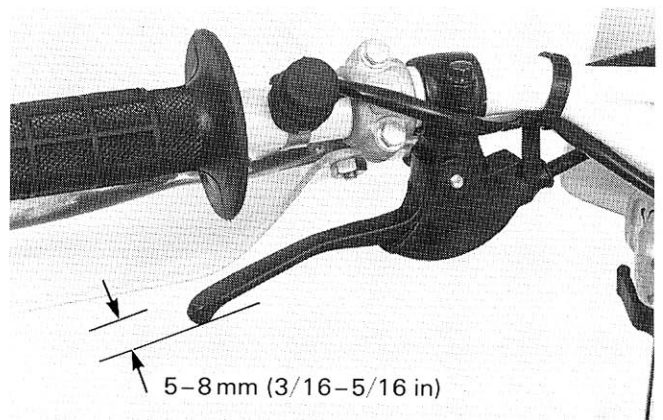
NOTE

- Always adjust the decompressor system after adjusting the valve clearance (page 3-10).

Rotate the crankshaft counterclockwise to align the T mark on the flywheel with the index notch on the left crankcase cover due to Top Dead Center on the compression stroke (page 3-10).

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

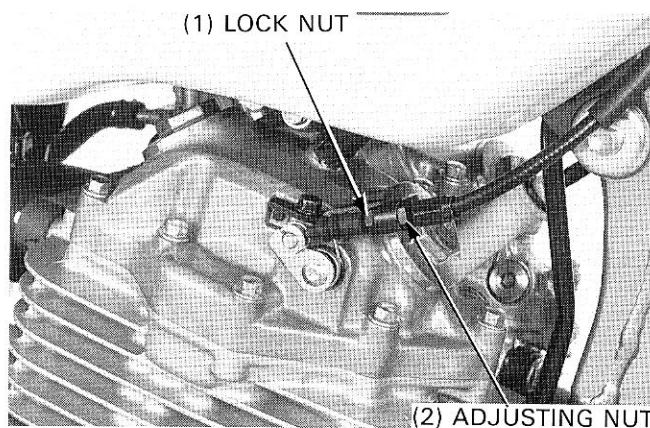
FREE PLAY: 5 – 8 mm (3/16 – 5/16 in)



Adjust by loosening the lock nut and turning the adjusting nut at the lower end of the decompressor cable. Tighten the lock nuts after adjustment has been made.

Recheck the free play and operation.

Install the crankshaft hole cap and timing hole cap (page 3-11).



ENGINE IDLE SPEED

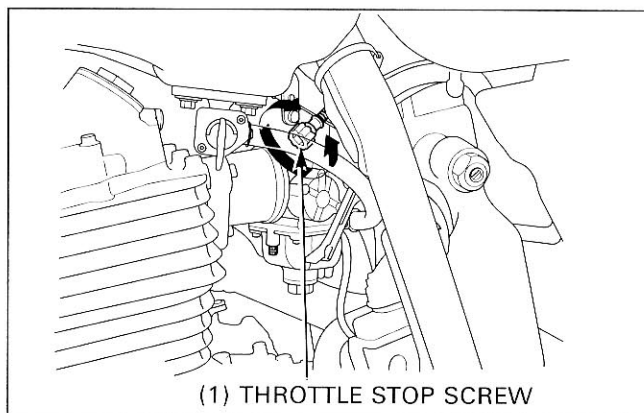
NOTE

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

Warm up the engine.

Support the motorcycle on a level surface and shift the transmission into neutral.

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



IDLE SPEED: 1,300 ± 100 rpm

DRIVE CHAIN

⚠ WARNING

- *Inspecting the drive chain while the engine is running can result serious hand or finger injury. Take care to prevent catching your fingers between the chain and sprocket.*

ADJUSTMENT

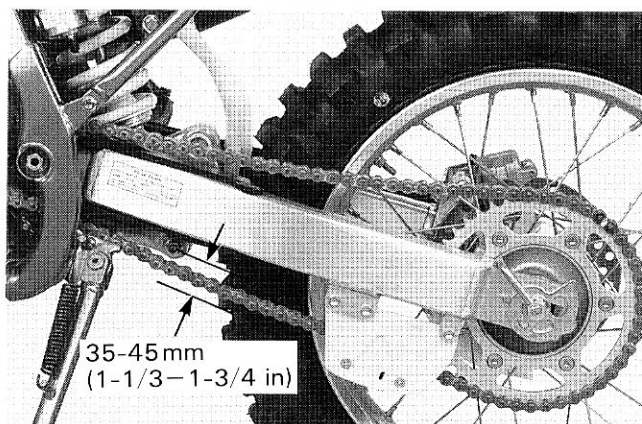
Turn the engine OFF.

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 lower drive chain run midway between the sprockets.

SLACK: 35 – 45mm (1-1/3 – 1-3/4 in)



MAINTENANCE

Adjust as follows:

Loosen the axle nut.

Turn both adjusters equally until the slack is correct, then temporarily tighten the axle nut.

A scale is included on the adjusters. Be sure the same adjuster grooves align with the stopper pins on both sides of the swingarm.

CAUTION

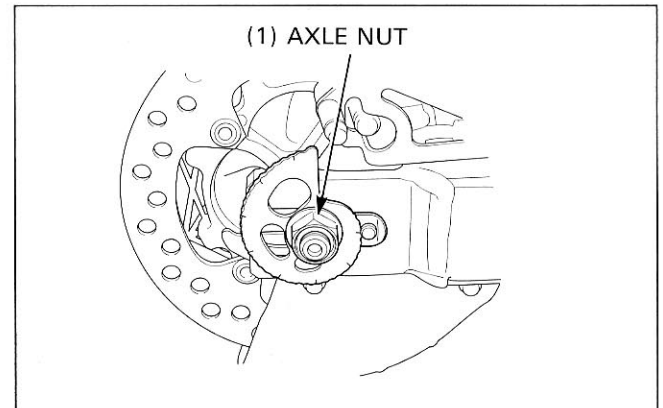
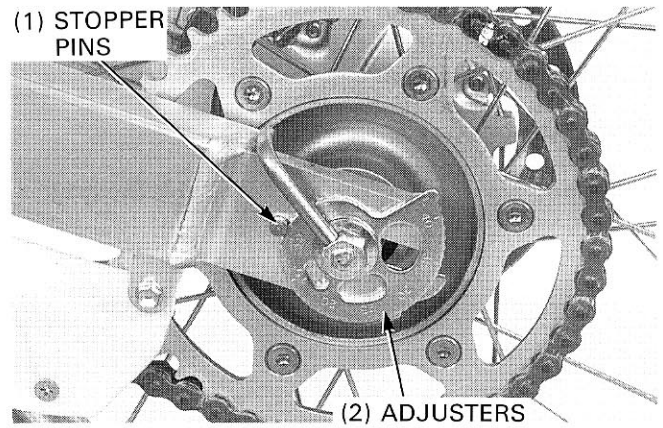
- *If the adjustment value is not the same, the wheel is out of alignment and can cause sprocket and chain wear.*

Chain slack should remain constant as the wheel rotates. If the chain is slack only in certain sections, inspect it.

Tighten the axle nut.

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

Recheck the chain slack and free wheel rotation.



REMOVAL/INSTALLATION AND REPLACEMENT PERIOD

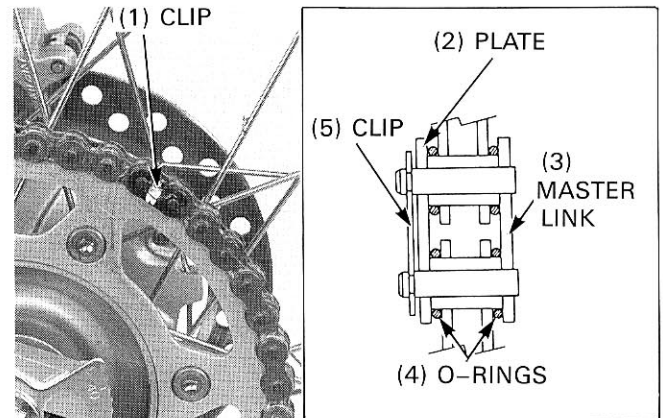
Remove the drive sprocket cover (page 6-2).

Remove the retainer clip carefully.

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

CAUTION

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

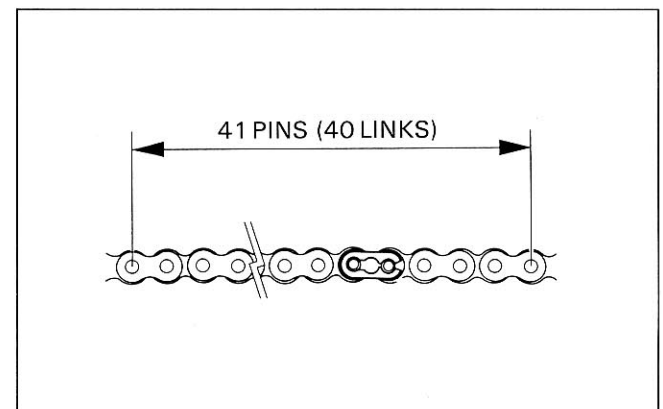


Measure the length between the chain's pins with the chain held so that all links are straight.

SERVICE LIMIT: 638 mm (25.1 in) at 41 pins/40 links
REPLACEMENT DRIVE CHAIN SIZE/LINK: DID 520V8/108 or RK 520MOZ6/108

NOTE

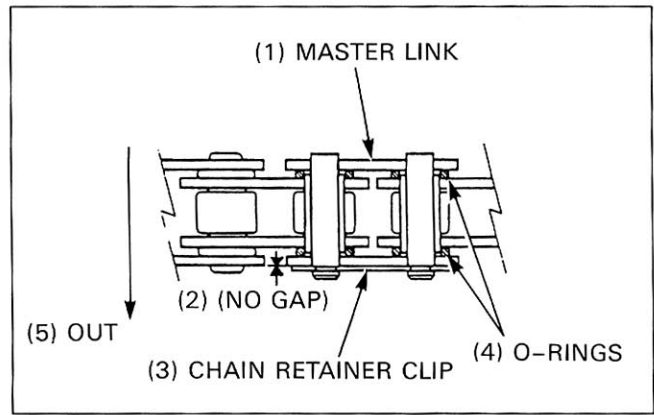
- Never install a new drive chain on worn sprocket or a worn chain on new sprockets. Both chain and sprockets must be in good condition, or new replacement parts will wear rapidly (see next page).



Lubricate new drive chain.
 Install the drive chain onto the driven and drive sprockets.
 Connect the drive chain by installing the master link and plate with the O-rings.
 Install the retaining clip so that its open end is opposite the normal rotation of the chain. Check that the clip is fully seated.

CAUTION

- *Improper positioning of the retaining clip may cause the drive chain to come apart and possibly damage the crankcase, rear wheel or exhaust.*
- *Be sure that there is no gap between the link plate and clip.*

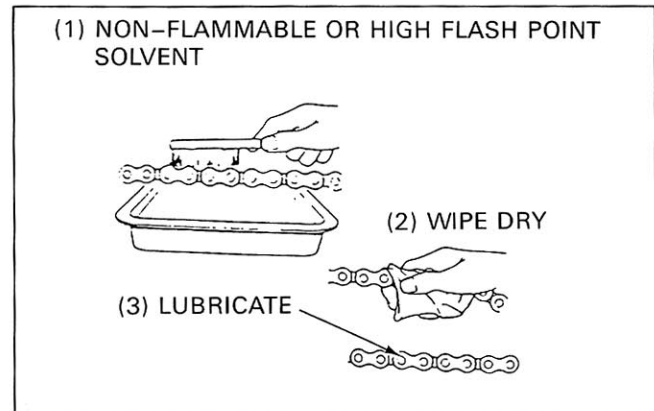


CLEANING, INSPECTION AND LUBRICATION

Chain Cleaning and Inspection

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

Inspect the drive chain for possible wear or damage. Replace any chain that has damaged rollers, loose fitting links, or otherwise appears unserviceable (see previous page).
 Installing a new drive chain on badly worn sprockets will cause new chain to wear quickly. Inspect and replace sprockets as necessary (see below).

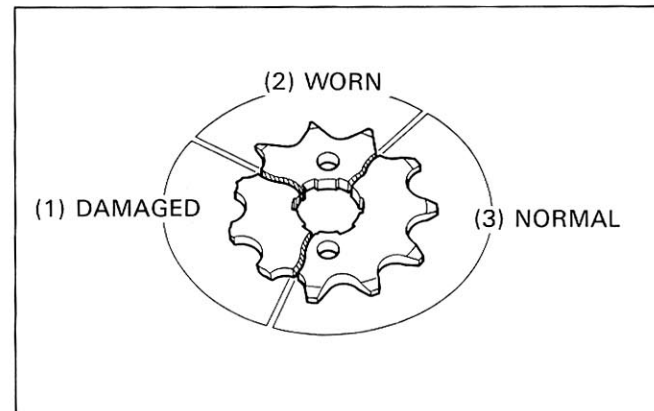


Sprocket Inspection

Inspect the drive and driven sprocket teeth for wear or damage. Replace if necessary (page 6-2 and 14-4).

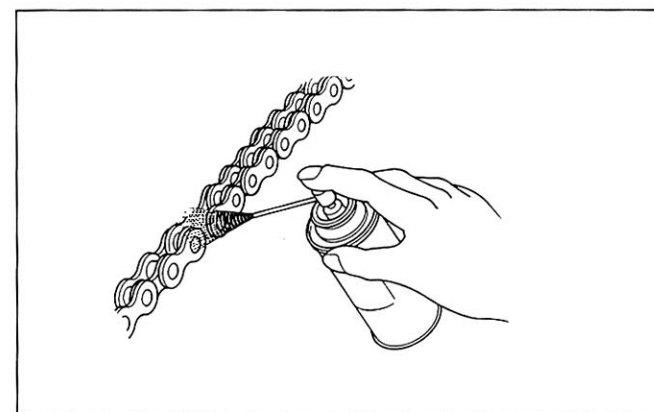
Check for looseness of the attaching bolts and nuts on the drive and driven sprockets, and if loose, retighten.

TORQUE: Driven sprocket: 32 N·m (3.3 kgf·m, 24 lbf·ft)
Drive sprocket: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Lubrication

Lubricate the chain with Pro Honda Chain Lube or equivalent chain lubricant designed specifically for use O-ring chains. Some commercial chain lubricants may contain solvents which could damage the O-rings. Wipe off the excess chain lube to prevent it from flying off when in operation.



DRIVE CHAIN SLIDER

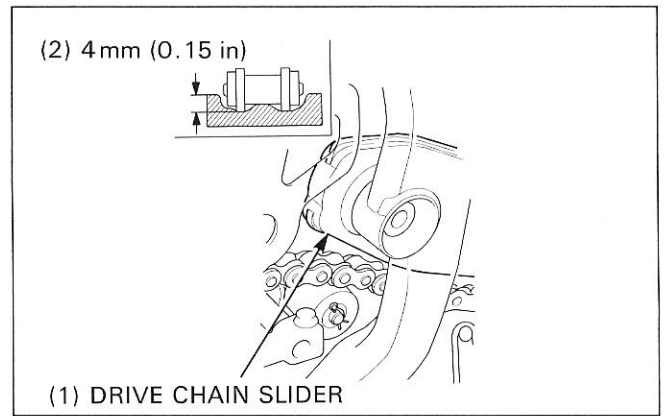
DRIVE CHAIN SLIDER

Remove the drive sprocket cover (page 6-2).

Inspect the chain slider for depth of wear.

Service limit: 4.0 mm (0.15 in)

Failure to replace a worn chain slider will result in chain damage to the swingarm and damage to the chain.

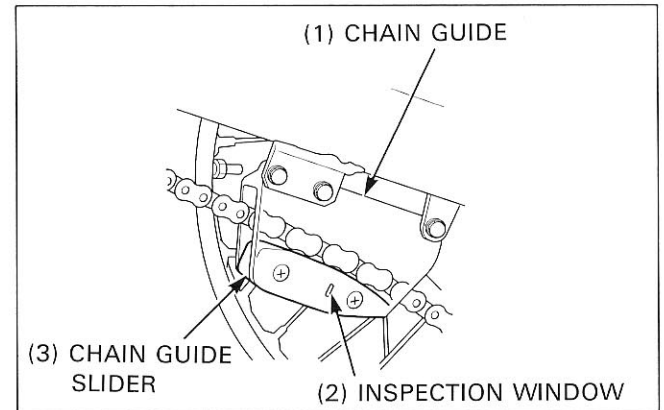


CHAIN GUIDE SLIDER

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

If the chain is through the wear inspection window, replace the guide slider.

If the chain guide is damaged or worn, replace it.



BRAKE FLUID

CAUTION

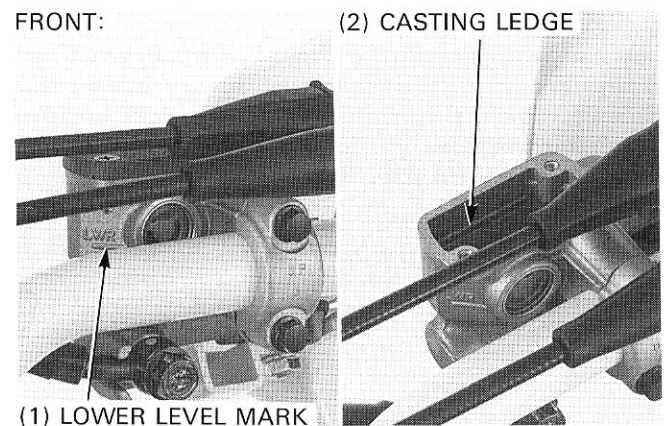
- Do not remove the cover or cap unless the reservoir is level because fluid may spill out.
- Do not mix different types of fluid, as they are not compatible with each other.
- Do not let foreign material enter the system when filling the reservoir.
- Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.

NOTE

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

FRONT BRAKE

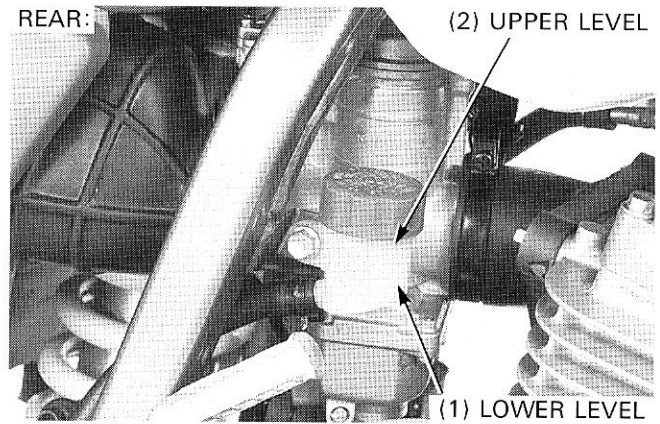
Turn the handlebar so that the reservoir is level and check the front brake reservoir fluid level through the sight glass. If the level is near the lower level mark, remove the cover, set plate and diaphragm and fill the reservoir with DOT 4 brake fluid from a sealed container to the casting ledge.



REAR BRAKE

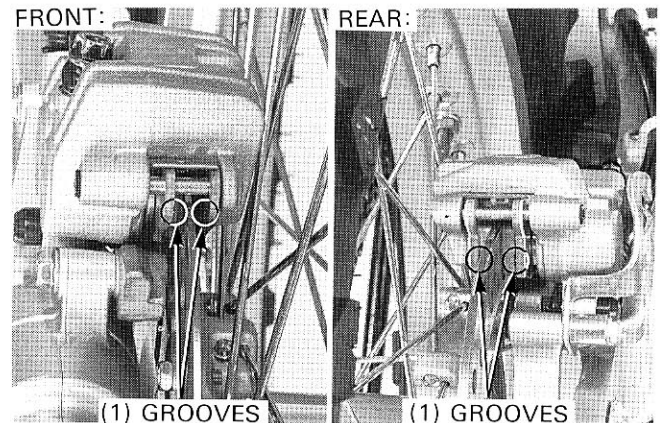
Place the motorcycle on a level surface, and support it upright. Check the rear brake fluid reservoir level. If the level is near the lower level mark, remove the reservoir cap and fill the reservoir with DOT 4 brake fluid from a sealed container to the upper level mark.

Refer to page 15-4 for brake fluid replacement/bleeding procedures.



BRAKE PAD WEAR

Check the brake pad for wear. If either pad is worn to the wear limit groove, replace the brake pads (page 15-6).

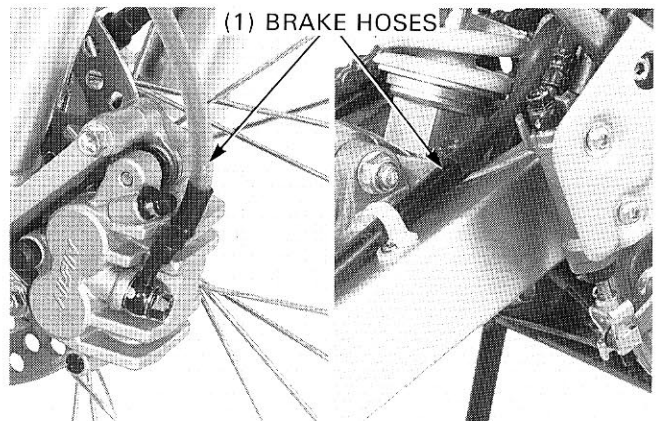


BRAKE SYSTEM

INSPECTION FOR AIR IN SYSTEM

Firmly apply the brake lever or pedal, and check that no air has entered the system. If the lever or pedal feels soft or spongy when operated, bleed air from the system (page 15-4).

Inspect the brake hose and fittings for deterioration, cracks and signs or leakage. Tighten any loose fittings. Replace hoses and fittings as required.

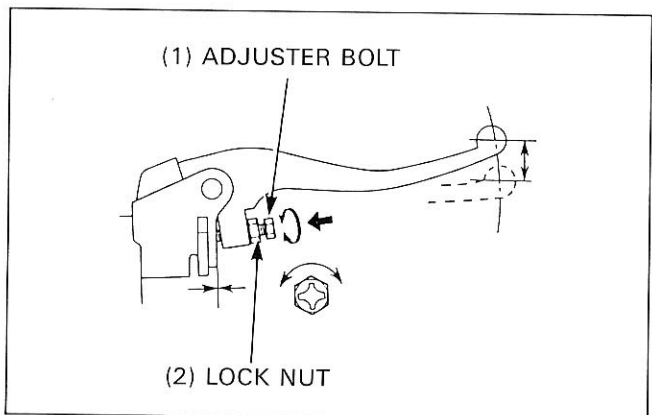


BRAKE LEVER POSITION

The front 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. Tighten the lock nut.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)

After tightening the lock nut, make sure that there is slight clearance between the adjuster bolt tip and master piston end when moving the lever forward (The adjuster is not pushing the piston at the lever free). Apply silicone grease to the contact face of the adjuster bolt and master piston.



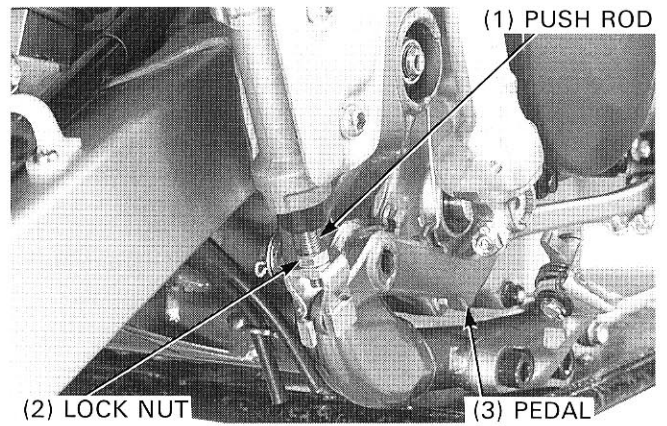
If the brake lever free play exceeds 10 – 20 mm (0.4 – 0.8 in), there is probably air in the brake system and it must be bled (page 15-4).

MAINTENANCE

BRAKE PEDAL HEIGHT

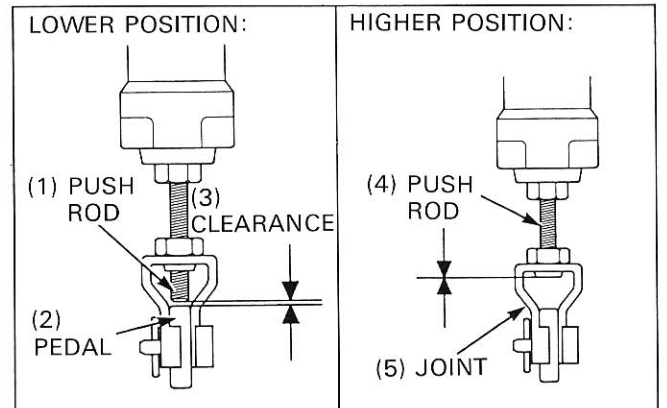
Adjust the brake pedal to the desired height.
Loosen the lock nut and turn the push rod to obtain the pedal height.

Tighten the lock nut after adjustment has been made.



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

If adjusting to the higher position, do not allow the lower end of the push rod thread to enter into the brake pedal joint.



HEADLIGHT AIM

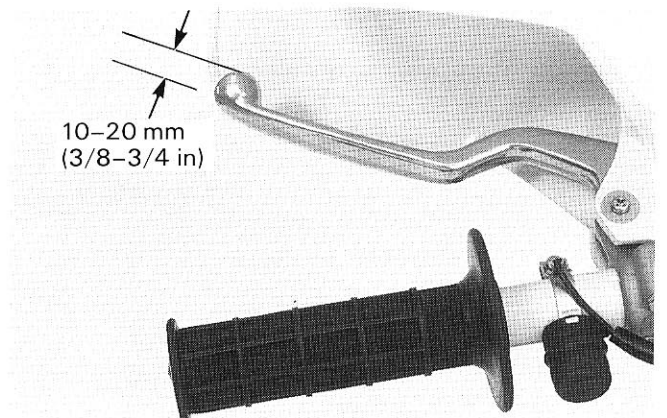
Adjust the headlight beam vertically by turning the adjusting screw on the headlight case.



CLUTCH SYSTEM

Measure the clutch lever free play at the lever end.

FREE PLAY: 10 – 20 mm (3/8 – 3/4 in)



Adjust as follows:

Minor adjustments are made at the near the lever.

Pull the dust cover off.

Loosen the lock nut and turn the adjuster to obtain the free play.

Tighten the lock nut and install the dust cover.

CAUTION

- *The adjuster may be damaged if it is positioned too far out, leaving minimal thread engagement.*

If the adjuster is threaded out near its limit and the correct free play cannot be obtained, turn the adjuster all the way in and back out one turn.

Tighten the lock nut, install the dust cover and make a major adjustment as described on following.

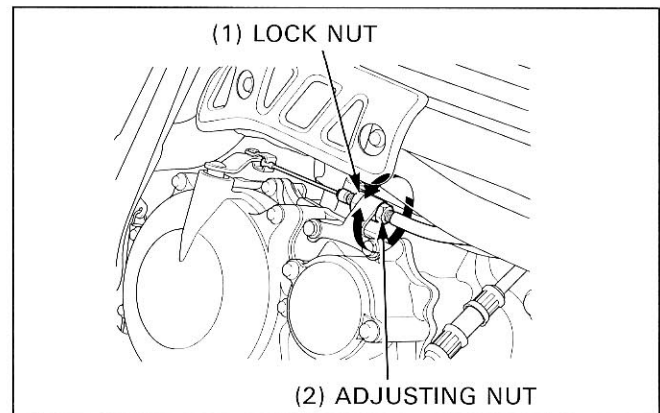
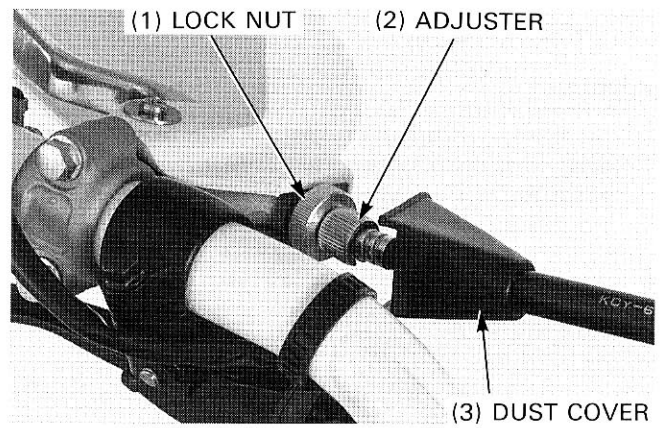
Major adjustment is performed at the clutch arm.

Loosen the lock nut and turn the adjusting nut to adjust free play.

Hold the adjusting nut securely and tighten the lock nut.

Check the clutch operation.

If free play cannot be obtained, or the clutch slips during the test ride, disassemble and inspect the clutch (see section 9).



SIDE STAND

Support the motorcycle on a level surface.

Check the side stand spring for damage or loss of tension. Check the side stand operation for freedom of movement and lubricate the side stand pivot if necessary. Make sure that the side stand is not bent.

Check that the side stand pivot bolt and nut are tightened. Torque any loose bolt and nut to the following.

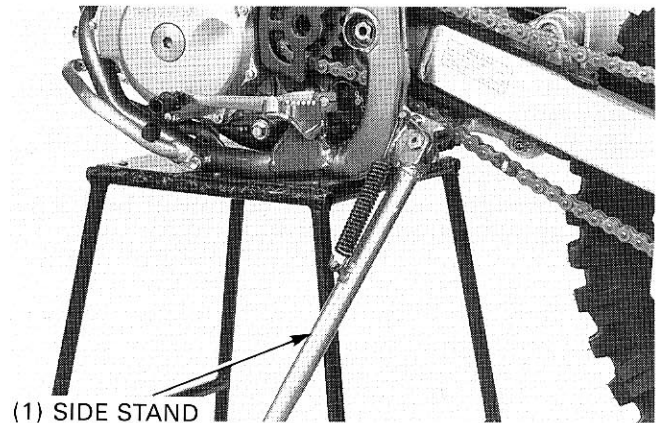
Tighten the pivot bolt.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Loosen the pivot bolt 1/8 to 1/4 turns after tightening it to the specified torque.

Tighten the pivot nut.

TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)



SUSPENSION

⚠ WARNING

- *Loose, worn, or damaged suspension parts impair motorcycle stability and control. Replace any damaged components before riding. Riding a motorcycle with faulty suspension increases your risk of an accident and possible injury.*

FRONT

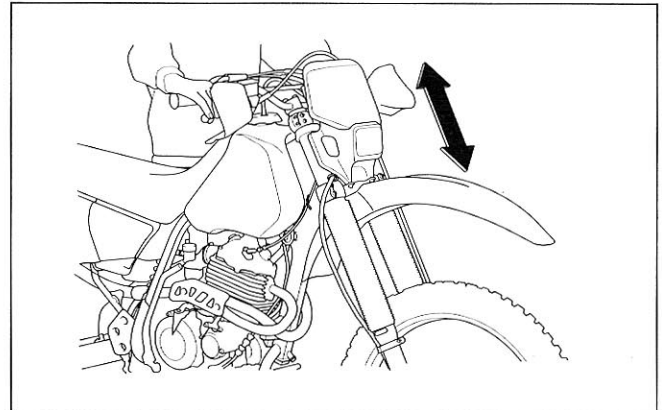
Check the action of forks by compressing the front suspension several times.

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

Replace damage components which cannot be repaired.

Tighten all nuts and bolts (page 1-12).

Refer to section 13 for front fork service.



REAR

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

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

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts (page 1-12).

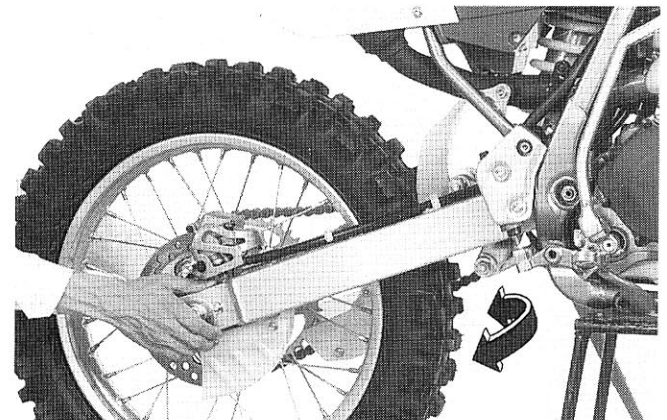


Place the motorcycle on a work stand or box to raise the rear wheel off the ground and support the motorcycle securely.

Check for worn swingarm and linkage bearings by grabbing the swingarm and attempting to move the wheel side to side.

Replace the bearings if any looseness is noted.

Refer to section 14 for shock absorber and swingarm service.



SPARK ARRESTER

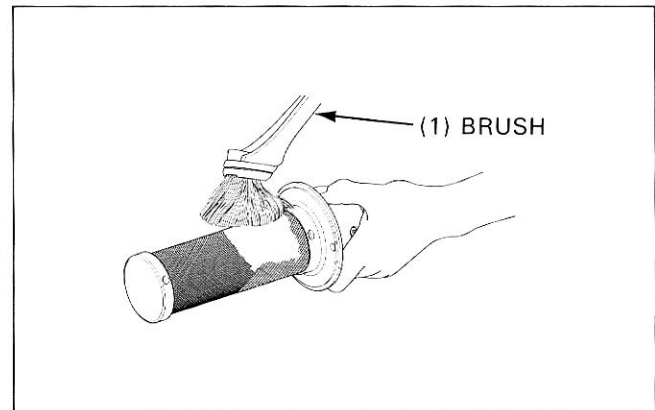
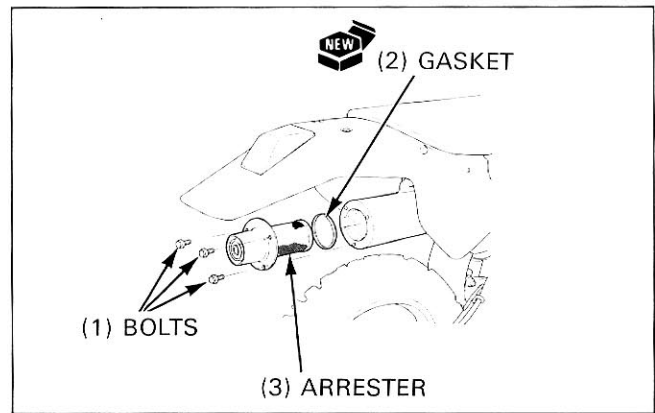
⚠ WARNING

- *Wait until the exhaust system has cooled before removing or installing the arrester. Touching the hot exhaust may result in severe burns.*

Remove the three bolts and the spark arrester and the gasket.

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

Install the spark arrester with a new gasket and tighten the three bolts securely.



NUTS, BOLTS, FASTENERS

Check that all chassis nuts and bolts are tightened to their correct torque values (page 1-12).

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

MAINTENANCE

WHEELS/TIRES

NOTE

- Tire pressure should be checked when tires are COLD.

Check the tire pressure.

TIRE PRESSURE AND TIRE SIZES:

	Front	Rear
Standard pressure	100kPa (1.0 kgf/m ² , 15 psi)	
Tire size	80/100-21 51M	110/100-18 64M
Tire brand (Dunlop)	K490G	K695

Check the tires for cuts, embedded nails, or other damage. Check the front and rear wheels for trueness (refer to sections 13 and 14).

Check the tire cleat height.

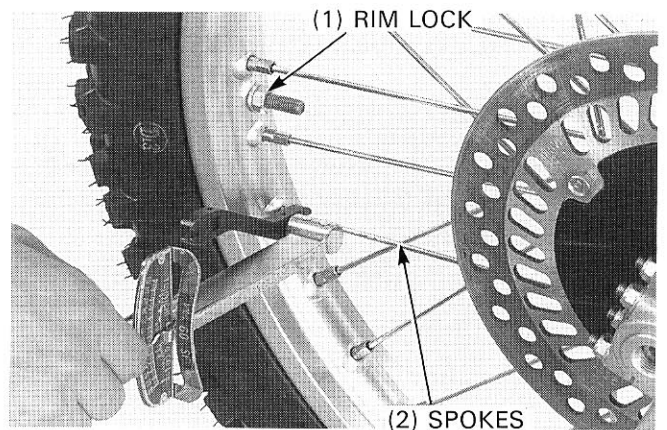
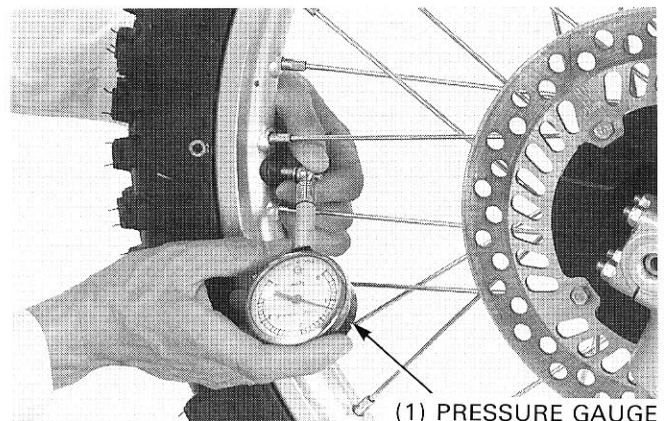
SERVICE LIMIT: Front/Rear: 3 mm (1/8 in)

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

TORQUE: Spoke: 3.7 N·m (0.38 kgf·m, 2.7 lbf·ft)
Rim lock: 13 N·m (1.3 kgf·m, 9 lbf·ft)

TOOL:

Spoke wrench C, 5.8 × 6.1 mm **07701 – 0020300 or equivalent commercially available in U.S.A.**



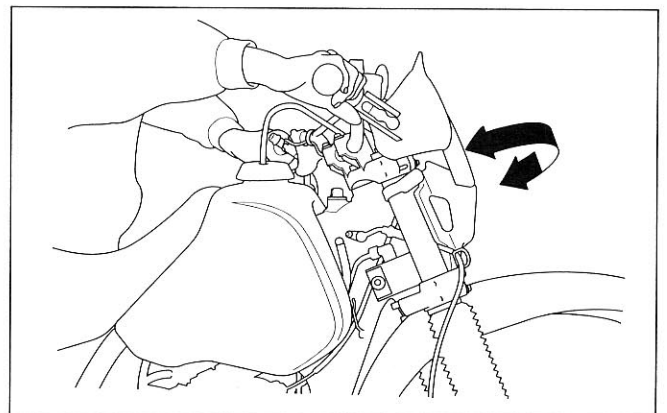
STEERING HEAD BEARINGS

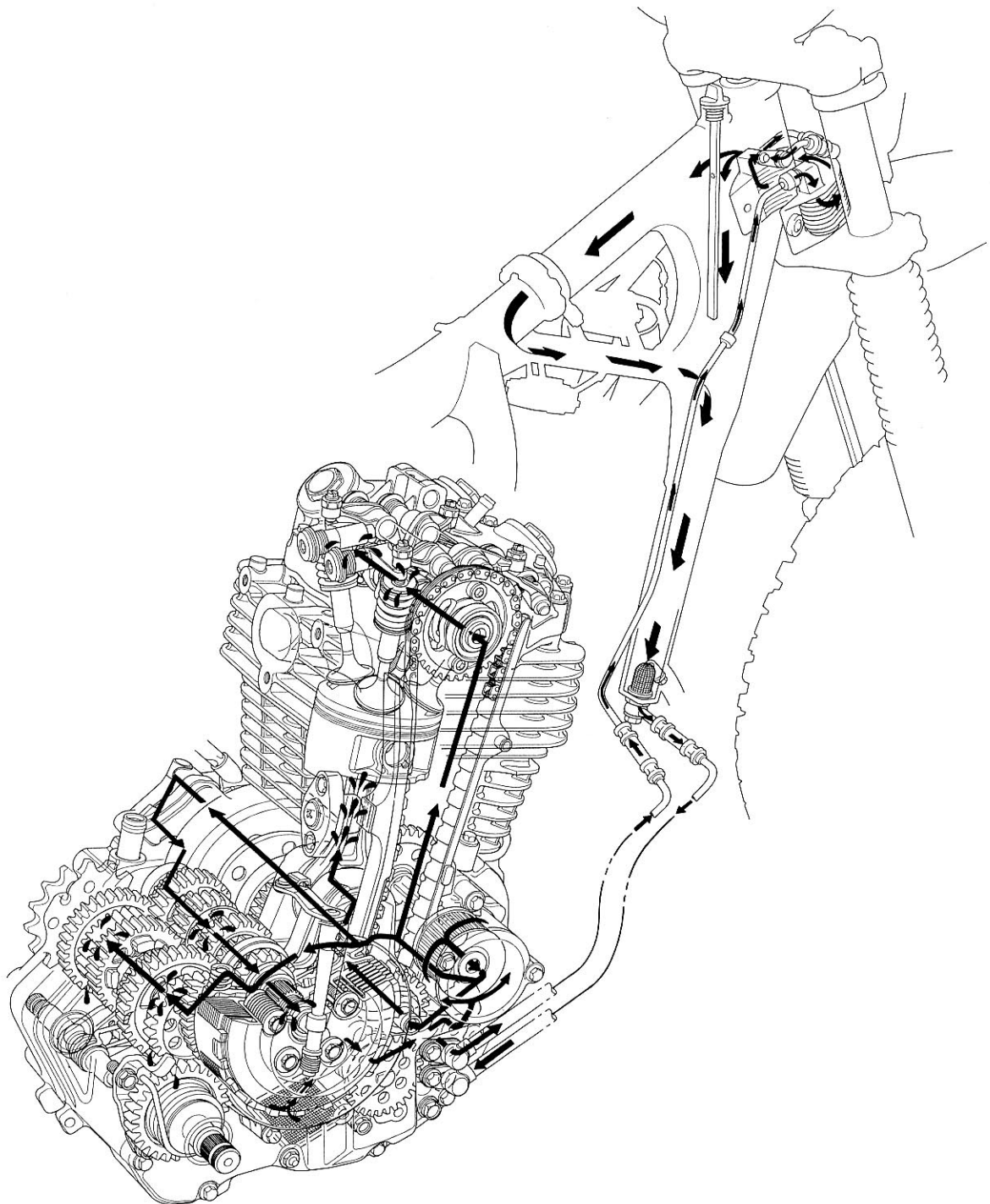
NOTE

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

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

Check that the handlebar moves freely from side to side. If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (section 13).





4. LUBRICATION SYSTEM

SERVICE INFORMATION	4-1	OIL PUMP & OIL STRAINER	4-2
TROUBLESHOOTING	4-1	OIL COOLER & OIL PIPE	4-6

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. KEEP OUT OF REACH OF CHILDREN.*

- This section covers service of the oil pump, oil strainer (in crankcase) and oil cooler.
For oil level check, oil change, oil filter replacement and oil strainer (at frame down tube) cleaning, refer to section 3 of this manual.
The service procedures in this section can be performed with engine in the frame.
- When removing and installing the oil pump use care not to allow dust or dirt to enter the engine.
- If any portion of the oil pump is worn beyond the specified service limits, replace the oil pump as an assembly.
- After oil pump, oil cooler and/or oil pipes has been installed, check that there are no oil leaks.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
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)

TORQUE VALUES

Oil cooler joint flare nut (left side)	20 N·m (2.0 kgf·m, 14 lbf·ft)
(right side)	20 N·m (2.0 kgf·m, 14 lbf·ft)
Oil pump assembly bolt	13 N·m (1.3 kgf·m, 9 lbf·ft)

TROUBLESHOOTING

Oil level too low—high oil consumption

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

Oil contamination

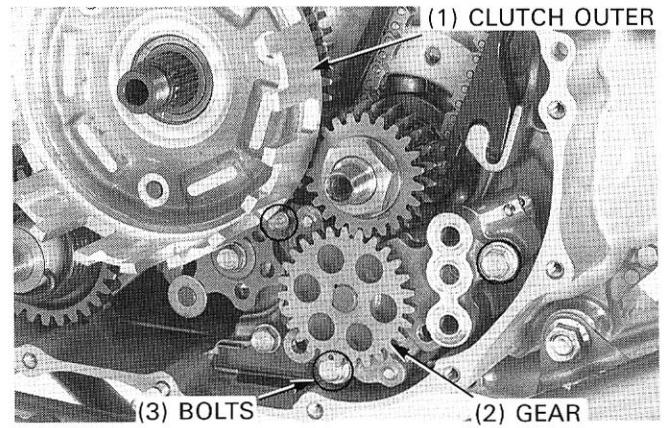
- Oil not changed often enough
- Worn piston rings or incorrect piston ring installation
- Worn valve guide or seal

OIL PUMP & STRAINER

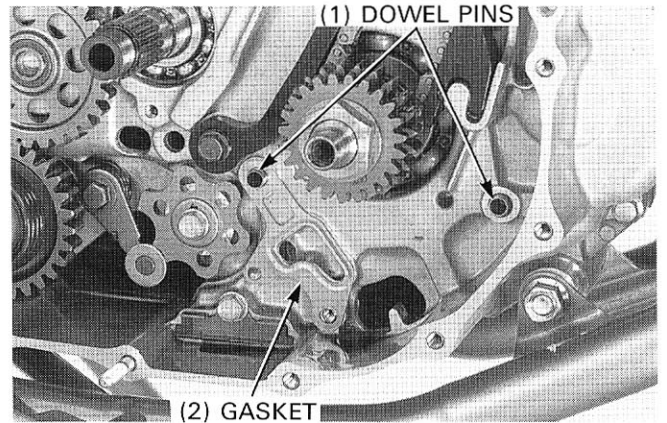
REMOVAL

Remove the right crankcase cover (page 9-11).
Remove the clutch outer (page 9-4).

Remove the oil pump driven gear.
Remove the three mounting bolts and the oil pump.



Remove the gasket and two dowel pins.



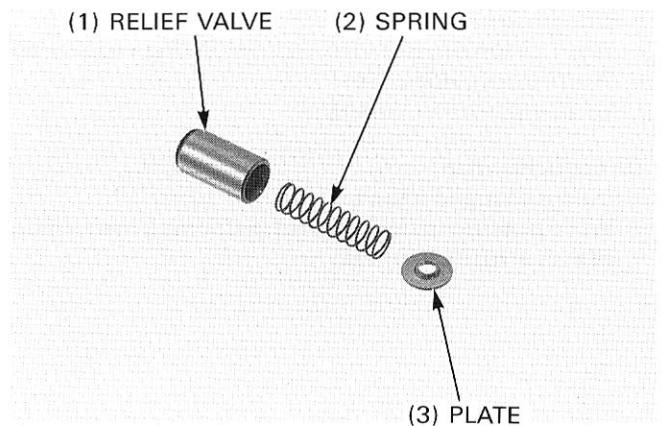
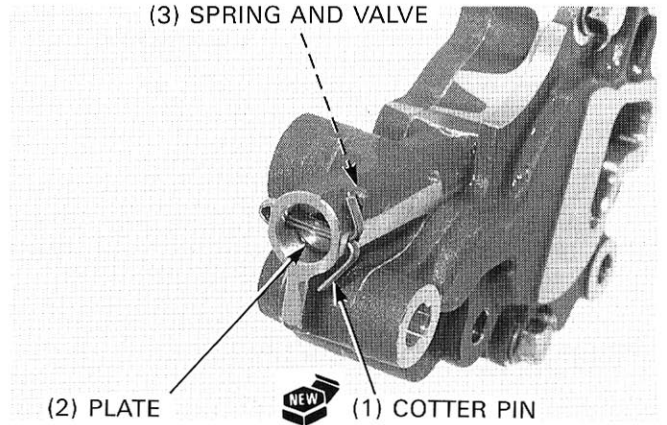
RELIEF VALVE CHECK

Remove the following:

- cotter pin
- stopper plate
- spring
- valve.

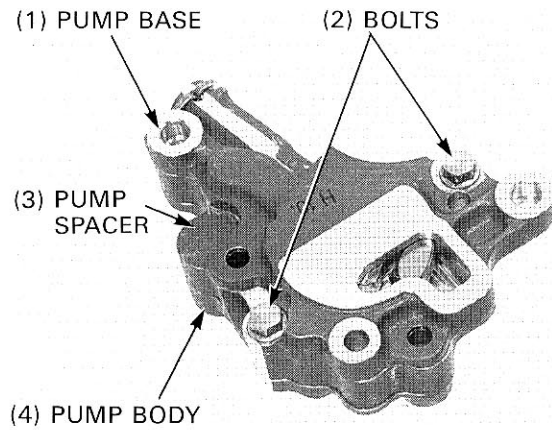
Check the spring and valve for wear or damage.

Install the valve, spring and stopper plate into the oil pump then insert a new cotter pin from the pump body side and secure it.



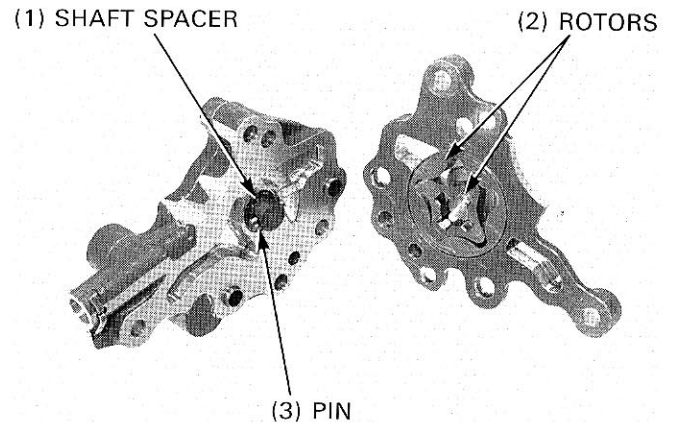
DISASSEMBLY

Remove the two bolts and separate the pump base from the pump spacer.



Remove the following:

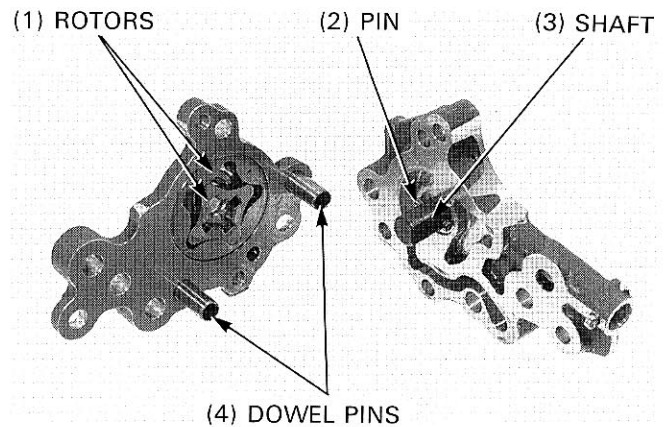
- drive pin
- spacer
- inner rotor
- outer rotor.



Separate the pump body from the pump spacer.

Remove the following:

- shaft
- drive pin
- dowel pin
- inner rotor
- outer rotor.



INSPECTION

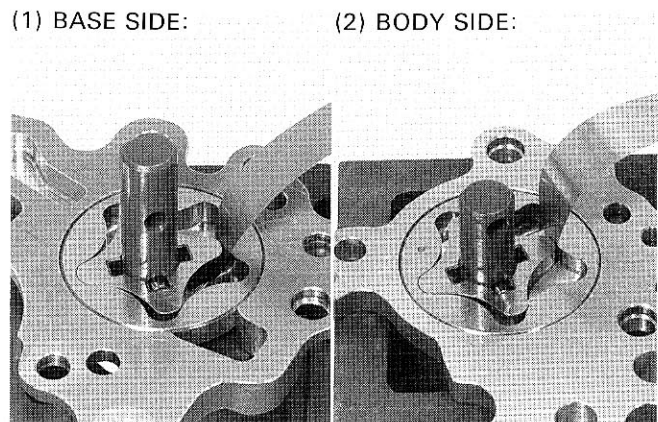
NOTE

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

Install the inner and outer rotors onto the pump base or pump body. Install the pump shaft with the drive pin into the inner rotor securely.

Measure the rotor tip clearance.

SERVICE LIMIT: 0.20 mm (0.008 in)



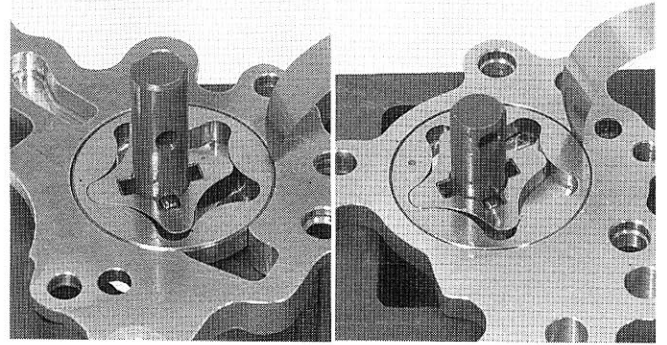
LUBRICATION SYSTEM

Measure the body clearance.

SERVICE LIMIT: 0.25 mm (0.010 in)

(1) BASE SIDE:

(2) BODY SIDE:

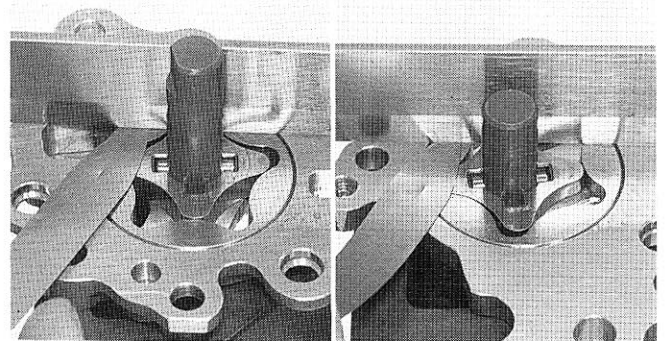


Measure the end clearance.

SERVICE LIMIT: 0.12 mm (0.005 in)

(1) BASE SIDE:

(2) BODY SIDE:



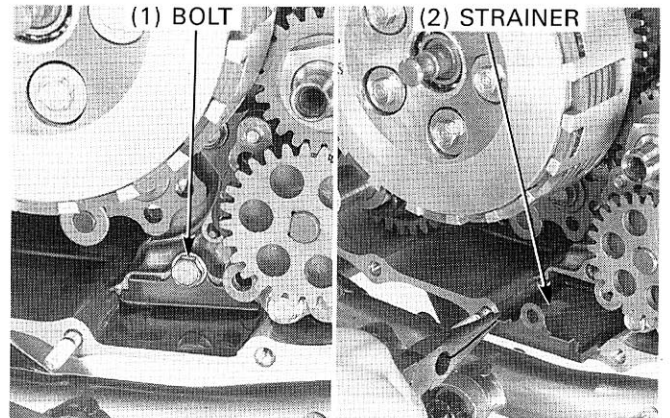
OIL STRAINER CLEANING

Remove the bolt and pull out the strainer from the crankcase.

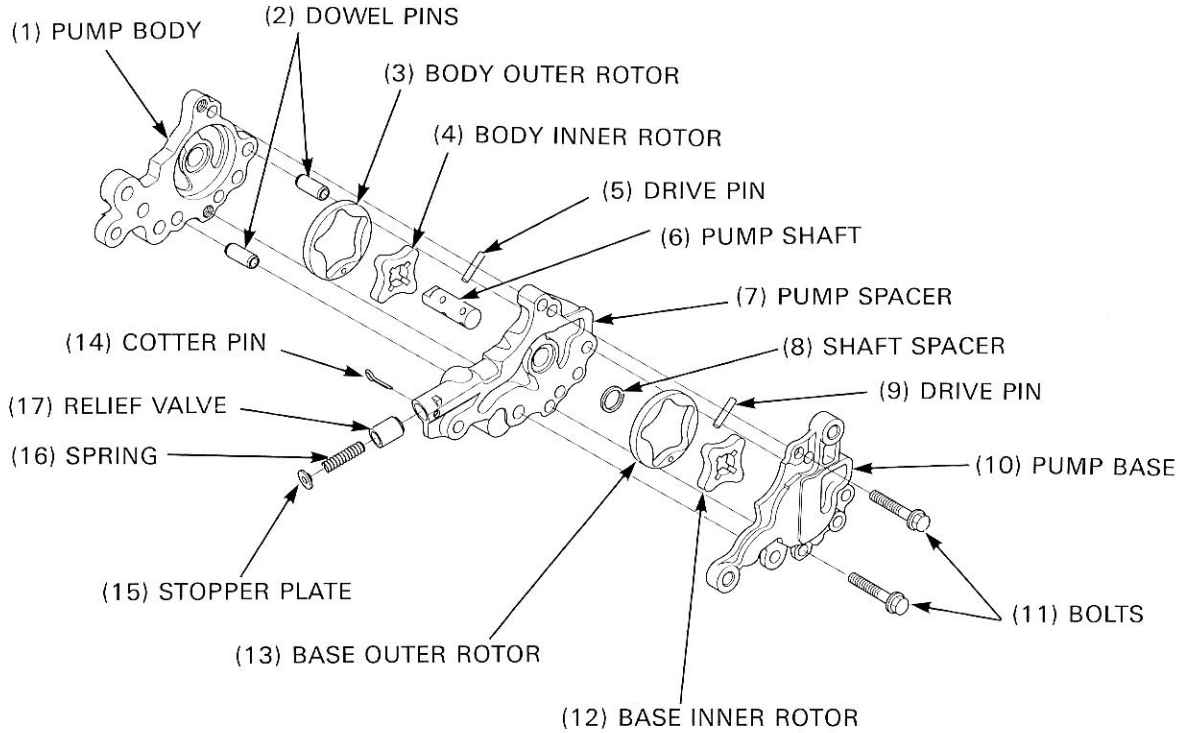
Wash the strainer screen thoroughly in high flash point solventt.

Before installing the oil strainer, it should be checked for damage.

Install the oil strainer into crankcase and tighten the bolt securely.



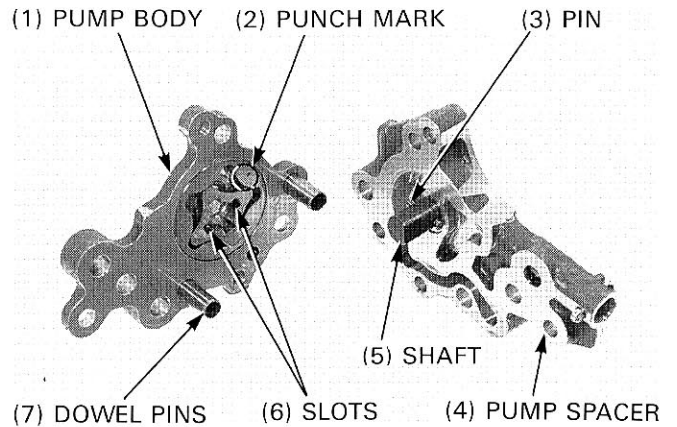
ASSEMBLY



Install the following to the pump body and pump spacer:

- outer rotor with the punch mark facing pump spacer
- inner rotor
- dowel pins
- shaft with the stepped end facing the pump body
- drive pin.

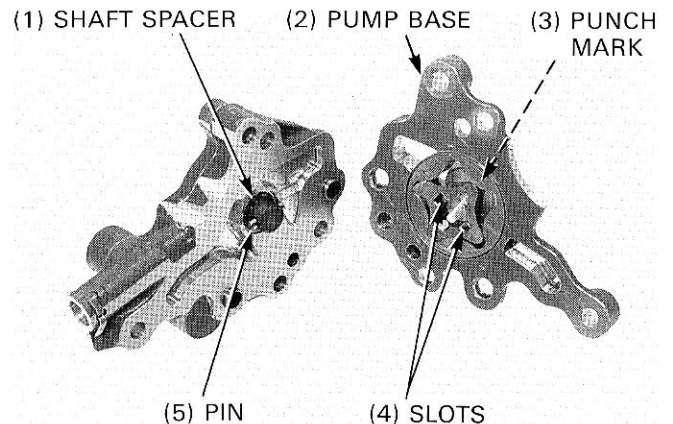
Assemble the pump body and spacer while aligning the drive pin with the slots in the inner rotor.



Install the following to the pump assembly and pump base:

- shaft spacer
- drive pin
- outer rotor with the punch mark facing the pump base
- inner rotor.

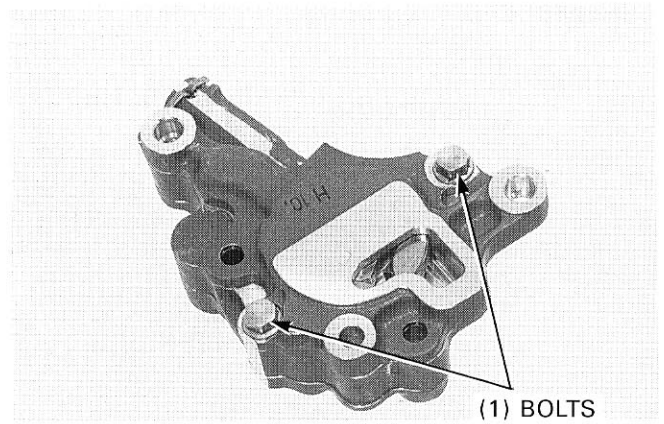
Assemble the pump assembly and pump base while aligning the pin with the slots in the same way above procedure.



LUBRICATION SYSTEM

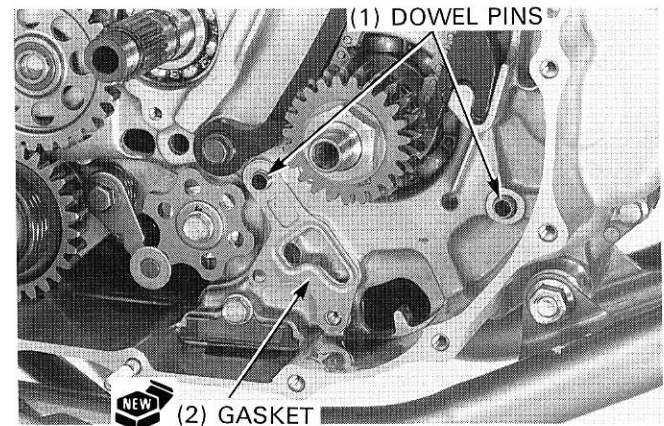
Be sure that there is no gap between the mating surfaces and tighten the two bolts.

TORQUE: 13 N·m (1.3 kgf·m, 9 lbf·ft)



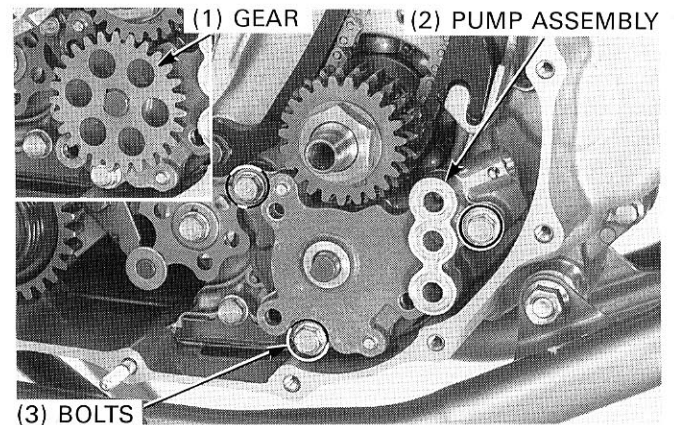
INSTALLATION

Install the two dowel pins and a new gasket.



Set the pump assembly onto crankcase and tighten the three bolts securely.
Install the driven gear by aligning the flat surfaces.

Install the clutch assembly (page 9-7).
Install the right crankcase cover (page 9-11).

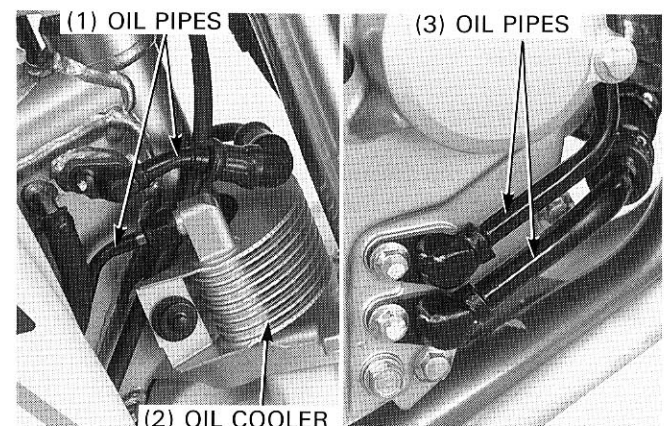


OIL COOLER & OIL PIPE

INSPECTION

Remove the front visor (page 2-4).

Check the oil cooler fins for clogging or damage.
Check for any oil leakage from the oil cooler and pipe joints.



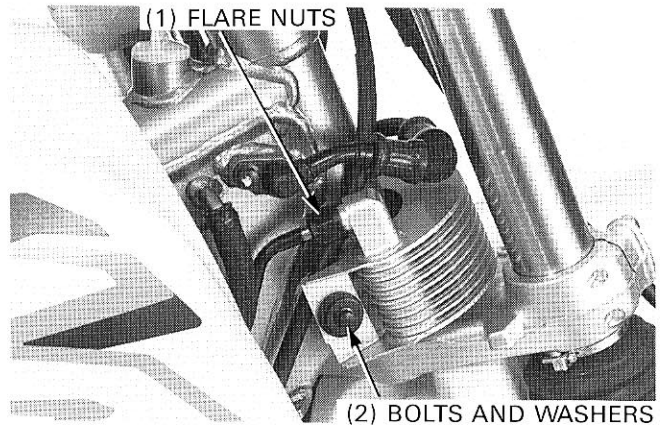
REMOVAL/INSTALLATION

Drain the engine oil (page 3-12).

Oil Cooler

Loosen the flare nuts.

Remove the two mounting bolts and washers, and the oil cooler.

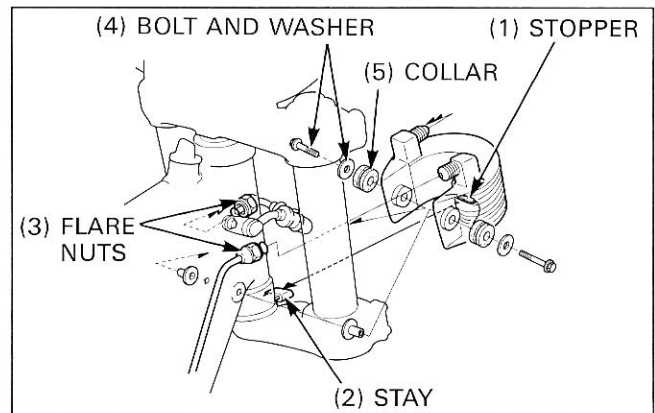


Be sure to install the rubber cap onto the stay.
Install the oil cooler aligning the stopper with the stay on the steering head pipe.
Install and tighten the two bolts with the collars and washers.

Connect the oil pipes to the oil cooler by tightening the flare nuts.

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

Pour the engine oil (page 3-13).

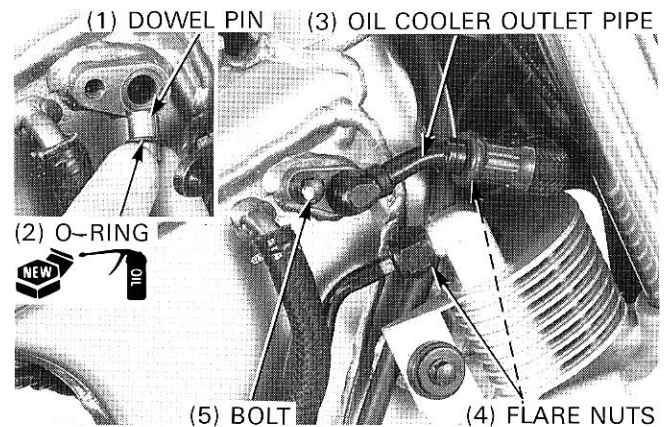


Oil Pipes

OIL COOLER OUTLET PIPE:

Remove the following:

- flare nut on the oil cooler
- joint bolt of the oil cooler outlet pipe from the frame
- oil cooler outlet pipe
- dowel pin
- O-ring

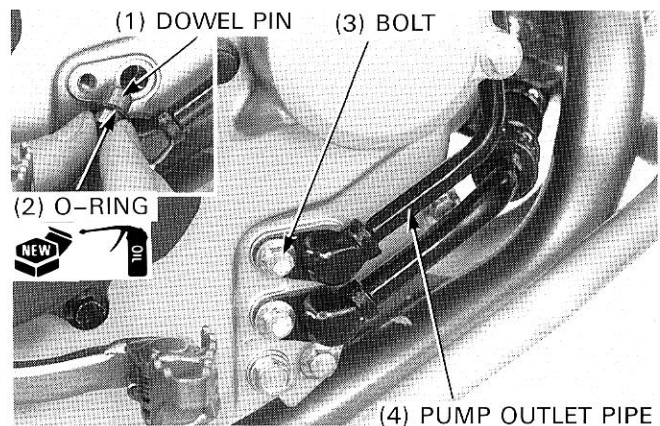


OIL PUMP OUTLET PIPE:

NOTE

- Be careful not to bend or damage the oil pipe when removing it out of motorcycle.

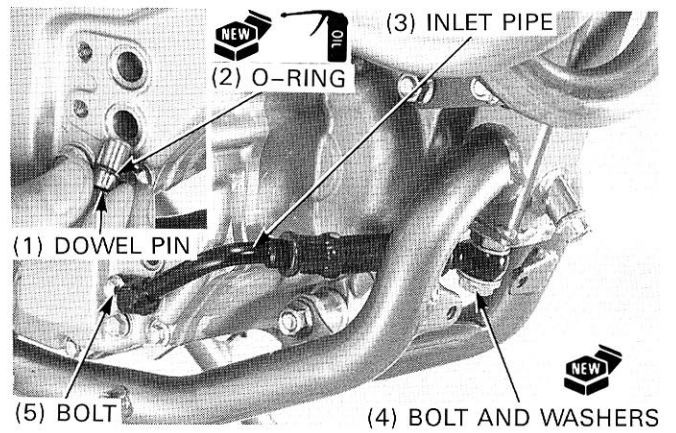
- fuel tank (page 2-2)
- flare nut on the oil cooler
- joint bolt of the pump outlet pipe from the engine
- pump outlet pipe
- dowel pin
- O-ring



LUBRICATION SYSTEM

OIL PUMP INLET PIPE:

- under guard (page 2-5)
- oil pipe bolt
- sealing washers
- joint bolt of the pump inlet pipe
- inlet pipe
- dowel pin
- O-ring.



After removing the pipes, check for clogging.

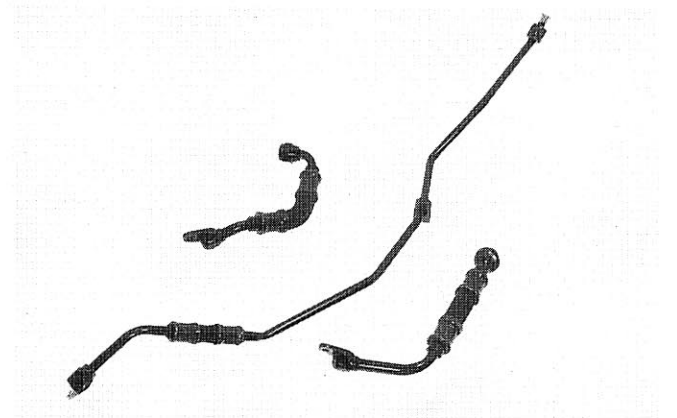
Oil pipe installation is in the reverse order of removal. However, replace the O-rings with a new one and coat them with engine oil

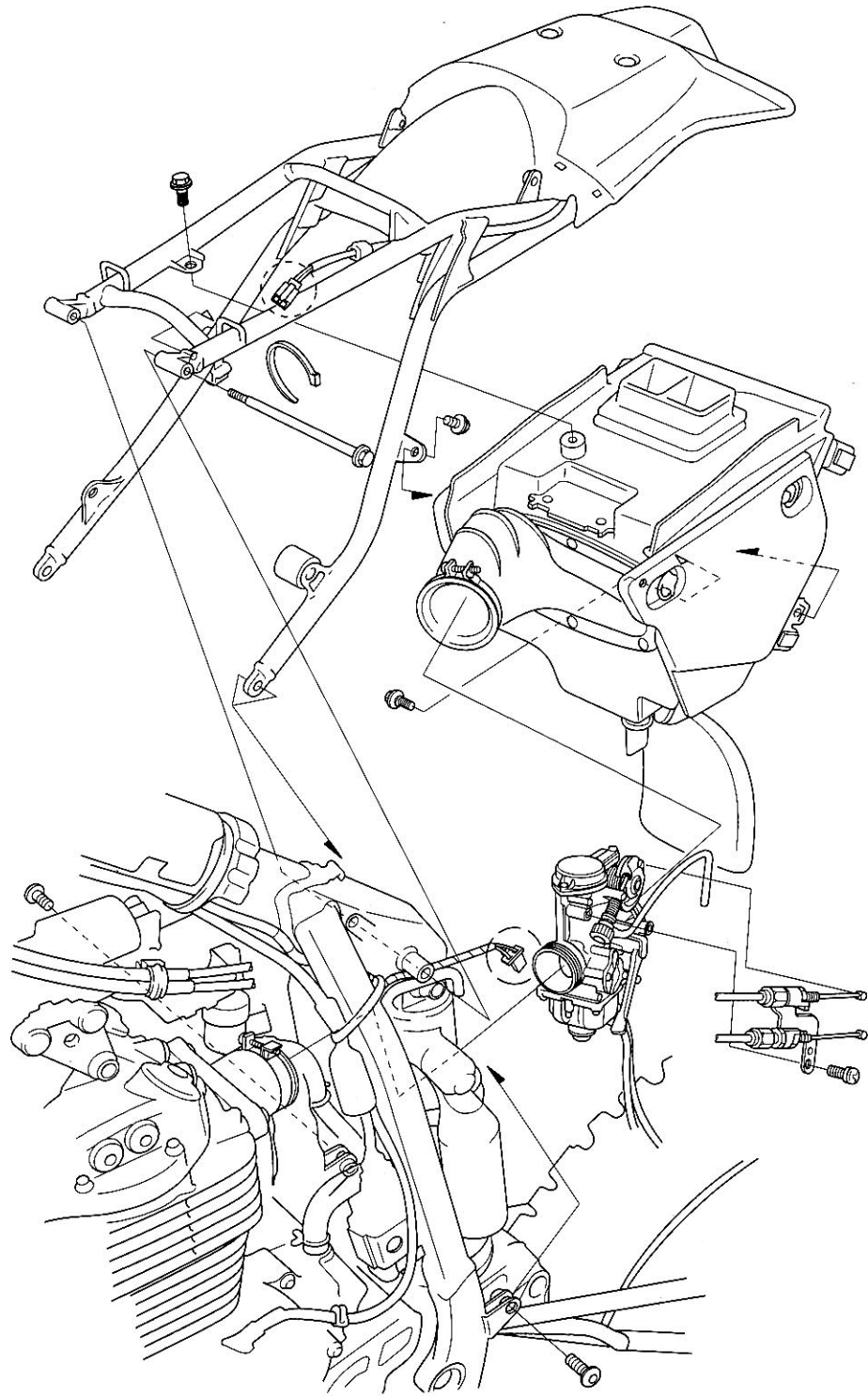
TORQUE: Flare nuts: 20 N·m (2.0 kgf·m, 14 lbf·ft)

Install the following:

- fuel tank (page 2-2)
- front visor (page 2-4)
- under guard (page 2-5).

Pour the engine oil (page 3-13).





5. FUEL SYSTEM

SERVICE INFORMATION	5-1	CARBURETOR INSTALLATION	5-10
TROUBLESHOOTING	5-2	PILOT SCREW ADJUSTMENT	5-11
CARBURETOR REMOVAL	5-3	CARBURETOR TUNING ('96 – '97)	5-13
CARBURETOR DISASSEMBLY	5-3	TEMPERATURE AND ALTITUDE ADJUSTMENT (AFTER '97)	5-15
CARBURETOR ASSEMBLY	5-7	AIR CLEANER HOUSING	5-16

SERVICE INFORMATION

GENERAL

▲WARNING

- *Gasoline is extremely flammable and is explosive under certain conditions. KEEP OUT OF REACH OF 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 may cause loss of consciousness and 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 for more than one month, drain the float chamber. Fuel left in the float chamber may cause clogged jets resulting in hard starting or poor driveability.
- For fuel tank removal and installation, refer to section 2.
- For air cleaner and fuel strainer cleaning, refer to section 3.
- Before disassembling the carburetor, place an approved fuel container under the carburetor drain tube, loosen the drain screw and drain the carburetor.
- When disassembling fuel system parts, note the locations of the O-rings. replace them with new ones on reassembly.
- After removing the carburetor, wrap the intake port of the engine with a shop towel or cover it with a piece of tape to prevent any foreign material from dropping into the engine.

FUEL SYSTEM

SPECIFICATIONS

ITEM		SPECIFICATION
Carburetor identification number	'96, '97 :	PDK 1A
	After '97: 49 state type	PDK 1C
	After '97: California type	PDK 1E
Main jet	'96, '97:	#162*, #158**
	After '97:	#142
Slow jet	'96, '97:	#62*, #60**
	After '97:	#52
Jet needle clip position	'96, '97:	3rd groove from top*, 2nd groove from top**
	After '97:	3rd groove from top
Pilot screw opening		See page 5-11
Float level		14.5 mm (0.57 in)
Idle speed		1,300 ± 100 rpm
Throttle grip free play		2 – 6 mm (1/8 – 1/4 in)

* Standard settings (as delivered)

** Suggested settings for trail riding (noise suppressor and exhaust diffuser installed)

TOOLS

Carburetor float level gauge

07401 – 0010000

TROUBLESHOOTING

Engine cranks but won't start

- No fuel in tank
- No fuel to carburetor
 - Fuel strainer screen
 - Fuel line clogged
 - Float level misadjusted
 - Fuel tank breather tube clogged
- Too much fuel getting to the engine
 - Air cleaner clogged
 - Flooded carburetor
- Intake air leak
- Fuel contaminated/deteriorated
 - jets clogged
- Improper throttle operation
- No spark at plug (ignition system faulty)

Engine stalls, hard to start, rough idling

- Fuel line restricted
- Fuel mixture too lean/rich
- Fuel contaminated/deteriorated
 - jets clogged
- Intake air leak
- Idle speed misadjusted
- Float level misadjusted
- Fuel tank breather tube clogged
- Pilot screw misadjusted
- Slow circuit clogged
- Ignition system malfunction

Afterburn when engine braking is used

- Lean mixture in slow circuit
- Air cut-off valve malfunction

Backfiring or misfiring during acceleration

- Ignition system malfunction
- Fuel mixture too lean

Lean mixture

- Fuel jets clogged
- Float valve faulty
- Float level too low
- Fuel line restricted
- Carburetor air vent tube clogged
- Intake air leak
- Throttle valve faulty

Rich mixture

- Starting enrichment valve in ON position (closed)
- Float valve faulty
- Worn jet needle or needle jet
- Float level too high
- Air jets clogged
- Air cleaner clogged
- Flooded carburetor

Poor performance (driveability) and poor fuel economy

- Fuel system clogged
- Ignition system malfunction
- Air cleaner clogged

CARBURETOR REMOVAL

Remove the sub-frame (page 2-3).

Turn the fuel valve OFF.

Place an approved fuel container under the drain tube.
Loosen the drain screw and drain the carburetor.

Remove the drain and air vent tubes from the clamps.
Disconnect the fuel tube from the carburetor.

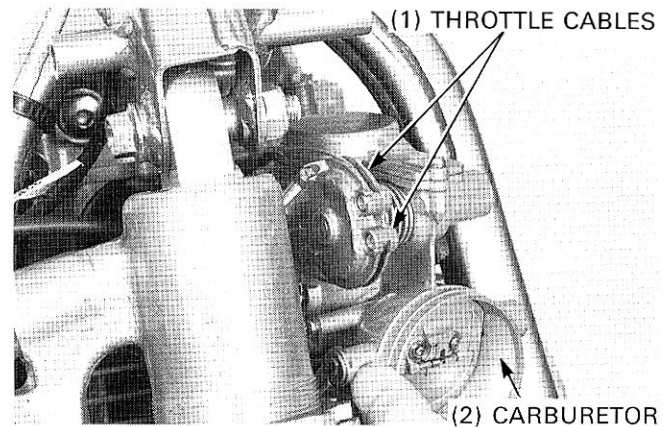
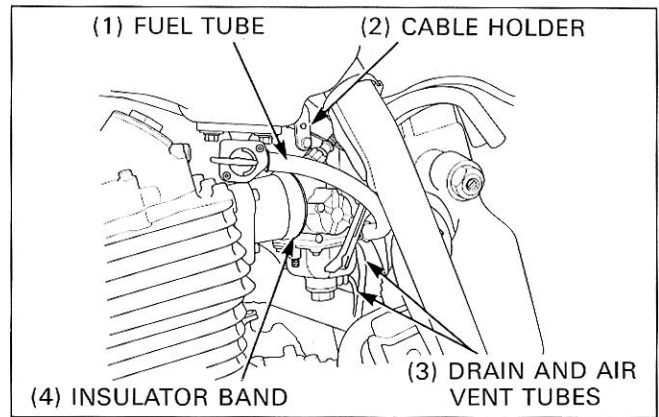
Loosen the insulator band screw.

NOTE

- Be careful not to damage the screw.

Remove the screw and the cable holder from the carburetor.

Release the carburetor from the insulator. Disconnect the throttle cables from the throttle drum and remove the carburetor out of the frame to the rear.



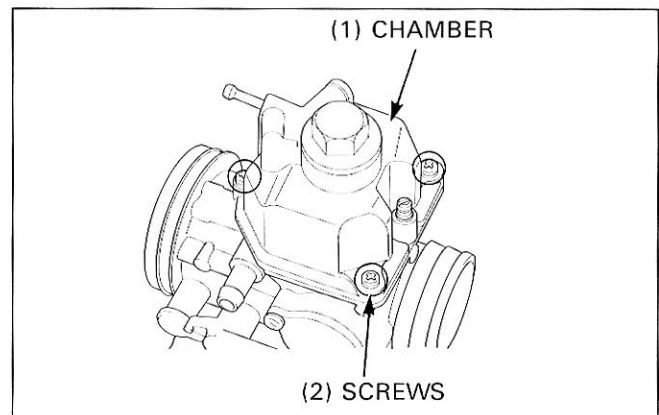
CARBURETOR DISASSEMBLY

Remove the drain and air vent tubes.

FLOAT AND JETS

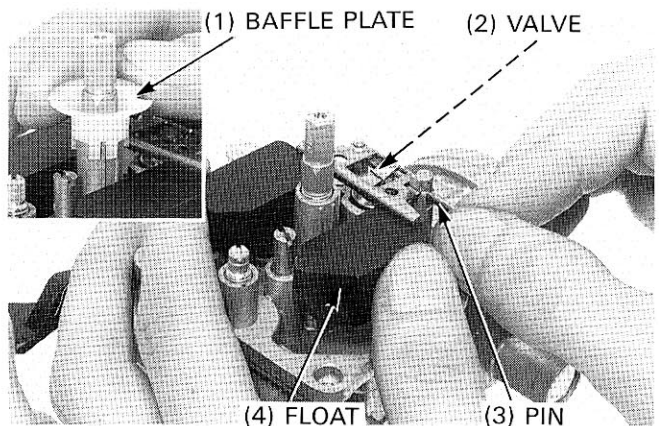
REMOVAL

Remove the three screws and the float chamber.



Remove the baffle plate.

Remove the float pin, float and float valve.



FUEL SYSTEM

CAUTION

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

Remove the main jet, needle jet holder and needle jet.
Remove the slow jet.

CAUTION

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

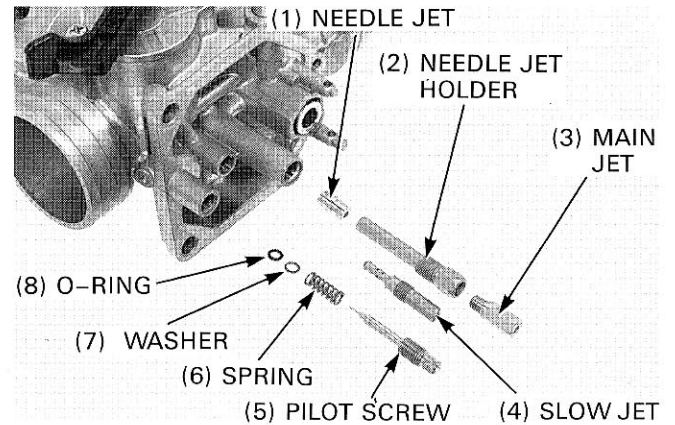
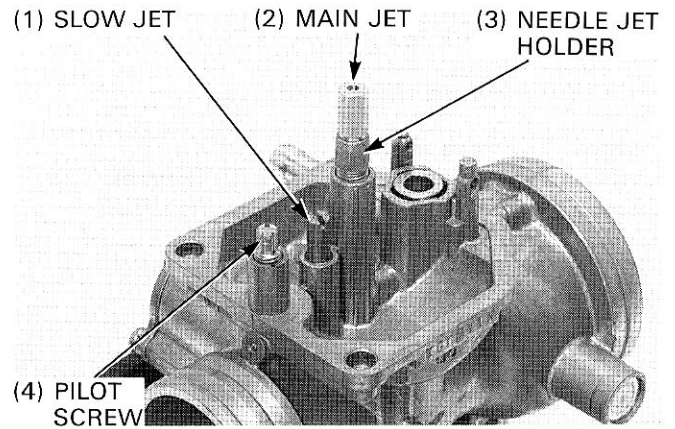
Turn the pilot screw in and carefully count the number of turns until it seats lightly. Make a note of this to use as a reference when reinstalling the pilot screw.

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

Inspection and Cleaning

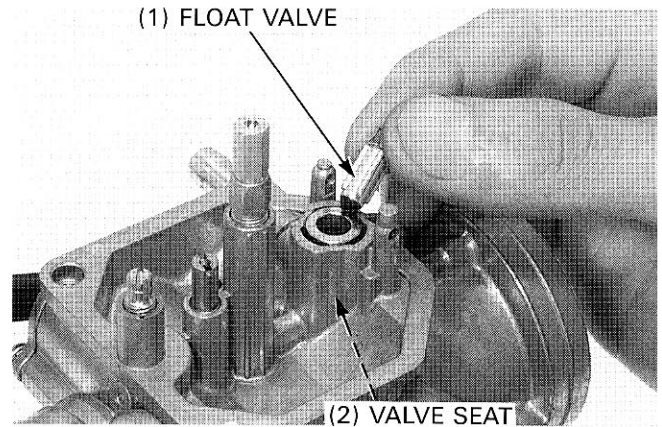
Check each jet for wear or damage.
Clean the jets with non-flammable or high flash point solvent and blow open with compressed air.

Check the pilot screw for wear or damaged.



Check the float for damage, deterioration or fuel in the float.
Check the float valve and valve seat for scoring, scratches, clogging or damage.
Check the tip of the float valve, where it contacts the valve seat, for stepped wear or contamination.

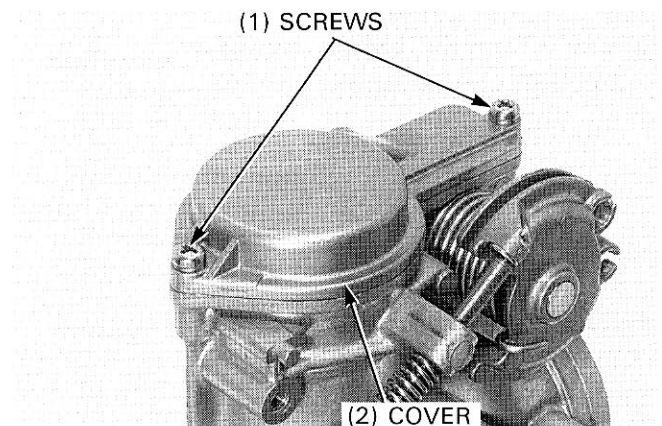
A worn or contaminated valve does not seat properly and will eventually flood the carburetor.



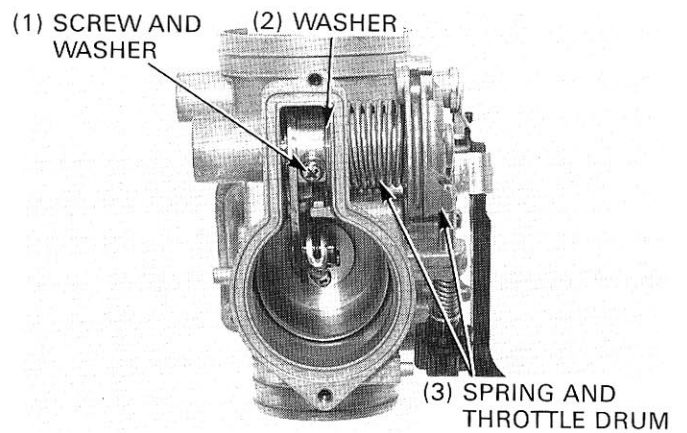
THROTTLE VALVE

Removal

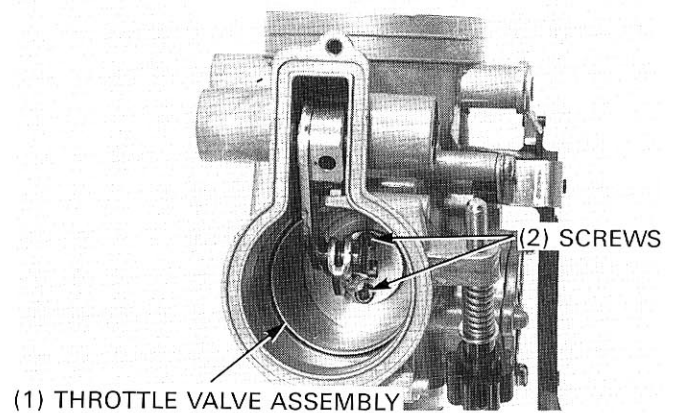
Remove the two screws and the top cover.



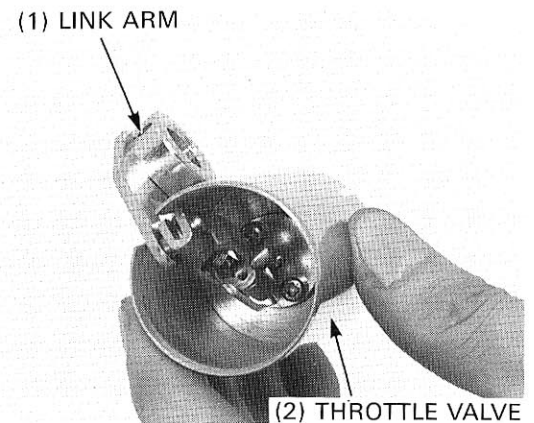
Remove the link arm set screw and washer.
 Pull out the throttle drum with the return spring then remove the washer between the link arm and carburetor body.



Loosen the two screws attaching the link arm-to-throttle valve.
 Remove the throttle valve assembly from the carburetor body, being careful not to damage the jet needle.

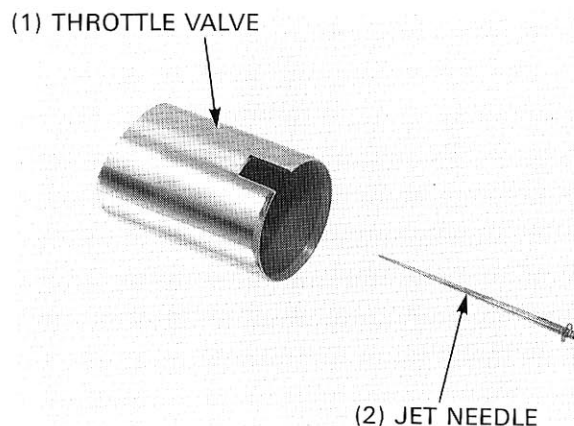


Remove the two screws and separate the link arm from the throttle valve.
 Remove the jet needle.



Inspection

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



FUEL SYSTEM

AIR CUT-OFF VALVE

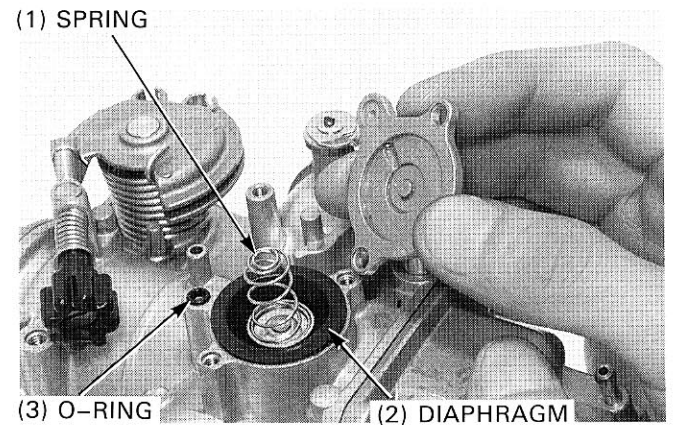
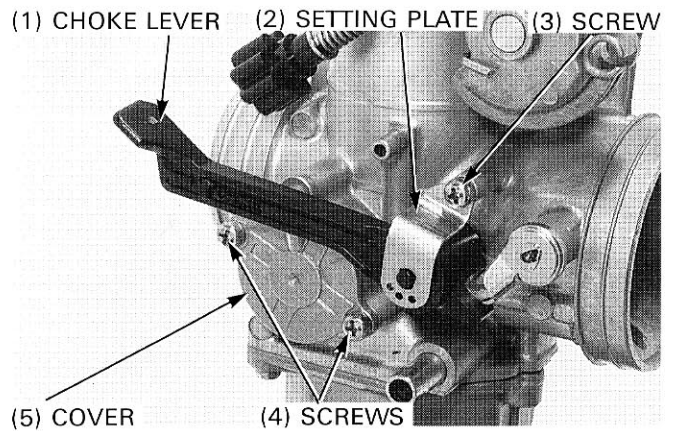
Removal

NOTE

- The air cut-off valve cover is under spring pressure. Do not lose the screws and O-ring.

Remove the following

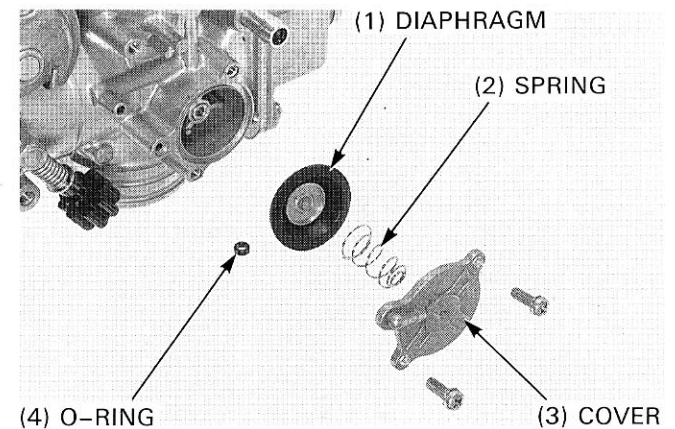
- screw
- lever setting plate
- choke lever
- screws
- valve cover
- spring
- diaphragm
- O-ring.



Inspection

Visually check the following:

- the diaphragm for deterioration or pin holes
- the spring for deterioration
- the needle on the diaphragm for excessive wear at the tip
- the orifice in the cover and body for clogging or restriction
- the O-ring for damage.



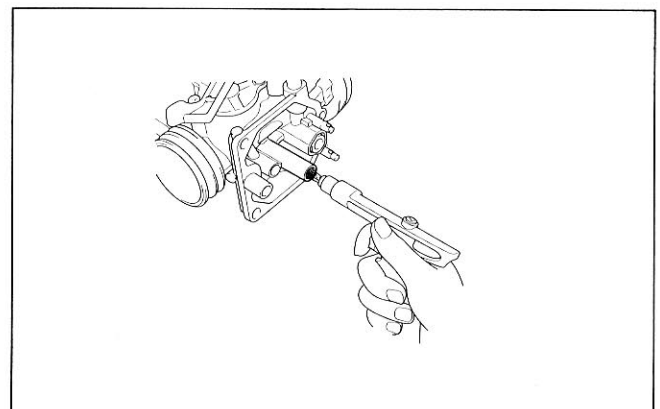
CARBURETOR CLEANING

CAUTION

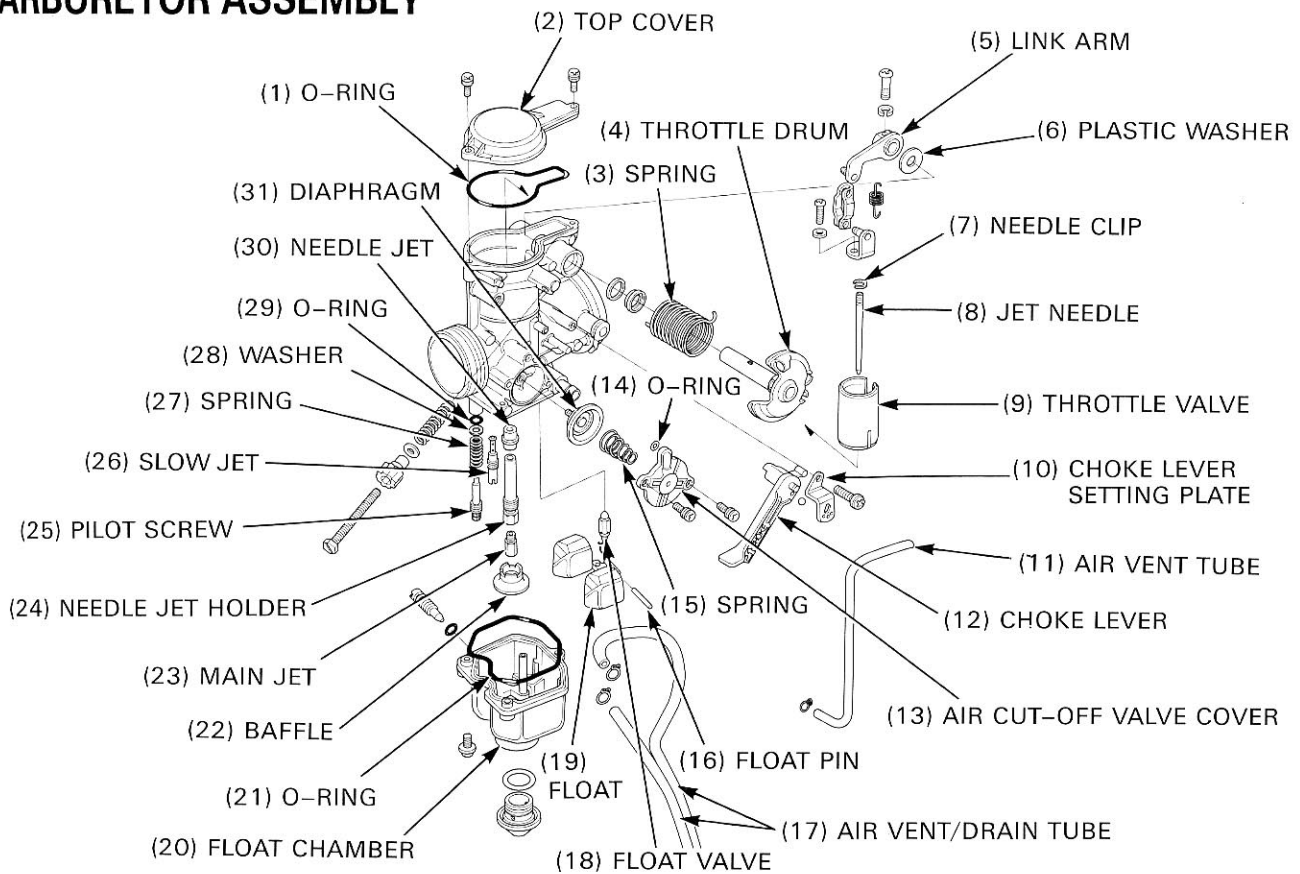
- *Cleaning the air and fuel passages with a piece of wire will damage the carburetor body.*

Remove the all parts from the carburetor as mentioned above.

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



CARBURETOR ASSEMBLY



AIR CUT-OFF VALVE

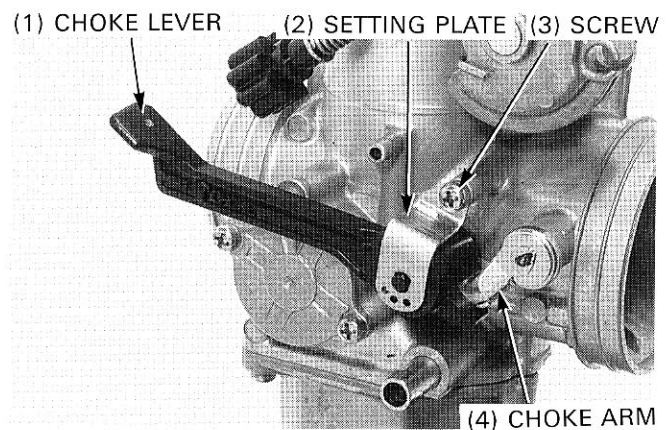
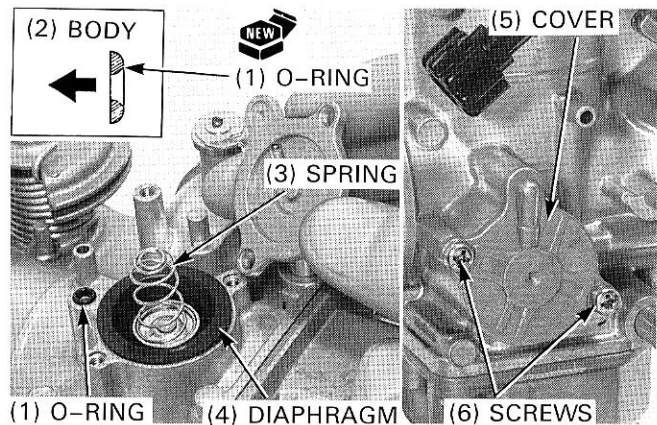
NOTE

- Be careful not to pinch the diaphragm and O-ring between the body and valve cover when tightening the cover screws.

Install the O-ring with its flat side facing the carburetor body. Install the diaphragm to set the diaphragm rib in the groove in the carburetor body properly.

Place the spring onto diaphragm with its tapered side facing out, install and hold the valve cover securely and tighten the two screws.

Install the choke lever against the choke arm as shown and secure it with setting plate and screw securely. Be sure to operate the choke lever smoothly (3 position stops).



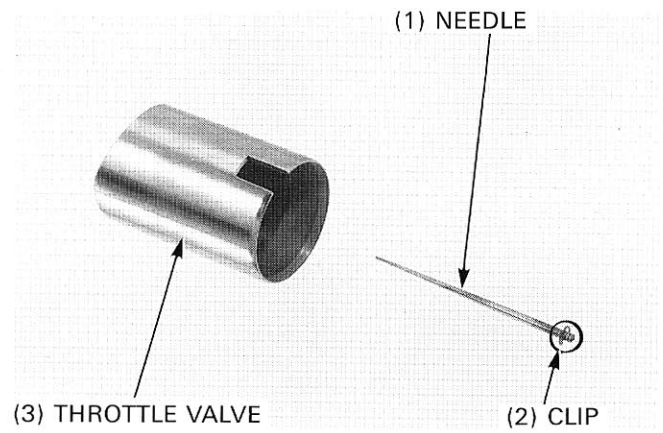
FUEL SYSTEM

THROTTLE VALVE

Install the needle clip on the jet needle.

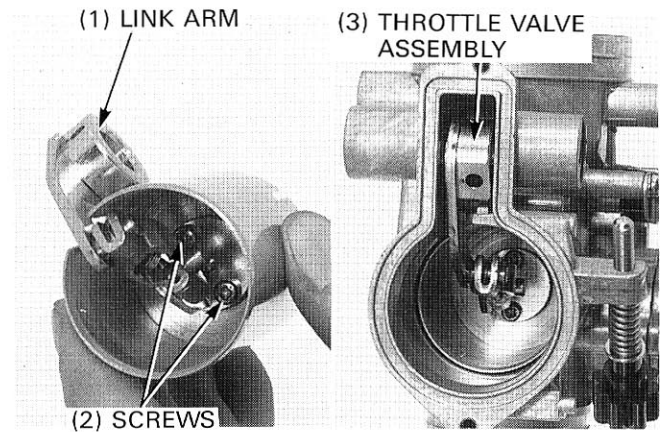
STANDARD CLIP POSITION: 3rd groove from top

Insert the jet needle into the throttle valve.



Assemble the throttle valve and link arm tightening the two screws.

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

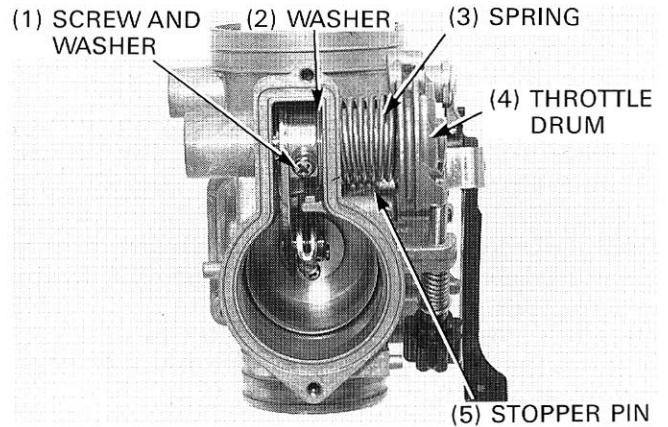


Install the return spring over the throttle drum spindle.

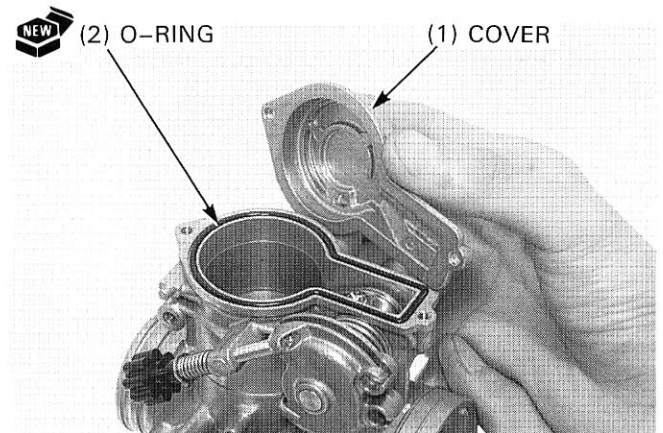
Set the plastic washer between the link arm and carburetor body (throttle drum side) and insert the throttle drum spindle through the carburetor body, washer and link arm while hanging the spring end against the stopper pin on the carburetor.

Align the screw holes in the link arm and drum spindle and tighten the screw with the spring washer.

Rotate the throttle drum and check for smooth operation.



Install a new O-ring into the groove in the carburetor body. Install the top cover and tighten the two screws.



FLOAT AND JETS

Install the pilot screw with the spring, washer and a new O-ring and return it to its original position as noted during removal.

Perform pilot screw adjustment if new pilot screw is installed (page 5-11).

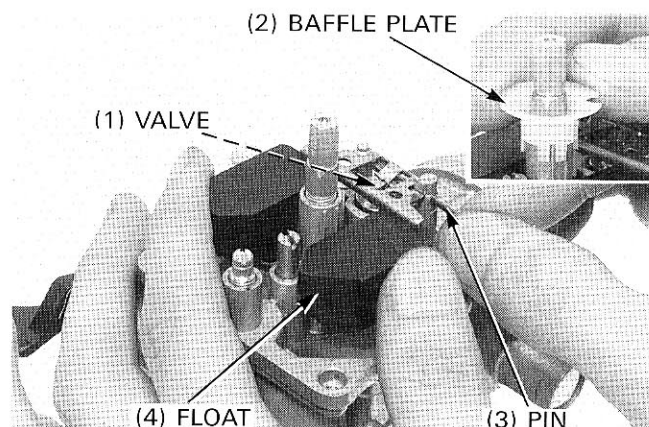
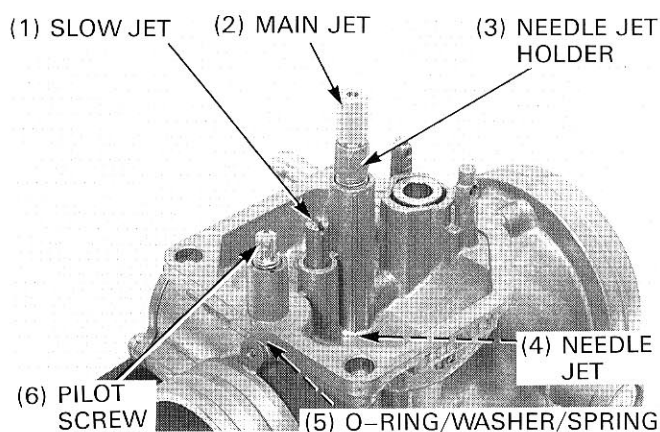
Install the following:

- slow jet
- needle jet
- needle jet holder
- main jet.

Hang the float valve onto the float arm lip.

Intall the float valve with float in the carburetor body, then install the float pin through the body and float.

Install the baffle plate aligning the its grooves with the lugs on the carburetor body as shown.



Float Level Inspection

NOTE

- Check the float level after checking the float valve, valve seat and float (page 5-4).
- Set the float level gauge so that it is perpendicular to the float chamber face and in line with the main jet.

Measure the float lever with the float level gauge.

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

TOOL:

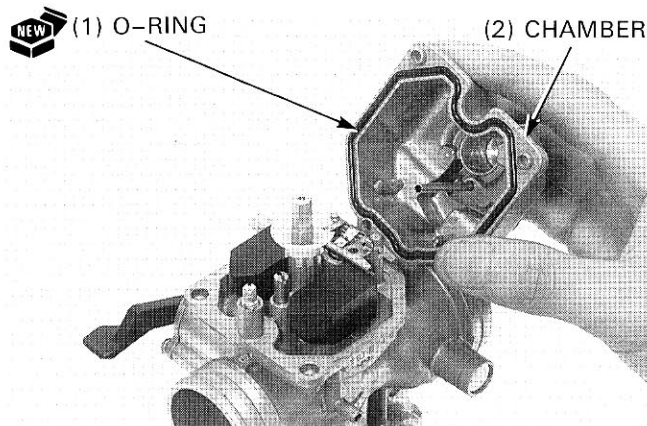
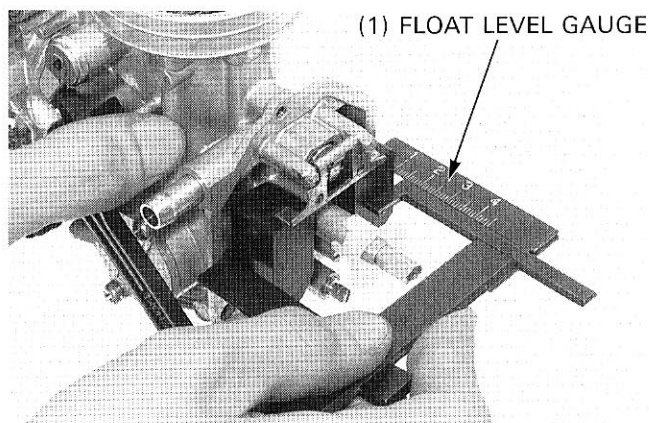
Carburetor float level gauge 07401 – 0010000

FLOAT LEVEL: 14.5 mm (0.57 in)

If the level is out of specification and the float arm lip can be bent, adjust the float level by carefully bending the lip.

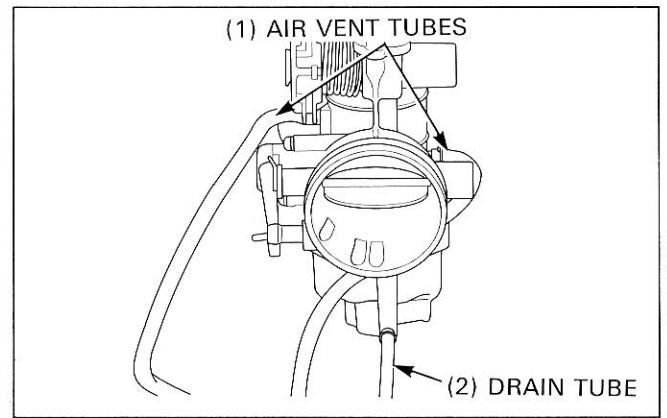
Install a new O-ring into the chamber groove.

Install the float chamber and tighten the three screws.



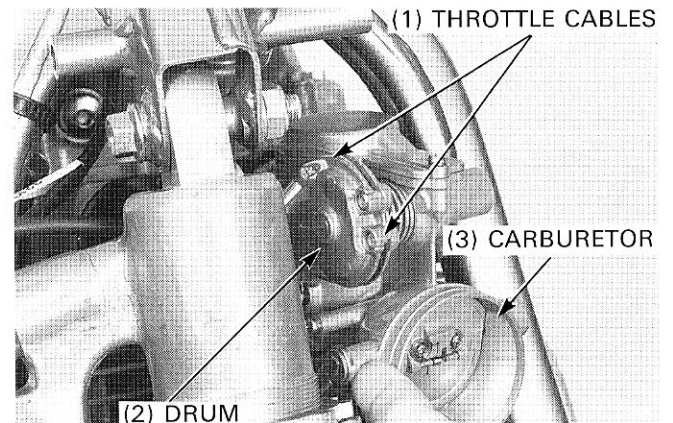
FUEL SYSTEM

Install the drain and air vent tubes to the carburetor.



CARBURETOR INSTALLATION

Connect the throttle cables onto the throttle drum.
Set the carburetor assembly into the carburetor insulator.



Set the cable holder by aligning the hole and setting pin on the carburetor body and tighten the screw.

Align the lug on the carburetor with the groove in the carburetor insulator and tighten the band screw.

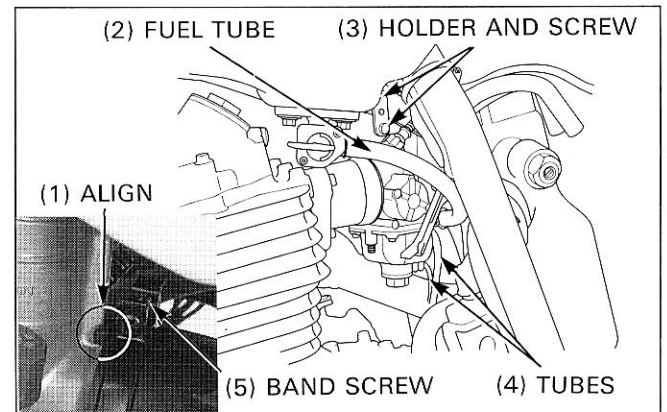
Connect the fuel tube to the carburetor.
Route the drain and air vent tubes properly and install them into the clamps (page 1-19).

After installation, turn the fuel valve ON and check for fuel leakage.
Check the throttle operation (page 3-6).

Install the following:

- sub-frame (page 2-3)
- muffler (page 2-6)
- seat (page 2-2).

Adjust the pilot screw (see next page) if it is replaced.



PILOT SCREW ADJUSTMENT

BEST IDLE PROCEDURE ('96, '97)

NOTE

- The pilot screw is factory pre-set and no adjustment is necessary unless the pilot screw is replaced.

CAUTION

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

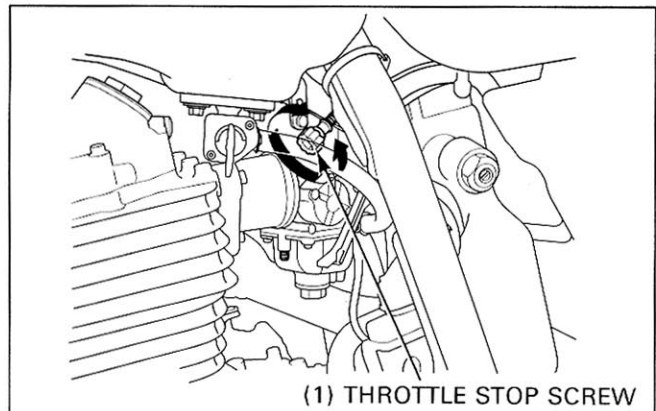
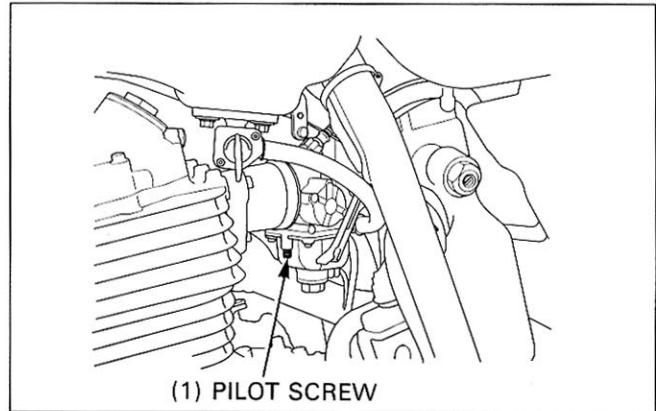
1. Turn the pilot screw clockwise until it seats lightly, then back it out to the specification given. This is an initial seating prior to the final pilot screw adjustment.

INITIAL OPENING: 2-1/4 turns out

2. Warm up the engine to operating temperature. Stop and go riding for 10 minutes is sufficient.
3. Stop the engine and connect the tachometer, following manufacturer's instructions.
4. Start the engine and adjust the idle speed to 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 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 increase smoothly.
8. Readjust the idle speed with the throttle stop screw.



FUEL SYSTEM

IDLE DROP PROCEDURE (After '97)

NOTE

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

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.

CAUTION

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

INITIAL OPENING:

Except California type: 1-1/2 turns out
California type: 1-5/8 turns out

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

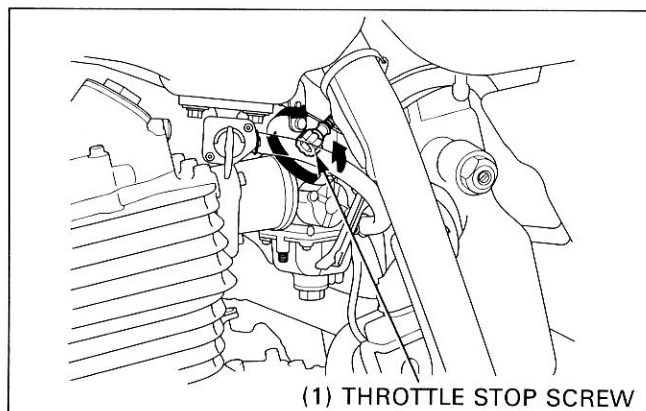
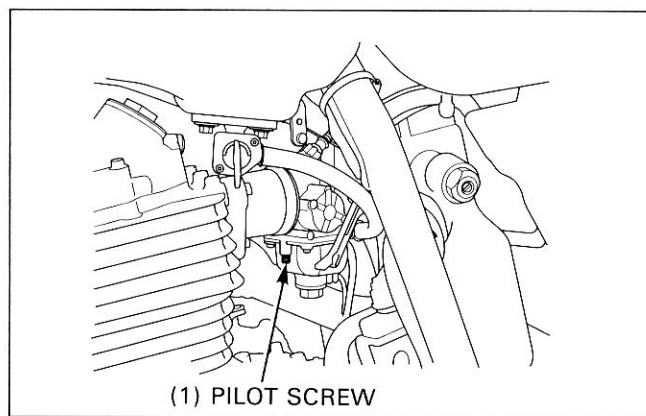
IDLE SPEED: 1,300 ± 100 rpm

5. Turn the pilot screw in or out slowly to obtain the highest engine speed.
6. Lightly open the throttle 2 – 3 times, then adjust the idle speed with the throttle stop screw.
7. Turn the pilot screw in gradually until the engine speed drops 100 rpm.
8. Turn the pilot screw counterclockwise to the final opening.

FINAL OPENING:

Except California type: 1/2 turn out
California type: 1/4 turn out

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



CARBURETOR TUNING ('96 – '97)

As delivered with the exhaust diffuser and the noise suppressor installed, motorcycle may be jetted rich for their riding needs.

The standard settings offer maximum performance for closed-course competition after removal of the exhaust diffuser and noise suppressor.

The standard settings also prevent the possibility of engine damage if the exhaust diffuser and noise suppressor are removed for closed course competition without making a jetting change.

For maximum trail riding performance with the diffuser and suppressor installed, adjust the carburetor settings as shown in the chart.

	Standard settings (as delivered)	Suggested settings for trail riding**
Pilot screw opening	2-1/4 turns out	2-1/4 ± 3/4 turns out
Slow jet	#62	#60
Needle clip position	3rd groove (from top)	2nd groove (from top)
Main jet	#162	#158
Float level	14.5 mm (0.57 in)	
Identification number	PDK1A	

**Exhaust diffuser and noise suppressor installed

Before adjusting carburetor settings, check the following:

- air cleaner (clean, properly installed?)
- air leaks (carburetor bands tight?)
- float level (is it correct?)
- main/slow jets (clean, correct type?)
- spark plug (fouling, improper heat range)
- fuel (fresh, or contaminated)
- modifications (aftermarket pipe, air filter)

Correct any of the above, if necessary, prior to making jetting changes.

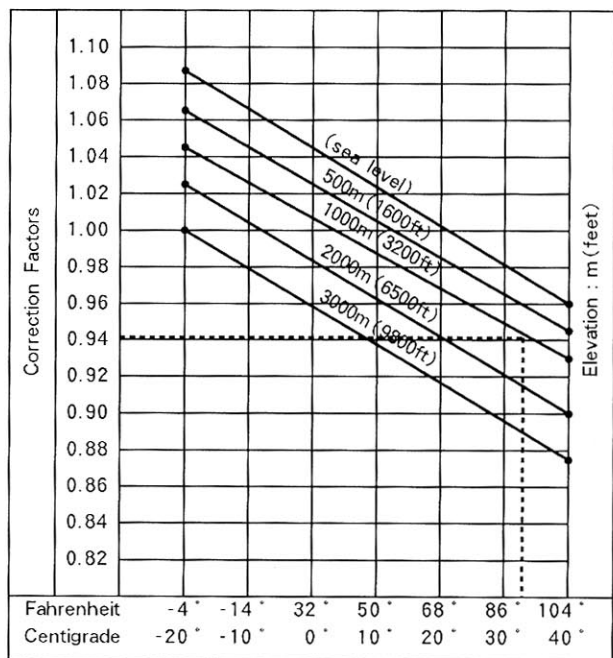
ADJUSTMENT FOR ALTITUDE AND TEMPERATURE

Use the correction factor chart(s) to determine if carburetor adjustments are needed because of changes in temperature and/or altitude.

NOTE

- With the trail riding settings (noise suppressor and exhaust diffuser installed), carburetion is more sensitive to altitude and temperature changes. The correction factor charts are for both the main jet and slow jet. Also note the range for possible fine tuning of the pilot screw opening (± 3/4 turn).

MAIN JET CORRECTION FACTORS
Standard Settings (as delivered)



- If the correction factor is 0.95 or below, turn the pilot screw in 1/4 turn.

FUEL SYSTEM

HOW TO USE THE CORRECTION FACTOR CHARTS

- Plot a straight line up from the temperature to the diagonal line of the altitude. (For example, see the standard settings.)
- At the intersection of these two lines, plot a horizontal line to the left edge of the chart. Determine the closest correction factor.
- Multiply the correction factor by the jet size. Round the resulting number up or down to the nearest jet size. (Honda main jet and slow jet sizes are numbered in increments of 2 or 3.)

JETTING ADJUSTMENT EXAMPLES

At a temperature of 35°C (95°F) and an altitude of 1,000 m (3,280 feet), the recommended carburetion is:

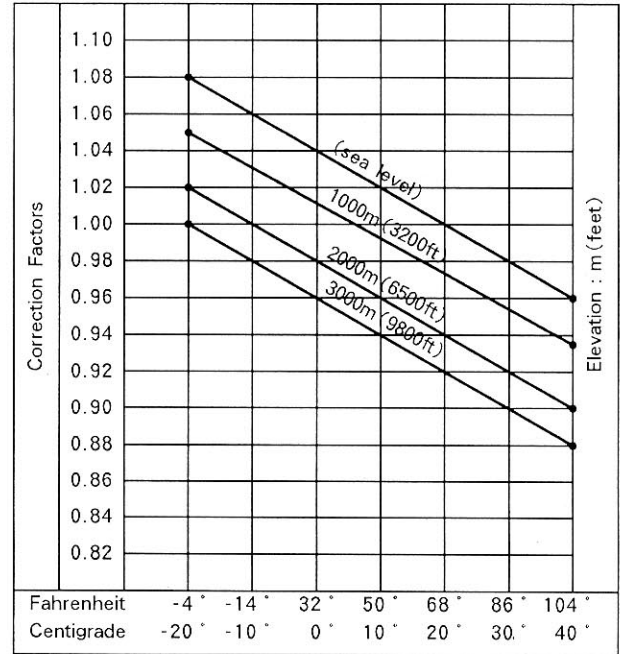
- **Standard settings as delivered**
Main jet: $162 \times 0.94 = 152.28 = \#152$
Pilot screw opening: $2\text{-}1/4 - 1/4 = 2$ turns out
- **Trail riding, suppressor and diffuser installed**
Main jet: $158 \times 0.94 = 148.52 = \#148$
Slow jet: $60 \times 0.89 = 53.40 = \#52$ or $\#55$
Pilot screw opening: $2\text{-}1/4 \pm 3/4$ turns out

NOTE

- There may be some unique atmospheric conditions or situations that may require additional adjustments.

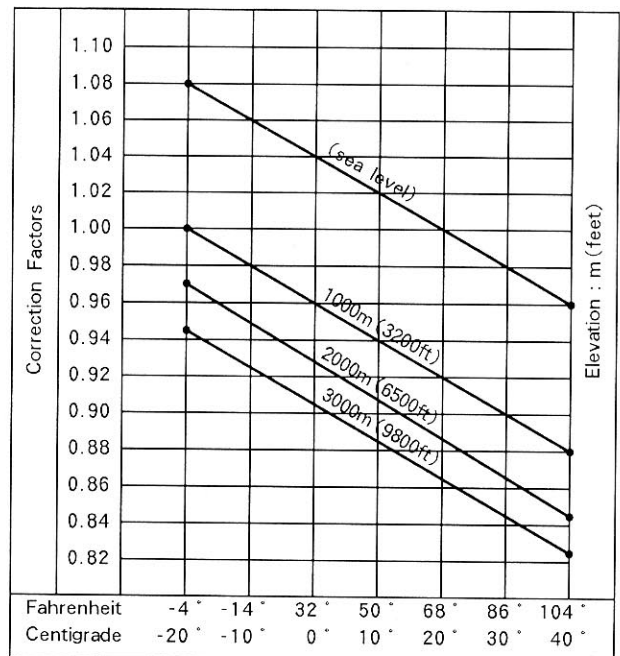
MAIN JET CORRECTION FACTORS

Trail Riding Settings (noise suppressor and exhaust diffuser installed)



SLOW JET CORRECTION FACTORS

Trail Riding Settings (noise suppressor and exhaust diffuser installed)



TEMPERATURE AND ALTITUDE ADJUSTMENT (AFTER '97)

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, turn in the pilot screw 1/4 turn.

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

For example:

At a temperature of 35°C (95°F) and an altitude of 1,000 m (3,280 ft), carburetor recommendations are as follows:

- **Main jet**
 $142 \times 0.94 = \#132 \text{ or } \#135$
- **Pilot screw opening**
 $1\text{-}1/2 \text{ minus } 1/4 = 1\text{-}1/4 \text{ turns out}$

STANDARD CARBURETOR SETTING:

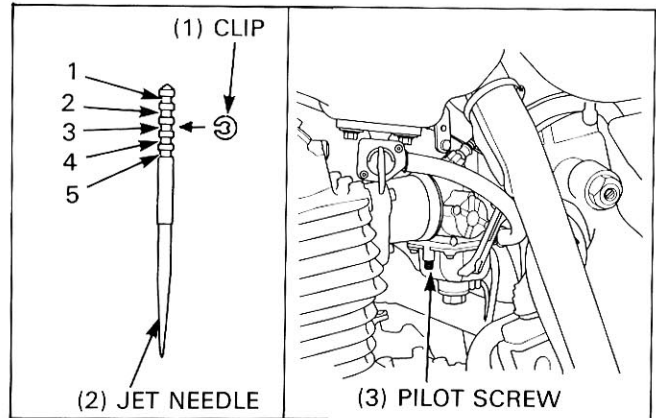
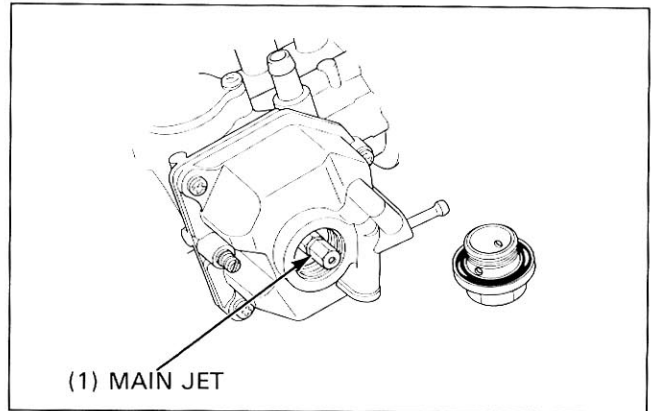
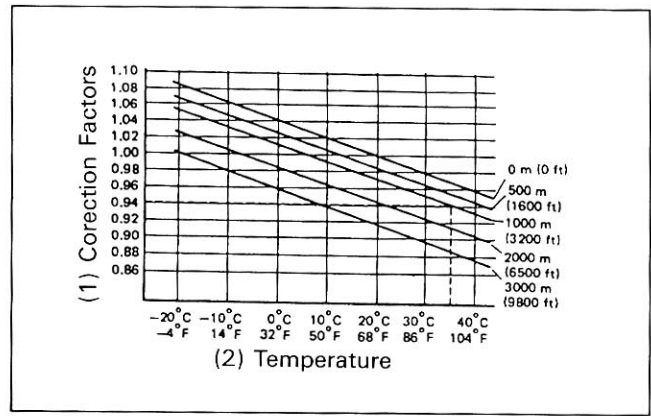
Main jet: #142

Pilot screw opening:

Except California type: 1-1/2 turns out

California type: 1-5/8 turns out

Jet needle clip position: 3rd groove from top



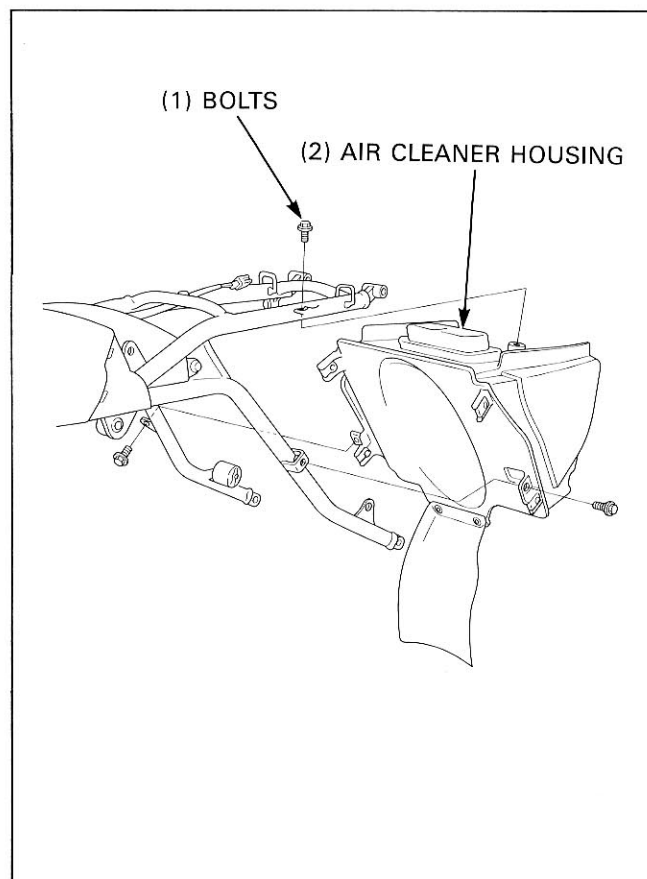
AIR CLEANER HOUSING

REMOVAL/INSTALLATION

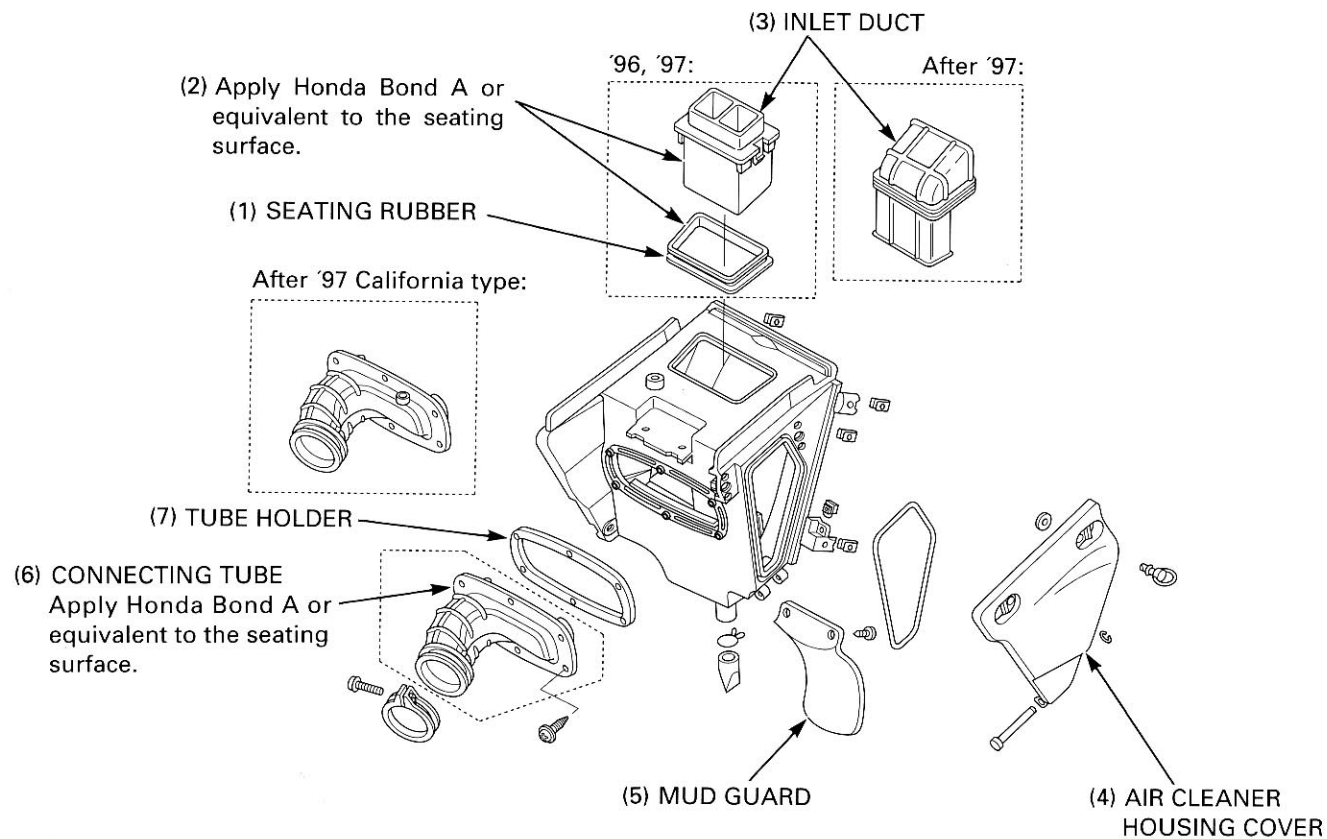
Remove the sub-frame and side covers (page 2-3).
Remove the air cleaner (page 3-7).

Remove the three bolts and the air cleaner housing.

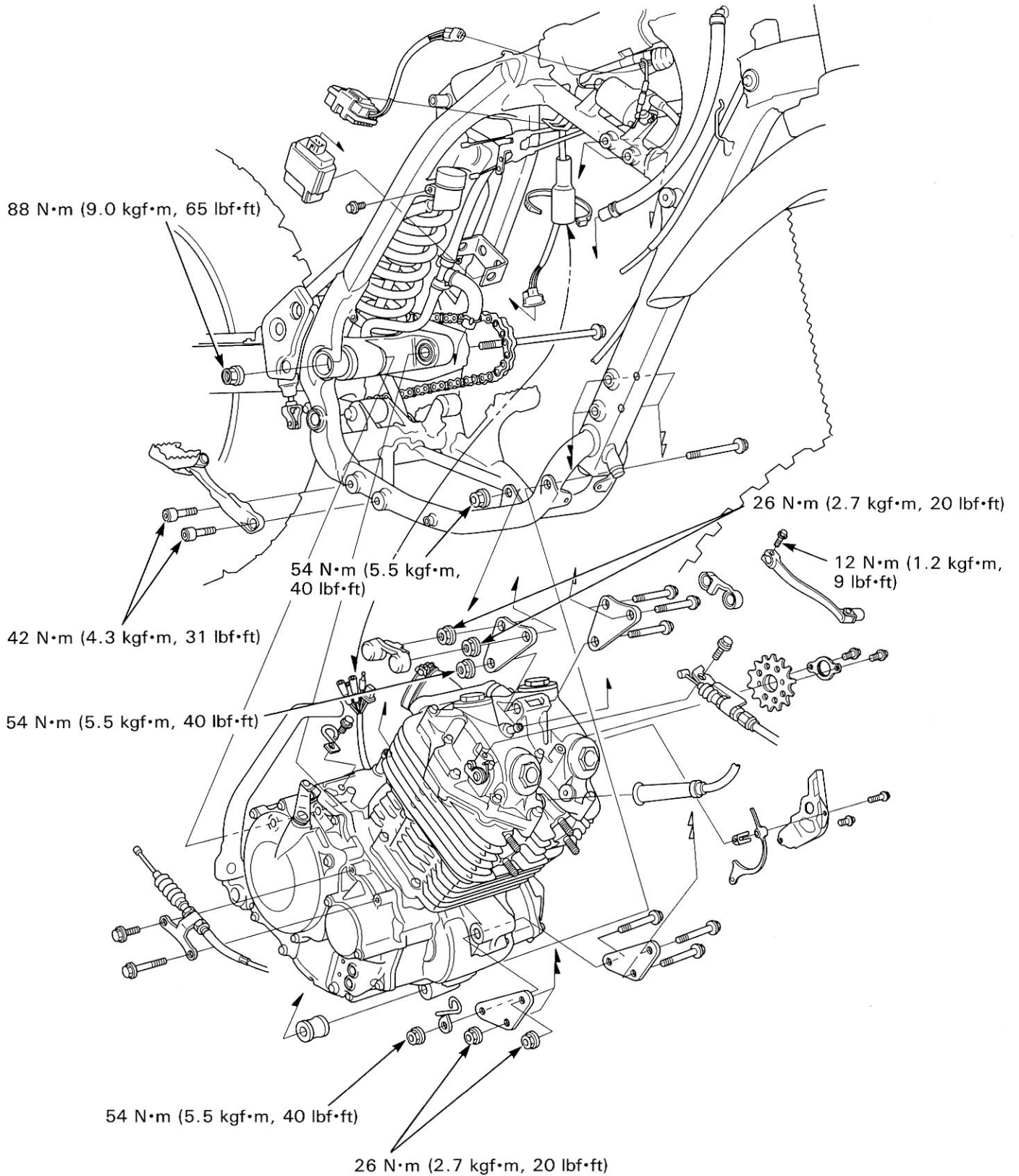
Installation is in the reverse order of removal.



DISASSEMBLY/ASSEMBLY



ENGINE REMOVAL/INSTALLATION



6. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION

6-1

ENGINE INSTALLATION

6-4

ENGINE REMOVAL

6-2

SERVICE INFORMATION

GENERAL

- When removing and installing the engine, tape the frame around the engine beforehand for frame protection.
- The following components require engine removal for service.
 - Transmission/shift fork/shift drum (Section 11)
 - Crankshaft/balancer (Section 12)

Other components without above can be serviced with engine in the frame.

SPECIFICATIONS

ITEM	SPECIFICATION
Engine dry weight	38.5 kg (85 lbs)
Engine oil capacity at disassemble	2.2 ℓ (2.3 US qt, 1.9 Imp qt)

TORQUE VALUES

Right footpeg bolt	42 N·m (4.3 kgf·m, 31 lbf·ft)
Gearshift pedal pinch bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Upper engine hanger nut (engine)	54 N·m (5.5 kgf·m, 40 lbf·ft)
(frame)	26 N·m (2.7 kgf·m, 20 lbf·ft)
Front engine hanger nut (engine)	54 N·m (5.5 kgf·m, 40 lbf·ft)
(frame)	26 N·m (2.7 kgf·m, 20 lbf·ft)
Lower engine mounting nut	54 N·m (5.5 kgf·m, 40 lbf·ft)
Swingarm pivot nut	88 N·m (9.0 kgf·m, 65 lbf·ft)

ENGINE REMOVAL

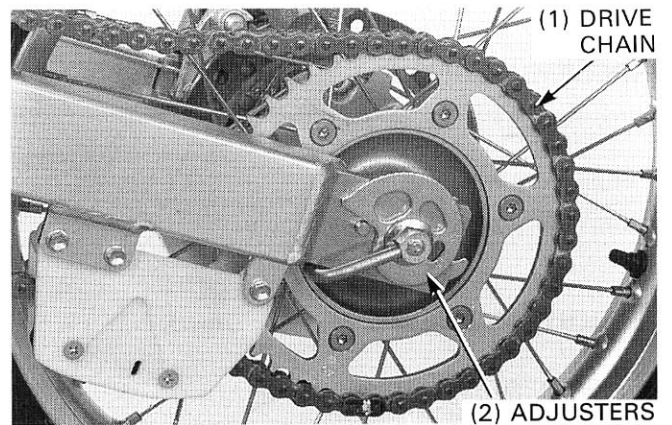
Drain the engine oil (page 3-12).

Remove the following:

- fuel tank (page 2-2)
- carburetor (page 5-3)
- exhaust pipe (page 2-6)
- oil pipes [oil pump outlet pipe/oil pump inlet pipe] (page 4-7)
- under guard (page 2-5)
- rear brake pedal (page 15-18).

Raise the rear wheel off the ground by supporting the frame securely.

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

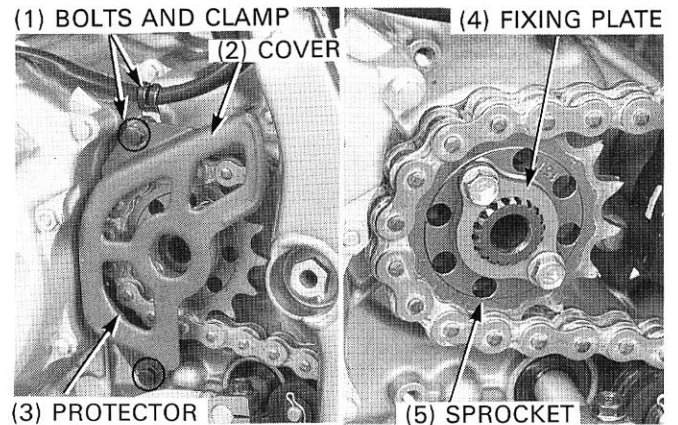


Remove the two bolts and remove the drive sprocket cover, sprocket protector and clamp.

Remove the two fixing plate bolts.

Remove the fixing plate by aligning the splines of the plate and countershaft.

Pull out the drive sprocket off the countershaft and remove the drive sprocket from the chain.



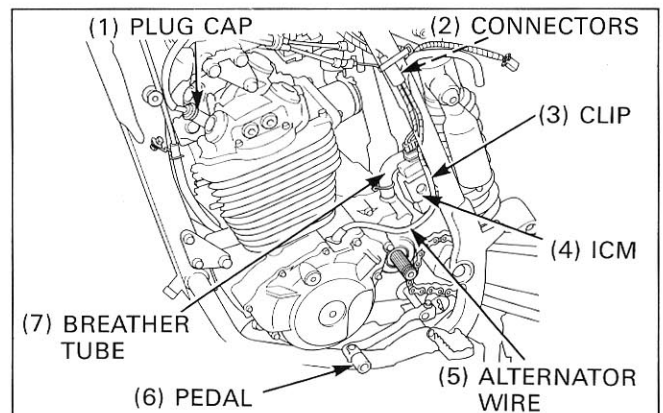
Disconnect the spark plug cap.

Disconnect the crankcase breather tube from the engine.

Release the wire clip from the frame with a flat blade screw driver and disconnect the alternator connectors.

Remove the ignition control module (ICM) from the frame .

Remove the gearshift pedal.



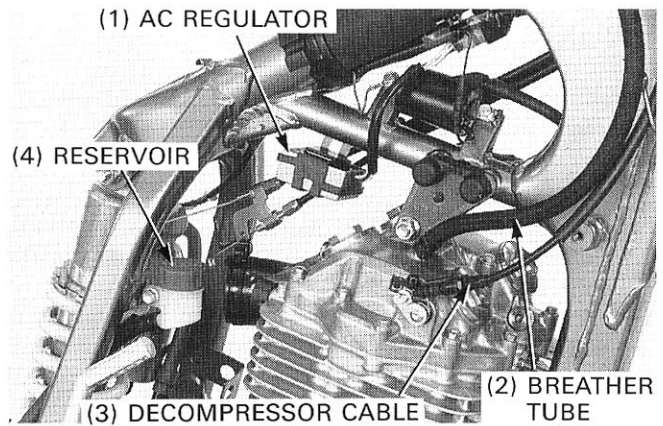
ENGINE REMOVAL/INSTALLATION

Disconnect the 4P connector and remove the AC regulator from the frame.

Disconnect the cylinder head breather tube from the engine.

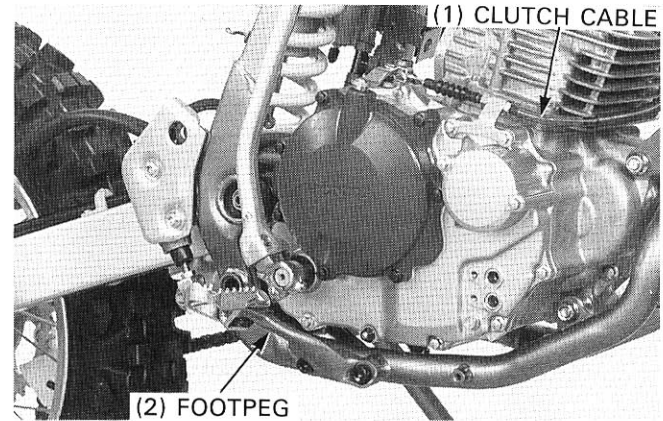
Loosen the decompressor cable lock nuts, remove the cable holder and disconnect the decompressor cable from the valve lifter arm.

Remove the bolt and the rear brake master cylinder reservoir. Always hold the reservoir level.



Loosen the clutch cable lock nuts, remove the cable holder and disconnect the clutch cable from the clutch arm.

Remove the two bolts and right footpeg.



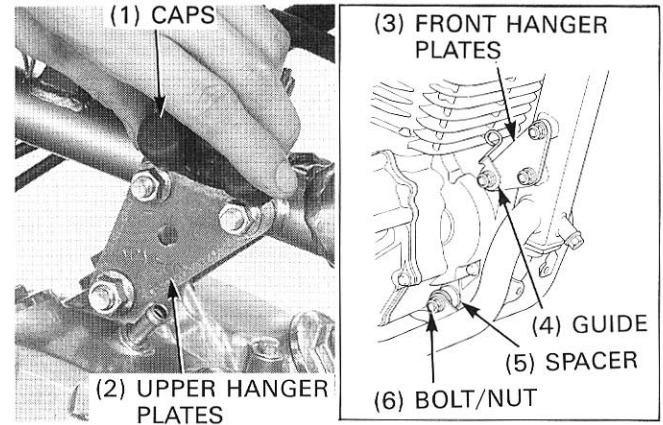
Support the engine with a floor jack or other adjustable support.

Remove the rubber caps.

Remove the upper mounting nuts, bolts and hanger plates.

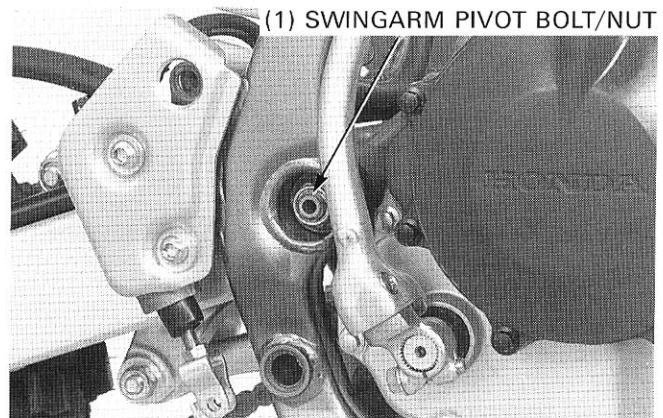
Remove the front mounting nuts, cable guide, bolts and hanger plates.

Remove the lower mounting nuts, spacer and bolt.



Remove the swingarm pivot nut and bolt.

Support the frame securely and remove the engine out of the frame to the right.



ENGINE INSTALLATION

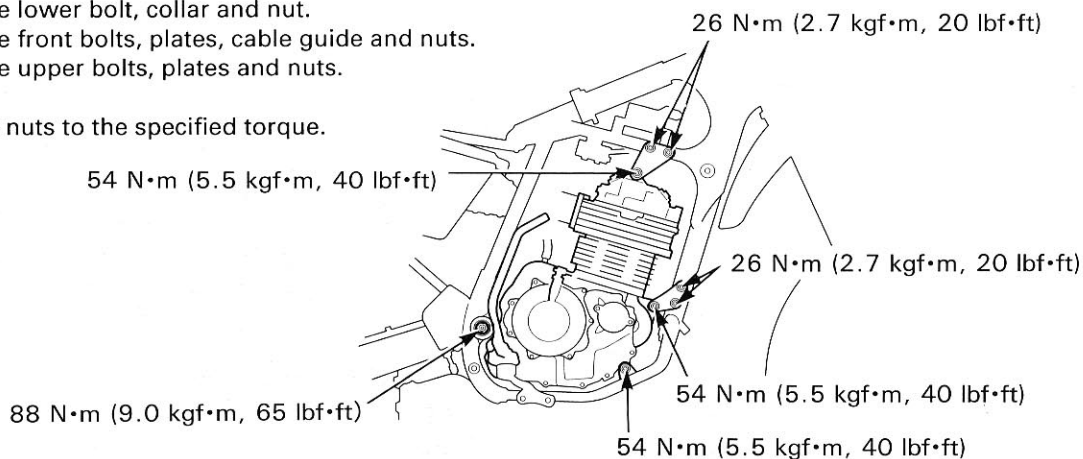
Install the engine into the frame from the right side in the reverse order of removal.

NOTE

- Note the installation direction of the engine mounting bolts and swingarm pivot bolt. All bolts are installed from left side of the frame.
When inserting the lower mounting bolt, install the spacer to the right side of the engine.

- Install the swing arm pivot and nut.
- Install the lower bolt, collar and nut.
- Install the front bolts, plates, cable guide and nuts.
- Install the upper bolts, plates and nuts.

Tighten the nuts to the specified torque.



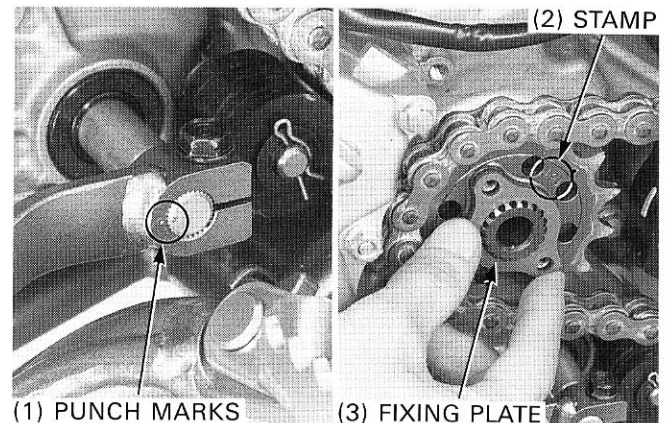
Install the removed parts on engine removal in the reverse order of removal.

TORQUE:

- Gearshift pedal pinch bolt: 12 N·m (1.2 kgf·m, 9 lbf·ft)**
- Right footpeg bolt: 42 N·m (4.3 kgf·m, 31 lbf·ft)**

NOTE

- When installing the gearshift pedal, align the punch marks on the pedal and spindle.
- When installing the drive sprocket, install with the stamp facing out. Set the fixing plate into the countershaft groove and move it to align the bolt holes in the plate and sprocket then tighten the bolts.
- Route the wires, cables and tubes properly (page 1-19).



Install the following:

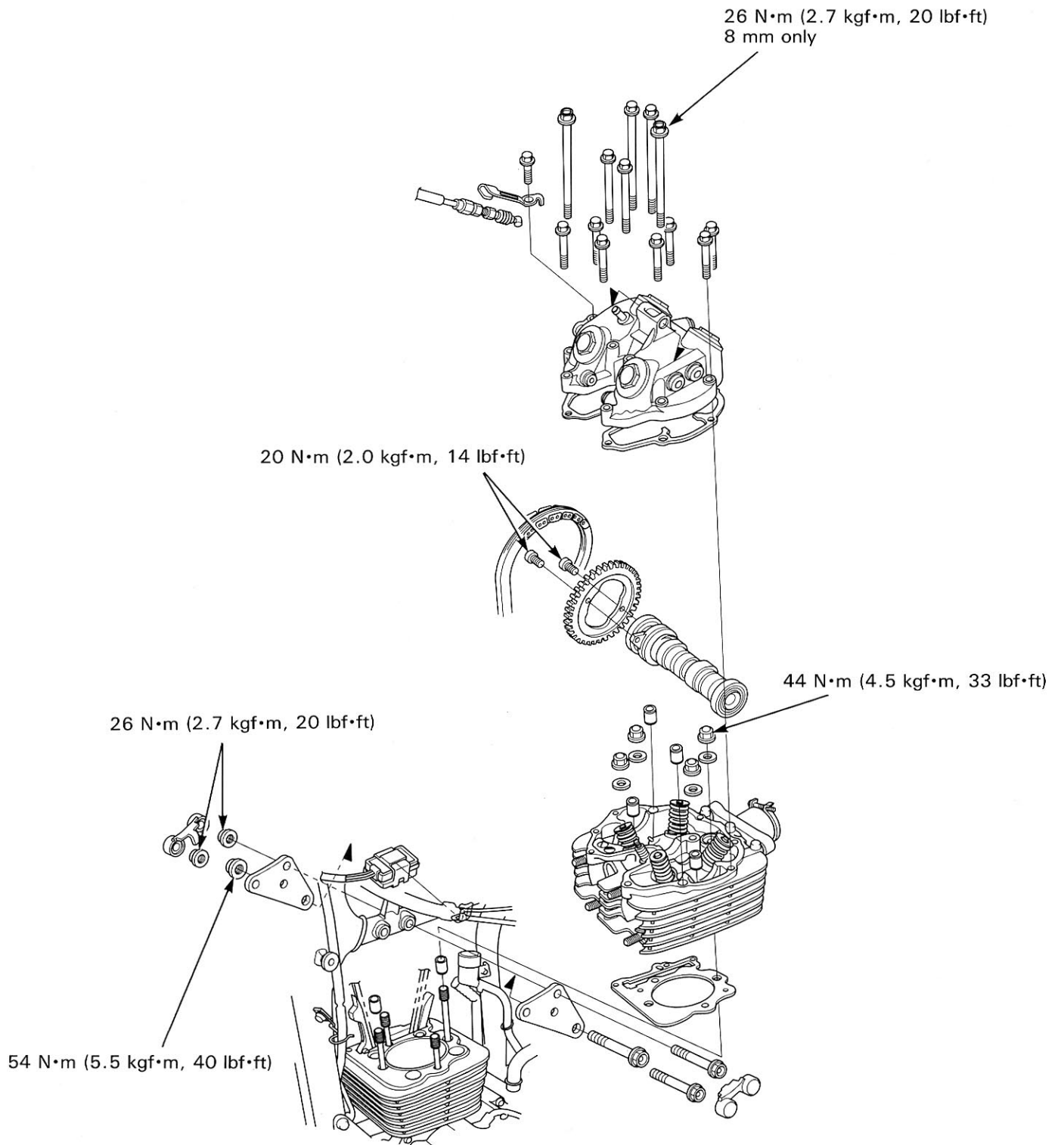
- rear brake pedal (page 15-18)
- under guard (page 2-5)
- oil pipes (page 4-7)
- exhaust pipe (page 2-6)
- fuel tank (page 2-2)
- carburetor (page 5-10)

After installation, perform the following adjustments:

- drive chain (page 3-15)
- clutch cable (page 3-21)
- decompressor cable (page 3-14)
- throttle cable (page 3-6)

Fill with recommended engine oil (page 3-13)

CYLINDER HEAD/VALVE



7. CYLINDER HEAD/VALVE

SERVICE INFORMATION	7-1	VALVE GUIDE REPLACEMENT	7-14
TROUBLESHOOTING	7-3	VALVE SEAT INSPECTION/ REFACING	7-15
CYLINDER COMPRESSION	7-4	CYLINDER HEAD ASSEMBLY	7-18
CYLINDER HEAD COVER REMOVAL	7-5	CYLINDER HEAD INSTALLATION	7-19
CAMSHAFT REMOVAL	7-6	CAMSHAFT INSTALLATION	7-20
CYLINDER HEAD COVER DISASSEMBLY	7-9	CYLINDER HEAD COVER ASSEMBLY	7-22
CYLINDER HEAD REMOVAL	7-10	CYLINDER HEAD COVER INSTALLATION	7-24
CYLINDER HEAD DISASSEMBLY	7-11		

SERVICE INFORMATION

GENERAL

- This section covers service of the cylinder head, valves, camshafts and rocker arms. These parts can be serviced with the engine in the frame.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.
- Camshaft and rocker arm lubricating oil is fed through oil passages in the cylinder head and head cover. Clean the oil passages before assembling cylinder head and head cover.
- Pour clean engine oil into the oil pockets in the cylinder head during assembly to lubricate the camshaft.
- Be careful not to damage the mating surfaces by using the screw driver when removing the head cover and cylinder head. Do not strike the head cover and cylinder head too hard during removal.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			686 - 980 kPa (7.0 - 10.0 kgf/cm ² , 100 - 142 psi)/450 rpm	—
Cylinder head	Warpage		—	0.10 (0.004)
Camshaft	Cam lobe height	IN	30.925 - 31.025 (1.2175 - 1.2215)	30.82 (1.213)
		EX	30.827 - 30.927 (1.2137 - 1.2176)	30.72 (1.209)
	Runout		—	0.03 (0.001)
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 (0.4514 - 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)	—

CYLINDER HEAD/VALVE

Unit: mm (in)

(cont'd)			STANDARD	SERVICE LIMIT
ITEM				
Valve and valve guide	Valve clearance	IN	0.10 ± 0.02 (0.004 ± 0.0008)	—
		EX	0.12 ± 0.02 (0.005 ± 0.0008)	—
	Valve stem O.D.	IN	5.475 – 5.490 (0.2156 – 0.2161)	5.46 (0.215)
		EX	5.455 – 5.470 (0.2148 – 0.2154)	5.44 (0.214)
	Valve guide I.D.	IN/EX	5.500 – 5.512 (0.2165 – 0.2170)	5.52 (0.217)
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)	0.12 (0.005)
		EX	0.030 – 0.057 (0.0012 – 0.0022)	0.14 (0.006)
Valve seat width	IN/EX	1.0 – 1.1 (0.039 – 0.043)	2.0 (0.08)	
Valve spring	Free length	Inner	IN/EX	37.19 (1.464)
		Outer	IN/EX	44.20 (1.740)

TORQUE VALUES

Upper engine hanger bracket nut (10 mm)	54 N·m (5.5 kgf·m, 40 lbf·ft)
(8 mm)	26 N·m (2.7 kgf·m, 20 lbf·ft)
Spark plug	18 N·m (1.8 kgf·m, 13 lbf·ft)
Valve hole cap	15 N·m (1.5 kgf·m, 11 lbf·ft)
Timing hole cap	10 N·m (1.0 kgf·m, 7 lbf·ft)
Crankshaft hole cap	8 N·m (0.8 kgf·m, 5.8 lbf·ft)
Valve adjusting lock nut	24 N·m (2.4 kgf·m, 17 lbf·ft)
Head cove bolt (8 mm)	26 N·m (2.7 kgf·m, 20 lbf·ft)
Rocker arm shaft	27 N·m (2.8 kgf·m, 20 lbf·ft) Apply locking agent to the threads.
Intake sub-rocker arm shaft	27 N·m (2.8 kgf·m, 20 lbf·ft) Apply locking agent to the threads.
Exhaust sub-rocker arm shaft	27 N·m (2.8 kgf·m, 20 lbf·ft) Apply locking agent to the threads.
Cam sprocket bolt	20 N·m (2.0 kgf·m, 14 lbf·ft) Apply locking agent to the threads.
Cam chain tensioner plug	4 N·m (0.4 kgf·m, 2.9 lbf·ft)
Cylinder head nut	44 N·m (4.5 kgf·m, 33 lbf·ft) Apply oil to the threads and seating surfaces.

TOOLS

Valve spring compressor	07757 – 0010000
Valve guide driver, 5.5 mm	07742 – 0010100
Valve guide reamer, 5.5 mm	07984 – 2000001 or 07984 – 200000D
Valve seat cutter holder, 5.5 mm	07781 – 0010101
Valve seat cutter, 35 mm (32° IN)	07780 – 0012300
30 mm (32° EX)	07780 – 0012200
30 mm (60° IN/EX)	07780 – 0014000
35 mm (45° IN)	07780 – 0010400
29 mm (45° EX)	07780 – 0010300
Compression gauge attachment	07908 – KK60000

or equivalent commercially available in U.S.A.

TROUBLESHOOTING

- Engine top-end problems usually affect engine performance. These can be diagnosed by a compression test (page 7-4), or by tracing top-end noise with a sounding rod or stethoscope.
- If the performance is poor at low speeds, check for a white smoke in the crankcase breather tube. If the tube is smokey, check for sized piston ring (section 8).

Compression too low, Hard starting or Poor performance at low speed

- Valves
 - Incorrect valve adjustment
 - Burned or bent valves
 - Incorrect valve timing
 - Broken valve springs
 - Uneven valve seating
 - Valve stuck open
- Cylinder head
 - Leaking or damaged cylinder head gasket
 - Warped or cracked cylinder head
 - Loose spark plug
- Decompressor system
 - Decompressor out of adjustment

Compression too high

- Excessive carbon built-up on piston or combustion chamber.

Excessive smoke

- Worn valve stem or valve guide
- Damaged stem seal

Excessive noise

- Valves
 - Incorrect valve adjustment
 - Sticking valve or broken valve spring
 - Excessive worn valve seat
- Cylinder head
 - Worn or damaged camshaft
 - Worn or damaged rocker arm and/or shaft
 - Worn rocker arm follower or valve stem end
 - Worn or damaged cam sprocket teeth
 - Loose or worn cam chain
 - Worn or damaged cam chain tensioner

Rough idle

- Low cylinder compression
- Incorrect decompressor adjustment

CYLINDER COMPRESSION

Warm up the engine to normal operation temperature.

Stop the engine, disconnect the spark plug cap and remove the spark plug.

Connect the compression gauge with the gauge attachment.

TOOL:

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

Shift the transmission in neutral and open the choke lever (OFF).

Open the throttle all the way and operate the kickstarter 5–6 time.

Check the gauge reading.

COMPRESSION PRESSURE:

686 – 980 kPa (7.0 – 10.0 kgf/cm², 100 – 142 psi)

NOTE

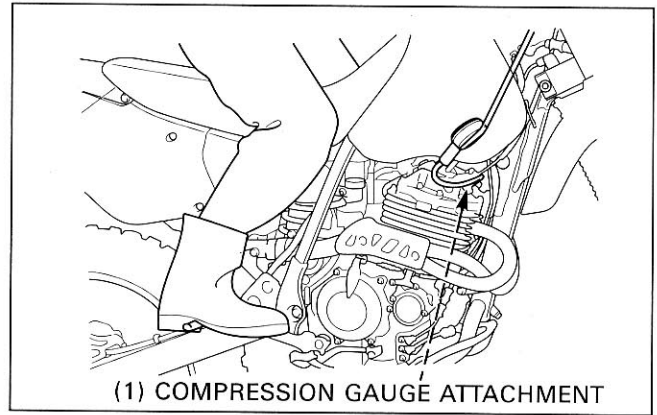
- Check that there is no leakage at the gauge connection.

If compression is high, it indicates that carbon deposits have accumulated on the combustion chamber and/or the piston crown.

If compression is low, pour 3 – 5 cc (0.1 – 0,2 oz) of clean engine oil into the cylinder through the spark plug hole and recheck the compression.

If compression increases from the previous value, check the cylinder, piston and piston ring (section 8).

If compression is the same as the previous value, check the valves, cylinder head or decompressor etc. (page 7-3).



CYLINDER HEAD COVER REMOVAL

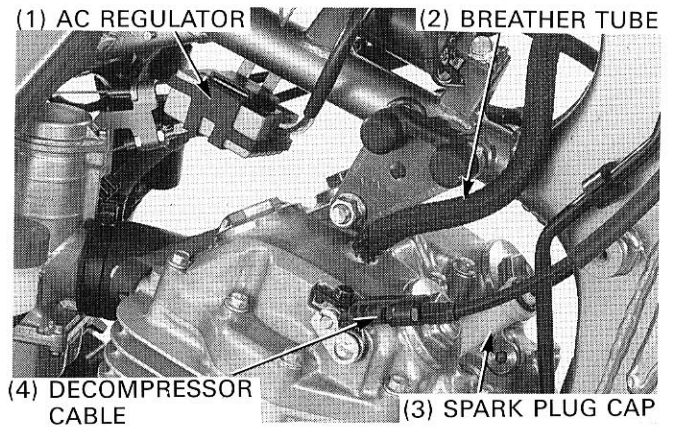
Remove the fuel tank (page 2-2).

Remove the spark plug cap.

Remove the AC regulator from the frame.

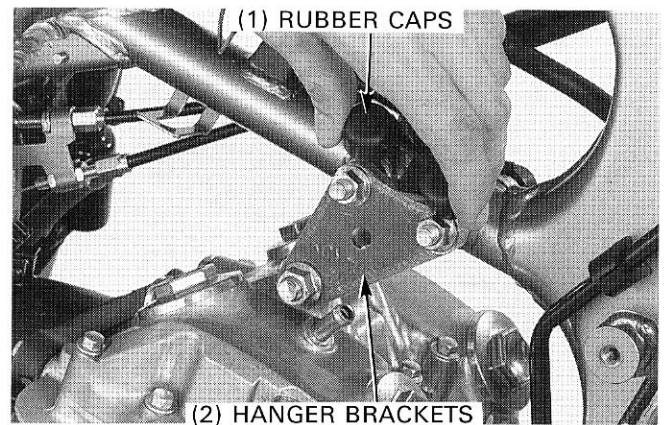
Disconnect the breather tube from the head cover.

Loosen the decompressor cable lock nuts, remove the cable holder bolt and disconnect the cable from the valve lifter arm.



Remove the rubber caps.

Remove the three bolts, nuts and hanger brackets.



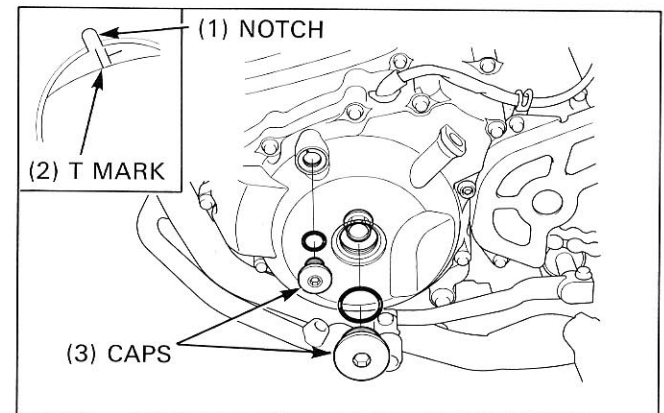
CAUTION

- *The crankshaft should be turned only counterclockwise. This must be done to prevent the one-way decompressor system functioning.*

Remove the timing hole and crankshaft hole caps.

Rotate the crankshaft counterclockwise to align the T mark on the flywheel with the index notch in the crankcase cover. Remove the valve hole cap. Make sure the piston is at TDC (Top Dead Center) on the compression stroke.

This position can be obtained by confirming that there is slack in the rocker arm. If there is no slack, it is because the piston is moving through the exhaust stroke to TDC. Rotate the crankshaft one full turn counterclockwise and match up the T mark again.

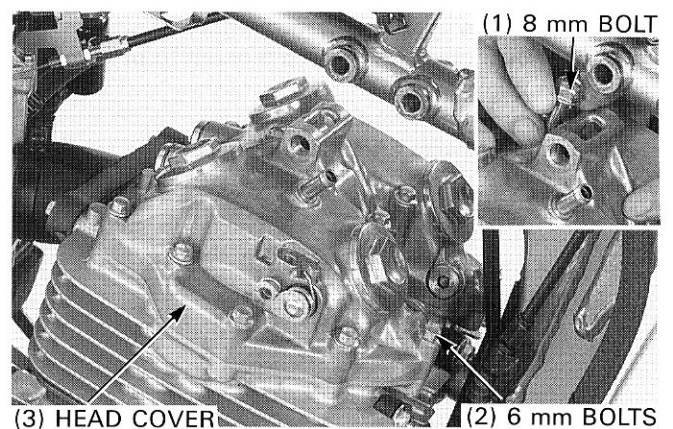


Loosen the 6 mm bolts and 8 mm bolt.

Remove the all bolts except the 8 mm bolt.

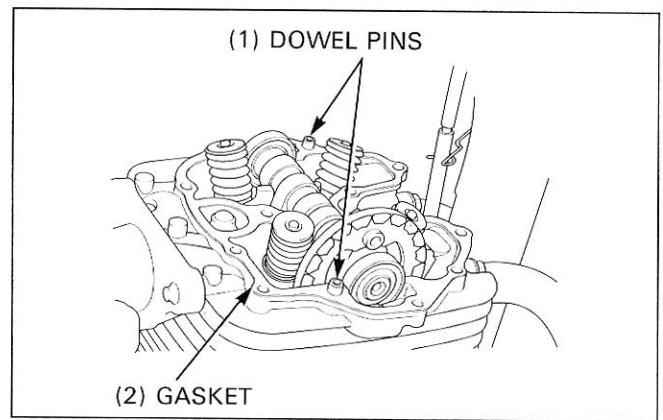
Remove the cylinder head cover to the right side while lifting the 8 mm bolt gently, being careful not to drop the dowel pins into the cylinder.

Do not strike the head cover too hard and do not damage the mating surface by using a screw driver when removing it.



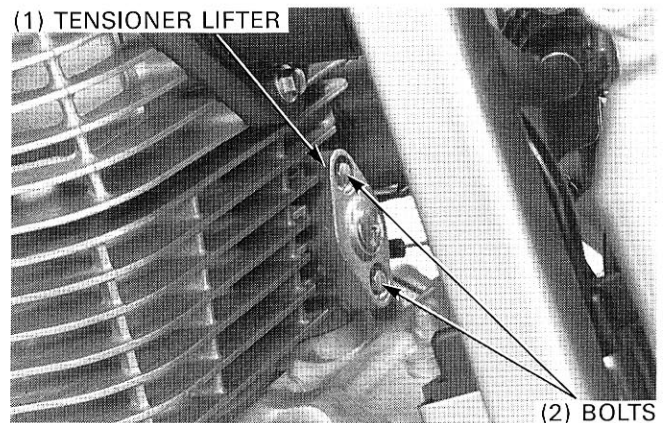
CYLINDER HEAD/VALVE

Remove the gasket and dowel pins.



CAMSHAFT REMOVAL

Remove the cam chain tensioner lifter with the gasket by loosening the two bolts alternately.

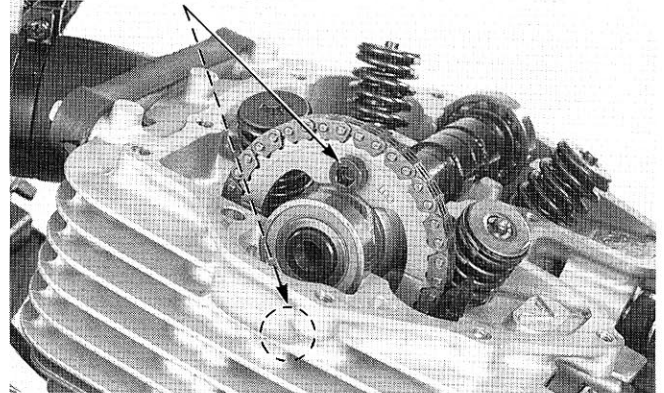


NOTE

- Be careful not to let the sprocket bolts fall into the crankcase.

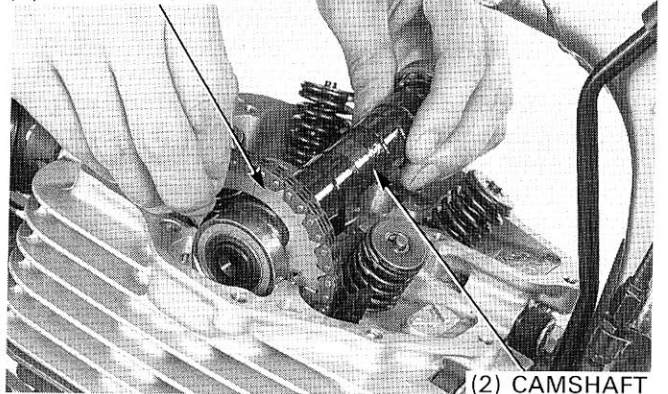
Remove a cam sprocket bolt.
Rotate the crankshaft counterclockwise one turn and remove the other sprocket bolt.

(1) SPROCKET BOLTS

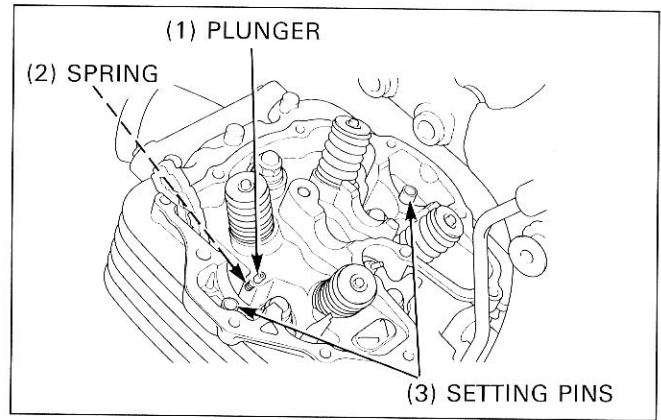


Remove the cam sprocket off the camshaft flange.
Attach a piece of wire to the cam chain to prevent it from falling into the crankcase.
Lift the camshaft and remove it.
Remove the sprocket from the cam chain.

(1) CAM SPROCKET



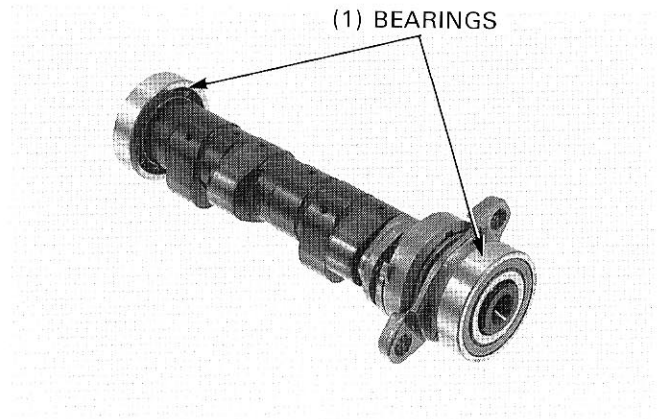
Remove the plunger, spring and bearing setting pins, being careful not to drop them into the crankcase.



INSPECTION

Camshaft Bearing

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

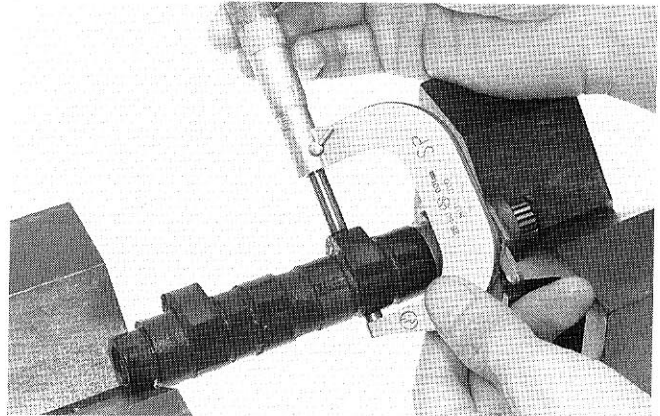


Cam Lobe Height

Measure the height of each cam lobe.

SERVICE LIMIT: IN: 30.82 mm (1.213 in)
EX: 30.72 mm (1.209 in)

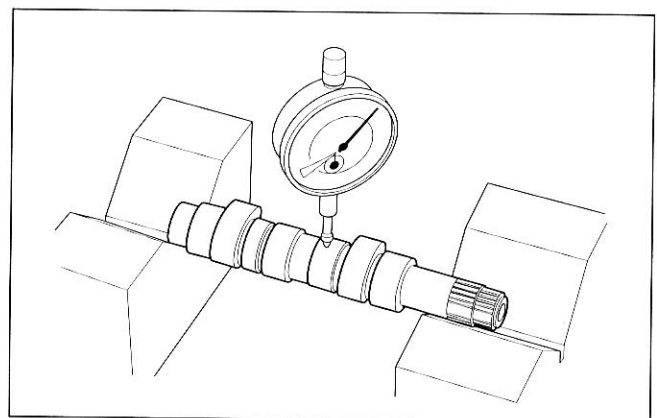
If the cam lobe is damaged or excessively worn, inspect the oil passages and rocker arms for wear or damage.



Camshaft Runout

Remove the decompressor system (see following page). Support both ends of the camshaft with V-blocks and check the camshaft runout with a dial indicator.

SERVICE LIMIT: 0.03 mm (0.001 in)



DECOMPRESSOR SYSTEM DISASSEMBLY

Set the camshaft assembly onto the hydraulic press by supporting the reverse decompressor cam flange.

CAUTION

- The sprocket flange must not be supported. It will cause break or crack to its flange portion.
- When setting the camshaft assembly, take care not to contact the support blocks against the cam lobe or decompressor cam to avoid damaging them when pressing.

Press the camshaft out of the sprocket flange.

Remove the following:

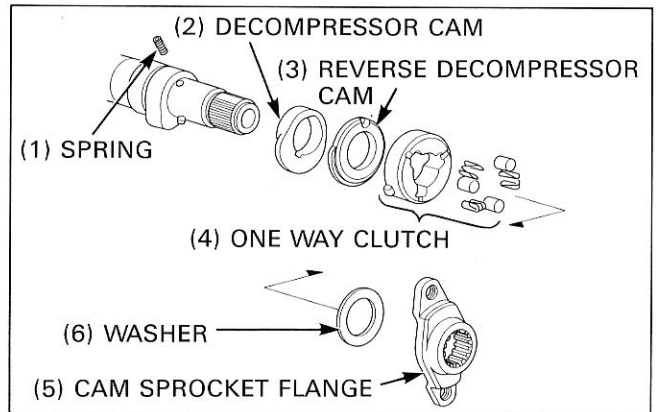
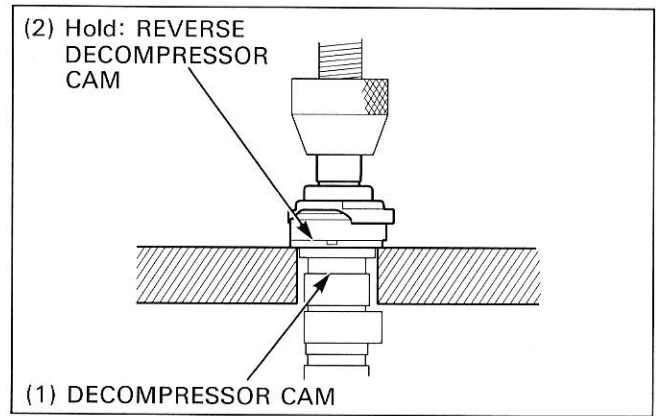
- thrust washer
- one way clutch (clutch outer, rollers and springs)
- reverse decompressor cam
- stopper pin
- decompressor cam
- spring

Inspection

Check the one way clutch outer, rollers and springs for wear or damage.

Check both cams for wear or damage.

Inspect the cam's sliding surface on the camshaft for scoring or wear.

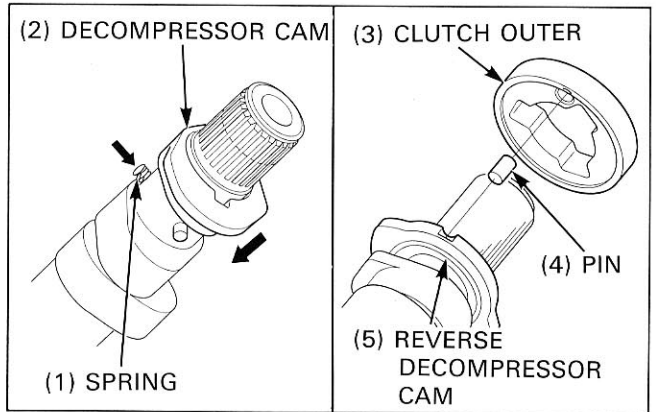


DECOMPRESSOR SYSTEM ASSEMBLY

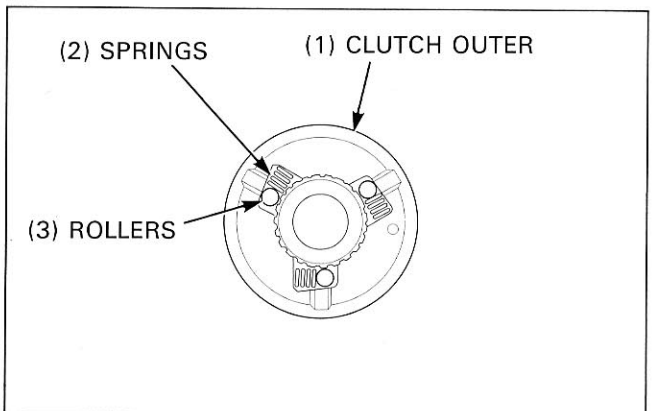
Lubricate the cams, one way clutch and washer.

Install the spring into camshaft hole, then install the decompressor cam while holding the spring.

Assemble the reverse decompressor cam and clutch outer with the stopper pin and install the assembly over the camshaft.



Install the rollers and springs into the clutch outer grooves as shown.

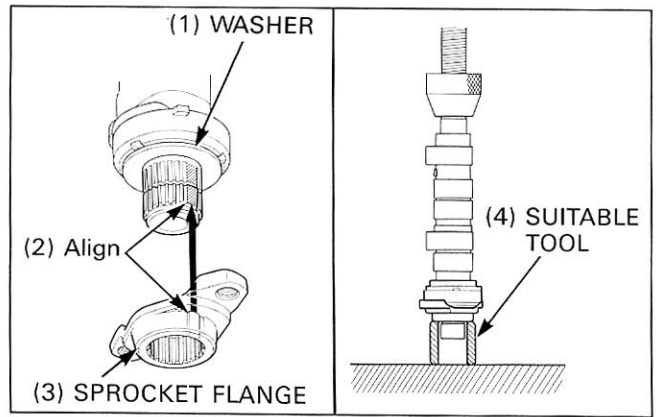


Install the thrust washer onto clutch outer.

Use a suitable tool (collar: more than 19 mm I.D.). Press the sprocket flange onto the camshaft using a suitable tool by aligning the wide groove with the wide teeth.

CAUTION

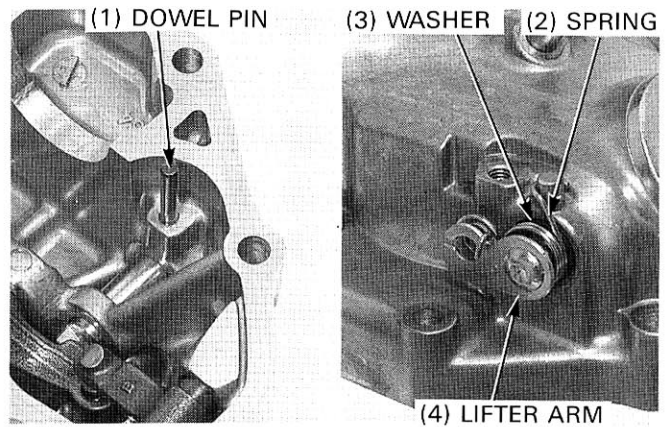
- *The sprocket flange must not be supported. It will cause break or crack to its flange portion.*



CYLINDER HEAD COVER DISASSEMBLY

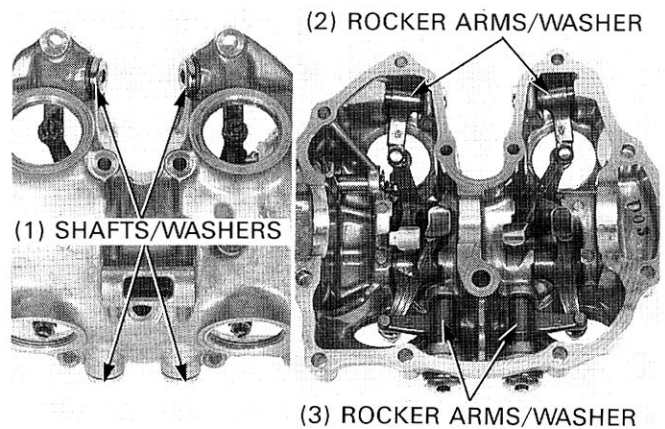
Remove the valve hole caps.

Remove the valve lifter arm, return spring and washer if necessary. Drive out the dowel pin using a screw driver and remove them.



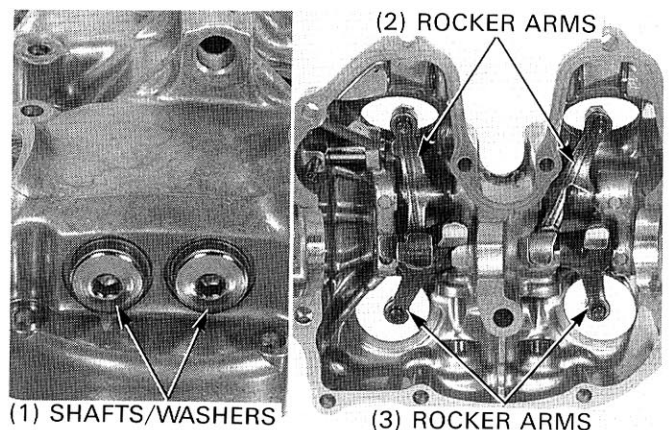
Hold the cylinder head cover securely and loosen the sub-rocker arm shafts, being careful not to damage the mating surface of the head cover and the bolt heads due to these shafts are applied locking agent and tightened with copper washers.

Remove the shafts with the sealing washers, and the sub-rocker arms and wave washers.



Be careful not to damage as same above and loosen the rocker arm shafts.

Remove the shafts with the sealing washers and the rocker arms.



CYLINDER HEAD/VALVE

INSPECTION

Inspect the rocker arms and shafts for wear or damage. If the rocker arm slipper surface is worn or damaged, inspect the cam lobe of the camshaft and oil passages.

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

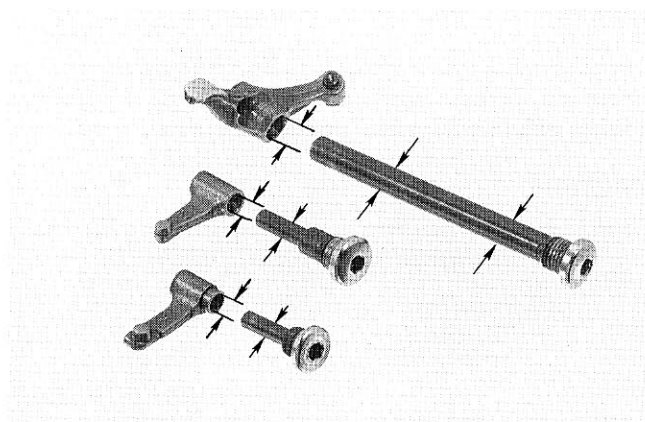
SERVICE LIMITS: Rocker arm shaft: 11.41 mm (0.449 in)
Sub-rocker arm shaft: 6.92 mm (0.272 in)

Measure the I.D of each rocker arm.

SERVICE LIMITS: Rocker arm: 11.53 mm (0.454 in)
Sub-rocker arm: 7.05 mm (0.278 in)

Subtract each rocker arm shaft O.D from the corresponding rocker arm I.D to obtain the rocker arm-to-arm shaft clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)

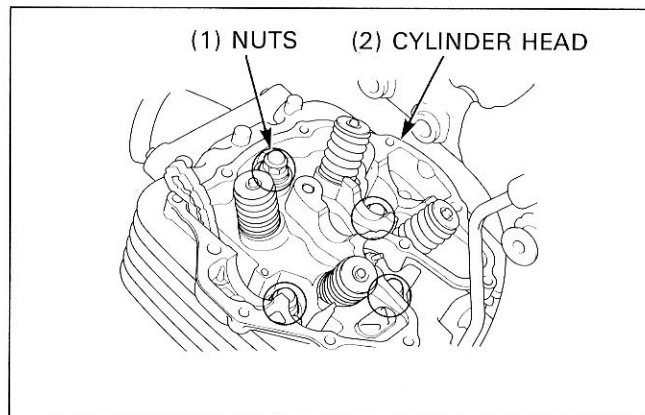


CYLINDER HEAD REMOVAL

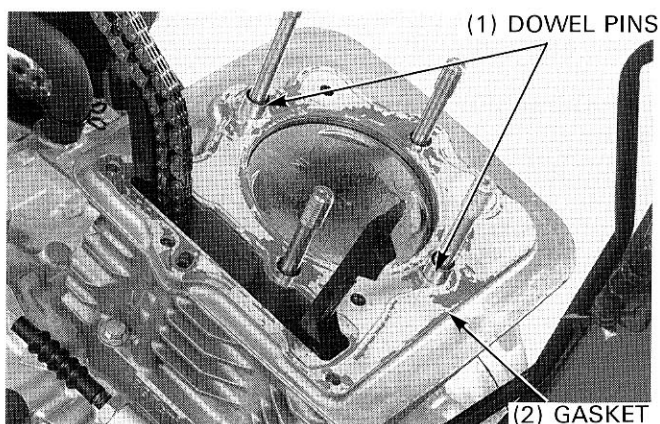
Remove the carburetor (page 5-3)
Remove the exhaust pipe (page 2-6)

Loosen the upper clutch cable bracket.
Remove the four cap nuts and the washers, being careful not to drop them into the crankcase.

Remove the cylinder head to the left.
Do not strike the cylinder head too hard and do not damage the mating surface by using a screw driver.

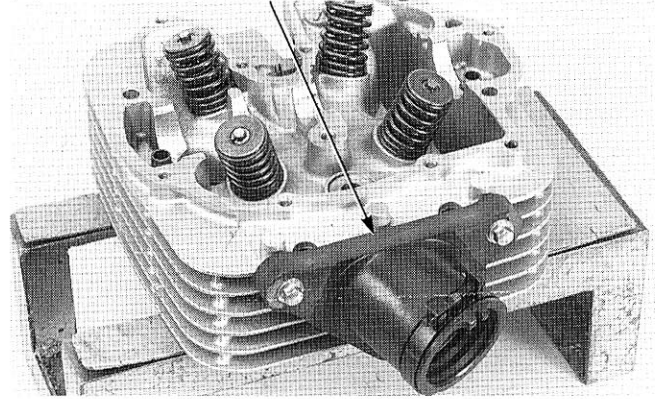


Remove the gasket and two dowel pins.



Remove the three bolts and carburetor insulator from the cylinder head.

(1) CARBURETOR INSULATOR



CYLINDER HEAD DISASSEMBLY

NOTE

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

Remove the valve spring cotters using the valve spring compressor.

TOOL:

Valve spring compressor

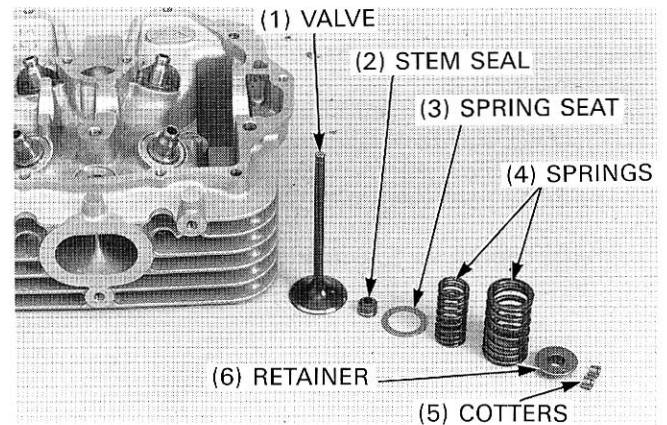
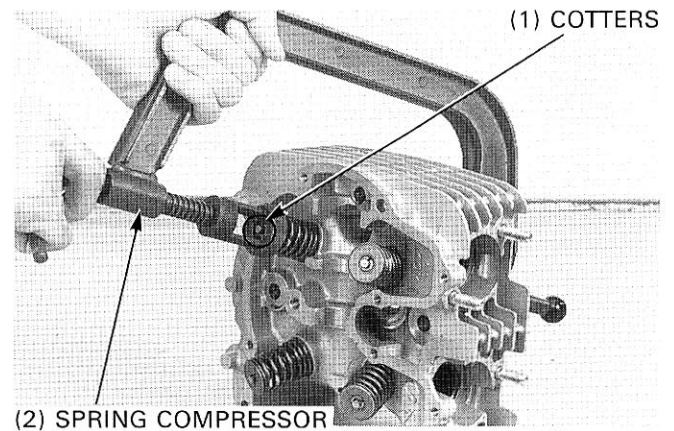
07757 - 0010000

CAUTION

- *Compressing the valve springs more than necessary will cause loss of valve spring tension.*

Remove the valve spring compressor, then remove the retainer, springs and valve.

Remove the stem seals and spring seat. Do not reuse the old stem seals.

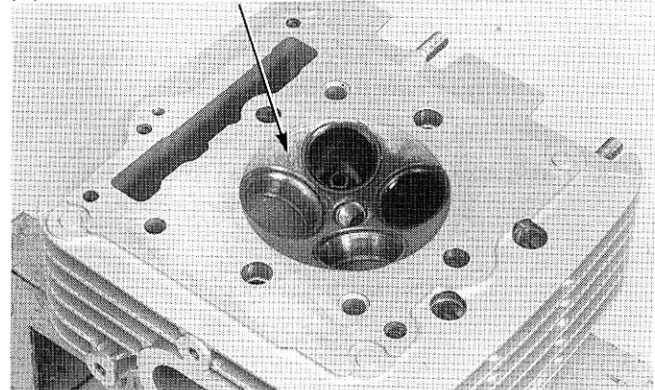


CAUTION

- *Avoid damaging the gasket and valve seat surfaces.*

Remove the carbon deposits from the combustion chamber and clean off the head gasket surfaces.

(1) COMBUSTION CHAMBER



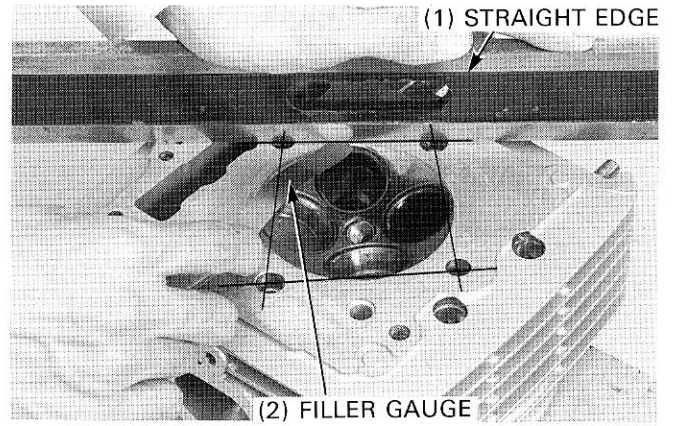
CYLINDER HEAD/VALVE

INSPECTION

Cylinder Head

Check the spark plug hole and valve areas for cracks.
Check the cylinder head for warpage with a straight edge and feeler gauge.

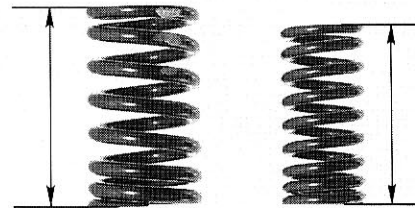
SERVICE LIMIT: 0.10 mm (0.004 in)



Valve Spring

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

SERVICE LIMITS: Inner (IN/EX): 36.3 mm (1.43 in)
Outer (IN/EX): 43.1 mm (1.70 in)



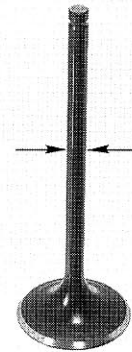
Valve Stem-to-Guide Clearance

Inspect each valve for bending, burning, scratches or abnormal wear.

Insert the valves in their original positions in the cylinder head. Check that each valve moves up and down smoothly, without binding.

Measure the each valve stem O.D. and record it.

SERVICE LIMITS: IN: 5.46 mm (0.215 in)
EX: 5.44 mm (0.214 in)

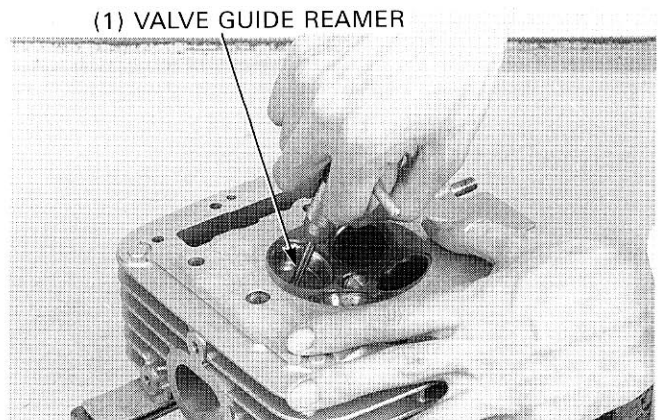


Ream the valve guide to remove any carbon build-up before measuring the guide.

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

TOOL:

Valve guide reamer, 5.5 mm 07984 – 2000001 or
07984 – 200000D



Measure each valve guide I.D. and record it.

SERVICE LIMITS: IN/EX: 5.52 mm (0.217 in)

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

**SERVICE LIMITS: IN: 0.12 mm (0.005 in)
EX: 0.14 mm (0.006 in)**

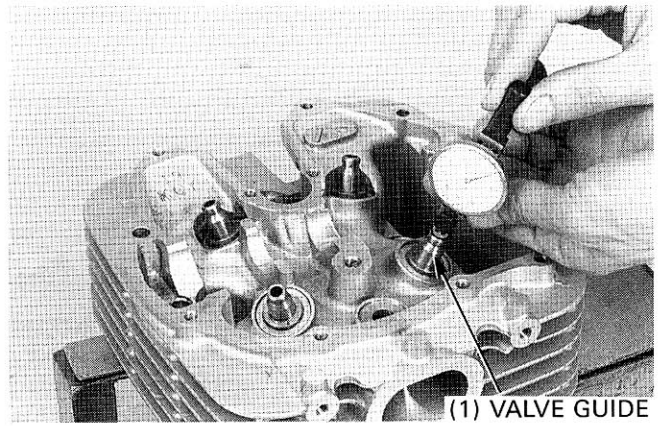
If the stem-to-guide clearance exceeds the service limit, determine if a new guide with standard dimensions would bring the clearance within tolerance.

If so, replace any guides as necessary and ream to fit.

If the stem-to-guide clearance exceeds the service limit with new guide, also replace the valve.

NOTE

- Inspect and reface the valve seats whenever the valve guides are replaced (page 7-15).
-



VALVE GUIDE REPLACEMENT

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

⚠ WARNING

- *Wear insulated gloves to avoid burns when handling the heated cylinder head.*

Heat the cylinder head to 130°C – 140°C (275°F – 290°F) with a hot plate or oven. Do not heat the cylinder head beyond 150°C (300°F). Use temperature indicator sticks, available from welding supply stores, to be sure the cylinder head is heated to the proper temperature.

CAUTION

- *Using a torch to heat the cylinder head may cause warping.*

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

TOOL:

Valve guide driver, 5.5 mm 07742 – 0010100

CAUTION

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

Install a new O-ring onto a new valve guide. Drive the new guide in from the camshaft side of the cylinder head while the cylinder head is still heated.

Let the cylinder head cool to room temperature, then ream the new valve guides.

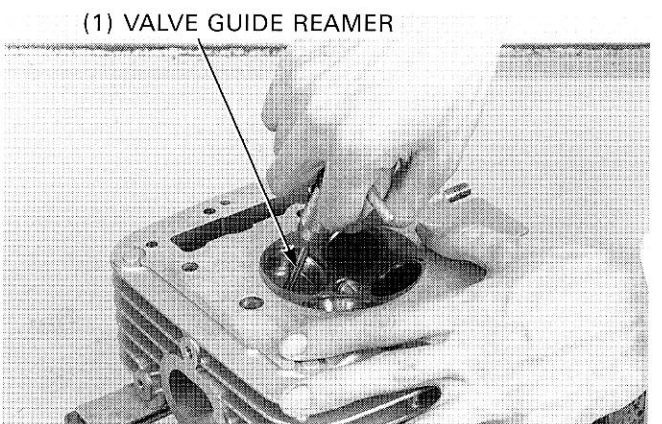
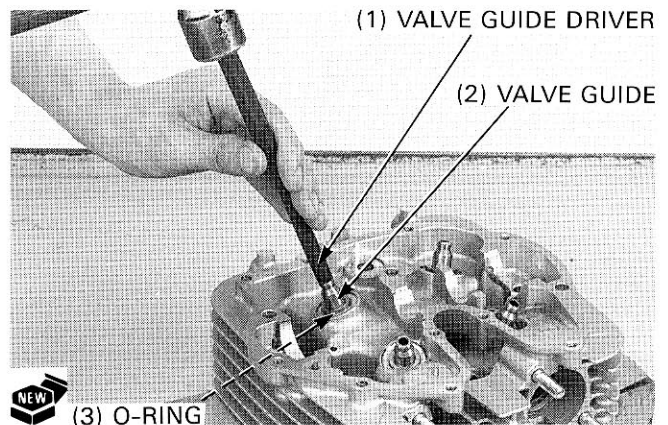
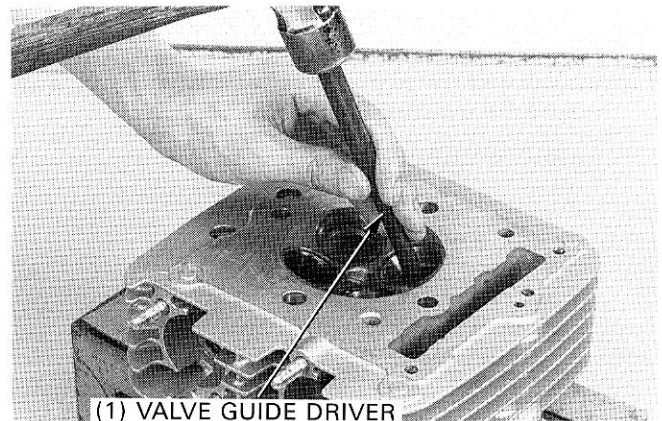
TOOL:

**Valve guide reamer, 5.5 mm 07984 – 2000001 or
07984 – 200000D**

NOTE

- Take care not to tilt or lean the reamer in the guide while reaming. Otherwise, the valve is installed slanted, that causes oil leaks from the stem seal and improper valve seat contact and results in the valve seat refacing not able to be performed.
- Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise.

Clean the cylinder head thoroughly to remove any metal particles after reaming.



VALVE SEAT INSPECTION/REFACING

INSPECTION

Clean all intake and exhaust valves thoroughly to remove carbon deposits.

Apply a light coating of Prussian Blue to each valve face. Tap the valve against the valve seat several times using a hand-lapping tool, without rotating the valve to make a clear pattern.

Remove the valve and inspect the valve seat face.

NOTE

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

Inspect the valve seat face for:

- 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.

- Contact area (too high or too low area):
 - reface the valve seat.

Inspect the width of valve seat.

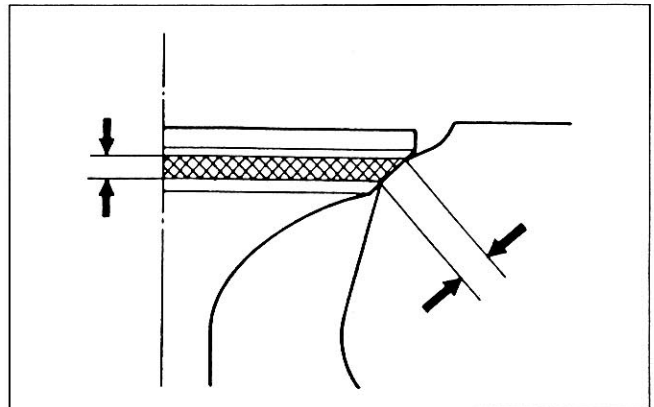
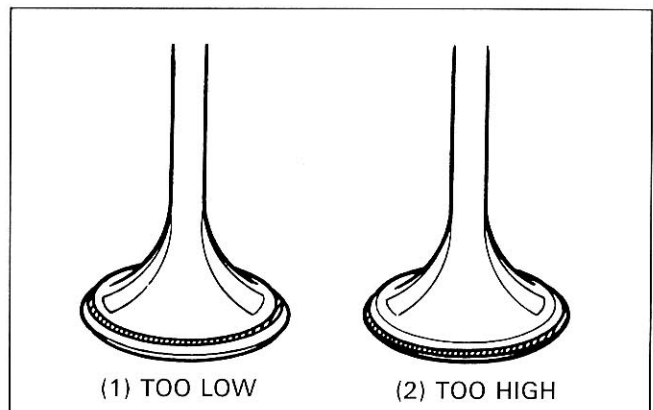
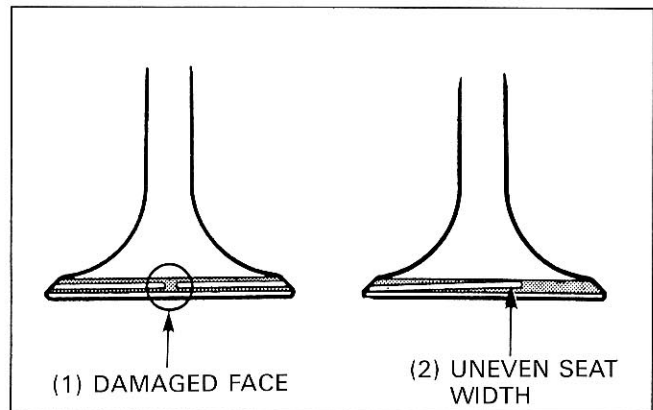
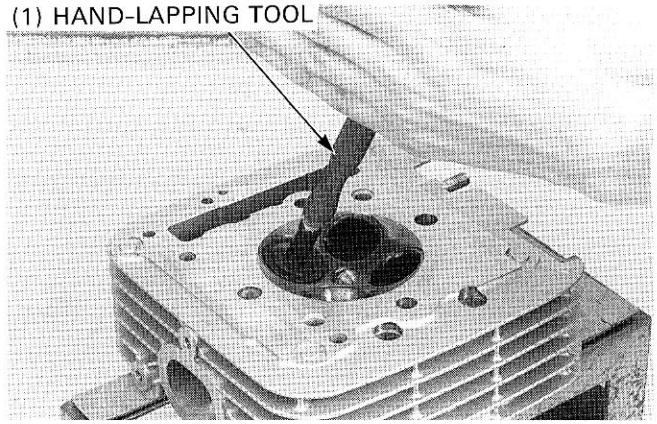
The valve seat contact should be within the specified width and evenly all around the circumference.

STANDARD: 1.0 – 1.1 mm (0.039 – 0.043 in)

SERVICE LIMIT: 2.0 mm (0.08 in)

If the valve seat width is not within specification, reface the valve seat.

(1) HAND-LAPPING TOOL



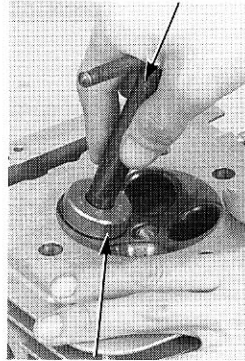
CYLINDER HEAD/VALVE

VALVE SEAT REFACING

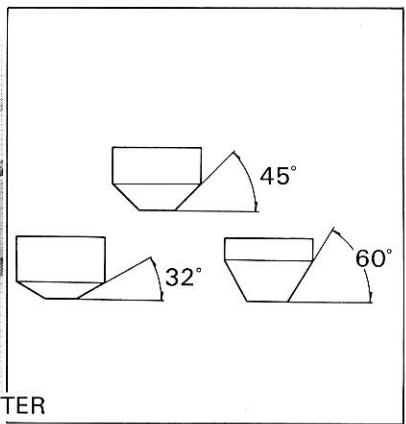
NOTE

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

(1) CUTTER HOLDER

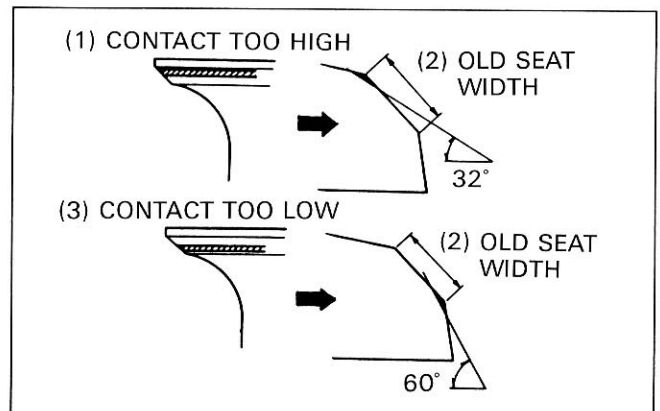


(2) VALVE SEAT CUTTER



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

If the contact area is too low on the valve, the seat must be raised using a 60° inner cutter. Refinish the seat to specifications, using a 45° finish cutter.

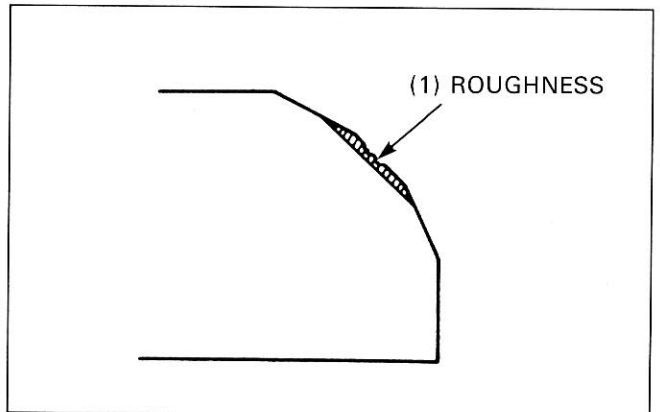


Using a 45° cutter, remove any roughness or irregularities from the seat.

TOOLS:

Valve seat cutter, 35 mm (45° IN)	07780 - 0010400
Valve seat cutter, 29 mm (45° EX)	07780 - 0010300
Valve seat cutter holder (5.5 mm)	07781 - 0010101

or equivalent commercially available in U.S.A.

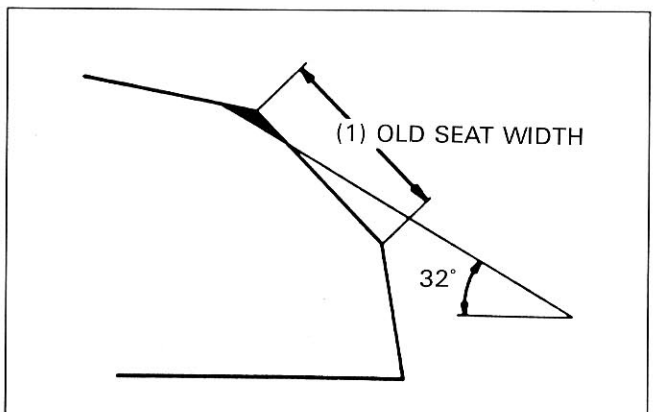


Using a 32° cutter, remove 1/4 of the existing valve seat material.

TOOLS:

Valve seat cutter, 35 mm (32° IN)	07780 - 0012300
Valve seat cutter, 30 mm (32° EX)	07780 - 0012200
Valve seat cutter holder (5.5 mm)	07781 - 0010101

or equivalent commercially available in U.S.A.

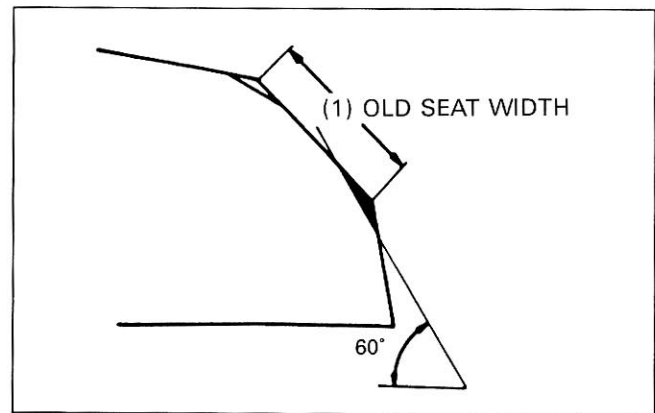


Using a 60° cutter, remove the bottom 1/4 of the old seat.

TOOLS:

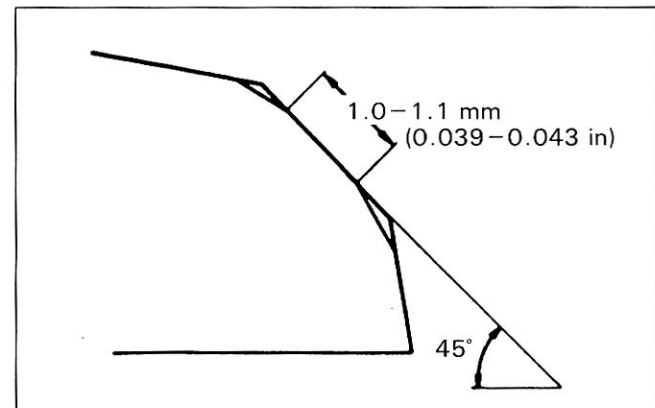
Valve seat cutter, 30 mm (60° IN/EX) 07780 – 0014000
 Valve seat cutter holder (5.5 mm) 07781 – 0010101

or equivalent commercially available in U.S.A.



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

Make sure that all pitting and irregularities are removed.

**CAUTION**

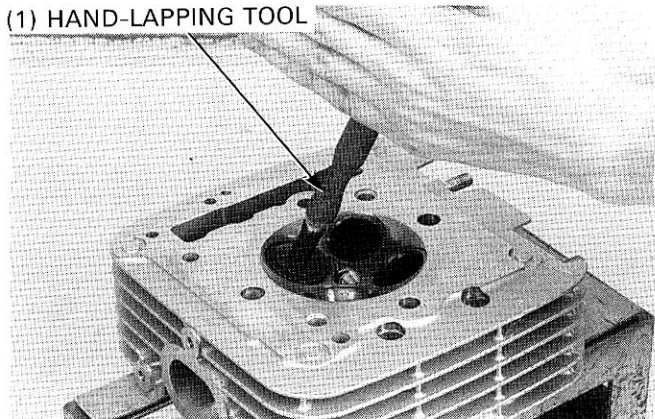
- Excessive lapping pressure may deform or damage the seat.
- Change the angle of lapping tool frequently to prevent uneven seat wear.
- Lapping compound can cause damage if it enters between the valve stem and guide.

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

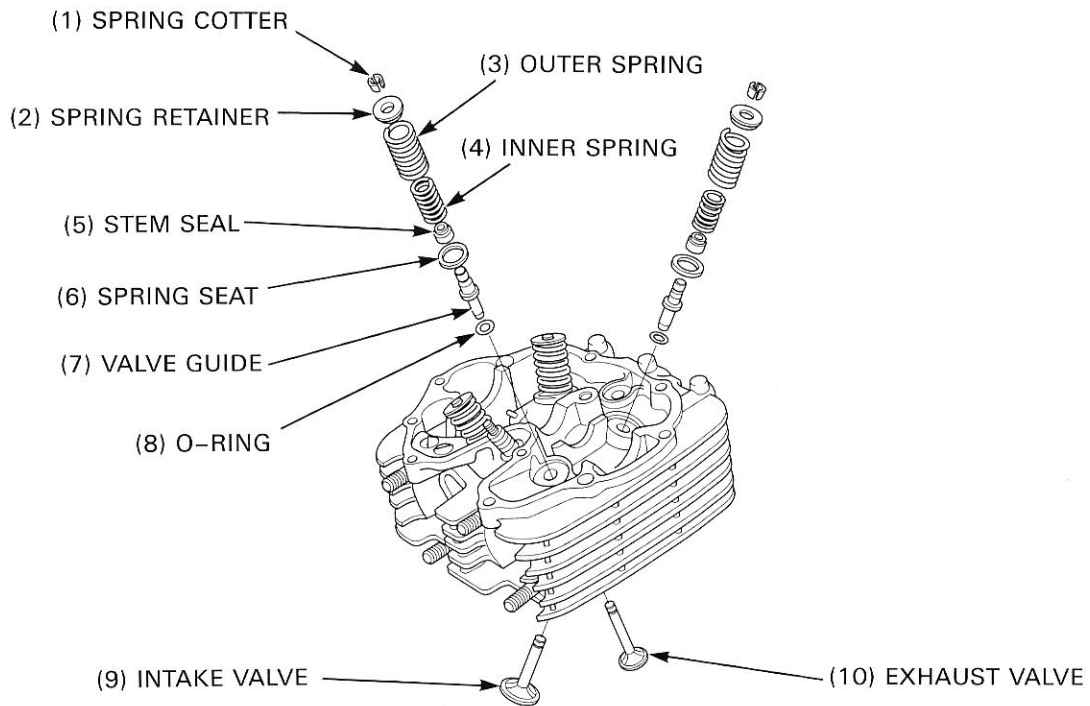
After lapping, wash any residual compound off the cylinder head and valve.

Recheck the seat contact after lapping.

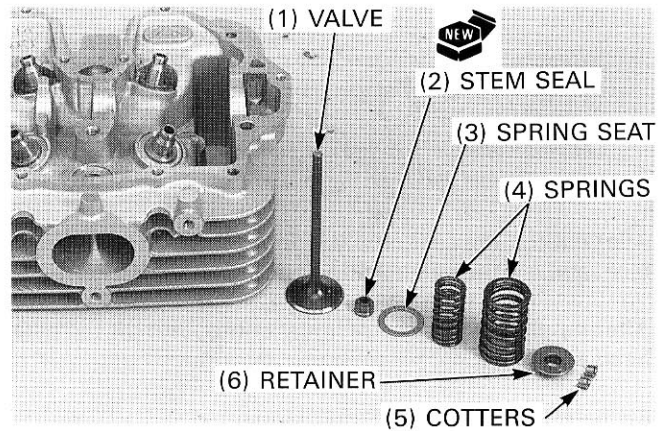
(1) HAND-LAPPING TOOL



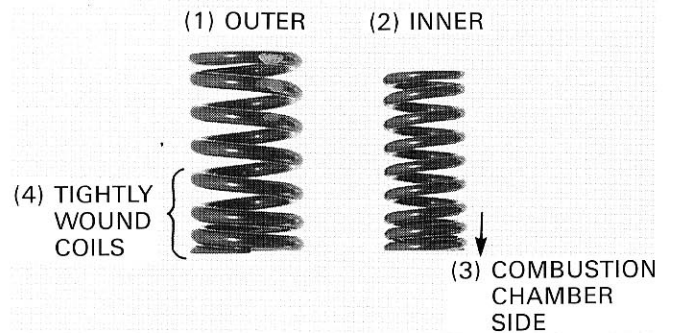
CYLINDER HEAD ASSEMBLY



Install the spring seats and new stem seals. Lubricate each valve stem with molybdenum oil solution and insert the valves into the valve guides. To avoid damage to the stem seal, turn the valve slowly when inserting.



Install the valve springs and retainers. The springs tightly wound coils should face toward the combustion chamber.



CAUTION

- *Compressing the valve spring more than necessary when installing the valve cotters may cause loss of valve spring tension.*

NOTE

- To ease installation of the cotters, grease them first.

Compress the valve springs with the valve spring compressor and install the valve cotters.

TOOL:

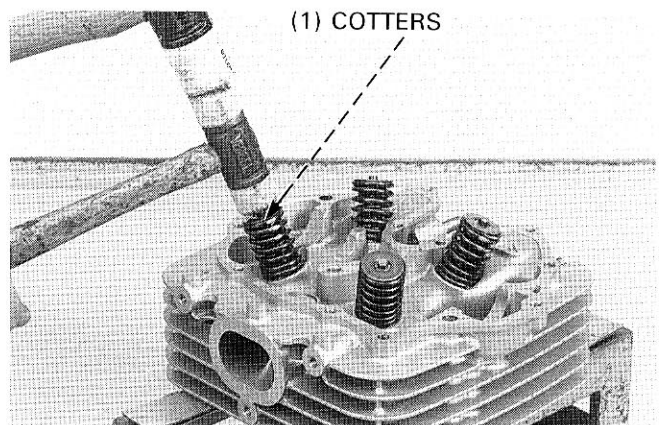
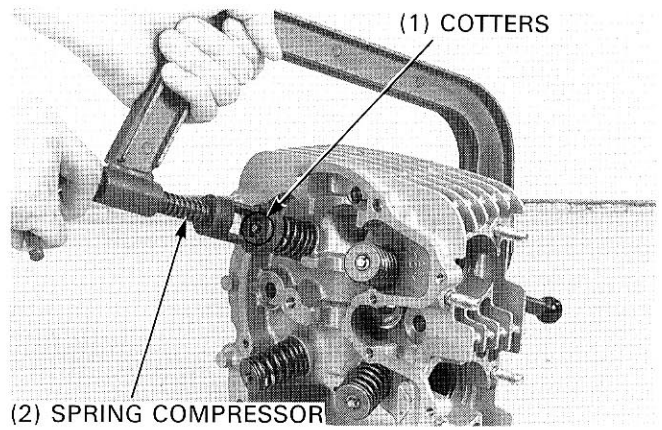
Valve spring compressor

07757 - 0010000

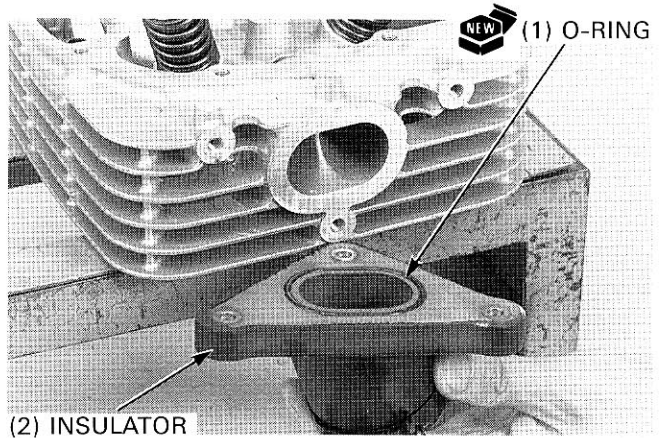
NOTE

- Support the cylinder head so that the valve heads will not contact anything that causes damage.

Tap the valve stems gently with a soft hammer to firmly seat the cotters.



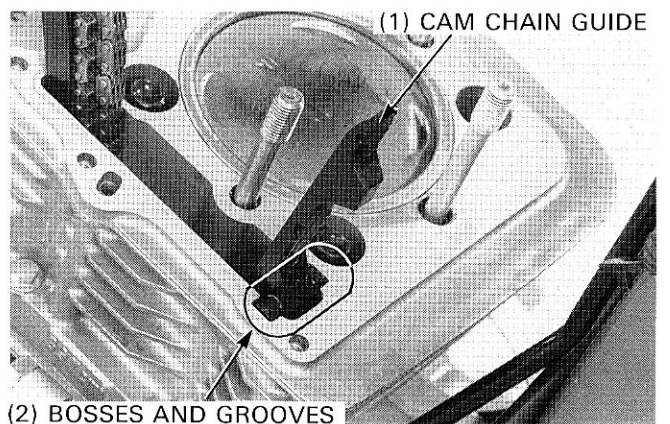
Coat a new O-ring with oil and install it into the groove in the insulator. Install the insulator tightening the three bolts.



CYLINDER HEAD INSTALLATION

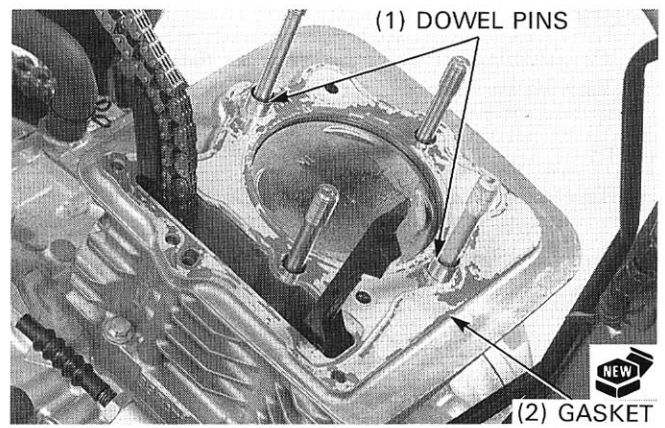
Clean any gasket material from the cylinder mating surfaces.

Make sure that the cam chain guide bosses are in the grooves of cylinder.



CYLINDER HEAD/VALVE

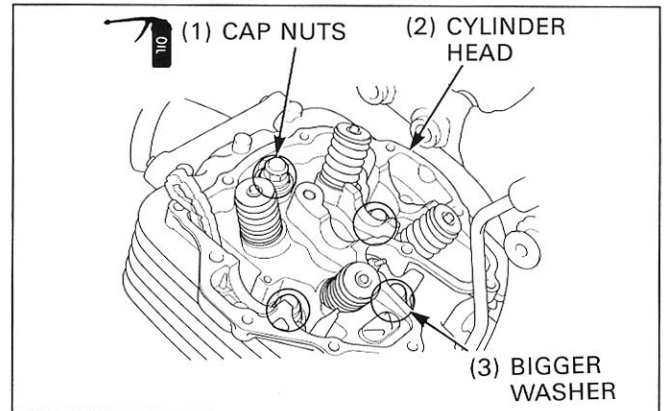
Install the dowel pins and new gasket.



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

Apply engine oil to the cylinder head nut threads and seating surfaces. Install and tighten the nuts. Tighten the upper clutch cable bracket.

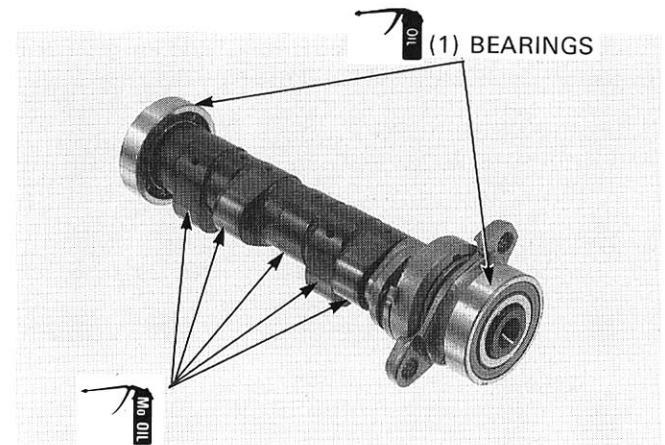
Install the exhaust pipe (page 2-5).
Install the carburetor (page 5-10).



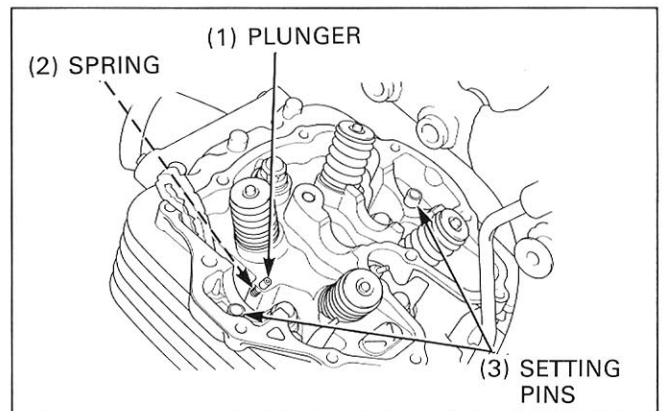
CAMSHAFT INSTALLATION

Lubricate the camshaft bearings with engine oil.
Install the bearings with the sealed side of the cam sprocket side bearing facing out.

Apply molybdenum oil solution to the cam lobes and journal.

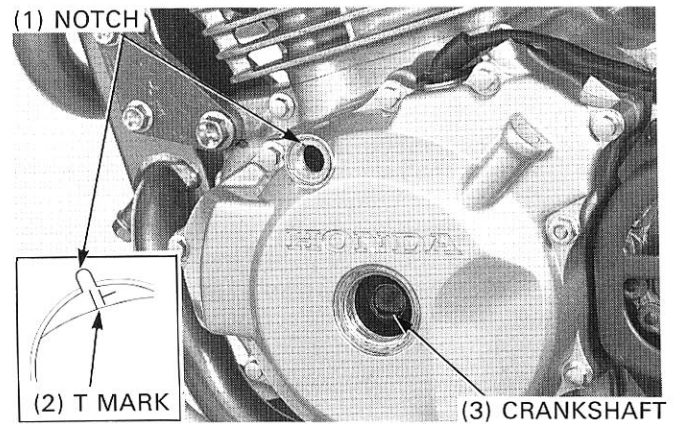


Install the bearing setting pins in the cylinder head.
Install the spring and plunger, being careful not to drop them into the crankcase.

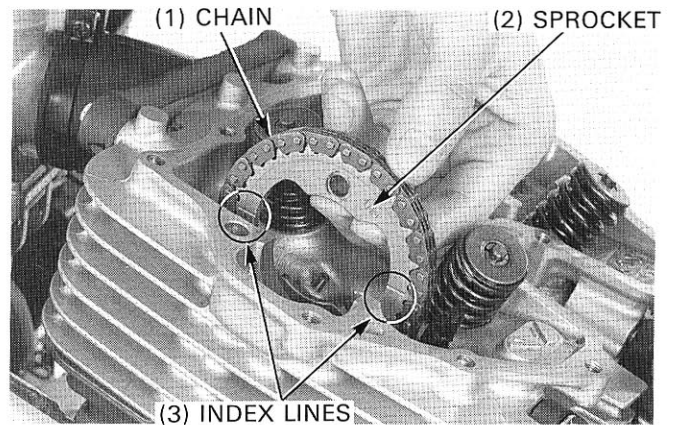


Attach the cam sprocket to the cam chain with the index lines facing outside.

Rotate the crankshaft counterclockwise slowly while holding the cam chain to align T mark on the flywheel with the index notch in the crankcase cover.



Temporarily align the index lines on the sprocket with the upper surface of the cylinder head without moving the cam chain.



Install the camshaft onto the cylinder head through the cam sprocket.
Install the cam sprocket onto the camshaft flange securely.

NOTE

- Be sure that the index lines on the cam sprocket align with the upper surface of the cylinder head when the I mark on the flywheel is aligned with the index notch on the crankcase cover.

CAUTION

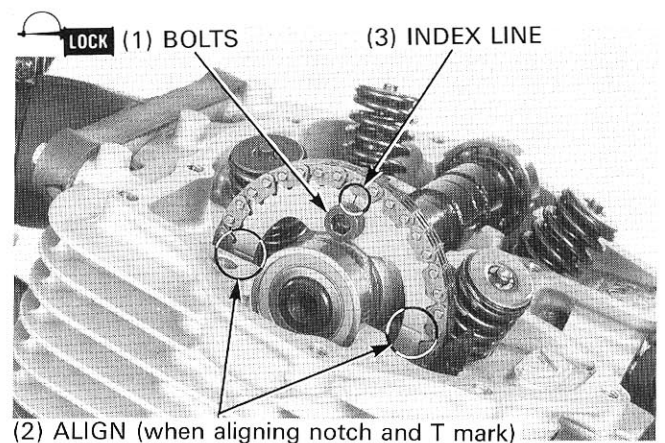
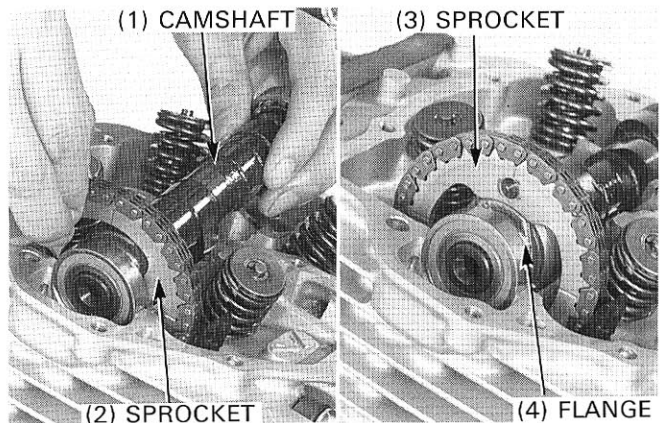
- *The crankshaft should be turned counterclockwise. This must be done to prevent the one-way decompressor system from functioning.*

Apply locking agent to the sprocket bolt threads.
Align the bolt holes in the cam sprocket and camshaft flange and install the cam sprocket bolt.

Turn the crankshaft one revolution counterclockwise. Apply locking agent to the sprocket bolt threads and install the remaining sprocket bolt.
Tighten the INDEX LINE side bolt first.

TORQUE: 20 N·m (2.0 kgf·m, 14 lbf·ft)

Turn the crankshaft one revolution counterclockwise again and tighten the other bolt ("OUT" mark side) to the same torque.

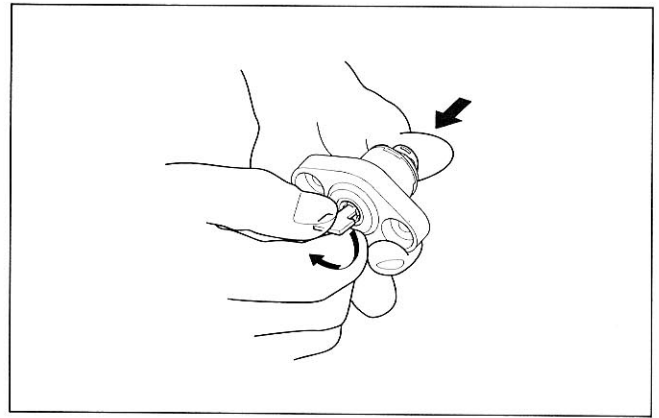


CAM CHAIN TENSIONER LIFTER INSTALLATION

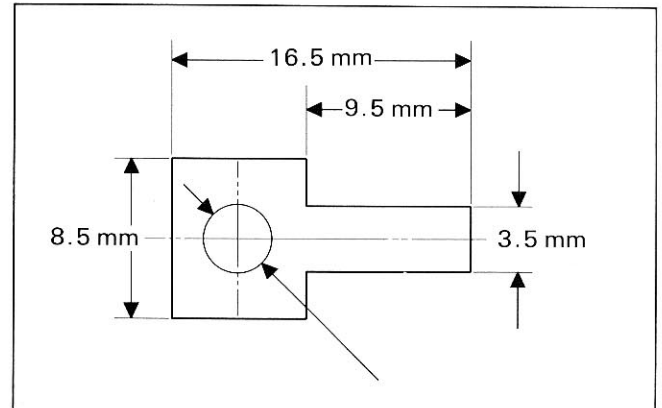
Remove the tensioner lifter plug.

Check the lifter operation:

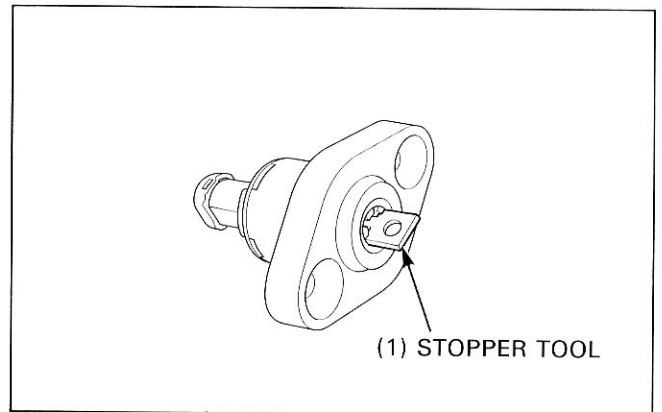
- The tensioner shaft should not go into the body when it is pushed.
- When it is turned clockwise with a screwdriver, the tensioner shaft should be pulled into the body. The shaft spring out of the body as soon as the screwdriver is released.



Make a tensioner shaft stopper tool out of a thin piece of steel (0.8 mm thick) using the diagram.



Turn the tensioner shaft clockwise with the stopper tool to retract the tensioner, then insert the stopper fully to hold the tensioner in the fully retracted position.

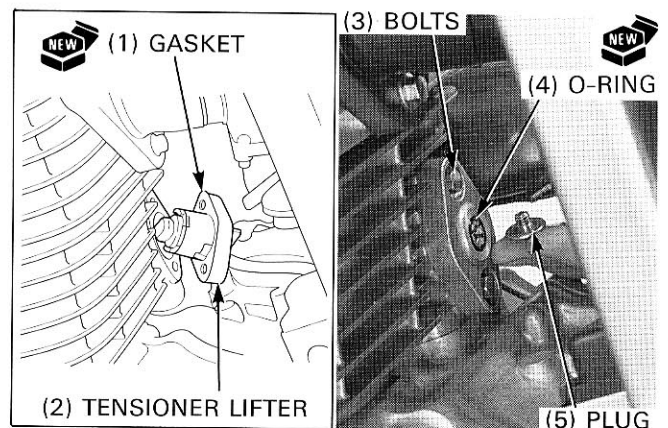


Install a new gasket on the cam chain tensioner lifter. Install the tensioner lifter into the cylinder and tighten the mounting bolts.

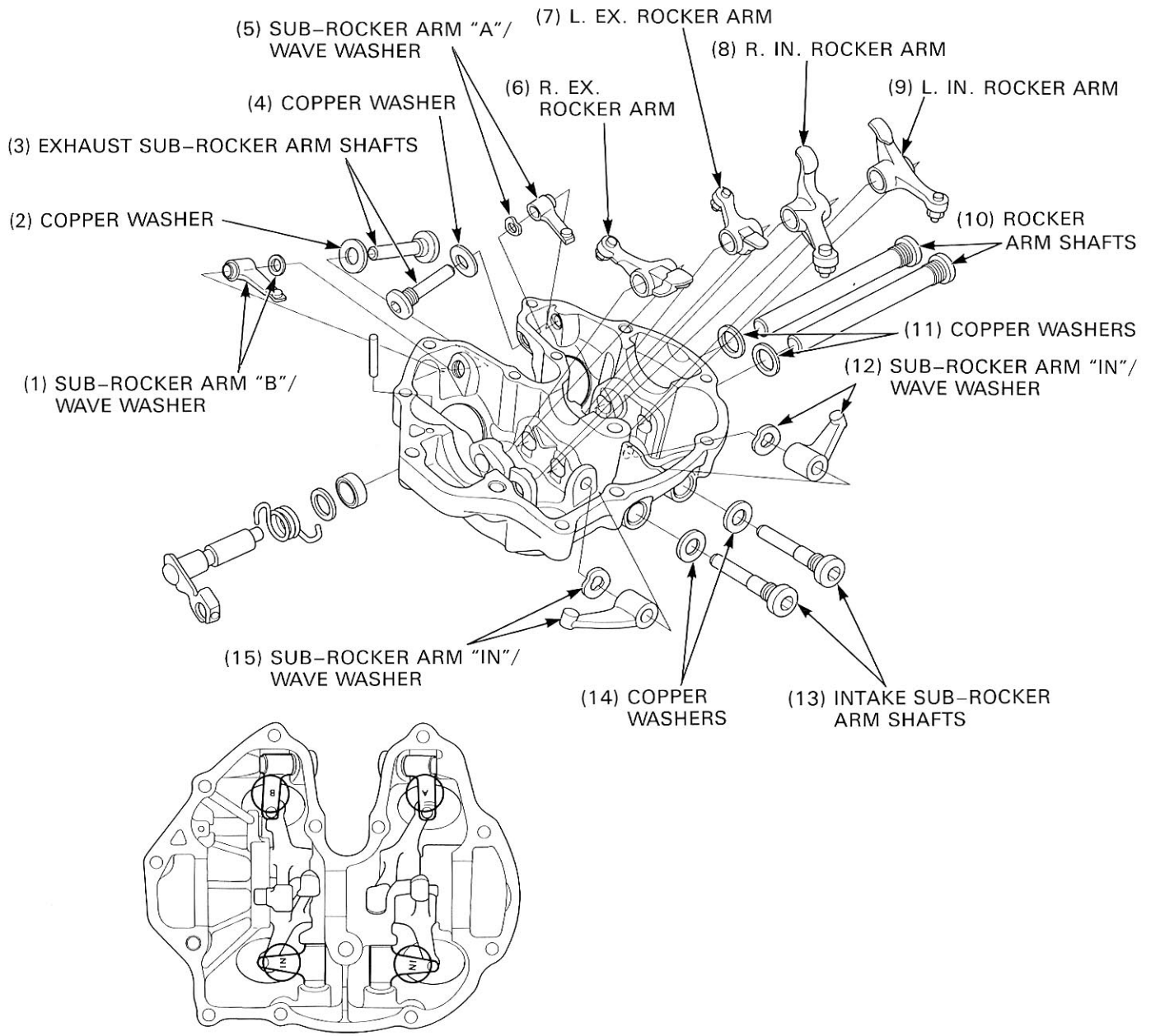
Remove the stopper tool from the tensioner lifter. Install the plug with a new O-ring and tighten it.

TORQUE: 4 N·m (0.4 kgf·m, 2.9 lbf·ft)

Make sure that the index lines align with the upper surface of the cylinder head when the T mark is aligned with the index notch on the crankcase cover again (see previous page).

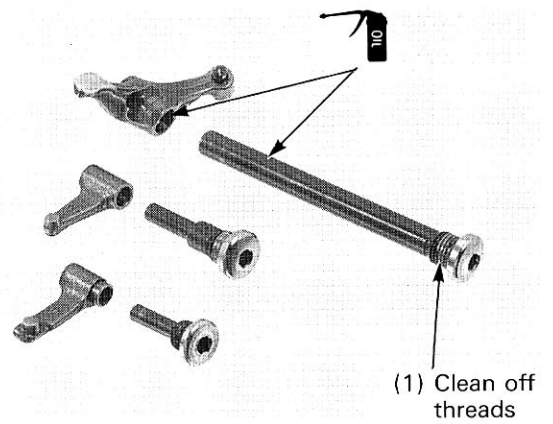


CYLINDER HEAD COVER ASSEMBLY



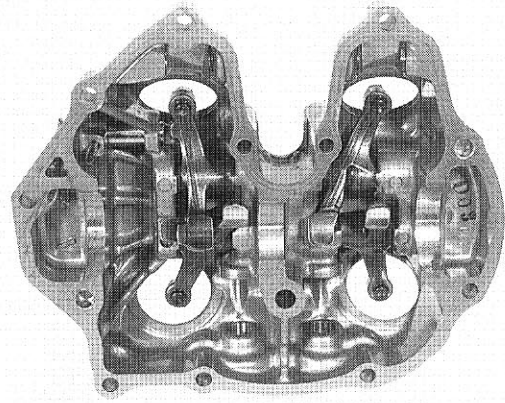
Clean the threads of each rocker arm shaft thoroughly.

Apply engine oil to the rocker arms and shafts sliding surfaces.



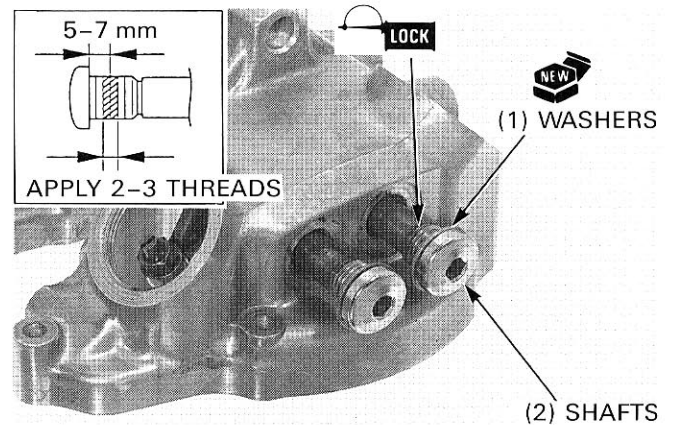
CYLINDER HEAD/VALVE

Set the rocker arm in the head cover, then install the shaft with a new sealing washer into the head cover through the rocker arm as shown.

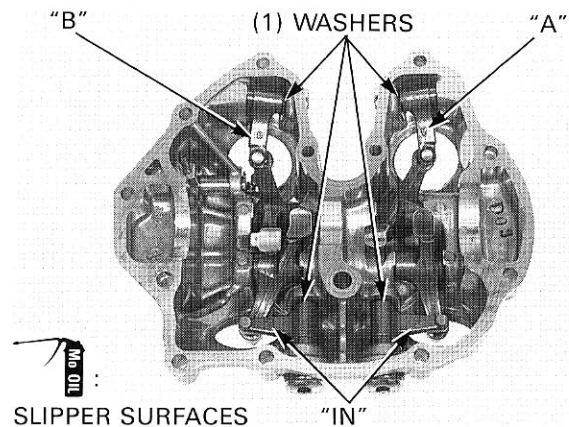


Apply locking agent to the 2 – 3 threads of the rocker arm shaft and tighten the shaft.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)



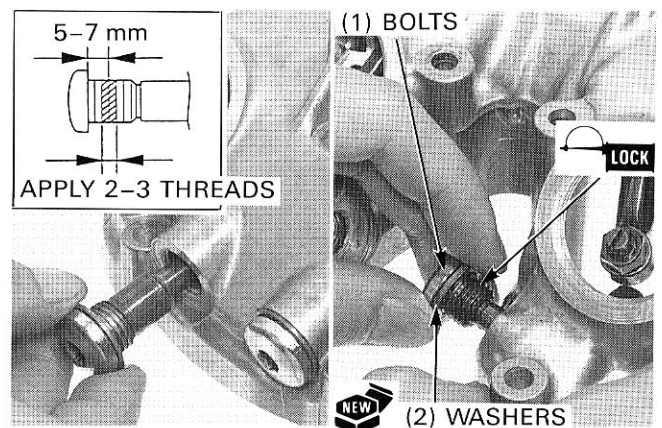
Set the sub-rocker arm and wave washer in the cylinder head cover, then install the sub-rocker arm shaft with a new sealing washer into the head cover through the wave washer and sub-rocker arm.



Apply locking agent to the 2 – 3 threads of the sub-rocker arm shaft and tighten the shaft.

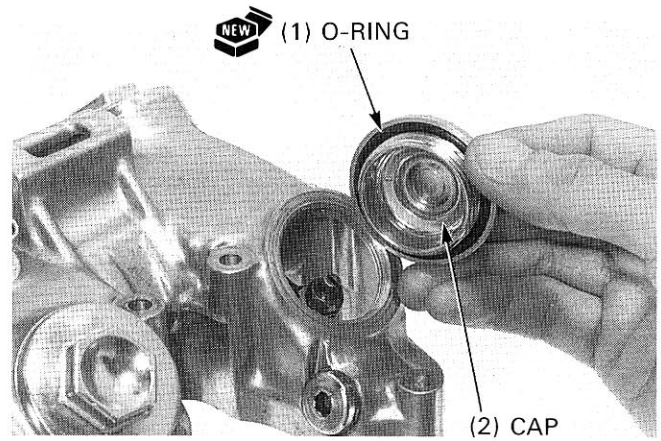
TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)

After installing all rocker arms, apply molybdenum disulfide solution to the slipper surfaces of the rocker arm and sub-rocker arm.

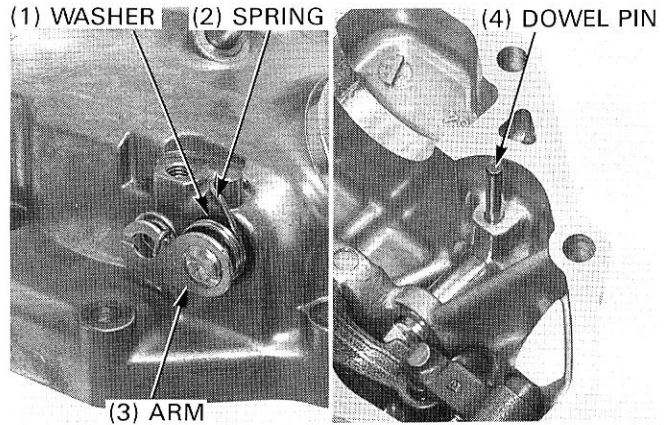


Coat new O-rings with engine oil and install them into the valve hole cap grooves. Install and tighten the valve hole caps.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)



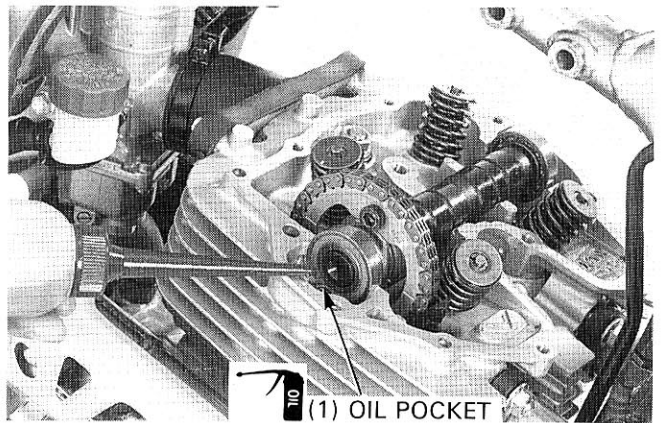
If the valve filter arm was removed, install the valve lifter arm with the spring and washer into the head cover. Press the dowel pin into the head cover while aligning the groove of the arm shaft with the dowel hole.



CYLINDER HEAD COVER INSTALLATION

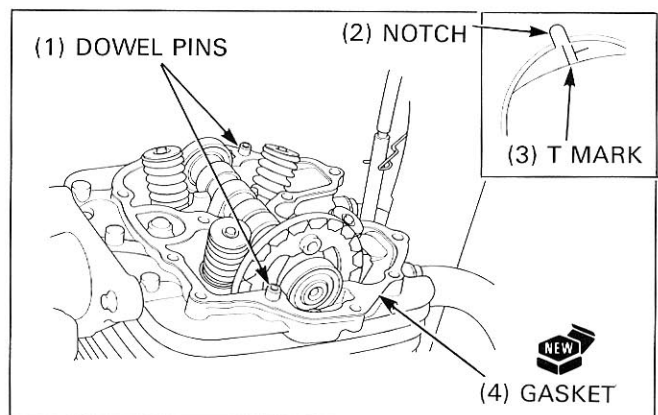
Clean the mating surface of the cylinder head and head cover.

Pour engine oil into the oil pocket in the cylinder head.



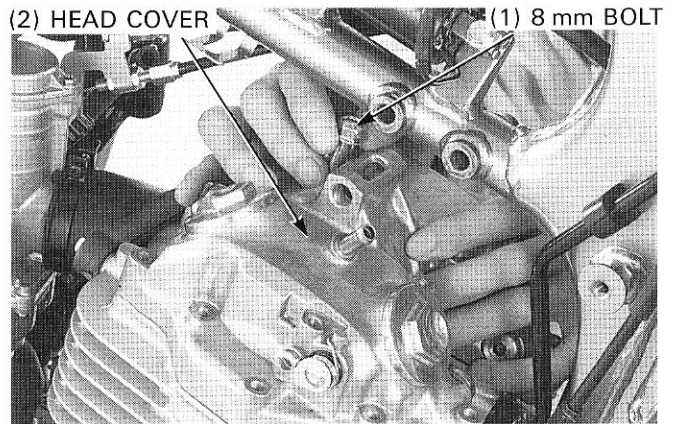
Install the two dowel pins and a new gasket onto the cylinder head.

Rotate the crankshaft counterclockwise and align the T mark on the flywheel with the index notch in the crankcase cover, that is cam lobes facing down. The crankshaft must not be turned clockwise.



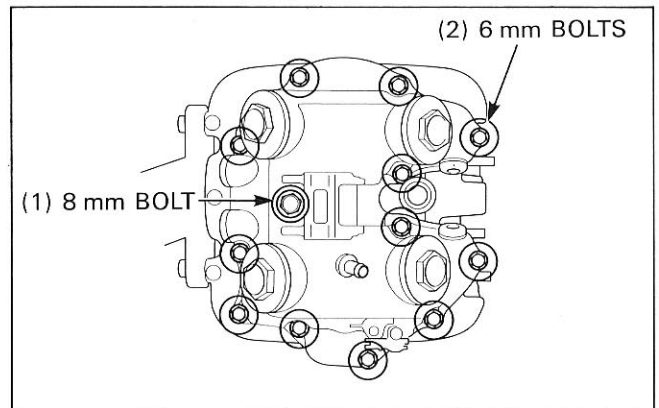
CYLINDER HEAD/VALVE

Insert the head cover 8 mm bolt into the head cover and install the head cover onto the cylinder head while holding the 8 mm bolt.



Install and tighten the all head cover bolts in a crisscross pattern in 2 – 3 steps.

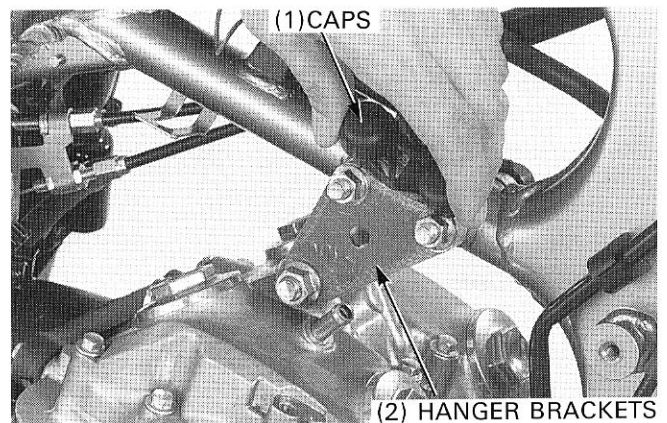
TORQUE: 8 mm: 26 N·m (2.7 kgf·m, 20 lbf·ft)



Install the upper hanger brackets, bolts and nuts and tighten the nuts.

TORQUE: 10 mm: 54 N·m (5.5 kgf·m, 40 lbf·ft)
8 mm: 26 N·m (2.7 kgf·m, 20 lbf·ft)

Install the rubber caps properly.

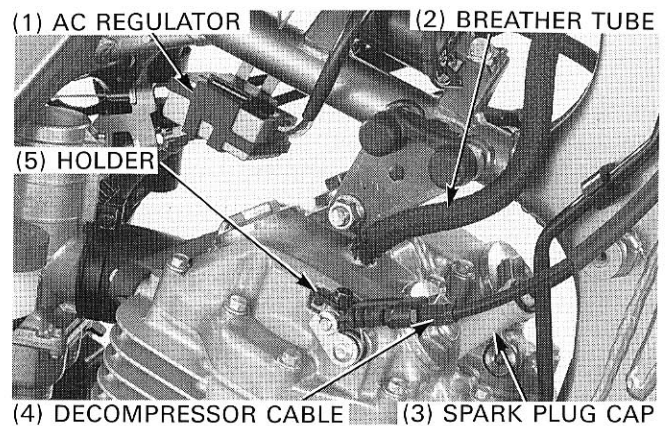


Connect the decompressor cable to the valve lifter arm and install the cable holder.

Install the breather tube to the cylinder head.

Install the AC regulator onto the frame and connect the 4P connector securely.

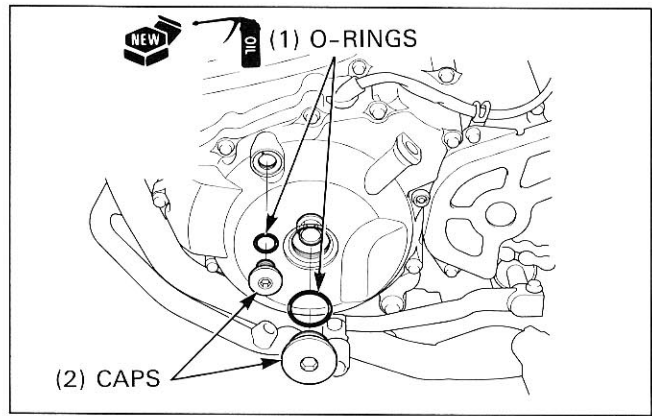
Install the spark plug cap.

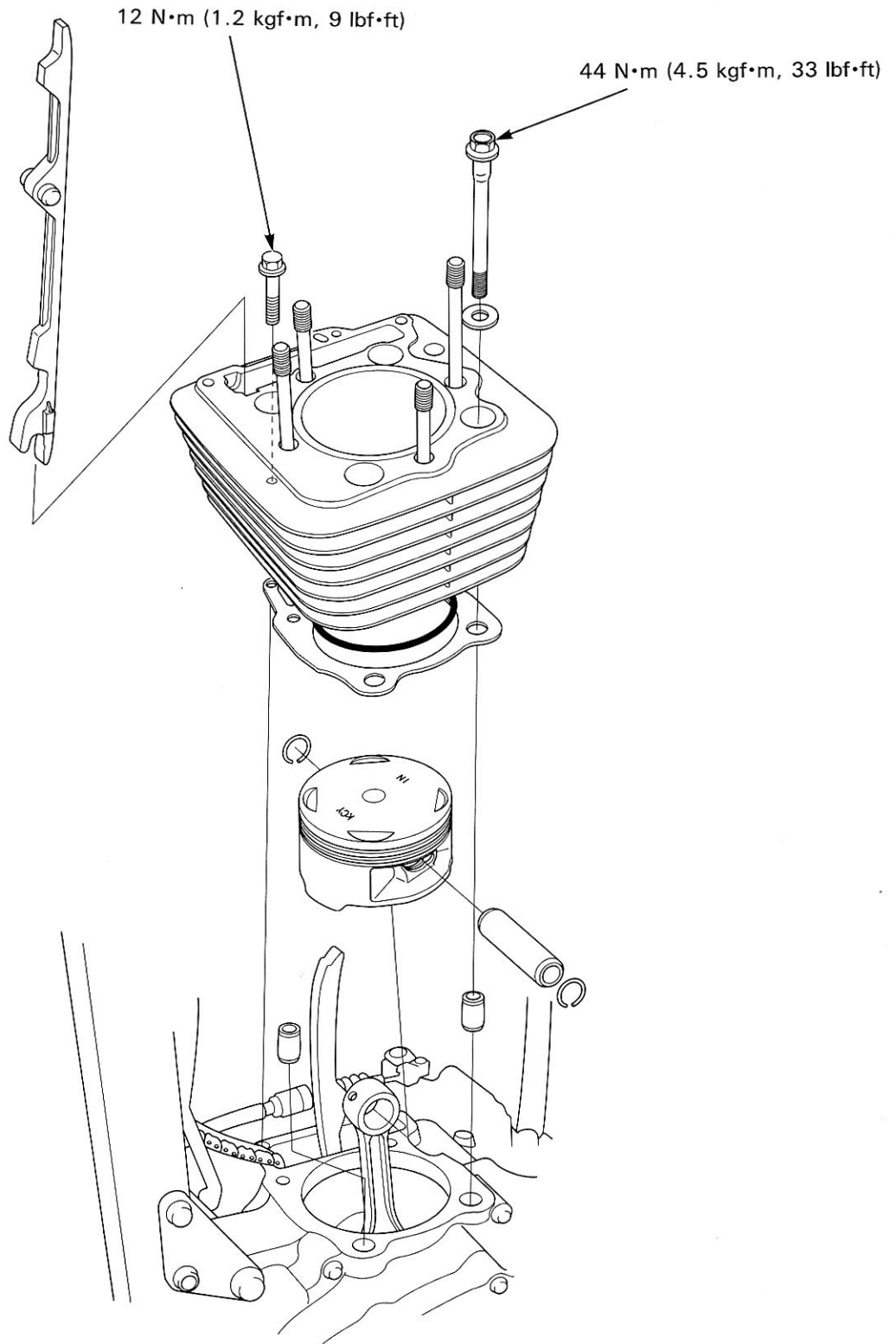


Apply oil to a new crankshaft hole and timing hole O-rings and install them onto the caps. Install and tighten the caps.

TORQUE: Timing hole cap: 10 N·m (1.0 kgf·m, 7 lbf·ft)
Crankshaft hole cap: 8 N·m (0.8 kgf·m, 5.8 lbf·ft)

After installation, adjust the decompressor system (page 3-14).





8. CYLINDER/PISTON

SERVICE INFORMATION	8-1	PISTON RING INSTALLATION	8-7
TROUBLESHOOTING	8-2	PISTON INSTALLATION	8-7
CYLINDER REMOVAL	8-3	CYLINDER INSTALLATION	8-8
PISTON REMOVAL	8-4		

SERVICE INFORMATION

GENERAL

- The cylinder/piston can be serviced with the engine installed in the frame.
- Take care not to damage the cylinder wall and piston.
- Be careful not to damage the mating surfaces by using the screw driver when removing the cylinder.
- When removing the piston, clean carbon and sludge from the top of the cylinder.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Cylinder	I.D.	85.000 – 85.010 (3.3465 – 3.3468)	85.10 (3.350)	
	Out of round	—	0.05 (0.002)	
	Taper	—	0.05 (0.002)	
	Warpage	—	0.10 (0.004)	
Piston, piston ring and piston pin	Piston mark direction	"IN" mark toward the intake side	—	
	Piston O.D.	84.960 – 84.985 (3.3449 – 3.3459) at 15 (0.6) from the bottom	84.880 (3.3417)	
	Piston pin hole I.D.	20.002 – 20.008 (0.7875 – 0.7877)	20.060 (0.7898)	
	Piston pin O.D.	19.994 – 20.000 (0.7872 – 0.7874)	19.964 (0.7860)	
	Connecting rod small end I.D.	20.020 – 20.041 (0.7882 – 0.7890)	20.067 (0.7900)	
	Cylinder-to-piston clearance	0.015 – 0.050 (0.0006 – 0.0020)	0.10 (0.004)	
	Piston-to-piston pin clearance	0.002 – 0.014 (0.0001 – 0.0006)	0.096 (0.0038)	
	Connecting rod-to-piston pin clearance	0.020 – 0.047 (0.0008 – 0.0019)	0.103 (0.0041)	
	Piston ring-to-ring groove clearance	Top	0.030 – 0.065 (0.0012 – 0.0026)	0.14 (0.006)
		Second	0.015 – 0.050 (0.0006 – 0.0020)	0.12 (0.005)
	Piston ring end gap	Top	0.20 – 0.35 (0.008 – 0.014)	0.50 (0.020)
		Second	0.35 – 0.50 (0.014 – 0.020)	0.65 (0.026)
		Oil (side rail)	0.2 – 0.7 (0.01 – 0.03)	0.9 (0.04)
Piston ring mark direction	Top/second	Marking facing up	—	

TORQUE VALUES

Cylinder bolt (10mm) 44 N·m (4.5 kgf·m, 33 lbf·ft) Apply oil to the threads and seating surface.

TROUBLESHOOTING

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

- Leaking cylinder head gasket
- Worn, stuck or broken piston ring
- Worn or damaged cylinder and piston

Compression too high, overheating or knocking

- Excessive carbon built-up on piston or combustion chamber.

Excessive smoke

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

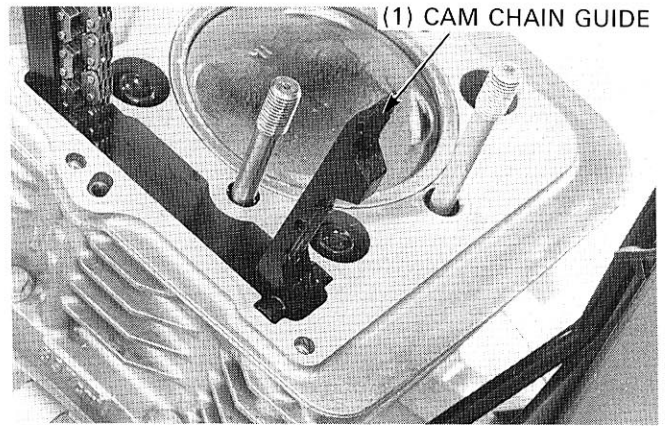
Abnormal noise (piston)

- Worn piston pin or piston pin hole
- Worn cylinder, piston or piston ring
- Worn connecting rod small end

CYLINDER REMOVAL

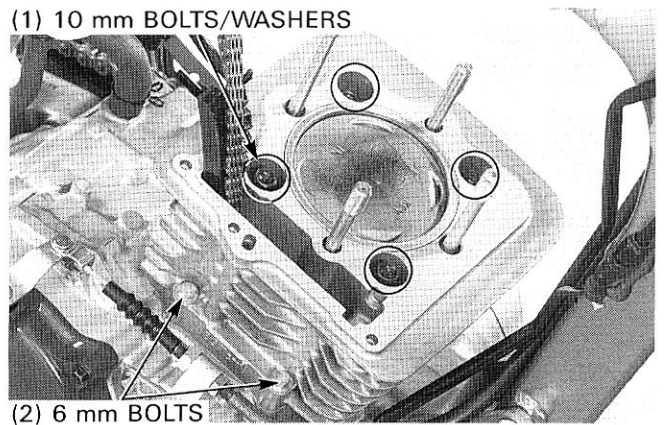
Remove the cylinder head (section 7).

Remove the cam chain guide.

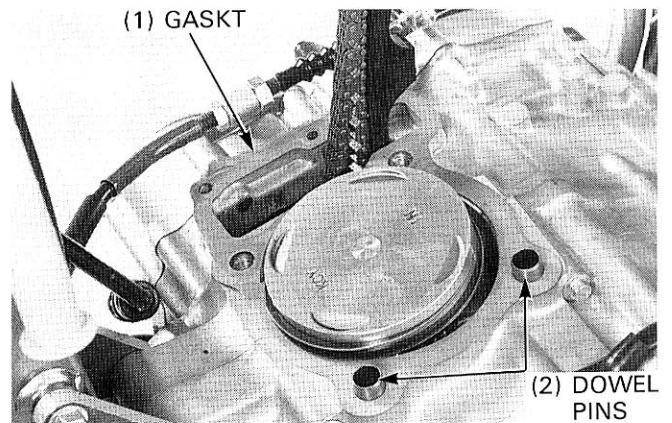


Remove the two 6 mm bolts and four 10 mm bolts/washers.

Remove the cylinder. Do not strike the cylinder too hard and do not damage the mating surface by using a screw driver when removing it.



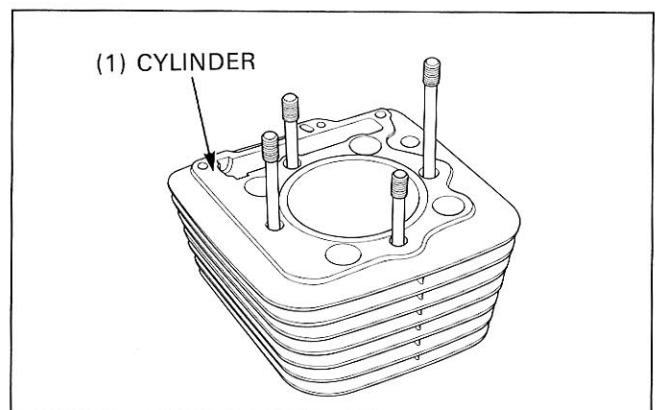
Remove the dowel pins and gasket.



Clean the top of the cylinder thoroughly.

CAUTION

- *Avoid damaging the gasket surfaces.*



CYLINDER/PISTON

CYLINDER INSPECTION

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

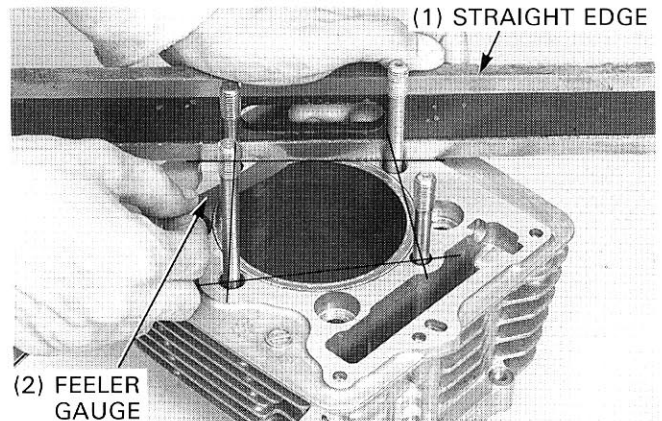
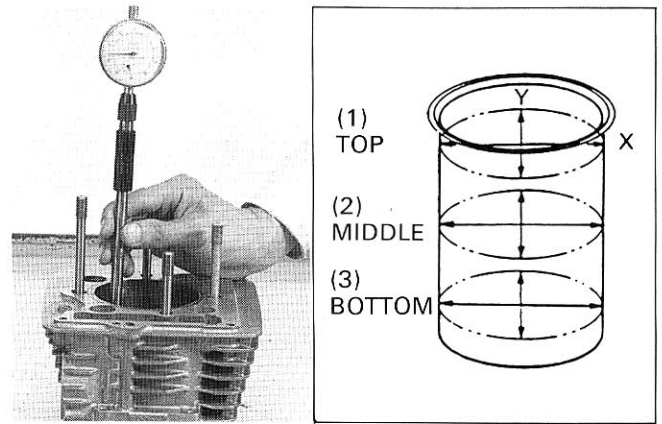
SERVICE LIMIT: 85.10 mm (3.350 in)

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

SERVICE LIMIT: Taper: 0.05 mm (0.002 in)
Out of round: 0.05 mm (0.002 in)

Check the cylinder for warpage by placing a straight edge and a feeler gauge across the studs and bolt holes as shown.

SERVICE LIMIT: 0.10 mm (0.004 in)



PISTON REMOVAL

NOTE

- Place a clean shop towel over the crankcase to prevent the possibility of the clip falling into the crankcase.

Remove the piston pin clip using the pair of pliers.

Remove the piston pin out and remove the piston.

Inspect the piston rings for movement by pressing the rings. The rings should be able to move in its groove without catching.

Spread each piston ring and remove it by lifting it up at a point just opposite the gap.

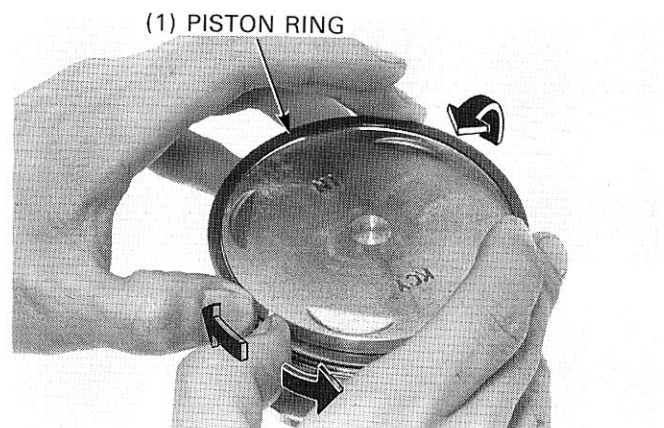
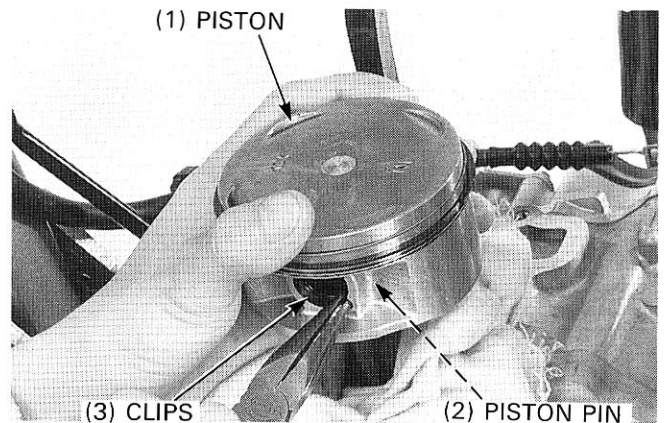
CAUTION

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

Clean carbon deposits from the piston.

NOTE

- Clean carbon deposits from the pin grooves with a ring that will be discarded. Never use the wire brush; it will scratch the groove.



PISTON/PISTON RING INSPECTION

Measure and record the piston O.D.

NOTE

- Take measurements 15 mm (0.6 in) from the bottom and at 90° to the piston pin hole.

SERVICE LIMIT: 84.880 mm (3.3417 in)

Calculate the cylinder-to-piston clearance (cylinder I.D.: see previous page).

SERVICE LIMIT: 0.10 mm (0.004 in)

Measure and record the piston pin hole I.D. in an X and Y axis. Take the maximum reading to determine the I.D.

SERVICE LIMIT: 20.060 mm (0.7898 in)

Measure and record the piston pin O.D. at three points.

SERVICE LIMIT: 19.964 mm (0.7860 in)

Calculate the piston-to-piston pin clearance by subtracting the piston pin O.D. from the piston pin hole I.D.

SERVICE LIMIT: 0.096 mm (0.0038 in)

Measure and record the connecting rod small end I.D.

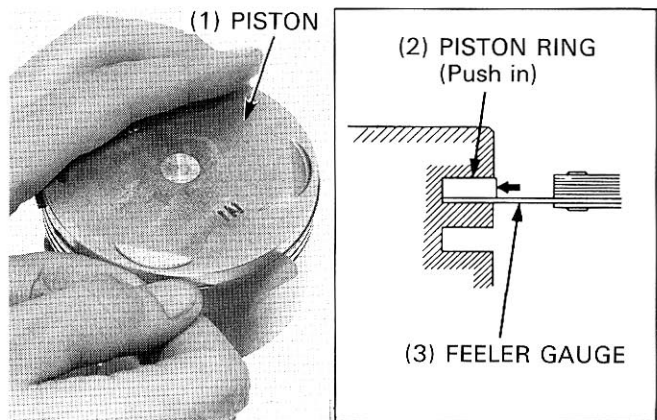
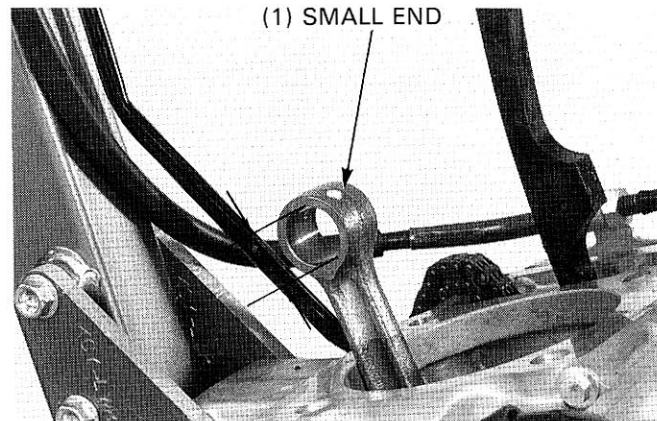
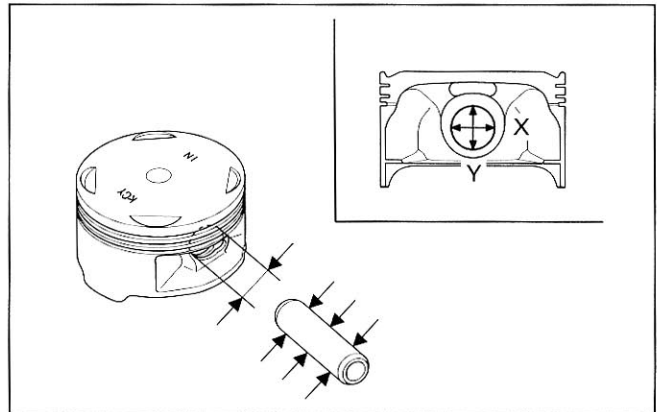
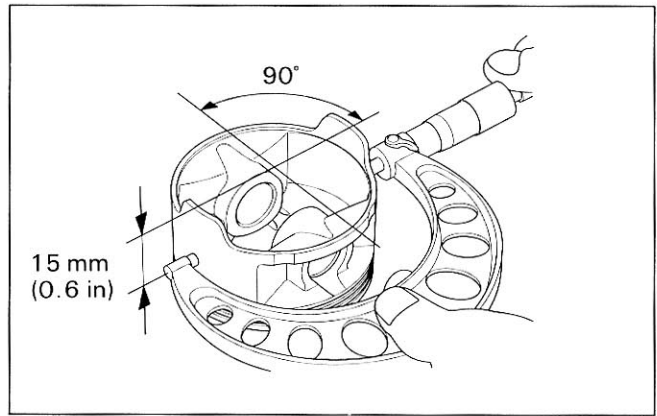
SERVICE LIMIT: 20.067 mm (0.7900 in)

Calculate the connecting rod-to-piston pin clearance by subtracting the piston pin O.D. from the small end I.D.

SERVICE LIMIT: 0.103 mm (0.0041 in)

Push the ring until the outer surface of the piston ring is nearly flush with the piston and measure the clearance using a feeler gauge.

**SERVICE LIMITS: Top: 0.14 mm (0.006 in)
Second: 0.12 mm (0.005 in)**

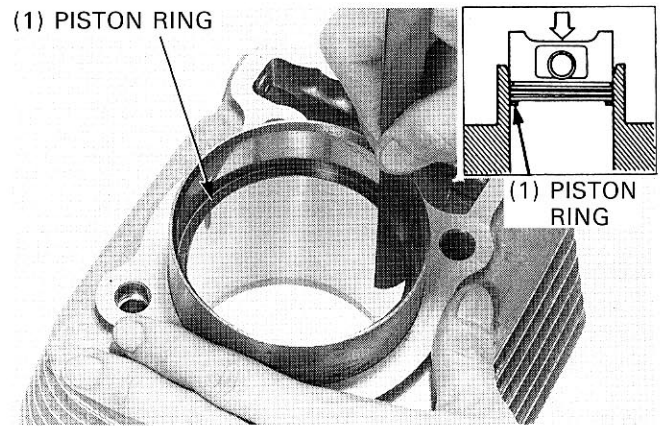


CYLINDER/PISTON

Insert the piston ring into the bottom of the cylinder squarely using the piston as shown.

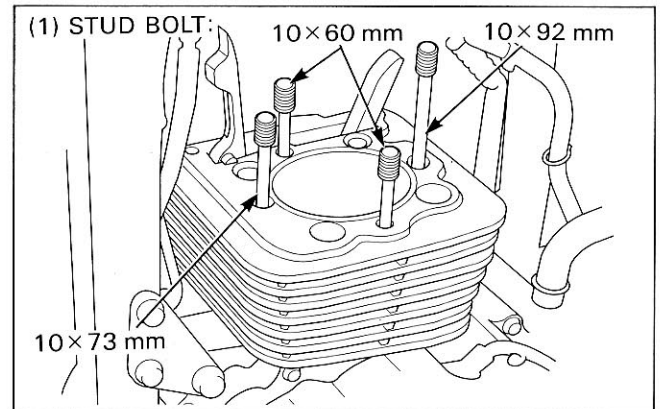
Measure the end gap using a feeler gauge.

SERVICE LIMIT: Top: 0.50 mm (0.020 in)
Second: 0.65 mm (0.026 in)
Oil: 0.9 mm (0.04 in)



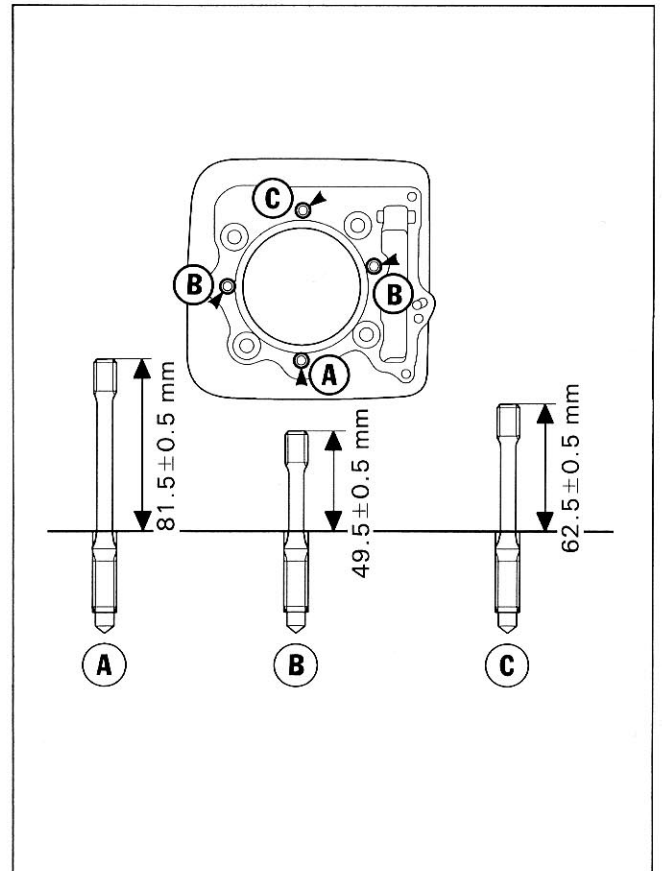
CYLINDER STUD BOLT REPLACEMENT

If you will replace the stud bolts, remove the stud bolts from the cylinder.



Install the stud bolts.

After installing, be sure to measure the distance from top of each stud to the crankcase surface as shown.



PISTON RING INSTALLATION

CAUTION

- Be careful not to damage the piston and rings during assembly.

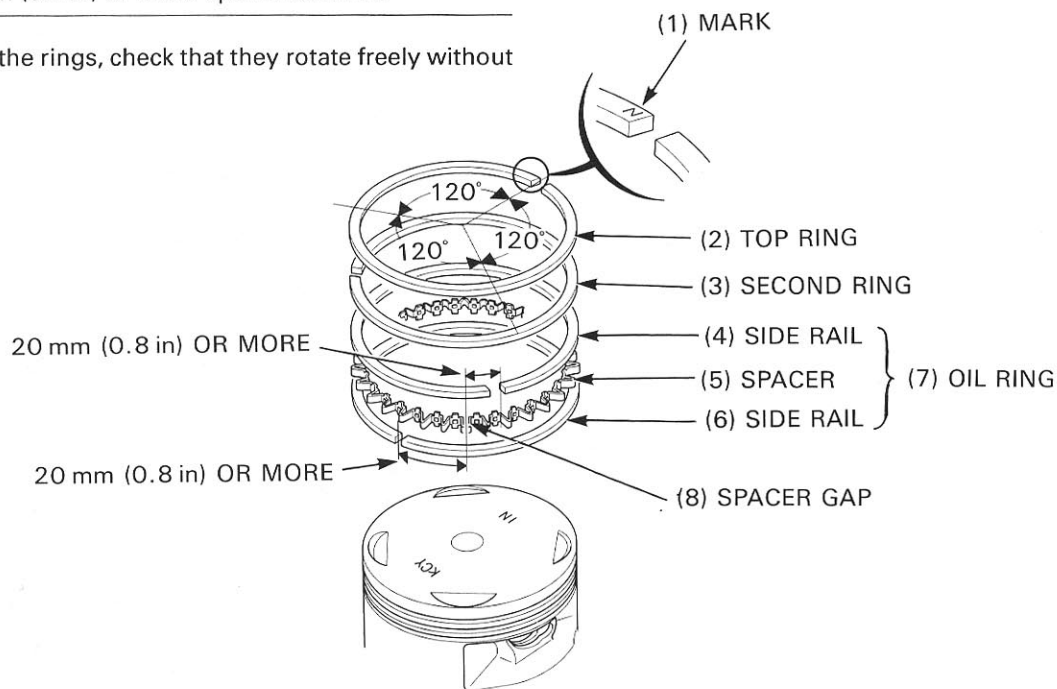
Clean the piston head, ring lands and skirt.

Carefully install the piston rings onto the piston with the markings facing up.

NOTE

- Do not confuse the top and second rings.
- To install the oil ring, install the spacer first, then install the side rails.
- Stagger the ring end gaps 120° and space the side rail gaps 20 mm (0.8 in) or more apart as shown.

After installing the rings, check that they rotate freely without sticking.



PISTON INSTALLATION

NOTE

- Place a clean shop towel over the crankcase to prevent the clip falling into the crankcase.

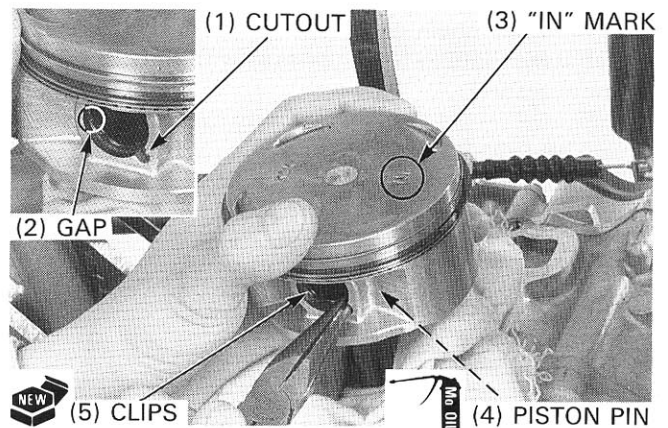
Apply molybdenum oil solution to the piston pin outer surface and connecting rod inner surface.

Set the piston over the connecting rod with the "IN" mark facing towards the intake side and install the piston pin through the piston and connecting rod.

Install new piston pin clips.

NOTE

- Make sure that the piston pin clips are seated properly and their end gaps are not aligned with the cutout in the piston.



CYLINDER INSTALLATION

Clean the gasket surface of the crankcase thoroughly, being careful not to damage it, and careful not to allow gasket material into the crankcase.

Install a new gasket and the two dowel pins.

Apply engine oil to the cylinder wall, piston and piston ring outer surfaces.

Coat a new O-ring with engine oil and install it into the groove in the cylinder bottom.

CAUTION

- *Be careful not to damage the piston rings and cylinder wall.*

Route the cam chain through the cylinder and install the cylinder over the piston while compressing the piston rings with your fingers.

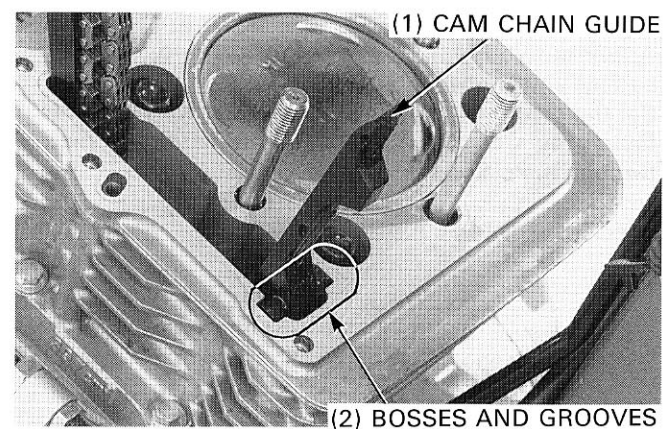
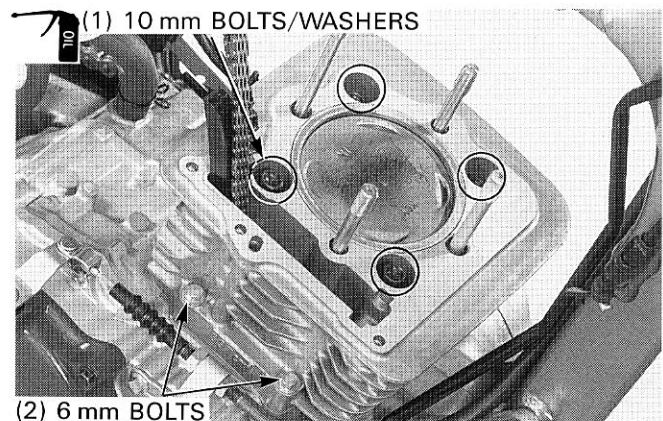
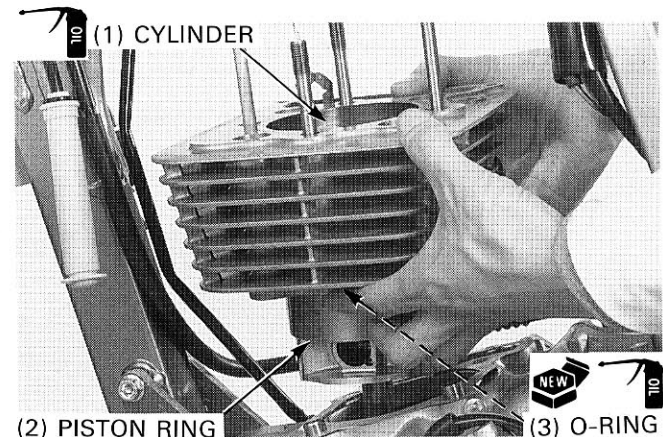
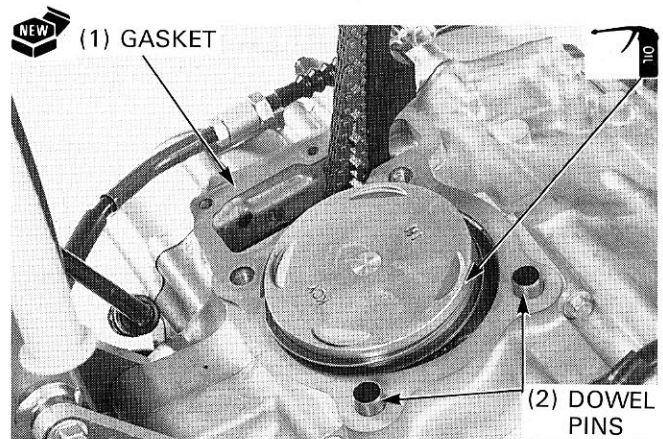
Apply engine oil to the 10 mm bolt threads and seating surface.

Install the two 6 mm bolts and four 10 mm with the washers. Tighten all bolts in crisscross pattern in 2 – 3 steps.

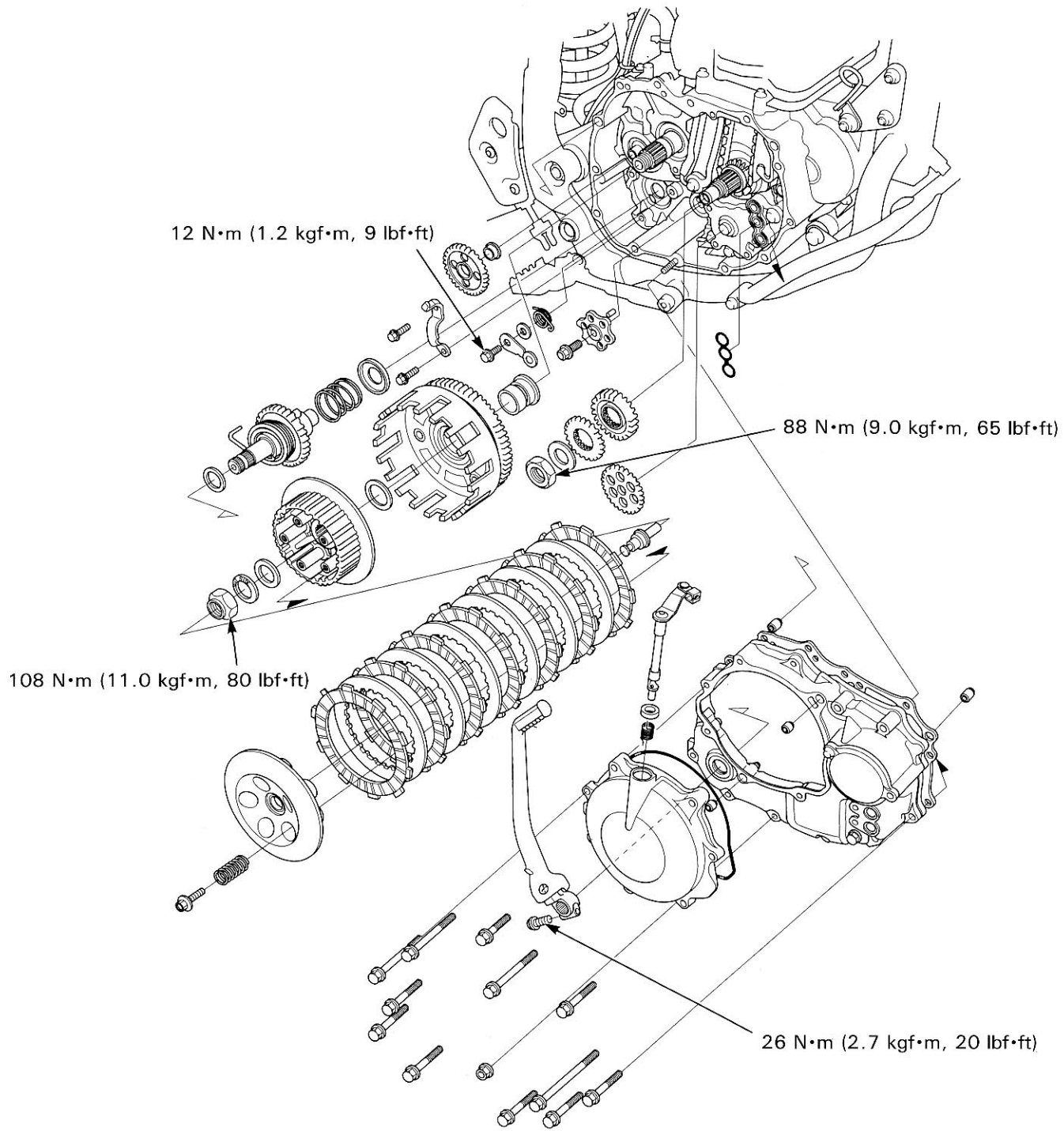
TORQUE: 10 mm: 44 N·m (4.5 kgf·m, 33 lbf·ft)

Insert the cam chain guide into cylinder and crankcase and install it by aligning the its bosses with the grooves in the cylinder securely.

Install the cylinder head (page 7-19)



CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE



9. CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

SERVICE INFORMATION	9-1	RIGHT CRANKCASE COVER	9-11
TROUBLESHOOTING	9-2	PRIMARY DRIVE GEAR	9-13
CLUTCH REMOVAL	9-3	KICKSTARTER	9-14
CLUTCH INSTALLATION	9-7	GEARSHIFT LINKAGE	9-18

SERVICE INFORMATION

GENERAL

- The clutch, kickstarter and gearshift linkage parts can be serviced with the engine installed in the frame.
- Engine oil viscosity and level and the use of oil additives have an effect on clutch disengagement. Oil additives of any kind are specifically not recommended. When the clutch does not disengage or the motorcycle creeps with the clutch disengaged, inspect the engine oil viscosity and level before servicing the clutch system.
- The crankcase must be separated when the transmission, shift drum and shift forks require service (section 11).
- The clutch plates/discs can be serviced without removing the right crankcase cover.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Clutch	Clutch lever free play	10 – 20 (3/8 – 3/4)	—	
	Clutch spring free length	'96:	45.5 (1.79)	
		After '96:	43.2 (1.70)	
	Clutch disc thickness		2.92 – 3.08 (0.115 – 0.121)	2.69 (0.106)
	Clutch plate warpage		—	0.30 (0.012)
	Clutch outer I.D.		28.000 – 28.021 (1.1024 – 1.1032)	28.04 (1.104)
	Clutch outer guide	I.D.	22.010 – 22.035 (0.8665 – 0.8675)	22.05 (0.868)
		O.D.	27.959 – 27.980 (1.1007 – 1.1016)	27.90 (1.098)
Mainshaft O.D. at clutch outer guide		21.959 – 21.980 (0.8645 – 0.8654)	21.91 (0.863)	
Kickstarter	Kickstarter pinion gear I.D.		22.020 – 22.041 (0.8669 – 0.8678)	
	Kickstarter spindle O.D.		21.959 – 21.980 (0.8645 – 0.8654)	
	Kickstarter idle gear I.D.		19.010 – 19.034 (0.7484 – 0.7494)	
	Idle gear bushing	I.D.	14.000 – 14.018 (0.5512 – 0.5519)	
		O.D.	18.959 – 18.980 (0.7464 – 0.7472)	
Countershaft O.D. at idle gear		13.966 – 13.984 (0.5498 – 0.5506)	13.93 (0.548)	

TORQUE VALUES

Kickstarter pedal pinch bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)
Clutch center lock nut	108 N·m (11.0 kgf·m, 80 lbf·ft) Apply oil to the threads and seating surface. Stake.
Gearshift drum stopper arm pivot bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Primary drive gear nut	88 N·m (9.0 kgf·m, 65 lbf·ft) Apply oil to the threads and seating surface.

TOOLS

Clutch center holder	07724 – 0050002 or equivalent commercially available in U.S.A.
Gear holder	07724 – 0010100 not available in U.S.A.
Driver	07749 – 0010000
Attachment, 32×35mm	07746 – 0010100
Pilot, 17 mm	07746 – 0040400

TROUBLESHOOTING

Clutch lever too hard

- Damaged, kinked or dirty clutch cable
- Improperly routed clutch cable
- Damaged clutch lifter mechanism
- Faulty clutch lifter plate bearing

Clutch will not disengage or motorcycle creeps with clutch disengaged

- Too much clutch lever free play
- Warped plate
- Loose clutch center lock nut
- Improper engine oil viscosity or oil additive used

Clutch slips

- No clutch lever free play
- Clutch lifter sticking
- Worn clutch discs
- Weak clutch springs
- Oil additive used

Hard to shift

- Improper clutch operation
- Incorrect engine oil viscosity
- Incorrect clutch adjustment
- Bent or damaged gearshift spindle
- Damaged shift drum grooves
- Bent shift forks or fork shaft (section 11)

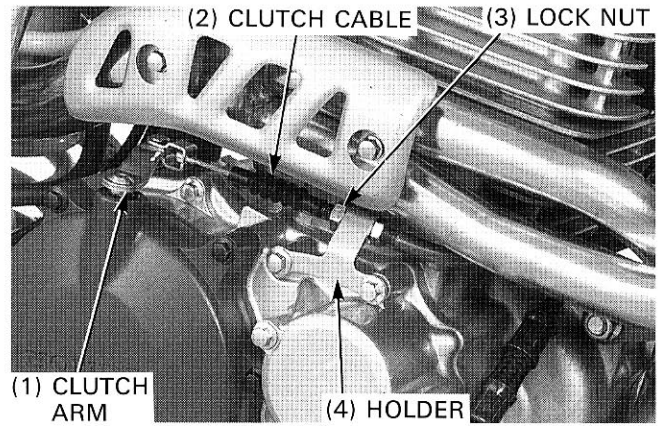
Transmission jumps out of gear

- Broken shift drum stopper arm
- Broken shift linkage return springs
- Damaged shift drum cam grooves
- Bent shift fork shaft (section 11)
- Worn or bent shift forks (section 11)
- Worn gear dogs or slots (section 11)

CLUTCH REMOVAL

NOTE

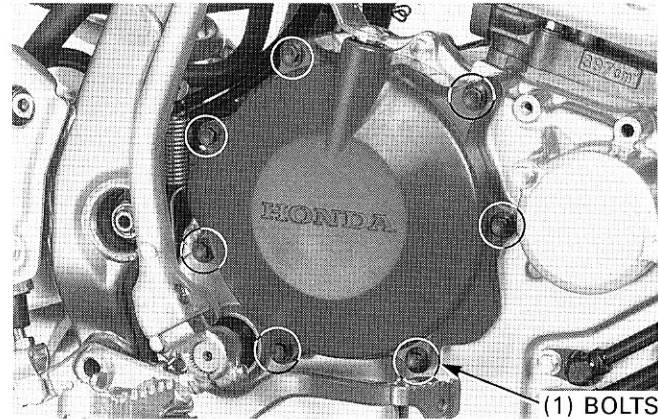
- All clutch components can be serviced by removing the clutch cover. If the gearshift linkage, kickstarter and primary drive gear requires service, remove the right crankcase cover (page 9-11) in the first place and begin on that service.



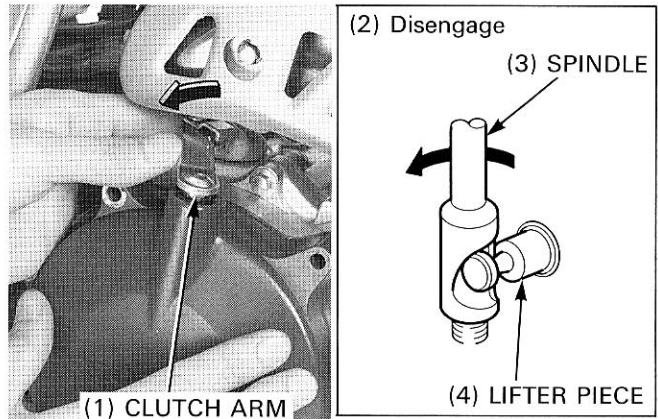
CLUTCH COVER REMOVAL

Loosen the clutch cable lock nut and remove the cable holder by removing the two bolts. Disconnect the clutch cable from the clutch arm.

Remove the clutch cover bolts.

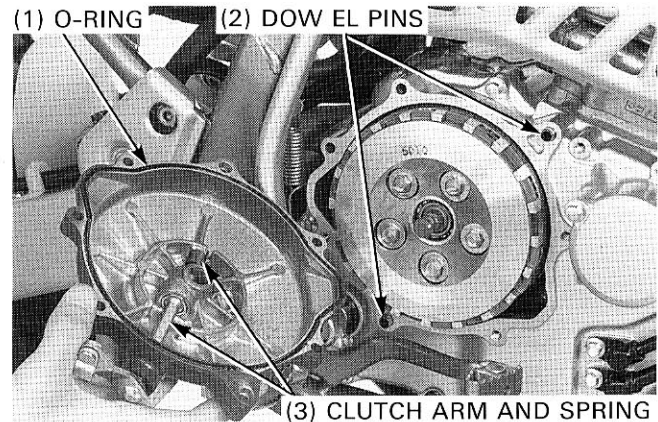


The clutch arm spindle inside the clutch cover is engaged at the lifter piece. Carefully remove the clutch cover while turning the clutch arm counterclockwise to disengage the clutch arm spindle from the lifter piece.



Remove the dowel pins.

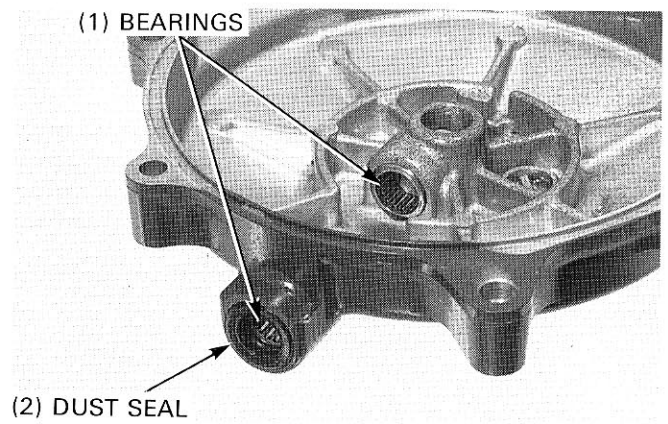
Pull out the clutch arm from the clutch cover and remove the return spring.



CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

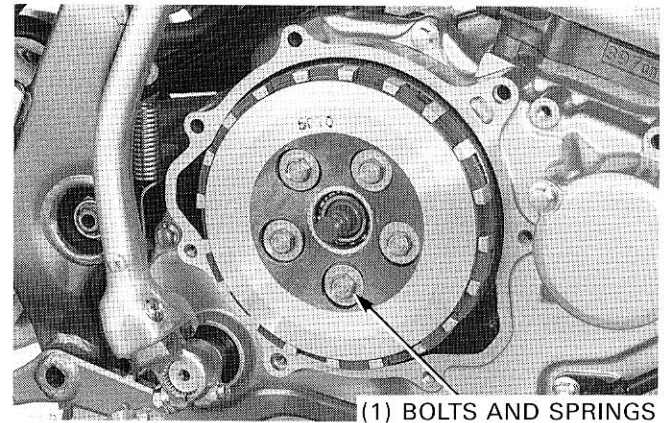
Check the dust seal and bearings for wear or damage.
Check the lifter arm for wear or damage.
Check the return spring for fatigue or damage.

Replace any faulty parts.

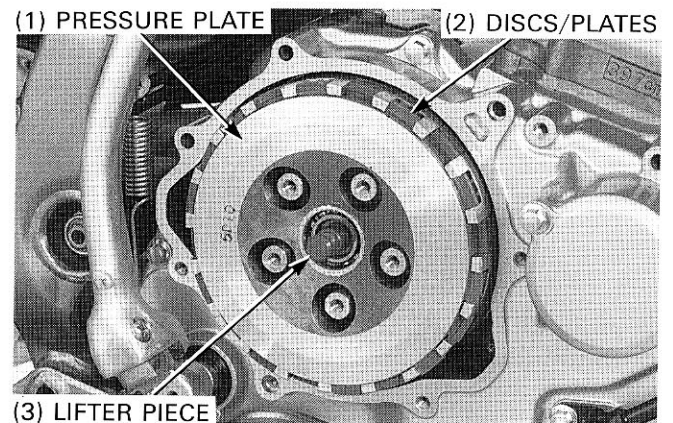


DISASSEMBLY

Loosen the clutch spring bolts in a crisscross pattern in several steps.
Remove the bolts and springs.



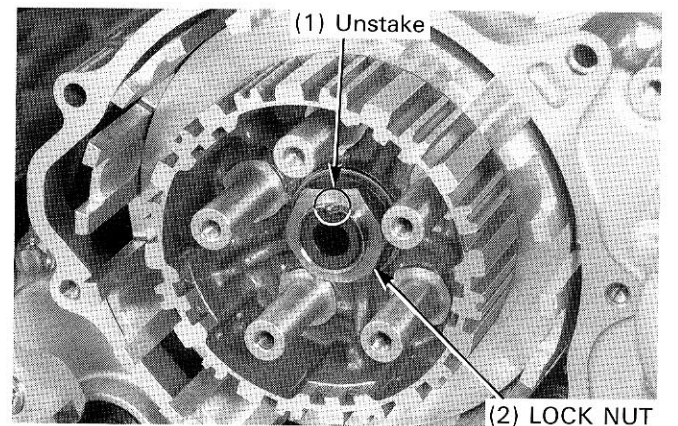
Remove the pressure plate and lifter piece.
Remove the clutch discs and plates.



CAUTION

- *Be careful not to damage the mainshaft threads.*

Unstake the clutch lock nut with a drill or grinder.

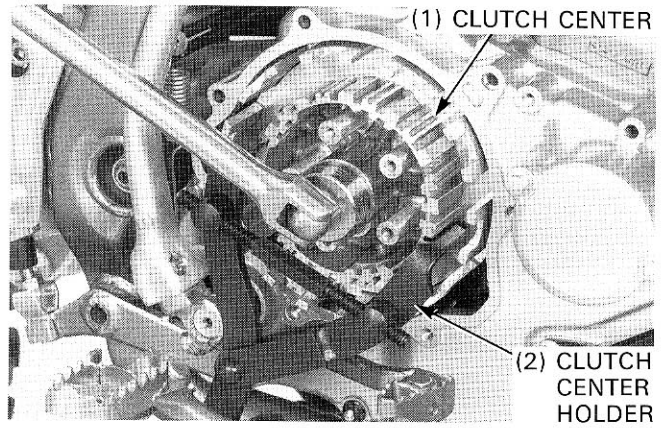


Hold the clutch center with the clutch center holder and loosen the clutch center lock nut.

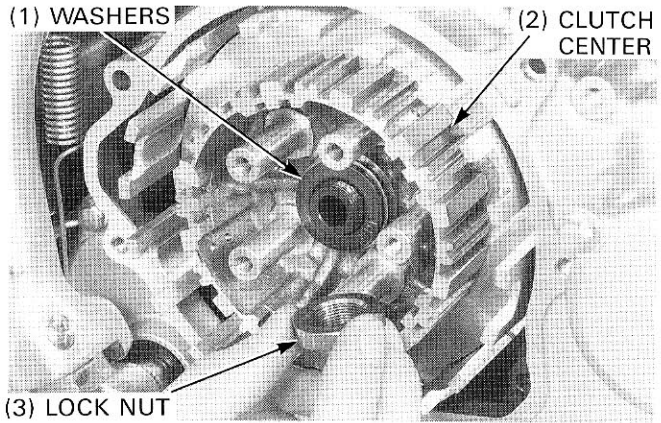
TOOL:

Clutch center holder

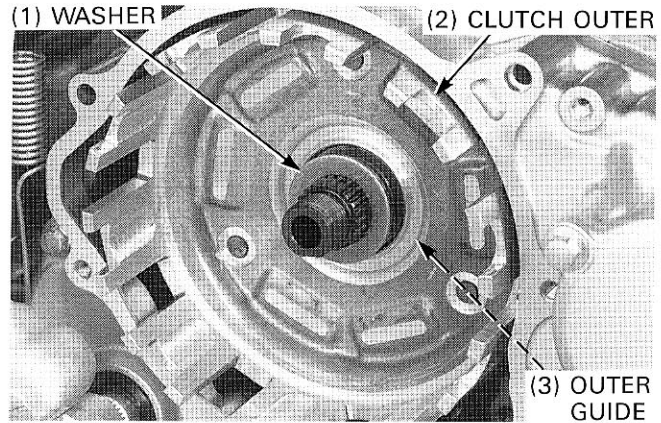
07724 - 0050002 or equivalent commercially available in U.S.A.



Remove the lock nut and two washers. Remove the clutch center.



Remove the thrust washer and clutch outer. Remove the outer guide.



INSPECTION

Pressure Plate Bearing

Check the pressure plate bearing for damage. Turn the bearing inner race with your finger. The bearing should turn smoothly and quietly without play. Also check that the bearing outer race fits tightly in the pressure plate. Replace the bearing if necessary.

TOOLS:

Driver

Attachment, 32 x 35mm

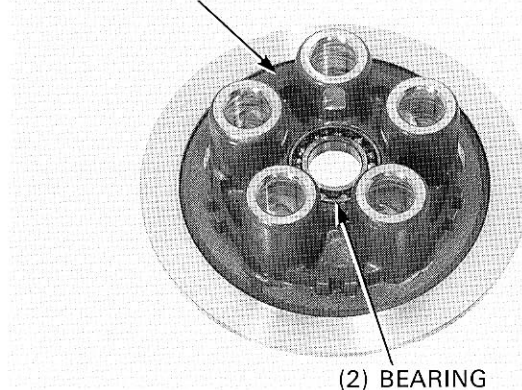
Pilot, 17mm

07749 - 0010000

07746 - 0010100

07746 - 0040400

(1) PRESSURE PLATE



CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

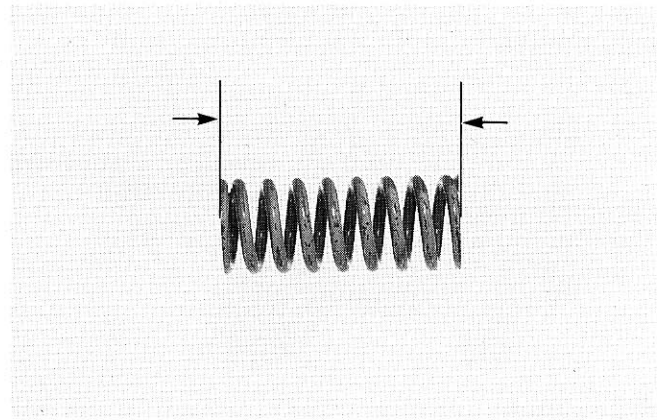
Clutch Spring

Measure the spring free length.

SERVICE LIMIT: '96: 44.5 mm (1.75 in)
After '96: 41.6 mm (1.64 in)

NOTE

- Replace the clutch springs as a set.



Clutch Disc

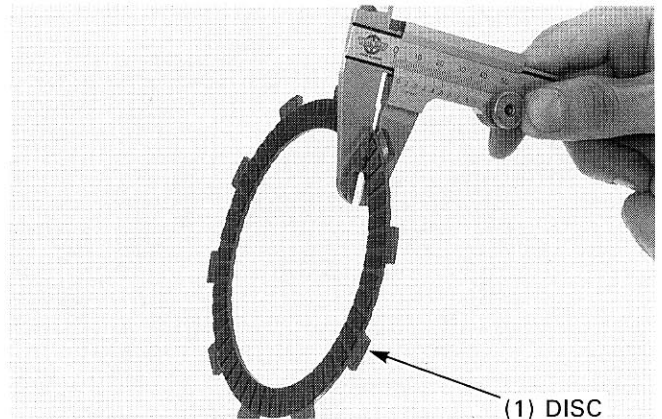
Check the clutch discs for signs of scoring or discoloration.

Measure the clutch disc thickness.

SERVICE LIMIT: 2.69 mm (0.106 in)

NOTE

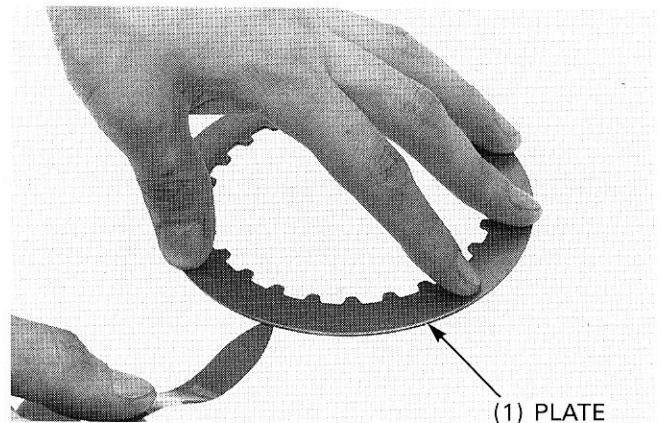
- Replace the discs and plates as a set.



Clutch Plate

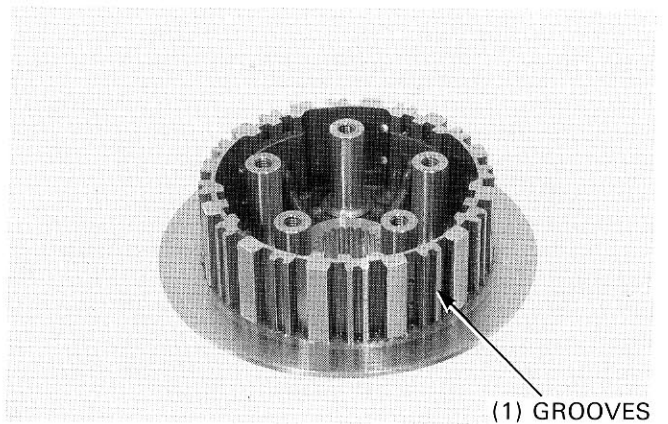
Check the plate for excessive warpage or discoloration.
Check the plate warpage on a surface plate using a feeler gauge.

SERVICE LIMIT: 0.30 mm (0.012 in)



Clutch Center

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



Clutch Outer/Outer Guide

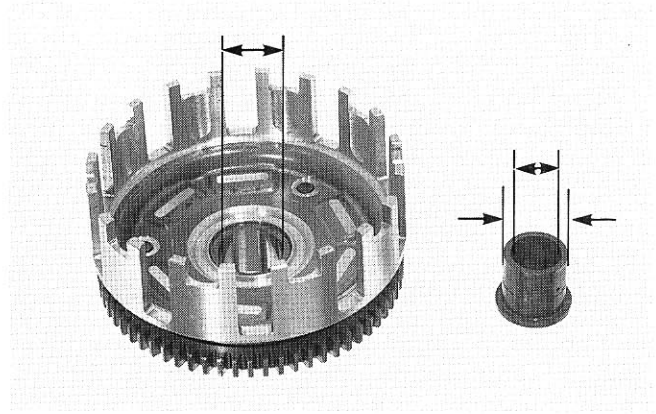
Check the primary driven gear teeth for wear or damage. Check the slots in the clutch outer for nicks, indentations or abnormal wear made by the clutch discs.

Measure the clutch outer I.D.

SERVICE LIMIT: 28.04 mm (1.104 in)

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

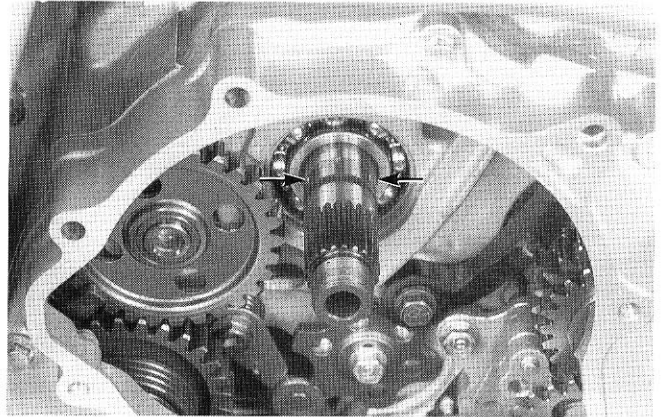
**SERVICE LIMITS: O.D.: 27.90 mm (1.098 in)
I.D.: 22.05 mm (0.868 in)**



Mainshaft

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

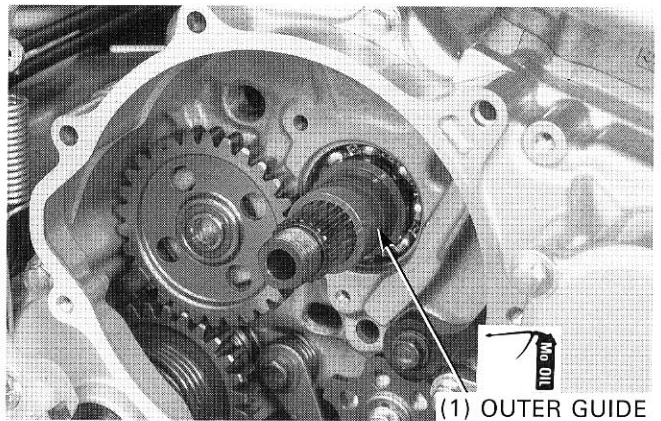
SERVICE LIMIT: 21.91 mm (0.863 in)



CLUTCH INSTALLATION

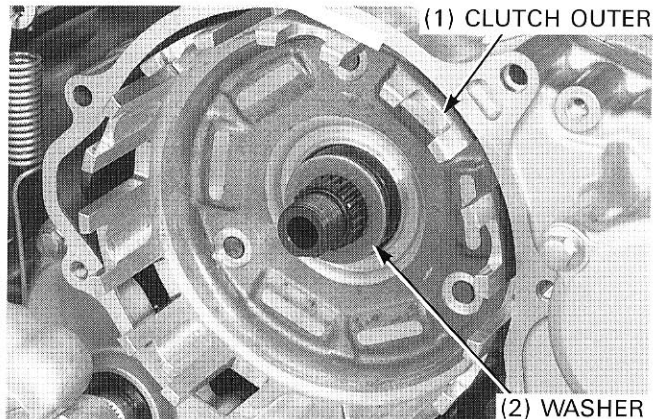
ASSEMBLY

Apply molybdenum oil solution to the inner and outer surface of the clutch outer guide and install it over the mainshaft.



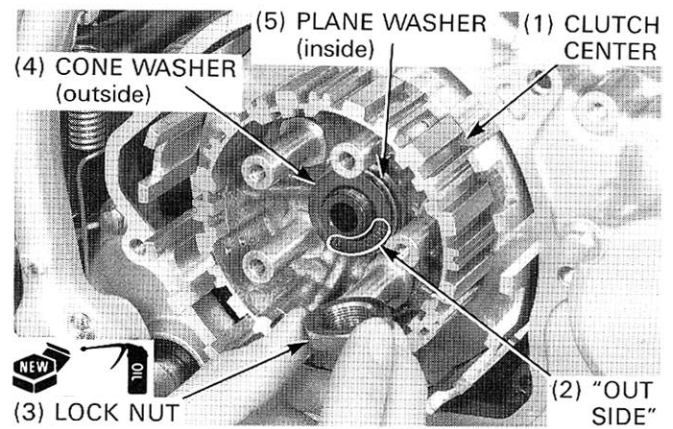
Install the clutch outer by engaging the its primary driven gear with the primary drive gear on the crankshaft and its starter driven gear with the starter idle gear while moving the kickstarter pedal slightly.

Install the thrust washer.



CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

Install the clutch center onto the mainshaft.
 Install the plain washer and cone washer with cone washer's "OUT SIDE" mark facing out.
 Apply engine oil to the threads and seating surface of a new clutch center lock nut and temporarily install it.



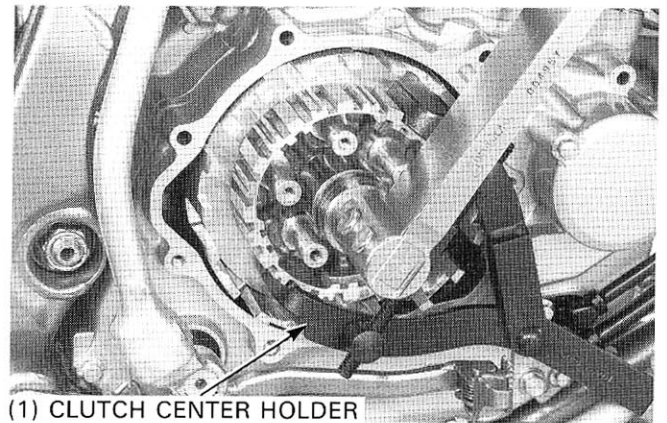
Tighten the lock nut by holding the clutch center with the clutch center holder.

TOOL:

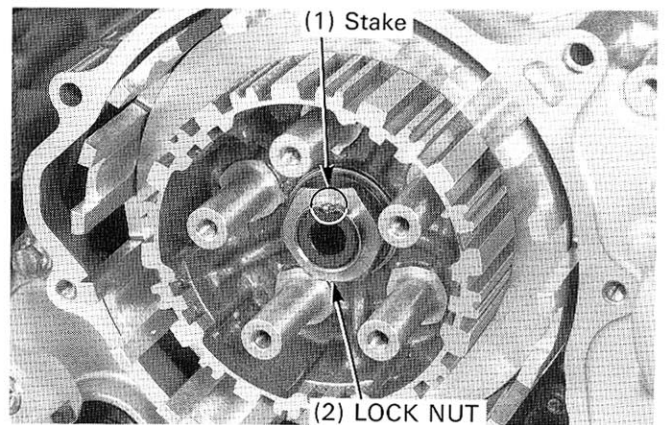
Clutch center holder

07724 - 0050002 or equivalent commercially available in U.S.A.

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

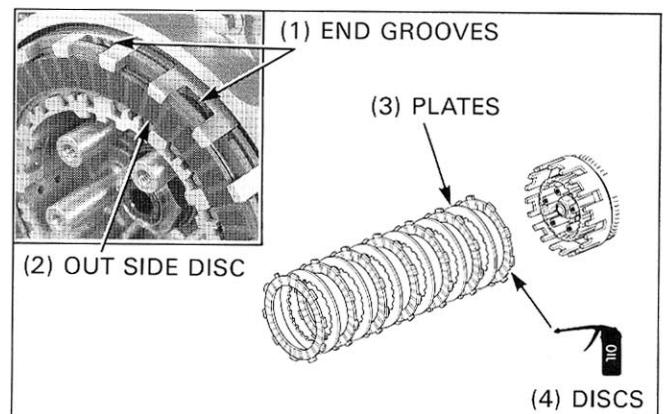


Stake the lock nut into the mainshaft groove.



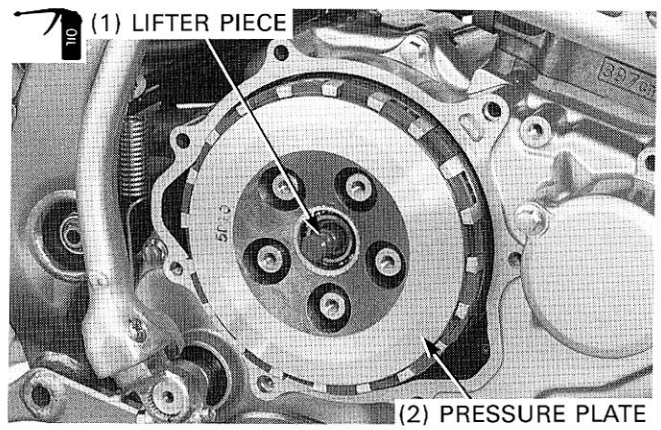
Coat the clutch discs with clean engine oil.

Install the seven clutch discs and six clutch plate alternately, starting with a clutch disc.
 When installing the out side disc only, align the end grooves in the clutch outer with the tabs of the disc.

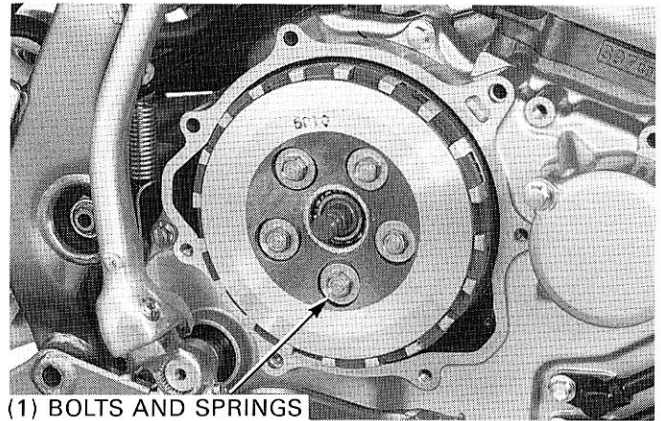


Apply engine oil to the clutch lifter piece whole surface and the bearing in the pressure plate.
Install the lifter piece into the pressure plate bearing with the flange side facing out.

Install the pressure plate.

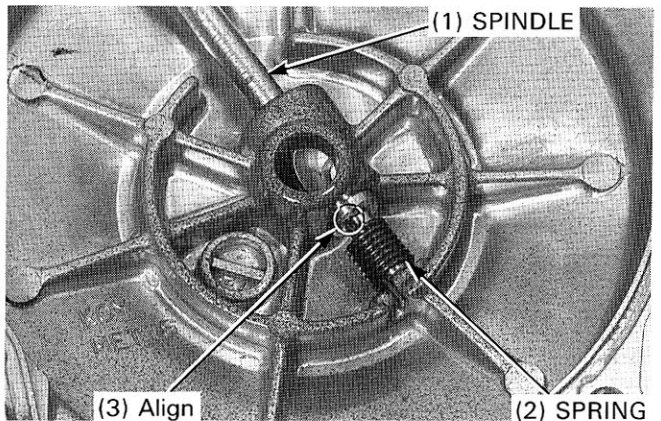


Install the clutch springs and bolts.
Tighten the bolts in a crisscross pattern in several steps.



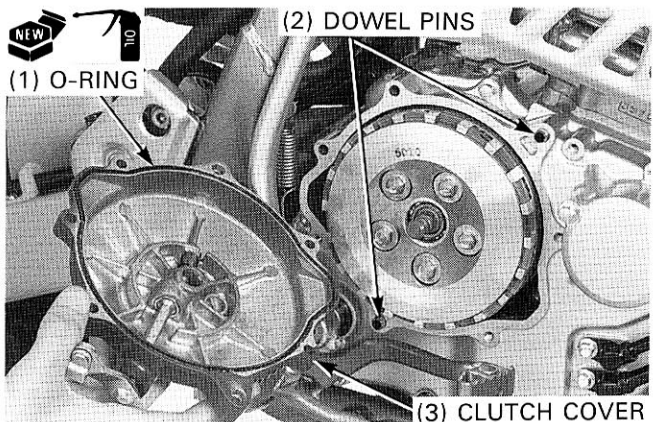
CLUTCH COVER INSTALLATION

Insert the clutch arm into the clutch cover with the return spring, aligning the spring upper end with the hole in the clutch arm spindle.



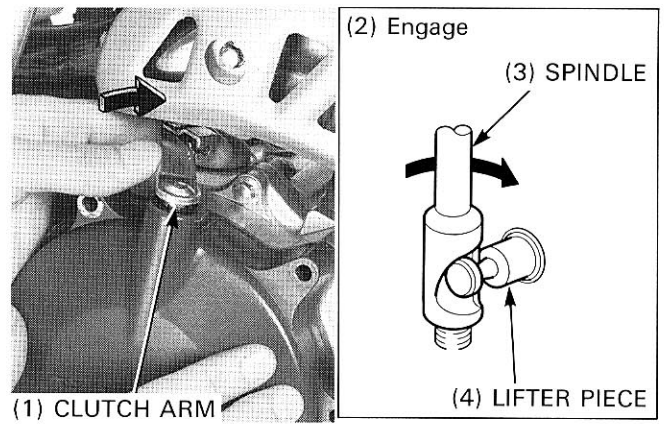
Apply engine oil to a new clutch cover O-ring and install it into the clutch cover groove properly.

Install the two dowel pins into the right crankcase cover.

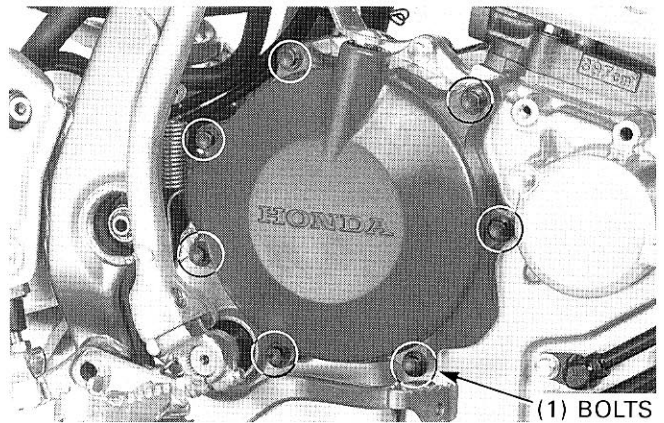


CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

Set the clutch cover onto the right crankcase cover while turning the clutch arm clockwise to engage the cutout in the clutch arm spindle with the lifter piece flange.

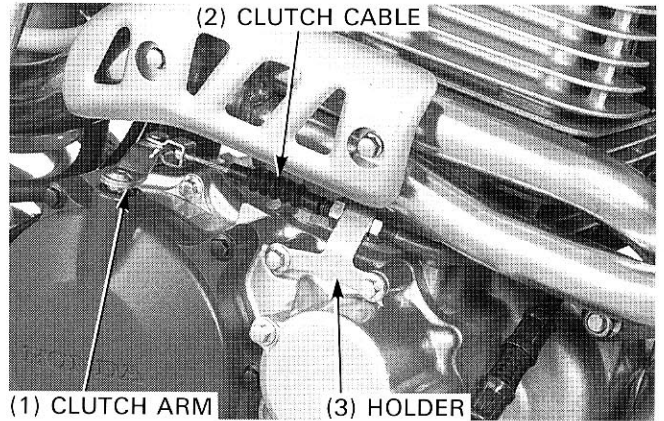


Make sure that the clutch cover is evenly seated on the right crankcase cover and tighten the cover bolts.



Connect the clutch cable to the clutch arm and install the cable holder by tightening the two bolts.

After clutch system service, perform the clutch adjustment (page 3-20).



RIGHT CRANKCASE COVER

REMOVAL

Remove the oil pipes (page 4-7).
Remove the rear brake pedal (page 15-18).

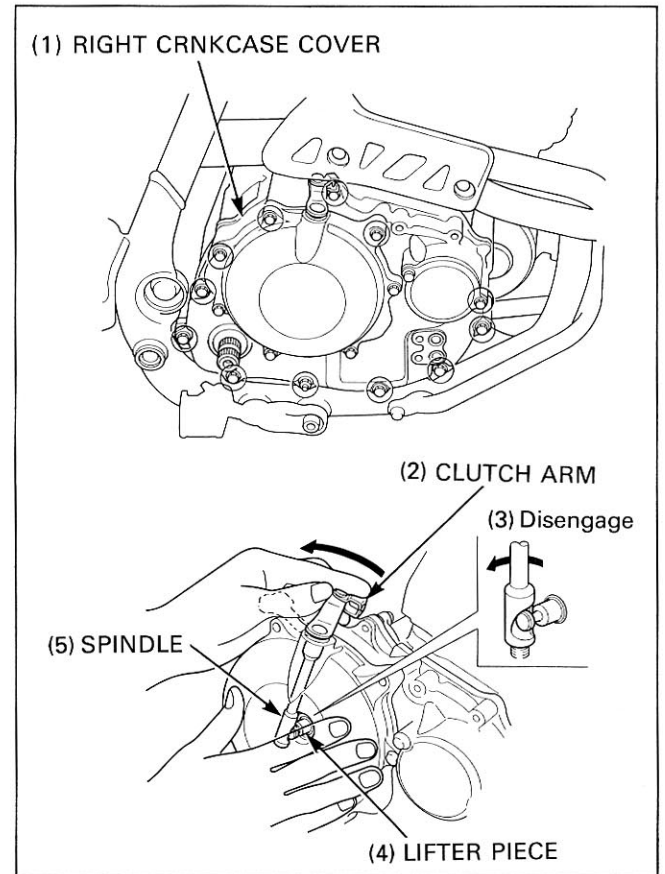
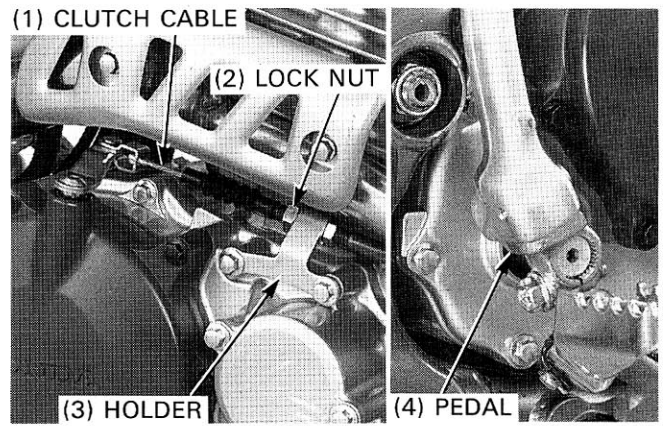
Loosen the clutch cable lock nut and remove the cable holder.
Disconnect the clutch cable from the clutch arm.

Remove the kickstarter pedal.

Remove the cover bolts and nut.

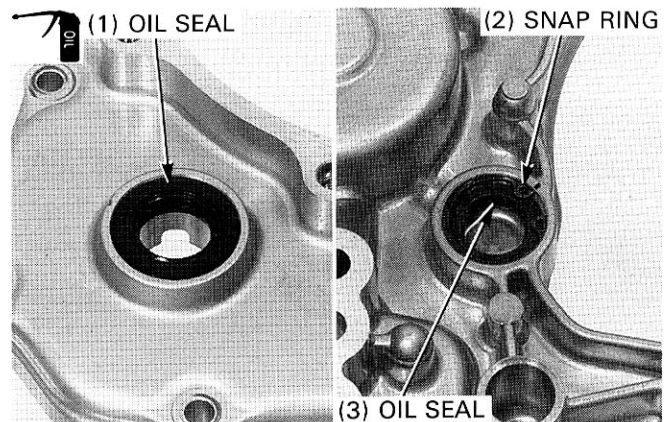
The clutch arm spindle inside the clutch cover is engaged at the clutch lifter piece.
Carefully remove the right crankcase cover from the crankcase while turning the clutch arm counterclockwise to disengage the clutch arm spindle from the lifter piece.

Remove the gasket, dowel pins and O-ring.



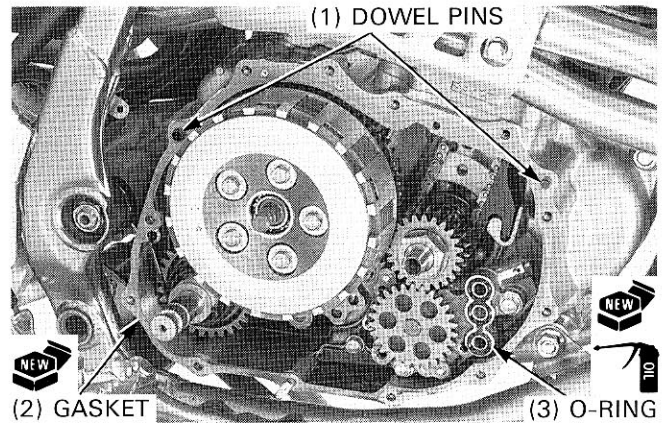
INSTALLATION

Check the oil seal of the kickstarter spindle for wear or damage.
Check the crankshaft oil seal for wear or damage and that the snap ring is seated in the groove securely.

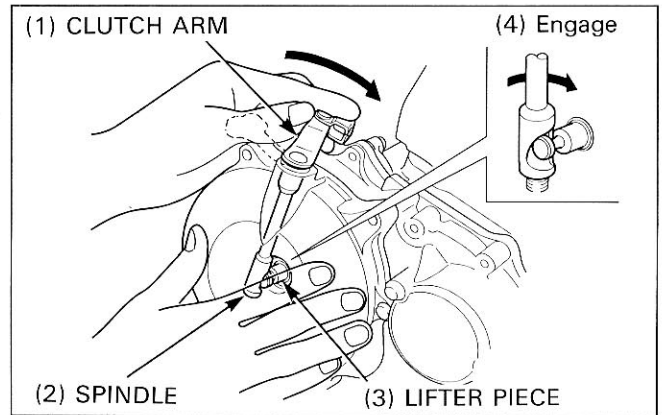


CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

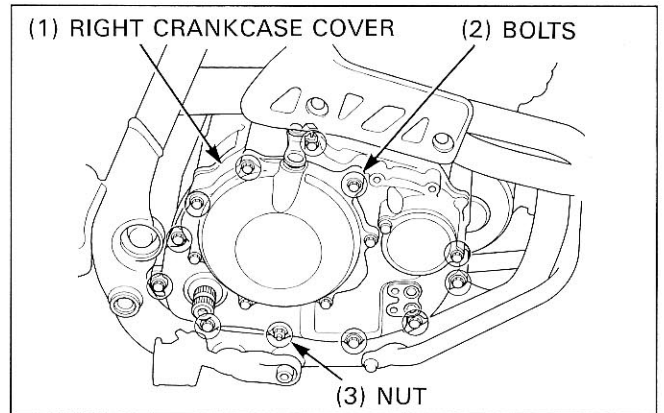
Install the dowel pins into the crankcase and a new gasket. Apply engine oil to a new oil pump O-ring and install it into the groove in the oil pump.



Carefully set the right crankcase cover onto the crankcase while turning the clutch arm clockwise to engage the cutout in the clutch arm spindle with the lifter piece flange.



Install and tighten the cover bolts and nut.



Connect the clutch cable to the clutch arm and install the cable holder by tightening the two bolts.

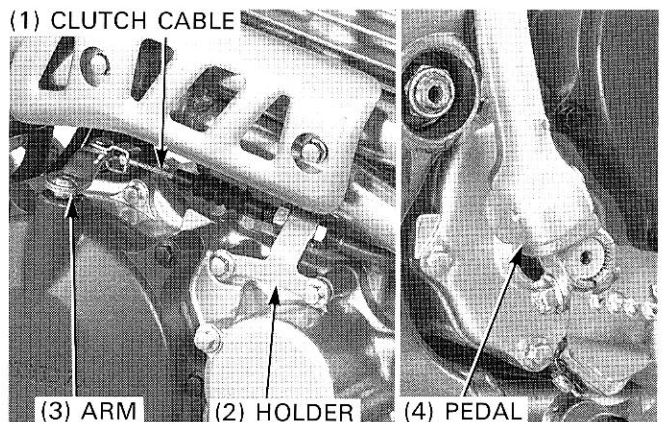
Install the kickstar pedal and tighten the bolts.

TORQUE: 26 N·m (2.7 kgf·m, 20 lbf·ft)

Install the brake pedal (page 15-18).

Install the oil pipes (page 4-7).

After installation, adjust the clutch cable free play (page 3-20).



PRIMARY DRIVE GEAR

REMOVAL

Remove the right crankcase cover (page 9-11).
Remove the clutch components except the clutch outer (page 9-3).

Insert the gear holder as shown.
Loosen the primary drive gear nut and remove the nut and washer.

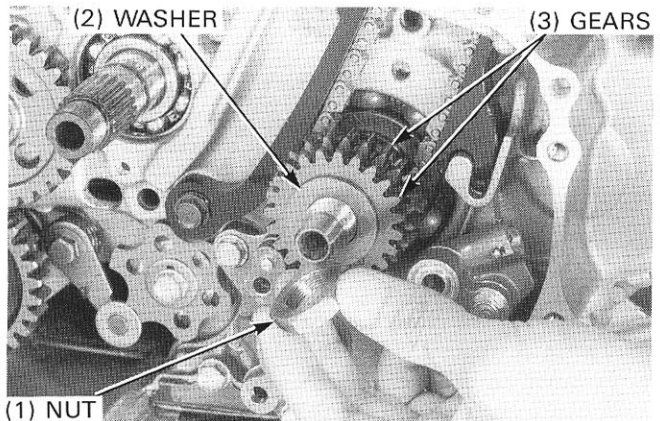
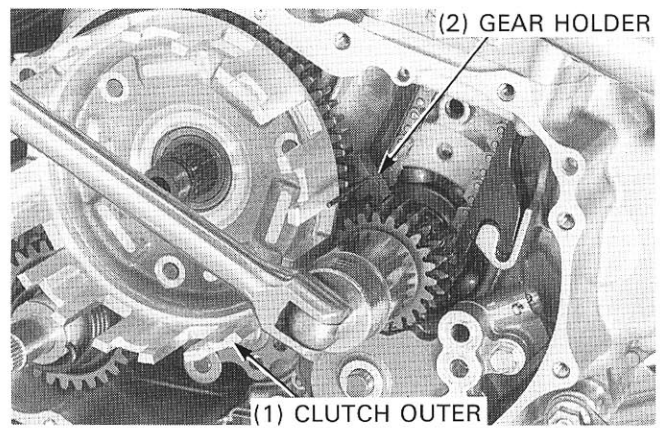
TOOL:

Gear holder

07724 - 0010100
not available in U.S.A.

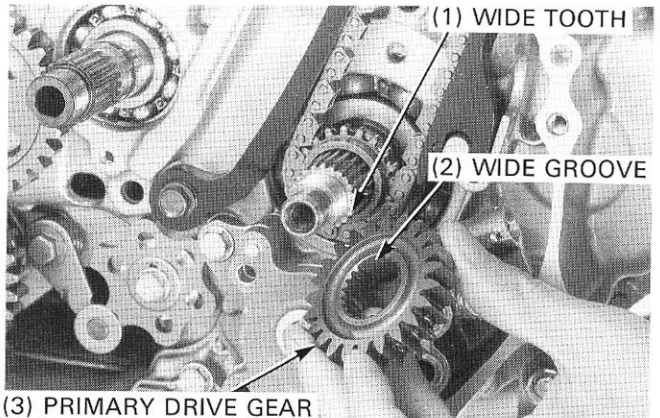
Remove the clutch outer and outer guide.

Remove the oil pump drive gear and primary drive gear from the crankshaft.

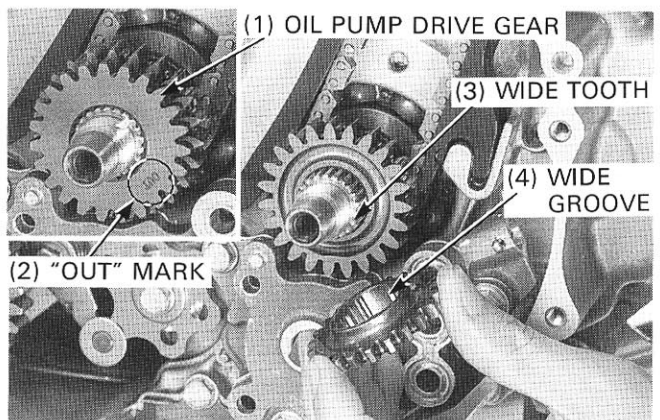


INSTALLATION

Install the primary drive gear, aligning the its wide groove with the wide tooth on the crankshaft (page 11-13).

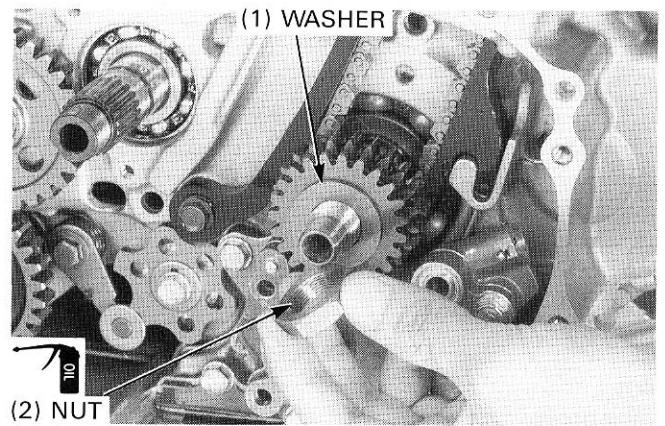


Install the oil pump drive gear with the "OUT" mark facing out by aligning the wide groove with the wide tooth.



CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

Apply engine oil to the threads and seating surface of the primary drive gear nut and install it with the washer.



Remove the oil pump (page 4-2).
Install the clutch outer and outer guide (page 9-7).
Insert the gear holder as shown and tighten the nut.

TOOL:

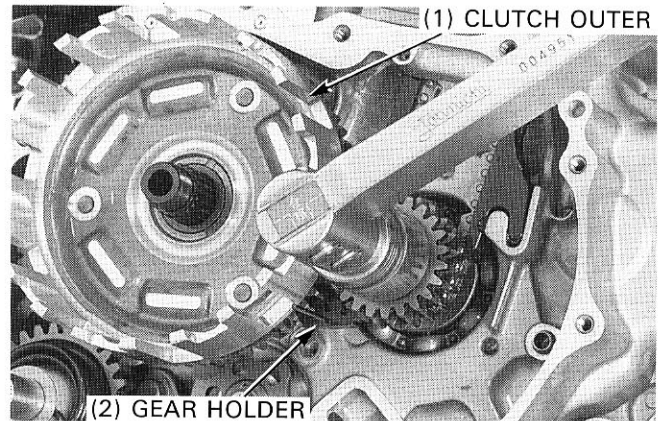
Gear holder

07724 - 0010100
not available in U.S.A.

TORQUE: 88 N·m (9.0 kgf·m, 65 lbf·ft)

Install the following:

- oil pump (page 4-6)
- all clutch components (page 9-7)
- right crankcase cover (page 9-11).



KICKSTARTER

CAUTION

- *Be careful not to damage the mating surface of the crankcase made by the return spring end.*

REMOVAL

Remove the right crankcase cover (page 9-11).

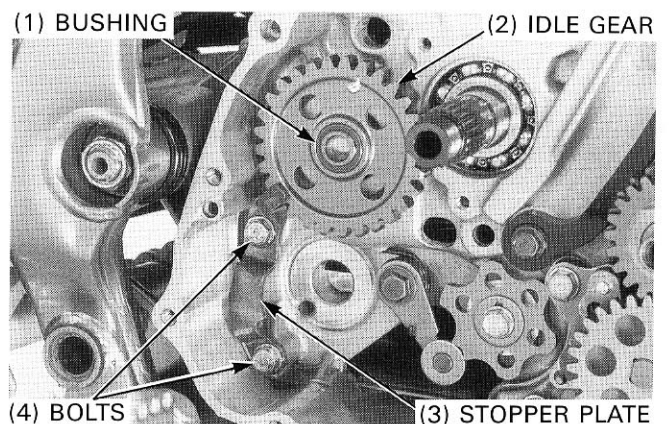
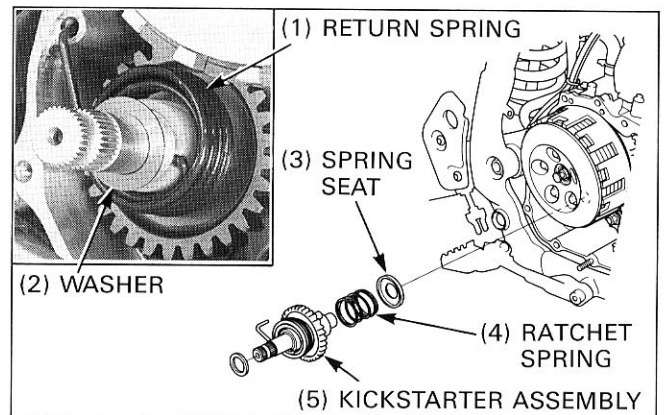
Remove the thrust washer.

Unhook the return spring end from the crankcase and pull the kickstarter spindle assembly out.

Remove the ratchet spring and spring seat.

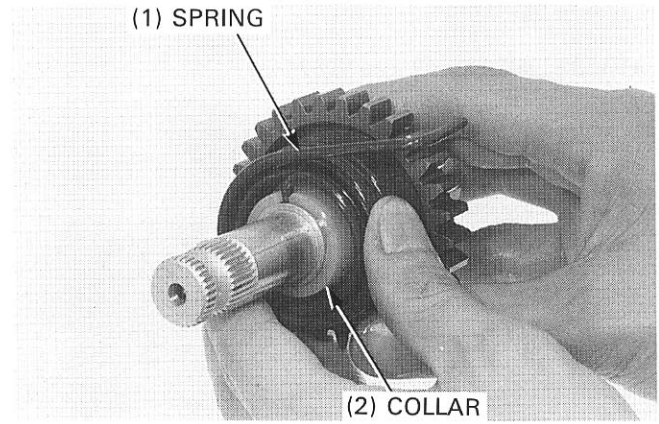
If the starter idel gear requires service, remove all clutch components (page 9-4).

Remove the two bolts and stopper plate.
Remove the idle gear and bushing.



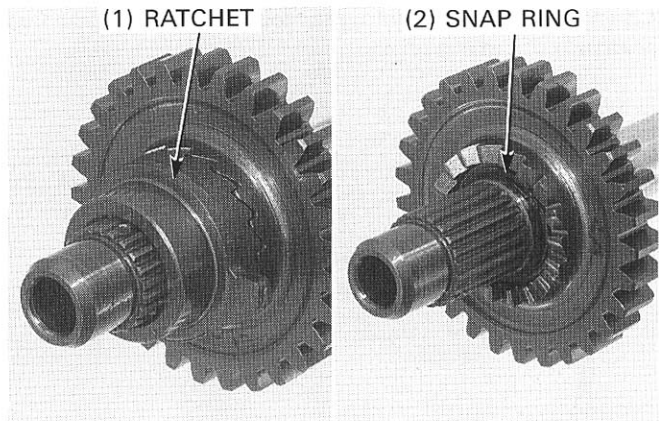
DISASSEMBLY

Remove the return spring from the hole in the spindle and the spring collar.

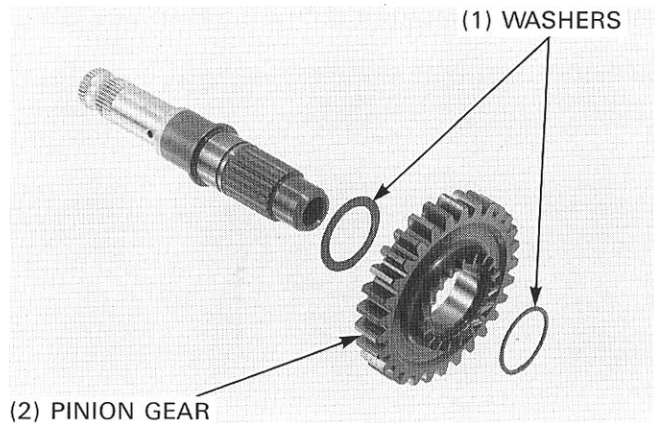


Remove the starter ratchet.

Remove the snap ring.

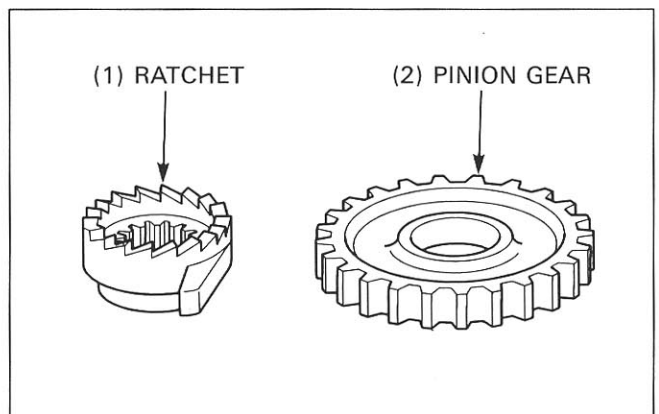


Remove the pinion gear and washers.



INSPECTION

Check the ratchet teeth of the starter ratchet and pinion gear for wear or damage.



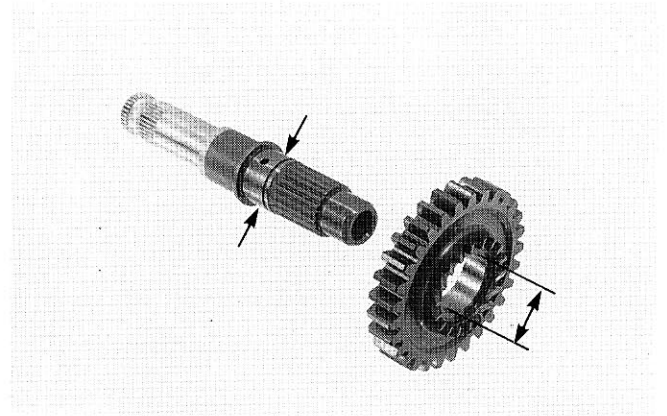
CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

Measure the pinion gear I.D.

SERVICE LIMIT: 22.12 mm (0.871 in)

Measure the kickstarter spindle O.D.

SERVICE LIMIT: 21.91 mm (0.863 in)

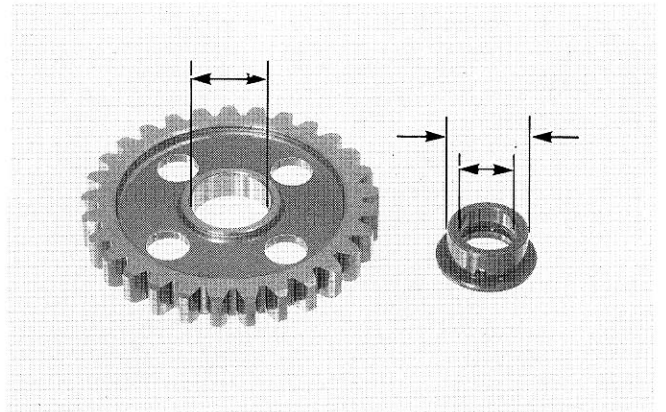


Check the kickstarter idle gear teeth for wear or damage.
Measure the idle gear I.D.

SERVICE LIMIT: 19.13 mm (0.753 in)

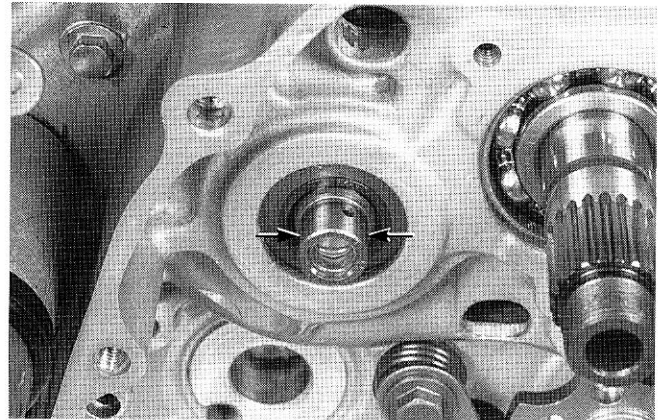
Check the idle gear busing for scoring or damage.
Measure the busing I.D. and O.D.

**SERVICE LIMITS: I.D.: 14.05 mm (0.553 in)
O.D.: 18.92 mm (0.745 in)**

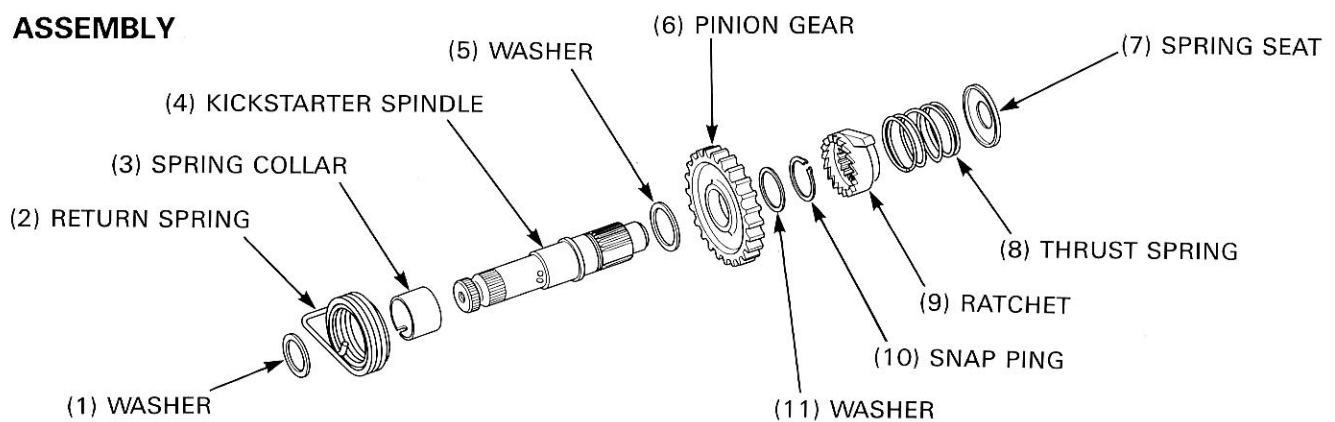


Measure the countershaft O.D. at the kickstarter idle gear.

SERVICE LIMIT: 13.93 mm (0.548 in)



ASSEMBLY

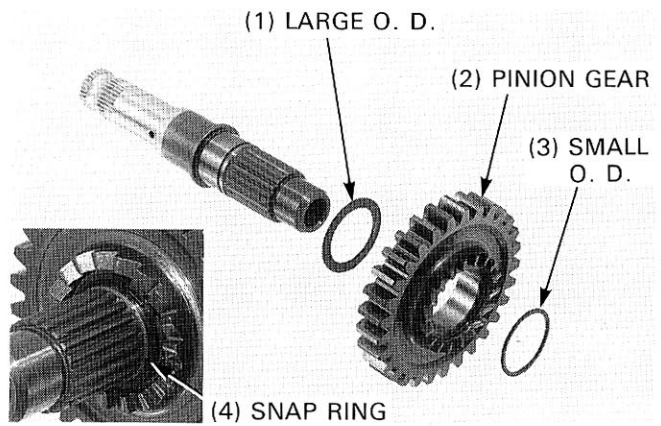


NOTE

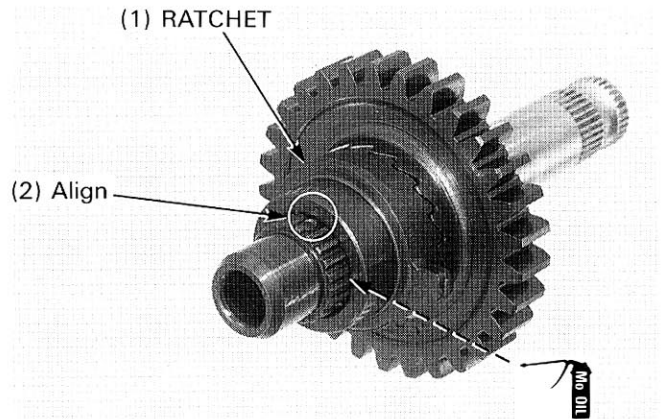
- Always install the washers and snap ring with the chamfered side facing the pinion gear.

Install the large O.D. washer onto spindle flange, and the pinion gear and small O.D. washer.

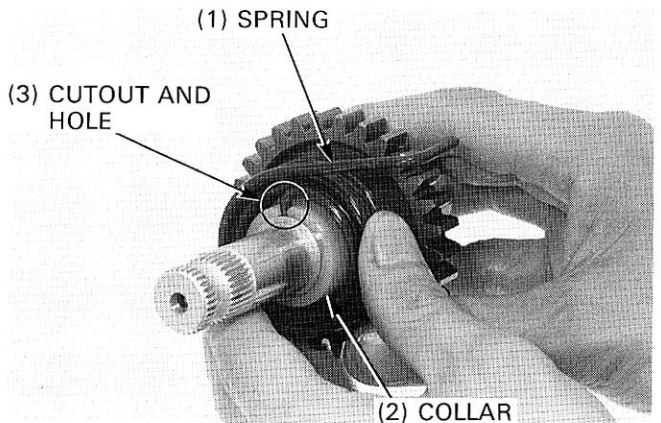
Install the snap ring into the groove in the spindle. Make sure the snap ring is fully seated in the groove.



Apply molybdenum disulfide oil to the spindle splines. Install the starter pinion aligning its punch mark with the stamp on the spindle.



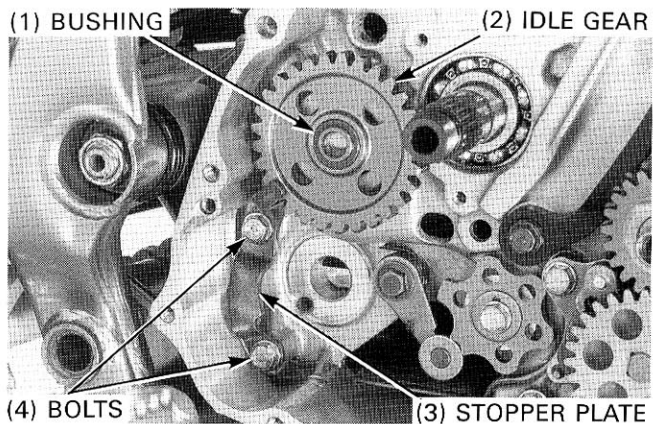
Install the spring collar over the spindle. Align the cutout in the collar with the hole in the spindle and install the return spring into the hole in the spindle as shown.



INSTALLATION

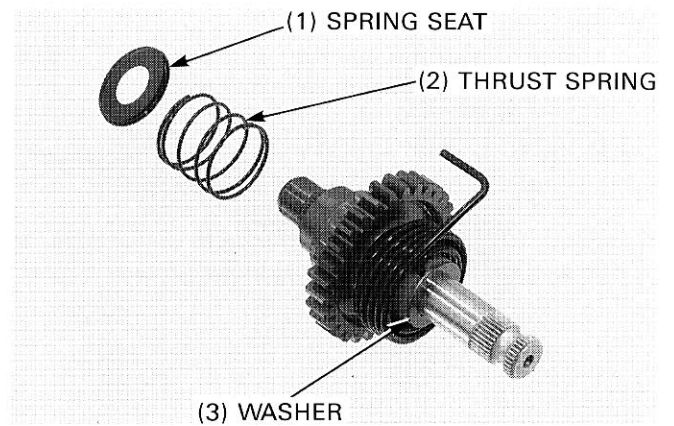
Install the idle gear bushing and idle gear onto the countershaft with the bushing flange facing inside.

Install the stopper plate. Tighten the two bolts.



CLUTCH/KICKSTARTER/GEARSHIFT LINKAGE

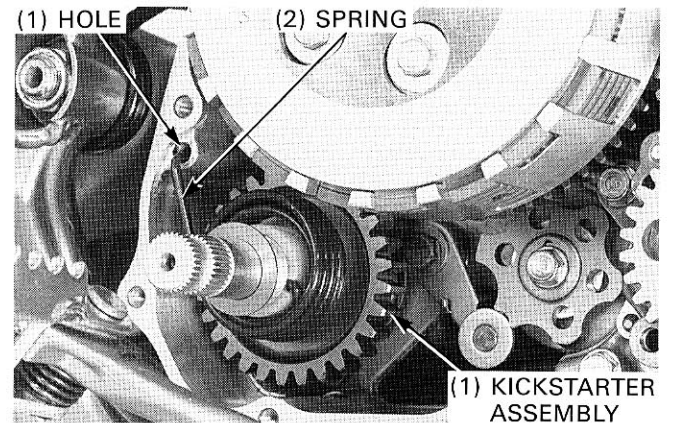
Install the thrust washer onto the spring collar.
Set the thrust spring and spring seat and install the assembly into the crankcase while holding the seat and spring.



Push the kickstarter assembly into the crankcase so that the ratchet guide tab rests against the stopper plate.
Turn the spring end clockwise and hook the return spring into the hole in the crankcase, being careful not to damage the crankcase mating surface.

Install the clutch assembly if the idle gear was removed (page 9-7).

Install the right crankcase cover (page 9-11).



GEARSHIFT LINKAGE

NOTE

- For gearshift spindle, shift forks and drum, refer to section 11.

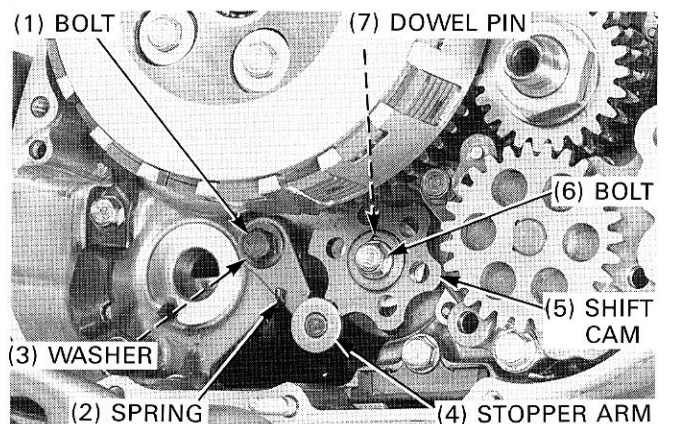
REMOVAL

Remove the right crankcase cover (page 9-11).
Remove the kickstarter spindle (page 9-14).

Remove the following:

- stopper arm bolt
- stopper arm
- washer
- return spring
- shift cam bolt
- shift cam
- dowel pin.

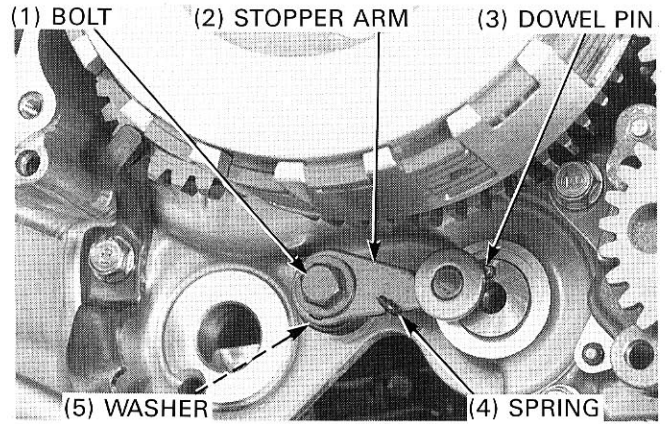
Check the stopper arm and spring for damage.
Check the shift cam for wear or damage.



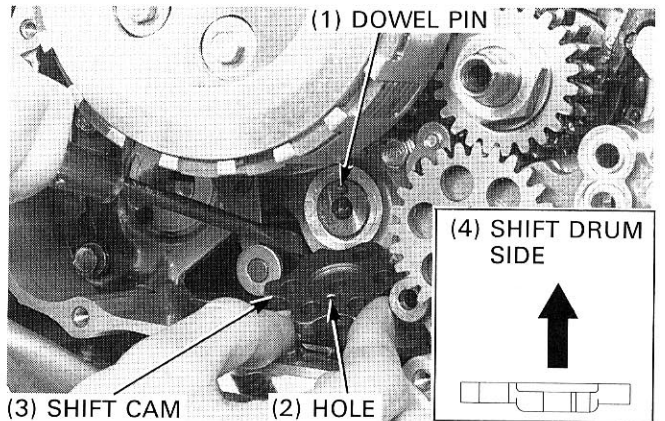
INSTALLATION

Install the dowel pin into the shift drum.

Install the stopper arm with the washer (between the spring and arm) and return spring and temporarily tighten the arm bolt to avoid interfering the arm with the dowel pin.



Install the shift cam by aligning the hole in the cam with the dowel pin while lowering down the stopper arm with a screw driver.



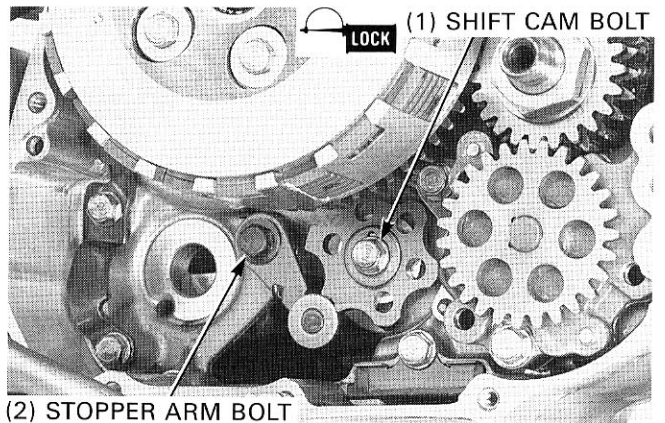
Apply locking agent to the cam bolt threads and tighten it.

Tighten the stopper arm bolt to the specified torque.

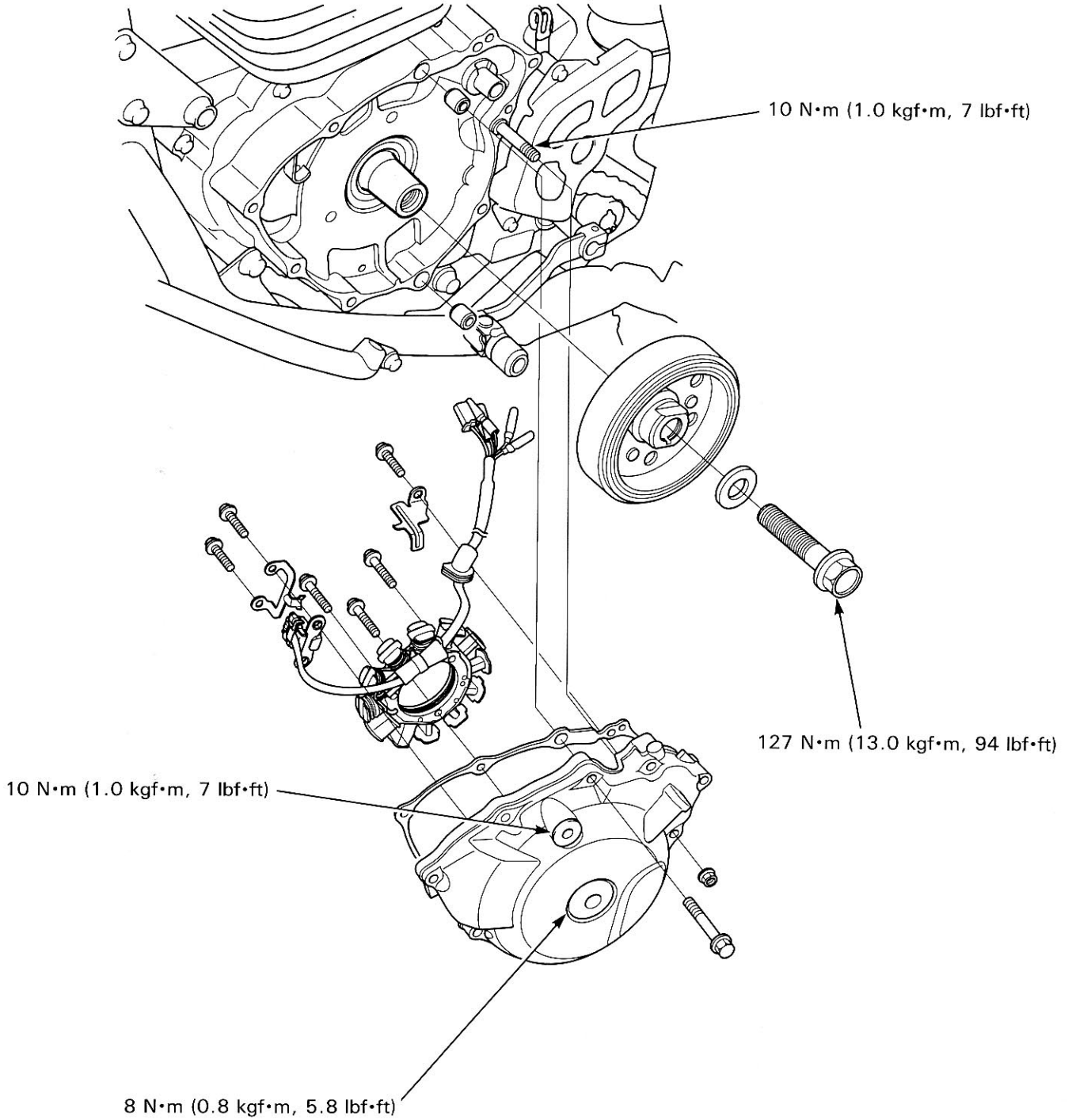
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the kickstarter spindle (page 9-17).

Install the right crankcase cover (page 9-11).



ALTERNATOR



10. ALTERNATOR

SERVICE INFORMATION	10-1	ALTERNATOR INSTALLATION	10-3
ALTERNATOR REMOVAL	10-2		

SERVICE INFORMATION

GENERAL

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

TORQUE VALUES

Timing hole cap	10 N·m (1.0 kgf·m, 7 lbf·ft)
Crankshaft hole cap	8 N·m (0.8 kgf·m, 5.8 lbf·ft)
Flywheel bolt	127 N·m (13.0 kgf·m, 94 lbf·ft) Apply oil to the threads and seating surface.
Left crankcase stud bolt	10 N·m (1.0 kgf·m, 7 lbf·ft) Apply locking agent to the threads.

TOOLS

Flywheel puller	07733 – 0020001 or 07933 – 3950000 (U.S.A. only)
Flywheel holder	07725 – 0040000 or equivalent commercially available in U.S.A.

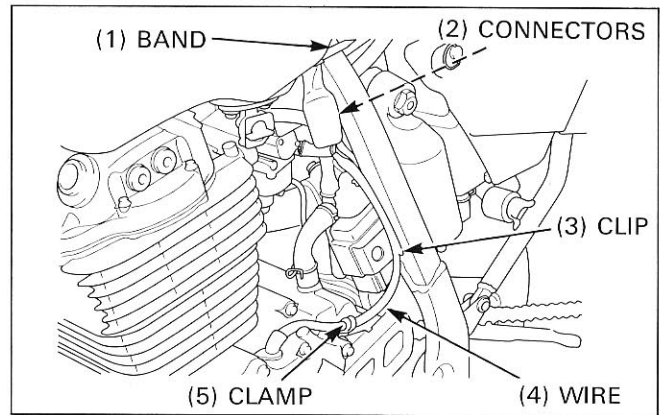
ALTERNATOR REMOVAL

LEFT CRANKCASE COVER REMOVAL.

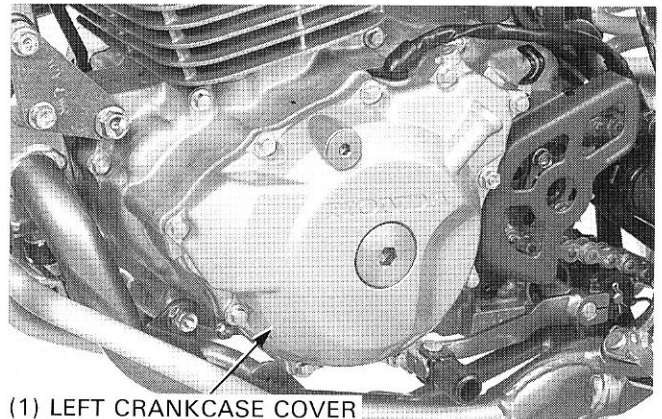
Drain the engine oil (page 3-12).

Release the wire band and disconnect the lighting coil, exciter coil and ignition pulse generator 2P (White) connectors.

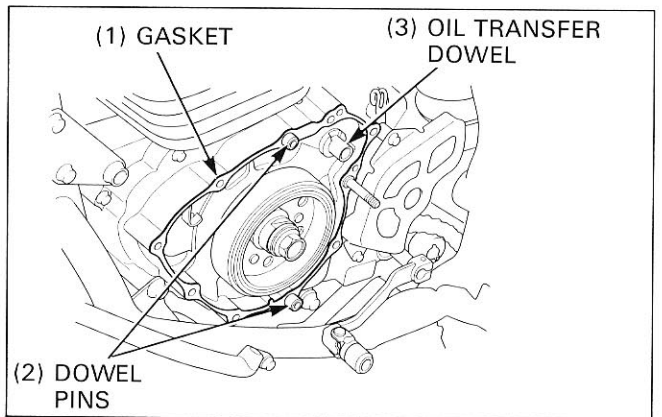
Release the alternator wire from the clamp on the engine and the wire clip of the wire from the frame with a flat blade screw driver.



Remove the crackcase cover bolts and nut, and the left crankcase cover.

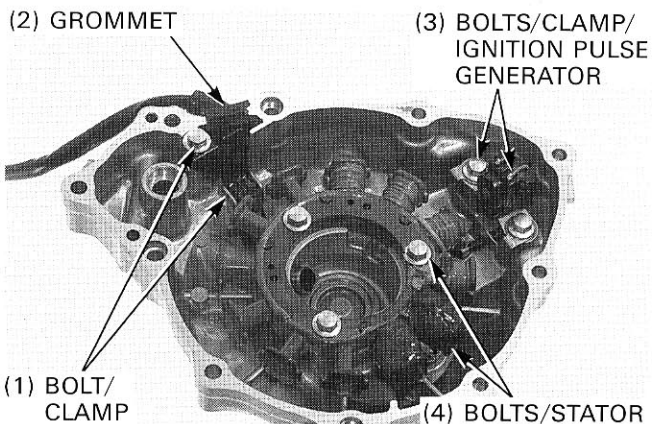


Remove the gasket and dowel pins.



STATOR/IGNITION PULSE GENERATOR REMOVAL

Remove the clamp bolt and clamp.
 Remove the two stator bolts and clamp.
 Remove the three stator bolts and wire grommet then remove the stator/ignition pulse generator from the left crankcase cover.



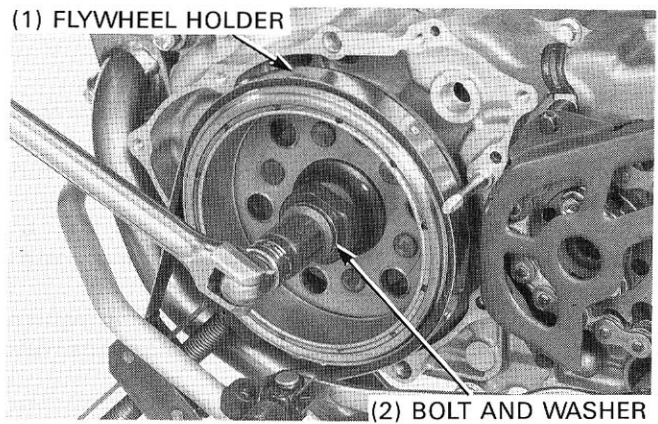
FLYWHEEL REMOVAL

Hold the flywheel with the flywheel holder and remove the flywheel bolt and the washer.

TOOL:

Flywheel holder

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



NOTE

- Be careful not to interfere the puller with the gearshift pedal.

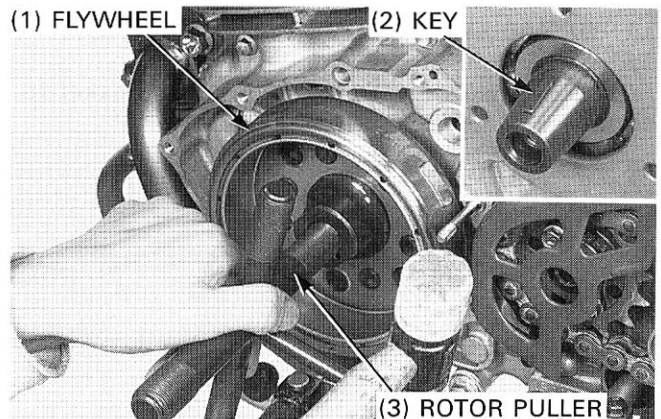
Remove the flywheel using the rotor puller.

TOOL:

Flywheel puller

**07733 – 0020001 or
07933 – 3950000
(U.S.A. only)**

Remove the woodruff key from the crankshaft.



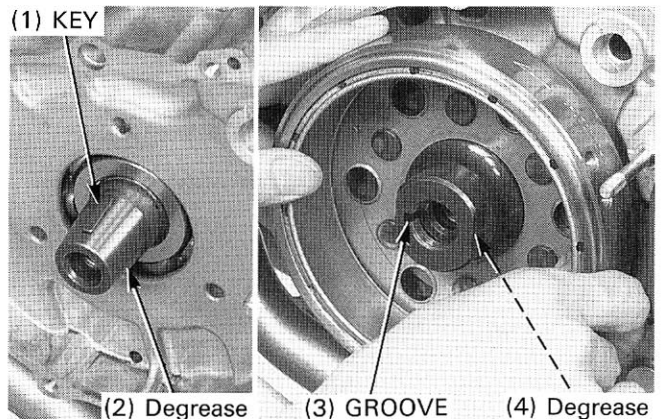
ALTERNATOR INSTALLATION

FLYWHEEL INSTALLATION

Install the woodruff key into the crankshaft.

Clean the tapered area of the crankshaft and flywheel with a degreasing agent and wipe them off completely.

Install the flywheel over the crankshaft by aligning its groove with the woodruff key.



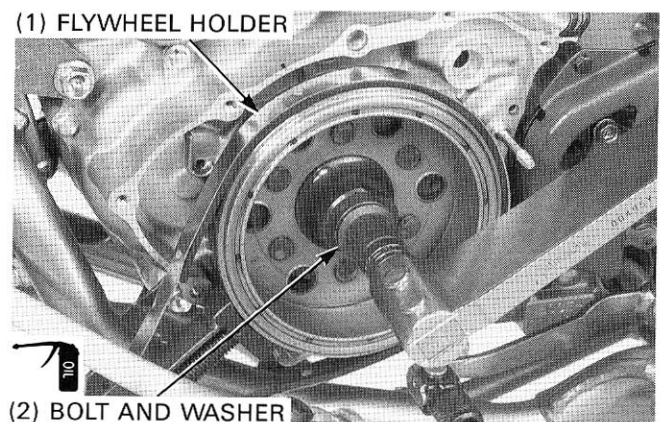
Apply engine oil to the flywheel bolt threads and seating surface and install it with the washer. Hold the flywheel securely and tighten the bolt.

TOOL:

Flywheel holder

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

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



ALTERNATOR

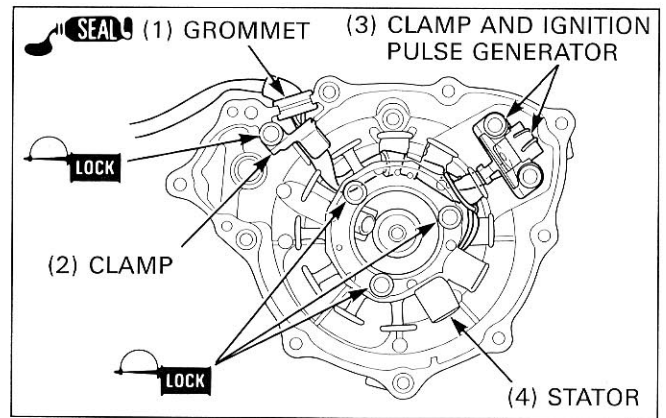
STATOR/IGNITION PULSE GENERATOR INSTALLATION

Place the stator/ignition pulse generator into the left crankcase cover.

Apply liquid sealant to the wire grommet seating surface and install the grommet into cover groove.

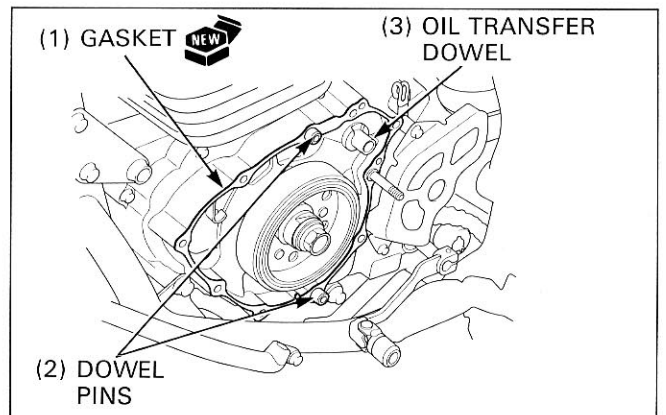
Apply locking agent to the clamp and stator mounting bolt threads.

Route the wire properly and install the clamp tightening the bolt. Tighten the ignition pulse generator bolts with the clamp and the three stator bolts.



LEFT CRANKCASE COVER INSTALLATION

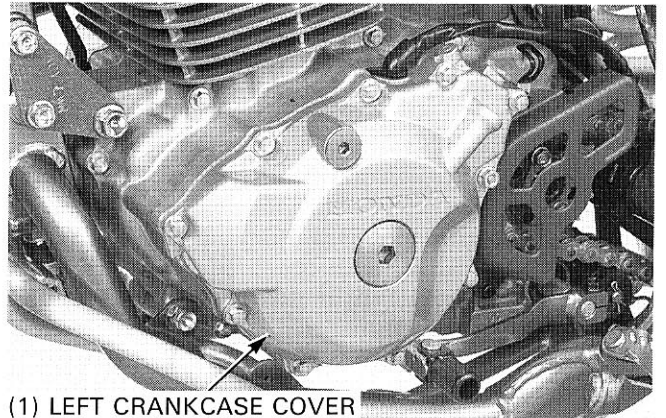
Install the two dowel pins and a new gasket to the crankcase.



Install the left crankcase cover and tighten the cover bolts.

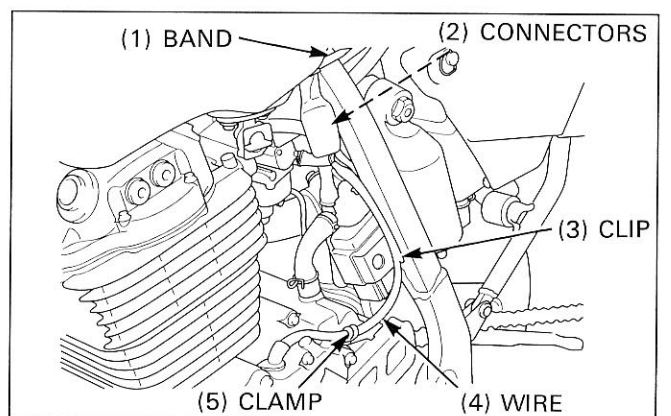
NOTE

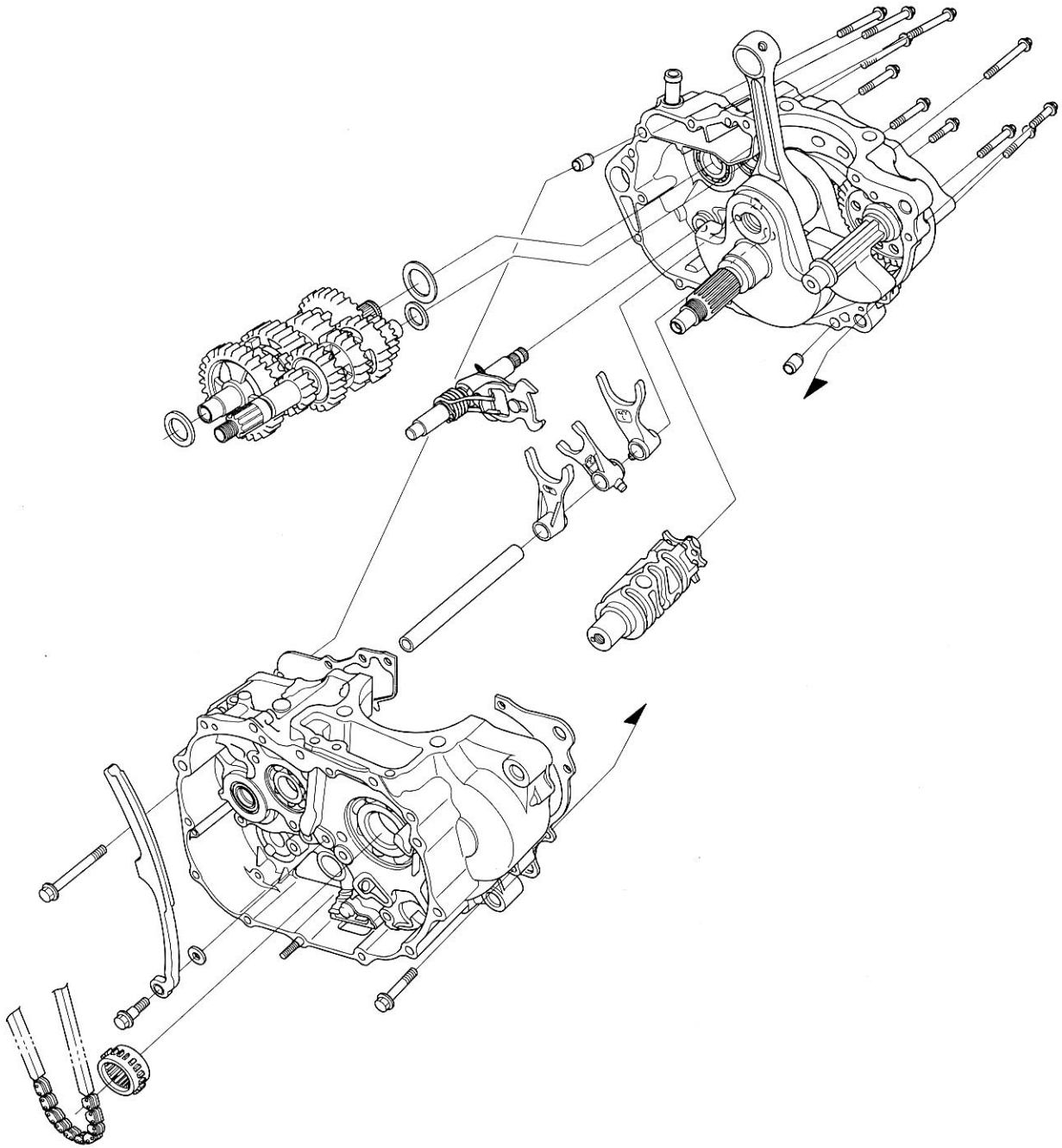
- Careful not to pinch your fingers because of the magnet.



Route the alternator wire through the frame properly, and connect the connectors and cover the boot securely. Install the wire to the stud on frame tube and secure it with the clamp and band (wire routing: page 1-19).

Pour the engine oil (page 3-13).





11. TRANSMISSION

SERVICE INFORMATION	11-1	TRANSMISSION DISASSEMBLY	11-4
TROUBLESHOOTING	11-2	TRANSMISSION ASSEMBLY	11-9
CRANKCASE SEPARATION	11-3	CRANKCASE ASSEMBLY	11-12

SERVICE INFORMATION

GENERAL

- This section covers service of the transmission (including the shift fork, shift drum and shift spindle). For crankshaft and balancer service, refer to section 12.
- The crankcase halves must be separated to service the transmission. To service these parts, the engine must be removed from the frame (section 6).
- The following parts must be removed before disassembling the crankcase.
 - Cylinder head (section 7)
 - Cylinder and piston (section 8)
 - Clutch, primary drive gear, gearshift linkage and kickstarter (section 9)
 - Oil pump (section 4)
 - Flywheel (section 10)
- Be careful not to damage the crankcase mating surfaces when servicing.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Transmission	Gear I.D.	M4	25.020 – 25.041 (0.9850 – 0.9859)	25.08 (0.987)
		M5	25.000 – 25.021 (0.9843 – 0.9851)	25.06 (0.987)
		C1	23.000 – 23.021 (0.9055 – 0.9063)	23.07 (0.908)
		C2, C3	28.020 – 28.041 (1.1031 – 1.1040)	28.08 (1.106)
	Gear bushing O.D.	M4	24.979 – 25.000 (0.9834 – 0.9843)	24.90 (0.980)
		M5	24.959 – 24.980 (0.9826 – 0.9835)	24.90 (0.980)
		C1	22.959 – 22.980 (0.9039 – 0.9047)	22.90 (0.902)
		C2, C3	27.979 – 28.000 (1.1015 – 1.1024)	27.94 (1.100)
	Gear bushing I.D.	M4	22.000 – 22.021 (0.8661 – 0.8670)	22.10 (0.870)
		C1	20.020 – 20.041 (0.7882 – 0.7890)	20.08 (0.791)
		C2, C3	25.000 – 25.021 (0.9843 – 0.9851)	25.06 (0.987)
	Mainshaft O.D.	at M4	21.959 – 21.980 (0.8645 – 0.8654)	21.92 (0.863)
	Countershaft O.D.	at C1	19.979 – 20.000 (0.7866 – 0.7874)	19.94 (0.785)
		at C2, C3	24.959 – 24.980 (0.9826 – 0.9835)	24.92 (0.981)
Gear-to-bushing clearance		0.020 – 0.062 (0.0008 – 0.0022)	0.10 (0.004)	
Gear bushing-to-shaft clearance		0.020 – 0.062 (0.0008 – 0.0022)	0.10 (0.004)	
Shift fork, fork shaft and drum	Shift fork I.D.	13.000 – 13.021 (0.5118 – 0.5126)	13.05 (0.514)	
	Shift fork claw thickness	5.93 – 6.00 (0.233 – 0.236)	5.5 (0.22)	
	Shift fork shaft O.D.	12.966 – 12.984 (0.5105 – 0.5112)	12.90 (0.508)	
	Drum O.D. at right end	19.959 – 19.980 (0.7858 – 0.7866)	19.90 (0.783)	
	Drum journal (R. crankcase)	20.000 – 20.033 (0.7874 – 0.7887)	20.07 (0.790)	

TRANSMISSION

TORQUE VALUES

Mainshaft bearing setting plate bolt	12 N·m (1.2 kgf·m, 9 lbf·ft) Apply locking agent to the threads.
Gearshift return spring pin	24 N·m (2.4 kgf·m, 17 lbf·ft)

TOOLS

Bearing remover, 17mm	07936 – 3710300
Remover handle	07936 – 3710100
Remover weight	07741 – 0010201 or 07936 – 371020A or 07936 – 3710200
Driver	07749 – 0010000
Attachment, 37 × 40 mm	07746 – 0010200
Attachment, 42 × 47 mm	07746 – 0010300
Attachment, 52 × 55 mm	07746 – 0010400
Pilot, 17 mm	07746 – 0040400
Pilot, 22 mm	07746 – 0041000
Pilot, 25 mm	07746 – 0040600

TROUBLESHOOTING

Excessive noise

- Worn, sized or chipped transmission gear
- Worn or damaged transmission bearing

Hard to shift

- Bent shift fork
- Bent shift fork shaft
- Damaged shift drum guide groove
- Damaged shift fork guide pin

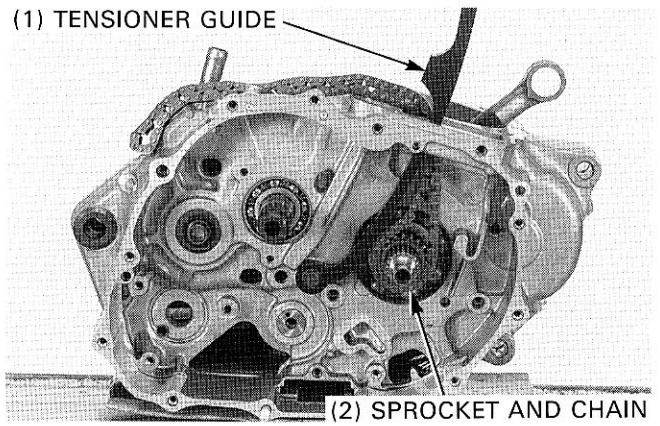
Transmission jumps out of gear

- Worn gear dogs or slots
- Worn shift drum guide groove
- Worn shift fork guide pin
- Worn shift fork groove in gear

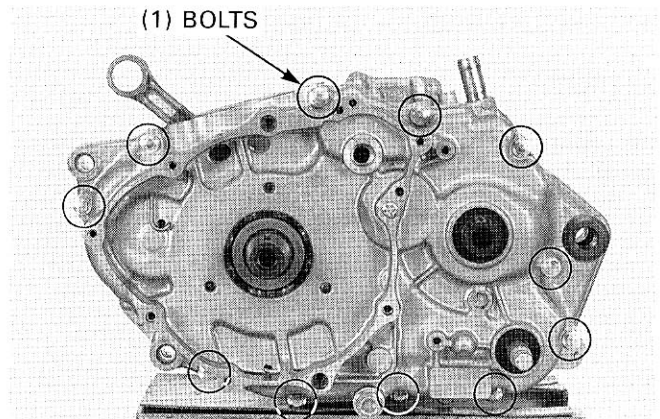
CRANKCASE SEPARATION

Refer to Service Information (page 11-1) for removal of necessary parts before disassembling the crankcase.

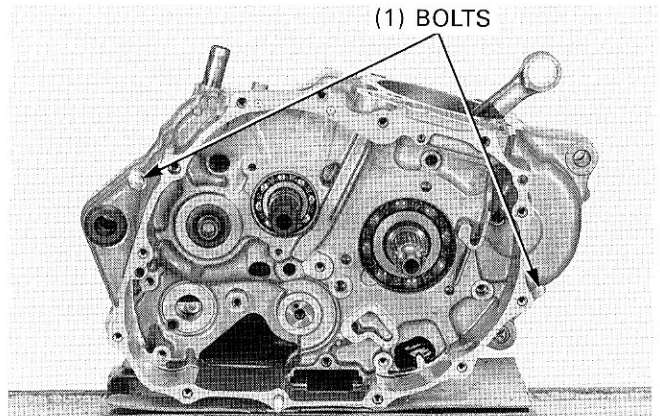
Remove the cam chain and chain drive sprocket.
Remove the tensioner guide bolt, guide and washer.



Remove the left crankcase bolts.

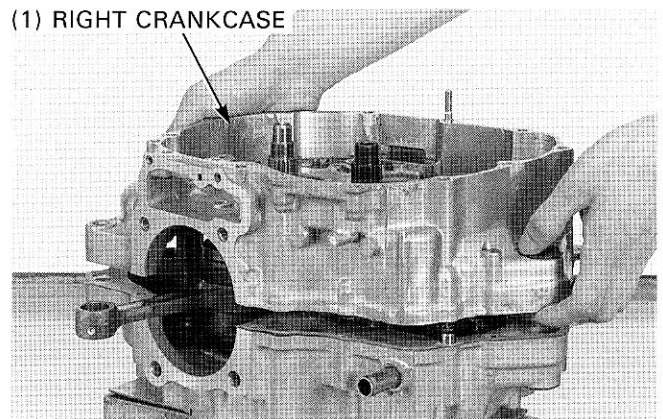


Remove the right crankcase bolts.



Place the crankcase assembly with the left side down.

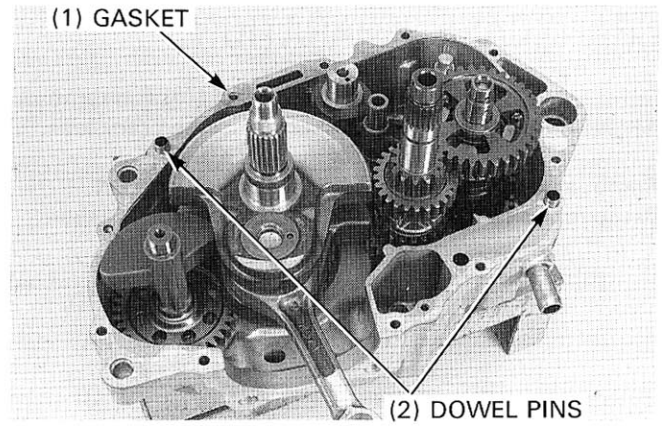
Carefully separate the right crankcase from the left crankcase while tapping them at several locations with a soft hammer. Do not pry the crankcase halves.



TRANSMISSION

Remove the gasket and dowel pins.

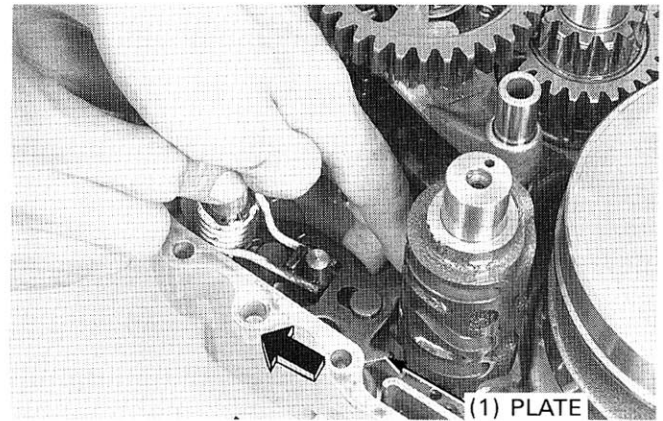
For the crankcase assembly, see page 11-12.



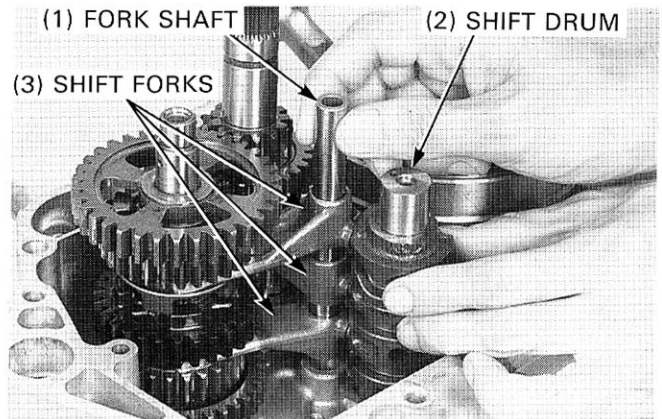
TRANSMISSION DISASSEMBLY

REMOVAL

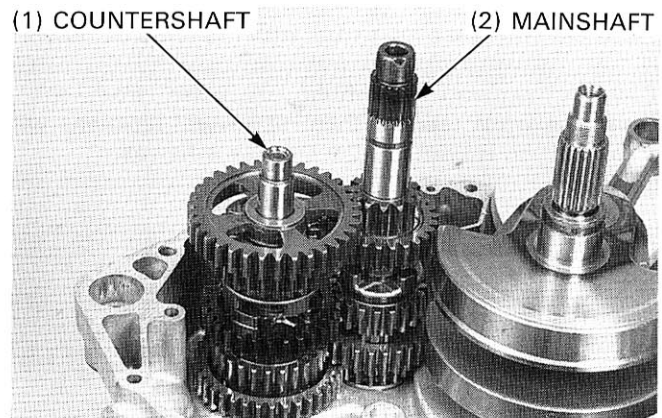
Release the gearshift plate from the shift drum by pulling it away from the drum and remove the gearshift spindle.



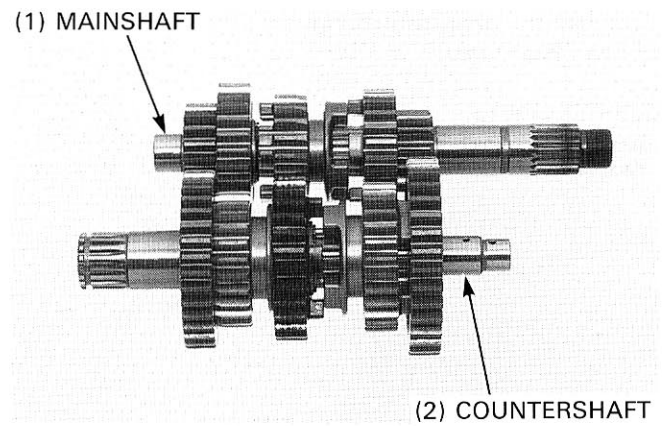
Pull the fork shaft and remove it from the shift forks. Remove the shift drum and shift forks.



Remove the mainshaft and countershaft together.



Disassemble the mainshaft and countershaft.



INSPECTION

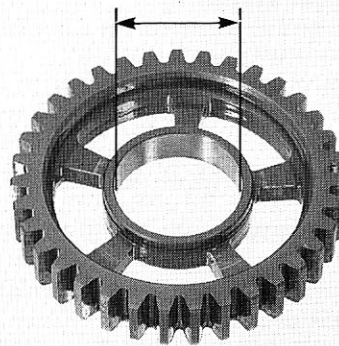
Gears

Check the gear dogs, dog holes and teeth for damage or excessive wear.

Measure the I.D. of each gear.

SERVICE LIMITS:

- M4: 25.08 mm (0.987 in)
- M5: 25.06 mm (0.987 in)
- C1: 23.07 mm (0.908 in)
- C2, C3: 28.08 mm (1.106 in)



Bushings

Check the bushings for wear or damage.
Measure O.D. of each bushing.

SERVICE LIMITS:

- M4, M5: 24.90 mm (0.980 in)
- C1: 22.90 mm (0.902 in)
- C2, C3: 27.94 mm (1.100 in)

Measure I.D. of each bushing.

SERVICE LIMITS:

- M4: 22.10 mm (0.870 in)
- C1: 20.08 mm (0.791 in)
- C2, C3: 25.06 mm (0.987 in)

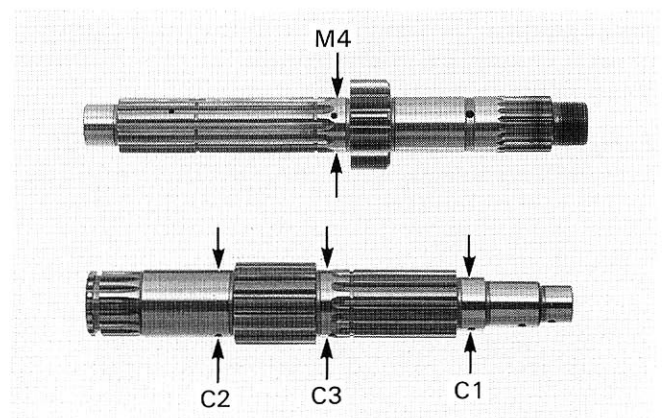
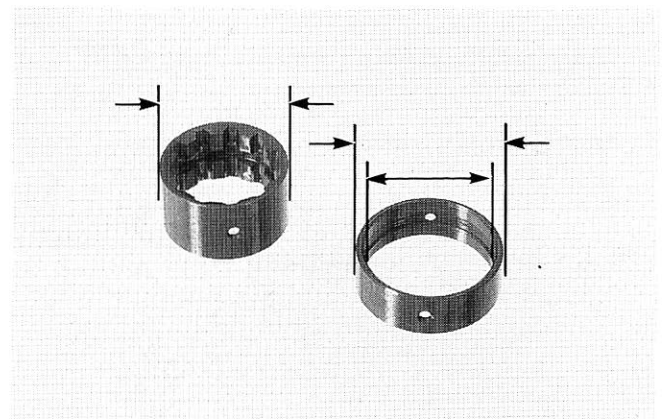
Mainshaft/Countershaft

Check the spline grooves and sliding surfaces for abnormal wear or damage.

Measure the O.D. of the mainshaft and countershaft at the gear and bushing sliding areas.

SERVICE LIMITS:

- Mainshaft (at M4 gear bushing): 21.92 mm (0.863 in)
- Countershaft (at C1 gear bushing): 19.94 mm (0.785 in)
- (at C2, C3 gear bushing): 24.92 mm (0.981 in)



TRANSMISSION

Calculate the gear-to-bushing, bushing-to-shaft and shaft-to-gear clearance.

SERVICE LIMITS:

Gear-to-bushing: 0.10 mm (0.004 in)

Bushing-to-shaft: 0.10 mm (0.004 in)

Shift Drum/Drum Journal

Inspect the shift drum end for scoring, scratches, or evidence of sufficient lubrication.

Check the shift drum grooves for abnormal wear or damage.

Measure the shift drum O.D. at right end.

SERVICE LIMIT: 19.90 mm (0.783 in)

Check the shift drum journal in the right crankcase for excessive wear or damage.

Measure the shift drum journal I.D.

SERVICE LIMIT: 20.07 mm (0.790 in)

Shift Fork

Check the shift forks for deformation or abnormal wear.

Measure each shift fork claw thickness.

SERVICE LIMIT: 5.5 mm (0.22 in)

Measure I.D. of each fork.

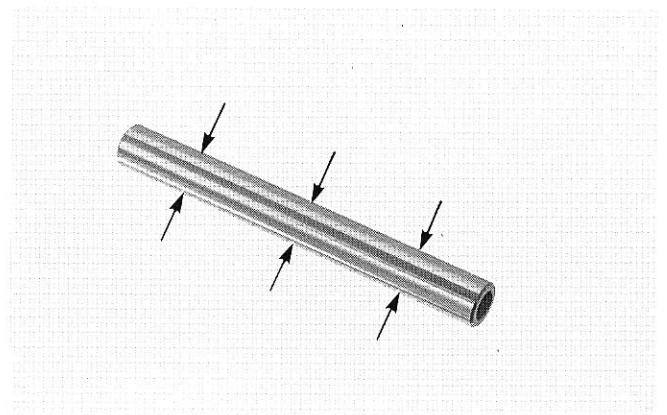
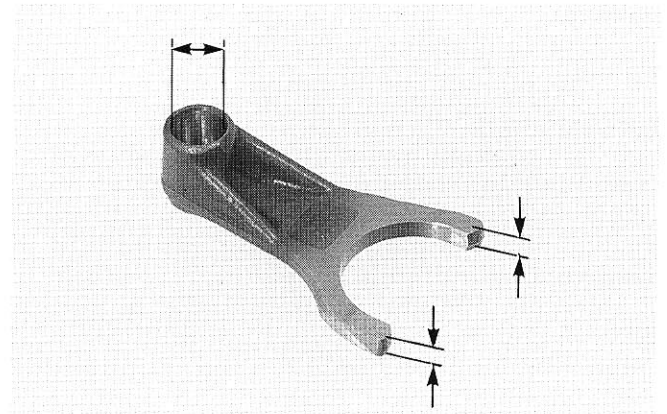
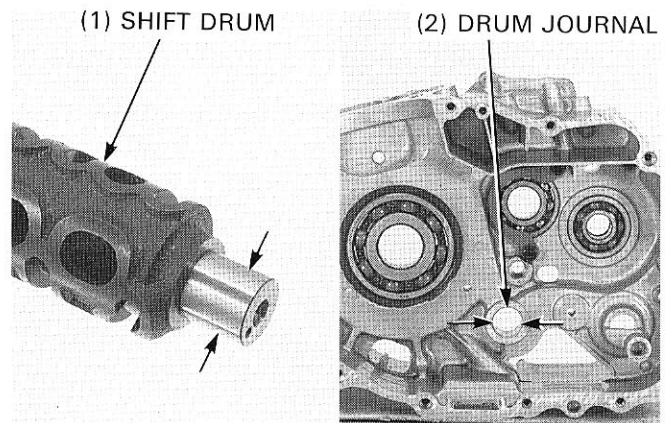
SERVICE LIMIT: 13.05 mm (0.514 in)

Shift Fork Shaft

Check for damage and straightness.

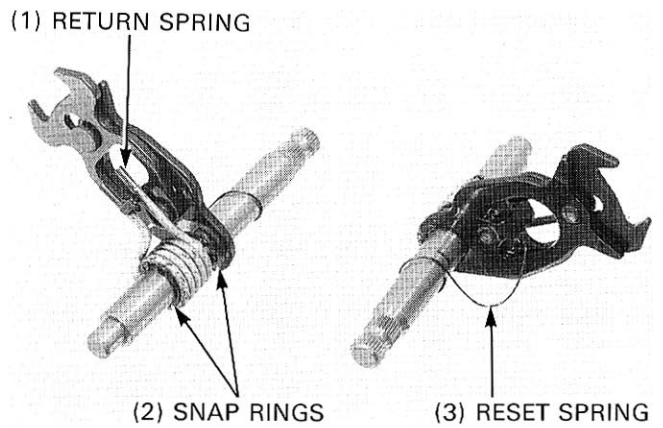
Measure the shift fork shaft O.D.

SERVICE LIMIT: 12.90 mm (0.508 in)



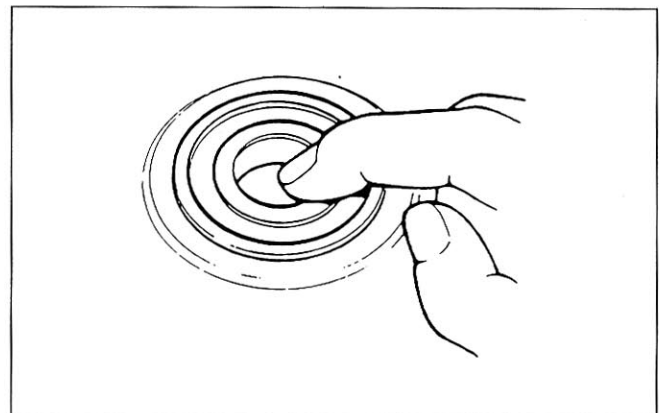
Gearshift Spindle

Remove the snap rings and return spring.
 Check the gearshift plate for damage or wear.
 Check the return and reset springs for damage.



Transmission Bearing

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

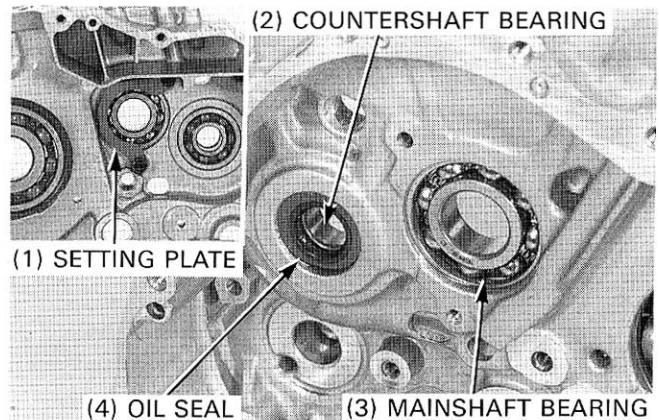


TRANSMISSION BEARING REPLACEMENT

Right Crankcase Bearing

Remove the mainshaft bearing setting plate.

Drive the bearings and oil seal out of the right crankcase.



Drive new bearings and oil seal with following tools.

TOOLS:

Mainshaft bearing:

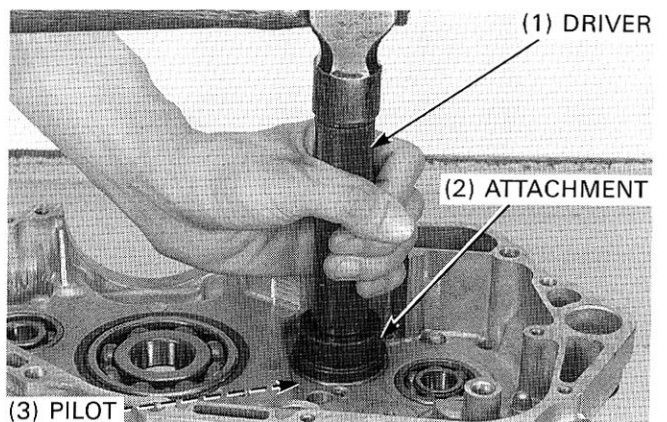
Driver	07749 - 0010000
Attachment, 42 × 47 mm	07746 - 0010300
Pilot, 22 mm	07746 - 0041000

Countershaft oil seal:

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

Countershaft bearing:

Driver	07749 - 0010000
Attachment, 42 × 47 mm	07746 - 0010300
Pilot, 17 mm	07746 - 0040400



TRANSMISSION

Left Crankcase Bearing

Remove the crankshaft (section 12).

Remove the countershaft oil seal and drive the countershaft bearing.

Remove the mainshaft bearing with following tools:

TOOLS:

Bearing remover, 17 mm	07936 - 3710300
Remover handle	07936 - 3710100
Remover weight	07741 - 0010201 or 07936 - 371020A or 07936 - 3710200

Drive new bearings into the left crankcase with following tools:

TOOLS:

Mainshaft bearing:

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

Countershaft bearing:

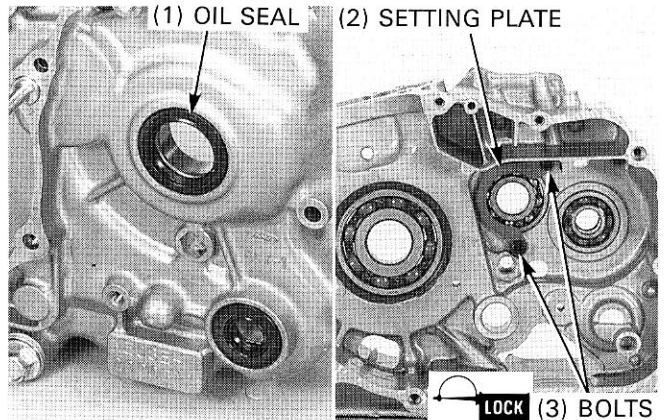
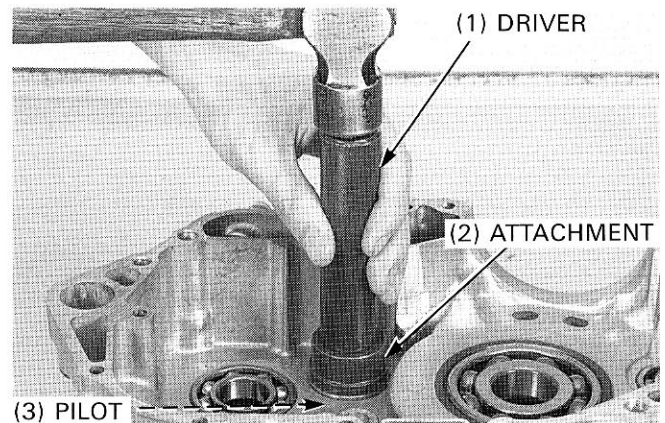
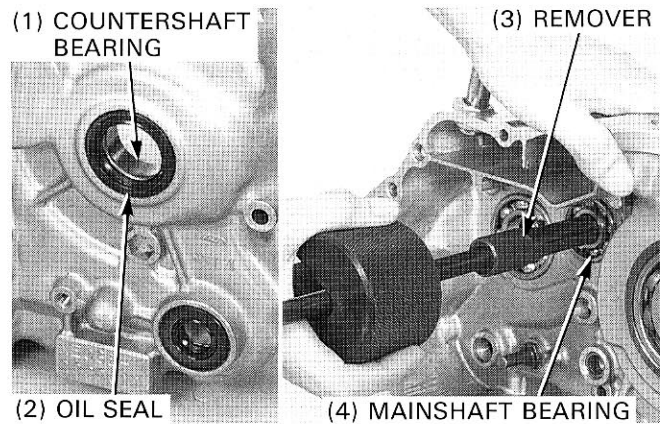
Driver	07749 - 0010000
Attachment, 52 × 55 mm	07746 - 0010400
Pilot, 25 mm	07746 - 0040600

After installing the bearings, install a new countershaft oil seal.

Apply locking agent to the threads of the setting plate bolts, and install the mainshaft bearing setting plate by tightening the bolts.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Lubricate the all bearings with engine oil.



TRANSMISSION ASSEMBLY

Clean all parts in solvent.

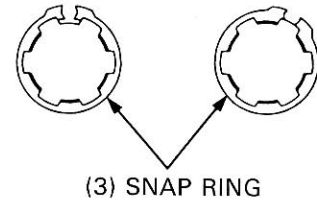
Apply molybdenum oil solution to the gear and bushing sliding surface and shift fork grooves to ensure initial lubrication.

Assemble all parts into their original positions.

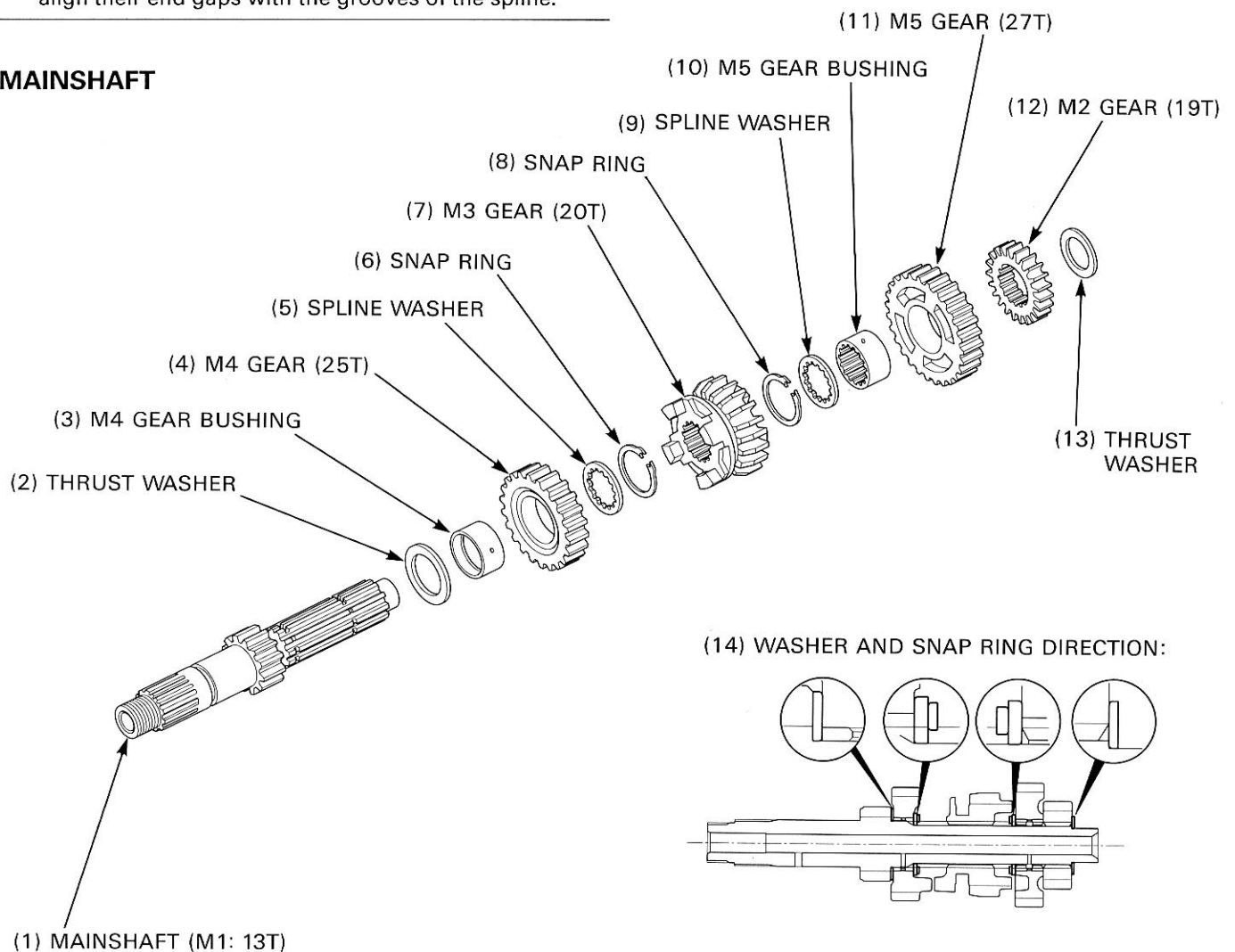
NOTE


- Check the gears for freedom of movement or rotation on the shaft.
- Install the washers and snap rings with the chamfered edges facing the thrust load side. Do not reuse worn snap ring which could easily spin in the groove.
- Check that the snap rings are seated in the grooves and align their end gaps with the grooves of the spline.

(1) CORRECT (2) INCORRECT



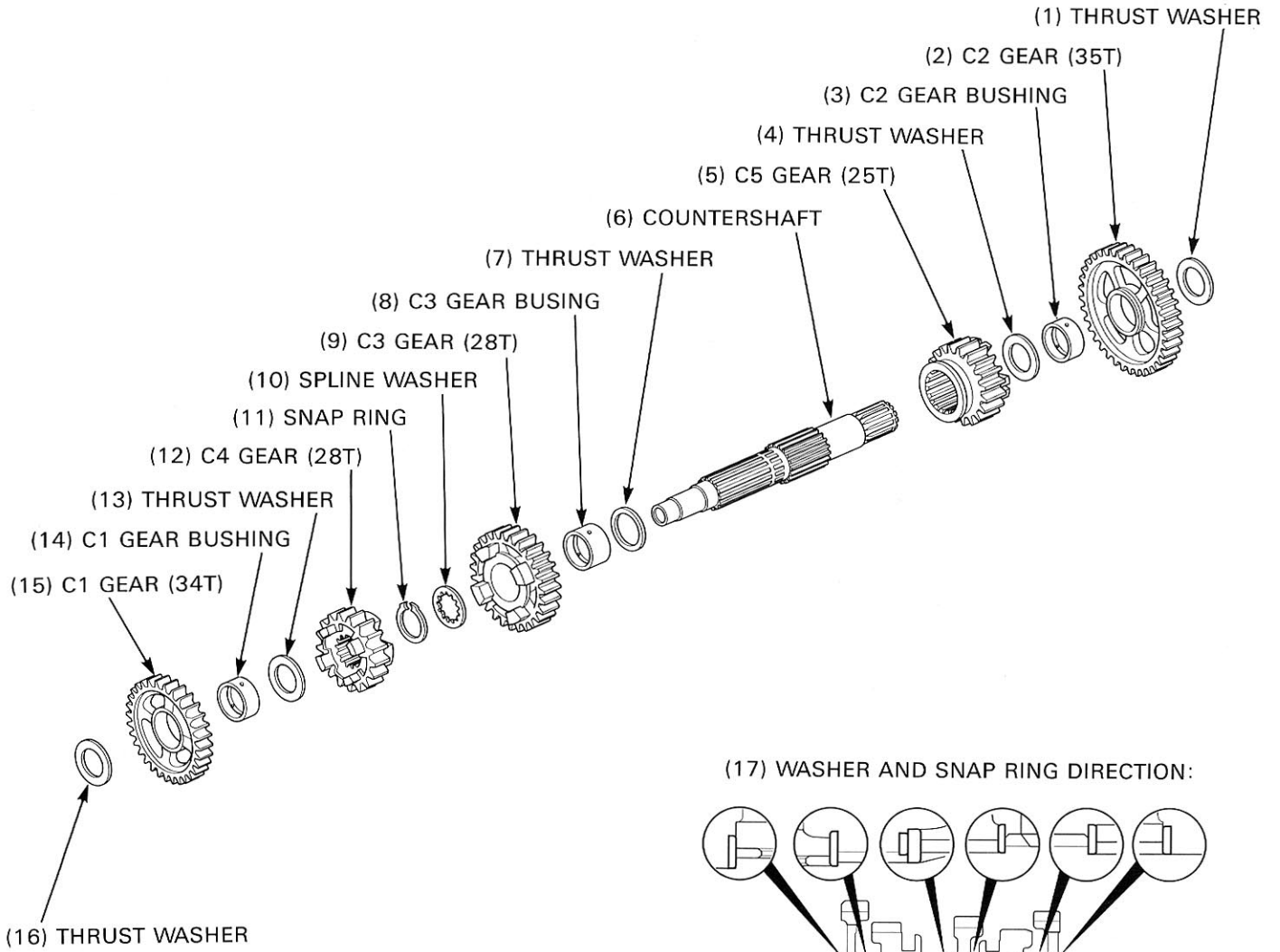
MAINSHAFT



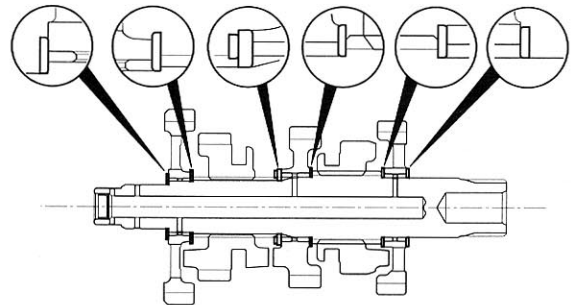
 : Gear and bushing sliding surfaces and shift fork grooves


TRANSMISSION

COUNTERSHAFT



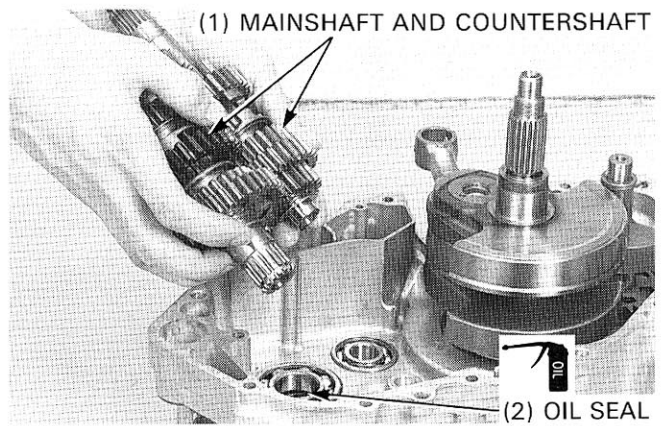
(17) WASHER AND SNAP RING DIRECTION:



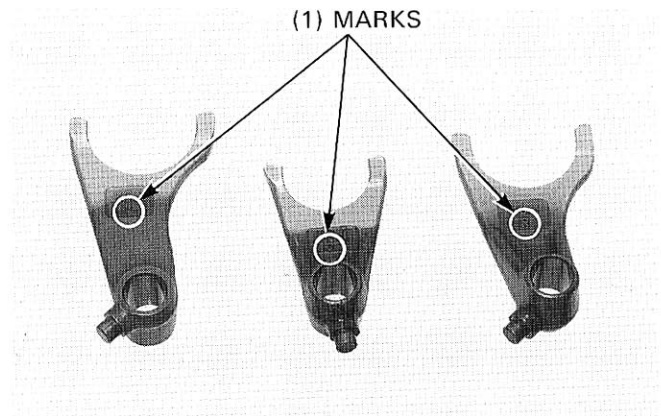
 : Gear and bushing sliding surfaces and shift fork grooves

If the crankshaft removed, install the crankshaft and balancer first (page 12-5).

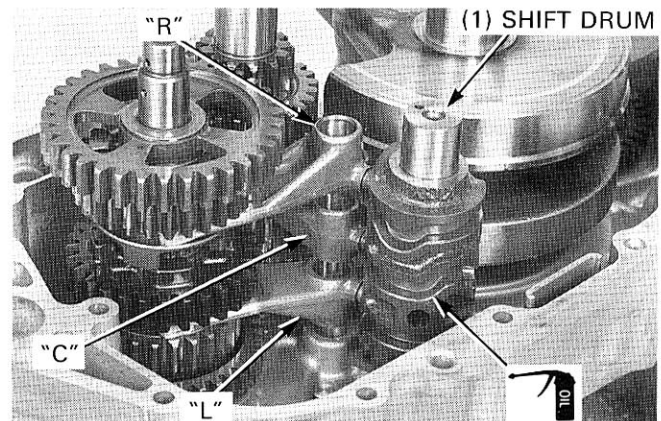
Apply engine oil to the countershaft oil seal lips. Install the mainshaft and countershaft together into the left crankcase. Be sure to install the three end washers (mainshaft; both ends/countershaft; left only).



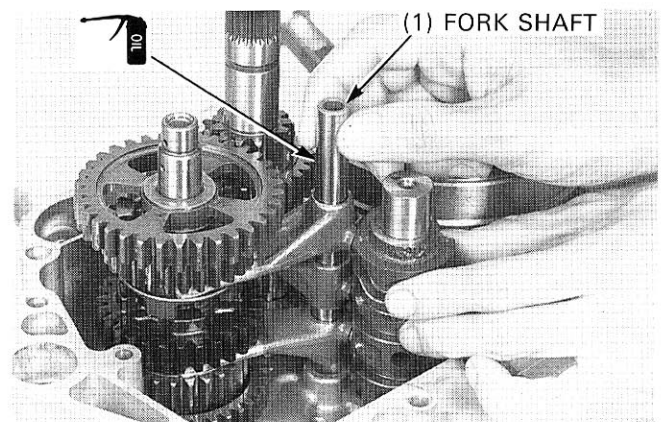
Each shift fork has an identification marks; "R" (right), "C" (center), "L" (left). Install the shift forks into the shifter gear grooves with the marks facing up (right crankcase side).



Apply engine oil to the guide grooves in the shift drum and install it by aligning the shift fork guide pins with the guide grooves.

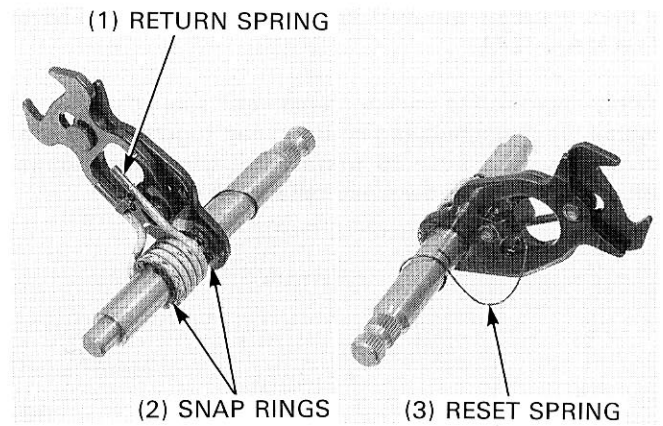


Apply engine oil to the shift fork shaft insert it through the shift forks into the left crankcase.

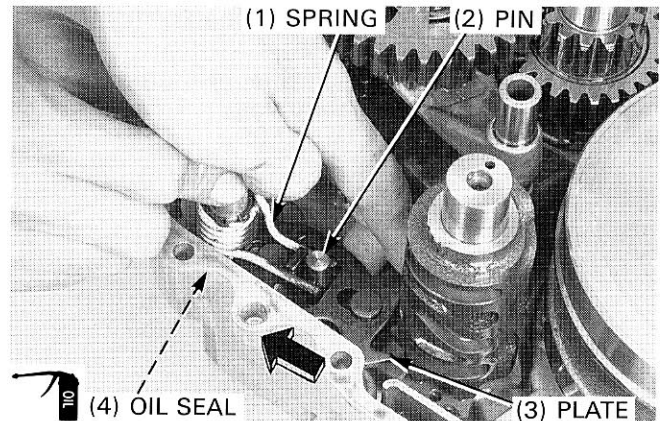


TRANSMISSION

Install the snap rings, return spring and reset spring to the gearshift spindle as shown.



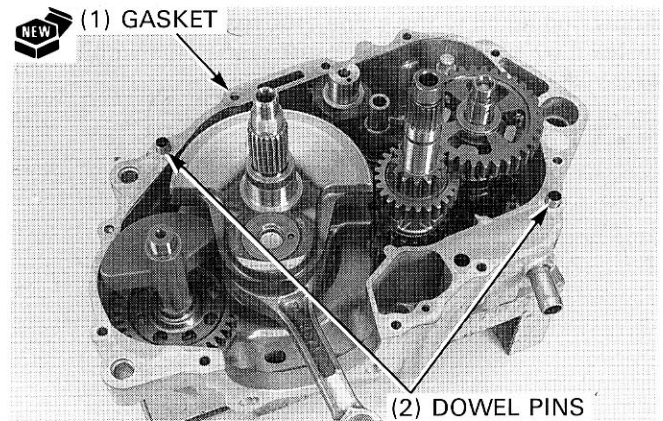
Apply engine oil to the gearshift spindle oil seal. Install the gearshift spindle by aligning the return spring ends with the pin bolt while pulling the shift plate.



CRANKCASE ASSEMBLY

Clean the left and right crankcase mating surfaces thoroughly, being careful not to damage them and check for damage.

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

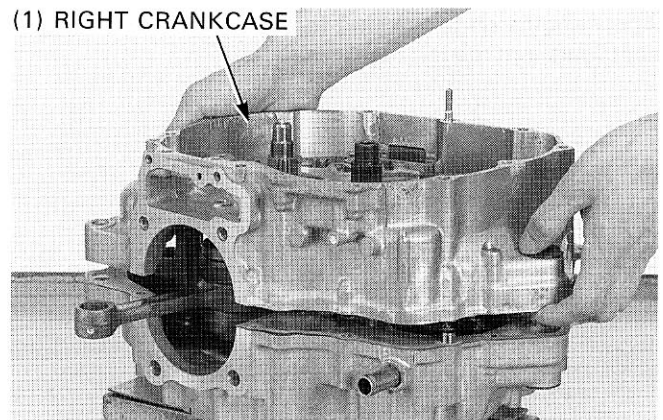


Make sure all the parts are installed in the left and right crankcases.

CAUTION

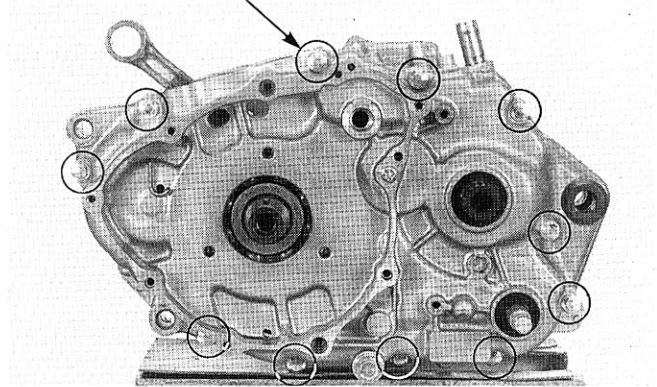
- Do not force the crankcase halves together; if there is excessive force required, something is wrong. Remove the right crankcase and check for misaligned parts.

Install the right crankcase over the left crankcase.



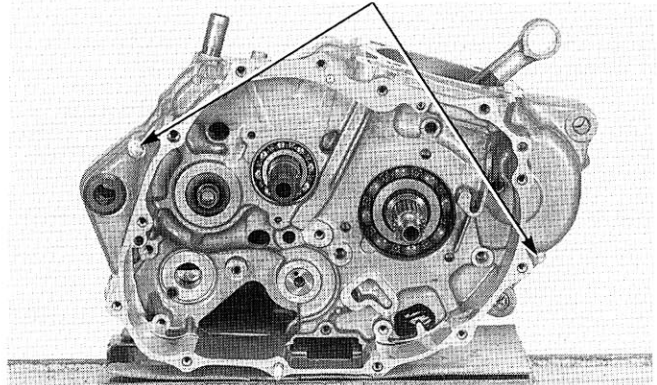
Make sure that the crankcase mating surfaces are touched evenly.
 Install and tighten the left crankcase bolts in a crisscross pattern in 2-3 steps.

(1) LEFT CRANKCASE BOLTS



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

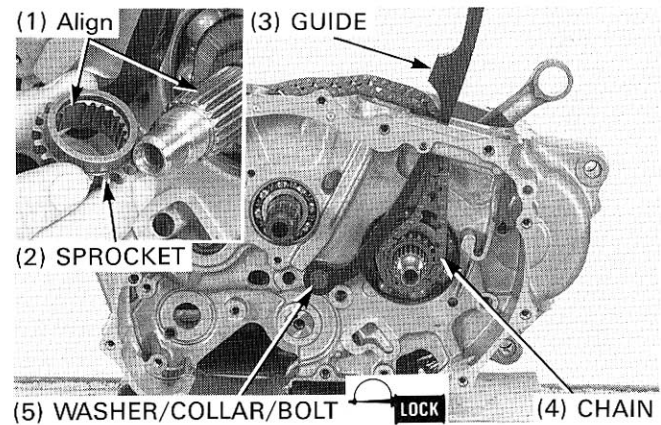
(1) RIGHT CRANKCASE BOLTS

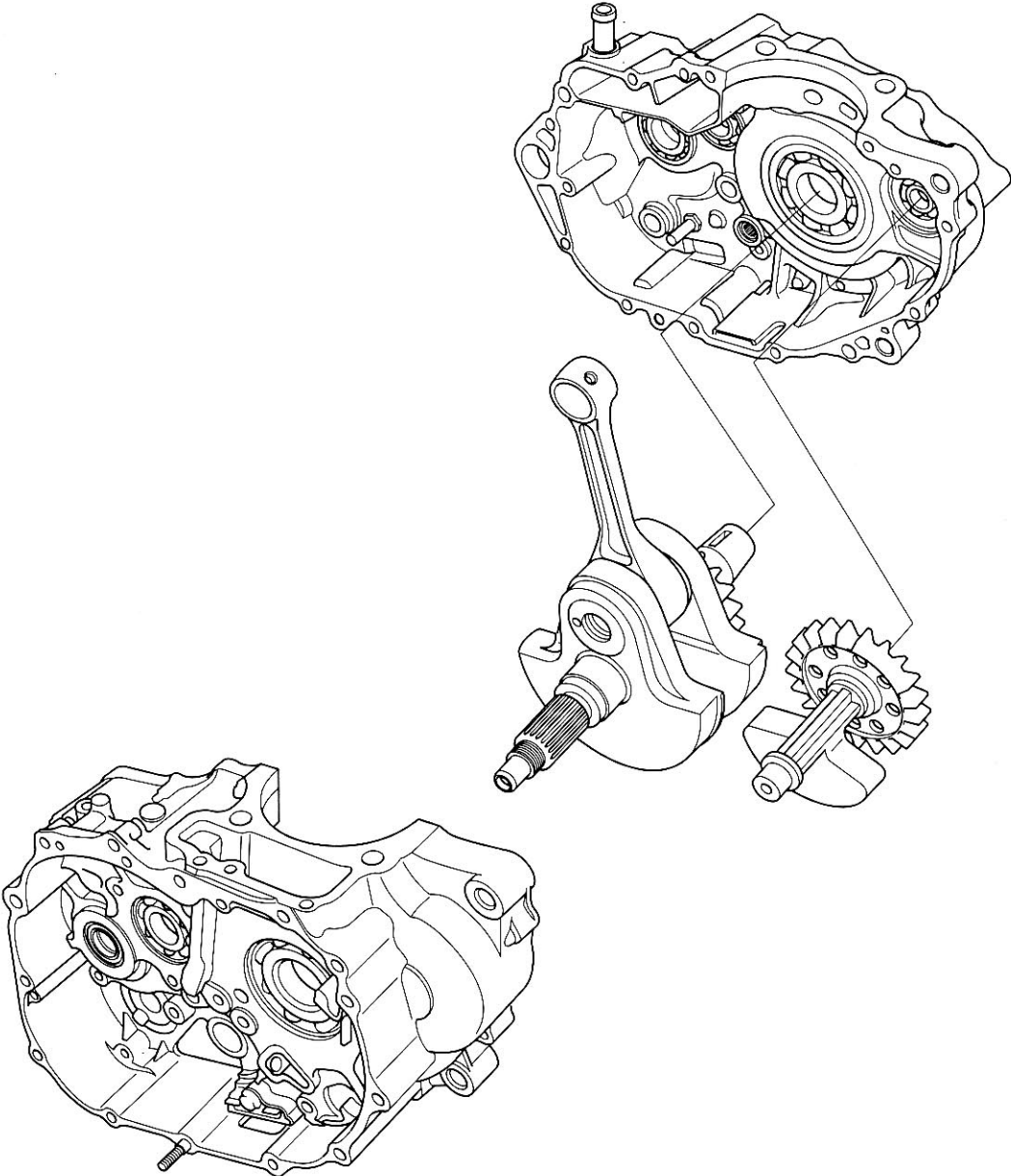


Install the cam chain drive sprocket aligning the wide groove with the wide tooth and install the cam chain through the crankcase.

Apply locking agent to the tensioner guide bolt threads. Install the chain tensioner guide with the washer (between the crankcase and tensioner guide) and bolt collar and tighten the bolt.

Install the remaining parts.
 Install the engine in the frame (section 6)





12. CRANKSHAFT/BALANCER

SERVICE INFORMATION	12-1	CRANKSHAFT REMOVAL	12-2
TROUBLESHOOTING	12-1	CRANKSHAFT INSTALLATION	12-5

SERVICE INFORMATION

GENERAL

- This section covers service of the crankshaft and balancer.
- The crankcase halves must be separated to service the crankshaft and balancer. For crankcase separation and assembly, refer to section 11.
- Be careful not to damage the crankcase mating surfaces when servicing.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Connecting rod	Big end side clearance	0.05 – 0.45 (0.002 – 0.018)	0.6 (0.02)
	Big end radial clearance	0.006 – 0.018 (0.0002 – 0.0007)	0.05 (0.002)
Crankshaft runout		—	0.12 (0.005)

TOOLS

Bearing remover, 13 mm	07LMC – KZ10100 not available in U.S.A.
Remover shaft	07936 – 1660120
Remover weight	07741 – 0010201 or 07936 – 371020A or 07936 – 3710200
Bearing remover set, 15 mm	07936 – KC10000 not available in U.S.A.
– bearing remover, 15 mm	07936 – KC10500
– bearing remover	07936 – KC10200 not available in U.S.A.
– remover shaft	07936 – KC10100
– remover weight	07741 – 0010201 or 07936 – 371020A or 07936 – 3710200
Driver	07749 – 0010000
Attachment, 32 x 35 mm	07746 – 0010100
Attachment, 37 x 40 mm	07746 – 0010200
Attachment, 72 x 75 mm	07746 – 0010600
Pilot, 12 mm	07746 – 0040200
Pilot, 15 mm	07746 – 0040300
Pilot, 30 mm	07746 – 0040700
Crankcase assembly tool	07965 – VM00000 not available in U.S.A.
– assembly collar	07965 – VM00100
– assembly shaft	07965 – VM00200 or 07931 – ME4010B and 07931 – HB3020A
– threaded adaptor	07965 – VM00300 or 07931 – KF00200
Universal bearing puller	07631 – 0010000 or equivalent commercially available in U.S.A.

TROUBLESHOOTING

Excessive noise

- Worn crankshaft main journal bearings
- Worn or damaged connecting rod bearings
- Worn connecting rod small end
- Worn balancer bearings
- Improper balancer installation

Abnormal vibration

- Improper balancer timing

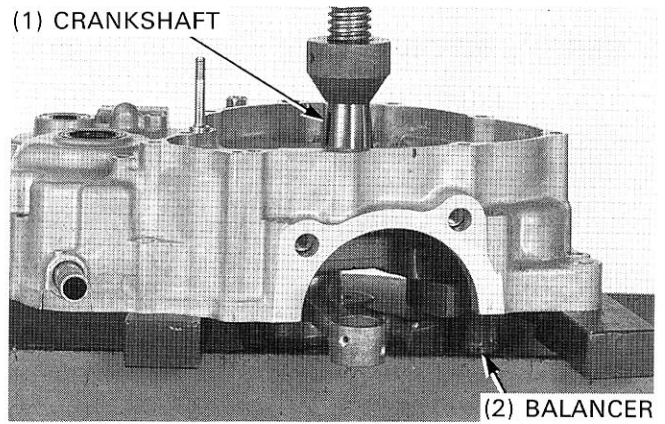
CRANKSHAFT REMOVAL

Separate the crankcase and remove the transmission (section 11).

Remove the crankshaft and balancer from the left crankcase using a hydraulic press while holding them.

CAUTION

- *Be careful not to damage the crankcase mating surface and crankshaft assembly.*



If the crankshaft bearings are left on the crankshaft, remove them using the bearing puller with a suitable protector.

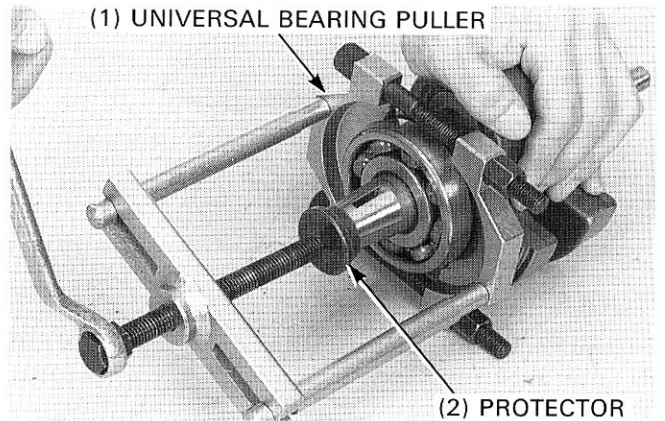
TOOL:

Universal bearing puller

07631 – 0010000 or
equivalent commercially
available in U.S.A.

NOTE

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

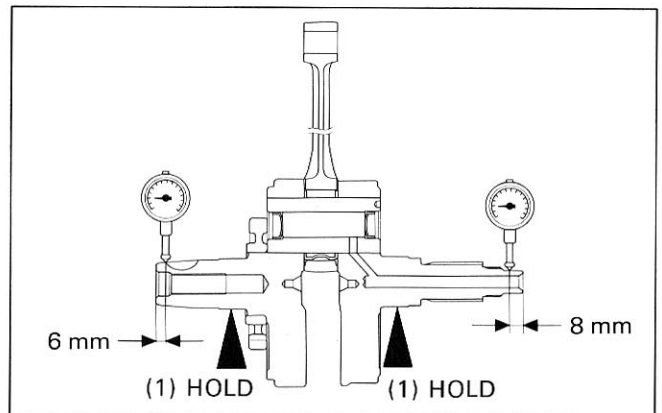


INSPECTION

Crankshaft Runout

Place the crankshaft on a stand or V-blocks.
Set the dial indicator on the shafts.
Rotate the crankshaft two revolutions and read the runout.

SERVICE LIMIT: 0.12 mm (0.005 in)

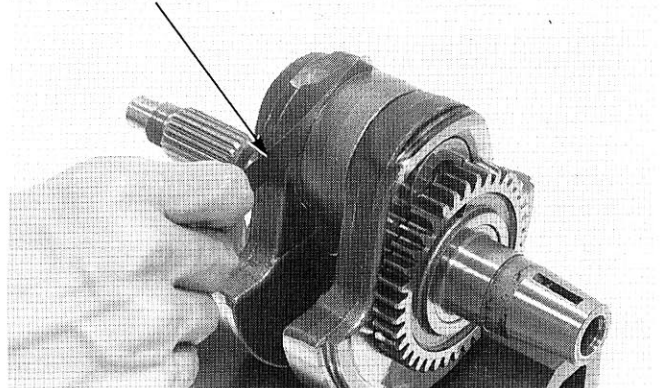


Big End Side Clearance

Measure the side clearance of the connection rod big end.

SERVICE LIMIT: 0.6 mm (0.02 in)

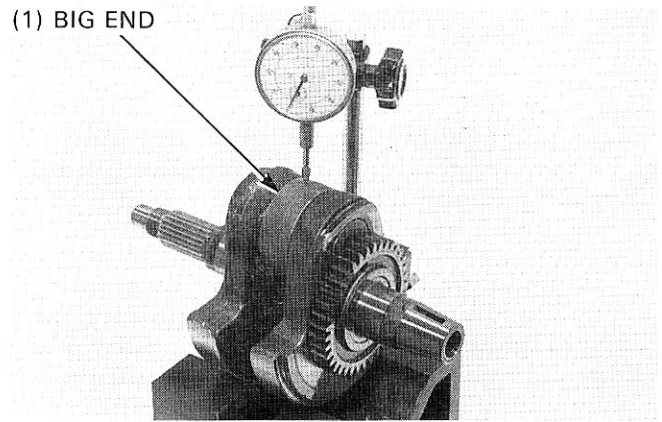
(1) FEELER GAUGE



Big End Radial Clearance

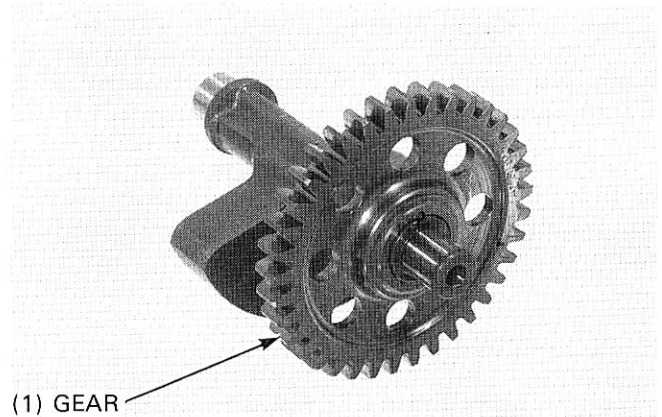
Measure the radial clearance of the connecting rod big end.

SERVICE LIMIT: 0.05 mm (0.002 in)



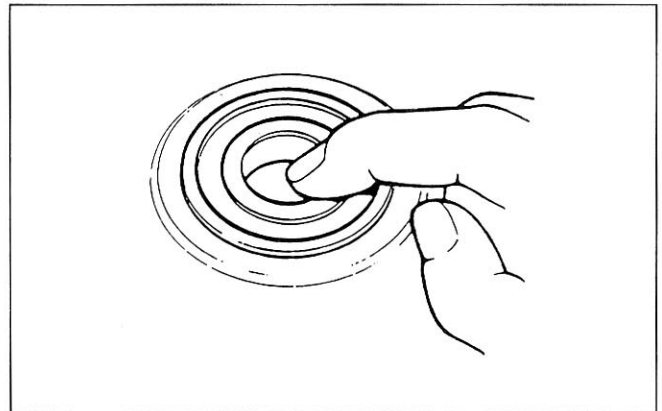
Balancer Gear

Check the balancer gear for wear or damage.



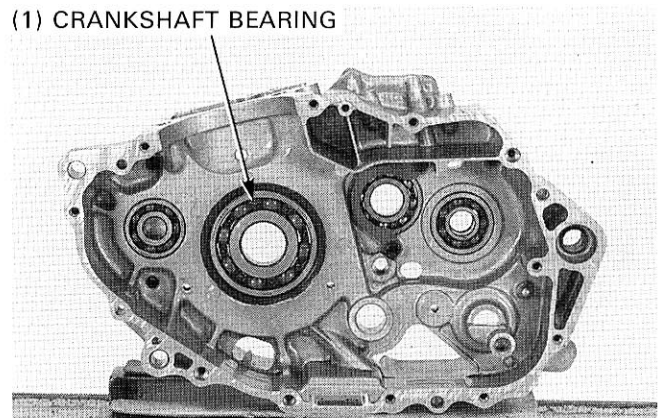
Crankshaft/Balancer Bearing

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



CRANKSHAFT/BALANCER BEARING REPLACEMENT

Drive the crankshaft bearings out of the crankcases.



CRANKSHAFT/BALANCER

Remove the balancer bearings with following special tools:

TOOLS:

Right:

Bearing remover set, 15 mm	07936 - KC10000 not available in U.S.A.
- bearing remover, 15 mm	07936 - KC10500
- bearing remover	07936 - KC10200 not available in U.S.A.
- remover shaft	07936 - KC10100 not available in U.S.A.
- remover weight	07741 - 0010201 or 07936 - 371020A or 07936 - 3710200

Left:

Bearing remover, 13 mm	07LMC - KZ10100 not available in U.S.A.
Remover shaft	07936 - 1660120
Remover weight	07741 - 0010201 or 07936 - 371020A or 07936 - 3710200

Drive new bearings into the crankcases with following special tools:

TOOLS:

Crankshaft bearings:

Driver	07749 - 0010000
Attachment, 72 × 75 mm	07746 - 0010600
Pilot, 30 mm	07746 - 0040700

Right balancer bearing:

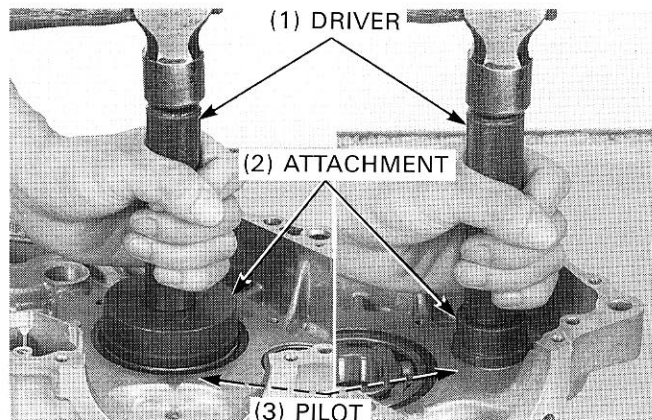
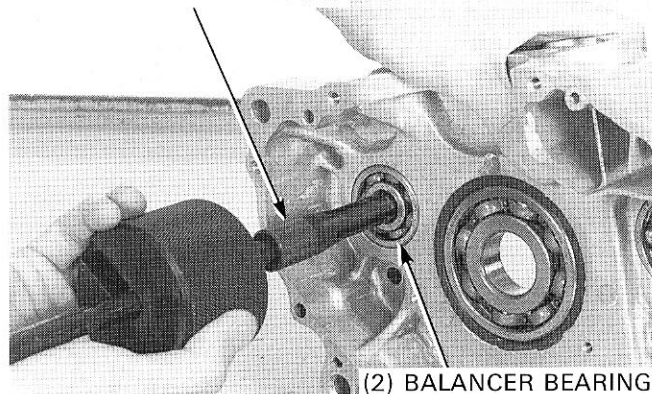
Driver	07749 - 0010000
Attachment, 37 × 40 mm	07746 - 0010200
Pilot, 15 mm	07746 - 0040300

Left balancer bearing:

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

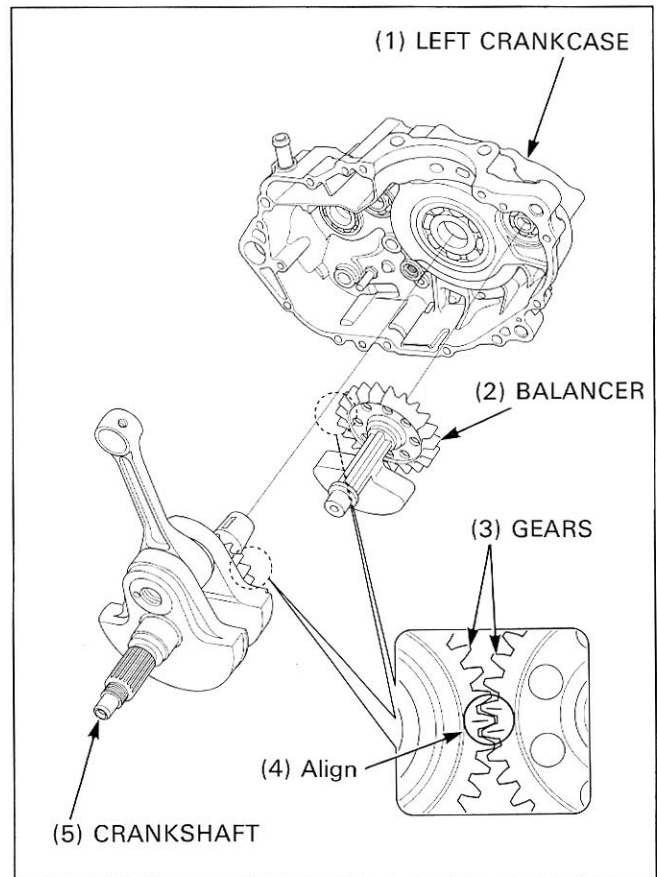
After installing the bearings, lubricate them with engine oil.

(1) BEARING REMOVER SET



CRANKSHAFT INSTALLATION

Engage the balancer and crankshaft aligning the index lines on the balancer driven and drive gears as shown and set the crankshaft and balancer together into the left crankcase.



Assemble the special tools onto the crankshaft.
Install the crankshaft drawing it.

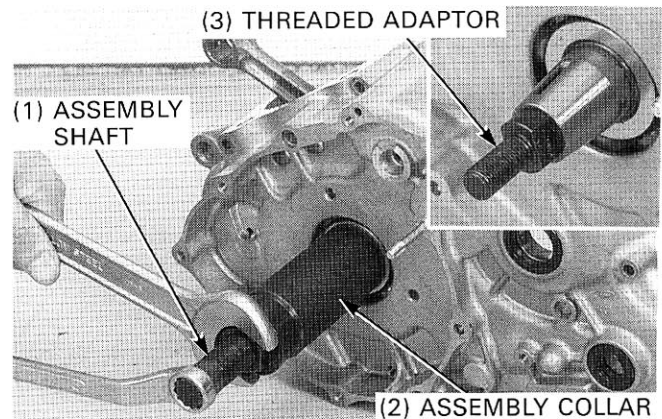
TOOLS:

Crankcase assembly tool

- assembly collar
- assembly shaft

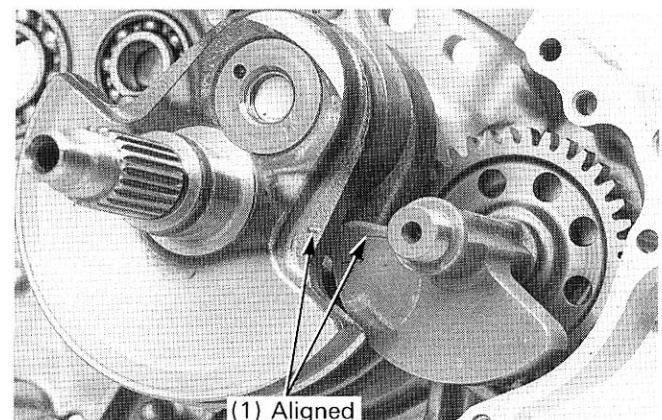
- threaded adaptor

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

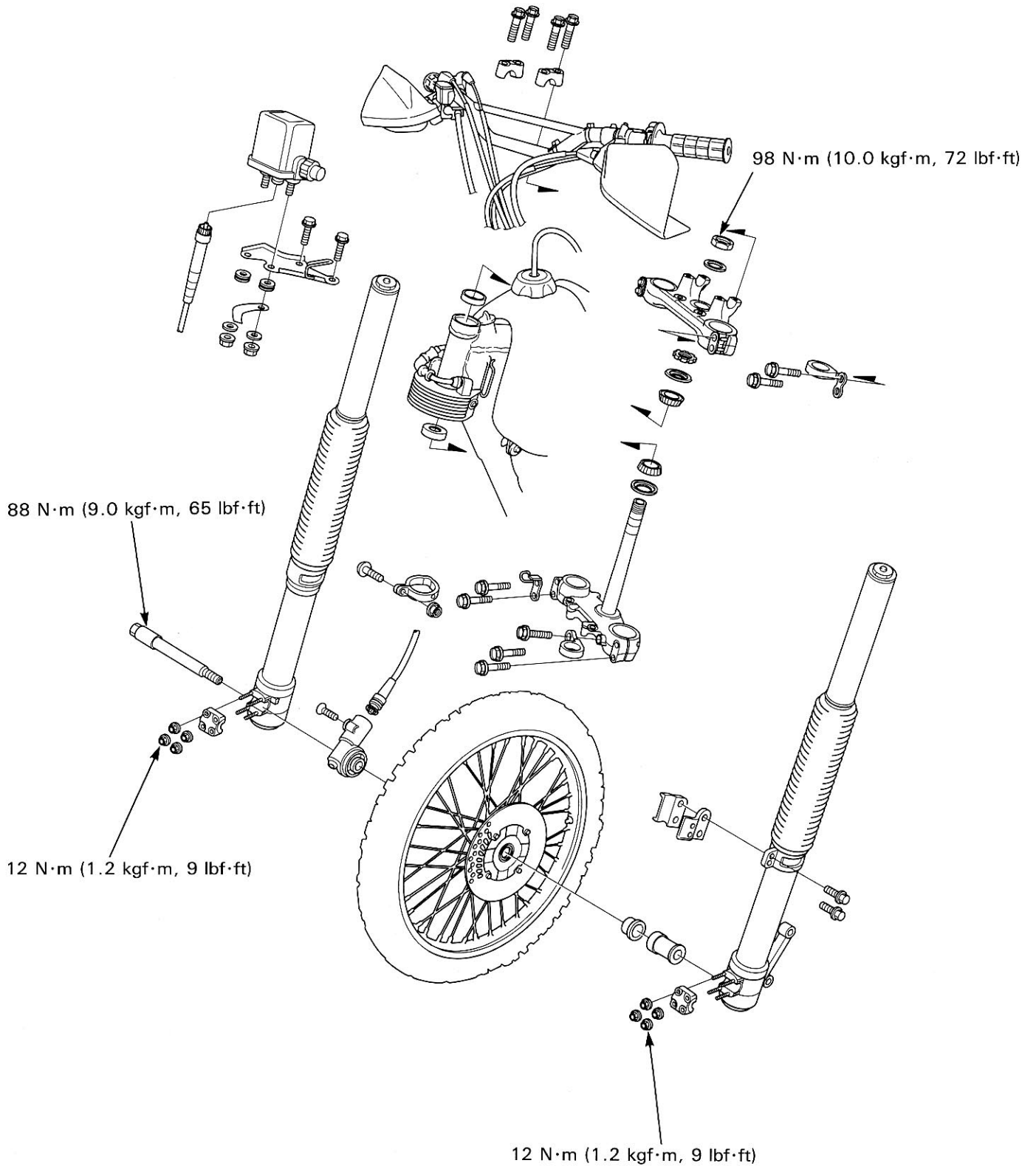


After installing the crankshaft, make sure that the index lines on the crank weight and balancer weight are aligned.

Install the transmission and assemble the crankcases (page 11-9).



FRONT WHEEL/SUSPENSION/STEERING



13. FRONT WHEEL/SUSPENSION/STEERING

SERVICE INFORMATION	13-1	FORK	13-9
TROUBLESHOOTING	13-2	HANDLEBAR	13-20
FRONT WHEEL	13-3	STEERING STEM	13-24

SERVICE INFORMATION

GENERAL

⚠ WARNING

- *Riding on damaged rims impairs safe operation of the vehicle.*
 - *A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.*
-
- This section covers maintenance of the front wheel, fork and steering stem.
 - Raise the front wheel off the ground by supporting the frame securely when servicing. A box or work stand is required to support the motorcycle.
 - Refer to section 15 for brake system information.
 - Refer to section 16 for light and switch information.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Tire and wheel	Cold tire pressure	100 kPa (1.0 kgf/cm ² , 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	Fork spring free length	'96, '97:	510.4 (20.09)	
		After '97:	536.1 (21.11)	
	Fork spring direction		Narrow end facing down	—
	Fork tube runout		—	0.20 (0.008)
	Fork air pressure		0 kPa	—
	Recommended fork oil		Pro Honda Suspension Fluid SS – 7	—
	Fork oil level	'96, '97:	100 (3.9)	—
		After '97:	116 (4.6)	—
Fork oil capacity	'96, '97:	570 cm ³ (19.2 US gal, 20.0 Imp gal)	—	
	After '97:	559 cm ³ (18.9 US gal, 19.7 Imp gal)	—	

TORQUE VALUES

Front axle holder nut	12 N·m (1.2 kgf·m, 9 lbf·ft)
Front axle	88 N·m (9.0 kgf·m, 65 lbf·ft)
Front brake disc bolt	20 N·m, (2.0 kgf·m, 14 lbf·ft) ALOC bolt. Do not reuse.
Spoke nipple	3.7 N·m (0.38 kgf·m, 2.7 lbf·ft)
Rim lock	13 N·m (1.3 kgf·m, 9 lbf·ft)
Fork center bolt	34 N·m (3.5 kgf·m, 25 lbf·ft) Apply locking agent to the threads.
Piston rod lock nut	20 N·m (2.0 kgf·m, 14 lbf·ft)
Fork cap	23 N·m (2.3 kgf·m, 17 lbf·ft)
Rebound damping adjuster	27 N·m (2.8 kgf·m, 20 lbf·ft)
Steering stem nut	98 N·m (10.0 kgf·m, 72 lbf·ft)
Steering bearing adjustment nut	See page 13-25. Apply oil to the threads.
Throttle pulley pivot screw	4 N·m (0.4 kgf·m, 2.9 lbf·ft)

FRONT WHEEL/SUSPENSION/STEERING

TOOLS

Bearing remover head, 17 mm	07746 – 0050500
Bearing remover shaft	07746 – 0050100
Driver	07749 – 0010000
Attachment, 32 × 35 mm	07746 – 0010100
Attachment, 42 × 47 mm	07746 – 0010300
Pilot, 17 mm	07746 – 0040400
Spoke nipple wrench C, 5.8 × 6.1 mm	07701 – 0020300 or equivalent commercially available in U.S.A.
Fork damper holder	07WMB – KCY0100 or 07TMB – KCY010A and 07TMB – 001010A
Fork seal driver weight	07947 – KA50100
Fork seal driver attachment	07947 – KA40200
Steering stem socket	07916 – KA50100
Oil seal remover	07948 – 4630100 or M9360 – 277 – 91774 and 07953 – MJ1000B or 07953 – MJ1000A
Steering stem driver	07946 – 4300101 or 07946 – MB00000 and 07946 – KA6000A or GN HT-51

TROUBLESHOOTING

Hard steering

- Steering bearing adjustment nut too tight
- Worn or damaged steering bearings
- Worn or damaged steering bearing races
- Bent steering stem
- Insufficient tire pressure
- Faulty front tire

Steers to one side or does not track straight

- Damaged or loose steering bearings
- Bent forks
- Bent front axle: wheel installed incorrectly
- Bent frame
- Faulty front tire
- Worn or damaged front wheel bearings
- Worn slider or fork tube bushing

Front wheel wobbling

- Bent rim
- Worn or damaged front wheel bearings
- Faulty front tire
- Loose or broken spokes
- Loose front axle fasteners

Wheel turns hard

- Faulty front wheel bearings
- Bent front axle
- Brake drag

Soft suspension

- Weak fork springs
- Insufficient fluid in fork
- Deteriorated fork fluid
- Incorrect fork fluid weight
- Low tire pressure

Hard suspension

- Bent fork tubes
- Too much fluid in fork
- Incorrect fork fluid weight
- Clogged fork fluid weight
- High tire pressure

Front suspension noise

- Worn slider or fork tube bushing
- Insufficient fluid in fork
- Loose fork fasteners

FRONT WHEEL

NOTE

- Do not operate the front brake lever after removing the front wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.

REMOVAL

Remove the odometer cable set screw and disconnect the odometer cable from the gear box.

When the wheel or fork will be disassembled, you should remove it following procedure:

Loosen the four axle holder nuts on the right fork leg and loosen the axle.

Raise the front wheel off the ground by supporting the frame under the engine using a box or work stand.

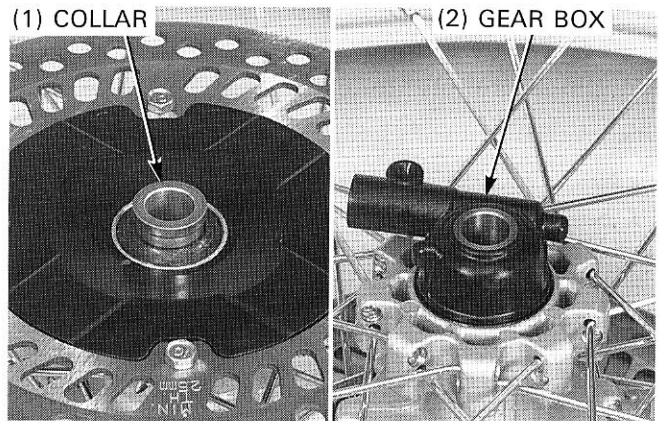
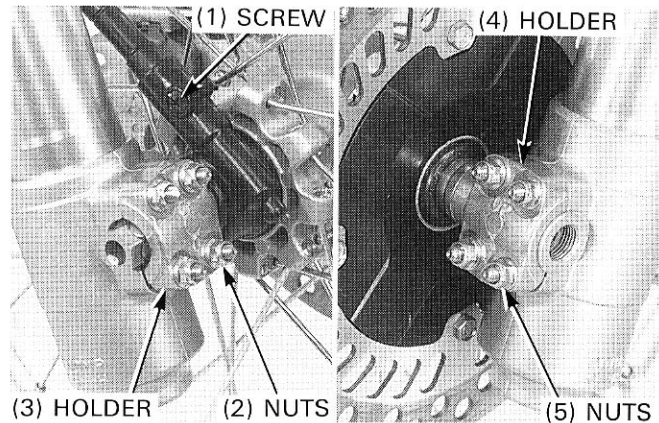
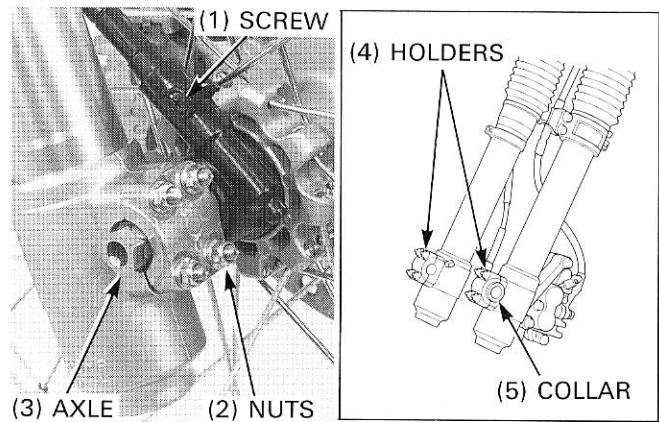
Pull the axle out and remove the front wheel
Remove the holder nuts and the axle holders and holder collar.

If the wheel is not disassembled, you can remove the wheel and axle as an assembly:

Raise the front wheel off the ground by supporting the frame under the engine using a box or work stand.

Remove the holder nuts and axle holders on both sides, then remove the front wheel from the fork legs.

Remove the side collar and odometer gear box from the wheel.

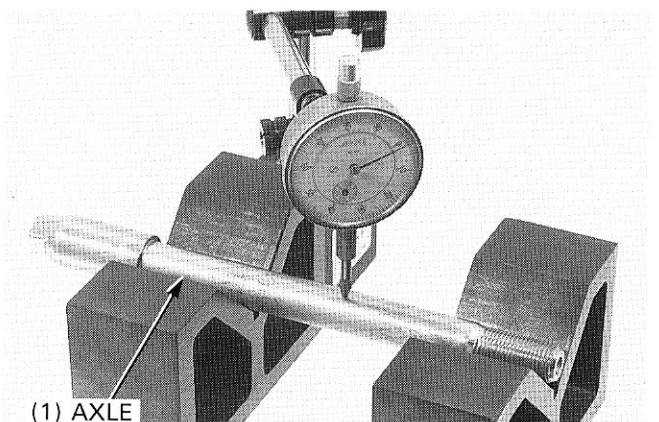


INSPECTION

Axle

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

SERVICE LIMIT: 0.2 mm (0.01 in)



FRONT WHEEL/SUSPENSION/STEERING

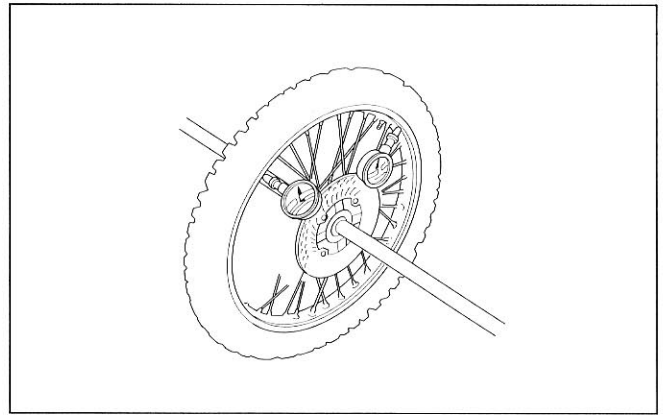
Wheel

Check the rim runout by placing the wheel in a truing stand. Spin the wheel slowly and read the runout using a dial indicator.

Actual runout is 1/2 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.



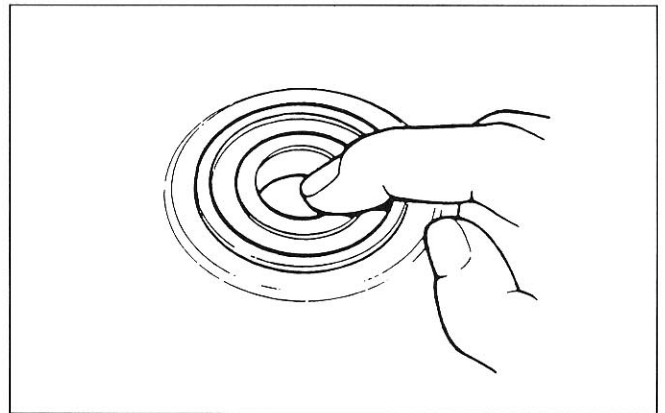
Wheel Bearing

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

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

NOTE

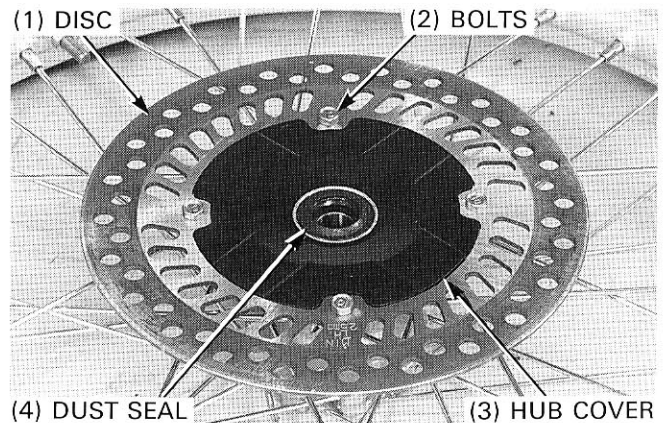
- Replace the wheel bearings in pairs.



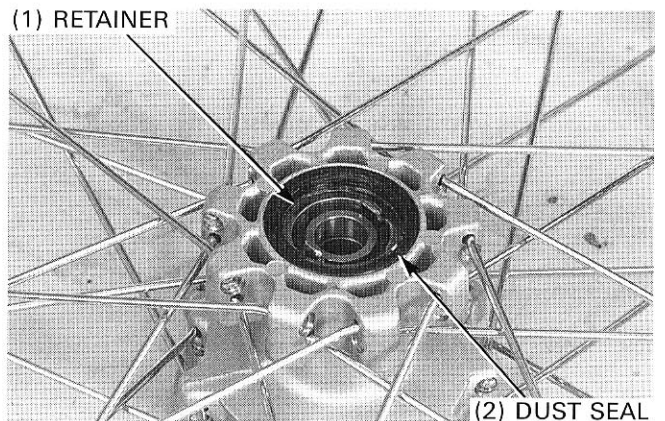
DISASSEMBLY

Remove the four bolts and the brake disc and hub cover.

Remove the dust seals from both sides of the wheel.



Remove the odometer gear retainer.



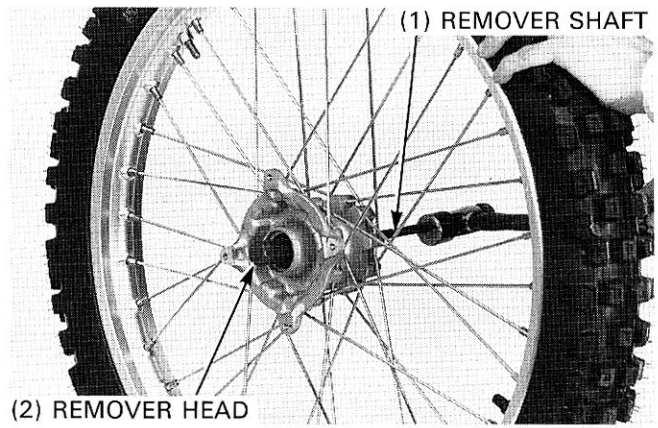
Install the remover head into the bearing.
 From the opposite side, install the remover shaft and drive the bearing out of the wheel hub.
 Remove the distance collar and drive out the other bearing using the special tools.

TOOLS:

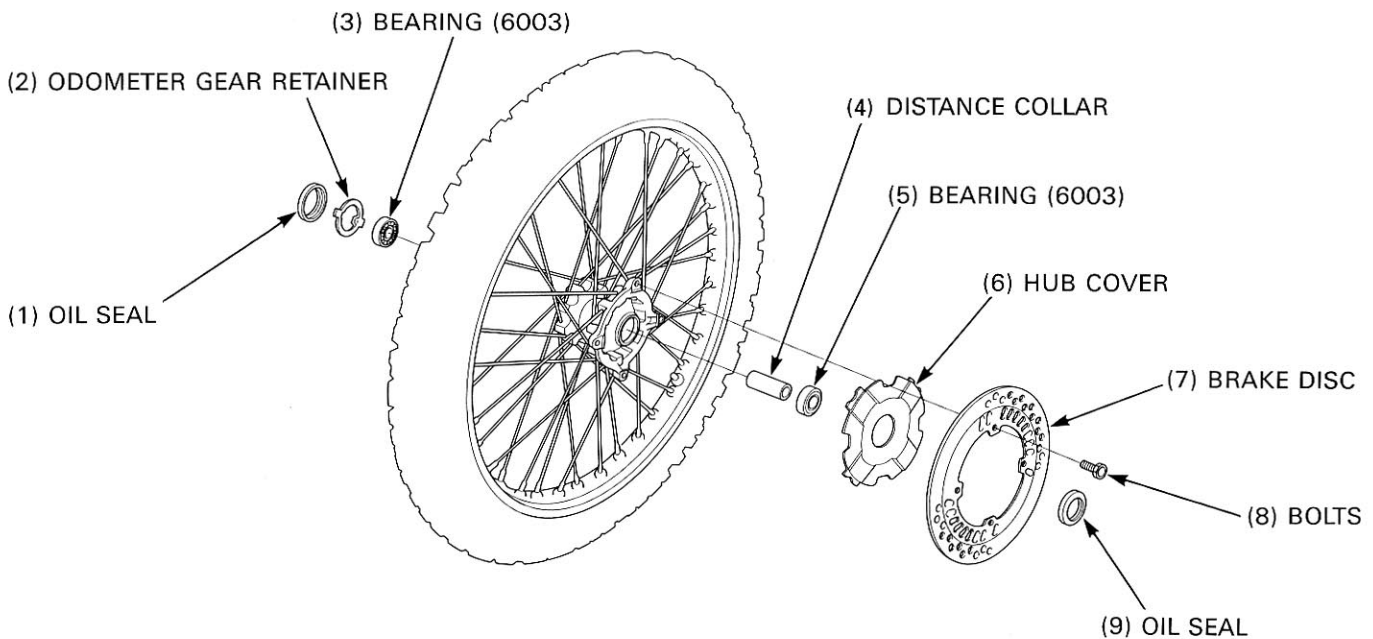
- Bearing remover shaft** 07746 – 0050100
- Bearing remover head, 17 mm** 07746 – 0050500

NOTE

- If the bearings are removed, they must be replaced with new ones.



ASSEMBLY



WHEEL CENTER ADJUSTMENT

NOTE

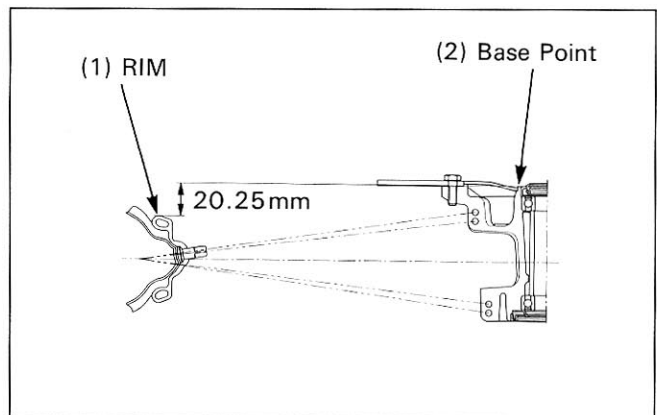
- Wheel center adjustment is necessary when new spokes are installed.

Adjust the hub position so that the distance from the left end surface of the hub center to the side of rim is 20.25 mm as shown.
 Tighten the spokes in 2 or 3 progressive steps to the specified torque.

TOOL:

- Spoke nipple wrench** 07701 – 0020300 or equivalent commercially available in U.S.A.

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



FRONT WHEEL/SUSPENSION/STEERING

Pack grease each wheel bearing cavities with grease.
In the first place, drive in a new right bearing (gear box side) squarely with the sealed side facing up until it is fully seated. Install the distance collar.

Drive a new left bearing squarely with the sealed side facing up until it is seated, using the special tools as shown.

TOOLS:

Driver

07749 - 0010000

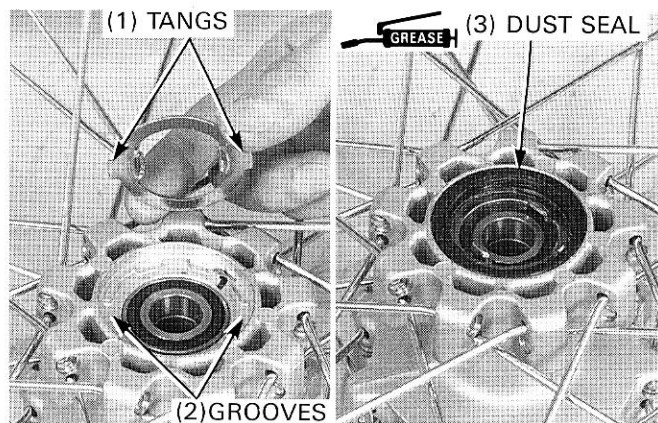
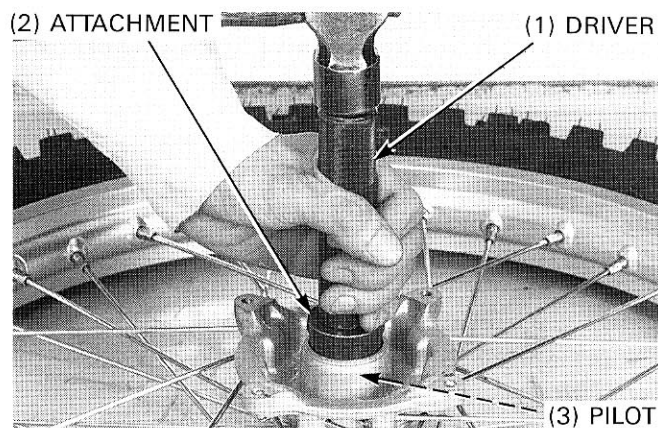
Attachment, 32 × 35 mm

07746 - 0010100

Pilot, 17 mm

07746 - 0040400

Install the odometer gear retainer into the wheel hub, aligning the tangs with the grooves in the hub. Apply grease to a new dust seal lip and install the dust seal over the gear retainer.



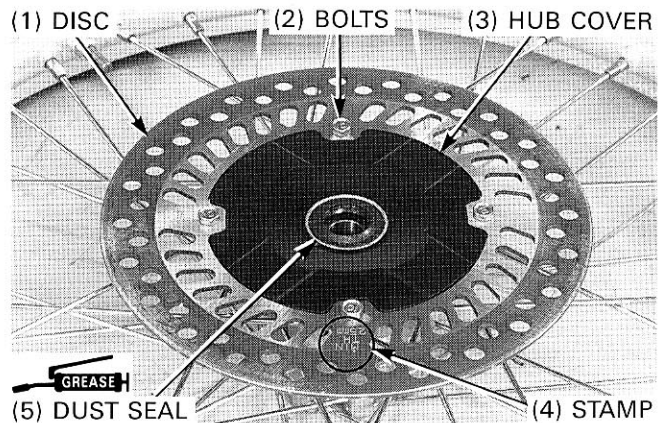
⚠ WARNING

- Do not get grease on the brake disc or stopping power will be reduced.

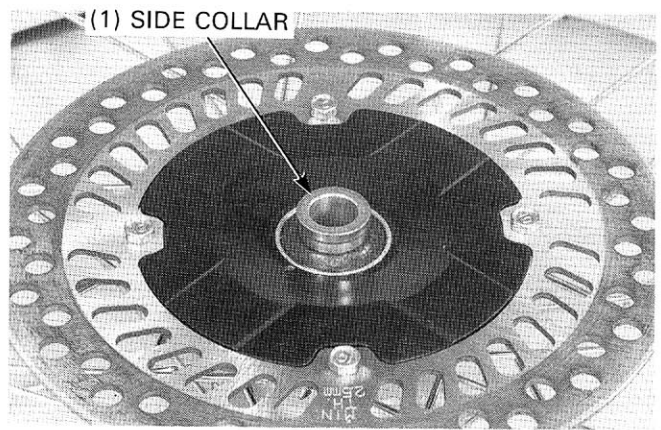
Install the hub cover and brake disc onto the wheel hub with the disc's stamp facing out. Install and tighten new disc bolts.

TORQUE: 20 N·m (2.0 kgf·m, 14 lbf·ft)

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

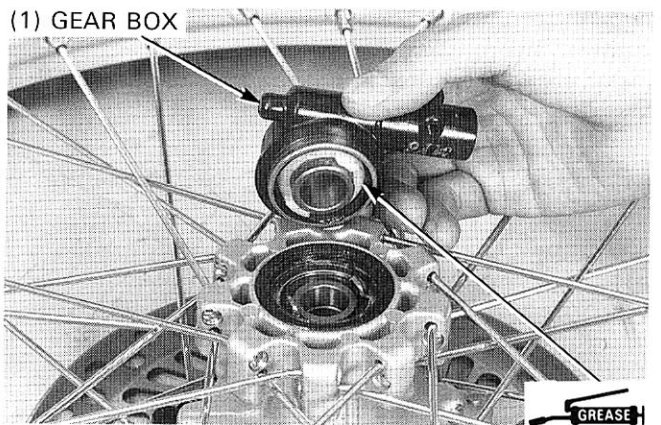


Install the side collar into the left wheel hub.

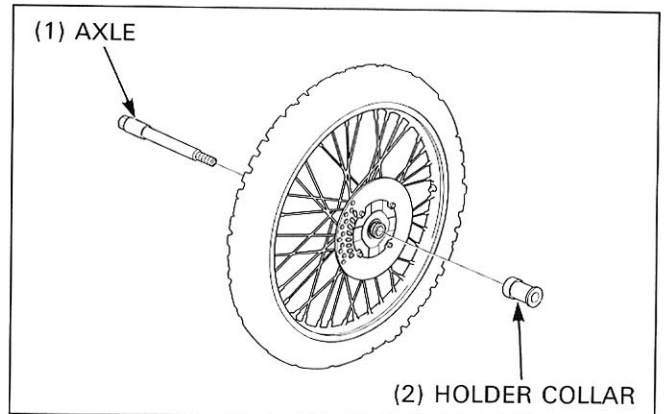


Apply grease to the inside of the odometer gear box and gear teeth, and install the plain washers and gear.

Install the gear box into the right wheel hub.



Insert the axle into the wheel from the gear box side and install the holder collar over the axle with the flanged side facing out. Temporarily tighten the holder collar by hand.



FRONT WHEEL/SUSPENSION/STEERING

INSTALLATION

Clean the axle seating surfaces of the axle holders and fork legs and the fork legs each other.

Install the wheel assembly onto the fork legs so that the brake disc is positioned between the pads, being careful not to damage the pads. Position the lug on the gear box against the back of the stopper on the fork leg.

Make sure the holder collar and left end of the axle are seated firmly onto the fork legs clamp surfaces. Install the axle holder onto the right fork leg with the "UP" mark facing up and loosely tighten the four right holder nuts.

Install the axle holder onto the left fork leg with the "UP" mark facing up.

Install the four left holder nuts and tighten the upper nuts first, then tighten the lower bolts.

Do not tighten the right holder nuts yet.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

After securing the holder collar, tighten the front axle.

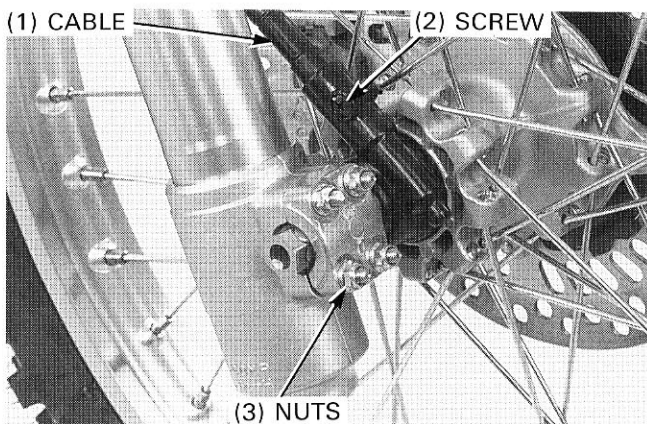
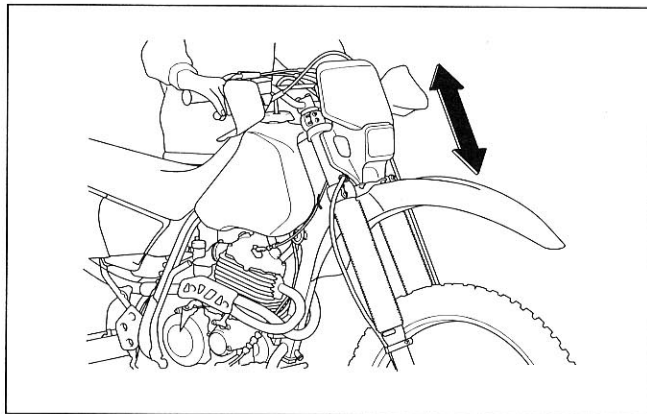
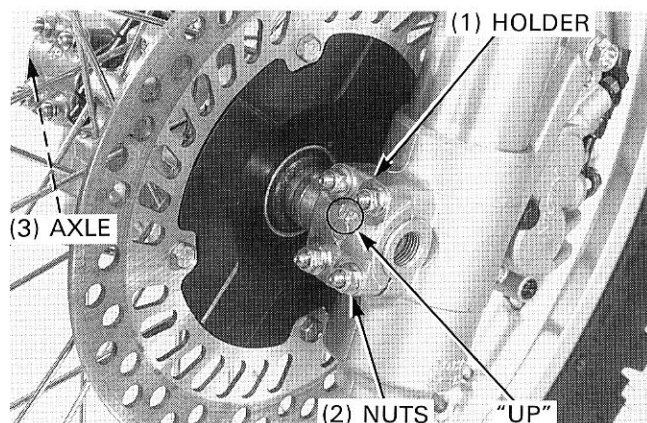
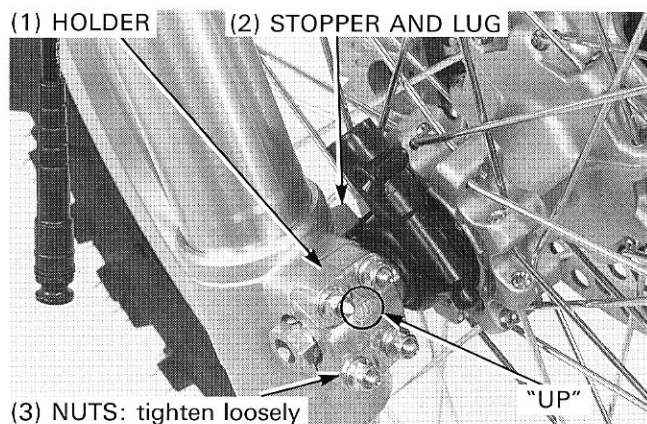
TORQUE: 88 N·m (9.0 kgf·m, 65 lbf·ft)

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

While keeping the fork parallel, tighten the upper holder nuts of the right axle holder first, then tighten the lower nuts.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Connect the odometer cable to the gear box and secure it with the set screw.



FORK

REMOVAL

Remove the screw, nut and odometer clamp.
Remove the two bolts and brake hose clamps.

Remove the following:

- front brake caliper (page 15-9) without disconnecting the brake hose
- front wheel (page 13-3)
- front visor (page 2-4).

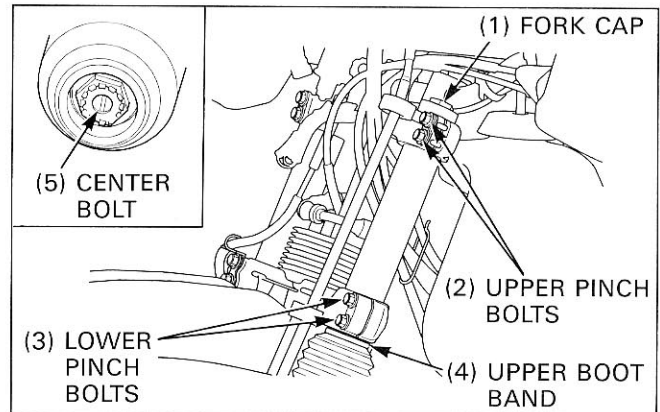
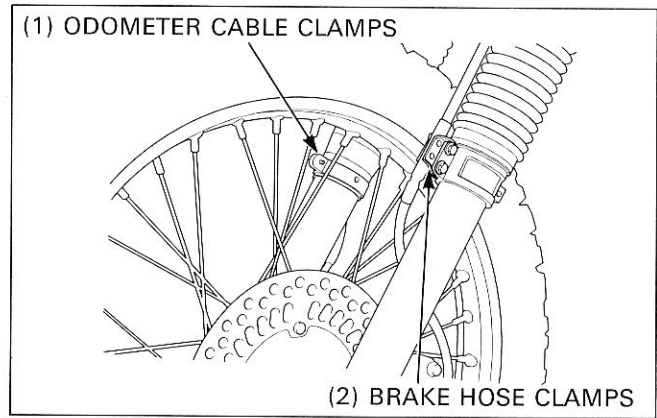
CAUTION

- Do not hang the brake caliper from the brake hose.

If you plan to disassemble the fork legs, remove the front fender and loosen the center bolts ('96, '97 only), upper fork pinch bolts, fork caps, and upper fork boot screw before loosening the lower fork pinch bolts. It is necessary to loosen the upper fork boot band screw to avoid damaging the boot when removing the fork leg.

If you don't plan to disassemble the fork legs, just loosen the upper fork pinch bolts.

Hold the fork leg while loosening the lower fork pinch bolts. Pull the fork leg down and out of the top bridge and bottom bridge.

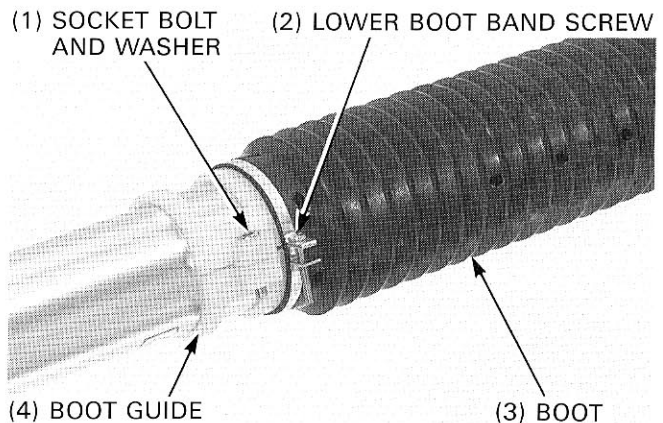


DISASSEMBLY

Loosen the lower boot band screw and remove the boot from the fork tube. Remove the boot guide.

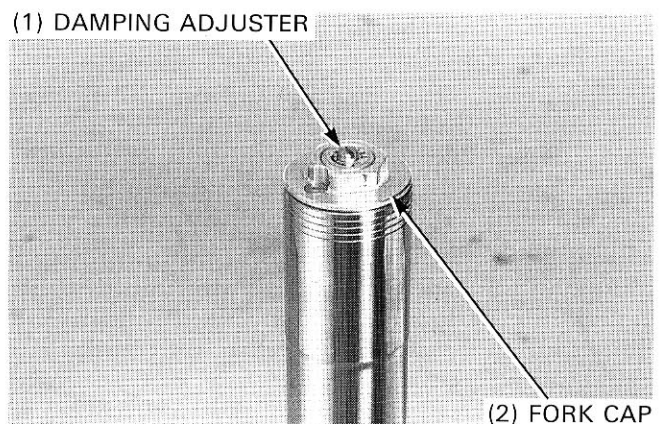
On the left fork:

Remove the socket bolt and washer and the boot guide.



CAUTION

- Before removing the fork cap, turn the rebound damping adjuster counterclockwise to softest position to prevent the needle of the adjuster from damaging (Record the number of clicks to the softest position).

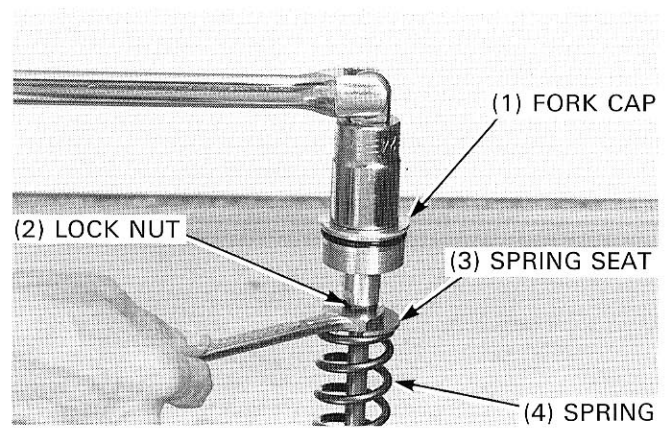


Remove the fork cap from the fork tube.

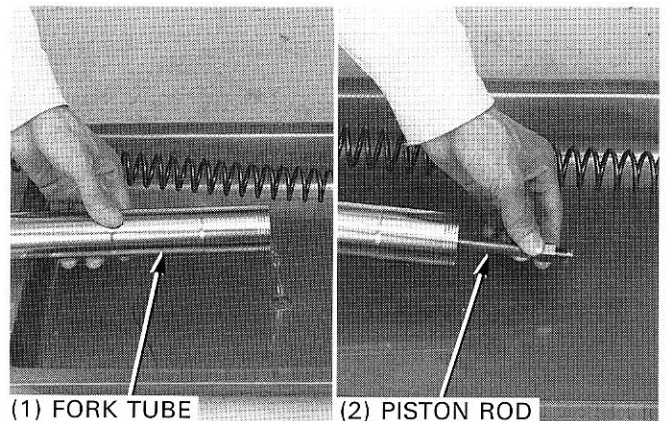
FRONT WHEEL/SUSPENSION/STEERING

Pull the fork spring down with the spring seat to access the lock nut with a wrench.
Hold the lock nut and remove the fork cap from the piston rod.

Remove the spring seat and fork spring.



Pour out the fork fluid.
Empty the fork fluid out of the fork by pumping the fork tube 8—10 times. Also pumping the piston rod.



After '97 only:

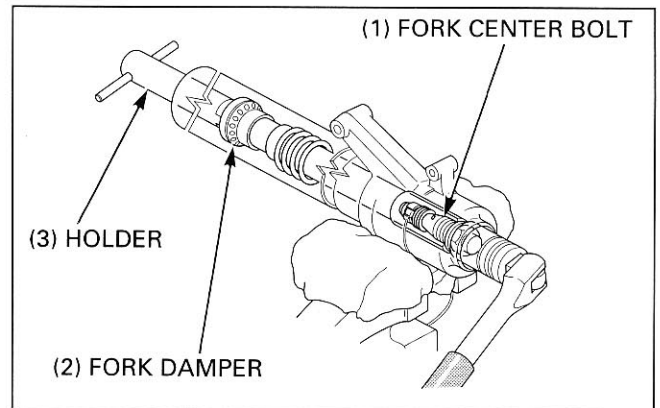
Hold the fork slider in a vise with a soft jaws or shop towel.
Hold the fork damper with the special tool and loosen the fork center bolt.

TOOLS:

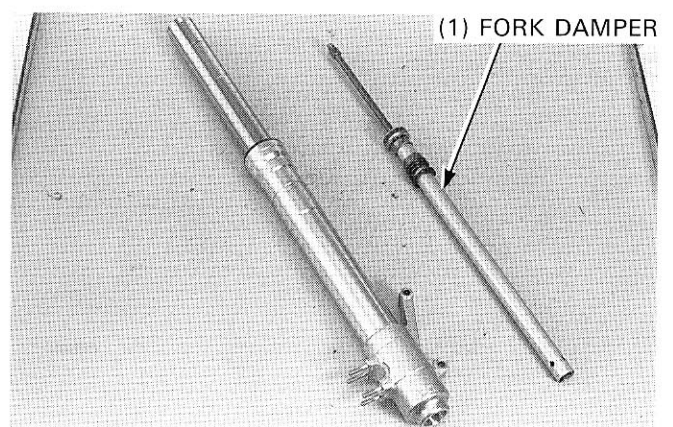
Fork damper holder 07WMB – KCY0100
not available in U.S.A.

U.S.A. only:

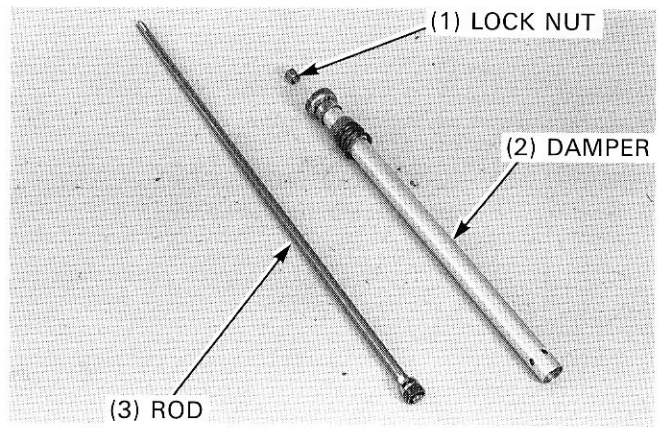
Fork rod holder attachment 2 pin 29.5 mm 07TMB – KCY010A
Fork rod holder handle 07TMB – 001010A



Remove the center bolt and the fork damper assembly from the fork.



Remove the lock nut and the piston rod from the fork damper.

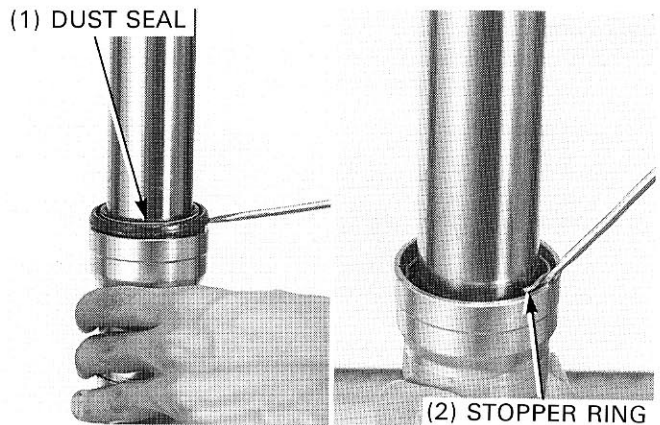


CAUTION

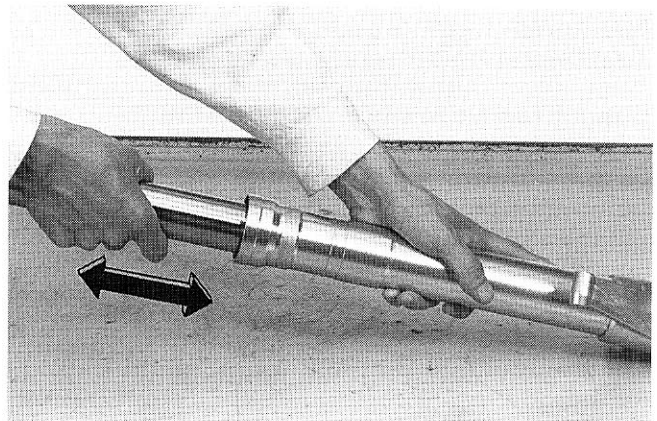
- *Be careful not to scratch the fork tube and slider.*

Remove the dust seal.

Remove the stopper ring.



Pull the fork tube out until resistance from the slider bushing is felt. Then move it in and out, tapping the bushing lightly until the fork tube separates from the fork slider. The slider bushing will be forced out by the fork tube bushing.



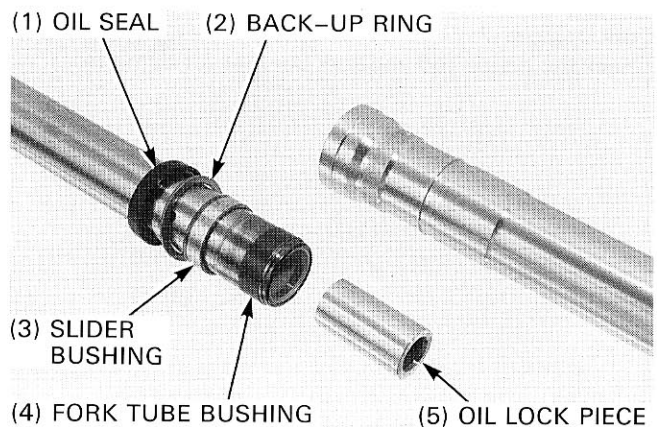
Remove the oil lock piece from the fork slider.

Remove the oil seal, back-up ring and slider bushing from the fork tube.

NOTE

- Do not remove the fork tube bushing unless it is necessary to replace it with a new one.

Carefully remove the fork tube bushing by prying the slit with a flat blade screw driver until the bushing can be pulled off by hand, being careful not to damage the fork tube.



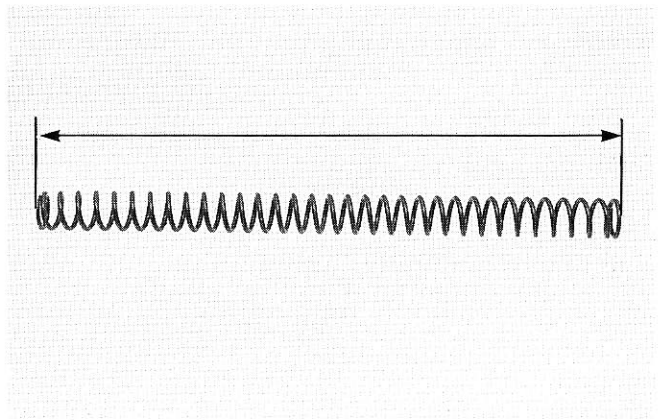
FRONT WHEEL/SUSPENSION/STEERING

INSPECTION

Fork Spring

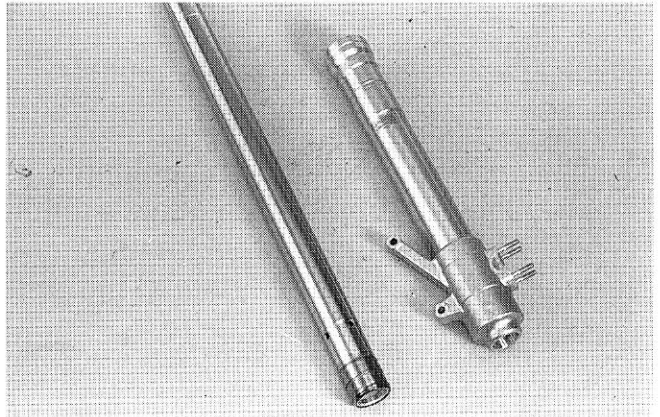
Measure the fork spring free length.

SERVICE LIMIT: '96, '97: 505.3 mm (19.89 in)
After '97: 528 mm (20.8 in)



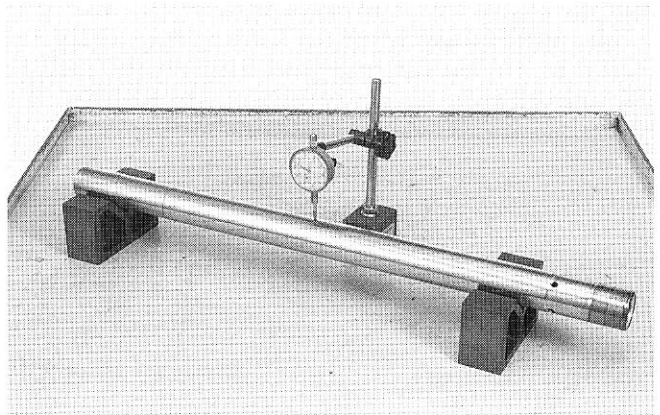
Fork Tube/Slider

Check the fork tube, fork slider and oil lock piece for score marks, and excessive or abnormal wear.



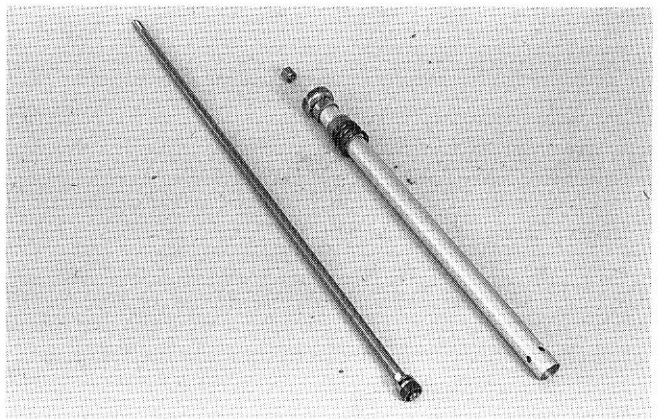
Place the fork tube in V-blocks and measure runout. Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.20 mm (0.008 in)

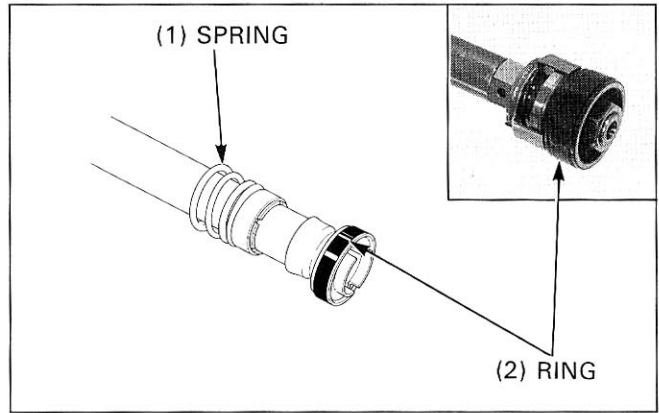


Fork Damper/Piston Rod

Check the piston rod and fork damper for damage.



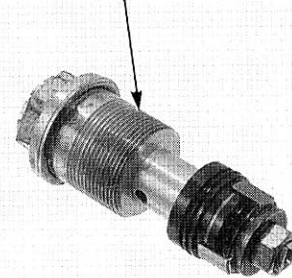
Check the piston ring on the damper and piston rod for wear or damage.
 Check the rebound spring for fatigue or damage.



Center Bolt

Check the center bolt assembly for damage.

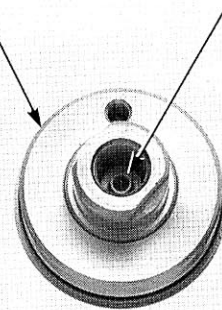
(1) CENTER BOLT



Fork Cap

Check the damping force adjusting needle for bending or damage.

(2) FORK CAP (3) NEEDLE



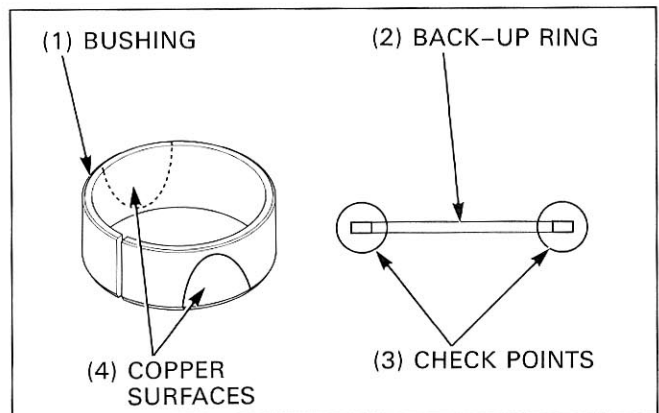
CAUTION

- *If the needle is bent or damaged, the rebound damping force will be impaired.*

Bushings

Visually inspect the slider and fork tube bushings. Replace the bushings if there is excessive scoring or scratching, or if the teflon is worn so that the copper surface appears on more than 3/4 of the entire surface.

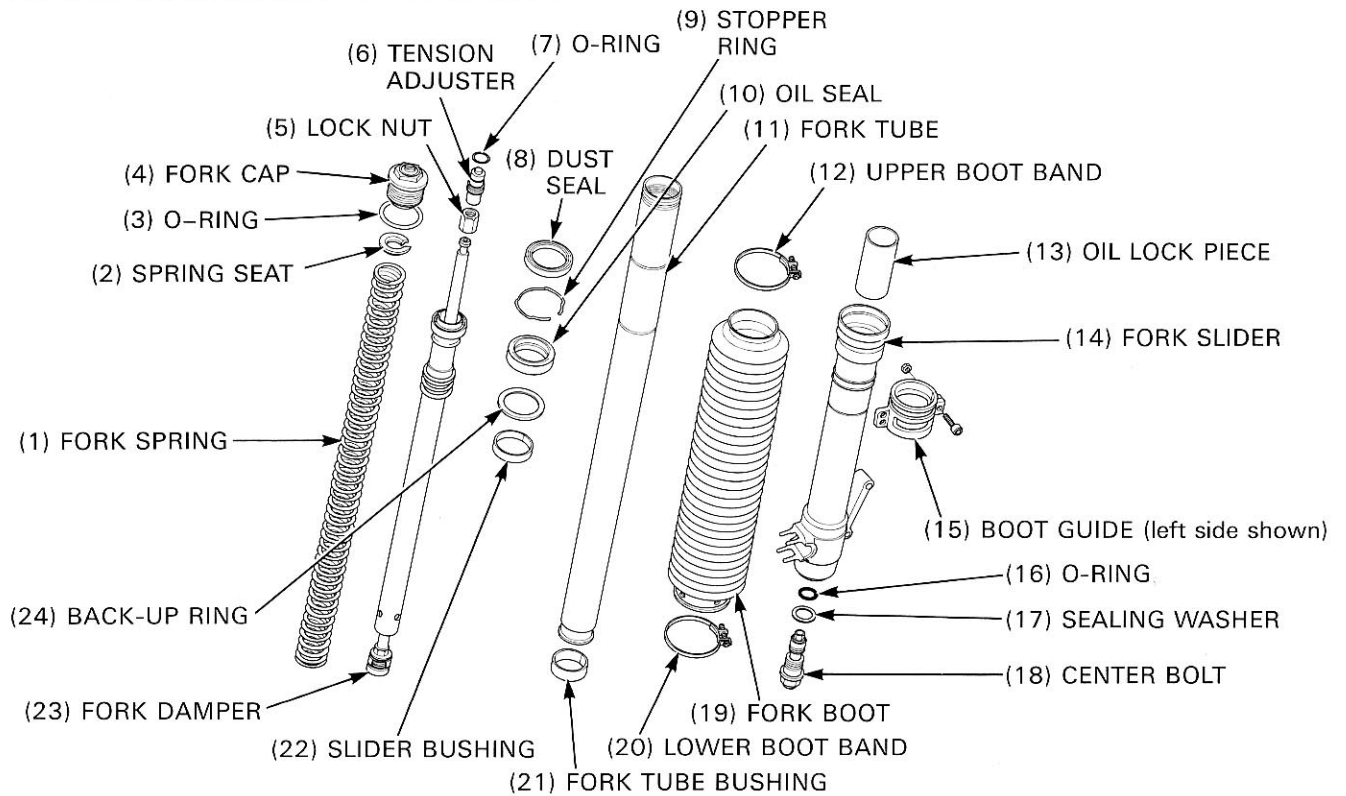
Check the back up ring; replace if there is any distortion at the points shown.



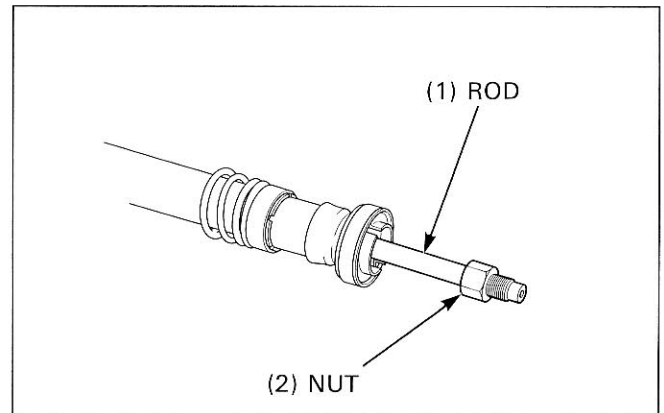
FRONT WHEEL/SUSPENSION/STEERING

ASSEMBLY

Before assembly, wash all parts with a high flash point or non-flammable solvent and wipe them off completely.

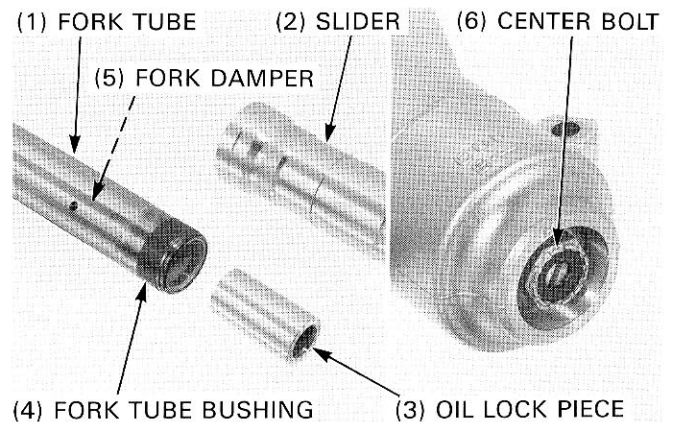


Insert the piston rod into the fork damper from the center bolt side and install the lock nut to the rod end.



Remove the burrs from the fork tube bushing, taking care not to peel off its coating. Carefully install a new fork tube bushing if it has been removed.

Install the fork damper into the fork tube. Set the oil lock piece into the fork tube and install the fork slider over the fork tube. '96, '97 only: Clean the center bolt threads. Install the center bolt into the fork slider and thread it to the fork damper.



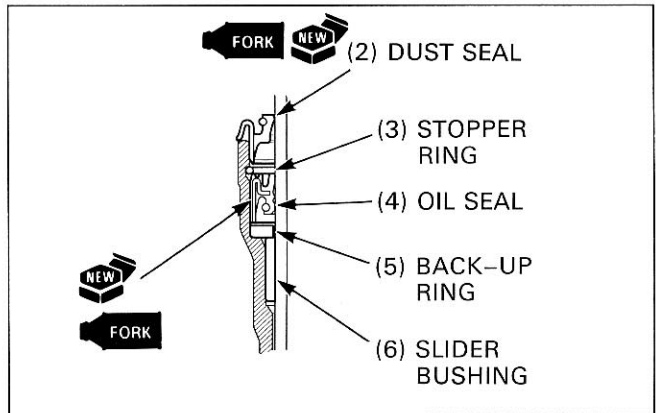
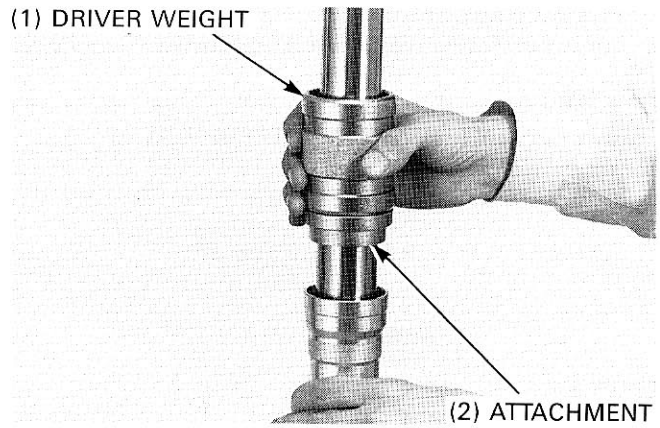
Place the slider bushing over the fork tube and rest it on the slider. Put the back up ring with the chamfered side facing down, and an old bushing or equivalent tool on the top of the slider bushing. Drive the bushing into place and remove a old bushing or equivalent tool.

Wrap vinyl tape around the fork tube top end to avoid damaging the oil seal lip. Coat a new oil seal with fork fluid and install it over the fork tube with the marked side facing up. Drive the oil seal into place using the special tools.

TOOLS:

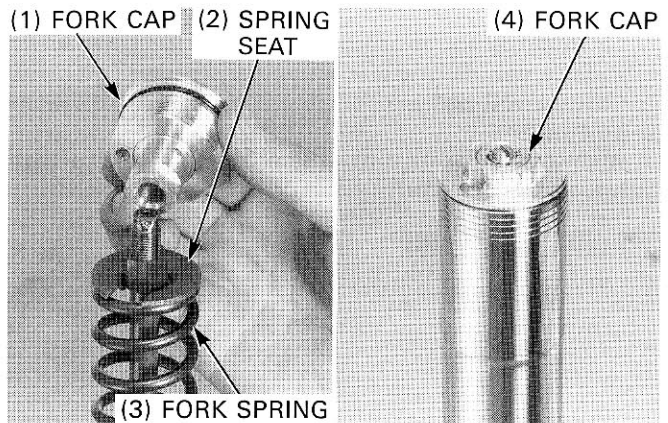
- Fork seal driver weight 07947 – KA50100
- Fork seal driver attachment 07947 – KA40200

Install the stopper ring into the groove in the fork slider. Apply fork fluid to the lip of a new dust seal and install it. Remove the vinyl tape from the fork tube end.



'96, '97 only:

Install the fork spring into the fork tube. Screw the fork cap to the piston rod and install the spring seat. Temporarily tighten the fork cap into the fork tube.



Reinstall the fork tubes into the top and bottom fork bridges. Tighten the upper and lower pinch bolts.

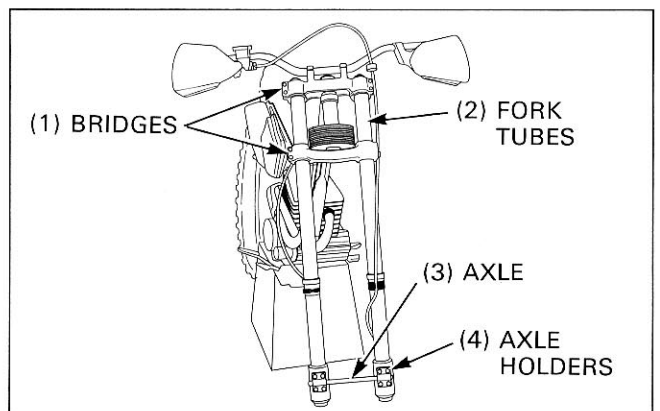
Install the holder collar over the axle. Set the axle onto the fork sliders and install the axle holders and tighten the holder nuts.

Loop a tie-down strap over the bottom fork bridge and around the front axle as shown.

CAUTION:

- To prevent possible damage, take care to attach the tie-down strap so it does not contact the oil cooler.

Using the tie-down strap, carefully compress the fork tubes 5–10 cm (2–4 in).

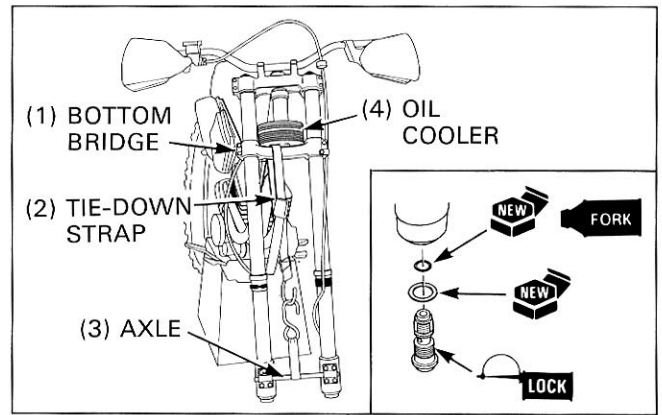


FRONT WHEEL/SUSPENSION/STEERING

Remove the fork center bolt.
 Coat a new O-ring with fork fluid and install it into the center bolt groove.
 Install a new sealing washer onto the center bolt and apply locking agent to the center bolt threads.

Install and tighten the center bolts to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

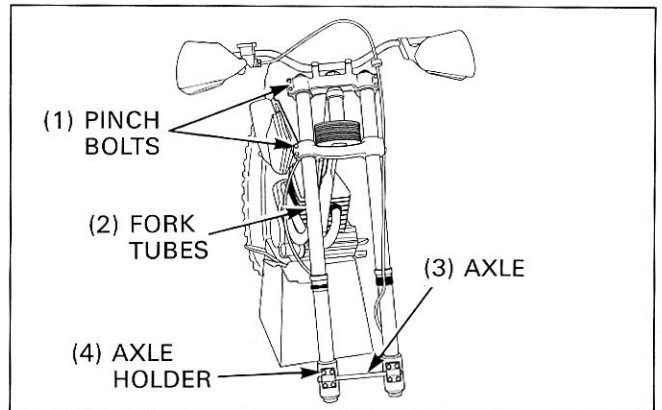


Carefully loosen and remove the tie-down strap.

Loosen the right axle holder nuts and remove the axle.

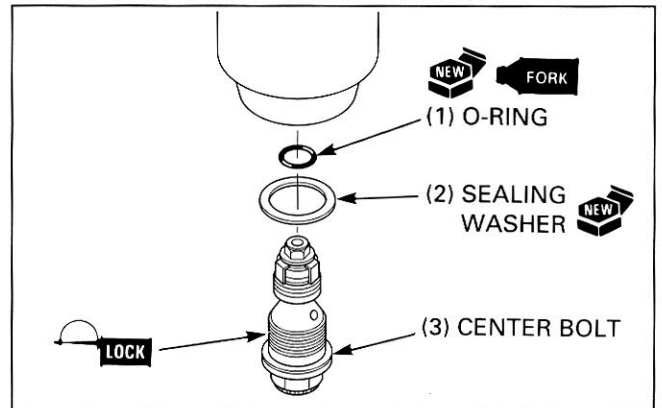
Loosen the upper and lower pinch bolts.
 Remove the fork tubes from the top and bottom bridges.

Remove the fork cap, spring seat and fork spring.



After '97 only:

Clean the center bolt threads.
 Install a new sealing washer onto the center bolt.
 Coat a new O-ring with fork fluid and install it into the center bolt groove.
 Apply locking agent to the center bolt threads and install it into the fork damper.



Hold the fork slider in a vise with a soft jaws or shop towel.
 Hold the fork damper with the special tool and tighten the fork center bolt.

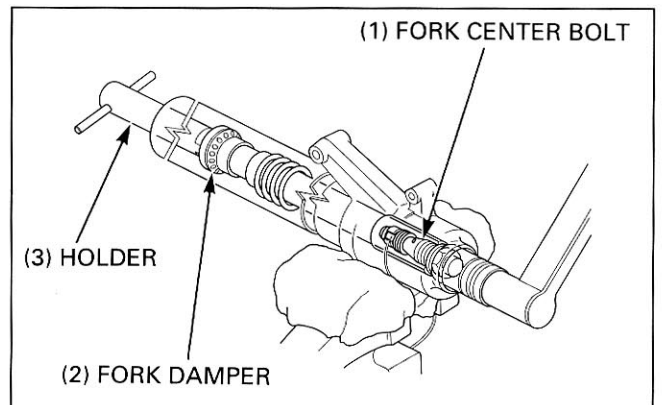
TOOLS:

Fork damper holder 07WMB – KCY0100
 not available in U.S.A.

U.S.A. only:

Fork rod holder attachment 2 pin 29.5 mm 07TMB – KCY010A
 Fork rod holder handle 07TMB – 001010A

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)



Pour the half amount of recommended fork fluid into the fork tube.

RECOMMENDED FORK FLUID: Pro Honda Suspension Fluid SS-7

FORK FLUID CAPACITY:

'96, '97: 570 cm³ (19.2 US gal, 20.0 Imp gal)
After '97: 559 cm³ (18.9 US gal, 19.7 Imp gal)

Slowly pump the fork tube 8 – 10 times to remove trapped air from the lower portion of the fork tube.

With the piston rod fully pushed in slowly, pour the recommended fork fluid into the piston rod until a fluid flows out from the piston rod end.

Pump the fork tube and piston rod slowly 8 – 10 times.

Fill with the recommended fork fluid to the specified capacity and pump the fork tube and piston rod again.

Compress the fork leg fully and leave it for 5 minutes to remove air bubbles from the oil.

Measure the oil level from top of the fork tube by supporting the fork leg vertically.

FORK FLUID LEVEL: '96, '97: 100 mm (3.9 in)
After '97: 116 mm (4.6 in)

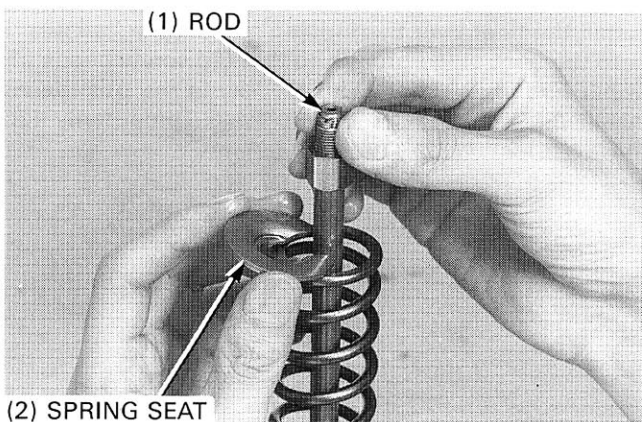
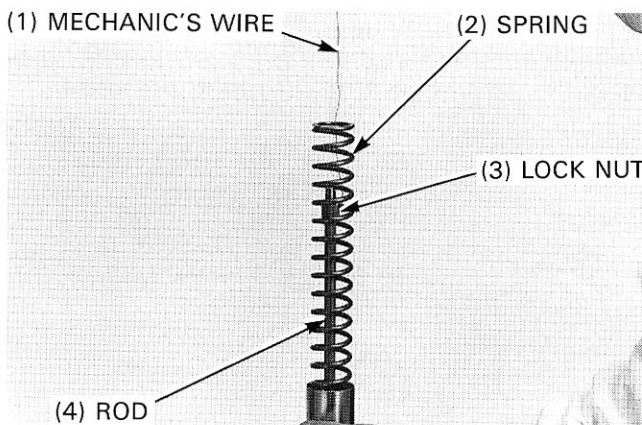
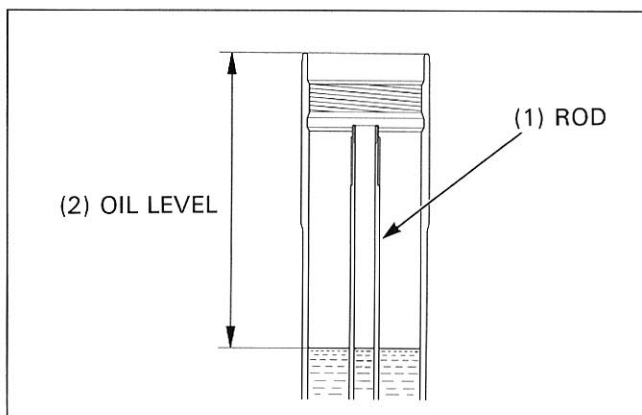
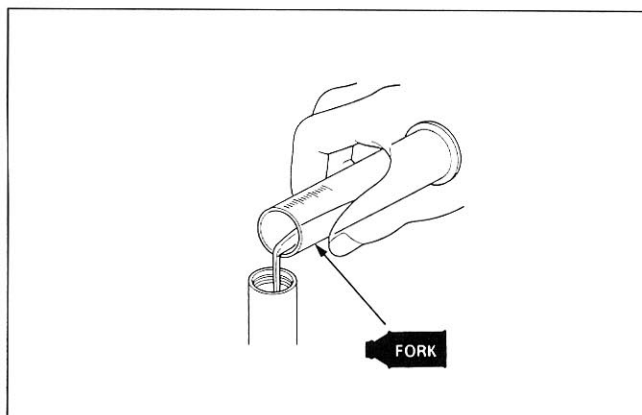
NOTE

- Be sure the fluid level is the same in both fork legs.

Thread the lock nut by hand until it seats.

Attach a mechanic's wire to the lock nut on the piston rod. Install the fork spring into the fork tube through the mechanic's wire with the narrow end facing down.

Feed the mechanic's wire up through the spring, hold the piston rod and remove the mechanic's wire. Install the spring seat onto the fork spring.



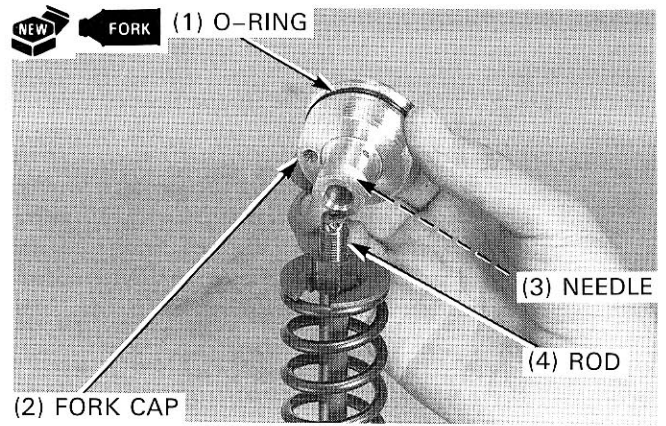
FRONT WHEEL/SUSPENSION/STEERING

Apply fork fluid to a new fork cap O-ring and install it into the fork cap grooves.

CAUTION

- Handle the fork cap carefully to prevent the needle of the cap from being damaged.

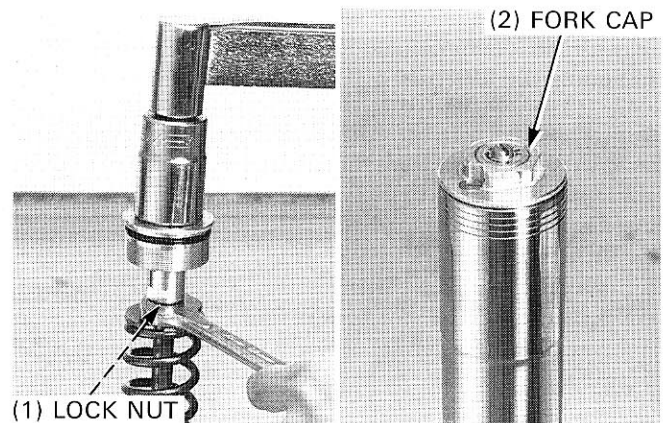
Screw the cap to the piston rod until it is fully seated.



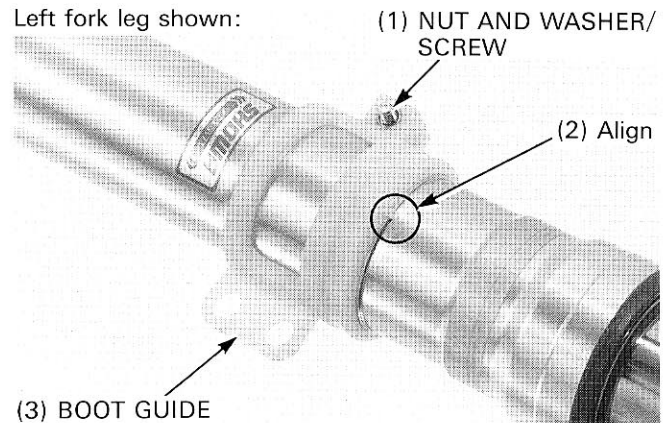
Hold the lock nut and tighten the fork cap.

TORQUE: 20 N·m (2.0 kgf·m, 14 lbf·ft)

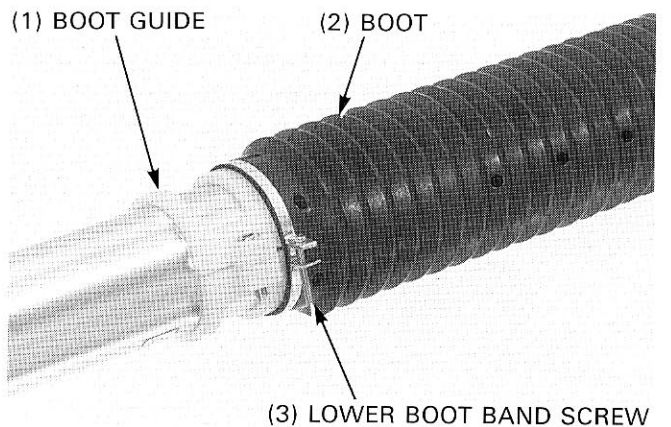
Temporarily tighten the fork cap into the fork tube.



Install the boot guide onto the groove in the fork slider aligning the tab on the guide with the groove in the slider. Secure the left boot guide with the screw and washer.



Install the boot over the fork leg and set its lower end onto the boot guide groove so that the screw heads of the upper and lower boot band are facing the outside when installed the fork leg to the motorcycle. Temporarily tighten the lower boot band screw.



INSTALLATION

Insert the fork leg into the steering stem and top bridge and align the upper surface of the top bridge with the lower groove in the fork tube, then tighten the lower fork pinch bolts.

Be sure the fork tube installed position is the same on both fork legs.

Tighten the fork cap if it was removed.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)

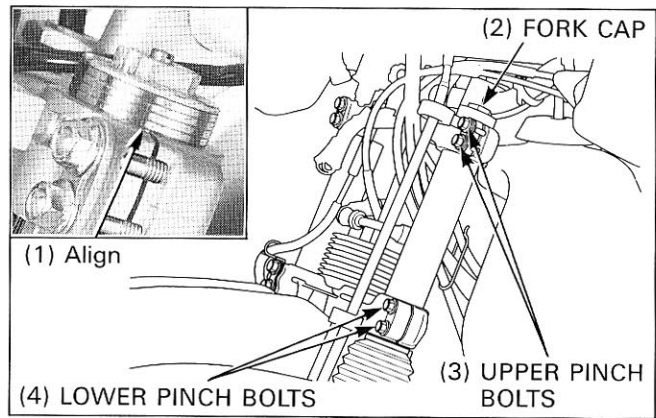
Tighten the upper fork pinch bolts.

Install the following:

- front wheel (page 13-7)
- front brake caliper (page 15-12)
- front visor (page 2-4).

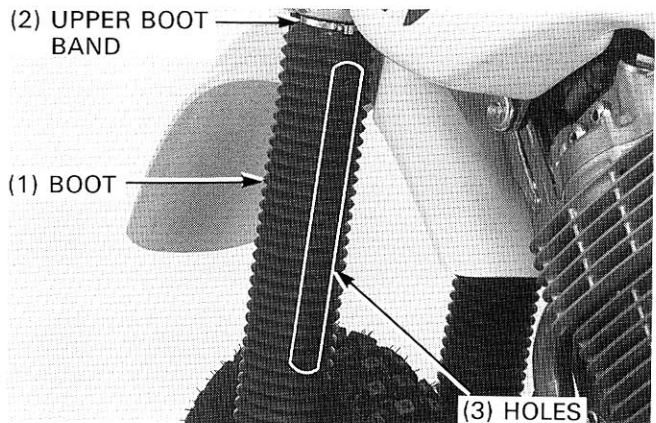
NOTE

- Route the cable and hose properly (page 1-19).



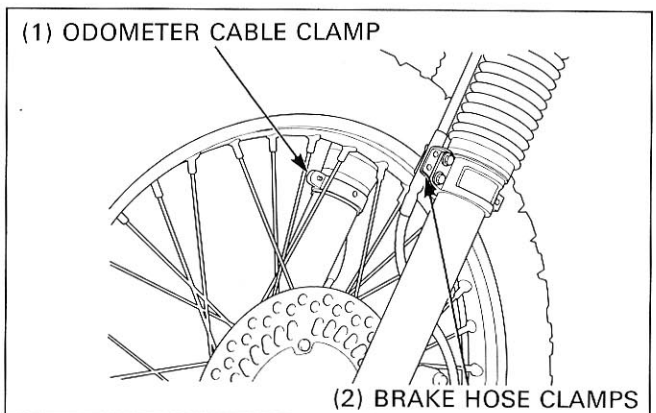
If the fork is disassembled; position the air vent holes in the fork boot facing rearward. Be sure to install the lower boot end onto the boot guide groove and tighten the lower band screw with the boot band end facing rearward.

Extend and seat the boot upper end against the lower surface of the steering stem firmly, then tighten the upper band screw with the boot band end facing rearward.



Install the cable clamp with the odometer cable against the boot guide and tighten the screw with the clamp end facing forward.

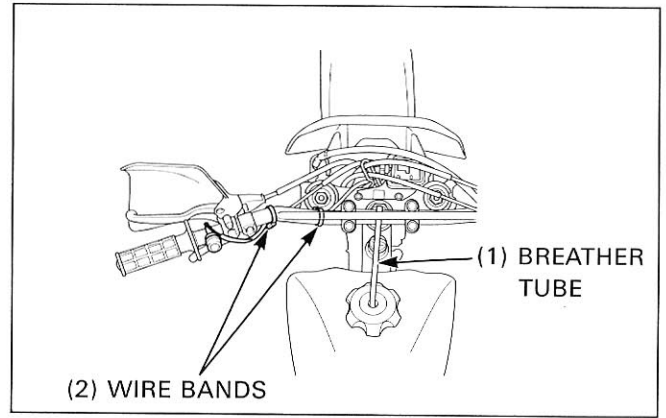
Place the hose clamps onto the brake hose with the upper edge of the clamps positioned 10 mm (0.4 in) below the upper end of the hose tube on the brake hose, then secure it to the boot guide with the two bolts.



HANDLEBAR

REMOVAL

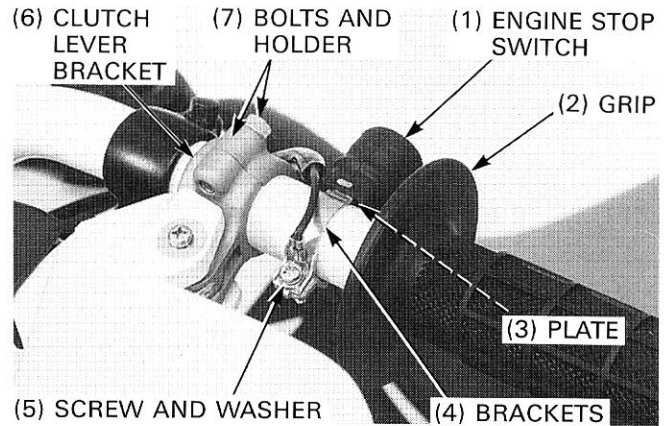
Remove the fuel tank breather tube from the steering stem. Release the wire band from the handlebar.



Remove the screw, washer and brackets and the engine stop switch with the setting plate of the switch bottom.

Remove the two bolts, clutch lever holder and the clutch lever bracket.

Remove the left handlebar grip.

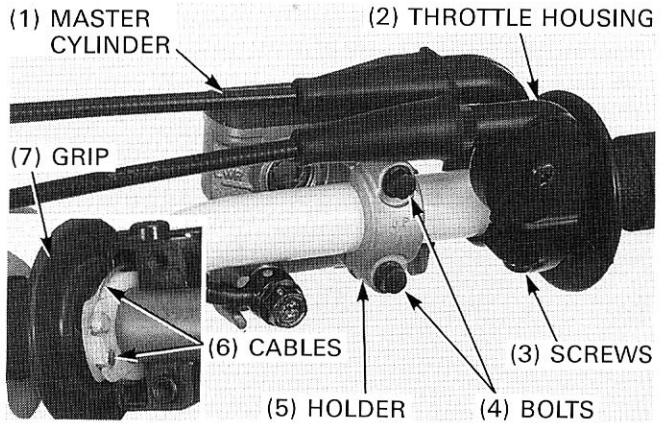


Remove the two attaching screws at the bottom of the throttle housing and the throttle housing cover. Turn the handlebar to the left fully, disconnect the throttle cables from the throttle grip flange and remove the throttle grip from the handlebar.

NOTE

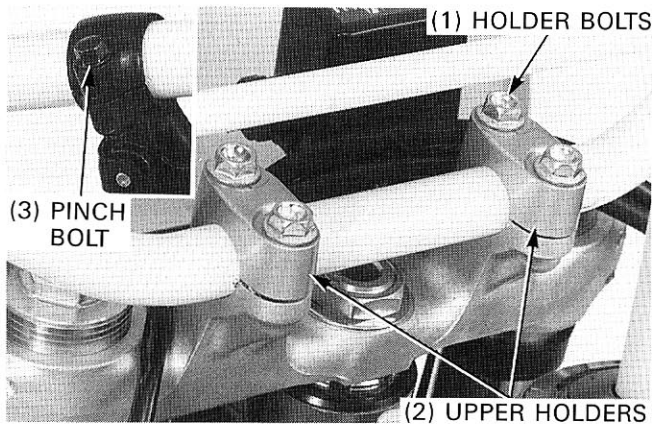
- Keep the master cylinder upright to prevent air from entering the hydraulic system.

Remove the two bolts, master cylinder holder and the master cylinder from the handlebar.



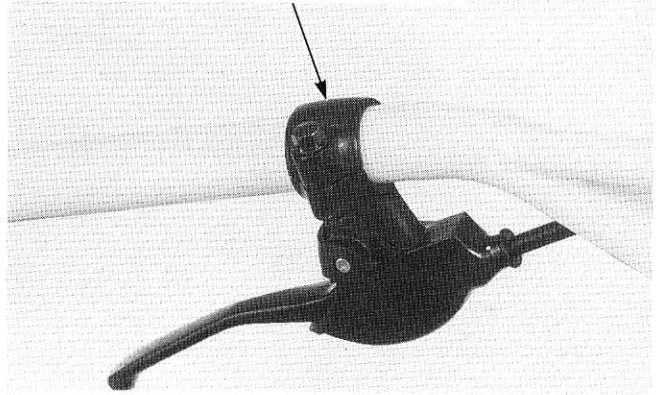
Loosen the decompressor lever bracket pinch bolt.

Remove the four bolts and the handlebar upper holders. Remove the handlebar from the top bridge.



Remove the decompressor lever bracket from the handlebar.

(1) DECOMPRESSOR LEVER BRACKET



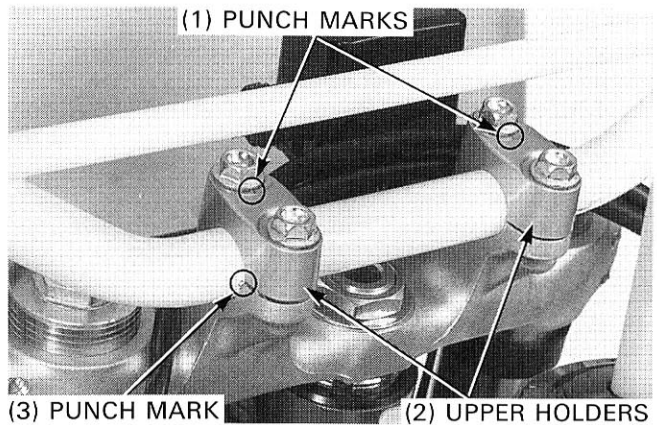
INSTALLATION

Insert the handlebar into the decompressor lever bracket.

Place the handlebar onto the lower holder of the top bridge and align the punch mark on the handlebar with the top of the lower holder.

Install the upper holders with the punch marks facing forward.

Install the four bolts and tighten the forward bolts first, then tighten the rear bolts.



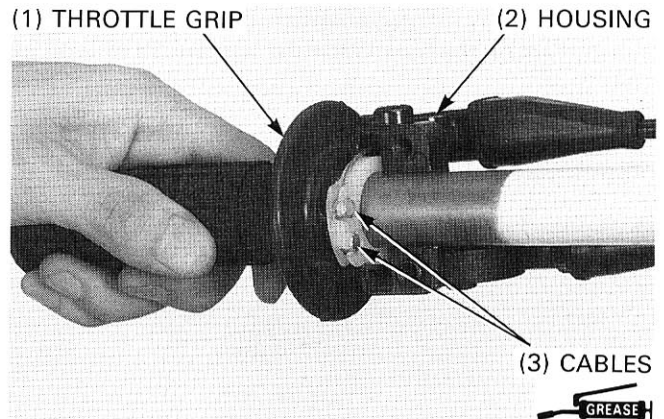
(1) PUNCH MARKS (2) UPPER HOLDERS (3) PUNCH MARK

Right Side:

Apply grease to the throttle grip flange groove and sliding surface.

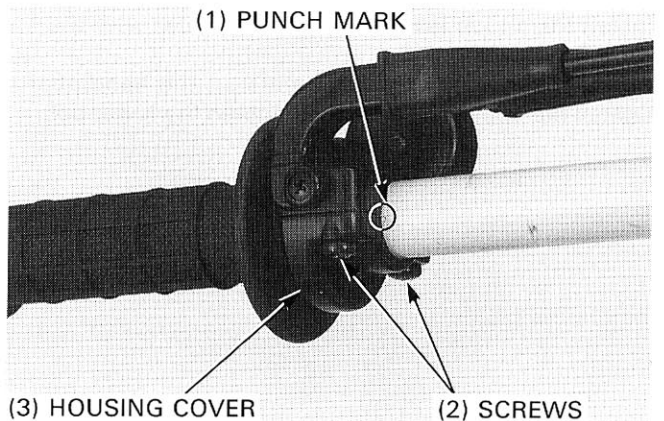
Connect the throttle cables to the throttle grip flange.

Turn the handlebar to the left fully and install the throttle grip onto the handlebar.



(1) THROTTLE GRIP (2) HOUSING (3) CABLES

Install the throttle housing cover. Align its slit with the punch mark on the handlebar and tighten the forward attaching screw first, then tighten the rear screw.

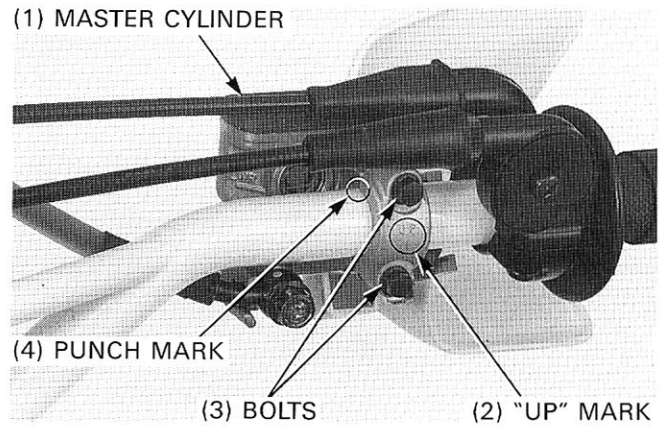


(1) PUNCH MARK (2) SCREWS (3) HOUSING COVER

FRONT WHEEL/SUSPENSION/STEERING

Install the master cylinder and holder with the "UP" mark facing up.

Align its slits with the punch mark on the handlebar and tighten the upper bolt first, then tighten the lower bolt.



Left Side:

Clean the inside surface of the left handlebar grip and the outside surface of the left handlebar.

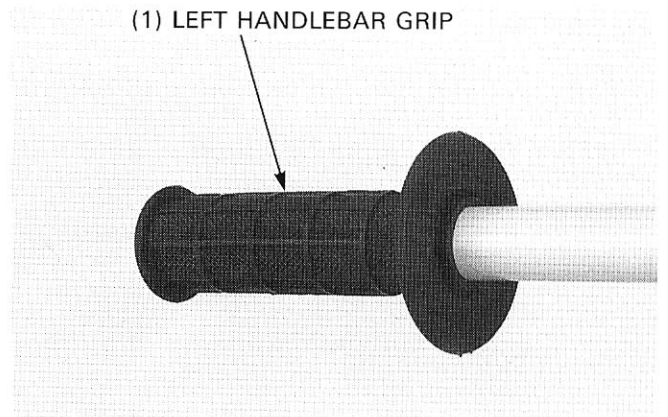
Apply Honda Bond A or Honda Grip Cement (U.S.A. only) to the inside surface of the left handlebar grip and to the outside surface of the handlebar.

Wait 3-5 minutes and install the grip.

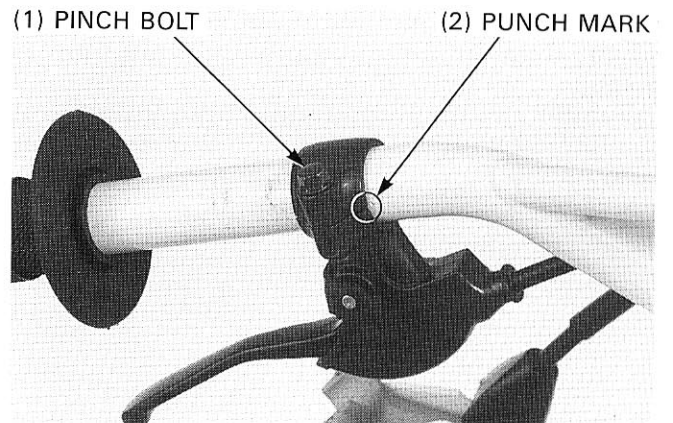
Rotate the grip for even application of the adhesive.

NOTE

- Allow the adhesive to dry for an hour before using.

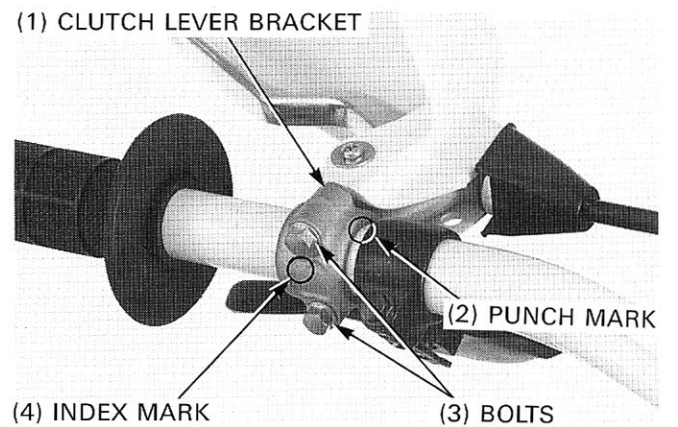


Align the slit in the decompressor lever bracket with the punch mark on the handlebar and tighten the bracket pinch bolt.



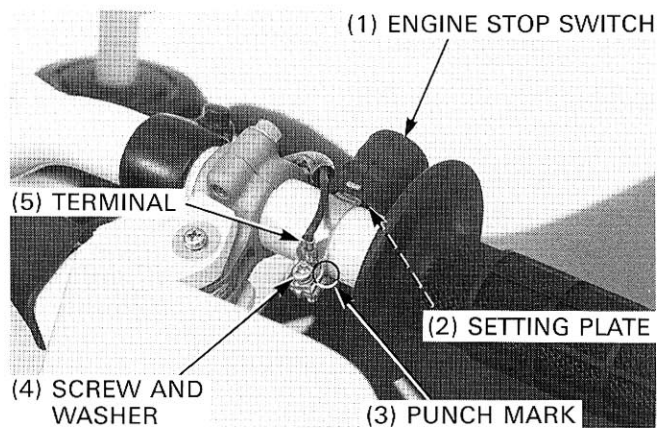
Install the clutch lever bracket and holder with the index mark facing up.

Align its slit with the punch mark on the handlebar and tighten the upper bolt first, then tighten the lower bolt.



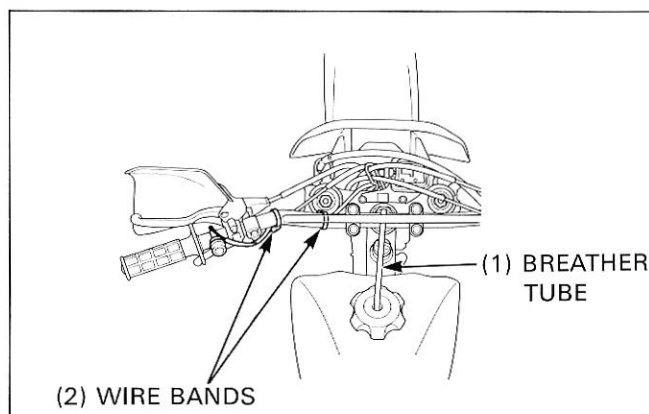
FRONT WHEEL/SUSPENSION/STEERING

Place the setting plate onto the engine stop switch bottom. Hook the switch brackets into the slits in the switch and install them aligning the bracket end with the punch mark on the handlebar. Tighten the screw with the washer and wire terminal as shown.



Secure the engine stop wire with the wire bands.

Install the fuel tank breather tube into the steering stem.



STEERING STEM

REMOVAL

Remove the front visor (page 2-4).

Loosen the cable lock nut and disconnect the odometer cable.

Release the harness clamp from the wire harness.

Remove the throttle cables from the cable guide of the odometer stay.

Remove the odometer mounting bolts and the odometer from the top bridge.

Remove the brake hose guide and odometer cable guide located at the steering stem.

Remove the followings:

- front wheel (page 13-3)
- front fender (page 2-4)
- handlebar (page 13-20)
- fork legs (page 13-9).

Temporarily install the fork legs and remove the steering stem nut and washer.

Remove the fork legs.

Remove the top bridge.

Loosen the steering stem adjustment nut, hold the steering stem and remove the adjustment nut using the special tool.

TOOL:

Steering stem socket 07916 – KA50100

Remove the dust seal, upper bearing and steering stem.

Check the steering bearings and outer races for wear or damage.

NOTE

- Always replace the bearings and races as a set.

Remove the upper and lower bearing outer race using the special tools.

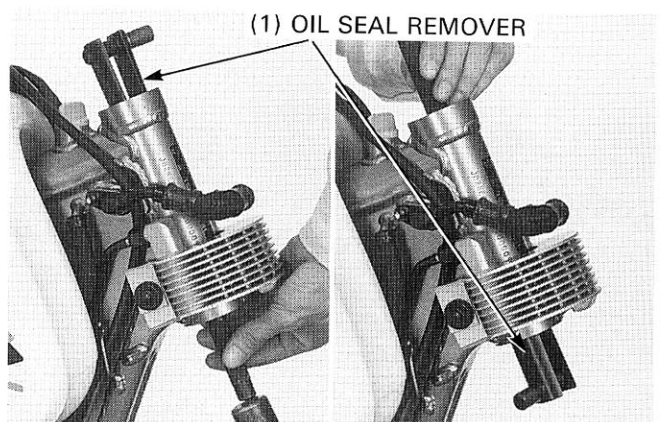
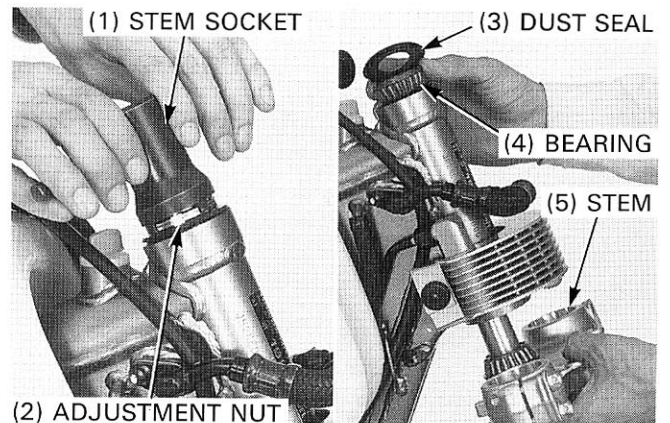
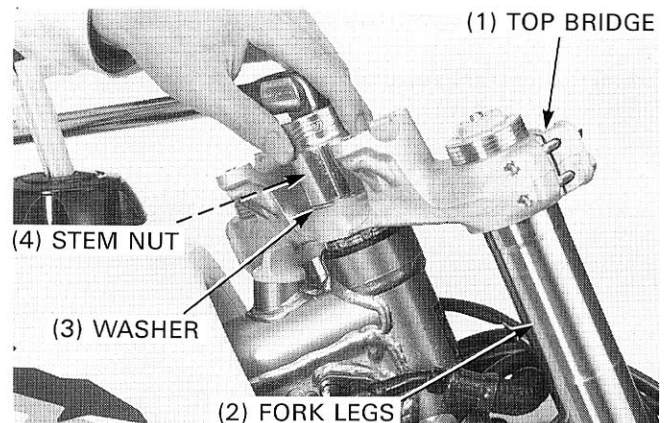
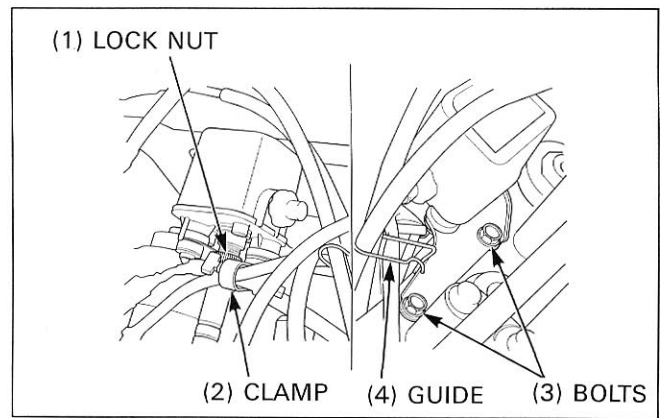
TOOLS:

Oil seal remover 07948 – 4630100

U.S.A. only:

Bearing remover M9360 – 277 – 91774

Race remover attachment 07953 – MJ1000B or
07953 – MJ1000A

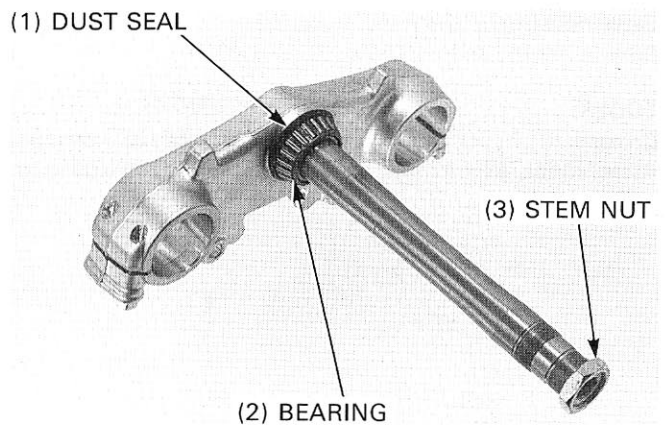


FRONT WHEEL/SUSPENSION/STEERING

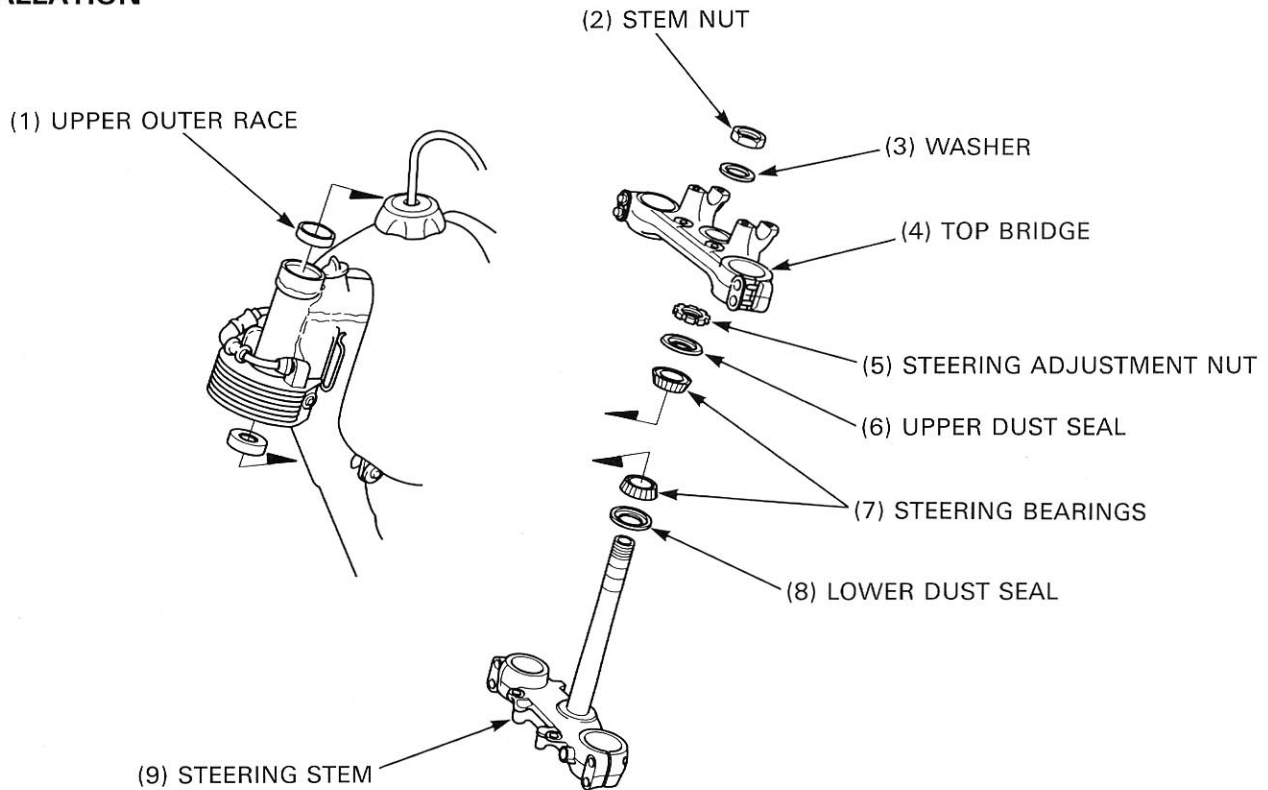
Install the stem nut onto the stem to prevent the threads from being damaged when removing the lower steering bearing from the stem.

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

Remove the dust seal.



INSTALLATION



Apply grease to a new dust seal lip and install it over the steering stem.

Install a new lower steering bearing using a hydraulic press.

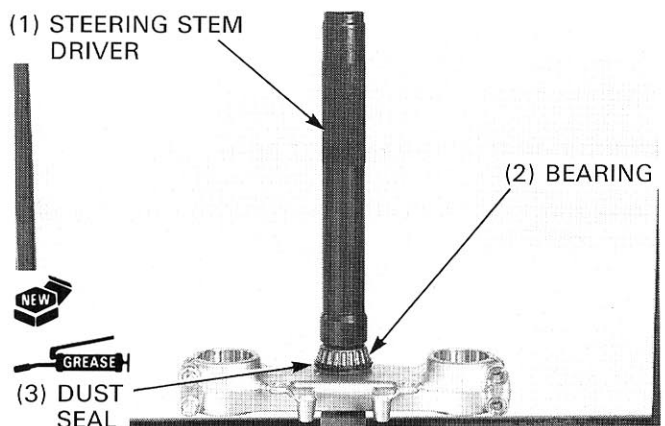
TOOLS:

Steering stem driver 07946 - 4300101

U.S.A. only:

Steering stem driver 07946 - MB00000

Steering stem driver attachment 07946 - KA6000A or
GN HT-54



FRONT WHEEL/SUSPENSION/STEERING

Drive new upper and lower outer races into the steering head pipe using the special tools.

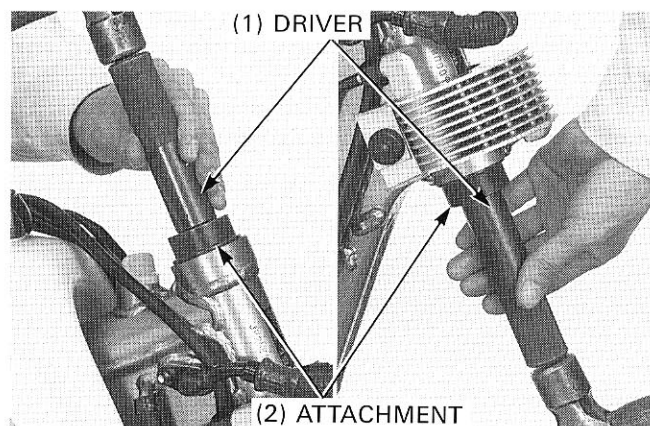
TOOLS:

Driver

07749 - 0010000

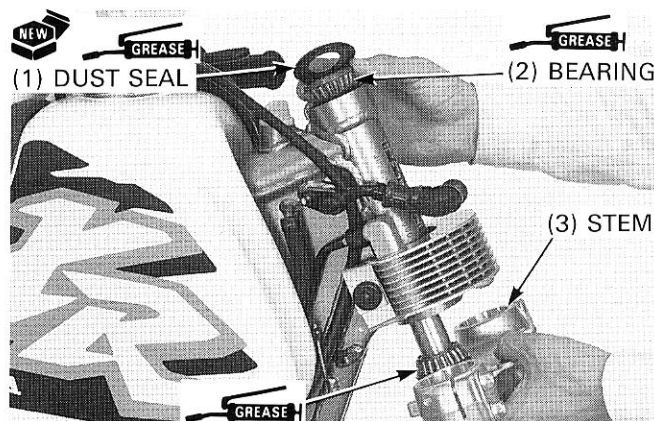
Attachment, 42 × 47 mm

07746 - 0010300



Apply 3g (0.11 oz) of grease to each new bearing rollers.
Apply grease to the upper dust seal lip.
Apply oil to the steering bearing adjustment nut.

Insert the steering stem into the steering head pipe, and install the upper bearing, dust seal and adjustment nut.



Tighten the steering bearing adjustment nut.

TOOL:

Steering stem socket

07916 - KA50100

TORQUE: 29 N·m (3.0 kgf·m, 22 lbf·ft)

Turn the steering stem lock-to-lock several times to seat the bearings.

Loosen the adjustment nut.

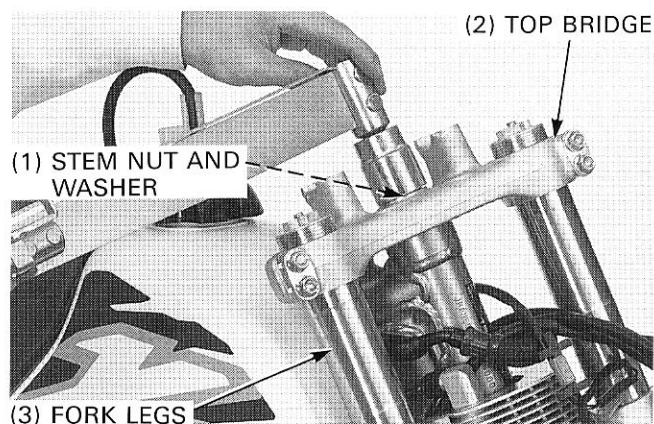
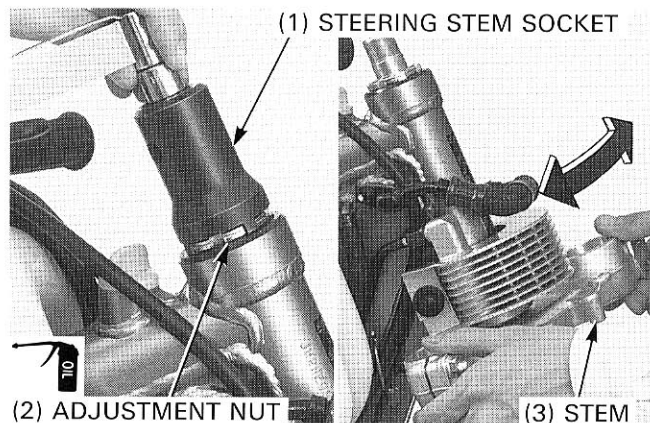
Tighten the adjustment nut again.

TORQUE: 4.5 N·m (0.45 kgf·m, 3.3 lbf·ft)

Install the top bridge, washer and stem nut.
Temporarily install the fork legs.
Tighten the steering stem nut.

TORQUE: 98 N·m (10.0 kgf·m, 72 lbf·ft)

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



Install the following:

- fork legs (page 13-19)
- front wheel (page 13-7)
- handlebar (page 13-21)
- front fender (page 2-4).

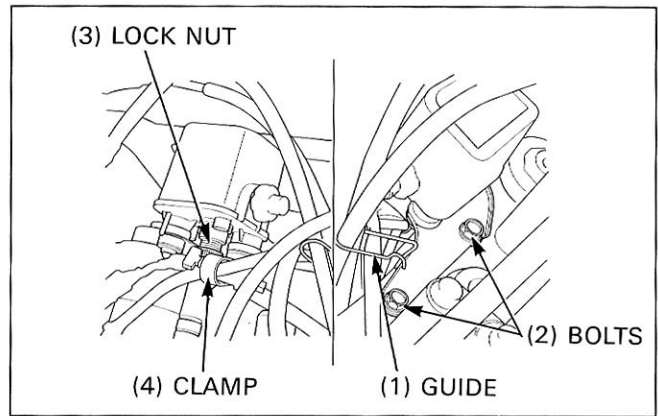
Install the odometer onto the top bridge by tightening the two bolts.

Connect the odometer cable by tightening the lock nut.

Clamp the wire harness.

Install the throttle cables to the cable guide.

Install the odometer cable guide and brake hose guide to the steering stem.

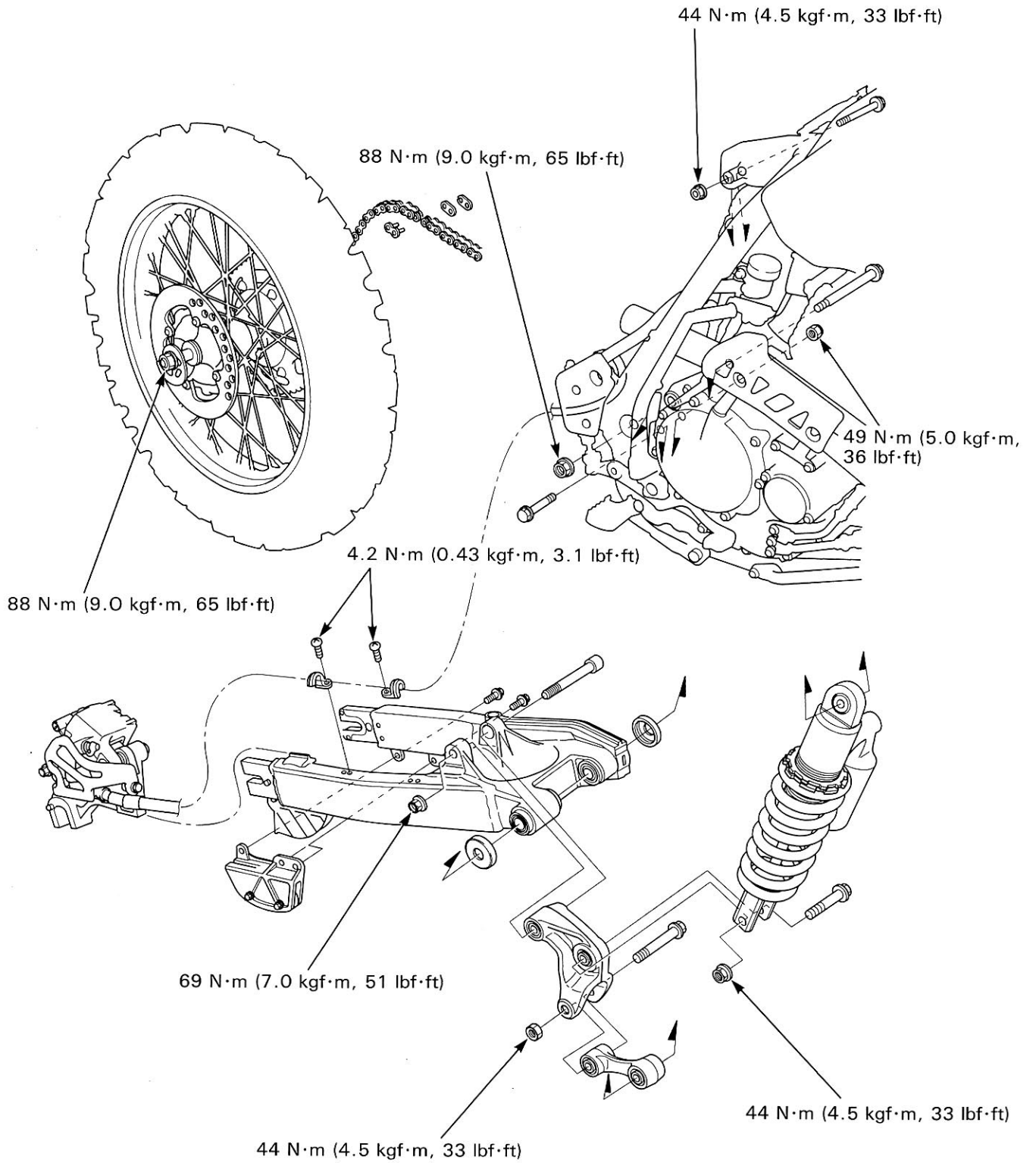


NOTE

- Route the wire harness properly (page 1-19).

Install the front visor (page 2-4).

REAR WHEEL/SUSPENSION



14. REAR WHEEL/SUSPENSION

SERVICE INFORMATION	14-1	SHOCK ABSORBER	14-10
TROUBLESHOOTING	14-3	SHOCK LINKAGE	14-27
REAR WHEEL	14-4	SWINGARM	14-31

SERVICE INFORMATION

GENERAL

⚠ WARNING

- *Riding on damaged rims impairs safe operation of the vehicle.*
- *A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.*
- *Use only nitrogen to pressurize the shock absorber. The use of 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 reservoir.*

- This section covers maintenance of the rear wheel, suspension/linkage and swingarm.
- Raise the rear wheel off the ground by supporting the frame securely when servicing. A box or work stand is required to support the motorcycle.
- Use only genuine Honda bolts and nuts for all suspension linkage and swingarm pivot and mounting points; ordinary bolts lack adequate strength for these applications. Also take note of the installation direction of these bolts since they must be installed correctly.
- Refer to section 3 for drive chain information.
- Refer to section 15 for brake system information.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT	
Tire and Wheel	Cold tire pressure	100 kPa (1.0 kgf/cm ² , 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	19 (0.7)	—	
Drive chain	Drive chain slack	35–45 (1-1/3–1-3/4)	—	
	Drive chain length (at 41 pins/40 links)	—	638 (25.1)	
	Drive chain size/link	DID 520V8-Z2/108 or RK 520MOZ6/108	—	
	Chain slider depth	—	4.0 (0.15)	
Shock absorber	Shock absorber spring free length	217.3 (8.56)	213.0 (8.39)	
	Shock absorber spring direction	Narrow end facing down	—	
	Shock absorber spring installed length	Standard	212.3 (8.36)	—
		Adjustable range	205.3–216.3 (8.08–8.52)	—

REAR WHEEL/SUSPENSION

Unit: mm (in)

(cont'd)		STANDARD	SERVICE LIMIT
ITEM			
Shock absorber	Damper rod compressed force at 10 mm (0.4 in) compressed	15.4 kg (34.0 lbs)	—
	Damper gas pressure/compressed gas	981 kPa (10.0 kgf/cm ² , 142 psi)/ Nitrogen	—
	Recommended shock absorber oil	Pro Honda Suspension Fluid SS-7	—

TORQUE VALUES

Rear axle nut	88 N·m (9.0 kgf·m, 65 lbf·ft)
Rear brake disc bolt	42 N·m (4.3 kgf·m, 31 lbf·ft) ALOC bolt. Do not reuse.
Driven sprocket bolt	32 N·m (3.3 kgf·m, 24 lbf·ft)
Spoke nipple	3.7 N·m (0.38 kgf·m, 2.7 lbf·ft)
Rim lock nut	13 N·m (1.3 kgf·m, 9 lbf·ft)
Damper rod end nut	30 N·m (3.1 kgf·m, 22 lbf·ft)
Compression damping adjuster	18 N·m (1.8 kgf·m, 13 lbf·ft)
Shock absorber spring lock nut	88 N·m (9.0 kgf·m, 65 lbf·ft)
Shock absorber upper mounting nut	44 N·m (4.5 kgf·m, 33 lbf·ft)
Shock absorber lower mounting nut	44 N·m (4.5 kgf·m, 33 lbf·ft)
Shock arm-to-swingarm nut	69 N·m (7.0 kgf·m, 51 lbf·ft)
Shock link-to-frame nut	49 N·m (5.0 kgf·m, 36 lbf·ft)
Shock link-to-shock arm nut	44 N·m (4.5 kgf·m, 33 lbf·ft)
Swingarm pivot nut	88 N·m (9.0 kgf·m, 65 lbf·ft)
Rear brake hose guide screw	4.2 N·m (0.43 kgf·m, 3.1 lbf·ft) ALOC bolt. Do not reuse.
Chain slider screw	4.2 N·m (0.43 kgf·m, 3.1 lbf·ft) ALOC bolt. Do not reuse.
Chain adjuster stopper pin	34 N·m (3.5 kgf·m, 25 lbf·ft) Apply locking agent to the threads.
Wheel setting plate fixing screw	4.2 N·m (0.43 kgf·m, 3.1 lbf·ft) ALOC bolt. Do not reuse.

TOOLS

Bearing remover head, 17 mm	07746 – 0050500
Bearing remover shaft	07746 – 0050100
Driver	07749 – 0010000
Attachment, 24×26 mm	07746 – 0010700
Attachment, 37×40 mm	07746 – 0010200
Attachment, 42×47 mm	07746 – 0010300
Pilot, 17 mm	07746 – 0040400
Spoke nipple wrench C, 5.8×6.1 mm	07701 – 0020300 or equivalent commercially available in U.S.A.
Slider guide, 14 mm	07974 – KA40000 — not available in U.S.A.
Slider guide attachment	07974 – KA50102 —
Spherical bearing driver ('96, '97)	07HMF – KS60100 or
U.S.A. only:	
Assembly collar	07965 – GM00100 or
Assembly collar	07965 – VM00100
Needle bearing remover	07946 – KA50000
Pin driver	07GMD – KT80100 not available in U.S.A.
Needle bearing remover	07931 – MA70000 or
U.S.A. only:	
Bearing remover, 20 mm	07936 – 3710600
Remover handle	07936 – 3710100
Remover weight	07936 – 3710200
Driver shaft (After '97)	07946 – MJ00100
Driver head (After '97)	07946 – KM40701 not available in U.S.A.

TROUBLESHOOTING

Rear wheel wobbling

- Bent rim
- Worn rear wheel bearings
- Loose or bent spokes
- Faulty rear tire
- Worn or damaged swingarm pivot bearings
- Bent frame or swingarm
- Axle not tightened properly

Wheel turns hard

- Brake drag
- Faulty rear wheel bearings
- Drive chain too tight
- Bent rear axle

Soft suspension

- Improperly adjusted spring preload
- Weak shock absorber spring
- Oil leakage from damper unit

Hard suspension

- Improperly adjusted spring preload
- Bent shock absorber damper rod
- Bent swingarm pivot or frame
- Faulty swingarm pivot bearings
- Damaged shock absorber

Steers to one side or does not track straight

- Drive chain adjusters not adjusted equally
- Bent rear axle

REAR WHEEL

NOTE

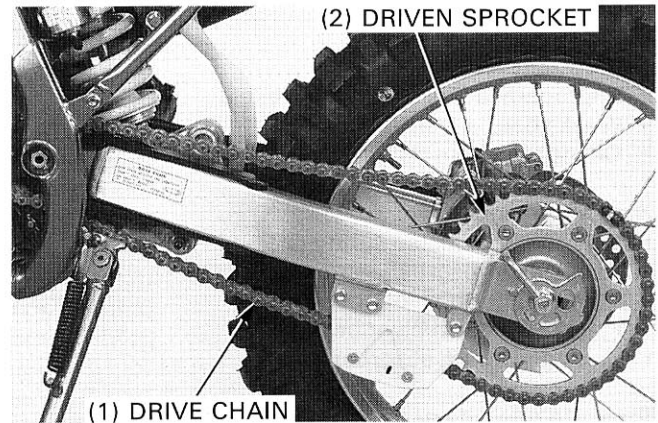
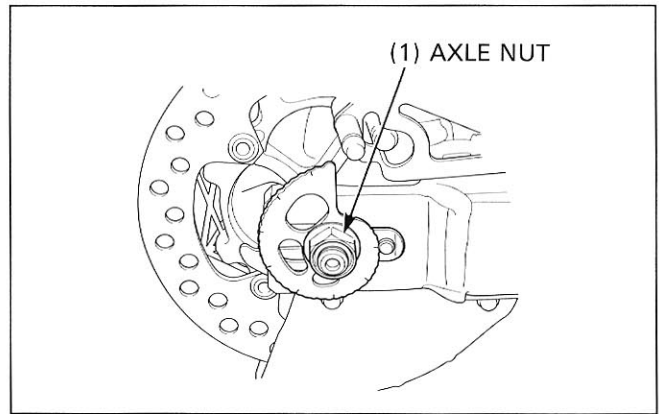
- Do not operate the rear brake pedal after removing the rear wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.

REMOVAL

Loose the rear axle nut.

Raise the rear wheel off the ground by supporting the frame under the engine using a box or work stand.

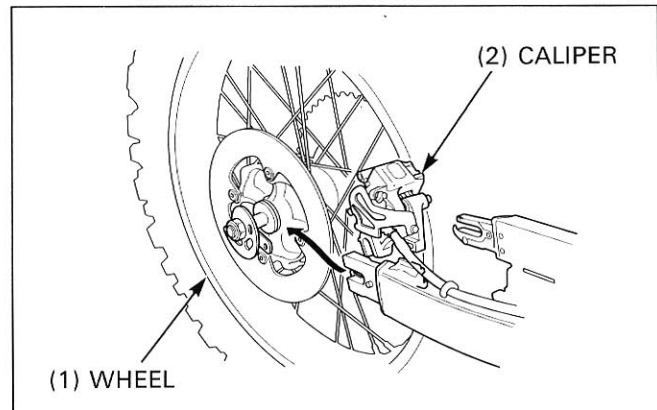
Move the rear wheel forward for maximum drive chain slack and remove the drive chain from the final driven sprocket.



CAUTION

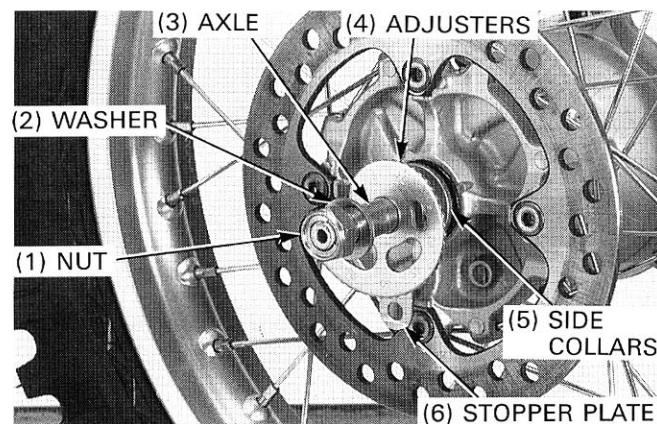
- Do not hang the brake caliper from the brake hose.

Move the rear wheel back and remove the rear wheel with the axle while holding the brake caliper.



If you will inspect or disassemble the rear wheel, remove the following:

- axle nut
- washer
- adjusters
- stopper plate
- axle
- left and right side collars.

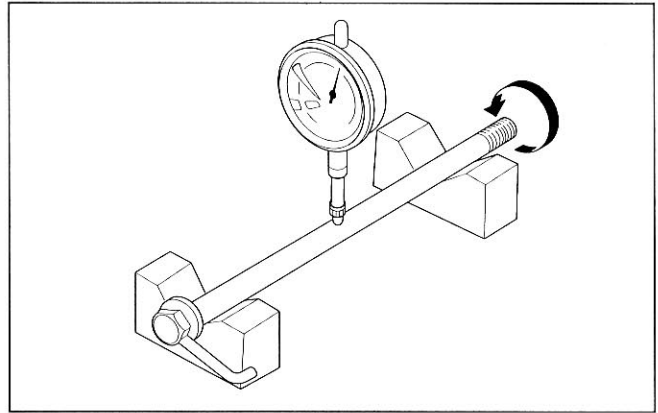


INSPECTION

Axle

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

SERVICE LIMIT: 0.2 mm (0.01 in)

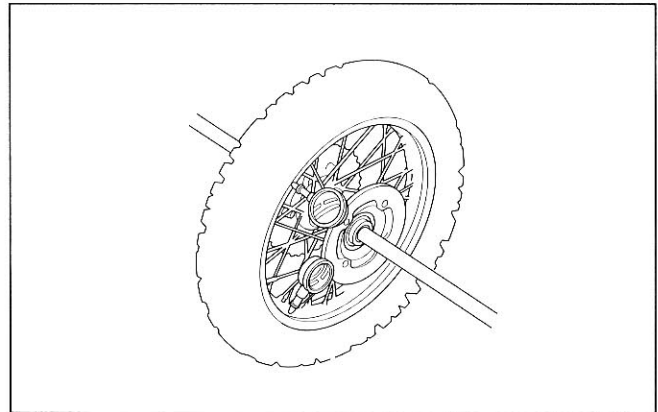


Wheel

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



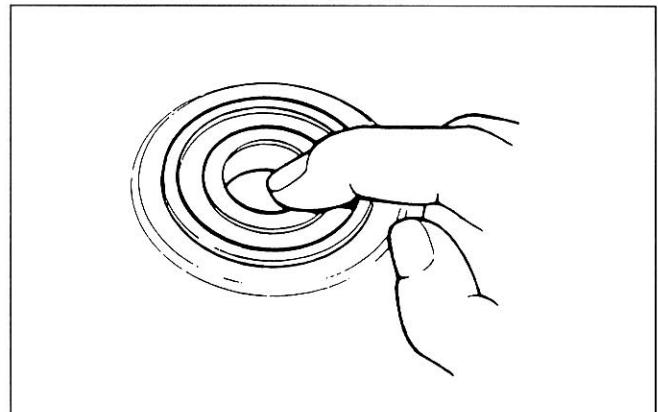
Wheel Bearing

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

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.

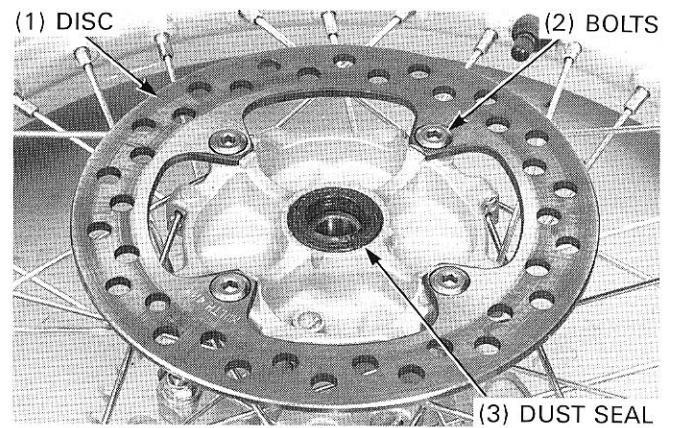


REAR WHEEL/SUSPENSION

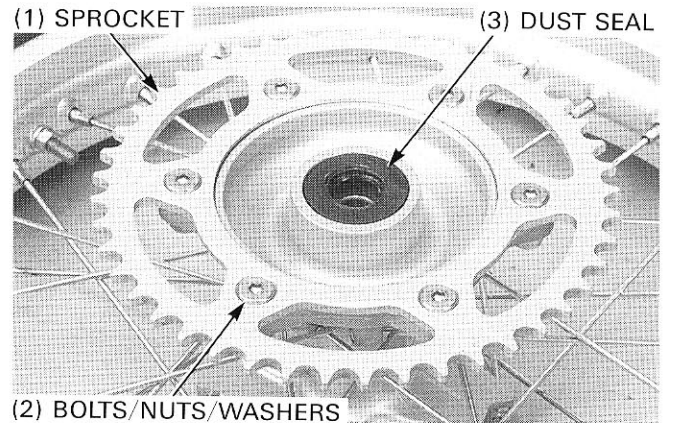
DISASSEMBLY

Remove the four socket bolts and the brake disc.

Remove the dust seals from both sides of the wheel.



Remove the six socket bolt, nuts and washers and the final driven sprocket.



Install the remover head into the bearing.

From the opposite side, install the remover shaft and drive the bearing out of the wheel hub.

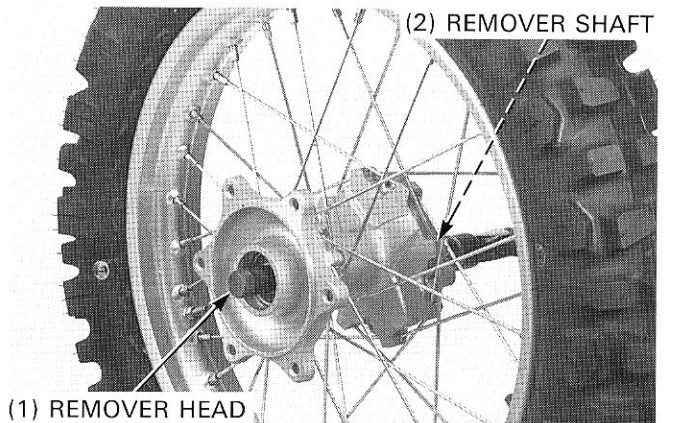
Remove the distance collar and drive out the other bearing using the special tools.

TOOLS:

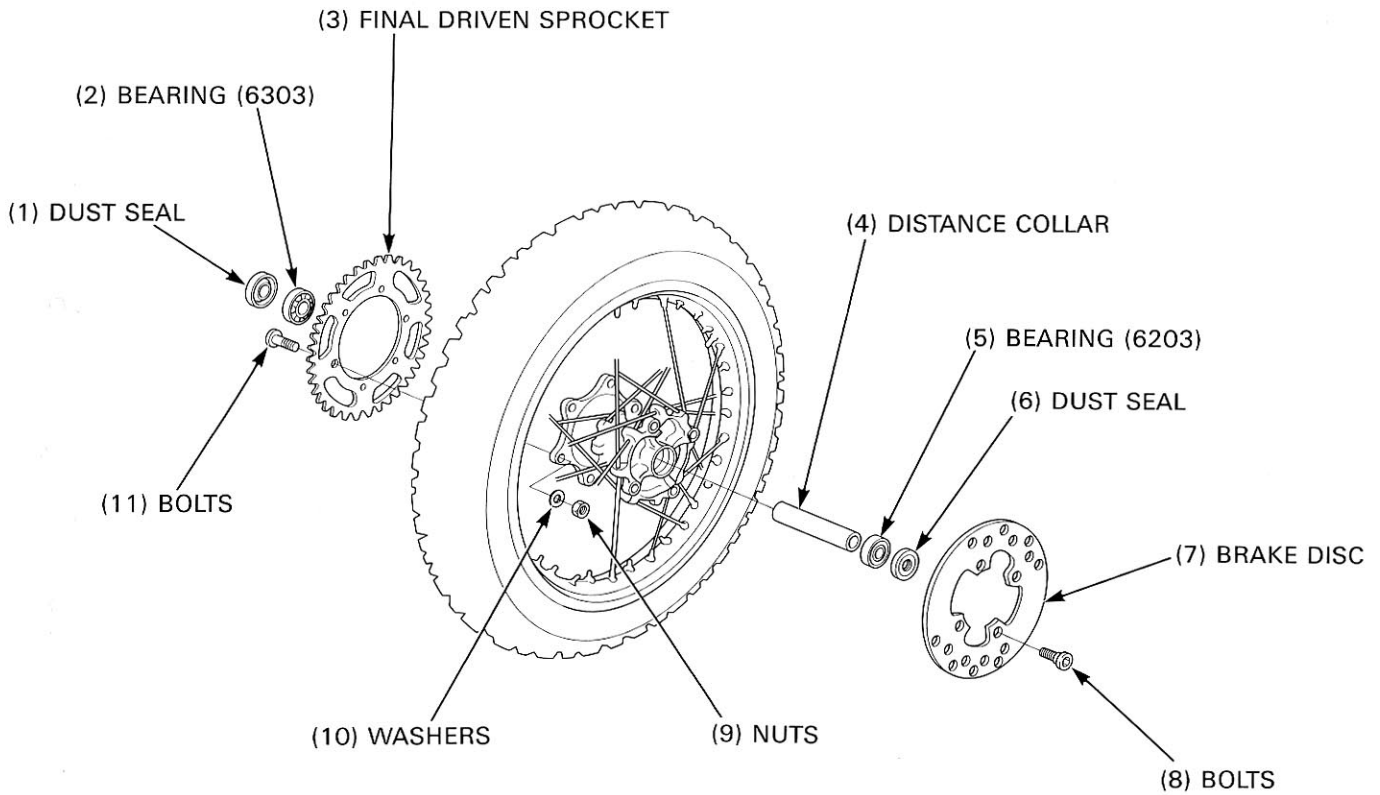
Bearing remover shaft	07746 - 0050100
Bearing remover head, 17 mm	07746 - 0050500

NOTE

- If the bearings are removed, they must be replaced with new ones.



ASSEMBLY



Wheel Center Adjustment

NOTE

- Wheel center adjustment is necessary when new spokes are installed.

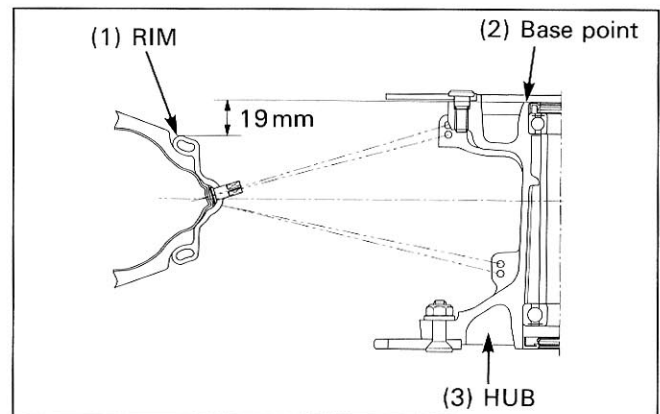
Adjust the hub position so that the distance from the left end surface of the hub center to the side of rim is 19 mm as shown.

Tighten the spokes in 2 or 3 progressive steps to the specified torque.

TOOL:

Spoke nipple wrench

07701-0020300 or equivalent commercially available in U.S.A.



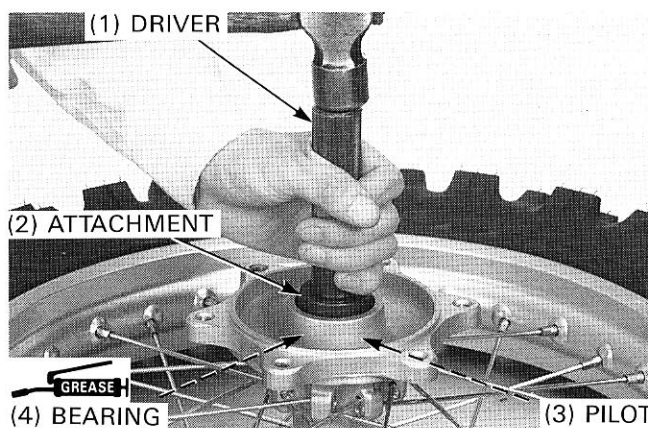
TORQUE: 3.7 N·m (0.38 kgf·m, 2.7 lbf·ft)

REAR WHEEL/SUSPENSION

Pack grease each wheel bearing cavities with grease.
In the first place, drive in a new left bearing (drive sprocket side) squarely with the sealed side facing up until it is fully seated using the special tools.

TOOLS:

Driver	07749-0010000
Attachment, 42 × 47 mm	07746-0010300
Pilot, 17 mm	07746-0040400

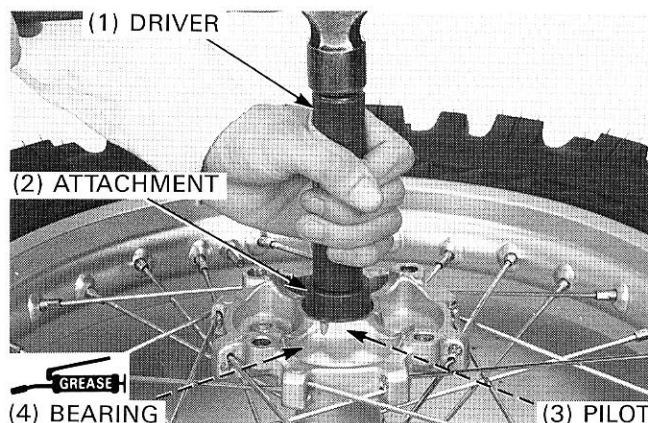


Install the distance collar.

Drive a new right bearing squarely with the sealed side facing up until it is seated using the special tools.

TOOLS:

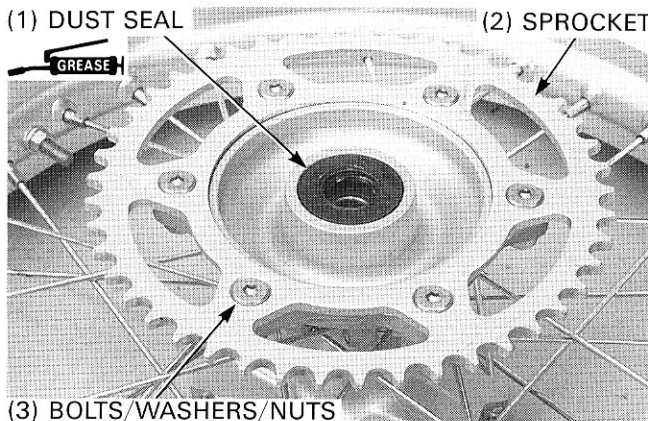
Driver	07749-0010000
Attachment, 37 × 40 mm	07746-0010200
Pilot, 17 mm	07746-0040400



Install the driven sprocket onto hub. Install the socket bolts, washer and nuts and tighten them.

TORQUE: 32 N·m (3.3 kgf·m, 24 lbf·ft)

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



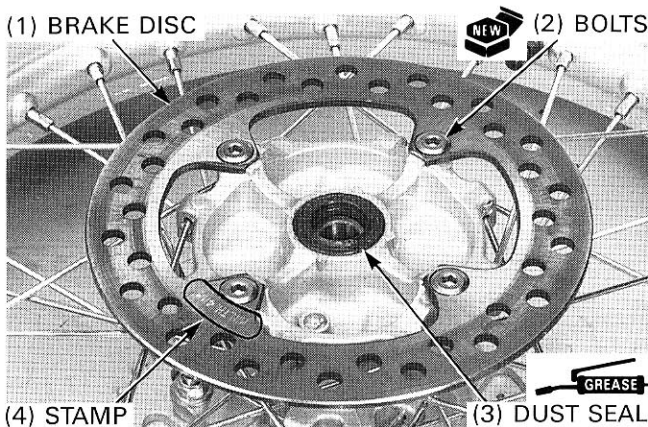
⚠ WARNING

- Do not get grease on the brake disc or stopping power will be reduced.

Install the brake disc onto the wheel hub with the stamp facing out.
Install and tighten new brake disc bolts

TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)

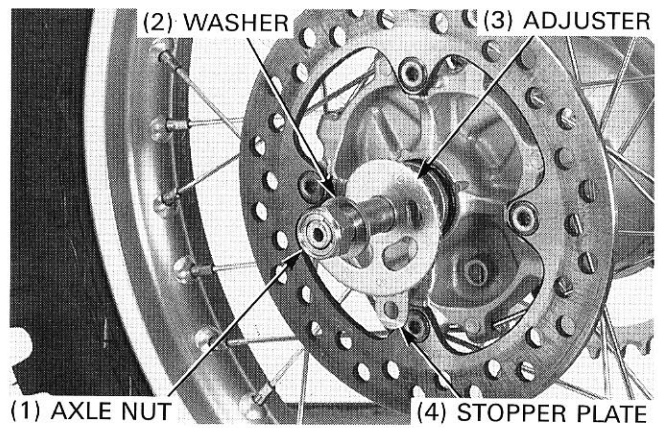
Apply grease to a new dust seal lip and install it into the wheel hub.



INSTALLATION

If the rear wheel is not disassembled or inspected, remove the following from the axle:

- axle nut
- washer
- right adjuster
- stopper plate.

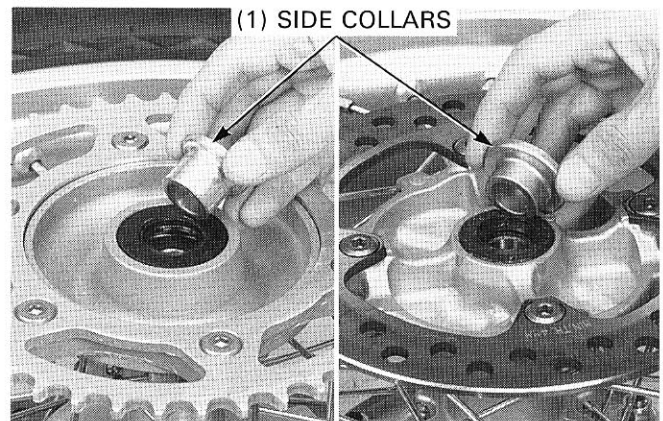


The wheel was disassembled:

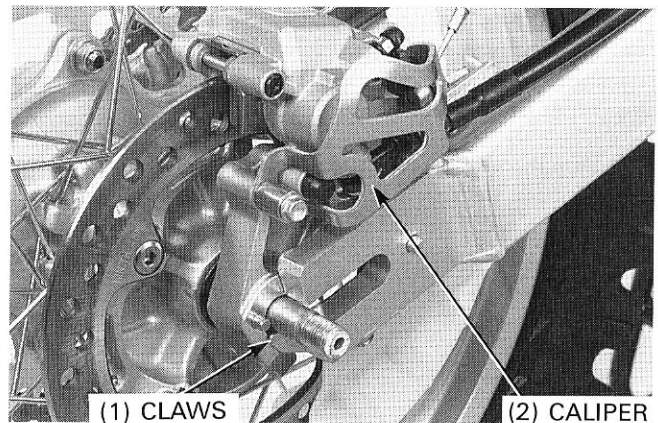
Install the left and right side collars into the wheel hub.

Install the left adjuster over the axle with the stamp side facing bolt head.

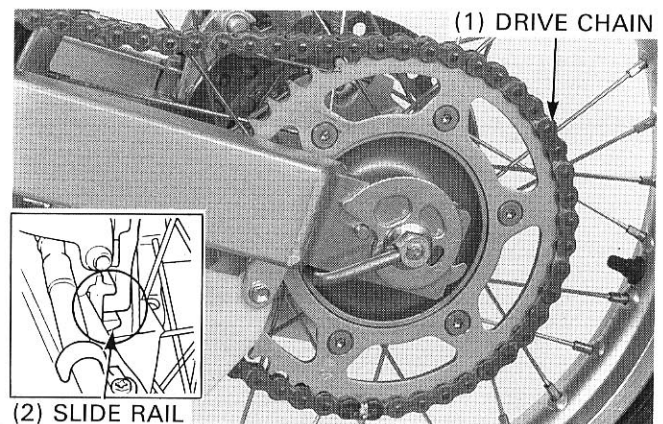
Insert the axle into the wheel from the left side (driven sprocket side).



Set the rear wheel onto the claws of the swingarm ends. Install the brake caliper on the axle so that the brake disc is positioned between the pads, being careful not to damage the pads, align the caliper bracket with the slide rail on the swingarm.



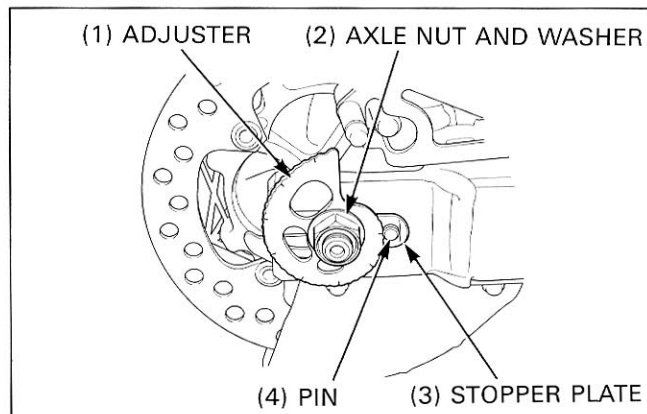
Move the wheel forward for maximum drive chain slack and install the drive chain onto the driven sprocket.



REAR WHEEL/SUSPENSION

Install the stopper plate over the axle and hook it to the stopper pin on the swingarm.
Install the right adjuster, washer and axle nut and temporarily tighten the axle nut.

Adjust the drive chain slack (page 3-15).



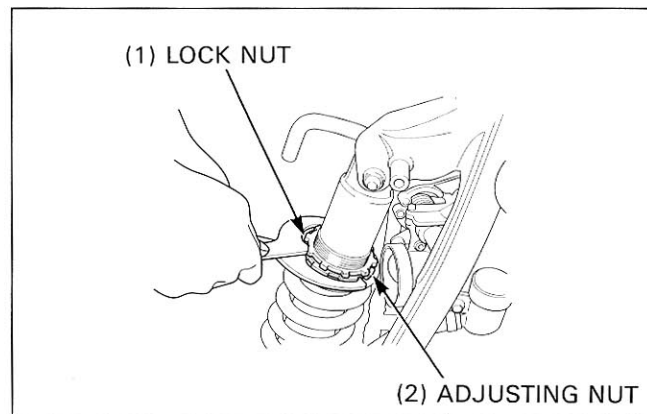
SHOCK ABSORBER

REMOVAL

Raise the rear wheel off the ground by placing under the engine using a box or work stand and support the swingarm.

Remove the sub-frame (page 2-3).

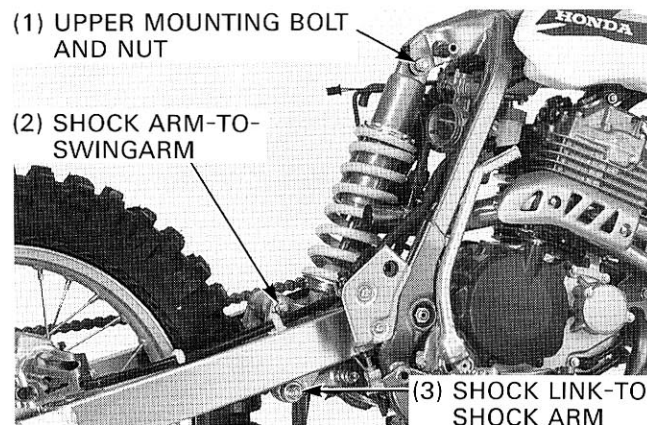
If you will disassemble the shock absorber, loosen the spring lock nut and adjusting nut before removing the shock absorber from the frame.



Remove the following bolts and nuts:

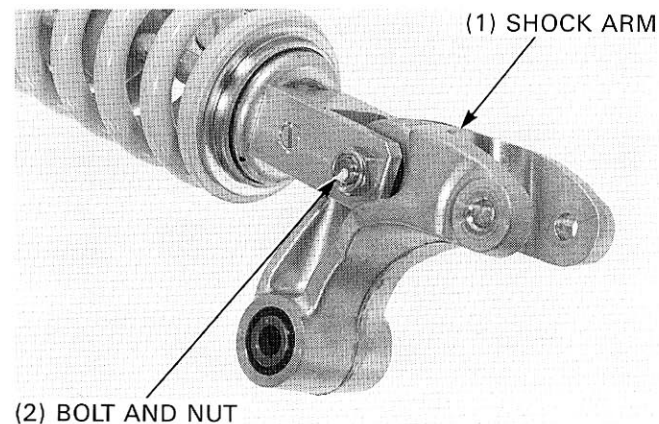
- shock arm-to-swingarm
- shock link-to-shock arm
- upper mounting bolt/nut

Remove the shock absorber with the shock arm.



Remove the lower mounting nut and bolt and the shock arm from the shock absorber.

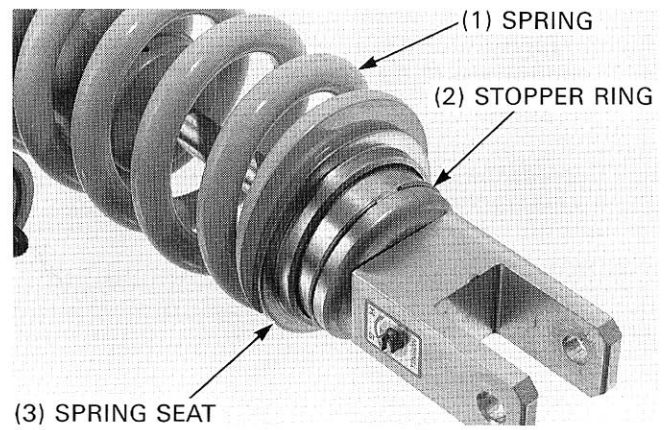
For shock absorber bearing replacement, see page 14-23.



SPRING REMOVAL

Loosen the lock nut and adjusting nut all the way.

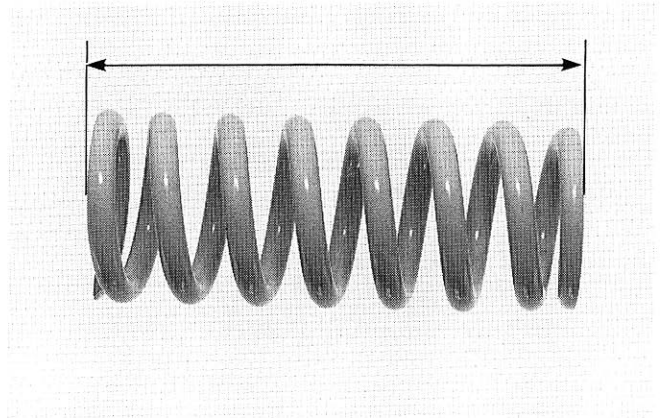
Remove the stopper ring from the rubber seat.
Remove the spring seat and the spring.



Inspection

Measure the spring free length.

SERVICE LIMIT: 213.0 mm (8.39 in)



BLADDER REPLACEMENT

⚠ WARNING

- *Release all nitrogen pressure before disassembly; otherwise the chamber cap will be under significant pressure and could cause serious injury.*
- *Wear protective clothing and adequate eye protection to protect against injury and prevent debris from getting in your eyes.*

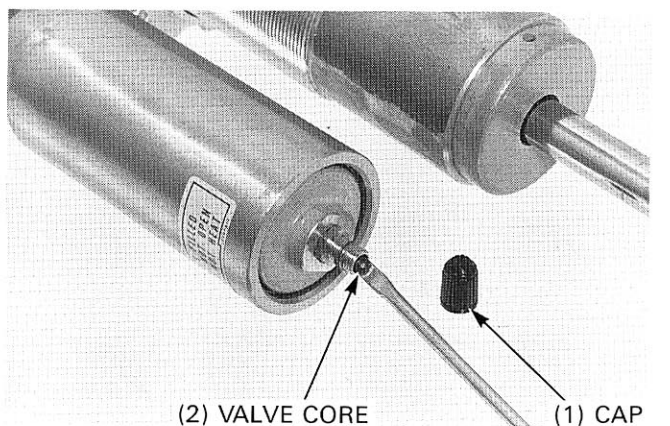
NOTE

- Replace the bladder if oil is present around the chamber cap or if oil spills out when the nitrogen is released from the reservoir.

Remove the valve cap.

Depress the valve core to release the nitrogen from the reservoir before draining the oil.

Remove the valve core.



REAR WHEEL/SUSPENSION

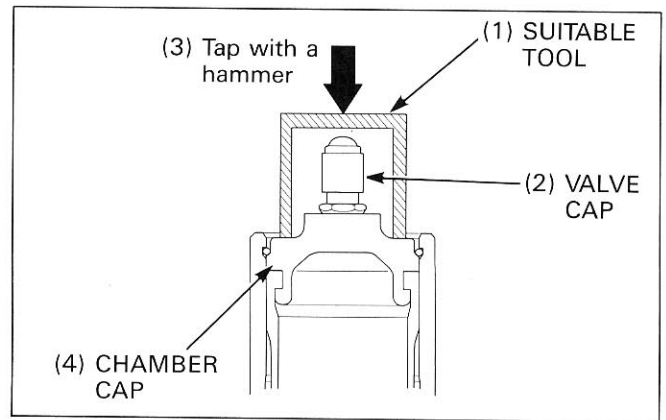
Put a suitable tool on the chamber cap and push it in by lightly tapping on the tool with a plastic hammer until you have good access to the stopper ring.

NOTE

- Depress the chamber cap just the minimum amount necessary for stopper ring access.

CAUTION

- To avoid damaging the threads of the valve, install the valve cap.



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 damage to the inside surface of the reservoir, cover the screwdriver and with a shop towel.

To remove the stopper ring, first push one end of the stopper ring out of its groove, then slip the second screw driver between the stopper ring and the reservoir to act as a ramp. Now, use the other screw driver to pull the stopper ring completely out.

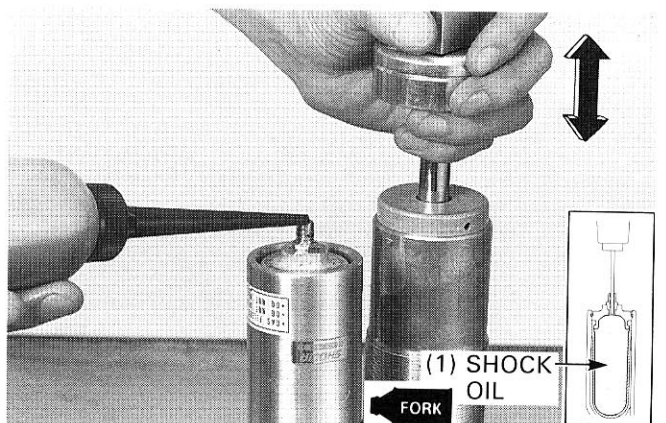
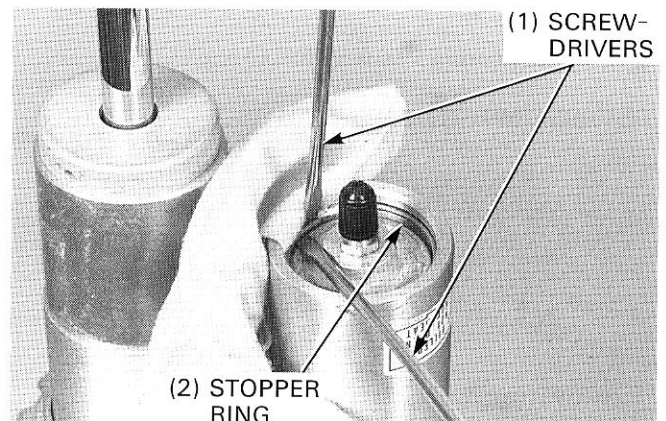
Check if there are burrs in the groove of the reservoir case. Remove any burrs and refinish the groove surface with fine emery cloth.

Hold the shock absorber in a vise with soft jaws or a shop towel.

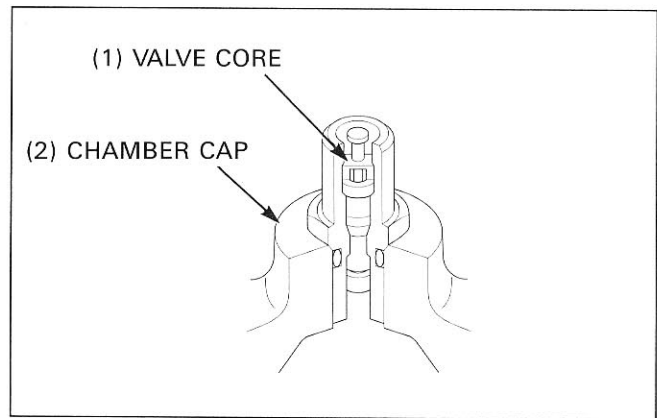
Using a suitable squeeze bottle, fill the reservoir with the recommended shock absorber oil while slowly pumping the damper rod.

RECOMMENDED 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 out.



Install the valve core securely.

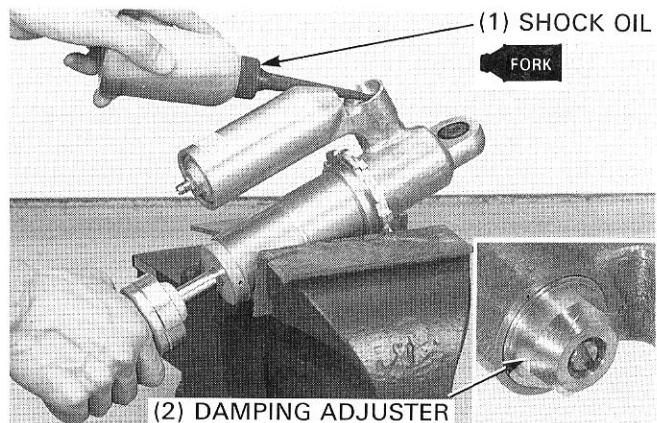


Remove the chamber cap and bladder following the procedure below:

1. Position the damper with the damping adjuster facing up. Remove the damping adjuster.
2. Fill the damper with the recommended shock absorber oil through the damping adjuster hole, while pulling the damper rod all the way out.
3. Reinstall the damping adjuster after filling the damper.

NOTE

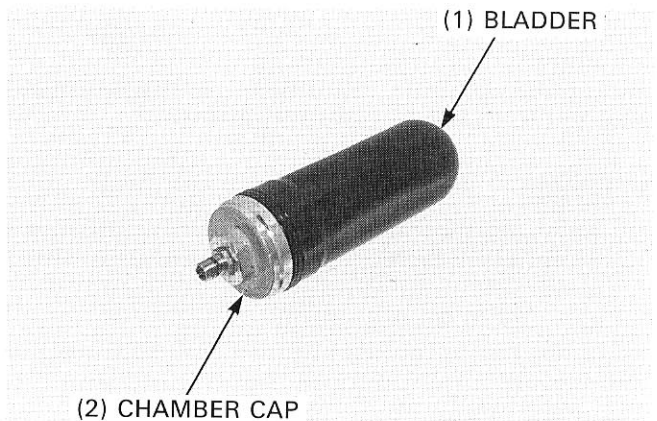
- The damper must be kept upright to prevent oil from leaking out.
4. Position the damper with the chamber cap facing up. Wrap a shop towel around the chamber cap.
 5. Repeat steps 1 through 4 until the chamber cap is removed from the reservoir.



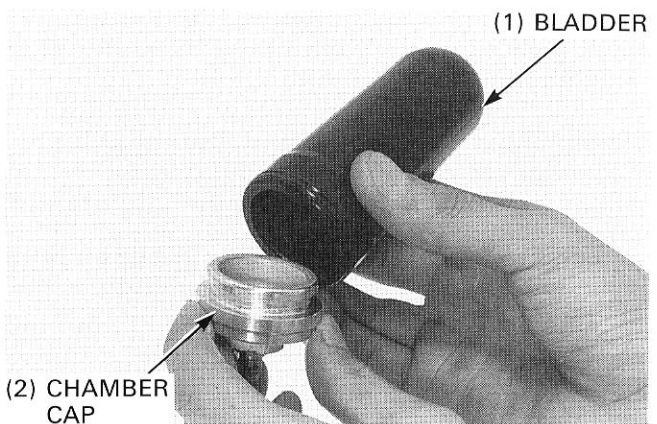
Remove the bladder from the chamber cap and drain the shock absorber oil from the bladder.

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 bladder.



Attach a new bladder to the chamber cap.

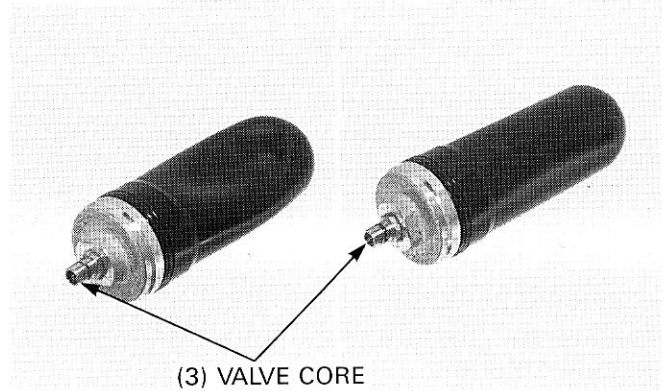


REAR WHEEL/SUSPENSION

If you distort the bladder when attaching it, depress the valve core to reform it.

(1) No Good

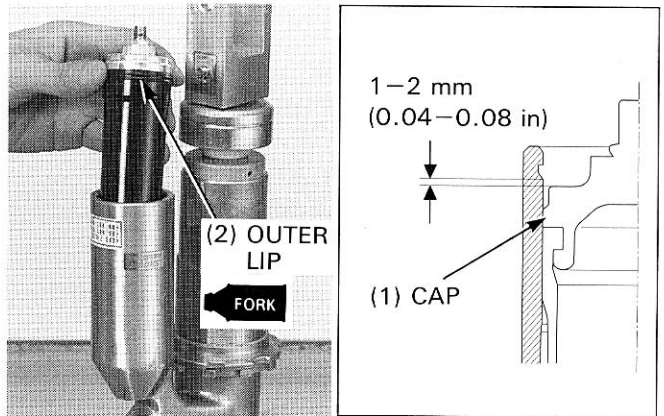
(2) Good



Clean the inside of the reservoir and fill the reservoir with the recommended shock absorber oil.

RECOMMENDED OIL: Pro Honda Suspension Fluid SS-7 or equivalent

Apply a light coating of shock absorber oil to the outer lip of the bladder, and carefully push the chamber cap into the reservoir to about 1–2 mm (0.04 – 0.08 in) below the stopper ring groove.



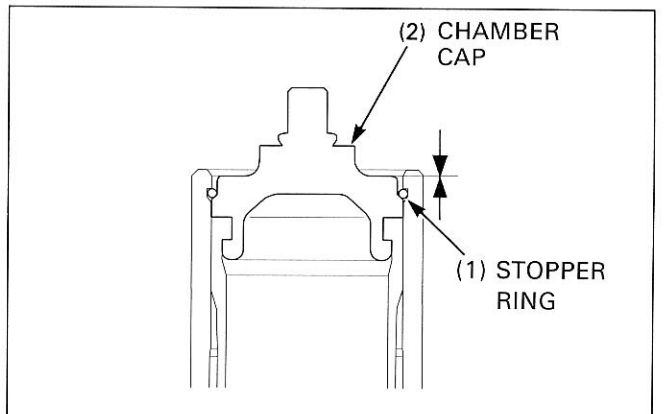
Install the stopper ring securely in the groove of the reservoir.

Fill the reservoir with low-pressure compressed air until the stopper ring seats fully all the way around.

⚠ WARNING

- *Be sure the stopper ring is seated in the ring groove all the way around or the chamber cap can come out when riding the motorcycle.*

Make sure that the distance between the top surface of the chamber cap and inner edge of the reservoir case is equal height as shown.



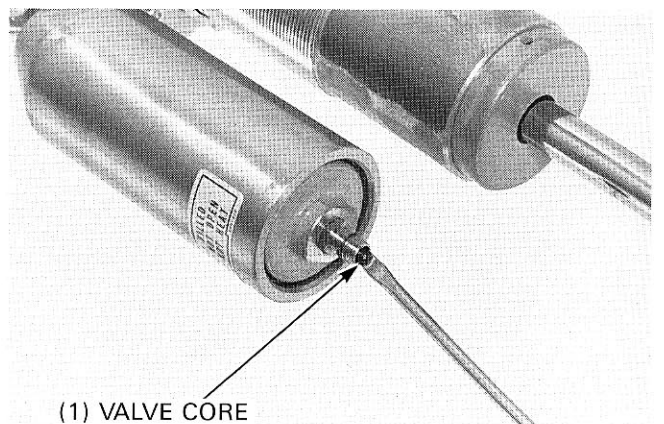
CAUTION

- *If the chamber cap is not evenly seated, it may come out when filling the reservoir with nitrogen.*

Position the damper with damper adjuster facing up and remove the damper adjuster.

Release the air from the reservoir by compressing the valve core.

Bleed the air from the shock absorber and fill the reservoir with the specified pressure nitrogen (page 14-22).



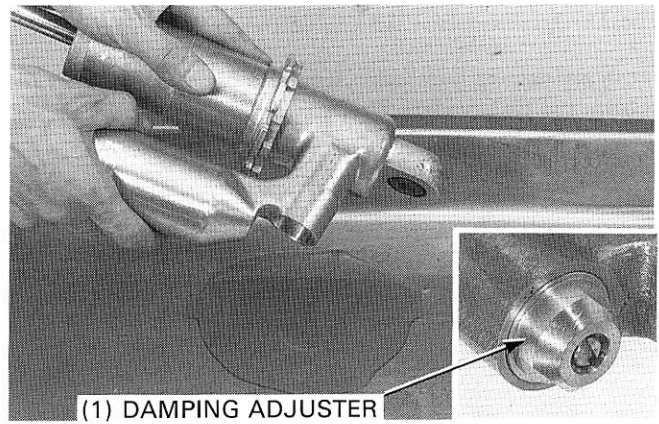
DAMPER DISASSEMBLY

CAUTION

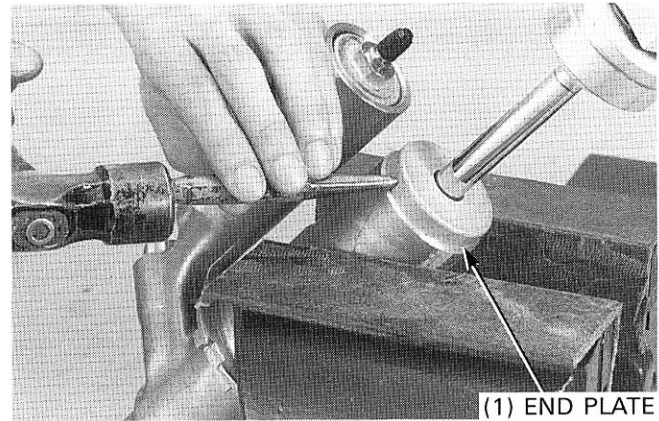
- Do not remove the valve core before discharging the nitrogen.

Depress the valve core to release the nitrogen from the reservoir (page 14-11).

Remove the damping adjuster.
Drain most of the oil from damper and reservoir by pumping the damper back-and-forth several times.



Hold the shock absorber in a vise with pieces of wood.
Remove the end plate and tape or tie it to the antibottoming bump rubber, so it won't get in the way.



Push in the rod guide case 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.
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.



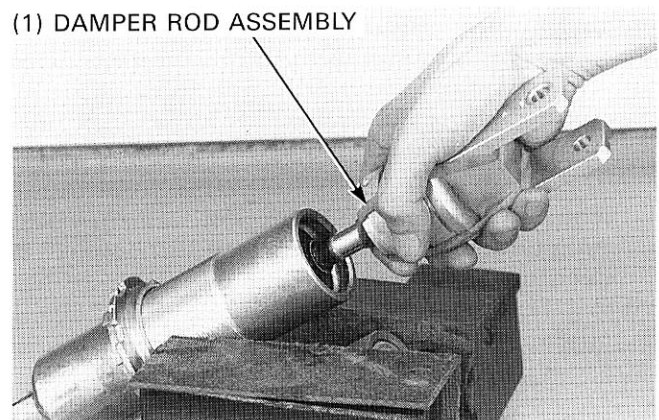
CAUTION

- Burrs on the stopper ring will damage the damper rod piston ring.

NOTE

- Check the stop ring groove for burrs. If any burrs are found, remove them with fine emery cloth before pulling the damper rod assembly out of the case.

Carefully pull the damper rod assembly out of the damper case.



REAR WHEEL/SUSPENSION

PISTON RING REPLACEMENT

If the piston ring is damaged, cut the piston ring and remove it from the piston.

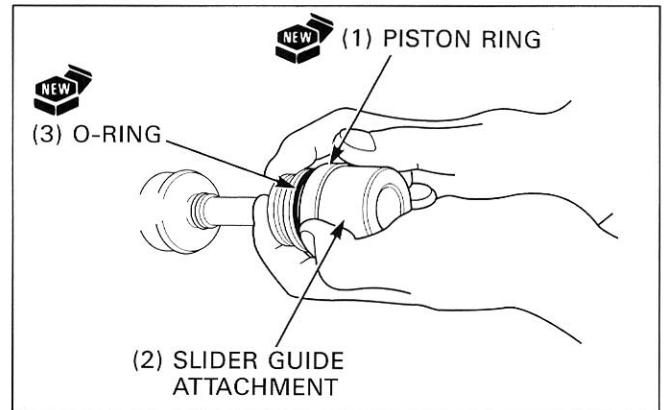
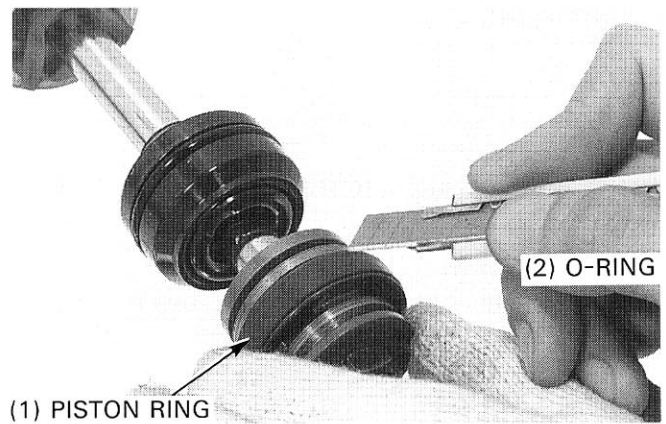
Replace the O-ring under the piston ring with a new one.

Place the slider guide attachment over the piston and compress the piston ring against the ring groove, and seat the piston ring into the ring groove.

TOOL:

Slider guide attachment

07974 - KA50102
not available in U.S.A.



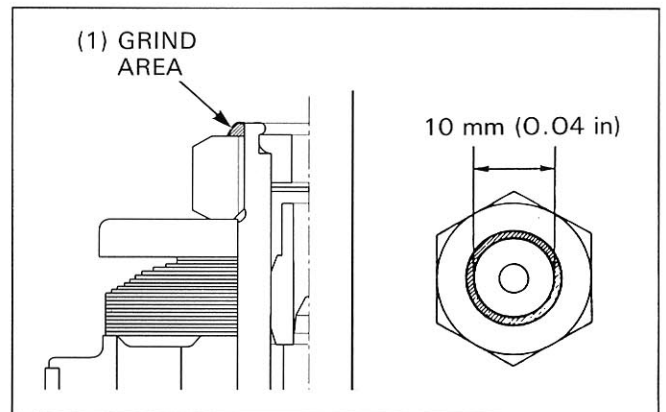
DAMPER ROD DISASSEMBLY

CAUTION

- To keep lint or dirt from getting onto damper rod parts, do not wear gloves while working on the damper rod.
- Be careful to grind so that the O.D. of the rod end is about 10 mm (0.04 in) and do not over grind.

Turn the rebound damping adjuster clockwise fully to prevent metal chips from entering the damper rod.

Untake the damper rod end nut with a grinder as shown.



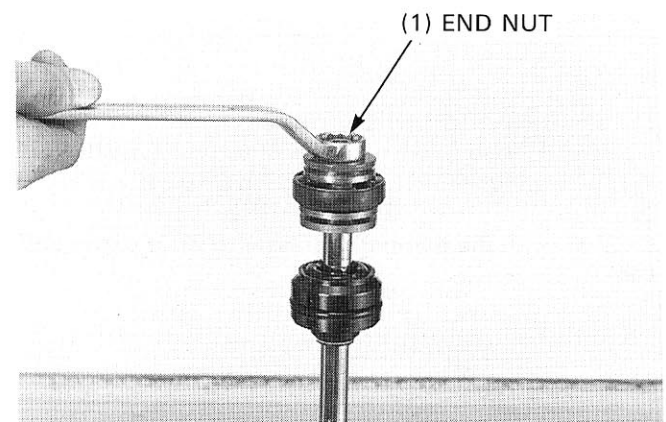
Place the damper rod lower mount in a vise with soft jaws or a shop towel, being careful not to distort the lower mount.

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 the burrs from the end of the damper rod.



NOTE

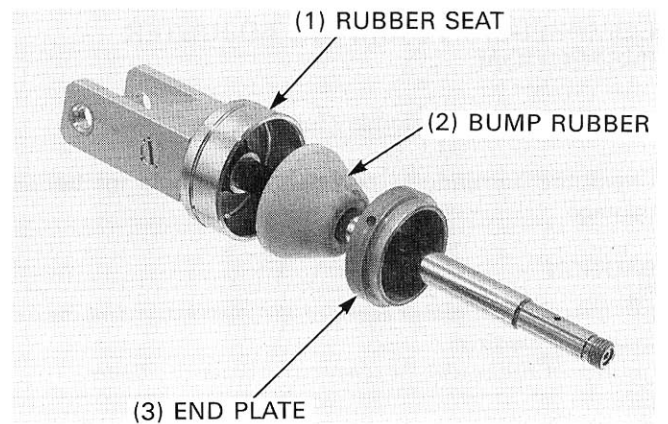
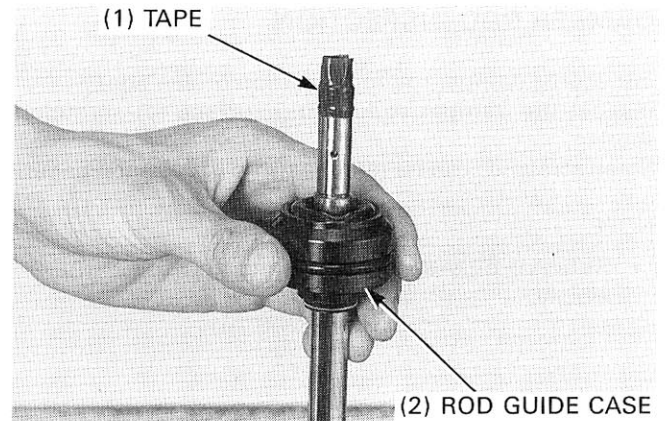
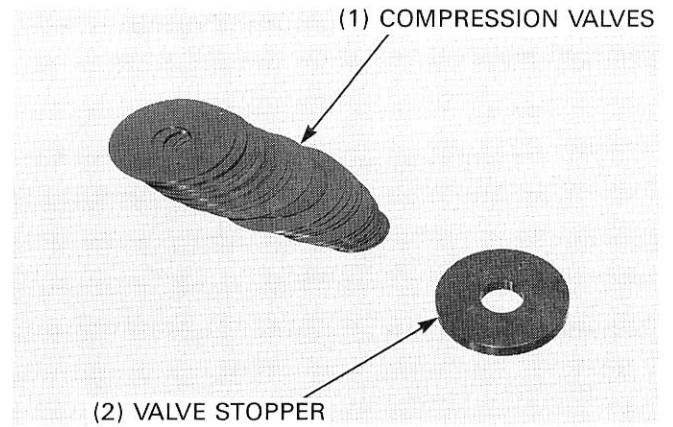
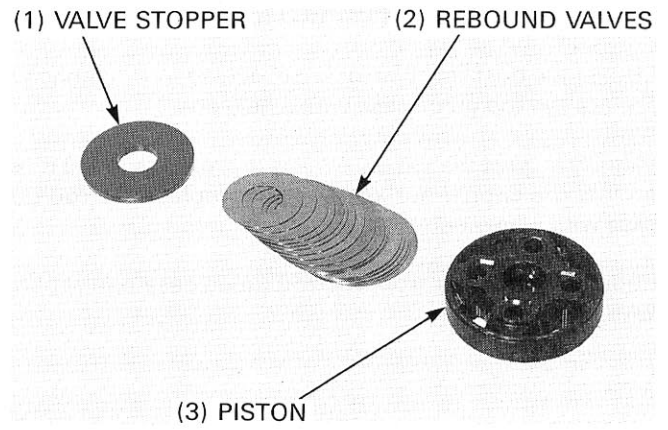
- Pass a piece of thin wire through the removed valves to ensure correct reassembly order.
- Keep dust and abrasives away from all damper rod parts.
- Thoroughly clean the valves in solvent if they have been disassembled and separated or contaminated with dust or dirt.
- Be careful not to get solvent on the O-ring and piston ring.
- The valve arrangement and number of valves shown is typical, but may not be exact for this model.

Remove the valve stopper, rebound valves and piston from the damper rod.

Remove the compression valves and valve stopper.

Wrap the top threads of the damper rod with tape.
Remove the rod guide case.

Remove the end plate, bump rubber and rubber seat from the damper rod.



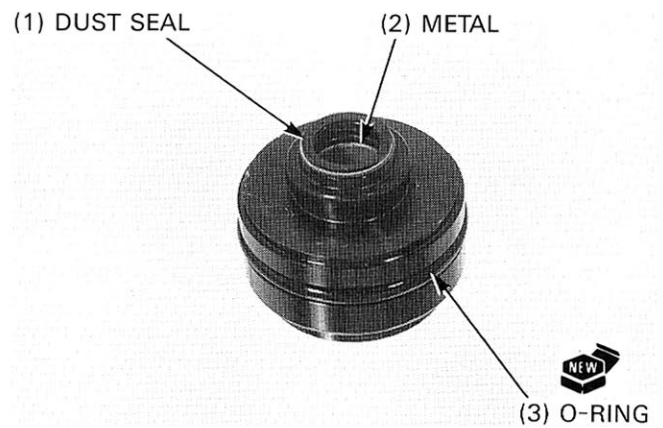
REAR WHEEL/SUSPENSION

ROD GUIDE CASE INSPECTION

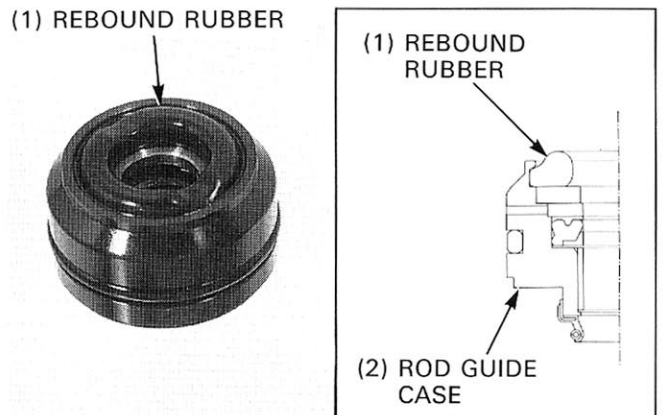
Inspect the dust seal lips for wear, scratches or damage and replace the rod guide case with a new one.

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.



Inspect the rebound rubber. If the rubber is worn or damaged, replace the rod guide case with a new one.

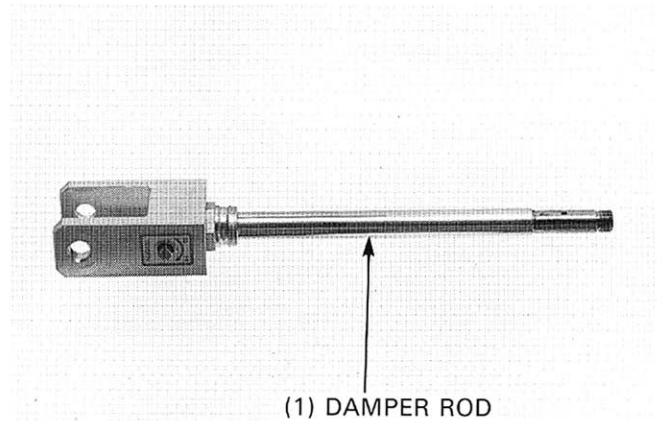


DAMPER ROD INSPECTION

Inspect the damper rod for distortion or damage. Inspect the damper rod sliding surface for scratches or scoring. Small scratches can be removed with #2000 sand paper.

NOTE

- Remove only small scratches and dress the area evenly.



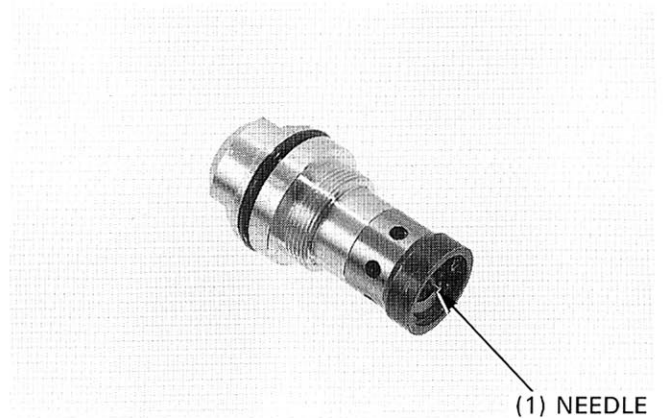
COMPRESSION DAMPING ADJUSTER INSPECTION

Check the adjuster assembly for damage.

Check the damping force adjusting needle for bends or damage.

CAUTION

- If the needle is bent or damaged, the compression damping force will be impaired.
- Do not disassemble the compression damping adjuster.



ASSEMBLY

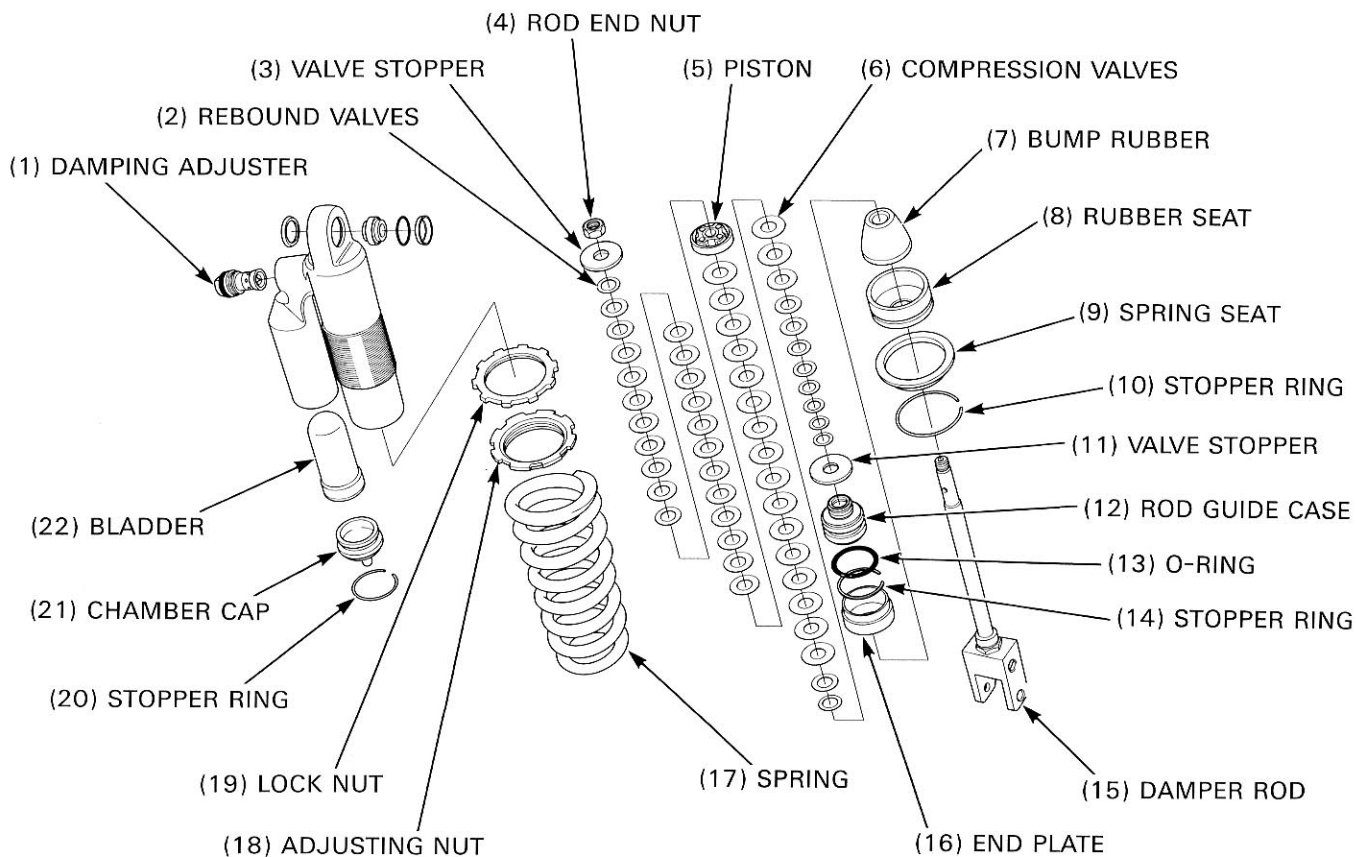
Before assembly, wash all parts except O-rings and seals with solvent and blow dry with compressed air. Make sure that there is no dust or lint on any parts.

CAUTION

- Use added care to avoid getting solvent on the O-rings and seals.

NOTE

- The valve arrangement and number of valves shown is typical, but may not be exact for this model.



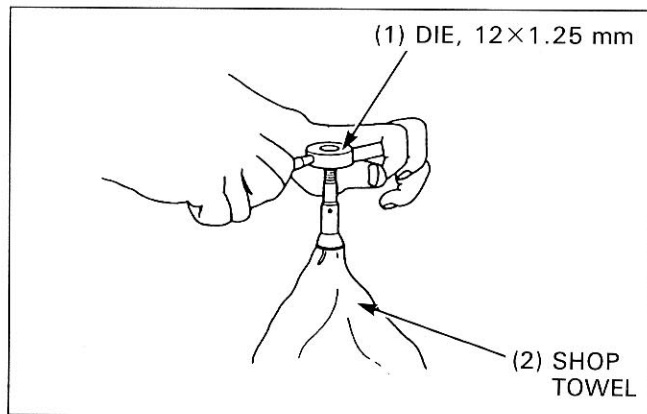
Turn the rebound damping adjuster clockwise fully to prevent metal chips from entering the damper rod.

Hold the damper rod lower mount in a vise with soft jaws or a shop towel, being careful not to distort the lower mount. Remove the all burrs from the end of the damper rod and chase the threads with a die.

Clean the damper rod with solvent after chasing the threads.

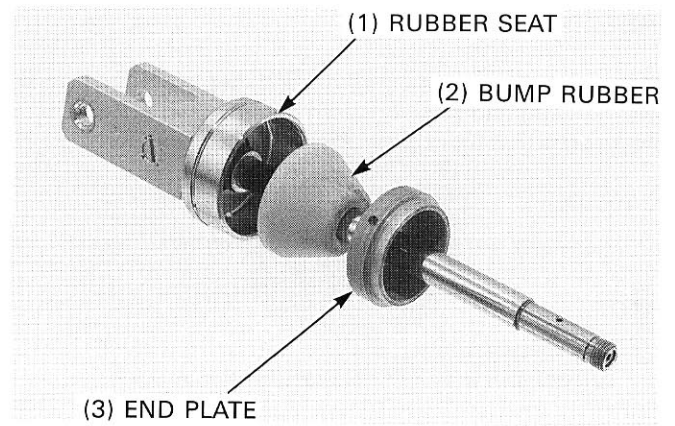
NOTE

- Make sure that burrs are not stuck inside the damper rod.



REAR WHEEL/SUSPENSION

Install the rubber seat, bump rubber and end plate over the damper rod.



CAUTION

- Be careful not to damage the dust seal lip or turn it inside out.

Apply shock absorber oil to the oil seal and dust seal lips of the rod guide case.

Install the slider guide onto the damper rod.

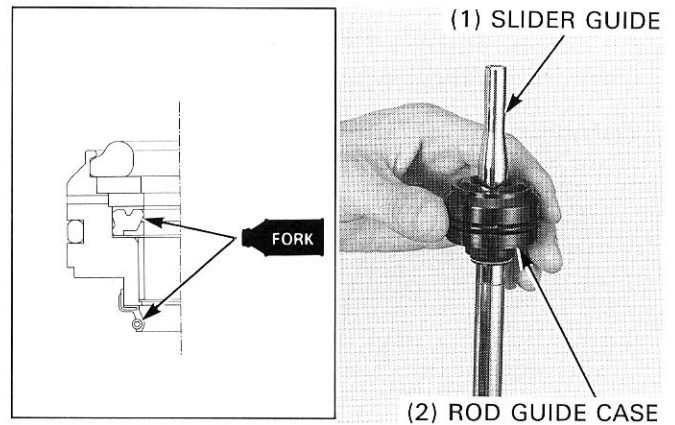
Install the rod guide case with the rebound rubber facing up, carefully over the damper rod.

TOOL:

Slider guide, 14 mm

07974 - KA40000
not available in U.S.A.

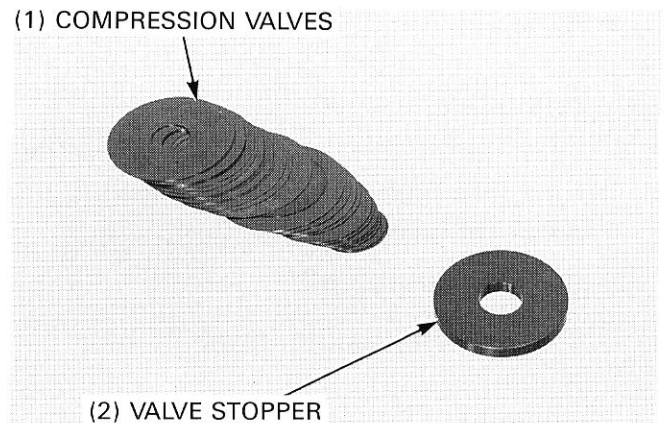
Remove the slider guide.



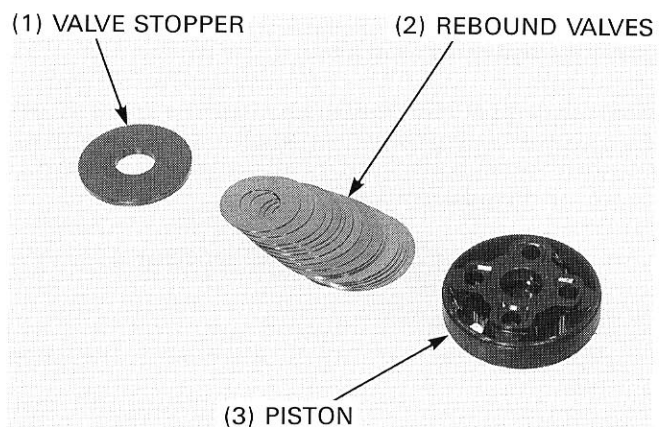
NOTE

- Note the installation direction of the piston and valves.

Install the valve stopper and compression valves onto the damper rod.



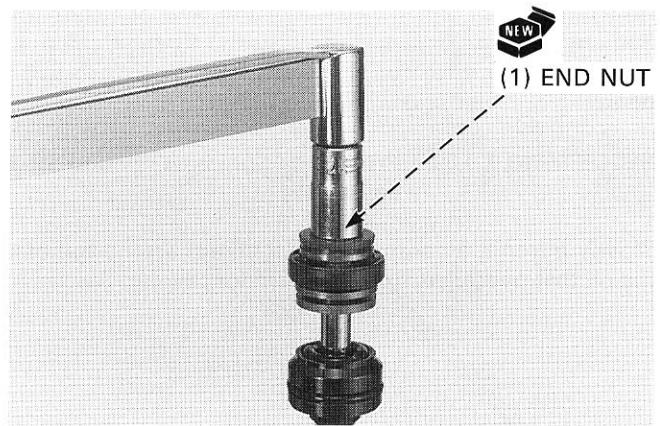
Install the piston, rebound valves and valve stopper onto the damper rod.



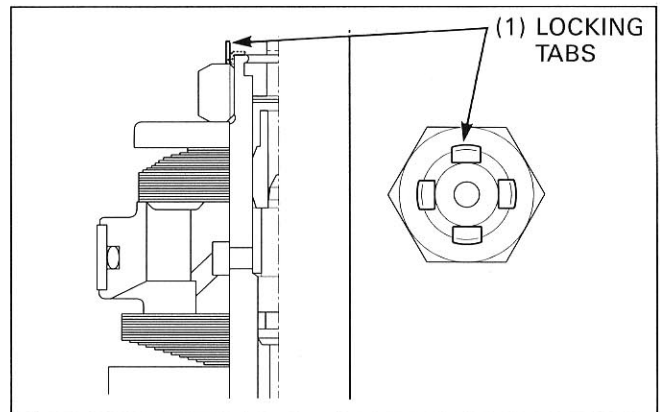
Hold the damper rod lower mount in a vise with soft jaws or a shop towel, being careful not to damage the lower mount.

Install and tighten a new damper rod end nut.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

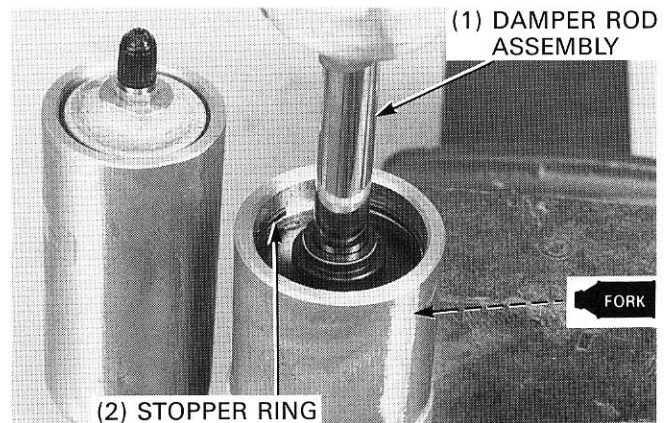


Bend the locking tabs of the nut against the damper rod as shown.



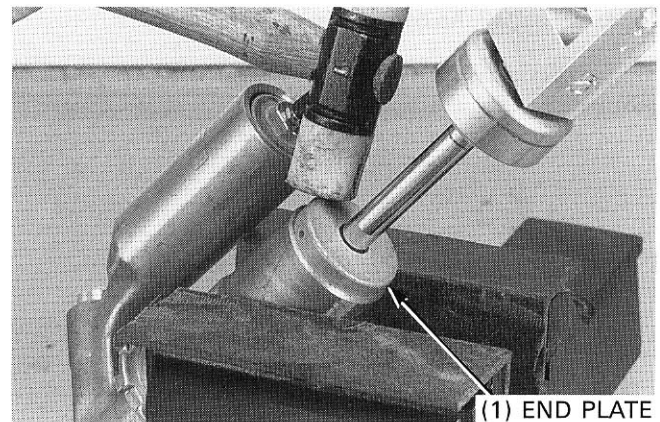
Coat the piston ring and the damper case inner surface with clean shock absorber oil and insert the damper rod assembly into the damper case.

Install the stopper ring into the ring groove in the damper case properly.



Drive the end plate squarely and evenly into the damper case with a plastic hammer.

After installing the end plate, pull the damper rod all the way to seat the rod guide case against the stopper ring.

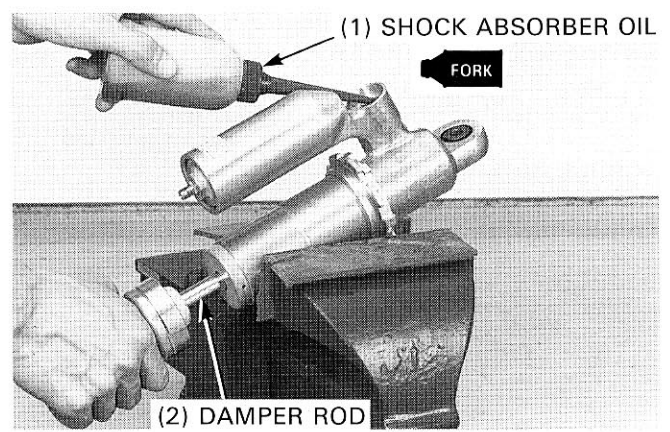


REAR WHEEL/SUSPENSION

Hold the damper unit in a vise with soft jaws or a shop towel. Pull out the damper rod all the way and fill the damper case and reservoir with the recommended oil through the damping adjuster hole.

RECOMMENDED OIL: Pro Honda Suspension Fluid SS-7 or equivalent

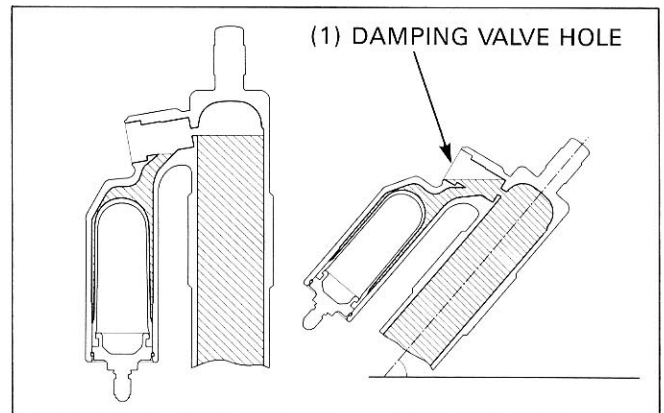
Slowly pump the damper rod until there are no bubbles in the oil that overflows from the damper case.



Remove the damper unit from the vise.

Continue to add the recommended oil up to the damping adjuster hole.

While holding the damper with the damping adjuster hole facing up, turn the damper unit as shown to bleed the air from the damper unit completely.

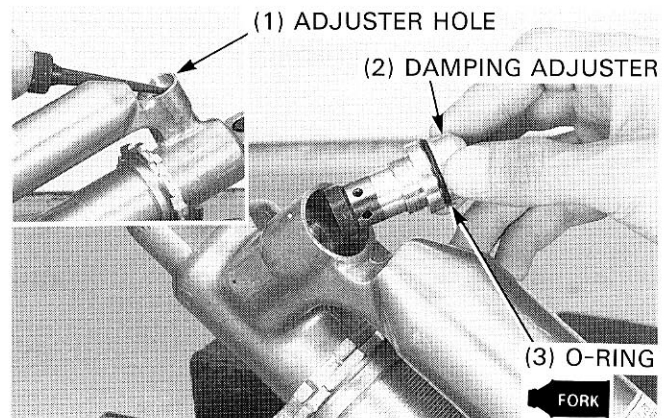


Temporarily charge the reservoir slowly with 49 kPa (0.5 kgf/cm², 7.1 psi) of air to inflate the bladder inside the reservoir. Be careful not to charge the reservoir with excess pressure at this time.

Top off the damper with recommended oil to the edge of the adjuster hole; this excess oil will be forced out when the adjuster is installed.

Coat a new O-ring with oil and install it onto the damping adjuster.

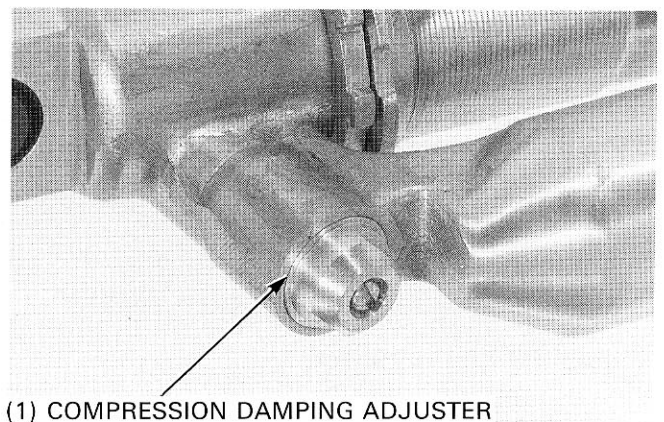
Dip the adjuster in recommended oil.



Carefully install the damping adjuster and tighten it.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Wipe off any excess oil and check for oil leaks.



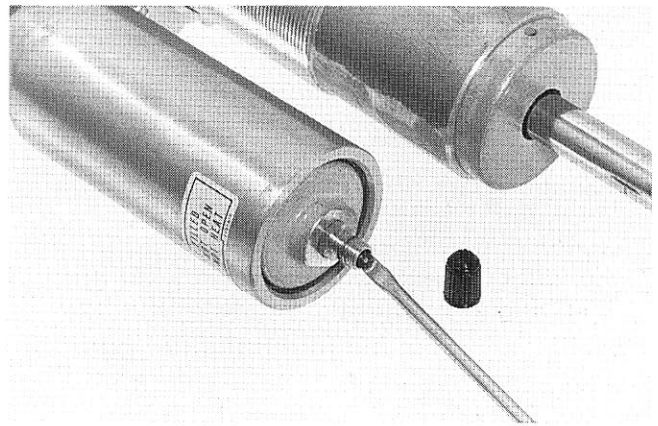
⚠ WARNING

- 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.

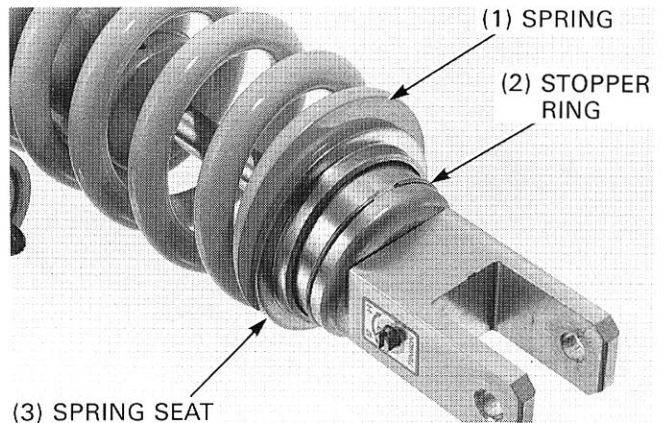
Release the 49 kPa of air that was in the reservoir at pre-compression.

Fill the reservoir with 981 kPa (10.0 kgf/cm², 142 psi)

Install the valve cap.

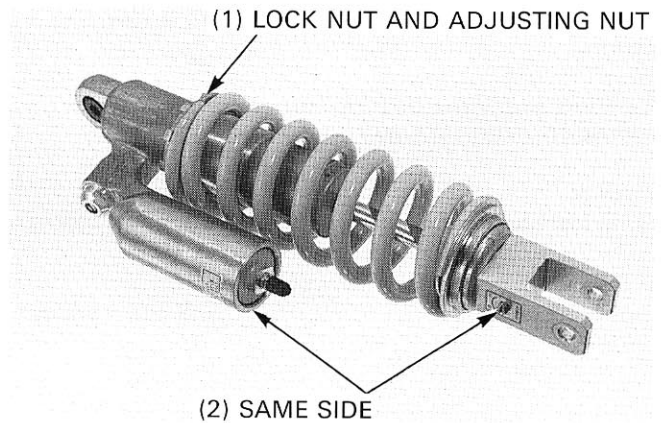


Install the spring with the narrow end facing down. Install the spring seat and the stopper ring into the rubber seat groove properly.



Loosely tighten the lock nut and adjusting nut. Turn the lower shock mount so that the rebound adjuster screw is on the same side as the reservoir.

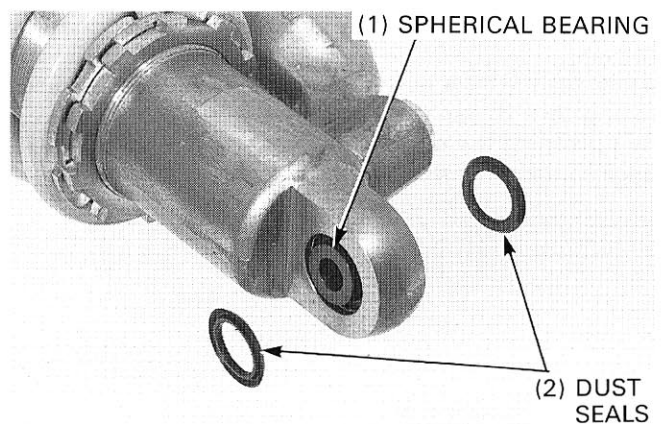
Install the shock absorber onto the motorcycle (page 14-25).



UPPER MOUNT BEARING REPLACEMENT

'96, '97:

Remove the dust seals. Check the spherical bearing for wear or damage.



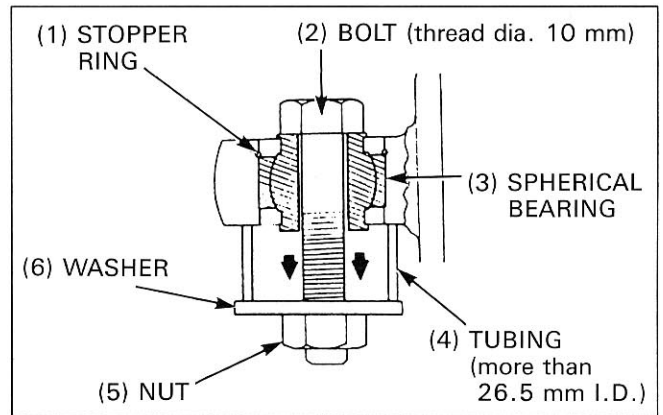
REAR WHEEL/SUSPENSION

Assemble a piece of tubing (more than 26.5 mm I.D.), bolt (thread dia. 10 mm), washer and nut against the spherical bearing as shown.

Tightening the nut, pull the bearing away from the stopper side.

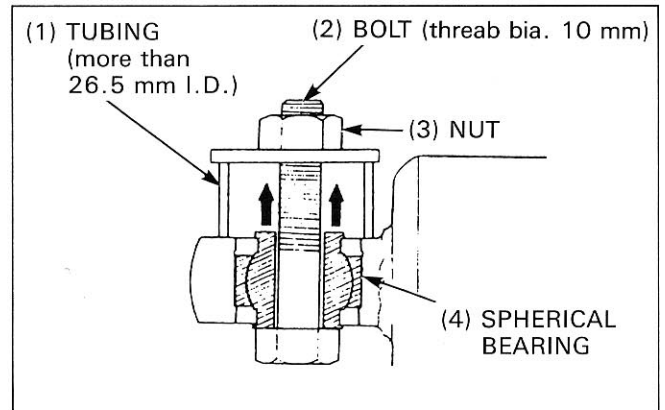
Remove the stopper ring.

Disassemble the tubing, bolt, washer and nut.



Install the same piece of tubing, bolt, washer and nut to the shock absorber upper mount as shown.

Draw the bearing out of the stopper ring groove by tightening the nut.



Apply molybdenum disulfide paste to a new spherical bearing.

Carefully press the bearing into the upper mount until it contacts the stopper side.

TOOLS:

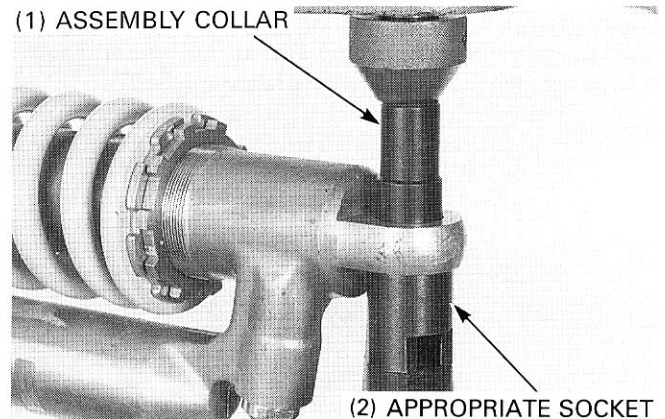
Spherical bearing driver

07HMF - KS60100

U.S.A. only:

Assembly collar

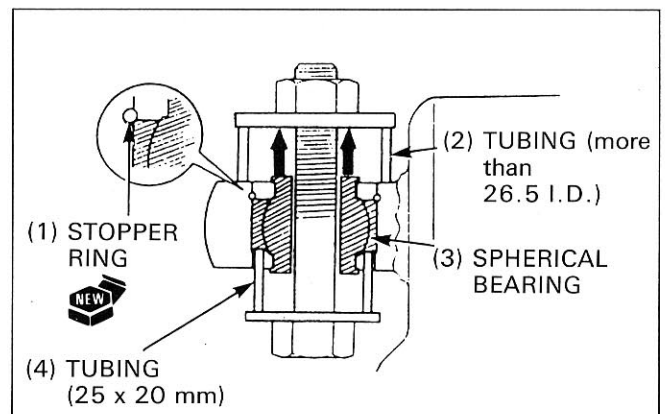
07965 - GM00100



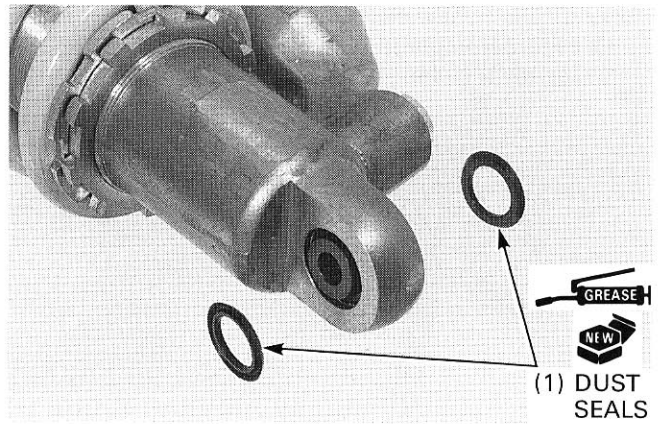
Install a new stopper ring into the groove in the upper mount.

Assemble the tools used for removal with a second piece of tubing (25 x 20 mm O.D.) as shown.

By tightening the nut, pull the bearing in until the bearing edge contacts the stopper ring all the way around.

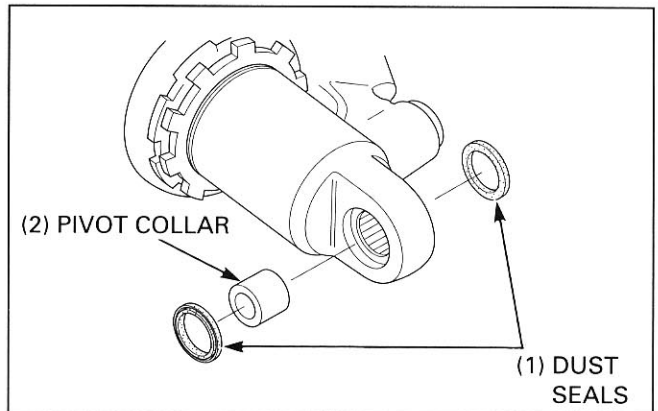


Apply grease to new dust seal lips and install them into the spherical bearing.



AFTER '97

Remove the pivot collar and dust seals.
Check the needle bearing for wear or damage.

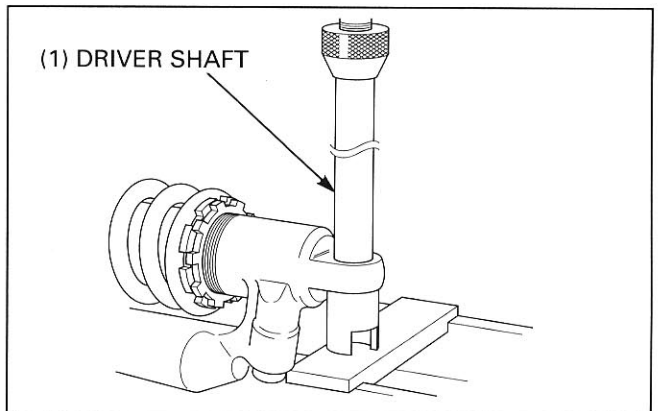


Press the needle bearing out of the shock absorber upper mount.

TOOL:

Driver shaft

07946 – MJ00100



Apply grease to new needle bearing rollers.
Carefully press the needle bearing into the shock absorber upper mount until the depth from the upper mount outer surface is 3.5 mm (0.14 in).

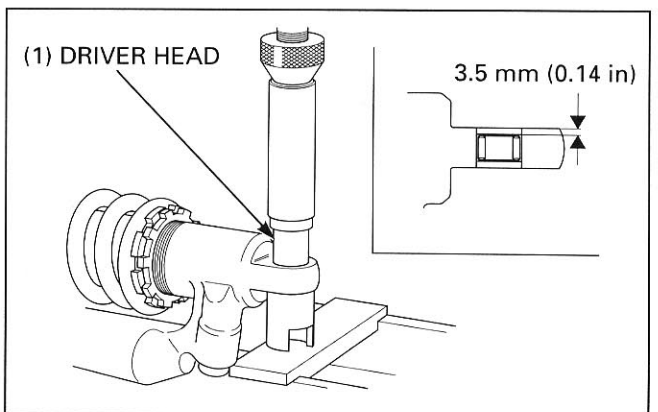
NOTE

- Press the marking side of the bearing

TOOL:

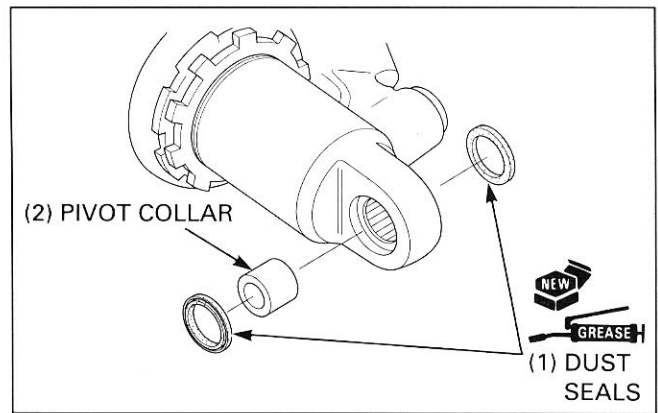
Driver head

**07946 – KM40701
not available in U.S.A.**



REAR WHEEL/SUSPENSION

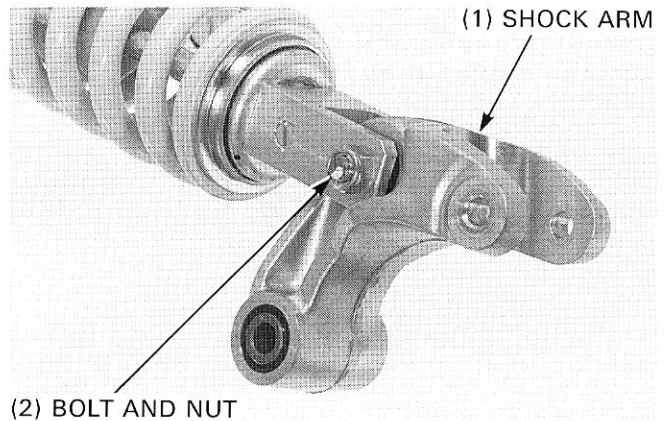
Apply grease to new dust seal lips and install them into the shock absorber upper mount.
Install the pivot collar.



INSTALLATION

Set the shock arm between the lower mount, install the lower mounting bolt from the damping adjuster screw (on the lower mount) side and tighten the nut to the specified torque.

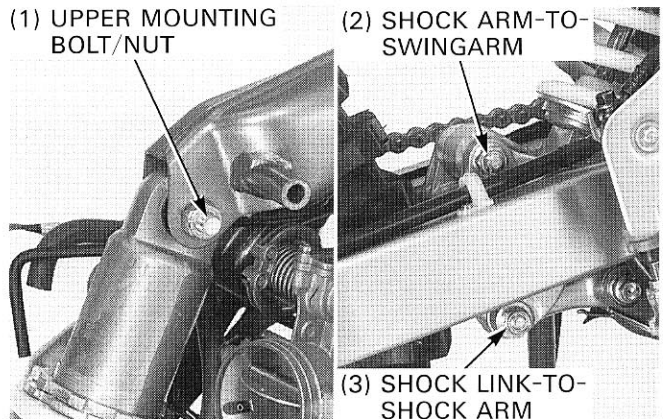
TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)



Install the shock absorber assembly to the frame and swingarm.
Install all mounting bolts from the left side and tighten the nuts.

TORQUE:

Upper mounting nut: 44 N·m (4.5 kgf·m, 33 lbf·ft)
Shock arm-to-swingarm: 69 N·m (7.0 kgf·m, 51 lbf·ft)
Shock link-to-shock arm: 44 N·m (4.5 kgf·m, 33 lbf·ft)



If the shock absorber is disassembled, adjust the spring installed length.
Turn the spring adjusting nut until the spring length is the specified standard length.

STANDARD SPRING LENGTH: 212.3 mm (8.36 in)

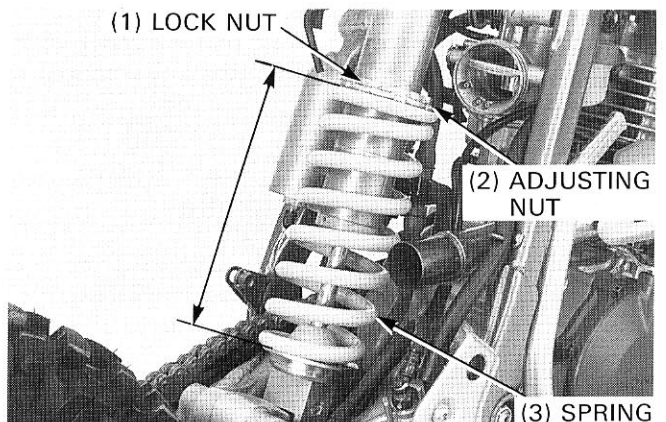
NOTE

- One complete turn of the adjusting nut changes the spring length by 1.5 mm (0.06 in)

Hold the adjusting nut and tighten the lock nut.

TORQUE: 88 N·m (9.0 kgf·m, 65 lbf·ft)

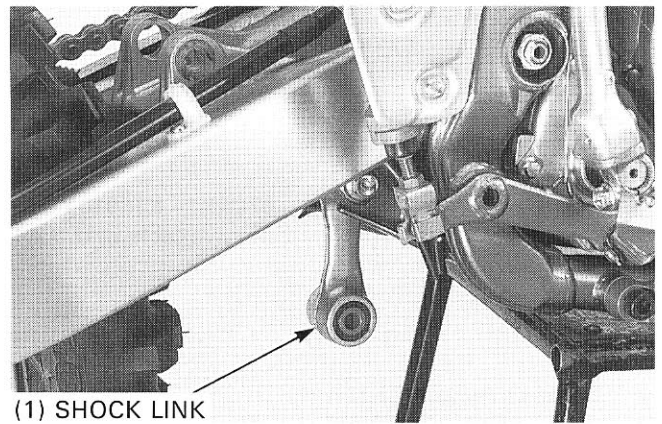
Install the sub-frame (page 2-3).



SHOCK LINKAGE

Remove the shock absorber and separate the shock arm from the shock absorber (page 14-10).

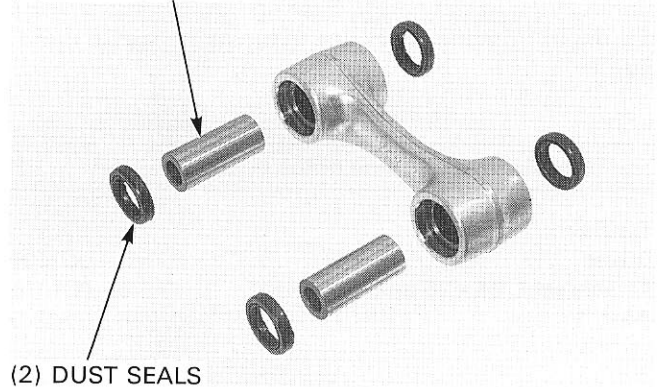
Remove the shock link-to-frame nut and bolt and the shock link.



(1) SHOCK LINK

Remove the pivot collars and dust seals from the shock link.

(1) PIVOT COLLARS

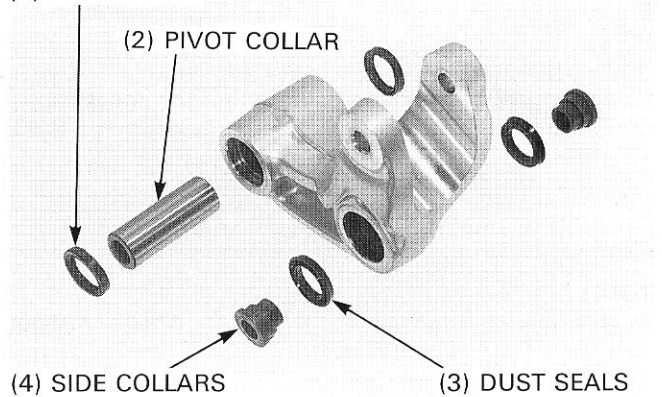


(2) DUST SEALS

'96, '97:

Remove the side collar, pivot collar and dust seals from the shock arm.

(1) DUST SEALS



(4) SIDE COLLARS

(3) DUST SEALS

After '97:

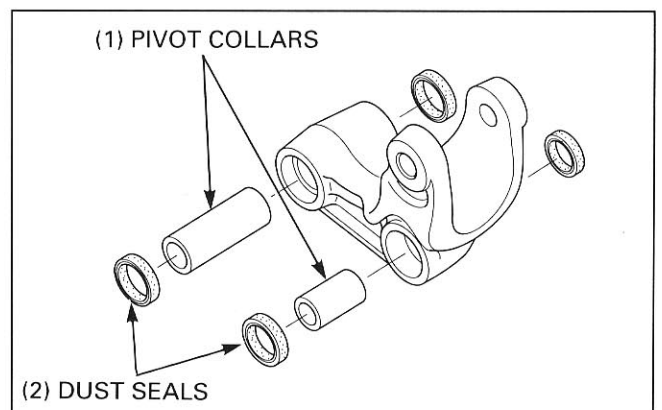
Remove the pivot collars and dust seals from the shock arm.

INSPECTION

Check the pivot collars and pivot bearings for wear or damage.

NOTE

- Be careful not to lose the needle rollers of the needle bearing.



(2) DUST SEALS

REAR WHEEL/SUSPENSION

NEEDLE BEARING REPLACEMENT

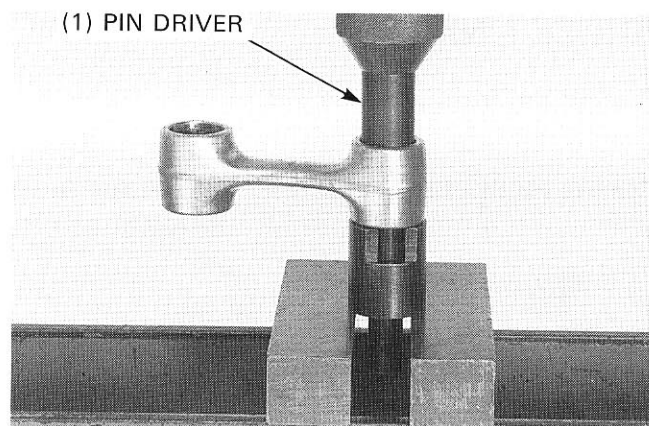
Shock Link

Press the needle bearing out of the shock link.

TOOL:

Pin driver

07GMD – KT80100
not available in U.S.A.



Apply grease to new needle bearing rollers.
Carefully press the needle bearing into the shock link until the depth from the shock link outer surface is 5.5 mm (0.22 in).

NOTE

- Press the marking side of the bearing.

TOOLS:

Driver

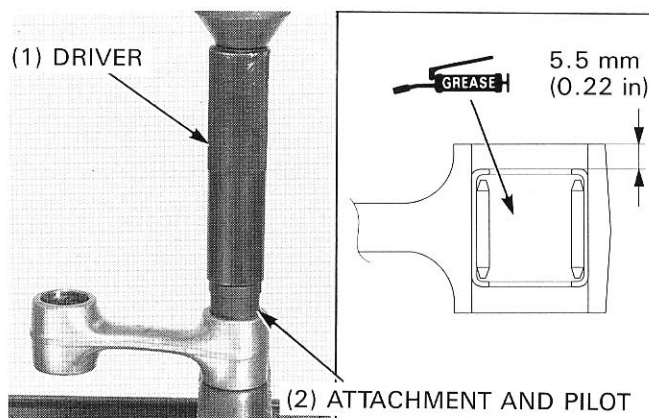
07749 – 0010000

Attachment, 24 x 26 mm

07746 – 0010700

Pilot, 17 mm

07746 – 0040400



Shock Arm

Press the needle bearing out of the shock arm.

Apply grease to new needle bearing rollers.
Carefully press the needle bearing into the shock arm until the depth from the shock link outer surface is 6 mm (0.24 in).

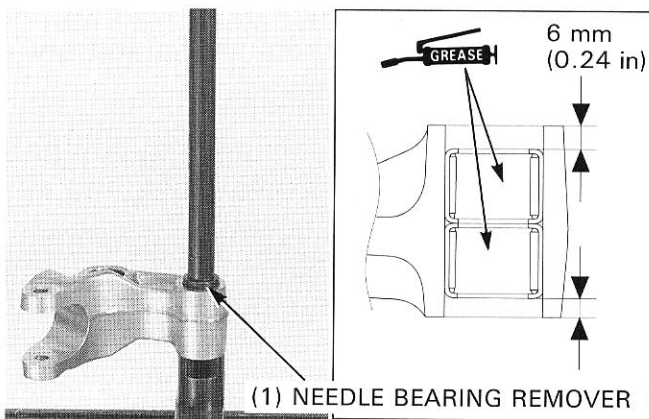
NOTE

- Press the marking side of the bearing

TOOL:

Needle bearing remover

07946 – KA50000



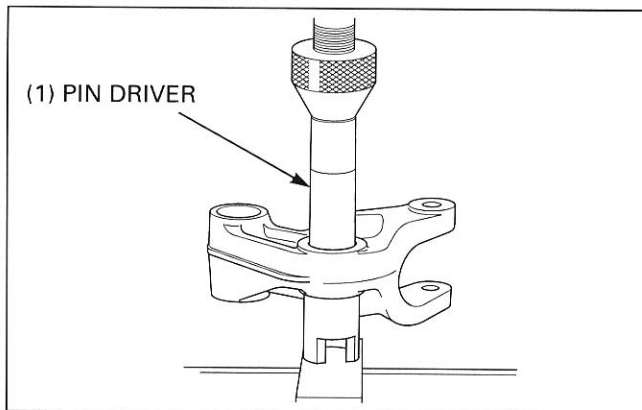
After '97 only:

Press the needle bearing out of the shock absorber side pivot of the shock arm.

TOOL:

Pin driver

07GMD – KT80100
not available in U.S.A.



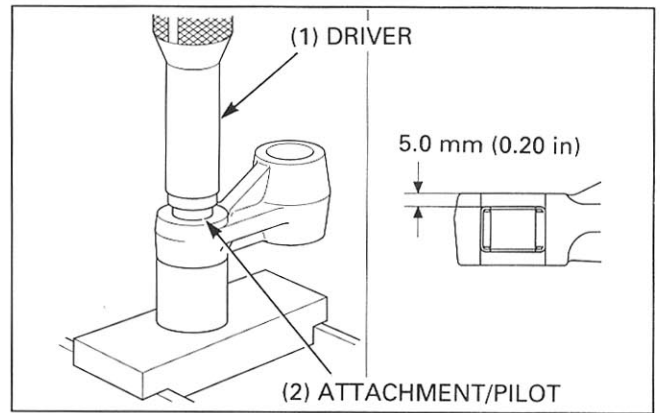
Apply grease to new needle bearing rollers.
Carefully press the needle bearing into the shock arm until the depth from the shock arm outer surface is 5.0 mm (0.20 in).

NOTE

- Press the marking side of the bearing.

TOOLS:

Driver	07749 - 001000
Attachment, 24 x 26 mm	07746 - 0010700
Pilot, 17 mm	07746 - 0040400



SPHERICAL BEARING REPLACEMENT ('96, '97 only)

Press the spherical bearing out of the shock arm using the special tools.

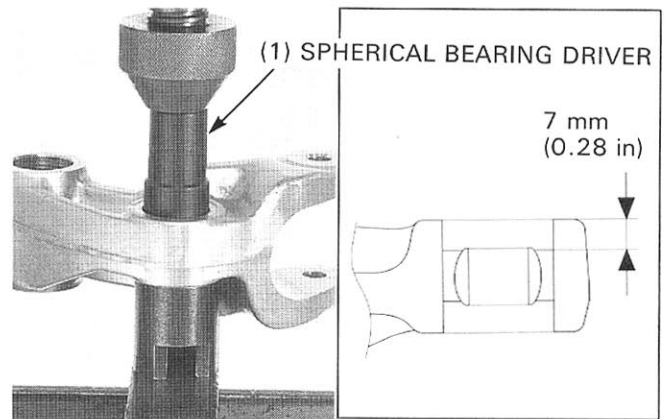
Carefully press the spherical bearing into the shock arm until the depth from the shock arm outer surface is 7 mm (0.28 in).

TOOLS:

Spherical bearing driver	07HMF - KS60100
---------------------------------	------------------------

U.S.A. only:

Assembly collar	07965 - GM00100 or
Assembly collar	07965 - VM00100



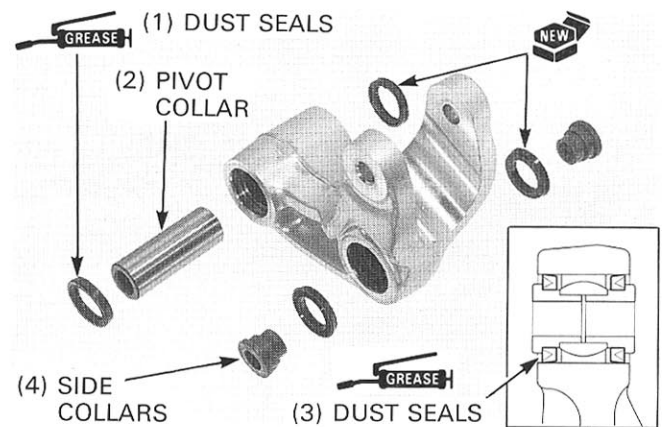
INSTALLATION

Make sure that the needle bearing rollers are in position.

'96, '97:

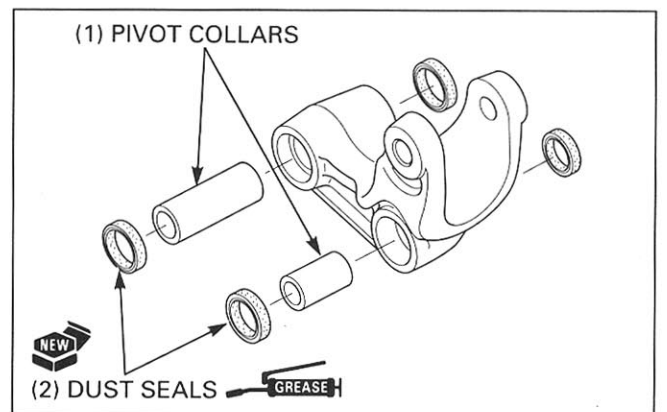
Apply grease to new needle bearing dust seal lips and install them into the shock arm pivot until they are seated. Install the pivot collar into the needle bearing.

Apply grease to new spherical bearing dust seal lips and install them over the pivot collars. Install the side collars into the spherical bearing.



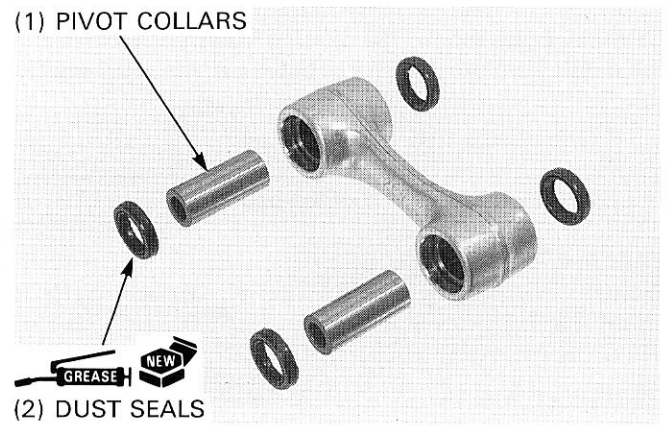
After '97:

Apply grease to new needle bearing dust seal lips and install them into the shock arm pivots. Install the pivot collars into the needle bearings.



REAR WHEEL/SUSPENSION

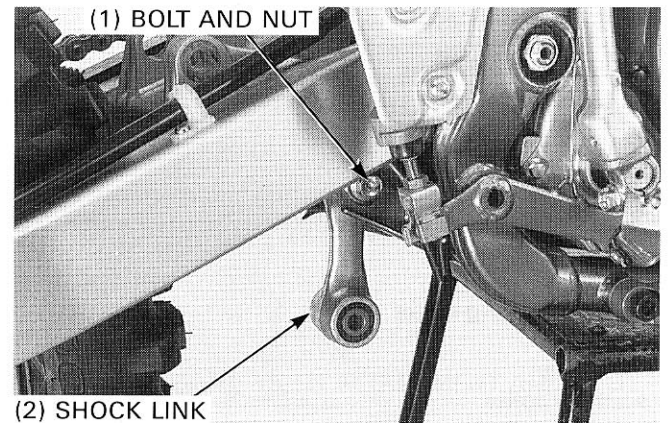
Apply grease to new needle bearing dust seal lips and install them onto the needle bearings until they are seated firmly. Install the pivot collars into the needle bearings.



Install the shock link onto the frame and insert the bolt from the right side and tighten the nut.

TORQUE: 49 N·m (5.0 kgf·m, 36 lbf·ft)

Assemble the shock arm and shock absorber and install it (page 14-26).



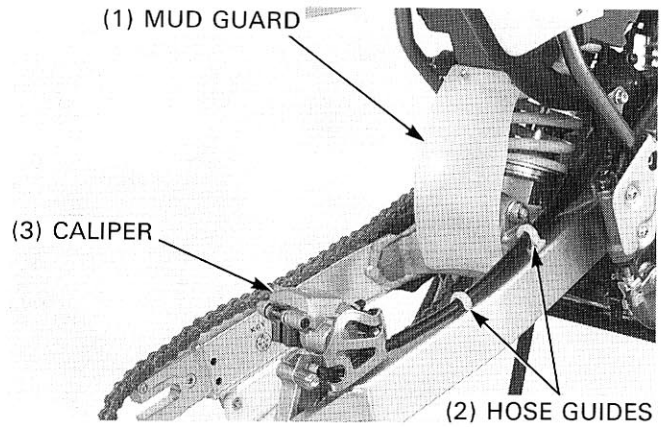
SWINGARM

REMOVAL

Remove the rear wheel (page 14-4).

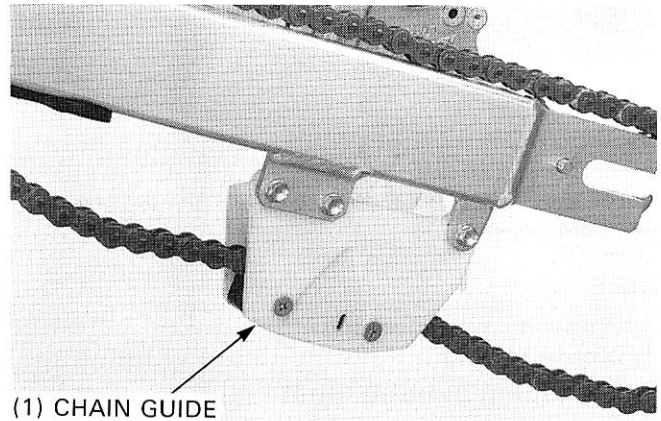
Remove the two screws and mud guard from the air cleaner housing.

Remove the two screws and brake hose guides and the brake caliper from the swingarm.



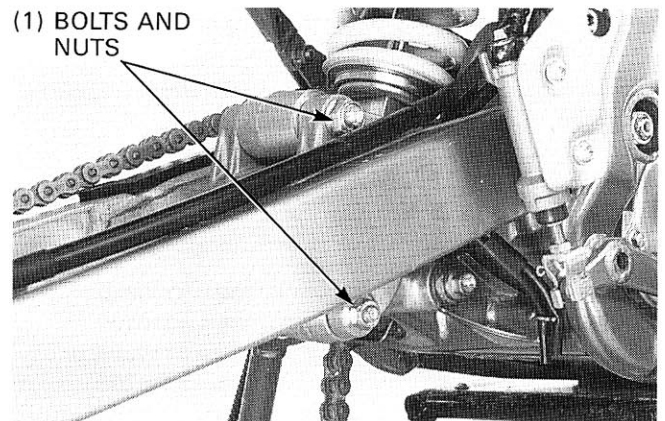
Remove the three bolts and the drive chain guide from the swingarm.

Remove the carburetor drain/air vent and crankcase breather tubes from the clamps.

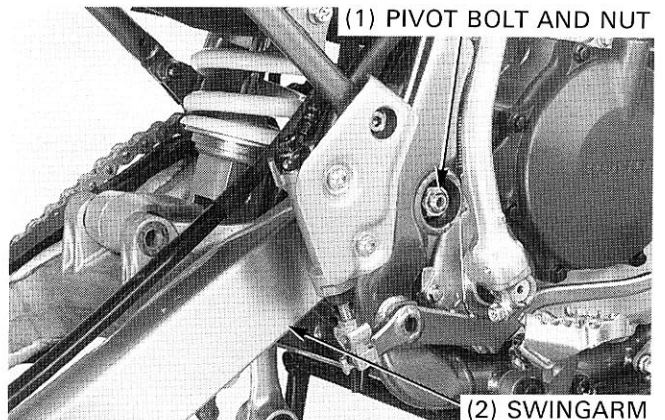


Remove the following:

- shock arm-to-swingarm bolt/nut
- shock link-to-shock arm bolt/nut

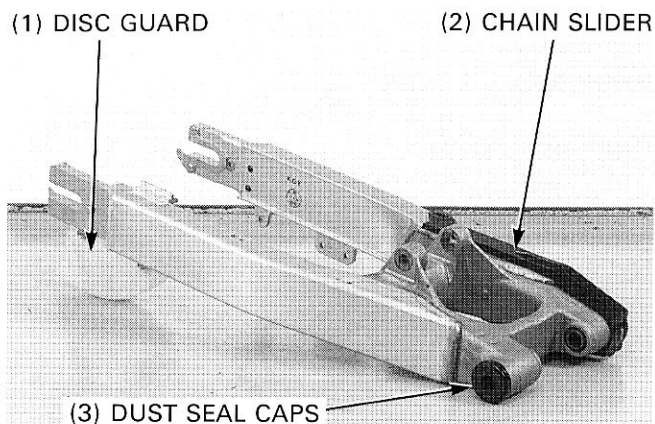


- swingarm pivot nut
- swingarm pivot bolt
- swingarm



REAR WHEEL/SUSPENSION

- dust seal caps
- chain slider and brake disc guard if necessary



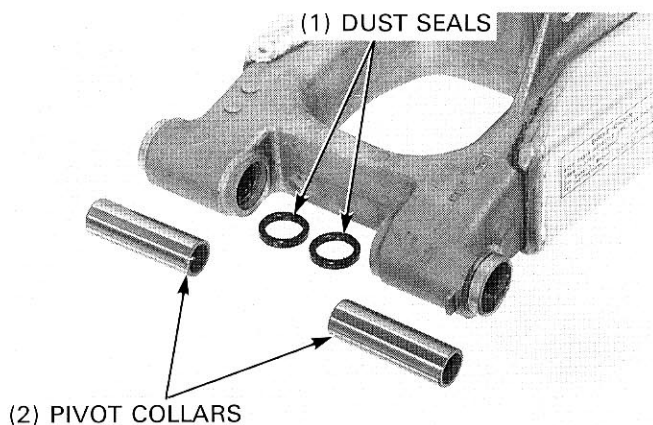
- pivot collars
- dust seals.

INSPECTION

Check the pivot collars, dust seals and needle bearings for wear or damage.

NOTE

- Be careful not to lose the needle bearing rollers of the needle bearing.



PIVOT BEARING REPLACEMENT

Remove the outside needle bearings from the swingarm pivot using the special tool.

TOOLS:

Needle bearing remover 07931 - MA70000 or

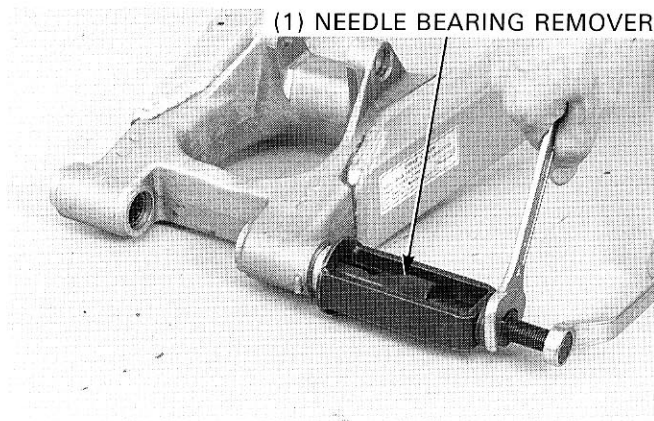
U.S.A. only:

Bearing remover, 20 mm 07936 - 3710600

Remover handle 07936 - 3710100

Remover weight 07936 - 371020A or

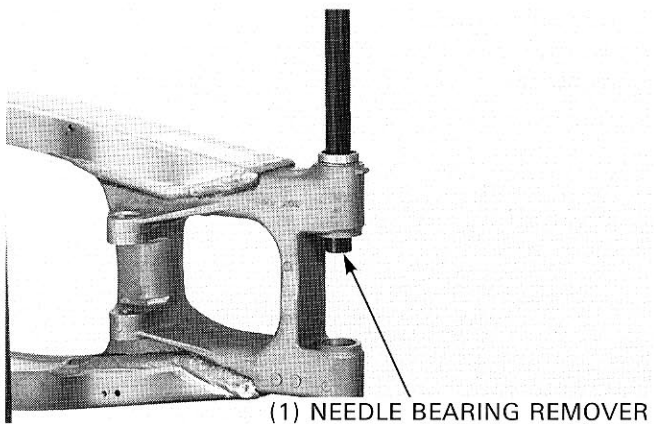
07936 - 3710200



Press the inside needle bearings out of the swingarm pivot using the special tool.

TOOL:

Needle bearing remover 07946-KA50000



Apply grease to new needle bearing rollers.
Carefully press the needle bearings until the depth from the outer surface of the swingarm pivot is 8 mm (0.31 in) at the outside, and depth from the outer surface of the pivot is 5.5 mm (0.22 in) at the inside as shown.

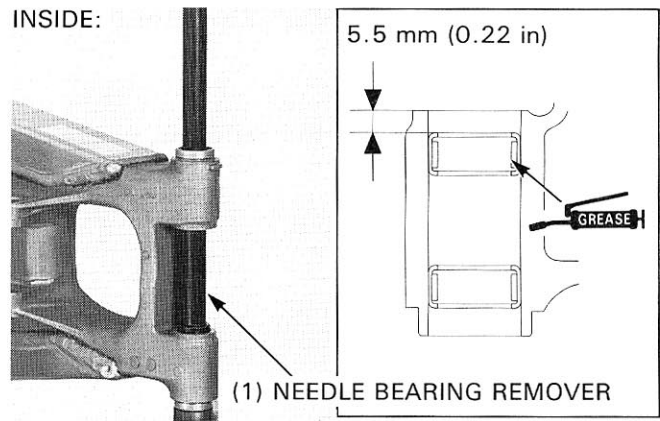
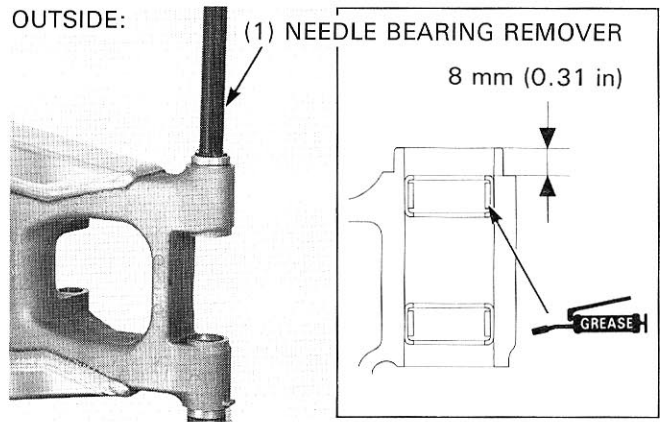
NOTE

- Press the marking side of the bearing.

TOOL:

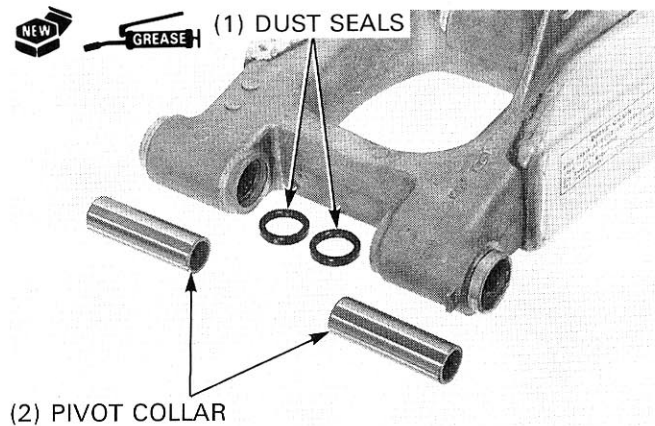
Needle bearing remover

07946 - KA50000



INSTALLATION

Apply grease to new dust seal lips and install them into the swingarm pivots until the outer surface of the dust seal and swingarm are equal height.
Install the pivot collars into the bearings.

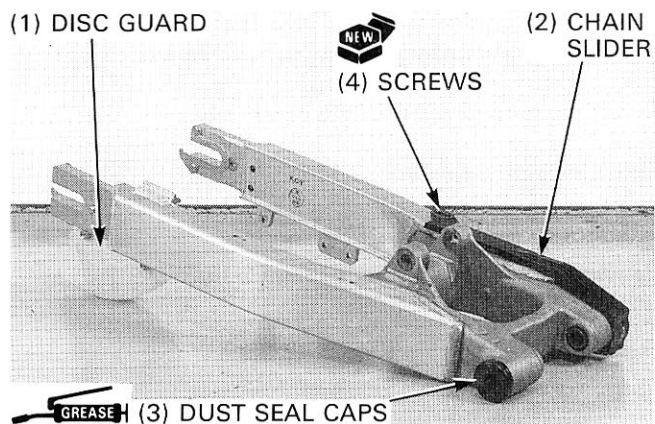


Install the disc guard with the two bolts.

Install the chain slider and tighten new slider screws with the setting washers.

Check the dust seal caps and replace them if the seal lips are worn or damaged.

Apply grease to the dust seal lips and install the dust seal caps.

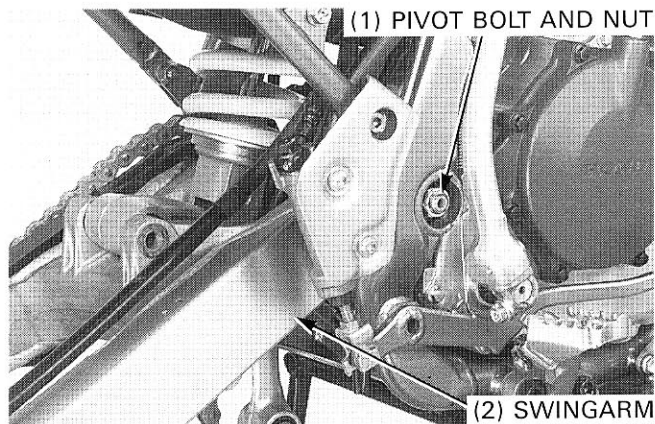


REAR WHEEL/SUSPENSION

Install the swingarm in the frame and insert the pivot bolt from the left side.

Install and tighten the pivot nut.

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

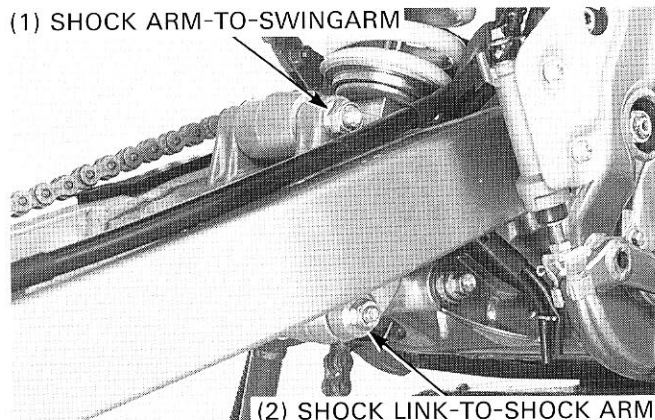


Install the linkage bolts from the left side while holding the swingarm and tighten the nuts.

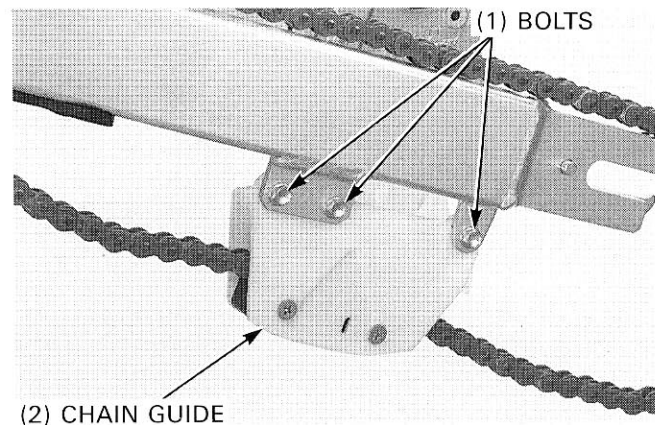
TORQUE:

Shock arm-to-swingarm: 69 N-m (7.0 kgf-m, 51 lbf-ft)

Shock link-to-shock arm: 44 N-m (4.5 kgf-m, 33 lbf-ft)



Install the drive chain guide with the three bolts.



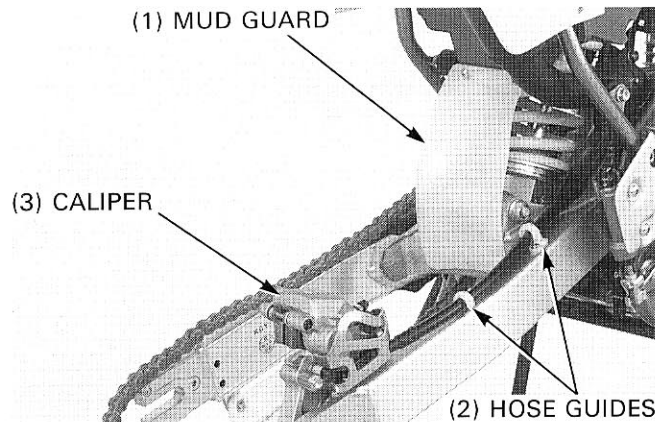
Set the brake caliper onto the slide rail on the swingarm and install the brake hose guides with new screws.

Install the mud guard with the two screws.

Install the rear wheel (page 14-9).

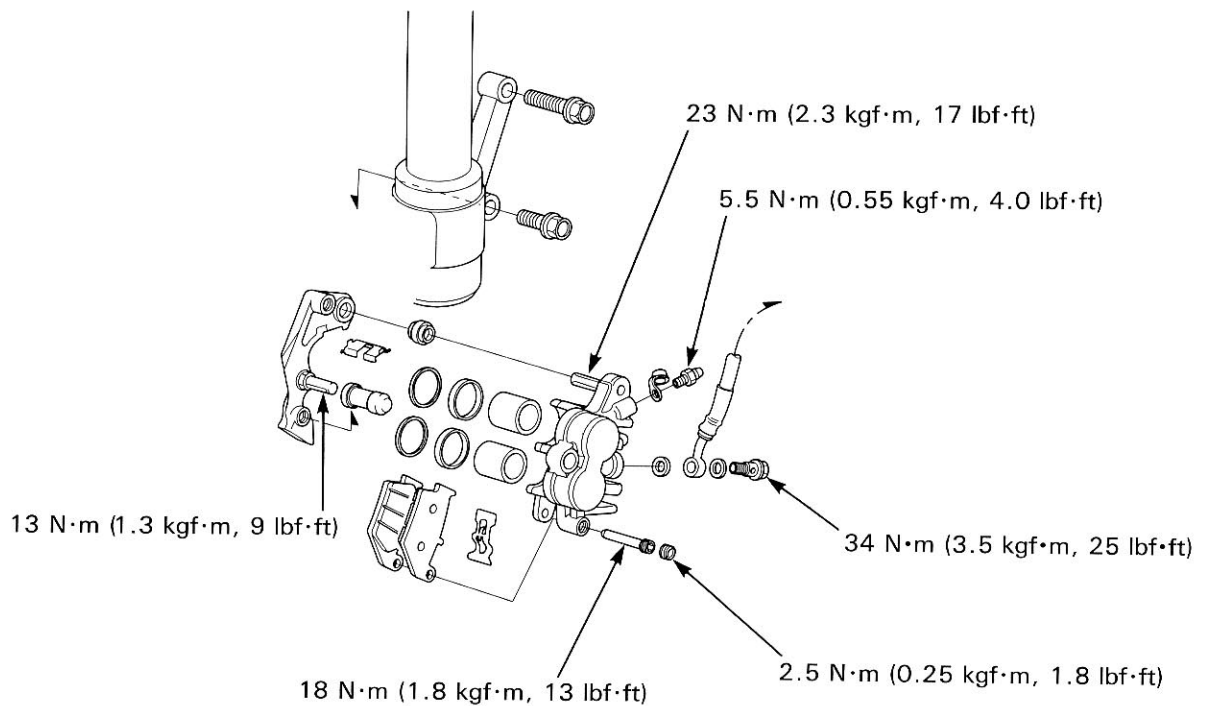
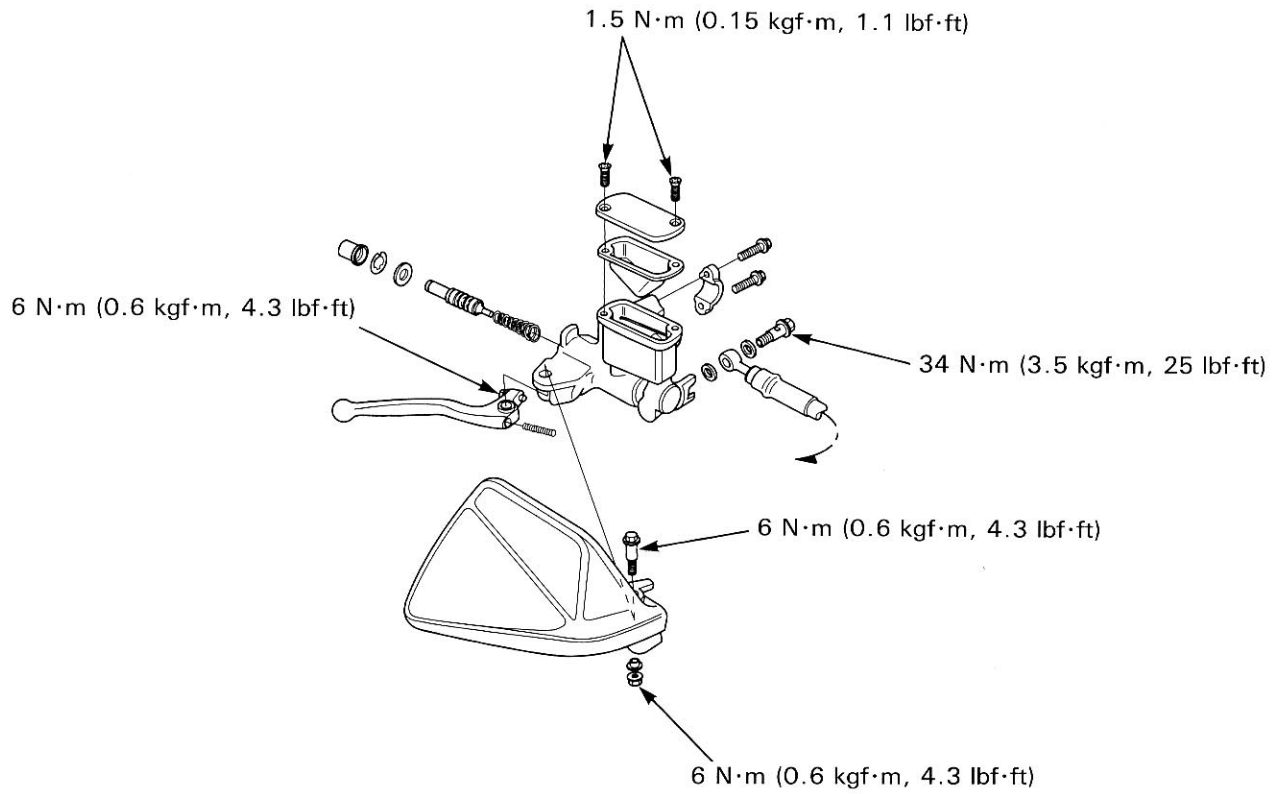
NOTE

- Route the tubes properly (page 1-19).



HYDRAULIC DISC BRAKE

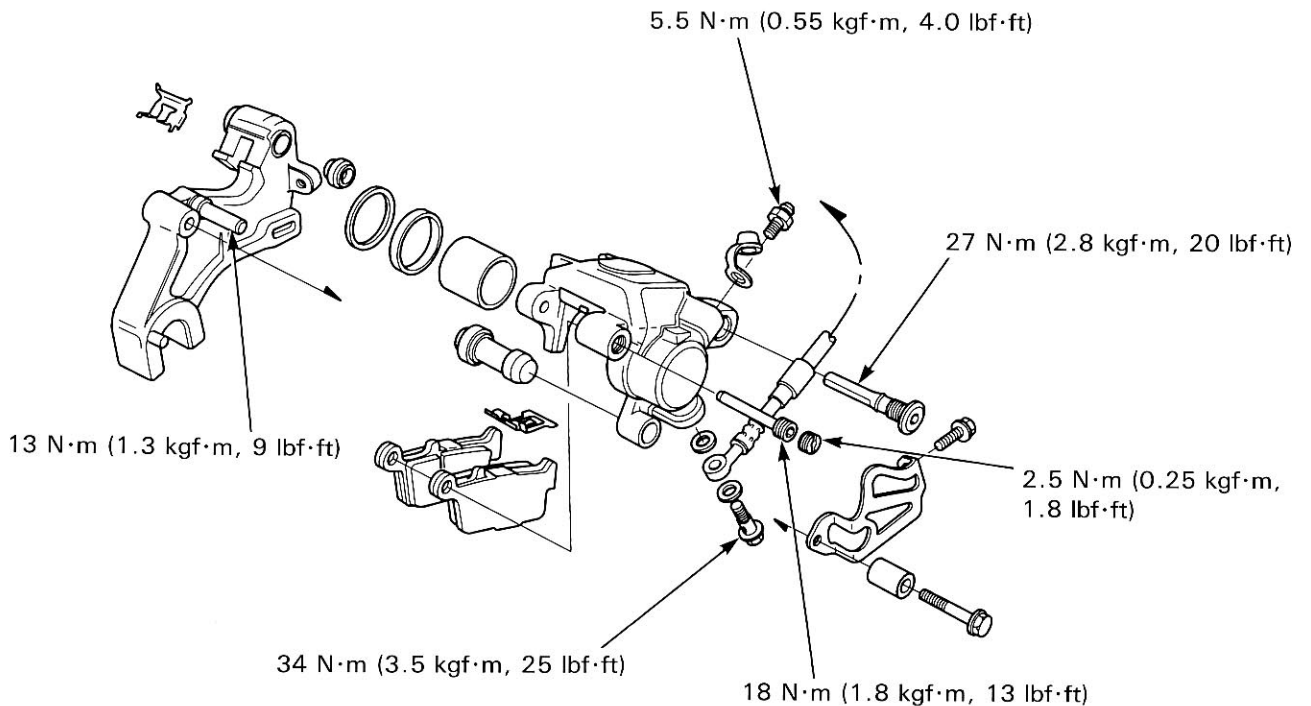
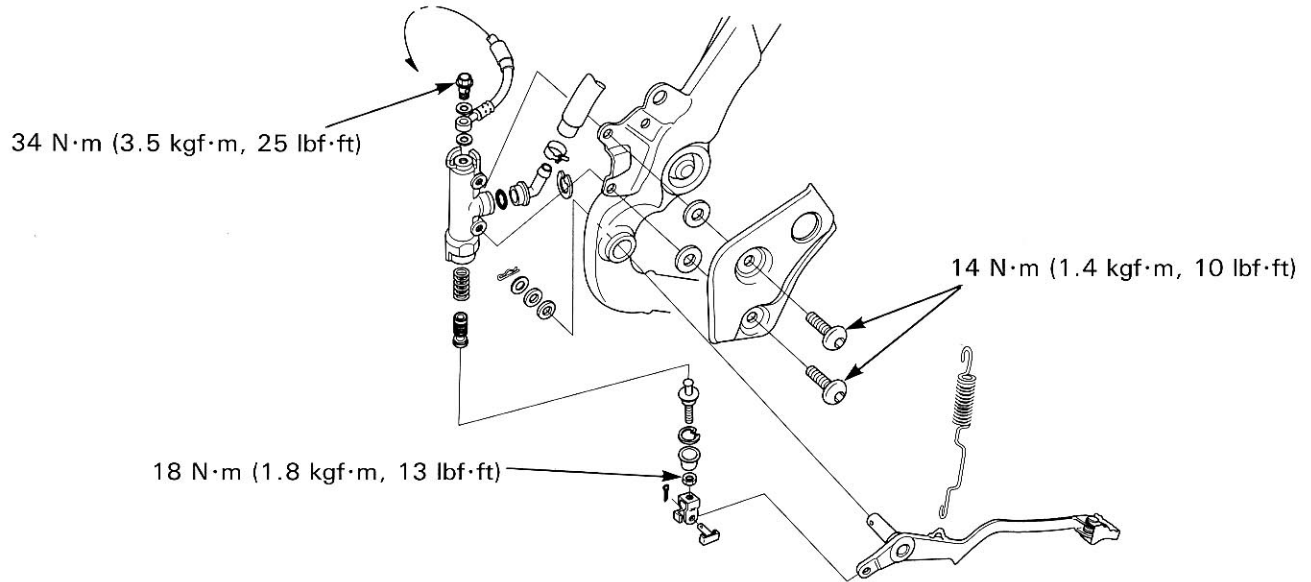
FRONT:



15. HYDRAULIC DISC BRAKE

SERVICE INFORMATION	15-2	FRONT CALIPER	15-9
TROUBLESHOOTING	15-3	REAR MASTER CYLINDER	15-12
BRAKE FLUID REPLACEMENT/ AIR BLEEDING	15-4	REAR CALIPER	15-15
BRAKE PAD/DISC	15-6	BRAKE PEDAL	15-18
FRONT MASTER CYLINDER	15-7		

REAR:



SERVICE INFORMATION

GENERAL

⚠ WARNING

- *A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean contaminated disc with a high quality degreasing agent.*
- *Inhaled asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies. Use a vacuum cleaner or alternate method minimize the hazard caused by airborne asbestos fibers.*

CAUTION

- *Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag or shop towel over these parts whenever the system is serviced.*
- Bleed the hydraulic system if it has been disassembled or if the brake feels spongy.
- Never allow contaminants (dirt, water, etc.) to get into an open reservoir.
- Always use fresh DOT 4 brake fluid from a sealed container when servicing the system. Do not mix different types of fluid as they may not be compatible.
- Always check the brake operation before riding the motorcycle.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Specified brake fluid		DOT 4	—
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)	11.06 (0.435)
	RR	12.700 – 12.743 (0.5000 – 0.5017)	12.76 (0.502)
Master piston O.D.	FR	10.957 – 10.984 (0.4314 – 0.4324)	10.84 (0.427)
	RR	12.657 – 12.684 (0.4983 – 0.4994)	12.64 (0.498)
Caliper cylinder I.D.		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)	26.91 (1.059)

TORQUE VALUES

Brake hose oil bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)
Pad pin	18 N·m (1.8 kgf·m, 13 lbf·ft)
Pad pin plug	2.5 N·m (0.25 kgf·m, 1.8 lbf·ft)
Caliper bleed valve	5.5 N·m (0.55 kgf·m, 4.0 lbf·ft)
Front caliper mounting bolt	30 N·m (3.1 kgf·m, 22 lbf·ft) ALOC bolt. Do not reuse.
Front caliper pin bolt	23 N·m (2.3 kgf·m, 17 lbf·ft) Apply locking agent to the threads.
Front caliper bracket pin bolt	13 N·m (1.3 kgf·m, 9 lbf·ft) Apply locking agent to the threads.
Front master cylinder reservoir cap screw	1.5 N·m (0.15 kgf·m, 1.1 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 lever adjusting bolt	6 N·m (0.6 kgf·m, 4.3 lbf·ft)
Rear caliper pin bolt	27 N·m (2.8 kgf·m, 20 lbf·ft)
Rear caliper bracket pin bolt	13 N·m (1.3 kgf·m, 9 lbf·ft) Apply locking agent to the threads.
Rear master cylinder mounting bolt	14 N·m (1.4 kgf·m, 10 lbf·ft) ALOC bolt. Do not reuse.
Rear master cylinder push rod lock nut	18 N·m (1.8 kgf·m, 13 lbf·ft)

TOOLS

Snap ring pliers	07914-3230001
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TROUBLESHOOTING

Brake lever/pedal soft or spongy

- Air in hydraulic system
- Leaking hydraulic system
- Contaminated brake pad/disc
- Worn caliper piston seal
- Worn master cylinder piston cup
- Worn brake pad/disc
- Contaminated caliper
- Caliper not sliding properly
- Low brake fluid level
- Clogged fluid passage
- Warped/deformed brake disc
- Sticking/worn caliper piston
- Sticking/worn master cylinder piston
- Contaminated master cylinder
- Bent brake lever/pedal

Brake lever/pedal hard

- Clogged/restricted brake system
- Sticking/worn caliper piston
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Worn caliper piston seal
- Sticking/worn master cylinder piston
- Bent brake lever/pedal

Brake drag

- Contaminated brake pad/disc
- Misaligned wheel
- Badly worn brake pad/disc
- Warped/deformed brake disc
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Sticking/worn caliper piston

BRAKE FLUID REPLACEMENT/ AIR BLEEDING

⚠ WARNING

- A brake fluid contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.

CAUTION

- Do not allow foreign material to enter the system when filling the reservoir.
- Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.

BRAKE FLUID DRAINING

For the front brake, turn the handlebar until the reservoir is level before removing the reservoir cap.

Remove the reservoir cap, set plate and diaphragm.

Connect a bleed hose to the bleed valve.
Loosen the bleed valve and pump the brake lever or pedal until no more fluid flows out of the bleed valve.

BRAKE FLUID FILLING/BLEEDING

Fill the reservoir with DOT 4 brake fluid from a sealed container.

CAUTION

- Use only DOT 4 brake fluid from a sealed container.
- Do not mix different types of fluid. They are not compatible.

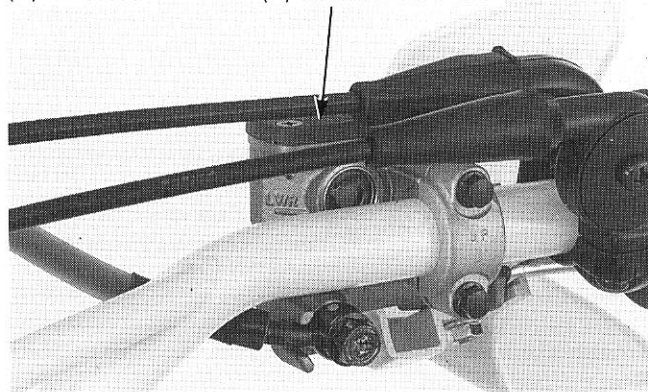
Connect a commercially available brake bleeder to the bleed valve.

Pump the brake bleeder and loosen the bleed valve.
Add brake fluid when the fluid level in the reservoir is low.

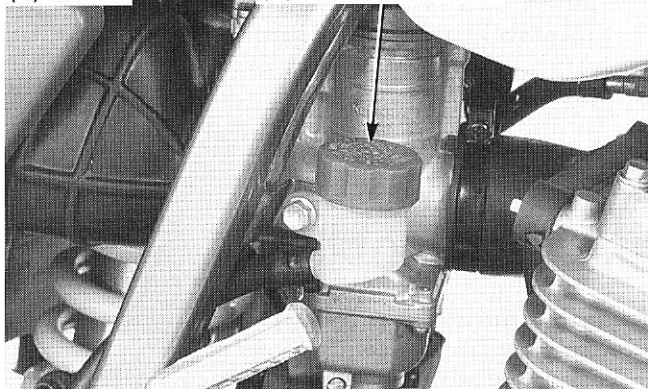
NOTE

- Check the fluid level often while bleeding the brake to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.

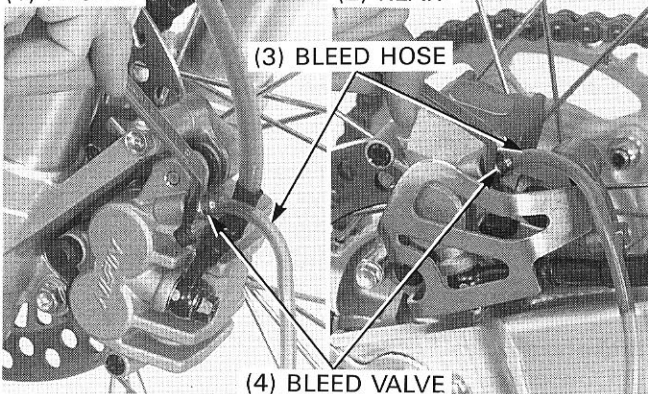
(1) FRONT: (2) RESERVOIR CAP



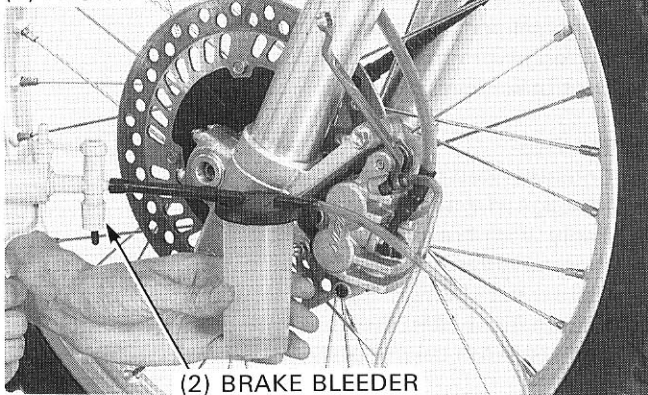
(1) REAR: (2) RESERVOIR CAP



(1) FRONT: (2) REAR:



(1) FRONT:



Repeat the above procedures until air bubbles do not appear in the plastic hose.

NOTE

- If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Close the bleed valve and operate the brake lever or pedal. If it still feels spongy, bleed the system again.

If a brake bleeder is not available, use the following procedure.

Pump up the system pressure with the brake lever or pedal until lever or pedal resistance is felt.

Connect a bleed hose to the bleed valve and bleed the system as follows:

1. Squeeze the brake lever or depress the brake pedal, open the bleed valve 1/2 turn and then close it.

NOTE

- Do not release the brake lever until the bleed valve has been closed.

2. Release the brake lever slowly and wait several seconds after it reaches the end of its travel.

Repeat the steps 1 and 2 until air bubbles do not appear in the bleed hose.

Tighten the bleed valve.

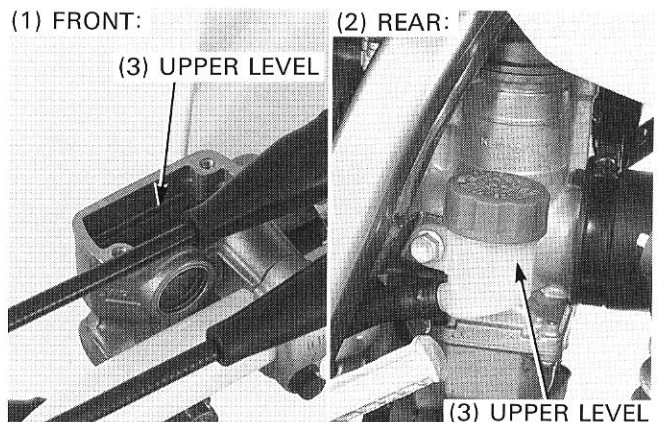
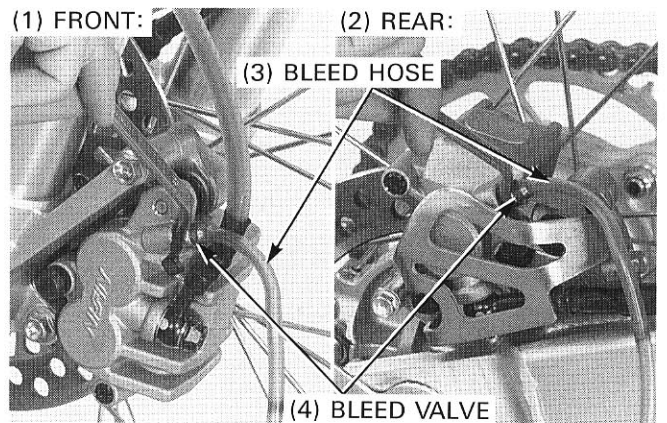
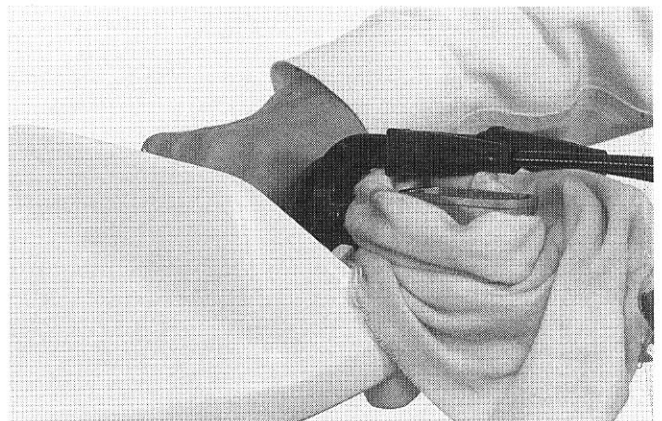
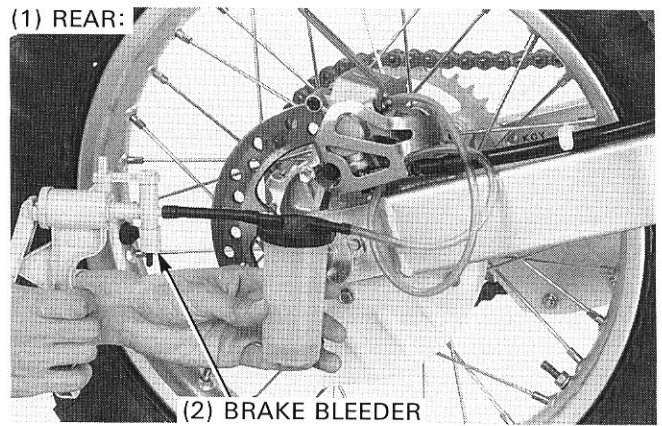
TORQUE: 5.5 N·m (0.55 kgf·m, 4.0 lbf·ft)

Fill the reservoir to the upper level mark with DOT 4 brake fluid from a sealed container.

Install the diaphragm, set plate and reservoir cap.

On the front brake, tighten the reservoir cap screws.

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



BRAKE PAD/DISC

BRAKE PAD REPLACEMENT

NOTE

- Always replace the brake pads in pairs to assure even disc pressure.

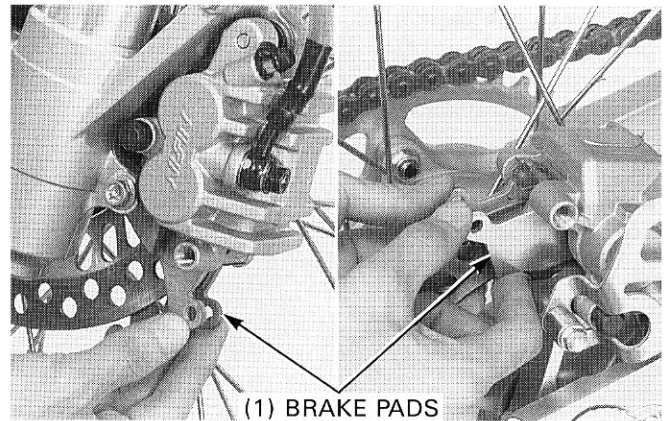
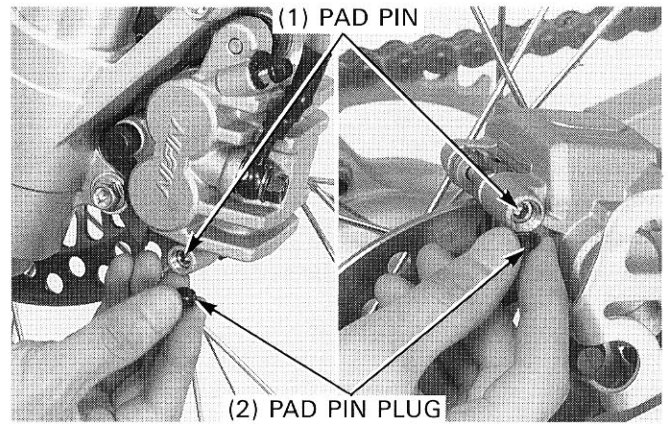
Push the caliper pistons all the way in by pushing the caliper body inward to provide clearance for the new pads.

Remove the pad pin plug and loosen the pad pin.

Remove the pad pin and the brake pads.

Make sure that the pad spring is installed in position.

Install new pads so that their ends rest on the pad retainer on the bracket properly.



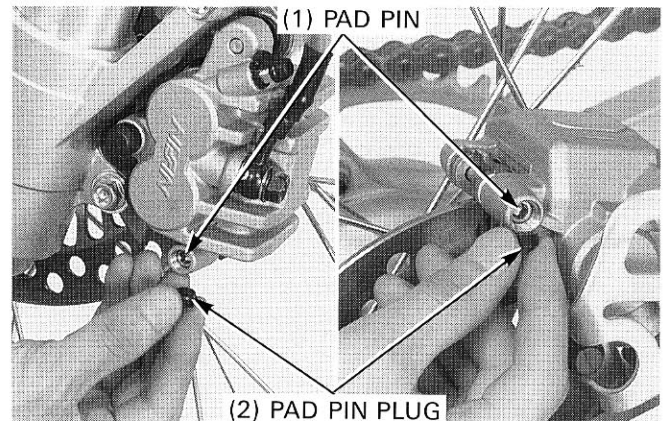
Install the pad pin by pushing the pads against the pad spring to align the pad pin holes in the pads and caliper. Tighten the pad pin.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Install and tighten the pad pin plug.

TORQUE: 2.5 N·m (0.25 kgf·m, 1.8 lbf·ft)

Operate the brake lever or pedal to seat the caliper pistons against the pads.



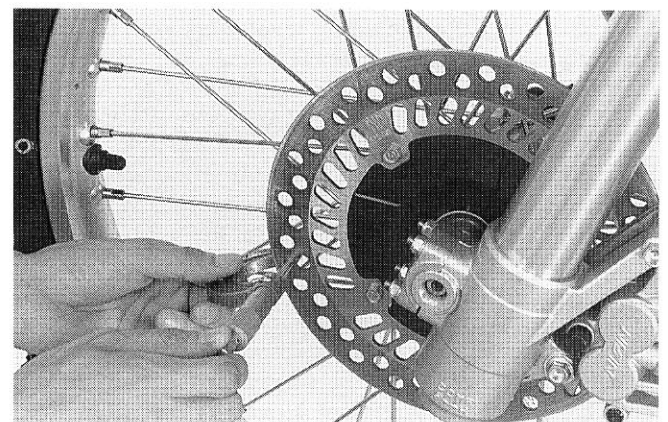
BRAKE DISC INSPECTION

Visually inspect the disc for damage or cracks.

Measure the brake disc thickness at the several points.

SERVICE LIMIT: Front: 2.5 mm (0.10 in)
Rear: 4.0 mm (0.16 in)

Replace the brake disc if the smallest measurement is less than the service limit.

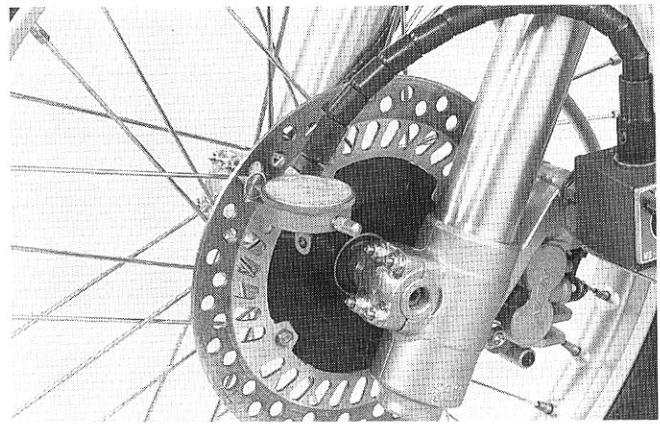


Check the brake disc for warpage.

Service limit: 0.25 mm (0.010 in)

Check the wheel bearing for excessive play, if the warpage exceeds the service limit.

Replace the brake disc if the wheel bearings are normal.



FRONT MASTER CYLINDER

DISASSEMBLY

Drain the brake fluid from the front hydraulic system (page 15-4).

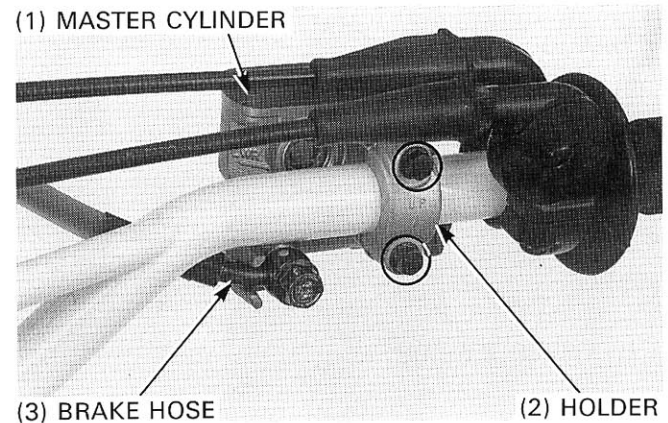
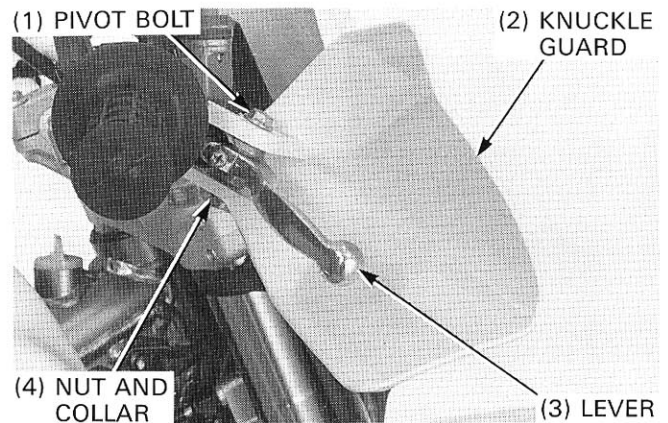
Remove the brake lever pivot nut, collar and the bolt while holding the brake lever, then remove the brake lever with the return spring and the knuckle guard.

CAUTION

- Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.
- When removing the oil bolt, cover the end of the hose to prevent contamination.

Disconnect the brake hose from the master cylinder by removing the oil bolt and sealing washers.

Remove the master cylinder holder bolts, holder and the master cylinder.



Remove the piston boot from the master piston and cylinder. Remove the snap ring.

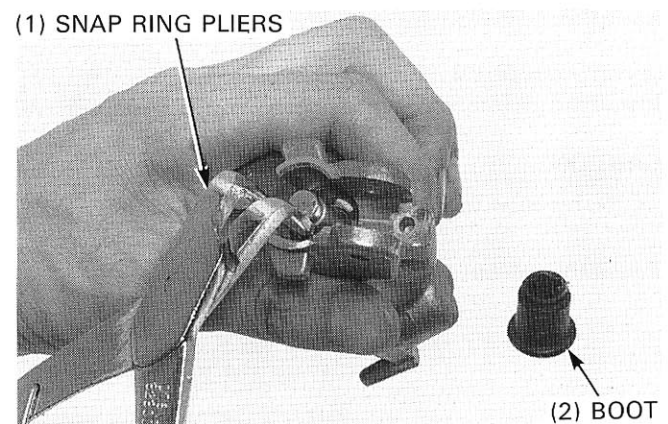
TOOL:

Snap ring pliers

07914-3230001

Remove the washer, master piston and spring.

Clean the master cylinder, reservoir and master piston in clean brake fluid.



HYDRAULIC DISC BRAKE

INSPECTION

Check the piston cups for wear, deterioration or damage.

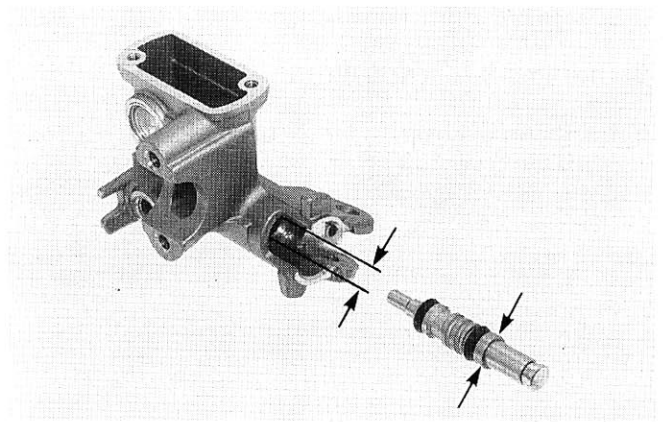
Check the master cylinder and piston for scoring or damage.

Measure the master cylinder I.D.

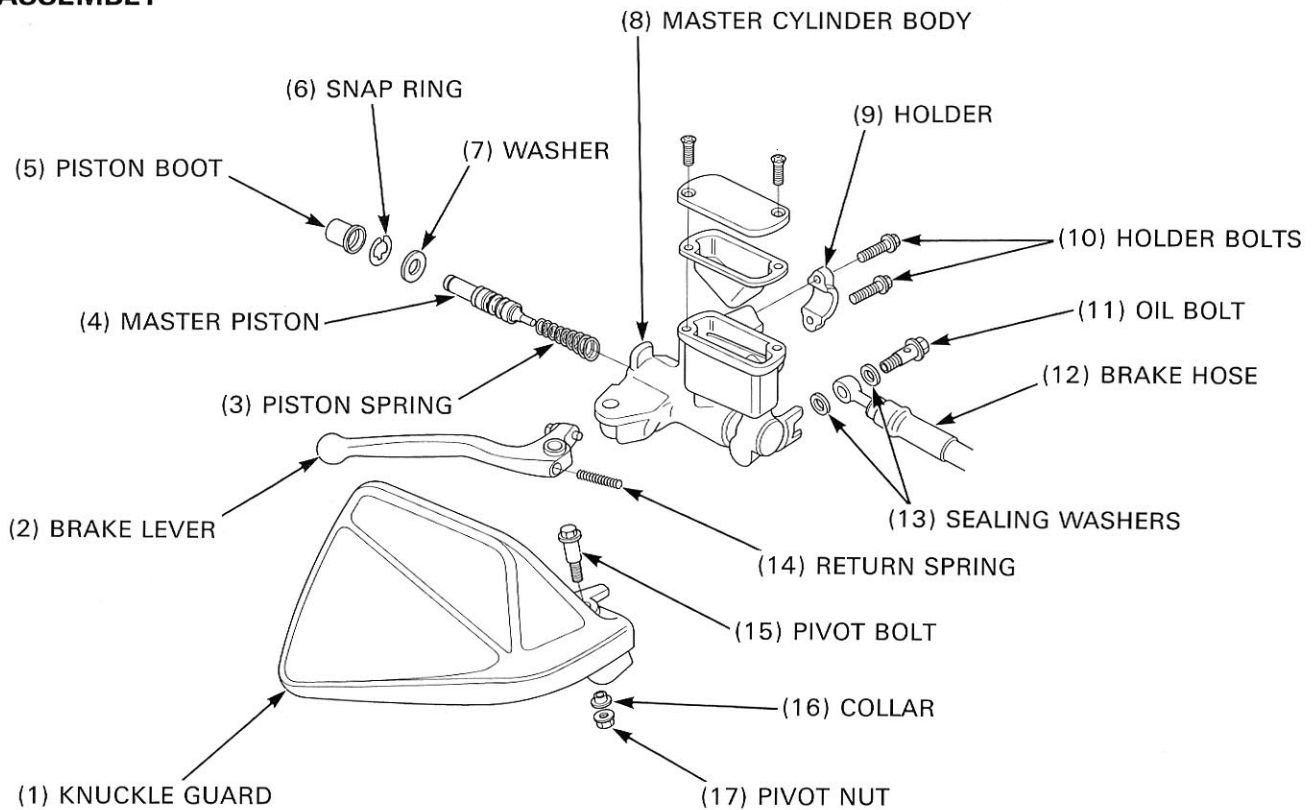
SERVICE LIMIT: 11.06 mm (0.435 in)

Measure the master piston O.D.

SERVICE LIMIT: 10.84 mm (0.427 in)



ASSEMBLY



Coat the master piston and piston cups with clean DOT 4 brake fluid.

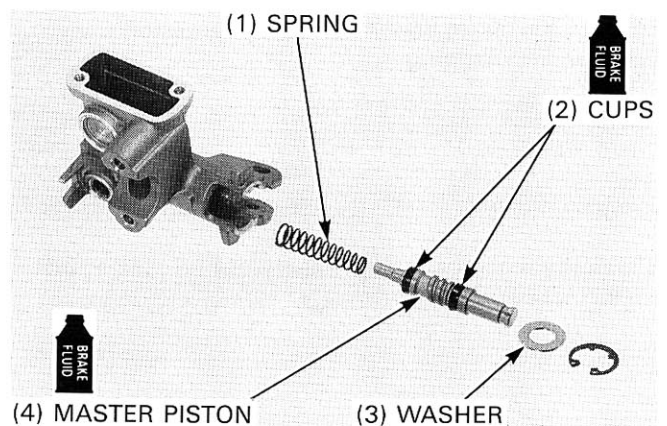
Install the piston spring onto the piston end.

Install the piston spring and piston into the master cylinder.

CAUTION

- Do not allow the piston cup lips to turn inside out.

Install the washer over the piston.



Install the snap ring into the groove in the master cylinder.

TOOL:

Snap ring pliers

07914-3230001

CAUTION

- *Be certain the snap ring is firmly seated in the groove.*

Install the piston boot into the master cylinder and the groove in the master piston.

Apply silicone grease to the brake lever contacting surface of the master piston.

Install the master cylinder and the holder with the "UP" mark facing up.

Align the end of the master cylinder with the punch mark on the handlebar, and tighten the upper bolt first, then tighten the lower bolt.

Connect the brake hose to the master cylinder with the oil bolt and new sealing washers, and tighten the oil bolt.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Apply silicone grease to the brake lever pivot.

Install the return spring into the master cylinder.

Set the brake lever and knuckle guard onto the master cylinder and hold them, then install the pivot bolts aligning the bolt holes.

Tighten the pivot bolt.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)

Install the collar and nut and tighten it.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)

FRONT CALIPER

DISASSEMBLY

Drain the brake fluid from the front hydraulic system (page 15-4).

Remove the brake pads (page 15-6).

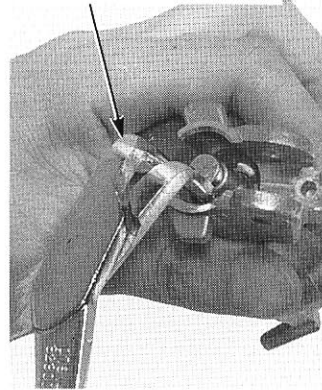
CAUTION

- *Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.*

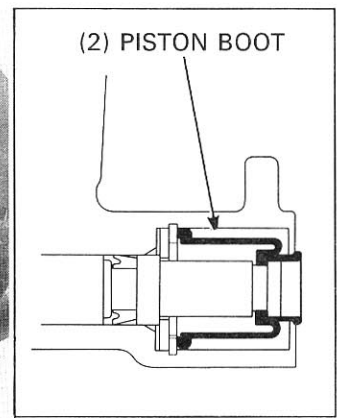
Disconnect the brake hose from the caliper by removing the oil bolt and sealing washers.

Remove the front caliper mounting bolts and the caliper.

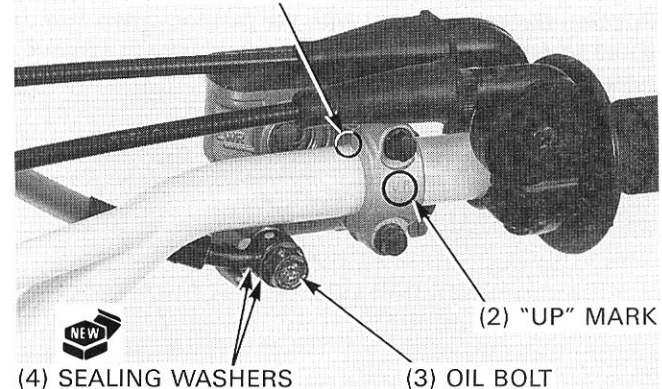
(1) SNAP RING PLIERS



(2) PISTON BOOT



(1) PUNCH MARK

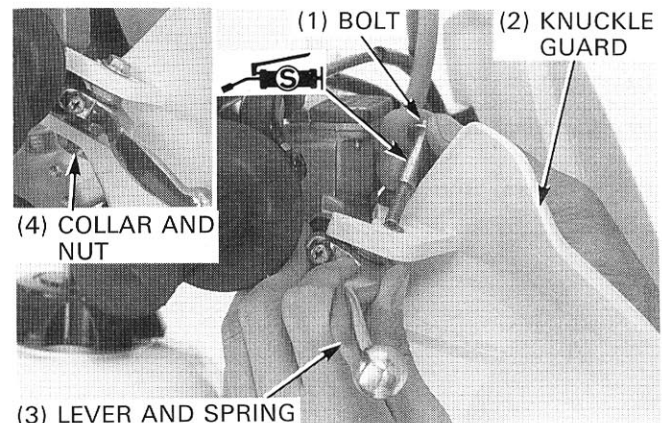


(4) SEALING WASHERS

(3) OIL BOLT

(1) BOLT

(2) KNUCKLE GUARD

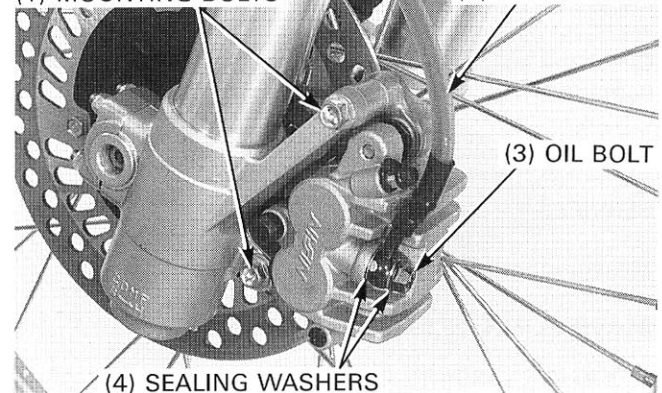


(4) COLLAR AND NUT

(3) LEVER AND SPRING

(1) MOUNTING BOLTS

(2) BRAKE HOSE



(3) OIL BOLT

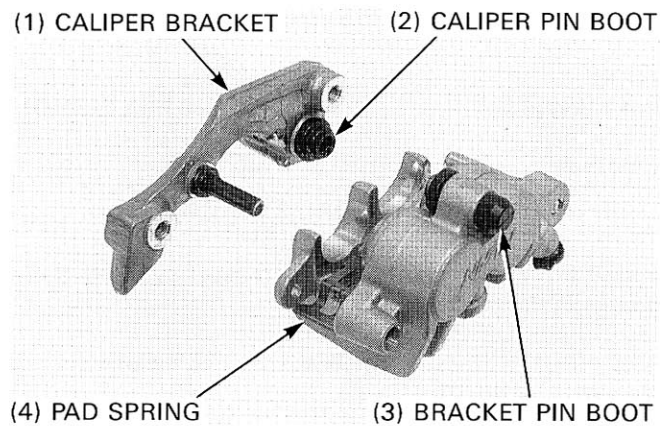
(4) SEALING WASHERS

HYDRAULIC DISC BRAKE

Remove the caliper bracket from the caliper body.

Remove the caliper pin boot from the bracket.

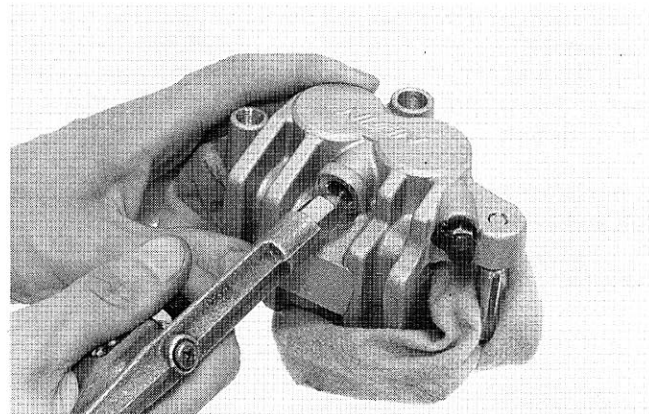
Remove the pad spring and bracket pin boot from the caliper body.



Place a shop towel over the pistons.
Position the caliper body with the pistons down and apply small squirts of air pressure to the fluid inlet to remove the pistons.

⚠ WARNING

- *Do not use high pressure air or bring the nozzle too close to the inlet.*

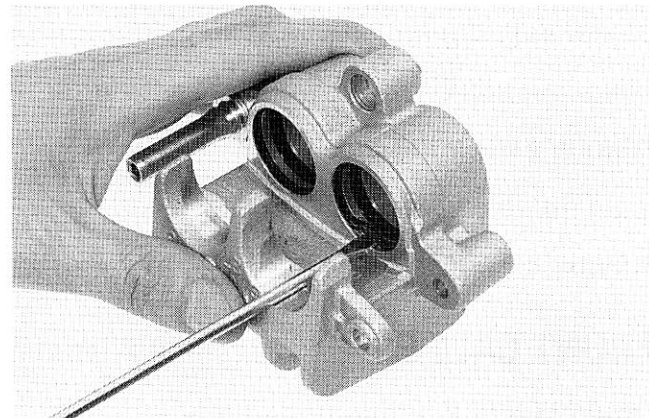


Push the dust and piston seals in and lift them out.

CAUTION

- *Be careful not to damage the piston sliding surface.*

Clean the seal grooves with clean brake fluid.



INSPECTION

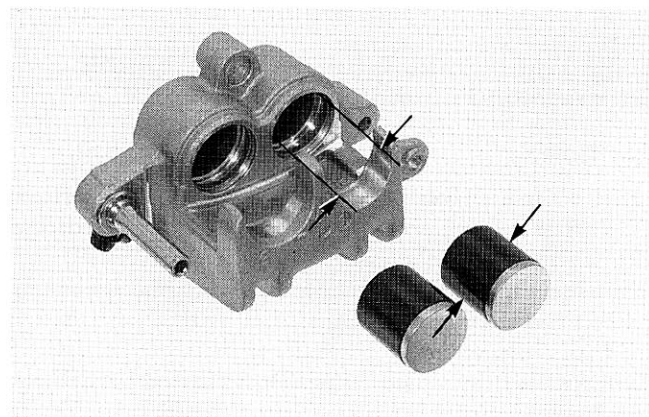
Check the caliper cylinder and pistons for scoring or other damage.

Measure the caliper cylinder I.D.

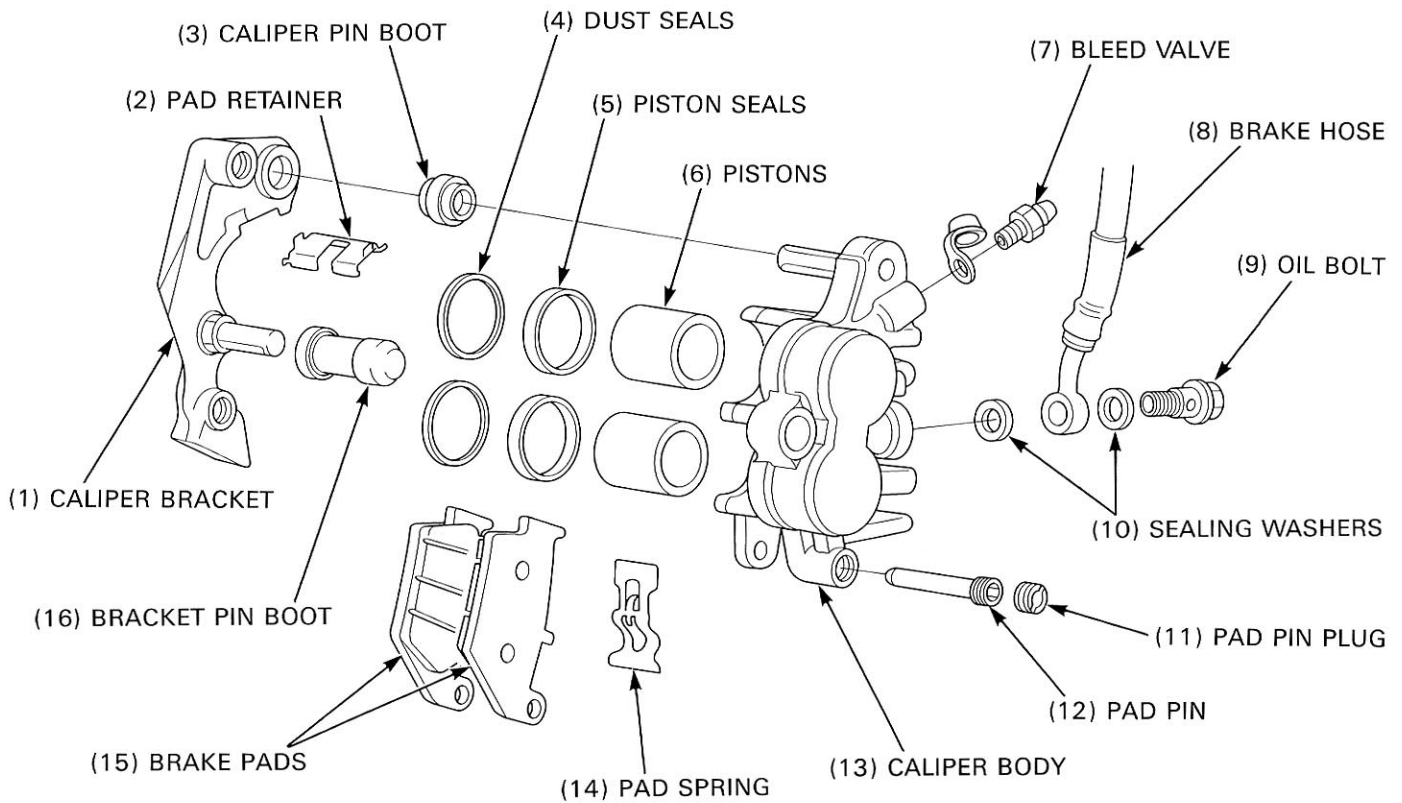
SERVICE LIMIT: 27.06 mm (1.065 in)

Measure the caliper piston O.D.

SERVICE LIMIT: 26.89 mm (1.059 in)

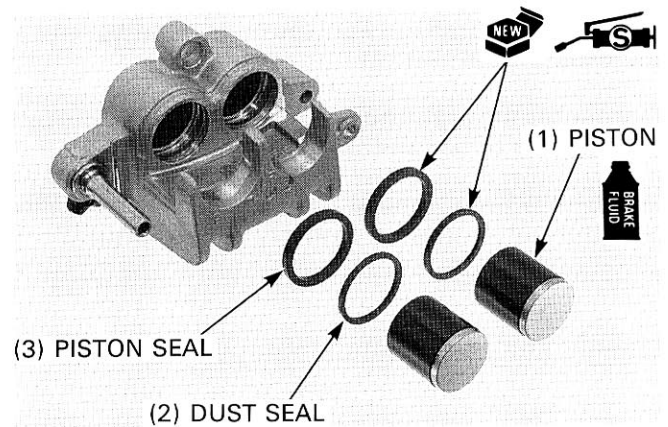


ASSEMBLY



Coat new dust and piston seals with silicone grease and install them in the seal grooves in the caliper.

Coat the caliper pistons with clean brake fluid and install them into the caliper cylinder with the concaved side away from the pads.

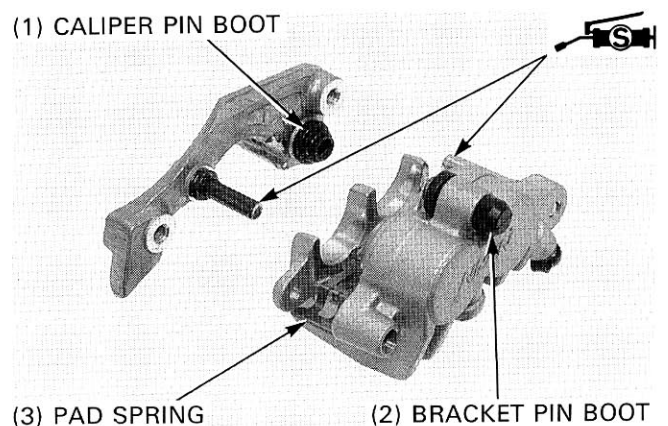


Install the pad spring in the caliper body.

If the caliper and bracket pin boots are hard or deteriorated, replace them with new ones. Install the bracket pin boot into the caliper body.

Install the caliper pin boot into the bracket.

Apply silicone grease to the caliper and bracket pins and install the caliper bracket over the caliper body. Make sure the boots are securely seated into the pin grooves.



HYDRAULIC DISC BRAKE

Install the caliper assembly over the brake disc and onto the fork leg.
Install and tighten new caliper mounting bolts.

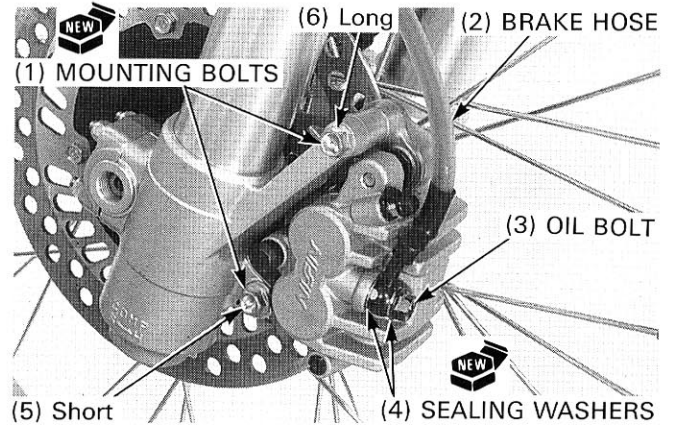
TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

Connect the brake hose to the caliper with new sealing washers and the oil bolt.
Tighten the oil bolt.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Install the brake pads (page 15-6).

Fill and bleed the front hydraulic system (page 15-4).



REAR MASTER CYLINDER

DISASSEMBLY

Drain the brake fluid from the rear hydraulic system (page 15-4).

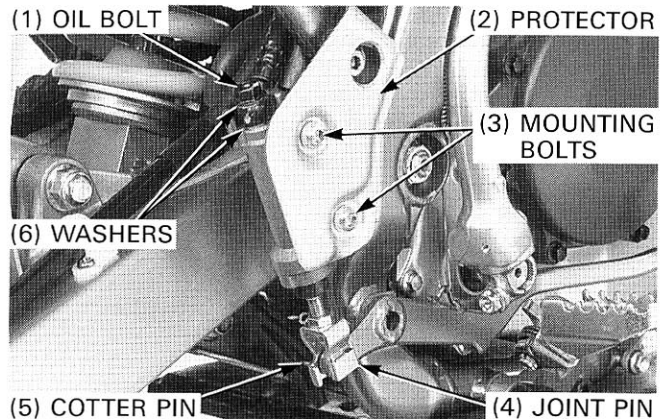
CAUTION

- *Avoid spilling brake fluid on painted, plastic or rubber parts.
Place a rag over these parts whenever the system is serviced.*

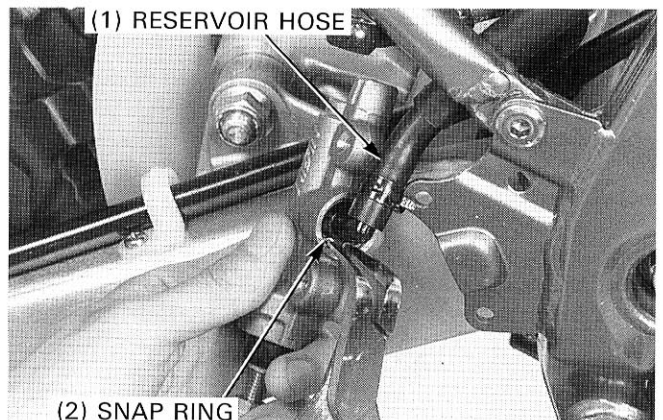
Disconnect the push rod from the brake pedal by removing the cotter pin and joint pin.

Disconnect the brake hose from the master cylinder by removing the oil bolt and sealing washers.

Remove the two mounting bolts, washers master cylinder protector and the master cylinder.



Disconnect the reservoir hose joint from the master cylinder by removing the snap ring.



Remove the boot from the master cylinder.

Remove the snap ring and push rod.

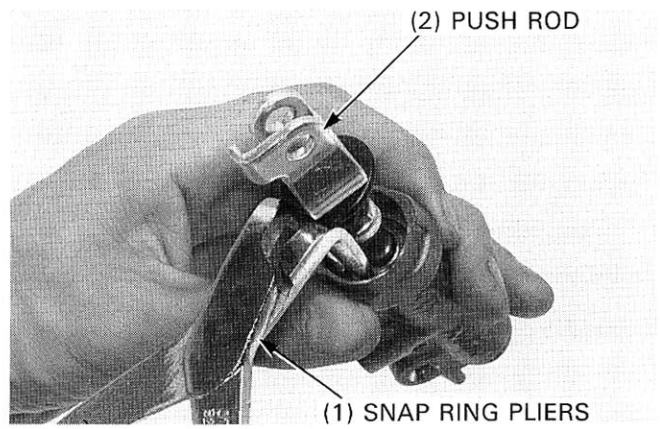
TOOL:

Snap ring pliers

07914-3230001

Remove the master piston and spring.

Clean the master cylinder and master piston in clean brake fluid.



INSPECTION

Check the piston cups for wear, deterioration or damage.

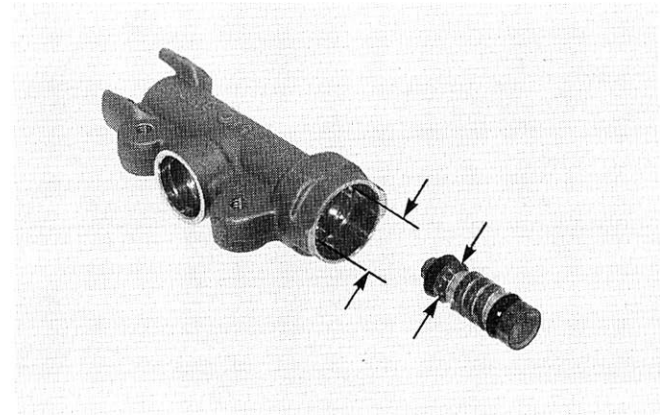
Check the master cylinder and piston for scoring or damage.

Measure the master cylinder I.D.

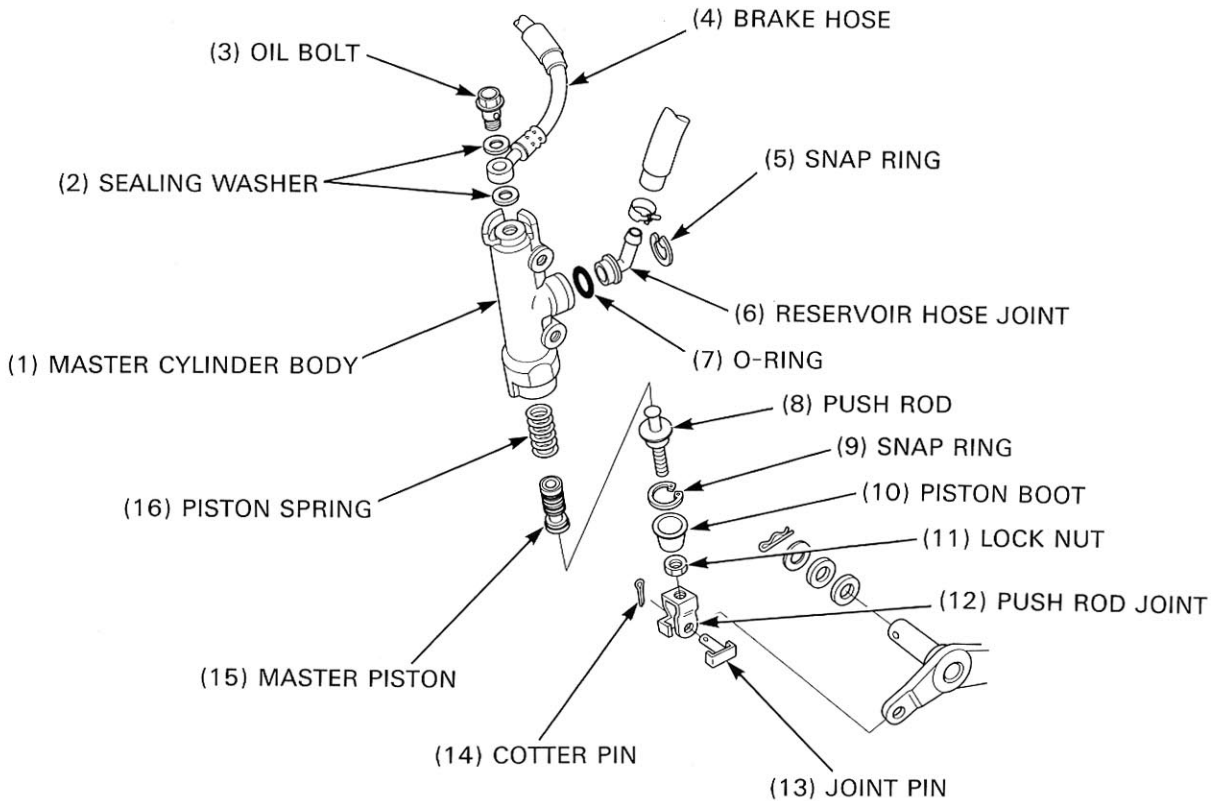
SERVICE LIMIT: 12.76 mm (0.502 in)

Measure the master piston O.D.

SERVICE LIMIT: 12.64 mm (0.498 in)



ASSEMBLY



HYDRAULIC DISC BRAKE

Coat the master piston and piston cups with clean DOT 4 brake fluid.
Install the piston spring onto the piston end.
Install the piston spring and piston into the master cylinder.

CAUTION

- Do not allow the piston cup lips to turn inside out.

Apply silicone grease to the piston contacting surface of the push rod.
Install the push rod into the master cylinder.

Install the snap ring into the groove in the master cylinder.

TOOL:

Snap ring pliers

07914-3230001

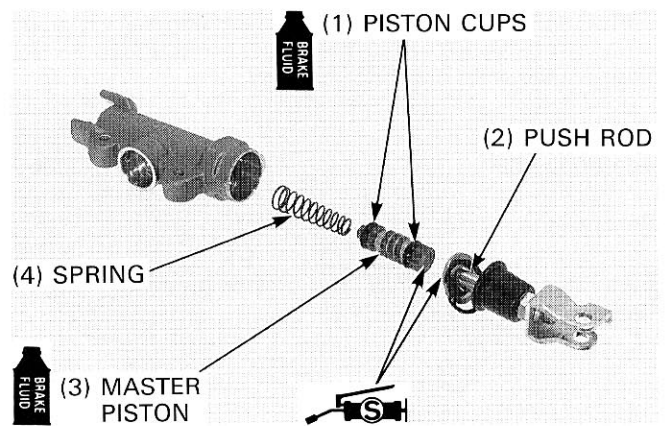
CAUTION

- Be certain the snap ring is firmly seated in the groove.

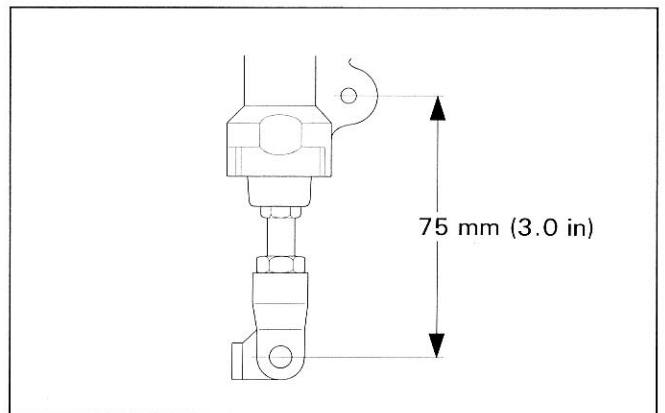
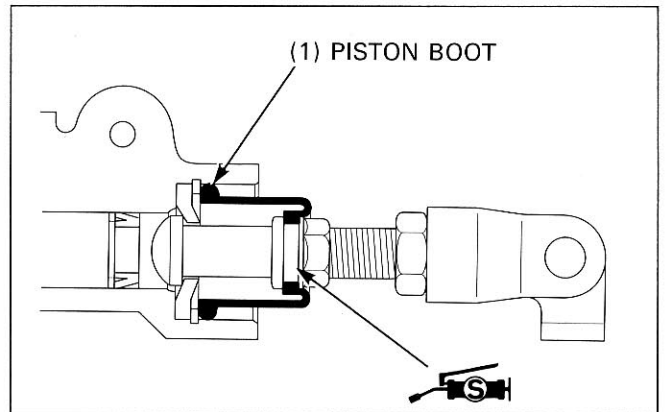
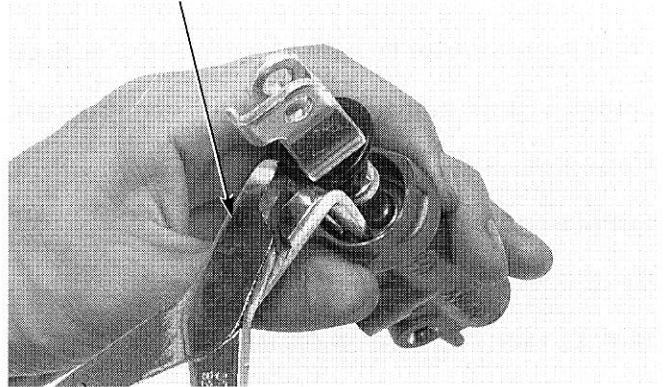
Apply silicone grease to the boot groove in the push rod and install the piston boot into the master cylinder and the groove in the push rod.

If the push rod joint is reinstalled, adjust the push rod length so that the distance from the center of the master cylinder lower mounting hole to the center of the joint pin hole is 75 mm (3.0 in).
After adjustment tighten the lock nut.

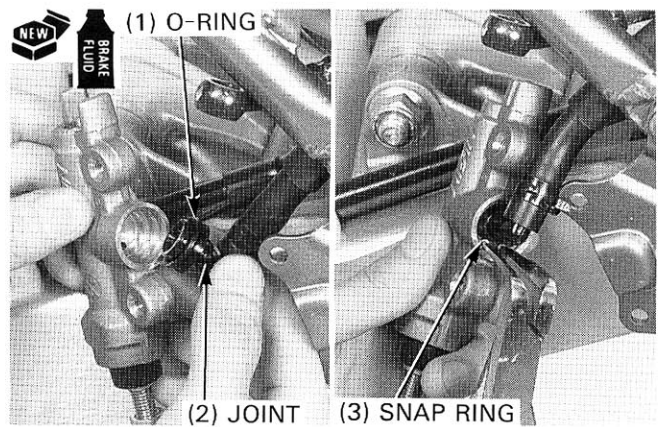
TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)



(1) SNAP RING PLIERS



Coat a new O-ring with clean brake fluid and install it onto the reservoir hose joint.
 Connect the reservoir hose joint to the master cylinder and install the snap ring into the groove in the master cylinder.



Install the master cylinder and tighten new mounting bolts with the protector and washers (between the frame and protector).

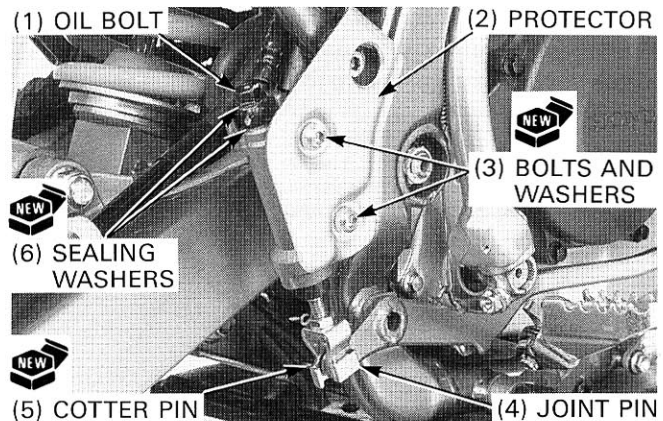
TORQUE: 14 N·m (1.4 kgf·m, 10 lbf·ft)

Connect the brake hose to the master cylinder with the oil bolt and new sealing washers, and tighten the oil bolt.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

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

Fill and bleed the rear hydraulic system (page 15-4).



REAR CALIPER

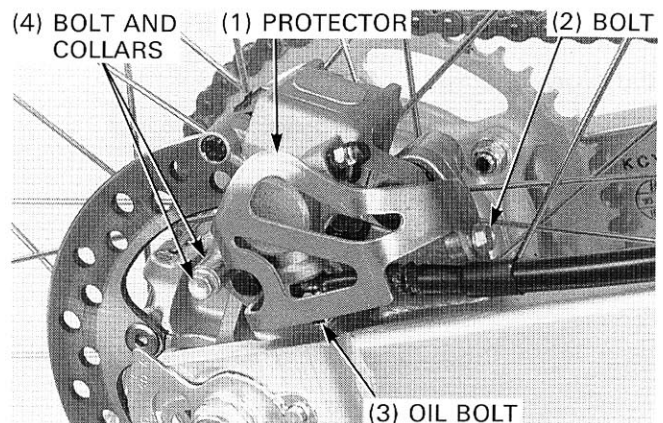
DISASSEMBLY

Drain the brake fluid from the rear hydraulic system (page 15-4).

Remove the brake pads (page 15-6).

CAUTION

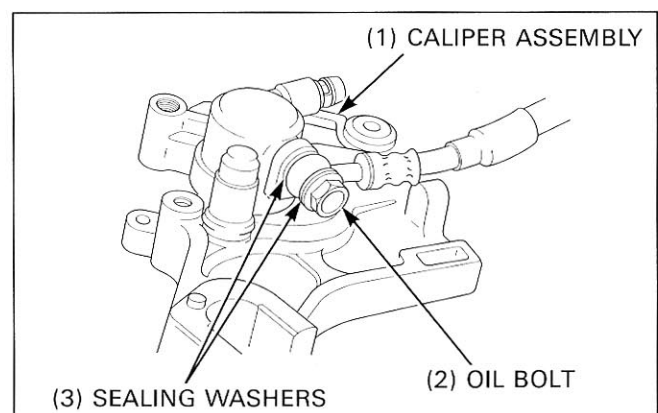
- Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.



Remove the caliper protector bolts, distance collar and protector.
 Loosen the oil bolt.

Loosen the rear axle nut and move the rear wheel back to place the wheel onto the claws on the swingarm end (page 14-9).

Remove the rear caliper from the swingarm and axle. Disconnect the brake hose from the caliper by removing the oil bolt and sealing washers.



HYDRAULIC DISC BRAKE

Remove the caliper bracket from the caliper body.

Remove the caliper pin boot from the bracket.

Remove the pad spring and bracket pin boot from the caliper body.

Place a shop towel over the piston.

Position the caliper body with the piston down and apply small squirts of air pressure to the fluid inlet to remove the piston.

⚠ WARNING

- *Do not use high pressure air or bring the nozzle too close to the inlet.*

Push the dust and piston seals in and lift them out.

CAUTION

- *Be careful not to damage the piston sliding surface.*

Clean the seal groove with clean brake fluid.

INSPECTION

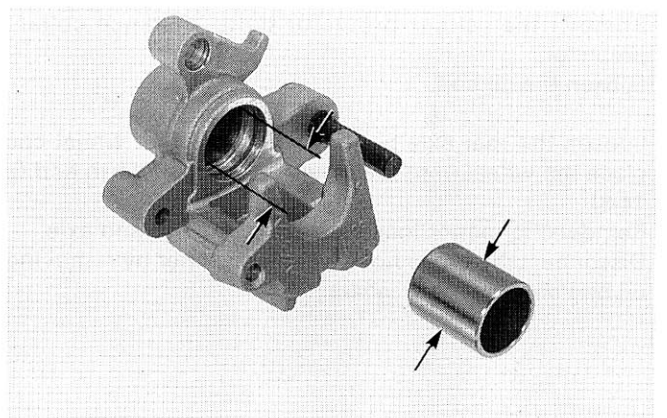
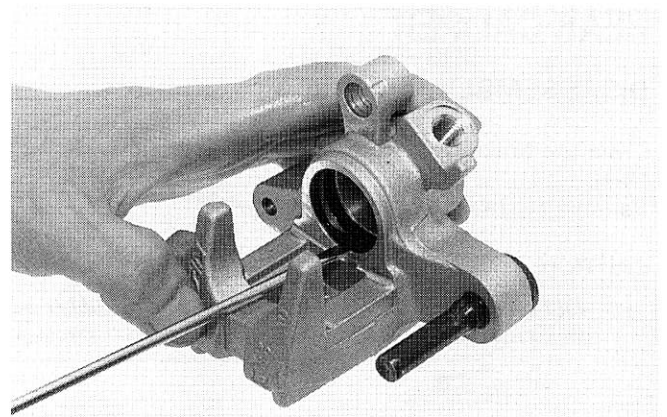
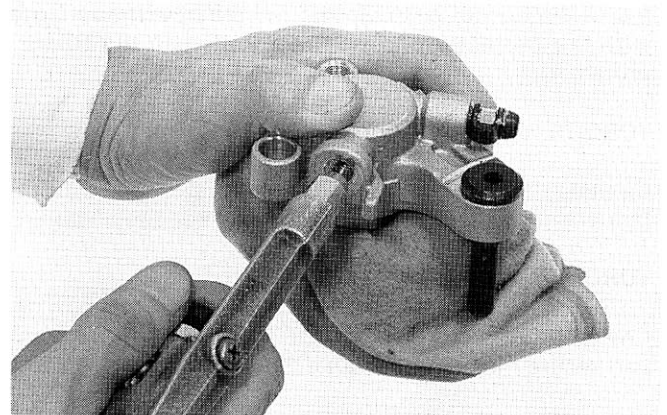
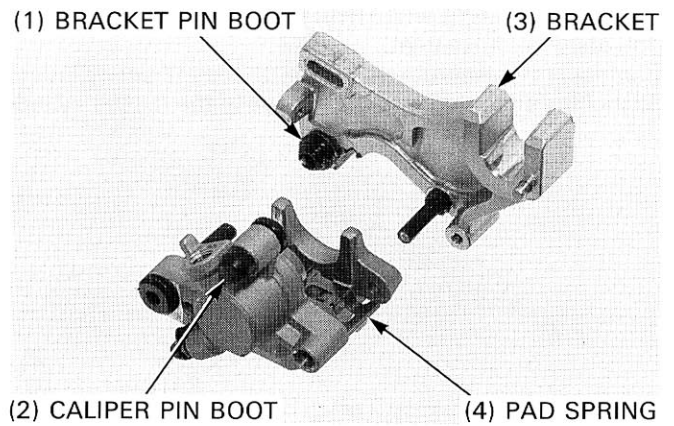
Check the caliper cylinder and pistons for scoring or other damage.

Measure the caliper cylinder I.D.

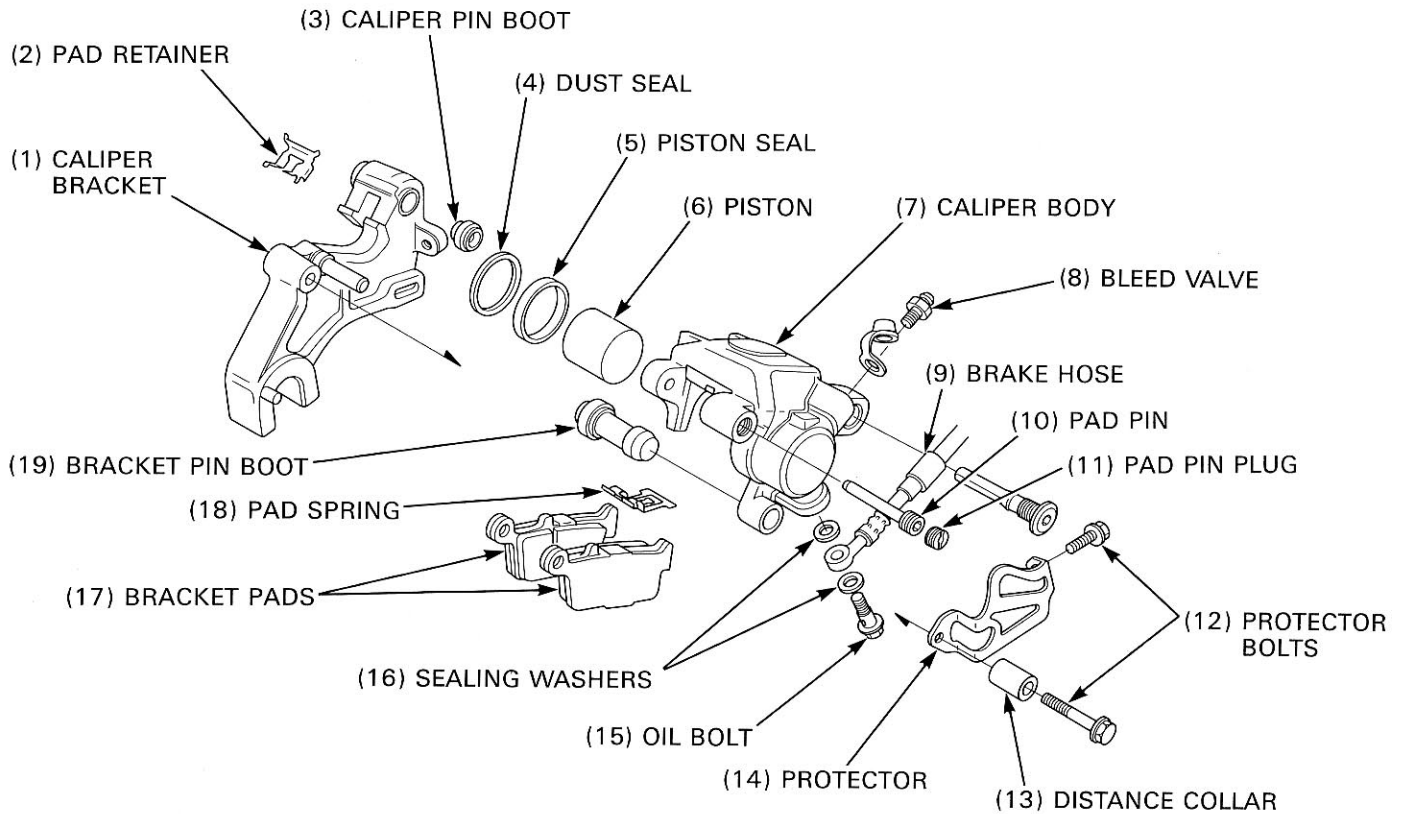
SERVICE LIMIT: 27.06 mm (1.065 in)

Measure the caliper piston O.D.

SERVICE LIMIT: 26.91 mm (1.059 in)

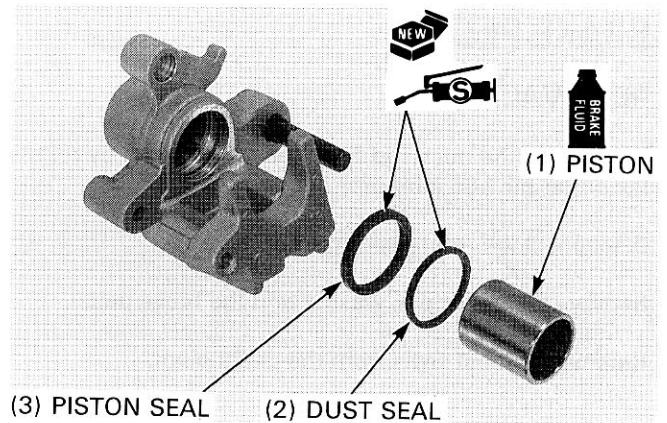


ASSEMBLY



Coat new dust and piston seals with silicone grease and install them in the seal grooves in the caliper.

Coat the caliper piston with clean brake fluid and install it into the caliper cylinder with the opening toward the pads.



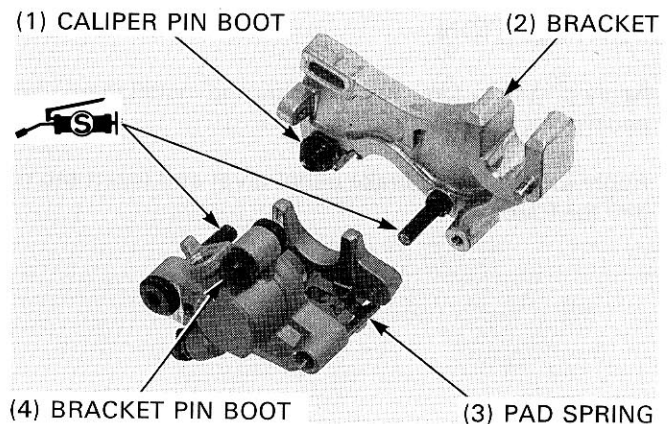
Install the pad spring in the caliper.

If the caliper and bracket pin boots are hard or deteriorated, replace them with new ones.

Install the caliper pin boot into the bracket.

Apply silicone grease to the caliper and bracket pins and install the caliper bracket over the caliper body.

Make sure the boots are securely seated into the pin grooves.

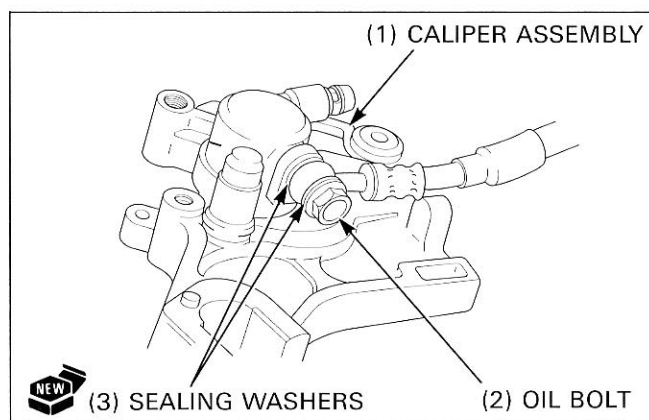


HYDRAULIC DISC BRAKE

Connect the brake hose to the brake caliper with the oil bolt and new sealing washers. Temporarily tighten the oil bolt.

Install the brake caliper and the rear wheel (page 14-9).

Install the brake pads (page 15-6).

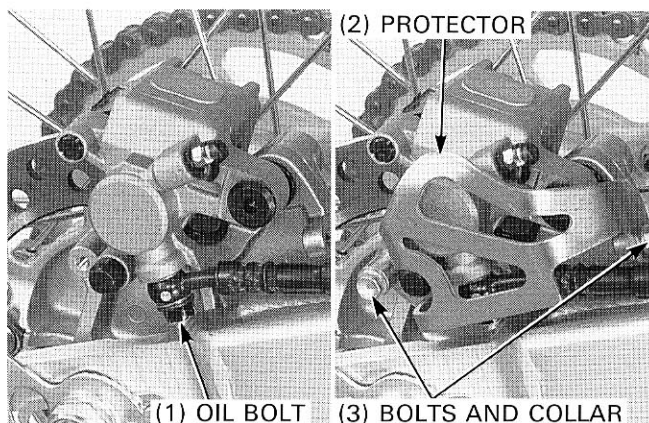


Tighten the oil bolt.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Install the caliper protector and tighten the two bolts with the collar.

Fill and bleed the rear hydraulic system (page 15-4).



BRAKE PEDAL

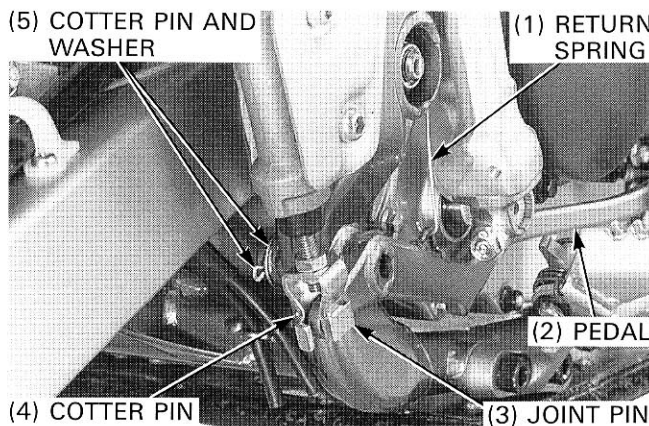
REMOVAL

Disconnect the push rod from the brake pedal by removing the cotter pin and joint pin.

Disconnect the return spring from the pedal.

Remove the cotter pin, washer and the brake pedal.

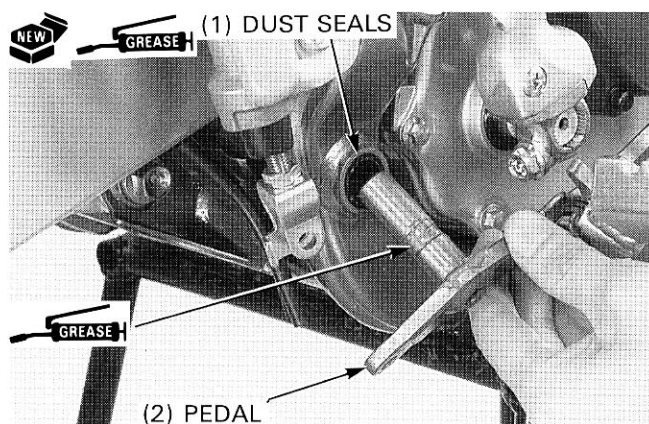
Remove the dust seals from the pedal pivot.



INSTALLATION

Apply grease to new dust seal lips and install them into the pedal pivot in the frame.

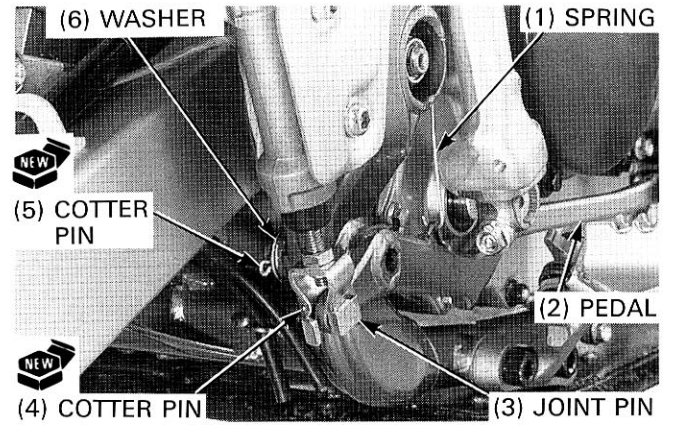
Apply grease to the brake pedal pivot and insert the pedal into the frame.



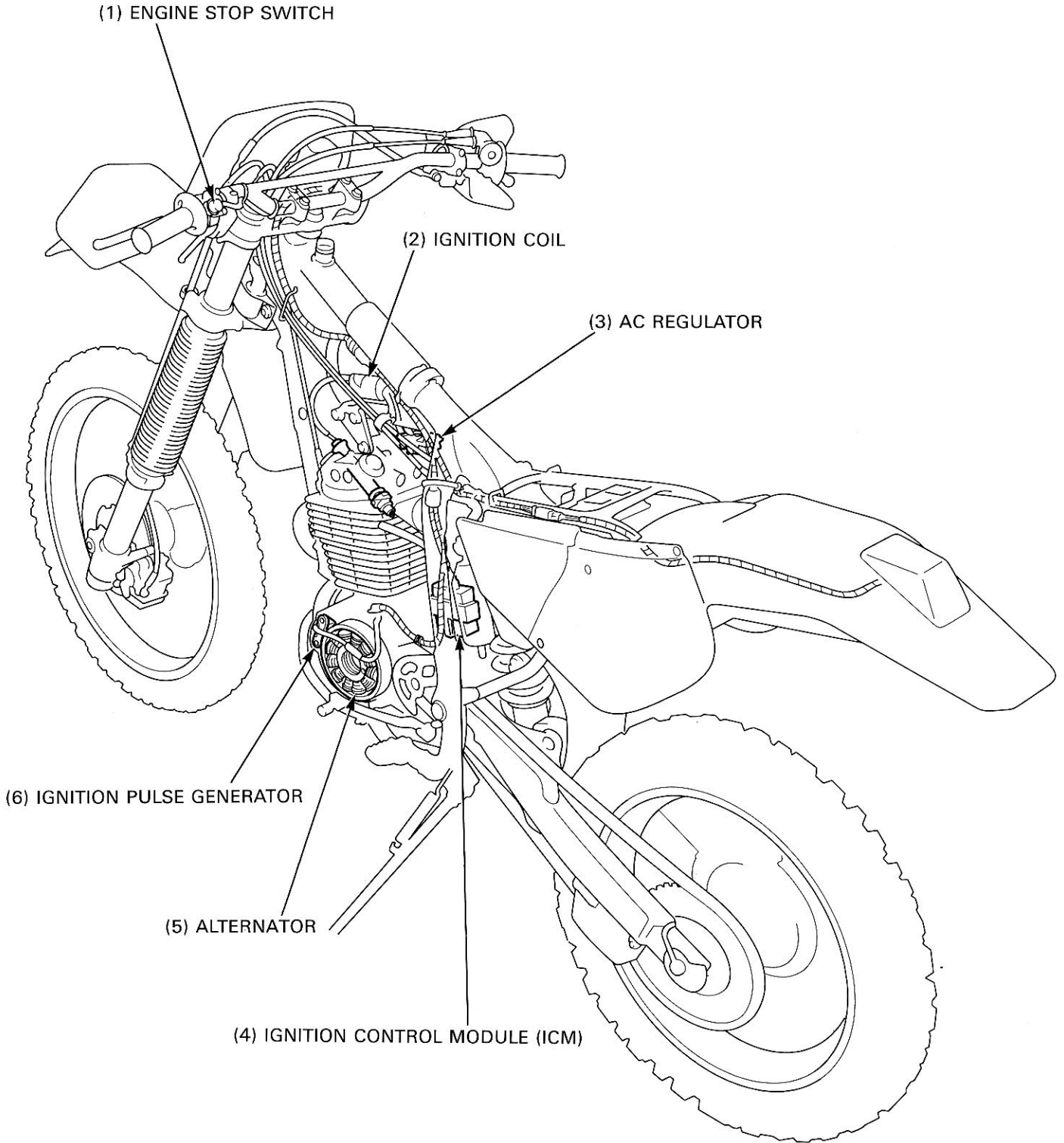
Secure the brake pedal with the washer and a new cotter pin.

Hook the return spring to the pedal.

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



ELECTRICAL SYSTEM



16. ELECTRICAL SYSTEM

SERVICE INFORMATION	16-1	IGNITION TIMING	16-9
TROUBLESHOOTING	16-3	HEADLIGHT	16-10
LIGHTING SYSTEM INSPECTION	16-5	TAILLIGHT	16-10
IGNITION SYSTEM INSPECTION	16-6	ENGINE STOP SWITCH	16-11

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 may lead to death.*
-
- When servicing the electrical system, always follow the steps in the troubleshooting flow chart (page 16-3).
 - 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.
 - The ignition control module (ICM) may be damaged if dropped. Also, if the connector is disconnected when current is flowing, the excessive voltage may damage the module.
 - A faulty ignition system is often related to poor connections. Check those connections before proceeding.
 - Use spark plug of the correct heat range. Using spark plug with an incorrect heat range can damage the engine.
 - For alternator/ignition pulse generator removal and installation, see section 10.

SPECIFICATIONS

ITEM		SPECIFICATION		
Lighting system	AC regulator regulated voltage	12.5 – 13.5 V/3,000 rpm		
	Lighting coil resistance (at 20°C/68°F)	0.1 – 1.0 Ω		
Ignition system	Spark plug	NGK	DENSO	
		Standard	DPR8Z	X24GPR-U
		For extended high speed riding	DPR9Z	X27GPR-U
	Spark plug gap	0.6 – 0.7 mm (0.023 – 0.028 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		
	Ignition timing F mark	8° BTDC at idle		
Bulb	Headlight	12 V 35 W		
	Taillight	12 V 5 W		

ELECTRICAL SYSTEM

TORQUE VALUES

Timing hole cap 10 N·m (1.0 kgf·m, 7 lbf·ft)

TOOLS

Peak voltage tester (U.S.A. only) or
Peak voltage adaptor

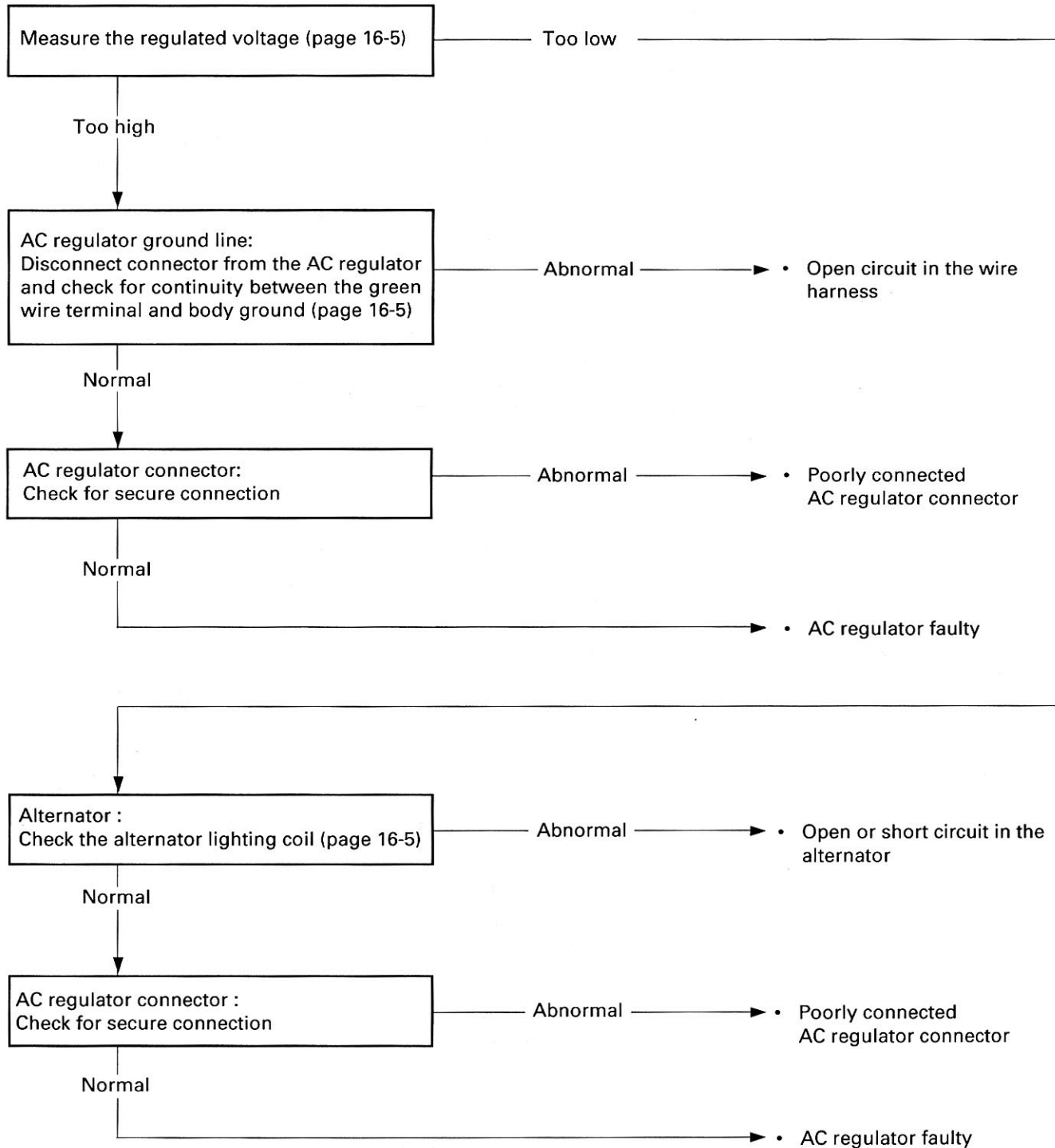
07HGJ – 0020100 with
Commercially available digital multimeter (impedance 10 M Ω /DCV
minimum)

TROUBLESHOOTING

LIGHTING SYSTEM

Lighting Circuit Faulty

- Before inspection, check the headlight and taillight for blown and the bulbs for improper rating.



ELECTRICAL SYSTEM

IGNITION SYSTEM

No Spark at Spark Plug

- 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).

Unusual Condition		Probable Cause (Check in numerical order)
Ignition coil primary voltage	Low peak voltage.	① incorrect peak voltage adaptor connections. (system is normal if measured voltage is over the specifications with reverse connections) ② The multimeter impedance is too low. ③ Cranking speed is too slow (operating force of the kickstarter is weak). ④ The sample timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once). ⑤ Poorly connected connectors or an open circuit in ignition system. ⑥ Faulty exciter coil (Measure the peak voltage). ⑦ Faulty ignition coil. ⑧ Faulty ignition control module (in case when above No. ① – ⑦ are normal).
	No peak voltage.	① Incorrect peak voltage adaptor connections (system is normal if measured voltage is over the specifications with reverse connections). ② Short circuit in engine stop switch wire. ③ Faulty engine stop switch. ④ Loose or poorly connected ignition control module connector. ⑤ Open circuit or poor connection in ground cord of the ignition control module. ⑥ Faulty peak voltage adaptor. ⑦ Faulty exciter coil (Measure peak voltage). ⑧ Faulty ignition pulse generator (Measure peak voltage). ⑨ Faulty ignition control module (in case when above No. ① – ⑧ are normal).
	Peak voltage is normal, but no spark jumps at plug.	① Faulty spark plug or leaking ignition coil secondary current ampere. ② Faulty ignition coil.
Exciter coil	Low peak voltage.	① The multimeter impedance is too low. ② Cranking speed is too slow (operating force of the kickstarter is weak). ③ The sample timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the specifications at least once). ④ Faulty exciter coil (in case when above No. ① – ③ are normal).
	No peak voltage	① Faulty peak voltage adaptor. ② Faulty exciter coil.
Ignition pulse generator	Low peak voltage.	① The multimeter impedance is too low. ② Cranking speed is too slow (operating force of the kickstarter is weak). ③ The sample timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the specifications at least once). ④ Faulty ignition pulse generator (in case when above No. ① – ③ are normal).
	No peak voltage.	① Faulty peak voltage adaptor. ② Faulty ignition pulse generator.

LIGHTING SYSTEM INSPECTION

REGULATED VOLTAGE INSPECTION

⚠ 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.

Remove the front visor (page 2-4) with the headlight connectors connected.

Connect a voltmeter (+) probe to Blue wire terminal, and (-) probe to the Green wire terminal. Select the AC range on the voltmeter

Connect a tachometer.

Start the engine, gradually increase the engine speed and read the lighting regulated voltage.

REGULATED VOLTAGE: 12.5 – 13.5 V/3,000 rpm

WIRE HARNESS INSPECTION

NOTE

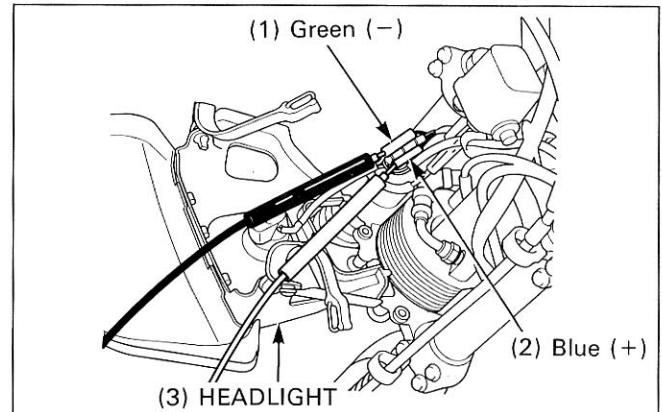
- If the engine has been running, after stopping the engine, wait for 10 minutes or more and perform the inspection.

Remove the fuel tank (page 2-2).

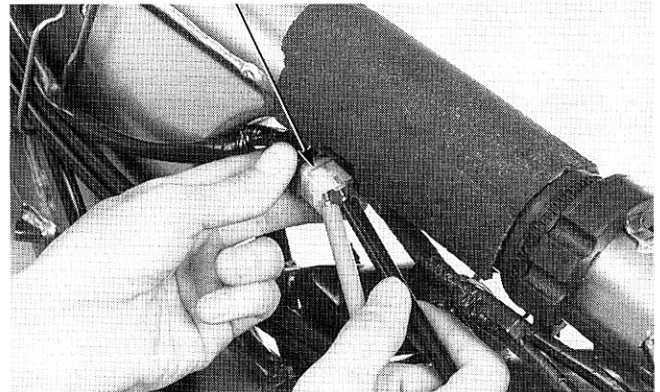
Disconnect the AC regulator 4P connector and check the connector for loose or corroded terminals.

Measure the following between connector terminals of the wire harness.

ITEM	TERMINALS	SPECIFICATION
Lighting coil line	Pink and Yellow	0.1 – 1.0 Ω
Ground line	Green and ground	Continuity



(1) AC REGULATOR 4P CONNECTOR



IGNITION SYSTEM INSPECTION

NOTE

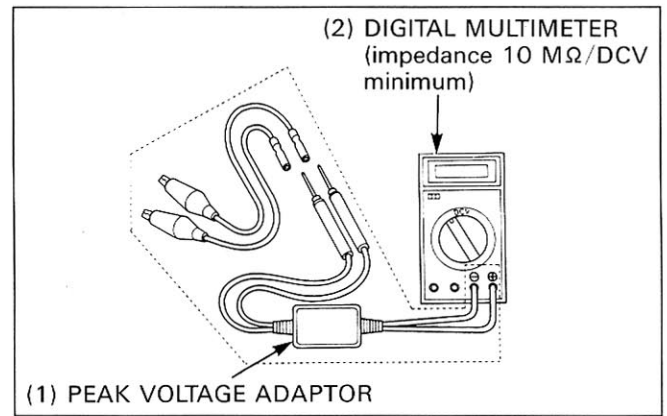
- If there is no spark at spark plug, check that all connections for loose or poor contact before measuring each peak voltage.
- Use recommended digital multimeter or commercially available digital multimeter with an impedance 10 M Ω /DCV minimum.
- The display value differs depending upon the internal impedance of the multimeter.
- If using Imrie diagnostic tester (model 625), follow the manufacturer's instructions.

Connect the peak voltage adaptor to the digital multimeter.

TOOLS:

Peak voltage tester (U.S.A. only) or

**Peak voltage adaptor 07HGJ - 0020100 with
Commercially available digital multimeter (impedance
10 M Ω /DCV minimum)**



IGNITION PRIMARY VOLTAGE INSPECTION

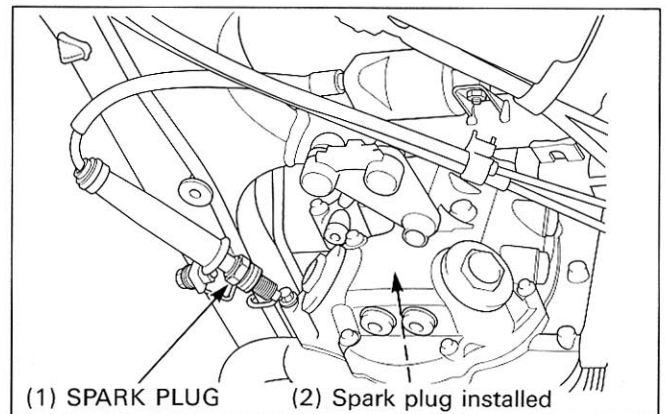
NOTE

- Check all system connections before the 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 2-2).

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 adaptor or Imrie tester to the ignition coil.

NOTE

- Do not disconnect the ignition coil primary wires.

TOOLS:

Peak voltage tester (U.S.A. only) or

Peak voltage adaptor 07HGJ – 0020100 with
Commercially available digital multimeter (impedance
10 M Ω /DCV minimum)

CONNECTION: Black/Yellow terminal (+)—Body ground (–)

Shift the transmission into neutral.

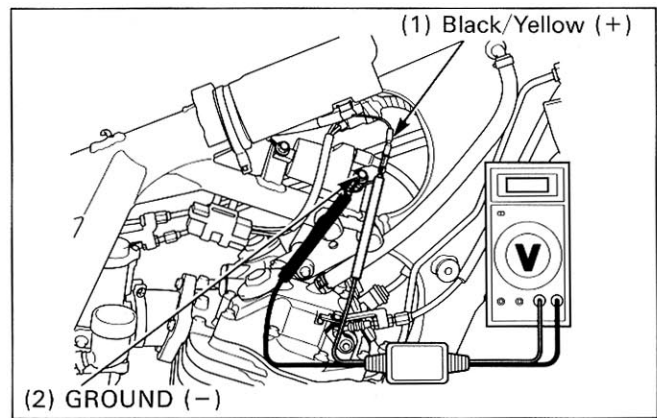
Crank the engine with the kickstarter and read ignition coil primary voltage.

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 (page 16-4).



EXCITER COIL PEAK VOLTAGE

Disconnect the ignition control module (ICM) 6P connector and connect the peak voltage adaptor or Imrie tester probes to the connector terminals of the exciter coil side

TOOLS:

Peak voltage tester (U.S.A. only) or

Peak voltage adaptor 07HGJ – 0020100 with
Commercially available digital multimeter (impedance
10 M Ω /DCV minimum)

CONNECTION: Black/Red terminal (+)—Brown terminal (–)

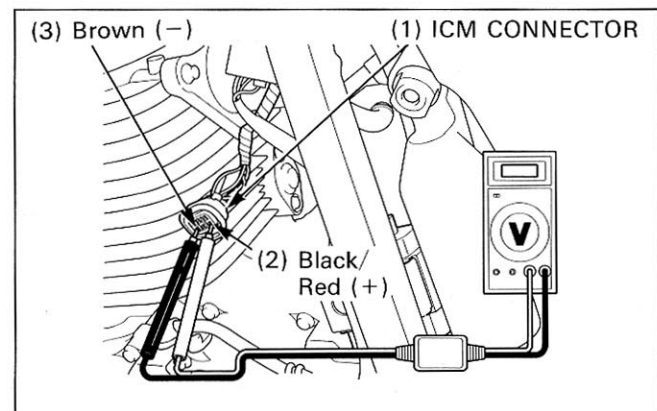
Shift the transmission into neutral.

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.



ELECTRICAL SYSTEM

If the peak voltage measured at the ICM is lower than standard value, recheck the following:

Disconnect the exciter coil Brown and Black/Red connectors located over the ICM.

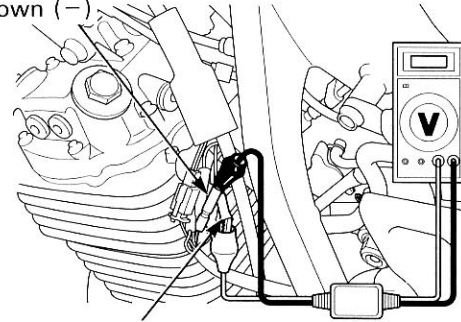
Connect the voltage adaptor or Imrie tester probes to the connector terminals of the exciter coil side.

In the same manner as at the ICM connector, measure the peak voltage and compare it to the voltage measured at the ICM connector.

- If the peak voltage measured at the ICM connector is abnormal and the one measured at the exciter coil side is normal, the wire harness has an open circuit or loose connections.
- If both peak voltage measured are lower than standard value, follow the checks described in the troubleshooting on page 16-4.

(1) EXCITER COIL SIDE:

(3) Brown (-)



(2) Black/Red (+)

IGNITION PULSE GENERATOR COIL PEAK VOLTAGE

Disconnect the ignition control module (ICM) 6P connector and connect the peak voltage adaptor or Imrie tester probes to the connector terminals of the ignition pulse generator coil side.

TOOLS:

Peak voltage tester (U.S.A. only) or

**Peak voltage adaptor 07HGJ - 0020100 with
Commercially available digital multimeter (impedance
10 MΩ/DCV minimum)**

CONNECTION: Blue/Yellow terminal (+)—Green terminal (-)

Shift the transmission into neutral.

Crank the engine with the kickstarter and read ignition pulse generator coil peak voltage.

PEAK VOLTAGE: 0.7 V minimum

If the peak voltage measured at the ICM is lower than standard value, recheck the following :

Disconnect the ignition pulse generator 2P (White) connectors located over the ICM.

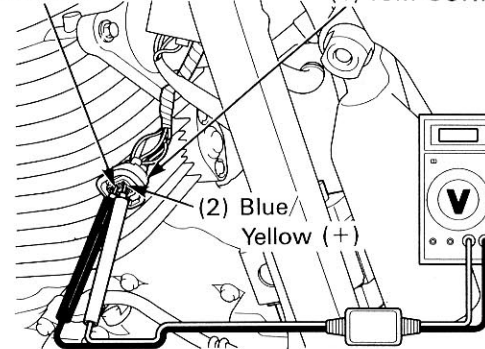
Connect the voltage adaptor or Imrie tester probes to the connector terminals of the ignition pulse generator side.

In the same manner as at the ICM connector, measure the peak voltage and compare it to the voltage measured at the ICM connector.

- If the peak voltage measured at the ICM connector is abnormal and the one measured at the ignition pulse generator side is normal, the wire harness has an open circuit or loose connections.
- If both peak voltage measured are lower than standard value, follow the checks described in the troubleshooting on page 16-4.

(3) Green (-)

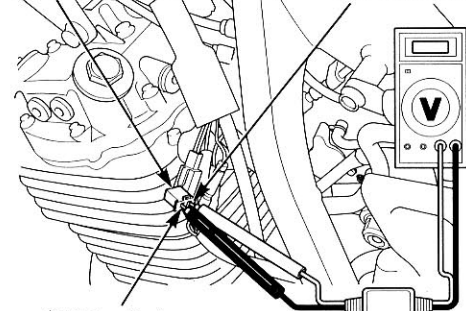
(1) ICM CONNECTOR



(2) Blue/
Yellow (+)

(3) IGNITION PULSE GENERATOR
2P CONNECTOR

(1) Blue/Yellow (+)



(2) Green/White (-)

IGNITION TIMING

⚠ WARNING

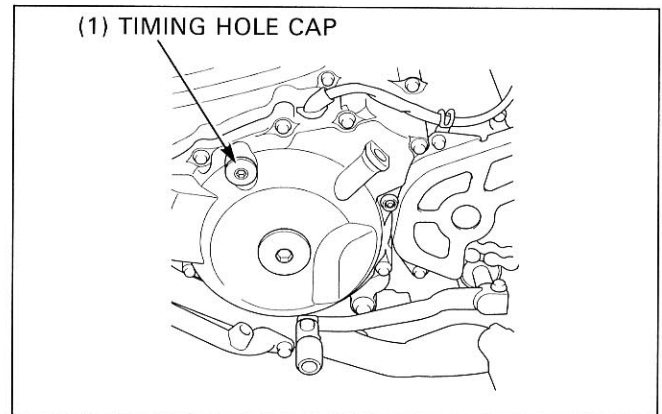
- *If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area.*
- *The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and lead to death.*

NOTE

- Read the instructions for timing light operation.

Warm up the engine.

Stop the engine and remove the timing hole cap.

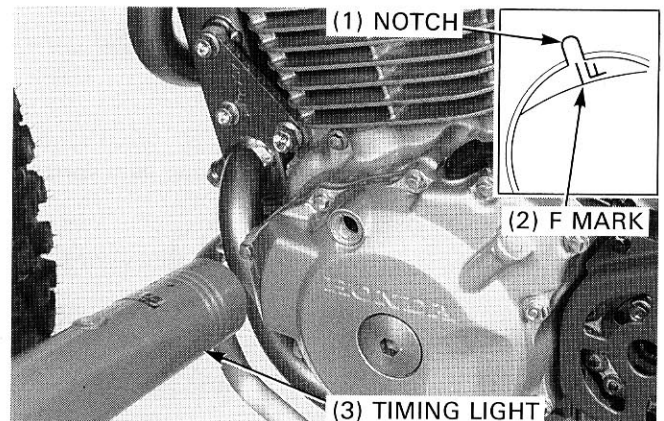


Connect the timing light to the spark plug wire.

Start the engine and let it idle.

IDLE SPEED : 1,300±100rpm

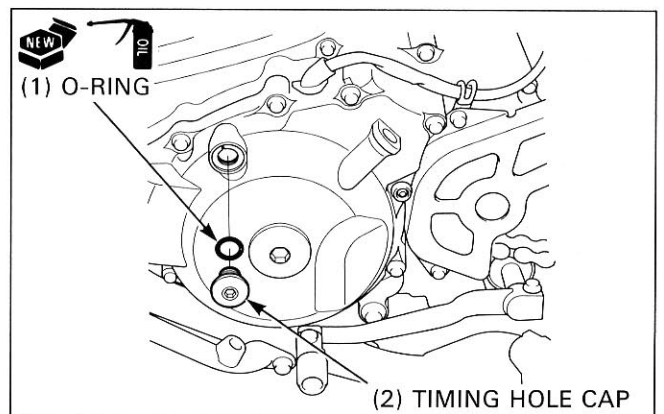
The timing is correct if the F mark aligns with index notch on the crankcase cover.



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

Install and tighten the cap after checking the ignition timing.

TORQUE: 10 N·m (1.0kgf·m, 7lbf·ft)



HEADLIGHT

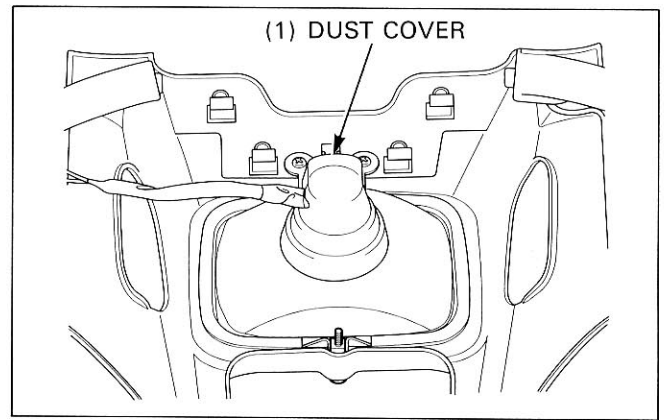
BULB REPLACEMENT

Remove the front visor (page 2-4)

Remove the dust cover.

While pushing in, turn the bulb socket counterclockwise to remove it.

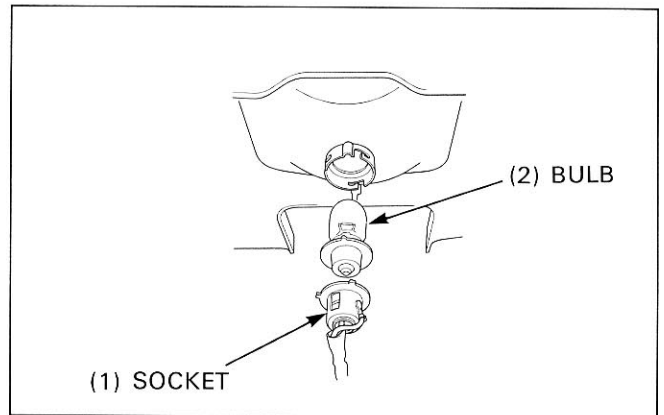
Remove the bulb from the headlight and replace with a new one.



Installation is in the reverse order of removal.

NOTE

- When installing the dust cover, install it tightly against the headlight with the wire harness facing left side.



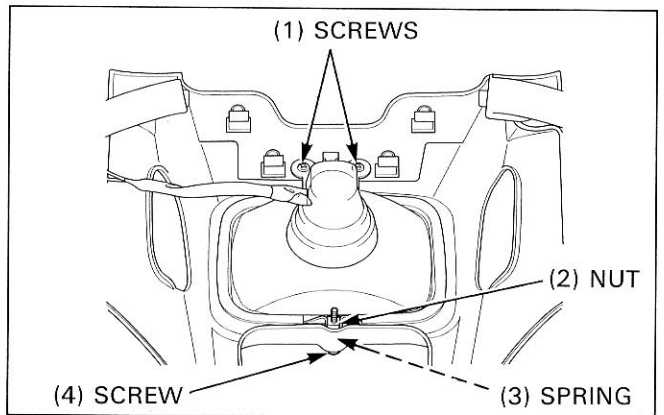
DISASSEMBLY/ASSEMBLY

Remove the front visor (page 2-4).

Remove the two mounting screws.
Remove the headlight aim adjusting screw, nut, spring and the headlight.

Release the tabs on the visor and separate the visor from the headlight case.

Assembly is in the reverse order of removal.

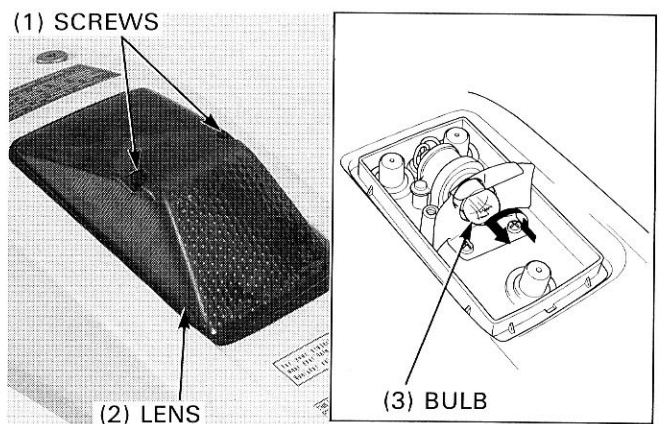


TAILLIGHT

Remove the two screws and the taillight lens.

While pushing in, turn the bulb counterclockwise to remove it and replace with a new one.

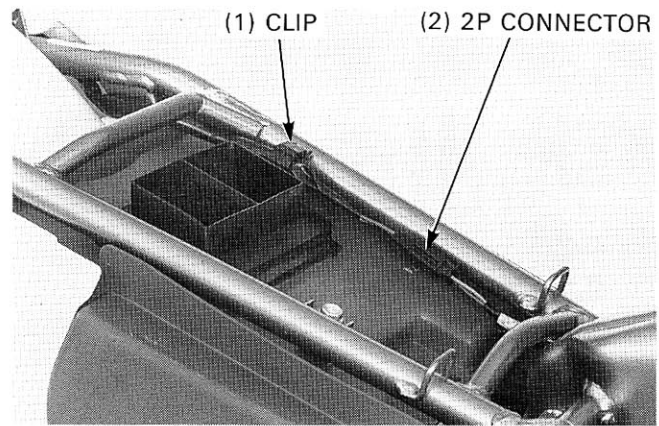
Install in the reverse order of removal.



REMOVAL/INSTALLATION

Remove the seat (page 2-2).

Release the harness clips from the wire harness.
Disconnect the taillight 2P connector and remove the wire through the rear fender and frame.

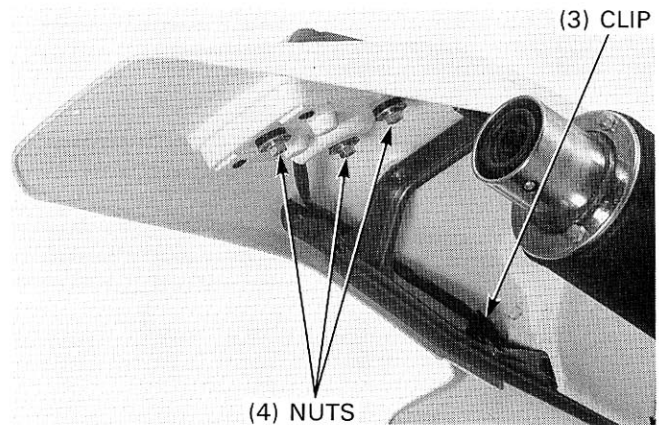


Remove the three nuts, collars and the taillight assembly from the rear fender.

Installation is in the reverse order of removal.

NOTE

- Route the wire harness properly (page 1-19).

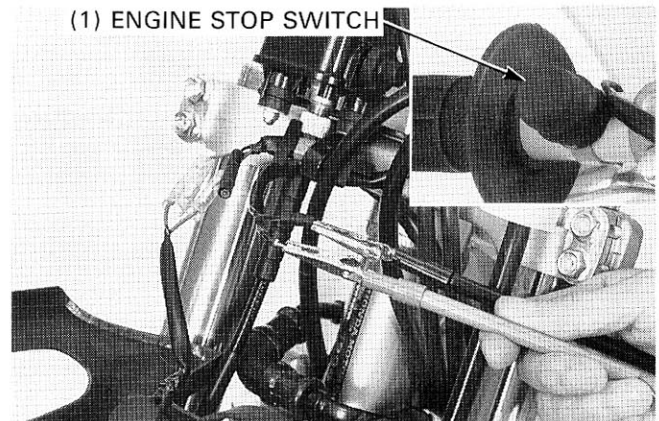
**ENGINE STOP SWITCH****INSPECTION**

Remove the front visor (page 2-4).

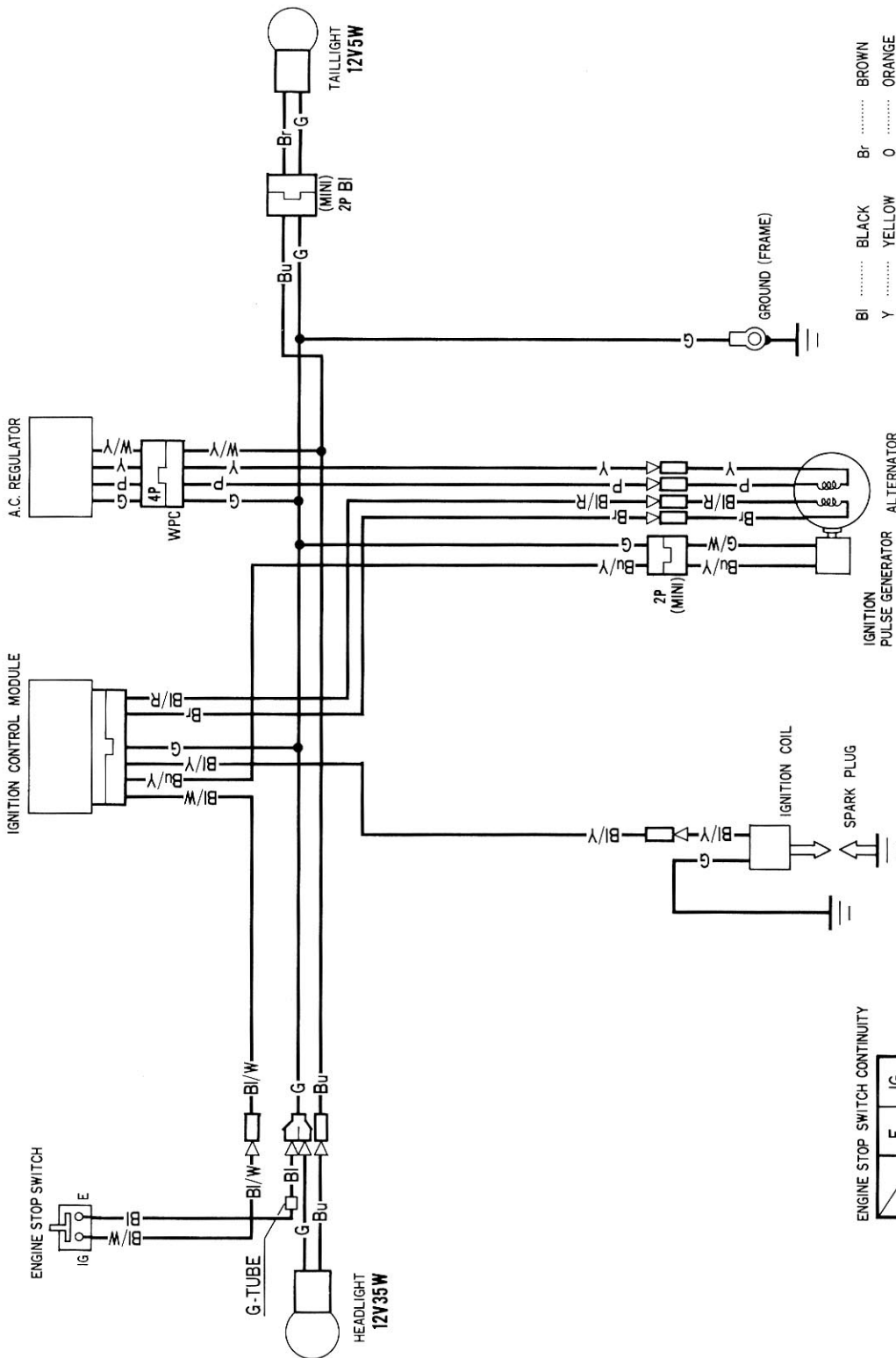
Disconnect the engine stop switch connectors.

Check the switch for continuity with the switch pressed; and no continuity when the switch is not being pushed.

For engine stop switch removal/installation, see section 13 "HADLEBAR".



17. WIRING DIAGRAM



0030Z - KCY - 6700

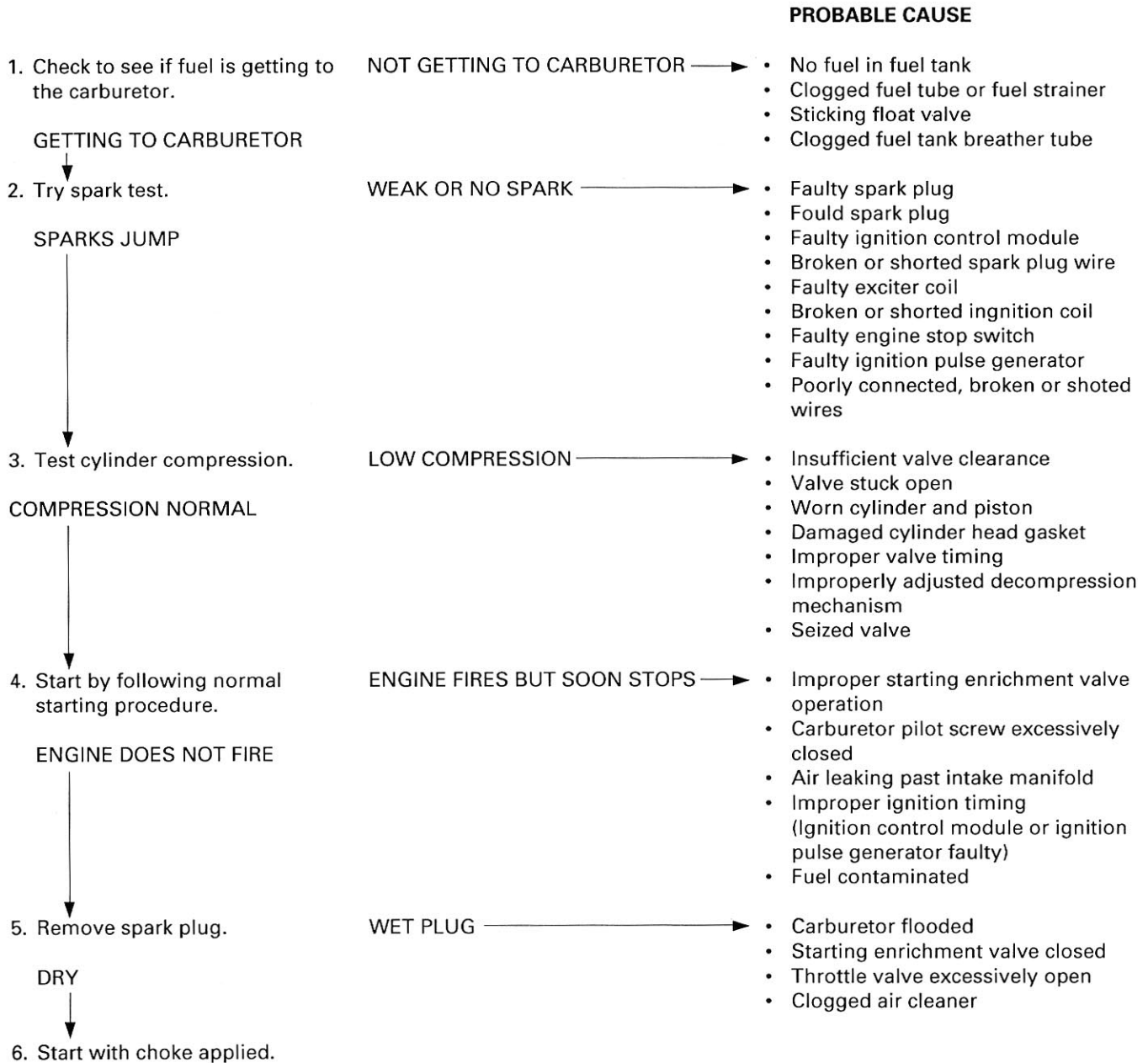
ENGINE STOP SWITCH CONTINUITY

E	IG	
FREE		
PUSH		
COLOR	BI(G)	BI/W

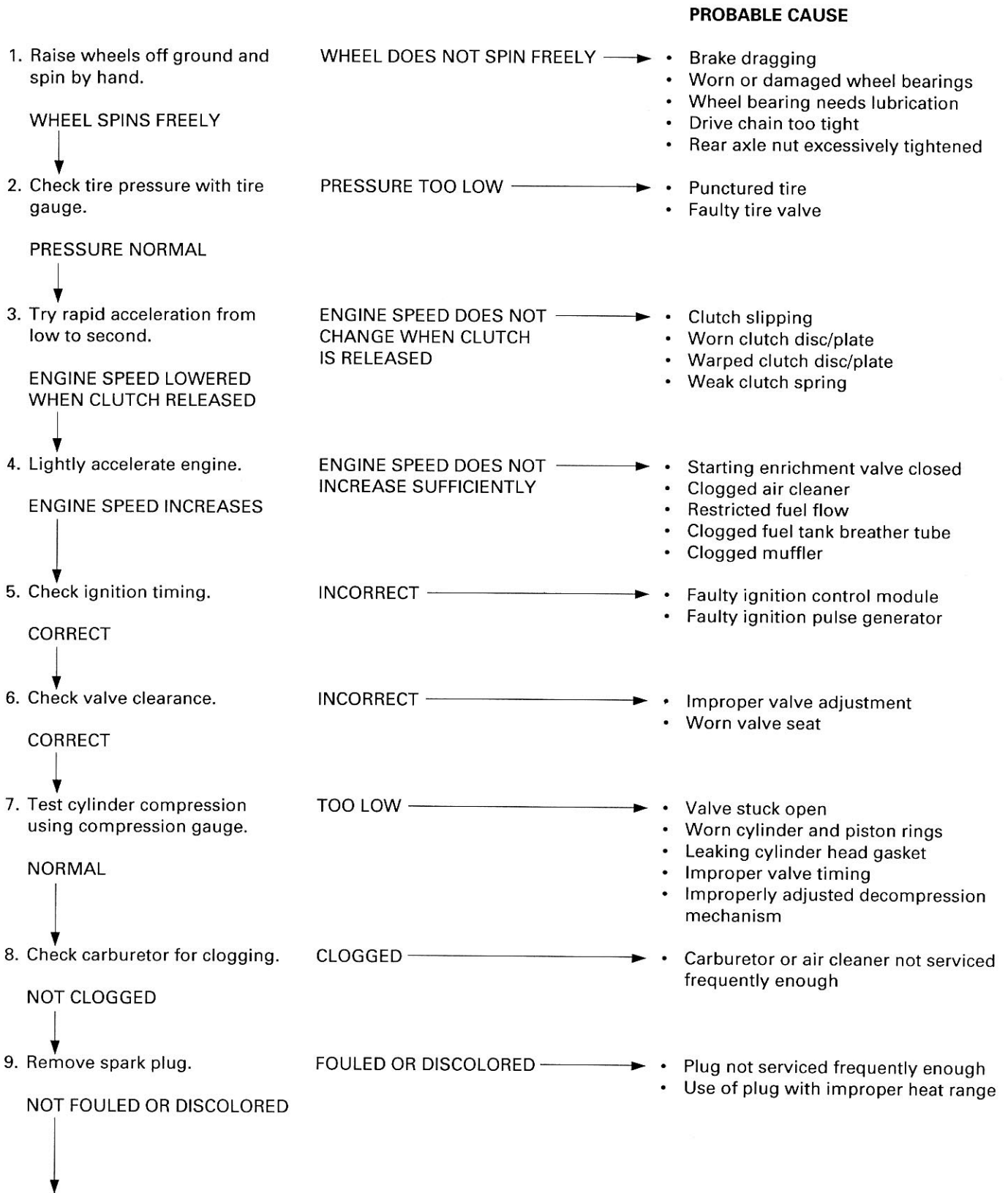
18. TROUBLESHOOTING

ENGINE DOES NOT START OR IS HARD TO START	18-1	POOR PERFORMANCE AT HIGH SPEED	18-4
ENGINE LACKS POWER	18-2	POOR HANDLING	18-4
POOR PERFORMANCE AT LOW AND IDLE SPEEDS	18-3		

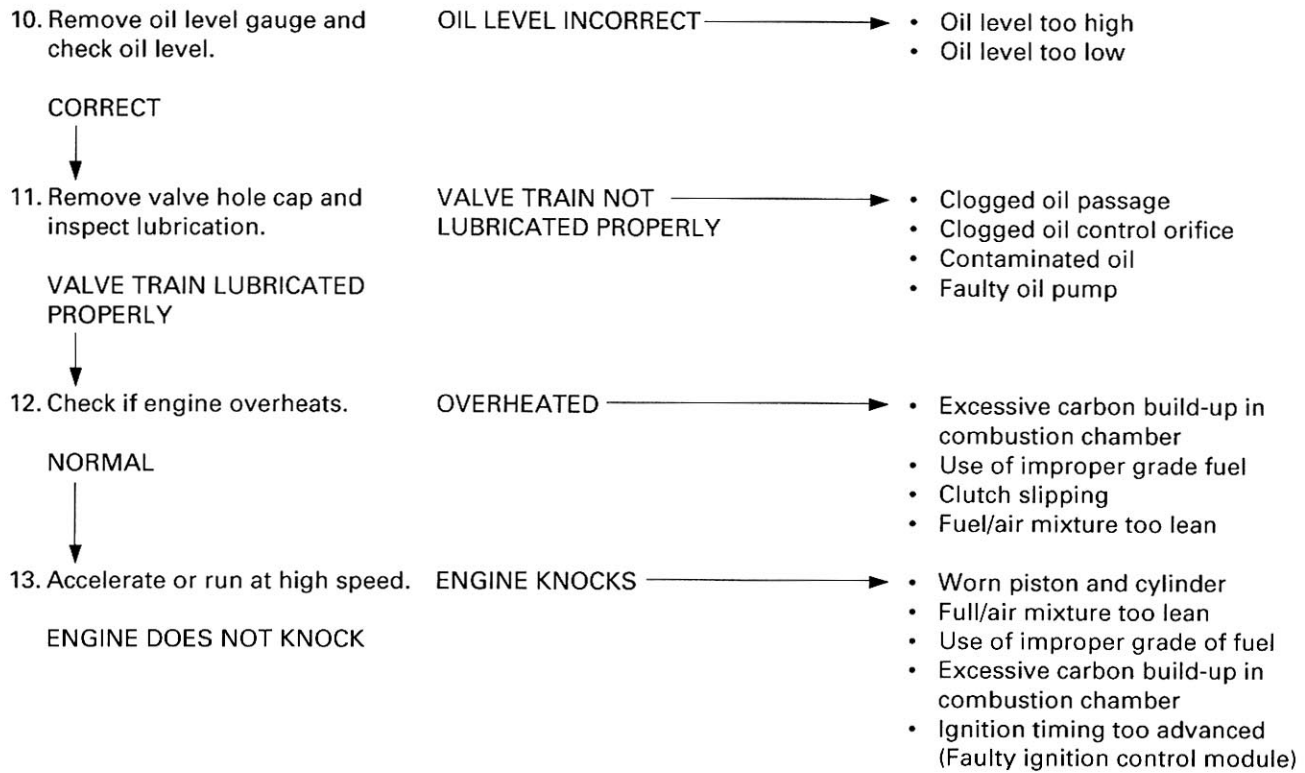
ENGINE DOES NOT START OR IS HARD TO START



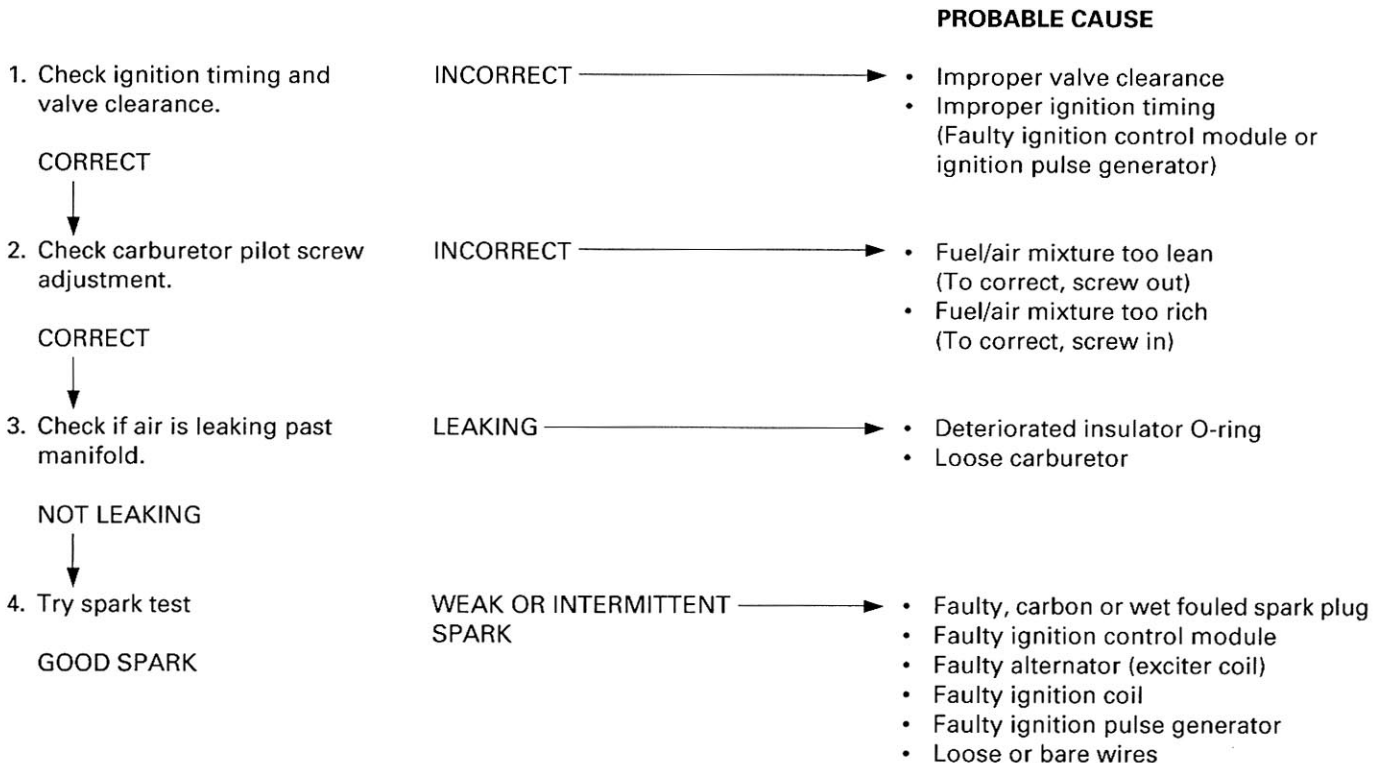
ENGINE LACKS POWER



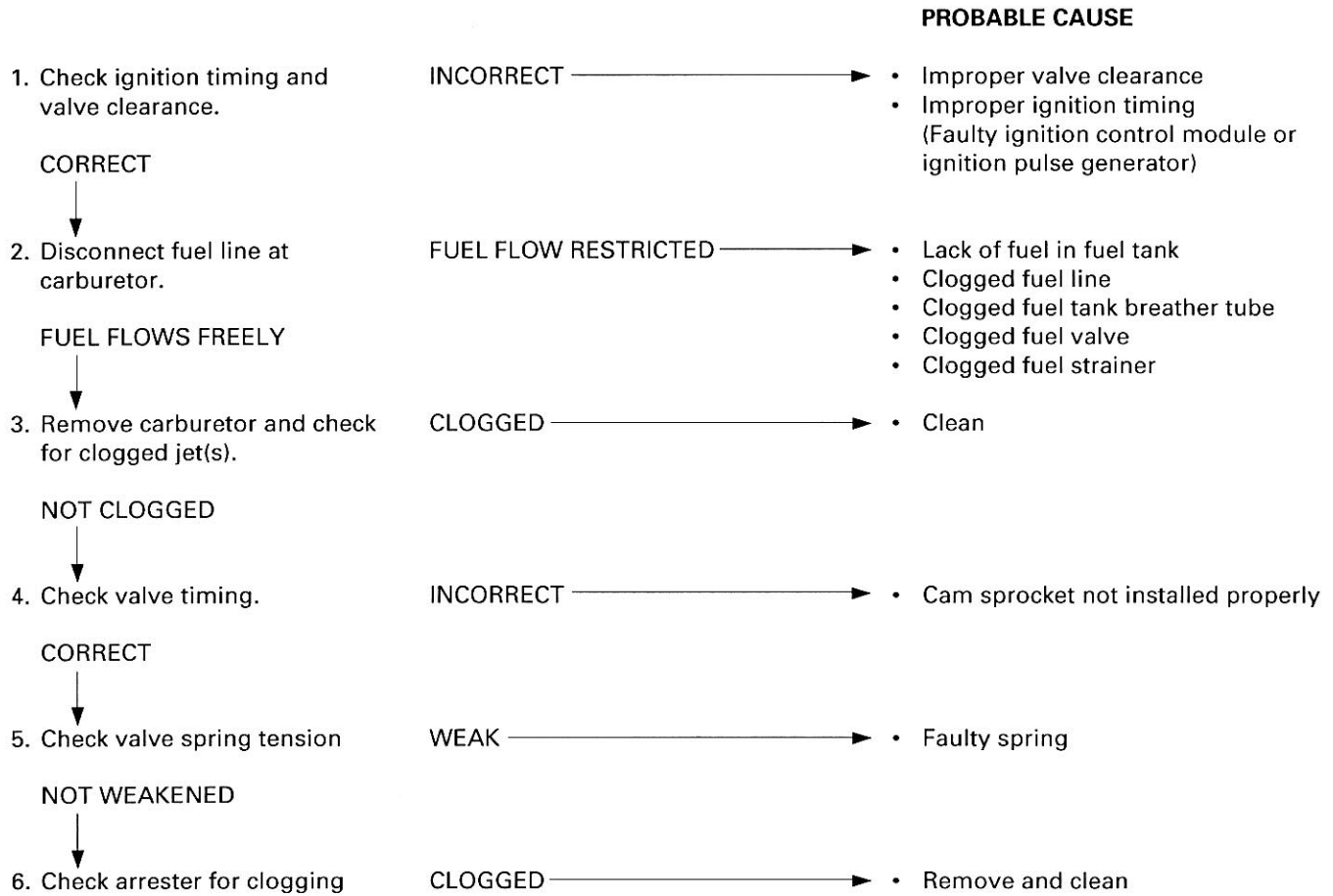
TROUBLESHOOTING



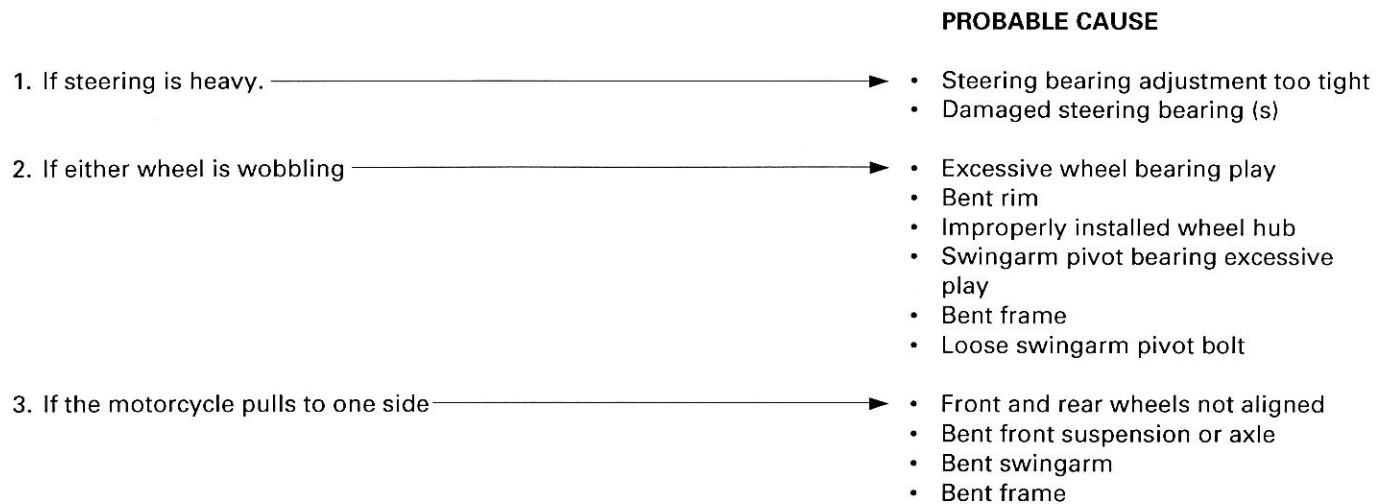
POOR PERFORMANCE AT LOW AND IDLE SPEEDS



POOR PERFORMANCE AT HIGH SPEED



POOR HANDLING → Check tire pressure.



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