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SERVICE MANUAL

XR70R

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 possibly 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 methods or tools selected.

HOW TO USE THIS MANUAL

This service manual describes the service procedures for the XR70R.

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

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

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

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

Most sections have an assembly or system illustration, service information and troubleshooting for the section.

The subsequent pages give detailed procedures.

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

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SYMBOLS

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

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

1. GENERAL INFORMATION

1

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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 can cause loss of consciousness and may lead to death.

Run the engine in an open area or with an exhaust evacuation system in an enclosed area.

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.

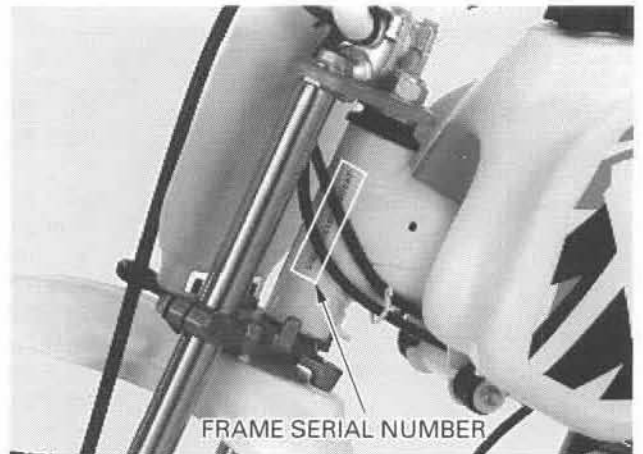
GENERAL INFORMATION

SERVICE RULES

1. Use genuine HONDA or HONDA-recommended parts and lubricants or their equivalents. Parts that don't meet HONDA's design specifications may cause damage to the motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the motorcycle. Metric bolts, nuts and screws are not interchangeable with English fasteners.
4. Install new gaskets, O-rings, cotter pins, and lock plates when reassembling.
5. When tightening bolts or nuts, begin with the larger diameter or inner bolt first. Then tighten to the specified torque diagonally in incremental steps unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all electrical wires as show on pages 1-14 and 1-16, Cable and Harness Routing.

MODEL IDENTIFICATION

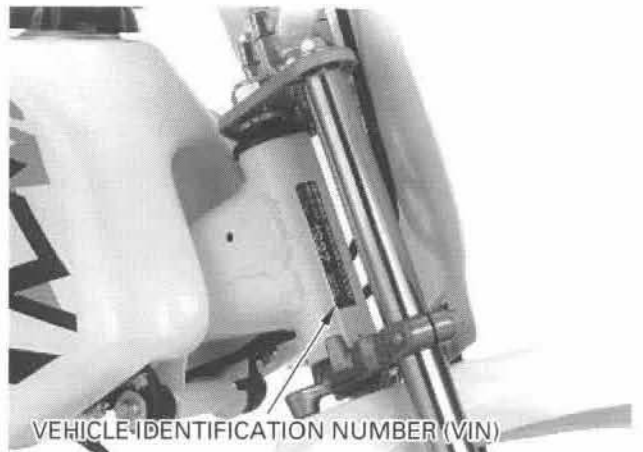
'97 SHOWN; AFTER '97 Similar



- (1) The frame serial number is stamped on the left side of the steering head.



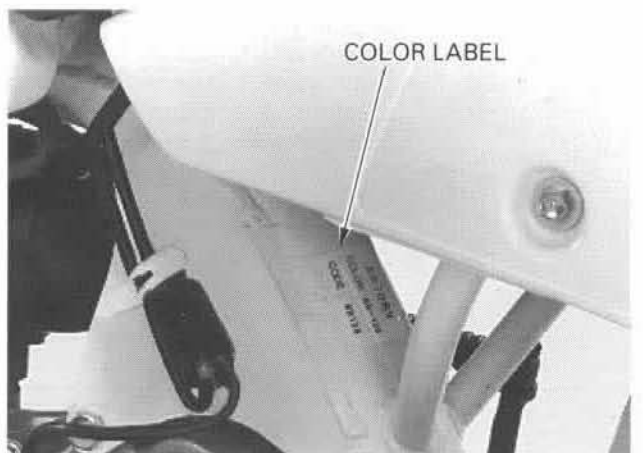
- (2) The engine serial number is stamped on the lower left of the crankcase.



- (3) The Vehicle Identification Number (VIN) is located on right side of the steering head on the Safety Certification Label.



- (4) The carburetor identification number is stamped on the left side of the carburetor body as shown.



- (5) The color label is attached as shown. When ordering color-coded parts, always specify the designated color code.

GENERAL INFORMATION

SPECIFICATIONS

GENERAL		ITEM	SPECIFICATIONS
DIMENSIONS	Overall length	'97 – 2000: After 2000:	1,543 mm (60.7 in) 1,565 mm (61.6 in)
	Overall width		694 mm (27.3 in)
	Overall height	'97 – 2000: After 2000:	877 mm (34.5 in) 881 mm (34.7 in)
	Wheelbase	'97 – 2000: After 2000:	1,055 mm (41.5 in) 1,067 mm (42.0 in)
	Seat height	'97 – 2000: After 2000:	648 mm (25.5 in) 655 mm (25.8 in)
	Footpeg height	'97 – 2000: After 2000:	230 mm (9.1 in) 226 mm (8.9 in)
	Ground clearance	'97 – 2000: After 2000:	163 mm (6.4 in) 162 mm (6.4 in)
	Dry weight	'97 – 2000: After 2000:	57 kg (126 lbs) 58 kg (128 lbs)
	Curb weight		63 kg (139 lbs)
FRAME	Frame type		Back bone
	Front suspension		Telescopic fork
	Front wheel travel		90 mm (3.5 in)
	Rear suspension		Swingarm
	Rear wheel travel		88 mm (3.5 in)
	Rear damper		Conventional type oil damper
	Front tire size		2.50-14 4PR
	Rear tire size		3.00-12 4PR
	Tire brand	CHENG SHIN	Front: C803 /Rear: C803
	Front brake		Internal expanding shoe
	Rear brake		Internal expanding shoe
	Caster angle	'97 – 2000: After 2000:	26° 27° 02'
	Trail length	'97 – 2000: After 2000:	55 mm (2.2 in) 68 mm (2.7 in)
	Fuel tank capacity	'97 – 2000: After 2000:	6.2 l (1.64 US gal , 1.36 Imp gal) 5.6 l (1.48 US gal , 1.23 Imp gal)
	Fuel tank reserve capacity	'97 – 2000: After 2000:	2.1 l (0.55 US gal , 0.46 Imp gal) 1.1 l (0.29 US gal , 0.24 Imp gal)
ENGINE	Bore and stroke		47.0 × 41.4 mm (1.85 × 1.63 in)
	Displacement		71.8 cm ³ (4.38 cu-in)
	Compression ratio		9.0 : 1
	Valve train		Silent multi-link chain drive and OHC with rocker arm
	Intake valve	opens — at 1 mm closes — (0.04 in)	7.5° BTDC
	Exhaust valve	opens — lift closes —	12.5° ABDC
			22.5° BBDC
			2.5° BTDC
	Lubrication system		Forced pressure and wet sump
	Oil pump type		Trochoid
	Cooling system		Air cooled
	Air filtration		Oiled polyurethane foam
	Crankshaft type		Assembled type
	Engine dry weight		17.7 kg (39.0 lbs)
	Cylinder arrangement		Single cylinder inclined 80° from vertical

GENERAL (Cont'd)

ITEM		SPECIFICATIONS
CARBURETOR	Carburetor type	Piston valve
	Throttle bore	13 mm (0.5 in)
DRIVE TRAIN	Clutch system	Multi-plate, wet
	Clutch operation system	Automatic centrifugal
	Transmission	3-speed
	Primary reduction	3.722 (67/18)
	Final reduction	2.400 (36/15)
	Gear ratio 1st	3.272 (36/11)
	2nd ('97 – '99)	1.722 (31/18)
	(After '99)	1.667 (25/15)
	3rd	1.190 (25/21)
	Gearshift pattern	Left foot operated, return system, N – 1 – 2 – 3
ELECTRICAL	Ignition system	Condenser Discharged Ignition
	Starting system	Kickstarter

GENERAL INFORMATION

Unit: mm (in)

LUBRICATION SYSTEM ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	At draining	0.6 l (0.6 US qt, 0.5 Imp qt)	————
	At disassembly	0.8 l (0.8 US qt, 0.7 Imp qt)	————
Recommended engine oil		HONDA GN4 4-stroke oil or equivalent motor oil API service classification SF or SG Viscosity : SAE 10W-30	————
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.10 – 0.21 (0.004 – 0.008)	0.27 (0.011)
	Side clearance	0.03 – 0.08 (0.001 – 0.003)	0.12 (0.005)

FUEL SYSTEM ITEM		SPECIFICATIONS
Carburetor identification number		PB12H
Main jet		# 62
Slow jet		# 38 × # 38
Jet needle clip position		3rd groove from top
Air screw initial opening		1-1/2 turns out
Float level		10.7 mm (0.42 in)
Idle speed		1,700 ± 100 rpm
Throttle grip free play		2.0 – 6.0 mm (1/12 – 1/4 in)

Unit: mm (in)

CYLINDER HEAD/VALVES ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			981 – 1,177 kPa (10.0 – 12.0 kgf/cm ² , 142 – 171 psi) at 500 – 600 rpm	————
Cylinder head warpage			————	0.05 (0.002)
Valve, valve guide	Valve clearance	IN	0.05 ± 0.02 mm (0.002 ± 0.001 in)	————
		EX	0.05 ± 0.02 mm (0.002 ± 0.001 in)	————
	Valve stem O.D.	IN	4.970 – 4.985 (0.1957 – 0.1963)	4.92 (0.194)
		EX	4.970 – 4.985 (0.1957 – 0.1963)	4.92 (0.194)
	Valve guide I.D.	IN	5.000 – 5.012 (0.1969 – 0.1973)	5.03 (0.198)
		EX	5.000 – 5.012 (0.1969 – 0.1973)	5.03 (0.198)
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)	0.08 (0.003)
		EX	0.030 – 0.057 (0.0012 – 0.0022)	0.10 (0.004)
Valve spring	Valve seat width		IN/EX 1.0 – 1.3 (0.04 – 0.05)	2.0 (0.08)
	Inner	IN/EX	32.78 (1.291)	31.2 (1.23)
	Outer	IN/EX	35.55 (1.400)	34.0 (1.34)
Rocker arm/shaft	Rocker arm I.D.		IN/EX 10.000 – 10.015 (0.3937 – 0.3943)	10.10 (0.398)
	Rocker arm shaft O.D.		IN/EX 9.978 – 9.987 (0.3928 – 0.3932)	9.91 (0.390)
Camshaft	Cam lobe height		IN 27.945 (1.1002)	27.55 (1.085)
			EX 26.076 (1.0266)	25.69 (1.011)

Unit: mm (in)

Unit: mm (in)

CYLINDER/PISTON ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		47.005—47.015 (1.8506—1.8510)	47.05 (1.852)
	Out of round		—————	0.10 (0.004)
	Taper		—————	0.10 (0.004)
	Warpage		—————	0.05 (0.002)
Piston, piston rings	Piston mark direction		“IN” mark facing toward the intake side	—————
	Piston O.D.		46.980—46.995 (1.8496—1.8502)	46.90 (1.846)
	Piston O.D. measurement point		10 mm (0.4 in) from bottom of skirt	—————
	Piston pin bore I.D.		13.002—13.008 (0.5119—0.5121)	13.06 (0.514)
	Piston pin O.D.		12.994—13.000 (0.5116—0.5118)	12.98 (0.511)
	Piston-to-piston pin clearance		0.002—0.014 (0.0001—0.0006)	0.08 (0.003)
	Piston ring-to-ring groove clearance	Top	0.015—0.050 (0.0006—0.0020)	0.12 (0.005)
		Second	0.015—0.050 (0.0006—0.0020)	0.12 (0.005)
	Piston ring end gap	Top	0.05—0.20 (0.002—0.008)	0.5 (0.02)
		Second	0.05—0.20 (0.002—0.008)	0.5 (0.02)
		Oil (side rail)	0.20—0.90 (0.008—0.035)	1.1 (0.04)
Cylinder-to-piston clearance			0.010—0.040 (0.0004—0.0016)	0.15 (0.006)
Connecting rod small end I.D.			13.013—13.043 (0.5123—0.5135)	13.10 (0.516)
Connecting rod-to-piston pin clearance			0.002—0.014 (0.0001—0.0006)	0.08 (0.003)

Unit: mm (in)

CLUTCH/GEARSHIFT LINKAGE ITEM		STANDARD	SERVICE LIMIT
Clutch disc thickness	A	2.52 – 2.68 (0.099 – 0.106)	2.3 (0.09)
	B	3.35 – 3.45 (0.132 – 0.136)	3.0 (0.12)
Clutch plate warpage		—	0.20 (0.008)
Centrifugal clutch spring free length		17.3 (0.68)	16.4 (0.65)
Primary drive gear I.D.		21.000 – 21.021 (0.8268 – 0.8276)	21.05 (0.829)
Clutch center guide	I.D.	16.988 – 17.006 (0.6688 – 0.6695)	17.04 (0.671)
	O.D.	20.930 – 20.950 (0.8240 – 0.8248)	20.90 (0.823)
Crankshaft O.D. at clutch center guide		16.966 – 16.984 (0.6680 – 0.6687)	16.90 (0.665)

Unit: mm (in)

ALTERNATOR/CAM CHAIN TENSIONER ITEM		STANDARD	SERVICE LIMIT
Cam chain tensioner	Push rod O.D.	11.985 – 12.000 (0.4718 – 0.4724)	11.94 (0.470)
	Spring free length	117 (4.6)	100 (3.9)

GENERAL INFORMATION

Unit: mm (in)

CRANKSHAFT/TRANSMISSION/KICKSTARTER			STANDARD	SERVICE LIMIT
ITEM				
Crankshaft	Side clearance		0.010 – 0.350 (0.0004 – 0.0138)	0.60 (0.024)
	Radial clearance		0 – 0.012 (0 – 0.0005)	0.05 (0.002)
	Runout			0.10 (0.004)
Transmission (‘97 – ‘99:)	Gear I.D.	M2	17.016 – 17.043 (0.6699 – 0.6710)	17.10 (0.673)
		C1	20.020 – 20.053 (0.7882 – 0.7895)	20.10 (0.791)
		C3	17.016 – 17.043 (0.6699 – 0.6710)	17.10 (0.673)
	Bushing O.D.	C1	19.979 – 20.000 (0.7866 – 0.7874)	19.93 (0.785)
	Bushing I.D.	C1	17.000 – 17.018 (0.6693 – 0.6700)	17.08 (0.672)
	Gear-to-bushing clearance	C1	0.020 – 0.074 (0.0008 – 0.0029)	0.10 (0.004)
	Mainshaft O.D.	M2	16.983 – 16.986 (0.6686 – 0.6687)	16.95 (0.667)
	Countershaft O.D.	C1	16.966 – 16.986 (0.6680 – 0.6687)	16.94 (0.667)
	Gear-to-shaft clearance	M2	0.022 – 0.060 (0.0009 – 0.0024)	0.10 (0.004)
	Gear bushing-to-shaft clearance	C1	0.014 – 0.052 (0.0006 – 0.0020)	0.10 (0.004)
Transmission (After ‘99:)	Gear I.D.	M2	17.016 – 17.043 (0.6699 – 0.6710)	17.10 (0.673)
		C1	23.020 – 23.053 (0.9063 – 0.9076)	23.10 (0.909)
		C3	20.020 – 20.053 (0.7882 – 0.7895)	20.10 (0.791)
	Bushing O.D.	C1	22.979 – 23.000 (0.9047 – 0.9055)	22.93 (0.903)
	Bushing I.D.	C1	20.000 – 20.021 (0.7874 – 0.7882)	20.08 (0.791)
	Gear-to-bushing clearance	C1	0.020 – 0.074 (0.0008 – 0.0029)	0.10 (0.004)
	Mainshaft O.D.	M2	16.9840 – 16.9860 (0.66866 – 0.66874)	16.950 (0.6673)
	Countershaft O.D.	C1	19.959 – 19.980 (0.7858 – 0.7866)	19.94 (0.785)
	Gear-to-shaft clearance	M2	0.022 – 0.059 (0.0009 – 0.0023)	0.10 (0.004)
	Gear bushing-to-shaft clearance	C1	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
Shift fork	I.D.		34.075 – 34.100 (1.3415 – 1.3425)	34.14 (1.344)
	Claw thickness		4.86 – 4.94 (0.191 – 0.194)	4.60 (0.181)
	Shift drum O.D.		33.950 – 33.975 (1.3366 – 1.3376)	33.93 (1.336)

Unit: mm(in)

FRONT WHEEL/SUSPENSION/STEERING
ITEM

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		_____	1.5 (0.06)
Cold tire pressure		100 kPa (1.00 kgf/cm ² , 15 psi)	_____
Axle runout		_____	0.20 (0.008)
Wheel rim-to-hub distance		12.0 ± 1.0 (0.47 ± 0.04)	_____
Wheel rim runout	Radial	_____	2.0 (0.08)
	Axial	_____	2.0 (0.08)
Brake	Brake lever free play	10 – 20 (3/8 – 3/4)	_____
	Brake drum I.D.	95.0 (3.74)	96.0 (3.78)
	Brake lining thickness	4.0 (0.16)	2.0 (0.08)
Fork	Spring free length	404.5 (15.93)	396.4 (15.61)
	Spring direction	With the tapered end facing down	_____
	Tube runout	_____	0.20 (0.008)
	Recommended fork fluid	Pro Honda Suspension Fluid SS-8	_____
	Fluid level	135 (5.3)	_____
Fluid capacity		74 ± 1 cm ³ (2.50 ± 0.03 US oz, 2.60 ± 0.04 Imp oz)	_____

Unit: mm(in)

REAR WHEEL/BRAKE/SUSPENSION
ITEM

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		_____	2.0 (0.08)
Cold tire pressure		100 kPa (1.00 kgf/cm ² , 15 psi)	_____
Axle runout		_____	0.20 (0.008)
Wheel rim-to-hub distance		11.0 ± 1.0 (0.43 ± 0.04)	_____
Wheel rim runout	Radial	_____	2.0 (0.08)
	Axial	_____	2.0 (0.08)
Drive chain	Size/link	DID DID420M-86RB RK RK420MZ-86RJ	_____
	Slack	10 – 20 (3/8 – 3/4)	_____
Brake	Brake pedal free play	20 – 30 (3/4 – 1-1/4)	_____
	Brake drum I.D.	95.0 (3.74)	96.0 (3.78)
	Brake lining thickness	4.0 (0.16)	2.0 (0.08)

IGNITION SYSTEM
ITEM

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

GENERAL INFORMATION

TORQUE VALUES

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

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

NOTES: 1. Apply a locking agent to the threads.
 2. Apply oil to the threads and flange surface.
 3. U-nut.
 4. ALOC bolt; replace with a new one.

ENGINE				
ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
MAINTENANCE:				
Spark plug	1	10	12 (1.2 , 9)	
Oil drain bolt	1	12	25 (2.5 , 18)	
Valve adjuster hole cap	2	30	12 (1.2 , 9)	
Valve adjuster lock nut	2	5	9 (0.9 , 6.5)	
Clutch adjuster lock nut	1	8	12 (1.2 , 9)	
LUBRICATION SYSTEM:				
Oil pump mounting screw	3	6	8 (0.8 , 5.8)	
Oil pump cover screw	3	5	5 (0.5 , 3.6)	
CYLINDER HEAD/VALVES:				
Cylinder head cap nut	3	6	11 (1.1 , 8)	
Cylinder head nut	1	6	11 (1.1 , 8)	
Cylinder head right side cover bolt	2	6	10 (1.0 , 7)	
Cam sprocket bolt	2	5	9 (0.9 , 6.5)	
CYLINDER/PISTON:				
Cam chain guide roller pin bolt	1	8	10 (1.0 , 7)	
CLUTCH/GEARSHIFT LINKAGE:				
Clutch outer cover screw	4	5	4 (0.45 , 3.3)	
Clutch lock nut	1	14	42 (4.3 , 31)	
Clutch outer spring screw	4	5	6 (0.6 , 4.3)	
Shift drum stopper arm bolt	1	6	13 (1.3 , 9)	
Shift return spring pin	1	8	29 (3.0 , 22)	
Gearshift cam bolt	1	6	17 (1.7 , 12)	
ALTERNATOR/CAM CHAIN TENSIONER:				
Flywheel nut	1	10	41 (4.2 , 30)	
Cam chain tensioner sealing bolt	1	14	23 (2.3 , 17)	
Cam chain tensioner pivot bolt	1	8	16 (1.6 , 12)	
CRANKSHAFT/TRANSMISSION:				
Shift drum bolt	1	6	12 (1.2 , 9)	
Drive sprocket fixing plate bolt	2	6	12 (1.2 , 9)	

FRAME

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
FRAME BODY PANELS/EXHAUST SYSTEM:				
Fuel valve mounting bolt	2	6	9 (0.9, 6.5)	
Side stand pivot bolt	1	10	See page 2-6	
Muffler stay bolt	1	8	26 (2.7, 20)	
Exhaust pipe protector bolt	3	6	15 (1.5, 11)	
Exhaust pipe cover screw A	2	5	6 (0.6, 4.3)	
Exhaust pipe cover screw B	2	5	6 (0.6, 4.3)	
FUEL SYSTEM:				
Connecting tube band screw	1	4	1 (0.1, 0.7)	
ENGINE REMOVAL/INSTALLATION:				
Engine hanger bolt/nut (Rear/upper)	1	8	31 (3.2, 23)	
Engine hanger bolt/nut (Rear/lower)	1	8	31 (3.2, 23)	
FRONT WHEEL/BRAKE/SUSPENSION/STEERING:				
Handlebar upper holder bolt	4	6	10 (1.0, 7)	
Handlebar lower holder nut	2	10	45 (4.6, 33)	NOTE 3
Fork bottom bridge pinch bolt	2	8	32 (3.3, 24)	
Brake lever pivot bolt	1	5	3 (0.3, 2.2)	
Brake lever pivot nut	1	5	3 (0.3, 2.2)	
Spoke	36	BC 2.9	3 (0.3, 2.2)	
Front axle nut	1	12	59 (6.0, 43)	NOTE 3
Front brake arm pinch bolt/nut	1	6	10 (1.0, 7)	NOTE 4
Fork bolt	2	10	23 (2.3, 17)	
Fork cap	2	20	23 (2.3, 17)	
Fork socket bolt	2	8	20 (2.0, 14)	NOTE 1
Steering stem nut	1	22	74 (7.5, 54)	
Steering stem top thread	1	22	See page 12-24	
REAR WHEEL/BRAKE/SUSPENSION:				
Spoke	36	BC 2.9	3 (0.3, 2.2)	NOTE 3
Rear axle nut	1	12	59 (6.0, 43)	NOTE 3
Driven sprocket nut	4	8	32 (3.3, 24)	NOTE 3
Rear brake arm pinch bolt/nut	1	6	10 (1.0, 7)	NOTE 3
Swingarm pivot bolt/nut	1	10	39 (4.0, 29)	NOTE 3
Shock absorber upper mounting bolt/nut	1	10	34 (3.5, 25)	NOTE 3
Shock absorber lower mounting bolt/nut	1	10	34 (3.5, 25)	
IGNITION SYSTEM:				
Ignition coil mounting bolt	1	5	6 (0.6, 4.3)	

GENERAL INFORMATION

TOOLS

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

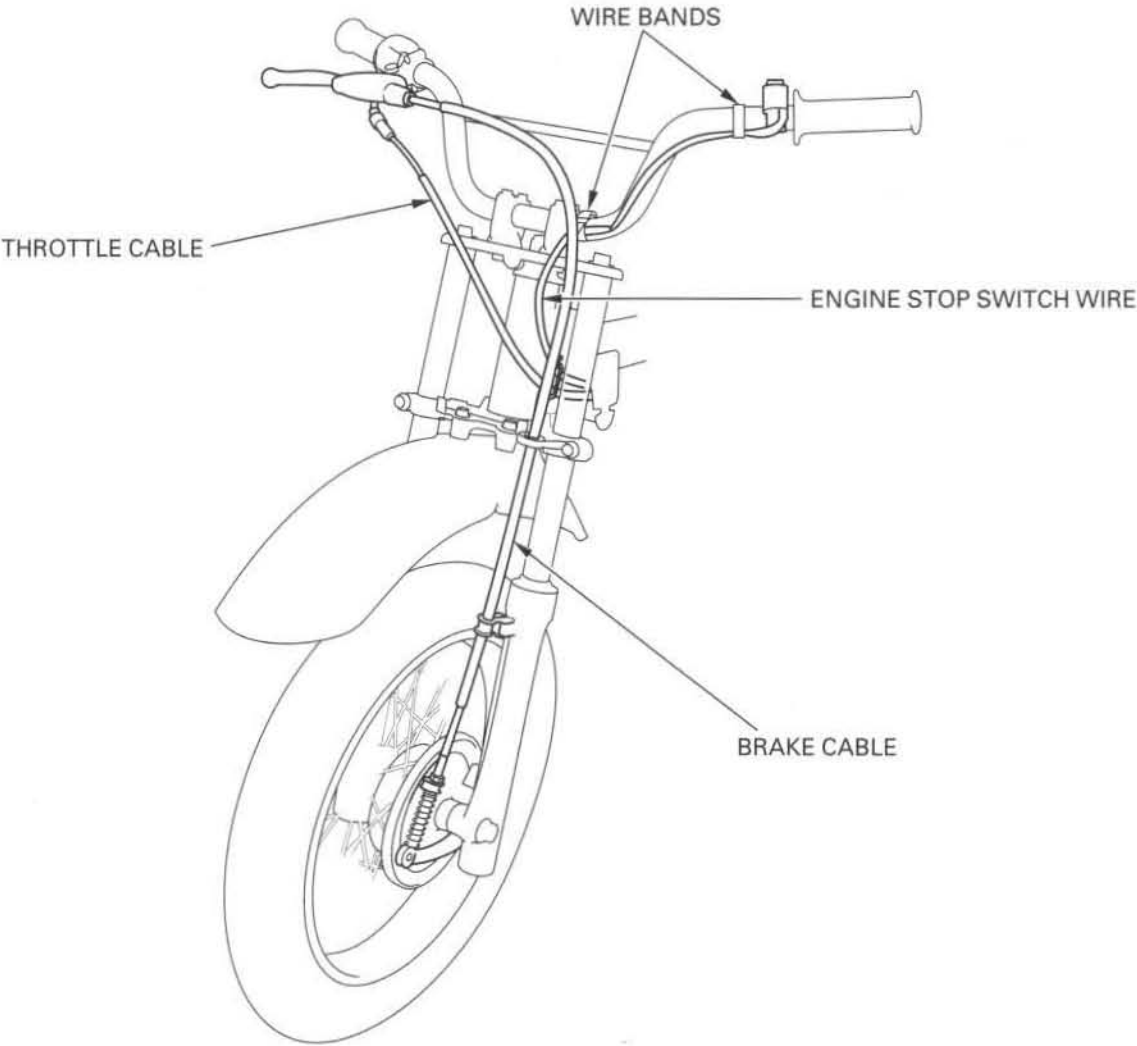
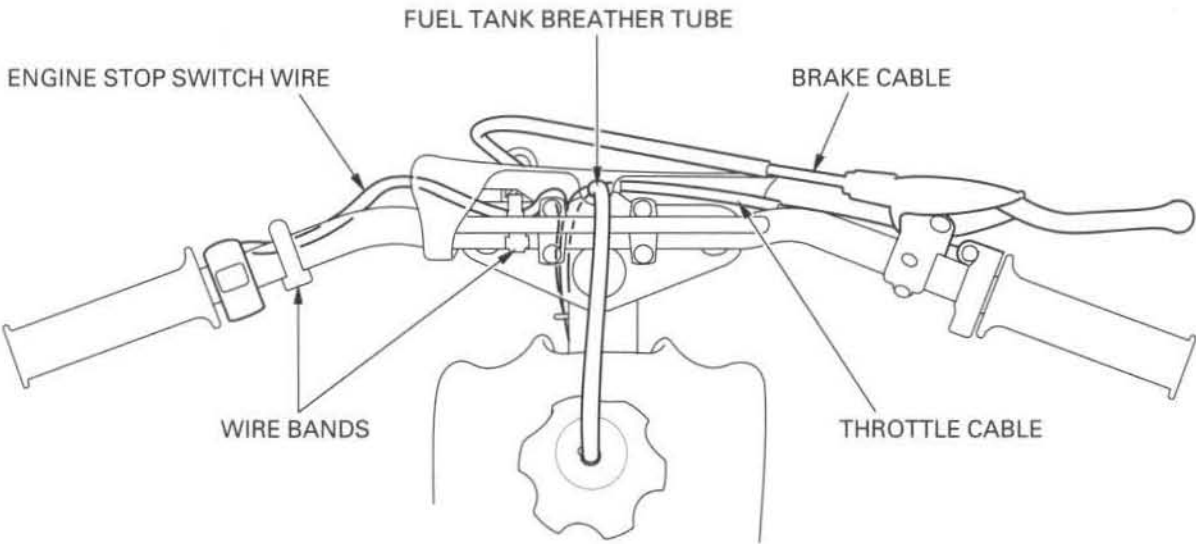
DESCRIPTION	TOOL NUMBER	REMARKS	REF. SEC.
Carburetor float level gauge	07401-0010000		5
Spoke wrench, 4.5 × 5.1 mm	07701-0020200	NOTE 1	3
Pin spanner	07702-0020001		12
Valve adjusting wrench, 8 × 9 mm	07708-0030100	NOTE 1	3
Valve adjuster B	07708-0030400	NOTE 3: 07908-KE90200 (U.S.A. only)	3
Lock nut wrench, 20 × 24 mm	07716-0020100		9
Extension bar	07716-0020500	NOTE 1	9
Universal holder	07725-0030000		10
Flywheel holder	07725-0040000	NOTE 1	9
Attachment, 32 × 35 mm	07746-0010100		11, 13
Attachment, 37 × 40 mm	07746-0010200		10, 11, 13
Pilot, 12 mm	07746-0040200		12, 13
Pilot, 17 mm	07746-0040400		11
Bearing remover shaft	07746-0050100	NOTE 1	12, 13
Bearing remover head, 12 mm	07746-0050300	NOTE 1	12, 13
Fork seal driver	07747-0010100	NOTE 3:	12
Fork seal driver attachment	07747-0010200	07947-1180001	12
Driver	07749-0010000		11, 12, 13
Valve spring compressor	07757-0010000		7
Valve seat cutter		NOTE 1	7
Seat cutter, 24 mm (45° IN)	07780-0010600		
Seat cutter, 20.5 mm (45° EX)	07780-0011000		
Flat cutter, 24 mm (30° IN)	07780-0012500		
Flat cutter, 21.5 mm (32° EX)	07780-0012800		
Interior cutter, 22 mm (60° IN/EX)	07780-0014202		
Cutter holder, 5 mm	07781-0010400		
Flywheel puller	07933-GE00000	NOTE 2, 3: 07933-0010000	10
Valve guide driver, 5.0 mm	07942-MA60000		7
Ball race remover	07944-1150001		12
Steering stem driver	07946-GC40000	NOTE 3: 07946-MB00000 07946-GC4000A (U.S.A. only)	12
Valve spring compressor attachment	07959-KM30101		7
Valve guide reamer, 5.0 mm	07984-MA60001	NOTE 3: 07984-MA6000C (U.S.A. only)	7
Peak voltage adaptor	07HGJ-0020100	NOTE 3 Peak voltage tester (U.S.A. only)	14

LUBRICATION & SEAL POINTS

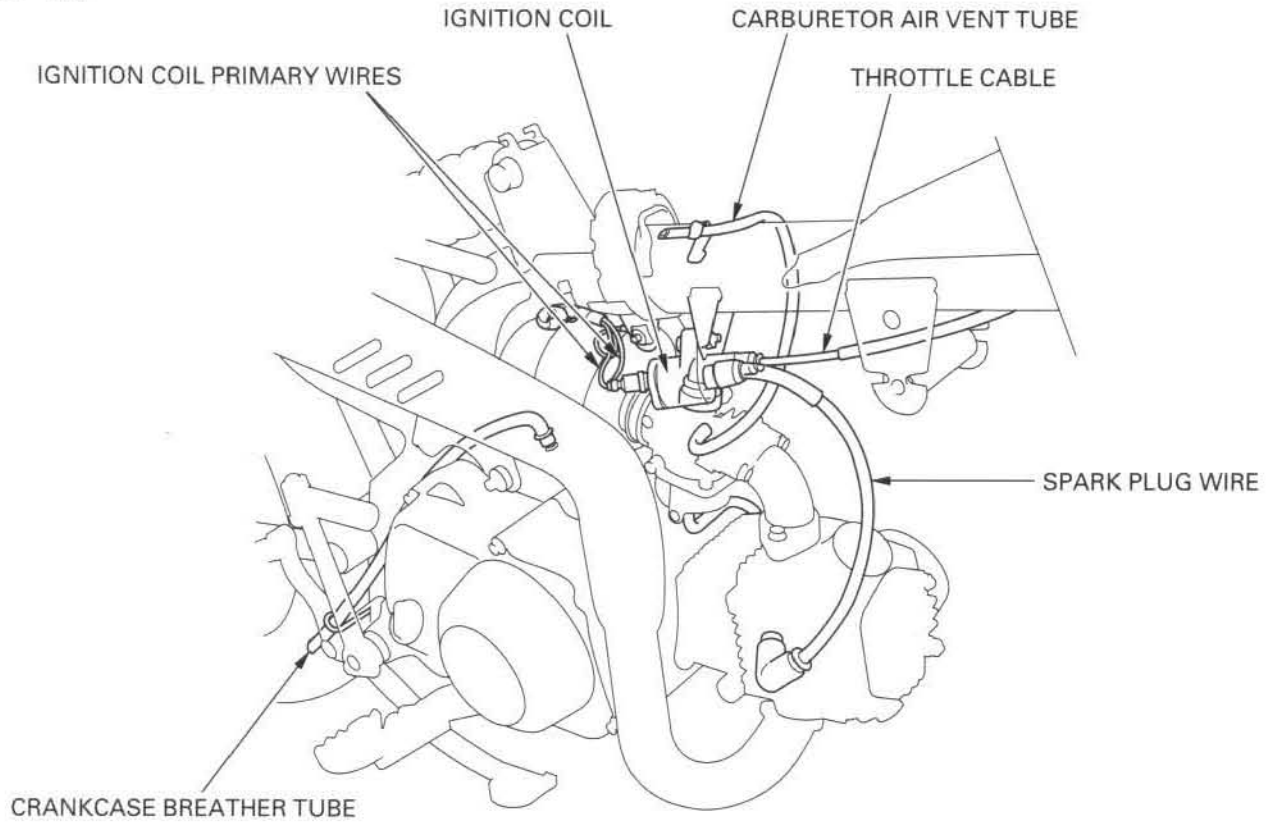
ENGINE		
LOCATION	MATERIAL	REMARKS
Cylinder bore surface Valve adjuster hole cap threads Connecting rod big end needle bearing Connecting rod small end Piston pin bore Piston ring grooves Piston outer surface Piston pin outer surface Piston ring surface Valve stem sliding surface Camshaft lobes Cam chain Cam chain guide roller inner surface Rocker arm I.D. and slipper surface Cam chain tensioner push rod inside Oil pump rotor inside Clutch center guide surface Clutch discs Primary drive gear teeth Primary driven gear teeth, inner surface Mainshaft sliding surface Countershaft sliding surface Transmission gear rotating surface Transmission gear teeth and shift fork groove Shift drum outer surface Shift drum lock plate sliding surface Kickstarter spindle sliding surface Each sliding surface Oil seal lips Radial ball bearing and needle bearing O-rings	Engine oil	Fill with 1 – 2 cm ³ (page 10-6) Fill with 0.5 – 1 cm ³ (page 4-4)

FRAME		
LOCATION	MATERIAL	REMARKS
Steering stem ball race and steel ball sliding surface Swingarm pivot nut seating surface Wheel hub dust seal lips Brake panel anchor pin (brake shoe sliding surface) Brake cam (brake shoe sliding surface) Brake pedal pivot surface Side stand pivot sliding surface	Multi-purpose grease	
Brake cam dust seal	Engine oil	
Final driven sprocket stud bolt threads	Locking agent	
Fork socket bolt threads		
Fork dust seal lip	Fork fluid	
Brake cable inside	Cable lubricant	
Handle grip rubber inner surface	Honda Bond A	

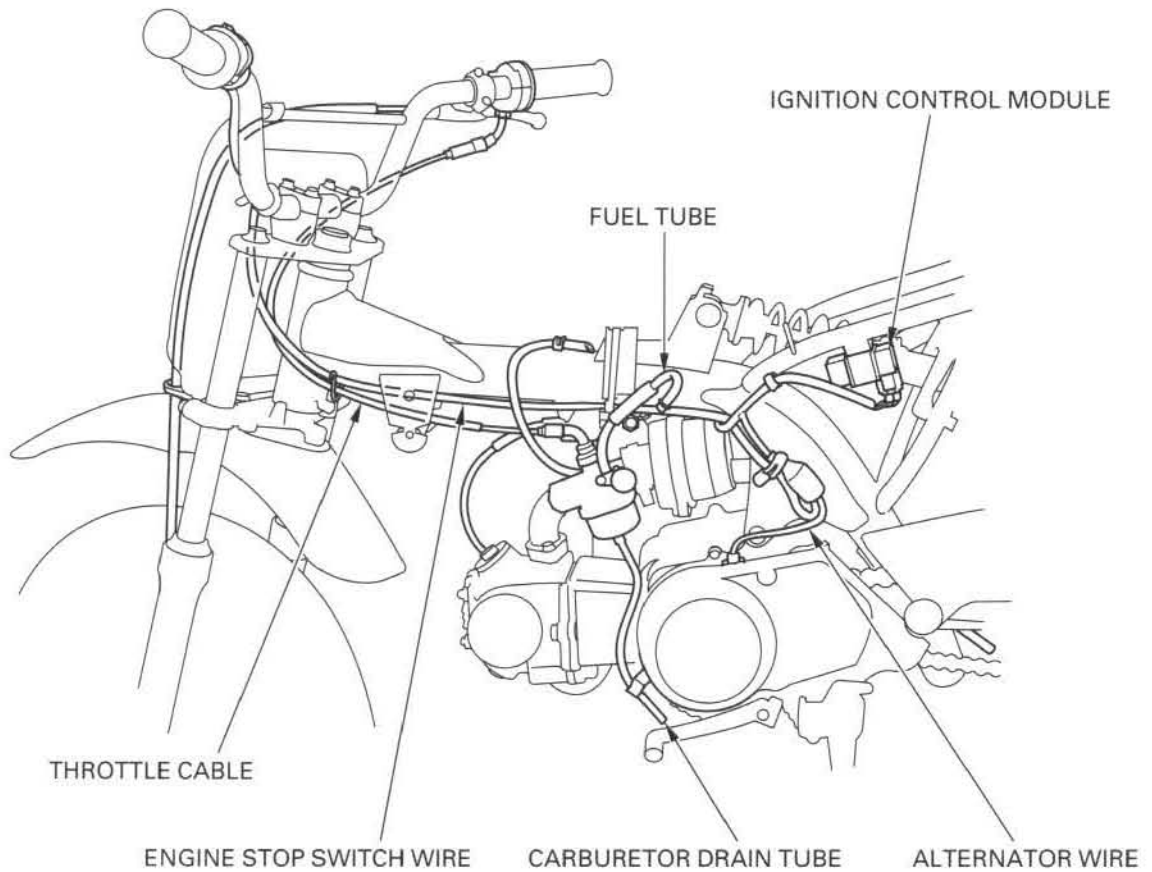
CABLE & HARNESS ROUTING



'97-'99:

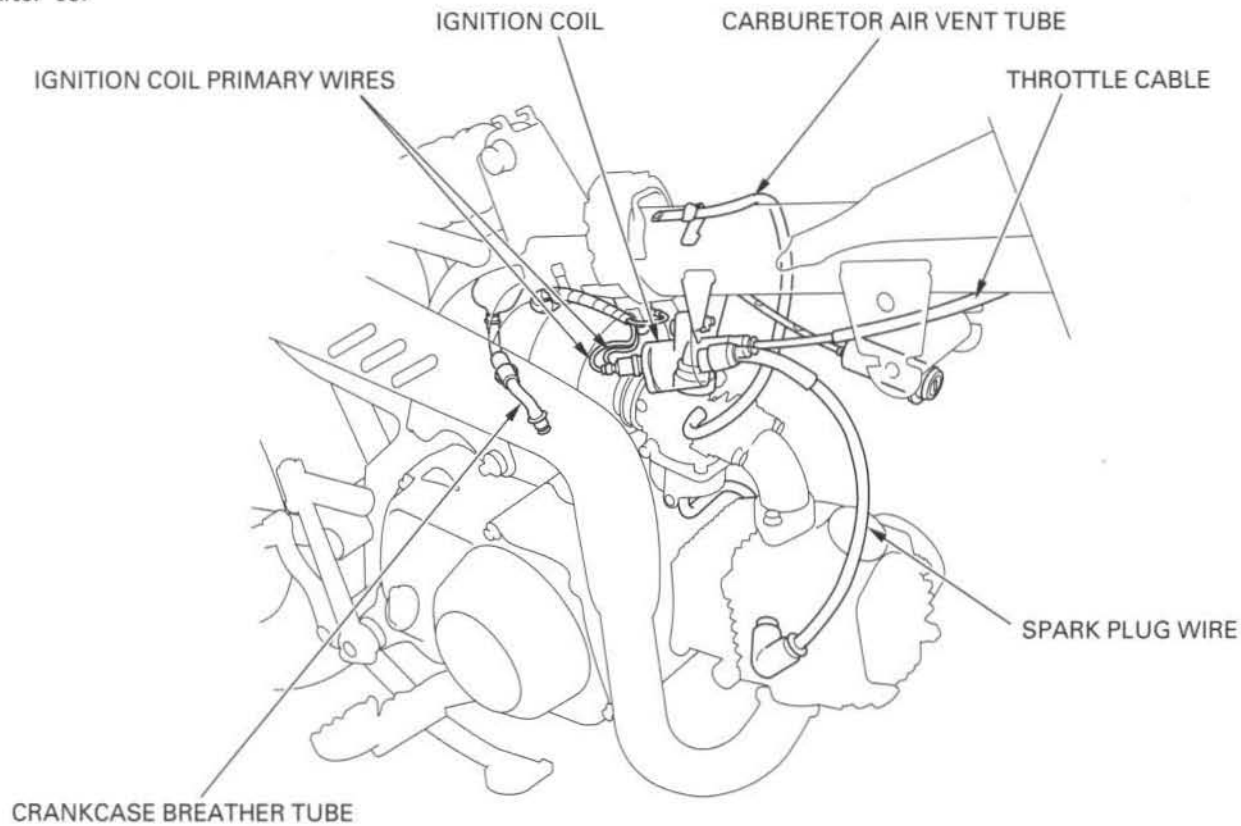


'97-'99:

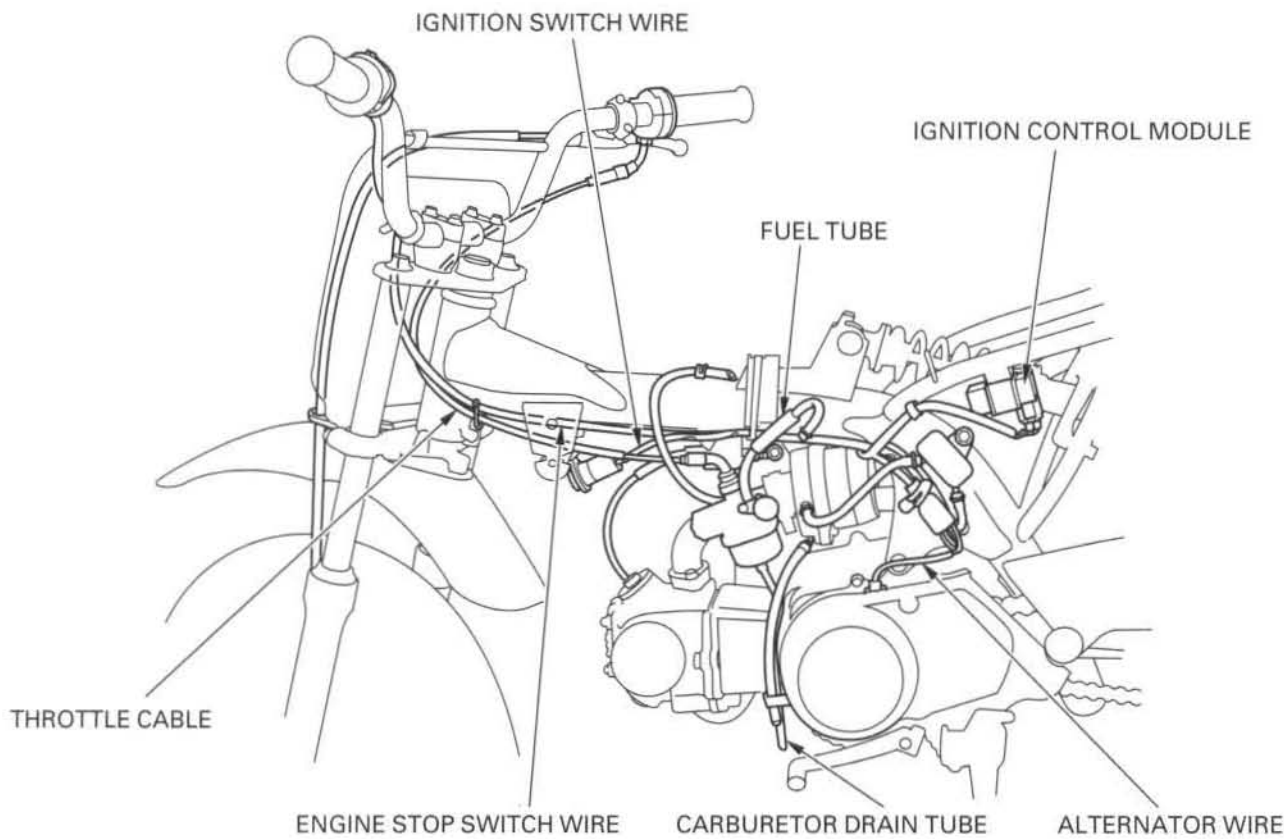


GENERAL INFORMATION

After '99:



After '99:



EMISSION CONTROL SYSTEM (AFTER '99)

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

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.

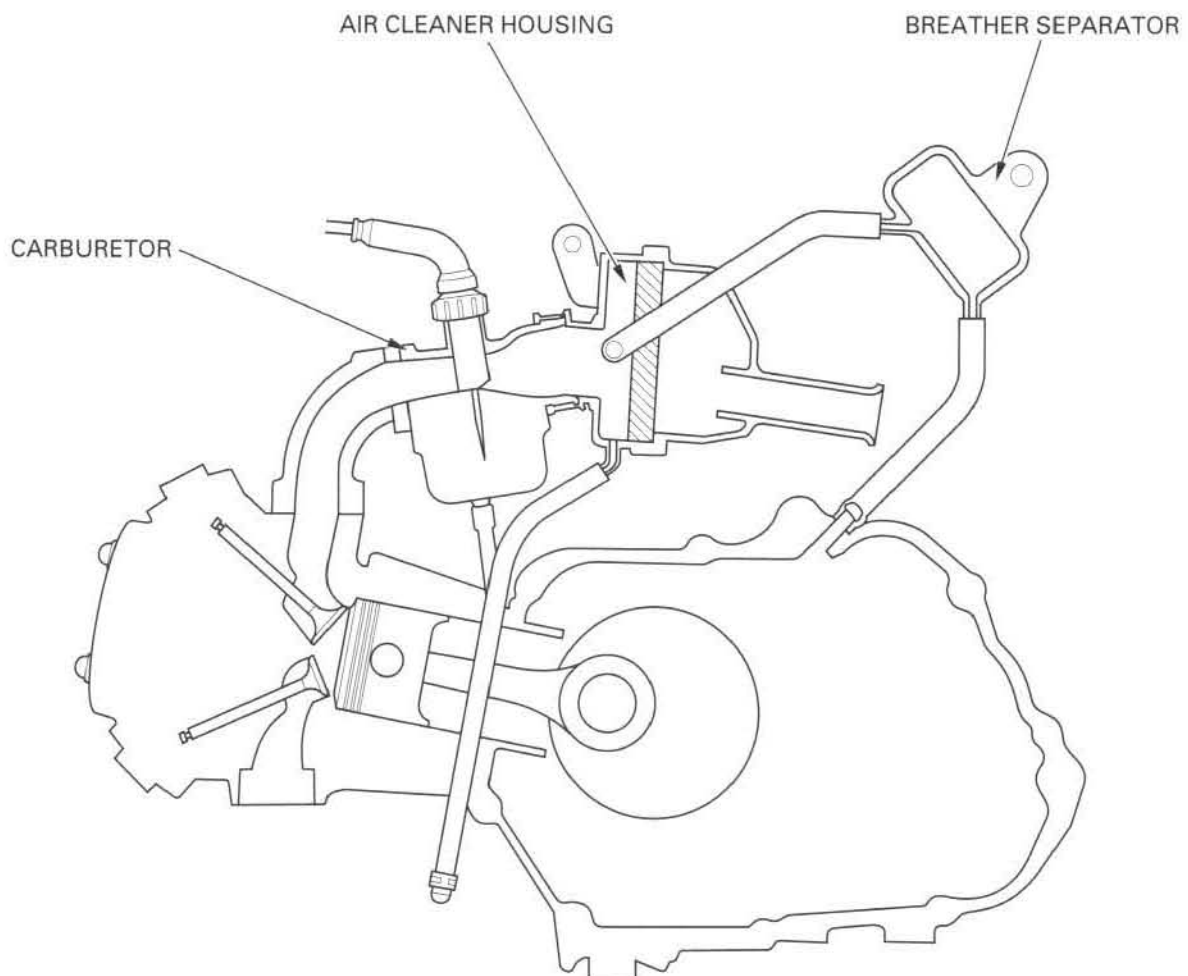
Honda Motor Co., Ltd. utilizes lean carburetor settings as well as other system, to reduce carbon monoxide and hydrocarbons.

EXHAUST EMISSION CONTROL SYSTEM

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

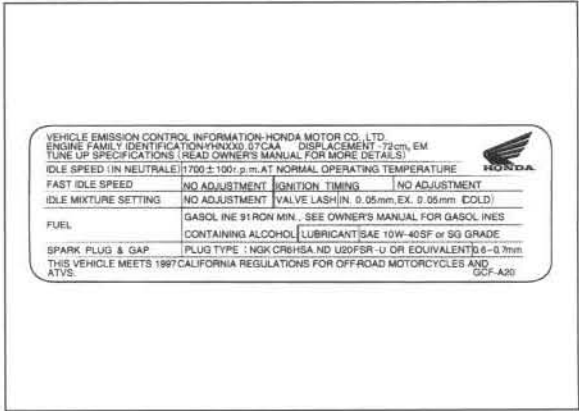
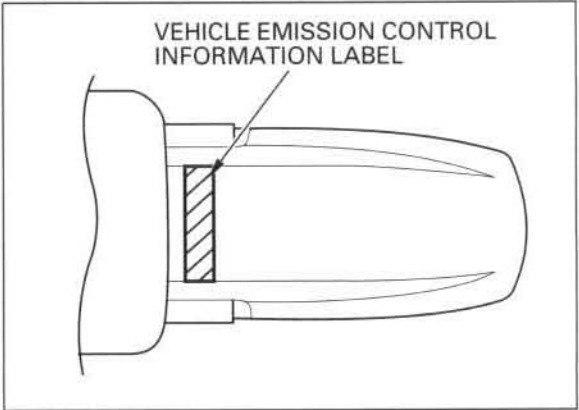
The engine is equipped with a closed crankcase system to prevent discharging crankcase emissions into the atmosphere. Blow-by gas is returned to the combustion chamber through the air cleaner and carburetor.



GENERAL INFORMATION

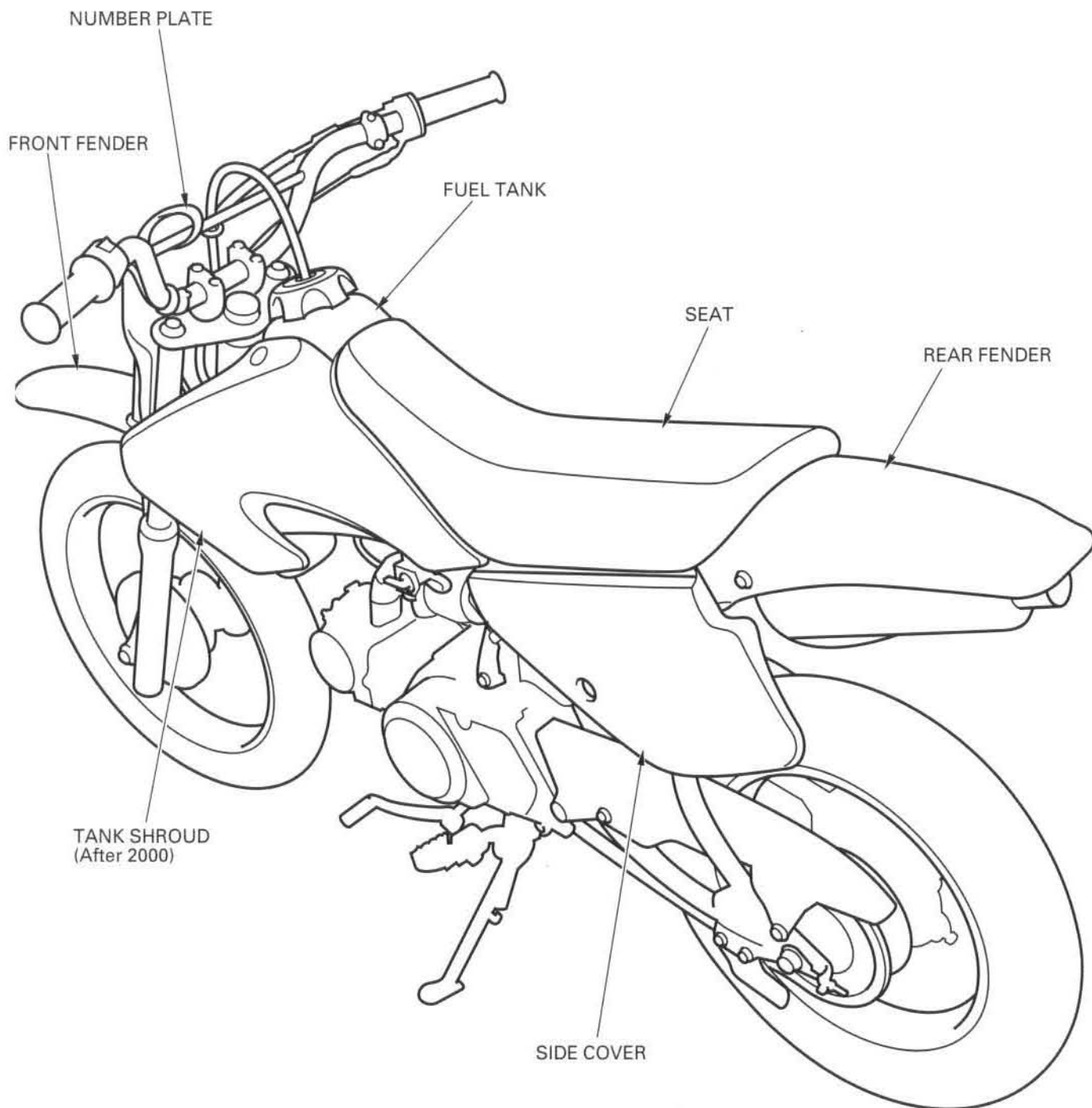
EMISSION CONTROL
INFORMATION LABEL (AFTER '99)

The Vehicle Emission Control Information Label is attached on the rear fender.



MEMO

BODY PANEL LOCATIONS



2. FRAME/BODY PANELS/EXHAUST SYSTEM

BODY PANEL LOCATIONS	2-0	FRONT FENDER	2-4
SERVICE INFORMATION	2-1	MUD GUARD	2-4
TROUBLESHOOTING	2-1	MUFFLER/EXHAUST PIPE	2-4
SEAT/FUEL TANK/SIDE COVER	2-2	SIDE STAND	2-6
NUMBER PLATE	2-3		

SERVICE INFORMATION

GENERAL

▲WARNING

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

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.
- This section covers removal and installation of the body panels, fuel tank and exhaust system.
- Always replace the exhaust pipe gaskets after removing the exhaust pipe from the engine.
- When installing the exhaust system, loosely install all of the exhaust pipe fasteners. Always tighten the exhaust clamps 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

Fuel valve mounting bolt	9 N·m (0.9 kgf·m , 6.5 lbf·ft)
Side stand pivot bolt	See page 2-6
Muffler stay bolt	26 N·m (2.7 kgf·m , 20 lbf·ft)
Exhaust pipe protector bolt	15 N·m (1.5 kgf·m , 11 lbf·ft)
Exhaust pipe cover screw A	6 N·m (0.6 kgf·m , 4.3 lbf·ft)
Exhaust pipe cover screw B	6 N·m (0.6 kgf·m , 4.3 lbf·ft)

TROUBLESHOOTING

Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leak

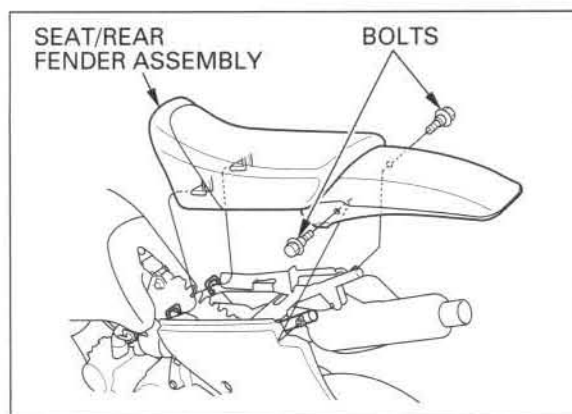
Poor performance

- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

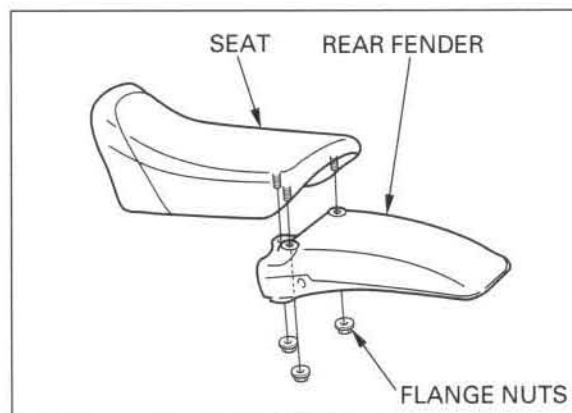
SEAT/REAR FENDER

REMOVAL

Remove the two mounting bolts and seat/rear fender assembly.



Remove the three flange nuts and rear fender from the seat.



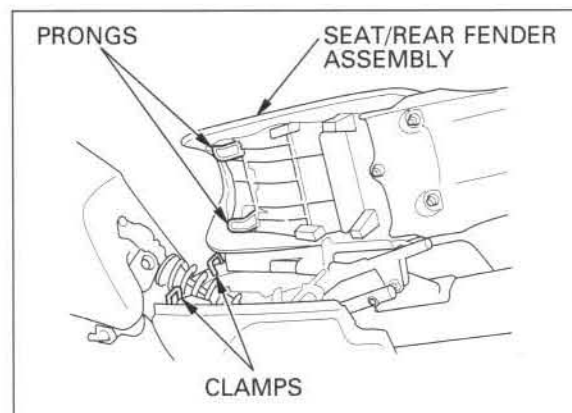
INSTALLATION

Installation is in the reverse order of removal.

NOTE:

'97-2000:

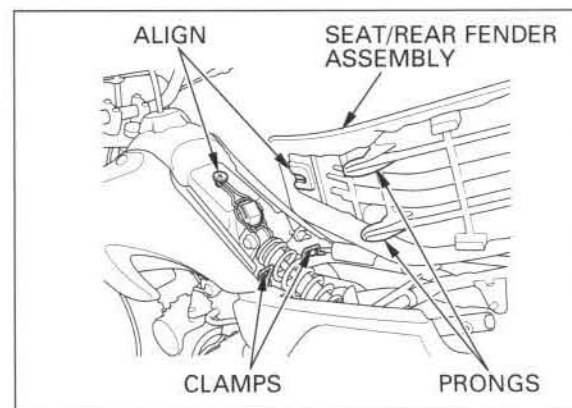
For seat installation, align the seat prongs with the frame clamps.



NOTE:

After 2000:

For seat installation, align the seat hook with the screw on the fuel tank, and also align the seat prongs with the frame clamps.



FUEL TANK

REMOVAL/INSTALLATION

▲WARNING

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

Turn the fuel valve OFF.
Disconnect the fuel tube from the fuel valve.
Disconnect the fuel tank breather tube from the number plate.

Remove the fuel tank holder band.
Remove the fuel tank mounting bolts and fuel tank.

Installation is in the reverse order of removal.

TANK SHROUD (AFTER 2000)

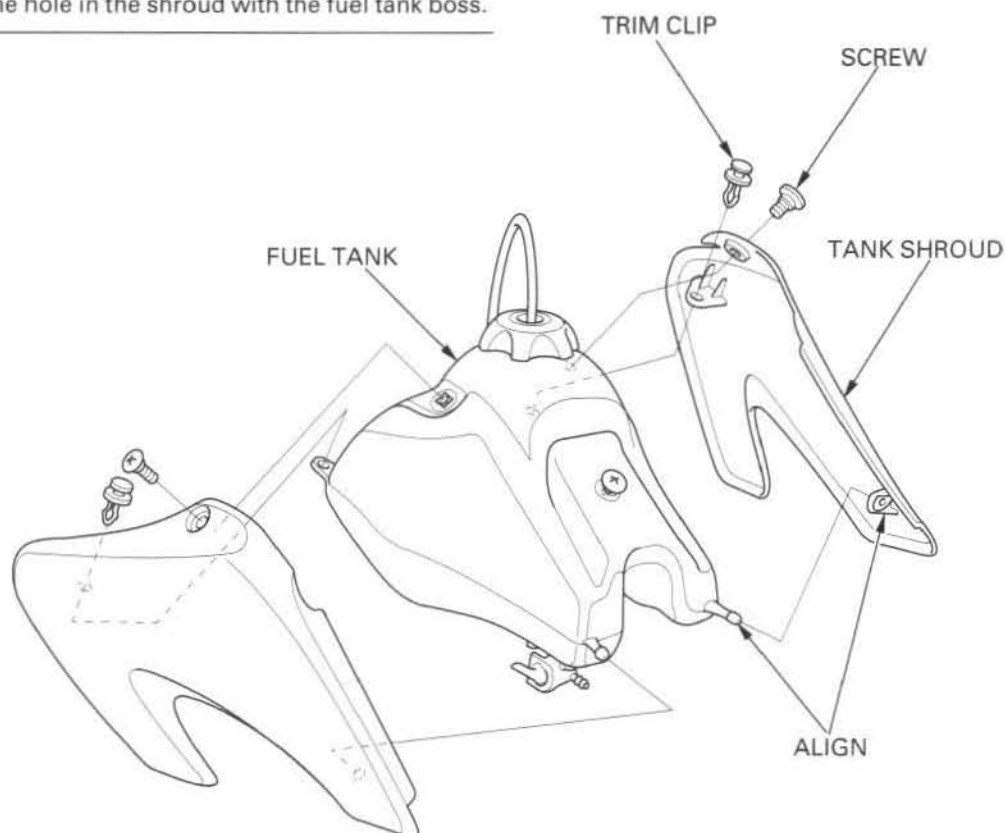
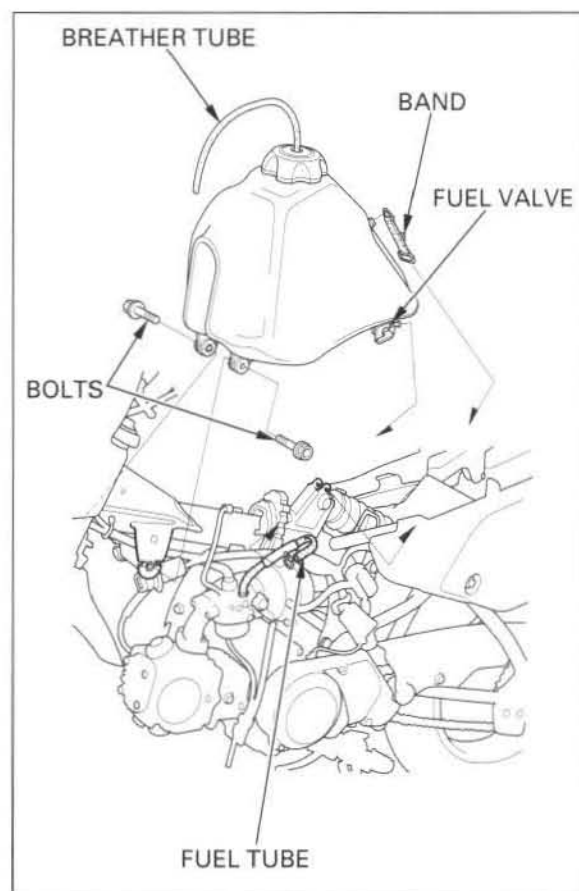
REMOVAL/INSTALLATION

Remove the screw and trim clip.
Remove the tank shroud from the fuel tank.

Installation is in the reverse order of removal.

NOTE:

Align the hole in the shroud with the fuel tank boss.



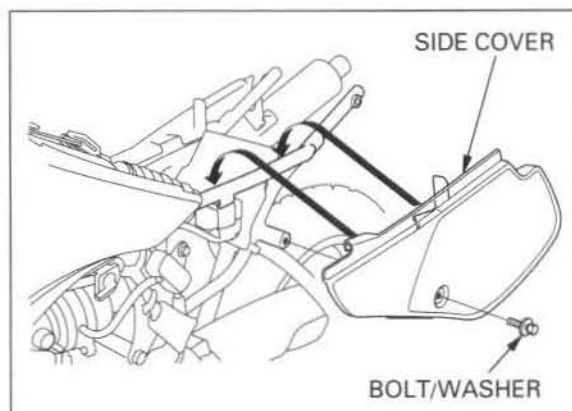
SIDE COVER

REMOVAL/INSTALLATION

Remove the seat (page 2-2).

Remove the bolt/washer and side cover.

Installation is in the reverse order of removal.



NUMBER PLATE

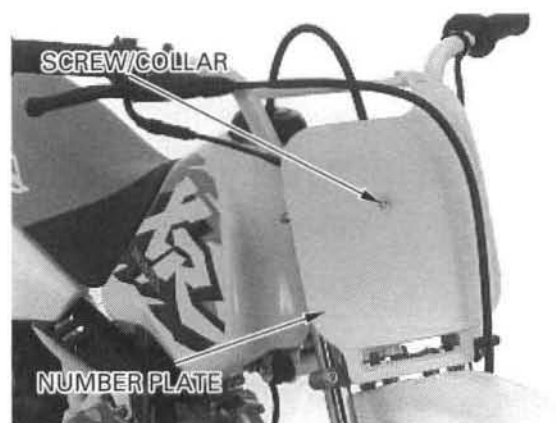
REMOVAL/INSTALLATION

Unfasten the number plate from the handlebar. Remove the screw, collar and number plate.

Installation is in the reverse order of removal.

NOTE:

At installation, align the lower grooves with the bracket tabs on the steering stem.

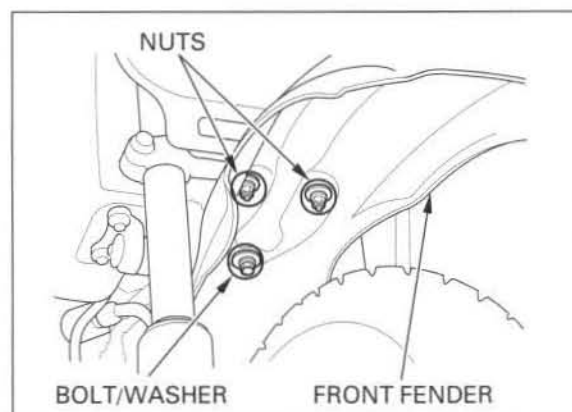


FRONT FENDER

REMOVAL/INSTALLATION

Remove the bolt, nuts, collars and front fender.

Installation is in the reverse order of removal.



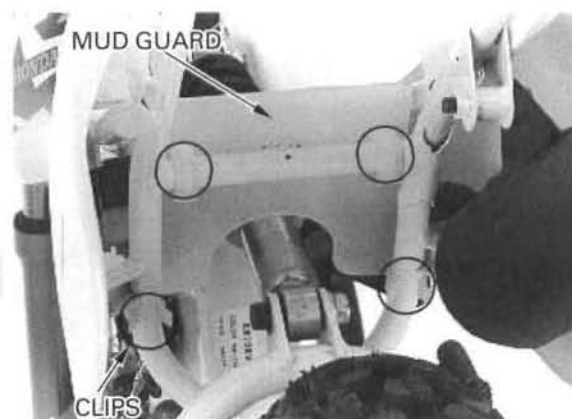
MUD GUARD

REMOVAL/INSTALLATION

Remove the seat (page 2-2).

Unhook the retaining clips and remove the mud guard.

Installation is in the reverse order of removal.



MUFFLER/EXHAUST PIPE

REMOVAL

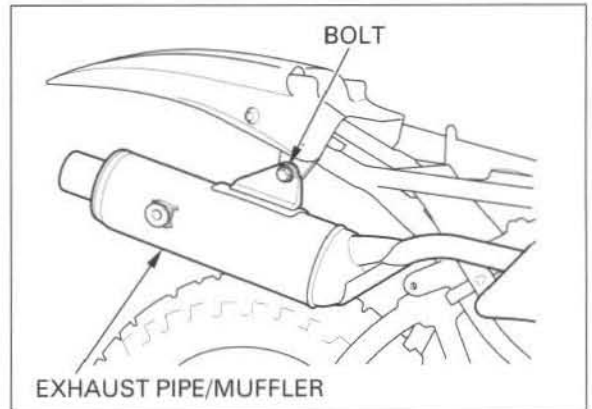
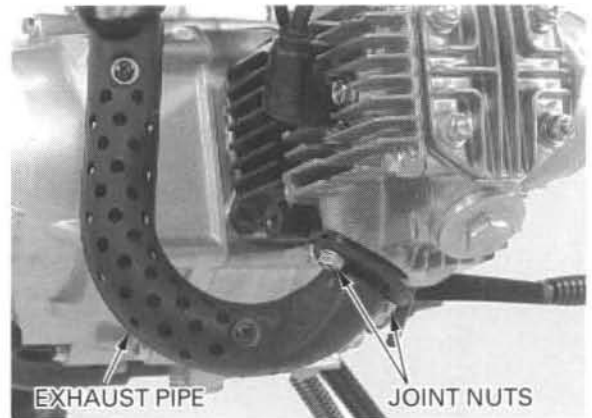
▲WARNING

Do not service the exhaust system while it is hot.

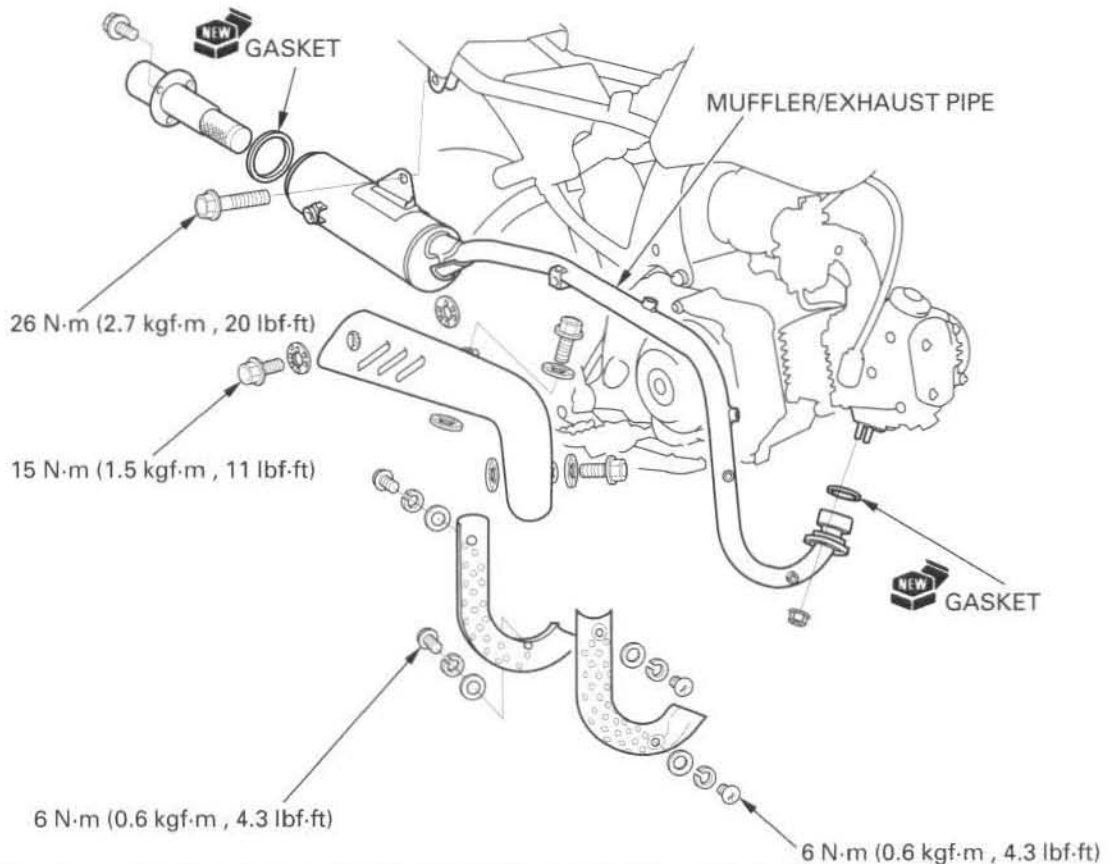
Remove the right side cover (page 2-2).

Remove the exhaust pipe joint nuts.

Remove the muffler mounting bolt and exhaust pipe/muffler assembly.



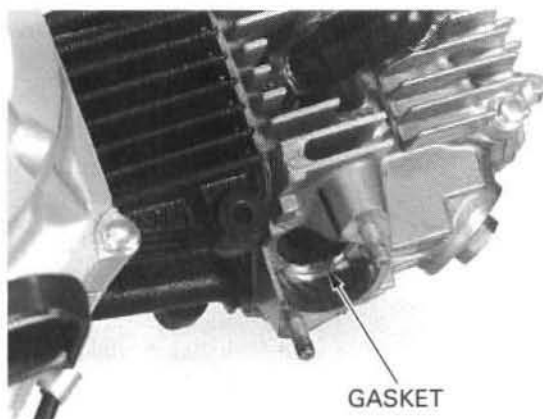
INSTALLATION



FRAME/BODY PANELS/EXHAUST SYSTEM

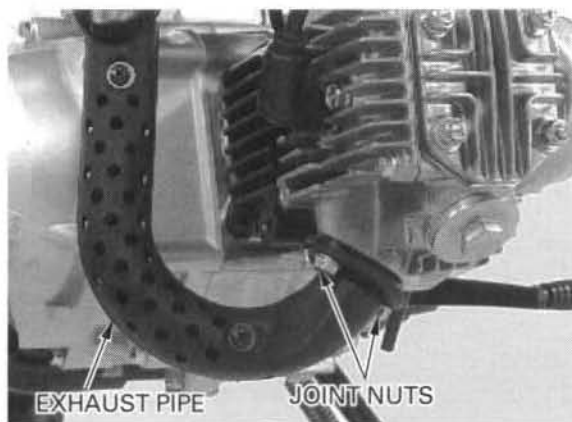
Always replace the exhaust pipe gasket with a new one.

Install the new exhaust pipe gasket onto the exhaust port of the cylinder head.



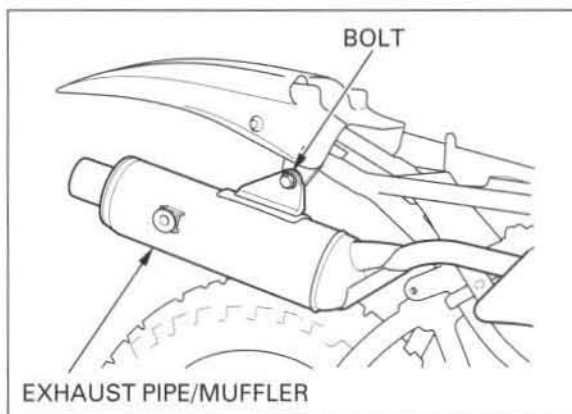
Install the exhaust pipe, then temporarily install the exhaust pipe joint nuts and mounting bolt.

First tighten the exhaust pipe joint nuts.



Tighten the exhaust pipe/muffler mounting bolt to the specified torque.

TORQUE: 26 N·m (2.7 kgf·m, 20 lbf·ft)



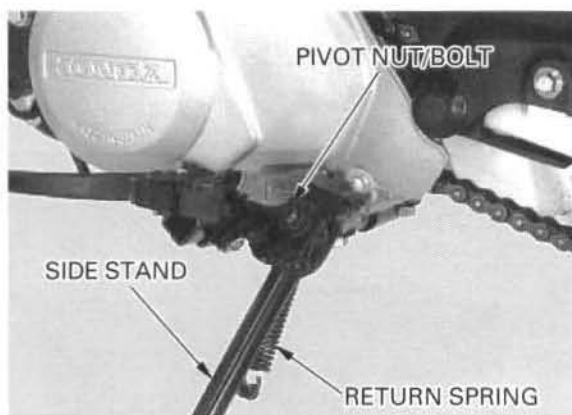
SIDE STAND

REMOVAL

NOTE:

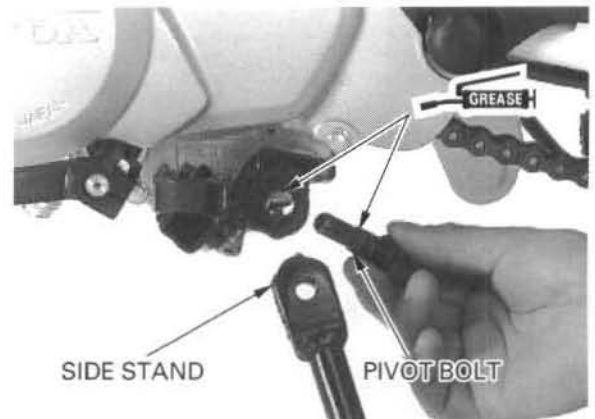
Support the motorcycle securely using a hoist or equivalent.

Unhook the side stand return spring.
Remove the pivot nut, bolt and side stand.



INSTALLATION

Apply grease to the side stand sliding area and pivot bolt.
Install the side stand to the main footpeg bracket.



Install the side stand pivot bolt and tighten it to the specified torque.

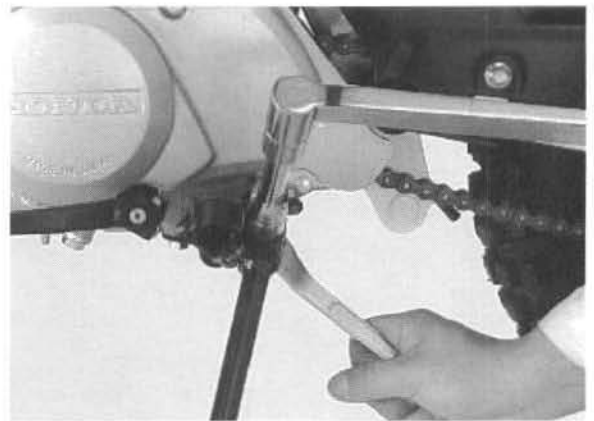
TORQUE: 10 N·m (1.0 kgf·m , 7 lbf·ft)



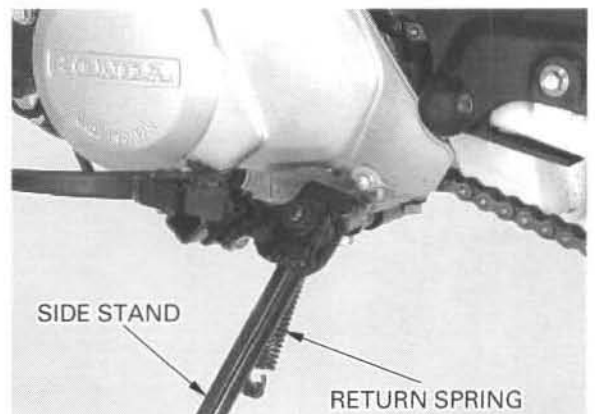
Loosen the pivot bolt about 45—90 degrees.

Hold the pivot bolt and tighten the pivot nut to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m , 25 lbf·ft)



Hook the side stand return spring as shown.



MEMO



3. MAINTENANCE

3

SERVICE INFORMATION	3-1	DRIVE CHAIN	3-13
MAINTENANCE SCHEDULE	3-3	DRIVE CHAIN SLIDER	3-15
FUEL LINE	3-5	BRAKE SHOE WEAR	3-15
THROTTLE OPERATION	3-5	BRAKE SYSTEM	3-15
AIR CLEANER	3-6	CLUTCH SYSTEM	3-17
SPARK PLUG	3-7	SIDE STAND	3-17
VALVE CLEARANCE	3-8	SUSPENSION	3-17
ENGINE OIL	3-9	SPARK ARRESTER	3-18
ENGINE OIL STRAINER SCREEN	3-11	NUTS, BOLTS, FASTENERS	3-19
ENGINE OIL CENTRIFUGAL FILTER	3-11	WHEELS/TIRES	3-19
ENGINE IDLE SPEED	3-12	STEERING HEAD BEARINGS	3-20

SERVICE INFORMATION

GENERAL

▲WARNING

- Gasoline is extremely flammable and is explosive under certain conditions. Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where the gasoline is stored can cause a fire or explosion.
- When 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.

- Place the motorcycle on level ground before starting any work.

SPECIFICATIONS

ITEM		SPECIFICATIONS	
Spark plug	Standard	CR6HSA (NGK)	U20FSR-U (DENSO)
	For cold climate/below 41°F/5°C	CR5HSA (NGK)	U16FSR-U (DENSO)
	For extended high speed riding	CR7HSA (NGK)	U22FSR-U (DENSO)

MAINTENANCE

ITEM		SPECIFICATIONS
Engine oil capacity	At draining	0.6 ℓ (0.6 US qt, 0.5 Imp qt)
	At disassembly	0.8 ℓ (0.8 US qt, 0.7 Imp qt)
Recommended engine oil		HONDA GN4 4-stroke oil or equivalent motor oil API service classification SF or SG Viscosity : SAE 10W-30
Engine idle speed		1,700 ± 100 rpm
Throttle grip free play		2.0 – 6.0 mm (1/12 – 1/4 in)
Valve clearance	IN	0.05 ± 0.02 mm (0.002 ± 0.001 in)
	EX	0.05 ± 0.02 mm (0.002 ± 0.001 in)
Drive chain slack		10 – 20 mm (3/8 – 3/4 in)
Brake lever free play		10 – 20 mm (3/8 – 3/4 in)
Brake pedal free play		20 – 30 mm (3/4 – 1-1/4 in)
Tire size	Front	2.50-14 4PR
	Rear	3.00-12 4PR
Tire brand	CHENG SHIN	Front C803
		Rear C803
Tire air pressure	Front	100 kPa (1.00 kgf/cm ² , 15 psi)
	Rear	100 kPa (1.00 kgf/cm ² , 15 psi)
Minimum tire tread depth	Front	1.5 mm (0.06 in)
	Rear	2.0 mm (0.08 in)

TORQUE VALUES

Spark plug	12 N·m (1.2 kgf·m, 9 lbf·ft)
Valve adjuster hole cap	12 N·m (1.2 kgf·m, 9 lbf·ft)
Valve adjuster lock nut	9 N·m (0.9 kgf·m, 6.5 lbf·ft)
Oil drain bolt	25 N·m (2.5 kgf·m, 18 lbf·ft)
Clutch outer cover screw	4 N·m (0.45 kgf·m, 3.3 lbf·ft)
Clutch adjuster lock nut	12 N·m (1.2 kgf·m, 9 lbf·ft)
Rear axle nut	59 N·m (6.0 kgf·m, 43 lbf·ft) U-nut

TOOLS

Valve adjusting wrench, 8 × 9 mm	07708-0030100	Equivalent commercially available in U.S.A.
Valve adjuster B	07708-0030400	or 07908-KE90200 (U.S.A. only)
Spoke wrench, 4.5 × 5.1 mm	07701-0020200	Equivalent commercially available in U.S.A.

MAINTENANCE SCHEDULE

'97:

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

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

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

ITEMS	FREQUENCY	NOTE ↓	BREAK-IN MAINTENANCE	REGULAR MAINTENANCE INTERVAL	REFER TO PAGE
			First week of operation— about 200 miles/ 350 km	Every 30 operat- ing days—about 1,000 miles/ 1,600 km	
* FUEL LINE				I	3-5
* THROTTLE OPERATION				I	3-5
AIR CLEANER		NOTE 1		C	3-6
SPARK PLUG				I	3-7
* VALVE CLEARANCE			I	I	3-8
ENGINE OIL			R	R	3-9
* * ENGINE OIL STRAINER SCREEN				YEAR: C	3-11
* * ENGINE OIL CENTRIFUGAL FILTER				YEAR: C	3-11
* ENGINE IDLE SPEED			I	I	3-12
DRIVE CHAIN			I, L	Every 10 operating days about 300 mi (500 km) I,L	3-13
DRIVE CHAIN SLIDER			I	I	3-15
BRAKE SHOE WEAR				I	3-15
BRAKE SYSTEM			I	I	3-15
CLUTCH SYSTEM			I	I	3-17
SIDE STAND				I	3-17
* SUSPENSION				I	3-17
* SPARK ARRESTER				1,000 mi (1,600 km) or every 100 operat- ing hours	3-18
* NUTS, BOLTS, FASTENERS			I	I	3-19
* * WHEELS/TIRES			I	I	3-19
* * STEERING HEAD BEARINGS			I	I	3-20

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

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

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

MAINTENANCE

AFTER '97

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

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

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

ITEMS			FREQUENCY	WHICHEVER COMES FIRST	INITIAL MAINTENANCE	REGULAR MAINTENANCE INTERVAL					REFER TO PAGE		
						⇨	mi	100	600	1,200		1,800	2,400
							km	150	1,000	2,000		3,000	4,000
							NOTE	MONTH	1	6		12	18
EMISSION RELATED ITEMS (After '99)	*	FUEL LINE					I		I	3-5			
	*	THROTTLE OPERATION					I		I	3-5			
		AIR CLEANER	NOTE 1			C	C	C	C	3-6			
		SPARK PLUG				I	I	I	I	3-7			
	*	VALVE CLEARANCE			I	I	I	I	I	3-8			
		ENGINE OIL			R	R	R	R	R	3-9			
	**	ENGINE OIL STRAINER SCREEN					C		C	3-11			
	**	ENGINE OIL CENTRIFUGAL FILTER					C		C	3-11			
	**	ENGINE IDLE SPEED			I		I	I	I	3-12			
		DRIVE CHAIN	NOTE 1		I, L	I, L: Every 300 mi (500 km) or 3 month					3-13		
NON-EMISSION RELATED ITEMS (After '99)		DRIVE CHAIN SLIDER				I	I	I	I	3-15			
		BRAKE SHOE WEAR				I	I	I	I	3-15			
		BRAKE SYSTEM			I	I	I	I	I	3-15			
		CLUTCH SYSTEM			I	I	I	I	I	3-17			
		SIDE STAND					I		I	3-17			
	*	SUSPENSION					I		I	3-17			
	*	SPARK ARRESTER				C : Every 1,000 mi(1,600 km) or every 100 operating hours					3-18		
	*	NUTS, BOLTS, FASTENERS			I		I		I	3-19			
	**	WHEELS/TIRES			I	I	I	I	I	3-19			
	**	STEERING HEAD BEARINGS			I		I		I	3-20			

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

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

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

FUEL LINE

Check the fuel lines 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. Smoking or allowing flames or sparks in the work area or where the gasoline is stored can cause a fire or explosion.*
- *Wipe spilled gasoline at once.*

Turn the fuel valve OFF and disconnect the fuel tube at the carburetor.

Place a drain pan under the fuel tube and turn the fuel valve ON to drain the fuel tank.

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

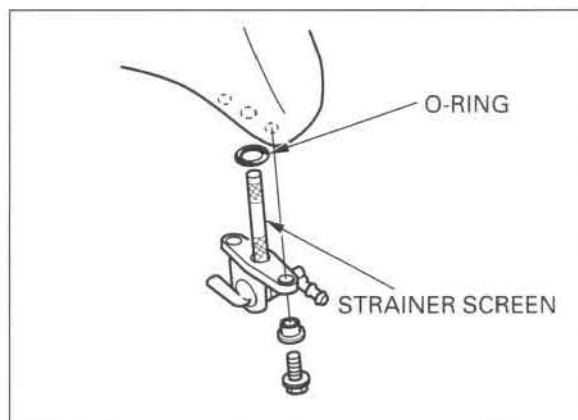
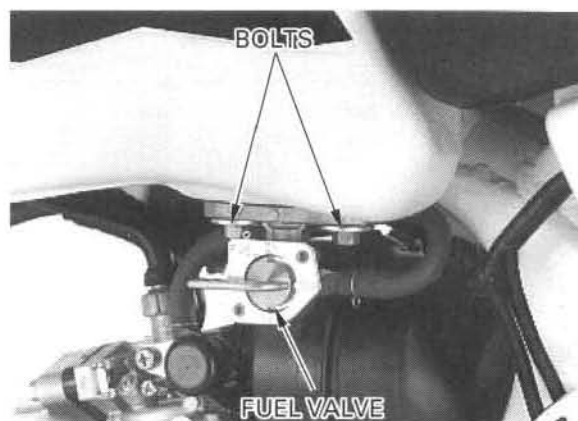
Wash the fuel strainer screen in non-flammable or high flash solvent.

Check the O-ring is in good condition, reinstall the fuel valve.

Tighten the fuel valve mounting bolts to the specified torque.

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

After installation, check for fuel leaks.



THROTTLE OPERATION

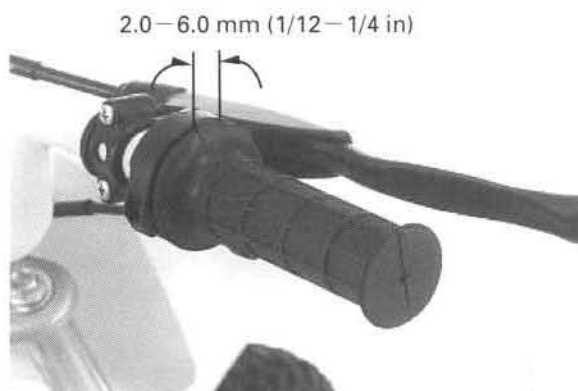
Check for smooth throttle grip full opening and automatic full closing in all steering positions.

Check the throttle cable and replace it if it is deteriorated, kinked or damaged.

Lubricate the throttle cable, if throttle operation is not smooth.

Measure the free play at the throttle grip flange.

FREE PLAY: 2.0—6.0 mm (1/12—1/4 in)

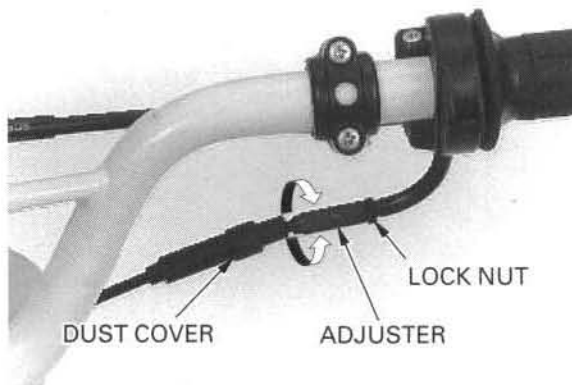


MAINTENANCE

Throttle grip free play can be adjusted at throttle housing adjuster.

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

Recheck the throttle operation.
Replace any damaged parts, if necessary.

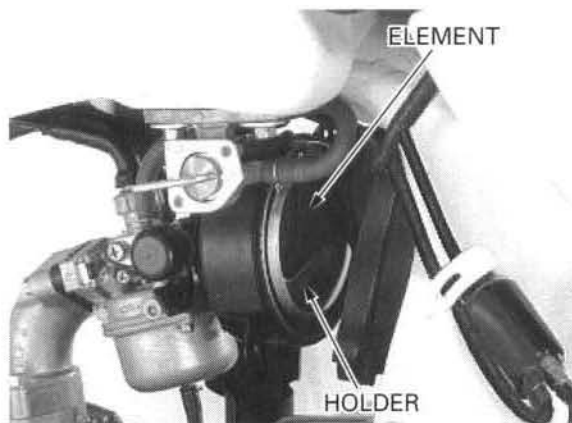


AIR CLEANER

Remove the air cleaner housing cover mounting screws.

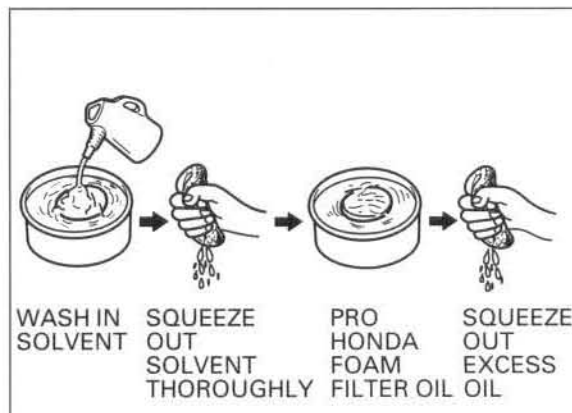


Remove air cleaner element holder and element from the housing.



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

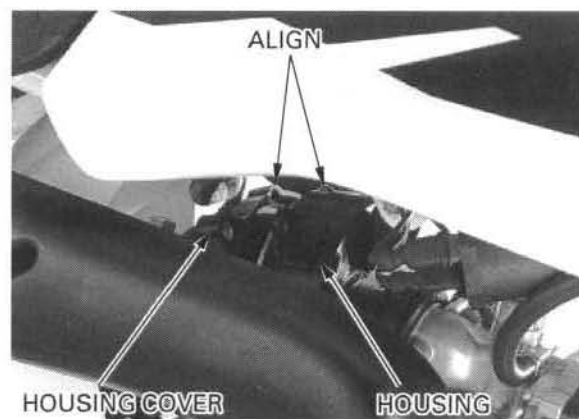
Soak the element in Pro Honda Foam Filter Oil or equivalent, and squeeze out any excess oil.



Install the air cleaner housing cover by aligning its groove with the projection on the housing.

Reinstall the element and air cleaner housing cover.

Install and tighten the housing cover screws.



SPARK PLUG

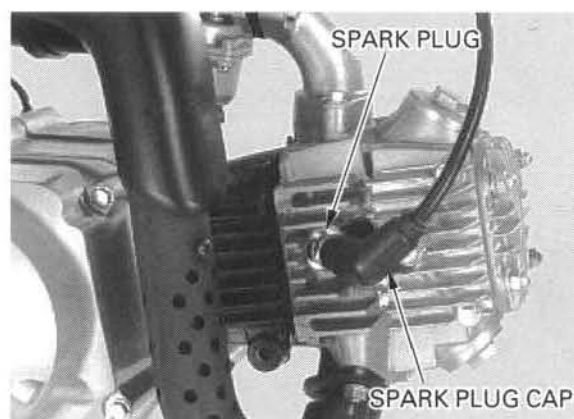
REMOVAL

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

Disconnect the spark plug cap.

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

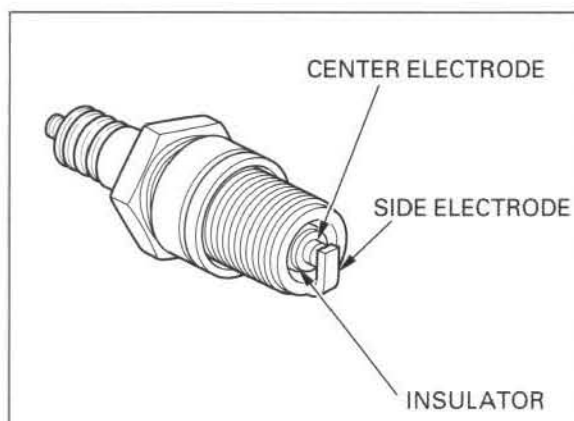
Inspect or replace as described in the maintenance schedule (page 3-3).



INSPECTION

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

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



REUSING A SPARK PLUG

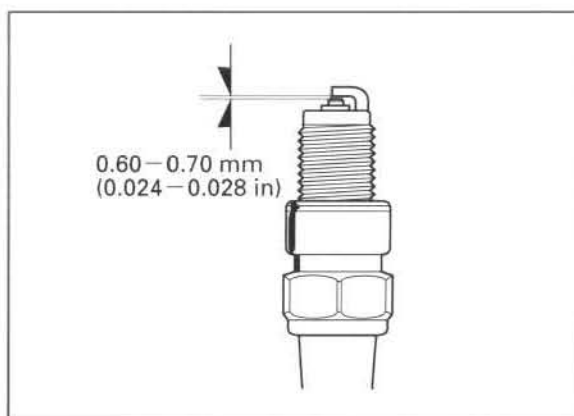
Clean the spark plug electrodes with a wire brush or special plug cleaner.

Check the gap between the center and side electrodes with a wire-type feeler gauge.

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

SPARK PLUG GAP:

0.60–0.70 mm (0.024–0.028 in)



CAUTION:

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

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

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

REPLACING A SPARK PLUG

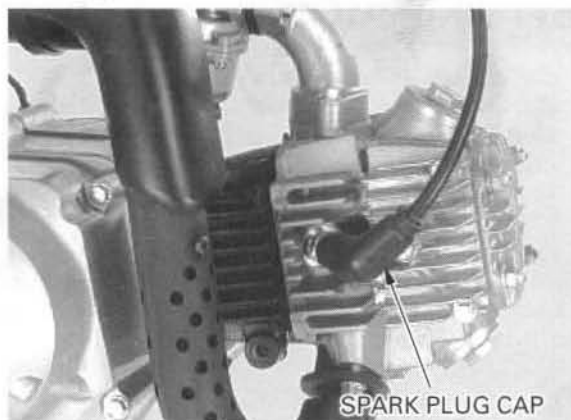
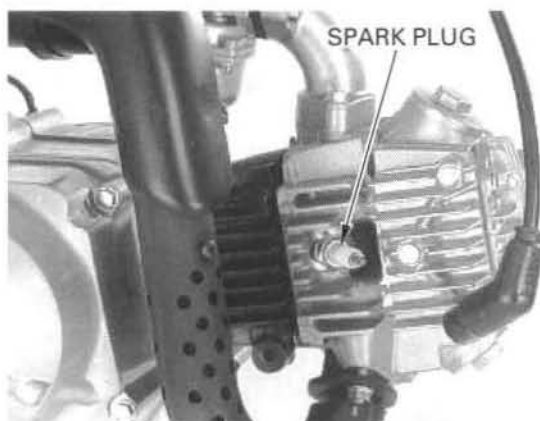
Set the plug gap to specification with a wire-type feeler gauge (see above).

CAUTION:

Do not overtighten the spark plug.

Install and hand tighten the new spark plug, then tighten it about 1/2 of a turn after the sealing washer contacts the seat of the plug hole.

Install the spark plug cap.



VALVE CLEARANCE

INSPECTION

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

Remove the valve adjuster hole caps.



Remove the left crankcase cover (page 10-2).

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

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



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

VALVE CLEARANCE:

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



ADJUSTMENT

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

Hold the adjusting screw and tighten the lock nut.

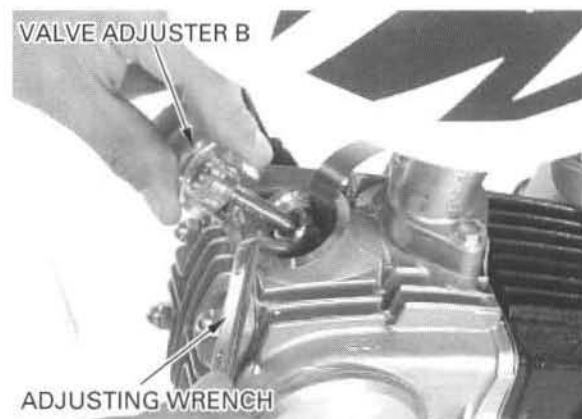
TOOLS:

Valve adjusting wrench, 8×9 mm

07708-0030100
(Equivalent commercially available in U.S.A.)

Valve adjuster B

07708-0030400 or
07908-KE90200
(U.S.A. only)



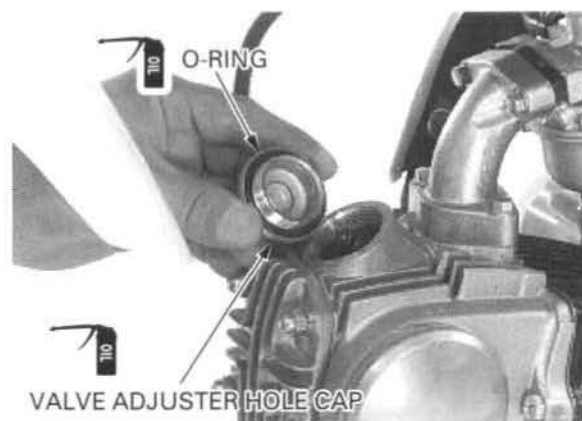
TORQUE: 9 N·m (0.9 kgf·m, 6.5 lbf·ft)

Recheck the valve clearance.

Check the valve adjuster hole cap O-ring is in good condition, replace if necessary.

Coat the O-rings with clean engine oil and install them on the valve adjuster hole caps.

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



TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

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

ENGINE OIL

OIL LEVEL INSPECTION

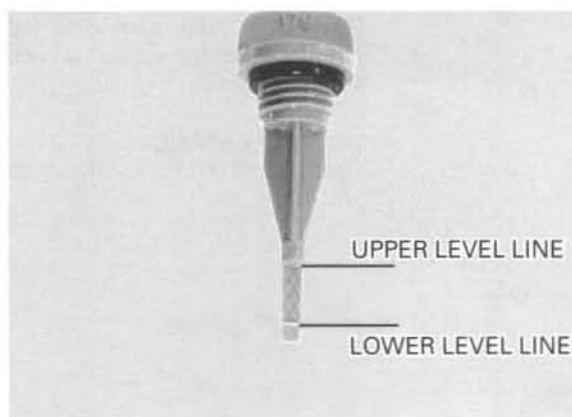
Support the motorcycle in an upright position on level ground.

Remove the oil level dipstick wipe it clean. Reinstall the oil level dipstick, but do not screw it into the case.



Remove the oil level dipstick and check the oil level.

If the level is below the lower mark on the dipstick, fill the crankcase with recommended oil.



RECOMMENDED ENGINE OIL:

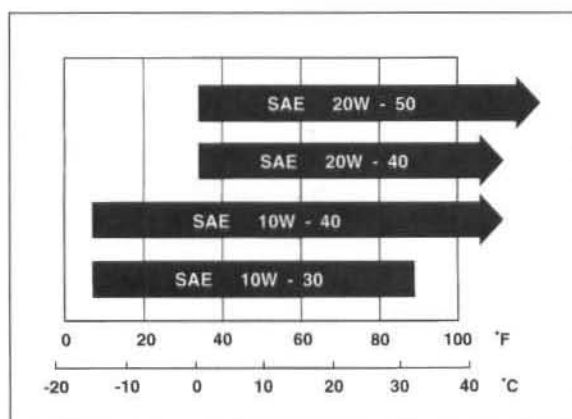
HONDA GN4 4-stroke oil or equivalent motor oil

API service classification: SF or SG

Viscosity: 10W-30

NOTE:

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

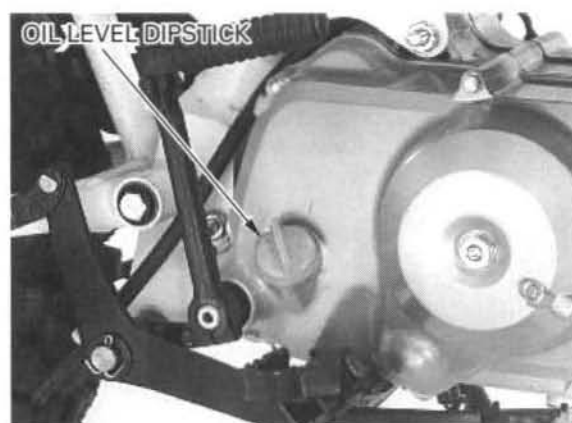


Reinstall the filler cap and dipstick.

ENGINE OIL CHANGE

▲WARNING

When 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.



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

Warm up the engine.

Stop the engine and remove the oil filler cap/dipstick and drain bolt. Drain the oil completely.

▲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.

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

TORQUE: 25 N·m (2.5 kgf·m , 18 lbf·ft)



DRAIN BOLT/SEALING WASHER

Fill the crankcase with recommended engine oil.

OIL CAPACITY:

0.6 l (0.6 US qt , 0.5 Imp qt) at draining

Install the oil level/dipstick.

Start the engine and let it idle for 2 to 3 minutes. Stop the engine and recheck the oil level. Make sure there are no oil leaks.



OIL LEVEL DIPSTICK

ENGINE OIL STRAINER SCREEN

OIL LEVEL INSPECTION

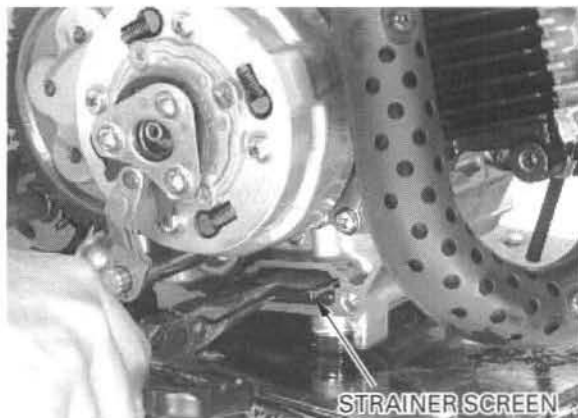
Perform this maintenance before filling the engine with oil.

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

Remove the oil strainer screen and clean it.

Reinstall the oil strainer screen and right crankcase cover (page 9-17).

Fill the crankcase with recommended engine oil (see above).



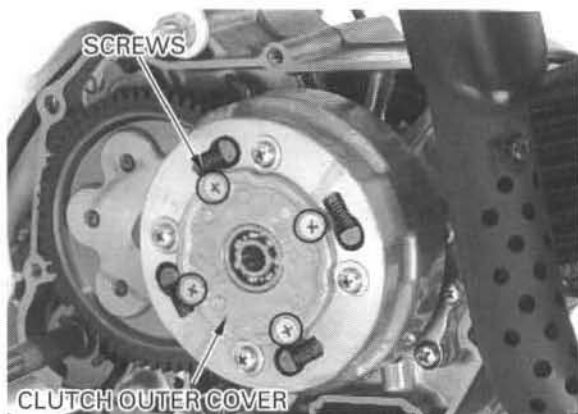
STRAINER SCREEN

ENGINE OIL CENTRIFUGAL FILTER

CLEANING

Remove the right crankcase cover and clutch lifter lever (page 9-3).

Remove the four screws and clutch outer cover.



SCREWS

CLUTCH OUTER COVER

MAINTENANCE

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

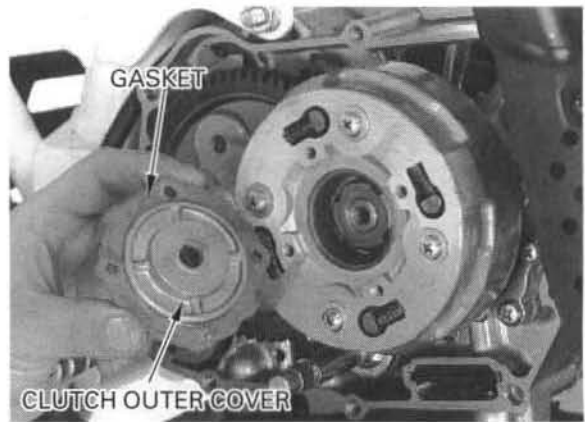
CAUTION:

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



Check the gasket is in good condition, replace if necessary.
Reinstall the clutch outer cover and tighten the screws to the specified torque.

TORQUE: 4 N·m (0.45 kgf·m, 3.3 lbf·ft)



ENGINE IDLE SPEED

▲WARNING

When 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.

NOTE:

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

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

IDLE SPEED: 1,700 ± 100 rpm



DRIVE CHAIN

DRIVE CHAIN SLACK INSPECTION

⚠ WARNING

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

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

CHAIN SLACK: 10–20 mm (3/8–3/4 in)

CAUTION:

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

ADJUSTMENT

Loosen the rear axle nut.
Turn both adjusting nuts until the correct drive chain slack is obtained.

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

TORQUE: 59 N·m (6.0 kgf·m , 43 lbf·ft)

Tighten the both adjusting nuts.

Recheck the drive chain slack and free wheel rotation.

Check the rear brake pedal free play (page 3-16), adjust if necessary.

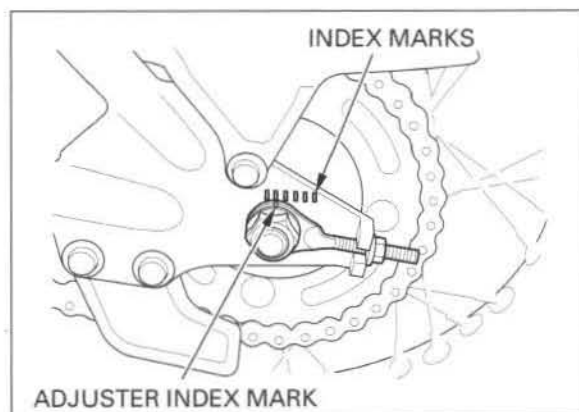
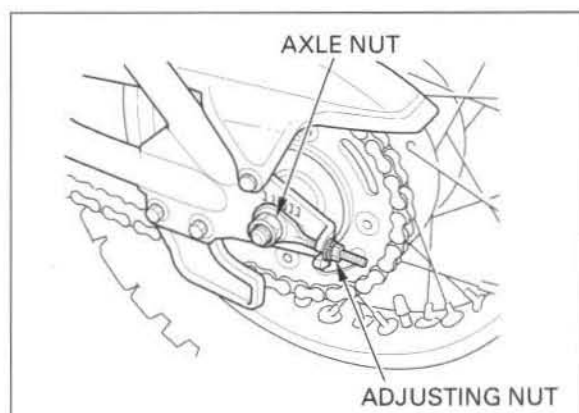
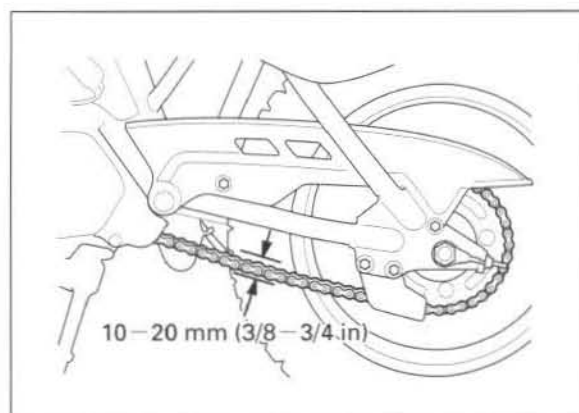
Lubricate the drive chain with #80–90 gear oil. Wipe off the excess oil.

CLEANING INSPECTION AND LUBRICATION

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

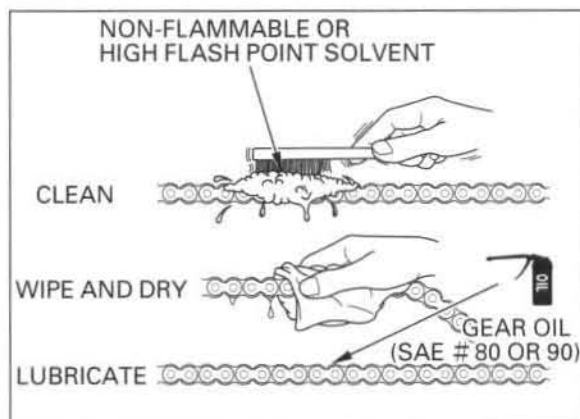
Remove the left crankcase cover (page 10-2).

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



MAINTENANCE

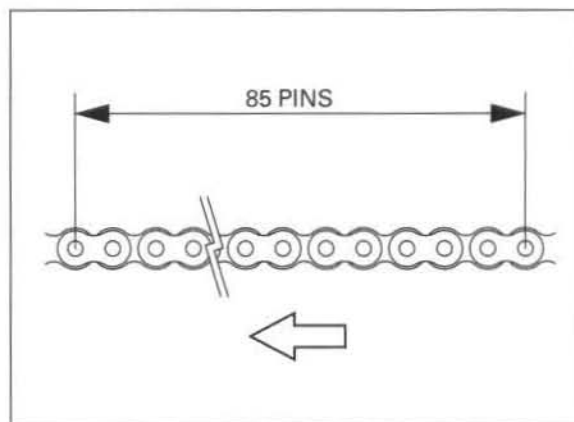
Clean the chain with non-flammable or high flash point solvent and wipe it dry.
Be sure the chain has dried completely before lubricating.
Lubricate the drive chain with # 80–90 gear oil.
Wipe off the excess gear oil.



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

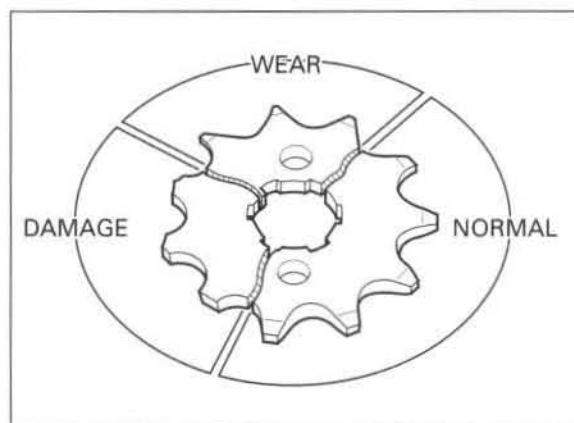
Measure the drive chain distance between a span of 85 pins from pin center to pin center with the chain held taut and any kinked joint straightened.

SERVICE LIMIT: 1,101 mm (43.3 in)

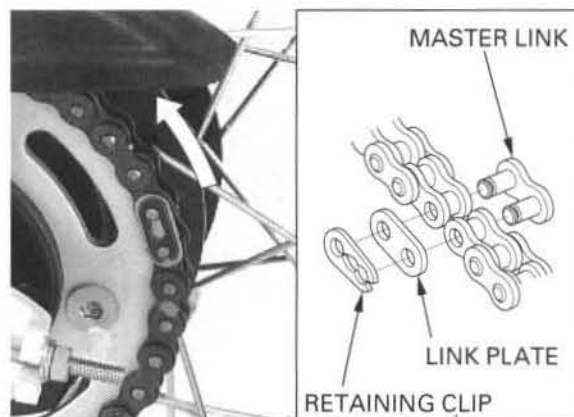


Installing a new chain on badly worn sprockets will cause the new chain to wear quickly.
Inspect the drive and driven sprocket teeth for wear or damage, replace if necessary.
Never use a new drive chain on worn sprockets.
Both chain and sprockets must be in good condition, or the new replacement chain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

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



Install the drive chain onto the sprockets.
Install the master link and link plate.
Install the retaining clip with the open end opposite the direction of chain travel.



DRIVE CHAIN SLIDER

Check the drive chain slider for wear or damage.

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



BRAKE SHOE WEAR

FRONT BRAKE SHOES

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

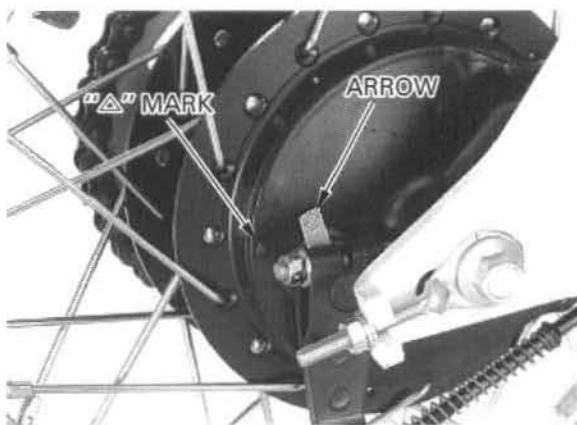
Refer to page 12-12 for brake shoe replacement.



REAR BRAKE SHOES

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

Refer to page 13-8 for brake shoe replacement.

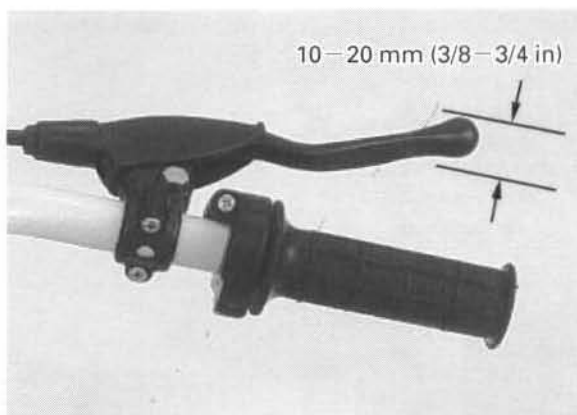


BRAKE SYSTEM

FRONT BRAKE

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

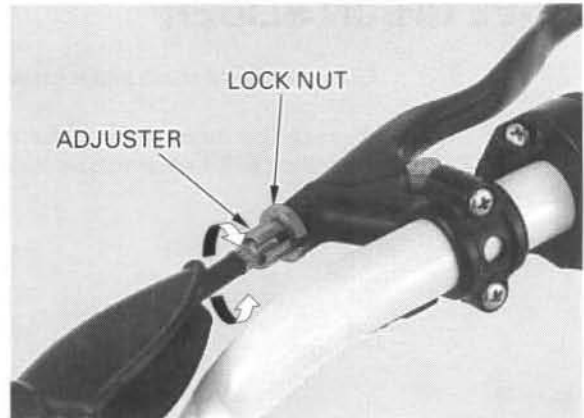
FREE PLAY: 10–20 mm (3/8–3/4 in)



MAINTENANCE

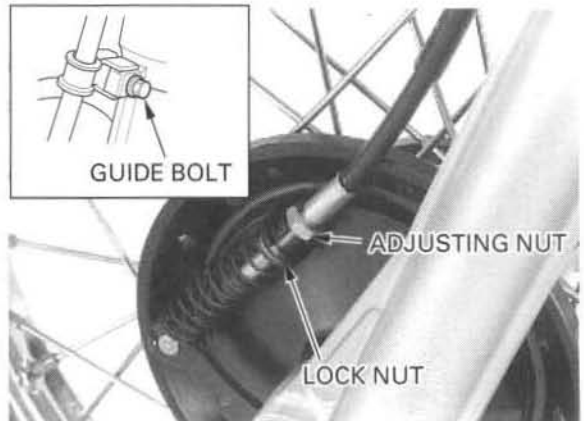
Minor adjustments can be made with the upper adjuster.
Loosen the lock nut and turning the adjuster.

After adjustment, tighten the lock nut.



Major adjustment can be made with the lower adjuster on the brake panel.
Loosen the brake cable guide bolt.
Loosen the lock nut and turning the adjusting nut.

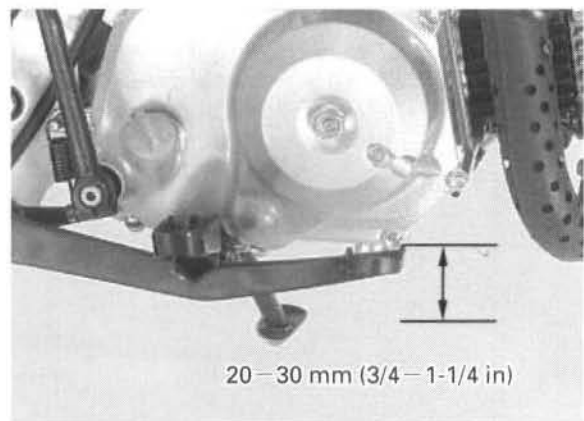
After adjustment, tighten the lock nut.
Tighten the brake cable guide bolt.



REAR BRAKE

Check the brake pedal free play.

FREE PLAY: 20–30 mm (3/4–1-1/4 in)



Make sure the cut-out on the adjusting nut is seated on the brake arm pin after making the final free play adjustment.

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



CLUTCH SYSTEM

If the clutch does not operate properly, adjust the following:

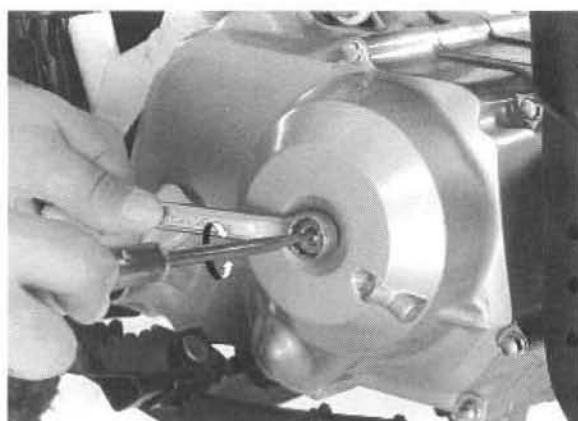
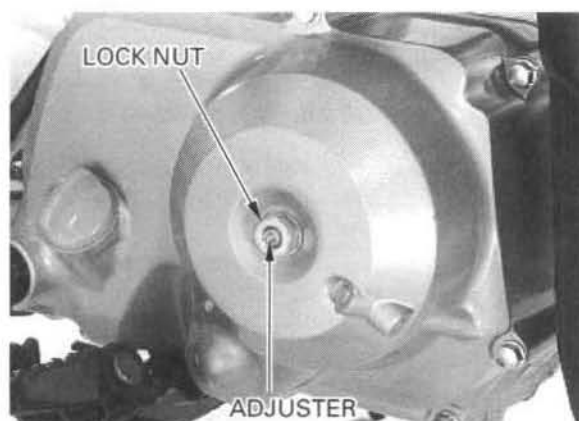
Loosen the clutch adjuster lock nut and turn the adjusting screw clockwise one full turn.
Do not turn excessively.

Slowly turn the adjusting screw counterclockwise until resistance is felt.

Turn the adjusting screw 1/8 turn clockwise from this position, and tighten the lock nut while holding the adjusting screw.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

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

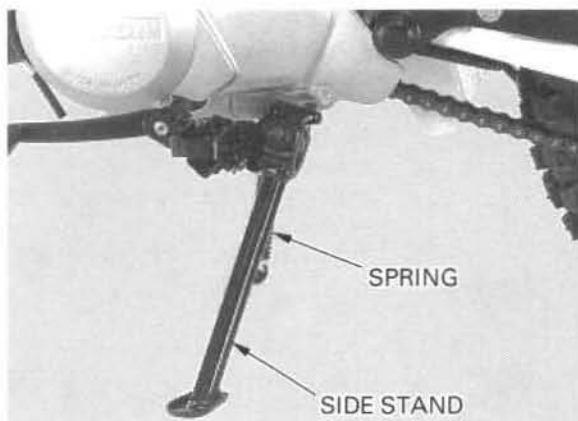


SIDE STAND

Support the motorcycle on a level surface.

Check the side stand spring for damage or loss of tension.

Check the side stand assembly for freedom of movement and lubricate the side stand pivot if necessary.



SUSPENSION

▲WARNING

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

FRONT SUSPENSION INSPECTION

Check the action of the fork legs by operating the front brake and compressing the front suspension several times.

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

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

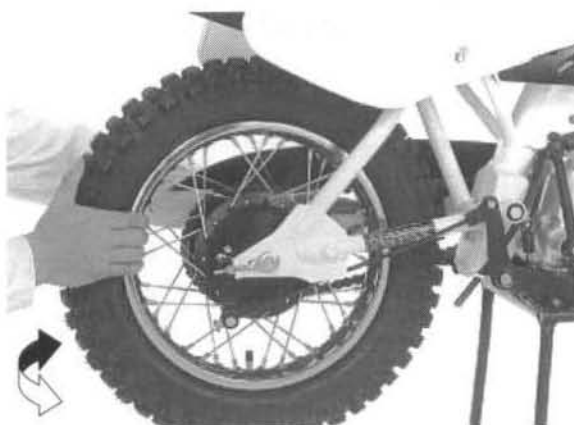
Refer to section 12 for fork service.



REAR SUSPENSION INSPECTION

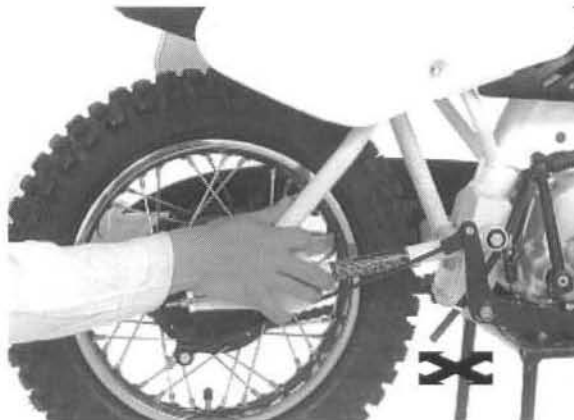
Support the motorcycle on safety stand or box and raise the rear wheel off the ground.

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



Check for worn swingarm bushings by grabbing the swingarm and attempting to move the swingarm side to side.

Replace the bushings if any are looseness is noted.



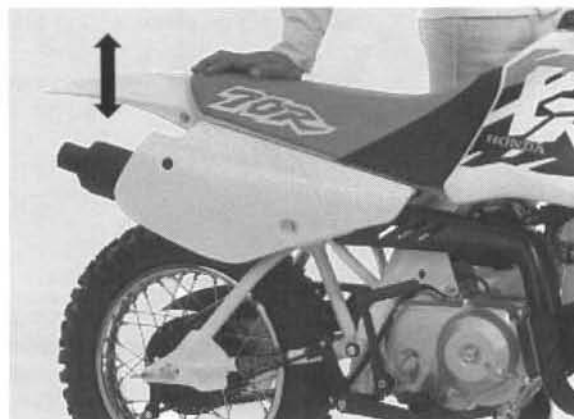
Check the action of the shock absorber by compressing it several times.

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

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

Refer to section 13 for shock absorber service.

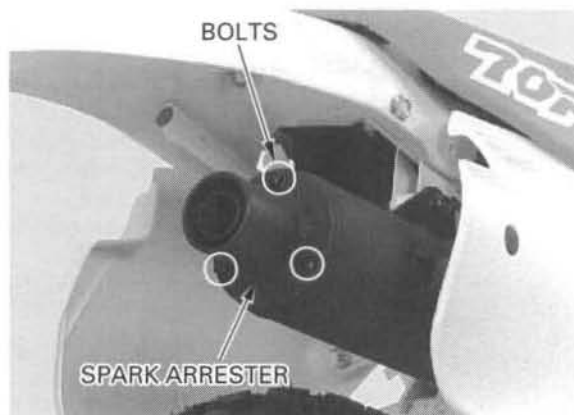


SPARK ARRESTER

⚠ WARNING

- *Wait until the pipe has cooled before removing or installing the spark arrester.*
- *Perform this operation in a well/ventilated area free from combustible materials.*

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



Use a soft brush to remove carbon from spark arrester screen.
The spark arrester must be free of breaks and holes.
Replace if necessary.

SPARK ARRESTER



Install the spark arrester and gasket in the muffler.
Tighten the three bolts securely.

NUTS, BOLTS, FASTENERS

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



WHEELS/TIRES

Tire pressure should be checked when the tires are COLD.

RECOMMENDED TIRE PRESSURE AND TIRE SIZE:

	FRONT	REAR
Tire pressure kPa (kgf/cm ² , psi)	100 (1.00, 15)	100 (1.00, 15)
Tire size	2.50-14 4PR	3.00-12 4PR
Tire brand (CHENG SHIN)	C803	C803

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

Check the front and rear wheels for trueness (refer to section 12 and 13).

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

MINIMUM TREAD DEPTH:

FRONT: 1.5 mm (0.06 in)

REAR: 2.0 mm (0.08 in)



Tighten any loose spokes.

TOOL:

Spoke wrench, 4.5 × 5.1 mm 07701-0020200
(Equivalent commercially available in U.S.A.)



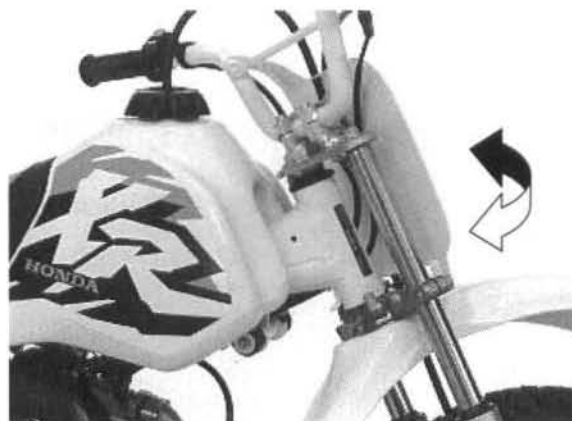
STEERING HEAD BEARINGS

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

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

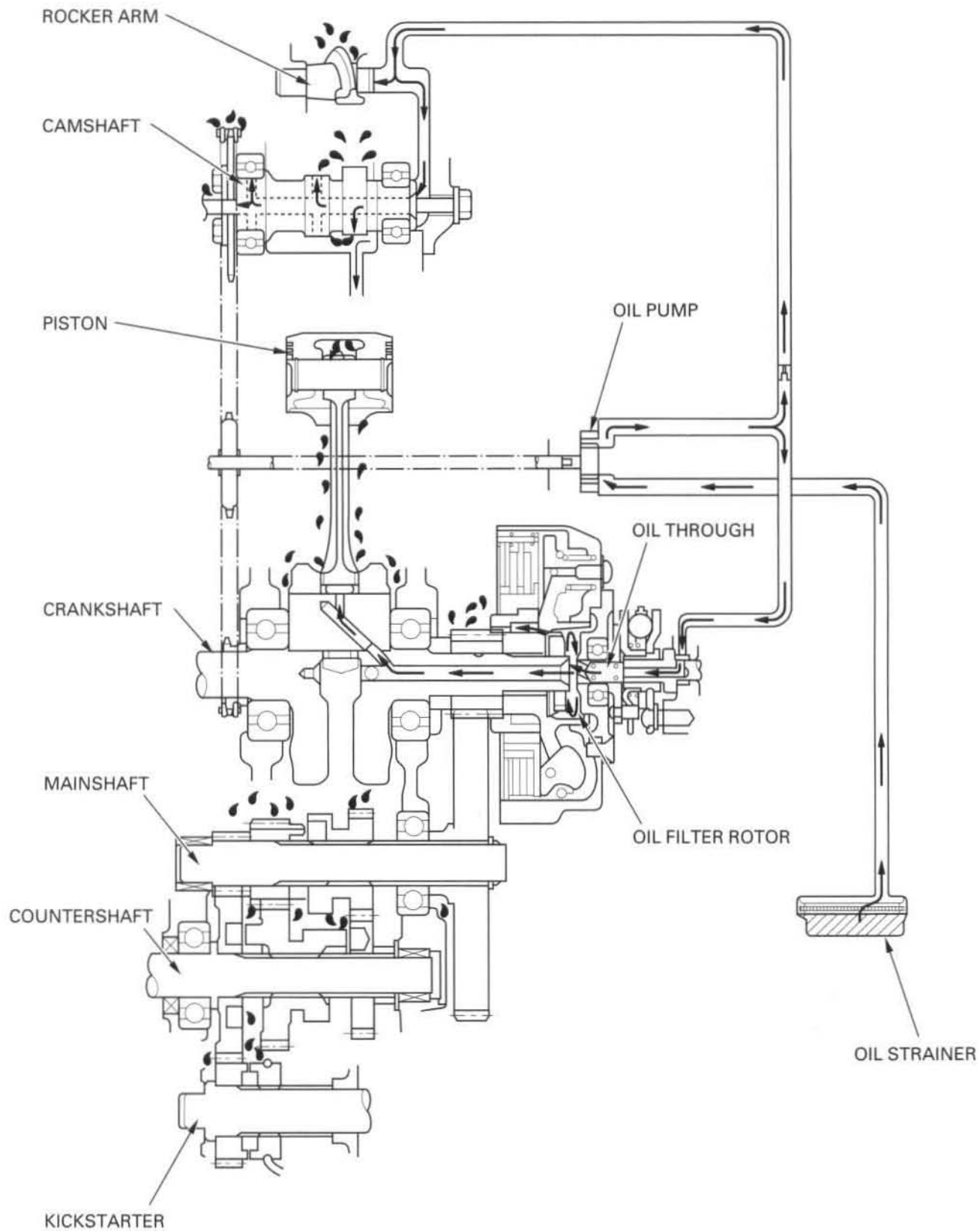
Check that the handlebar moves freely from side to side.

If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (page 12-21).



MEMO

LUBRICATION SYSTEM DIAGRAM



4. LUBRICATION SYSTEM

LUBRICATION SYSTEM DIAGRAM	4-0	TROUBLESHOOTING	4-1
SERVICE INFORMATION	4-1	OIL PUMP	4-2

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. Run the engine in an open area or with an exhaust evacuation system in enclosed area.
- 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.**

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

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	At draining	0.6 l (0.6 US qt, 0.5 Imp qt)	—
	At disassembly	0.8 l (0.8 US qt, 0.7 Imp qt)	—
Recommended engine oil		HONDA GN4 4-stroke oil or equivalent motor oil API service classification SF or SG Viscosity : SAE 10W-30	—
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.10—0.21 (0.004—0.008)	0.27 (0.011)
	Side clearance	0.03—0.08 (0.001—0.003)	0.12 (0.005)

TORQUE VALUES

Oil pump mounting screw	8 N·m (0.8 kgf·m, 5.8 lbf·ft)
Oil pump cover screw	5 N·m (0.5 kgf·m, 3.6 lbf·ft)
Oil drain bolt	25 N·m (2.5 kgf·m, 18 lbf·ft)

TROUBLESHOOTING

Engine oil level too low

- Normal oil consumption
- External oil leak
- Worn piston ring or incorrect piston ring installation
- Worn valve guide or seal

Oil contamination

- External oil leak
- Worn piston ring or incorrect piston ring installation
- Worn valve guide or seal
- Clogged oil strainer screen

Low oil pressure

- Oil pump worn or damaged
- Oil not change often enough
- Oil pump drive sprocket broken

OIL PUMP

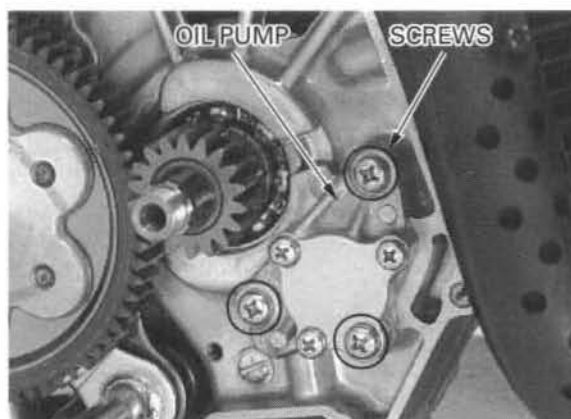
REMOVAL

Drain the engine oil (page 3-10).

Remove the following:

- Right crankcase cover (page 9-3)
- Clutch assembly (page 9-4)

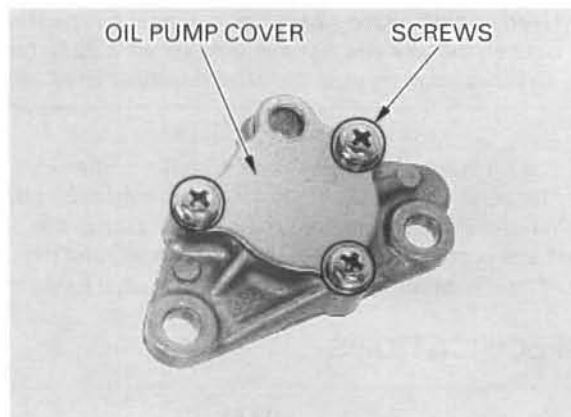
Remove the three screws and oil pump assembly.



DISASSEMBLY

Remove the three screws and oil pump cover.

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



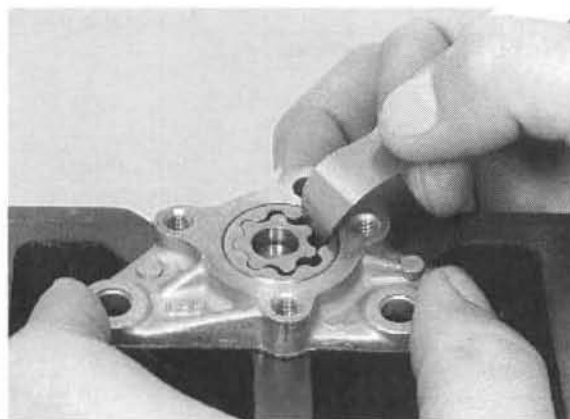
INSPECTION

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

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

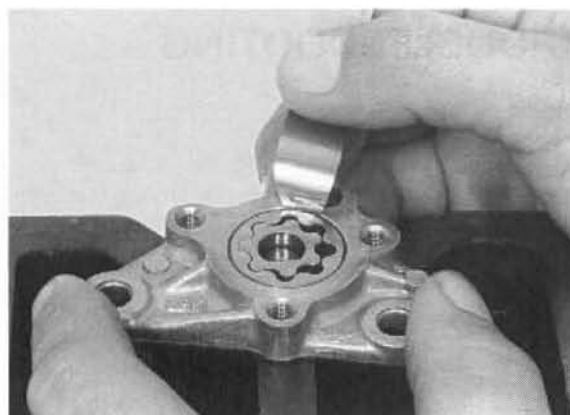
Measure the tip clearance between the inner and outer rotors.

SERVICE LIMIT: 0.20 mm (0.008 in)



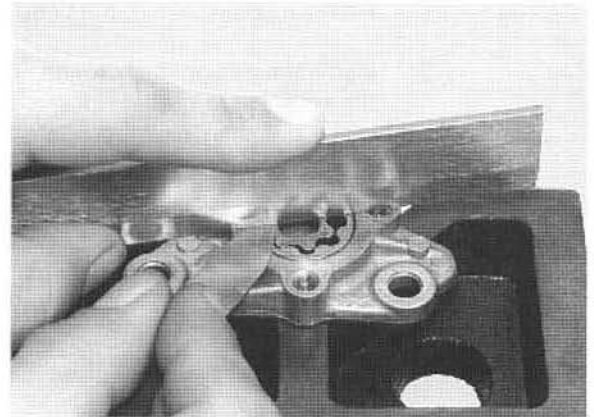
Measure the pump body clearance between the outer rotor and pump body.

SERVICE LIMIT: 0.27 mm (0.011 in)

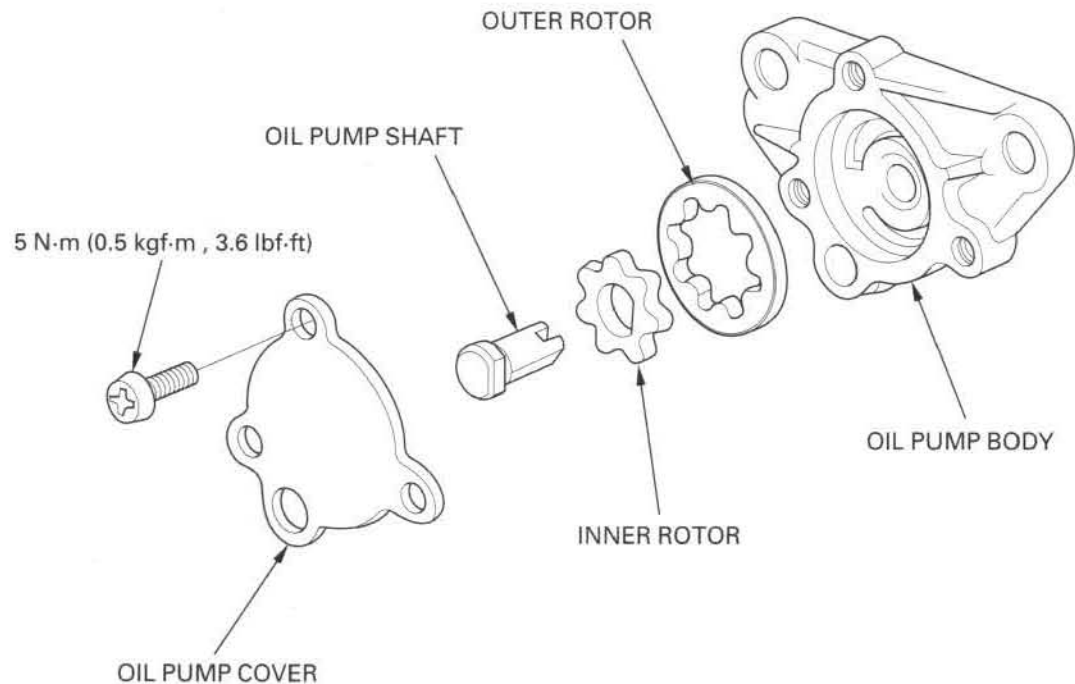


Measure the side clearance using a straight edge and feeler gauge.

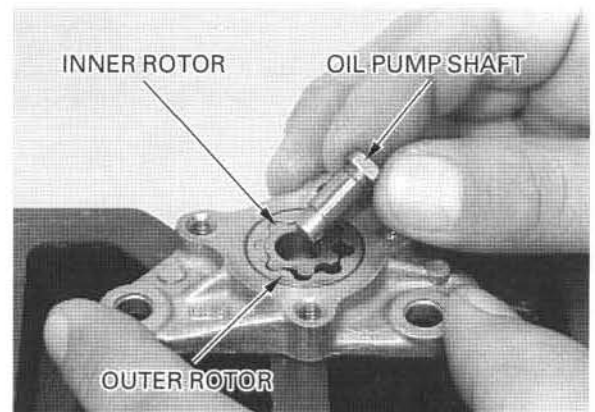
SERVICE LIMIT: 0.12 mm (0.005 in)



ASSEMBLY



Install the inner and outer rotors into the oil pump body.
Install the oil pump shaft aligning the flats between the shaft and inner rotor.

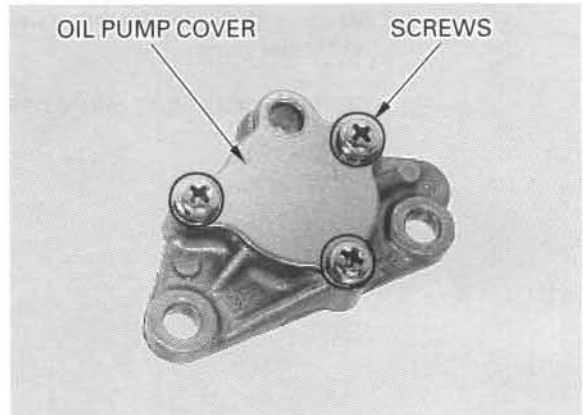


LUBRICATION SYSTEM

Fill the oil pump with 0.5–1 cm³ of engine oil.

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

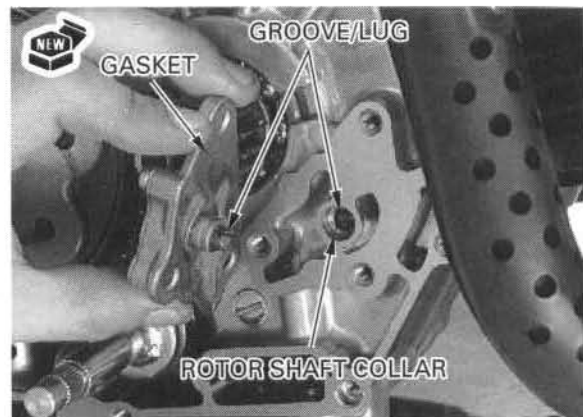
TORQUE: 5 N·m (0.5 kgf·m , 3.6 lbf·ft)



INSTALLATION

Install the rotor shaft collar into the crankcase.
Install a new gasket onto the oil pump body.

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



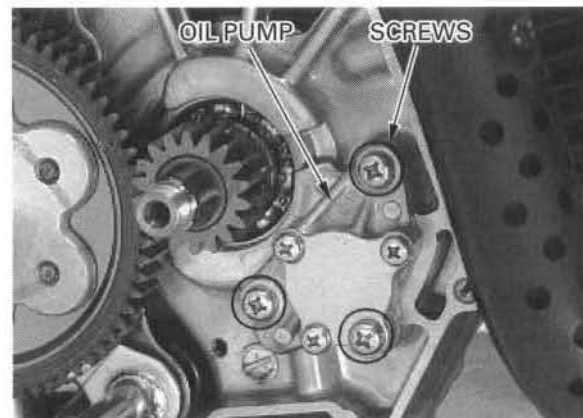
Install and tighten the three screws to the specified torque.

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

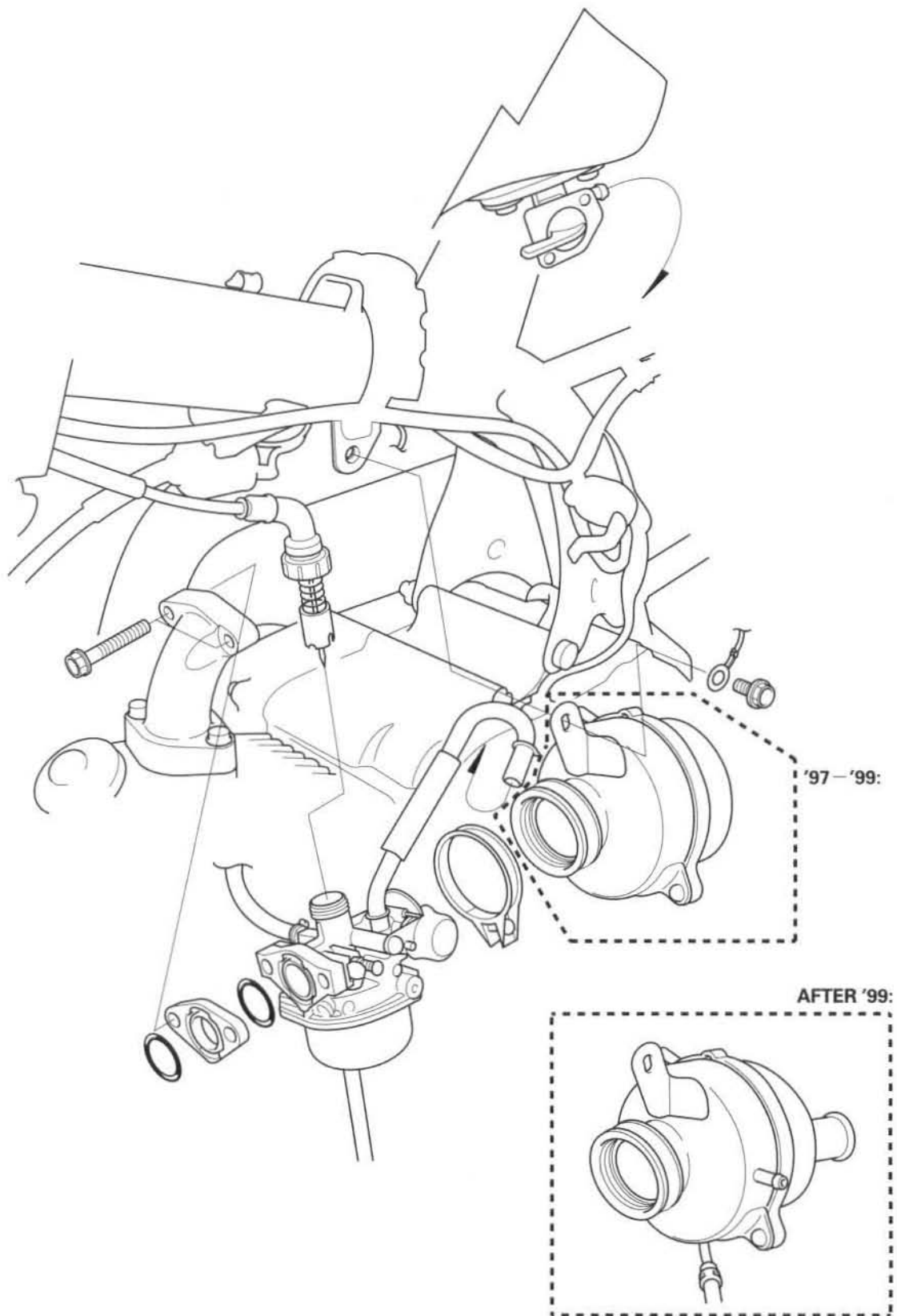
Install the following:

- Clutch assembly (page 9-12)
- Right crankcase cover (page 9-17)

After installation, fill the crankcase with recommended oil (page 3-10) and check that there is no oil leak.



MEMO



5. FUEL SYSTEM

5

SERVICE INFORMATION	5-1	CARBURETOR ASSEMBLY	5-6
TROUBLESHOOTING	5-2	CARBURETOR INSTALLATION	5-8
AIR CLEANER HOUSING	5-3	AIR SCREW ADJUSTMENT	5-11
CARBURETOR REMOVAL	5-4	CRANKCASE BREATHER	5-13
CARBURETOR DISASSEMBLY	5-5		

SERVICE INFORMATION

GENERAL

▲WARNING

- Gasoline is extremely flammable and is explosive under certain conditions. **KEEP OUT OF REACH OF CHILDREN.**
- Bending or twisting the control cable will impair smooth operation and could cause the cable to stick or bind, resulting in loss of vehicle control.

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.
- Refer to section 2 for fuel tank removal and installation.
- When disassembling fuel system parts, note the location of the O-rings. Replace them with new ones on reassembly.
- Before disassembling the carburetor, place the suitable container under the carburetor drain tube. Loosen the screw and drain the carburetor.
- After removing the carburetor, wrap the intake port of the engine with a shop towel or cover it with piece of tape to prevent any foreign material from dropping into the engine.

NOTE:

If the vehicle is to be stored for more than one month, drain the float bowl. Fuel left in the float bowl may cause clogged jets, resulting in hard starting or poor driveability.

SPECIFICATIONS

ITEM	SPECIFICATIONS
Carburetor identification number	PB12H
Main jet	#62
Slow jet	#38 × #38
Jet needle clip position	3rd groove from top
Air screw initial opening	1-1/2 turns out
Float level	10.7 mm (0.42 in)
Idle speed	1,700 ± 100 rpm
Throttle grip free play	2.0–6.0 mm(1/12–1/4in)

TOOL

Carburetor float level gauge

07401–0010000

TROUBLESHOOTING

Engine won't start

- Too much fuel getting to the engine
 - Air cleaner clogged
 - Flooded carburetor
- Intake air leak
- Fuel contaminated/deteriorated
- No fuel to carburetor
 - Fuel strainer clogged
 - Fuel tube clogged
 - Float level misadjusted
 - Fuel tank breather tube clogged

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

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

Engine stall, hard to start, rough idling

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

Afterburn when engine braking is used

- Lean mixture in slow circuit

Backfiring or misfiring during acceleration

- Ignition system malfunction
- Fuel mixture too lean

Poor performance (driveability) and poor fuel economy

- Fuel system clogged
- Ignition system malfunction

AIR CLEANER HOUSING

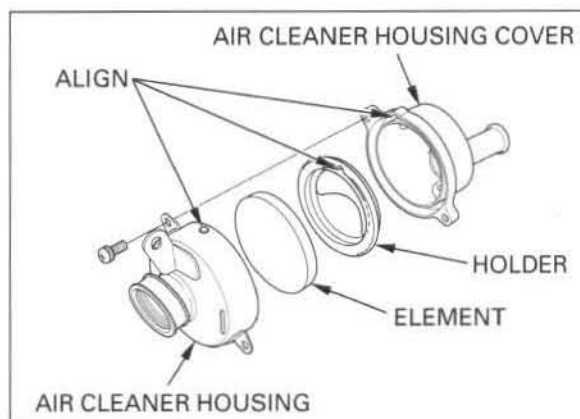
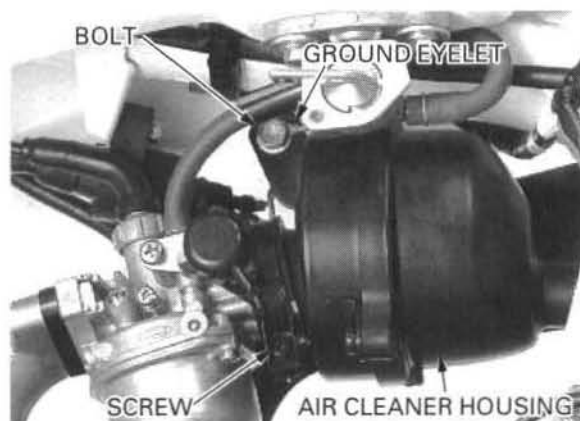
REMOVAL/INSTALLATION

NOTE:

Refer to page 3-6 for air cleaner element service.

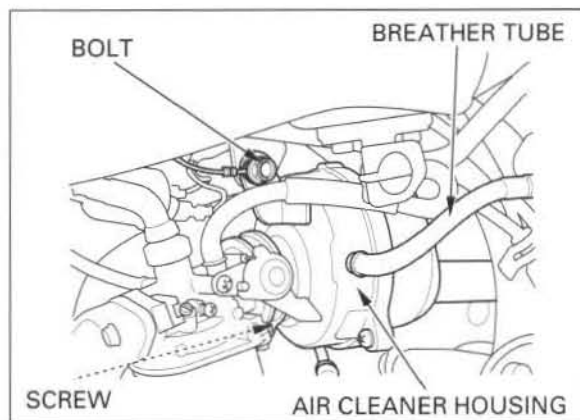
- '97-'99: Loosen the connecting tube band screw.
Remove the bolt and air cleaner housing assembly.

At installation, secure the ground eyelet with the air cleaner housing mounting bolt. Installation is in the reverse order of removal.

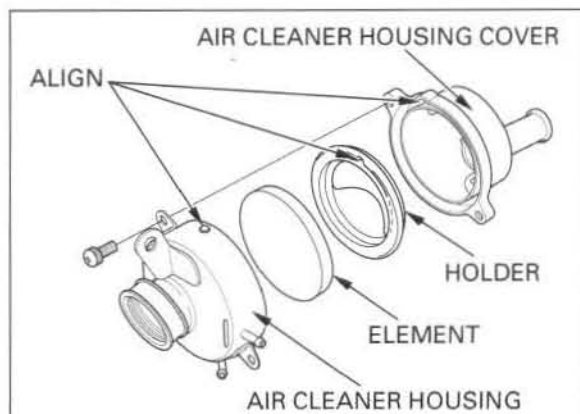


- After '99: Disconnect the crankcase breather tube from the air cleaner housing.

Loosen the connecting tube band screw.
Remove the bolt and air cleaner housing assembly.



At installation, secure the ground eyelet with the air cleaner housing mounting bolt. Installation is in the reverse order of removal.



CARBURETOR REMOVAL

⚠WARNING

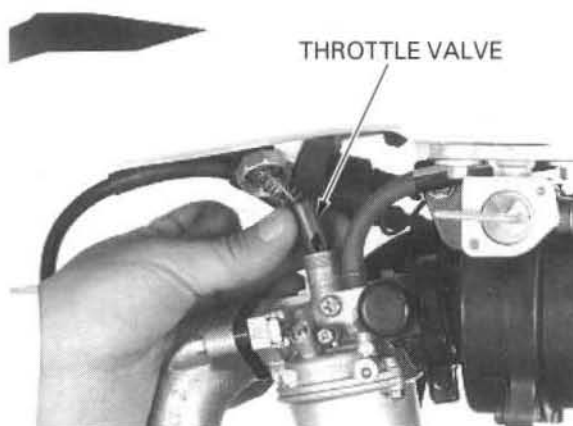
Gasoline is extremely flammable and is explosive under certain conditions. KEEP OUT OF REACH OF CHILDREN.

THROTTLE VALVE

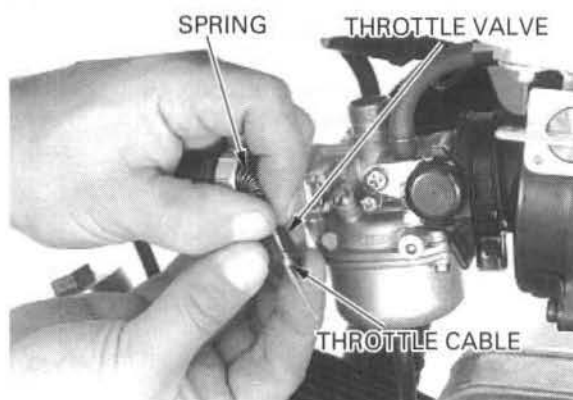
Loosen the carburetor top.



Remove the carburetor top and throttle valve from the carburetor.

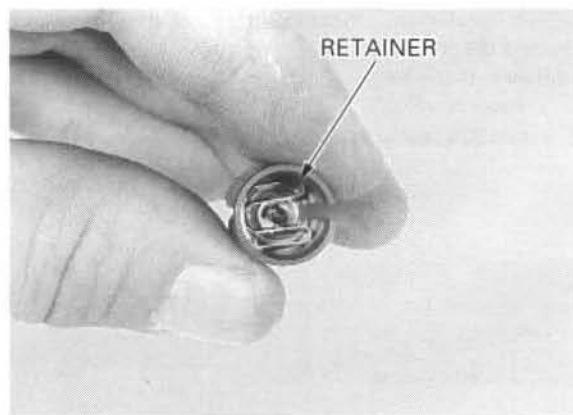


Remove the throttle cable from the throttle valve while compressing the throttle valve spring.



Remove the jet needle retainer and jet needle.

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



CARBURETOR BODY

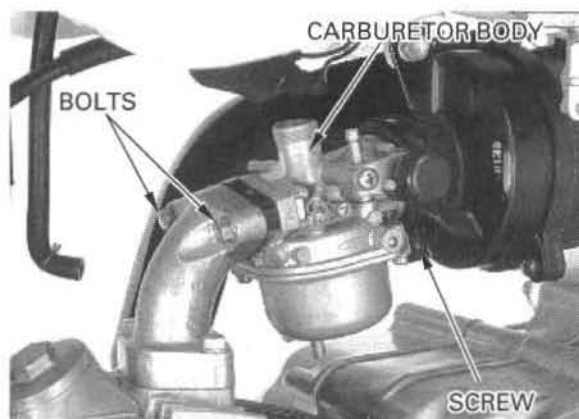
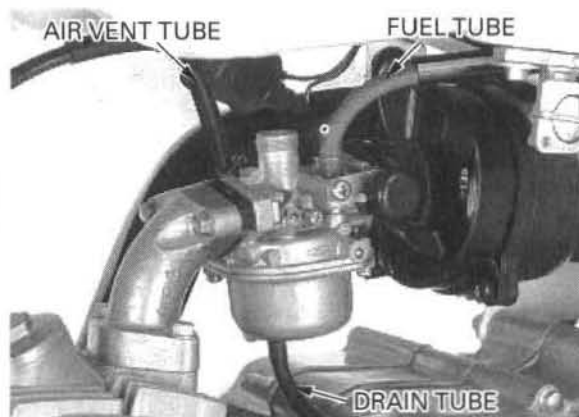
⚠ WARNING

Gasoline is extremely flammable and is explosive under certain conditions. Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where the gasoline is stored can cause a fire or explosion.

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

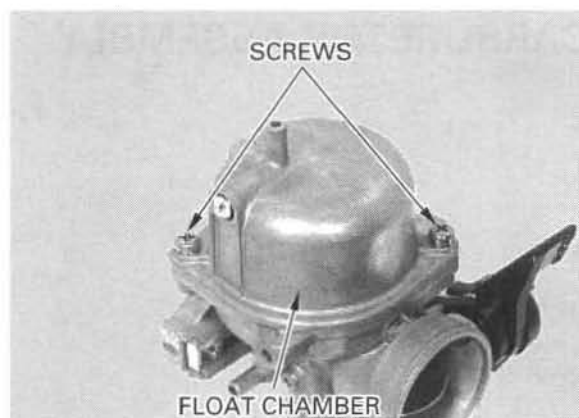
Disconnect the fuel tube, air vent tube and drain tube from the carburetor body.

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



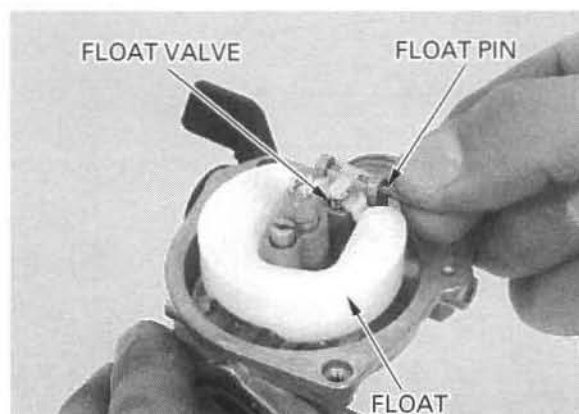
CARBURETOR DISASSEMBLY

Remove the screws and float chamber.



Remove the float pin, float and float valve.

Inspect the float for deformation or damage.



FUEL SYSTEM

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

Check the operation of the float valve.

Remove the following:

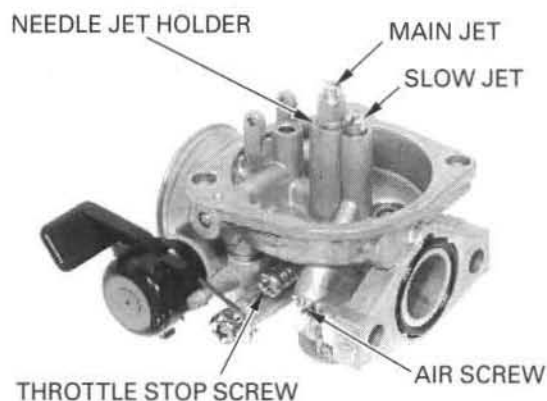
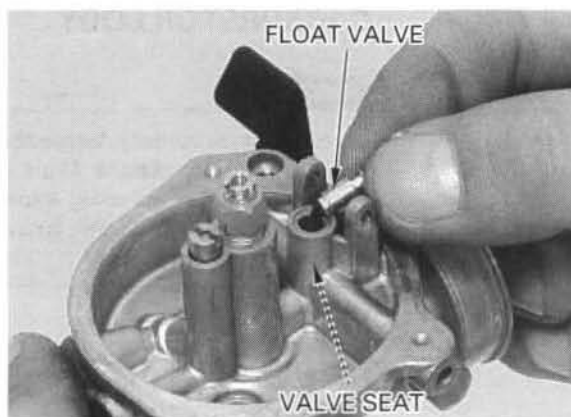
- Main jet
- Needle jet holder
- Needle jet
- Slow jet
- Throttle stop screw/spring

Turn the air screw in and record the number of turns it takes before it seats lightly.
Remove the air screw and spring.

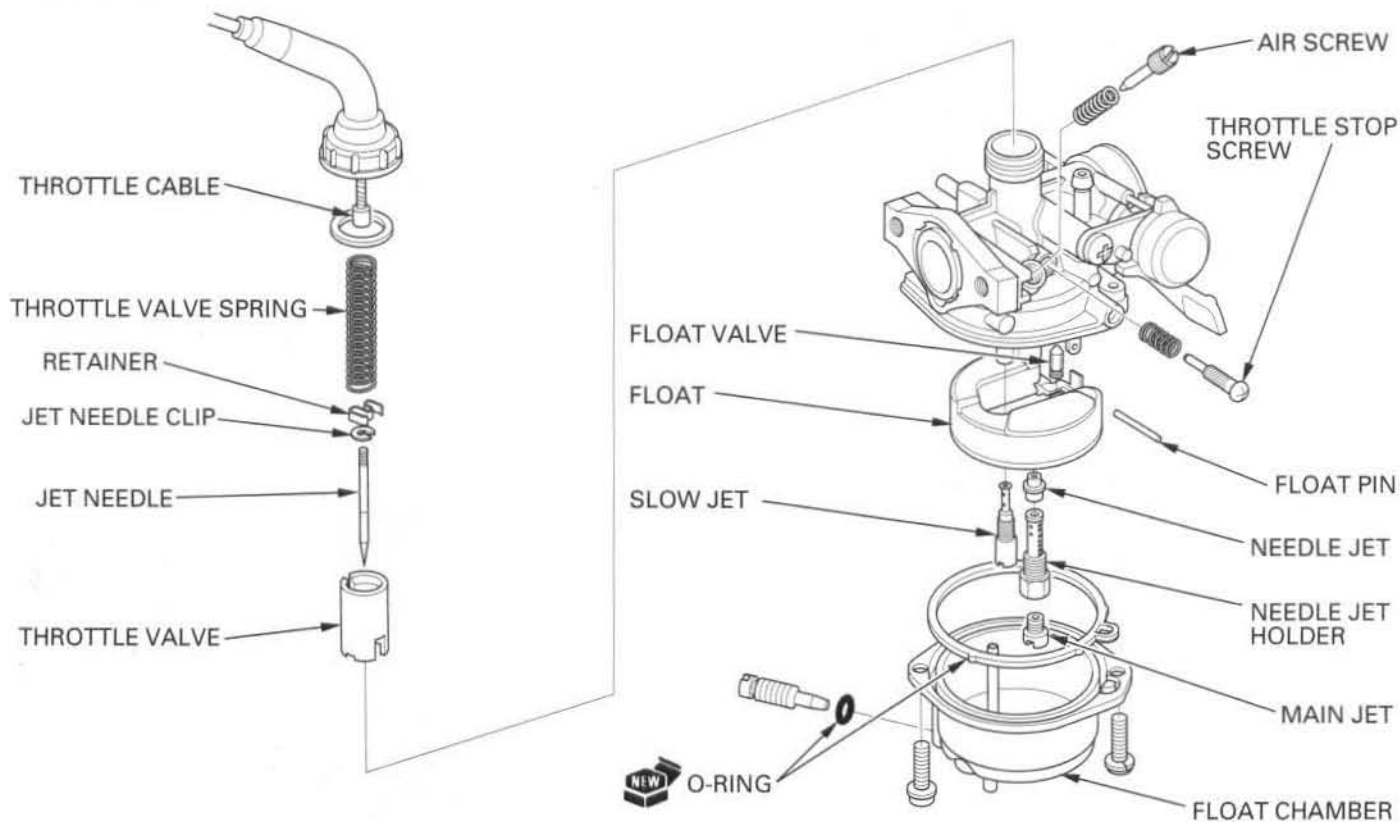
CAUTION:

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

Inspect each jet for wear or damage and replace if necessary.



CARBURETOR ASSEMBLY



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

Install the following:

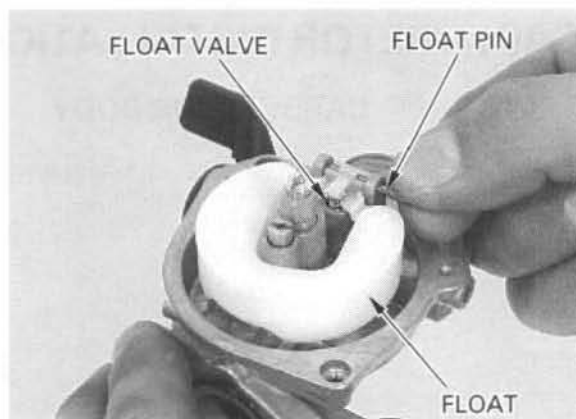
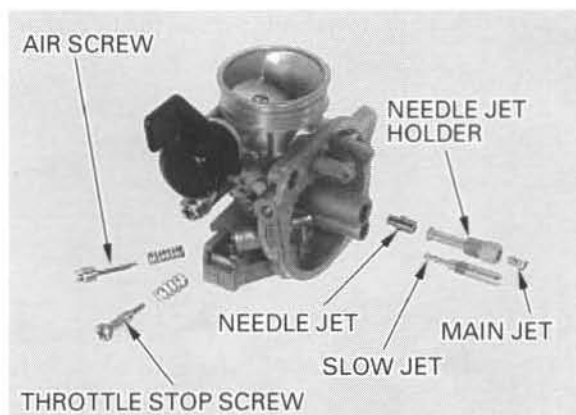
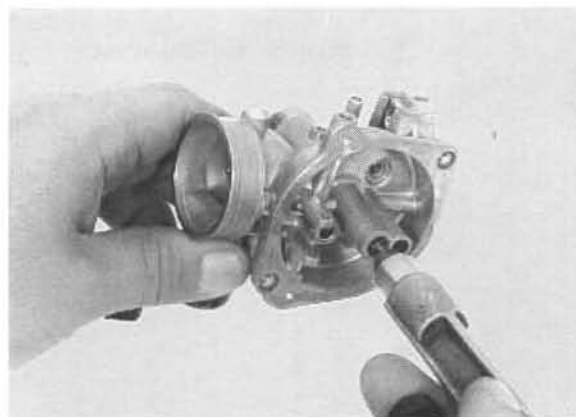
- Throttle stop screw/spring
- Slow jet
- Needle jet
- Needle jet holder
- Main jet

CAUTION:

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

Install the air screw and return it to its original position as noted during removal. Perform the air screw adjustment procedure if a new air screw is installed (page 5-11,12).

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



FLOAT LEVEL INSPECTION

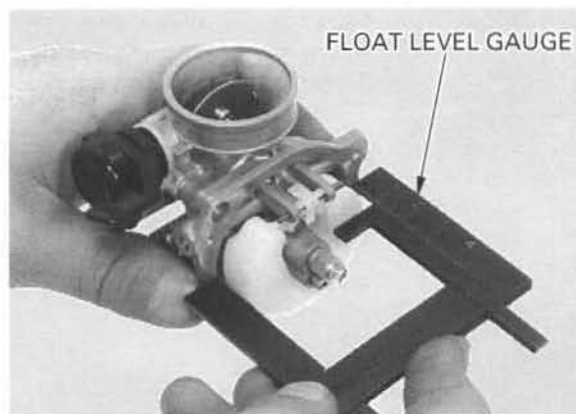
With the float valve seated and the float arm just touching the valve, measure the float level with the special tool as shown.

FLOAT LEVEL: 10.7 mm (0.42 in)

TOOL:

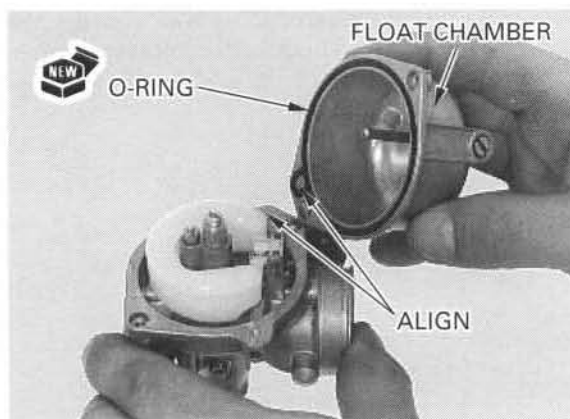
Carburetor float level gauge 07401-0010000

The float cannot be adjusted. Replace the float assembly if the float level is out of specification.

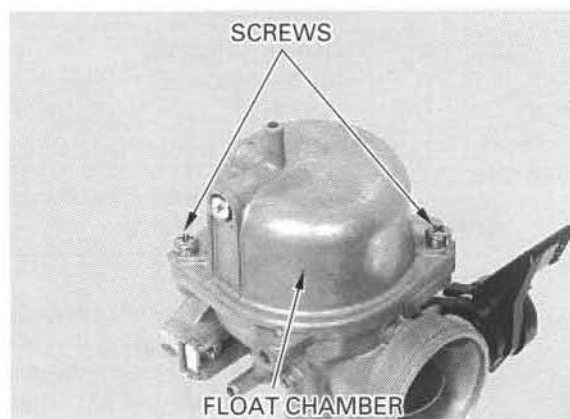


FUEL SYSTEM

Install a new O-ring in the float chamber.
Install the float chamber.



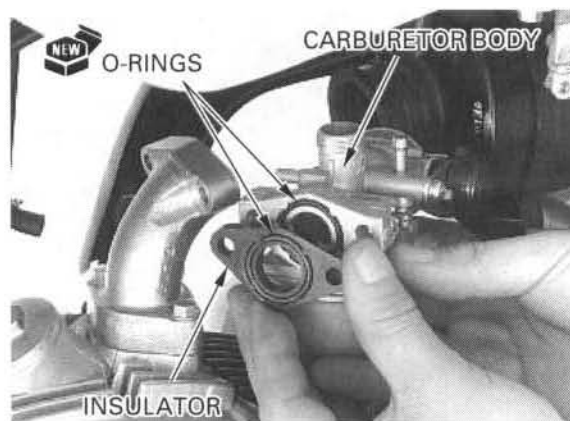
Install and tighten the float chamber screws.



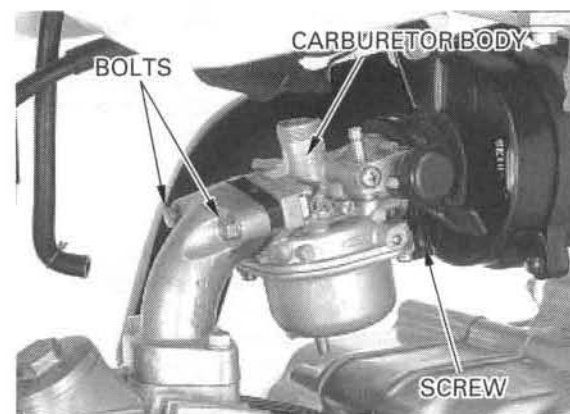
CARBURETOR INSTALLATION

CARBURETOR BODY

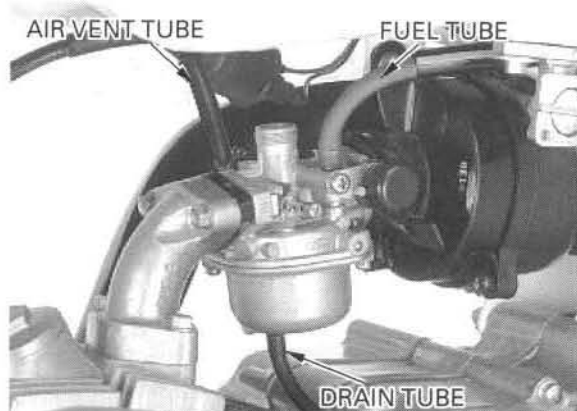
Install the new O-rings into the insulator and carburetor body grooves.



Install the insulator and carburetor body to the intake manifold and tighten the bolts securely.
Tighten the connecting tube band screw.



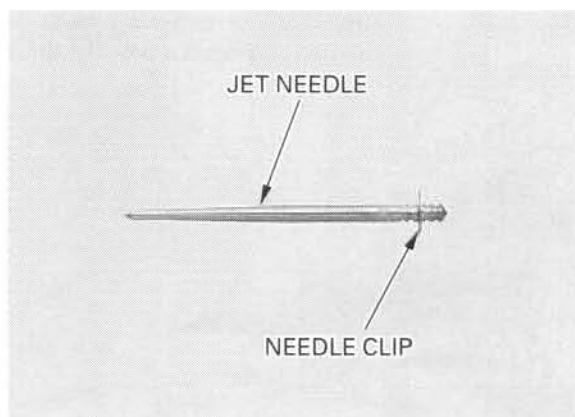
Install the fuel tube, drain tube and air vent tube.



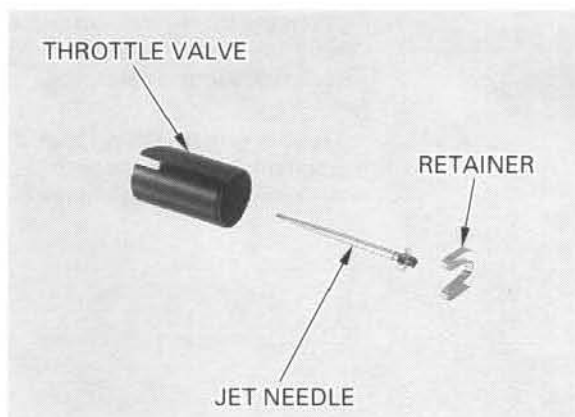
THROTTLE VALVE

Install the needle clip on the jet needle.

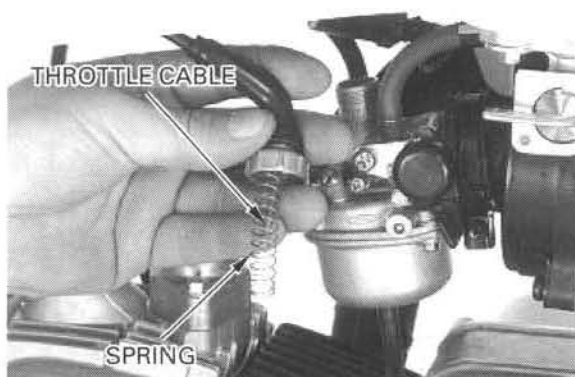
STANDARD POSITION: 3rd groove from top



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



Install the throttle valve spring onto the throttle cable.

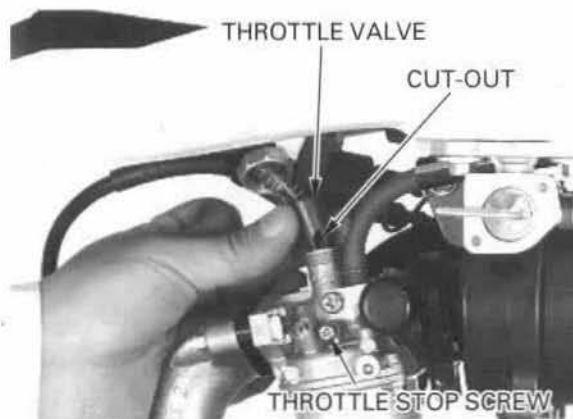


FUEL SYSTEM

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



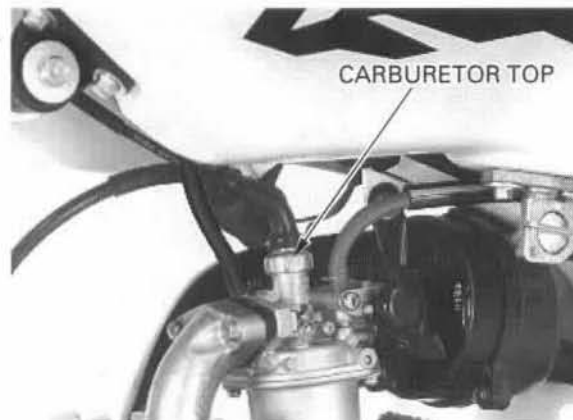
Install the throttle valve into the carburetor body, aligning its cut-out with the throttle stop screw.



Tighten the carburetor top securely.

After installing the carburetor, check for the following:

- Throttle grip free play (page 3-5)
- Engine idle speed (page 3-12)
- Air screw adjustment (page 5-11,12)



AIR SCREW ADJUSTMENT

BEST IDLE PROCEDURE ('97 – '99)

▲WARNING

When 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.

NOTE:

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

1. Turn the air screw clockwise until it seats lightly, and then back it out to the specification given.

CAUTION:

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

INITIAL OPENING: 1-1/2 turns out

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

IDLE SPEED: 1,700 ± 100 rpm

5. Turn the air screw in or out slowly to obtain the highest engine speed.
6. Repeat step 4 and 5.
7. Readjust the idle speed with the throttle stop screw.
8. Lightly open the throttle grip and check that the engine speed increases smoothly; if it is not smooth, repeat steps 4 through 7.



IDLE DROP PROCEDURE (AFTER '99)

▲WARNING

When 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.

NOTE:

- The air screw is factory pre-set and no adjustment is necessary unless the air screw is replaced.
- The engine must be warm for accurate adjustment. Ten minutes of stop-and-go riding is sufficient.
- Use a tachometer with graduations of 50 rpm or smaller that will accurately indicate 50 rpm change.

1. Warm up the engine until drain bolt to operating temperature.
2. Turn the air screw clockwise until it seats lightly, and then back it out to the specification given.

CAUTION:

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

INITIAL OPENING: 1-1/2 turns out

3. Attach a tachometer according to its manufacturer's instructions.
4. Adjust the idle speed with the throttle stop screw.

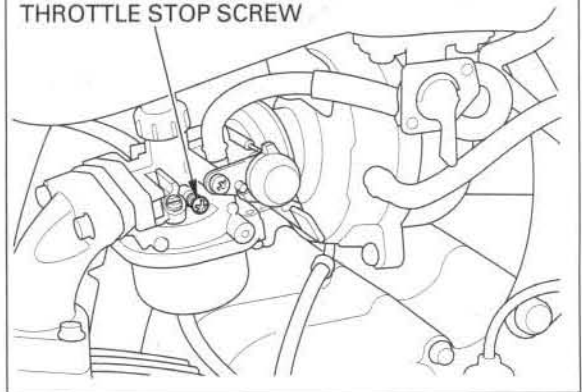
IDLE SPEED: 1,700 \pm 100 rpm

5. Turn the air screw in or out slowly to obtain the highest engine speed.
6. Snap the throttle 2 or 3 times and readjust the idle speed with the throttle stop screw.
7. Turn the air screw in gradually until the engine speed drop 100 rpm.
8. Turn the air screw counterclockwise to the final opening from the position in step 7.

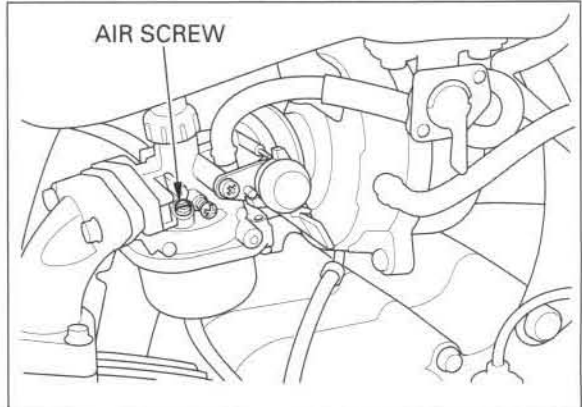
FINAL OPENING: 1/4 turns out

9. Readjust the idle speed with the throttle stop screw.
10. Repeat steps 5 through 9, if the idle is not smooth.

THROTTLE STOP SCREW

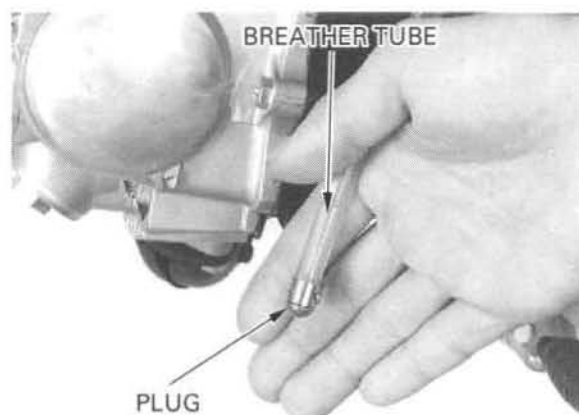


AIR SCREW

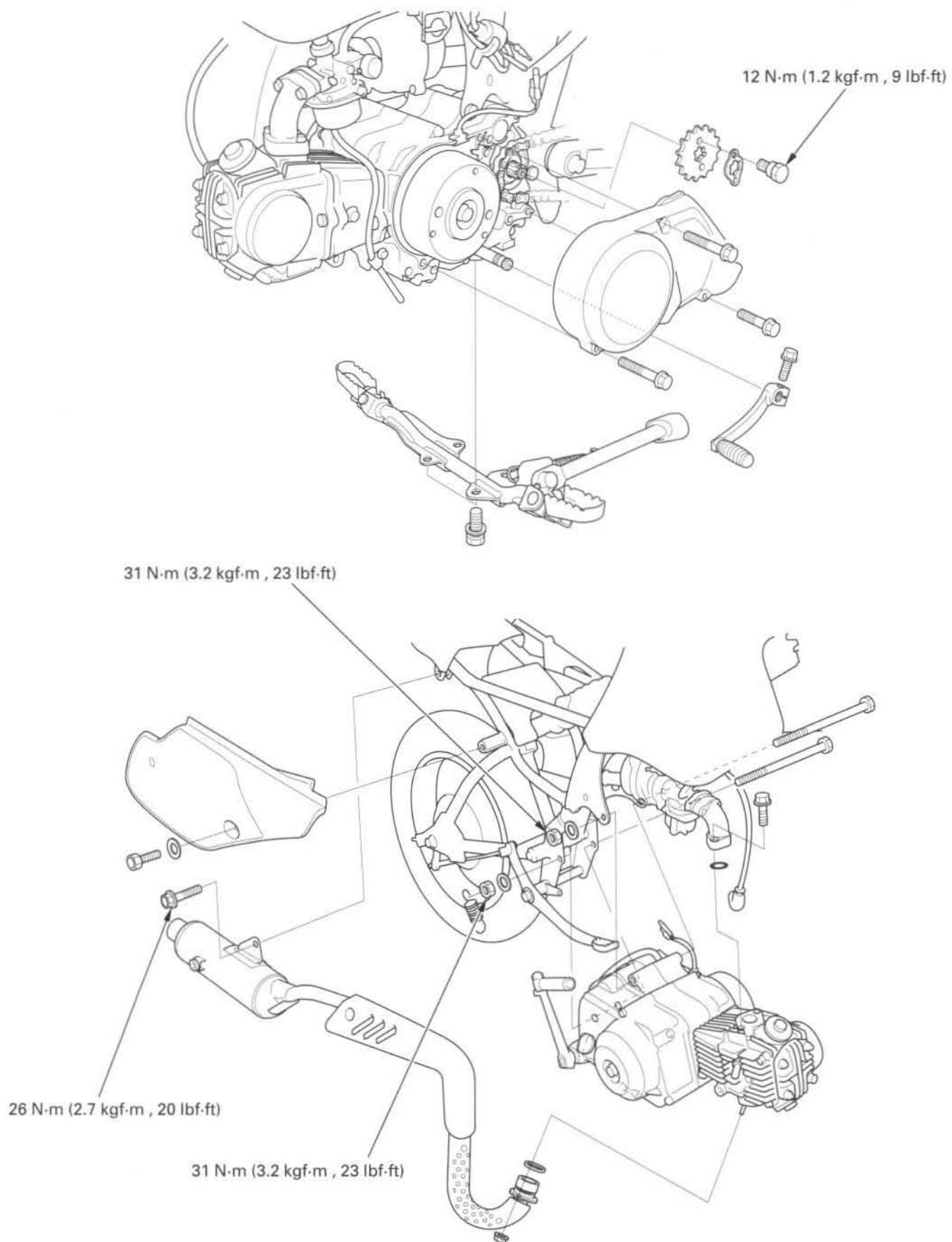


CRANKCASE BREATHER

Remove the crankcase breather tube plug from the tube end and drain deposits into a suitable container, then install the tube plug securely.



ENGINE REMOVAL/INSTALLATION



6. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION

6-1

ENGINE INSTALLATION

6-4

ENGINE REMOVAL

6-2

SERVICE INFORMATION

GENERAL

- During engine removal and installation, support the motorcycle securely using a hoist.
- Support the engine using a jack or other adjustable support to ease engine hanger bolt removal.
- The following components can be serviced with the engine installed in the frame.
 - Alternator/cam chain tensioner (Section 10)
 - Clutch (Section 9)
 - Cylinder/piston (Section 8)
 - Cylinder head/valves (Section 7)
 - Gearshift linkage (Section 9)
 - Oil pump (Section 4)
- The following components require engine removal for service.
 - Crankshaft/transmission (Section 11)
 - Shift forks/shift drum (Section 11)

6

SPECIFICATIONS

ITEM		SPECIFICATIONS
Engine dry weight		17.7 kg (39.0 lbs)
Engine oil capacity	At disassembly	0.8 ℓ (0.8 US qt, 0.7 Imp qt)

TORQUE VALUES

Drive sprocket fixing plate bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Engine hanger bolt/nut (Upper)	31 N·m (3.2 kgf·m, 23 lbf·ft)
(Lower)	31 N·m (3.2 kgf·m, 23 lbf·ft)

ENGINE REMOVAL

Support the motorcycle securely with a hoist or equivalent.

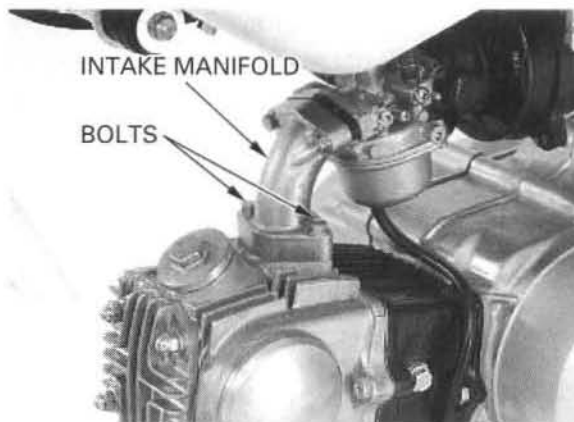
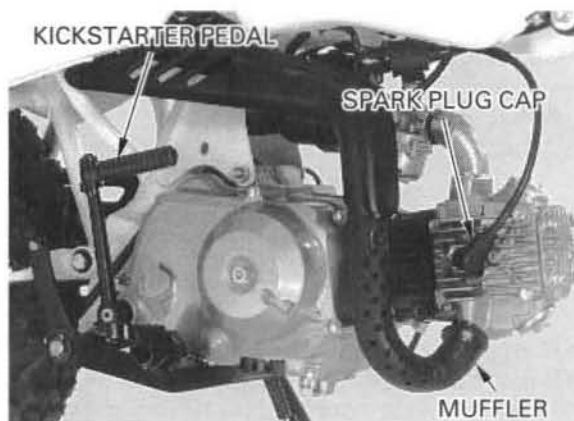
Drain the engine oil (page 3-10).

Remove the following:

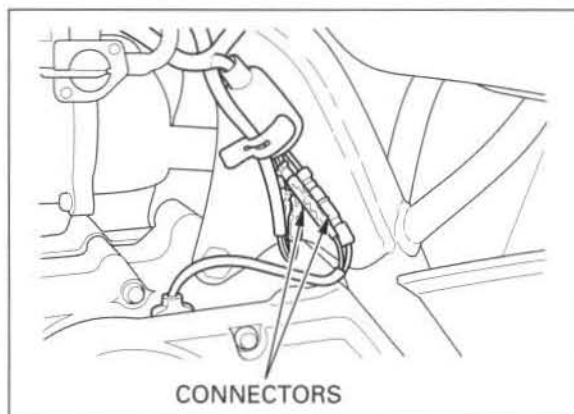
- Right side cover (page 2-2)
- Muffler (page 2-4)
- Kickstarter pedal (page 9-3)
- Left crankcase cover (page 10-2)

Disconnect the spark plug cap.

Remove the intake manifold mounting bolts.



'97-'99: Disconnect the alternator and ignition pulse generator connectors.

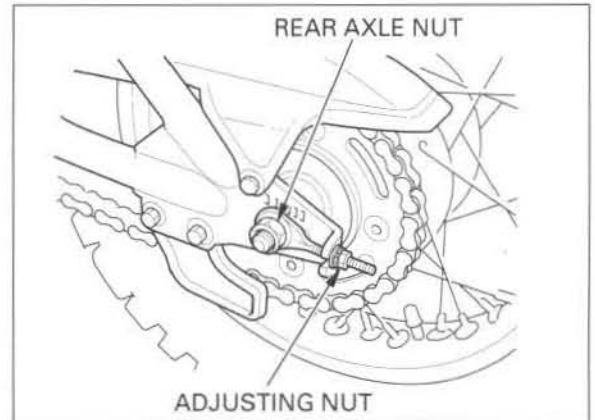


After '99: Disconnect the crankcase breather tube from the breather separator.

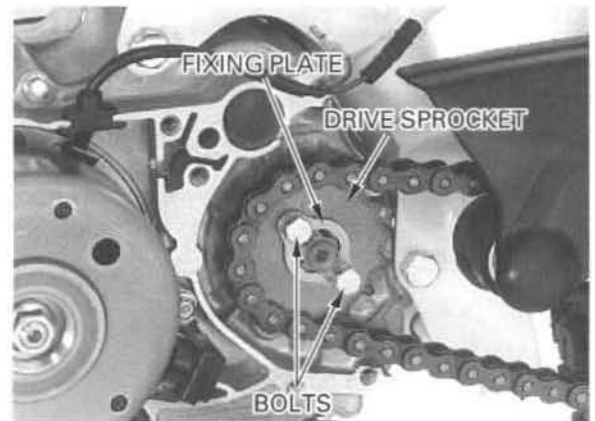
Disconnect the alternator and ignition pulse generator connectors.



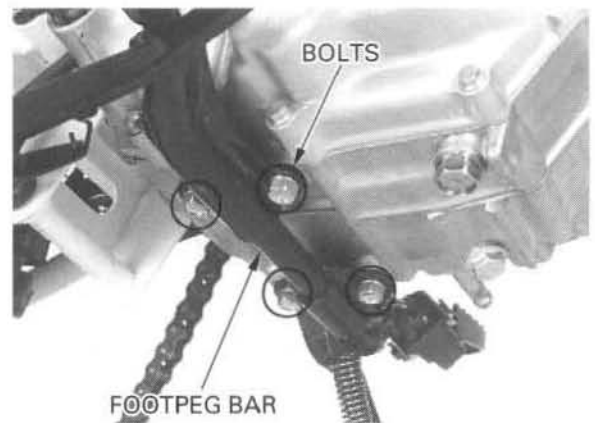
Loosen the rear axle nut and drive chain adjusting nuts.
Push the rear wheel forward and fully slacken the drive chain.



Remove the fixing plate bolts, fixing plate and drive sprocket.



Remove the bolts and footpeg bar.

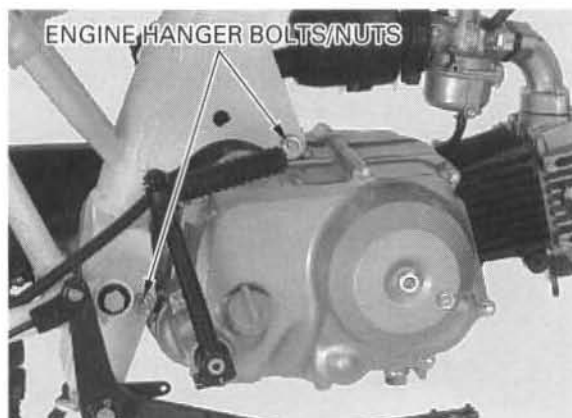


Unhook the brake pedal return spring.



ENGINE REMOVAL/INSTALLATION

Loosen the engine hanger bolts/nuts.
Support the engine using a jack or other adjustable support to ease of engine hanger bolts removal.
Remove the engine hanger bolts and engine from the frame.



ENGINE INSTALLATION

NOTE:

- Note the direction of the hanger bolts.
- Use a floor jack or other adjustable support to carefully maneuver the engine into place.



The lower engine hanger bolt has a spring hook.

Place the engine into the frame, and install the engine hanger bolts from the left side.

CAUTION:

Be careful not to damage the frame.

Install the spring washers and nuts, then tighten the nuts to the specified torque.

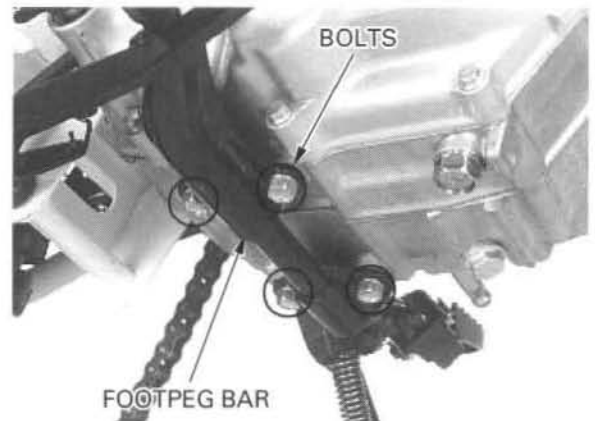
TORQUE: 31 N·m (3.2 kgf·m , 23 lbf·ft)



Hook the brake pedal return spring to the tip of the lower engine hanger bolt as shown.

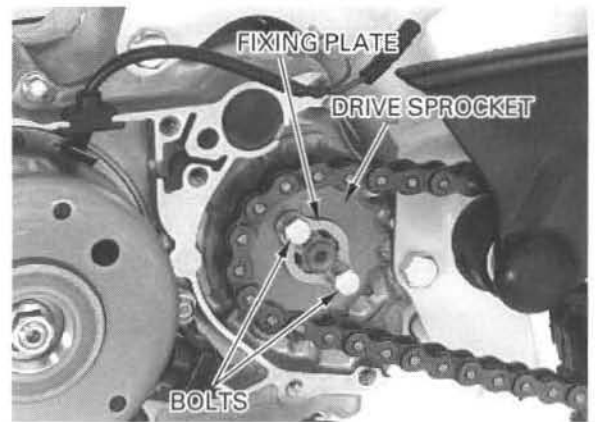


Install the footpeg bar and tighten the bolts.

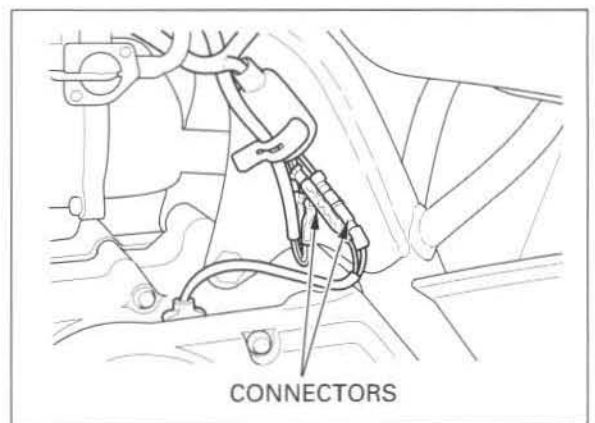


Install the drive sprocket onto the countershaft. Install the fixing plate and tighten the bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)



'97-'99: Connect the alternator and ignition pulse generator connectors.



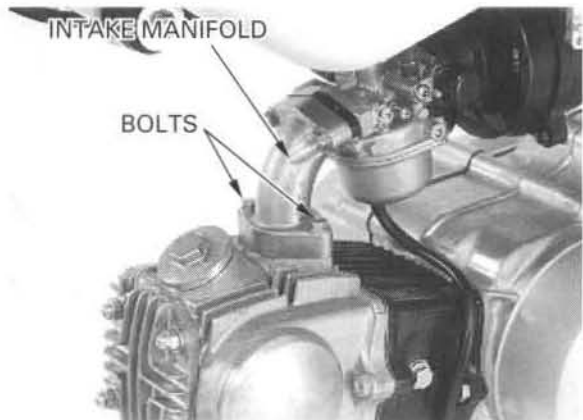
After '99: Connect the crankcase breather tube from the breather separator.

Connect the alternator and ignition pulse generator connectors.



ENGINE REMOVAL/INSTALLATION

Install a new O-ring into the groove of the intake manifold and install and tighten the intake manifold mounting bolts.



Install the spark plug cap to the spark plug.

Install the following:

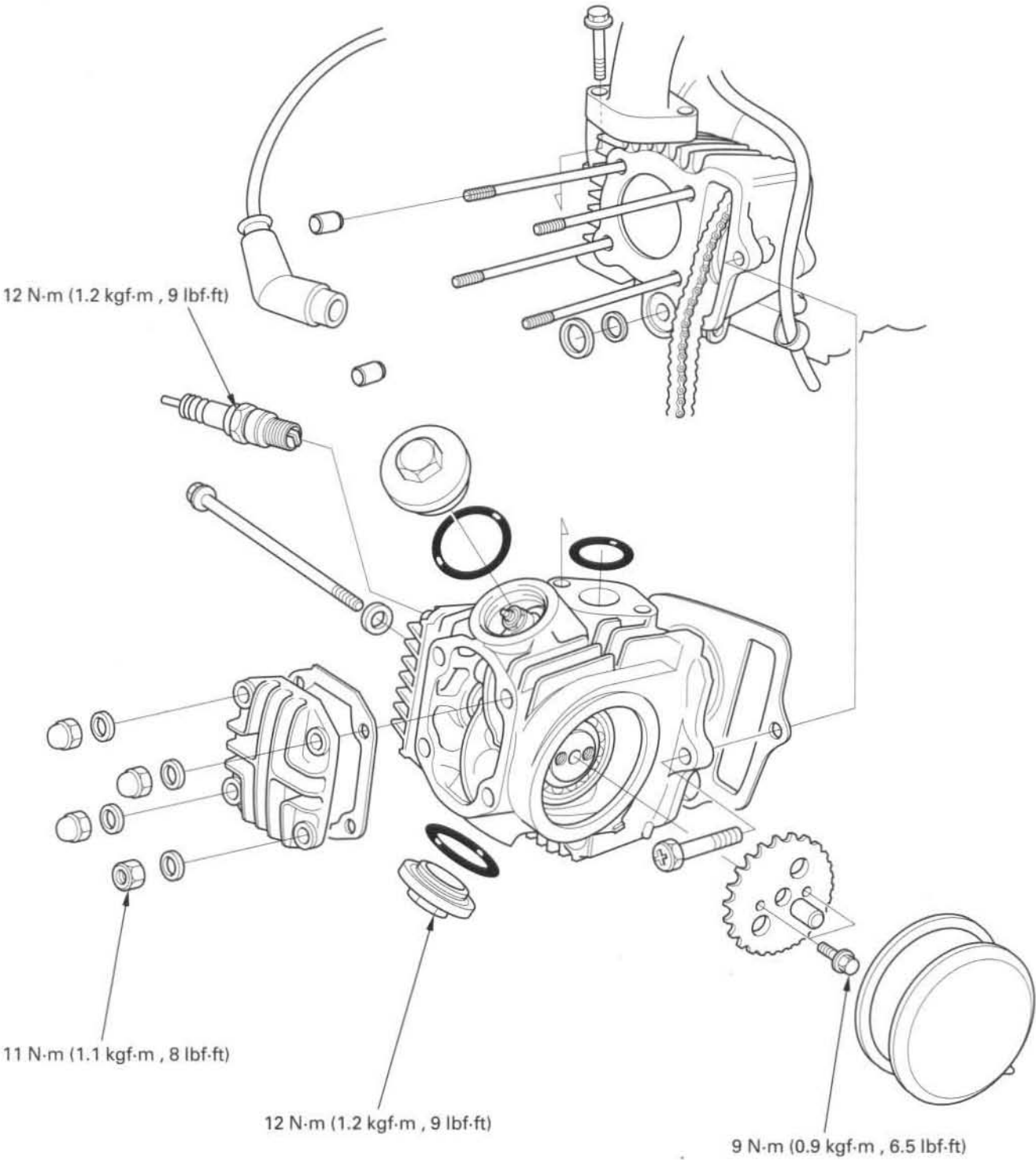
- Left crankcase cover (page 10-8)
- Kickstarter pedal (page 9-18)
- Muffler (page 2-5)
- Right side cover (page 2-3)

Pour recommended engine oil up to the proper level (page 3-11).

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



MEMO



7. CYLINDER HEAD/VALVES

SERVICE INFORMATION	7-1	CAMSHAFT REMOVAL	7-3
TROUBLESHOOTING	7-2	CYLINDER HEAD	7-4
CYLINDER COMPRESSION TEST	7-3	CAMSHAFT INSTALLATION	7-15

SERVICE INFORMATION

GENERAL

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

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			981 – 1,177 kPa (10.0 – 12.0 kgf/cm ² , 142 – 171 psi) at 500 – 600 rpm	————
Cylinder head warpage			————	0.05 (0.002)
Valve, valve guide	Valve clearance	IN	0.05 ± 0.02 mm (0.002 ± 0.001 in)	————
		EX	0.05 ± 0.02 mm (0.002 ± 0.001 in)	————
	Valve stem O.D.	IN	4.970 – 4.985 (0.1957 – 0.1963)	4.92 (0.194)
		EX	4.970 – 4.985 (0.1957 – 0.1963)	4.92 (0.194)
	Valve guide I.D.	IN	5.000 – 5.012 (0.1969 – 0.1973)	5.03 (0.198)
		EX	5.000 – 5.012 (0.1969 – 0.1973)	5.03 (0.198)
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)	0.08 (0.003)
		EX	0.030 – 0.057 (0.0012 – 0.0022)	0.10 (0.004)
Valve spring	Valve seat width	IN/EX	1.0 – 1.3 (0.04 – 0.05)	2.0 (0.08)
	Inner	IN/EX	32.78 (1.291)	31.2 (1.23)
Rocker arm/ shaft	Outer	IN/EX	35.55 (1.400)	34.0 (1.34)
	Rocker arm I.D.	IN/EX	10.000 – 10.015 (0.3937 – 0.3943)	10.10 (0.398)
Camshaft	Rocker arm shaft O.D.	IN/EX	9.978 – 9.987 (0.3928 – 0.3932)	9.91 (0.390)
	Cam lobe height	IN	27.945 (1.1002)	27.55 (1.085)
		EX	26.076 (1.0266)	25.69 (1.011)

TORQUE VALUES

Valve adjuster hole cap	12 N·m (1.2 kgf·m, 9 lbf·ft)
Valve adjuster lock nut	9 N·m (0.9 kgf·m, 6.5 lbf·ft)
Cylinder head cap nut	11 N·m (1.1 kgf·m, 8 lbf·ft)
Cylinder head nut	11 N·m (1.1 kgf·m, 8 lbf·ft)
Cylinder head right side cover bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)
Cam sprocket bolt	9 N·m (0.9 kgf·m, 6.5 lbf·ft)

CYLINDER HEAD/VALVES

TOOLS

Valve adjusting wrench, 8 × 9 mm	07708-0030100	Commercially available in U.S.A.
Valve adjuster B	07708-0030400	or 07908-KE90200 (U.S.A. only)
Valve spring compressor	07757-0010000	
Valve spring compressor attachment	07959-KM30101	
Valve guide driver, 5.0 mm	07742-MA60000	
Valve guide reamer, 5.0 mm	07984-MA60001	or 07984-MA6000C (U.S.A. only)
Valve seat cutters		— These are commercially available in U.S.A.
Seat cutter, 24 mm (45° IN)	07780-0010600	
Seat cutter, 20.5 mm (45° EX)	07780-0011000	
Flat cutter, 24 mm (30° IN)	07780-0012500	
Flat cutter, 21.5 mm (32° EX)	07780-0012800	
Interior cutter, 22 mm (60° IN/EX)	07780-0014202	
Cutter holder, 5 mm	07781-0010400	

TROUBLESHOOTING

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

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

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

Compression too high, overheating or knocking

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

Excessive smoke

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

Excessive noise

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

Rough idle

- Low cylinder compression

CYLINDER COMPRESSION TEST

⚠ WARNING

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

Warm up the engine to normal operating temperature.

Stop the engine and remove the spark plug.

Install a compression gauge.

Open the throttle all the way and crank the engine with the kickstarter until the gauge reading stops rising.

COMPRESSION PRESSURE:

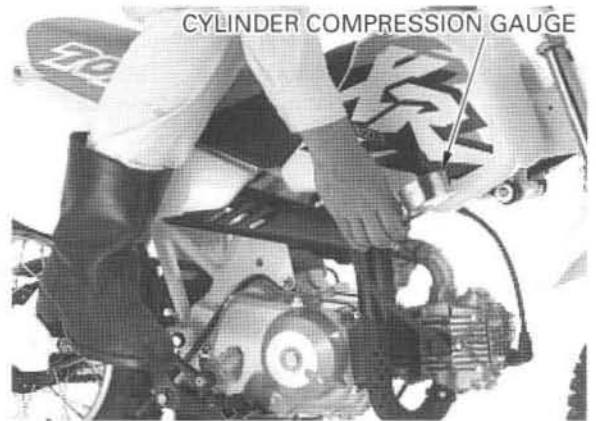
981–1,177 kPa (10.0–12.0 kgf/cm²,
142–171 psi) at 500–600 rpm

Low compression can be caused by:

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

High compression can be caused by:

- Carbon deposits in combustion chamber or on piston head



CAMSHAFT REMOVAL

Disconnect the spark plug cap.

Remove the valve adjuster hole caps.

Loosen the cylinder head side cover 6 mm bolt.

Tap the head of the 6 mm bolt and release the cylinder head left side cover from the cylinder head. Remove the 6 mm bolt, sealing washer and cylinder head left side cover.

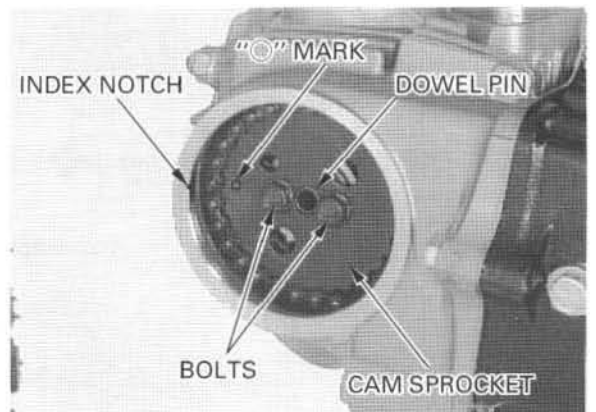
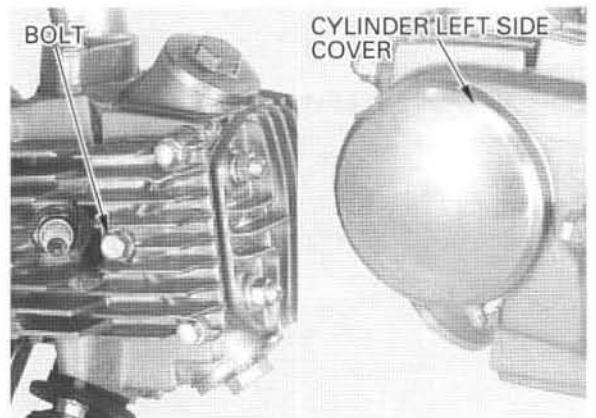
Remove the following:

- Left crankcase cover (page 10-2)
- Cam chain tensioner (page 10-4)

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

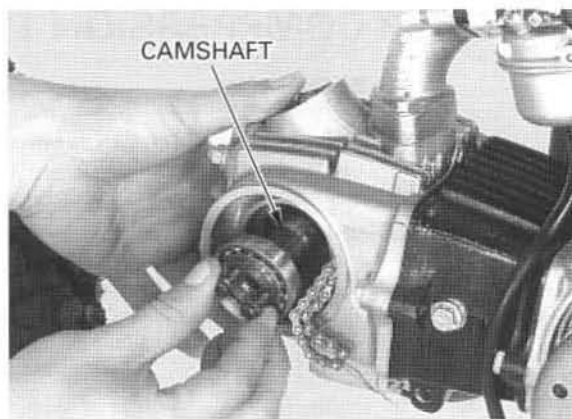
Remove the bolts, cam sprocket and dowel pin.

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



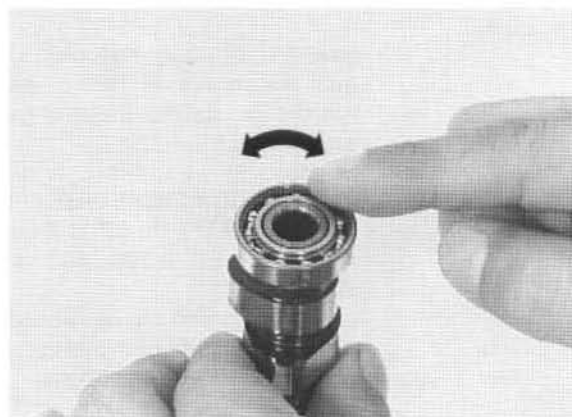
CYLINDER HEAD/VALVES

Loosen the valve adjusting screw fully to make a valve clearance maximum.
Temporarily install the cam sprocket bolts onto the camshaft, then remove the camshaft from the cylinder head.



INSPECTION

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



Using a micrometer, measure each cam lobe height.

SERVICE LIMITS:

IN: 27.55 mm (1.085 in)

EX: 25.69 mm (1.011 in)



CYLINDER HEAD

REMOVAL

Remove the following:
— Muffler/exhaust pipe (page 2-4)
— Camshaft (page 7-3)

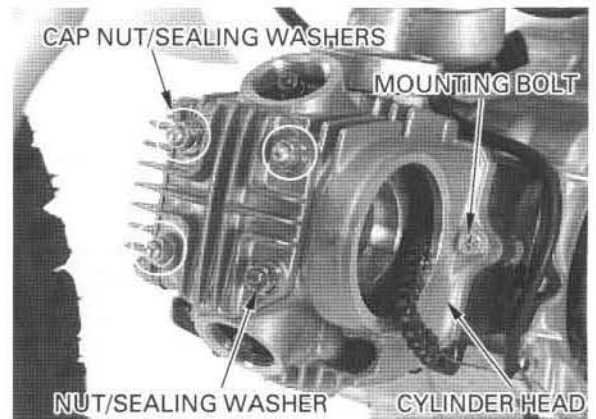
Remove the intake manifold mounting bolts.



Remove the following:

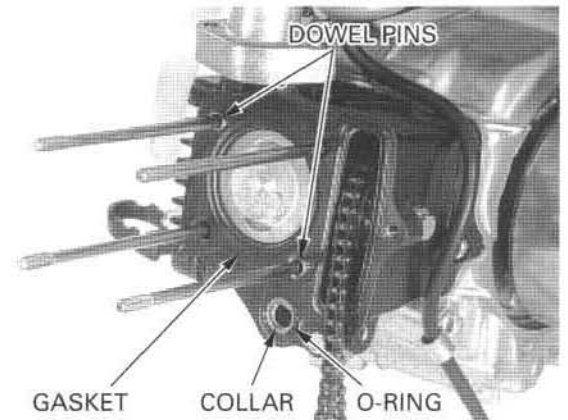
- Cap nuts/sealing washers
- Nut/sealing washer
- Cylinder head cover
- Gasket

Remove the cylinder head mounting bolt and cylinder head.



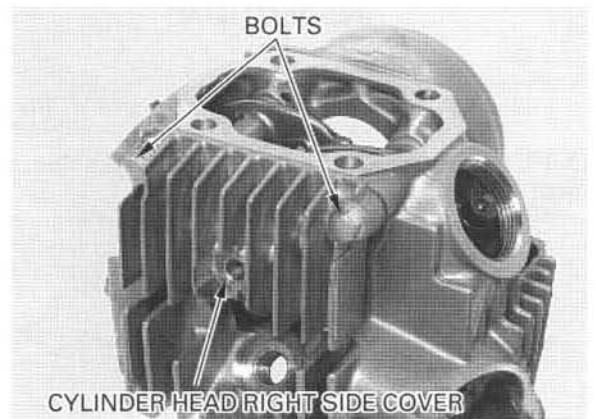
Remove the following:

- Gasket
- Dowel pins
- Collar, 14.8 mm
- O-ring, 14.5 mm

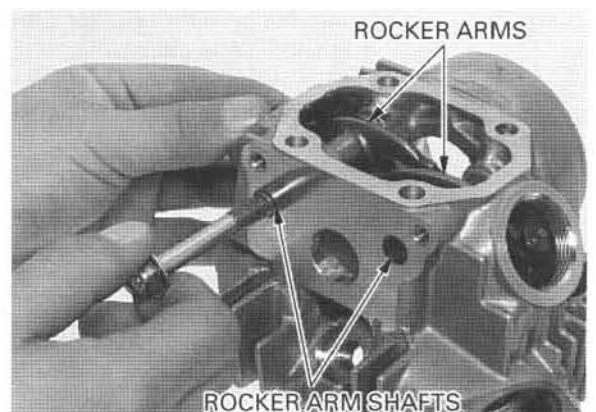


DISASSEMBLY

Remove the bolts and cylinder right side cover.



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



CYLINDER HEAD/VALVES

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

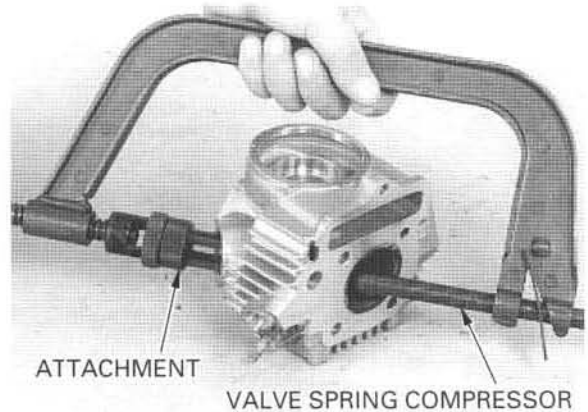
TOOLS:

Valve spring compressor 07757-0010000

Valve spring compressor attachment
07959-KM30101

CAUTION:

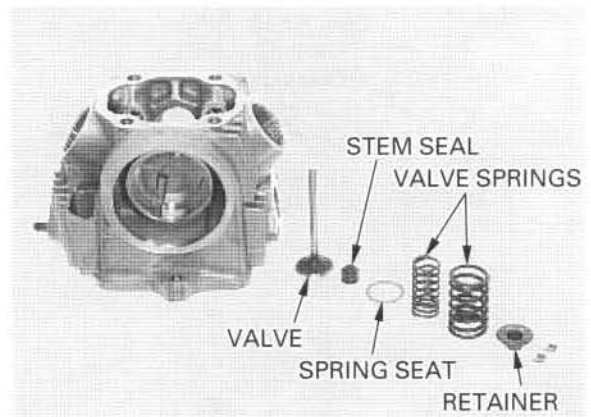
To prevent loss of tension, do not compress the valve springs more than necessary to remove the cotters.



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

Remove the following:

- Spring retainer
- Outer and inner valve springs
- Valve
- Stem seal
- Valve spring seat

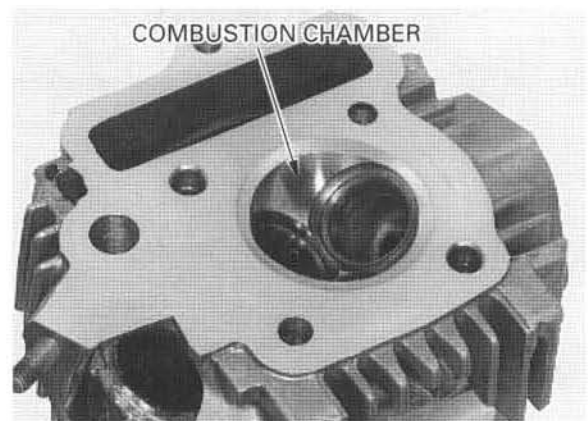


INSPECTION

CYLINDER HEAD

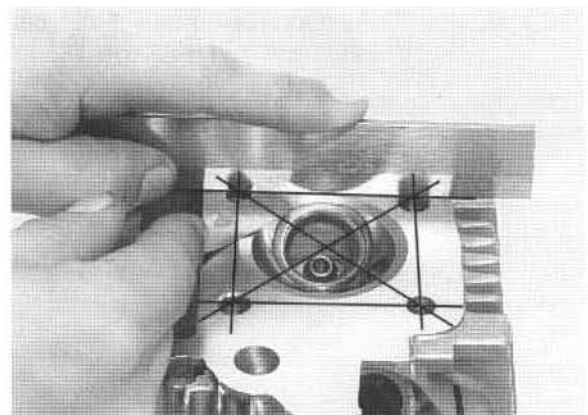
Remove carbon deposits from the combustion chamber.

Avoid damaging the gasket surface. Check the spark plug hole and valve areas for cracks.



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

SERVICE LIMIT: 0.05 mm (0.002 in)



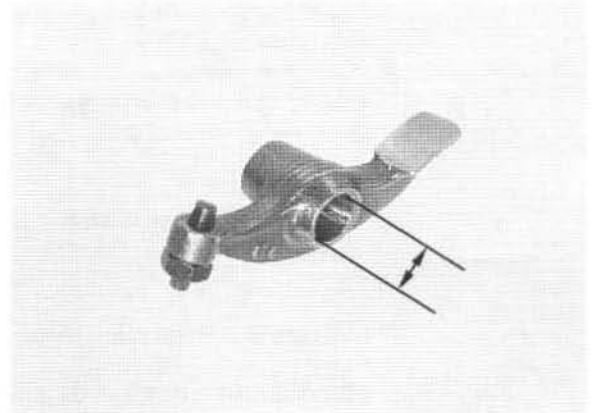
ROCKER ARM

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

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

Measure the rocker arm I.D.

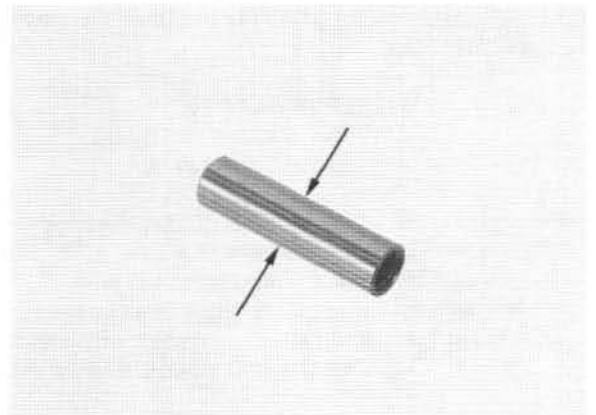
SERVICE LIMIT: 10.10 mm (0.398 in)



Inspect the rocker arm shafts for wear or damage.

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

SERVICE LIMIT: 9.91 mm (0.390 in)

**VALVE SPRING**

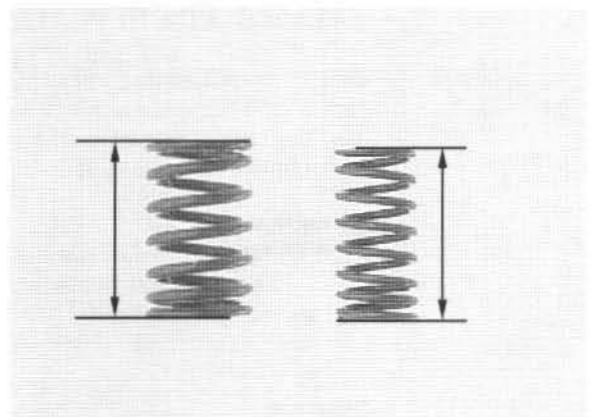
Measure the free length of the inner and outer valve springs.

SERVICE LIMITS:

Inner: 31.2 mm (1.23 in)

Outer: 34.0 mm (1.34 in)

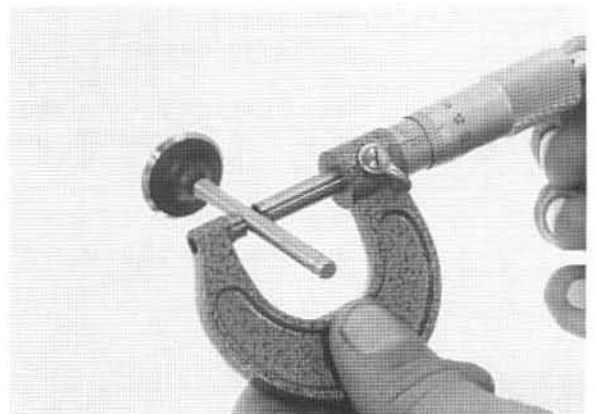
Replace the springs if they are shorter than the service limits.

**VALVE**

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

Check valve movement in the guide, measure and record each valve stem O.D.

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



CYLINDER HEAD/VALVES

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

TOOL:

Valve guide reamer, 5.0 mm 07984 – MA60001 or 07984 – MA6000C (U.S.A. only)

Measure and record each valve guide I.D.

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

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

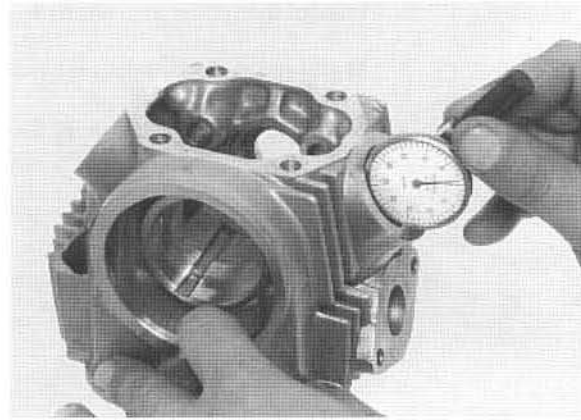
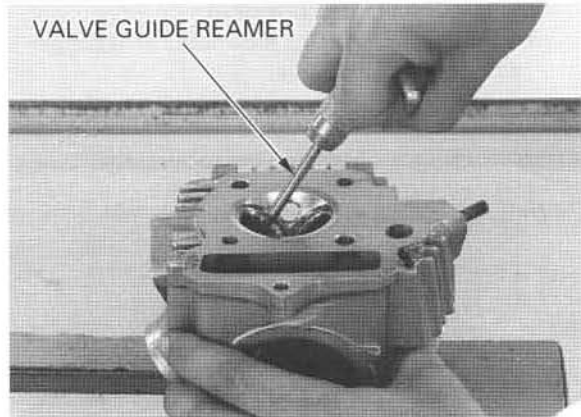
SERVICE LIMITS:

IN: 0.08 mm (0.003 in)

EX: 0.10 mm (0.004 in)

Reface the valve seats whenever the valve guides are replaced (page 7-9).

If the stem-to-guide clearance is out of specification, determine if a new guide with standard dimensions would bring the clearance within tolerance. If so, replace any guides as necessary and ream to fit. If the stem-to-guide clearance is out of specification with the new guides, replace the valves and guides.



VALVE GUIDE REPLACEMENT

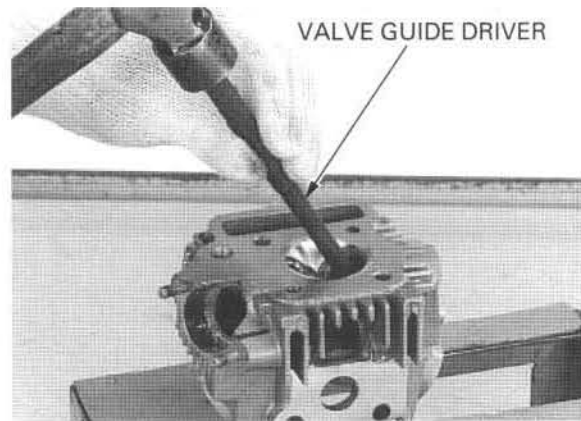
Chill the replacement valve guides in the freezer section of a refrigerator for about an hour. Heat the cylinder head to 212–302°F (100–150°C) with a hot plate or oven.

⚠ WARNING

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

CAUTION:

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



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

TOOL:

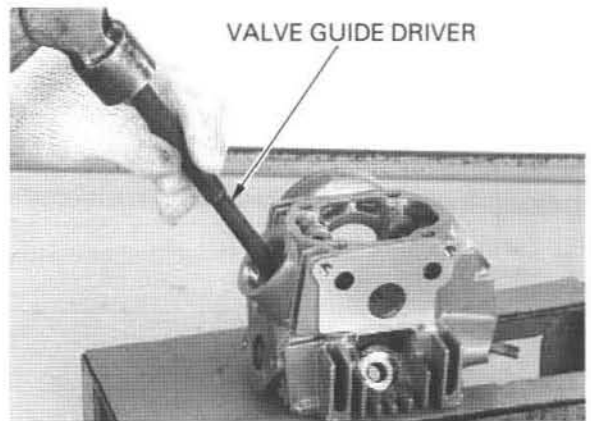
Valve guide driver, 5.0 mm 07942 – MA60000

Drive in the guide from the top of the head using the special tool as shown.

TOOL:

Valve guide driver, 5.0 mm 07942 – MA60000

Let the cylinder head cool to room temperature.



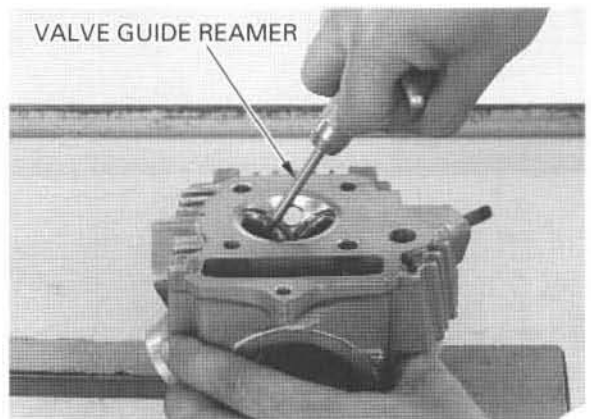
Ream the new valve guide after installation. Insert the reamer from the combustion chamber side of the head and also always rotate the reamer clockwise.

TOOL:

Valve guide reamer, 5.0 mm 07984 – MA60001

NOTE:

Use cutting oil on the reamer during this operation.



Clean the cylinder head thoroughly to remove any metal particles.

Reface the valve seat (see below)

VALVE SEAT INSPECTION/REFACING

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

Apply a light coating of Prussian Blue to the valve seats. Lap the valves and seats using a rubber hose or other hand-lapping tool.



Remove and inspect the valves.

CAUTION:

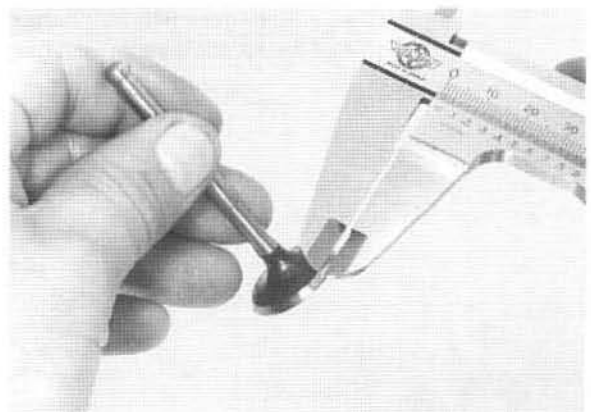
The valves cannot be ground. If a valve face is burned or badly worn or if it contacts the seat unevenly, replace the valve.

Inspect the width of each valve seat.

STANDARD: 1.0 – 1.3 mm (0.04 – 0.05 in)

SERVICE LIMIT: 2.0 mm (0.08 in)

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



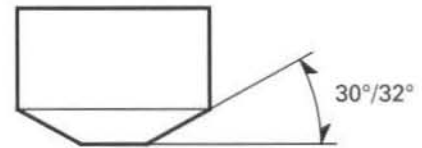
VALVE SEAT REFACING

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

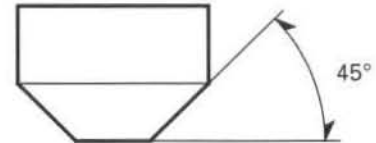
NOTE:

Follow the refacing manufacturer's operating instructions.

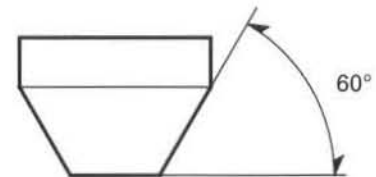
VALVE SEAT CUTTERS (EQUIVALENT COMMERCIALLY AVAILABLE IN U.S.A.)



IN: 07780-0012500 (24 mm/30°)
EX: 07780-0012800 (21.5 mm/32°)



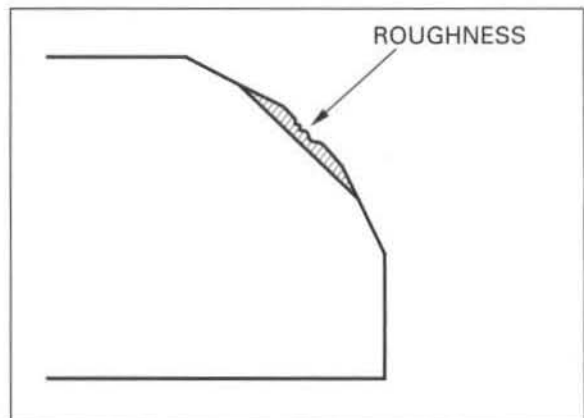
IN: 07780-0010600 (24 mm)
EX: 07780-0011000 (20.5 mm)



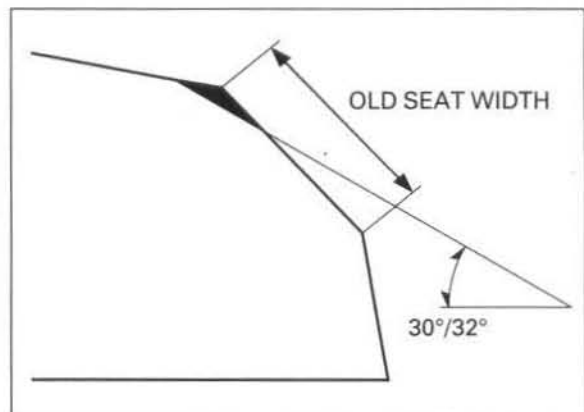
IN, EX 07780-0014202 (22 mm)

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

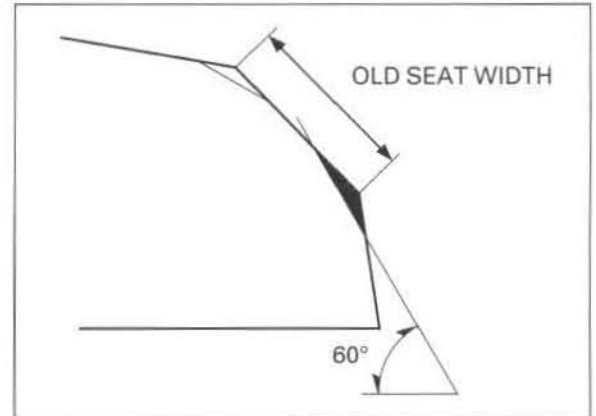
Use a 45-degree cutter to remove any roughness or irregularities from the seat.



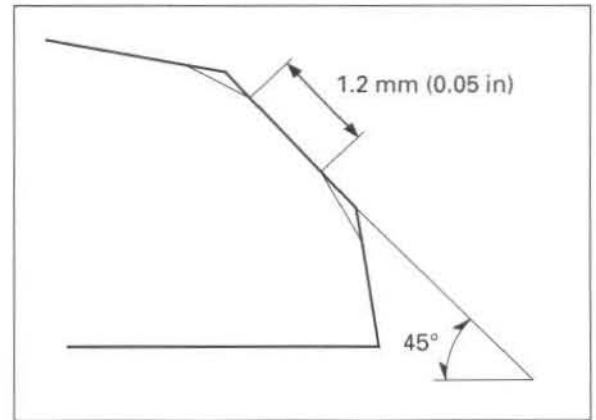
Use a 32-degree (IN: 30°) cutter to remove the top 1/4 of the existing valve seat material.



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



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

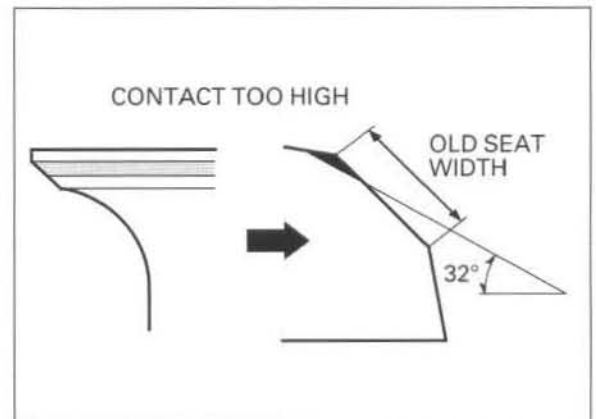


Apply a thin coating of Prussian Blue to the valve seat.
Press the valve through the valve guide and onto the seat to make a clear pattern.

NOTE:

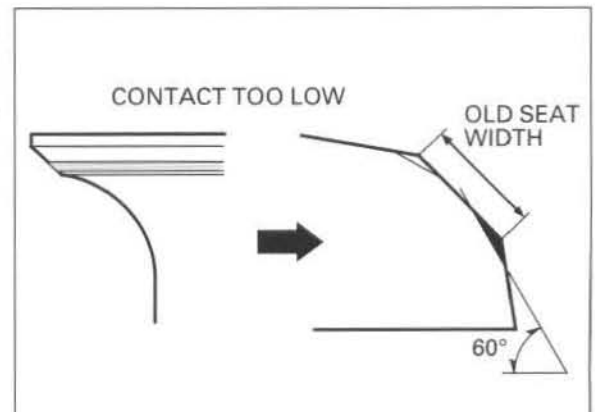
The location of the valve seat in relation to the valve face is very important for good sealing.

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



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

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



CYLINDER HEAD/VALVES

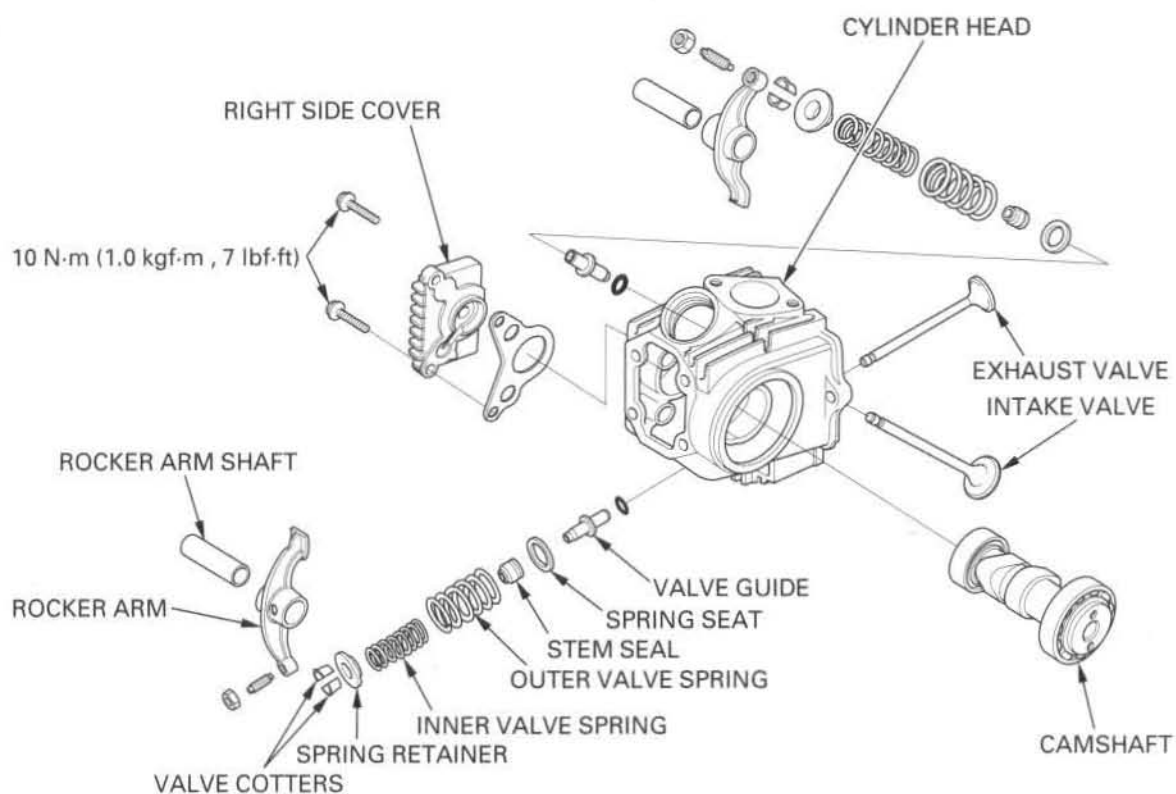
After cutting the seat, apply lapping compound to the valve face, and lap the valve using light pressure.

Do not allow lapping compound to enter the guides.

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



ASSEMBLY

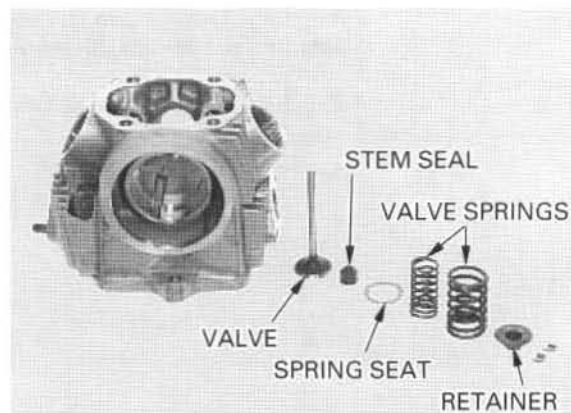


Clean the cylinder head assembly with solvent and blow through all oil passages with compressed air.

Install the valve spring seats.
Install the new stem seals.

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

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



Install the valve cotters using the special tool as shown.

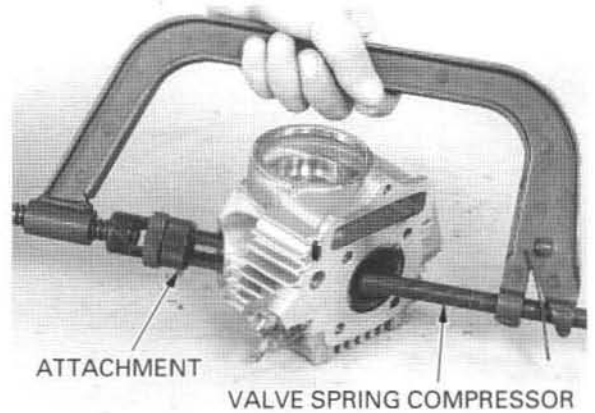
TOOL:

Valve spring compressor 07757-0010000

Valve spring compressor attachment
07959-KM30101

CAUTION:

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



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

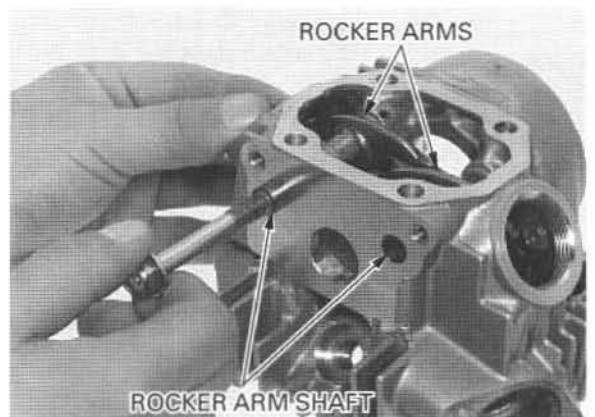
CAUTION:

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



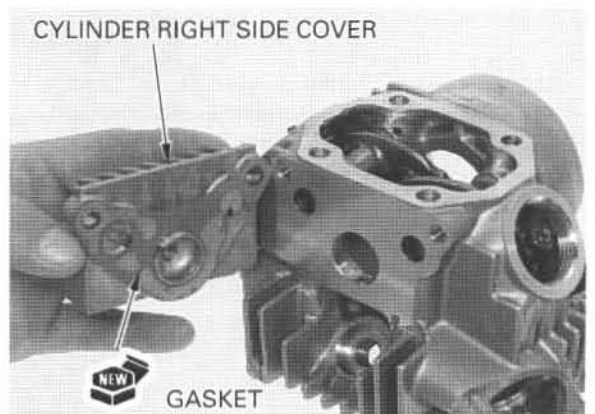
Install the rocker arm shaft with its threaded end facing the right side.

Install the rocker arms and rocker arm shafts.



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

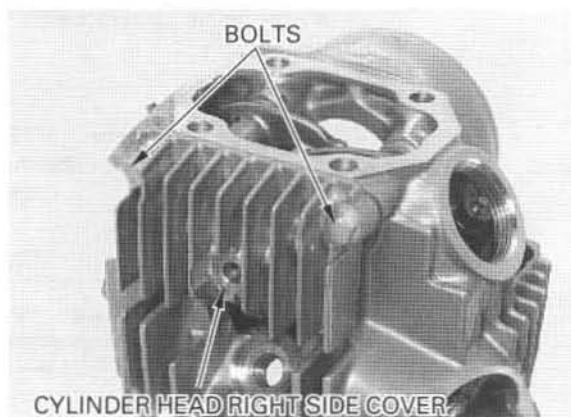
Install the right side cover onto the cylinder head.



CYLINDER HEAD/VALVES

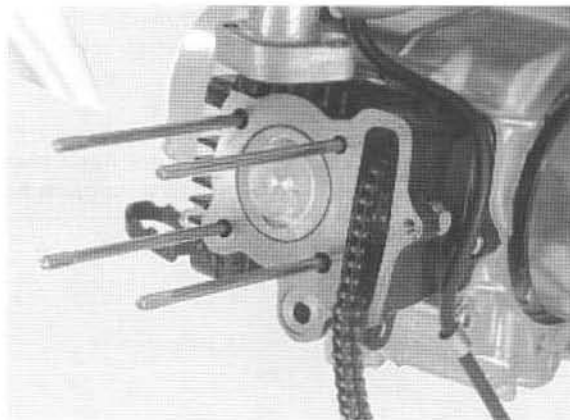
Install and tighten the right side cover mounting bolts.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



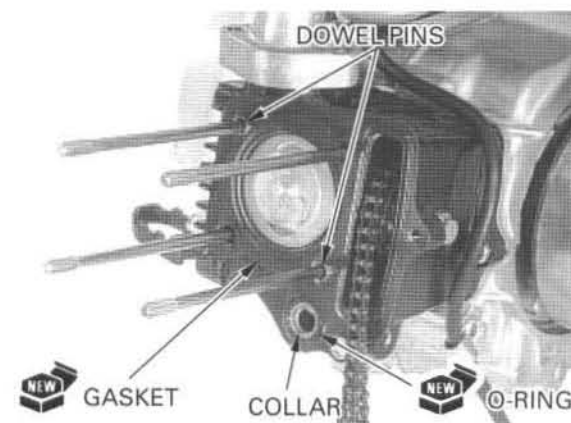
INSTALLATION

Clean off the gasket material from the cylinder surface.



Install the following:

- New O-ring, 14.5 mm
- Collar, 14.8 mm
- Dowel pins
- New gasket



Install the cylinder head.

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

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



Install the following:

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

NOTE:

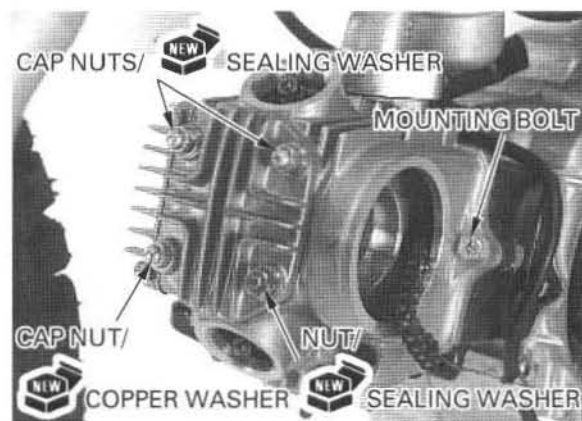
Note the position of the new copper washer.

Tighten the cylinder head cover nuts to the specified torque.

TORQUE: 11 N·m (1.1 kgf·m, 8 lbf·ft)

Install and tighten the cylinder head mounting bolt.

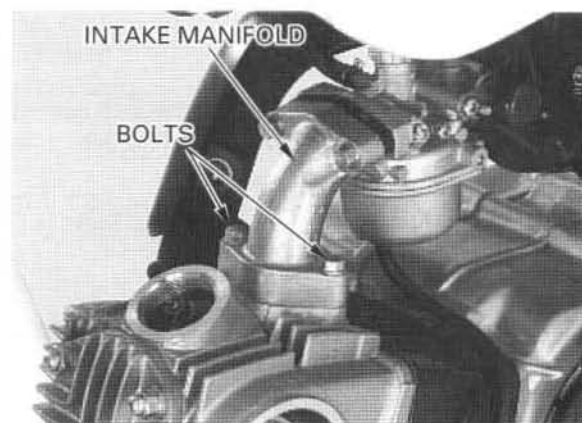
Install a new O-ring into the groove of the intake manifold.



Install and tighten the intake manifold mounting bolts.

Install the following:

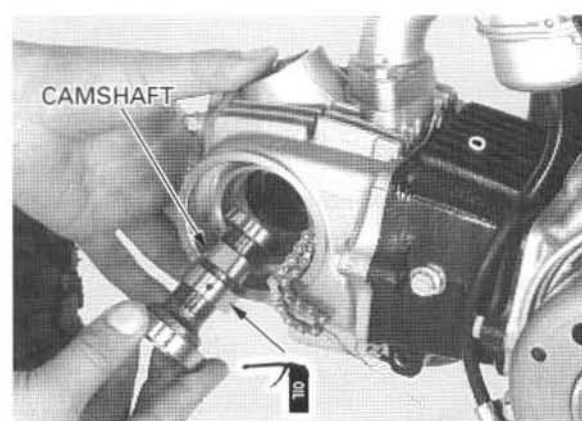
- Muffler/exhaust pipe (page 2-5)
- Camshaft (see below)



CAMSHAFT INSTALLATION

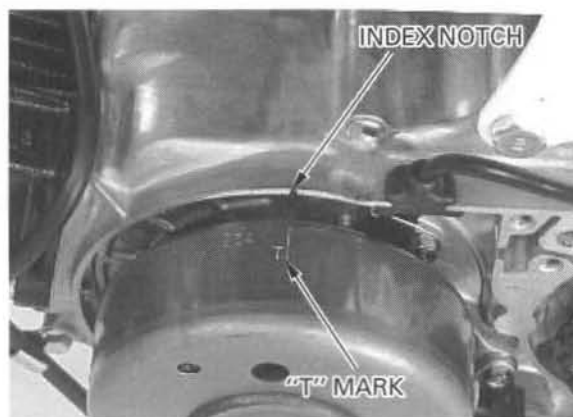
Apply clean engine oil to the camshaft and bearings.

Install the camshaft into the cylinder head with its cam lobes facing the combustion chamber.



CYLINDER HEAD/VALVES

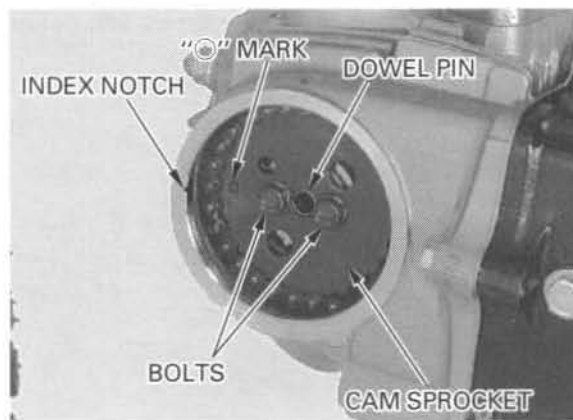
Turn the crankshaft counterclockwise and align the "T" mark with the index notch on the left crankcase.



Install the dowel pin and cam sprocket.

NOTE:

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



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

TORQUE: 9 N·m (0.9 kgf·m, 6.5 lbf·ft)

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

Align the tab on the side cover with the stopper on the cylinder head as shown.

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



Adjust the valve clearance (page 3-7).

Apply oil to the valve adjuster hole cap threads. Check that the O-ring is in good condition, replace if necessary.

Coat the O-rings with clean engine oil and install them onto the valve adjuster hole caps. Install and tighten the valve adjuster hole caps to the specified torque.

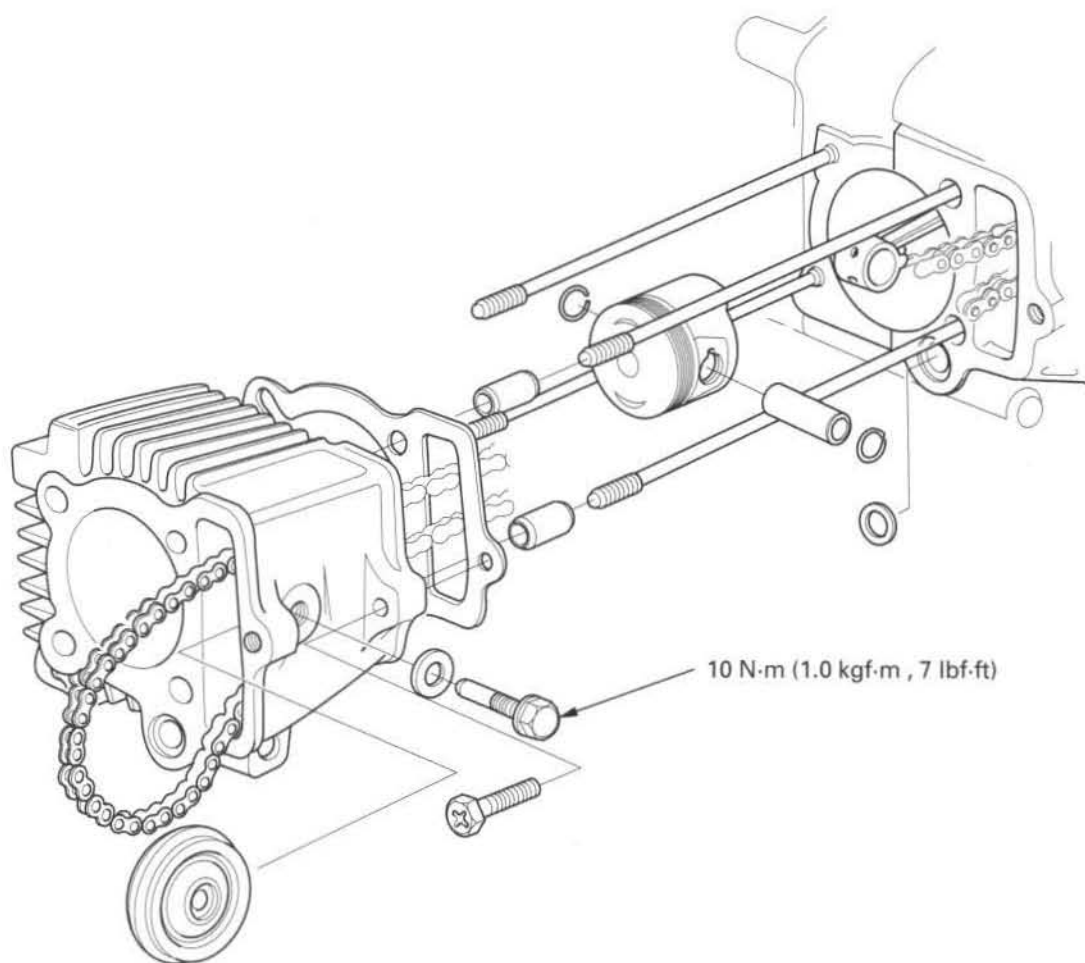
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the spark plug cap.

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



MEMO



8. CYLINDER/PISTON

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

SERVICE INFORMATION

GENERAL

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

SPECIFICATIONS

Unit: mm (in)

8

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		47.005 – 47.015 (1.8506 – 1.8510)	47.05 (1.852)
	Out of round		—	0.10 (0.004)
	Taper		—	0.10 (0.004)
	Warpage		—	0.05 (0.002)
Piston, piston rings	Piston mark direction		“IN” mark facing toward the intake side	—
	Piston O.D.		46.980 – 46.995 (1.8496 – 1.8502)	46.90 (1.846)
	Piston O.D. measurement point		10 mm (0.4 in) from bottom of skirt	—
	Piston pin bore I.D.		13.002 – 13.008 (0.5119 – 0.5121)	13.06 (0.514)
	Piston pin O.D.		12.994 – 13.000 (0.5116 – 0.5118)	12.98 (0.511)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.08 (0.003)
	Piston ring-to-ring groove clearance	Top	0.015 – 0.050 (0.0006 – 0.0020)	0.12 (0.005)
		Second	0.015 – 0.050 (0.0006 – 0.0020)	0.12 (0.005)
	Piston ring end gap	Top	0.05 – 0.20 (0.002 – 0.008)	0.5 (0.02)
		Second	0.05 – 0.20 (0.002 – 0.008)	0.5 (0.02)
		Oil (side rail)	0.20 – 0.90 (0.008 – 0.035)	1.1 (0.04)
Cylinder-to-piston clearance			0.010 – 0.040 (0.0004 – 0.0016)	0.15 (0.006)
Connecting rod small end I.D.			13.013 – 13.043 (0.5123 – 0.5135)	13.10 (0.516)
Connecting rod-to-piston pin clearance			0.002 – 0.014 (0.0001 – 0.0006)	0.08 (0.003)

TORQUE VALUES

Cam chain guide roller pin bolt

10 N·m (1.0 kgf·m, 7 lbf·ft)

TROUBLESHOOTING

- If the performance is poor at low speeds, check for white smoke in the crankcase breather tube. If the tube is smoky, check for a seized piston ring.

Cylinder compression is too low, or engine is hard to start

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

Cylinder compression is too high, or engine overheats or knocks

- Carbon deposits on the cylinder head and/or piston crown

Piston rattle

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

Excessive smoke

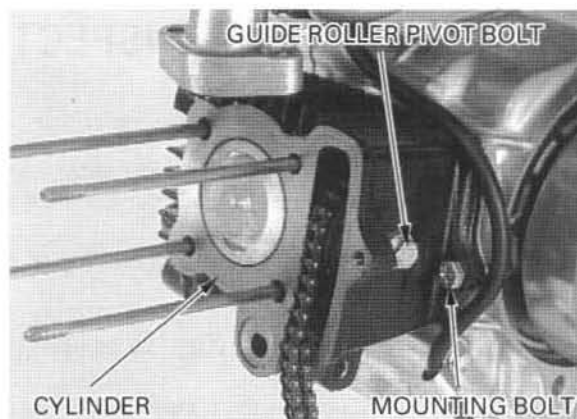
- Worn, stuck or broken piston ring

CYLINDER REMOVAL

Remove the cylinder head (page 7-4).

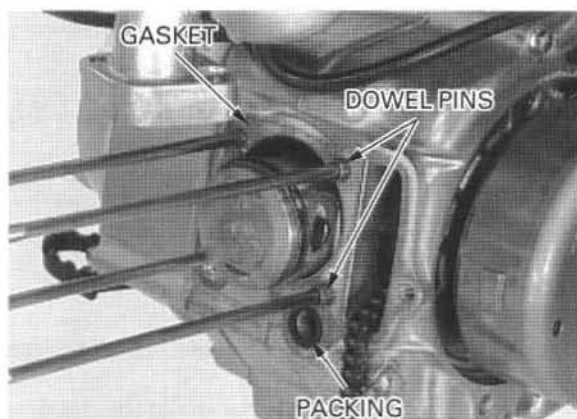
Remove the cam chain guide roller pivot bolt, washer and guide roller.

Remove the mounting bolt and cylinder.



Remove the following:

- Rubber packing
- Gasket
- Dowel pins

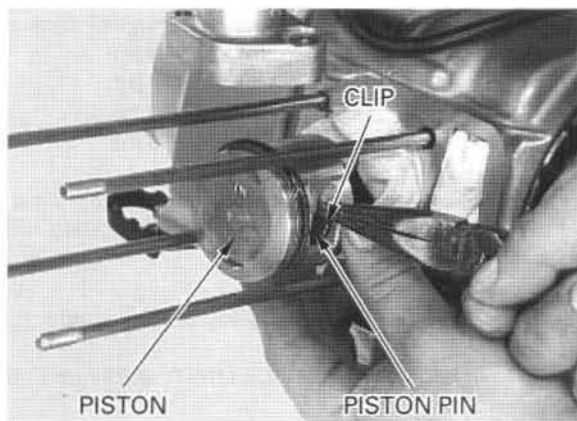


PISTON REMOVAL

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

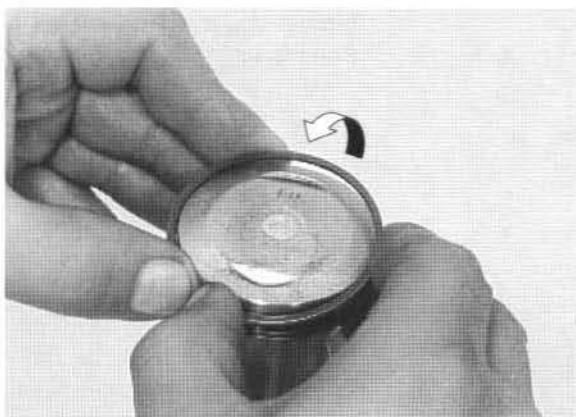
Remove the piston pin clip with pliers.

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



Do not damage the piston rings during removal.

Remove the piston rings.



CYLINDER/PISTON INSPECTION

CYLINDER

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

Take the maximum reading to determine the cylinder wear.

SERVICE LIMIT: 47.05 mm (1.852 in)

Calculate the piston-to-cylinder clearance.
Take a maximum reading to determine the clearance.
Refer to page 8-5 for measurement of the piston O.D.

SERVICE LIMIT: 0.15 mm (0.006 in)

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

SERVICE LIMITS:

Taper: 0.10 mm (0.004 in)

Out of round: 0.10 mm (0.004 in)

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

The following oversize pistons are available:

0.25 mm (0.010 in)

0.50 mm (0.020 in)

0.75 mm (0.030 in)

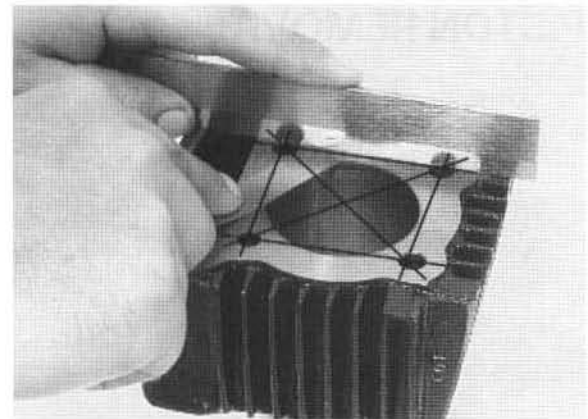
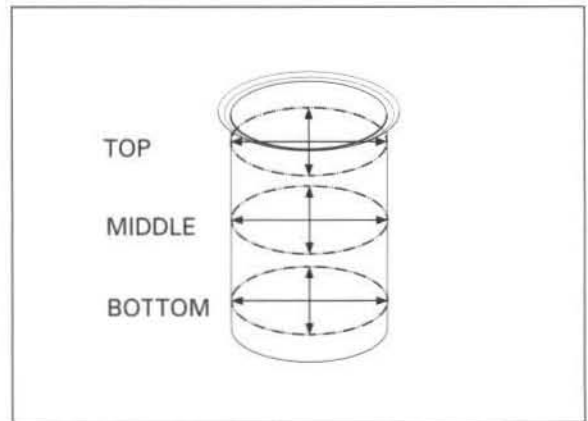
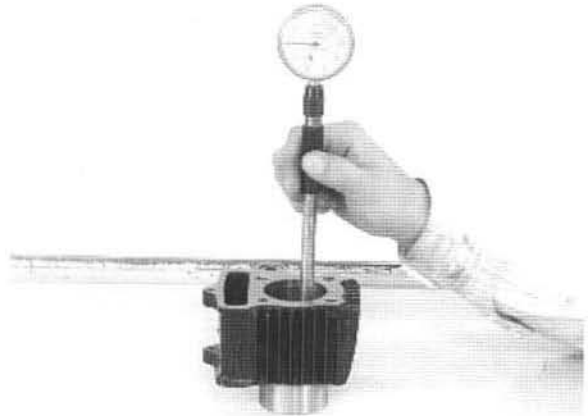
1.00 mm (0.039 in)

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

Inspect the top of the cylinder for warpage.

SERVICE LIMIT: 0.05 mm (0.002 in)

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



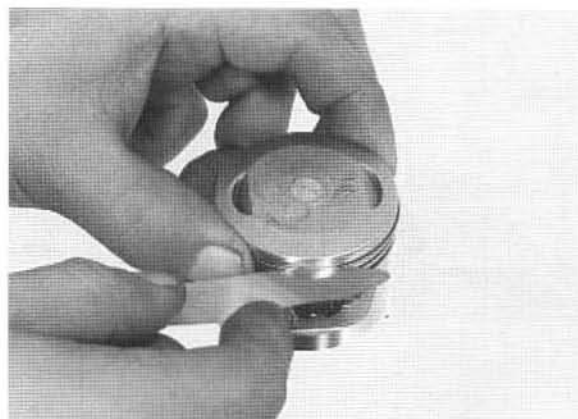
Temporarily install the piston rings to their proper position with the mark facing up.

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

SERVICE LIMITS:

Top: 0.12 mm (0.005 in)

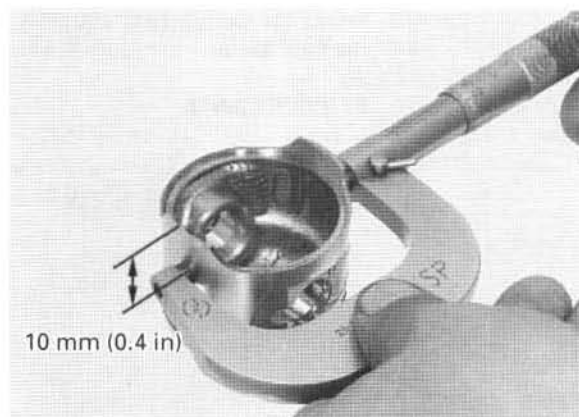
Second: 0.12 mm (0.005 in)



Inspect the piston for wear or damage.

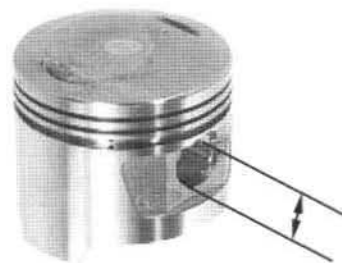
Measure the diameter of the piston at 10 mm (0.4 in) from the bottom and 90 degrees to the piston pin hole.

SERVICE LIMIT: 46.90 mm (1.846 in)



Measure the piston pin bore.

SERVICE LIMIT: 13.06 mm (0.514 in)

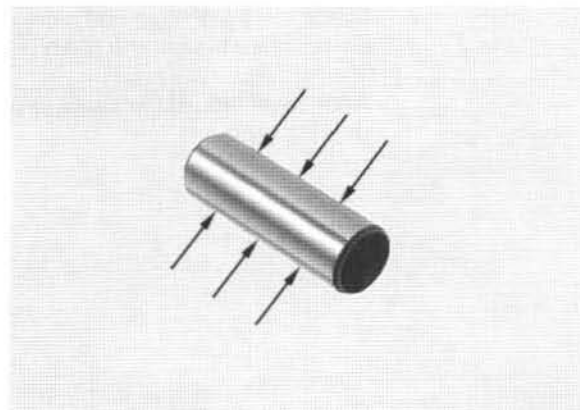


Measure the O.D. of the piston pin.

SERVICE LIMIT: 12.98 mm (0.511 in)

Calculate the piston-to-piston pin clearance.

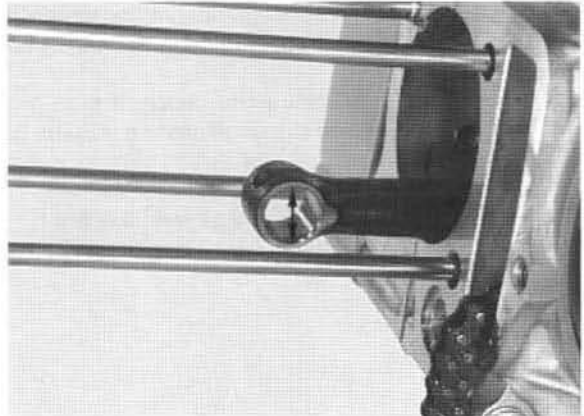
SERVICE LIMIT: 0.08 mm (0.003 in)



CYLINDER/PISTON

Measure the connecting rod small end I.D.

SERVICE LIMIT: 13.10 mm (0.516 in)



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

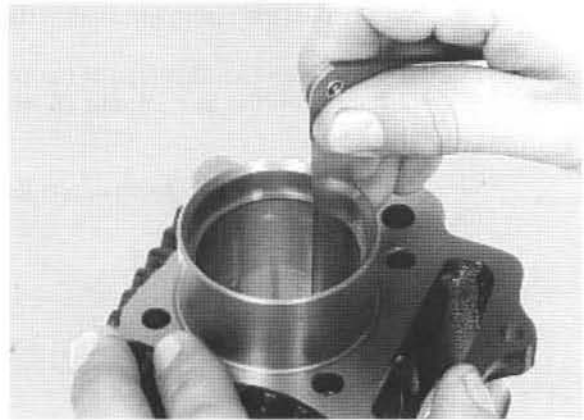
Insert the piston ring squarely into the bottom of the cylinder and measure the ring end gap.

SERVICE LIMITS:

Top: 0.5 mm (0.02 in)

Second: 0.5 mm (0.02 in)

Oil (side rail): 1.1 mm (0.04 in)



PISTON RING INSTALLATION

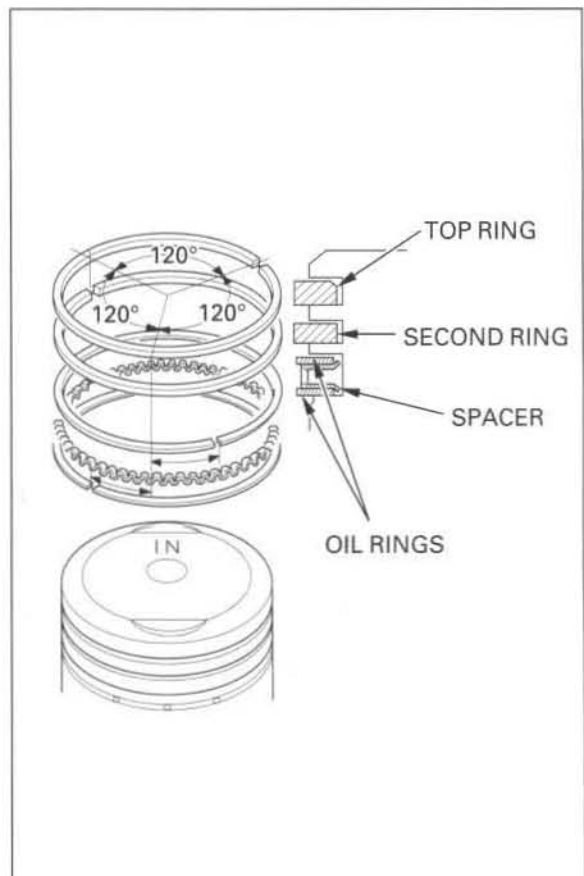
Clean the piston ring grooves thoroughly and install the piston rings.

NOTE:

- Apply oil to the piston rings.
- Avoid piston and piston ring damage during installation.
- Install the piston rings with their marking facing up.
- Do not mix the top and second rings; the top ring is narrower than the second ring in width.

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

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

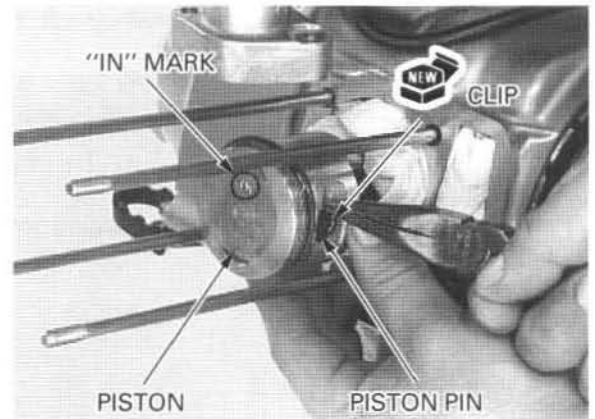


PISTON INSTALLATION

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

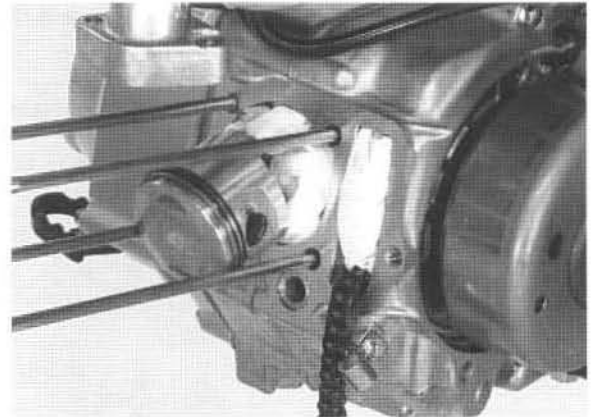
NOTE:

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

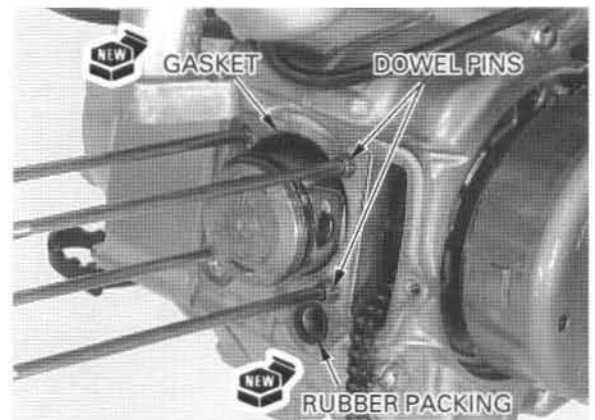


CYLINDER INSTALLATION

Clean off any gasket materials from the crankcase surface.



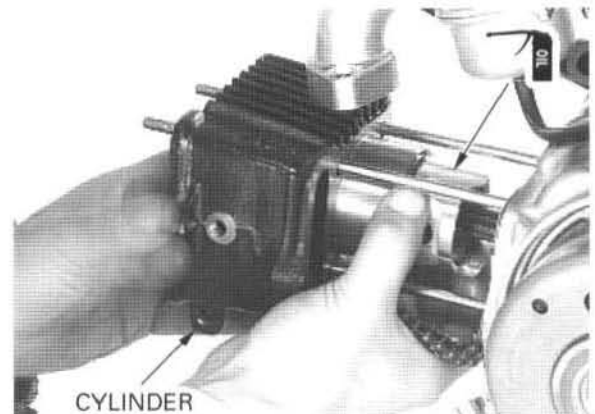
Install the dowel pins, new gasket and new rubber packing.



Coat the cylinder bore, piston outer surface and piston ring grooves with clean engine oil.
Install the cylinder while compressing the piston rings.

NOTE:

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

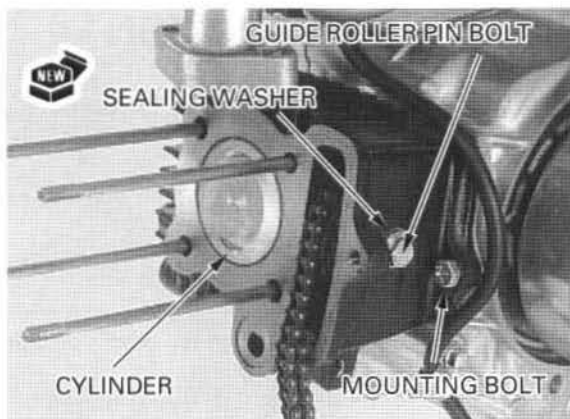


CYLINDER/PISTON

Install the cam chain guide roller, new sealing washer and pin bolt.
Tighten the cam chain guide roller pin bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m , 7 lbf·ft)

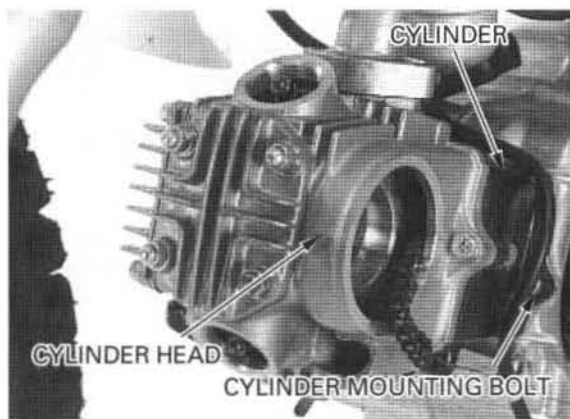
Install the cylinder mounting bolt but do not tighten it yet.



Install the cylinder head and tighten the bolt and nuts (page 7-14).

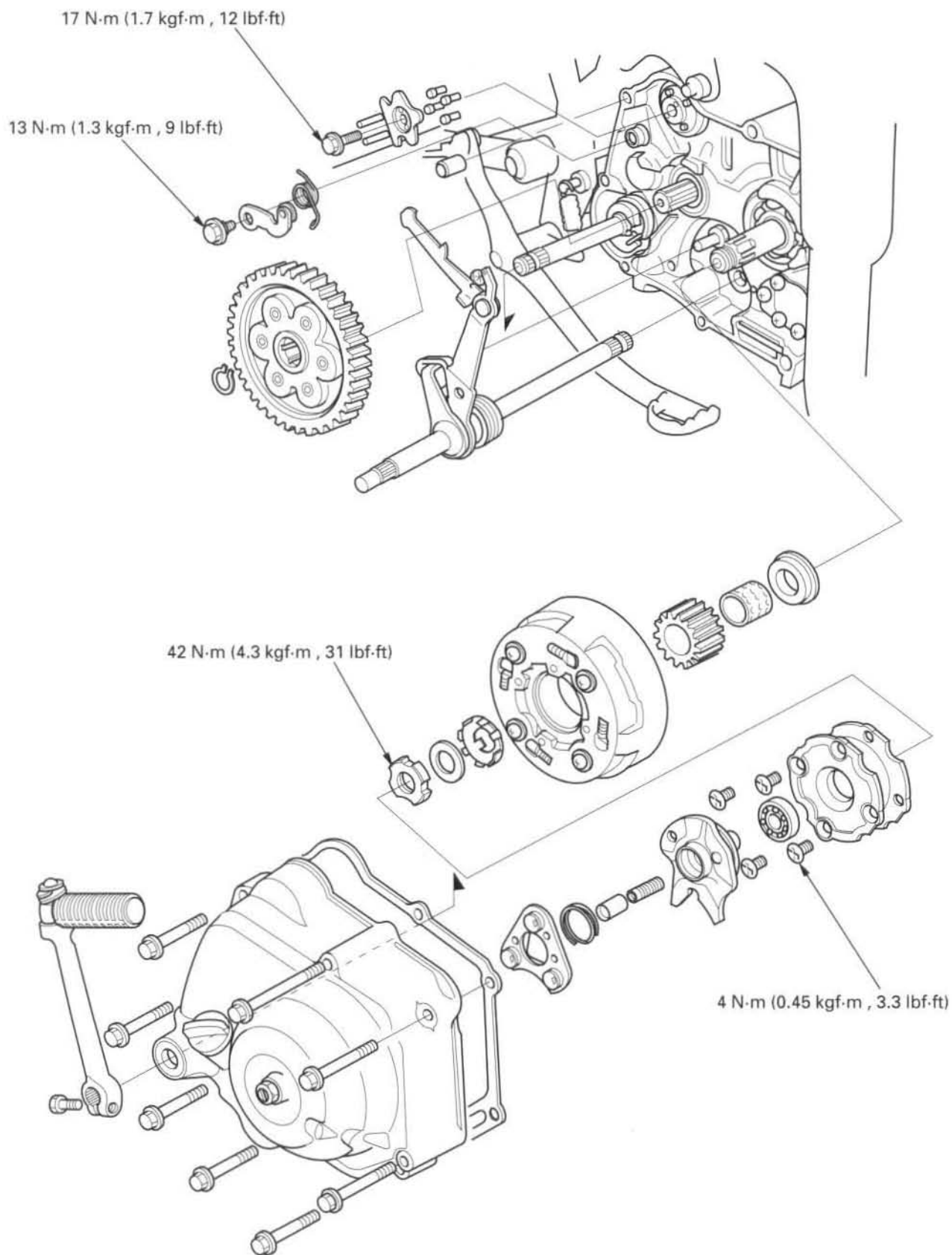
Tighten the cylinder mounting bolt.

Install the removed parts in the reverse order of removal.



MEMO

CLUTCH/GEARSHIFT LINKAGE



9. CLUTCH/GEARSHIFT LINKAGE

SERVICE INFORMATION	9-1	CLUTCH	9-4
TROUBLESHOOTING	9-2	GEARSHIFT LINKAGE	9-14
RIGHT CRANKCASE COVER REMOVAL	9-3	RIGHT CRANKCASE COVER INSTALLATION	9-17

SERVICE INFORMATION

GENERAL

- This section covers service of the clutch and gearshift linkage. All service can be done with the engine installed in the frame.
- Use care not to allow dust or dirt to enter the engine.
- Transmission oil viscosity and level have an effect on clutch disengagement. When the clutch does not disengage or the motorcycle creeps with clutch disengaged, inspect the transmission oil level before servicing the clutch system.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Clutch disc thickness	A	2.52 – 2.68 (0.099 – 0.106)	2.3 (0.09)
	B	3.35 – 3.45 (0.132 – 0.136)	3.0 (0.12)
Clutch plate warpage			0.20 (0.008)
Centrifugal clutch spring free length		17.3 (0.68)	16.4 (0.65)
Primary drive gear I.D.		21.000 – 21.021 (0.8268 – 0.8276)	21.05 (0.829)
Clutch center guide	I.D.	16.988 – 17.006 (0.6688 – 0.6695)	17.04 (0.671)
	O.D.	20.930 – 20.950 (0.8240 – 0.8248)	20.90 (0.823)
Crankshaft O.D. at clutch center guide		16.966 – 16.984 (0.6680 – 0.6687)	16.90 (0.665)

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TORQUE VALUES

Clutch outer cover screw	4 N·m (0.45 kgf·m , 3.3 lbf·ft)
Clutch lock nut	42 N·m (4.3 kgf·m , 31 lbf·ft)
Clutch outer spring screw	6 N·m (0.6 kgf·m , 4.3 lbf·ft)
Shift drum stopper arm bolt	13 N·m (1.3 kgf·m , 9 lbf·ft)
Shift spring pin bolt	29 N·m (3.0 kgf·m , 22 lbf·ft)
Gearshift cam bolt	17 N·m (1.7 kgf·m , 12 lbf·ft)

TOOLS

Flywheel holder	07725 – 0040000	Equivalent commercially available in U.S.A.
Lock nut wrench, 20 × 24 mm	07716 – 0020100	
Extension bar	07716 – 0020500	Equivalent commercially available in U.S.A.

TROUBLESHOOTING

Clutch slips when accelerating

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

Motorcycle creeps with clutch disengaged

- Incorrect clutch adjustment
- Clutch plate warped
- Faulty clutch lifter
- Faulty clutch weight
- Incorrect engine oil weight

Hard to shift

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

Transmission jumps out of gear

- Worn shift drum stopper arm
- Weak or broken shift arm return spring
- Loose stopper plate bolt

Gearshift pedal will not return

- Weak or broken gearshift spindle return spring
- Bent gearshift spindle

RIGHT CRANKCASE COVER REMOVAL

Drain the engine oil (page 3-10).
Remove the footpeg bar (page 6-3).

Remove the bolt and kickstarter pedal.

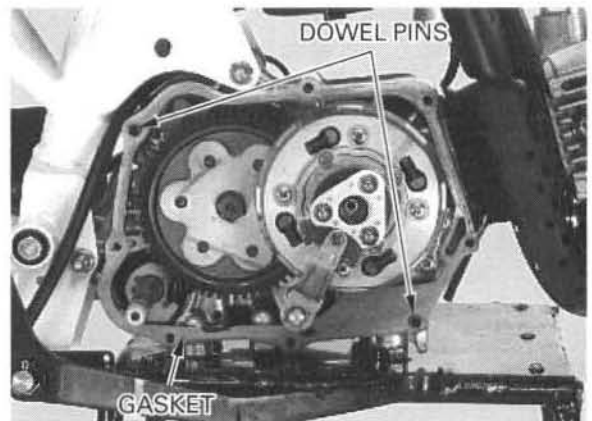
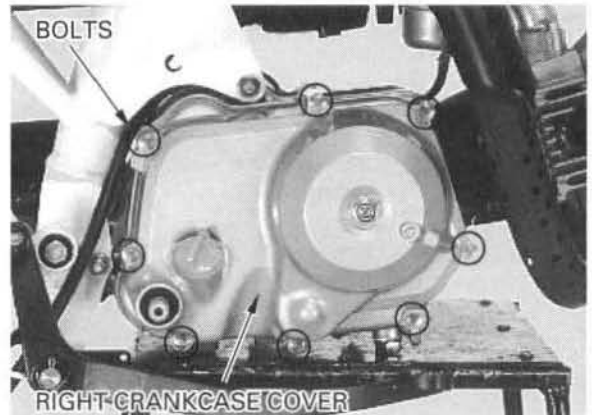
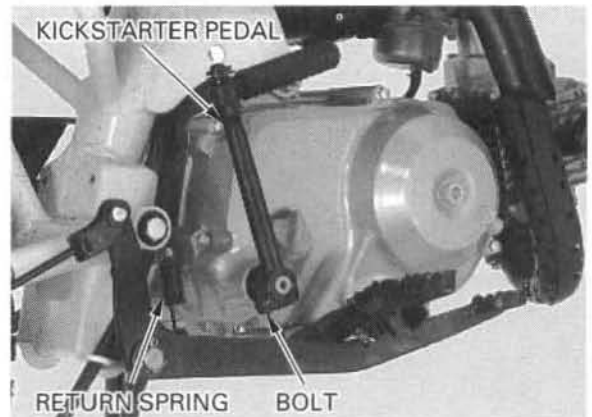
Unhook the brake pedal return spring.
Loosen the rear brake pedal adjusting nut and lower the brake pedal.

Remove the bolts and right crankcase cover.

Remove the gasket and dowel pins.

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

Remove the clutch lifter/adjusting bolt assembly.



CLUTCH/GEARSHIFT LINKAGE

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



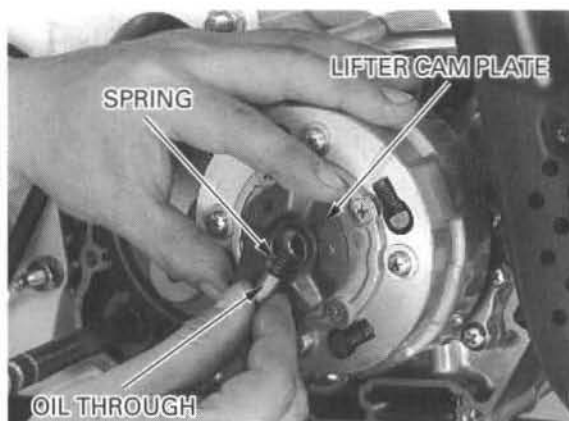
CLUTCH

REMOVAL

Remove the clutch lifter lever, ball retainer and spring.



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



Remove the screws and clutch outer cover and bearing.



Bend up the tab of the lock washer.



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

TOOLS:

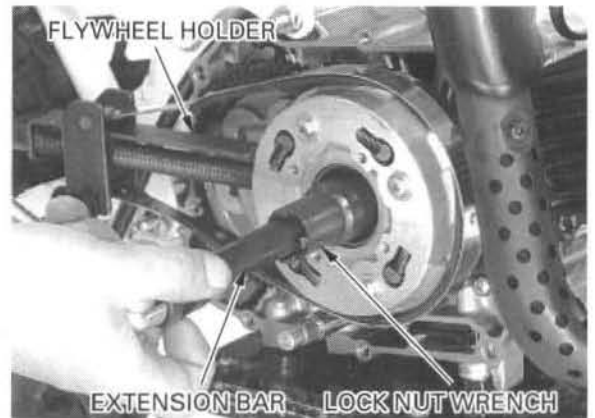
Flywheel holder

07725-0040000
(Equivalent commercially available in U.S.A.)

Lock nut wrench, 20 × 24 mm

07716-0020100
07716-0020500
(Equivalent commercially available in U.S.A.)

Extension bar



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

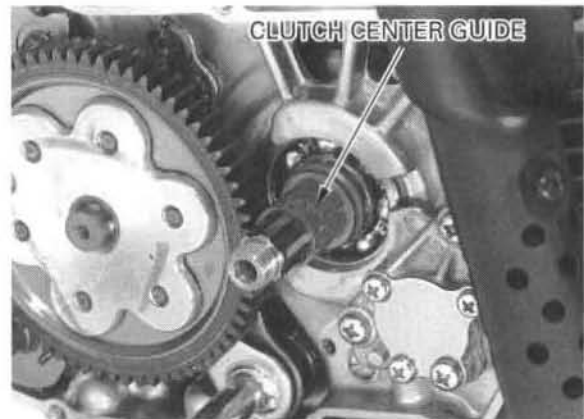


Remove the primary drive gear.



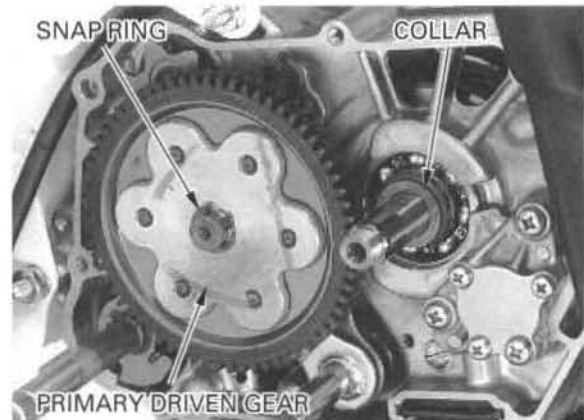
CLUTCH/GEARSHIFT LINKAGE

Remove the clutch center guide.



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

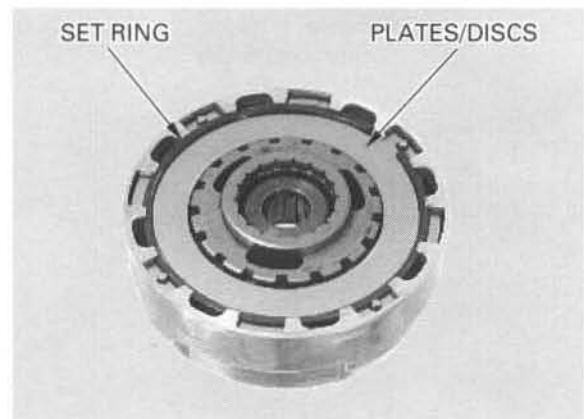
Remove the collar from the crankshaft.



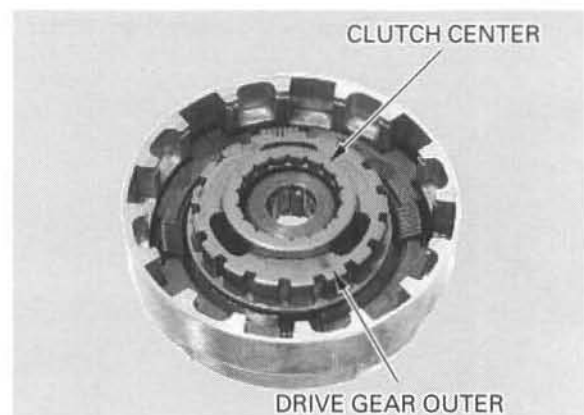
DISASSEMBLY

Remove the following:

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



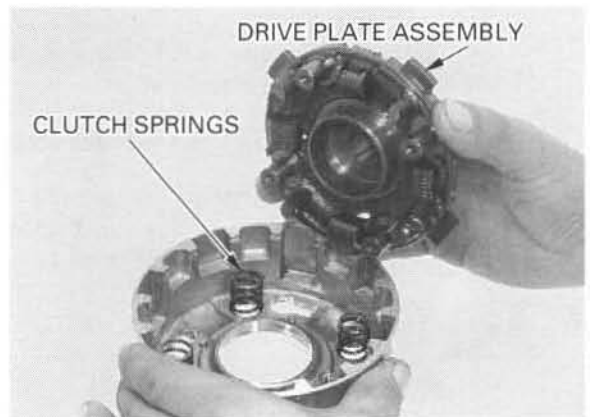
Remove the drive gear outer and clutch center.



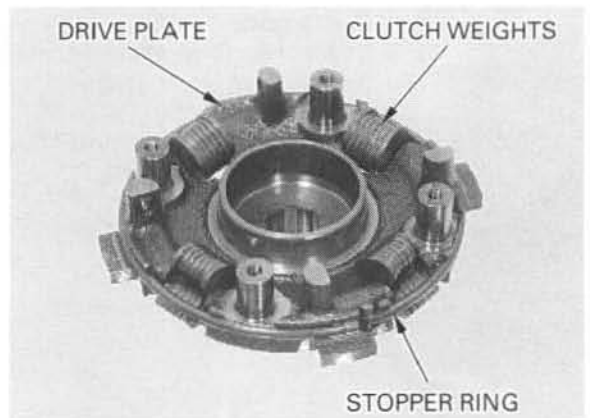
Remove the four damper springs.
Remove the four screws and plain washers.



Remove the drive plate assembly and clutch springs.



Remove the clutch weight stopper ring.
Remove the clutch weights and center ring.



INSPECTION

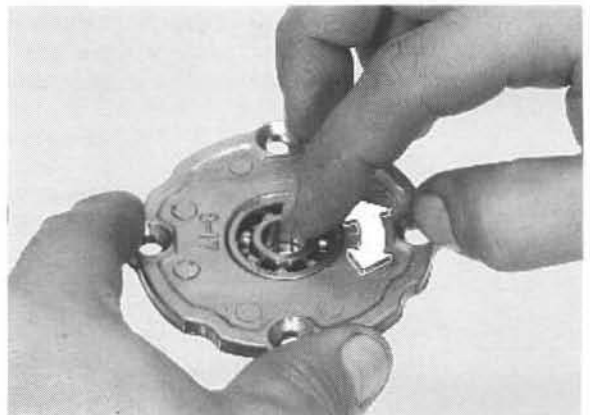
Clutch lifter bearing

Turn the inner race of the lifter bearing with your finger.

The bearing should turn smoothly and freely without excessive play.

Also check that the bearing fits tightly in the clutch outer cover.

If necessary replace the bearing.

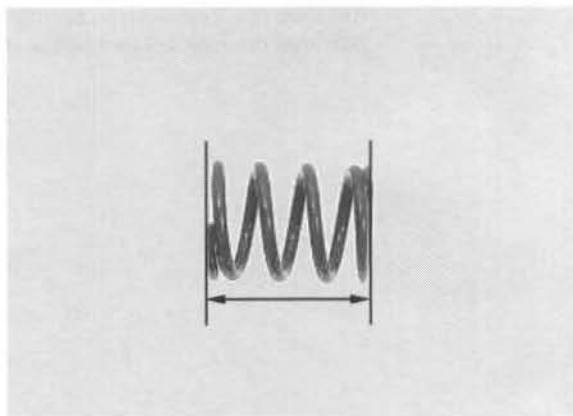


CLUTCH/GEARSHIFT LINKAGE

Clutch spring

Measure the clutch spring free length.

SERVICE LIMIT: 16.4 mm (0.65 in)



Clutch disc

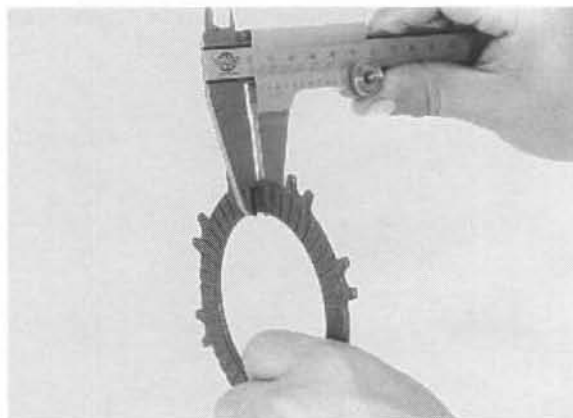
Replace the clutch discs if they show signs of scoring or discoloration.

Measure the disc thickness of each disc.

SERVICE LIMITS:

Clutch disc A: 2.3 mm (0.09 in)

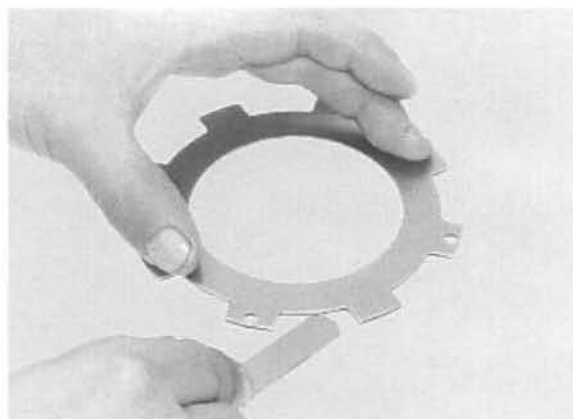
Clutch disc B: 3.0 mm (0.12 in)



Clutch plate

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

SERVICE LIMIT: 0.20 mm (0.008 in)



Primary drive gear/clutch center guide

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

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

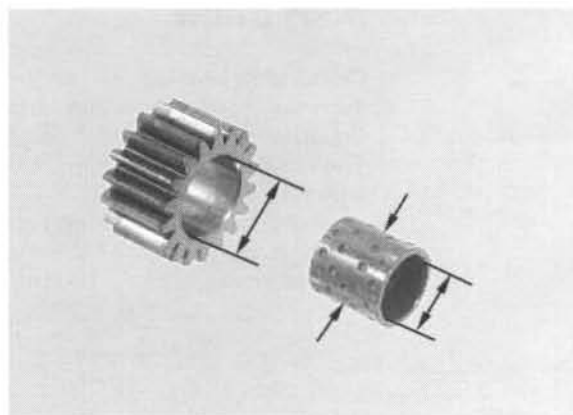
SERVICE LIMIT: 21.05 mm (0.829 in)

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

SERVICE LIMITS:

I.D.: 17.04 mm (0.671 in)

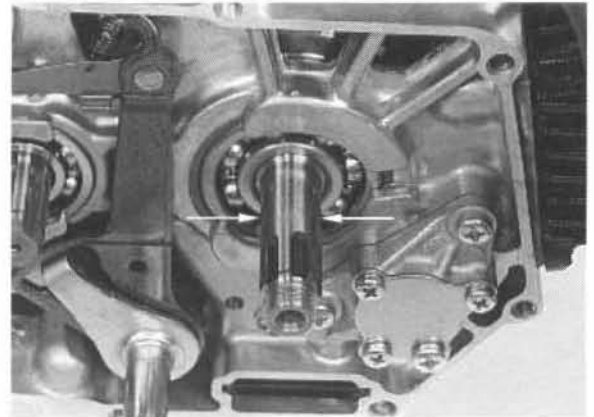
O.D.: 20.90 mm (0.823 in)



Crankshaft

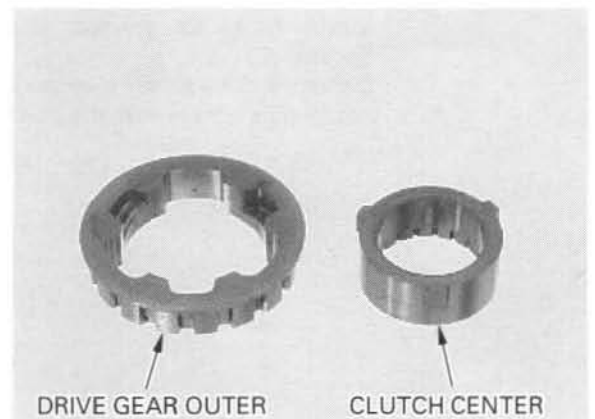
Measure the crankshaft O.D at clutch center guide.

SERVICE LIMIT: 16.90 mm (0.665 in)

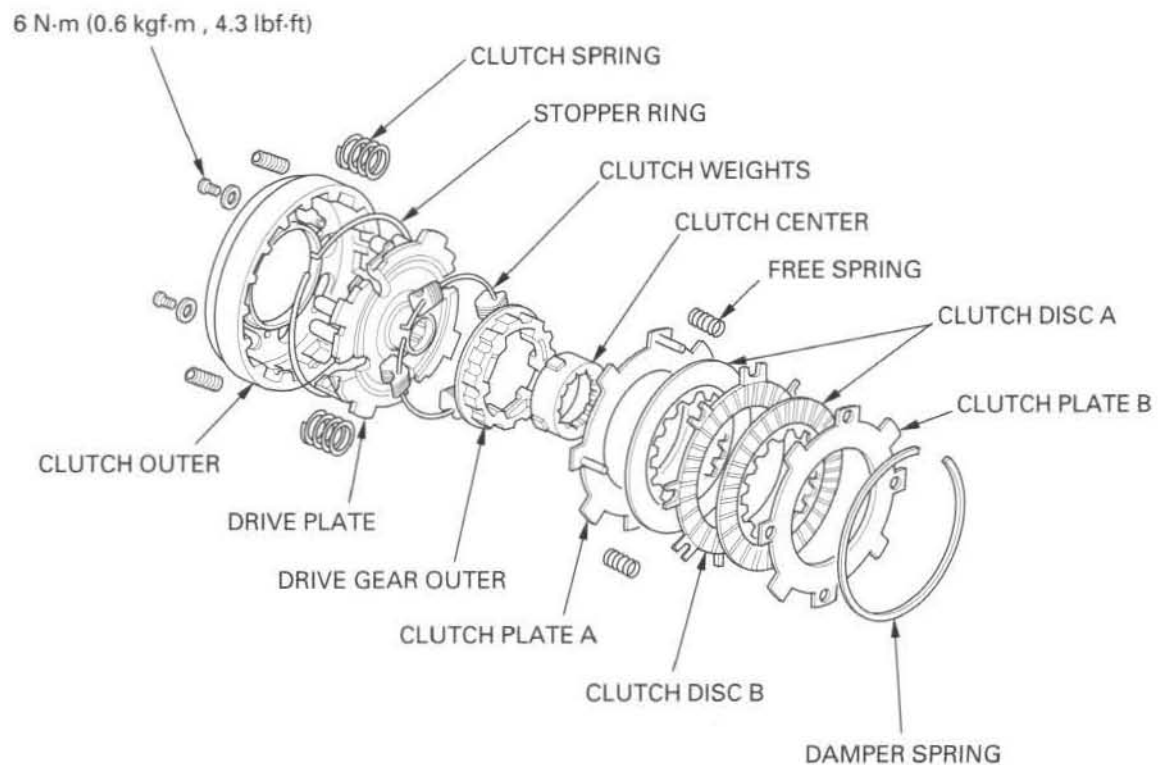


Drive gear outer/clutch center

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

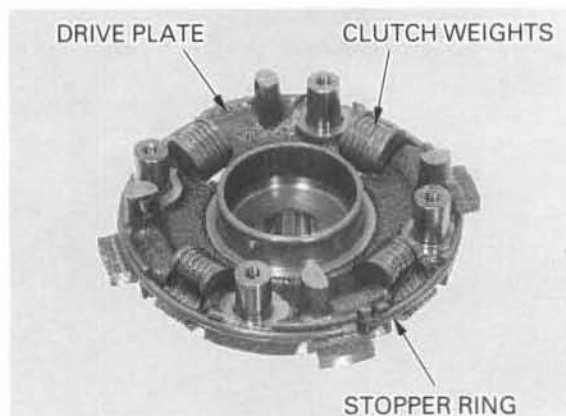


ASSEMBLY

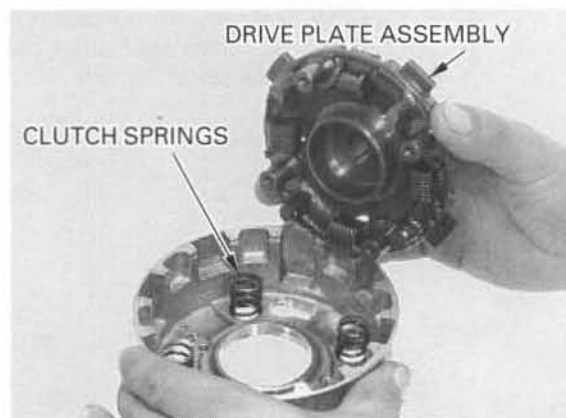


CLUTCH/GEARSHIFT LINKAGE

Install the clutch weights and center ring onto the drive plate, and secure them with the stopper ring as shown.



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



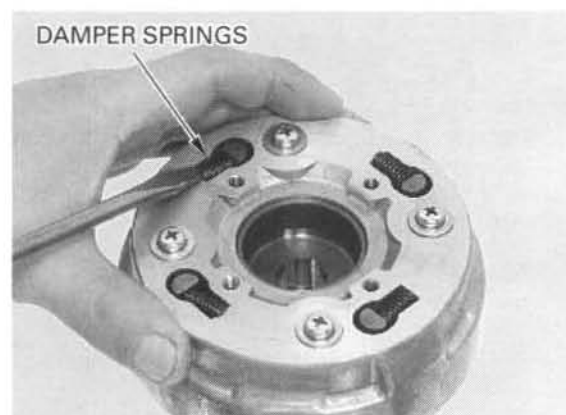
Install the plain washers and screws.
Tighten the screws in a crisscross pattern in 2 – 3 steps.

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

WASHERS/SCREWS

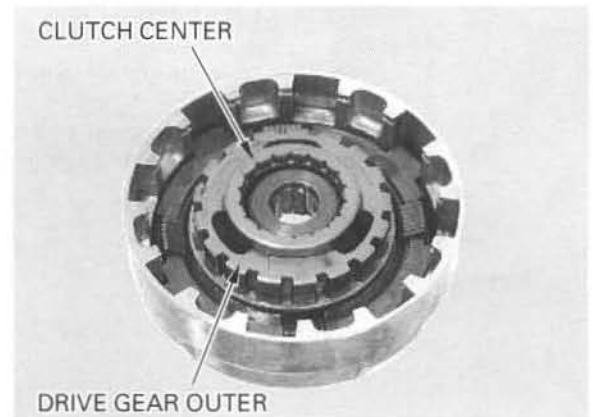


Install the damper springs as shown.



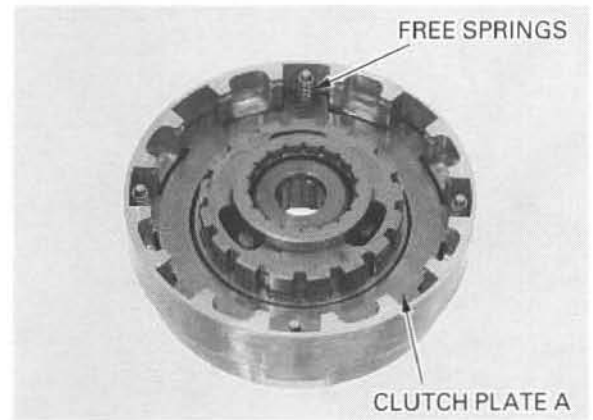
Note the direction of the drive gear outer.

Install the clutch center and drive gear outer.



Install the following:

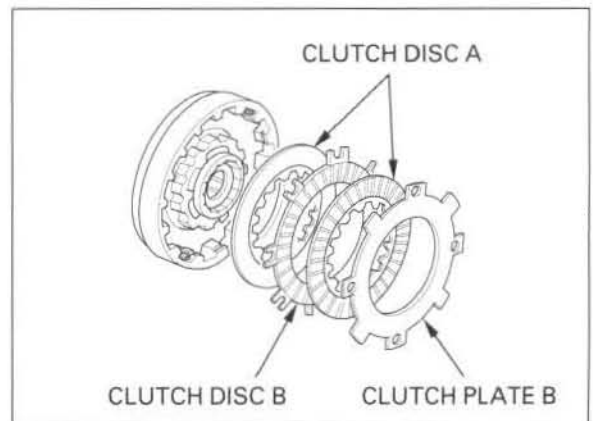
- Clutch plate A
- Free springs



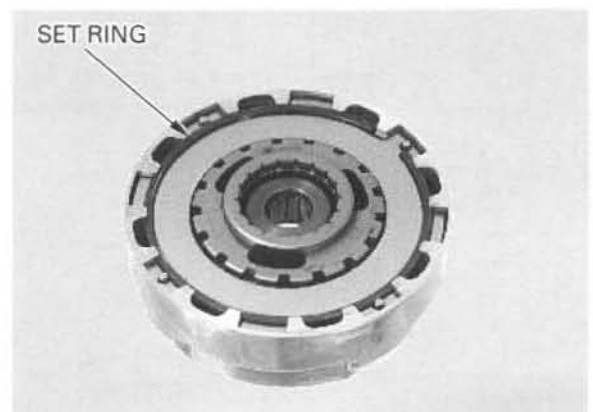
- Clutch disc A
- Clutch disc B
- Clutch disc A
- Clutch plate B

NOTE:

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



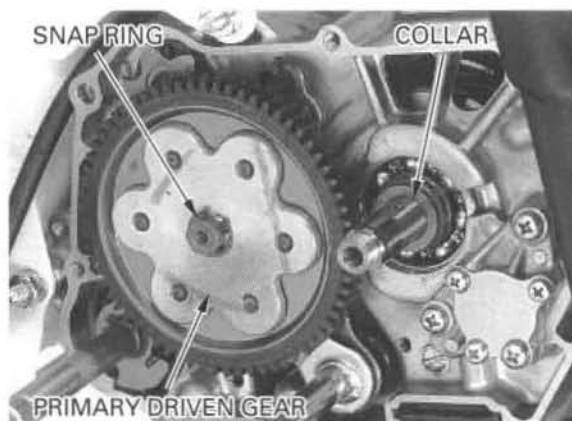
Install the clutch set ring with its chamfered end facing the clutch plate B.



INSTALLATION

Install the collar onto the crankshaft.

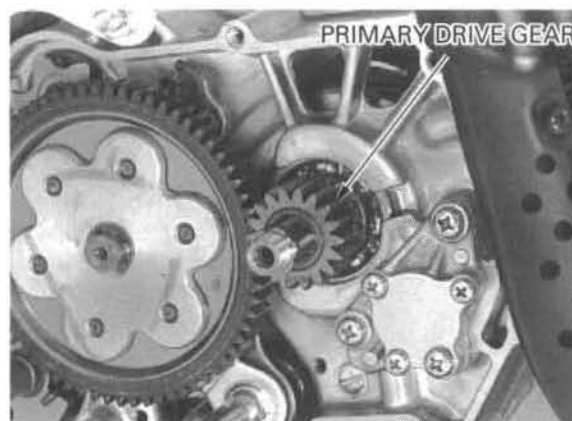
Install the primary driven gear onto the mainshaft and secure it with the snap ring.



Install the clutch center guide onto the crankshaft.



Install the primary drive gear.



Install the clutch assembly onto the crankshaft.

Install the new 14 mm lock washer aligning its tab with the groove in the clutch outer.



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



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

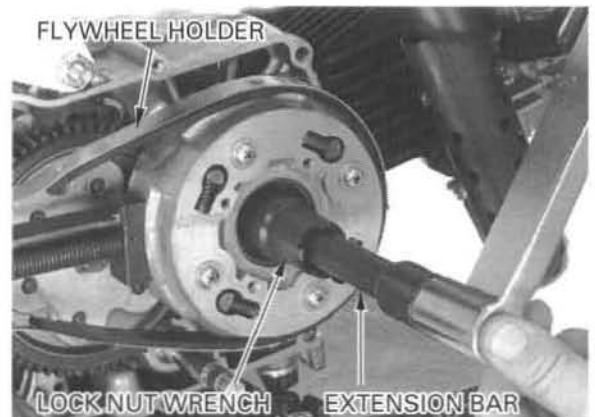
TOOLS:

Flywheel holder

07725-0040000
(Equivalent commercially available in U.S.A.)

Lock nut wrench, 20 × 24 mm
Extension bar

07716-0020100
07716-0020500
(Equivalent commercially available in U.S.A.)



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

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

Bend the tab of the 14 mm lock washer into the groove of the lock nut.



Clean the inside of the clutch outer and outer cover (page 3-11).

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



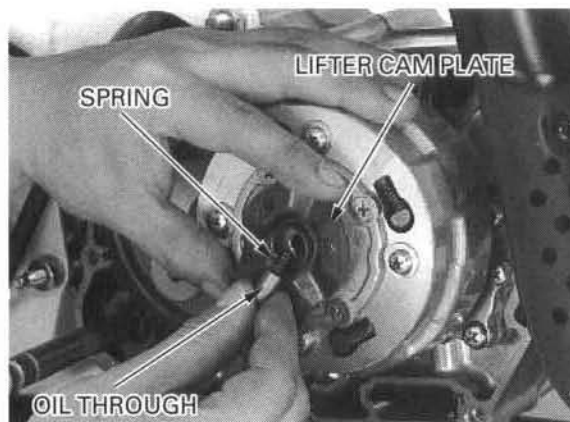
CLUTCH/GEARSHIFT LINKAGE

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

TORQUE: 4 N·m (0.45 kgf·m , 3.3 lbf·ft)

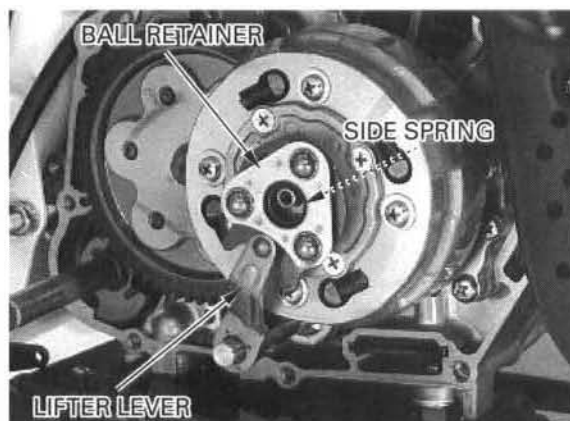


Install the clutch lifter cam plate.
Install the oil through spring and oil through.



Install the cam plate side spring.
Install the ball retainer and clutch lifter lever.

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



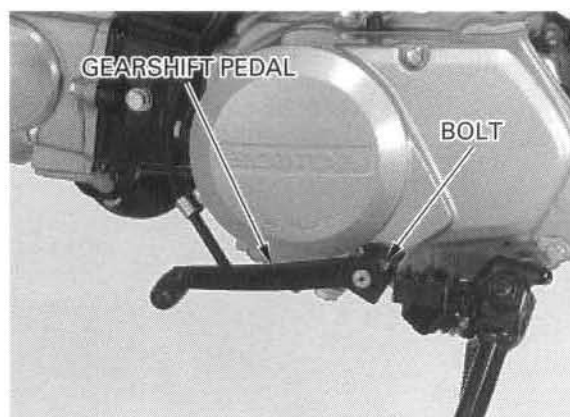
GEARSHIFT LINKAGE

REMOVAL

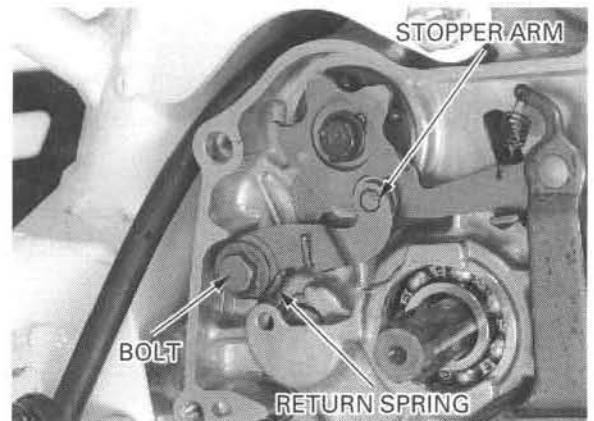
Remove the clutch and primary driven gear (page 9-4).

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

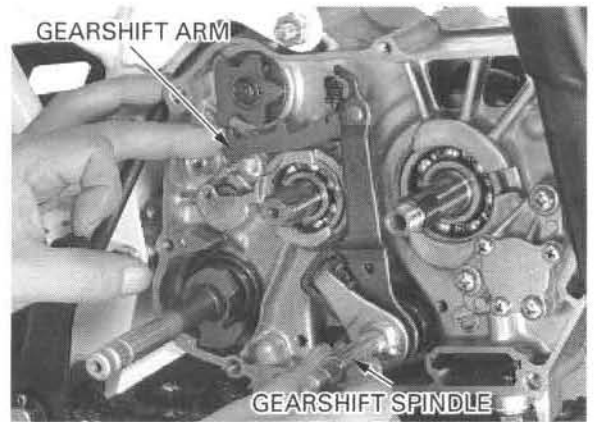
Remove the bolt and gearshift pedal.



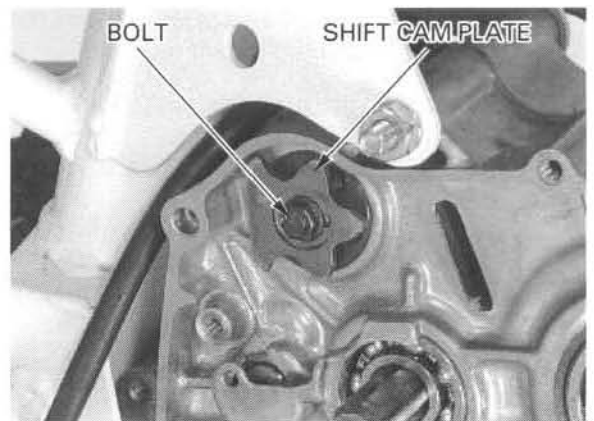
Remove the bolt, stopper arm and return spring.



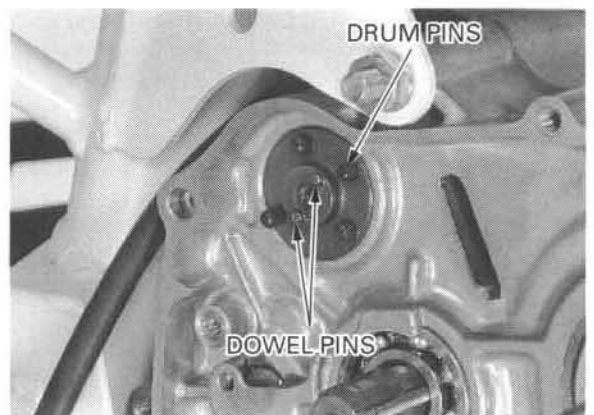
Pull down the gearshift arm, then pull out the gearshift spindle from the crankcase.



Remove the bolt and shift cam plate.

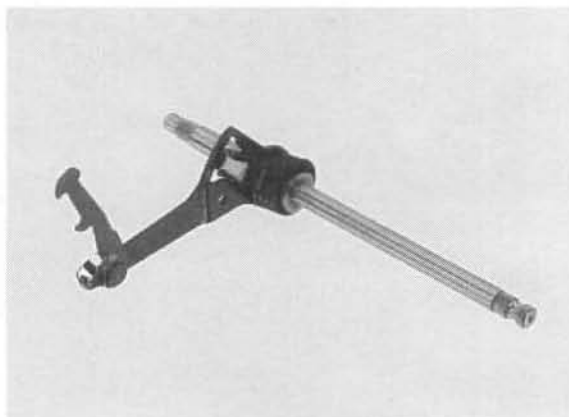


Remove the dowel pins and gearshift drum pins.



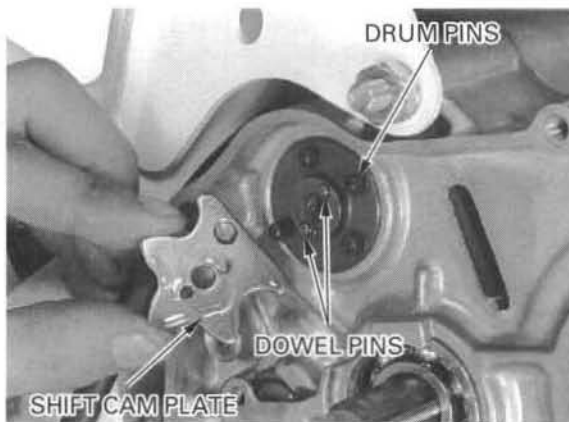
INSPECTION

Check the gearshift spindle for bending or other damage.



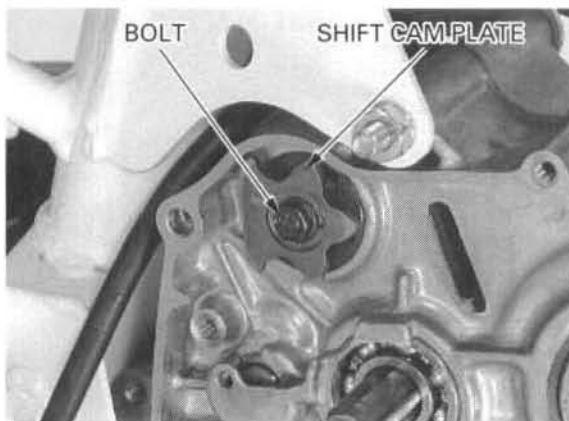
INSTALLATION

Install the four gearshift drum pins and two dowel pins.



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

TORQUE: 17 N·m (1.7 kgf·m , 12 lbf·ft)

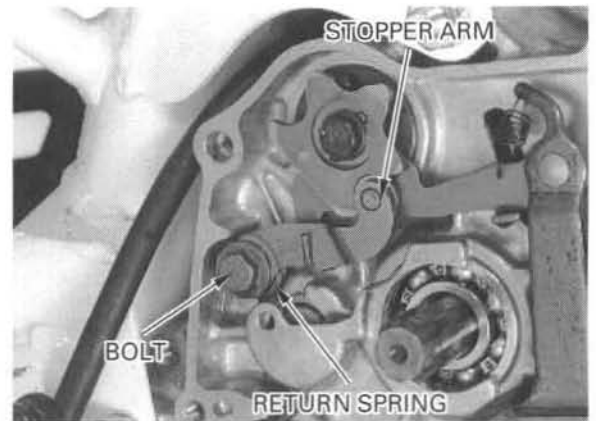


Install the gearshift spindle while pushing down the gearshift arm and align the return spring end with the crankcase stopper pin.



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

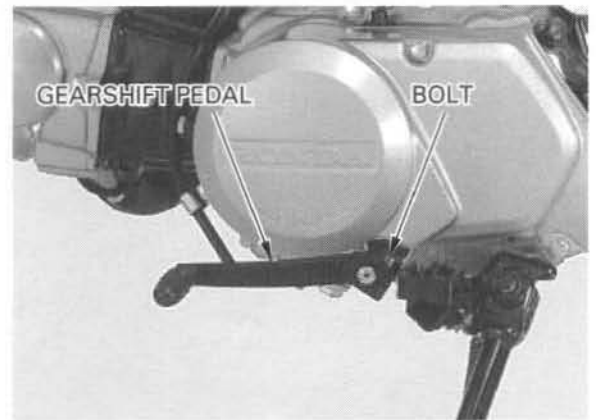
TORQUE: 13 N·m (1.3 kgf·m, 9 lbf·ft)



Install the gearshift pedal and tighten the bolt.

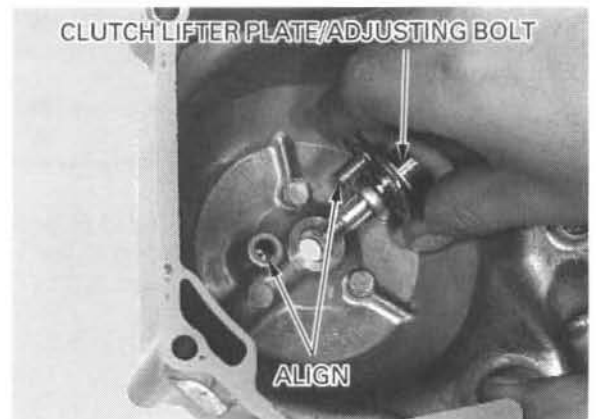
Install the following:

- Clutch (page 9-12)
- Right crankcase cover (see below)



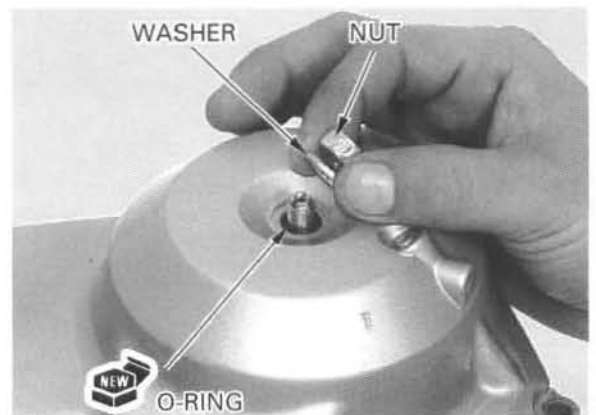
RIGHT CRANKCASE COVER INSTALLATION

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



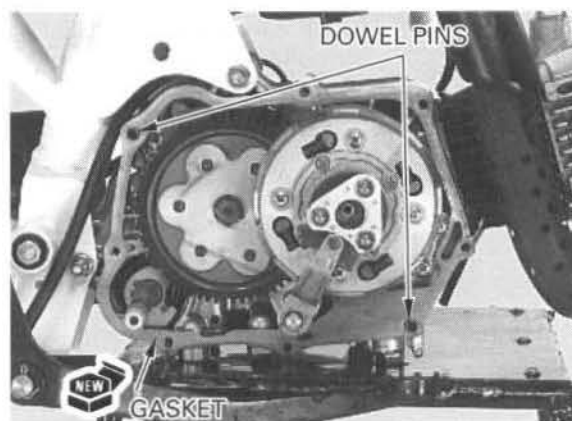
Remove the clutch and primary driven gear (page 9-4).

Remove the bolt and gearshift pedal.

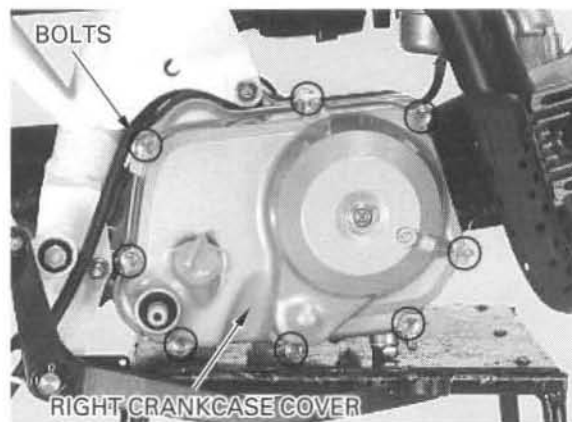


CLUTCH/GEARSHIFT LINKAGE

Install the dowel pins and new gasket.



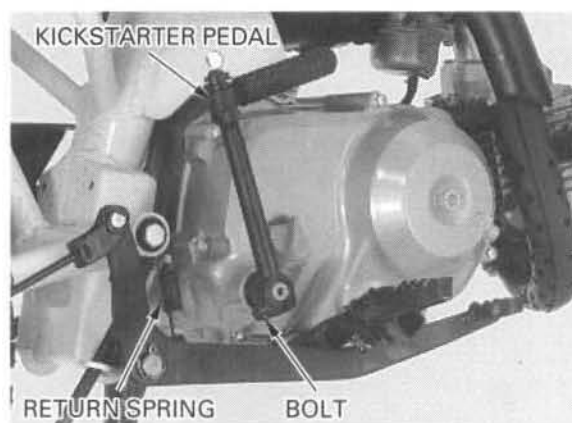
Install the right crankcase cover.
Install and tighten the right crankcase cover SH bolts.



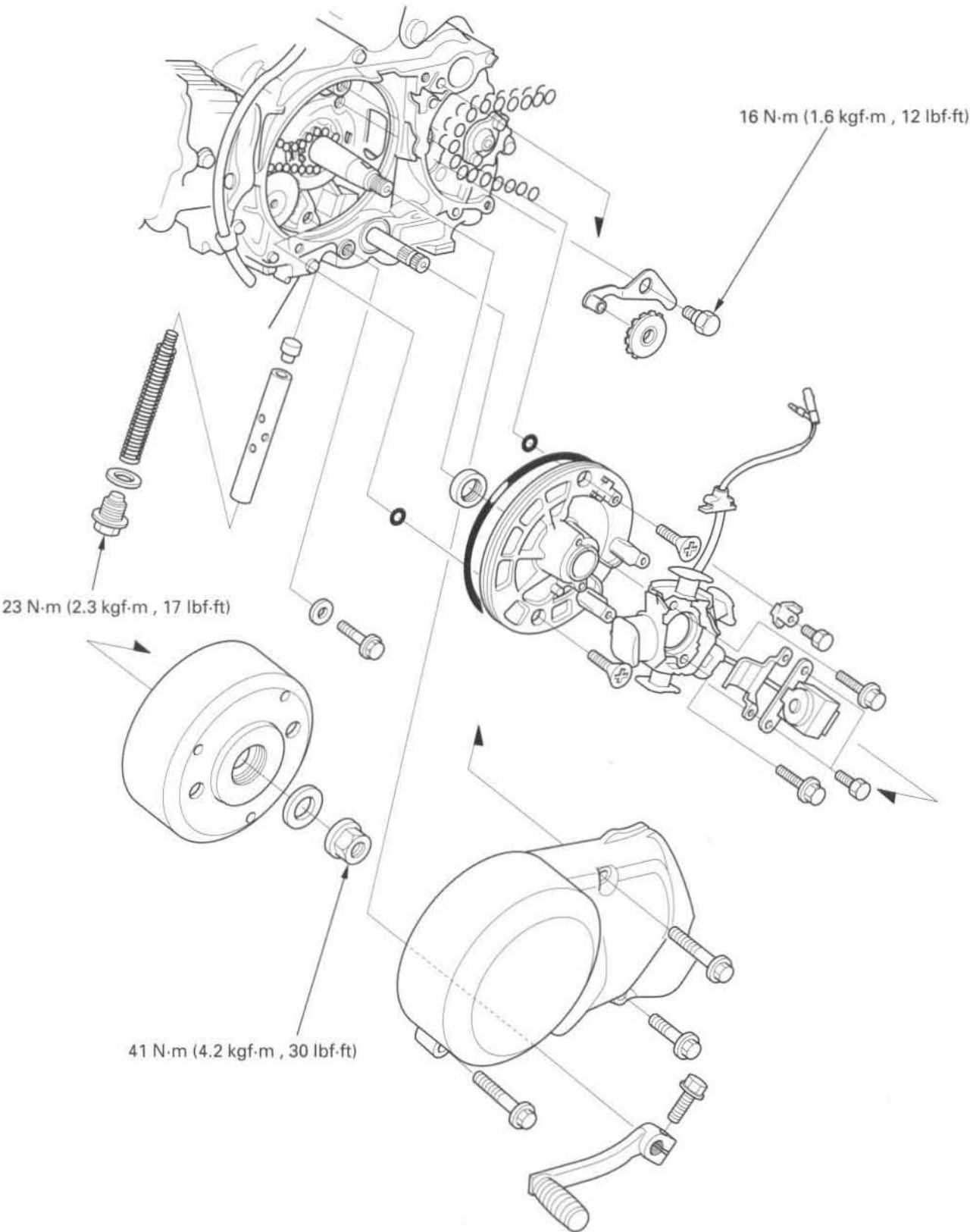
Install the kickstarter pedal and tighten the bolt.
Hook the return spring to the brake pedal and lower engine hanger bolt.
Adjust the brake pedal free play (page 3-16).

Install the footpeg bar (page 6-5).

Pour the recommended engine oil (page 3-10) and
make sure there are no oil leaks.
Adjust the clutch (page 3-17).



MEMO



10. ALTERNATOR/CAM CHAIN TENSIONER

SERVICE INFORMATION	10-1	CAM CHAIN TENSIONER	10-4
TROUBLESHOOTING	10-1	STATOR/FLYWHEEL INSTALLATION	10-6
FLYWHEEL/STATOR REMOVAL	10-2		

SERVICE INFORMATION

GENERAL

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

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Cam chain tensioner	Push rod O.D.	11.985 – 12.000 (0.4718 – 0.4724)	11.94 (0.470)
	Spring free length	117 (4.6)	100 (3.9)

TORQUE VALUES

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

TOOLS

Universal holder	07725 – 0030000	
Flywheel puller	07933 – GE00000	Not available in U.S.A.
Flywheel puller	07933 – 0010000	U.S.A. only

TROUBLESHOOTING

Excessive engine noise

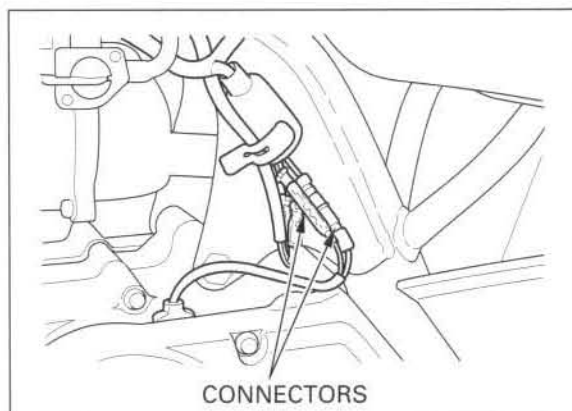
- Worn or damaged cam chain tensioner
- Clogged one-way valve
- Weak or damaged cam chain tensioner spring

Loose cam chain

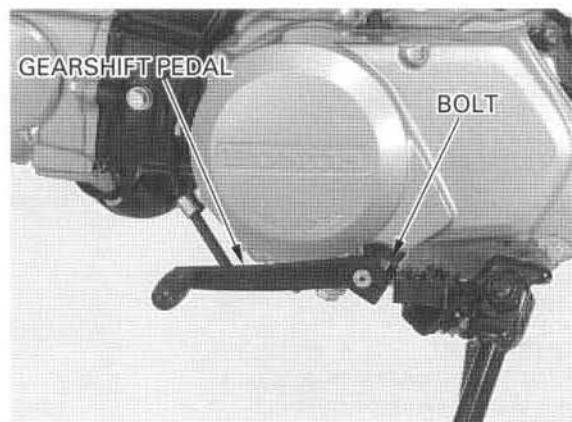
- Weak or damaged cam chain tensioner spring
- Improper push rod operation
- Clogged one-way valve
- Air in cam chain tensioner chamber

FLYWHEEL/STATOR REMOVAL

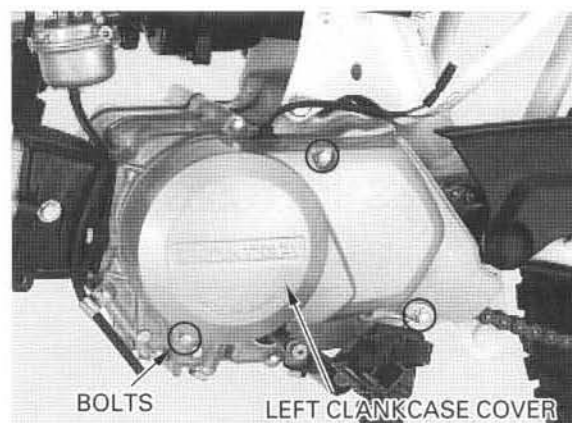
Disconnect the alternator and ignition pulse generator connectors.



Remove the bolt and gearshift pedal.



Remove the SH bolts and left crankcase cover.



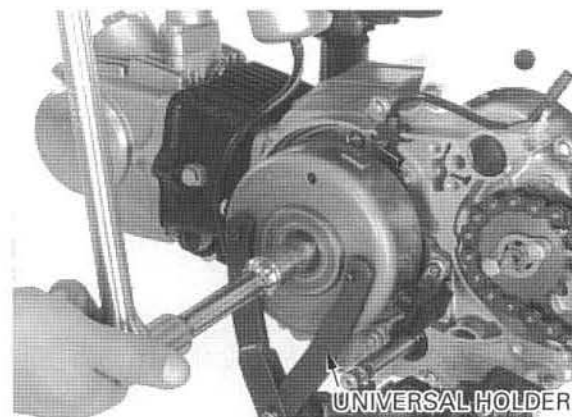
Hold the flywheel using the universal holder, then remove the flywheel nut.

TOOL:

Universal holder

07725-0030000

Remove the washer.



Remove the flywheel using the special tool.

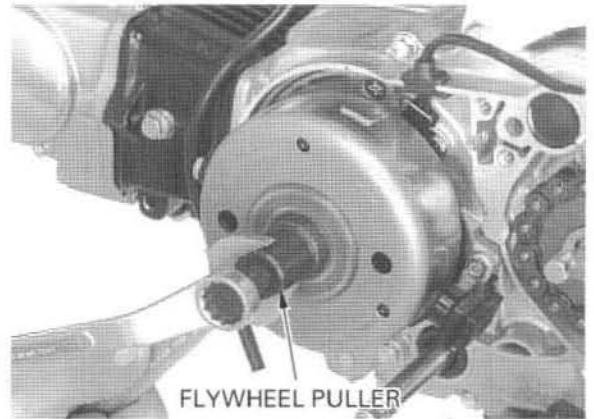
TOOL:

Flywheel puller

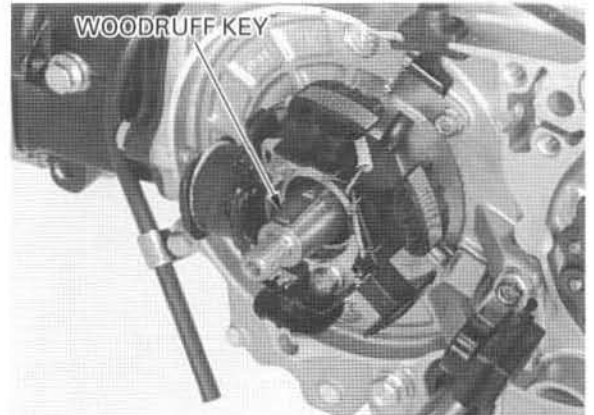
07933—GE00000
(Not available in U.S.A.)

Flywheel puller

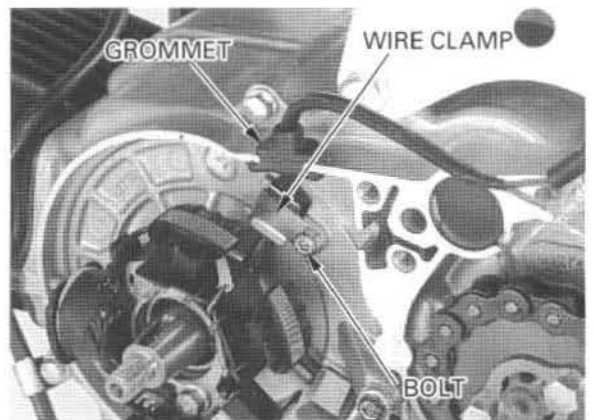
07933—0010000
(U.S.A. only)



Remove the woodruff key.

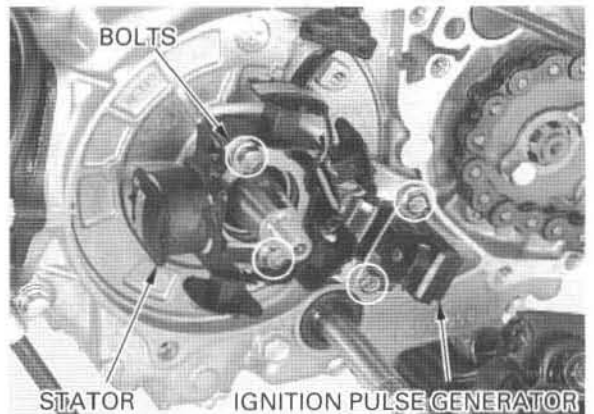


Remove the bolt and wire clamp.
Release the wire grommet from the crankcase groove.



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

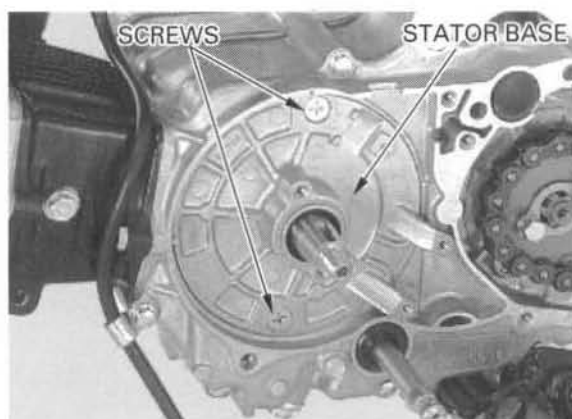
Remove the ignition pulse generator and stator as an assembly.



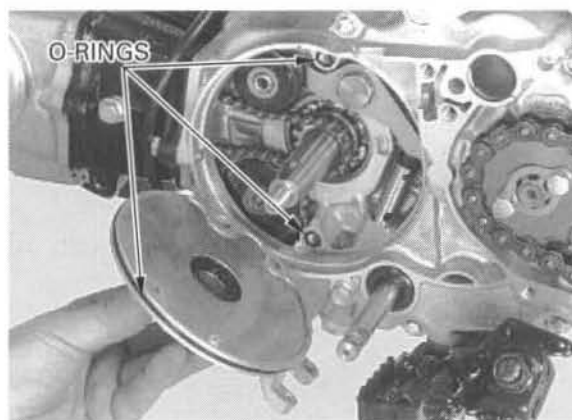
ALTERNATOR/CAM CHAIN TENSIONER

Drain the engine oil (page 3-10).

Remove the screws and stator base.



Remove the O-rings.

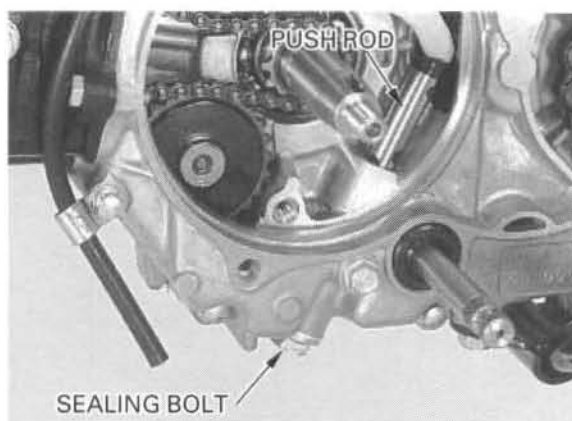


CAM CHAIN TENSIONER

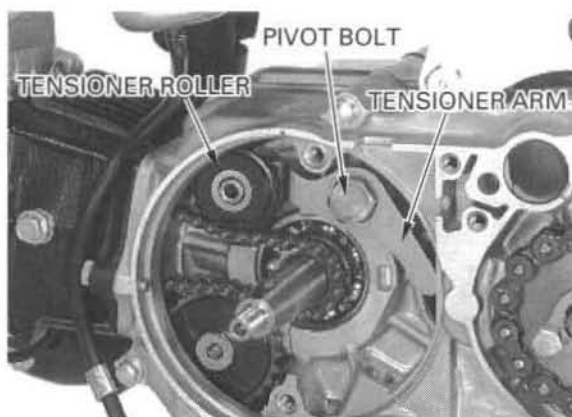
REMOVAL

Remove the stator base (page 10-2).

Remove the sealing bolt, tensioner spring and push rod.



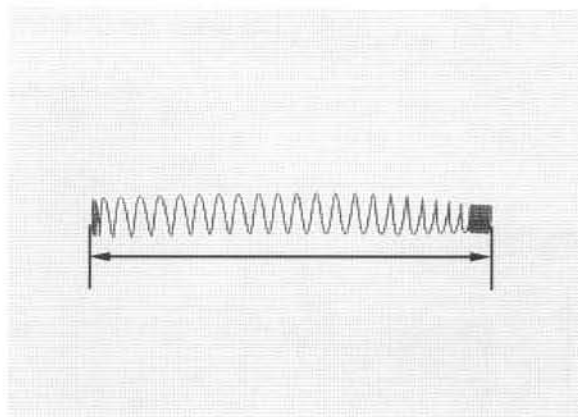
Remove the pivot bolt, tensioner arm and tensioner roller.



INSPECTION

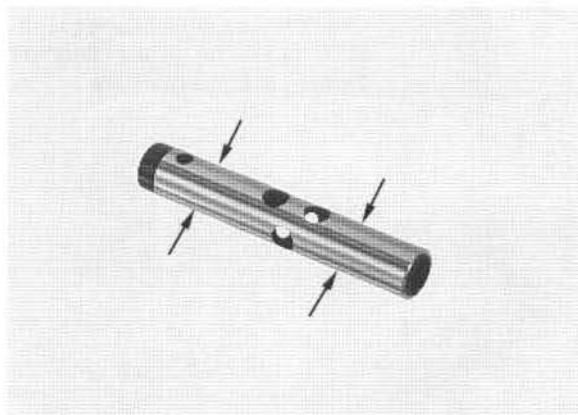
Measure the tensioner spring free length.

SERVICE LIMIT: 100 mm (3.9 in)



Check the push rod for wear or damage.
Measure the push rod O.D.

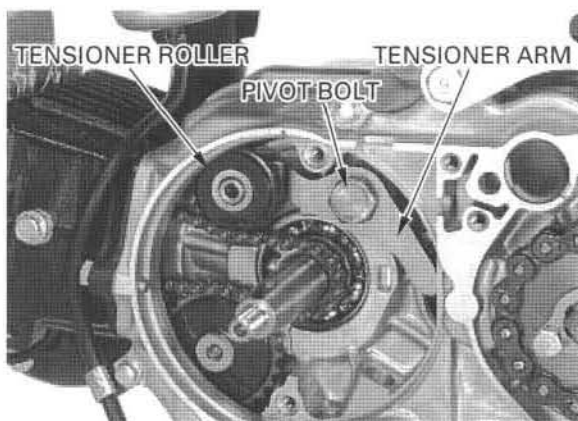
SERVICE LIMIT: 11.94 mm (0.470 in)



INSTALLATION

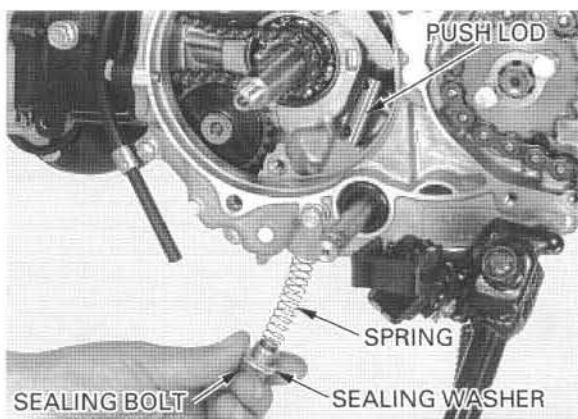
Install the cam chain tensioner roller, tensioner arm and pivot bolt.
Tighten the pivot bolt to the specified torque.

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



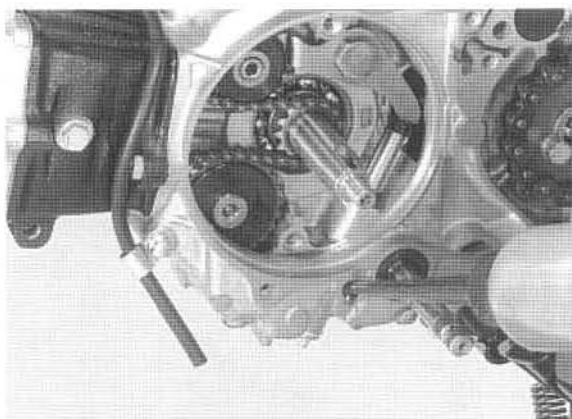
Install the push rod and tensioner spring.
Check the sealing washer is in good condition, install the cam chain tensioner sealing bolt.
Tighten the sealing bolt to the specified torque.

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

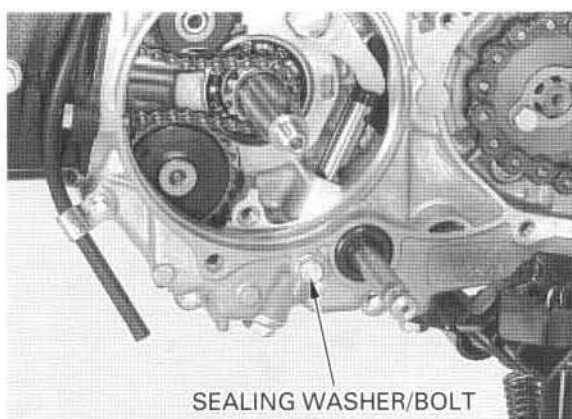


ALTERNATOR/CAM CHAIN TENSIONER

Remove the crankcase sealing bolt and washer.
Pour 1 — 2 cm³ of engine oil into the push rod.



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



STATOR/FLYWHEEL INSTALLATION

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

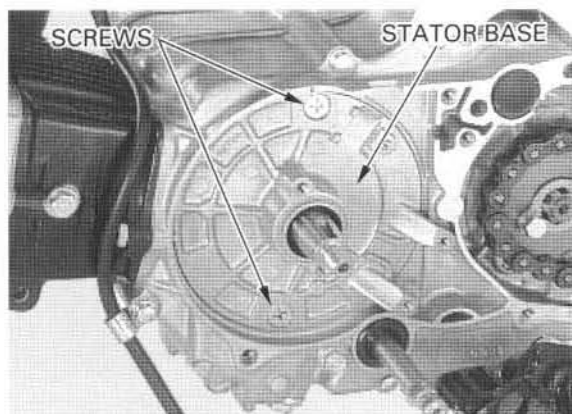
Apply engine oil to the new O-rings, install them onto the crankcase grooves and stator base groove.



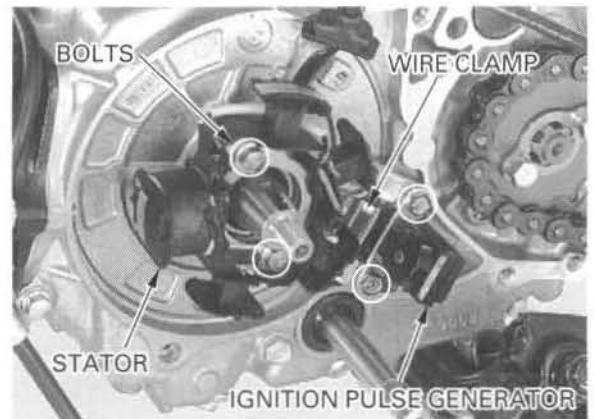
Install the stator base and tighten the screws securely.

CAUTION:

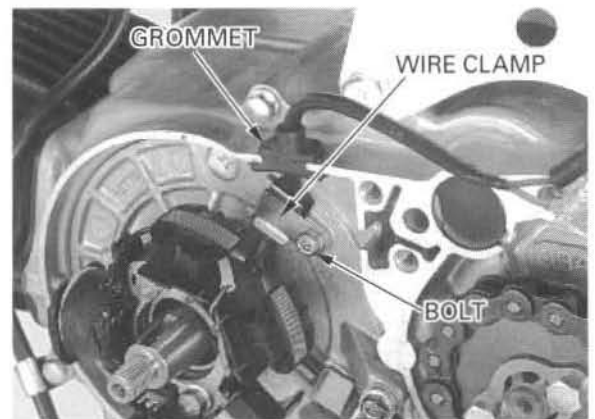
Be careful not to damage the oil seal lips.



Install the stator, wire clamp and ignition pulse generator, then tighten the bolts securely.



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



Clean any oil from the crankshaft taper. Install the woodruff key on the crankshaft.



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

Install the washer and flywheel nut.



ALTERNATOR/CAM CHAIN TENSIONER

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

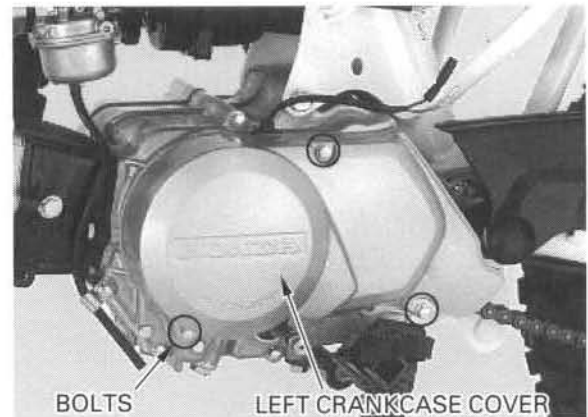
TOOL:

Universal holder 07725-0030000

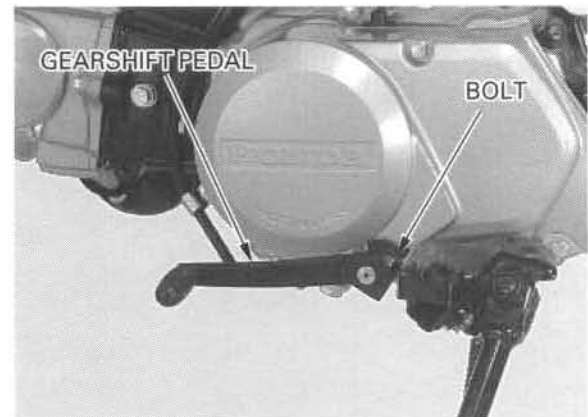
TORQUE: 41 N·m (4.2 kgf·m, 30 lbf·ft)



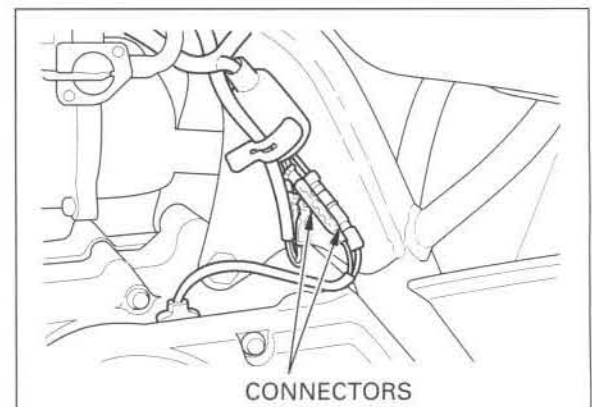
Install the left crankcase cover and tighten the SH bolts.



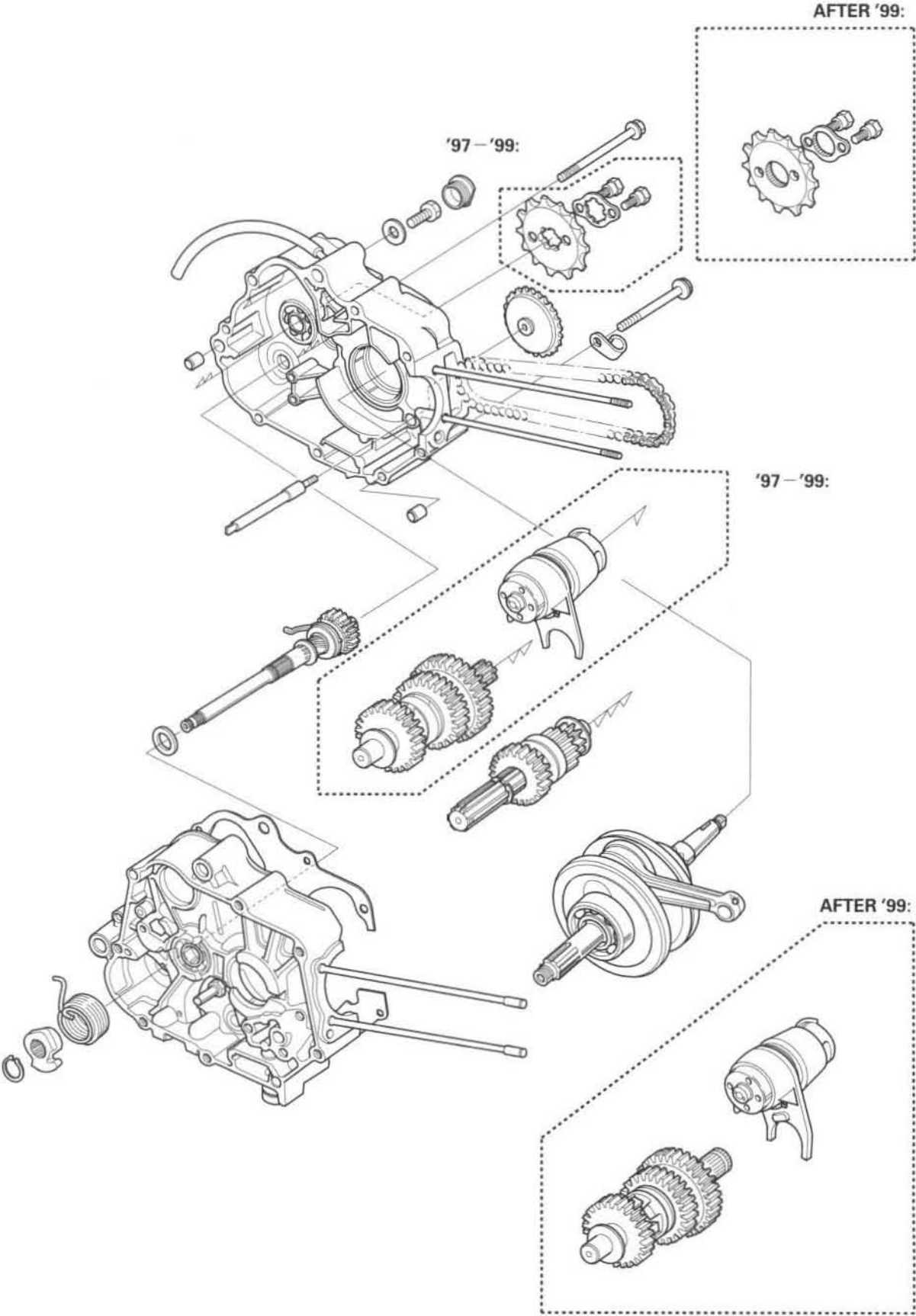
Install the gearshift pedal and tighten the bolt.



Connect the ignition pulse generator and alternator connectors.



MEMO



11. CRANKSHAFT/TRANSMISSION/KICKSTARTER

SERVICE INFORMATION	11-1	TRANSMISSION	11-6
TROUBLESHOOTING	11-2	KICKSTARTER	11-14
CRANKCASE SEPARATION	11-3	CRANKCASE ASSEMBLY	11-15
CRANKSHAFT	11-4		

SERVICE INFORMATION

GENERAL

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

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT	
Crankshaft	Side clearance		0.010—0.350 (0.0004—0.0138)	0.60 (0.024)	
	Radial clearance		0—0.012 (0—0.0005)	0.05 (0.002)	
	Runout		—	0.10 (0.004)	
Transmission (‘97—‘99:)	Gear I.D.	M2	17.016—17.043 (0.6699—0.6710)	17.10 (0.673)	
		C1	20.020—20.053 (0.7882—0.7895)	20.10 (0.791)	
		C3	17.016—17.043 (0.6699—0.6710)	17.10 (0.673)	
	Bushing O.D.		C1	19.979—20.000 (0.7866—0.7874)	19.93 (0.785)
	Bushing I.D.		C1	17.000—17.018 (0.6693—0.6700)	17.08 (0.672)
	Gear-to-bushing clearance		C1	0.020—0.074 (0.0008—0.0029)	0.10 (0.004)
	Mainshaft O.D.		M2	16.983—16.986 (0.6686—0.6687)	16.95 (0.667)
	Countershaft O.D.		C1	16.966—16.986 (0.6680—0.6687)	16.94 (0.667)
	Gear-to-shaft clearance		M2	0.022—0.060 (0.0009—0.0024)	0.10 (0.004)
	Gear bushing-to-shaft clearance		C1	0.014—0.052 (0.0006—0.0020)	0.10 (0.004)
Transmission (After ‘99:)	Gear I.D.	M2	17.016—17.043 (0.6699—0.6710)	17.10 (0.673)	
		C1	23.020—23.053 (0.9063—0.9076)	23.10 (0.909)	
		C3	20.020—20.053 (0.7882—0.7895)	20.10 (0.791)	
	Bushing O.D.		C1	22.979—23.000 (0.9047—0.9055)	22.93 (0.903)
	Bushing I.D.		C1	20.000—20.021 (0.7874—0.7882)	20.08 (0.791)
	Gear-to-bushing clearance		C1	0.020—0.074 (0.0008—0.0029)	0.10 (0.004)
	Mainshaft O.D.		M2	16.9840—16.9860 (0.66866—0.66874)	16.950 (0.6673)
	Countershaft O.D.		C1	19.959—19.980 (0.7858—0.7866)	19.94 (0.785)
	Gear-to-shaft clearance		M2	0.022—0.059 (0.0009—0.0023)	0.10 (0.004)
	Gear bushing-to-shaft clearance		C1	0.020—0.062 (0.0008—0.0024)	0.10 (0.004)
Shift fork	I.D.		34.075—34.100 (1.3415—1.3425)	34.14 (1.344)	
	Claw thickness		4.86—4.94 (0.191—0.194)	4.60 (0.181)	
	Shift drum O.D.		33.950—33.975 (1.3366—1.3376)	33.93 (1.336)	

TORQUE VALUES

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

TOOLS

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

TROUBLESHOOTING

Hard to shift

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

Transmission jumps out of gear

- Worn gear dogs and slots
- Bent fork shaft
- Broken shift drum stopper

Excessive noise

- Worn crankshaft big end bearing
- Worn crankshaft journal bearing

CRANKCASE SEPARATION

NOTE:

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

Remove the snap ring from the kickstarter spindle.

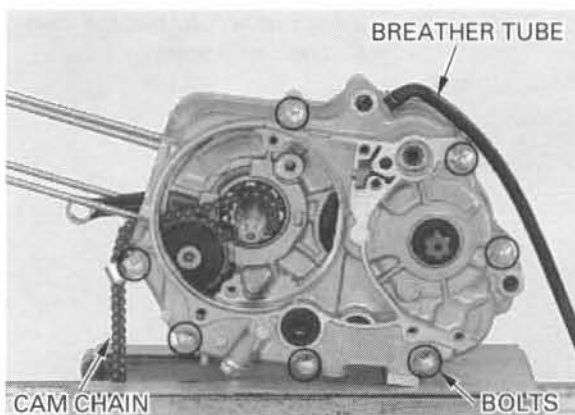
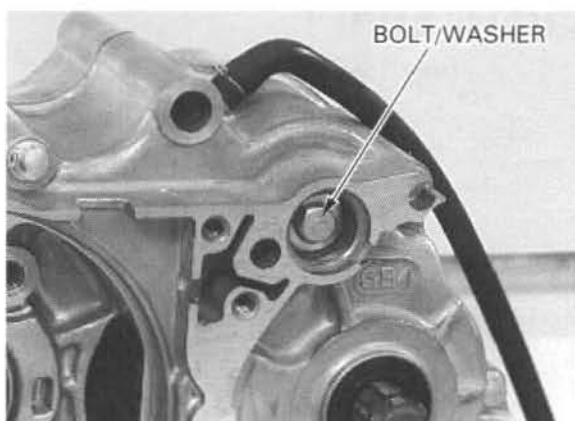
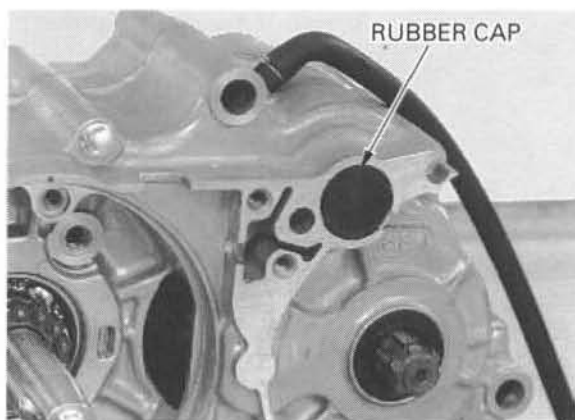
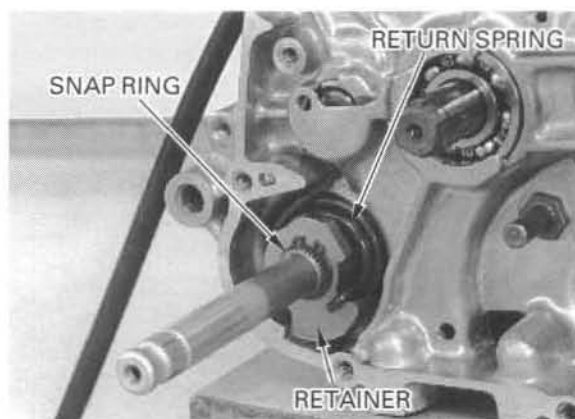
Unhook the return spring and remove the retainer and return spring.

Remove the rubber cap.

Hold the shift drum and remove the shift drum bolt and washer.

Remove the crankcase breather tube and cam chain.

Loosen the crankcase bolts in a crisscross pattern in 2–3 steps.

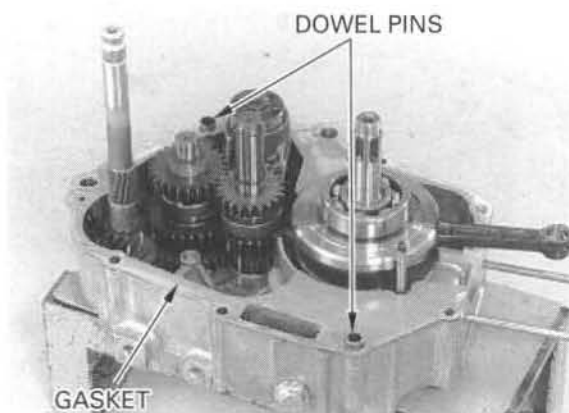


CRANKSHAFT/TRANSMISSION/KICKSTARTER

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



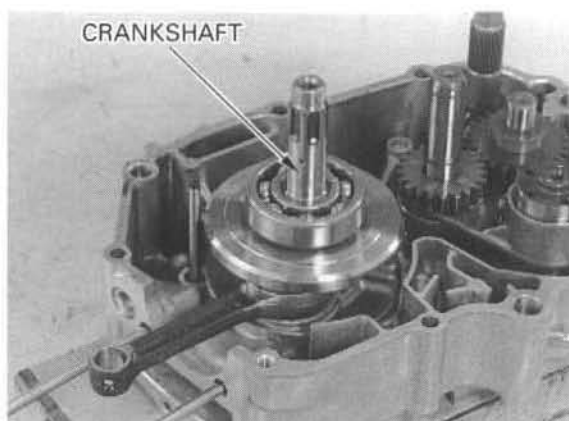
Remove the gasket and dowel pins.



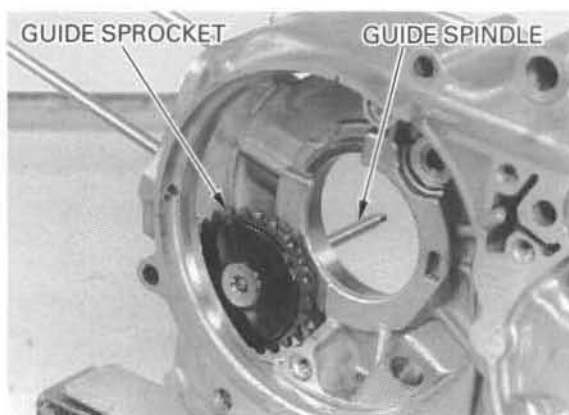
CRANKSHAFT

REMOVAL

Remove the crankshaft from the left crankcase.



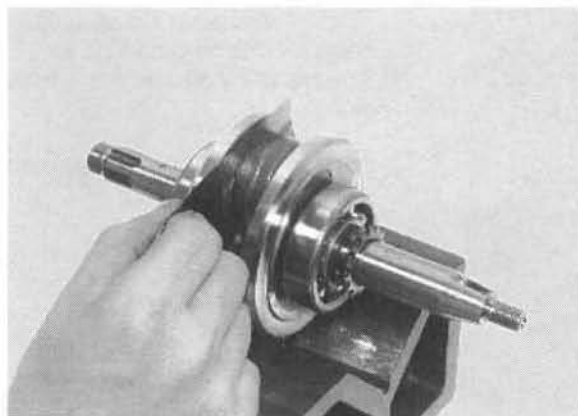
If necessary, remove the cam chain guide spindle and guide sprocket.



INSPECTION

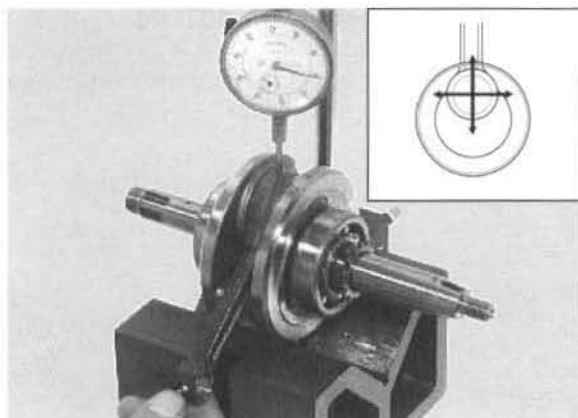
Measure the connecting rod big end side clearance with a feeler gauge.

SERVICE LIMIT: 0.60 mm (0.024 in)



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

SERVICE LIMIT: 0.05 mm (0.002 in)



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



Check the timing sprocket for wear or damage.

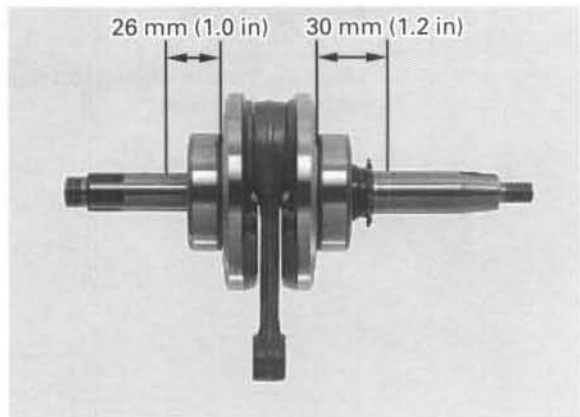
If you replacing the timing sprocket, align the center of the sprocket teeth with the center of woodruff key groove as shown.



CRANKSHAFT/TRANSMISSION/KICKSTARTER

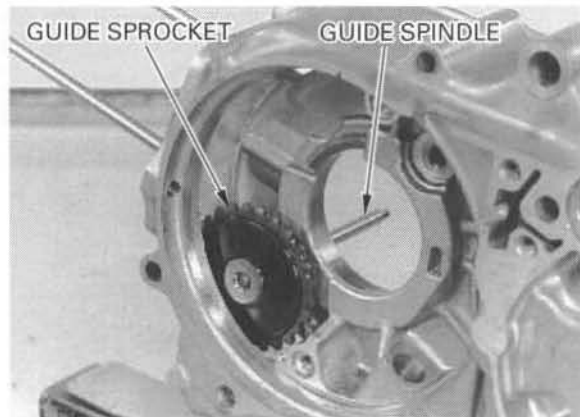
Place the crankshaft on a stand or V-blocks and measure the runout using a dial gauge. The measuring locations are shown in the illustration.

SERVICE LIMIT: 0.10 mm (0.004 in)



INSTALLATION

Install the guide sprocket and guide spindle.



Install the crankshaft into the left crankcase.

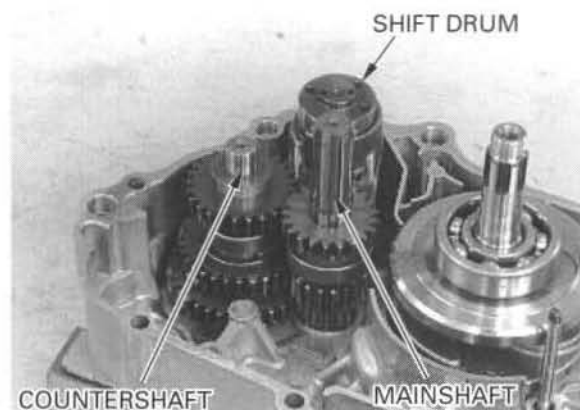


TRANSMISSION

REMOVAL

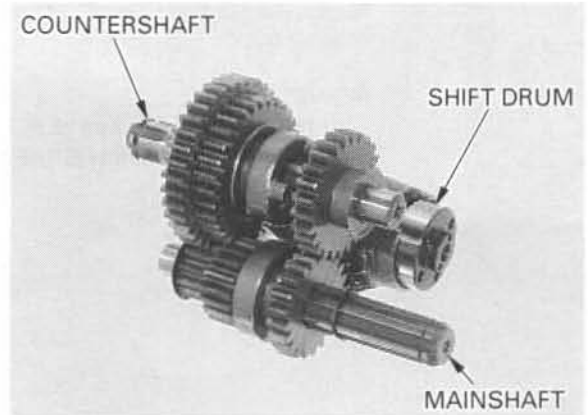
Remove the kickstarter spindle (page 11-14).

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



TRANSMISSION DISASSEMBLY

Disassembly the mainshaft, countershaft and shift drum.



TRANSMISSION INSPECTION

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

SERVICE LIMITS:

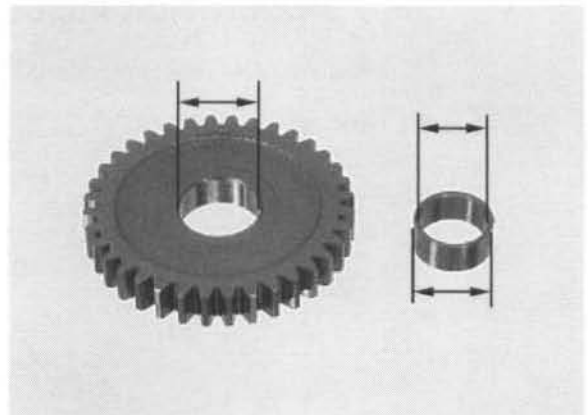
'97-'99:	M2, C3:	17.10 mm (0.673 in)
	C1:	20.10 mm (0.791 in)
After '99:	M2:	17.10 mm (0.673 in)
	C1:	23.10 mm (0.909 in)
	C3:	20.10 mm (0.791 in)

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

SERVICE LIMITS:

'97-'99:	O.D.:	19.93 mm (0.785 in)
	I.D.:	17.08 mm (0.672 in)
After '99:	O.D.:	22.93 mm (0.903 in)
	I.D.:	20.08 mm (0.791 in)

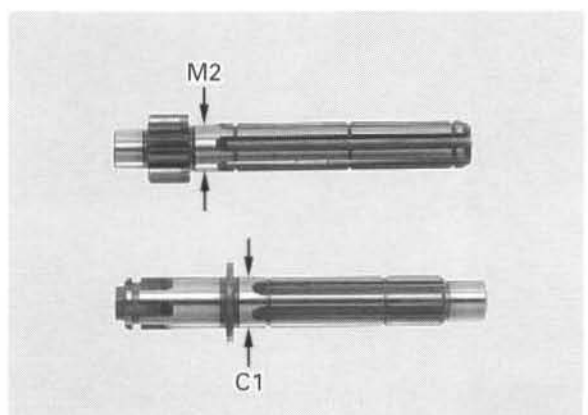
Check the shift fork groove of the shifter gear for excessive wear or damage.



'97-'99: Measure the O.D. of the mainshaft and countershaft.

SERVICE LIMITS:

At M2 gear:	16.95 mm (0.667 in)
At C1 gear:	16.94 mm (0.667 in)



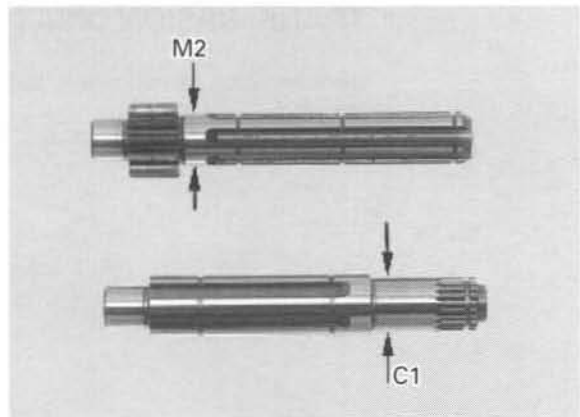
CRANKSHAFT/TRANSMISSION/KICKSTARTER

After '99: Measure the O.D. of the mainshaft and countershaft.

SERVICE LIMITS:

At M2 gear: 16.950 mm (0.6673 in)

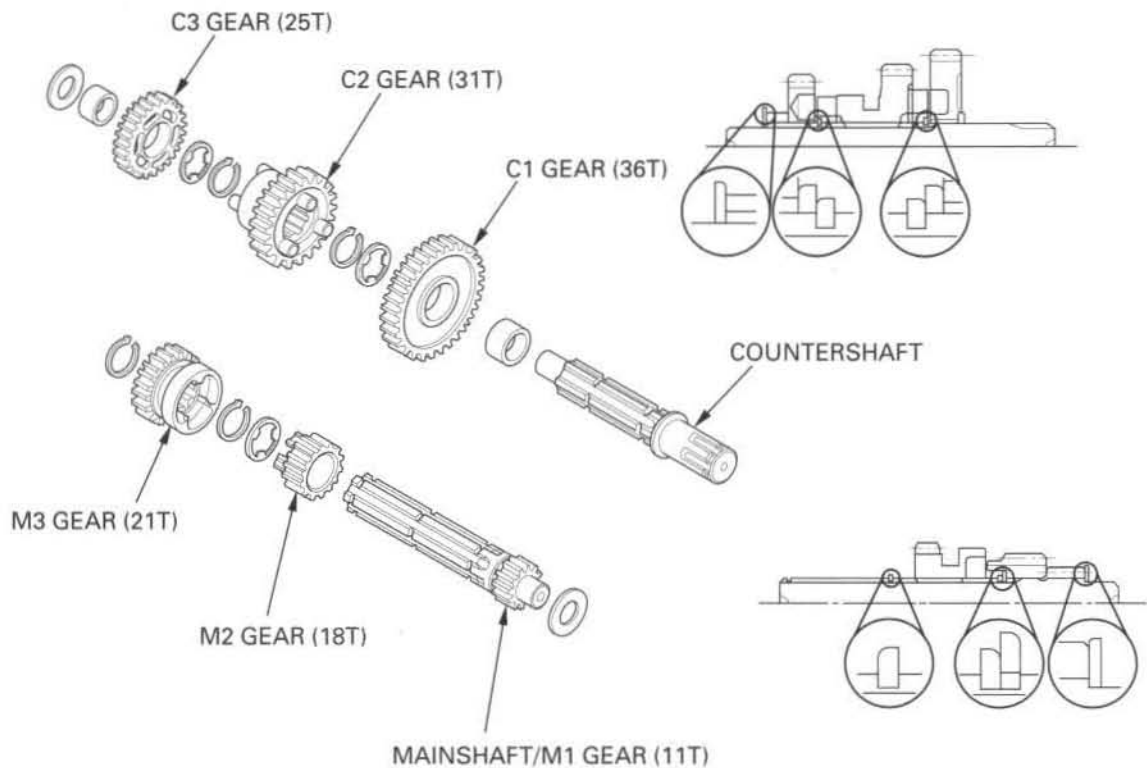
At C1 gear: 19.94 mm (0.785 in)



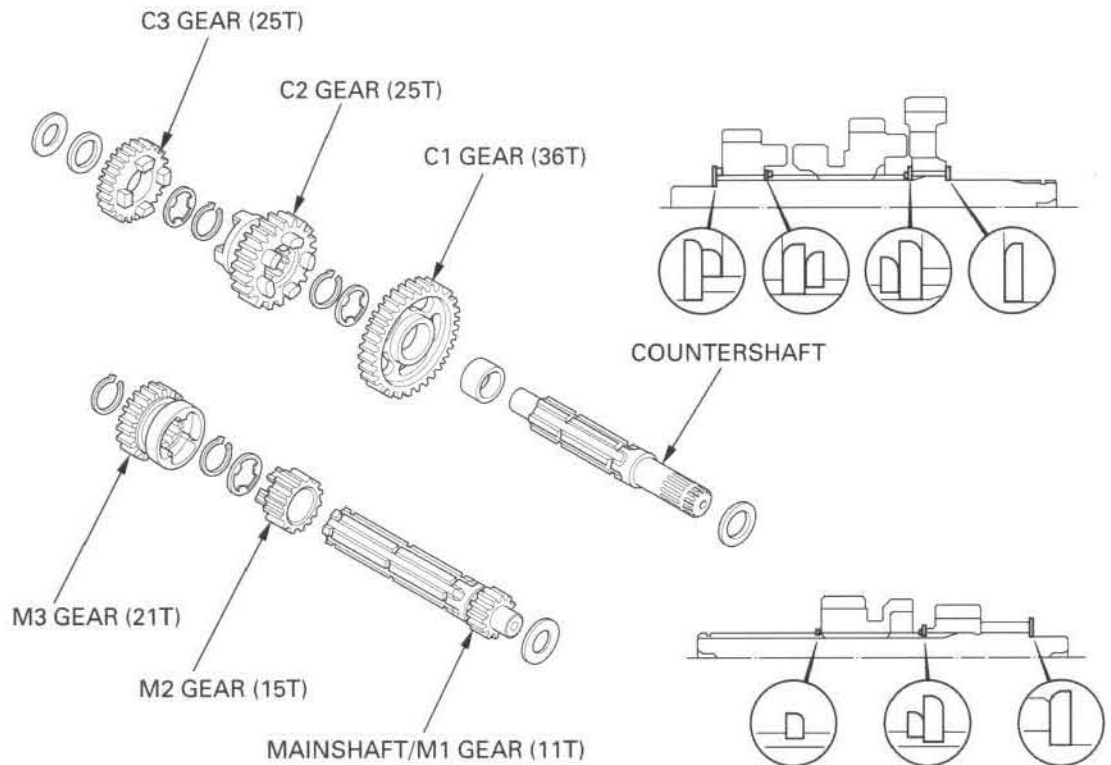
TRANSMISSION ASSEMBLY

Assembly is in the reverse order of removal.

'97-'99:

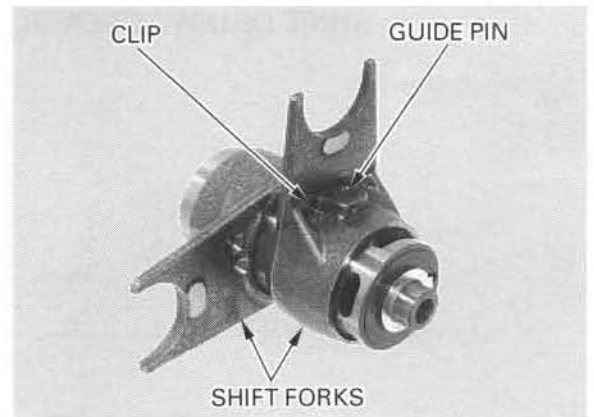


After '99:



GEARSHIFT DRUM DISASSEMBLY

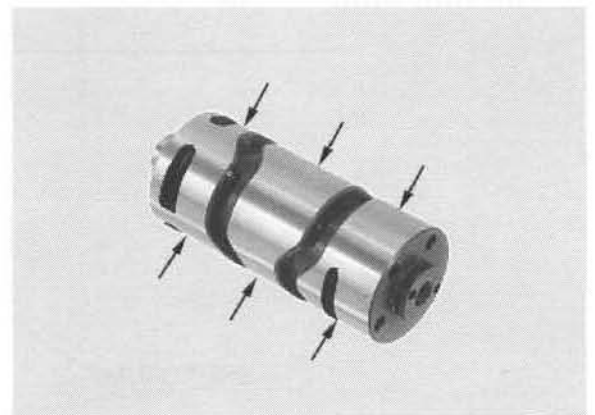
Remove the guide pin clips.
Remove the guide pins, then remove the shift forks.



Inspect the shift drum grooves for wear or damage.

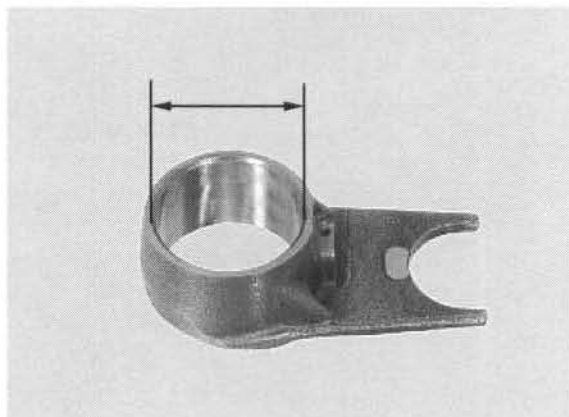
Measure the O.D. of the shift drum.

SERVICE LIMIT: 33.93 mm (1.336 in)



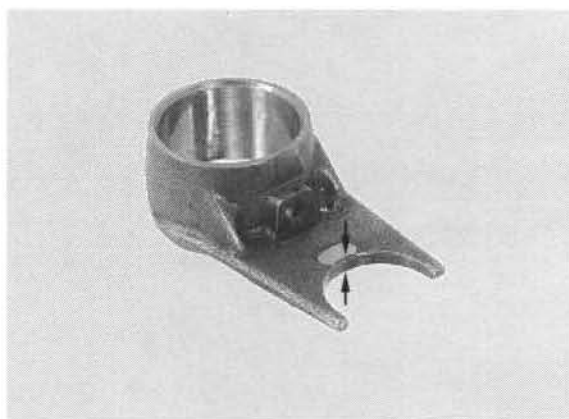
Measure the shift fork I.D.

SERVICE LIMIT: 34.14 mm (1.344 in)



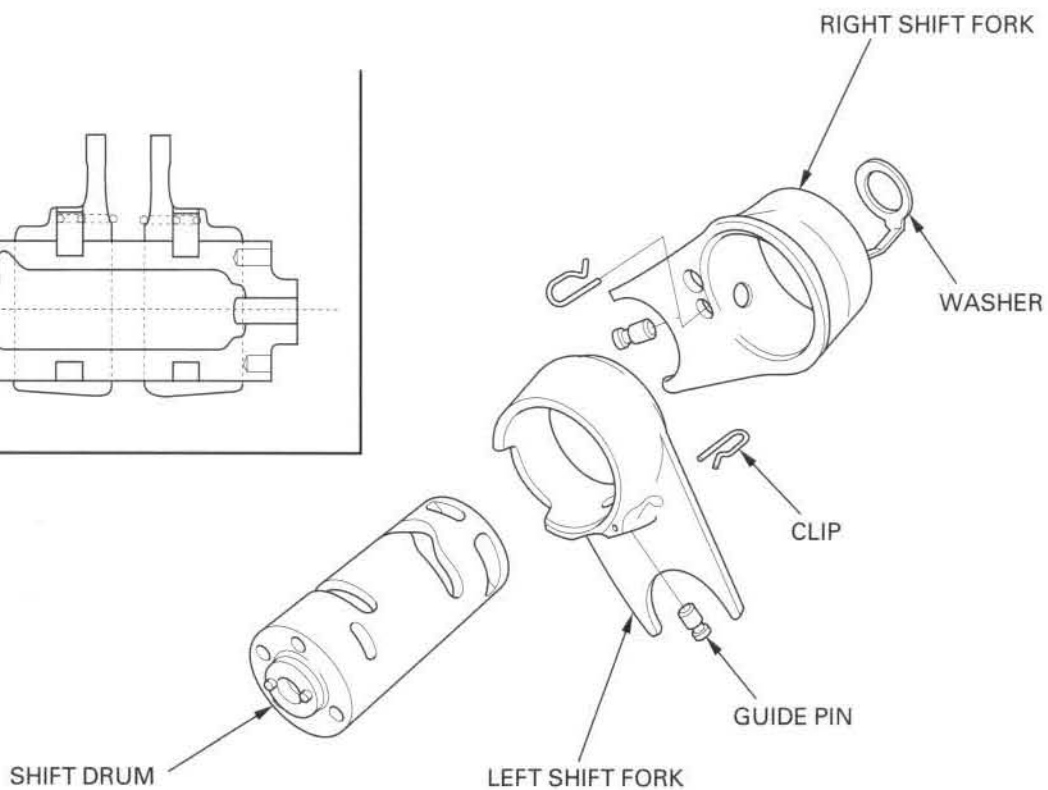
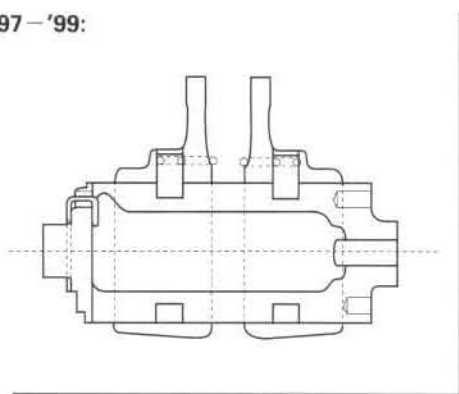
Measure the shift fork claw thickness.

SERVICE LIMIT: 4.60 mm (0.181 in)

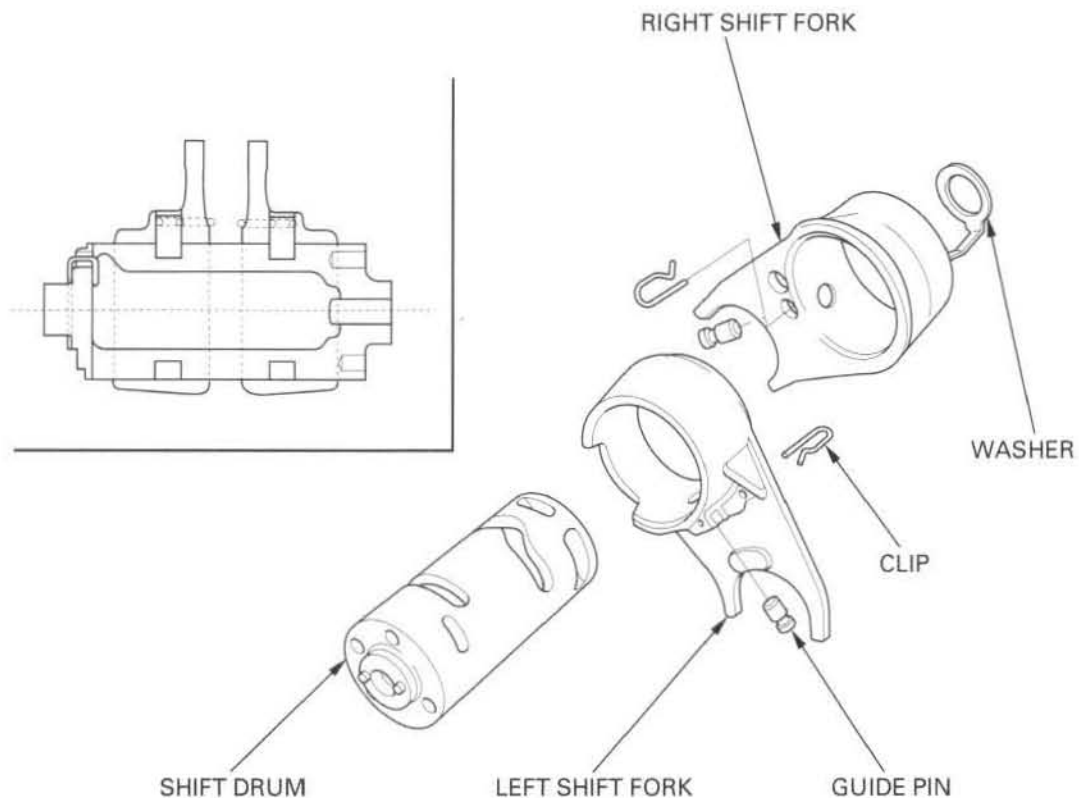


SHIFT DRUM ASSEMBLY

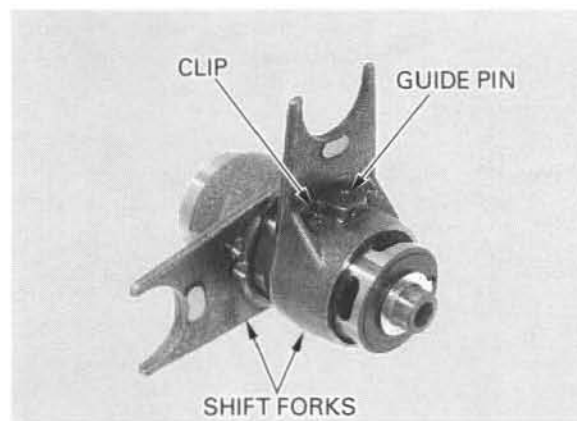
'97 - '99:



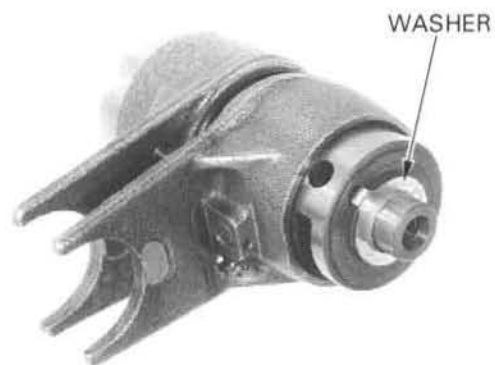
After '99:



Install the shift forks onto the gearshift drum.
Install the guide pins and secure them with clips.



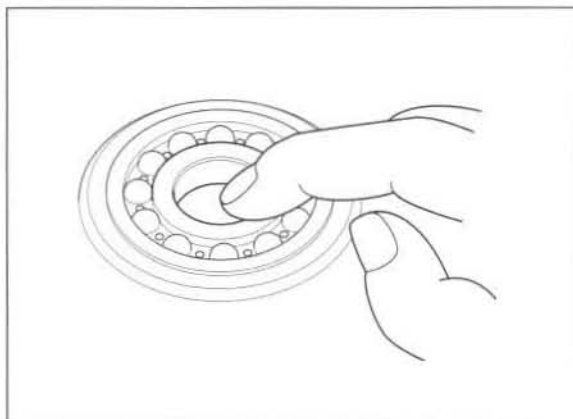
If the washer has been removed, install the new washer and bend the tab to lock the washer.



TRANSMISSION BEARING REPLACEMENT

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

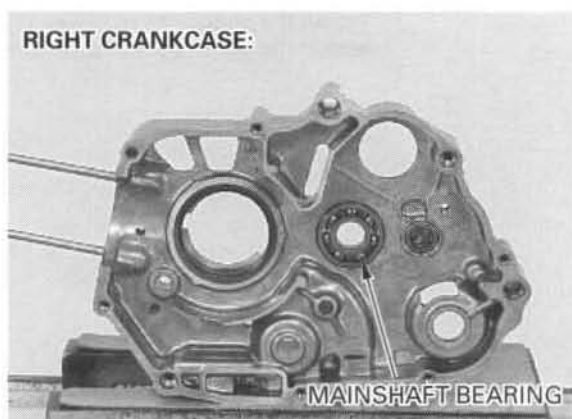
Remove and discard the bearing if the race does not turn smoothly, quietly, or fits loosely in the crankcase.



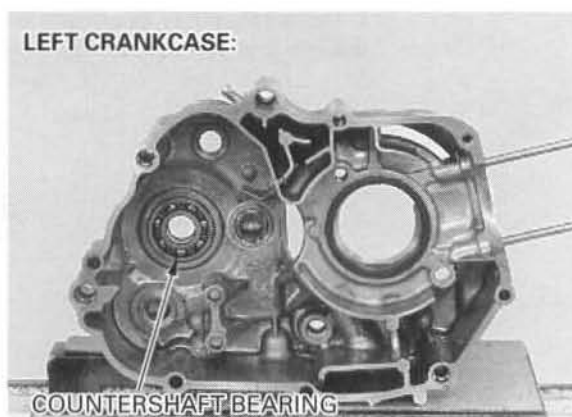
Remove the countershaft oil seal.



Drive the mainshaft bearing out of the right crankcase.



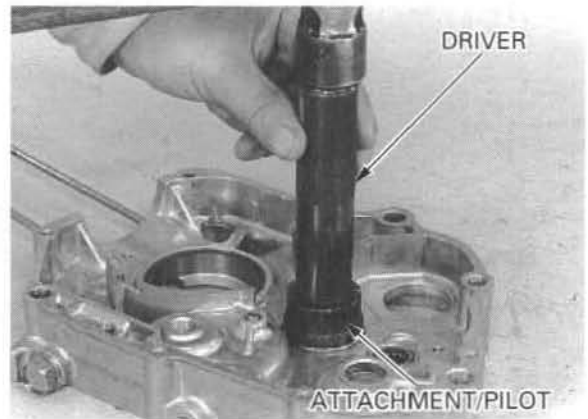
Drive the countershaft bearing out of the left crankcase.



Drive new bearings into the crankcases using the special tools as shown.

TOOLS:

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



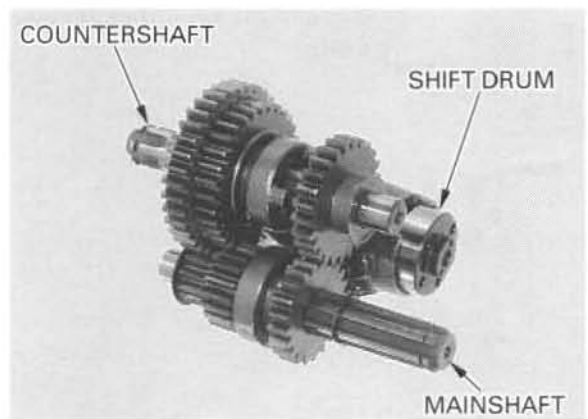
Apply grease to the new countershaft oil seal lip. Install the countershaft oil seal.



TRANSMISSION INSTALLATION

Apply clean engine oil to the transmission gears and shift drum.

Assemble the mainshaft, countershaft and shift drum as shown.



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

Rotate the shift drum to check the transmission operation.



KICKSTARTER

REMOVAL

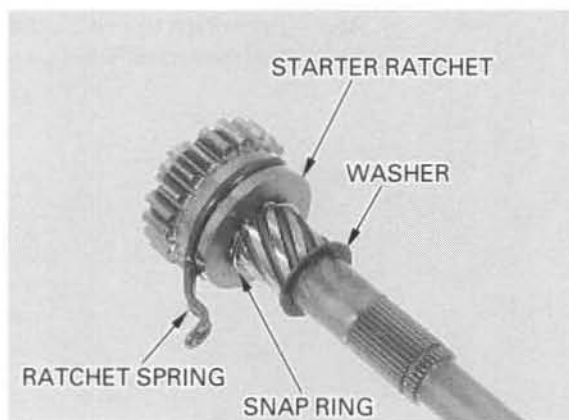
Remove the kickstarter spindle from the right crankcase.

KICKSTARTER SPINDLE

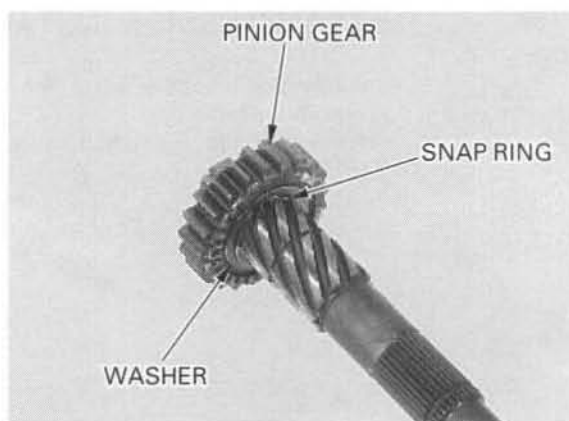


DISASSEMBLY

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



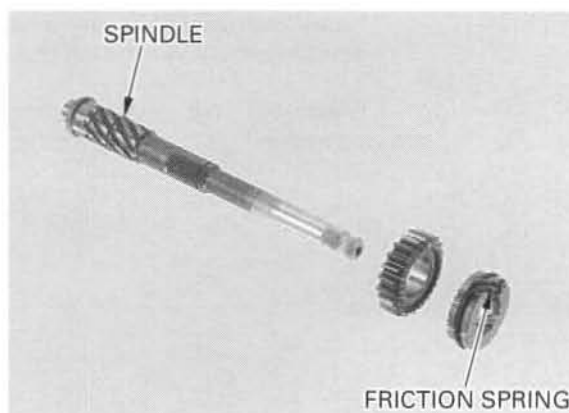
Remove the snap ring, washer and starter pinion gear.



INSPECTION

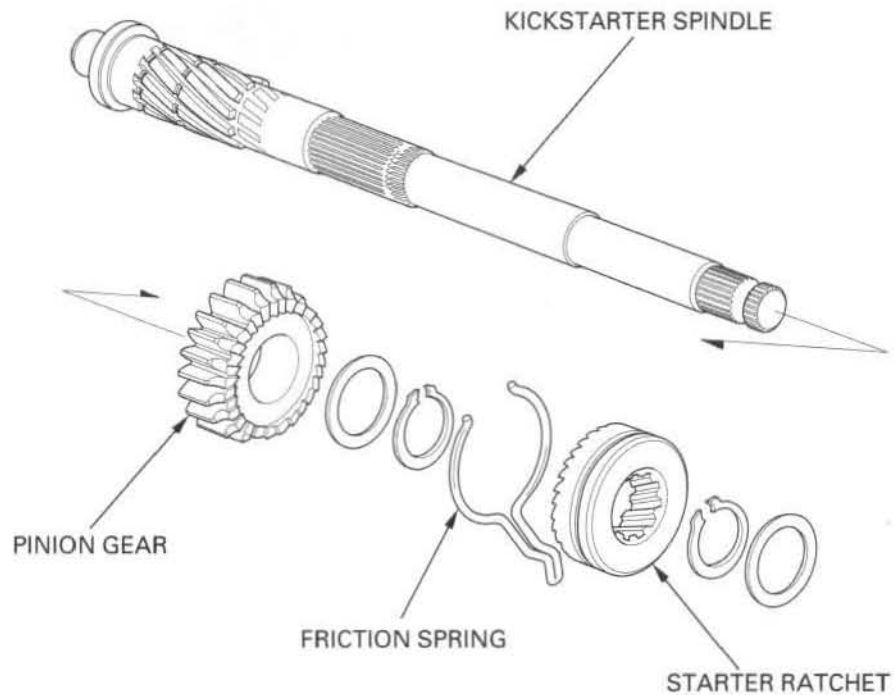
Check the kickstarter spindle for bent.
Check the friction spring for fatigue.

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



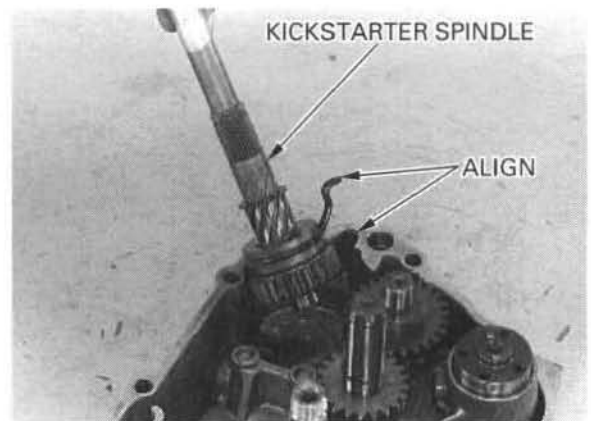
ASSEMBLY

Assembly is in the reverse order of disassembly.



INSTALLATION

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



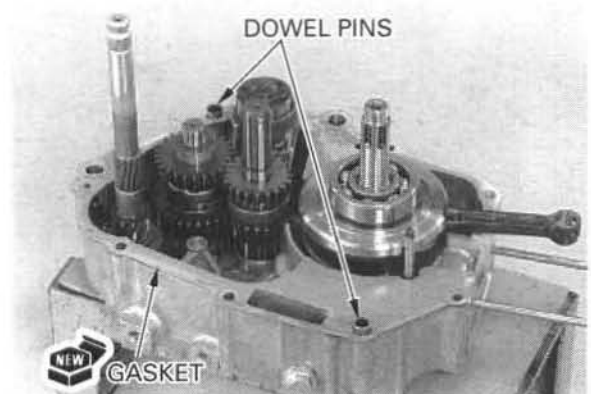
CRANKCASE ASSEMBLY

Clean the crankcase mating surfaces before assembling.

NOTE:

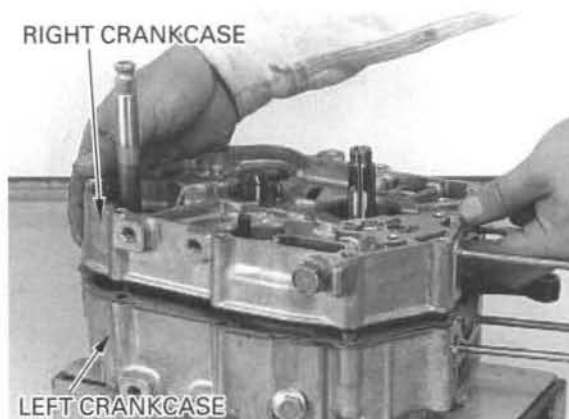
- Dress the surfaces with an oil stone if necessary to correct any minor roughness or irregularities.
- After cleaning, lubricate the crankshaft bearings and other contacting surfaces with clean engine oil.

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



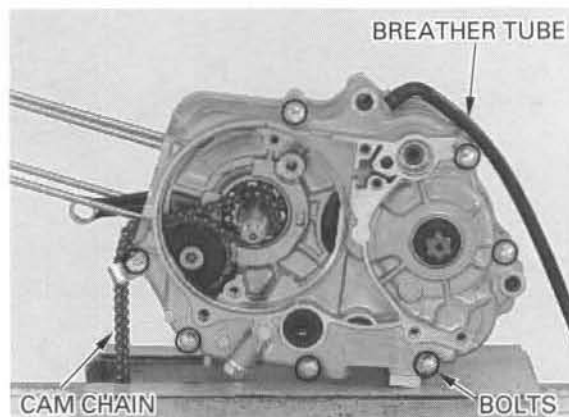
CRANKSHAFT/TRANSMISSION/KICKSTARTER

Make sure that the gasket stays in place. Install the right crankcase over the left crankcase.



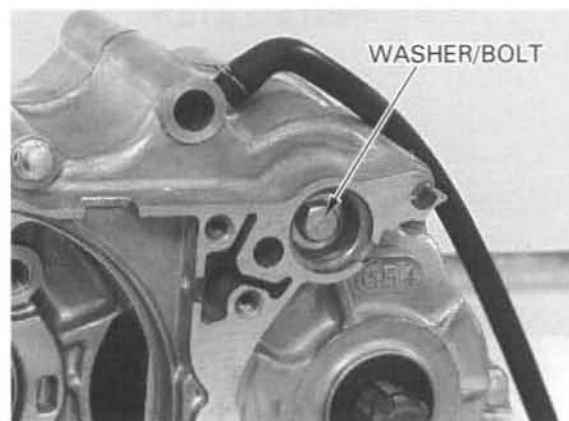
Install and tighten the crankcase bolts in a criss-cross pattern in 2–3 steps.

Install the crankcase breather tube and cam chain.

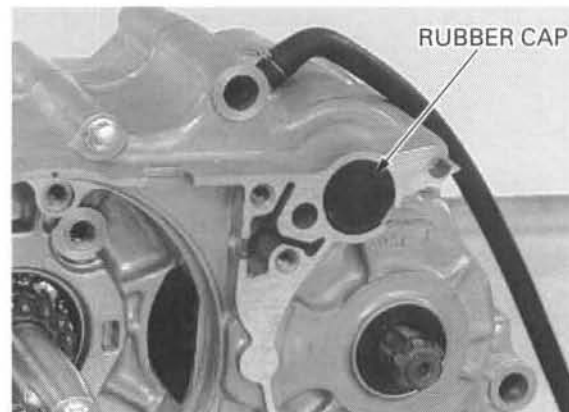


Install the washer and bolt to the shift drum, then tighten the bolt to the specified torque.

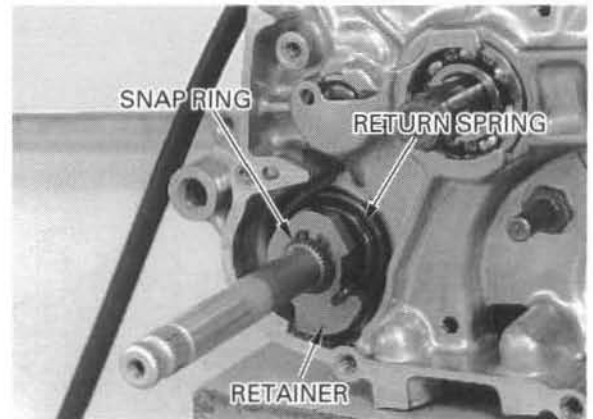
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



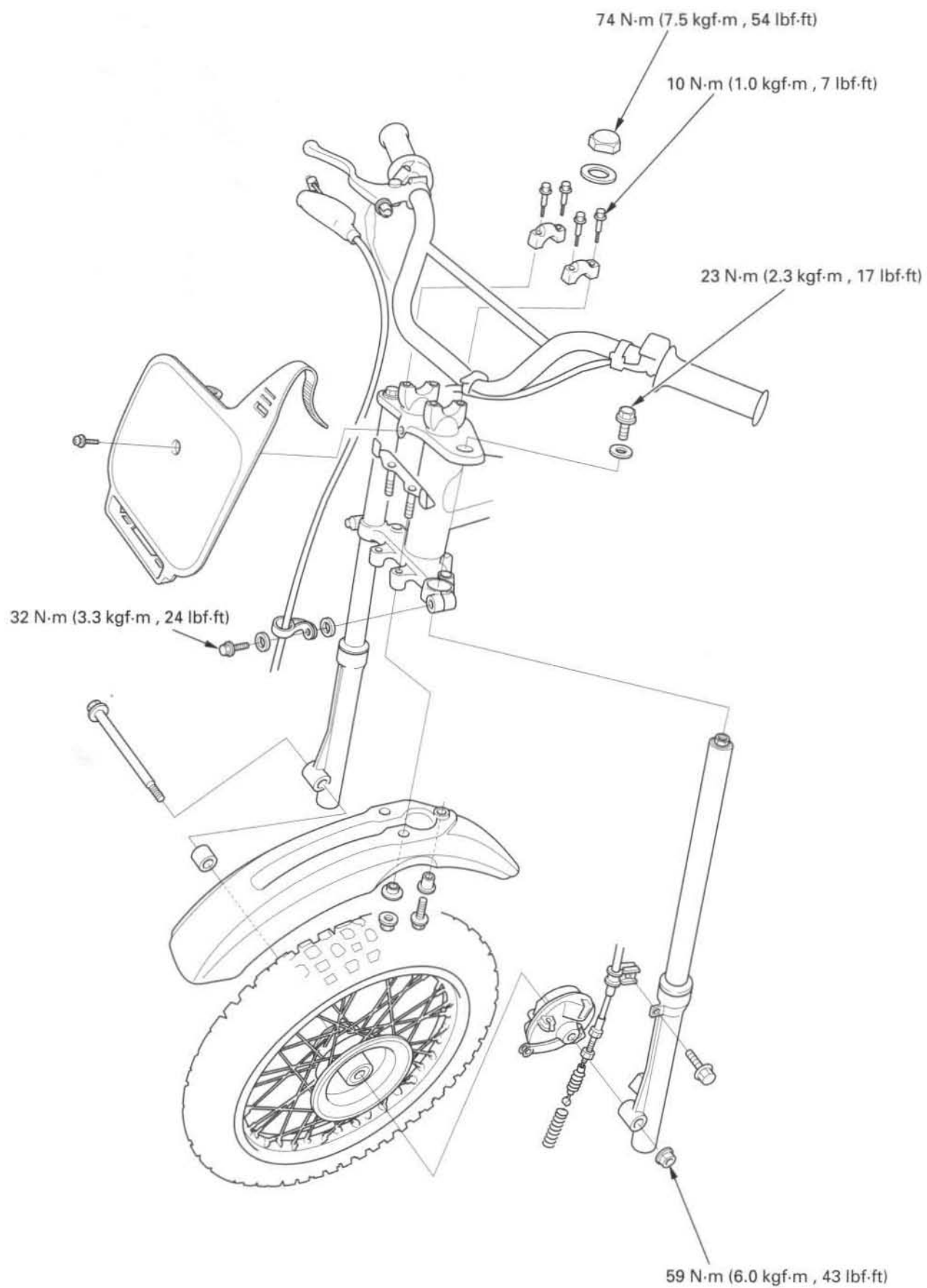
Install the rubber cap.



Install the retainer with its tab with the groove in the crankcase. Install the return spring and retainer onto the kickstarter spindle. Install the snap ring into the groove on the kickstarter spindle securely.



FRONT WHEEL/BRAKE/SUSPENSION/STEERING



12. FRONT WHEEL/BRAKE/SUSPENSION/STEERING

SERVICE INFORMATION	12-1	FRONT BRAKE	12-12
TROUBLESHOOTING	12-2	FORK	12-14
HANDLEBAR	12-3	STEERING STEM	12-21
FRONT WHEEL	12-7		

SERVICE INFORMATION

GENERAL

▲WARNING

A contaminated brake drum or shoe reduces stopping power. Discard contaminated shoes and clean a contaminated drum with a high quality brake degreasing agent.

- When servicing the front wheel, brake, fork or steering stem, support the motorcycle using a safety stand or hoist.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		—	1.5 (0.06)
Cold tire pressure		100 kPa (1.00 kgf/cm ² , 15 psi)	—
Axle runout		—	0.20 (0.008)
Wheel rim-to-hub distance		12.0 ± 1.0 (0.47 ± 0.04)	—
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Brake	Brake lever free play	10 – 20 (3/8 – 3/4)	—
	Brake drum I.D.	95.0 (3.74)	96.0 (3.78)
	Brake lining thickness	4.0 (0.16)	2.0 (0.08)
Fork	Spring free length	404.5 (15.93)	396.4 (15.61)
	Spring direction	With the tapered end facing down	—
	Tube runout	—	0.20 (0.008)
	Recommended fork fluid	Pro Honda Suspension Fluid SS-8	—
	Fluid level	135 (5.3)	—
	Fluid capacity	74 ± 1 cm ³ (2.50 ± 0.03 US oz, 2.60 ± 0.04 Imp oz)	—

TORQUE VALUES

Handlebar upper holder bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Handlebar lower holder nut	45 N·m (4.6 kgf·m, 33 lbf·ft)	U-nut
Fork bottom bridge pinch bolt	32 N·m (3.3 kgf·m, 24 lbf·ft)	
Brake lever pivot bolt	3 N·m (0.3 kgf·m, 2.2 lbf·ft)	
Brake lever pivot nut	3 N·m (0.3 kgf·m, 2.2 lbf·ft)	
Spoke nipple	3 N·m (0.3 kgf·m, 2.2 lbf·ft)	
Front axle nut	59 N·m (6.0 kgf·m, 43 lbf·ft)	U-nut
Front brake arm pinch bolt/nut	10 N·m (1.0 kgf·m, 7 lbf·ft)	Apply a locking agent to the threads
Fork bolt	23 N·m (2.3 kgf·m, 17 lbf·ft)	
Fork cap	23 N·m (2.3 kgf·m, 17 lbf·ft)	
Fork socket bolt	20 N·m (2.0 kgf·m, 14 lbf·ft)	Apply a locking agent to the threads
Steering stem nut	74 N·m (7.5 kgf·m, 54 lbf·ft)	
Steering stem top thread	29 N·m (3.0 kgf·m, 22 lbf·ft)	

FRONT WHEEL/BRAKE/SUSPENSION/STEERING

TOOLS

Spoke wrench, 4.5 × 5.1 mm
Bearing remover shaft
Bearing remover head, 12 mm
Driver
Attachment, 32 × 35 mm
Pilot, 12 mm
Fork seal driver
Fork seal driver attachment
Ball race remover
Attachment, 37 × 40 mm
Steering stem driver

07701-0020200 Commercially available in U.S.A.
07746-0050100 Commercially available in U.S.A.
07746-0050300]
07749-0010000
07746-0010100
07746-0040200
07747-0010100 07947-1180001
07747-0010200]
07944-1150001
07746-0010200
07946-GC40000 or Steering stem driver 07946-MB00000
 Steering stem driver attachment
 07946-GC4000A (U.S.A. only)

TROUBLESHOOTING

Hard steering

- Faulty or damaged steering head bearings
- Insufficient tire pressure
- Steering head bearing adjustment nut too tight

Steers to one side or does not track straight

- Bent fork
- Bent axle
- Wheel installed incorrectly
- Faulty steering head bearings
- Bent frame
- Worn wheel bearing
- Worn swingarm pivot components

Front wheel wobbling

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

Wheel turns hard

- Faulty wheel bearing
- Bent front axle
- Brake drag

Soft suspension

- Insufficient fluid in fork
- Weak fork springs
- Tire pressure too low

Hard suspension

- Incorrect fluid weight
- Bent fork tubes
- Clogged fork fluid passage

Front suspension noisy

- Insufficient fluid in fork
- Loose fork fasteners

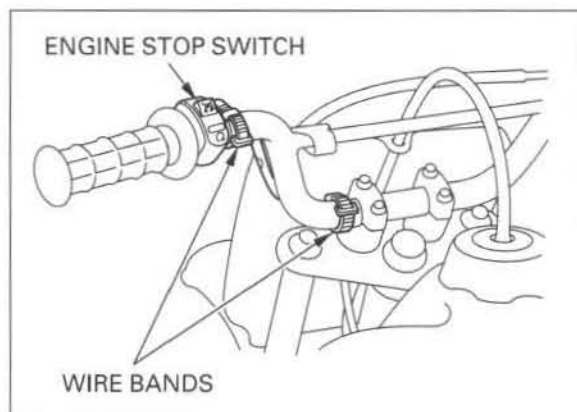
HANDLEBAR

REMOVAL

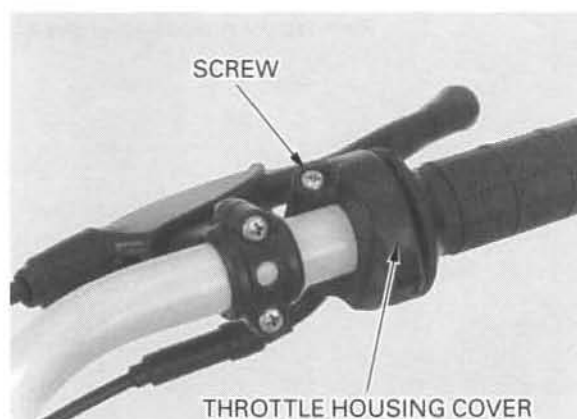
Remove the number plate (page 2-4).

Remove the wire bands.

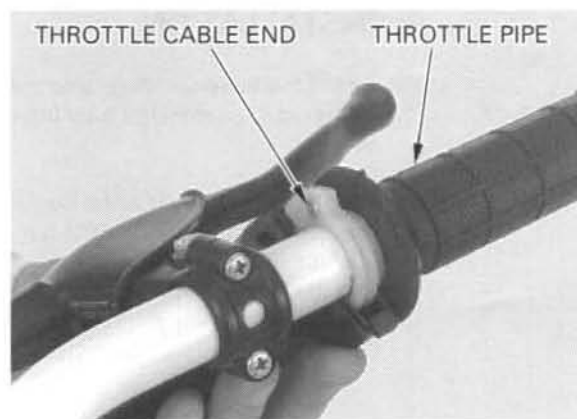
Remove the screw and engine stop switch.



Remove the throttle housing screw.

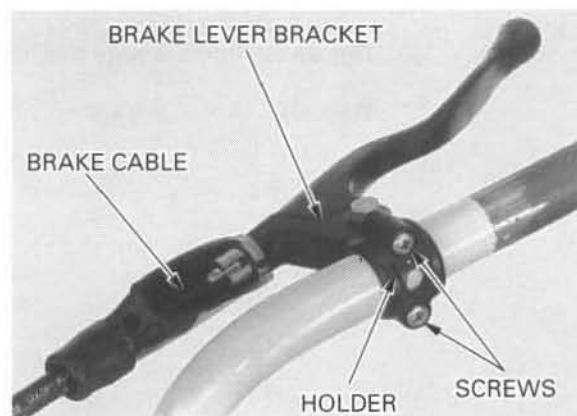


Disconnect the throttle cable end from the throttle pipe and remove the housing.
Remove the throttle pipe from the handlebar.



Slide the dust cover off from the brake lever pivot.
Disconnect the brake cable from the brake lever.

Remove the screws, holder and brake lever bracket.

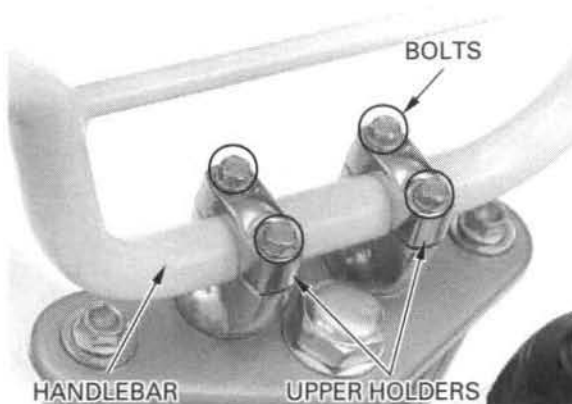


FRONT WHEEL/BRAKE/SUSPENSION/STEERING

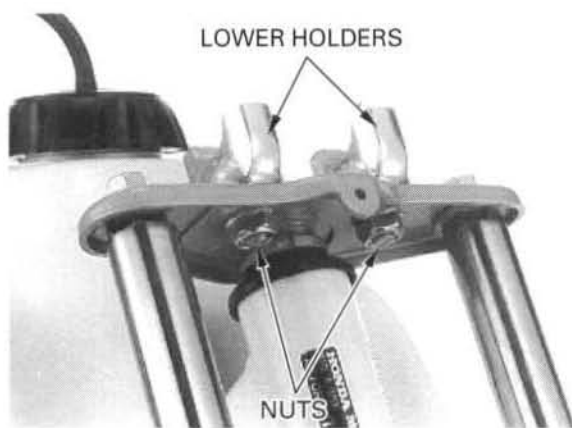
If you plan to remove the handlebar lower holders, loosen the lower holder nut before removing the upper holder bolts.

Remove the handlebar upper holder bolts and holder.

Remove the handlebar.



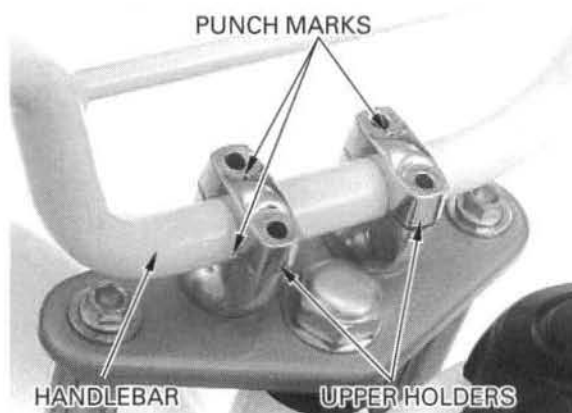
Remove the nuts and handlebar lower holders.



INSTALLATION

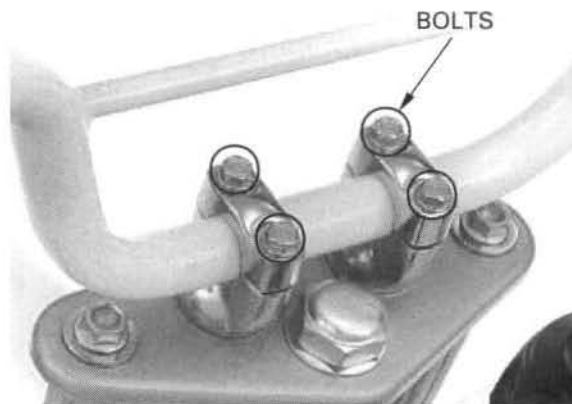
Install the lower holders onto the top bridge. Temporarily install the nuts but do not tighten them yet.

Place the handlebar onto the lower holders, aligning the punch marks on the handlebar with the top surface of the lower holder. Install the upper holders with their punch marks facing forward.



Install the holder bolts. Tighten the forward bolts first, then the rear bolts.

TORQUE: 10 N·m (1.0 kgf·m , 7 lbf·ft)



If you removing the lower holder, tighten the lower holder nuts to the specified torque.

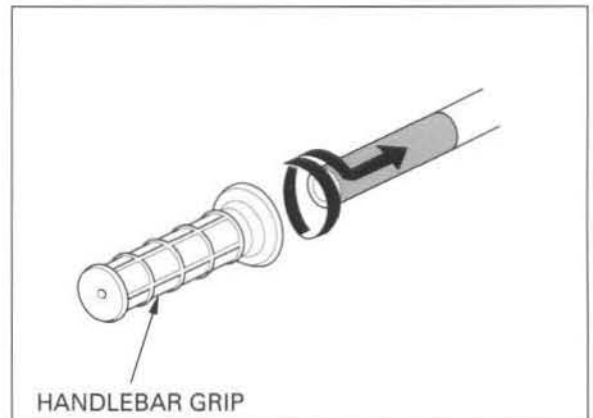
TORQUE: 45 N·m (4.6 kgf·m , 33 lbf·ft)



Apply Honda Bond A or Honda Hand Grip Cement (U.S.A. only) to the inside of the grip and to the clean surfaces of the left handlebar and throttle grip.

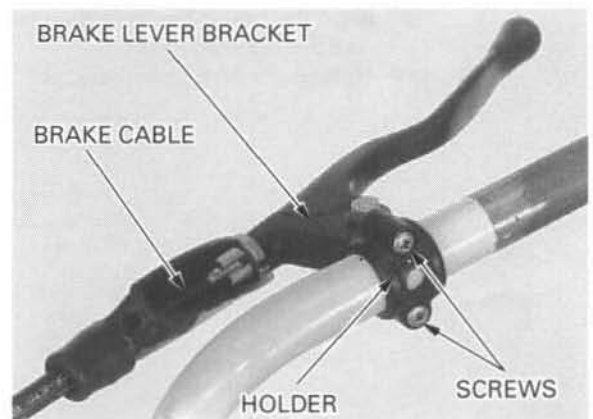
Wait 3—5 minutes and install the grip.
Rotate the grip for even application of the adhesive.

Allow the adhesive to dry for an hour before using.



Place the brake lever bracket onto the handlebar. Install the holder with its punch mark facing up. Align the mating surface of the bracket with the punch mark on the handlebar. Tighten the upper bolt first, then the lower bolt.

Connect the brake cable to the brake lever.

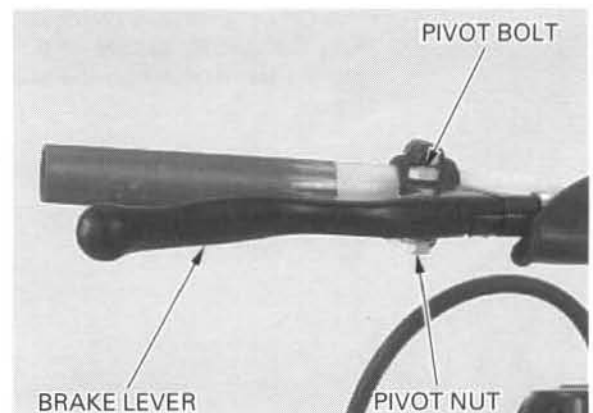


If the brake lever is removed, install the brake lever and tighten the pivot bolt to the specified torque.

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

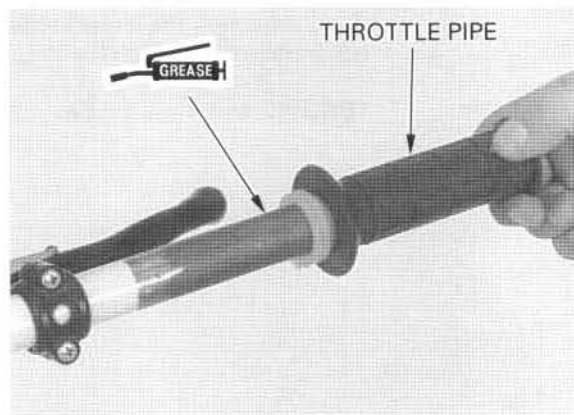
Hold the pivot bolt, tighten the pivot nut to the specified torque.

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



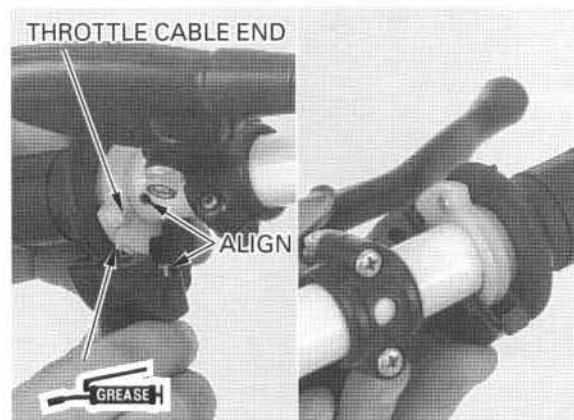
FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Apply grease to the sliding surface of the throttle pipe.
Install the throttle pipe on the handlebar.

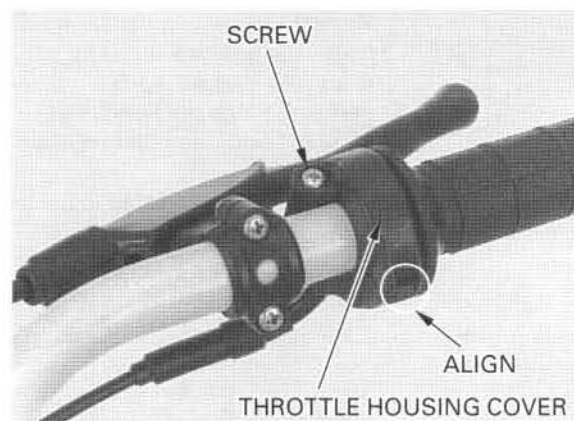


Apply grease to the throttle cable end and sliding surface.
Connect the throttle cable to the throttle pipe.

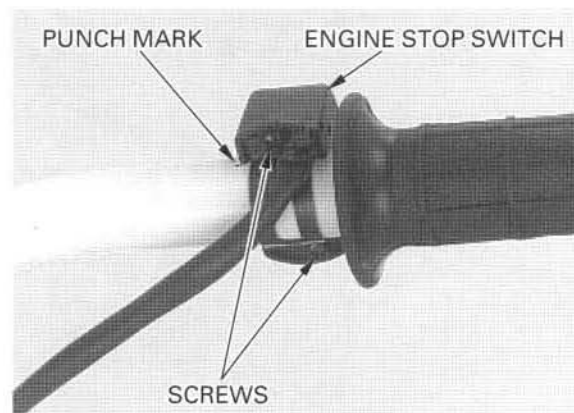
Install the throttle housing by aligning its locating pin with the hole in the handlebar.



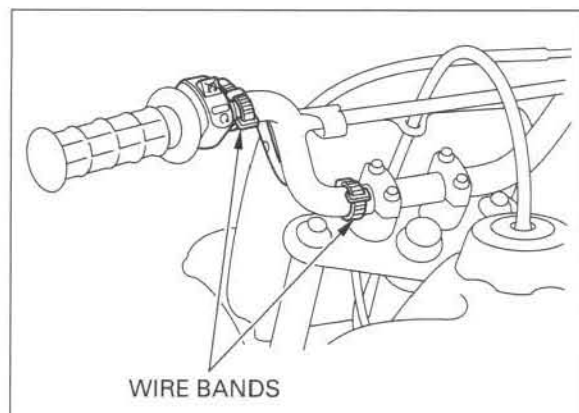
Align the hooks between the housing and cover, install the housing cover.
Tighten the screw securely.



Install the engine stop switch and mounting screws.
Align the mating surface of the switch and holder with the punch mark on the handlebar, tighten the screws.



Secure the engine stop switch wire with wire bands. Install the number plate (page 2-4).



FRONT WHEEL

REMOVAL

▲WARNING

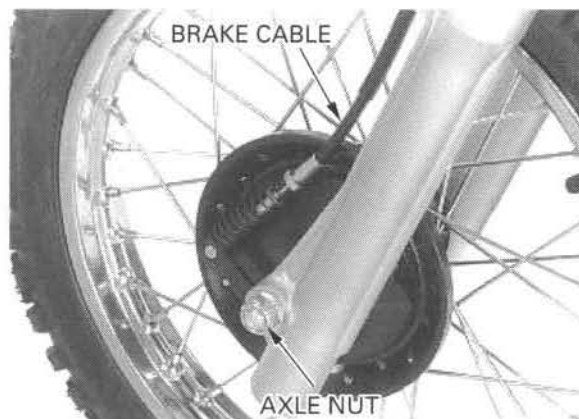
A contaminated brake drum or shoe reduces stopping power. Discard contaminated shoes and clean a contaminated drum with a high quality brake degreasing agent.

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

Disconnect the brake cable from the brake panel and brake arm.

Remove the axle nut, axle and front wheel.

Remove the side collar from the right wheel hub.



Remove the brake panel from the left wheel hub.

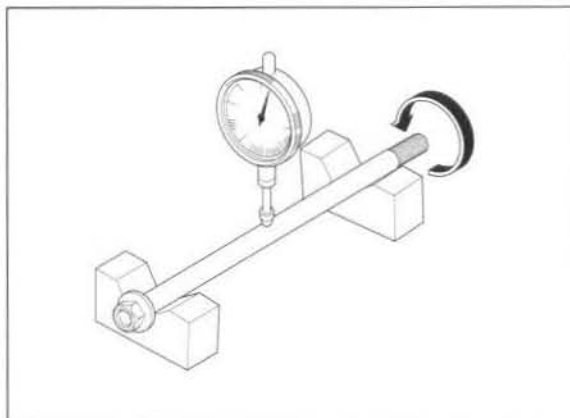


INSPECTION

Axle

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

SERVICE LIMIT: 0.20 mm (0.008 in)



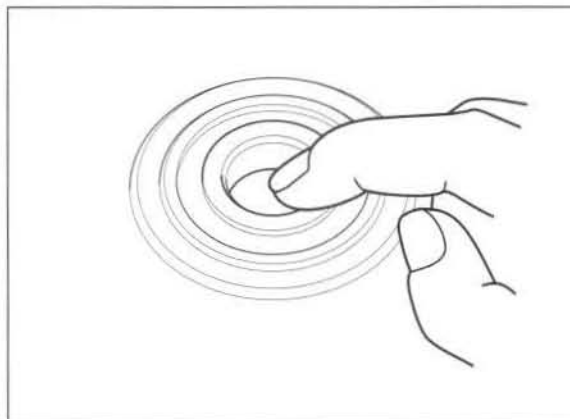
Wheel bearing

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

Always replace the bearings in pairs.

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

Install the new bearings into the hub using the special tools (page 12-9).



Wheel rim runout

Check the rim runout by placing the wheel in a turning stand. Spin the wheel by hand, and read the runout using a dial indicator.

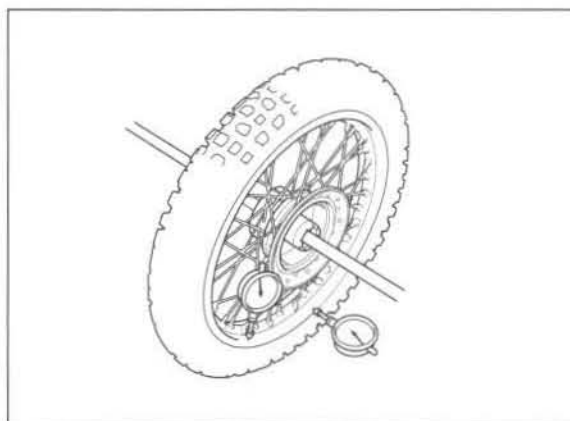
Spin the wheel by hand, and read the runout using a dial indicator.

Actual runout is 1/2 the total indicator reading.

SERVICE LIMITS:

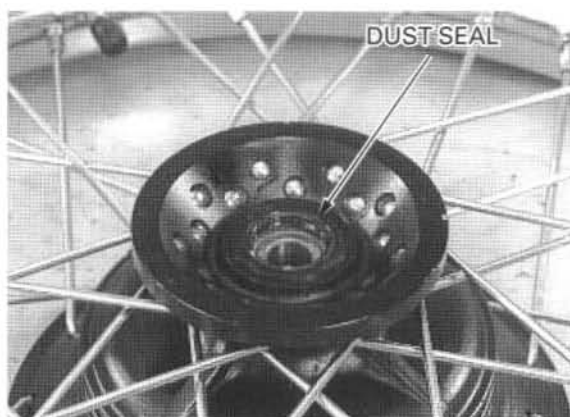
Radial: 2.0 mm (0.08 in)

Axial: 2.0 mm (0.08 in)



DISASSEMBLY

Remove the dust seal.



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

TOOLS:

Bearing remover head, 12 mm 07746-0050300
(Equivalent commercially available in U.S.A.)

Bearing remover shaft 07746-0050100
(Equivalent commercially available in U.S.A.)



ASSEMBLY

RIGHT WHEEL BEARING (6201U)

DUST SEAL

DISTANCE COLLAR

LEFT WHEEL BEARING (6201U)

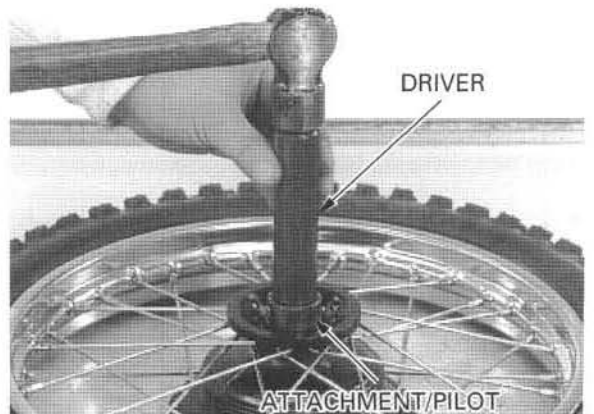
CAUTION:

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

Drive in a new right bearing squarely with its sealed end facing out. Install the distance collar, then drive in the left bearing using the special tools.

TOOLS:

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



FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Place the rim on the work bench.
Place the hub with the left side down and begin lacing with new spokes.
Adjust the hub position so that the distance from the hub left end surface to the side of rim is 12.0 ± 1 mm (0.47 ± 0.04 in) as shown.

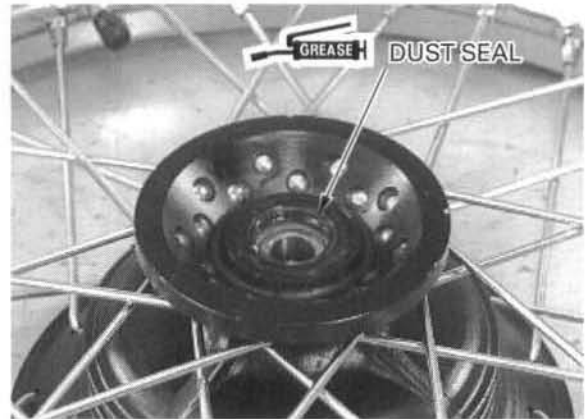
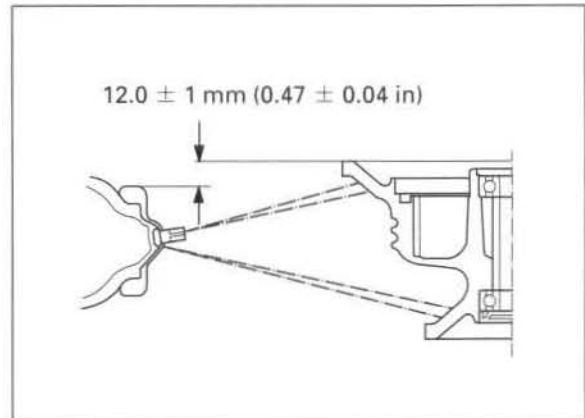
TOOL:

Spoke wrench, 4.5×5.1 mm 07701-0020200
(Equivalent commercially available in U.S.A.)

TORQUE: 3 N·m (0.3 kgf·m, 2.2 lbf·ft)

Check the rim runout (page 12-8).

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



INSTALLATION

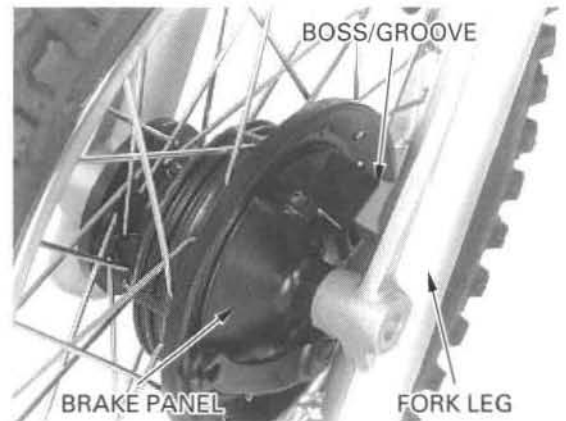
Install the brake panel into the left wheel hub.



Install the side collar into the right wheel hub.



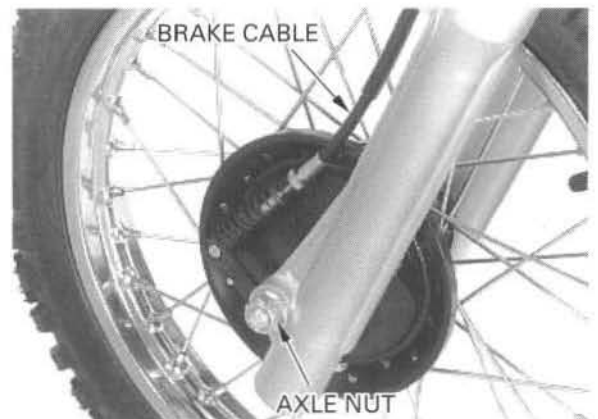
Install the front wheel between the fork legs while aligning the brake panel groove with the boss on the left fork slider.



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

Install the brake cable to the brake panel. Install the spring and connect the cable end to the brake arm.

Adjust the front brake lever free play (page 3-15).



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



Tighten the axle nut to the specified torque.

TORQUE: 59 N·m (6.0 kgf·m , 43 lbf·ft)



FRONT BRAKE

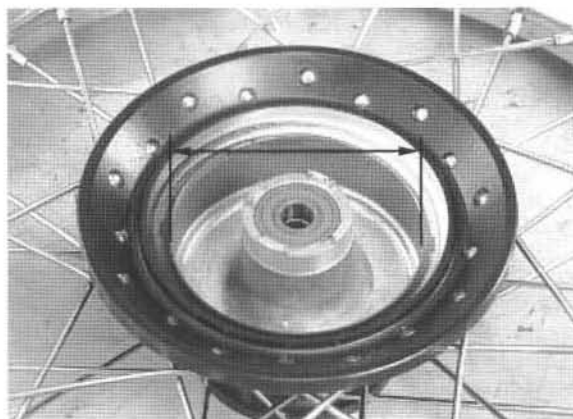
REMOVAL

Remove the brake panel from the front wheel (page 12-7).

INSPECTION

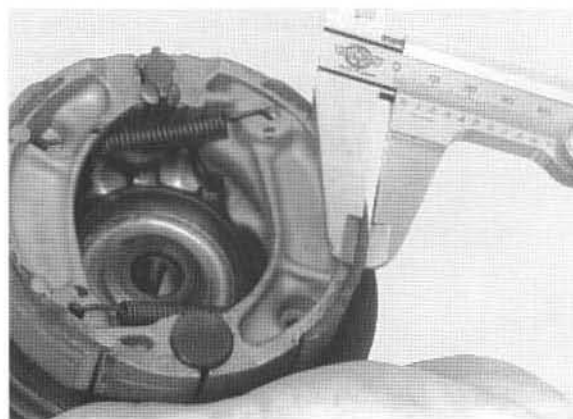
Measure the front brake drum I.D.

SERVICE LIMIT: 96.0 mm (3.78 in)



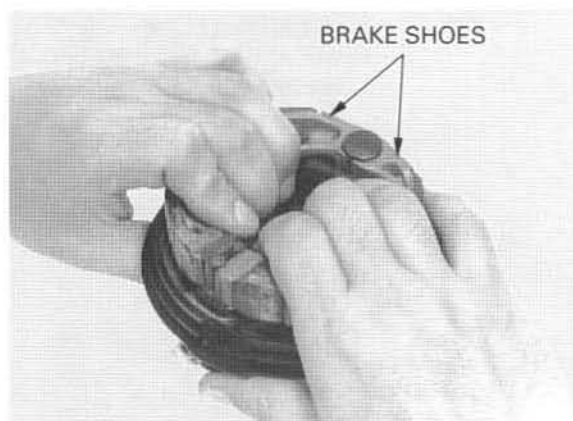
Measure the brake lining thickness.

SERVICE LIMIT: 2.0 mm (0.08 in)



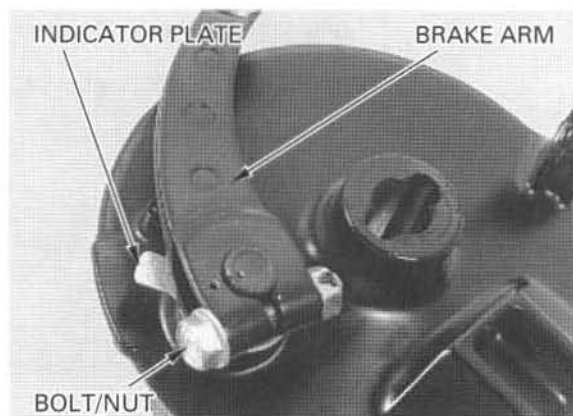
DISASSEMBLY

Remove the brake shoes and springs.

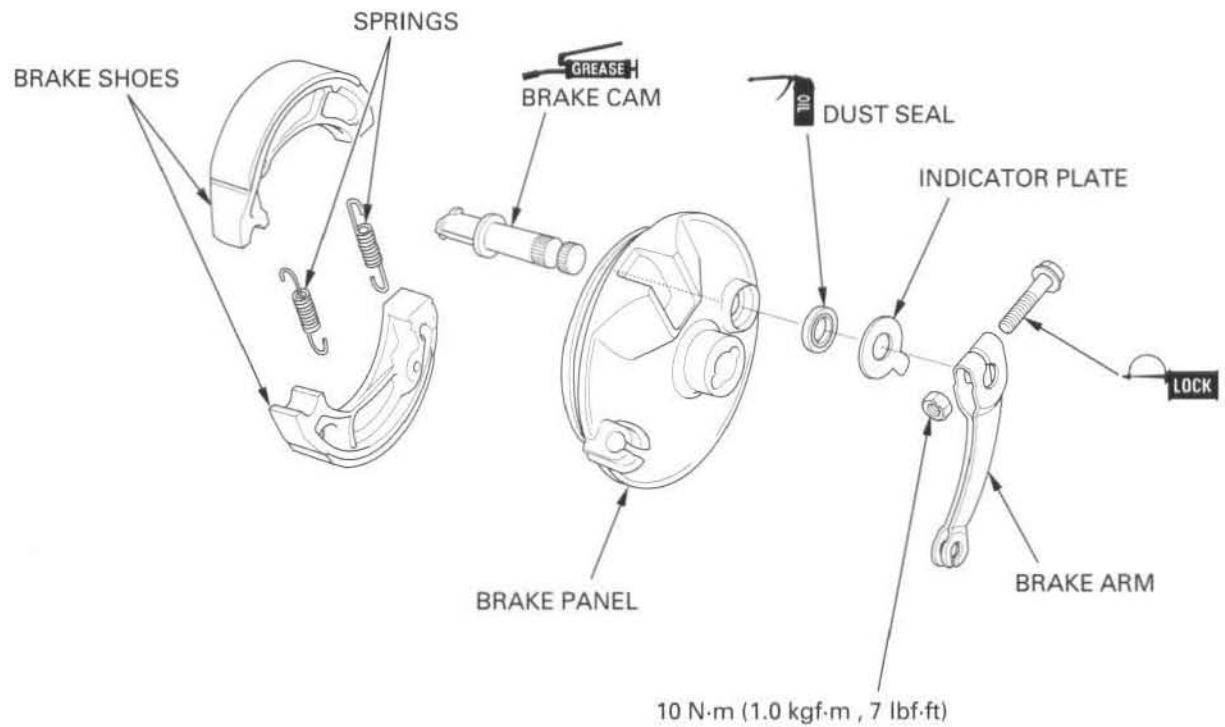


Remove the nut, bolt and brake arm.

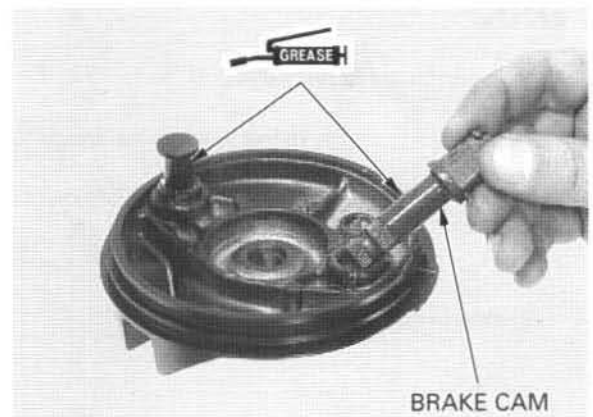
Remove the indicator plate, dust seal and brake cam.



ASSEMBLY

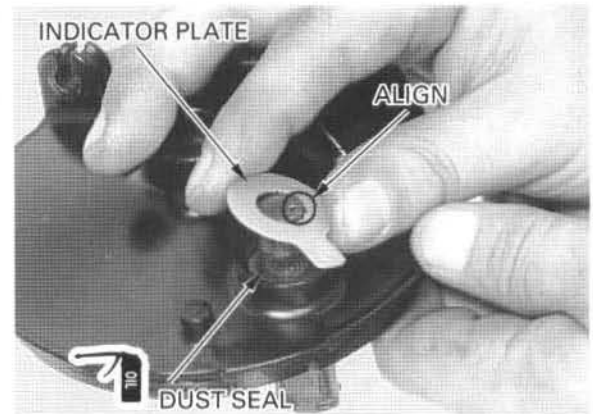


Apply grease to the anchor pin and brake cam.
Install the brake cam into the brake panel.



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

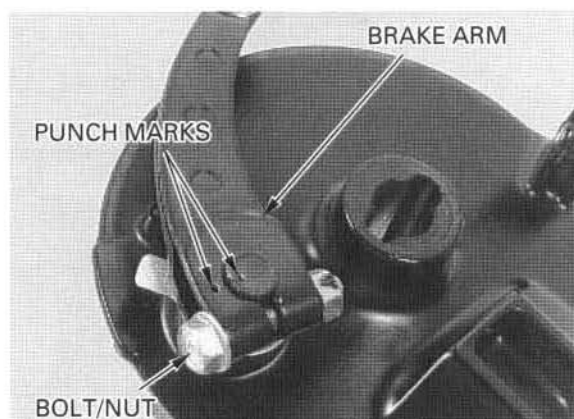
Install the wear indicator plate on the brake cam aligning its wide tooth with the wide groove on the brake cam.



FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Install the brake arm aligning the punch marks between the arm and the brake cam. Apply a locking agent to the pinch bolt threads. Install the brake arm pinch bolt and tighten the nut to the specified torque.

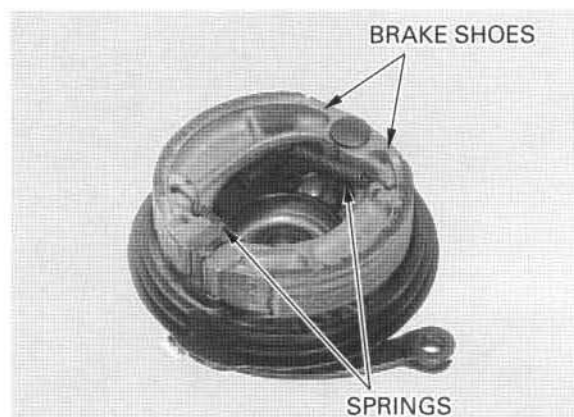
TORQUE: 10 N·m (1.0 kgf·m , 7 lbf·ft)



Install the brake shoes and springs.

INSTALLATION

Install the brake panel into the left wheel hub (page 12-10).

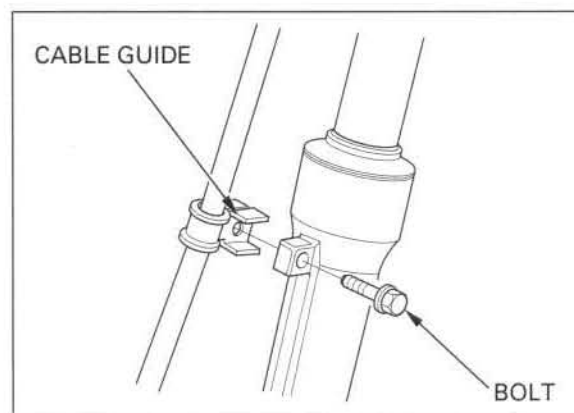


FORK

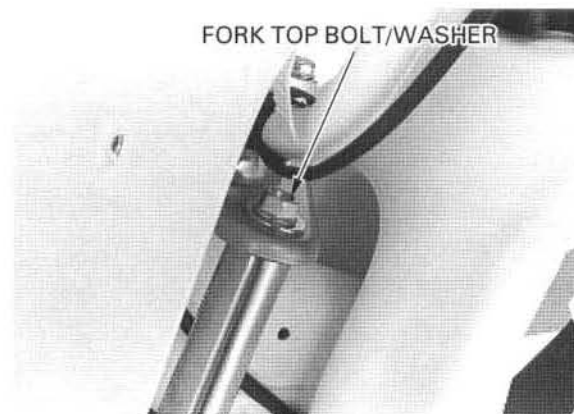
REMOVAL

Remove the front wheel (page 12-7).

Remove the bolt and brake cable guide from the left fork slider.



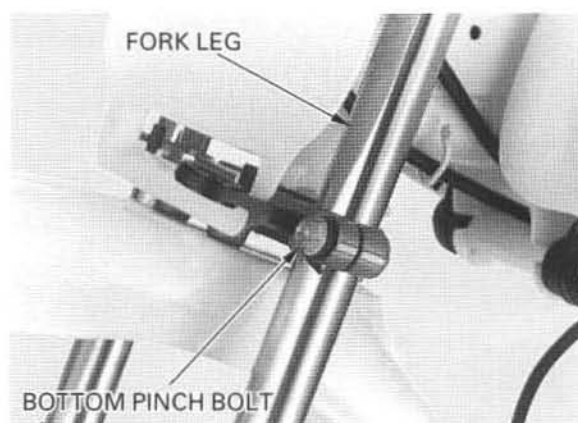
Remove the fork top bolt and washer.



Loosen the fork bottom pinch bolt.

When the fork is to be disassembled, lower the fork leg and tighten the bottom pinch bolt. Loosen the fork bolt, but do not remove it yet.

Loosen the fork bottom pinch bolt and remove the fork leg.

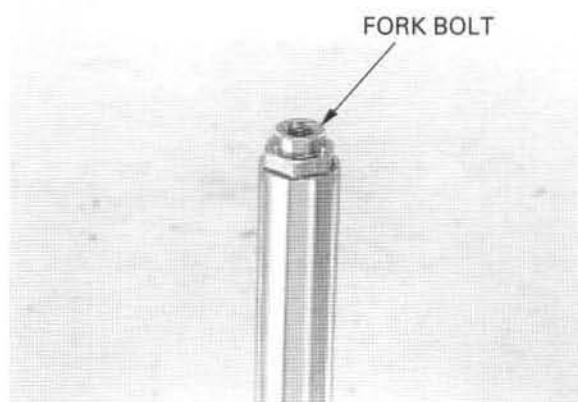


DISASSEMBLY

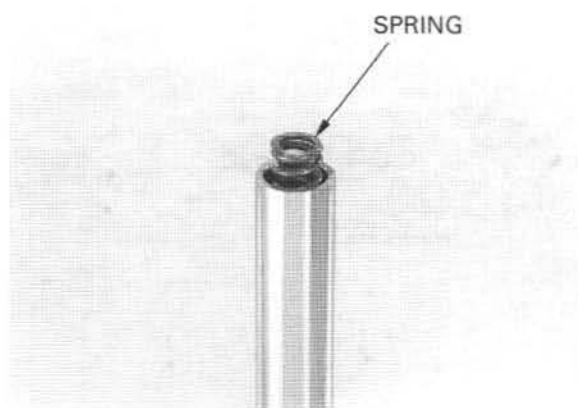
Remove the fork bolt.

⚠ WARNING

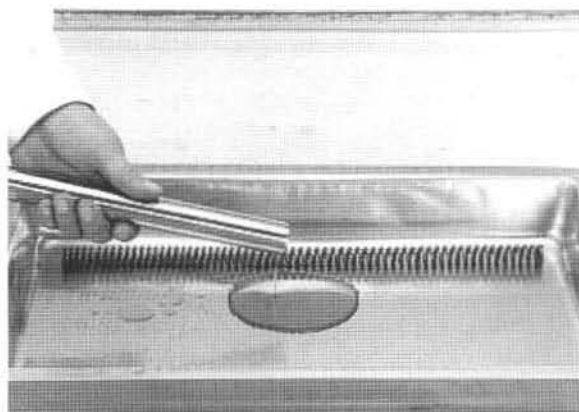
The fork bolt is under spring pressure. Use care when removing it.



Remove the fork spring.

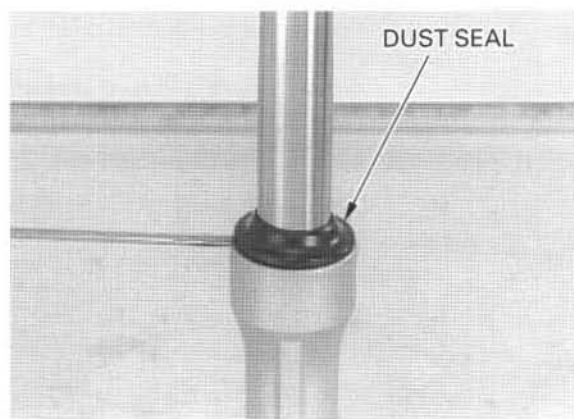


Pour out the fork fluid by pumping the fork tube up and down several times.

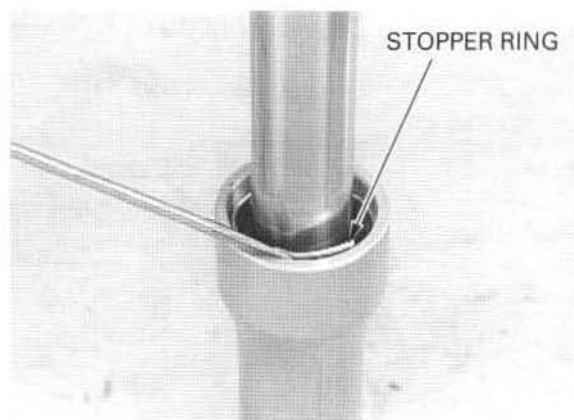


FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Remove the dust seal.



Remove the oil seal stopper ring.



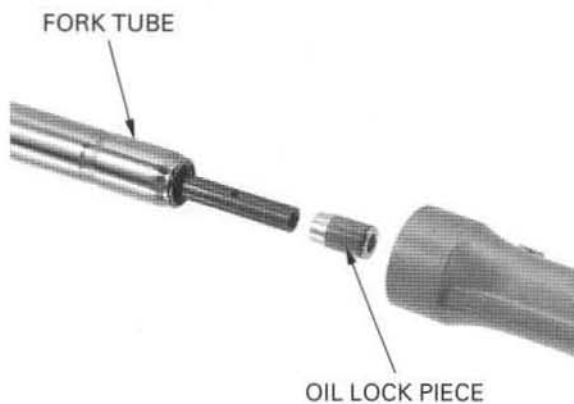
Hold the fork slider in a vice with soft jaws or a shop towel.

If the fork piston turns with the socket bolt, temporarily install the fork spring and fork bolt.

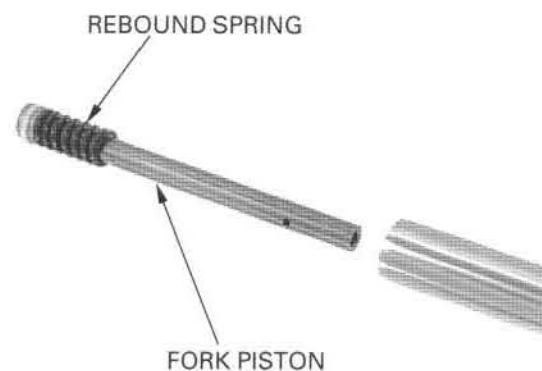
Remove the fork socket bolt with a hex wrench.



Pull the fork tube out from the fork slider.
Remove the oil lock piece.



Remove the fork piston and rebound spring from the fork tube.



Remove the oil seal using a commercially available oil seal remover.

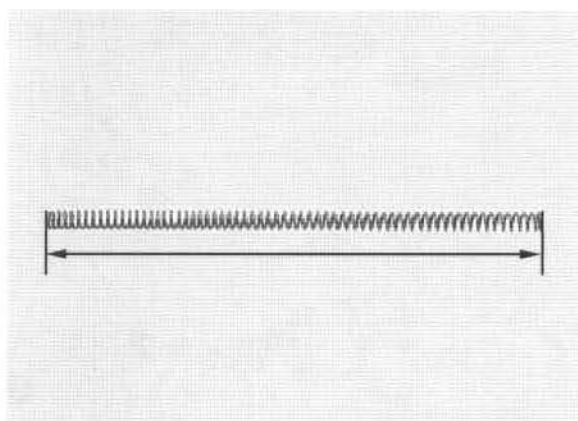


INSPECTION

Fork spring

Measure the fork spring free length.

SERVICE LIMIT: 396.4 mm (15.61 in)

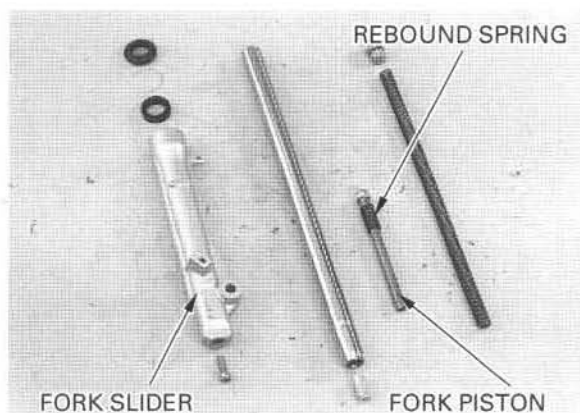


Fork tube/slider/piston

Check the fork tube, fork slider and fork piston for score marks, and excessive or abnormal wear.

Check the fork piston ring for wear or damage.
Check the rebound spring for fatigue or damage.

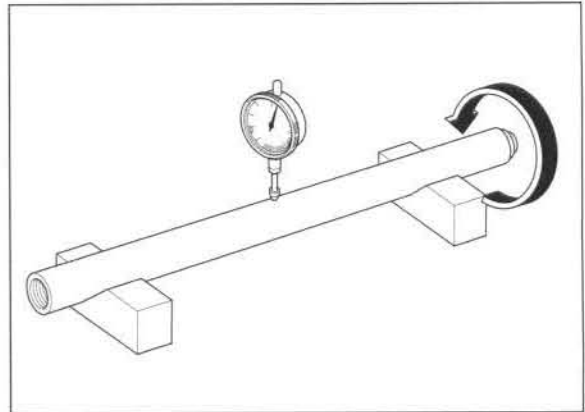
Replace the components if necessary.



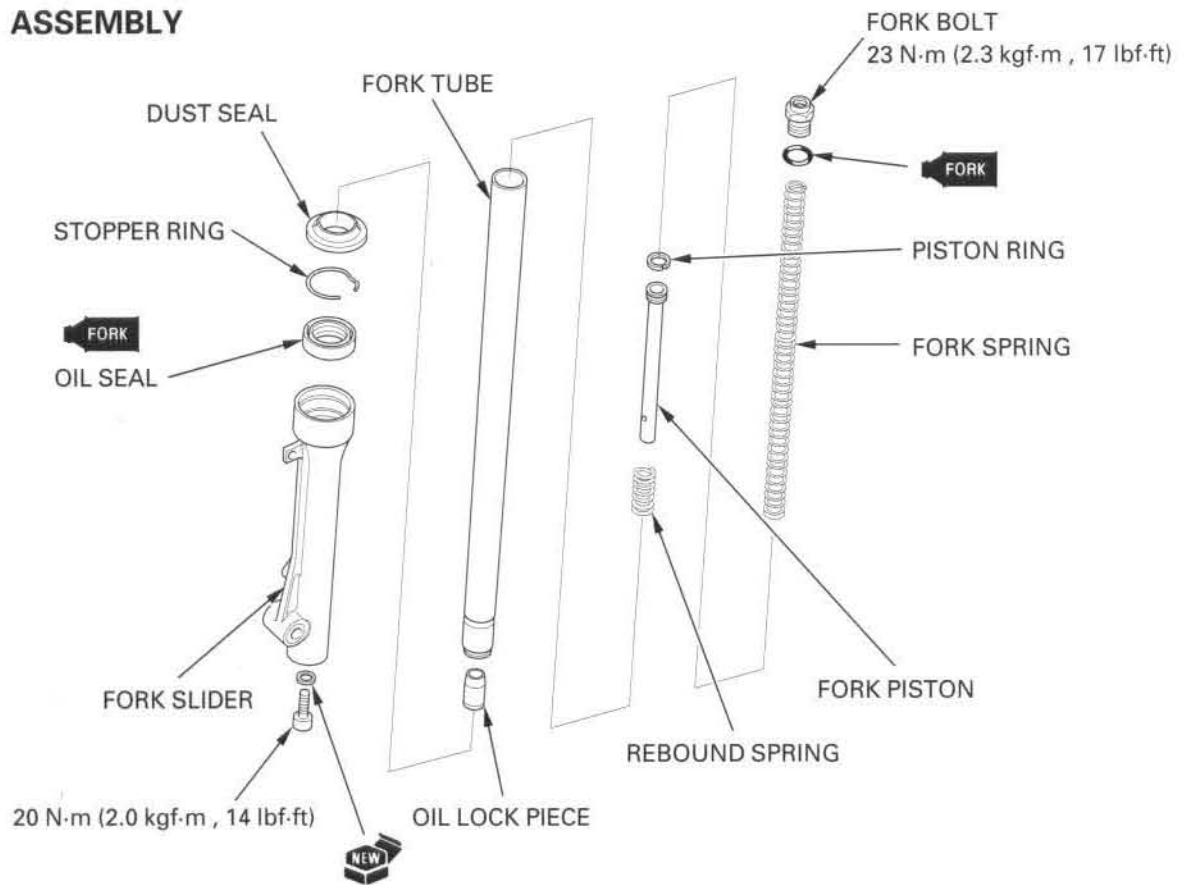
FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Place the fork tube in V-block and measure the runout.
Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.20 mm (0.008 in)

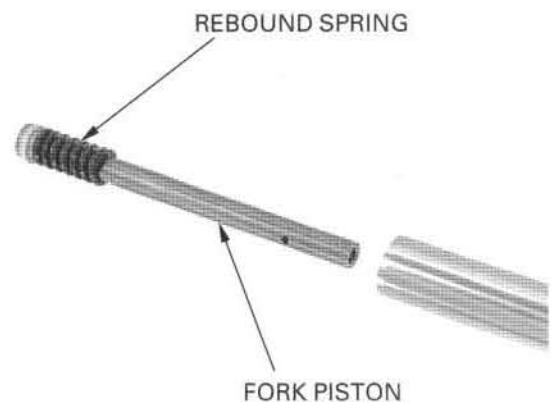


ASSEMBLY

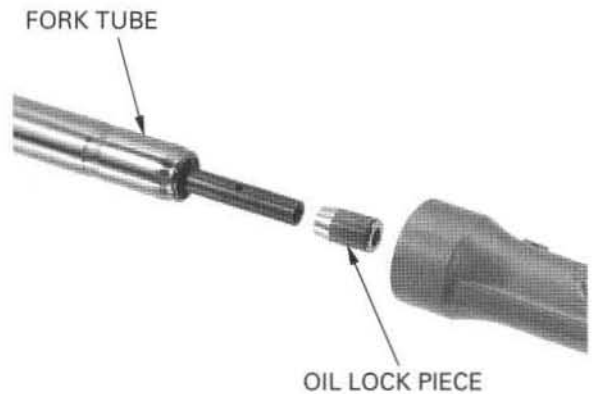


Before assembly, wash all parts with a high flash or non-flammable solvent and wipe them dry.

Install the rebound spring and fork piston into the fork tube.



Install the oil lock piece to the end of the fork piston.
Install the fork tube into the fork slider.

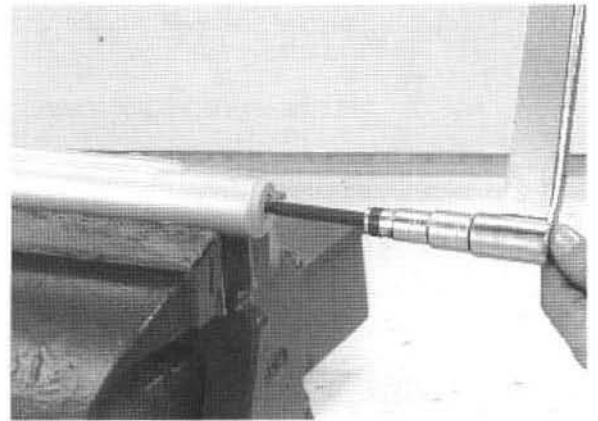


Hold the fork slider in a vise with soft jaws or a shop towel.

If the fork piston turns with the socket bolt, temporarily install the fork spring and fork bolt.

Apply a locking agent to the fork socket bolt threads and install and tighten the socket bolt with a new sealing washer into the fork piston.

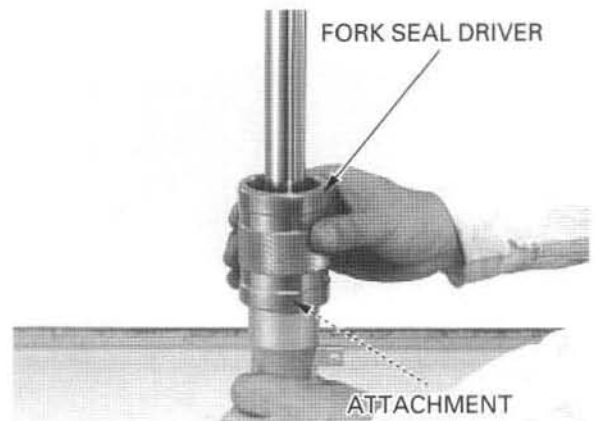
TORQUE: 20 N·m (2.0 kgf·m , 14 lbf·ft)



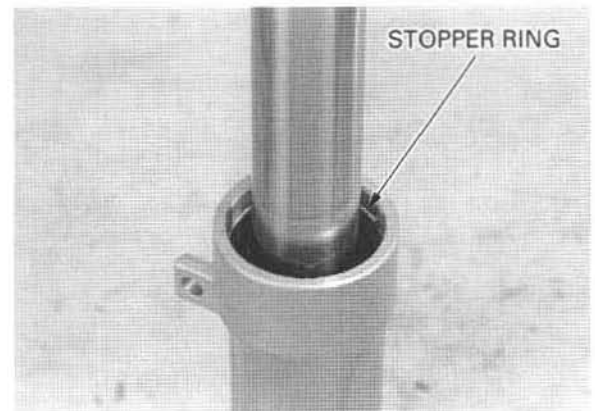
Apply fork fluid to the oil seal lips, then install it into the fork slider with its marking facing up.
Drive the oil seal into the fork slider using the special tools.

TOOLS:

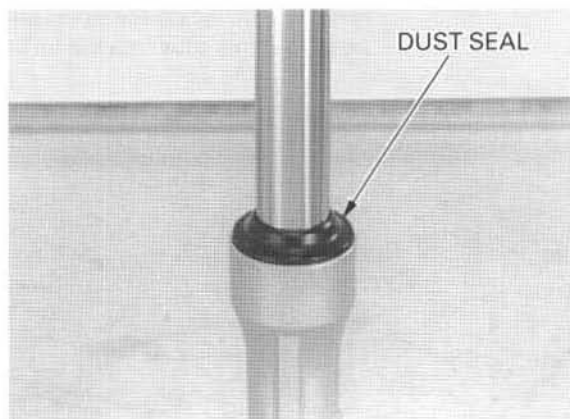
Fork seal driver body	07747-0010100
Fork seat driver attachment	07747-0010200
Fork seal driver, 27 mm	07947-1180001
	(U. S. A. only)



Install the oil seal stopper ring into the fork slider groove securely.



Install the dust seal.



Pour the specified amount of recommended fork fluid into the fork tube.

RECOMMENDED FORK FLUID:

Pro Honda Suspension Fluid SS-8

FORK FLUID CAPACITY:

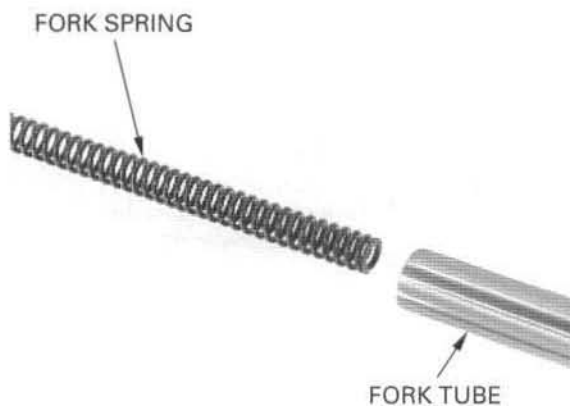
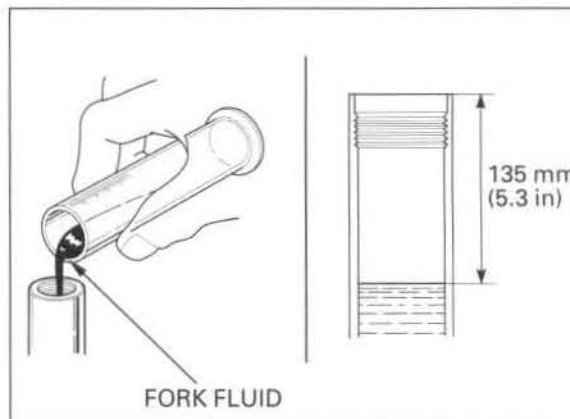
$74 \pm 1 \text{ cm}^3$ ($2.50 \pm 0.03 \text{ US oz}$,
 $2.60 \pm 0.04 \text{ Imp oz}$)

Pump the fork tube several times to remove trapped air from the lower portion of the fork tube.

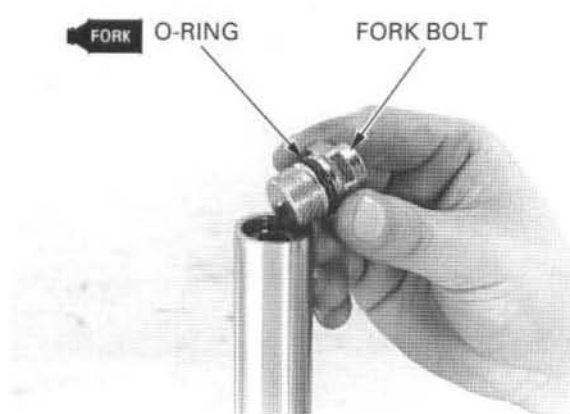
Compress the fork leg fully and measure the oil level from the top of the fork tube.

FORK OIL LEVEL: 135 mm (5.3 in)

Pull the fork tube up and install the fork spring with its tapered (narrow coil pitch) end facing down.



Apply fork fluid to a new O-ring and install it onto the fork bolt.
Install the fork bolt onto the fork tube.

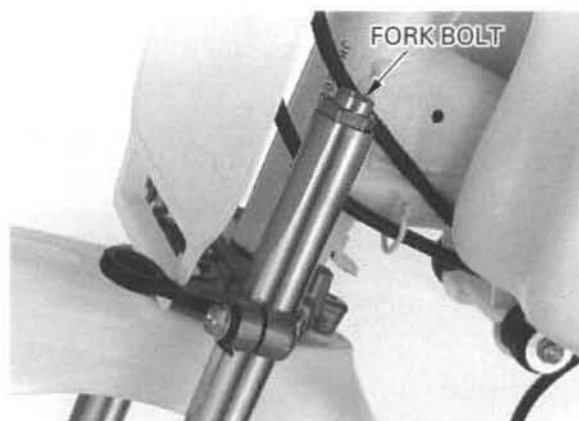


INSTALLATION

Install the fork tube into the steering stem.

Temporarily tighten the fork bottom pinch bolt.
Tighten the fork bolt to the specified torque.

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

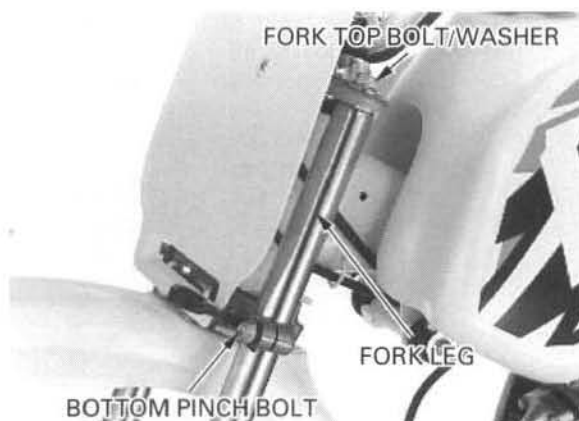


Loosen the fork bottom pinch bolt and pull up the fork leg until it seats bottom of the top bridge.
Install the washer and fork top bolt, tighten the bolt to the specified torque.

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

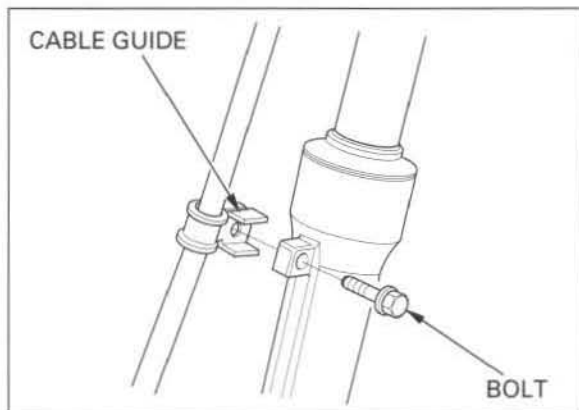
Tighten the fork bottom pinch bolt to the specified torque.

TORQUE: 32 N·m (3.3 kgf·m , 24 lbf·ft)



Install the front wheel (page 12-10).
Adjust the brake lever free play (page 3-14).

Install the brake cable guide to the left fork slider, tighten the bolt securely.



STEERING STEM

REMOVAL

Remove the following:

- Handlebar (page 12-3)
- Front wheel (page 12-7)
- Front fender (page 2-4)

Remove the steering stem nut and washer.

Remove the fork leg (page 12-14).

Remove the top bridge.



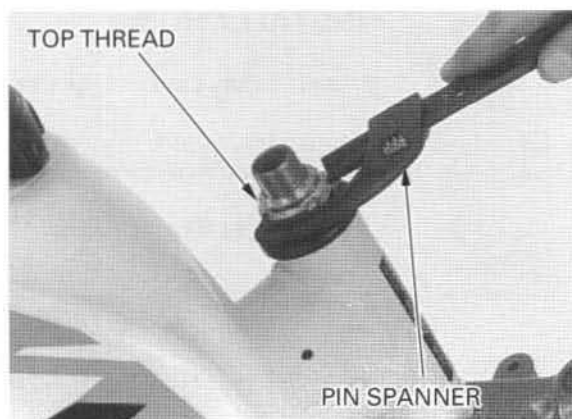
FRONT WHEEL/BRAKE/SUSPENSION/STEERING

Remove the steering stem top thread using the special tool.

TOOL:

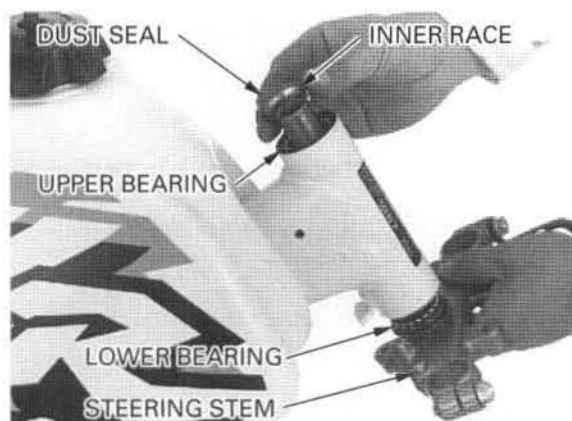
Pin spanner

07702-0020001



Remove the following:

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



BEARING RACE REPLACEMENT

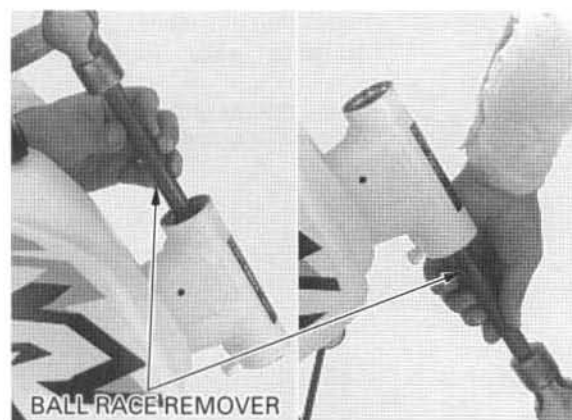
Always replace the bearings and races as a set.

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

TOOL:

Ball race remover

07944-1150001



Drive a new lower bearing outer races into the steering head pipe using the special tools as shown.

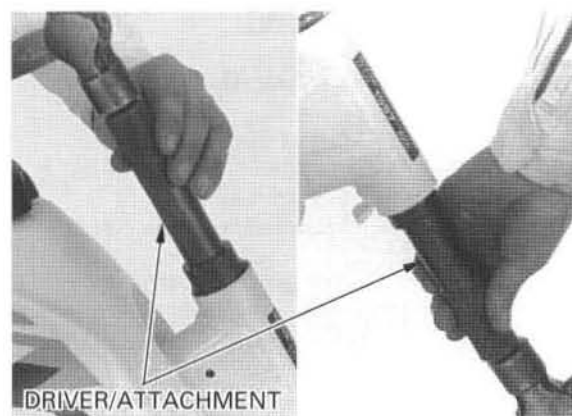
TOOLS:

Driver

07749-0010000

Attachment, 37 × 40 mm

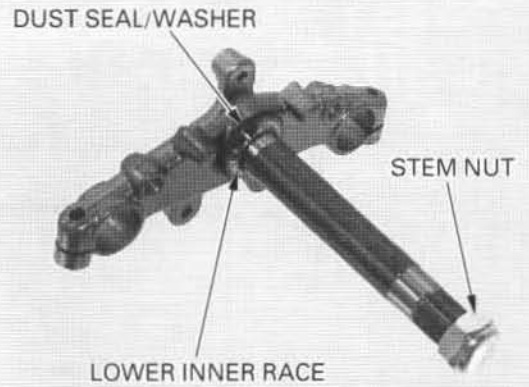
07746-0010200



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

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

Remove the dust seal and washer.



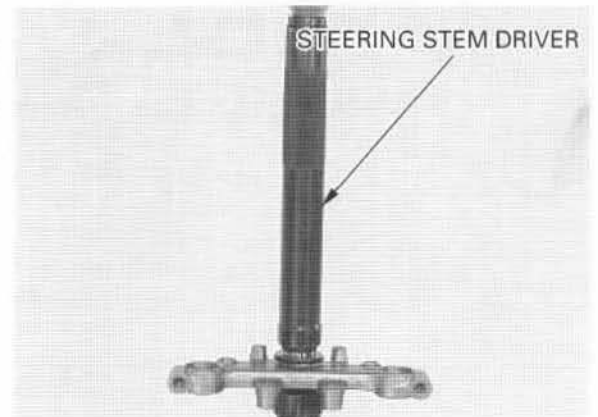
Install the washer over the steering stem.

Apply grease to new dust seal lips and install it over the steering stem.

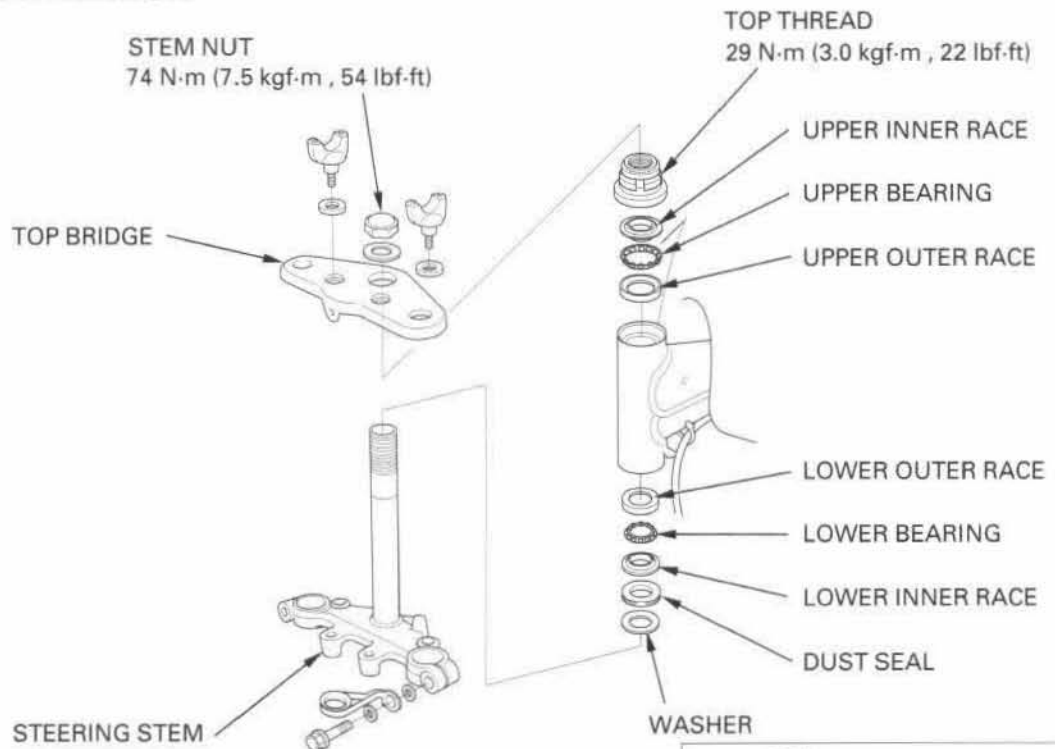
Install a new lower bearing inner race using a special tool and a hydraulic press.

TOOL:

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



INSTALLATION



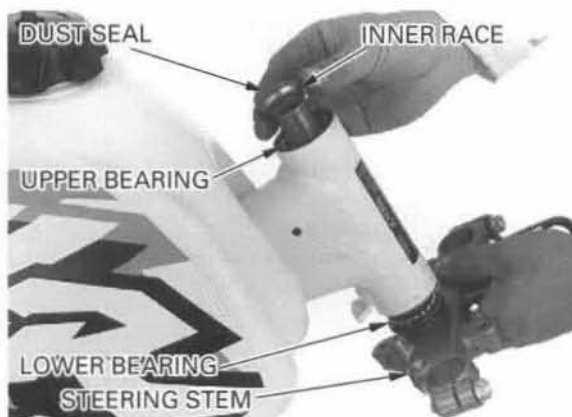
GREASE : INNER/OUTER RACES
BEARINGS
DUST SEAL

FRONT WHEEL/BRAKE/SUSPENSION/STEERING

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

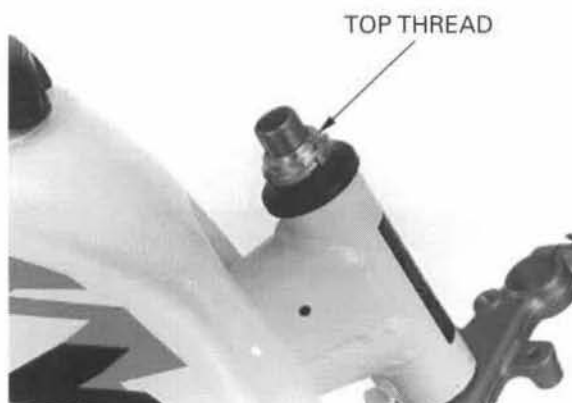
Insert the steering stem into the steering head pipe.

Install upper bearing, inner race, dust seal and top thread.



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

TORQUE: 25 N·m (2.5 kgf·m , 18 lbf·ft)



Move the steering stem right and left, lock-to-lock, five times to seat the bearings.

Make sure the steering stem moves smoothly, without play or binding; then loosen the top thread.

Retighten the top thread to the specified torque.

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

Recheck that the steering stem moves smoothly without play or binding.



Install the top bridge and fork leg (page 12-21).

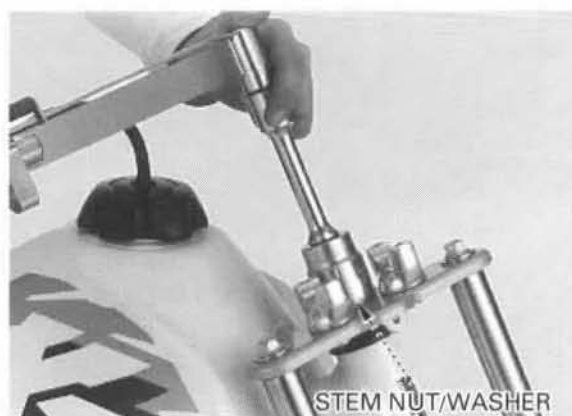
Install the washer and stem nut.

Tighten the steering stem nut to the specified torque.

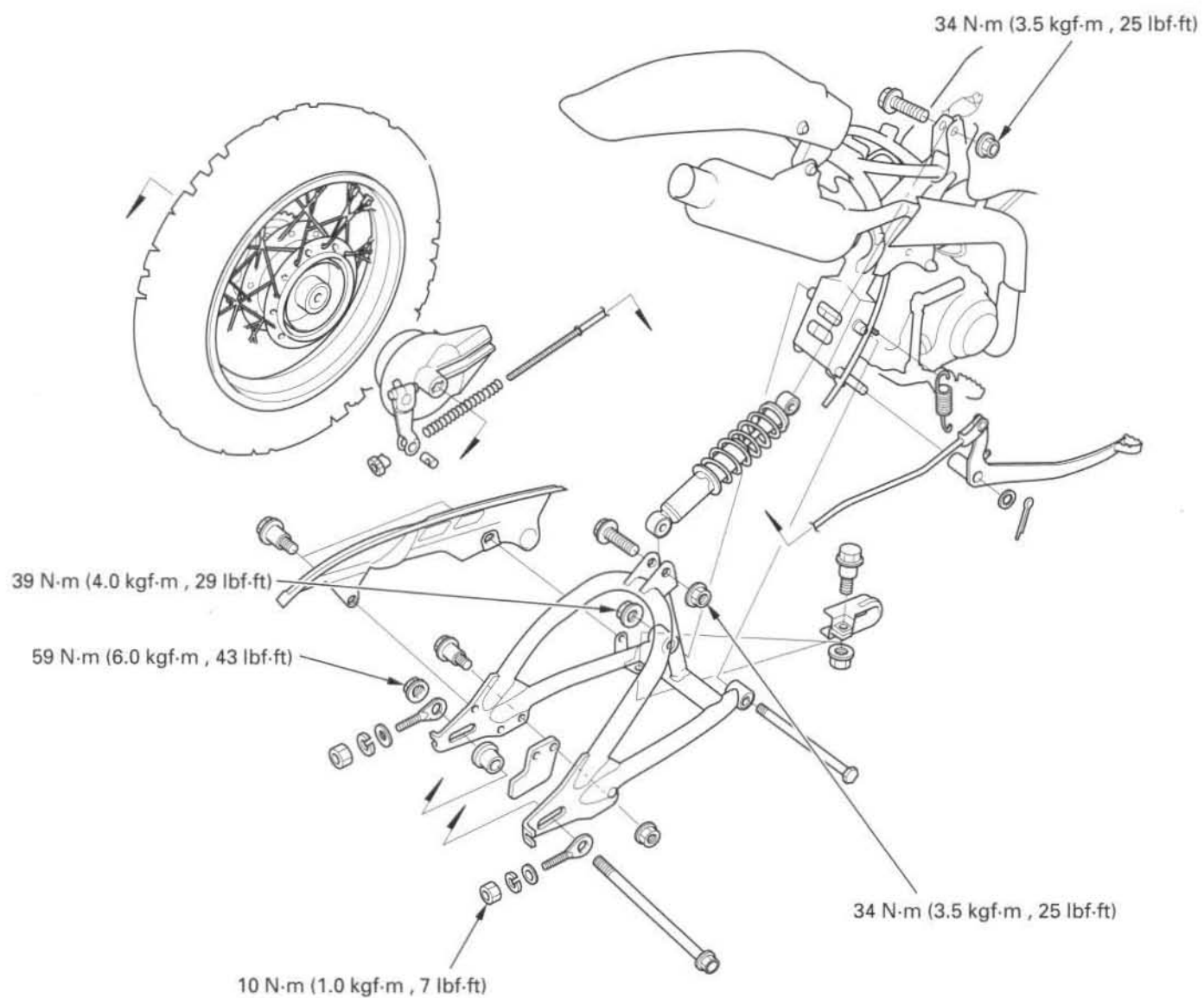
TORQUE: 74 N·m (7.5 kgf·m , 54 lbf·ft)

Install the following:

- Front fender (page 2-4)
- Front wheel (page 12-10)
- Handlebar (page 12-4)



MEMO



13. REAR WHEEL/BRAKE/SUSPENSION

SERVICE INFORMATION	13-1	SHOCK ABSORBER	13-10
TROUBLESHOOTING	13-2	SWINGARM	13-12
REAR WHEEL	13-3	BRAKE PEDAL	13-13
REAR BRAKE	13-8		

SERVICE INFORMATION

GENERAL

▲WARNING

A contaminated brake drum or shoe reduces stopping power. Discard contaminated shoes and clean a contaminated drum with a high quality brake degreasing agent.

- When servicing the rear wheel, support the motorcycle using a safety stand or hoist.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Minimum tire tread depth			_____	2.0 (0.08)
Cold tire pressure			100 kPa (1.00 kgf/cm ² , 15 psi)	_____
Axle runout			_____	0.20 (0.008)
Wheel rim-to-hub distance			11.0 ± 1.0 (0.43 ± 0.04)	_____
Wheel rim runout	Radial		_____	2.0 (0.08)
	Axial		_____	2.0 (0.08)
Drive chain	Size/link	DID	DID420M-86RB	_____
		RK	RK420MZ-86RJ	_____
	Slack		10 – 20 (3/8 – 3/4)	_____
Brake	Brake pedal free play		20 – 30 (3/4 – 1-1/4)	_____
	Brake drum I.D.		95.0 (3.74)	96.0 (3.78)
	Brake lining thickness		4.0 (0.16)	2.0 (0.08)

13

TORQUE VALUES

Spoke nipple	3 N·m (0.3 kgf·m, 2.2 lbf·ft)	
Rear axle nut	59 N·m (6.0 kgf·m, 43 lbf·ft)	U-nut
Driven sprocket nut	32 N·m (3.3 kgf·m, 24 lbf·ft)	U-nut
Rear brake arm pinch bolt/nut	10 N·m (1.0 kgf·m, 7 lbf·ft)	U-nut
Swingarm pivot bolt/nut	39 N·m (4.0 kgf·m, 29 lbf·ft)	U-nut
Shock absorber upper mounting bolt/nut	34 N·m (3.5 kgf·m, 25 lbf·ft)	U-nut
Shock absorber lower mounting bolt/nut	34 N·m (3.5 kgf·m, 25 lbf·ft)	U-nut

TOOLS

Spoke wrench, 4.5 × 5.1 mm	07701-0020200	Equivalent commercially available in U.S.A.
Bearing remover shaft	07746-0050100	Equivalent commercially available in U.S.A.
Bearing remover head, 12 mm	07746-0050300	
Driver	07749-0010000	
Attachment, 32 × 35 mm	07746-0010100	
Attachment, 37 × 40 mm	07746-0010200	
Pilot, 12 mm	07746-0040200	

TROUBLESHOOTING

Soft suspension

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

Hard suspension

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

Steers to one side or does not track straight

- Bent rear axle
- Axle alignment/chain adjustment not equal on both sides

Rear wheel wobbling

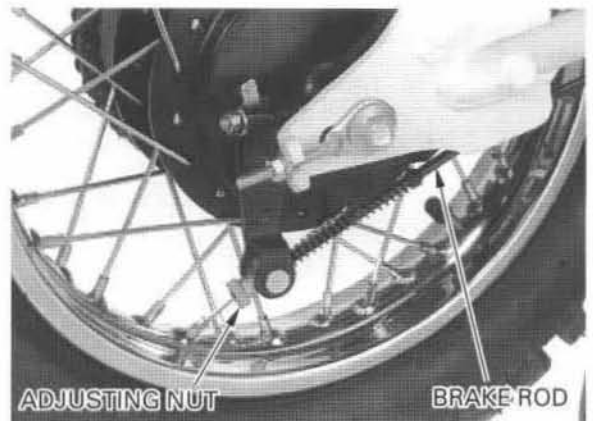
- Bent rim
- Worn rear wheel bearings
- Faulty tire
- Unbalanced tire and wheel
- Tire pressure too low
- Faulty swingarm pivot bushings

REAR WHEEL

REMOVAL

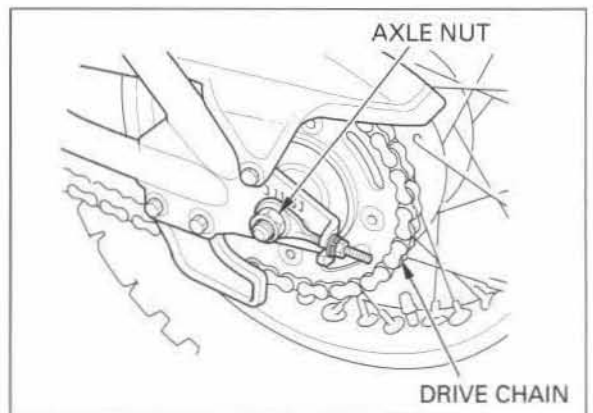
Support the motorcycle securely using a hoist or equivalent and raise the rear wheel off the ground.

Remove the rear brake adjusting nut and disconnect the rear brake rod from the brake arm.



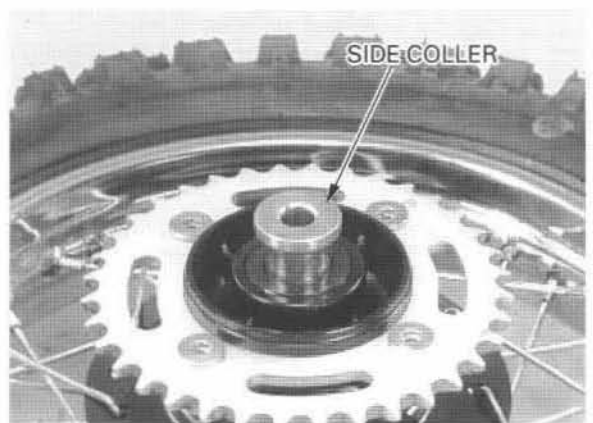
Remove the axle nut.

Push the rear wheel forward.
Derail the drive chain from the driven sprocket.



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

Remove the left side collar from the left wheel hub.



Remove the brake panel from the right wheel hub.

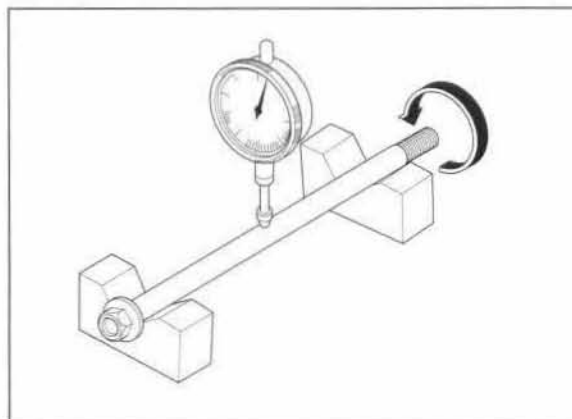


INSPECTION

Axle

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

SERVICE LIMIT: 0.20 mm (0.008 in)



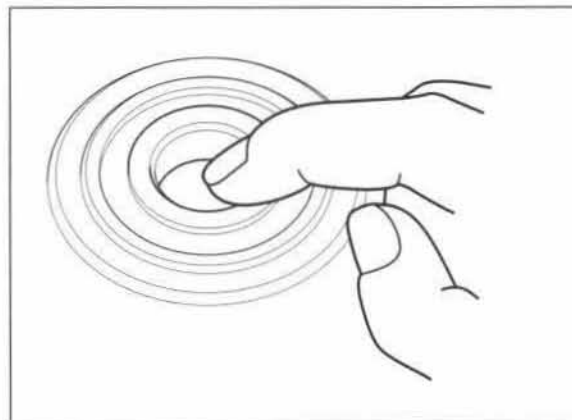
Wheel bearing

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

Replace the wheel bearings in pairs.

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

Install the new bearings into the hub using the special tools (page 13-6).



Wheel rim runout

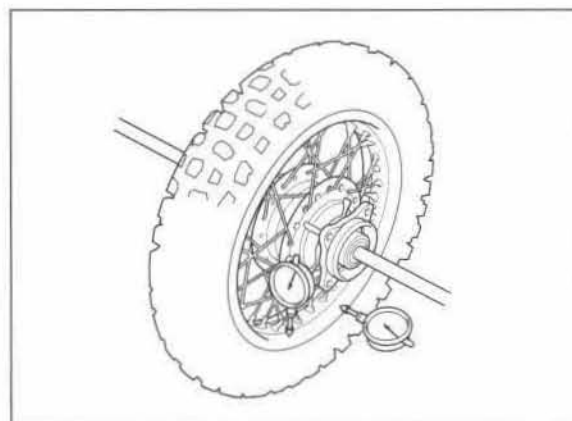
Check the rim runout by placing the wheel in a turning stand.

Spin the wheel slowly and read the runout using a dial indicator.

Actual runout is 1/2 the total indicator reading.

SERVICE LIMITS: Radial: 2.0 mm (0.08 in)

Axial: 2.0 mm (0.08 in)



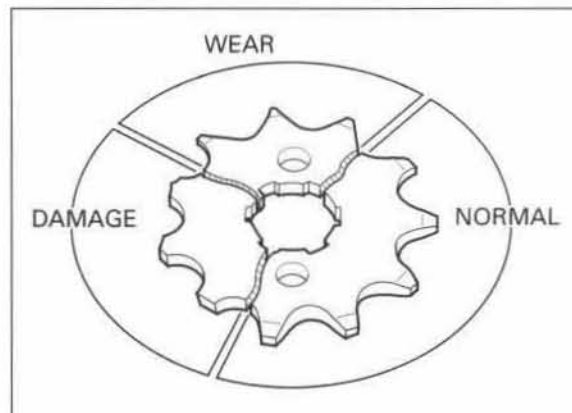
Driven sprocket

Check the condition of the final driven sprocket teeth.

Replace the sprocket if worn or damaged.

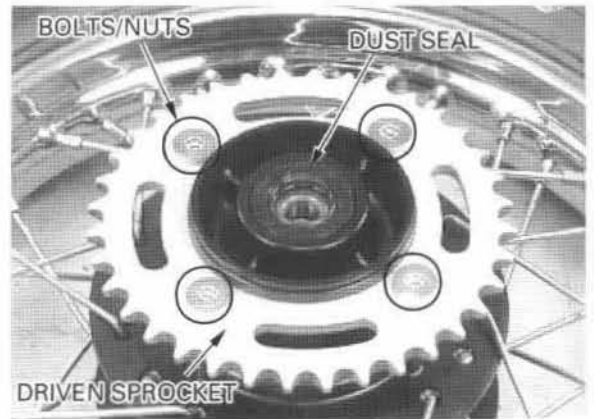
NOTE:

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



DISASSEMBLY

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



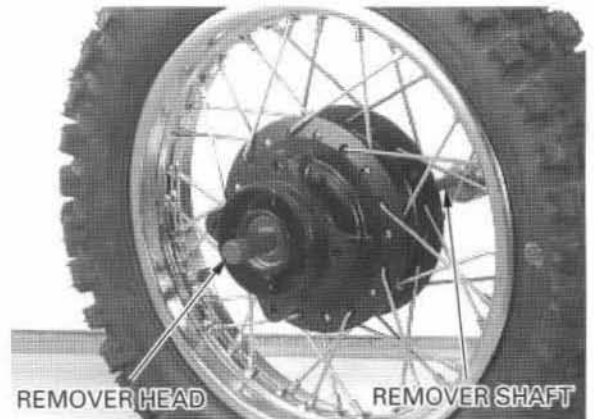
Wheel bearing removal

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

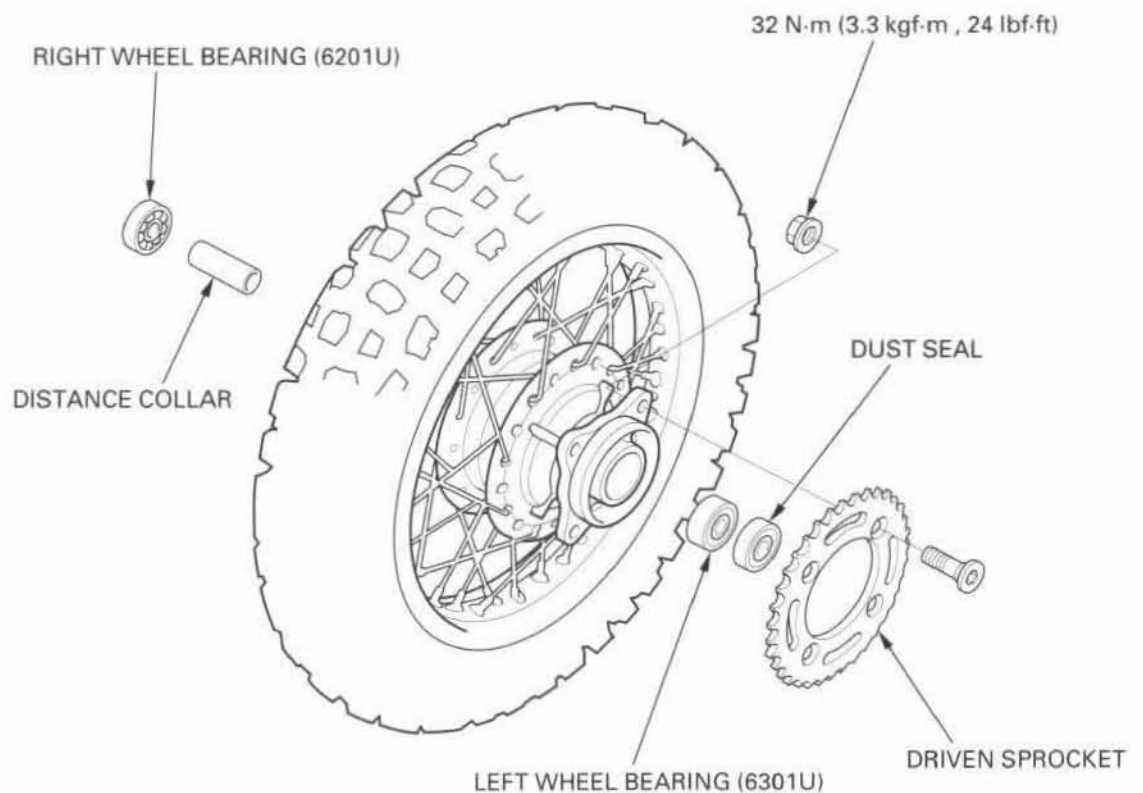
TOOLS:

Bearing remover head, 12 mm 07746-0050300
(Equivalent commercially available in U.S.A.)

Bearing remover shaft 07746-0050100
(Equivalent commercially available in U.S.A.)



ASSEMBLY



REAR WHEEL/BRAKE/SUSPENSION

Wheel bearing installation

CAUTION:

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

Drive in a new right bearing squarely using the special tools as shown.

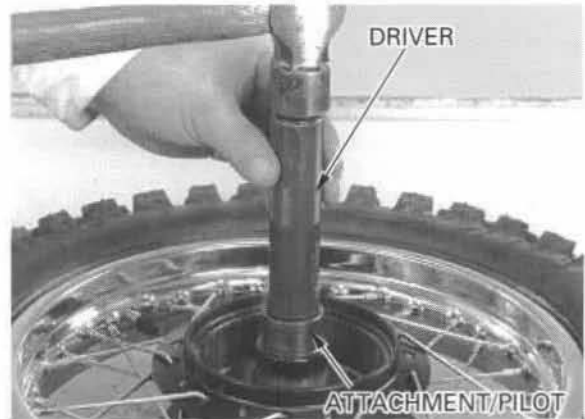
TOOLS:

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

Install the distance collar, then drive in the new left side bearing using the special tools as shown.

TOOLS:

Driver	07749-0010000
Attachment, 37 × 40 mm	07746-0010200
Pilot, 12 mm	07746-0040200



Place the rim on the work bench.
Place the hub with the left side down and begin lacing with new spokes.
Adjust the hub position so that the distance from the hub left end surface to the side of rim is 11.0 ± 1.0 mm (0.43 ± 0.04 in) as shown.

TOOL:

Spoke wrench, 4.5 × 5.1 mm	07701-0020200 (Equivalent commercially available in U.S.A.)
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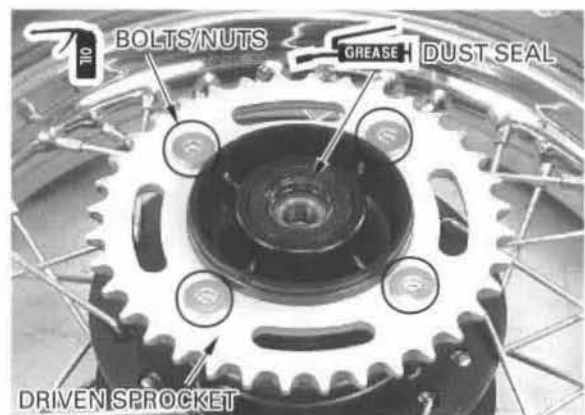
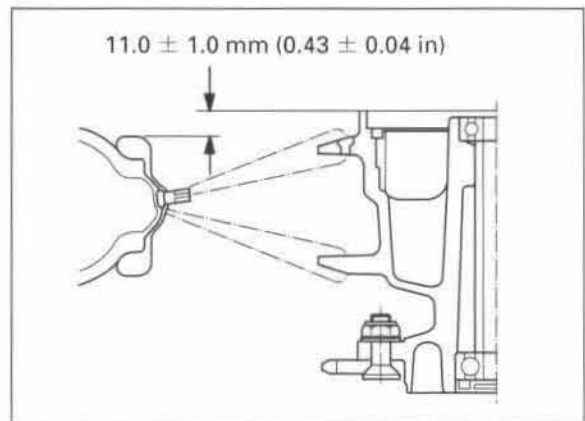
TORQUE: 3 N·m (0.3 kgf·m , 2.2 lbf·ft)

Check the rim runout (page 13-4).

Apply grease to the dust seal lips, then install it into the left wheel hub.

Apply oil to the driven sprocket mounting nut threads and seating surface.
Install the driven sprocket, bolts and nuts, then tighten the nuts to the specified torque while holding the bolts.

TORQUE: 32 N·m (3.3 kgf·m , 24 lbf·ft)



INSTALLATION

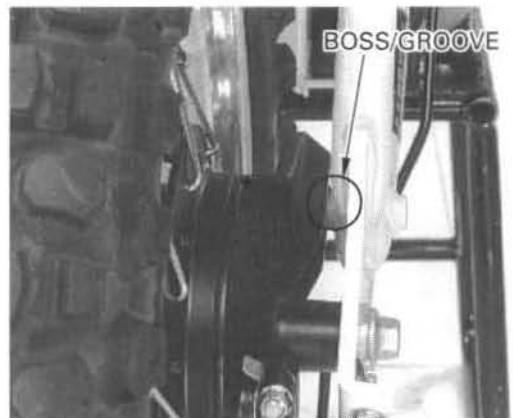
Install the left side collar into the left wheel hub.



Install the brake panel into the right wheel hub.



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

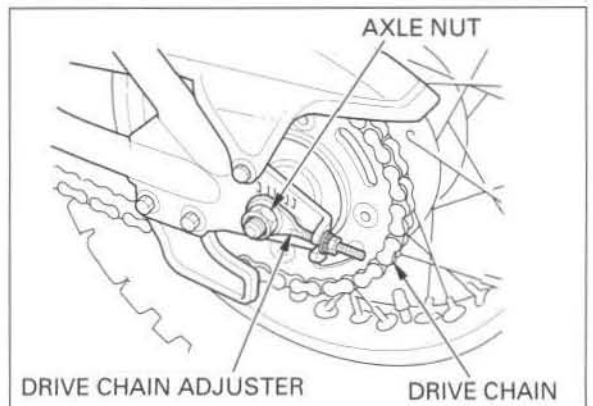


Install the drive chain over the driven sprocket.
Apply thin layer of grease to the axle.
Install the axle and right drive chain adjuster from the right side.
Install the left drive chain adjuster and axle nut.

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

Tighten the axle nut to the specified torque.

TORQUE: 59 N·m (6.0 kgf·m , 43 lbf·ft)



REAR WHEEL/BRAKE/SUSPENSION

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

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



REAR BRAKE

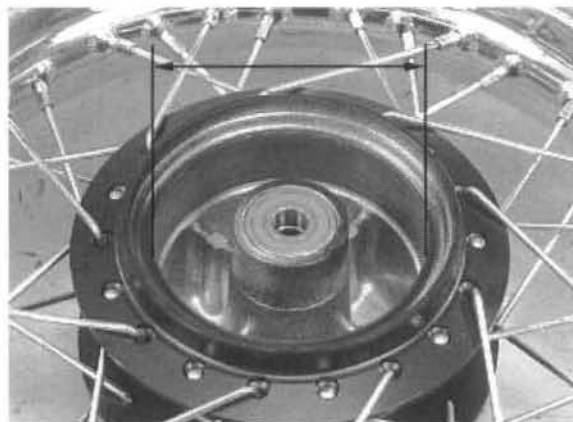
REMOVAL

Remove the brake panel from the rear wheel (page 13-3).

INSPECTION

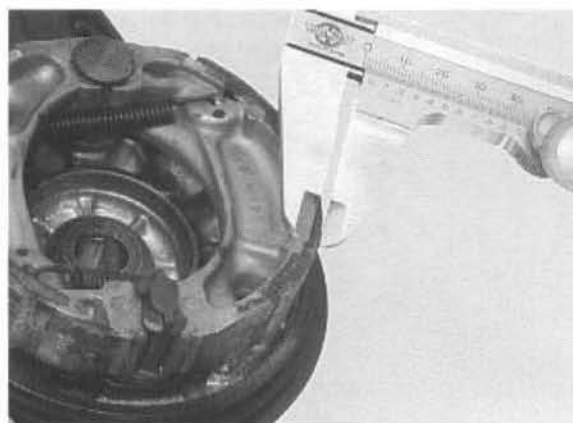
Measure the rear brake drum I.D.

SERVICE LIMIT: 96.0 mm (3.78 in)



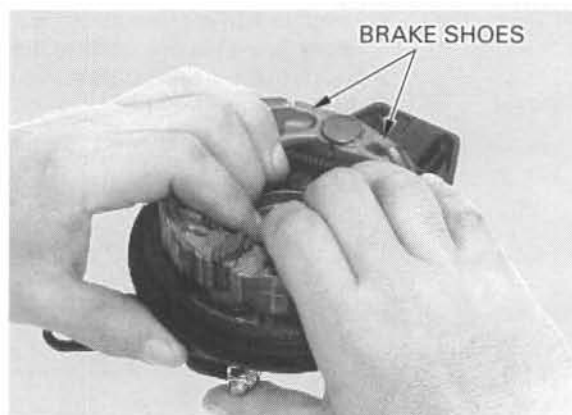
Measure the brake lining thickness.

SERVICE LIMIT: 2.0 mm (0.08 in)



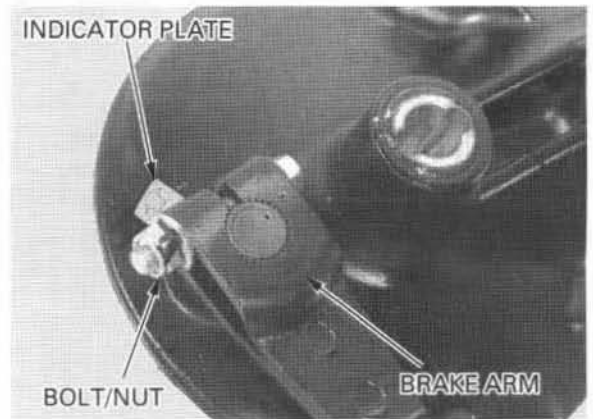
DISASSEMBLY

Remove the brake shoes and springs.

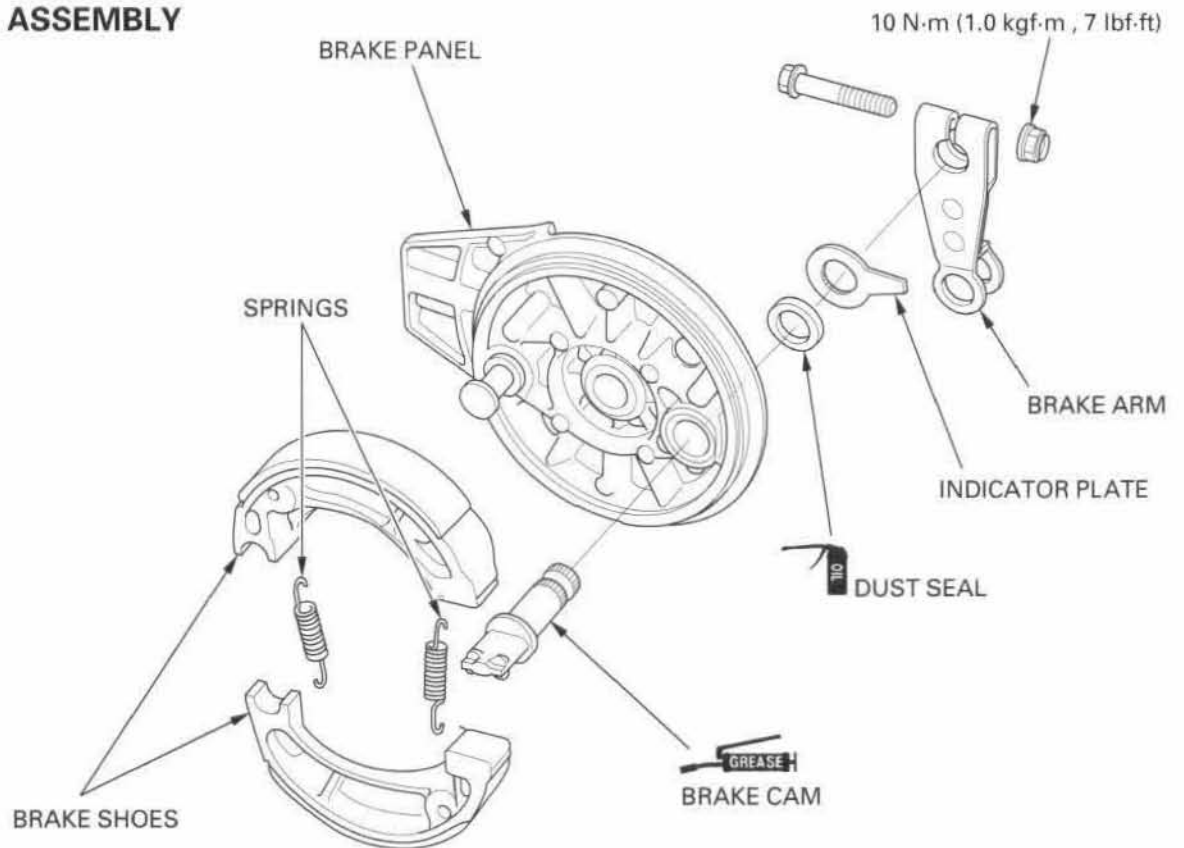


Remove the nut, bolt and brake arm.

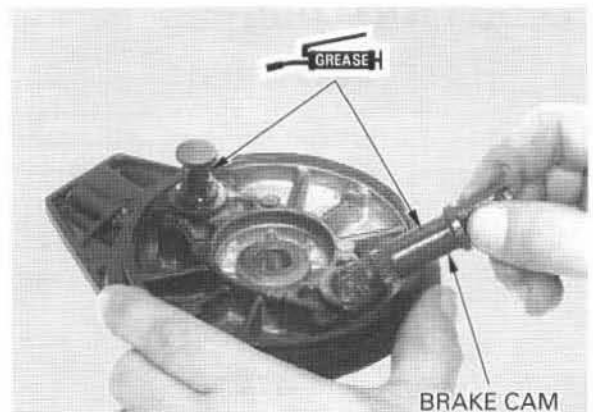
Remove the indicator plate, dust seal and brake cam.



ASSEMBLY



Apply grease to the anchor pin and brake cam. Install the brake cam into the brake panel.



REAR WHEEL/BRAKE/SUSPENSION

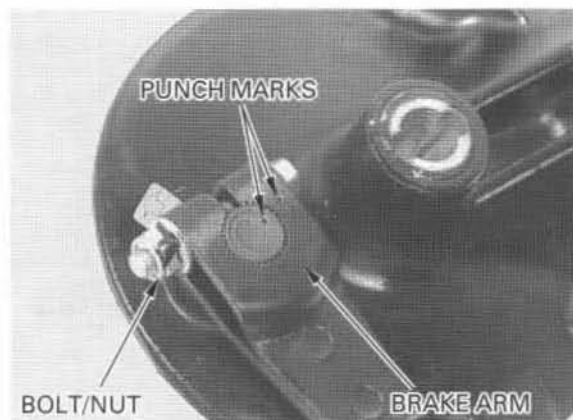
Apply oil to the dust seal and install it onto the brake panel.

Install the wear indicator plate on the brake cam aligning its wide tooth with the wide groove on the brake cam.



Install the brake arm aligning the punch marks between the arm and the brake cam. Install the brake arm pinch bolt and tighten the nut to the specified torque.

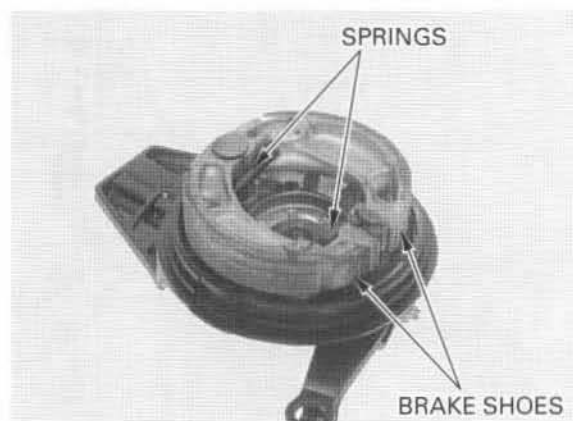
TORQUE: 10 N·m (1.0 kgf·m , 7 lbf·ft)



Install the brake shoes and springs.

INSTALLATION

Install the brake panel into the right wheel hub (page 13-7).



SHOCK ABSORBER

REMOVAL

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

Remove the seat (page 2-2).

Remove the shock absorber lower mounting bolt/nut.



Remove the upper mounting bolt/nut and shock absorber.



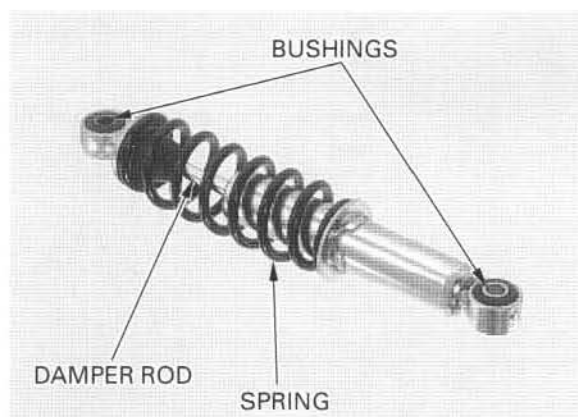
INSPECTION

Visually inspect the shock absorber unit for damage.

Check for the:

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

Inspect all the other parts for wear or damage.

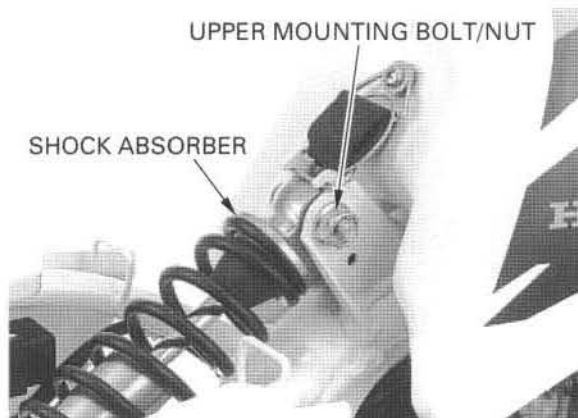


INSTALLATION

Install the shock absorber into the frame.

Install the upper and lower mounting bolts and nuts. Tighten the upper mounting bolts/nuts to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m , 25 lbf·ft)



Tighten the lower mounting bolts/nuts to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m , 25 lbf·ft)



SWINGARM

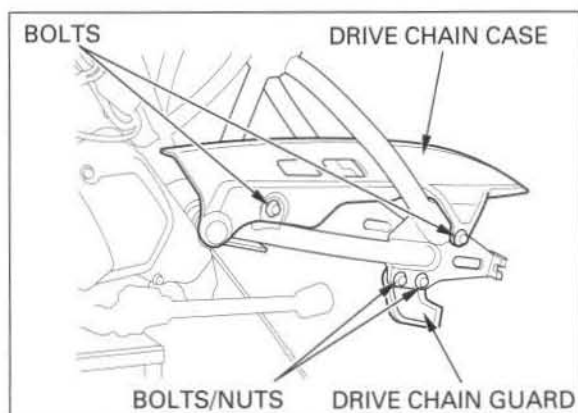
REMOVAL

Remove the following:

- Rear wheel (page 13-3)
- Drive chain (page 3-13)

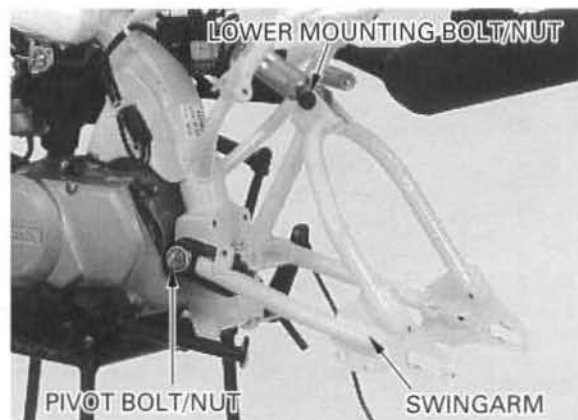
Remove the bolts and drive chain case.

Remove the bolts, nuts and drive chain guard.

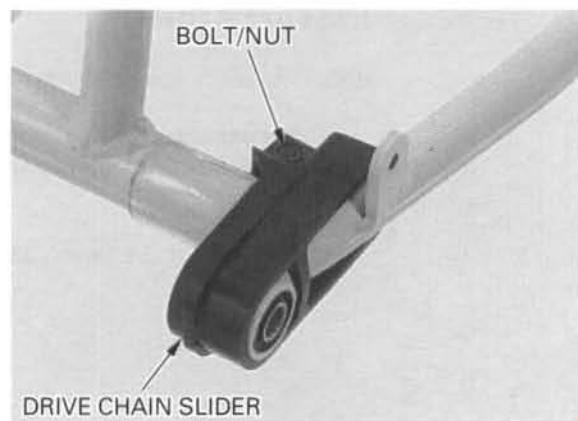


Remove the shock absorber lower mounting bolt/nut.

Remove the swingarm pivot nut, bolt and swingarm.



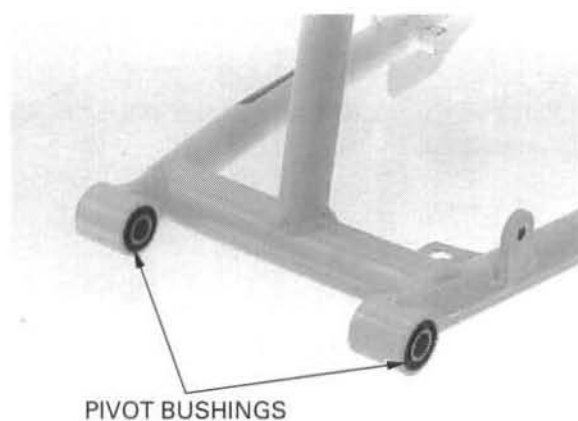
Remove the bolt/nut and drive chain slider.



INSPECTION

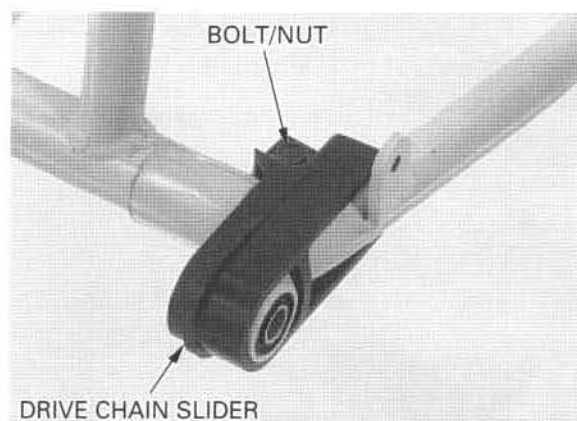
Inspect the swingarm for wear or damage.

Inspect the pivot bushing for wear or damage.



INSTALLATION

Install the drive chain slider and tighten the bolt and nut.



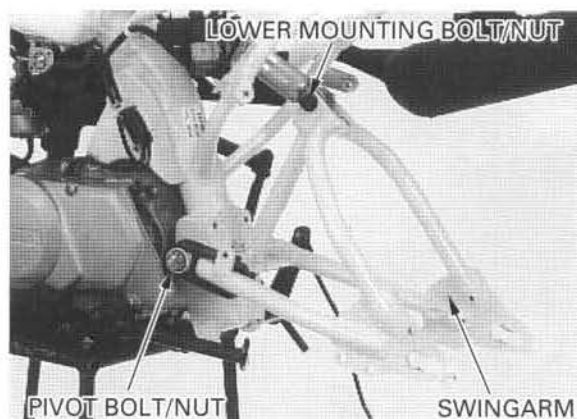
Install the swingarm into the frame, then install the pivot bolt from the right side.

Install and tighten the pivot nut to the specified torque.

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

Install the shock absorber lower mounting bolt/nut, tighten the nut to the specified torque.

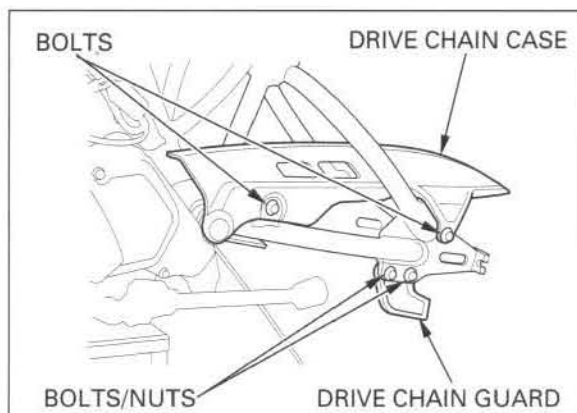
TORQUE: 34 N·m (3.5 kgf·m , 25 lbf·ft)



Install the drive chain guard, bolts and washers, and tighten the bolts.

Install the drive chain case and tighten the bolts.

Install the rear wheel (page 13-7).



BRAKE PEDAL

REMOVAL/DISASSEMBLY

Remove the rear brake adjusting nut.
Push the brake pedal down and remove the brake rod from the brake arm.
Remove the spring and joint pin.



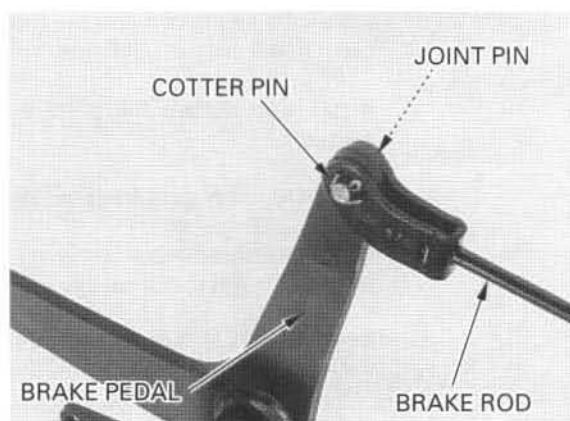
REAR WHEEL/BRAKE/SUSPENSION

Unhook the brake pedal return spring from the lower engine hanger bolt.

Remove the cotter pin, washer and brake pedal/rod.



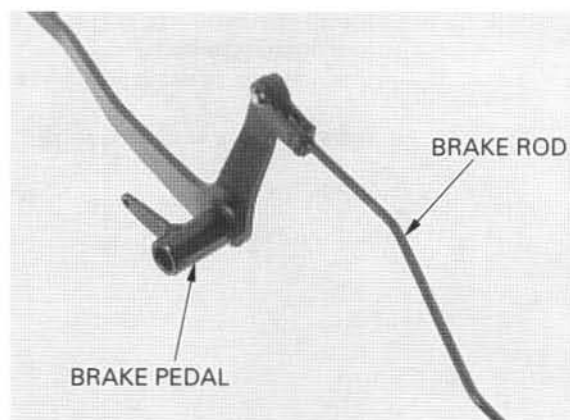
Remove the cotter pin and joint pin, then separate the brake rod from the brake pedal.



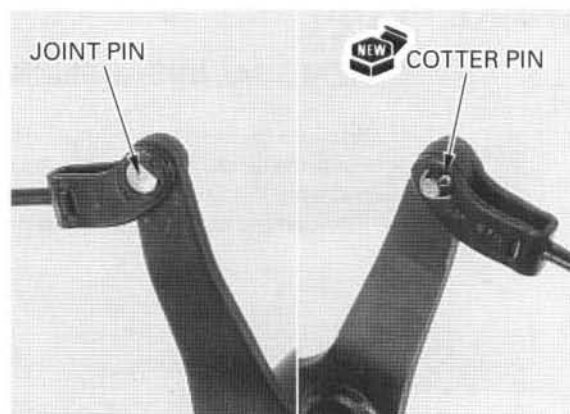
ASSEMBLY/INSTALLATION

Note the installation direction of the brake rod.

Install the brake rod to the brake pedal.

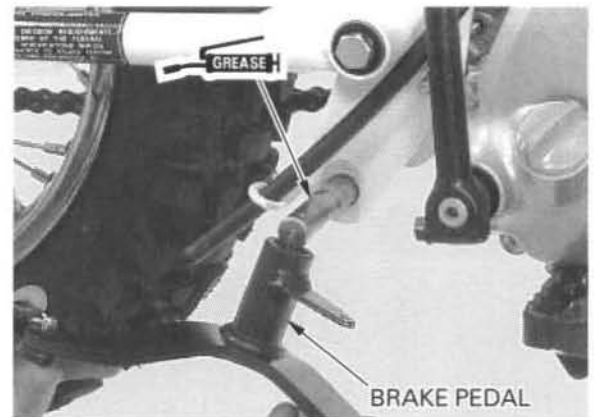


Install the joint pin and secure it with a new cotter pin.



Apply grease to the brake pedal pivot sliding surface.

Install the brake pedal/rod onto the frame.



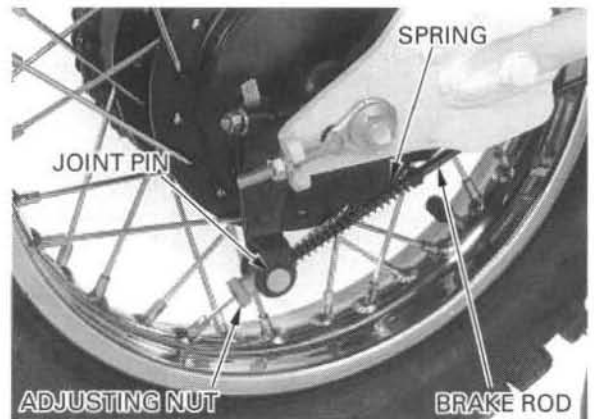
Install the washer and secure it with a new cotter pin.

Hook the return spring to the lower engine hanger bolt.



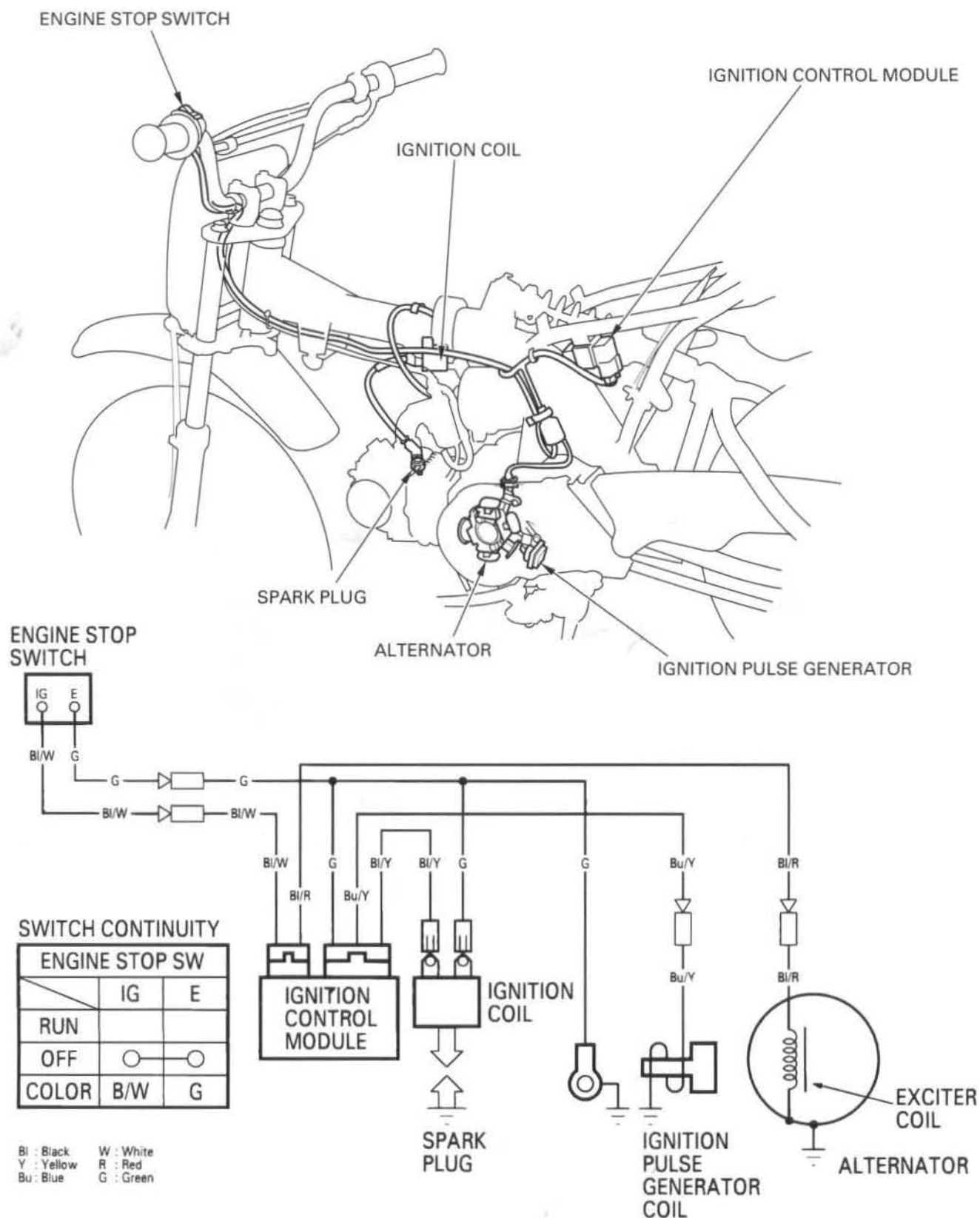
Install the spring onto the brake rod.
Install the joint pin onto the brake arm.

Push down the brake pedal, and install the brake rod into the joint pin.
Install the brake adjusting nut and adjust the brake pedal free play (page 3-16).



SYSTEM DIAGRAM

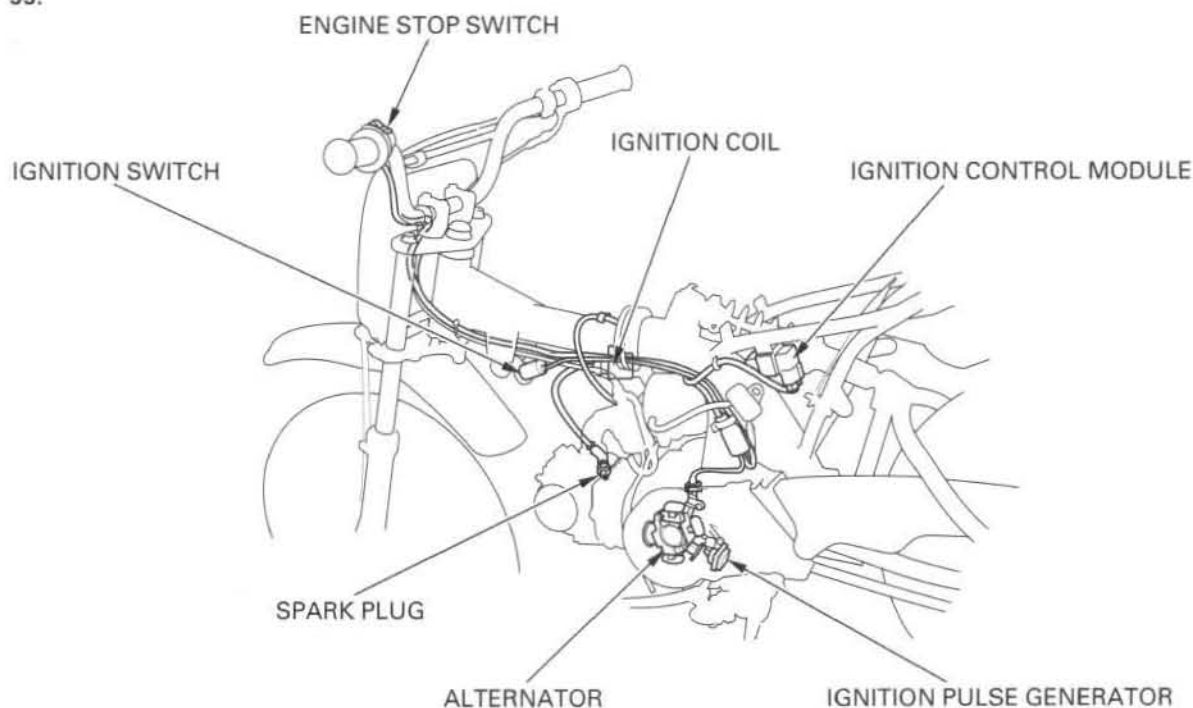
'97-'99:



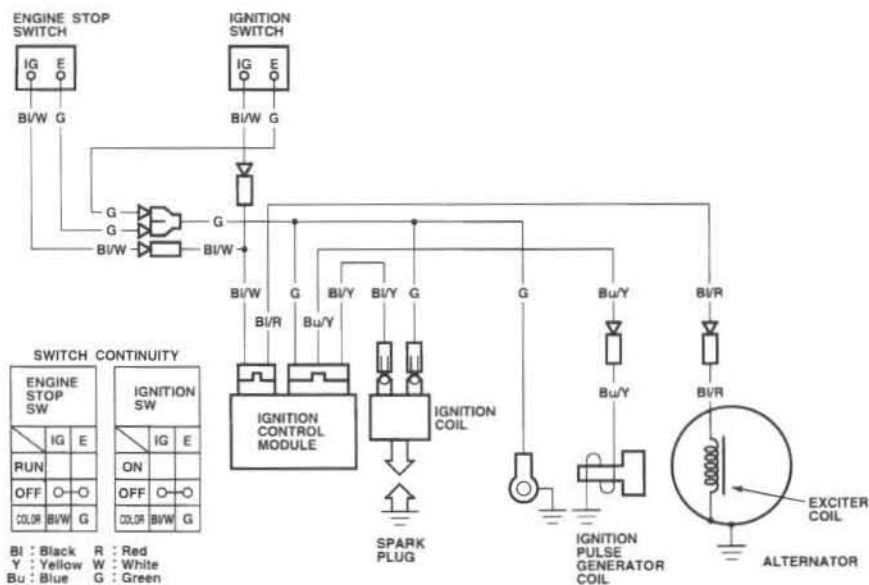
14. IGNITION SYSTEM

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IGNITION COIL	14-8		

After '99:



14



IGNITION SYSTEM

SERVICE INFORMATION

GENERAL

⚠ WARNING

When 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.

CAUTION:

Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is ON and current is present.

- When servicing the ignition system, always follow the steps in the troubleshooting sequence on page 14-4.
- The ignition timing does not normally need to be adjusted since the Ignition Control Module (ICM) is factory preset.
- The ICM may be damaged if dropped. Also if the connector is disconnected when current is flowing, the excessive voltage may damage the module. Always turn off the engine stop switch before servicing.
- 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.

SPECIFICATIONS

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

TORQUE VALUES

Ignition coil mounting bolt

6 N·m (0.6 kgf·m , 4.3 lbf·ft)

TOOLS

Peak voltage tester (U.S.A. only) or
Peak voltage adaptor

07HGJ-0020100 (not available in U.S.A.) with commercially available
digital multimeter (impedance 10 M Ω /DCV minimum)

TROUBLESHOOTING

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

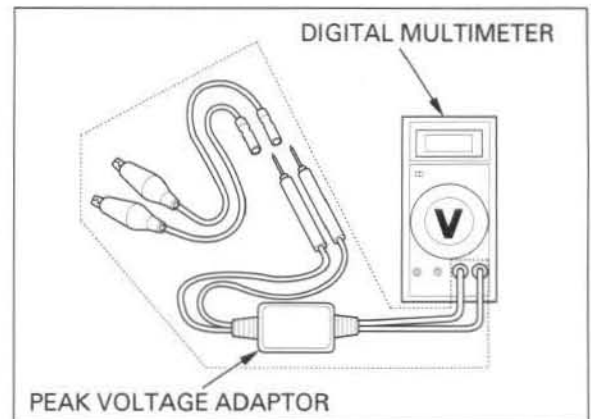
No spark at plug

Unusual condition		Probable cause (Check in numerical order)
Ignition coil primary voltage	Low peak voltage	1. The multimeter impedance is too low. 2. Cranking speed is too low. 3. The sampling time of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least one). 4. Poorly connected connector or an open circuit in ignition system. 5. Faulty ignition coil (Measure the peak voltage). 6. Faulty ICM (when above No. 1 — 5 are normal).
	No peak voltage	1. Incorrect peak voltage adaptor connections. 2. Faulty engine stop switch and/or ignition switch. 3. Loose or poorly connected ICM connector. 4. An open circuit or loose connection in Green wire. 5. Open circuit or poor connection in ground wire of the ICM. 6. Faulty peak voltage adaptor, or peak voltage tester. 7. Faulty exciter coil (measure the peak voltage). 8. Faulty ignition pulse generator (measure the peak voltage). 9. Faulty ICM (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. 2. Faulty ignition coil.
Exciter coil	Low peak voltage	1. The multimeter impedance is too low; below 10 M Ω /DCV. 2. Cranking speed is too low. 3. The sampling timing of the tester and measured pulse were not synchronized (system is normal if measured voltage is over the standard voltage at least once). 4. Faulty exciter coil (in case when above No. 1 — 3 are normal).
	No peak voltage	1. Faulty peak voltage adaptor or peak voltage tester. 2. Faulty exciter coil.
Ignition pulse generator	Low peak voltage	1. The multimeter impedance is too low; below 10M Ω /DCV. 2. Cranking speed is too low. 3. The sampling timing of the tester and measured pulse were not synchronized (system is normal if measured voltage is over the standard voltage at least once). 4. Faulty ignition pulse generator (in case when above No. 1 — 3 are normal).
	No peak voltage	1. Faulty peak voltage adaptor or peak voltage tester. 2. Faulty ignition pulse generator.

IGNITION SYSTEM INSPECTION

NOTE:

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



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

TOOLS:

Peak voltage tester (U.S.A. only) or
Peak voltage adaptor 07HGJ-0020100
(not available in U.S.A.) with commercially available digital multimeter (impedance 10 M Ω /DCV minimum)

IGNITION COIL PRIMARY PEAK VOLTAGE

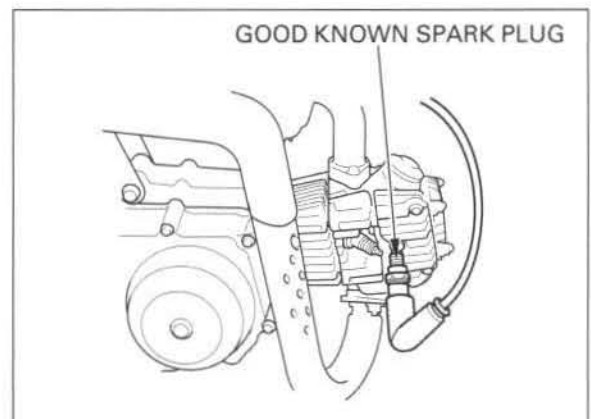
▲WARNING

Avoid touching the spark plug and tester probes to prevent electric shock.

NOTE:

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

Shift the transmission into neutral and disconnect the spark plug cap from the spark plug. Connect a known good spark plug to the spark plug cap and ground the spark plug to the cylinder as done in a spark test.



IGNITION SYSTEM

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

CONNECTION:

Black/Yellow terminal (+) — Body ground (—)

Turn the engine stop switch to "RUN".

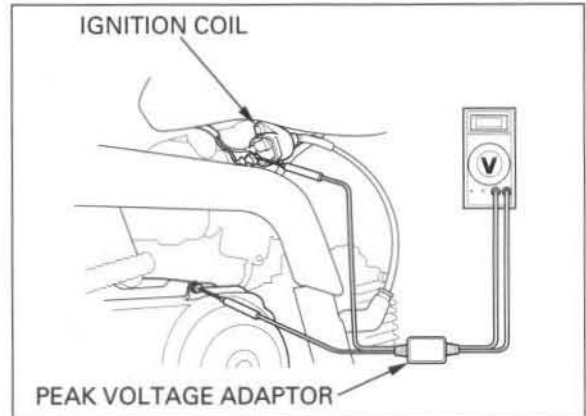
Turn the ignition switch to "ON".

Crank the engine with the kickstarter and read ignition coil primary peak voltage.

PEAK VOLTAGE: 100 V minimum

If the peak voltage is abnormal, check for an open circuit or poor connection in Black/Yellow wire.

If not defects are found in the harness, refer to the troubleshooting chart on page 14-4.



IGNITION PULSE GENERATOR PEAK VOLTAGE

NOTE:

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

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

Disconnect the 3P connector from the ICM. Connect the peak voltage adaptor or peak voltage tester probes to the connector terminals of the wire harness side.

TOOLS:

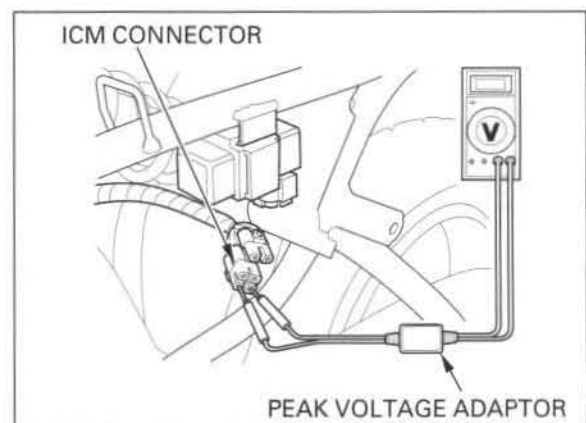
Peak voltage tester (U.S.A. only) or
Peak voltage adaptor 07HGJ-0020100
(not available in U.S.A.) with commercially available digital multimeter (impedance 10 M Ω /DCV minimum)

CONNECTION:

Black/Yellow terminal (+) — Green (—)

Crank the engine with the kickstarter and read the peak voltage.

PEAK VOLTAGE: 0.7 V minimum



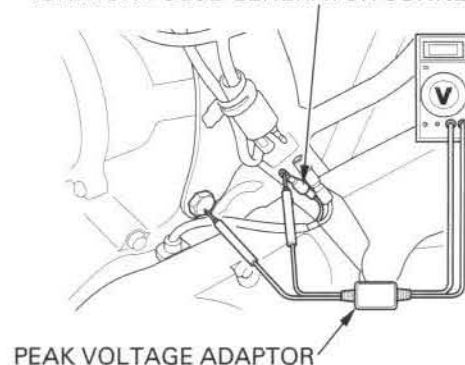
If the peak voltage measured at ICM connector is abnormal, measure the peak voltage at the pulse generator connector.

Disconnect the ignition pulse generator connector and connect the tester probes to the terminal (Blue/Yellow and Ground).

In the same manner as at the ICM connector, measure the peak voltage and compare it to the voltage measured at the ICM connector.

- If the peak voltage measured at the ICM is abnormal and the one measured at the ignition pulse generator is normal, the wire harness has an open circuit or loose connection.
- If both peak voltages measure are abnormal, check each item in the troubleshooting chart on page 14-4. If all items are normal, the ignition pulse generator is faulty. See section 10 for ignition pulse generator replacement.

IGNITION PULSE GENERATOR CONNECTOR



ALTERNATOR EXCITER COIL PEAK VOLTAGE

NOTE:

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

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

Disconnect the 3P and 2P connectors from the ICM. Connect the peak voltage adaptor or peak voltage tester probes to the connector terminals of the wire harness side.

TOOLS:

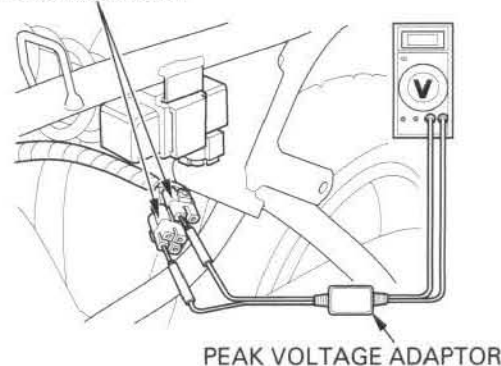
Peak voltage tester (U.S.A. only) or
Peak voltage adaptor 07HGJ-0020100
 (not available in U.S.A.) with commercially available digital multimeter (impedance 10 M Ω /DCV minimum)

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

Crank the engine with kickstarter and read the peak voltage.

PEAK VOLTAGE: 100 V minimum

ICM CONNECTORS



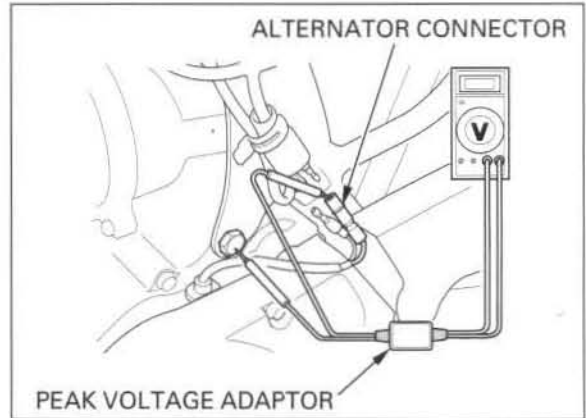
IGNITION SYSTEM

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

Disconnect the alternator exciter coil connector and connect the tester probe to the Black/Red terminal and Ground.

In the same manner as at the ICM connector, measure the peak voltage and compare it to the voltage measured at the ICM connector.

- If the peak voltage measured at the ICM is abnormal and the one measured at the alternator exciter coil is normal, the wire harness has an open circuit or loose connection.
- If both peak voltages measure are abnormal, check each item in the troubleshooting chart (page 14-4). If all items are normal, the alternator exciter coil is faulty. See section 10 for stator replacement.



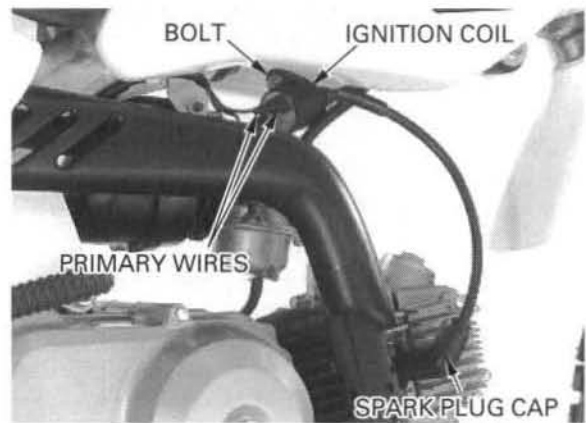
IGNITION COIL

REMOVAL/INSTALLATION

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

Remove the bolt and ignition coil.

Installation is in the reverse order of removal.



IGNITION CONTROL MODULE

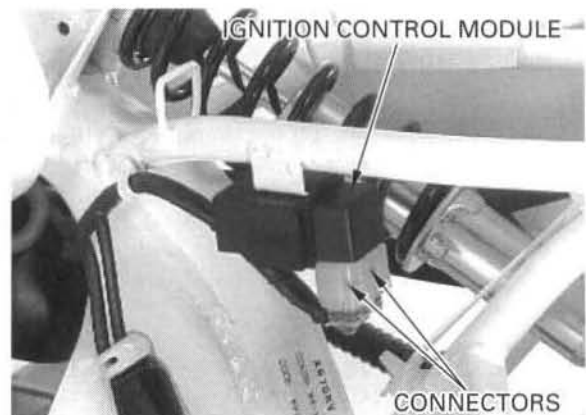
REMOVAL/INSTALLATION

Remove the seat and left side cover (page 2-2, 3).

Disconnect the Ignition Control Module (ICM) connectors.

Remove the ICM from the frame.

Installation is in the reverse order of removal.

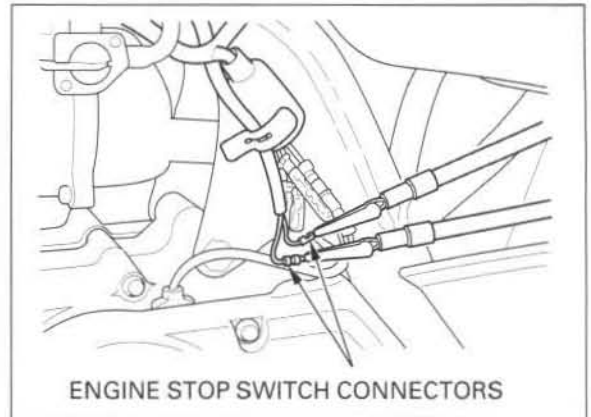


ENGINE STOP SWITCH

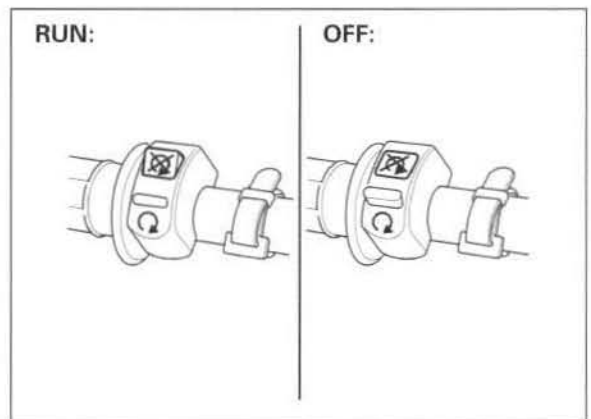
INSPECTION

Disconnect the engine stop switch connectors.

Check for continuity between the terminals.



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



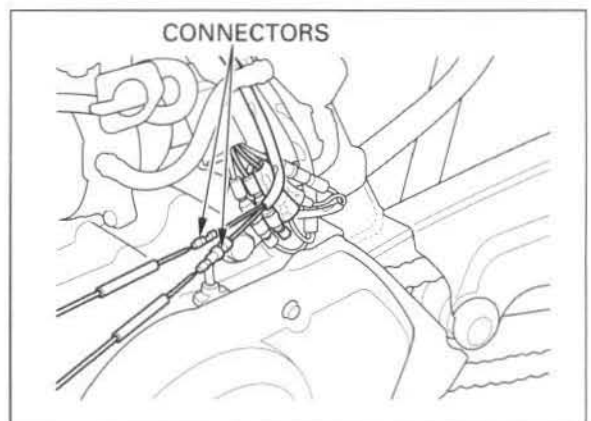
IGNITION SWITCH (AFTER '99)

INSPECTION

Disconnect the ignition switch connectors.

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

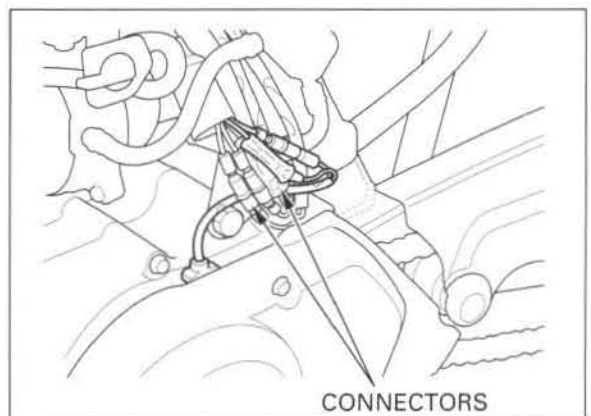
There should be no continuity when the ignition switch is in the "ON" position and continuity when the ignition switch is in the "OFF" position.



REMOVAL/INSTALLATION

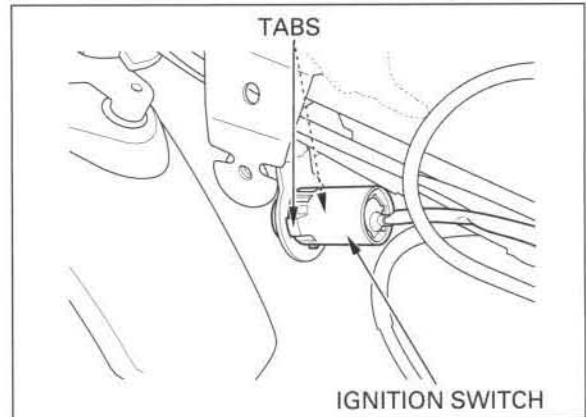
Attach a tachometer according to its manufacturer's instructions.

Adjust the idle speed with the throttle stop screw.



IGNITION SYSTEM

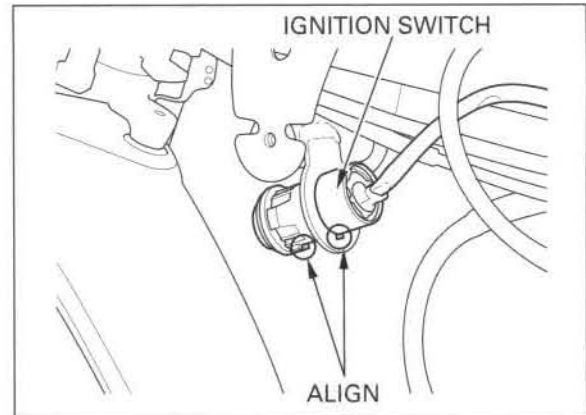
Release the tabs on the ignition switch body and remove the ignition switch.



Installation is in the reverse order of removal.

NOTE:

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

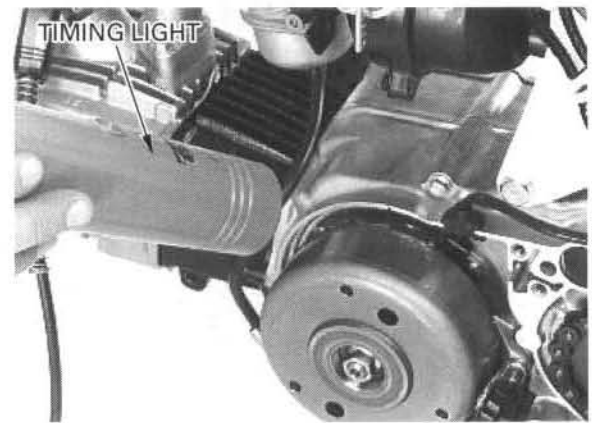


IGNITION TIMING

⚠ WARNING

When 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.

Warm up the engine.
Stop the engine and remove the left crankcase cover (page 10-2).



Read the instructions for timing light operation.

Connect the timing light to the spark plug wire.

Start the engine and let it idle.

IDLE SPEED: 1,700 ± 100 rpm

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

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

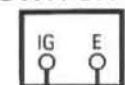
Install the left crankcase cover (page 10-8).



15. WIRING DIAGRAM

'97-'99:

ENGINE STOP
SWITCH



BI/W

G

G

BI/W

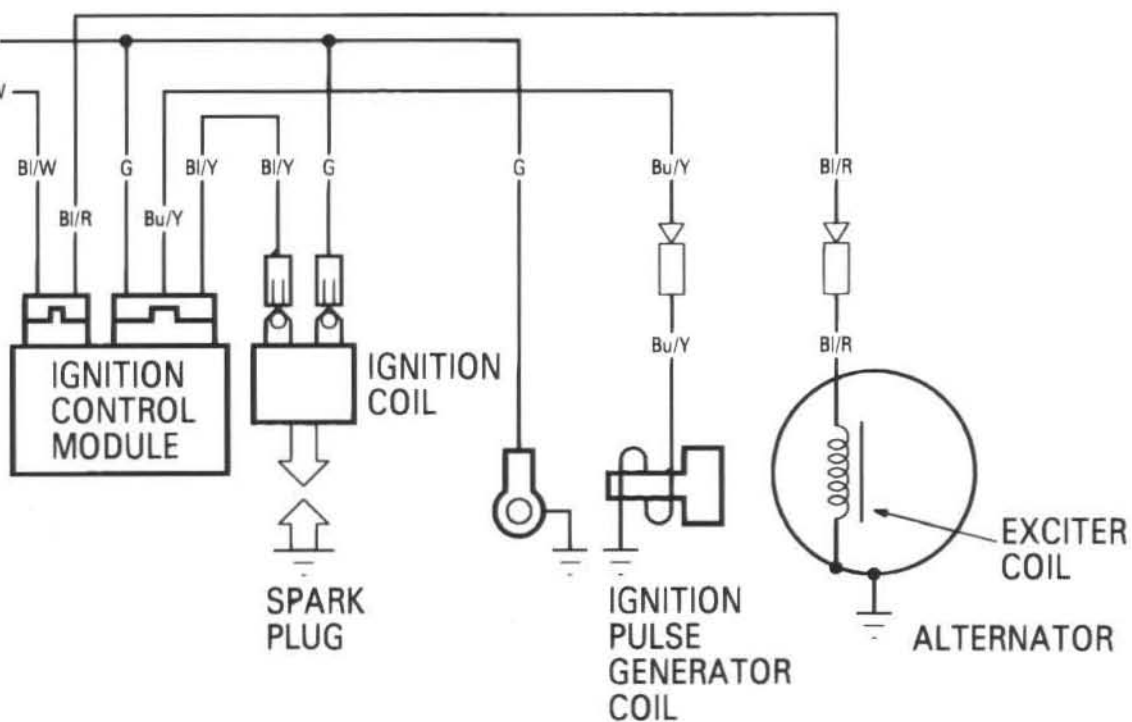
G

SWITCH CONTINUITY

ENGINE STOP SW		
	IG	E
RUN		
OFF		
COLOR	B/W	G

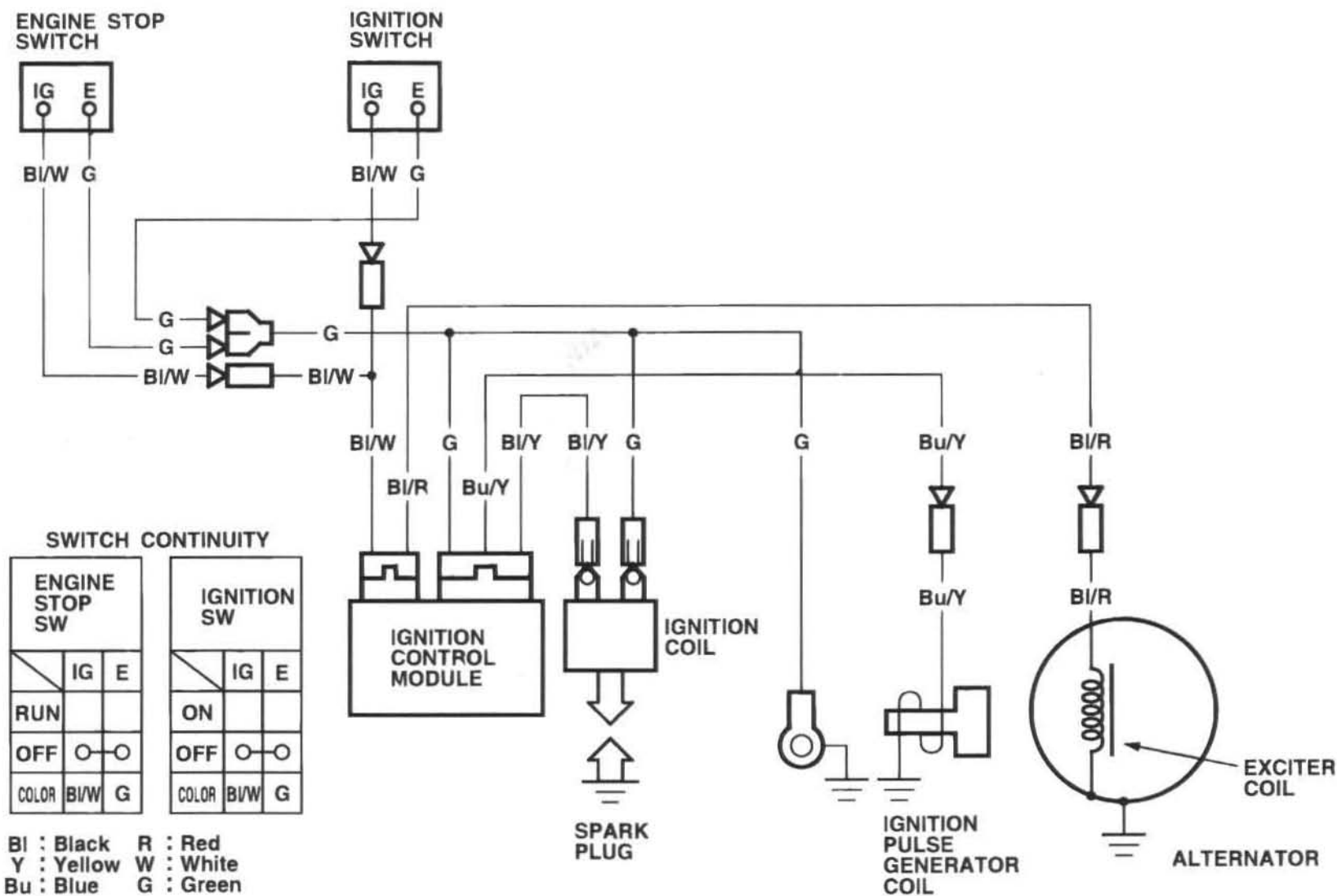
BI : Black
Y : Yellow
Bu : Blue

W : White
R : Red
G : Green



0030Z - GCF - 0000

After '99:



0030Z-GCF-A200

16. TROUBLESHOOTING

ENGINE DOES NOT START OR IS
HARD TO START

16-1

POOR PERFORMANCE AT HIGH
SPEED

16-4

ENGINE LACKS POWER

16-2

POOR HANDLING

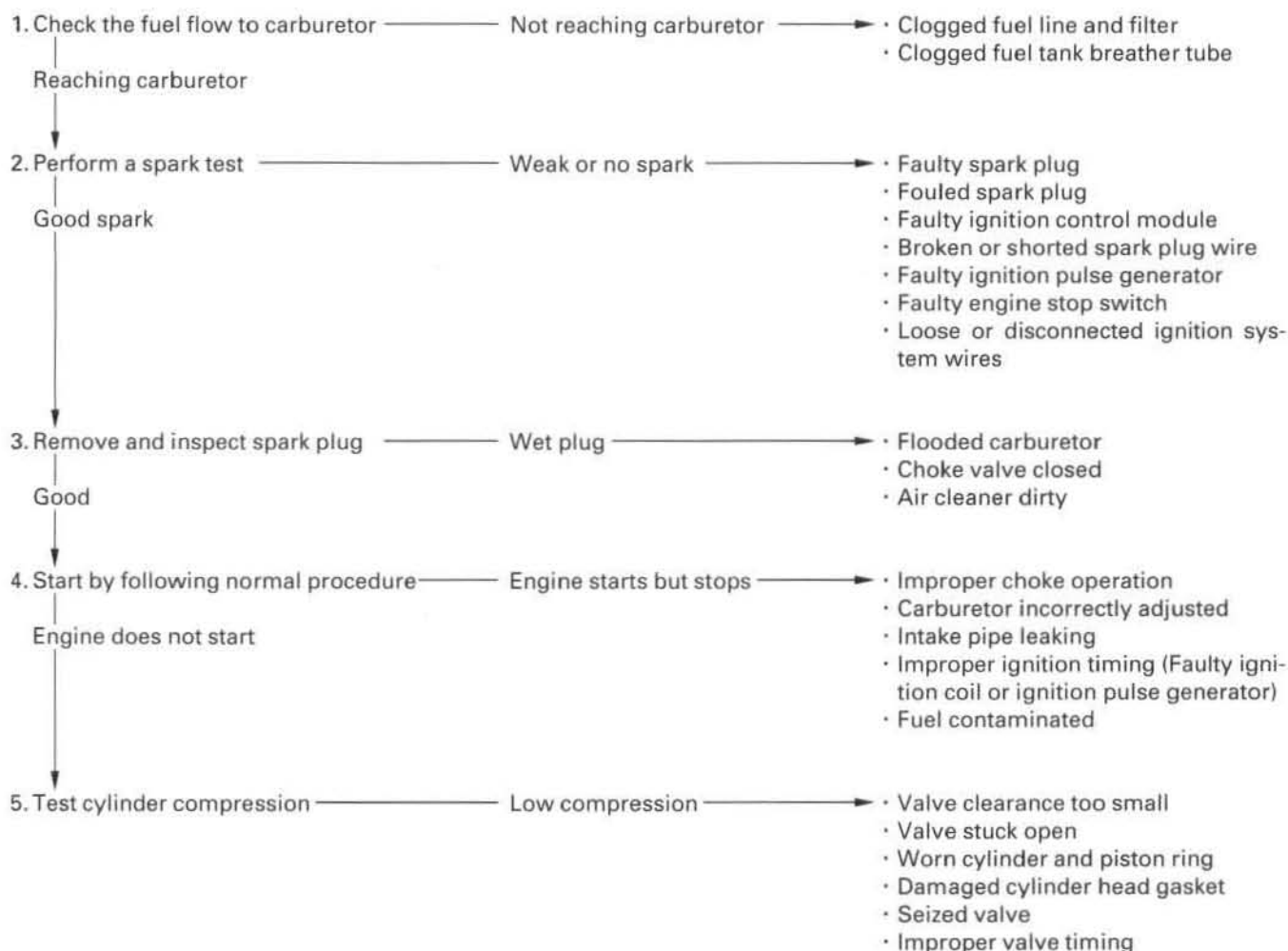
16-4

POOR PERFORMANCE AT LOW
AND IDLE SPEED

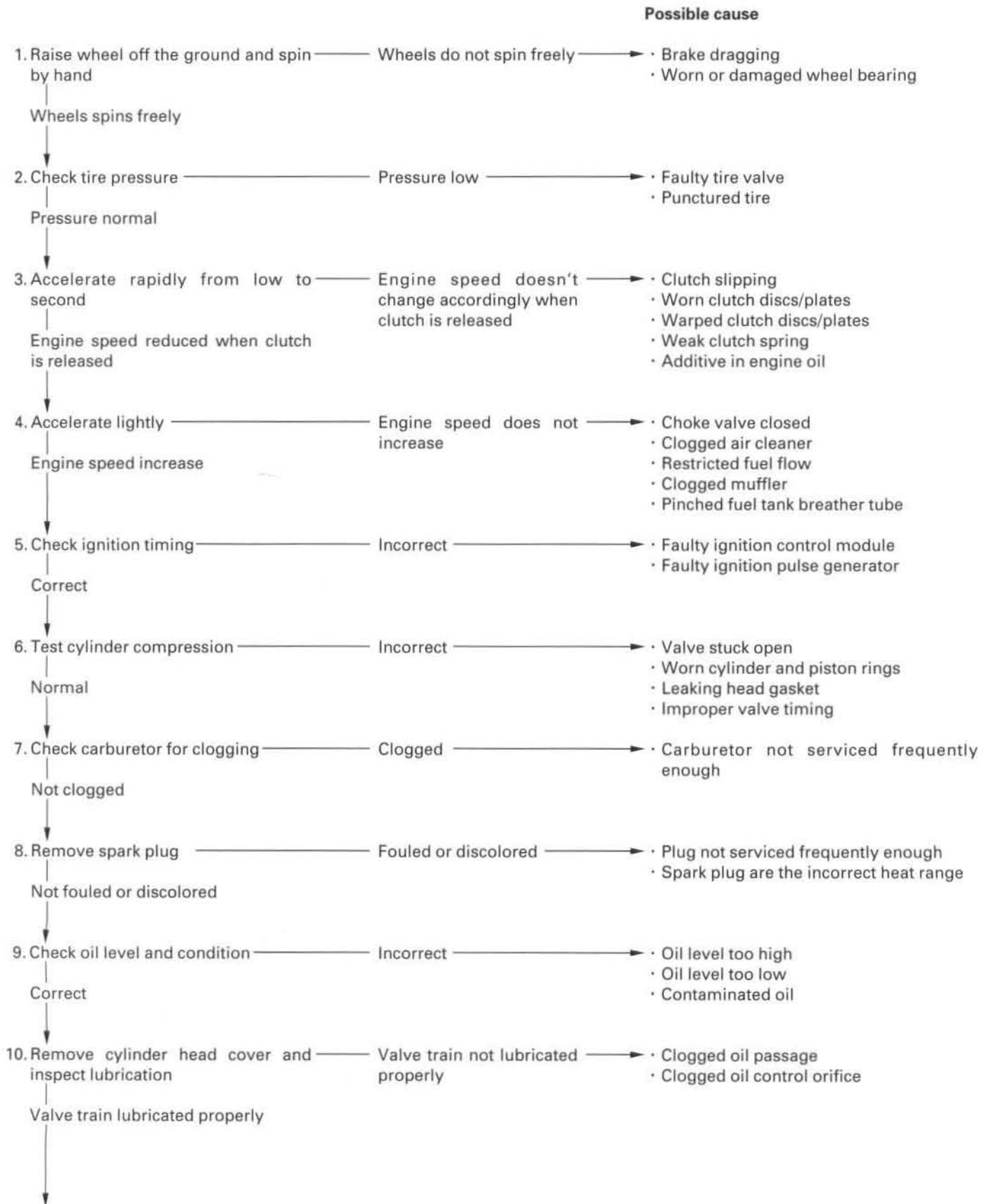
16-3

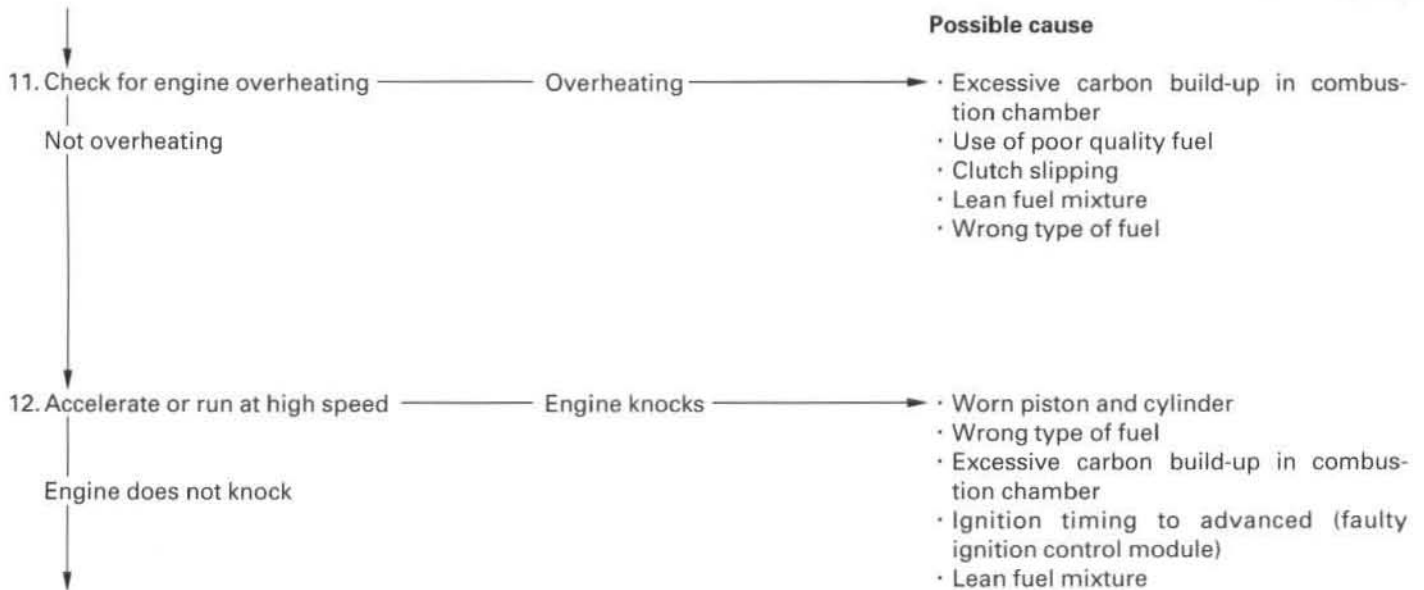
ENGINE DOES NOT START OR IS HARD TO START

Possible cause

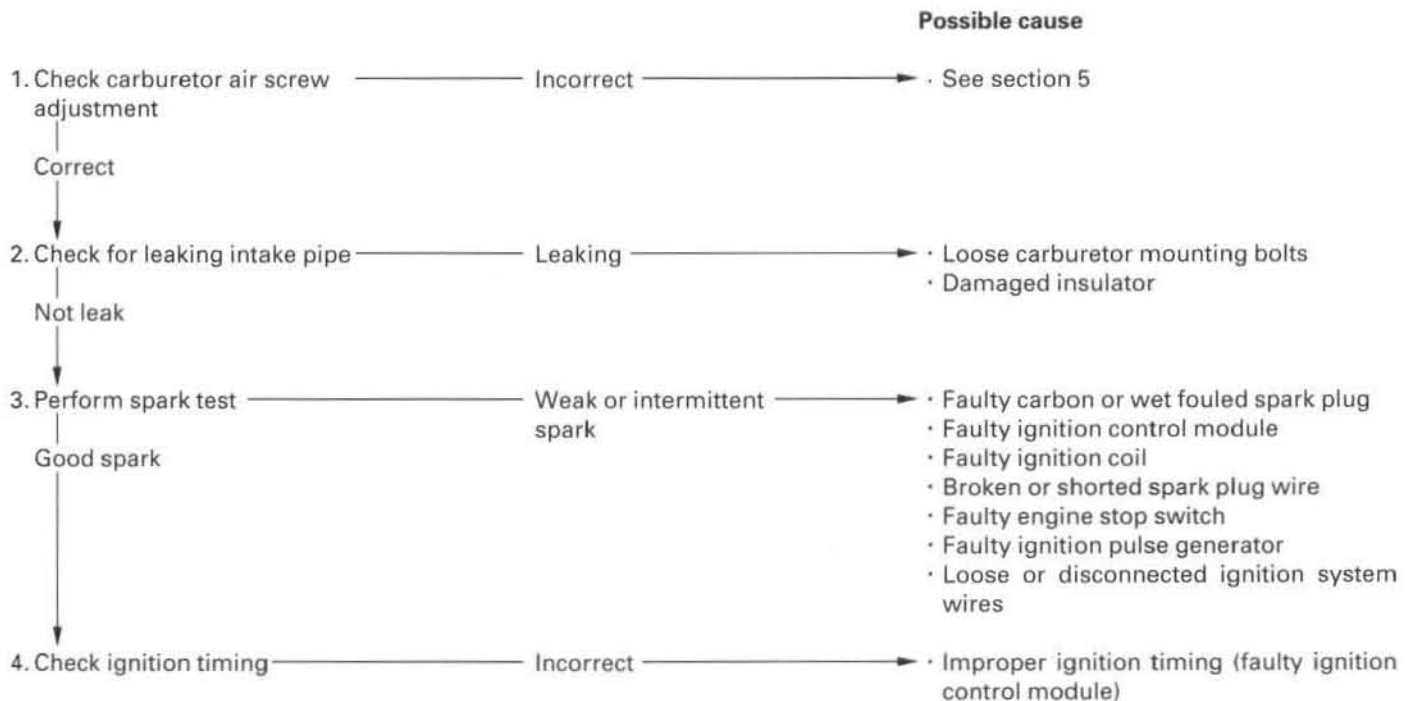


ENGINE LACKS POWER

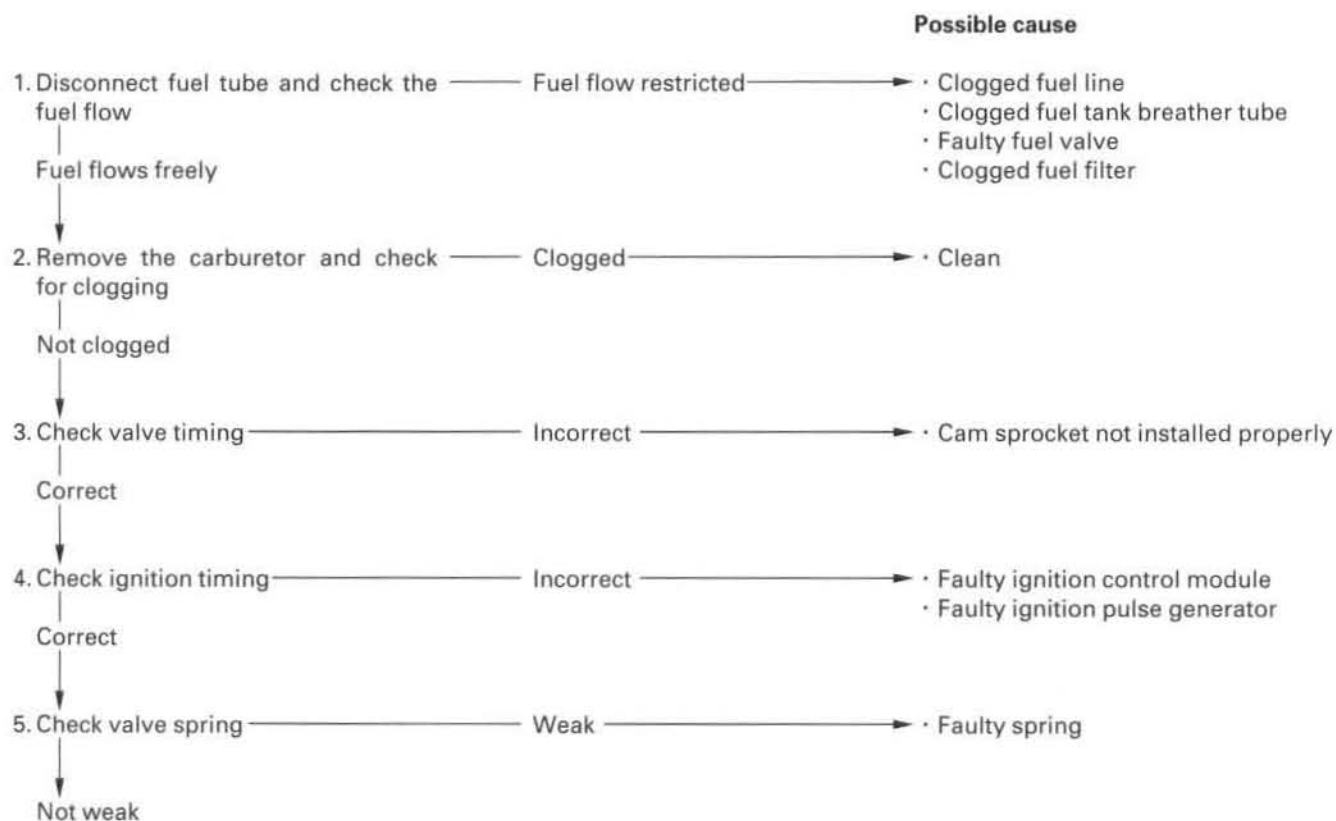




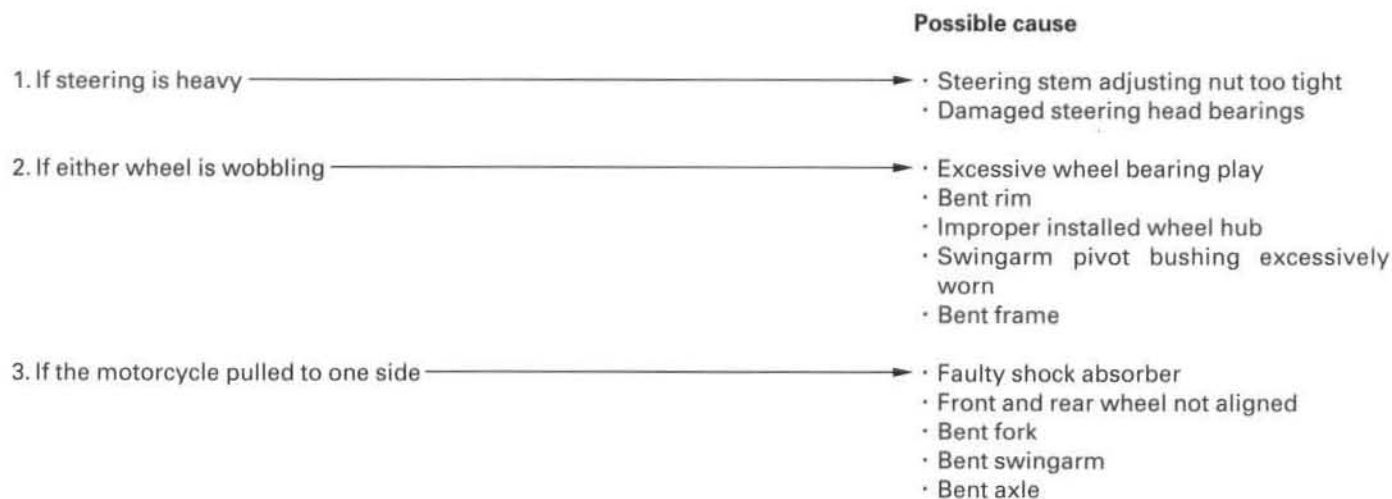
POOR PERFORMANCE AT LOW AND IDLE SPEED



POOR PERFORMANCE AT HIGH SPEED



POOR HANDLING



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