2013-2015

HONDA

SERVICE MANUAL

CRF110F

How To Use This Manual

This manual describes the service procedures for the CRF110F-D.

Sections 1 and 3 apply to the whole vehicle. Section 2 illustrates procedures for removal/installation of components that may be required to perform service described in the following sections.
Section 4 through 16 describe parts of the motorcycle, grouped according to location.

Follow the Maintenance Schedule recommendations to ensure that the vehicle is in peak operating condition.
Performing the first scheduled maintenance is very important. It compensates for the initial wear that occurs during the break-in period.

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

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

Refer to the troubleshooting in each section according to the malfunction or symptom.

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

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

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

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

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

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

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

SYMBOLS

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

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

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MEMO

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SERVICE RULES

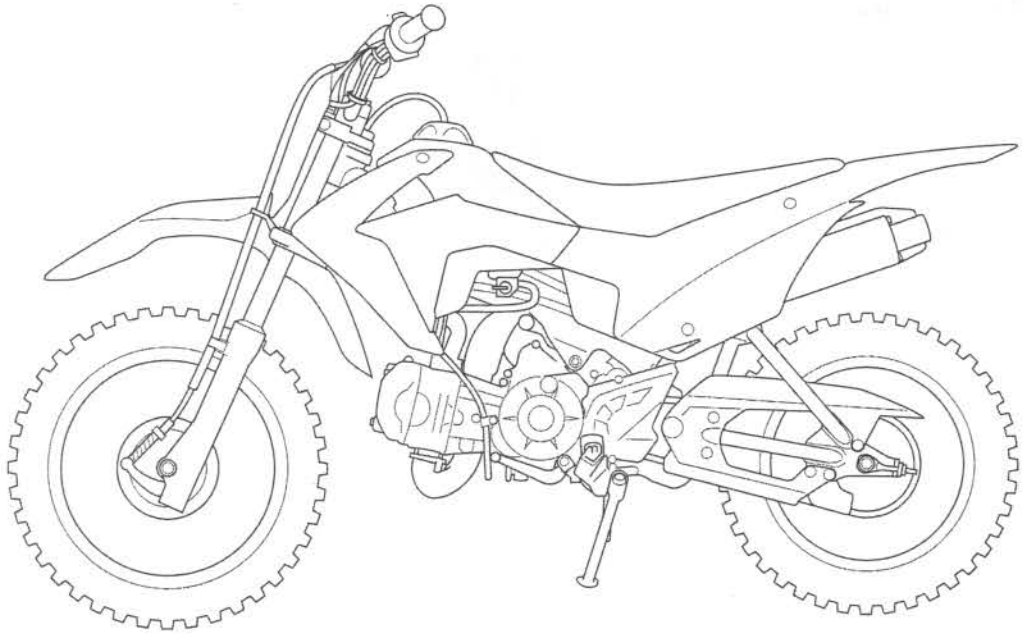
1. Use genuine Honda or Honda-recommended parts and lubricants or their equivalents. Parts that don't meet Honda's design specifications may cause damage to the motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing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

ABBREVIATION

Throughout this manual, the following abbreviations are used to identify the respective parts or systems.

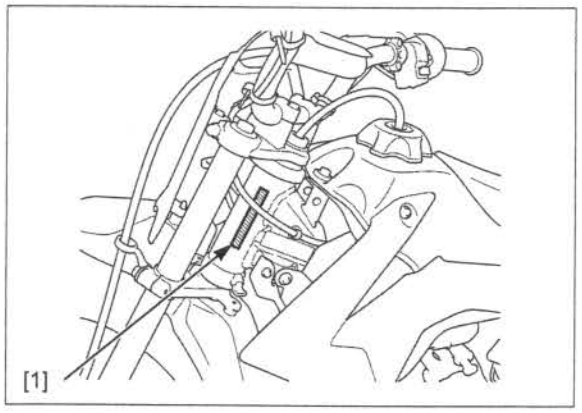
Abbrev. term	Full term
ICM	Ignition Control Module

MODEL IDENTIFICATION

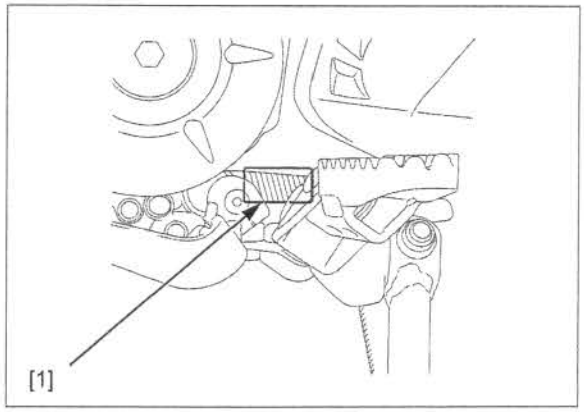


SERIAL NUMBERS

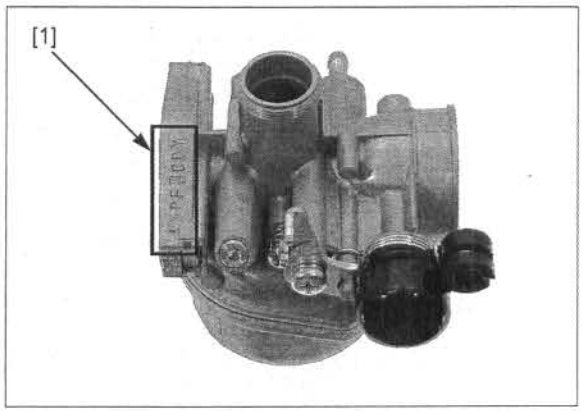
The Vehicle Identification Number (V.I.N) [1] is stamped on the left side of the steering head.



The engine serial number [1] is stamped on the lower left side of the crankcase.

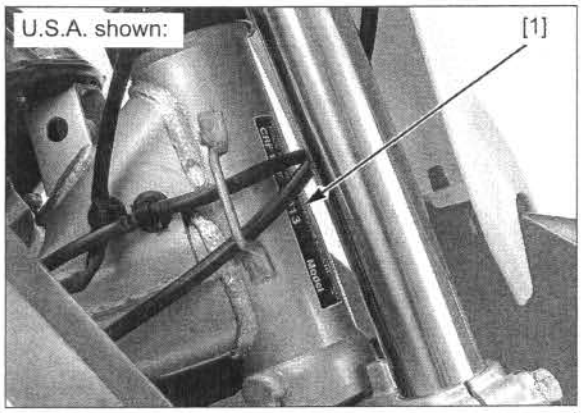


The carburetor identification number [1] is stamped on the right side of the carburetor body as shown.

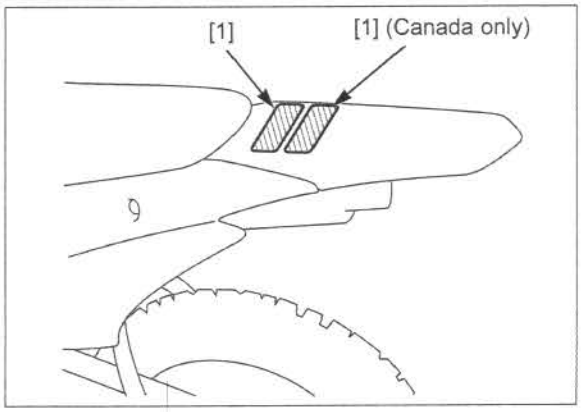


LABELS

The name plate [1] (Canada: safety certification label) is attached on the steering head.



The Emission Control Information Label [1] is attached as shown.



SPECIFICATIONS

GENERAL SPECIFICATIONS

ITEM				SPECIFICATION
DIMENSIONS	Overall length			1,560 mm (61.4 in)
	Overall width			685 mm (27.0 in)
	Overall height			910 mm (35.8 in)
	Wheelbase			1,065 mm (41.9 in)
	Seat height			667 mm (26.3 in)
	Footpeg height			252 mm (9.9 in)
	Ground clearance			175 mm (6.9 in)
	Curb weight			74 kg (163 lbs)
FRAME	Frame type			Back bone
	Front suspension			Telescopic fork
	Front wheel travel			90 mm (3.5 in)
	Rear suspension			Swingarm
	Rear wheel travel			87 mm (3.4 in)
	Rear damper			Conventional type oil damper
	Front tire size			70/100-14 M/C 37J
	Rear tire size			80/100-12 50J
	Tire brand	Front		C-803 (CHENG SHIN)
		Rear		C-803 (CHENG SHIN)
	Front brake			Mechanical leading trailing
	Rear brake			Mechanical leading trailing
	Caster angle			24°25'
	Trail length			52 mm (2.0 in)
	Fuel tank capacity			4.0 liter (1.06 US gal, 0.88 Imp gal)
	Fuel tank reserve capacity			1.0 liter (0.26 US gal, 0.22 Imp gal)
ENGINE	Bore and stroke			50.0 x 55.6 mm (1.97 x 2.19 in)
	Displacement			109 cm^3 (6.6 cu-in)
	Compression ratio			9.0 : 1
	Valve train			2 valve, single chain driven SOHC
	Intake valve	opens	at 1 mm (0.04 in) lift	5° BTDC
		closes	at 1 mm (0.04 in) lift	30° ABDC
	Exhaust valve	opens	at 1 mm (0.04 in) lift	34° BBDC
		closes	at 1 mm (0.04 in) lift	0° TDC
	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			22.3 kg (49.2 lbs)
	Cylinder arrangement			Single cylinder inclined 77° from vertical
CARBURETOR	Carburetor type			Piston valve type
	Throttle bore			15 mm (0.6 in)
DRIVE TRAIN	Clutch system			Multi-plate, wet
	Clutch operation system			Automatic centrifugal type
	Transmission			Constant mesh, 4-speed
	Primary reduction			4.059 (69/17)
	Final reduction			2.714 (38/14)
	Gear ratio		1st	2.615 (34/13)
			2nd	1.555 (28/18)
			3rd	1.136 (25/22)
			4th	0.916 (22/24)
	Gearshift pattern			Left foot operated return system,
				N - 1 - 2 - 3 - 4
ELECTRICAL	Ignition system			Condenser Discharged Ignition
	Starting system			Kickstarter with electric starter

IGNITION SYSTEM SPECIFICATIONS

ITEM		SPECIFICATION
Spark plug	Standard	CPR6EA-9S (NGK)
Spark plug gap		0.8 – 0.9 mm (0.03 – 0.04 in)
Ignition coil peak voltage		100 V minimum
Ignition pulse generator peak voltage		1.5 V minimum
Ignition timing ("F" mark)		10° BTDC at idle

ELECTRIC STARTER SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	7.0 (0.28)	3.5 (0.14)

FUEL SYSTEM SPECIFICATIONS

ITEM	SPECIFICATIONS
Carburetor identification number	PB5PF
Carburetor type	Piston valve
Main jet	#68
Slow jet	#38
Air screw opening	See page 6-15
Float level	10.7 mm (0.42 in)
Engine idle speed	1,400 ± 100 rpm
Throttle grip freeplay	3 – 6 mm (0.12 – 0.24 in)

LUBRICATION SYSTEM SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Engine oil capacity		At draining	1.0 liter (1.1 US qt, 0.9 Imp qt)	–
		At disassembly	1.15 liter (1.22 US qt, 1.01 Imp qt)	–
Recommended engine oil			Pro Honda GN4 4-stroke oil (U.S.A and Canada) or equivalent motor oil API service classification: SG or higher JASO T 903 standard: MA Viscosity: SAE 10W-30	–
Oil pump rotor	Tip clearance		0.10 – 0.15 (0.004 – 0.006)	0.15 (0.006)
	Body clearance		0.15 – 0.21 (0.006 – 0.008)	0.26 (0.010)
	Side clearance		0.03 – 0.09 (0.001 – 0.004)	0.15 (0.006)

CYLINDER HEAD/VALVES SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			1,412 kPa (14.4 kgf/cm², 205 psi) at 400 rpm	–
Cylinder head warpage			–	0.05 (0.002)
Rocker arm	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	9.972 – 9.987 (0.3926 – 0.3932)	9.91 (0.390)
	Arm to shaft clearance	IN/EX	0.013 – 0.043 (0.0005 – 0.0017)	0.044 (0.0017)
Camshaft	Cam lobe height	IN	32.194 – 32.434 (1.2675 – 1.2769)	32.16 (1.266)
		EX	31.990 – 32.230 (1.2594 – 1.2689)	31.96 (1.258)
Valve, valve guide	Valve clearance	IN/EX	0.10 ± 0.02 (0.004 ± 0.001)	–
	Valve stem O.D.	IN	4.975 – 4.990 (0.1959 – 0.1965)	4.965 (0.1955)
		EX	4.955 – 4.970 (0.1951 – 0.1957)	4.945 (0.1947)
	Valve guide I.D.	IN/EX	5.000 – 5.012 (0.1969 – 0.1973)	5.03 (0.198)
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)	0.065 (0.0026)
		EX	0.030 – 0.057 (0.0012 – 0.0022)	0.085 (0.0033)
	Valve guide projection	IN/EX	9.1 – 9.3 (0.36 – 0.37)	–
	Valve seat width	IN/EX	0.9 – 1.1 (0.035 – 0.043)	1.6 (0.06)
Valve spring free length		IN	30.67 (1.207)	29.82 (1.174)
		EX Inner	31.30 (1.232)	30.35 (1.195)
		EX Outer	32.05 (1.262)	31.08 (1.224)
Cam chain tensioner	Push rod O.D.		11.985 – 12.000 (0.4718 – 0.4724)	11.94 (0.470)
	Spring free length		111.3 (4.38)	109 (4.3)

CYLINDER/PISTON SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		50.005 – 50.015 (1.9687 – 1.9691)	50.05 (1.970)
	Out-of-round		–	0.10 (0.004)
	Taper		–	0.10 (0.004)
	Warpage		–	0.05 (0.002)
Piston, piston rings, piston pin	Piston O.D.		49.980 – 49.995 (1.9677 – 1.9683)	49.91 (1.965)
	Piston O.D. measurement point		10 (0.4) from bottom of skirt	–
	Piston pin bore I.D.		13.002 – 13.008 (0.5119 – 0.5121)	13.03 (0.513)
	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)	0.075 (0.0030)
	Piston ring-to-ring groove clearance	Top	0.015 – 0.045 (0.0006 – 0.0018)	0.08 (0.003)
		Second	0.015 – 0.045 (0.0006 – 0.0018)	0.08 (0.003)
	Piston ring end gap	Top	0.10 – 0.25 (0.004 – 0.0010)	0.5 (0.02)
		Second	0.10 – 0.25 (0.004 – 0.0010)	0.5 (0.02)
		Oil (side rail)	0.20 – 0.70 (0.008 – 0.028)	1.1 (0.04)
Cylinder-to-piston clearance			0.010 – 0.035 (0.0004 – 0.0014)	0.10 (0.004)
Connecting rod small end I.D.			13.016 – 13.034 (0.5124 – 0.5131)	13.05 (0.514)
Connecting rod-to-piston pin clearance			0.016 – 0.040 (0.0006 – 0.0016)	0.07 (0.003)

CLUTCH/GEARSHIFT LINKAGE SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Change clutch	Disc thickness		2.00 – 2.20 (0.079 – 0.087)	1.82 (0.072)
	Plate warpage		–	0.20 (0.008)
	Clutch spring free height		5.01 (0.197)	4.63 (0.182)
	Primary driven gear I.D.		23.000 – 23.021 (0.9055 – 0.9063)	23.07 (0.908)
	Clutch outer guide	I.D.	16.991 – 17.009 (0.6689 – 0.6696)	17.049 (0.6712)
		O.D.	22.959 – 22.980 (0.9039 – 0.9047)	22.940 (0.9031)
	Mainshaft O.D. at clutch outer guide		16.966 – 16.984 (0.6680 – 0.6687)	16.87 (0.664)
Centrifugal clutch	Clutch drum I.D.		104.0 – 104.2 (4.09 – 4.10)	104.3 (4.11)
	Clutch weight lining thickness		1.5 (0.06)	1.0 (0.04)
	One-way clutch drum I.D.		42.000 – 42.020 (1.6535 – 1.6543)	42.04 (1.655)
	One-way clutch roller O.D.		4.990 – 5.000 (0.1965 – 0.1969)	4.97 (0.196)
	Primary drive gear I.D.		19.030 – 19.058 (0.7492 – 0.7503)	19.11 (0.752)
	Crankshaft O.D. at primary drive gear		18.967 – 18.980 (0.7467 – 0.7472)	18.92 (0.745)

ALTERNATOR/STARTER CLUTCH SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter driven gear boss O.D.	45.660 – 45.673 (1.7976 – 1.7981)	45.642 (1.7969)

CRANKSHAFT/TRANSMISSION/KICKSTARTER SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod side clearance		0.10 – 0.35 (0.004 – 0.014)	0.60 (0.024)
	Connecting rod radial clearance		0 – 0.008 (0.0003)	0.05 (0.002)
	Runout		–	0.10 (0.004)
Transmission	Gear I.D.	M2, M3	17.000 – 17.018 (0.6693 – 0.6700)	17.04 (0.671)
		C1	18.000 – 18.018 (0.7087 – 0.7094)	18.04 (0.710)
		C4	20.000 – 20.021 (0.7874 – 0.7882)	20.04 (0.789)
	Bushing O.D.	C1	17.966 – 17.984 (0.7073 – 0.7080)	17.94 (0.706)
	Bushing I.D.	C1	15.000 – 15.018 (0.5906 – 0.5913)	15.04 (0.592)
	Gear-to-bushing clearance	C1	0.016 – 0.052 (0.0006 – 0.0020)	0.10 (0.004)
	Mainshaft O.D.	at M3	16.966 – 16.984 (0.6680 – 0.6687)	16.95 (0.667)
	Countershaft O.D.	at C1 bushing	14.966 – 14.984 (0.5892 – 0.5899)	14.95 (0.589)
	Gear-to-shaft clearance	M3	0.016 – 0.052 (0.0006 – 0.0020)	0.09 (0.004)
	Bushing-to-shaft clearance	C1	0.016 – 0.052 (0.0006 – 0.0020)	0.09 (0.004)
Shift fork/ Shift drum	Shift fork I.D.		34.075 – 34.100 (1.3415 – 1.3425)	34.14 (1.344)
	Shift fork claw thickness		4.85 – 4.95 (0.191 – 0.195)	4.60 (0.181)
	Shift drum O.D.	Left	23.940 – 23.980 (0.9425 – 0.9441)	23.92 (0.942)
		Right	33.950 – 33.975 (1.3366 – 1.3376)	33.93 (1.336)
Kickstarter	Pinion I.D.		20.000 – 20.021 (0.7874 – 0.7882)	20.08 (0.791)
	Spindle O.D.		19.959 – 19.980 (0.7858 – 0.7866)	19.94 (0.785)

FRONT WHEEL/BRAKE/SUSPENSION/STEERING SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Front wheel	Cold tire pressure		100 kPa (1.00 kgf/cm^2, 15 psi)	–
	Front wheel rim runout	Radial	–	1.0 (0.04)
		Axial	–	1.0 (0.04)
	Wheel hub-to-rim distance		12.0 ± 1.0 (0.47 ± 0.04)	–
	Front axle runout		–	0.20 (0.008)
	Minimum tire tread depth		–	To indicator
Brake	Brake lever freeplay		15 (0.59)	–
	Lining thickness		3.0 (0.12)	2.0 (0.08)
	Drum I.D.		95.0 (3.74)	96.0 (3.78)
Fork	Spring free length		278 (10.94)	272 (10.71)
	Fork pipe runout		–	0.20 (0.008)
	Recommended fork fluid		Pro Honda suspension Fluid SS-8 (10W)	–
	Fluid level		96.0 (3.78)	–
	Fluid capacity		179 ± 2.5 cm^3 (6.1 ± 0.08 US oz, 6.3 ± 0.09 Imp oz)	–

REAR WHEEL/BRAKE/SUSPENSION SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Rear wheel	Cold tire pressure		100 kPa (1.00 kgf/cm², 15 psi)	–
	Rear wheel rim runout	Radial	–	1.0 (0.04)
		Axial	–	1.0 (0.04)
	Wheel hub-to-rim distance		11.0 ± 1.0 (0.43 ± 0.04)	–
	Rear axle runout		–	0.20 (0.008)
	Minimum tire tread depth		–	To indicator
Drive chain	Slack		10 – 20 (0.4 – 0.8)	–
	Size/link	DID	DID420D-86RB	–
Brake	Brake pedal freeplay		15 (0.59)	–
	Lining thickness		3.0 (0.12)	2.0 (0.08)
	Drum I.D.		95.0 (3.74)	96.0 (3.78)

BATTERY/CHARGING SYSTEM SPECIFICATIONS

ITEM			SPECIFICATIONS
Battery	Type		YTX4L-BS
	Capacity		12 V – 3 Ah (10 HR)
	Current leakage		0.1 mA max.
	Voltage	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.4 V
	Charging current	Normal	0.4 A/5 – 10 h
		Quick	4.0 A/0.5 h
Alternator	Capacity		0.063 kW/5,000 rpm
	Charging coil resistance (20°C/68°F)		0.2 – 1.4 Ω

TORQUE VALUES

STANDARD 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	5.2 (0.5, 3.8)	5 mm screw	4.2 (0.4, 3.1)
6 mm hex bolt and nut (Include SH flange bolt)	10 (1.0, 7)	6 mm screw	9 (0.9, 6.6)
		6 mm flange bolt (Include NSHF) and nut	12 (1.2, 9)
8 mm hex bolt and nut	22 (2.2, 16)		
10 mm hex bolt and nut	34 (3.5, 25)	8 mm flange bolt and nut	27 (2.8, 20)
12 mm hex bolt and nut	54 (5.5, 40)	10 mm flange bolt and nut	39 (4.0, 29)

ENGINE & FRAME TORQUE VALUES

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

FRAME/BODY PANELS/EXHAUST SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Fuel tank shroud special bolt	4	6	10 (1.0, 7)	
Left side cover special bolt	1	6	10 (1.0, 7)	
Rear fender special bolt	3	6	10 (1.0, 7)	
Front reflector mounting nut (Canada only)	2	6	2.5 (0.26, 1.8)	
Fork bottom bridge pinch bolt	2	8	32 (3.3, 24)	
Rear side reflector mounting nut (Canada only)	2	6	2.5 (0.26, 1.8)	
Rear reflector mounting nut (Canada only)	1	5	1.8 (0.18, 1.3)	
Rear reflector stay special bolt (Canada only)	2	6	10 (1.0, 7)	
Main step mounting bolt	4	8	27 (2.8, 20)	
Drive chain cover special bolt	3	6	10 (1.0, 7)	
Muffler mounting bolt	1	8	32 (3.3, 24)	
Exhaust pipe stud bolt	2	8	11 (1.1, 8)	See page 2-8
Muffler cover bolt	1	6	9 (0.9, 6.6)	
Exhaust pipe cover screw	4	5	6 (0.6, 4.4)	
Exhaust pipe cover bolt	3	6	15 (1.5, 11)	
Spark arrester mounting bolt	3	6	10 (1.0, 7)	

MAINTENANCE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Air cleaner housing cover screw	4	5	1.5 (0.15, 1.1)	
Air cleaner element guard holder screw	2	5	1.5 (0.15, 1.1)	
Spark plug	1	10	16 (1.6, 12)	
Valve adjusting lock nut	2	5	9 (0.9, 6.6)	Apply oil to the threads and seating surface.
Crankshaft hole cap	1	30	8 (0.8, 5.9)	
Timing hole cap	1	14	10 (1.0, 7)	
Oil drain bolt	1	12	24 (2.4, 18)	
Oil centrifugal filter cover bolt	3	5	5 (0.5, 3.7)	Apply locking agent to the threads.
Rear axle nut	1	12	64 (6.5, 47)	U-nut
Clutch adjuster lock nut	1	8	12 (1.2, 9)	
Sidestand pivot bolt	1	10	10 (1.0, 7)	See page 3-17
Sidestand pivot nut	1	10	39 (4.0, 29)	See page 3-17, U-nut
Spark arrester mounting bolt	3	6	10 (1.0, 7)	
Front spoke	36	BC2.9	3.2 (0.33, 2.4)	
Rear spoke	36	BC2.9	3.2 (0.33, 2.4)	

IGNITION SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Timing hole cap	1	14	10 (1.0, 7)	

ELECTRIC STARTER SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Starter motor cable screw	1	4	2 (0.2, 1.5)	

FUEL SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Fuel tank mounting bolt	3	8	21 (2.1, 16)	
Intake pipe mounting bolt	2	6	12 (1.2, 9)	
Slow jet	1	–	1.5 (0.15, 1.1)	
Main jet	1	–	1.5 (0.15, 1.1)	
Needle jet holder	1	–	2.5 (0.25, 1.8)	
Float chamber screw	2	4	2.1 (0.21, 1.5)	
Float chamber drain screw	1	–	1.5 (0.15, 1.1)	

LUBRICATION SYSTEM

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Oil pump cover screw	3	5	5 (0.5, 3.7)	

CYLINDER HEAD/VALVES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder head cover special bolt	2	6	10 (1.0, 7)	
Cam sprocket bolt	1	8	27 (2.8, 20)	Apply oil to the threads and seating surface.
Crankshaft hole cap	1	30	8 (0.8, 5.9)	
Timing hole cap	1	14	10 (1.0, 7)	
Cylinder head nut	4	7	13 (1.3, 10)	Apply oil to the threads and seating surface.
Intake pipe mounting bolt	2	6	12 (1.2, 9)	
Cam chain tensioner sealing bolt	1	14	22 (2.2, 16)	
Cam chain tensioner arm pivot bolt	1	8	16 (1.6, 12)	

CYLINDER PISTON

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cam chain guide roller pin bolt	1	8	10 (1.0, 7)	
Cylinder stud bolt	4	7	6 (0.6, 4.4)	See page 9-7

CLUTCH/GEARSHIFT LINKAGE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Clutch lifter plate bolt	4	6	12 (1.2, 9)	
Clutch center lock nut	1	14	54 (5.5, 40)	Apply oil to the threads and seating surface.
Centrifugal clutch lock nut	1	14	54 (5.5, 40)	Apply oil to the threads and seating surface.
Gearshift cam plate bolt	1	6	17 (1.7, 13)	Apply locking agent to the threads: See page 10-29
Shift drum stopper arm bolt	1	6	10 (1.0, 7)	Apply locking agent to the threads: See page 10-29
Gearshift pedal pinch bolt	1	6	12 (1.2, 9)	
Shift return spring pin	1	8	30 (3.1, 22)	

ALTERNATOR/STARTER CLUTCH

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Flywheel nut	1	10	40 (4.1, 30)	Apply oil to the threads and seating surface.
Starter clutch mounting torx bolt	6	6	16 (1.6, 12)	Apply locking agent to the threads: See page 11-8

CRANKSHAFT/TRANSMISSION/KICKSTARTER

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cam chain guide sprocket spindle	1	6	10 (1.0, 7)	

ENGINE REMOVAL/INSTALLATION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Engine hanger nut	3	10	54 (5.5, 40)	
Drive sprocket fixing plate bolt	2	6	12 (1.2, 9)	
Intake pipe mounting bolt	2	6	12 (1.2, 9)	
Starter motor cable screw	1	4	2 (0.2, 1.5)	

FRONT WHEEL/BRAKE/SUSPENSION/STEERING

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Handlebar upper holder bolt	4	6	12 (1.2, 9)	
Engine stop switch mounting screw	2	4	0.9 (0.09, 0.7)	
Starter switch mounting screw	2	4	0.9 (0.09, 0.7)	
Front spoke	36	BC2.9	3.2 (0.33, 2.4)	
Front axle nut	1	12	59 (6.0, 44)	U-nut
Front brake arm pinch bolt	1	6	9.9 (1.01, 7.3)	Apply a locking agent to the threads.
Fork socket bolt	2	8	20 (2.0, 15)	Apply a locking agent to the threads.
Fork cap bolt	2	22	22 (2.2, 16)	
Fork bottom bridge pinch bolt	2	8	32 (3.3, 24)	
Fork top bridge pinch bolt	2	8	22 (2.2, 16)	
Steering stem lock nut	1	24	–	See page 14-28
Steering stem top thread	1	26	–	See page 14-28
Brake lever pivot bolt	1	6	3 (0.3, 2.2)	
Brake lever pivot nut	1	6	5.9 (0.6, 4.4)	

REAR WHEEL/BRAKE/SUSPENSION

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear spoke	36	BC2.9	3.2 (0.33, 2.4)	
Driven sprocket nut	4	8	32 (3.3, 24)	U-nut
Rear axle nut	1	12	64 (6.5, 47)	U-nut
Rear brake arm nut	1	6	9.9 (1.01, 7.3)	U-nut
Shock absorber upper mounting nut	1	10	50 (5.1, 37)	U-nut
Shock absorber lower mounting nut	1	10	50 (5.1, 37)	U-nut
Driven chain slider nut	1	6	5.9 (0.6, 4.4)	U-nut
Swingarm pivot nut	1	12	59 (6.0, 44)	U-nut

LUBRICATION & SEAL POINTS

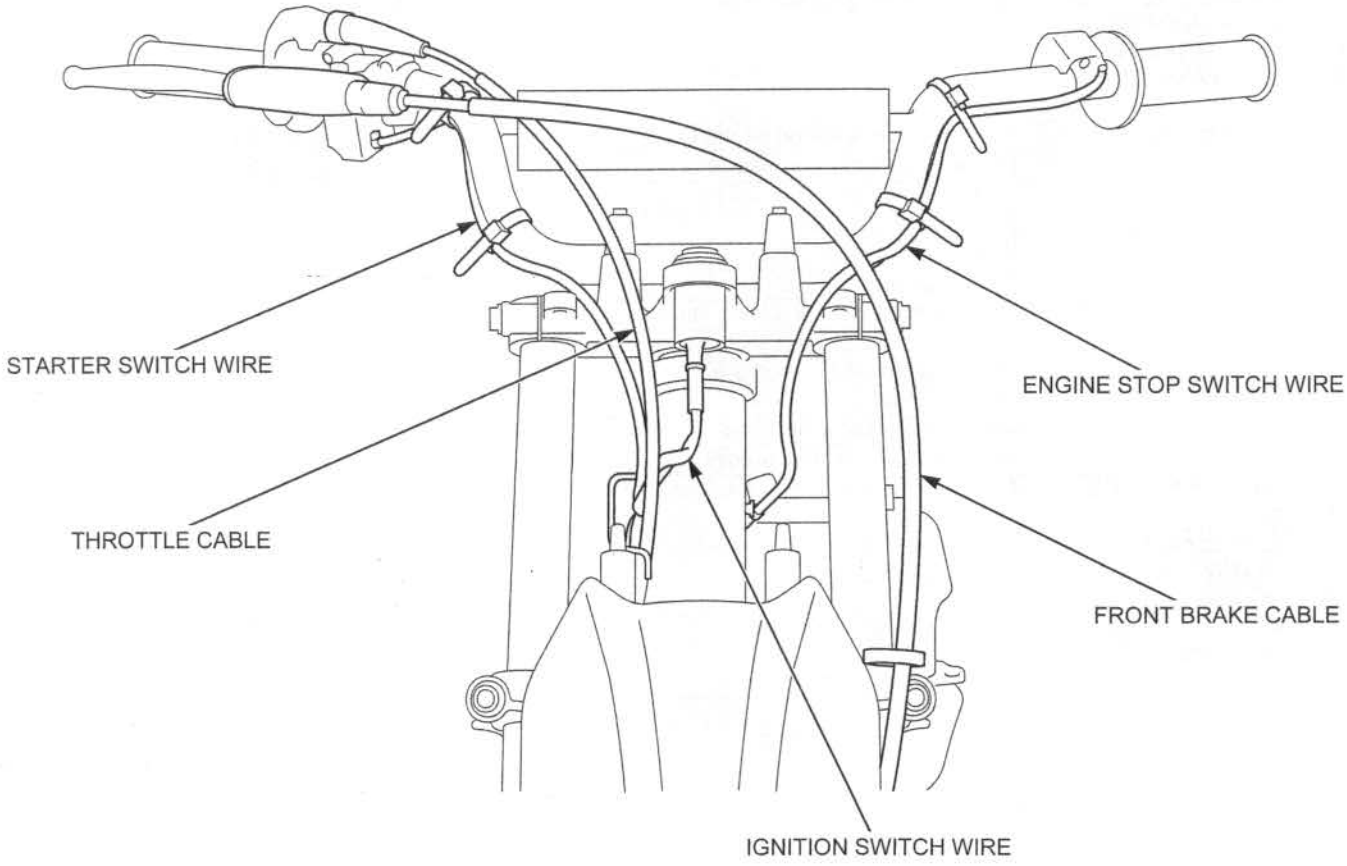
ENGINE

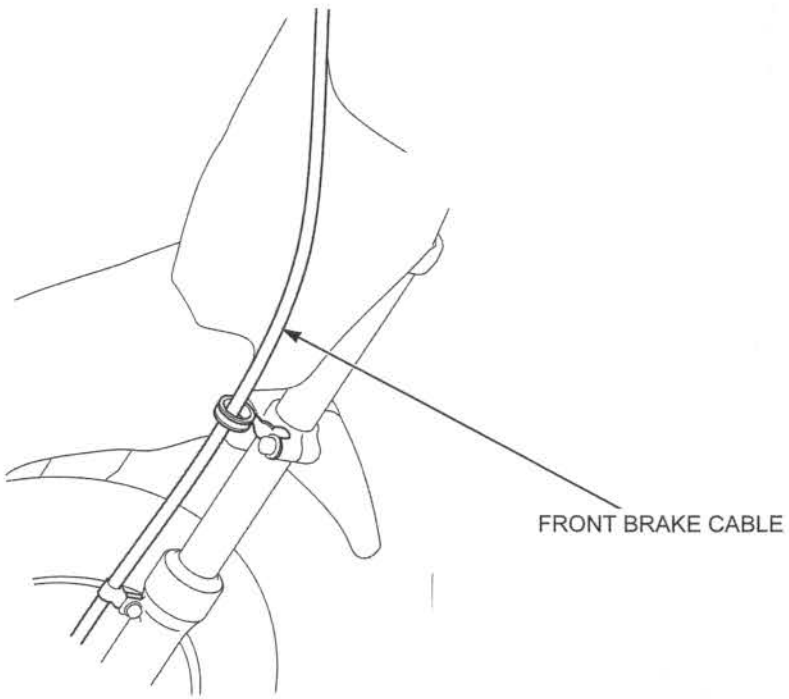
MATERIAL	LOCATION	REMARKS
Engine oil	Cylinder bore	
	Piston outer sliding area and piston ring grooves	
	Piston pin hole inner surface	
	Piston pin outer surface	
	Piston ring whole surface	
	Connecting rod small end inner surface	
	Connecting rod big end	1 – 2 cm^3
	IN/EX valve stem outer surface and stem end	
	Camshaft cam whole surface	
	Cam chain whole surface	
	Cam sprocket teeth	
	Rocker arm hole inner surface and roller contact surface	
	Rocker arm shaft whole surface	
	Rocker arm roller rolling area	
	Oil pump inner and outer rotor sliding area	
	Cam chain guide sprocket spindle whole surface	
	Clutch outer guide outer surface	
	Clutch disc whole surface	
	Gearshift spindle journal	
	Shift fork inner surface	
	Shift drum whole surface	
	Gear teeth (primary, transmission)	
	Cam chain tensioner push rod inside	4.0 cm^3 minimum
	Starter reduction gear both journal area	
	Starter reduction gear shaft whole surface	
	Starter clutch rolling surface	
	Starter clutch reduction gear teeth	
	Each bearing rolling surface	
	Each O-ring	
Locking agent (Three bond 1322 or equivalent)	Oil stopper plate bolt threads	See page 8-25
	Mainshaft bearing set plate bolt threads	See page 12-15
Molybdenum disulfide oil (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease)	Kickstarter pinion gear inner surface	
	Primary drive gear inner surface	
	Each transmission rotating gear inner surface	
	C1 gear bushing whole surface	
	M4, C3 gear shift fork groove	
	Cam chain timing sprocket starter gear sliding surface	
	Camshaft decompressor cam and arm sliding surface	
Sealant (Three bond 1215 or equivalent)	Left crankcase mating surface	See page 12-18
	Cylinder head cover rubber seal (semicircular area)	See page 8-7
Sealant (Three bond 1215 or 1207B or equivalent)	Alternator wire grommet seating surface	
Multi-purpose grease	Gearshift spindle oil seal lip	
	Countershaft oil seal lip	
	Kickstarter spindle oil seal lip	
Degreasing	Flywheel and left crankshaft contact areas	

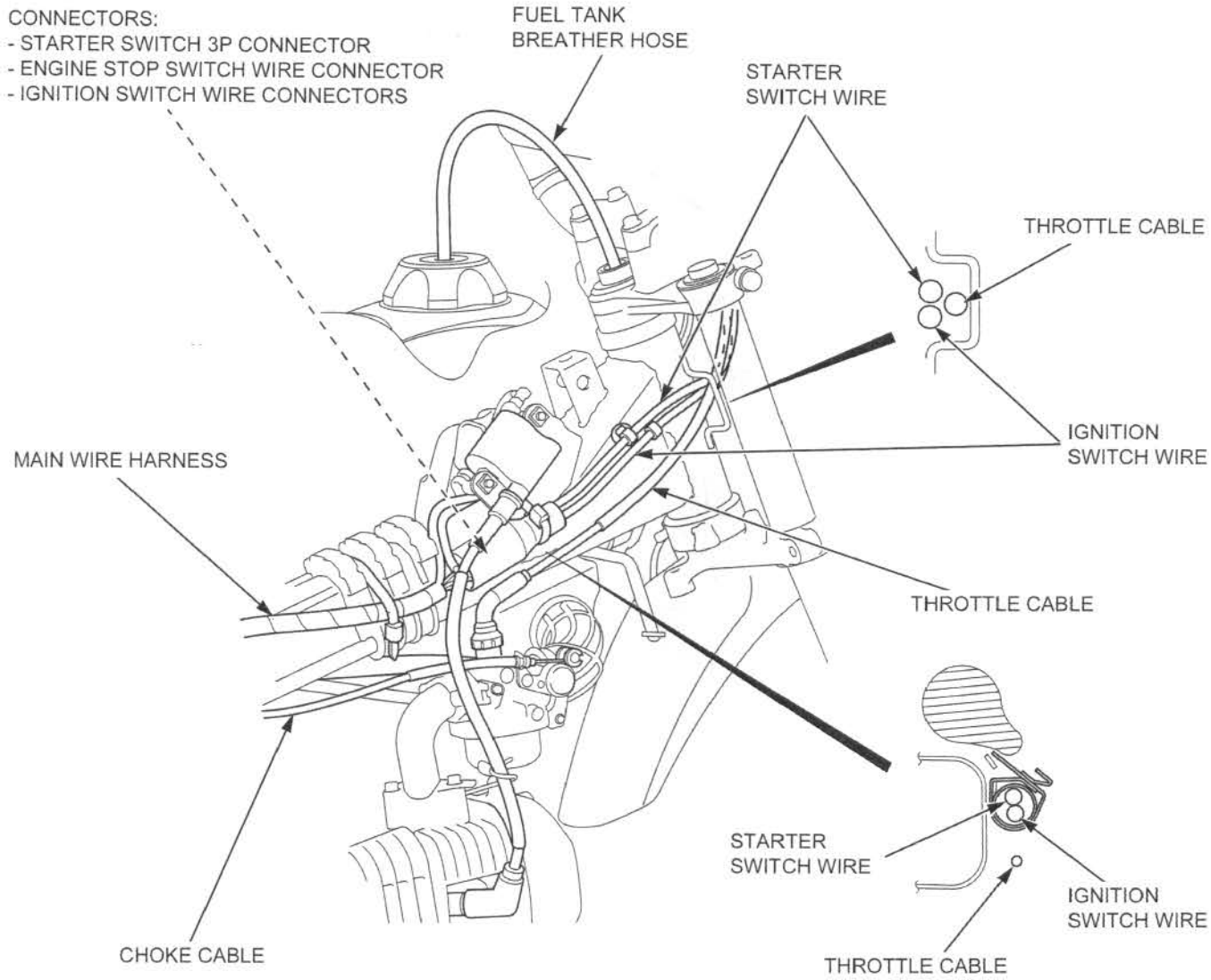
FRAME

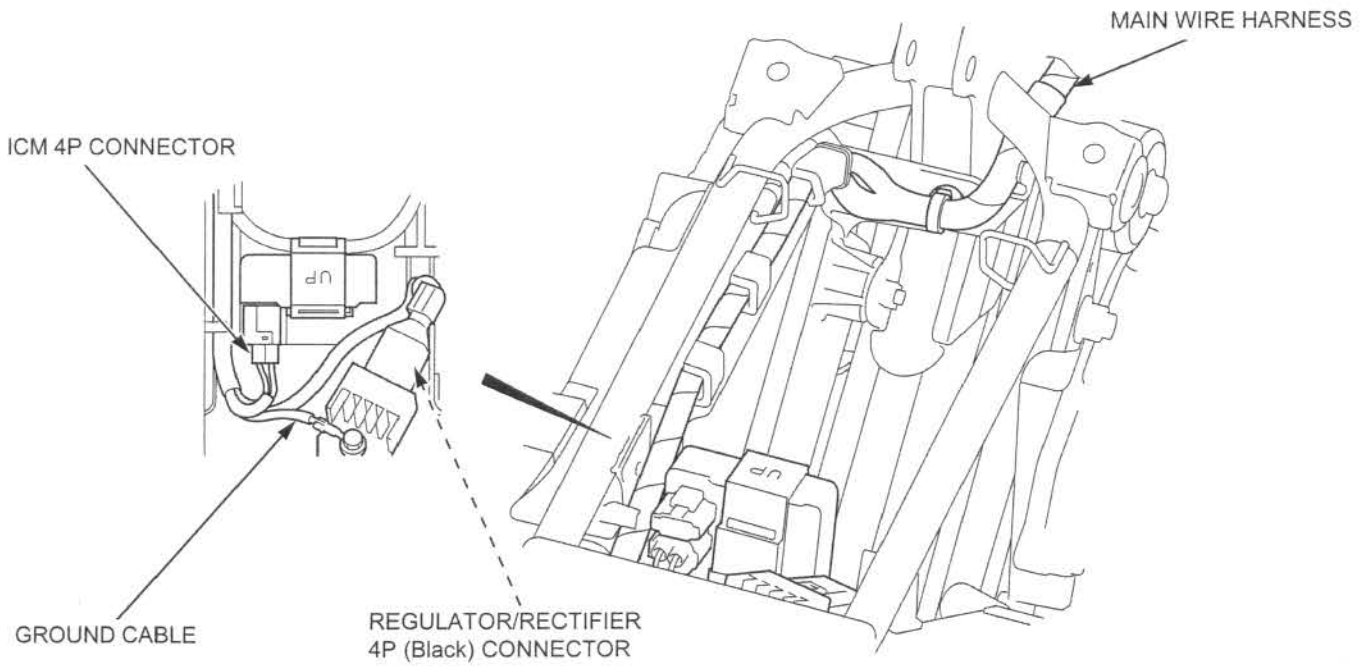
MATERIAL	LOCATION	REMARKS
Urea based multipurpose grease with extreme pressure agent (example: Kyodo Yushi EXCELITE EP2, Shell ALVANIA EP2 or equivalent)	Steering stem upper/lower bearing	Apply 3 – 5 g
	Steering stem dust seal lips	
Multi-purpose grease	Brake cam brake shoe contact area	Apply 0.1 – 0.2 g
	Brake cam shaft sliding surface	Apply 0.03 – 0.08 g
	Brake anchor pin	Apply 0.1 – 0.2 g
	Brake cam dust seal	
	Wheel hub dust seal lips	
	Sidestand pivot	
	Brake lever pivot bolt sliding surface	
	Rear brake pedal pivot sliding surface	
	Throttle slider sliding surface	
	Throttle cable end	
	Kickstarter pedal joint movable area	
	Air cleaner element all around	
Pro Honda Foam Filter Oil or equivalent	Air cleaner element entire surface	
Pro Honda Suspension Fluid SS-8 (10W) or equivalent	Fork oil seal lips and dust seal lips	
	Fork cap bolt O-ring	
Honda Bond A or Honda Hand Grip Cement (U.S.A. only)	Handlebar grip inner surface	

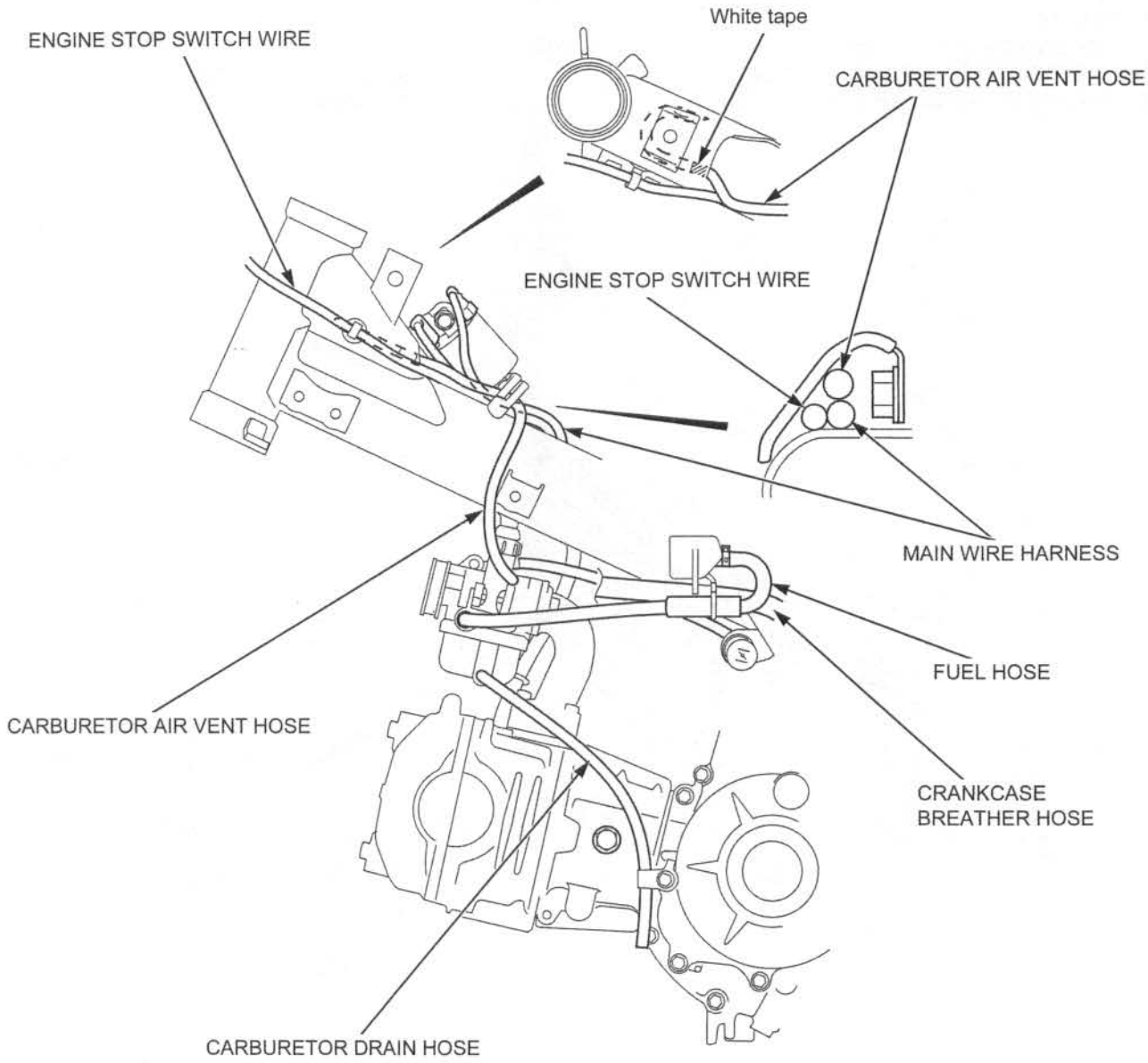
CABLE & HARNESS ROUTING

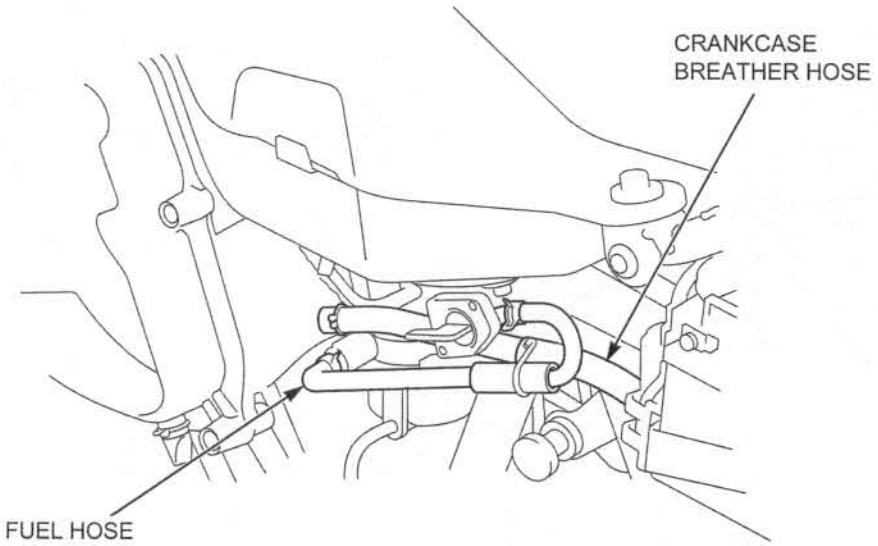


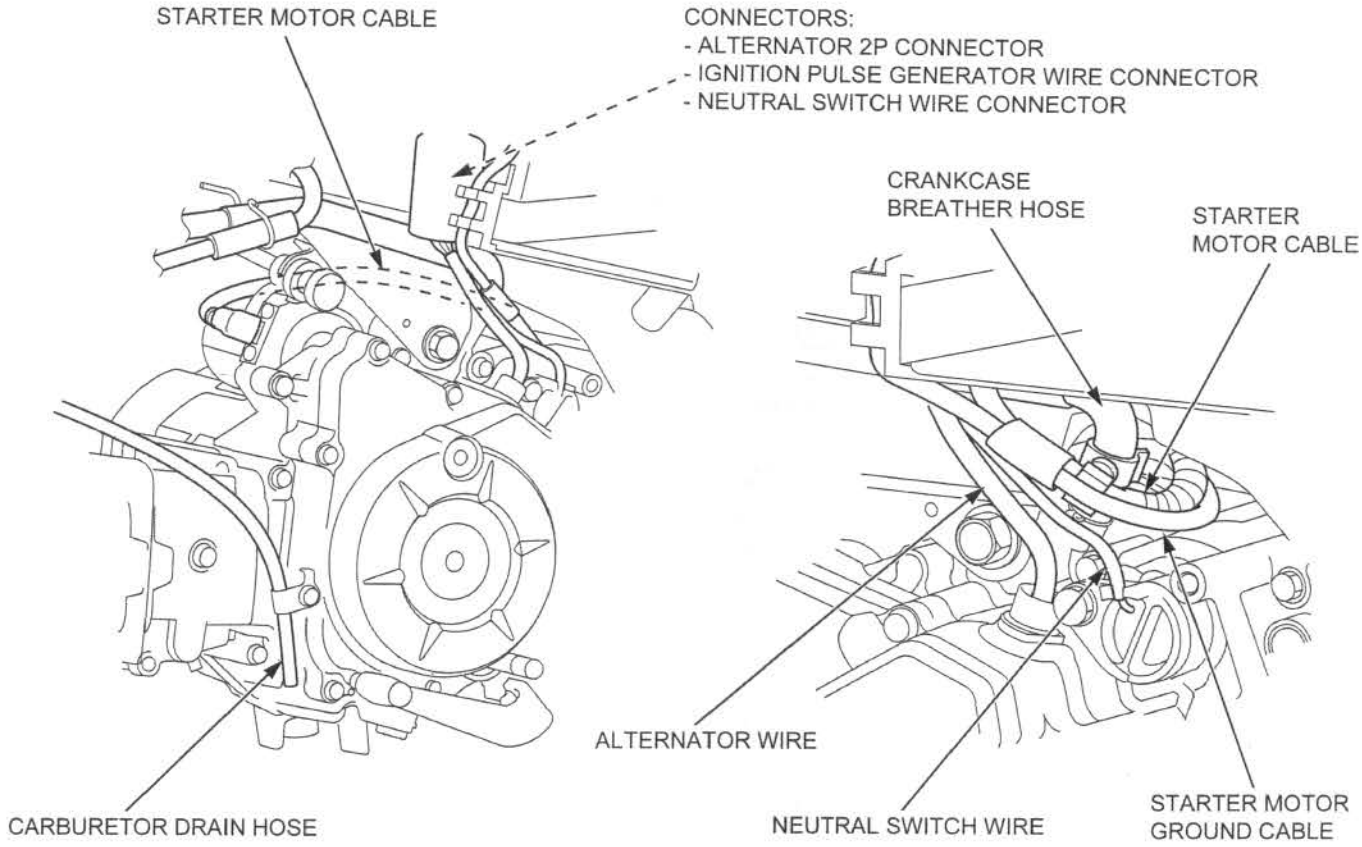


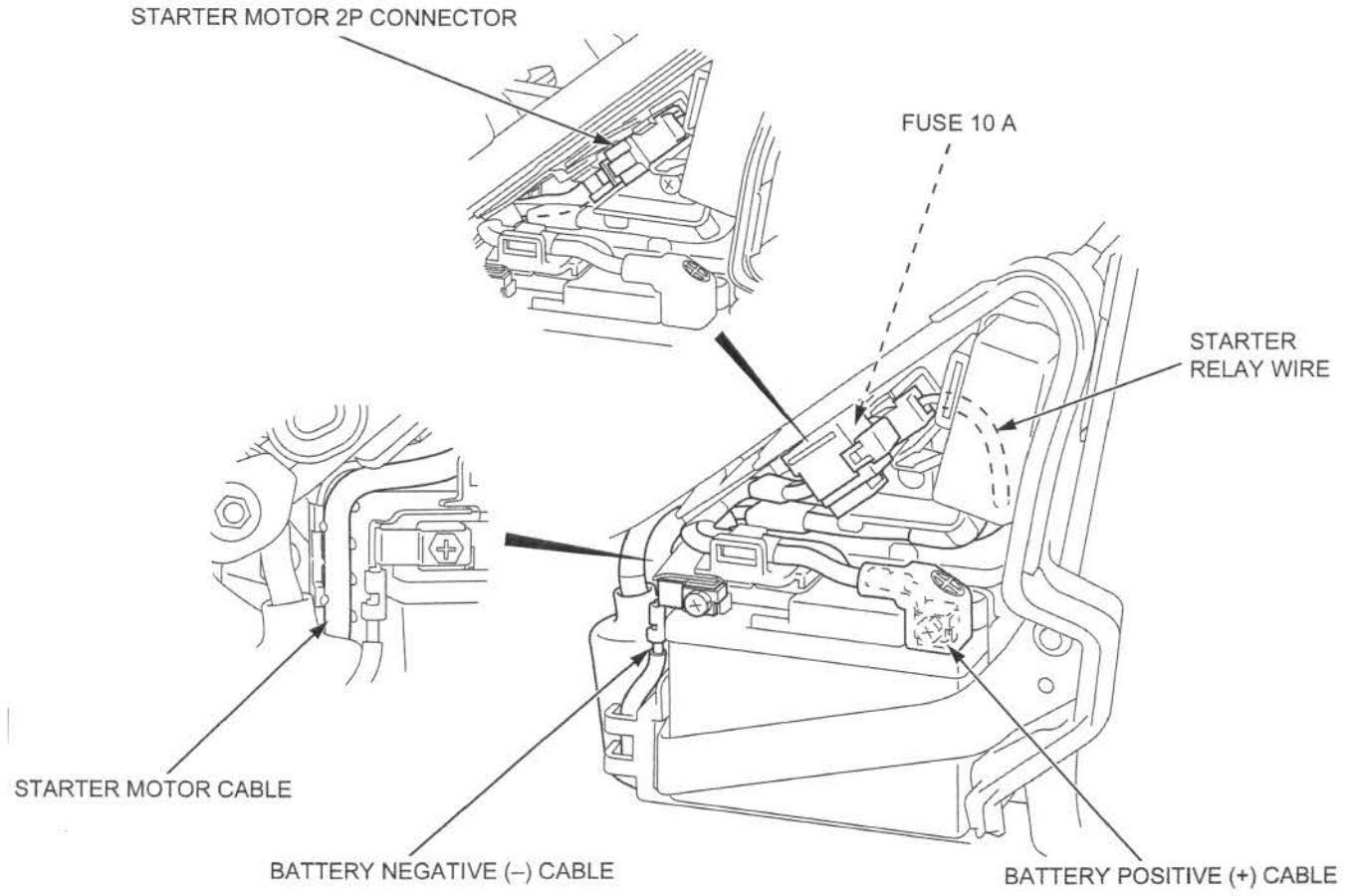

CONNECTORS:
- STARTER SWITCH 3P CONNECTOR
- ENGINE STOP SWITCH WIRE CONNECTOR
- IGNITION SWITCH WIRE CONNECTORS
FUEL TANK BREATHER HOSE
STARTER SWITCH WIRE
THROTTLE CABLE
IGNITION SWITCH WIRE
MAIN WIRE HARNESS
THROTTLE CABLE
CHOKE CABLE
STARTER SWITCH WIRE
IGNITION SWITCH WIRE
THROTTLE CABLE


MAIN WIRE HARNESS
ICM 4P CONNECTOR
UP
GROUND CABLE
REGULATOR/RECTIFIER 4P (Black) CONNECTOR
UP


ENGINE STOP SWITCH WIRE
White tape
CARBURETOR AIR VENT HOSE
ENGINE STOP SWITCH WIRE
MAIN WIRE HARNESS
FUEL HOSE
CARBURETOR AIR VENT HOSE
CRANKCASE
BREATHER HOSE
CARBURETOR DRAIN HOSE


CRANKCASE
BREATHER HOSE
FUEL HOSE


STARTER MOTOR CABLE
CONNECTORS:
- ALTERNATOR 2P CONNECTOR
- IGNITION PULSE GENERATOR WIRE CONNECTOR
- NEUTRAL SWITCH WIRE CONNECTOR
CRANKCASE BREATHER HOSE
STARTER MOTOR CABLE
ALTERNATOR WIRE
CARBURETOR DRAIN HOSE
NEUTRAL SWITCH WIRE
STARTER MOTOR GROUND CABLE


STARTER MOTOR 2P CONNECTOR
FUSE 10 A
STARTER RELAY WIRE
STARTER MOTOR CABLE
BATTERY NEGATIVE (–) CABLE
BATTERY POSITIVE (+) CABLE

EMISSION CONTROL SYSTEMS

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

SOURCE OF EMISSIONS

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

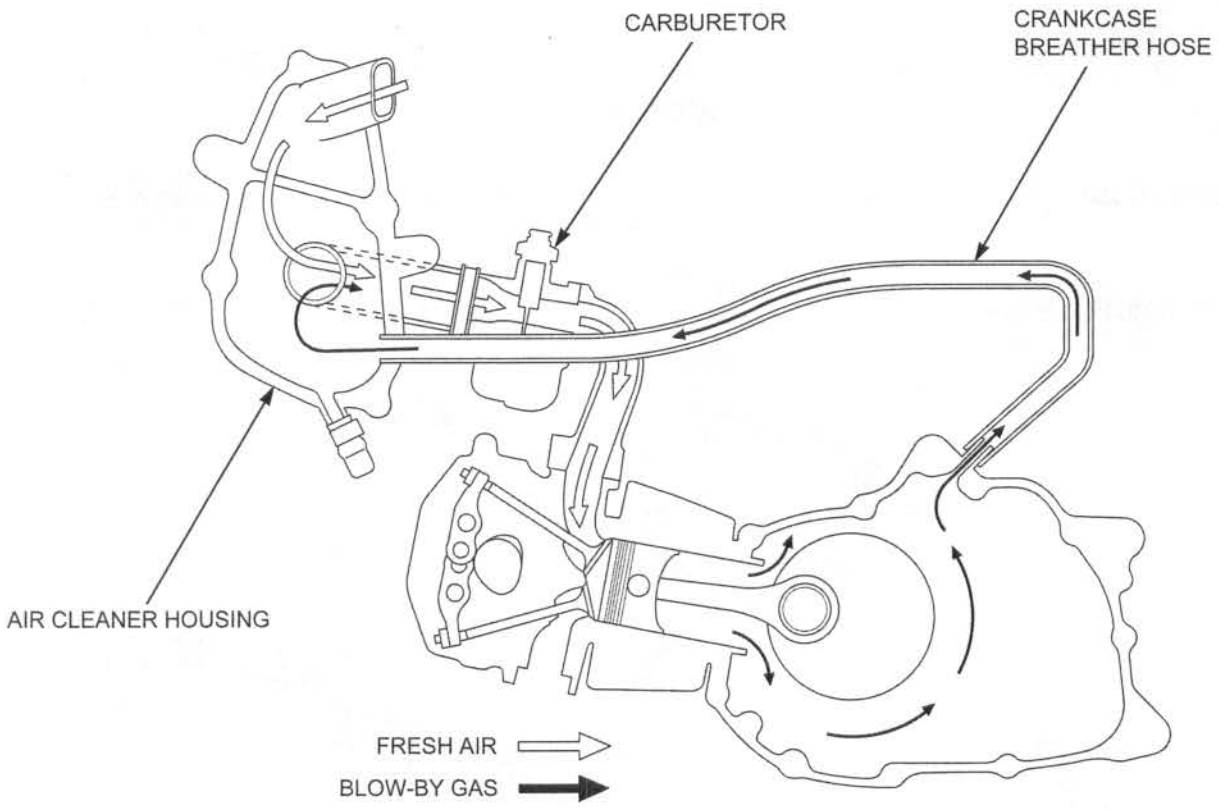
Honda Motor Co., Ltd. utilizes appropriate carburetor settings as well as other systems, to reduce carbon monoxide and hydrocarbons.

EXHAUST EMISSION CONTROL SYSTEM

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

CRANKCASE EMISSION CONTROL SYSTEM

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



SERVICING THE Honda

U.S.A. Only

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

PROHIBITED ACTIONS

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

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

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

NOISE EMISSION CONTROL SYSTEM

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

AMONG THOSE ACTS PRESUMED TO CONSTITUTE TAMPERING ARE THE ACTS LISTED BELOW:

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

FUEL PERMEATION EMISSION CONTROL SYSTEM

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

REBUILT ENGINE

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

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

MEMO

2. FRAME/BODY PANELS/EXHAUST SYSTEM

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FUEL TANK SHROUD 2-3
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FRONT FENDER 2-5
REAR FENDER 2-5
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MAIN STEP 2-6
LEFT CRANKCASE REAR COVER 2-7
DRIVE CHAIN COVER 2-7
EXHAUST PIPE/MUFFLER 2-8

SERVICE INFORMATION

GENERAL

- This section covers removal and installation of the body panels, fuel tank and exhaust system.
- Serious burns may result if the exhaust system is not allowed to cool before components are removed or serviced.
- 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 first. 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

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Fuel tank shroud special bolt	4	6	10 (1.0, 7)	
Left side cover special bolt	1	6	10 (1.0, 7)	
Rear fender special bolt	3	6	10 (1.0, 7)	
Front reflector mounting nut (Canada only)	2	6	2.5 (0.26, 1.8)	
Fork bottom bridge pinch bolt	2	8	32 (3.3, 24)	
Rear side reflector mounting nut (Canada only)	2	6	2.5 (0.26, 1.8)	
Rear reflector mounting nut (Canada only)	1	5	1.8 (0.18, 1.3)	
Rear reflector stay special bolt (Canada only)	2	6	10 (1.0, 7)	
Main step mounting bolt	4	8	27 (2.8, 20)	
Drive chain cover special bolt	3	6	10 (1.0, 7)	
Muffler mounting bolt	1	8	32 (3.3, 24)	
Exhaust pipe stud bolt	2	8	11 (1.1, 8)	See page 2-8
Muffler cover bolt	1	6	9 (0.9, 6.6)	
Exhaust pipe cover screw	4	5	6 (0.6, 4.4)	
Exhaust pipe cover bolt	3	6	15 (1.5, 11)	
Spark arrester mounting bolt	3	6	10 (1.0, 7)	

TROUBLESHOOTING

Excessive exhaust noise
- Broken exhaust system
- Exhaust gas leak

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

FUEL TANK SHROUD

REMOVAL/INSTALLATION

RIGHT SIDE:

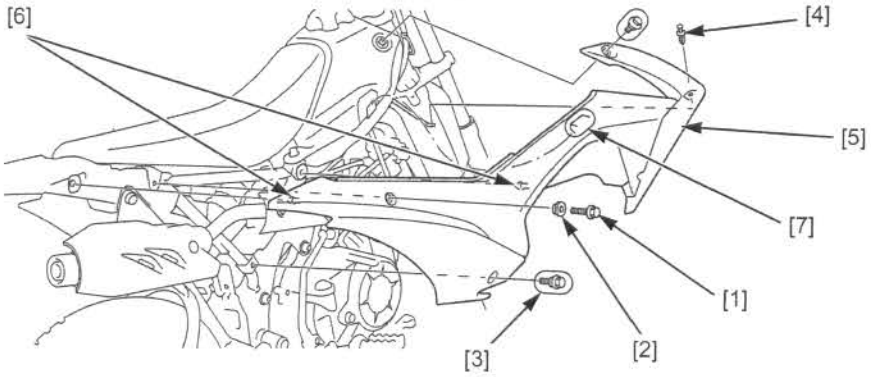
Remove the following:

- Bolt [1]/collar [2]
- Two special bolts [3]
- Trim clip [4]

Remove the right fuel tank shroud [5] by releasing the two bosses [6] from the grommets and groove [7] from the hook of the fuel tank.

Installation is in the reverse order of removal.

TORQUE:
Fuel tank shroud special bolt:
10 N·m (1.0 kgf·m, 7 lbf·ft)



LEFT SIDE:

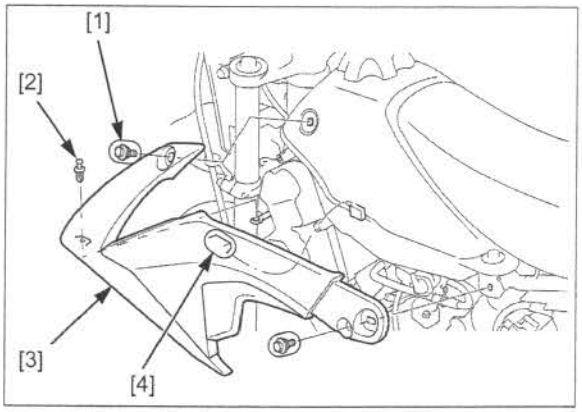
Remove the left side cover (page 2-4).

Remove the two special bolts [1] and trim clip [2].

Remove the left fuel tank shroud [3] by releasing the groove [4] from the hook of the fuel tank.

Installation is in the reverse order of removal.

TORQUE:
Fuel tank shroud special bolt:
10 N·m (1.0 kgf·m, 7 lbf·ft)

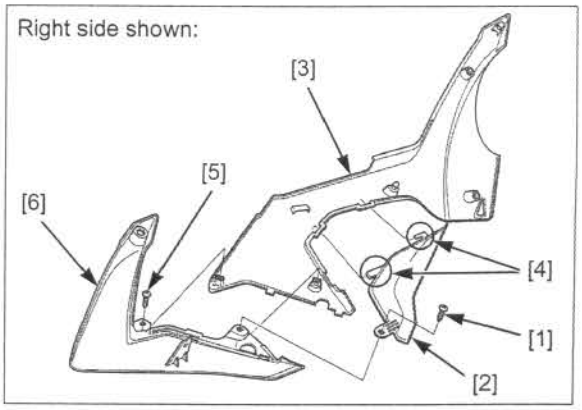


DISASSEMBLY/ASSEMBLY

Remove the screw [1].
Remove the fuel tank shroud C [2] from the fuel tank shroud B [3] by releasing the hooks [4].

Right side only: Remove the screw [5] and fuel tank shroud A [6].

Assembly is in the reverse order of disassembly.



LEFT SIDE COVER

REMOVAL/INSTALLATION

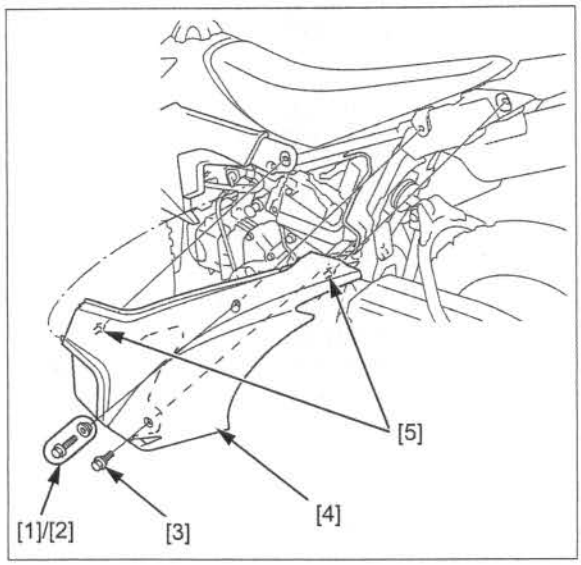
Remove the following:

- Bolt [1]/collar [2]
- Special bolt [3]

Remove the left side cover [4] by releasing the two bosses [5] from the grommets.

Installation is in the reverse order of removal.

TORQUE:
Left side cover special bolt:
10 N·m (1.0 kgf·m, 7 lbf·ft)

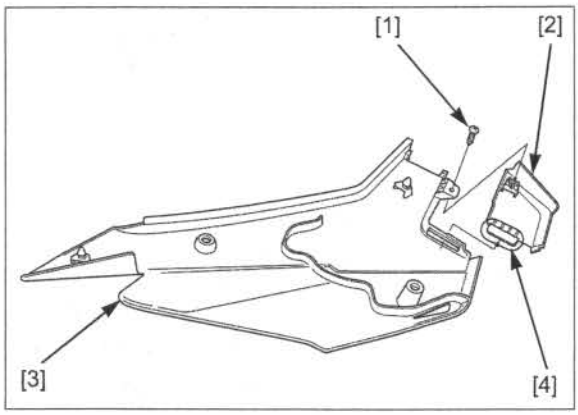


DISASSEMBLY/ASSEMBLY

Remove the screw [1].

Remove the battery cover [2] from the left side cover [3] by releasing the tab [4].

Assembly is in the reverse order of disassembly.



SEAT

REMOVAL/INSTALLATION

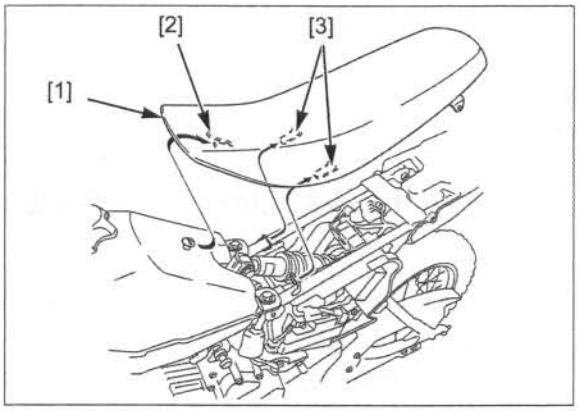
Remove the following:

- Left side cover (page 2-4)
- Fuel tank shrouds (page 2-3)

Remove the seat [1] by pulling it backward.

Align the seat hook [2] with the seat bracket on the fuel tank and seat prong [3] with the hook on the frame.

Install the removed parts in the reverse order of removal.



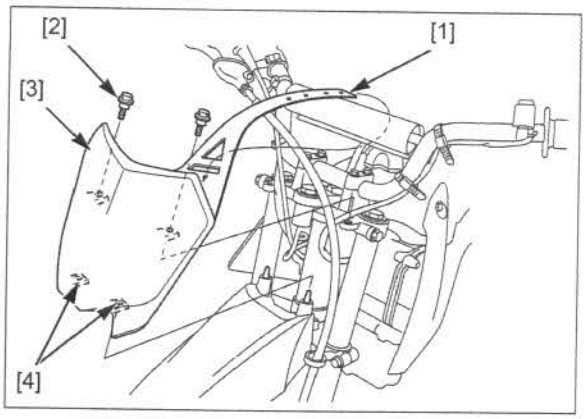
NUMBER PLATE

REMOVAL/INSTALLATION

Release the number plate band [1] from the handlebar pad and remove the two special bolts [2].

Remove the number plate [3] by releasing the holes [4] from the boss on the front fender.

Installation is in the reverse order of removal.



FRONT FENDER

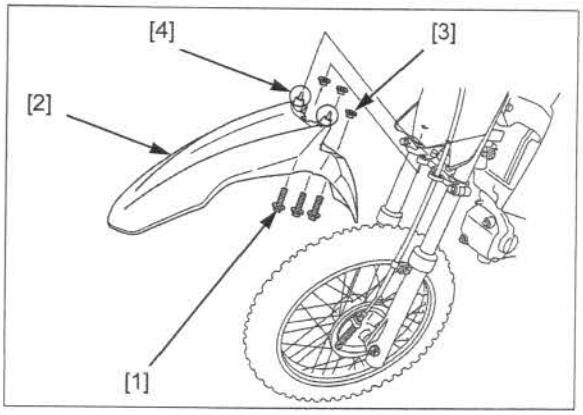
REMOVAL/INSTALLATION

Remove the following:

- Three bolts [1]
- Front fender [2]
- Three collars [3]

Installation is in the reverse order of removal.

- Align the bosses [4] of the front fender with holes of the number plate.



REAR FENDER

REMOVAL/INSTALLATION

Remove the ICM (page 4-8).

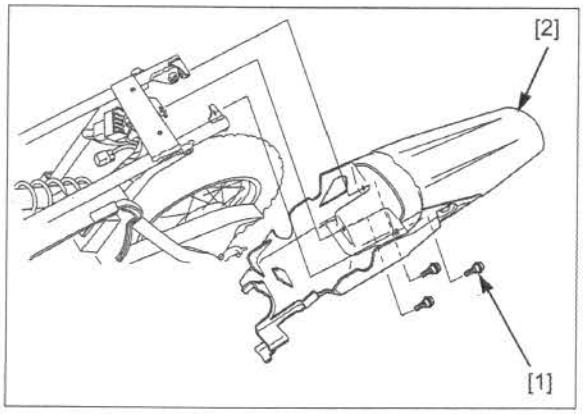
Remove the three special bolts [1].

Pull the rear fender [2] backward and remove it from the frame pipe.

Installation is in the reverse order of removal.

TORQUE:

Rear fender special bolt:
10 N·m (1.0 kgf·m, 7 lbf·ft)



REFLECTOR (CANADA ONLY)

REMOVAL/INSTALLATION

FRONT

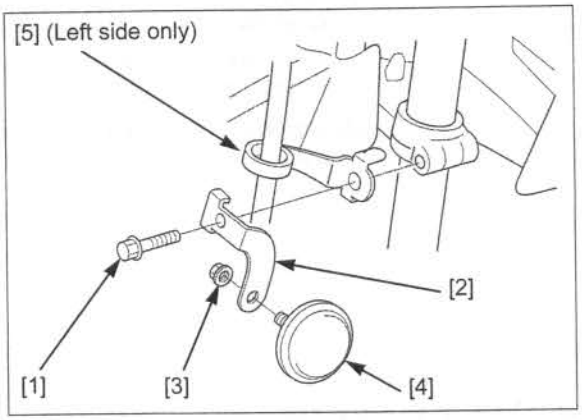
Remove the following:

- Bottom bridge pinch bolt [1]
- Front reflector stay [2]
- Nut [3] and front reflector [4]
- Cable guide [5] (Left side only)

Installation is in the reverse order of removal.

TORQUE:

Front reflector mounting nut:
2.5 N·m (0.26 kgf·m, 1.8 lbf·ft)
Fork bottom bridge pinch bolt:
32 N·m (3.3 kgf·m, 24 lbf·ft)



REAR

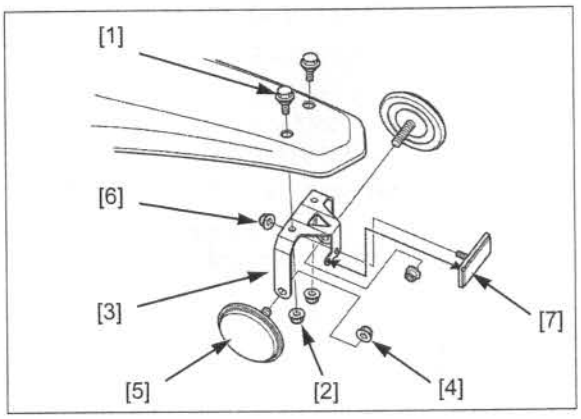
Remove the following:

- Special bolts [1], nuts [2] and rear reflector stay [3]
- Nuts [4] and rear side reflectors [5]
- Nut [6] and rear reflector [7]

Installation is in the reverse order of removal.

TORQUE:

Rear side reflector mounting nut:
2.5 N·m (0.26 kgf·m, 1.8 lbf·ft)
Rear reflector mounting nut:
1.8 N·m (0.18 kgf·m, 1.3 lbf·ft)
Rear reflector stay special bolt:
10 N·m (1.0 kgf·m, 7 lbf·ft)



MAIN STEP

REMOVAL/INSTALLATION

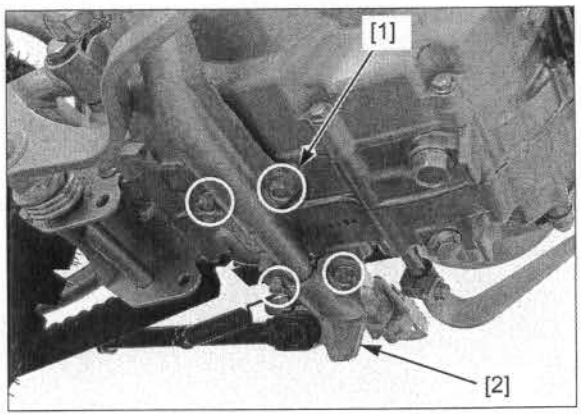
Support the motorcycle securely with a hoist or equivalent.

Remove the four bolts [1] and main step [2].

Installation is in the reverse order of removal.

TORQUE:

Main step mounting bolt:
27 N·m (2.8 kgf·m, 20 lbf·ft)

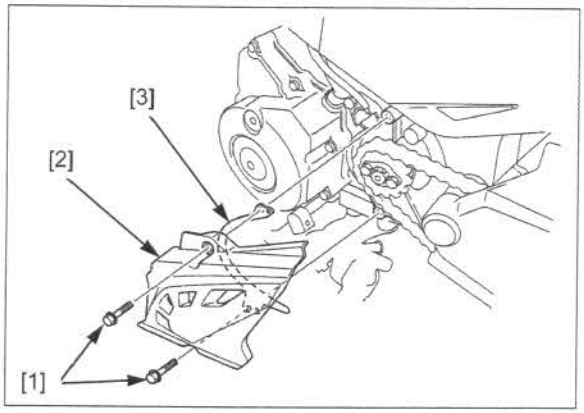


LEFT CRANKCASE REAR COVER

REMOVAL/INSTALLATION

Remove the two bolts [1], left crankcase rear cover [2] and set plate [3].

Installation is in the reverse order of removal.



DRIVE CHAIN COVER

REMOVAL/INSTALLATION

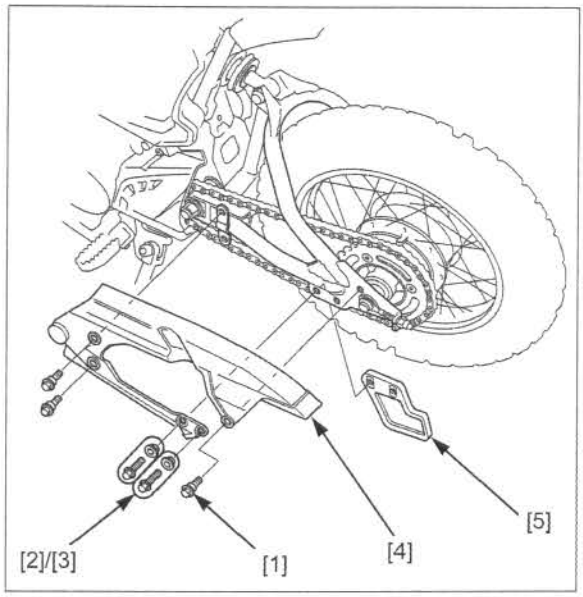
Remove the following:

- Three special bolts [1]
- Two bolts [2]/collars [3]
- Drive chain cover [4]
- Drive chain guard [5]

Installation is in the reverse order of removal.

TORQUE:

Drive chain cover special bolt:
10 N·m (1.0 kgf·m, 7 lbf·ft)



EXHAUST PIPE/MUFFLER

REMOVAL/INSTALLATION

Remove the following:

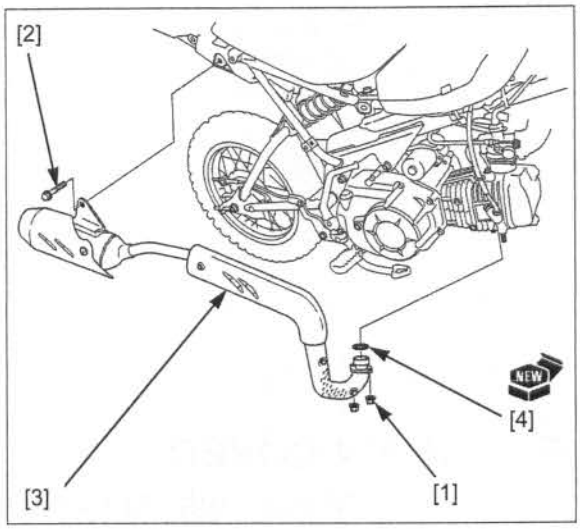
- Right fuel tank shroud (page 2-3)
- Two exhaust pipe joint nuts [1]
- Muffler mounting bolt [2]
- Exhaust pipe/muffler [3]
- Gasket [4]

Install a new gasket.

Set the exhaust pipe/muffler and install the muffler mounting bolt and joint nuts.

Tighten the joint nuts first then the mounting bolt to the specified torque.

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



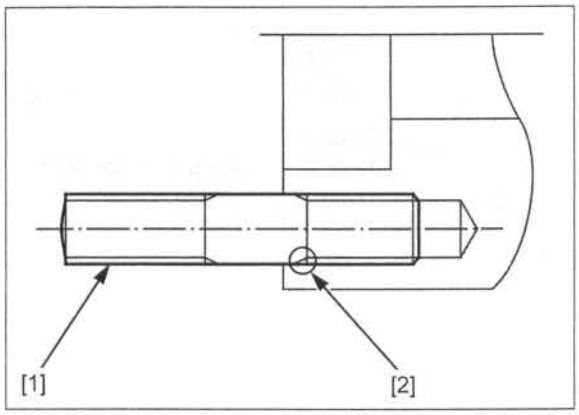
EXHAUST PIPE STUD BOLT

Thread two nuts to the stud bolt [1] and tighten them together, then use a wrench on them to turn the stud bolt out.

Install and tighten new stud bolts into the cylinder head to the specified torque.

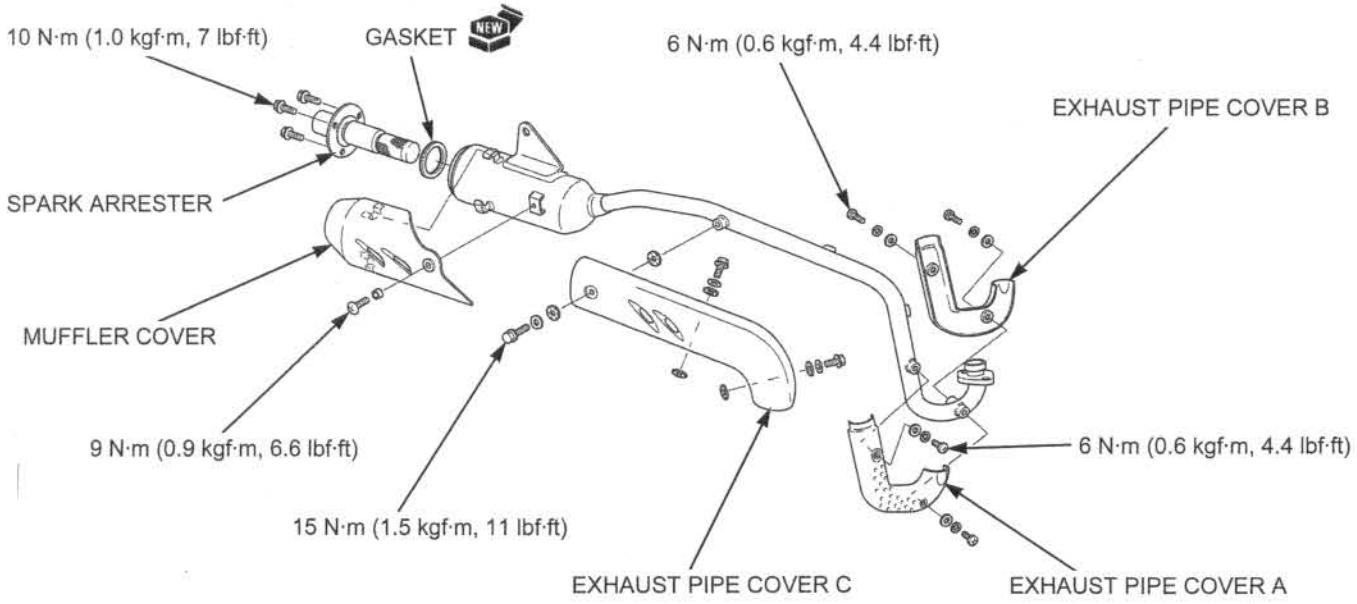
TORQUE: 11 N·m (1.1 kgf·m, 8 lbf·ft)

After tightening the stud bolts, check that the incomplete threads [2] is buried into the cylinder head.



DISASSEMBLY/ASSEMBLY

- Replace the gasket with a new one.



3. MAINTENANCE

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SERVICE INFORMATION

GENERAL

- Place the motorcycle on a level surface before starting any work.
- The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and may lead to death. Run the engine in an open area or with an exhaust evacuation system in an enclosed area.

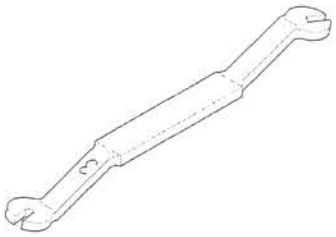
SPECIFICATIONS

ITEM			SPECIFICATIONS
Throttle grip freeplay			3 – 6 mm (0.12 – 0.24 in)
Spark plug	Standard		CPR6EA-9S (NGK)
Spark plug gap			0.8 – 0.9 mm (0.03 – 0.04 in)
Valve clearance		IN/EX	0.10 ± 0.02 mm (0.004 ± 0.001 in)
Engine oil capacity	At draining		1.0 liter (1.1 US qt, 0.9 Imp qt)
	At disassembly		1.15 liter (1.22 US qt, 1.01 Imp qt)
Recommended engine oil			Pro Honda GN4 4-stroke oil (U.S.A and Canada) or equivalent motor oil API service classification: SG or higher JASO T 903 standard: MA Viscosity: SAE 10W-30
Engine idle speed			1,400 ± 100 rpm
Drive chain slack			10 – 20 mm (0.4 – 0.8 in)
Drive chain size/link		RK	DID420D-86RB
Brake lever freeplay			15 mm (0.59 in)
Brake pedal freeplay			15 mm (0.59 in)
Tire size		Front	70/100-14 M/C 37J
		Rear	80/100-12 50J
Tire brand		Front	C-803 (CHENG SHIN)
		Rear	C-803 (CHENG SHIN)
Cold tire pressure		Front	100 kPa (1.00 kgf/cm^2, 15 psi)
		Rear	100 kPa (1.00 kgf/cm^2, 15 psi)

TORQUE VALUES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Air cleaner housing cover screw	4	5	1.5 (0.15, 1.1)	
Air cleaner element guard holder screw	2	5	1.5 (0.15, 1.1)	
Spark plug	1	10	16 (1.6, 12)	
Valve adjusting lock nut	2	5	9 (0.9, 6.6)	Apply oil to the threads and seating surface.
Crankshaft hole cap	1	30	8 (0.8, 5.9)	
Timing hole cap	1	14	10 (1.0, 7)	
Oil drain bolt	1	12	24 (2.4, 18)	
Oil centrifugal filter cover bolt	3	5	5 (0.5, 3.7)	Apply locking agent to the threads.
Rear axle nut	1	12	64 (6.5, 47)	U-nut
Clutch adjuster lock nut	1	8	12 (1.2, 9)	
Sidestand pivot bolt	1	10	10 (1.0, 7)	See page 3-17
Sidestand pivot nut	1	10	39 (4.0, 29)	See page 3-17, U-nut
Spark arrester mounting bolt	3	10	10 (1.0, 7)	
Front spoke	36	BC2.9	3.2 (0.33, 2.4)	
Rear spoke	36	BC2.9	3.2 (0.33, 2.4)	

TOOLS

Valve adjuster B 07908-KE90000  or 07908-KE90200 (U.S.A. only)	Spoke wrench, 4.5 x 5.1 mm 07701-0020200 

MAINTENANCE SCHEDULE

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

I: Inspect and Clean, Adjust, Lubricate or Replace if necessary. 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 a dealer.

FREQUENCY / ITEMS		WHICHEVER COMES FIRST		INITIAL MAINTENANCE	REGULAR MAINTENANCE INTERVAL				REFER TO PAGE
			mi	100	600	1200	1800	2400	
			km	150	1000	2000	3000	4000	
			Months	1	6	12	18	24	
*	FUEL LINE					I		I	3-5
*	THROTTLE OPERATION					I		I	3-6
	AIR CLEANER	NOTE1			C	C	C	C	3-7
	CRANKCASE BREATHER				I	I	I	I	3-7
	SPARK PLUG				I	I	I	I	3-8
*	VALVE CLEARANCE			I	I	I	I	I	3-9
	ENGINE OIL			R	R	R	R	R	3-10
**	ENGINE OIL STRAINER SCREEN					C		C	3-11
**	ENGINE OIL CENTRIFUGAL FILTER					C		C	3-11
**	ENGINE IDLE SPEED			I	I	I	I	I	3-12
	DRIVE CHAIN	NOTE1		I, L	I, L: EVERY 300 mi (500 km) or 3 month				3-12
	DRIVE CHAIN SLIDER				I	I	I	I	3-15
	BRAKE SHOES 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
	SIDESTAND					I		I	3-17
*	SUSPENSION					I		I	3-17
*	SPARK ARRESTER				C: EVERY 1000 mi (1600 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	3-19

* SHOULD BE SERVICED BY A 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 A DEALER.

Honda recommends that a dealer should road test your motorcycle after each periodic maintenance is carried out.

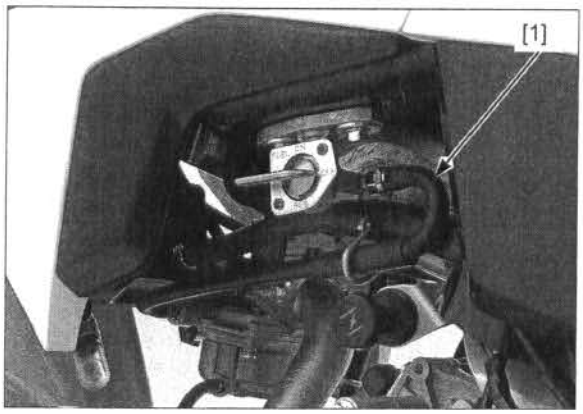
NOTES:

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

FUEL LINE

Check the fuel line [1] for deterioration, damage or leakage.

Replace the fuel line if necessary.

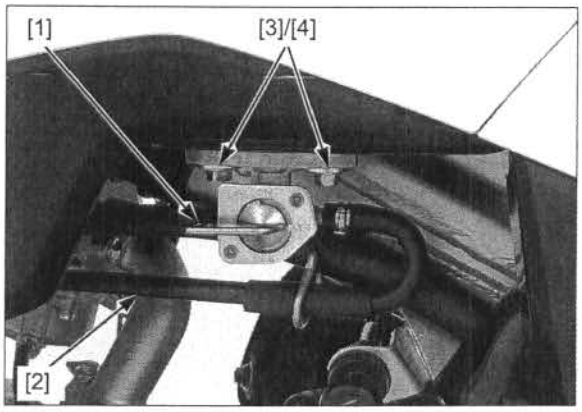


FUEL STRAINER SCREEN

Turn the fuel valve lever [1] to OFF position and disconnect the fuel hose [2] from the carburetor.

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

After the tank has drained completely, remove the two bolts [3] and collars [4].



Remove the fuel valve [1] and fuel strainer screen [2].

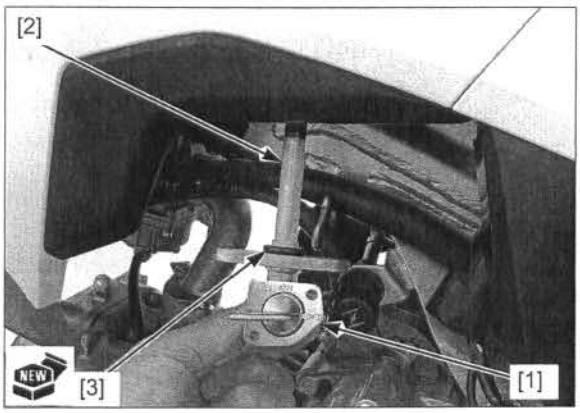
Remove the O-ring [3] from the fuel valve.

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

Install a new O-ring to the fuel valve.

Install the removed parts in the reverse order of removal.

After installation, check for fuel leaks.



THROTTLE OPERATION

INSPECTION/ADJUSTMENT

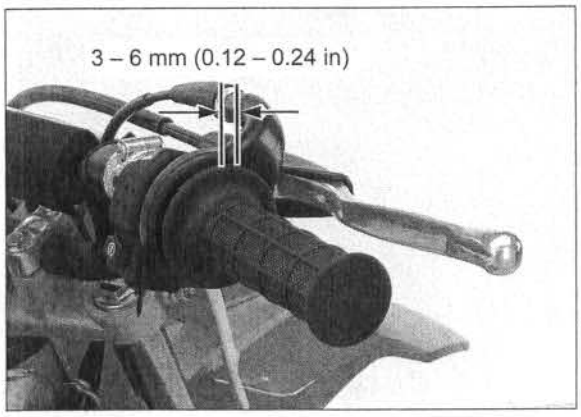
Check for any deterioration or damage to the throttle cable. Check the throttle grip for smooth operation. Check that the throttle opens and automatically closes in all steering positions.

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

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

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

Measure the throttle grip freeplay at the grip flange.



FREEPLAY: 3 – 6 mm (0.12 – 0.24 in)

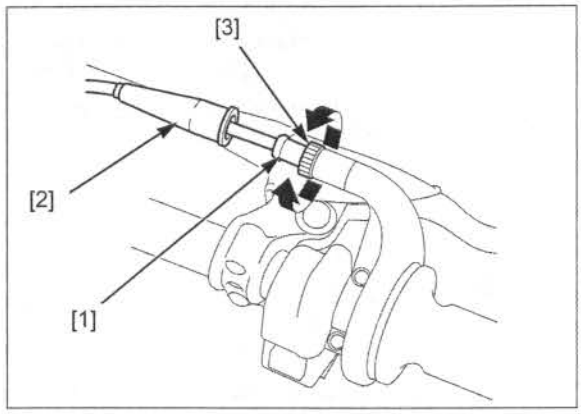
Throttle grip freeplay can be adjusted at the throttle housing adjuster [1].

Remove the dust cover [2] from the adjuster.

Adjust the freeplay by loosening the lock nut [3] and turning the adjuster.

Recheck the throttle operation.

Replace any damaged parts if necessary.



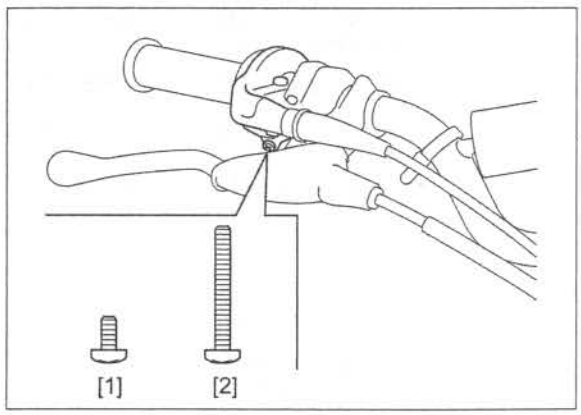
THROTTLE LIMITER ACTIVATION

This motorcycle can reduce the throttle grip movement.

Remove the M5 x 10 screw [1] from the throttle housing.
Replace the M5 x 10 screw with the M5 x 40 screw [2] provided and tighten it fully.

When the M5 x 10 screw is installed, the throttle can be fully opened.
When the M5 x 40 screw is installed, the throttle opening is restricted to approximately 50% and maximum engine speed is limited.

- Do not remove the screw except when activating or deactivating the limiter.
- Use only provided screws. Do not use any other screw.
- Never operate the motorcycle without either the M5 x 10 or M5 x 40 screws installed as debris can enter the housing and cause the throttle to bind.



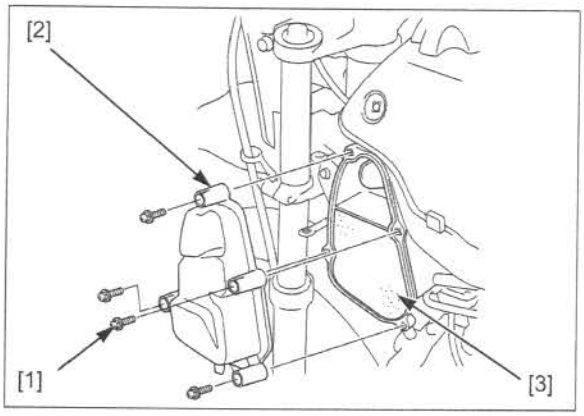
AIR CLEANER

Remove the left fuel tank shroud (page 2-3).

Remove the four screws [1] and air cleaner housing cover [2].

Remove the air cleaner element [3] from the housing.

Pour clean Pro Honda Foam Filter Oil or equivalent (Canada: Honda Foam Filter Oil or equivalent) over the entire surface of the air cleaner.
Use both hands to evenly spread the oil into the air cleaner.
Gently squeeze out any excess oil (To keep your hands dry, place the air cleaner in a clean plastic bag before spreading the oil into the air cleaner).



Clean the inside of the air cleaner housing.

Installation is in the reverse order of removal.

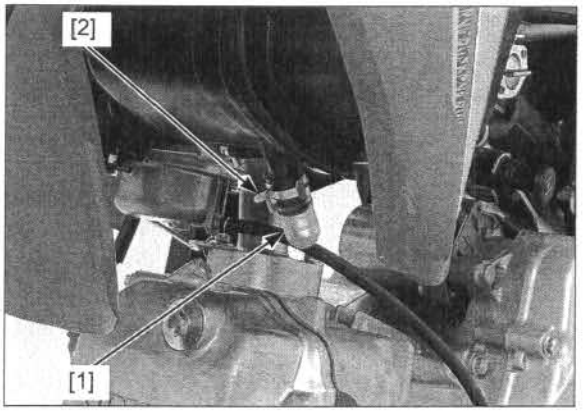
- When installing the air cleaner element, apply grease to the element all around.

TORQUE:
Air cleaner housing cover screw:
1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)

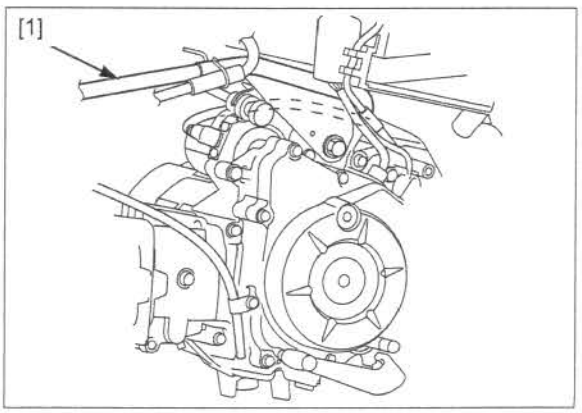
CRANKCASE BREATHER

NOTE:
Service more frequently when ridden in rain, at full throttle, or after the motorcycle is washed. Service if the deposit level can be seen in the drain cap.

Check the crankcase breather drain cap [1].
If deposits has collected, remove the clip [2] and crankcase breather drain cap.
Drain deposits into the suitable container.
Install the crankcase breather drain cap and clip.



Check the crankcase breather hose [1] for deterioration, damage or leakage.



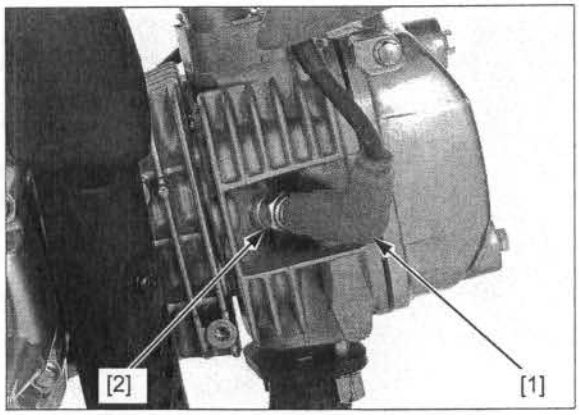
SPARK PLUG

Disconnect the spark plug cap [1].

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

Remove the spark plug [2] using a spark plug wrench or equivalent.

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

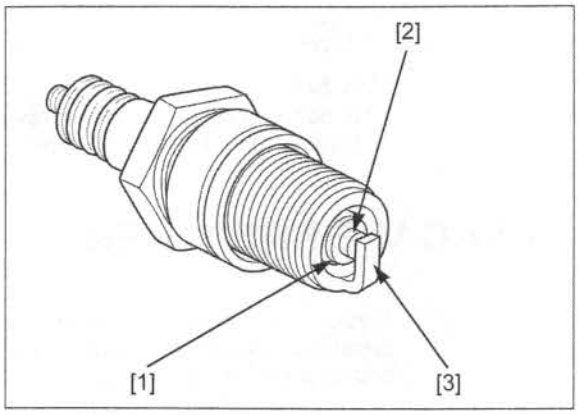


INSPECTION

Check the following and replace if necessary.

- Insulator [1] for damage
- Center electrode [2] and side electrode [3] 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.

RECOMMENDED SPARK PLUG: CPR6EA-9S (NGK)

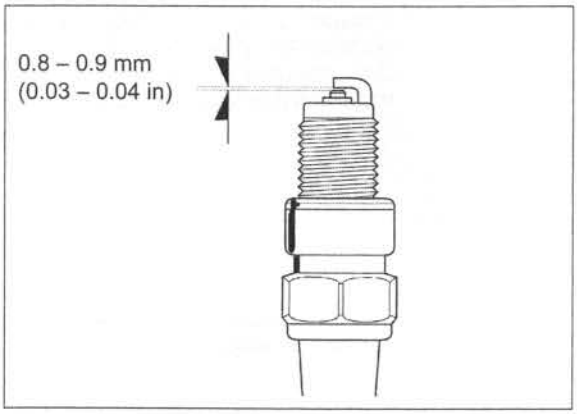


Clean the spark plug electrodes with a wire brush or special plug cleaner.

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.

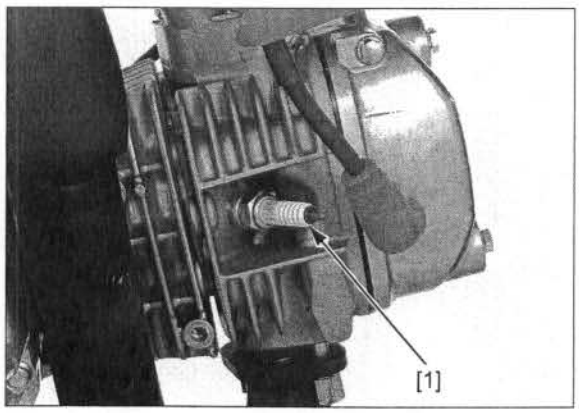
SPARK PLUG GAP: 0.8 – 0.9 mm (0.03 – 0.04 in)



Install and hand tighten the spark plug [1] to the cylinder head, then tighten the spark plug to the specified torque.

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)

Install the spark plug cap.



VALVE CLEARANCE

INSPECTION

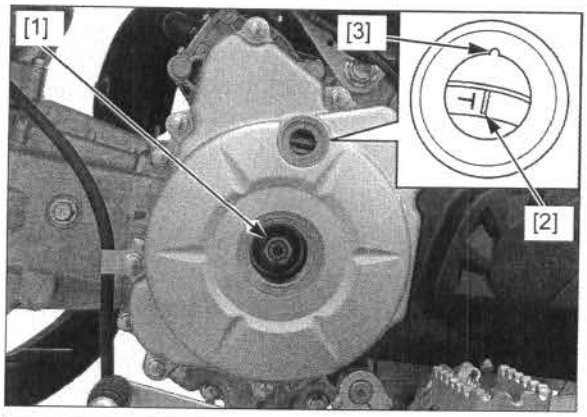
Inspect and adjust the valve clearance while the engine is cold (below 35°C/ 95°F)

Remove the cylinder head cover (page 8-6).

Remove the crankshaft hole cap and timing hole cap from the left crankcase cover.

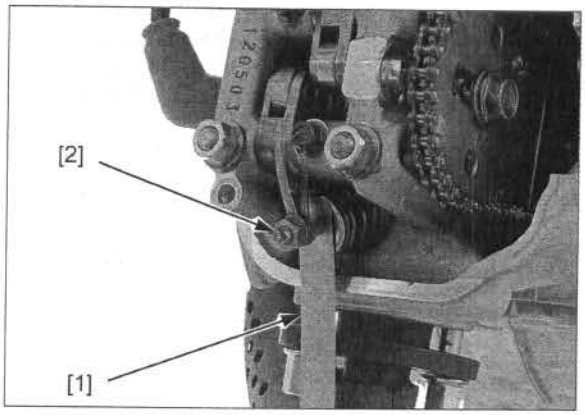
Rotate the crankshaft [1] counterclockwise until the "T" mark [2] on the flywheel is aligned with the index notch [3] on the left crankcase cover.

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



Check the valve clearance by inserting a feeler gauge [1] between the valve adjusting screw [2] and valve stem.

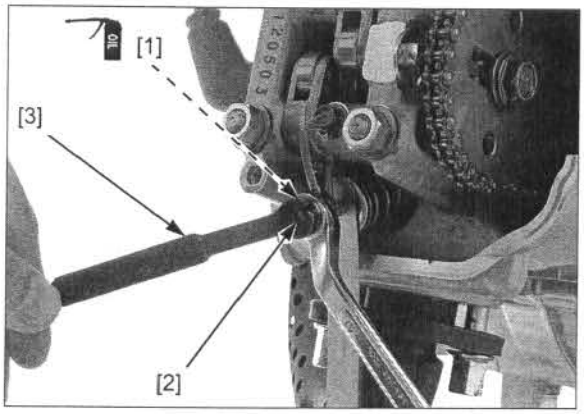
VALVE CLEARANCE:
IN/EX: 0.10 ± 0.02 mm (0.004 ± 0.001 in)



ADJUSTMENT

Adjust by loosening the lock nut [1] and turning the adjusting screw [2] until there is a slight drag on the feeler gauge.

TOOLS:
[3] Valve adjuster B 07908-KE90000 or 07908-KE90200 (U.S.A. only)



Apply engine oil to the lock nut.
Hold the adjusting screw and tighten the lock nut to the specified torque.

TORQUE: 9 N·m (0.9 kgf·m, 6.6 lbf·ft)

After tightening the valve adjuster lock nut, recheck the valve clearance.

Apply engine oil to a new crankshaft hole cap O-ring and timing hole cap O-ring, then install them to the caps.
Install and tighten the crankshaft hole cap and timing hole cap to the specified torque.

TORQUE:
Crankshaft hole cap 8 N·m (0.8 kgf·m, 5.9 lbf·ft)
Timing hole cap 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the cylinder head cover (page 8-7).

ENGINE OIL

ENGINE OIL LEVEL CHECK

Start the engine and let it idle for 3 – 5 minutes.

Stop the engine and wait 2 – 3 minutes.

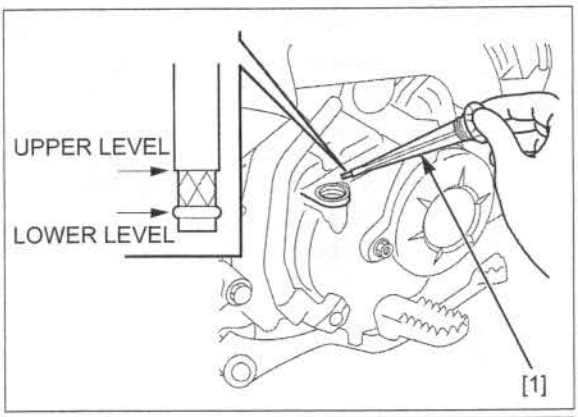
Support the motorcycle in an upright position on level ground.

Remove the filler cap/dipstick [1] and wipe it clean.

Reinstall the oil filler cap/dipstick, but do not screw in.

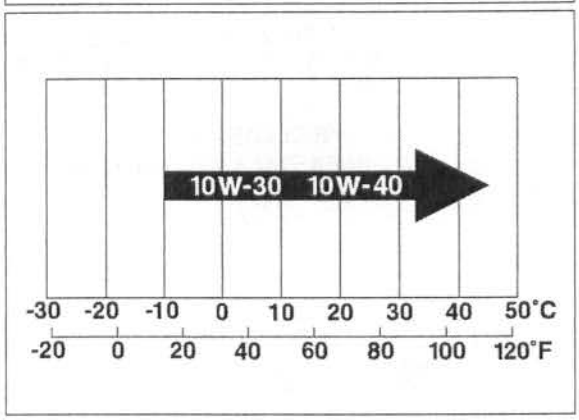
Remove the filler cap and check the oil level.

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



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

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



Check that the O-ring is in good condition, replace if necessary.

Reinstall the oil filler cap/dipstick.

ENGINE OIL CHANGE

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

Warm up the engine.

Stop the engine and remove the oil filler cap/dipstick, drain bolt [1] and sealing washer [2].

Drain the oil completely.

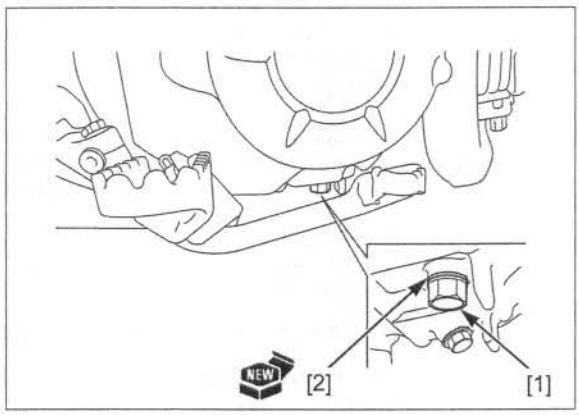
After the oil has drained completely, install the drain bolt with a new sealing washer.

Tighten the drain bolt to the specified torque.

TORQUE: 24 N·m (2.4 kgf·m, 18 lbf·ft)

Fill the crankcase with the recommended engine oil.

ENGINE OIL CAPACITY:
1.0 liter (1.1 US qt, 0.9 Imp qt) at draining
1.15 liter (1.22 US qt, 1.01 Imp qt) at disassembly



Check that the O-ring on the oil filler cap is in good condition, and replace it if necessary.
Install the oil filler cap/dipstick.

Start the engine and let it idle for 2 to 3 minutes.

Stop the engine and recheck the oil level.

Check the engine oil level (page 3-10) and make sure there are no oil leaks.

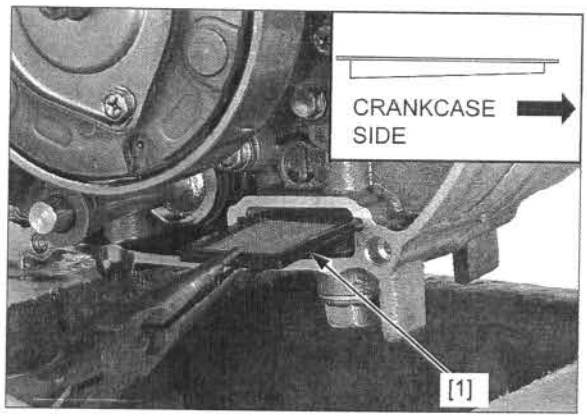
ENGINE OIL STRAINER SCREEN

Remove the right crankcase cover (page 10-5).

Remove the oil strainer screen [1] and clean it.

Install the oil strainer screen with its tapered side facing the crankcase side and thinner edge facing up as shown.

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

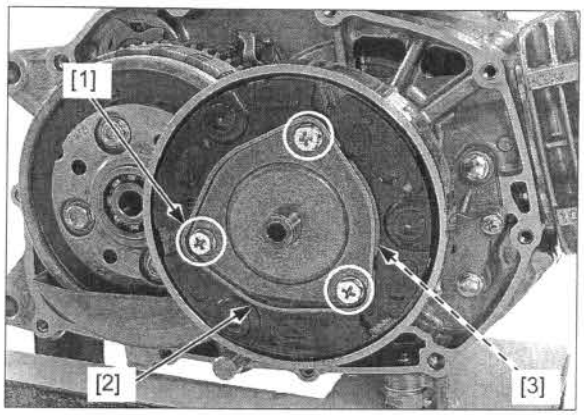


ENGINE OIL CENTRIFUGAL FILTER

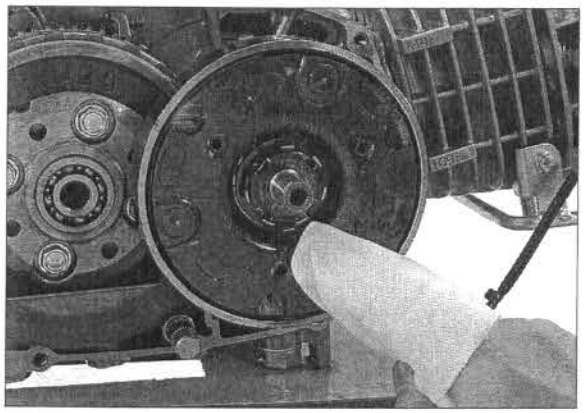
CLEANING

Remove the right crankcase cover (page 10-5).

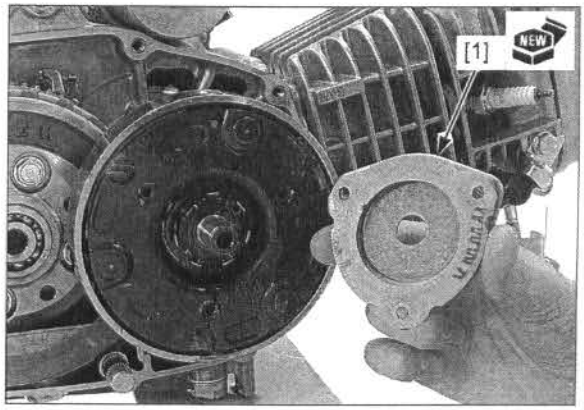
Remove the bolts [1], oil centrifugal filter cover [2] and gasket [3].



Clean the oil centrifugal filter cover and inside of the drive plate using a clean lint-free cloth.



Install a new gasket [1] with its sealed side facing the oil centrifugal filter cover.

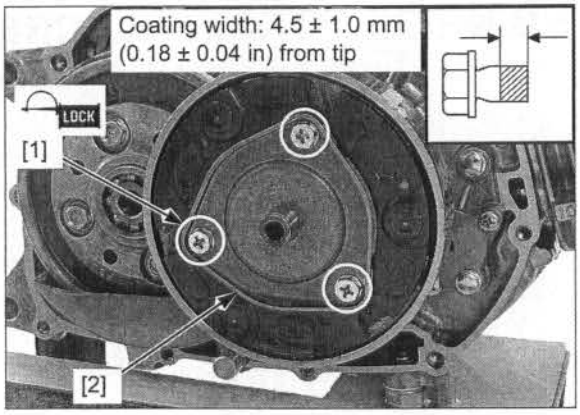


Apply locking agent to the oil centrifugal filter cover bolt [1] threads.

Install the oil centrifugal filter cover [2] and bolts. Tighten the bolts to the specified torque.

TORQUE: 5 N·m (0.5 kgf·m, 3.7 lbf·ft)

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



ENGINE IDLE SPEED

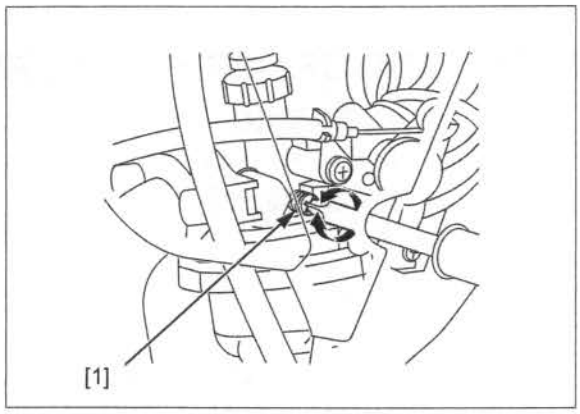
- Inspect and adjust the idle speed after all other engine maintenance items have been performed and are within specifications.
- The engine must be warm for accurate idle speed inspection and adjustment.

Connect a tachometer.

Warm up the engine for about 10 minutes.

Turn the throttle stop screw [1] as required to obtain the specified idle speed.

IDLE SPEED: 1,400 ± 100 rpm



DRIVE CHAIN

⚠WARNING

Amputation hazard. Never inspect or adjust the drive chain while the engine is running.

DRIVE CHAIN SLACK INSPECTION

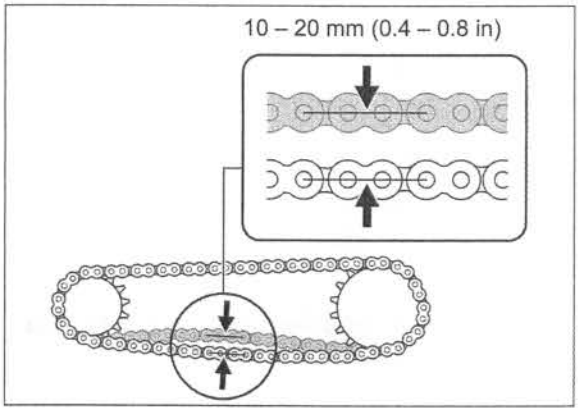
Turn the ignition switch OFF, place the motorcycle on its sidestand and shift the transmission into neutral.

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

CHAIN SLACK: 10 – 20 mm (0.4 – 0.8 in)

NOTICE

Excessive chain slack, 50 mm (2.0 in) or more, may damage the frame.



ADJUSTMENT

Loosen the rear axle nut [1] and chain adjuster lock nuts [2].

Turn both chain adjusting nuts [3] equally until the chain slack is correct.

Make sure the both adjusters [4] end surface are aligned with the index marks [5] on the swingarm.

Tighten the rear axle nut to the specified torque.

TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)

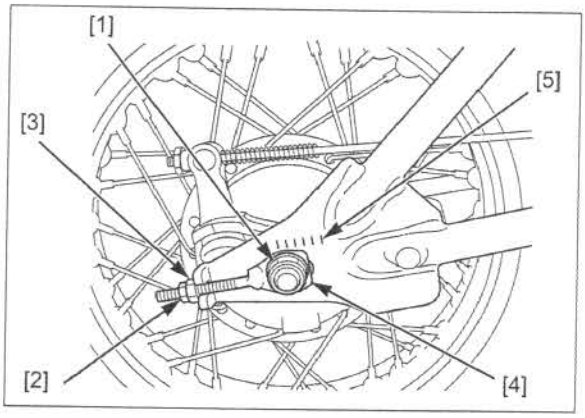
Tighten both chain adjuster lock nuts.

Recheck the drive chain slack and free wheel rotation.

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

Lubricate the drive chain with Pro Honda chain lube or equivalent.

Wipe off any excess drive chain lubricant.



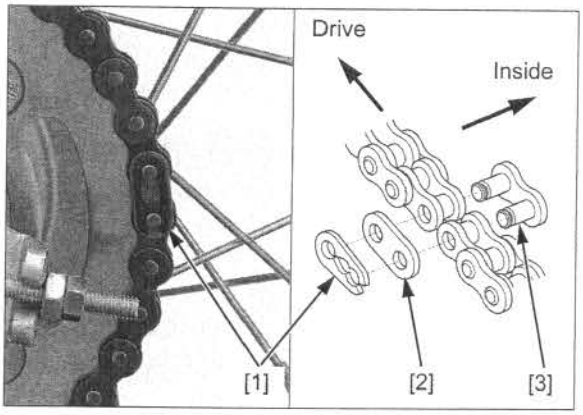
CLEANING, INSPECTION AND LUBRICATION

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

Remove the left crankcase rear cover (page 2-7).

Carefully remove the retaining clip [1] with pliers.

Remove the link plate [2], master link [3] and drive chain.



Clean the chain with non-flammable or high flash point solvent and wipe it dry.

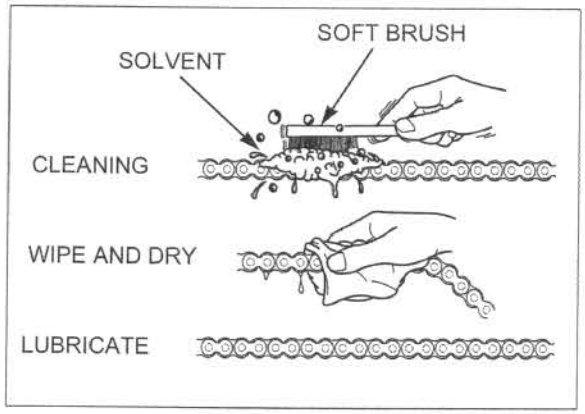
Be sure the chain has dried completely before lubricating.

Inspect the drive chain for possible damage or wear.

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

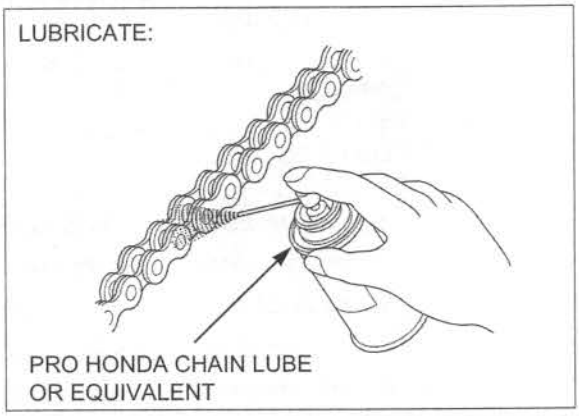
Installing a new chain on badly worn sprockets will cause the new chain to wear quickly.

Inspect and replace sprocket if necessary.



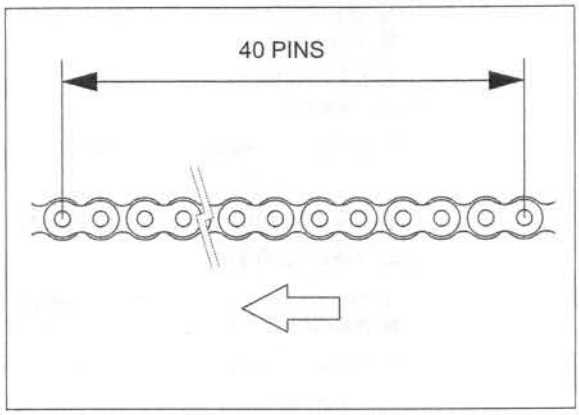
Lubricate the drive chain with Pro Honda chain lube or equivalent.

Wipe off any excess drive chain lubricant.



Measure the drive chain distance between a span of 40 pins from pin center to pin center with the chain held taut and any kinked joint straightened.

SERVICE LIMIT: 518 mm (20.4 in)



SPROCKETS INSPECTION

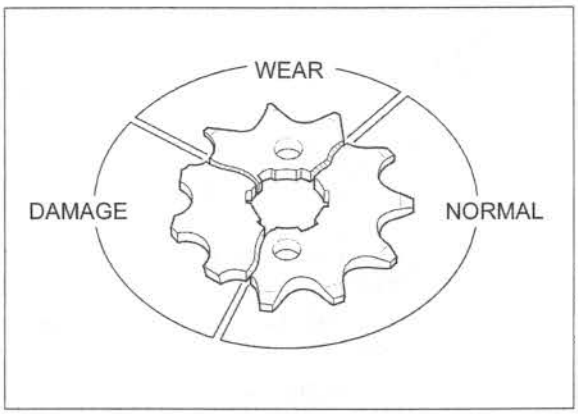
Inspect the drive and driven sprocket teeth for wear or damage, replace if necessary.

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.

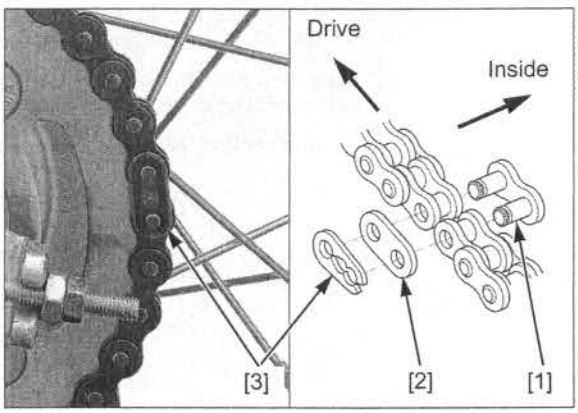
If any are loose, torque them.



Install the drive chain onto the sprockets.

Install the master link [1] and link plate [2].

Install the retaining clip [3] with the open end opposite the direction of chain travel.



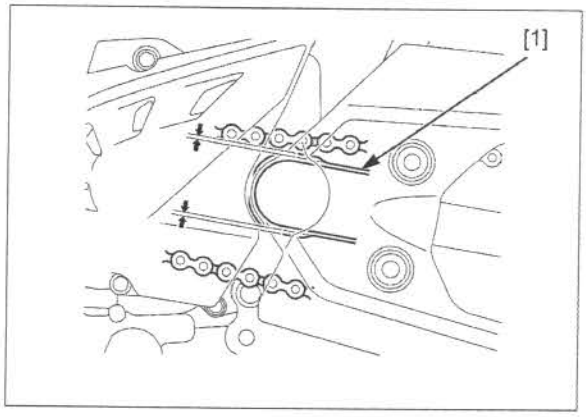
DRIVE CHAIN SLIDER

INSPECTION

Check the drive chain slider [1] for wear or damage.

Replace the drive chain slider if it is worn to the service limit of if it has been damaged.

SERVICE LIMIT: 1.5 mm (0.06 in)



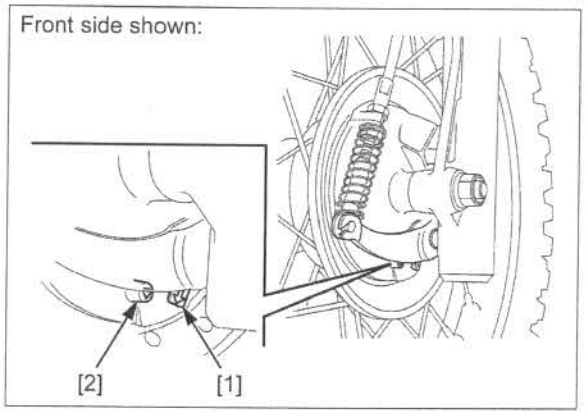
BRAKE SHOE WEAR

FRONT/REAR BRAKE SHOES

Check the brake shoes and brake drum if the arrow mark [1] on the indicator plate aligns with the triangle mark [2] on the brake panel when the brake lever/brake pedal is applied.

Refer to for brake shoe replacement:

- Front brake (page 14-14)
- Rear brake (page 15-10)

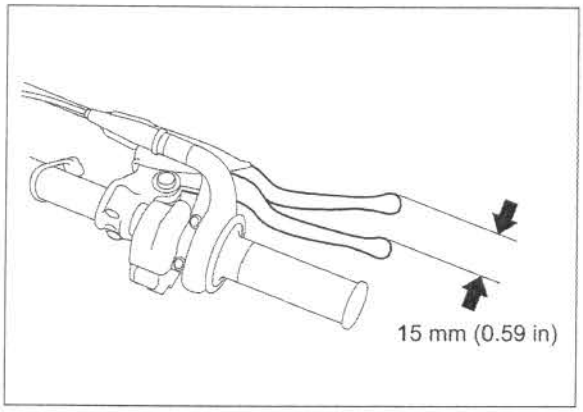


BRAKE SYSTEM

FRONT BRAKE

Measure the front brake lever freeplay at the tip of the lever.

FREEPLAY: 15 mm (0.59 in)

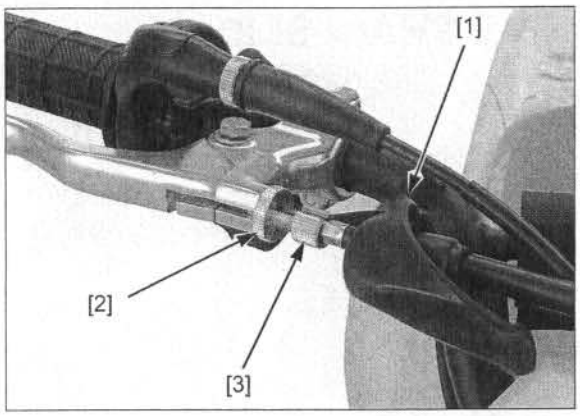


Pull the dust cover [1] off.

Minor adjustments can be made with the upper adjuster.

Loosen the lock nut [2] and turn the adjuster [3] until the freeplay is within specification.

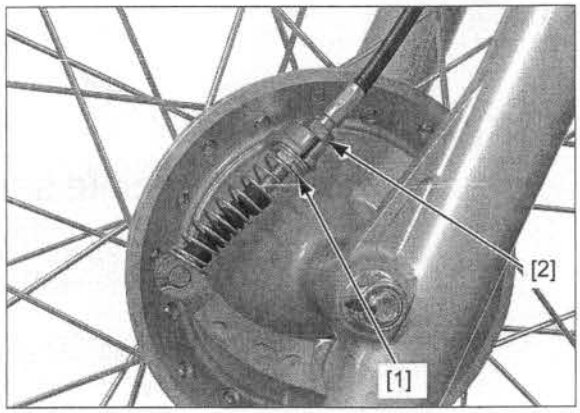
After adjustment, tighten the lock nut.



Major adjustments can be made with the lower adjuster on the brake panel.

Loosen the lock nut [1] and turn the adjusting nut [2] until the freeplay is within specification.

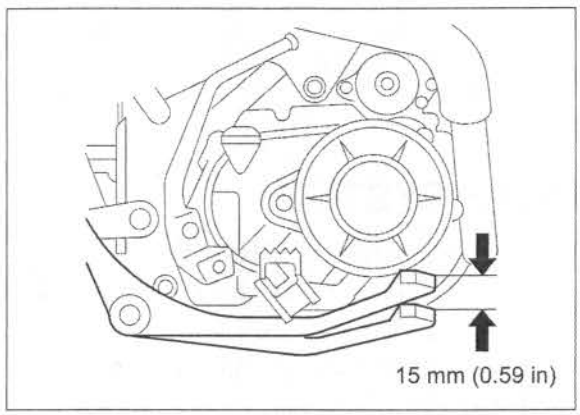
After adjustment, tighten the lock nut.



REAR BRAKE

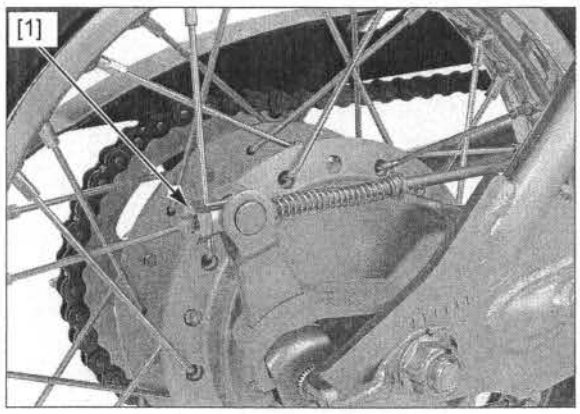
Check the brake pedal freeplay.

FREEPLAY: 15 mm (0.59 in)



Make sure the cutout on the adjusting nut is seated on the brake arm pin after making the final freeplay adjustment.

Adjust the brake pedal freeplay by turning the adjusting nut [1].



CLUTCH SYSTEM

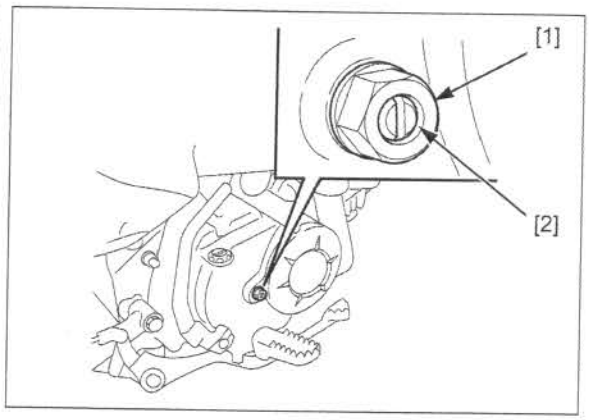
Loosen the clutch adjuster lock nut [1] and turn the clutch adjuster [2] clockwise one full turn; do not turn excessively.
Slowly turn the adjuster counterclockwise until resistance is felt.

Hold the adjuster while tightening the lock nut.

From this point, turn the adjuster clockwise 1/8 turn, and tighten the lock nut to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

- Check for clutch operation after adjustment.



SIDESTAND

Support the motorcycle on a level surface.

Check the sidestand spring [1] for damage or loss of tension.

Check the sidestand assembly [2] for freedom of movement and lubricate the sidestand pivot if necessary.

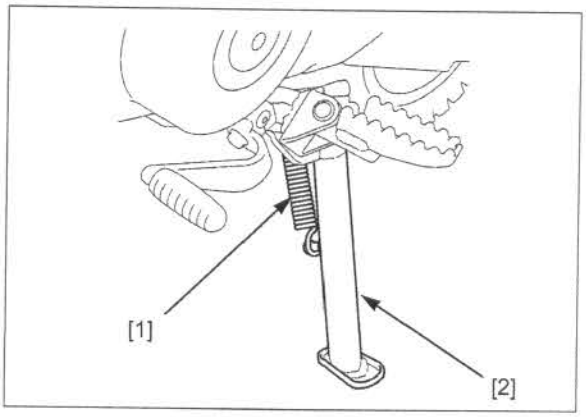
Check that the sidestand pivot bolt is tightened to the correct torque value.

Tighten the pivot bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Loosen the pivot bolt 1/8 to 1/4 turns, then tighten the sidestand pivot lock nut to the specified torque.

TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)



SUSPENSION

FRONT SUSPENSION INSPECTION

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

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

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

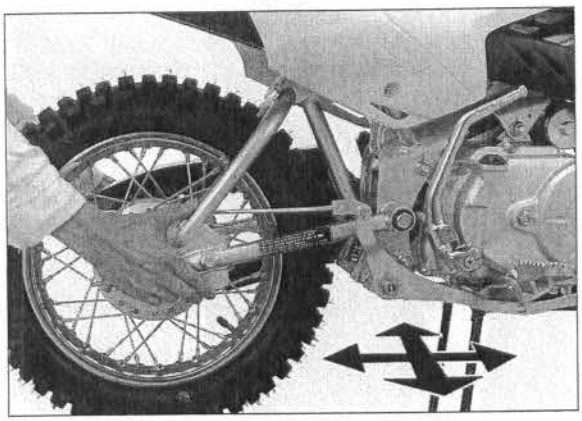
Refer to page 14-18 for fork service.

REAR SUSPENSION INSPECTION

Support the motorcycle securely and raise the rear wheel off the ground by placing a work stand or a box under the engine.

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

Replace the bushings if any are looseness is noted.



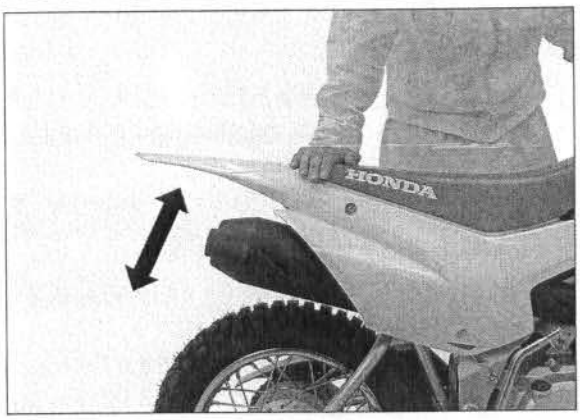
Check the action of the shock absorber by compressing it several times.

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 page 15-15 for shock absorber service.



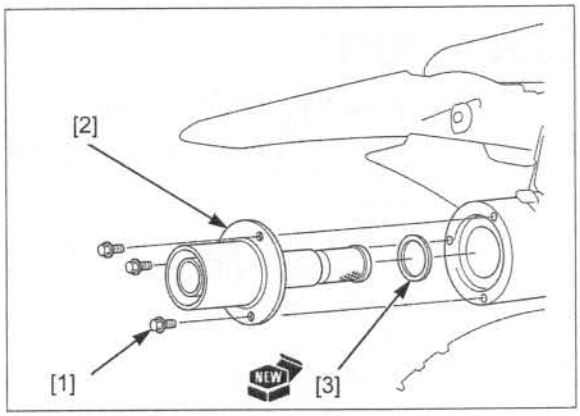
SPARK ARRESTER

INSPECTION/CLEANING

Remove the following:

- Right fuel tank shroud (page 2-3)
- Muffler cover (page 2-8)

Remove the three bolts [1], spark arrester [2] and gasket [3] from the muffler.



Check the screen mesh [1], replace if necessary.

Use a soft brush to remove carbon deposits from the spark arrester screen.

Be careful not to damage the spark arrester screen.

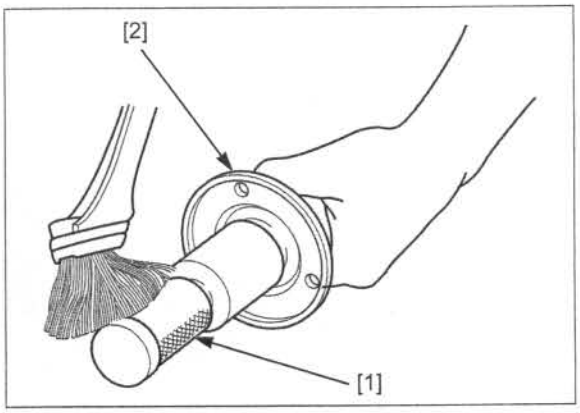
The spark arrester [2] must be free of breaks and holes, replace if necessary.

Install the spark arrester in the reverse order of removal.

- Replace the gasket with a new one.

TORQUE:

Spark arrester mounting bolt	**10 N·m (1.0 kgf·m, 7 lbf·ft)**



NUTS, BOLTS, FASTENERS

Check that all chassis nuts and bolts are tightened to their correct torque values (page 1-9).
Check that all safety clips, hose clamps and cable stays are in place and properly secured.

WHEELS/TIRES

Support the motorcycle using a hoist or equivalent, raise the front wheel off the ground.

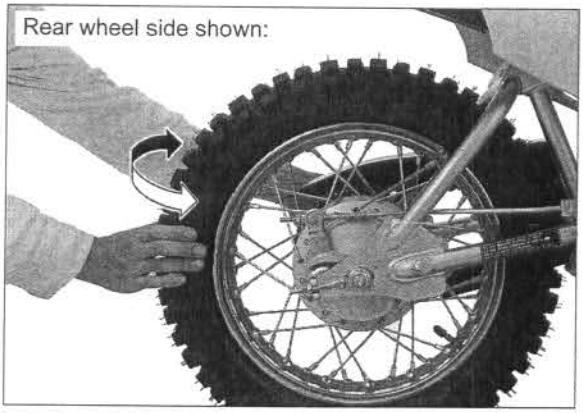
Hold the front fork leg and move the front wheel sideways with force to see if the wheel bearings are worn.

For front wheel service (page 14-9).

Support the motorcycle using a hoist or equivalent, 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.

For rear wheel service (page 15-6).



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

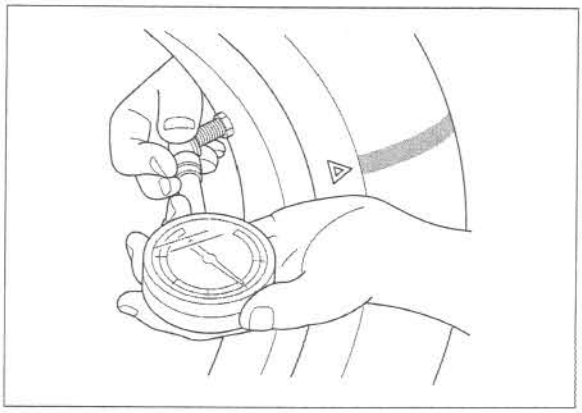
Check the front and rear wheels for trueness (refer to Sections 14 and 15).

Tire pressure should be checked when the tires are cold.

Check the cold tire pressure.

RECOMMENDED TIRE PRESSURE AND TIRE SIZE:

Tire pressure kpa (kgf/cm², psi)	Front	100 (1.00 15)
	Rear	100 (1.00 15)
Tire size	Front	70/100-14 M/C 37J
	Rear	80/100-12 50J
Tire brand	Front	C-803 (CHENG SHIN)
	Rear	C-803 (CHENG SHIN)



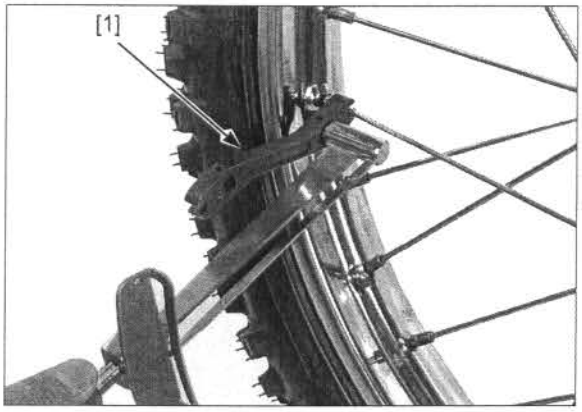
Maintenance of spoke tension and wheel trueness are critical to safe motorcycle operation. During the first 150 km (100 miles), spokes will loosen more rapidly due to initial seating of parts. Excessively loose spokes may result in high speed instability and possible loss of control.

Inspect the wheel rims and spokes for damage.

Tighten any loose spokes to the specified torque.

TOOL:
[1] Spoke wrench, 4.5 x 5.1 mm 07701 – 0020200

TORQUE: 3.2 N·m (0.33 kgf·m, 2.4 lbf·ft)



STEERING HEAD BEARINGS

Raise the front wheel off the ground by placing a work stand or box under the engine.

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

Check that the handlebar moves freely from side to side.

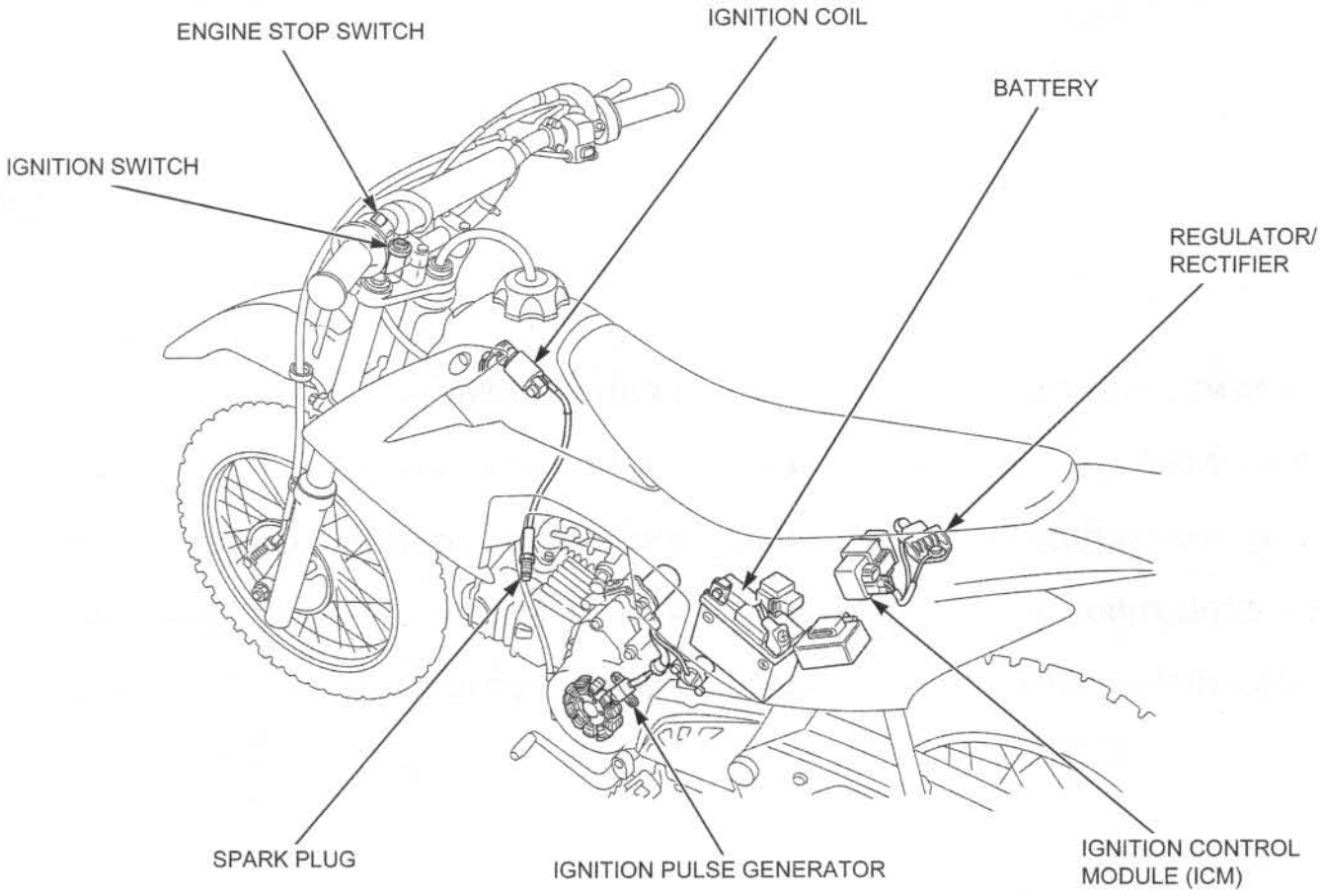
If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (page 14-26).

MEMO

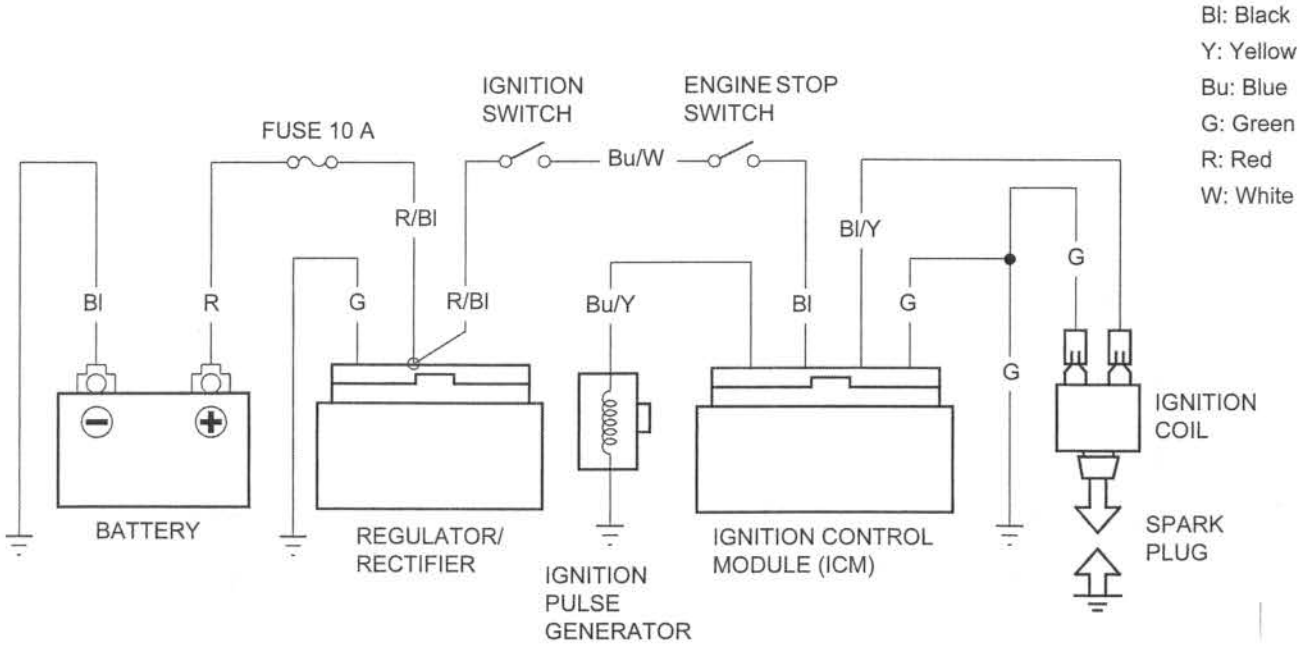
4. IGNITION SYSTEM

COMPONENT LOCATION 4-2
SYSTEM DIAGRAM 4-2
SERVICE INFORMATION 4-3
TROUBLESHOOTING 4-4
IGNITION SYSTEM INSPECTION 4-5
IGNITION TIMING 4-7
IGNITION COIL 4-8
ICM (IGNITION CONTROL MODULE) 4-8
IGNITION SWITCH 4-9
ENGINE STOP SWITCH 4-10

COMPONENT LOCATION



SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

NOTICE

- *The Ignition Control Module (ICM) may be damaged if dropped. Also, if the connector is disconnected when current is flowing, the excessive voltage may damage the ICM. Always turn the ignition switch to OFF before servicing.*
- *Use a spark plug of the correct heat range. Using a spark plug with an incorrect heat range can damage the engine.*

- When servicing the ignition system, always follow the steps in the troubleshooting sequence on page 4-4.
- The ignition timing cannot be adjusted since the ICM is factory preset.
- A faulty ignition system is often related to poor connections. Check those connections before proceeding.
- Make sure the battery is adequately charged. Using the starter motor with a weak battery results in a slower engine cranking speed as well as no spark at the spark plug.

SPECIFICATIONS

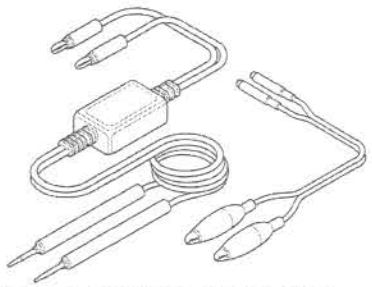
ITEM		SPECIFICATION
Spark plug	Standard	CPR6EA-9S (NGK)
Spark plug gap		0.8 – 0.9 mm (0.03 – 0.04 in)
Ignition coil peak voltage		100 V minimum
Ignition pulse generator peak voltage		1.5 V minimum
Ignition timing ("F" mark)		10° BTDC at idle

TORQUE VALUE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Timing hole cap	1	14	10 (1.0, 7)	

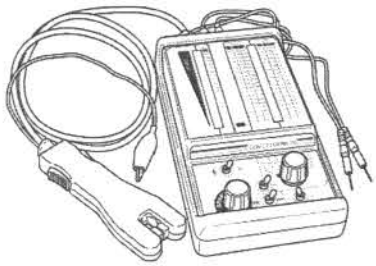
TOOLS

Peak voltage adaptor
07HGJ-0020100
(Not available in U.S.A.)



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

IgnitionMate peak voltage tester
MTP07-0286 (U.S.A. only)



TROUBLESHOOTING

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

No spark at plug

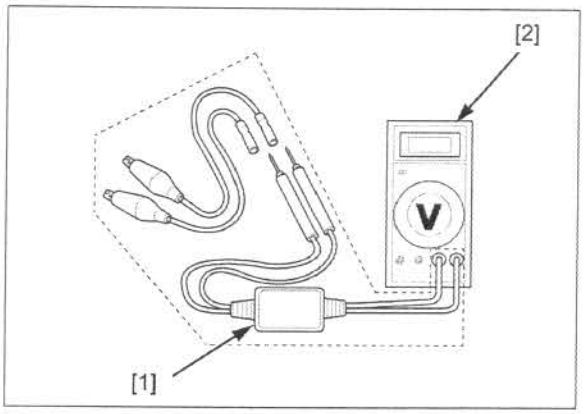
Unusual condition		Probable cause (check in numerical order)
Ignition coil primary voltage	Low peak voltage.	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too slow. (Battery is undercharged or the operating force of kickstarter is weak.) 3. The sampling time of the tester and measured pulse were not synchronized. (System is normal if measured voltage is over the standard voltage at least once.) 4. Poorly connected connectors or an open circuit in the ignition system. 5. Faulty ignition coil. 6. Faulty ignition control module (ICM) (in case when above No. 1 – 5 are normal).
	No peak voltage.	1. Incorrect peak voltage adaptor connections. 2. Faulty ignition switch or engine stop switch. 3. Loose or poorly connected ICM connectors. 4. No voltage at the Black wire of the ICM. 5. Open circuit or poor connection in the Green wire of the ICM. 6. Faulty peak voltage adaptor. 7. Faulty ignition pulse generator. (Measure the peak voltage.) 8. Faulty ICM (in case when above No.1 – 7 are normal).
	Peak voltage is normal, but no spark jumps at the plug.	1. Faulty spark plug or leaking ignition coil secondary current. 2. Faulty ignition coil.
Ignition pulse generator	Low peak voltage.	1. The multimeter impedance is too low. 2. Cranking speed is too slow. (Battery is undercharged or the operating force of kickstarter is weak.) 3. The sampling time of the tester and measured pulse were not synchronized. (System is normal if measured voltage is over the standard voltage at least once.) 4. Faulty ignition pulse generator (in case when above No.1 – 3 are normal).
	No peak voltage.	1. Faulty peak voltage adaptor. 2. Faulty ignition pulse generator.

IGNITION SYSTEM INSPECTION

NOTE:

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

Connect the peak voltage adaptor [1] to the digital multimeter [2], or use the peak voltage tester.



TOOL:

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

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

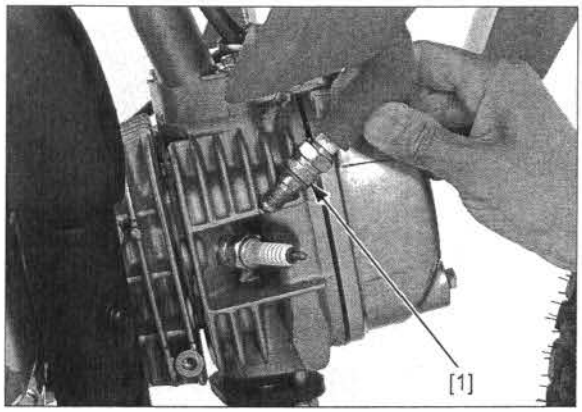
IGNITION COIL PRIMARY PEAK VOLTAGE

NOTE:

- Check all system connections before this inspection. Poor connected connectors can cause incorrect readings.
- Check the cylinder compression and check that the spark plug is installed correctly in the cylinder head.

Remove the fuel tank (page 6-5).

Disconnect the spark plug cap from the spark plug. Connect a known good spark plug [1] to the spark plug cap and ground it to the cylinder head as done in a spark test.



With the ignition coil primary wire connected, connect the peak voltage tester or adaptor probes to the ignition coil primary terminal (Black/yellow) [1] and body ground.

TOOL:

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

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

CONNECTION:

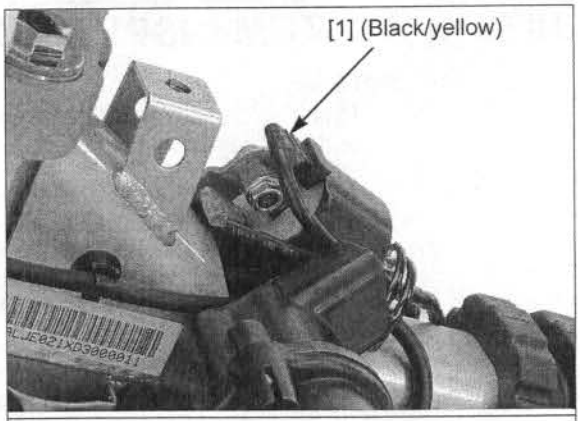
Black/yellow wire terminal (–) – Body ground (+)

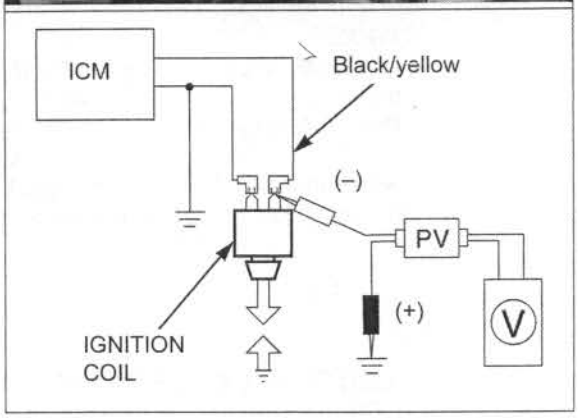
Shift the transmission into neutral.
Turn the ignition switch to ON.

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

PEAK VOLTAGE: 100 V minimum

If the peak voltage is lower than the standard value, follow the checks described in the troubleshooting chart (page 4-4).





IGNITION PULSE GENERATOR PEAK VOLTAGE

NOTE:

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

Remove the seat (page 2-4).

Disconnect the ICM 4P connector [1].
Connect the peak voltage tester or adaptor probes to the ignition pulse generator wire terminal of the ICM 4P connector and body ground.

TOOL:

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

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

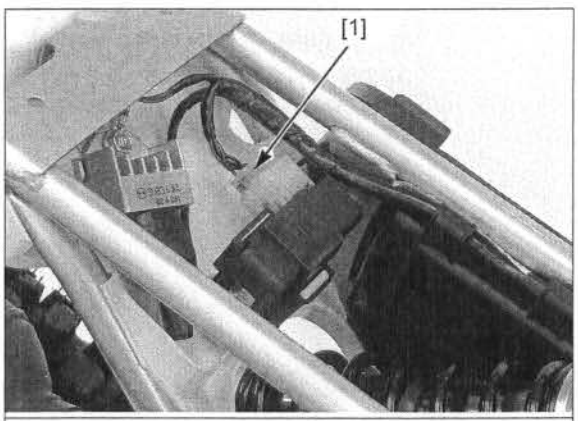
CONNECTION:

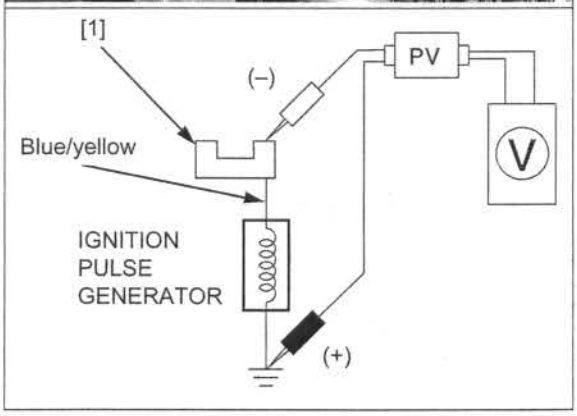
Blue/yellow wire terminal (–) – Body ground (+)

Shift the transmission into neutral.
Turn the ignition switch to ON.
Crank the engine with the starter motor and read ignition pulse generator peak voltage.

PEAK VOLTAGE: 1.5 V minimum

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



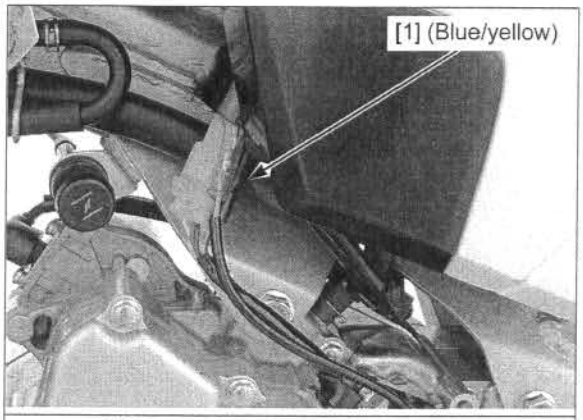


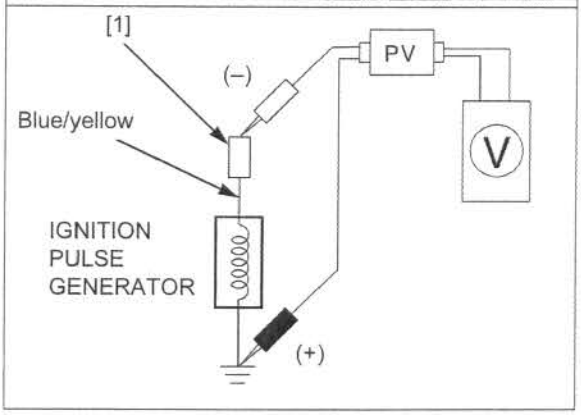
Disconnect the ignition pulse generator wire connector (Blue/yellow) [1].
Connect the peak voltage tester or adaptor probes to the ignition pulse generator wire connector and body ground.

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 or short circuit, or loose connection.
- If both peak voltages are abnormal, follow the checks described in the troubleshooting chart (page 4-4).

Refer to procedure for alternator stator replacement (page 11-5).





IGNITION TIMING

Warm up the engine.

Stop the engine and remove the timing hole cap from the left crankcase cover.

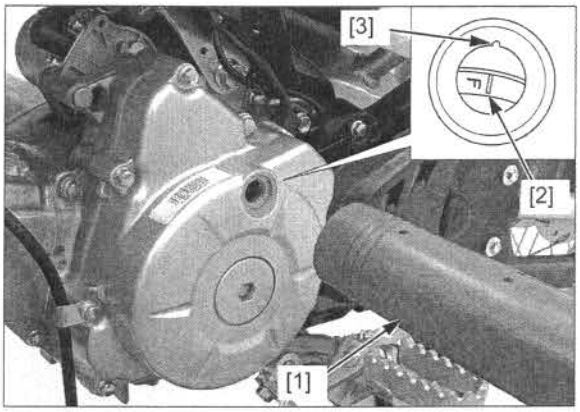
Read the instructions for timing light operation.

Connect a timing light [1] to the spark plug wire.

Start the engine and let it idle.

IDLE SPEED: 1,400 ± 100 rpm

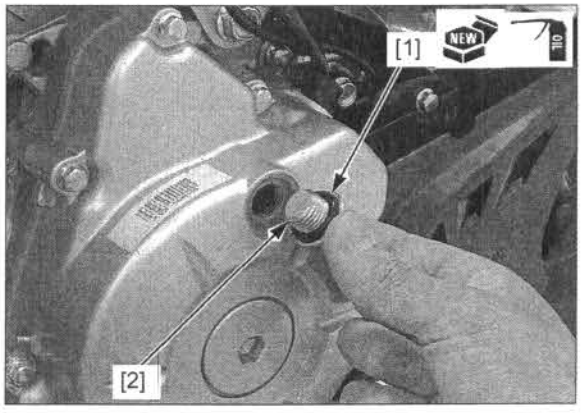
The ignition timing is correct if the "F" mark [2] on the flywheel aligns with the index notch [3] on the left crankcase cover.



Coat a new O-ring [1] with engine oil and install it onto the timing hole cap [2].

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

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



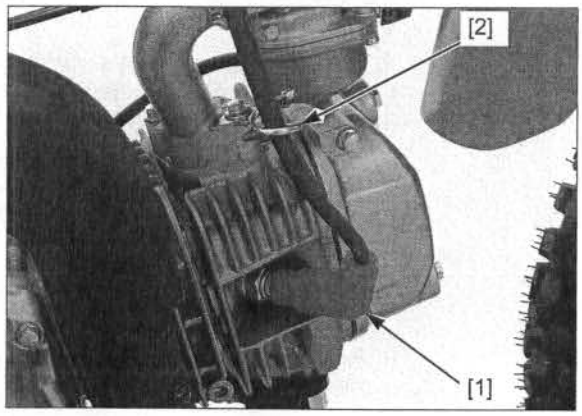
IGNITION COIL

REMOVAL/INSTALLATION

Remove the fuel tank (page 6-5).

Disconnect the spark plug cap [1] from the spark plug.

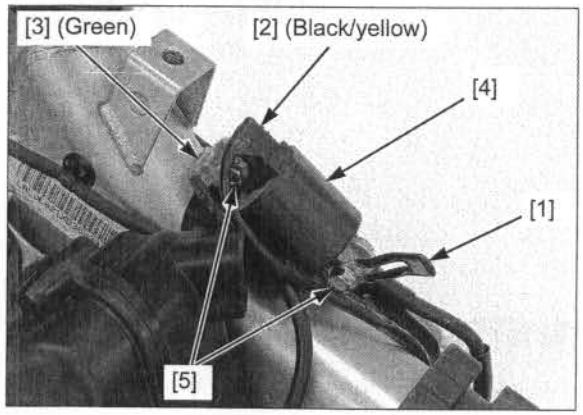
Release the plug wire from the wire guide [2].



Open the wire clamp [1] and disconnect the primary wire connector [2] and ground wire connector [3] from the ignition coil [4].

Remove the bolts [5], wire clamp and ignition coil.

Installation is in the reverse order of removal.



ICM (IGNITION CONTROL MODULE)

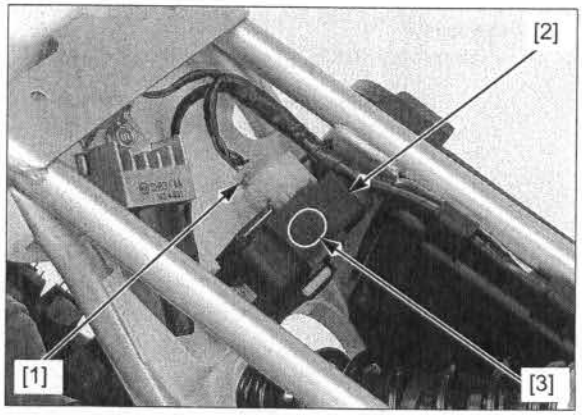
REMOVAL/INSTALLATION

Remove the seat (page 2-4).

Disconnect the ICM 4P connector [1].
Remove the ICM [2] from the rear fender.

Installation is in the reverse order of removal.

- Install the ICM with the "UP" mark [3] facing up.



IGNITION SWITCH

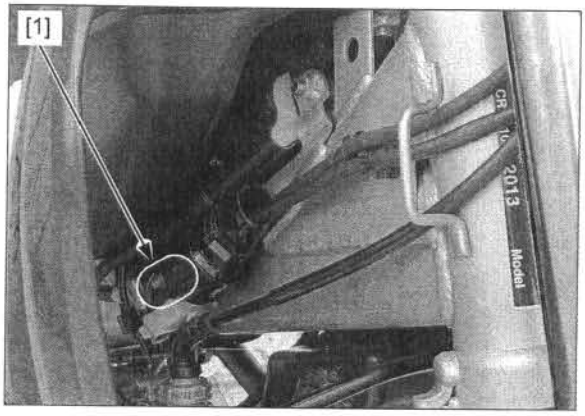
INSPECTION

Disconnect the ignition switch wire connectors [1].

Check for continuity between the ignition switch side connector terminals.

CONNECTION: Red/black – Blue/white

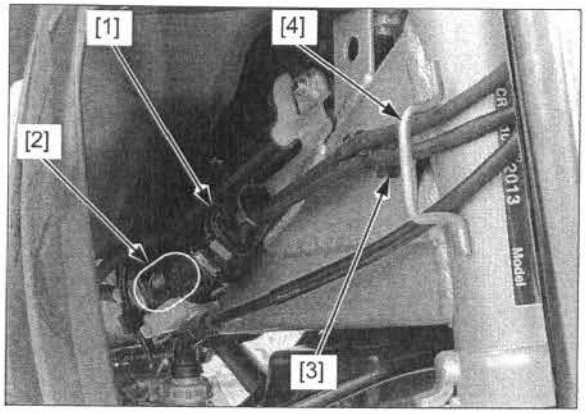
There should be continuity with the ignition switch ON and no continuity with the ignition switch OFF.



REMOVAL/INSTALLATION

Release the wire band [1] and disconnect the ignition switch wire connectors [2].

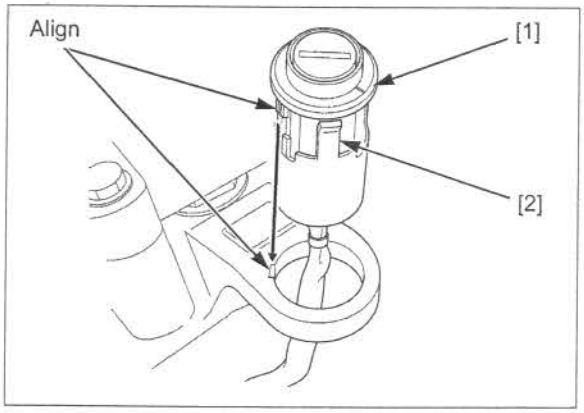
Remove the wire band boss [3] and release the ignition switch wire from the wire guide [4].



Remove the ignition switch [1] from the top bridge by pushing the two stoppers [2].

Install the removed parts in the reverse order of removal.

- Install the ignition switch by aligning the tab with the groove of the top bridge.



ENGINE STOP SWITCH

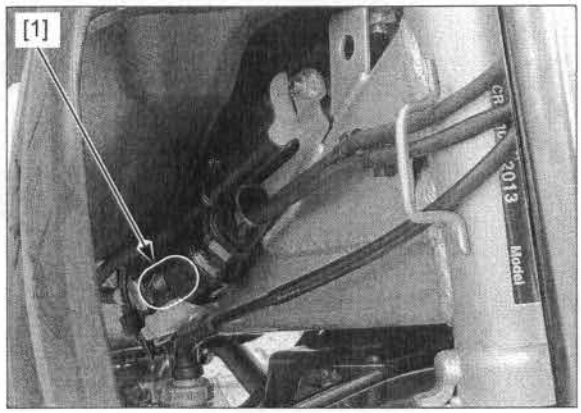
INSPECTION

Disconnect the engine stop switch wire connectors [1].

Check for continuity between the engine stop switch side connector terminals.

CONNECTION: Blue/white - Black

There should be continuity with the engine stop switch is "○" and no continuity with the engine stop switch "⊗".



5. ELECTRIC STARTER

5

COMPONENT LOCATION 5-2

SYSTEM DIAGRAM 5-2

SERVICE INFORMATION 5-3

TROUBLESHOOTING 5-4

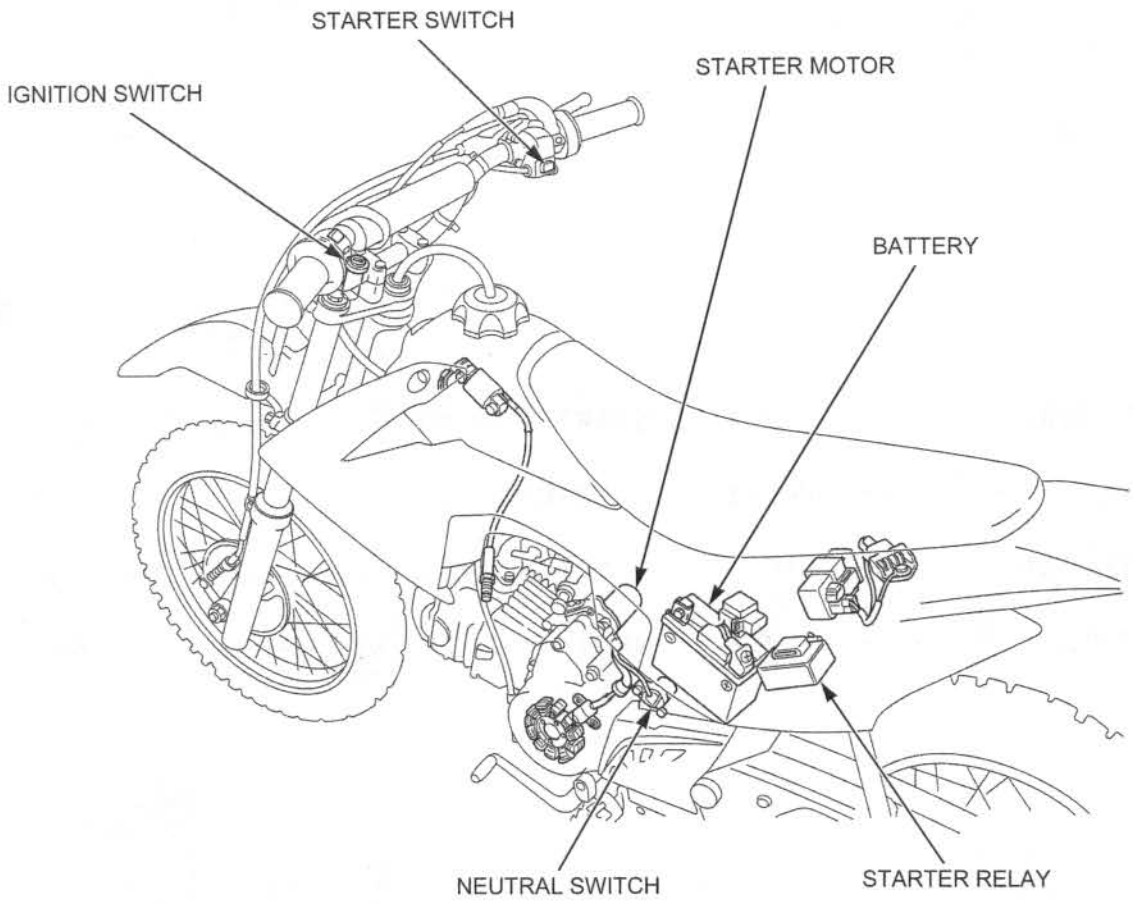
STARTER MOTOR 5-6

STARTER RELAY 5-9

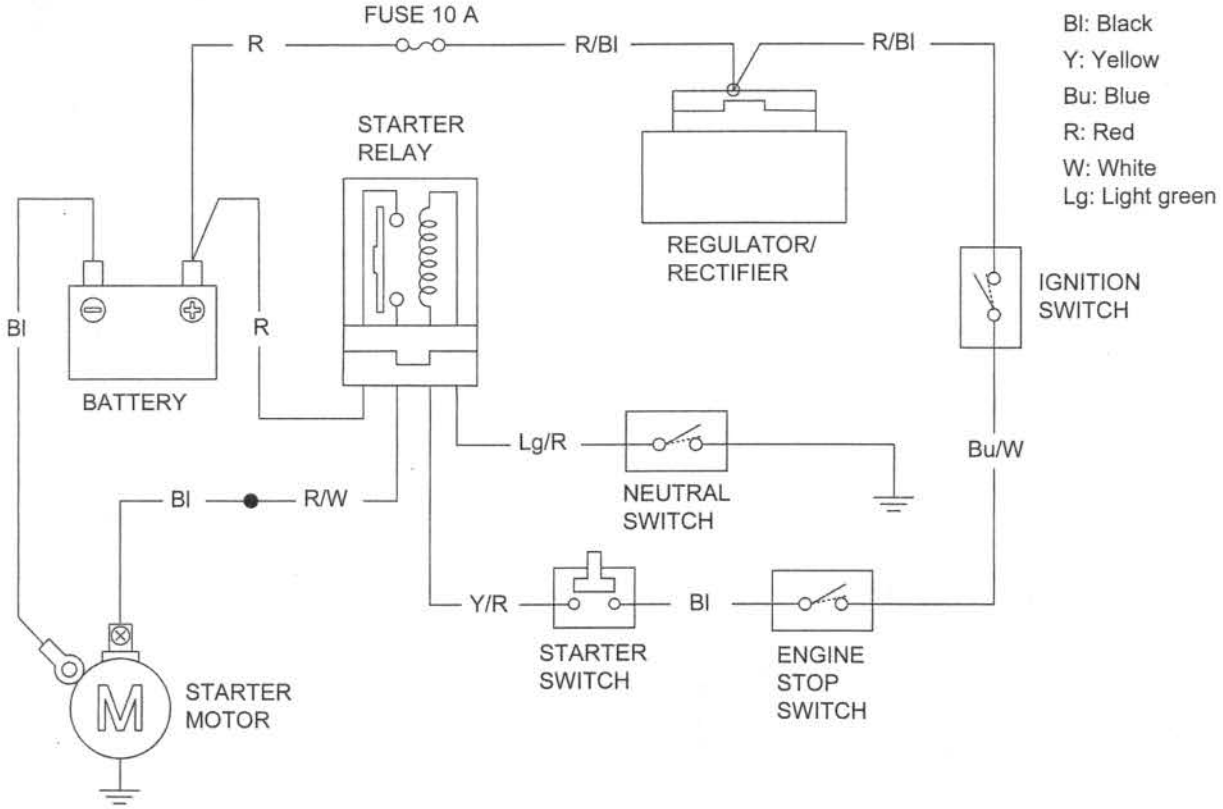
STARTER SWITCH 5-10

NEUTRAL SWITCH 5-11

COMPONENT LOCATION



SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

NOTICE

If the current is kept flowing through the starter motor to turn it while the engine is not cranking over, the starter motor may be damaged.

- When checking the starter system, always follow the steps in the troubleshooting (page 5-4).
- The starter motor can be serviced with the engine in the frame.
- Always turn the ignition switch to OFF before servicing the starter motor. The motor could suddenly start, causing serious injury.
- Refer to procedure for starter clutch servicing (page 11-5).
- Refer to information for ignition switch (page 4-9).
- Refer to inspection for engine stop switch (page 4-10).

SPECIFICATION

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	7.0 (0.28)	3.5 (0.14)

TORQUE VALUE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Starter motor cable screw	1	4	2 (0.2, 1.5)	

TROUBLESHOOTING

Starter motor does not turn

1. **Fuse Inspection**

   Check for blown fuse (10 A).

   Is the fuse blown?

   YES – Replace the fuse.

   NO – GO TO STEP 2.

2. **Battery Inspection**

   Make sure the battery is fully charged and in good condition.

   Is the battery in good condition?

   YES – GO TO STEP 3.

   NO – Charge or replace the battery.

3. **Battery Cable Inspection**

   Check the battery cables for loose or poorly connected terminal, and for an open circuit.

   Is the battery cable in good condition?

   YES – GO TO STEP 4.

   NO – • Loose or poorly connected battery cables.
   • Open circuit in the battery cable.

4. **Starter Motor Cable Inspection**

   Check the starter motor cable for loose or poorly connected terminal, and for an open circuit.

   Is the terminal loose or poorly connected?

   YES – • Loose or poorly connected starter motor cable.
   • Open circuit in the starter motor cable.

   NO – GO TO STEP 5.

5. **Starter Relay Operation Inspection**

   Check the operation of the starter relay (page 5-9).

   Does the starter relay click?

   YES – GO TO STEP 6.

   NO – GO TO STEP 7.

6. **Starter Motor Inspection**

   Connect the starter motor terminal to the battery positive terminal directly. (A large amount of current flows, so do not use a thin wire.)

   Does the starter motor turn?

   YES – Faulty starter relay.

   NO – Faulty starter motor.

7. **Relay Coil Ground Line Inspection**

   Check the ground line of the starter relay (page 5-10).

   Is the ground line normal?

   YES – GO TO STEP 8.

   NO – • Faulty neutral switch (page 5-11).
   • Loose or poor contact of the related connector terminal.
   • Open circuit in Light green/red wire between the starter relay and neutral switch.

8. **Relay Coil Power Input Line Inspection**

   Check the power input line of the starter relay (page 5-10).

   Is the power input line normal?

   YES – GO TO STEP 9.

   NO – • Faulty ignition switch.
   • Faulty engine stop switch.
   • Faulty starter switch.
   • Loose or poor contact of the related connector terminal.
   • Open circuit in Yellow/red wire between the starter relay and starter switch.
   • Open circuit in Black wire between the starter switch and engine stop switch.
   • Open circuit in Blue/white between the engine stop switch and ignition switch.

9. **Starter Relay Inspection**

   Check the function of the starter relay (page 5-10).

   Does the starter relay function properly?

   YES – Loose or poor contact of the starter relay connector.

   NO – Faulty starter relay.

Starter motor turns engine slowly
- Low battery voltage
- Poorly connected battery cable
- Poorly connected starter motor cable
- Faulty starter motor
- Poorly connected ground cable terminal

Starter motor turns, but engine does not turn
- Faulty starter clutch
- Damaged starter gear train

Starter relay clicks, but engine does not turn over
- Crankshaft does not turn due to engine problems

STARTER MOTOR

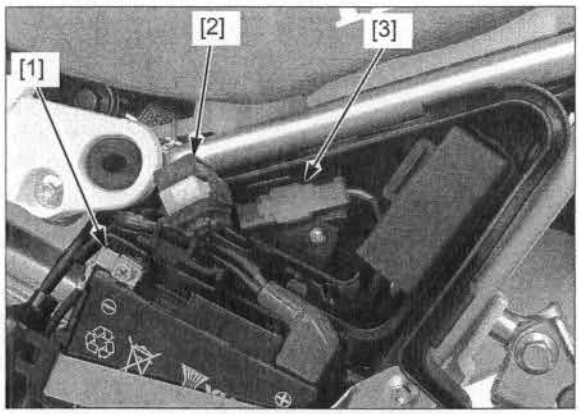
REMOVAL/INSTALLATION

Remove the left side cover (page 2-4).

Disconnect the negative (–) cable [1] from the battery.

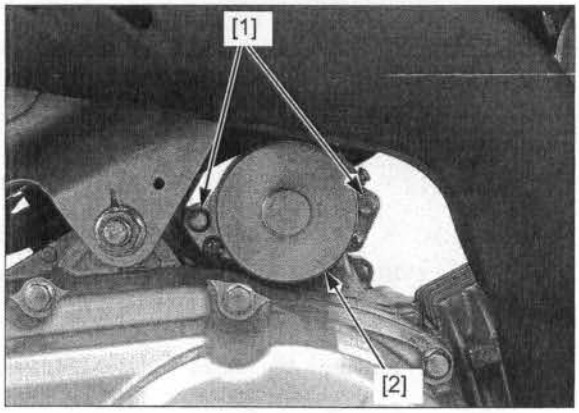
Release the fuse box [2] and starter motor 2P connector [3] from the battery case.

Disconnect the starter motor 2P connector and pull out the starter motor wire from the battery case.



Remove the starter motor mounting bolts [1].

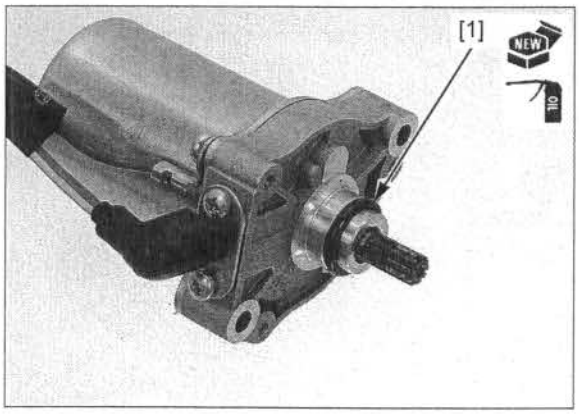
Remove the starter motor [2] from the engine.



Remove the O-ring [1].

Installation is in the reverse order of removal.

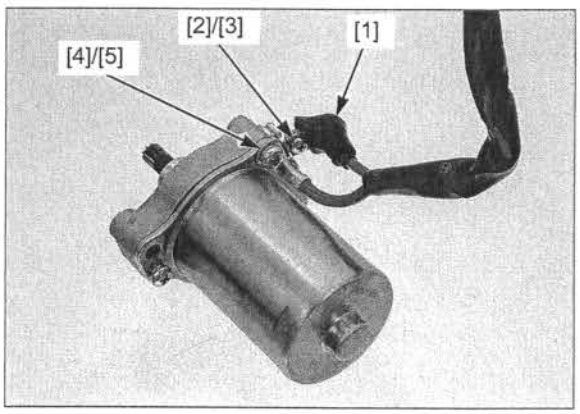
- Coat a new O-ring [1] with engine oil



DISASSEMBLY

Pull off the dust cover [1].
Remove the screw [2] and starter motor cable terminal [3].

Remove the screw [4] and ground cable terminal [5].

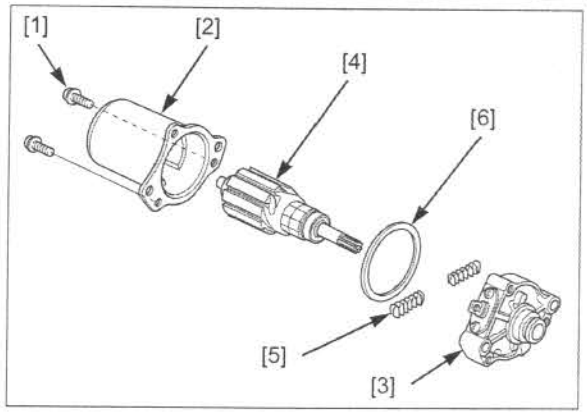


The armature is magnetically attracted to the motor case, be careful during removal.

Remove the screws [1] and starter motor case [2].

Remove the following from the bracket [3]:

- Armature [4]
- Springs [5]
- Gasket [6]

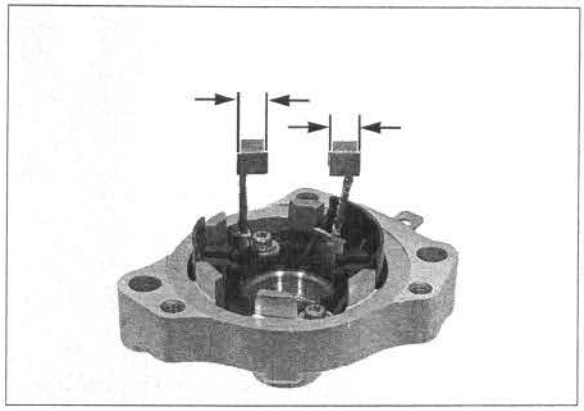


INSPECTION

BRUSH

Inspect the brushes for damage and measure the brush length.

SERVICE LIMIT: 3.5 mm (0.14 in)

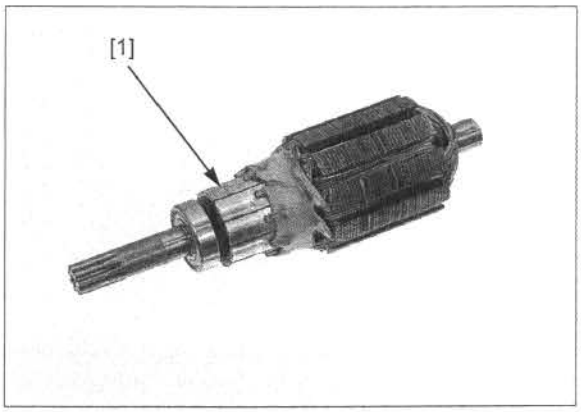


ARMATURE

Do not use emery or sand paper on the commutator.

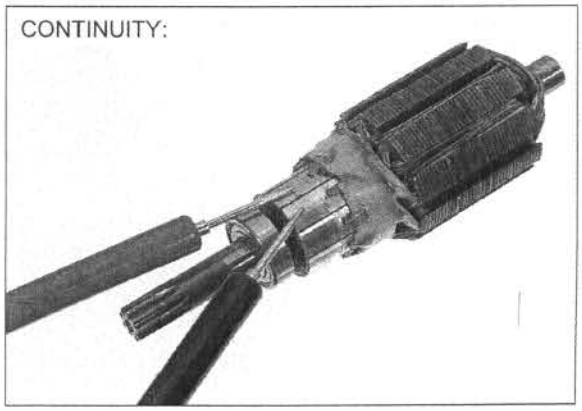
Inspect the commutator bars [1] of the armature for discoloration.

Bars discolored in pairs indicate shorted coils.



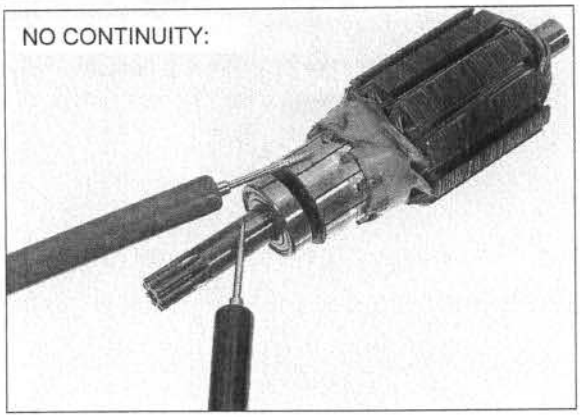
Check for continuity between each pair of commutator bars.

There should be continuity.



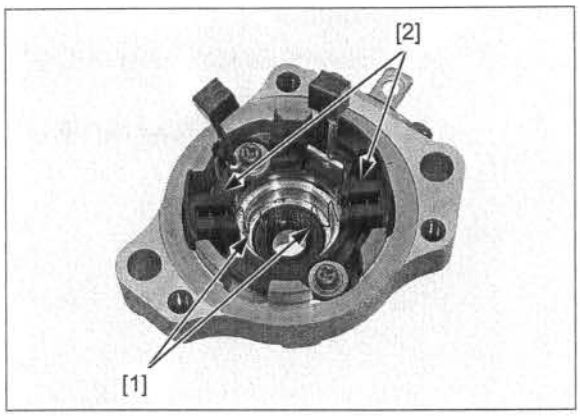
Check for continuity between each commutator bar and the armature shaft.

There should be no continuity.

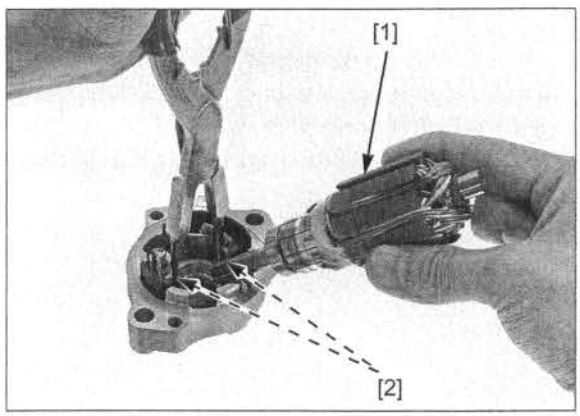


ASSEMBLY

Install the springs [1] in the brush holders [2].



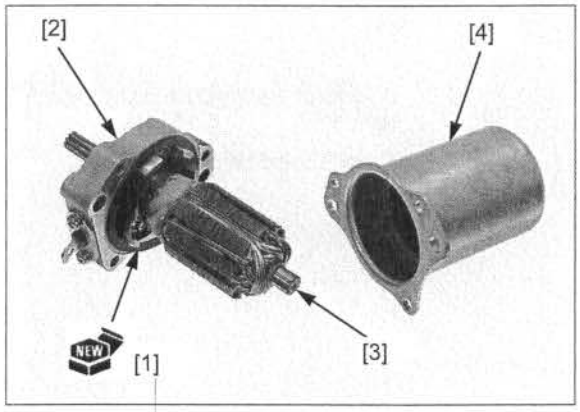
Install the armature [1] into the bracket while holding the brushes [2].



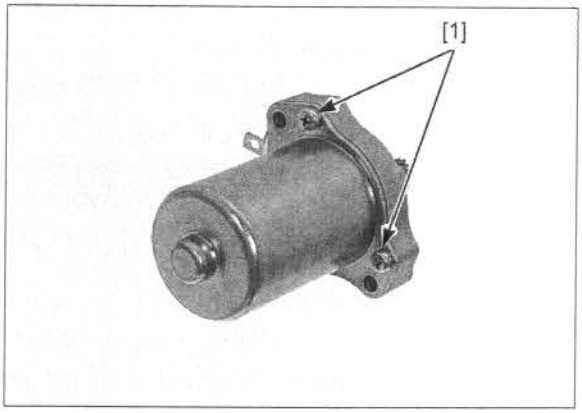
Install a new gasket [1] onto the bracket [2].

Install the bracket and armature [3] to the motor case [4] while holding the bracket side armature shaft tightly.

The armature is magnetically attracted to the motor case, be careful during installation.



Install and tighten the motor case screws [1].

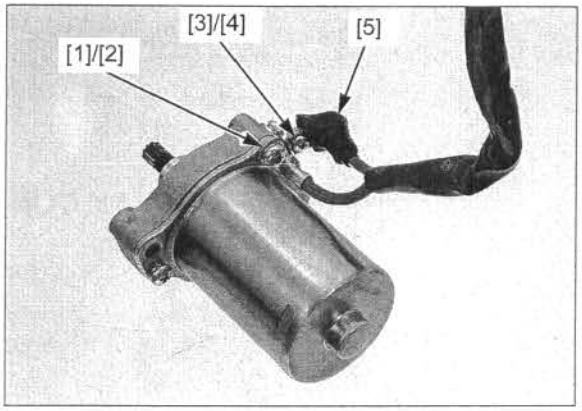


Install the ground cable terminal [1] and tighten the screw [2].

Install the starter motor cable terminal [3] and tighten the screw [4] to the specified torque.

TORQUE: 2 N·m (0.2 kgf·m, 1.5 lbf·ft)

Put back the dust cover [5] in the appropriate position.

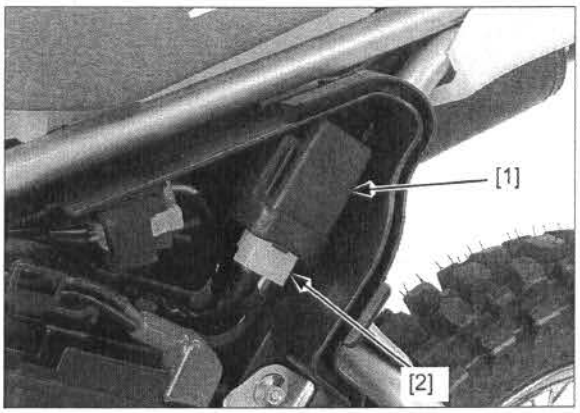


STARTER RELAY

REMOVAL/INSTALLATION

Remove the left side cover (page 2-4).

Release the starer relay [1] from the battery case and Disconnect the starter relay 5P connector [2].



OPERATION INSPECTION

Remove the left side cover (page 2-4).

Shift the transmission into neutral.
Turn the ignition switch to ON and engine stop switch to "○", push the starter switch.
The coil is normal if the starter relay [1] clicks.

If you don't hear the click, inspect the starter relay circuits (page 5-10).

CIRCUIT INSPECTION

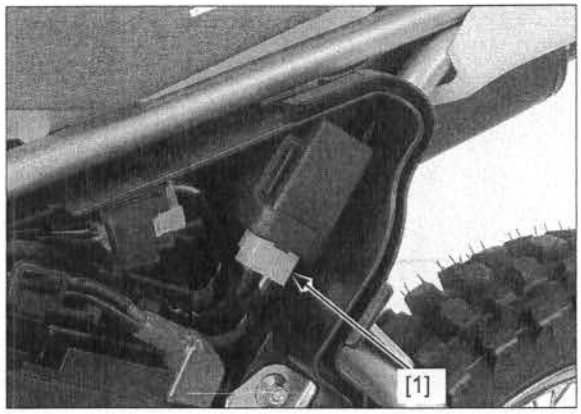
GROUND LINE

Remove the left side cover (page 2-4).

Disconnect the starter relay 5P connector [1].

Check for continuity between the Light green/red wire terminal of the wire harness side connector and ground.

If there is continuity when the transmission is in neutral, the ground circuit is normal.



POWER INPUT LINE

Connect the starter relay 5P connector.

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

Measure the voltage between the Yellow/red wire terminal (+) and ground (–).

If battery voltage appears only when the starter switch is pushed, the circuit is normal.

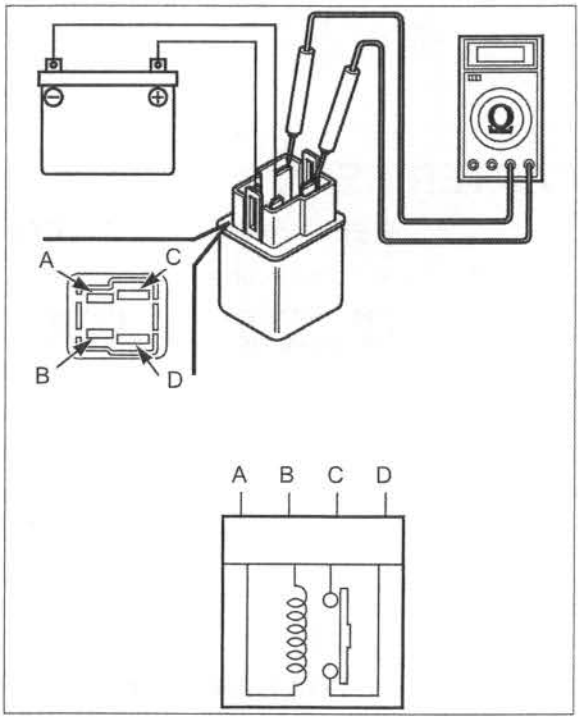
STARTER RELAY CONTINUITY INSPECTION

Remove the starter relay (page 5-9).

Connect a fully charged 12 V battery positive wire to the relay switch terminal A and negative wire to the terminal B.

Check for continuity at the terminal C and terminal D.

There should be continuity between the C and D terminals while the battery is connected, and no continuity when the battery is disconnected.



STARTER SWITCH

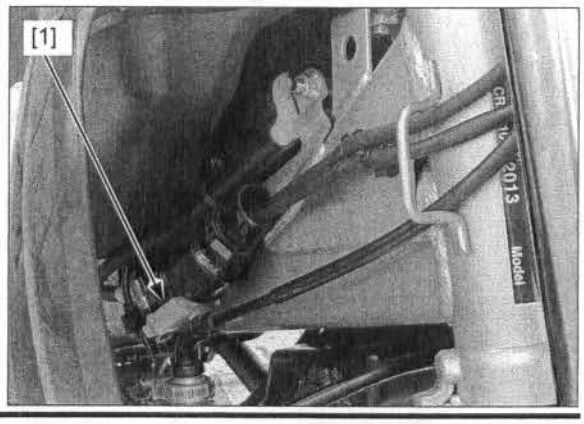
Remove the right fuel tank shroud (page 2-3).

Disconnect the starter switch 3P connector [1].

Check for continuity between the starter switch connector terminals.

CONNECTION: Black – Yellow/red

There should be continuity with the starter switch depressed, and no continuity with the switch released.



NEUTRAL SWITCH

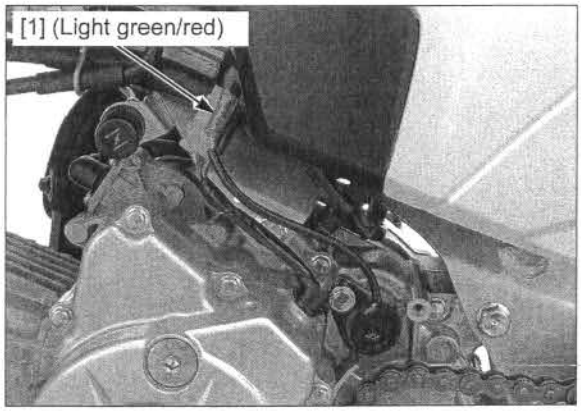
INSPECTION

Disconnect the neutral switch wire connector [1].

Check for continuity between the switch side Light green/red terminal and ground.

There should be continuity with the transmission is in neutral, and no continuity when the transmission is into gear.

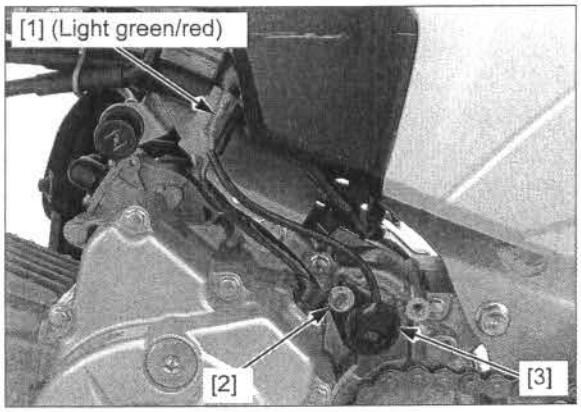
Connect the neutral switch wire connector.



REMOVAL/INSTALLATION

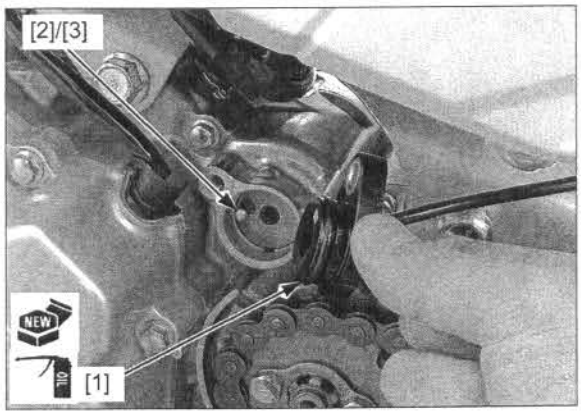
Remove the neutral switch wire connector [1].

Remove the bolt [2] and neutral switch [3].



Remove O-ring [1] from the neutral switch.

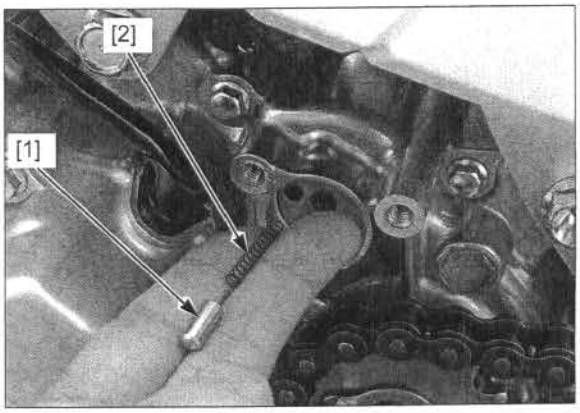
Remove the contact switch cap [2] and spring [3] from the shift drum.



Install the contact switch cap [1] and spring [2] into the shift drum hole.

Install the removed parts in the reverse order of removal.

- Apply engine oil to a new O-ring.

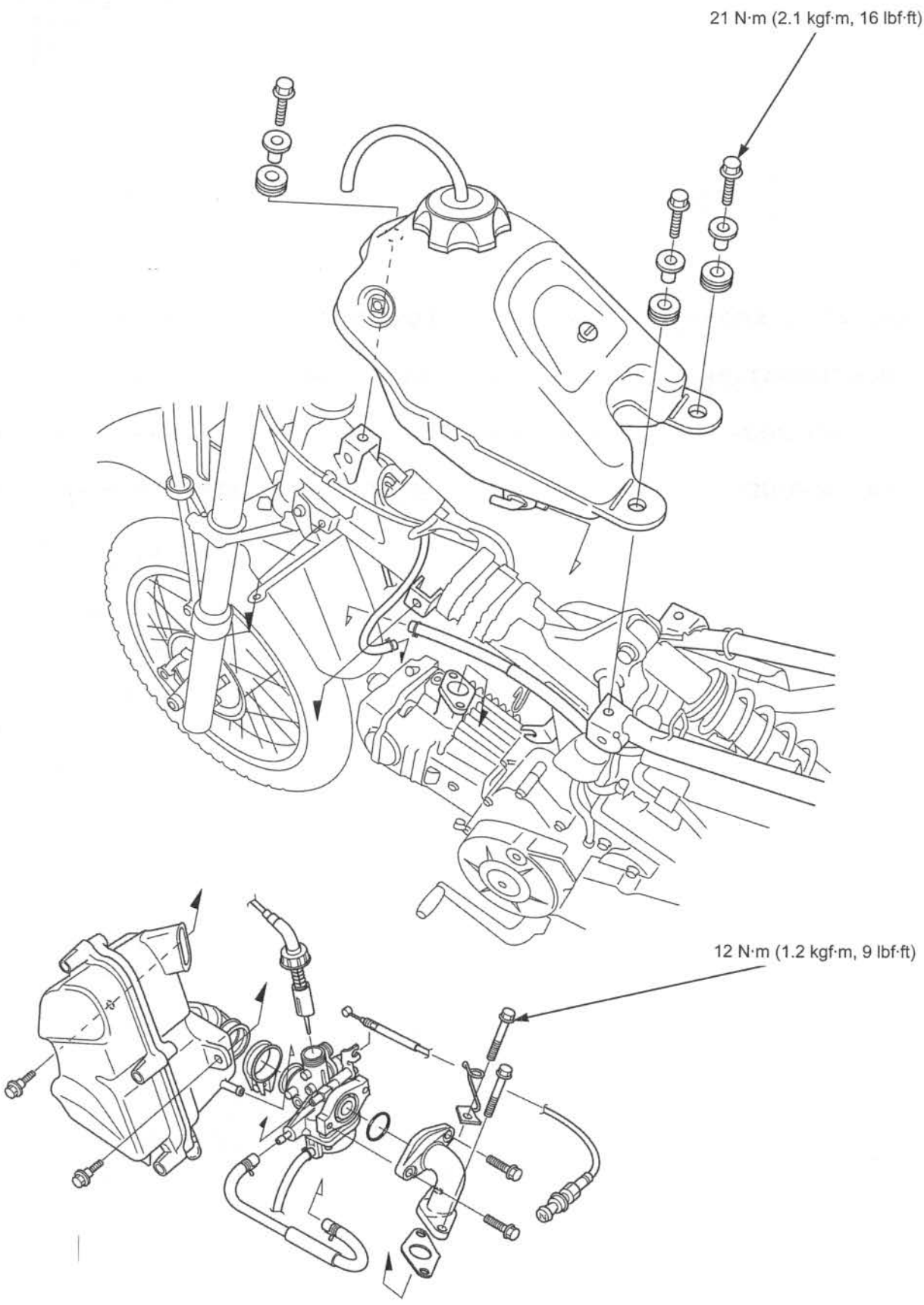


MEMO

6. FUEL SYSTEM

COMPONENT LOCATION 6-2
SERVICE INFORMATION 6-3
TROUBLESHOOTING 6-4
AIR CLEANER HOUSING 6-5
FUEL TANK 6-5
INTAKE PIPE 6-6
CARBURETOR 6-6
AIR SCREW ADJUSTMENT 6-15

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

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

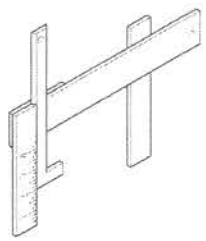
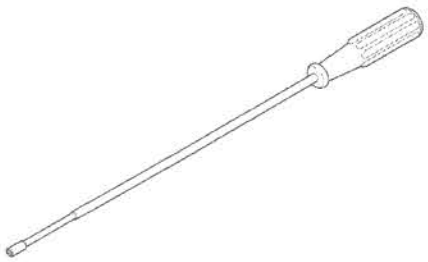
SPECIFICATIONS

ITEM	SPECIFICATIONS
Carburetor identification number	PB5PF
Carburetor type	Piston valve
Main jet	#68
Slow jet	#38
Air screw opening	See page 6-15
Float level	10.7 mm (0.42 in)
Engine idle speed	1,400 ± 100 rpm
Throttle grip freeplay	3 – 6 mm (0.12 – 0.24 in)

TORQUE VALUES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Fuel tank mounting bolt	3	8	21 (2.1, 16)	
Intake pipe mounting bolt	2	6	12 (1.2, 9)	
Slow jet	1	–	1.5 (0.15, 1.1)	
Main jet	1	–	1.5 (0.15, 1.1)	
Needle jet holder	1	–	2.5 (0.25, 1.8)	
Float chamber screw	2	4	2.1 (0.21, 1.5)	
Float chamber drain screw	1	–	1.5 (0.15, 1.1)	

TOOLS

Carburetor float level gauge 07401-0010000 	Pilot screw wrench (D type) 07KMA-MS60102  or 07KMA-MN9A100 (U.S.A. only)

TROUBLESHOOTING

Engine cranks but won't start
- No fuel to carburetor
  - Fuel strainer clogged
  - Fuel hose clogged
  - Float level misadjusted
  - Fuel tank breather hose clogged
- Too much fuel getting to the engine
  - Flooded carburetor
  - Clogged air cleaner
- Fuel contaminated/deteriorated
- No spark at plug (ignition system faulty)
- Intake air leak
- Improper choke operation
- Improper throttle operation

Engine idles roughly, runs poorly or stalls
- Fuel line restricted
- Improper choke operation
- Ignition malfunction
- Fuel contaminated/deteriorated
- Intake air leak
- Incorrect idle speed
- Incorrect float level
- Throttle stop screw not adjusted properly
- Low cylinder compression
- Rich mixture
- Lean mixture
- Clogged carburetor

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

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

Poor performance (driveability) and/or poor fuel economy
- Fuel system clogged
- Ignition system faulty
- Air cleaner clogged
- 40 mm throttle limiter screw installed in the throttle housing (replace with 10 mm screw to allow full throttle) (page 3-6)

Lean mixture
- Clogged fuel jets
- Faulty float valve
- Float level too low
- Blocked fuel fill cap air vent hose
- Clogged fuel strainer screen
- Restricted fuel line
- Clogged carburetor air vent hose
- Intake air leak
- Throttle valve faulty

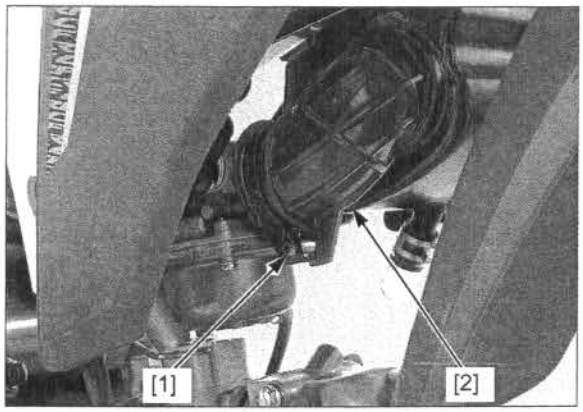
Rich mixture
- Clogged air cleaner
- Worn jet needle or needle jet
- Faulty float valve
- Float level too high
- Choke lever in CLOSE position
- Air jets clogged
- Flooded carburetor

AIR CLEANER HOUSING

REMOVAL/INSTALLATION

Remove the left fuel tank shroud (page 2-3).

Loosen the band screw [1] and release the air cleaner connecting hose [2] from the carburetor.

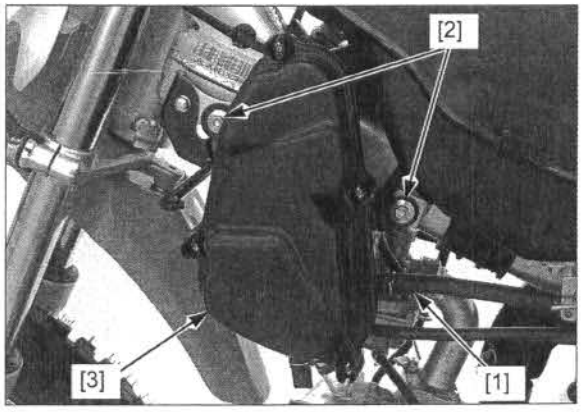


Disconnect the crankcase breather hose [1].

Remove the two air cleaner housing mounting bolts [2] and air cleaner housing [3].

Installation is in the reverse order of removal.

- Tighten the connecting hose band screw until the band seat on the collar.



FUEL TANK

REMOVAL/INSTALLATION

Remove the following:

- Seat (page 2-4)
- Fuel tank shrouds (page 2-3)

Turn the fuel valve [1] OFF.

Disconnect the fuel hose [2] from the fuel valve.

Disconnect the fuel tank breather hose [3] from the hole on the top bridge.

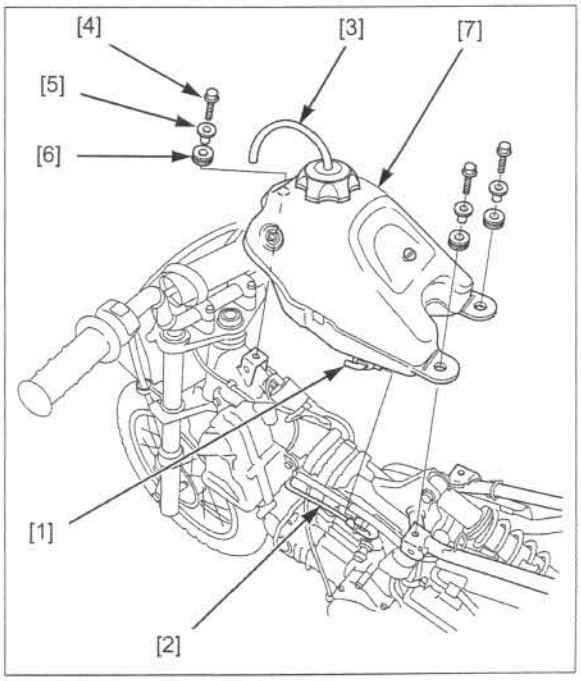
Remove the following:

- Bolts [4]
- Collars [5]
- Rubber cushions [6]
- Fuel tank [7]

Installation is in the reverse order of removal.

TORQUE:

Fuel tank mounting bolt:
21 N·m (2.1 kgf·m, 16 lbf·ft)

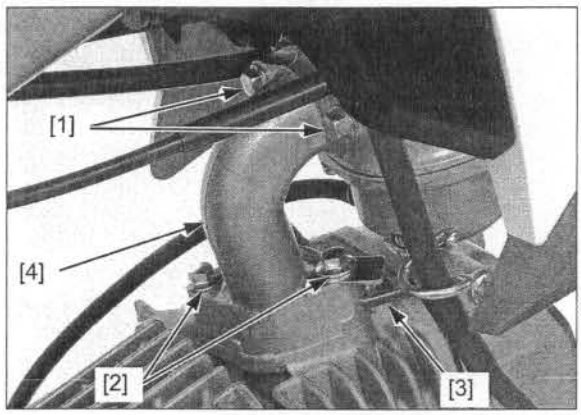


INTAKE PIPE

REMOVAL/INSTALLATION

Remove the following:

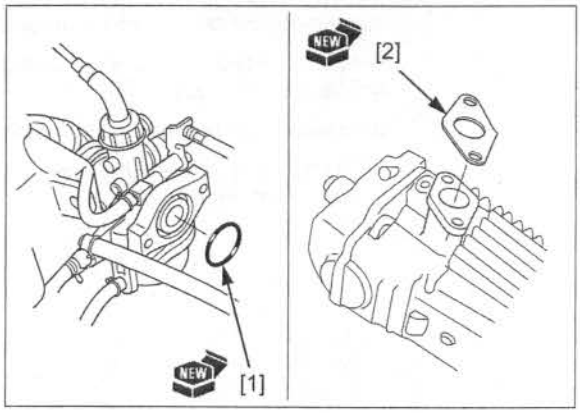
- Carburetor mounting bolts [1]
- Intake pipe mounting bolts [2]
- Wire guide [3]
- Intake pipe [4]



Replace the O-ring [1] and gasket [2] new ones.

Installation is in the reverse order of removal.

TORQUE:
Intake pipe mounting bolt:
12 N·m (1.2 kgf·m, 9 lbf·ft)



CARBURETOR

REMOVAL

Remove the right fuel tank shroud (page 2-3).

Turn the fuel valve OFF.

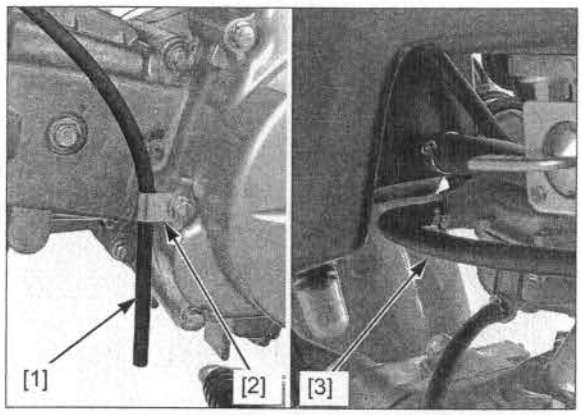
Place an approved gasoline container under the drain hose [1] and loosen the drain screw to drain the fuel.

Tighten the drain screw to the specified torque.

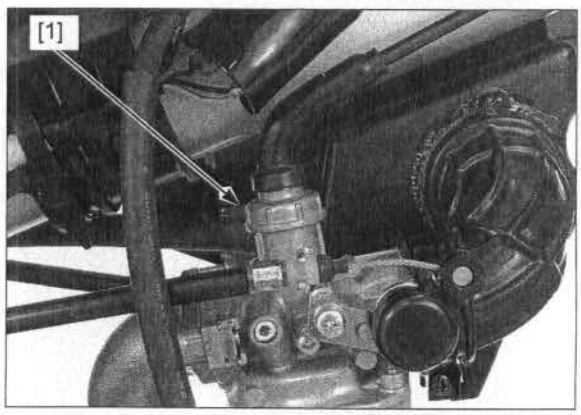
TORQUE: 1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)

Release the drain hose from the hose guide [2].

Disconnect the fuel hose [3] from the carburetor.

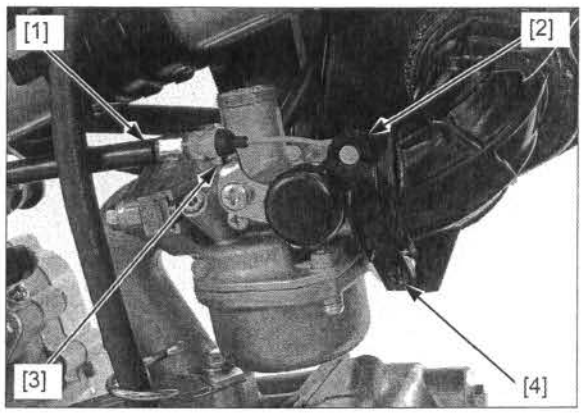


Loosen the carburetor top [1] and pull the throttle valve out.



Remove the choke cable [1] from the choke lever [2] and cable guide [3].

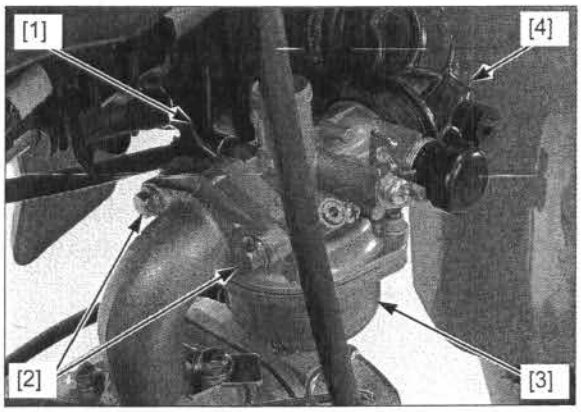
Loosen the band screw [4].



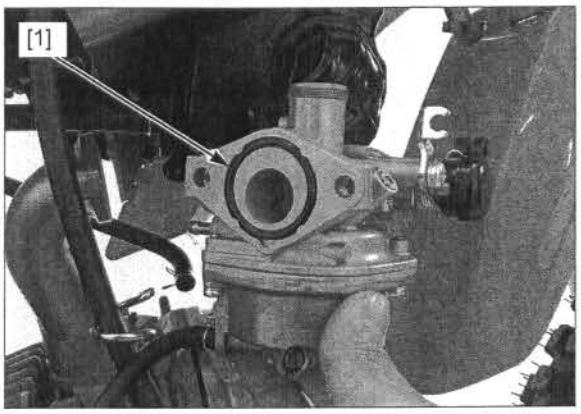
Disconnect the air vent hose [1].

Remove the two bolts [2]

Remove the carburetor [3] from the air cleaner connecting hose [4].



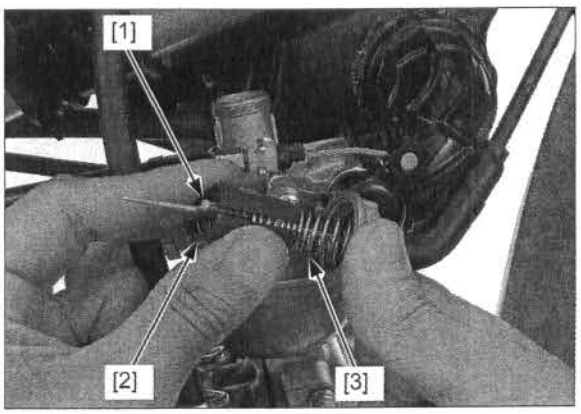
Remove the O-ring [1] from the carburetor body.



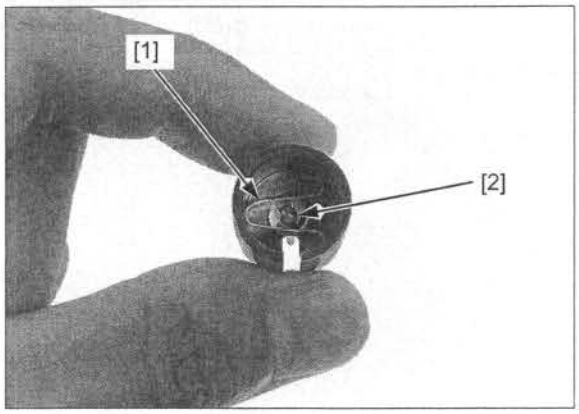
DISASSEMBLY

THROTTLE VALVE

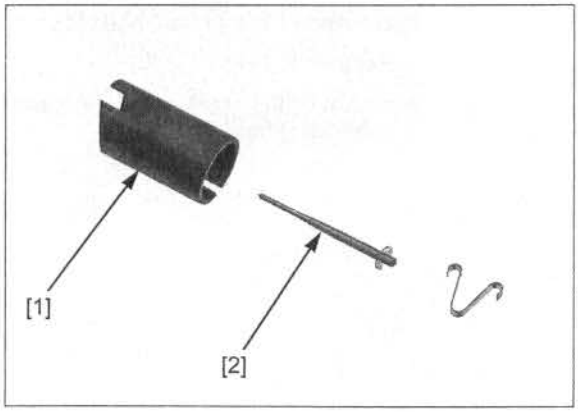
Remove the throttle cable [1] from the throttle valve [2] while compressing the throttle valve spring [3].



Remove the jet needle retainer [1] and jet needle [2].



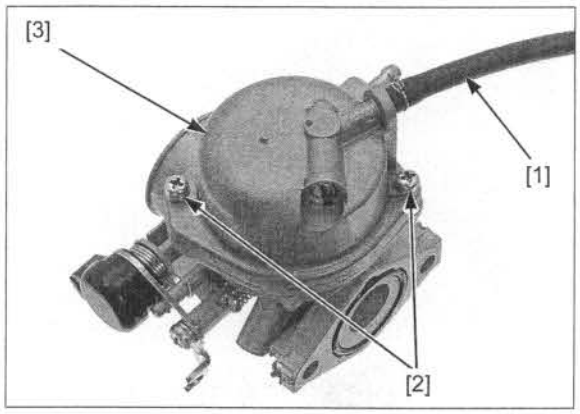
Check the throttle valve [1] and jet needle [2] for scratches, wear or damage.



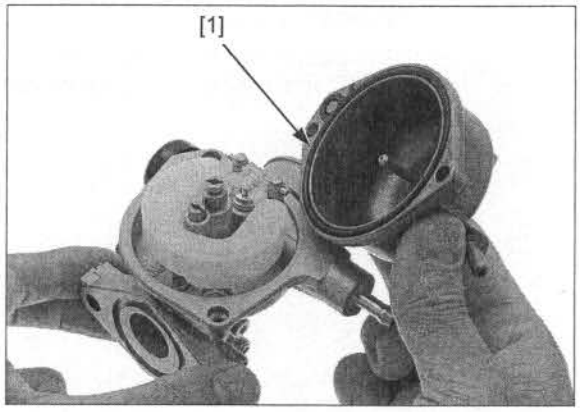
FLOAT AND JETS

Disconnect the drain hose [1].

Remove the two screws [2] and float chamber [3].

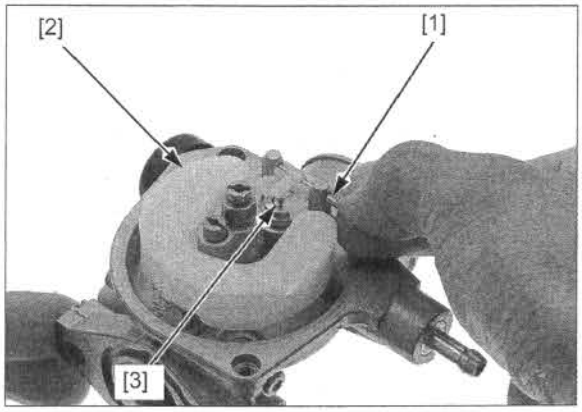


Remove the O-ring from the float chamber.



Remove the float pin [1], float [2] and float valve [3].

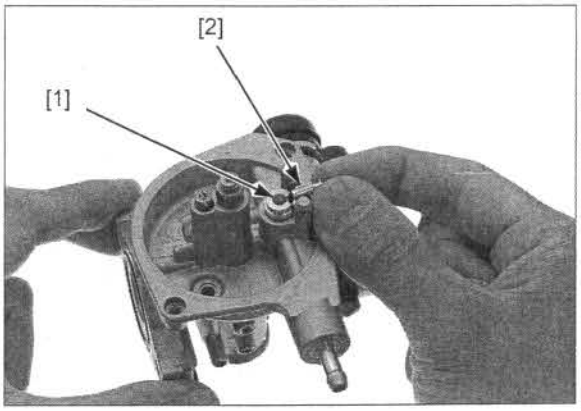
Inspect the float for deformation or damage.



Inspect the float valve seat [1] for scores, scratches, clogging and damage.

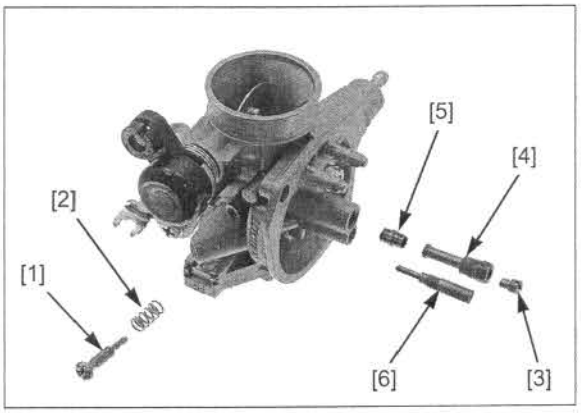
Check the tip of the float valve [2] where it contacts the valve seat for stepped wear or contamination.

Replace the valve if the tip is worn or contaminated.



Remove the following:

- Throttle stop screw [1]
- Spring [2]
- Main jet [3]
- Needle jet holder [4]
- Needle jet [5]
- Slow jet [6]



The Air screw is factory pre-set. When not necessary, do not turn or disassemble the air screw.

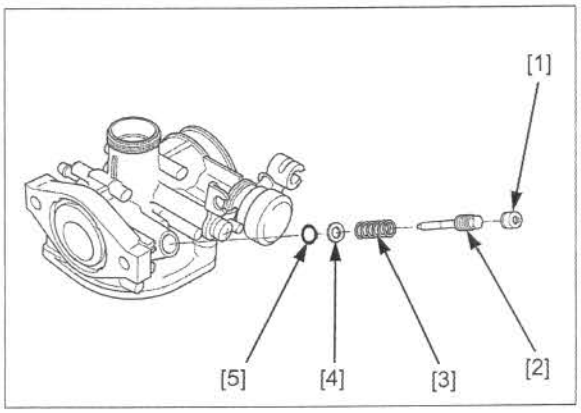
Remove the tamper-proof plug [1].

Turn the air screw [2] in and record the number of turns it takes before it seats lightly.

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

TOOLS:

Pilot screw wrench (D type) 07KMA-MS60102 or 07KMA-MN9A100 (U.S.A. only)



Remove the following:

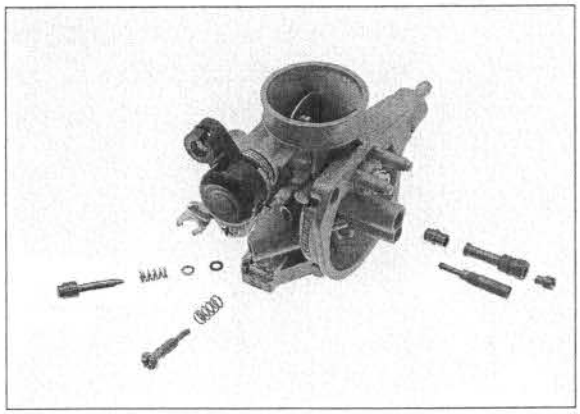
- Air screw
- Spring [3]
- Washer [4]
- O-ring [5]

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

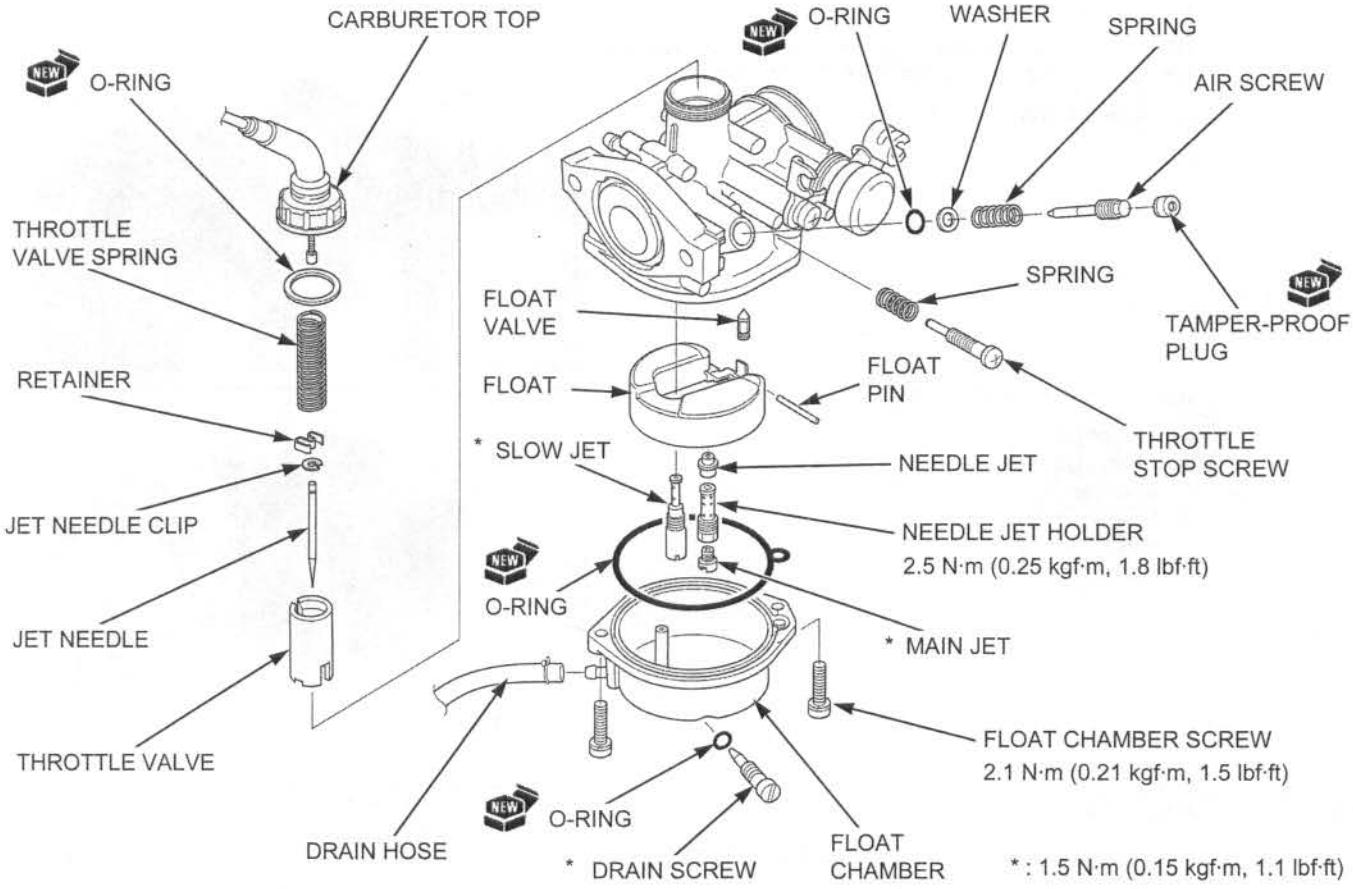
Clean each jet with non-flammable or high flash point solvent and blow open with compressed air.

Check the spring for damage.

Replace these parts if necessary.

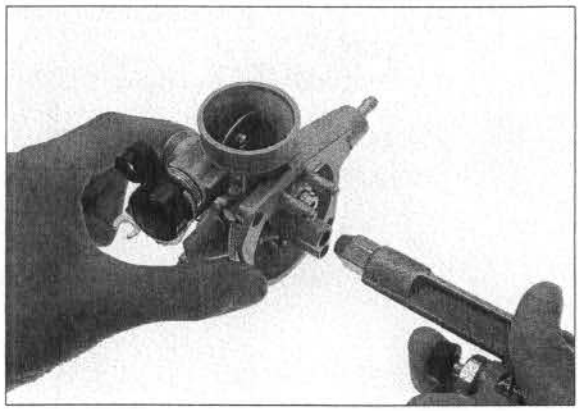


ASSEMBLY



FLOAT AND JETS

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

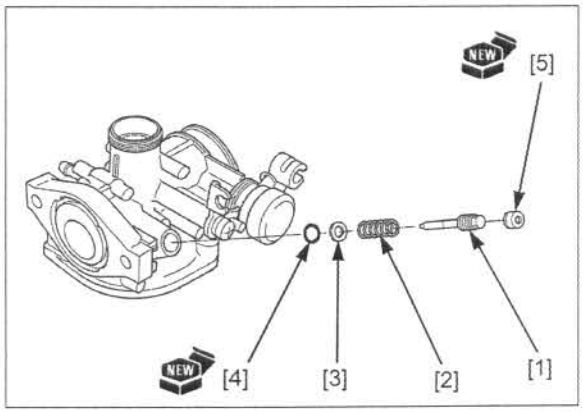


Install the following:

- Air screw [1]
- Spring [2]
- Washer [3]
- O-ring [4]

NOTE:

- Install a new tamper-proof plug [5], after the air screw adjustment (page 6-15).



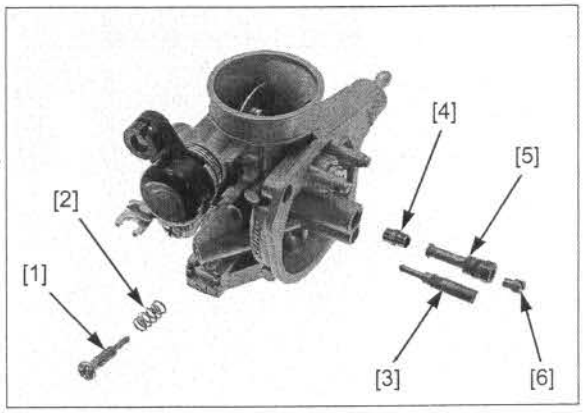
Handle all jets with care. They can easily be scored or scratched.

Install the following:

- Throttle stop screw [1]/spring [2]
- Slow jet [3]
- Needle jet [4]
- Needle jet holder [5]
- Main jet [6]

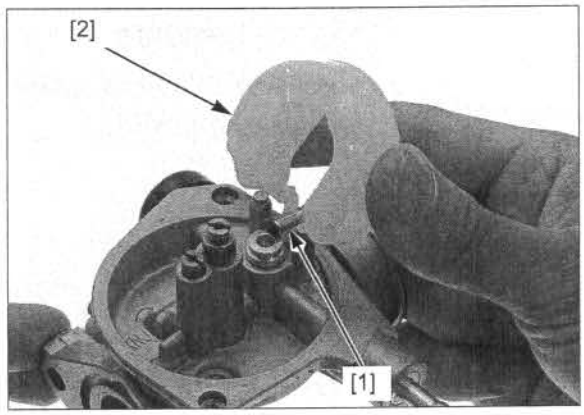
TORQUE:

Slow/main jet: 1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)
Needle jet holder: 2.5 N·m (0.25 kgf·m, 1.8 lbf·ft)

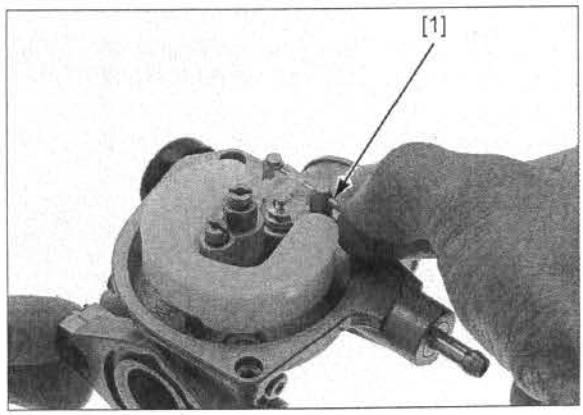


Install the float valve [1] into the groove of the float [2].

Install the float to the carburetor body while aligning the float valve tip with the valve seat hole.



Install the float pin [1] through the carburetor body and float.

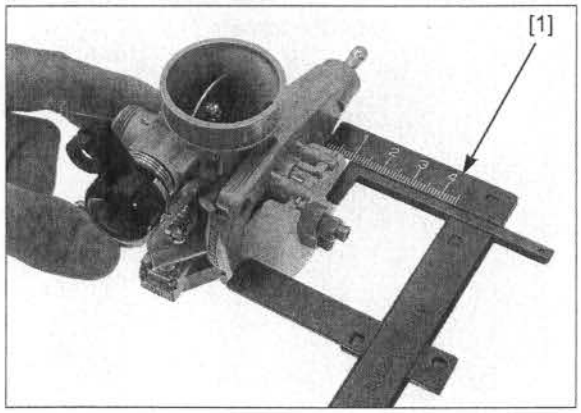


With the float valve seated and the float arm just touching the valve, measure the float level with the special tool as shown.

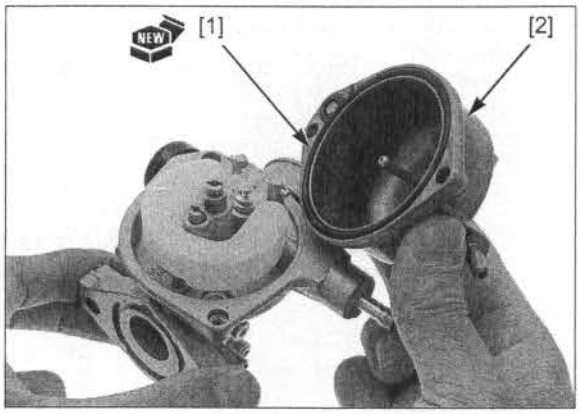
FLOAT LEVEL: 10.7 mm (0.42 in)

TOOL:
[1] Carburetor float level gauge 07401-0010000

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



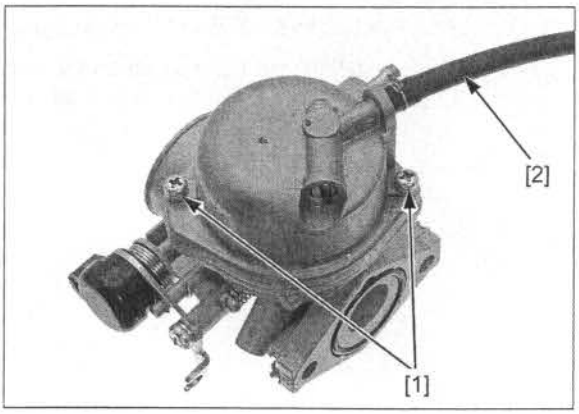
Install a new O-ring [1] into the float chamber groove.
Install the float chamber [2] onto the carburetor body.



Install the two float chamber screws [1] and tighten them to the specified torque.

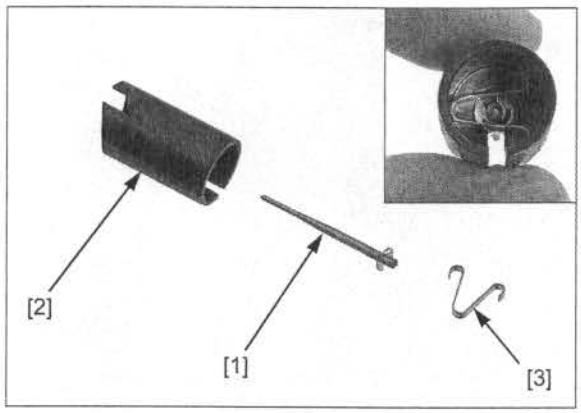
TORQUE: 2.1 N·m (0.21 kgf·m, 1.5 lbf·ft)

Connect the drain hose [2]



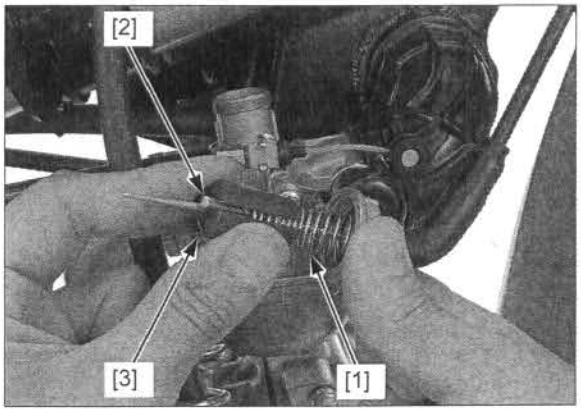
THROTTLE VALVE

Install the jet needle [1] into the throttle valve [2] and secure it with a jet needle retainer [3] as shown.



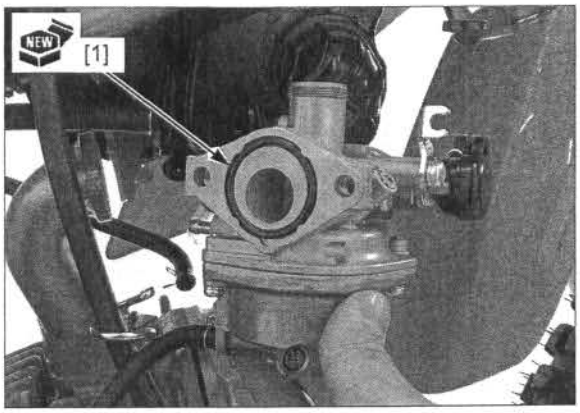
Install the throttle valve spring [1] onto the throttle cable [2].

Connect the throttle cable to the throttle valve [3] while compressing the throttle valve spring.



INSTALLATION

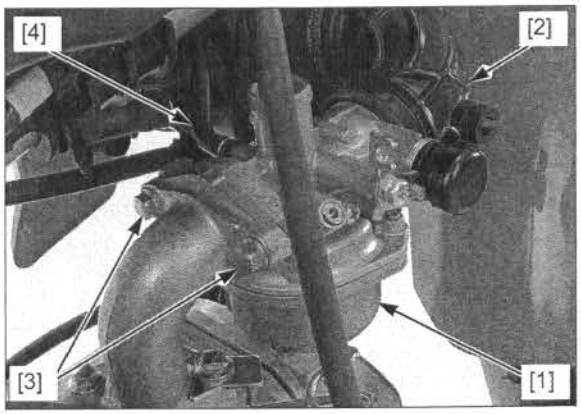
Install the new O-ring into the carburetor body groove.



Install the carburetor body [1] to the air cleaner connecting hose [2].

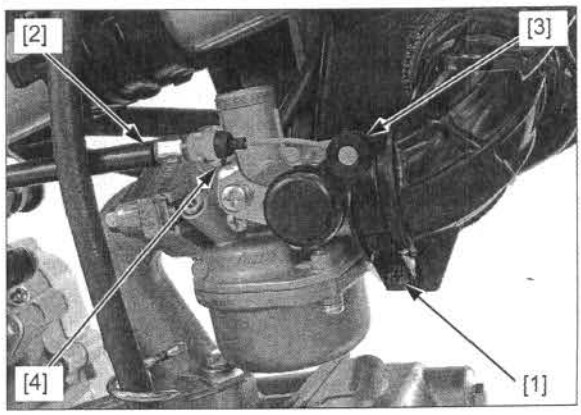
Install and tighten the bolts [3].

Connect the air vent hose [4].

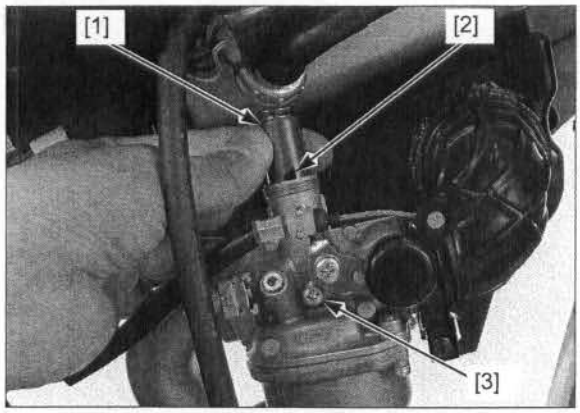


Tighten the band screw [1] until the band ends seat on the collar.

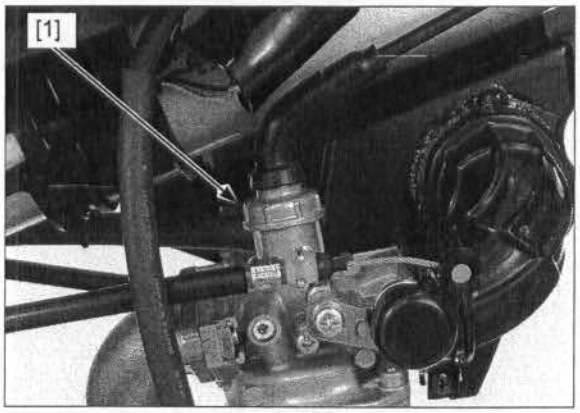
Install the choke cable [2] to the choke lever [3] and cable guide [4].



Install the throttle valve [1] into the carburetor body, aligning its cut-out [2] with the throttle stop screw [3].



Tighten the carburetor top [1] securely.



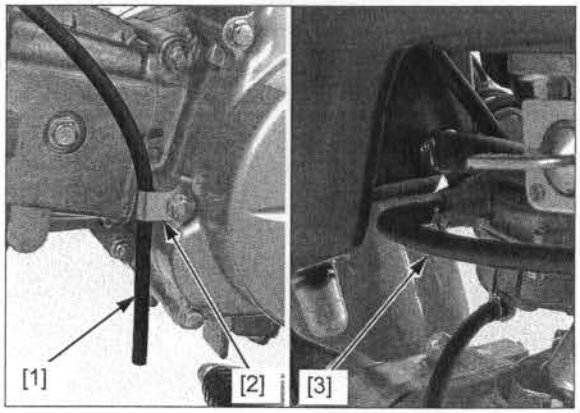
Install the drain hose [1] into the hose guide [2].

Connect the fuel hose [3] to the carburetor.

After installing the carburetor, check the following:

- Tighten the drain screw (page 6-6)
- Choke operation
- Throttle grip freeplay (page 3-6)
- Engine idle speed (page 3-12)

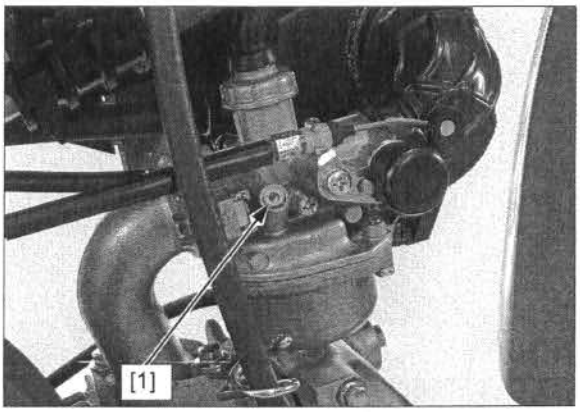
Install the right fuel tank shroud (page 2-3).



AIR SCREW ADJUSTMENT

IDLE DROP PROCEDURE

- The air screw is factory pre-set, adjustment is not necessary unless the carburetor is overhauled or 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.
- If equipped, remove the tamper-proof plug [1] to gain access to air screw. See the Common Service Manual, Fuel Systems Principles/Carburetor section for instructions.



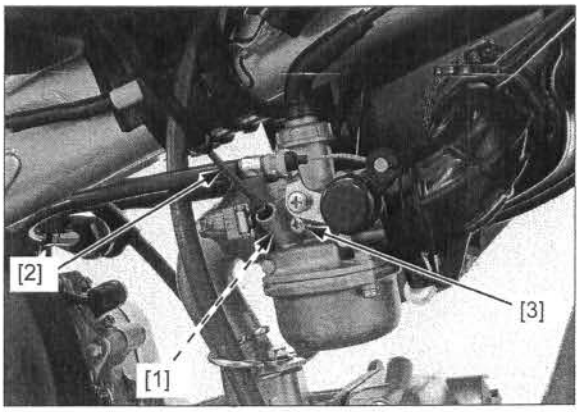
Damage to the air screw seat will occur if the air screw is tightened against the seat.

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

INITIAL OPENING: 1 5/8 turns out

TOOLS:

[2] Pilot screw wrench (D type)	**07KMA-MS60102 or 07KMA-MN9A100 (U.S.A. only)**



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

IDLE SPEED: 1400 ± 100 rpm

5. Turn the air screw in or out slowly to obtain the highest engine speed.
6. Readjust the idle speed with the throttle stop screw.
7. Turn the air screw in gradually until the engine speed drops 50 rpm.
8. Turn the air screw counterclockwise the specified number of turns.

FINAL OPENING: 1/8 turns out from step 7

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

IDLE SPEED: 1400 ± 100 rpm

10. After the air screw is adjusted, a new tamper-proof plug must be installed.

    Apply a high-strength, instant adhesive, such as Three Bond 7737 or equivalent, to the outside circumference of the tamper-proof plug and install it over the air screw.

MEMO

7. LUBRICATION SYSTEM

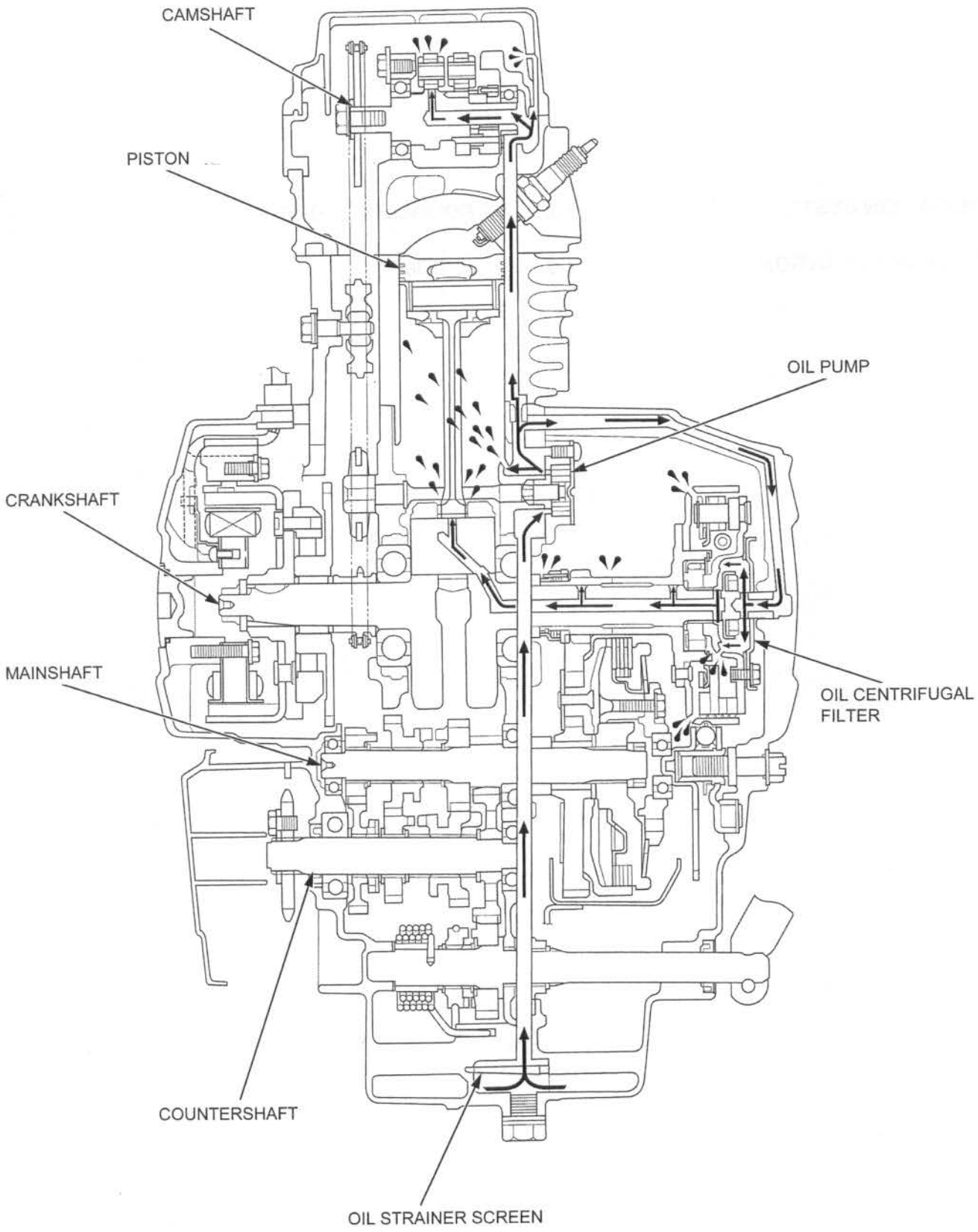
LUBRICATION SYSTEM DIAGRAM 7-2

SERVICE INFORMATION 7-3

TROUBLESHOOTING 7-3

OIL PUMP 7-4

LUBRICATION SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

⚠CAUTION

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

- This section covers service of the oil pump.
- The 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	1.0 liter (1.1 US qt, 0.9 Imp qt)	–
		At disassembly	1.15 liter (1.22 US qt, 1.01 Imp qt)	–
Recommended engine oil			Pro Honda GN4 4-stroke oil (U.S.A and Canada) or equivalent motor oil API service classification: SG or higher JASO T 903 standard: MA Viscosity: SAE 10W-30	–
Oil pump rotor	Tip clearance		0.10 – 0.15 (0.004 – 0.006)	0.15 (0.006)
	Body clearance		0.15 – 0.21 (0.006 – 0.008)	0.26 (0.010)
	Side clearance		0.03 – 0.09 (0.001 – 0.004)	0.15 (0.006)

TORQUE VALUE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Oil pump cover screw	3	5	5 (0.5, 3.7)	

TROUBLESHOOTING

Engine oil level too low

- Oil consumption
- External oil leak
- Worn piston rings (page 9-6)
- Improperly installed piston rings (page 9-4)
- Worn valve guide or stem seal (page 8-21)
- Worn cylinder (page 9-5)

Oil contamination

- Worn piston rings (page 9-6)
- Improperly installed piston rings (page 9-4)
- Worn valve guide or stem seal (page 8-21)
- Oil not changed frequently enough
- Clogged oil strainer screen (page 3-11)

OIL PUMP

REMOVAL/INSTALLATION

Drain the engine oil (page 3-10).

Remove the following:

- Right crankcase cover (page 10-5)
- Three bolts [1]
- Oil pump [2]

Remove the gasket [3] from the oil pump.

Install a new gasket to the oil pump.

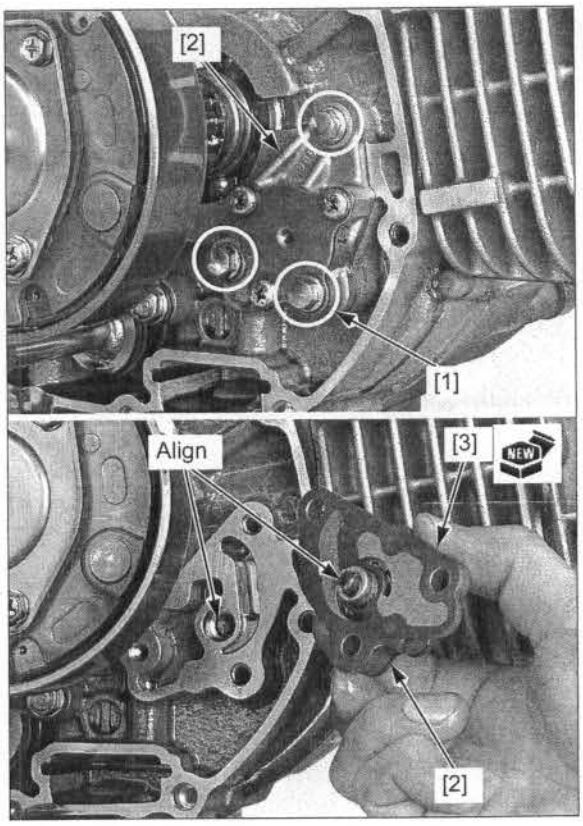
Install the oil pump to the crankcase aligning the oil pump shaft groove with the cam chain guide sprocket spindle.

Install and tighten the three bolts.

Clean the oil strainer screen (page 3-11).

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

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



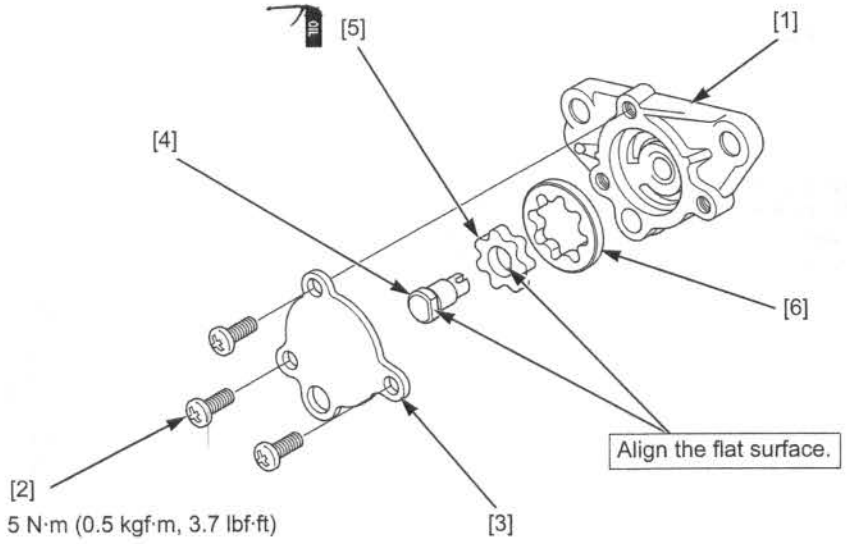
DISASSEMBLY/ASSEMBLY

Remove the following from the oil pump body [1]:

- Three screws [2]
- Oil pump cover [3]
- Oil pump shaft [4]
- Inner rotor [5]
- Outer rotor [6]

Assembly is in the reverse order of disassembly.

- Apply engine oil to the inner rotor and outer rotor sliding surface.



INSPECTION

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

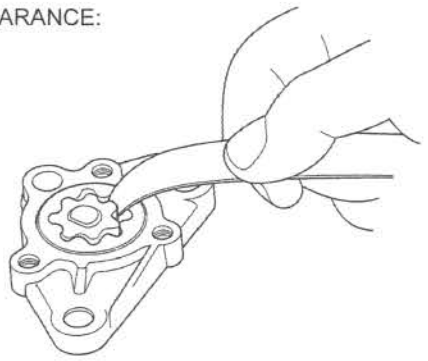
Disassemble the oil pump (page 7-4).

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: 0.15 mm (0.006 in)

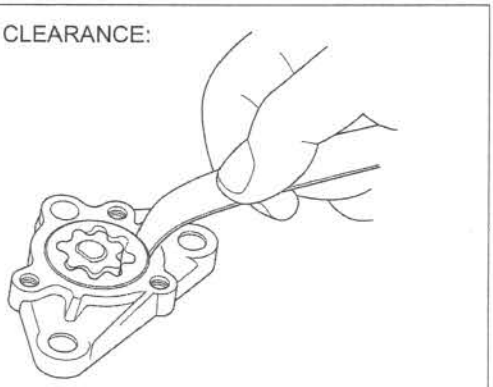
TIP CLEARANCE:



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

SERVICE LIMIT: 0.26 mm (0.010 in)

BODY CLEARANCE:

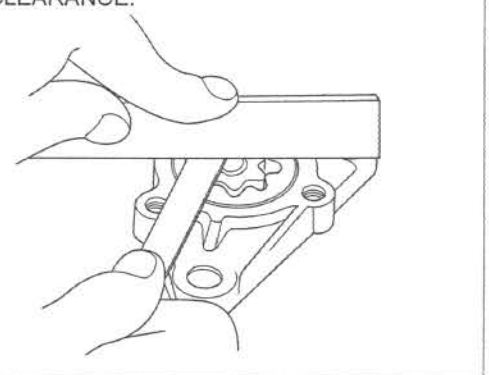


Measure the side clearance using a straight edge and a feeler gauge.

SERVICE LIMIT: 0.15 mm (0.006 in)

Assemble the oil pump (page 7-4).

SIDE CLEARANCE:



MEMO

8. CYLINDER HEAD/VALVES

COMPONENT LOCATION 8-2

SERVICE INFORMATION 8-3

TROUBLESHOOTING 8-5

CYLINDER COMPRESSION TEST 8-6

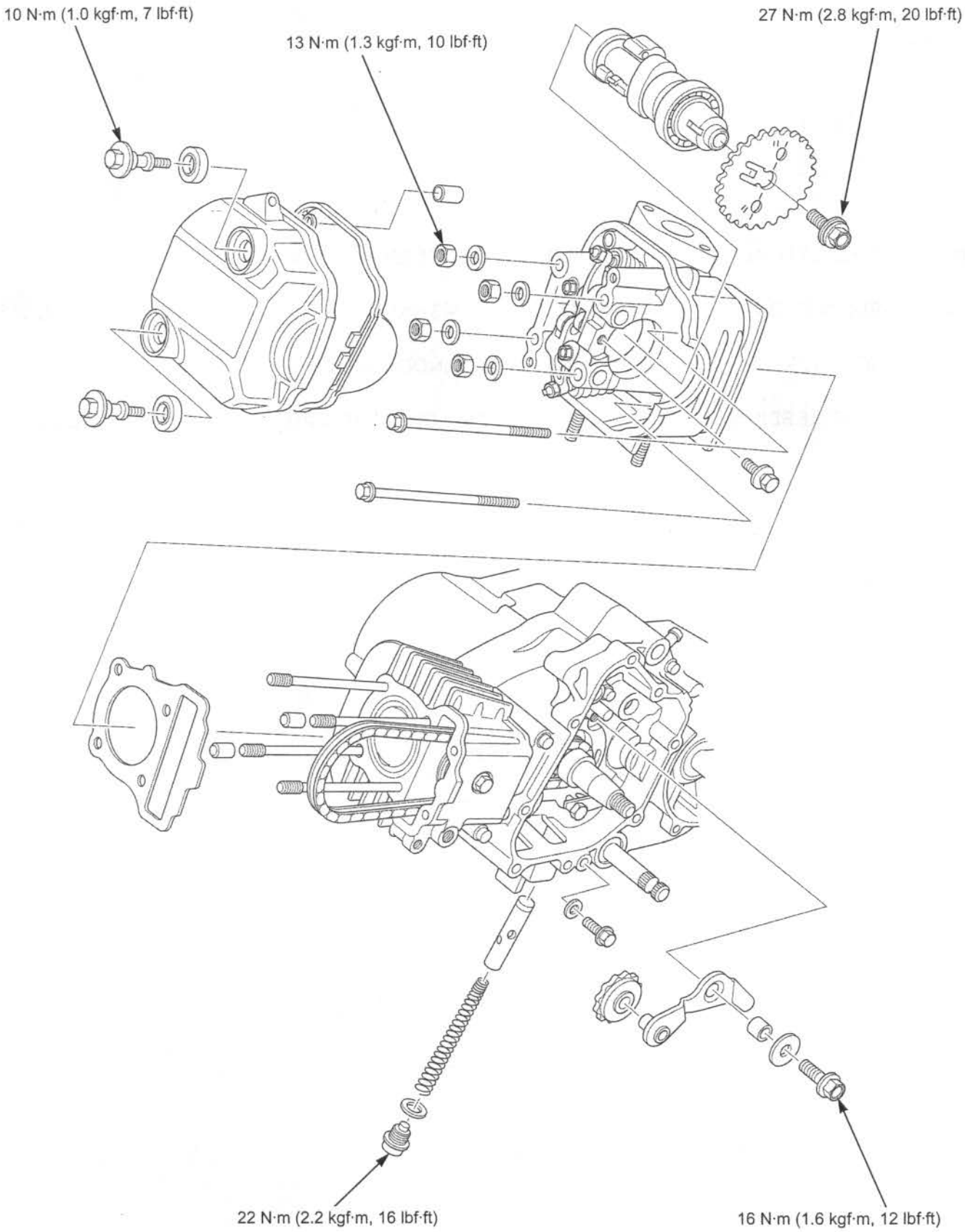
CYLINDER HEAD COVER 8-6

CAMSHAFT 8-8

CYLINDER HEAD 8-11

CAM CHAIN TENSIONER 8-23

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- This section covers service of the cylinder head, valves, camshaft and cam chain tensioner.
- The cylinder head, valves, camshaft and cam chain tensioner 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.

SPECIFICATIONS

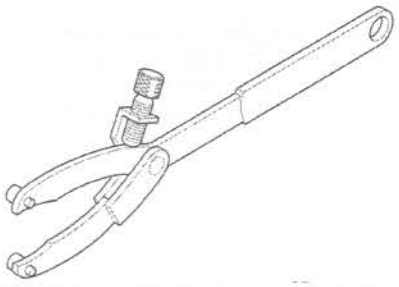
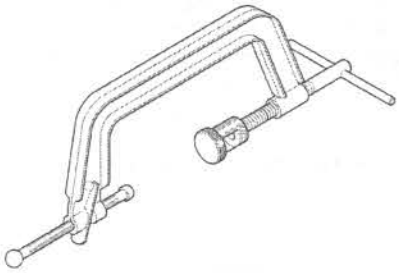
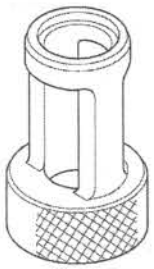
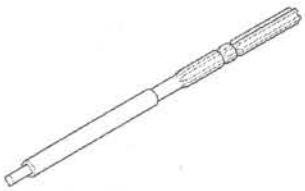
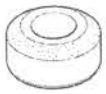
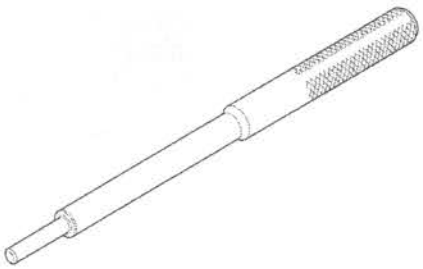
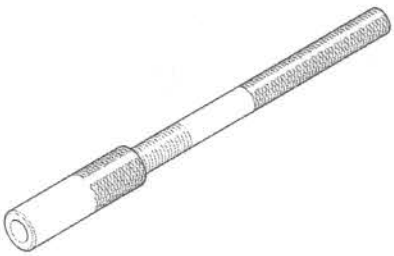
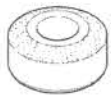
Unit: mm (in)

ITEM				STANDARD	SERVICE LIMIT
Cylinder compression				1,412 kPa (14.4 kgf/cm², 205 psi) at 400 rpm	–
Cylinder head warpage				–	0.05 (0.002)
Rocker arm	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	9.972 – 9.987 (0.3926 – 0.3932)	9.91 (0.390)
	Arm to shaft clearance		IN/EX	0.013 – 0.043 (0.0005 – 0.0017)	0.044 (0.0017)
Camshaft	Cam lobe height		IN	32.194 – 32.434 (1.2675 – 1.2769)	32.16 (1.266)
			EX	31.990 – 32.230 (1.2594 – 1.2689)	31.96 (1.258)
Valve, valve guide	Valve clearance		IN/EX	0.10 ± 0.02 (0.004 ± 0.001)	–
	Valve stem O.D.		IN	4.975 – 4.990 (0.1959 – 0.1965)	4.965 (0.1955)
			EX	4.955 – 4.970 (0.1951 – 0.1957)	4.945 (0.1947)
	Valve guide I.D.		IN/EX	5.000 – 5.012 (0.1969 – 0.1973)	5.03 (0.198)
	Stem-to-guide clearance		IN	0.010 – 0.037 (0.0004 – 0.0015)	0.065 (0.0026)
			EX	0.030 – 0.057 (0.0012 – 0.0022)	0.085 (0.0033)
	Valve guide projection		IN/EX	9.1 – 9.3 (0.36 – 0.37)	–
	Valve seat width		IN/EX	0.9 – 1.1 (0.035 – 0.043)	1.6 (0.06)
Valve spring free length		IN		30.67 (1.207)	29.82 (1.174)
		EX	Inner	31.30 (1.232)	30.35 (1.195)
			Outer	32.05 (1.262)	31.08 (1.224)
Cam chain tensioner	Push rod O.D.			11.985 – 12.000 (0.4718 – 0.4724)	11.94 (0.470)
	Spring free length			111.3 (4.38)	109 (4.3)

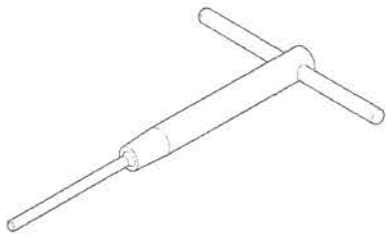
TORQUE VALUES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cylinder head cover special bolt	2	6	10 (1.0, 7)	
Cam sprocket bolt	1	8	27 (2.8, 20)	Apply oil to the threads and seating surface.
Crankshaft hole cap	1	30	8 (0.8, 5.9)	
Timing hole cap	1	14	10 (1.0, 7)	
Cylinder head nut	4	7	13 (1.3, 10)	Apply oil to the threads and seating surface.
Intake pipe mounting bolt	2	6	12 (1.2, 9)	
Cam chain tensioner sealing bolt	1	14	22 (2.2, 16)	
Cam chain tensioner arm pivot bolt	1	8	16 (1.6, 12)	

TOOLS

Universal holder 07725-0030000 	Valve spring compressor 07757-0010000 	Valve spring compressor attachment 07959-KM30101 
Valve guide reamer 5.0 mm 07984-MA60001  or 07984-MA6000D (U.S.A. only)	Seat cutter 27.5 mm (45° IN) 07780-0010200  or equivalent commercially available in U.S.A.	Seat cutter 24 mm (45° EX) 07780-0010600  or equivalent commercially available in U.S.A.
Valve guide driver, 5.0 mm 07942-MA60000 	Valve guide adjusting driver 07743-0020000  (Not available in U.S.A.)	Flat cutter 27 mm (32° IN) 07780-0013300  or equivalent commercially available in U.S.A.
Flat cutter 22 mm (32° EX) 07780-0012601  or equivalent commercially available in U.S.A.	Interior cutter 26 mm (60° IN) 07780-0014500  or equivalent commercially available in U.S.A.	Interior cutter 22 mm (60° EX) 07780-0014202  or equivalent commercially available in U.S.A.

Cutter holder 5.0 mm
07781-0010400



TROUBLESHOOTING

- Engine top-end problems usually affect engine performance. These problems can be diagnosed by a compression test or by tracing engine noises to the top-end with a sounding rod stethoscope.
- If the performance is poor at low speeds, check for white smoke in the crankcase breather hose. If the hose is smoky, check for a seized piston ring (page 9-6).

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

- Valves:
  - Incorrect valve clearance
  - Burned or bent valves
  - Incorrect valve timing
  - Broken valve spring
  - Valve stuck open
- Cylinder head:
  - Uneven valve seating
  - Leaking or damaged cylinder head gasket
  - Warped or cracked cylinder head
- Worn cylinder, piston or piston rings (page 9-5)

Compression too high, overheating or knocking

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

Excessive smoke

- Cylinder head:
  - Worn valve stem or valve guide
  - Damaged stem seal
- Worn cylinder, piston or piston rings (page 9-5)

Excessive noise

- Cylinder head:
  - Incorrect valve clearance
  - Sticking valve or broken valve spring
  - Damaged or worn camshaft
  - Loose or worn cam chain
  - Worn or damaged cam chain guide roller/sprocket
  - Worn or damaged cam chain tensioner
  - Worn cam sprocket teeth
  - Worn rocker arm and/or shaft
- Worn cylinder, piston or piston rings (page 9-5)

Rough idle

- Low cylinder compression
- Faulty fuel system (page 6-4)

CYLINDER COMPRESSION TEST

Warm up the engine to normal operating temperature.

Stop the engine and disconnect the spark plug cap.

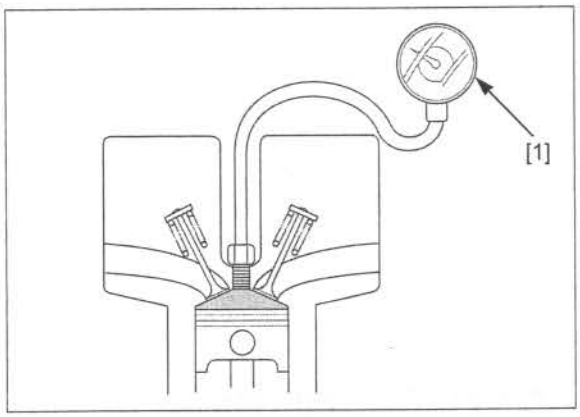
Remove the spark plug (page 3-8).

Install the compression gauge [1] in the spark plug hole.

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

Shift the transmission into neutral.

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



STANDARD:

1,412 kPa (14.4 kgf/cm², 205 psi) at 400 rpm

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

If compression is low, pour 3 – 5 cm³ (0.1 – 0.2 oz) of engine oil into the cylinder through the spark plug hole and recheck the compression.

If the compression increases from the previous value, check the cylinder, piston and piston rings for the following:

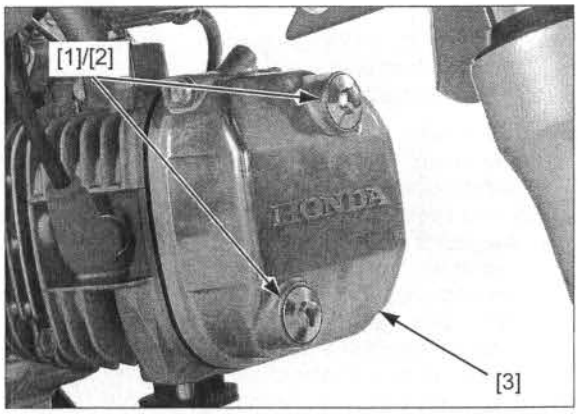
- Leaking cylinder head gasket
- Worn piston ring
- Worn cylinder and piston

If the compression is the same as the previous value, check the valves for leakage.

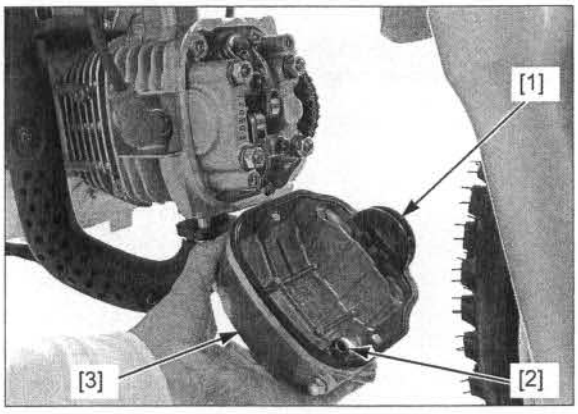
CYLINDER HEAD COVER

REMOVAL

Remove the special bolts [1], mounting rubbers [2] and cylinder head cover [3].

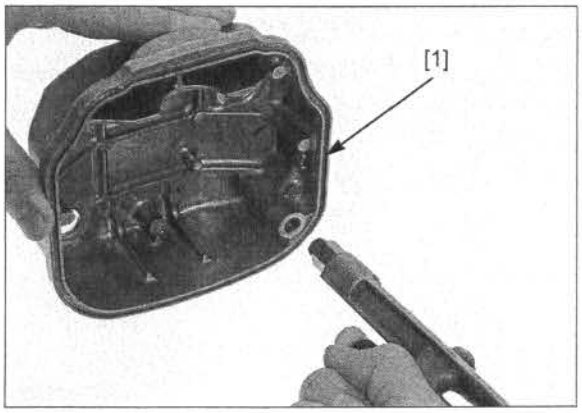


Remove the rubber seal [1] and dowel pin [2] from the cylinder head cover [3].



INSTALLATION

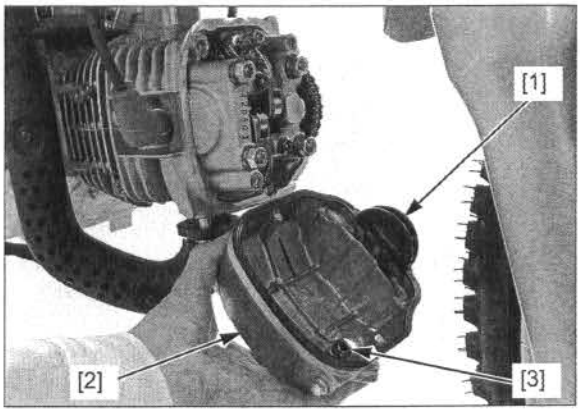
Blow open the oil passage in the cylinder head cover [1] with the compressed air.



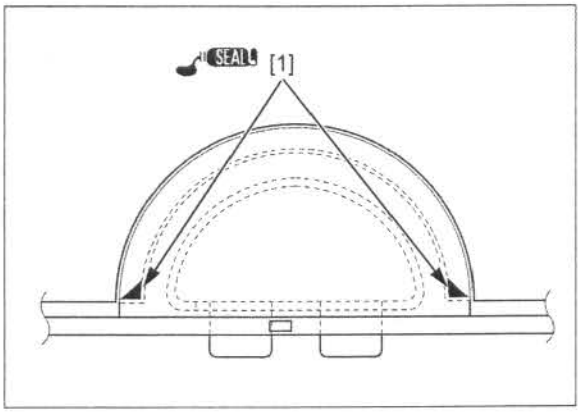
Make sure the rubber seal [1] is in good condition and replace it if necessary.

Install the rubber seal into the groove on the cylinder head cover [2].

Install the dowel pin [3].



Apply liquid sealant (Three bond 1215 or equivalent) to the semicircular area [1] of rubber seal as shown.

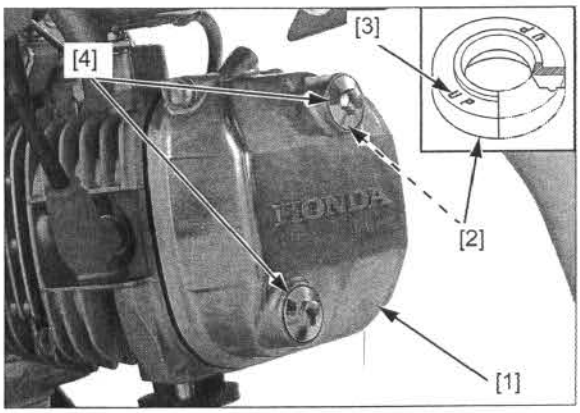


Set the cylinder head cover [1] onto the cylinder head.

Install the mounting rubbers [2] with their "UP" mark [3] facing up.

Install the special bolts [4] and tighten them to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



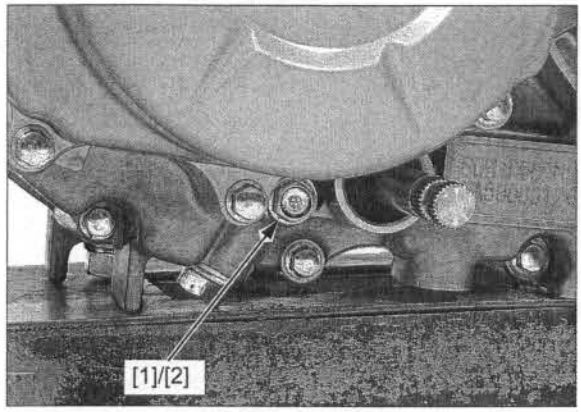
CAMSHAFT

REMOVAL

Remove the cylinder head cover (page 8-6).

Set the piston to the TDC (Top Dead Center) on the compression stroke (page 3-9).

Remove the cam chain tensioner sealing bolt [1] and washer [2].

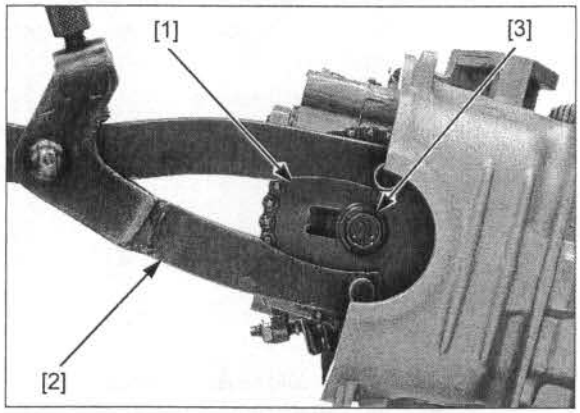


Hold the cam sprocket [1] by using the special tool.

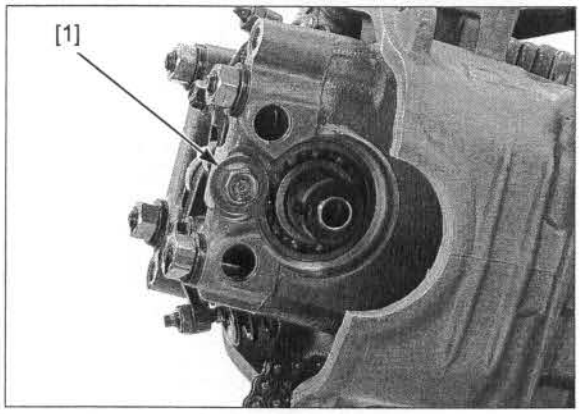
TOOL:
[2] Universal holder 07725-0030000

Remove the washer bolt [3], cam sprocket from the camshaft and cam chain off the cam sprocket.

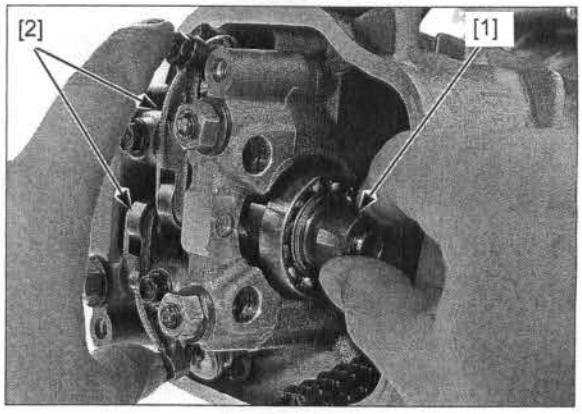
Attach a piece of wire to the cam chain to prevent it from falling into the crankcase.



Remove the bolt/washer [1] from the cylinder head.



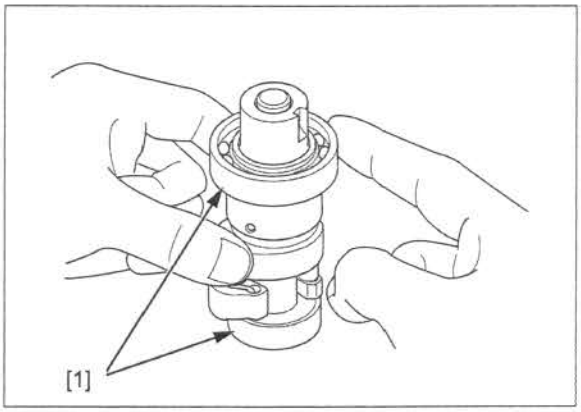
Remove the camshaft [1] from the cylinder head while holding the rocker arms [2] to ease removal.



INSPECTION

CAMSHAFT

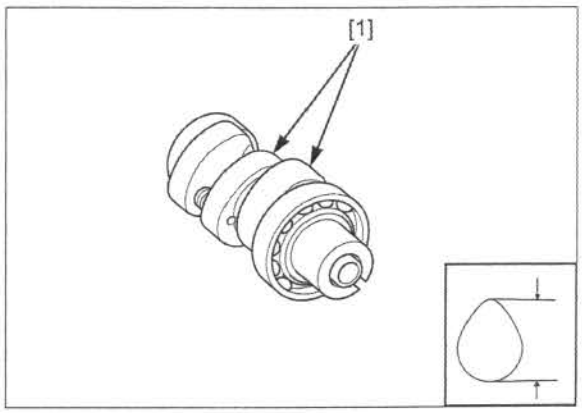
Turn the outer race of each camshaft bearing [1] with your finger. The bearing should turn smoothly and quietly.
Also check that the bearing inner race fits tightly on the camshaft.
Replace the camshaft assembly if the bearing does not turn smoothly, quietly, or if they fit loosely on the camshaft.



Check the cam lobes [1] for excessive wear and damage.

Measure the height of each cam lobe.

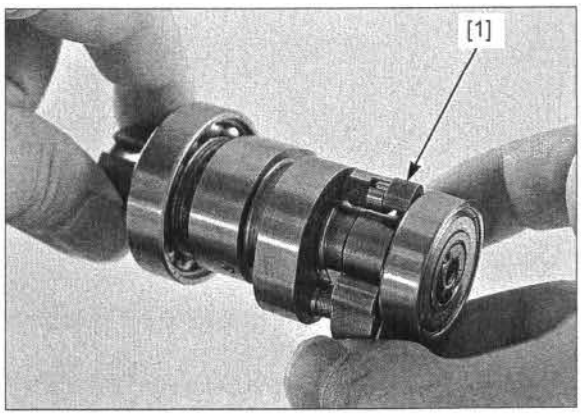
SERVICE LIMIT:
IN: 32.16 mm (1.266 in)
EX: 31.96 mm (1.258 in)



DECOMPRESSOR CAM

Check the decompressor system that it operates smoothly and that the spring returns the decompressor weight in position.

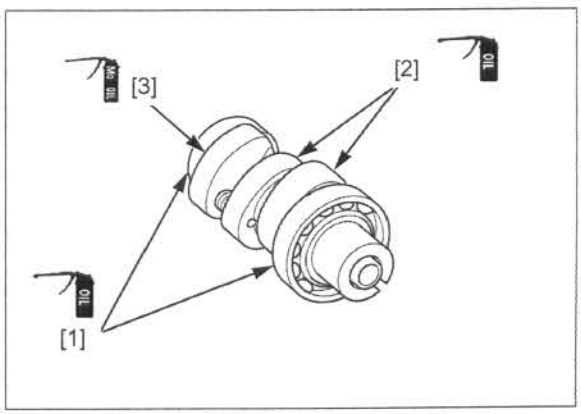
If the decompressor weight is faulty, replace the camshaft as an assembly.



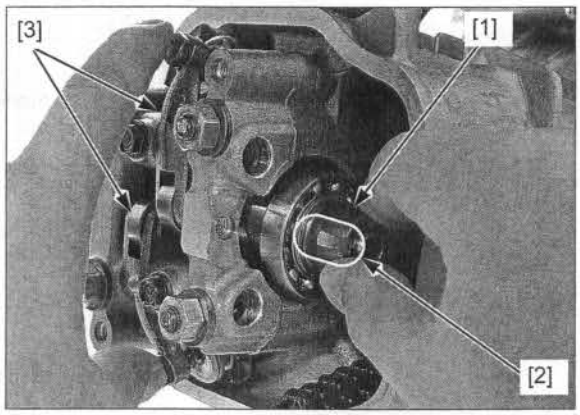
INSTALLATION

Apply engine oil to the camshaft bearings [1] and cam lobes [2].

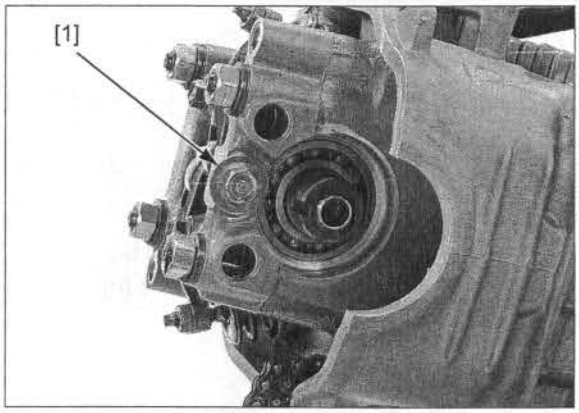
Apply molybdenum oil solution to the decompressor cam [3] and arm sliding area.



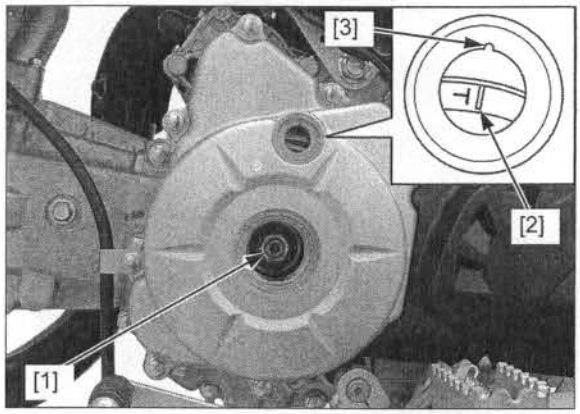
Install the camshaft [1] into the cylinder head with its groove [2] facing forward while holding the rocker arms [3] to ease installation.



Install and tighten the bolt/washer [1].

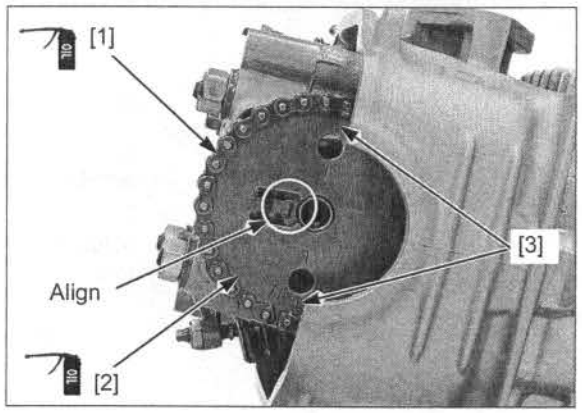


Rotate the crankshaft [1] counterclockwise until the "T" mark [2] on the flywheel is aligned with the index notch [3] on the left crankcase cover.



Apply engine oil to the cam chain [1] and cam sprocket [2] teeth.

Install the cam chain on the cam sprocket by aligning its tab with the groove of the camshaft, making sure that the index lines [3] on the cam sprocket are flush with the top surface of the cylinder head as shown (TDC on the compression stroke).
Install the cam sprocket to the camshaft.



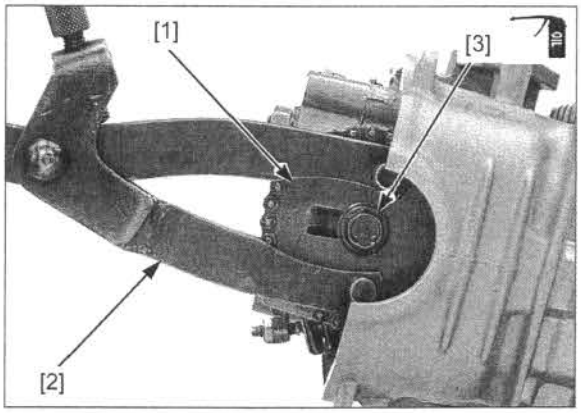
Hold the cam sprocket [1] by using the special tool.

TOOL:
[2] Universal Holder 07725-0030000

Apply engine oil to the cam sprocket washer bolt [3] threads and seating surface.

Install and tighten the cam sprocket washer bolt to specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)



Pour 4.0 cm^3 minimum of engine oil into the push rod.

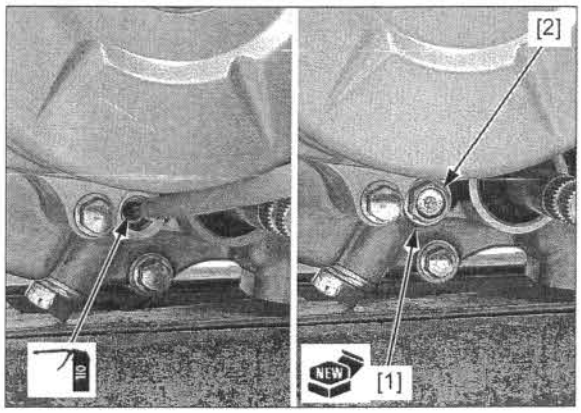
Install a new sealing washer [1] and bolt [2], then tighten it.

Apply engine oil to the new crankshaft hole cap O-ring and timing hole cap O-ring, then install them to the caps.
Install the crankshaft hole cap and timing hole cap to the left crankcase cover.

TORQUE:

Crankshaft hole cap	**8 N·m (0.8 kgf·m, 5.9 lbf·ft)**
Timing hole cap	**10 N·m (1.0 kgf·m, 7 lbf·ft)**

Install the cylinder head cover (page 8-7).



CYLINDER HEAD

REMOVAL

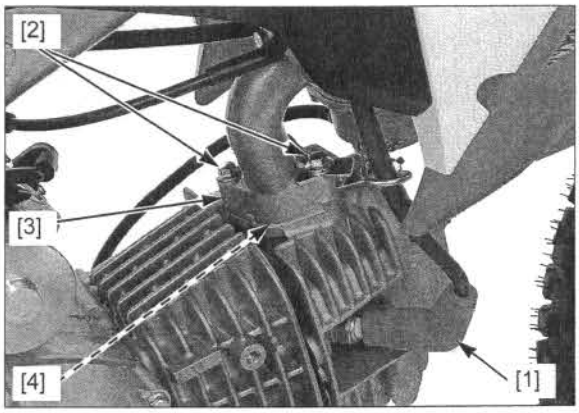
Remove the following:

- Cam sprocket (page 8-8)
- Exhaust pipe/muffler (page 2-8)

Disconnect the spark plug cap [1].

Remove the two bolts [2] and release the intake pipe [3] from the cylinder head.

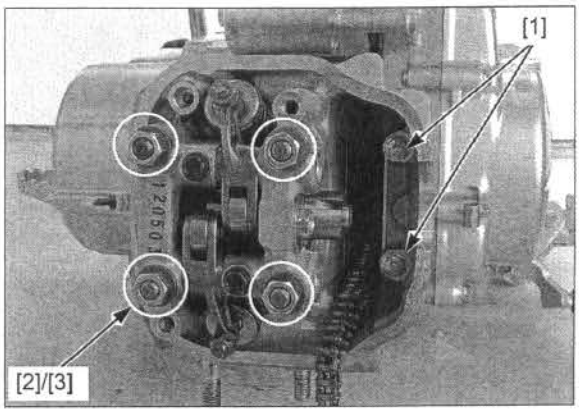
Remove the gasket [4].



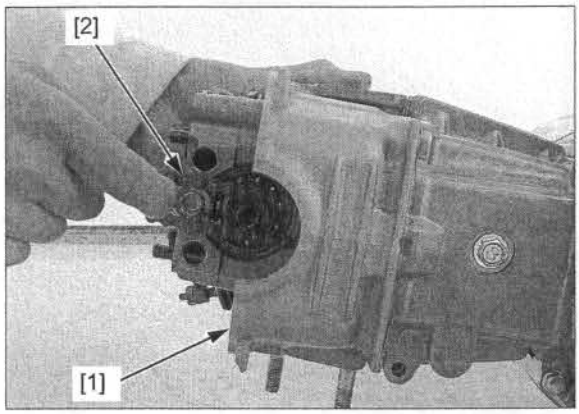
Remove the cylinder head bolts [1].

Loosen the cylinder head nuts [2] in a crisscross pattern in two or three steps.

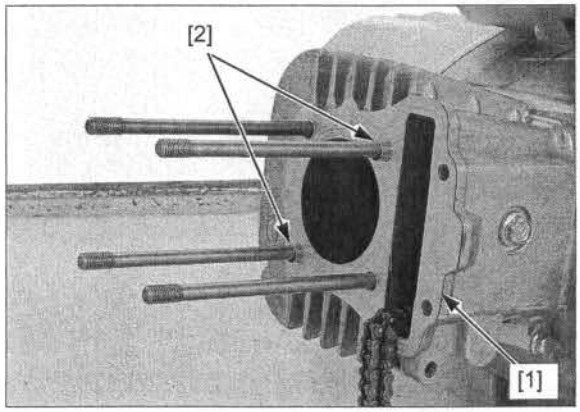
Remove the four nuts and washers [3].



Remove the cylinder head [1] while holding the cam chain [2] as shown.



Remove the gasket [1] and dowel pins [2].

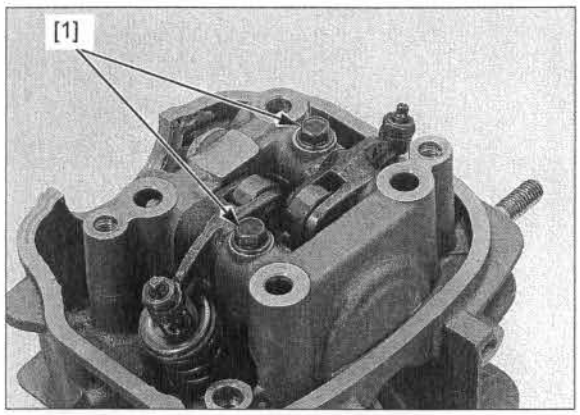


DISASSEMBLY

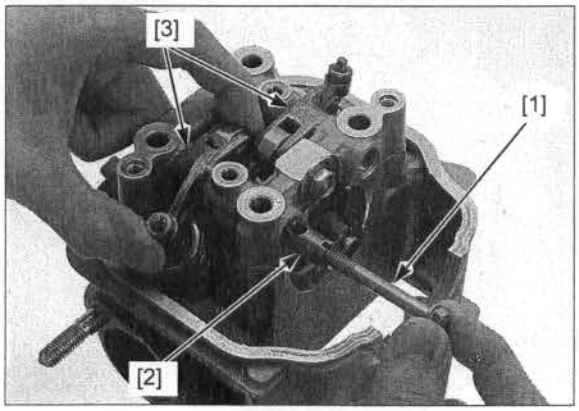
Remove the spark plug (page 3-8).

ROCKER ARM/SHAFT

Remove the rocker arm shaft stopper bolts [1].

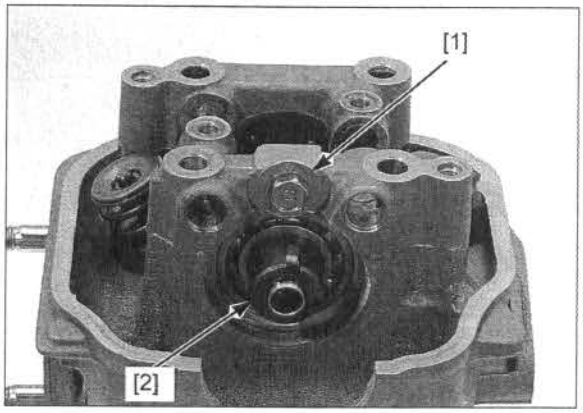


Screw the 6 mm bolt [1] into the threaded hole in the rocker arm shaft [2] and pull it out of the cylinder head. Remove the rocker arms [3].



CAMSHAFT

Remove the bolt/washer [1] and camshaft [2].



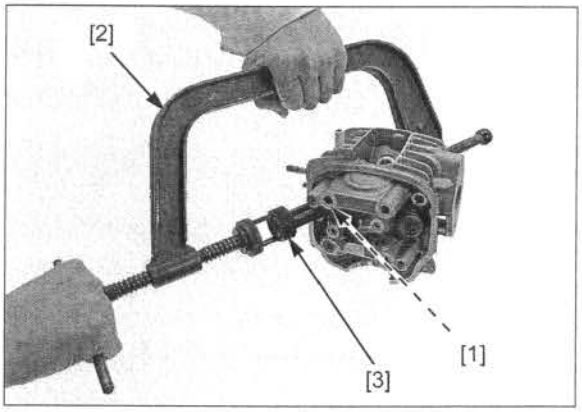
VALVE

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

Remove the valve cotters [1] using the special tools.

TOOLS:

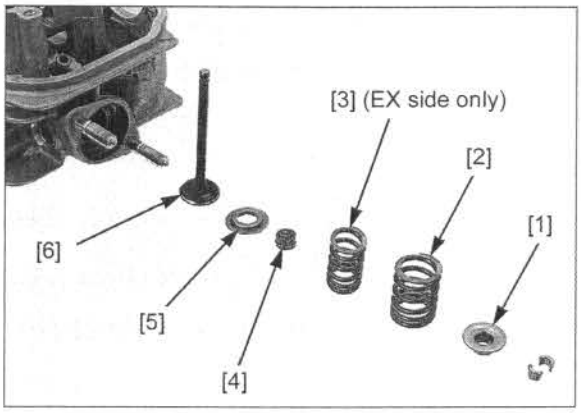
[2] Valve spring compressor	**07757-0010000**
[3] Valve spring compressor attachment	**07959-KM30101**



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

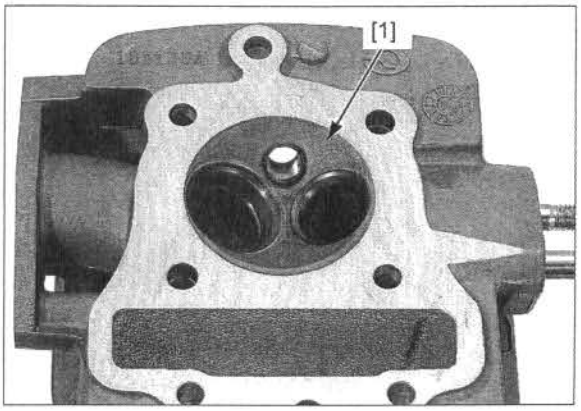
Remove the valve spring compressor and remove the following:

- Valve spring retainers [1]
- Valve springs [2]
- Inner valve spring (EX side only) [3]
- Valve stem seals [4]
- Valve spring seats [5]
- Valves [6]



Avoid damaging the mating surface and valve seat surfaces.

Remove the carbon deposits form the combustion chamber [1] and clean off the cylinder head gasket surface.

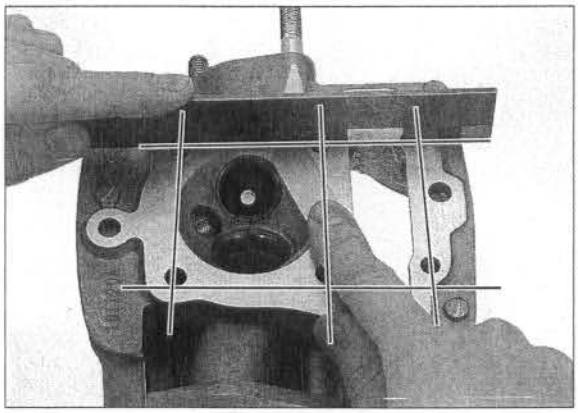


INSPECTION

CYLINDER HEAD

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

SERVICE LIMIT: 0.05 mm (0.002 in)



ROCKER ARM/SHAFT

Disassemble the cylinder head (page 8-12).

Check the rocker arm shafts and rocker arms for wear or damage.

Turn the rocker arm rollers [1] with your finger.
The rollers should turn smoothly and quietly.

Measure the I.D. of each rocker arm.

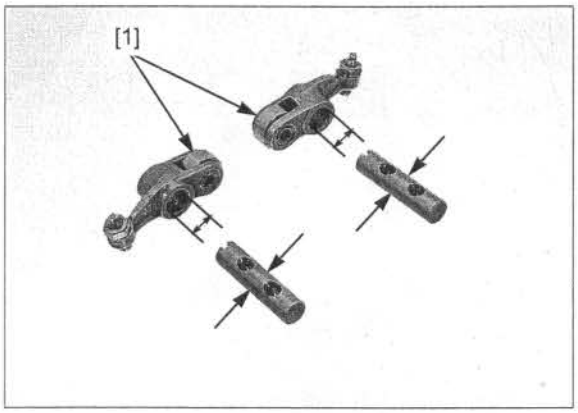
SERVICE LIMIT: IN/EX: 10.10 mm (0.398 in)

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

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

Calculate the rocker arm-to-shaft clearance.

SERVICE LIMIT: IN/EX: 0.044 mm (0.0017 in)



VALVE SPRING

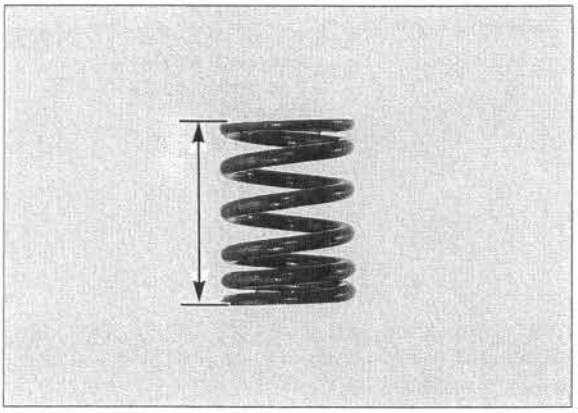
Disassemble the cylinder head (page 8-12).

Measure the free length of the valve springs.

SERVICE LIMIT:

IN:		**29.82 mm (1.174 in)**
EX:	**INNER:**	**30.35 mm (1.195 in)**
	OUTER:	**31.08 mm (1.224 in)**

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



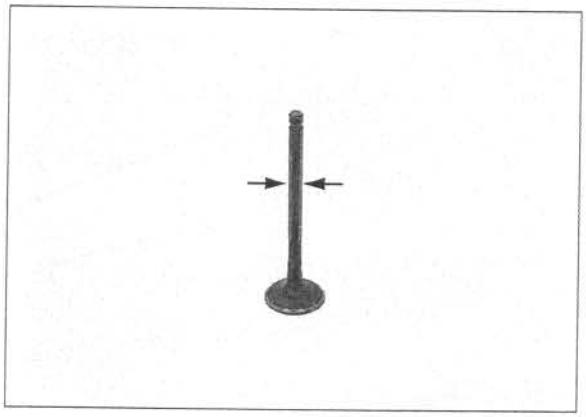
VALVE/VALVE GUIDE

Disassemble the cylinder head (page 8-12).

Check that the valve moves smoothly in the guide.
Check each valve for bend, burn, scratch or abnormal wear.

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

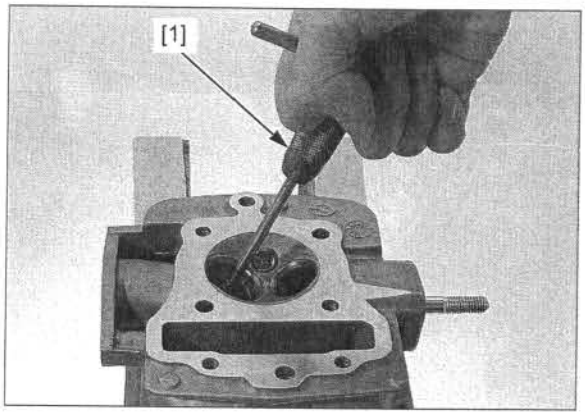
SERVICE LIMIT: IN: 4.965 mm (0.1955 in)
EX: 4.945 mm (0.1947 in)



Always rotate the reamer clockwise, never counterclockwise when inserting, removing and reaming.

Ream the valve guide to remove any carbon build up before measuring the guide.
Insert the reamer from the combustion chamber side of the cylinder head and always rotate the reamer clockwise.

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



Inspect and reface the valve seats whenever the valve guides are replaced (page 8-21).

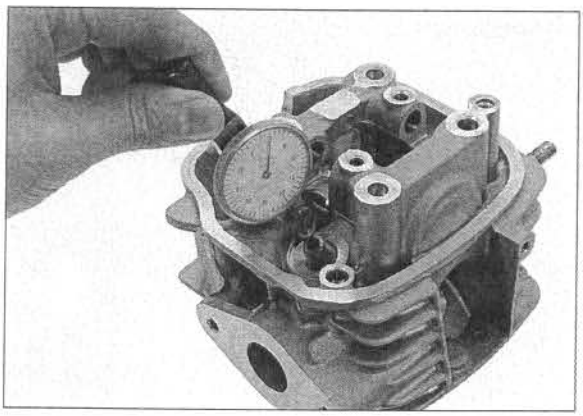
Measure each valve guide I.D. and record it.

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

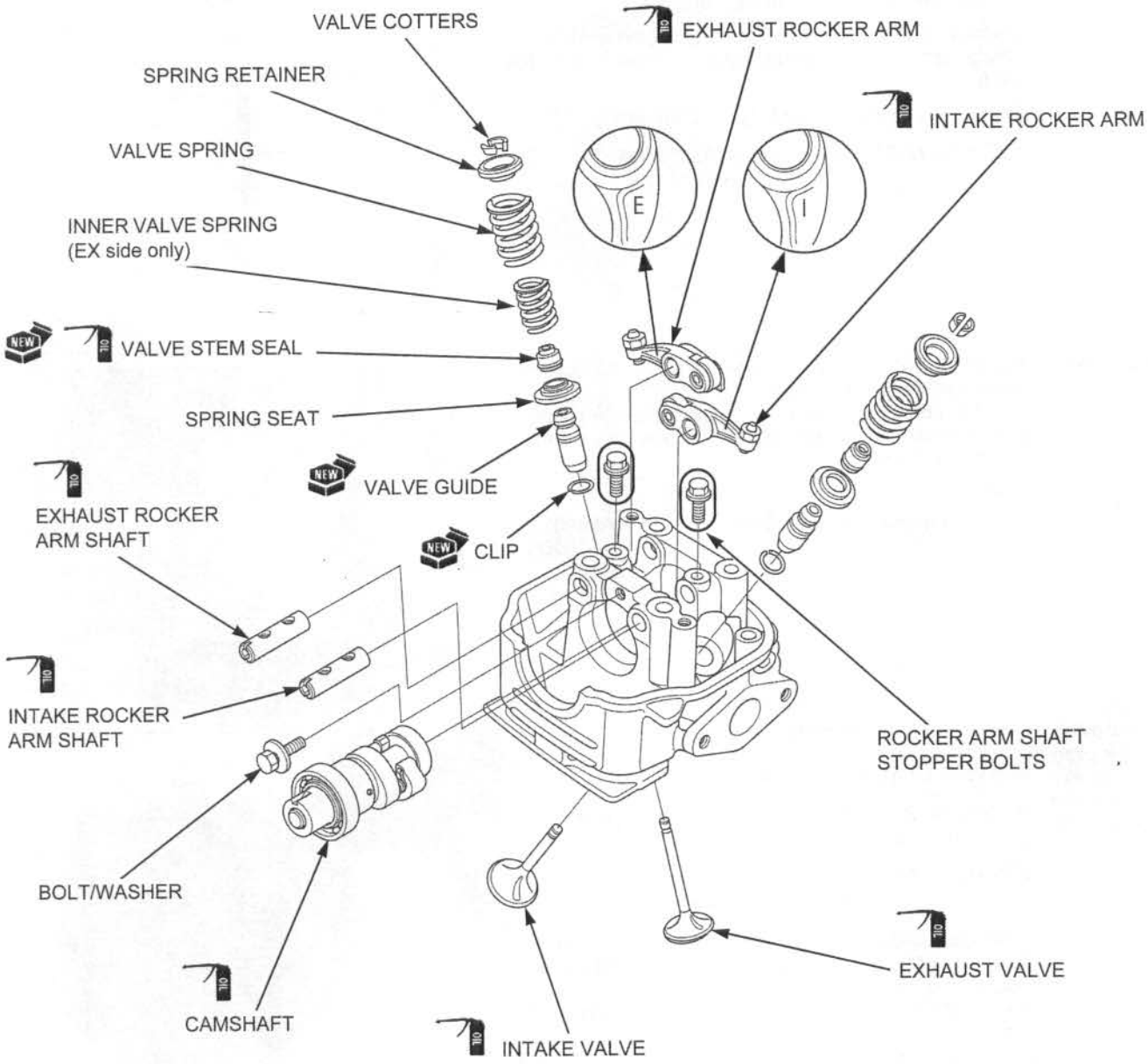
Subtract each valve stem O.D. from the corresponding guide I.D. to obtain the stem-to-guide clearance.

SERVICE LIMIT: IN: 0.065 mm (0.0026 in)
EX: 0.085 mm (0.0033 in)

If the stem-to-guide clearance exceeds the service limit, determine if a new guide with standard dimensions would bring the clearance within tolerance.
If so, replace any guides as necessary and ream to fit (page 8-20).
If the stem-to-guide clearance exceeds the service limit with new guide, also replace the valve.



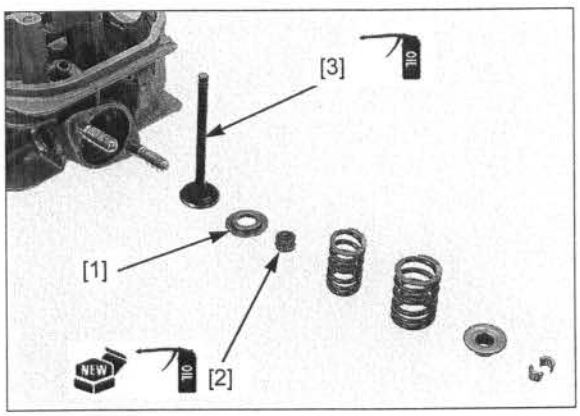
ASSEMBLY



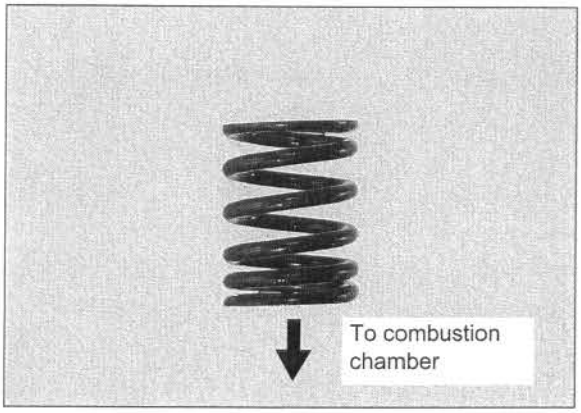
VALVE

Blow through the oil passage in the cylinder head with compressed air.
Install the valve spring seats [1].
Apply engine oil to the new valve stem seals [2] and install them.

Apply engine oil to the valve stem [3] outer surface and stem end.
Insert the valves into the valve guides while turning them slowly to avoid damage to the valve stem seals.



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



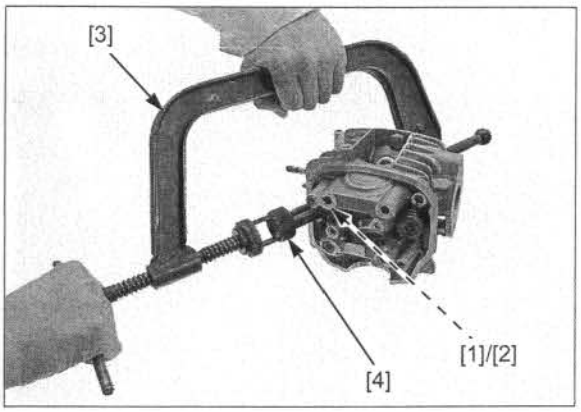
Install the valve spring retainer [1].

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

Install the valve cotters [2] using the special tools.

TOOLS:

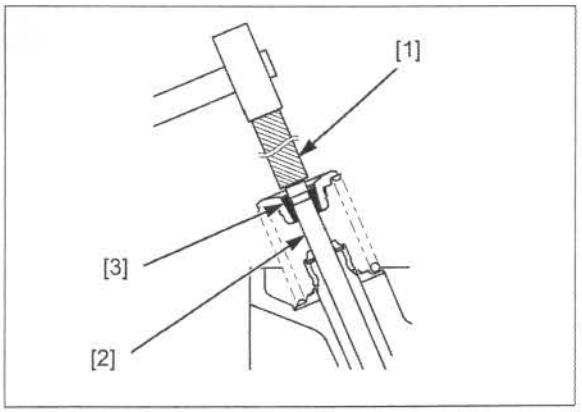
[3] Valve spring compressor	**07757-0010000**
[4] Valve spring compressor attachment	**07959-KM30101**



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

Place a suitable tool [1] onto the valve stem [2].

Tap the tool gently to seat the cotters [3] firmly using a plastic hammer.

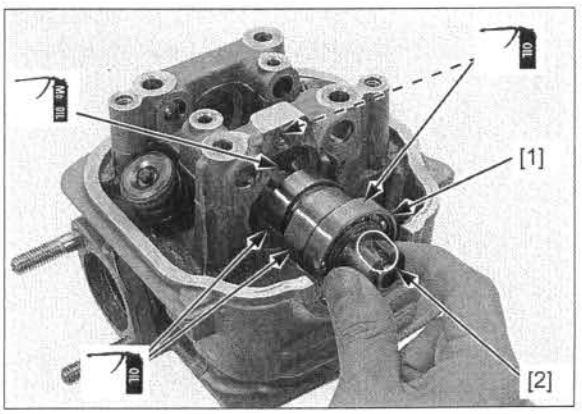


CAMSHAFT

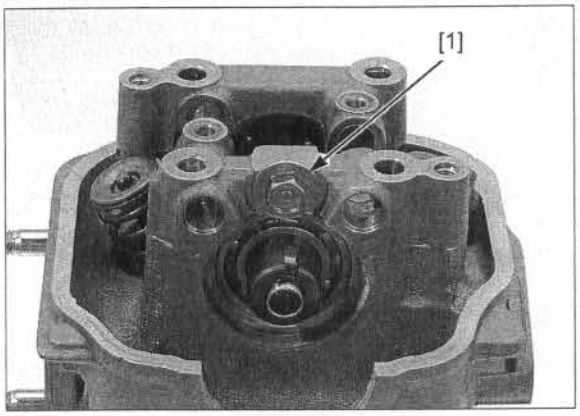
Apply engine oil to the camshaft [1] cam whole surface and bearings.

Apply molybdenum oil solution to the decompressor cam and arm sliding area.

Install the camshaft into the cylinder head with its groove [2] facing up.

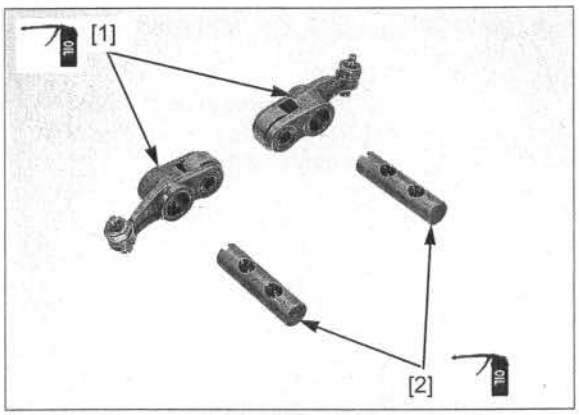


Install and tighten the bolt/washer [1].



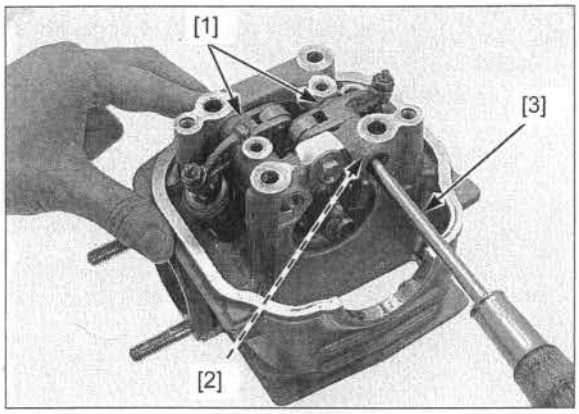
ROCKER ARM

Apply engine oil to the rocker arm [1] hole inner surface and roller contact surface.
Apply engine oil to the rocker arm shaft [2] whole surface.



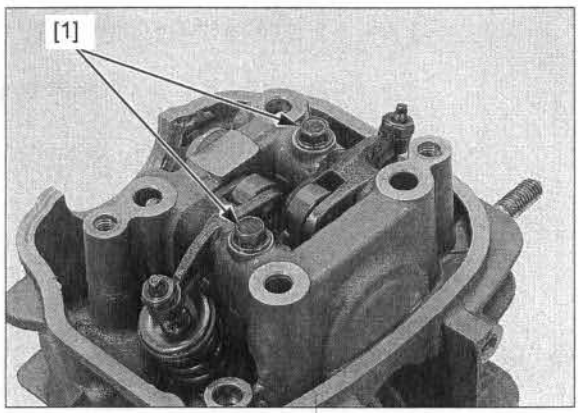
Install the rocker arms [1] to the cylinder head.

Insert the rocker arm shafts [2] into the cylinder head using a screwdriver [3] while aligning the bolt holes of the shafts and cylinder head.



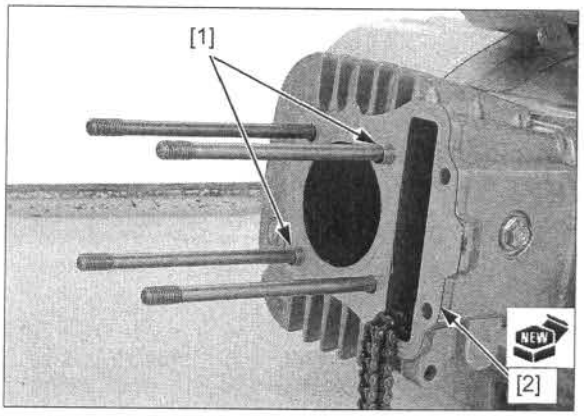
Install and tighten the rocker arm shaft stopper bolts [1].

Install the spark plug (page 3-8).

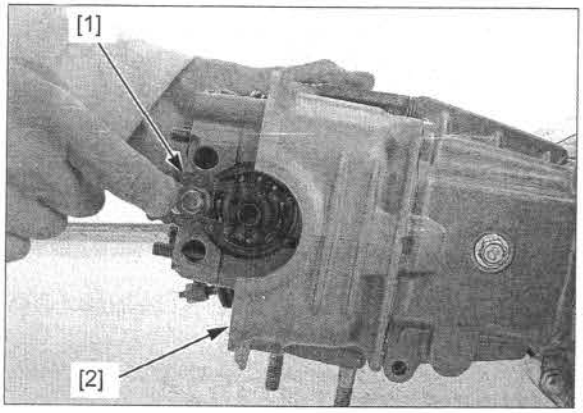


INSTALLATION

Clean the cylinder and cylinder head mating surface. Install the dowel pins [1] and a new gasket [2] onto the cylinder.



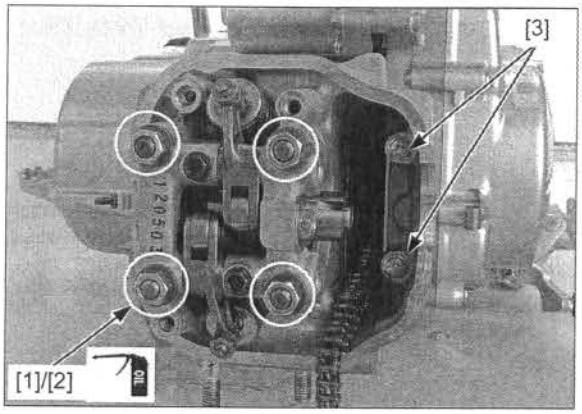
Route the cam chain [1] through the cylinder head [2] and install the cylinder head onto the cylinder.



Apply engine oil to the seating surface and threads of the cylinder head nuts [1]. Install the four washers [2] and tighten the cylinder head nuts to the specified torque in a crisscross pattern.

TORQUE: 13 N·m (1.3 kgf·m, 10 lbf·ft)

Install and tighten the cylinder head mounting bolts [3].



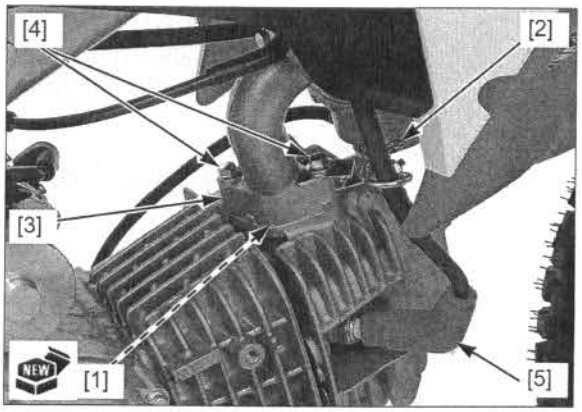
Install a new gasket [1] onto the cylinder head.
Set the wire guide [2] to the intake pipe [3] and tighten the two bolts [4] to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Connect the spark plug cap [5].

Install the following:

- Cam sprocket (page 8-9)
- Exhaust pipe/muffler (page 2-8)



VALVE GUIDE REPLACEMENT

Disassemble the cylinder head (page 8-12).

Chill new valve guides in a freezer for about 1 hour.

NOTE:

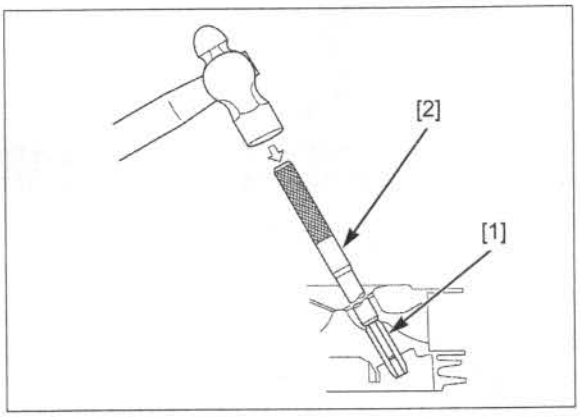
- Be sure to wear heavy gloves to avoid burns when handling the heated cylinder head.
- Using a torch to heat the cylinder head may cause warpage.
- Drive new guides from the camshaft side while the cylinder head is still heated.

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

Support the cylinder head and drive the valve guides [1] out of the cylinder head from the combustion chamber side.

TOOL:

[2] Valve guide driver, 5.0 mm 07942-MA60000



Take out new valve guides from the freezer.

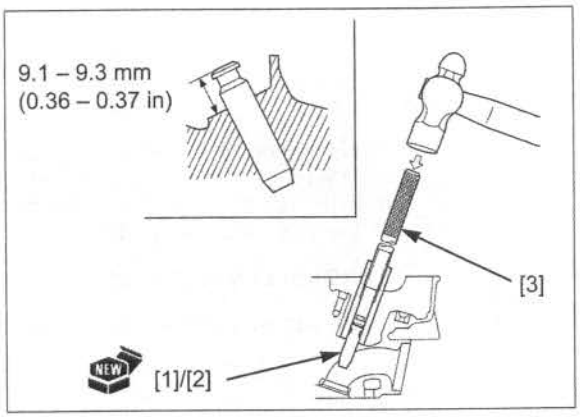
Drive new clips [1] and valve guides [2] into the cylinder head to the specified height from the cylinder head.

TOOL:

[3] Valve guide adjusting driver 07743-0020000 (Not available in U.S.A.)

VALVE GUIDE PROJECTION:

IN/EX: 9.1 – 9.3 mm (0.36 – 0.37 in)



Let the cylinder head cool to room temperature.

Ream new valve guides after installation.

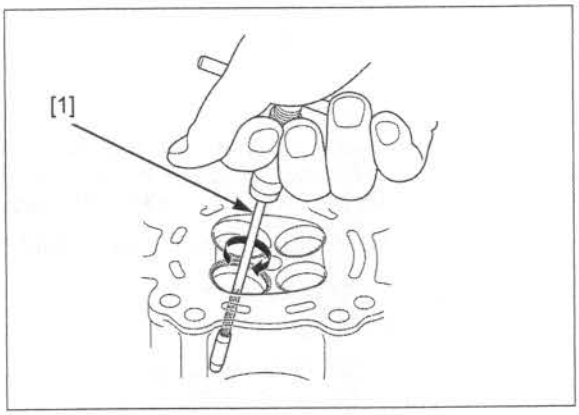
NOTE:

- Take care not to tilt or lean the reamer in the guide while reaming.
- Use cutting oil on the reamer during this operation.

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

TOOL:

[1] Valve guide reamer, 5.0 mm 07984-MA60001 or 07984-MA6000D (U.S.A. only)



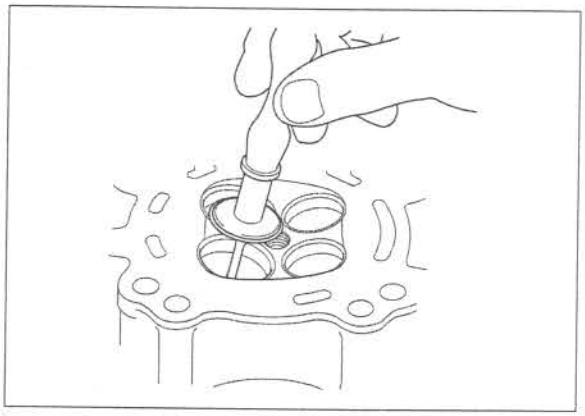
Clean the cylinder head thoroughly to remove any metal particles after reaming and reface the valve seat (page 8-21).

VALVE SEAT INSPECTION/REFACING

Disassemble the cylinder head (page 8-12).

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

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



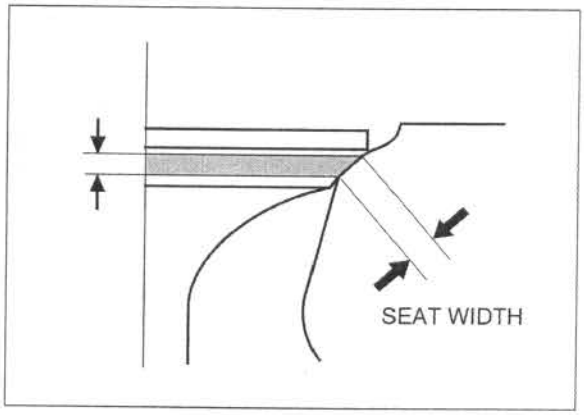
The valves cannot be ground. If the valve face is burned, badly worn or if it contacts the seat unevenly, replace the valve.

Remove the valve and inspect the valve seat face.

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

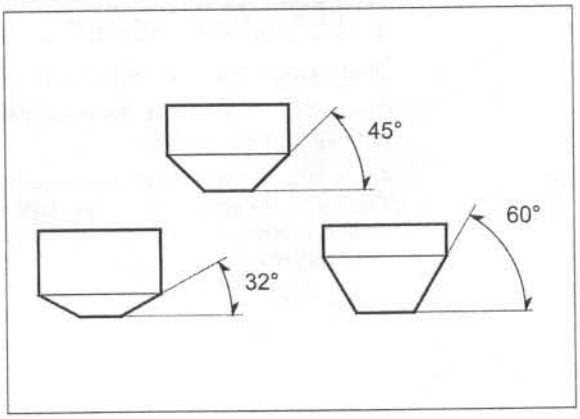
STANDARD: 0.9 – 1.1 mm (0.035 – 0.043 in)
SERVICE LIMIT: 1.6 mm (0.06 in)

If the valve seat width is not within specification, reface the valve seat (page 8-21).



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

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



TOOLS:

Seat cutter, 27.5 mm (45° IN)	**07780-0010200**
Seat cutter, 24 mm (45° EX)	**07780-0010600**
Cutter holder, 5.0 mm	**07781-0010400**

or equivalent commercially available in U.S.A.

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

TOOLS:

Flat cutter, 27 mm (32° IN)	**07780-0013300**
Flat cutter, 22 mm (32° EX)	**07780-0012601**
Cutter holder, 5.0 mm	**07781-0010400**

or equivalent commercially available in U.S.A.

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

TOOLS:

Interior cutter, 26 mm (60° IN)	**07780-0014500**
Interior cutter, 22 mm (60° EX)	**07780-0014202**
Cutter holder, 5.0 mm	**07781-0010400**

or equivalent commercially available in U.S.A.

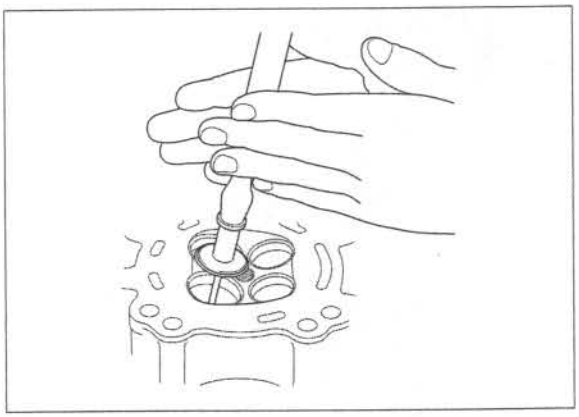
Using a 45° seat cutter, cut the seat to the proper width.

VALVE SEAT WIDTH: 0.9 – 1.1 mm (0.035 – 0.043 in)

Make sure that all pitting and irregularities are removed.

NOTE:

- Excessive lapping pressure may deform or damage the seat.
- Change the angle of lapping tool frequently to prevent uneven seat wear.
- Do not allow lapping compound to enter the guides.



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

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

Assemble the cylinder head (page 8-16).

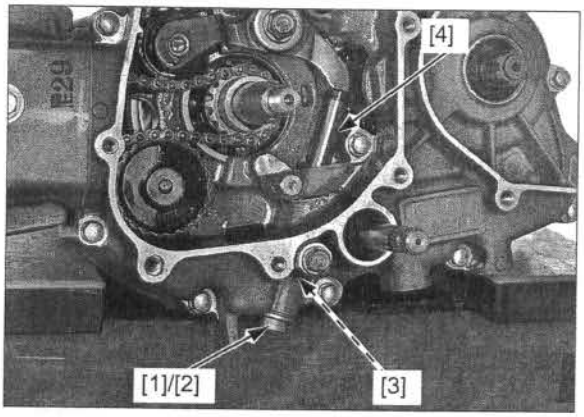
CAM CHAIN TENSIONER

REMOVAL

Remove the flywheel (page 11-5).

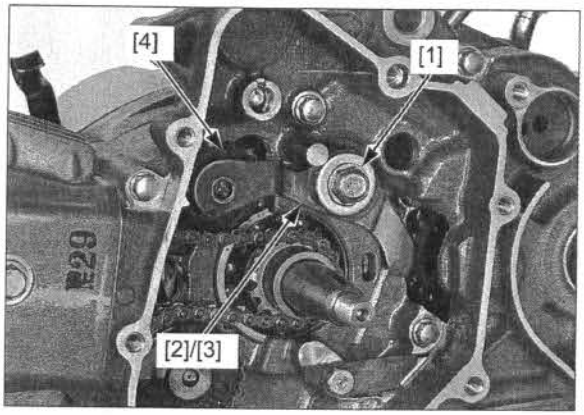
Remove the following:

- Cam chain tensioner sealing bolt [1] and washer [2]
- Tensioner spring [3]
- Push rod [4]



Remove the following:

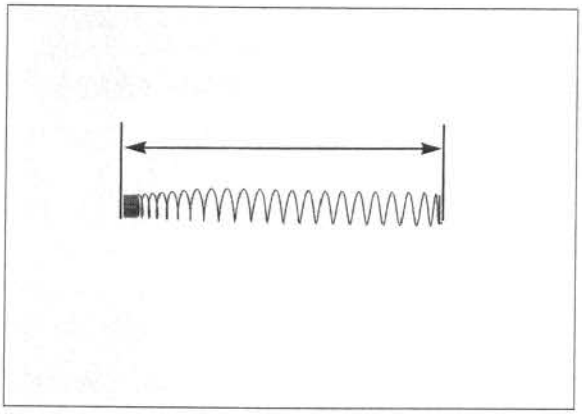
- Pivot bolt/washer [1]
- Tensioner arm [2] and collar [3]
- Tensioner roller [4]



INSPECTION

Measure the tensioner spring free length.

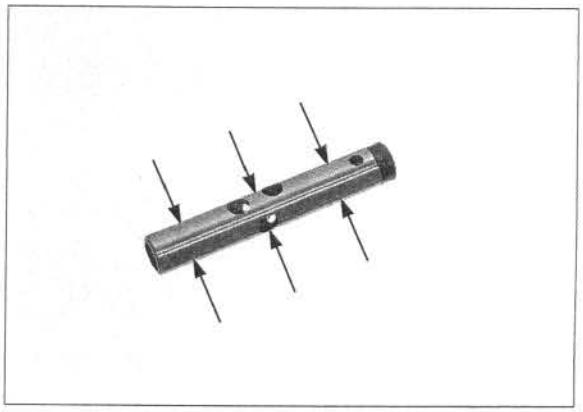
SERVICE LIMIT: 109 mm (4.3 in)



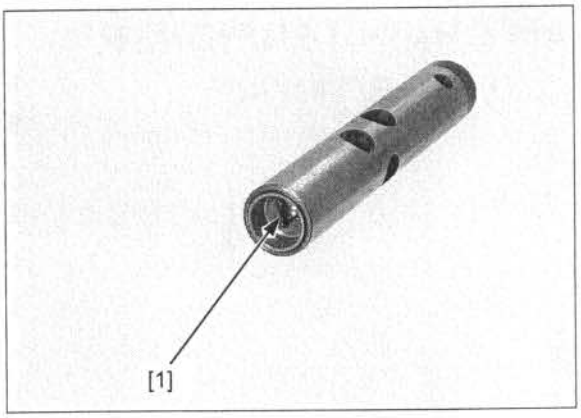
Check the push rod for wear or damage.

Measure the push rod O.D.

SERVICE LIMIT: 11.94 mm (0.470 in)



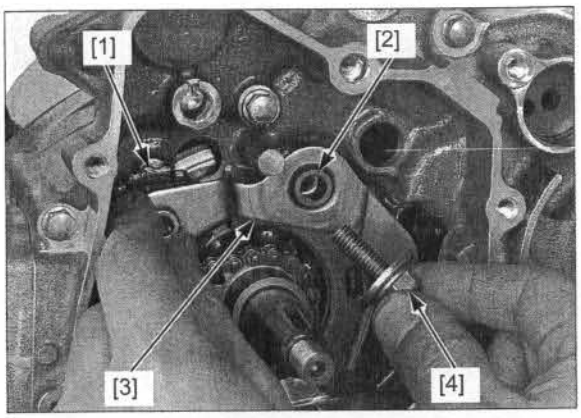
Inspect the check valve [1] in the push rod for wear or damage.



INSTALLATION

Install the cam chain tensioner roller [1], collar [2], tensioner arm [3] and pivot bolt/washer [4], then tighten it to the specified torque.

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)

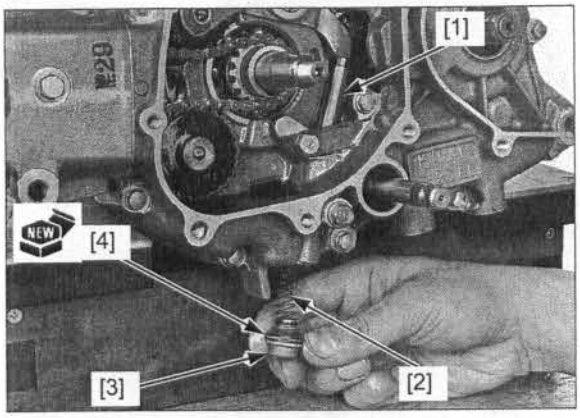


Install the following:

- Push rod [1]
- Tensioner spring [2]

Install and tighten the sealing bolt [3] with a new sealing washer [4] to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

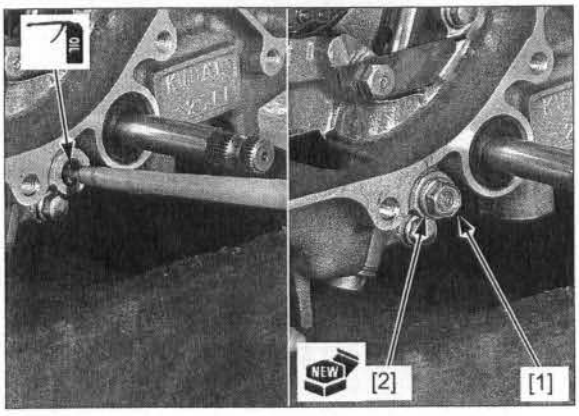


Remove the cam chain tensioner sealing bolt [1] and washer [2].

Pour 4.0 cm^3 minimum of engine oil into the push rod.

Install and tighten the sealing bolt with a new sealing washer.

Install the flywheel (page 11-9).



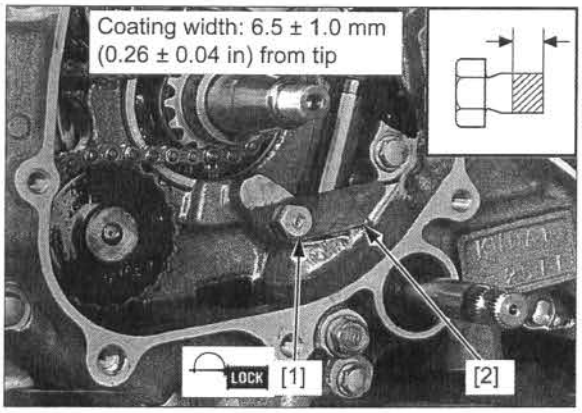
OIL STOPPER PLATE REMOVAL/ INSTALLATION

Remove the flywheel (page 11-5).

Remove the bolt [1] and oil stopper plate [2].

Apply locking agent (Three Bond 1322 or equivalent) to the bolt threads as specified.
Install the oil stopper plate and tighten the bolt.

Install the flywheel (page 11-9).



MEMO

9. CYLINDER/PISTON

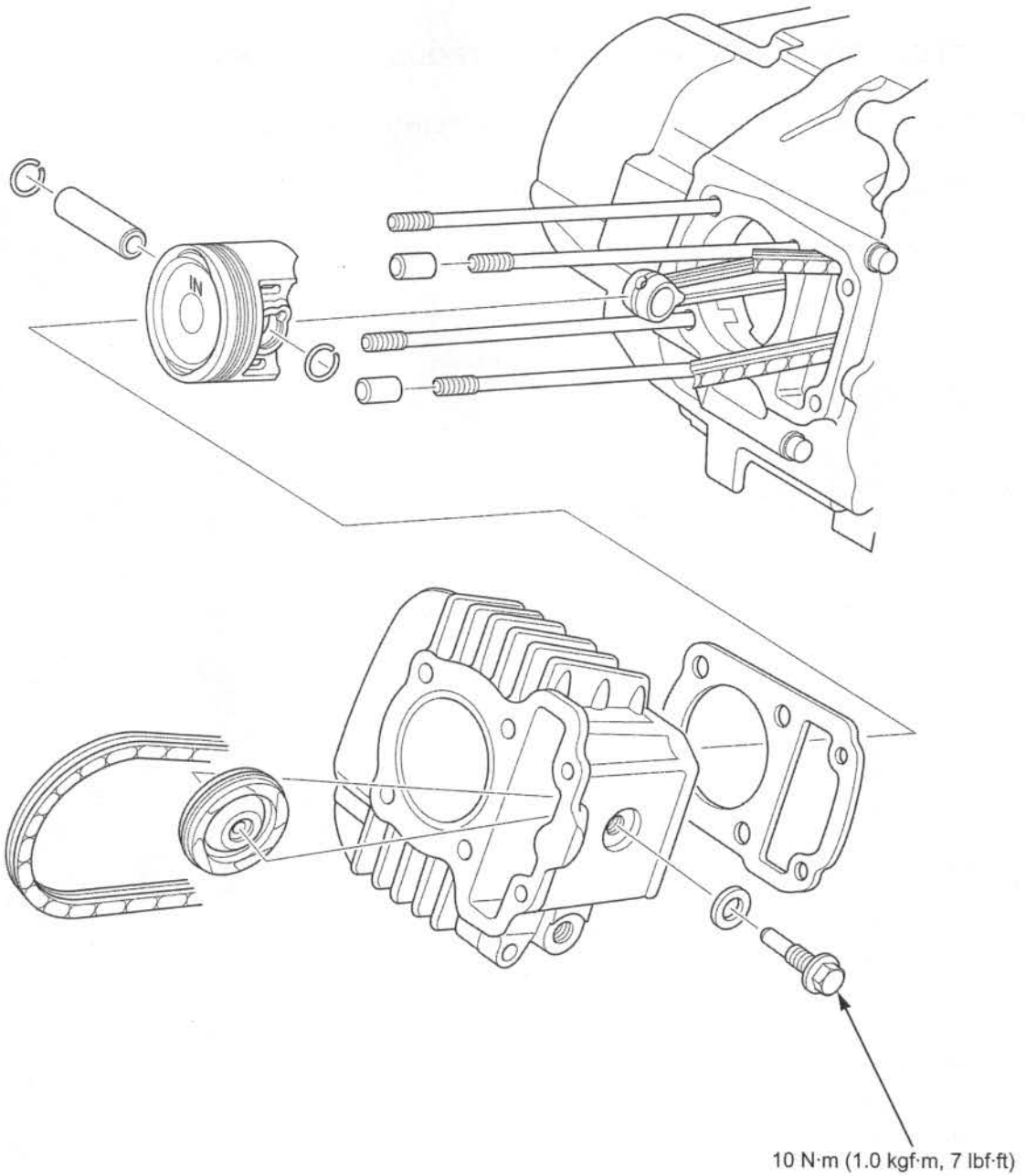
COMPONENT LOCATION 9-2

SERVICE INFORMATION 9-3

TROUBLESHOOTING 9-3

CYLINDER/PISTON 9-4

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- This section covers service of the cylinder and piston. These services can be performed with the engine installed in the frame.
- Take care not to damage the cylinder wall and piston.
- Be careful not to damage the mating surfaces when removing the cylinder. Do not tap the cylinder too hard during removal.
- 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.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		50.005 – 50.015 (1.9687 – 1.9691)	50.05 (1.970)
	Out-of-round		–	0.10 (0.004)
	Taper		–	0.10 (0.004)
	Warpage		–	0.05 (0.002)
Piston, piston rings, piston pin	Piston O.D.		49.980 – 49.995 (1.9677 – 1.9683)	49.91 (1.965)
	Piston O.D. measurement point		10 (0.4) from bottom of skirt	–
	Piston pin bore I.D.		13.002 – 13.008 (0.5119 – 0.5121)	13.03 (0.513)
	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)	0.075 (0.0030)
	Piston ring-to-ring groove clearance	Top	0.015 – 0.045 (0.0006 – 0.0018)	0.08 (0.003)
		Second	0.015 – 0.045 (0.0006 – 0.0018)	0.08 (0.003)
	Piston ring end gap	Top	0.10 – 0.25 (0.004 – 0.0010)	0.5 (0.02)
		Second	0.10 – 0.25 (0.004 – 0.0010)	0.5 (0.02)
		Oil (side rail)	0.20 – 0.70 (0.008 – 0.028)	1.1 (0.04)
Cylinder-to-piston clearance			0.010 – 0.035 (0.0004 – 0.0014)	0.10 (0.004)
Connecting rod small end I.D.			13.016 – 13.034 (0.5124 – 0.5131)	13.05 (0.514)
Connecting rod-to-piston pin clearance			0.016 – 0.040 (0.0006 – 0.0016)	0.07 (0.003)

TORQUE VALUES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cam chain guide roller pin bolt	1	8	10 (1.0, 7)	
Cylinder stud bolt	4	7	6 (0.6, 4.4)	See page 9-7

TROUBLESHOOTING

Compression too low, hard starting or poor performance at low speed
- Leaking cylinder head gasket
- Worn, stuck or broken piston ring
- Worn or damaged cylinder and piston
- Bent connecting rod

Compression too high, overheating or knocking
- Excessive carbon built-up on piston head or combustion chamber

Excessive smoke
- Worn cylinder, piston or piston rings
- Improper installation of piston rings
- Scored or scratched piston or cylinder wall
- Cylinder head/valve problem (page 8-5)

Abnormal noise
- Worn piston pin or piston pin hole
- Worn cylinder, piston or piston rings
- Worn connecting rod small end

CYLINDER/PISTON

CYLINDER REMOVAL

NOTE:

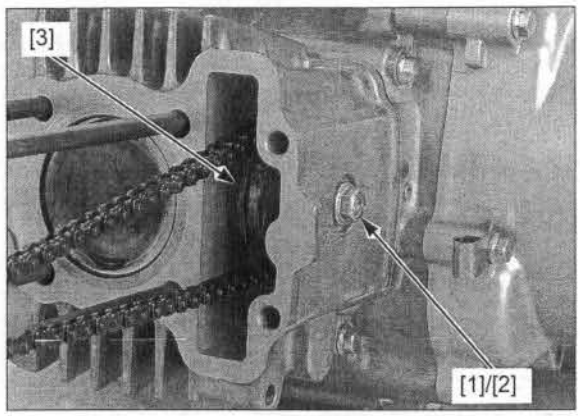
- Cylinder and piston can be serviced with the engine installed on the frame.

Remove the cylinder head (page 8-11).

Be careful not to drop the guide roller into the crankcase.

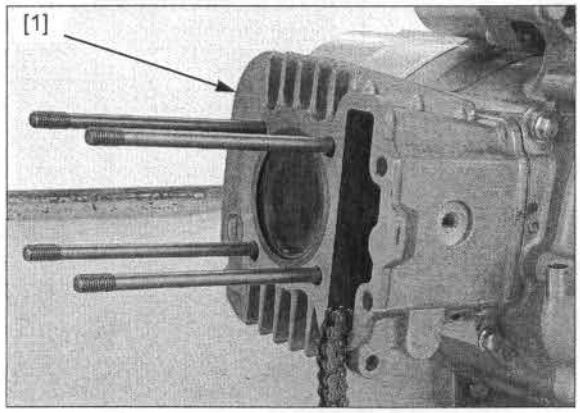
Remove the following:

- Cam chain guide roller pin bolt [1] and sealing washer [2]
- Guide roller [3]

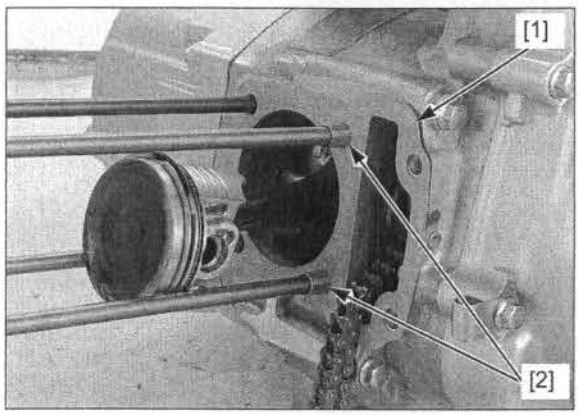


Be careful not to damage the mating surface.

Remove the cylinder [1].



Remove the gasket [1] and dowel pins [2].

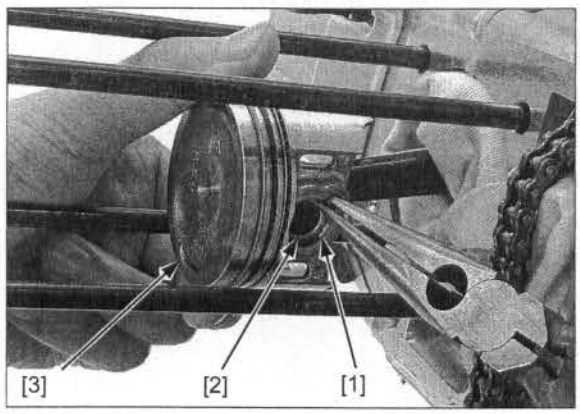


PISTON REMOVAL

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

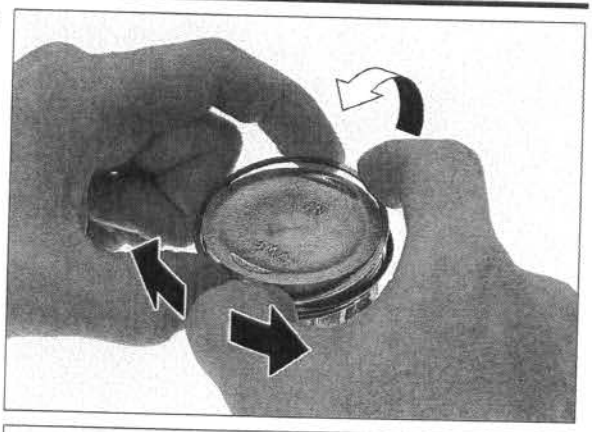
Remove the piston pin clip [1] with pliers.

Push the piston pin [2] out of the piston [3] and connecting rod, and remove the piston.



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

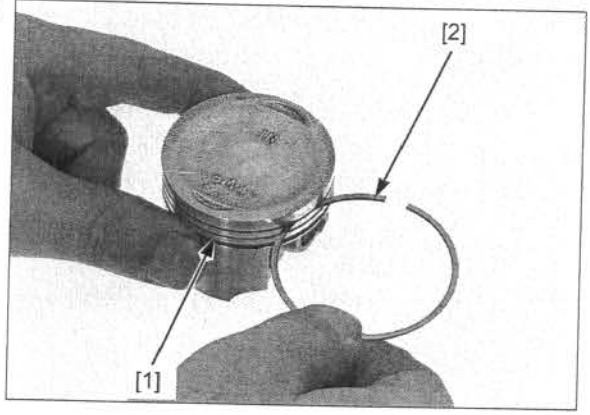
Spread each piston ring and remove it by lifting it up at a point just opposite the gap.



Never use a wire brush; it will damage the groove.

Clean carbon deposits from the piston ring grooves [1] with a used piston ring [2] that will be discarded.

Blow the oil passage with compressed air, if necessary.



INSPECTION

CYLINDER

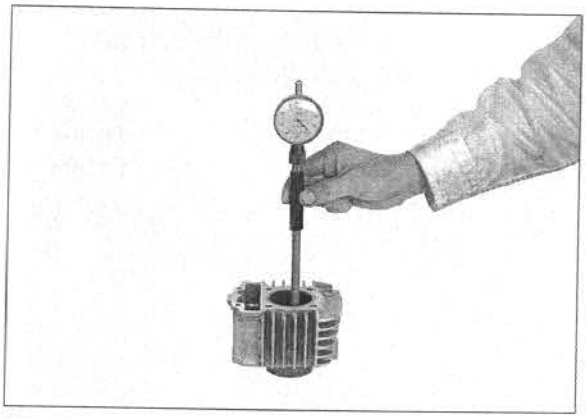
Inspect the cylinder wall for scratches and wear.
Measure and record the cylinder I.D. at three levels in both the X and Y axis. Take the maximum reading to determine the cylinder wear.

SERVICE LIMIT: 50.05 mm (1.970 in)

Calculate the cylinder-to-piston clearance.

For measurement of the piston O.D. (page 9-6).

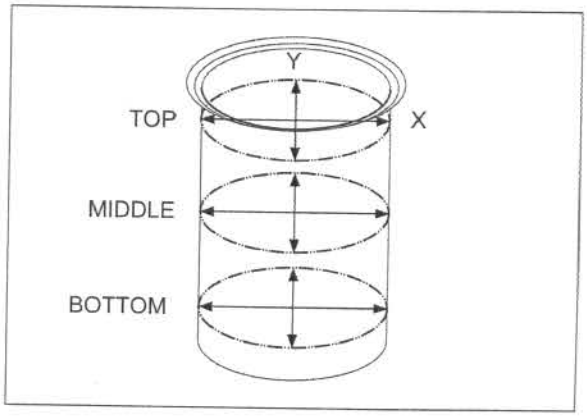
SERVICE LIMIT: 0.10 mm (0.004 in)



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

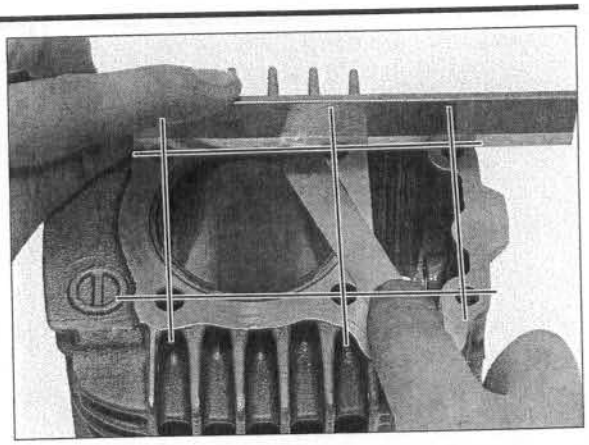
SERVICE LIMITS:
Out-of-round: 0.10 mm (0.004 in)
Taper: 0.10 mm (0.004 in)

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



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

SERVICE LIMIT: 0.05 mm (0.002 in)



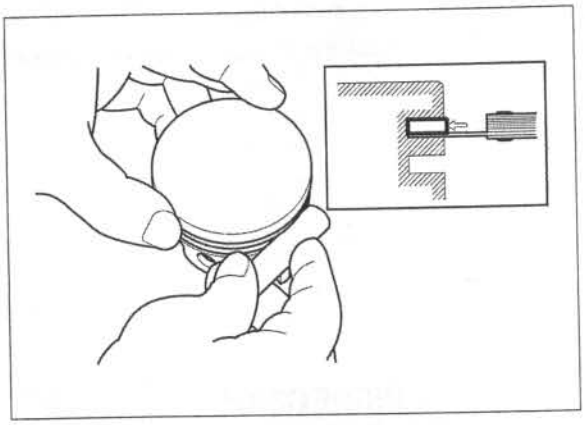
PISTON/PISTON RING

Always replace the piston rings as a set.

Inspect the piston rings for smooth movement by rotating them. The rings should be able to move in their grooves without catching.

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

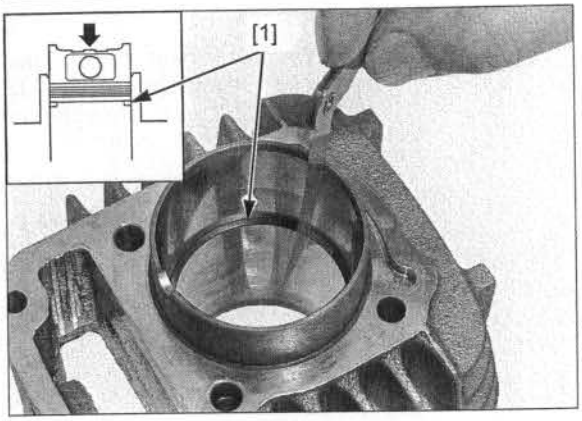
SERVICE LIMITS:
Top: 0.08 mm (0.003 in)
Second: 0.08 mm (0.003 in)



Insert the piston ring [1] into the bottom of the cylinder squarely using the piston crown.
Measure the ring end gap.

SERVICE LIMITS:

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



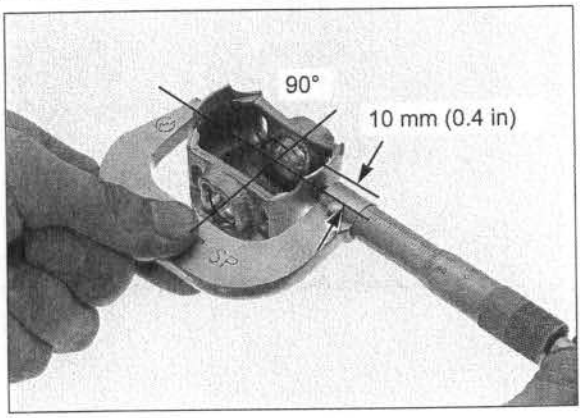
Measure the piston O.D. at a point 10 mm (0.4 in) from the bottom and 90° to the piston pin hole.

SERVICE LIMIT: 49.91 mm (1.965 in)

For measurement of the cylinder I.D. (page 9-5).

Calculate the cylinder-to-piston clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)



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

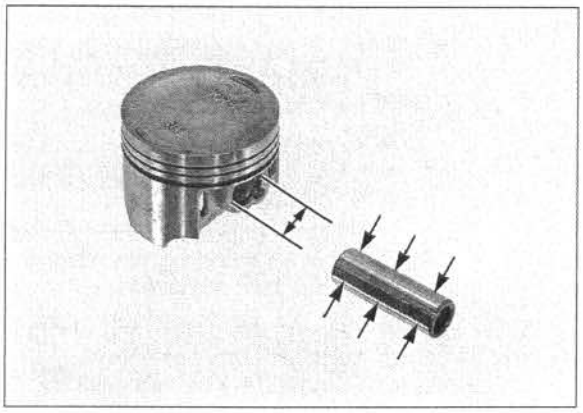
SERVICE LIMIT: 13.03 mm (0.513 in)

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

SERVICE LIMIT: 12.98 mm (0.511 in)

Calculate the piston-to-piston pin clearance.

SERVICE LIMIT: 0.075 mm (0.0030 in)



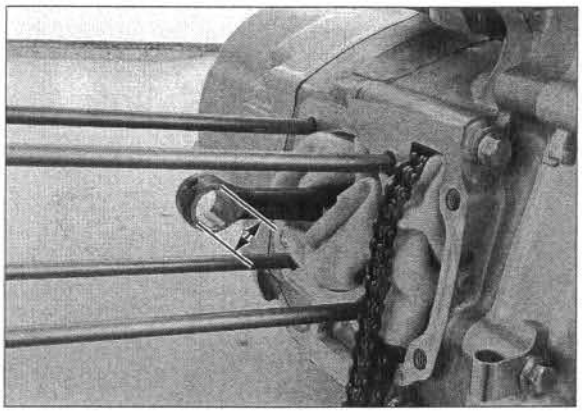
CONNECTING ROD

Measure the connecting rod small end I.D.

SERVICE LIMIT: 13.05 mm (0.514 in)

Calculate the connecting rod-to-piston pin clearance.

SERVICE LIMIT: 0.07 mm (0.003 in)



CYLINDER STUD BOLT REPLACEMENT

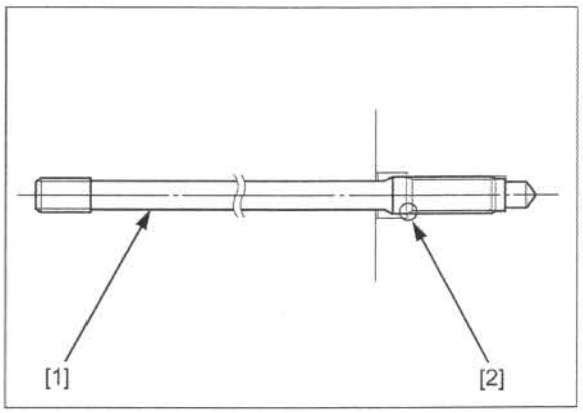
If replacing the cylinder stud bolts, be sure to install them as shown.

Thread two nuts onto the stud bolt [1] and tighten them together, then use a wrench on them to turn the stud bolt out.

Install and tighten new stud bolts to the specified torque.

TORQUE: 6 N·m (0.6 kgf·m, 4.4 lbf·ft)

After tightening the stud bolts, check that the incomplete threads [2] is buried into the cylinder.



PISTON INSTALLATION

Clean the piston heads, ring grooves and skirts.
Carefully install the piston rings onto the piston with their markings facing up.

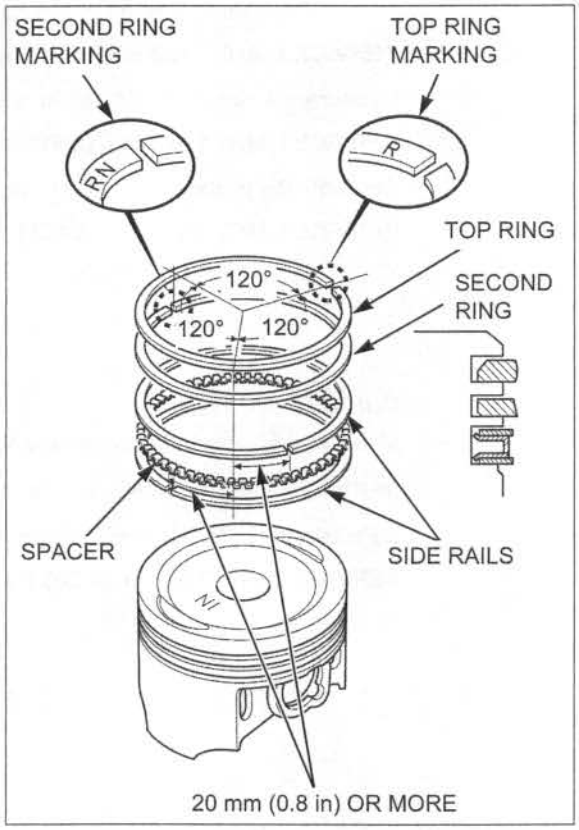
NOTE:

- Be careful not to damage the piston and piston rings during installation.
- Do not confuse the top and second rings.
- When installing the oil ring, install the spacer first and then the side rails.

Do not align the gaps of the oil ring side rails.

Stagger the piston ring end gaps 120 degrees apart from each other as shown.
Stagger the side rails gaps as shown.

After installation, the piston rings should be free to rotate in the groove.

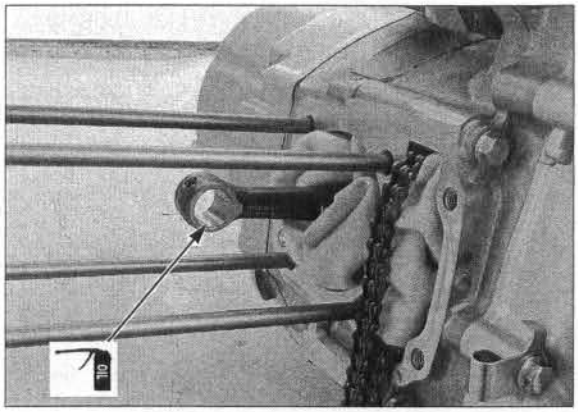


Place a clean shop towel over the crankcase to prevent the dirt, dust or piston pin clips from entering the crankcase.

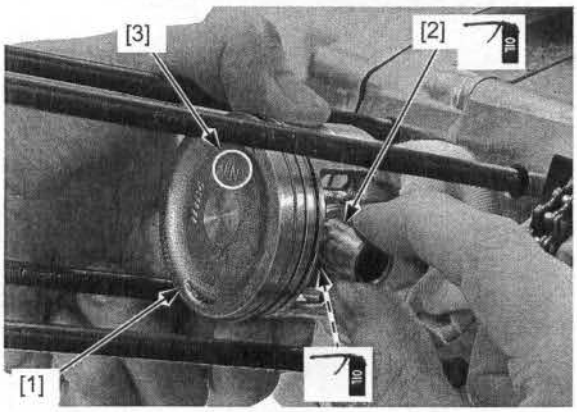
Be careful not to damage the gasket mating surfaces.

Clean the gasket mating surfaces of the crankcase and cylinder thoroughly.

Apply oil to the connecting rod small end inner surface.



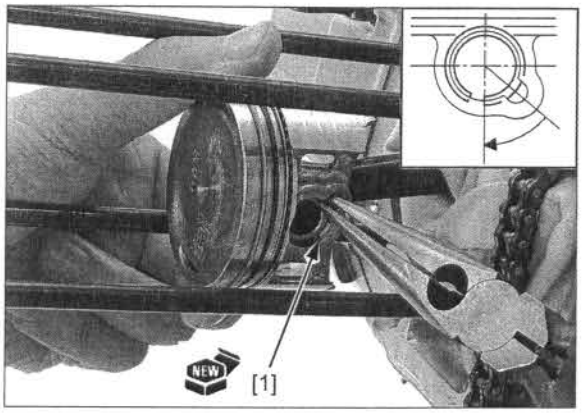
Apply oil to the piston [1] pin hole inner surface and piston pin [2] outer surface.
Install the piston with the "IN" mark [3] facing the intake side.
Instal the piston pin.



Install the new piston pin clip [1].

NOTE:

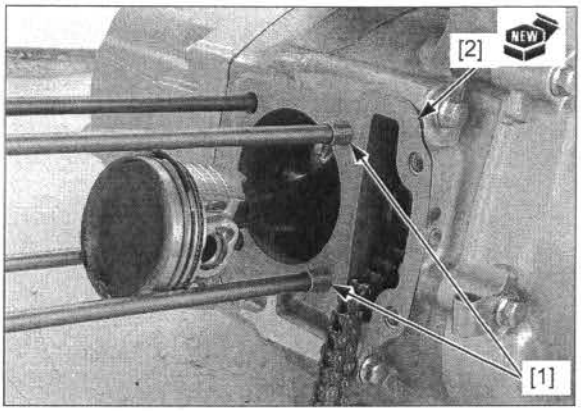
- Make sure the piston pin clips are seated securely.
- Do not align the piston pin clip end gap with the piston cutout.



CYLINDER INSTALLATION

Do not reuse the gasket, replace with a new one.

Install the dowel pins [1] and a new gasket [2].

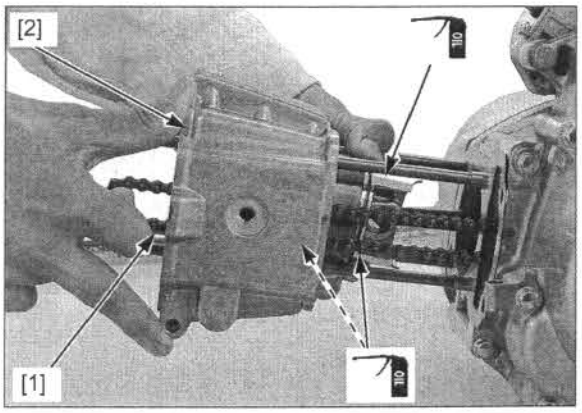


Apply oil to the cylinder bore, piston sliding area, piston ring grooves and piston rings whole surface.

Route the cam chain [1] through the cylinder [2].

Be careful not to damage the piston rings and cylinder bore.

Install the cylinder over the piston while compressing the piston rings with your fingers.

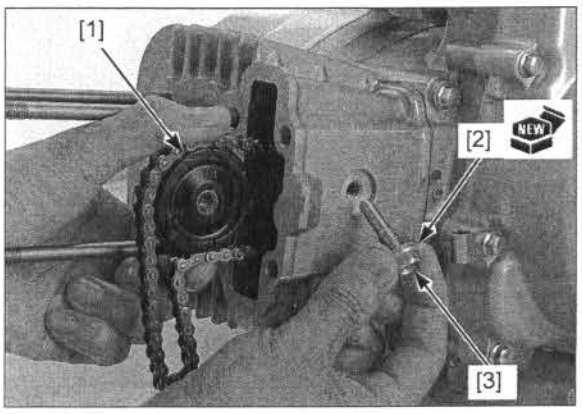


Be careful not to drop the guide roller into the crankcase.

Install the cam chain guide roller [1], new sealing washer [2] and cam chain guide roller pin bolt [3]. Tighten the roller pin bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the cylinder head (page 8-19).



MEMO

10. CLUTCH/GEARSHIFT LINKAGE

COMPONENT LOCATION 10-2

SERVICE INFORMATION 10-3

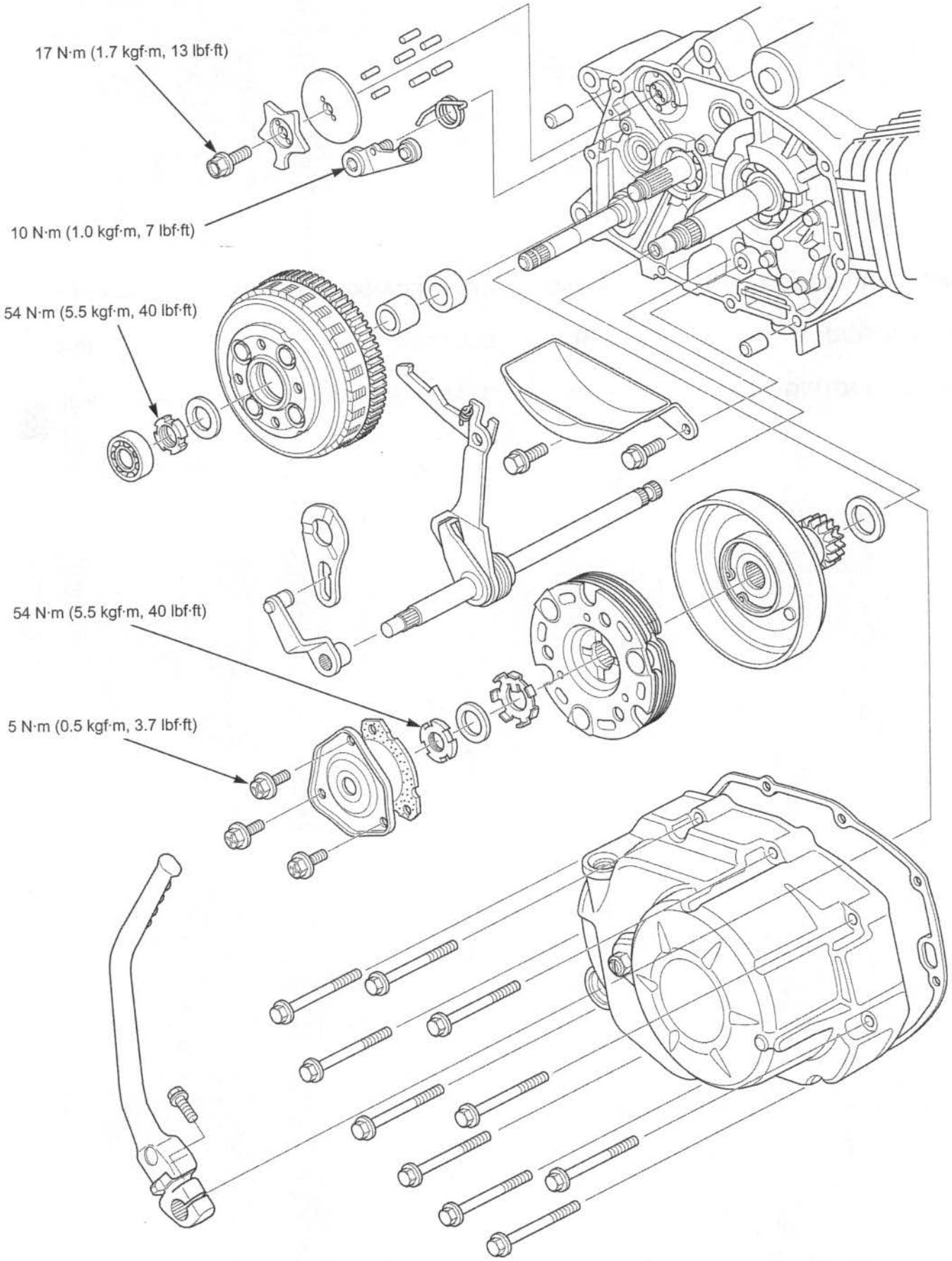
TROUBLESHOOTING 10-4

RIGHT CRANKCASE COVER 10-5

CLUTCH 10-9

GEARSHIFT LINKAGE 10-26

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- This section covers service of the clutch (centrifugal clutch and change clutch) and gearshift linkage. These service can be done with the engine installed in the frame.
- Engine oil viscosity, oil level and the use of oil additives have an effect on clutch operation. Oil additives of any kind are specifically not recommended. When the clutch does not disengage or the motorcycle creeps with clutch disengaged, inspect the engine oil and oil level before servicing the clutch system.

SPECIFICATIONS

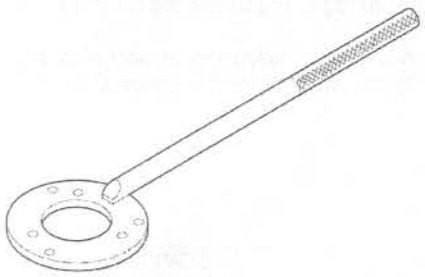
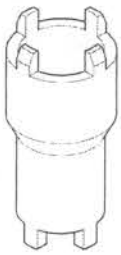
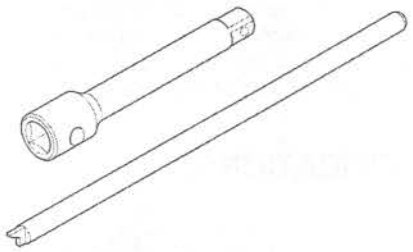
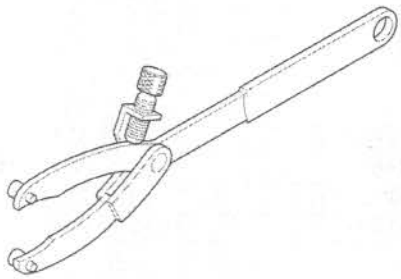
Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Change clutch	Disc thickness		2.00 – 2.20 (0.079 – 0.087)	1.82 (0.072)
	Plate warpage		–	0.20 (0.008)
	Clutch spring free height		5.01 (0.197)	4.63 (0.182)
	Primary driven gear I.D.		23.000 – 23.021 (0.9055 – 0.9063)	23.07 (0.908)
	Clutch outer guide	I.D.	16.991 – 17.009 (0.6689 – 0.6696)	17.049 (0.6712)
		O.D.	22.959 – 22.980 (0.9039 – 0.9047)	22.940 (0.9031)
	Mainshaft O.D. at clutch outer guide		16.966 – 16.984 (0.6680 – 0.6687)	16.87 (0.664)
Centrifugal clutch	Clutch drum I.D.		104.0 – 104.2 (4.09 – 4.10)	104.3 (4.11)
	Clutch weight lining thickness		1.5 (0.06)	1.0 (0.04)
	One-way clutch drum I.D.		42.000 – 42.020 (1.6535 – 1.6543)	42.04 (1.655)
	One-way clutch roller O.D.		4.990 – 5.000 (0.1965 – 0.1969)	4.97 (0.196)
	Primary drive gear I.D.		19.030 – 19.058 (0.7492 – 0.7503)	19.11 (0.752)
	Crankshaft O.D. at primary drive gear		18.967 – 18.980 (0.7467 – 0.7472)	18.92 (0.745)

TORQUE VALUES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Clutch lifter plate bolt	4	6	12 (1.2, 9)	
Clutch center lock nut	1	14	54 (5.5, 40)	Apply oil to the threads and seating surface.
Centrifugal clutch lock nut	1	14	54 (5.5, 40)	Apply oil to the threads and seating surface.
Gearshift cam plate bolt	1	6	17 (1.7, 13)	Apply locking agent to the threads: See page 10-29
Shift drum stopper arm bolt	1	6	10 (1.0, 7)	Apply locking agent to the threads: See page 10-29
Gearshift pedal pinch bolt	1	6	12 (1.2, 9)	
Shift return spring pin	1	8	30 (3.1, 22)	

TOOLS

Clutch center holder 07HMB-HB70100  or 07923-HB3000B (U.S.A. only)	Lock nut wrench 20 x 24 mm 07716-0020100 	Extension bar 07716-0020500  or equivalent commercially available in U.S.A.
Universal Holder 07725-0030000 		

TROUBLESHOOTING

Faulty clutch operation can usually be corrected by adjusting the clutch system.

Clutch slips when accelerating
- Incorrect clutch adjustment
- Worn clutch disc
- Weak clutch spring
- Faulty clutch weight
- Molybdenum or graphite additive

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

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

Transmission jumps out of gear
- Damaged stopper arm
- Damaged gearshift cam plate
- Loose gearshift cam plate bolt

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

RIGHT CRANKCASE COVER

REMOVAL

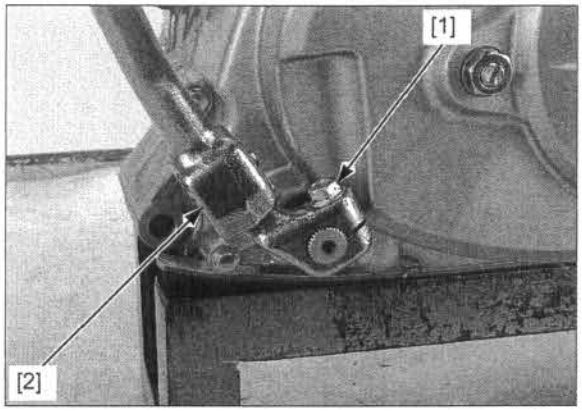
Drain the engine oil (page 3-10).

Support the motorcycle securely with a hoist or equivalent.

Remove the main step (page 2-6).

When removing the kickstarter pedal, mark the pedal position to ensure the original location.

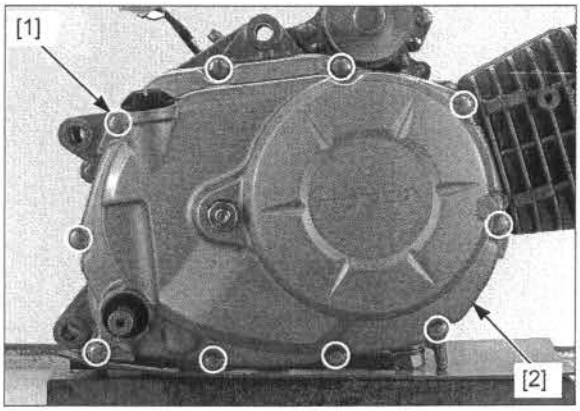
Remove the bolt [1] and kickstarter pedal [2].



Remove the bolts [1] in a crisscross pattern in several steps.

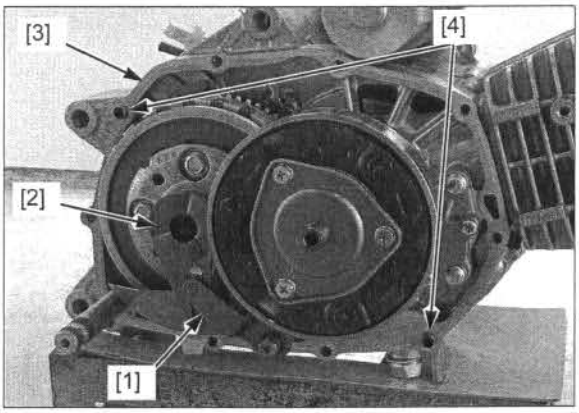
Be careful not to damage the mating surface.

Remove the right crankcase cover [2].



Remove the following:

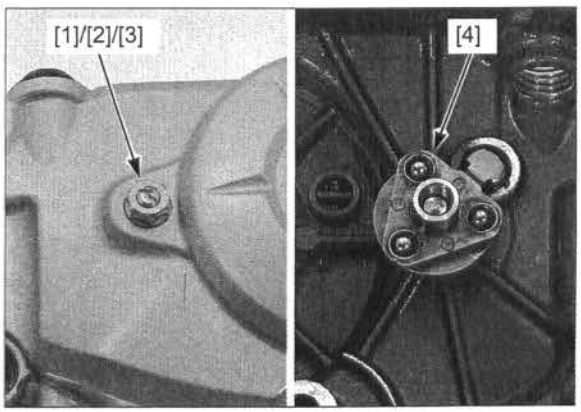
- Clutch lever [1]
- Clutch lifter cam plate [2]
- Gasket [3]
- Dowel pins [4]



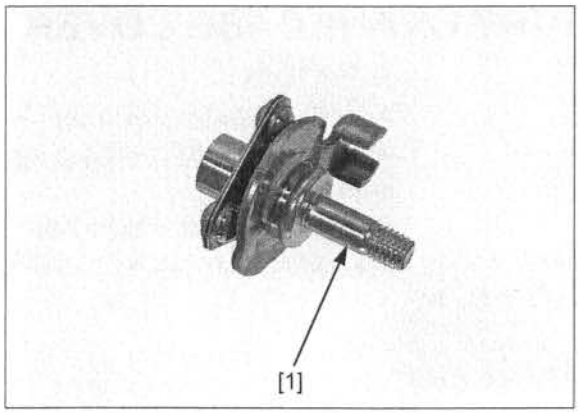
DISASSEMBLY

Remove the following:

- Clutch adjuster lock nut [1]
- Washer [2]
- O-ring [3]
- Clutch adjuster/lifter boss [4]

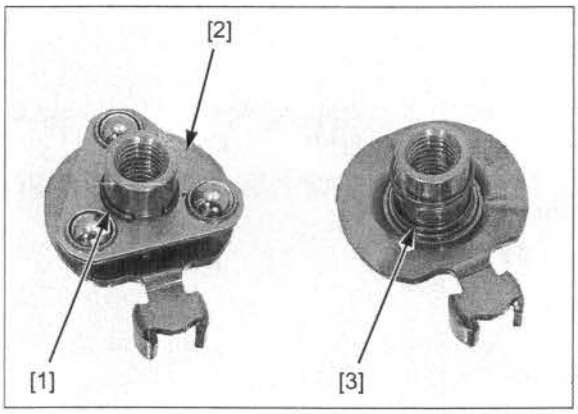


Remove the clutch adjuster bolt [1].



Remove the following:

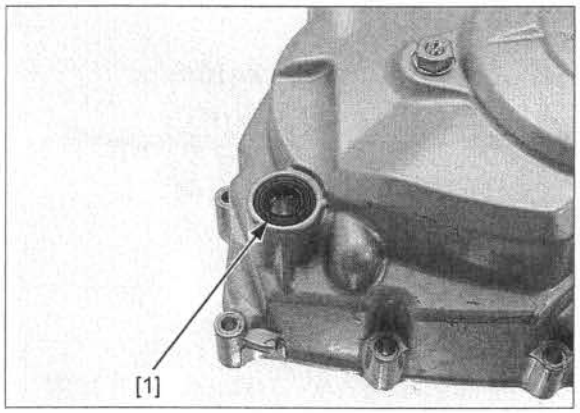
- Snap ring [1]
- Clutch lifter boss [2]
- Spring [3]



KICKSTARTER SPINDLE OIL SEAL

Check that the kickstarter spindle oil seal [1] is in good condition, replace it if necessary.

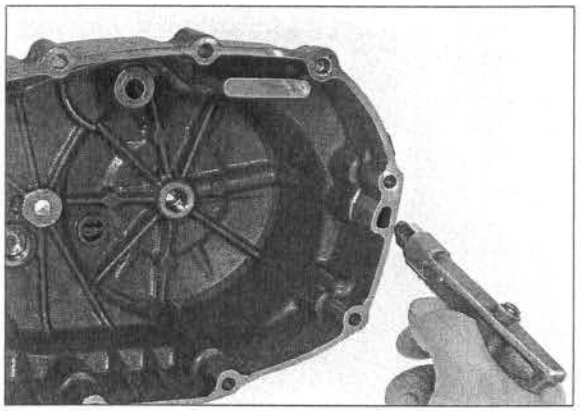
If replacing the oil seal, install it until it is fully seated.



OIL PASSAGES

Blow open the oil passage of the right crankcase cover with compressed air.

Check the oil passage for any clogs.

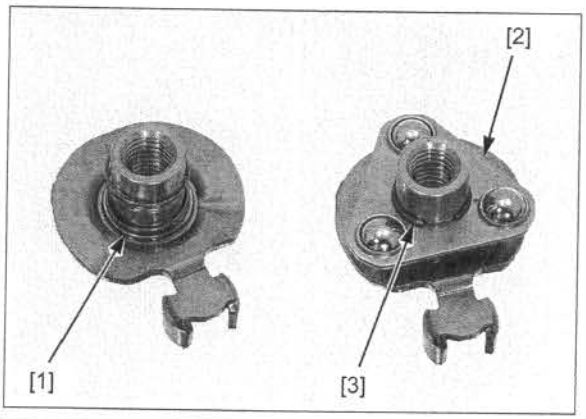


ASSEMBLY

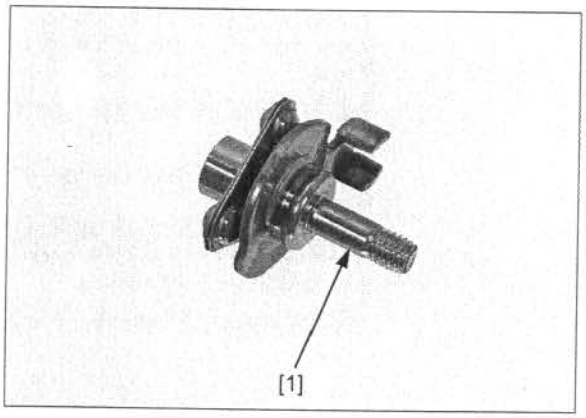
Make sure that the snap ring is firmly seated in the groove.

Install the following:

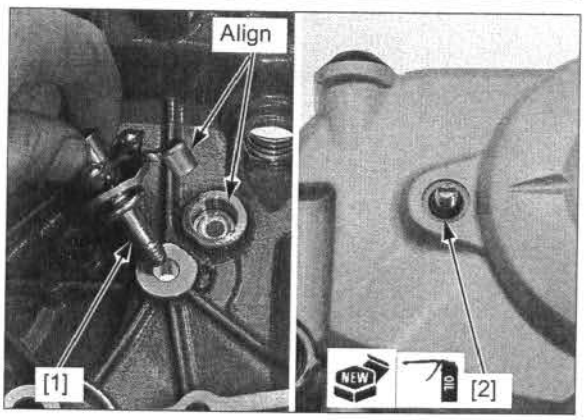
- Spring [1]
- Clutch lifter boss [2]
- Snap ring [3]



Install the clutch adjuster bolt [1].

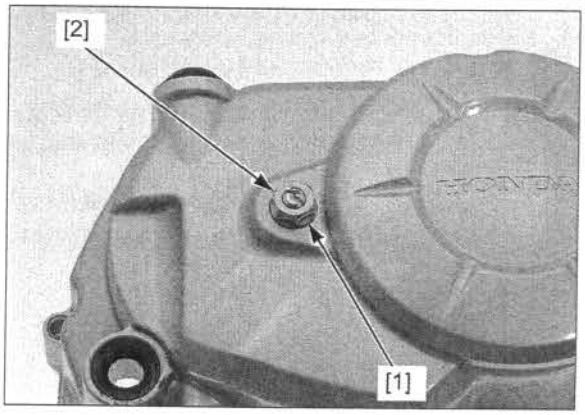


Install the clutch adjuster/lifter boss [1] into the right crankcase cover aligning its boss with the hole in the crankcase cover.
Apply oil to a new O-ring [2].
Install the O-ring onto the clutch adjuster/lifter boss.



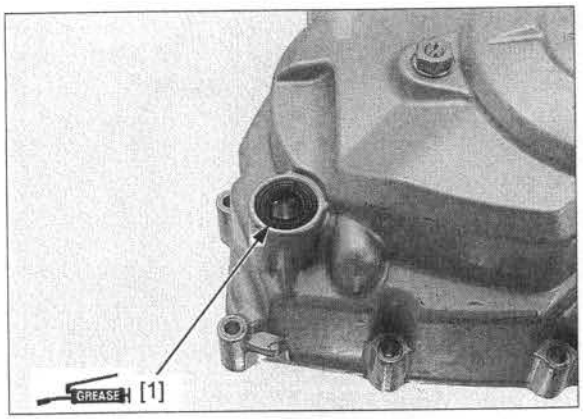
Install the washer [1] and clutch adjuster lock nut [2].

Adjust the clutch system (page 3-17) after installing the right crankcase cover.



INSTALLATION

Apply grease to the kickstarter spindle oil seal [1] lips.

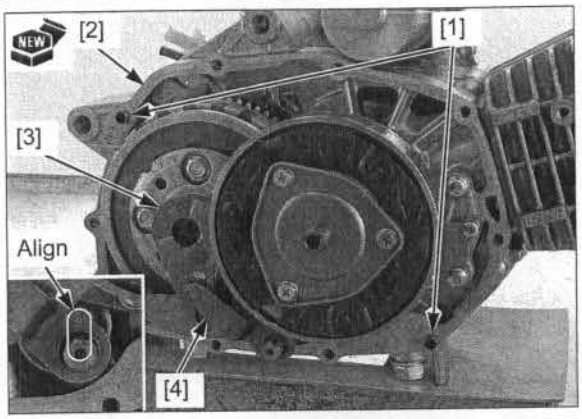


Clean the gasket mating surface of the crankcase and right crankcase cover, being careful not to damage them.

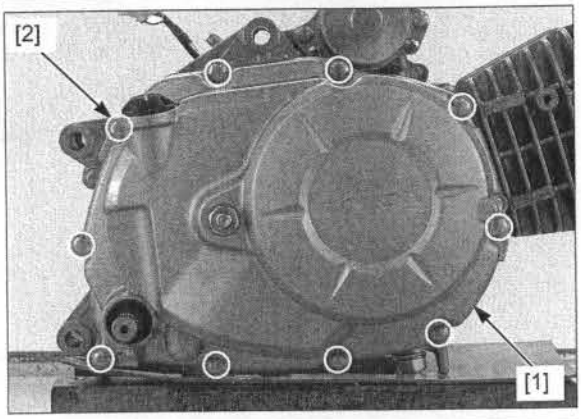
Install the dowel pins [1] and a new gasket [2] onto the crankcase.

Install the clutch lifter cam plate [3] onto the clutch lifter bearing.
Install the clutch lever [4] onto the gearshift spindle while aligning the punch mark of the lever with index line of the gearshift spindle.

Apply engine oil to the gearshift spindle journal area.



Install the right crankcase cover [1] and tighten the right crankcase cover bolts [2] in a crisscross pattern in several steps.

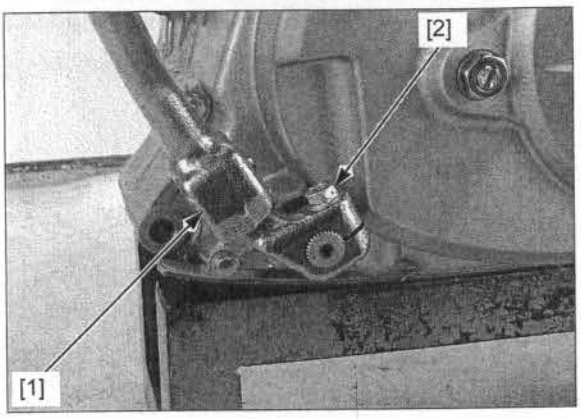


Install the kickstarter pedal [1] to its original position as marked during removal.
Install and tighten the bolt [2].

Install the main step (page 2-6).

Fill the engine with recommended engine oil (page 3-10).
Make sure there are no oil leaks.

Check the clutch system adjustment (page 3-17).



CLUTCH

REMOVAL

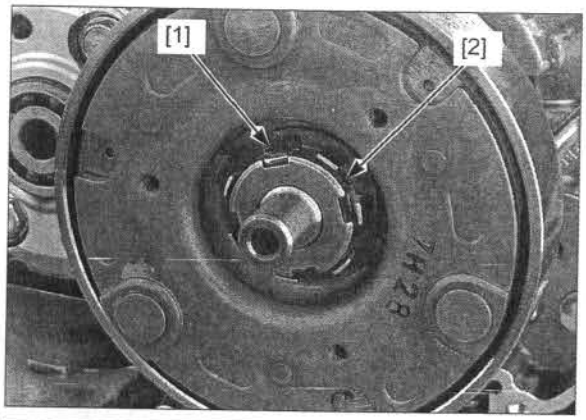
NOTE:

- Clutch system can be serviced with the engine installed on the frame.

Remove the following:

- Right crankcase cover (page 10-5)
- Engine oil centrifugal filter cover (page 3-11)

Bend up the tab [1] of the lock washer to clear the lock nut [2] groove.



Install the special tool using proper bolts or screws.

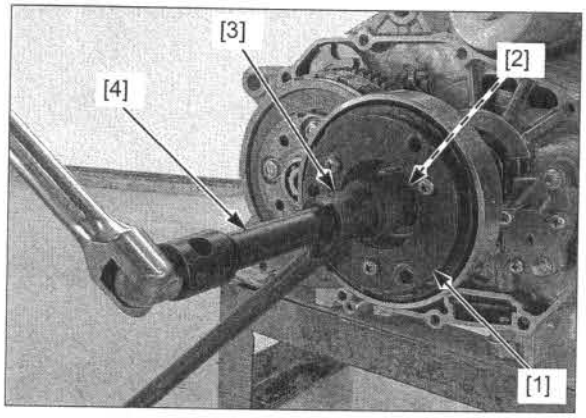
TOOL:

[1] Clutch center holder **07HMB-HB70100 or 07923-HB3000B (U.S.A. only)**

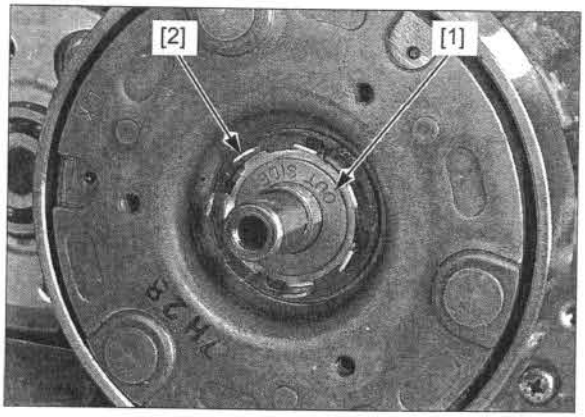
Remove the centrifugal clutch lock nut [2] using the special tools.

TOOLS:

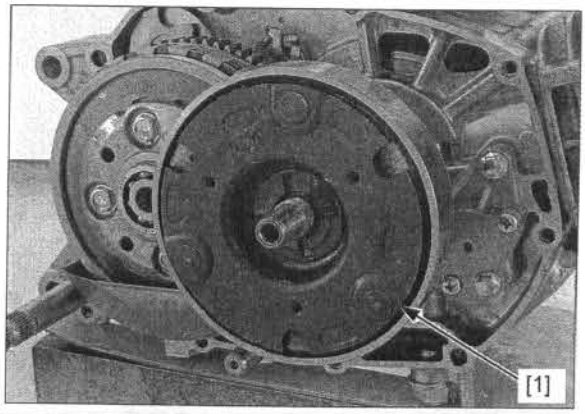
[3] Lock nut wrench, 20 x 24 mm **07716-0020100**
[4] Extension bar **07716-0020500**
or equivalent commercially available in U.S.A.



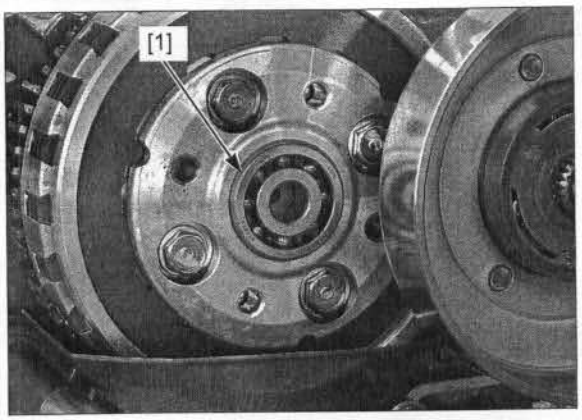
Remove the washer [1] and lock washer [2].



Remove the clutch weight assembly [1].



Remove the clutch lifter bearing [1].

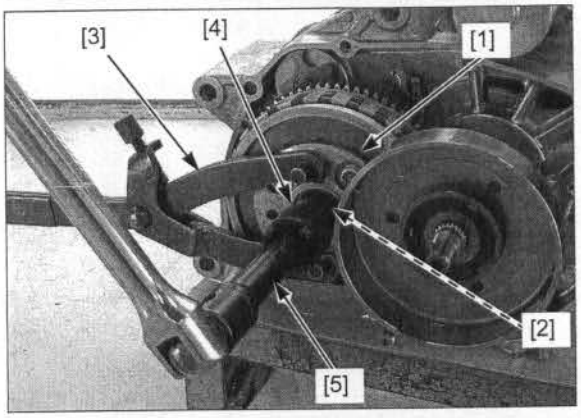


Hold the clutch lifter plate [1] and remove the clutch center lock nut [2] using the special tools.

TOOLS:

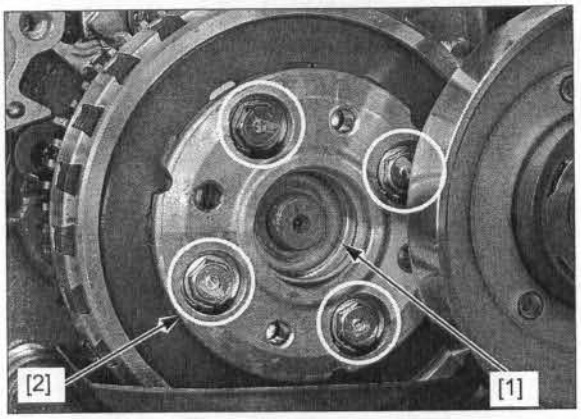
[3] Universal holder	**07725-0030000**
[4] Lock nut wrench, 20 x 24 mm	**07716-0020100**
[5] Extension bar	**07716-0020500**

or equivalent commercially available in U.S.A.

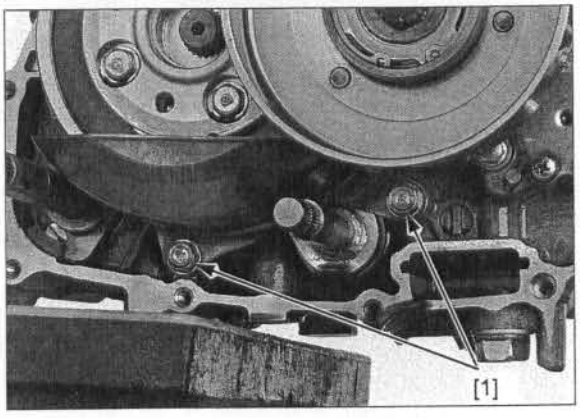


Remove the washer [1].

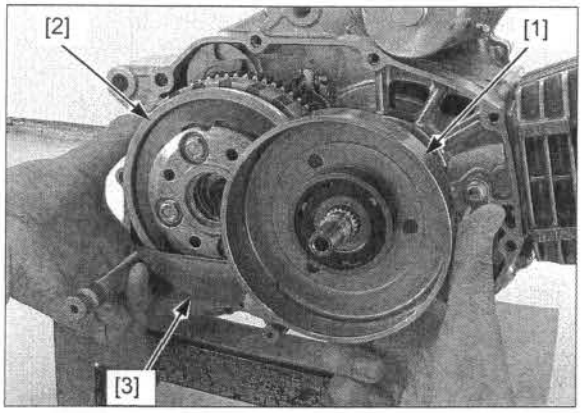
Loosen the clutch lifter plate bolts [2].



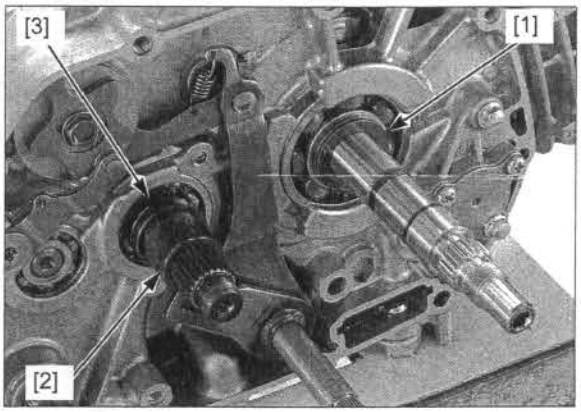
Remove the two oil separator plate mounting bolts [1].



Remove the centrifugal clutch outer [1], change clutch [2] and oil separator plate [3] as an assembly.



Remove the collar [1] from the crankshaft.
Remove the clutch outer guide [2] and collar [3] from the mainshaft.



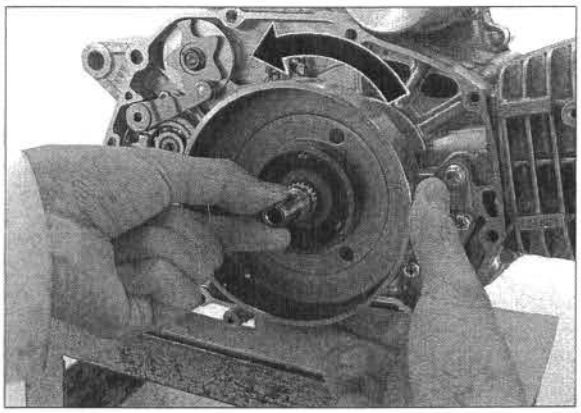
CENTRIFUGAL CLUTCH DISASSEMBLY/INSPECTION

ONE-WAY CLUTCH

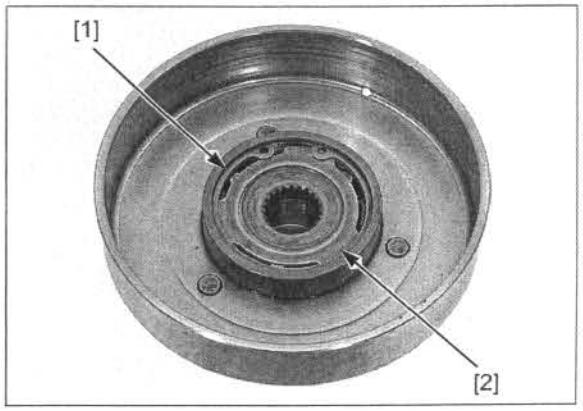
Temporarily install the centrifugal clutch outer to the crankshaft.

Hold the crankshaft and turn the centrifugal clutch outer by hand.
Make sure that the centrifugal clutch outer only turns counterclockwise as shown and does not turn clockwise.

Remove the centrifugal clutch outer from the crankshaft.



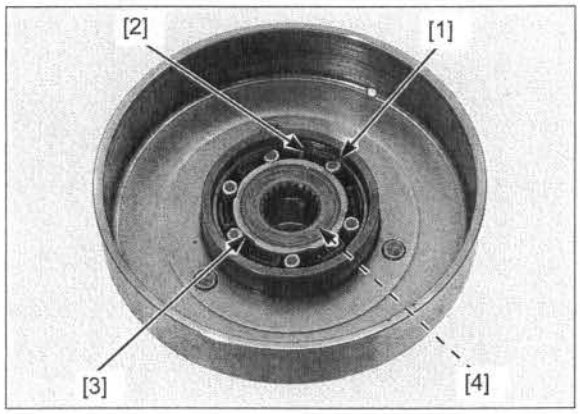
Remove the snap ring [1] and retainer [2].



Be careful not to lose the clutch rollers and clutch springs.

Remove the following:

- Rollers [1]
- Springs [2]
- One-way clutch inner [3]
- Washer [4]



Replace the clutch rollers as a set.

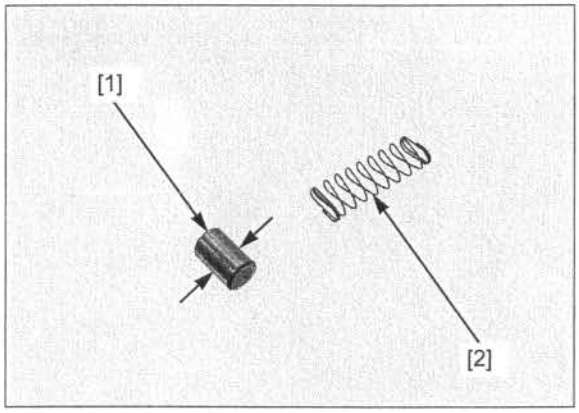
Check the rollers [1] for excessive wear or damage.

Measure the one-way clutch roller O.D.

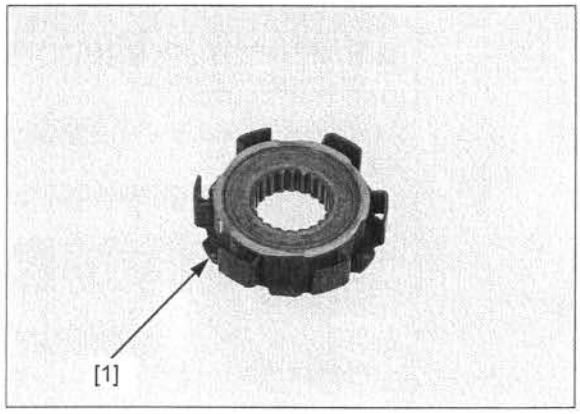
SERVICE LIMIT: 4.97 mm (0.196 in)

Replace the clutch springs as a set.

Check the springs [2] for fatigue or damage.



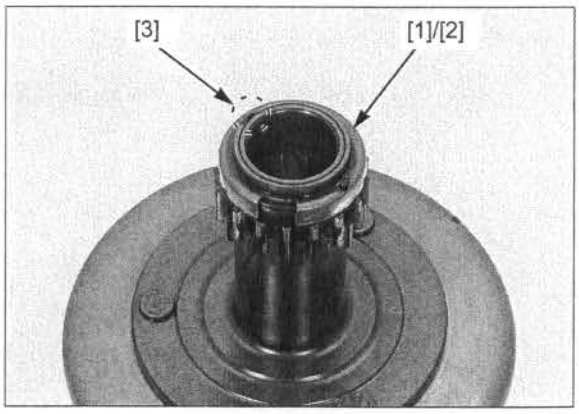
Check the one-way clutch inner [1] for wear or damage.



CLUTCH OUTER/SUB-GEAR

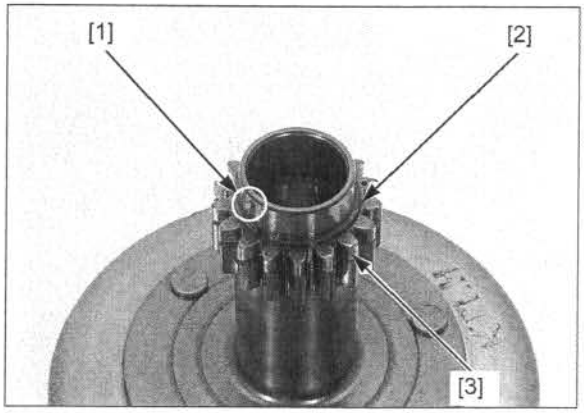
Remove the spring retainer [1] and spring [2] by carefully prying up on the retainer.

- Be careful not to lose the pin [3].



Remove the pin [1], snap ring [2] and sub-gear [3].

Check the sub-gear for wear or damage.



Check the sliding surfaces of the centrifugal clutch outer for excessive wear or damage.

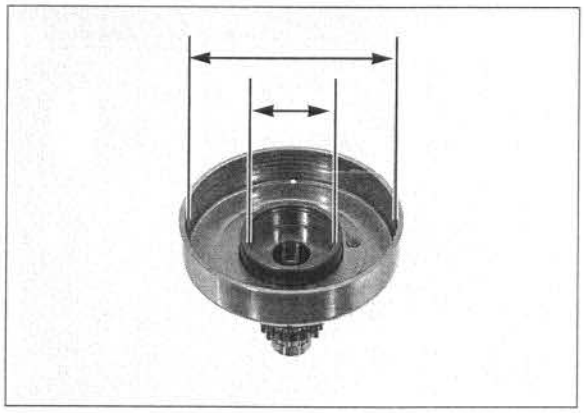
Measure the one-way clutch drum I.D.

SERVICE LIMIT: 42.04 mm (1.655 in)

Check the inside of the centrifugal clutch drum for scratches or excessive wear.

Measure the centrifugal clutch drum I.D.

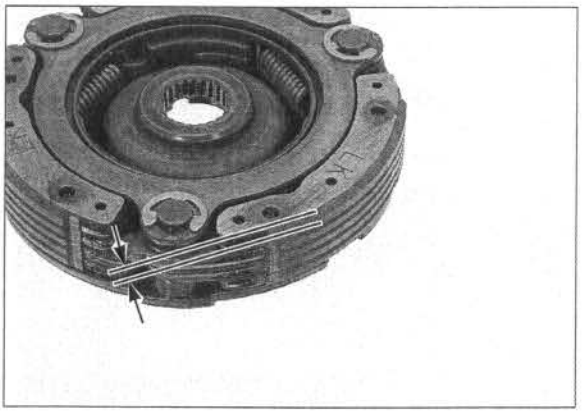
SERVICE LIMIT: 104.3 mm (4.11 in)



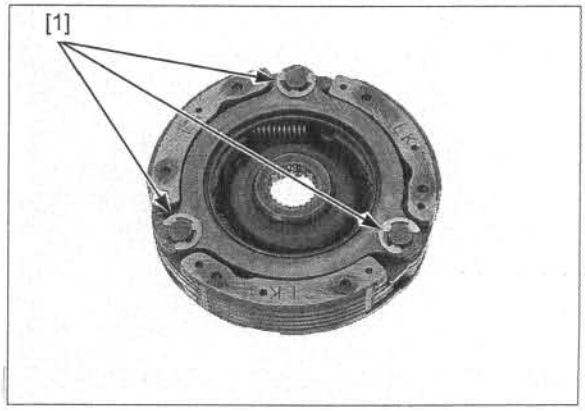
CLUTCH WEIGHT

Check the clutch weight assembly for damage.
Measure the clutch weight lining thickness.

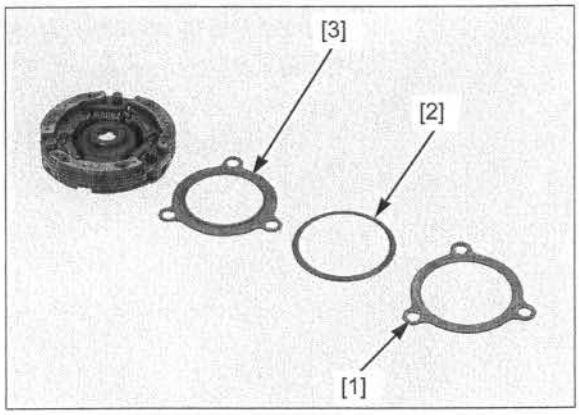
SERVICE LIMIT: 1.0 mm (0.04 in)



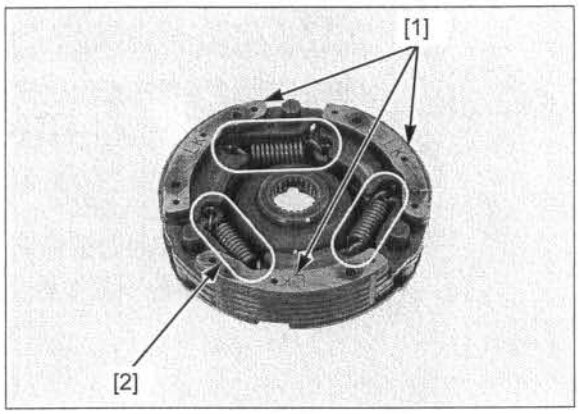
Remove the E-clips [1].



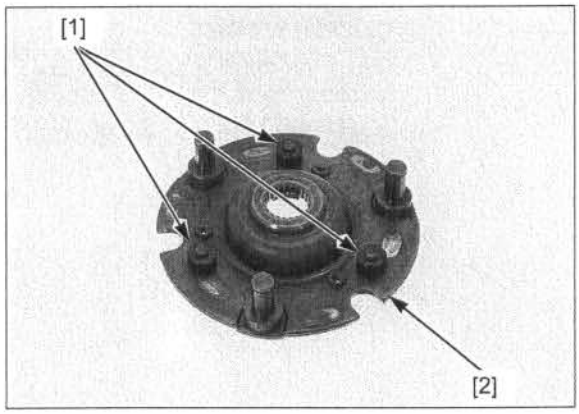
Remove the side plate [1], friction spring [2] and spring seat [3].



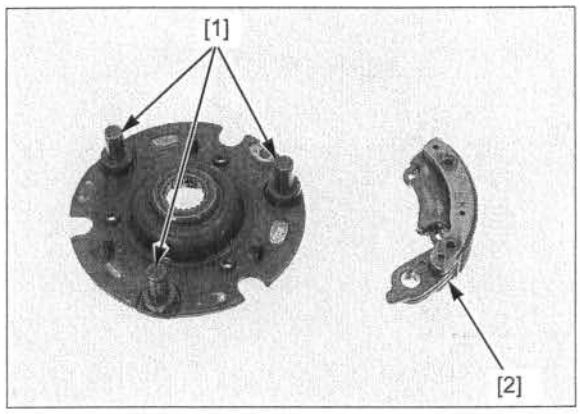
Alternately lift the clutch weights [1], then remove the clutch weights and springs [2].



Remove the damper rubbers [1] from the drive plate [2].



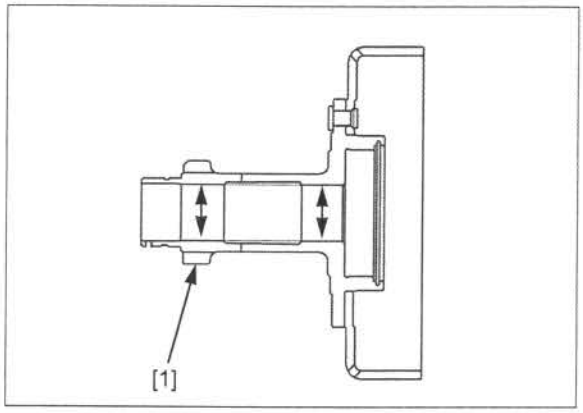
Check the drive plate bosses [1] for wear or damage.
Check each clutch weight [2] for wear or damage.



PRIMARY DRIVE GEAR

Measure the primary drive gear [1] I.D.

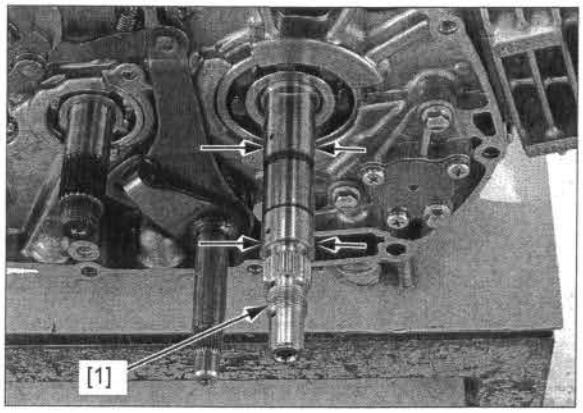
SERVICE LIMIT: 19.11 mm (0.752 in)



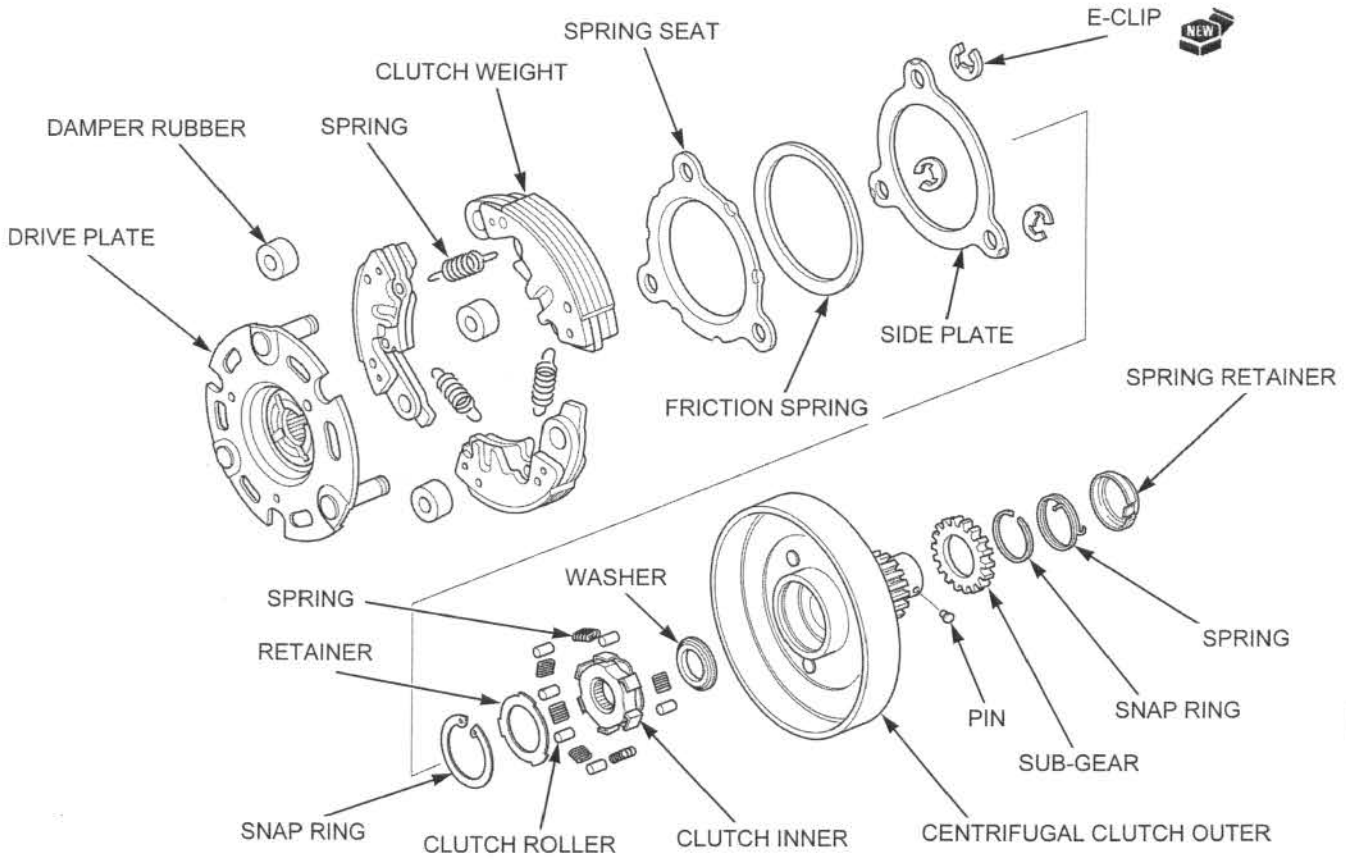
CRANKSHAFT

Measure the crankshaft [1] O.D.

SERVICE LIMIT: 18.92 mm (0.745 in)

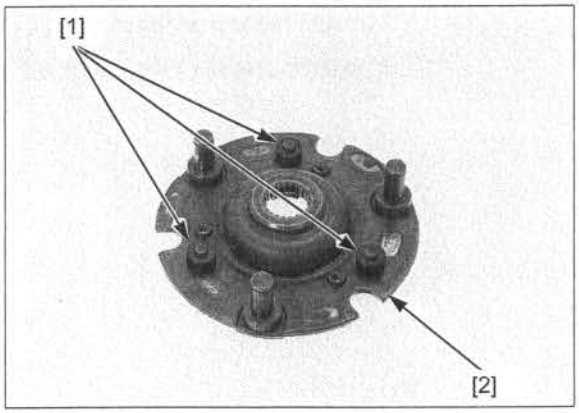


CENTRIFUGAL CLUTCH ASSEMBLY



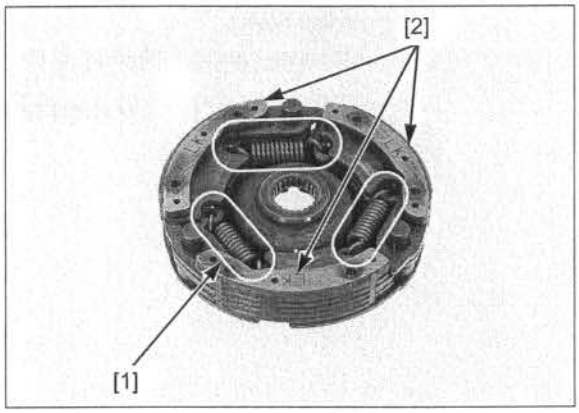
CLUTCH WEIGHT

Install the damper rubbers [1] to the drive plate [2].

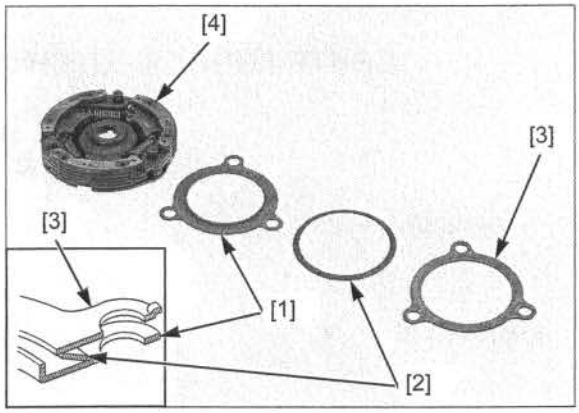


Hook the springs [1] to the clutch weights [2] so that their open ends facing the drive plate side.

Install the clutch weights and springs onto the drive plate as shown.

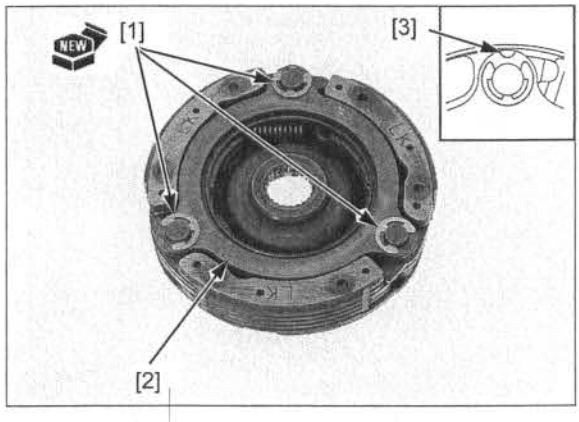


Install the spring seat [1], friction spring [2] and side plate [3] to the clutch weight assembly [4] as shown.



Install the new E-clips [1] while compressing the side plate [2].

- Align the open end of the E-clips and bosses [3] of the side plate.



CLUTCH OUTER/SUB-GEAR

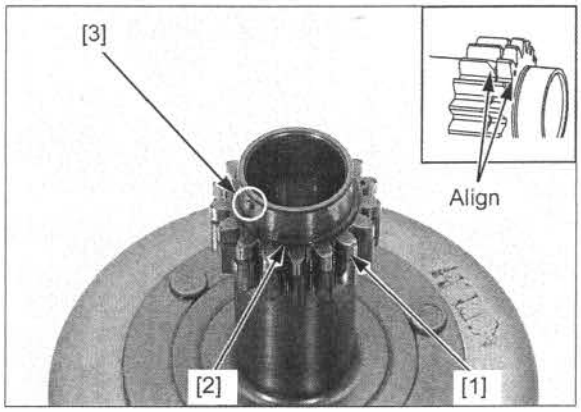
Install the sub-gear [1] by aligning its hole and primary drive gear cut-out.

Check that the snap ring is seated in the groove.

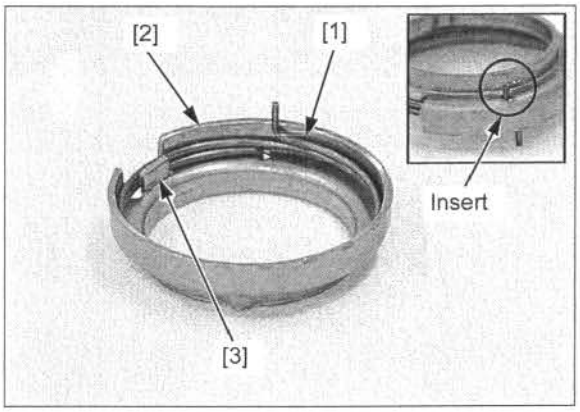
Install the snap ring [2].

Be careful not to lose the pin.

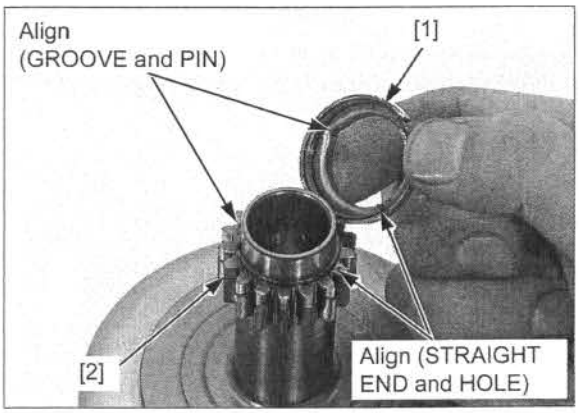
Install the pin [3].



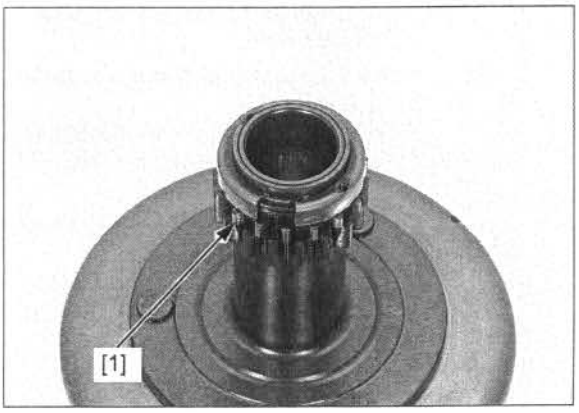
Insert the bent end of the spring [1] into the hole on the spring retainer [2].
Coil the spring into the spring retainer, making sure that the spring is set between the retainer and tab [3].



Install the spring retainer/spring [1] to the clutch outer while aligning the straight end of spring into the hole on the sub-gear [2] and aligning the retainer groove with the pin.

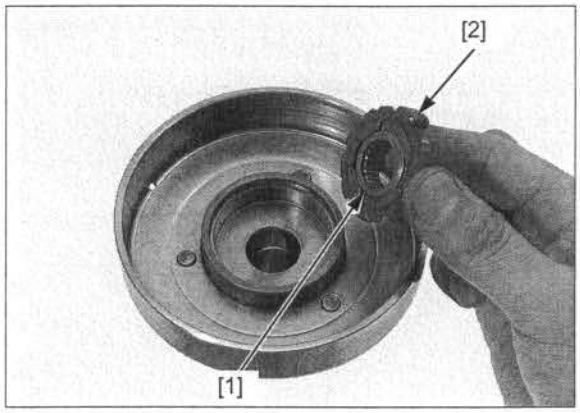


Check the sub-gear [1] operation by moving it and make sure that it returns without binding.

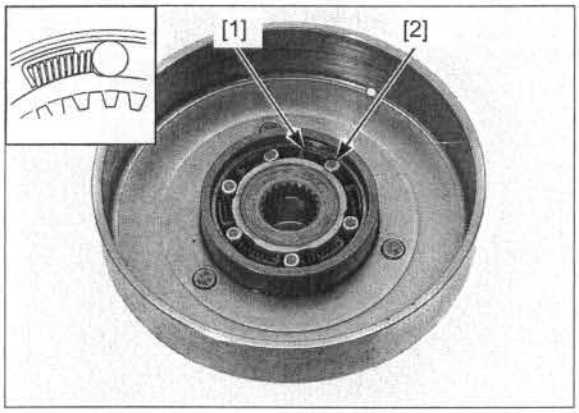


ONE-WAY CLUTCH

Install the washer [1] and one-way clutch inner [2] into the centrifugal clutch outer.



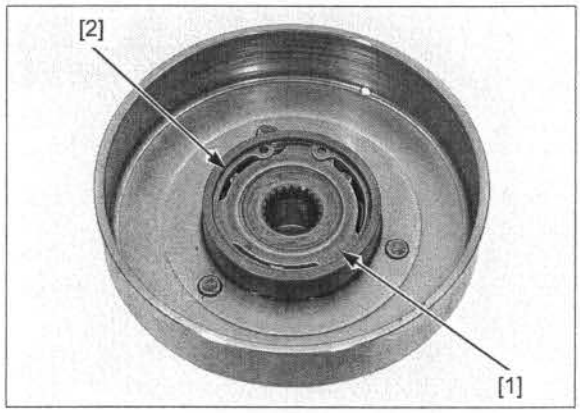
Install the springs [1] and rollers [2] as shown.



Install the retainer [1].

Check that the snap ring is seated in the groove.

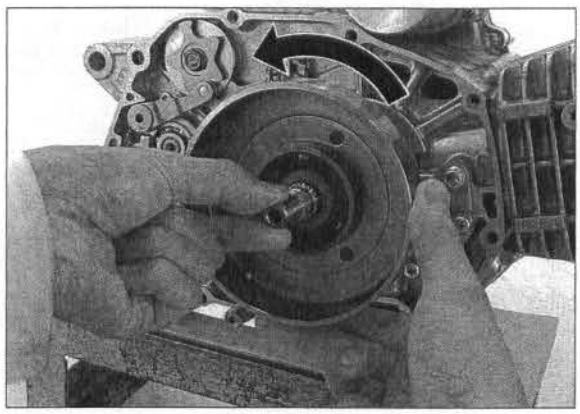
Install the snap ring [2] into the groove of the one-way clutch outer securely.



Temporarily install the centrifugal clutch outer to the crankshaft.

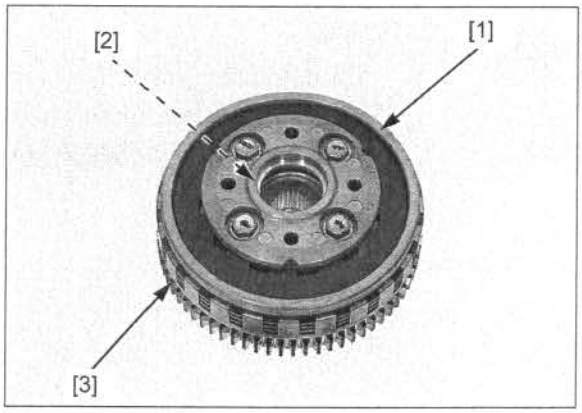
Hold the crankshaft and turn the centrifugal clutch outer by hand.
Make sure that the centrifugal clutch outer only turns counterclockwise as shown and does not turn clockwise.

Remove the centrifugal clutch outer from the crankshaft.



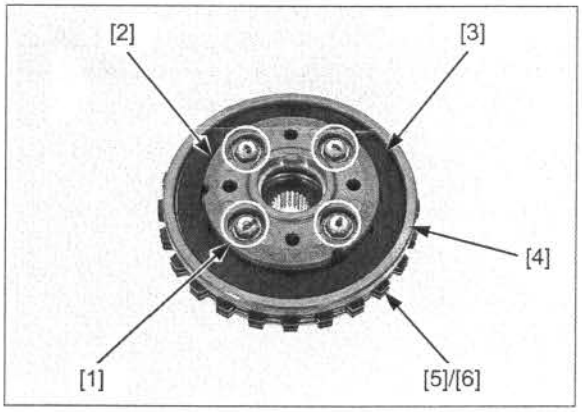
CHANGE CLUTCH DISASSEMBLY

Remove the clutch lifter plate assembly [1] and washer [2] from the clutch outer [3].

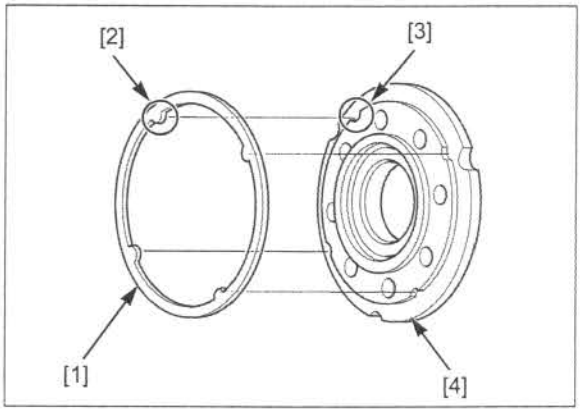


Remove the following:

- Four bolts [1]
- Clutch lifter plate [2]
- Spring [3]
- Clutch center [4]
- Clutch discs [5]
- Clutch plates [6]



Turn the clutch spring seat [1] until its tabs [2] are aligned with the slots [3] on the clutch lifter plate [4], then remove it.



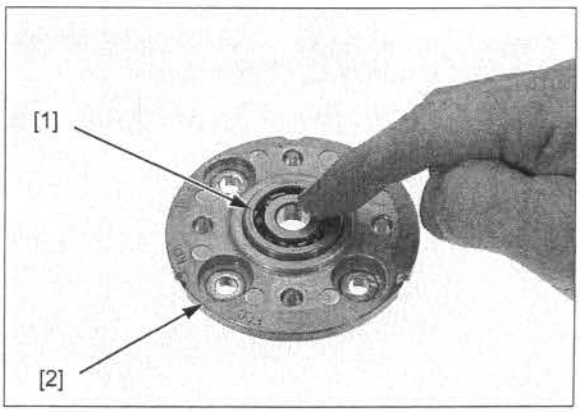
CHANGE CLUTCH INSPECTION

CLUTCH LIFTER BEARING

Temporarily install the clutch lifter bearing [1] to the clutch lifter plate [2].

Turn the inner race of the clutch lifter bearing with your finger.
The bearing should turn smoothly and quietly.
Also check that the bearing outer race of the bearing fits tightly in the clutch lifter plate.

Replace the bearing if the inner race does not turn smoothly, quietly, or if the outer race fits loosely in the clutch lifter plate.



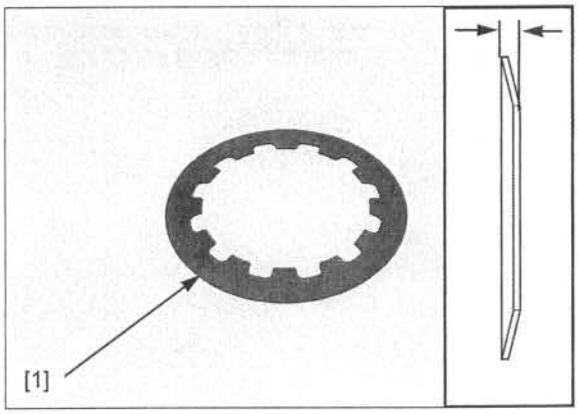
CLUTCH SPRING

Check the grooves and tabs of clutch spring [1] for damage.

Check the spring for fatigue or other damage.

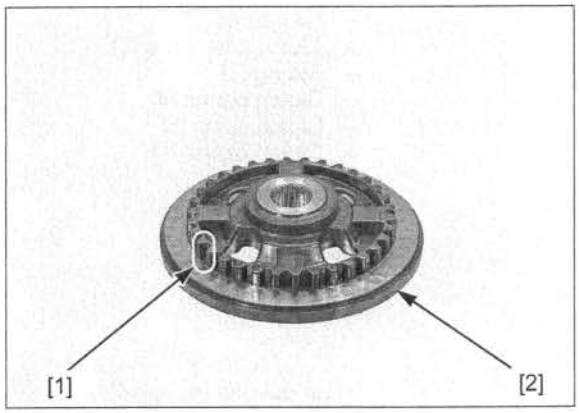
Measure the clutch spring free height.

SERVICE LIMIT: 4.63 mm (0.182 in)



CLUTCH CENTER

Check the grooves [1] of the clutch center [2] for damage or wear caused by the clutch plates.
Replace if necessary.



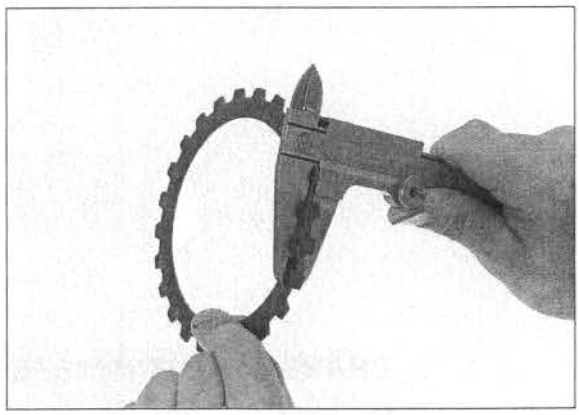
CLUTCH DISC

Replace the clutch discs and plates as a set.

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

Measure the thickness of each clutch disc.

SERVICE LIMIT: 1.82 mm (0.072 in)

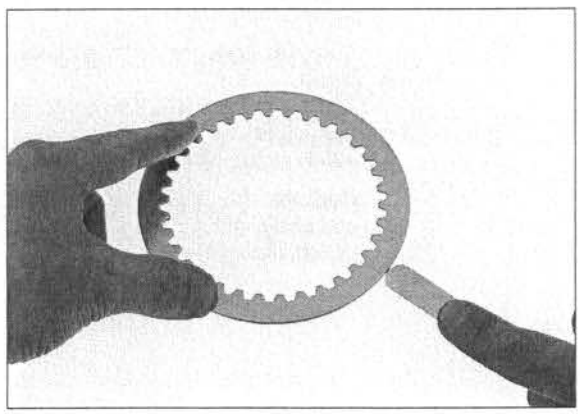


CLUTCH PLATE

Replace the clutch discs and plates as a set.

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

SERVICE LIMIT: 0.20 mm (0.008 in)



CLUTCH OUTER/CLUTCH OUTER GUIDE

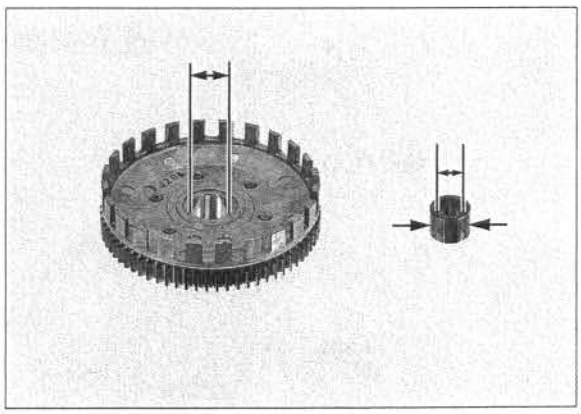
Check the primary driven gear teeth for wear or damage.
Check the slots of the clutch outer for damage or wear caused by the clutch discs.

Measure the primary driven gear I.D.

SERVICE LIMIT: 23.07 mm (0.908 in)

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

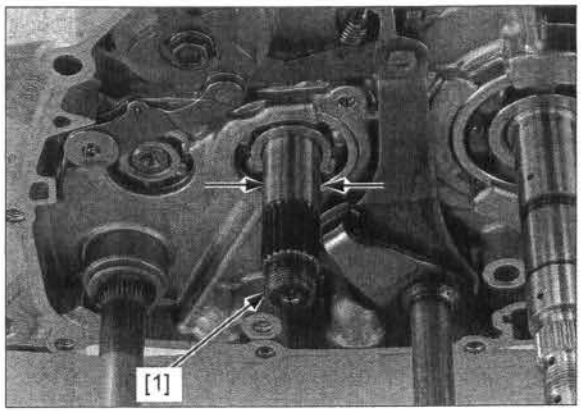
SERVICE LIMITS:
I.D.: 17.049 mm (0.6712 in)
O.D.: 22.940 mm (0.9031 in)



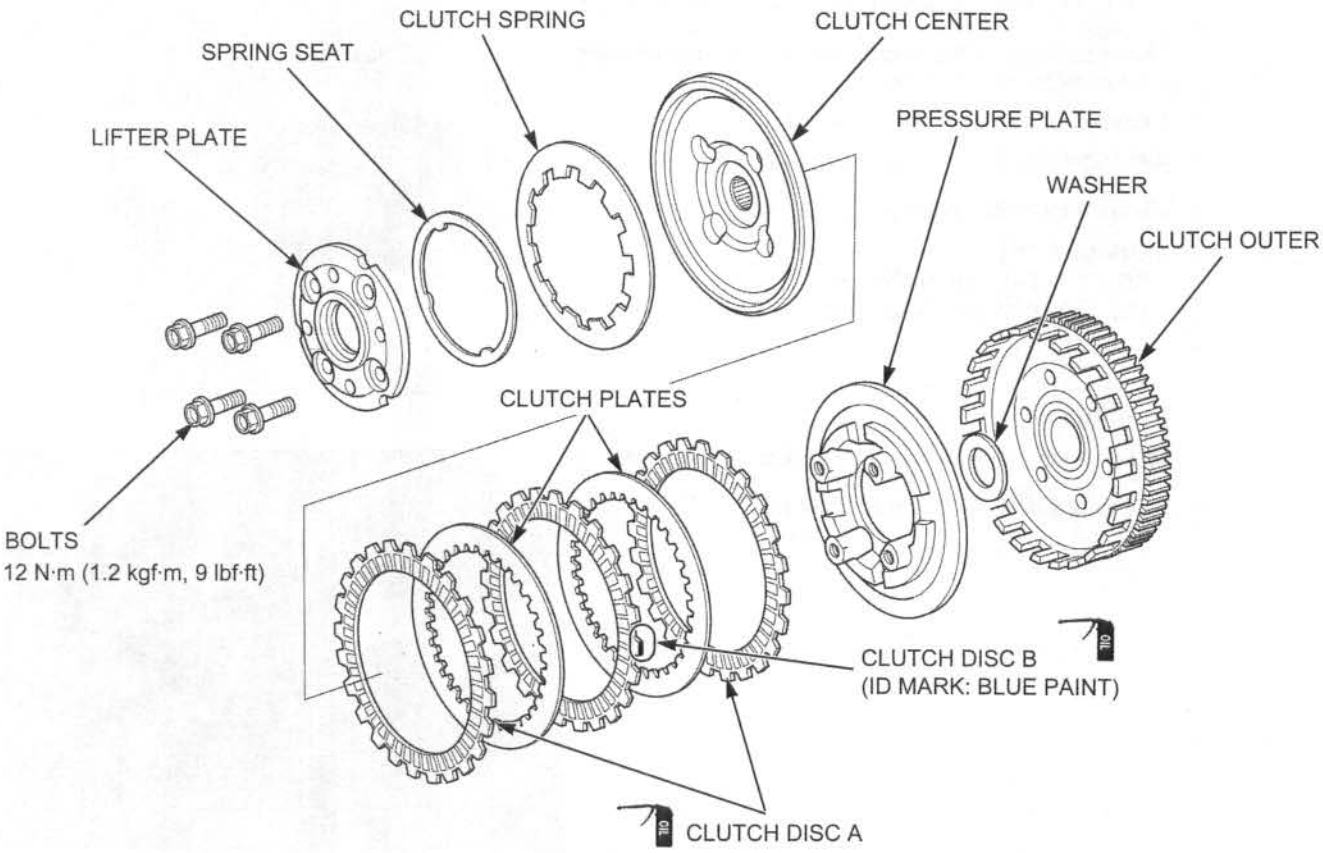
MAINSHAFT

Measure the mainshaft [1] O.D. at clutch outer guide.

SERVICE LIMIT: 16.87 mm (0.664 in)



CHANGE CLUTCH ASSEMBLY



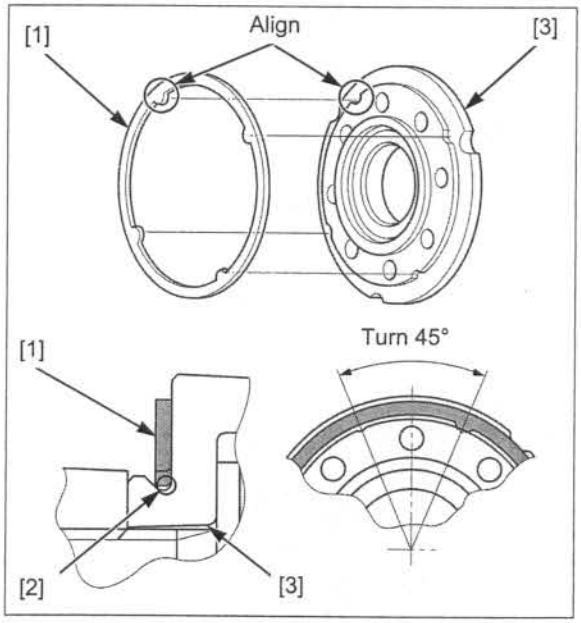
Coat the clutch discs with oil.

Replace the clutch discs and plates as a set.
Do not confuse the disc A with disc B.

Install the items in the following sequence:

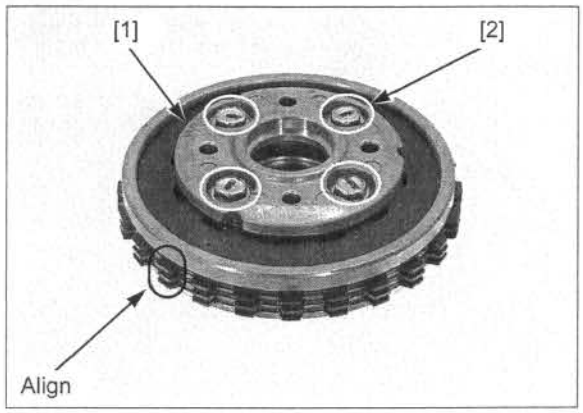
- Clutch spring
- Clutch center
- Clutch disc A
- Clutch plate
- Clutch disc B (ID mark: Blue paint on a tab)
- Clutch plate
- Clutch disc A
- Pressure plate

Set the spring seat [1] with its chamfered edge [2] facing the clutch lifter plate [3] as shown while aligning its tab with the slot on the plate.
Turn the clutch spring seat about 45°.

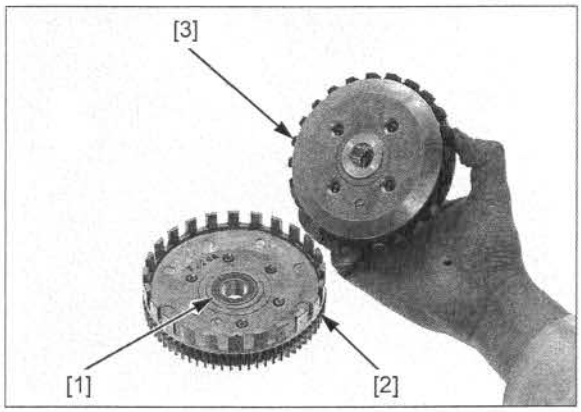


Install the clutch lifter plate [1].
Loosely install the four bolts [2].

Align the tabs of the clutch discs.



Install the washer [1] onto the clutch outer [2].
Install the clutch center assembly [3] into the clutch outer.

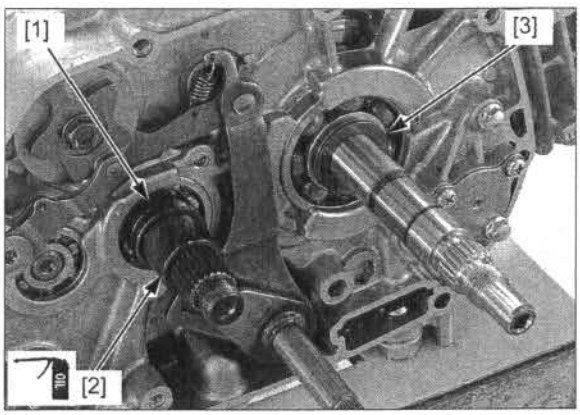


INSTALLATION

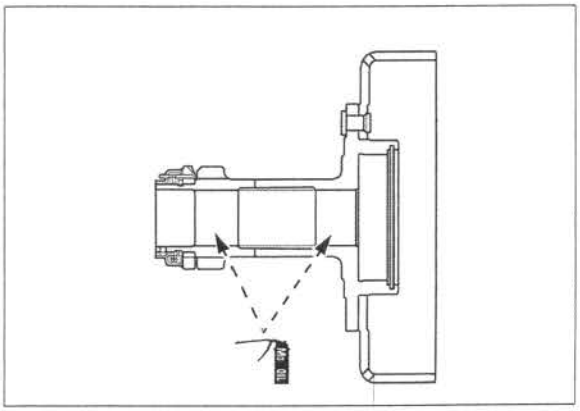
Install the collar [1] onto the mainshaft.

Apply oil to the clutch outer guide [2] outer surface.
Install the clutch outer guide onto the mainshaft.

Install the collar [3] onto the crankshaft.

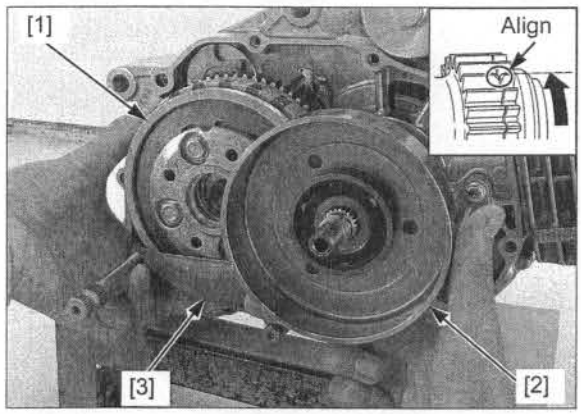


Apply molybdenum disulfide oil to the primary drive gear inner surface.

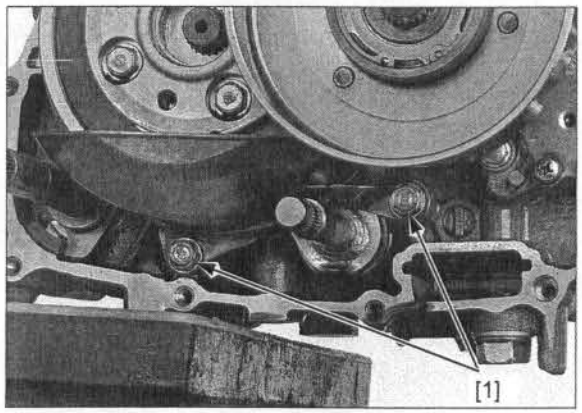


Align the cut-outs of the primary drive gear and sub-gear as shown, then engage the primary drive/driven gears.

Install the change clutch [1], centrifugal clutch outer [2] and oil separator plate [3] as assembly.



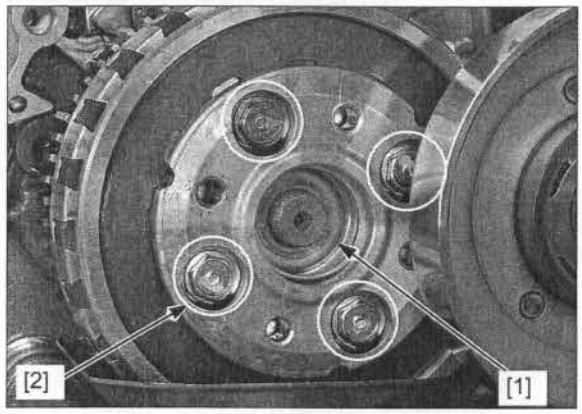
Install and tighten the two oil separator plate mounting bolts [1].



Install the washer [1] onto the mainshaft.

Tighten the clutch lifter plate bolts [2] to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



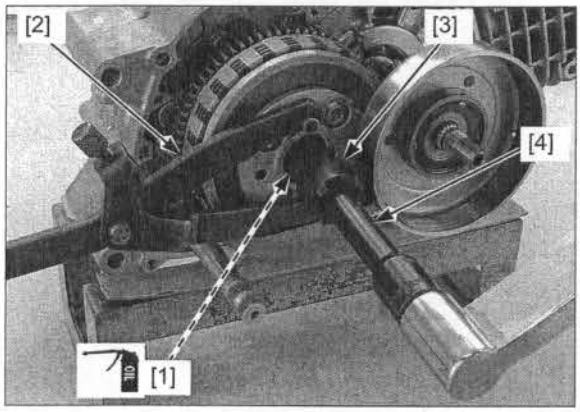
Apply oil to the clutch center lock nut [1] threads and seating surface.
Install the clutch center lock nut.
Hold the clutch lifter plate and tighten the clutch center lock nut to the specified torque using the special tools.

TOOLS:

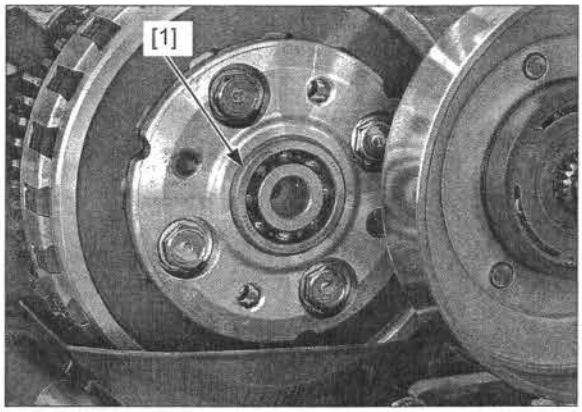
[2] Universal holder	**07725-0030000**
[3] Lock nut wrench, 20 x 24 mm	**07716-0020100**
[4] Extension bar	**07716-0020500**

or equivalent commercially available in U.S.A.

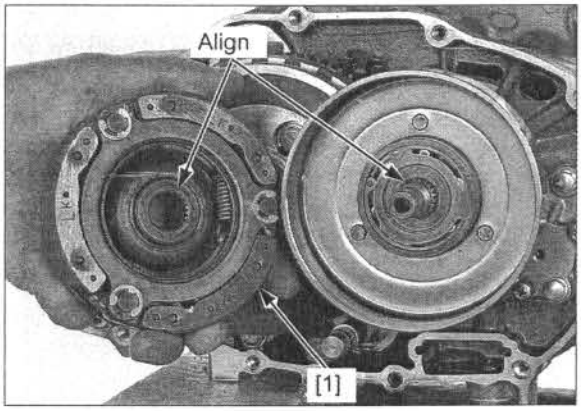
TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)



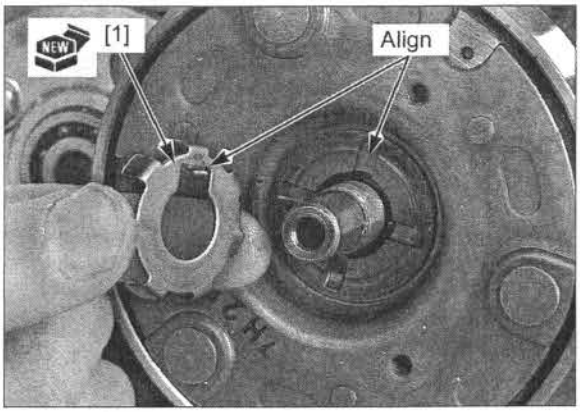
Install the clutch lifter bearing [1].



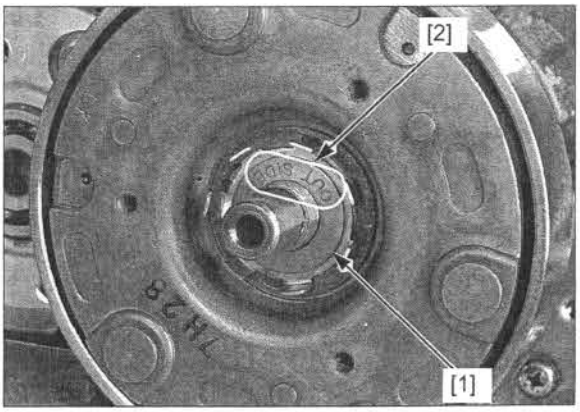
Install the clutch weight assembly [1] into the clutch outer while aligning the splines of the clutch weight assembly and crankshaft.



Install a new lock washer [1] onto the crankshaft aligning its inner tab with the groove of the clutch weight assembly.



Install the washer [1] with its "OUT SIDE" mark [2] facing out.



Apply oil to the centrifugal clutch lock nut [1] threads and seating surface.

Install the special tool using proper bolts or screws.

TOOL:

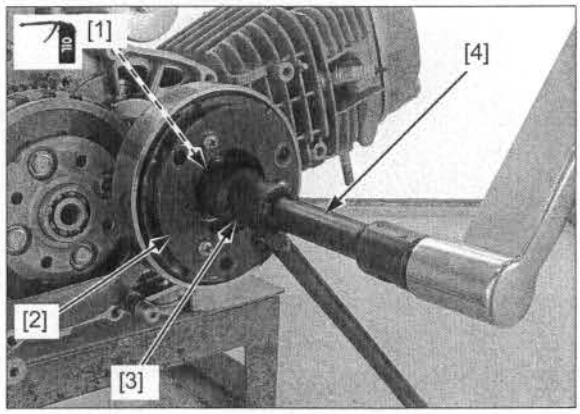
[2] Clutch center holder	**07HMB-HB70100 or 07923-HB3000B (U.S.A. only)**

Install and tighten the centrifugal clutch lock nut to the specified torque using the special tools.

TOOLS:

[3] Lock nut wrench, 20 x 24 mm	**07716-0020100**
[4] Extension bar	**07716-0020500**

or equivalent commercially available in U.S.A.



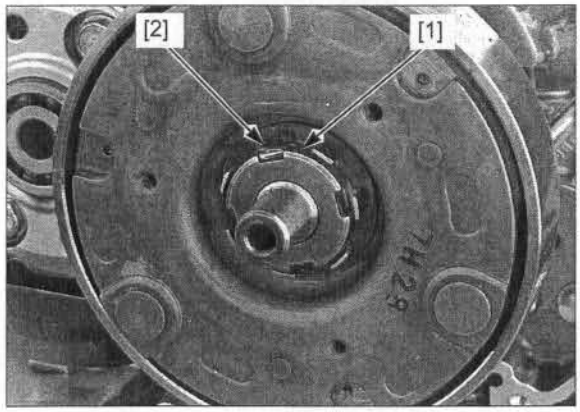
TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)

If any of the centrifugal clutch lock nut [1] groove is not aligned with the lock washer tab [2], further tighten the centrifugal clutch lock nut and align the centrifugal clutch lock nut groove with the lock washer tab.

Bend the lock washer tab against the centrifugal clutch lock nut groove.

Install the following:

- Engine oil centrifugal filter cover (page 3-11)
- Right crankcase cover (page 10-8)



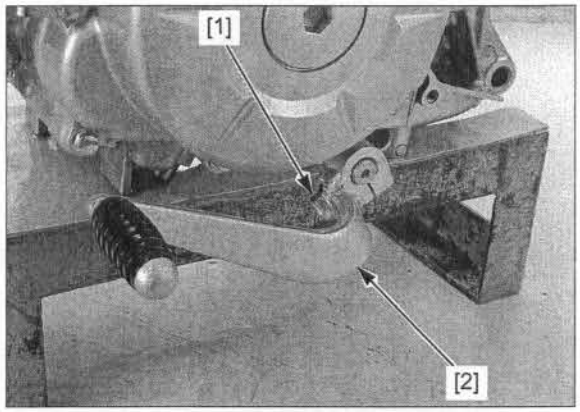
GEARSHIFT LINKAGE

REMOVAL

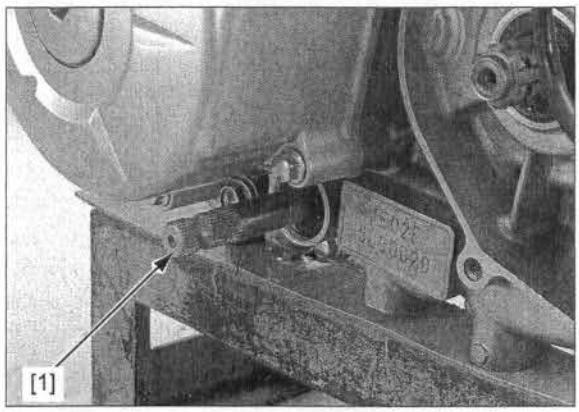
Remove the clutch (page 10-9).

When removing the gearshift pedal, mark the pedal position to ensure the original position.

Remove the bolt [1] and gearshift pedal [2].

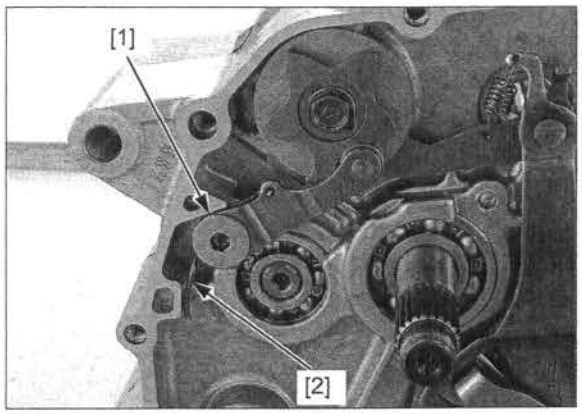


Clean the gearshift spindle [1] thoroughly to prevent the dirt or dust from entering the engine.

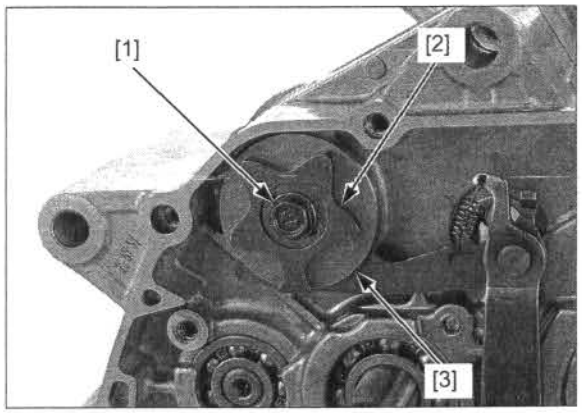


Remove the following:

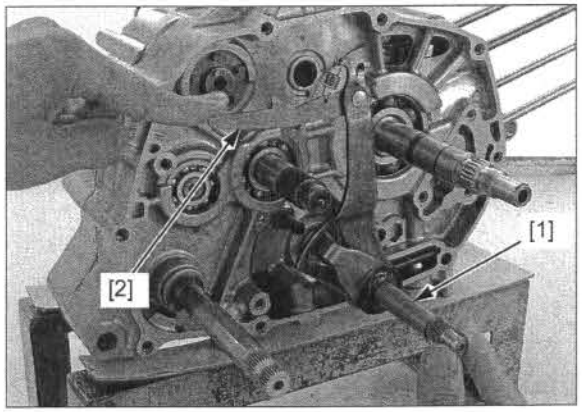
- Shift drum stopper arm/bolt [1]
- Return spring [2]



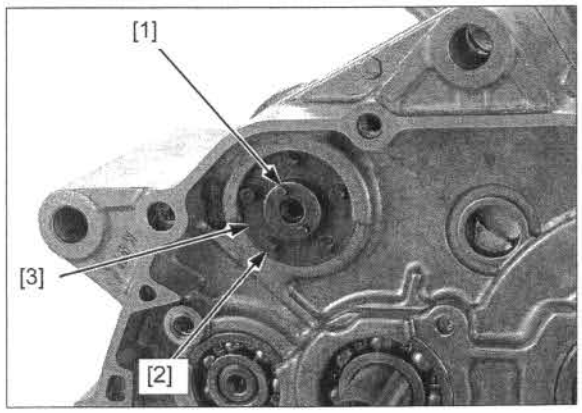
Remove the bolt [1], gearshift cam plate [2] and shift drum side plate [3].



Remove the gearshift spindle [1] by holding down the gearshift arm [2] as shown.

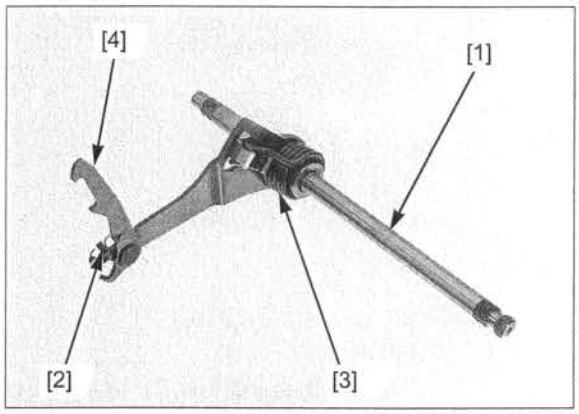


Remove the side plate pins [1] and gearshift drum pins [2] from the gearshift drum [3].



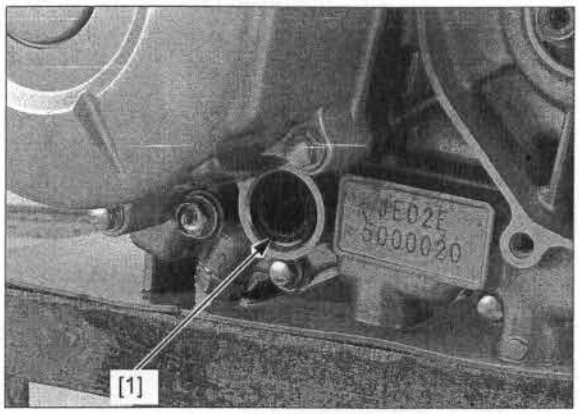
INSPECTION

Check the gearshift spindle [1] for bend, wear or damage.
Check the gearshift arm spring [2] and return spring [3] for damage or fatigue.
Check the gearshift arm [4] for wear or damage.



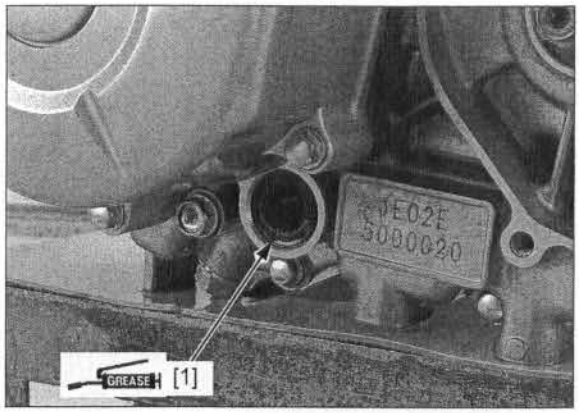
Inspect the gearshift spindle oil seal [1] for deterioration or damage, replace if necessary.

If replacing the oil seal, install it until it is fully seated.

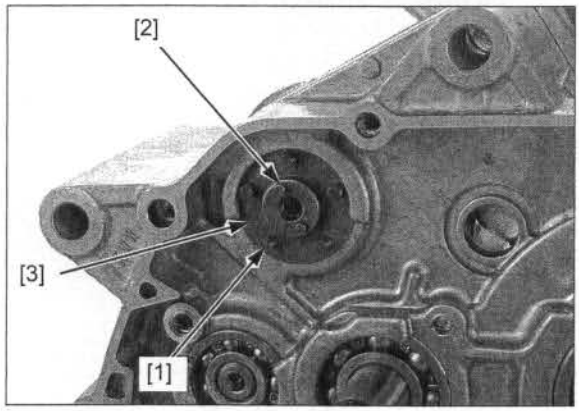


INSTALLATION

Apply grease to the gearshift spindle oil seal [1] lips.

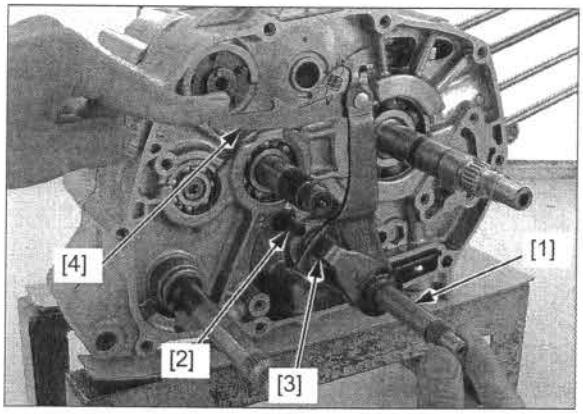


Install the five gearshift drum pins [1] and two side plate pins [2] to the holes on the gearshift drum [3].



Install the gearshift spindle [1] so that the shift return spring pin [2] is located between both ends of the return spring [3] as shown.

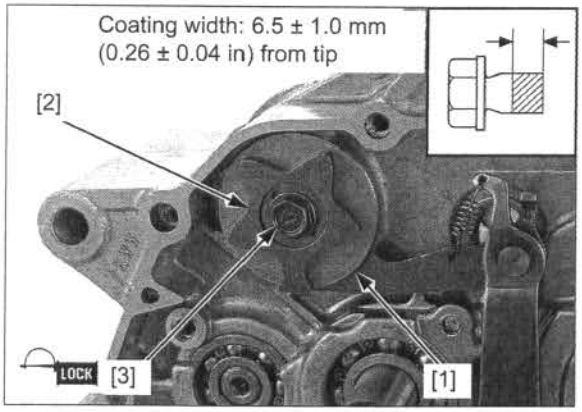
Insert the gearshift spindle completely while holding down the gearshift arm [4] as shown.



Install the shift drum side plate [1] and gearshift cam plate [2] while aligning the holes on the plates with the side plate pins.

Apply locking agent (Three Bond 1322 or equivalent) to the gearshift cam plate bolt [3] as specified, then install and tighten it to the specified torque.

TORQUE: 17 N·m (1.7 kgf·m, 13 lbf·ft)

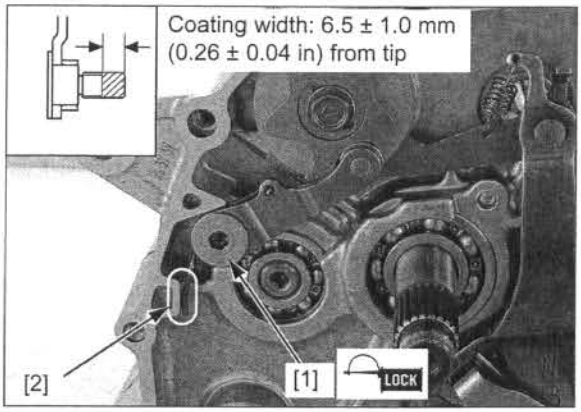


Apply locking agent (Three Bond 1322 or equivalent) to the shift drum stopper arm/bolt [1] as specified.

Set the return spring end [2] along the crankcase wall as shown.

Install the stopper arm/bolt, then tighten it to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

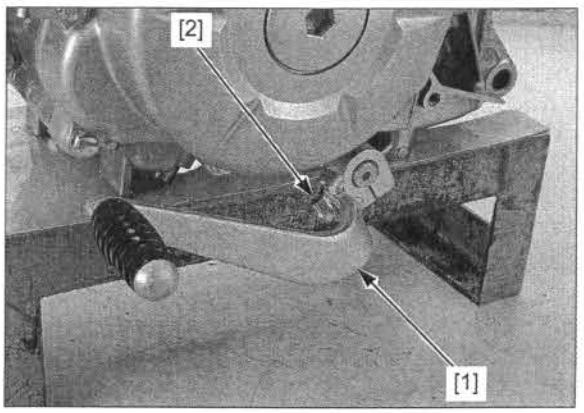


Install the gearshift pedal [1] to its original position as marked during removal.

Install and tighten the bolt [2] to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the clutch (page 10-23).



MEMO

11. ALTERNATOR/STARTER CLUTCH

COMPONENT LOCATION 11-2

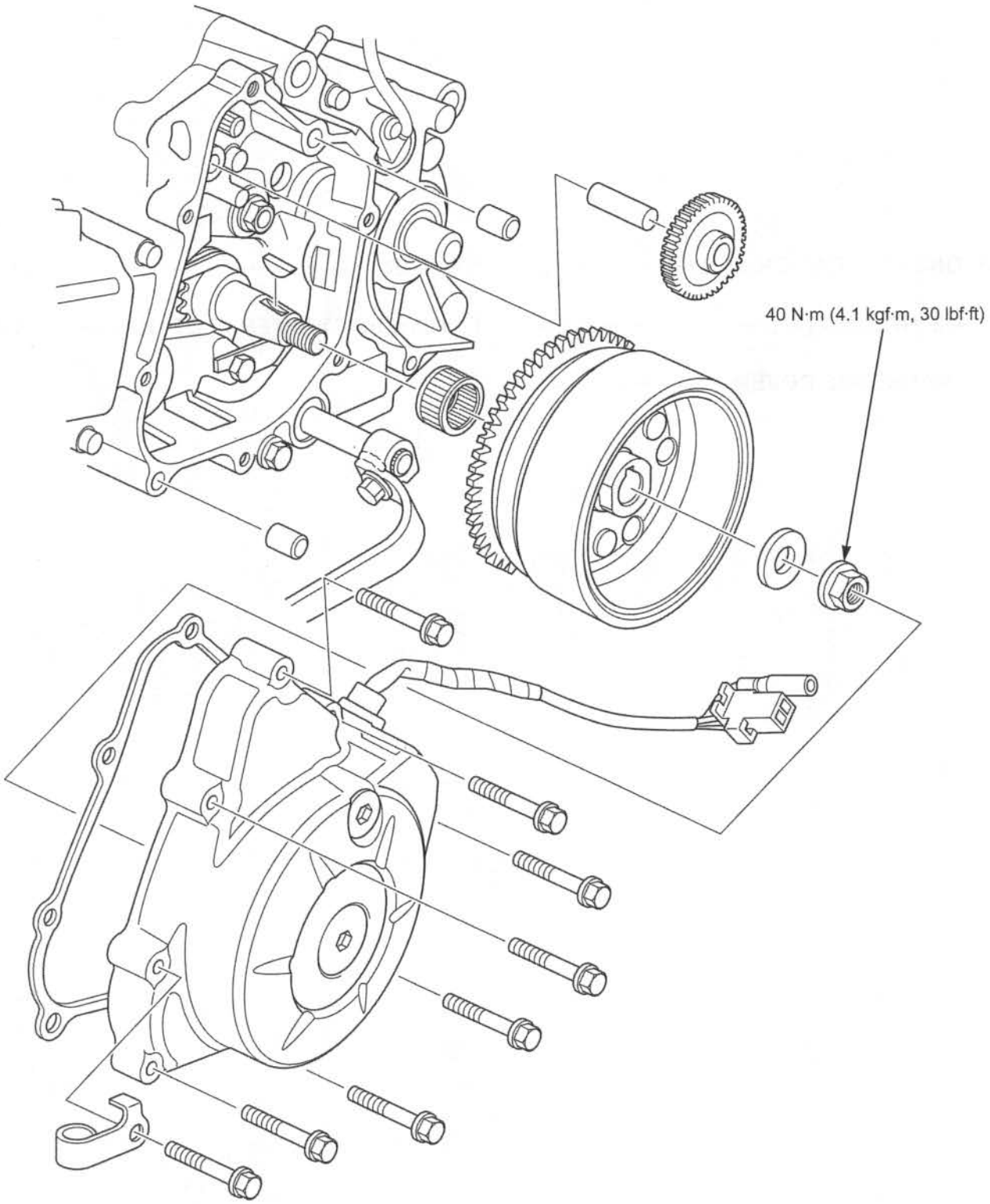
SERVICE INFORMATION 11-3

LEFT CRANKCASE COVER 11-4

STATOR 11-5

FLYWHEEL/STARTER CLUTCH 11-5

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- This section covers service of the alternator and starter clutch.
- These services can be done with the engine installed in the frame.
- For alternator inspection (page 16-8).
- For ignition pulse generator inspection (page 4-6).

SPECIFICATION

Unit: mm (in)

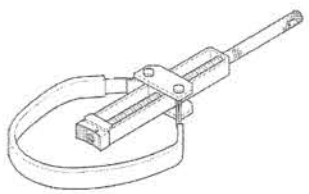
ITEM	STANDARD	SERVICE LIMIT
Starter driven gear boss O.D.	45.660 – 45.673 (1.7976 – 1.7981)	45.642 (1.7969)

TORQUE VALUES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Flywheel nut	1	10	40 (4.1, 30)	Apply oil to the threads and seating surface.
Starter clutch mounting torx bolt	6	6	16 (1.6, 12)	Apply locking agent to the threads: See page 11-8

TOOLS

Flywheel holder
07725-0040001



Flywheel puller, 30 mm
07KMC-HE00100

LEFT CRANKCASE COVER

REMOVAL

Remove the left crankcase rear cover (page 2-7).

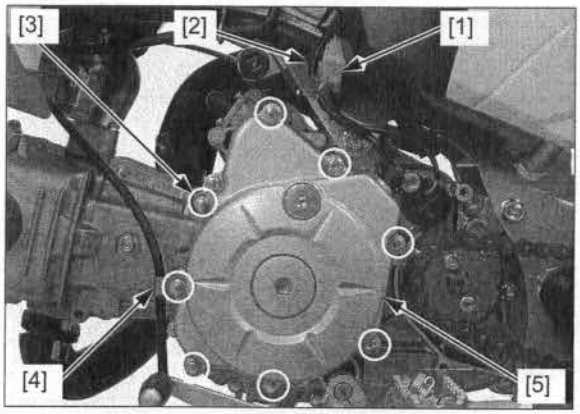
Drain the engine oil (page 3-10).

Disconnect the following:

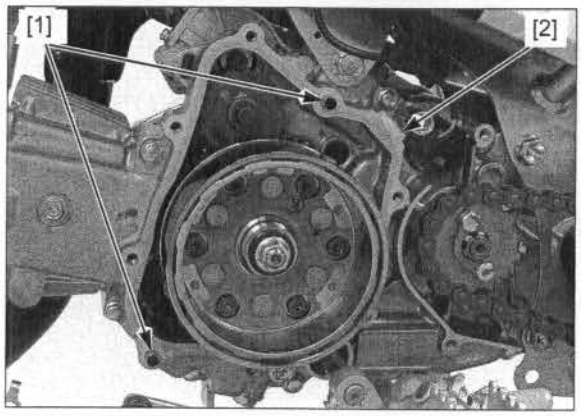
- Alternator 2P connector [1]
- Ignition pulse generator wire connector [2]

Loosen the bolts [3] in a crisscross pattern in several steps, then remove the bolts and hose guide [4].

Remove the left crankcase cover [5].



Remove the dowel pins [1] and gasket [2].

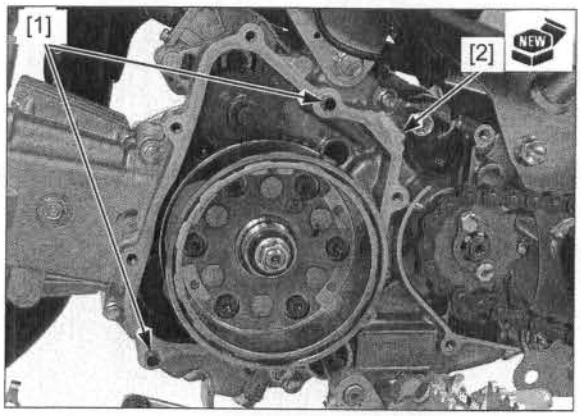


INSTALLATION

Be careful not to damage the mating surface.

Clean any gasket material from the left crankcase cover and crankcase mating surface.

Install the dowel pins [1] and a new gasket [2].



Apply engine oil to the reduction gear journal of the left crankcase cover.

The left crankcase cover is magnetically attracted to the flywheel, be careful during installation.

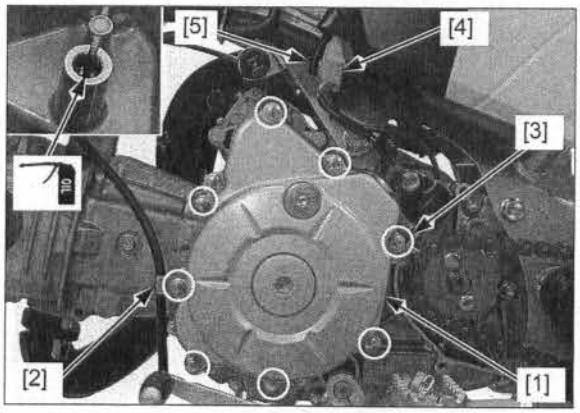
Install the left crankcase cover [1].
Install the hose guide [2] and bolts [3], then tighten them in a crisscross pattern in several steps.

Connect the following:

- Alternator 2P connector [4]
- Ignition pulse generator wire connector [5]

Fill the engine with the recommended engine oil (page 3-10).

Install the left crankcase rear cover (page 2-7).

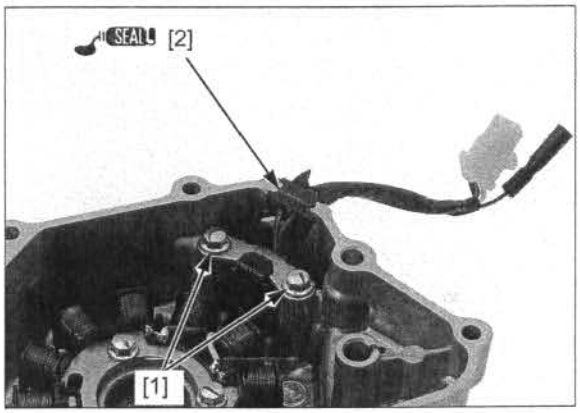


STATOR

REMOVAL/INSTALLATION

Remove the left crankcase cover (page 11-4).

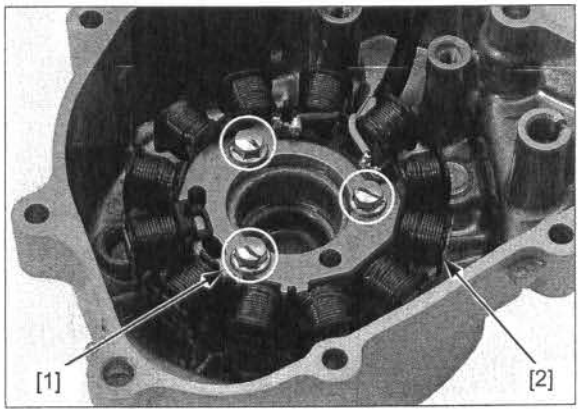
Remove the ignition pulse generator mounting bolts [1] and release the wire grommet [2] from the left crankcase cover.



Remove the stator mounting bolts [1], then remove the stator [2] from the left crankcase cover.

Installation is in the reverse order of removal.

- Apply liquid sealant (THREE BOND 1215 or 1207B or equivalent) to the wire grommet seating surface and install the grommet into the cover groove.

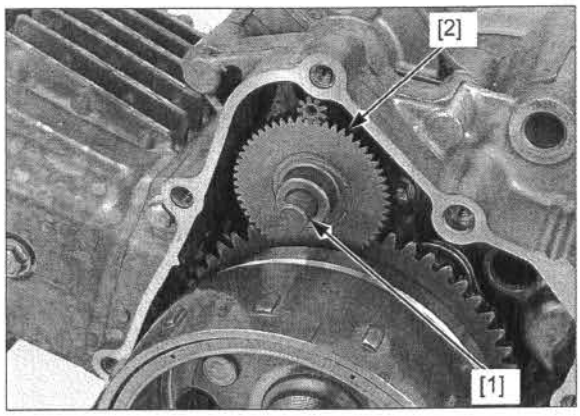


FLYWHEEL/STARTER CLUTCH

REMOVAL

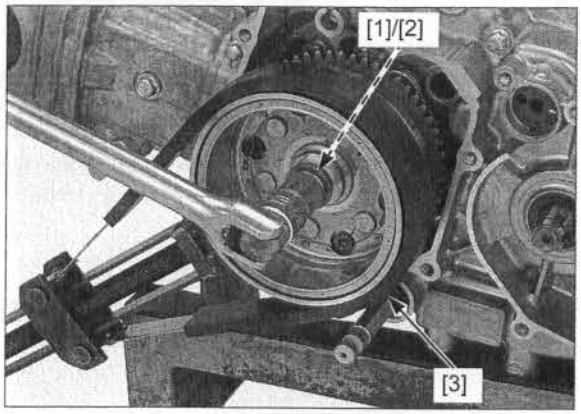
Remove the left crankcase cover (page 11-4).

Remove the shaft [1] and starter reduction gear [2].



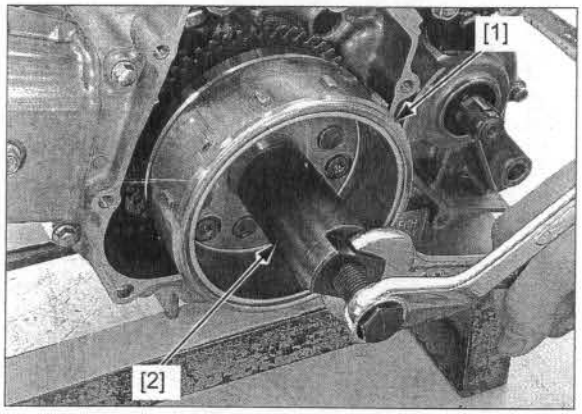
Remove the flywheel nut [1] and washer [2] using the special tool.

TOOL:
[3] Flywheel holder **07725-0040001**



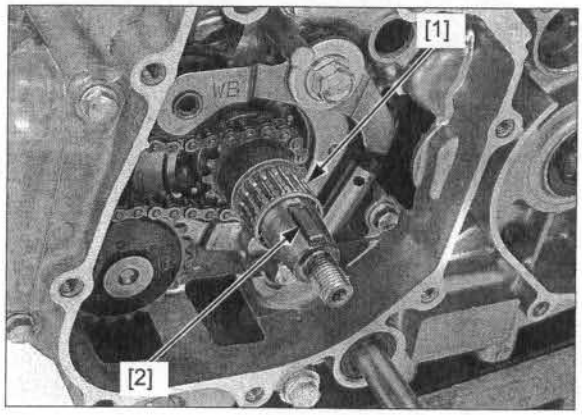
Remove the flywheel/starter clutch [1] using the special tool.

TOOL:
[2] Flywheel puller, 30 mm **07KMC-HE00100**



Remove the needle bearing [1].
Remove the woodruff key [2].

When woodruff key removal, be careful not to damage the key groove and crankshaft. Do not lose the woodruff key.

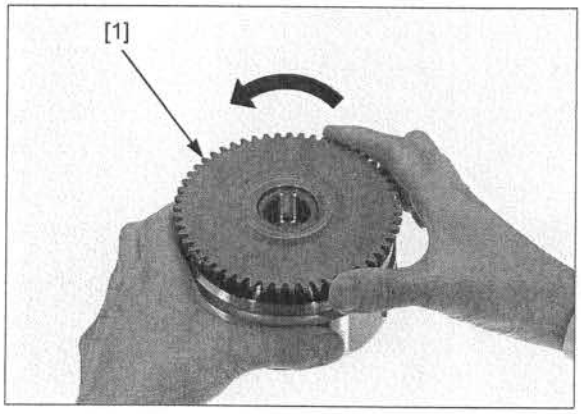


STARTER CLUTCH DISASSEMBLY

Remove the flywheel/starter clutch (page 11-5).

Check the operation of the one way clutch by turning the driven gear [1].
You should be able to turn the driven gear counterclockwise smoothly, but the gear should not turn clockwise.

Remove the starter driven gear from the flywheel/starter clutch while turning the driven gear counterclockwise.

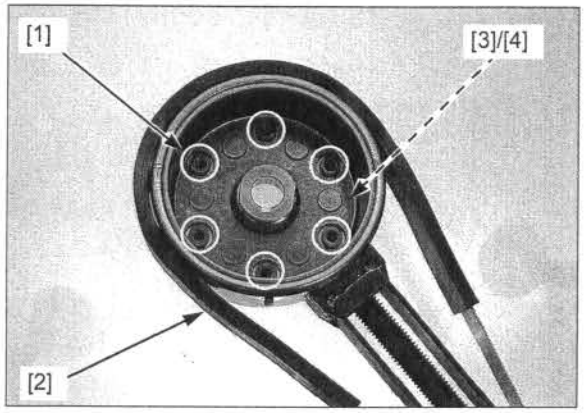


Hold the flywheel using the special tool and remove the starter clutch outer mounting torx bolts [1].

TOOL:
[2] Flywheel holder 07725-0040001

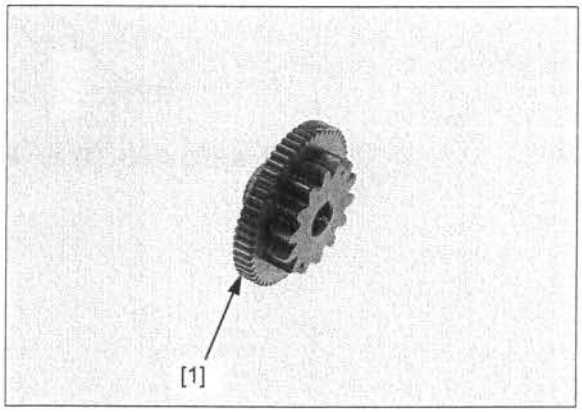
Remove the starter clutch assembly [3].

Remove the sprag clutch [4] from the starter clutch outer.



INSPECTION

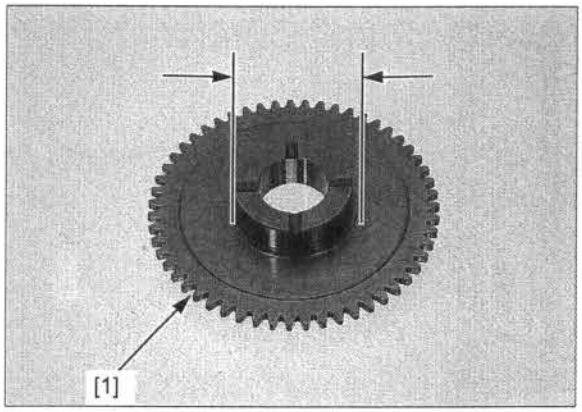
Check the starter reduction gear [1] or wear or damage.



Check the starter driven gear [1] for wear or damage.

Measure the driven gear boss O.D.

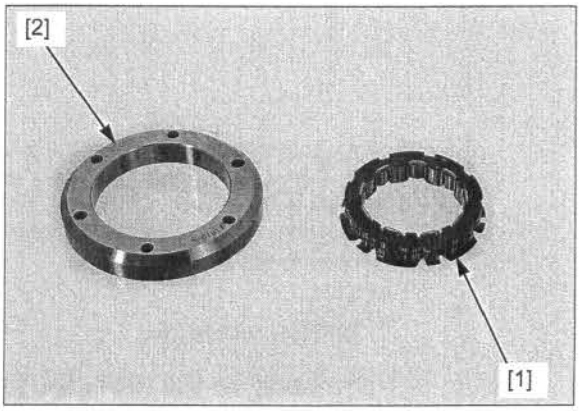
SERVICE LIMIT: 45.642 mm (1.7969 in)



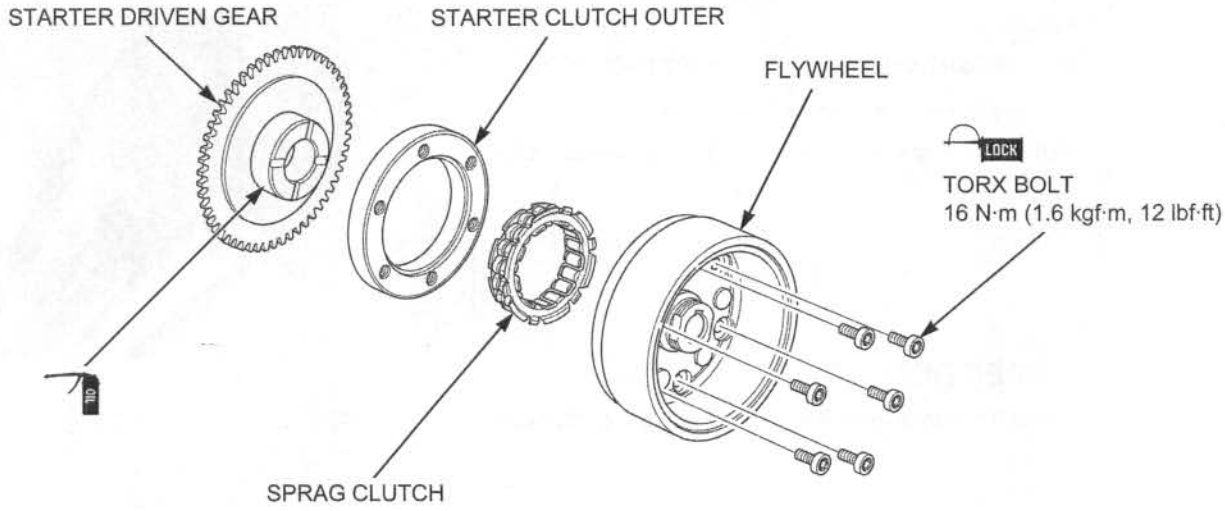
Remove the starter sprag clutch [1] from the clutch outer [2].

Starter clutch should be replaced as an assembly if any parts are damaged or worn.

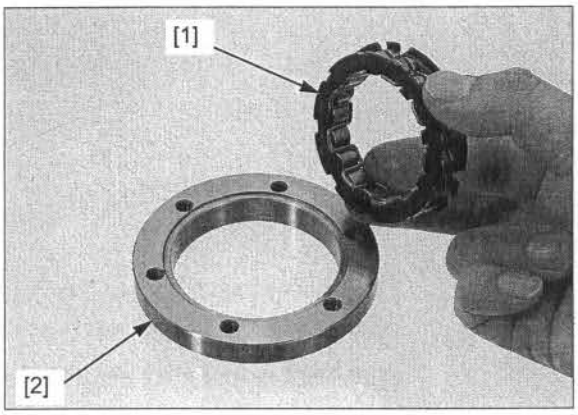
Check the starter sprag clutch for abnormal wear or damage.
Check the sprag clutch sliding surface of the clutch outer for abnormal wear or damage.



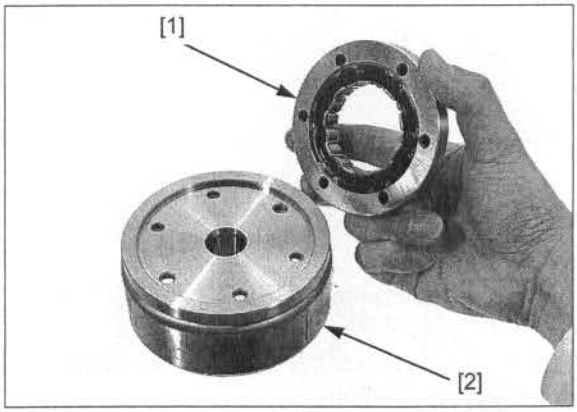
STARTER CLUTCH ASSEMBLY



Install the sprag clutch [1] into the starter clutch outer [2].



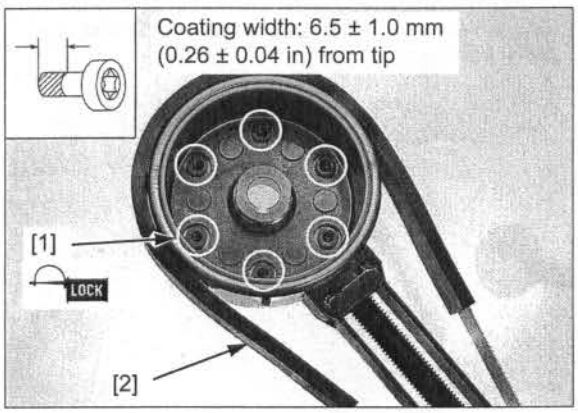
Install the starter clutch assembly [1] onto the flywheel [2].



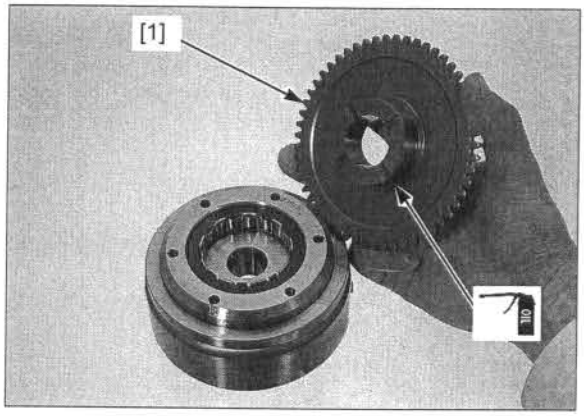
Apply a locking agent (Three Bond 1322 or equivalent) to the starter clutch mounting torx bolt [1] threads as specified.
Hold the flywheel using the special tool and tighten the bolts to the specified torque.

TOOL:
[2] Flywheel holder 07725-0040001

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)



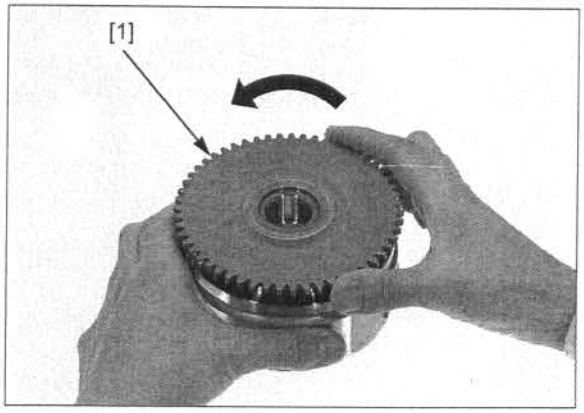
Apply engine oil to the starter clutch rolling surface of the driven gear [1].



Install the starter driven gear [1] to the flywheel/starter clutch while turning it counterclockwise.

Make sure that the starter driven gear turns counterclockwise smoothly and does not turn clockwise.

Install the flywheel/starter clutch (page 11-9).

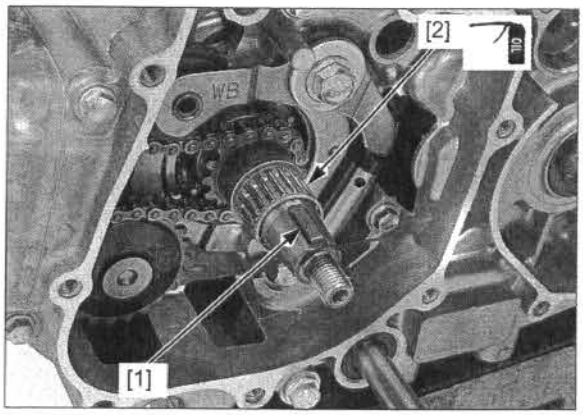


INSTALLATION

During woodruff key installation, be careful not to damage the key groove or crankshaft.

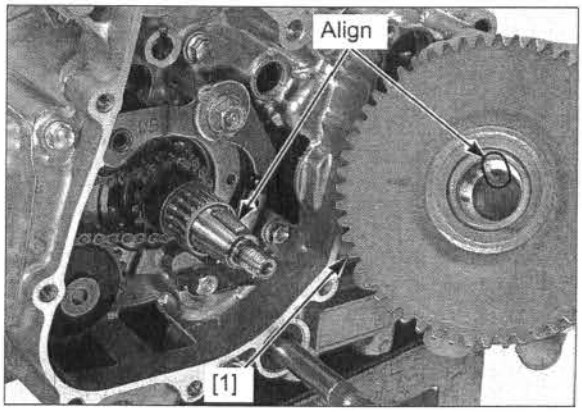
Install the woodruff key [1] in the crankshaft key groove.

Apply engine oil to the needle bearing [2] and install it to the crankshaft.



Wipe any oil off the mating surface of the crankshaft and flywheel.

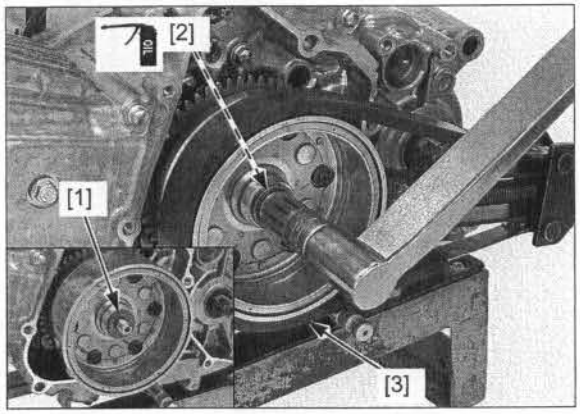
Install the flywheel/starter clutch [1] to the crankshaft, aligning the key way with the woodruff key.



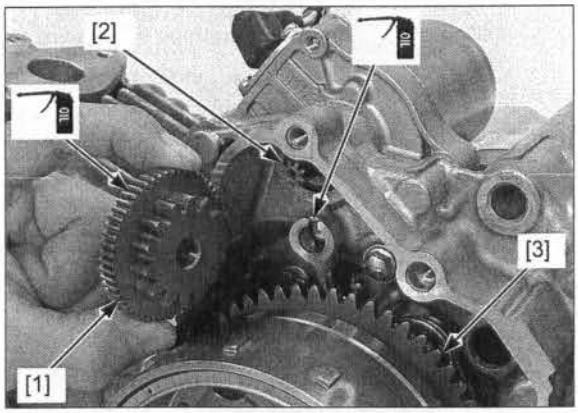
Install the washer [1].
Apply engine oil to the flywheel nut [2] threads and seating surface, then install it.
Hold the flywheel using the special tool and tighten the flywheel nut to the specified torque.

TOOL:
[3] Flywheel holder 07725-0040001

TORQUE: 40 N·m (4.1 kgf·m, 30 lbf·ft)

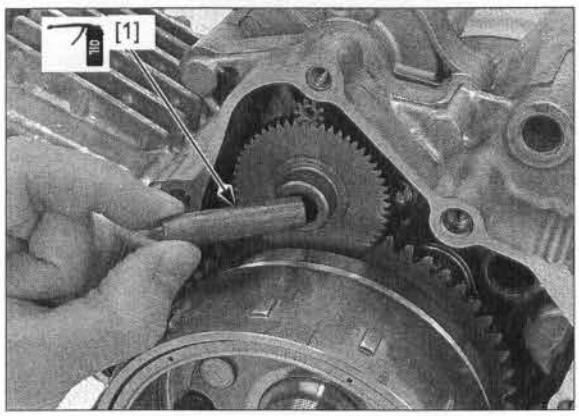


Apply engine oil to the starter reduction gear [1] journal area and gear teeth.
Install the starter reduction gear with aligning the starter drive gear [2] and starter driven gear [3].



Apply engine oil to the starter reduction gear shaft [1] whole surface.
Install the shaft into the reduction gear.

Install the left crankcase cover (page 11-4).



12. CRANKSHAFT/TRANSMISSION/KICKSTARTER

COMPONENT LOCATION 12-2

SERVICE INFORMATION 12-3

TROUBLESHOOTING 12-5

CRANKCASE SEPARATION 12-6

CRANKSHAFT 12-7

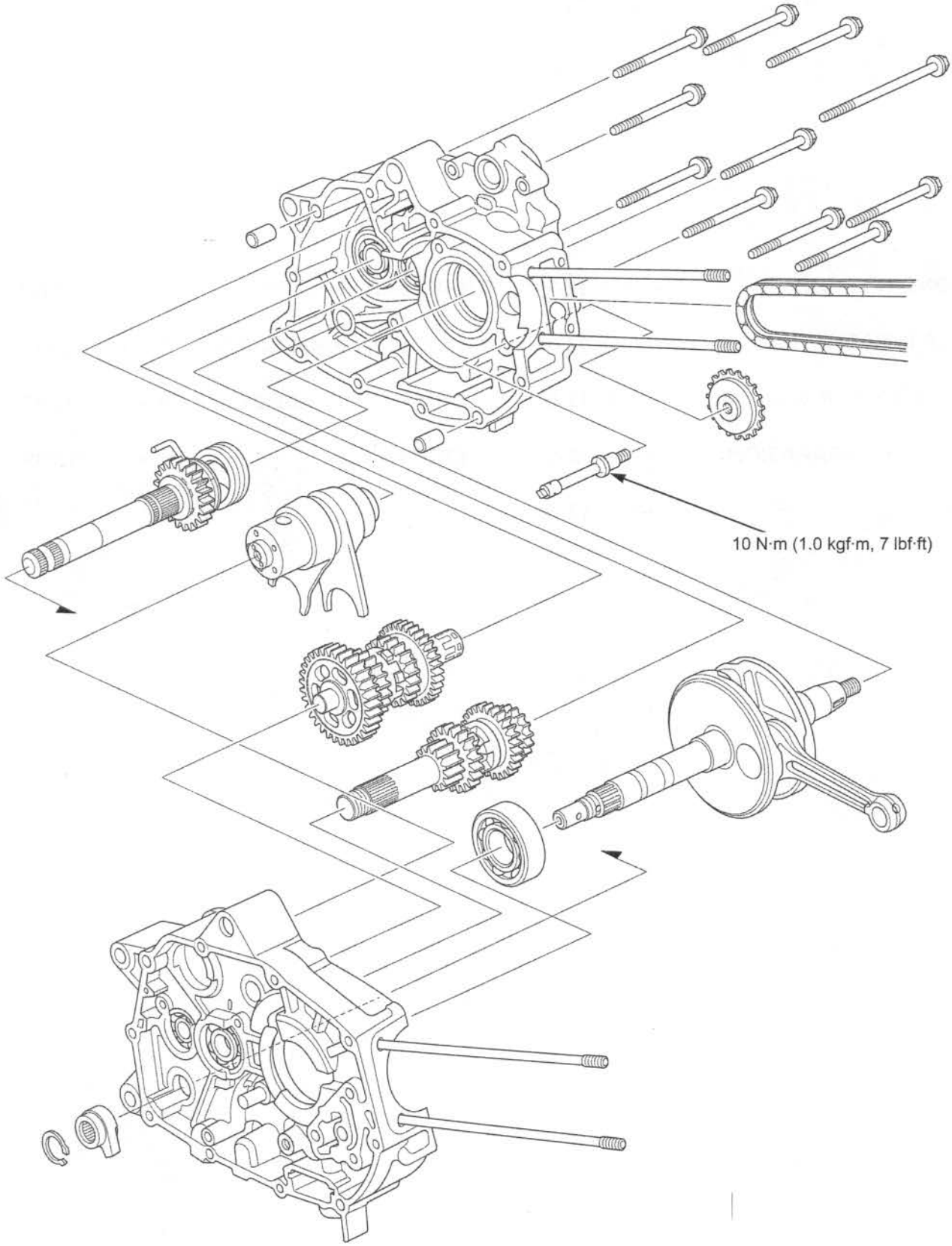
TRANSMISSION 12-9

CAM CHAIN GUIDE SPROCKET 12-16

CRANKCASE ASSEMBLY 12-17

KICKSTARTER 12-19

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- The crankcase must be separated to service the crankshaft, transmission, kickstarter and cam chain guide sprocket.
- The following parts must be removed before separating the crankcase.
  - Engine (page 13-4)
  - Stator (page 11-5)
  - Flywheel (page 11-5)
  - Clutch (page 10-9)
  - Gearshift linkage (page 10-26)
  - Cam chain tensioner (page 8-23)
  - Cylinder head (page 8-11)
  - Cylinder/piston (page 9-4)
  - Oil pump (page 7-4)
  - Starter motor (page 5-6)
  - Neutral switch (page 5-11)
- Be careful not to damage the crankcase mating surfaces when servicing.
- Prior to assembling the crankcase halves, apply sealant to the mating surface. Wipe off excess sealant thoroughly.
- Clean all disassembled parts with clean solvent and dry them using compressed air before inspection.

SPECIFICATIONS

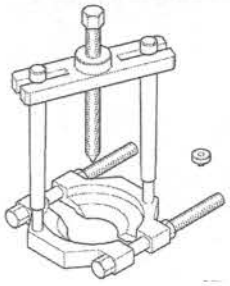
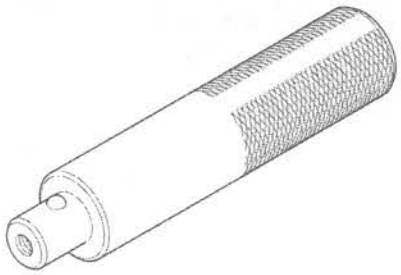
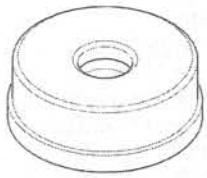
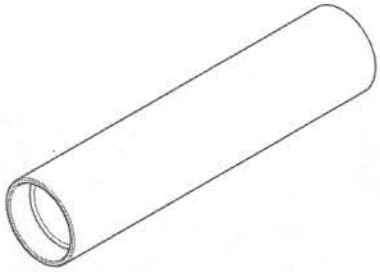
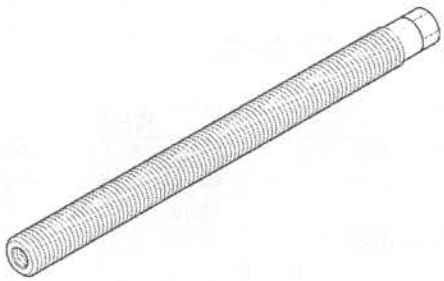
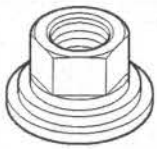
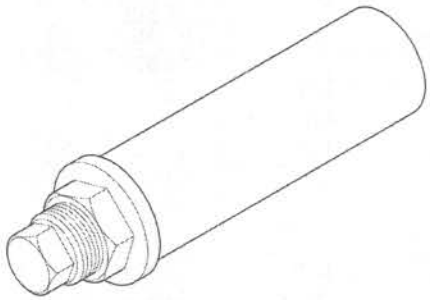
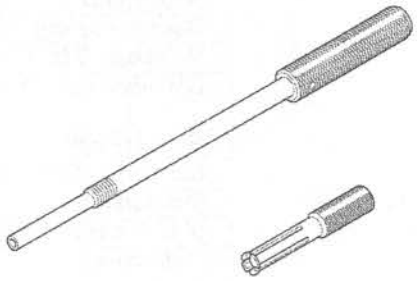
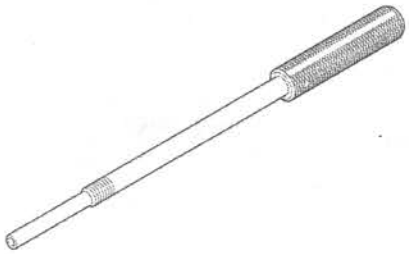
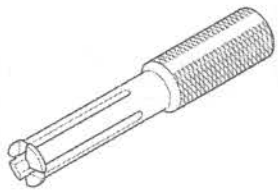
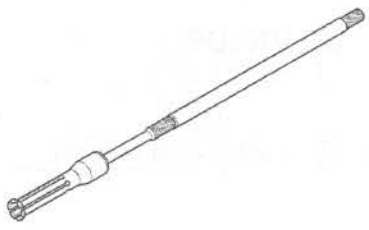
Unit: mm (in)

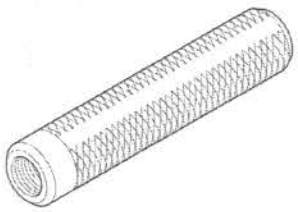
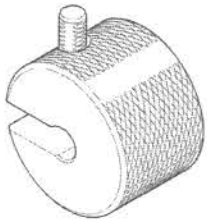
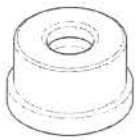
ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod side clearance		0.10 – 0.35 (0.004 – 0.014)	0.60 (0.024)
	Connecting rod radial clearance		0 – 0.008 (0.0003)	0.05 (0.002)
	Runout		–	0.10 (0.004)
Transmission	Gear I.D.	M2, M3	17.000 – 17.018 (0.6693 – 0.6700)	17.04 (0.671)
		C1	18.000 – 18.018 (0.7087 – 0.7094)	18.04 (0.710)
		C4	20.000 – 20.021 (0.7874 – 0.7882)	20.04 (0.789)
	Bushing O.D.	C1	17.966 – 17.984 (0.7073 – 0.7080)	17.94 (0.706)
	Bushing I.D.	C1	15.000 – 15.018 (0.5906 – 0.5913)	15.04 (0.592)
	Gear-to-bushing clearance	C1	0.016 – 0.052 (0.0006 – 0.0020)	0.10 (0.004)
	Mainshaft O.D.	at M3	16.966 – 16.984 (0.6680 – 0.6687)	16.95 (0.667)
	Countershaft O.D.	at C1 bushing	14.966 – 14.984 (0.5892 – 0.5899)	14.95 (0.589)
	Gear-to-shaft clearance	M3	0.016 – 0.052 (0.0006 – 0.0020)	0.09 (0.004)
	Bushing-to-shaft clearance	C1	0.016 – 0.052 (0.0006 – 0.0020)	0.09 (0.004)
Shift fork/ Shift drum	Shift fork I.D.		34.075 – 34.100 (1.3415 – 1.3425)	34.14 (1.344)
	Shift fork claw thickness		4.85 – 4.95 (0.191 – 0.195)	4.60 (0.181)
	Shift drum O.D.	Left	23.940 – 23.980 (0.9425 – 0.9441)	23.92 (0.942)
		Right	33.950 – 33.975 (1.3366 – 1.3376)	33.93 (1.336)
Kickstarter	Pinion I.D.		20.000 – 20.021 (0.7874 – 0.7882)	20.08 (0.791)
	Spindle O.D.		19.959 – 19.980 (0.7858 – 0.7866)	19.94 (0.785)

TORQUE VALUE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Cam chain guide sprocket spindle	1	6	10 (1.0, 7)	

TOOLS

Universal bearing puller 07631-0010000  or equivalent commercially available in U.S.A.	Driver 07749-0010000 	Attachment, 52 x 55 mm 07746-0010400 
Pilot 22 mm 07746-0041000 	Assembly collar 07YMF-KPB0100 	Assembly shaft (U.S.A. only) 07931-ME4010B 
Special nut (U.S.A. only) 07931-HB3020A 	Assembly set, 14 mm 07JMF-KW70100 	Bearing remover set, 12 mm 07936-1660101 
Bearing remover shaft, 12 mm 07936-1660120 	Bearing remover head, 12 mm 07936-1660110 	Bearing remover, 12 mm 07936-166010A (U.S.A. only) 

Remover handle 07936-3710100 	Remover weight 07741-0010201  or 07936-371020A (U.S.A. only)	Attachment, 37 x 40 mm 07746-0010200 
Pilot 17 mm 07746-0040400 	Attachment, 32 x 35 mm 07746-0010100 	Pilot 12 mm 07746-0040200 
Attachment, 28 x 30 mm 07946-1870100 		

TROUBLESHOOTING

Hard to shift
- Incorrect clutch adjustment (page 3-17)
- Bent shift forks
- Bent gearshift spindle (page 10-28)
- Damaged shift drum cam grooves
- Incorrect engine oil viscosity

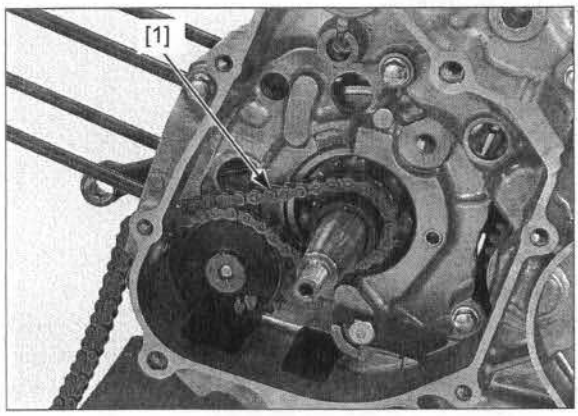
Transmission jumps out of gear
- Worn gear dogs and dog holes
- Broken shift drum stopper arm
- Broken drum stopper arm spring (page 10-28)
- Broken gearshift spindle return spring (page 10-28)
- Worn or bent shift forks
- Worn gear shifter groove

Excessive noise
- Worn connecting rod big end bearing
- Worn crankshaft bearing
- Worn transmission bearing
- Worn or damaged transmission gears

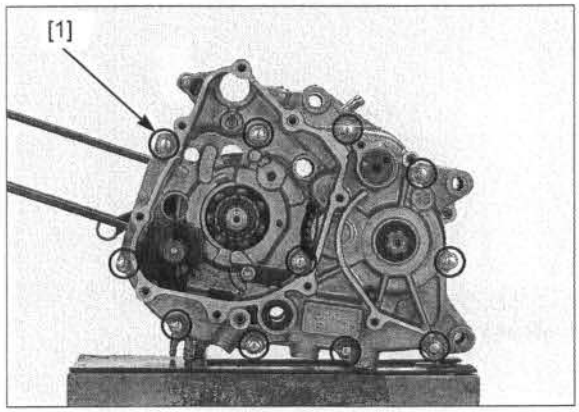
CRANKCASE SEPARATION

Refer to Service Information (page 12-3) for removal of necessary parts before separating the crankcase.

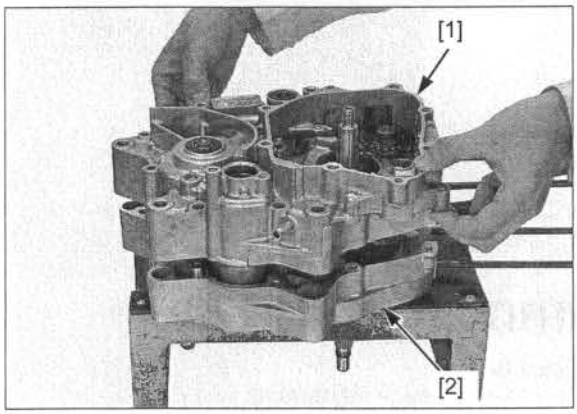
Remove the cam chain [1] from the timing sprocket.



Loosen and remove the crankcase bolts [1] in a crisscross pattern in several steps.



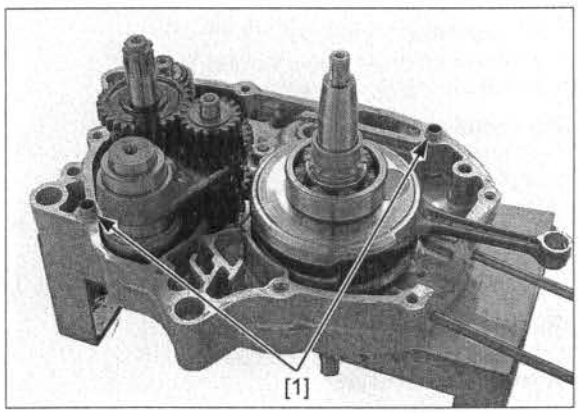
Place the left crankcase up.
Carefully separate the left crankcase [1] from the right crankcase [2] while tapping them at several locations with a soft hammer.



Remove the dowel pins [1].

Be careful not to damage the mating surfaces.

Clean off the sealant from the left and right crankcase mating surfaces.



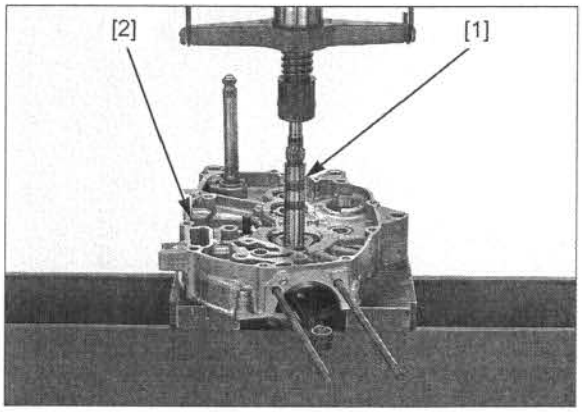
CRANKSHAFT

REMOVAL

Remove the transmission (page 12-9).

Be careful not to drop the crankshaft.

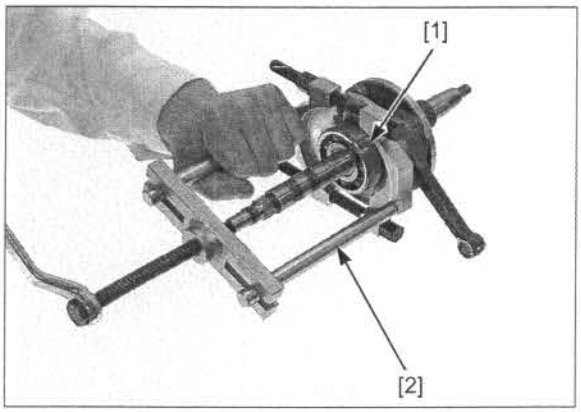
Remove the crankshaft [1] from the right crankcase [2] using a hydraulic press.



If the crankshaft bearing [1] remains on the crankshaft, remove it using a special tool as shown.

TOOL:

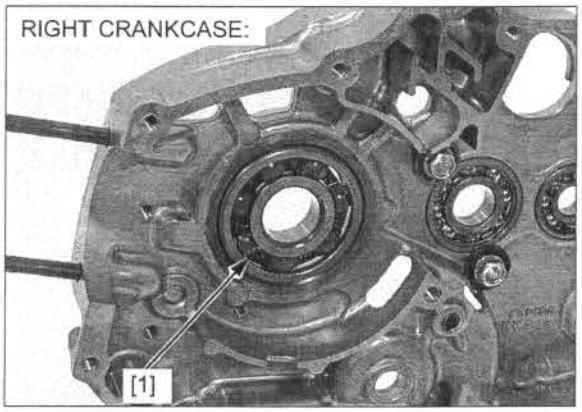
[2] Universal bearing puller **07631-0010000 or equivalent commercially available in U.S.A.**



If the bearing remains in the crankcase, drive it out from the outside.

Do not reuse the crankshaft bearing.

Discard the crankshaft bearing [1].

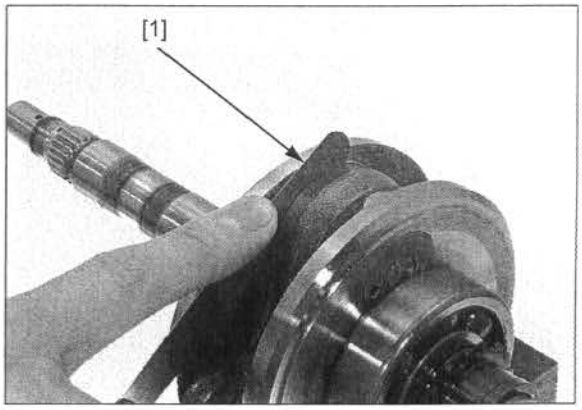


INSPECTION

SIDE CLEARANCE

Measure the side clearance by inserting the feeler gauge [1] between the crankshaft and connecting rod big end.

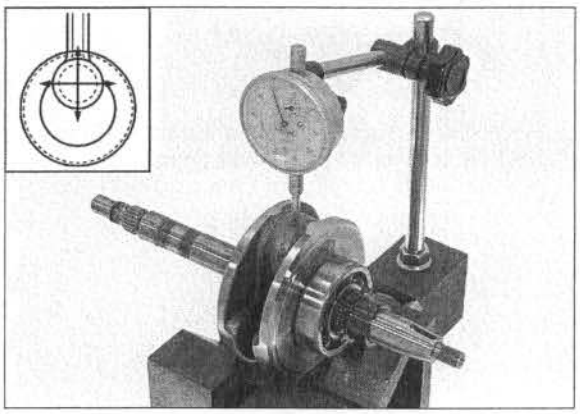
SERVICE LIMIT: 0.60 mm (0.024 in)



RADIAL CLEARANCE

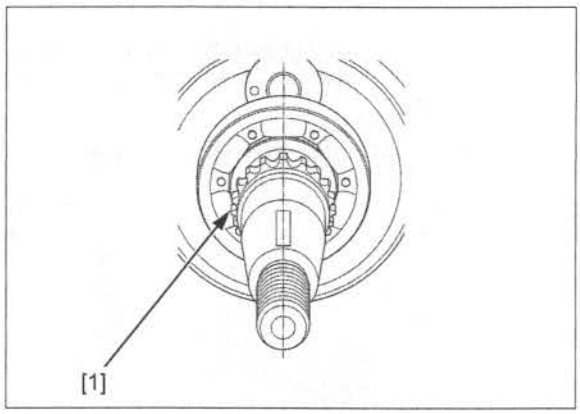
Set the crankshaft on V-blocks and measure the connecting rod big end radial clearance.

SERVICE LIMIT: 0.05 mm (0.002 in)



CRANKSHAFT

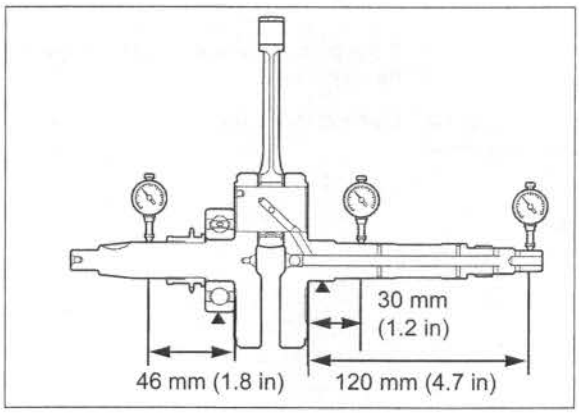
Check the timing sprocket [1] for wear or damage.



Place the crankshaft on a stand or V-blocks and measure the runout using a dial gauge.

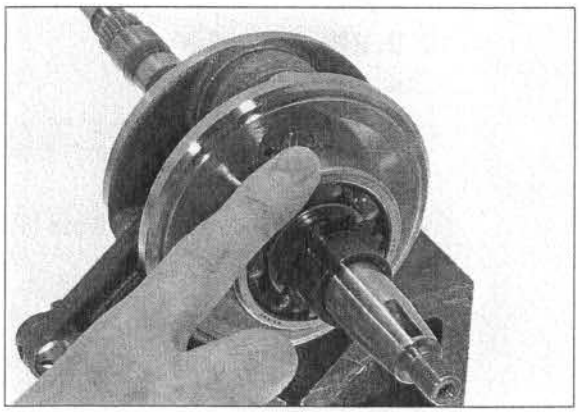
The measuring locations are shown in the illustration.

SERVICE LIMIT: 0.10 mm (0.004 in)



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

Replace the crankshaft if the outer race does not turn smoothly, quietly, or if inner race fits loosely on the crankshaft.



CRANKSHAFT BEARING REPLACEMENT

Apply oil to a new right crankshaft bearing [1] rolling surface.

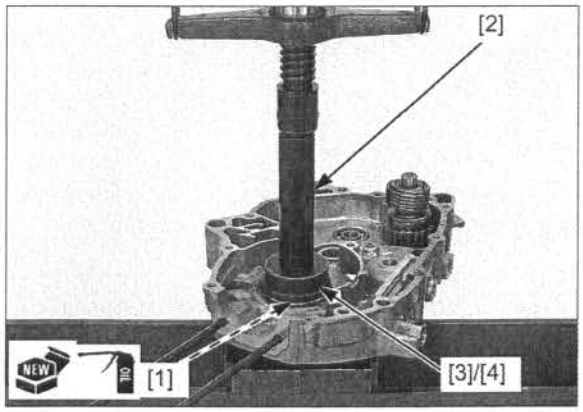
Be careful not to damage the crankcase.

Drive in the right crankshaft bearing with its marked side facing up until it is fully seated, using the special tools.

TOOLS:

[2] Driver	**07749-0010000**
[3] Attachment, 52 x 55 mm	**07746-0010400**
[4] Pilot, 22 mm	**07746-0041000**

For transmission bearing replacement (page 12-14).



INSTALLATION

Apply 1 – 2 cm^3 of oil to the connecting rod [1] big end.

Be sure that the connecting rod is located in the crankcase opening.

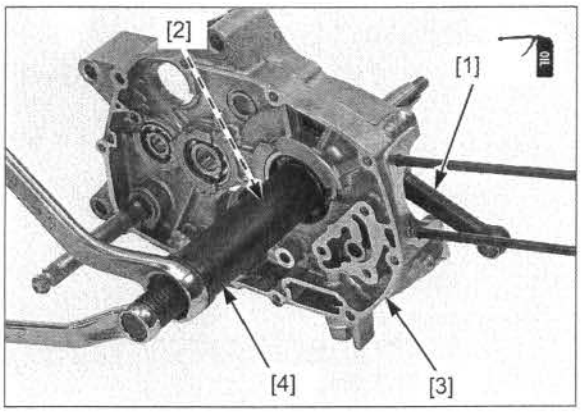
Draw the crankshaft [2] into the right crankcase [3] bearing inner race using the special tool.

TOOLS:

[4] Assembly set, 14 mm	**07JMF-KW70100**

U.S.A. TOOLS:

Threaded adapter, (16 x 15) x (14 x 1.0) mm	**07AMF-KYKA100**
Assembly collar	**07YMF-KPB0100**
Assembly shaft	**07931-ME4010B**
Special nut	**07931-HB3020A**



Install the transmission (page 12-16).

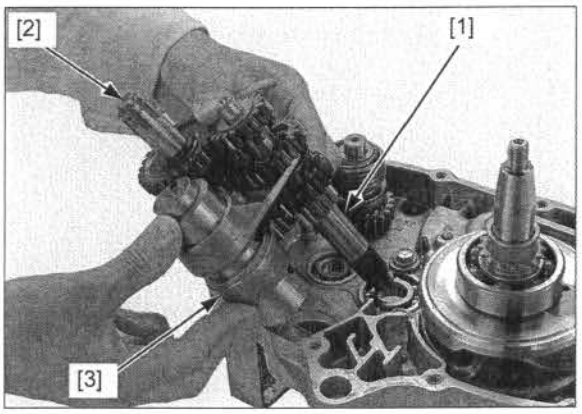
Assemble the crankcase (page 12-17).

TRANSMISSION

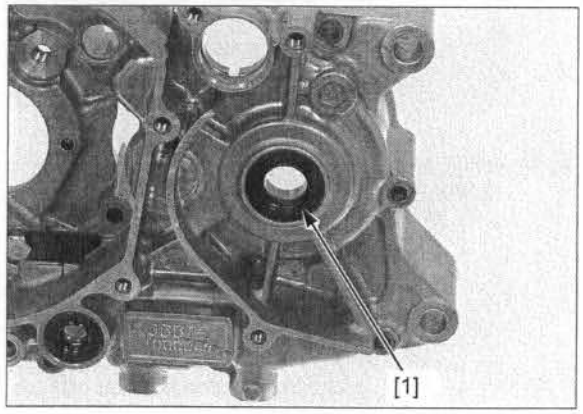
REMOVAL

Separate the crankcase halves (page 12-6).

Remove the mainshaft [1], countershaft [2] and shift drum [3] as an assembly.



Remove the countershaft oil seal [1] from the left crankcase.



DISASSEMBLY

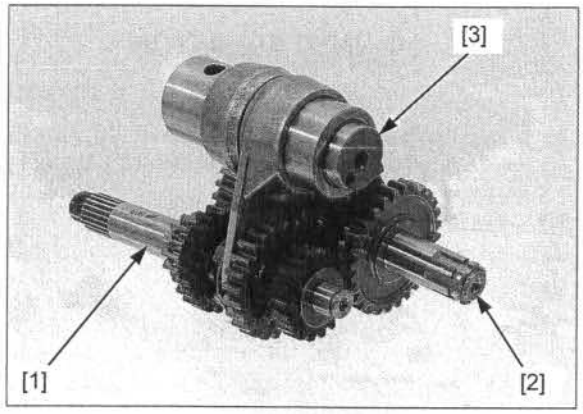
Do not expand the snap ring more than necessary for removal.

Disassemble the mainshaft [1], countershaft [2] and shift drum [3].

Clean all disassembled parts in solvent thoroughly.

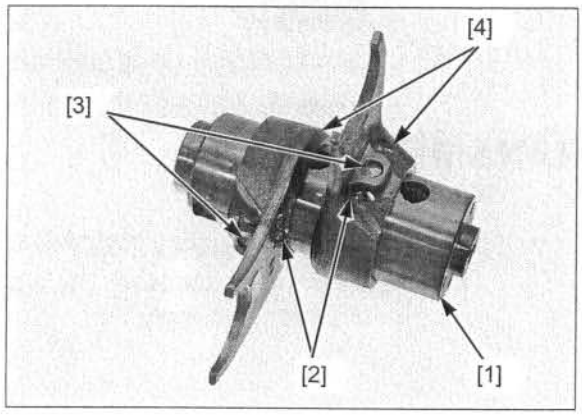
NOTE:

Keep track of the disassembled parts (gears, bushings, washers and snap rings) by sliding them onto a tool or slipping them onto a piece of wire.



Remove the following from shift drum [1]:

- Guide pin clips [2]
- Guide pins [3]
- Shift forks [4]



INSPECTION

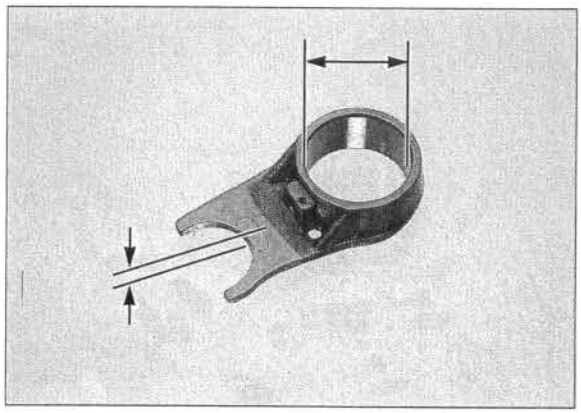
SHIFT FORK

Check the shift fork for deformation or abnormal wear. Measure each shift fork claw thickness.

SERVICE LIMIT: 4.60 mm (0.181 in)

Measure each shift fork I.D.

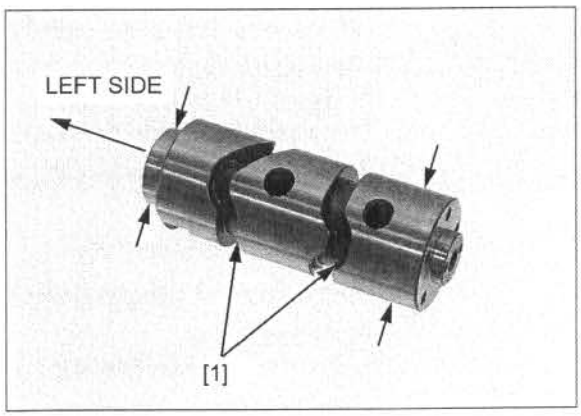
SERVICE LIMIT: 34.14 mm (1.344 in)



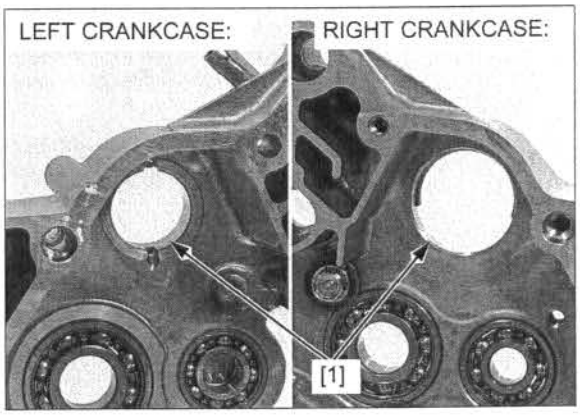
SHIFT DRUM

Check the shift drum grooves [1] for wear or damage.
Measure the shift drum O.D. at each end.

SERVICE LIMITS:
Left side: 23.92 mm (0.942 in)
Right side: 33.93 mm (1.336 in)

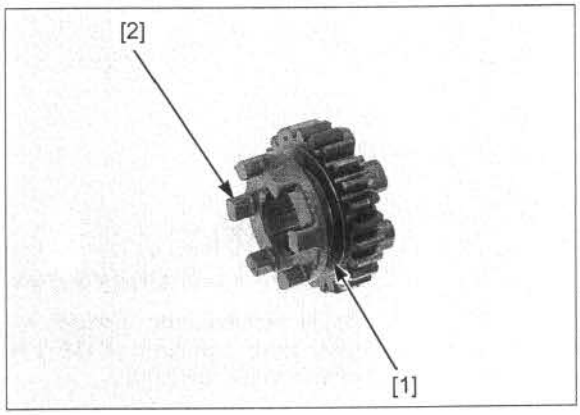


Inspect the shift drum journal [1] for abnormal wear or damage.



GEAR/BUSHING/SHAFT

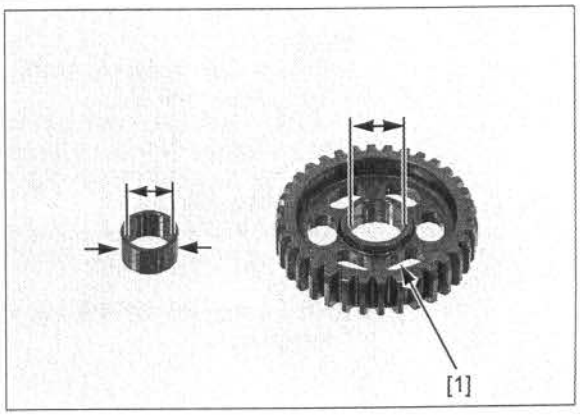
Check the gear shifter groove [1] for abnormal wear or damage.
Check the gear dogs [2] and teeth for abnormal wear or lack of lubrication.



Check the dog holes [1] for abnormal wear or lack of lubrication.

Measure the I.D. of each gear.

SERVICE LIMITS:
M2, M3: 17.04 mm (0.671 in)
C1: 18.04 mm (0.710 in)
C4: 20.04 mm (0.789 in)



Check the C1 gear bushing for wear or damage.

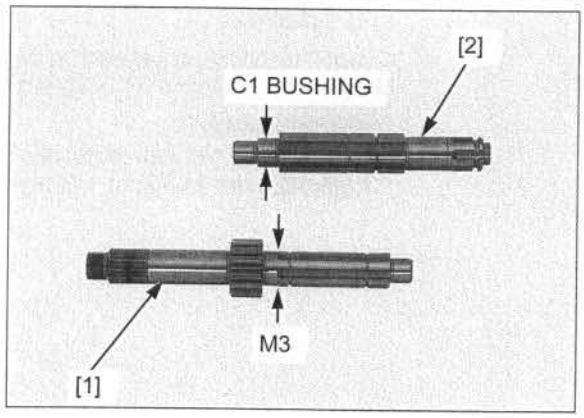
Measure the gear bushing O.D. and I.D.

SERVICE LIMITS:
O.D.: 17.94 mm (0.706 in)
I.D.: 15.04 mm (0.592 in)

Calculate the gear to bushing clearance.

SERVICE LIMIT:
C1: 0.10 mm (0.004 in)

Check the mainshaft [1] and countershaft [2] for abnormal wear or damage.
Measure the O.D. of the mainshaft and countershaft.



SERVICE LIMITS:
At M3: 16.95 mm (0.667 in)
At C1: 14.95 mm (0.589 in)

Calculate the gear-to-shaft clearance.

SERVICE LIMIT:
M3: 0.09 mm (0.004 in)

Calculate the bushing-to-shaft clearance.

SERVICE LIMIT:
C1: 0.09 mm (0.004 in)

TRANSMISSION BEARING

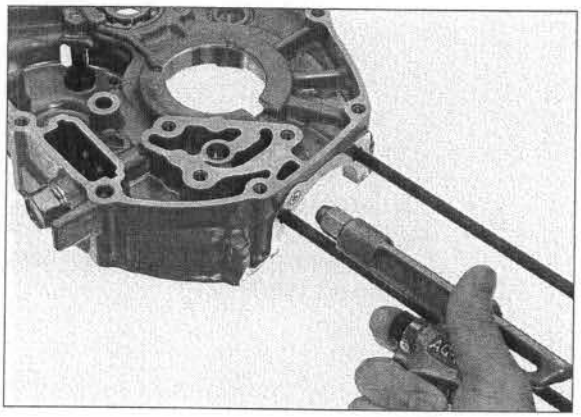
Turn the inner race of each bearing with your finger.
The bearings should turn smoothly and quietly.
Also check that each bearing outer race fits tightly in the crankcase.

Replace the bearing if the inner race does not turn smoothly, quietly, or if the outer race fits loosely in the crankcase.

OIL PASSAGES

Blow open the oil passages of the right crankcase with compressed air.

Check the oil passages for clog, wear or damage.



ASSEMBLY

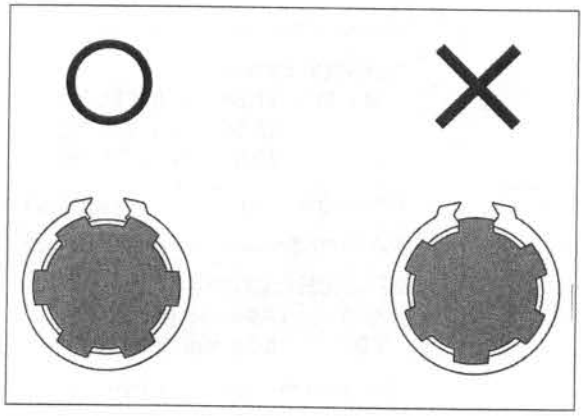
Clean all parts in solvent and dry them thoroughly.

Apply molybdenum disulfide oil to the each rotating gear inner surface and C1 bushing whole surface to ensure initial lubrication.

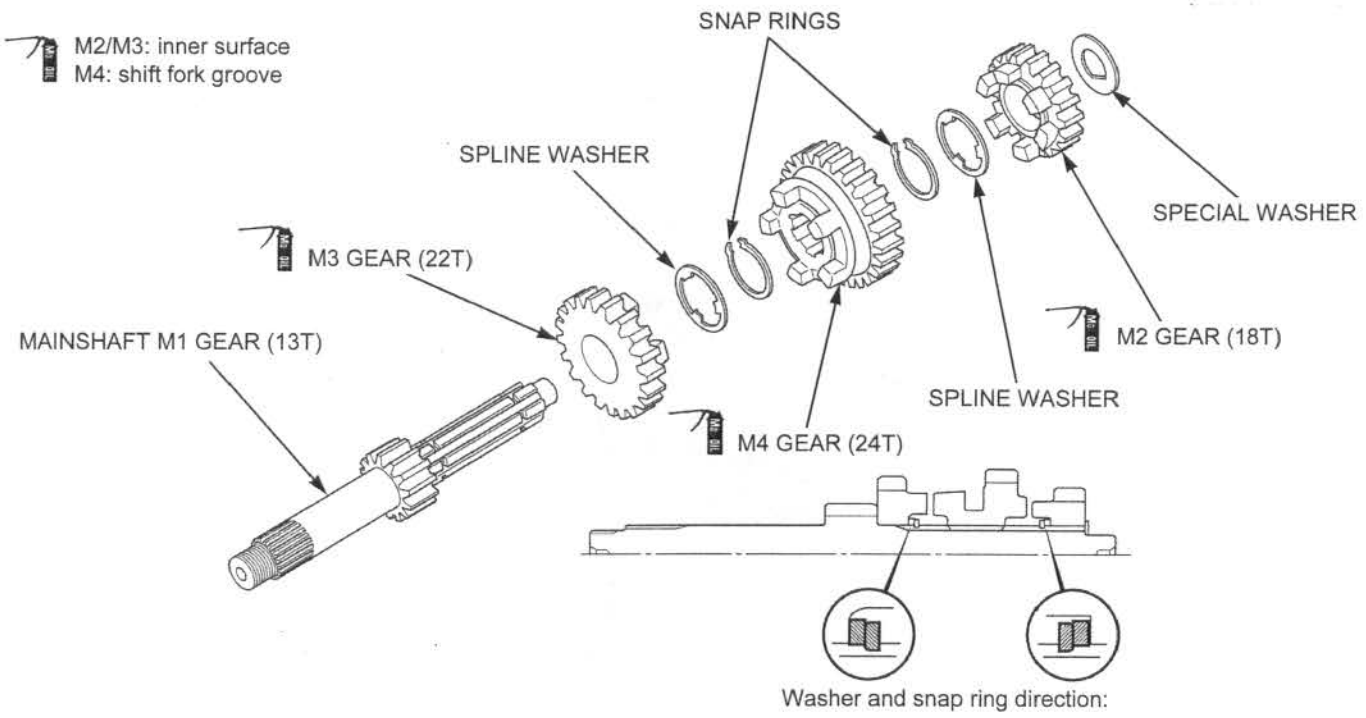
Assemble all parts into their original positions.

NOTE:

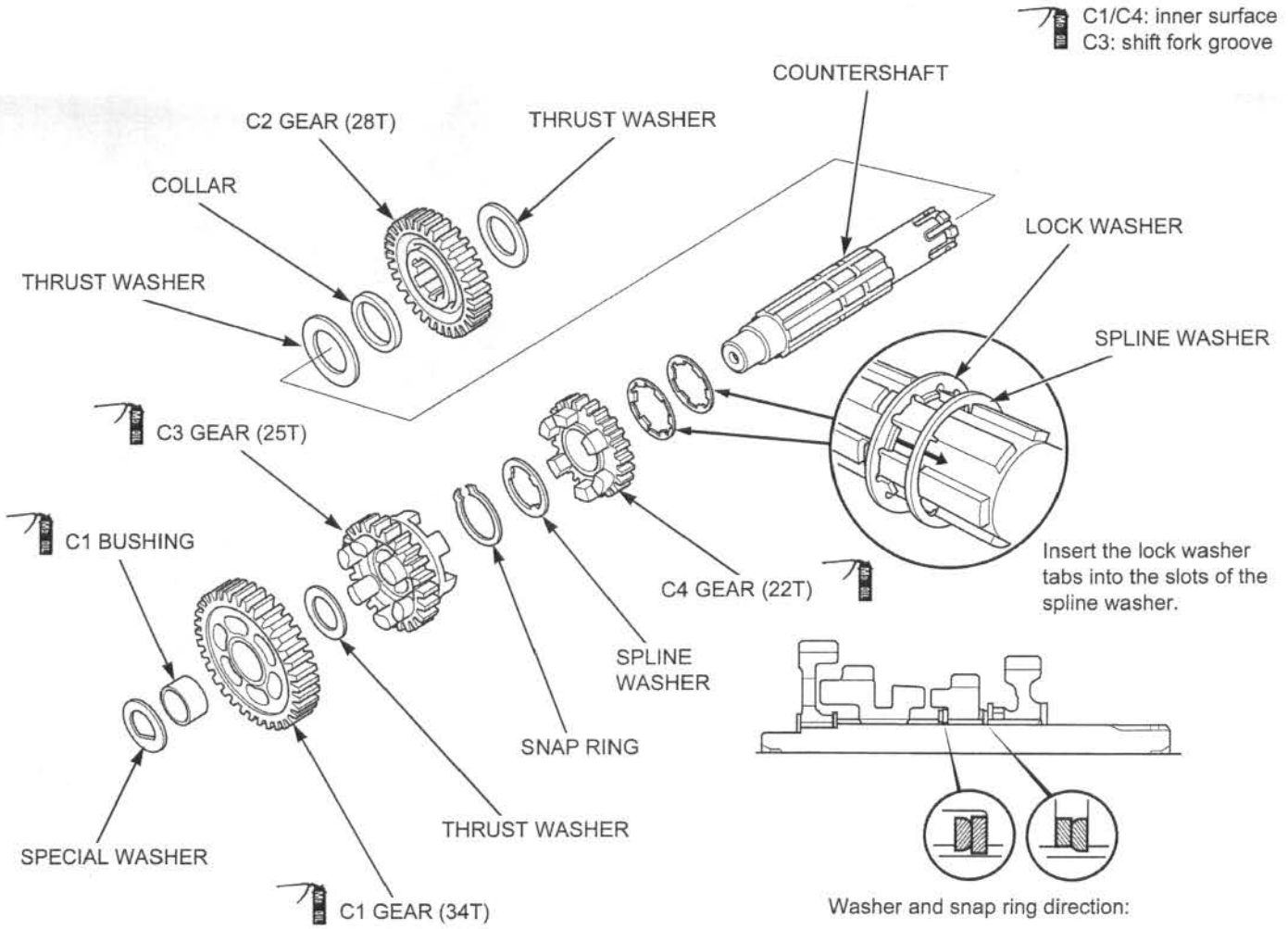
- Check the gears for freedom of movement or rotation on the shaft.
- Install the washers and snap rings with the chamfered edges facing the thrust load side.
- Do not reuse a worn snap ring which could easily spin in the groove.
- Check that the snap rings are seated in the grooves and align their end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



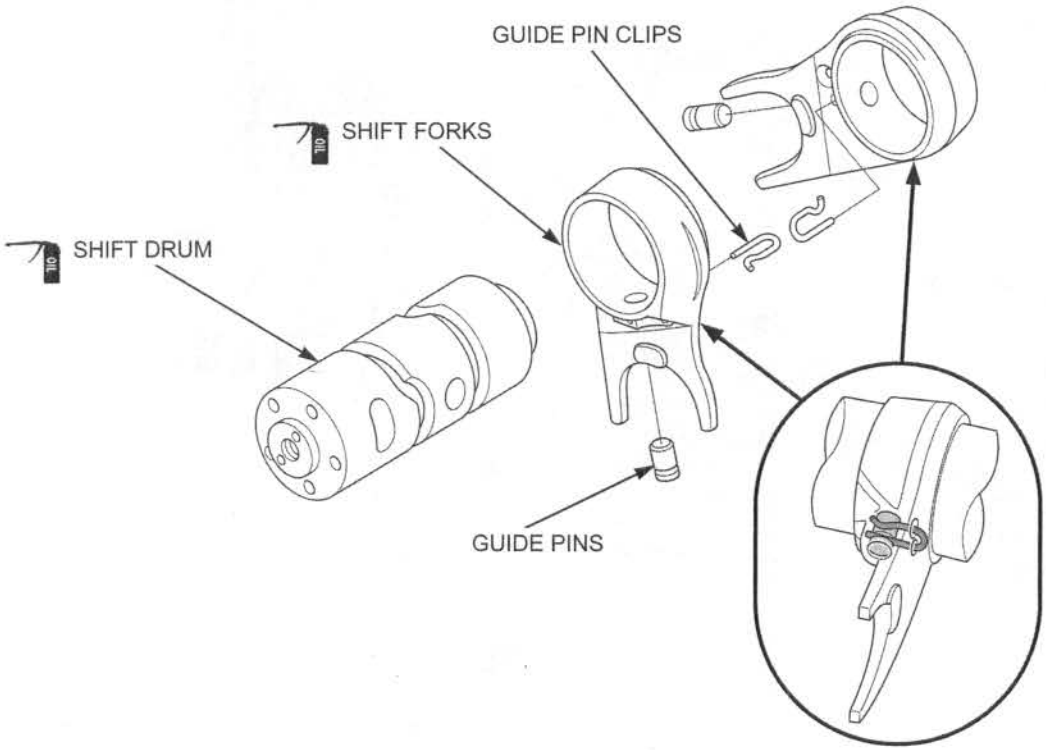
MAINSHAFT:



COUNTERSHAFT:



SHIFT DRUM:

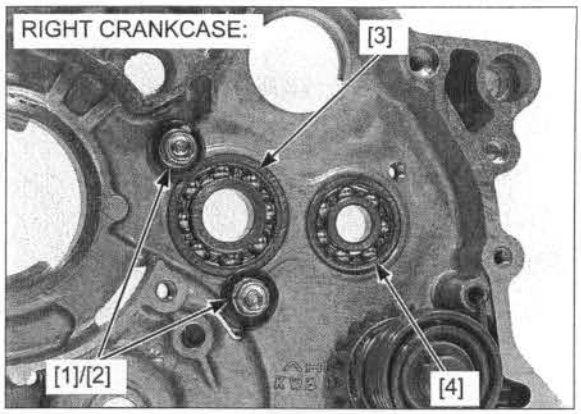


TRANSMISSION BEARING REPLACEMENT

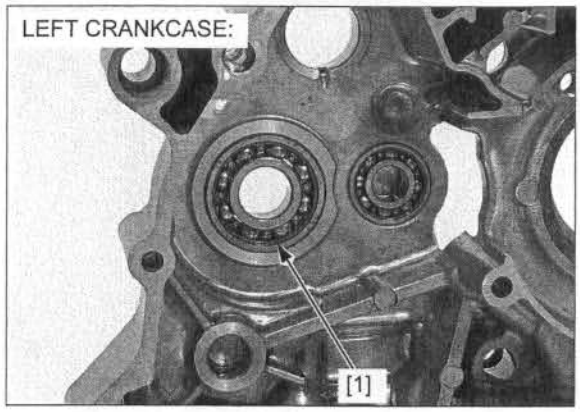
Remove the crankshaft (page 12-7).

Remove the bolts [1] and mainshaft bearing set plates [2].

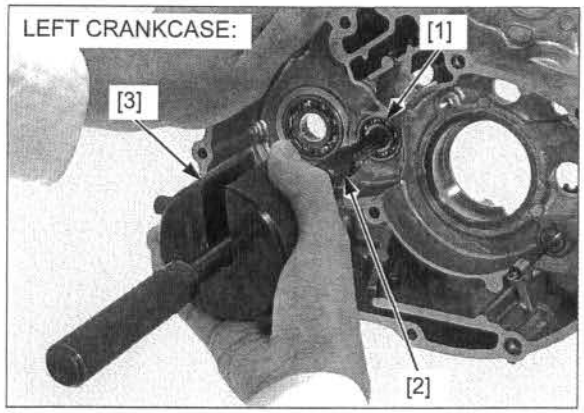
Drive out the mainshaft bearing [3] and countershaft bearing [4] from the right crankcase.



Drive out the countershaft bearing [1] from the left crankcase.



Remove the mainshaft bearing [1] from the left crankcase using the special tools.



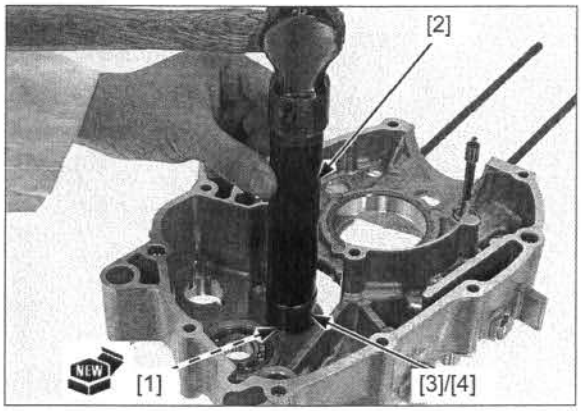
TOOLS:

[2] Bearing remover set, 12 mm	**07936-1660101**
– Bearing remover shaft, 12 mm	**07936-1660120**
– Bearing remover head, 12 mm	**07936-1660110**
[3] Remover weight	**07741-0010201**

U.S.A. TOOLS:

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

Drive new bearings into the crankcase with their marked side facing up until they are fully seated, using the special tools.



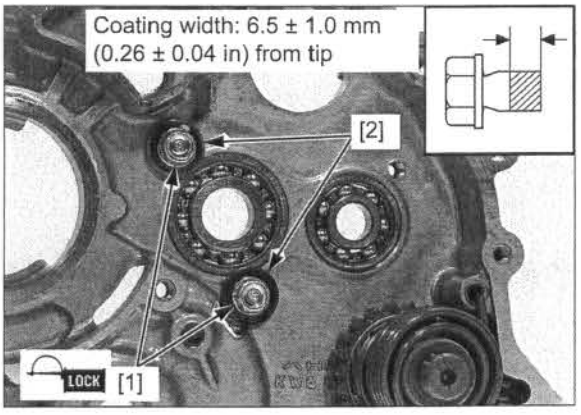
TOOLS:

Right crankcase mainshaft bearing:	
Driver	**07749-0010000**
Attachment, 37 x 40 mm	**07746-0010200**
Pilot, 17 mm	**07746-0040400**
Right crankcase countershaft bearing:	
Driver	**07749-0010000**
Attachment, 32 x 35 mm	**07746-0010100**
Pilot, 12 mm	**07746-0040200**
[1] Left crankcase mainshaft bearing:	
[2] Driver	**07749-0010000**
[3] Attachment, 28 x 30 mm	**07946-1870100**
[4] Pilot, 12 mm	**07746-0040200**
Left crankcase countershaft bearing:	
Driver	**07749-0010000**
Attachment, 37 x 40 mm	**07746-0010200**
Pilot, 17 mm	**07746-0040400**

Apply locking agent (Three Bond 1322 or equivalent) to the mainshaft bearing set plate bolt [1] threads as specified.

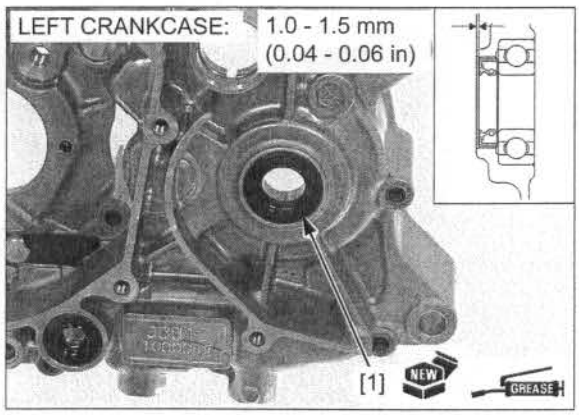
Install the mainshaft bearing set plates [2] and bolts to the right crankcase and tighten the bolts.

Install the crankshaft (page 12-9).

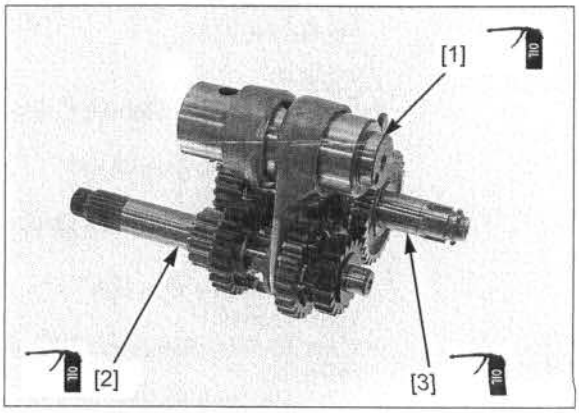


INSTALLATION

Apply grease to a new countershaft oil seal [1] lips.
Install the oil seal as specified.



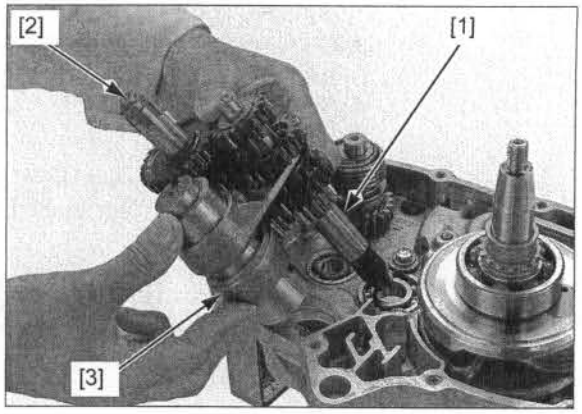
Apply engine oil to the transmission gears and shift drum [1] whole surface.
Engage the mainshaft [2] gears, countershaft [3] gears and shift drum assembly.



Install the mainshaft [1], countershaft [2] and shift drum [3] into the right crankcase.

Rotate the shift drum to check the transmission operation.

Assemble the crankcase (page 12-17).

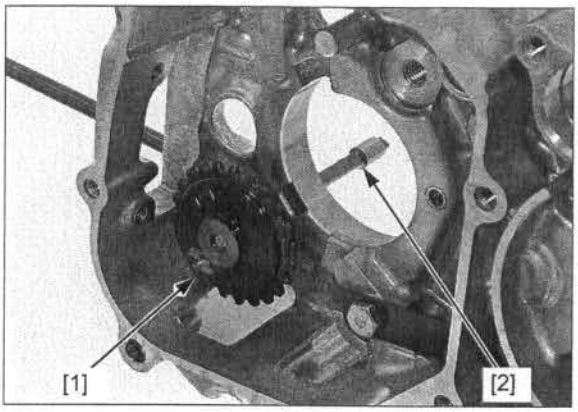


CAM CHAIN GUIDE SPROCKET

REMOVAL

Separate the crankcase (page 12-6).

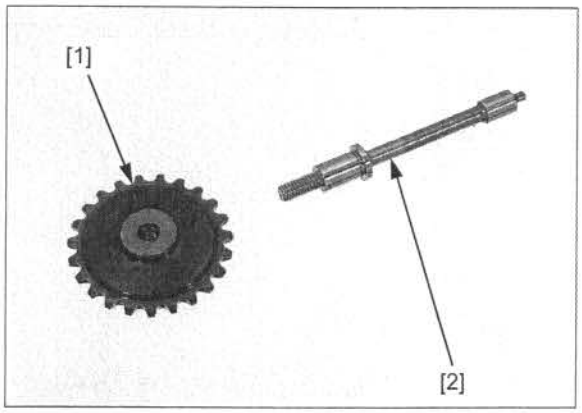
Hold the cam chain guide sprocket [1], turn the cam chain guide sprocket spindle [2] counterclockwise and remove them from the left crankcase.



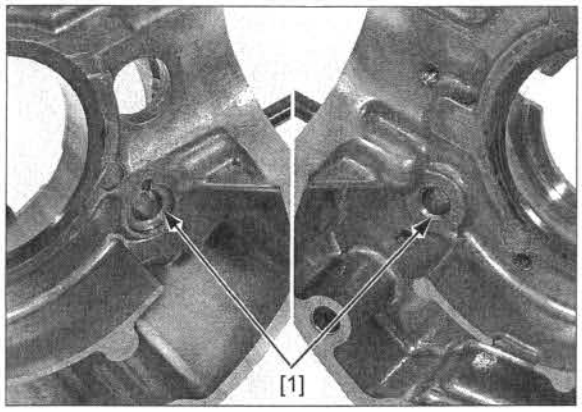
INSPECTION

Inspect the following:

- Cam chain guide sprocket [1] for wear or damage
- Cam chain guide sprocket spindle [2] for wear or damage



- Spindle journal [1] for abnormal wear or damage



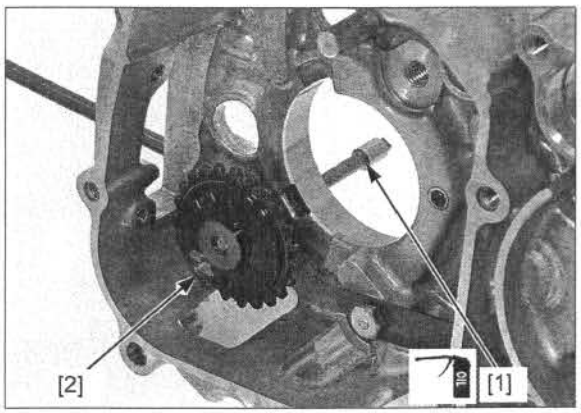
INSTALLATION

Apply engine oil to the cam chain guide sprocket spindle [1] sliding surface.

Install the spindle to the left crankcase, hold the sprocket [2] and tighten the spindle to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

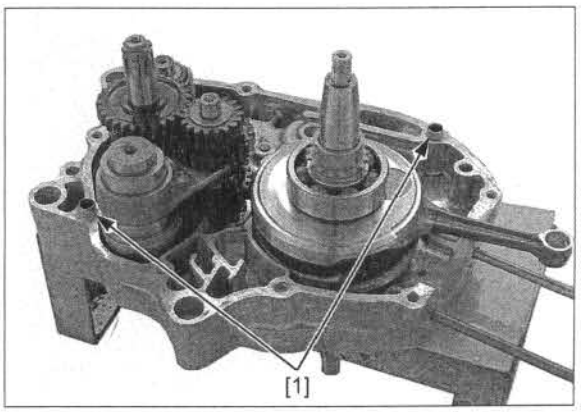
Assemble the crankcase (page 12-17).



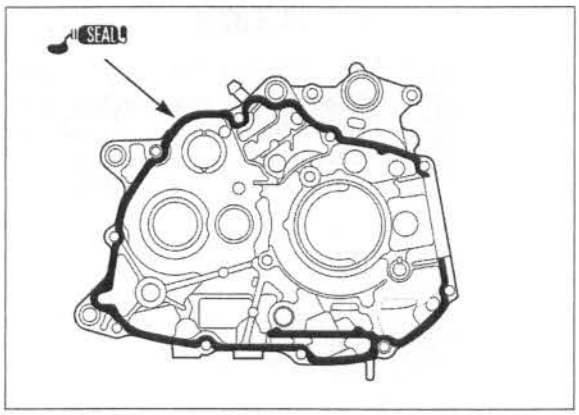
CRANKCASE ASSEMBLY

Clean off the sealant from the left and right crankcase mating surfaces.

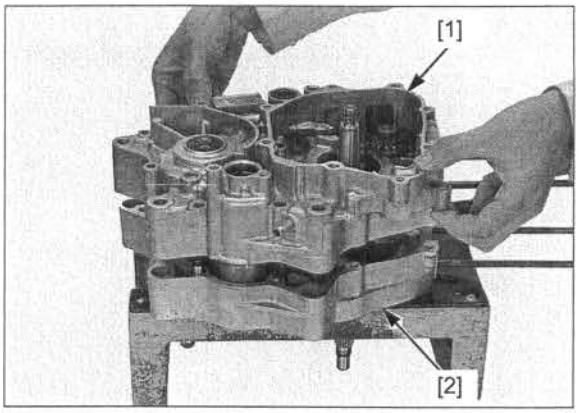
Install the dowel pins [1] onto the right crankcase.



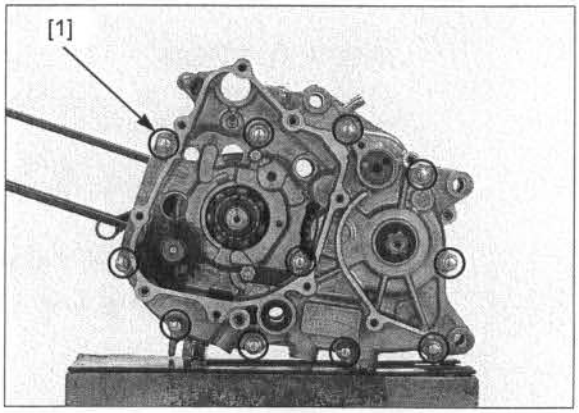
Apply light but thorough coating of sealant (Three Bond 1215 or equivalent) to the left crankcase mating surface except the oil passage area as shown.



Install the left crankcase [1] onto the right crankcase [2].

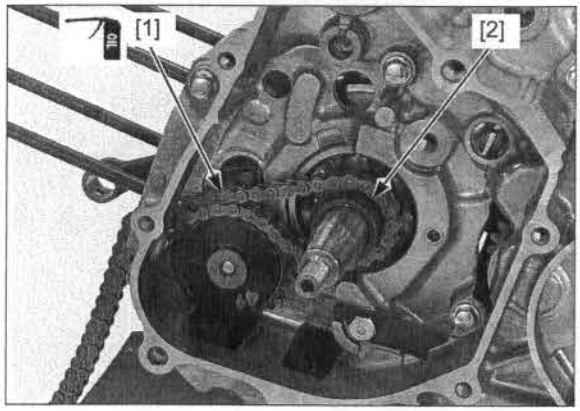


Install and tighten the crankcase bolts [1] in a crisscross pattern in several steps.



Apply oil to the cam chain [1] whole surface.
Install the cam chain over the timing sprocket [2].

Install the removed parts in the reverse order of removal (page 12-3).

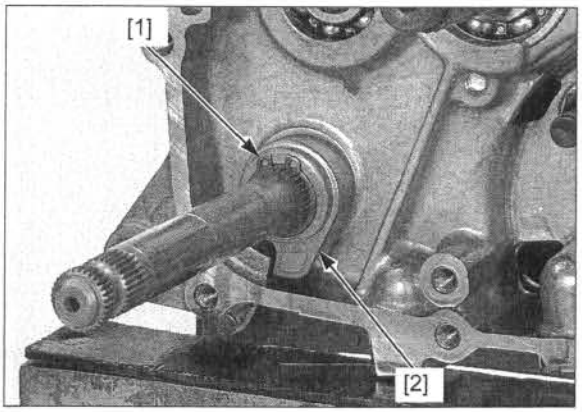


KICKSTARTER

REMOVAL

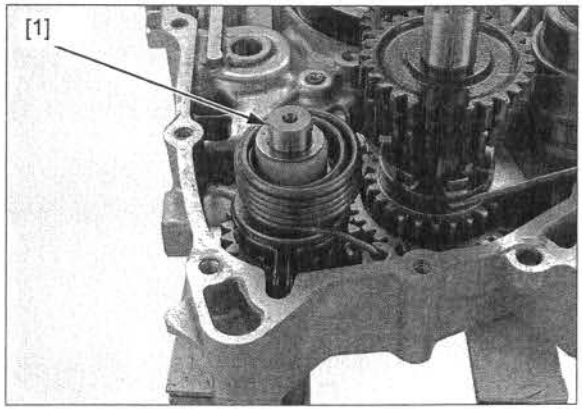
Remove the gearshift linkage (page 10-26).

Remove the snap ring [1] and retainer [2] from the kickstarter spindle.



Separate the crankcase (page 12-6).

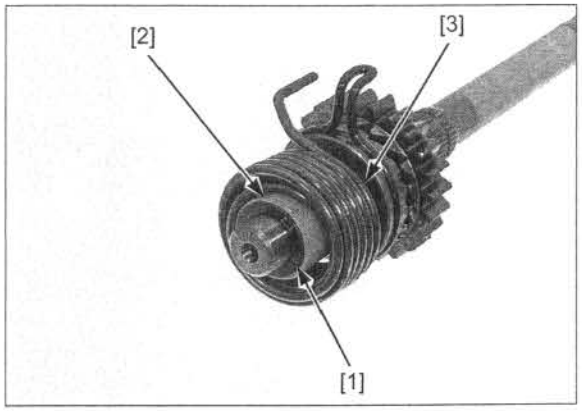
Remove the kickstarter spindle [1] from the right crankcase.



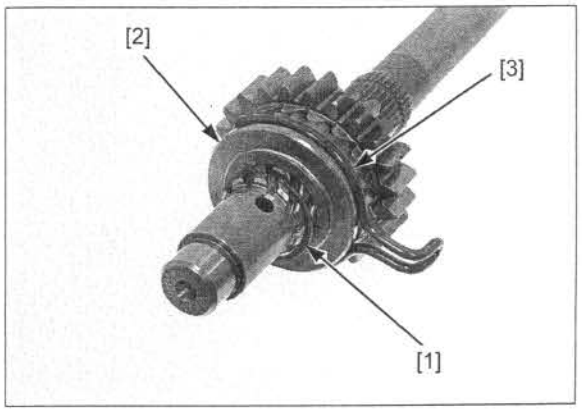
DISASSEMBLY/INSPECTION

Remove the following:

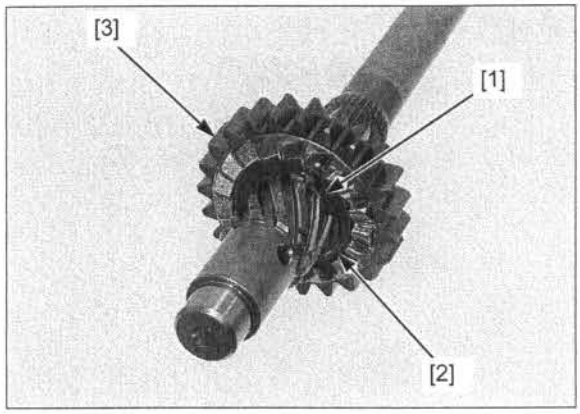
- Special washer [1]
- Collar [2]
- Return spring [3]



- Snap ring [1]
- Starter ratchet [2]
- Ratchet spring [3]



- Snap ring [1]
- Washer [2]
- Starter pinion gear [3]



INSPECTION

Check the kickstarter spindle [1] for bend, wear or damage.

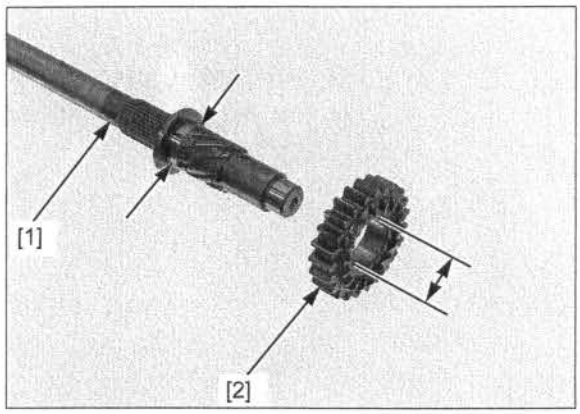
Measure the kickstarter spindle O.D.

SERVICE LIMIT: 19.94 mm (0.785 in)

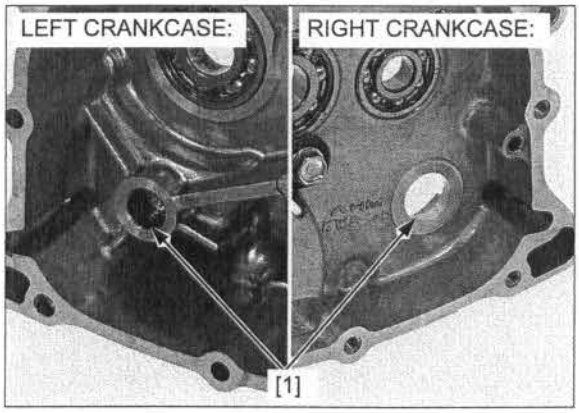
Check the starter pinion gear [2] for abnormal wear or damage.

Measure the starter pinion gear I.D.

SERVICE LIMIT: 20.08 mm (0.791 in)



Check the kickstarter spindle journals [1] of the left and right crankcase for excessive wear or damage.

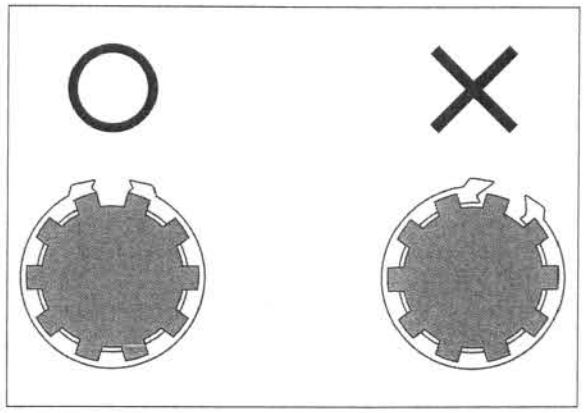


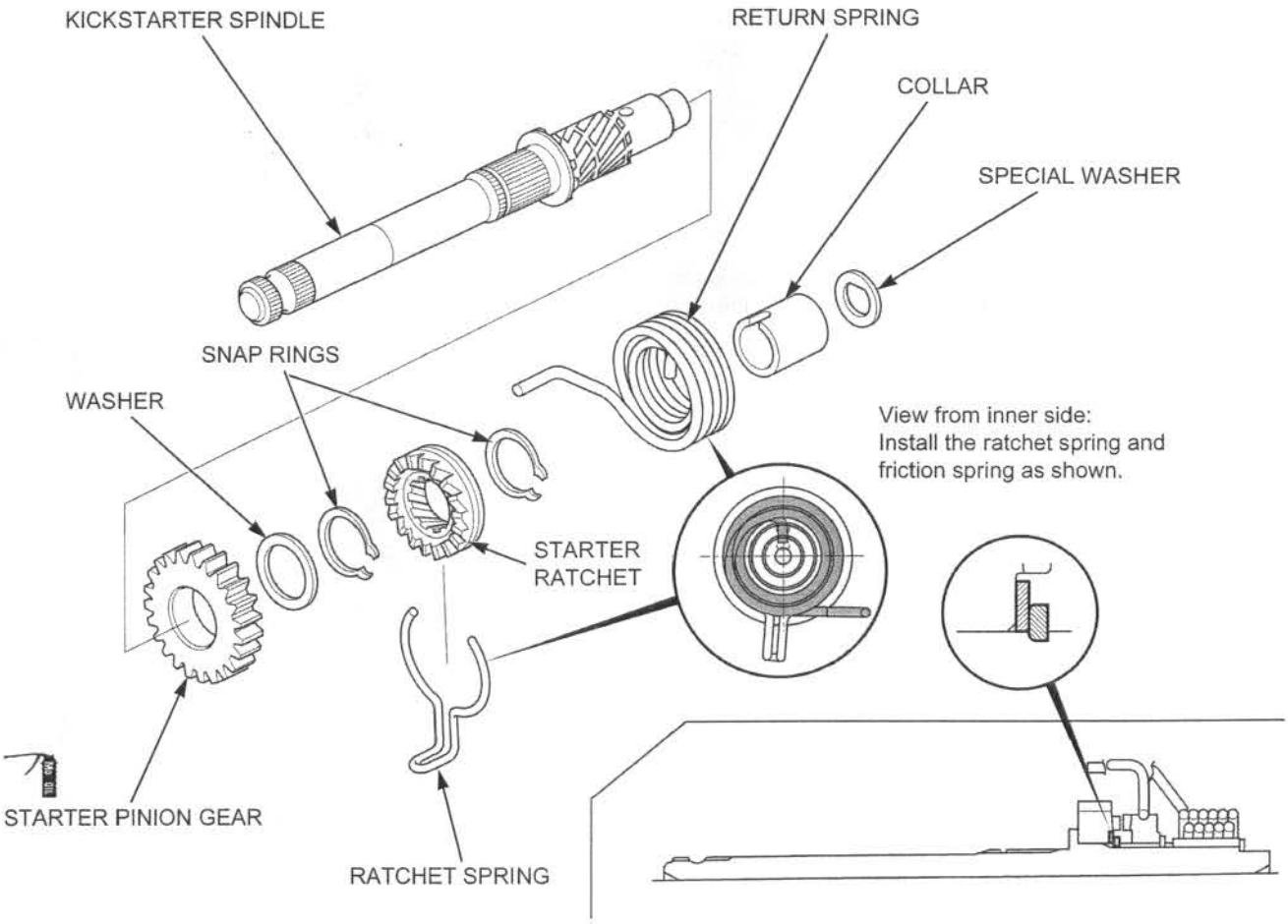
ASSEMBLY

Clean all parts in solvent and dry them thoroughly.

NOTE:

- Install the washers and snap rings with the chamfered edges facing the thrust load side.
- Do not reuse a worn snap ring which could easily spin in the groove.
- Check that the snap rings are seated in the grooves and align their end gaps with the grooves of the spline.
- Check that the special washer is seated in the groove.



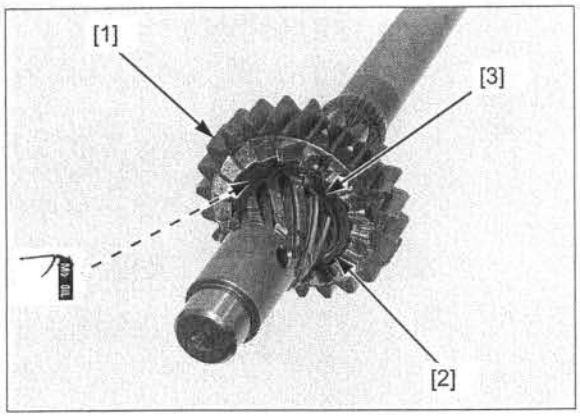


Washer and snap ring direction:

Apply molybdenum oil solution to the starter pinion gear [1] inner surface.

Make sure that the snap ring is firmly seated in the groove.

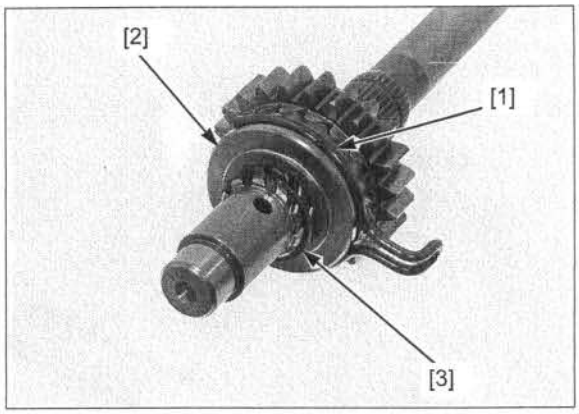
Install the starter pinion gear, washer [2] and snap ring [3].



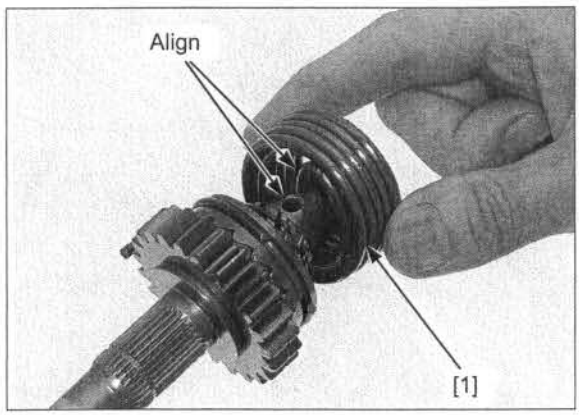
Install the ratchet spring [1] to the starter ratchet [2].

Make sure that the snap ring is firmly seated in the groove.

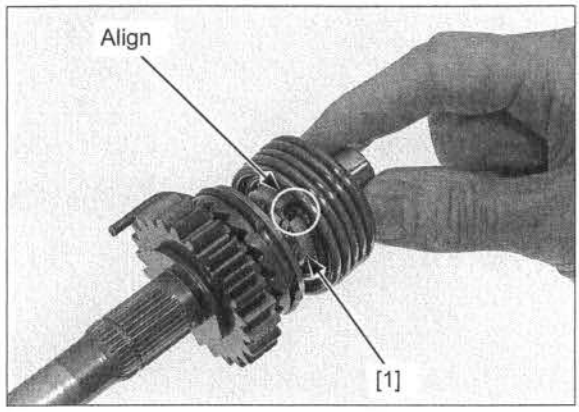
Install the starter ratchet and snap ring [3] to the kickstarter spindle.



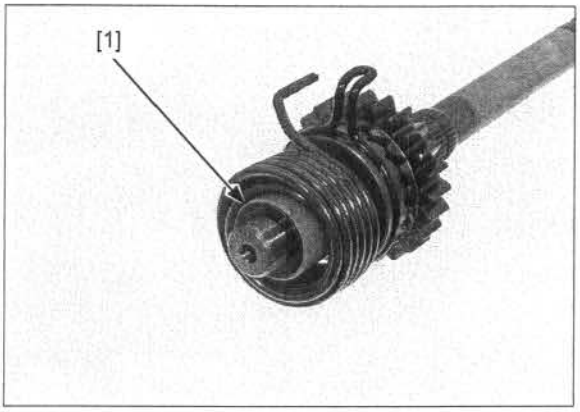
Install the return spring [1] to the kickstarter spindle while aligning the spring end with the hole on the spindle.



Install the collar [1] to the kickstarter spindle while aligning its groove with the return spring end.



Install the special washer [1] to the kickstarter spindle.



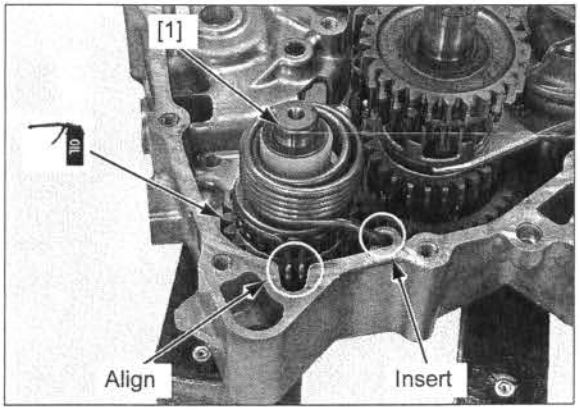
INSTALLATION

Apply engine oil to the kickstarter gear teeth.

Install the kickstarter spindle [1] while aligning its ratchet spring with the groove of the right crankcase as shown.

Insert the return spring end into the hole on the right crankcase as shown.

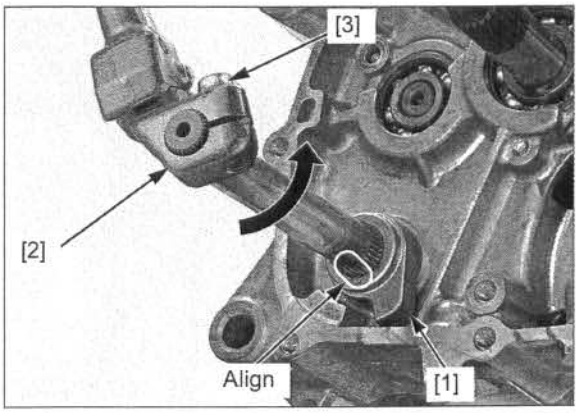
Assemble the crankcase (page 12-17).



Set the retainer [1] to the kickstarter spindle.

Temporarily install the kickstarter pedal [2] and bolt [3]. Turn the kickstarter pedal and completely install the retainer while aligning its wide tooth with the wide spline on the spindle.

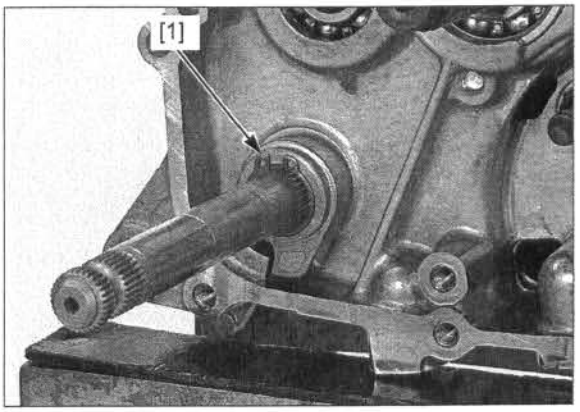
Release the kickstarter pedal.
Remove the bolt and kickstarter pedal.



Make sure that the snap ring is firmly seated in the groove.

Install the snap ring [1] to the kickstarter spindle groove.

Install the gearshift linkage (page 10-28).



MEMO

13. ENGINE REMOVAL/INSTALLATION

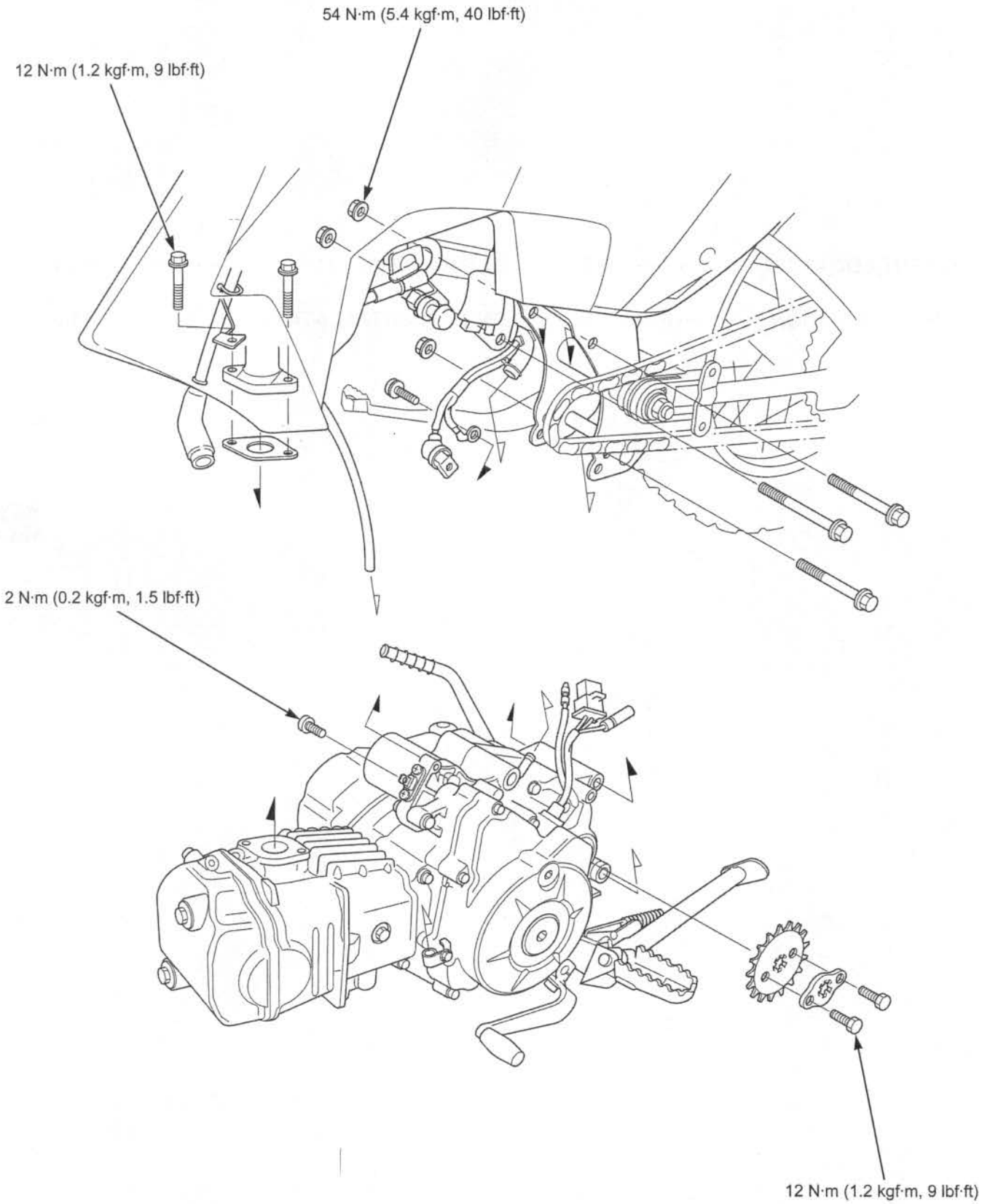
COMPONENT LOCATION 13-2

SERVICE INFORMATION 13-3

ENGINE REMOVAL 13-4

ENGINE INSTALLATION 13-5

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

- When removing/installing the engine, tape the frame around the engine beforehand for frame protection.
- The following components require engine removal for service.
  - Crankshaft (page 12-7)
  - Transmission (page 12-9)
  - Kickstarter (page 12-19)
  - Cam chain guide sprocket (page 12-16)

Other components can be serviced with the engine installed in the frame.

SPECIFICATIONS

ITEM		SPECIFICATIONS
Engine oil capacity	After draining	1.0 liter (1.1 US qt, 0.9 Imp qt)
	After disassembly	1.15 liter (1.22 US qt, 1.01 Imp qt)
Engine dry weight		22.3 kg (49.2 lbs)

TORQUE VALUES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Engine hanger nut	3	10	54 (5.5, 40)	
Drive sprocket fixing plate bolt	2	6	12 (1.2, 9)	
Intake pipe mounting bolt	2	6	12 (1.2, 9)	
Starter motor cable screw	1	4	2 (0.2, 1.5)	

ENGINE REMOVAL

Drain the engine oil (page 3-10).

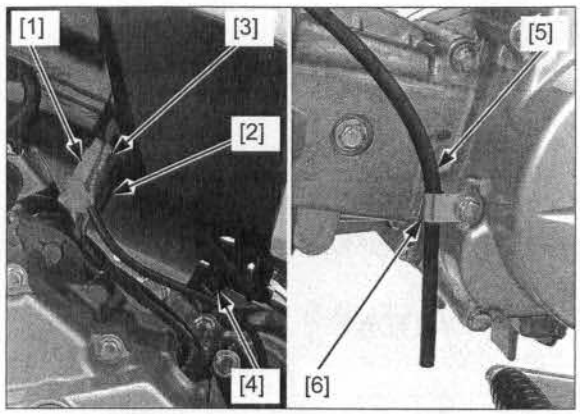
Remove the following.

- Left crankcase rear cover (page 2-7)
- Drive chain cover (page 2-7)
- Exhaust pipe/muffler (page 2-8)

Disconnect the following:

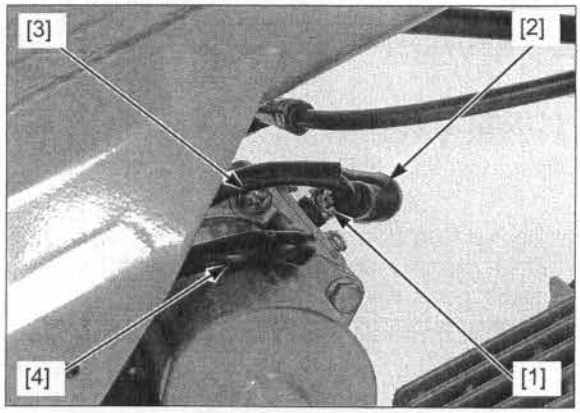
- Alternator 2P connector [1]
- Ignition pulse generator wire connector [2]
- Neutral switch wire connector [3]
- Crankcase breather hose [4]

Release the carburetor drain hose [5] from the hose guide [6].



Remove the starter motor cable screw [1] and disconnect the starter motor cable [2] from the starter motor.

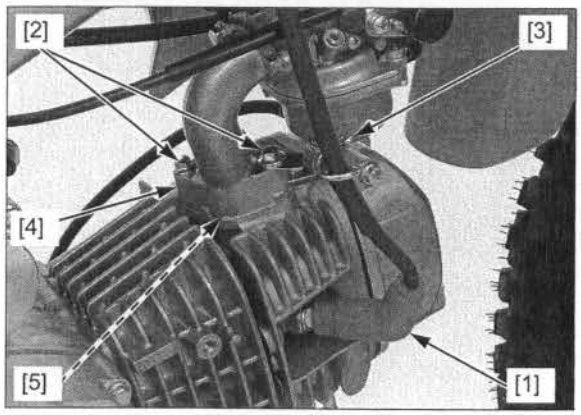
Remove the screw [3] and disconnect the ground cable [4] from the starter motor.



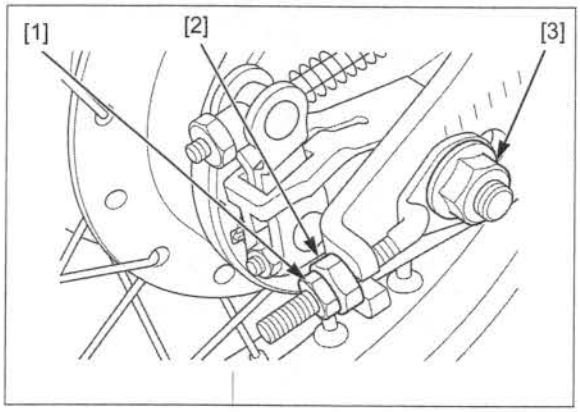
Disconnect the spark plug cap [1].

Remove the two bolts [2] and wire guide [3], then release the intake pipe [4] from the cylinder head.

Remove the gasket [5].

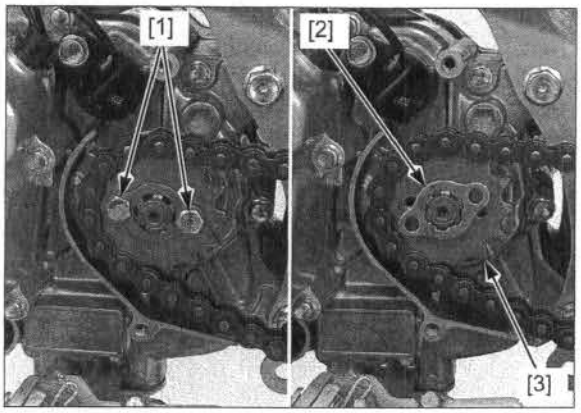


Loosen the lock nuts [1], drive chain adjusting nuts [2] and axle nut [3].
Push the rear wheel forward.



Remove the drive sprocket fixing plate bolts [1].
Turn and remove the fixing plate [2].

Remove the drive sprocket [3] from the countershaft and drive chain.



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

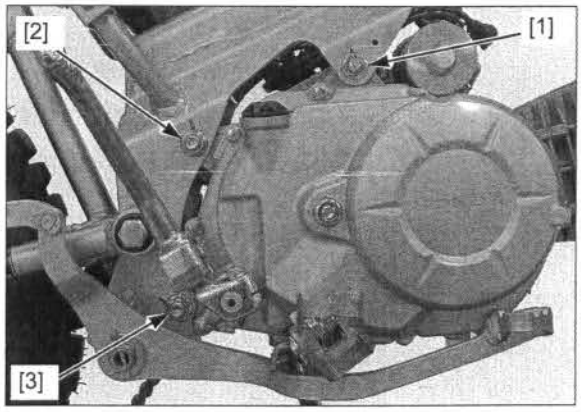
Support the engine using a jack or other adjustable support.

Remove the front engine hanger nut [1].

Remove the rear upper engine hanger nut [2] and rear lower engine hanger nut [3].

Remove the engine hanger bolts and engine from the frame.

- Wrap the intake manifold port with a shop towel or cover it with a piece of tape to prevent any foreign material from dropping into the engine.



ENGINE INSTALLATION

NOTE:

- Note the direction of the hanger bolts.
- Use a floor jack or other adjustable support, carefully place the engine into the frame and maneuver it into place.
- Route the wires and hoses properly (page 1-14).

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

Place the engine into the frame and support the engine using a jack or other adjustable support.

Install the engine hanger bolts and nuts.

Tighten the rear upper engine hanger nut [1] to the specified torque.

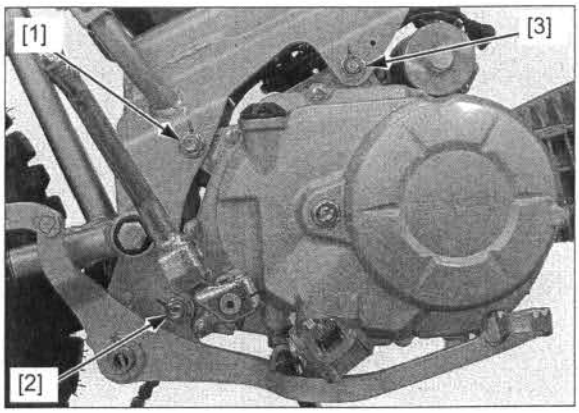
TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)

Tighten the rear lower engine hanger nut [2] to the specified torque.

TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)

Tighten the front engine hanger nut [3] to the specified torque.

TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)

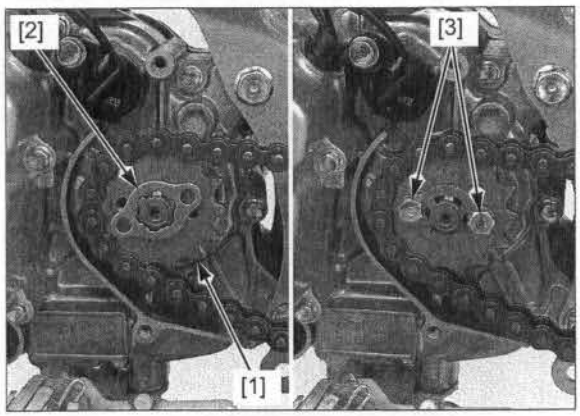


Install the drive chain onto the drive sprocket [1].
Install the drive sprocket onto the countershaft.

Install the fixing plate [2] to the countershaft while aligning their teeth.
Rotate the fixing plate and align their bolt holes.

Install and tighten the drive sprocket fixing plate bolts [3] alternately to the specified torque.

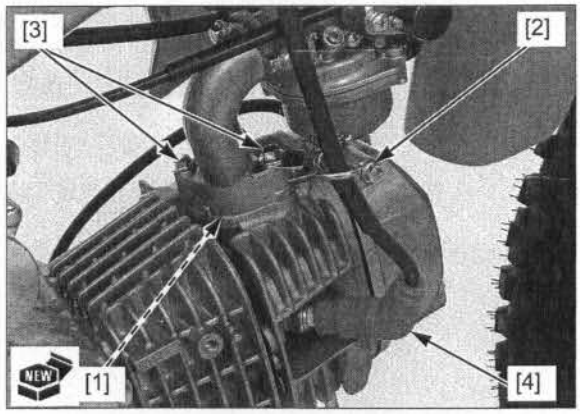
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Install a new gasket [1] onto the cylinder head.
Set the wire guide [2] to the intake pipe and tighten the two bolts [3] to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

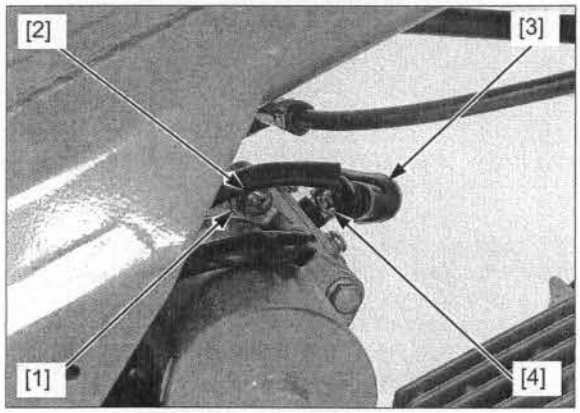
Connect the spark plug cap [4].



Set the ground cable terminal [1] against the starter motor case and tighten the screw [2].

Connect the starter motor cable [3] to the starter motor and tighten the screw [4] to the specified torque.

TORQUE: 2 N·m (0.2 kgf·m, 1.5 lbf·ft)



Connect the following:

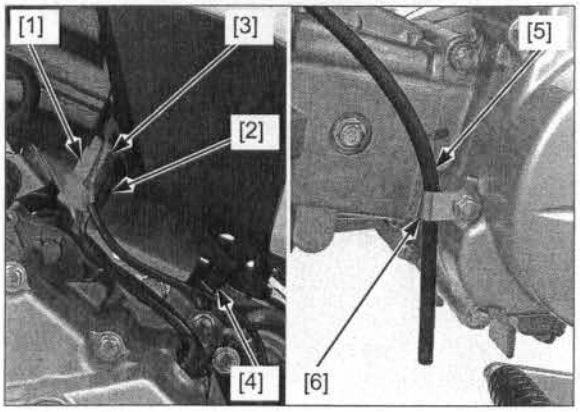
- Alternator 2P connector [1]
- Ignition pulse generator wire connector [2]
- Neutral switch wire connector [3]
- Crankcase breather hose [4]

Install the carburetor drain hose [5] into the hose guide [6].

Fill the recommended engine oil up to the proper level (page 3-10).
Adjust the drive chain slack (page 3-13).
Adjust the brake pedal freeplay (page 3-16).

Install the following.

- Exhaust pipe/muffler (page 2-8)
- Left crankcase rear cover (page 2-7)
- Drive chain cover (page 2-7)



14. FRONT WHEEL/BRAKE/SUSPENSION/STEERING

COMPONENT LOCATION 14-2

SERVICE INFORMATION 14-3

TROUBLESHOOTING 14-5

HANDLEBAR 14-6

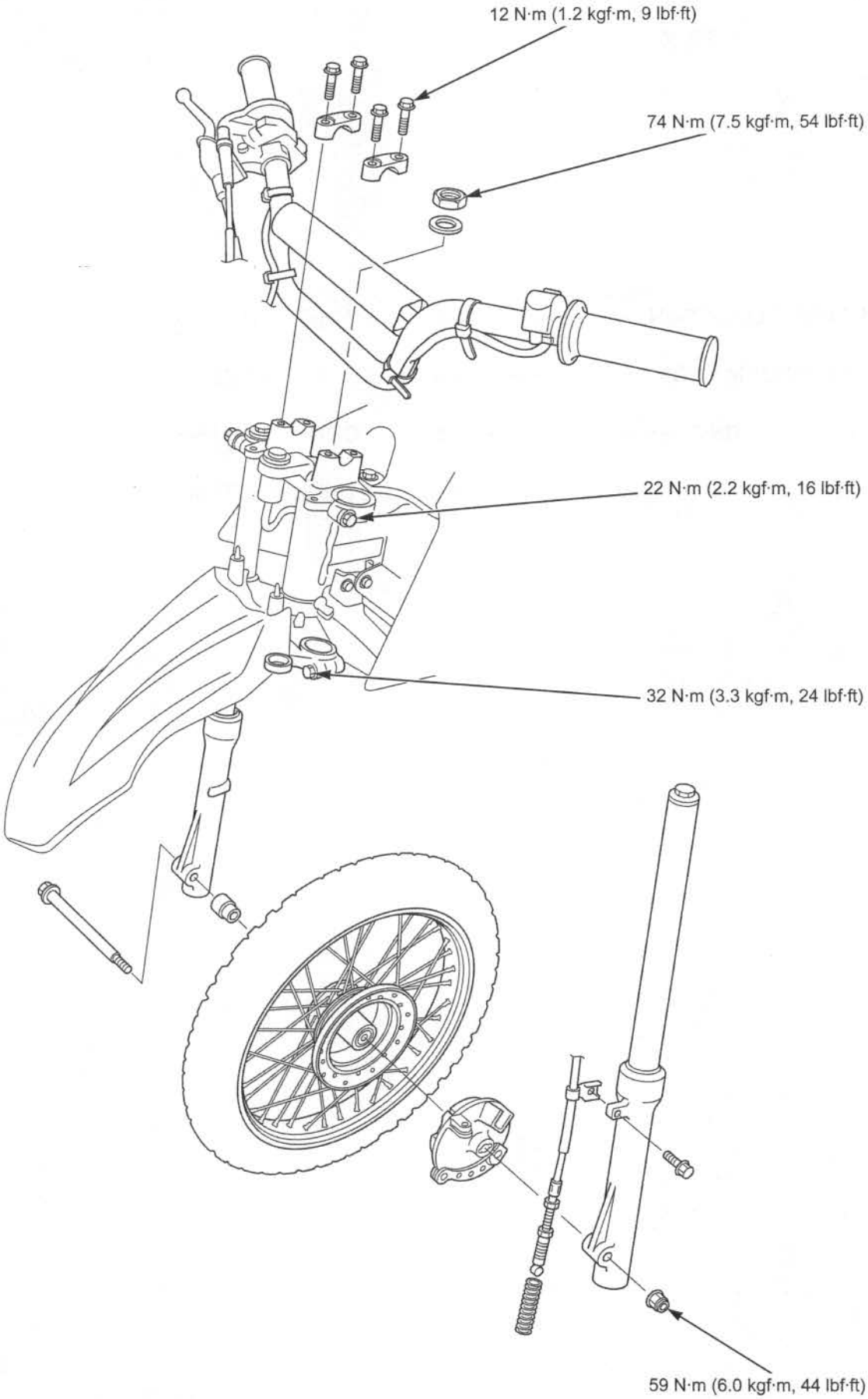
FRONT WHEEL 14-9

FRONT BRAKE 14-14

FORK 14-18

STEERING STEM 14-26

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

⚠CAUTION

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

- Riding on damaged rims impairs safe operation of the motorcycle.
- When servicing the front wheel, brake, fork or steering stem, support the motorcycle using a safety stand or hoist.

SPECIFICATIONS

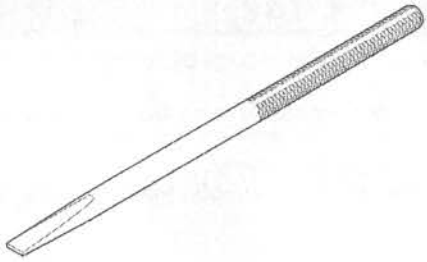
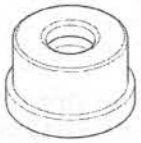
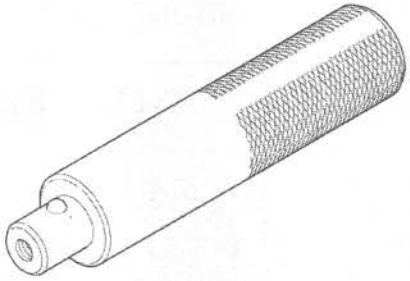
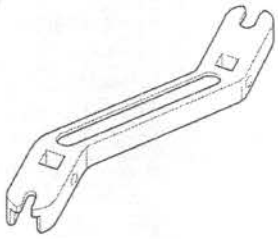
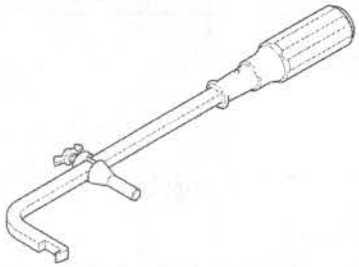
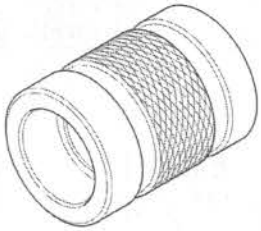
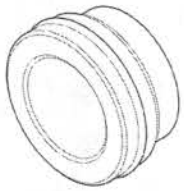
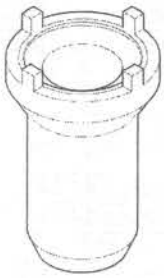
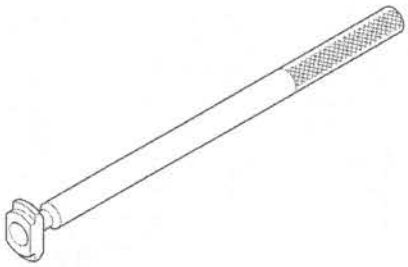
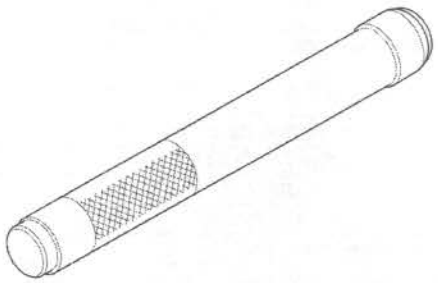
Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Front wheel	Cold tire pressure		100 kPa (1.00 kgf/cm^2, 15 psi)	–
	Front wheel rim runout	Radial	–	1.0 (0.04)
		Axial	–	1.0 (0.04)
	Wheel hub-to-rim distance		12.0 ± 1.0 (0.47 ± 0.04)	–
	Front axle runout		–	0.20 (0.008)
	Minimum tire tread depth		–	To indicator
Brake	Brake lever freeplay		15 (0.59)	–
	Lining thickness		3.0 (0.12)	2.0 (0.08)
	Drum I.D.		95.0 (3.74)	96.0 (3.78)
Fork	Spring free length		278 (10.94)	272 (10.71)
	Fork pipe runout		–	0.20 (0.008)
	Recommended fork fluid		Pro Honda suspension Fluid SS-8 (10W)	–
	Fluid level		96.0 (3.78)	–
	Fluid capacity		179 ± 2.5 cm^3 (6.1 ± 0.08 US oz, 6.3 ± 0.09 Imp oz)	–

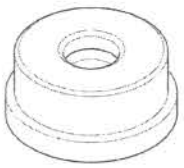
TORQUE VALUES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Handlebar upper holder bolt	4	6	12 (1.2, 9)	
Engine stop switch mounting screw	2	4	0.9 (0.09, 0.7)	
Starter switch mounting screw	2	4	0.9 (0.09, 0.7)	
Front spoke	36	BC2.9	3.2 (0.33, 2.4)	
Front axle nut	1	12	59 (6.0, 44)	U-nut
Front brake arm pinch bolt	1	6	9.9 (1.01, 7.3)	Apply a locking agent to the threads.
Fork socket bolt	2	8	20 (2.0, 15)	Apply a locking agent to the threads.
Fork cap bolt	2	22	22 (2.2, 16)	
Fork bottom bridge pinch bolt	2	8	32 (3.3, 24)	
Fork top bridge pinch bolt	2	8	22 (2.2, 16)	
Steering stem lock nut	1	24	–	See page 14-28
Steering stem top thread	1	26	–	See page 14-28
Brake lever pivot bolt	1	6	3 (0.3, 2.2)	
Brake lever pivot nut	1	6	5.9 (0.6, 4.4)	

TOOLS

Bearing remover head, 12 mm 07746-0050300 	Bearing remover shaft 07746-0050100 	Attachment, 32 x 35 mm 07746-0010100 
Pilot, 12 mm 07746-0040200 	Driver 07749-0010000 	Spoke wrench, 4.5 x 5.1 mm 07701-0020200 
Oil seal remover 07748-0010001  or equivalent commercially available in U.S.A.	Fork seal driver weight 07747-0010100  or 07947-KA50100 (U.S.A. only)	Fork seal driver attachment, 31 mm 07747-0010400  or 07AMD-GFMA100 (U.S.A. only)
Lock nut wrench 07916-3710101  or 07916-3710100 (U.S.A. only)	Ball race remover 07GMD-KS40100 	Steering stem driver, 28 mm 07946-4300101  or 07946-MB00000 and 07946-KA6000A (U.S.A. only)

Attachment, 42 x 47 mm
07746-0010300



TROUBLESHOOTING

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

Steers to one side or does not track straight
- Bent fork
- Bent front axle
- Wheel installed incorrectly
- Faulty steering head bearings
- Bent frame
- Worn wheel bearings
- Worn swingarm pivot components
- Uneven fork oil quantity in each fork

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

Front wheel hard to turn
- Faulty wheel bearings
- Bent front axle
- Brake drag

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

Stiff suspension
- Incorrect fork fluid viscosity
- Bent fork pipes
- Clogged fluid passage
- Tire pressure too high

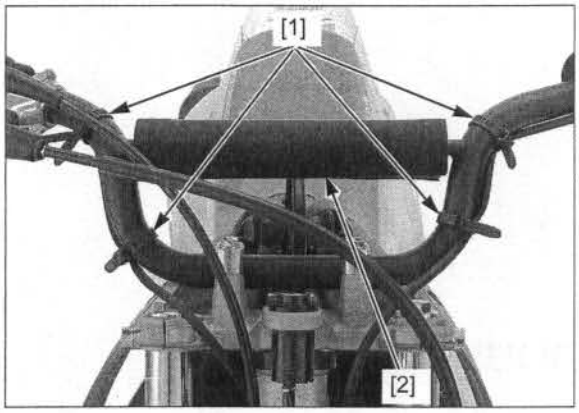
Front suspension noise
- Low fork fluid level
- Loose fork fasteners

HANDLEBAR

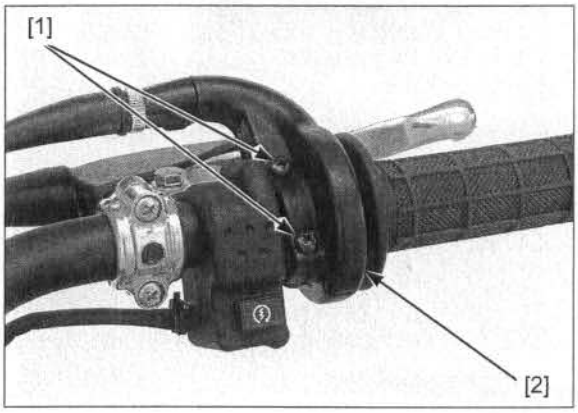
REMOVAL

Remove the number plate (page 2-5).

Remove the wire bands [1] and handlebar pad [2].

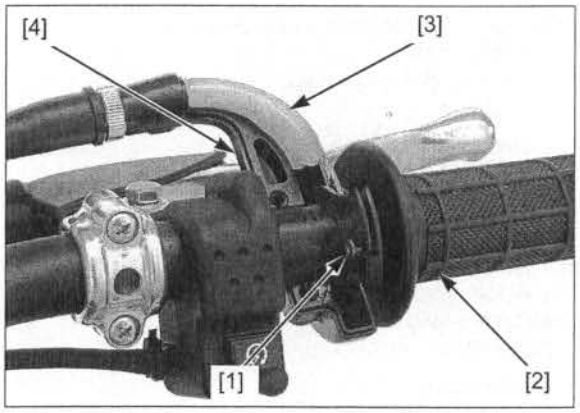


Remove the two screws [1] and throttle housing cover [2].

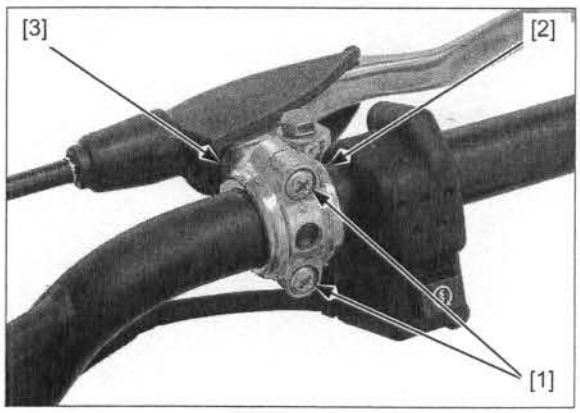


Disconnect the throttle cable end [1] from the throttle pipe flange and remove the throttle pipe [2].

Remove the throttle cable slider [3] and throttle housing [4].

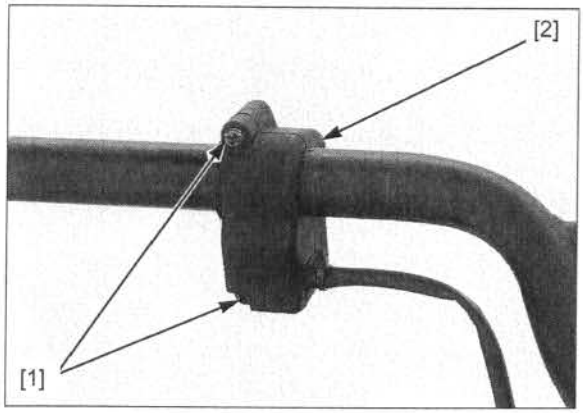


Remove the two screws [1], holder [2] and front brake lever bracket [3].

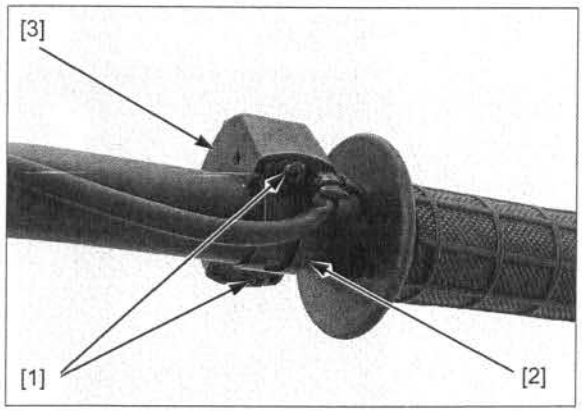


Remove the two screws [1].

Separate the starter switch [2] and remove them from the handlebar.

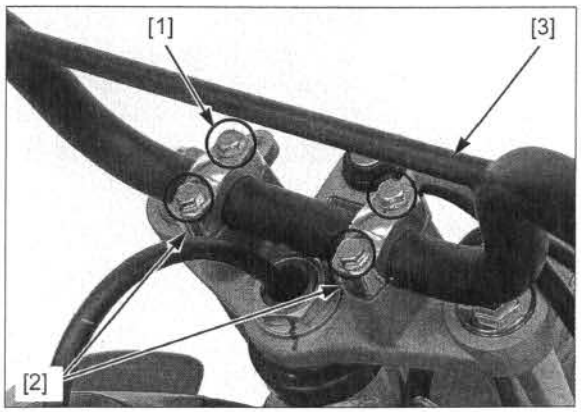


Remove the two screws [1], holder [2] and engine stop switch [3].



Remove the handlebar upper holder bolts [1] and holders [2].

Remove the handlebar [3].



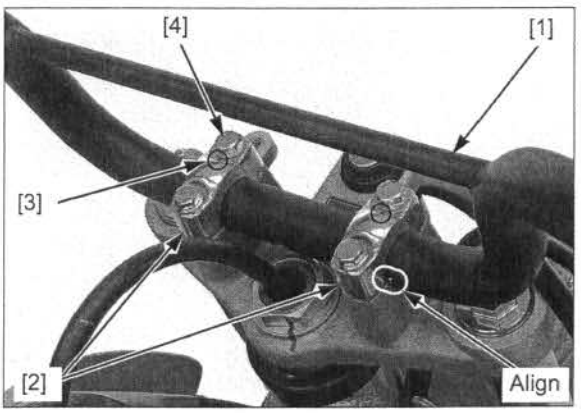
INSTALLATION

Place the handlebar [1] onto the lower holders, aligning the punch mark on the handlebar with the mating surface of the lower holder.

Place the upper holders [2] with the punch marks [3] facing forward.

Install the upper holder bolts [4], tighten the forward bolts first, then the rear bolts.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

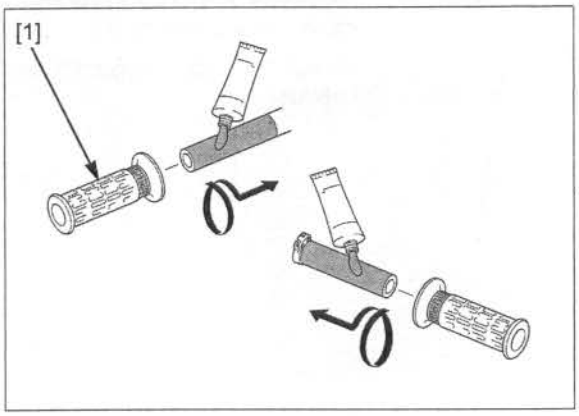


If the handlebar grips [1] were removed, apply Honda Bond A or Pro Honda Hand Grip Cement (U.S.A. only) to the inside of the grip and to the clean surfaces of the left handlebar and throttle grip.

Allow the adhesive to dry for an hour before using.

Wait 3 – 5 minutes and install the grip.

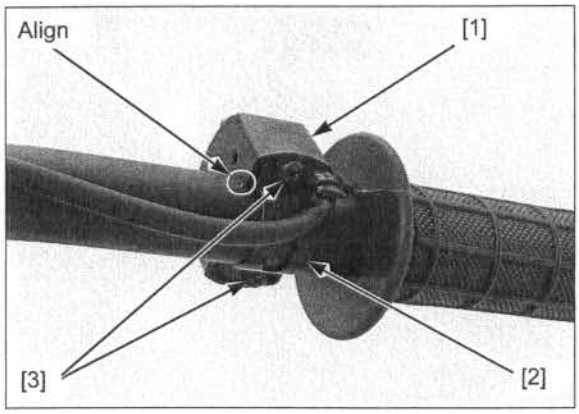
Rotate the grip for even application of the adhesive.



Install the engine stop switch [1] and holder [2] onto the handlebar.

Align the edge of the engine stop switch with the punch mark on the handlebar, then tighten the two screws [3] to the specified torque.

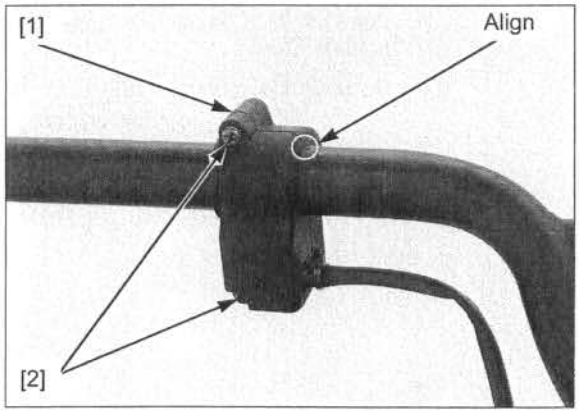
TORQUE: 0.9 N·m (0.09 kgf·m, 0.7 lbf·ft)



Install the starter switch [1] onto the handlebar.

Align the mating surface of the starter switch with the punch mark on the handlebar, then tighten the two screws [2] to the specified torque.

TORQUE: 0.9 N·m (0.09 kgf·m, 0.7 lbf·ft)

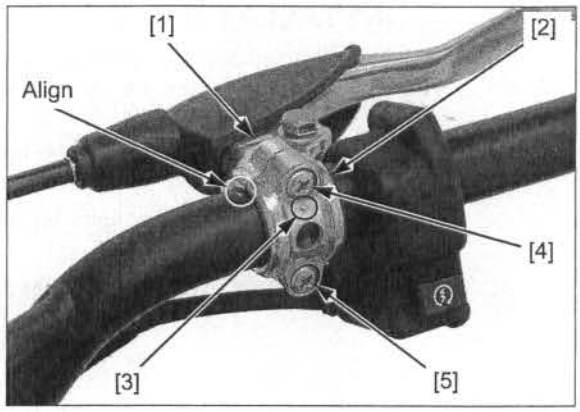


Place the front brake lever bracket [1] onto the handlebar.

Install the holder [2] with its punch mark [3] facing up.

Align the mating surface of the bracket with the punch mark on the handlebar.

Tighten the upper screw [4] first, then the lower screw [5].

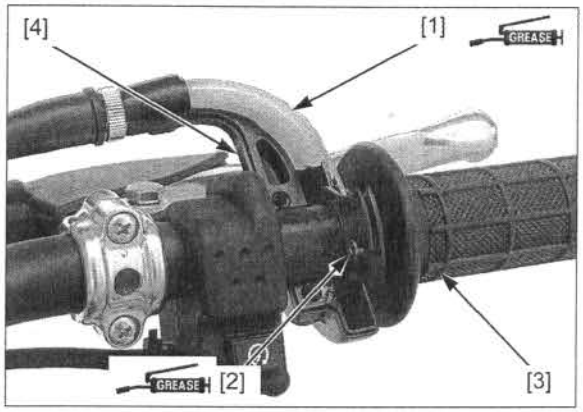


Apply grease to the throttle cable slider [1] sliding surface and throttle cable end [2].

Install the throttle pipe [3] on the handlebar.

Set the throttle housing [4] onto the handlebar and connect the throttle cable to the throttle pipe.

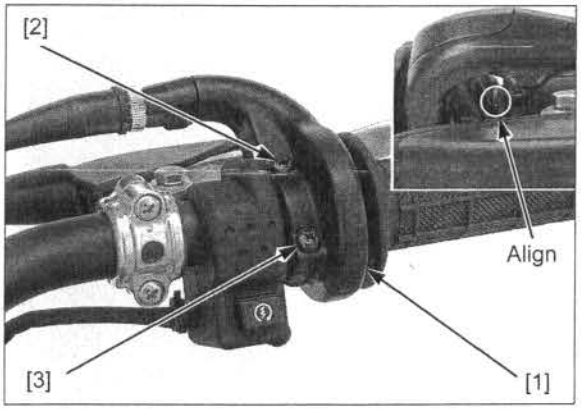
Install the throttle cable slider.



Install the throttle housing cover [1].

Align the mating surface of the throttle housing with the punch mark on the handlebar.

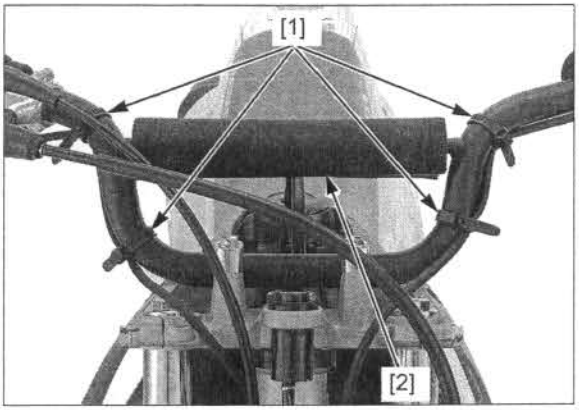
Tighten the upper screw [2] first, then the lower screw [3].



Secure the handlebar switch wires with the wire bands [1].

Install the handlebar pad [2].

Install the number plate (page 2-5).

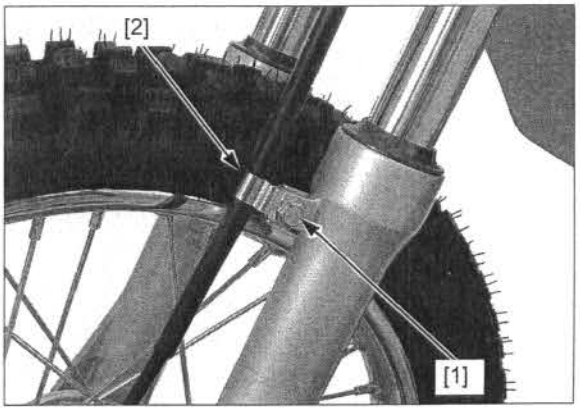


FRONT WHEEL

REMOVAL

Support the motorcycle securely using a safety stand or a hoist and raise the front wheel off the ground.

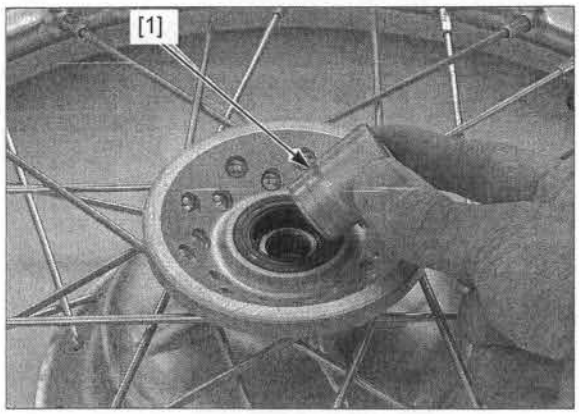
Remove the bolt [1] and front brake cable guide [2] from the left fork slider.



Remove the front axle nut [1], axle [2] and front wheel.

Remove the brake panel [3] from the front wheel.

Remove the side collar [1] from the right wheel hub.

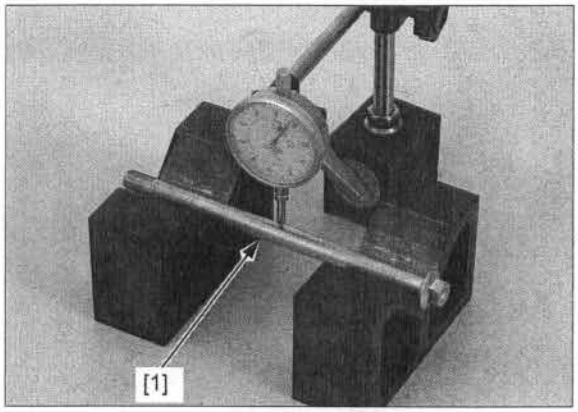


INSPECTION

Axle runout

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

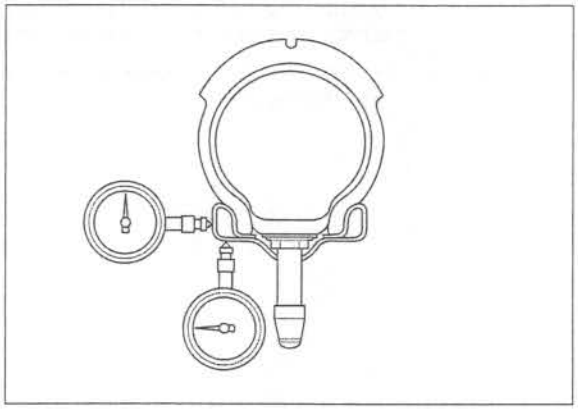
SERVICE LIMIT: 0.20 mm (0.008 in)



Wheel rim

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

SERVICE LIMITS:
Radial: 1.0 mm (0.04 in)
Axial: 1.0 mm (0.04 in)



Wheel bearing

Turn the inner race of each bearing with your finger.

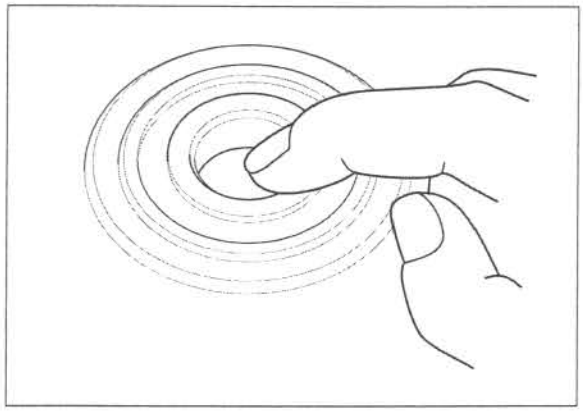
Also check that the bearing outer race fits tightly in the hub.

The bearings should turn smoothly and quietly.

Replace the bearings in pairs.

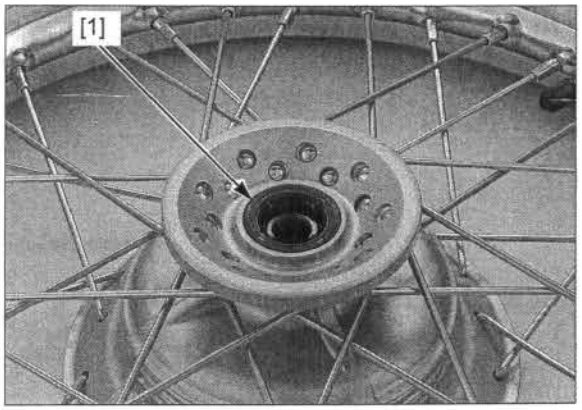
Remove and discard the bearings if they do not turn smoothly, quietly, or if they fit loosely in the hub.

Install the new bearings into the hub using the special tools (page 14-12).



DISASSEMBLY

Remove the dust seal [1] from the right wheel hub.



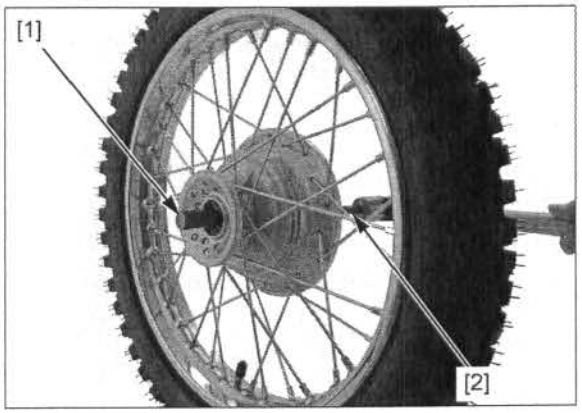
Install the bearing remover head [1] into the bearing.

From the opposite side, install the bearing remover shaft [2] and drive the bearing out of the wheel hub.

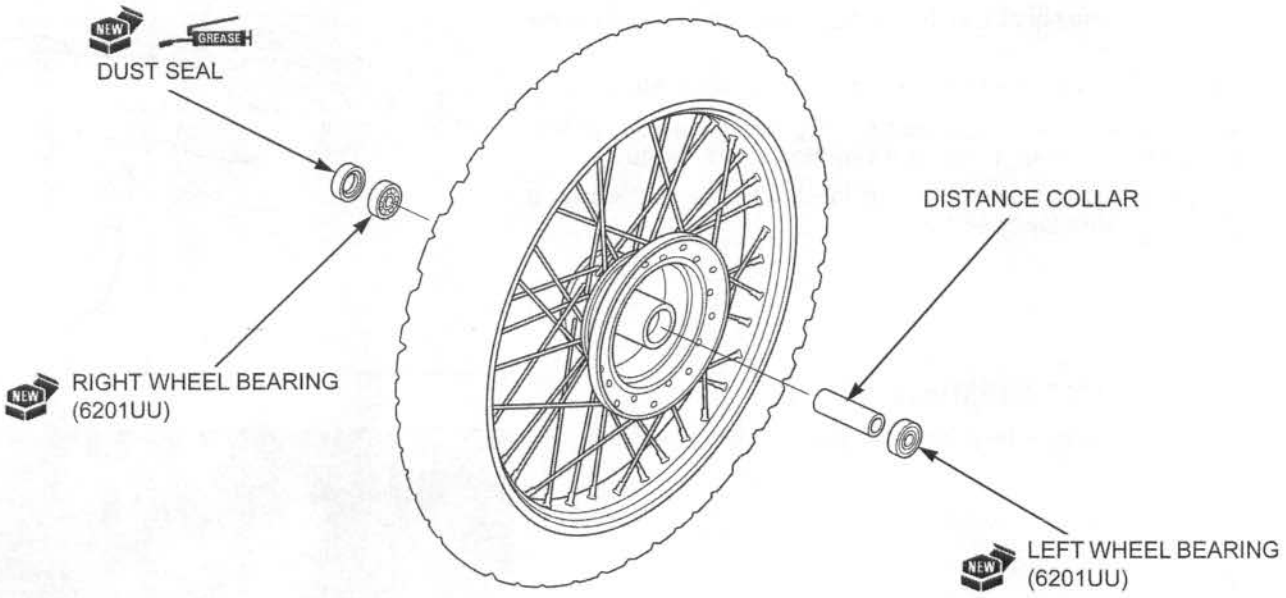
Remove the distance collar and drive out the other bearing.

TOOLS:

[1] Bearing remover head, 12 mm	**07746-0050300**
[2] Bearing remover shaft	**07746-0050100**



ASSEMBLY

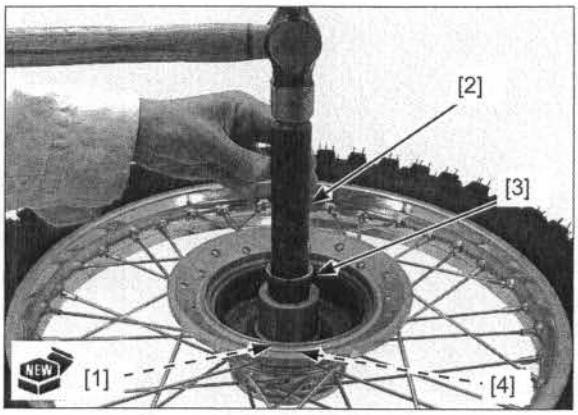


Replace the wheel bearings in pairs. Do not reuse old bearings.

Drive in a new left (brake panel side) wheel bearing [1] until it is fully seated.
Install the distance collar, then drive in the right wheel bearing until it is seated on the distance collar.

TOOLS:

[2] Driver	**07749-0010000**
[3] Attachment, 32 x 35 mm	**07746-0010100**
[4] Pilot, 12 mm	**07746-0040200**



Wheel center adjustment

Wheel center adjustment is necessary when new spokes are installed.

Place the rim on the work bench and begin lacing with new spokes.
Tighten the spokes in 2 or 3 progressive steps to the specified torque.

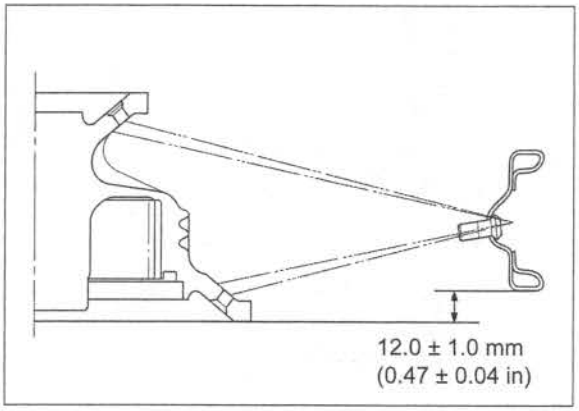
TOOL:

Spoke wrench, 4.5 x 5.1 mm 07701-0020200

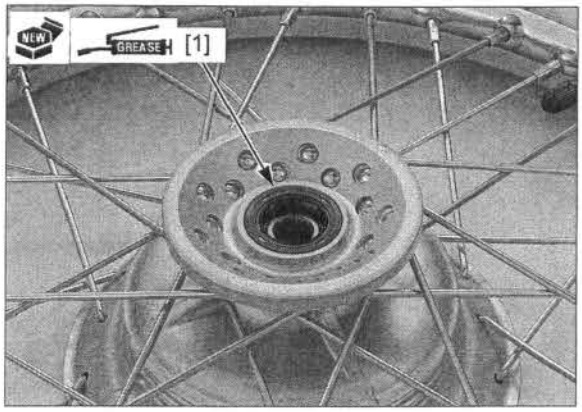
TORQUE: 3.2 N·m (0.33 kgf·m, 2.4 lbf·ft)

Adjust the hub position so that the distance from the right end surface of the hub center to the side of rim is 12.0 ± 1.0 mm (0.47 ± 0.04 in) as shown.

Recheck the rim runout (page 14-10).

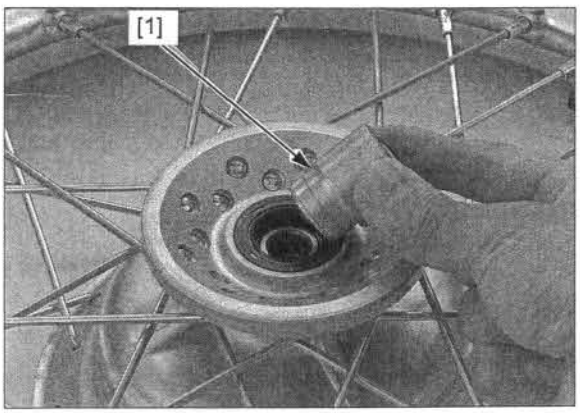


Apply grease to a new dust seal [1] lips, and install the dust seal into the right wheel hub.



INSTALLATION

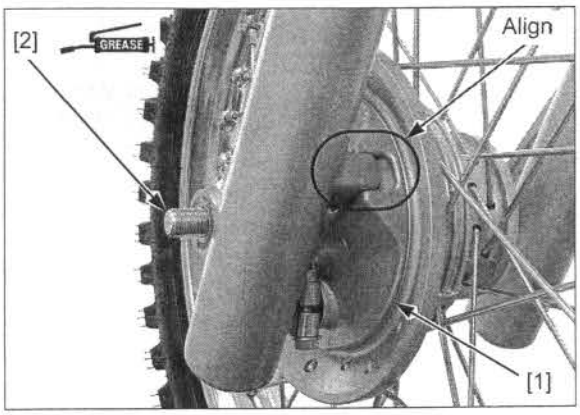
Install the side collar [1] into the right wheel hub.



Install the brake panel [1] into the front wheel.

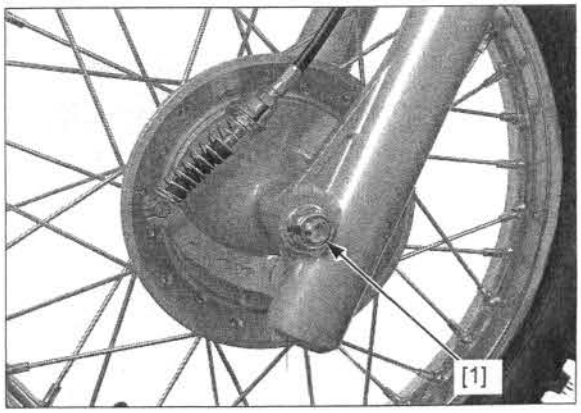
Install the front wheel between the fork legs while aligning the brake panel groove with the boss on the left fork slider.

Apply a thin coat of grease to the front axle [2] surface, then install the front axle from right side.



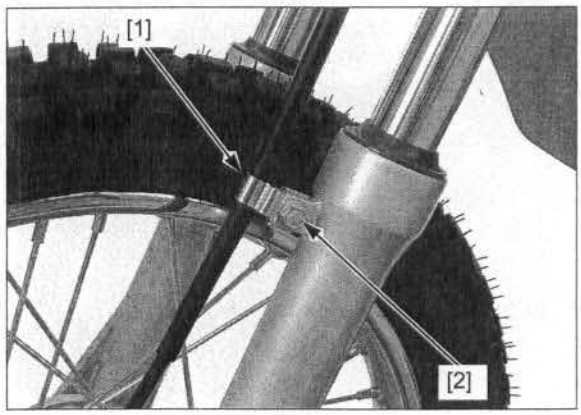
Install and tighten the axle nut [1] to the specified torque.

TORQUE: 59 N·m (6.0 kgf·m, 44 lbf·ft)



Install the brake cable guide [1] to the left fork slider and tighten the bolt [2] securely.

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



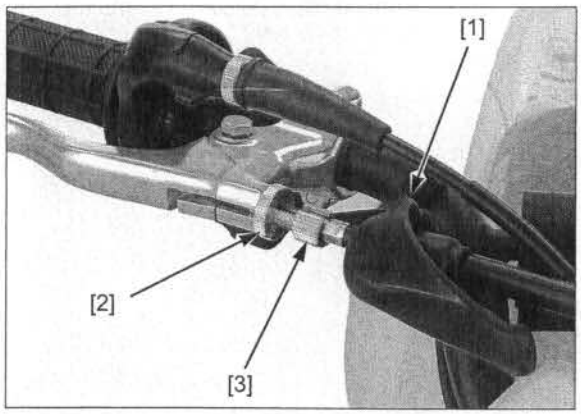
FRONT BRAKE

REMOVAL

Remove the front wheel (page 14-9).

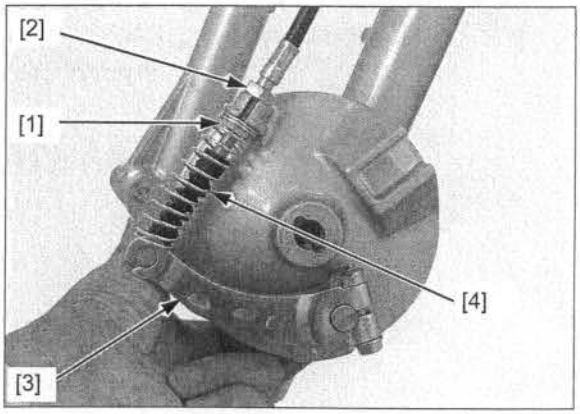
Pull the dust cover [1] off.

Loosen the lever side lock nut [2] and adjuster [3], then disconnect the brake cable from the front brake lever.



Loosen the brake panel side lock nut [1] and adjusting nut [2].

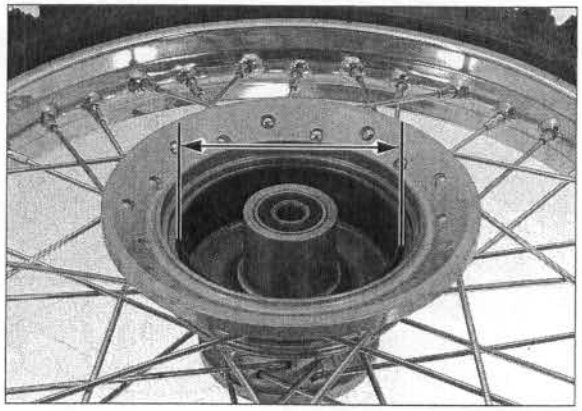
Disconnect the brake cable from the brake arm [3] and brake panel, then remove the spring [4].



INSPECTION

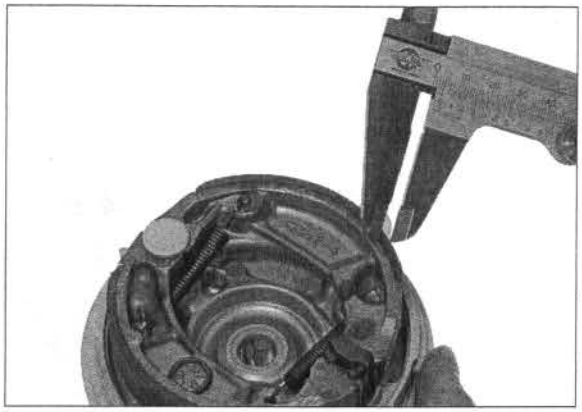
Measure the front brake drum I.D.

SERVICE LIMIT: 96.0 mm (3.78 in)



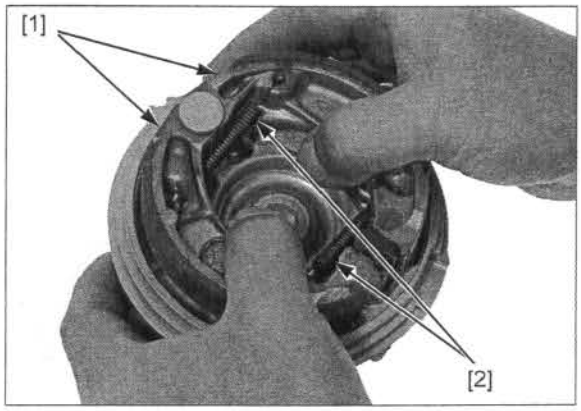
Measure the brake lining thickness.

SERVICE LIMIT: 2.0 mm (0.08 in)

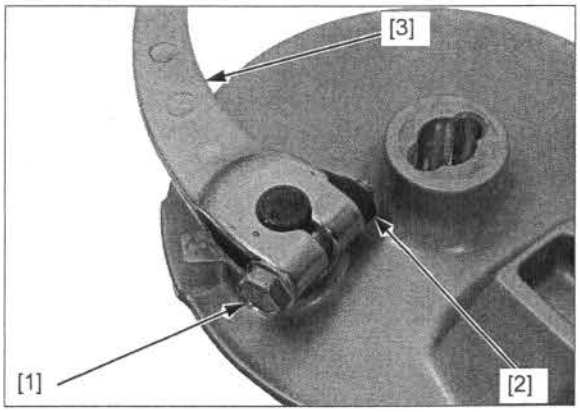


DISASSEMBLY

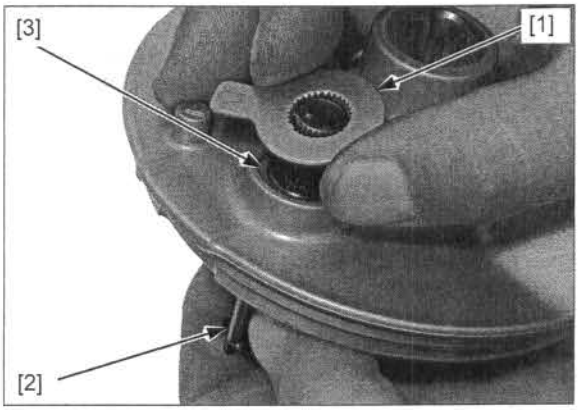
Remove the brake shoes [1] and springs [2].



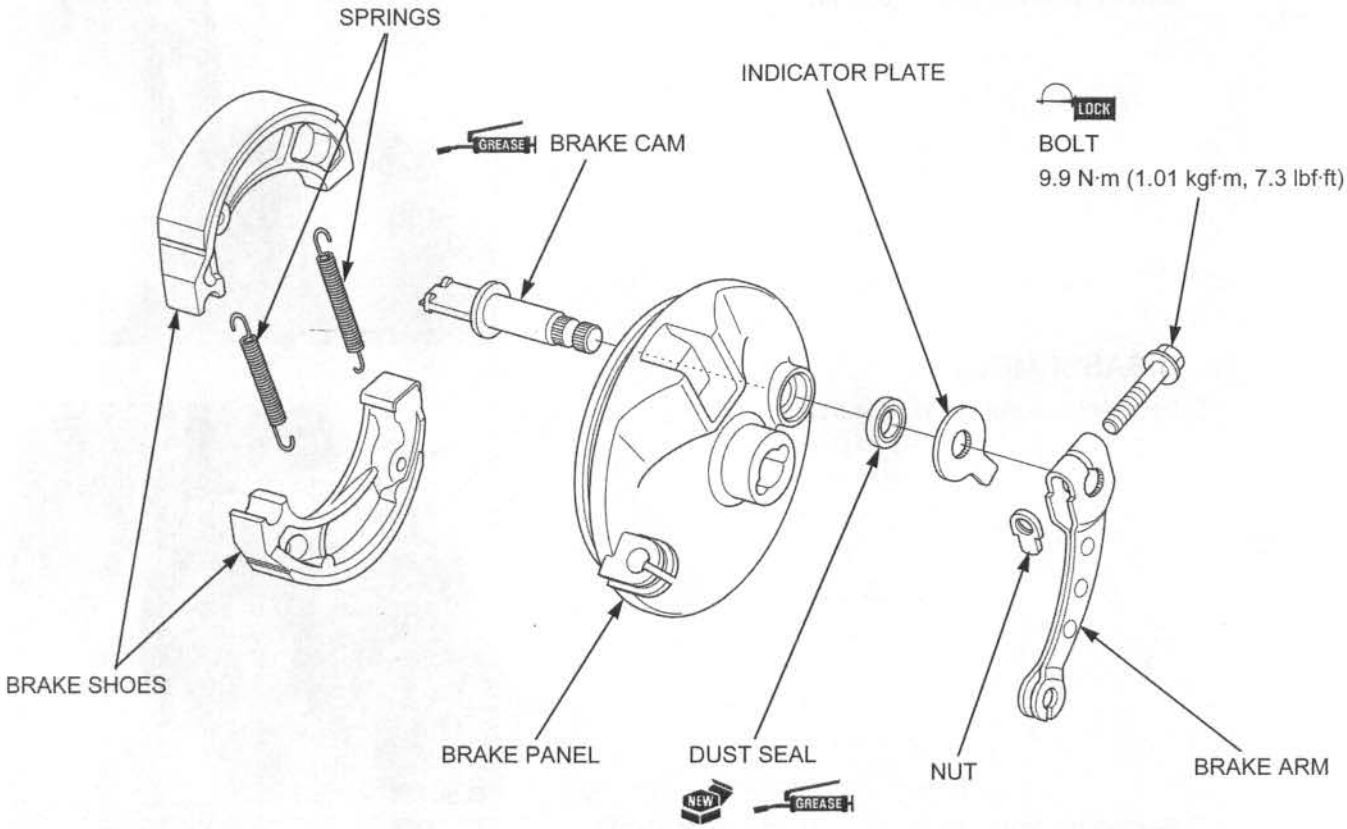
Remove the brake arm pinch bolt [1], nut [2] and brake arm [3].



Remove the indicator plate [1], brake cam [2] and dust seal [3].



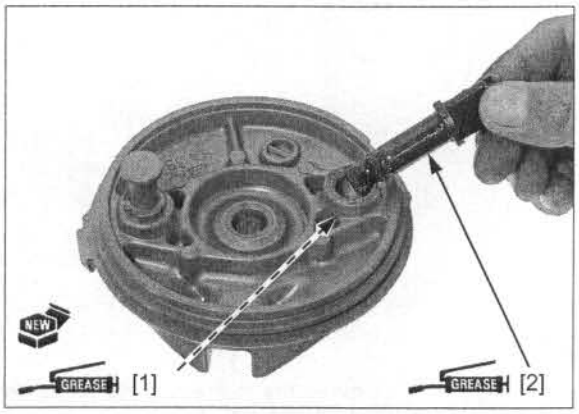
ASSEMBLY



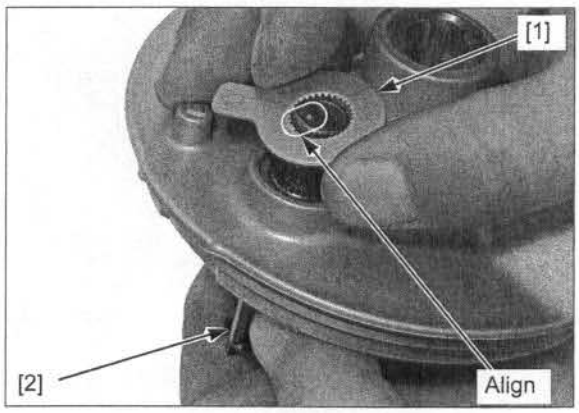
Apply grease to the dust seal [1] and install it onto the brake panel.

Apply 0.03 - 0.08 g of grease to the brake cam [2] sliding surface.

Install the brake cam into the brake panel.



Install the wear indicator plate [1] on the brake cam [2] by aligning its wide tooth with the wide groove on the brake cam.



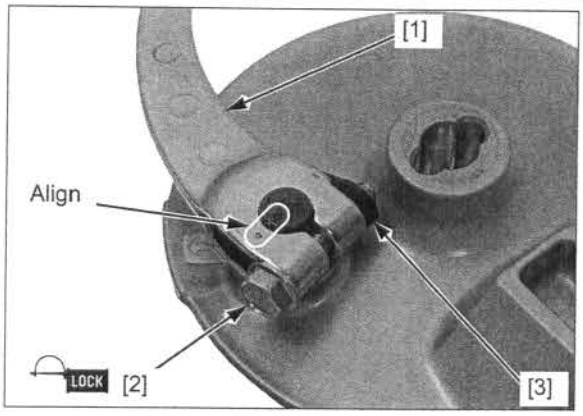
Install the brake arm [1] by aligning the punch marks of the arm and brake cam.

Apply a locking agent to the brake arm pinch bolt [2] threads.

Install the brake arm pinch bolt and brake arm nut [3].

Tighten the bolt to the specified torque.

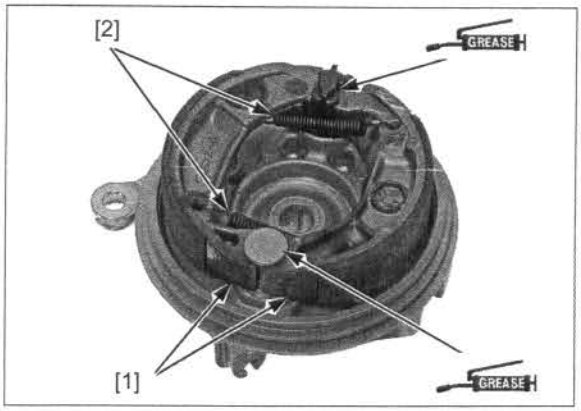
TORQUE: 9.9 N·m (1.01 kgf·m, 7.3 lbf·ft)



Apply 0.1 - 0.2 g of grease to the brake cam brake shoe contact area and anchor pin.

Assemble the brake shoes [1] and springs [2] in the direction as shown.
Install the shoe assembly onto the brake panel.

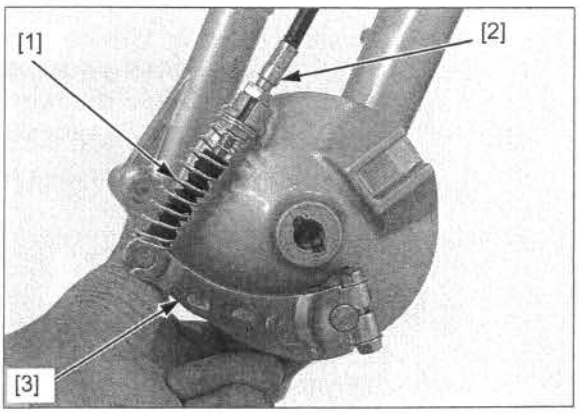
Wipe any excess grease from the brake cam and anchor pin.



INSTALLATION

Set the spring [1] to the brake cable [2].

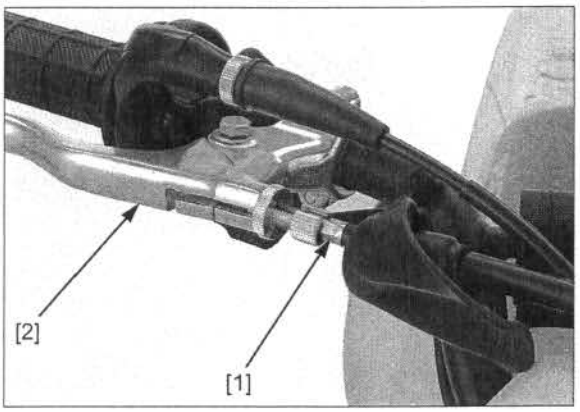
Connect the brake cable to the brake arm [3] and brake panel.



Connect the brake cable [1] to the front brake lever [2].

Install the front wheel (page 14-13).

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



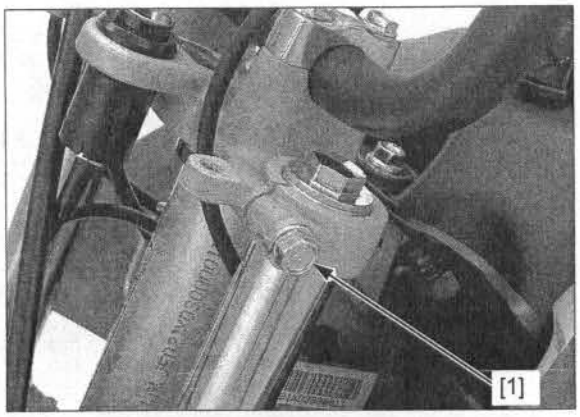
FORK

REMOVAL

Remove the following:

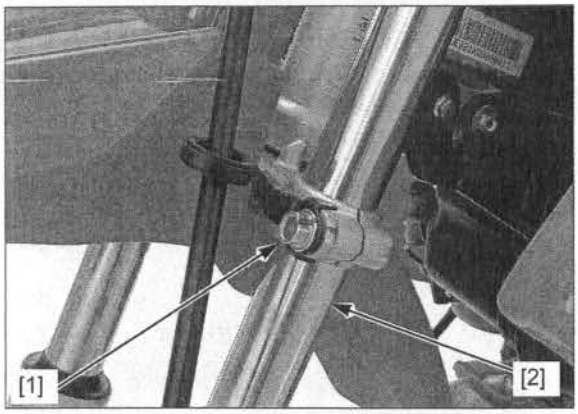
- Number plate (page 2-5)
- Front wheel (page 14-9)

Loosen the fork top bridge pinch bolt [1].



Loosen the fork bottom bridge pinch bolt [1].

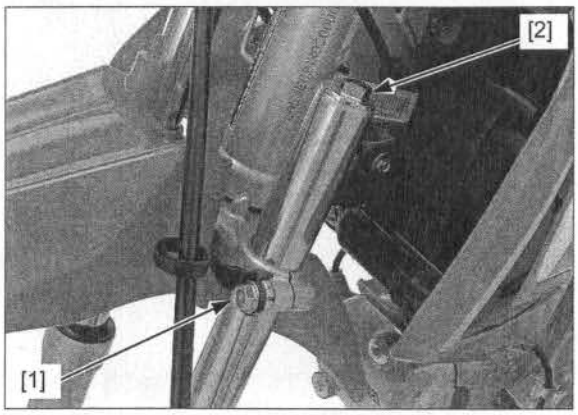
Remove the fork leg [2].



When the fork is to be disassembled, lower the fork leg and tighten the bottom pinch bolt [1].

Loosen the fork cap bolt [2], but do not remove it yet.

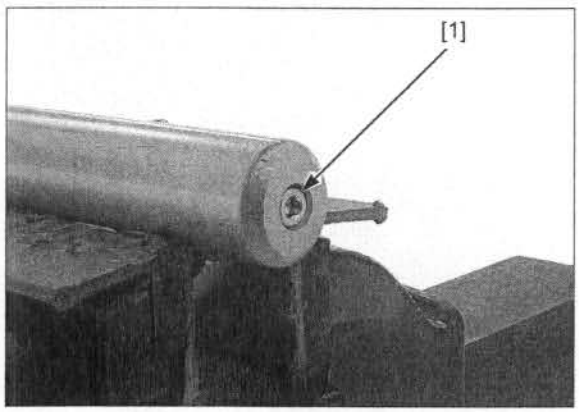
Loosen the fork bottom pinch bolt and remove the fork leg.



DISASSEMBLY

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

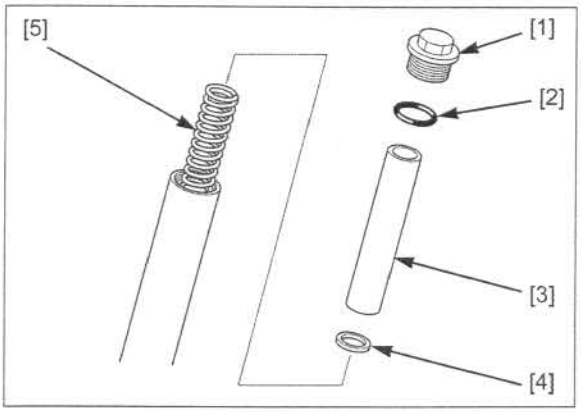
Loosen the fork socket bolt [1], but do not remove it yet.



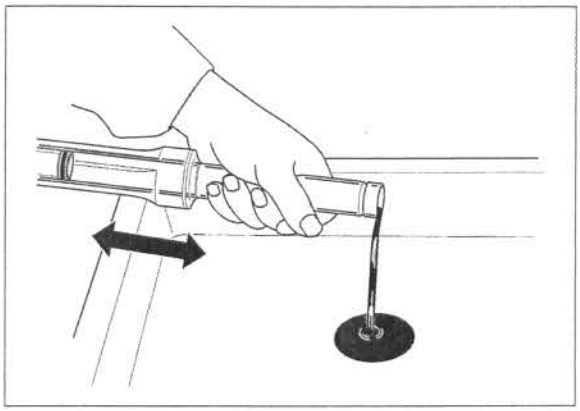
Remove the following:

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

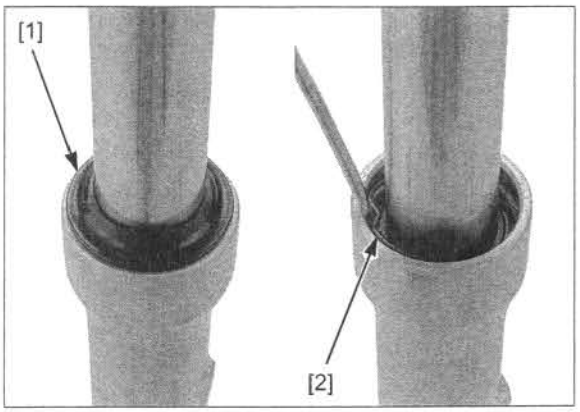
- Fork cap bolt [1]
- O-ring [2]
- Collar [3]
- Spring seat [4]
- Fork spring [5]



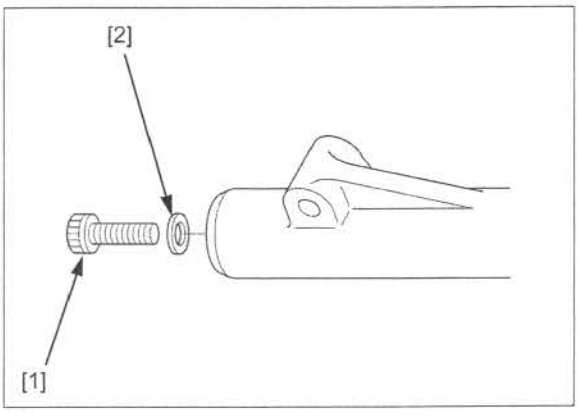
Pour out the fork fluid by pumping the fork pipe up and down several times.



Remove the dust seal [1] and stopper ring [2] from the fork slider.

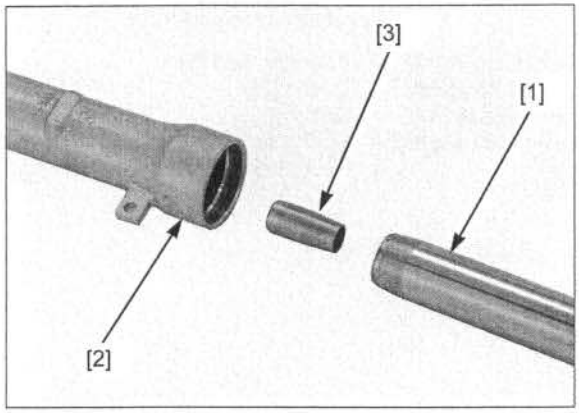


Remove the socket bolt [1] and sealing washer [2].

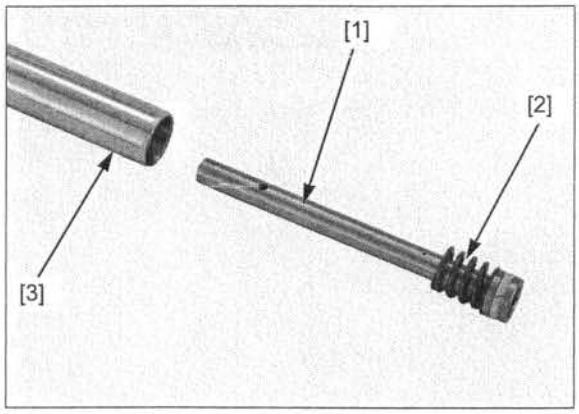


Pull the fork pipe [1] out from the fork slider [2].

Remove the oil lock piece [3].



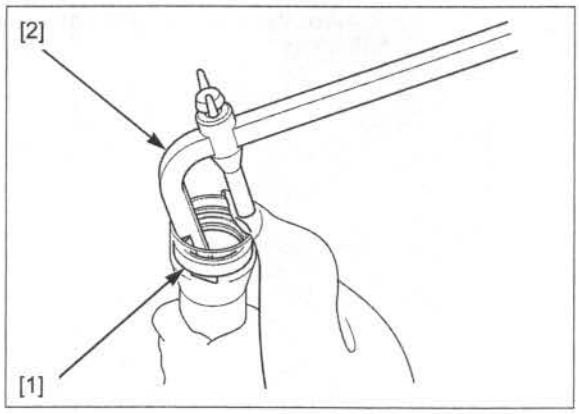
Remove the fork piston [1] and rebound spring [2] from the fork pipe [3].



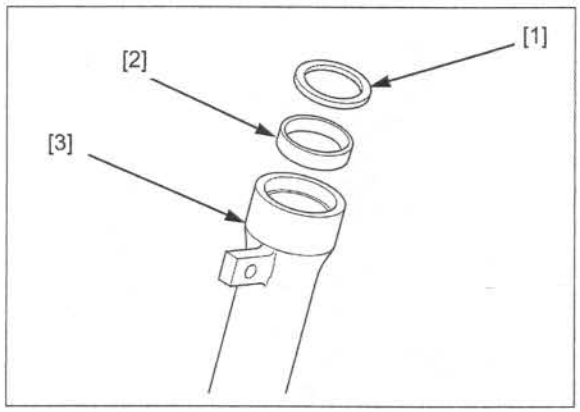
Remove the fork oil seal [1] from the fork slider.

TOOL:

[2] Oil seal remover **07748-0010001 or equivalent commercially available in U.S.A.**



Remove the back-up ring [1] and guide bushing [2] from the fork slider [3].

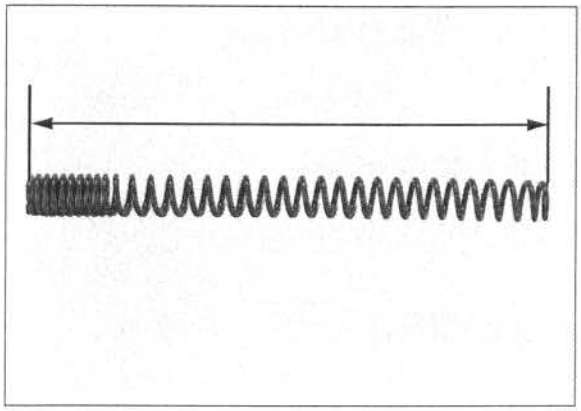


INSPECTION

Fork spring

Measure the fork spring free length.

SERVICE LIMIT: 272 mm (10.71 in)



Fork pipe/fork slider/piston

Check the fork pipe [1] and fork slider [2] for score marks and excessive or abnormal wear.

Replace the components if necessary.

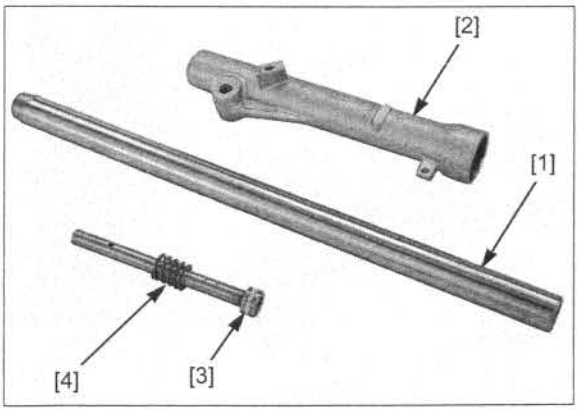
Place the fork pipe in V-blocks and measure the runout. Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.20 mm (0.008 in)

Do not remove the fork piston ring except to replace it with a new one.

Check the fork piston ring [3] for wear or damage.
Check the rebound spring [4] for fatigue or damage.

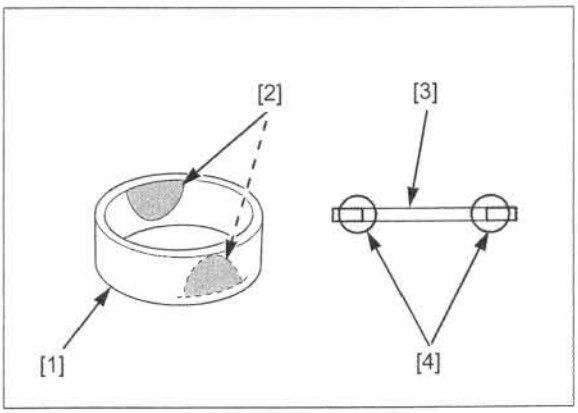
Replace the components if necessary.



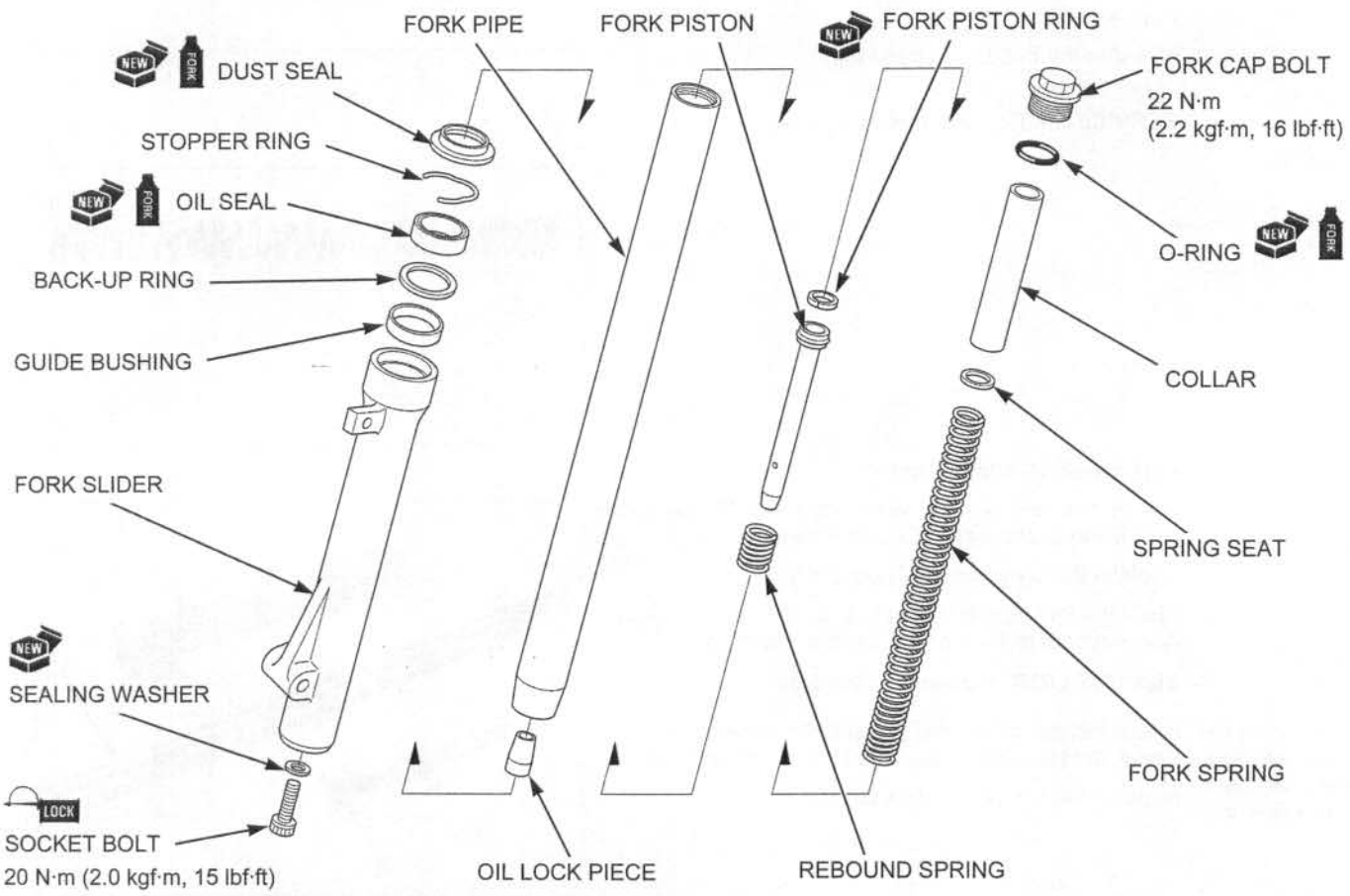
Fork pipe bushing/back-up ring

Visually inspect the guide bushing [1].
Replace the guide bushing if there is excessive scoring or scratching, or if the teflon is worn so that the copper surface [2] appears on more than 3/4 of the entire surface.

Check the back-up ring [3], replace it if there is any distortion at the points [4] indicated by arrows on the figure.

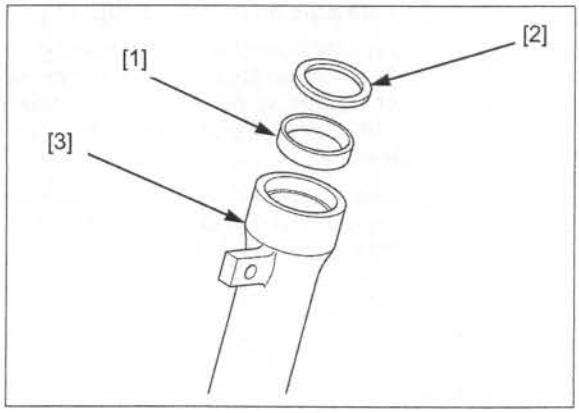


ASSEMBLY



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

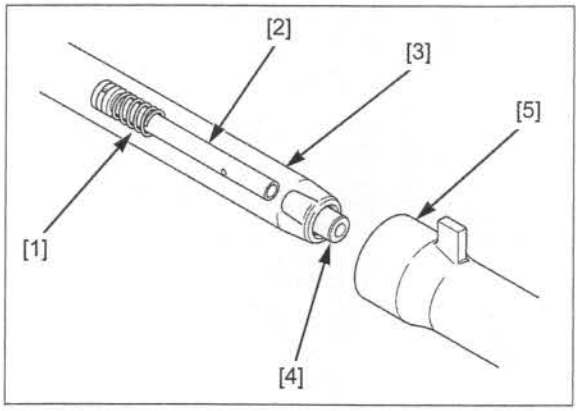
Install the guide bushing [1] and back-up ring [2] into the fork slider [3].



Install the rebound spring [1] and fork piston [2] into the fork pipe [3].

Install the oil lock piece [4] to the end of the fork piston.

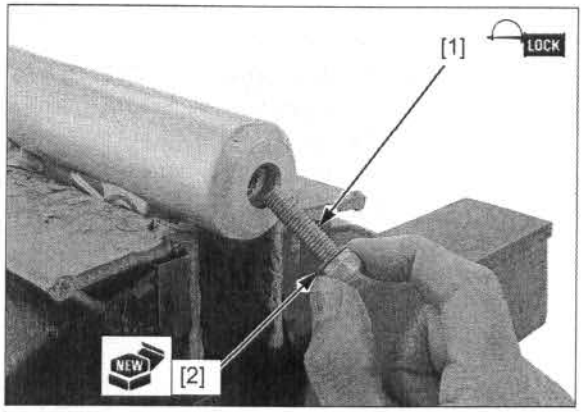
Install the fork pipe into the fork slider [5].



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

Apply a locking agent to the fork socket bolt [1] threads.

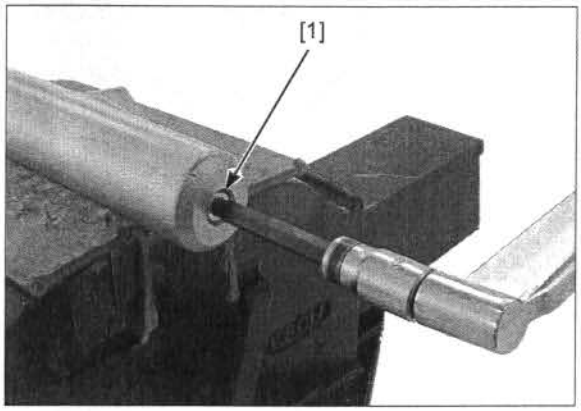
Install the socket bolt with a new sealing washer [2] into the fork piston.



If the fork piston turns together with the socket bolt, temporarily install the fork spring, spring seat, collar and fork cap bolt.

Tighten the socket bolt [1] to the specified torque.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)



Wrap vinyl tape around the fork top end to avoid damaging the fork oil seal lips.

Coat a new fork oil seal [1] lips with fork fluid and install it over the fork pipe with the marking side facing up.

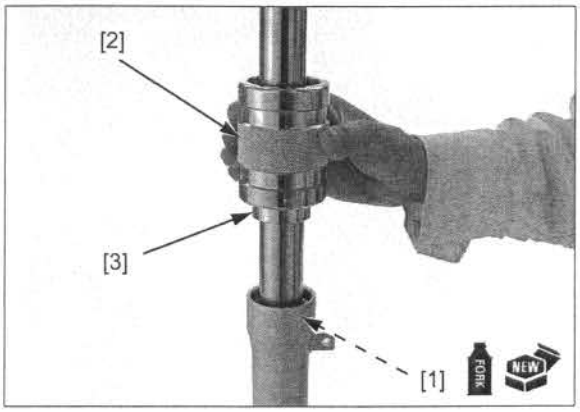
Drive the fork oil seal into the fork slider using the special tools.

TOOLS:

[2] Fork seal driver weight	**07747-0010100**
[3] Fork seal driver attachment, 31 mm	**07747-0010400**

U.S.A. TOOLS:

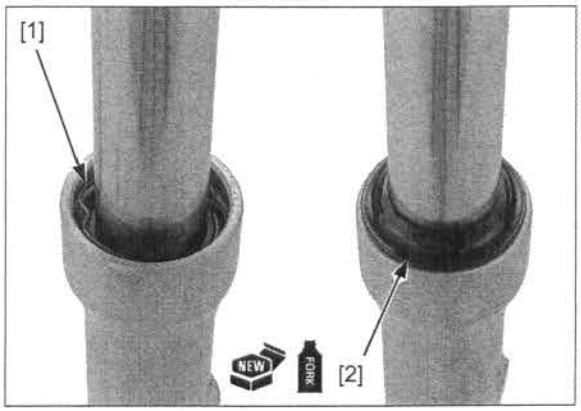
Driver weight	**07947-KA50100**
Fork seal driver attachment, 31 mm	**07AMD-GFMA100**



Install the oil seal stopper ring [1] into the fork slider groove securely.

Apply fork fluid to a new dust seal [2] lips and install it to the fork slider.

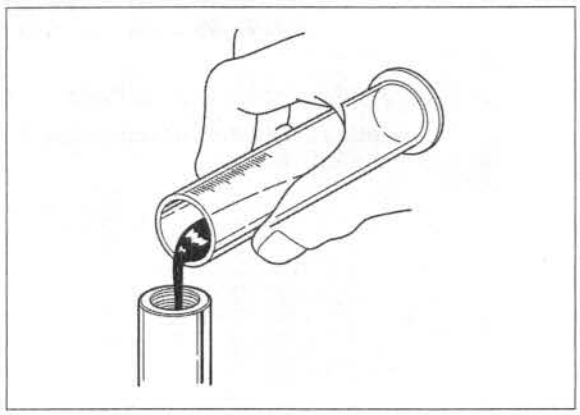
Remove the vinyl tape from the fork pipe end.



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

RECOMMENDED FORK FLUID:
Pro Honda Suspension Fluid SS-8 (10W)
FORK FLUID CAPACITY:
179 ± 2.5 cm³ (6.1 ± 0.08 US oz, 6.3 ± 0.09 Imp oz)

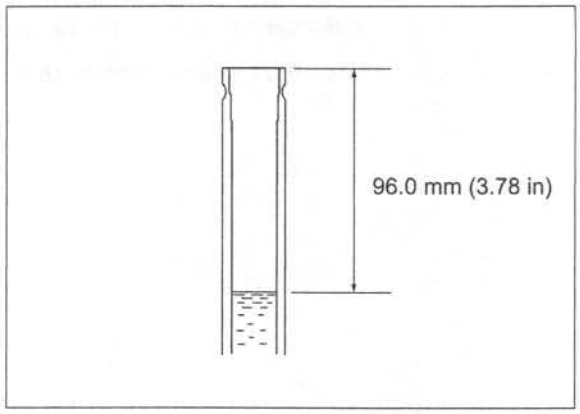
Slowly pump the fork pipe several times to remove trapped air from the lower portion of the fork pipe.



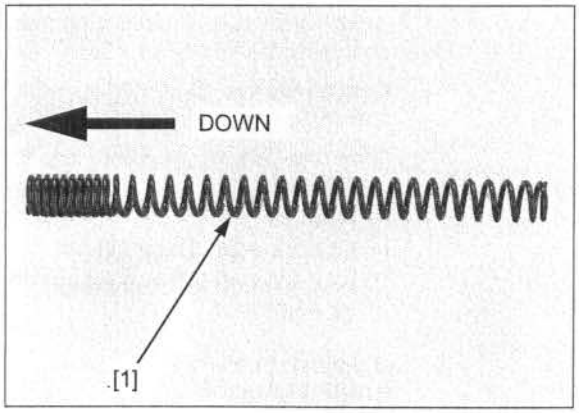
Be sure the oil level is the same in both fork pipes.

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

FORK FLUID LEVEL: 96.0 mm (3.78 in)



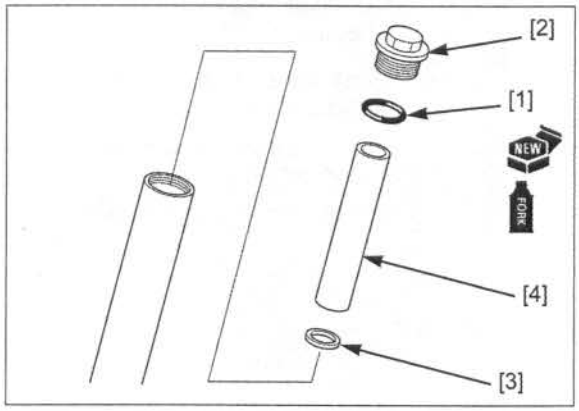
Pull the fork pipe up and install the fork spring [1] with the tightly wound coil end facing down.



Coat a new O-ring [1] with fork fluid and install it into the fork cap bolt [2] groove.

Install the following.

- Spring seat [3]
- Collar [4]
- Fork cap bolt

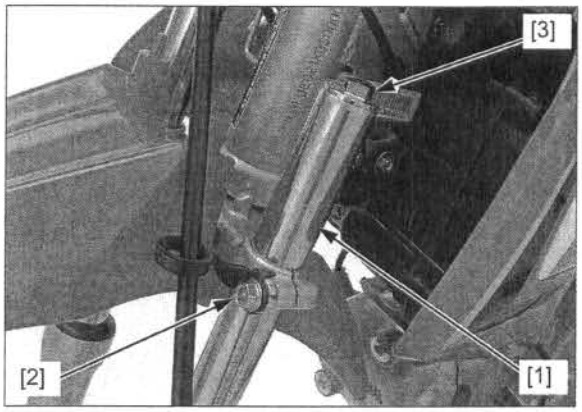


INSTALLATION

Install the fork pipe [1] into the steering stem.

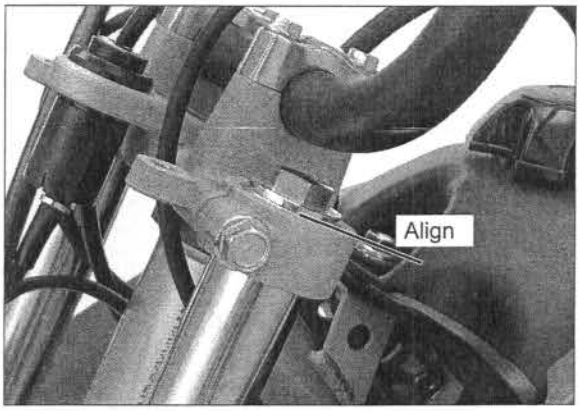
If the fork has been reassembled, temporarily tighten the bottom bridge pinch bolt [2] and tighten the fork cap bolt [3] to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)



Loosen the bottom bridge pinch bolts and pull up the fork pipe to the top bridge.

Align the top end of the fork pipe with the upper surface of the top bridge as shown.



Tighten the bottom bridge pinch bolt [1] to the specified torque.

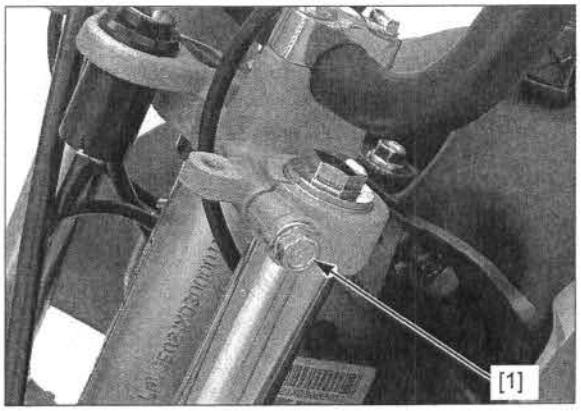
TORQUE: 32 N·m (3.3 kgf·m, 24 lbf·ft)

Tighten the top bridge pinch bolt to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Install the following:

- Front wheel (page 14-13)
- Number plate (page 2-5)



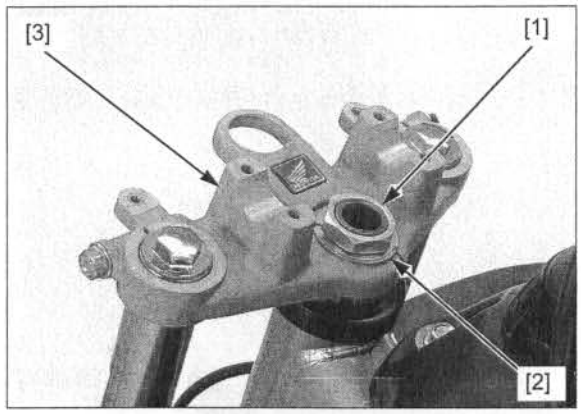
STEERING STEM

REMOVAL

Remove the following:

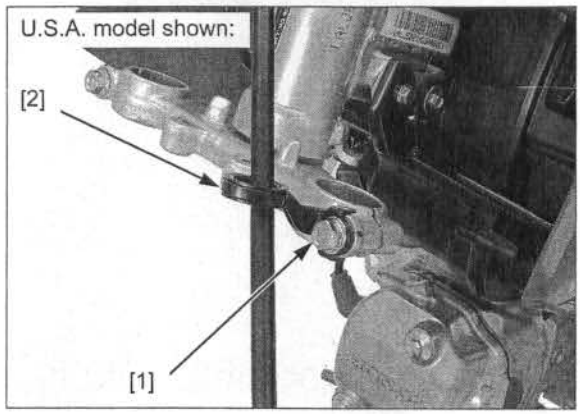
- Handlebar (page 14-6)
- Front wheel (page 14-9)
- Front fender (page 2-5)
- Ignition switch (page 4-9)

Loosen the steering stem lock nut [1], then remove the fork legs (page 14-18), steering stem lock nut, washer [2] and top bridge [3].



U.S.A.: Remove the left bottom bridge pinch bolt [1] and cable guide [2].

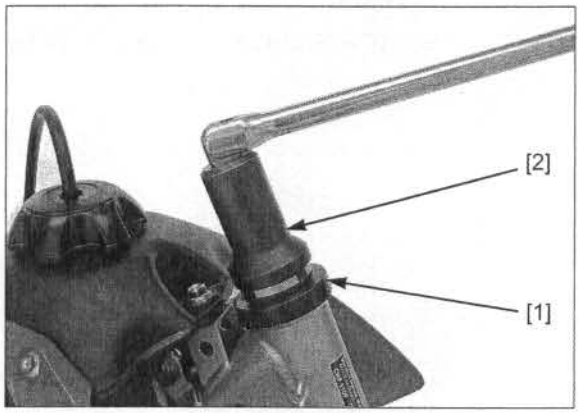
Canada: Remove the front reflectors (page 2-6).



Remove the steering stem top thread [1] using the special tool.

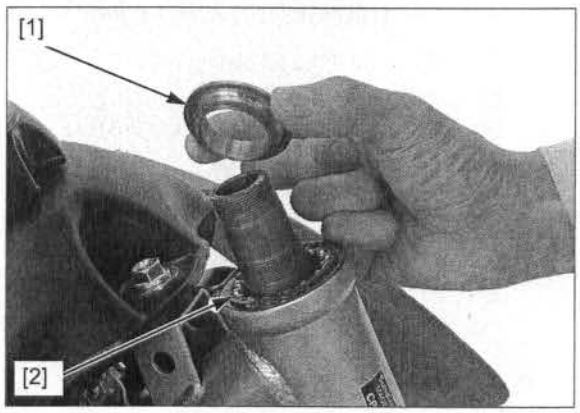
TOOL:

[2] Lock nut wrench	**07916-3710101 or 07916-3710100 (U.S.A. only)**

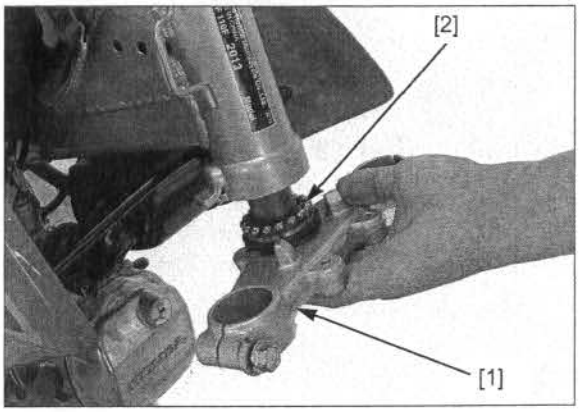


Hold the bottom of steering stem to prevent it from falling out of the steering head, then remove the adjustment nut.

Remove the upper bearing inner race [1] and upper bearing [2].



Remove the steering stem [1] and lower bearing [2].



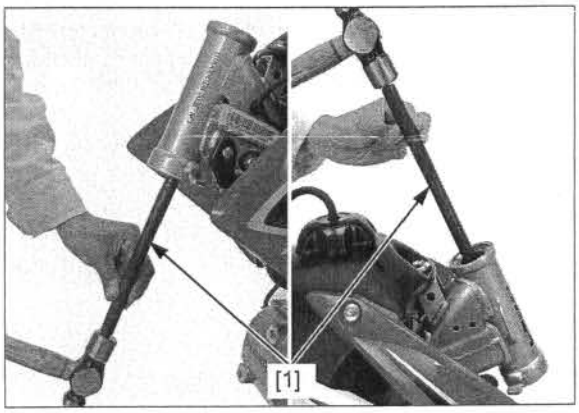
BEARING RACE REPLACEMENT

Always replace the bearings and races as a set.

Remove the upper and lower bearing outer races using the special tool.

TOOL:

[1] Ball race remover	**07GMD-KS40100**

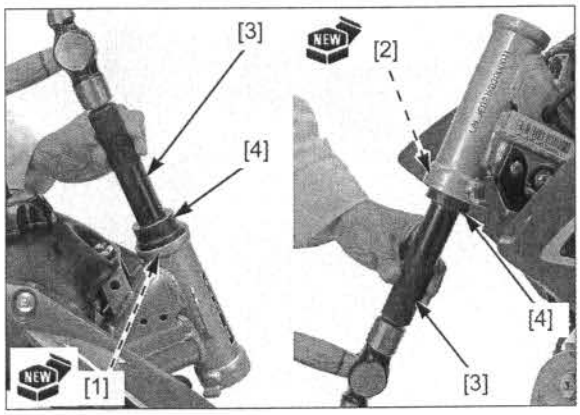


If the motorcycle has been involved in an accident, examine the area around the steering head for cracks.

Install the new upper bearing outer race [1] and lower bearing outer race [2] using the special tool.

TOOLS:

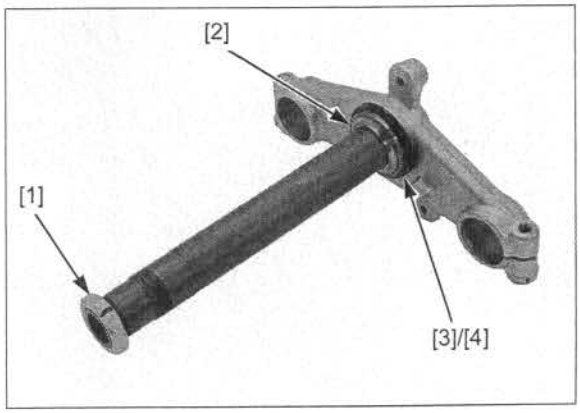
[3] Driver	**07749-0010000**
[4] Attachment, 42 x 47 mm	**07746-0010300**



Temporarily install the steering stem lock nut [1] onto the stem to prevent the threads from being damaged when removing the lower bearing inner race [2] 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 [3] and washer [4].



Install the washer [1] over the steering stem.

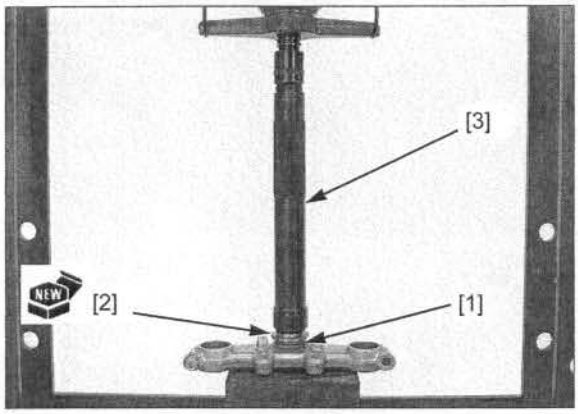
Install a new lower bearing inner race [2] using a special tool and a hydraulic press.

TOOL:

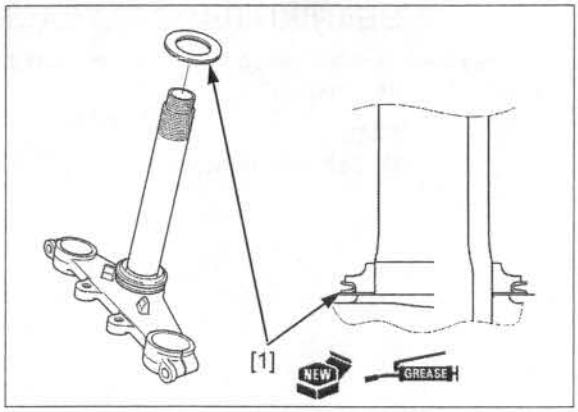
[3] Steering stem driver, 28 mm	**07946-4300101**

U.S.A. TOOLS:

Steering stem driver	**07946-MB00000**
Steering stem driver attachment	**07946-KA6000D**



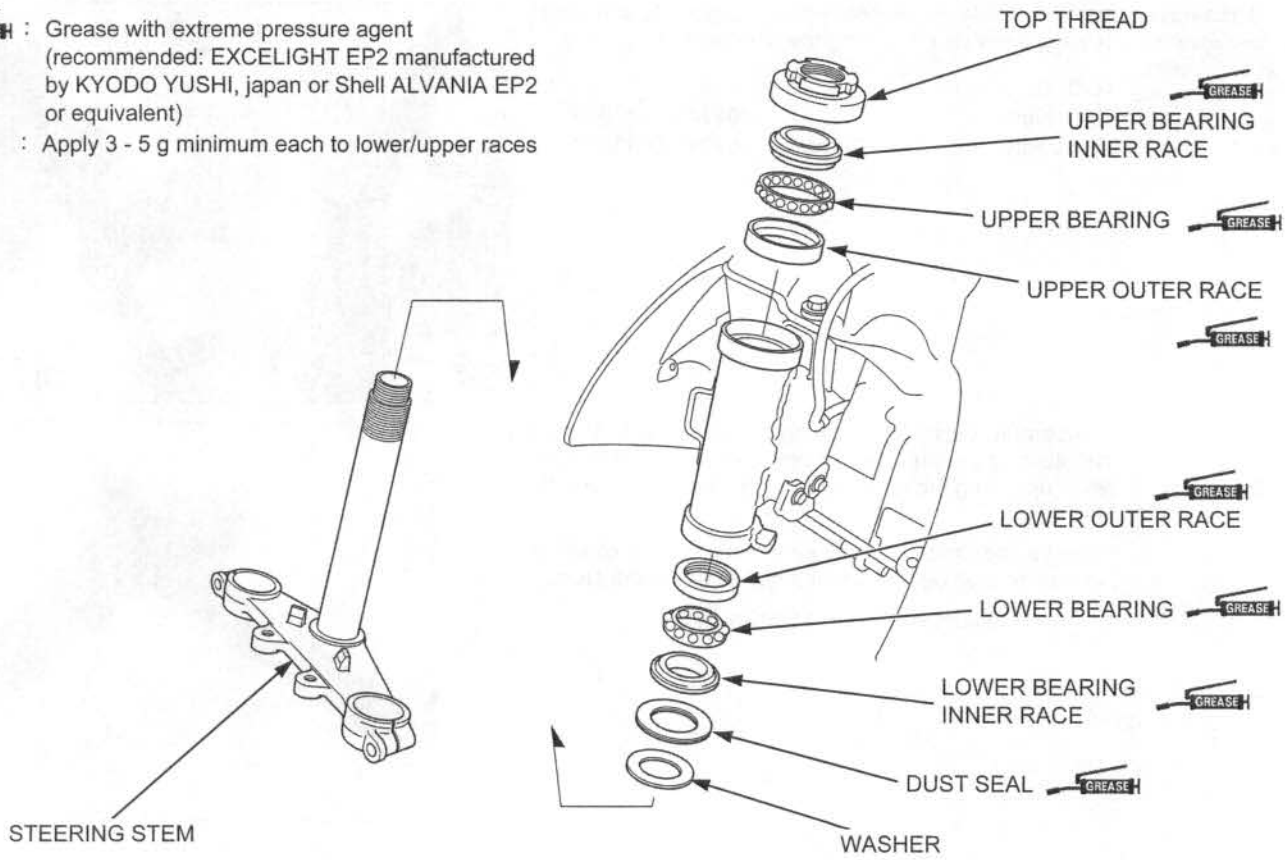
Apply grease with extreme pressure agent (recommended: EXCELIGHT EP2 manufactured by KYODO YUSHI, Japan or Shell ALVANIA EP2 or equivalent) to the lip of a new dust seal [1], then install it to the lower bearing inner race.



INSTALLATION

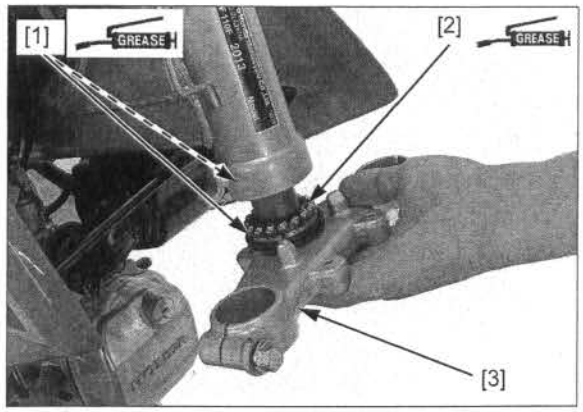
GREASE : Grease with extreme pressure agent (recommended: EXCELIGHT EP2 manufactured by KYODO YUSHI, japan or Shell ALVANIA EP2 or equivalent)

: Apply 3 - 5 g minimum each to lower/upper races

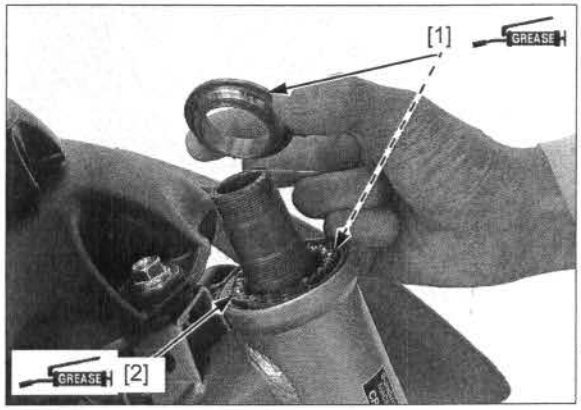


Apply grease to the lower races [1] and lower bearing [2], then insert the lower bearing into the steering stem [3].

Insert the steering stem into the steering head pipe.



Apply grease to the upper races [1] and upper bearing [2], then install the upper bearing and upper bearing inner race.

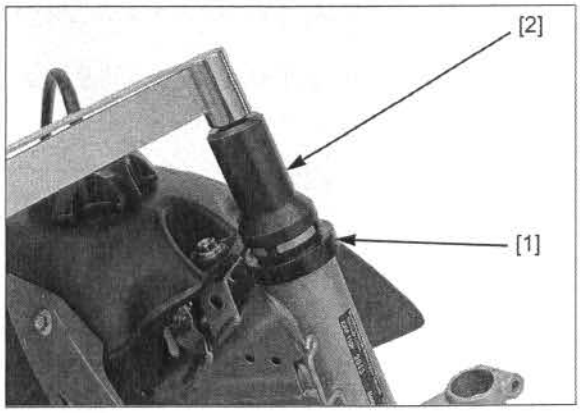


Hold the steering stem and tighten the top thread [1] to the initial torque using the special tool.

TOOL:

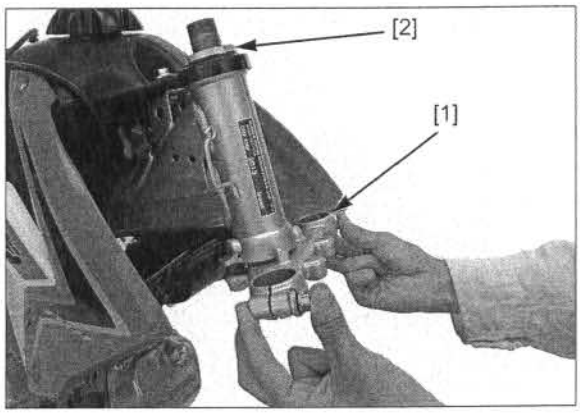
[2] Lock nut wrench	**07916-3710101 or 07916-3710100 (U.S.A. only)**

TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)



Move the steering stem [1] to the right and left, lock-to-lock, five times to seat the bearings.

Completely loosen the top thread [2].

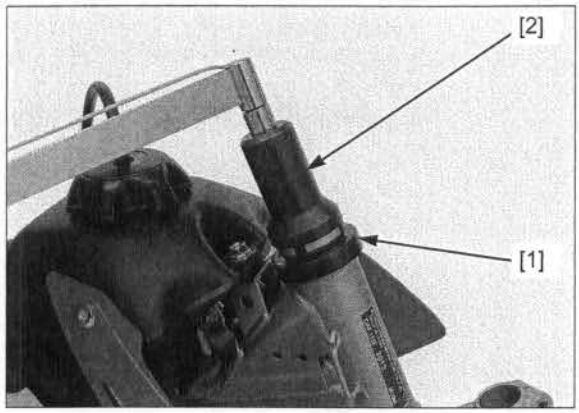


Retighten the top thread [1] to the specified torque.

TOOL:

[2] Lock nut wrench	**07916-3710101 or 07916-3710100 (U.S.A. only)**

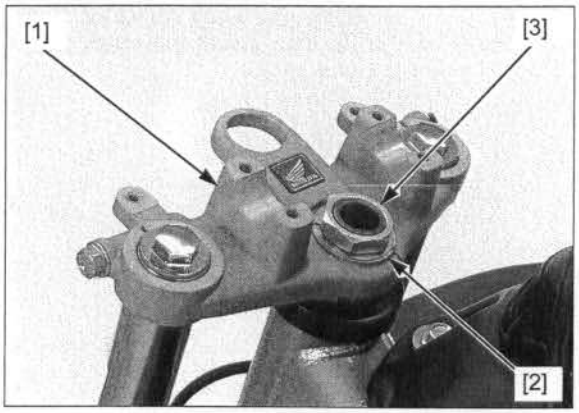
TORQUE: 2.5 N·m (0.25 kgf·m, 1.8 lbf·ft)



Install the top bridge [1] to the steering head and temporarily install the fork legs.
Install the washer [2] and stem lock nut [3].
Tighten the steering stem lock nut to the specified torque.

TORQUE: 74 N·m (7.5 kgf·m, 54 lbf·ft)

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

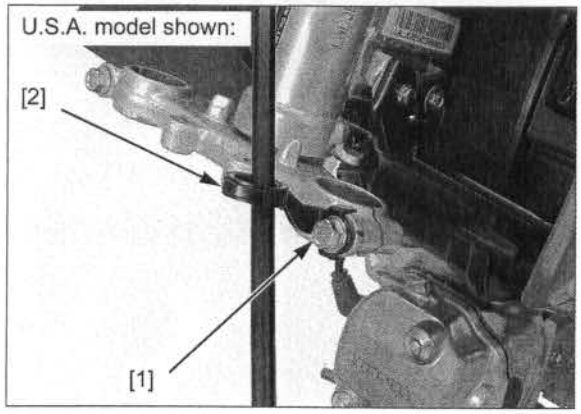


U.S.A.: Install the bottom bridge pinch bolt [1] and cable guide [2].

Canada: Install the front reflectors (page 2-6).

Install the following:

- Fork legs (page 14-25)
- Front fender (page 2-5)
- Front wheel (page 14-13)
- Ignition switch (page 4-9)
- Handlebar (page 14-7)



15. REAR WHEEL/BRAKE/SUSPENSION

COMPONENT LOCATION 15-2

SERVICE INFORMATION 15-3

TROUBLESHOOTING 15-5

REAR WHEEL 15-6

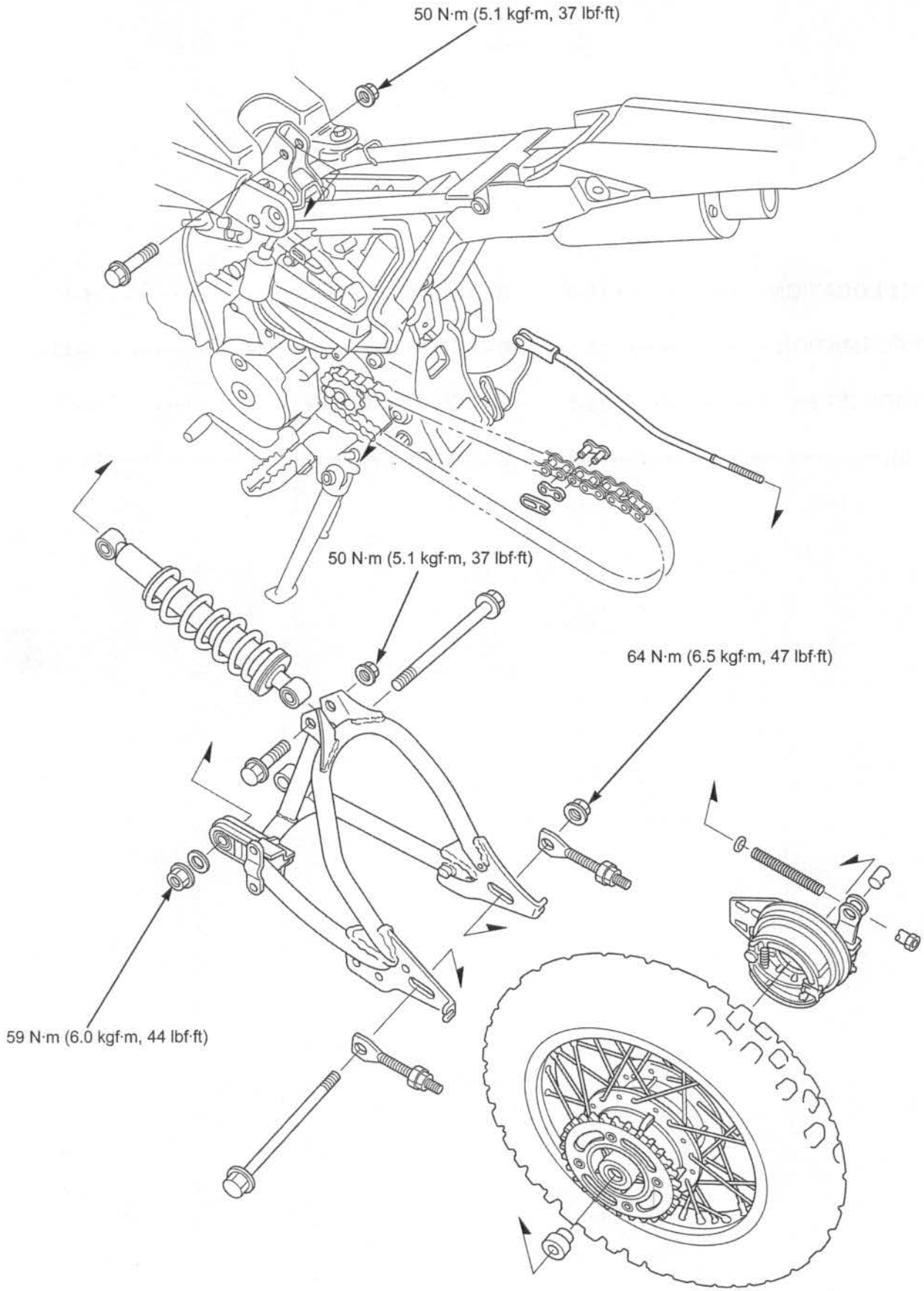
REAR BRAKE 15-10

BRAKE PEDAL 15-13

SHOCK ABSORBER 15-15

SWINGARM 15-16

COMPONENT LOCATION



SERVICE INFORMATION

GENERAL

⚠ CAUTION

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

- Riding on damaged rims impairs safe operation of the motorcycle.
- Raise the rear wheel off the ground by supporting the frame securely when servicing. A box or work stand is required to support the motorcycle.
- A contaminated brake drum or shoe reduces stopping power. Discard contaminated shoes and clean a contaminated drum with a high quality brake degreasing agent.
- Use only genuine Honda replacement bolts and nuts for all suspension linkage and swingarm pivot mounting points; ordinary bolts lack adequate strength for these application. Also take note of the installation direction of these bolts since they must be installed correctly.
- Refer to page 3-12 for drive chain information.

SPECIFICATIONS

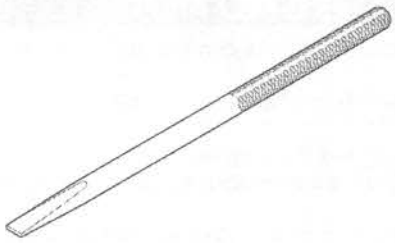
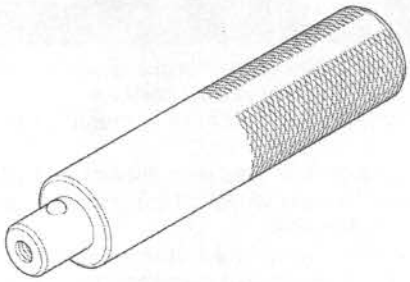
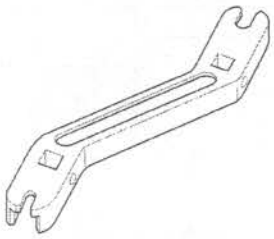
Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Rear wheel	Cold tire pressure		100 kPa (1.00 kgf/cm², 15 psi)	–
	Rear wheel rim runout	Radial	–	1.0 (0.04)
		Axial	–	1.0 (0.04)
	Wheel hub-to-rim distance		11.0 ± 1.0 (0.43 ± 0.04)	–
	Rear axle runout		–	0.20 (0.008)
	Minimum tire tread depth		–	To indicator
Drive chain	Slack		10 – 20 (0.4 – 0.8)	–
	Size/link	DID	DID420D-86RB	–
Brake	Brake pedal freeplay		15 (0.59)	–
	Lining thickness		3.0 (0.12)	2.0 (0.08)
	Drum I.D.		95.0 (3.74)	96.0 (3.78)

TORQUE VALUES

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Rear spoke	36	BC2.9	3.2 (0.33, 2.4)	
Driven sprocket nut	4	8	32 (3.3, 24)	U-nut
Rear axle nut	1	12	64 (6.5, 47)	U-nut
Rear brake arm nut	1	6	9.9 (1.01, 7.3)	U-nut
Shock absorber upper mounting nut	1	10	50 (5.1, 37)	U-nut
Shock absorber lower mounting nut	1	10	50 (5.1, 37)	U-nut
Driven chain slider nut	1	6	5.9 (0.6, 4.4)	U-nut
Swingarm pivot nut	1	12	59 (6.0, 44)	U-nut

TOOLS

Bearing remover head, 12 mm 07746-0050300 	Bearing remover shaft 07746-0050100 	Driver 07749-0010000 
Attachment, 32 x 35 mm 07746-0010100 	Pilot, 12 mm 07746-0040200 	Attachment, 37 x 40 mm 07746-0010200 
Spoke wrench, 4.5 x 5.1 mm 07701-0020200 		

TROUBLESHOOTING

Steers to one side or does not track straight
- Drive chain adjusters not adjusted equally
- Bent axle
- Bent frame

Rear wheel wobbles
- Bent rim
- Worn or damaged rear wheel bearings
- Faulty rear tire
- Bent spokes
- Worn or damaged swingarm pivot bushings
- Bent frame or swingarm
- Axle fastener not tightened properly
- Unbalanced tire and wheel
- Tire pressure too low

Rear wheel hard to turn
- Brake drag
- Faulty wheel bearings
- Bent rear axle
- Drive chain too tight (See page 3-12)

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

Stiff suspension
- Bent shock absorber damper rod
- Damaged suspension
- Damaged swingarm pivot bushings
- Bent swingarm pivot or frame
- Tire pressure too high

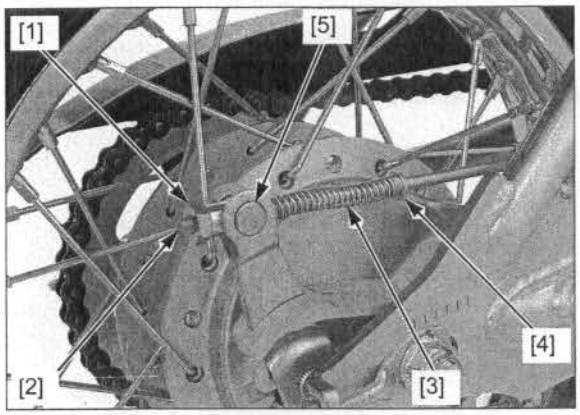
Rear suspension noise
- Loose suspension fasteners
- Worn or damaged suspension pivot bushings
- Faulty shock absorber

REAR WHEEL

REMOVAL

Remove the rear brake adjusting nut [1] and disconnect the rear brake rod [2] from the brake arm.

Remove the spring [3], washer [4] and joint pin [5].



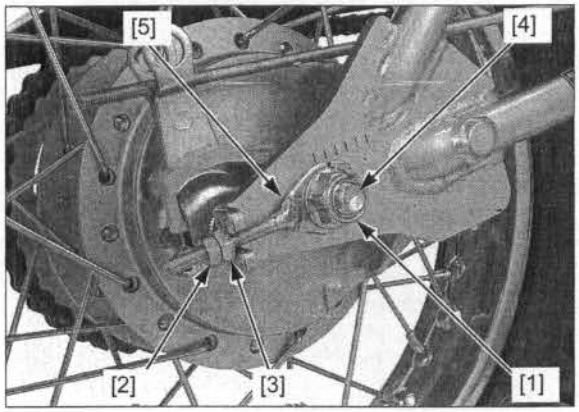
Loosen the axle nut [1].

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

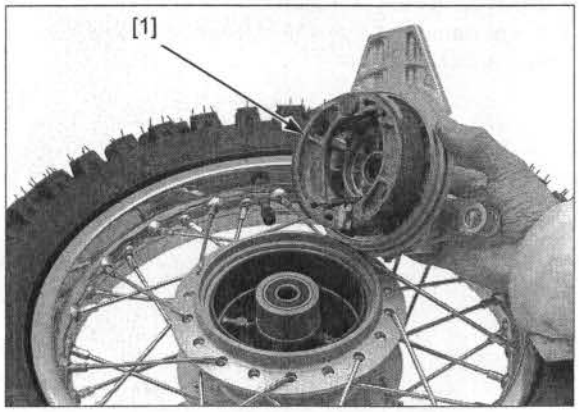
Loosen both lock nuts [2] and adjusting nuts [3].
Push the rear wheel forward and release the drive chain.

Remove the following:

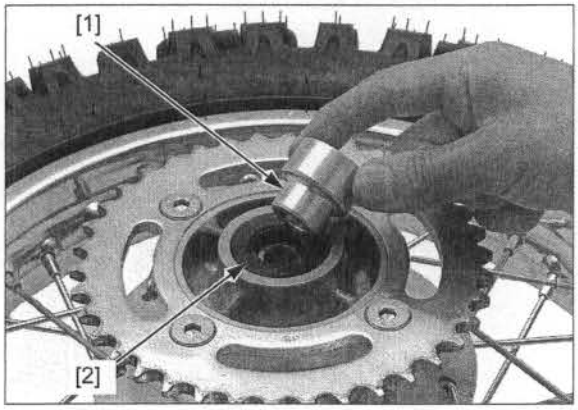
- Axle nut
- Rear axle [4]
- Adjuster plates [5]
- Rear wheel



Remove the brake panel assembly [1] from the right wheel hub.



Remove the left side collar [1] and dust seal [2] from the left wheel hub.

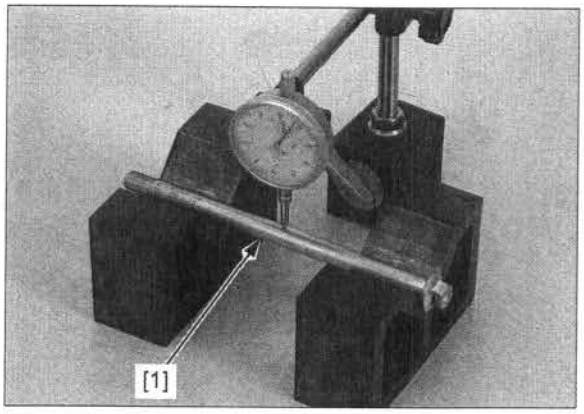


INSPECTION

Axle

Set the axle [1] on V-blocks and measure the runout. The actual runout is 1/2 of the total indicator reading.

SERVICE LIMIT: 0.20 mm (0.008 in)



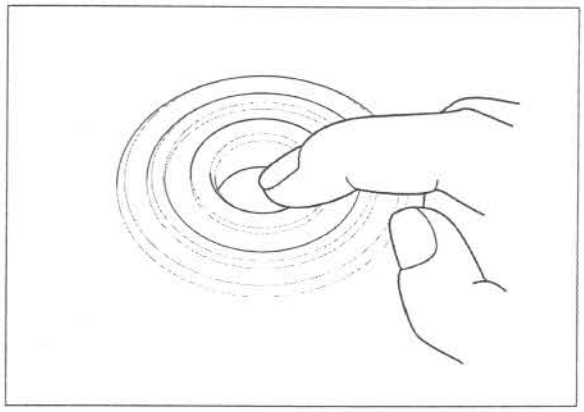
Wheel bearing

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.

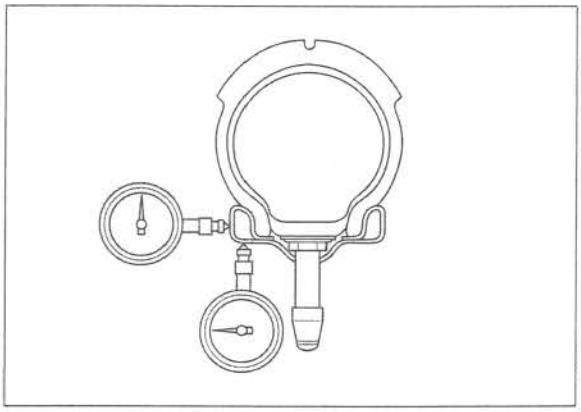
Install the new bearings into the hub using the special tools (page 15-8).



Wheel rim runout

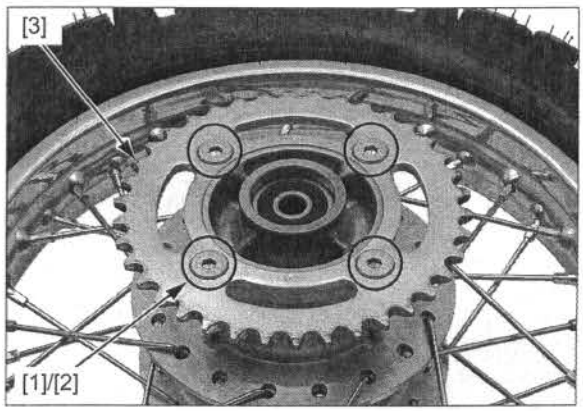
Check the rim runout by placing the wheel in a trueing stand.
Spin the wheel by hand, and read the runout using a dial indicator.

SERVICE LIMITS:
Radial: 1.0 mm (0.04 in)
Axial: 1.0 mm (0.04 in)



DISASSEMBLY

Remove the driven sprocket nuts [1], bolts [2] and driven sprocket [3].



Wheel bearing removal

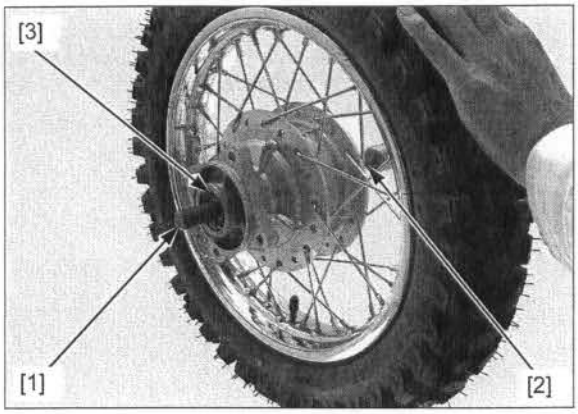
Install the bearing remover head [1] into the bearing.

From the opposite side, install the bearing remover shaft [2] and drive the bearing [3] out of the wheel hub.

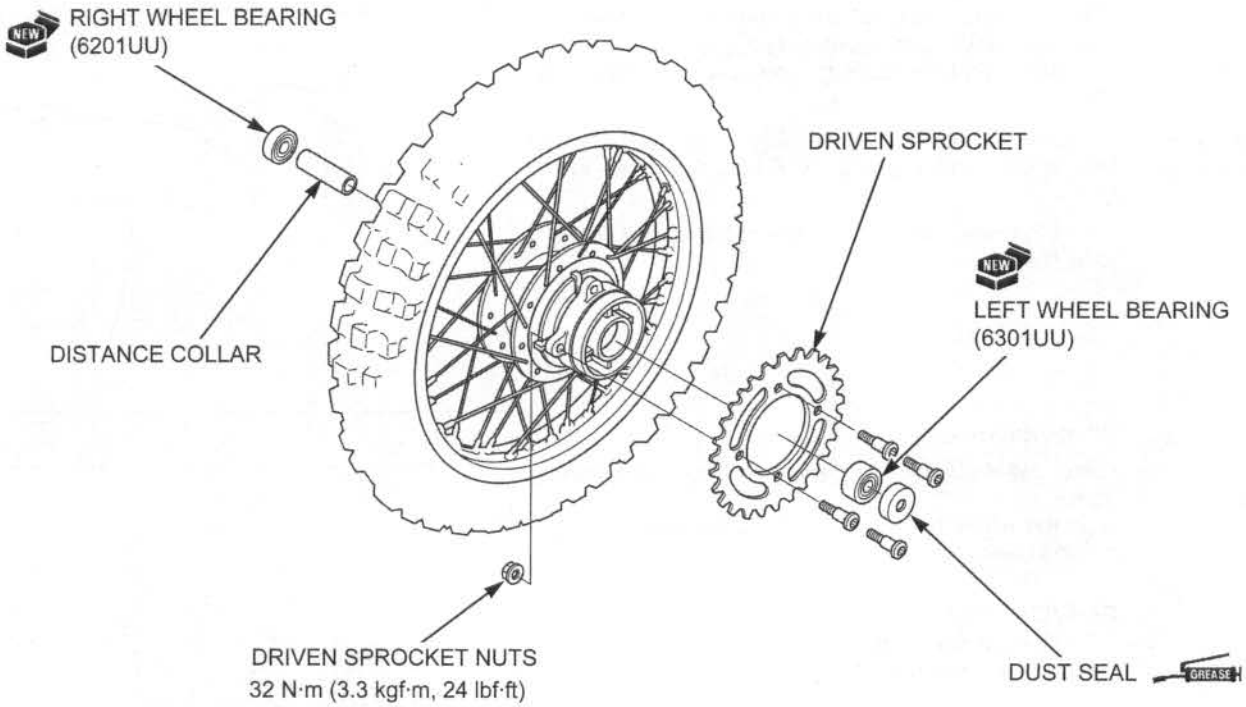
Remove the distance collar and drive out the other bearing.

TOOLS:

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



ASSEMBLY



Wheel bearing installation

Replace the wheel bearings in pairs. Do not reuse old bearings.

Drive in a new right (brake panel side) wheel bearing [1] squarely.

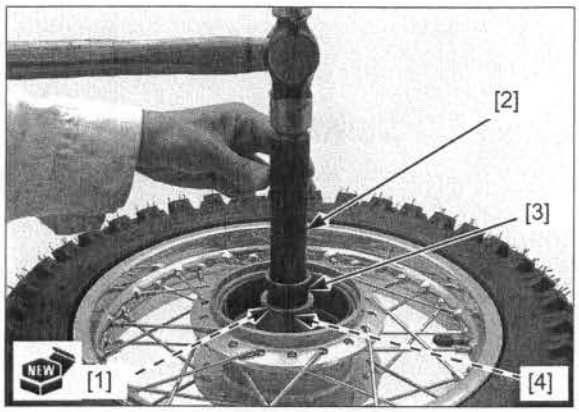
TOOLS:

[2] Driver	**07749-0010000**
[3] Attachment, 32 x 35 mm	**07746-0010100**
[4] Pilot, 12 mm	**07746-0040200**

Install the distance collar, then drive in the left wheel bearing until it is seated on the distance collar.

TOOLS:

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



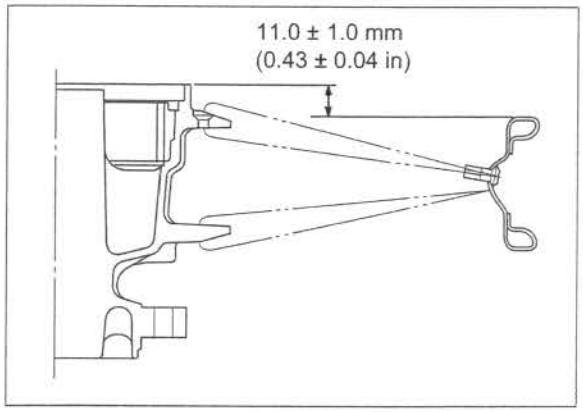
Wheel center adjustment

Wheel center adjustment is necessary when new spokes are installed.

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 the distance from the hub right end surface to the side of the rim is 11.0 ± 1.0 mm (0.43 ± 0.04 in) as shown.



Tighten the spokes in 2 or 3 progressive steps to the specified torque.

TOOL:
Spoke wrench, 4.5 x 5.1 mm 07701-0020200

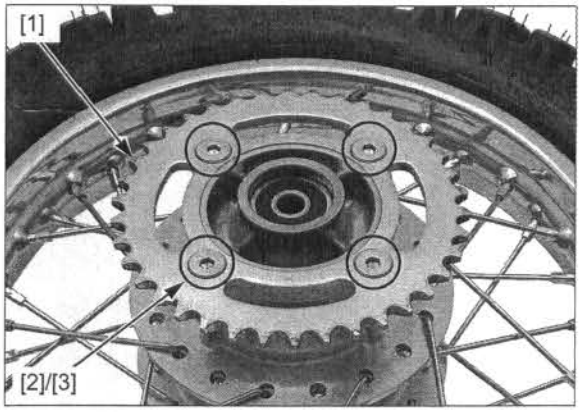
TORQUE: 3.2 N·m (0.33 kgf·m, 2.4 lbf·ft)

Check the wheel rim runout (page 15-7).

Install the driven sprocket [1], bolts [2] and nuts [3].

Tighten the nuts to the specified torque while holding the bolts.

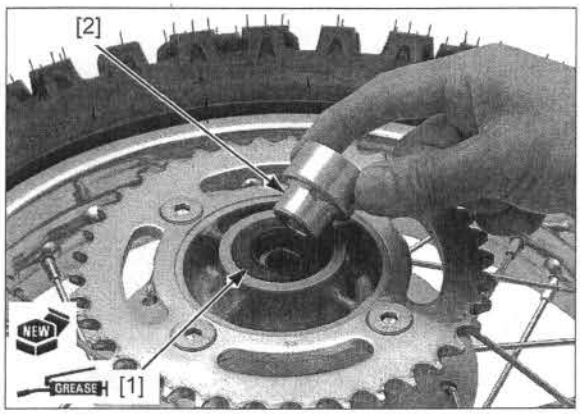
TORQUE: 32 N·m (3.3 kgf·m, 24 lbf·ft)



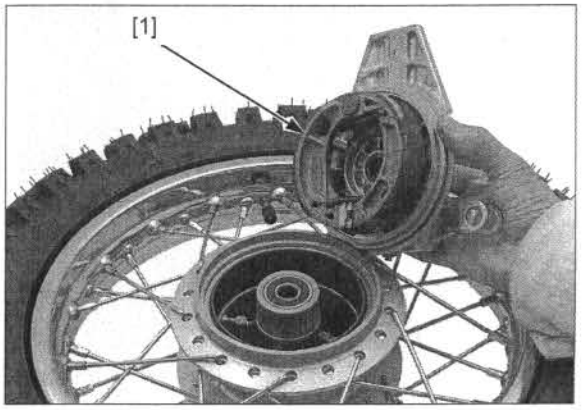
INSTALLATION

Apply grease to a new dust seal [1] lips, then install it into the left wheel hub.

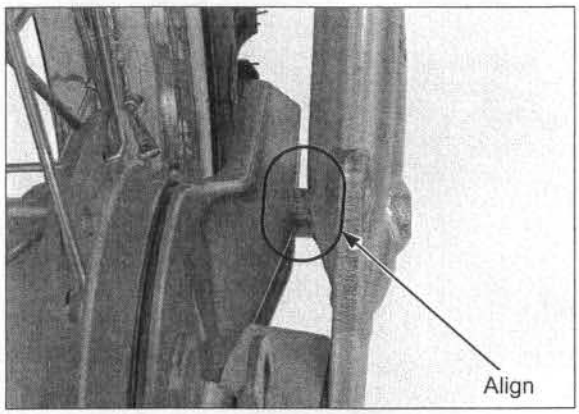
Install the left side collar [2] into the left wheel hub.



Install the brake panel assembly [1] into the right wheel hub.



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



Place the rear wheel between the swingarm.

Install the drive chain over the driven sprocket.

Apply grease to the rear axle [1] surface.

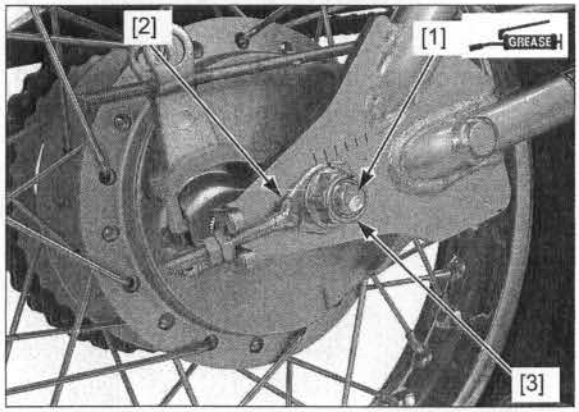
Install the following:

- Left adjuster plate
- Rear axle
- Right adjuster plate [2]
- Axle nut [3]

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

Tighten the axle nut to the specified torque.

TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)

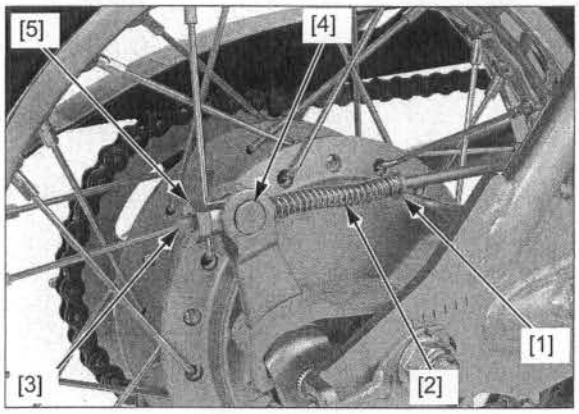


Install the washer [1] and spring [2] onto the brake rod [3].

Connect the brake rod to the brake arm with the joint pin [4].

Install the brake adjusting nut [5] loosely.

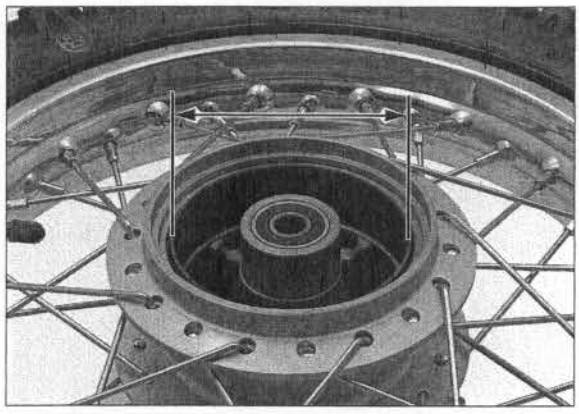
Adjust the rear brake pedal freeplay (page 3-16).



REAR BRAKE

BRAKE PANEL REMOVAL

Remove the rear wheel and then remove the brake panel (page 15-6).



INSPECTION

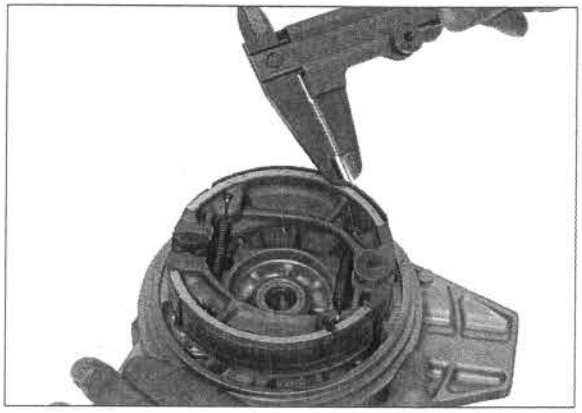
Measure the rear brake drum I.D.

SERVICE LIMIT: 96.0 mm (3.78 in)

Check the brake shoe springs for fatigue or damage and check the brake cam for wear or damage.

Measure the brake lining thickness.

SERVICE LIMIT: 2.0 mm (0.08 in)

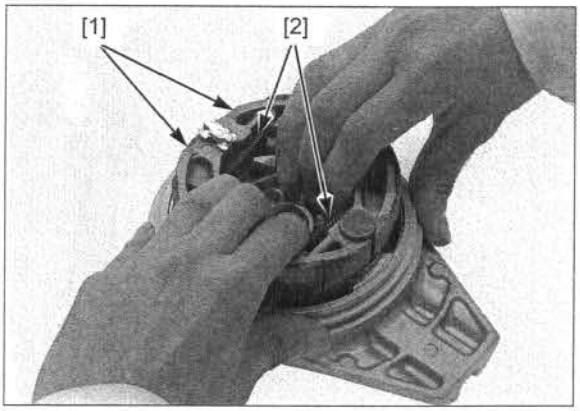


BRAKE PANEL DISASSEMBLY

Mark the side of the brake shoes to indicate their original position, before removing them.

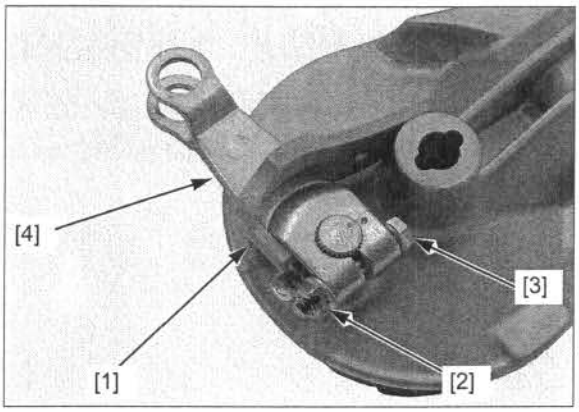
Pull the brake shoes [1] apart and remove them from the brake panel.

Remove the springs [2] from the brake shoes.



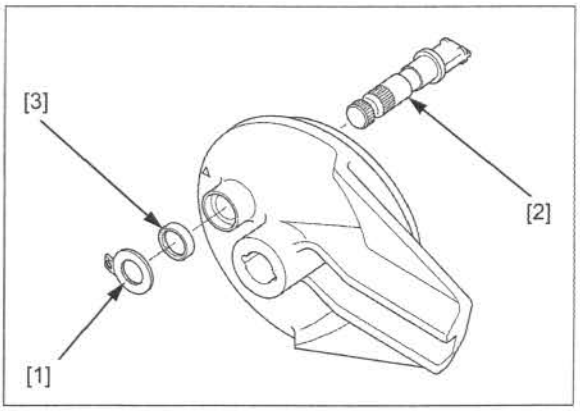
Remove the brake arm cover [1].

Remove the nut [2], bolt [3] and brake arm [4].

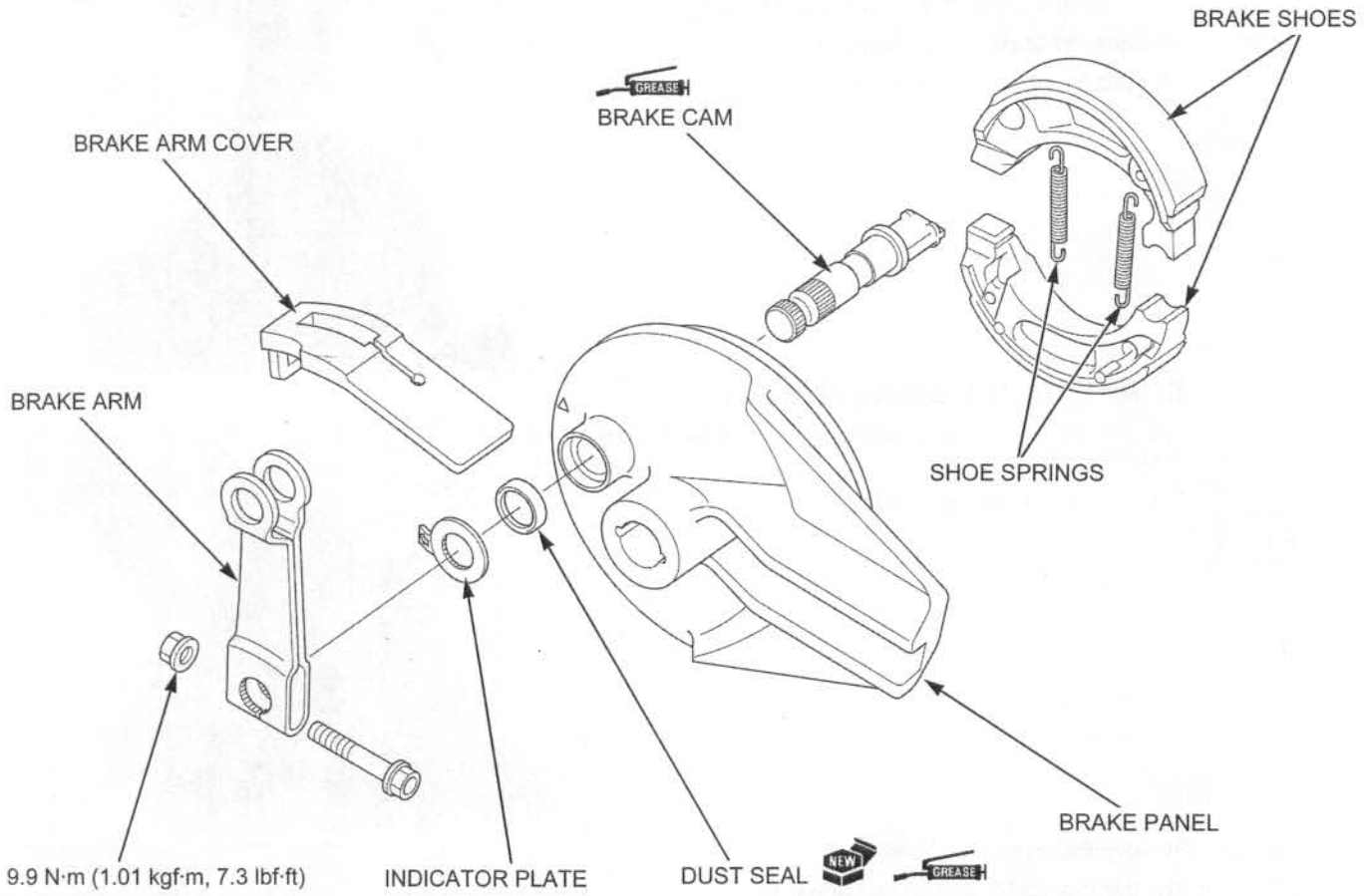


Remove the following:

- Indicator plate [1]
- Brake cam [2]
- Dust seal [3]

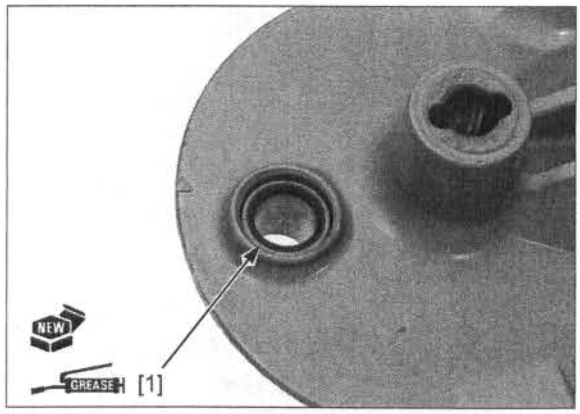


BRAKE PANEL ASSEMBLY



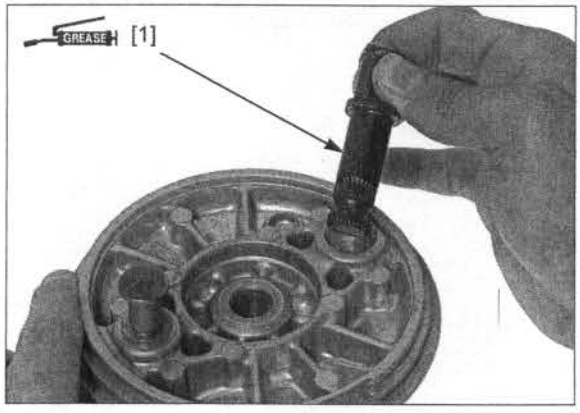
Apply grease to the new dust seal [1] lips.

Install a dust seal with the flat surface facing out until it is fully seated.

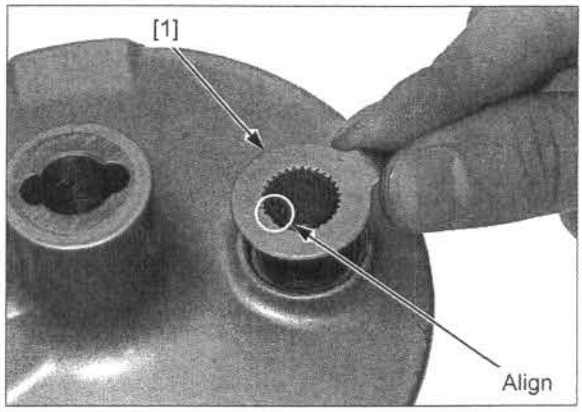


Apply 0.03 - 0.08 g of grease to the brake cam [1] sliding surface.

Install the brake cam into the brake panel.



Install the wear indicator plate [1] onto the brake cam by aligning its wide tooth with the wide groove in the brake cam.

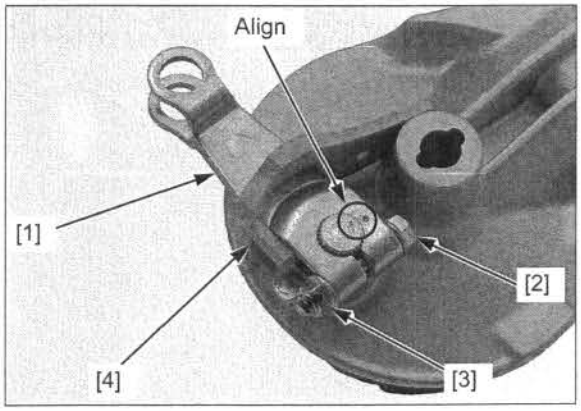


Install the brake arm [1] by aligning the punch marks on the brake arm and brake cam.

Install the brake arm pinch bolt [2] and nut [3], then tighten the nut to the specified torque.

TORQUE: 9.9 N·m (1.01 kgf·m, 7.3 lbf·ft)

Install the brake arm cover [4].

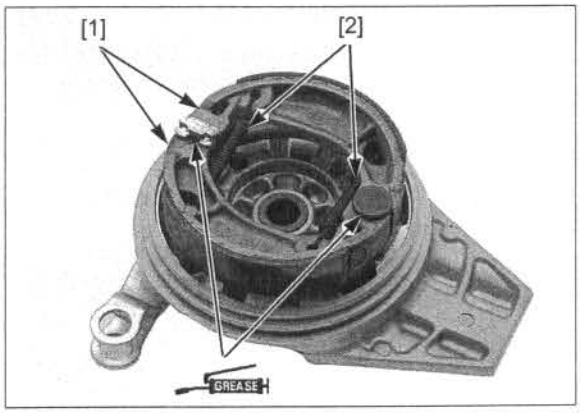


Apply 0.1 - 0.2 g of grease to the brake cam and brake shoe contact area and anchor pin.

Assemble the brake shoes [1] and springs [2] in the direction as shown.
Install the shoe assembly onto the brake panel.

Wipe any excess grease from the brake cam and anchor pin.

Install the rear wheel (page 15-9).



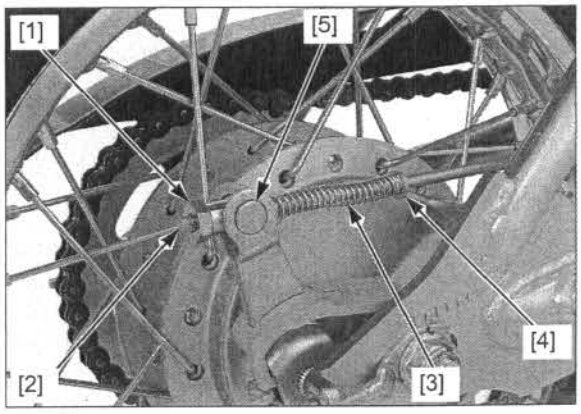
BRAKE PEDAL

REMOVAL/DISASSEMBLY

Remove the brake pedal adjusting nut [1].

Push the brake pedal down and remove the brake rod [2] from the brake arm.

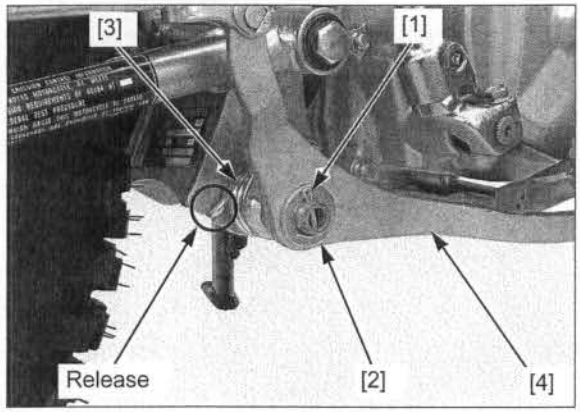
Remove the spring [3], washer [4] and joint pin [5].



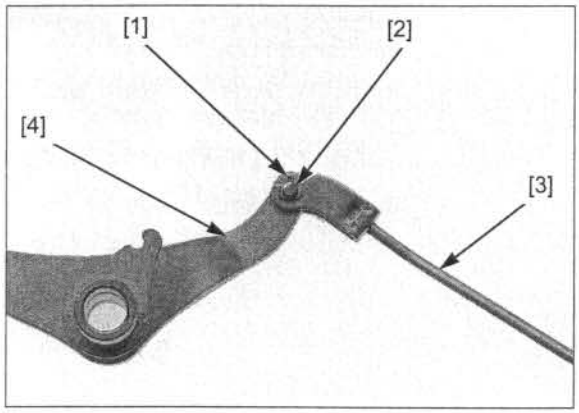
Remove the cotter pin [1] and washer [2].

Release the return spring [3] end from the cut out of the frame.

Remove the brake pedal [4] and return spring.

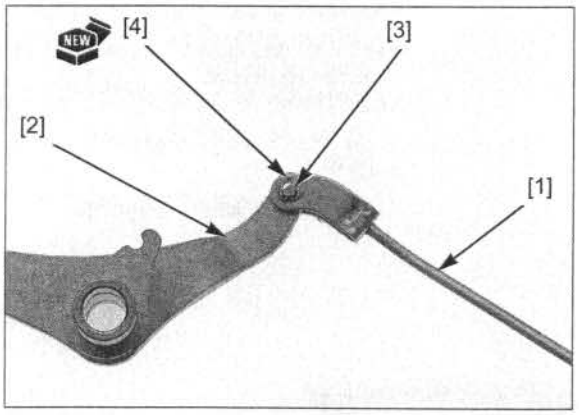


Remove the cotter pin [1] and joint pin [2], then separate the brake rod [3] and brake pedal [4].



ASSEMBLY/INSTALLATION

Set the brake rod [1] and brake pedal [2], install the joint pin [3] and new cotter pin [4].

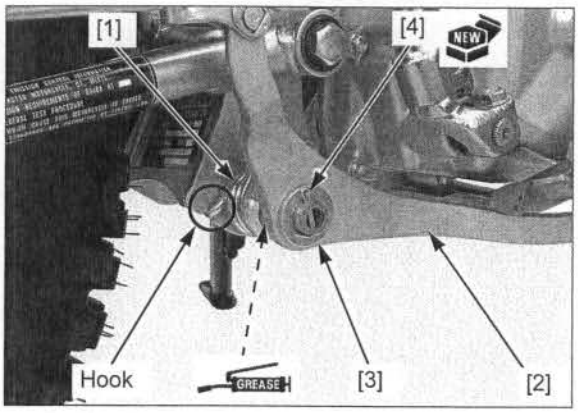


Apply grease to the brake pedal pivot sliding surface.

Install the return spring [1] and brake pedal [2] to the pivot.

Hook the return spring end to the cut out of the frame.

Install the washer [3] and new cotter pin [4].

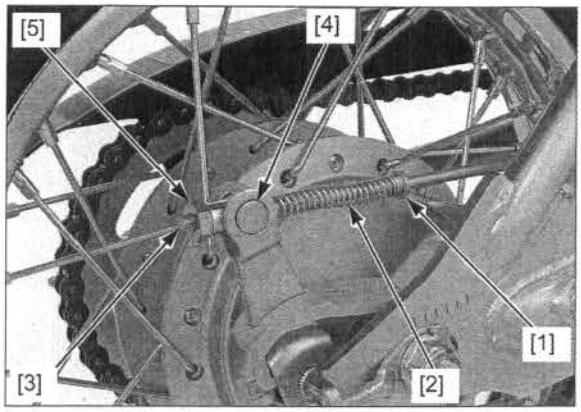


Install the washer [1] and spring [2] onto the brake rod [3].

Install the joint pin [4] onto the brake arm.

Push down the brake pedal and install the brake rod into the joint pin.

Install the brake adjusting nut [5] and adjust the brake pedal freeplay (page 3-16).



SHOCK ABSORBER

REMOVAL

Remove the seat (page 2-4).

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

Remove the shock absorber lower mounting nut [1] and bolt [2].

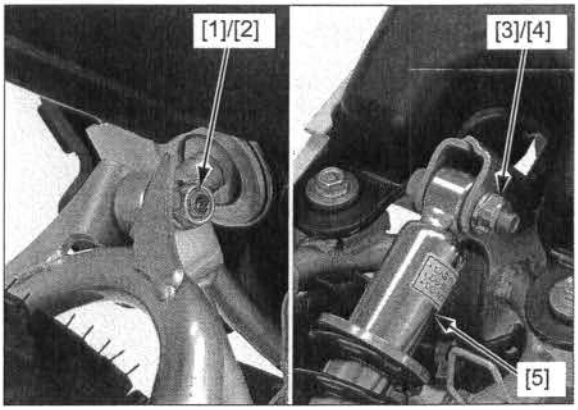
Remove the shock absorber upper mounting nut [3], bolt [4] and shock absorber [5].

Installation is in the reverse order of removal.

TORQUE:

Shock absorber upper mounting nut:
50 N·m (5.1 kgf·m, 37 lbf·ft)

Shock absorber lower mounting nut:
50 N·m (5.1 kgf·m, 37 lbf·ft)



INSPECTION

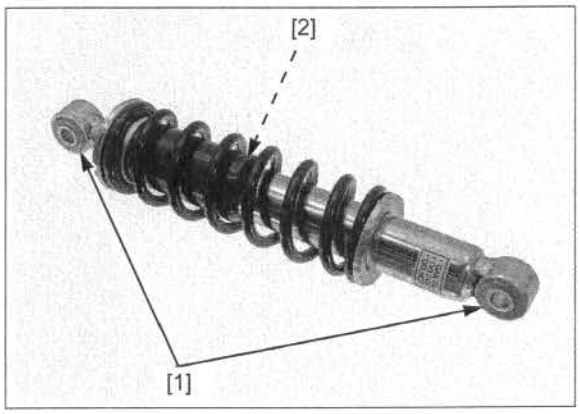
Do not disassemble the shock absorber.

Visually inspect the shock absorber for wear or damage.

Check the following:

- Deformation or oil leakage
- Bushings [1] for wear or damage
- Damper rod [2] for bend or damage

Check the smooth damper operation.



SHOCK ABSORBER DISPOSAL PROCEDURE

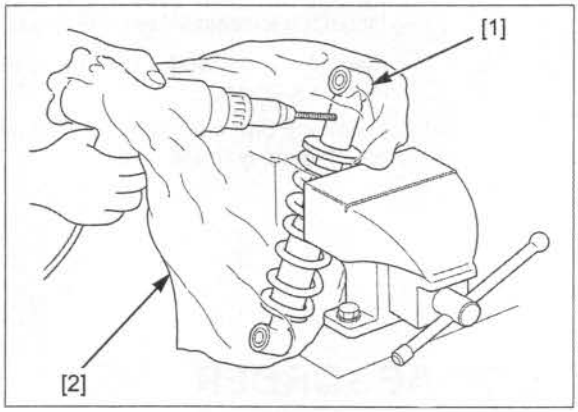
Center punch the damper to mark the drilling point.

Wrap the shock absorber [1] inside a plastic bag [2]. Support the shock absorber in a vise as shown. Through the open end of the bag, insert a drill motor with a sharp 2 - 3 mm (0.08 - 0.12 in) drill bit.

NOTE:

- Point the drill hole away from you to prevent debris getting in your eyes.

Hold the bag around the drill motor and briefly run the drill motor inside the bag; this will inflate the bag with air from the motor and help keep the bag from getting caught in the bit when you start.



SWINGARM

REMOVAL

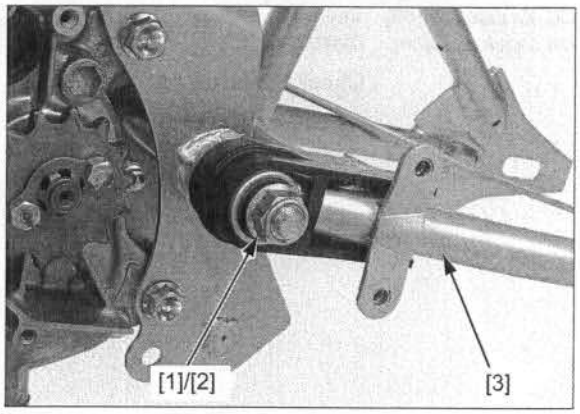
Support the motorcycle securely and raise the rear wheel off the ground with a hoist or equivalent.

Remove the following:

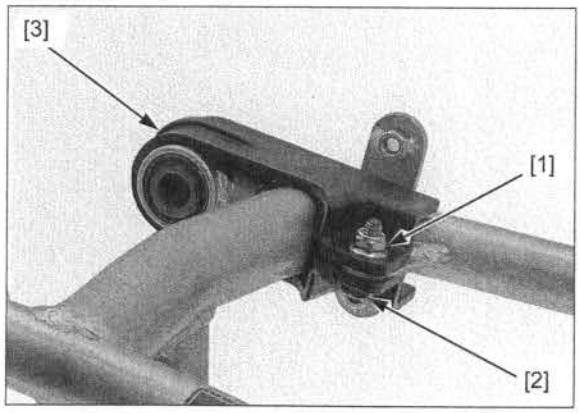
- Drive chain cover (page 2-7)
- Drive chain (page 3-13).
- Rear wheel (page 15-6)

Remove shock absorber lower mounting nut [1] and bolt [2].

Remove the swingarm pivot nut [1], bolt [2] and swingarm [3].



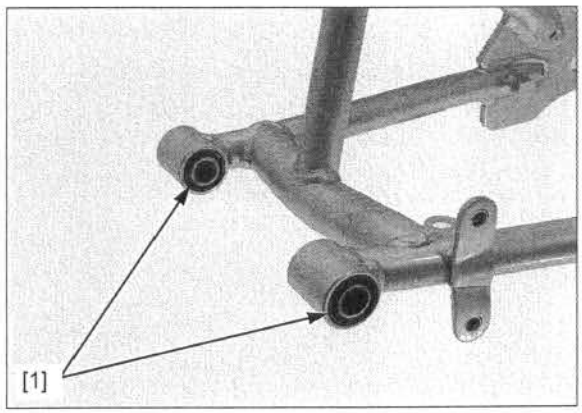
Remove the nut [1], bolt [2] and drive chain slider [3].



INSPECTION

Check the pivot bushings [1] for wear or damage.

Check the swingarm for cracks or damage.

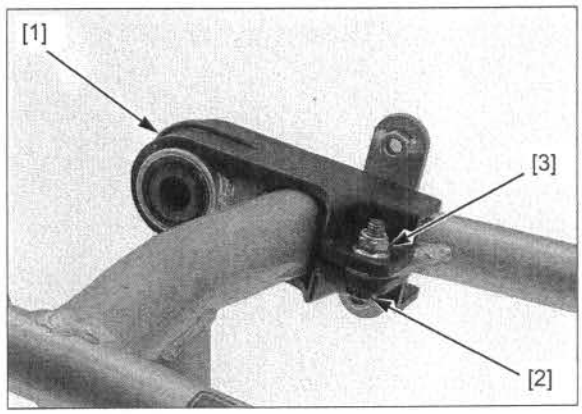


INSTALLATION

Install the chain slider [1], bolt [2] and nut [3].

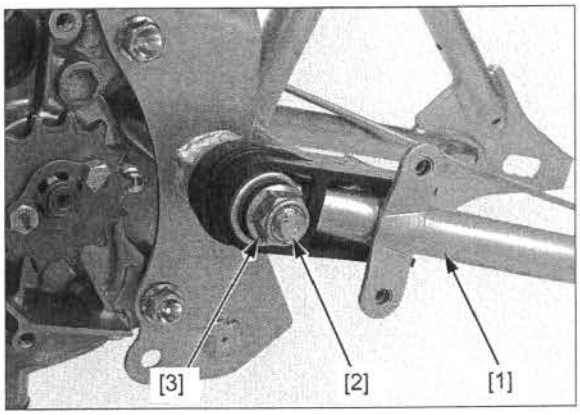
Tighten the nut to the specified torque while holding the bolt.

TORQUE: 5.9 N·m (0.6 kgf·m, 4.4 lbf·ft)



Set the swingarm [1] onto the frame and insert the pivot bolt [2] from the right side.

Install the swingarm pivot nut [3], but do not tighten it yet.



Align the holes of the swingarm and shock absorber lower mount, then install the bolt [1] and nut [2].

Tighten the shock absorber lower mounting nut and swingarm pivot nut to the specified torque.

TORQUE:
Shock absorber
lower mounting nut: 50 N·m (5.1 kgf·m, 37 lbf·ft)
Swingarm pivot nut: 59 N·m (6.0 kgf·m, 44 lbf·ft)

Install the following:

- Rear wheel (page 15-9)
- Drive chain (page 3-14).
- Drive chain cover (page 2-7)

Check and adjust the following:

- Drive chain (page 3-13)
- Rear brake (page 3-16)
- Rear suspension (page 3-18)

MEMO

16. BATTERY/CHARGING SYSTEM

COMPONENT LOCATION 16-2

SYSTEM DIAGRAM 16-2

SERVICE INFORMATION 16-3

TROUBLESHOOTING 16-5

BATTERY 16-6

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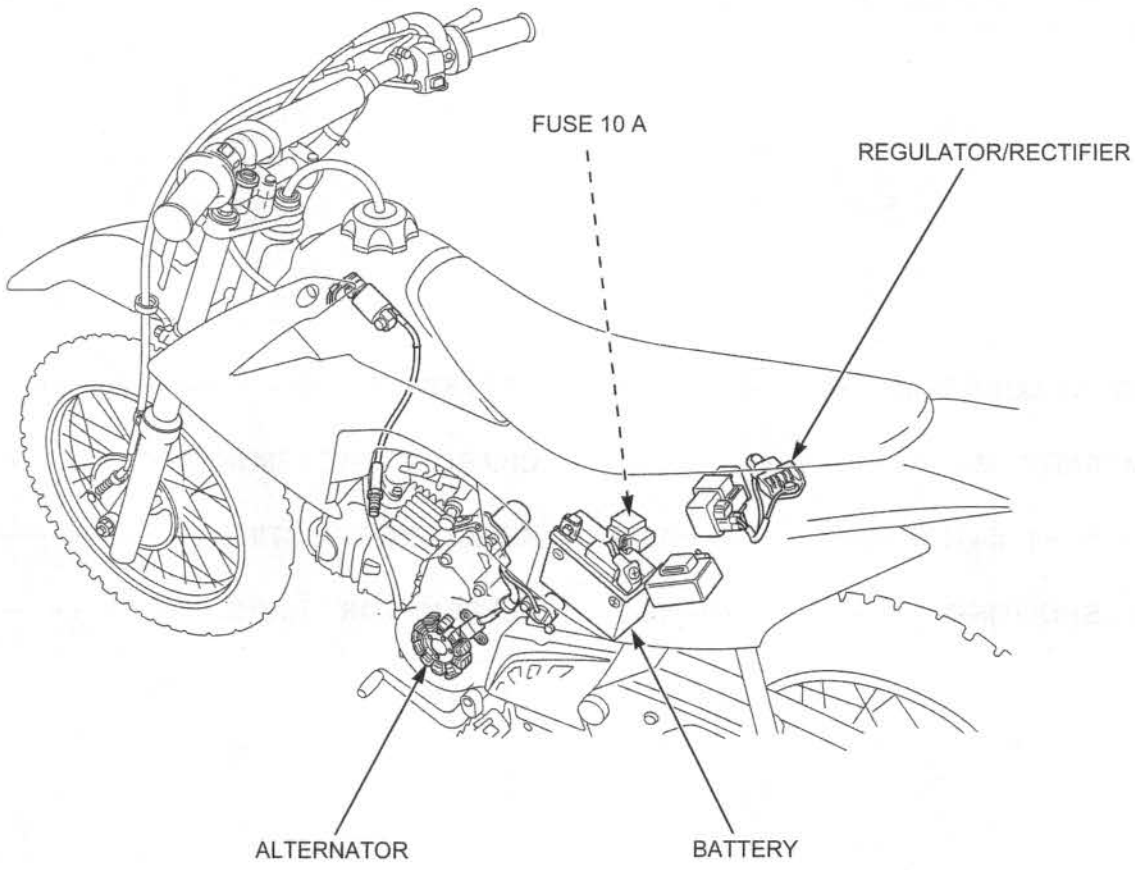
REGULATOR/RECTIFIER 16-8

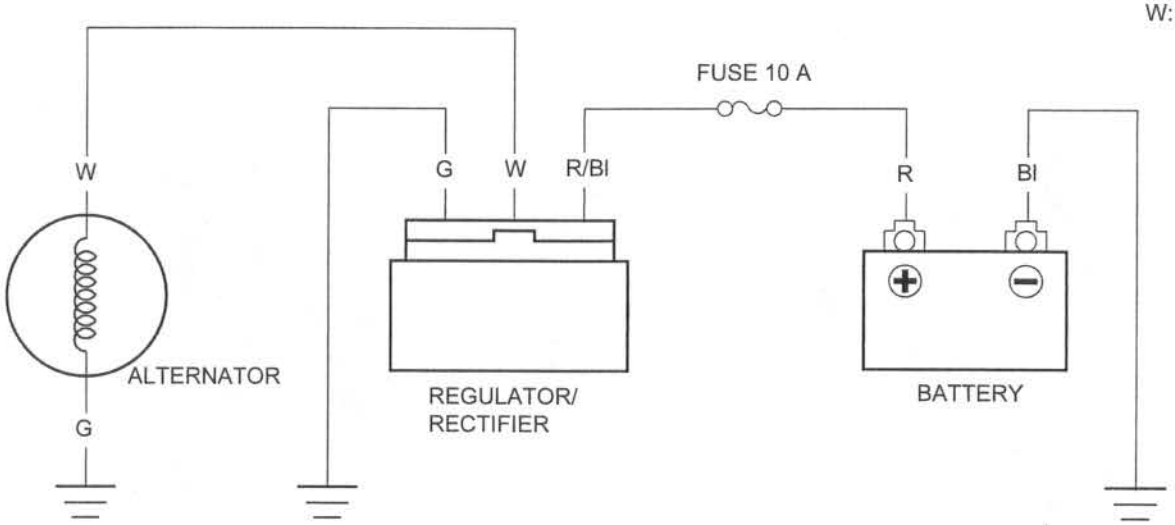
ALTERNATOR CHARGING COIL 16-8

COMPONENT LOCATION



SYSTEM DIAGRAM

Bl: Black
G: Green
R: Red
W: White



SERVICE INFORMATION

GENERAL

⚠WARNING

- The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.
- The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.
  - If electrolyte gets on your skin, flush with water.
  - If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.
- Electrolyte is poisonous.
  - If swallowed, drink large quantities of water or milk and call your local Poison Control Center or a physician immediately.

- Always turn OFF the ignition switch before disconnecting any electrical component.
- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is ON and current is present.
- This model comes with a maintenance free (MF) battery. The maintenance free battery must be replaced when it reaches the end of its service life.
- For extended storage, remove the battery, give it a full charge, and store it in a cool, dry space.
- For a battery remaining in a stored motorcycle, disconnect the negative battery cable from the battery terminal.
- The battery sealing caps should not be removed. Attempting to remove the sealing caps from the cells may damage the battery.
- The battery can be damaged if overcharged or undercharged, or if left to discharge for a long period. These same conditions contribute to shortening the life span of the battery. Even under normal use, the performance of the battery deteriorates after 2–3 years.
- Battery voltage may recover after battery charging, but under heavy load, battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected as the problem. Battery overcharge often results from problems in the battery itself, which may appear to be an overcharging symptom. If one of the battery cells is shorted and battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level goes down quickly.
- Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under heavy load.
- The battery will self-discharge when the motorcycle is not in use. For this reason, charge the battery every 2 weeks to prevent sulfation from occurring.
- Filling a new battery with electrolyte will produce some voltage, but in order to achieve its maximum performance, always charge the battery. Also, the battery life is lengthened when it is initially charged.
- When checking the charging system, always follow the steps in the troubleshooting flow chart (page 16-5).
- For alternator removal (page 11-5).

BATTERY CHARGING

- Turn power ON/OFF at the charger, not at the battery terminal.
- For battery charging, do not exceed the charging current and time specified on the battery. Use excessive current or extending the charging time may damage the battery.
- Quick charging should only be done in an emergency; slow charging is preferred.

BATTERY TESTING

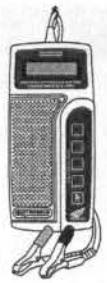
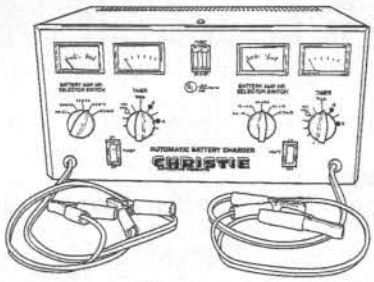
Refer to the instruction in the Operation Manual for the recommended battery tester for details about battery testing. The recommended battery tester puts a "load" on the battery so that the actual battery condition can be measured.

Recommended battery tester **Micro 404XL (U.S.A. only)**

SPECIFICATIONS

ITEM			SPECIFICATIONS
Battery	Type		YTX4L-BS
	Capacity		12 V – 3 Ah (10 HR)
	Current leakage		0.1 mA max.
	Voltage	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.4 V
	Charging current	Normal	0.4 A/5 – 10 h
		Quick	4.0 A/0.5 h
Alternator	Capacity		0.063 kW/5,000 rpm
	Charging coil resistance (20°C/68°F)		0.2 – 1.4 Ω

TOOLS

Motorcycle battery analyzer Micro 404XL	Christie battery charger MC1012/2T (U.S.A. only)
	

TROUBLESHOOTING

BATTERY IS DAMAGED OR WEAK

1. BATTERY TEST

Remove the battery (page 16-6).

Check the battery condition using the recommended battery tester.

RECOMMENDED BATTERY TESTER:
Micro 404XL (U.S.A. only) or equivalent

Is the battery in good condition?

YES – GO TO STEP 2.

NO – Faulty battery.

2. CURRENT LEAKAGE TEST

Install the battery (page 16-6).

Check the battery current leakage test (Leak test; (page 16-7)).

Is the current leakage below 0.1 mA?

YES – GO TO STEP 4.

NO – GO TO STEP 3.

3. CURRENT LEAKAGE TEST WITHOUT REGULATOR/RECTIFIER CONNECTOR

Disconnect the regulator/rectifier connector and recheck the battery current leakage.

Is the current leakage below 0.1 mA?

YES – Faulty regulator/rectifier

NO –
- Shorted wire harness
- Faulty ignition switch

4. CHARGING VOLTAGE INSPECTION

Measure and record the battery voltage using a digital multimeter (page 16-6).

Start the engine.

Measure the charging voltage (page 16-7).

Compare the measurements to the results of the following calculation.

STANDARD: Measured BV < Measured CV < 15.5 V
BV: Battery Voltage
CV: Charging Voltage

Is the measured charging voltage within the standard voltage?

YES – Faulty battery

NO – GO TO STEP 5.

5. REGULATOR/RECTIFIER SYSTEM INSPECTION

Check the voltage and resistance at the regulator/rectifier connector (page 16-8).

Are the measurements correct?

YES – Faulty regulator/rectifier

NO –
- Open circuit in related wire
- Loose or poor contacts of related terminal
- Shorted wire harness

BATTERY

REMOVAL/INSTALLATION

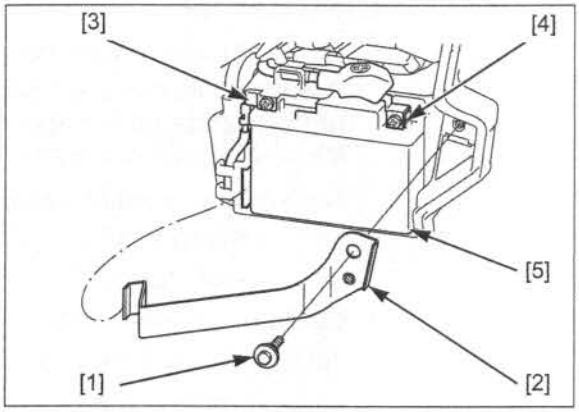
Remove the left side cover (page 2-4).

Remove the bolt [1] and battery holder plate [2].

Disconnect the negative (–) cable [3] and then the positive (+) cable [4], remove the battery [5].

Install the battery in the reverse order of removal.

- Connect the positive (+) terminal first and then the negative (–) cable.

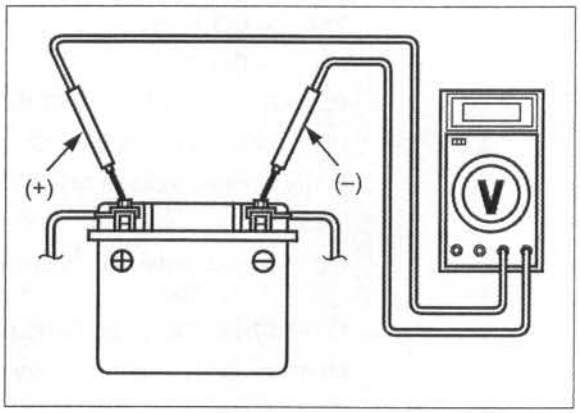


VOLTAGE INSPECTION

Measure the battery voltage using a digital multimeter.

VOLTAGE:

Fully charged: 13.0 – 13.2 V
Under charged: Below 12.4 V



BATTERY TESTING

Refer to the instructions that are appropriate to the battery testing equipment available to you.

TOOL:

Battery tester	**Micro 404XL (U.S.A. only)**

BATTERY CHARGING (U.S.A. only)

Remove the battery (page 16-6).

Refer to the instructions that are appropriate to the battery charging equipment available to you.

TOOL:

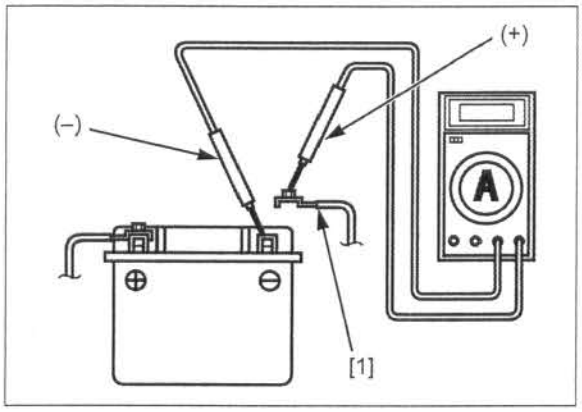
Christie battery charger	**MC1012/2T (U.S.A. only)**

CHARGING SYSTEM INSPECTION

CURRENT LEAKAGE INSPECTION

Remove the left side cover (page 2-4).

With the ignition switch turned to OFF, disconnect the negative (–) cable [1] from the battery.
Connect the ammeter (+) probe to the negative (–) cable and the ammeter (–) probe to the battery (–) terminal.
With the ignition switch turned to OFF, check for current leakage.



NOTE:

- When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher than the range selected may blow the fuse in the tester.
- While measuring current, do not turn the ignition switch to ON. A sudden surge of current may blow the fuse in the tester.

SPECIFIED CURRENT LEAKAGE: 0.1 mA max.

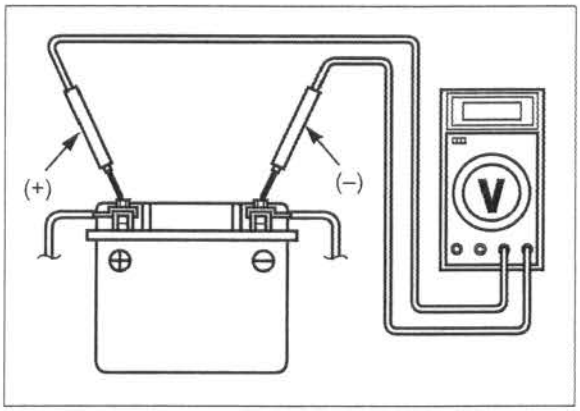
If current leakage exceeds the specified value, a shorted circuit is likely.
Locate the short by disconnecting connections one by one and measuring the current.

CHARGING VOLTAGE INSPECTION

Remove the left side cover (page 2-4).

Be sure the battery is in good condition before performing this test.

Warm up the engine to normal operating temperature.
Connect the multimeter between the battery positive (+) and negative (–) terminals.



NOTICE

- *To prevent a short, make absolutely certain which are the positive (+) and negative (–) terminals or cables.*
- *Do not disconnect the battery or any cable in the charging system without first turning the ignition switch to OFF. Failure to follow this precaution can damage the tester or electrical components.*

Measure the voltage on the multimeter when the engine runs at 5,000 rpm.

STANDARD: Measured BV < Measured CV < 15.5 V
BV = Battery voltage (page 16-6)
CV = Charging voltage

REGULATOR/RECTIFIER

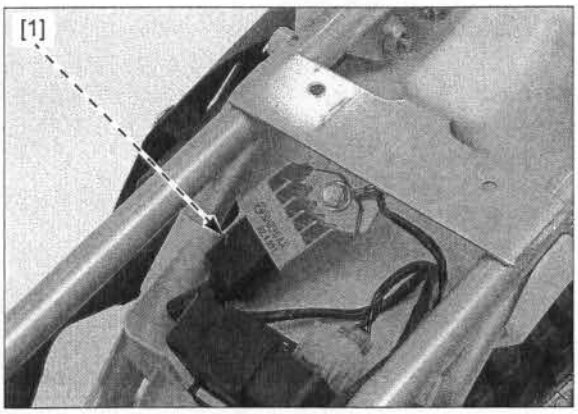
SYSTEM INSPECTION

Remove the fuel tank (page 6-5).

Disconnect the regulator/rectifier 4P (Black) connector [1] and check it for loose contacts or corroded terminals.

Check the following at the wire harness side connector. If the charging voltage reading is out of the specification (page 16-7):

Item	Terminal	Specification
Battery charging line	Red/black (+) and ground (–)	Battery voltage should register
Charging coil line	White and ground	0.2 – 1.4 Ω at (20° C/68° F)
Ground line	Green and ground	Continuity should exist



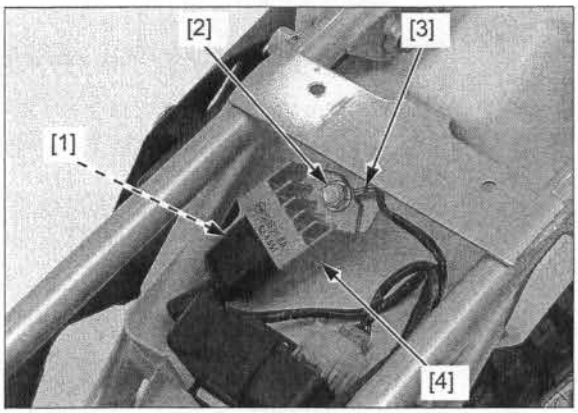
If all lines are normal and there are no loose connections at the regulator/rectifier connector, replace the regulator/rectifier.

REMOVAL/INSTALLATION

Remove the seat (page 2-4).

Disconnect the regulator/rectifier 4P (Black) connector [1].
Remove the bolt [2], ground cable [3] and regulator/rectifier [4] .

Installation is in the reverse order of removal.



ALTERNATOR CHARGING COIL

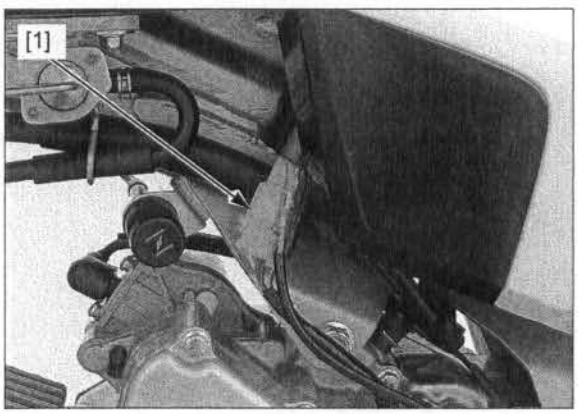
INSPECTION

Disconnect the alternator 2P connector [1].
Measure the resistance between the White wire terminal of the alternator side connector and ground.

STANDARD: 0.2 – 1.4 Ω (20°C/68°F)

Replace the alternator stator if resistance is out of specification.

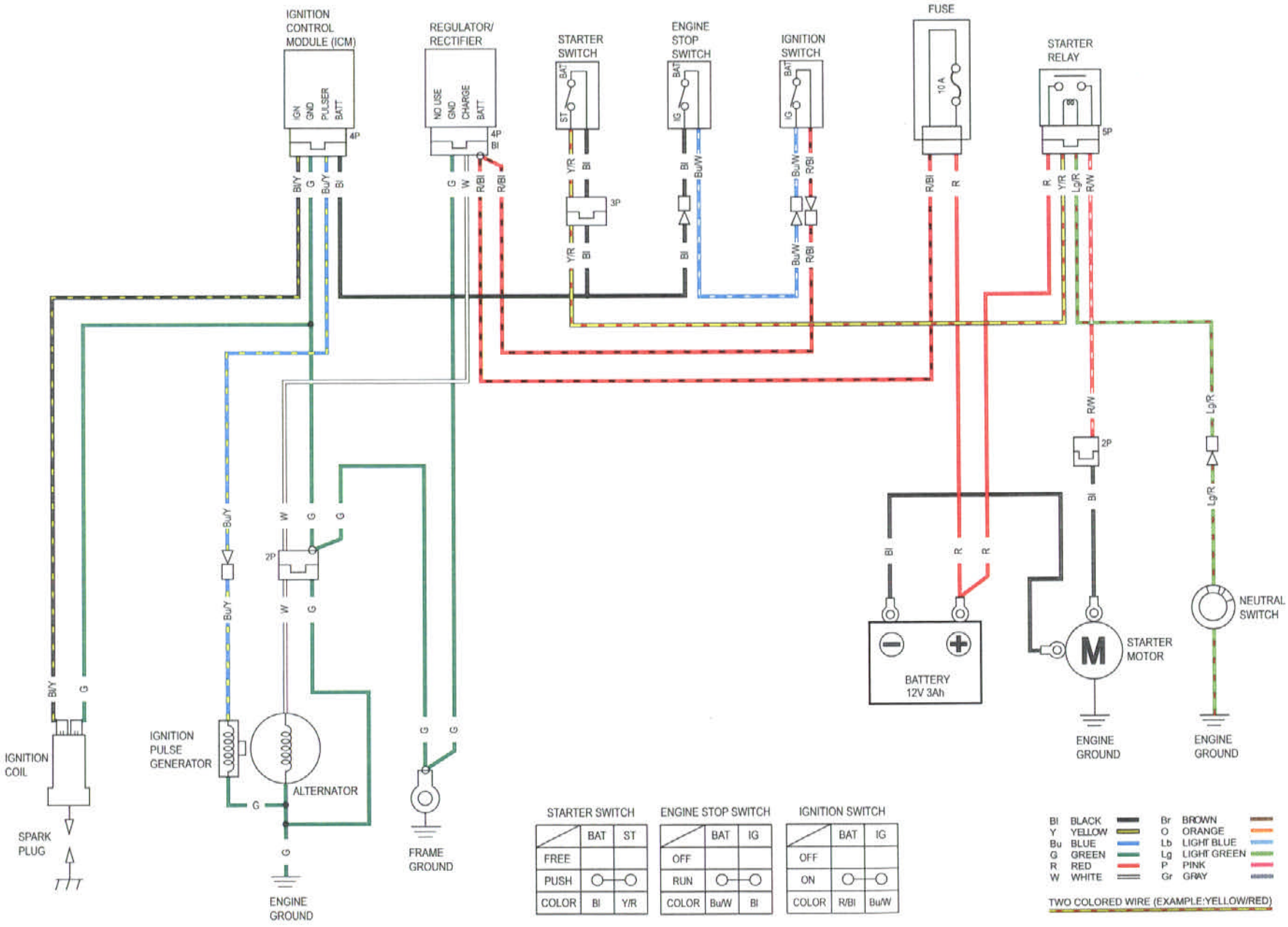
Refer to replacement for alternator stator (page 11-5).



17. WIRING DIAGRAM

WIRING DIAGRAM·····17-2

WIRING DIAGRAM



STARTER SWITCH

	BAT	ST
FREE		
PUSH	○	○
COLOR	Bl	Y/R

ENGINE STOP SWITCH

	BAT	IG
OFF		
RUN	○	○
COLOR	Bu/W	Bl

IGNITION SWITCH

	BAT	IG
OFF		
ON	○	○
COLOR	R/Bl	Bu/W

Bl	BLACK	Br	BROWN
Y	YELLOW	O	ORANGE
Bu	BLUE	Lb	LIGHT BLUE
G	GREEN	Lg	LIGHT GREEN
R	RED	P	PINK
W	WHITE	Gr	GRAY

TWO COLORED WIRE (EXAMPLE:YELLOW/RED)

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