

A Few Words About Safety

Service information

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

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

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

For Your Customer's Safety

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

⚠ WARNING

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

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

For Your Safety

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

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

⚠ WARNING

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

Follow the procedures and precautions in this manual carefully.

Important Safety Precautions

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

- Read all of the instructions before you begin, and make sure you have the tools, the replacement or repair parts, and the skills required to perform the tasks safely and completely.
- Protect your eyes by using proper safety glasses, goggles or face shields any time you hammer, drill, grind, pry or work around pressurized air or liquids, and springs or other stored-energy components. If there is any doubt, put on eye protection.

- Use other protective wear when necessary, for example gloves or safety shoes. Handling hot or sharp parts can cause severe burns or cuts. Before you grab something that looks like it can hurt you, stop and put on gloves.
- Protect yourself and others whenever you have the vehicle up in the air. Any time you lift the vehicle, either with a hoist or a jack, make sure that it is always securely supported. Use jack stands.

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

- Injury from moving parts. If the instruction tells you to run the engine, be sure your hands, fingers and clothing are out of the way.

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

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

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 judgment.

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 - on 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.

ALL INFORMATION, ILLUSTRATIONS, DIRECTIONS AND SPECIFICATIONS INCLUDED IN THIS PUBLICATION ARE BASED ON THE LATEST PRODUCT INFORMATION AVAILABLE AT THE TIME OF APPROVAL FOR PRINTING. HONDA MOTOR CO., LTD. RESERVES THE RIGHT TO MAKE CHANGES AT ANY TIME WITHOUT NOTICE AND WITHOUT INCURRING ANY OBLIGATION WHATEVER. NO PART OF THIS PUBLICATION MAY BE REPRODUCED WITHOUT WRITTEN PERMISSION. THIS MANUAL IS WRITTEN FOR PERSONS WHO HAVE ACQUIRED BASIC KNOWLEDGE OF MAINTENANCE ON HONDA MOTORCYCLES, MOTOR SCOOTERS OR ATVS.

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SYMBOLS

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

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

1. GENERAL INFORMATION

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GENERAL SAFETY

CARBON MONOXIDE

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

⚠ WARNING

- *The exhaust contains poisonous carbon monoxide gas that can cause loss of consciousness and may lead to death.*

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

GASOLINE

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

⚠ WARNING

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

HOT COMPONENTS

⚠ WARNING

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

USED ENGINE OIL

⚠ WARNING

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

BRAKE DUST

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

⚠ WARNING

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

BRAKE FLUID

CAUTION

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

GENERAL INFORMATION

BATTERY HYDROGEN GAS & ELECTROLYTE

▲ 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 follow with milk of magnesia or vegetable oil and call a physician. KEEP OUT OF REACH OF CHILDREN.*

SERVICE RULES

1. Use genuine HONDA or HONDA-recommended parts and lubricants or their equivalents. Parts that don't meet HONDA's design specifications may cause damage to the motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the motorcycle. Metric bolts, nuts and screws are not interchangeable with English fasteners.
4. Install new gaskets, O-rings, cotter pins, and lock plates when reassembling.
5. When tightening bolts or nuts, begin with the larger diameter or inner bolt first. Then tighten to the specified torque diagonally in incremental steps unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all electrical wires as show on pages 1-18 through 1-25, Cable and Harness Routing.

MODEL IDENTIFICATION

'96 – 2000 shown; After 2000 similar.



(1) FRAME SERIAL NUMBER

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



(2) VEHICLE IDENTIFICATION NUMBER

(2) The vehicle identification number (VIN) is attached on the left side of the down tube as shown.



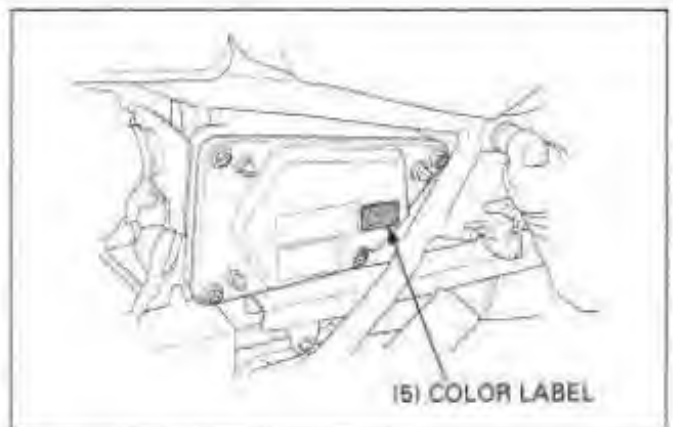
(3) ENGINE SERIAL NUMBER

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



(4) CARBURETOR IDENTIFICATION NUMBER

(4) The carburetor identification numbers are stamped on the left side of the carburetor body.



(5) COLOR LABEL

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

GENERAL INFORMATION

SPECIFICATIONS

GENERAL		
	ITEM	SPECIFICATION
DIMENSIONS	Overall length	2,115 mm (83.3 in)
	Overall width	835 mm (32.9 in)
	Overall height	1,080 mm (42.5 in)
	Wheelbase	1,450 mm (57.1 in)
	Seat height	675 mm (26.6 in)
	Footpeg height	300 mm (11.8 in)
	Ground clearance	150 mm (5.9 in)
	Dry weight	141 kg (311 lbs)
	Curb weight	150 kg (331 lbs)
	Maximum weight capacity	156 kg (345 lbs)
	Except Canada type Canada type	161 kg (355 lbs)
FRAME	Frame type	Semi double cradle
	Front suspension	Telescopic fork
	Front wheel travel	116 mm (4.6 in)
	Rear suspension	Swingarm
	Rear wheel travel	74 mm (2.9 in)
	Front tire size	3.00 - 18 47P
	Rear tire size	130/90 - 15M/C 66P
	Tire brand	(Bridgestone) (Dunlop)
	Front brake	Front: L303A/Rear: G508
	Rear brake	Front: F11/Rear: K627
	Caster angle	Hydraulic single brake
	Trail length	Internal expanding shoe
	Fuel tank capacity	30° 40'
	Fuel tank reserve capacity	113 mm (4.4 in)
ENGINE	Bore and stroke	10.0 liter (2.64 US gal, 2.20 imp gal)
	Displacement	2.7 liter (0.71 US gal, 0.59 imp gal)
	Compression ratio	53 x 53 mm (2.1 x 2.1 in)
	Valve train	234 cm ³ (14.3 cu-in)
	Intake valve opens	9.2 : 1
	Intake valve closes	Chain drive and OHC with rocker arm
	Exhaust valve opens	-5° BTDC
	Exhaust valve closes	35° ABDC
	Lubrication system	35° BBDC
	Oil pump type	-5° ATDC
	Cooling system	Forced pressure and wet sump
	Air filtration	Trochoid
	Crankshaft type	Air cooled
	Engine dry weight	Paper filter
	Cylinder arrangement	Assembled type
		38.5 kg (84.9 lbs)
		Vertical twin, parallel

GENERAL (Cont'd)

ITEM		SPECIFICATION
CARBURETOR	Carburetor type	Constant velocity single carburetor
	Throttle bore	26 mm (1.0 in)
DRIVE TRAIN	Clutch system	Multi-plate, wet
	Clutch operation system	Mechanical type
	Transmission	Constant mesh, 5-speed
	Primary reduction	3.631 (69/19)
	Final reduction	2.357 (33/14)
	Gear ratio	1st 2.846 (37/13)
		2nd 1.777 (32/18)
		3rd 1.333 (28/21)
		4th 1.083 (26/24)
		5th 0.913 (21/23)
	Gearshift pattern	Left foot operated return system, 1 - N - 2 - 3 - 4 - 5
ELECTRICAL	Ignition system	AC-CDI
	Starting system	Electric starter motor
	Charging system	Triple phase output alternator
	Regulator/rectifier	SCR shorted/triple phase full wave rectification
	Lighting system	Battery

GENERAL INFORMATION

Unit: mm (in)

LUBRICATION SYSTEM

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	At draining	1.5 liter (1.6 US qt, 1.3 Imp qt)	—
	At disassembly	1.8 liter (1.9 US qt, 1.6 Imp qt)	—
Recommended engine oil		HONDA GN4 4-stroke oil or equivalent motor oil API service classification SF or SG Viscosity: SAE 10W - 40	—
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 - 0.21 (0.006 - 0.008)	0.25 (0.010)
	End clearance	0.05 - 0.13 (0.002 - 0.005)	0.14 (0.006)

FUEL SYSTEM

ITEM		SPECIFICATION
Carburetor identification number	49 states type	VE35C
	California type	VE36B
	CM type	VE35D
Main jet		# 108
Slow jet		# 38
Pilot screw	Initial opening	2-3/4 turns out
	High altitude setting	2-1/4 turns out
Float level		18.5 mm (0.73 in)
Idle speed		1,400 ± 100 rpm
Throttle grip free play		2 - 6 mm (1/12 - 1/4 in)

Unit: mm (in)

CYLINDER HEAD/VALVES			STANDARD	SERVICE LIMIT
ITEM				
Cylinder compression			1,100 kPa (11.2 kgf/cm ² , 159 psi) at 600 rpm	—
Cylinder head warpage			—	0.10 (0.004)
Valve and valve guide	Valve clearance	IN/EX	0.06 – 0.10 (0.002 – 0.004)	—
	Valve stem O.D.	IN	5.450 – 5.465 (0.2146 – 0.2152)	5.42 (0.213)
		EX	5.430 – 5.445 (0.2138 – 0.2144)	5.40 (0.213)
	Valve guide I.D.	IN	5.475 – 5.485 (0.2156 – 0.2159)	5.50 (0.217)
		EX	5.475 – 5.485 (0.2156 – 0.2159)	5.50 (0.217)
	Stem-to-guide clearance	IN	0.010 – 0.035 (0.0004 – 0.0014)	0.08 (0.003)
		EX	0.030 – 0.055 (0.0012 – 0.0022)	0.10 (0.004)
	Valve seat width	IN/EX	1.0 – 1.1 (0.039 – 0.043)	1.8 (0.07)
Valve spring free length	Inner	IN/EX	29.9 (1.18)	29.0 (1.14)
	Outer	IN/EX	38.2 (1.50)	37.0 (1.46)
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)
	Rocker arm-to-shaft clearance		0.013 – 0.043 (0.0005 – 0.0017)	0.05 (0.002)
Camshaft	Cam lobe height	IN	27.383 – 27.543 (1.0781 – 1.0844)	27.2 (1.07)
		EX	27.209 – 27.369 (1.0712 – 1.0775)	27.0 (1.06)
	Runout		—	0.05 (0.002)
	Journal O.D.		19.967 – 19.980 (0.7861 – 0.7866)	19.92 (0.784)
	Bushing I.D.		20.063 – 20.083 (0.7899 – 0.7907)	20.20 (0.795)

Unit: mm (in)

Unit: mm (in)

CYLINDER/PISTON			STANDARD	SERVICE LIMIT
ITEM				
Cylinder	I.D.		53.000 – 53.010 (2.0866 – 2.0870)	53.10 (2.091)
	Out of round		—	0.05 (0.002)
	Taper		—	0.06 (0.002)
	Warpage		—	0.05 (0.002)
Piston, piston ring	Piston mark direction		"IN" mark facing toward the intake side	—
	Piston O.D.		52.970 – 52.990 (2.0854 – 2.0862)	52.90 (2.083)
	Piston O.D. measurement point		10 mm (0.4 in) from bottom of skirt	—
	Piston pin bore I.D.		15.002 – 15.008 (0.5906 – 0.5909)	15.05 (0.593)
	Piston pin O.D.		14.994 – 15.000 (0.5903 – 0.5906)	14.98 (0.590)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.07 (0.003)
	Piston ring-to-ring groove clearance	Top	0.015 – 0.045 (0.0006 – 0.0018)	0.10 (0.004)
		Second	0.015 – 0.050 (0.0006 – 0.0020)	0.10 (0.004)
	Piston ring end gap	Top	0.15 – 0.30 (0.006 – 0.012)	0.45 (0.018)
		Second	0.30 – 0.45 (0.012 – 0.018)	0.60 (0.024)
		Oil (side rail)	0.2 – 0.7 (0.01 – 0.03)	0.90 (0.035)
Cylinder-to-piston clearance			0.010 – 0.040 (0.0004 – 0.0016)	0.10 (0.004)
Connecting rod small end I.D.			15.016 – 15.034 (0.5912 – 0.5919)	15.08 (0.594)
Connecting rod-to-piston pin clearance			0.016 – 0.040 (0.0006 – 0.0016)	0.10 (0.004)

GENERAL INFORMATION

Unit: mm (in)

CLUTCH/GEARSHIFT LINKAGE			
ITEM		STANDARD	SERVICE LIMIT
Clutch lever free play		10 – 20 (3/8 – 3/4)	—
Clutch spring free length		37.8 (1.49)	36.0 (1.42)
Clutch disc thickness		2.92 – 3.08 (0.115 – 0.121)	2.6 (0.10)
Clutch plate warpage		—	0.20 (0.008)
Clutch outer I.D.		26.000 – 26.021 (1.0236 – 1.0244)	26.04 (1.025)
Clutch outer guide	I.D.	20.000 – 20.021 (0.7874 – 0.7882)	20.05 (0.789)
	O.D.	25.959 – 25.980 (1.0220 – 1.0228)	25.90 (1.020)

Unit: mm (in)

ALTERNATOR/STARTER CLUTCH			
ITEM		STANDARD	SERVICE LIMIT
Starter driven sprocket	I.D.	22.010 – 22.022 (0.8665 – 0.8670)	22.08 (0.869)
	Boss O.D.	36.975 – 37.000 (1.4557 – 1.4567)	36.90 (1.453)

Unit: mm (in)

Unit: mm (in)

CRANKSHAFT/TRANSMISSION						
ITEM			STANDARD		SERVICE LIMIT	
Crankshaft	Connecting rod big end	Side clearance	0.10 – 0.40 (0.004 – 0.016)		0.60 (0.024)	
		Radial clearance	0.004 – 0.012 (0.0002 – 0.0005)		0.05 (0.002)	
	Runout	At both ends	—		0.03 (0.001)	
		At bearing holder	—		0.05 (0.002)	
Transmission	Gear I.D.	M5	20.020 – 20.041 (0.7882 – 0.7890)		20.08 (0.791)	
		C1	20.020 – 20.041 (0.7882 – 0.7890)		20.08 (0.791)	
		C4	20.020 – 20.041 (0.7882 – 0.7890)		20.08 (0.791)	
	Gear bushing O.D.		C1	19.979 – 20.000 (0.7866 – 0.7874)		19.93 (0.785)
	Gear bushing I.D.		C1	16.516 – 16.534 (0.6502 – 0.6509)		16.58 (0.653)
	Gear-to-bushing clearance		C1	0.020 – 0.062 (0.0008 – 0.0024)		0.10 (0.004)
	Mainshaft O.D.		M5	19.959 – 19.980 (0.7858 – 0.7866)		19.91 (0.784)
	Countershaft O.D.	C1	16.466 – 16.484 (0.6475 – 0.6490)		16.41 (0.646)	
		C4	19.959 – 19.980 (0.7858 – 0.7866)		19.91 (0.784)	
	Gear-to-shaft clearance	M5	0.040 – 0.082 (0.0016 – 0.0032)		0.10 (0.004)	
		C4	0.040 – 0.082 (0.0016 – 0.0032)		0.10 (0.004)	
	Bushing-to-shaft clearance		C1	0.032 – 0.068 (0.0013 – 0.0027)		0.10 (0.004)
Shift fork, shaft	Fork	I.D.	12.000 – 12.018 (0.4724 – 0.4731)		12.05 (0.474)	
		Claw thickness	4.93 – 5.00 (0.194 – 0.197)		4.80 (0.189)	
	Fork shaft O.D.		11.976 – 11.994 (0.4724 – 0.4731)		11.93 (0.470)	

Unit: mm (in)

FRONT WHEEL/SUSPENSION/STEERING

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		—	1.5 (0.06)
Cold tire pressure	Up to 90 kg (200 lb) load	200 kPa (2.00 kgf/cm ² , 29 psi)	—
	Up to maximum weight capacity	200 kPa (2.00 kgf/cm ² , 29 psi)	—
Axle runout		—	0.20 (0.008)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Wheel hub-to-rim distance		30.75 ± 1 (1.21 ± 0.04)	—
Fork spring free length		546.0 (21.50)	535.1 (21.07)
Fork tube runout		—	0.20 (0.008)
Recommended fork fluid		Pro Honda Suspension Fluid SS-8	—
Fork fluid level		129 (5.1)	—
Fork fluid capacity		234 cm ³ (7.9 US oz, 8.2 imp oz)	—
Steering head bearing preload		1.04 - 1.53 kg (2.29 - 3.37 lbs)	—

Unit: mm (in)

REAR WHEEL/BRAKE/SUSPENSION

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		—	2.0 (0.08)
Cold tire pressure	Up to 90 kg (200 lb) load	200 kPa (2.00 kgf/cm ² , 29 psi)	—
	Up to maximum weight capacity	200 kPa (2.00 kgf/cm ² , 29 psi)	—
Axle runout		—	0.20 (0.008)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Wheel hub-to-rim distance		21.6 ± 1 (0.85 ± 0.04)	—
Brake pedal free play		20 - 30 (3/4 - 1-1/4)	—
Brake drum I.D.		130.0 (5.12)	131 (5.2)
Brake lining thickness		4.5 (0.18)	2.0 (0.08)

Unit: mm (in)

HYDRAULIC BRAKE

ITEM		STANDARD	SERVICE LIMIT
Specified brake fluid		DOT 3 or 4	—
Brake disc thickness		4.0 (0.16)	3.5 (0.14)
Brake disc runout		—	0.30 (0.012)
Master cylinder	Cylinder I.D.	12.700 - 12.743 (0.5000 - 0.5017)	12.755 (0.5022)
	Piston O.D.	12.657 - 12.684 (0.4983 - 0.4994)	12.645 (0.4978)
Brake caliper	Cylinder I.D.	25.400 - 25.405 (1.0000 - 1.0002)	25.450 (1.0020)
	Piston O.D.	25.363 - 25.368 (0.9981 - 0.9987)	25.300 (0.9961)

GENERAL INFORMATION

BATTERY/CHARGING SYSTEM

ITEM			SPECIFICATION
Battery	Capacity		12V – 6 Ah
	Current leakage		1 mA max.
	Voltage (20°C/68°F)	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.3 V
	Charging current	Normal	0.6 A/10 h
		Quick	3.0 A/1.0 h
Alternator	Capacity		190 W/5,000 rpm
	Charging coil resistance		0.2 – 0.8 Ω
Regulator/rectifier regulated voltage		'96 – 2000	13.5 – 14.0 V/5,000 rpm
		After 2000	14.6 – 15.6 V/5,000 rpm

IGNITION SYSTEM

ITEM		SPECIFICATION	
Spark plug		NGK	DENSO
	Standard	CR6HSA	U20FSR-U
	For cold climate (below 5°C/41°F)	CR5HSA	U16FSR-U
	For extended high speed riding	CR7HSA	U22FSR-U
Spark plug gap		0.6 – 0.7 mm (0.02 – 0.03 in)	
Ignition coil peak voltage		100 V minimum	
Alternator exciter coil peak voltage		100 V minimum	
Ignition pulse generator peak voltage		0.7 V minimum	
Ignition timing	"F" mark	10° BTDC/1,400 rpm	
	Full advance	25° BTDC	

Unit: mm (in)

ELECTRIC STARTER

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush spring tension	780 – 1,060 g	450 g
Starter motor brush length	12.5 – 13.0 (0.49 – 0.51)	8.5 (0.33)

LIGHTS/METER/SWITCHES			SPECIFICATION
ITEM			
Bulbs	Headlight (High/low beam)	'98 – 2000	12 V – 36.8/35 W
		After 2000	12 V – 60/55 W
	Tail/brake light		12 V – 2/32 cp (7/27 W)
	License light		12 V – 4 cp (8 W)
	Front turn signal light		12 V – 32 cp (23 W)
	Rear turn signal light		12 V – 32 cp (23 W)
	Instrument light		12 V – 3.4 W
	High beam indicator		12 V – 3.4 W
	Turn signal indicator		12 V – 3.4 W
	Neutral indicator		12 V – 3 W
	Side stand indicator ('96 – 2000)		12 V – 2 W
	Fuse	Main fuse	
Sub fuse		10 A x 2	

GENERAL INFORMATION

TORQUE VALUES

FASTENER TYPE	TORQUE Nm (kgf-m, lbf-ft)	FASTENER TYPE	TORQUE Nm (kgf-m, lbf-ft)
5 mm hex bolt and nut	5 (0.5, 3.6)	5 mm screw	4 (0.4, 2.9)
6 mm hex bolt and nut	10 (1.0, 7)	6 mm screw	9 (0.9, 6.5)
8 mm hex bolt and nut	22 (2.2, 16)	6 mm flange bolt (8 mm head)	9 (0.9, 6.5)
10 mm hex bolt and nut	34 (3.5, 25)	6 mm flange bolt (10 mm head) and nut	12 (1.2, 9)
12 mm hex bolt and nut	64 (5.5, 40)	8 mm flange bolt and nut	26 (2.7, 20)
		10 mm flange bolt and nut	39 (4.0, 29)

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

NOTES: 1. Apply a locking agent to the threads.
 2. Left hand threads.
 3. Stake.
 4. U-nut.
 5. ALOC bolt: replace with a new one.

ENGINE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE Nm (kgf-m, lbf-ft)	REMARKS
Lubrication System:				
Oil pump mounting screw	3	6	10 (1.0, 7)	
Cylinder Head/Valves:				
Spark plug	2	10	12 (1.2, 9)	
Valve adjuster lock nut	4	5	10 (1.0, 7)	
Cylinder head/camshaft holder nut	8	8	23 (2.3, 17)	
Cylinder head bolt	3	6	12 (1.2, 9)	
Cam sprocket bolt	2	7	20 (2.0, 14)	Note 1
Cylinder head cover bolt	2	6	10 (1.0, 7)	
Clutch/Gearshift Linkage:				
Clutch lifter bolt	4	6	12 (1.2, 9)	
Clutch center lock nut	1	16	74 (7.5, 54)	Note 2
Shift drum stopper arm bolt	1	6	12 (1.2, 9)	
Gearshift return spring pin	1	8	25 (2.5, 18)	Note 1
Primary drive gear lock nut	1	16	53 (5.4, 39)	
Crankcase/Crankshaft:				
Drive sprocket bolt	2	6	12 (1.2, 9)	
Oil drain bolt	1	12	25 (2.5, 18)	
Crankshaft mounting bolt	5	8	23 (2.3, 17)	
Crankshaft mounting nut	1	6	12 (1.2, 9)	
Oil passage plate mounting screw	3	6	10 (1.0, 7)	Note 1
Alternator/Starter Clutch:				
Flywheel bolt	1	10	59 (6.0, 43)	
Starter clutch mounting screw	3	6	9 (0.9, 6.5)	Note 1, 2
Stator mounting bolt	3	5	6 (0.6, 4.3)	
Stator wire clamp bolt	1	5	6 (0.6, 4.3)	
Ignition pulse generator mounting bolt	2	6	10 (1.0, 7)	
Starter motor terminal nut	1	6	6 (0.6, 4.3)	

FRAME				
ITEM	QTY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
Frame/Body Panels/Exhaust System:				
Steering lock mounting screw	2	6	9 (0.9, 6.5)	Note 1
Gearshift pedal pivot cap nut	1	8	22 (2.2, 16)	
Gearshift pedal link adjuster lock nut (front)	1	6	10 (1.0, 7)	Note 2
Gearshift pedal link adjuster lock nut	1	6	10 (1.0, 7)	
Side stand pivot bolt	1	10	10 (1.0, 7)	
Side stand pivot nut	1	10	29 (3.0, 22)	Note 4
Fuel valve lock nut	1	18	26 (2.7, 20)	
Engine Mounting:				
Engine front mounting nut	1	10	62 (6.3, 46)	
Engine rear mounting nut	2	10	88 (9.0, 65)	
Front Wheel/Suspension/Steering:				
Steering stem nut	1	22	74 (7.5, 54)	
Steering stem bearing adjusting nut	1	22	3 (0.3, 2.2)	
Fork top pinch bolt	2	7	11 (1.1, 8)	
Fork bottom pinch bolt	2	8	34 (3.5, 25)	
Front axle bolt	1	12	62 (6.3, 46)	
Brake disc mounting bolt	6	8	39 (4.0, 29)	Note 5
Wheel spoke	36	BC 3.2	4 (0.4, 2.9)	
Tire valve nut	1	8V1	3 (0.3, 2.2)	
Fork cap	2	28	22 (2.2, 16)	
Fork socket bolt	2	8	20 (2.0, 14)	Note 1
Rear Wheel/Brake/Suspension:				
Rear axle nut	1	14	88 (9.0, 65)	Note 4
Wheel spoke	36	BC 3.2	4 (0.4, 2.9)	
Tire valve nut	1	8V1	3 (0.3, 2.2)	
Driven sprocket mounting nut	4	10	64 (6.5, 48)	Note 4
Shock absorber mounting bolt (upper)	2	8	26 (2.7, 20)	
(lower)	2	10	42 (4.3, 31)	
Swingarm pivot nut	1	14	88 (9.0, 65)	Note 4
Drive chain slider mounting self tapping screw	3	5	3 (0.3, 2.2)	
Drive chain adjuster lock nut	2	6	10 (1.0, 7)	
Hydraulic brake:				
Caliper pin bolt	1	8	22 (2.2, 16)	
Caliper pin bolt A	1	8	18 (1.8, 13)	
Caliper bleed valve	1	7	6 (0.6, 4.3)	
Pad pin	2	10	18 (1.8, 13)	
Pad pin plug	2	10	2 (0.2, 1.4)	
Caliper bracket mounting bolt	2	8	30 (3.1, 22)	Note 5
Brake hose bolt	2	10	34 (3.5, 25)	
Master cylinder holder bolt	2	6	12 (1.2, 9)	
Master cylinder reservoir cap screw	2	4	1 (0.1, 0.7)	
Brake lever pivot bolt	1	6	6 (0.6, 4.3)	
Brake lever pivot nut	1	6	6 (0.6, 4.3)	
Brake switch mounting screw	1	4	1 (0.1, 0.7)	
Brake hose clamp bolt	2	6	12 (1.2, 9)	
Lights/Meter/Switches:				
Headlight bracket mounting nut	1	10	34 (3.5, 25)	Note 4
Tail light unit mounting nut	2	8	7 (0.7, 5.1)	

GENERAL INFORMATION

TOOLS

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

DESCRIPTION	TOOL NUMBER	REMARKS	REF. SEC.
Carburetor float level gauge	07401 - 0010000		5
Wheel spoke wrench	07701 - 0020300	NOTE 2	12, 13
Valve adjuster wrench B	07708 - 0030400	NOTE 3: 07908 - KE90200	3
Timing cap wrench	07709 - 0010001		3
Lock nut wrench, 20 x 24 mm	07716 - 0020100		9
Extension bar	07716 - 0020500	NOTE 1	9
Gear holder	07724 - 0010200		9
Flywheel holder	07725 - 0040000		10
Flywheel puller	07733 - 0020001		10
Valve guide driver, 5.5 mm	07742 - 0010100		7
Attachment, 32 x 35 mm	07746 - 0010100		11, 13
Attachment, 37 x 40 mm	07746 - 0010200		12
Attachment, 42 x 47 mm	07746 - 0010300		11, 12
Attachment, 52 x 55 mm	07746 - 0010400		11
Attachment, 62 x 68 mm	07746 - 0010500		11
Pilot, 15 mm	07746 - 0040300		11, 12, 13
Pilot, 20 mm	07746 - 0040500		11
Pilot, 25 mm	07746 - 0040600		11
Pilot, 22 mm	07746 - 0041000		11
Bearing remover head, 15 mm	07746 - 0050400		12, 13
Bearing remover shaft	07746 - 0050100		12, 13
Oil seal driver	07747 - 0010100		12
Oil seal driver attachment	07747 - 0010501		12
Driver	07749 - 0010000		11, 12, 13
Valve spring compressor	07757 - 0010000		7
Valve seat cutter		NOTE 1	
Seat cutter, 24.5 mm (45° IN)	07780 - 0010100		7
Seat cutter, 22 mm (45° EX)	07780 - 0010701		7
Flat cutter, 25 mm (32° IN)	07780 - 0012000		7
Flat cutter, 21.5 mm (32° EX)	07780 - 0012800		7
Interior cutter, 30 mm (60° IN/EX)	07780 - 0014000		7
Cutter holder, 5.5 mm	07781 - 0010101	NOTE 1	7
Pilot screw wrench	07908 - 4220201		5
Snap ring pliers	07914 - 3230001		14
Steering stem socket	07916 - 3710101		12
Bearing remover set	07936 - 3710001		13
— Remover handle	07936 - 3710100		
— Bearing remover set	07936 - 3710600		
— Remover weight	07741 - 0010201	NOTE 3: 07936 - 3710200	
Bearing remover set, 15 mm	07936 - KC10000		11
— Remover shaft, 15 mm	07936 - KC10100		11
— Remover head, 15 mm	07936 - KC10200		11
— Remover weight	07741 - 0010201	NOTE 3: 07936 - 3710200	11

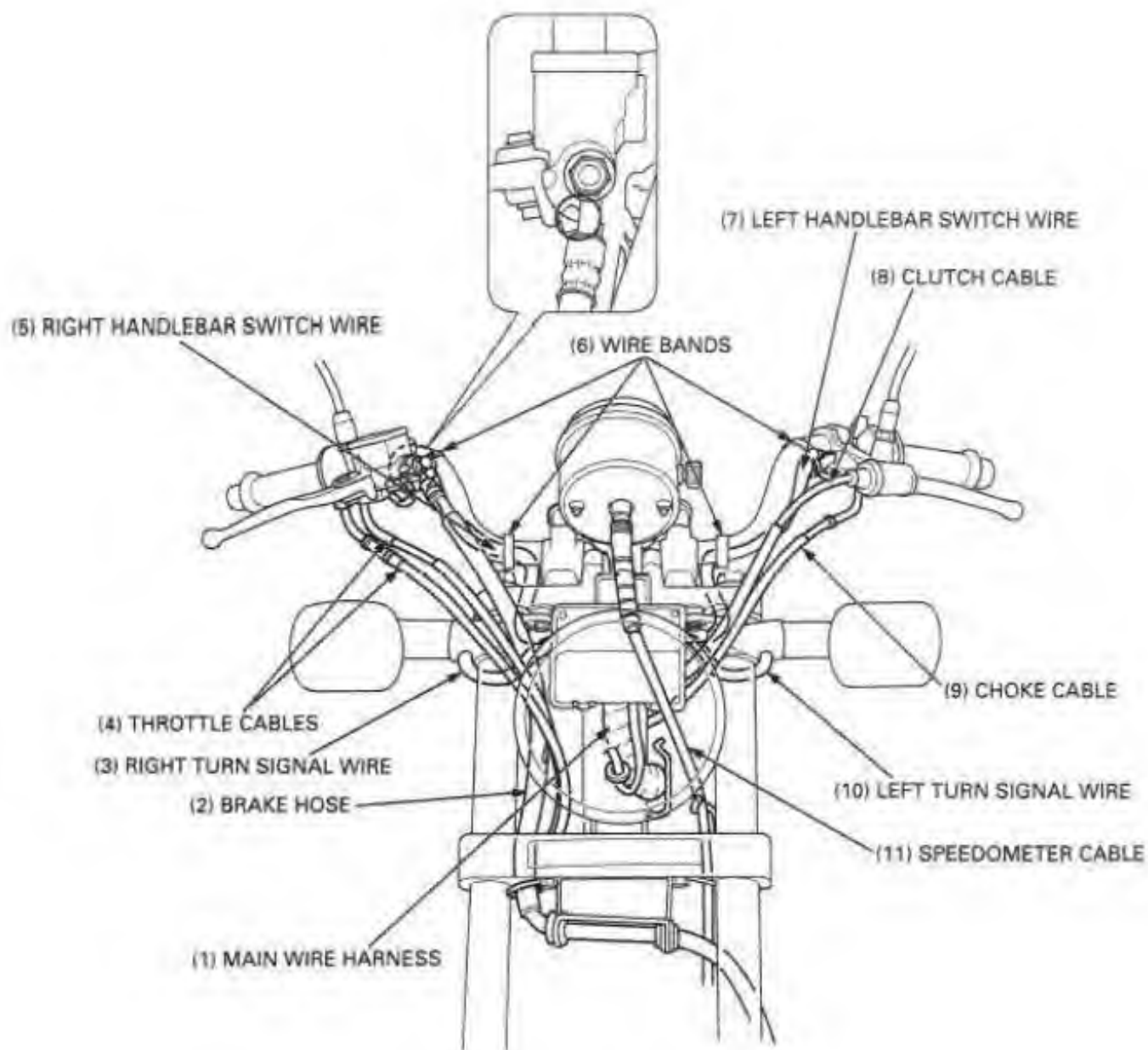
DESCRIPTION	TOOL NUMBER	REMARKS	REF. SEC.
Ball race driver	07944 - 1150001		12
Stem bearing driver	07946 - GC40000		12
Needle bearing remover	07946 - KA50000		13
Piston base	07958 - 3000000		8
Valve guide reamer, 5.485 mm	07984 - 0980001	NOTE 3: 07984 - 098000D (U.S.A. only)	7
Clutch center holder	07GMB - KT70101		9
Peak voltage adapter	07HGJ - 0020100	NOTE 3: Imrie diagnostic tester (model 625)	16
Drive chain tool set	07HMH - MR10103	NOTE 3: 07HMH - MR1010A (U.S.A. only)	3
Analog tester (SANWA)	SP - 15D	NOTE 1	16, 17, 18
Analog tester (KOWA)	TH - 5H		16, 17, 18

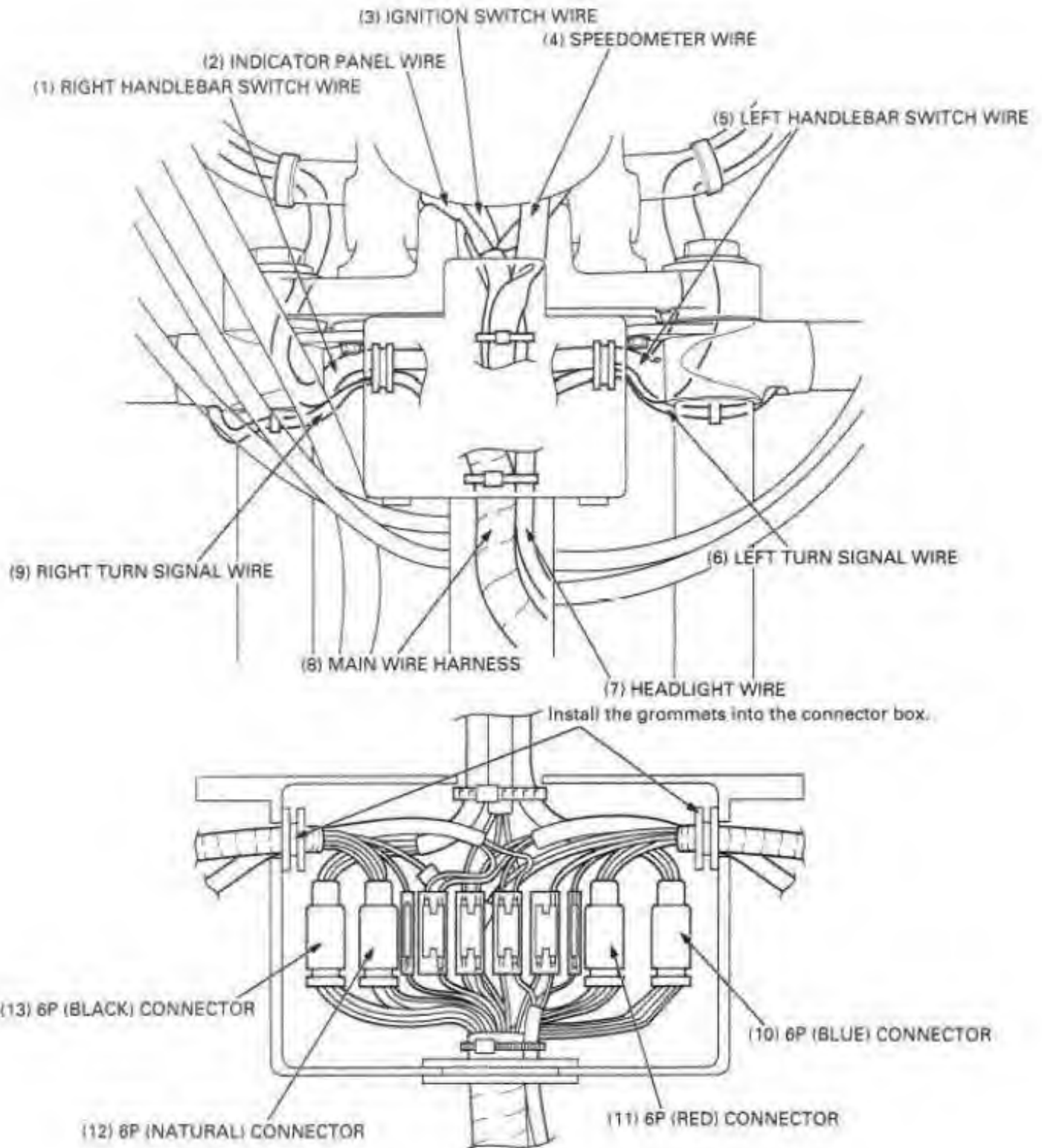
LUBRICATION & SEAL POINTS

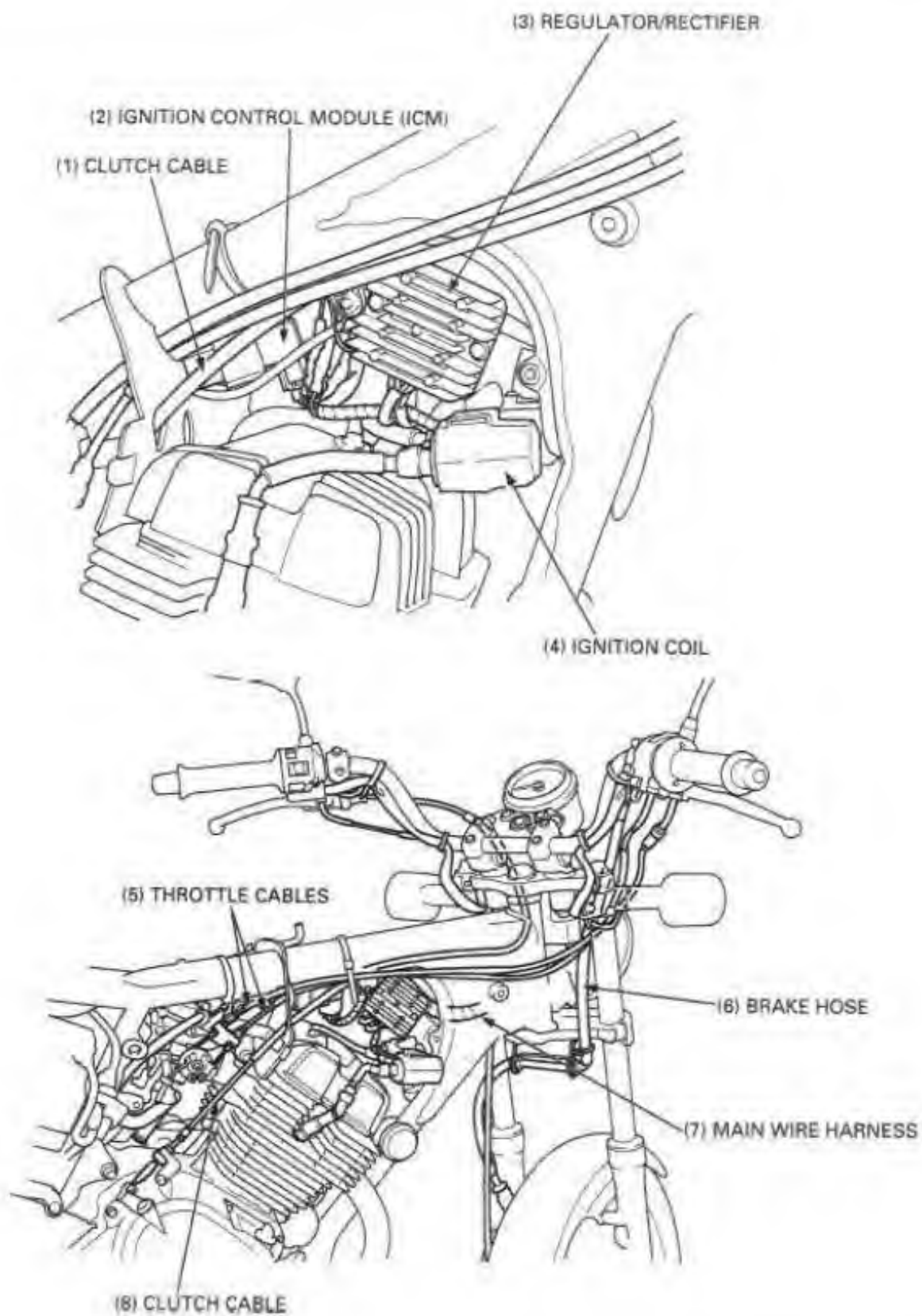
ENGINE		
LOCATION	MATERIAL	REMARKS
Rocker arm and shaft sliding surface Cam chain Transmission gear teeth and bushings Piston pin hole Piston pin surface Connecting rod small end Each bearing Piston ring sliding surface Piston ring and ring groove Crankshaft big end Shift fork claw and pivot inner surface Shift drum grooves Clutch disc	Engine oil	
Valve stem (valve guide sliding surface) Valve guide (valve stem sliding surface) Camshaft bushing inner surface Cam lobes M3, 4 gear spline C1 gear, C1 bushing sliding surface M4, C3, C5 shift fork grooves	Molybdenum disulfide oil (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease)	
Oil passage plate screw threads Starter clutch outer bolt threads Gearshift stopper plate bolt threads	Locking agent	

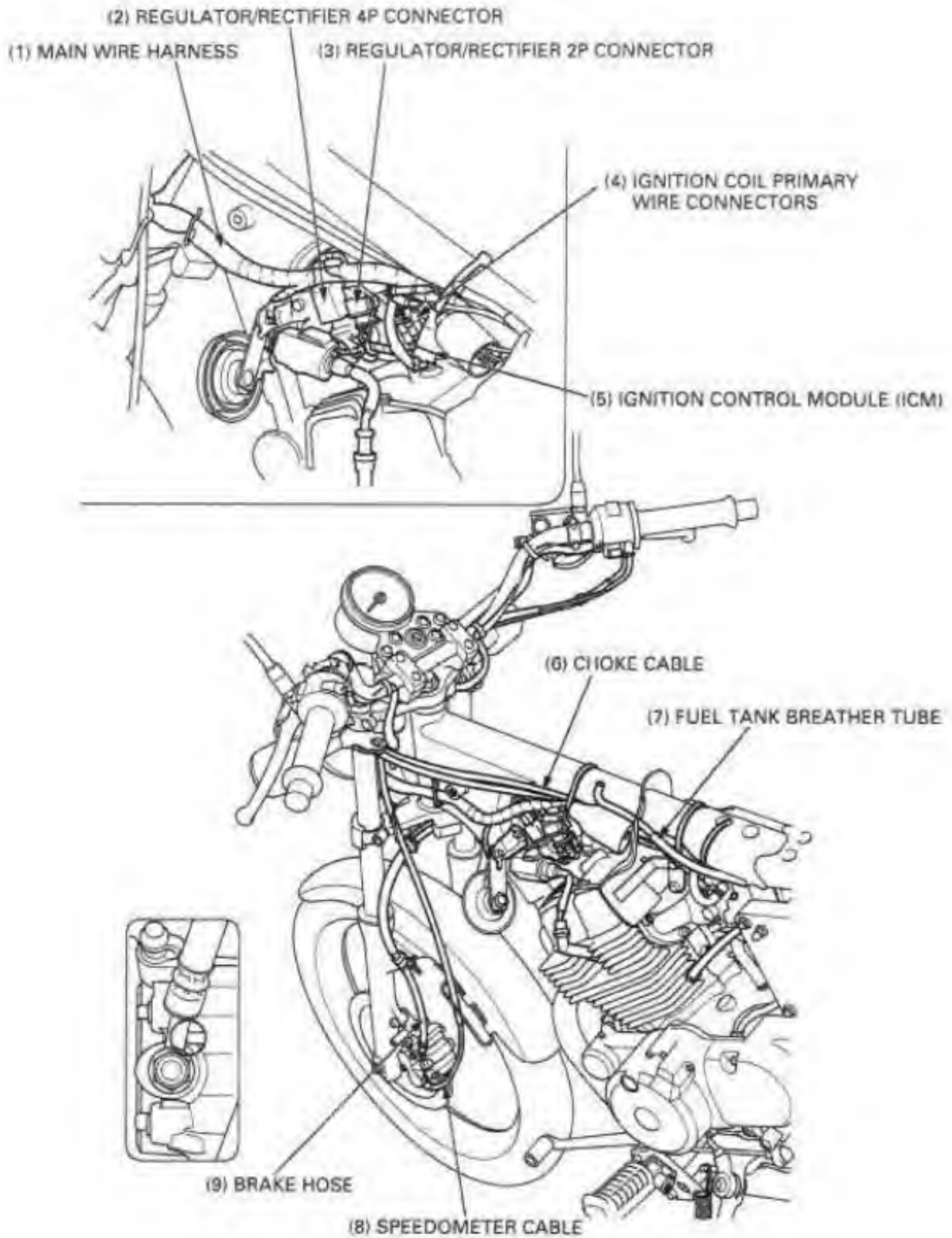
FRAME			
LOCATION	MATERIAL	REMARKS	
Steering stem bearing area Front wheel dust seal lips Rear wheel hub dust seal lips Speedometer gear inside Wheel axle outer surface Rear wheel O-ring Driven flange dust seal lips Rear brake anchor shaft Brake cam Rear brake pedal pivot shaft Swingarm pivot shaft outer surface Swingarm pivot dust seal lips Swingarm pivot bushing Throttle pipe inner surface Side stand pivot Gearshift pedal pivot Clutch lever pivot bolt	Multi purpose grease		
Steering lock mounting screw threads Drive chain case mounting bolt threads Helmet holder mounting bolt threads	Locking agent		
Fork oil seal lips Fork cap bolt O-ring	Pro-Honda suspension fluid SS-8 or equivalent		
Brake master cylinder piston and cups Caliper piston and piston seals	DOT 3 or DOT 4 brake fluid		
Caliper piston dust seals Front brake lever pivot bolt	Silicone grease		
Handlebar grip inner surface	Honda Bond A or Honda Hand Grip Cement (U.S.A. only)		

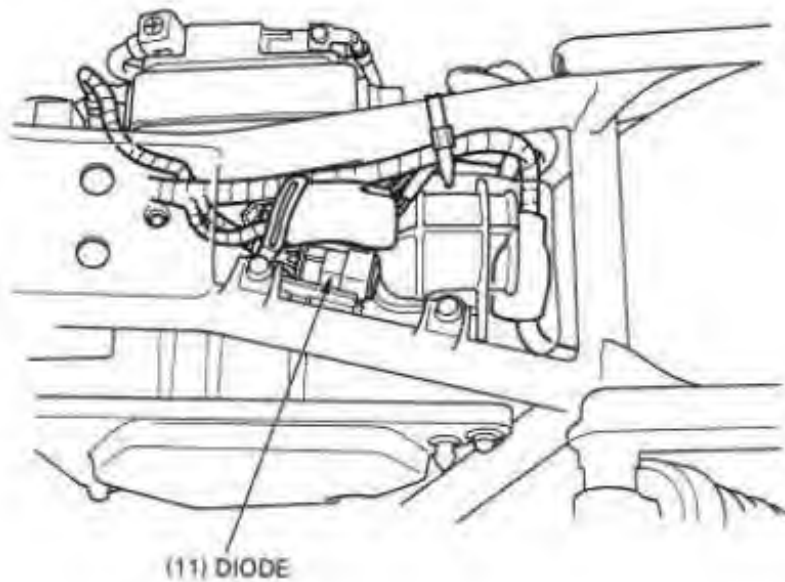
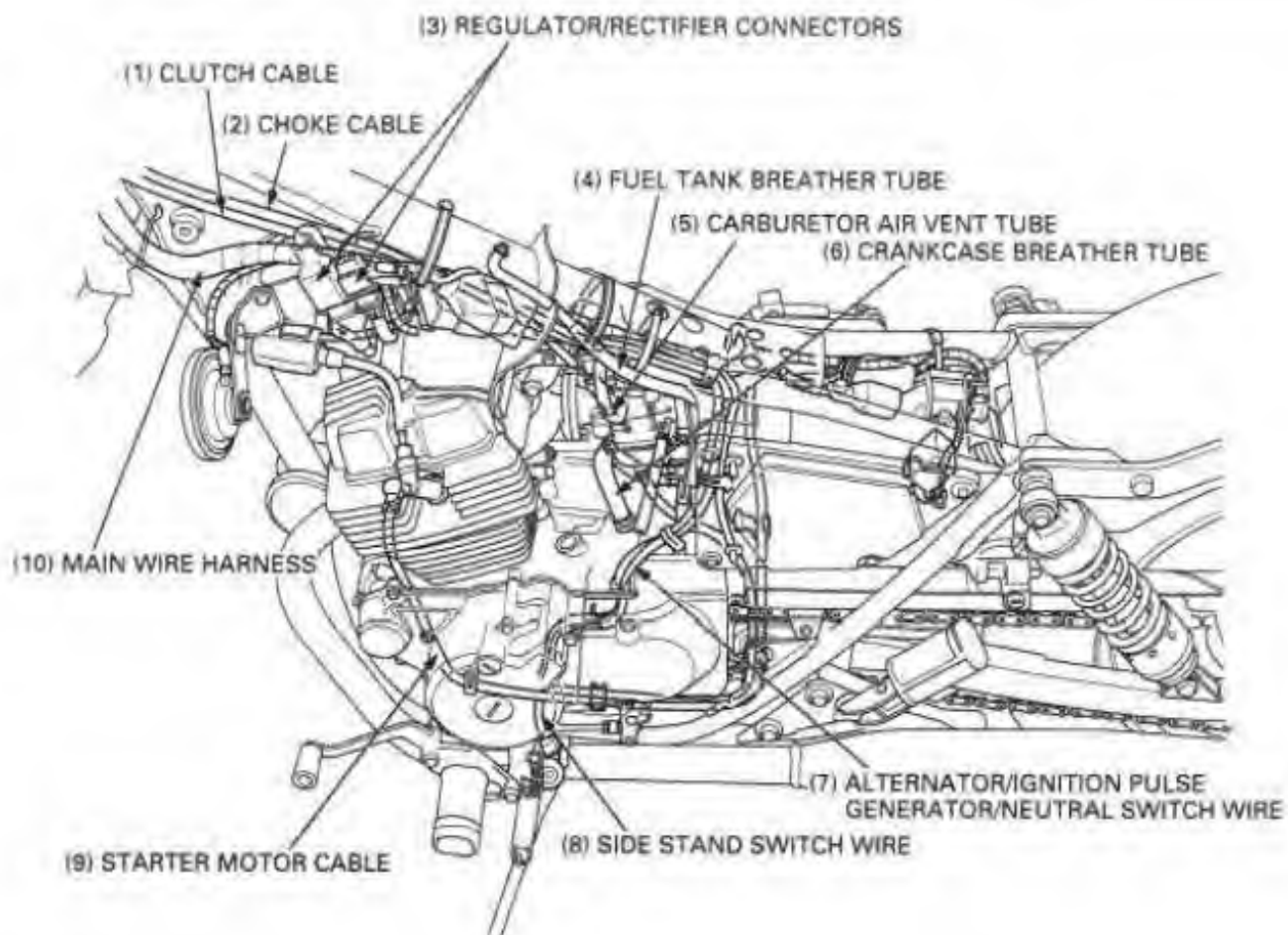
CABLE & HARNESS ROUTING

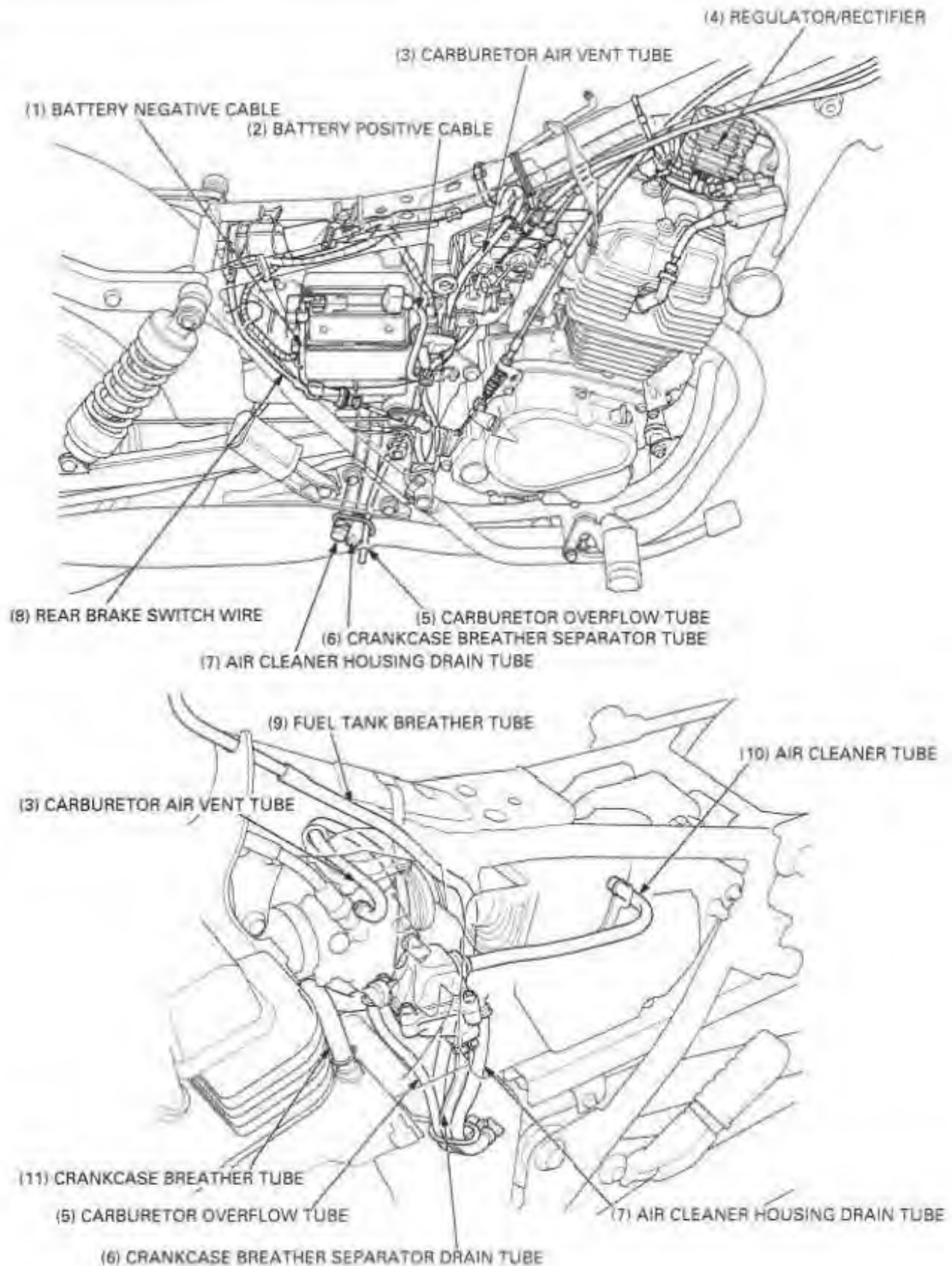


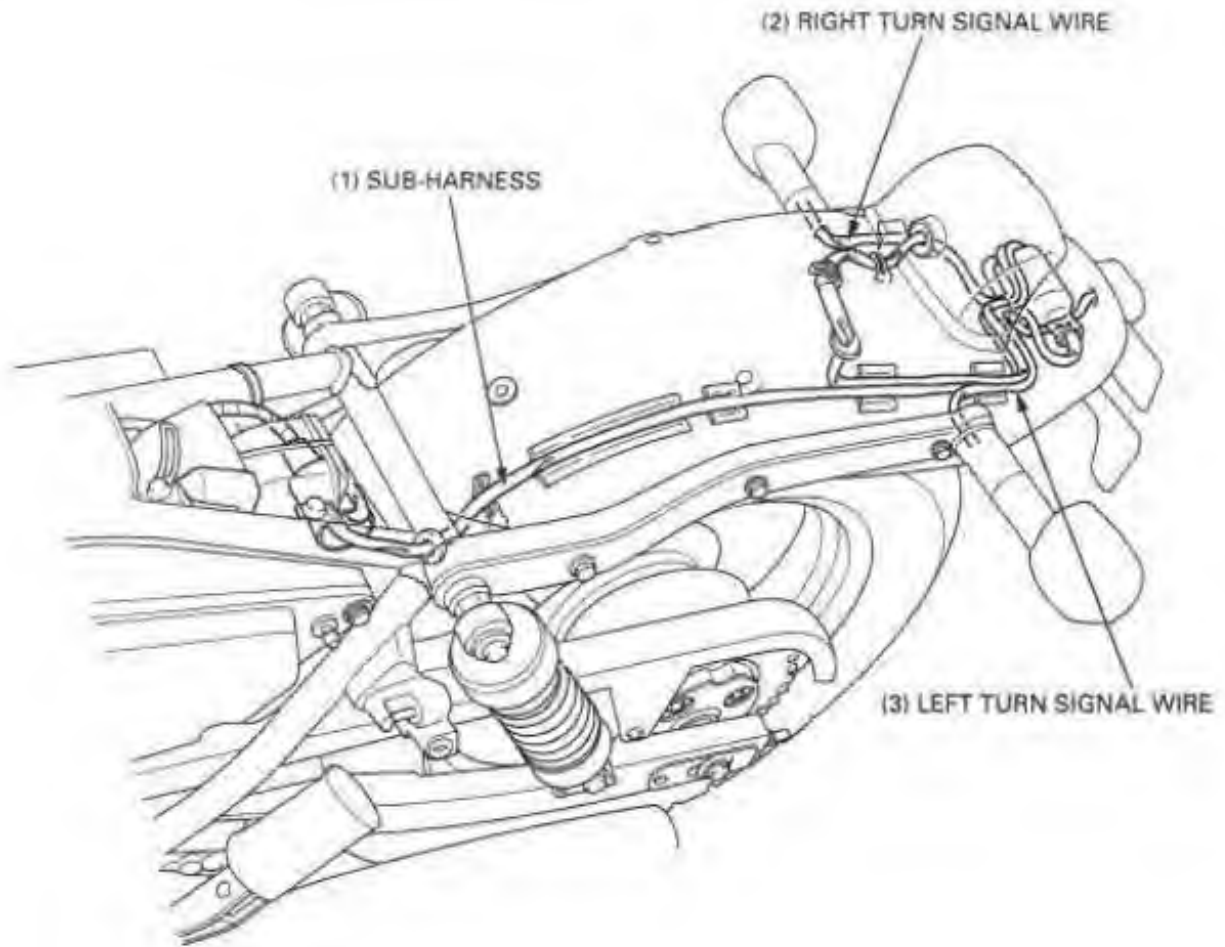




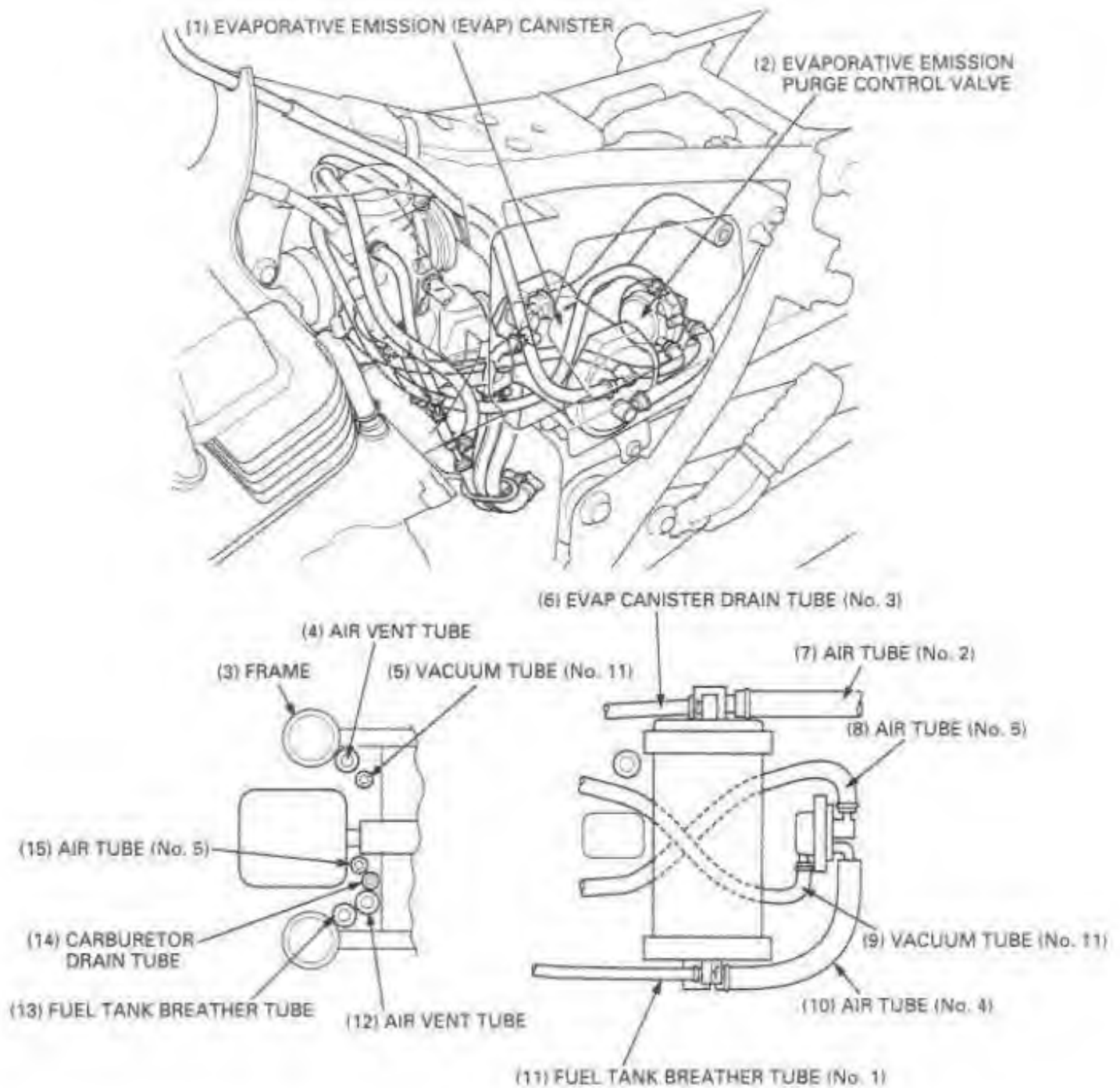








EMISSION CONTROL SYSTEM ROUTING (California Type Only)



EMISSION CONTROL SYSTEMS

The U.S. Environmental Protection Agency and California Air Resources Board (CARB) require manufacturers to certify that their motorcycles comply with applicable exhaust emissions standards during their useful life, when operated and maintained according to the instructions provided, and that motorcycles built after January 1, 1983 comply with applicable noise emission standards for one year or 6,000 km (3,730 miles) after the time of sale to the ultimate purchaser, when operated and maintained according to the instructions provided. Compliance with the terms of the Distributor's Limited Warranty for Honda Motorcycle Emission Control Systems is necessary in order to keep the emissions system warranty in effect.

SOURCE OF EMISSIONS

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

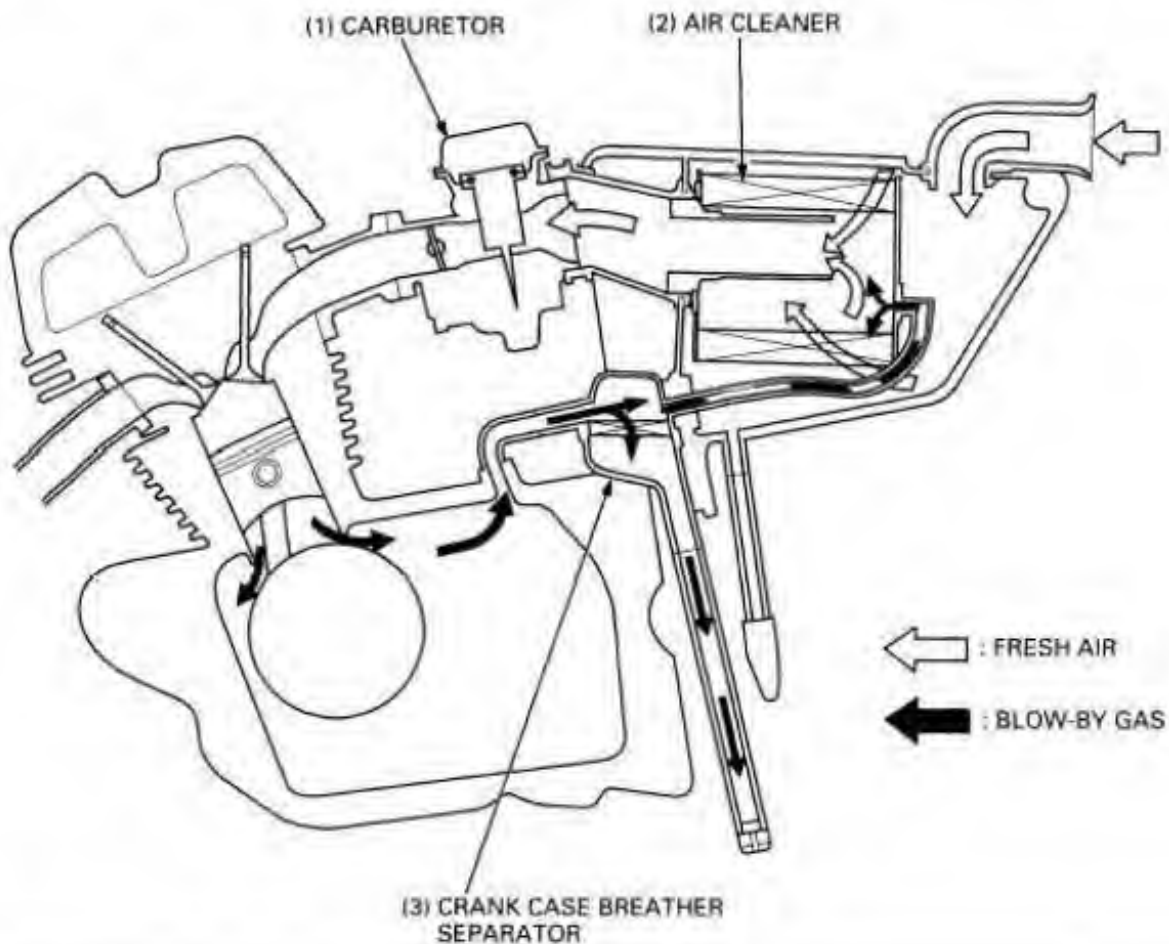
Honda Motor Co., Ltd. utilizes lean carburetor settings as well as other systems, to reduce carbon monoxide and hydrocarbons.

EXHAUST EMISSION CONTROL SYSTEM

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

CRANKCASE EMISSION CONTROL SYSTEM

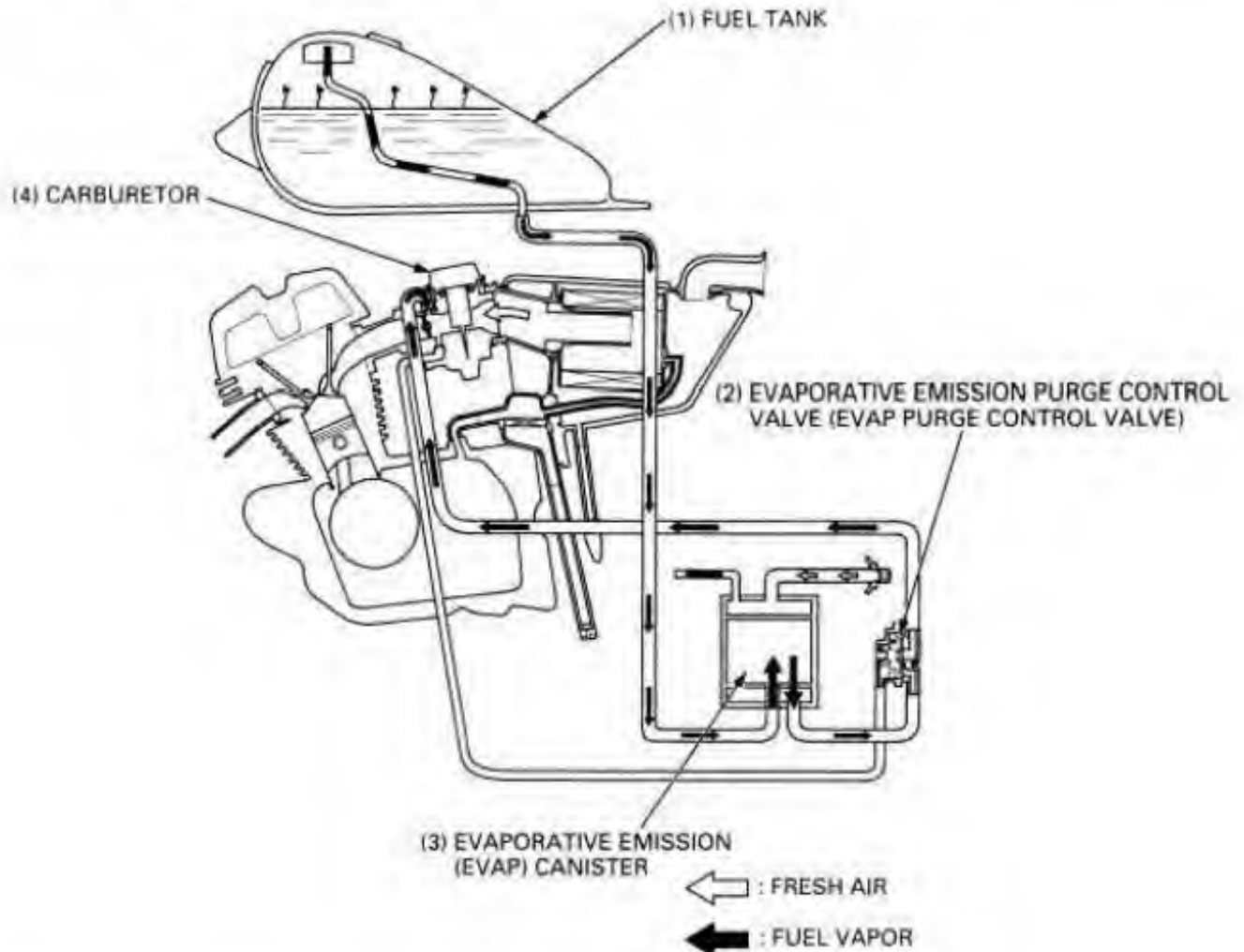
The engine is equipped with a closed crankcase system which routes crankcase emissions through the air cleaner into the combustion chamber.



EVAPORATIVE EMISSION CONTROL SYSTEM (California type only)

This vehicle complies with California Air Resources Board evaporative emission regulations.

Fuel vapor from the fuel tank and carburetor is directed into the evaporative emission (EVAP) canister where it is absorbed and stored while the engine is stopped. When the engine is running and the evaporative emission (EVAP) purge control valve is open, fuel vapor in the EVAP canister is drawn into the engine through the carburetor.

**NOISE EMISSION CONTROL SYSTEM**

TAMPERING WITH THE NOISE CONTROL SYSTEM IS PROHIBITED: federal law prohibits 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 the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use; (2) the use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

AMONG THOSE ACTS PRESUMED TO CONSTITUTE TAMPERING ARE THE 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.

GENERAL INFORMATION

EMISSION CONTROL INFORMATION LABELS (U.S.A. ONLY)

An Emission Control Information Label is located on the air cleaner housing cover as shown.

The left side cover must be removed to read it. It gives base tune-up specifications.

(1) EMISSION CONTROL INFORMATION LABEL



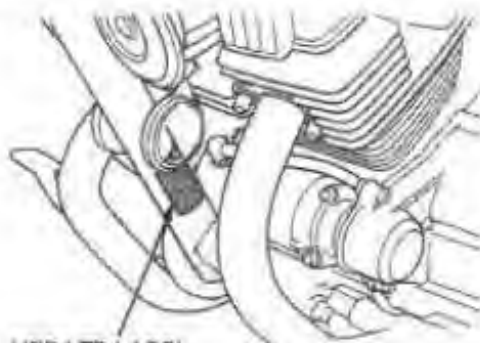
VEHICLE EMISSION CONTROL INFORMATION UPDATE LABEL

After making a high altitude carburetor adjustment, attach an update label on the right side of the down tube as shown.

Instructions for obtaining the update label are given in Service Letter 132.

When readjusting the carburetor back to the low altitude specifications, be sure to remove this update label.

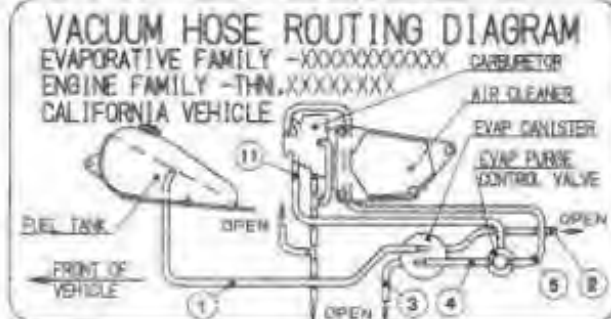
(1) UPDATE LABEL



VACUUM HOSE ROUTING DIAGRAM LABEL ('96 - '04 California type only)

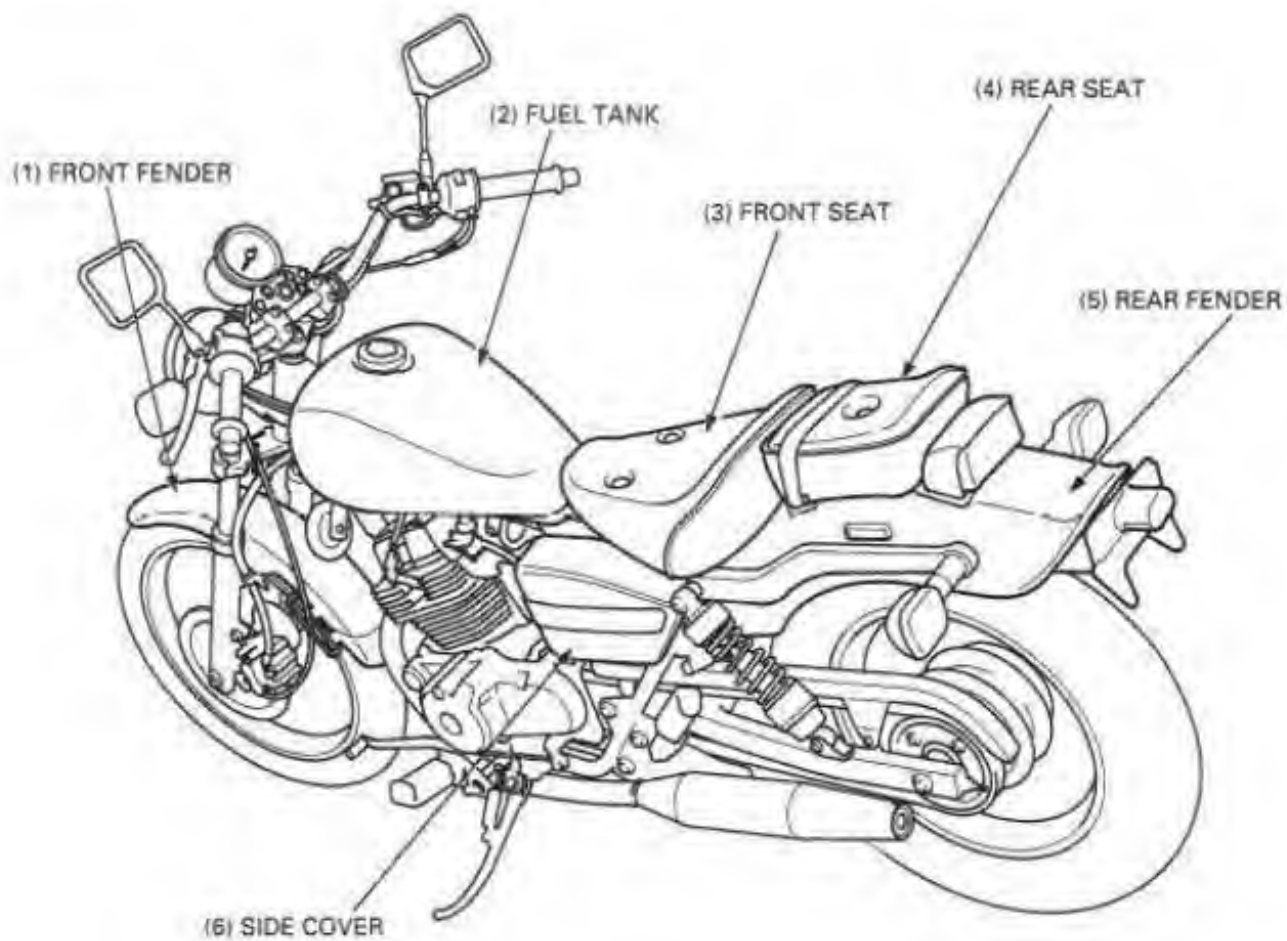
The Vacuum Hose Routing Diagram Label is on the air cleaner housing cover as shown.

The left side cover must be removed to read it.



MEMO

BODY PANEL LOCATIONS



2. FRAME/BODY PANELS/EXHAUST SYSTEM

2

BODY PANEL LOCATIONS	2-0	FUEL TANK	2-3
SERVICE INFORMATION	2-1	FRONT FENDER	2-4
TROUBLESHOOTING	2-1	REAR FENDER	2-4
SIDE COVER	2-2	EXHAUST SYSTEM	2-5
SEAT	2-2		

SERVICE INFORMATION

GENERAL

▲ WARNING

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

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.
- This section covers removal and installation of the body panels, fuel tank and exhaust system.
- Always replace the exhaust pipe gaskets after removing the exhaust pipe from the engine.
- When installing the exhaust system, loosely install all of the exhaust pipe fasteners. Always tighten the exhaust clamps first, then tighten the mounting fasteners. If you tighten the mounting fasteners first, the exhaust pipe may not seat properly.
- Always inspect the exhaust system for leaks after installation.

TORQUE VALUES

Fuel valve lock nut	26 N·m (2.7 kgf·m, 20 lbf·ft)
Exhaust pipe joint nut	14 N·m (1.4 kgf·m, 10 lbf·ft)

TROUBLESHOOTING

Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leak

Poor performance

- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

SIDE COVER

REMOVAL/INSTALLATION

Remove the side cover mounting screw.
Release the grommets from the air cleaner housing tabs
then remove the side cover.



Install the side cover in the reverse order of removal.



SEAT

REMOVAL

Remove the rear seat mounting bolts.
Slide the rear seat backward, then remove it upward.



Remove the front seat mounting bolts.
Slide the front seat backward, then remove it upward.



INSTALLATION

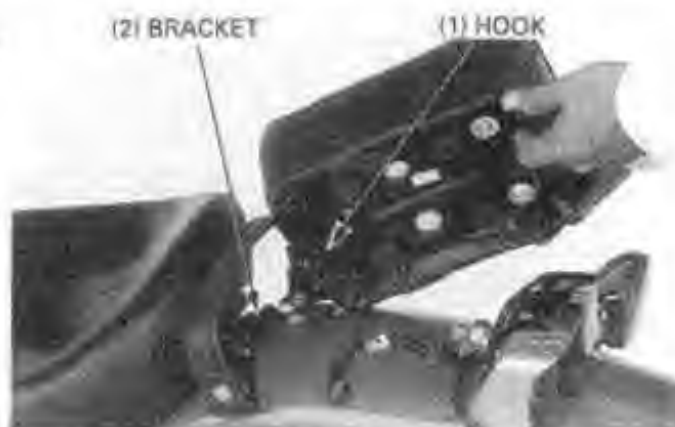
Install the front seat aligning its hook with the frame. Install and tighten the front seat mounting bolts.



Install the rear seat aligning its hook with the seat belt bracket groove. Install and tighten the rear seat mounting bolts.

CAUTION

- Do not damage the wire harness while installing the rear seat.



FUEL TANK

REMOVAL/INSTALLATION

WARNING

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

Remove the seat (page 2-2).

Turn the fuel valve OFF and disconnect the fuel tube.

Remove the fuel tank mounting bolts and collars, then remove the fuel tank.

Disconnect the fuel tank breather tube.

Installation is in the reverse order of removal.

NOTE

- After installation, turn the fuel valve ON and make sure there is no fuel leaks.



FRONT FENDER

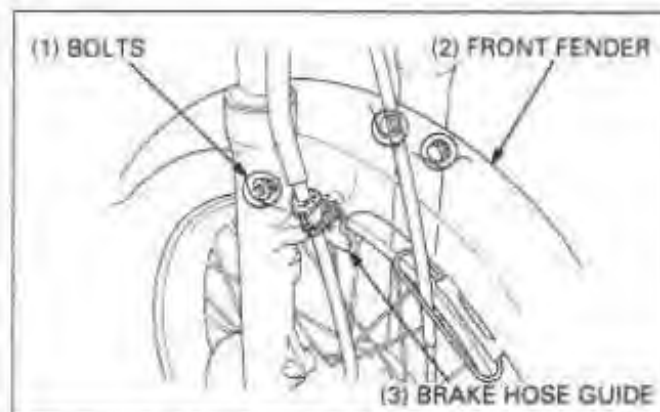
REMOVAL

Remove the screw and disconnect the speedometer cable from the gearbox.



Remove the speedometer cable from the guide on the front fender.
Remove the front fender mounting bolts, front fender and brake hose guide.

Installation is in the reverse order of removal.



REAR FENDER

REMOVAL

Remove the seat (page 2-2).

Remove the bolt and connector cover.



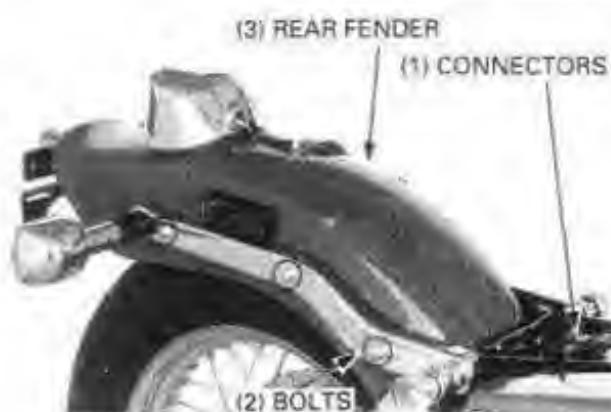
Disconnect the rear turn signal wire connectors.
Release the turn signal wires from the clamps.

Remove the nut and turn signal unit assembly.



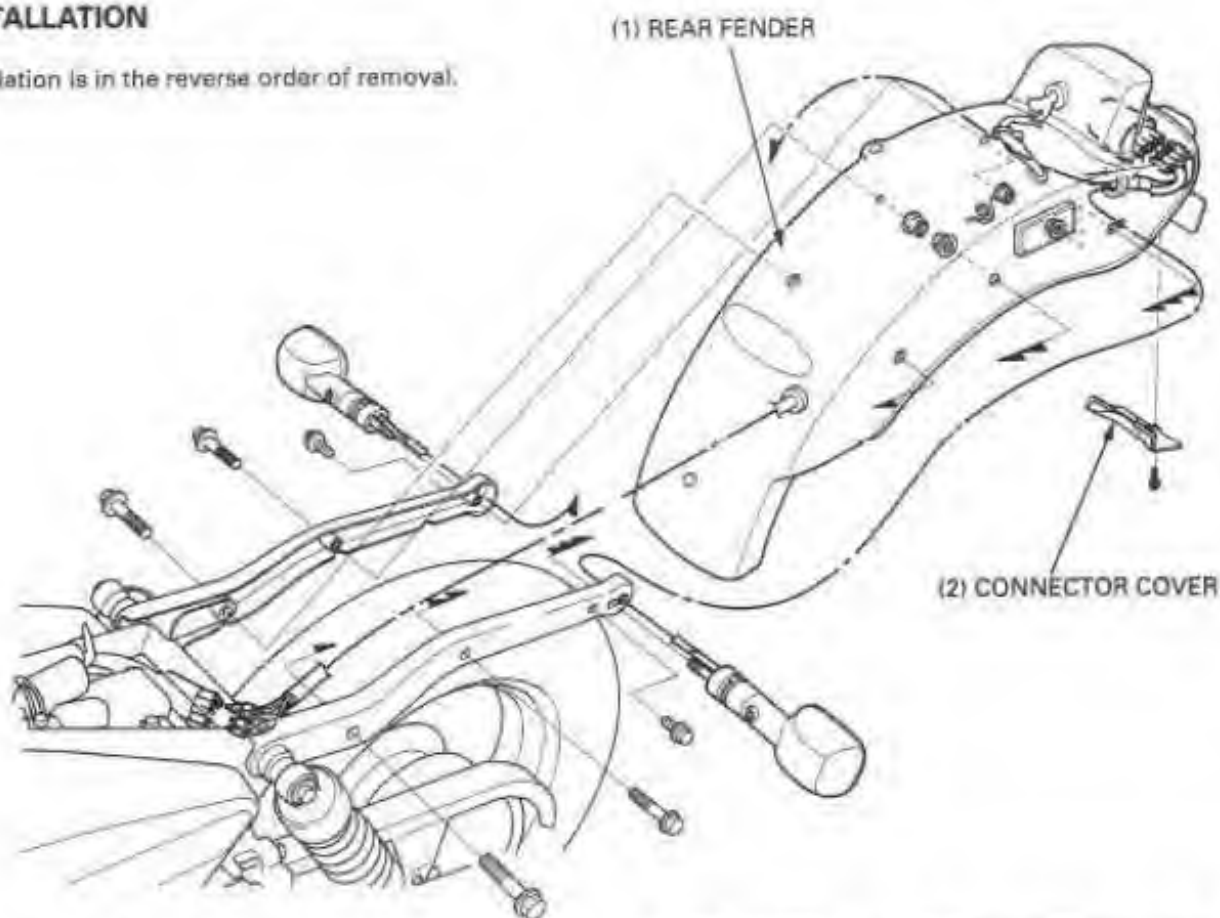
Disconnect the rear fender sub-harness connectors.

Remove the nuts, bolts and rear fender assembly.



INSTALLATION

Installation is in the reverse order of removal.



EXHAUST SYSTEM

REMOVAL

⚠ WARNING

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

NOTE

- The left or right mufflers can be removed individually.

Remove the exhaust pipe joint nuts and joint collars.



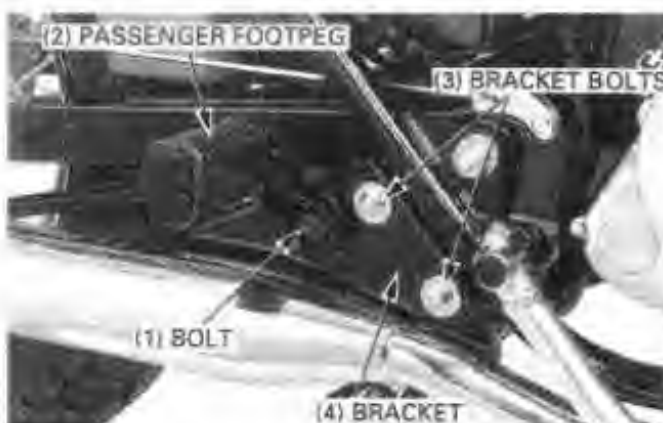
FRAME/BODY PANELS/EXHAUST SYSTEM

Loosen the exhaust pipe joint band bolt.

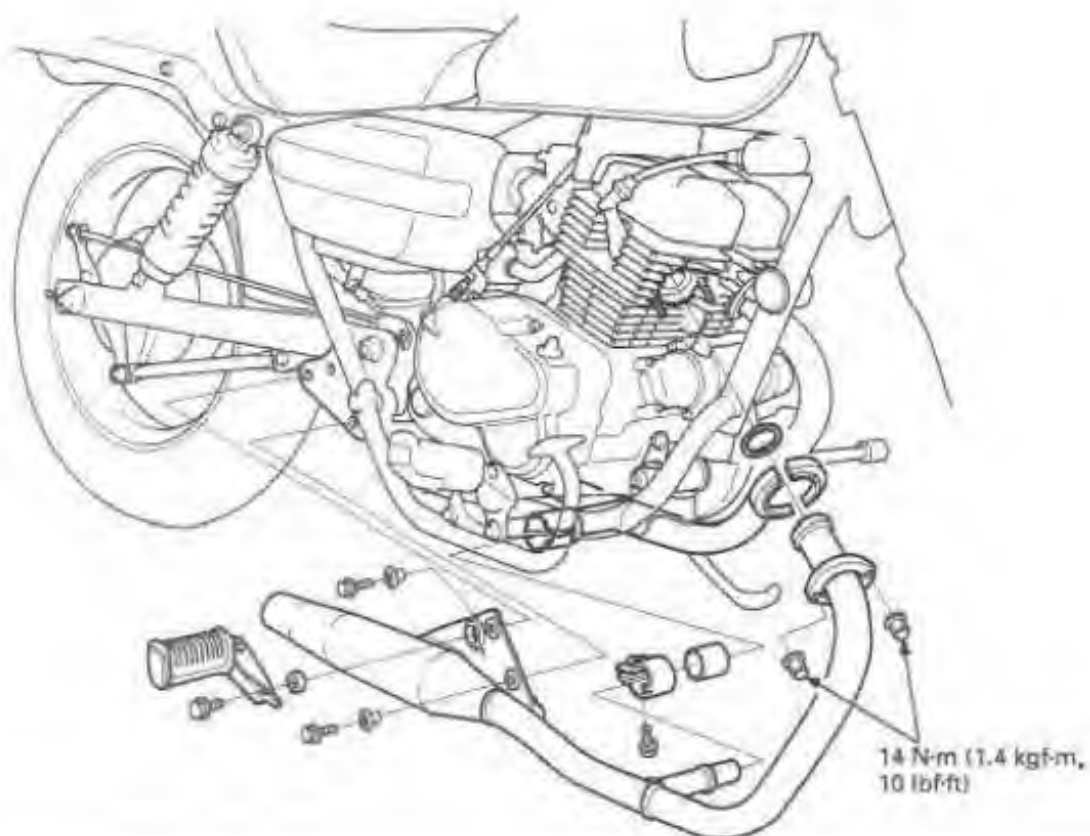


Remove the following:

- Passenger footpeg mounting bolt
- Footpeg and collar
- Muffler bracket mounting bolts and collars
- Exhaust pipe
- Exhaust pipe gasket
- Exhaust pipe joint gasket



INSTALLATION



Install the exhaust pipe in the reverse order of removal.

NOTE

- Always replace the exhaust pipe gaskets and joint pipe gasket with new ones.
- When installing the exhaust pipe, first install all the fasteners loosely. Next, tighten the exhaust pipe joint nuts. Then tighten the exhaust pipe joint bolt and mounting fasteners.
- At passenger footpeg installation, align the boss with the muffler bracket groove as shown.

TORQUE:

Exhaust pipe joint nut: 14 N·m (1.4 kgf·m, 10 lbf·ft)



SERVICE INFORMATION	3-1	DRIVE CHAIN	3-12
MAINTENANCE SCHEDULE	3-3	BRAKE FLUID	3-15
FUEL LINE	3-4	BRAKE SHOE/PAD WEAR	3-16
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AIR CLEANER	3-5	HEADLIGHT AIM	3-17
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SPARK PLUG	3-6	SIDE STAND	3-18
VALVE CLEARANCE	3-7	SUSPENSION	3-19
ENGINE OIL	3-9	NUTS, BOLTS, FASTENERS	3-19
ENGINE OIL STRAINER SCREEN	3-10	WHEELS/TIRES	3-20
ENGINE IDLE SPEED	3-11	STEERING HEAD BEARINGS	3-20
EVAPORATIVE EMISSION CONTROL SYSTEM (CALIFORNIA TYPE ONLY)	3-11		

SERVICE INFORMATION

GENERAL

⚠ WARNING

- Gasoline is extremely flammable and is explosive under certain conditions. Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where the gasoline is stored can cause a fire or explosion.
- If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that can cause loss of consciousness and may lead to death.

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

SPECIFICATIONS

ITEM		SPECIFICATION	
Throttle grip free play		2 - 6 mm (1/12 - 1/4 in)	
Spark plug		NGK	NIPPONDENSO
	Standard	CR6HSA	U20FSR-U
	For cold climate (below 5°C/41°F)	CR5HSA	U16FSR-U
	For extended high speed riding	CR7HSA	U22FSR-U
Spark plug gap		0.6 - 0.7 mm (0.02 - 0.03 in)	
Valve clearance	IN	0.06 - 0.10 mm (0.002 - 0.004 in)	
	EX	0.06 - 0.10 mm (0.002 - 0.004 in)	

MAINTENANCE

ITEM		SPECIFICATIONS
Engine oil capacity	At draining	1.5 liter (1.6 US qt, 1.3 Imp qt)
	At disassembly	1.8 liter (1.9 US qt, 1.6 Imp qt)
Recommended engine oil		HONDA GN4 4-stroke oil or equivalent motor oil API service classification SF or SG Viscosity: SAE 10W-40
Engine idle speed		1,400 ± 100 rpm
Drive chain slack		15 – 25 mm (5/8 – 1 in)
Recommended brake fluid		DOT 3 or 4
Brake pedal free play		20 – 30 mm (3/4 – 1-1/4 in)
Clutch lever free play		10 – 20 mm (3/8 – 3/4 in)
Tire size	Front	3.00 – 18 47P
	Rear	130/90 – 15M/C 86P
Cold tire pressure	Up to 90 kg (200 lbs) load	Front 200 kPa (2.00 kg/cm ² , 29 psi)
		Rear 200 kPa (2.00 kg/cm ² , 29 psi)
	Up to maximum weight capacity	Front 200 kPa (2.00 kg/cm ² , 29 psi)
		Rear 200 kPa (2.00 kg/cm ² , 29 psi)
Minimum tire tread depth	Front	1.5 mm (0.06 in)
	Rear	2.0 mm (0.08 in)

TORQUE VALUES

Spark plug	12 N·m (1.2 kgf·m, 9 lbf·ft)
Valve adjuster lock nut	10 N·m (1.0 kgf·m, 7 lbf·ft)
Cylinder head cover bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)
Oil drain bolt	25 N·m (2.5 kgf·m, 18 lbf·ft)
Rear axle nut	88 N·m (9.0 kgf·m, 65 lbf·ft)
Wheel spoke	4 N·m (0.4 kgf·m, 2.9 lbf·ft)
Tire valve nut	3 N·m (0.3 kgf·m, 2.2 lbf·ft)

TOOLS

Valve adjusting wrench B	07708 – 0030400 or 07908 – KE90200
Timing cap wrench	07709 – 0010001
Drive chain cutter	07HMH – MR10103
— Link plate holder	07HMH – MR10130
Wheel spoke wrench	07701 – 0020300 Not available in U.S.A.

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 their authorized HONDA dealer.

ITEMS	FREQUENCY	NOTE 	ODOMETER READING (NOTE 1)								Refer to page
			X1,000 mi	0.6	4	8	12	16	20	24	
			X100 km	10	64	128	192	256	320	384	
EMISSION RELATED ITEMS	* FUEL LINE					I		I		I	3-4
	* THROTTLE OPERATION					I		I		I	3-4
	* CARBURETOR CHOKE					I		I		I	3-5
	AIR CLEANER	NOTE 2					R		R		3-5
	CRANKCASE BREATHER	NOTE 3			C	C	C	C	C	C	3-6
	SPARK PLUG				I	R	I	R	I	R	3-6
	* VALVE CLEARANCE			I	I	I	I	I	I	I	3-7
	ENGINE OIL			R	R	R	R	R	R	R	3-9
	** ENGINE OIL STRAINER SCREEN					C		C		C	3-10
	* ENGINE IDLE SPEED			I	I	I	I	I	I	I	3-11
	* EVAPORATIVE EMISSION CONTROL SYSTEM	NOTE 4					I			I	3-11
NON-EMISSION RELATED ITEMS	DRIVE CHAIN			EVERY 500 mi (800 km) I, L							3-12
	BRAKE FLUID	NOTE 5			I	I	R	I	I	R	3-15
	BRAKE SHOE/PAD WEAR				I	I	I	I	I	I	3-16
	BRAKE SYSTEM			I		I		I		I	3-16
	* BRAKE LIGHT SWITCH					I		I		I	3-17
	* HEADLIGHT AIM					I		I		I	3-17
	CLUTCH SYSTEM			I	I	I	I	I	I	I	3-18
	SIDE STAND					I		I		I	3-18
	* SUSPENSION					I		I		I	3-19
	* NUTS, BOLTS, FASTENERS			I		I		I		I	3-19
	** WHEELS/TIRES			I	I	I	I	I	I	I	3-20
	** STEERING HEAD BEARINGS			I		I		I		I	3-20

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

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

NOTES: 1. At higher odometer reading, repeat at the frequency interval established here.

2. Service more frequently when riding in unusually wet or dusty areas.

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

4. California type only.

5. Replace every 2 years, or at indicated odometer interval, whichever comes first. Replacement requires mechanical skill.

FUEL LINE

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



THROTTLE OPERATION

Check for smooth throttle grip full opening and automatic full closing in all steering positions.
Check the throttle cables and replace them if they are deteriorated, kinked or damaged.

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

Measure the free play at the throttle grip flange.

FREE PLAY: 2 – 6 mm (1/12 – 1/4 in)



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

Minor adjustment are made with the upper adjuster.
Remove the dust cover from the adjuster.
Adjust the free play by loosening the lock nut and turning the adjuster.



Major adjustments are made with the lower adjusters.
Adjust the free play by loosening the lock nut and turning the adjuster.
After adjustment, tighten the lock nuts securely.

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



CARBURETOR CHOKE

The choke system uses a fuel enrichment circuit controlled by a starting enrichment (SE) valve. The SE valve opens the enrichment circuit via a cable when the choke lever on the handlebar is pulled back.

Check for smooth choke lever operation and lubricate the choke cable if required.

Inspect the cable for cracks which could allow moisture to enter.

Replace the cable if necessary.



AIR CLEANER

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

Remove the screws and air cleaner housing cover.



Disconnect the breather tube from the air cleaner.

Pull out the air cleaner setting plate, then remove the air cleaner from the housing.

Discard the air cleaner in accordance with the maintenance schedule.



Install the breather tube to the new air cleaner. Install the new air cleaner and secure it by compressing the setting plate as shown.

Install the removed parts in the reverse order of removal.



CRANKCASE BREATHER

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

Reinstall the drain plug and clip.

NOTE

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



SPARK PLUG

Disconnect the spark plug caps and remove the spark plugs.

NOTE

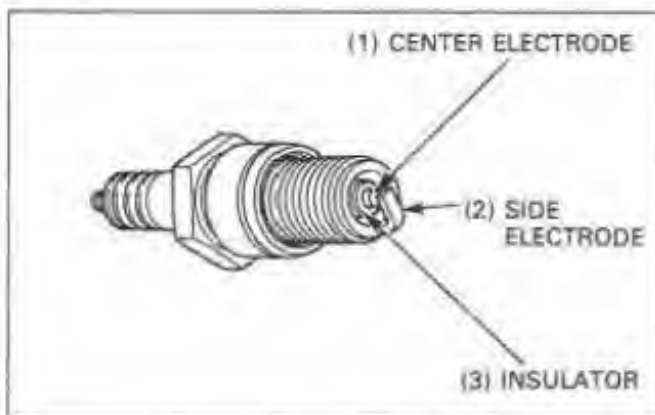
- Clean around the spark plug bases with compressed air before removing, and be sure that no debris is allowed to enter the combustion chamber.

Remove the spark plug and inspect or replace as described in the maintenance schedule.

INSPECTION

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

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

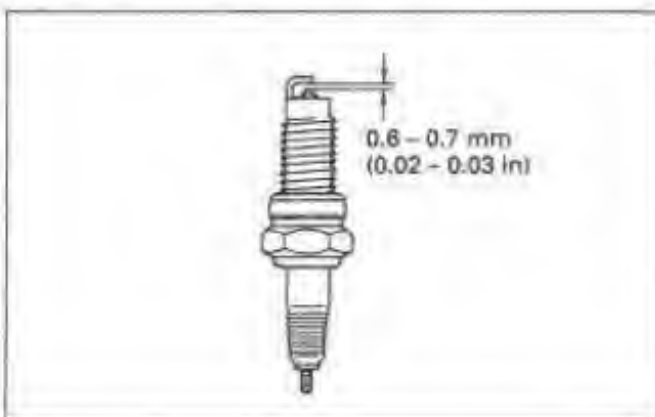


REUSING A SPARK PLUG

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

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

SPARK PLUG GAP: 0.6 – 0.7 mm (0.02 – 0.03 in)



CAUTION

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

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

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

REPLACING A SPARK PLUG

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

CAUTION

- Do not overtighten the spark plug.

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



VALVE CLEARANCE

NOTE

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

Remove the fuel tank (page 2-3).

Remove the spark plug cap and ignition coils.

Remove the bolts and cylinder head cover.

Remove the spark plug (page 3-6).



Remove the crankshaft and timing hole cap using the special tool.

TOOL:

Timing cap wrench

07709 - 0010001



MAINTENANCE

Turn the crankshaft clockwise, and align the "T" mark on the flywheel with the index mark on the left crankcase cover.

Make sure the No. 1 or No. 2 piston is at TDC on the compression stroke.



Inspect the intake and exhaust valve clearances of the cylinder at TDC by inserting a feeler gauge between the adjusting screw and valve stem.

VALVE CLEARANCE:

IN/EX: 0.06 – 0.10 mm (0.002 – 0.004 in)



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

Hold the adjusting screw and tighten the lock nut.

TOOL:

Valve adjusting wrench B 07708 – 0030400 or
07908 – KE90200

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Recheck the valve clearance.



Turn the crankshaft counterclockwise one full turn (360 degrees) and align the "T" mark on the flywheel with the index mark on the left crankcase cover.

Check the valve clearance of the other cylinder.

VALVE CLEARANCE:

IN/EX: 0.06 – 0.10 mm (0.002 – 0.004 in)



Check that the cylinder head cover packing is in good condition, replace if necessary.

Install the cylinder head cover.

Install the mounting rubbers and bolts, then tighten the bolts to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



Check that O-rings are in good condition, and install the timing hole cap and crankshaft hole cap.

Install the removed parts in the reverse order of removal.



ENGINE OIL

OIL LEVEL INSPECTION

Place the motorcycle on level ground.

Check the oil level using the oil filler cap/dipstick by placing it into the filler hole without screwing it in.

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

RECOMMENDED ENGINE OIL:

Honda GN4 4-stroke oil or equivalent

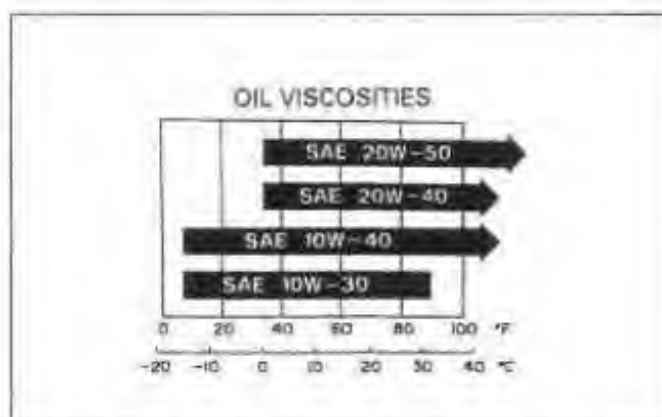
API service classification: SF or SG

Viscosity: 10W-40

NOTE

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

Reinstall the dipstick.



MAINTENANCE

ENGINE OIL CHANGE

▲ WARNING

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

Warm up the engine.

NOTE

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

Remove the oil filler cap/dipstick and drain bolt.

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.*

Drain the oil completely.

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

Install and tighten the drain bolt.

TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)

Fill the crankcase with recommended engine oil.

OIL CAPACITY:

1.5 liter (1.6 US qt, 1.3 Imp qt) after draining

Install the oil filler cap/dipstick.

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

Stop the engine and check that the oil level is at the upper level line on the dipstick.

Make sure there are no oil leaks.



(1) DRAIN BOLT/SEALING WASHER



(1) OIL FILLER CAP/DIP STICK

ENGINE OIL STRAINER SCREEN

Drain the engine oil.

Remove the oil pump (page 4-2).

Remove the engine oil strainer screen from the oil pump.

Clean the strainer screen by washing it in clean solvent and blowing it dry with compressed air.

Reinstall the oil filter screen onto the oil pump.

Install the oil pump (page 4-5).

Fill the crankcase up to the proper level with recommended oil.

(1) STRAINER SCREEN

(2) OIL PUMP



ENGINE IDLE SPEED

WARNING

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

NOTE

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

Warm up the engine for about ten minutes.

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

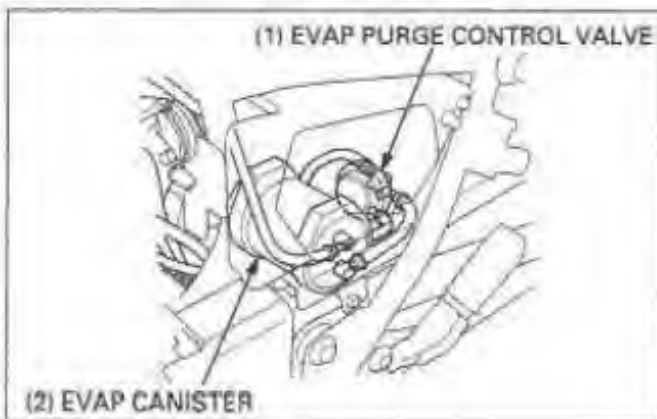
IDLE SPEED: 1,400 ± 100 rpm



(1) THROTTLE STOP SCREW

EVAPORATIVE EMISSION CONTROL SYSTEM (CALIFORNIA TYPE ONLY)

Check the tubes between the fuel tank, EVAP canister, EVAP purge control valve and carburetor for deterioration, damage or loose connections.



(2) EVAP CANISTER

Check the EVAP canister for cracks or other damage.

Refer to the Vacuum Hose Routing Diagram Label and Cable & Harness Routing (page 1-25) for tube connections.



(1) EVAP CANISTER

MAINTENANCE

DRIVE CHAIN

DRIVE CHAIN SLACK INSPECTION

⚠ WARNING

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

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

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

CHAIN SLACK: 15 – 25 mm (5/8 – 1 in)

CAUTION

- *Excessive chain slack, 50 mm (2 in) or more, may damage the frame.*

Lubricate the drive chain with Pro Honda Chain Lube or equivalent chain lubricant designed specifically for use with O-ring chains. Wipe off the excess chain lube.

ADJUSTMENT

Loosen the rear axle nut.

Loosen both lock nuts and turn both adjusting nuts until the correct drive chain slack is obtained.

Make sure the index marks on the both adjusters are aligned with the rear edges of the axle slots in the swingarm.

Tighten both lock nuts.

Tighten the rear axle nut to the specified torque.

TORQUE: 88 N·m (9.0 kgf·m, 65 lbf·ft)

Recheck the drive chain slack and free wheel rotation.

Lubricate the drive chain with Pro Honda Chain Lube or equivalent chain lubricant designed specifically for use with O-ring chains. Wipe off the excess chain lube.

Check the drive chain wear indicator label.

If the arrow mark of the chain adjuster reaches the red zone on the label, replace the drive chain with a new one (page 3-13).

CLEANING AND LUBRICATION

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

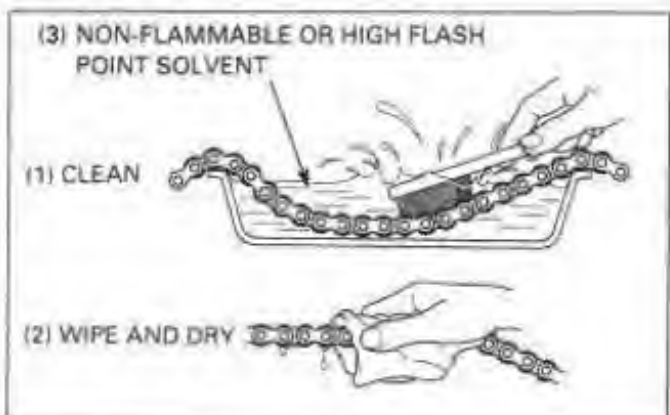
Be sure the chain has dried completely before lubricating.

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 as necessary.



Lubricate the drive chain with Pro Honda Chain Lube or equivalent chain lubricant designed specifically for use on O-ring chains.

Wipe off the excess chain lube.

(1) LUBRICATE

(2) PRO HONDA CHAIN LUBE
OR EQUIVALENT



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.

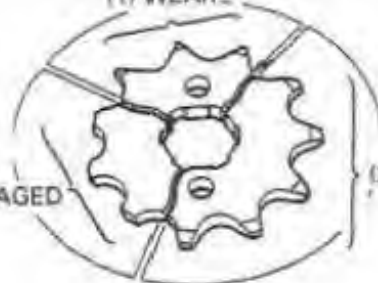
Check the attaching bolts and nuts on the drive and driven sprockets.

If any are loose, torque them.

(1) WEAR

(3) DAMAGED

(2) NORMAL



REPLACEMENT

This motorcycle uses a drive chain with a staked master link.

Loosen the drive chain (page 3-12).

Assemble the special tool as shown.

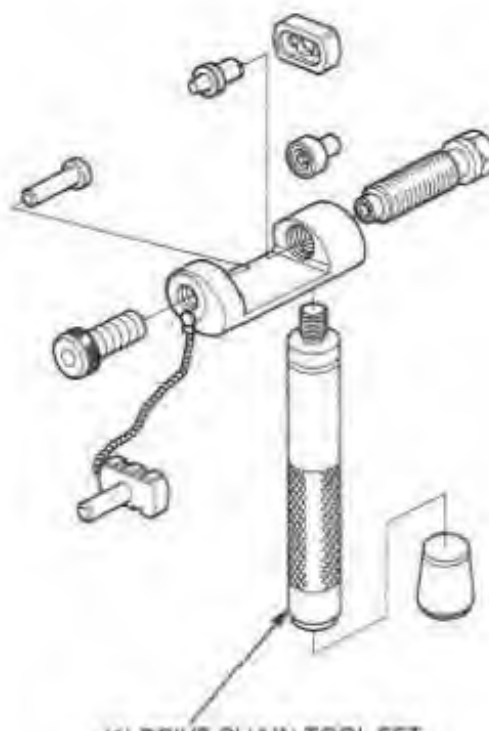
TOOL:

Drive chain tool set

07HMH - MR10103 or
07HMH - MR1010A
(U.S.A. only)

NOTE

- When using the special tool, follow the manufacturer's instruction.



(1) DRIVE CHAIN TOOL SET

MAINTENANCE

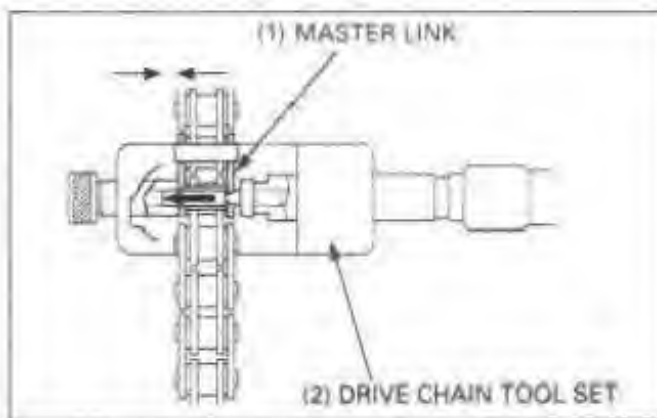
Locate the crimped pin ends of the master link from the outside of the chain, and remove the link with the drive chain cutter.

TOOL:

Drive chain tool set

07HMH – MR10103 or
07HMH – MR1010A
(U.S.A. only)

Remove the drive chain.



Remove the excess drive chain links from the new drive chain with the special tool.

NOTE

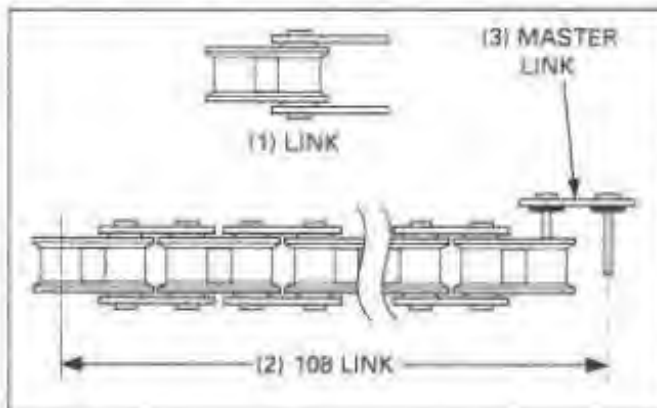
- Include the master link when you count the drive chain links.

STANDARD LINKS: 108 links

REPLACEMENT CHAIN:

DID: 520VC5

RK: 520MOZ9



CAUTION

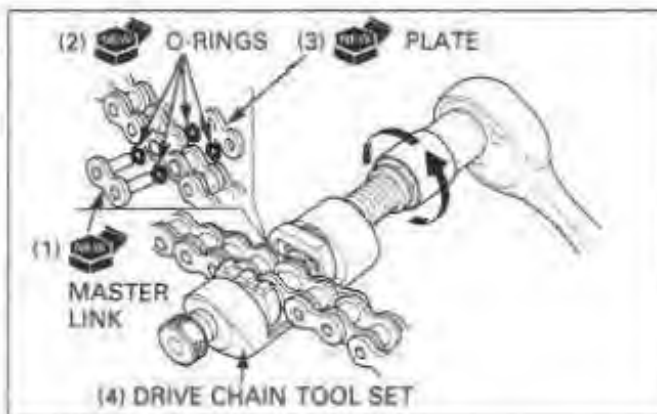
- *Never reuse the oil drive chain, master link, master link plate and O-rings.*

Install the new drive chain.

Assemble the new master link, O-rings and plate.

CAUTION

- *Insert the master link from the inside of the drive chain, and install the plate with the identification mark facing the outside.*



Assemble and set the special tool.

TOOL:

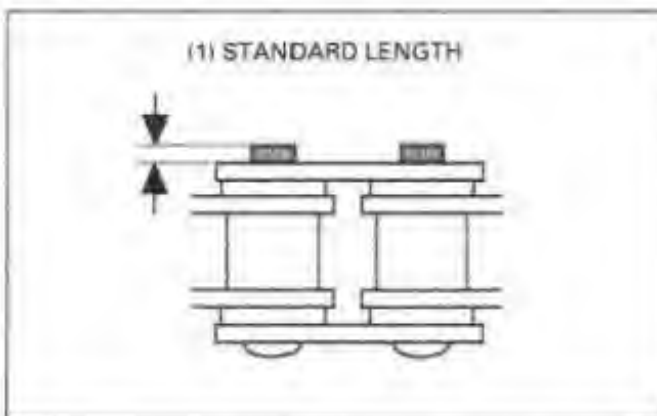
Drive chain tool set

07HMH – MR10103 or
07HMH – MR1010A
(U.S.A. only)

Make sure that the master link pins are installed properly.
Measure the master link pin length projected from the plate.

STANDARD LENGTH: DID: 1.15 – 1.55 mm (0.045 – 0.061 in)
RK: 1.2 – 1.4 mm (0.05 – 0.06 in)

Stake the master link pins.

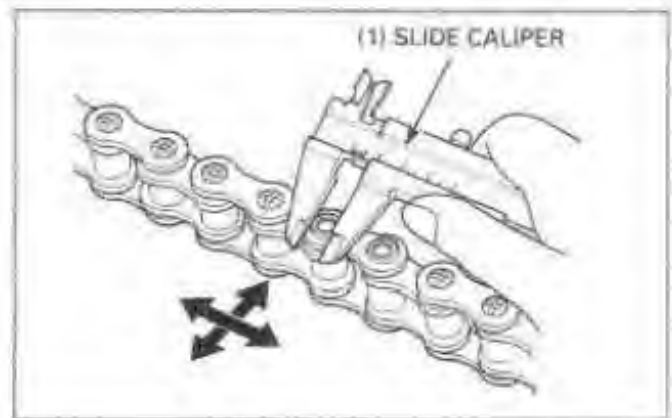


Make sure that the pins are staked properly by measuring the diameter of the staked area using a slide caliper.

DIAMETER OF THE STAKED AREA:

DID: 5.5 mm (0.22 in)

RK: 5.65 mm (0.222 in)

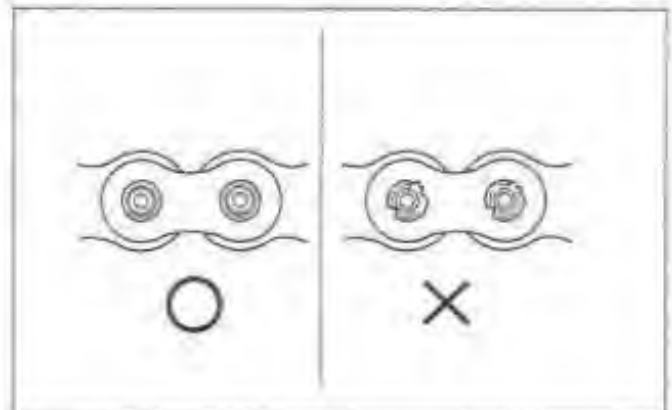


After staking, check the staked area of the master link for cracks.

If there is any cracking, replace the master link, O-rings and plate.

CAUTION

- A drive chain with a clip-type master link must not be used.



BRAKE FLUID

CAUTION

- Do not mix different types of fluid, as they are not compatible with each other.
- Do not allow foreign material to enter the system when filling the reservoir.
- Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.

NOTE

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

Check the brake reservoir level through the sight glass. If the level is near the lower level mark, check the brake pad wear (see next page).



BRAKE SHOE/PAD WEAR

FRONT BRAKE PADS

Check the brake pad for wear.
Replace the brake pads if either pad is worn to the bottom of wear limit groove.

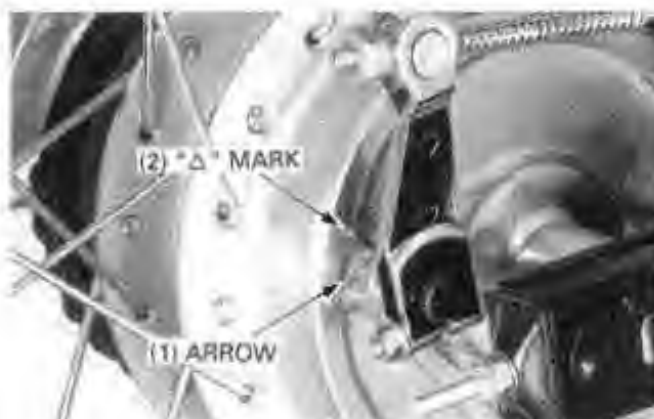
Refer to page 14-4 for brake pad replacement.



REAR BRAKE SHOE

Replace the brake shoes if the arrow on the brake arm aligns with the reference mark "Δ" when the rear brake pedal is applied.

Refer to page 13-9 for brake shoe replacement.



BRAKE SYSTEM

FRONT BRAKE

Firmly apply the brake lever, and check that no air has entered the system.
If the lever feels soft or spongy when operated, bleed the air from the system.

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

Refer to page 14-3 for brake bleeding procedures.

BRAKE PEDAL FREE PLAY

Check the brake pedal free play.

FREE PLAY: 20 – 30 mm (3/4 – 1-1/4 in)



If adjustment is necessary, use the rear brake adjusting nut.

NOTE

- After adjusting the brake pedal free play, check the rear brake light switch operation and adjust if necessary.

BRAKE LIGHT SWITCH

NOTE

- Perform the rear brake switch adjustment after adjusting the brake pedal free play.
- The front brake light switch does not require adjustment.

Adjust the brake light switch so that the brake light will come on when the brake pedal is depressed 20 mm (3/4 in), and brake engagement begins.

Hold the switch body and turn the adjusting nut. Do not turn the switch body.



HEADLIGHT AIM

WARNING

- *An improperly adjusted headlight may blind oncoming drivers, or it may fail to light the road for a safe distance.*

NOTE

- Adjust the headlight beam as specified by local laws and regulations.

Place the motorcycle on a level surface.

'96 - 2000:

Adjust the headlight beam vertically by loosening the headlight adjusting bolt.

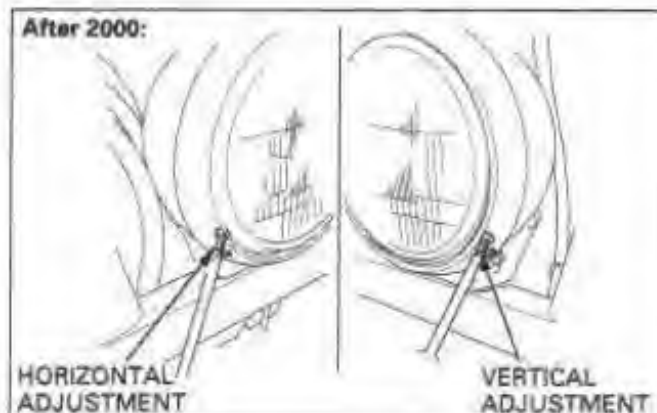
After 2000:

Adjust vertically by turning the vertical adjusting screw. Adjust horizontally by turning the horizontal adjusting screw.

'96 - 2000:



After 2000:



CLUTCH SYSTEM

Measure the clutch free play at the end of the clutch lever.

FREE PLAY: 10 – 20 mm (3/8 – 3/4 in)

Minor adjustment are made with the upper adjuster at the clutch lever.
Loosen the lock nut and turn the adjuster.

CAUTION

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

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

Tighten the lock nut and make a major adjustment as described below.

Major adjustment is performed at the clutch arm.

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

Hold the adjusting nut securely while tightening the lock nut.

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

SIDE STAND

Support the motorcycle on a level surface.

Check the side stand spring for damage or loss of tension.
Check the side stand assembly for freedom of movement and lubricate the side stand pivot if necessary.

Check the side stand ignition cut-off system:

- Sit astride the motorcycle and raise the side stand.
- Start the engine with the transmission in neutral, then shift the transmission into gear, with the clutch lever squeezed.
- Move the side stand full down.
- The engine should stop as the side stand is lowered.

If there is a problem with the system, check the side stand switch (section 18).



SUSPENSION

▲ WARNING

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

FRONT

Check the action of the forks by operating the front brakes and compressing the front suspension several times. Check the entire assembly for signs of leaks, damage or loose fasteners.

Replace damaged components which cannot be repaired. Tighten all nuts and bolts.

Refer to section 12 for fork service.

REAR

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

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

Replace the bushings if any looseness is noted.

Check the action of the shock absorbers by compressing them several times.

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

Replace damaged components which cannot be repaired. Tighten all nuts and bolts.

Refer to section 13 for shock absorber service.

NUTS, BOLTS, FASTENERS

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

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



MAINTENANCE

WHEELS/TIRES

NOTE

- Tire pressure should be checked when the tires are COLD.

RECOMMENDED TIRE PRESSURE AND TIRE SIZE:

Unit: kPa (kgf/cm², psi)

		FRONT	REAR
Cold tire pressure	Up to 90 kg (200 lbs) load	200 (2.00, 29)	200 (2.00, 29)
	Up to maximum weight capacity	200 (2.00, 29)	200 (2.00, 29)
Tire size		3.00 – 18 47P	130/90 – 15 M/C 66P

Check the tires for cuts, embedded nails, or other damage. Check the front and rear wheels for trueness (refer to section 12 and 13).

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

MINIMUM TREAD DEPTH:

FRONT: 1.5 mm (0.06 in)

REAR: 2.0 mm (0.08 in)

Tighten any loose spokes.

TOOL:

Wheel spoke wrench

07701 – 0020300

Not available in U.S.A.

TORQUE: 4 N·m (0.40 kgf·m, 2.9 lbf·ft)



(1) AIR PRESSURE GAUGE



(1) SPOKE WRENCH

STEERING HEAD BEARINGS

NOTE

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

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

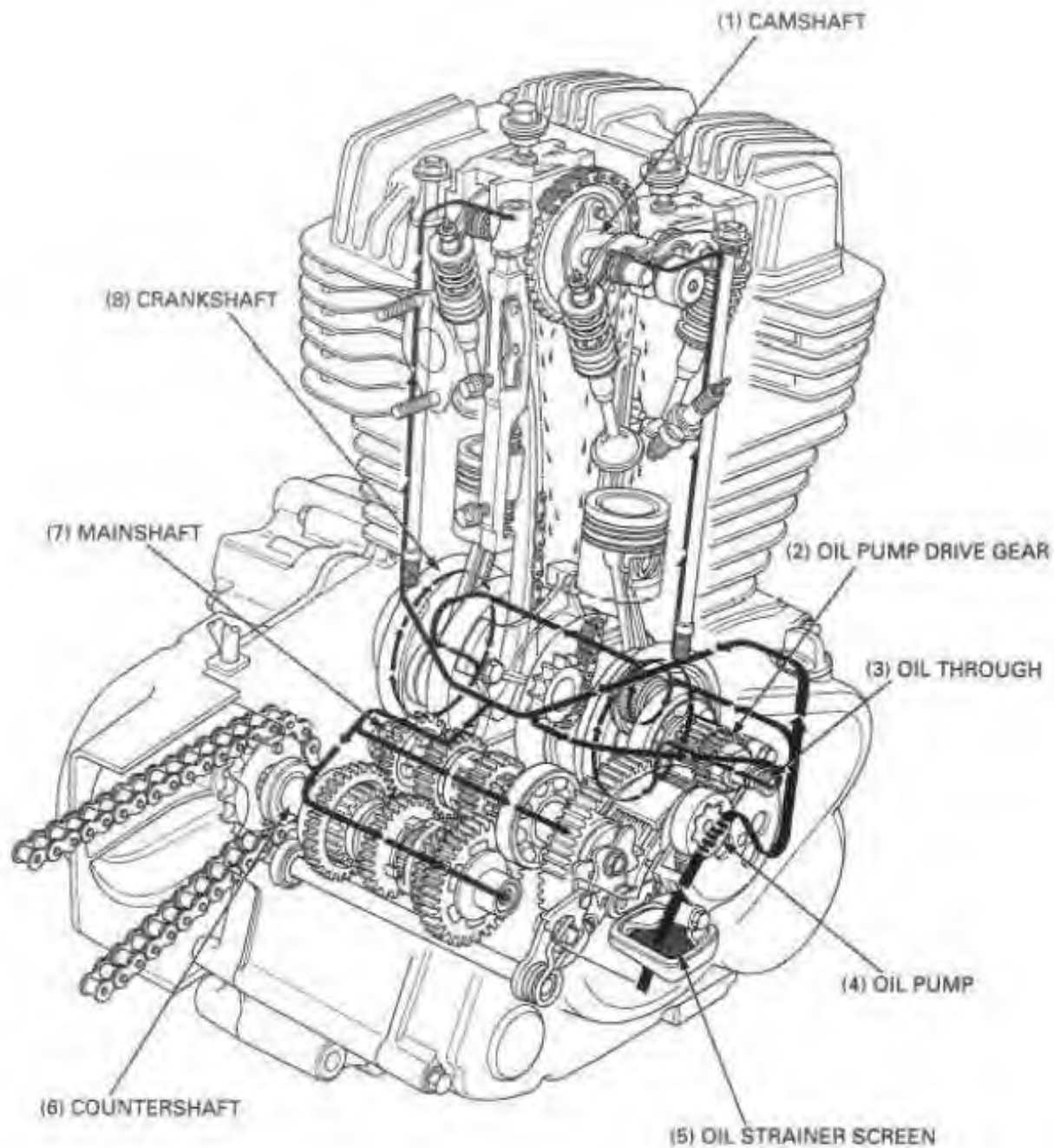
Check that the handlebar moves freely from side to side.

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



(1) STEERING HEAD BEARINGS

LUBRICATION SYSTEM DIAGRAM



4. LUBRICATION SYSTEM

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

SERVICE INFORMATION

GENERAL

▲ WARNING

- *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.*

4

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	At draining	1.5 liter (1.6 US qt, 1.3 Imp qt)	—
	At disassembly	1.8 liter (1.9 US qt, 1.6 Imp qt)	—
Recommended engine oil		Honda GN4 4-stroke oil or equivalent motor oil API service classification SF or SG Viscosity: SAE 10W – 40	—
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.21 (0.006 – 0.008)	0.25 (0.010)
	Side clearance	0.05 – 0.13 (0.002 – 0.005)	0.14 (0.006)

TORQUE VALUES

Oil drain bolt	25 N·m (2.5 kgf·m, 18 lbf·ft)
Oil pump mounting screw	10 N·m (1.0 kgf·m, 7 lbf·ft)

TROUBLESHOOTING

Engine oil level too low - high oil consumption

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

Engine oil contamination

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

OIL PUMP

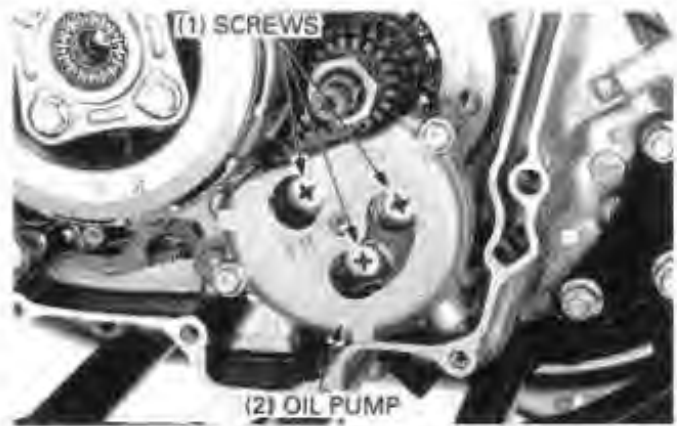
REMOVAL

Drain the engine oil (page 3-10).

Remove the right crankcase cover (page 9-3) and crankshaft hole cap.

Rotate the flywheel counterclockwise until the holes in the oil pump gear align with the oil pump attaching screws.

Remove the three screws and oil pump assembly.
Remove the O-ring.



DISASSEMBLY

Remove the oil strainer screen and clean it.



Remove the screw and oil pump cover, dowel pin and gasket.
Remove the inner and outer rotors.



Remove the bolts and gear cover.



Remove the pump gear and pull the pump shaft out of the pump body.

Thoroughly clean all the components.



INSPECTION

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

Measure the tip clearance.

SERVICE LIMIT: 0.20 mm (0.008 in)



Measure the pump body clearance.

SERVICE LIMIT: 0.25 mm (0.010 in)

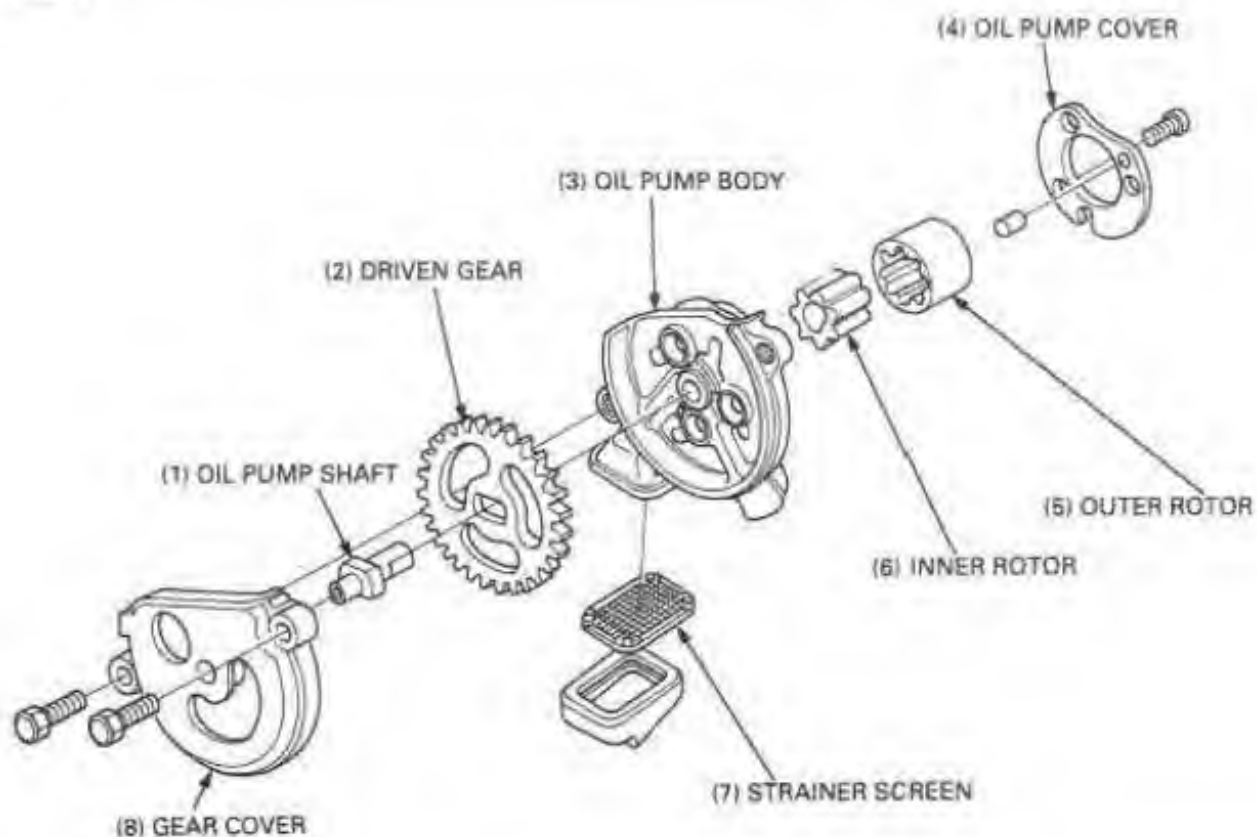


Measure the side clearance using a straight edge and feeler gauge.

SERVICE LIMIT: 0.14 mm (0.006 in)



ASSEMBLY



Install the oil pump shaft and pump gear into the oil pump body.

NOTE

- Align the cut-outs between the pump shaft and gear.



Install the gear cover and tighten the bolts.



Install the inner and outer rotors.

NOTE

- Align the cut-outs between the pump shaft and inner rotor.

Install the dowel pin.

Install the oil pump cover and tighten the screw.



Install the oil strainer screen to the oil pump body.



INSTALLATION

Apply oil to the new O-ring.

Install a new O-ring into the crankcase.

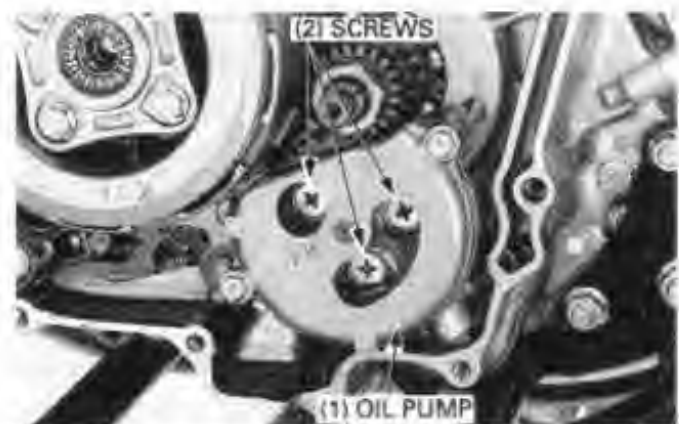


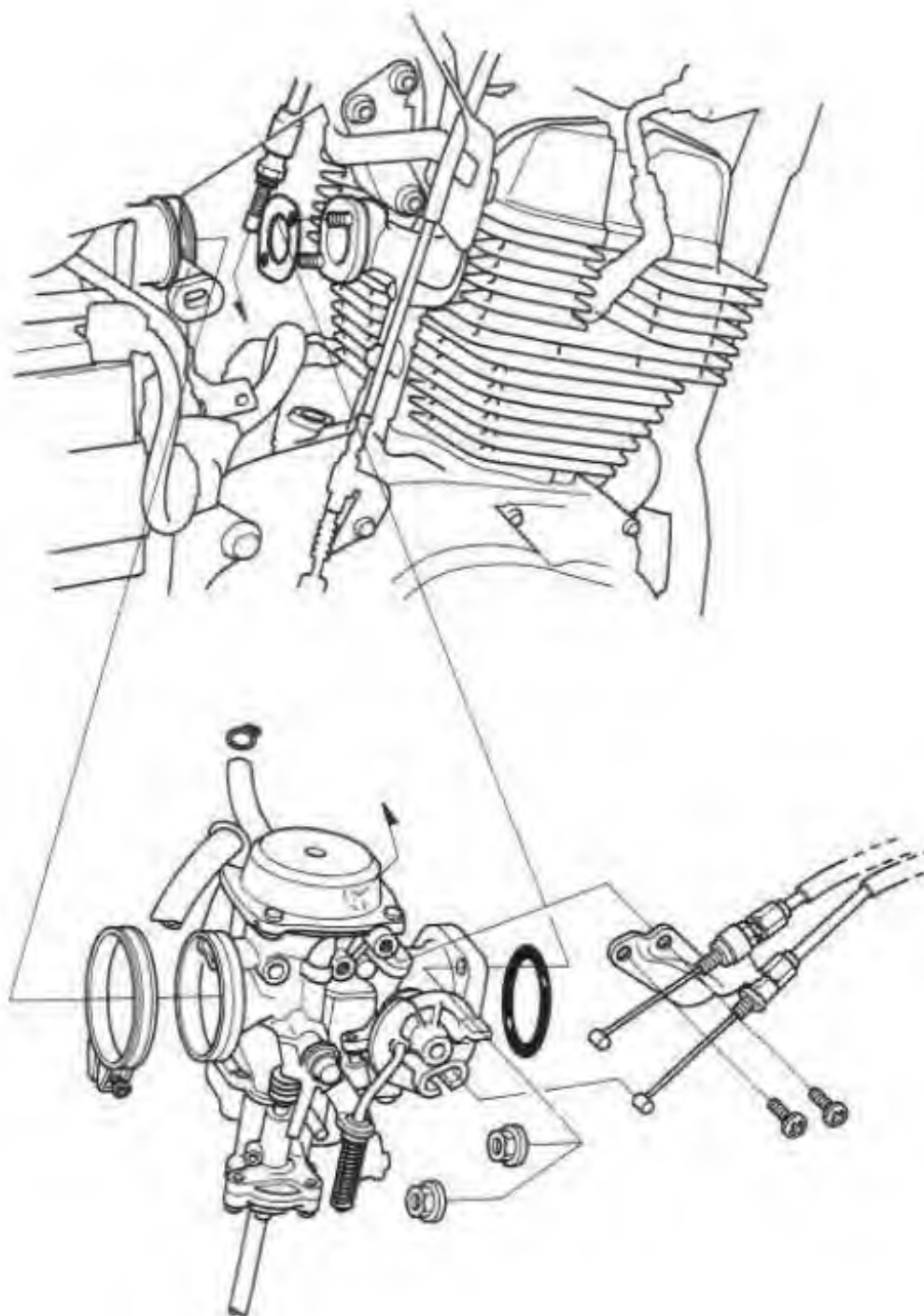
Install the oil pump and tighten the three screws to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the right crankcase cover (page 9-12) and crankshaft hole cap.

Fill the crankcase with recommended engine oil (page 3-9).





SERVICE INFORMATION	5-1	CARBURETOR INSTALLATION	5-11
TROUBLESHOOTING	5-3	PILOT SCREW ADJUSTMENT	5-12
CARBURETOR REMOVAL	5-4	HIGH ALTITUDE ADJUSTMENT	5-13
CARBURETOR DISASSEMBLY	5-4	AIR CLEANER HOUSING	5-14
CARBURETOR ASSEMBLY	5-7		

SERVICE INFORMATION

GENERAL

5

▲ WARNING

- Gasoline is extremely flammable and is explosive under certain conditions. **KEEP OUT OF REACH OF CHILDREN.**
 - If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that can cause loss of consciousness and may lead to death. Run the engine in an open area or with an exhaust evacuation system in an enclosed area.
 - Bending or twisting the control cables will impair smooth operation and could cause the cables to stick or bind, resulting in loss of vehicle control.
-
- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.

CAUTION

- Be sure to remove the diaphragms before cleaning air and fuel passages with compressed air. The diaphragms might be damaged.

NOTE

- If the motorcycle 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.
- Before disassembling the carburetor, place an approved gasoline container under the carburetor drain screw, loosen the screw and drain the carburetor.
- When disassembling the fuel system parts, note the locations of the O-rings. Replace them with new ones on reassembly.
- After removing the carburetor, wrap the intake port of the engine with a shop towel or cover it with a piece of tape to prevent any foreign material from dropping into the engine. Be sure to remove the cover when reinstalling the carburetor.

SPECIFICATIONS

ITEM		SPECIFICATION
Carburetor identification number	49 states type	VE35C
	California type	VE36B
	Canada type	VE35D
Main jet		#110
Slow jet		#35
Pilot screw	Initial opening	2-3/4 turns out
	High altitude setting	2-1/4 turns out
Float level		18.5 mm (0.73 in)
Idle speed		1,400 ± 100 rpm
Throttle grip free play		2 – 6 mm (1/12 – 1/4 in)

TORQUE VALUES

Fuel valve lock nut	26 N·m (2.7 kgf-m, 20 lbf-ft)
---------------------	-------------------------------

TOOL

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

TROUBLESHOOTING

Engine cranks but won't start

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

Engine idles roughly, runs poorly or stalls

- Improper choke operation
- Ignition malfunction
- Fuel contaminated
- Intake air leak
- Incorrect idle speed
- Incorrect pilot screw adjustment
- Low cylinder compression
- Starting enrichment (SE) valve stuck open
- Damaged starting enrichment (SE) valve seat
- Rich mixture
- Lean mixture
- Clogged carburetor

Misfiring during acceleration

- Ignition system faulty
- Lean mixture

Afterburn during acceleration

- Ignition system faulty
- Lean mixture

Poor performance (driveability) and poor fuel economy

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

Afterfiring

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

Lean mixture

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

Rich mixture

- Clogged air cleaner
- Worn jet needle or needle jet
- Faulty float valve
- Float level too high
- Starting enrichment (SE) valve stuck open
- Damaged starting enrichment (SE) valve seat
- Clogged air jet

Incorrect fast idle speed

- Incorrect choke cable operation
- Starting enrichment (SE) valve stuck or damaged

CARBURETOR REMOVAL

Loosen the starting enrichment (SE) valve nut and remove the SE valve from the carburetor.



Remove the throttle cable holder screws and disconnect the throttle cables from the throttle drum.

CAUTION

- * Do not kink or twist the throttle cable. It will not operate smoothly and may stick if it is kinked or twisted.



Loosen the connecting tube band screw.
Remove the carburetor mounting nuts and carburetor.

Disconnect the air vent tube and overflow tube.



CARBURETOR DISASSEMBLY

STARTING ENRICHMENT (SE) VALVE

Disconnect the choke cable end from the SE valve and remove the valve spring.

Check the valve for nicks, grooves or other damage.
Check the valve seat for wear.



DIAPHRAGM/VACUUM PISTON

NOTE

- The diaphragm/vacuum piston can be removed without removing the float chamber.

Remove the vacuum chamber cover and air vent tube guide by removing the four screws.



Remove the compression spring and diaphragm/vacuum piston.

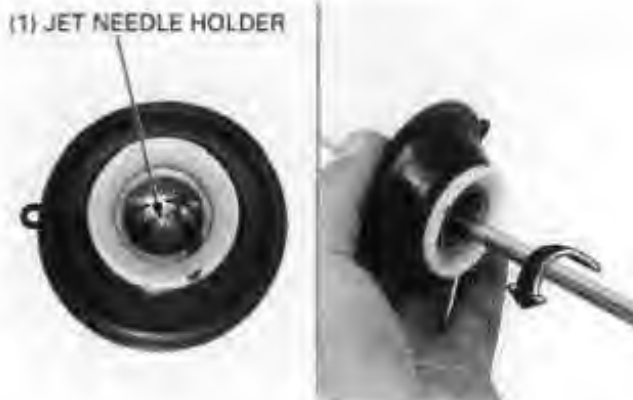
Inspect the vacuum piston for wear, nicks, or other damage. Make sure the piston moves up and down freely in the chamber.



Push the jet needle holder down and turn it counterclockwise 90 degrees with a screwdriver. Then remove the needle holder, spring, jet needle and washer from the diaphragm/vacuum piston.

Inspect the jet needle for excessive wear at the tip or other damage.

Check for a torn diaphragm or other deterioration.



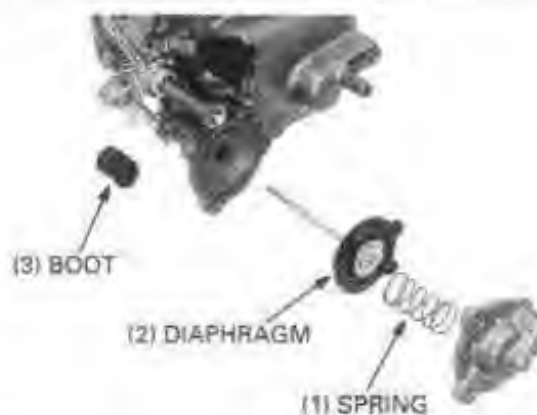
FLOAT AND JETS

Remove the three screws and accelerator pump diaphragm cover.



FUEL SYSTEM

Remove the spring, diaphragm and boot.



Remove the accelerator link bolt, collar and washer.

Remove the four screws and the float chamber.



Remove the following:

- Float pin
- Float
- Float valve

Inspect the float valve for grooves and nicks, and replace if necessary.

Inspect the operation of the valve.

Remove the following:

- Main jet
- Needle jet holder
- Needle jet
- Slow jet

Turn the pilot screw in and record the number of turns before it seats lightly. Use this as a reference for reinstallation.



CAUTION

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

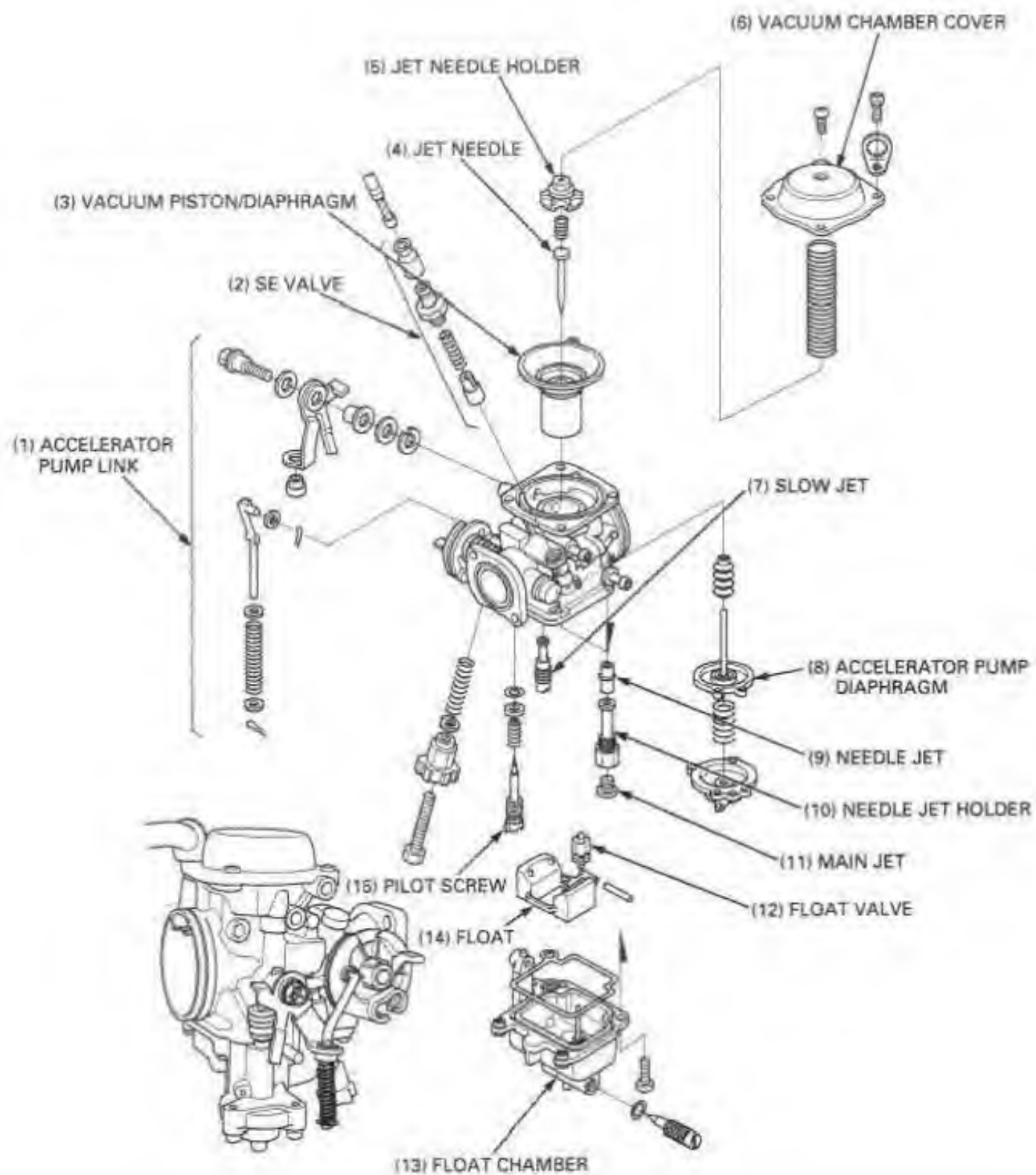
Remove the pilot screw.

Inspect the pilot screw and each jet and replace them if they are worn or damaged.

Blow open all carburetor body openings with compressed air.



CARBURETOR ASSEMBLY



FUEL SYSTEM

FLOAT AND JETS

Install the following:

- Slow jet
- Needle jet
- Needle jet holder
- Main jet

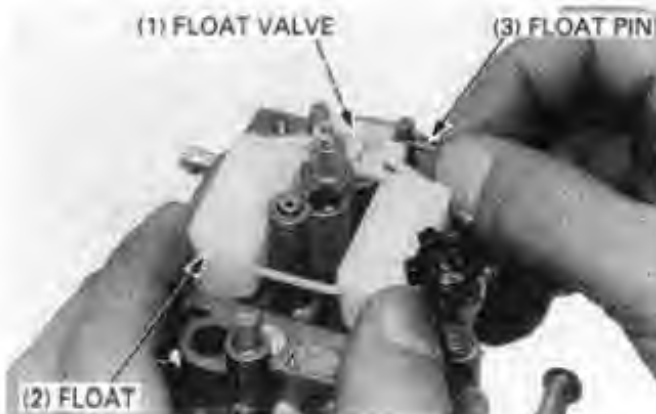
CAUTION

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

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



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



FLOAT LEVEL INSPECTION

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

Float level: 18.5 mm (0.73 in)

TOOL:

Carburetor float level gauge 07401 - 0010000

The float cannot be adjusted.

Replace the float assembly if the float level is out of specification.



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



Install the four float chamber screws.

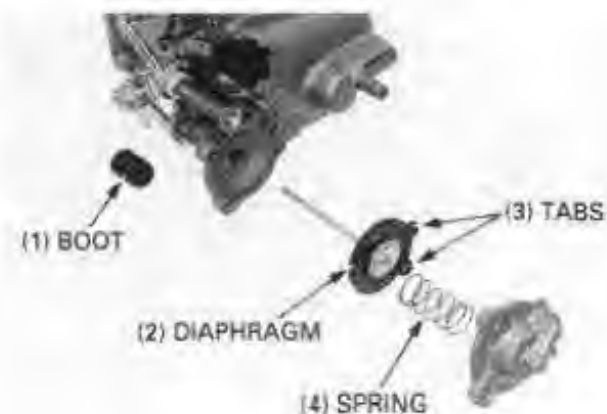
Install the accelerator link, washer collar and link bolt.



Set the boot and install the accelerator pump shaft/diaphragm.

NOTE

- Align the diaphragm tabs with the grooves of the float chamber.



Install the diaphragm spring and cover.

CAUTION

- Do not pinch the diaphragm under the cover.

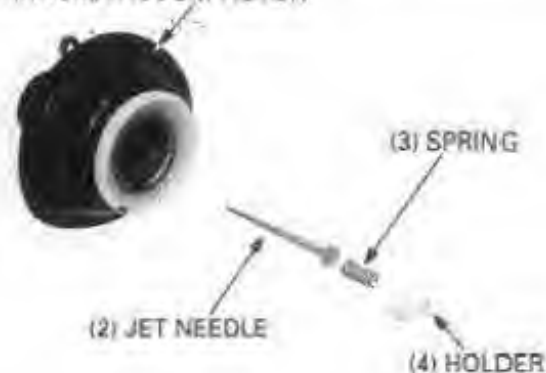
Tighten the diaphragm cover screws.



DIAPHRAGM/VACUUM PISTON

Install the jet needle, spring and jet needle holder to the vacuum piston.
Push the jet needle holder in and turn it 90 degrees clockwise.

(1) DIAPHRAGM/VACUUM PISTON



Install the diaphragm/vacuum piston in the carburetor body, aligning the diaphragm tab with the groove of the carburetor body.
Hold the vacuum piston up to almost full open so the diaphragm is not pinched by the chamber cover.

Install the chamber cover with the spring, aligning its tab with the hole in the carburetor, and secure with at least two screws before releasing the vacuum piston.

(4) CHAMBER COVER

(3) SPRING

(1) DIAPHRAGM

(2) TAB/GROOVE

Install the remaining vacuum chamber cover screws.

CAUTION

- Do not pinch the diaphragm under the chamber cover.

(2) TUBE GUIDE

(1) CHAMBER COVER

(3) SCREWS

STARTING ENRICHMENT (SE) VALVE

Install the spring over the choke cable and connect the cable end to the SE valve.

Move the choke lever all the way up and down and make sure that the SE valve operates properly.

(1) SPRING

(2) CABLE END

(3) SE VALVE

CARBURETOR INSTALLATION

Connect the overflow tube and air vent tube.

Install the new gasket onto the insulator.

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

Install the carburetor into the frame.



Install and tighten the carburetor mounting nuts. Tighten the insulator band screw.



Connect the throttle cables to the throttle drum, then install and tighten the throttle cable guide screws.



Install the starting enrichment (SE) valve to the carburetor body, and tighten the nut securely.

Route the overflow tube and air vent tube correctly (page 1-18).

Adjust the throttle grip free play (page 3-4).

Install the removed parts in the reverse order of removal.



PILOT SCREW ADJUSTMENT

IDLE DROP PROCEDURE

⚠ WARNING

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

NOTE

- The pilot screw is factory pre-set. Adjustment is not necessary unless the carburetor is overhauled or a new pilot screw is installed.
- Use a tachometer with graduations of 50 rpm change.

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

CAUTION

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

INITIAL OPENING: 2-3/4 turns out

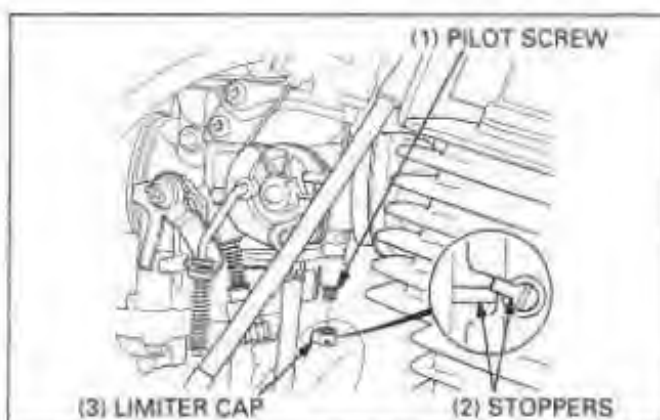
2. Warm the engine up to operating temperature. Stop and go riding for 10 minutes is sufficient.
3. Stop the engine and connect a tachometer according to the tachometer manufacturer's instructions.
4. Start the engine and adjust the idle speed with the throttle stop screw.

IDLE SPEED: 1,400 ± 100 rpm

5. Turn the pilot screw in or out slowly to obtain the highest engine speed.
6. Readjust the idle speed with the throttle stop screw.
7. Turn the pilot screw in until the engine speed drops 50 rpm.
8. Readjust the idle speed with the throttle stop screw.
9. Apply Loctite 601 or equivalent to the inside of the limiter cap. Place the cap over the pilot screw so that it can be turned clockwise only. This will prevent adjustment in the counterclockwise direction which richens the fuel mixture.

NOTE

- Be careful not to turn the pilot screw when installing the limiter cap.



HIGH ALTITUDE ADJUSTMENT

When the vehicle is to be operated continuously above 2,000 m (6,500 feet), the carburetor must be readjusted as follows to improve driveability and decrease exhaust emissions.

Warm up the engine to operating temperature. Stop and go riding for 10 minutes is sufficient.

Turn the pilot screw clockwise 1/2 turn.

Adjust the idle speed to $1,400 \pm 100$ rpm with the throttle stop screw.

HIGH ALTITUDE SETTING: 1/2 turn in from initial setting

NOTE

- This adjustment must be made at high altitude to ensure proper high altitude operation.

Attach a Vehicle Emission Control Information Update Label on the left side of the air cleaner housing as shown in the label position illustration.

NOTE

- Do not attach the label to any part that can be easily removed from the vehicle.

CAUTION

- Sustained operation at an altitude lower than 5,000 feet (1,500 m) with the carburetor adjusted for high altitude settings may cause engine to idle roughly and stall in traffic. It may also cause engine damage due to overheating.

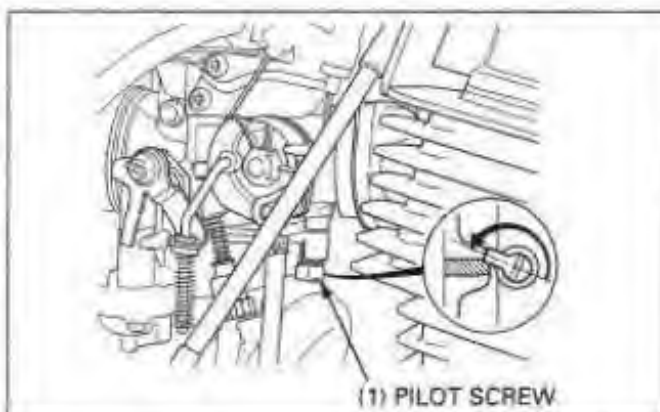
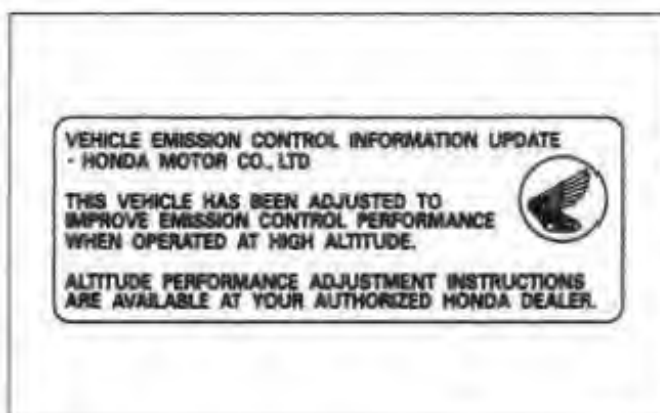
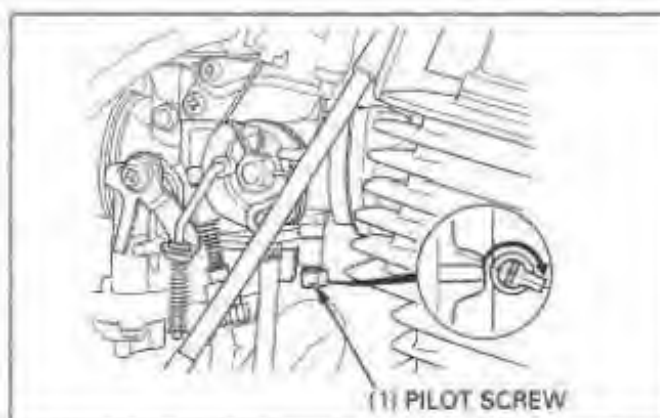
When the vehicle is to be operated continuously below 5,000 feet (1,500 m), turn the pilot screw to the Low Altitude Setting specified below.

LOW ALTITUDE SETTING: 1/2 turn out

Adjust the idle speed $1,400 \pm 100$ rpm with the throttle stop screw.

Be sure to make these adjustments at low altitude.

Remove the Vehicle Emission Control Information Update Label that is attached on the left side of the air cleaner housing.



AIR CLEANER HOUSING

REMOVAL

Remove the following:

- Rear fender (page 2-4)
- Side covers (page 2-2)
- Rear wheel (page 13-3)
- Battery (page 15-4)



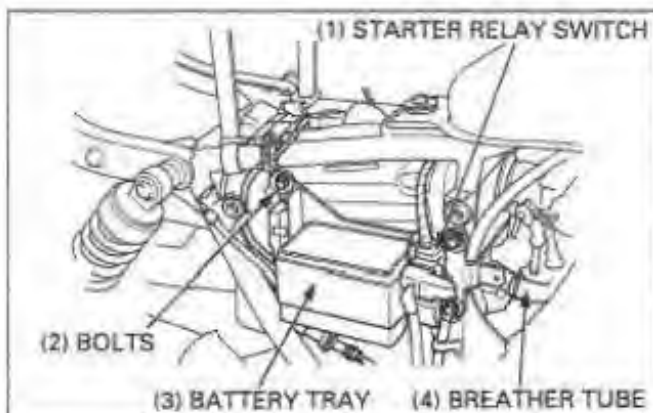
Disconnect the rear brake light switch connector.

Remove the starter relay switch from the battery tray.

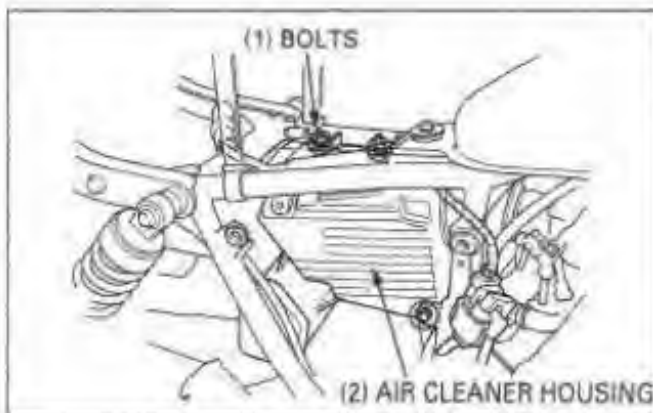
Remove the bolts and battery tray.

Disconnect the crankcase breather tube from the breather separator.

Loosen the connecting tube band screw.



Remove the air cleaner housing mounting bolts.

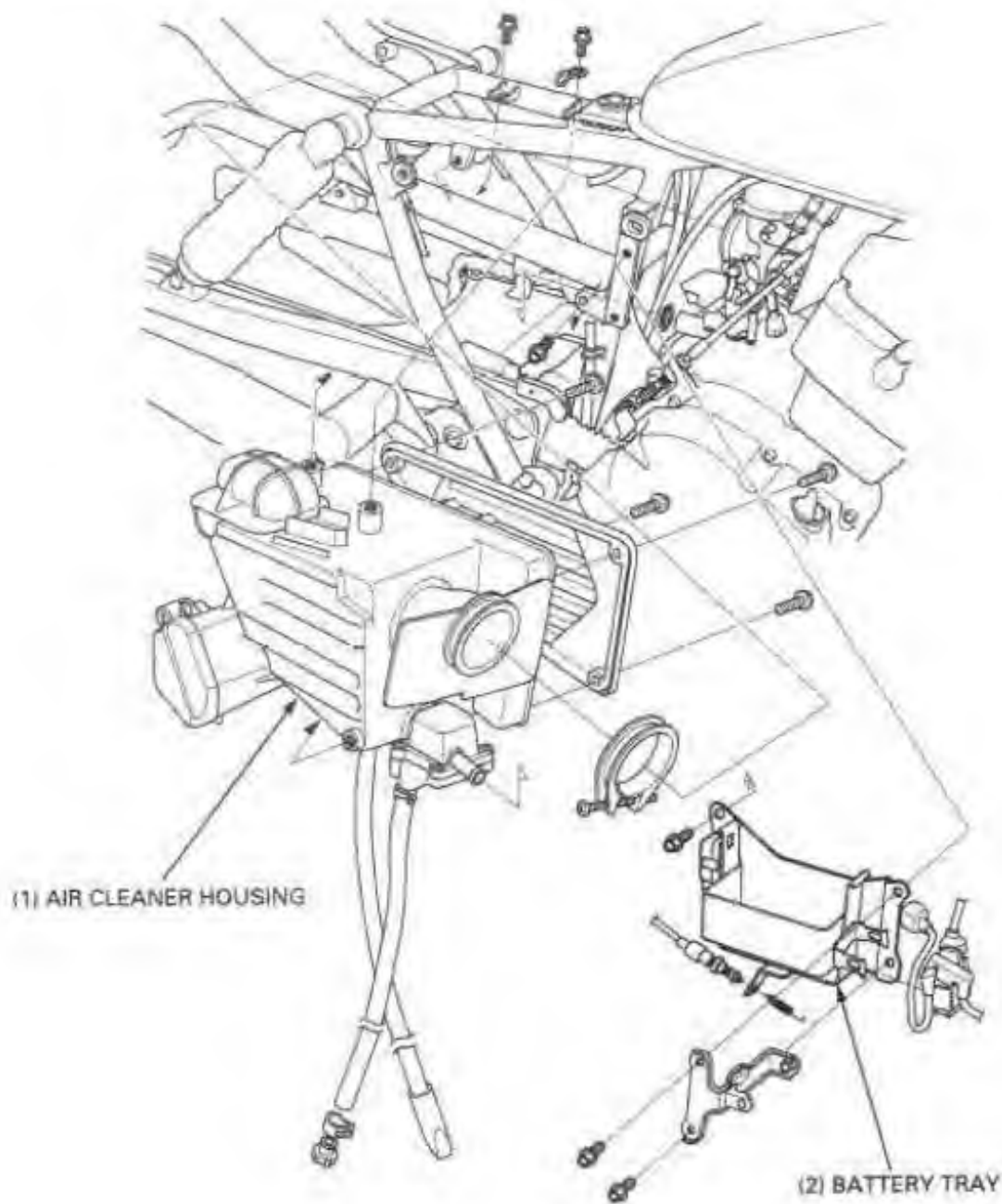


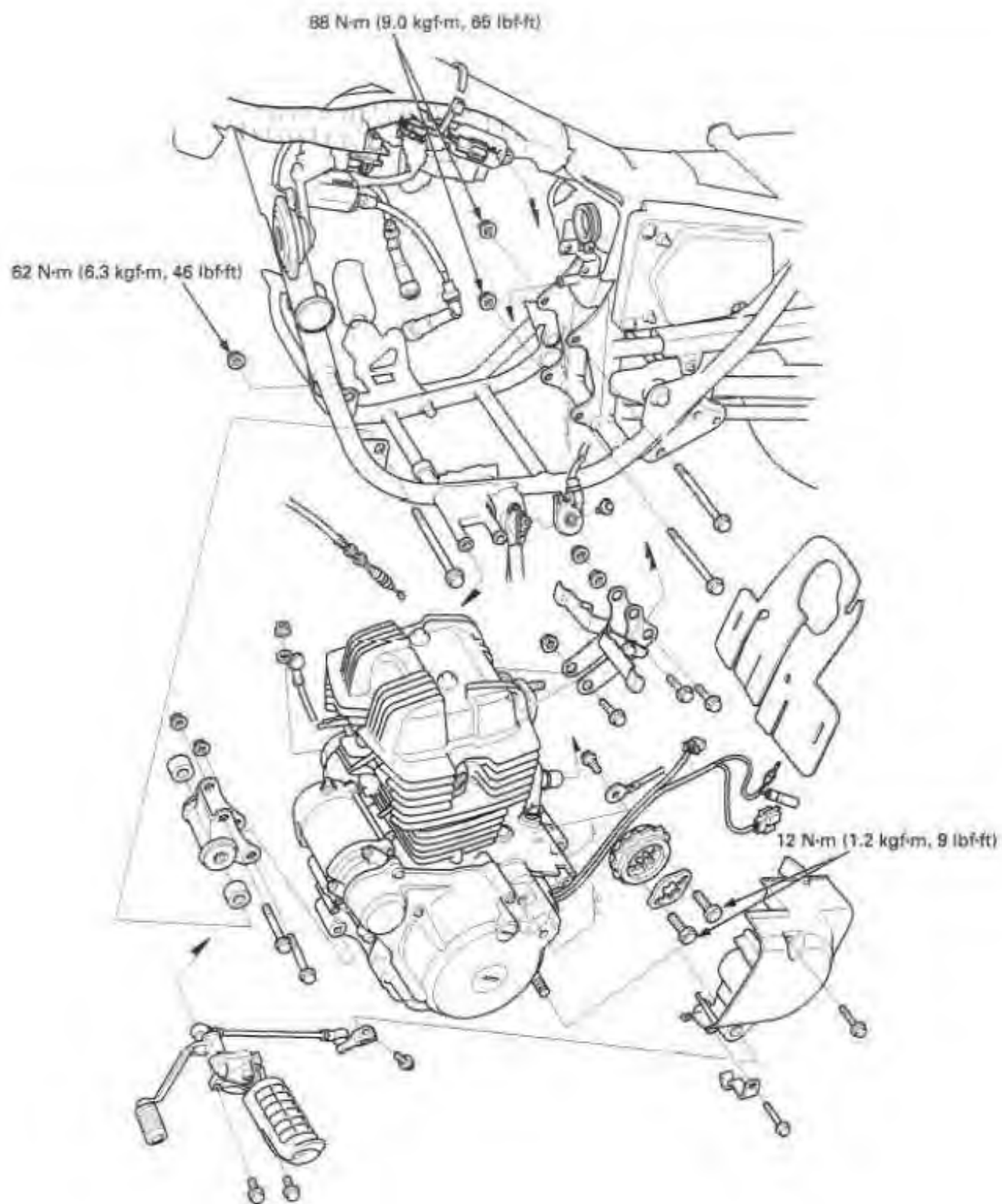
Pull and remove the air cleaner housing backward.



INSTALLATION

Installation is in the reverse order of removal.





6. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION

6-1

ENGINE INSTALLATION

6-4

ENGINE REMOVAL

6-2

SERVICE INFORMATION

GENERAL

- The following components require engine removal for service.
 - Cylinder head/valves (Section 7)
 - Cylinder/piston (Section 8)
 - Crankshaft (Section 11)
 - Transmission (Section 11)
- The following components can be serviced with engine installed in the frame.
 - Camshaft (Section 7)
 - Clutch (Section 9)
 - Gearshift linkage (Section 9)
 - Carburetor (Section 5)
 - Oil pump (Section 4)

6

SPECIFICATIONS

ITEM		SPECIFICATION
Engine oil capacity	At draining	1.5 liter (1.6 US qt, 1.3 imp qt)
	At disassembly	1.8 liter (1.9 US qt, 1.6 imp qt)
Engine weight		38.5 kg (84.9 lbs)

TORQUE VALUES

Exhaust pipe joint nut	14 N·m (1.4 kgf·m, 10 lbf·ft)
Engine rear mounting nut	83 N·m (8.5 kgf·m, 61 lbf·ft)
Gearshift pedal pivot nut	22 N·m (2.2 kgf·m, 16 lbf·ft)
Drive sprocket bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)

ENGINE REMOVAL

Support the motorcycle using a safety stand or a hoist.

Turn the ignition switch OFF and disconnect the battery negative (-) wire from the terminal.
Drain the engine oil (page 3-10).

Remove the following:

- Carburetor (page 5-4)
- Seat/fuel tank (page 2-2, 3)
- Exhaust system (page 2-4)

Disconnect the spark plug caps.

Disconnect the clutch cable from the bracket and clutch arm.

Remove the nut and starter motor cable from the starter motor.

Remove the bolt and engine ground wire.

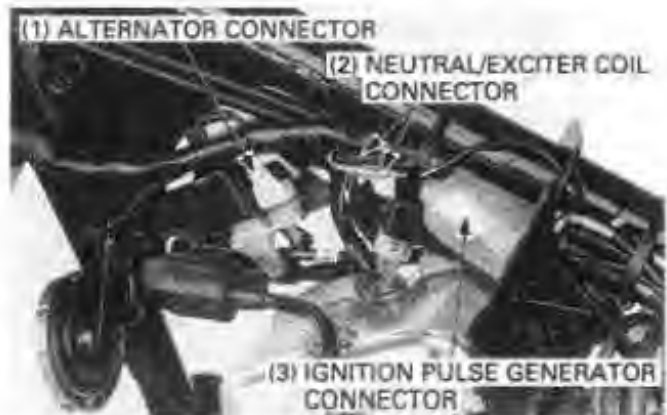
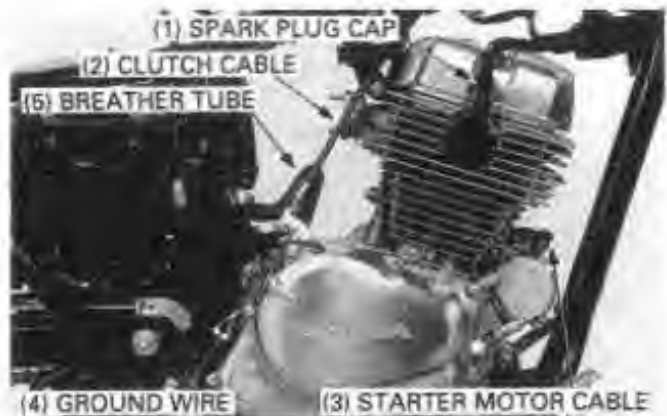
Disconnect the crankcase breather separator tube from the crankcase.

Disconnect the following connectors:

- Alternator connector
- Neutral switch connector
- Exciter coil connector
- Ignition pulse generator connector

Remove the gearshift pedal link pinch bolt.

Remove the left footpeg mounting bolts and footpeg/gearshift linkage assembly.



Remove the bolt and side stand switch.
Remove the bolts and starter motor cable clamp.
Remove the bolts and left crankcase rear cover.



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



Remove the upper engine hanger nut and bolt.
Remove the nuts, bolts and upper engine hanger bracket.

Remove the front engine hanger nuts and bolts.
Remove the nut, bolt and front engine hanger bracket.

Remove the rear engine mounting nuts and bolts, then remove the engine from the left side of the frame.



Note the direction of the engine hanger plate, bracket and hanger bolts.



ENGINE INSTALLATION

Install the engine into the frame.

Temporarily install the rear engine hanger bolts and nuts. Install the front engine hanger bracket, then temporarily install the hanger bolts and bracket bolt. Install the upper engine hanger plate, then temporarily install the hanger plate bolts and hanger bolt.

First tighten the rear engine hanger nuts to the specified torque.

TORQUE: 88 N·m (9.0 kgf·m, 65 lbf·ft)

Tighten the front engine hanger bracket bolt to the specified torque.

TORQUE: 62 N·m (6.3 kgf·m, 46 lbf·ft)

Tighten the upper engine hanger plate nuts and hanger nut securely.



Install the drive sprocket and fixing plate to the counter-shaft. Install and tighten the fixing plate bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Install the left crankcase rear cover and tighten the bolts.

Route the starter motor cable and secure it with the cable clamps and bolts.

Route the side stand switch wire properly (page 1-18). Install the side stand switch aligning the switch pin with the side stand hole and the switch groove with the return spring holding pin. Secure the side stand switch with a new bolt.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

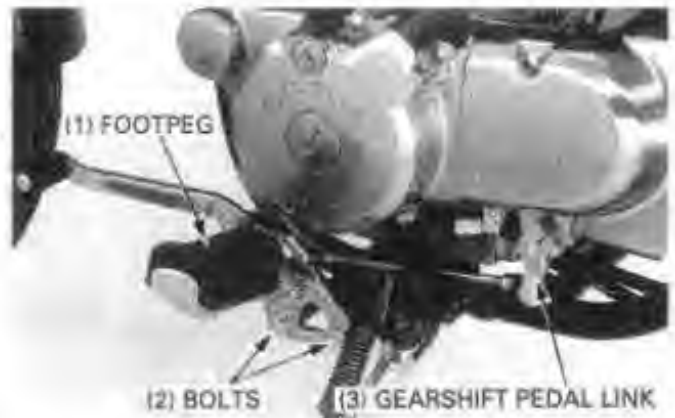


Install the left footpeg/gearshift linkage assembly, and install and tighten the mounting bolts.

Install the gearshift arm to the spindle aligning the punch marks.

Install and tighten the pinch bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



Connect the following connectors:

- Ignition pulse generator connector
- Exciter coil connector
- Neutral switch connector
- Alternator connector



Connect the crankcase breather tube to the engine.

Install the engine ground wire and tighten the bolt.

Connect the clutch cable to the clutch arm and bracket.

Install the spark plug caps.



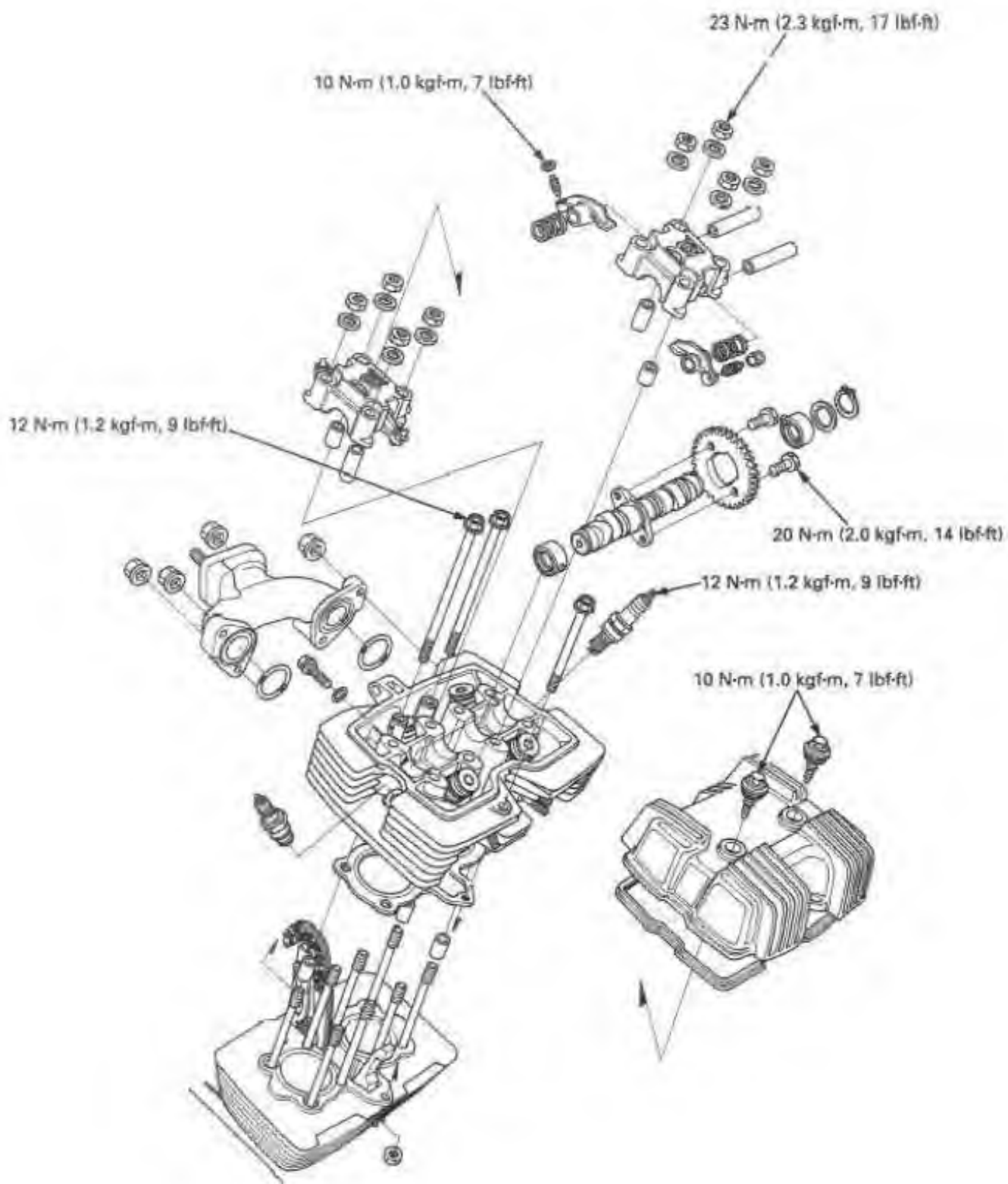
Install the following:

- Exhaust system (page 2-4)
- Carburetor (page 5-11)
- Seat/fuel tank (page 2-2, 3)

Fill the crankcase with the recommended engine oil (page 3-9).

Adjust the clutch lever free play (page 3-18).





7. CYLINDER HEAD/VALVES

SERVICE INFORMATION	7-1	VALVE GUIDE REPLACEMENT	7-10
TROUBLESHOOTING	7-2	VALVE SEAT INSPECTION/REFACING	7-11
CYLINDER COMPRESSION TEST	7-3	CYLINDER HEAD ASSEMBLY	7-14
ROCKER ARM/CAMSHAFT REMOVAL	7-3	CYLINDER HEAD INSTALLATION	7-15
CYLINDER HEAD REMOVAL	7-7	CAMSHAFT/ROCKER ARM INSTALLATION	7-16
CYLINDER HEAD DISASSEMBLY	7-8		
CYLINDER HEAD INSPECTION	7-9		

SERVICE INFORMATION

GENERAL

- This section covers service of the cylinder head, valves, rocker arms and camshaft.
- Rocker arms and camshaft can be serviced with the engine installed in the frame. The engine must be removed for servicing the cylinder head and valves.
- 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.
- Rocker arm lubricating oil is fed through oil passages in the cylinder head. Clean the oil passages before assembling cylinder head and rocker arm holder.
- Be careful not to damage the mating surfaces when removing the cylinder head cover and cylinder head.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			1,100 kPa (11.2 kg/cm ² , 159 psi) at 600 rpm	—
Cylinder head warpage			—	0.10 (0.004)
Valve and valve guide	Valve clearance	IN/EX	0.08 – 0.10 (0.002 – 0.004)	—
	Valve stem O.D.	IN	5.450 – 5.465 (0.2146 – 0.2152)	5.42 (0.213)
		EX	5.430 – 5.445 (0.2138 – 0.2144)	5.40 (0.213)
	Valve guide I.D.	IN	5.475 – 5.485 (0.2156 – 0.2159)	5.50 (0.217)
		EX	5.475 – 5.485 (0.2156 – 0.2159)	5.50 (0.217)
	Stem-to-guide clearance	IN	0.010 – 0.035 (0.0004 – 0.0014)	0.08 (0.003)
		EX	0.030 – 0.055 (0.0012 – 0.0022)	0.10 (0.004)
	Valve seat width	IN/EX	1.0 – 1.1 (0.039 – 0.043)	1.8 (0.07)
Valve spring free length	Inner	IN/EX	29.9 (1.18)	29.0 (1.14)
	Outer	IN/EX	38.2 (1.50)	37.0 (1.46)
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)
	Rocker arm-to-shaft clearance	IN/EX	0.013 – 0.043 (0.0005 – 0.0017)	0.05 (0.002)
Camshaft	Cam lobe height	IN	27.383 – 27.543 (1.0781 – 1.0844)	27.2 (1.07)
		EX	27.209 – 27.369 (1.0712 – 1.0775)	27.0 (1.06)
	Runout		—	0.05 (0.002)
	Journal O.D.		19.967 – 19.980 (0.7861 – 0.7866)	19.92 (0.784)
	Bushing I.D.		20.063 – 20.083 (0.7899 – 0.7907)	20.20 (0.795)

CYLINDER HEAD/VALUES

TORQUE VALVES

Valve adjuster lock nut	10 N·m (1.0 kgf·m, 7 lbf·ft)
Cylinder head/camshaft holder nut	23 N·m (2.3 kgf·m, 17 lbf·ft)
Cylinder head bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Cam sprocket bolt	20 N·m (2.0 kgf·m, 14 lbf·ft) Apply a locking agent to the threads
Cylinder head cover bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)

TOOLS

Timing cap wrench	07709 - 0010001
Valve guide driver, 5.5 mm	07742 - 0010100
Valve guide reamer, 5.485 mm	07984 - 0980000 or 07984 - 098000D (U.S.A. only)
Valve spring compressor	07757 - 0010000
Valve seat cutters	— these are commercially available in U.S.A.
Seat cutter, 24.5 mm (45° IN/EX)	07780 - 0010100
Flat cutter, 25 mm (32° IN)	07780 - 0012000
Flat cutter, 25 mm (32° EX)	07780 - 0012601
Interior cutter, 26 mm (60° IN/EX)	07780 - 0014500
Cutter holder, 5.5 mm	07781 - 0010101

TROUBLESHOOTING

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

Low compression

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

High compression

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

Excessive smoke

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

Excessive noise

- Incorrect valve adjustment
- Sticking valve or broken valve spring
- Worn rocker arm and/or shaft

Rough idle

- Low cylinder compression
- Intake air leak

Overheating

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

Knocking or abnormal noise

- Excessive carbon build-up
- Worn piston and cylinder (section 8)

CYLINDER COMPRESSION TEST

WARNING

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

Warm up the engine.

Stop the engine and remove the spark plugs.

Install a compression gauge.

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

COMPRESSION PRESSURE:

1,100 kPa (11.2 kg/cm², 159 psi) at 600 rpm

Low compression can be caused by:

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

High compression can be caused by:

- Carbon deposits in combustion chamber or on piston head



ROCKER ARM/CAMSHAFT REMOVAL

Remove the fuel tank (page 2-3).

Remove the spark plug caps.

Remove the ignition coils.

Remove the bolts and cylinder head cover.

Remove the cylinder head cover packing.



Remove the crankshaft and timing hole caps using the special tool.

TOOL:

Timing cap wrench

07709 - 0010001

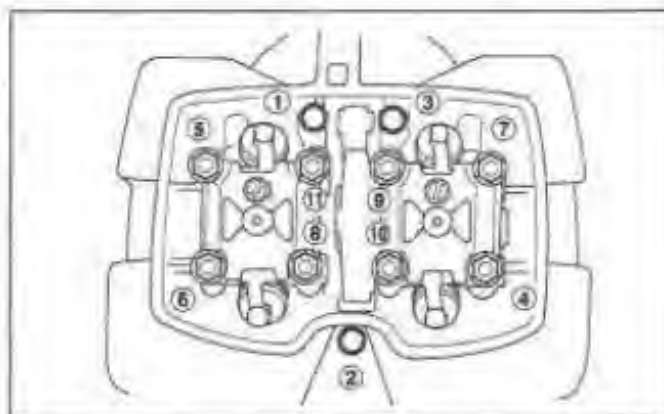


CYLINDER HEAD/VALVES

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



Loosen the camshaft holder nuts and cylinder head bolts in sequence shown in 2 - 3 steps.
Remove the nuts and camshaft holders and dowel pins.



Thread a 5 mm screw into the rocker arm shaft and pull the rocker arm shaft out of the camshaft holder.



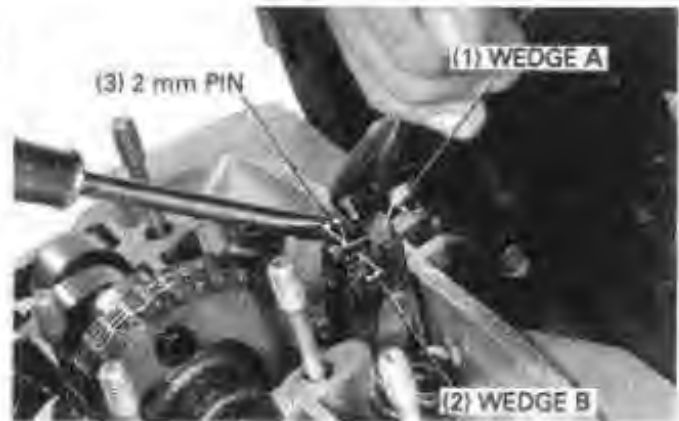
Remove the rocker arms and rocker arm springs.

NOTE

- Mark and store the disassembled parts to ensure that they are reinstalled in their original locations.



Pull the wedge A of the cam chain tensioner straight up while holding the wedge B down to release the cam chain tension.
Secure wedge A with a 2 mm pin as shown.



Remove the cam sprocket bolt.
Turn the crankshaft counterclockwise one turn, and remove the other cam sprocket bolt.

NOTE

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

Slide the cam sprocket off the camshaft flange and remove the cam chain from the sprocket.



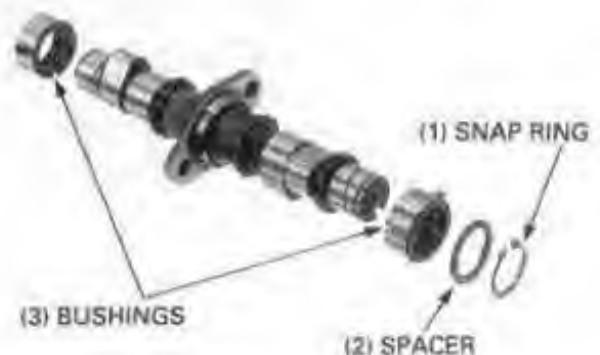
Remove the camshaft from the right side and remove the cam sprocket.
Hang the cam chain with a piece of wire to prevent it from falling into the crankcase.



Remove the snap ring, spacer and bushing from the camshaft.

NOTE

- The snap ring and spacer are installed on the left side only.



INSPECTION

Inspect the rocker arms for wear or damage to the camshaft contact surface and for a plugged oil hole.

NOTE

- If the camshaft contact surface of the rocker arm is damaged or abnormally worn, check the cam lobes for damage.



Measure the I.D. of each rocker arm.

SERVICE LIMIT: 10.10 mm (0.398 in)

Inspect the rocker arm shafts for wear or damage.

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

SERVICE LIMIT: 9.91 mm (0.390 in)

Calculate the rocker arm-to-shaft clearance.

SERVICE LIMIT: 0.05 mm (0.002 in)



Inspect the camshaft bushings for wear or damage.

Measure the I.D. of each bushing.

SERVICE LIMIT: 20.20 mm (0.795 in)



Support both ends of the camshaft with V-blocks and measure the camshaft runout with a dial gauge.

SERVICE LIMIT: 0.05 mm (0.002 in)



Measure the camshaft journal O.D.

SERVICE LIMIT: 19.92 mm (0.784 in)



Measure the height of each cam lobe.

SERVICE LIMIT:

IN: 27.2 mm (1.07 in)

EX: 27.0 mm (1.06 in)



CYLINDER HEAD REMOVAL

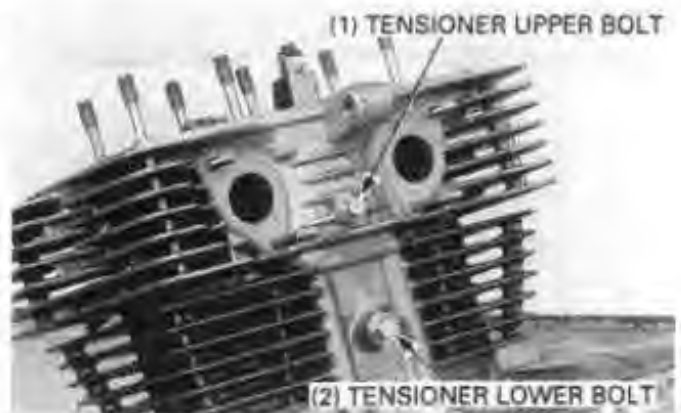
Remove the engine from the frame (section 6).

Remove the camshaft (page 7-3).

Remove the nuts and intake manifold.



Remove the cam chain tensioner upper bolt and loosen the lower bolt.



CYLINDER HEAD/VALVES

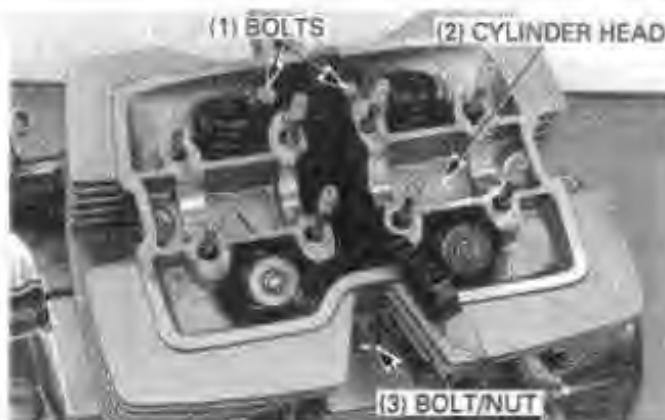
Remove the cylinder head bolts, nut and the cylinder head.

NOTE

- Be careful not to let the front cylinder head bolt fall into the cylinder.

CAUTION

- Do not strike the cylinder head fins to remove the cylinder head.



Remove the dowel pins and cylinder head gasket.



CYLINDER HEAD DISASSEMBLY

Remove the spark plugs from the cylinder head.

Remove the valve spring cotters, retainers, springs and valves using the special tools as shown.

TOOL:

Valve spring compressor 07757 - 0010000

CAUTION

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

NOTE

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

Remove the valve stem seals and valve spring seats.



CYLINDER HEAD INSPECTION

CYLINDER HEAD

Remove carbon deposits from the combustion chambers. Check the spark plug hole and valve areas for cracks.

NOTE

- Avoid damaging the gasket surface.
- Gasket will come off easier if soaked in solvent.

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

SERVICE LIMIT: 0.10 mm (0.004 in)



VALVE SPRING

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

SERVICE LIMITS:

Inner: 29.0 mm (1.14 in)

Outer: 37.0 mm (1.46 in)

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



VALVE/VALVE GUIDE

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

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

SERVICE LIMITS:

IN: 5.42 mm (0.213 in)

EX: 5.40 mm (0.213 in)



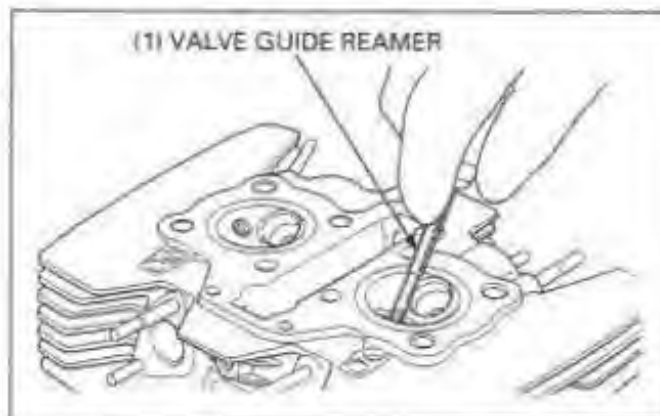
CYLINDER HEAD/VALVES

Ream the guides to remove any carbon deposits before checking clearances.

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

TOOL:

Valve guide reamer, 5.485 mm 07984 – 0980000 or
07984 – 098000D
(U.S.A. only)



Measure and record each valve guide I.D.

SERVICE LIMIT: IN/EX: 5.50 mm (0.217 in)

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

SERVICE LIMITS:

IN: 0.08 mm (0.003 in)

EX: 0.10 mm (0.004 in)

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

If the stem-to-guide clearance exceeds the service limits with new guides also, replace the valves and guides.



NOTE

- Reface the valve seats whenever the valve guides are replaced (page 7-11).

VALVE GUIDE REPLACEMENT

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

Heat the cylinder head to 100 – 150°C (212 – 300°F) with a hot plate or oven.

⚠ WARNING

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

CAUTION

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

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

TOOL:

Valve guide driver, 5.5 mm 07742 – 0010100



Install a new O-ring on the new valve guide.
Drive in the guide from the top of the head.

TOOL:

Valve guide driver, 5.5 mm 07742 - 0010100

Inspect the valve guide for damage.



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

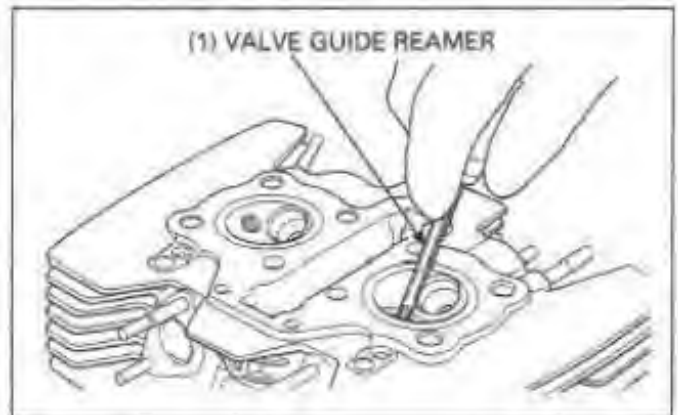
TOOL:

Valve guide reamer, 5.485 mm 07984 - 0980000 or
07984 - 098000D
(U.S.A. only)

NOTE

- Use cutting oil on the reamer during this operation.

Clean the cylinder head thoroughly to remove any metal particles.
Reface the valve seat (see below).



VALVE SEAT INSPECTION/REFACING

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

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

Remove and inspect the valves.

CAUTION

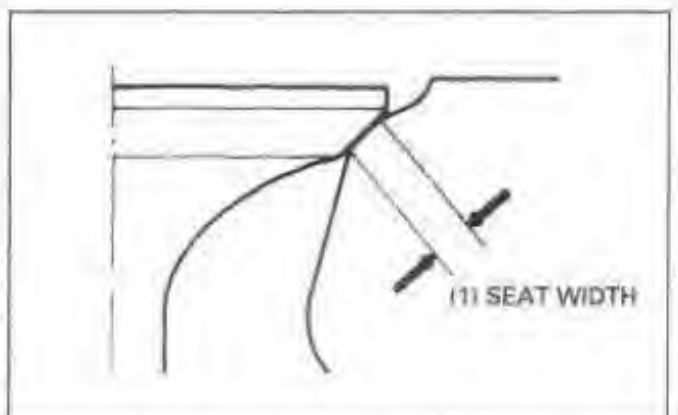
- The valves cannot be ground. If a valve face is burned or badly worn or if it contacts the seat unevenly, replace the valve.

Inspect the width of each valve seat.

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

SERVICE LIMIT: 1.8 mm (0.07 in)

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

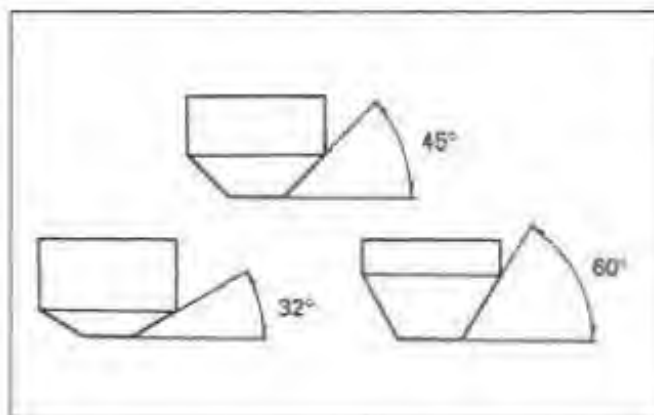


VALVE SEAT REFACING

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

NOTE

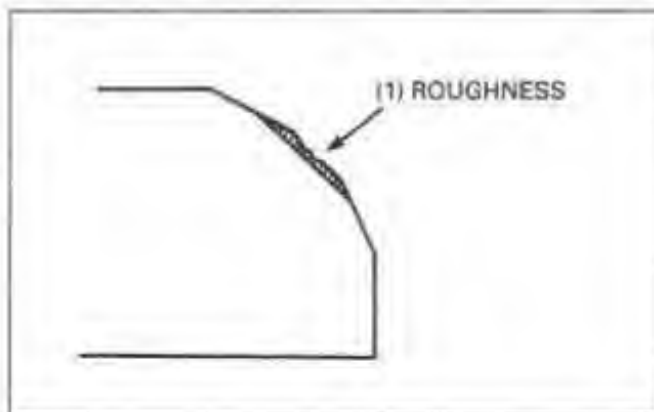
- Follow the refacing manufacturer's operating instructions.



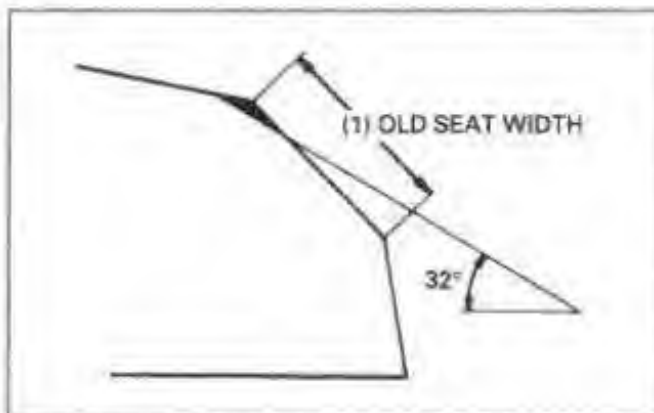
Use a 45 degrees cutter to remove any roughness or irregularities from the seat.

NOTE

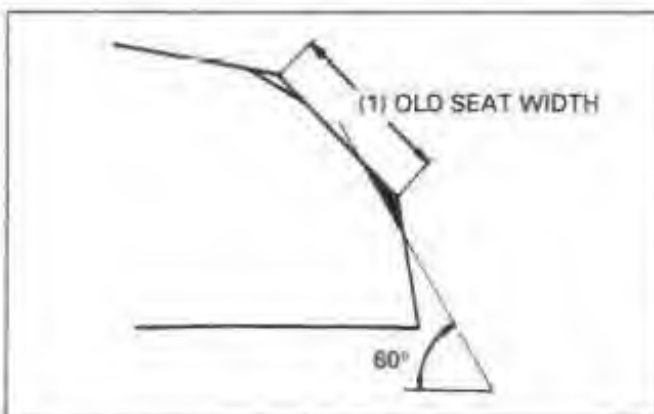
- Reface the seat with a 45 degrees cutter whenever a valve guide is replaced.



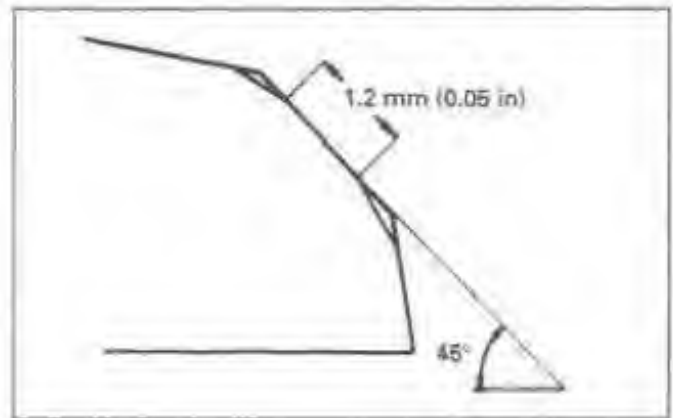
Use a 32 degrees cutter to remove the top 1/4 of the existing valve seat material.



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



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

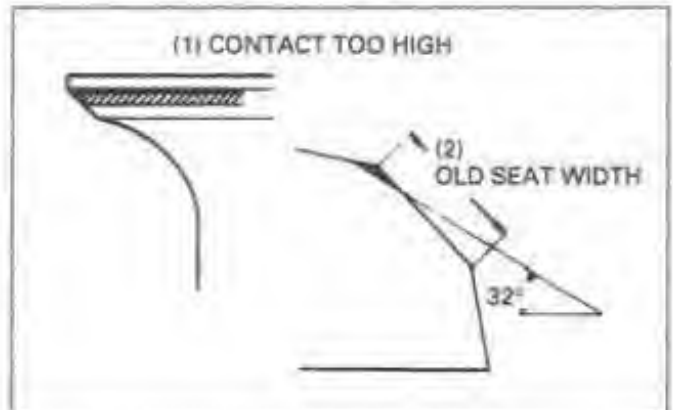


Apply a thin coating of Prussian Blue to the valve seat.
Press the valve through the valve guide and onto the seat to make a clear pattern.

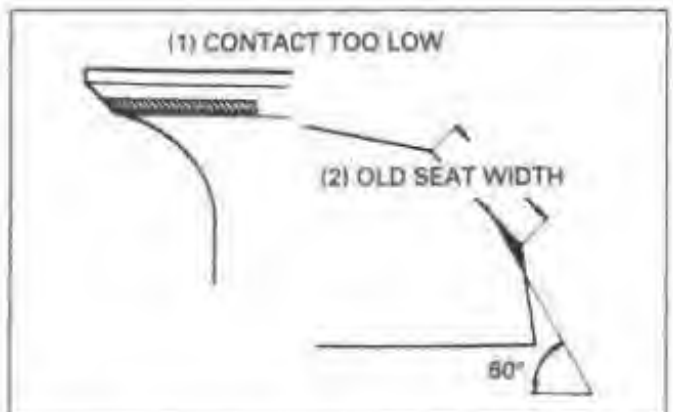
NOTE

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

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



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



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

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

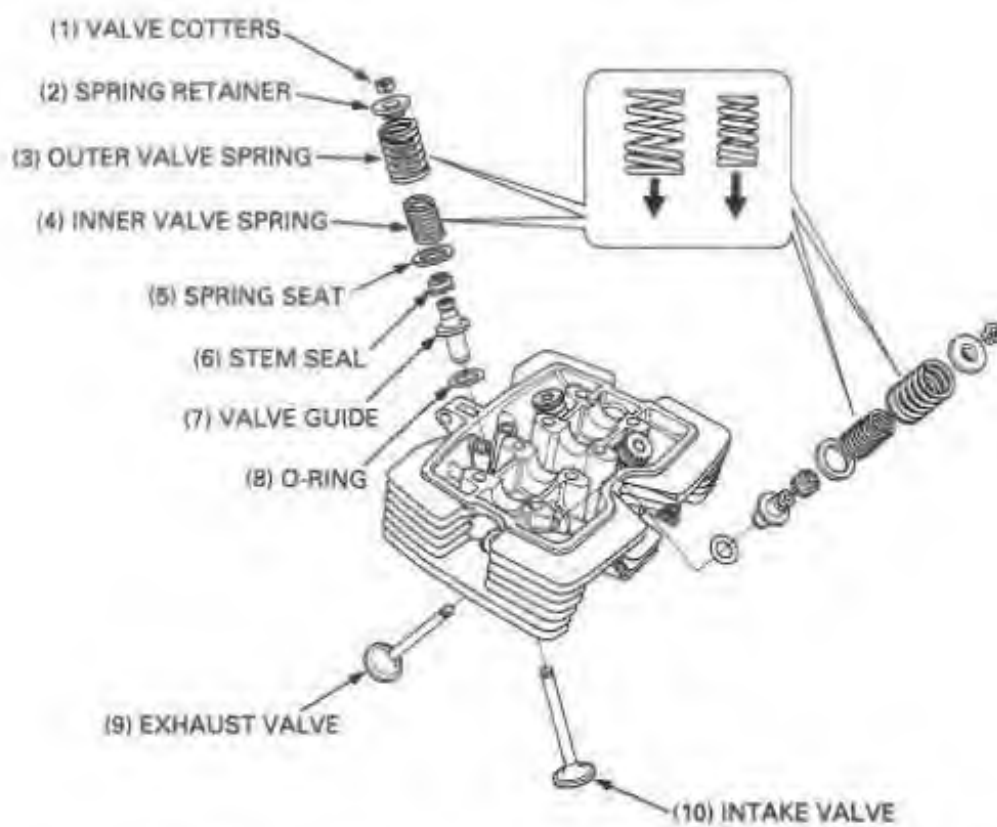
After lapping, wash all residual compound off the cylinder head and valve.

NOTE

- Do not allow lapping compound to enter the guides.



CYLINDER HEAD ASSEMBLY



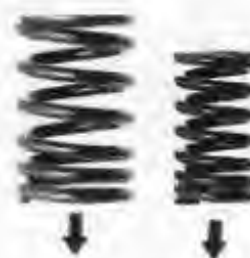
Install the valve spring seat and a new stem seal.

Lubricate the valve stems with molybdenum disulfide oil and insert the valve into the valve guide.

To avoid damage to the stem seal, turn the valve slowly when inserting.



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



(1) FACING TO THE COMBUSTION CHAMBER

Install the valve spring retainers and cotters using the special tool as shown.
To prevent loss of tension, do not compress the valve spring more than necessary.

TOOL:

Valve spring compressor

07757 - 0010000



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

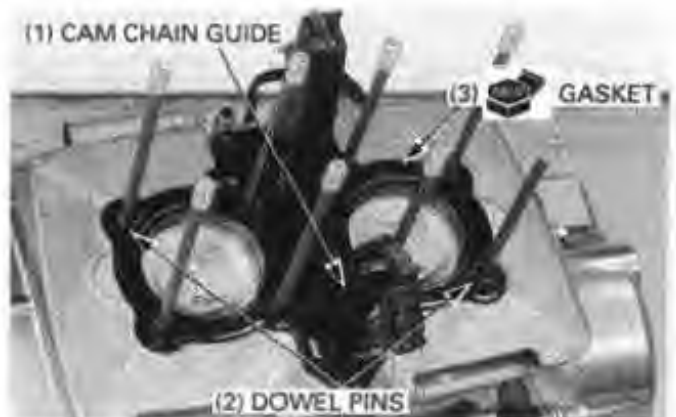
CAUTION

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

**CYLINDER HEAD INSTALLATION**

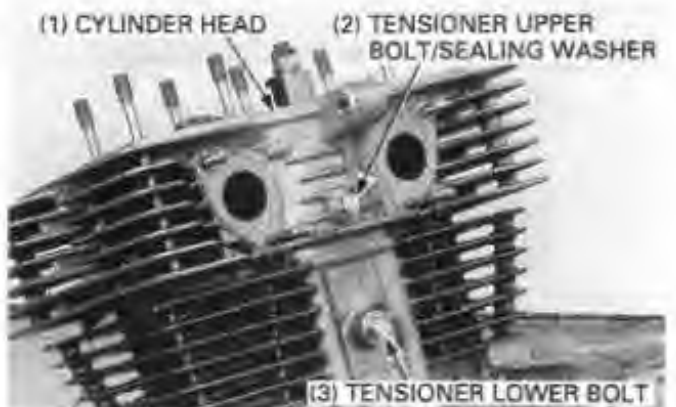
Clean the gasket material off the mating surface of the cylinder head.

Make sure that the cam chain guide is installed properly.
Install the dowel pins and a new cylinder head gasket as shown.



Install the cylinder head.

Install the cam chain tensioner upper bolt and sealing washer.
Tighten the cam chain tensioner bolts.



CYLINDER HEAD/VALVES

Temporarily install the cylinder head mounting bolts and nut, but do not tighten them.



Install the O-rings into the groove in the intake manifold and install it onto the cylinder head. Install the spark plugs.



CAMSHAFT/ROCKER ARM INSTALLATION

ROCKER ARM HOLDER ASSEMBLY

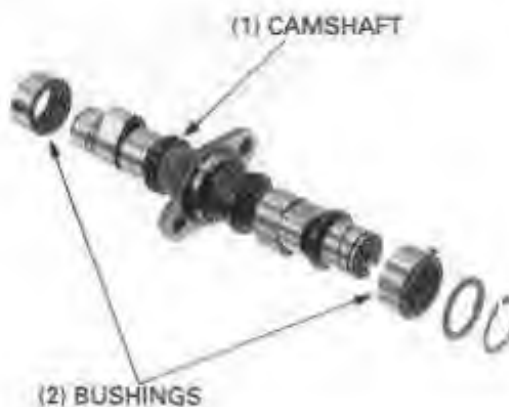
Lubricate the rocker arm and rocker arm shaft with clean engine oil.

Install the rocker arms and springs in the camshaft holder, and install the rocker arm shafts with the threaded end facing out.



Apply molybdenum disulfide oil to the inside of the camshaft bushings.

Install the camshaft bushings onto both ends of the camshaft.



Install the spacer by placing its tab into the groove in the left end of the shaft and secure it with the snap ring.



CAMSHAFT INSTALLATION

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



Pass the camshaft through the cam chain and sprocket and install it in the cylinder head.

NOTE

- Install the cam sprocket with the timing marks (index lines) facing toward the left side.



Position the dowel pins of the camshaft bushings into the grooves in the cylinder head.



CYLINDER HEAD/VALVES

Align the timing marks (index lines) on the cam sprocket with the top of the cylinder head and install the cam chain over the sprocket.

Install the cam sprocket on the camshaft flange and align the cam sprocket bolt holes in the sprocket and camshaft.



Apply a locking agent to the threads of the cam sprocket bolts. Install and tighten the sprocket bolt.

Turn the crankshaft counterclockwise one full turn (360°) and install and tighten the other bolt. Make sure that the timing marks on the sprocket align with the top of the cylinder head when the "T" mark on the flywheel aligns with the index mark on the left crankcase cover.



Remove the 2 mm pin from the chain tensioner wedge.



CAMSHAFT HOLDER INSTALLATION

Install the dowel pins into the cylinder head.



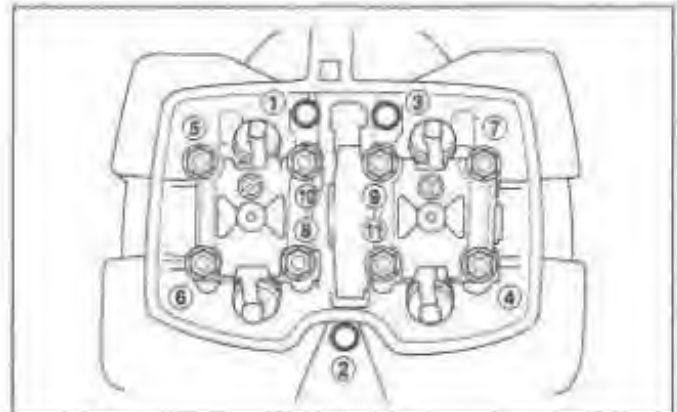
Loosen the valve adjusting screws fully and install the camshaft holders with the "F" mark toward the front. Install the cylinder head washers and nuts.



Tighten the nuts and bolts in the sequence shown in 2 – 3 steps.

TORQUE:

Nut: 23 N·m (2.3 kgf·m, 17 lbf·ft)



Pour fresh oil into the oil pockets in the cylinder head until the cams are submerged.

Adjust the valve clearance (page 3-7).



Inspect the cylinder head cover packing for damage or deterioration and replace with a new one if necessary.



CYLINDER HEAD/VALVES

Install the cylinder head cover and tighten the bolts.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the ignition coils and connect the connectors.
Install the spark plug caps to the spark plugs.



Check that the O-rings of the crankshaft and timing hole cap are in good condition, replace if necessary.



Install and tighten the crankshaft and timing hole caps using the special tool.

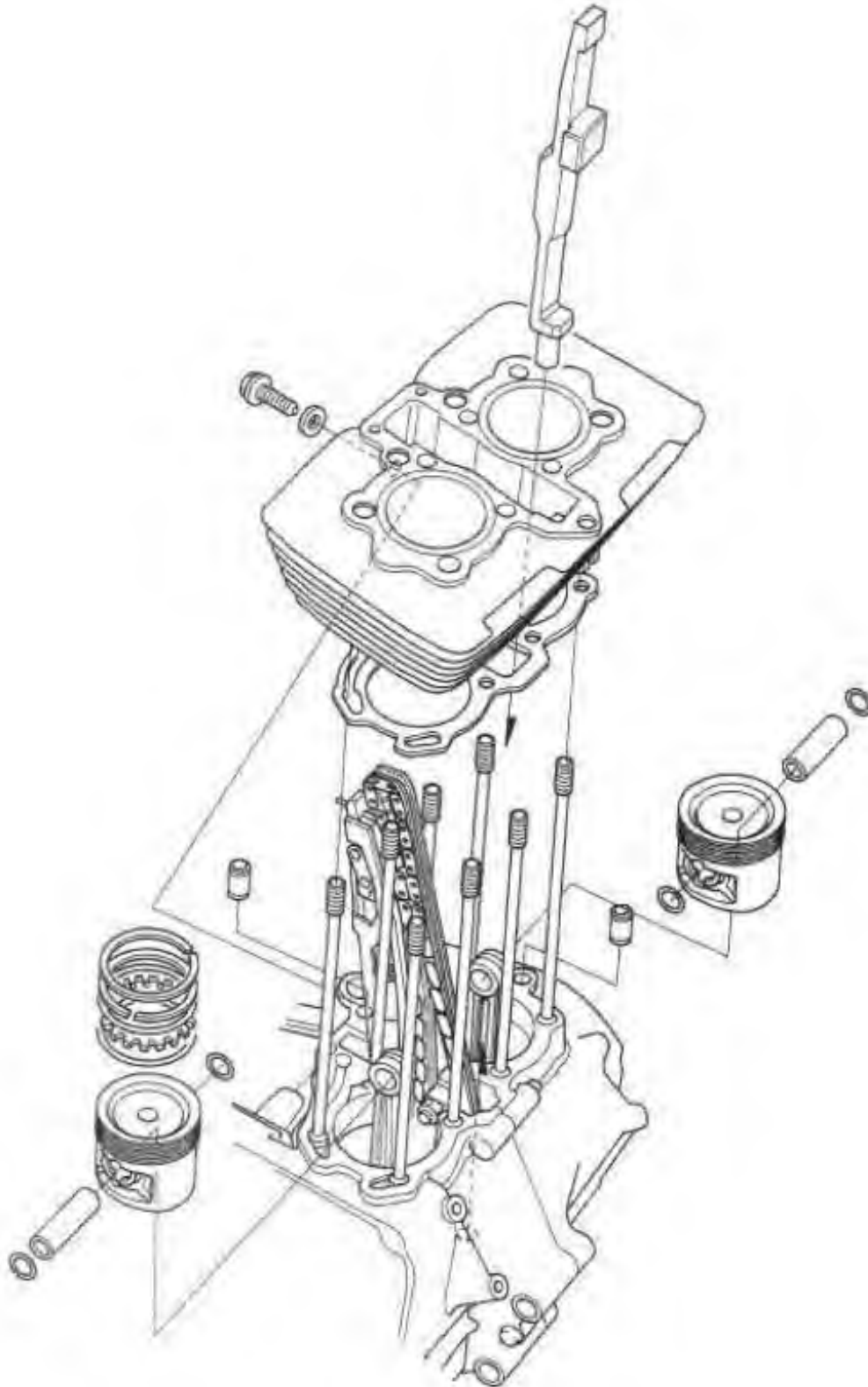
TOOL:

Timing cap wrench

07709 - 0010001

Install the fuel tank (page 2-3).





8. CYLINDER/PISTON

SERVICE INFORMATION	8-1	CYLINDER/PISTON INSPECTION	8-3
TROUBLESHOOTING	8-2	CYLINDER/PISTON INSTALLATION	8-6
CYLINDER/PISTON REMOVAL	8-3		

SERVICE INFORMATION

GENERAL

- This section covers service of the cylinder and piston.
- Cylinder head lubricating oil is fed through an oil passage in the cylinder. Be sure this oil passage is not clogged and that the O-rings and dowel pins are in place before installation.
- 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.
- Refer to section 11 for the cam chain tensioner removal and inspection.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		53.000 – 53.010 (2.0866 – 2.0870)	53.10 (2.091)
	Out of round		——	0.05 (0.002)
	Taper		——	0.05 (0.002)
	Warpage		——	0.05 (0.002)
Piston, piston ring	Piston mark direction		"IN" mark facing toward the intake side	——
	Piston O.D.		52.970 – 52.990 (2.0854 – 2.0862)	52.90 (2.083)
	Piston O.D. measurement point		10 mm (0.4 in) from bottom of skirt	——
	Piston pin bore I.D.		15.002 – 15.008 (0.5906 – 0.5909)	15.05 (0.593)
	Piston pin O.D.		14.994 – 15.000 (0.5903 – 0.5906)	14.98 (0.590)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.07 (0.003)
	Piston ring-to-ring groove clearance	Top	0.015 – 0.045 (0.0006 – 0.0018)	0.10 (0.004)
		Second	0.015 – 0.050 (0.0006 – 0.0020)	0.10 (0.004)
	Piston ring end gap	Top	0.15 – 0.30 (0.006 – 0.012)	0.45 (0.018)
		Second	0.30 – 0.45 (0.012 – 0.018)	0.60 (0.024)
		Oil (side rail)	0.2 – 0.7 (0.01 – 0.03)	0.90 (0.035)
Cylinder-to-piston clearance			0.010 – 0.040 (0.0004 – 0.0016)	0.10 (0.004)
Connecting rod small end I.D.			15.016 – 15.034 (0.5912 – 0.5919)	15.08 (0.594)
Connecting rod-to-piston pin clearance			0.016 – 0.040 (0.0006 – 0.0016)	0.10 (0.004)

TOOL

Piston base 07958 – 3000000

TROUBLESHOOTING

Low compression

- Worn cylinder or piston rings

Excessive smoke

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

Overheating

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

Knocking or abnormal noise

- Worn piston and cylinder
- Excessive carbon build-up

CYLINDER/PISTON REMOVAL

CYLINDER REMOVAL

Remove the following:

- Cylinder head (page 7-7)
- Cam chain tensioner lower bolt (page 7-7)
- Cam chain tensioner guide
- Cylinder

Remove the dowel pins and cylinder gasket.

(1) CAM CHAIN TENSIONER LOWER BOLT



(1) DOWEL PINS



PISTON REMOVAL

Remove a piston pin clip with pliers.

NOTE

- Do not let the clip fall into the crankcase.

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

CAUTION

- Always support the piston when pressing out the piston pin to prevent damage to the big-end bearing.

(2) PISTON PIN



CYLINDER/PISTON INSPECTION

CYLINDER INSPECTION

Inspect the top of the cylinder for warpage.

SERVICE LIMIT: 0.05 mm (0.002 in)



CYLINDER/PISTON

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

SERVICE LIMIT: 53.10 mm (2.091 in)

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

SERVICE LIMIT:

Taper: 0.05 mm (0.002 in)

Out of round: 0.05 mm (0.002 in)

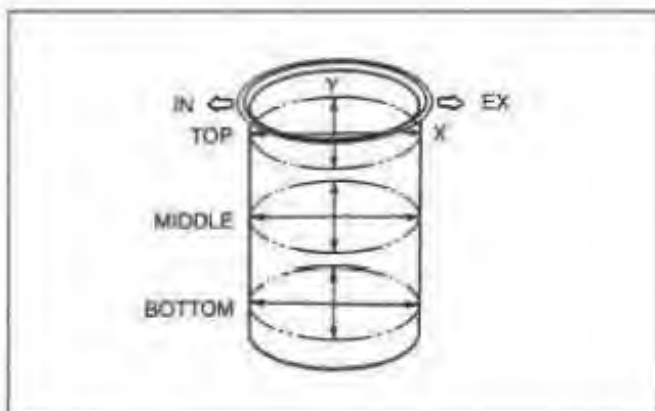
The cylinder must be rebored and an oversize piston fitted if the service limits are exceeded.

The following oversize pistons are available:

0.25 mm (0.010 in)

0.50 mm (0.020 in)

The piston to cylinder clearance for the oversize piston must be: 0.01 – 0.04 mm (0.0004 – 0.0016 in).



PISTON INSPECTION

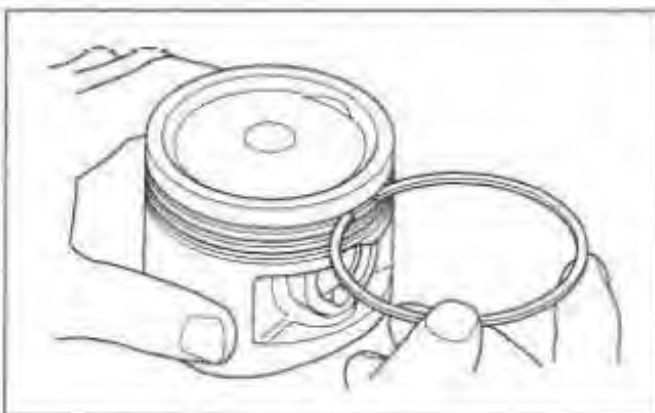
Remove the piston ring.

NOTE

- Do not damage the piston rings during removal.



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



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

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

SERVICE LIMIT:

Top: 0.10 mm (0.004 in)

Second: 0.10 mm (0.004 in)

Inspect the piston for wear or damage.



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

NOTE

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

SERVICE LIMIT:

Top: 0.45 mm (0.018 in)

Second: 0.60 mm (0.024 in)

Oil (side rail): 0.90 mm (0.035 in)



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

SERVICE LIMIT: 52.90 mm (2.083 in)

Calculate the piston-to-cylinder clearance.
Take a maximum reading to determine the clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)



Measure the piston pin bore.

SERVICE LIMIT: 15.05 mm (0.593 in)



CYLINDER/PISTON

Measure the O.D. of the piston pin.

SERVICE LIMIT: 14.98 mm (0.590 in)

Calculate the piston-to-piston pin clearance.

SERVICE LIMIT: 0.07 mm (0.003 in)



Measure the connecting rod small end I.D.

SERVICE LIMIT: 15.08 mm (0.594 in)



CYLINDER/PISTON INSTALLATION

PISTON RING INSTALLATION

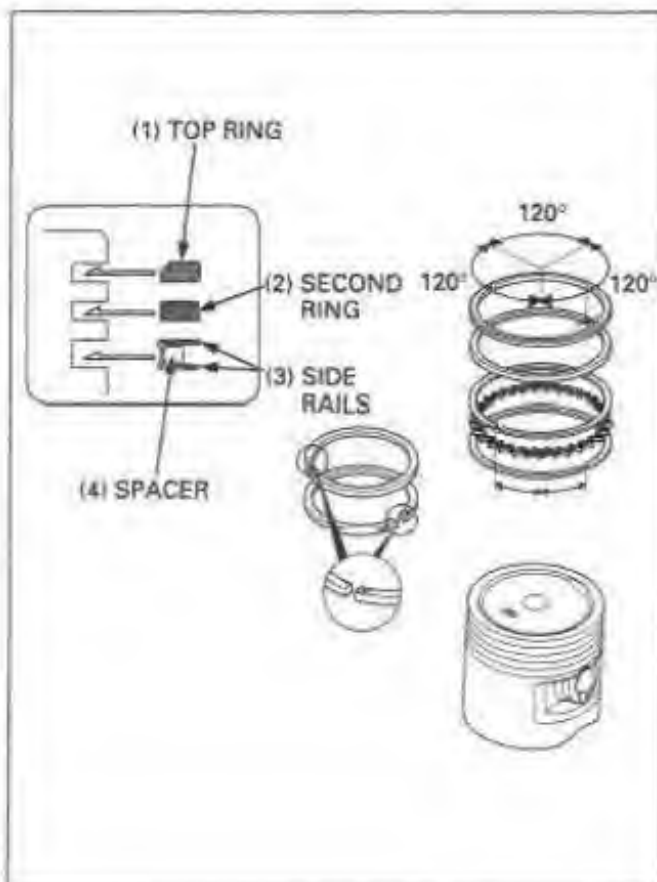
Clean the piston ring grooves thoroughly and install the piston rings.

NOTE

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

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

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



PISTON INSTALLATION

Clean off any gasket material from the cylinder base and crankcase upper surface.

NOTE

- Be careful not to damage the gasket mating surface.



Apply a thin coat of clean engine oil to the connecting rod small ends and piston pins.
Cover the opening into the crankcase with a rag.
Install the pistons and piston pins, using new piston pin clips.
Remove the rag.

NOTE

- Install the piston with its "IN" mark facing the intake side.
- Do not align the piston pin clip's end gap with the piston cut-out.
- Do not let the clip fall into the crankcase.



Install the dowel pins and a new gasket.



Coat the cylinder bores and pistons with engine oil.

Place the piston bases under the pistons, compress the piston rings and slide the cylinder over the pistons.

TOOL:

Piston base 07958 - 3000000

Remove the piston bases.

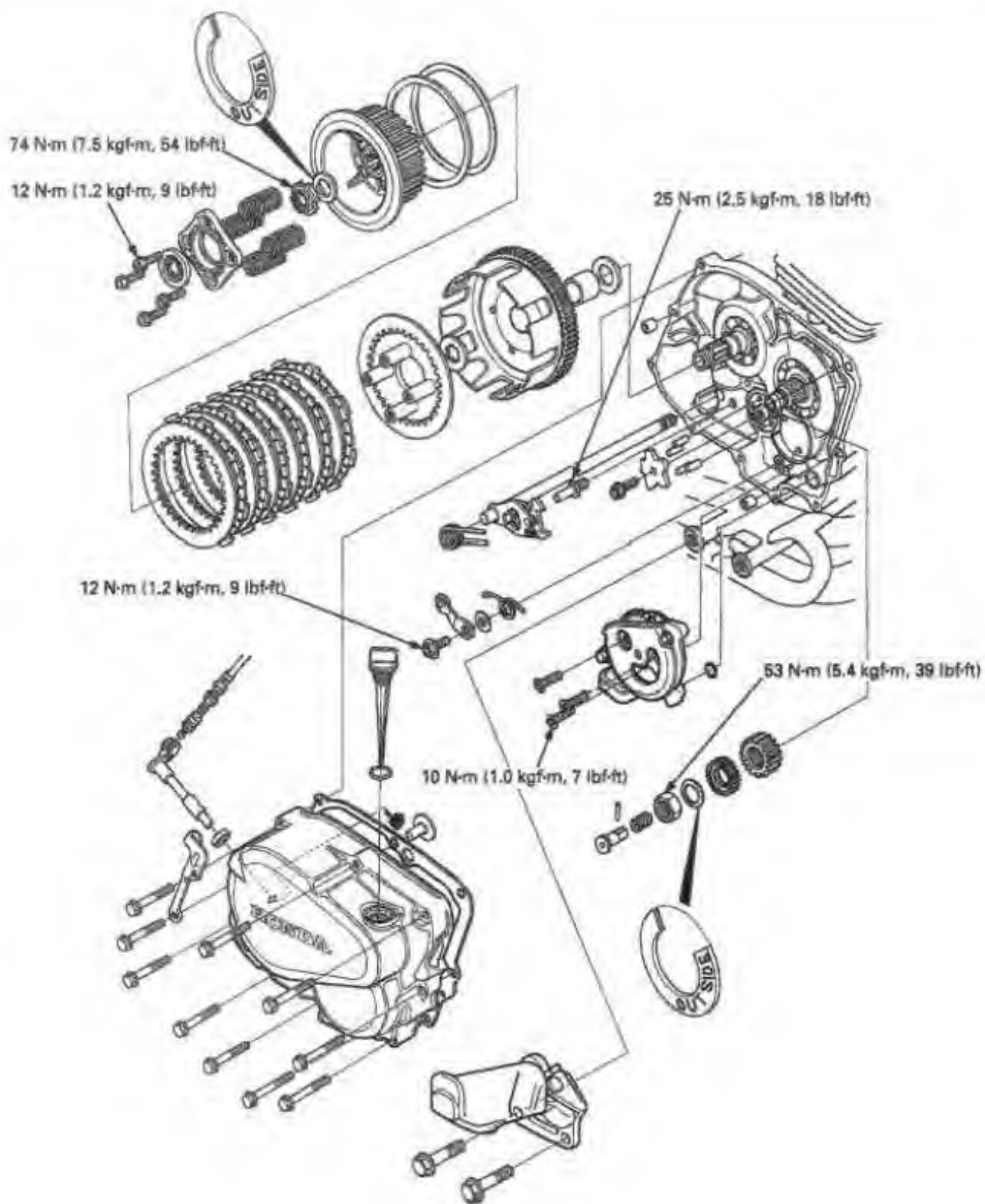


CYLINDER/PISTON

Install the cam chain tensioner lower bolt.
Install the cam chain tensioner guide.

Install the cylinder head (page 7-15).





9. CLUTCH/GEARSHIFT LINKAGE

SERVICE INFORMATION	9-1	PRIMARY AND OIL PUMP DRIVE GEARS	9-9
TROUBLESHOOTING	9-2	GEARSHIFT LINKAGE	9-10
RIGHT CRANKCASE COVER REMOVAL	9-3	RIGHT CRANKCASE COVER INSTALLATION	9-12
CLUTCH	9-4		

SERVICE INFORMATION

GENERAL

- This section covers removal and installation of the clutch, primary drive gear, oil pump drive gear and gearshift linkage. These services can be performed with the engine installed in the frame.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Clutch lever free play		10 – 20 (3/8 – 3/4)	—
Clutch spring free length		37.8 (1.49)	36.0 (1.42)
Clutch disc thickness		2.92 – 3.08 (0.115 – 0.121)	2.6 (0.10)
Clutch plate warpage		—	0.20 (0.008)
Clutch outer I.D.		26.000 – 26.021 (1.0236 – 1.0244)	26.04 (1.025)
Clutch outer guide	I.D.	20.000 – 20.021 (0.7874 – 0.7882)	20.05 (0.789)
	O.D.	25.959 – 25.980 (1.0220 – 1.0228)	25.90 (1.020)

9

TORQUE VALUES

Clutch lifter bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Clutch center lock nut	74 N·m (7.5 kgf·m, 54 lbf·ft)
Shift drum stopper arm bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)
Gearshift return spring pin	25 N·m (2.5 kgf·m, 18 lbf·ft) Apply a locking agent to the threads
Primary drive gear lock nut	53 N·m (5.4 kgf·m, 39 lbf·ft)

TOOLS

Clutch center holder	07GMB – KT70101
Gear holder	07724 – 0010200
Lock nut wrench, 20 x 24 mm	07716 – 0020100
Extension bar	07716 – 0020500 or equivalent commercially available in U.S.A.

TROUBLESHOOTING

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

Clutch lever hard to pull in

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

Clutch will not disengage or motorcycle creeps with clutch disengaged

- Too much clutch lever free play
- Clutch plate warped
- Oil level too high, improper oil viscosity, or additive used
- Check for oil additive

Clutch slips

- Clutch lifter sticking
- Worn clutch discs
- Weak clutch springs
- No clutch lever free play
- Check for oil additive

Hard to shift

- Misadjusted clutch cable
- Damaged or bent shift fork
- Bent shift fork shaft
- Incorrect engine oil viscosity
- Incorrect gearshift spindle assembly
- Damaged shift drum cam grooves

Transmission jumps out of gear

- Worn shift drum stopper arm
- Wear or broken gearshift spindle return spring
- Bent shift fork shaft
- Damaged shift drum cam grooves
- Worn gear dogs or slots

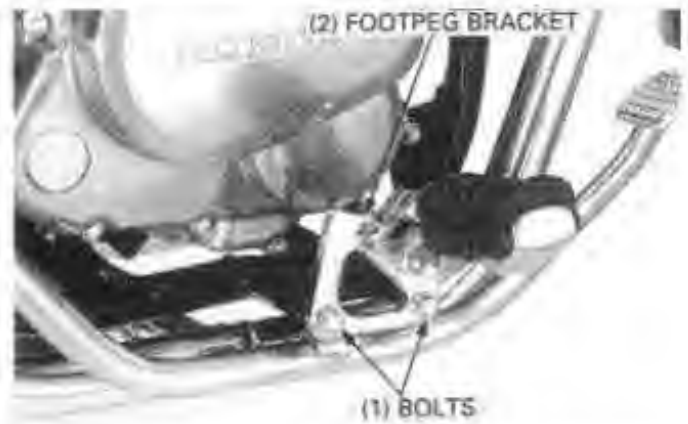
Gearshift pedal will not return

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

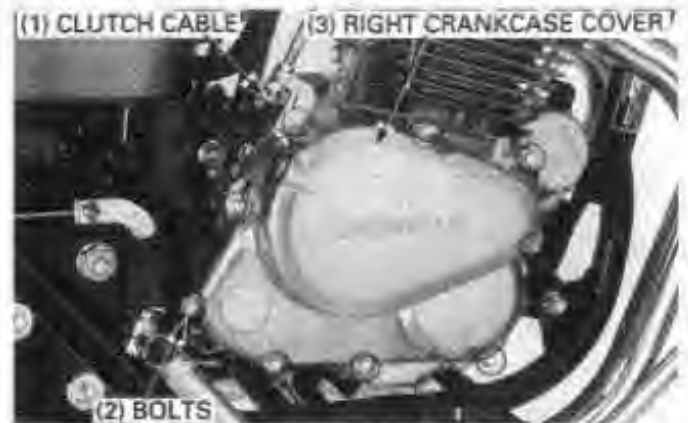
RIGHT CRANKCASE COVER REMOVAL

Drain the engine oil (page 3-10).

Remove the bolts and right footpeg bracket.



Disconnect the clutch cable from the clutch arm.
Remove the bolts and right crankcase cover.

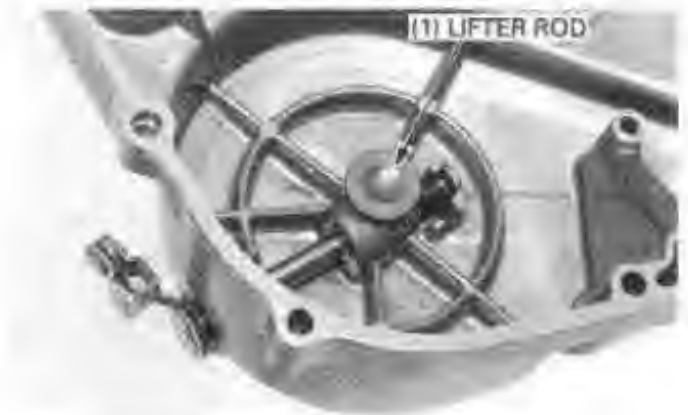


Remove the gasket and dowel pins.



CLUTCH LIFTER REMOVAL/INSTALLATION

Remove the clutch lifter rod.



CLUTCH/GEARSHIFT LINKAGE

Remove the lifter spring from the end of the clutch arm.

Check the clutch arm, lifter rod and spring for wear or damage.

Check the oil seal for damage.

Apply grease to the oil seal lip and insert the clutch arm into the right crankcase cover.
Install the lifter spring.



Slightly turn the clutch arm clockwise and install the lifter rod into the right crankcase cover.



CLUTCH

REMOVAL

Remove the clutch lifter plate bolts, plate and clutch springs.

NOTE

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



Unstake the clutch lock nut with a drill or grinder.

CAUTION

- Be careful not to damage the mainshaft threads.



Remove the clutch center lock nut using the special tools.

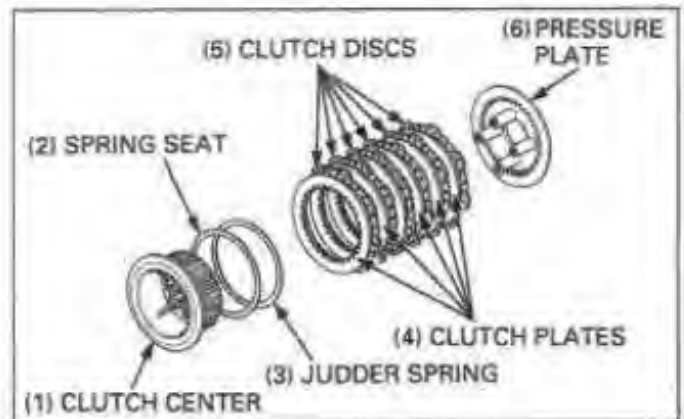
TOOLS:

Clutch center holder
Lock nut wrench, 20 x 24 mm
Extension bar

07GMB - KT70101
07716 - 0020100
07716 - 0020500 or
equivalent commercially
available in U.S.A.

Remove the following:

- Clutch center
- Spring seat
- Judder spring
- Clutch discs and plates
- Pressure plate
- Spline washer
- Clutch outer
- Outer guide
- Thrust washer



INSPECTION

Clutch lifter bearing

Turn the lifter bearing rollers with your finger. The bearing should turn smoothly and freely without excessive play. If necessary replace the bearing.



Clutch spring

Measure the clutch spring free length.

SERVICE LIMIT: 36.0 mm (1.42 in)



CLUTCH/GEARSHIFT LINKAGE

Clutch center

Check the grooves of the clutch center for damage or wear caused by the clutch plates.

Replace if necessary.



Clutch disc

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

Measure the disc thickness of each disc.

SERVICE LIMIT: 2.6 mm (0.10 in)



Clutch plate

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

SERVICE LIMIT: 0.20 mm (0.008 in)



Clutch outer/clutch outer guide

Check the slots of the clutch outer for damage or wear caused by the clutch discs.

Replace if necessary.

Measure the clutch outer I.D.

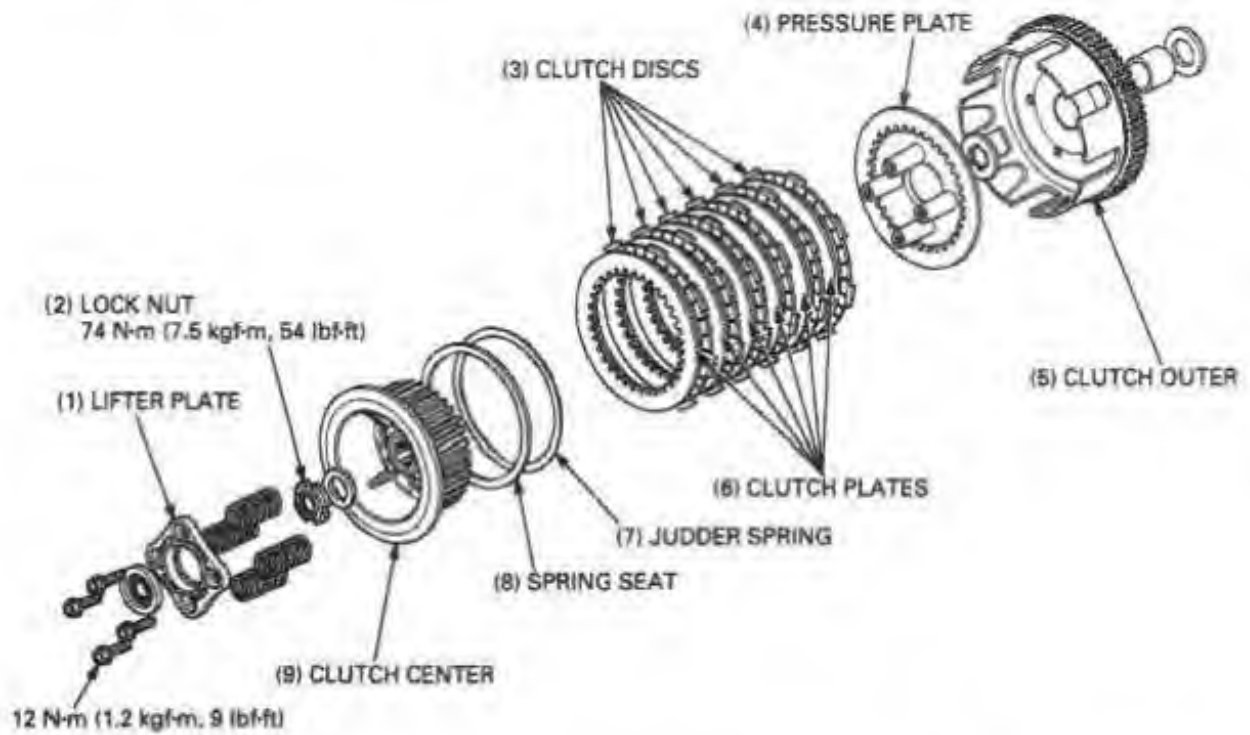
SERVICE LIMIT: 26.04 mm (1.025 in)

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

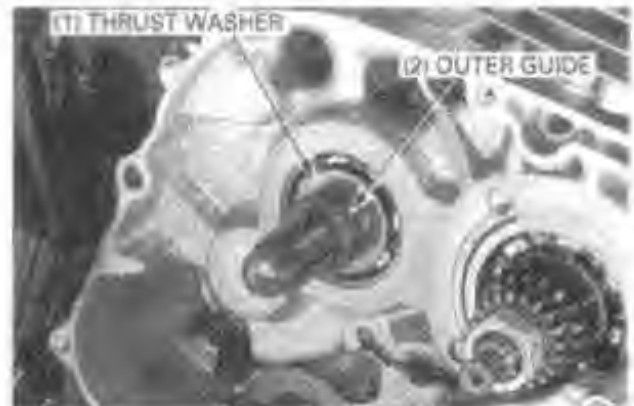
SERVICE LIMIT: O.D.: 25.90 mm (1.020 in)
I.D.: 20.05 mm (0.789 in)



INSTALLATION



Install the thrust washer and clutch outer guide onto the mainshaft.



Install the clutch outer and spline washer.

NOTE

- Note the direction of the spline washer.



CLUTCH/GEARSHIFT LINKAGE

Install the spring seat and judder spring onto the clutch center as shown.

Assemble the clutch pressure plate, discs, plates and clutch center, and install them in the clutch outer.

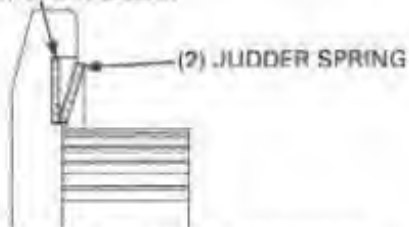
Coat new clutch discs with clean engine oil.

Stack the discs and plates alternately.

NOTE

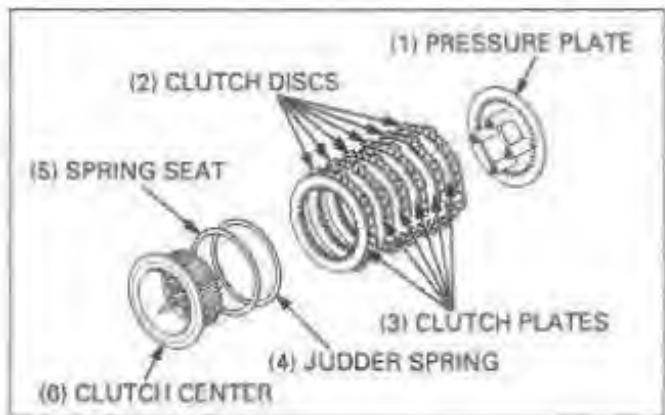
- Note the direction of the judder spring.

(1) SPRING SEAT



- Stack the discs and plates alternately.

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



Attach the clutch center holder using the clutch lifter bolts. Install a new lock nut, then tighten it to the specified torque using the special tools.

TOOLS:

Clutch center holder

Lock nut wrench, 20 x 24 mm

Extension bar

07GMB - KT70101

07716 - 0020100

07716 - 0020500 or
equivalent commercially
available in U.S.A.



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

Stake the end of the lock nut into the groove of the mainshaft with a punch.



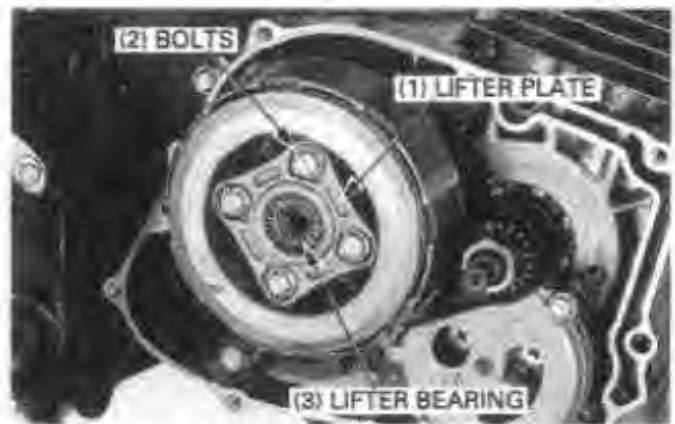
Install the clutch springs and lifter plate.
Install and tighten the lifter plate bolts to the specified torque.

NOTE

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

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the lifter plate bearing if it was removed.
Install the right crankcase cover (page 9-12).



PRIMARY AND OIL PUMP DRIVE GEARS

REMOVAL

Remove the right crankcase cover (page 9-3).
Remove the oil pump (page 4-2).

Remove the oil through and spring from the crankshaft.



Attach the gear holder between the primary drive and driven gear as shown.

TOOL:

Gear holder 07724 - 0010200

Remove the lock nut and washer.

Remove the clutch assembly (page 9-4).
Remove the oil pump drive gear and primary drive gear.



INSTALLATION

Install the primary drive gear and oil pump driven gear on the crankshaft.

NOTE

- Note the direction of the primary drive gear.

Install the clutch assembly (page 9-7).
Install the lock washer with its "OUTSIDE" mark facing out.



CLUTCH/GEARSHIFT LINKAGE

Attach the gear holder between the primary drive and driven gear as shown.

TOOL:

Gear holder 07724 - 0010200

Install the drive pin into the crankshaft hole.

Install and tighten the lock nut to the specified torque.

TORQUE: 53 N·m (5.4 kgf·m, 39 lbf·ft)



Install the oil through and spring.

Install the following:

- Oil pump (page 4-5)
- Right crankcase cover (page 9-12)



GEARSHIFT LINKAGE

DISASSEMBLY

Remove the following:

- Right crankcase cover (page 9-3)
- Oil pump (page 4-2)
- Clutch assembly (page 9-4)

Remove the bolt and gearshift pedal link.



Pull the gearshift spindle out of the crankcase.



Remove the following:

- Stopper arm bolt
- Stopper arm
- Return spring
- Shift drum stopper plate bolt
- Stopper plate
- Dowel pins

ASSEMBLY

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

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the dowel pins into the shift drum holes. Hold the stopper arm using the screwdriver and install the shift drum stopper plate by aligning the dowel pins with the holes in the stopper plate.

Install and tighten the shift drum stopper plate bolt.

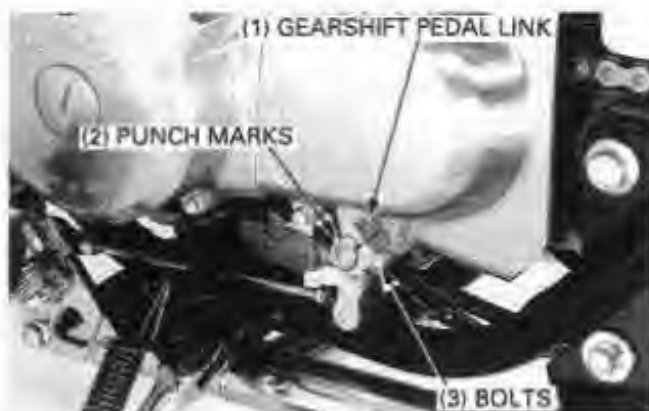
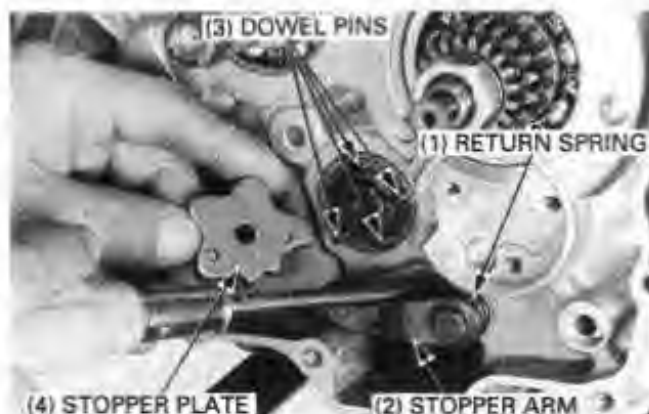
Install the gearshift spindle into the crankcase, so that the return spring pin is positioned between the spring ends.

Install the gearshift pedal link by aligning the punch marks.

Check the operation of the gearshift linkage.

Install the following:

- Oil pump (page 4-5)
- Clutch assembly (page 9-7)
- Right crankcase cover (see next page)



RIGHT CRANKCASE COVER INSTALLATION

Clean off any gasket material.

Install the dowel pins and new gasket.

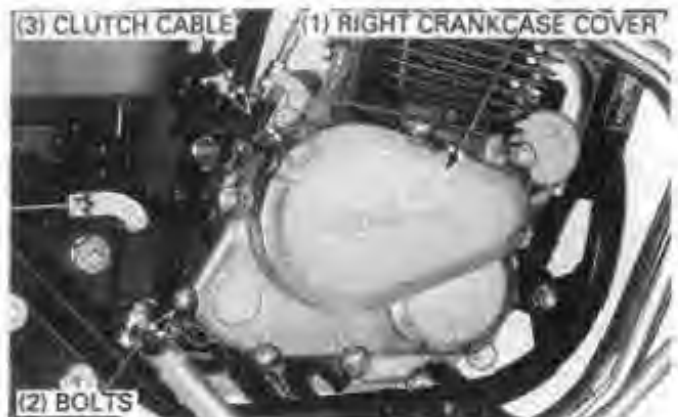
NOTE

- Be careful not to damage the gasket mating surface.



Install the right crankcase cover and connect the clutch cable to the clutch arm.

Set the clutch cable guide and tighten the right crankcase cover bolts.



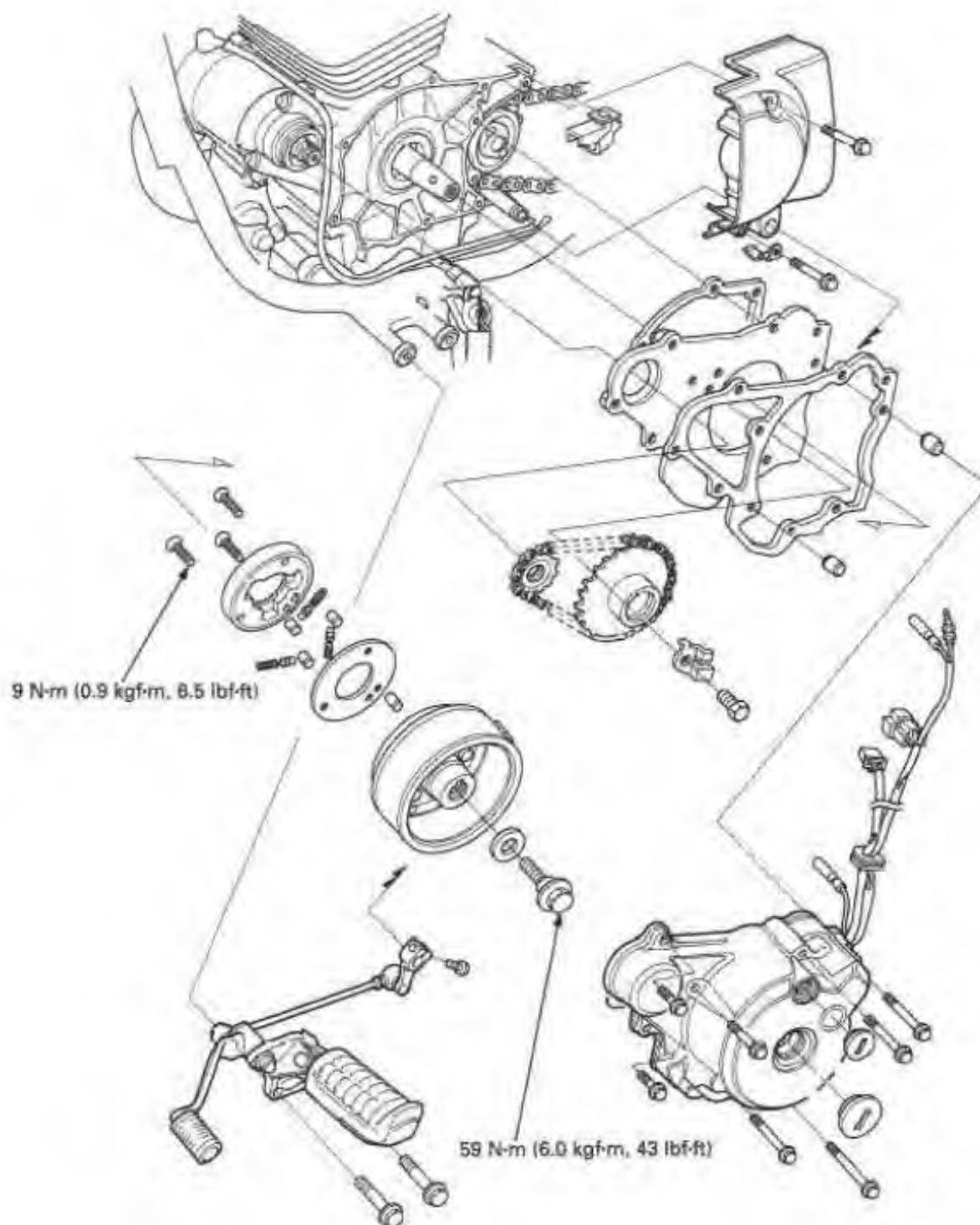
Install the right footpeg bracket and tighten the bolts.

Adjust the clutch (page 3-18).

Fill the crankcase with the recommended engine oil (page 3-8).

Start the engine and check the clutch for smooth operation.
Be sure there are no oil leaks.





10. ALTERNATOR/STARTER CLUTCH

SERVICE INFORMATION	10-1	STARTER CLUTCH	10-3
TROUBLESHOOTING	10-1	ALTERNATOR INSTALLATION	10-7
ALTERNATOR REMOVAL	10-2		

SERVICE INFORMATION

GENERAL

- This section covers the removal and installation of the flywheel, alternator, ignition pulse generator, and starter clutch.
- Refer to section 15 for alternator inspection, and to section 16 for ignition pulse generator inspection.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Starter driven sproket	I.D.	22.010 – 22.022 (0.8665 – 0.8670)	22.08 (0.869)
	Boss O.D.	36.975 – 37.000 (1.4557 – 1.4567)	36.90 (1.453)

TORQUE VALUES

Flywheel bolt	59 N·m (6.0 kgf·m, 43 lbf·ft)
Starter clutch mounting screw	9 N·m (0.9 kgf·m, 6.5 lbf·ft) Apply a locking agent to the threads
Stator mounting screw	6 N·m (0.6 kgf·m, 4.3 lbf·ft)
Stator wire clamp screw	8 N·m (0.6 kgf·m, 4.3 lbf·ft)
Ignition pulse generator screw	10 N·m (1.0 kgf·m, 7 lbf·ft)

TOOLS

Flywheel holder	07725 – 0040000
Rotor puller	07733 – 0020001

TROUBLESHOOTING

Engine does not turn

- Faulty starter one-way clutch

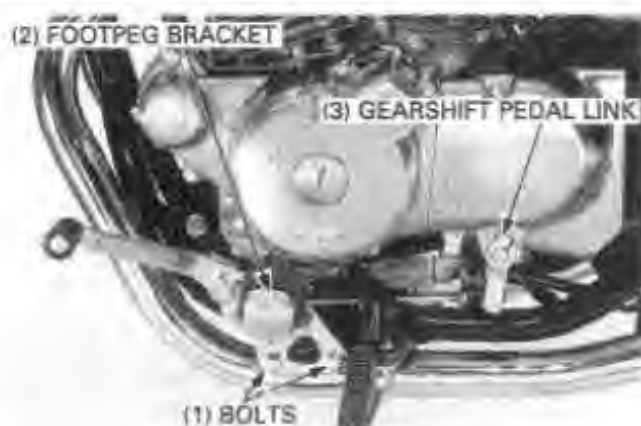
10

ALTERNATOR REMOVAL

FLYWHEEL REMOVAL

Remove the bolts and left footpeg bracket.

Remove the bolt and gearshift pedal link.



Remove the fuel tank (page 2-3).

Disconnect the alternator, exciter coil and ignition pulse generator wire connectors.



Remove the bolts and left crankcase rear cover.



Remove the alternator wire grommet from the left crankcase groove.
Remove the bolts and left crankcase cover.



Hold the flywheel using the special tool, then remove the flywheel bolt.

TOOL:

Flywheel holder

07725 - 0040000

Remove the washer.



Remove the flywheel using the special tool.

TOOL:

Rotor puller

07733 - 0020001



STATOR REMOVAL

Remove the following:

- Socket bolts and ignition pulse generator
- Socket bolts and wire clamp
- Socket bolts and stator



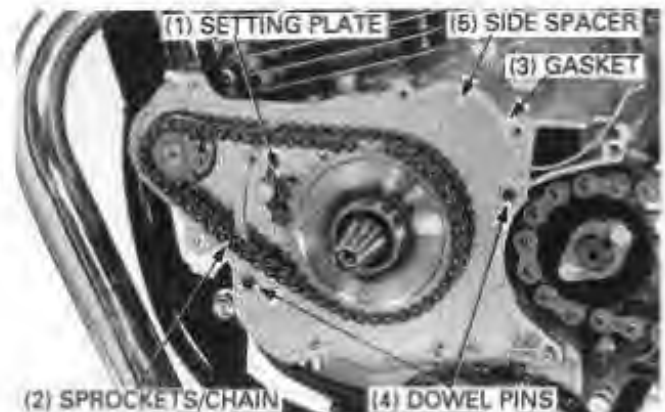
STARTER CLUTCH

REMOVAL

Remove the bolt and starter driven sprocket setting plate. Remove the starter drive gear, driven gear and drive chain as an assembly.

Remove the following:

- Left crankcase cover gasket
- Dowel pins
- Side spacer
- Side spacer gasket



ALTERNATOR/STARTER CLUTCH

Temporarily install the starter driven gear, and check the operation of the one-way clutch by turning the driven sprocket. You should be able to turn the driven sprocket counter-clockwise smoothly, but the sprocket should not turn clockwise.



DISASSEMBLY

Remove the rollers, spring caps and springs from the clutch outer.



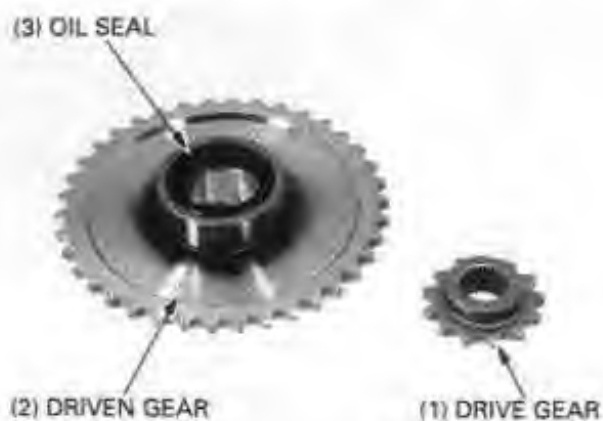
Remove the clutch outer mounting screws using an impact driver. Remove the starter clutch outer, side plate and dowel pin.



INSPECTION

Check the starter driven gear for abnormal wear or damage. Check the starter drive gear and driven gear teeth for wear or damage.

Check the oil seal of the driven sprocket for wear or damage.



Measure the starter driven sprocket I.D. and O.D.

SERVICE LIMITS:

I.D.: 22.08 mm (0.869 in)

O.D.: 36.90 mm (1.453 in)

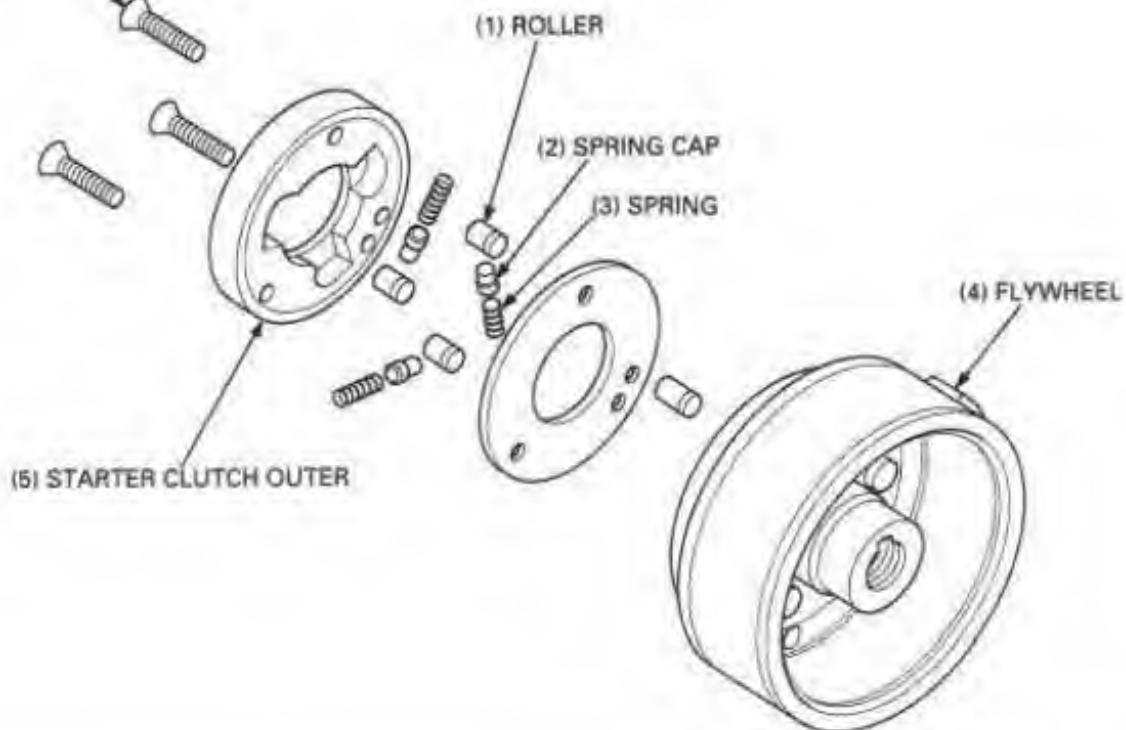


Check the rollers, spring caps and spring for wear, damage or deformation.

Check the rotor contact area of the clutch outer for wear or damage.

**ASSEMBLY**

9 N·m (0.9 kgf·m, 6.5 lbf·ft)



ALTERNATOR/STARTER CLUTCH

Install the dowel pin into the flywheel.
Install the starter clutch outer aligning its hole with the dowel pin.



Apply a locking agent to the starter clutch outer mounting screw threads.
Tighten the screws to the specified torque:

TORQUE: 9 N·m (0.9 kgf·m, 6.5 lbf·ft)



Stake the screws into the groove of the starter clutch outer.

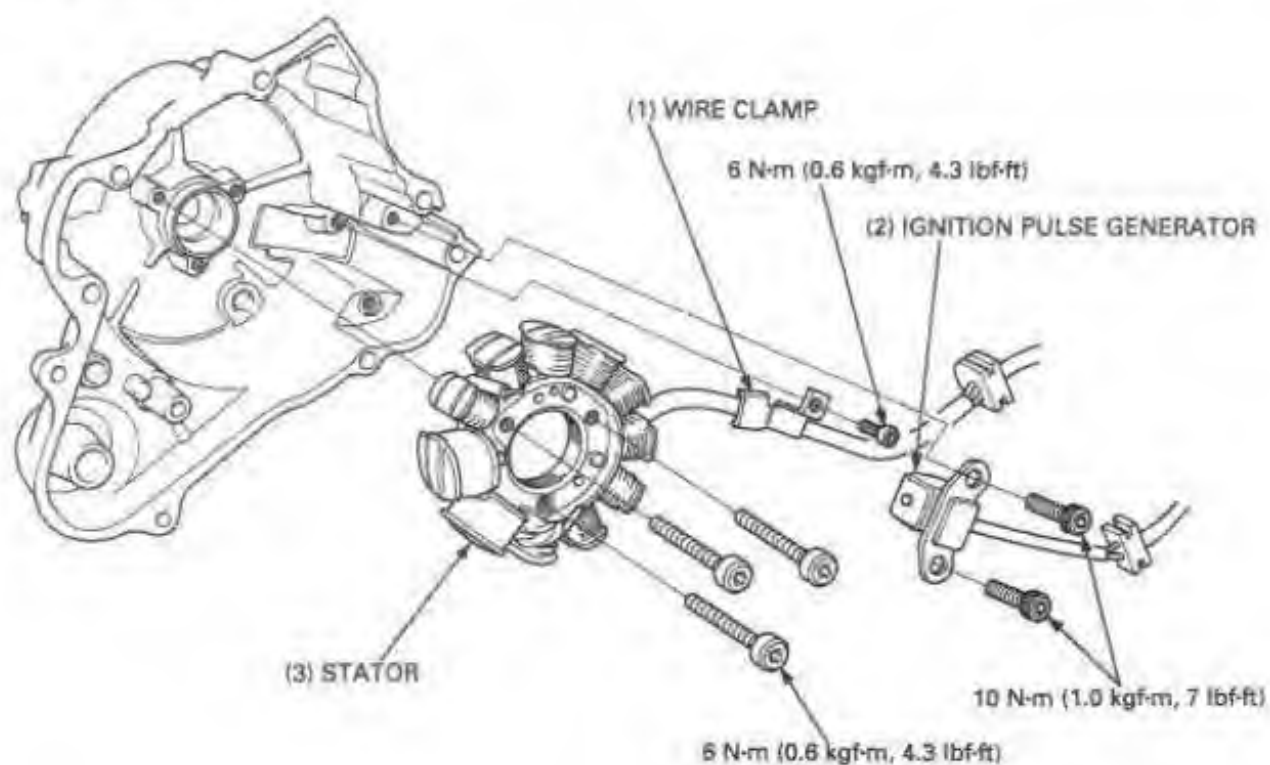


Install the springs, spring caps and rollers into the starter clutch outer.

Install the starter driven sprocket into the clutch outer.



STATOR ASSEMBLY



Install the following:

- Stator and socket bolts
- Wire clamp and socket bolts
- Ignition pulse generator and socket bolts

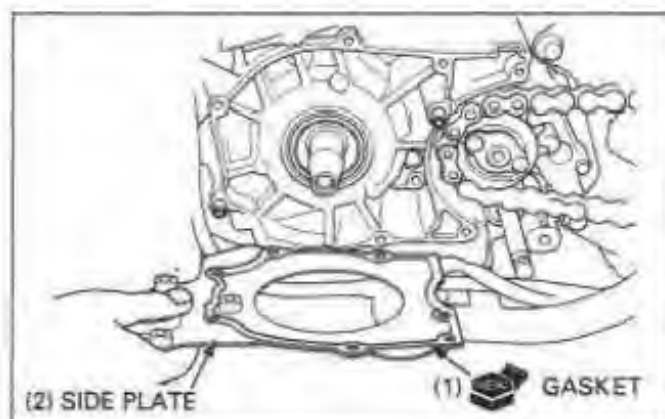
NOTE

- Install the ignition pulse generator wire grommet into the left crankcase cover groove securely.



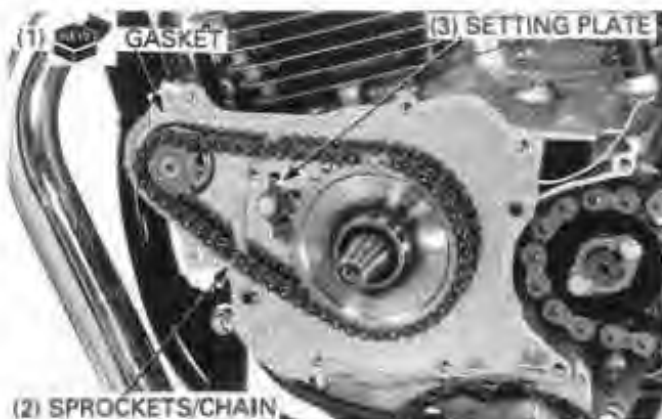
ALTERNATOR INSTALLATION

Install the dowel pins, new side plate gasket and side plate.



ALTERNATOR/STARTER CLUTCH

Install the new left crankcase cover gasket.
Install the starter drive sprocket, driven sprocket and drive chain as an assembly.
Install the starter driven sprocket setting plate and tighten the bolt securely.



FLYWHEEL INSTALLATION

Clean any oil from the crankshaft taper.



Install the flywheel aligning the key way in the flywheel with the dowel pin on the crankshaft.
Install the washer and flywheel bolt.

Hold the flywheel using the special tool, then tighten the bolt to the specified torque.

TOOL:

Flywheel holder 07725 - 0040000

TORQUE: 59 N·m (6.0 kgf·m, 43 lbf·ft)



LEFT CRANKCASE COVER INSTALLATION

Install the left crankcase cover and tighten the bolts.

NOTE

- At left crankcase cover installation, install the starter motor cable into the guide in the left crankcase cover.
- Install the alternator wire grommet into the left crankcase groove securely.

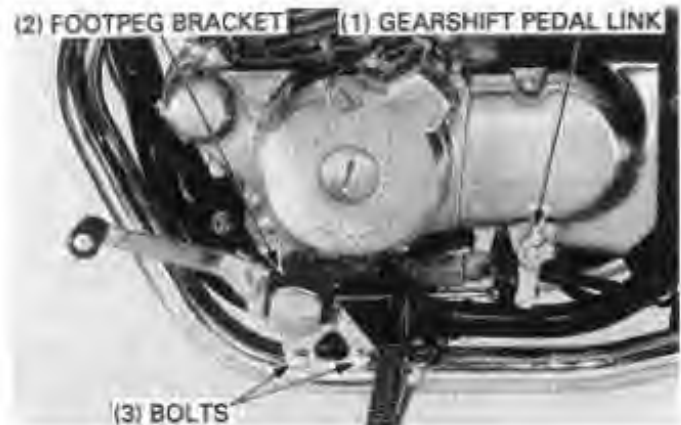


Install the left crankcase rear cover and side stand switch wire clamp, and then tighten the bolts.



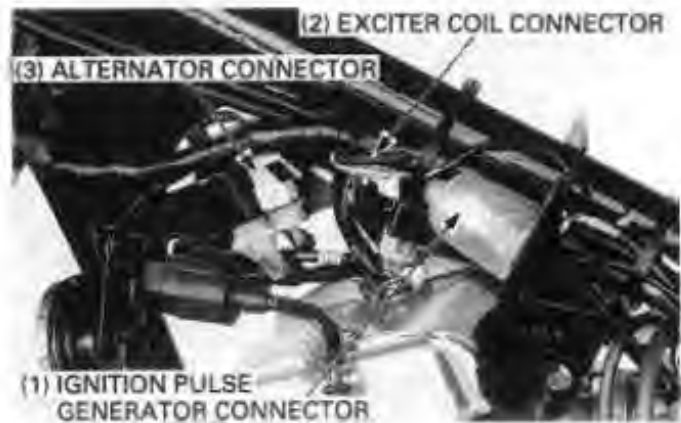
Install the gearshift pedal by aligning the punch marks, then tighten the bolt.

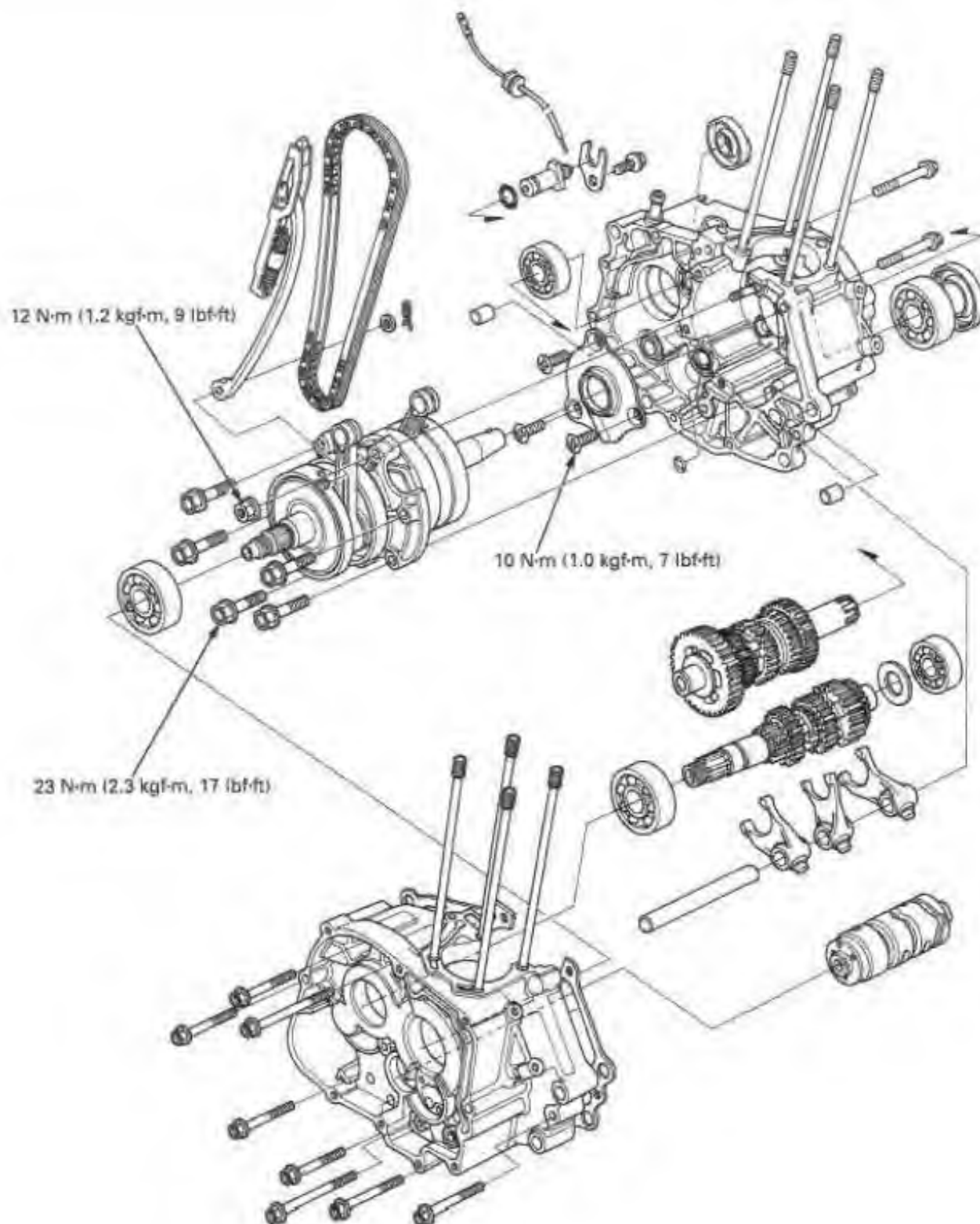
Install the left footpeg bracket and tighten the bolts.



Connect the alternator, exciter coil and ignition pulse generator connectors.

Install the fuel tank (page 2-3).





11. CRANKSHAFT/TRANSMISSION

SERVICE INFORMATION	11-1	CRANKSHAFT	11-8
TROUBLESHOOTING	11-2	CRANKCASE BEARING REPLACEMENT	11-10
CRANKCASE SEPARATION	11-3	CRANKCASE ASSEMBLY	11-13
TRANSMISSION	11-4		

SERVICE INFORMATION

GENERAL

- For crankshaft and transmission repair, the crankcase must be separated.
- The following parts must be removed before separating the crankcase.
 - Alternator/starter clutch (Section 10)
 - Clutch/gearshift linkage (Section 9)
 - Cylinder head (Section 7)
 - Cylinder/piston (Section 8)
 - Engine (Section 6)
 - Oil pump (Section 4)

SPECIFICATIONS

Unit: mm (in)

ITEM				STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod big end side clearance			0.10 – 0.40 (0.004 – 0.016)	0.60 (0.024)
	Radial clearance			0.004 – 0.012 (0.0002 – 0.0005)	0.05 (0.002)
	Runout	At both ends		—	0.03 (0.001)
		At bearing holder		—	0.05 (0.002)
Transmission	Gear I.D.		M5	20.020 – 20.041 (0.7882 – 0.7890)	20.08 (0.791)
			C1	20.020 – 20.041 (0.7882 – 0.7890)	20.08 (0.791)
			C4	20.020 – 20.041 (0.7882 – 0.7890)	20.08 (0.791)
	Gear bushing O.D.		C1	19.979 – 20.000 (0.7866 – 0.7874)	19.93 (0.785)
	Gear bushing I.D.		C1	16.516 – 16.534 (0.6502 – 0.6509)	16.58 (0.653)
	Gear-to-bushing clearance		C1	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
	Mainshaft O.D.		M5	19.959 – 19.980 (0.7858 – 0.7866)	19.91 (0.784)
	Countershaft O.D.		C1	16.466 – 16.484 (0.6475 – 0.6490)	16.41 (0.646)
			C4	19.959 – 19.980 (0.7858 – 0.7866)	19.91 (0.784)
	Gear-to-shaft clearance		M5	0.040 – 0.082 (0.0016 – 0.0032)	0.10 (0.004)
			C4	0.040 – 0.082 (0.0016 – 0.0032)	0.10 (0.004)
	Bushing-to-shaft clearance		C1	0.032 – 0.068 (0.0013 – 0.0027)	0.10 (0.004)
Shift fork, shaft	Fork	I.D.		12.000 – 12.018 (0.4724 – 0.4731)	12.05 (0.474)
		Claw thickness		4.93 – 5.00 (0.194 – 0.197)	4.80 (0.189)
	Fork shaft O.D.			11.976 – 11.994 (0.4724 – 0.4731)	11.93 (0.470)

11

TORQUE VALUES

Crankshaft mounting bolt	23 N·m (2.3 kgf·m, 17 lbf·ft)
Crankshaft mounting nut	12 N·m (1.2 kgf·m, 9 lbf·ft)
Oil passage plate mounting screw	10 N·m (1.0 kgf·m, 7 lbf·ft) Apply a locking agent to the threads

TOOLS

Bearing remover, 15 mm	07936 - KC10500
Remover weight	07741 - 0010201 or 07936 - 3710200
Attachment, 32 x 35 mm	07746 - 0010100
Attachment, 42 x 47 mm	07746 - 0010300
Attachment, 52 x 55 mm	07746 - 0010400
Attachment, 62 x 68 mm	07746 - 0010500
Pilot, 20 mm	07746 - 0040500
Pilot, 22 mm	07746 - 0041000
Pilot, 25 mm	07746 - 0040600

TROUBLESHOOTING

Crankshaft noisy

- Worn connecting rod big end bearing
- Bent connecting rod
- Worn crankshaft main journal bearing

Transmission jumps out of gear

- Worn gear dogs or slots
- Bent fork shaft
- Worn or bent shift forks
- Broken shift drum stopper
- Broken shift linkage return spring

Hard to shift

- Improper clutch operation
- Incorrect clutch adjustment
- Incorrect engine oil viscosity
- Bent shift fork
- Bent shift fork shaft
- Bent shift fork claw
- Damaged shift drum cam grooves
- Bent shift spindle

CRANKCASE SEPARATION

NOTE

- Refer to page 11-1 for the parts which must be removed before separating the crankcase.

Remove the bolt, neutral switch set plate and neutral switch.



Remove the two left crankcase bolts.



Remove the seven right crankcase bolts.



Place the left crankcase facing down and separate the right and left crankcase halves.



CRANKSHAFT/TRANSMISSION

Remove the gasket and dowel pins.



TRANSMISSION

REMOVAL/DISASSEMBLY

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



Remove the mainshaft and countershaft as an assembly from the left crankcase.

Disassemble the transmission.



INSPECTION

Check the shift fork and fork shaft for wear or damage.

Measure the I.D. of the shift fork.

SERVICE LIMIT: 12.05 mm (0.474 in)

Measure the shift fork claw thickness.

SERVICE LIMIT: 4.80 mm (0.189 in)



Measure the O.D. of the shift fork shaft.

SERVICE LIMIT: 11.93 mm (0.470 in)



Inspect the shift drum grooves for wear or damage.



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

SERVICE LIMIT:

M5, C1, C4: 20.08 mm (0.791 in)

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

SERVICE LIMIT:

O.D.: 19.93 mm (0.785 in)

I.D.: 18.58 mm (0.653 in)



Calculate the gear-to-gear bushing clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)

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

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

SERVICE LIMIT:

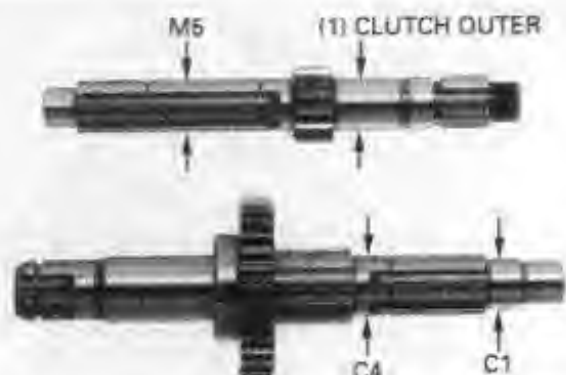
M5, clutch outer: 19.91 mm (0.784 in)

C1: 16.41 mm (0.646 in)

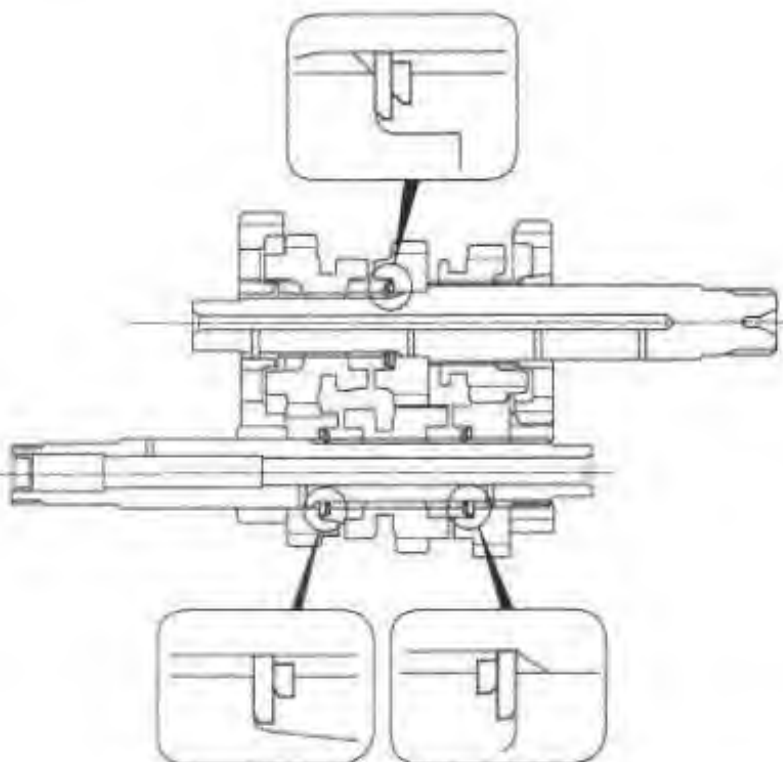
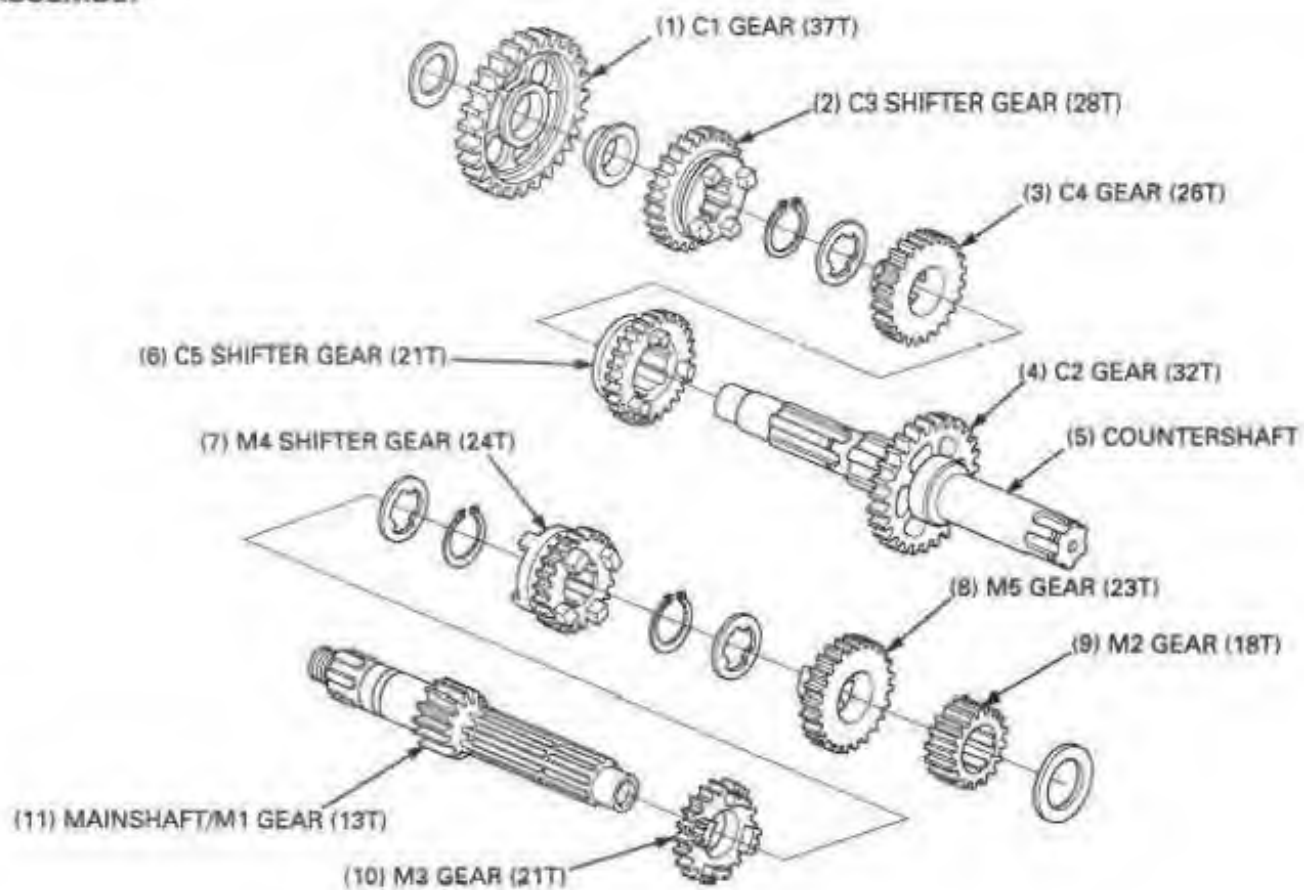
C4: 19.91 mm (0.784 in)

Calculate the gear bushing-to-shaft clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)



ASSEMBLY



Assemble the transmission gear and shafts.
Coat each gear with clean engine oil and check for smooth movement.

Apply molybdenum disulfide oil to the shift fork grooves in the M4, C3 and C5 gear.

(1) SHIFT FORK GROOVES



INSTALLATION

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



Install the shift drum into the crankcase.
Align the neutral switch rotor tab with the neutral switch hole in the left crankcase.



Install the shift forks and shift fork shaft.

NOTE

- Install the shift forks into the shifter gear grooves with their marks facing down.

(2) SHIFT FORK SHAFT

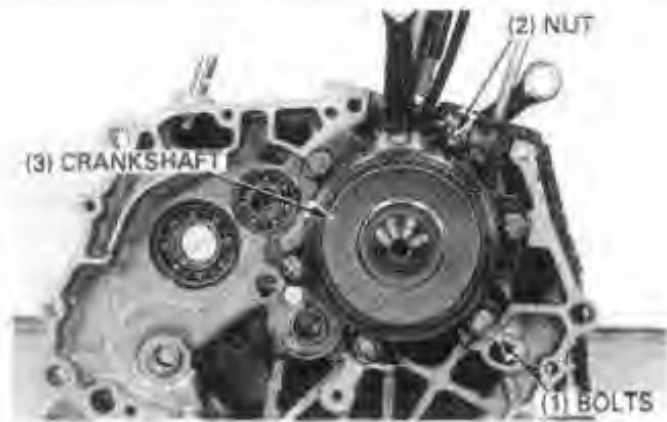


CRANKSHAFT

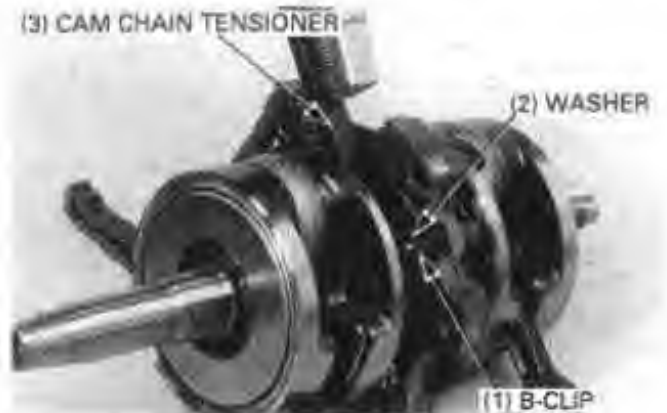
REMOVAL

Separate the crankcase halves (page 11-3).
Remove the transmission (page 11-4).

Remove the crankshaft mounting bolts and nut, then remove the crankshaft.



Remove the B-clips, plain washer and cam chain tensioner.



Position the crank balancer weight as shown.

Pass the cam chain between the guide insertion part and crank balancer weight, then pass it between the cam chain tensioner pin and crank balancer weight.



INSPECTION

Measure the connecting rod big end side clearance.

SERVICE LIMIT: 0.60 mm (0.024 in)



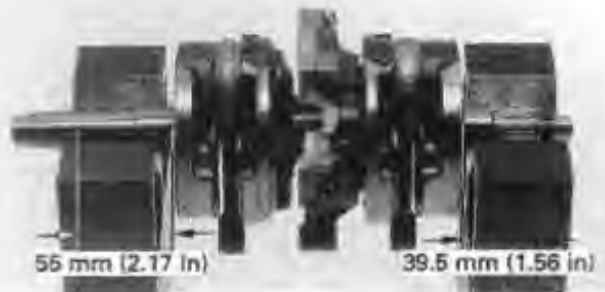
Measure the connecting rod big end radial clearance.

SERVICE LIMIT: 0.05 mm (0.002 in)



Measure the crankshaft runout at both ends.

SERVICE LIMIT: 0.03 mm (0.001 in)



Measure the crankshaft runout at the center bearing holder.

SERVICE LIMIT: 0.05 mm (0.002 in)



Check the cam chain guide and slipper for excessive wear or damage.

Inspect the tensioner spring for damage or weakness.

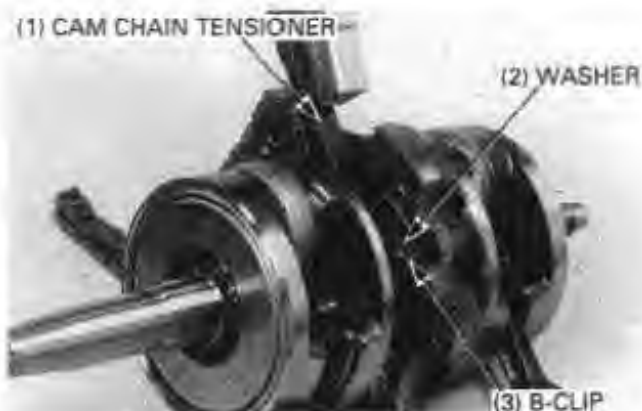


INSTALLATION

Position the crank balancer weight as shown and install the cam chain in the reverse order of removal.



Install the cam chain tensioner and plain washer, and secure them with a B-clip.



Install the crankshaft into the left crankcase. Tighten the crankshaft mounting bolts and nut to the specified torque.

TORQUE: Bolts: 23 N·m (2.3 kgf·m, 17 lbf·ft)
Nut: 12 N·m (1.2 kgf·m, 9 lbf·ft)

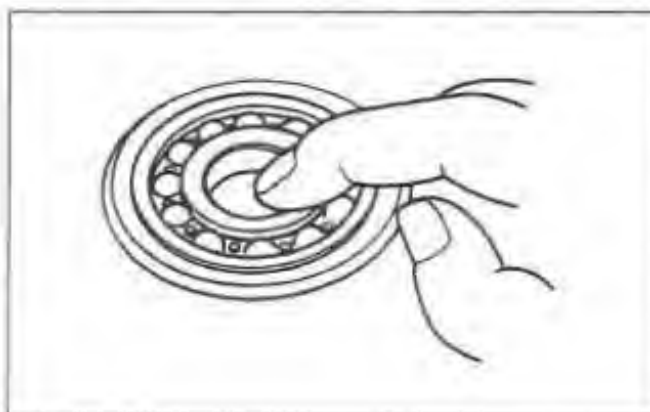
Install the transmission (page 11-7).
Assemble the crankcase (page 11-13).



CRANK CASE BEARING REPLACEMENT

Separate the crankcase halves (page 11-3).
Remove the crankshaft (page 11-8).
Remove the transmission (page 11-4).

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



Right crankcase:

Drive out the mainshaft and crankshaft bearings.



Drive new bearings into the right crankcase using the special tools.

TOOLS:

Crankshaft bearing:

Driver	07749 - 0010000
Attachment, 62 x 68 mm	07746 - 0010500
Pilot, 25 mm	07746 - 0040600

Mainshaft bearing:

Driver	07749 - 0010000
Attachment, 52 x 58 mm	07746 - 0010500
Pilot, 20 mm	07746 - 0040500



Left crankcase:

Remove the crankshaft and countershaft oil seals.



Remove the oil passage plate screws and plate.



CRANKSHAFT/TRANSMISSION

Drive out the countershaft and crankshaft bearings.
Remove the mainshaft bearing using the special tools.

TOOLS:

Bearing remover, 15 mm	07936 - KC10500
Remover weight	07741 - 0010201 or 07936 - 3710200 (U.S.A. only)

(1) BEARING REMOVER



Drive new bearings into the left crankcase.

TOOLS:

Crankshaft bearing:

Driver	07749 - 0010000
Attachment, 62 x 68 mm	07746 - 0010500
Pilot, 25 mm	07746 - 0040600

Mainshaft bearing:

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

Countershaft bearing:

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

(1) DRIVER



(2) ATTACHMENT/PILOT

Install a new O-ring.



(1) O-RING

Apply a locking agent to the oil passage plate mounting screw threads.
Install the oil passage plate and tighten the screws to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



(1) OIL PASSAGE PLATE

(2) LOCKING AGENT SCREWS

Install the new crankshaft and countershaft oil seals.

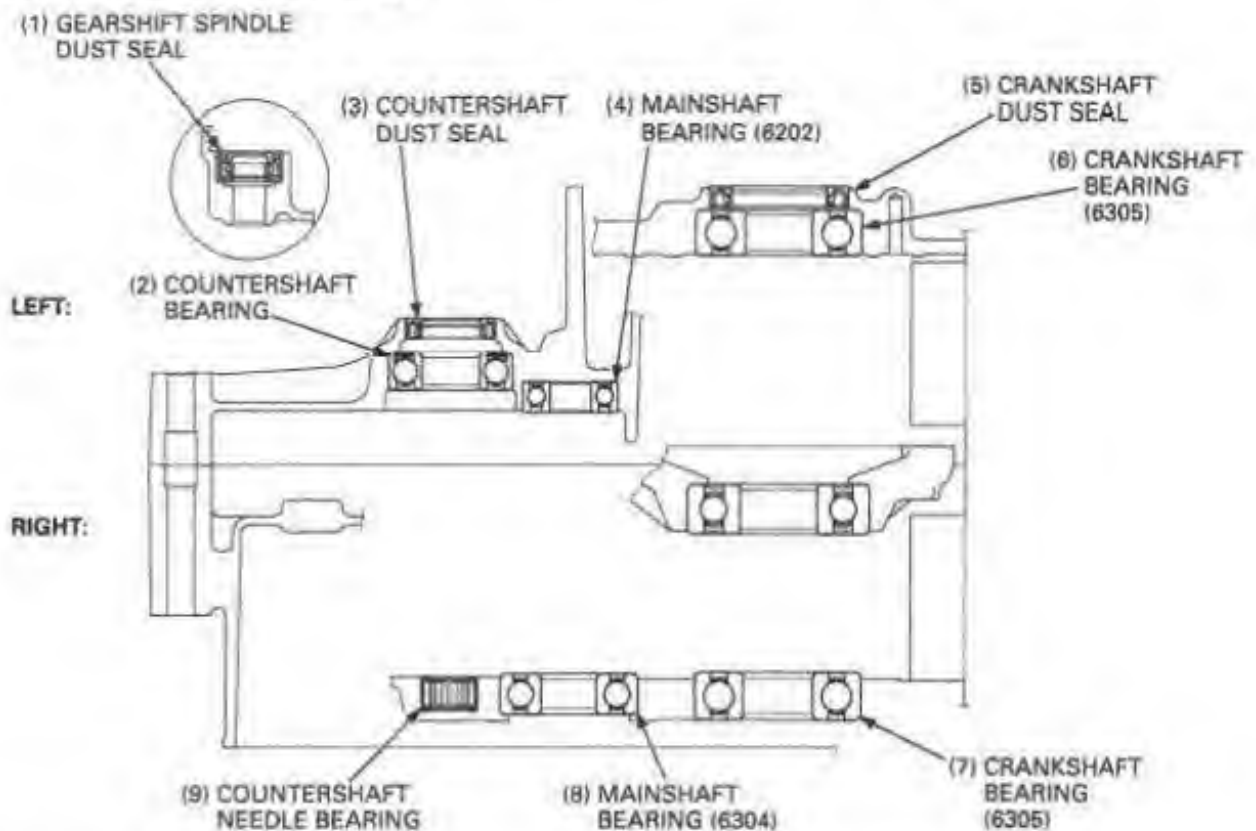
CAUTION

- Do not drive the countershaft oil seal below the end of the crankcase as this will block the oil passage in the shaft.

Install the crankshaft (page 11-10).
Install the transmission (page 11-7).



CRANKCASE BEARING LOCATIONS



CRANKCASE ASSEMBLY

Install the dowel pins and new gasket.



CRANKSHAFT/TRANSMISSION

Assemble the crankcase halves together.
Install and tighten the eight seven crankcase bolts.

NOTE

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

(1) RIGHT CRANKCASE BOLTS



Install and tighten the two left crankcase bolts.

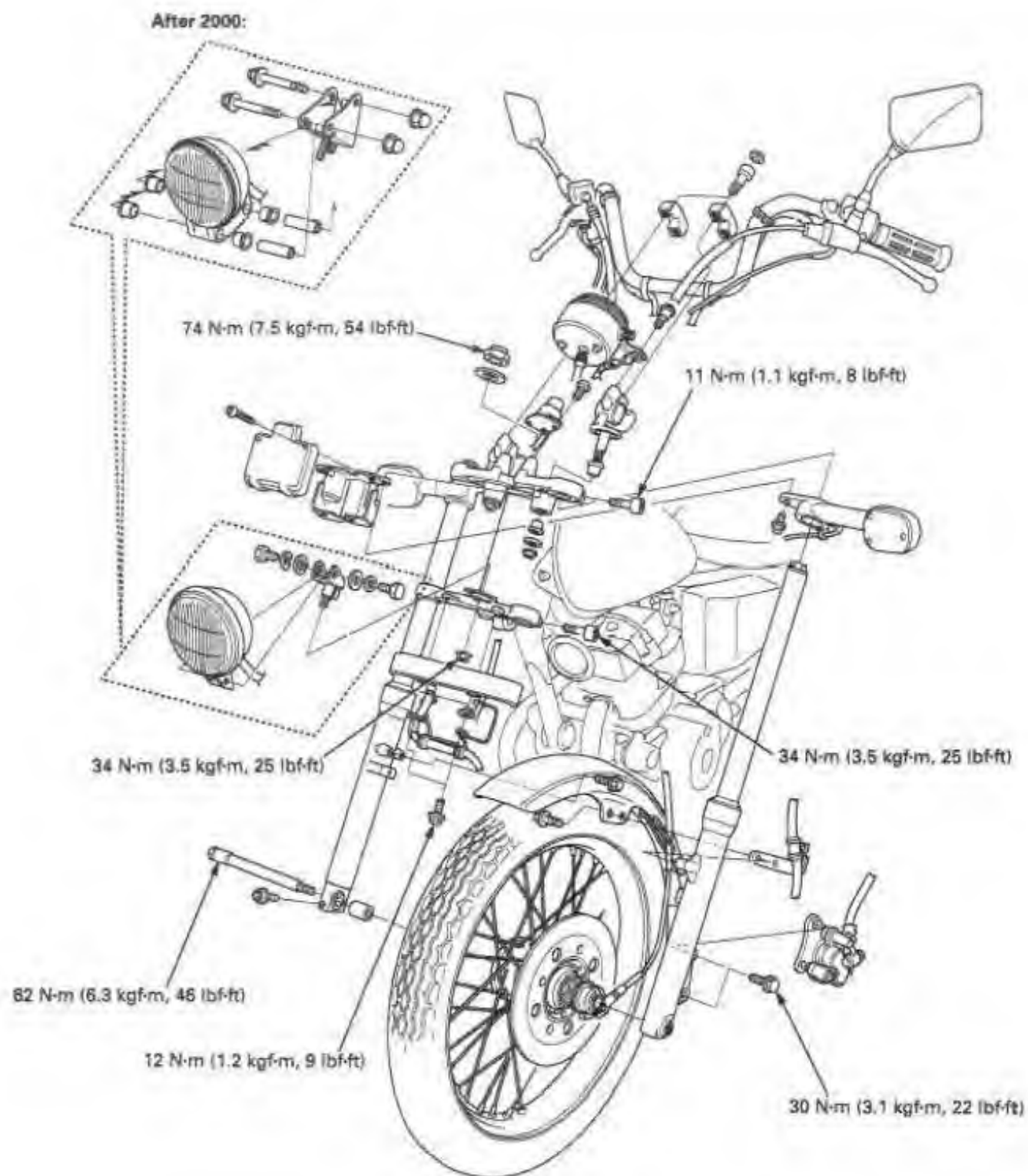
(1) LEFT CRANKCASE BOLTS



Install the neutral switch and neutral switch set plate, and tighten the bolt.

Install the removed parts in the reverse order of removal.





12. FRONT WHEEL/SUSPENSION/STEERING

SERVICE INFORMATION	12-1	FRONT WHEEL	12-8
TROUBLESHOOTING	12-2	FORK	12-13
HANDLEBAR	12-3	STEERING STEM	12-22

SERVICE INFORMATION

GENERAL

⚠ WARNING

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- When servicing the front wheel, fork or steering stem, support the motorcycle securely with a jack or other support.
- Refer to section 14 for brake system information.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		—	1.5 (0.06)
Cold tire pressure	Up to 90 kg (200 lb) load	200 kPa (2.00 kgf/cm ² , 29 psi)	—
	Up to maximum weight capacity	200 kPa (2.00 kgf/cm ² , 29 psi)	—
Axle runout		—	0.20 (0.008)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Wheel hub-to-rim distance		30.75 ± 1 (1.21 ± 0.04)	—
Fork spring free length		546.0 (21.50)	535.1 (21.07)
Fork tube runout		—	0.20 (0.008)
Recommended fork fluid		Pro Honda Suspension Fluid SS-8	—
Fork fluid level		129 (5.1)	—
Fork fluid capacity		234 cm ³ (7.9 US oz, 8.2 imp oz)	—
Steering head bearing preload		1.04 – 1.53 kg (2.29 – 3.37 lbs)	—

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TORQUE VALUES

Steering stem nut	74 N·m (7.5 kgf·m, 54 lbf·ft)
Steering stem bearing adjusting nut	3 N·m (0.3 kgf·m, 2.2 lbf·ft)
Fork top pinch bolt	11 N·m (1.1 kgf·m, 8 lbf·ft)
Fork bottom pinch bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)
Front axle bolt	82 N·m (8.3 kgf·m, 46 lbf·ft)
Brake caliper bracket mounting bolt	30 N·m (3.1 kgf·m, 22 lbf·ft) ALOC bolt
Brake disc mounting bolt	39 N·m (4.0 kgf·m, 29 lbf·ft) ALOC bolt
Wheel spoke	4 N·m (0.4 kgf·m, 2.9 lbf·ft)
Tire valve nut	3 N·m (0.3 kgf·m, 2.2 lbf·ft)
Fork cap	22 N·m (2.2 kgf·m, 16 lbf·ft)
Fork socket bolt	20 N·m (2.0 kgf·m, 14 lbf·ft) Apply a locking agent to the threads
Headlight bracket mounting bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)

TOOLS

Wheel spoke wrench	07701 - 0020300 not available in U.S.A.
Bearing remover head, 15 mm	07746 - 0050400
Bearing remover shaft	07746 - 0050100
Driver	07749 - 0010000
Attachment, 37 x 40 mm	07746 - 0010200
Attachment, 42 x 47 mm	07746 - 0010300
Pilot, 15 mm	07746 - 0040300
Oil seal driver body	07747 - 0010100
Oil seal driver attachment	07747 - 0010501
Steering stem socket	07916 - 3710101
Ball race remover	07946 - 1790000
Stem bearing driver	07946 - GC40000

TROUBLESHOOTING

Hard steering

- Steering head bearing adjusting nut too tight
- Faulty steering head bearing
- Insufficient tire pressure
- Faulty tire

Steers to one side or does not track straight

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

Front wheel wobbling

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

Wheel turns hard

- Faulty wheel bearings
- Faulty speedometer gear
- Bent front axle

Soft suspension

- Weak springs
- Low fork fluid level
- Low tire pressure

Hard suspension

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

Suspension noisy

- Low fork fluid level
- Loose fork fasteners
- Lack of grease in speedometer gear

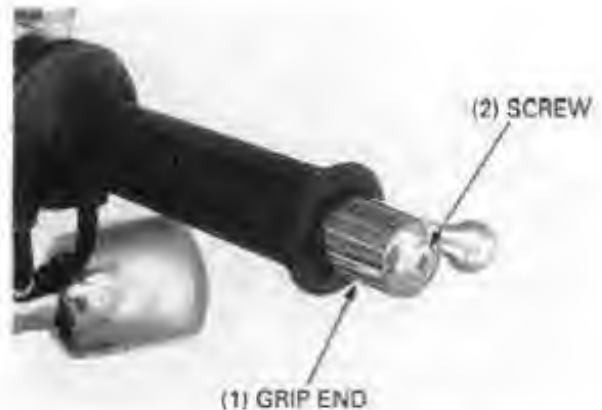
HANDLEBAR

REMOVAL

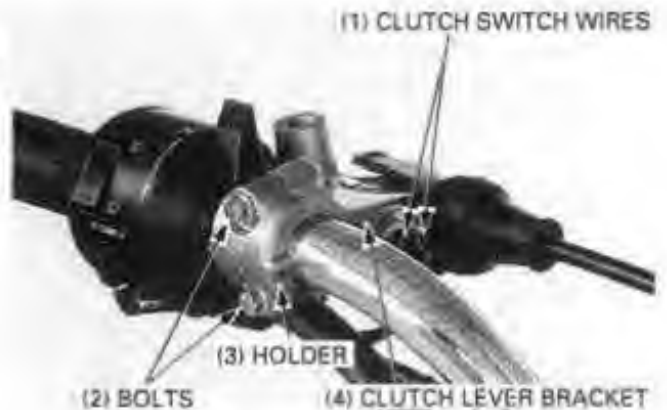
Remove the wire bands.
Remove the rearview mirrors.



Remove the grip end by holding the grip end and removing the screw.



Disconnect the clutch switch wires from the switch.
Remove the clutch lever holder bolts, holder and clutch lever bracket assembly.



Remove the left handlebar switch screws.

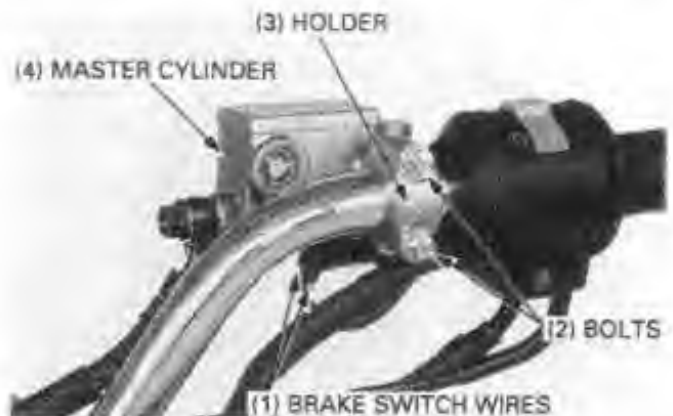


FRONT WHEEL/SUSPENSION/STEERING

Disconnect the choke cable from the choke lever and remove the left handlebar switch.



Disconnect the front brake switch wires from the switch. Remove the master cylinder holder bolts, holder and master cylinder assembly.



Remove the right handlebar switch/throttle housing screws.



Disconnect the throttle cables from the throttle pipe and remove the right handlebar switch/throttle housing.



Remove the handlebar upper holder caps.

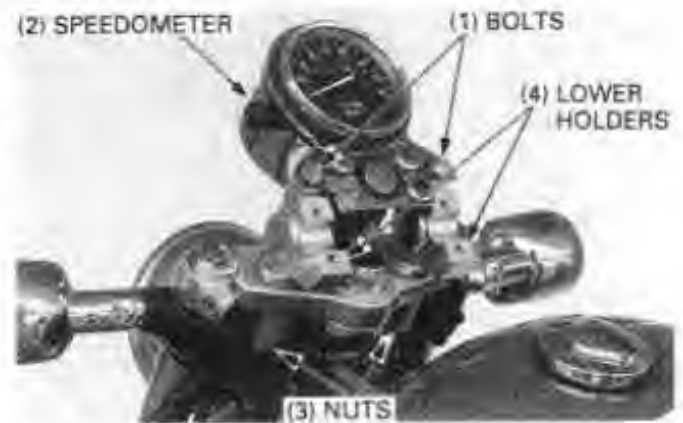


Remove the upper holder bolts, holders and handlebar.



Remove the bolts and speedometer/indicator panel assembly.

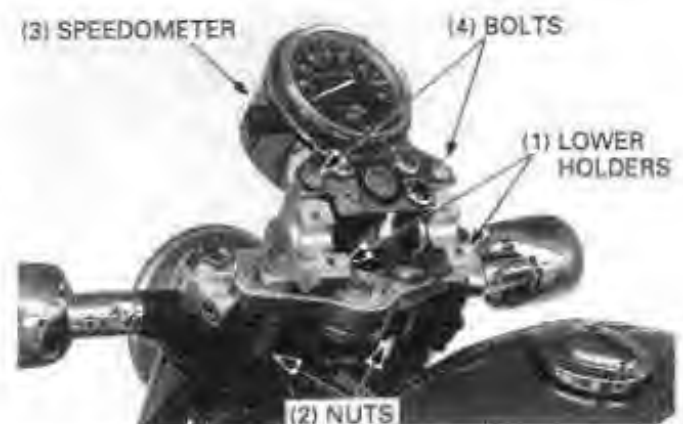
Remove the nuts, lower holders, cushion washers and cushion rubbers.



INSTALLATION

Install the cushion rubbers, washers and lower holders. Temporarily tighten the lower holder nuts.

Install the speedometer/indicator panel assembly and tighten the bolts.



FRONT WHEEL/SUSPENSION/STEERING

Place the handlebar on the lower holders.
Install the upper holders and temporarily tighten the upper holder bolts.
Tighten the lower holder nut.



Align the punch mark on the handlebar with the top of the lower holders.
Install the upper holders on the handlebar with their punch marks forward.
Tighten the front bolts first, then tighten the rear bolts.



If the handlebar grips were removed, apply Honda Bond A or Honda Hand Grip Cement (U.S.A. only) to the inside of the grip and to the clean surfaces of the right and left handlebar.

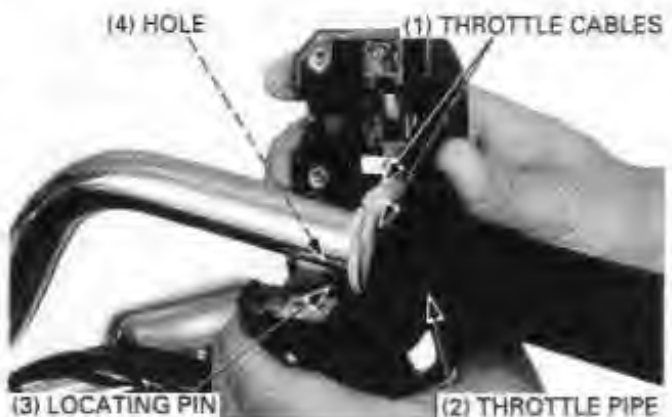
Wait 3 – 5 minutes and install the grip.
Rotate the grip for even application of the adhesive.

NOTE

- Allow the adhesive to dry for an hour before using.



Connect the throttle cables to the throttle grip flange.
Install the right handlebar switch/throttle housing aligning its locating pin with the hole in the handlebar.



Tighten the forward screw first, then the rear screw.

(1) RIGHT HANDLEBAR SWITCH/THROTTLE HOUSING



(2) SCREWS

Install the master cylinder aligning the end of the master cylinder with the punch mark on the handlebar. Install the master cylinder holder with the "UP" mark facing up. Tighten the upper bolt first, then the lower bolt.

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

Connect the brake switch wires.

(1) MASTER CYLINDER

(4) PUNCH MARK

(2) HOLDER



(6) BRAKE SWITCH WIRES

(3) "UP" MARK

(5) BOLTS

Connect the choke cable to the choke lever.

Install the left handlebar switch housing aligning its locating pin with the hole in the handlebar.

(4) HOLE

(2) CHOKE LEVER



(1) CHOKE CABLE

(3) LOCATING PIN

Tighten the forward screw first, then the rear screw.

(1) LEFT HANDLEBAR SWITCH HOUSING



(2) SCREWS

FRONT WHEEL/SUSPENSION/STEERING

Install the clutch lever bracket assembly aligning the end of the bracket with the punch mark on the handlebar. Install the clutch lever bracket holder with the "UP" mark facing up.

Tighten the upper bolt first, then the lower bolt.

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

Connect the clutch switch wires.



Install the grip end and tighten the screw.



Install the wire bands.
Install the rearview mirrors.



FRONT WHEEL

REMOVAL

Support the motorcycle securely using a hoist or equivalent.

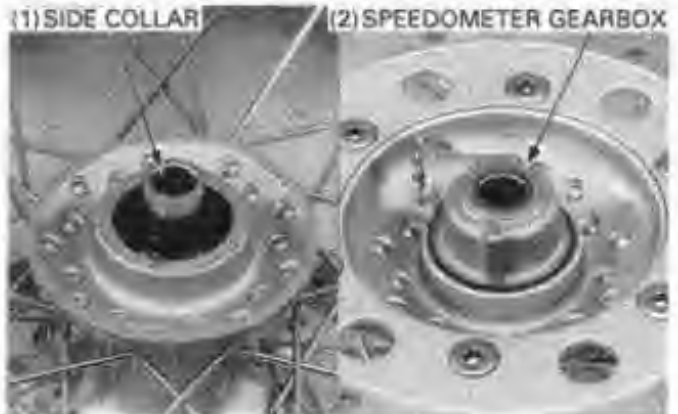
Remove the speedometer cable setting screw and disconnect the cable.



Loosen the front axle pinch bolt.
Remove the axle and the front wheel.



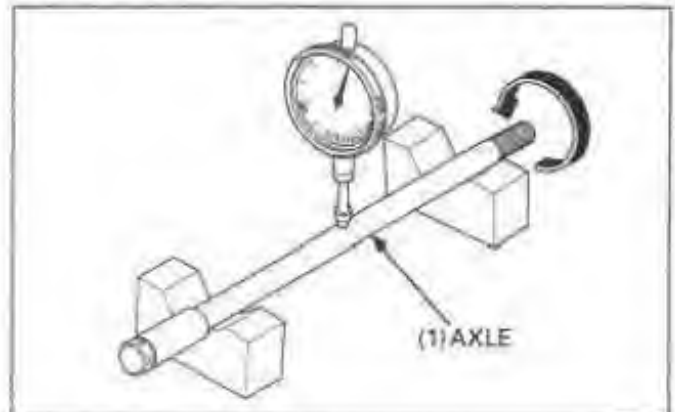
Remove the side collar from the right wheel hub.
Remove the speedometer gear box from the left wheel hub.



INSPECTION

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

SERVICE LIMIT: 0.20 mm (0.008 in)



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

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

NOTE

- Replace the bearings in pairs.

Pack new bearings with grease and install them into the hub using the special tools (page 12-11).



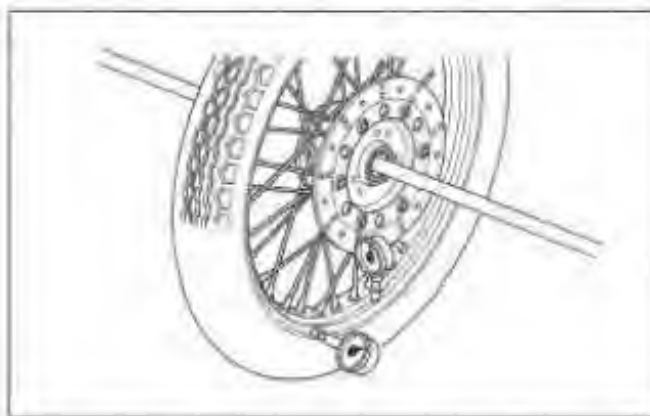
FRONT WHEEL/SUSPENSION/STEERING

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

SERVICE LIMIT:

Radial: 2.0 mm (0.08 in)

Axial: 2.0 mm (0.08 in)



DISASSEMBLY

Remove the bolts and brake disc.
Remove the dust seal and speedometer gear retainer from the left wheel hub.



Remove the dust seal from the right wheel hub.



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

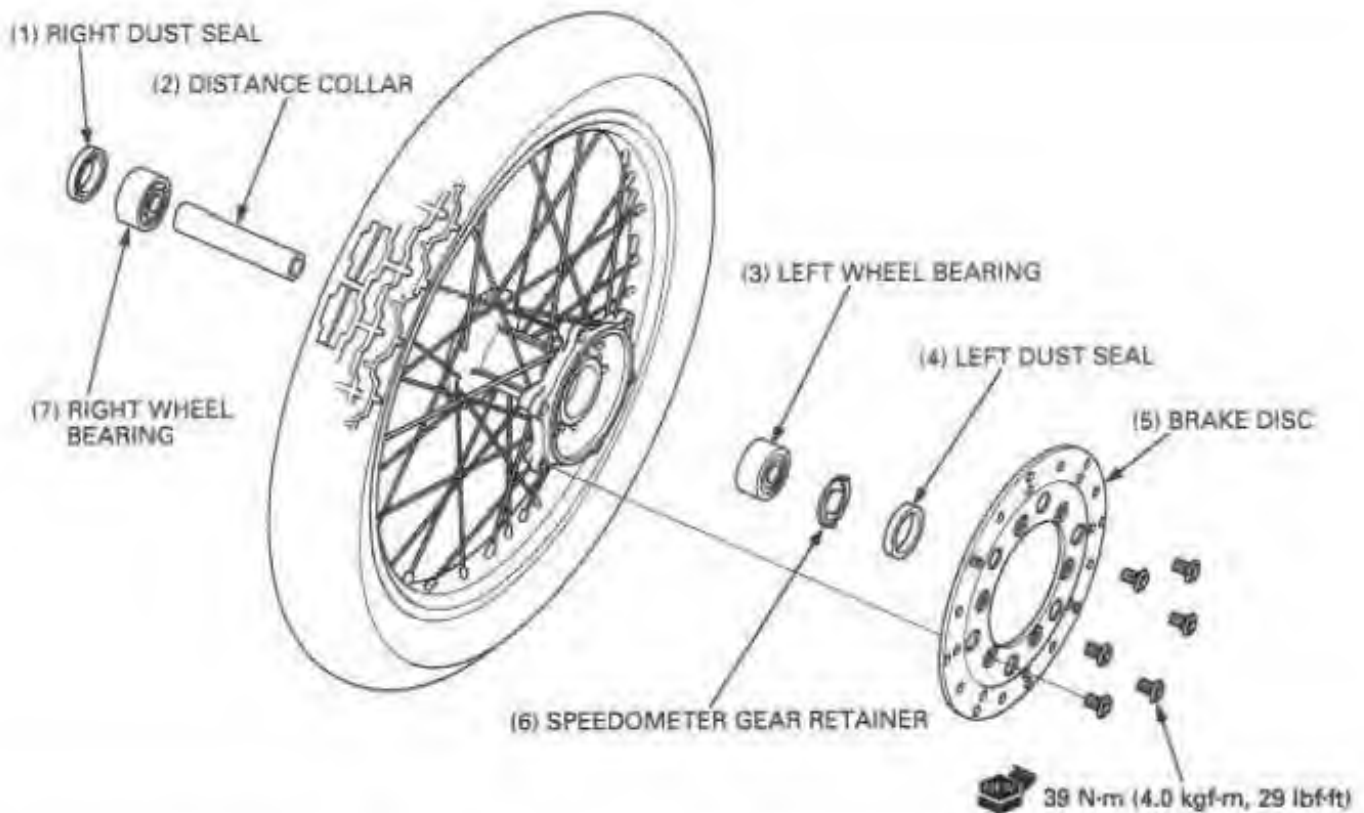
TOOLS:

Bearing remover head, 15 mm 07745 - 0050400

Bearing remover shaft 07746 - 0050100



ASSEMBLY



Pack all bearing cavities with grease.

CAUTION

- *Never reinstall an old bearing, once a bearing has been removed, the bearing must be replaced with a new one.*

Drive in a new left bearing squarely with its sealed side facing out.

Install the distance collar, then drive in the right side bearing with its sealed side facing out.

TOOLS:

Driver	07749 - 0010000
Attachment, 42 x 47 mm	07746 - 0010300
Pilot, 15 mm	07746 - 0040300

WARNING

- *Do not get grease on the brake disc or stopping power will be reduced.*

Install the brake disc on the wheel hub.

Install the tighten the new mounting bolts to the specified torque.

TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)



FRONT WHEEL/SUSPENSION/STEERING

Place the rim on the work bench.
Place the hub with the left side down and begin facing with new spokes.

Adjust the hub position so that the distance from the hub left end surface to the side of rim is $30.75 \pm 1 \text{ mm}$ ($1.21 \pm 0.04 \text{ in}$) as shown.

TOOL:

Wheel spoke wrench

07701 - 0020300
not available in U.S.A.

TORQUE: 4 N·m (0.4 kgf·m, 2.9 lbf·ft)

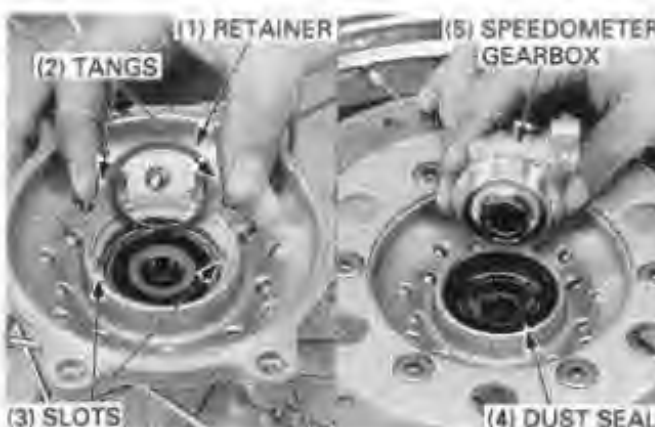
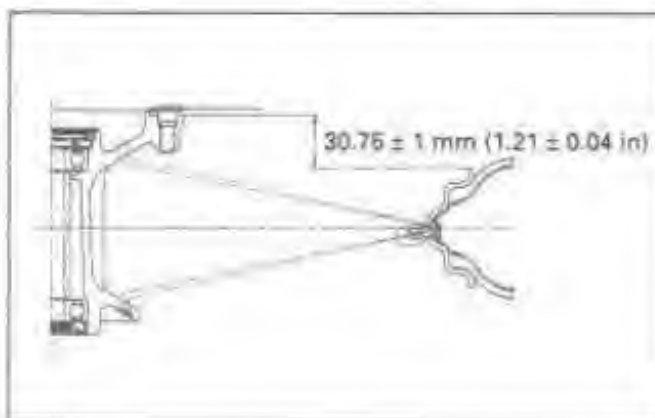
Check the rim runout (page 13-10).

Install the speedometer gear retainer into the left wheel hub, aligning its tangs with the slots in the hub.

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

Fill the speedometer gear box with grease.

Install the speedometer gear box in the wheel hub, aligning its slots with the retainer tangs.



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

Install the right side collar.



INSTALLATION

Install the front wheel between the fork legs so that the brake disc is positioned between the pads, being careful not to damage the pads.

Install the front axle.

Position the lug on the speedometer gear box against the back of the stopper on the left fork leg.



Install and tighten the axle to the specified torque.

TORQUE: 62 N·m (6.3 kgf-m, 46 lbf-ft)

Tighten the axle pinch bolt.



Connect the speedometer cable and secure it with a screw.



FORK

REMOVAL

Remove the following:

- Front wheel (page 12-8)
- Brake caliper (page 14-10)

⚠ WARNING

- Do not allow the brake caliper to hang from the brake hose.

Remove the bolts and front fender.



Loosen the front turn signal bracket bolt/nut.

Loosen the fork top pinch bolt.

If the fork is disassembled, loosen the fork cap, but do not remove it yet.

Loosen the fork bottom pinch bolt and remove the fork tube from the fork top bridge and steering stem.



DISASSEMBLY

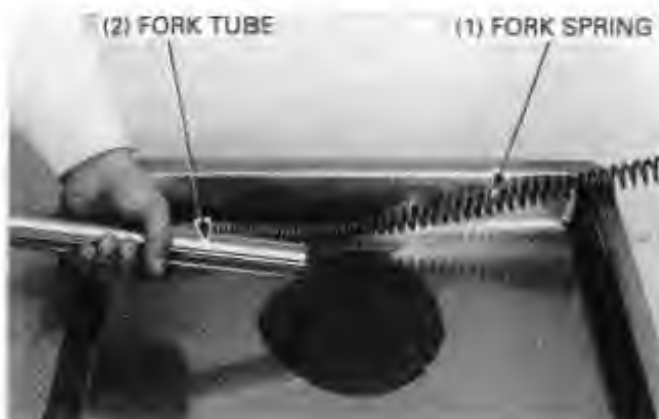
Remove the fork cap.

▲ WARNING

- *The fork spring is under spring pressure. Use care when removing the fork cap.*



Remove the fork spring.
Pour out the fork fluid by pumping the fork tube several times.



Hold the fork slider in a vice with soft jaws or a shop towel.
Remove the fork socket bolt with a hex wrench.

NOTE

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



Remove the dust seal.



Remove the oil seal stopper ring.



Pull the fork tube out until resistance from the slider bushing is felt. Then move it in and out, tapping the bushing lightly until the fork tube separates from the fork slider. The slider bushing will be forced out by the fork tube bushing.



Remove the oil lock piece from the fork slider.



Remove the stop ring from the fork piston.



FRONT WHEEL/SUSPENSION/STEERING

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



Remove the oil seal, back-up ring and slider bushing from the fork tube.

NOTE

- Do not remove the fork tube bushing unless it is necessary to replace it with a new one.



INSPECTION

Fork spring

Measure the fork spring free length.

SERVICE LIMIT: 535.1 mm (21.07 in)



Fork tube/slider/piston

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

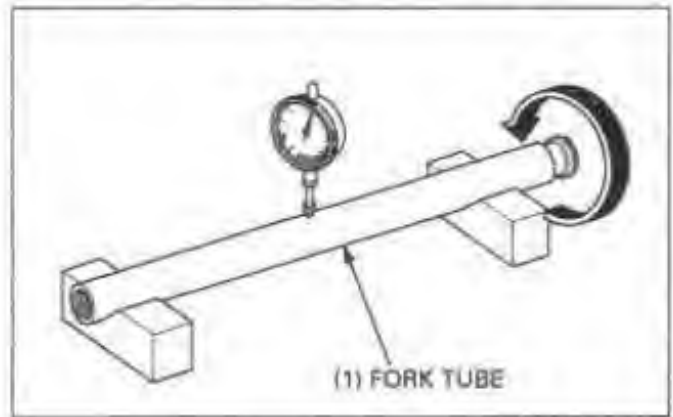
Check the fork piston ring for wear or damage.
Check the rebound spring for fatigue or damage.

Replace the components if necessary.



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

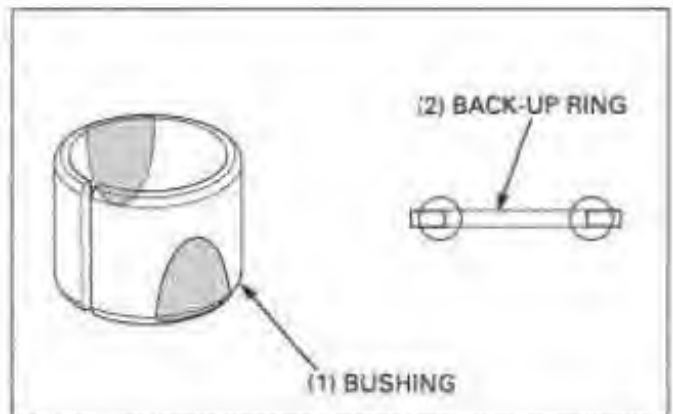
SERVICE LIMIT: 0.20 mm (0.008 in)



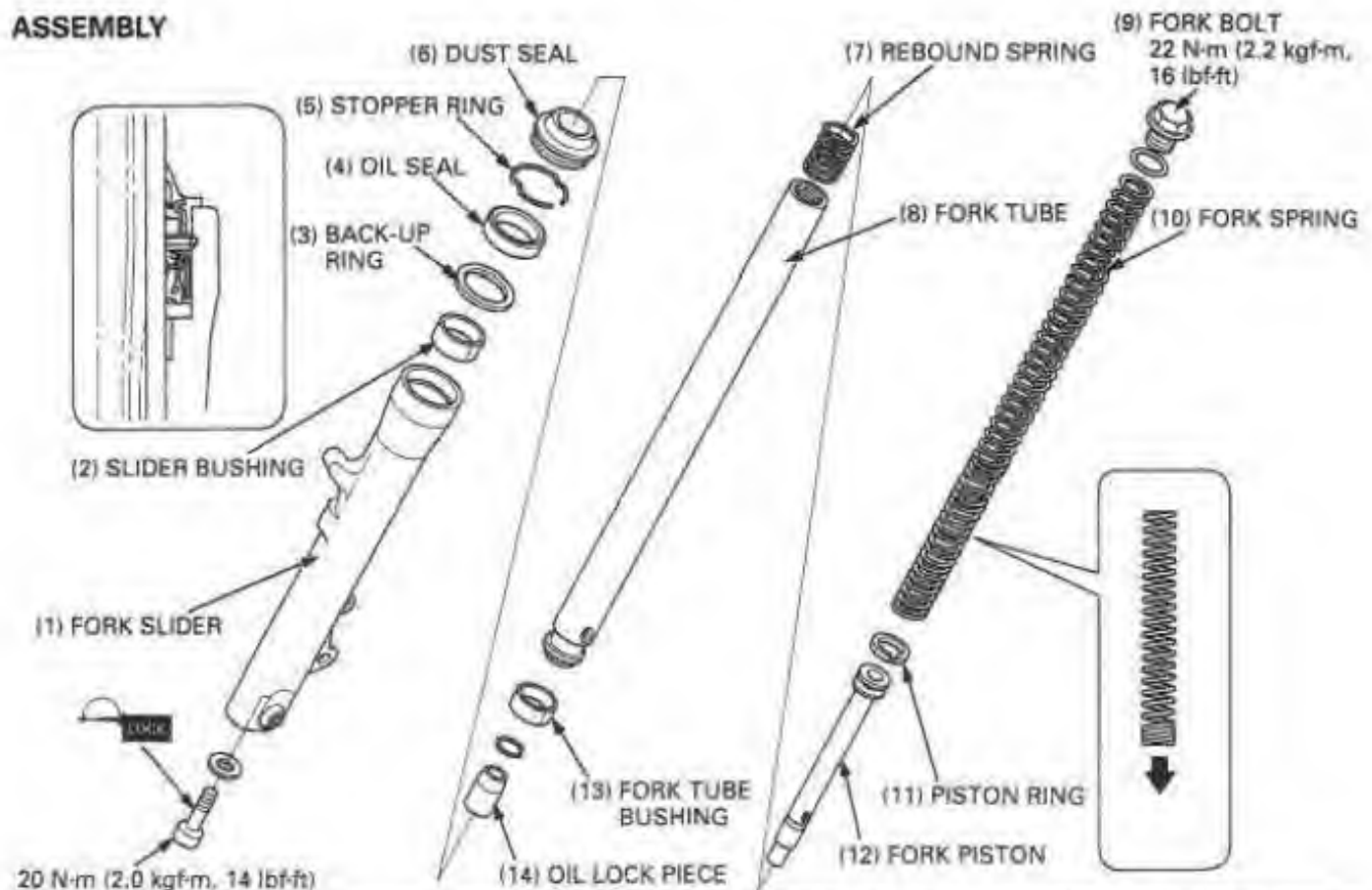
Fork tube bushing

Visually inspect the slider and fork tube bushings. Replace the bushings if there is excessive scoring or scratching, or if the teflon is worn so that the copper surface appears on more than 3/4 of the entire surface.

Check the back-up ring; replace it if there is any distortion at the points shown.



ASSEMBLY



FRONT WHEEL/SUSPENSION/STEERING

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

Install a new fork tube bushing if the bushing has been removed.

Install the sliding bushing, back-up ring and a new oil seal.

NOTE

- Install the oil seal with its lip facing down.



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



Install the stop ring onto the fork piston.



Install the oil lock piece onto the fork piston end.

Install the fork tube into the fork slider.



Hold the fork slider in a vise with soft jaws or a shop towel. Apply a locking agent to the fork socket bolt threads and install and tighten the socket bolt with a new sealing washer into the fork piston.

NOTE

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

TORQUE: 20 N·m (2.0 kgf-m, 14 lbf-ft)



Drive the oil seal in using the special tools.

TOOLS:

Oil seal driver body	07747 - 0010100
Oil seal driver attachment	07747 - 0010501



Install the stopper ring into the fork slider groove securely.



Install the dust seal.



FRONT WHEEL/SUSPENSION/STEERING

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

RECOMMENDED FORK FLUID:

Pro Honda Suspension Fluid SS-8

FORK FLUID CAPACITY:

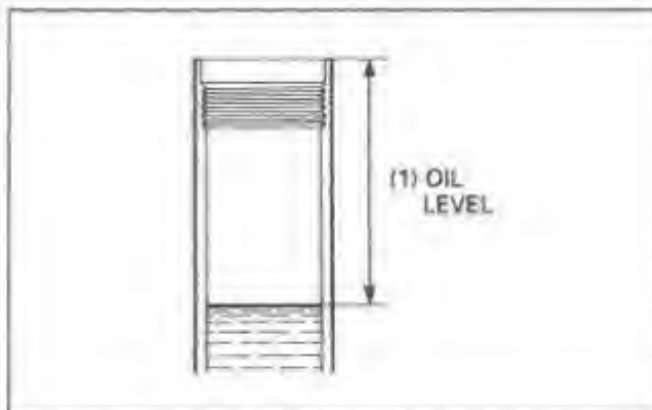
234 cm³ (7.9 US oz, 8.2 imp oz)

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



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

FORK OIL LEVEL: 129 mm (5.1 in)



Pull the fork tube up and install the fork spring with the tightly wound coil end facing down.



Install a new O-ring onto the fork cap.
Install the fork cap onto the fork tube.



INSTALLATION

Install the fork tube into the steering stem, front turn signal bracket and fork top bridge. Align the top end of the fork tube with the upper surface of the top bridge as shown.



Tighten the bottom bridge pinch bolt.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)



Tighten the fork cap to the specified torque if it was removed.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Tighten the top fork pinch bolt to the specified torque.

TORQUE: 11 N·m (1.1 kgf·m, 8 lbf·ft)

Install and tighten the front turn signal bracket bolt/nut.



Install the front fender with the brake hose stay. Install and tighten the front fender mounting bolts.

Install the front wheel (page 12-12).
Install the brake caliper (page 14-12).



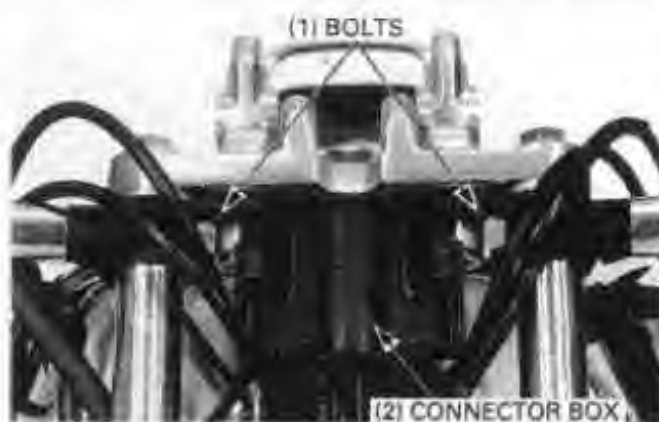
STEERING STEM

REMOVAL

Remove the following:

- Handlebar (page 12-3)
- Front wheel (page 12-8)
- Headlight case
- Speedometer (page 18-4)
- Ignition switch (page 18-6)

Remove the bolts and connector box.



Remove the front brake hose clamp bolts, hose clamp and front cover.

Remove the nut and headlight bracket.



Loosen the steering stem nut.

Remove the fork legs (page 12-13)

Remove the stem nut and washer and the top bridge.



Remove the steering stem bearing adjusting nut using the special tool.

TOOL:

Steering stem socket

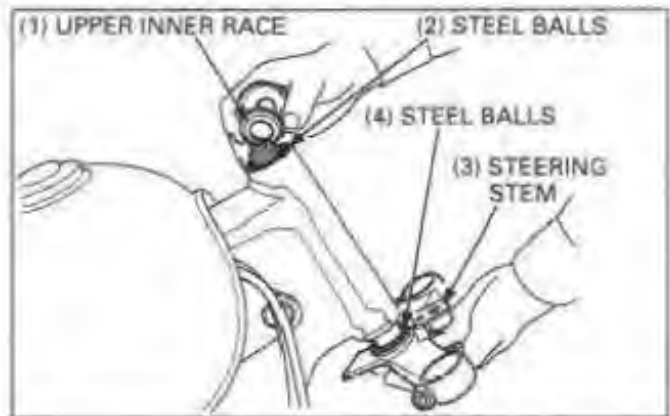
07936 - 3710101



Remove the upper bearing inner race, steel balls (21) and steering stem.

NOTE

- Be careful not to loose the steel balls.



BEARING RACE REPLACEMENT

NOTE

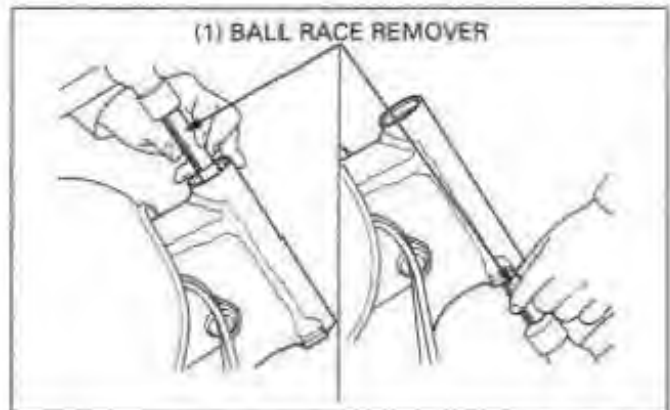
- Always replace the bearings and races as a set.

Remove the upper and lower bearing outer races using the special tools.

TOOL:

Ball race remover

07946 - 1790000



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

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

Remove the dust seal and washer.



Install the washer onto the steering stem.

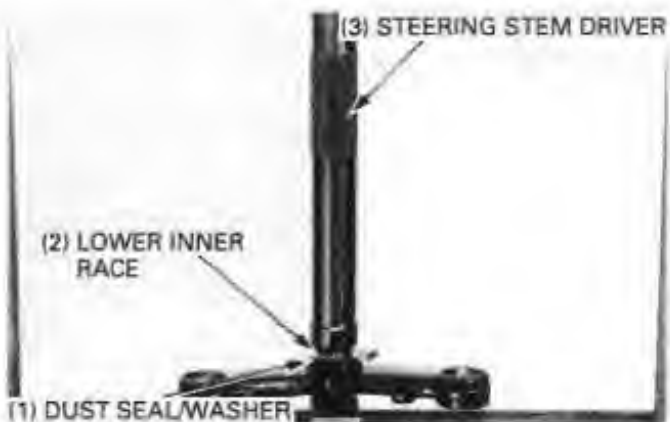
Apply grease to new dust seal lips and install it over the steering stem.

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

TOOL:

Steering stem driver

07946 - GC40000



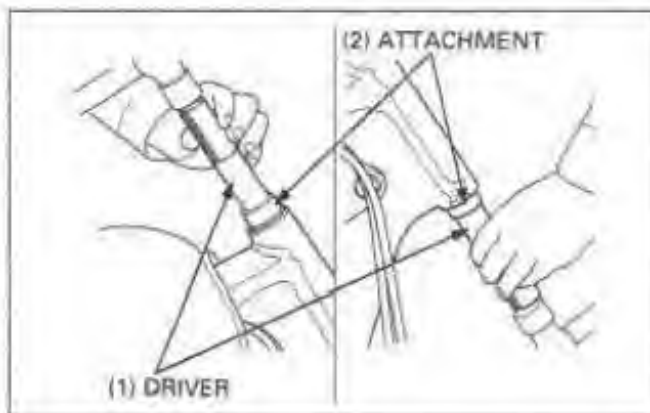
FRONT WHEEL/SUSPENSION/STEERING

Drive new bearing outer races into the steering head pipe.

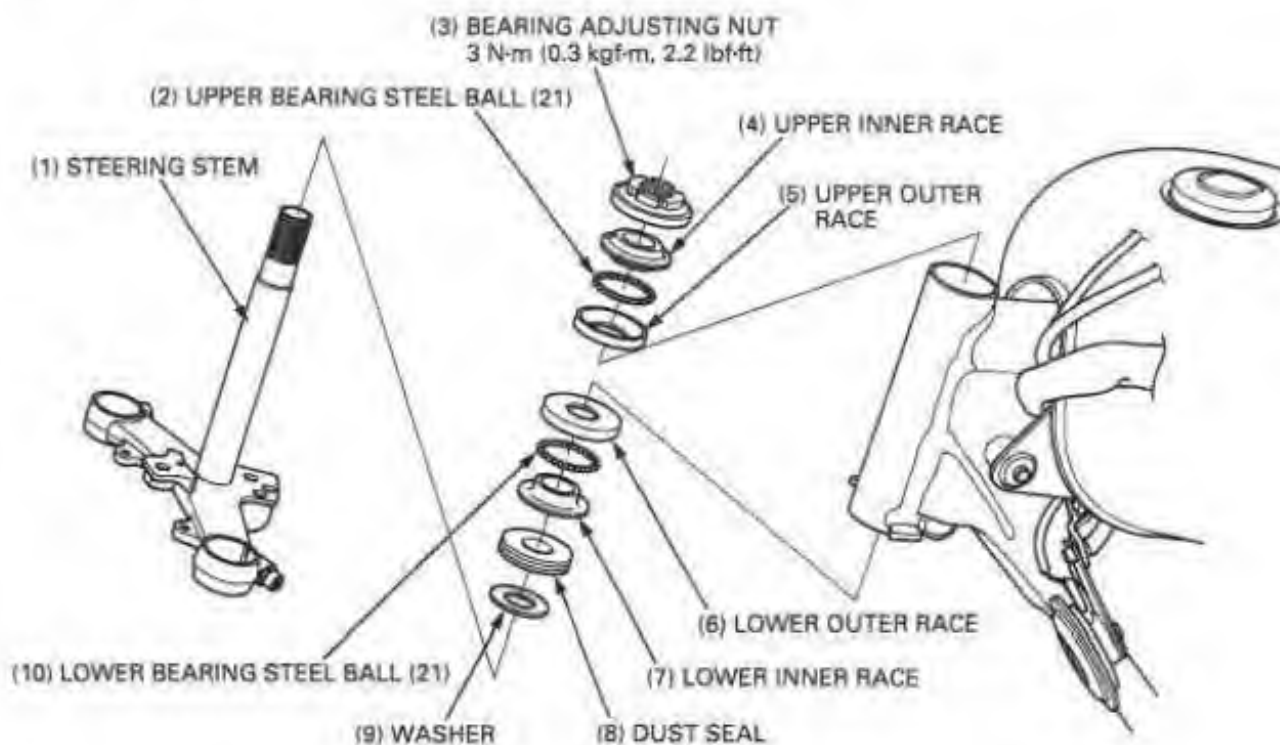
TOOLS:

Driver 07749 - 0010000

Attachment, 37 x 40 mm 07746 - 0010200



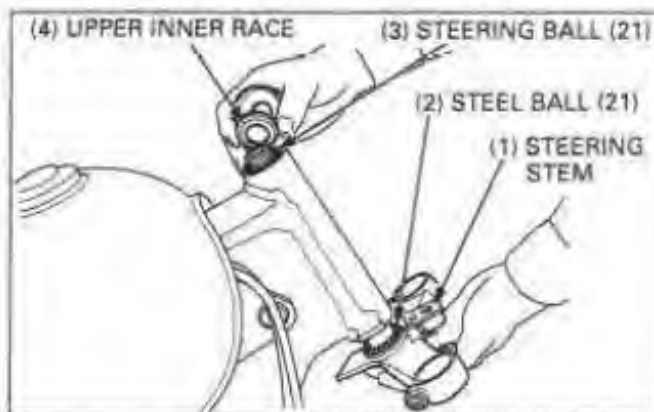
INSTALLATION



Apply grease to upper and lower bearing races.
Install the 21 steel balls onto each bearing race.

Insert the steering stem into the steering head pipe, being careful not to drop the steel balls.

Install the upper bearing inner race and stem bearing adjusting nut.

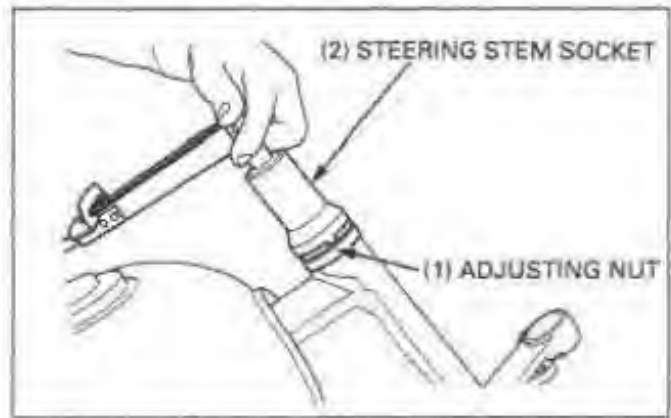


Tighten the stem bearing adjusting nut to the initial torque.

TOOL:

Steering stem socket 07916 - 3710101

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



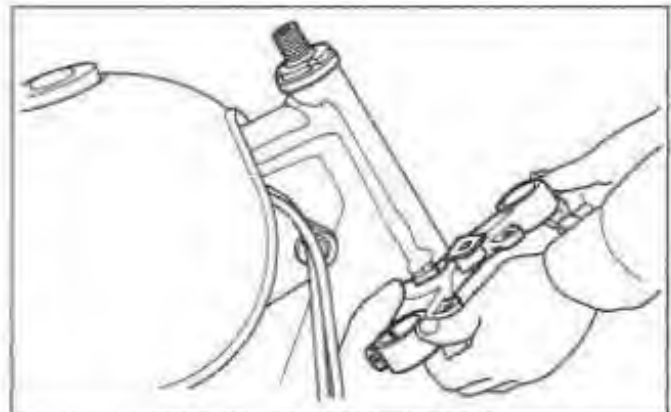
Move the steering stem right and left, lock-to-lock, five times to seat the bearings.

Make sure that the steering stem moves smoothly, without play or binding; then loosen the bearing adjusting nut.

Retighten the bearing adjusting nut to the specified torque.

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

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



Install the top bridge.

Install the fork legs (page 12-21).

Install the washer and stem nut.

Tighten the steering stem nut to the specified torque.

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

STEERING HEAD BEARING PRELOAD

Support the motorcycle using a work stand or box under the engine and raise the front wheel off the ground.

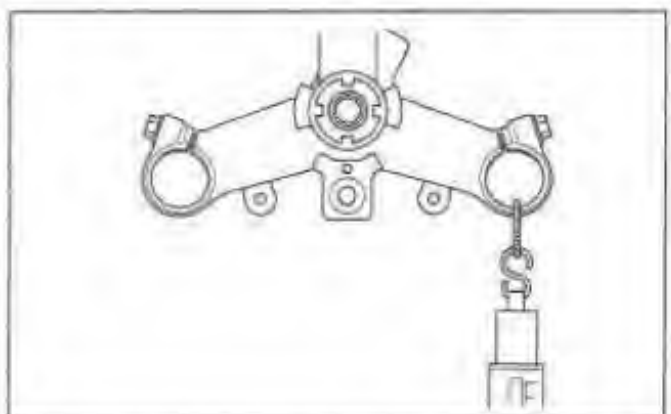
Position the steering stem to the straight ahead position.

Hook a spring scale to the fork tube and measure the steering head bearing preload.

NOTE

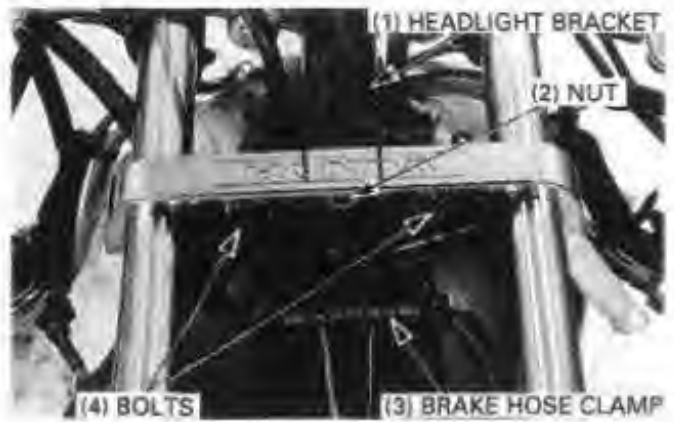
- Make sure that there is no cable or wire harness interference.

The preload should be within 1.04 – 1.53 kg (2.29 – 3.37 lb). If the reading does not fall within the limits, lower the front wheel onto the ground and adjust the steering bearing adjusting nut.



FRONT WHEEL/SUSPENSION/STEERING

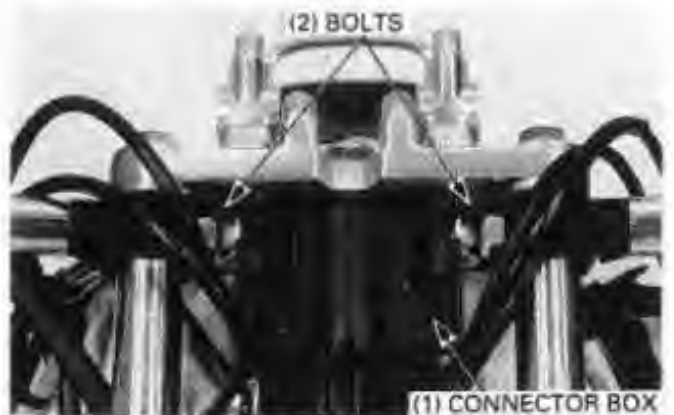
Install the headlight bracket and tighten the nut.
Install the brake hose clamp and tighten the bolts.

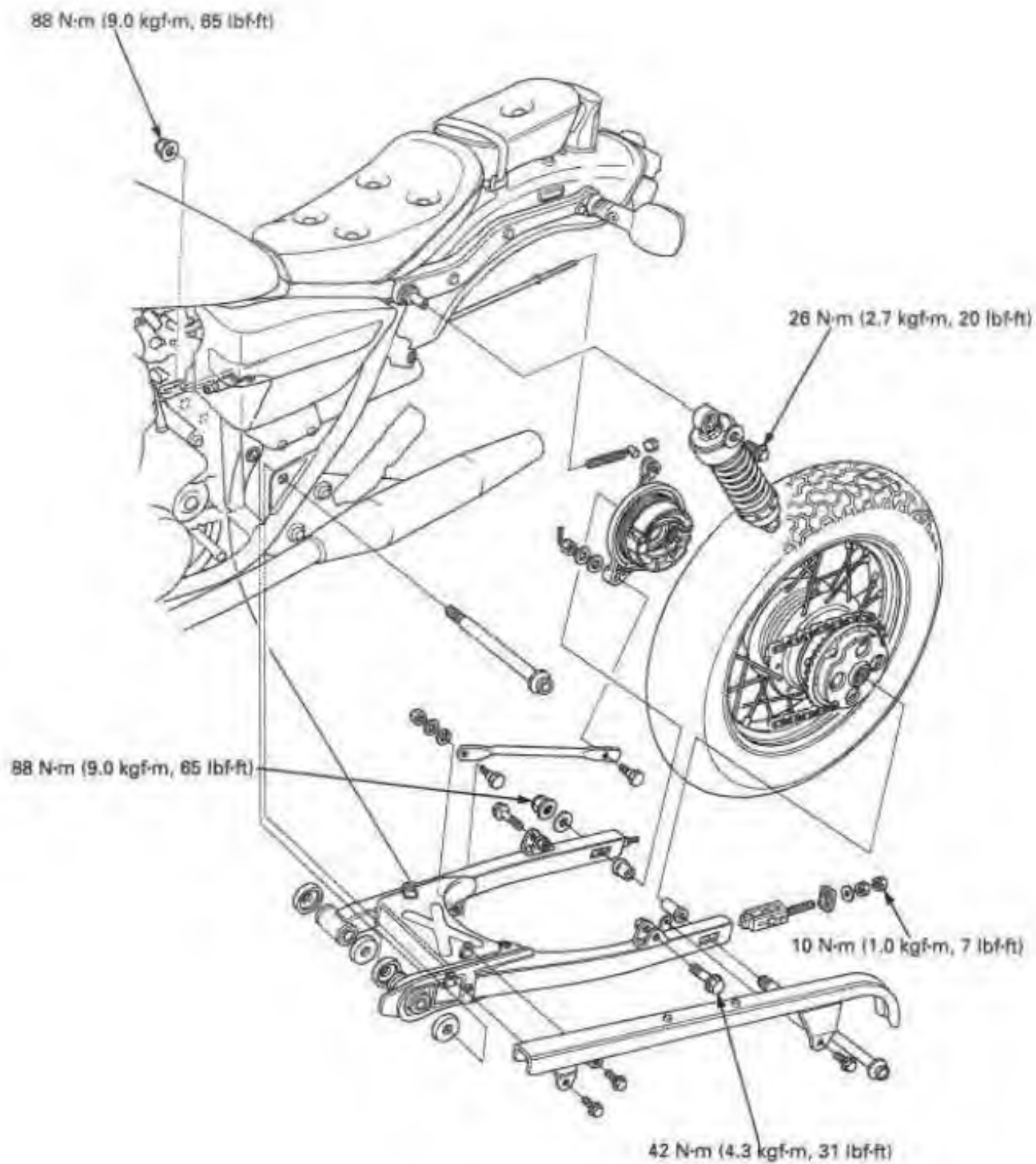


Install the connector box and tighten the bolts.

Install the following:

- Ignition switch (page 18-6)
- Speedometer (page 18-4)
- Headlight case
- Front wheel (page 12-12)
- Handlebar (page 12-5)





13. REAR WHEEL/BRAKE/SUSPENSION

SERVICE INFORMATION	13-1	SHOCK ABSORBER	13-12
TROUBLESHOOTING	13-2	SWINGARM	13-13
REAR WHEEL	13-3	BRAKE PEDAL	13-16
REAR BRAKE	13-9		

SERVICE INFORMATION

GENERAL

▲WARNING

- A contaminated brake drum or shoe reduces stopping power. Discard contaminated shoes and clean a contaminated drum with a high quality brake degreasing agent.
- A jack or other support is required to support the motorcycle.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		—	2.0 (0.08)
Cold tire pressure	Up to 90 kg (200 lb) load	200 kPa (2.00 kgf/cm ² , 29 psi)	—
	Up to maximum weight capacity	200 kPa (2.00 kgf/cm ² , 29 psi)	—
Axle runout		—	0.20 (0.008)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Wheel hub-to-rim distance		21.6 ± 1 (0.85 ± 0.04)	—
Brake pedal free play		20 – 30 (3/4 – 1-1/4)	—
Brake drum I.D.		130.0 (5.12)	131 (5.2)
Brake lining thickness		4.5 (0.18)	2.0 (0.08)

TORQUE VALUES

Rear axle nut	88 N·m (9.0 kgf·m, 65 lbf·ft)
Rear wheel spoke	4 N·m (0.4 kgf·m, 2.9 lbf·ft)
Rear tire valve nut	3 N·m (0.3 kgf·m, 2.2 lbf·ft)
Driven sprocket mounting nut	64 N·m (6.5 kgf·m, 37 lbf·ft)
Rear shock absorber upper mounting bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)
Rear shock absorber lower mounting bolt	42 N·m (4.3 kgf·m, 31 lbf·ft)
Swingarm pivot nut	88 N·m (9.0 kgf·m, 65 lbf·ft)
Drive chain slider mounting screw	3 N·m (0.3 kgf·m, 2.2 lbf·ft)
Drive chain adjuster lock nut	10 N·m (1.0 kgf·m, 7 lbf·ft)

TOOLS

Wheel spoke wrench	07701 - 0020300 not available in U.S.A.
Bearing remover head, 15 mm	07746 - 0050400
Bearing remover shaft	07746 - 0050100
Driver	07749 - 0010000
Attachment, 32 x 35 mm	07746 - 0010100
Attachment, 42 x 47 mm	07746 - 0010300
Pilot, 15 mm	07746 - 0040300
Bearing remover set	07936 - 3710001
— Remover handle	07936 - 3710100
— Bearing remover set	07936 - 3710600
— Remover weight	07741 - 0010201 or 07936 - 3710200
Needle bearing remover	07936 - KA50000

TROUBLESHOOTING

Suspension noise

- Weak shock absorber spring
- Oil leakage from damper unit
- Incorrect suspension adjustment
- Low tire pressure

Hard suspension

- Incorrect suspension adjustment
- Bent swingarm pivot
- Damaged swingarm pivot bushings
- Bent damper unit
- High tire pressure

Steers to one side or does not track straight

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

Rear wheel wobbling

- Bent rim
- Worn rear wheel bearings
- Faulty tire
- Low tire pressure
- Faulty swingarm pivot bushings

REAR WHEEL

REMOVAL

Support the motorcycle securely using a hoist or equivalent.

Remove the following:

- Cotter pin
- Nut, washer, rubber washer
- Pivot bolt
- Brake panel stopper arm
- Adjusting nut
- Brake rod, spring

Remove the axle nut and washer.

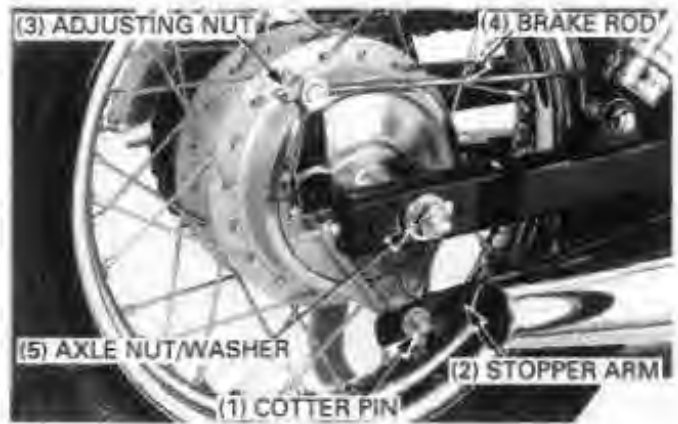
Loosen the drive chain adjusters.

Push the rear wheel forward.

Derail the drive chain.

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

Remove the drive chain adjusters.

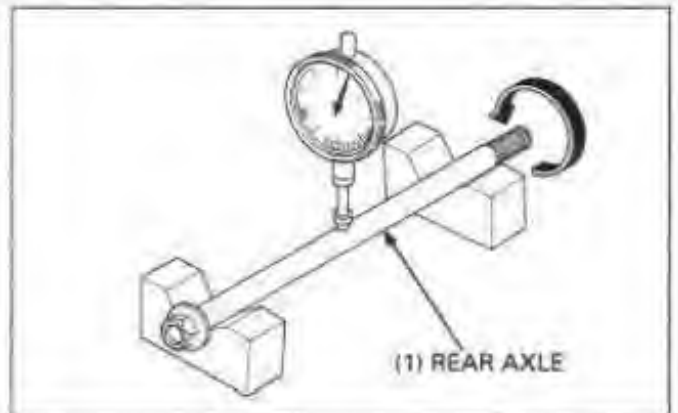


INSPECTION

Axle

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

SERVICE LIMIT: 0.20 mm (0.008 in)



Wheel

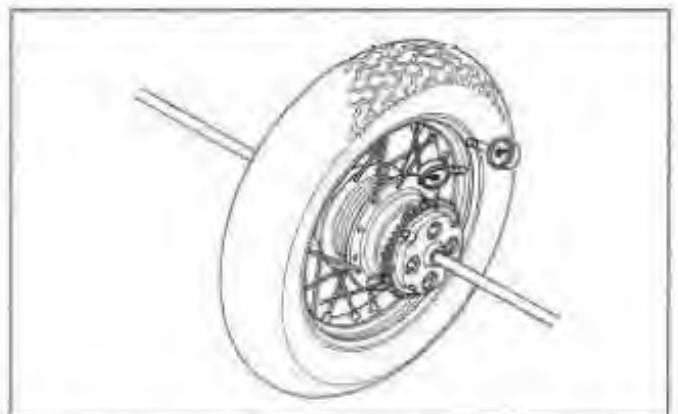
Check the rim runout by placing the wheel in a turning stand.

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

Actual runout is 1/2 the total indicator reading.

SERVICE LIMITS: Radial: 2.0 mm (0.08 in)

Axial: 2.0 mm (0.08 in)



REAR WHEEL/BRAKE/SUSPENSION

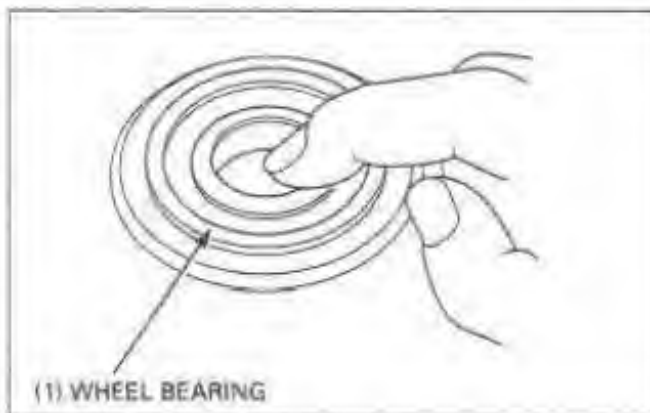
Wheel bearing

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.

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

NOTE

- Replace the wheel bearings in pairs.

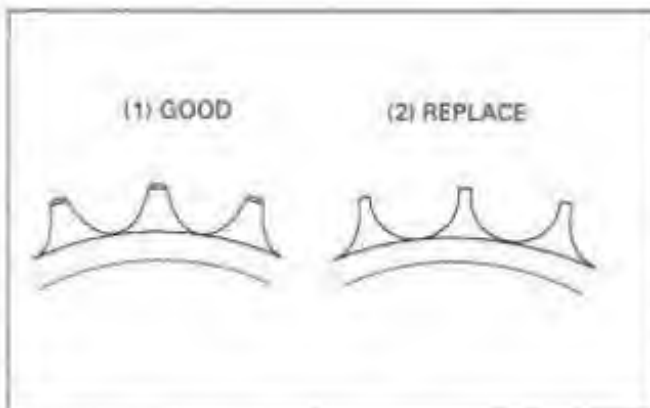


Driven sprocket

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

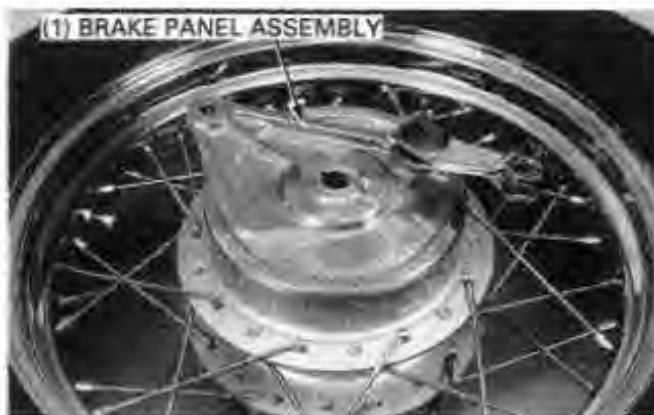
NOTE

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



DISASSEMBLY

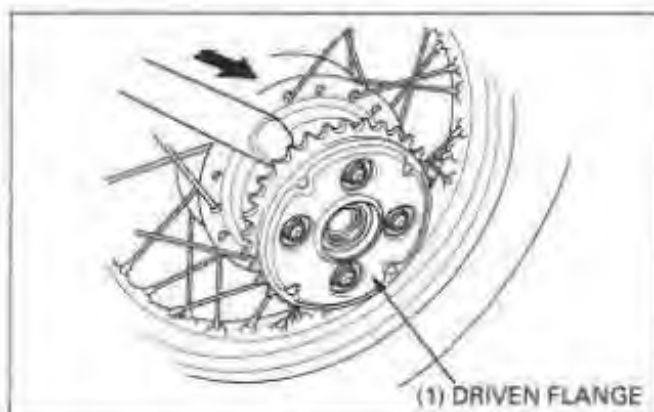
Remove the brake panel assembly from the right wheel hub.



Remove the driven flange from the left wheel hub.

NOTE

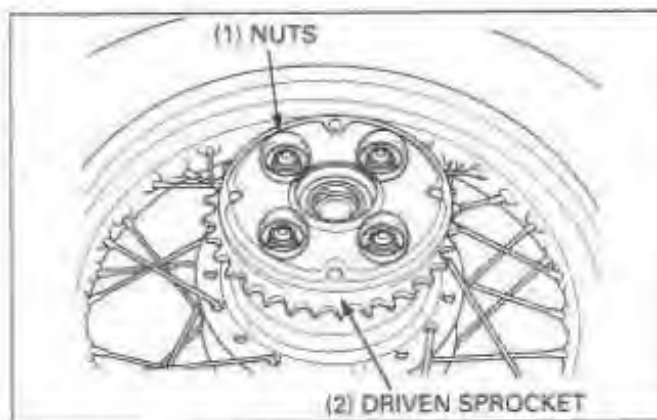
- If you will be disassemble the driven flange, loosen the driven sprocket bolts before removing the driven flange from the wheel hub.



Driven flange bearing removal

Loosen the driven sprocket nuts.

Remove the driven flange from the wheel hub, then remove the driven sprocket nuts and sprocket.



Remove the dust seal.



Remove the driven flange collar.

Drive out the driven flange bearing.



Wheel bearing removal

Install the bearing remover head into the bearing.

From the opposite side install the bearing remover shaft and drive the bearing out of the wheel hub.

Remove the distance collar and drive out the other bearing.

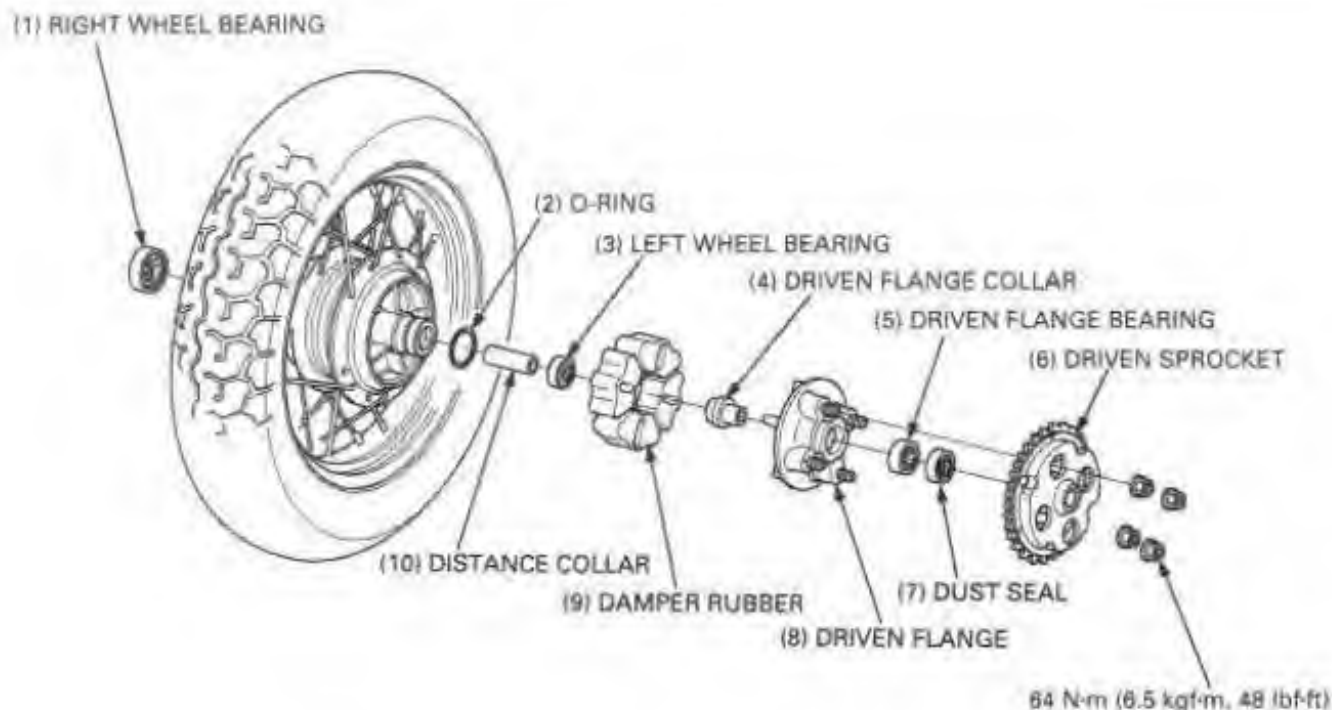
TOOLS:

Bearing remover head, 15 mm 07746 - 0050400

Bearing remover shaft 07746 - 0050100



ASSEMBLY



Wheel bearing installation

Pack all bearing cavities with grease.

CAUTION

* Never reinstall an old bearing, once a bearing has been removed, the bearing must be replaced with a new one.

Drive in a new left bearing squarely with its sealed side facing out.

Install the distance collar, then drive in the right side bearing with its sealed side facing out.

TOOLS:

Driver 07749 - 0010000

Right side:

Attachment, 42 x 47 mm 07746 - 0010300

Left side:

Attachment, 32 x 35 mm 07746 - 0010100

Pilot, 15 mm 07746 - 0040300

Driven flange bearing installation

Drive the new driven flange bearing into the driven flange using the special tools.

TOOLS:

Driver 07749 - 0010000

Attachment, 42 x 47 mm 07746 - 0010300

Pilot, 15 mm 07746 - 0040300



Place the rim on the work bench.
Place the hub with the left side down and begin lacing with new spokes.

Adjust the hub position so that the distance from the hub right end surface to the side of rim is 21.6 ± 1 mm (0.85 ± 0.04 in) as shown.

TOOL:

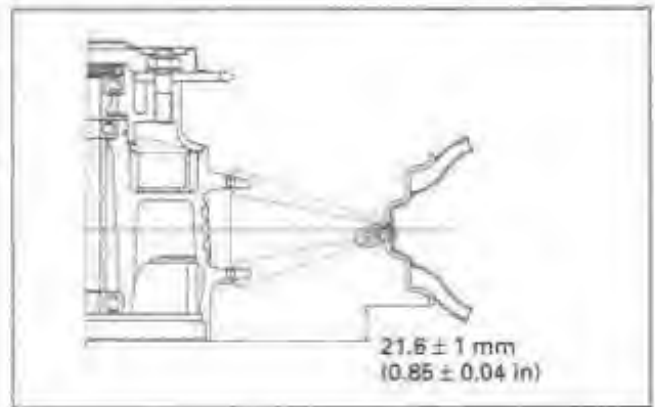
Wheel spoke wrench

07741 - 0020300
not available in U.S.A.

TORQUE: 4 N·m (0.4 kgf-m, 2.9 lbf-ft)

Check the rim runout (page 13-3).

Apply grease to the dust seal lips, then install it into the driven flange.



Install the driven flange collar.



Install the wheel damper rubbers into the wheel hub.



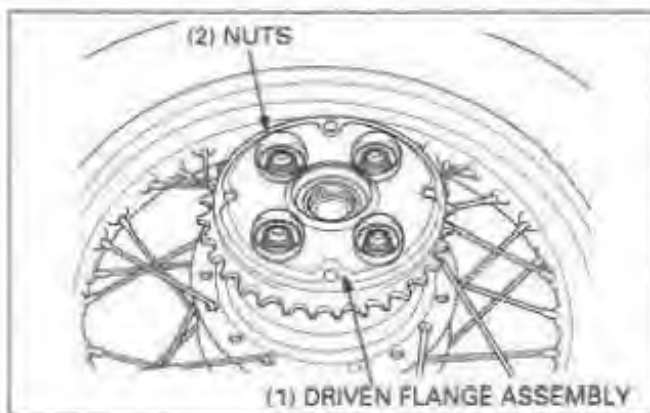
REAR WHEEL/BRAKE/SUSPENSION

⚠ WARNING

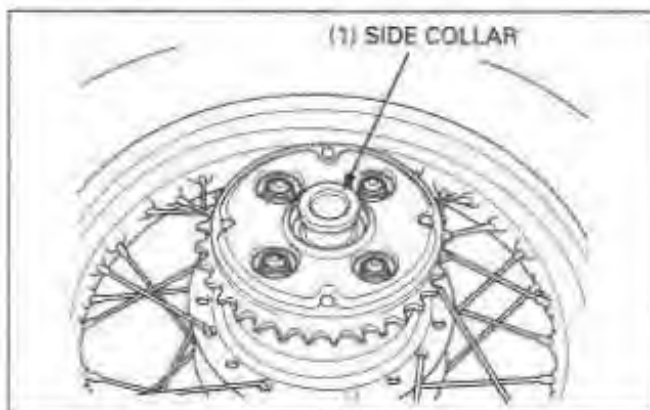
- *Do not get grease on the brake drum or stopping power will be reduced.*

Install the driven flange assembly into the left wheel hub. If the driven sprocket was removed, install the driven sprocket and tighten the nuts.

TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)



Install the left side collar.



Install the brake drum assembly into the right wheel hub.



INSTALLATION

Install both drive chain adjusters into the swingarm. Place the rear wheel into the frame and insert the axle through the left drive chain adjuster, rear wheel, right side collar and right chain adjuster. Install the drive chain onto the driven sprocket.



Install the washer and loosely install the axle nut.

Install the brake panel stopper arm onto the brake panel. Install the bolt, rubber cushion, washer and nut, then tighten the nut.

Secure the nut with a new cotter pin.



Install the joint piece to the brake arm and connect the brake rod with the spring. Install the adjusting nut.



Adjust the drive chain slack (page 3-12).

Tighten the axle nut to the specified torque.

TORQUE: 88 N·m (9.0 kgf-m, 65 lbf-ft)

Adjust the rear brake (page 3-16).



REAR BRAKE

REMOVAL

Remove the rear wheel (page 13-3).

Remove the brake panel from the rear wheel (page 13-4).

INSPECTION

Measure the rear brake drum I.D.

SERVICE LIMIT: 131 mm (5.2 in)



REAR WHEEL/BRAKE/SUSPENSION

Measure the brake lining thickness.

SERVICE LIMIT: 2.0 mm (0.08 in)



DISASSEMBLY

Remove the brake shoes and springs.



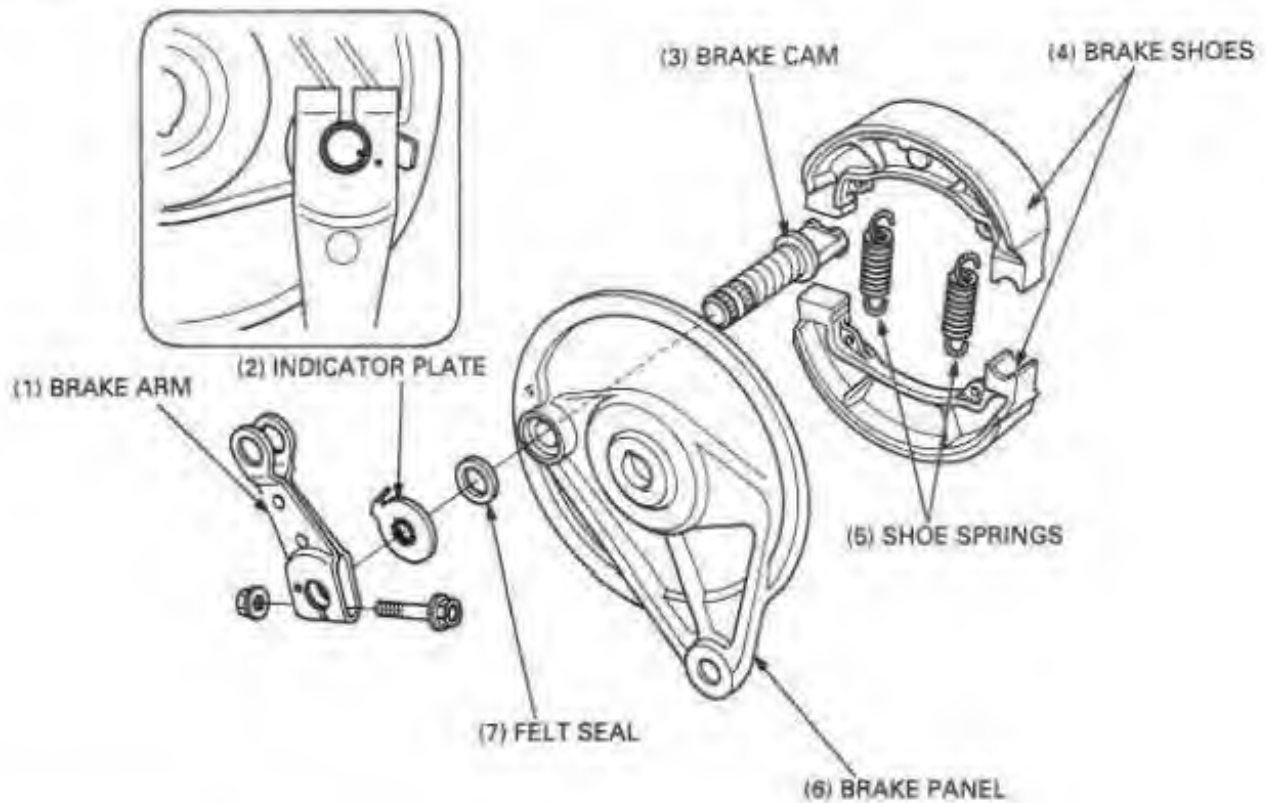
Remove the nut, bolt and brake arm.



Remove the indicator plate, felt seal and brake cam.



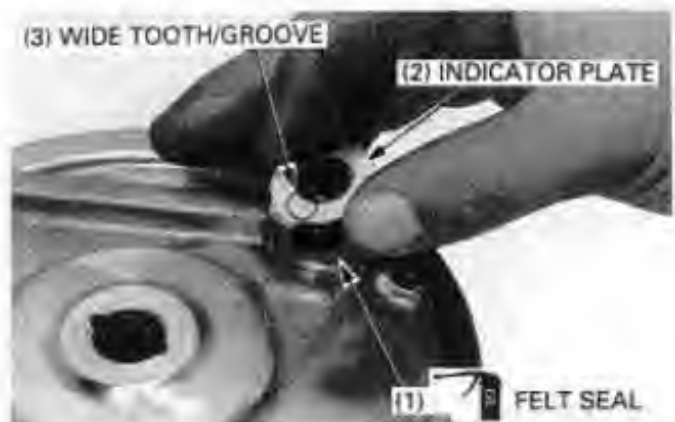
ASSEMBLY



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



Apply oil to the felt seal and install it onto the brake panel.
Install the wear indicator plate on the brake cam aligning its wide tooth with the wide groove on the brake cam.



REAR WHEEL/BRAKE/SUSPENSION

Install the brake arm aligning the punch marks of the arm and the brake cam.
Install the brake arm pinch bolt and tighten the nut securely.



Install the brake shoes and springs.
Install the brake panel into the wheel hub (page 13-8).
Install the rear wheel (page 13-8).



SHOCK ABSORBER

REMOVAL

Support the motorcycle securely using a hoist or equivalent.
Remove the upper and lower mounting bolts and shock absorber.



INSPECTION

Visually inspect the shock absorber for damage.
Check the:

- Damper rod for bend or damage
- Damper unit for deformation or oil leaks
- Upper and lower joint bushings for wear or damage

Check smooth damper operation.

CAUTION

- Do not disassemble the shock absorber. Replace the shock absorber if any component is damaged.



INSTALLATION

Install the shock absorber onto the frame.
Install and tighten the upper and lower mounting bolts to the specified torque.

TORQUE:

Upper mounting bolt: 26 N·m (2.7 kgf·m, 20 lbf·ft)

Lower mounting bolt: 42 N·m (4.3 kgf·m, 31 lbf·ft)



SWINGARM

REMOVAL

Remove the rear wheel (page 13-3).

Disconnect the rear brake pedal return spring.



Remove the bolts and drive chain cover.
Remove the rear shock absorber lower mounting bolts.

Remove the swingarm pivot nut, bolt and swingarm.



DISASSEMBLY

Remove the following:

- Drive chain slider
- Rear brake panel stopper arm



REAR WHEEL/BRAKE/SUSPENSION

Remove the dust seal caps and pivot collars.



INSPECTION

Check the pivot bushings and collars for wear or damage.
Check the swingarm for cracks or damage.



PIVOT BUSHING REPLACEMENT

Remove the outside pivot bushings using the special tools.

TOOLS:

Bearing remover set	07936 - 7310001
— Bearing remover handle	07936 - 3710100
— Bearing remover set	07936 - 3710600
— Remover weight	07741 - 0010201 or 07936 - 3710200

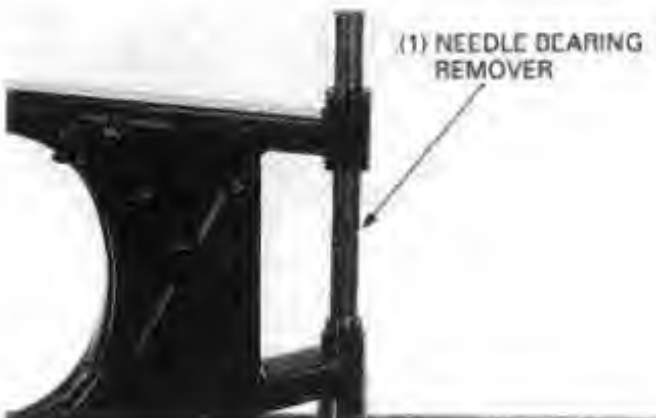
Drive out the inside pivot bushings.



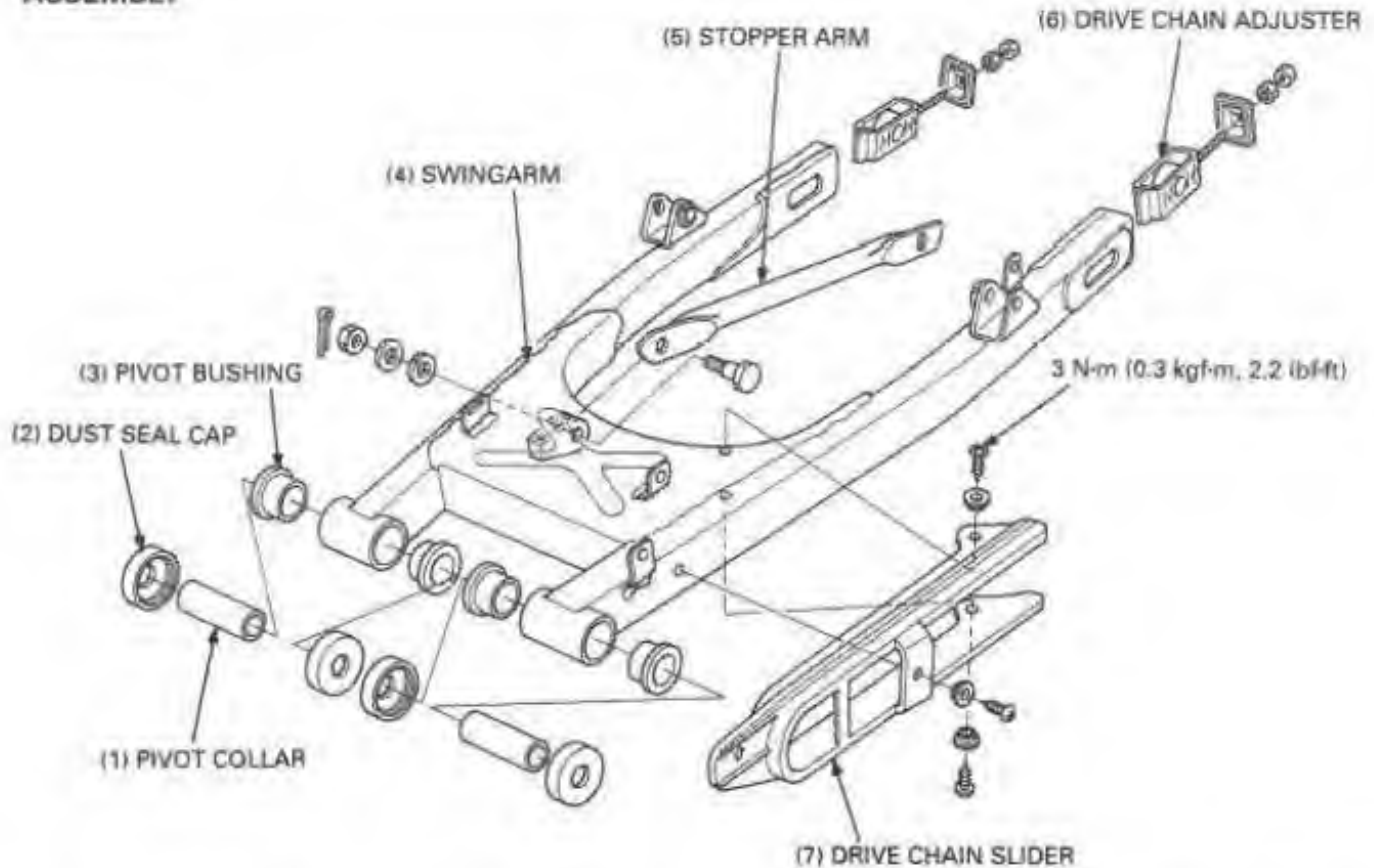
Apply grease to the inside of the pivot bushings.
Drive new bushings into the swingarm.

TOOL:

Needle bearing remover	07936 - KA50000
------------------------	-----------------



ASSEMBLY



Grease the pivot collars and install them into the swingarm pivot.
Apply grease to the dust seal lips and install the dust seal caps onto the swingarm pivot.



Install the rear brake stopper arm, bolt, spring washer, plain washer and nut.
Tighten the nut securely.
Install a new cotter pin to secure the nut.
Install the chain slider and tighten the screws.



REAR WHEEL/BRAKE/SUSPENSION

INSTALLATION

Install the swingarm into the frame, and insert the pivot bolt from the left side.

Install and tighten the pivot nut to the specified torque.

TORQUE: 88 N·m (9.0 kgf·m, 65 lbf·ft)

Install the shock absorber lower mounting bolts and tighten them to the specified torque.

TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)

Install the drive chain cover and tighten the bolts.

Install the rear brake pedal return spring.

Install the rear wheel (page 13-8).



BRAKE PEDAL

REMOVAL

Remove the adjusting nut, brake rod and spring from the rear brake arm.



Disconnect the brake pedal return spring from the swing-arm.

Disconnect the brake switch spring.

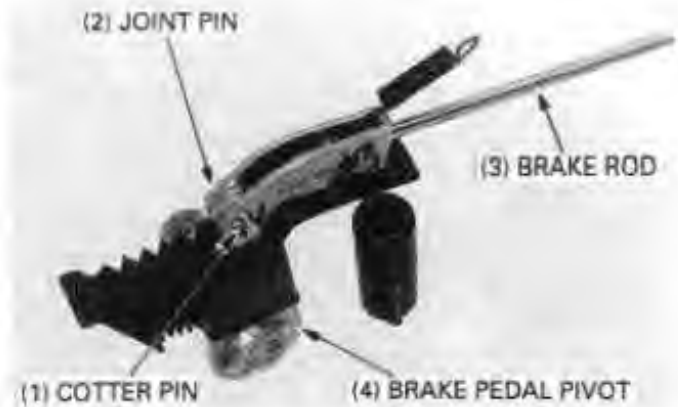


Remove the brake pedal pivot pinch bolt and brake pedal.

Remove the brake pedal pivot shaft and brake rod as an assembly.



Remove the cotter pin and joint pin, and separate the brake rod from the pivot shaft.



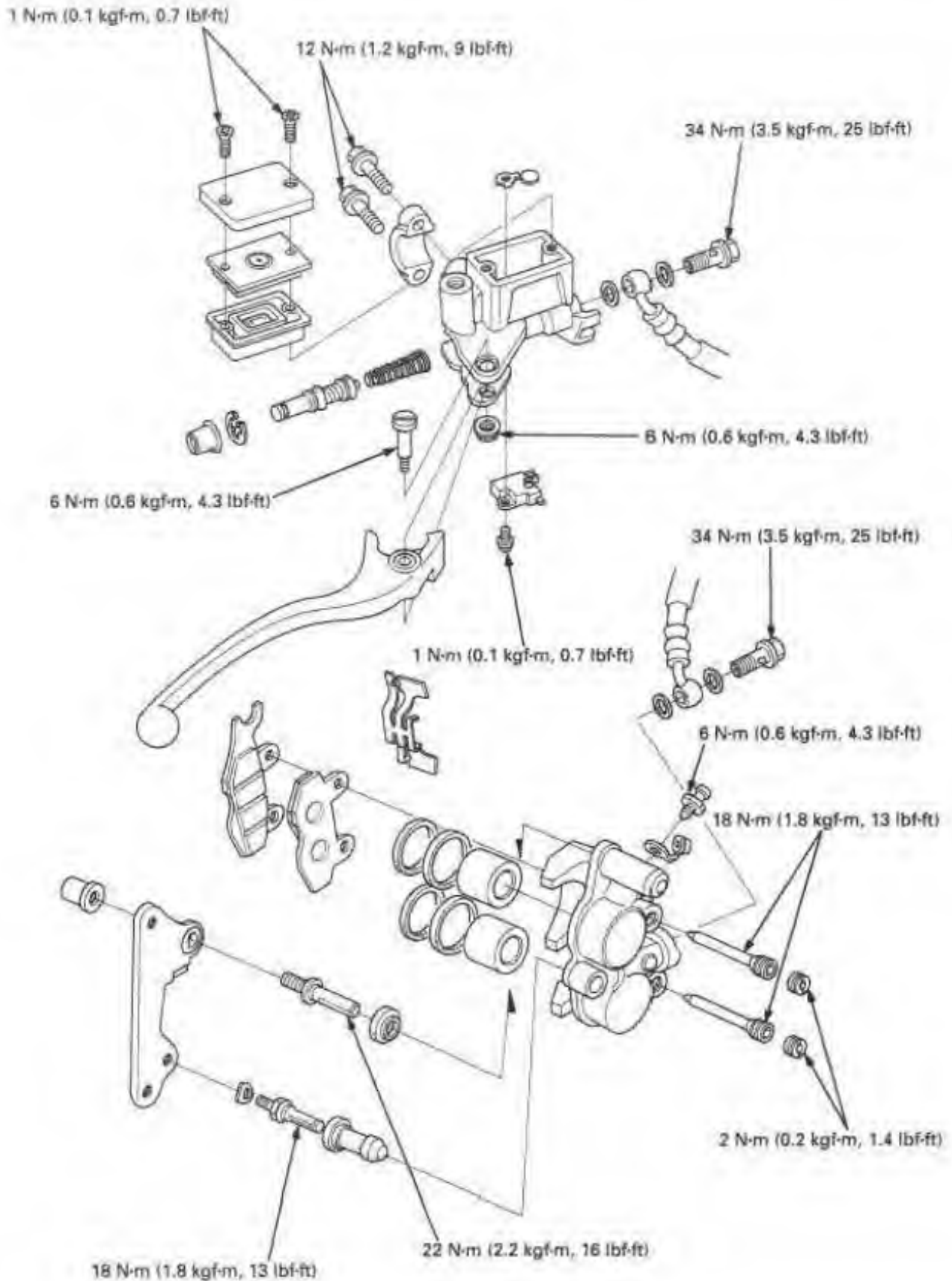
INSTALLATION

Installation is in the reverse order of removal.

NOTE

- At installation, align the punch marks of the pedal pivot and pedal.





SERVICE INFORMATION	14-1	BRAKE PAD/DISC	14-4
TROUBLESHOOTING	14-2	MASTER CYLINDER	14-6
BRAKE FLUID REPLACEMENT/AIR BLEEDING	14-3	BRAKE CALIPER	14-10

SERVICE INFORMATION

GENERAL

▲ WARNING

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.

CAUTION

- Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag or shop towel over these parts whenever the system is serviced.

- This section covers maintenance of the front hydraulic brake.
- Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled.
- Do not allow foreign material to enter the system when filling the reservoir.
- Always use fresh DOT 3 or 4 brake fluid from a sealed container when servicing the system. Do not mix different types of fluid as they may not be compatible.
- Always check brake operation before riding the motorcycle.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Specified brake fluid		DOT 3 or 4	—
Brake disc thickness		4.0 (0.16)	3.5 (0.14)
Brake disc runout		—	0.30 (0.012)
Master cylinder	Cylinder I.D.	12.700 – 12.743 (0.5000 – 0.5017)	12.765 (0.5022)
	Piston O.D.	12.657 – 12.684 (0.4983 – 0.4994)	12.645 (0.4978)
Brake caliper	Cylinder I.D.	25.400 – 25.405 (1.0000 – 1.0002)	25.450 (1.0020)
	Piston O.D.	25.353 – 25.368 (0.9981 – 0.9987)	25.300 (0.9961)

TORQUE VALUES

Caliper bracket mounting bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	ALOC bolt
Brake hose oil bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)	
Caliper bleeder valve	6 N·m (0.6 kgf·m, 4.3 lbf·ft)	
Caliper pin bolt	22 N·m (2.2 kgf·m, 16 lbf·ft)	Apply a locking agent to the threads
Caliper pin bolt A	18 N·m (1.8 kgf·m, 13 lbf·ft)	Apply a locking agent to the threads
Pad pin	18 N·m (1.8 kgf·m, 13 lbf·ft)	
Pad pin plug	2 N·m (0.2 kgf·m, 1.4 lbf·ft)	
Front brake hose clamp bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Master cylinder holder bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Master cylinder reservoir cap screw	1 N·m (0.1 kgf·m, 0.7 lbf·ft)	
Brake lever pivot bolt	6 N·m (0.6 kgf·m, 4.3 lbf·ft)	
Brake lever pivot nut	6 N·m (0.6 kgf·m, 4.3 lbf·ft)	
Brake switch mounting bolt	1 N·m (0.1 kgf·m, 0.7 lbf·ft)	

TOOLS

Snap ring pliers

07914 – 3230001

TROUBLESHOOTING

Brake lever soft or spongy

- Air in hydraulic system
- Leaking hydraulic system
- Contaminated brake pad/disc
- Worn caliper piston seal
- Worn master cylinder piston cups
- Worn brake pad/disc
- Contaminated caliper
- Caliper not sliding properly
- Low brake fluid level
- Clogged fluid passage
- Warped/deformed brake disc
- Sticking/worn caliper piston
- Sticking/worn master cylinder piston
- Contaminated master cylinder
- Bent brake lever

Brake lever hard

- Clogged/restricted brake system
- Sticking/worn caliper piston
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Worn caliper piston seal
- Sticking/worn master cylinder piston
- Bent brake lever

Brake grab or pull to one side

- Contaminated brake pad/disc
- Misaligned wheel
- Clogged/restricted brake/hose joint
- Warped/deformed brake disc
- Caliper not sliding properly

Brake drag

- Contaminated brake pad/disc
- Misaligned wheel
- Worn brake pad/disc
- Warped/deformed brake disc
- Caliper not sliding properly

BRAKE FLUID REPLACEMENT/AIR BLEEDING

BRAKE FLUID DRAINING

CAUTION

- Do not allow foreign material to enter the system when filling the reservoir.
- Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.

With the fluid reservoir parallel to the ground, remove the reservoir cover and diaphragm.

Connect a bleed hose to the caliper bleed valve. Loosen the bleed valve and pump the brake lever. Stop pumping the lever when no more fluid flows out of the bleed valve.



BRAKE FLUID FILLING

Fill the reservoir with DOT 3 or 4 brake fluid from a sealed container.

CAUTION

- Do not mix different types of fluid. There are not compatible.

Connect a commercially available brake bleeder to the bleed valve.

Pump the brake bleeder and loosen the bleed valve, adding fluid when the fluid level in the master cylinder reservoir is low.

NOTE

- Check the fluid level often while bleeding the brakes to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.



Repeat the above procedures until air bubbles do not appear in the plastic hose.

NOTE

- If air is entering the bleeder from around the bleed valve threads, seal the threads with Teflon tape.
- If a brake bleeder is not available, fill the master cylinder and operate the brake lever to fill the system (page 14-4).

Close the bleed valve. Next, perform the BLEEDING procedure (page 14-4).

HYDRAULIC BRAKE

BRAKE BLEEDING

Connect a clear bleed hose to the bleed valve. Pump up the system pressure with the lever until there are no air bubbles in the fluid flowing out of the master cylinder and lever resistance is felt.

1. Squeeze the brake lever, open the bleed valve 1/2 turn and then close the valve.

NOTE

- Do not release the brake lever until the bleed valve has been closed.

2. Release the brake lever after the bleed valve has been closed.

Repeat steps 1 and 2 until bubbles cease to appear in the fluid coming out of the bleed valve. Tighten the bleed valve.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)

Fill the fluid reservoir to the upper level.

Reinstall the diaphragm and reservoir cover, and tighten the screws.

TORQUE: 1 N·m (0.1 kgf·m, 0.7 lbf·ft)



(1) UPPER LEVEL



(1) RESERVOIR COVER

(2) SCREWS



BRAKE PAD/DISC

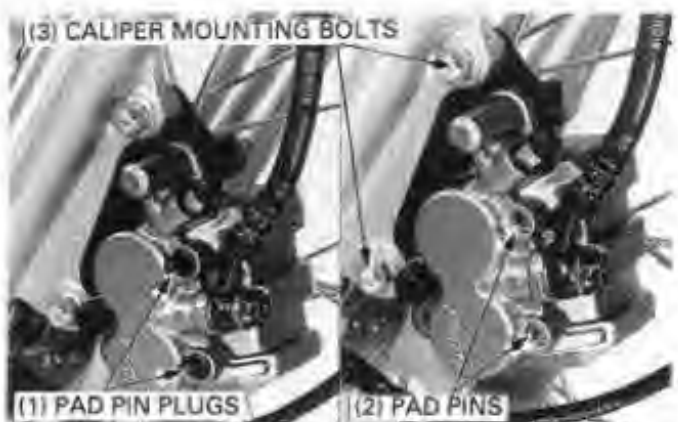
BRAKE PAD REPLACEMENT

NOTE

- Always replace the brake pads in pairs to assure even disc pressure.

Remove the pad pin plugs and loosen the pad pins.

Remove the caliper mounting bolts and caliper.



Remove the pad pins and brake pads.

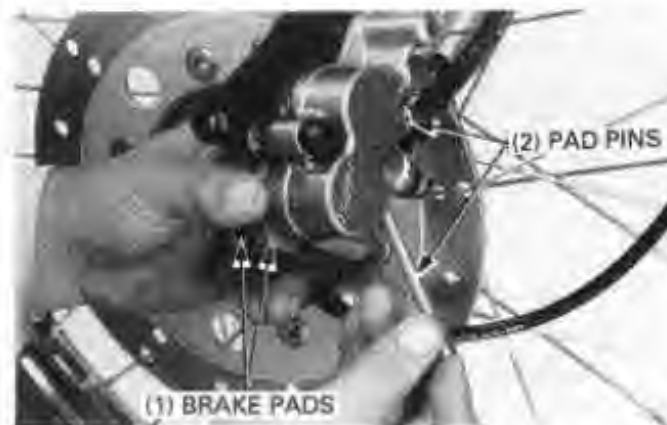


Make sure that the pad spring is in place as shown.



Install the brake pads.

Push the brake pads against the pad spring, then install the pad pins.



Push the caliper pistons all the way in to allow installation of new brake pad.

NOTE

- Check the brake fluid level in the brake master cylinder reservoir as this operation causes the level to rise.



HYDRAULIC BRAKE

Install the brake caliper to the left fork leg so the disc is positioned between the pads.

CAUTION

- Be careful not to damage the pads.

Install and tighten the new brake caliper mounting bolts.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

Tighten the pad pins.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

Install and tighten the pad pin plugs.

TORQUE: 2 N·m (0.2 kgf·m, 1.4 lbf·ft)

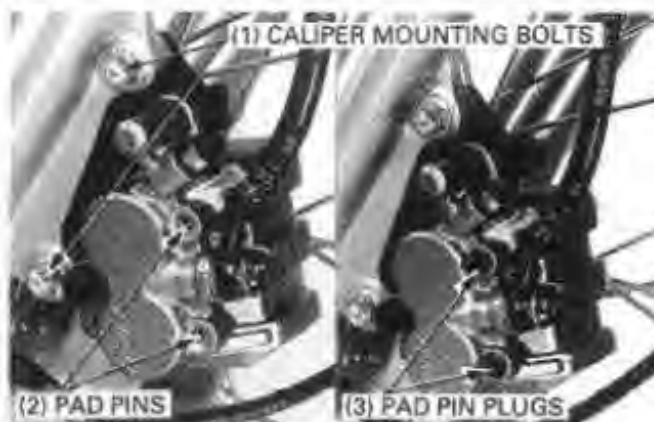
BRAKE DISC INSPECTION

Measure the brake disc thickness with a micrometer.

SERVICE LIMIT: 3.5 mm (0.14 in)

Measure the brake disc warpage with a dial indicator.

SERVICE LIMIT: 0.30 mm (0.012 in)



MASTER CYLINDER

REMOVAL

Disconnect the brake switch wires.
Remove the rearview mirror.
Remove the pivot nut, bolt and brake lever.

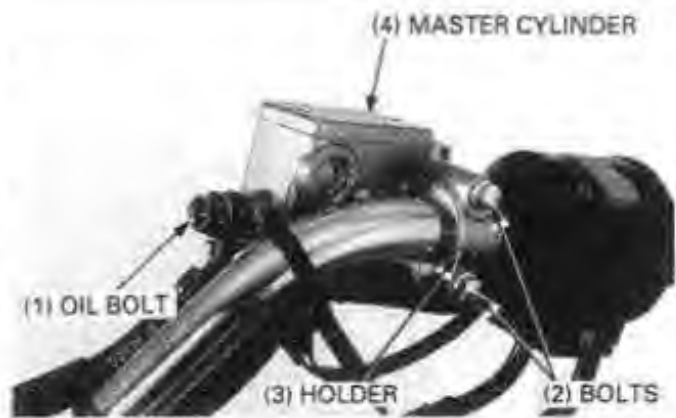


Drain the brake system (page 14-3).
Remove the brake hose oil bolt, sealing washers and brake hose.

CAUTION

* Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.

Remove the bolts from the master cylinder holder and remove the master cylinder.



DISASSEMBLY

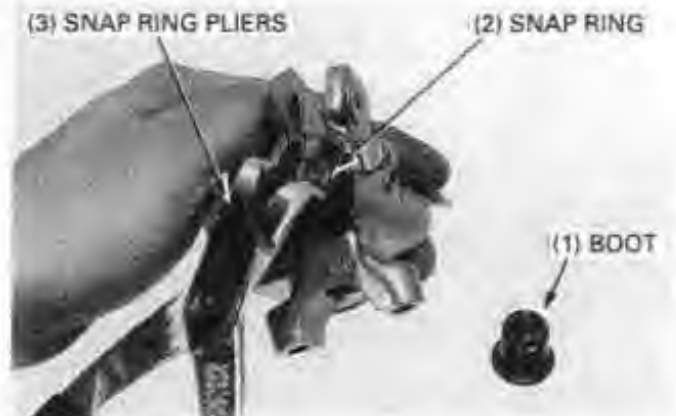
Remove the boot.

Remove the snap ring from the master cylinder body using the special tool as shown.

TOOL:

Snap ring pliers

07914 - 3230001



Remove the master piston and spring.

Clean the inside of the cylinder and reservoir with brake fluid.



INSPECTION

Check the piston boot, primary cup and secondary cup for fatigue or damage.

Check the master cylinder and piston for abnormal scratches.

Measure the master cylinder I.D.

SERVICE LIMIT: 12.755 mm (0.5022 in)



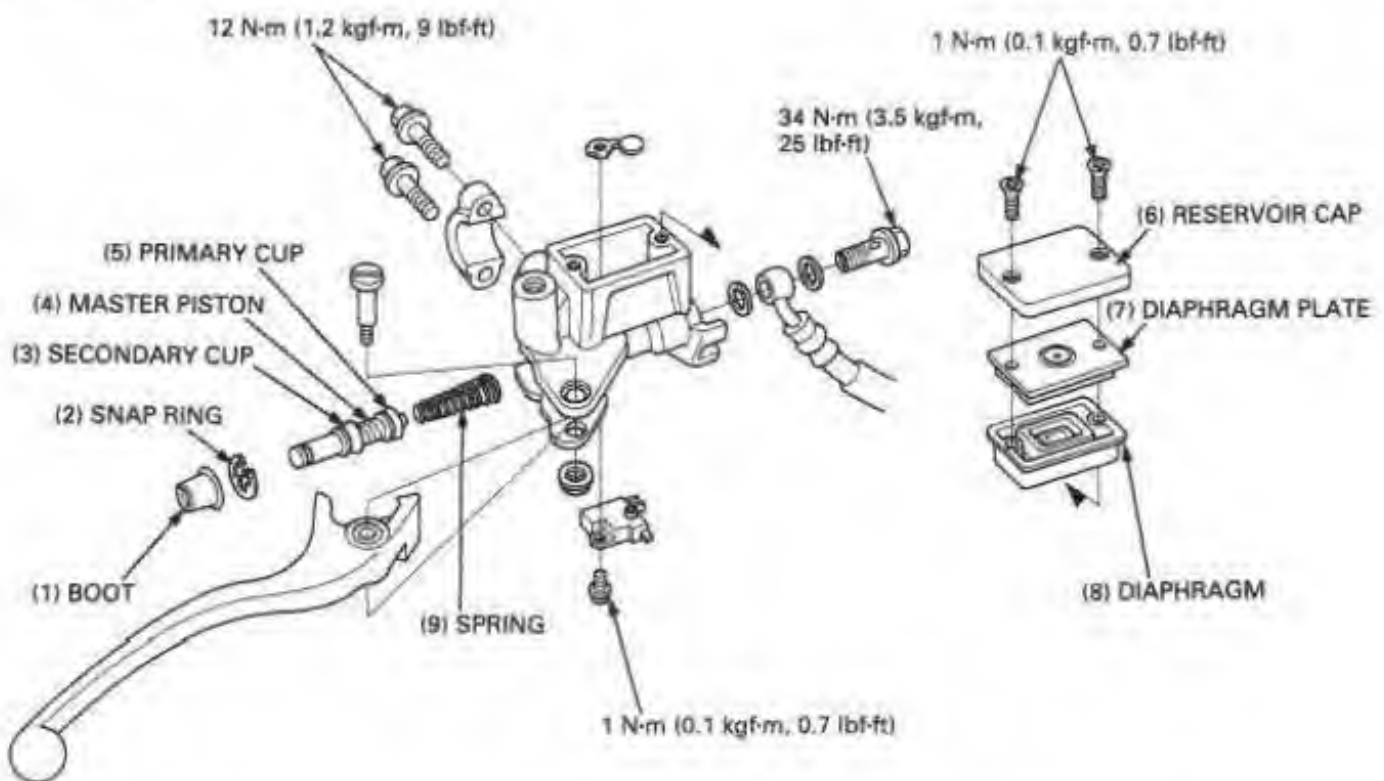
HYDRAULIC BRAKE

Measure the master cylinder piston O.D.

SERVICE LIMIT: 12.645 mm (0.4978 in)



ASSEMBLY



CAUTION

- Keep the piston, cups, spring, snap ring and boot as a set; do not substitute individual parts.

Coat all parts with clean brake fluid before assembly. Dip the piston in brake fluid.
Install the spring to the piston.
Install the piston assembly

CAUTION

- When installing the cups, do not allow the lips to turn inside out.

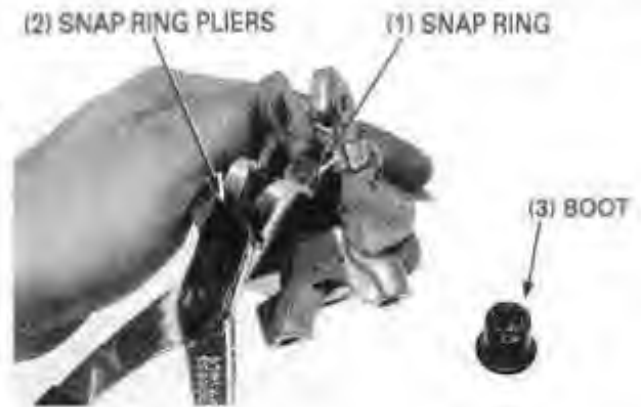


Install the snap ring.

CAUTION

* Be certain the snap ring is firmly seated in the groove.

Install the boot.



Place the master cylinder on the handlebar.

Install the master cylinder holder with the "UP" mark facing up.

Align the end of the master cylinder with the punch mark on the handlebar.

Tighten the upper bolt first, then the lower bolt.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Install the brake hose eyelet with the oil bolt and new sealing washers.

Push the brake hose against the stopper, then tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)



Install the brake lever.

First install and tighten the pivot bolt to the specified torque.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)

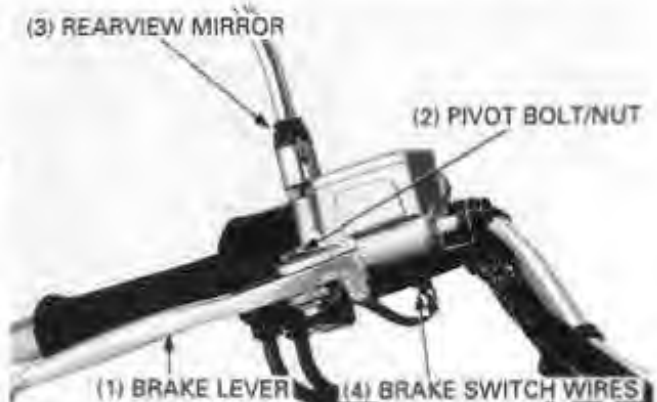
Hold the pivot bolt and tighten the nut to the specified torque.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)

Connect the brake switch wires.

Install the rearview mirror.

Fill the reservoir to the upper level and bleed the brake system (page 14-3).



BRAKE CALIPER

REMOVAL

Drain the brake system (page 14-3).

Remove the oil bolt, sealing washers and brake hose eyelet joint.

Remove the caliper mounting bolts and the brake pads (page 14-4).

CAUTION

- *Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.*

DISASSEMBLY

Remove the caliper bracket from the caliper body.

Remove the caliper pin boot from the bracket.

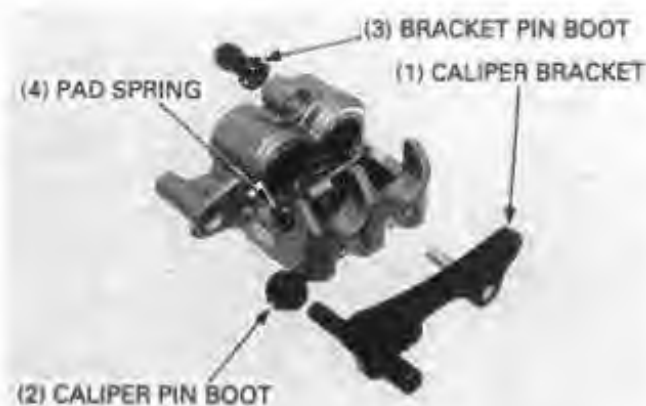
Remove the pad spring and bracket pin boot from the caliper body.

Place a shop towel over the piston.

Position the caliper body with the pistons down and apply small squirts of air pressure to the fluid inlet to remove the pistons.

WARNING

- *Do not use high pressure air or bring the nozzle too close to the inlet.*



INSPECTION

Check the caliper cylinder for scoring or other damage.

Measure the caliper cylinder I.D.

SERVICE LIMIT: 25.450 mm (1.0020 in)



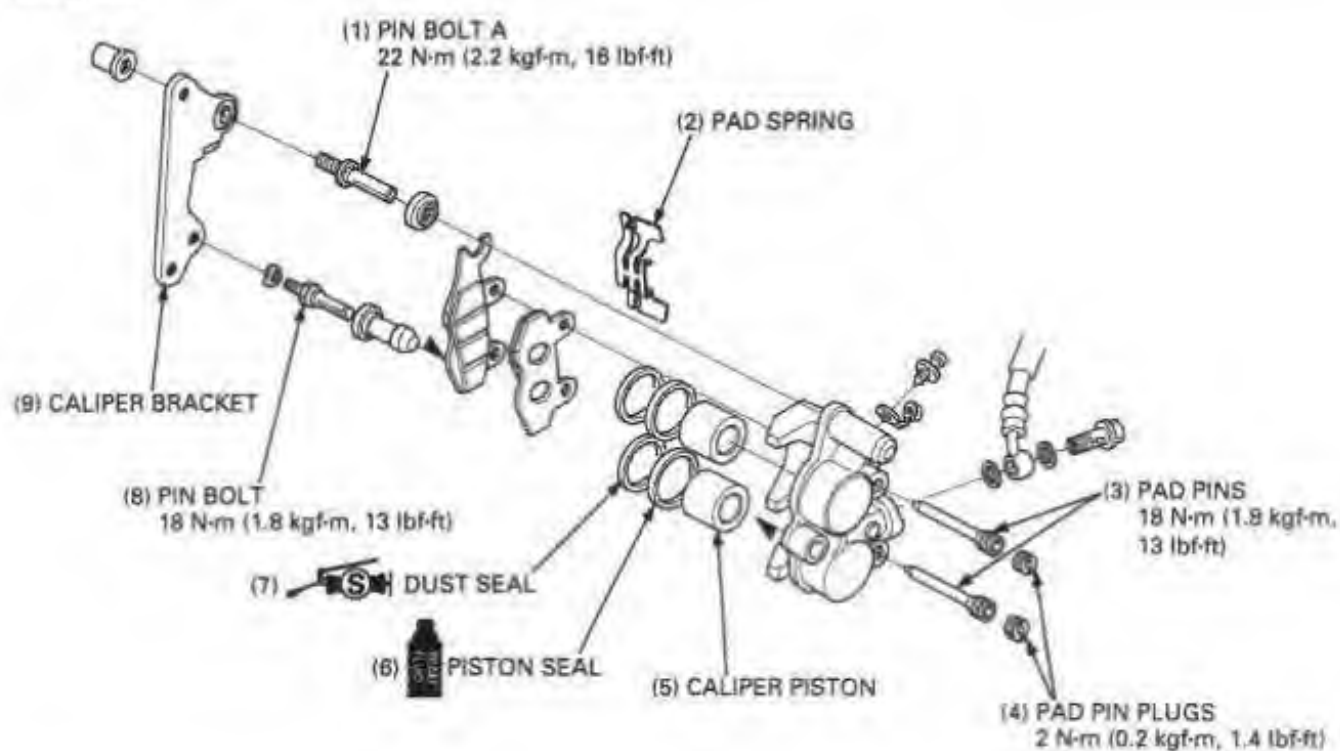
Check the caliper pistons for scratches, scoring or other damage.

Measure the caliper piston O.D.

SERVICE LIMIT: 25.300 mm (0.9961 in)



ASSEMBLY



HYDRAULIC BRAKE

Coat the new piston seals with clean brake fluid.
Coat the new dust seals with silicone grease.
Install the piston and dust seals into the grooves of the caliper body.

Coat the caliper pistons with clean brake fluid and install them into the caliper cylinder with their open ends toward the pad.



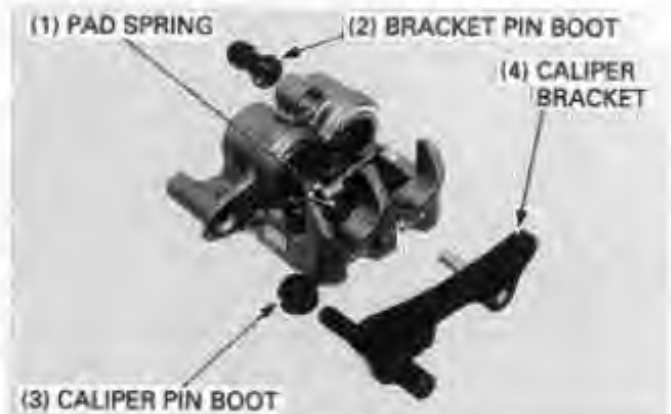
Install the pad spring in the caliper body.

If a caliper and bracket pin boots are hard or deteriorated, replace them with new ones.

Install the bracket pin boot into the caliper body.

Install the caliper pin boot into the bracket.

Apply silicone grease to the caliper and bracket pins and install the caliper bracket over the caliper body.



INSTALLATION

Install the brake pads and caliper onto the left fork leg (page 14-5).

Install the brake hose eyelet to the caliper body with two new sealing washers and oil bolt.

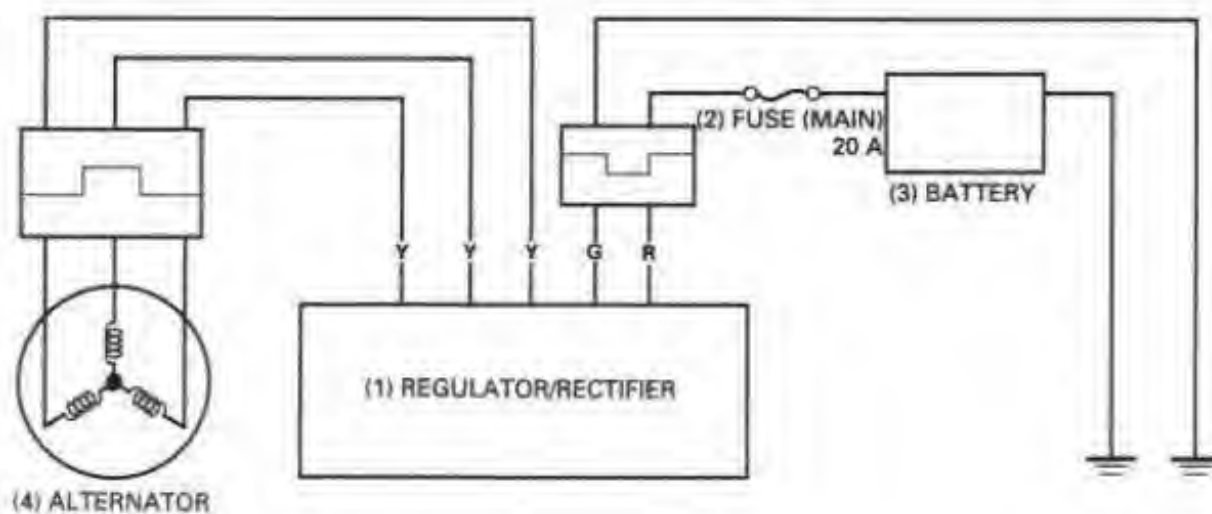
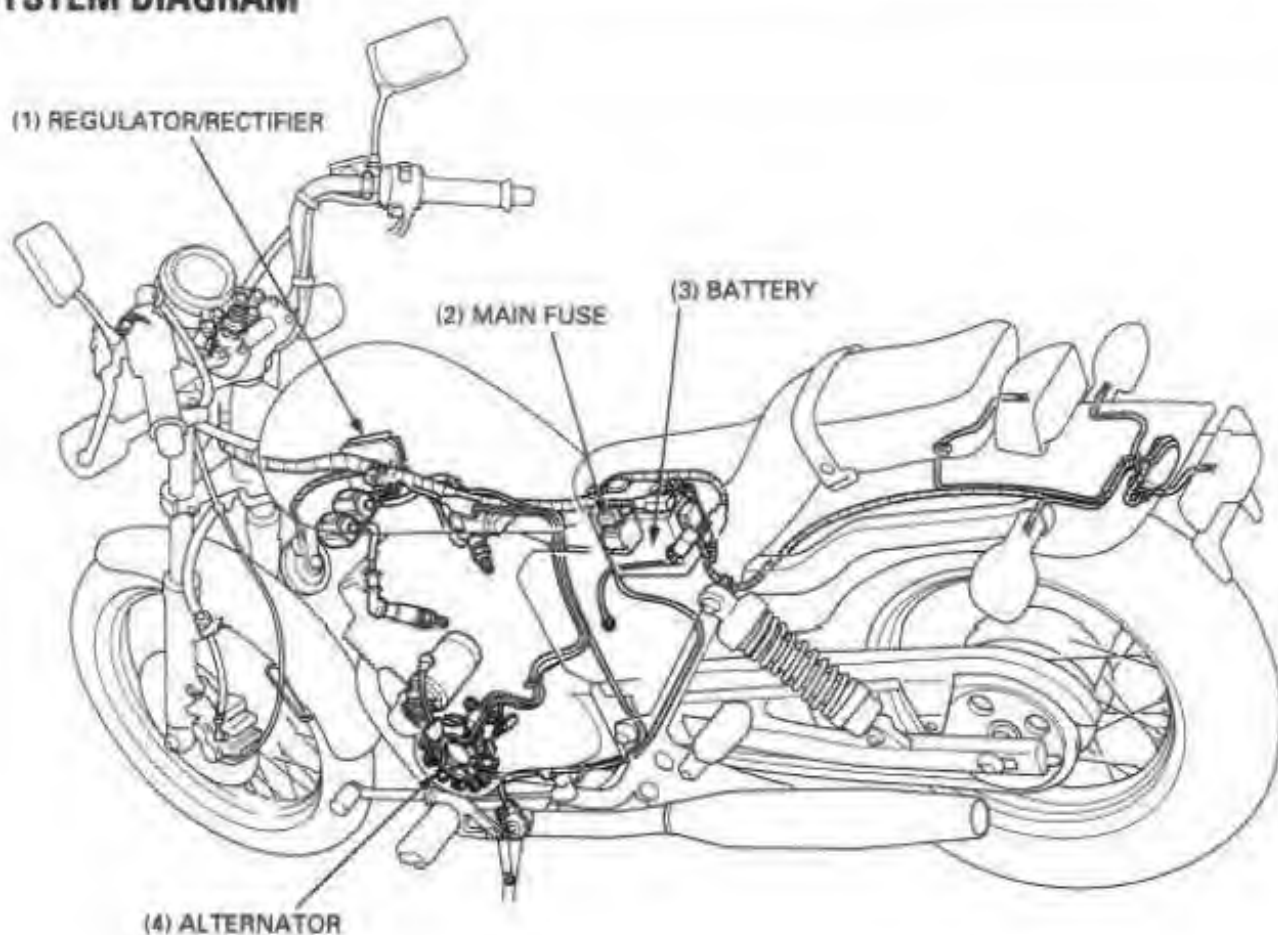
Push the brake hose eyelet to the stopper on the caliper, then tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the brake hydraulic system (page 14-3).



SYSTEM DIAGRAM



15. BATTERY/CHARGING SYSTEM

SYSTEM DIAGRAM	15-0	CHARGING SYSTEM INSPECTION	15-7
SERVICE INFORMATION	15-1	ALTERNATOR CHARGING COIL	15-8
TROUBLESHOOTING	15-3	REGULATOR/RECTIFIER	15-8
BATTERY	15-4		

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.
- Electrolyte is poisonous.
 - If swallowed, drink large quantities of water or milk and follow with milk of magnesia or vegetable oil and call a physician.
- **KEEP OUT OF REACH OF CHILDREN.**

- Always turn off the ignition switch before disconnecting any electrical component.

CAUTION

- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is ON and current is present.
- For extended storage, remove the battery, give it a full charge, and store it in a cool, dry space. For maximum service life, charge the stored battery every two weeks.
- For a battery remaining in a stored motorcycle, disconnect the negative battery cable from the battery terminal.

NOTE

- The maintenance free battery must be replaced when it reaches the end of its service life.

15

CAUTION

- The battery 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 under 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 to be the problem. Battery overcharge often results from problems in the battery itself, which may appear to be an overcharge 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, such as having the headlight and taillight ON for long periods of time without riding the motorcycle.
- The battery will self-discharge when the motorcycle is not in use. For this reason, charge the battery every two weeks to prevent sulfation from forming.
- 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 initial-charged.
- When checking the charging system, always follow the steps in the troubleshooting flow chart (page 15-3).

BATTERY/CHARGING SYSTEM

Battery charging

This model comes with a maintenance-free (MF) battery. Remember the following about MF batteries.

- Use only the electrolyte that comes with the battery
- Use all of the electrolyte
- Seal the battery properly
- Never open the seals again

CAUTION

- For battery charging, do not exceed the charging current and time specified on the battery. Use of excessive current or charging time may damage the battery.

After activation, both conventional and maintenance-free batteries must be charged at the appropriate ampere-hour rating for the proper length of time.

Set the battery Amp. Hr. Selector Switch on the Christie battery charger (#MC1012/2) for the size of the battery being charged. Set the Timer to the NEW BATT position and connect the battery clamps. When the time reaches the "trickle" position, the charging cycle is complete.

After charging, test the condition of the new battery using the Honda Battery Tester (07GMJ - 0010000) — refer to the Operation Manual for complete details.

Battery charging/testing equipment

Refer to the instruction in the Operation Manual for the Honda Battery Tester and Christie Battery Charger for detailed battery charging steps.

The Christie Battery Charger (#MC1012/2) is a constant current (amperage) type designed to produce current at a constant rate for the duration of the charge, even if the voltage varies.

The Honda Battery Tester (07GMJ - 0010000) puts a "load" on the battery so that the actual battery condition at the time of the load can be measured. This provides an accurate determination of the battery condition — good (green), fair (yellow), or poor (red).

- Slow-charge the battery whenever possible, quick charging should be an emergency procedure only.
- Remove the battery from the motorcycle for charging.
- The battery on this motorcycle is a maintenance-free type. Do not try to remove the filler hole caps even during charging. Do not use a conventional battery as a replacement.

SPECIFICATIONS

ITEM			SPECIFICATION
Battery	Capacity		12 V - 6 Ah
	Current leakage		1 mA max.
	Voltage (20°C/68°F)	Fully charged	13.0 - 13.2 V
		Needs charging	Below 12.3 V
	Charging current	Normal	0.6 A/10 h
		Quick	3.0 A/1.0 h
Alternator	Capacity		190 W/5,000 rpm
	Charging coil resistance		0.2 - 0.6 Ω
Regulator/rectifier regulated voltage	'96 - 2000		13.5 - 14.0 V/5,000 rpm
	After 2000		14.6 - 15.6 V/5,000 rpm

TOOLS

Analog tester (KOWA) TH-5H  equivalent commercially available in U.S.A.

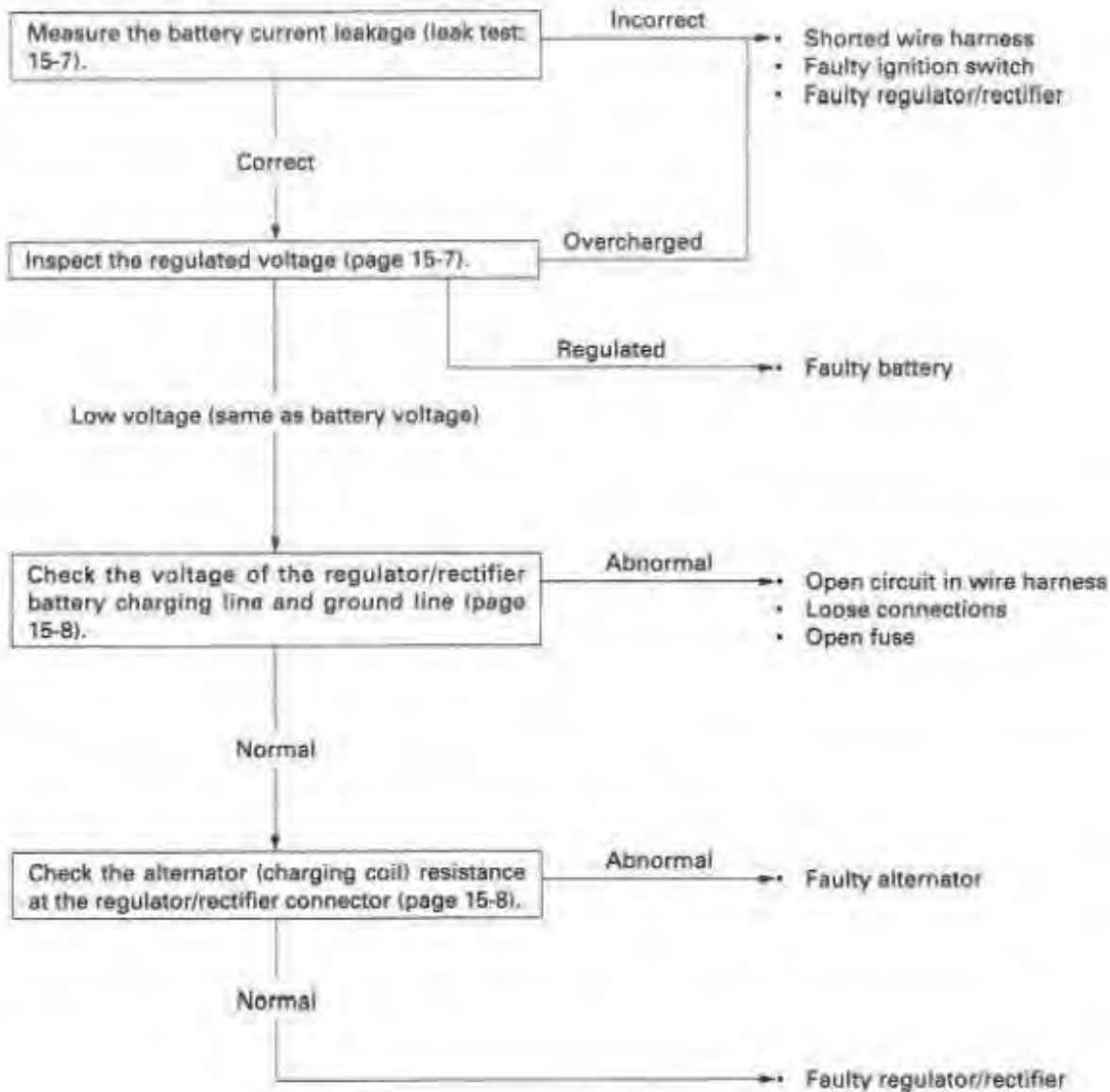
Analog tester (SANWA) SP-15D 

TROUBLESHOOTING

Battery overcharged

- Faulty regulator/rectifier

Battery undercharged



BATTERY

REMOVAL

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

Remove the battery holder band.

Disconnect the negative cable and then the positive cable, and remove the battery.

INSTALLATION

Install the battery in the reverse order of removal with the proper wiring as shown.

NOTE

- Connect the positive terminal first and then the negative cable.

After installing the battery, coat the terminals with clean grease.

Reinstall the removed parts.



VOLTAGE INSPECTION

Measure the battery voltage using a digital multimeter.

VOLTAGE: Fully charged: 13.0 – 13.2 V

Under charged: Below 12.3 V

TOOL:

Digital multimeter

Commercially
available

BATTERY TESTING

NOTE

- Always clear the work area of flammable materials such as gasoline, brake fluid, electrolyte, or cloth towels when operating the tester, the heat generated by the tester may cause a fire.

Remove the battery.

TOOL:

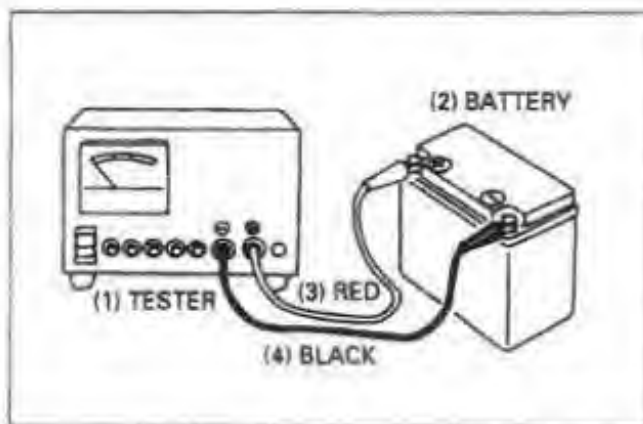
Battery tester

BM-210-AH OR
BM-210 (USA only)

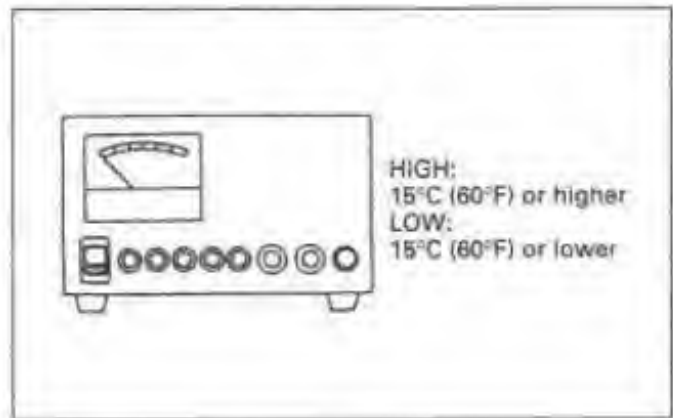
Securely connect the tester's positive (+) cable first, then connect the negative (–) cable.

NOTE

- For accurate test results, be sure the tester's cables and clamps are in good working condition and that a secure connection can be made at the battery.



Set the temperature switch to "HIGH" or "LOW" depending on the ambient temperature.



Push in the appropriate test button for three seconds and read the condition of the battery on the meter.

NOTE

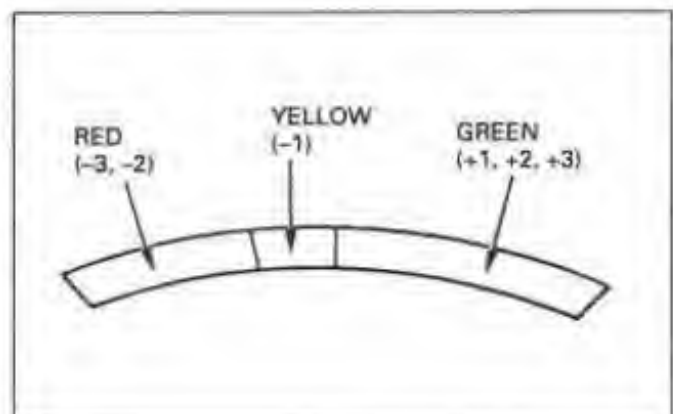
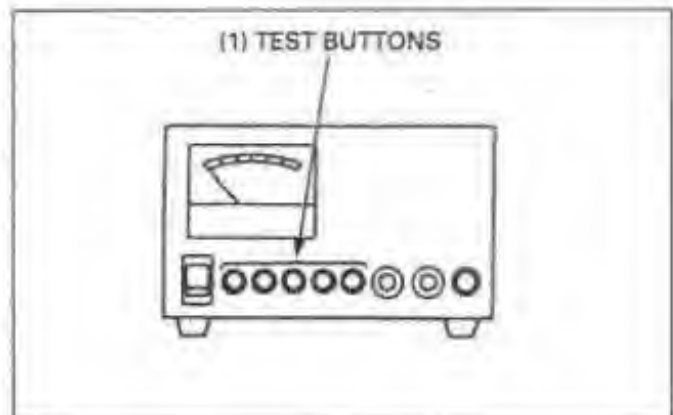
- For the first check, DO NOT charge the battery before testing; test it in an "as is" condition.

CAUTION

- To avoid damaging the tester, only test batteries with an amperage rating of less than 30 A.
- Tester damage can result from overheating when:
 - The test button is pushed in for more than three seconds.
 - The tester is used without being allowed to cool for at least one minute when testing more than one battery.
 - More than ten consecutive tests are performed without allowing at least a 30-minute cool-down period.

NOTE

- The result of a test on the meter scale is relative to the amp. hour rating of the battery. Any BATTERY READING IN THE GREEN ZONE IS OK. Batteries should only be charged if they register in the YELLOW or RED zone.



BATTERY CHARGING

⚠ 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.
- Electrolyte is poisonous.
 - If swallowed, drink large quantities of water or milk and follow with milk of magnesia or vegetable oil and call a physician.
- Turn power ON/OFF at the charger, not at the battery terminals.

BATTERY/CHARGING SYSTEM

NOTE

- Be sure that the area around the charger is well ventilated, clear of flammable materials, and free from heat, humidity, water and dust.
- Clean the battery terminals and position the battery as far away from the charger as the leads will permit.
- Do not place batteries below the charger; gases from the battery may corrode and damage the charger.
- Do not place batteries on top of the charger. Be sure the air vents are not blocked.

TOOL:

Christie battery charger

MC1012/2

1. Turn the Power Switch to the OFF position.
2. Set the battery Amp. Hr. Selector Switch for the size of the battery being charged.
3. Set the Timer to the position indicated by the Honda Battery Tester; RED-3, RED-2 or YELLOW-1. If you are charging a new battery, set the switch to the NEW BATT position.
4. Attach the clamps to the battery terminals; RED to Positive, BLACK to Negative.

Connect the battery cables only when the Power Switch is OFF.

⚠ WARNING

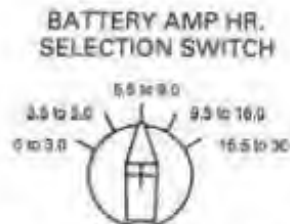
- *Connecting the cables with the Power Switch ON can produce a spark which could ignite or explode the battery.*

5. Turn the Power Switch to the ON position.
6. When the timer reaches the "Trickle" position, the charging cycle is complete. Turn the Power Switch OFF and disconnect the clamps.

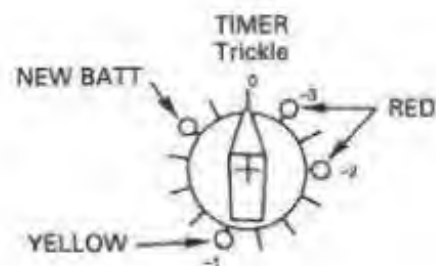
NOTE

- The charger will automatically switch to the "Trickle" mode after the set charging time has elapsed.

7. Let the battery cool for at least ten minutes or until gassing subsides after charging.
8. Retest the battery using the Honda Battery Tester and recharge if necessary using the above steps.



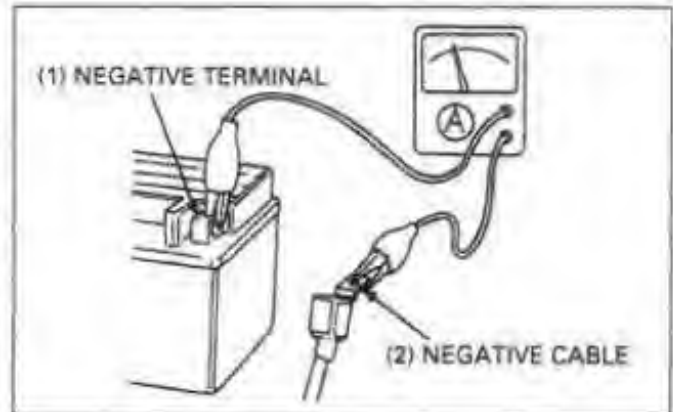
Set the appropriate amp. hour rating.



CHARGING SYSTEM INSPECTION

NOTE

- When inspecting the charging system, check the system components and lines step-by-step according to the troubleshooting on page 15-3.
- Measuring circuits with a large capacity that exceeds the capacity of the tester may cause damage to the tester. Before starting each test, set the tester at the high capacity range first, then gradually down to low capacity ranges until you have the correct range so you do not damage the tester.
- When measuring small capacity circuits, keep the ignition switch off. If the switch is suddenly turned on during a test, the tester fuse may blow.



LEAKAGE INSPECTION

Check the battery ampere leakage before making a regulated voltage inspection.

Turn the ignition switch off and disconnect the battery negative cable from the battery.

Connect the tester between the negative cable and the negative terminal.

The voltage should indicate less than 1 mA with the ignition switch off.

LEAKAGE AMPERE: 1 mA max.

REGULATED VOLTAGE INSPECTION

⚠ WARNING

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

NOTE

- Be sure the battery is in good condition before performing this test.

Warm up the engine to normal operating temperature. Stop the engine, and connect the voltmeter as shown. Connect a tachometer and restart the engine.

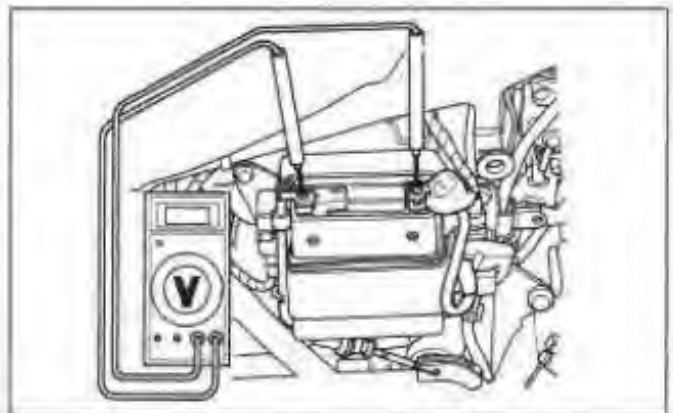
Allow the engine to idle, and increase the engine speed gradually.

The voltage should be controlled as specified.

Standard: '96 – 2000: 13.5 – 14.0 V at 5,000 rpm
After 2000: 14.6 – 15.6 V at 5,000 rpm

CAUTION

- *Be careful not to allow the battery positive cable to touch the frame while testing.*



ALTERNATOR CHARGING COIL

NOTE

- It is not necessary to remove the stator coil to make this test.

INSPECTION

Remove the fuel tank (page 2-3).

Disconnect the regulator/rectifier (alternator) 3P connector.
Check the resistance between all three Yellow terminals.

STANDARD: 0.2 – 0.6 Ω (at 20°C/68°F)

Check for continuity between all three Yellow terminals and Ground.

There should be no continuity.

Replace the alternator stator if readings are far beyond the standard, or if any wire has continuity to ground.
Refer to section 10 for stator removal.



REGULATOR/RECTIFIER

SYSTEM INSPECTION

Remove the fuel tank (page 2-3).

Disconnect the regulator/rectifier connectors, and check them for loose contact or corroded terminals.

If the regulated voltage reading (see page 15-7) is out of the specification, measure the voltage between connector terminals (wire harness side) as follows:

ITEM	TERMINAL	SPECIFICATION
Battery charging line	Red/White (+) and ground (-)	Battery voltage should register
Charging coil line	Yellow and Yellow	0.2 – 0.6 Ω (at 20°C/68°F)
Ground line	Green and ground	Continuity should exist

If all components of the charging system are normal and there are no loose connections at the regulator/rectifier connectors, replace the regulator/rectifier unit.



REPLACEMENT

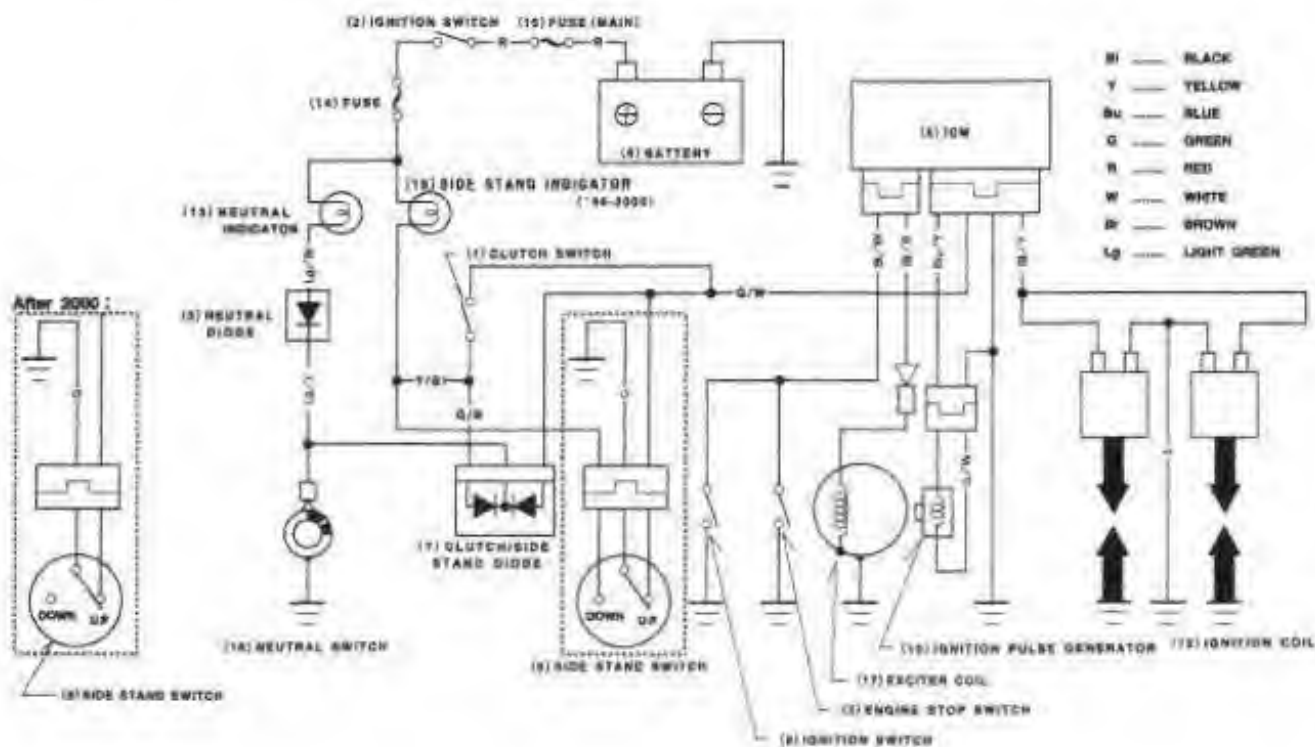
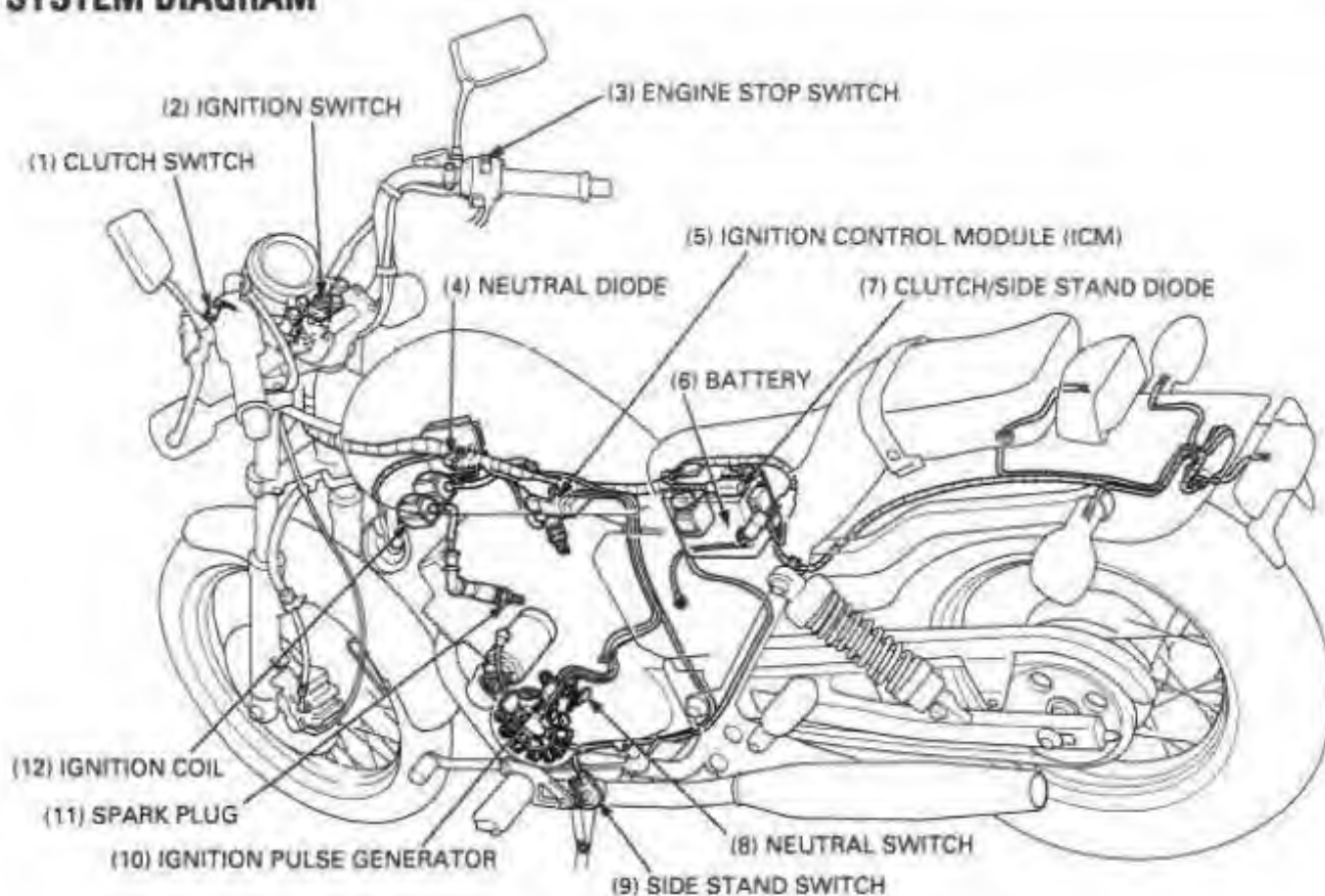
Disconnect the regulator/rectifier connectors.



Remove the bolts and regulator/rectifier.



SYSTEM DIAGRAM



16. IGNITION SYSTEM

SYSTEM DIAGRAM	16-0	IGNITION SYSTEM INSPECTION	16-4
SERVICE INFORMATION	16-1	IGNITION COIL	16-7
TROUBLESHOOTING	16-3	IGNITION TIMING	16-7

SERVICE INFORMATION

GENERAL

⚠ WARNING

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

CAUTION

- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is ON and current is present.
- When servicing the ignition system, always follow the steps in the troubleshooting sequence on page 16-3.
- The ignition timing cannot be adjusted since the Ignition Control Module (ICM) is factory preset.
- The Ignition Control Module (ICM) may be damaged if dropped. Also if the connector is disconnected when current is flowing, the excessive voltage may damage the module. Always turn off the ignition switch before servicing.
- 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.
- Use spark plug of the correct heat range. Using a spark plug with an incorrect heat range can damage the engine.

SPECIFICATIONS

ITEM		SPECIFICATION	
Spark plug		NGK	NIPPONDENSO
	Standard	CR6HSA	U20FSR-U
	For cold climate (below 5°C/41°F)	CR5HSA	U16FSR-U
	For extended high speed riding	CR7HSA	U22FSR-U
Spark plug gap		0.6 – 0.7 mm (0.02 – 0.03 in)	
Ignition coil peak voltage		100 V minimum	
Alternator exciter coil peak voltage		100 V minimum	
Ignition pulse generator peak voltage		0.7 V minimum	
Ignition timing	"F" mark	10° BTDC/1,400 rpm	
	Full advance	25° BTDC	

IGNITION SYSTEM

TORQUE VALUES

Spark plug	12 N·m (1.2 kgf·m, 9 lbf·ft)
Ignition pulse generator socket bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)

TOOLS

Imrie diagnostic tester (model 625) or Peak voltage adapter	07HGJ – 0020100 with Commercially available digital multimeter (impedance 10 M Ω /DCV minimum)
--	--

TROUBLESHOOTING

- Inspect the following before diagnosing the system.
 - Faulty spark plug
 - Loose spark plug cap or spark plug wire connection
 - Water got into the spark plug cap (leaking the ignition coil secondary voltage)
- Temporarily exchange the ignition coil with the other good one and perform the spark test. If there is spark, the exchanged ignition coil is faulty.

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. (Does not apply to Imrie tester). 2. Cranking speed is too low. • Battery under-charged. 3. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once). (Does not apply to Imrie tester) 4. Poorly connected connectors or an open circuit in ignition system. 5. Faulty exciter coil (Measure the peak voltage). 6. Faulty side stand switch circuit. 7. Faulty ICM (in case when above No. 1 - 6 are normal).
	No peak voltage.	1. Incorrect peak voltage adapter connections. (Does not apply to Imrie tester). 2. Short circuit in engine stop switch wire. 3. Faulty ignition switch or engine stop switch. 4. Loose or poor connected ICM connectors. 5. Open circuit or poor connection in ground wire of the ICM. 6. Faulty side stand switch circuit. 7. Faulty peak voltage adapter, or Imrie tester. 8. Faulty exciter coil (Measure the peak voltage). 9. Faulty ignition pulse generator. 10. Faulty ICM (in case when above No. 1 - 9 are normal).
	Peak voltage is normal, but no spark jumps at plug.	1. Faulty spark plug or leaking ignition coil secondary current. 2. Faulty ignition coil.
Exciter coil	Low peak voltage.	1. The multimeter impedance is too low. (Does not apply to Imrie tester). 2. Cranking speed is too low. • Battery under-charged. 3. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once). (Does not apply to Imrie tester). 4. Faulty exciter coil (in case when above No. 1 - 3 are normal).
	No peak voltage.	1. Faulty peak voltage adapter or Imrie tester. 2. Faulty exciter coil.
Ignition pulse generator	Low peak voltage.	1. The multimeter impedance is too low. (Does not apply to Imrie tester). 2. Cranking speed is too low. • Battery under-charged. 3. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once). (Does not apply to Imrie tester). 4. Faulty ignition pulse generator (in case when above No. 1 - 3 are normal).
	No peak voltage.	1. Faulty peak voltage adapter or Imrie tester. 2. Faulty ignition pulse generator.

IGNITION SYSTEM INSPECTION

NOTE

- If there is no spark at all plugs, check all connections for loose or poor contact before measuring each peak voltage.
- If using the peak voltage adaptor, use the recommended digital multimeter or commercially available digital multimeter with an impedance of 10 M Ω /DCV minimum.
- The display value differs depending upon the internal impedance of the multimeter.
- If using Imrie diagnostic tester (model 625), follow the manufacturer's instructions.

Connect the peak voltage adaptor to the digital multimeter, or use the Imrie diagnostic tester.

TOOLS:

Imrie diagnostic tester (model 625) or

Peak voltage adaptor 07HGJ - 0020100 with

Commercially available digital multimeter (impedance 10 M Ω /DCV minimum)

IGNITION PRIMARY PEAK VOLTAGE

NOTE

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

Shift the transmission into neutral, disconnect the spark plug caps from the spark plugs.

Connect a good known spark plug to the spark plug cap and ground the spark plug to the cylinder as done in a spark test. Remove the rubber boot from one ignition coil.

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

CONNECTION:

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

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

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

PEAK VOLTAGE: 100 V minimum

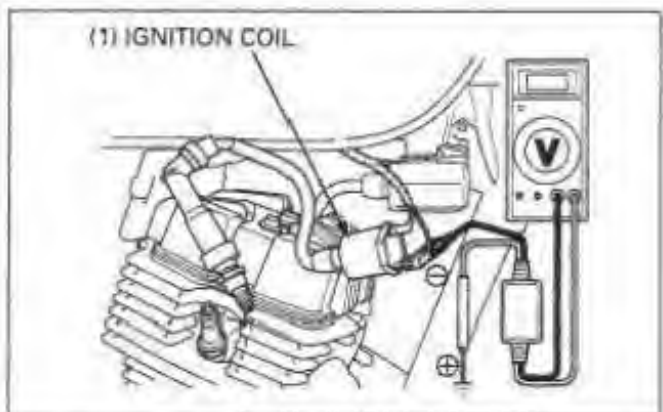
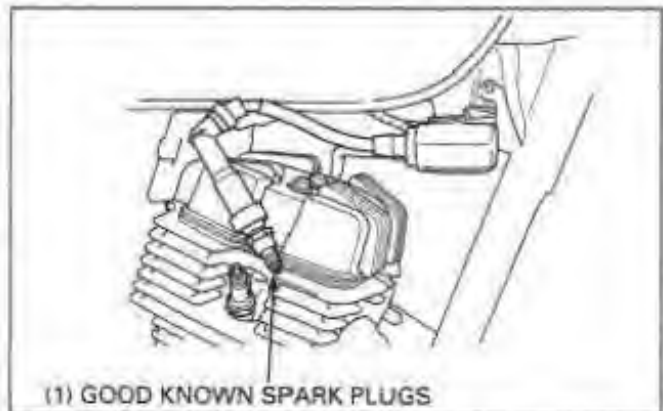
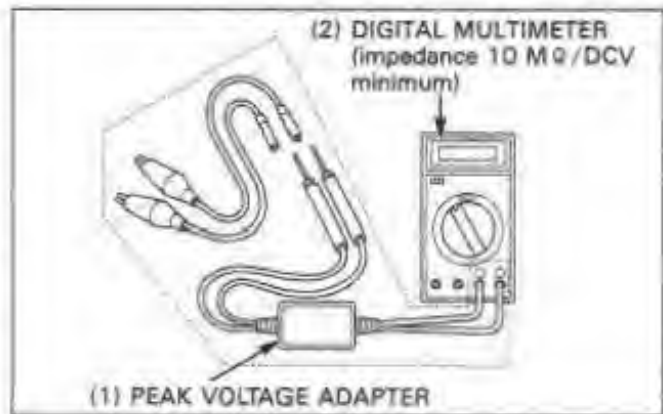
WARNING

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

If the peak voltage is abnormal, check for an open circuit or poorly connected connectors in Black/Yellow wires.

If no defects are found in the harness, refer to the troubleshooting chart on page 16-3.

Reinstall the removed part in the reverse order of removal.



EXCITER COIL PEAK VOLTAGE

NOTE

- Check cylinder compression and check that the spark plugs are installed correctly.

Remove the fuel tank (page 2-3).

Remove the ignition control module (ICM) and disconnect the 2P connector from the ICM.

Connect the peak voltage adapter or imrie tester probes to the connector terminals of the exciter coil side.

TOOLS:

Imrie diagnostic tester (model 625) or

Peak voltage adapter 07HGJ - 0020100 with

Commercially available digital multimeter (impedance 10 M Ω /DCV minimum)

CONNECTION:

Black/Red terminal (+) - Body ground (-)

Crank the engine with the starter motor and read the peak voltage.

PEAK VOLTAGE: 100 V minimum

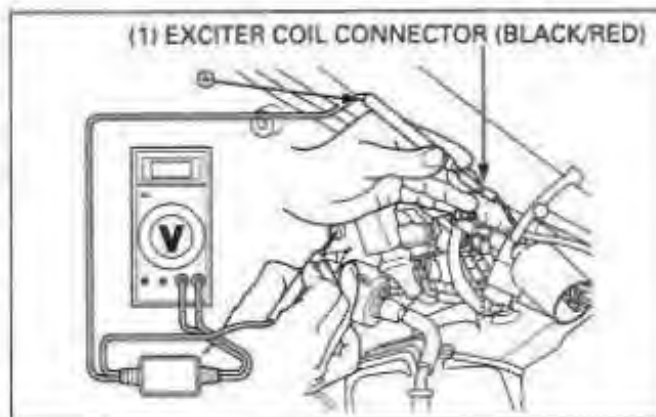
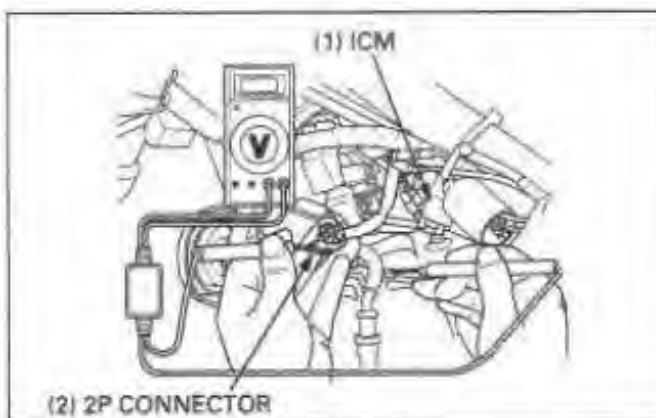
⚠ WARNING

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

If the peak voltage measured at ICM connector is abnormal, disconnect the exciter Black/Red connector and connect the tester probes to the Black/Red 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 exciter coil is normal, the wire harness has an open circuit or loose connection.
- If both peak voltages measure are abnormal, check each item in the troubleshooting chart. If all items are normal, the exciter coil is faulty. See section 10 for alternator replacement.

Reinstall the removed parts in the reverse order of removal.



IGNITION SYSTEM

IGNITION PULSE GENERATOR PEAK VOLTAGE

NOTE

- Check cylinder compression and check that the spark plugs are installed correctly.

Remove the fuel tank (page 2-3).

Remove the ignition control module (ICM) and disconnect the 4P connector from the ICM.

Connect the peak voltage adapter or Imrie tester probes to the connector terminals of the ignition pulse generator side.

TOOLS:

Imrie diagnostic tester (model 625) or

Peak voltage adapter 07HGJ - 0020100 with

Commercially available digital multimeter (impedance 10 MD/DCV minimum)

CONNECTION:

Blue/Yellow terminal (+) - Body ground (-)

Crank the engine with the starter motor and read the peak voltage.

PEAK VOLTAGE: 0.7 V minimum

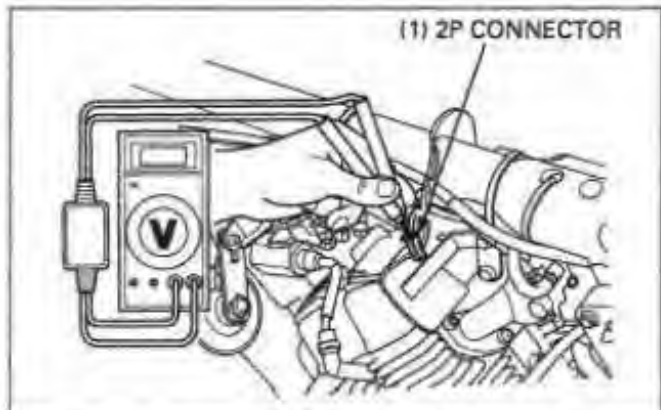
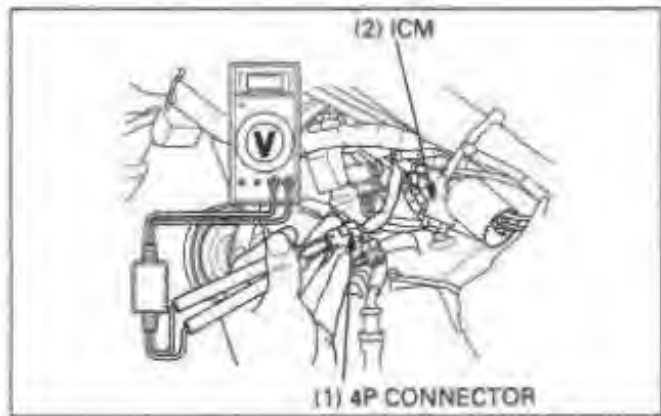
⚠ WARNING

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

If the peak voltage measured at the ICM connector is abnormal, disconnect the ignition pulse generator 2P (White) connector and connect the tester probes to the terminal (Blue/Yellow and Green/White).

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

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



IGNITION COIL

REMOVAL/INSTALLATION

Remove the fuel tank (page 2-3).

Disconnect the spark plug caps from the plugs.
Disconnect the primary wire connectors.
Remove the ignition coil from the bracket.

Installation is in the reverse order of removal.



IGNITION TIMING

⚠ WARNING

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

NOTE

- Read the manufacturer's instructions for timing light operation.

Warm up the engine.

Stop the engine and remove the timing hole cap.

Connect a timing light to the No. 1 spark plug wire.

Start the engine and let it idle.

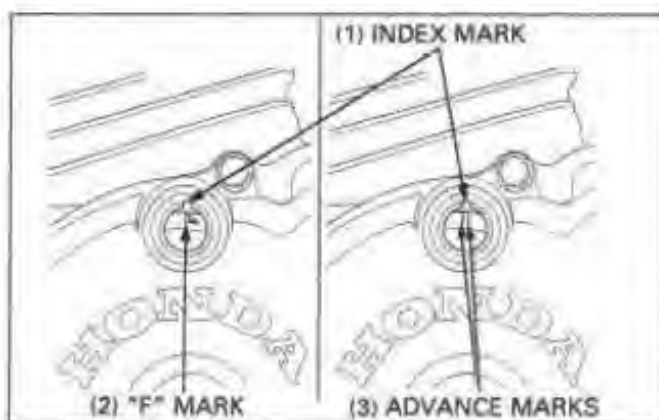
IDLE SPEED: 1,400 ± 100 rpm

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

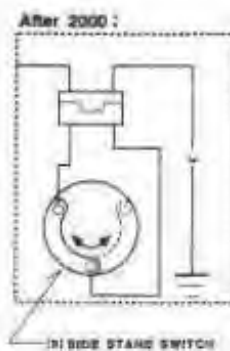
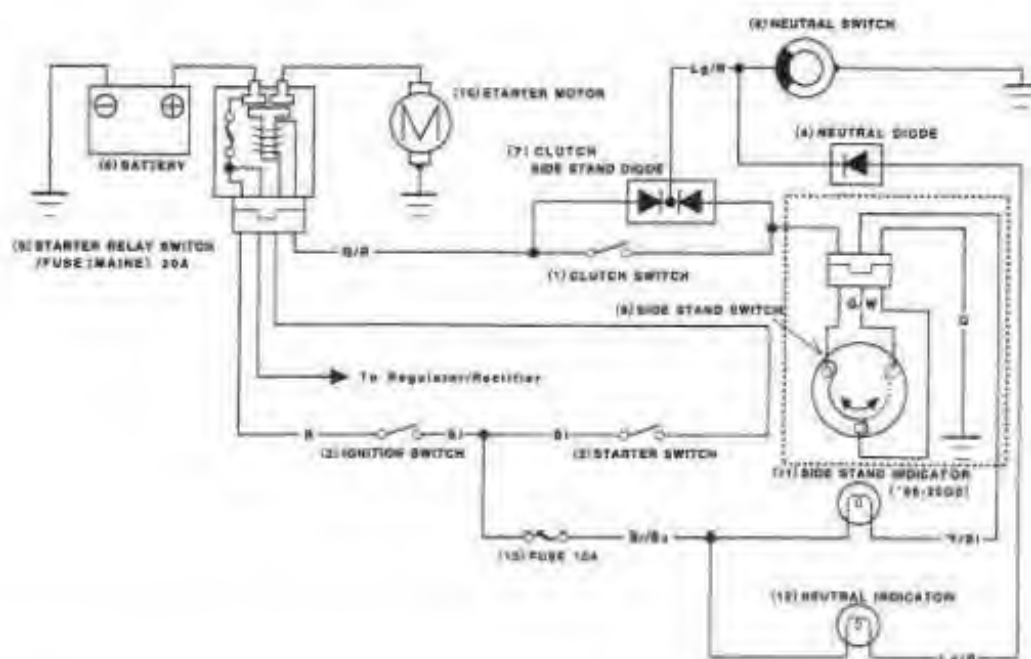
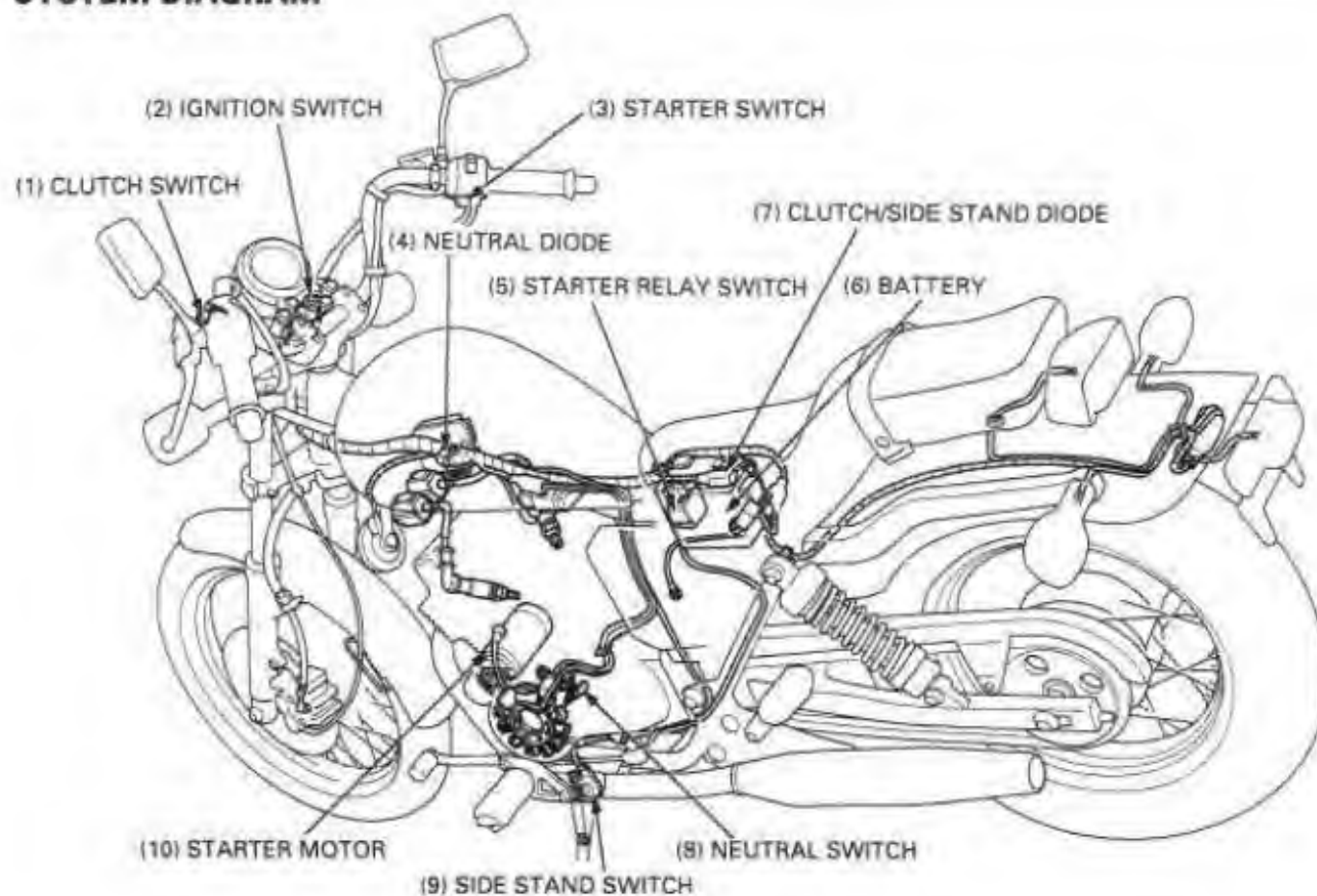
Check that the "F" mark begins to move when the engine speed reaches the advance start rpm.

At 6,000 rpm, the ignition is correct if the index mark is between the two advance marks.

Check that the O-ring is in good condition, replace if necessary. Apply oil to the O-ring and install and tighten the timing hole cap.



SYSTEM DIAGRAM



17. ELECTRIC STARTER

SYSTEM DIAGRAM	17-0	STARER MOTOR	17-4
SERVICE INFORMATION	17-1	STARTER RELAY SWITCH	17-10
TROUBLESHOOTING	17-2	DIODE	17-11

SERVICE INFORMATION

GENERAL

- The starter motor can be removed with the engine in the frame.
- For the starter drive and driven sprocket removal/installation, see section 10.

SPECIFICATIONS

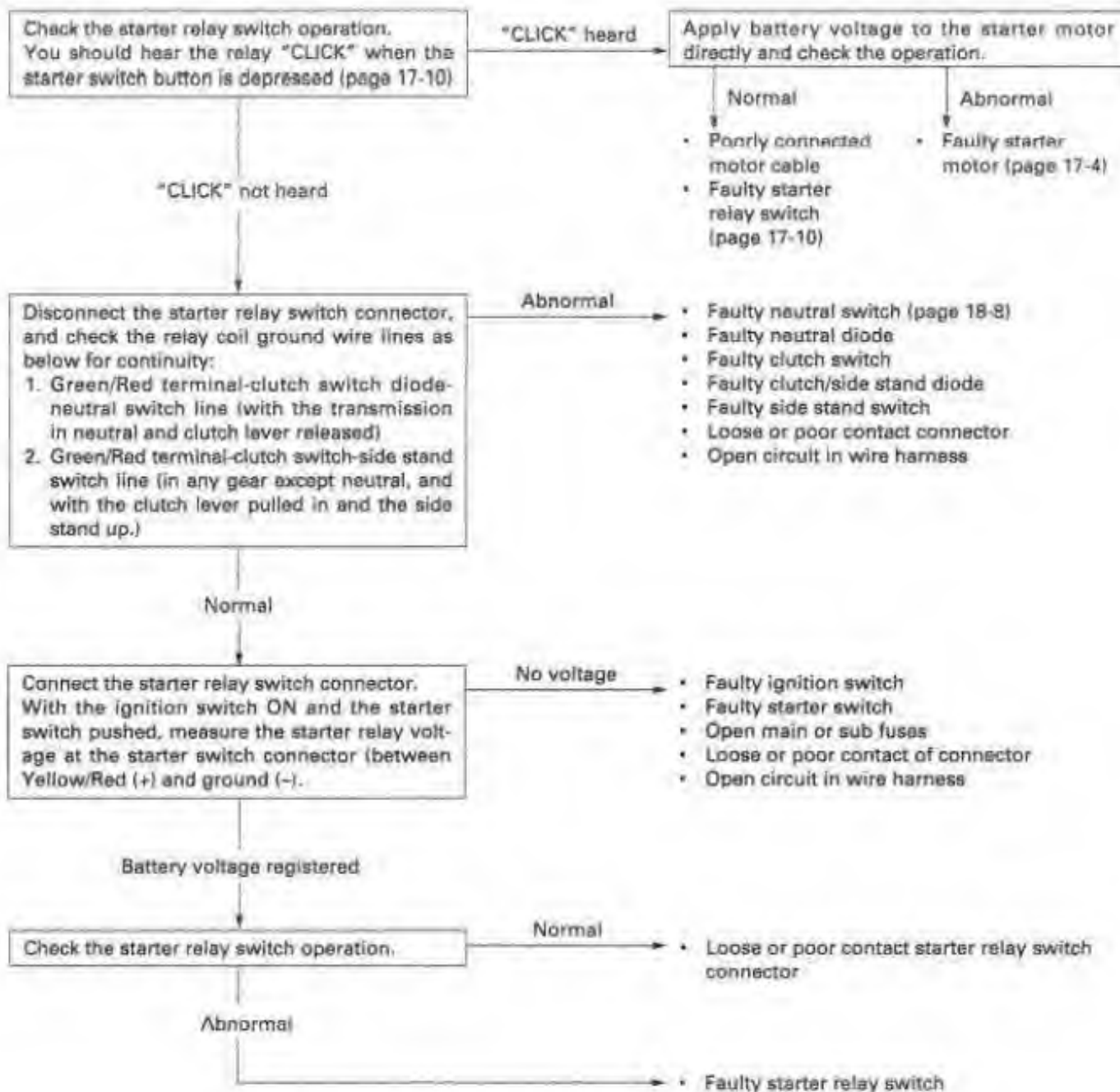
Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush spring tension	780 – 1,060 g	450 g
Starter motor brush length	12.5 – 13.0 (0.49 – 0.51)	8.5 (0.33)

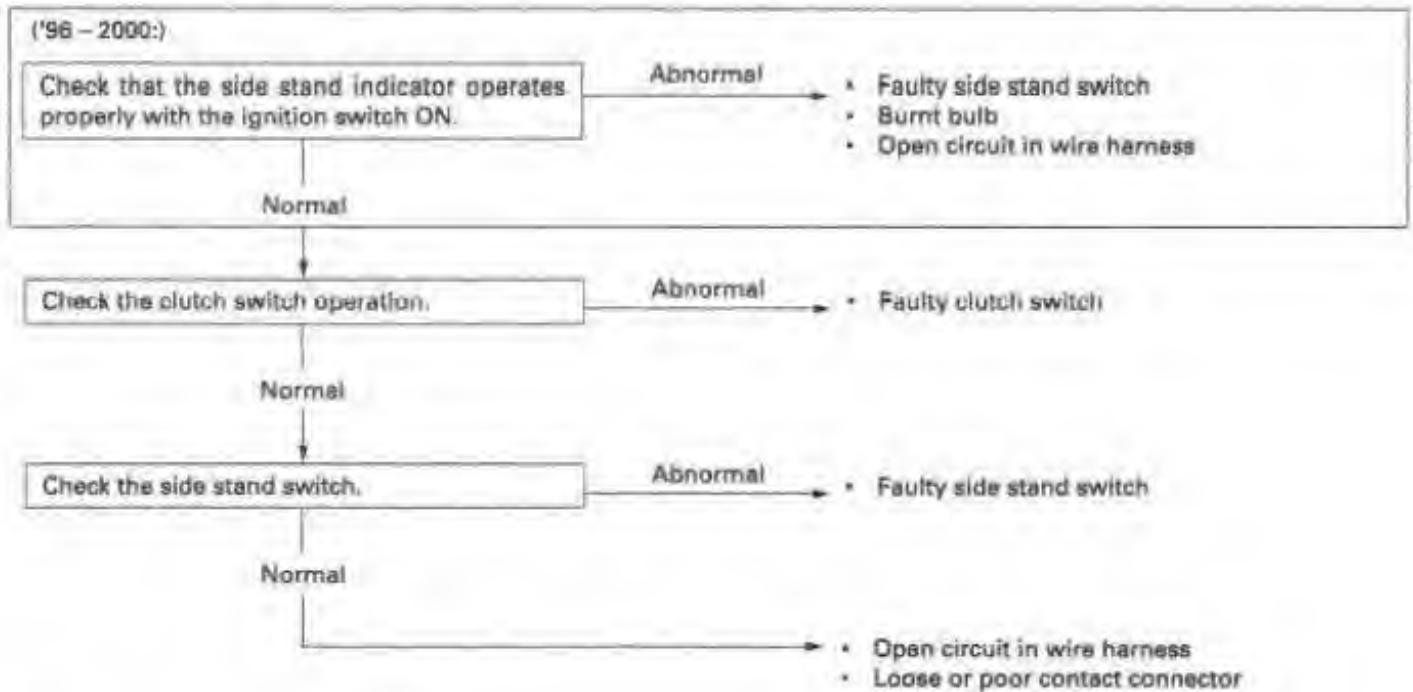
TROUBLESHOOTING

Starter motor does not turn

- Check for a open main or sub fuses before servicing.
- Make sure the battery is fully charged and in good condition.



The starter motor turns when the transmission is in neutral, but does not turn with the transmission in any position except neutral, with the side stand up and the clutch lever pulled in.



Starter motor turns engine slowly

- Low battery voltage
- Poorly connected battery terminal cable
- Poorly connected starter motor cable
- Faulty starter motor
- Poorly connected battery ground cable

Starter motor turns, but engine does not turn

- Starter motor is running backwards
 - Case assembled improperly
 - Terminals connected improperly
- Faulty starter clutch
- Damaged or faulty starter drive sprocket
- Damaged or faulty starter drive chain

Starter relay switch "clicks", but engine does not turn over

- Crankshaft does not turn due to engine problems

STARTER MOTOR

REMOVAL

⚠ WARNING

- With the ignition switch OFF, remove the negative cable at the battery before servicing the starter motor.

Remove the starter drive and driven sprockets, chain and side spacer (page 10-3).

Disconnect the starter cable from the starter motor.
Remove the four mounting bolts and the starter motor.

DISASSEMBLY

NOTE

- Record the location and number of shims.

Remove the following:

- Starter motor case bolts

- Front cover assembly
- Seal ring
- Separator
- Shims

- Rear cover assembly
- Seal ring
- Shims
- Armature



INSPECTION

Check for continuity between the cable terminal and the brush wire (the indigo colored wire or the insulated brush holder).

There should be continuity.



Check for continuity between the rear cover and the brush wire (the indigo cover wire or the insulated brush holder). There should be no continuity.



Remove the following:

- Nut
- Washer
- Insulators
- O-ring
- Brush holder
- Brush/terminal



Inspect the brushes for damage and measure the brush length.

SERVICE LIMIT: 8.5 mm (0.33 in)



ELECTRIC STARTER

Measure the each brush spring tension with a spring scale.

SERVICE LIMIT: 450 g



Check the bushing of the rear cover for wear or damage.



Inspect the commutator bars for discoloration. Bars discolored in pairs indicate grounded armature coils, in which case the starter motor must be replaced.

NOTE

- Do not use emery or sand paper on the commutator.



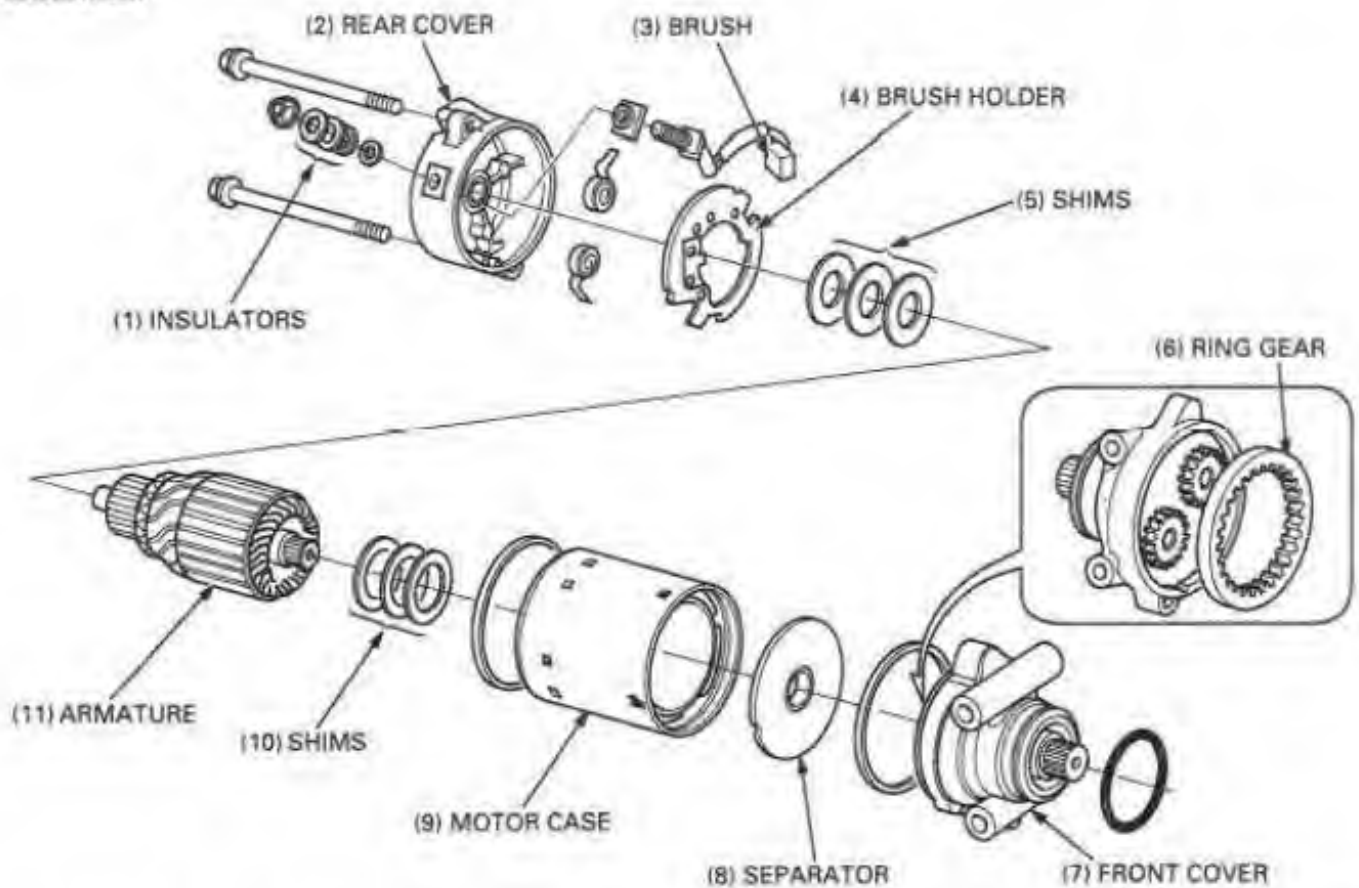
Check for continuity between individual commutator bars; there should be continuity.



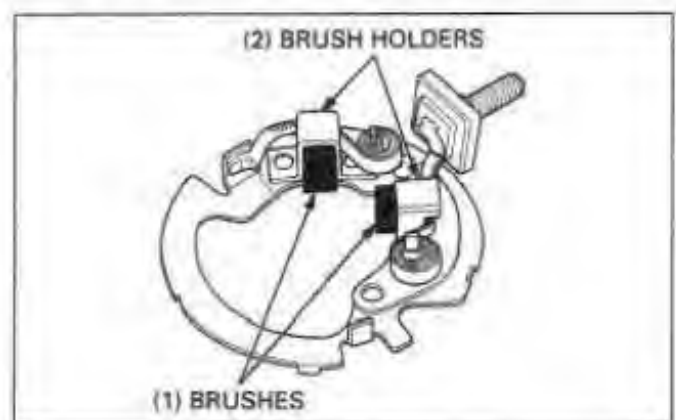
Also, check for continuity between individual commutator bars and the armature shaft; there should be no continuity.



ASSEMBLY



Install the brushes in the brush holders as shown.



ELECTRIC STARTER

Install the brush holder assembly to the rear cover aligning its boss with the groove in the rear cover.



Install the following:

- O-ring
- Insulators
- Washer
- Nut

NOTE

- Install the insulators properly as noted during removal.



Install the armature in the motor case.

Install the seal ring on the motor case.
Install the shims on the armature shaft.

NOTE

- Install the shims properly as noted during removal.



Assemble the motor case and rear cover, aligning the index marks.



Install the shims on the armature shaft.

NOTE

- Install the shims properly as noted during removal.

Install the separator into the motor case aligning its groove with the projection in the motor case.



If the front cover ring gear is removed, install the ring gear onto the pinion gears aligning its groove with the projection in the front cover.



Install the seal ring onto the front cover.

Install the front cover to the motor case aligning the ring gear groove with the projection in the motor case.



Install and tighten the case bolts securely.

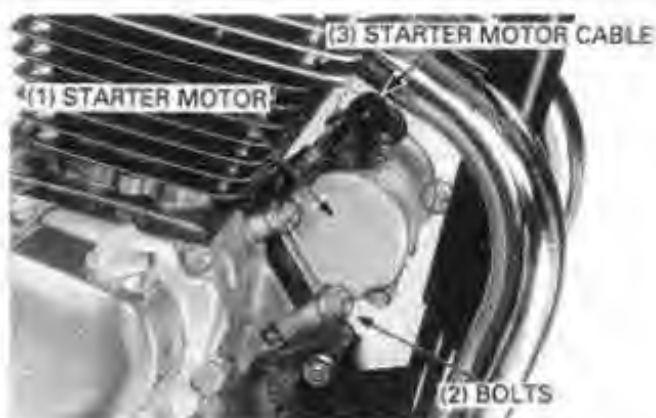


ELECTRIC STARTER

INSTALLATION

Install the starter motor with the four mounting bolts.
Connect the starter cable to the motor and tighten the nut.

Install the side spacer, starter drive and driven sprockets
and chain (page 10-8).



STARTER RELAY SWITCH

OPERATION INSPECTION

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

Shift the transmission into neutral.

Turn the ignition switch ON and depress the starter switch button.

The coil is normal if the starter relay switch clicks.

If the switch "CLICK" is not heard, inspect the relay switch
using the procedure below.

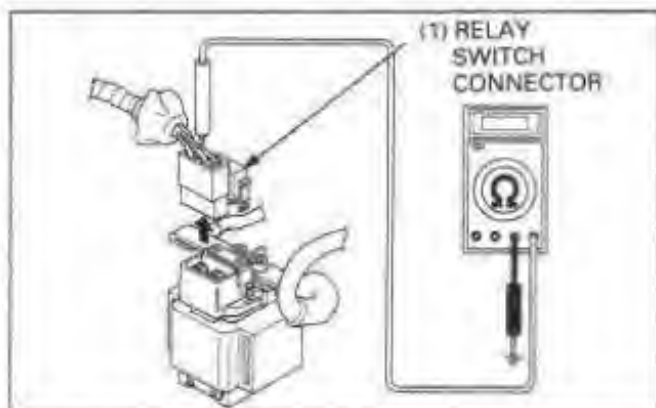


GROUND LINE INSPECTION

Disconnect the relay connector.

Check for continuity between the Green/Red wire and
ground.

If there is continuity when the transmission is in neutral or
when the clutch is disengaged and the side stand switch is
up, the ground circuit is normal (In neutral, there is a slight
resistance due to the diode).



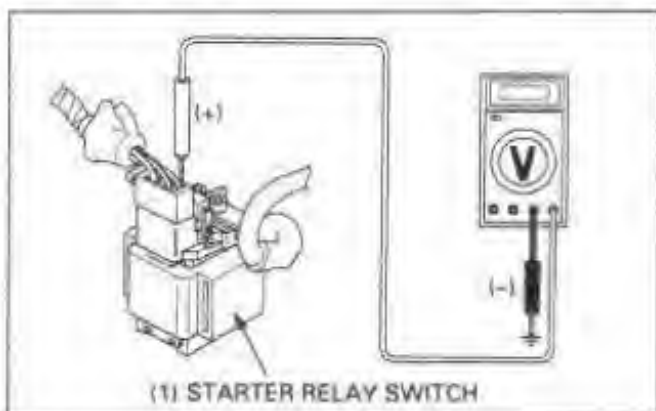
VOLTAGE INSPECTION

Connect the starter relay switch connector.

Shift the transmission into neutral.

Measure the voltage between the Yellow/Red wire (+) and
ground at the starter relay switch connector.

There should be battery voltage only when the starter
switch button is depressed with the ignition switch is ON.



CONTINUITY INSPECTION

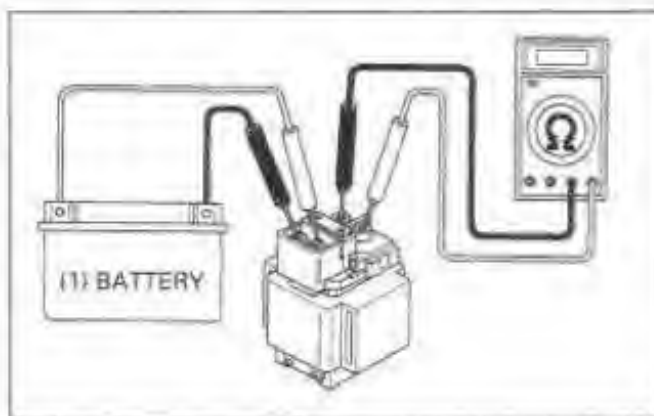
Disconnect the starter relay connector and cables.

Connect an ohmmeter to the starter relay switch large terminals.

Connect a fully charged 12 V battery to the starter relay switch connector terminals (Yellow/Red and Green/Red).

Check for continuity between the starter relay switch terminals.

There should be continuity while 12 V battery is connected to the starter relay switch connector terminals and should be no continuity when the battery is disconnected.



DIODE

REMOVAL

Remove the seat and fuel tank (page 2-3).

Remove the neutral diode from the wire harness.



Remove the clutch/side stand diode from the wire harness.



INSPECTION

Check for continuity with an ohmmeter.

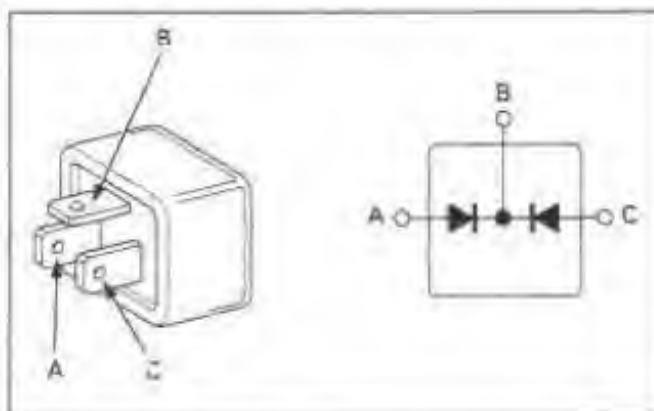
NORMAL DIRECTION: Continuity

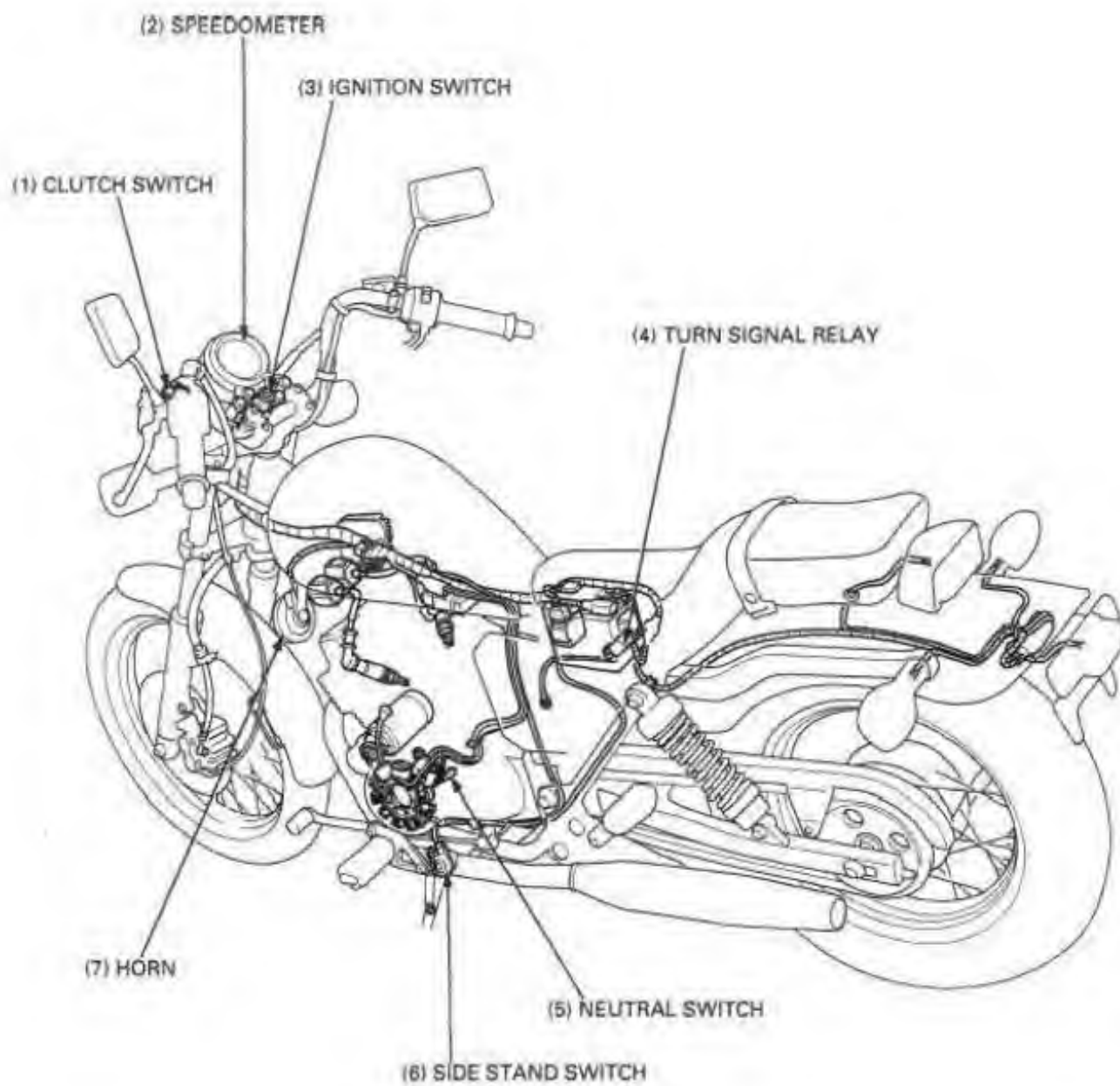
REVERSE DIRECTION: No continuity

INSTALLATION

Install the diodes in the reverse order of removal.

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





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BRAKE LIGHT SWITCH	18-8		

SERVICE INFORMATION

GENERAL

- Check the battery condition before performing any inspection that requires proper battery voltage.
- A continuity test can be made with the switches installed on the motorcycle.
- The following color codes are used throughout this section.

Bu = Blue	G = Green	Lg = Light Green	R = Red
Bl = Black	Gr = Gray	O = Orange	W = White
Br = Brown	Lb = Light Blue	P = Pink	Y = Yellow

SPECIFICATIONS

ITEM			SPECIFICATION
Bulbs	Headlight (High/low beam)	'96 – 2000	12 V – 36.5/35 W
		After 2000	12 V – 60/55 W
	Tail/brake light		12 V – 2/32 cp (7/27 W)
	License light		12 V – 4cp (8 W)
	Front turn signal light		12 V – 32cp (23 W)
	Rear turn signal light		12 V – 32cp (23 W)
	Instrument light		12 V – 3.4 W
	High beam indicator		12 V – 3.4 W
	Turn signal indicator		12 V – 3.4 W
	Neutral indicator		12 V – 3 W
	Side stand indicator ('96 – 2000)		12 V – 2 W
Fuse	Main fuse		20 A
	Sub fuse		10 A X 2

TORQUE VALUES

Headlight bracket mounting bolt	34 N·m (35 kgf·m, 25 lbf·ft)
Taillight unit mounting nut	7 N·m (0.7 kgf·m, 5.1 lbf·ft)

BULB REPLACEMENT

HEADLIGHT

Remove the headlight unit mounting screw and nut.



Remove the screws and connector box lid. Disconnect the headlight connectors, and then remove the headlight unit.

NOTE

- If the headlight bulb is worn, replace the headlight unit as an assembly.

Install the headlight unit in the reverse order of removal.



TAIL/BRAKE LIGHT

Remove the two screws and tail/brake light lens.



While pushing in, turn the bulb counterclockwise to remove it. Replace it with a new one.

Install the tail/brake light lens in the reverse order of removal.



LICENSE LIGHT

Remove the lens cover attaching nuts on the reverse side of the number plate base, then remove the license light cover and lens.

(2) LICENSE LIGHT COVER/LENS

(1) NUTS



While pushing in, turn the bulb counterclockwise to remove it. Replace it with a new one.

Install the tail/brake light lens in the reverse order of removal.

(1) BULB

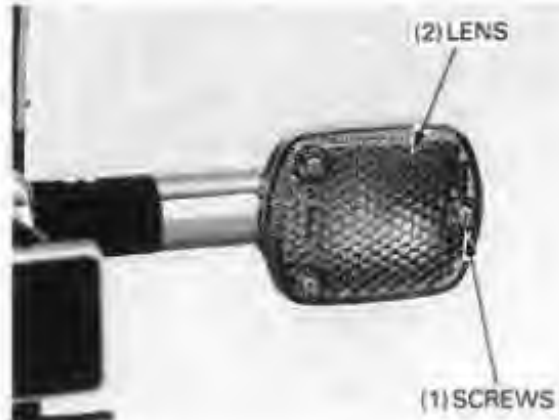


TURN SIGNAL

Remove the three screws and turn signal lens.

(2) LENS

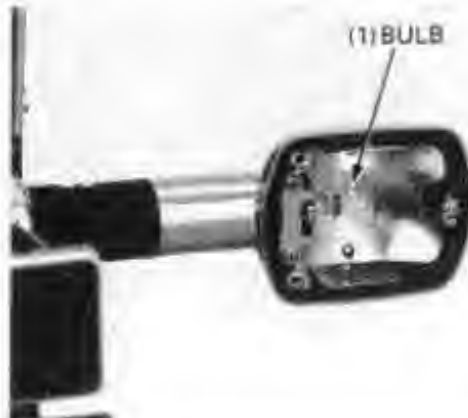
(1) SCREWS



While pushing in, turn the bulb counterclockwise to remove it. Replace it with a new one.

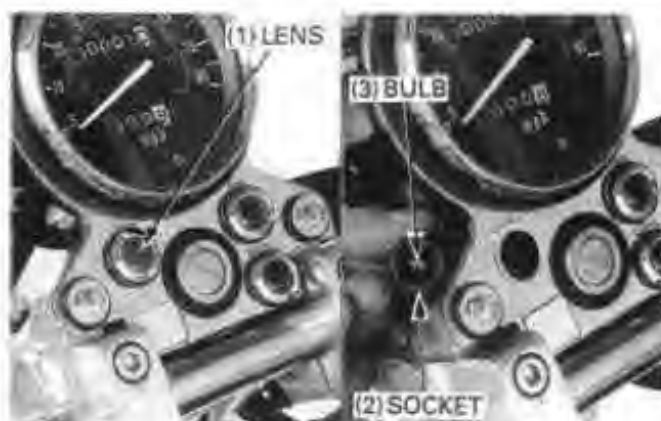
Install the turn signal light lens in the reverse order of removal.

(1) BULB



INDICATOR BULBS ON THE INSTRUMENT PANEL

Remove the indicator lens.
Pull the indicator lamp socket out of the indicator panel.
Remove the bulb from the socket and replace it with a new one.



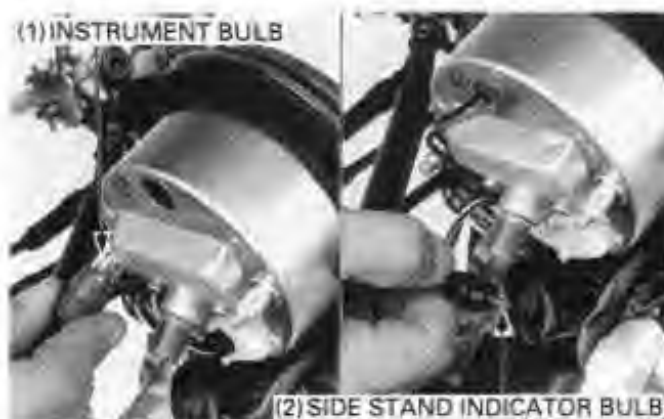
SIDE STAND INDICATOR BULB AND INSTRUMENT BULB

Disconnect the speedometer cable.
Remove the nuts and speedometer rear cover.



Pull the side stand indicator bulb and instrument bulb socket out of the speedometer unit.
Remove the bulb from the socket and replace it with a new one.

Install the removed parts in the reverse order of removal.



SPEEDOMETER

REMOVAL/DISASSEMBLY

Remove the screws and connector box lid.



Disconnect the speedometer connectors.
Disconnect the speedometer cable.

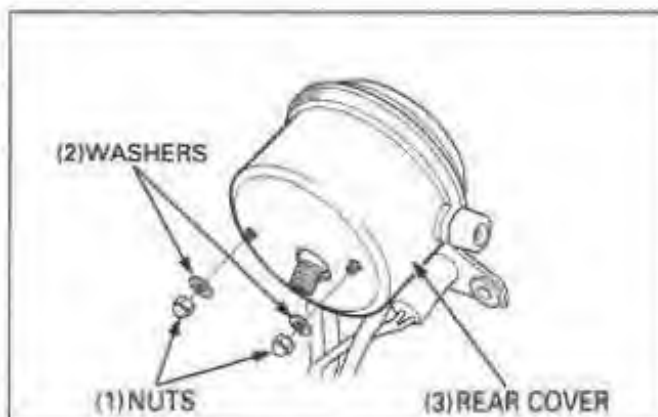


Remove the bolts and speedometer/indicator panel as an assembly.



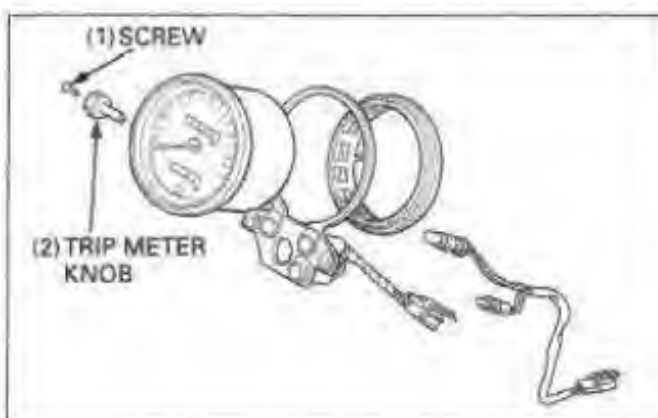
Remove the nuts, washers and speedometer rear cover.

Disconnect the side stand indicator bulb socket and meter light socket.



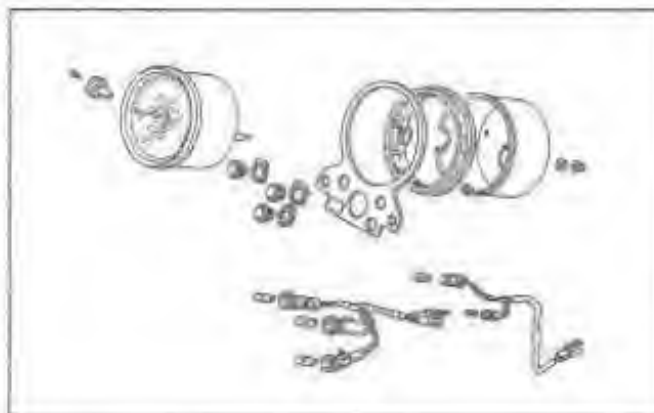
Remove the screw and trip meter knob.

Disassemble the speedometer unit, indicator panel and setting rubber.



ASSEMBLY/INSTALLATION

Assembly/installation is the reverse order of removal/disassembly.



IGNITION SWITCH

INSPECTION

Remove the screws and connector box lid (page 18-4).

Disconnect the ignition switch wire connectors.

Check for continuity between the wire terminals of the ignition switch connector in each switch position. Continuity should exist between the color coded wires as follows:

IGNITION SWITCH

	IG	E	BAT1	BAT2
OFF	○	○		
ON			○	○
COLOR	BI/W	G	R	BI



REMOVAL/INSTALLATION

Remove the speedometer (page 18-4).

Remove the screws and ignition switch.

Install the ignition switch in the reverse order of removal.



HANDLEBAR SWITCHES

Disconnect the handlebar switch connectors.

Check for continuity between the wire terminals of the handlebar switch connectors.

Continuity should exist between the color coded wire terminals as follows:

ENGINE STOP SWITCH

	IG	E
OFF	○	○
RUN		
COLOR	Bl/W	G

STARTER SWITCH

	BAT3	HL	ST	BAT4
FREE	○	○		
PUSH			○	○
COLOR	Br/R	Bu/W	Y/R	Bl

DIMMER SWITCH

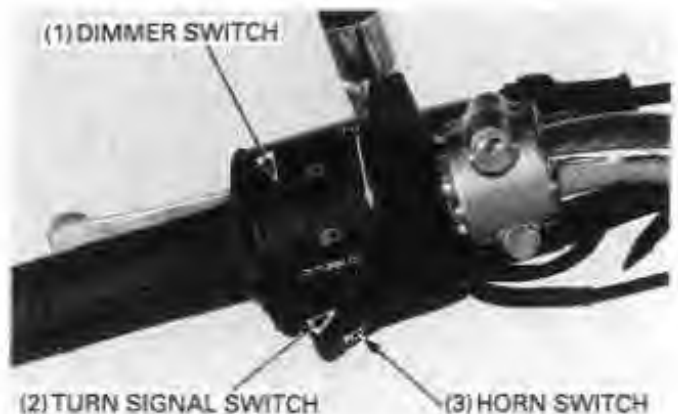
	HL	Hi	Lo
Hi	○	○	
(N)	○	○	○
Lo	○		○
COLOR	Bu/W	Bu	W

TURN SIGNAL SWITCH

	W	R	L
R	○	○	
N			
L	○		○
COLOR	Gr	Lb	O

HORN SWITCH

	HO	BAT4
FREE		
PUSH	○	○
COLOR	Lg	Bl



BRAKE LIGHT SWITCH

FRONT

Disconnect the front brake light switch connectors.

There should be continuity with the brake lever applied, and there should be no continuity when the brake lever is released.



REAR

Disconnect the rear brake light switch connector and check for continuity between the terminals.

There should be continuity with the brake pedal applied, and there should be no continuity when the brake pedal is released.



CLUTCH SWITCH

Disconnect the clutch switch connectors.

There should be continuity with the clutch lever applied, and there should be no continuity when the clutch lever is released.



NEUTRAL SWITCH

Remove the fuel tank (page 2-3).

Disconnect the neutral switch connector.
Shift the transmission into neutral and check for continuity between the Light Green/Red wire terminal and ground.
There should be continuity with the transmission in neutral, and no continuity when the transmission is in gear.



SIDE STAND SWITCH

INSPECTION

Remove the fuel tank (page 2-3).

Disconnect the side stand switch 3P (Green) connector.

Check for continuity between the wire terminals of the side stand switch connector.

Continuity should exist between the color coded wire terminals as follows:

SIDE STAND SWITCH

'96 – 2000:

	Green/White	Yellow/Black	Green
Side stand up	○		○
Side stand down		○	○

After 2000:

	Green/White	Green
Side stand up	○	○
Side stand down		

REMOVAL

Disconnect the side stand switch 3P (Green) connector.

Remove the bolt and side stand switch.

INSTALLATION

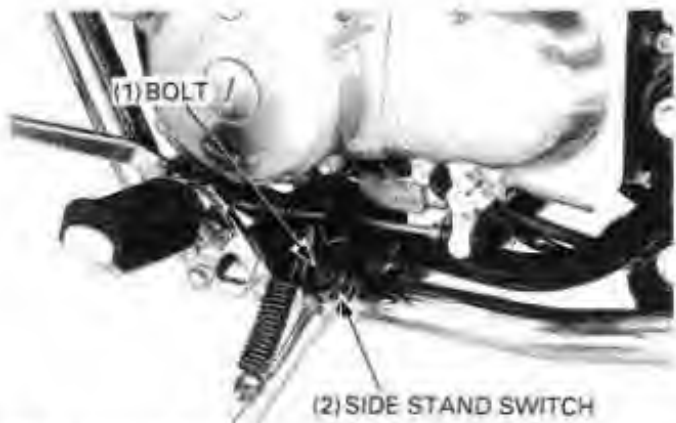
Install the side stand switch aligning the switch pin with the side stand hole and the switch groove with the return spring holding pin.

Secure the side stand switch with a new bolt.

TORQUE: 10 N·m (1.0 kgf-m, 7 lbf-ft)



(1) SIDE STAND SWITCH CONNECTOR



(1) BOLT /

(2) SIDE STAND SWITCH



(2) GROOVE/PIN

(1) PIN/HOLE

HORN

Disconnect the wire connectors from the horn.

Connect the 12 V battery to the horn terminal directly.
The horn is normal if it sounds when the 12 V battery is connected across the horn terminals.



TURN SIGNAL RELAY

INSPECTION

Check the following:

- Battery condition
- Burned out bulb or non-specified wattage
- Open fuse
- Ignition switch and turn signal switch function
- Loose connectors

If above items all normal, check the following:
Disconnect the turn signal connectors from the relay.



1. Short the black and gray terminals of the turn signal relay connector with a jumper wire. Start the engine and check the turn signal light by turning the switch ON.

Light comes on

Light does not come on

- Broken wire harness.

2. Check for continuity between the green terminal of the relay connector and ground.

Continuity

No continuity

- Broken ground wire

- Faulty turn signal relay.
- Poor connection of the connector.

19-1



19. WIRING DIAGRAM

ENGINE DOES NOT START OR IS
HARD TO START

20-1

POOR PERFORMANCE AT HIGH
SPEED

20-4

ENGINE LACKS POWER

20-2

POOR HANDLING

20-4

POOR PERFORMANCE AT LOW
AND IDLE SPEED

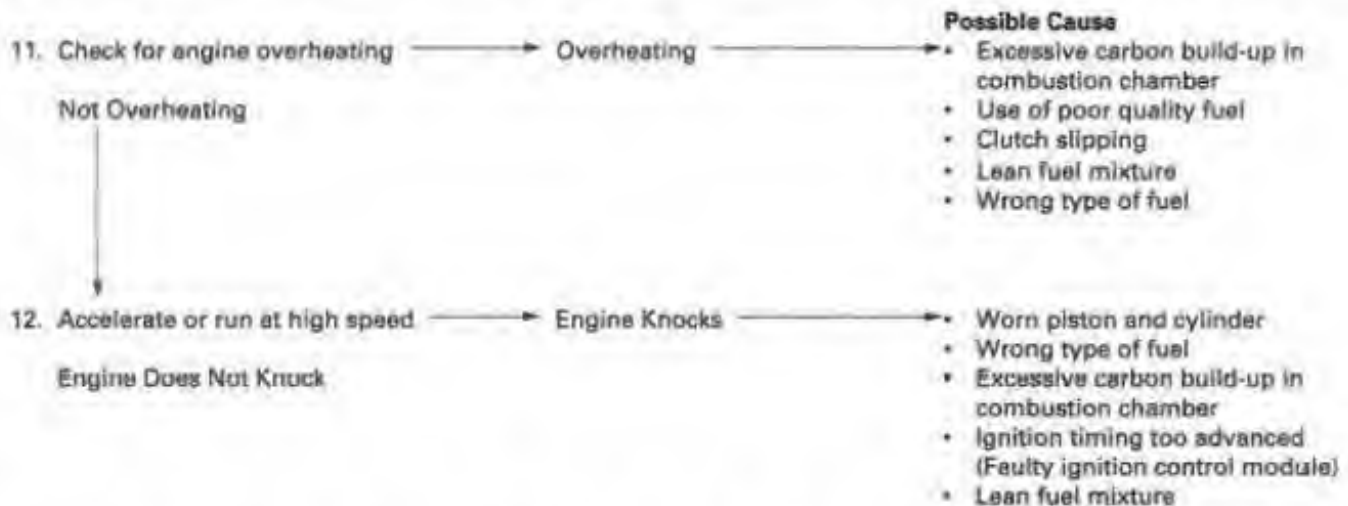
20-3

ENGINE DOES NOT START OR IS HARD TO START

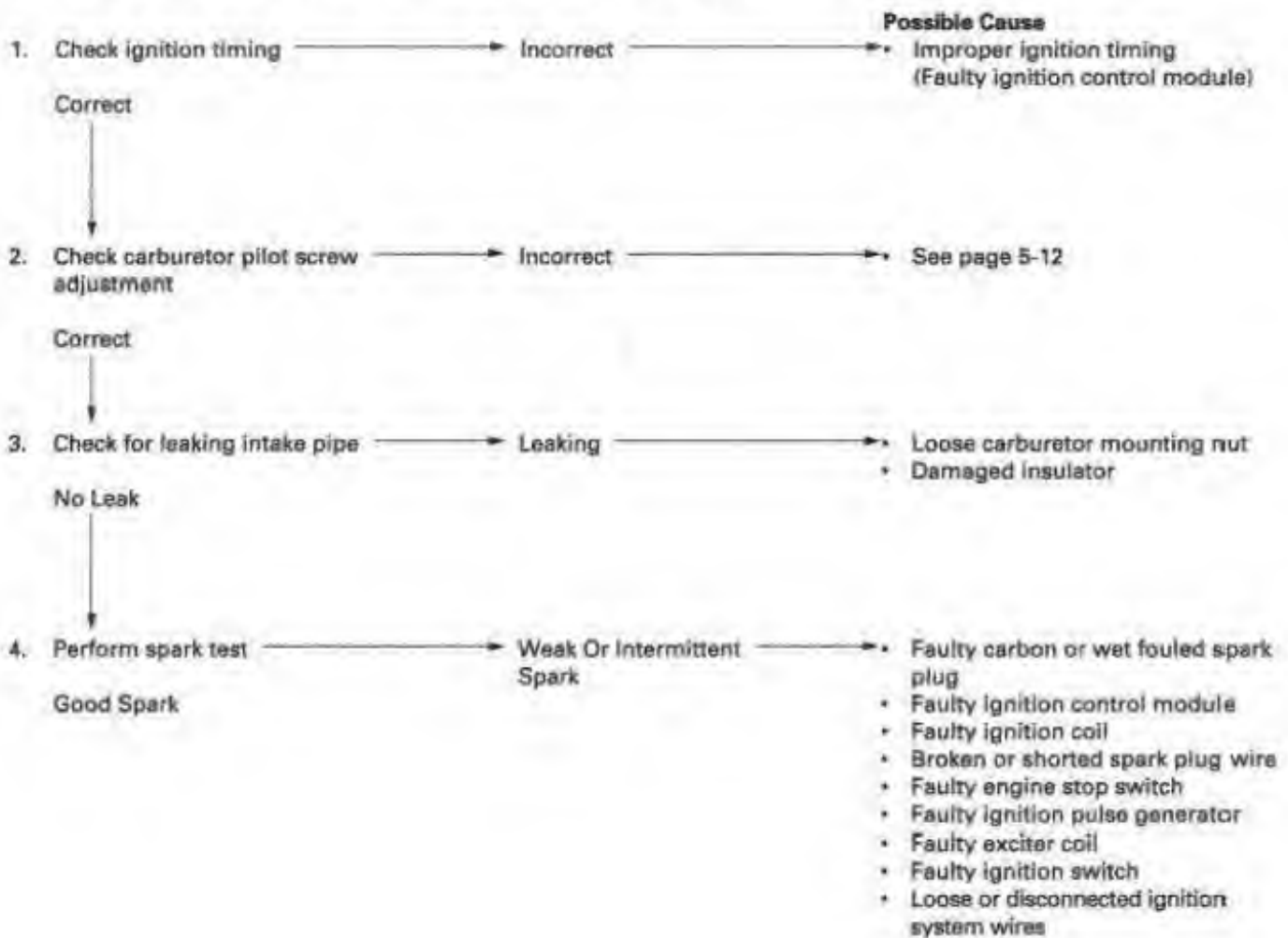


ENGINE LACKS POWER

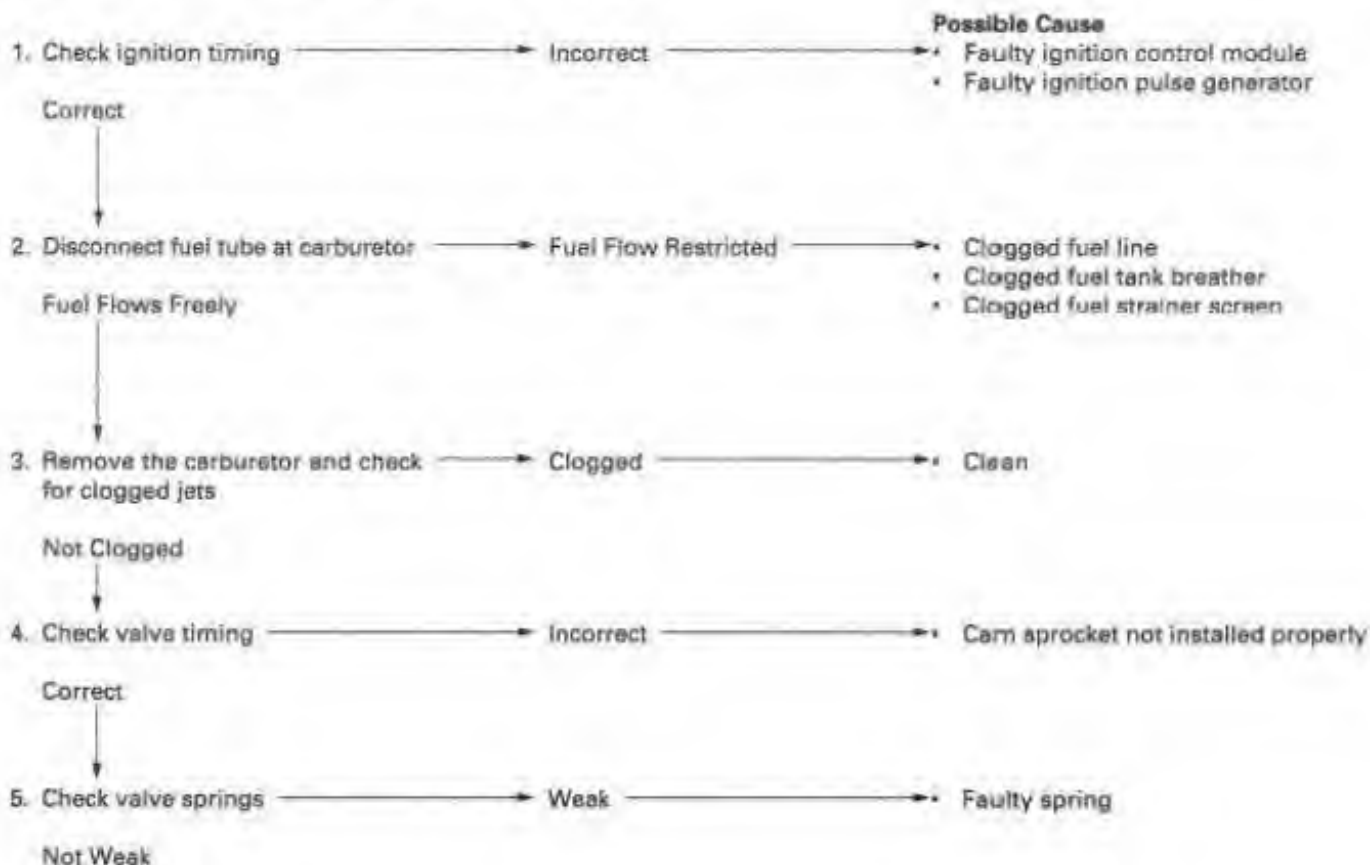




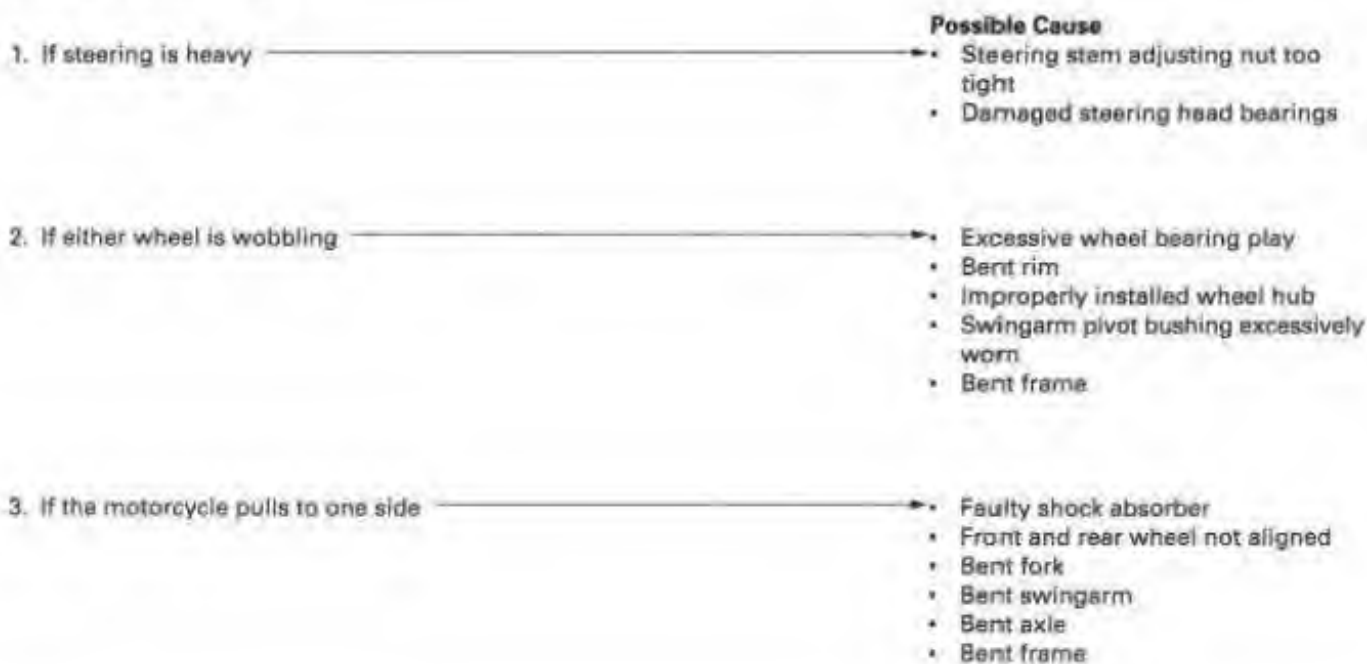
POOR PERFORMANCE AT LOW AND IDLE SPEED



POOR PERFORMANCE AT HIGH SPEED



POOR HANDLING



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