



NX-250
Full Service Manual

IMPORTANT SAFETY NOTICE

⚠ WARNING Indicates a strong possibility of severe personal injury or loss of life if instructions are not followed.

CAUTION: Indicates a possibility of personal injury or equipment damage if instructions are not followed.

NOTE: Gives helpful information.

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

AVIS IMPORTANT

⚠ ATTENTION Indique un grand risque d'accident corporel grave, voire mortel, si les instructions ne sont pas observées.

PRECAUTION: Indique un risque d'accident corporel ou de détérioration du véhicule si les instructions ne sont pas observées.

NOTE: Fournit des renseignements utiles.

On ne trouvera pas dans ce manuel de description détaillée des procédures en atelier, des principes de sécurité ou des opérations d'entretien. Noter cependant que ce manuel comprend quelques avertissements contre certaines méthodes de révision de la machine qui risquent, si on les applique, de provoquer des **BLESSURES** d'endommager la machine ou de rendre son utilisation peu sûre. On comprendra, par ailleurs, que ces avertissements ne peuvent couvrir toutes les façons de procéder à une révision, que celle-ci soit recommandée par Honda ou non, ni tous les dangers que l'on encourt à suivre telle ou telle façon étant donné qu'il est impossible pour Honda de ne serait-ce que répertorier toutes les procédures de révision. Avant de procéder à une révision, qu'elle soit ou non recommandée par Honda; il faudra donc s'assurer absolument que ni le personnel ni la machine ne sont soumis à un risque quelconque à cause des méthodes ou des outils utilisés pour la révision.

WICHTIGER SICHERHEITSHINWEIS

⚠ WARNUNG Zeigt mögliche persönliche Verletzungs- oder Lebensgefahr an, falls Anweisungen nicht beachtet werden.

VORSICHT: Zeigt mögliche persönliche Verletzungsgefahr oder Beschädigung der Maschine an, falls Anweisungen nicht befolgt werden.

ZUR BEACHTUNG: Gibt wertvolle Informationen.

Ausführliche Beschreibungen allgemeiner Werkstatt-Arbeitsweisen, Sicherheitsregeln und Wartungsverfahren sind nicht eingeschlossen. Es ist wichtig zu beachten, daß dieses Handbuch einige Warnungen und Vorsichtsmaßnahmen für bestimmte Wartungsmethoden enthält, die **PERSÖNLICHE VERLETZUNG** des Werkstattpersonals verursachen, das Fahrzeug beschädigen oder es fahrunsicher machen können. Verständlicherweise können diese Warnungen nicht alle absehbaren Verfahrensweisen der Wartung, ob von Honda empfohlen oder nicht, oder die möglichen gefährlichen Folgen der einzelnen Verfahrensweisen erfassen, ganz abgesehen davon, daß Honda nicht alle solche Verfahrensweisen erforschen kann. Jeder, der bestimmte Wartungsverfahren oder Werkzeuge benutzt, ob von Honda empfohlen oder nicht, muß sich selbst gründlich davon überzeugen, daß durch die gewählten Wartungsmethoden oder Werkzeuge weder die persönliche Sicherheit noch die Sicherheit des Fahrzeugs gefährdet ist.

HOW TO USE THIS MANUAL

This shop manual describes the servicing procedures for the NX250.

Throughout the manual, the following abbreviations are used to identify individual models.

CODE	AREA (TYPE)	CODE	AREA (TYPE)
F	France	G	Germany
ED	Europe	G II	Germany
ND	Northern Europe		

Follow the Maintenance Schedule (Section 3) recommendations to ensure that the vehicle is in peak operating condition.

Performing the first scheduled maintenance is very important. It compensates for the initial wear that occurs during the break-in period. Sections 1 through 3 apply to the whole motorcycle, while sections 4 through 19 describe parts of the motorcycle, grouped according to location.

Find the section you want on this page, then turn to the table of contents on page 1 of that section.

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

If you don't know the source of the trouble, go to section 21, Troubleshooting.

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SERVICE PUBLICATIONS OFFICE

CONTENTS

	GENERAL INFORMATION	1
	LUBRICATION	2
	MAINTENANCE	3
ENGINE	FUEL SYSTEM	4
	COOLING SYSTEM	5
	ENGINE REMOVAL/INSTALLATION	6
	CLUTCH	7
	ALTERNATOR/STARTER CLUTCH	8
	CYLINDER HEAD/VALVES	9
	CYLINDER/PISTON	10
	CRANKSHAFT/TRANSMISSION	11
CHASSIS	FRONT WHEEL/SUSPENSION/STEERING	12
	REAR WHEEL/BRAKE/SUSPENSION	13
	HYDRAULIC BRAKE	14
	FAIRING/EXHAUST SYSTEM	15
ELECTRICAL	BATTERY/CHARGING SYSTEM	16
	IGNITION SYSTEM	17
	ELECTRIC STARTER	18
	LIGHTS/METERS/SWITCHES	19
	WIRING DIAGRAM	20
	TROUBLESHOOTING	21

GENERAL SAFETY	1-1	TORQUE VALUES	1-5
SERVICE RULES	1-1	TOOLS	1-7
MODEL IDENTIFICATION	1-2	CABLE & HARNESS ROUTING	1-9
SPECIFICATIONS	1-3		

GENERAL SAFETY

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

▲ 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.
- 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.

▲ WARNING

- Inhaled asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies.

▲ WARNING

Gasoline is extremely flammable and is explosive under certain conditions work in a well ventilated area with the engine stopped. Do not smoke or allow flames or sparks in the work area or where gasoline is stored.

CAUTION

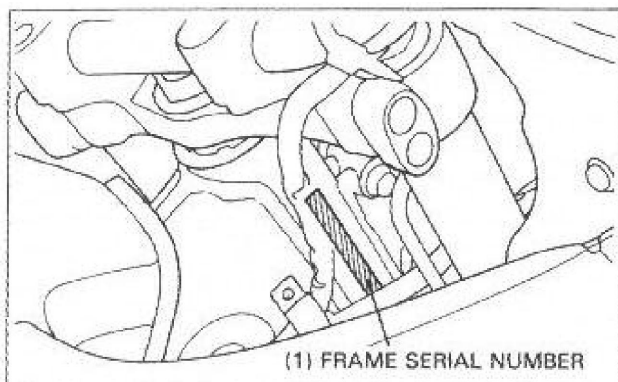
Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.

SERVICE RULES

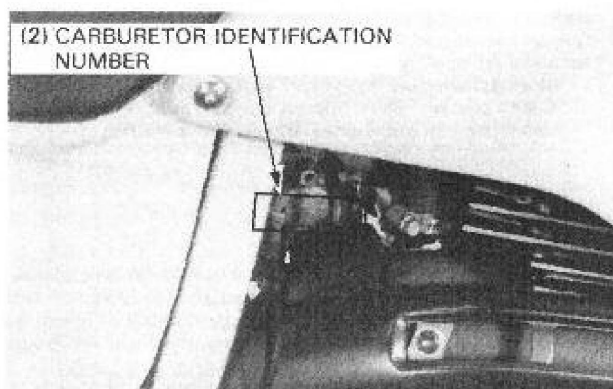
1. Use genuine HONDA or HONDA-recommended parts and lubricants or their equivalents. Parts that don't meet HONDA's design specifications may damage to the motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing this 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 bolts first. Then tighten to the specified torque diagonally in 1-5 steps, unless a particular sequence is specified.
6. Clean parts in non-flammable or high flash point solvent upon disassembly.
7. Lubricate any sliding surfaces before reassembly.
8. After reassembly, check all parts for proper installation and operation.

GENERAL INFORMATION

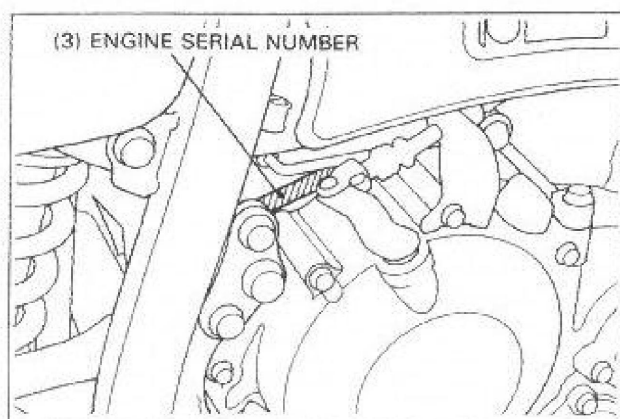
MODEL IDENTIFICATION



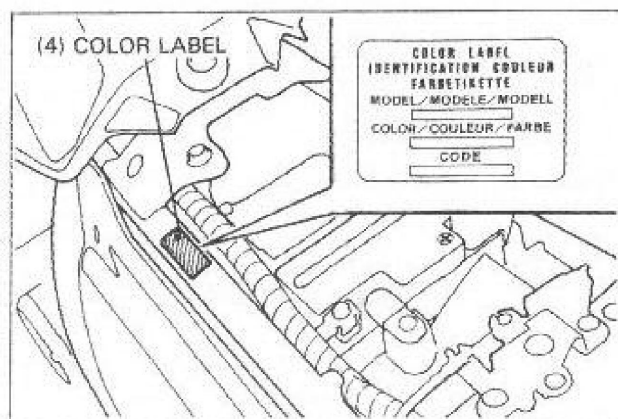
The frame serial number is stamped on the right side of the steering head.



The carburetor identification number is on the right side of the carburetor body.



The engine serial number is stamped on the right side of the crankcase.



The color code label is attached on the left frame tube under the seat. When ordering a color coded part, always specify its designated color code.

GENERAL INFORMATION

SPECIFICATIONS

ITEM				SPECIFICATIONS	
DIMENSIONS	Overall length			2,085 mm (82.1 in)	
	Overall width			ND, G, GII types: 2,095 mm (82.5 in)	
	Overall height			805 mm (31.7 in)	
	Wheelbase			1,120 mm (44.1 in)	
	Ground clearance			1,350 mm (53.1 in)	
	Dry weight			250 mm (9.8 in)	
	Curb weight			118 kg (260 lbs)	
FRAME	Type			Diamond	
	Front suspension, travel			Telescopic fork, 220 mm (8.7 in)	
	Rear suspension, travel			Swingarm, 200 mm (7.8 in)	
	Front tire size			90/100—19 55P	
	Rear tire size			120/90—16 63P	
	Cold tire pressure	Driver only	Front	150 kPa (1.50 kg/cm ² , 22 psi)	
			Rear	150 kPa (1.50 kg/cm ² , 22 psi)	
		Driver and one passenger	Front	150 kPa (1.50 kg/cm ² , 22 psi)	
			Rear	175 kPa (1.75 kg/cm ² , 25 psi)	
	Front brake, lining swept area			Single disc, 306 cm ² (47.4 sq in)	
	Rear brake, lining swept area			Internal expanding shoe, 103.6 cm ² (16.1 sq in)	
	Fuel capacity			9.0 liters (2.38 US gal, 1.98 Imp gal)	
	Fuel reserve capacity			1.6 liters (0.42 US gal, 0.35 Imp gal)	
	Caster angle			25°30'	
Trail			89 mm (3.5 in)		
Fork fork oil capacity			412 cm ³ (13.9 US oz, 14.5 Imp oz)		
ENGINE	Type			Water cooled 4-stroke	
	Cylinder arrangement			Single cylinder inclined 15° from vertical	
	Bore and stroke			70.0 x 64.8 mm (2.76 x 2.55 in)	
	Displacement			F type: 68.5 x 64.8 mm (2.70 x 2.55 in)	
	Compression ratio			249 cm ³ (15.1 cu in)	
	Valve train			F type: 239 cm ³ (14.6 cu in)	
	Oil capacity			11.0:1	
	Coolant capacity			Chain drive DOHC	
	Lubrication system			1.6 liters (1.69 US qt, 1.41 Imp qt) after disassembly	
	Air filtration			1.3 liters (1.37 US qt, 1.14 Imp qt) after draining	
	Cylinder compression			1.0 liter (1.06 US qt, 0.88 Imp qt)	
	Intake valve	Opens	Forced pressure and wet sump		
			Paper filter		
	Exhaust valve	Closes	1,569 ± 96 kPa (16.0 ± 1.0 kg/cm ² , 228 ± 14 psi)		
			10° BTDC		
	Valve clearance (Cold)		40° ABDC		
	Idle speed	Intake	40° BBDC		
			5° ATDC		
			at 1 mm lift		
			0.23 mm (0.009 in)		
			0.23 mm (0.009 in)		
			1,300 ± 100 min ⁻¹ (rpm)		

GENERAL INFORMATION

ITEM		SPECIFICATIONS	
CARBURETOR	Carburetor type/venturi dia. Identification number	KEIHIN/32 mm (1.3 in) PD 6BA  F type: PD 6BC GII type: PD 6BB	
	Pilot screw opening	1-1/2	
	Float level	GII type: 2-5/8 14 mm (0.55 in)	
DRIVE TRAIN	Clutch	Wet multi-plate	
	Transmission	6-speed constant mesh	
	Primary reduction	2.7272 (60/22)	
	Final reduction	3.1538 (41/13)	
	Gear ratio I	2.8461 (37/13)	
	II	1.7777 (32/18)	
	III	1.3333 (28/21)	
	IV	1.0416 (25/24)	
	V	0.8846 (23/26)	
	VI	0.7857 (22/28)	
ELECTRICAL	Gear shift pattern	Left foot operated return system, 1-N-2-3-4-5-6	
	Ignition	CDI	
	Ignition timing	Initial	8° BTDC at idle
		Full advance	30° BTDC at 4,500 min ⁻¹ (rpm)
	Alternator	200W/5,000 min ⁻¹ (rpm)	
	Battery capacity	12 V—6 AH	
	Spark plug		
		Standard	NGK CR9EH-9
			ND U27FER-9
	Spark plug gap	0.8—0.9 mm (0.031—0.035 in)	
LIGHTS	Main fuse	20 A	
	Fuse	10 A x 3, 15 A x 1	
	Headlight (high/low beam)	12 V 60 W/55 W	
	Position light	12 V 4 W	
	Turn signal light	12 V 21 W	
	Tail/brake light	12 V 5 W/21W	
	Instrument light	12 V 1.7 W x 3	
	Neutral indicator	12 V 3.4 W	
	High beam indicator	12 V 1.7 W	
	Turn signal indicator	12 V 3.4 W	

GENERAL INFORMATION

TORQUE VALUES

ENGINE

ITEM	Q'TY	Thread dia. (mm)	TORQUE N·m (kg-m, ft-lb)	REMARKS
Cylinder head cover bolt	8	6	12 (1.2, 9)	
Camshaft holder bolt	8	6	12 (1.2, 9)	
Cylinder head cap nut	4	10	46 (4.6, 33)	
Crankcase cover bolt	19	6	10 (1.0, 7)	
Flywheel bolt	1	12	110 (11.0, 80)	
Primary drive gear nut	1	18	95 (9.5, 69)	
Clutch center lock nut	1	16	60 (6.0, 43)	
Oil drain bolt	1	12	25 (2.5, 18)	
Spark plug	1	10	12 (1.2, 9)	
Crankcase bolt	12	6	12 (1.2, 9)	
Camplate bolt	1	6	12 (1.2, 9)	
Stopper arm bolt	1	6	12 (1.2, 9)	Apply locking agent to the threads
Oil pipe bolt	1	7	12 (1.2, 9)	
	2	8	14 (1.4, 10)	
Water pump	1	7	12 (1.2, 9)	
Starter clutch outer bolt	6	6	16 (1.6, 12)	Apply locking agent to the threads
Temperature sensor	1	—	10 (1.0, 7)	Apply sealant

FRAME

ITEM	Q'TY	Thread dia. (mm)	TORQUE N·m (kg-m, ft-lb)	REMARKS
Steering stem nut	1	24	118 (11.8, 85)	
Steering bearing adjustment nut	1	26	5 (0.5, 4)	
Handlebar holder bolt	4	8	24 (2.4, 17)	
Spoke	72	—	3.8 (0.38, 2.7)	
Front axle	1	12	65 (6.5, 47)	
Front axle holder nut	4	6	12 (1.2, 9)	
Rear axle nut	1	16	95 (9.5, 69)	
Shock absorber mounting bolt (Lower)	1	10	45 (4.5, 33)	
(Upper)	1	10	65 (6.5, 47)	
Fork top pinch bolt	4	8	33 (3.3, 24)	
Fork bottom pinch bolt	4	8	33 (3.3, 24)	
Swingarm pivot bolt	1	14	90 (9.0, 65)	
Shock link-to-swingarm bolt	1	12	105 (10.5, 76)	
Shock link-to-shock arm bolt	1	12	105 (10.5, 76)	
Shock arm-to-frame bolt	1	12	105 (10.5, 76)	
Brake hose oil bolt	3	10	35 (3.5, 25)	
Brake hose joint (master cylinder side)	1	10	35 (3.5, 25)	
(brake hose side)	1	10	14 (1.4, 10)	
Brake pipe nut	2	10	14 (1.4, 10)	

GENERAL INFORMATION

ITEM	Q'TY	Thread dia. (mm)	TORQUE N-m (kg-m, ft-lb)	REMARKS
Caliper mounting bolt	2	3	25 (2.5, 18)	Apply a locking agent to the threads
Master cylinder cover screw	2	4	1.5 (0.15, 1.1)	
Brake lever pivot nut	1	6	10 (1.0, 7)	
Front brake light switch screw	1	4	1.0 (0.1, 0.7)	
Brake pedal bolt	1	8	18 (1.8, 13)	
Caliper pin bolt	1	8	23 (2.3, 17)	
Caliper bracket pin bolt	1	8	13 (1.3, 9)	
Shock absorber lower joint	1	12	49 (4.9, 35)	
Fork cap	2	—	23 (2.3, 17)	
Fork socket bolt	2	8	20 (2.0, 14)	
Brake pad pin	2	10	18 (1.8, 13)	
Brake pad pin plug	2	10	2.5 (0.25, 1.8)	
Brake disc bolt	8	6	15 (1.5, 11)	
Gearshift pedal bolt	1	6	10 (1.0, 7)	
Fuel tank mounting bolt	1	6	10 (1.0, 7)	
Fuel valve lock nut	1	18	40 (4.0, 29)	
Engine mounting bolt	5	10	75 (7.5, 54)	
bracket bolt	8	8	27 (2.7, 20)	
Muffler pipe band	1	8	23 (2.3, 17)	
Exhaust pipe joint nut	2	8	27 (2.7, 20)	
Exhaust pipe cover bolt	3	6	10 (1.0, 7)	
Exhaust muffler bolt	3	8	35 (3.5, 25)	
	1	10	55 (5.5, 40)	
Thermostatic switch	1	—	18 (1.8, 13)	
Brake caliper bleed valve	1	7	6 (0.6, 4.3)	

Torque specifications listed above are for specific tightening points. If a specification is not listed, follow the standard torque values below.

STANDARD TORQUE VALUES

TYPE	TORQUE N-m (kg-m, ft-lb)	TYPE	TORQUE N-m (kg-m, ft-lb)
5 mm bolt, nut	5 (0.50, 3.6)	5 mm screw	4 (0.40, 2.9)
6 mm bolt, nut	10 (1.0, 7.2)	6 mm screw, 6 mm	
8 mm bolt, nut	22 (2.2, 16)	bolt with 8 mm head	9 (0.9, 6.5)
10 mm bolt, nut	35 (3.5, 25)	6 mm flange bolt, nut	12 (1.2, 9)
12 mm bolt, nut	55 (5.5, 40)	8 mm flange bolt, nut	27 (2.7, 20)
		10 mm flange bolt, nut	40 (4.0, 29)

GENERAL INFORMATION

TOOLS

SPECIAL

DESCRIPTION	TOOL NUMBER	REF. TO SECTION
* Valve hole protector	07HMG-MR70001	9
Driver base	07947-KR10100	5
Driver shaft	07947-KR10000	5
Fork seal driver	07947-3710101	5
Universal bearing puller	07631-0010000	11
Snap ring pliers	07914-3230001	14
Steering stem socket	07916-KA50100	12
Clutch center holder	07923-KE10000	7
Needle bearing remover	07931-MA70000	13
Bearing remover, 15 mm	07936-KC10000	11
— remover assembly, 15 mm	07936-KC10500	11
— remover shaft, 15 mm	07936-KC10100	11
— remover head, 15 mm	07936-KC10200	11
— remover weight	07741-0010201	11
Valve guide driver	07HMD-ML00100	9
Steering stem driver	07946-4300101	12
Remover shaft	07946-MJ00100	13
Ball race remover	07953-MJ10000	12
— driver attachment	07953-MJ10100	12
— driver handle	07953-MJ10200	12
Shock absorber compressor attachment	07959-MB10000	13
Valve compressor attachment	07959-KM30101	9
Crankcase assembly tool	07965-VM00000	11
— collar assembly	07965-VM00100	11
— threaded shaft	07965-VM00200	11
— threaded adaptor	07965-VM00300	11
Valve guide reamer, 4.5 mm	07HMH-ML00100	9
Pilot screw wrench	07908-4730001	4

* New for this model.

GENERAL INFORMATION

COMMON

DESCRIPTION	TOOL NUMBER	REF. TO SECTION
Float level gauge	07401-0010000	4
Lock nut wrench, 20 x 24 mm	07716-0020100	7
Gear holder	07724-0010100	7
Retainer wrench body	07710-0010401	13
Retainer wrench B	07710-0010200	13
Flywheel holder	07725-0040000	8
Rotor puller	07733-0020001	8
Attachment, 32 x 35 mm	07746-0010100	11, 12, 13
Attachment, 37 x 40 mm	07746-0010200	11, 13
Attachment, 42 x 47 mm	07746-0010300	11, 12, 13
Attachment, 52 x 55 mm	07746-0010400	11
Attachment, 62 x 68 mm	07746-0010500	11
Attachment, 24 x 26 mm	07746-0010700	13
Pilot, 15 mm	07746-0040300	5, 11, 12, 13
Pilot, 17 mm	07746-0040400	11, 13
Pilot, 20 mm	07746-0040500	11, 13
Pilot, 22 mm	07746-0041000	11, 13
Pilot, 28 mm	07746-0041100	11
Bearing remover head, 15 mm	07746-0050400	12
Bearing remover shaft	07746-0050100	12, 13
Bearing remover head, 17 mm	07746-0050500	13
Fork seal driver body	07747-0010100	12
Fork seal driver attachment	07747-0010600	12
Driver	07749-0010000	5, 11, 12, 13
Valve spring compressor	07757-0010000	9
Shock absorber compressor	07GME-0010000	13
— screw assembly	07GME-0010100	13
Spoke wrench, 5.8 x 6.1 mm	07701-0020300	3
Digital multimeter	07411-0020000	16, 17, 18, 19
or circuit tester (KOWA)	TH-5H	16, 17, 18, 19
or circuit tester (SANWA)	07308-0020001	16, 17, 18, 19

VALVE SEAT CUTTER

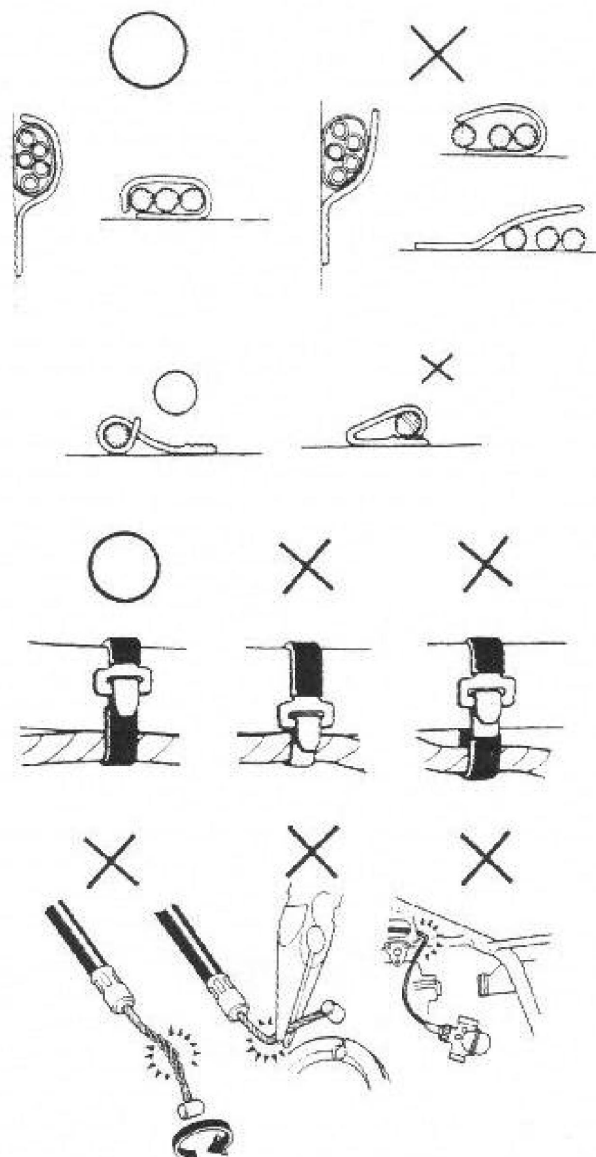
DESCRIPTION	TOOL NO.	REF. TO SECTION
Seat cutter, 24.5 mm (45° EX)	07780-0010100	9
Seat cutter, 27.5 mm (45° IN)	07780-0010200	
Flat cutter, 25 mm (32° EX)	07780-0012000	
Flat cutter, 28 mm (32° IN)	07780-0012100	
Interior cutter, 30 mm (60° IN)	07780-0014000	
Interior cutter, 26 mm (60° EX)	07780-0014500	
Cutter holder, 4.5 mm	07781-0010600	

GENERAL INFORMATION

CABLE & HARNESS ROUTING

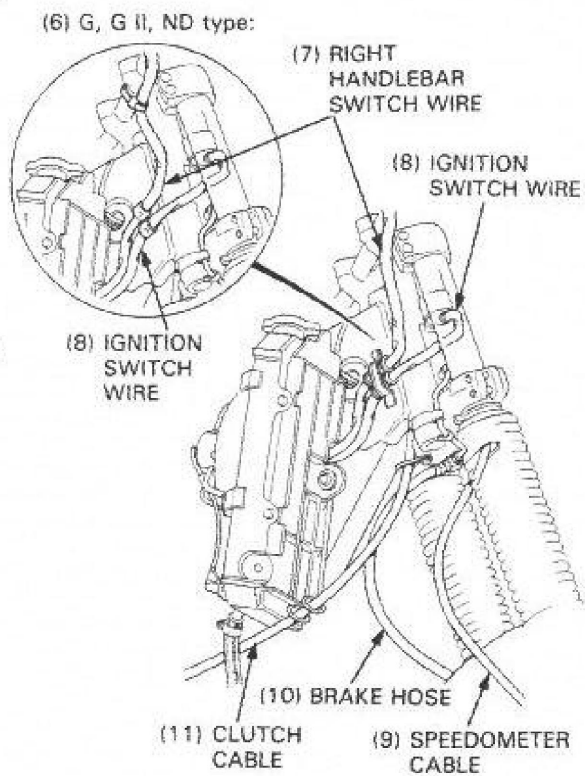
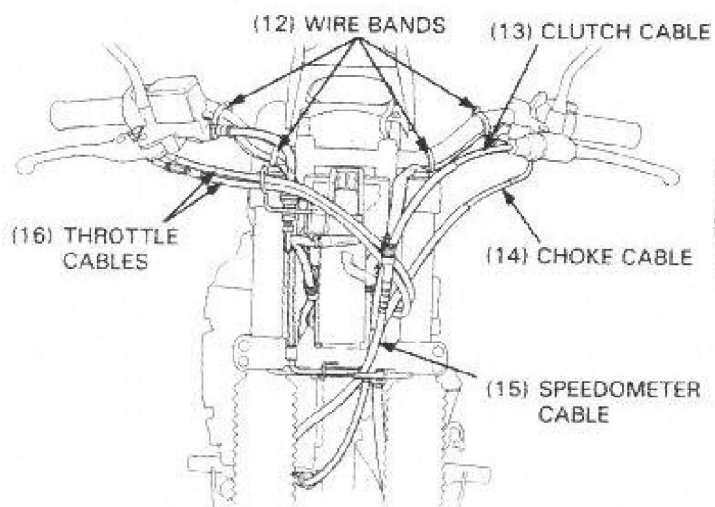
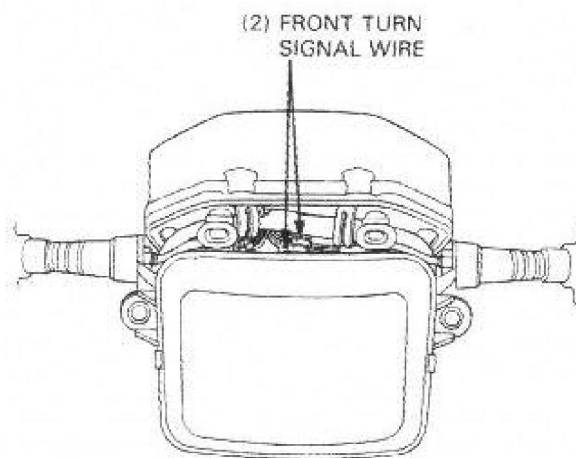
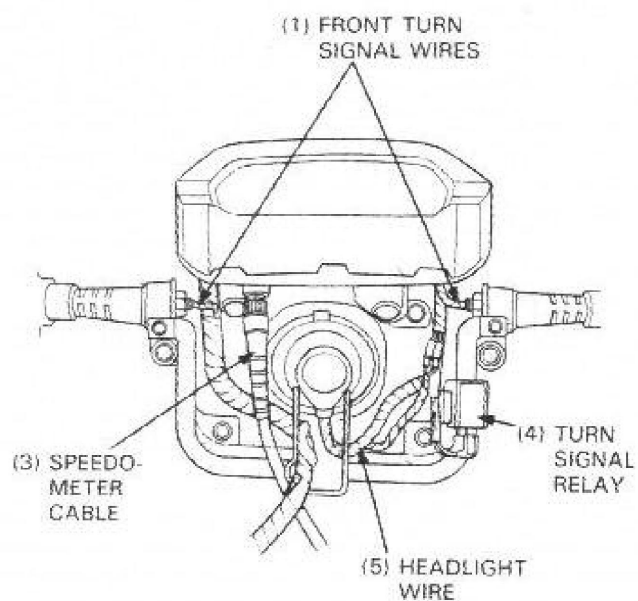
Note the following when routing cables and wire harnesses:

- A loose wire, harness or cable can be a safety hazard. After clamping, check each wire to be sure it is secure.
- Do not squeeze wires against welds or clamps.
- Secure wires and wire harnesses to the frame with their respective wire bands at the designated locations. Tighten the bands so that only the insulated surfaces contact the wires or wire harnesses.
- Route harnesses so they are neither pulled taut nor have excessive slack.
- Protect wires and harnesses with electrical tape or a tube if they contact a sharp edge or corner. Clean the attaching surface thoroughly before applying tape.
- Do not use a wire or harness with broken insulation. Repair by wrapping them with protective tape or replace them.
- Route wire harnesses to avoid sharp edges or corners. Also avoid the projected ends of bolts and screws.
- Keep wire harnesses away from the exhaust pipes and other hot parts.
- Be sure grommets are seated in their grooves properly.
- After clamping, check each harness to be certain that it does not interfere with any moving or sliding parts.
- After routing, check that the wire harnesses are not twisted or kinked.
- Wire harnesses routed along the handlebars should not be pulled taut, have excessive slack, be pinched by or interfere with adjacent or surrounding parts in all steering positions.
- Do not bend or twist the control cables. Damaged control cables will not operate smoothly and may stick or bind.

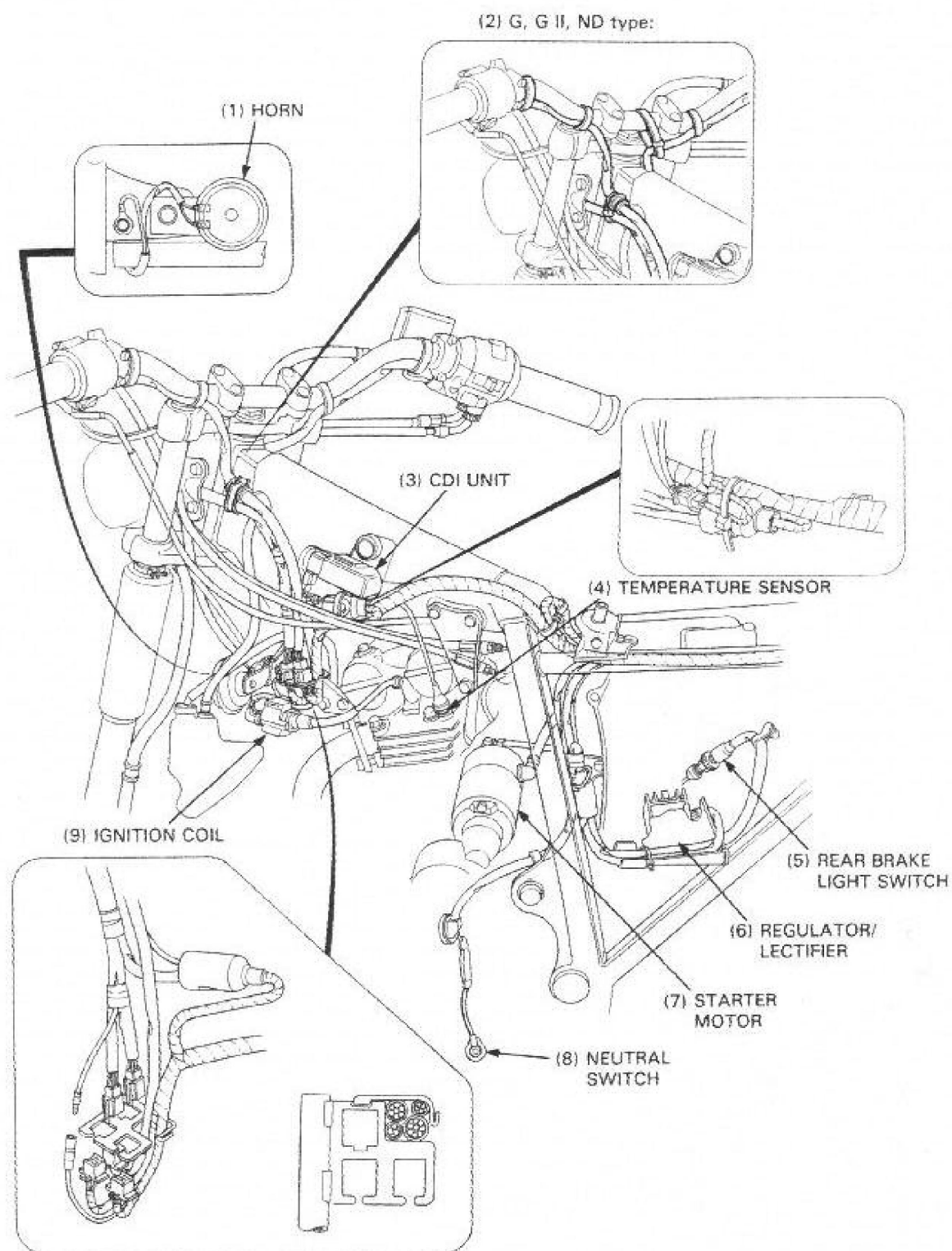


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X: INCORRECT

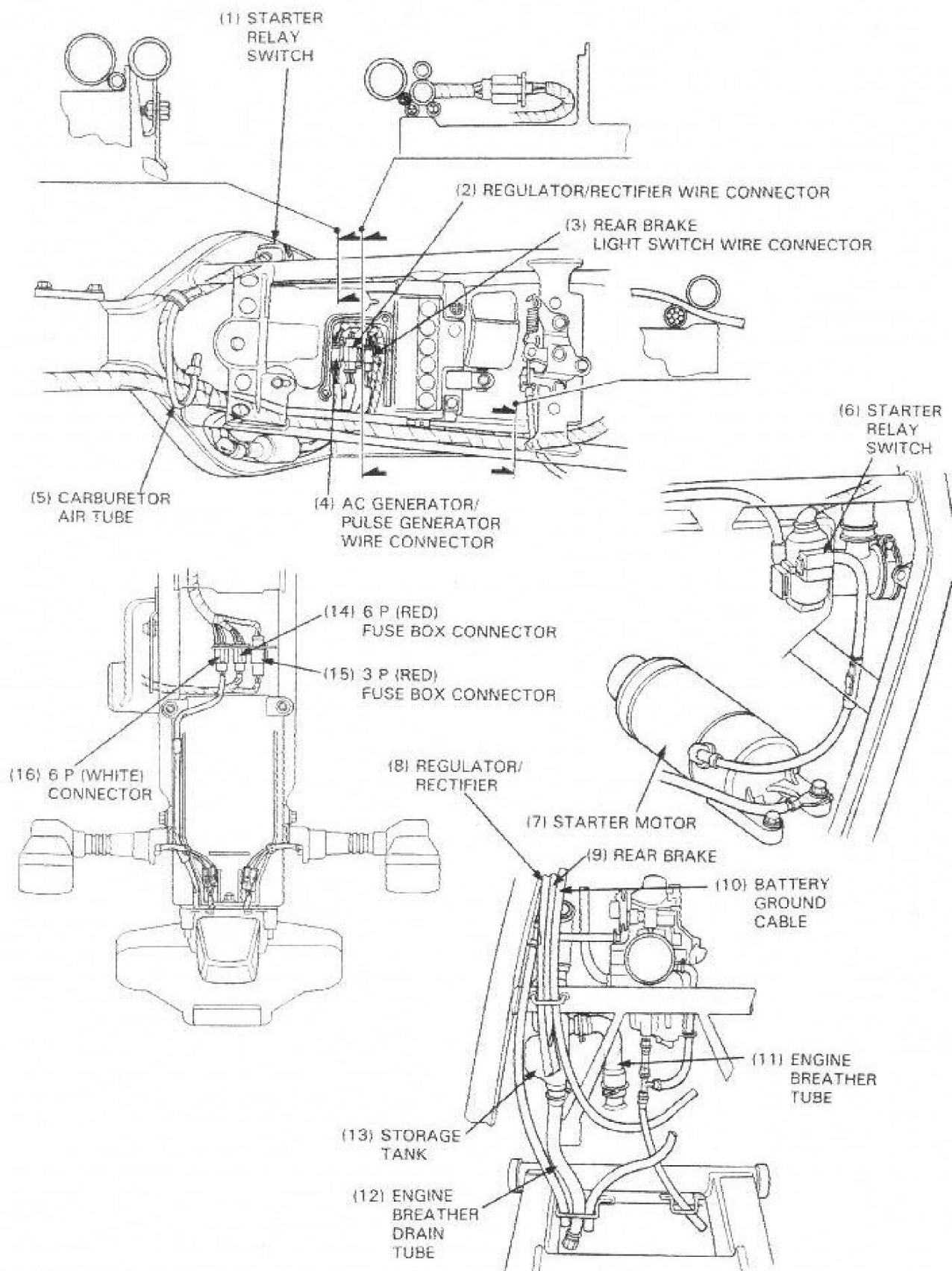
GENERAL INFORMATION



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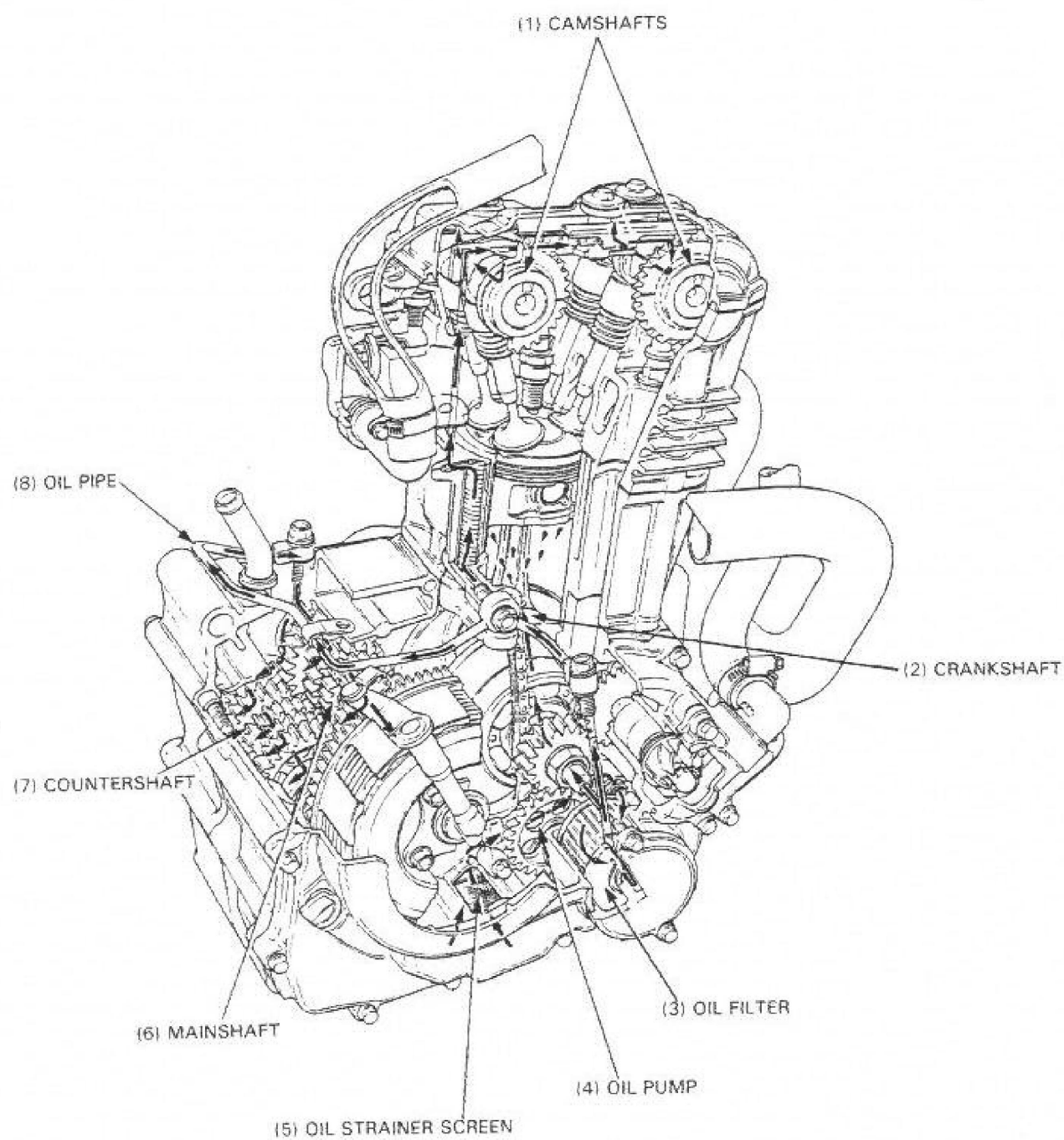
LUBRICATION

LUBRIFICATION

SCHMIERUNG

- (1) ARBRES A CAMES
- (2) VILEBREQUIN
- (3) FILTRE A HUILE
- (4) POMPE A HUILE
- (5) ECRAN DE CREPINE A HUILE
- (6) ARBRE PRIMAIRE
- (7) ARBRE DE RENVOI
- (8) TUYAU A HUILE

- (1) NOCKENWELLEN
- (2) KURBELWELLE
- (3) ÖLFILTER
- (4) ÖLPUMPE
- (5) ÖLSIEB
- (6) HAUPTWELLE
- (7) VORGELEGEWELLE
- (8) ÖLLEITUNG



LUBRICATION

SERVICE INFORMATION	2-1	ENGINE OIL STRAINER CLEANING	2-3
TROUBLESHOOTING	2-1	OIL PUMP	2-3
ENGINE OIL LEVEL CHECK	2-2	LUBRICATION POINTS	2-7
ENGINE OIL & FILTER CHANGE	2-2		

SERVICE INFORMATION

GENERAL

⚠ WARNING

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

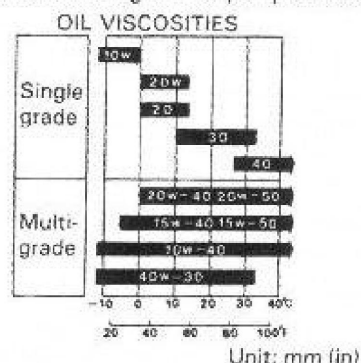
CAUTION

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

- This section describes inspection and replacement of engine oil and oil filter, oil strainer cleaning and oil pump service.

SPECIFICATIONS

Oil capacity	1.6 lit (1.69 U.S. qt., 1.41 Imp qt) at engine assembly
	1.3 lit (1.37 U.S. qt., 1.14 Imp qt) after draining
	1.32 lit (1.39 U.S. qt., 1.16 Imp qt) at oil and oil filter change
Recommended oil	Use Honda 4-Stroke Oil or equivalent.
	API Service Classification: SE or SF
	VISCOSITY: SAE 10W-40
	Other viscosities shown in the chart may be used when the average temperature in your riding area is within the indicated range.



ITEM	STANDARD	SERVICE LIMIT
Oil pump body clearance	0.10-0.21 (0.004-0.008)	0.25 (0.010)
Oil pump tip clearance	0.15 (0.006)	0.20 (0.008)
Oil pump end clearance	0.02-0.09 (0.001-0.004)	0.12 (0.005)
Oil pump delivery	4 lit (4.2 US qt, 3.5 Imp qt)/min at 5,000 min ⁻¹ (rpm)	—

TORQUE VALUE

Oil drain bolt	25 N·m (2.5 kg-m, 18 ft-lb)
----------------	-----------------------------

TROUBLESHOOTING

Oil level too low

- Normal oil consumption
- External oil leaks
- Worn piston rings

Oil contamination

- Oil or filter not changed often enough
- Faulty head gasket
- Internal coolant leaks
- Faulty water pump mechanical seal

Low oil pressure

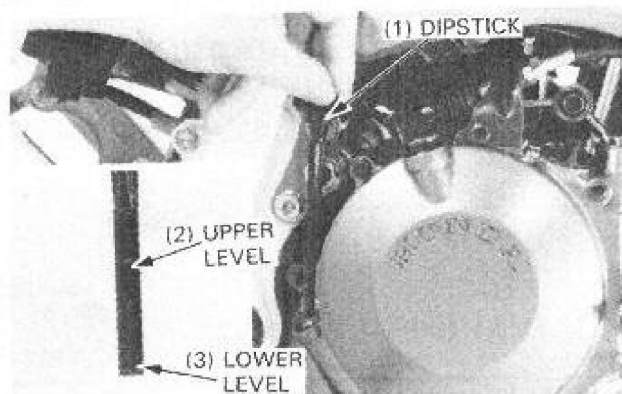
- Faulty oil pump
- Oil pump drive gear broken

LUBRICATION

ENGINE OIL LEVEL CHECK

Support the motorcycle upright on level ground.
Start the engine and let it idle for a few minutes.

Stop the engine. Check the oil level with the dipstick by inserting it in until the threads touch the hole.
Do not screw the dipstick in when making this check.



If the oil level is below the lower mark on the dipstick, fill to the upper level mark with the recommended oil through the filler cap hole.

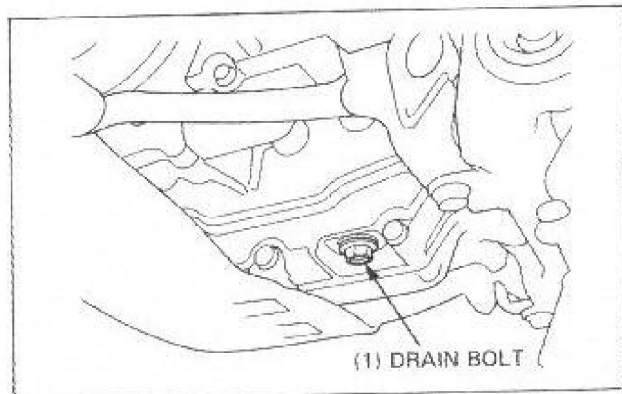


ENGINE OIL & FILTER CHANGE

NOTE

- Change engine oil with the engine warm and the motorcycle on its side stand to assure complete and rapid draining.

Remove the oil filler-cap and drain bolt.
Drain the oil.



Remove the following:

- oil filter cover.
- oil filter.
- spring.

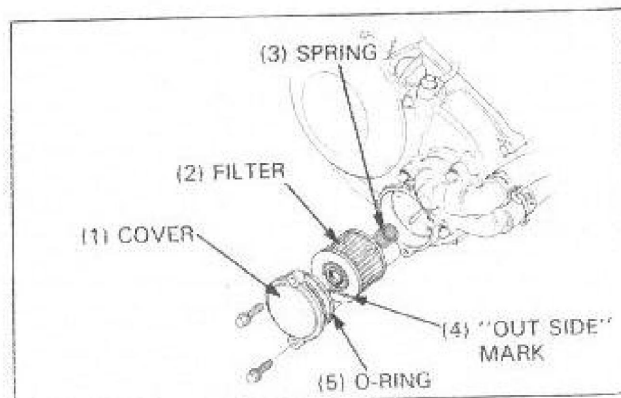
Discard the oil filter.

Install the following:

- spring.
- new oil filter.
- cover with a new O-ring.

NOTE

- Install the oil filter with the OUT SIDE mark facing out.



LUBRICATION

After the oil has drained, check that the drain bolt sealing washer is in good condition, and install the drain bolt.

TORQUE: 25 N·m (2.5 kg·m, 18 ft·lb)

NOTE

- Clean the engine oil strainer, if required, before filling the crankcase.

Fill the crankcase with the correct quantity of the recommended oil.

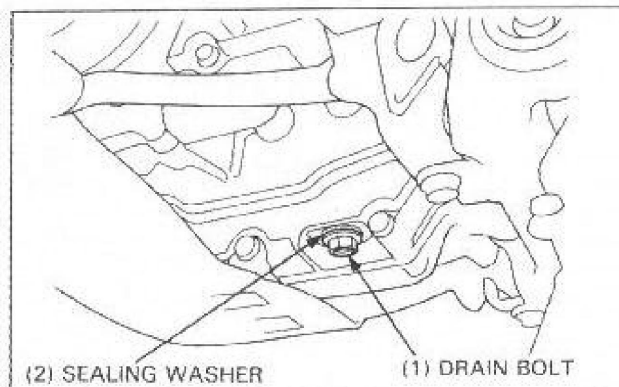
OIL CAPACITY: 1.32 lit (1.39 U.S. qt, 1.16 Imp qt)
at oil and oil filter change

RECOMMENDED OIL: Honda 4-stroke Oil or equivalent
API service classification: SE or SF
VISCOSITY: SAE 10W-40

Install the oil filler cap.

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

Stop the engine and wait a few minutes then check that the oil level is at the upper level mark with the motorcycle upright. Check that there are no oil leaks.



ENGINE OIL STRAINER CLEANING

NOTE

- Perform this maintenance before filling the engine with oil.

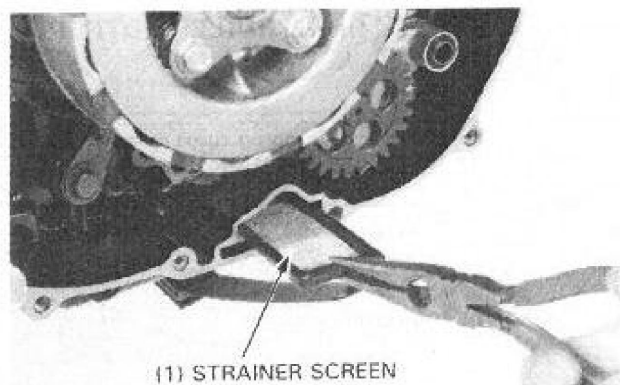
Remove the right crankcase cover (page 7-3).

Remove the oil strainer and clean it.

Install the oil strainer.

Install the right crankcase cover (page 7-10).

Fill the crankcase with recommended oil.

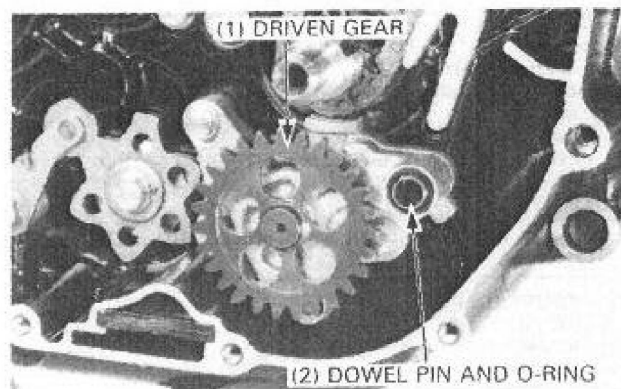


OIL PUMP

REMOVAL

Remove the following:

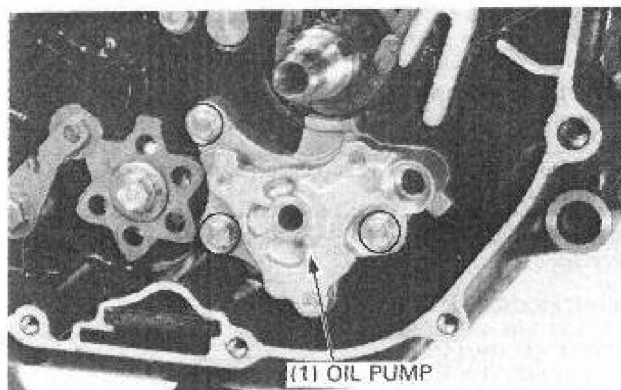
- right crankcase cover (page 7-3).
- clutch (page 7-4).
- primary drive gear (page 7-8).
- dowel pin with and O-ring.
- oil pump driven gear.



LUBRICATION

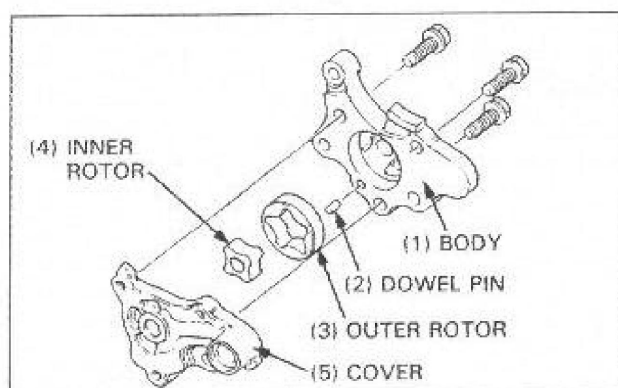
Remove the following:

- oil pump mounting bolts.
- oil pump.
- dowel pins.
- gasket.



Disassemble the oil pump.

Clean disassembled parts with non-flammable or high flash point solvent.

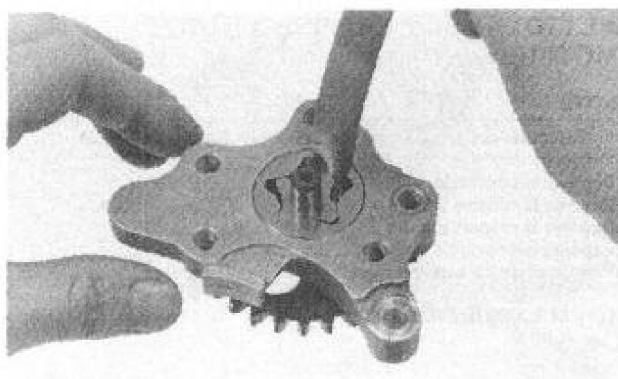


INSPECTION

Tip Clearance

Install the inner rotor and outer rotor in the oil pump body. Temporarily install the pump shaft to the pump body and measure the tip clearance.

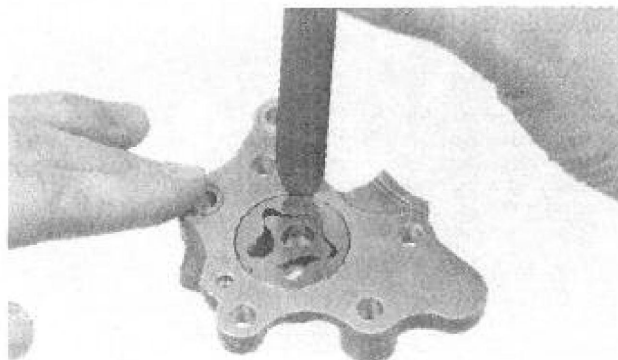
SERVICE LIMIT: 0.20 mm (0.008 in)



Body Clearance

Remove the pump shaft.
Measure the body clearance.

SERVICE LIMIT: 0.25 mm (0.010 in)

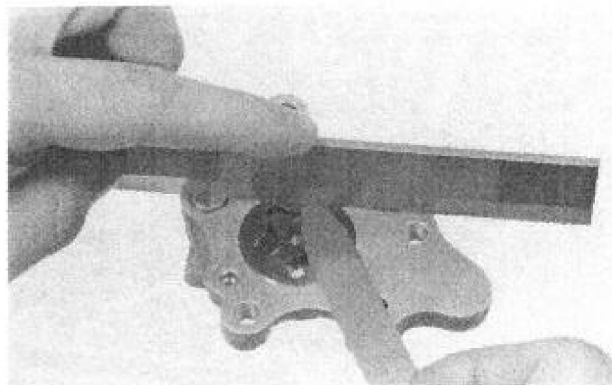


LUBRICATION

End Clearance

Measure the end clearance.

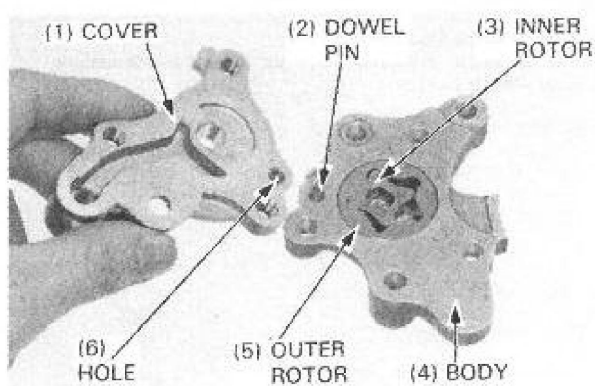
SERVICE LIMIT: 0.12 mm (0.005 in)



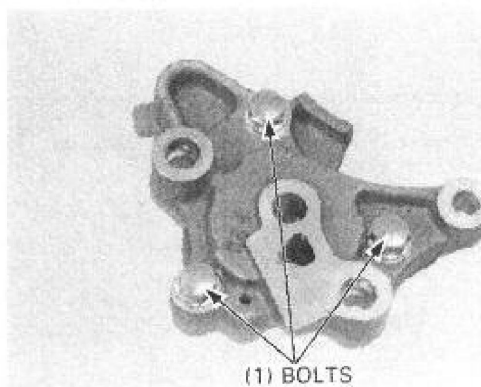
ASSEMBLY

Install the inner and outer rotors and the dowel pin in the pump body.

Install the pump cover on the body, aligning the cover hole with the dowel pin.

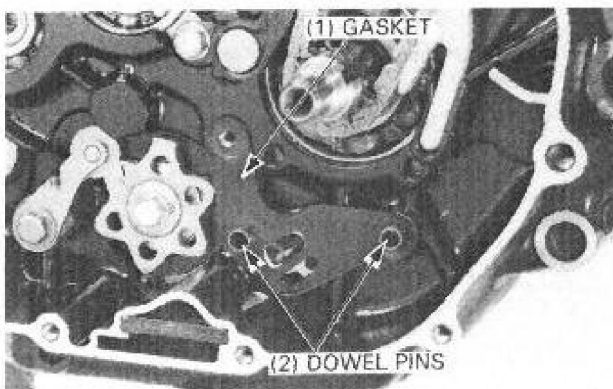


Tighten the bolts securely.



INSTALLATION

Install the dowel pins and a new gasket.



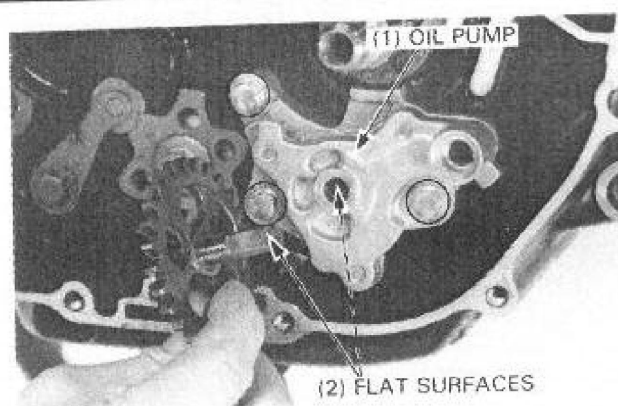
LUBRICATION

Install the oil pump and tighten the bolts securely.

Install the pump driven gear on the rotor by aligning their flat surfaces.

Install the following:

- primary drive gear (page 7-9).
- clutch (page 7-6).
- right crankcase cover (page 7-10).



LUBRICATION

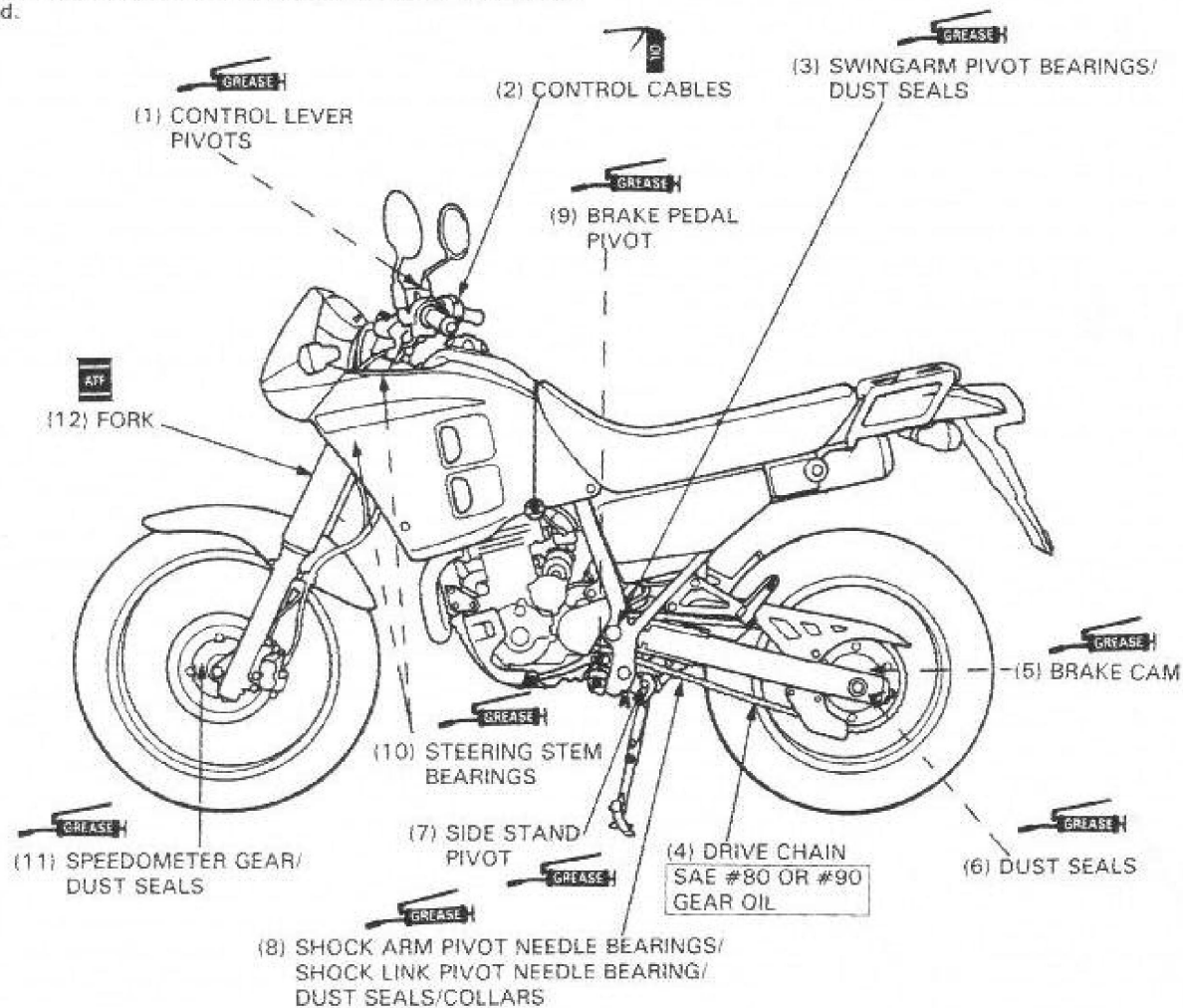
LUBRICATION POINTS

Use general purpose grease when not otherwise specified here.

Apply oil or grease to sliding surfaces and cables not shown here.

CONTROL CABLE LUBRICATION

Periodically disconnect the throttle and clutch cables at their upper ends. Clean the cable end mount in the throttle and clutch lever, then oil the cable ends and reinstall. It is not necessary to oil the cables: if a cable begins to bind, it must be replaced.



3 MAINTENANCE

SERVICE INFORMATION	3-1	DRIVE CHAIN	3-11
MAINTENANCE SCHEDULE	3-3	DRIVE CHAIN SLIDER	3-12
FUEL LINE	3-4	BRAKE FLUID	3-12
FUEL STRAINER SCREEN	3-4	BRAKE SHOE/PAD WEAR	3-13
THROTTLE OPERATION	3-4	BRAKE SYSTEM	3-13
CARBURETOR CHOKE	3-5	BRAKE LIGHT SWITCH	3-14
AIR CLEANER	3-5	HEADLIGHT AIM	3-14
CRANKCASE BREATHER	3-6	CLUTCH SYSTEM	3-14
SPARK PLUG	3-6	SIDE STAND	3-15
VALVE CLEARANCE	3-6	SUSPENSION	3-16
CARBURETOR IDLE SPEED	3-9	NUTS, BOLTS, FASTENERS	3-16
RADIATOR COOLANT	3-9	WHEELS/TIRES	3-17
COOLING SYSTEM	3-10	STEERING HEAD BEARINGS	3-18
CYLINDER COMPRESSION	3-10		

SERVICE INFORMATION

GENERAL

⚠ WARNING

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

NOTE

- For engine oil and oil filter maintenance see page 2-2.
- Support the motorcycle on a level surface before starting any work.

SPECIFICATIONS

Throttle grip free play: 2–6 mm (1/8–1/4 in)

Spark plug:

Standard	
NGK	ND
CR9EH-9	U27FER-9

Spark plug gap: 0.8–0.9 mm (0.031–0.035 in)

Valve clearance: IN 0.23 ± 0.03 mm (0.009 ± 0.001 in)

EX 0.23 ± 0.03 mm (0.009 ± 0.001 in)

Carburetor idle speed: 1,300 ± 100 rpm

Cylinder compression: 1,569 ± 96 kPa (16.0 ± 1.0 kg/cm², 228 ± 14 psi)

MAINTENANCE

Drive chain slack:	25–35 mm (1–1-3/8 in)
Drive chain slider depth limit:	3.0 mm (0.12 in)
Rear 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)
Tires:	

		Front	Rear
Tire size		90/100-19 55P (Tube type)	120/90-16 63P (Tube type)
Cold tire pressure kPa (kg/cm ² , psi)	Driver only	150 (1.50, 22)	150 (1.50, 22)
	Driver and one passenger	150 (1.50, 22)	175 (1.75, 25)
Tire brand	DUNLOP	K460	K460
	BRIDGESTONE	TW39	TW40

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 kg-m, 9 ft-lb)
Rear axle nut	95 N·m (9.5 kg-m, 69 ft-lb)
Spoke	3.8 N·m (0.38 kg-m, 2.7 ft-lb)
Brake reservoir cover screw	1.5 N·m (0.15 kg-m, 1.1 ft-lb)

TOOL

Common	
Spoke wrench, 5.8 x 6.1 mm	07701–0020300

MAINTENANCE SCHEDULE

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

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

R: Replace C: Clean L: Lubricate

ITEM	FREQUENCY	WHICHEVER COMES FIRST	ODOMETER READINGS (NOTE 1)								REFER TO PAGE
			x 1,000 km	1	6	12	18	24	30	36	
			x 1,000 mi	0.6	4	8	12	16	20	24	
			NOTES	MONTHS	6	12	18	24	30	36	
* FUEL LINE					I			I		I	3-4
* FUEL STRAINER SCREEN					C	C	C	C	C	C	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	3-6
ENGINE OIL				R		R		R		R	2-2
ENGINE OIL FILTER				R		R		R		R	2-2
* CARBURETOR IDLE SPEED				I	I	I	I	I	I	I	3-8
RADIATOR COOLANT	(NOTE 5)					I		I		R	3-8
* COOLING SYSTEM						I		I		I	3-9
DRIVE CHAIN	(NOTE 4)				EVERY 1,000 km (600 mi) I, L						3-11
DRIVE CHAIN SLIDER					I	I	I	I	I	I	3-12
BRAKE FLUID	(NOTE 5)				I	I	R	I	I	R	3-12
BRAKE SHOE/PAD WEAR					I	I	I	I	I	I	3-13
BRAKE SYSTEM				I		I		I		I	3-13
* BRAKE LIGHT SWITCH						I		I		I	3-14
* HEADLIGHT AIM						I		I		I	3-14
CLUTCH SYSTEM				I	I	I	I	I	I	I	3-14
SIDE STAND						I		I		I	3-15
* SUSPENSION						I		I		I	3-16
* NUTS, BOLTS, FASTENERS	(NOTE 4)			I		I		I		I	3-16
** WHEELS/TIRES	(NOTE 4)			I	I	I	I	I	I	I	3-17
** STEERING HEAD BEARINGS				I		I		I		I	3-18

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

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

NOTES: 1. At higher odometer readings, 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. Service more frequently when riding OFF-ROAD.

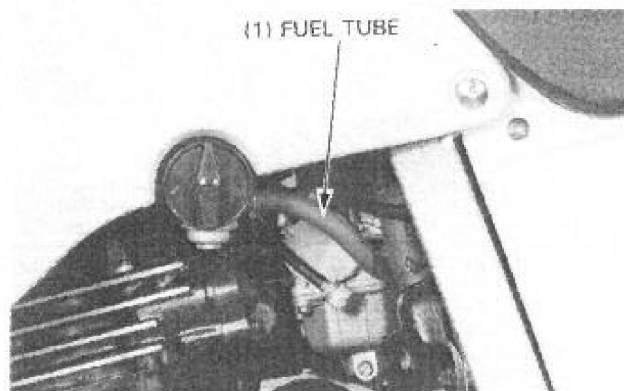
5. Replace every 2 years, or at the indicated odometer interval, whichever comes first.

Replacement requires mechanical skill.

MAINTENANCE

FUEL LINE

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



FUEL STRAINER SCREEN

⚠ WARNING

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

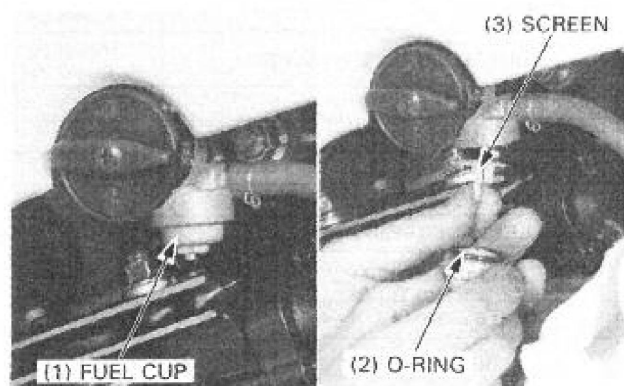
Turn the fuel valve OFF.

Remove the fuel cup, O-ring and strainer and pour the contents of the fuel cup into a suitable container.

Wash the screen and cup in clean non-flammable or high flash point solvent.

Reinstall the strainer, O-ring and fuel cup into the fuel valve body, making sure that the O-ring is in place.

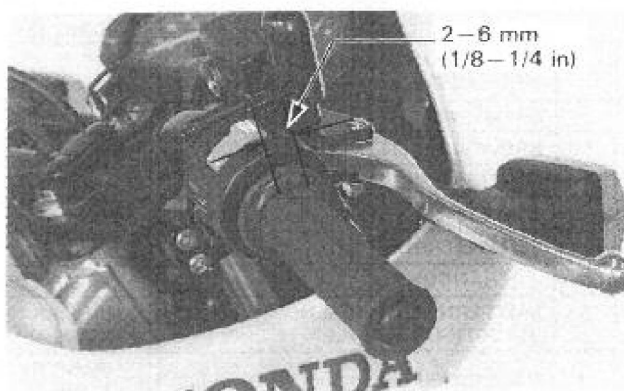
Tighten the fuel cup securely.



NOTE

- Do not over-tighten the fuel cup.

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



THROTTLE OPERATION

Check the throttle grip for smooth operation: complete opening and automatic closing in all steering positions.

Make sure there is no deterioration, damage, or kinking in the throttle cables. Replace any damaged parts.

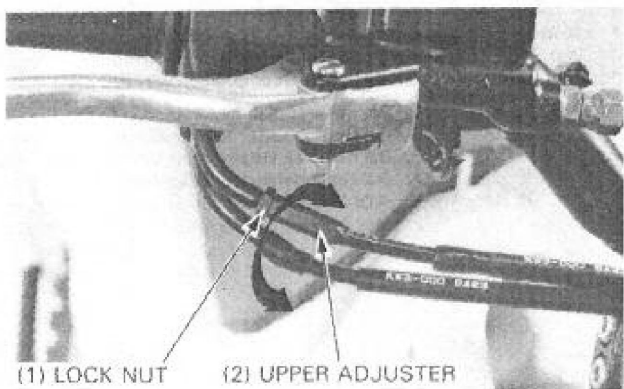
Lubricate the throttle cables (page 2-7) if throttle operation is not smooth.

Measure throttle grip free play at the throttle grip flange.

FREE PLAY: 2-6 mm (1/8-1/4 in)

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

Minor adjustments are made with the upper adjuster. Loosen the lock nut and turn the adjuster to increase or decrease free play.



MAINTENANCE

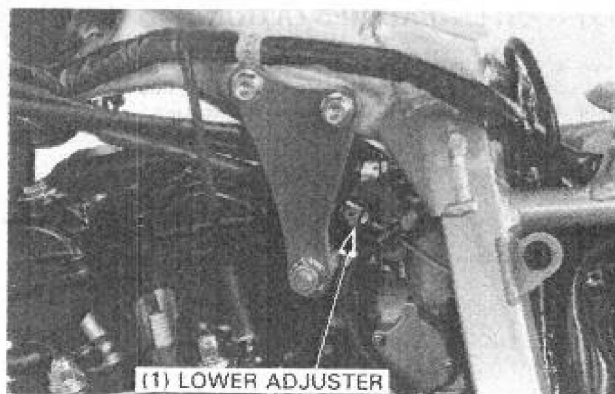
Major adjustments are made with the lower adjuster.

Remove the seat and left side fairing.

Adjust the free play by loosening the lock nuts and turning the adjuster.

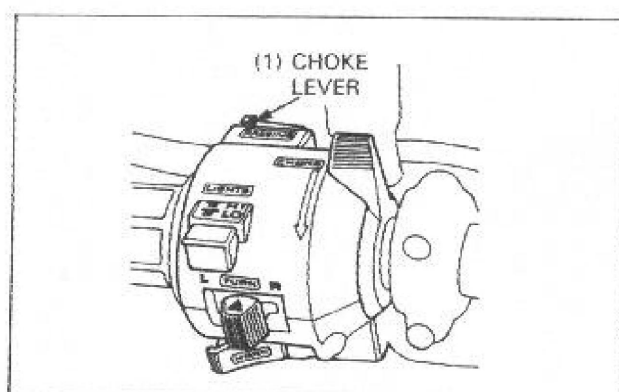
Tighten the lock nut.

Recheck the throttle grip free play.



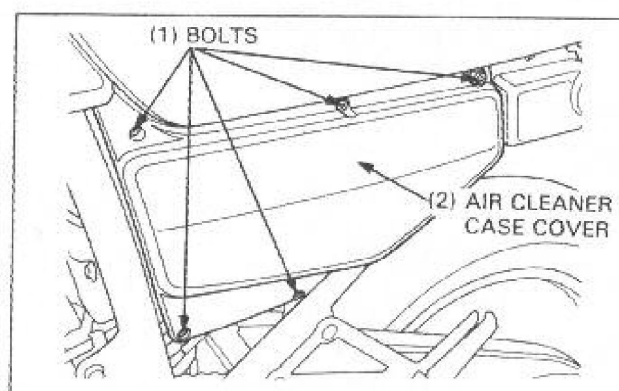
CARBURETOR CHOKE

Check for smooth upper choke lever operation. Lubricate the choke cable if the operation is not smooth.



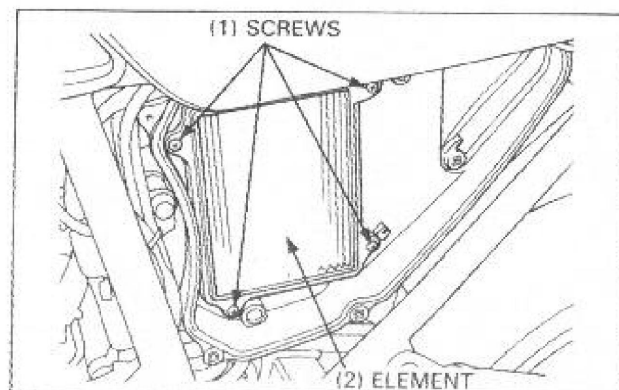
AIR CLEANER

Remove the five bolts attaching the air cleaner case cover.



Remove the screws and replace the air cleaner element.

Tighten the screws securely and install the air cleaner case cover.



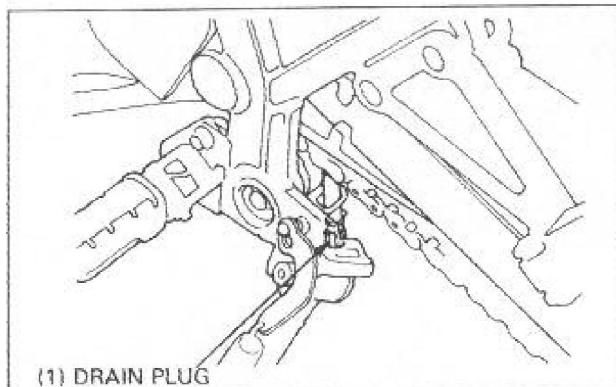
MAINTENANCE

CRANKCASE BREATHER

Remove the drain plug from the tube and drain the deposits. Reinstall the drain plug.

NOTE

- Service more frequently when the motorcycle has been ridden in rain, or at full throttle.



SPARK PLUG

RECOMMENDED SPARK PLUGS

	NGK	ND
Standard	CR9EH9	U27FER9

Disconnect the spark plug cap and clean any dirt from around the spark plug base.

Remove and discard the spark plug.

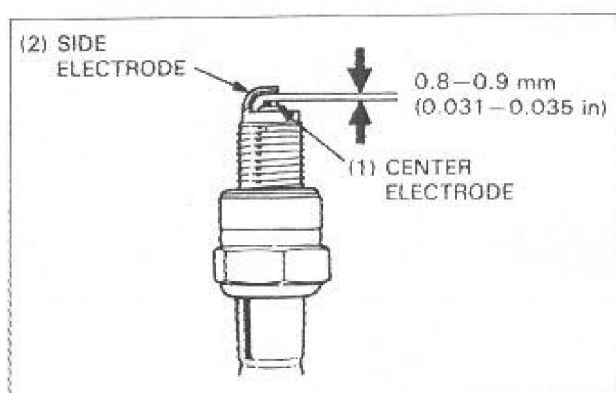
Measure the new spark plug gap using a wire-type feeler gauge.

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

Adjust the gap if necessary by bending the side electrode carefully and install the plugs.

TORQUE: 12 N·m (1.2 kg-m, 9 ft-lb)

Connect the spark plug caps.



VALVE CLEARANCE

INSPECTION

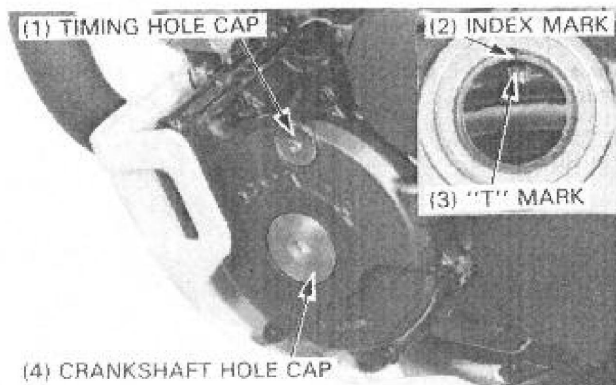
NOTE

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

Remove the cylinder head cover (page 9-3).

Remove the crankshaft hole cap and timing hole cap. Rotate the crankshaft counterclockwise and align the "T" mark on the flywheel with the index mark on the left crankcase cover.

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



MAINTENANCE

Check the valve clearance by inserting a feeler gauge between the cam lobe and valve lifter.

VALVE CLEARANCE:

Intake and Exhaust: 0.23 ± 0.03 mm (0.009 ± 0.001 in)

If the clearance is not correct:
Remove the camshafts (page 9-3).
Remove the valve lifters and shims.

NOTE

- Do not allow to fall shim into crankcase.
The shim(s) may occasionally stick to the lifter.
- Mark all lifters and shims to ensure correct reassembly.
- It is easy to remove the valve lifter with a valve lapping tool or magnet.
- Remove the shims with a tweezers or magnet.

Clean the valve retainers with compressed air.

Measure the shim thickness with a micrometer and record it.

Use the chart on the following page to select the shims needed to bring the valve clearances within specification.

NOTE

- Sixty-five shims are available in thickness intervals of 0.025 mm.
The thinnest is 1.200 mm the thickest is 2.800 mm.

To confirm your shim choice, you may use the following formula:

$$a = b - c + d$$

a: new shim thickness

b: recorded valve clearance

c: specified valve clearance

d: old shim thickness

example:

recorded valve clearance: 0.18 mm

old shim thickness: 1.750 mm

specified valve clearance: 0.23 mm

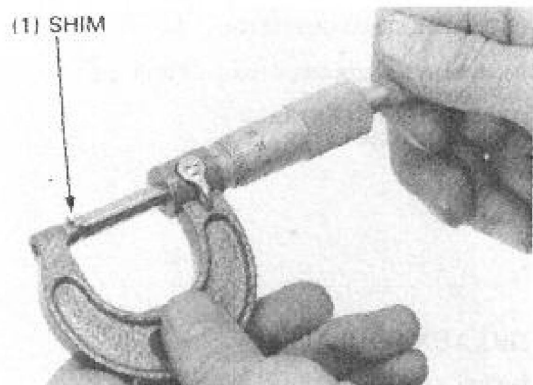
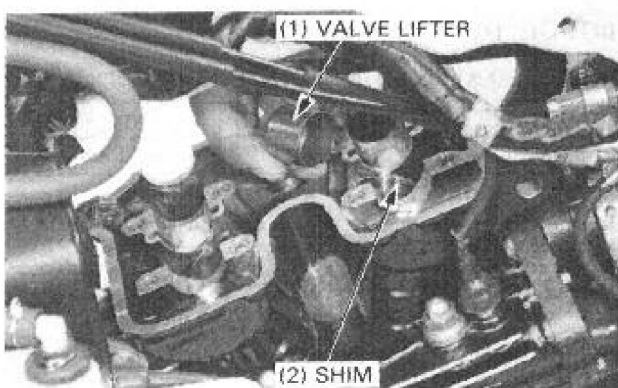
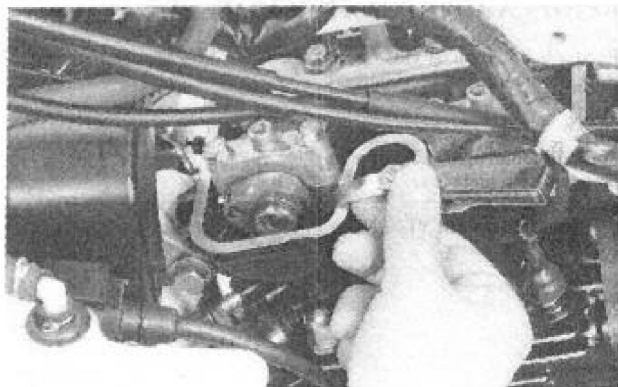
$$a = 0.18 - 0.23 + 1.750$$

$$a = 1.7$$

$$\text{new shim thickness} = 1.700 \text{ mm}$$

NOTE

- If the required thickness of the new shim is more than 2.800 mm, the valve seat is probable heavily carboned. Reface the seat, recheck valve clearance and reselect the shim.



			
1.200 mm	1.225 mm	1.250 mm	1.275 mm

SHIM SELECTION CHART

		VALVE CLEARANCE (MILLIMETERS)															
		0.00	0.06	0.11	0.16	0.20	0.27	0.31	0.36	0.41	0.46	0.51	0.56	0.61	0.66	0.71	0.76
		TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO	TO
		0.05	0.10	0.15	0.19	0.26	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80
1.20							1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75
1.25				1.20		S	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80
1.30	P		1.20	1.25	1.30		1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85
1.35	R		1.20	1.25	1.30	P	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90
1.40	E		1.25	1.30	1.35	E	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95
1.45	S		1.30	1.35	1.40	C	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00
1.50	E		1.35	1.40	1.45	I	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05
1.55	N		1.40	1.45	1.50	F	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10
1.60	F		1.45	1.50	1.55	I	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15
1.65			1.50	1.55	1.60	E	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20
1.70	S		1.55	1.60	1.65	D	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20	2.25
1.75	H		1.60	1.65	1.70		1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20	2.25	2.30
1.80	I		1.65	1.70	1.75	C	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20	2.25	2.30	2.35
1.85	M		1.70	1.75	1.80	I	1.90	1.95	2.00	2.05	2.10	2.15	2.20	2.25	2.30	2.35	2.40
1.90			1.75	1.80	1.85	E	1.95	2.00	2.05	2.10	2.15	2.20	2.25	2.30	2.35	2.40	2.45
1.95	S		1.80	1.85	1.90	A	2.00	2.05	2.10	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50
2.00	I		1.85	1.90	1.95	R	2.05	2.10	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55
2.05	Z		1.90	1.95	2.00	A	2.10	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60
2.10	E		1.95	2.00	2.05	N	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65
2.15			2.00	2.05	2.10	C	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70
2.20			2.05	2.10	2.15	E	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75
2.25			2.10	2.15	2.20		2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80
2.30			2.15	2.20	2.25		2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	
2.35			2.20	2.25	2.30		2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80		
2.40			2.25	2.30	2.35	N	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80			
2.45			2.30	2.35	2.40	O	2.50	2.55	2.60	2.65	2.70	2.75	2.80				
2.50			2.35	2.40	2.45		2.55	2.60	2.65	2.70	2.75	2.80					
2.55			2.40	2.45	2.50	C	2.60	2.65	2.70	2.75	2.80						
2.60			2.45	2.50	2.55	H	2.65	2.70	2.75	2.80							
2.65			2.50	2.55	2.60	A	2.70	2.75	2.80								
2.70			2.55	2.60	2.65	N	2.75	2.80									
2.75			2.60	2.65	2.70	G	2.80										
2.80			2.65	2.70	2.75	E											

To use this chart.

1. Locate the measured clearance on the top horizontal column.
2. Find the thickness of the old shim on vertical column on the left.
3. Find the replacement shim at the intersection of the two columns.

NOTE:

This chart is summary. For accurate shim selection, use the formula described on page 3-7.

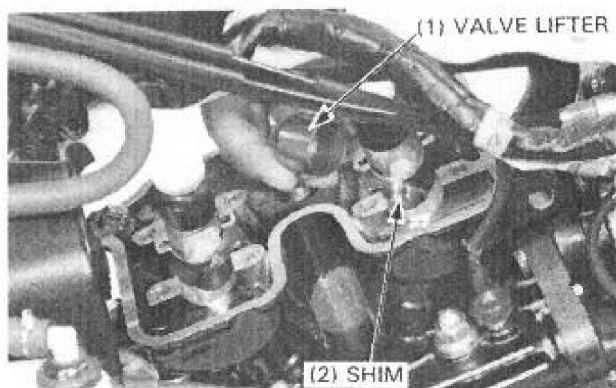
MAINTENANCE

Install the shims on the valve retainers.
Apply molybdenum disulfide oil to the valve lifters.
Install the valve lifters into valve lifter holes.

NOTE

- Replacement lifters come in four different thickness. Be sure to recheck valve clearance whenever a lifter is replaced.
- Install the shims and valve lifters in their original positions.

Install the camshafts (page 9-16) and rotate them by rotating the crankshaft counterclockwise several times.
Recheck the valve clearance.
Install the cylinder head cover (page 9-19).



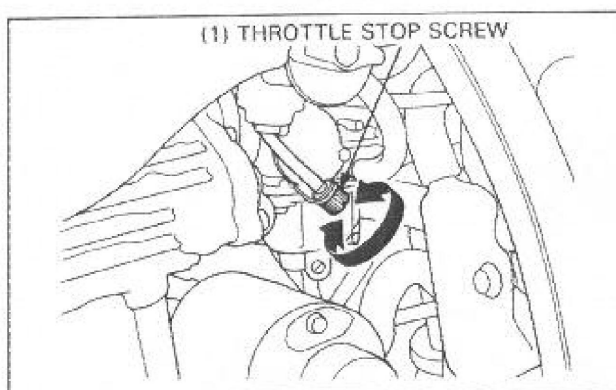
CARBURETOR IDLE SPEED

NOTE

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

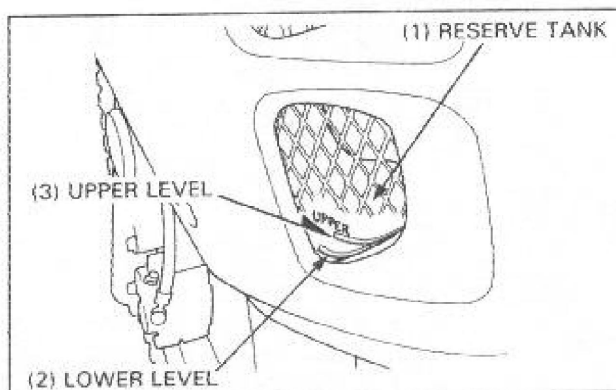
Warm up the engine.
Support the motorcycle in an upright position on level ground and shift the transmission into neutral.
Check the idle speed and adjust by turning the throttle stop screw if necessary.

IDLE SPEED: $1,300 \pm 100 \text{ min}^{-1}(\text{rpm})$

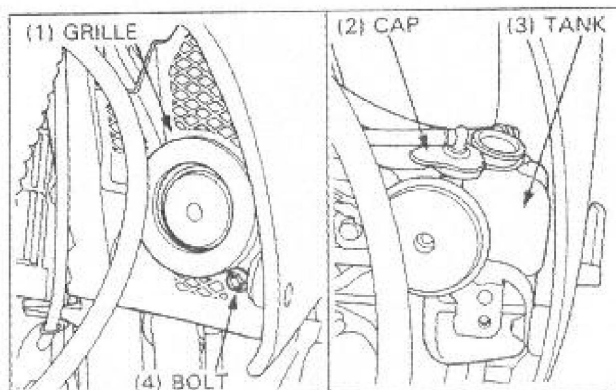


RADIATOR COOLANT

Check the coolant level of the reserve tank with the engine running at normal operating temperature. The level should be between the "UPPER" and "LOWER" level lines.



If necessary, remove the grille and reserve tank cap then fill to the "UPPER" level line with a 50/50 mixture of distilled water and antifreeze.



MAINTENANCE

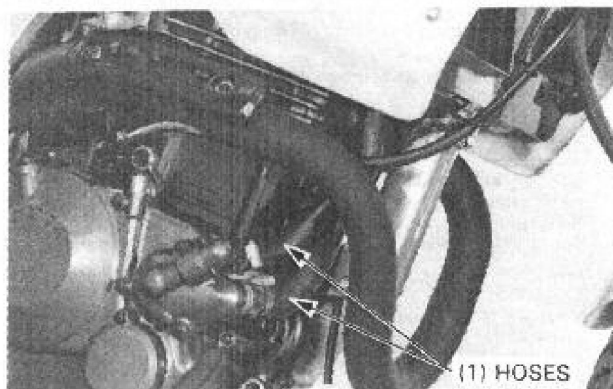
COOLING SYSTEM

Make sure the hoses are in good condition; they should not show any signs of deterioration.

Replace any hose that shows signs of deterioration.

Check that all hose clamps are tight.

Remove the right side fairing (page 15-2) and radiator grille.

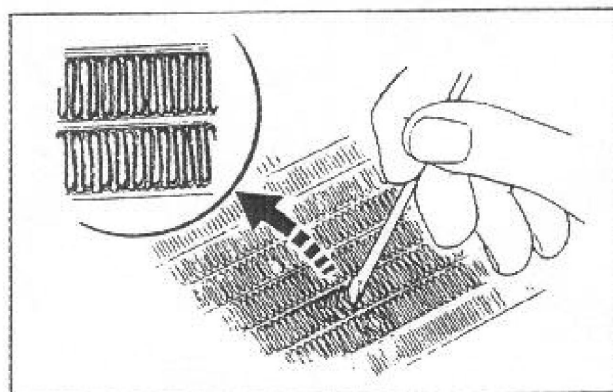


Check the air passages for clogging or damage.

Straighten bent fins or collapsed core tubes and remove insects, mud or any obstructions with compressed air or low water pressure.

Replace the radiator if the air flow is restricted over more than 30% of the radiating surface.

For radiator replacement, refer to page 5-5.



CYLINDER COMPRESSION

Warm up the engine to normal operating temperature.

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

Insert the compression gauge. Open the throttle all the way and crank the engine with the starter motor. Crank the engine until the gauge reading stops rising. The maximum reading is usually reached within 4–7 seconds.

COMPRESSION PRESSURE:

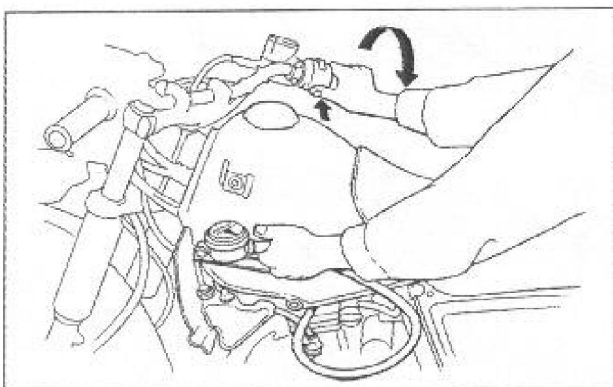
$1,596 \pm 96 \text{ kPa}$ ($16.0 \pm 1.0 \text{ kg/cm}^2$, $228 \pm 14 \text{ psi}$)

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

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

If the compression increases from the previous value, check the cylinder, piston and piston rings.

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



MAINTENANCE

DRIVE CHAIN

⚠ WARNING

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

CHAIN SLACK INSPECTION

Stop the engine, shift the transmission into neutral and support the motorcycle on its side stand.

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

SLACK: 25–35 mm (1 – 1-3/8 in)

CAUTION

- *Excessive chain slack, 40 mm (1-5/8 in) or more, may damage the frame.*

ADJUSTMENT

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

CAUTION

- *Make sure the same index marks on both the left and right adjusters align with the ends of the cut-outs.*

Tighten the axle nut.

TORQUE: 95 N·m (9.5 kg·m, 69 ft·lb)

Check the chain slack and free wheel rotation.

Check the chain wear label. If the red zone on the label aligns with, or is beyond the arrow mark, the chain must be replaced.

REPLACEMENT CHAIN:

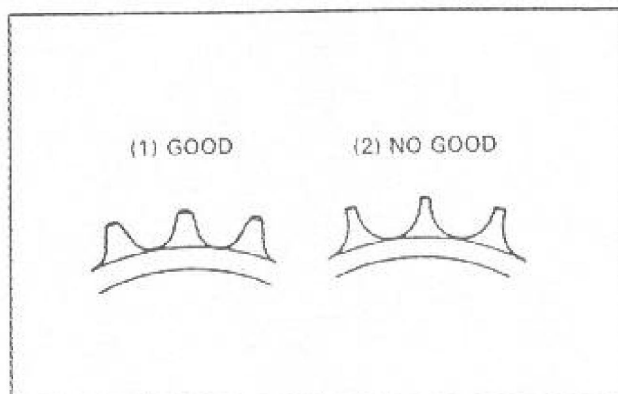
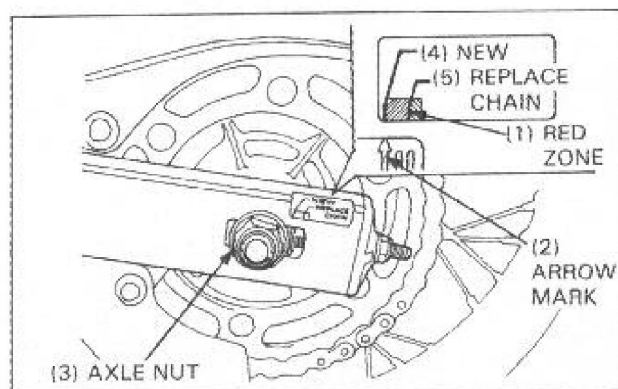
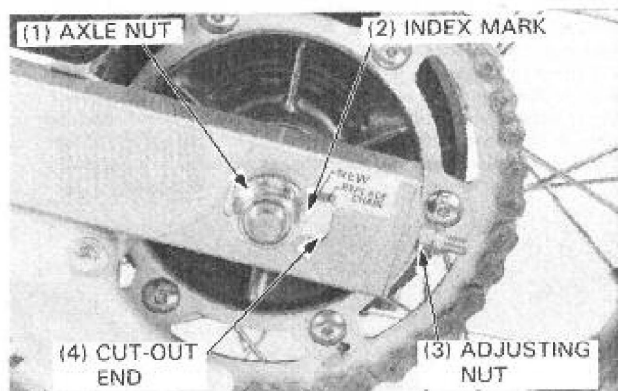
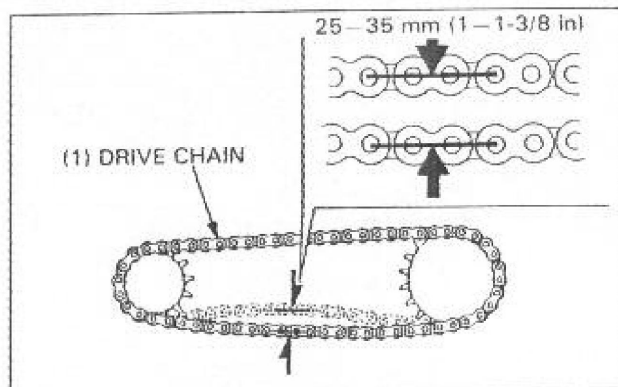
Daido: D.I.D.520VC.7-102L

Takasago: RK520T0-102L

Inspect the drive chain and sprockets for damage or wear. A drive chain with damaged rollers, loose pins, or missing O-rings must be replaced. Replace any sprocket which is damaged or excessively worn.

NOTE

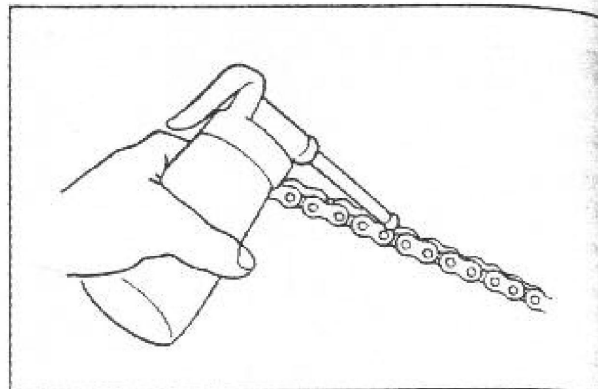
- *Never install a new drive chain on worn sprockets or a worn drive chain on new sprockets. Both chain and sprockets must be in good condition or the replacement chain or sprockets will wear rapidly.*



MAINTENANCE

Lubrication and cleaning:

The drive chain on this motorcycle is equipped with small O-rings between the link plates. The O-rings can be damaged by steam cleaners, high pressure washers, and certain solvents. Clean the chain with soapy water. Wipe dry and lubricate only with SAE #80 or 90 gear oil. Commercial chain lubricants may contain solvents which could damage the rubber O-rings.



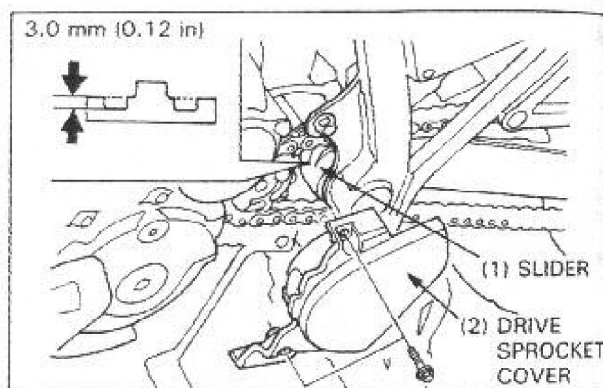
DRIVE CHAIN SLIDER

Remove the drive sprocket cover.
Inspect the chain slider for excessive wear.

SERVICE LIMIT:

(from upper surface): 3.0 mm (0.12 in)

Install the drive sprocket cover.

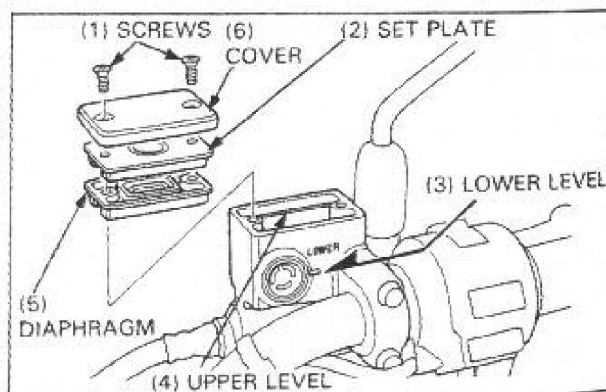


BRAKE FLUID

Check the front brake fluid through the sight glass; if the level is visible, remove the cover, set plate and diaphragm. Fill the reservoir to the upper level with DOT 4 fluid from a sealed container. Check the system for leaks.

CAUTION

- Do not remove the reservoir cover until the handlebar has been turned so that the reservoir is level.
- 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 the fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.



Refer to section 14 for brake bleeding procedures.

Tighten the cover screws to the specified torque.

TORQUE: 1.5 N·m (0.15 kg-m, 1.1 ft-lb)

MAINTENANCE

BRAKE SHOE/PAD WEAR

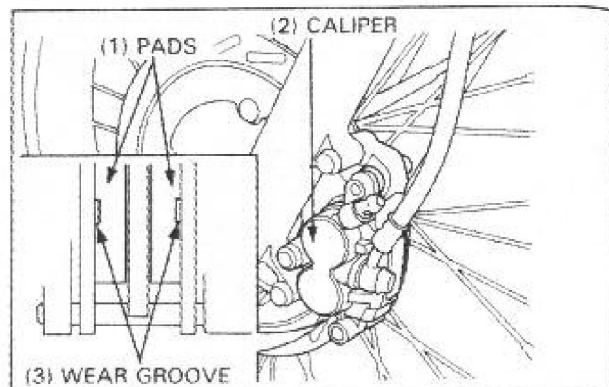
BRAKE PAD WEAR

Check the brake pads for wear.

Replace the brake pads if they are worn down to the wear groove on the pads.

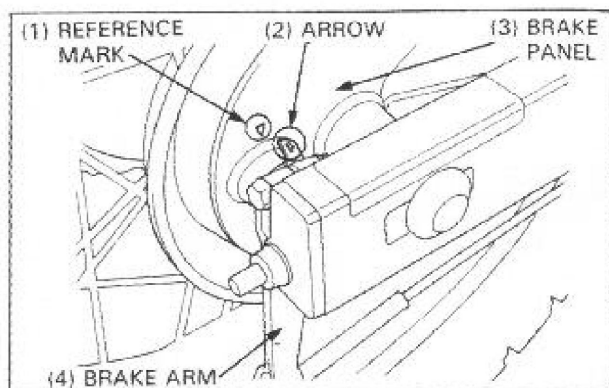
CAUTION

- Always replace the brake pads as a set to assure even disc pressure.



BRAKE SHOE INSPECTION

Replace the brake shoes if the arrow on the brake arm aligns with the reference mark "Δ" on full application of the rear brake pedal.



BRAKE SYSTEM

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

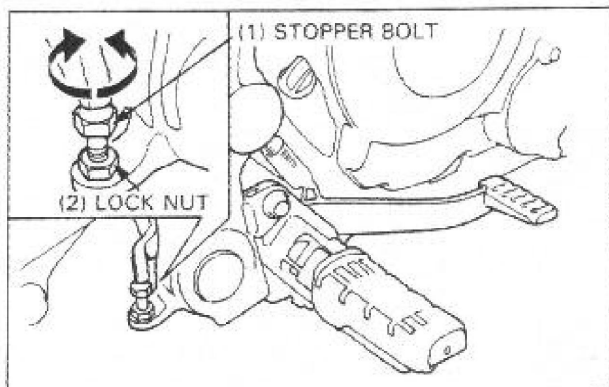
BRAKE PEDAL HEIGHT

To Adjust:

Loosen the stopper bolt lock nut and turn the stopper bolt. Retighten the lock nut.

NOTE

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



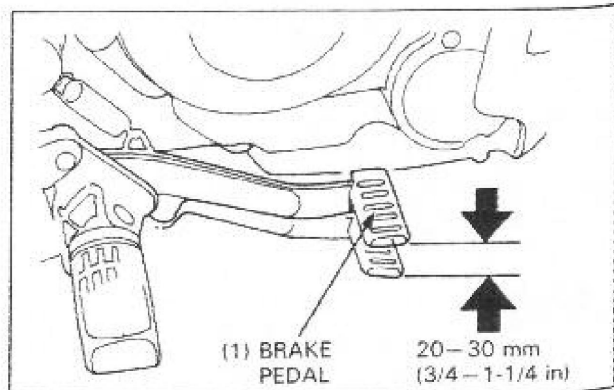
BRAKE PEDAL FREE PLAY

NOTE

- Always adjust the brake pedal free play after adjusting brake pedal height.

Check the brake pedal free play.

FREE PLAY: 20–30 mm (3/4–1-1/4 in)

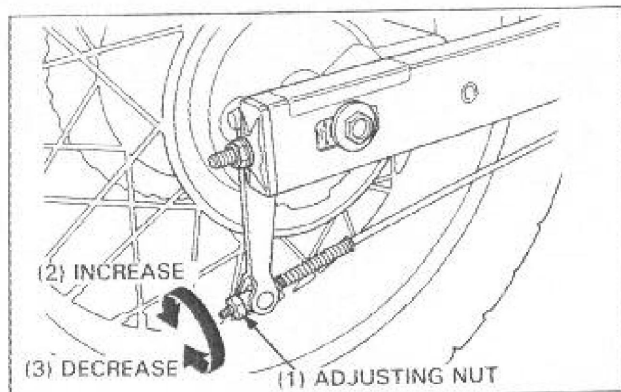


MAINTENANCE

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

NOTE

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

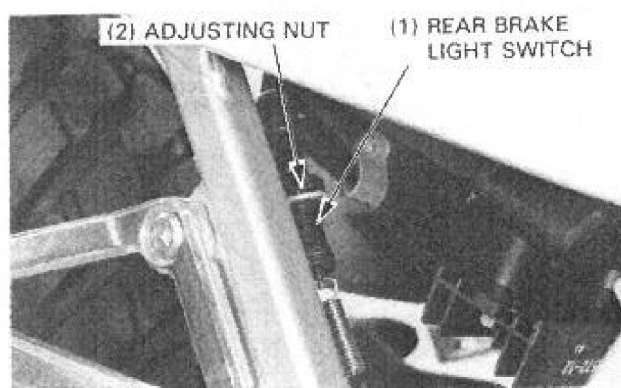


BRAKE LIGHT SWITCH

NOTE

- Always adjust the rear brake light switch after adjusting the brake pedal play and height.
- 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

ADJUSTMENT

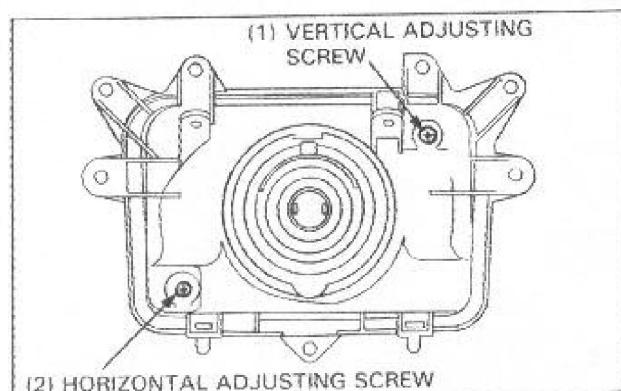
Adjust vertically by turning the vertical adjusting screw. Adjust horizontally by turning the horizontal adjusting screw.

NOTE

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

⚠ WARNING

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



CLUTCH SYSTEM

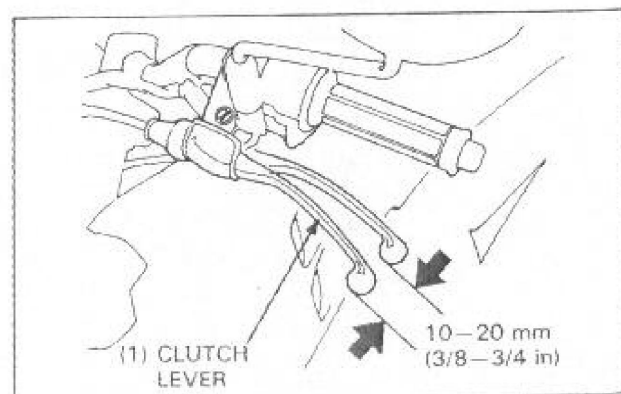
Check the clutch cable and clutch lever for loose connections, excessive play, or other damage. Replace or repair if necessary.

Disconnect the clutch cable at the upper end. Inspect the cable for kinks or damage and thoroughly lubricate the cable and pivot point with a commercially available cable lubricant to prevent premature wear. Install the cable.

CLUTCH LEVER FREE PLAY

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

FREE PLAY: 10–20 mm (3/8–3/4 in)

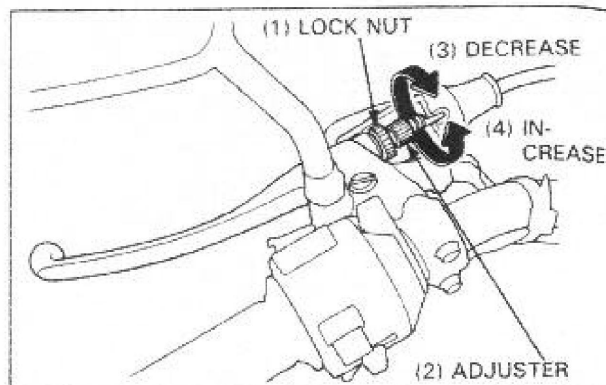


MAINTENANCE

A minor adjustment can be made with the upper adjuster. Slide the rubber cover off the adjuster, loosen the lock nut and adjust the free play by turning the adjuster. Tighten the lock nut with a pair of pliers after adjustment.

NOTE

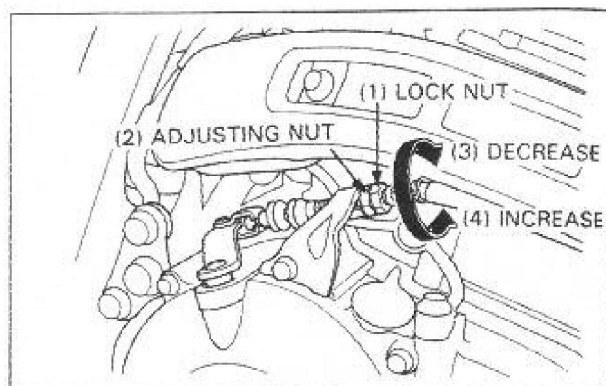
- Do not expose the adjuster threads more than 8 mm (0.32 in).



If necessary, a major adjustment can be made with the lower adjuster:

Loosen the adjuster lock nut at the clutch lever and turn the adjuster in completely. Then back it out 2 turns and tighten the lock nut. Install the rubber cover.

Loosen the cable lower adjuster lock nut. Turn the adjusting nut to obtain the specified free play. Then tighten the lock nut.



SIDE STAND

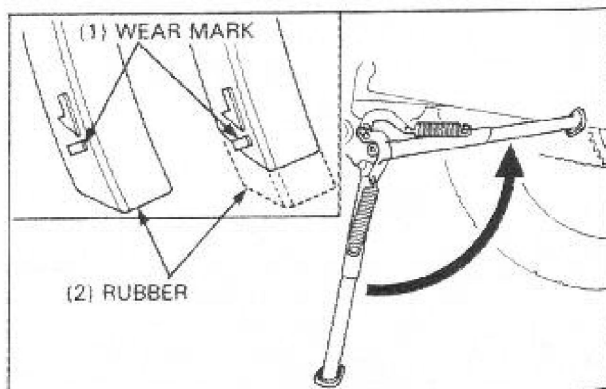
Check the rubber pad for wear or damage. Replace the rubber pad if wear extends to the wear line.

Check the side stand operation.

The side stand should lower easily to its first stop, then lock to support the motorcycle as the rubber touches the ground.

When the motorcycle is lifted upright, the stand should automatically move to the first click, and retract when kicked up.

If the side stand does not move freely, disassemble it:



Git Type:

Support the motorcycle on its side stand. Check the side stand operation: the side stand should fully retract automatically when you lift the motorcycle upright. If the side stand does not retract automatically, lubricate the side stand pivot with grease. Replace the side stand pivot bolt or springs, if the side stand still does not retract normally. Move the side stand sideways with force to check if the side stand pivot is worn.

MAINTENANCE

Remove the return spring at the retracted position.
Remove the pivot bolt and remove the side stand assembly from the frame.

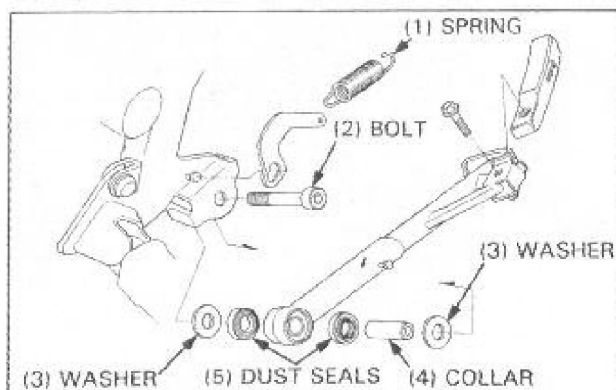
Check the following parts for wear or damage:

- inside of the pivot and pivot collar
- pivot dust seals

Lubricate the pivot area with clean grease and reassemble the side stand.

CAUTION

- *Install the dust seal with its mark side facing in.*
- *Make sure that the dust seal spring is seated on the outside of the seal lips after installing the pivot collar.*



Recheck the side stand movement.

SUSPENSION

WARNING

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

FRONT

Check the action of the fork by compressing the suspension several times.

Check the entire fork assembly for leaks or damage.

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.



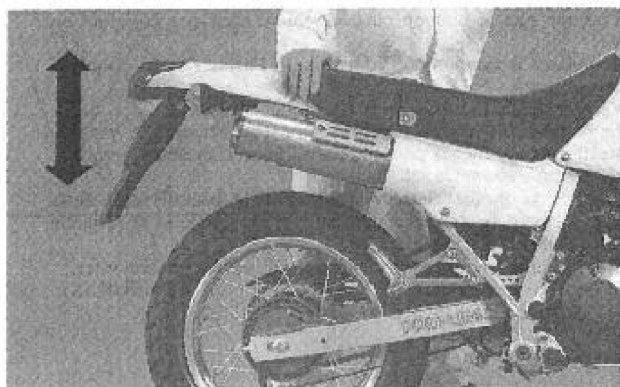
REAR

Support the motorcycle securely on level ground.

Check for worn swingarm bearings by grabbing the rear wheel as shown, and attempting to move the wheel side to side. Replace the bearings if any looseness is noted (page 13-20).

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

Check entire shock absorber assembly for leaks or damage. Replace any damaged components which cannot be repaired. Tighten all nuts and bolts.



NUTS, BOLTS, FASTENERS

Check that all chassis nuts and bolts are tightened to their correct torque values (page 1-5) at the intervals shown in the Maintenance Schedule (page 3-3).

Check all cotter pins, safety clips, hose clamps and cable stays.

MAINTENANCE

WHEELS/TIRES

TIRE PRESSURE

NOTE

- Tire pressure should be checked when tires are COLD.

Check the tire pressure, according to the table below.
Check the tires for cuts, imbedded nails, or other damage.
Check the front and rear wheels for trueness (Refer to sections 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)

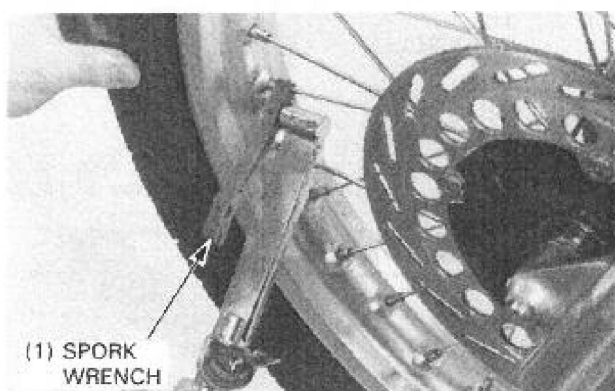
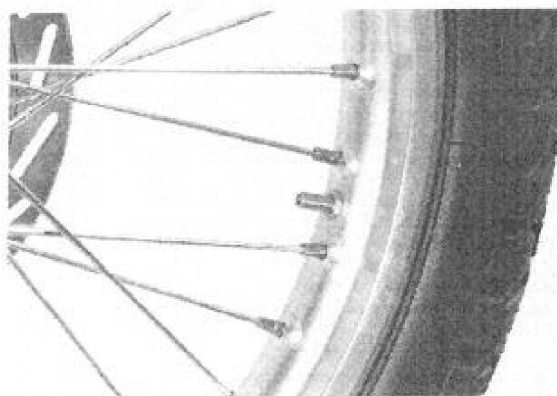
Inspect the wheel rims and spokes for damage.
Tighten any loose spokes.

TORQUE: 3.8 N·m (0.38 kg-m, 2.7 ft-lb)

TOOL:

Spoke wrench, 5.8 x 6.1 mm 07701-0020300

Check wheel rim runout (page 12-6, 13-4).



Recommended tire pressures and tire sizes:

		Front	Rear
Tire size		90/100-19 55P (Tube type)	120/90-16 63P (Tube type)
Cold tire pressure kPa (kg/cm ² , psi)	Driver only	150 (1.50, 22)	150 (1.50, 22)
	Driver and one passenger	150 (1.50, 22)	175 (1.75, 25)
Tire brand	DUNLOP	K460	K460
	BRIDGESTONE	TW39	TW40

MAINTENANCE

STEERING HEAD BEARINGS

NOTE

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

Raise the front wheel off the ground.

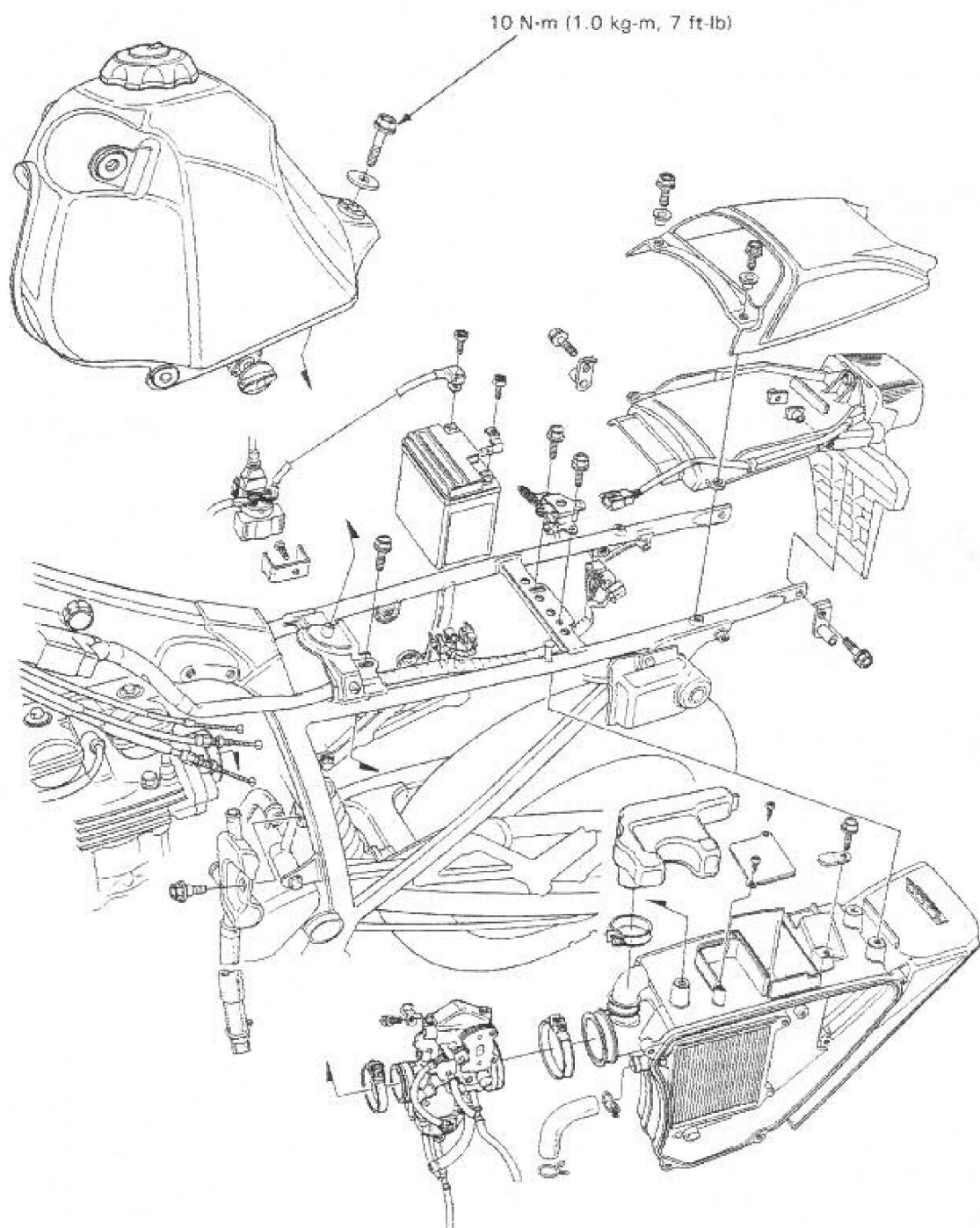
Check that the fork moves freely from side to side. If the fork moves unevenly, binds, or has vertical movement, inspect the steering head bearings (Section 12).



FUEL SYSTEM

CIRCUIT D'ALIMENTATION

KRAFTSTOFFSYSTEM



FUEL SYSTEM

SERVICE INFORMATION	4-1	CARBURETOR DISASSEMBLY	4-6
TROUBLESHOOTING	4-2	CARBURETOR ASSEMBLY	4-9
FUEL TANK	4-3	CARBURETOR INSTALLATION	4-14
AIR CLEANER CASE	4-4	PILOT SCREW ADJUSTMENT	4-14
CARBURETOR REMOVAL	4-5	ACCELERATOR PUMP	4-15

SERVICE INFORMATION

⚠ WARNING

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

GENERAL

- When disassembling fuel system parts, note the locations of the O-rings. Replace them during reassembly.
- The carburetor float bowl has a drain plug that can be loosened to drain residual fuel.

CAUTION

- Do not bend or twist control cables. Damaged control cables will not operate smoothly and may stick or bind.

NOTE

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

SPECIFICATIONS

Type	Piston valve carburetor
Venturi dia.	32 mm (1.3 in)
Identification No.	PD6BA P GII type: PD6B8 F type: PD6BC
Float level	14 mm (0.55 in)
Main jet	#138 GII type: #145 F type: #142
Slow jet	#38
Idle speed	1,300 ± 100 min ⁻¹ (rpm)
Throttle grip free play	2–6 mm (1/16–1/4 in)
Pilot screw initial opening	1-1/2 GII type 2-5/8

TORQUE VALUE

Fuel tank mounting bolt	10 N·m (1.0 kg·m, 7 ft·lb)
Engine mounting 10 mm bolt	75 N·m (7.5 kg·m, 54 ft·lb)
Engine bracket 8 mm bolt	27 N·m (2.7 kg·m, 20 ft·lb)

TOOLS

Special	
Pilot screw wrench	07908-4730001
Common	
Float level gauge	07401-0010000

TROUBLESHOOTING

Engine cranks but won't start

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

Hard starting or stalling after starting

- Improper choke operation
- Ignition malfunction
- Faulty carburetor
- Fuel contaminated
- Intake air leak
- Incorrect idle speed
- Incorrect valve clearance (Section 3)

Rough idle

- Ignition system malfunction
- Incorrect idle speed
- Incorrect valve clearance (Section 3)
- Cylinder compression too low
- Faulty carburetor
- Fuel contaminated
- Dirty air cleaner

Misfiring during acceleration

- Ignition system malfunction

Backfiring

- Ignition system malfunction
- Faulty carburetor

Poor performance (driveability) and poor fuel economy

- Clogged fuel system
- Ignition system malfunction
- Dirty air cleaner

Lean mixture

- Clogged fuel jets
- Faulty float valve
- Low float level
- Clogged fuel tank breather
- Clogged fuel strainer
- Restricted fuel line
- Intake air leak

Rich mixture

- Carburetor choke stuck closed
- Faulty float valve
- Float level too high
- Dirty air cleaner

FUEL SYSTEM

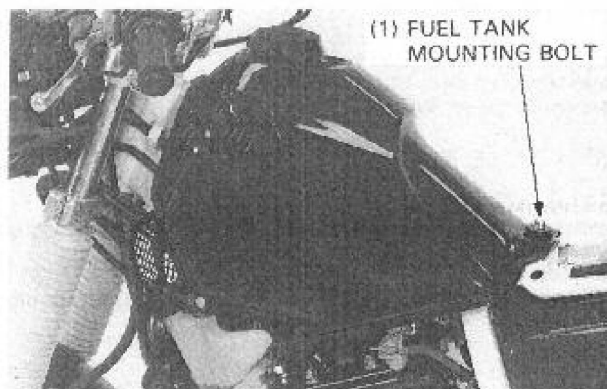
FUEL TANK

REMOVAL

⚠ WARNING

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

Remove the seat and side fairings (page 15-2).
Turn the fuel valve off, and disconnect the fuel tube.



Remove the mounting bolt and the fuel tank.
Check that the fuel flows out of the fuel valve freely.
If flow is restricted, clean the fuel strainer.

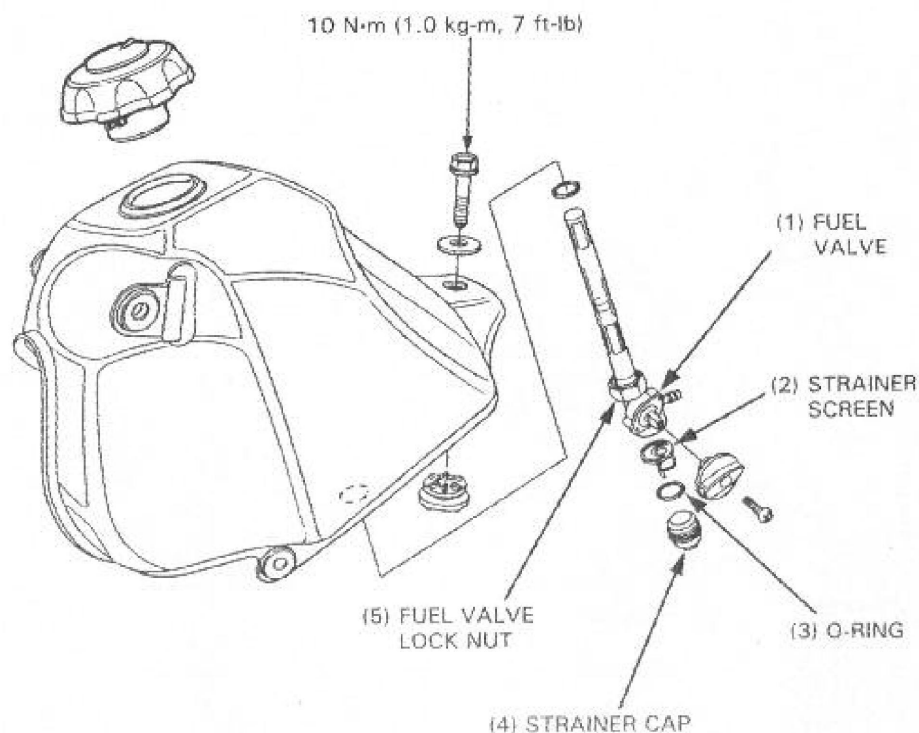
INSTALLATION

Install the fuel tank with the mounting bolt.
Connect the fuel line.

NOTE

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

Reinstall the fairings and the seat.



AIR CLEANER CASE

REMOVAL

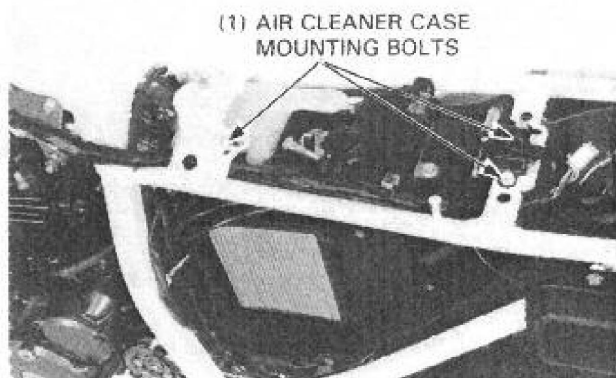
Remove the following;

- seat and fuel tank (page 4-3).
- air cleaner case cover.
- air cleaner case mounting bolts.

Disconnect the taillight connector, starter relay switch and breather tube from the air cleaner case.

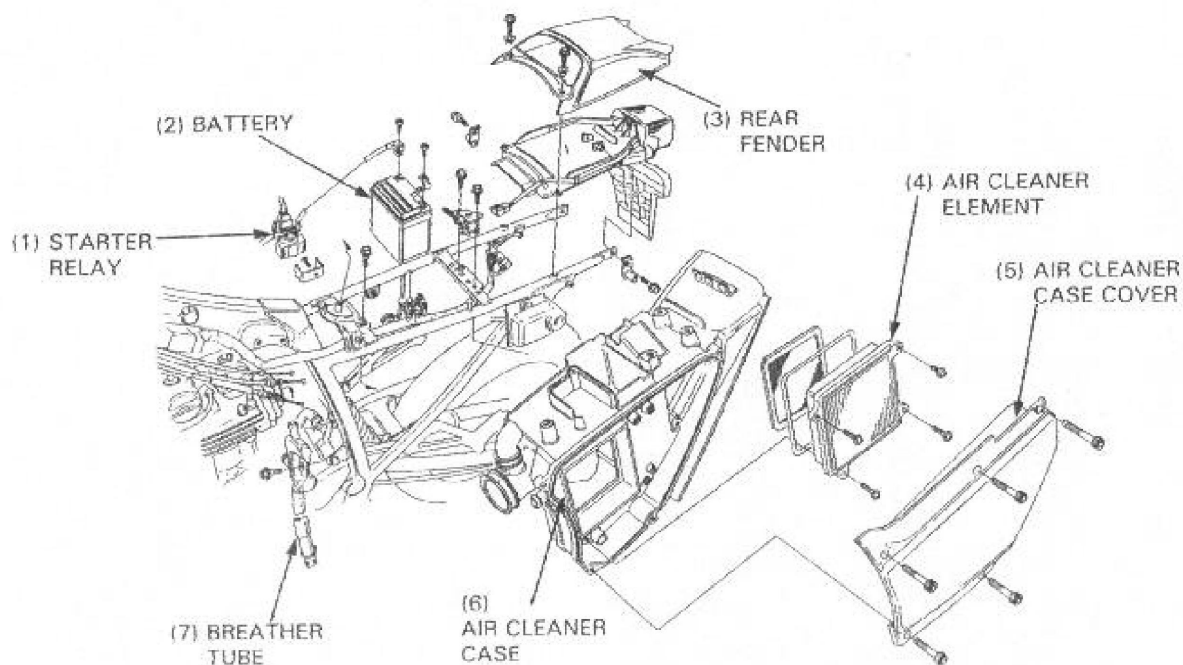
Remove the following;

- carburetor (page 4-5).
- exhaust pipe/muffler (page 15-1).
- regulator/rectifier (page 16-6).
- battery (page 16-4).
- rear fender.
- air cleaner case.



INSTALLATION

Install the removed parts in the reverse order of removal.



FUEL SYSTEM

CARBURETOR REMOVAL

WARNING

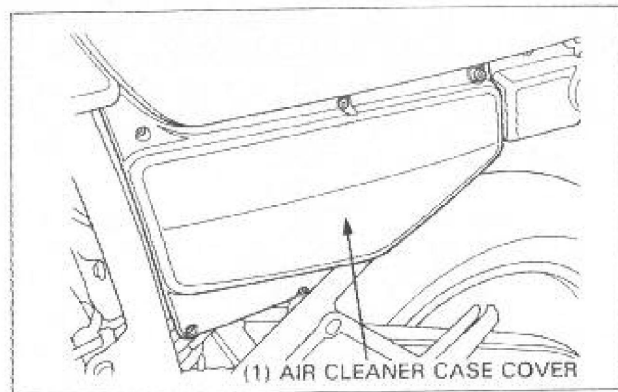
- Gasoline is extremely flammable and is explosive under certain conditions. Work in a well ventilated area with the engine stopped. Do not smoke or allow flames or sparks in the work area or where gasoline is stored.

Remove the following:

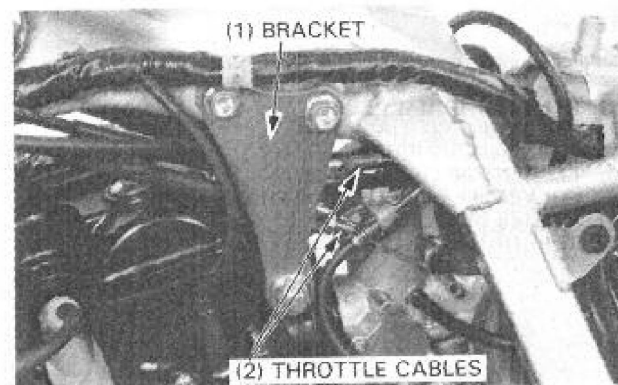
- seat and fuel tank (page 4-3).
- rear side cover and air cleaner case cover (page 15-2).

Loosen the carburetor drain screw and drain the fuel into a container.

Remove the air cleaner case mounting bolts.



Remove the upper engine bracket and disconnect the throttle cables.



Disconnect the choke cable and loosen the carburetor insulator band screws, then remove the carburetor from the left side.

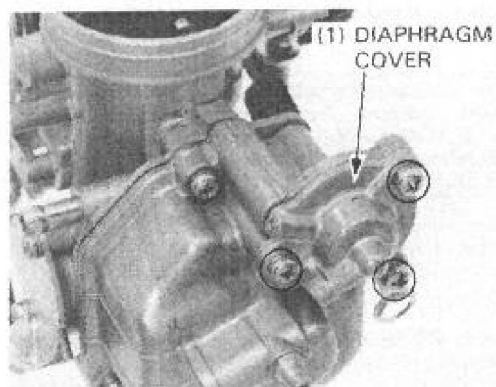


FUEL SYSTEM

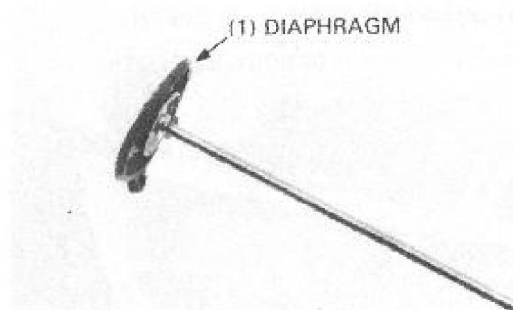
CARBURETOR DISASSEMBLY

Remove the three screws and the accelerator diaphragm cover.

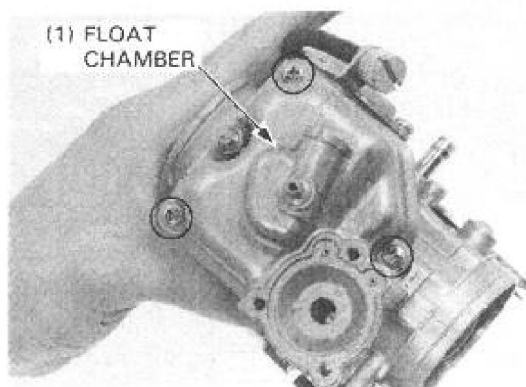
Remove the diaphragm spring and diaphragm.



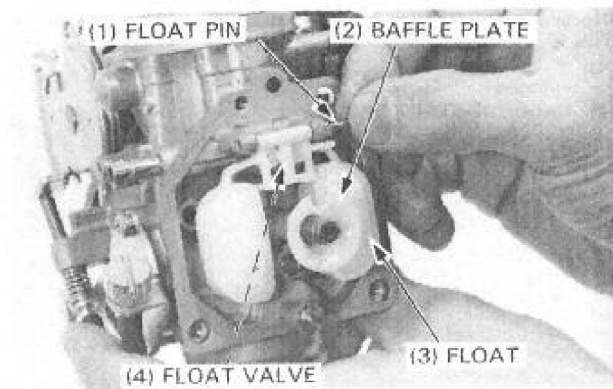
Check the diaphragm for a tear deterioration.
Check the rod for wear and trueness.



Remove the three screws and the float chamber.

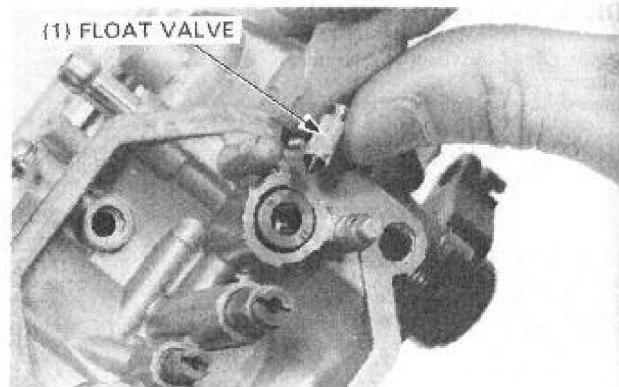


Remove the float pin, float, baffle plate and float valve.



FUEL SYSTEM

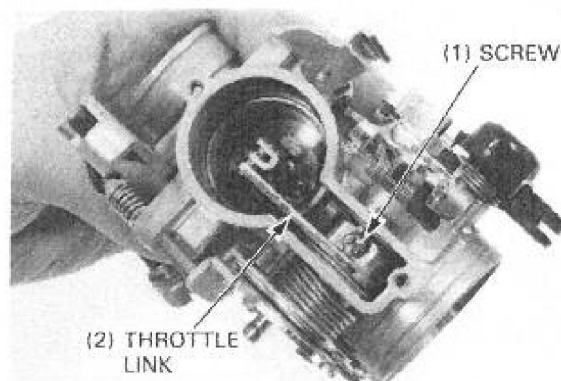
Inspect the float valve seat for grooves and nicks.
Check the operation of the float valve.



Remove the two screws and the carburetor top cover.



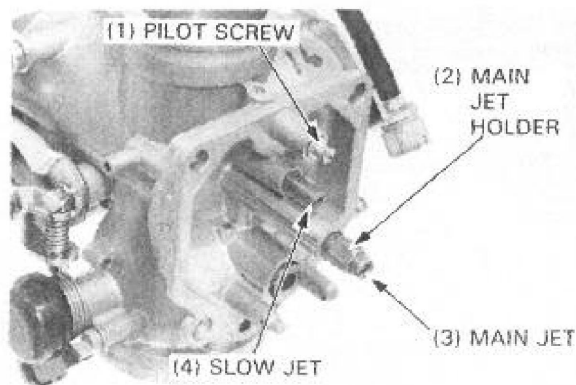
Remove the throttle link attaching screw and the throttle valve.



Remove the pilot screw, main jet holder and slow jet.

NOTE

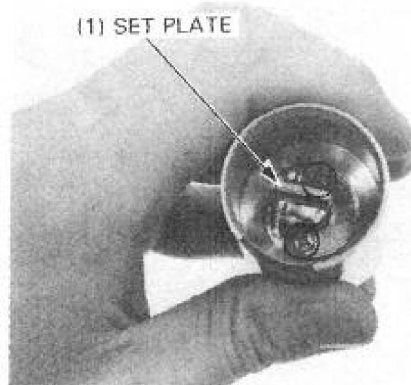
- Do not try to remove the float valve seat from the carburetor body.
- Before removing the pilot screw, record the number of turns until it seats lightly. Use this as a reference for reinstallation. Remove the jet needle by pressing it out from the throttle valve side carefully.



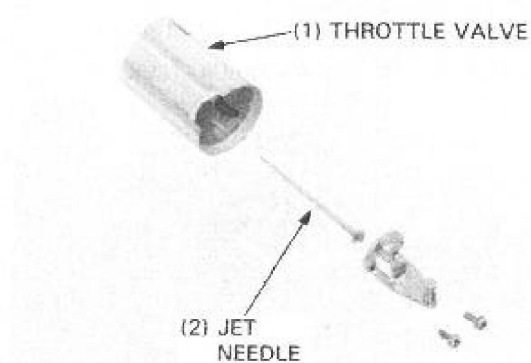
Clean the jets with compressed air.
Inspect the jets for wear or damage and replace if necessary.

FUEL SYSTEM

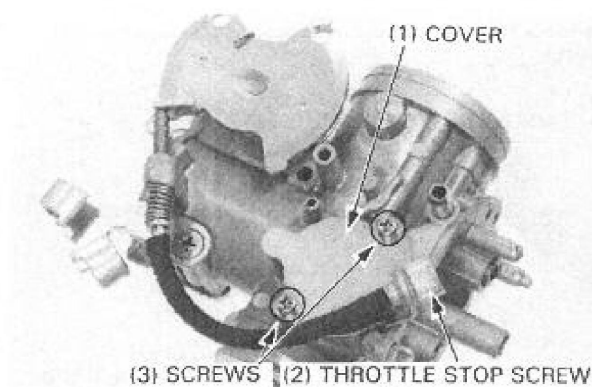
Remove the two screws and the set plate.



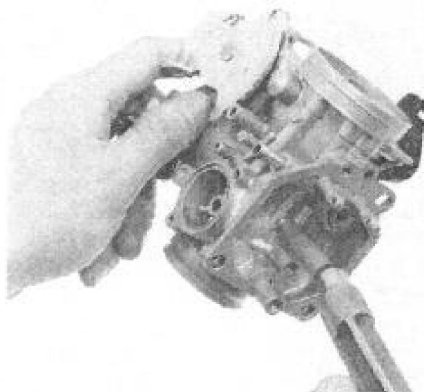
Inspect the throttle valve for wear or scratches.
Inspect the jet needle for damage.



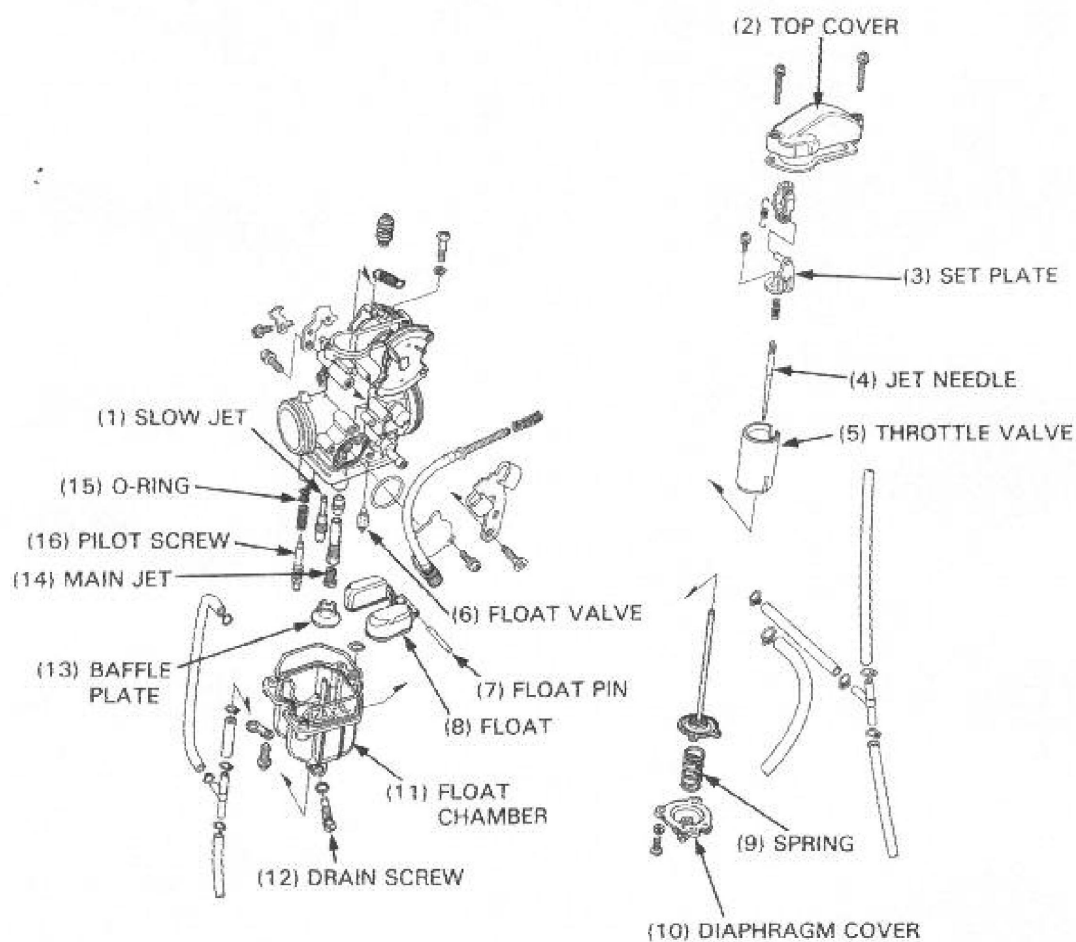
Remove the throttle stop screw and cable from the carburetor
by removing the cover screws.



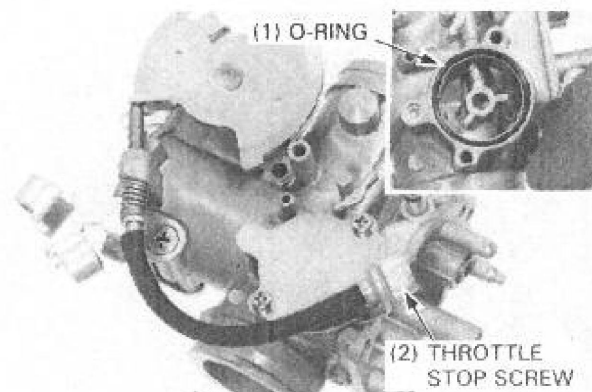
Blow open all carburetor body openings with compressed air.



CARBURETOR ASSEMBLY



Install the spring onto the cable and screw the cable in the carburetor.
Install a new O-ring and cover, then tighten the screws securely.



FUEL SYSTEM

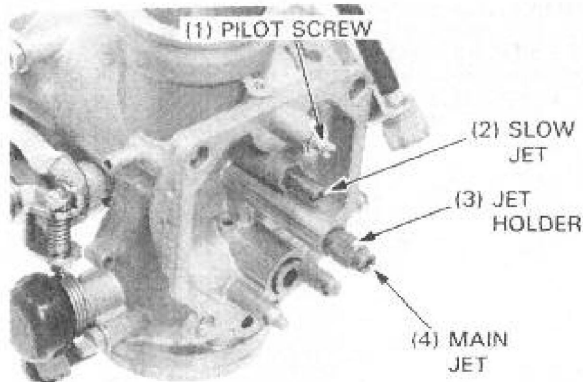
Install the main jet, jet holder and slow jet.

CAUTION

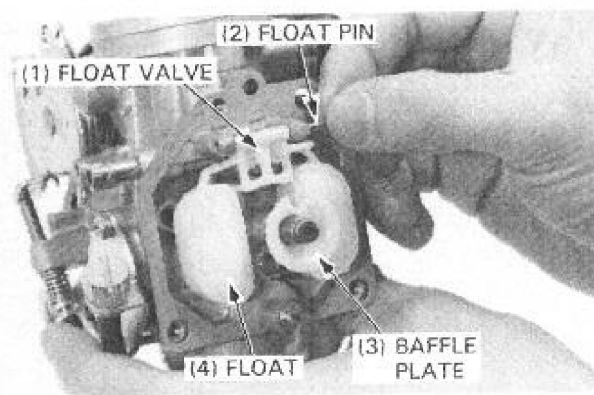
- *Handle all jets with care. They can easily be scored or scratched.*

Install the pilot screw and return it to its original position as noted during removal.

Perform a pilot screw adjustment if a new pilot screw is installed (page 4-14).



Install the float valve, float, float pin and baffle plate.



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

SPECIFICATION: 14 mm (0.55 in)

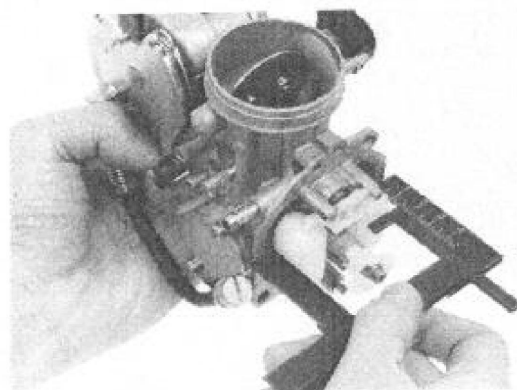
TOOL:

Float level gauge

07401-0010000

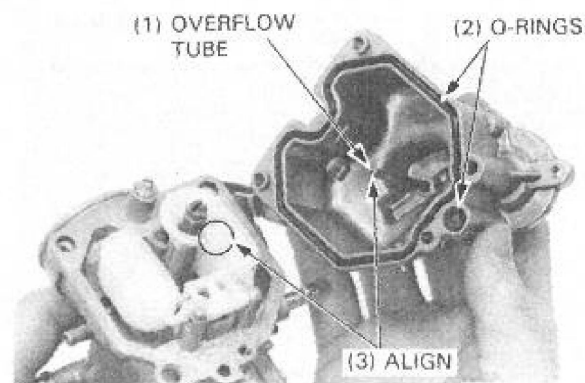
The float cannot be adjusted.

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



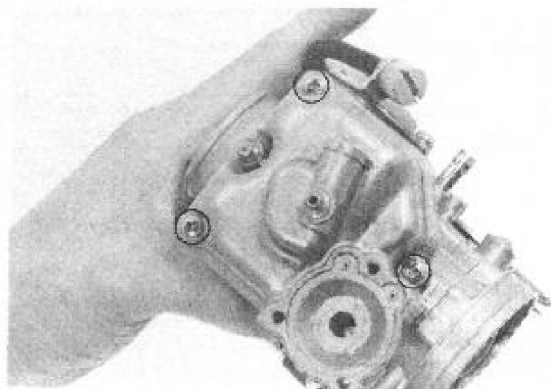
Install the O-rings.

Install the float chamber, aligning the overflow tube on the chamber with the hole in the baffle as shown.

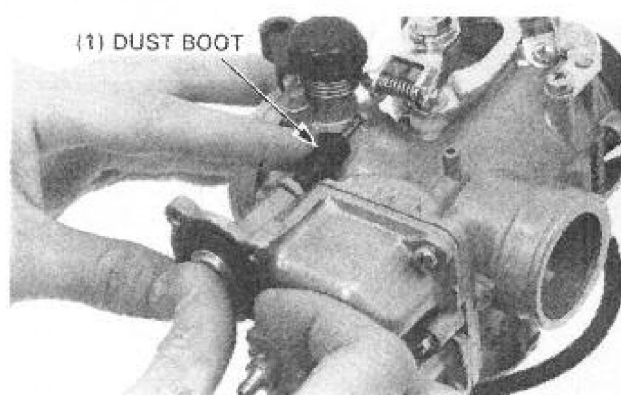


FUEL SYSTEM

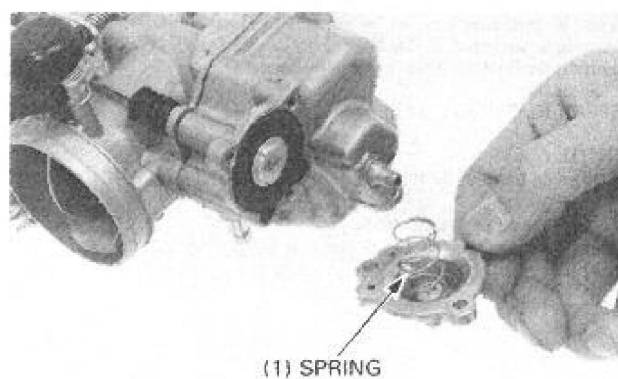
Tighten the float chamber screws.



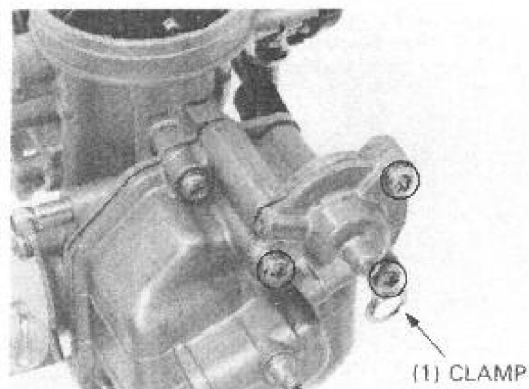
Install the accelerator diaphragm and dust boot.



Install the spring and cover.

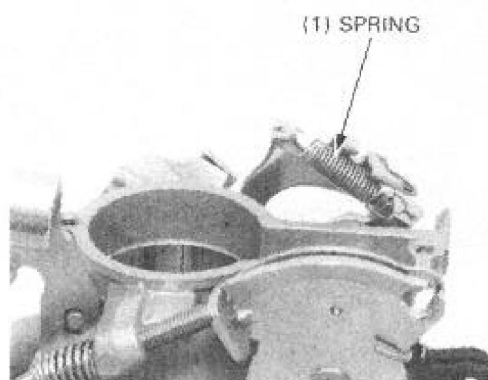


Tighten the screws and clamp as shown.

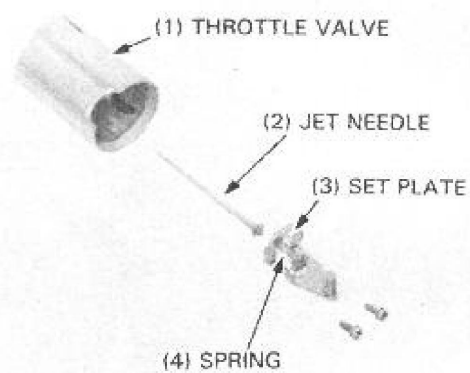


FUEL SYSTEM

Install the spring as shown.



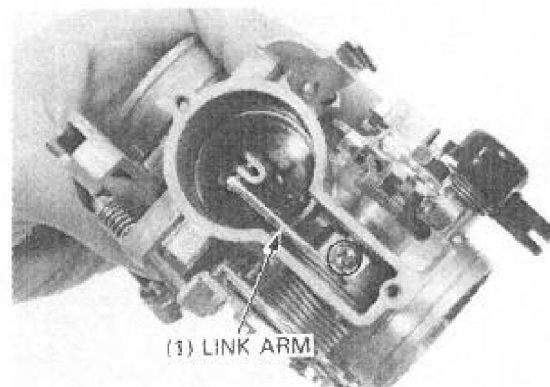
Install the jet needle into the throttle valve.
Install the spring on the set plate, and install the set plate in the throttle valve.



Install and tighten the screws.



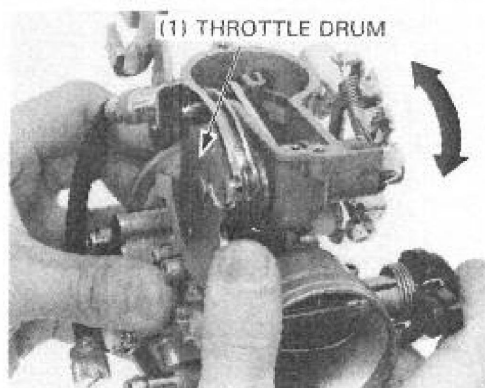
Install the link arm to the throttle valve and tighten the screw.



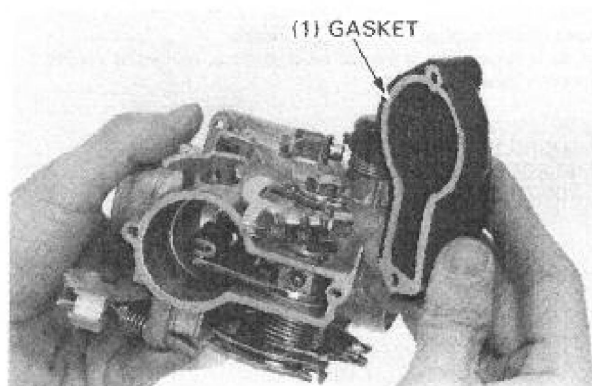
FUEL SYSTEM

Inspect the linkage operation:

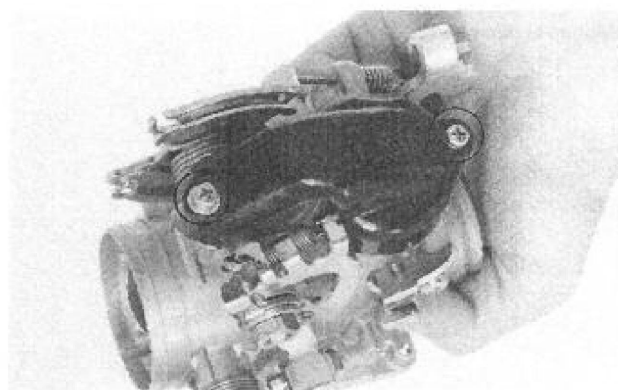
- Open the throttle slightly by pressing on the throttle drum. Then release the throttle.
- Make sure that there is no drag.



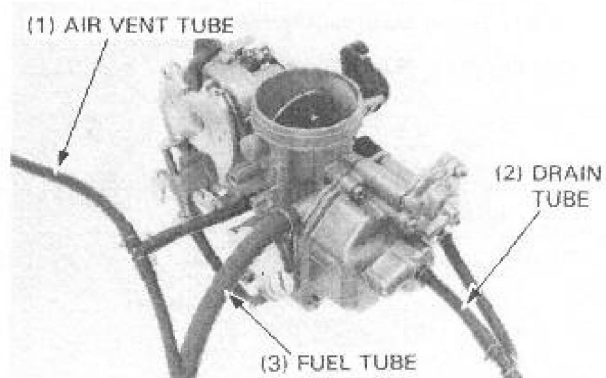
Install a new gasket on the top cover.



Tighten the screws.



Install the carburetor tubes.



FUEL SYSTEM

CARBURETOR INSTALLATION

Installation is essentially the reverse order of removal.

Install the carburetor by aligning its intake pipe boss with the insulator groove.

NOTE

- Route the throttle and choke cables properly (page 1-9 through 1-12).

Install the upper engine bracket and tighten the bolts:

TORQUE:

10 mm bolt: 75 N·m (7.5 kg·m, 54 ft·lb)

8 mm bolt: 27 N·m (2.5 kg·m, 20 ft·lb)

Perform the following inspections and adjustments.

- Throttle operation (page 3-4).
- Carburetor choke (page 3-5).
- Carburetor idle speed (page 3-9).

PILOT SCREW ADJUSTMENT

NOTE

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

CAUTION

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

Turn the pilot screw clockwise until it seats lightly and back it out 1-1/2, GII type 2-5/8 turns.

This is an initial setting prior to the final pilot screw adjustment.

TOOL:

Pilot screw wrench

07908-4730001

Warm the engine up to operating temperature.
Stop the engine and connect a tachometer.

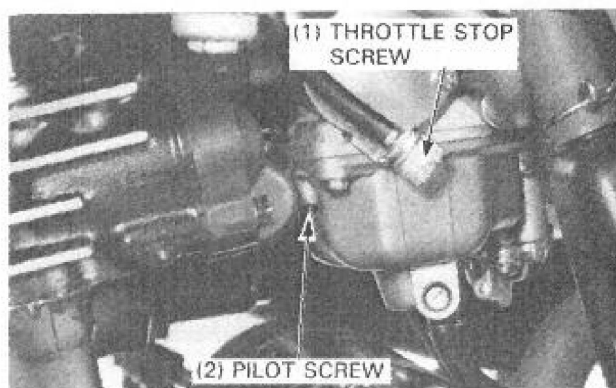
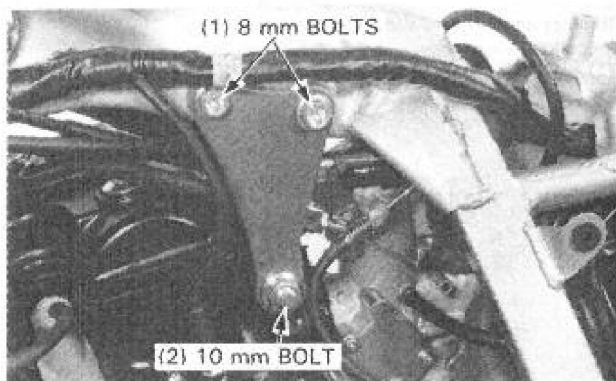
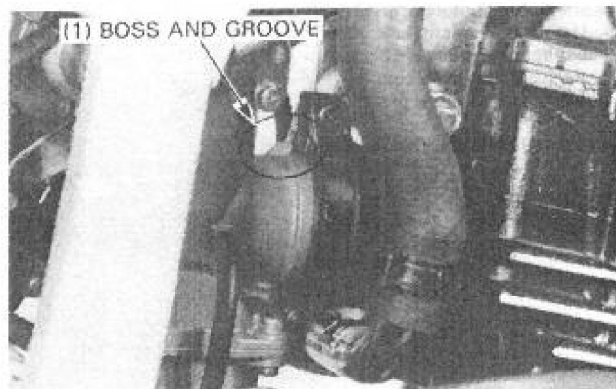
Start the engine and adjust the idle speed with the throttle stop screw.

IDLE SPEED: $1,300 \pm 100 \text{ min}^{-1} \text{ (rpm)}$

Turn the pilot screw clockwise until you hear the engine miss or decrease in speed, then turn counterclockwise until the engine again misses or decreases in speed.

Center the pilot screw exactly between these two extreme positions.

If idle speed changes after adjusting the pilot screw, readjust the throttle stop screw.



FUEL SYSTEM

ACCELERATOR PUMP

CAUTION

- *The accelerator pump-adjustment nut is factory pre-set.*

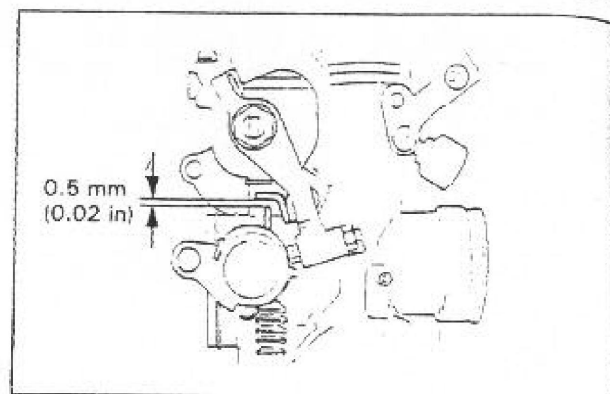
Start the engine and adjust the idle speed with the throttle stop screw.

IDLE SPEED: $1,300 \pm 100 \text{ min}^{-1}$ (rpm)

Stop the engine.

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

FREE PLAY: 2–6 mm (1/8–1/4 in)



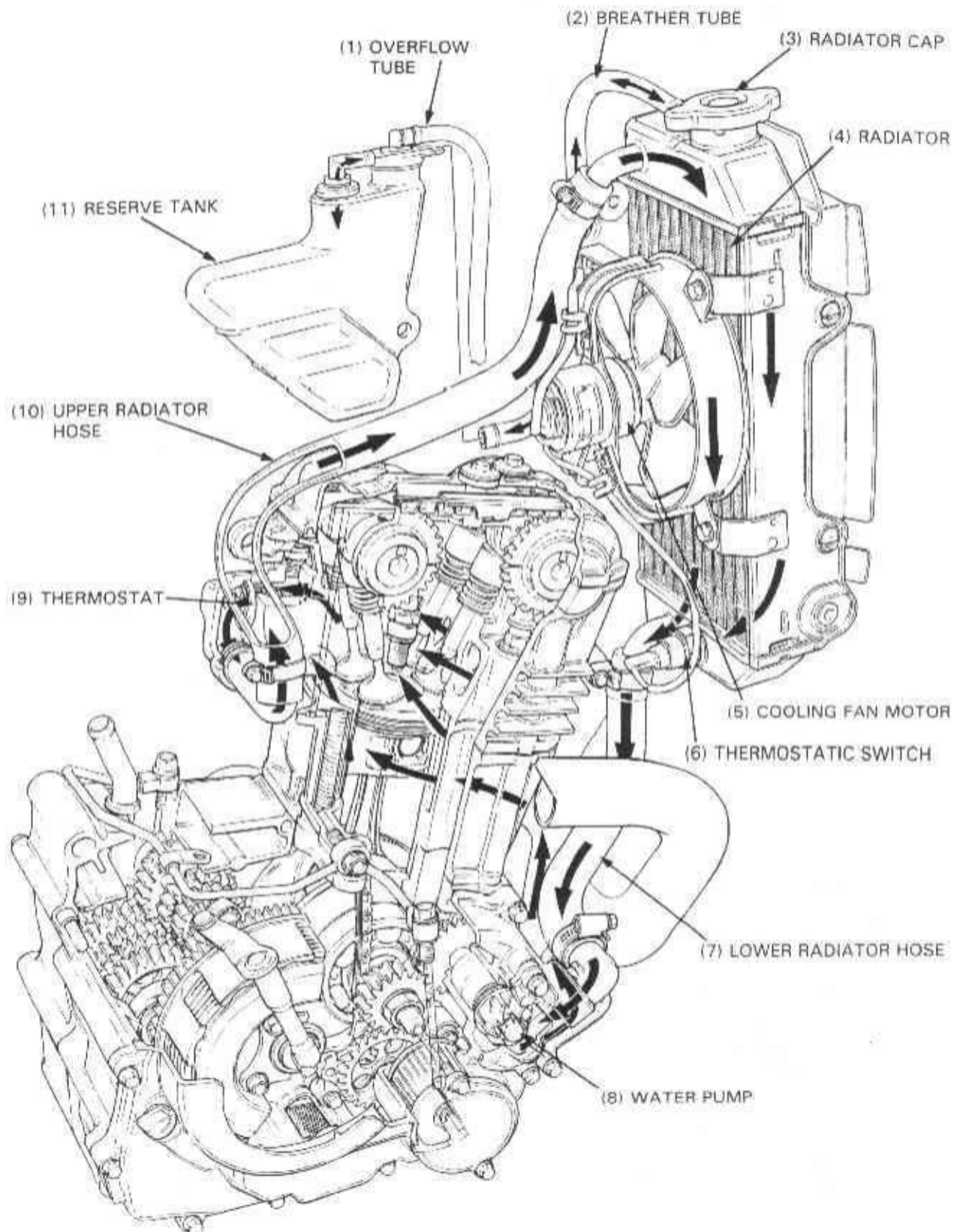
COOLING SYSTEM

CIRCUIT DE REFROIDISSEMENT

KÜHLSYSTEM

- (1) TUBE DE TROP-PLEIN
- (2) TUBE DE RENIFLARD
- (3) BOUCHON DE RADIATEUR
- (4) RADIATEUR
- (5) MOTEUR DE VENTILATEUR DE REFROIDISSEMENT
- (6) CONTACTEUR THERMOSTATIQUE
- (7) FLEXIBLE DE RADIATEUR INFERIEUR
- (8) POMPE A EAU
- (9) THERMOSTAT
- (10) FLEXIBLE DE RADIATEUR SUPERIEUR
- (11) RESERVOIR DE RESERVE

- (1) OBERLAUFROHR
- (2) ENTLÜFTERROHR
- (3) KÖHLERDECKEL
- (4) KÖHLER
- (5) KÜHLGEBLÄSEMOTOR
- (6) THERMOSTATSCHALTER
- (7) UNTERER KÖHLERSCHLAUCH
- (8) WASSERPUMPE
- (9) THERMOSTAT
- (10) OBERER KÖHLERSCHLAUCH
- (11) OBERLAUFTANK



COOLING SYSTEM

SERVICE INFORMATION	5-1	THERMOSTAT	5-4
TROUBLESHOOTING	5-2	RADIATOR/COOLING FAN	5-5
SYSTEM TESTING	5-3	WATER PUMP	5-7
COOLANT REPLACEMENT	5-4	RESERVE TANK	5-9

SERVICE INFORMATION

GENERAL

⚠ WARNING

- Do not remove the radiator cap when the engine is hot. The coolant is under pressure and severe scalding could result.
 - The engine must be cool before servicing the cooling system.
 - 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.
-
- Use only distilled water and ethylene glycol in the cooling system. A 50–50 mixture is recommended for maximum corrosion protection. Do not use alcohol-based antifreeze or an antifreeze with self sealing properties.
 - Add coolant at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
 - Radiator, cooling fan and thermostat services can be made with the engine in the frame.
 - Avoid spilling coolant on painted surfaces.
 - After servicing the system, check for leaks with a cooling system tester.
 - Refer to Section 19 for fan motor thermostatic switch and temperature sensor inspections.

SPECIFICATIONS

Radiator cap relief pressure	1.1–1.4 kg/cm ² (15.6–19.9 psi)
Freezing point (hydrometer test):	55% Distilled water + 45% ethylene glycol: –32°C (–25°F) 50% Distilled water + 50% ethylene glycol: –37°C (–34°F) 45% Distilled water + 55% ethylene glycol: –44.5°C (–48°F)
Coolant capacity:	
Radiator and engine	0.8 liters (0.85 US qt, 0.70 imp qt)
Reserve tank	0.2 liters (0.21 US qt, 0.18 imp qt)
Total system	1.0 liters (1.06 US qt, 0.88 imp qt)
Thermostat	Begins to open: 80° to 84°C (176° to 183°F) Valve lift: Minimum of 8 mm at 95°C (0.315 in at 203°F)
Boiling point (with 50–50 mixture):	Unpressurized: 107.7°C (226°F) Cap on, pressurized: 125.6°C (258°F)

TORQUE VALUES

Thermostatic switch	18 N·m (1.8 kg-m, 13 ft-lb)
Water pump impeller	12 N·m (1.2 kg-m, 9 ft-lb)

TOOLS

Special	
Driver base	07947-KR10100
Driver shaft	07947-KR10000
Fork seal driver	07947-3710101
Common	
Driver	07749-0010000
Pilot, 15 mm	07746-0040300

TROUBLESHOOTING**Engine temperature too high**

- Faulty temperature gauge or gauge sensor
- Thermostat stuck closed
- Faulty radiator cap
- Insufficient coolant
- Passages blocked in radiator, hoses, or water jacket
- Bent fan blades
- Faulty fan motor
- Air bubbles in cooling system

Engine temperature too low

- Faulty temperature gauge or sensor
- Thermostat stuck open

Coolant leaks

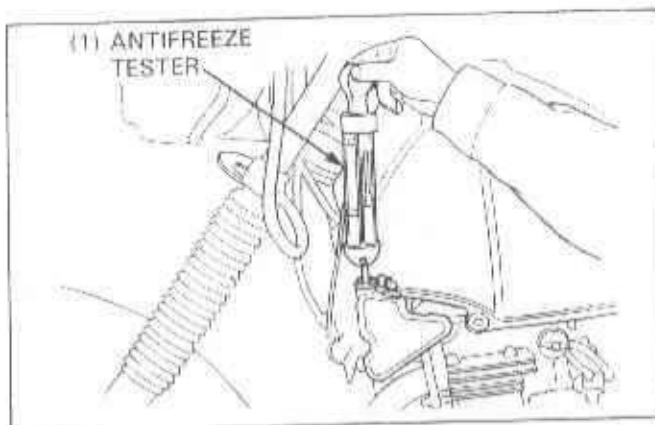
- Faulty water pump mechanical seal
- Deteriorated O-rings
- Damaged gasket

COOLING SYSTEM

SYSTEM TESTING

COOLANT

Remove the coolant reserve tank cap.
Test the coolant mixture with an antifreeze tester. For maximum corrosion protection, a 50–50% solution of ethylene glycol and distilled water is recommended.



RADIATOR CAP/SYSTEM INSPECTION

Remove the right side fairing (page 15-2).
Remove the radiator cap by removing the screw.

▲ WARNING

- *The engine must be cool before removing the radiator cap, or severe scalding may result.*

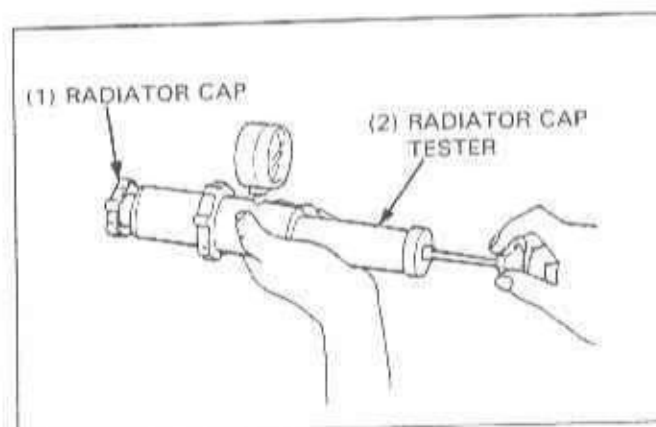


Pressure test the radiator cap. Replace the radiator cap if it does not hold pressure, or if relief pressure is too high or too low. It must hold the specified pressure for at least six seconds.

CAUTION

- *Before installing the cap on the tester, wet the sealing surfaces.*

RADIATOR CAP RELIEF PRESSURE:
1.1 – 1.4 kg/cm² (15.6 – 19.9 psi)

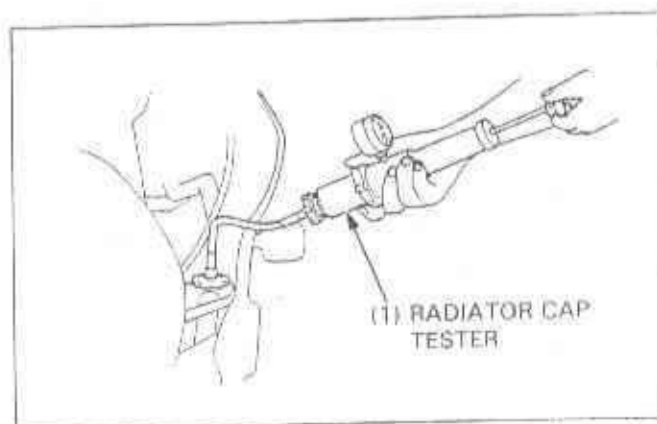


Pressurize the radiator, engine and hoses, and check for leaks.

CAUTION

- *Excessive pressure can damage the radiator.
Do not exceed 1.4 kg/cm² (19.9 psi).*

Repair or replace components if the system will not hold specified pressure for at least six seconds.



COOLING SYSTEM

COOLANT REPLACEMENT

⚠ WARNING

- The engine must be cool before servicing the cooling system, or severe scalding may result.

Remove the right side fairing and radiator cap by removing the screw.

Remove the skid plate.

Remove the drain bolt located at the water pump and drain the system coolant.

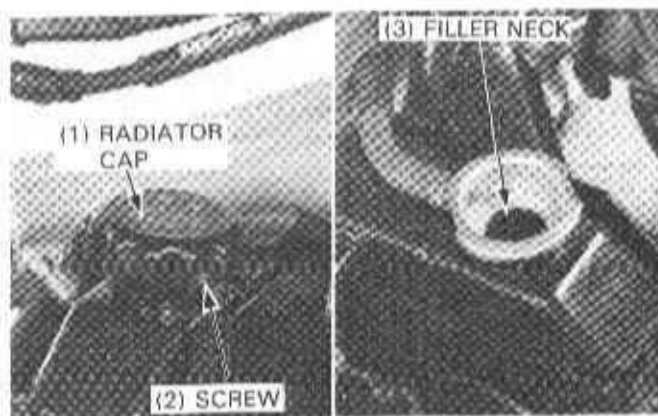
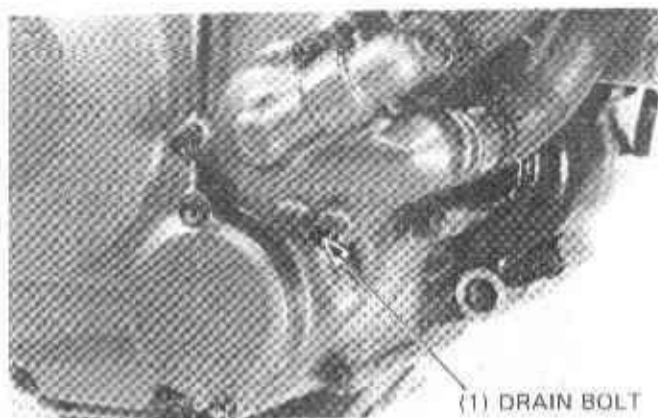
Replace the drain bolt if it is badly corroded.

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

Fill the system with a 50:50 mixture of distilled water and ethylene glycol.

Bleed the air from the radiator as follows:

- Support the motorcycle in an upright on level ground.
- Shift the transmission into neutral.
- Start the engine and snap the throttle grip 3–4 times at 4,000–5,000 min^{-1} (rpm). Then add coolant up to the radiator filler neck.
- Reinstall the radiator cap and tighten the screw securely.
- Check the level of coolant in the reserve tank and fill to the correct level if it is low.



THERMOSTAT

REMOVAL

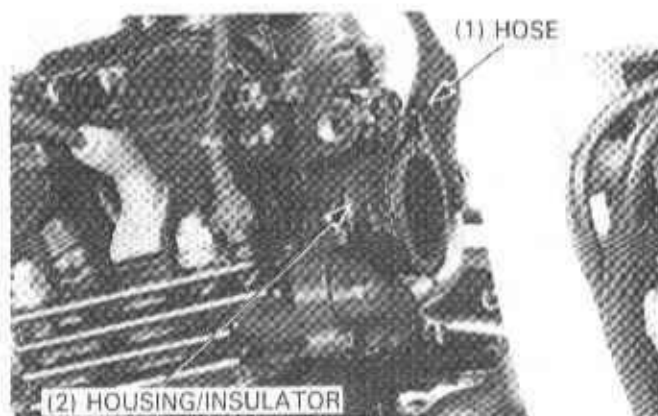
Drain the coolant.

Remove the carburetor (page 4-5).

Disconnect the upper radiator hose from the water pipe.

Remove the thermostat housing/carburetor insulator.

Remove the thermostat and O-ring.



INSPECTION

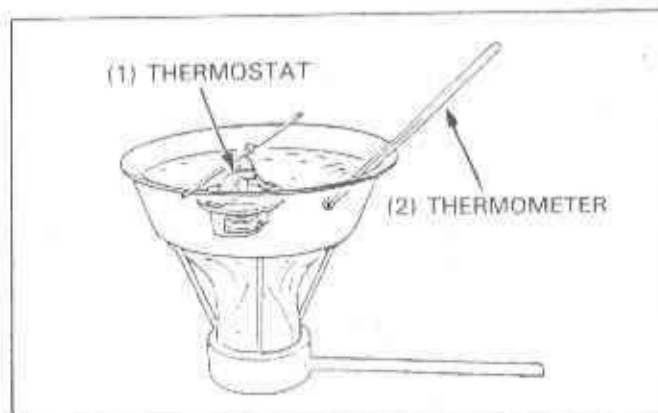
Visually inspect the thermostat for damage.

Suspend the thermostat in heated water to check its operation. Do not let the thermostat or thermometer touch the pan or false readings will result.

Replace the thermostat if the valve stays open at room temperature, or if it responds at temperatures other than those specified.

Technical Data

Starts to open	80° to 84°C (176° to 183°F)
Valve lift	8 mm minimum (0.315 in) when heated to 95°C (203°F) for five minutes.



COOLING SYSTEM

INSTALLATION

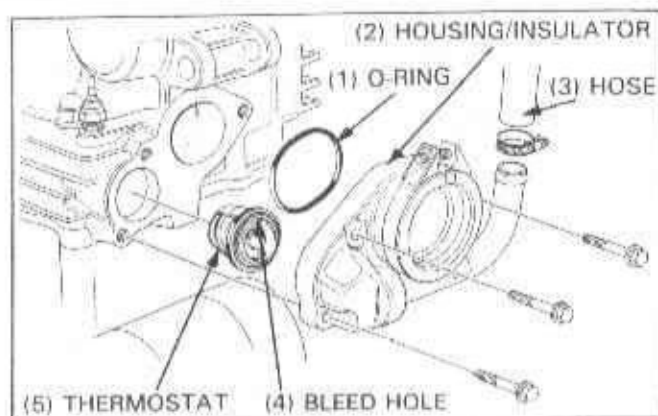
Install the thermostat into the cylinder head with its air bleed hole facing up.

Install a new O-ring in the groove on the thermostat housing/carburetor insulator.

Install the housing/insulator on the cylinder head.
Tighten the bolts securely.
Connect the upper radiator hose to the water pipe.

Install the carburetor (page 4-14).

Fill the cooling system (page 5-4).

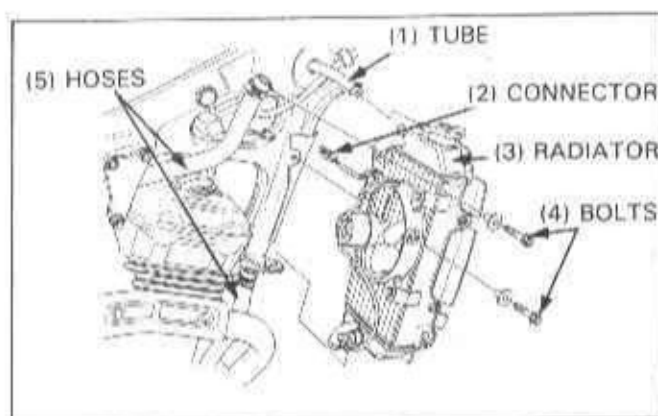


RADIATOR/COOLING FAN

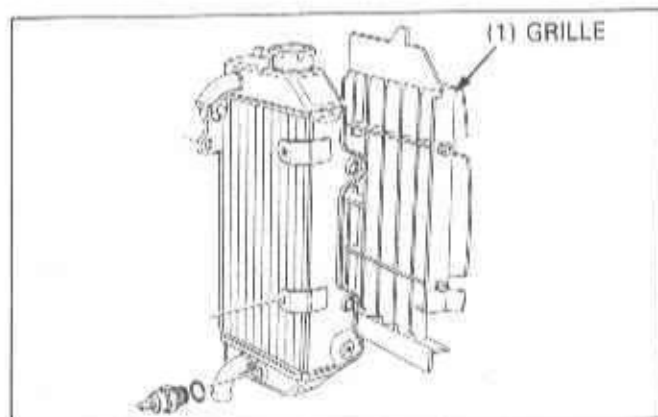
REMOVAL

Remove the fuel tank (page 4-3).
Drain the coolant (page 5-4).

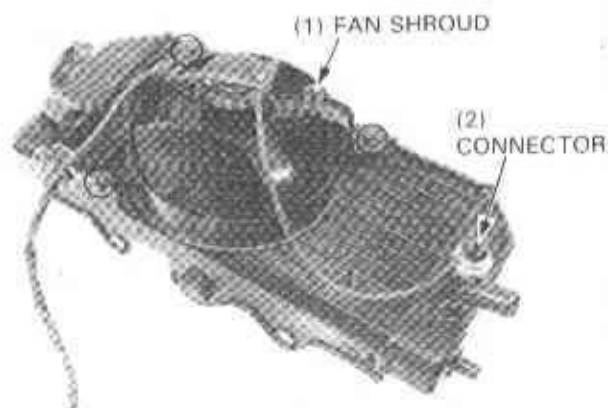
Remove the radiator mounting bolts.
Disconnect the radiator hoses and breather tube from the radiator.
Disconnect the cooling fan motor wire connector and remove the radiator.



Grasp the grille evenly on both sides and carefully free the bosses, then remove the grille.

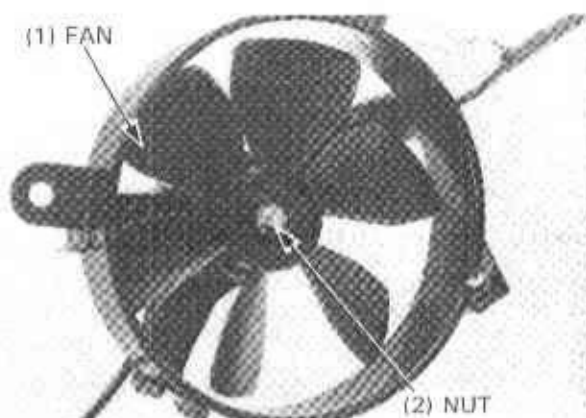


Disconnect the thermostatic switch wire connector.
Remove the fan shroud from the radiator.



COOLING SYSTEM

Remove the nut and the fan.
Release the motor by removing the three screws.

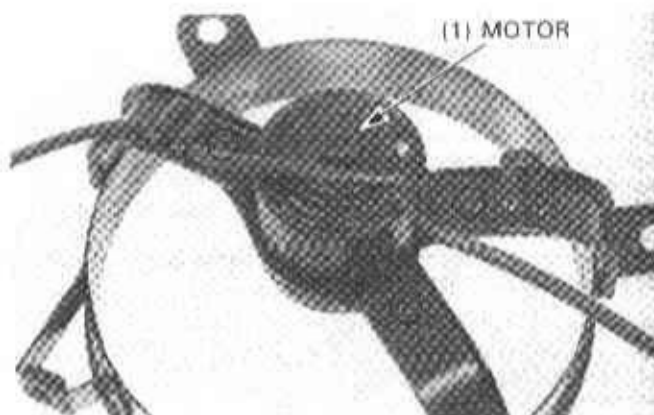


RADIATOR/FAN INSPECTION

Inspect the radiator soldered joints and seams for leaks.

Blow dirt out from between core fins with compressed air. If insects, etc., are clogging the radiator, wash them off with low pressure water.

Carefully straighten any bent fins.



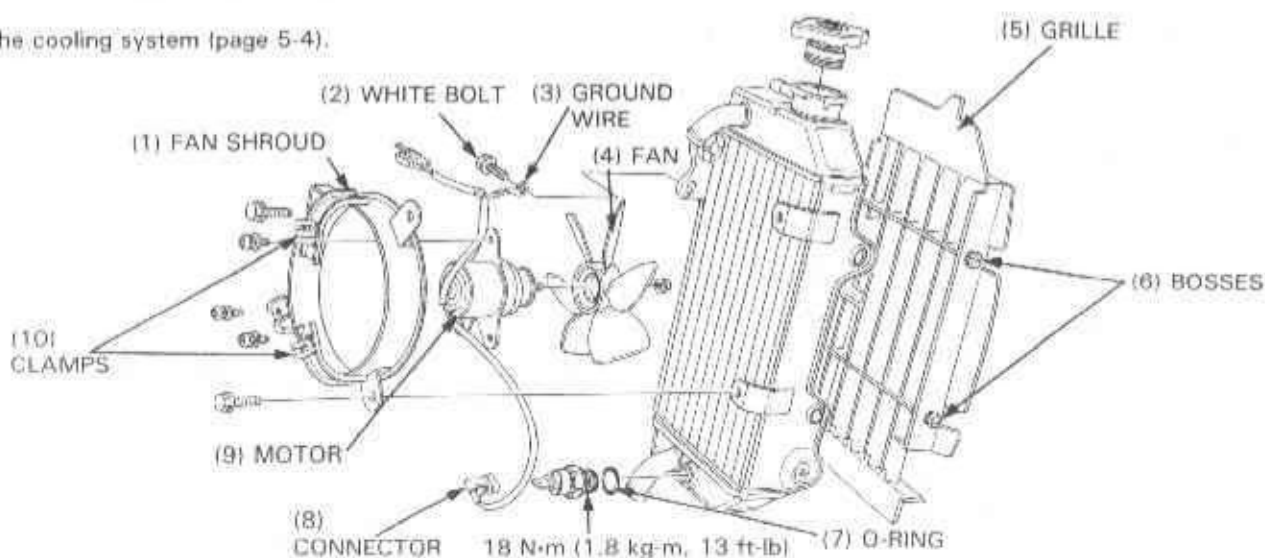
ASSEMBLY/INSTALLATION

Assemble and install the radiator in the reverse order of disassembly/removal.

If the thermostatic switch was removed, install a new O-ring and tighten the switch to the specified torque.

THERMOSTATIC SWITCH:
TORQUE: 18 N·m (1.8 kg-m, 13 ft-lb)

Fill the cooling system (page 5-4).

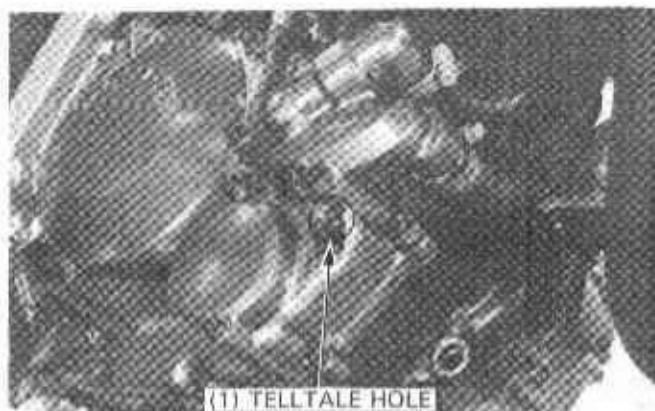


COOLING SYSTEM

WATER PUMP

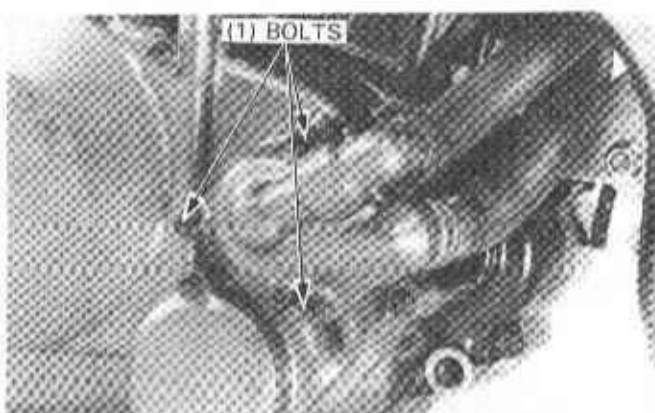
MECHANICAL SEAL INSPECTION

Inspect the telltale hole for signs of coolant leakage.
Replace the water pump mechanical seal if the coolant is leaking.



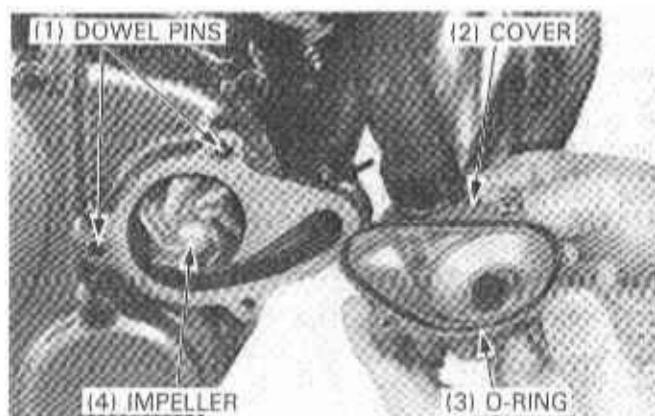
MECHANICAL SEAL REPLACEMENT

Drain the coolant (page 5-4).
Remove the water pump cover bolts.

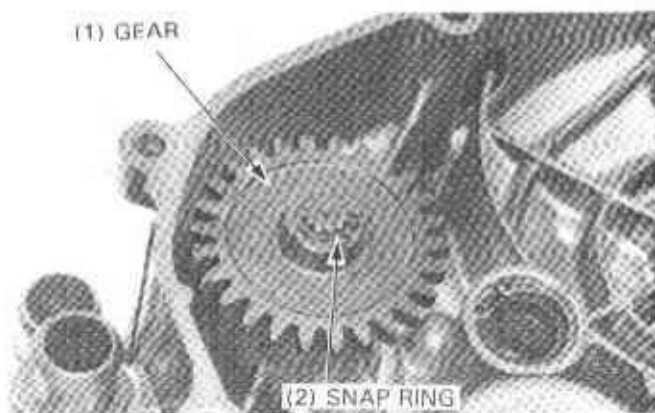


Remove the following:

- water pump cover.
- O-ring.
- dowel pins.
- impeller.
- right crankcase cover (page 7-3).



Remove snap ring and water pump driven gear.



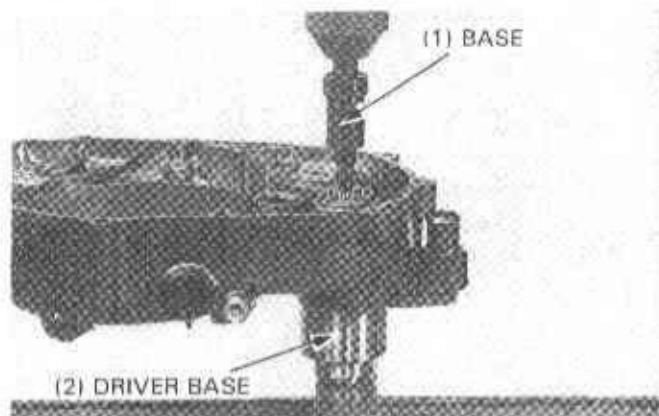
COOLING SYSTEM

Press the mechanical seal and water pump shaft out of the right crankcase cover.

TOOLS:

Driver base

07947-KR10100



Press the water pump shaft with bearing into the right crankcase cover.

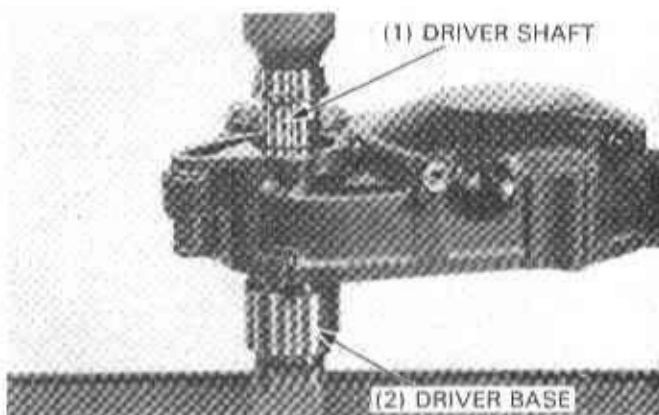
TOOLS:

Driver shaft

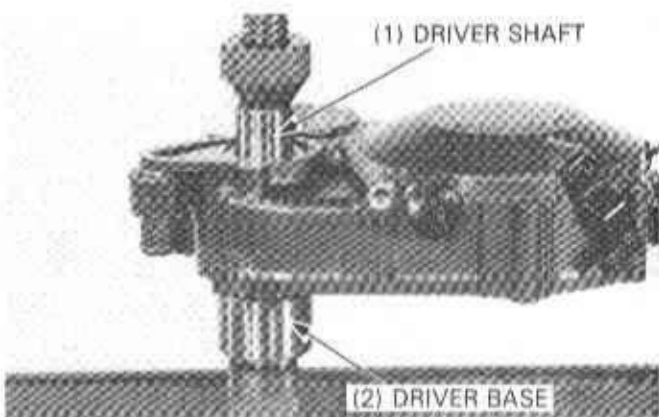
07947-KR10000

Driver base

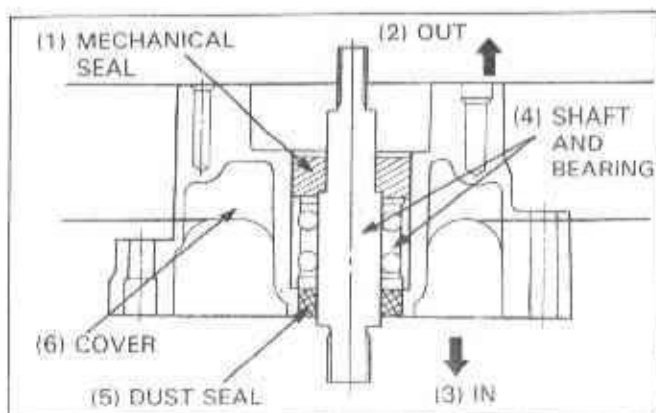
07947-KR10100



Press a new mechanical seal into the right crankcase cover using same tools.

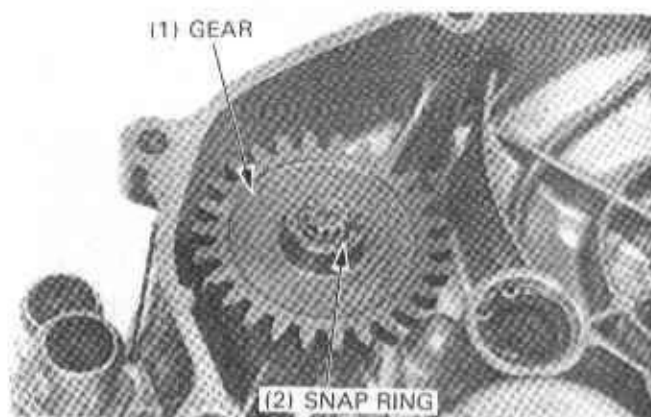


Install a new dust seal.



COOLING SYSTEM

Install the water pump driven gear and secure it with a new snap ring.



Install the right crankcase cover (page 7-10).

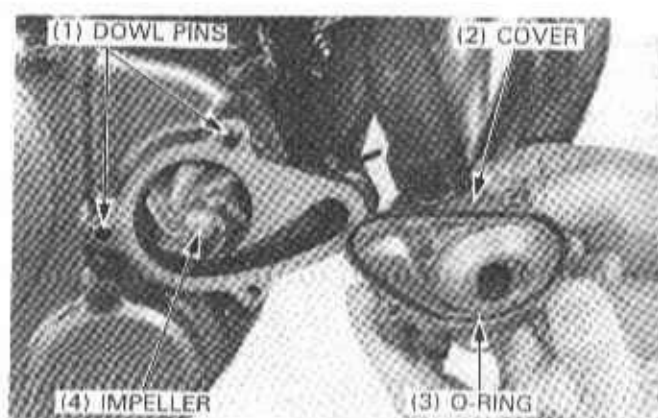
Install the impeller and tighten it to the specified torque.

TORQUE: 12 N·m (1.2 kg·m, 9 ft-lb)

Install the dowel pins.

Install a new O-ring in the groove of the water pump cover.
Install the cover and tighten the bolts securely.

Fill the cooling system (page 5-4).



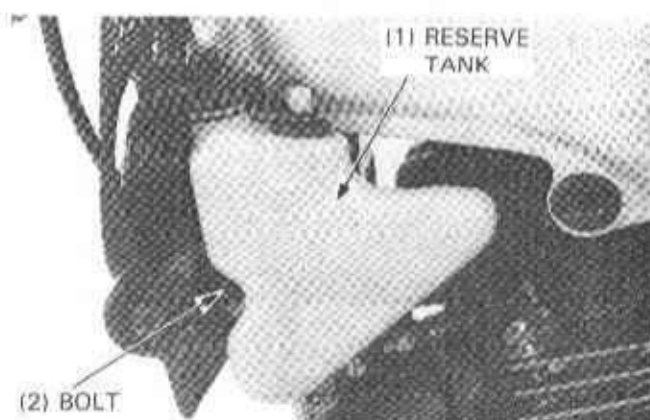
RESERVE TANK

Remove the left side fairing (page 15-2).

Remove the reserve tank by removing the mounting bolt.

Disconnect the tubes from the tank.

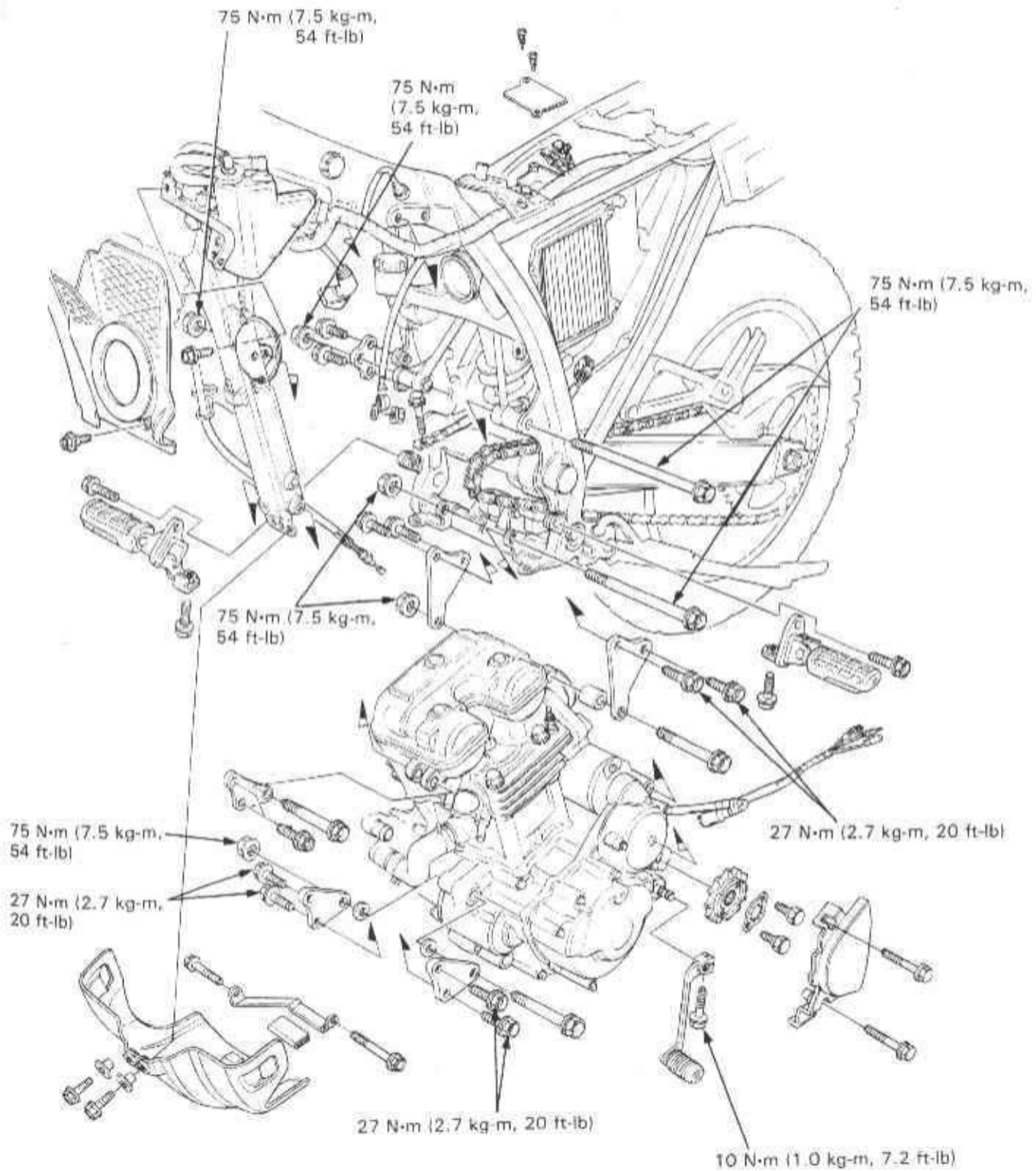
Install the reserve tank in the reverse order of the removal.



**ENGINE REMOVAL/
INSTALLATION**

DEPOSE/REPOSE DU MOTEUR

AUSBAU/EINBAU DES MOTORS



ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION

6-1

ENGINE INSTALLATION

6-4

ENGINE REMOVAL

6-2

SERVICE INFORMATION

GENERAL

CAUTION

- *If you sit on the motorcycle after the engine is removed, the frame will be damaged.*

- A floor jack or other adjustable support is required to support and maneuver the engine.
- The following parts or components can be serviced with the engine installed in the frame:
 - Clutch
 - Gearshift linkage (Stopper arm and cam plate)
 - Oil pump
 - Alternator
 - Starter motor
 - Starter clutch
 - Carburetor
 - Cylinder head
 - Cylinder, piston
 - Water pump

SPECIFICATIONS

Oil capacity	1.6 lit (1.69 US qt, 1.41 Imp qt) at disassembly
Coolant capacity	1.0 lit (1.06 US qt, 0.88 Imp qt) total

TORQUE VALUES

Engine mounting bolt 10 mm:	75 N·m (7.5 kg-m, 54 ft-lb)
Engine bracket bolt 8 mm:	27 N·m (2.7 kg-m, 20 ft-lb)

ENGINE REMOVAL/INSTALLATION

ENGINE REMOVAL

Support the motorcycle using a hoist or other adjustable support.

Drain the engine oil (page 2-2) and radiator coolant (page 5-4).

Remove the following:

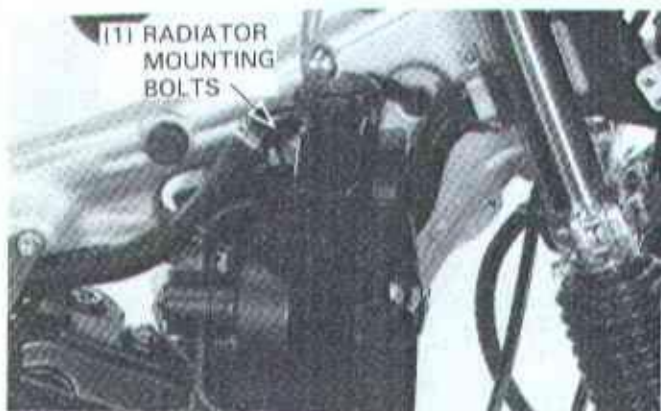
- fuel tank (page 4-3).
- side fairings (page 15-2).
- spark plug cap.

Remove the skid plate mounting bolts and the plate, then remove the skid plate stay from the engine.



Disconnect the upper and lower radiator hoses (page 5-5).

Remove the radiator mounting bolts then hook the radiator with piece of rope.

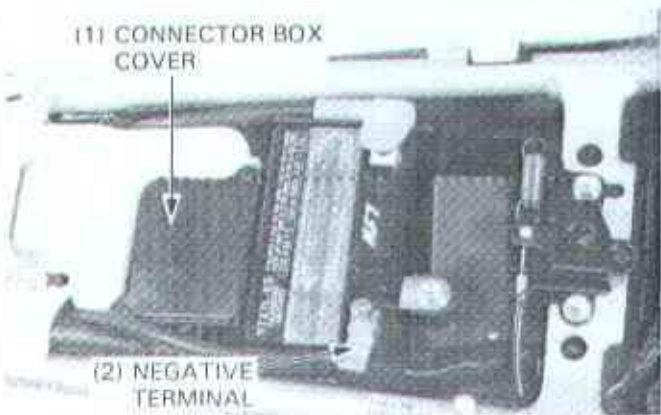


Remove the exhaust pipe by removing the joint nuts and loosening the pipe-to-muffler connecting band bolt.



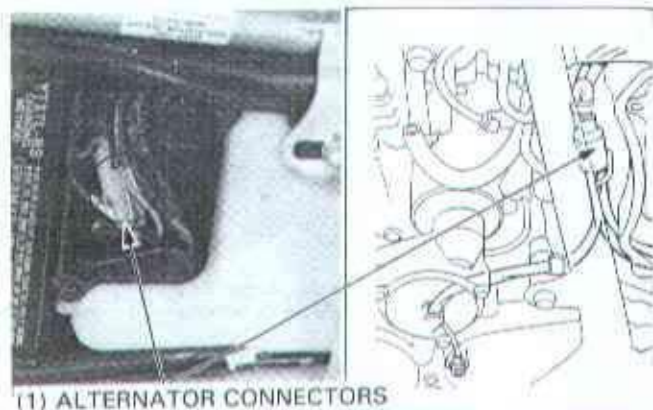
Disconnect the battery negative cable from the battery terminal.

Remove the connector box cover.

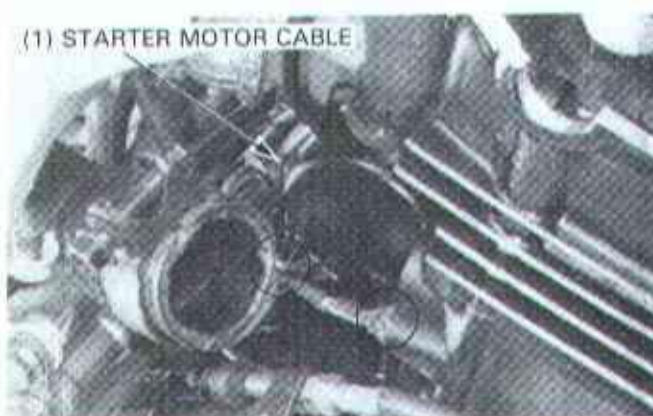


ENGINE REMOVAL/INSTALLATION

Disconnect the alternator 2P and 4P connectors and free the wire from the frame.



Remove the starter motor cable from the starter motor.
Disconnect the clutch cable from the engine (page 7-3).

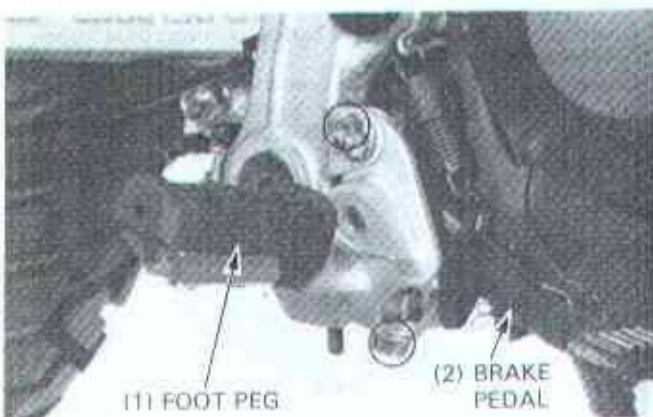


Remove the drive sprocket cover (page 8-2) and the gearshift pedal.

Remove the drive sprocket bolts, lock plate and drive sprocket from the drive chain.



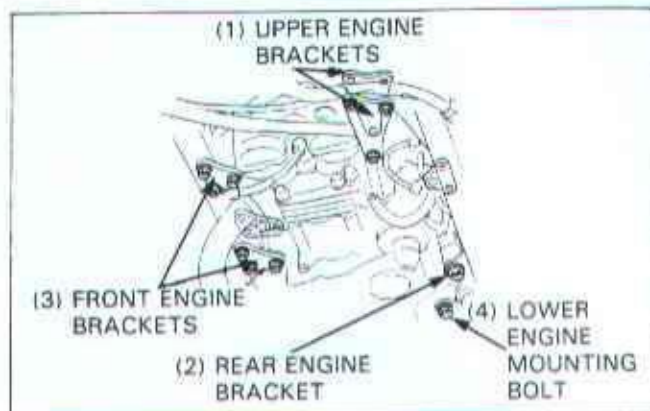
Remove the right and left foot pegs and the brake pedal.



ENGINE REMOVAL/INSTALLATION

Remove the upper engine brackets and the carburetor (page 4-5).

Remove the rear engine bracket and bolt.
Remove the front engine brackets, collars and bolts.
Remove the lower engine mounting bolts.
Remove the engine from the frame.



ENGINE INSTALLATION

Engine installation is essentially the reverse order of removal. Use a floor jack or other adjustable support to carefully maneuver the engine into place.

CAUTION

- Carefully align mounting points with the jack to prevent damage to mounting bolt threads and wire harness and cables.

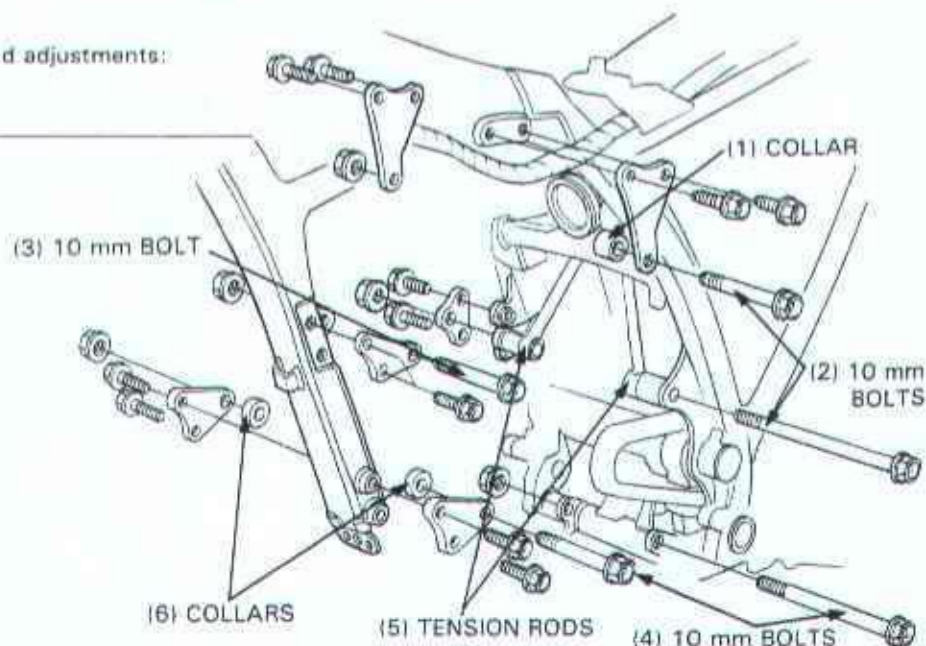
NOTE

- Be sure to install the mounting collars in their correct positions.

Tighten all the fasteners to the specified torque given on pages 6-0, and 6-1.

NOTE

- Route the wires and cables properly (section 1).
- Fill the crankcase to the proper level with the recommended oil (page 2-1).
- Fill the cooling system (page 5-4).
- Perform the following inspection and adjustments:
Throttle operation (page 3-4).
Clutch (page 3-14).



CLUTCH

EMBAYAGE

KUPPLUNG

CLUTCH

SERVICE INFORMATION	7-1	PRIMARY DRIVE GEAR	7-8
TROUBLESHOOTING	7-2	GEARSHIFT LINKAGE	7-9
RIGHT CRANKCASE COVER REMOVAL	7-3	RIGHT CRANKCASE COVER	
CLUTCH	7-3	INSTALLATION	7-10

SERVICE INFORMATION

GENERAL

- This section covers removal and installation of the right crankcase cover, clutch primary drive gear and gearshift linkage.
- Clean the oil strainer whenever the right crankcase cover is removed (refer to page 2-3).
- When the clutch discs are replaced, coat new discs with engine clean oil prior to assembly.
- For oil pump service, refer to section 2.
- For water pump service, refer to section 5.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Clutch	Spring free length	—	35.0 (1.38)
	Disc thickness	2.92–3.08 (0.115–0.121)	2.7 (0.12)
	Plate warpage	—	0.30 (0.012)
	Outer I.D.	25.000–25.021 (0.9843–0.9851)	25.25 (0.994)
	Outer guide O.D.	24.959–24.980 (0.9826–0.9835)	24.17 (0.952)

TORQUE VALUES

Primary drive gear nut	95 N·m (9.5 kg-m, 69 ft-lb)
Clutch center lock nut	60 N·m (6.0 kg-m, 43 ft-lb)
Oil pipe bolt (8 mm)	14 N·m (1.4 kg-m, 10 ft-lb)
Cam plate bolt	12 N·m (1.2 kg-m, 9 ft-lb)
Stopper arm bolt	12 N·m (1.2 kg-m, 9 ft-lb)
Crankcase cover bolt	10 N·m (1.0 kg-m, 7 ft-lb)
Rear brake pedal bolt	18 N·m (1.8 kg-m, 13 ft-lb)

TOOLS

Special

Clutch center holder	07923-KE10000
----------------------	---------------

Common

Lock nut wrench, 20 x 24 mm	07716-0020100
Gear holder	07724-0010100

TROUBLESHOOTING

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

Clutch Slips When Accelerating

- No free play
- Discs worn
- Spring weak

Clutch Will Not Disengage

- Too much free play
- Plates warped

Motorcycle Creeps With Clutch Disengaged

- Too much free play
- Plates warped

Excessive Lever Pressure

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

Clutch Operation Feels Rough

- Outer drum slots rough

CLUTCH

RIGHT CRANKCASE COVER REMOVAL

Remove the skid plate.
Drain the coolant (page 5-3).

Shift the transmission into neutral and drain the oil from the engine (page 2-2).

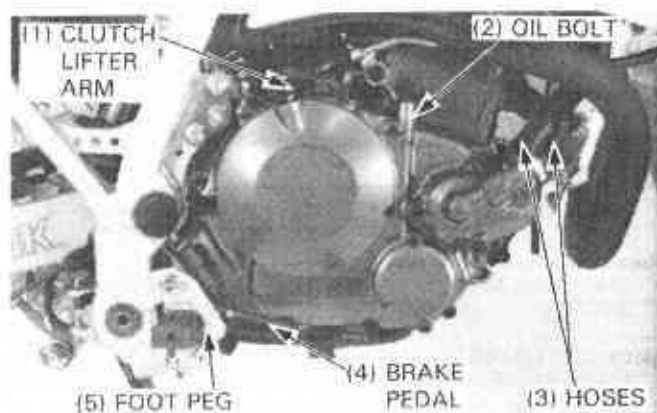


Remove the following:

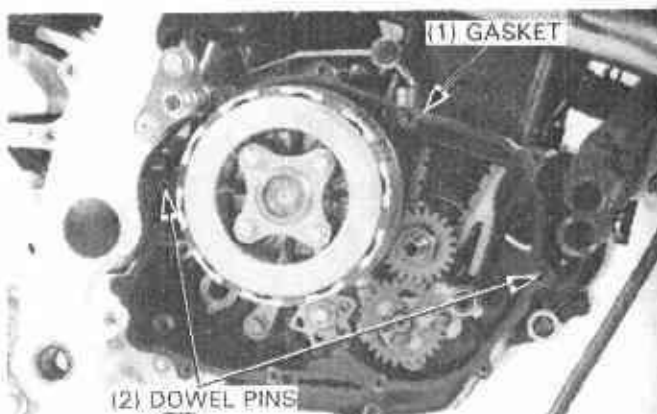
- oil bolt and two sealing washers from the cover.
- lower radiator hose and water hose from the water pump.
- right foot peg, rear brake pedal spring and pedal.

Disconnect the clutch cable from the lifter arm by removing the cable bracket bolt.

Remove the right crankcase cover bolts and cover.



Remove the gasket and dowel pins.



CLUTCH

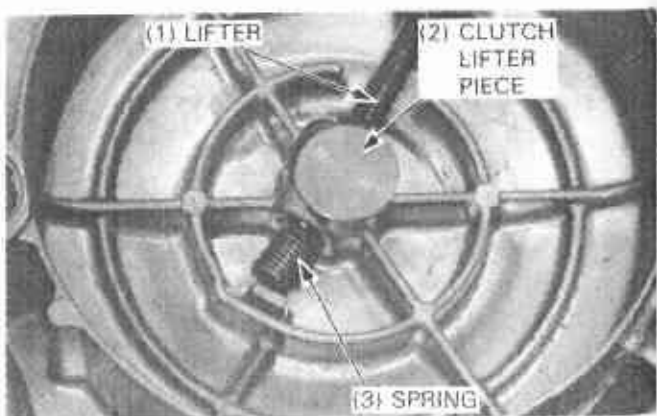
CLUTCH LIFTER REMOVAL/INSPECTION

Remove the clutch lifter piece and spring, then remove the lifter from the cover.

Check the spring for fatigue or damage.

Check the needle bearings for damage or loose fit in the cover.
Check the oil seal for wear or damage.

Apply grease to the oil seal lips and needle bearings.

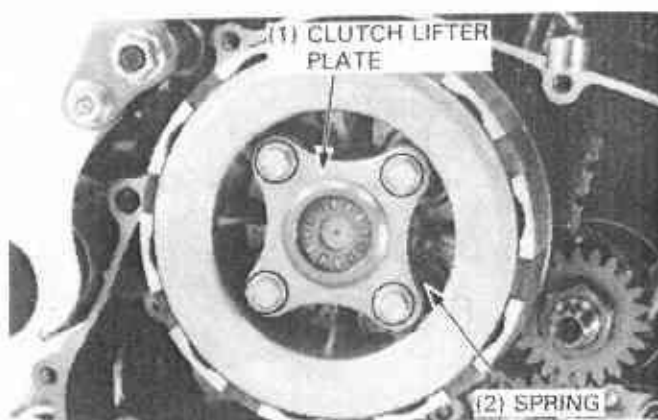


CLUTCH

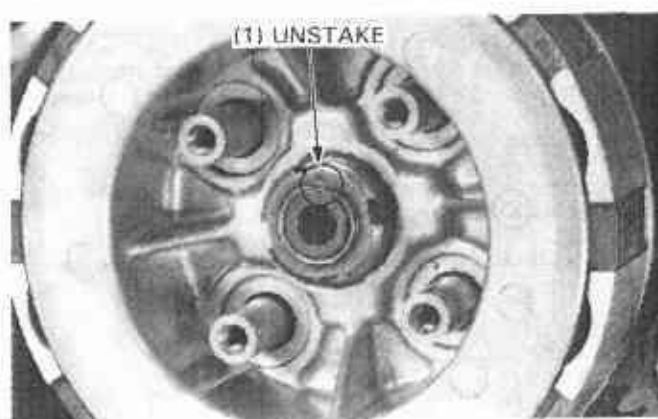
CLUTCH REMOVAL

Remove the following:

- clutch bolts.
- springs.
- lifter plate.
- lifter bearing.



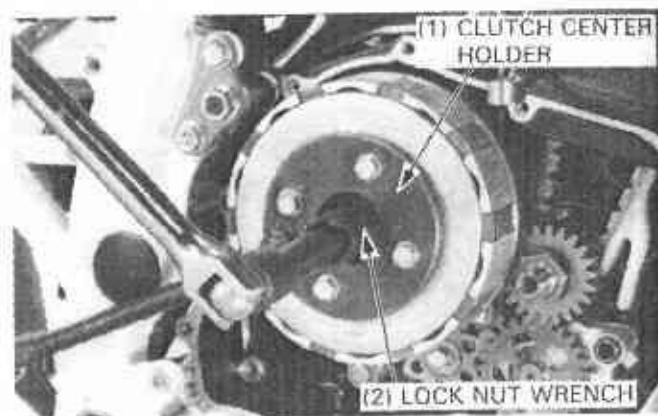
Unstake the lock nut.



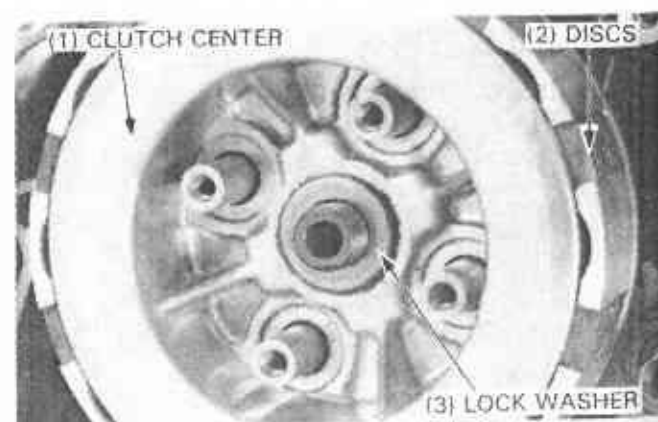
Install the clutch center holder as shown, and remove the clutch lock nut.

TOOLS:

Clutch center holder 07923-KE10000
Lock nut wrench, 20 x 24 mm 07716-0020100

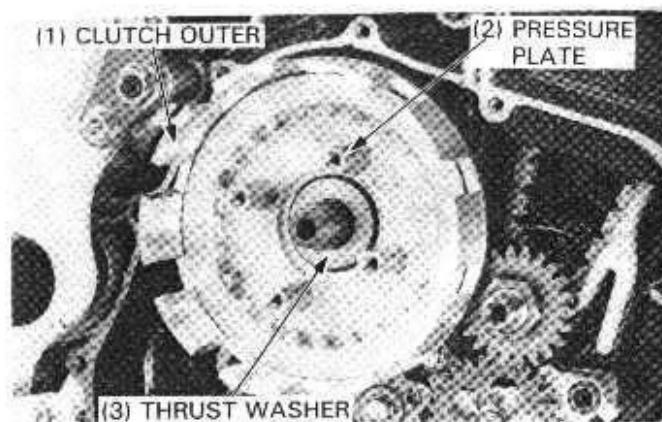


Remove the lock washer, clutch center and discs.

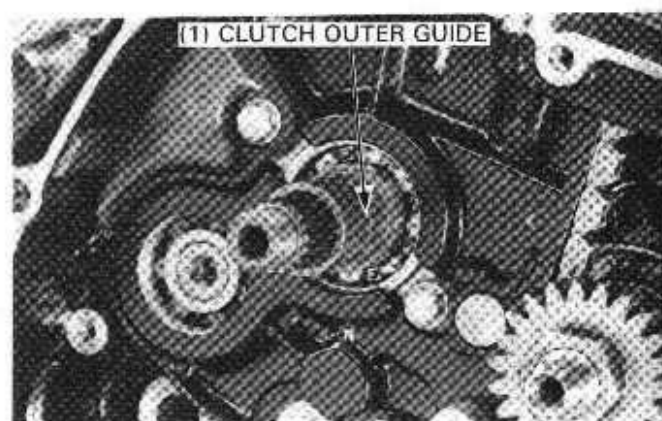


CLUTCH

Remove the thrust washer, pressure plate and clutch outer.



Remove the clutch outer guide from the mainshaft.



INSPECTION

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

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

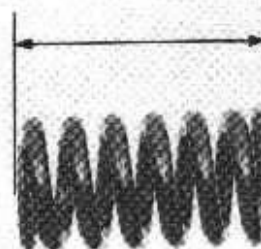
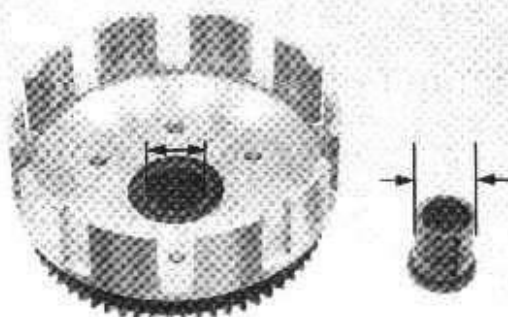
SERVICE LIMIT: 24.17 mm (0.952 in)

Measure the I.D. of the clutch outer.

SERVICE LIMIT: 25.25 mm (0.994 in)

Measure the spring free length.

SERVICE LIMIT: 35.0 mm (1.38 in)



CLUTCH

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

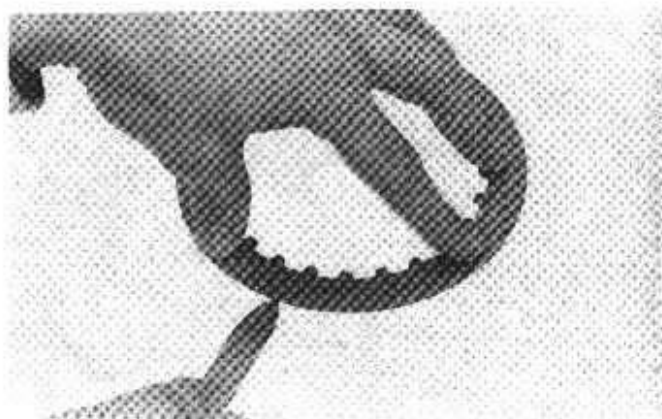
Measure the disc thickness.

SERVICE LIMIT: 2.7 mm (0.12 in)



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

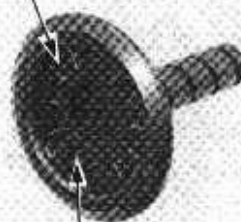
SERVICE LIMIT: 0.30 mm (0.012 in)



Check the lifter plate bearing for wear.

Remove the stop ring and replace the bearing with new one if necessary.

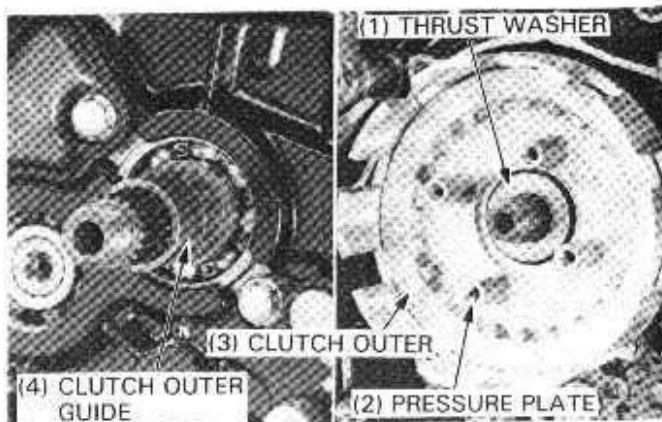
(1) STOP RING



(2) BEARING

INSTALLATION

Install the clutch outer guide, clutch outer, pressure plate and thrust washer.

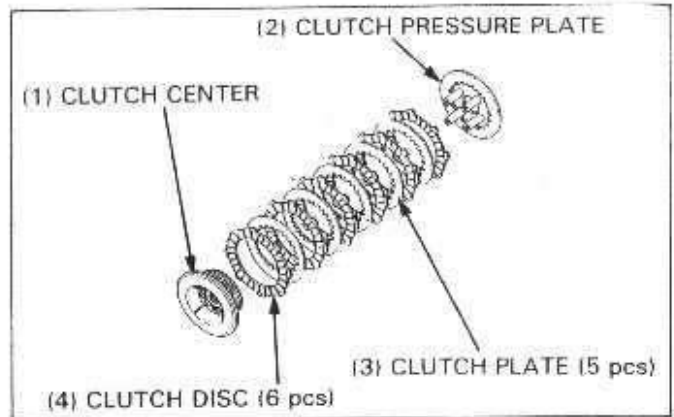


CLUTCH

Assemble the clutch pressure plate, discs, plates and clutch center.

NOTE

- Stack the discs and plates alternately.
- Coat new clutch discs with engine oil.



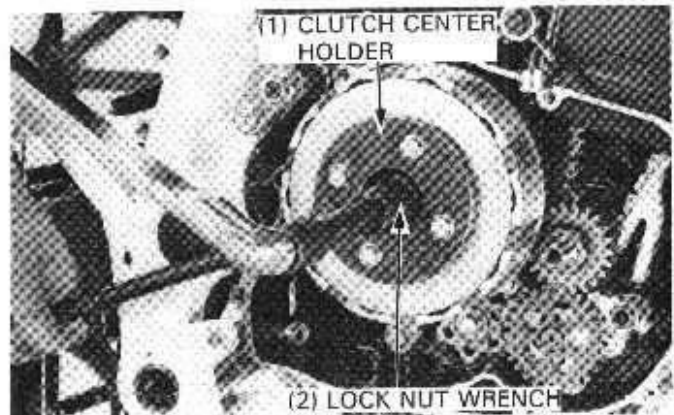
Install the lock nut washer and lock nut.

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

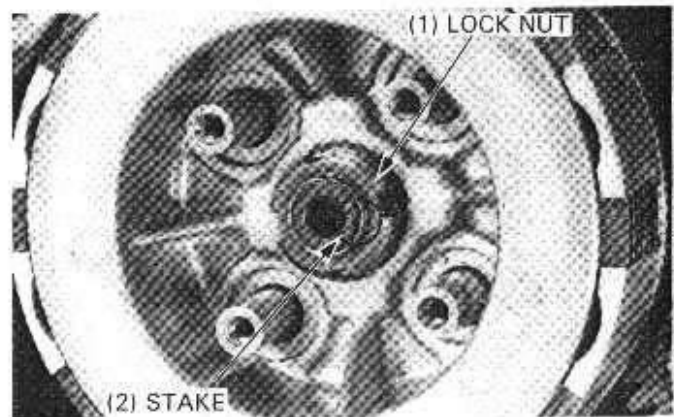
TORQUE: 60 N·m (6.0 kg-m, 43 ft-lb)

TOOLS:

Clutch center holder	07923-KE10000
Lock nut wrench, 20 x 24 mm	07716-0020100

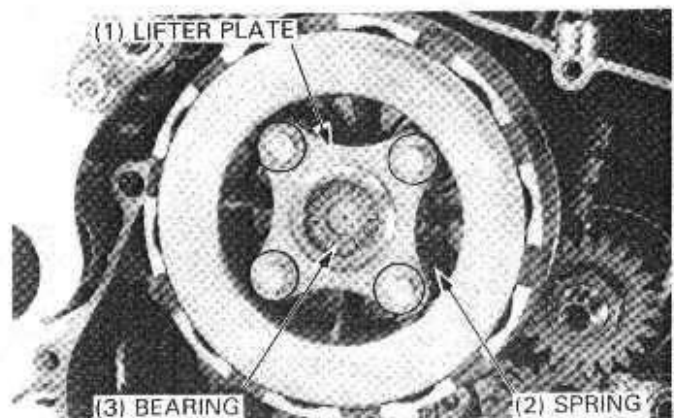


Stake the lock nut.



Install the clutch springs, lifter plate and bolts.
Tighten the bolts in a crisscross pattern in 2 or 3 steps.

Install the clutch lifter bearing.

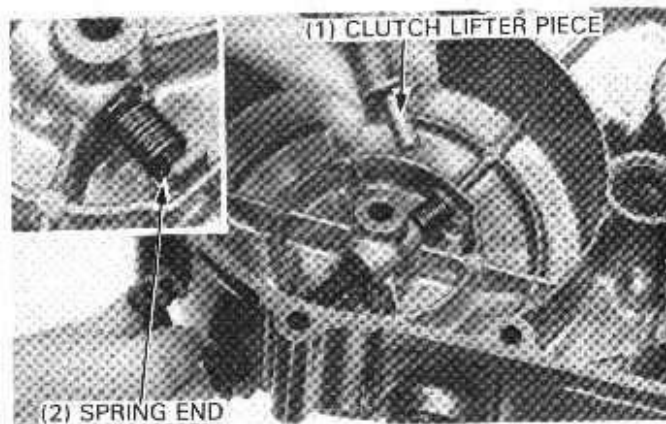


CLUTCH

CLUTCH LIFTER ASSEMBLY

Install the clutch lifter and spring, aligning the spring end with the hole in the lifter.

Install the clutch lifter piece.

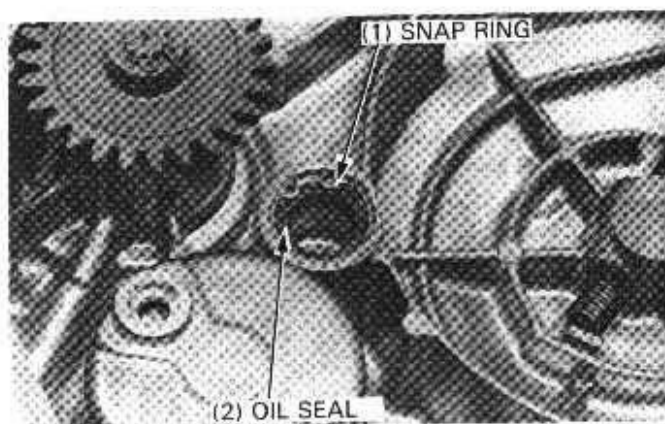


PRIMARY DRIVE GEAR

Remove the right crankcase cover (page 7-3).

CRANKSHAFT OIL SEAL

Remove the snap ring and oil seal from the cover.
Install a new oil seal and snap ring.



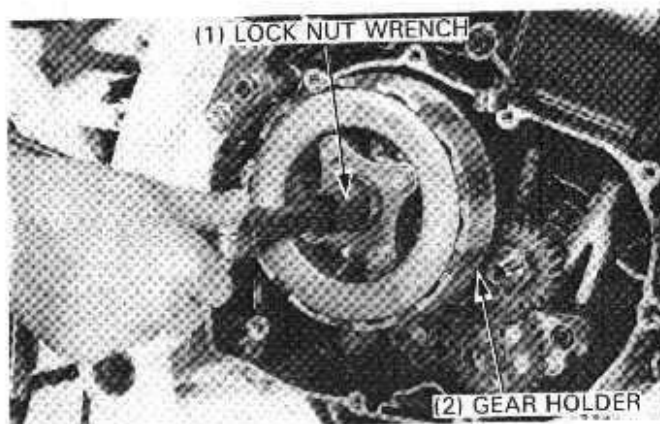
REMOVAL

Remove the lifter plate bearing and unstake the clutch lock nut.

Install the gear holder as shown and remove the clutch lock nut using a lock nut wrench.

TOOLS:

Gear holder	07724-0010100
Lock nut wrench, 20 x 24 mm	07716-0020100

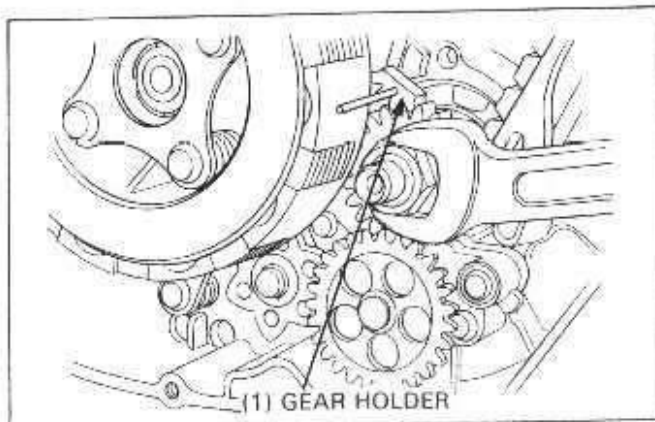


Remove the primary drive gear lock nut and washer.
Remove the clutch assembly from the mainshaft.

Remove the woodruff key and the drive gear.

NOTE

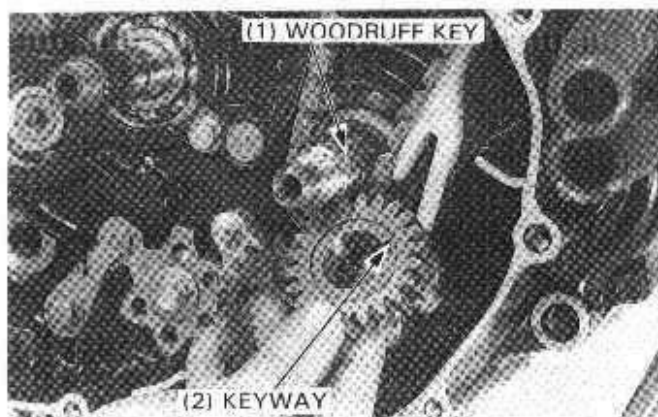
- Use care not to damage the shaft end when removing the drive gear.
- The shaft end has an oil seal in the case.



CLUTCH

INSTALLATION

Place the woodruff key into the crankshaft slot. Install the drive gear by aligning its keyway with the key in the crankshaft.



Install the washer and lock nut. Temporarily install the clutch, then install the gear holder as shown.

TOOL:

Gear holder 07724-0010100

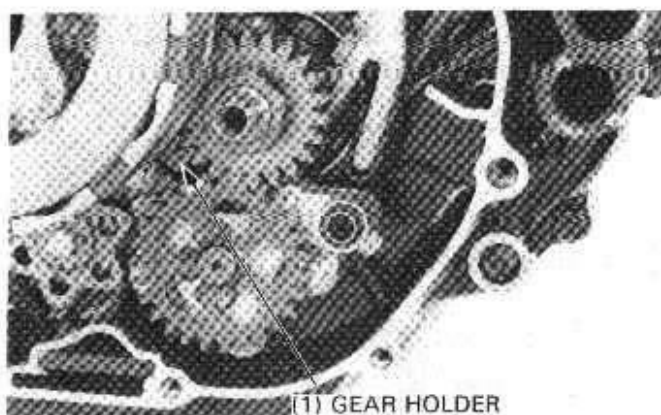
Tighten the drive gear lock nut.

TORQUE: 95 N·m (9.5 kg-m, 69 ft-lb)

Assemble the clutch, if the install the clutch lock nut washer and a new lock nut.

Tighten and stake the nut (see page 7-7), then install the lifter bearing.

Remove the gear holder.

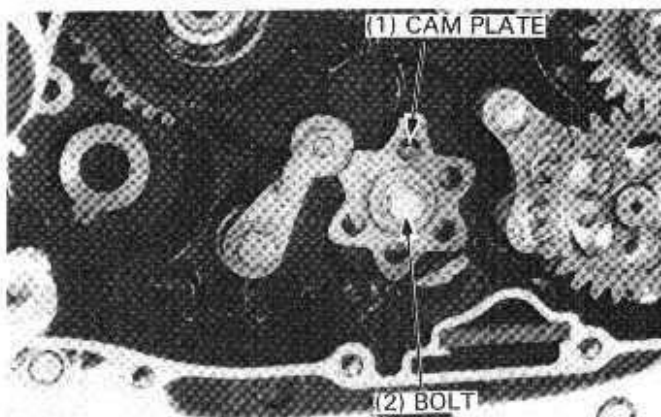


GEARSHIFT LINKAGE

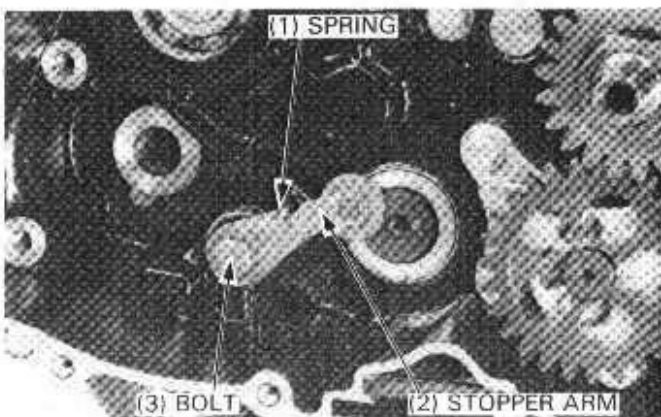
REMOVAL/INSTALLATION

Remove the following:

- right crankcase cover (page 7-3).
- clutch (page 7-4).
- cam plate bolt and cam plate.



Remove the stopper arm bolt, spring washer and stopper arm.

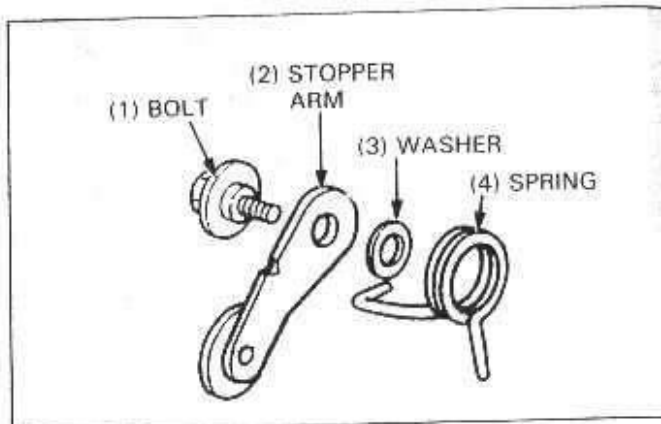


CLUTCH

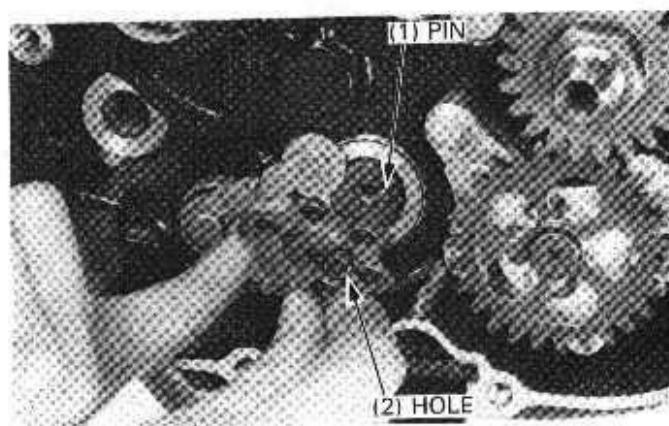
Assemble the stopper arm, bolt, washer and spring then install them in the case.

Tighten the bolt securely.

TORQUE: 12 N·m (1.2 kg-m, 9 ft-lb)



Pull up the stopper arm with your finger and install the cam plate by positioning its hole over the pin in the shift drum.

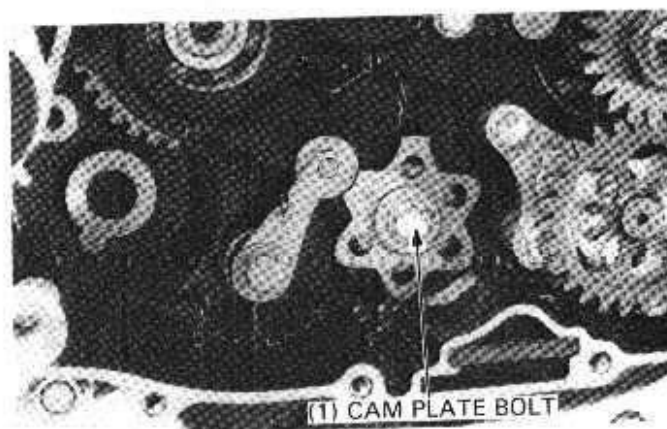


Apply locking agent to the cam plate bolt threads.

Install and tighten the bolt.

TORQUE: 12 N·m (1.2 kg-m, 9 ft-lb)

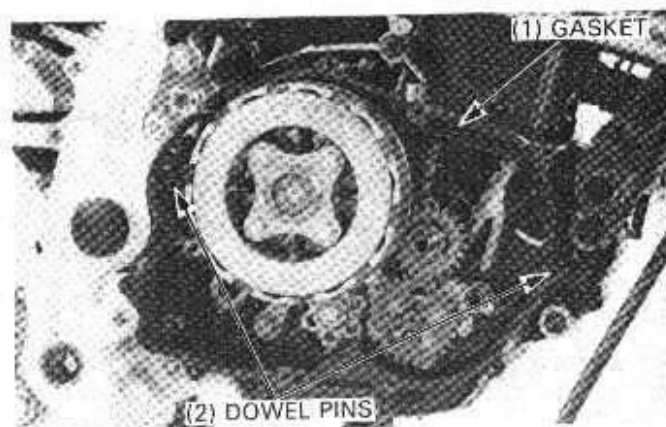
Install the clutch (page 7-6) and the crankcase cover.



RIGHT CRANKCASE COVER INSTALLATION

Install a new gasket and dowel pins.

Install the right crankcase cover.



CLUTCH

Install and tighten the crankcase cover bolts, except at the clutch cable holder, in 2 or 3 steps in a crisscross pattern.

TORQUE: 10 N·m (1.0 kg-m, 7 ft-lb)

Connect the clutch cable to the clutch lifter arm and install the cable holder on the cover with the bolt.

Install new sealing washers and oil pipe bolt.

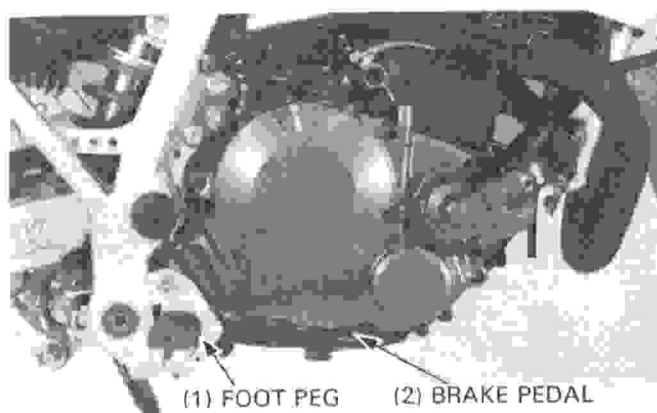
TORQUE: 14 N·m (1.4 kg-m, 10 ft-lb)



Install the right foot peg and rear brake pedal.

TORQUE: Rear brake pedal bolt:
18 N·m (1.8 kg-m, 13 ft-lb)

Install the spring as shown.



Connect the lower radiator and water hoses.

Fill the engine with oil (page 2-3).

Fill the cooling system (page 5-4).

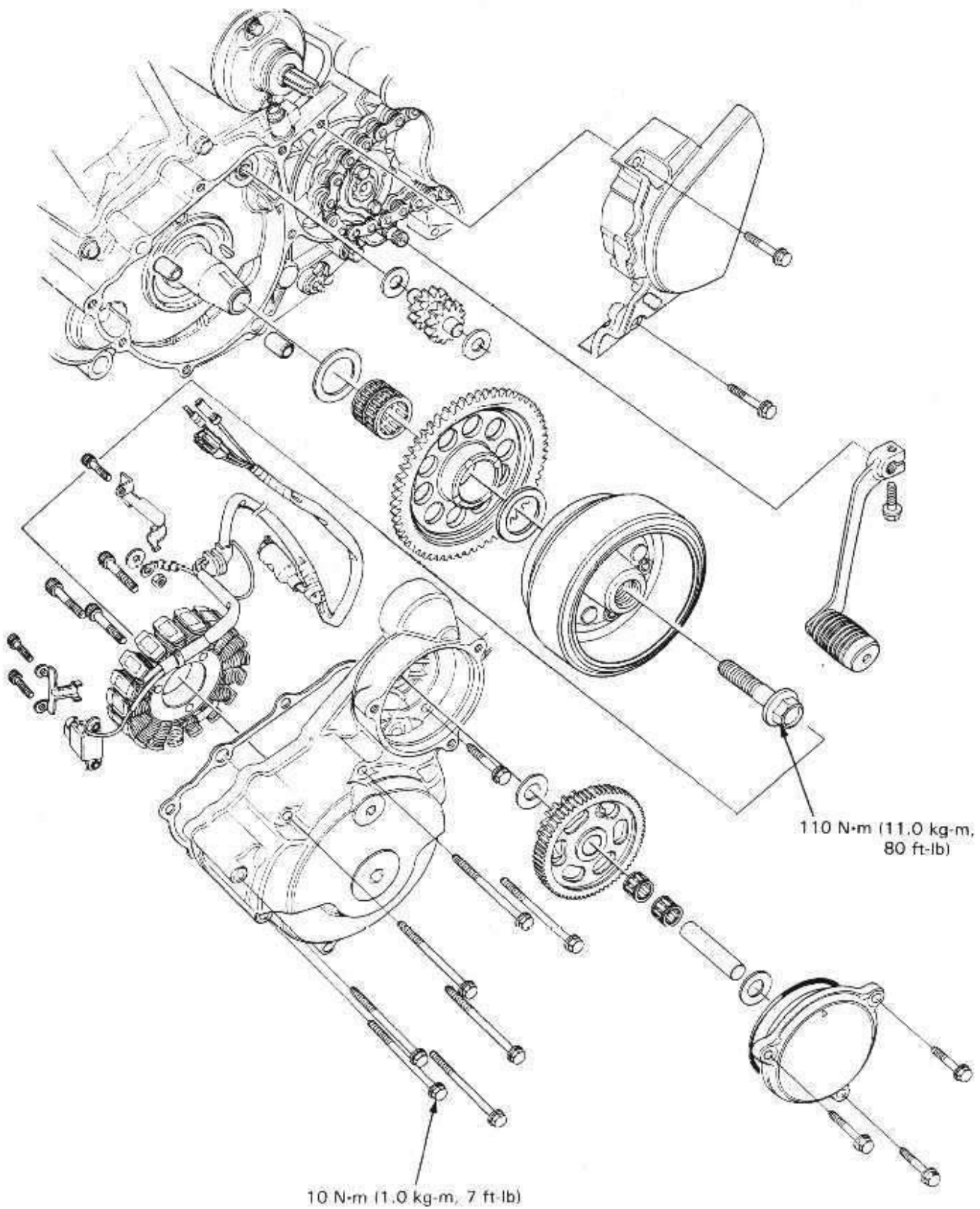
Adjust the clutch cable free play (page 3-14).
Check the clutch and gearshift pedals for smooth operation.
Make sure there are no oil or coolant leaks.



**ALTERNATOR/STARTER
CLUTCH**

**ALTERNATEUR/ROUE LIBRE DE
DE MARREUR**

LICHTMASCHINE/KICKSTARTER



ALTERNATOR/STARTER CLUTCH

SERVICE INFORMATION	8-1	LEFT CRANKCASE COVER	
LEFT CRANKCASE COVER REMOVAL	8-2	INSTALLATION	8-7
FLYWHEEL/STARTER CLUTCH	8-3		

SERVICE INFORMATION

GENERAL

- This section covers the removal and installation of the starter reduction gear, idle gear and starter clutch, flywheel and stator.
- For pulse generator removal and inspection, refer to section 17.

TORQUE VALUES

Flywheel bolt	110 N·m (11.0 kg-m, 80 ft-lb)
Starter clutch outer bolt	16 N·m (1.6 kg-m, 12 ft-lb)

TOOLS

Common	
Flywheel holder	07725-0040000
Rotor puller	07733-0020001

ALTERNATOR/STARTER CLUTCH

LEFT CRANKCASE COVER REMOVAL

Remove the following:

- drive sprocket cover.
- skid plate (page 8-2).

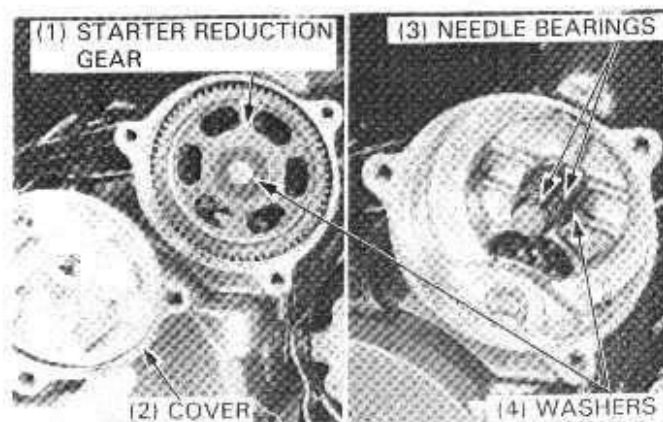
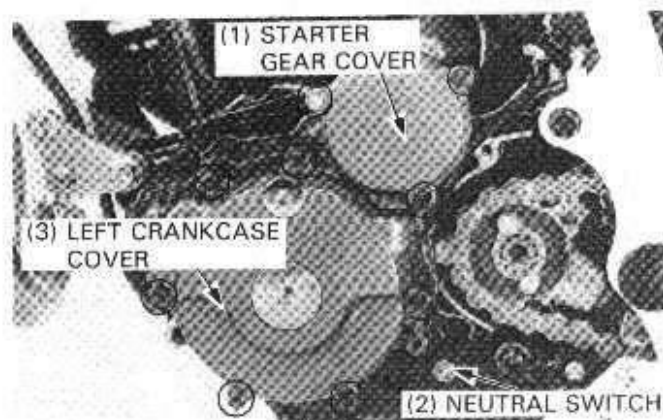
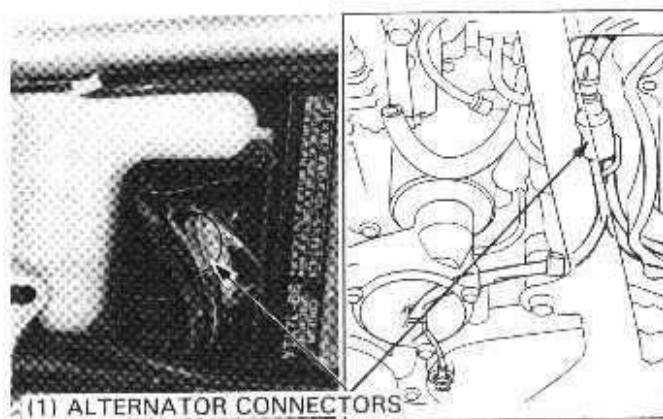
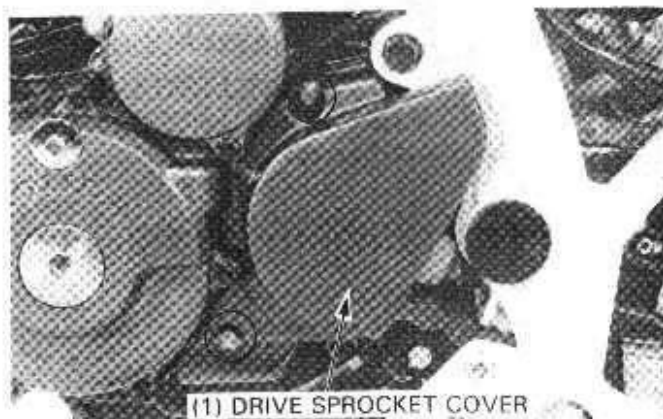
Disconnect the alternator 2P and 3P connectors.

Disconnect the neutral switch wire from the switch terminal.

Remove the bolts from the left crankcase and starter reduction gear covers.

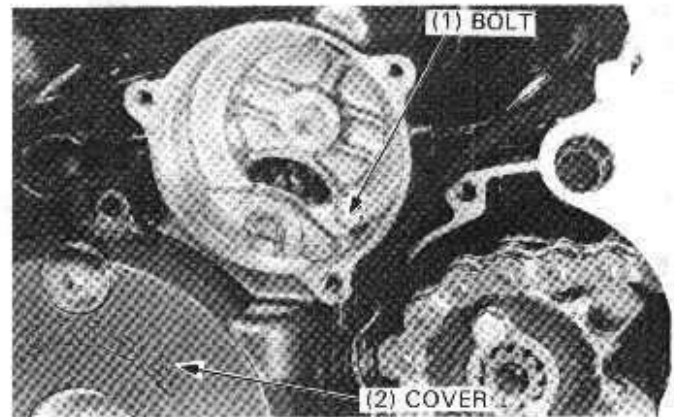
Remove the starter reduction gear cover, washer and gear.

Remove the needle bearings, washer and shaft.



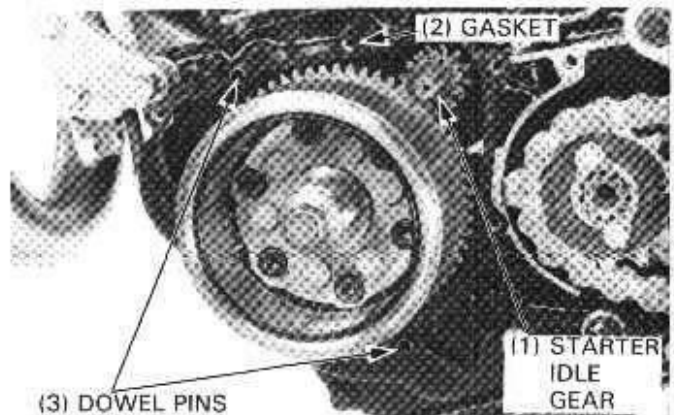
ALTERNATOR/STARTER CLUTCH

Remove the left crankcase cover bolt located in the reduction gear housing, then remove the crankcase cover.



Remove the starter idle gear.

Remove the gasket and dowel pins.



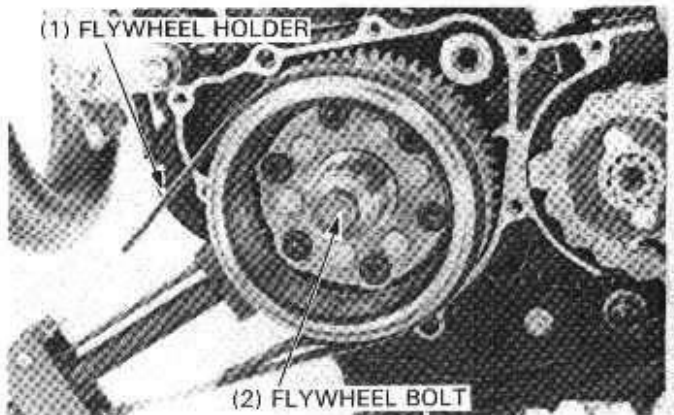
FLYWHEEL/STARTER CLUTCH

FLYWHEEL REMOVAL

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

TOOL: Flywheel holder

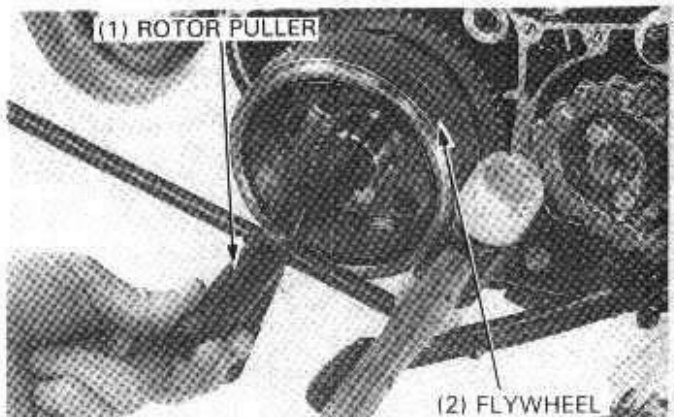
07725-0040000



Remove the flywheel with the rotor puller.

TOOL: Rotor puller

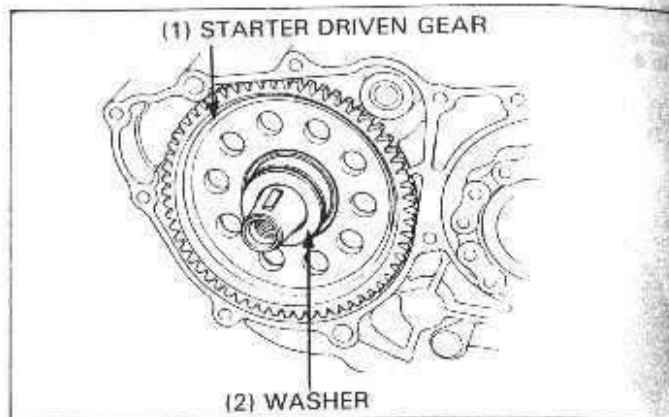
07733-0020001



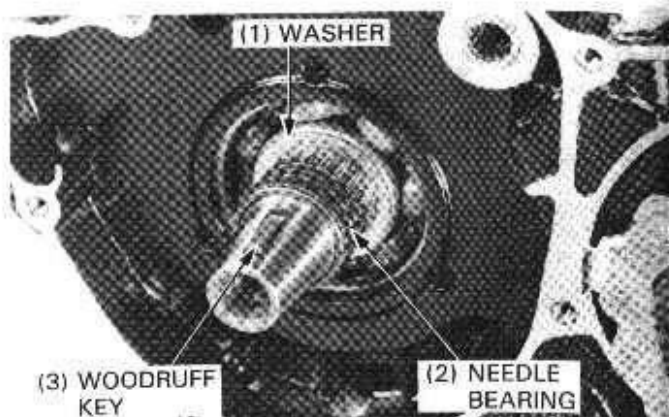
ALTERNATOR/STARTER CLUTCH

STARTER CLUTCH REMOVAL

Remove the washer and the starter driven gear.



Remove the needle bearing, washer and woodruff key.

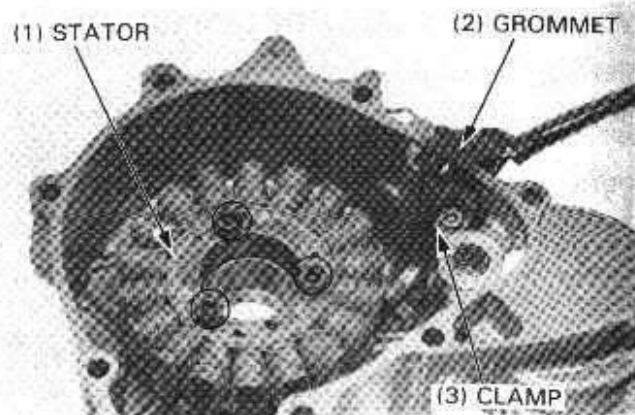


ALTERNATOR REPLACEMENT

Remove the wire clamp by removing the bolt.
Remove the three stator bolts and disconnect the wire terminal from the pulse generator (page 17-5).
Remove the stator and wire grommets from the cover.

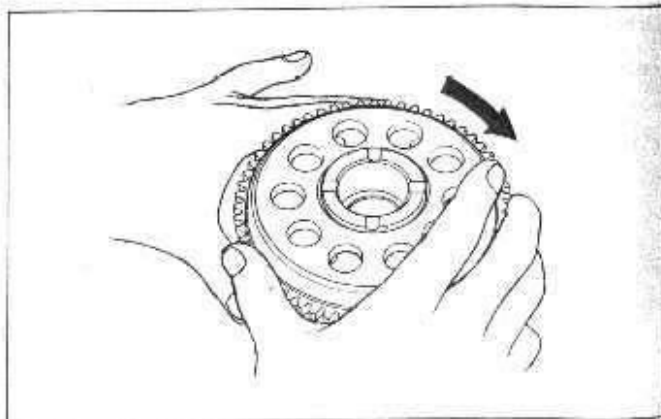
Insert the wire grommet into the groove in the cover. Apply a locking agent to the stator bolt and install and tighten the bolts.

Install the wire clamp and connect the wire to the pulse generator.



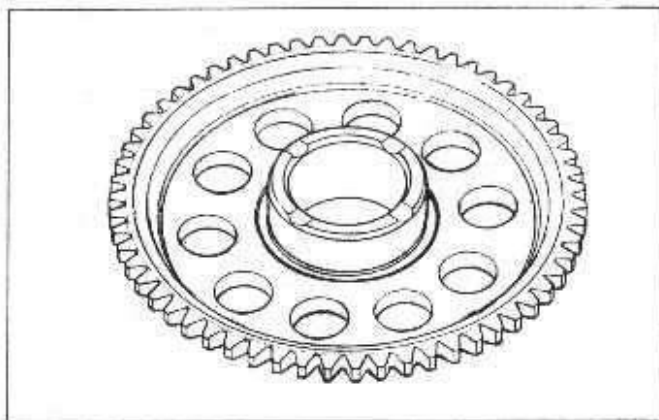
STARTER CLUTCH INSPECTION/DISASSEMBLY

Check the operation of the one-way clutch by turning the driven gear. You should be able to turn the driven gear clockwise smoothly, but the gear should not turn counter-clockwise.



ALTERNATOR/STARTER CLUTCH

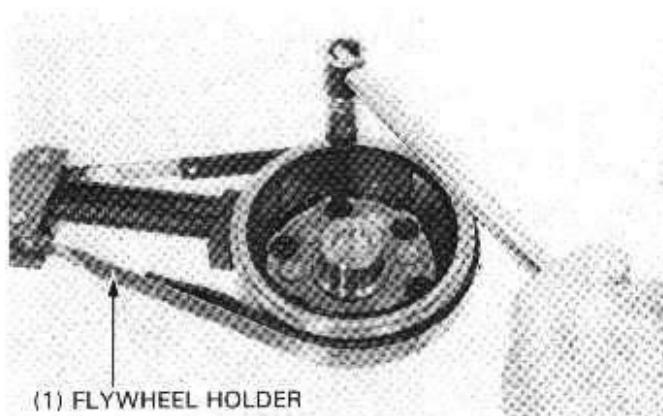
Inspect the starter driven gear teeth for damage or abnormal wear.



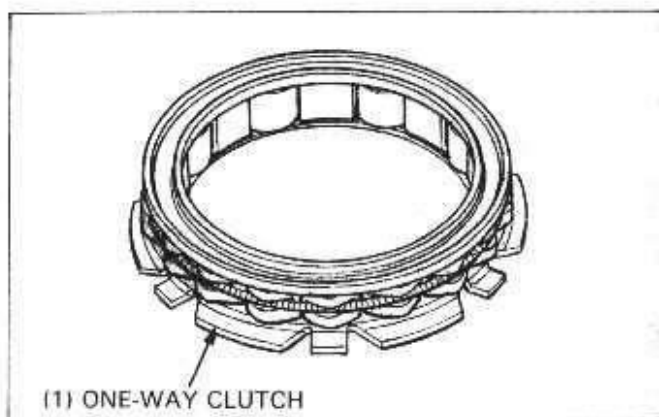
Hold the flywheel and remove the socket bolts, then remove the one-way clutch.

TOOL: Flywheel holder

07725-0040000



Check the one-way clutch rollers for wear or damage.

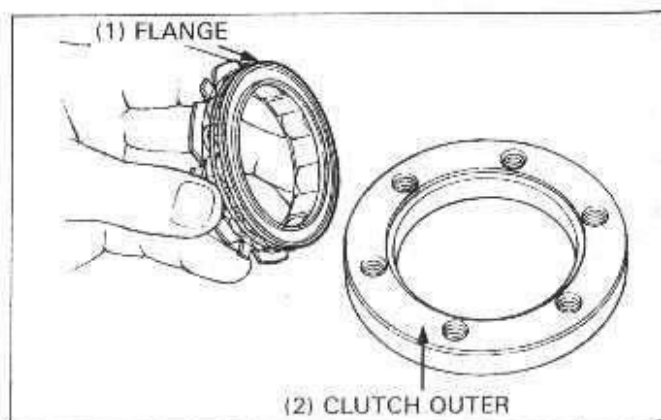


ASSEMBLY

Apply oil to the one-way clutch rollers.
Install the one-way clutch in the clutch outer.

NOTE

- Make sure the flange side of the one-way clutch is facing the flywheel.

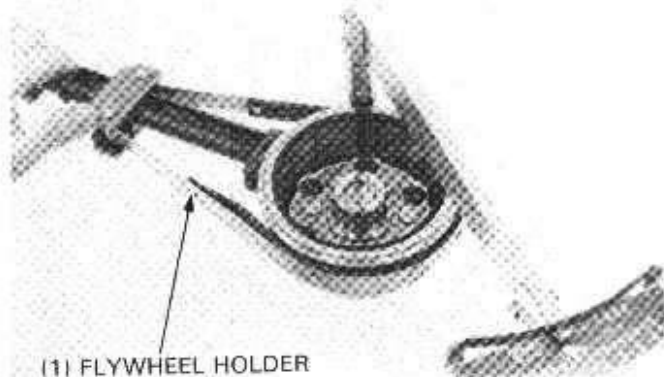


ALTERNATOR/STARTER CLUTCH

Apply a locking agent to the socket bolt threads.
Install the tighten the bolts.

TOOL: Flywheel holder 07725-0040000

TORQUE: 16 N·m (1.6 kg-m, 12 ft-lb)

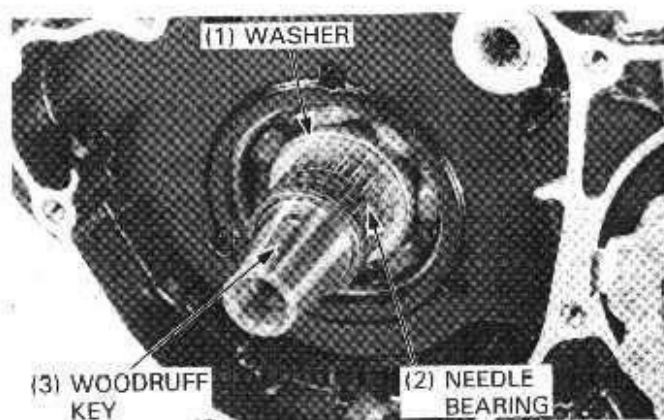


STARTER CLUTCH/FLYWHEEL INSTALLATION

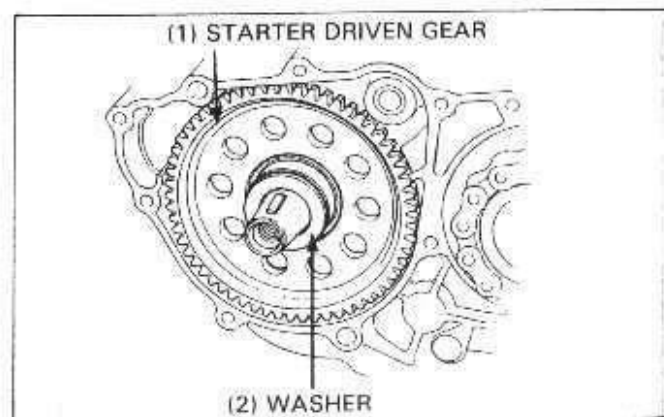
Clean any oil from the crankshaft.

Install the washer with its chamfered surface facing out.

Install the needle bearing and woodruff key.



Install the starter driven gear and washer.

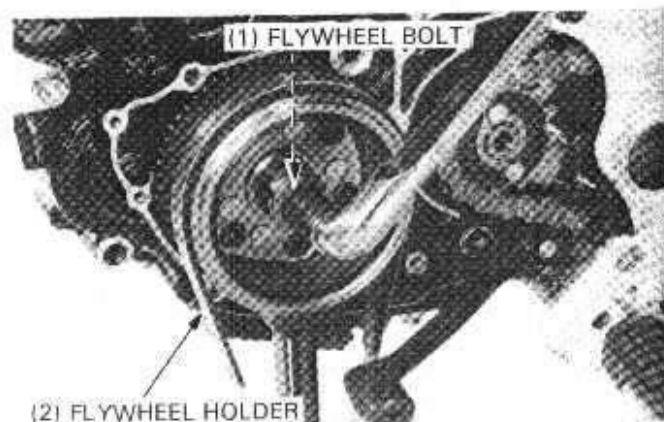


Install the flywheel with the one-way clutch, aligning the key way in the flywheel with the key on the crankshaft.

Install the washer and the flywheel bolt. Hold the flywheel and tighten the bolt.

TOOL: Flywheel holder 07725-0040000

TORQUE: 110 N·m (11.0 kg-m, 80 ft-lb)



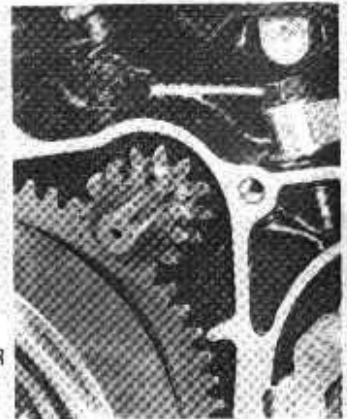
ALTERNATOR/STARTER CLUTCH

Assemble the inner washer, starter idle gear and outer washer, then install them as shown.

(1) INNER WASHER

(2) STARTER
IDLE GEAR

(3) OUTER WASHER

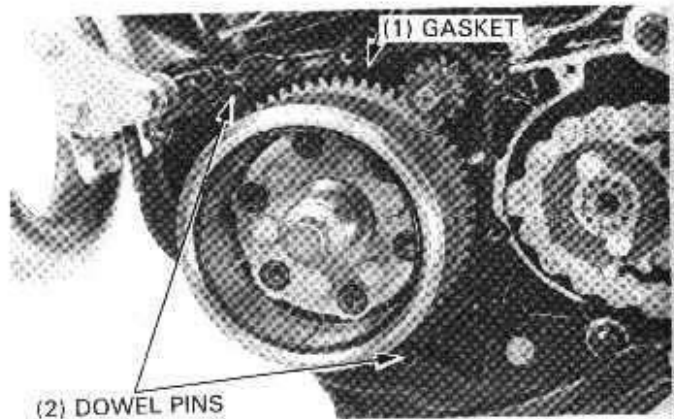


LEFT CRANKCASE COVER INSTALLATION

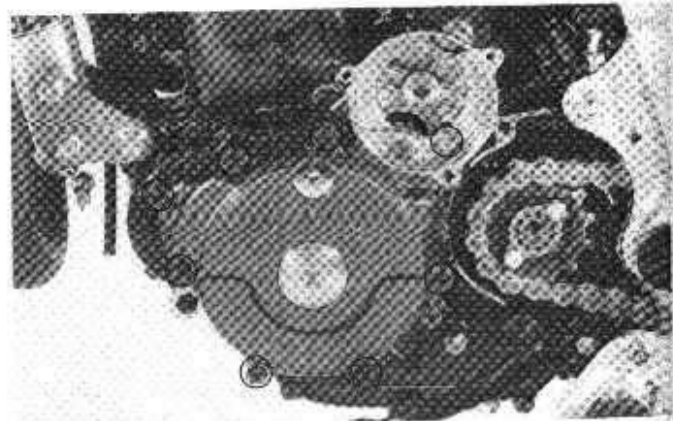
Install a new gasket and dowel pins.

(1) GASKET

(2) DOWEL PINS



Install the left crankcase cover.
Tighten the cover bolts in 2 or 3 steps in a crisscross pattern.

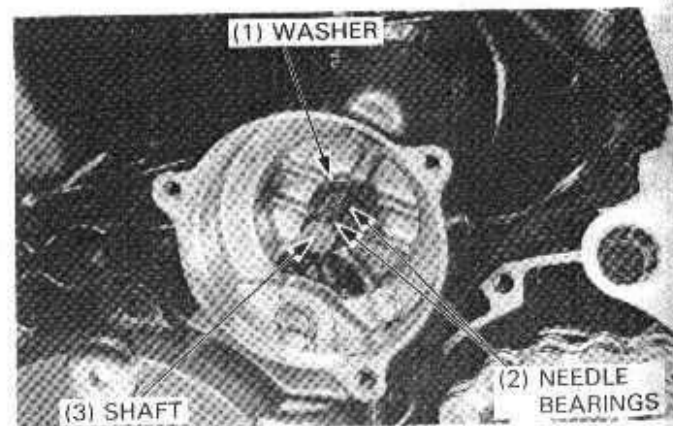


Install the shaft, washer and needle bearings.

(1) WASHER

(3) SHAFT

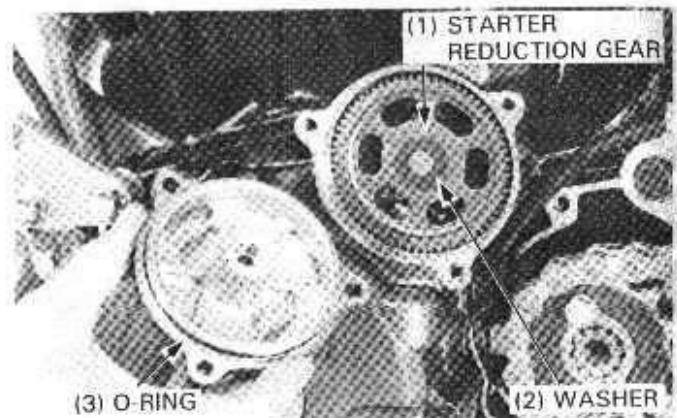
(2) NEEDLE
BEARINGS



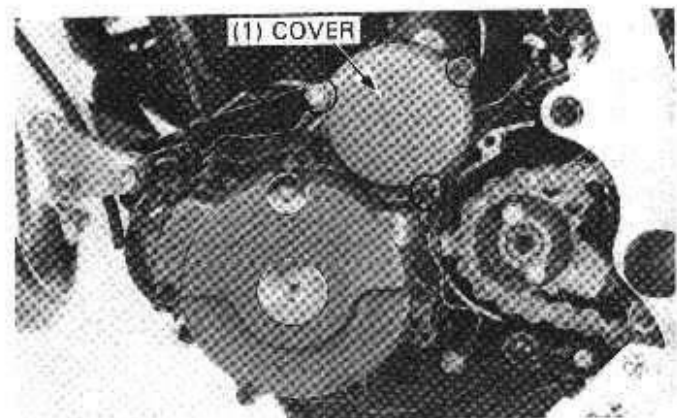
ALTERNATOR/STARTER CLUTCH

Install the starter reduction gear and washer.

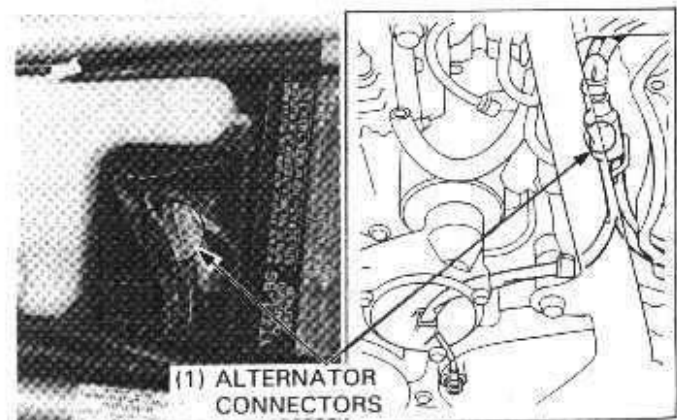
Install a new O-ring in the cover and install the cover.



Install the and tighten cover bolts.



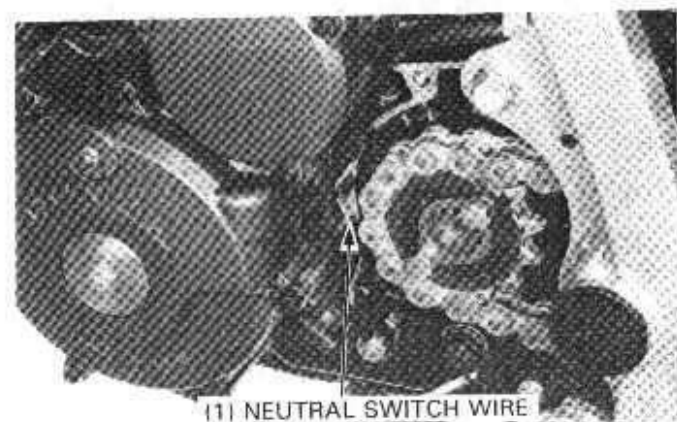
Connect the alternator 2P and 3P connectors.



Connect the neutral switch wire and route it properly.

Install the drive sprocket cover.

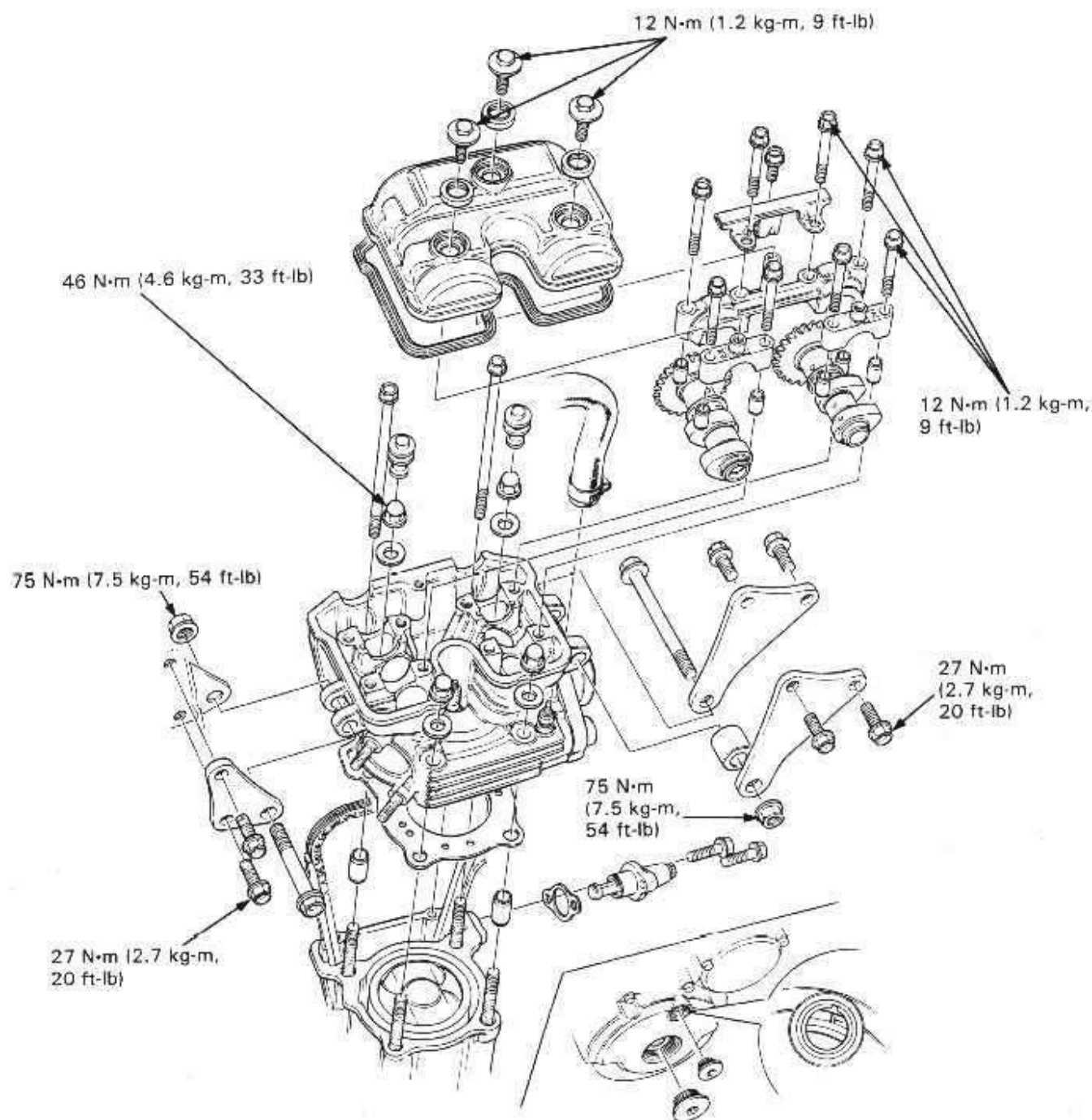
Install the skid plate (page 7-11).



CYLINDER HEAD/VALVE

CULASSE/SOUPAPE

ZYLINDERKOPE/VENTILE



CYLINDER HEAD/VALVES

SERVICE INFORMATION	9-1	VALVE SEAT INSPECTION/REFACING	9-11
TROUBLESHOOTING	9-2	CYLINDER HEAD ASSEMBLY	9-13
CYLINDER HEAD COVER REMOVAL	9-3	CYLINDER HEAD INSTALLATION	9-15
CAMSHAFT/CAM CHAIN TENSIONER REMOVAL	9-3	CAMSHAFT/CAM CHAIN TENSIONER INSTALLATION	9-16
CYLINDER HEAD REMOVAL	9-6	CYLINDER HEAD COVER INSTALLATION	9-19
CYLINDER HEAD DISASSEMBLY	9-7		
VALVE GUIDE REPLACEMENT	9-10		

SERVICE INFORMATION

GENERAL

- This section covers cylinder head, valves, camshaft and cam chain tensioner services.
These services can be performed with the engine installed in the frame.
- See Section 3 for valve clearance inspection and adjustment procedures.
- Lubricate the camshaft journal and cam lobes with molybdenum disulfide grease for initial lubrication.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			1,569 ± 96 kPa (16.0 ± 1.0 kg/cm ² , 228 ± 14 psi)	—
Camshaft	Cam lobe height	IN	38.21—38.45 (1.504—1.514)	38.150 (1.5020)
		EX	37.61—37.85 (1.481—1.490)	37.550 (1.4783)
	Journal	O.D.	24.959—24.980 (0.9826—0.9835)	24.940 (0.9819)
		Oil clearance	0.020—0.040 (0.0008—0.0016)	0.070 (0.0028)
Valve spring	Free length	Inner	34.41 (1.355)	33.0 (1.30)
		Outer	38.0 (1.50)	36.2 (1.43)
Valve, Valve guide	Valve stem O.D.	IN	4.475—4.490 (0.1762—0.1768)	4.47 (0.176)
		EX	4.455—4.470 (0.1754—0.1759)	4.45 (0.175)
	Valve guide I.D.	IN	4.500—4.512 (0.1772—0.1776)	4.55 (0.179)
		EX	4.500—4.512 (0.1772—0.1776)	4.55 (0.179)
	Stem-to-guide clearance	IN	0.010—0.037 (0.0004—0.0015)	0.08 (0.003)
		EX	0.030—0.057 (0.0012—0.0022)	0.10 (0.004)
Valve seat width			0.8—1.2 (0.03—0.05)	1.5 (0.06)
Valve guide projection height (IN/EX)			13 (0.51)	—
Valve lifter O.D.			25.978—25.993 (1.0228—1.0234)	25.97 (1.022)
Valve lifter bore (at cylinder head) I.D.			25.990—26.026 (1.0232—1.0246)	26.04 (1.039)
Cylinder head warpage			—	0.01 (0.0004)

TORQUE VALUES

Camshaft holder bolt	12 N·m (1.2 kg-m, 9 ft-lb)
Engine bracket bolt (8 mm)	27 N·m (2.7 kg-m, 20 ft-lb)
Engine mounting bolt (10 mm)	75 N·m (7.5 kg-m, 54 ft-lb)
Cylinder head cover bolt	12 N·m (1.2 kg-m, 9 ft-lb)
Cylinder head cap nut	46 N·m (4.6 kg-m, 33 ft-lb)

TOOLS

Special

Valve guide reamer, 4.5 mm	07HMH-ML00100
Valve hole protector	07HMG-MR70001
Valve compressor attachment	07959-KM30101
Valve guide driver	07HMD-ML00100

Common

Valve spring compressor	07757-0010000
-------------------------	---------------

VALVE SEAT CUTTER

Valve seat cutter 24.5 mm (45°EX)	07780-0010100
Valve seat cutter 27.5 mm (45°IN)	07780-0010200
Valve flat cutter 25 mm (32°EX)	07780-0012000
Valve flat cutter 28 mm (32°IN)	07780-0012100
Valve interior cutter 30 mm (60°IN)	07780-0014000
Valve interior cutter 26 mm (60°EX)	07780-0014500
Valve seat cutter holder 4.5 mm	07781-0010600

TROUBLESHOOTING

Engine top-end problems usually affect engine performance. These can be diagnosed by a compression test, or by tracing noises with a sounding rod or stethoscope.

Low compression

- Valves
 - Incorrect valve adjustment
 - Burned or bent valves
 - Incorrect valve timing
 - Broken valve spring
- Cylinder head
 - Leaking or damaged head gasket
 - Warped or cracked cylinder head
- Cylinder and piston (Refer to Section 10)

Compression too high

- Excessive carbon build-up on piston or combustion chamber

Compression too high

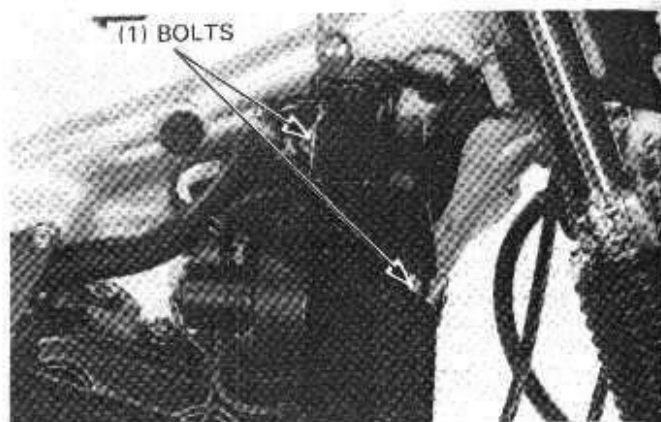
- Excessive carbon build-up on piston or combustion chamber

CYLINDER HEAD/VALVES

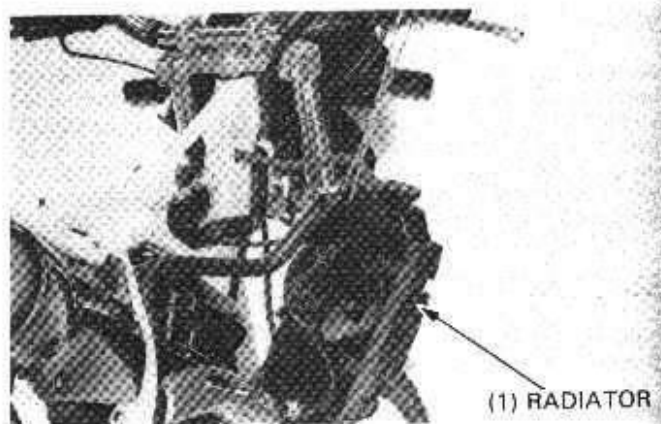
CYLINDER HEAD COVER REMOVAL

Remove the following:

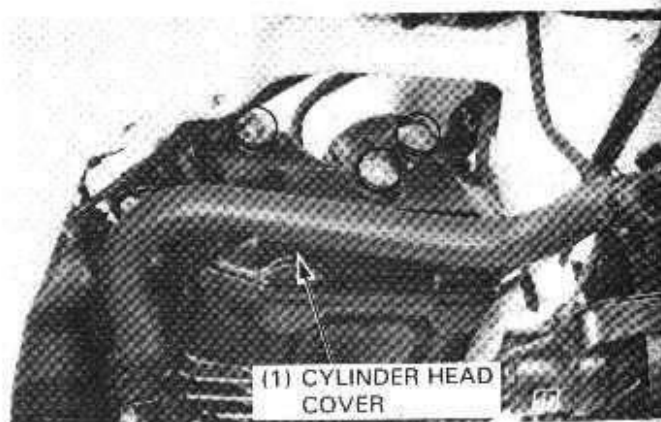
- fuel tank (page 4-3).
- radiator mounting bolts.
- upper engine brackets.



Remove the radiator from the frame and suspend the radiator with a piece of wire.



Remove the three bolts and cylinder head cover.



CAMSHAFT/CAM CHAIN TENSIONER REMOVAL

Remove the two bolts and cam chain tensioner.

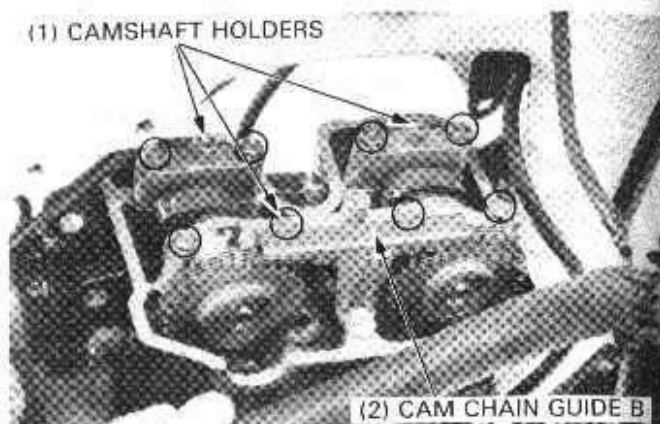


CYLINDER HEAD/VALVES

Remove the following:

- camshaft holders.
- cam chain guide B.
- camshafts.

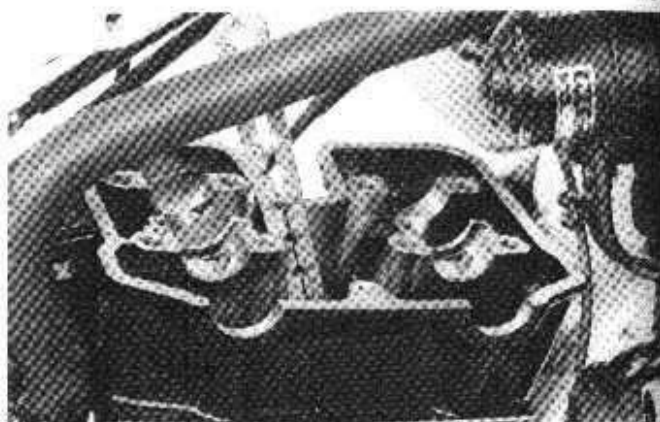
(1) CAMSHAFT HOLDERS



(2) CAM CHAIN GUIDE B

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

Inspect the camshaft holder and cylinder head journal surfaces for scoring or evidence of insufficient lubrication.



Camshaft bearing oil clearance

Wipe any oil from the journals. Lay a stripe of plastigauge lengthwise on top of each camshaft journal.

(1) PLASTIGAUGE

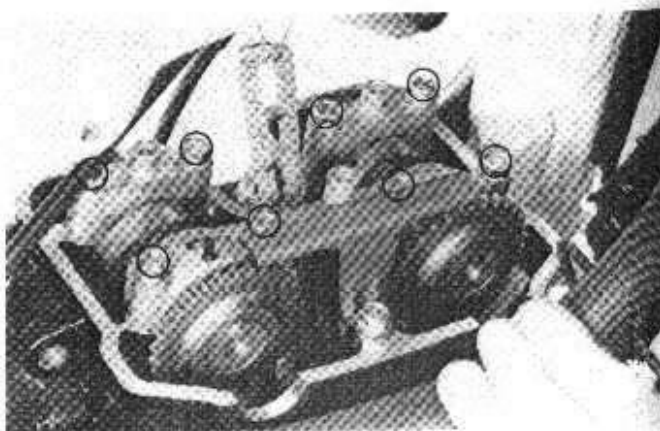


Install the camshaft holders and tighten the bolts in a crisscross pattern in 2 or 3 steps.

NOTE

- Do not rotate the camshaft when using plastigauge.

TORQUE: 12 N·m (1.2 kg-m, 9 ft-lb)



CYLINDER HEAD/VALVES

Remove the camshaft holders and measure the width of the plastigauge. The widest thickness determines the oil clearance.

SERVICE LIMITS: 0.070 mm (0.0028 in)

When the service limits are exceeded, measure the camshaft journals O.D. (below):

- If the journals are beyond the service limit, replace the camshaft and recheck the oil clearance.
- If the camshaft journals are O.K., replace the cylinder head and the camshaft holders.

NOTE

- The cylinder head and holders are a set.

Replace the camshaft holder and cylinder head if the clearance still exceeds the service limits.

Cam journal

Check the camshaft journals for wear or damage. Measure each camshaft journal O.D.

SERVICE LIMIT: 24.940 mm (0.9819 in)

Cam lobe height

Using a micrometer, measure the height of each cam lobe.

SERVICE LIMITS: IN: 38.150 mm (1.5020 in)

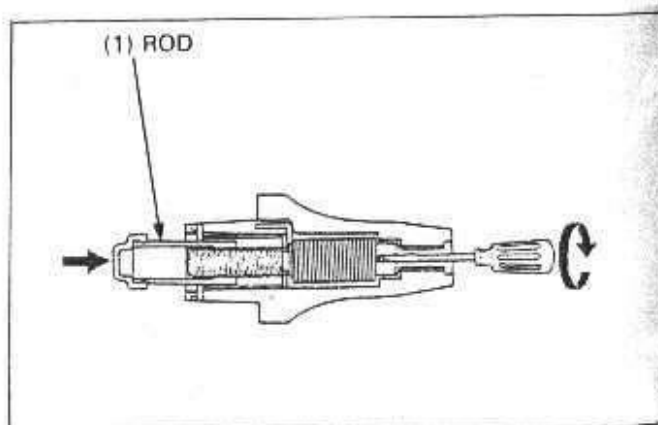
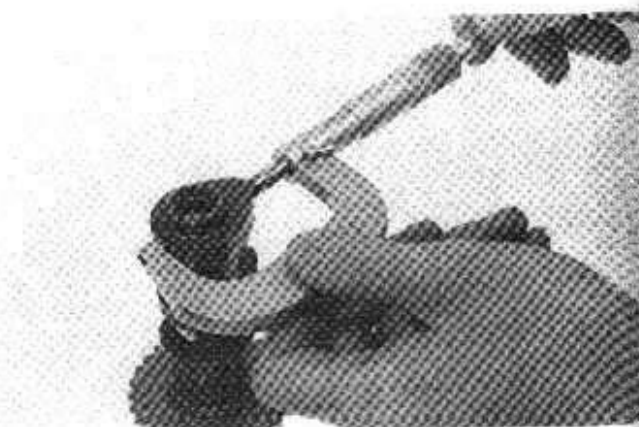
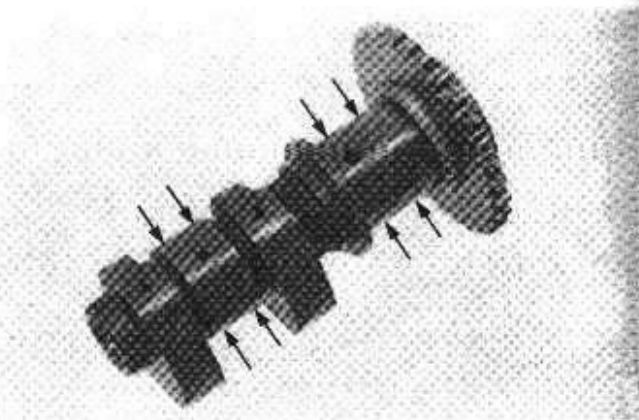
EX: 37.550 mm (1.4783 in)

Cam chain tensioner

Remove the cam chain tensioner lifter sealing bolt. Discard the gasket.

Check the lifter operation:

- the tensioner rod should not go into the body when it is pushed straight in.
- when it is turned clockwise with a screwdriver, the tensioner rod go pulled into the body. The rod should spring out of the body after being turned clockwise 2 or 3 turns and leased.

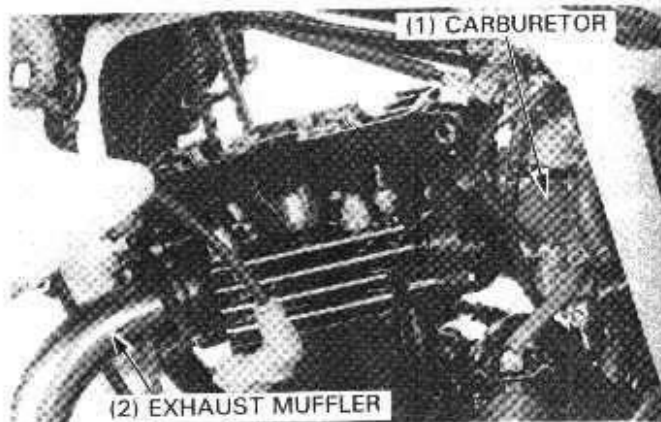


CYLINDER HEAD/VALVES

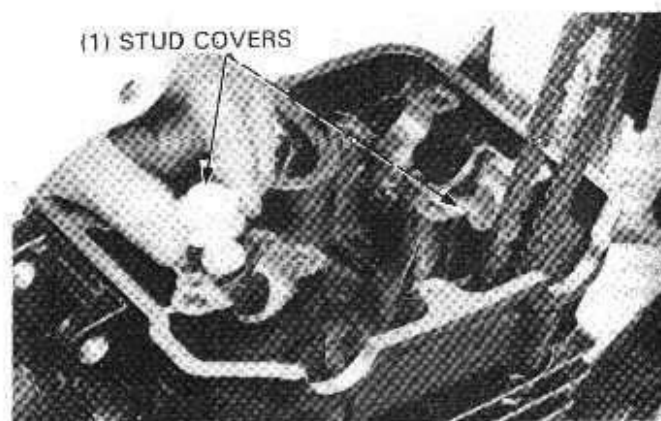
CYLINDER HEAD REMOVAL

Remove the following:

- exhaust muffler (page 15-1).
- carburetor (page 4-5).



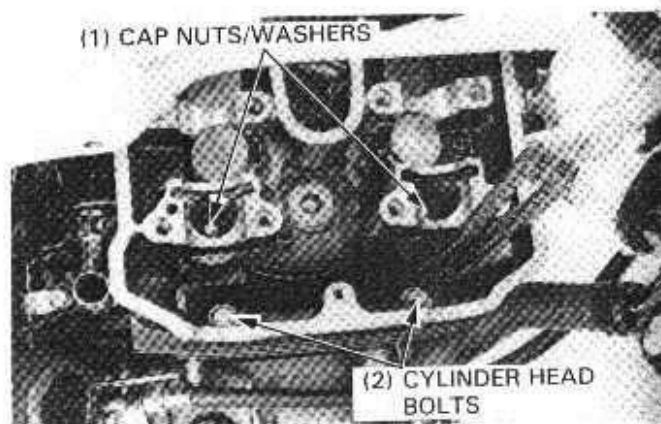
Remove the two plastic stud covers.



Remove the stud cap nuts and washers, and the two cylinder head bolts.

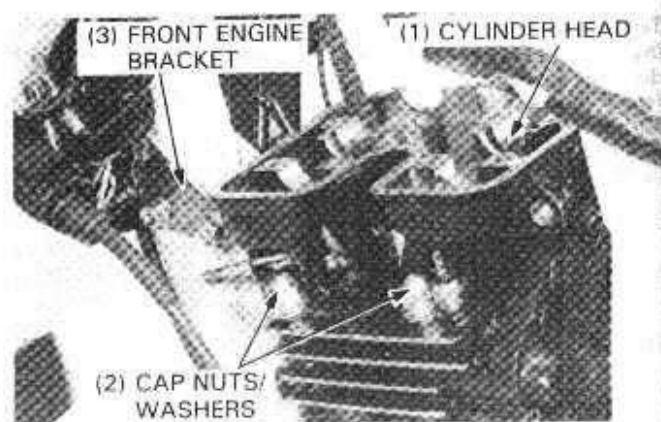
NOTE

- Do not let the washers fall into the crankcase.



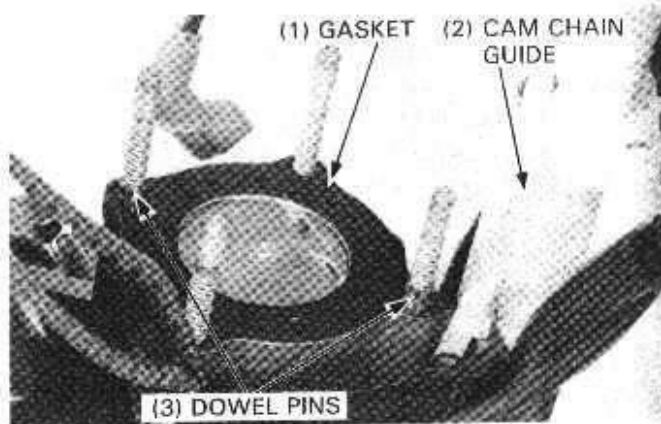
Remove the front engine bracket.

Remove the remaining stud cap nuts and washers, and remove the cylinder head.



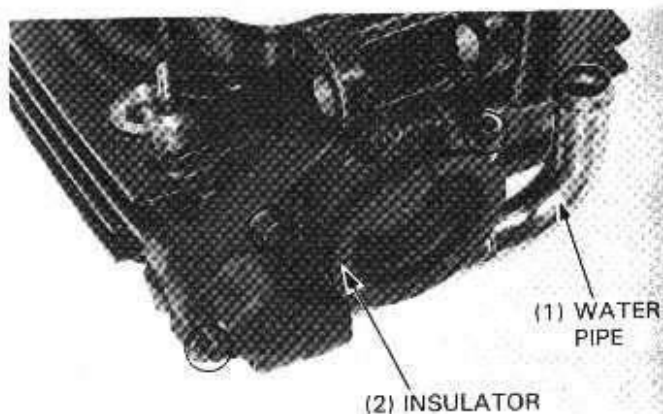
CYLINDER HEAD/VALVES

Remove the cylinder head gasket, dowel pins and cam chain guide.

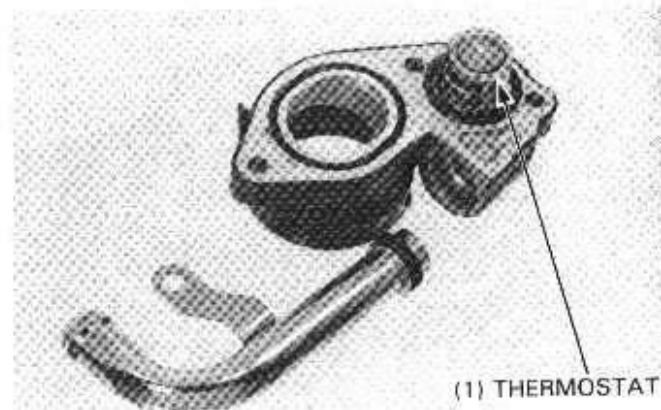


CYLINDER HEAD DISASSEMBLY

Remove the insulator and water pipe.



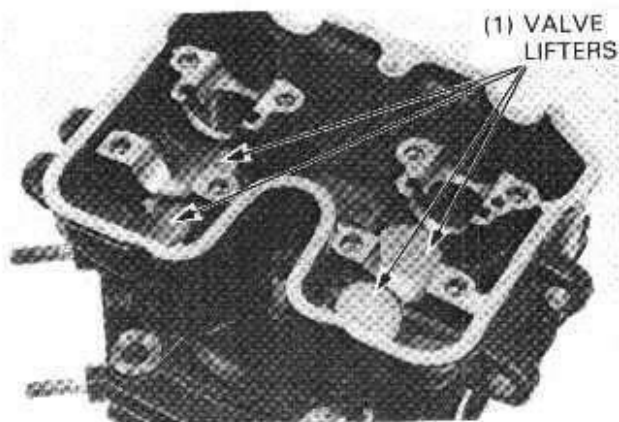
Remove the thermostat from the cylinder head.



Remove the valve lifters and shims.

NOTE

- Be careful not to damage the lifters during removal.
- Mark the lifters and shims to ensure correct reassembly.



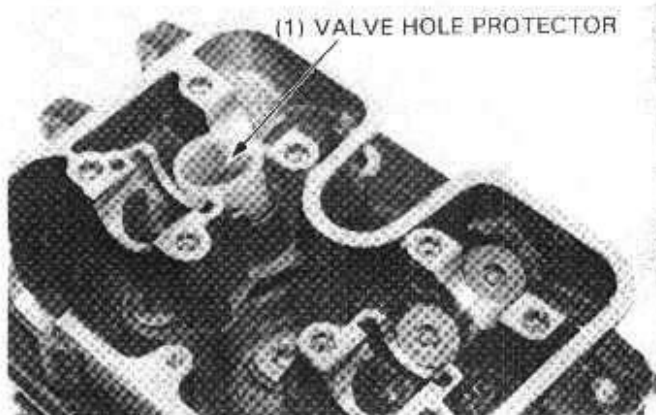
CYLINDER HEAD/VALVES

Install the valve hole protector as shown.

TOOL:

Valve hole protector

07HMG—MR70001



Install the valve compressor attachment in the valve spring compressor.

TOOLS:

Valve spring compressor

07757—0010000

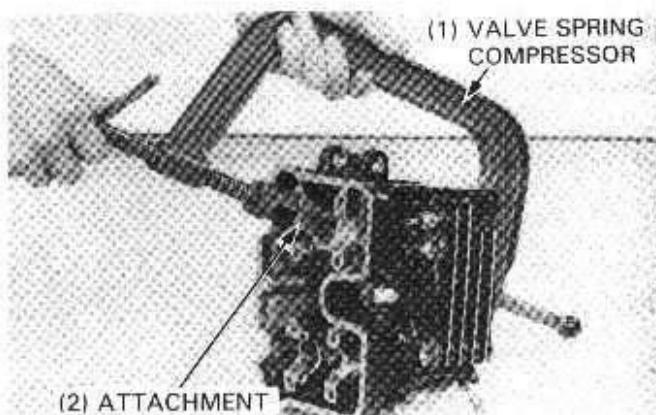
Valve compressor attachment

07959—KM30101

Remove the valve spring cotters, retainers, springs and valves with the valve spring compressor as shown.

CAUTION

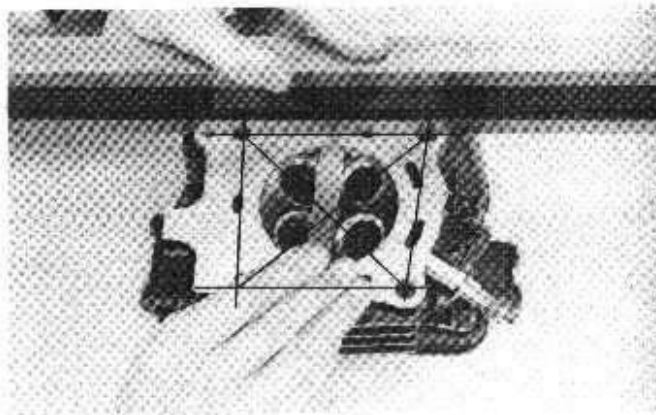
- To prevent loss of tension, do not compress the valve springs more than necessary to remove the cotters.



NOTE

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

Remove the valve stem seals and spring seats.



INSPECTION

● Cylinder head

Remove carbon deposits from the combustion chamber. Check the spark plug hole and valve areas for cracks. Check the cylinder head for warpage with a straight edge and feeler gauge.

SERVICE LIMIT: 0.01 mm (0.0004 in)

● Valve lifter

Check the valve lifter for wear or damage and measure the O.D. of each valve lifter.

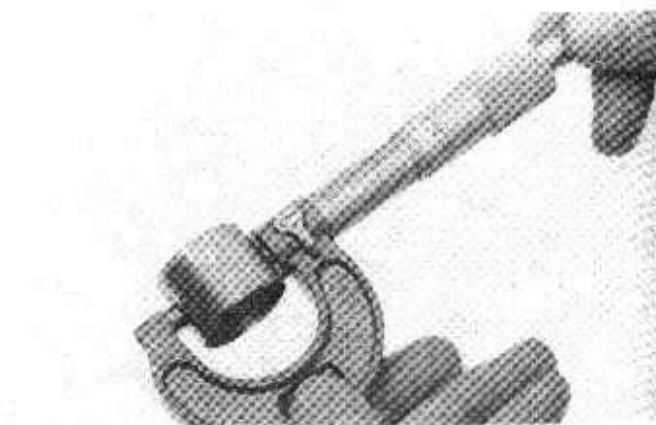
SERVICE LIMIT: 25.97 mm (1.022 in)

NOTE

- If a lifter is replaced for any reason, be sure to check its valve's clearance after installing the cylinder head.

Measure the I.D. of the valve hole in the cylinder head.

SERVICE LIMIT: 26.04 mm (1.039 in)



CYLINDER HEAD/VALVES

● Valve spring free length

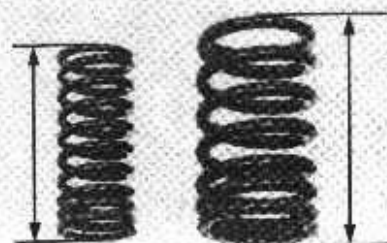
Measure the free length of the inner and outer valve springs.

SERVICE LIMITS:

Inner: 33.0 mm (1.30 in)

Outer: 36.2 mm (1.43 in)

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



● Valve stem-to-guide clearance

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

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

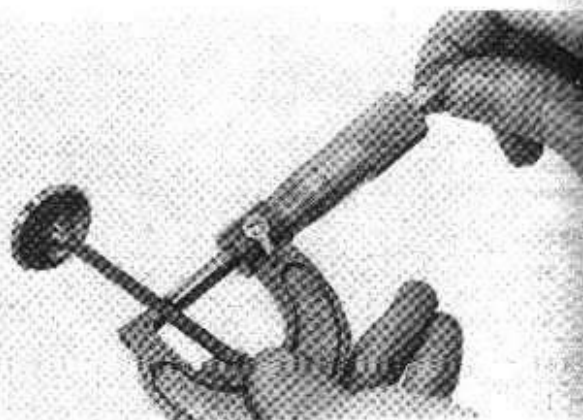
SERVICE LIMITS:

IN: 4.47 mm (0.176 in)

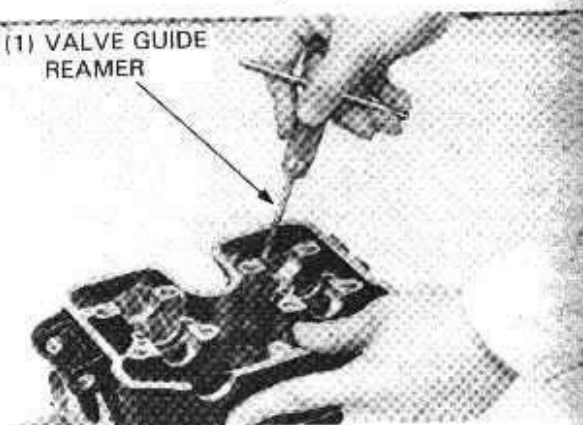
EX: 4.45 mm (0.175 in)

NOTE

- Ream the guides to remove any carbon deposits before checking clearances.
- Insert the reamer from the top of the head and also always rotate the reamer in the same direction.



(1) VALVE GUIDE REAMER



TOOL:

Valve guide reamer 4.5 mm 07HMH—ML00100

Measure and record each valve guide I.D.

SERVICE LIMIT (IN/EX): 4.55 mm (0.179 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)

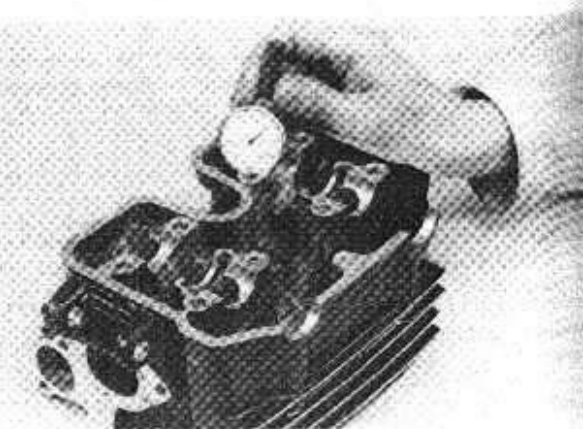
EX: 0.10 mm (0.004 in)

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 9-11).



CYLINDER HEAD/VALVES

VALVE GUIDE REPLACEMENT

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

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

⚠ WARNING

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

CAUTION

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

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

TOOL:

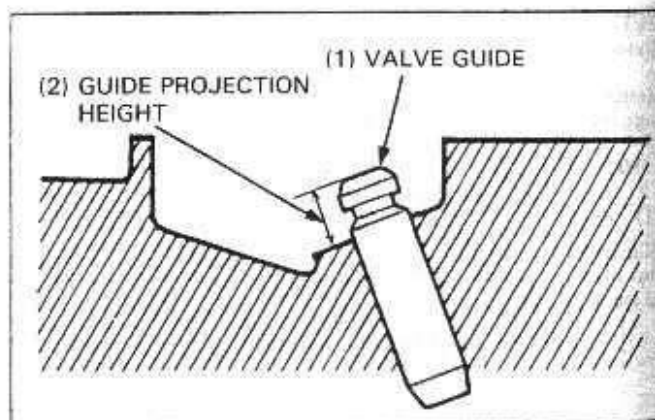
Valve guide driver 07HMD ML00100

CAUTION

- Avoid damaging the cylinder head.

VALVE GUIDE PROJECTION HEIGHT:

IN/EX: 13 mm (0.51 in)



Make note of the valve guide projection specifications (above), then drive in new guides from the camshaft side of the cylinder head.

TOOL:

Valve guide driver 07HMD—ML00100



CYLINDER HEAD/VALVES

Let the cylinder head cool to room temperature.
Inspect the valve guide for damage.

Ream the new valve guide after installation.

TOOL:

Valve guide reamer, 4.5 mm 07HMH-ML00100

NOTE

- Insert the reamer from the top of the head and also always rotate the reamer in the same direction.

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.

Removal 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: 0.8–1.2 mm (0.03–0.05 in)

SERVICE LIMIT: 1.5 mm (0.06 in)

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

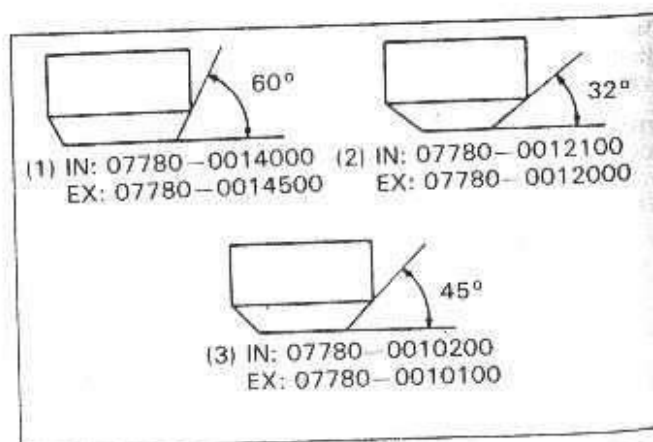
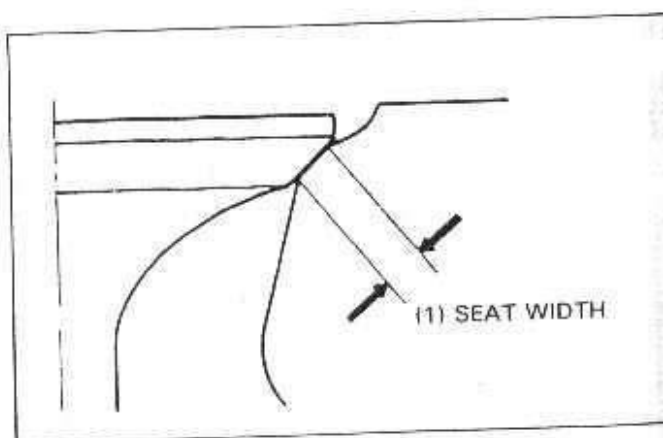
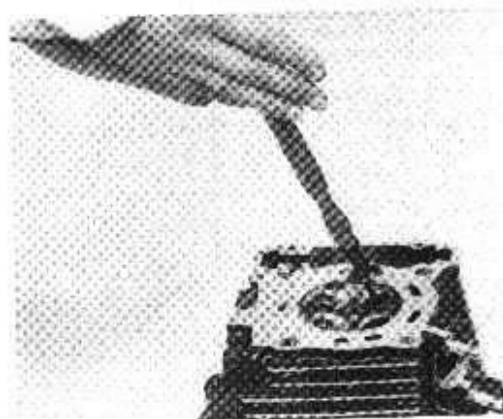
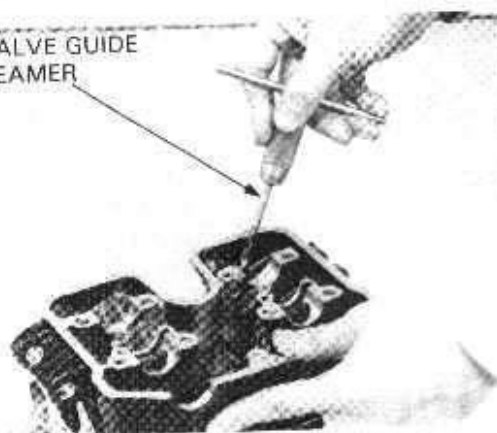
VALVE SEAT CUTTERS

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

NOTE

- Follow the refacer manufacturer's operating instructions.

(1) VALVE GUIDE REAMER



CYLINDER HEAD/VALVES

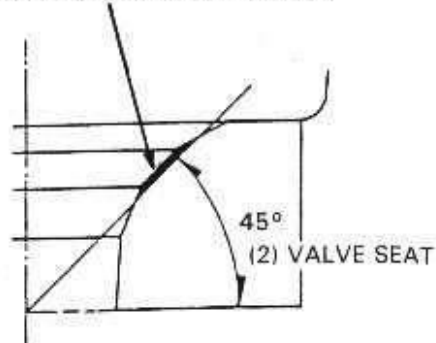
VALVE SEAT REFACING

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

NOTE

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

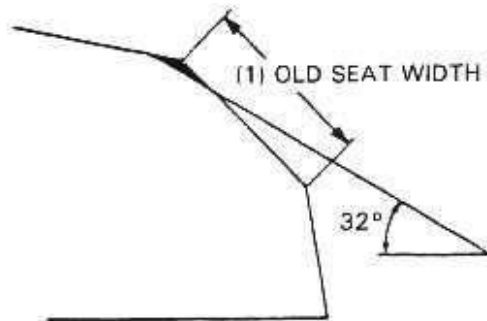
(1) ROUGHNESS/IRREGULARITIES



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

(1) OLD SEAT WIDTH

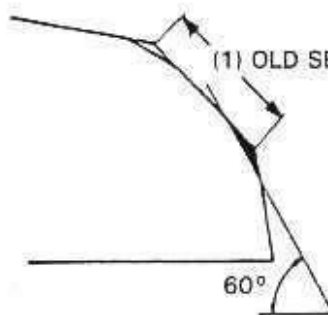
32°



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

(1) OLD SEAT WIDTH

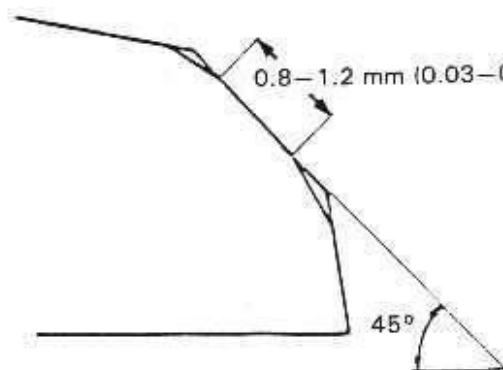
60°



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

0.8—1.2 mm (0.03—0.05 in)

45°



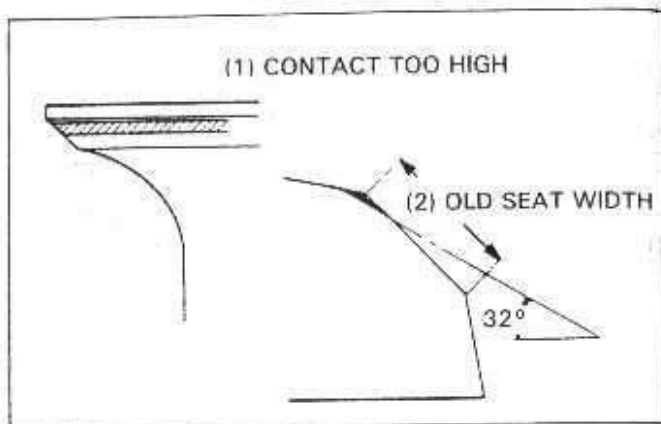
CYLINDER HEAD/VALVES

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

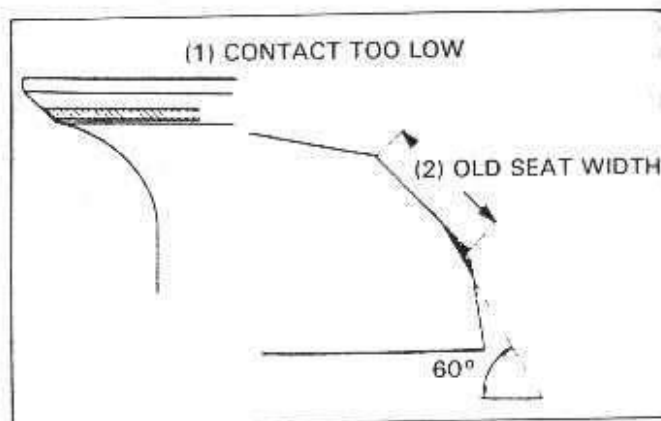
NOTE

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

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



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



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

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

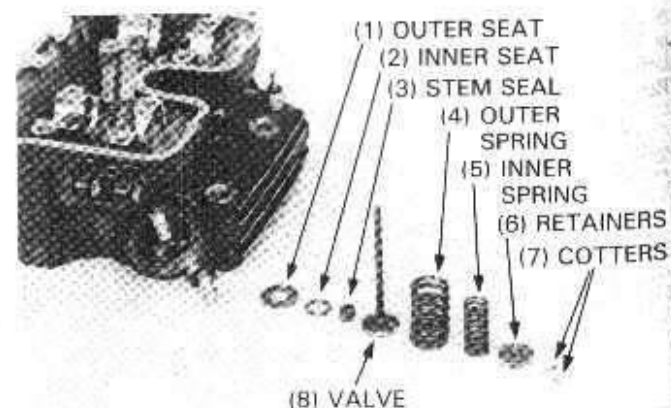
Install the valve spring outer and inner seats and a new stem seal.

Lubricate the valve stems with molybdenum disulfide grease 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 cylinder head.

Install the valve spring retainers.



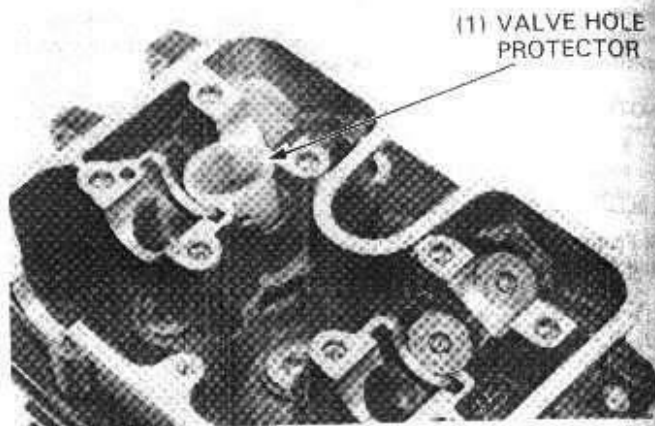
CYLINDER HEAD/VALVES

Install the valve hole protector as shown.

TOOLS:

Valve hole protector

07HMG-MR70001



Compress the springs and install the cotters.

TOOL:

Valve spring compressor

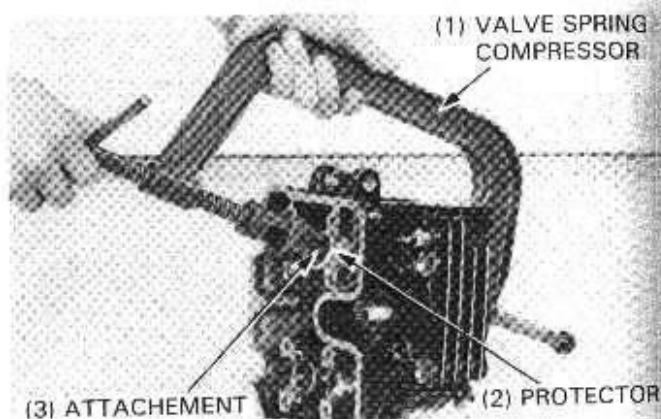
07757-0010000

Valve compressor attachment

07959-KM30101

CAUTION

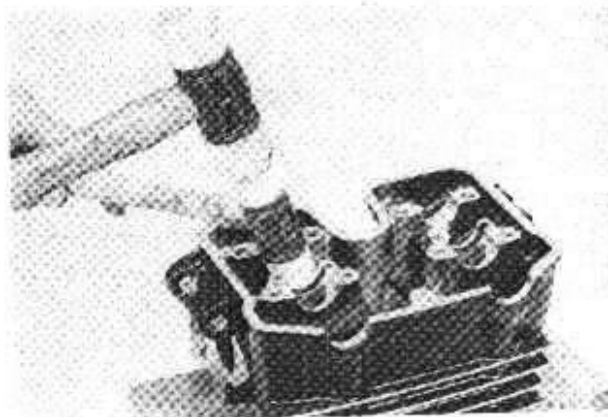
- To prevent loss of tension, do not compress the valve spring more than necessary.



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

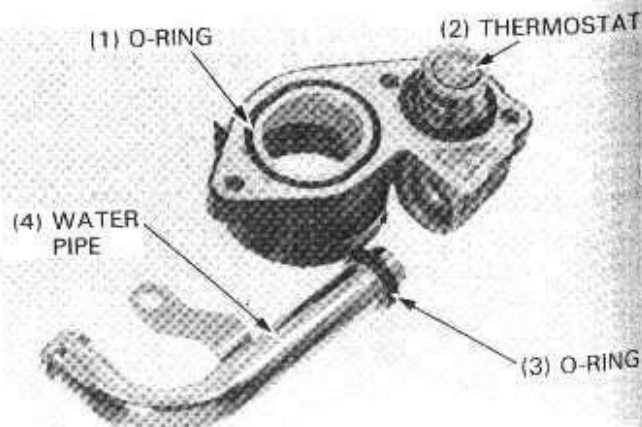
CAUTION

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



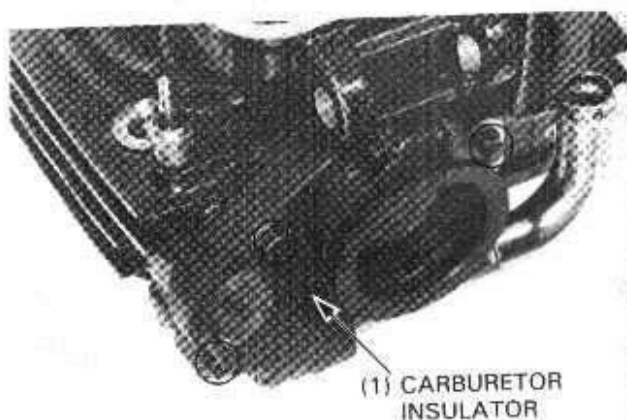
Install a new O-ring in the carburetor insulator groove and on the thermostat.

Install a new O-ring on the water pipe, with the tapered side facing in and install the water pipe in the insulator.



CYLINDER HEAD/VALVES

Install the carburetor insulator and tighten the bolts.

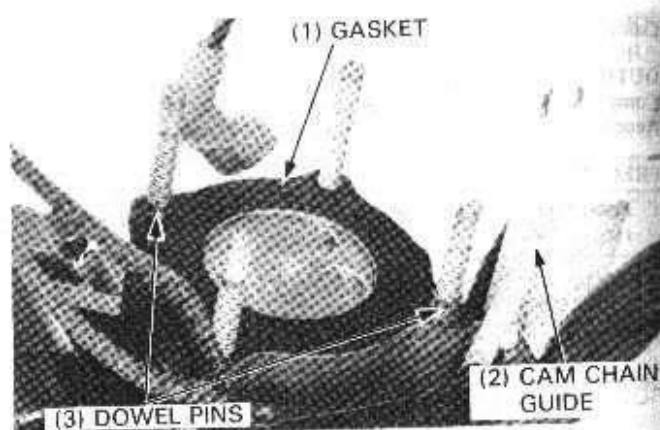


CYLINDER HEAD INSTALLATION

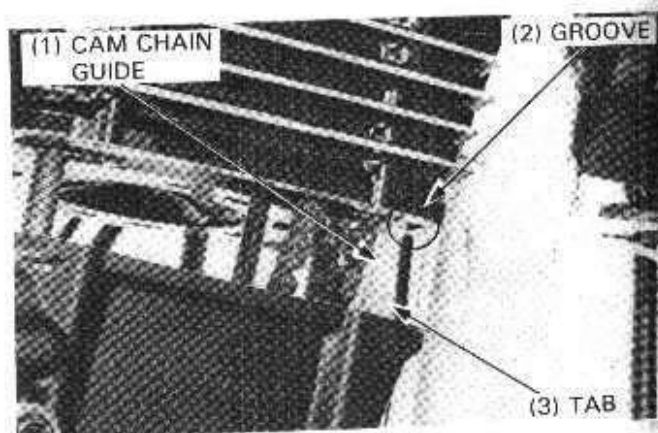
Install a new gasket and dowel pins.
Install the cam chain guide, placing the bottom end of the guide into the groove in the right crankcase.

NOTE

- Make sure that the cam chain is properly installed on the crankshaft drive gear.



Install the cylinder head over the cam chain and align the groove in the cylinder head lower surface with the tab on the cam chain guide.

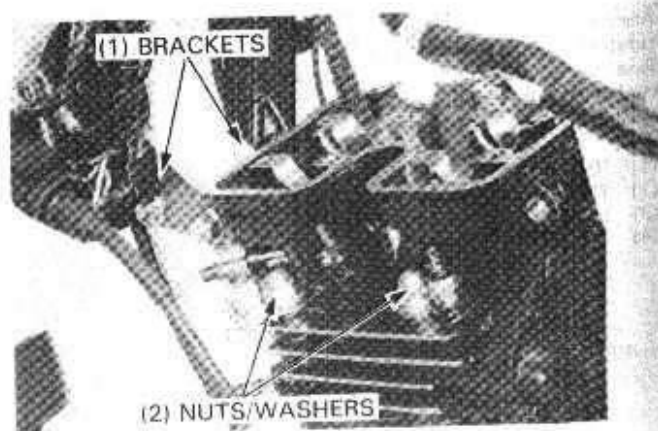


Install the outside washers and stud cap nuts.

Install the front engine brackets.

Tighten the bracket bolts and engine mounting bolt.

TORQUE: 8 mm bolt: 27 N·m (2.7 kg-m, 20 ft-lb)
10 mm bolt: 75 N·m (7.5 kg-m, 54 ft-lb)



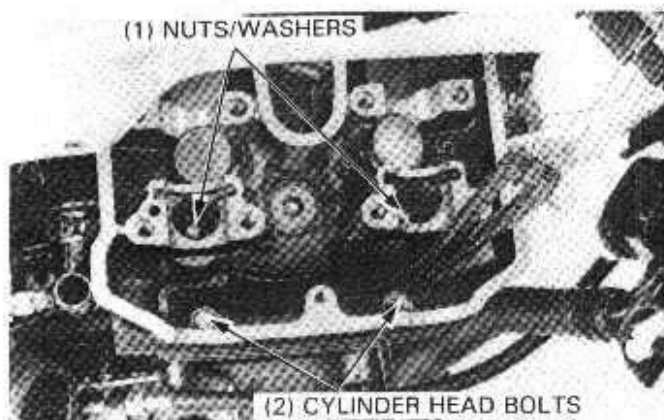
CYLINDER HEAD/VALVES

Install the cylinder head bolts, washers and stud cap nuts.

Tighten the cylinder head cap nuts in 2—3 steps in a criss-cross pattern.

TORQUE: 46 N·m (4.6 kg·m, 33 ft·lb)

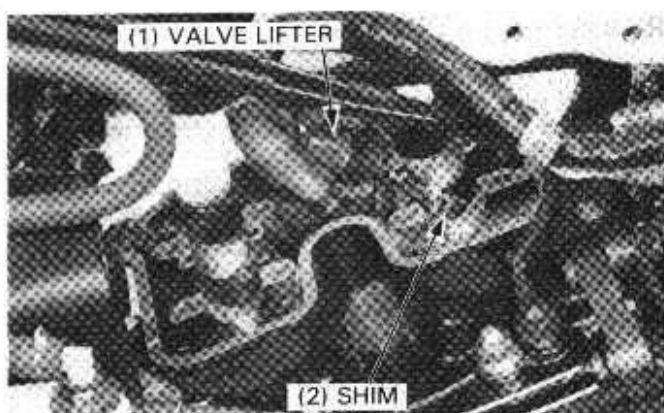
Tighten the cylinder head bolts.



Install the shims and valve lifters on their original positions.

NOTE

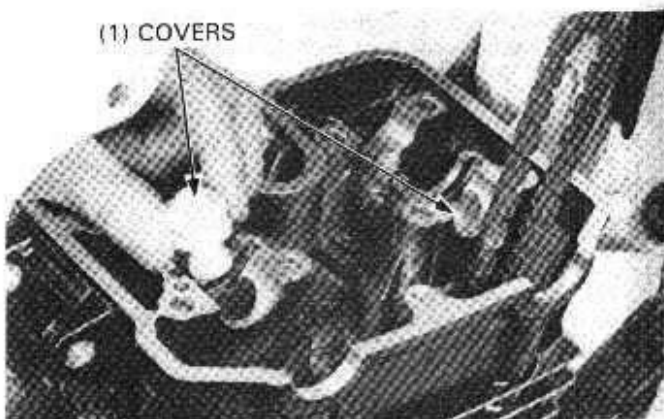
- If a lifter was replaced for any reason, be sure to check its valve clearance (page 3-6). Replacement lifters come in four different thicknesses.
- Be sure the shim and valve lifter are installed in their correct locations as noted during removal.
- Do not allow the shims to fall into the crankcase.



Install the stud covers as shown.

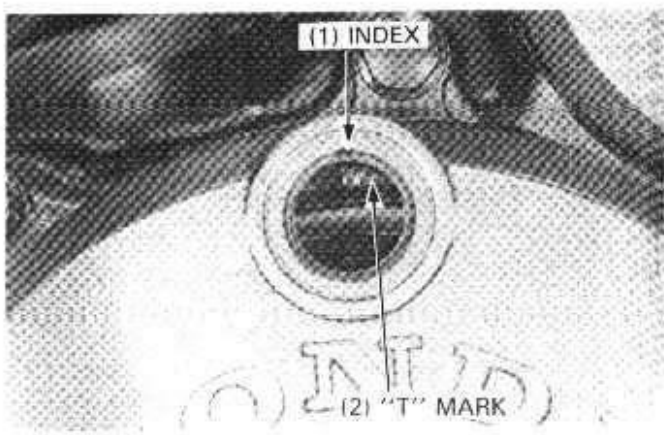
CAUTION

- *Do not forget to install the covers. If they are not in place, the top end may not receive adequate lubrication.*



CAMSHAFT/CAM CHAIN TENSIONER INSTALLATION

Align the "T" mark on the flywheel with the index mark on the left crankcase cover by turning the crankshaft counter-clockwise.



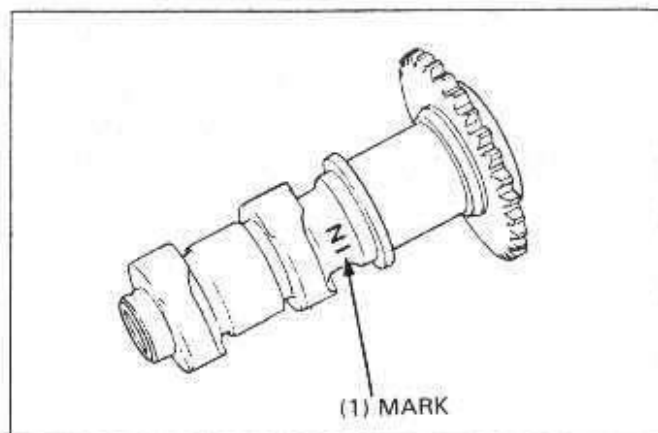
CYLINDER HEAD/VALVES

Check the camshaft marks so that you install each camshaft in its correct location.

Mark	Mean
IN	Intake camshaft
EX	Exhaust camshaft

Apply molybdenum disulfide grease to the camshaft journals and cam lobes.

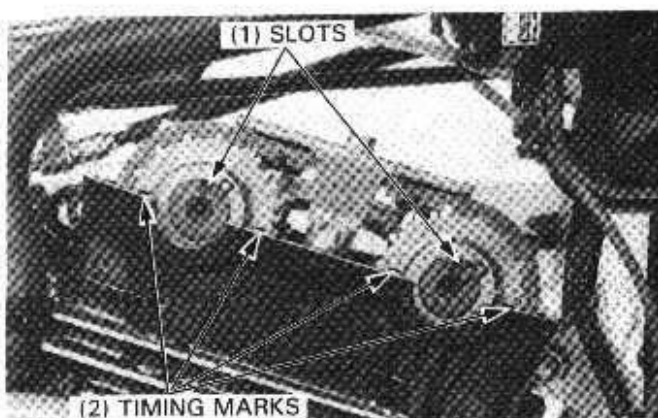
Install the camshafts in the cylinder head with the slots on the shaft ends facing up, aligning the sprocket timing marks with the upper surface of the cylinder head.



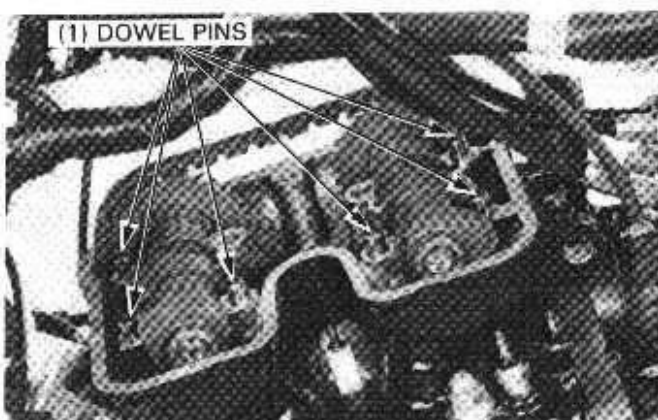
Install the cam chain over the camshaft sprockets.

NOTE

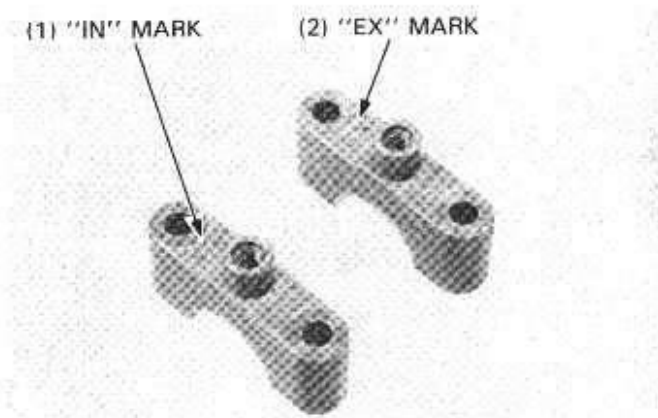
- Do not rotate the crankshaft from the "T" position when installing the camshafts.



Install the dowel pins.



Check the identification marks and install the camshaft holders over the corresponding camshafts.

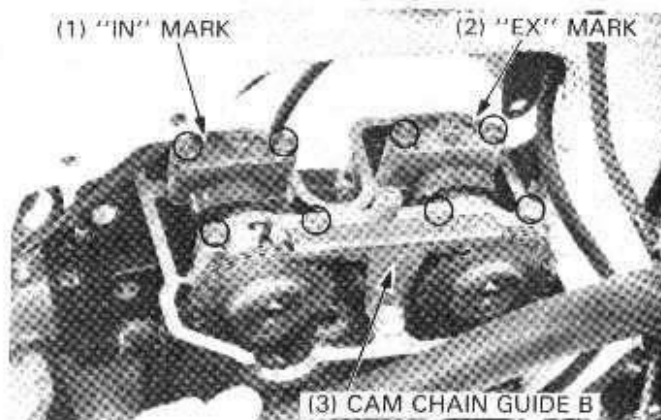


CYLINDER HEAD/VALVES

Install the holders with the "IN" and "EX" marks facing out. Tighten the camshaft holder bolts.

TORQUE: 12 N·m (1.2 kg-m, 9 ft-lb)

Install the cam chain guide B.

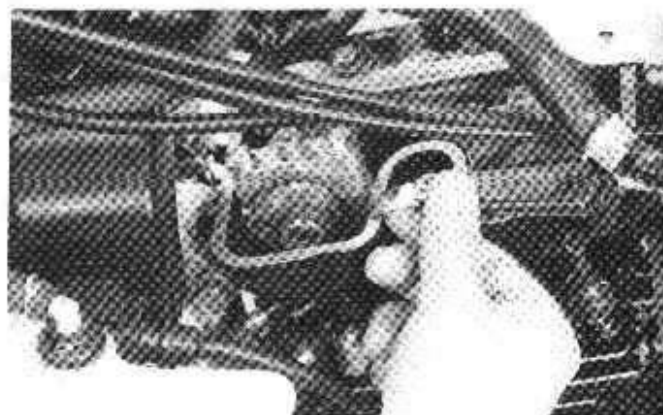


Measure and record the valve clearance for each valve (page 3-7).

If necessary, remove the camshaft holders and camshafts, then remove the valve lifters and shims.

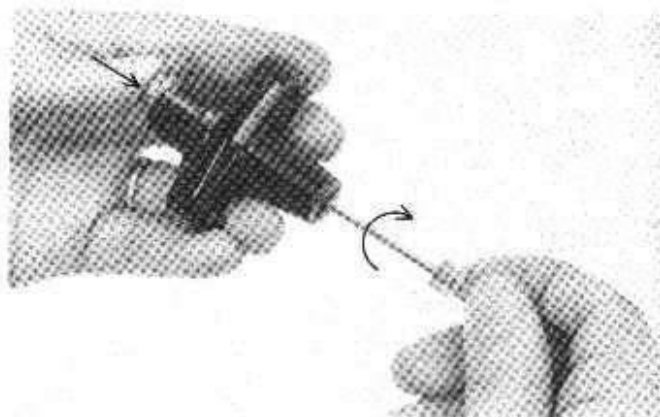
Select and install a new shims (page 3-7).

Install the removed parts in the reverse order of removal. Recheck the valve clearances.



To hold the tensioner rod, turn the screw in the cam chain tensioner with a screwdriver clockwise until the rod stops moving.

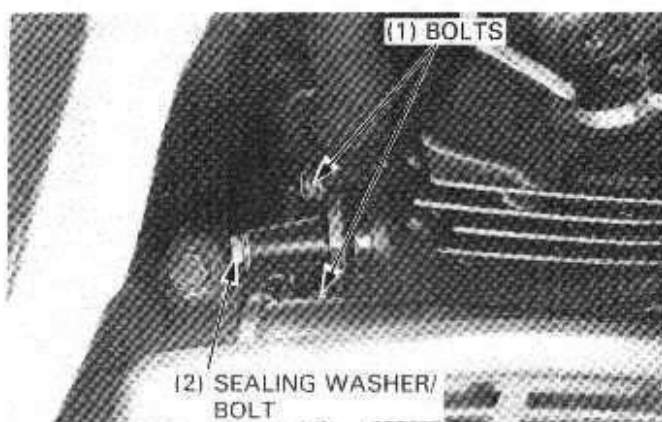
Turn the screw clockwise about 1/8 turn more until the rod locks in the retracted position.



Install a new gasket and cam chain tensioner in the cylinder and tighten the two mounting bolts.

Install a sealing washer and bolt.

Hit the tensioner body with the screwdriver grip then check the cam chain tension.

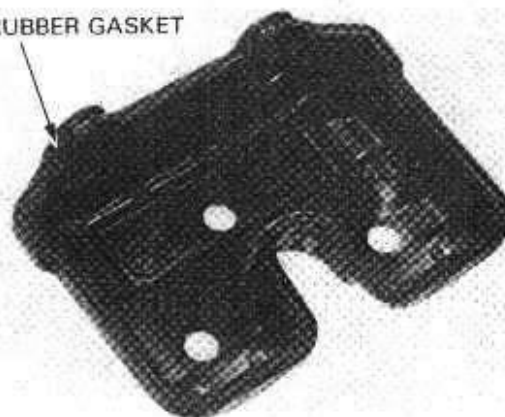


CYLINDER HEAD/VALVES

CYLINDER HEAD COVER INSTALLATION

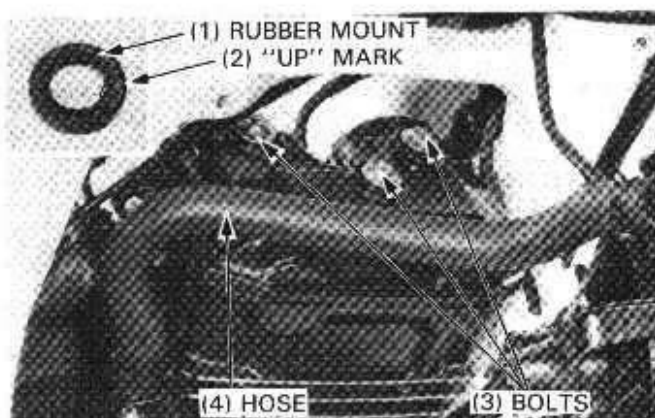
Apply a sealant to the cylinder head cover and install the rubber gasket.

(1) RUBBER GASKET



Install the rubber mounts with the UP mark facing up.

Install the bolts and tighten them securely.



Connect the upper radiator hose to the water pipe.

Install the following:

- radiator (page 5-5).
- carburetor (page 4-14).
- upper engine brackets.
- exhaust muffler (page 15-1).

Fill the cooling system (page 5-4).

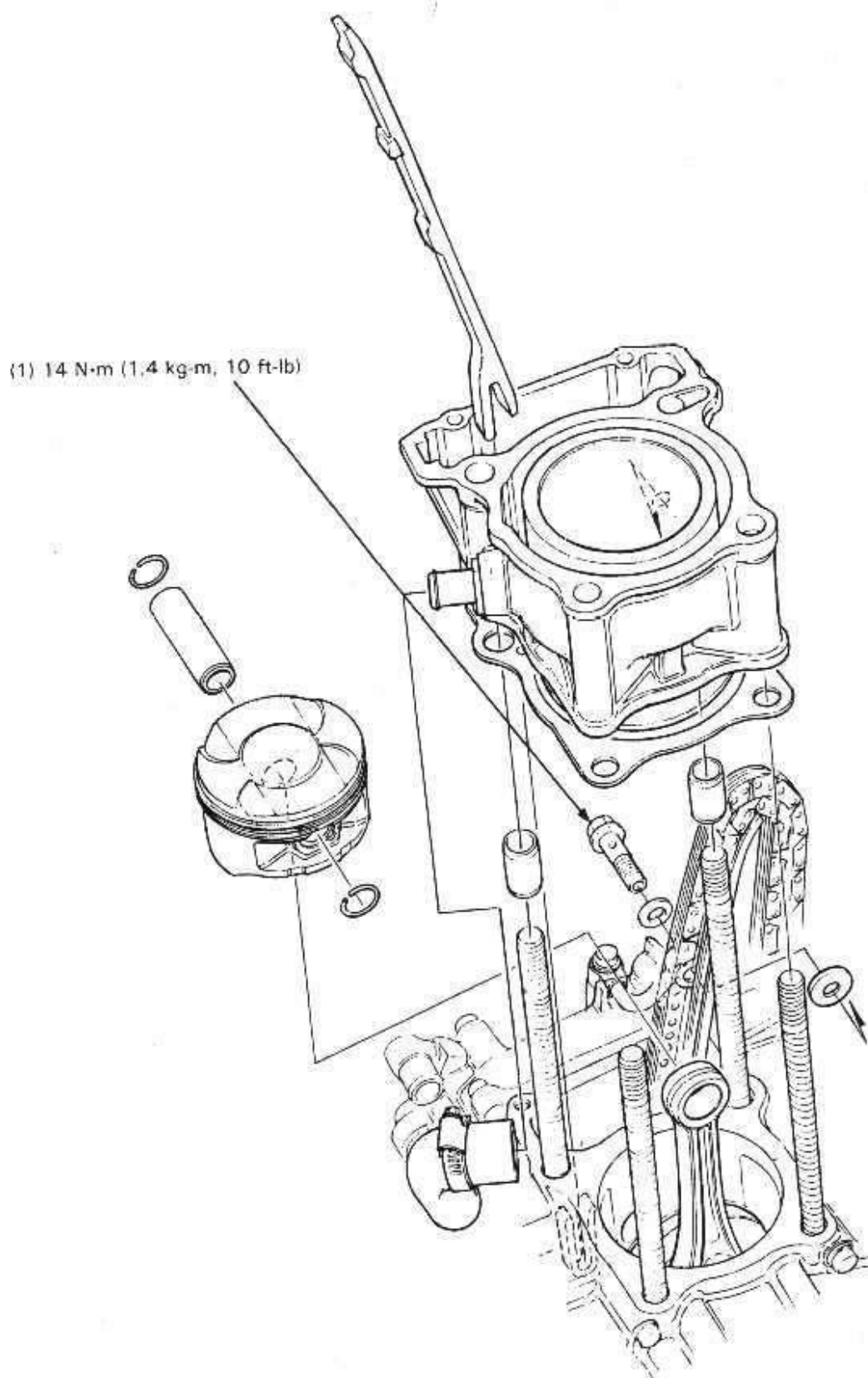
Check the following:

- throttle grip free play (page 3-4).
- electrical equipment.
- oil level (page 2-2).
- coolant leaks.

CYLINDER/PISTON

CYLINDRE/PISTON

ZYLINDER/KOLBEN



CYLINDER/PISTON

SERVICE INFORMATION	10-1	PISTON REMOVAL/INSPECTION	10-3
TROUBLESHOOTING	10-1	PISTON/CYLINDER INSTALLATION	10-6
CYLINDER REMOVAL/INSPECTION	10-2		

SERVICE INFORMATION

GENERAL

- Cylinder and piston servicing can be accomplished without removing the engine from the frame.
- Cylinder head coolant is fed through water jackets in the cylinder.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		70.00–70.01 (2.755–2.756)	70.10 (2.760)
		F type:	68.50–68.51 (2.696–2.697)	68.60 (2.701)
	Out-of-round		—	0.05 (0.002)
	Taper		—	0.01 (0.0004)
	Warpage		—	0.01 (0.0004)
Piston, piston ring and piston pin	Piston O.D.		69.97–69.99 (2.755–2.756)	69.85 (2.750)
		F type:	68.47–68.49 (2.695–2.696)	68.35 (2.691)
	Piston pin hole I.D.		17.002–17.008 (0.6694–0.6696)	17.02 (0.670)
	Piston pin O.D.		16.994–17.000 (0.6691–0.6693)	16.98 (0.669)
	Piston pin-to-piston clearance		0.002–0.014 (0.00008–0.0006)	0.04 (0.002)
	Piston ring-to-groove clearance	Top	0.015–0.050 (0.0006–0.002)	0.10 (0.004)
		Second	0.015–0.045 (0.0006–0.0018)	0.10 (0.004)
	Piston ring end gap	Top/second	0.20–0.35 (0.008–0.014)	0.45 (0.018)
		Oil (side rail)	0.20–0.70 (0.008–0.028)	0.90 (0.035)
Piston-to-cylinder clearance			0.010–0.040 (0.0004–0.0016)	0.10 (0.004)
Connecting rod small end I.D.			17.016–17.034 (0.6699–0.6706)	17.045 (0.6711)
Connecting rod-to-piston pin clearance			0.016–0.040 (0.00063–0.0016)	0.06 (0.0024)

TORQUE VALUE

Oil pipe bolt 14 N·m (1.4 kg-m, 10 ft-lb)

TROUBLESHOOTING

Low compression

- Worn cylinder or piston rings
- Leaking head gasket
- Incorrect valve timing

Excessive smoke

- Worn cylinder and piston rings
- Improperly installed piston rings
- Damaged piston or cylinder

Overheating

- Excessive carbon deposits on piston or in combustion chamber
- Faulty cooling system (Section 5)

Piston noise

- Worn cylinder and piston
- Excessive carbon deposits

CYLINDER/PISTON

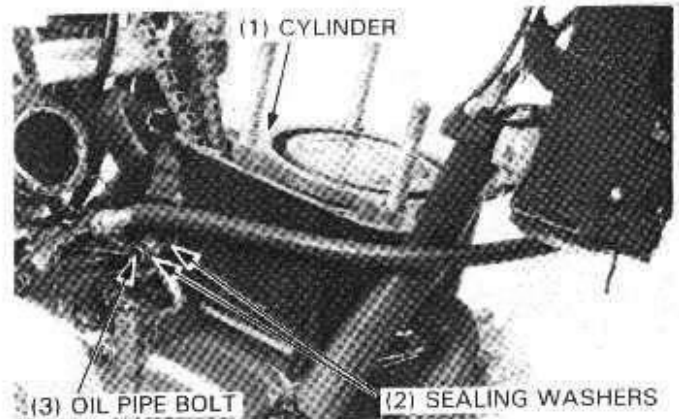
CYLINDER REMOVAL/INSPECTION

Remove the cylinder head (section 9).

Remove the oil pipe bolt and sealing washers.
Remove the cylinder.

NOTE

- Do not let the cam chain fall into the crankcase.



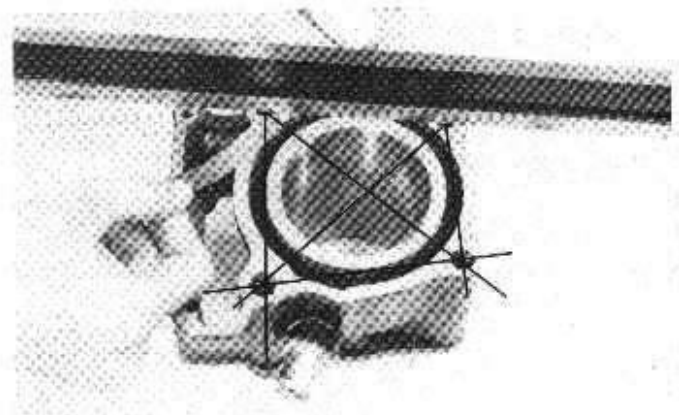
Clean the top of the cylinder thoroughly.

NOTE

- Avoid damaging the gasket surface.

Inspect the top of the cylinder for warpage.

SERVICE LIMIT: 0.01 mm (0.0004 in)



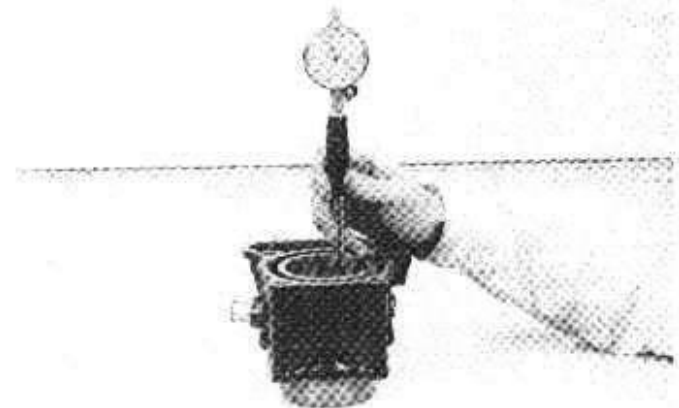
Inspect the cylinder walls for scratches and wear.
Measure and record the cylinder inside diameter at the three levels in both an X and Y axis. Take the maximum reading to determine the cylinder wear.

SERVICE LIMIT: 70.10 mm (2.760 in)

68.60mm (2.701 in) (F type)

Measure the piston O.D. (page 10-4) and calculate the piston-to-cylinder clearance. Take the maximum reading to determine the clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)

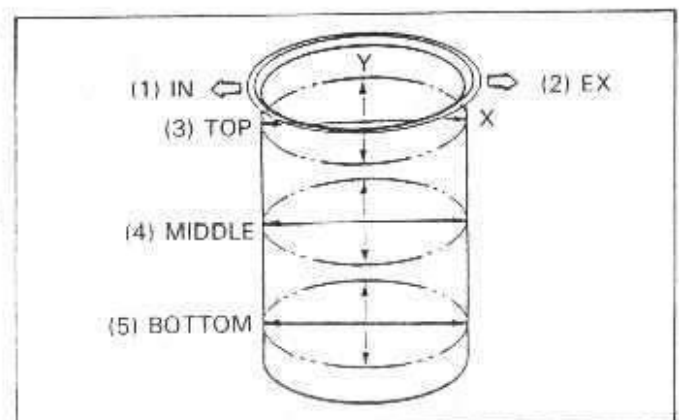


Calculate the cylinder for taper at three levels in an X and Y axis. Take the maximum reading to determine the taper.

SERVICE LIMIT: 0.01 mm (0.0004 in)

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

SERVICE LIMIT: 0.05 mm (0.002 in)



CYLINDER/PISTON

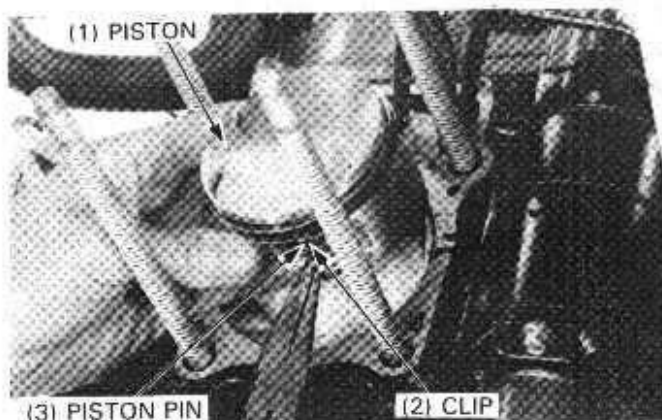
PISTON REMOVAL/INSPECTION

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

Remove the piston pin clips with pliers.

Press the piston pin out of the piston.

Remove the piston pin and piston.



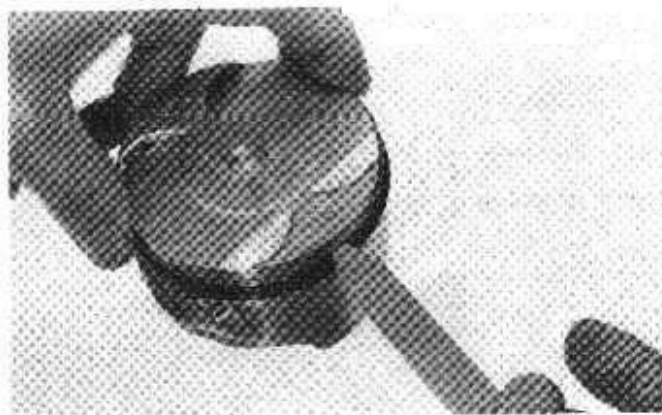
PISTON/PISTON RING INSPECTION

Measure the piston ring-to-groove clearance.

SERVICE LIMITS:

TOP: 0.10 mm (0.004 in)

2nd: 0.10 mm (0.004 in)

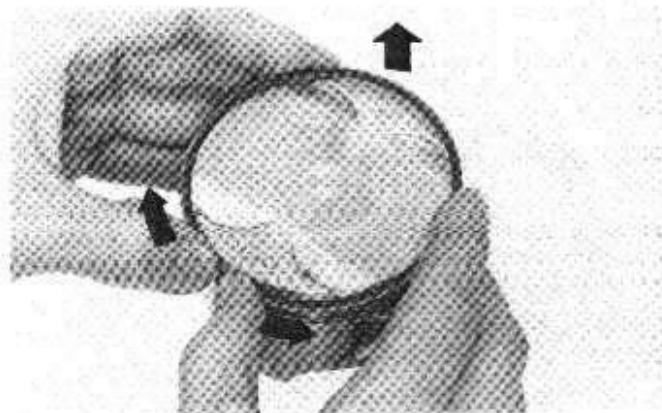


Remove the piston rings.

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

CAUTION

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



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

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

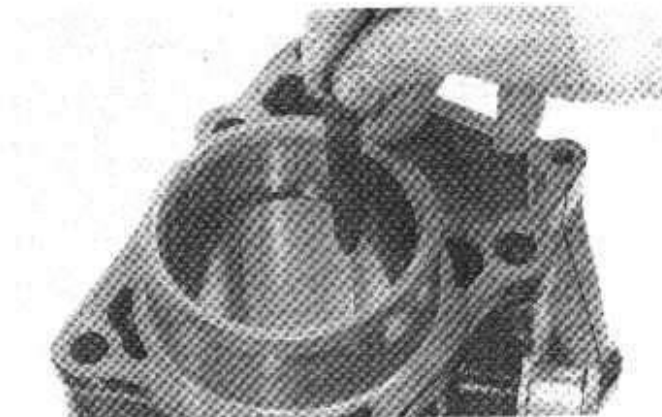
Measure the ring end gap.

SERVICE LIMITS:

TOP: 0.45 mm (0.018 in)

2nd: 0.45 mm (0.018 in)

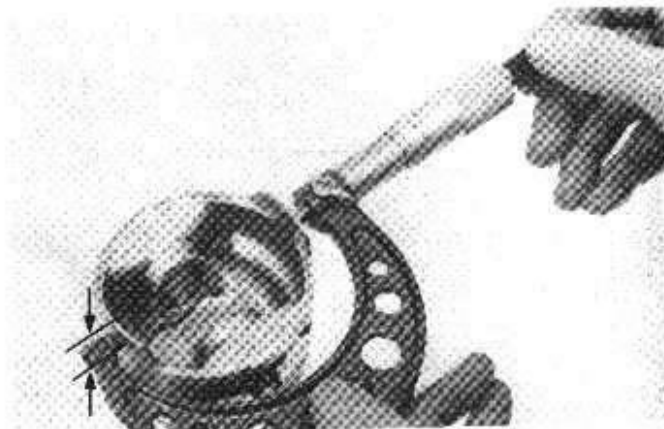
Oil: 0.90 mm (0.035 in)



CYLINDER/PISTON

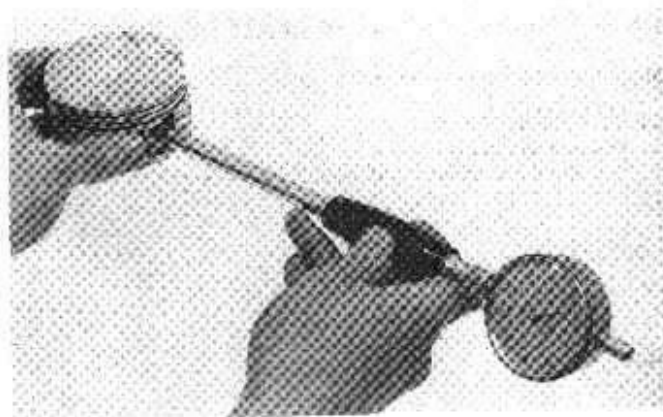
Measure the piston diameter 8 mm (0.3 in) from the bottom.

SERVICE LIMIT: 69.85 mm (2.750 in)
68.35 mm (2.691 in) (F type)



Measure the piston pin bore.

SERVICE LIMIT: 17.02 mm (0.670 in)

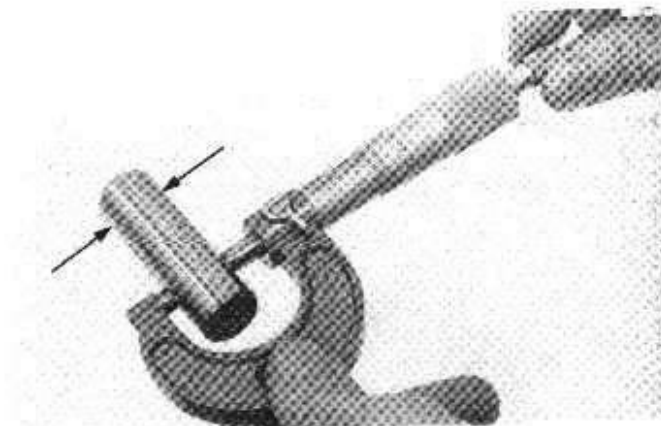


Measure the piston pin O.D..

SERVICE LIMIT: 16.98 mm (0.669 in)

Calculate the piston-to-piston pin clearance.

SERVICE LIMIT: 0.04 mm (0.002 in)



Measure the I.D. of the connecting rod small end.

SERVICE LIMIT: 17.045 mm (0.6711 in)

Calculate the connecting rod-to-piston pin clearance.

SERVICE LIMIT: 0.06 mm (0.0024 in)



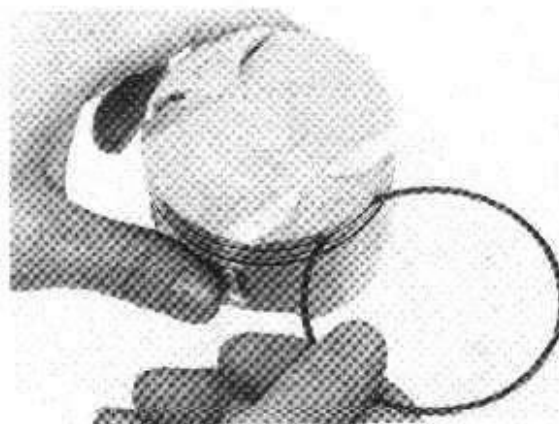
CYLINDER/PISTON

PISTON RING INSTALLATION

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

CAUTION

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



Install the piston rings with the marks facing up.

CAUTION

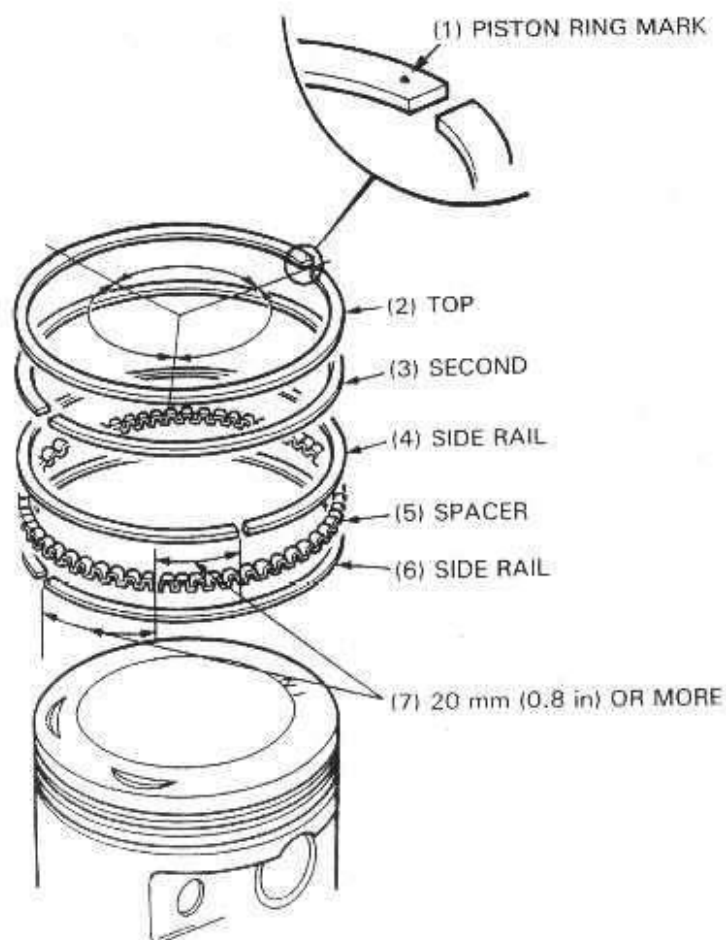
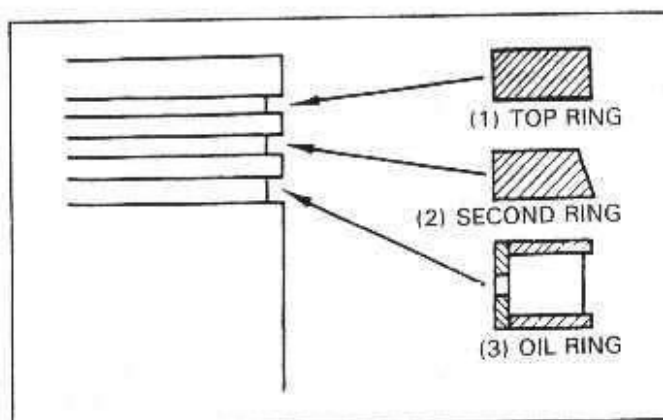
- Avoid piston and piston ring damage during installation.

Stagger the compression (1st and 2nd) and oil rings (side rails) 120 degrees apart as shown.

NOTE

- Install the oil ring spacer first, then install the side rails.

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



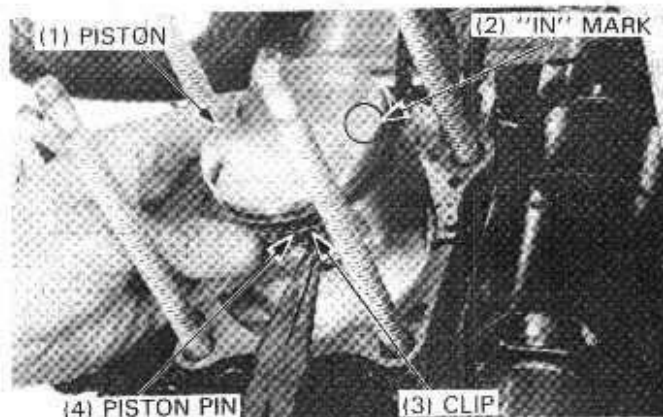
CYLINDER/PISTON

PISTON/CYLINDER INSTALLATION

Install the piston and piston pin. Position the piston "IN" mark on the intake valve side.
Install new piston clips.

NOTE

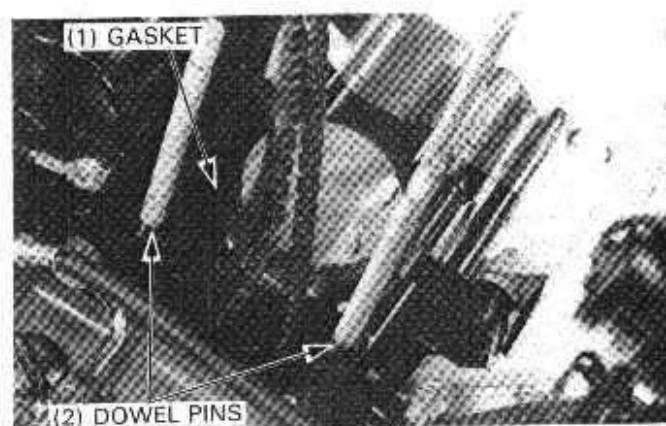
- Do not align the piston pin clip end gap with the piston cut-out.
- Place a shop towel around the piston skirt and in the crankcase to prevent the piston pin clips from falling into the crankcase.



Carefully clean any gasket material from the crankcase mating surface.

Apply a liquid sealant to the crankcase mating area to prevent oil leaks.

Install dowel pins and a new cylinder base gasket.

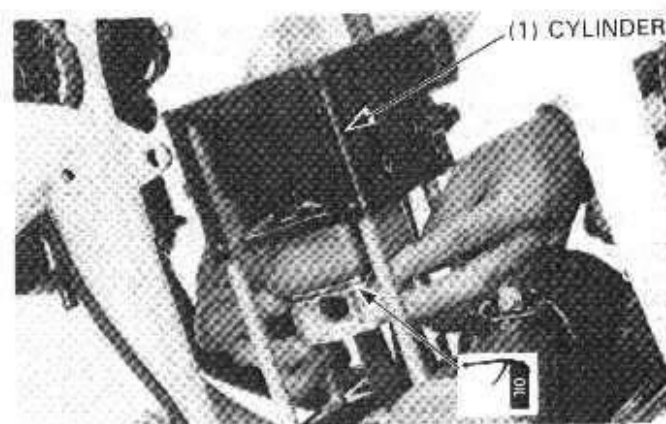


Coat the cylinder bore, piston and piston rings with fresh engine oil.

Carefully lower the cylinder over the piston by compressing the piston rings, one at a time.

CAUTION

- Do not force the cylinder over a ring; you may damage the piston and piston ring.



Tighten the oil pipe bolt (with new sealing washers) to the specified torque.

TORQUE: 14 N·m (1.4 kg-m, 10 ft-lb)

NOTE

- Install the larger outside diameter sealing washer between the cylinder and oil pipe.

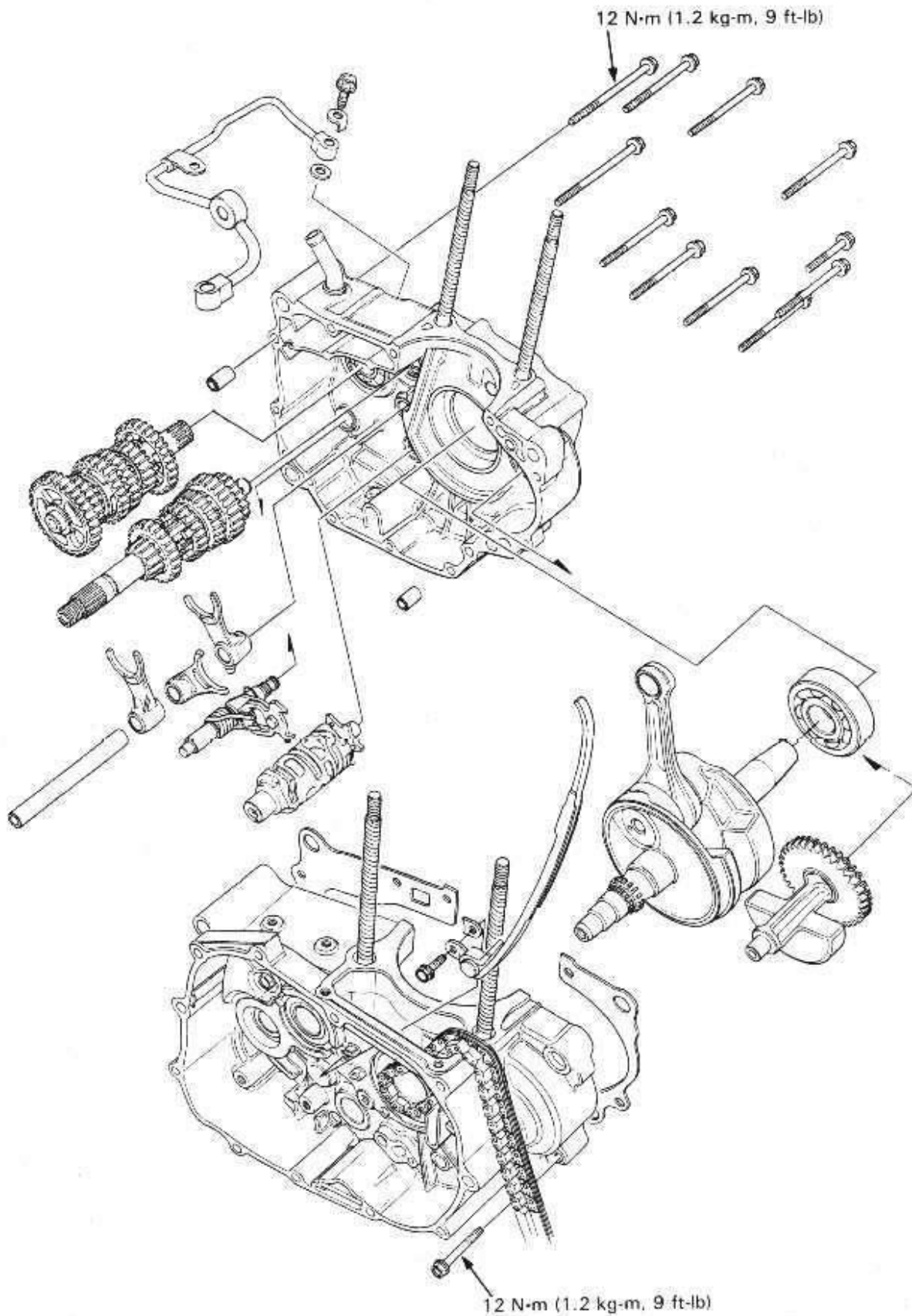
Install the cylinder head (section 9).



CRANKSHAFT/TRANSMISSION

VILEBREQUIN/BOITE DE VITESSES

KURBELWELLE/GETRIEBE



CRANKSHAFT/TRANSMISSION

SERVICE INFORMATION	11-1	CRANKSHAFT/BALANCER	11-9
TROUBLESHOOTING	11-3	CRANKCASE BEARINGS REPLACEMENT	11-11
CRANKCASE SEPARATION	11-4	CRANKCASE ASSEMBLY	11-13
TRANSMISSION	11-5		
TRANSMISSION ASSEMBLY	11-8		

SERVICE INFORMATION

GENERAL

- The gearshift stopper arm, plate and primary drive gear can be serviced with the engine installed in the frame.
 - The crankcase must be separated to repair the crankshaft, transmission, shift linkage and balancer.
- Remove the following parts before separating the crankcase.

Cylinder head	Section 9	Clutch	Section 7
Cylinder and piston	Section 10	Alternator	Section 8

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Shift fork I.D.		13.000 – 13.021 (0.5118 – 0.5126)	13.05 (0.514)
Shift fork pawl thickness		4.90 – 5.00 (0.1929 – 0.1969)	4.50 (0.177)
Shift fork shaft O.D.		12.966 – 12.984 (0.510 – 0.511)	12.91 (0.508)
Gear I.D.	M5	20.020 – 20.041 (0.7882 – 0.7890)	20.08 (0.791)
	M6	23.020 – 23.041 (0.9061 – 0.9071)	23.09 (0.909)
	C1	23.00 – 23.021 (0.9055 – 0.9063)	23.07 (0.908)
	C2	25.020 – 25.041 (0.9850 – 0.9859)	25.09 (0.988)
	C3	25.000 – 25.021 (0.9843 – 0.9850)	25.07 (0.987)
	C4	22.020 – 22.041 (0.8669 – 0.8678)	22.08 (0.869)
Bushing I.D.	C1	18.000 – 18.018 (0.7087 – 0.7094)	18.08 (0.712)
	C2	22.020 – 22.041 (0.8669 – 0.8678)	22.12 (0.871)
Bushing O.D.	M6	22.959 – 22.980 (0.9039 – 0.9047)	22.90 (0.902)
	C1	22.959 – 22.980 (0.9039 – 0.9047)	22.90 (0.902)
	C2	24.972 – 24.993 (0.9831 – 0.9840)	24.92 (0.981)
	C3	24.959 – 24.980 (0.9826 – 0.9835)	24.90 (0.980)
Mainshaft O.D.	M5	19.959 – 19.980 (0.7858 – 0.7866)	19.91 (0.984)

CRANKSHAFT/TRANSMISSION

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Countershaft O.D.	C1	17.966–17.984 (0.7073–0.7080)	17.93 (0.706)
	C2	21.959–21.980 (0.8645–0.8654)	21.91 (0.863)
	C4	21.959–21.980 (0.8645–0.8654)	21.91 (0.863)
Gear-to-bushing clearance	M6	0.040–0.082 (0.0016–0.0032)	0.10 (0.004)
	C1, C3	0.020–0.062 (0.0008–0.0024)	0.10 (0.004)
	C2	0.027–0.069 (0.0011–0.0027)	0.10 (0.004)
Gear-to-shaft clearance	M5	0.040–0.082 (0.0016–0.0032)	0.15 (0.006)
	C4	0.040–0.082 (0.0016–0.0032)	0.15 (0.006)
Bushing-to-shaft clearance	C1	0.016–0.052 (0.0006–0.0020)	0.07 (0.003)
	C2	0.040–0.082 (0.0016–0.0032)	0.15 (0.006)
Connecting rod big end side clearance		0.05–0.45 (0.002–0.0177)	0.60 (0.024)
Connecting rod big end radial clearance		0.006–0.012 (0.0002–0.0005)	0.04 (0.002)
Crankshaft journal runout		—	0.05 (0.002)

TORQUE VALUE

Crankcase bolt 12 N·m (1.2 kg-m, 9ft-lb)

TOOLS

Special

Universal bearing puller	07631–0010000
Bearing remover 15 mm	07936–KC10000
– remover assembly, 15 mm	07936–KC10500
– remover head, 15 mm	07936–KC10200
– remover shaft, 15 mm	07936–KC10100
– remover weight	07741–0010201
Crankcase assembly tool	07965–VM00000
– collar assembly	07965–VM00100
– threaded shaft	07965–VM00200
– threaded adaptor	07965–VM00300

Common

Driver	07749–0010000
Attachment, 32 x 35 mm	07746–0010100
Attachment, 37 x 40 mm	07746–0010200
Attachment, 42 x 47 mm	07746–0010300
Attachment, 52 x 55 mm	07746–0010400
Attachment, 62 x 68 mm	07746–0010500
Pilot, 15 mm	07746–0040300
Pilot, 17 mm	07746–0040400
Pilot, 20 mm	07746–0040500
Pilot, 22 mm	07746–0041000
Pilot, 28 mm	07746–0041100

TROUBLESHOOTING

Engine vibration

- Excessive crankshaft runout

Engine noise

- Worn crank pin bearing
- Worn crankshaft bearing(s)
- Worn transmission bearing(s)

Transmission jumps out of gear

- Gear dogs and holes worn
- Shift fork bent or damaged
- Shift fork shaft bent
- Shift drum stopper damaged

Hard to shift

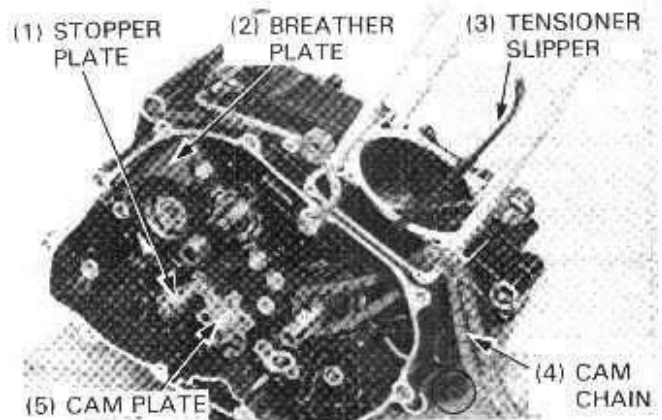
- Clutch not adjusted properly
- Shift fork bent
- Shift fork shaft bent
- Shift spindle pawl bent or damaged
- Worn or damaged shift drum cam grooves

CRANKCASE SEPARATION

Remove the following:

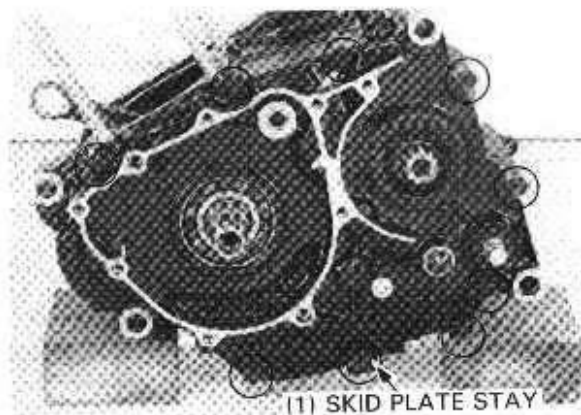
- cam chain.
- tensioner slipper.
- stopper plate.
- cam plate.
- breather plate.

Remove the right crankcase mounting bolts.



Remove the skid plate stay if it was not removed.

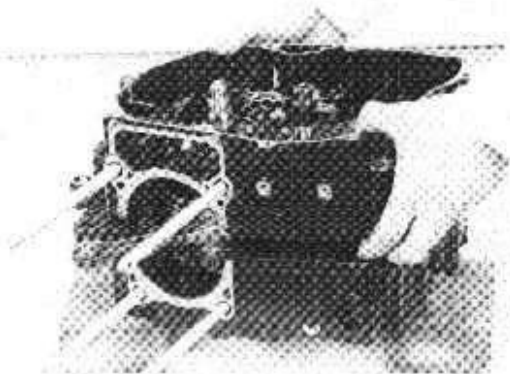
Remove the left crankcase mounting bolts.



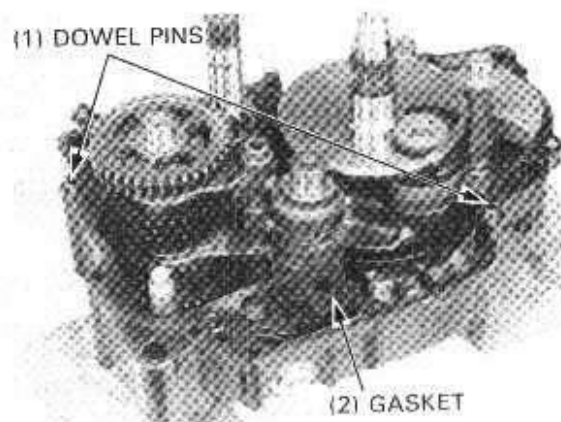
Place the left crankcase side down and separate the right crankcase from the left crankcase while tapping the cases at several locations with a soft hammer.

CAUTION

- *Do not pry between the left and right crankcases.*



Remove the gasket and dowel pins.

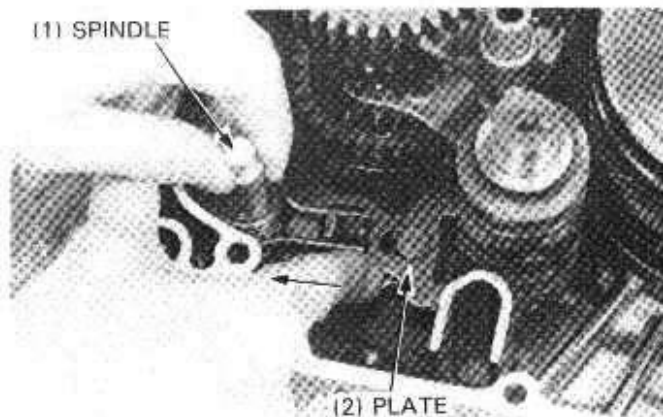


CRANKSHAFT/TRANSMISSION

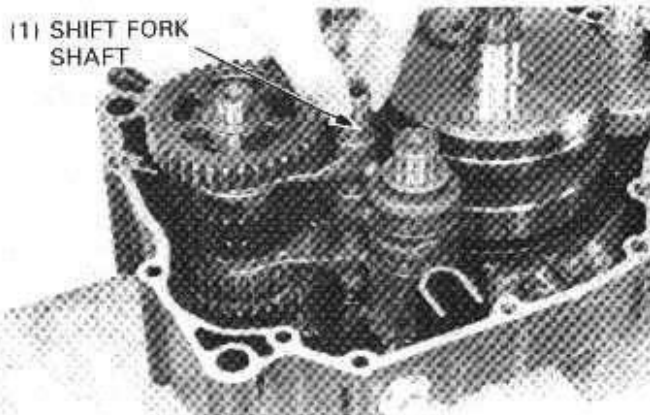
TRANSMISSION

REMOVAL

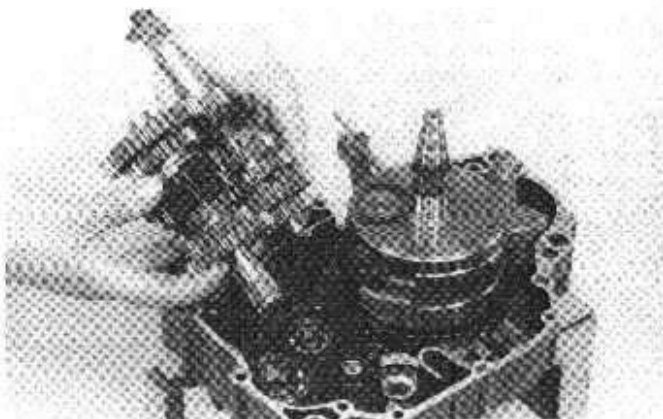
Pull the gearshift plate and remove the gearshift spindle.



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

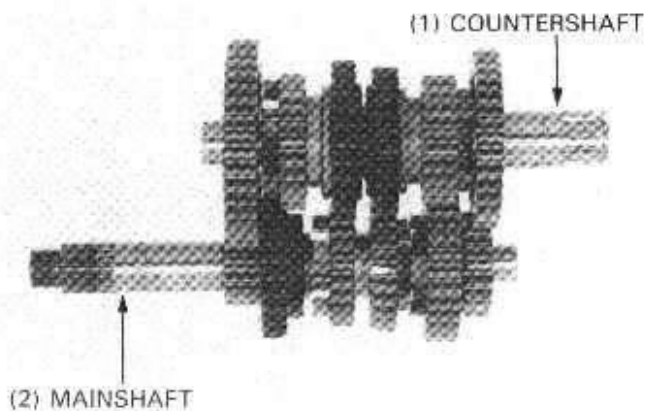


Remove the mainshaft and countershaft together.



TRANSMISSION DISASSEMBLY

Disassemble the mainshaft and countershaft.

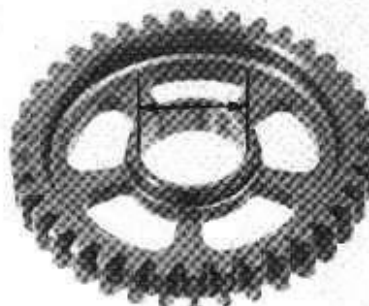


CRANKSHAFT/TRANSMISSION

INSPECTION

Check each gear dog for excessive or abnormal wear.
Inspect the I.D. each gear.

SERVICE LIMITS: M5 20.08 mm (0.791 in)
M6 23.09 mm (0.909 in)
C1 23.07 mm (0.908 in)
C2 25.09 mm (0.988 in)
C3 25.07 mm (0.987 in)
C4 22.08 mm (0.869 in)

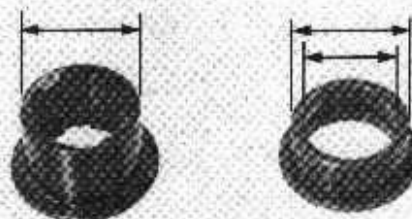


Measure the I.D. and O.D. of each gear bushing.

SERVICE LIMITS:

I.D. C1 18.08 mm (0.712 in)
C2 22.12 mm (0.871 in)
O.D. M6 22.90 mm (0.902 in)
C1 22.90 mm (0.902 in)
C2 24.92 mm (0.981 in)
C3 24.90 mm (0.980 in)

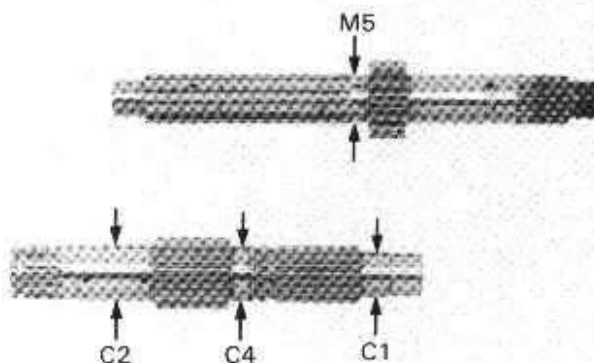
Calculate the clearance between the gear and bushing (refer to page 11-2).



Measure the mainshaft and countershaft O.D.

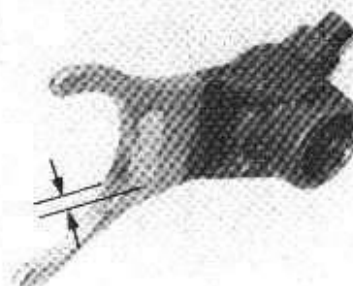
SERVICE LIMITS: M5 19.91 mm (0.984 in)
C1 17.93 mm (0.706 in)
C2 21.91 mm (0.863 in)
C4 21.91 mm (0.863 in)

Calculate the clearance between the shaft and gear or bushing (refer to page 11-2).



Measure the thickness of the shift fork.

SERVICE LIMIT: 4.50 mm (0.177 in)



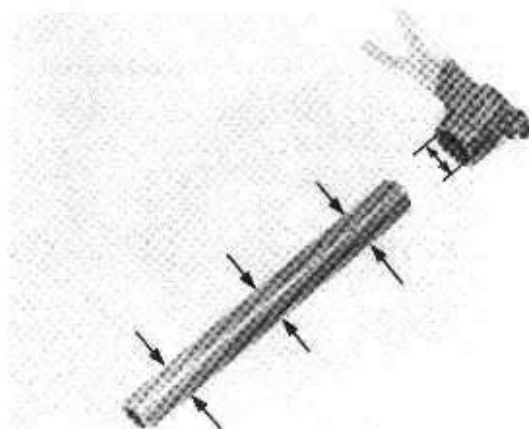
CRANKSHAFT/TRANSMISSION

Measure the I.D. of the shift fork.

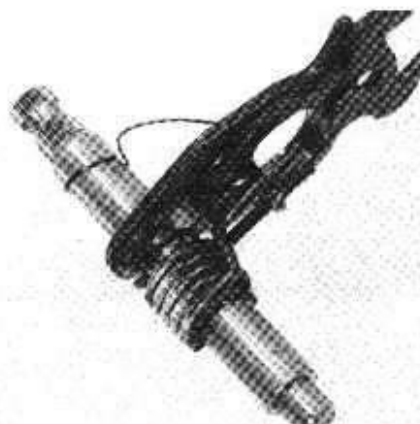
SERVICE LIMIT: 13.05 mm (0.514 in)

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

SERVICE LIMIT: 12.91 mm (0.508 in)

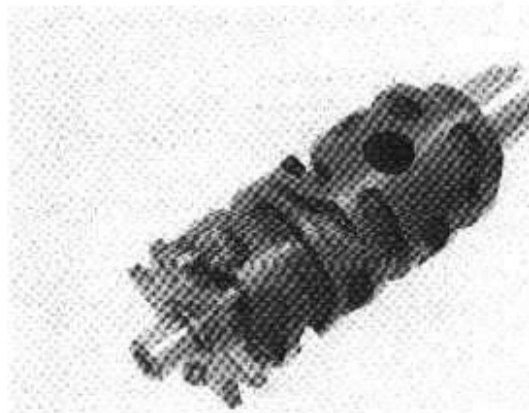


Inspect the shift shaft and springs for wear or damage.



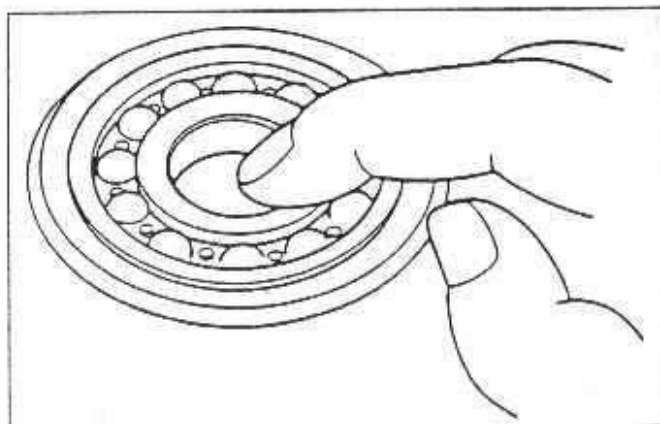
Inspect the shift drum grooves.

Replace the drum if the grooves are damaged or show excessive wear.



Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the crankcase. Remove and discard the bearings if the races do not turn smoothly quietly, or if they fit loosely in the crankcase.

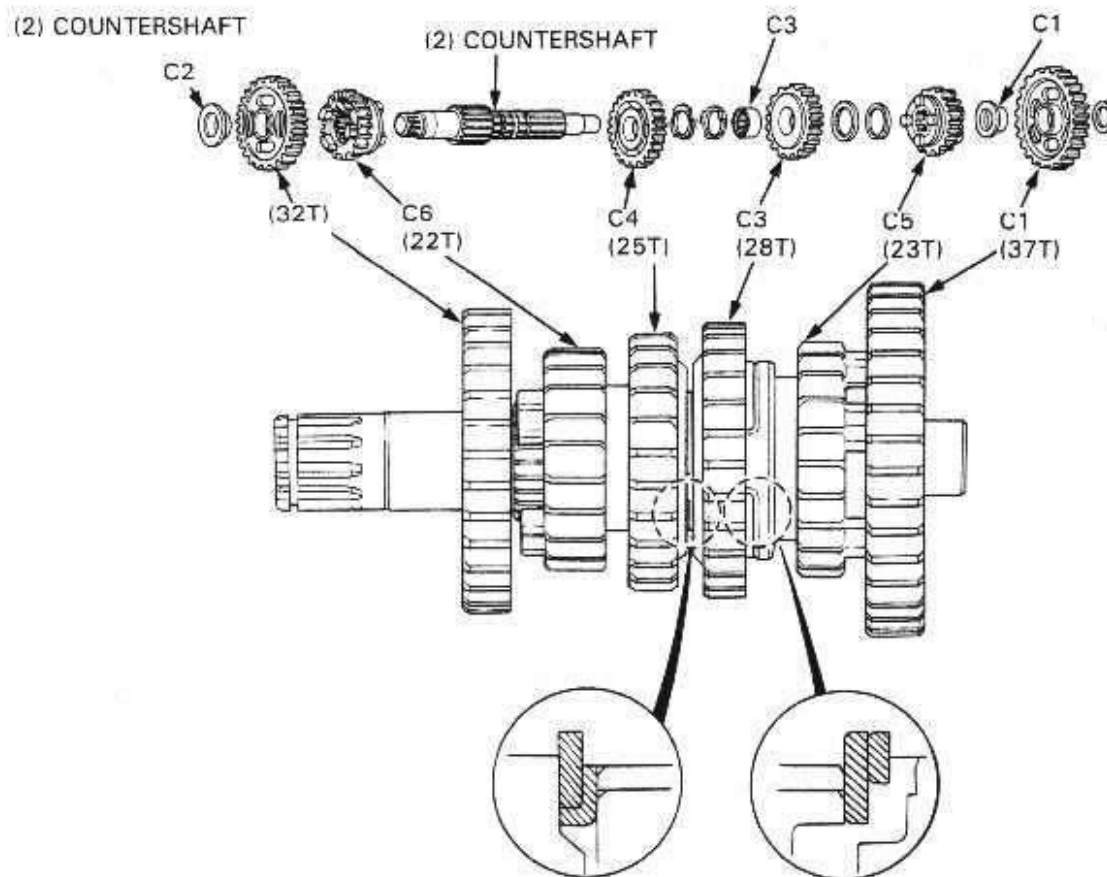
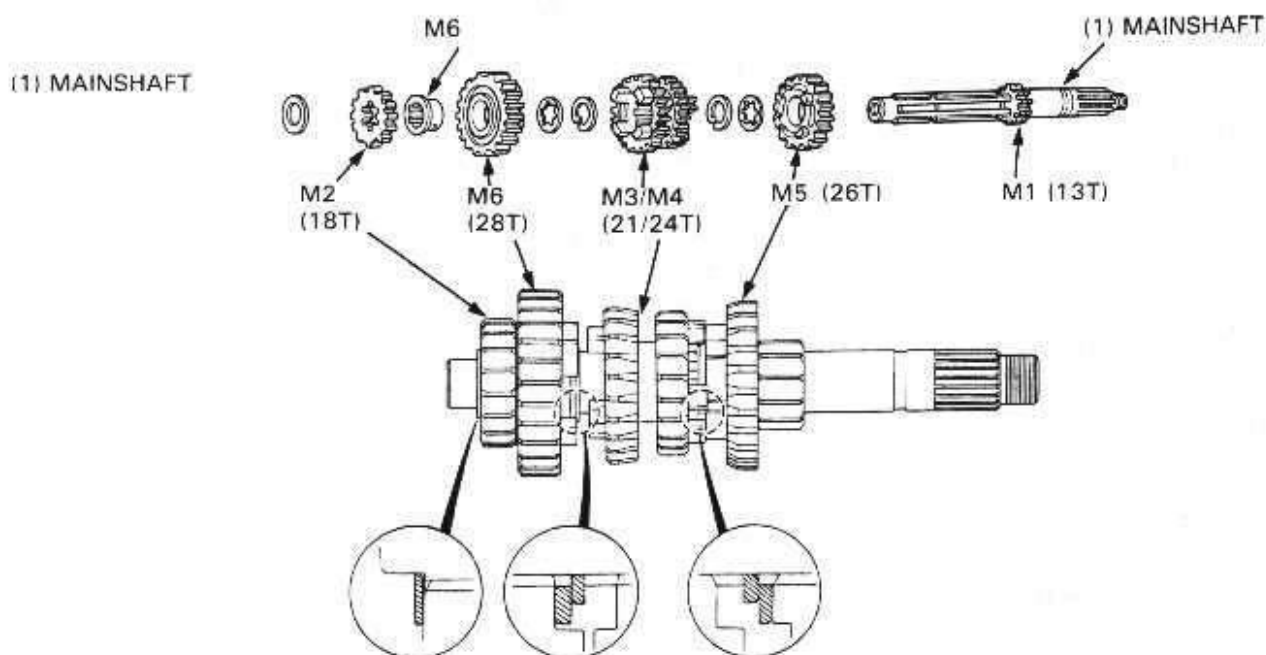
See page 11-11 for bearing replacement.



TRANSMISSION ASSEMBLY

Check the gears for freedom of movement or rotation on the shaft.

Check that the snap rings are seated in the grooves.



CRANKSHAFT/TRANSMISSION

CRANKSHAFT/BALANCER

REMOVAL

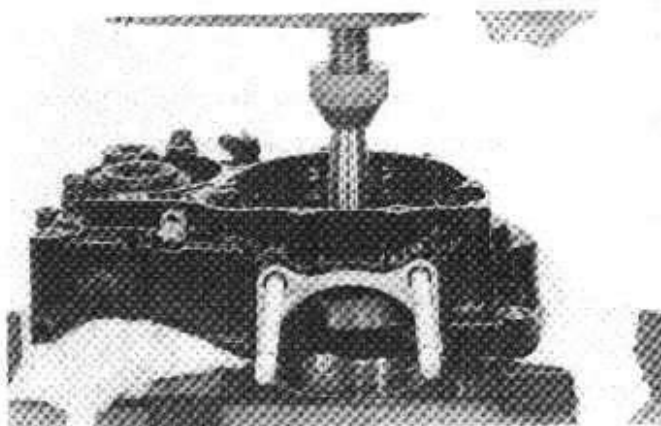
Separate the crankcase (page 11-4).

Remove the transmission (page 11-5).

Press the crankshaft and balancer out of the left crankcase.

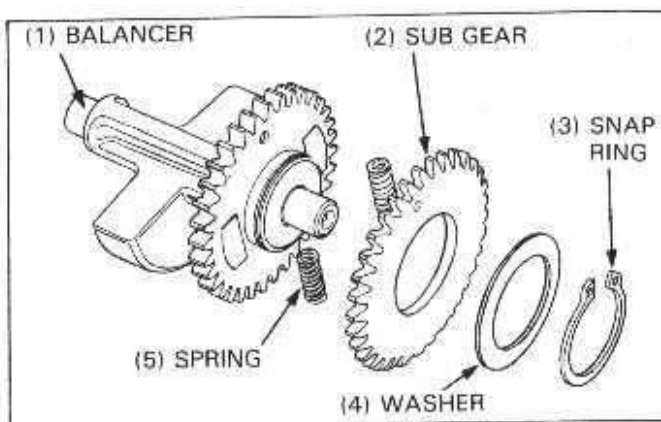
CAUTION

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

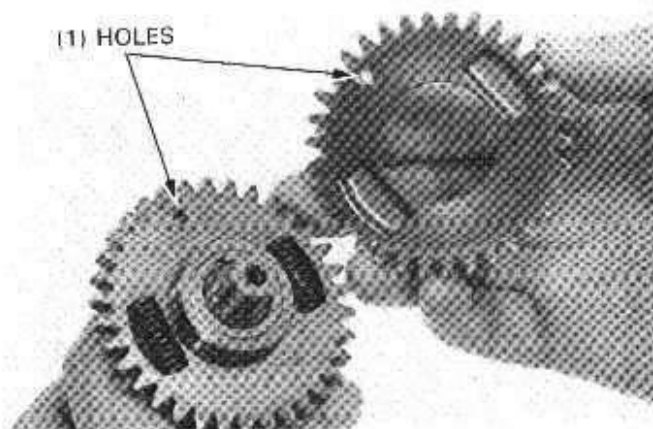


BALANCER DISASSEMBLY/ASSEMBLY

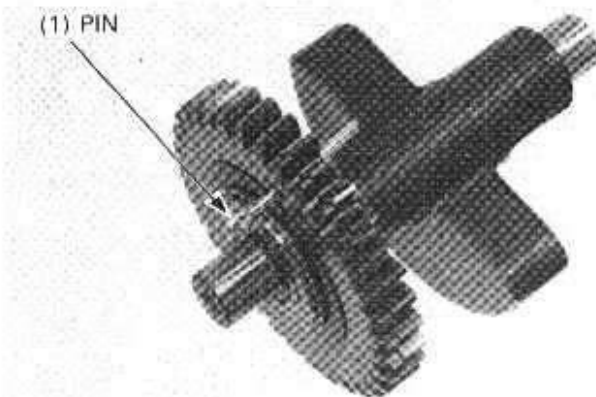
Remove the snap ring, and washer and sub gear.



Install the springs, then install the sub-gear on the balancer gear, aligning the holes as shown.



Install the washer and snap ring, then temporarily install a suitable pin as shown.



CRANKSHAFT/TRANSMISSION

Remove the left crankshaft bearing with a bearing puller if it is removed with the crankshaft. Discard the bearing.

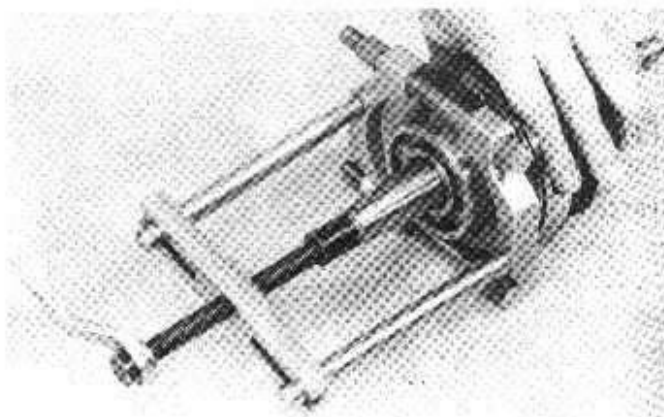
CAUTION

- *Always replace the left bearing with a new one if it is removed with the crankshaft.*

TOOL:

Universal bearing puller

07631-0010000



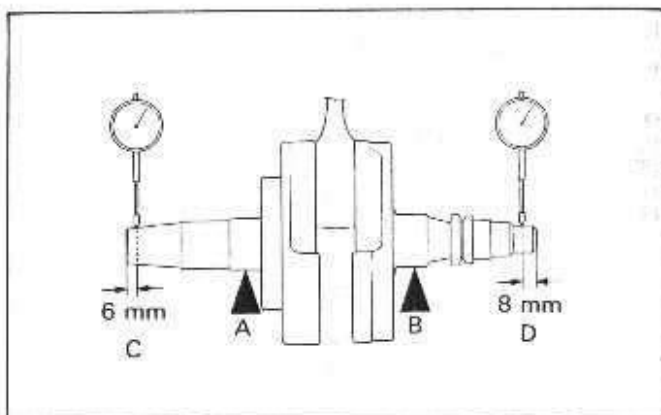
CRANKSHAFT INSPECTION

Measure the crankshaft runout.

Support the crankshaft at points A and B, and then measure the points C and D.

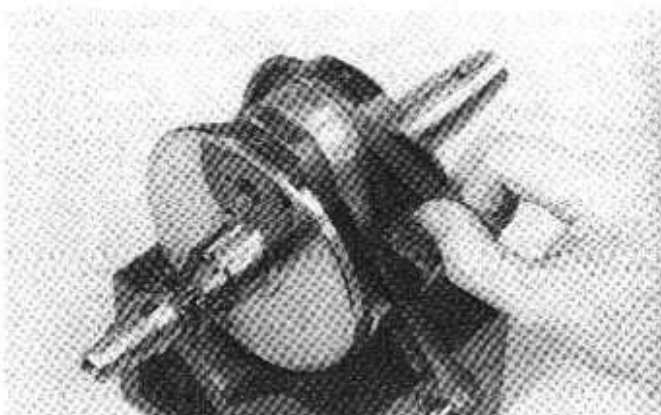
SERVICE LIMIT: 0.05 mm (0.002 in)

If runout exceeds the service limit, replace the crankshaft.



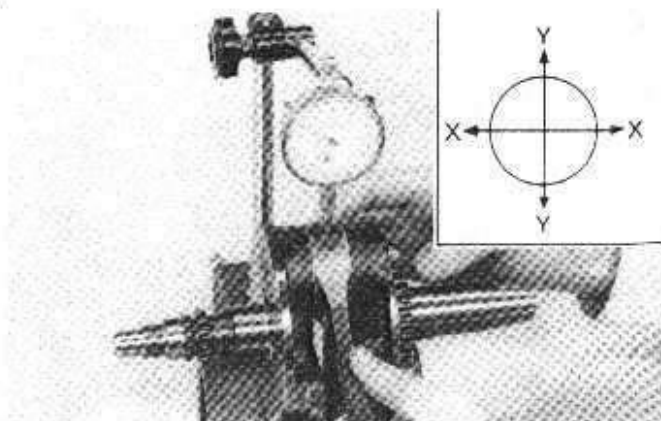
Measure the connecting rod big end side clearance with a feeler gauge.

SERVICE LIMIT: 0.60 mm (0.024 in)



Measure the radial clearance at the connecting rod big end, at two points in the directions indicated by the arrows.

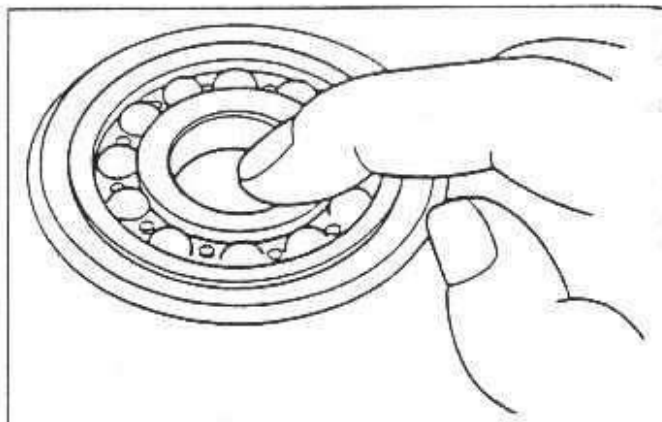
SERVICE LIMIT: 0.04 mm (0.002 in)



CRANKCASE BEARINGS REPLACEMENT

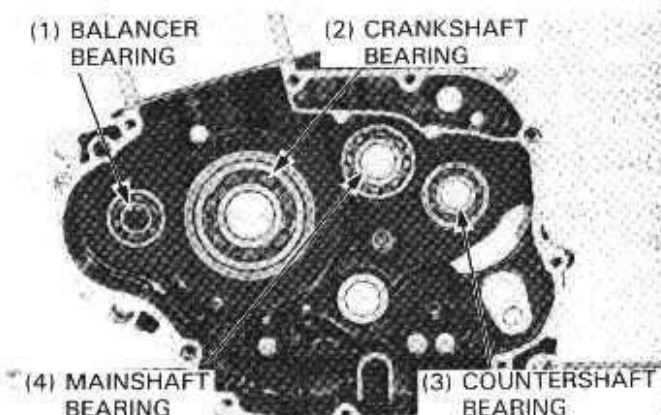
INSPECTION

Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the crankcase. Remove and discard the bearings if the races do not turn smoothly, quietly, or if they fit loosely in the crankcase.



REMOVAL

When no special tools are listed, use commercially available bearing remove tools.



- Right crankshaft bearing
Drive the right crankshaft bearing out of the crankcase.

- Countershaft bearing
Remove the dust seals.
Drive the countershaft bearing out of the right and left crankcases using commercially available tools.

- Mainshaft bearing

TOOLS:

Bearing remover, 15 mm	07936-KC10000
— remover assembly, 15 mm	07936-KC10500
— remover shaft, 15 mm	07936-KC10100
— remover head, 15 mm	07936-KC10200
— remover weight	07741-0010201

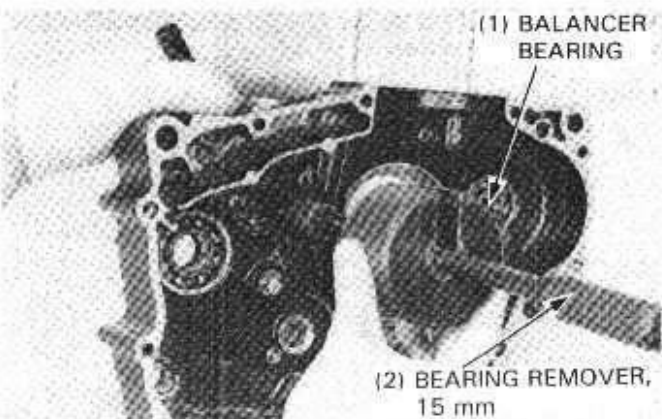
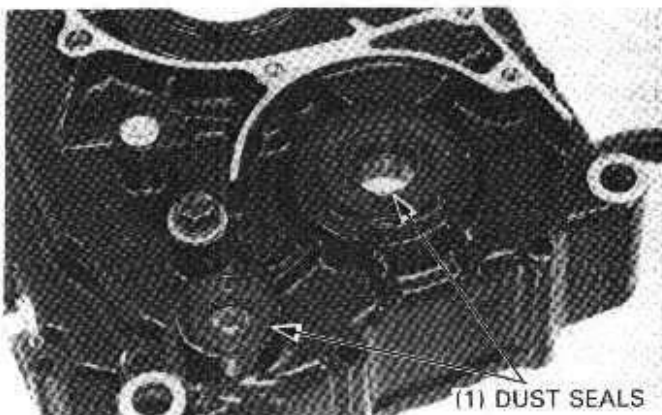
- Balancer bearing

Heat the crankcase around the balancer bearing to 176°F (80°C).

⚠ WARNING

- Always wear gloves when handling a heated crankcase.

Tap around the bearing with soft hammer, then remove it from the case.



CRANKSHAFT/TRANSMISSION

INSTALLATION

Drive-in new bearings with the following tools:

Left crankcase

- Countershaft bearing:

TOOLS:

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

- Mainshaft bearing:

TOOLS:

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

- Balancer bearing:

TOOLS:

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

- Crankshaft bearing:

TOOLS:

Driver	07749-0010000
Attachment, 62 x 68 mm	07746-0010500
Pilot, 28 mm	07746-0041100

Right crankcase

- Countershaft bearing:

TOOLS:

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

- Mainshaft bearing:

TOOLS:

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

- Balancer bearing:

TOOLS:

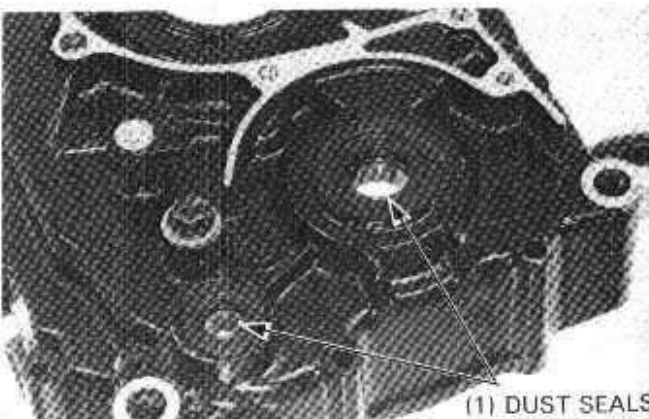
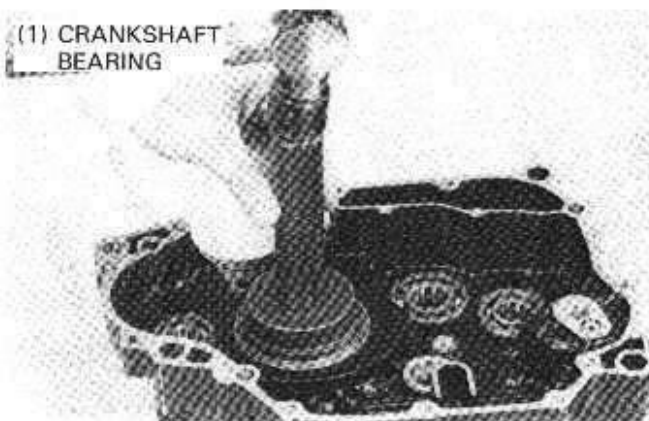
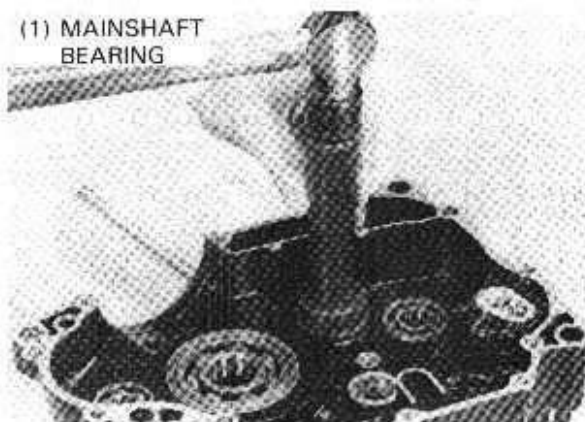
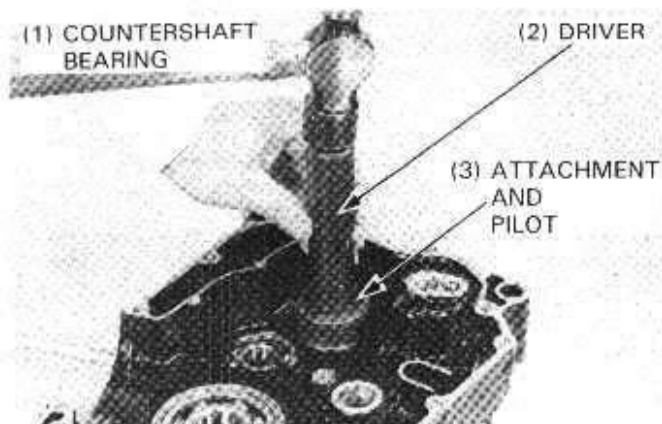
Driver	07749-0010000
Attachment, 37 x 40 mm	07746-0010200

- Crankshaft bearing:

TOOLS:

Driver	07749-0010000
Attachment, 62 x 68 mm	07746-0010500
Pilot, 28 mm	07746-0041100

Apply grease to the dust seal lips and install new dust seals.

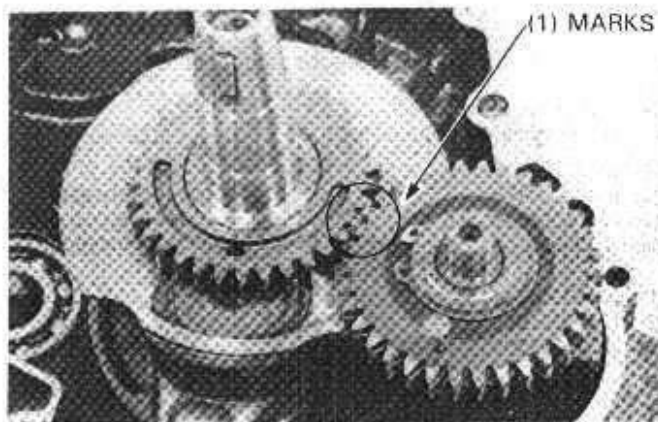


CRANKSHAFT/TRANSMISSION

CRANKCASE ASSEMBLY

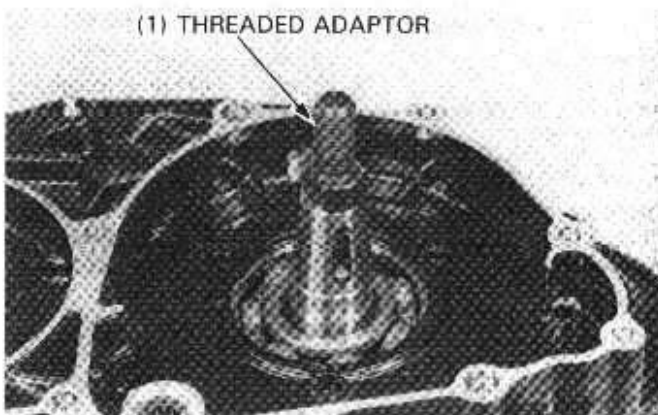
Install the crankshaft and balancer into the right crankcase, aligning the marks on the crankshaft gear and the balancer sub gear.

Remove the temporary holding pin from the balancer gear.



Position the left case cover the right case being careful to align the shaft.

Install the threaded adaptor into the crankshaft.

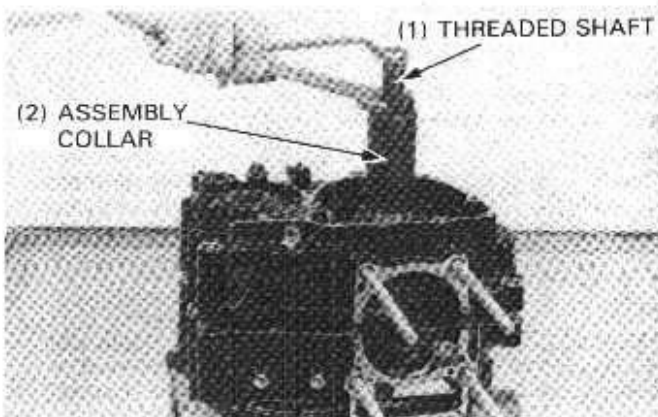


Draw the crankshaft into the left crankcase with the crankshaft assembly tool, noting the connecting rod location. Remove the tool and the threaded adaptor.

TOOLS:

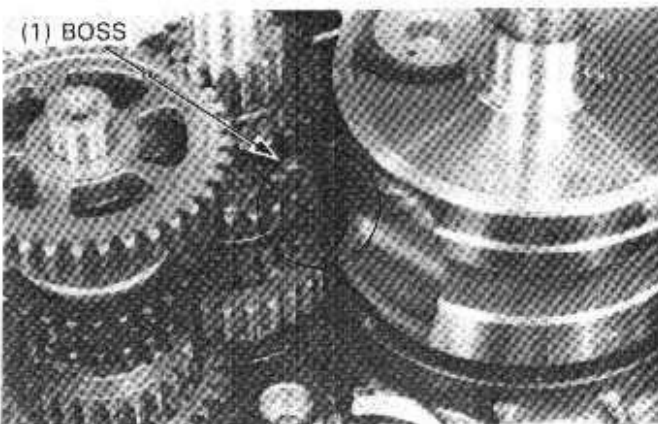
Crankcase assembly tool	07965-VM00000
— collar assembly	07965-VM00100
— threaded shaft	07965-VM00200
— threaded adaptor	07965-VM00300

Remove the right crankcase.



Remove the right crankcase.

Install the mainshaft and countershaft assemblies, together aligning the bosses on the crankshaft and mainshaft gears.



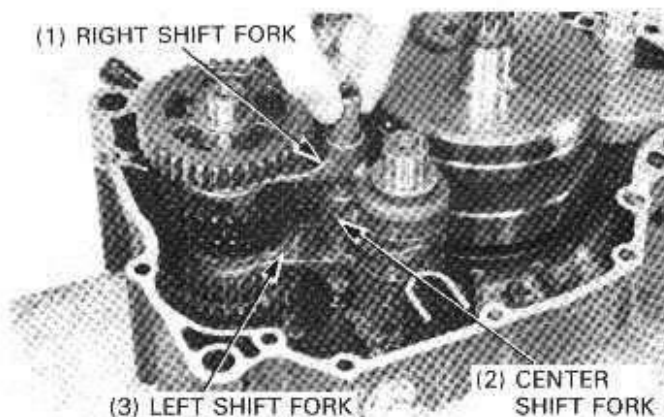
CRANKSHAFT/TRANSMISSION

Install the left shift fork into the C6 gear groove with the "L" mark facing down.

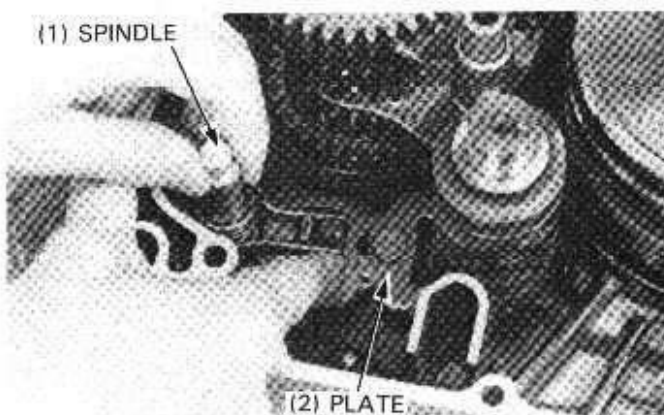
Install the center shift fork into the M3/M4 gear groove with "C" mark facing up.

Install the right shift fork into the C5 gear groove with "R" mark facing up.

Insert the shift fork shaft through the shift forks into the left crankcase.



Align the return spring with the pin bolt and install the shift spindle while pulling the shift plate.

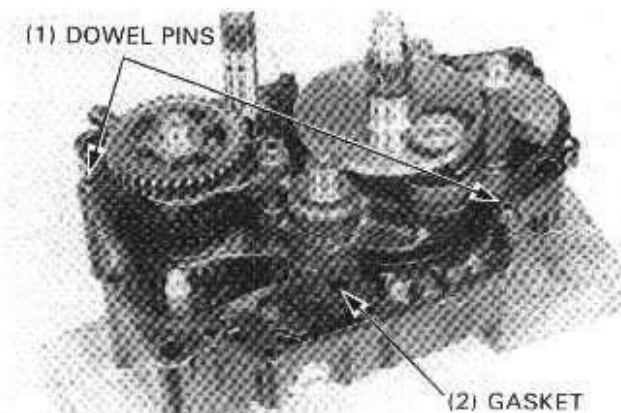


Clean the crankcase mating surfaces before assembling and check for wear or damage.

NOTE

- If there is minor roughness or irregularities on the crankcase mating surfaces, dress them with an oil stone.

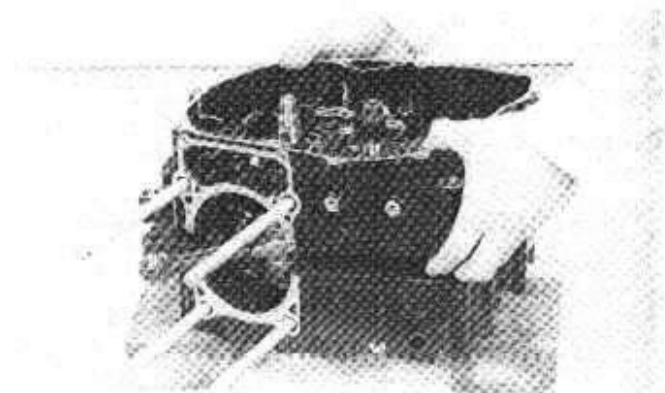
Install a new gasket and dowel pins.



Assembly the right and left crankcases being careful to align the dowel pins and shafts.

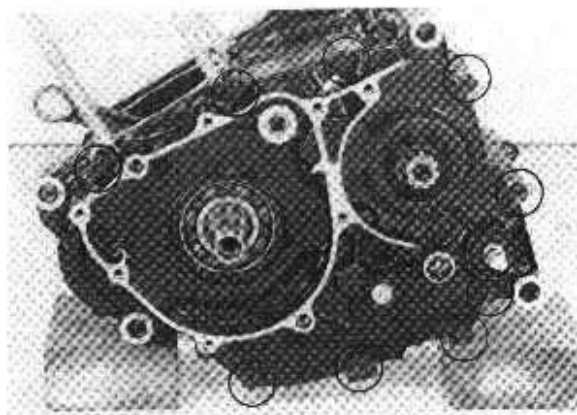
CAUTION

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

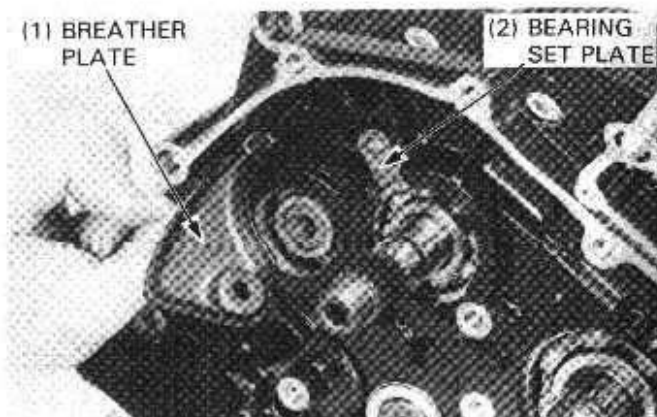


CRANKSHAFT/TRANSMISSION

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



Install the mainshaft bearing set plate and the crankcase breather plate.



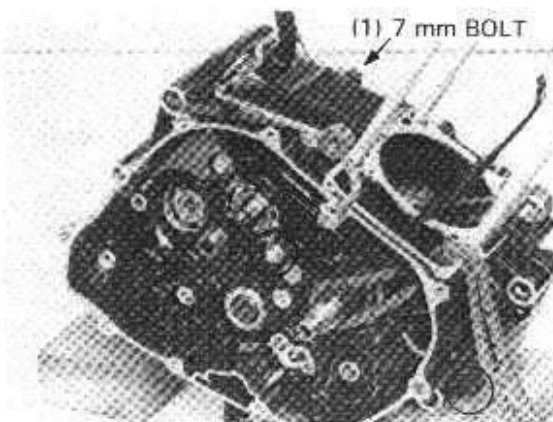
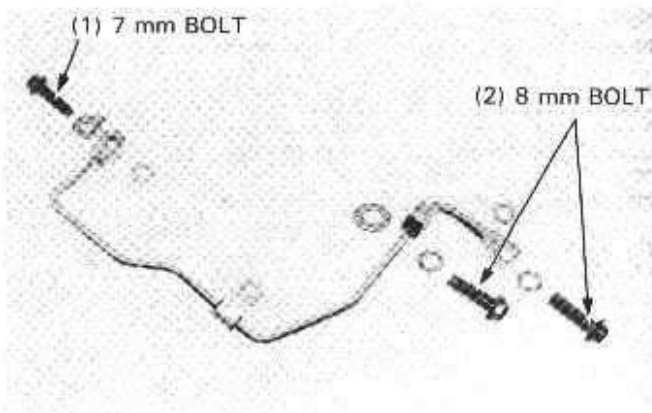
Make sure that the oil pipe and its oil bolt are not clogged, and that the sealing washers are in good condition.

NOTE

- When the installing the oil pipe on the engine, do not interchange the 7 mm and 8 mm oil bolts.

Install the crankcase bolts in a crisscross pattern in 2 or 3 steps.

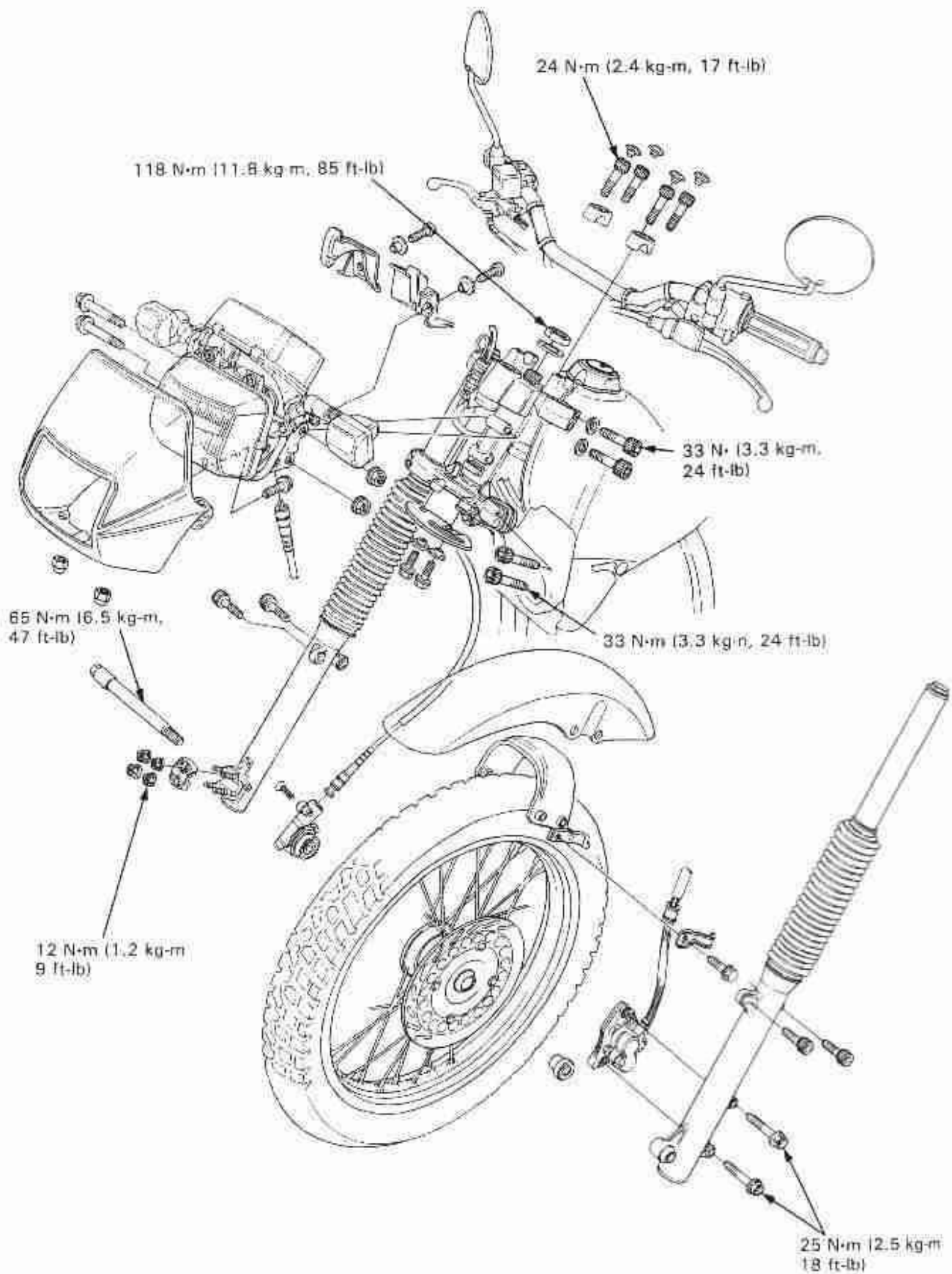
Install the removed parts in the reverse order of removal.



**FRONT WHEEL/SUSPENSION/
STEERING**

**ROUE AVANT/SUSPENSION/
DIRECTION**

**VORDERRAD/AUFHÄNGUNG/
LENKUNG**



FRONT WHEEL/SUSPENSION/STEERING

SERVICE INFORMATION	12-1	FRONT WHEEL	12-6
TROUBLESHOOTING	12-2	FORK	12-10
HANDLEBAR	12-3	STEERING STEM	12-18

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.
- Inhaled asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies.

- This section covers maintenance of the front wheel, fork and steering stem. Refer to section 14 for front (hydraulic) brake service.
- Support the motorcycle using a hoist or a jack under the engine.

SPECIFICATIONS

ITEM		STANDARD	SERVICE LIMIT
Axle runout		—	0.2 mm (0.008 in)
Front wheel rim runout	Radial	—	2.0 mm (0.08 in)
	Axial	—	2.0 mm (0.08 in)
Fork fluid level		107 mm (4.2 in)	—
Fork tube runout		—	0.2 mm (0.008 in)
Fork fluid capacity		412 cc (13.9 US oz, 14.5 imp oz)	—
Fork spring free length	A	74.9 mm (2.95 in)	74.2 mm (2.92 in)
	B	484.1 mm (19.06 in)	479.3 mm (18.87 in)

TORQUE VALUES

Handlebar holder bolt	24 N·m (2.4 kg-m, 17 ft-lb)
Brake disc bolt	15 N·m (1.5 kg-m, 11 ft-lb)
Front axle	65 N·m (6.5 kg-m, 47 ft-lb)
Front axle holder nut	12 N·m (1.2 kg-m, 9 ft-lb)
Fork top pinch bolt	33 N·m (3.3 kg-m, 24 ft-lb)
Fork bottom pinch bolt	33 N·m (3.3 kg-m, 24 ft-lb)
Fork cap	23 N·m (2.3 kg-m, 17 ft-lb)
Fork socket bolt	20 N·m (2.0 kg-m, 14 ft-lb)
Brake caliper mounting bolt	25 N·m (2.5 kg-m, 18 ft-lb)
Steering stem nut	118 N·m (11.8 kg-m, 85 ft-lb)
Steering bearing adjustment nut	5 N·m (0.5 kg-m, 4 ft-lb)

TOOLS

Special

Steering stem driver	07946-4300101
Steering stem socket	07916-KA50100
Ball race remover	07953-MJ10000
— driver attachment	07953-MJ10100
— driver handle	07953-MJ10200

Common

Driver	07749-0010000
Bearing remover head, 15 mm	07746-0050400
Bearing remover shaft	07746-0050100
Attachment, 32 x 35 mm	07746-0010100
Pilot, 15 mm	07746-0040300
Attachment, 42 x 47 mm	07746-0010300
Fork seal driver body	07747-0010100
Fork seal driver attachment	07747-0010600

TROUBLESHOOTING

Hard Steering

- Steering bearing adjustment nut too tight
- Faulty steering stem bearings
- Insufficient air in front tire

Steers to One Side or Does Not Track Straight

- Bent fork legs
- Bent front axle, wheel installed incorrectly
- Unequal oil quantity in each fork tube

Front Wheel Wobbling

- Distorted rim
- Worn front wheel bearings
- Loose or broken spokes
- Faulty tire
- Axle or axle holder not tightened properly

Soft Suspension

- Weak fork springs
- Insufficient fluid in fork legs

Hard Suspension

- Fork oil level too high
- Fork tube(s) bent or fork slider(s) damaged

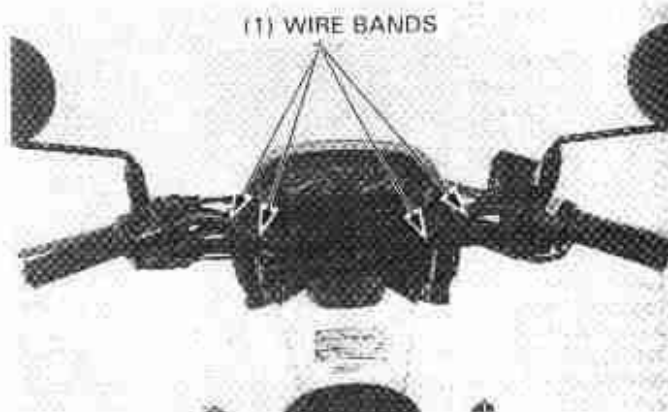
Front Suspension Noise

- Slider binding
- Insufficient fluid in fork legs
- Loose fork leg fasteners

HANDLEBAR

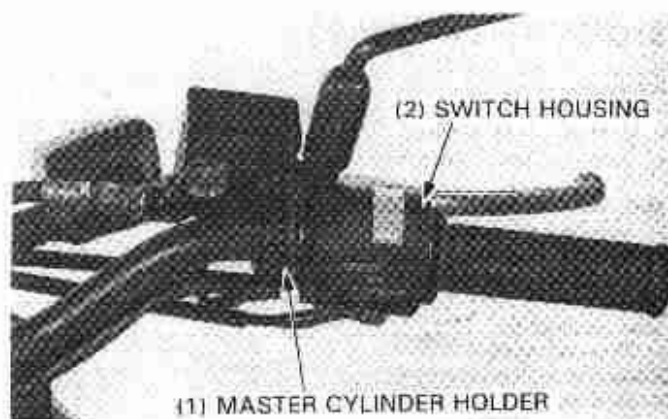
REMOVAL

Remove the wire bands.



Disconnect the front brake switch wires.
Remove the master cylinder holder.

Remove the right handlebar switch housing and disconnect the throttle cables, then remove the throttle grip end and grip.



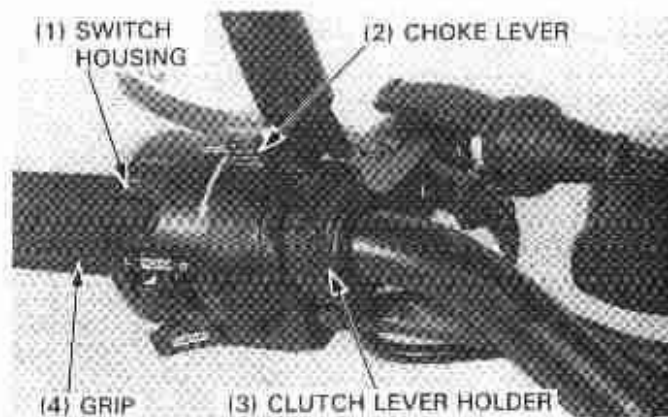
CAUTION

- Suspend the master cylinder, with a suitable wire, at least as high as originally installed so as to prevent air from getting into the brake fluid.

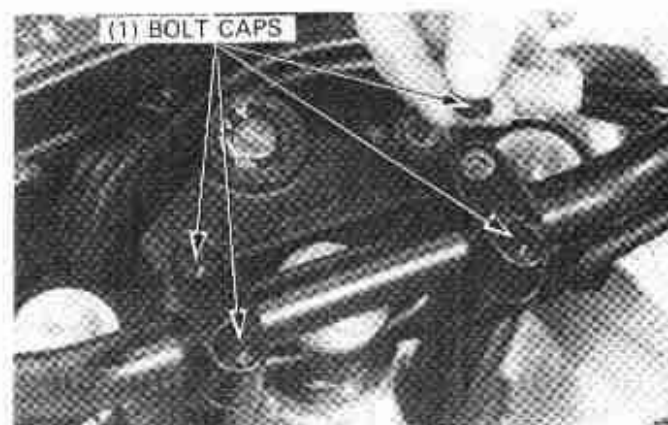
Remove the left handlebar grip and grip from the handlebar if necessary.

Remove the clutch lever holder.

Remove the left handlebar switch and disconnect the choke cable from the choke lever.



Remove the bolt caps and bolts, then remove the handlebar upper holders and the handlebar.



FRONT WHEEL/SUSPENSION/STEERING

INSTALLATION

Install the handlebar and align its punch mark with the top of the lower holders.

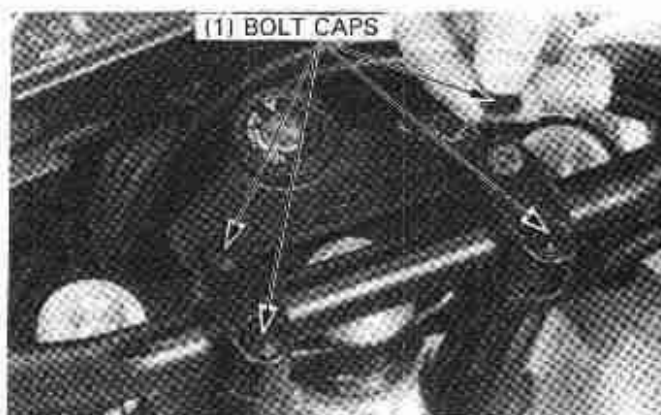
Place the upper holders on the handlebar with the punch marks forward.



Tighten the forward bolts first, then tighten the rear bolts.

TORQUE: 24 N·m (2.4 kg-m, 17 ft-lb)

Install the bolt caps.



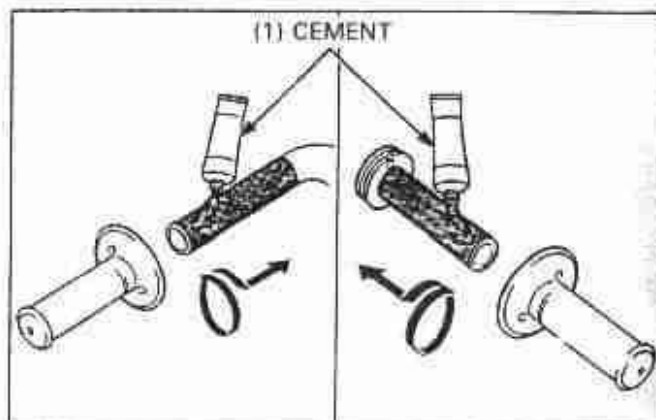
If the handlebar grips were removed, apply Honda Bond A to the inside of the grip and to the clean surfaces of the right and left handlebar.

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.

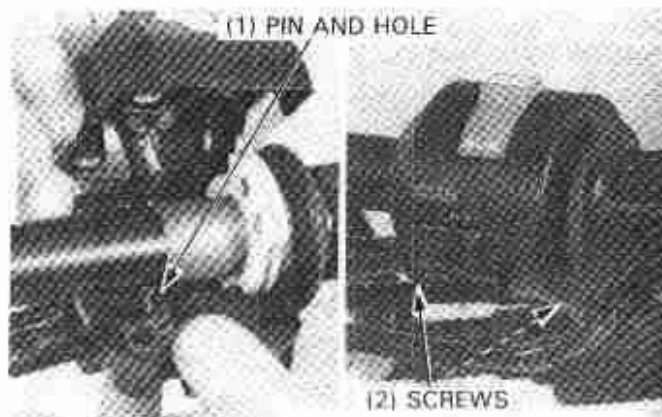


Apply a grease to the throttle cable ends.

Connect the throttle cables to the throttle pipe.

Align the location pin on the right handlebar switch with the hole in the handlebar.

Install and tighten the switch screws, front screw first, then rear screw.

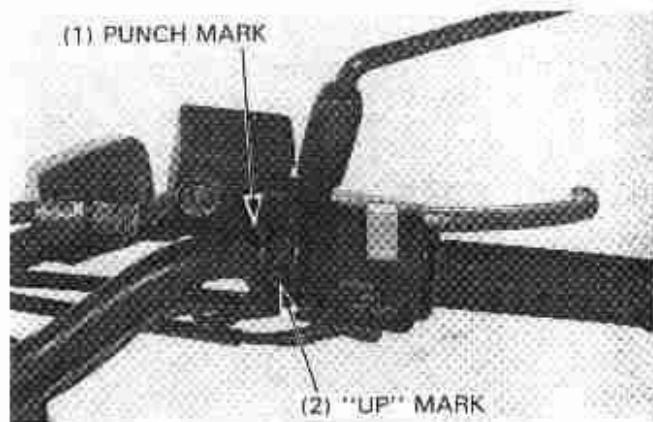


FRONT WHEEL/SUSPENSION/STEERING

Place the front brake master cylinder on the handlebar and install the master cylinder holder with the "UP" mark facing up.

Align the end of the holder with the punch mark on the handlebar. Tighten the upper holder bolt first, then tighten the lower bolt.

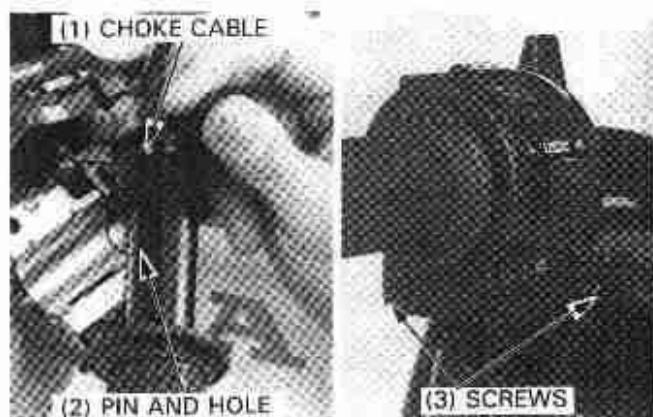
Connect the front brake switch wires.



Connect the choke cable to the choke lever.

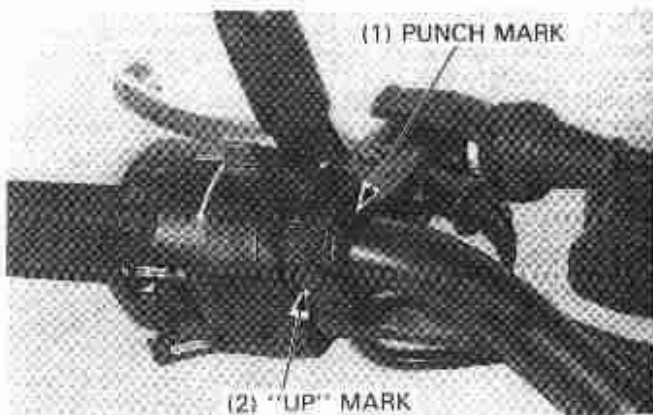
Install the left handlebar switch by aligning the locating pin with the hole in the handlebar.

Tighten the front screw first, then tighten the rear screw.

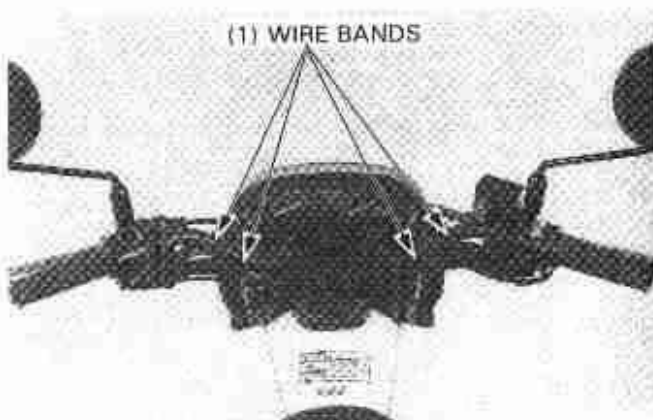


Install the clutch lever holder with the "UP" mark facing up.

Align the end of the holder with the punch mark on the handlebar. Tighten the upper holder bolt first, then tighten the lower bolt.



Install the wire bands.



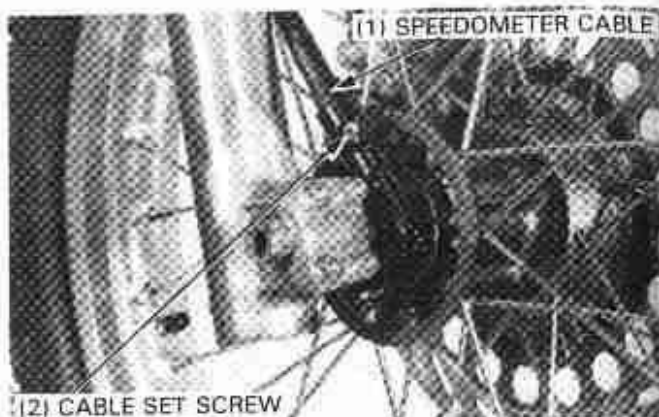
FRONT WHEEL/SUSPENSION/STEERING

FRONT WHEEL

REMOVAL

Raise the front wheel off the ground.

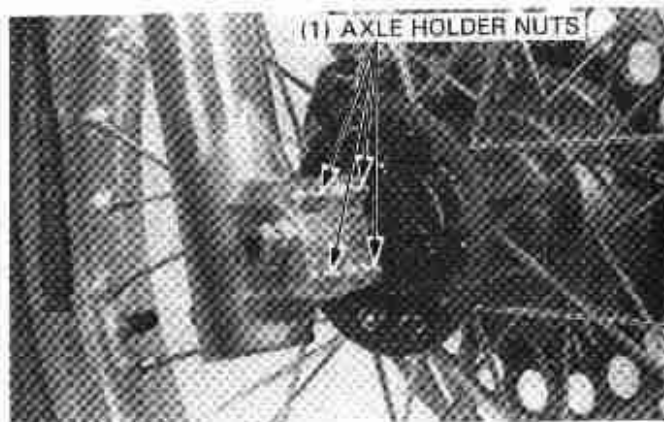
Disconnect the speedometer cable from the speedometer gear box by removing the cable set screw.



Loosen the front axle holder nuts.
Remove the axle and the front wheel.

NOTE

- If you squeeze the front brake lever after the caliper is removed, the caliper piston will move out and make assembly difficult.

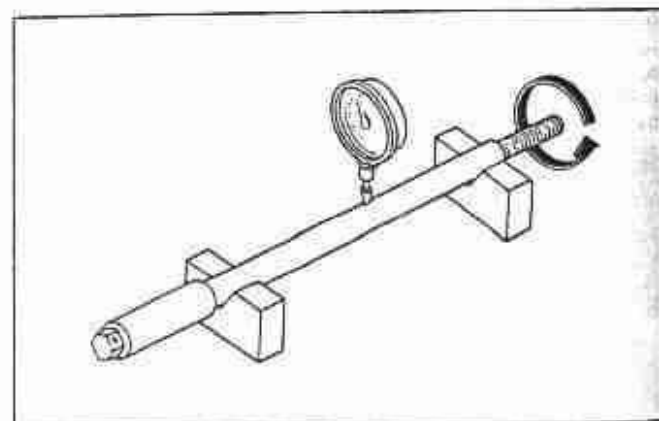


INSPECTION

• AXLE

Set the axle in V blocks and measure the runout.

SERVICE LIMIT: 0.2 mm (0.01 in)



Check the rim runout by placing the wheel in a truing stand. Spin the wheel slowly and read the runout using a dial indicator.

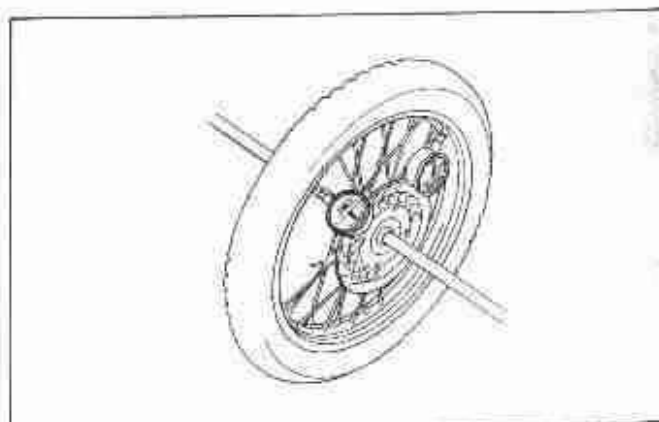
SERVICE LIMITS:

Radial runout: 2.0 mm (0.08 in)

Axial runout: 2.0 mm (0.08 in)

NOTE

- The wheel cannot be repaired and must be replaced with a new one if the service limits are exceeded.



FRONT WHEEL/SUSPENSION/STEERING

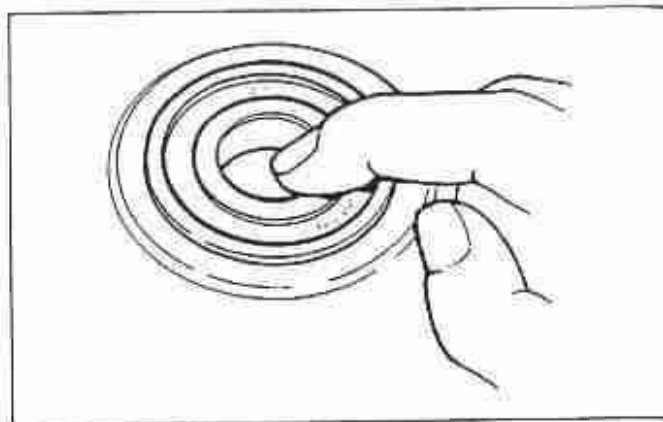
● WHEEL BEARING

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

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

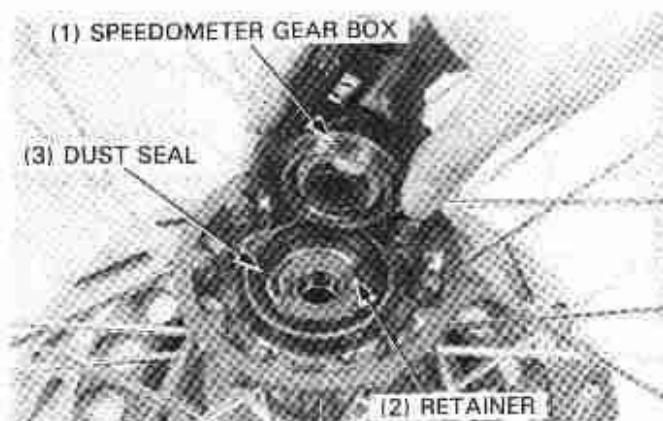
NOTE

- Replace hub bearings in pairs.



DISASSEMBLY

Remove the speedometer gear box dust seal and speedometer gear retainer.

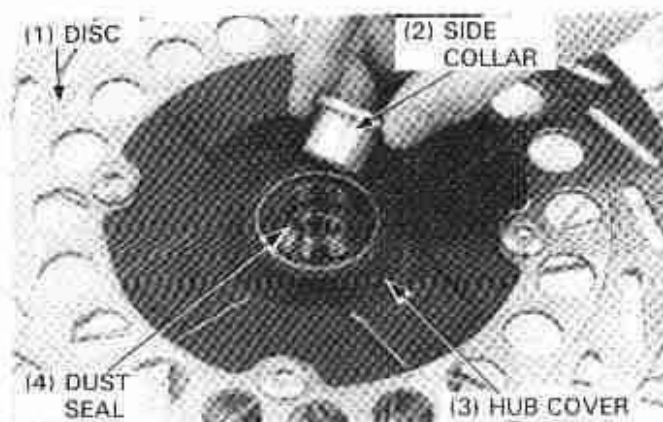


Remove the side collar from the left side.

Remove the hub cover and disc.

NOTE

- Check for disc warpage; see page 14-5.



WHEEL BEARING REPLACEMENT

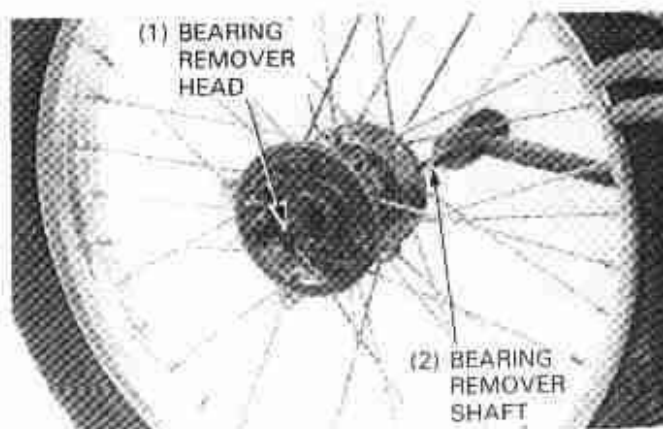
Install the bearing remover head and shaft; then remove the bearings and the distance collar.

NOTE

- Never reinstall old bearings once the bearings are removed, they must be replaced with new ones.

TOOLS:

- | | |
|-----------------------------|---------------|
| Bearing remover head, 15 mm | 07746-0050400 |
| Bearing remover shaft | 07746-0050100 |



FRONT WHEEL/SUSPENSION/STEERING

Drive in a new right side bearing first, then install the distance collar.

Drive in a new left side bearing.

TOOLS:

Driver

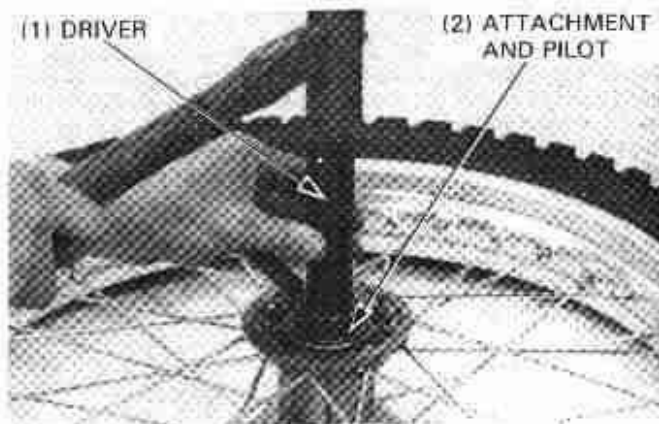
07749-0010000

Attachment, 32 x 35 mm

07746-0010100

Pilot, 15 mm

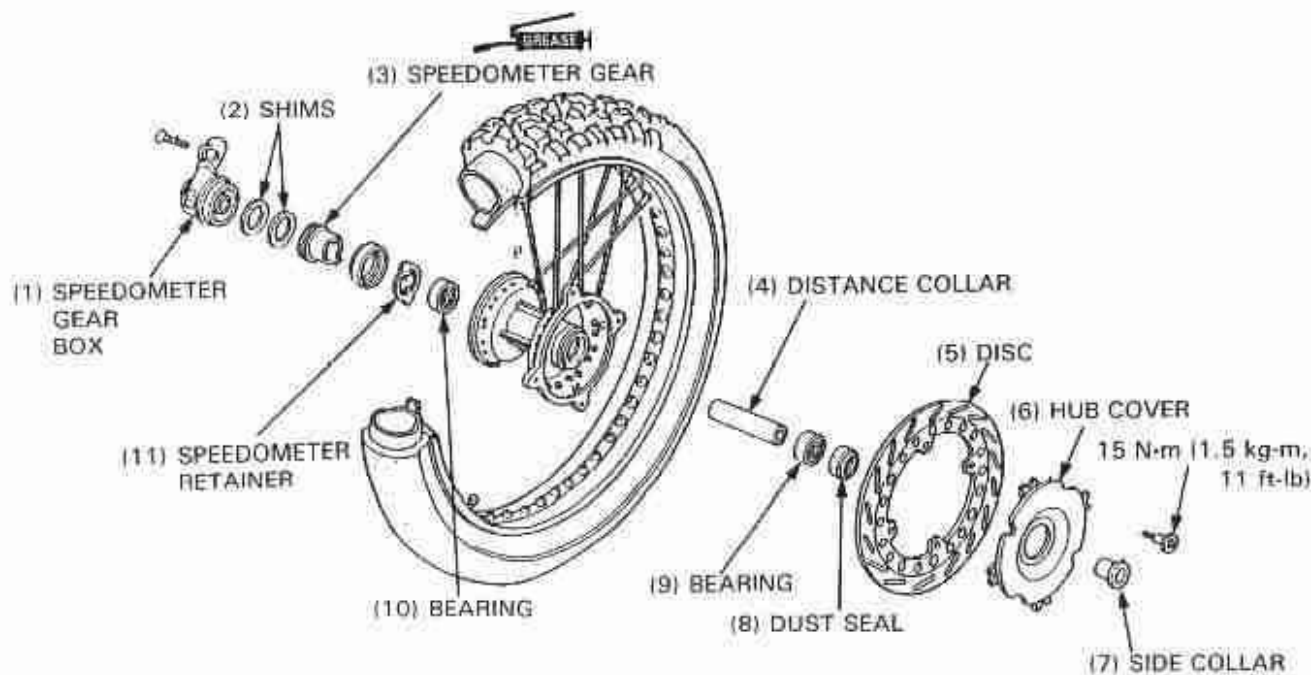
07746-0040300



ASSEMBLY

⚠ WARNING

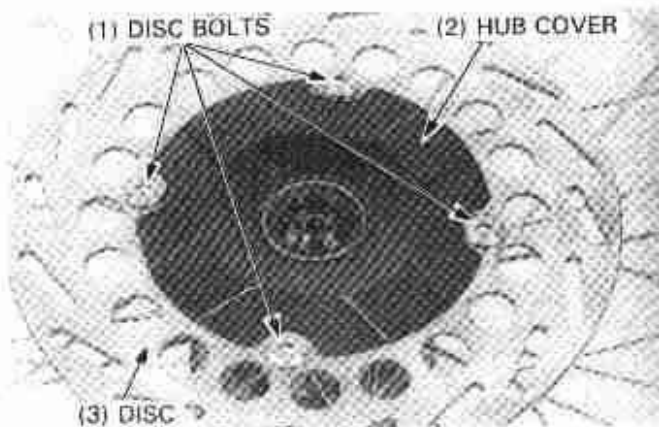
- Do not get grease on the brake disc or stopping power will be reduced.



Install the dust seal, disc and hub cover.

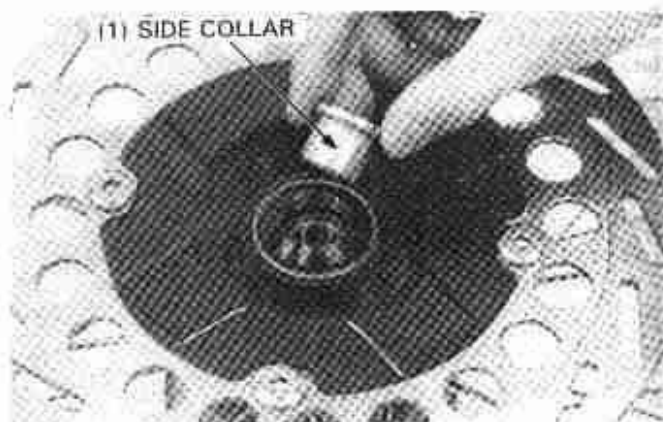
Tighten the disc mounting bolts.

TORQUE: 15 N·m (1.5 kg·m, 11 ft·lb)

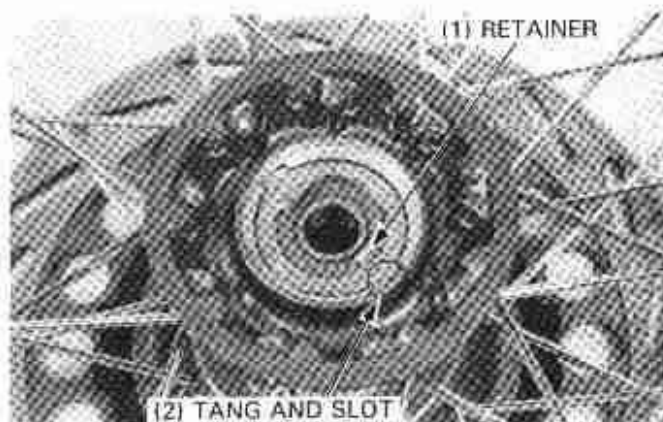


FRONT WHEEL/SUSPENSION/STEERING

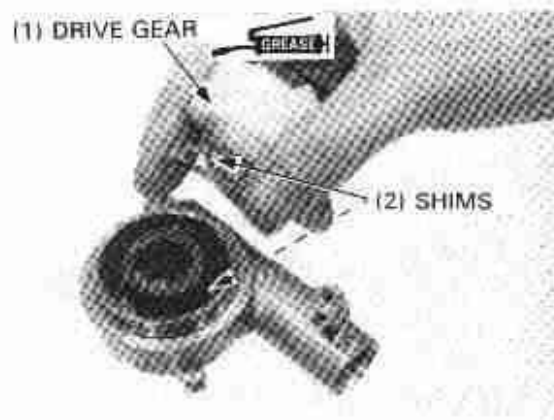
Install the left side collar.



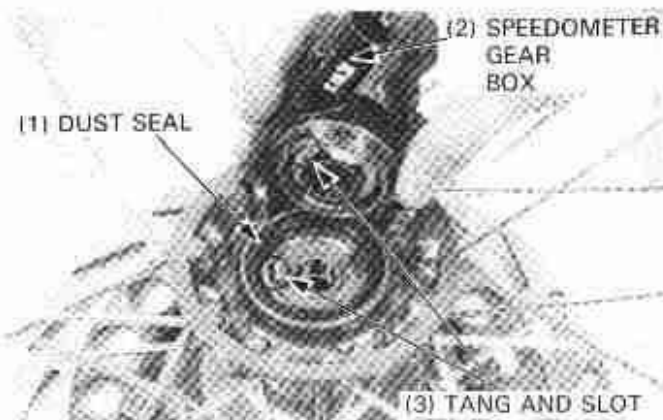
Install the speedometer gear retainer in the left side of the wheel hub, aligning its tangs with the slots in the hub.



Install the shims, fill the speedometer gear box with grease, and install the drive gear.



Install the dust seal and the speedometer gear box in the wheel hub, aligning the tangs with the slots.



FRONT WHEEL/SUSPENSION/STEERING

FRONT WHEEL INSTALLATION

Fit the caliper over the disc, taking care not to damage the brake pads.

Clean the axle and holder.

Install the holder with the "UP" mark facing upwards.

Install the axle holder nuts but do not tighten at this time.

CAUTION

- Set the tang on the gearbox under the stopper on the left fork leg.

Tighten the axle to the specified torque.

TORQUE: 65 N·m (6.5 kg-m, 47 ft-lb)

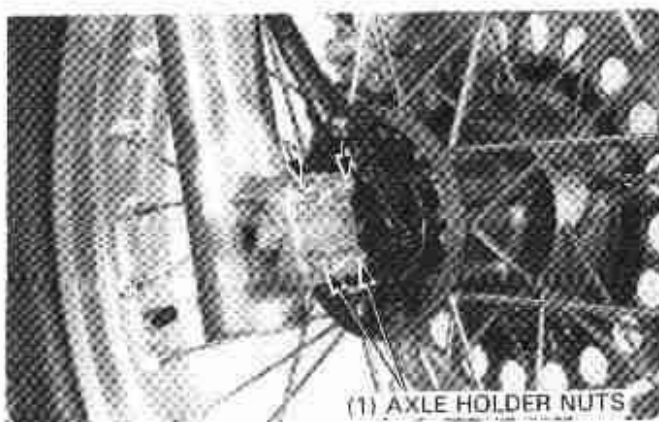
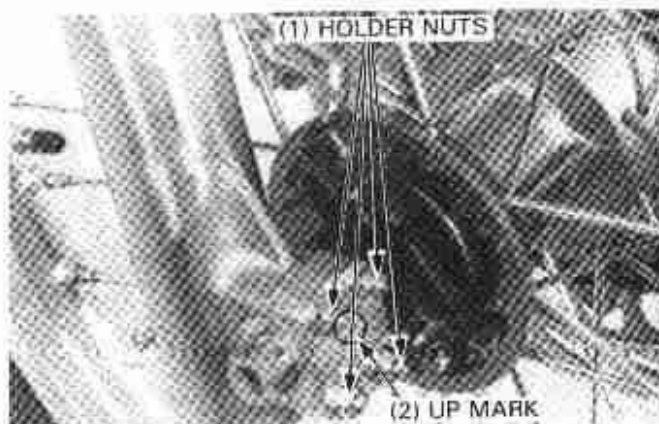
With the front brake applied, pump the fork up and down several times to seat the axle and check front brake operation.

Tighten the axle holder nut; the upper nuts first, then the lower nuts.

TORQUE: 12 N·m (1.2 kg-m, 9 ft-lb)

Connect the speedometer cable.

Tighten the speedometer cable set screw.

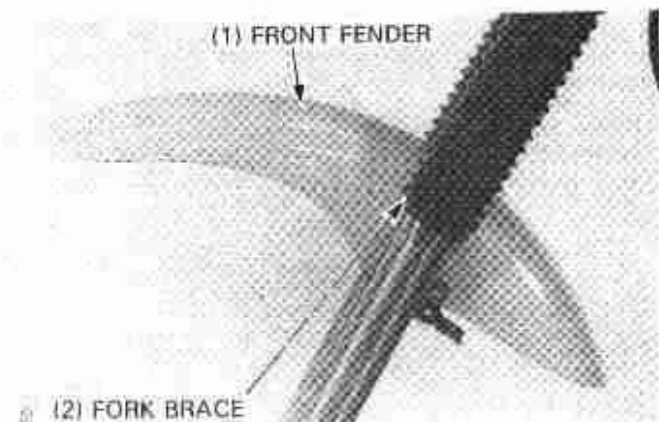


FORK

REMOVAL

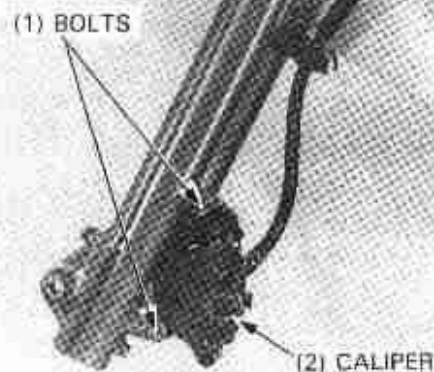
Remove the front wheel (page 12-6).

Remove the front fender and the fork brace.



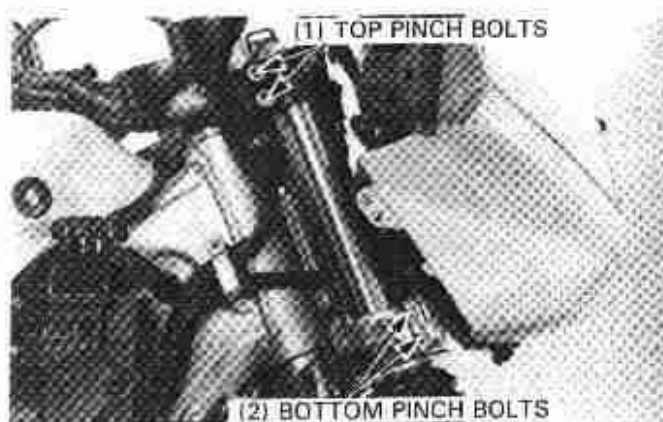
FRONT WHEEL/SUSPENSION/STEERING

Remove the brake caliper mounting bolts and the caliper.

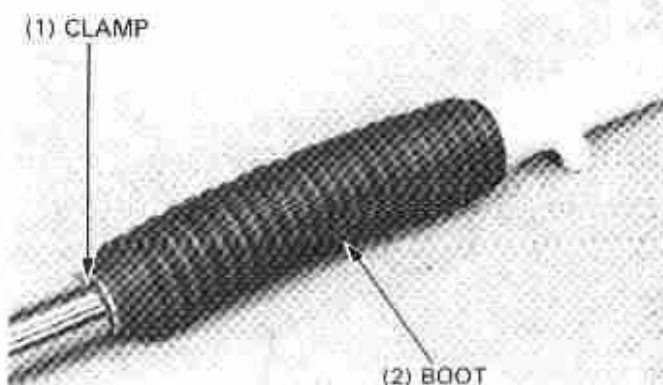


If the fork is to be disassembled, loosen the fork cap bolt, but do not remove it yet.

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



Remove the fork boot clamp and remove the boot.

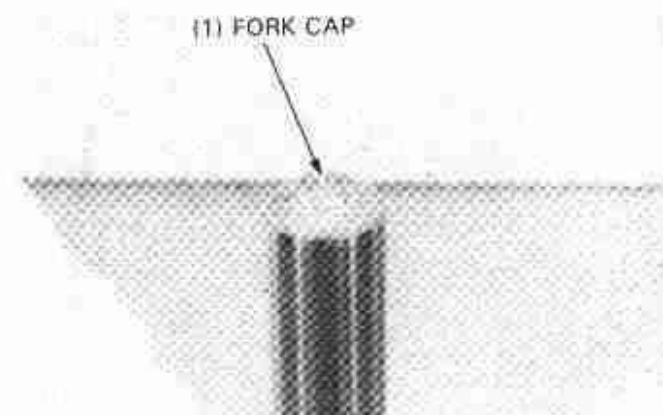


DISASSEMBLY

Remove the fork cap carefully.

⚠ WARNING

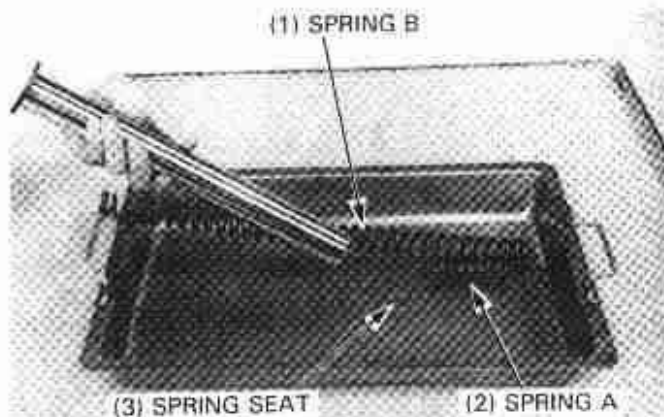
- The cap is under spring pressure. Use care when removing it and wear eye and face protection.



FRONT WHEEL/SUSPENSION/STEERING

Remove fork spring A, the spring seat and fork spring B.

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

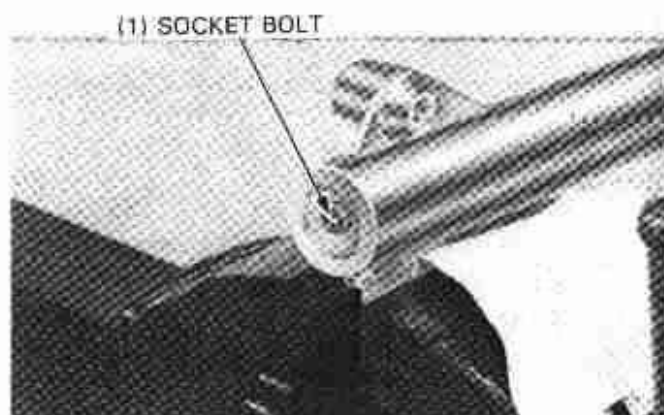


Hold the fork slider in a vise with soft jaws or use a shop towel.

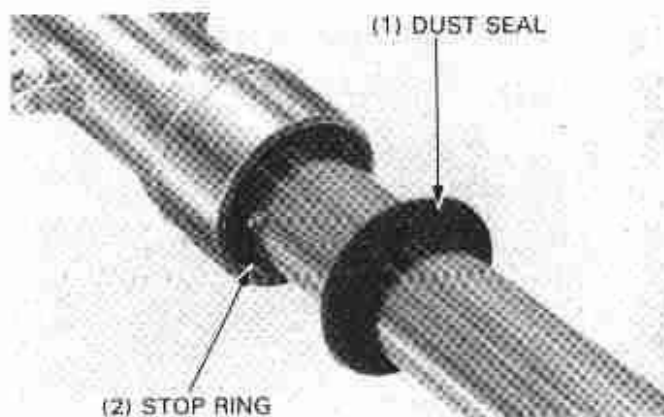
Remove the socket bolt with a hex wrench.

NOTE

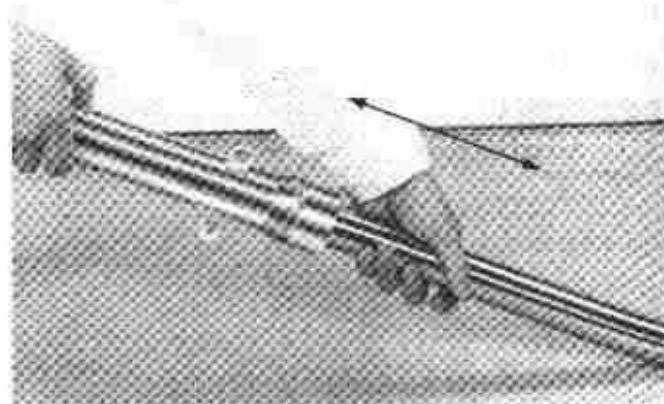
- Temporarily install the spring and fork bolt if difficulty is encountered in removing the bolt.



Remove the dust seal and stop 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 slider. The slider bushing will be forced out by the fork tube bushing.



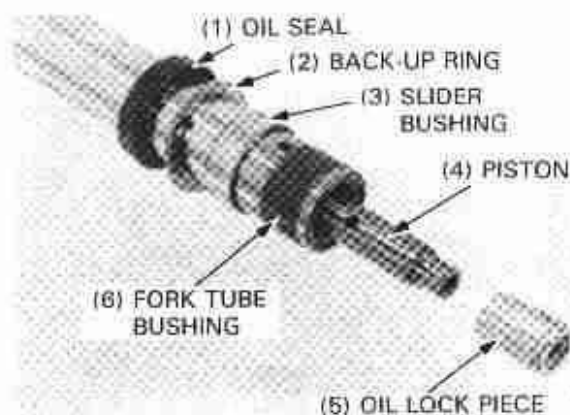
FRONT WHEEL/SUSPENSION/STEERING

Remove the oil lock piece from the piston.
Remove the 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.



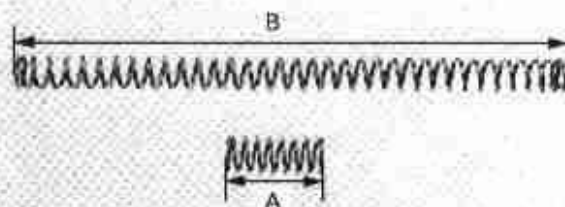
INSPECTION

Fork spring

Measure the fork springs free length.

SERVICE LIMITS: A: 74.2 mm (2.92 in)
B: 479.3 mm (18.87 in)

Replace either spring if it is shorter than the service limit.



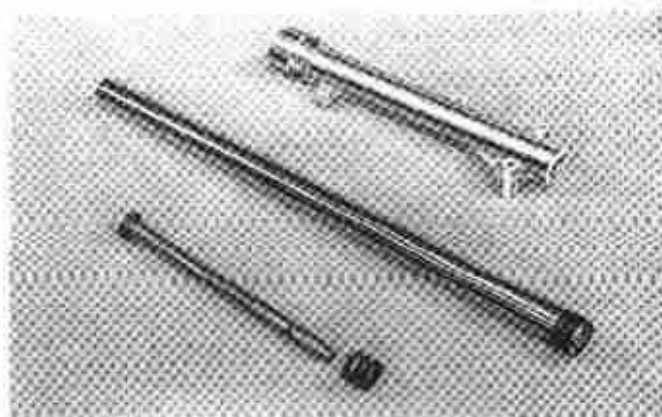
Fork tube/slider/piston

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

Replace any components which are worn or damaged.

Check the fork piston ring for wear or damage.

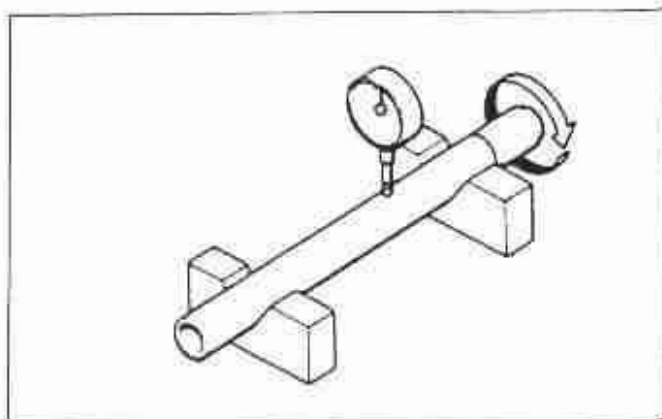
Check the rebound spring for fatigue or damage.



Set the fork tube in V blocks and read the runout.

Use 1/2 the total indicator reading to determine the actual runout.

SERVICE LIMIT: 0.20 mm (0.008 in)

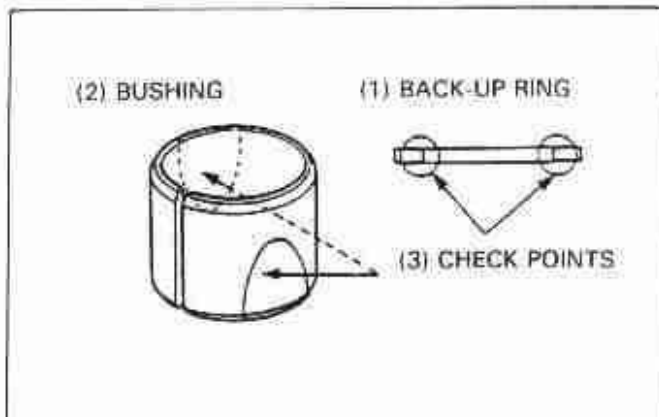


FRONT WHEEL/SUSPENSION/STEERING

Fork tube bushing

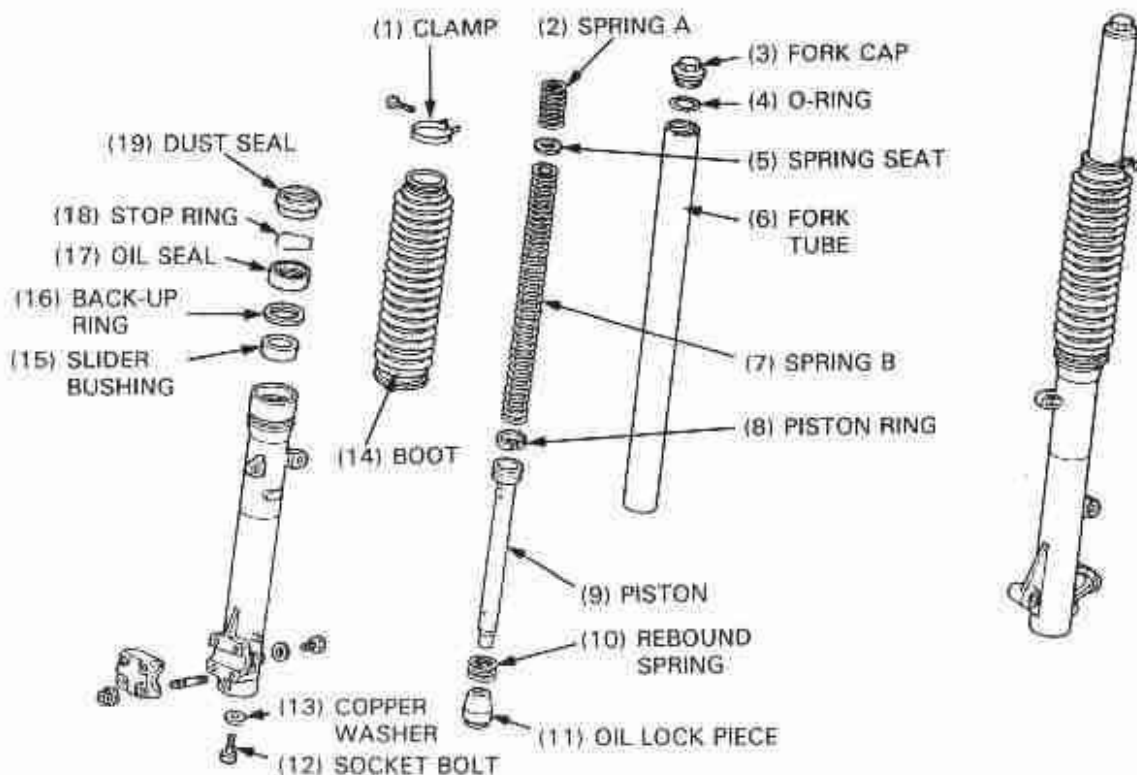
Visually inspect the slider and fork tube bushing. Replace the bushing if there is excessive scoring or scratching, or if the teflon is worn so that the copper surface appears on more than 3/4 of the entire surface.

Replace the back-up ring distorted.



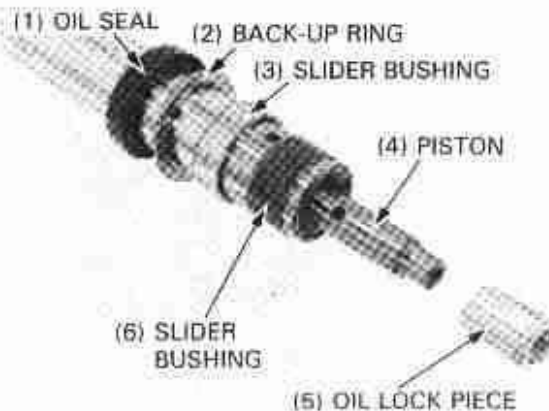
ASSEMBLY

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



Install the rebound spring into the fork tube.

Place the oil lock piece on the end of the piston and insert the fork tube into the slider.



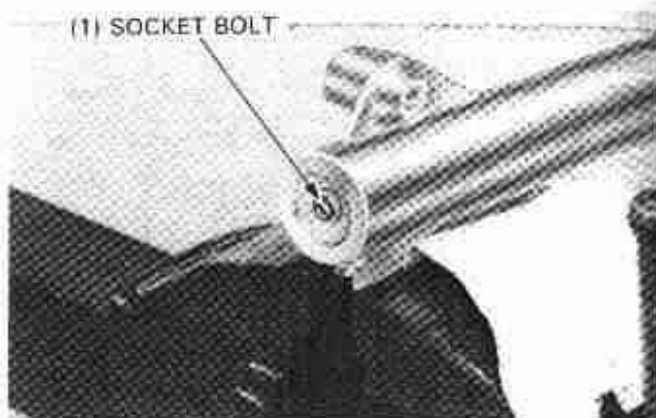
FRONT WHEEL/SUSPENSION/STEERING

Place the fork slider in a vise with soft jaws or use a shop towel. Apply a locking agent to the socket bolt and thread it into the piston. Tighten with an 8 mm hex wrench.

NOTE

- Temporarily install the fork spring and fork cap bolt to tighten the socket bolt.

TORQUE: 20 N·m (2.0 kg-m, 14 ft-lb)

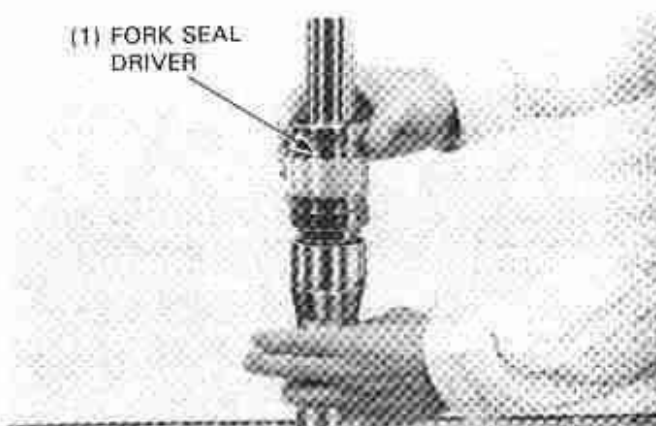


Place the slider bushing over the fork tube until it rests on the slider.

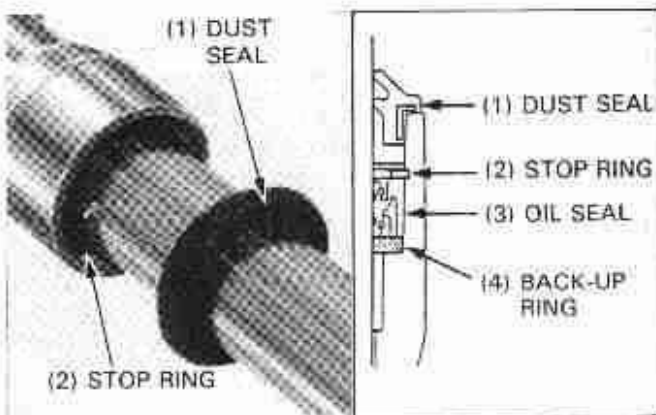
Using the fork seal driver, drive the bushing into place. Install the back-up ring with the chamfered side facing the slider bushing. Coat the oil seal lip with the recommended fork oil. Drive the oil seal into place using the fork seal driver.

TOOLS:

Fork seal driver body	07747-0010100
Fork seal driver attachment	07747-0010600



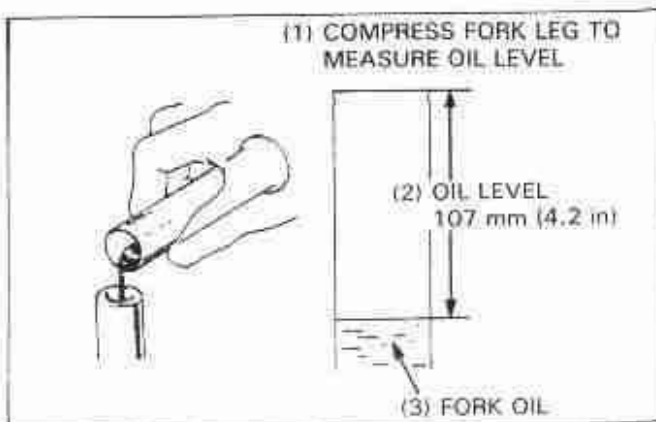
Install the oil seal stop ring and the dust seal.



Compress the fork leg and pour ATF into the fork tube.

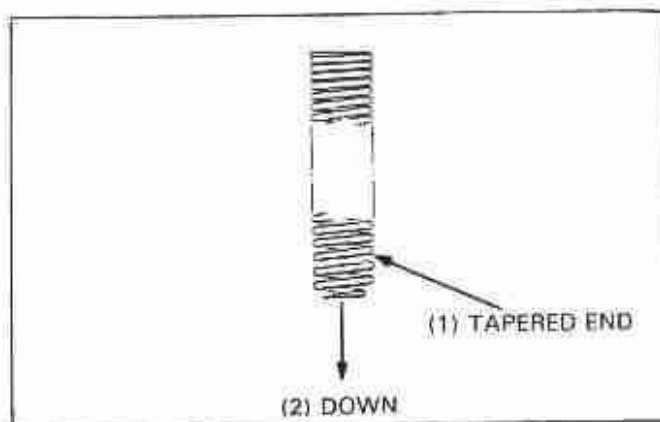
SPECIFIED LEVEL: 107 mm (4.2 in)

CAPACITY: 412 cc (13.9 US oz, 14.5 Imp oz)

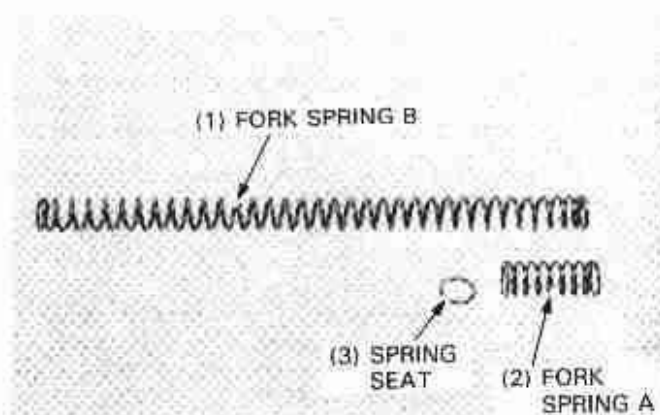


FRONT WHEEL/SUSPENSION/STEERING

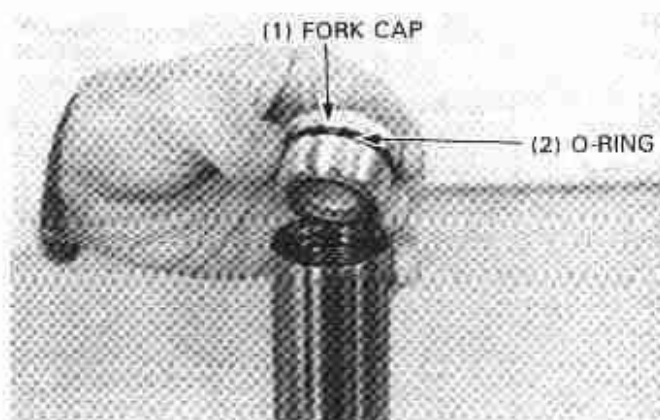
Note fork spring B; the tapered end must face toward the bottom of the fork tube.



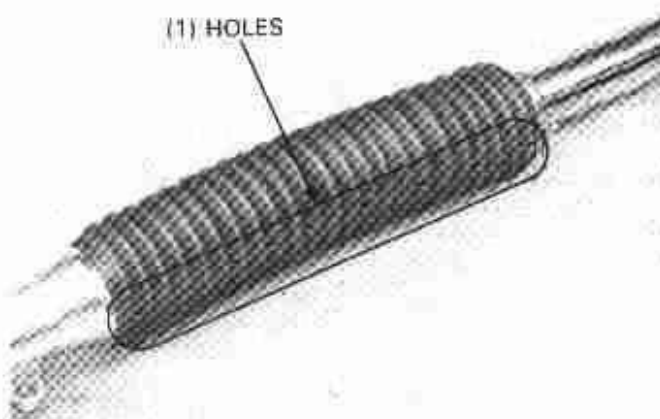
Install fork spring B, the spring seat and fork spring A into the fork tube.



Loosely install the fork cap with a new O-ring.



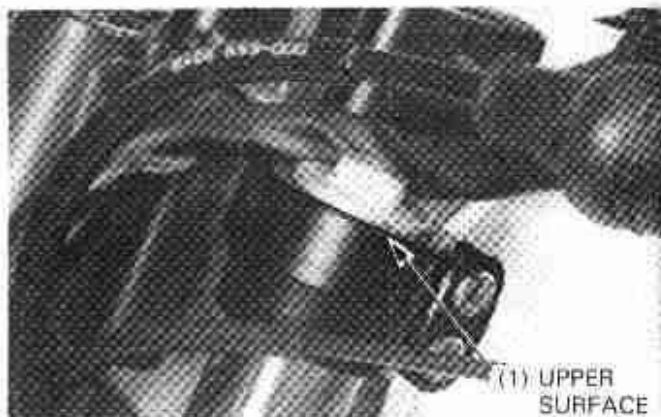
Install the fork boot with its breather holes toward the rear.



FRONT WHEEL/SUSPENSION/STEERING

INSTALLATION

Install the fork tube, aligning its top with the upper surface of the top bridge as shown.

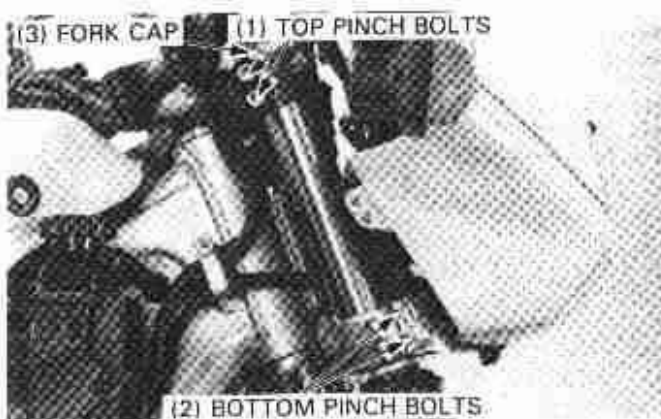


Apply oil to the bottom pinch bolt and tighten it.

TORQUE: 33 N·m (3.3 kg-m, 24 ft-lb)

Tighten the top pinch bolt.

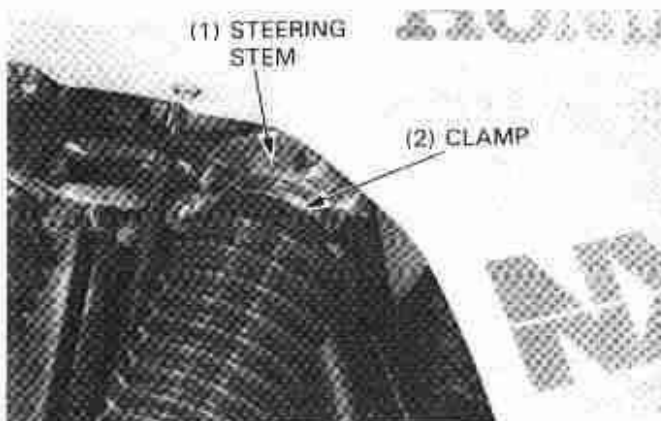
TORQUE: 33 N·m (3.3 kg-m, 24 ft-lb)



Tighten the fork cap.

TORQUE: 23 N·m (2.3 kg-m, 17 ft-lb)

Push the fork boots up until they just touch the bottom of the steering stem, then install and tighten the clamps.

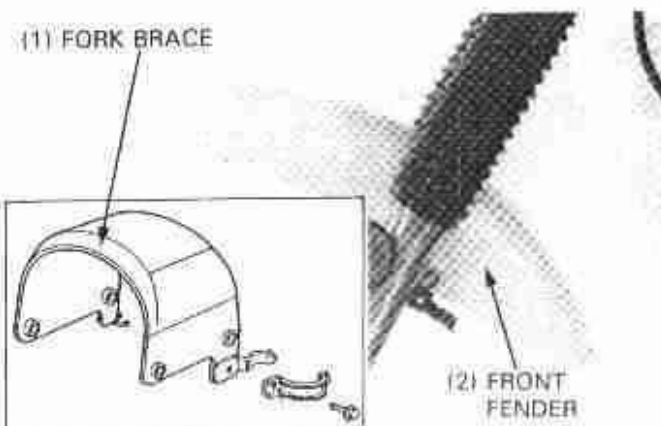


Install the front fender and the fork brace.

Tighten the front fender/brace mounting bolts.

NOTE

- Do not tighten the axle holder nuts, before tightening the front fender/brace mounting nuts.



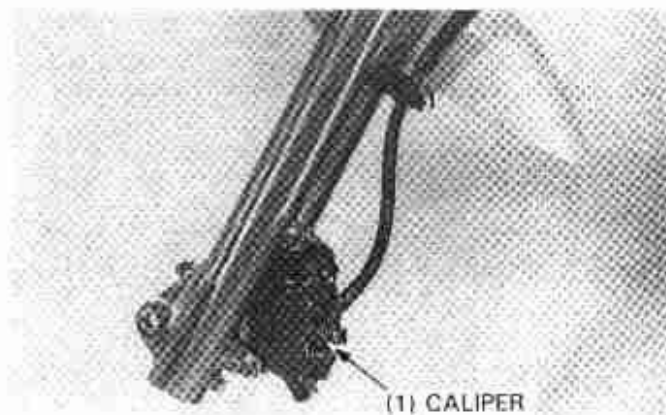
FRONT WHEEL/SUSPENSION/STEERING

Install the following:

- brake caliper
- front wheel (page 12-10).

NOTE

- After tightening the front fender/brace mounting bolts, tighten the axle holder nuts.

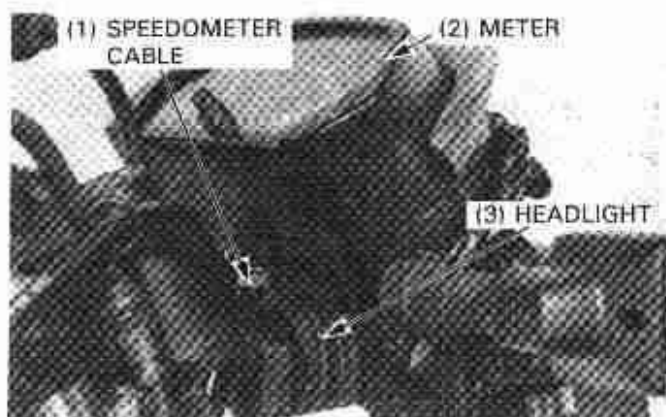


STEERING STEM

REMOVAL

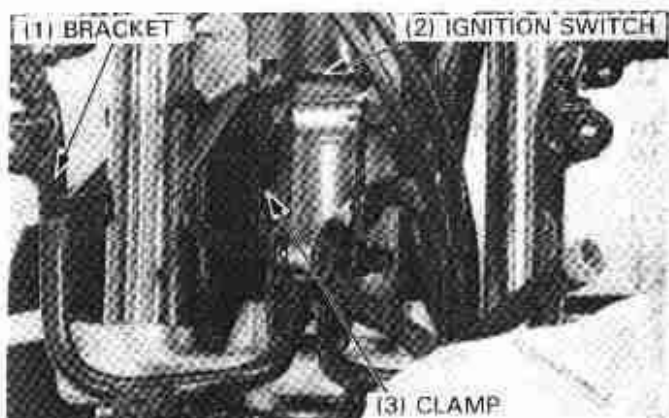
Remove the following:

- handlebar (page 12-3).
- front wheel (page 12-6).
- side fairing (page 15-2).
- headlight case (page 19-3).
- speedometer cable and meter (page 19-4).

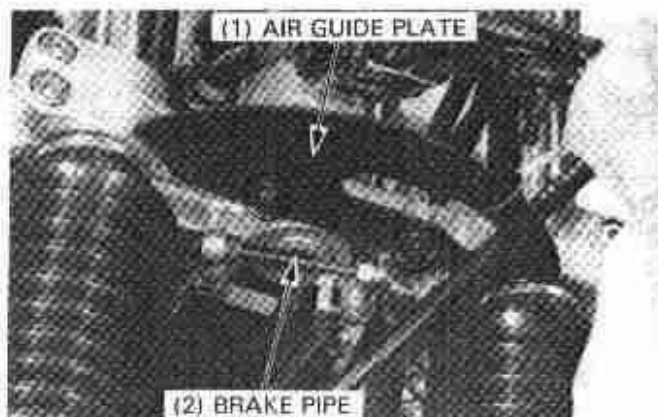


Remove the fairing bracket.

Unclamp the ignition switch wire by removing the screw.



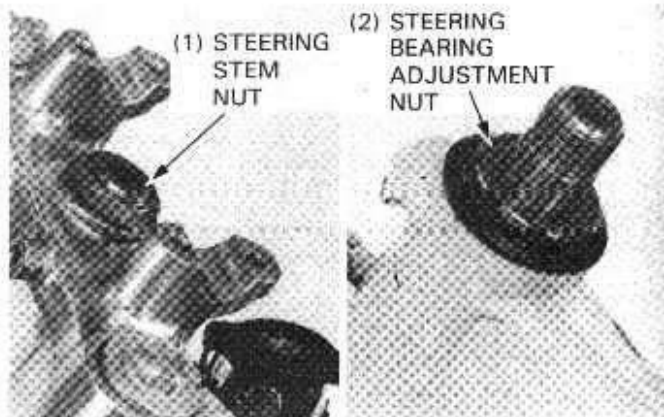
Remove the brake pipe and air guide plate by removing two bolts from the steering stem.



FRONT WHEEL/SUSPENSION/STEERING

Remove the steering stem nut and washer.

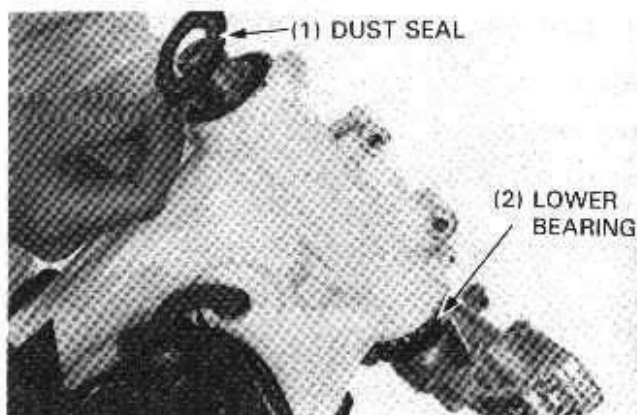
Remove the bridge and fork legs.



Remove the steering bearing adjustment nut.

Remove the dust seal, upper inner race, and upper bearing.

Pull the steering stem out of the steering head and remove the lower bearing.



BEARING REPLACEMENT

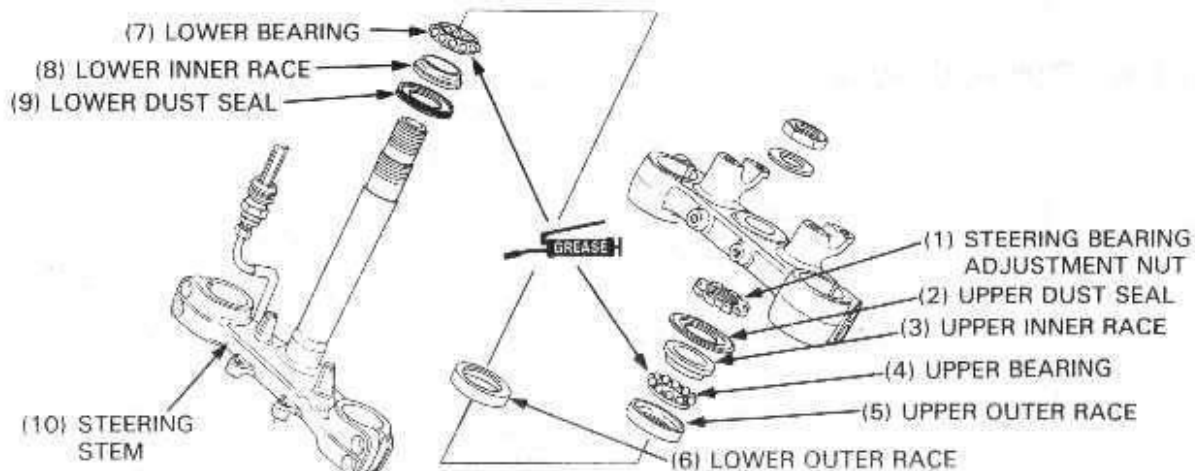
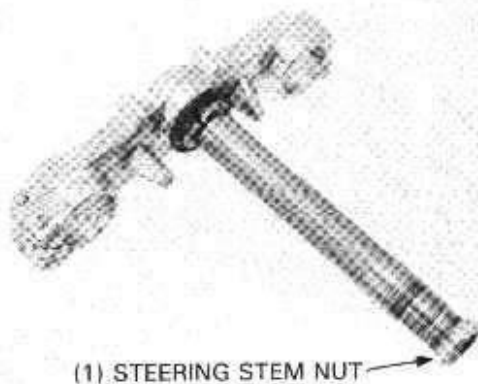
NOTE

- Always replace the bearing and races as a set.

Install the 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.



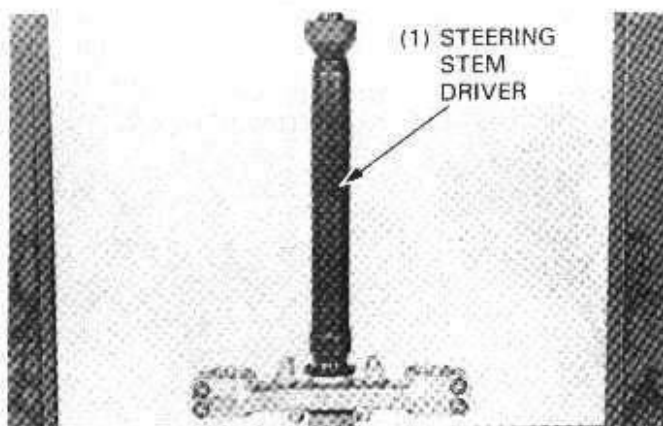
FRONT WHEEL/SUSPENSION/STEERING

Install a new dust seal over the steering stem.
Press a new lower bearing inner race onto the stem.

TOOLS:

Steering stem driver

07946-4300101



Remove the upper and lower bearing outer races with the ball race remover and attachment.

TOOLS:

Ball race remover

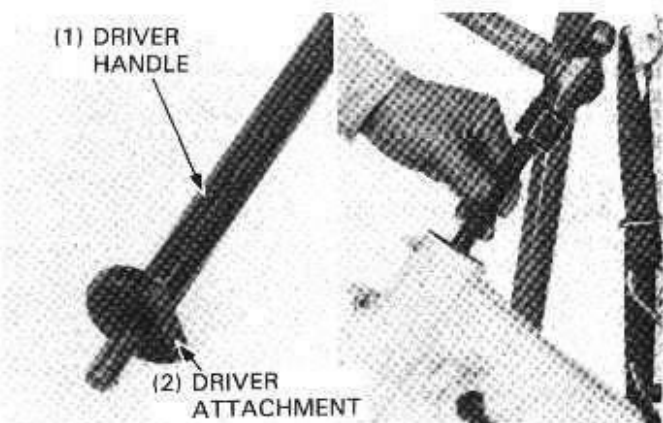
— driver attachment

— driver handle

07953-MJ10000

07953-MJ10100

07953-MJ10200



Drive new upper and lower bearing outer races into the steering head pipe.

TOOLS:

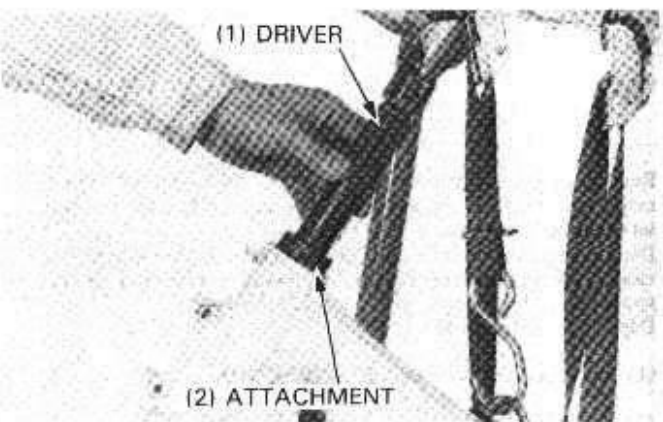
Upper bearing outer race:

Driver

Attachment, 42 x 47 mm

07749-0010000

07746-0010300



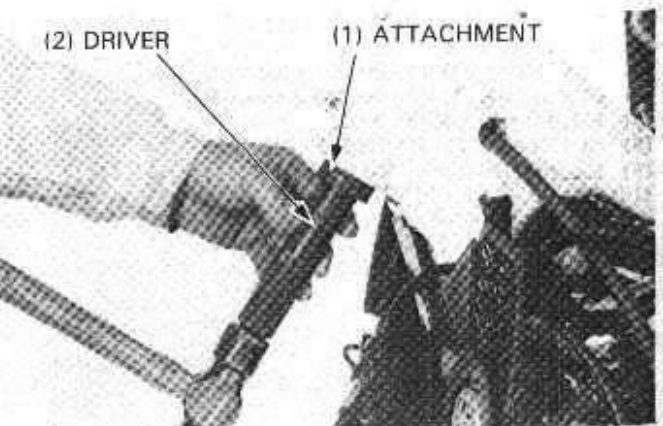
Lower bearing outer race:

Driver

Attachment, 42 x 47 mm

07749-0010000

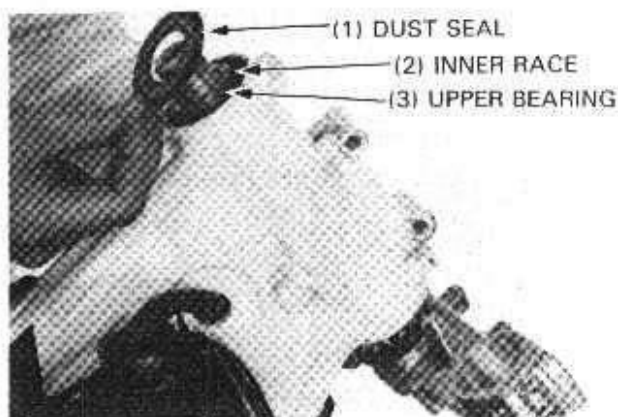
07746-0010300



FRONT WHEEL/SUSPENSION/STEERING

STEERING STEM INSTALLATION

Pack the bearing cavities with grease.
Install the lower bearing onto the stem.
Insert the stem into the steering head pipe and install the upper bearing, inner race, dust seal and steering bearing adjustment nut.



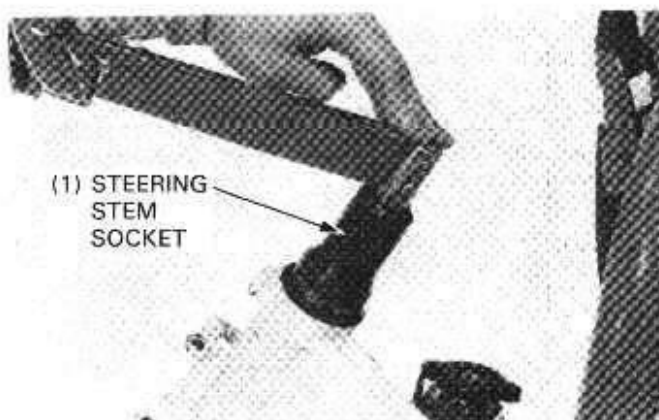
Temporarily tighten the steering bearing adjustment nut to the specified torque.

TORQUE: 25 N·m (2.5 kg-m, 18 ft-lb)

TOOL:

Steering stem socket

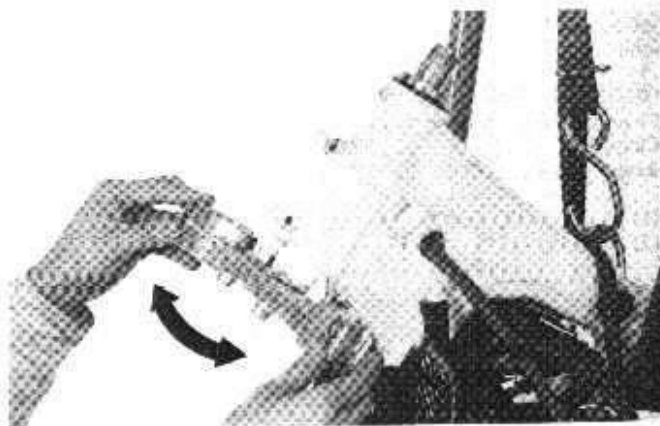
07916-KA50100



Turn the steering stem lock-to-lock four or five times to seat the bearings.

Retighten the adjustment nut to the specified torque.

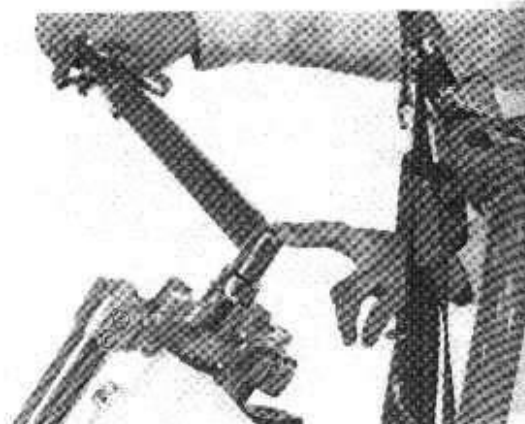
TORQUE: 5 N·m (0.5 kg-m, 4 ft-lb)



Install the fork bridge, washer and stem nut.
Temporarily install the fork legs and tighten the stem nut.

TORQUE: 118 N·m (11.8 kg-m, 85 ft-lb)

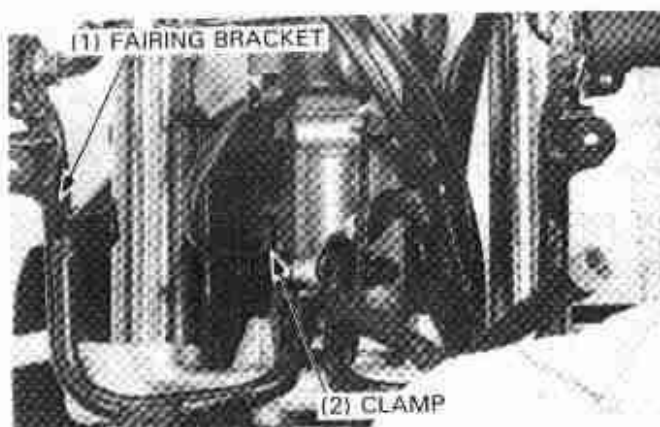
Install the fork tubes correctly (page 12-17).



FRONT WHEEL/SUSPENSION/STEERING

Install the fairing bracket.

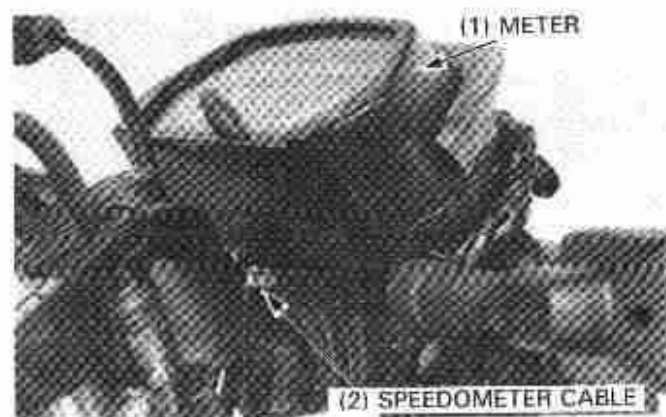
Clamp the ignition switch wire.



Install the brake pipe and air guide plate.
Tighten the bolts securely.



Install the speedometer and headlight case, then connect the speedometer cable and electrical wire connectors and wires.



Install the front fairing (page 15-2), front wheel (page 12-10) and handlebar.

Measure the steering head bearing preload.



FRONT WHEEL/SUSPENSION/STEERING

STEERING HEAD BEARING PRELOAD

Place a stand under the engine and raise the front wheel off the ground.

Position the steering stem to the straight ahead position.

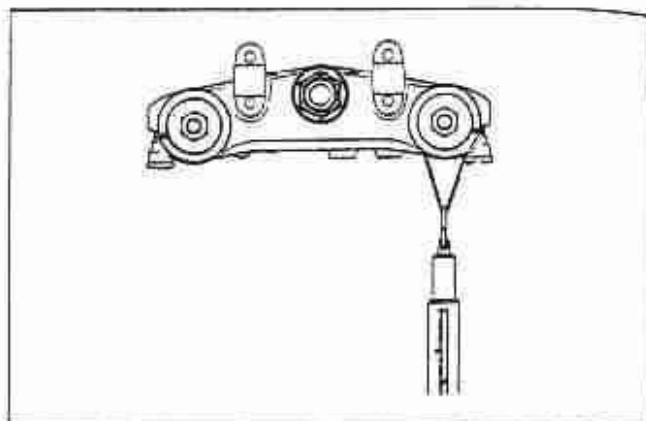
Hook a spring blancer to the fork tube and measure the steering head bearing preload.

NOTE

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

The preload should be within 1.1–1.7 kg (2.4–3.7 lb) for right and left turns.

If the readings do not fall within the limits, lower the front wheel on the ground and adjust the steering bearing adjustment nut.



**REAR WHEEL/BRAKE/
SUSPENSION**

**ROUE ARRIERE/FREIN/SUSPENSIO
SUSPENSION**

HINTERRAD/BREMSE/AUFHÄNGUNG

REAR WHEEL/BRAKE/SUSPENSION

SERVICE INFORMATION	13-1	BRAKE PEDAL	13-11
TROUBLESHOOTING	13-2	SHOCK ABSORBER	13-13
REAR WHEEL	13-3	SHOCK LINKAGE	13-17
REAR BRAKE	13-9	SWINGARM	13-19

SERVICE INFORMATION

GENERAL

- Support the motorcycle using a hoist or a jack under the engine.
- Use only genuine Honda replacement fasteners for the rear suspension. Note the installation direction of the bolts.

⚠ WARNING

- *The rear shock absorber contains nitrogen under high pressure. Do not allow fire or heat near the shock absorber.*
- *Inhaled asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies.*

SPECIFICATIONS

ITEM		STANDARD	SERVIE LIMIT
Rear wheel runout	Radial	—	2.0 mm (0.08 in)
	Axial	—	2.0 mm (0.08 in)
Rear axle ruout		—	0.2 mm (0.01 in)
Rear brake drum I.D.		110 mm (4.33 in)	111 mm (4.37 in)
Rear brake lining thickness		4.0 mm (0.16 in)	2.0 mm (0.08 in)
Shock absorber spring free length		186.8 mm (7.35 in)	184.9 mm (7.28 in)
Rear suspension damper compression		21.5 kg (47.39 lbs)	16.5 kg (36.38 lbs)

TORQUE VALUES

Rear axle	95 N·m (9.5 kg-m, 69 ft-lb)
Shock absorber mounting bolt (Lower)	45 N·m (4.5 kg-m, 33 ft-lb)
(Upper)	65 N·m (6.5 kg-m, 47 ft-lb)
Swingarm pivot bolt	90 N·m (9.0 kg-m, 65 ft-lb)
Shock link-to-swingarm bolt	105 N·m (10.5 kg-m, 76 ft-lb)
Shock link-to-shock arm bolt	105 N·m (10.5 kg-m, 76 ft-lb)
Shock link-to-frame bolt	105 N·m (10.5 kg-m, 76 ft-lb)

TOOLS

Special

Shock absorber compressor attachment	07959-MB10000
Remover shaft	07946-MJ00100
Needle bearing remover	07931-MA70000

Common

Driver	07749-0010000
Attachment, 32 x 35 mm	07746-0010100
Pilot, 20 mm	07746-0040500
Attachment, 24 x 26 mm	07746-0010700
Pilot, 17 mm	07746-0040400
Shock absorber compressor	07GME-0010000
— screw assembly	07GME-0010100
Attachment, 42 x 47 mm	07746-0010300
Attachment, 37 x 40 mm	07746-0010200
Retainer wrench body	07710-0010401
Retainer wrench B	07710-0010200
Bearing remover head, 17 mm	07746-0050500
Bearing remover shaft	07746-0050100
Pilot, 22 mm	07746-0041000
Pilot, 15 mm	07746-0040300

TROUBLESHOOTING

Wobble or vibration in motorcycle

- Bent rim
- Loose wheel bearing(s)
- Loose or bent spokes
- Damaged tire
- Axle not tightened properly
- Swingarm pivot bearing worn
- Chain adjusters not adjusted equally
- Bent frame or swingarm

Soft suspension

- Weak spring

Hard suspension

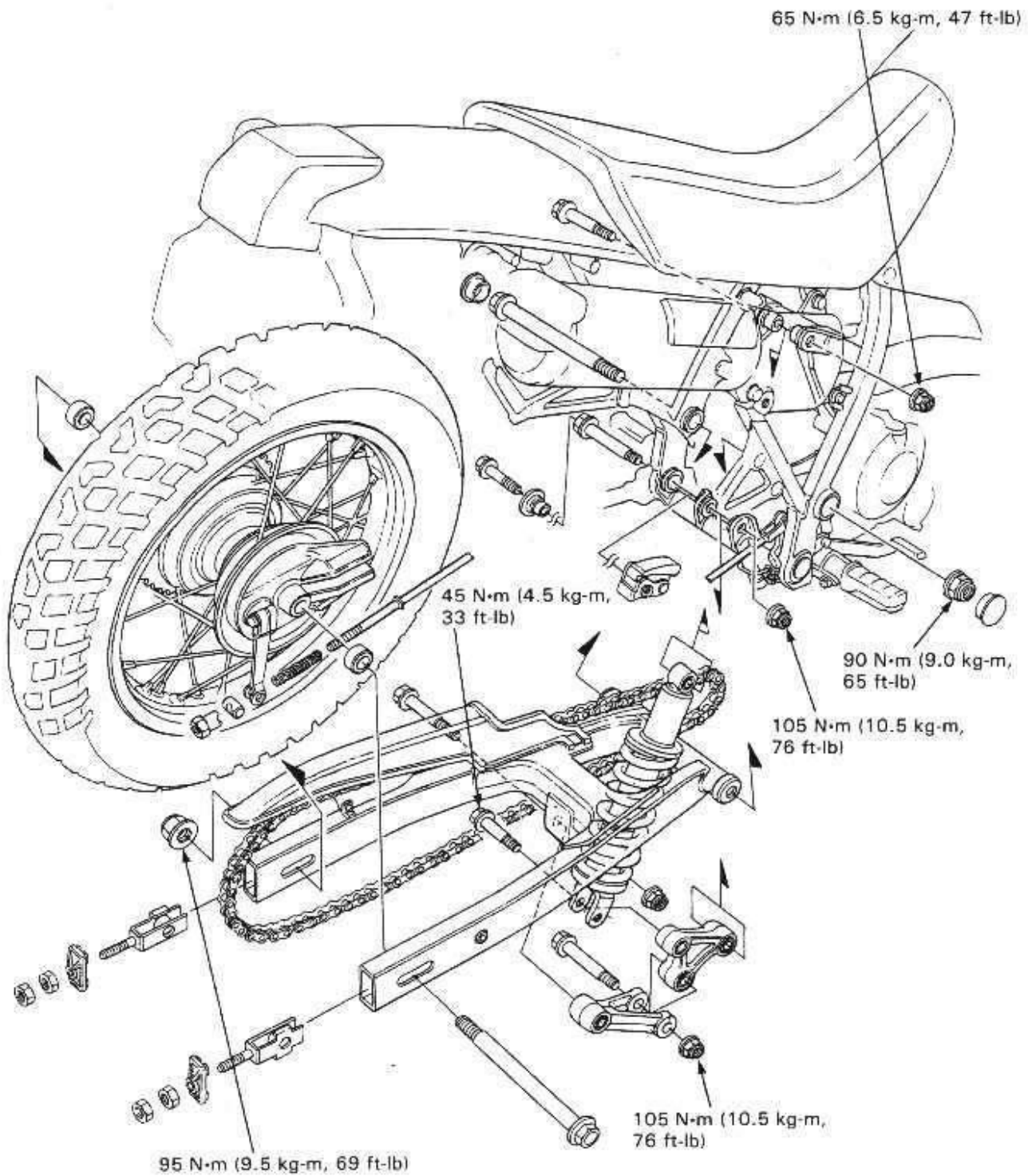
- Bent shock absorber rod
- Swingarm pivot bearings damaged
- Bent frame or swingarm

Suspension noise

- Faulty rear damper
- Loose fasteners

Poor brake performance

- Improper brake adjustment
- Worn brake shoes
- Brake linings oily, greasy or dirty
- Worn brake cam
- Worn brake drum
- Brake arm serrations improperly engaged
- Brake shoes worn at cam contact area



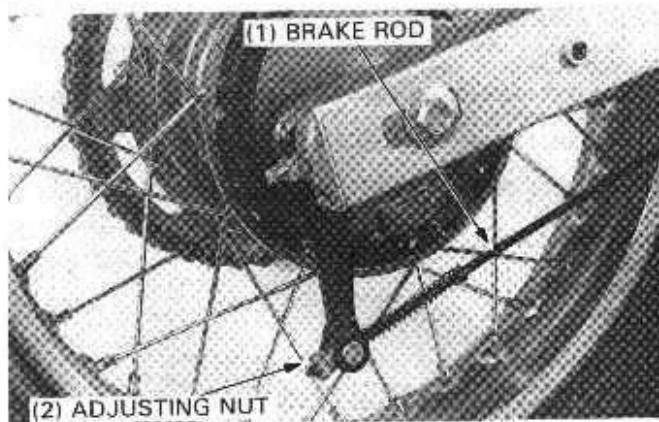
REAR WHEEL/BRAKE/SUSPENSION

REAR WHEEL

REMOVAL

Raise the rear wheel off the ground using a hoist or other adjustable support.

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

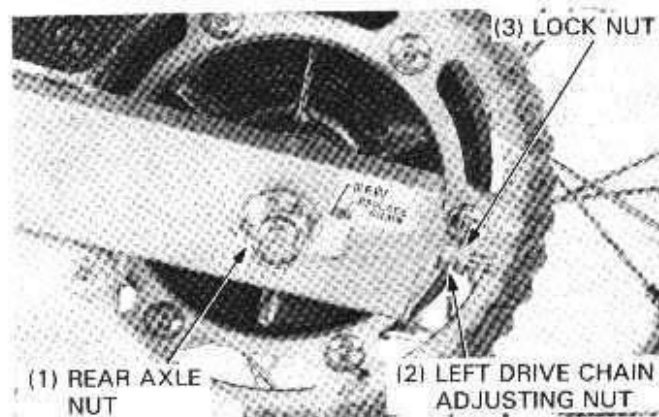


Loosen the rear axle nut.

Loosen the right and left drive chain adjusting nuts and lock nuts.

Move the rear wheel forward and derail the drive chain from the drive sprocket.

Remove the rear axle and the wheel, then remove the brake pedal.

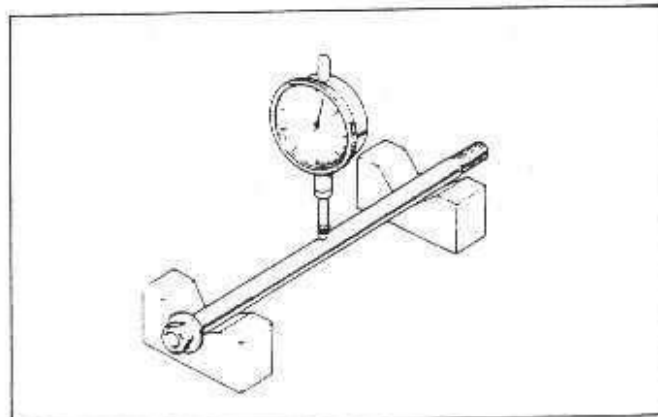


INSPECTION

● AXLE

Set the axle in V blocks and read the axle runout with a dial indicator.

SERVICE LIMIT: 0.2 mm (0.01 in)



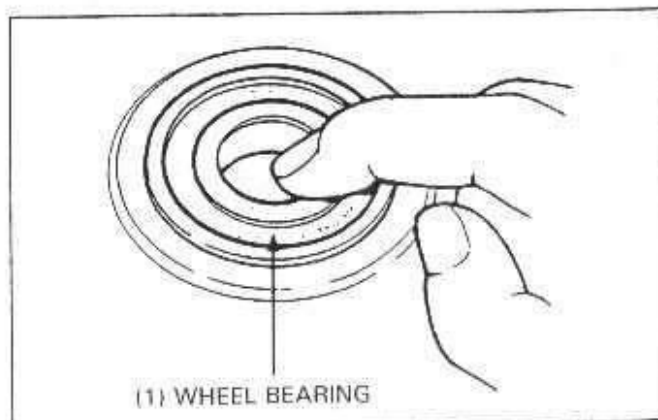
● WHEEL BEARING

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

Remove and discard the bearings if the races do not turn smoothly, quietly, or if they fit loosely in the hub (page 13-4).

NOTE

- Replace hub bearings in pairs.



REAR WHEEL/BRAKE/SUSPENSION

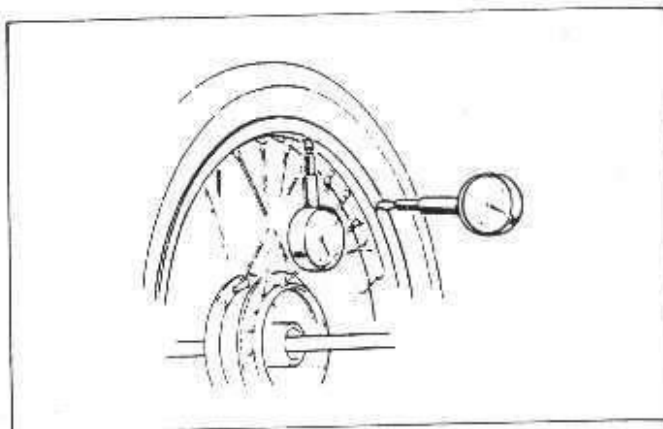
● RIM RUNOUT

Check the rim runout by placing the wheel on a truing stand. Turn the wheel by hand and measure the runout using a dial indicator.

SERVICE LIMITS:

Radial: 2.0 mm (0.08 in)

Axial: 2.0 mm (0.08 in)



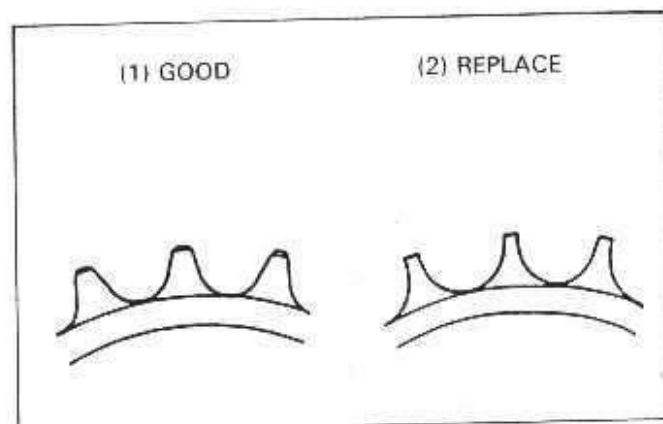
● DRIVEN SPROCKET

Check the condition of the final driven sprocket teeth.

Replace the sprocket if it is worn or damaged.

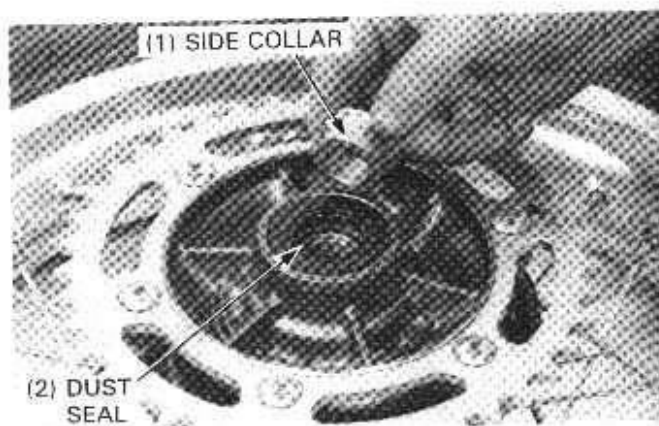
NOTE

- If the driven sprocket is worn or damaged, the drive chain and drive sprocket must be inspected.



BEARING REPLACEMENT

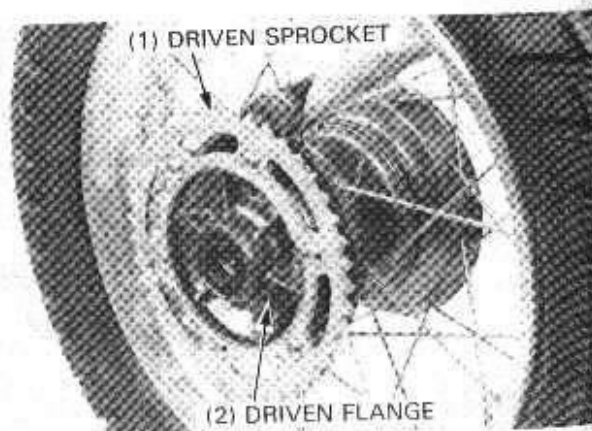
Remove the side collar and dust seal.



Remove the driven sprocket and driven flange together.

NOTE

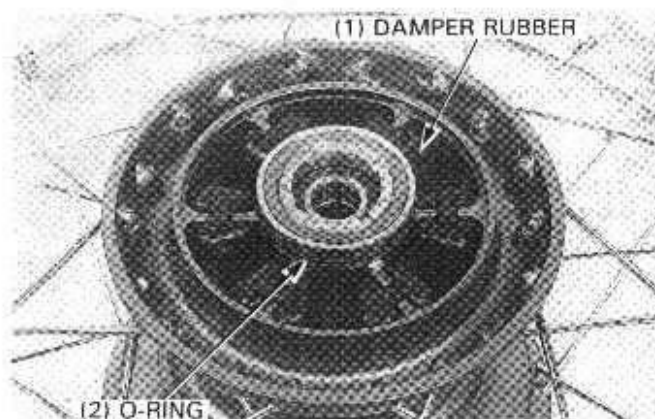
- Do not separate the sprocket and flange unless one of them needs to be replaced.



REAR WHEEL/BRAKE/SUSPENSION

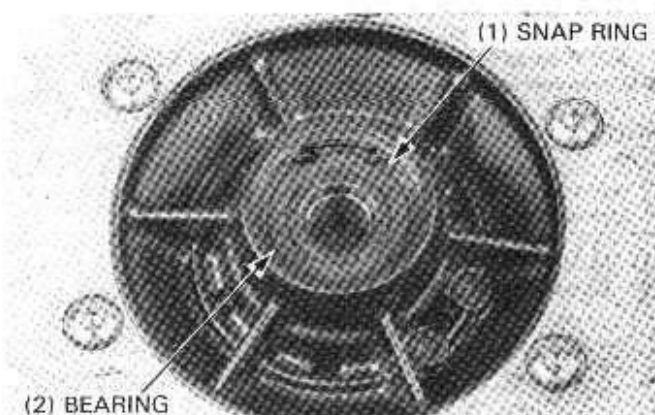
Replace the damper rubbers if they are damaged or deteriorated.

Remove the O-ring and the damper rubbers.



Remove the snap ring from the driven flange.

Remove the collar and bearing (page 13-7).

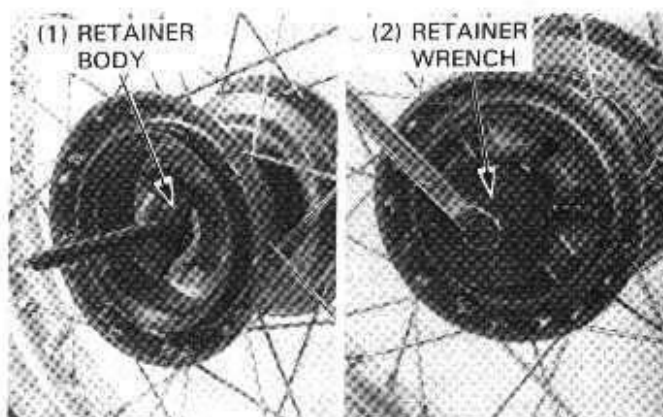


Install the retainer wrench and remove the retainer.

TOOLS:

Retainer wrench body
Retainer wrench B

07710-0010401
07710-0010200



Drive out the wheel bearings and the collar.

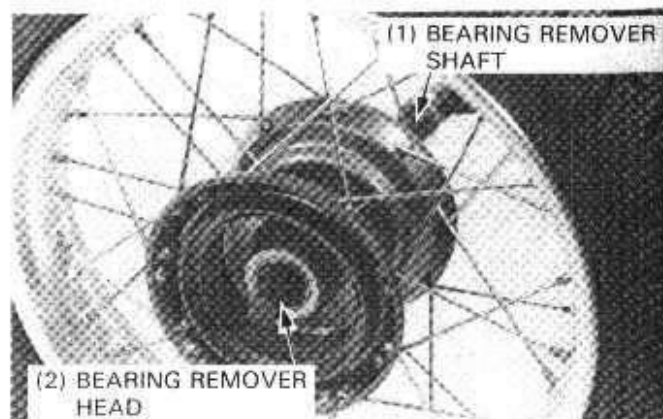
NOTE

- If the bearings are removed, they must be replaced with new ones.

TOOLS:

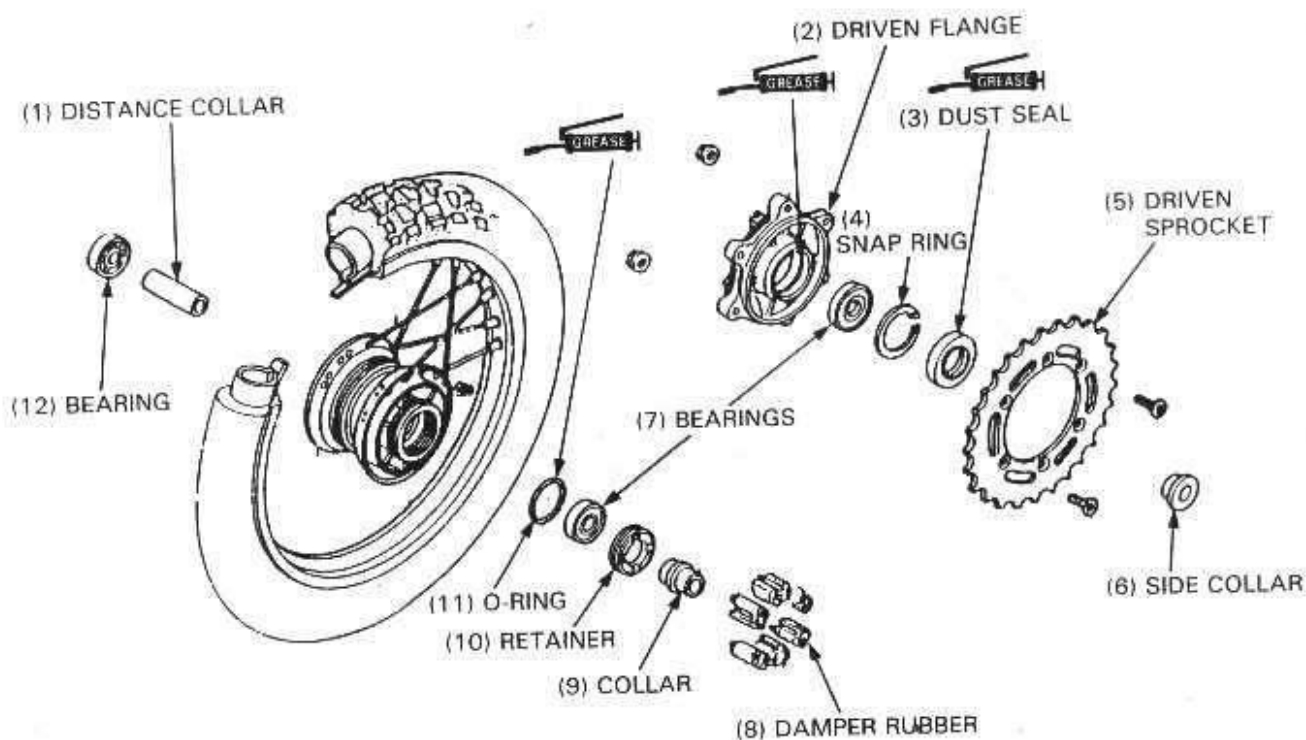
Bearing remover head, 17 mm
Bearing remover shaft

07746-0050500
07746-0050100



REAR WHEEL/BRAKE/SUSPENSION

ASSEMBLY



Pack the bearing cavities with grease.

Drive in a new left bearing with the sealed side of the bearing facing out.

TOOLS:

Driver

07749-0010000

Attachment, 37 x 40 mm

07746-0010200

Pilot, 17 mm

07746-0040400

Be careful not to tilt the bearing while driving it into the hub and make sure that it is fully seated. Install the distance collar in the hub, then drive in a new right bearing with its sealed side facing out.

WARNING

- Grease on the brake drum reduces stopping power. Keep grease off the brake drum.

Grease and install the bearing retainer with the retainer wrench and body.

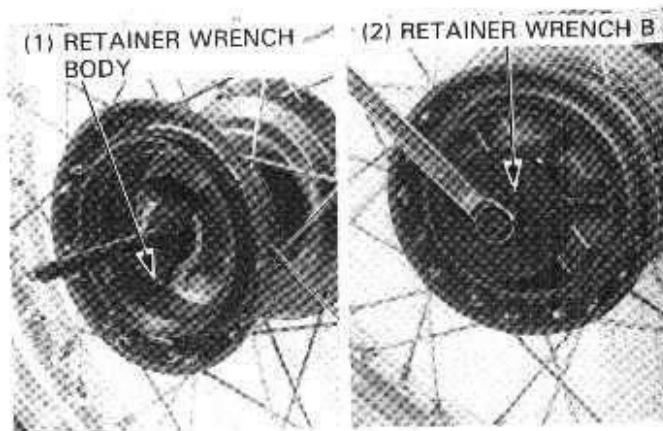
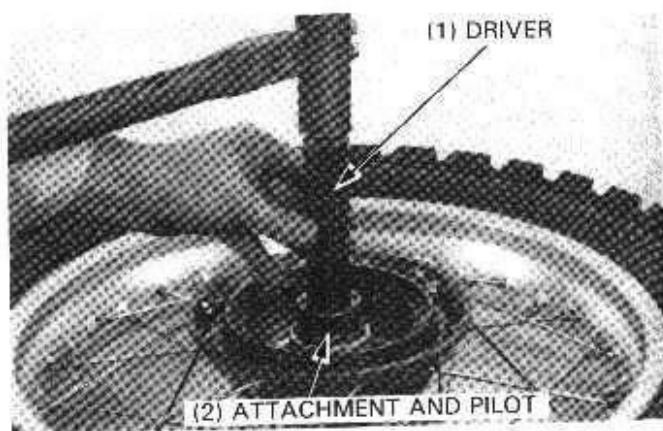
TOOLS:

Retainer wrench body

07710-0010401

Retainer wrench B

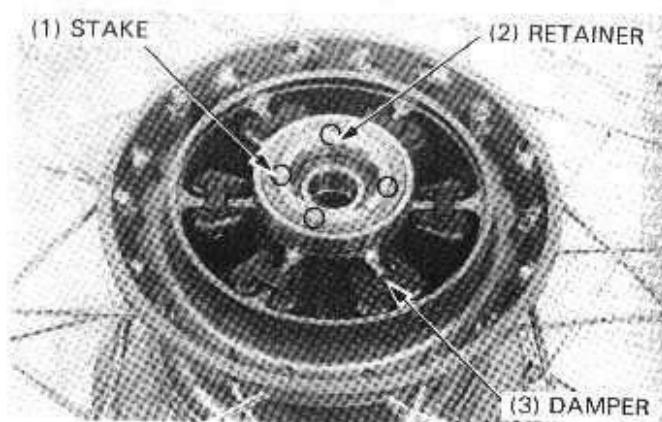
07710-0010200



REAR WHEEL/BRAKE/SUSPENSION

Stake the retainer as shown.

Install the dampers.



Flange bearing removal

Remove the following:

— hub bearing sleeve

TOOLS:

Driver 07749-0010000

Pilot, 20 mm 07746-0040500

— bearing

TOOLS:

Driver 07749-0010000

Attachment, 32 x 35 mm 07746-0010100

Grease the flange bearing and drive it into the flange hub.

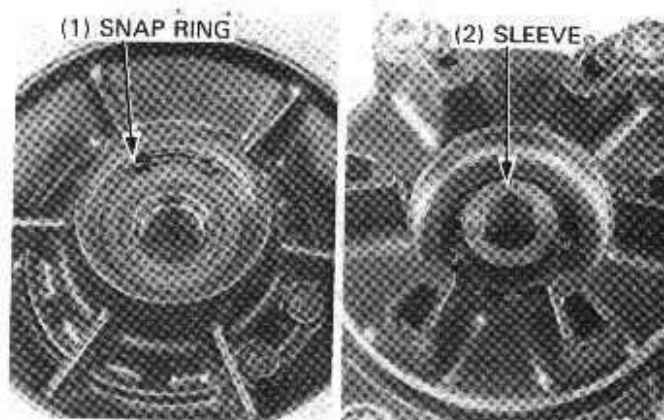
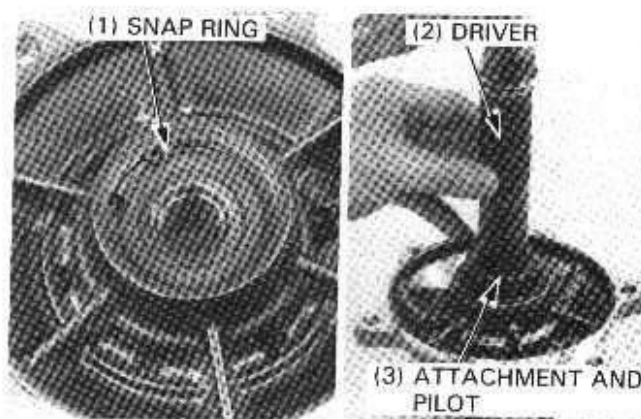
TOOLS:

Driver 07749-0010000

Attachment, 42 x 47 mm 07746-0010300

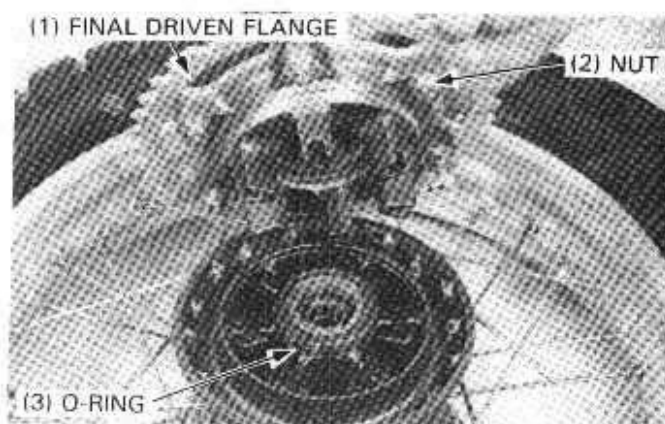
Pilot, 17 mm 07746-0040400

Install the snap ring and sleeve.



Install the driven sprocket to the flange hub.
Tighten the hub nuts.

Apply grease to the new O-ring and install it, then install the final driven flange.

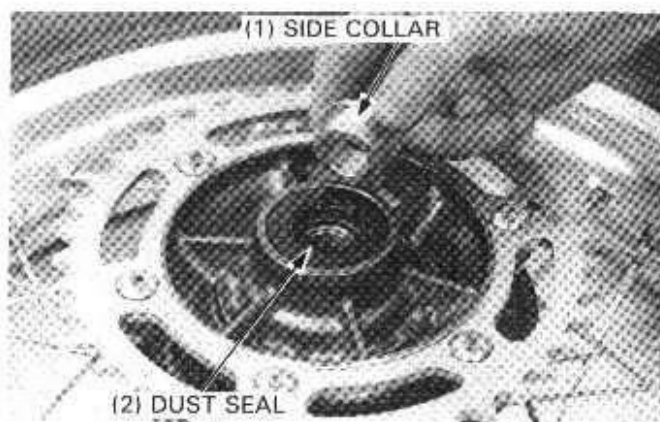


REAR WHEEL/BRAKE/SUSPENSION

Apply a grease to the dust seal lips and install the dust seal in the hub.

Install the side collar.

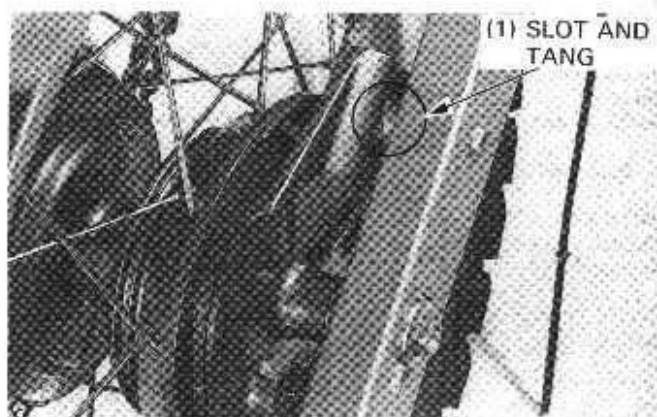
Install the brake panel.



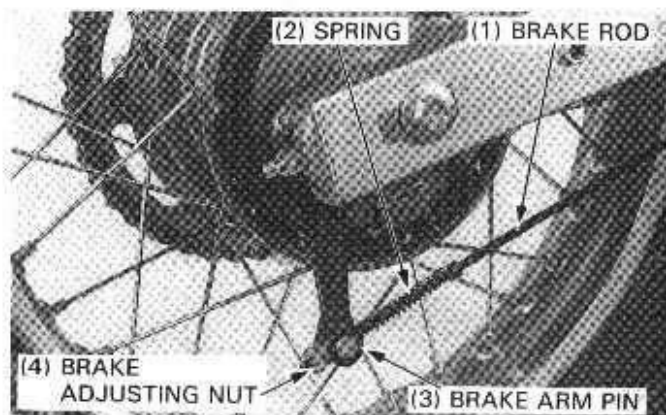
INSTALLATION

Place the slot on the brake panel over the tang on the swing-arm.

Install the drive chain over the drive sprocket.



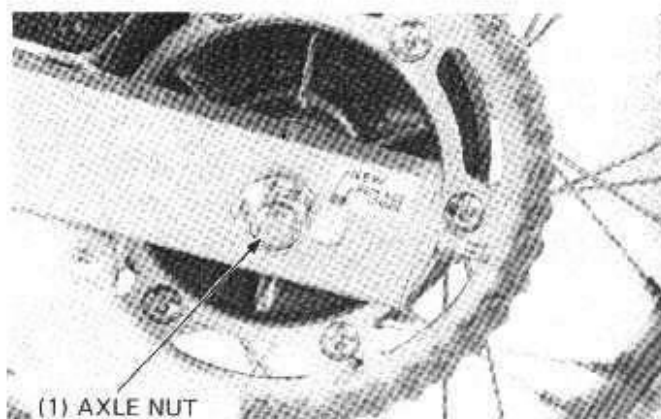
Install the rear axle and axle nut. Lightly tighten the nut. Install the brake rod to the brake arm with spring, brake arm pin and adjusting nut.



Adjust the drive chain slack (page 3-11) and tighten the axle nut.

TORQUE: Rear axle nut: 95 N·m (9.5 kg-m, 69 ft-lb)

Adjust the rear brake pedal free play (page 3-13).



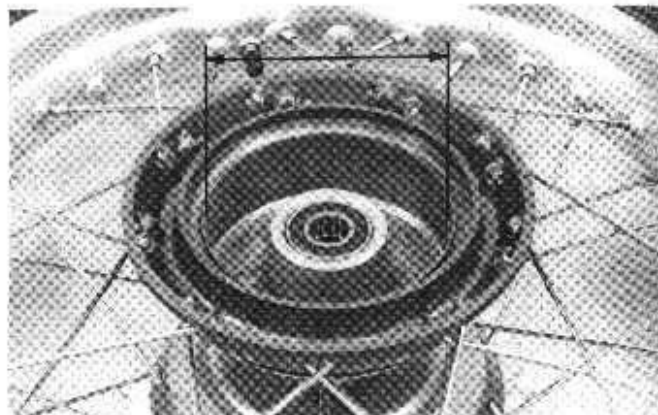
REAR BRAKE

REMOVAL/INSPECTION

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

⚠ WARNING

- *Inhaled asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies.*



● BRAKE DRUM

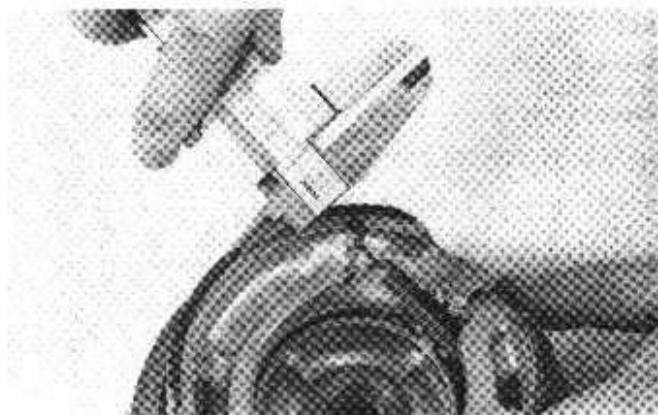
Measure the drum I.D.

SERVICE LIMIT: 111 mm (4.37 in)

● BRAKE LINING

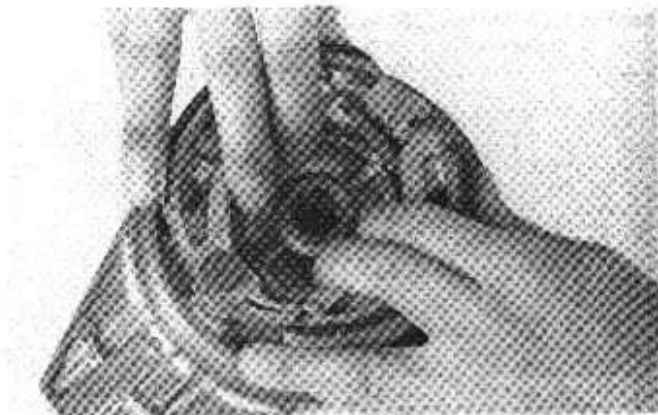
Check the brake shoe springs for fatigue or damage and check the brake cam for wear or cracks.
Measure the brake lining thickness.

SERVICE LIMIT: 2.0 mm (0.08 in)

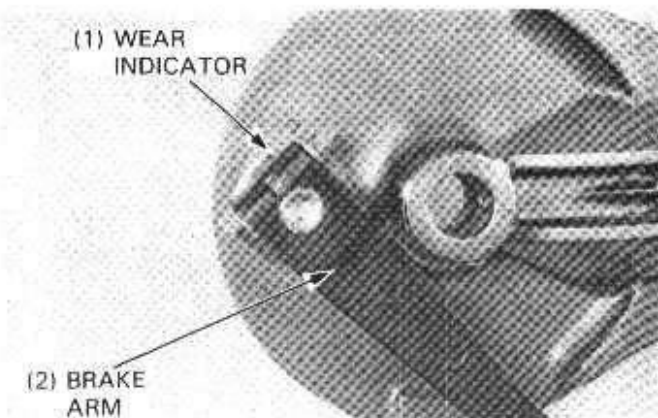


DISASSEMBLY

Force the brake shoes out and remove them by hand.



Remove the brake arm bolt, brake arm and wear indicator.

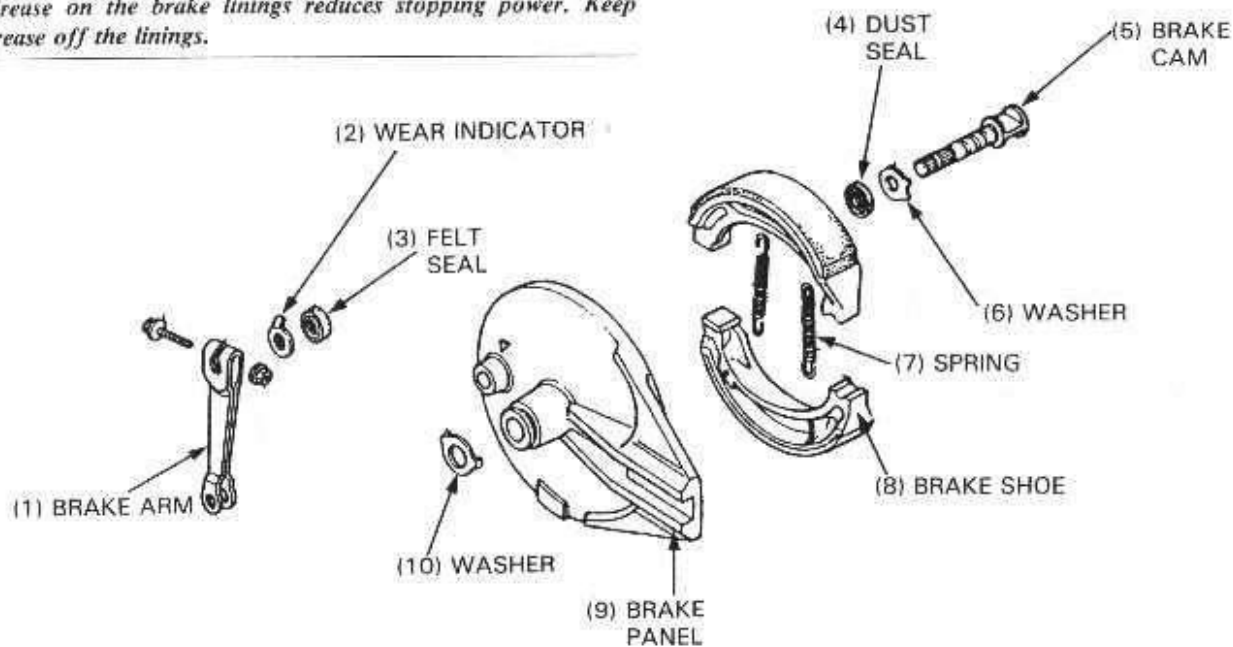


REAR WHEEL/BRAKE/SUSPENSION

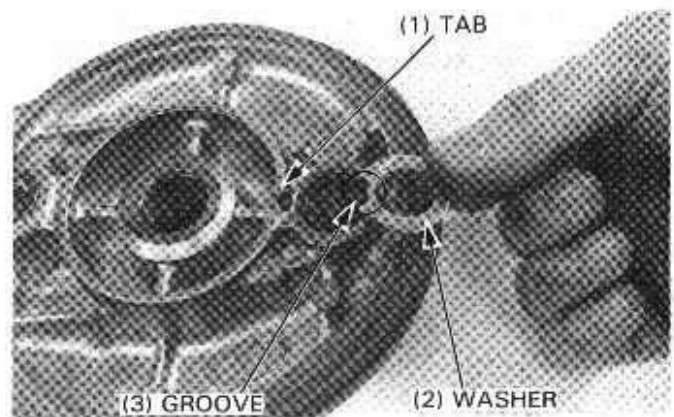
ASSEMBLY

⚠ WARNING

- Grease on the brake linings reduces stopping power. Keep grease off the linings.



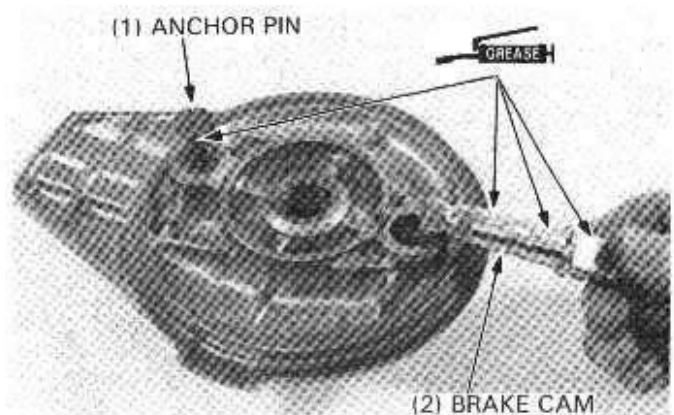
Install the washer onto the brake panel by aligning the groove with the boss of the brake panel.



Apply a small amount of grease to the brake cam and anchor pin and install the cam in the brake panel.

⚠ WARNING

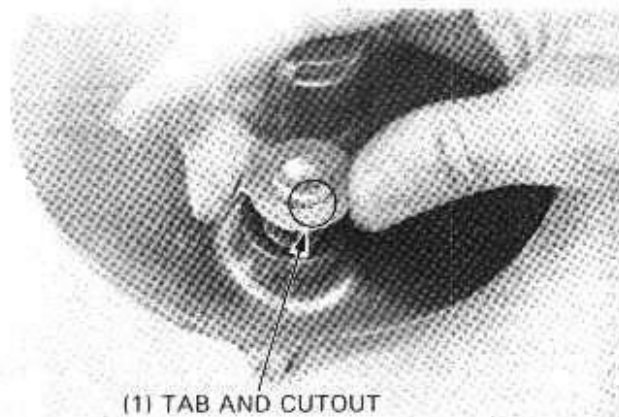
- Contaminated brake linings reduce stopping power. Keep grease off the brake linings. Wipe excess grease off the brake cam.



REAR WHEEL/BRAKE/SUSPENSION

Install the felt seal.

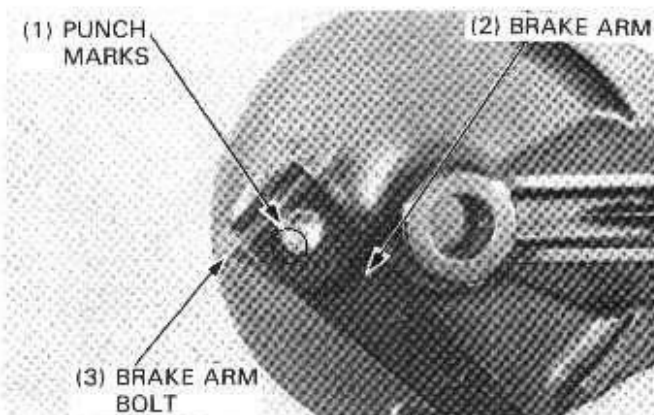
Install the wear indicator, aligning the indicator inner tab with the brake cam cutout.



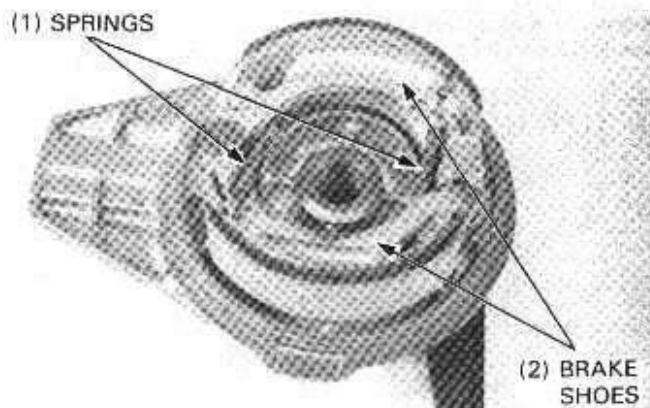
(1) TAB AND CUTOUT

Align the punch mark on the brake arm with the punch mark on the brake cam.

Tighten the brake arm bolt.



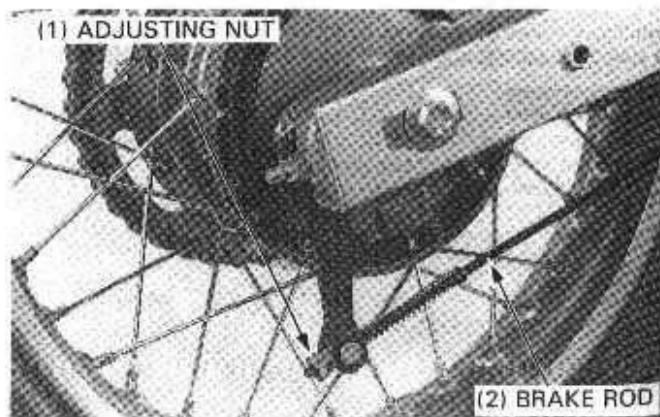
Install the new brake shoes on the brake panel.
Place the brake panel assembly in the wheel.
Install the rear wheel (page 13-8).



BRAKE PEDAL

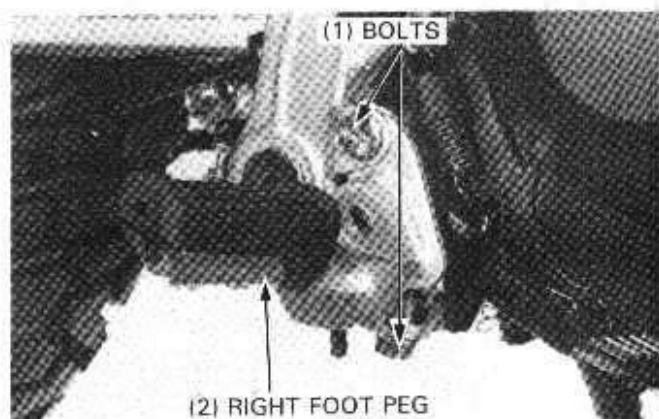
REMOVAL/INSTALLATION

Remove the brake adjusting nut and disengage the brake rod from the brake arm.



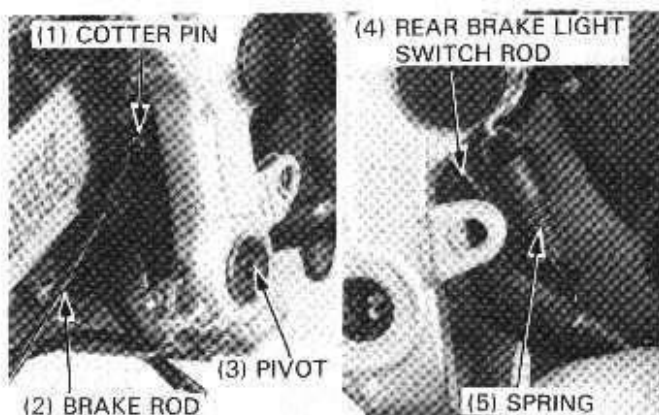
REAR WHEEL/BRAKE/SUSPENSION

Remove the right foot peg by removing two mounting bolts.



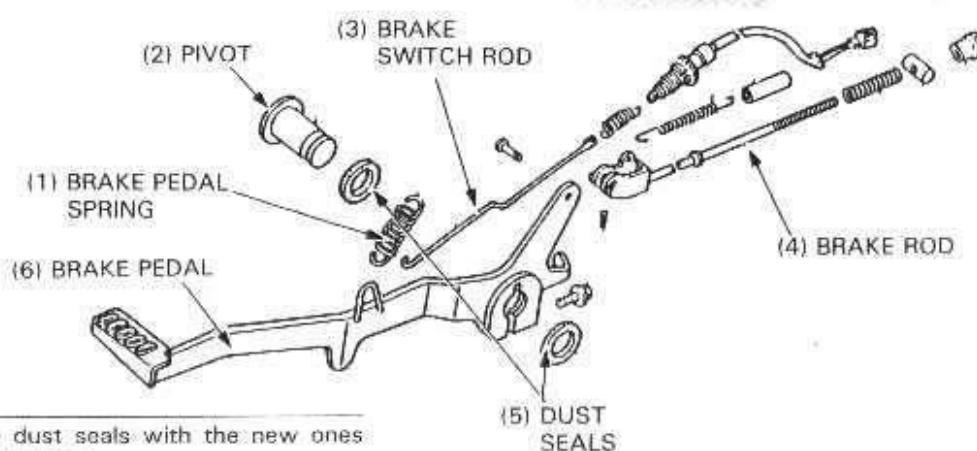
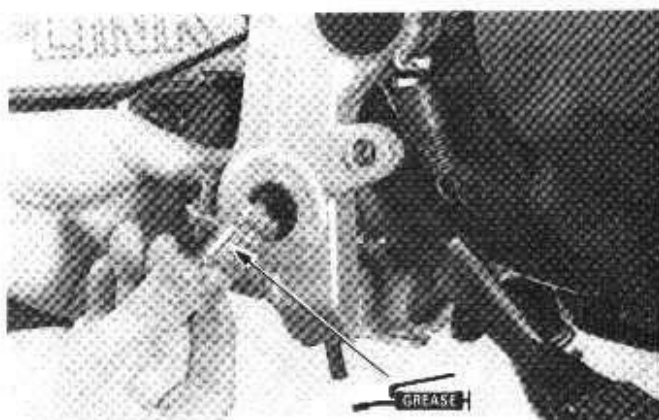
Remove the brake pedal pinch bolt, then remove the pivot. Remove the cotter pin and disconnect the brake rod from the brake pedal.

Disconnect the rear brake light switch rod and spring.



Apply grease to the pivot and install the removed parts in the reverse order of removal.

Adjust the brake pedal free play (page 3-13).



NOTE

- Replace the dust seals with the new ones when reassembling.

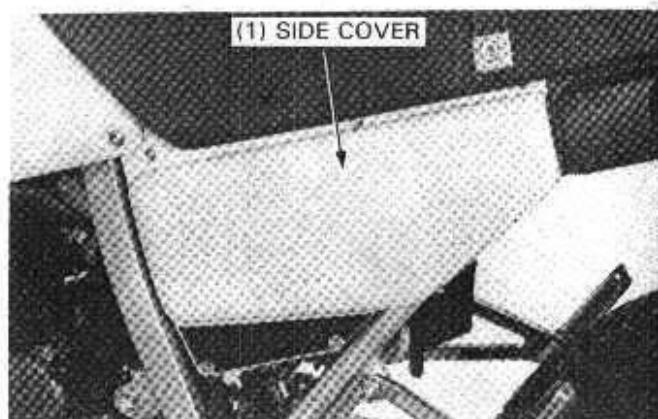
SHOCK ABSORBER

⚠ WARNING

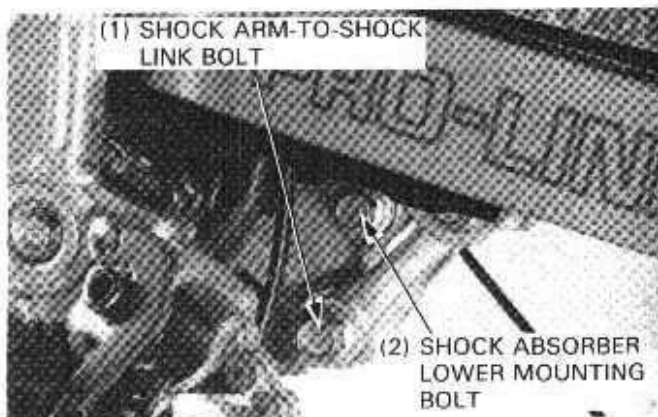
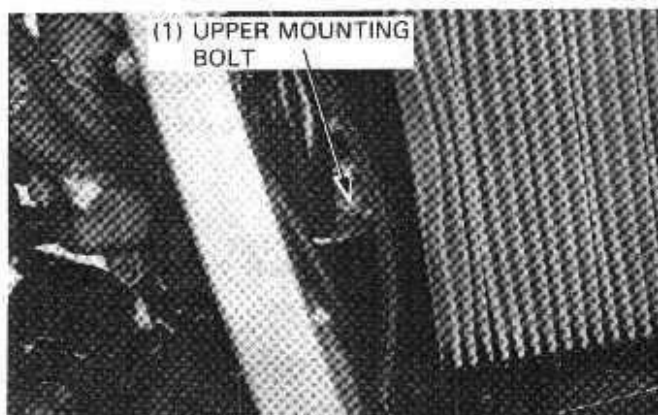
- *The shock absorber contains nitrogen gas under high pressure. Do not allow fire or heat near the shock absorber.*

Support the motorcycle in an upright position and raise the rear wheel off the ground.
Remove the seat and side covers (page 15-2).

Remove the shock absorber upper mounting bolt.



Remove the shock link-to-shock arm bolt.
Remove the shock absorber lower mounting bolt.



Unhook the shock absorber drain tube, then remove the shock absorber.



REAR WHEEL/BRAKE/SUSPENSION

DISASSEMBLY

⚠ WARNING

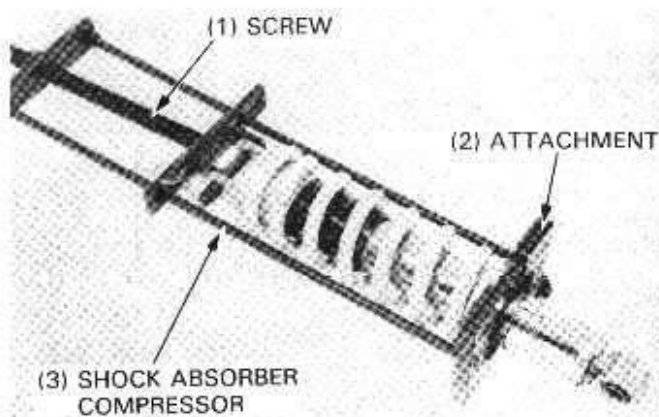
- The damper unit is filled with nitrogen gas under high pressure, do not try to disassemble it.

Install the attachment onto the shock absorber compressor. Set the shock absorber in the compressor as shown and compress the spring approximately 15 mm (0.6 in).

TOOLS:

Attachment	07959-MB10000
Shock absorber compressor	07GME-0010000
— screw assembly	07GME-0010100

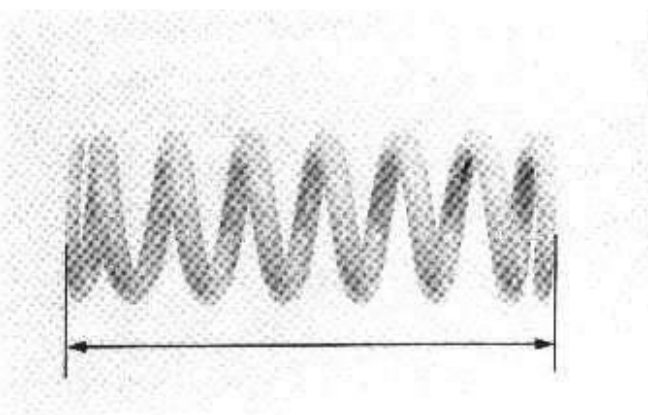
Remove the stop ring then loosen the compressor screw and remove the shock absorber upper spring seat, spring, dust seal, lower spring seat and spring guide.



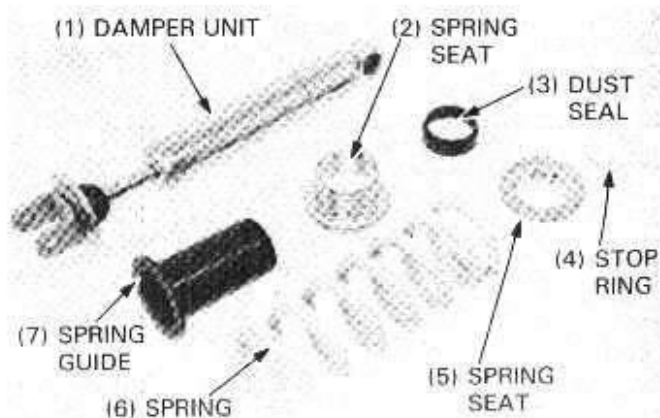
INSPECTION

Measure the spring free length.

SERVICE LIMIT: 184.9 mm (7.28 in)



Check the spring guide, lower spring seat, dust seal, spring and upper spring seat for wear or damage.

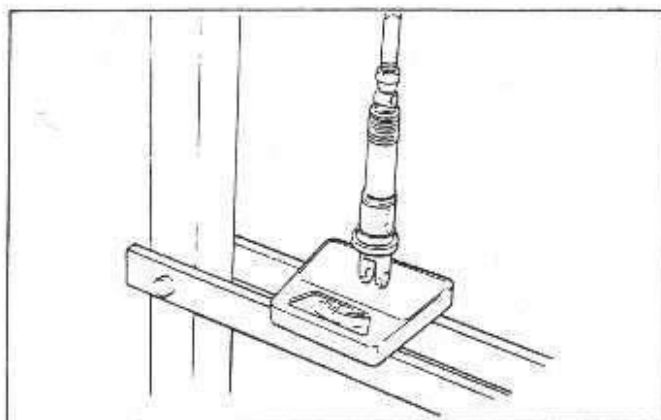


REAR WHEEL/BRAKE/SUSPENSION

Visually inspect the damper unit for dents, oil leaks or other faults. Replace the damper unit if necessary.

Place the damper rod on a scale and measure the force required to compress the damper 10 mm (0.4 in).

Calculate the compression force by subtracting the weight of the shock absorber from the value obtained. If the force required is less than 16.5 kg (61 lbs), gas is leaking. Examine the damper rod and replace the damper unit if it is bent or scored.

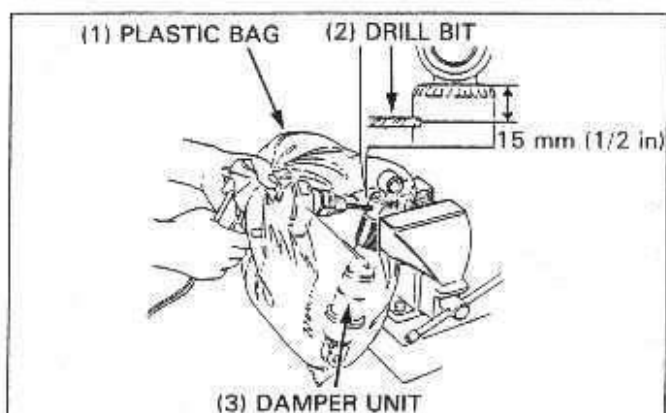


SHOCK ABSORBER DISPOSAL PROCEDURE

Center punch the damper case to mark the drilling point, approximately 15 mm (1/2 in) from the top surface. Wrap the damper unit inside a plastic bag. Support the damper unit upright in a vise as shown. Through the open end of the bag, insert a drill motor with a sharp 2–3 mm (5/64–1/8 in) drill bit.

⚠ WARNING

- Do not use a dull drill bit which could cause a build-up of excessive heat and pressure inside the damper, leading to explosion and severe personal injury.
- The shock absorber contains nitrogen gas and oil under high pressure. Do not drill any farther down the damper case than the measurement given above, or you may drill into the oil chamber; oil escaping under high pressure may cause serious personal injury.
- Always wear eye protection to avoid getting metal shavings in your eyes when the gas pressure is released. The plastic bag is only intended to shield you from the escaping gas.



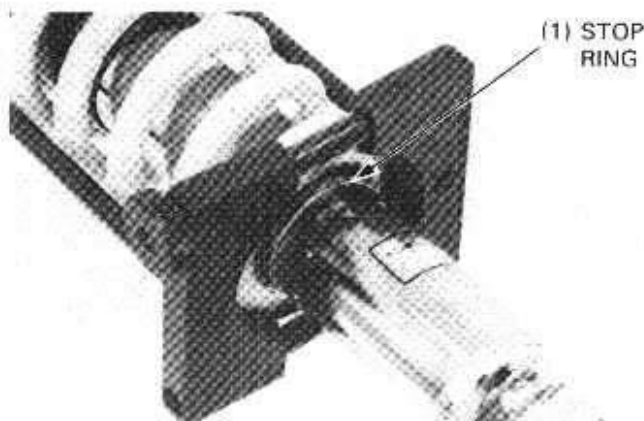
Hold the bag around the drill motor and briefly run the drill motor inside the bag; this will inflate the bag with air from the motor and help keep the bag from getting caught in the bit when you start.

ASSEMBLY

Install the spring guide, lower spring seat, dust seal, spring and upper spring seat on the damper.

Compress the spring with the compressor.

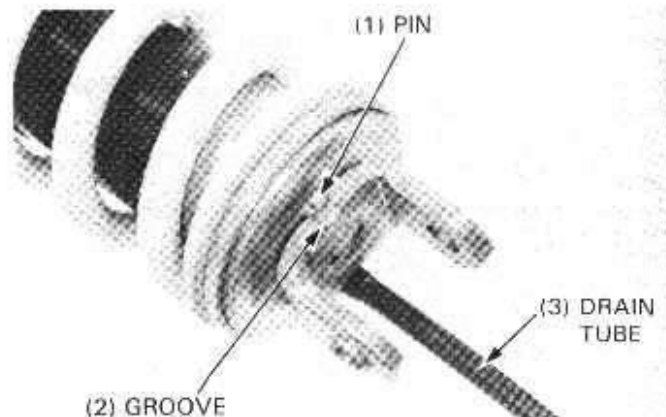
Install the stop ring securely into the groove in the damper.



REAR WHEEL/BRAKE/SUSPENSION

Loosen the compressor gradually and align the lower joint groove with the location pin on the spring seat as shown.

Remove the compressor and install the drain tube.



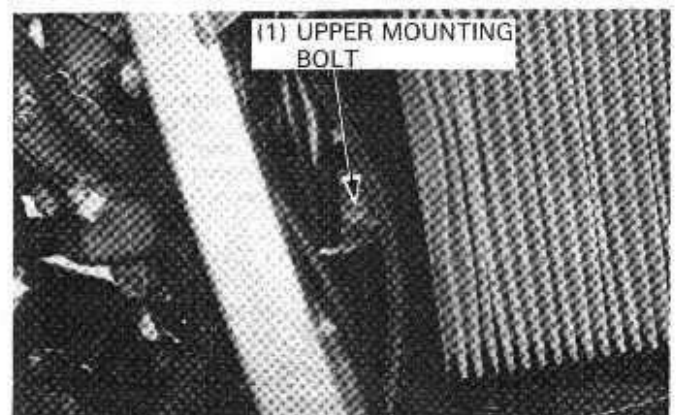
INSTALLATION

Raise the rear wheel fully and insert the shock absorber from the bottom.

Align the upper mount with the frame bracket and install the upper mounting bolt and nut.

Tighten the upper mounting bolt.

TORQUE: 65 N·m (6.5 kg-m, 47 ft-lb)



Align the lower mount with the shock arm and tighten the lower mounting bolt.

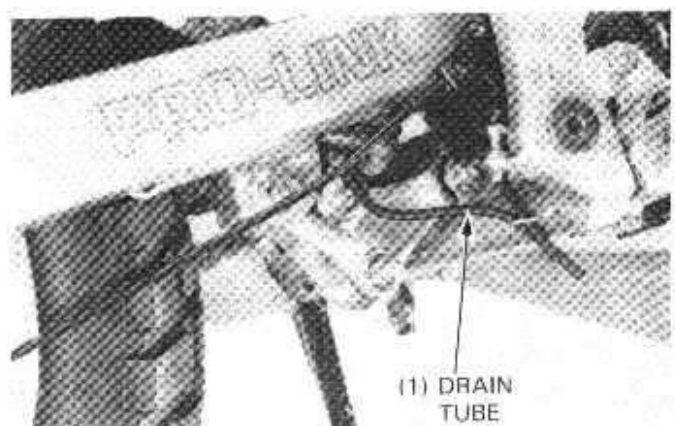
TORQUE: 45 N·m (4.5 kg-m, 33 ft-lb)

Connect the shock arm-to-shock link and tighten the bolt.

TORQUE: 105 N·m (10.5 kg-m, 76 ft-lb)



Install the shock absorber drain tube as shown.



REAR WHEEL/BRAKE/SUSPENSION

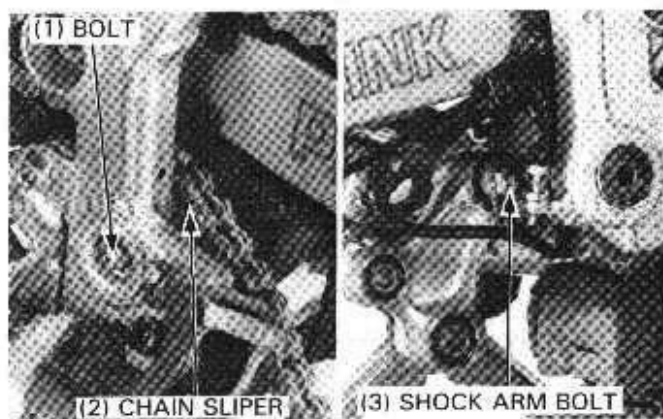
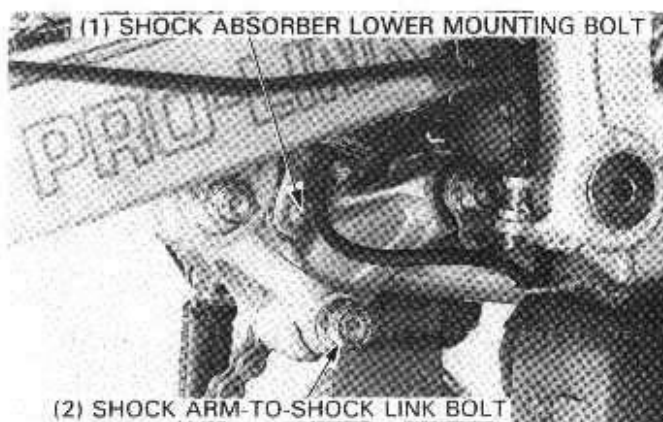
SHOCK LINKAGE

REMOVAL

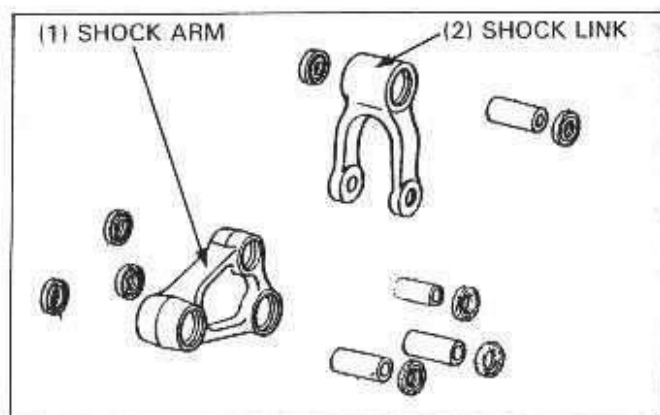
Raise the rear wheel off the ground with a workstand or box under the engine.

Remove the following:

- shock arm-to-shock link bolt and nut.
- rear shock absorber lower mounting bolt.
- shock link from the swingarm.
- chain sliper mounting bolt and chain sliper.
- shock arm bolt, nut, and remove the shock arm from the frame.



Check the shock arm, shock link dust seals and pivot collars for wear or damage.



BEARING REPLACEMENT

● Shock arm

Press out the shock arm bearings using the following tools.

TOOLS:

Driver

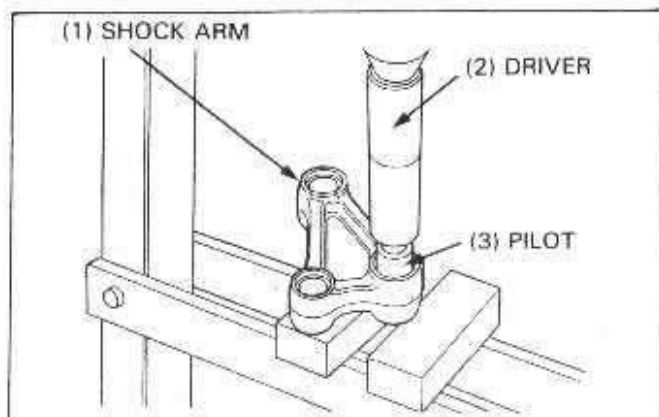
Pilot, 20 mm

Pilot, 22 mm

07749-0010000

07746-0040500

07746-0041000

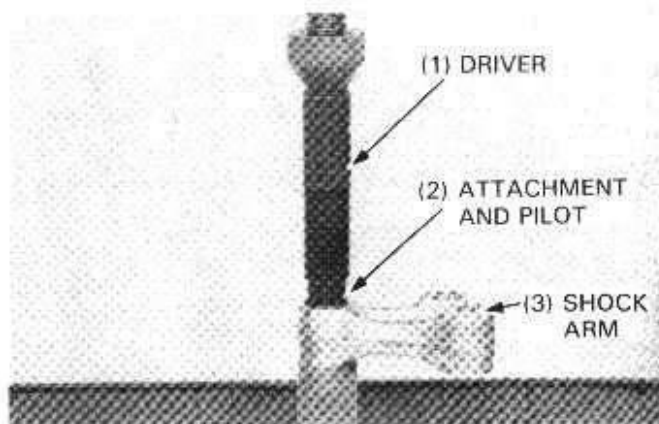


REAR WHEEL/BRAKE/SUSPENSION

Pack new needle bearings with grease.
Carefully press the needle bearing into the shock arm with the identification marks facing out.

TOOLS:

Driver	07749-0010000
Attachment, 24 x 26 mm	07746-0010700
Pilot, 17 mm	07746-0040400
Pilot, 15 mm	07746-0040300



● Shock link bearing

Removal:

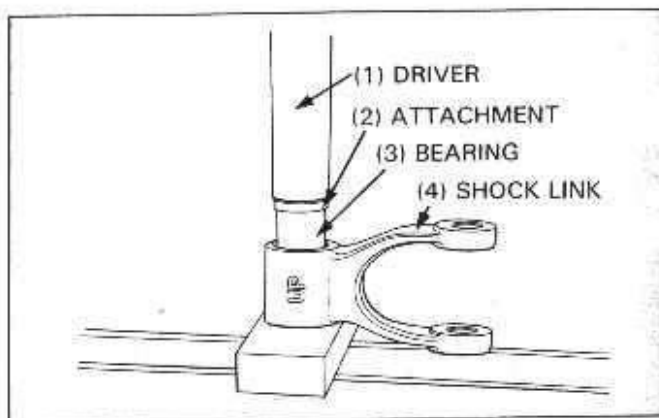
TOOLS:

Driver	07749-0010000
Pilot, 22 mm	07746-0041000

Installation:

TOOLS:

Driver	07749-0010000
Attachment, 24 x 26 mm	07746-0010700
Pilot, 17 mm	07746-0040400



INSTALLATION

Install the shock link with the pivot collar onto the swingarm.
Install the shock arm onto the frame.



Tighten the shock link-to-swingarm bolt.

TORQUE: 105 N·m (10.5 kg-m, 76 ft-lb)

Tighten the shock arm-to-frame bolt.

TORQUE: 105 N·m (10.5 kg-m, 76 ft-lb)

Tighten the shock absorber lower mounting bolt.

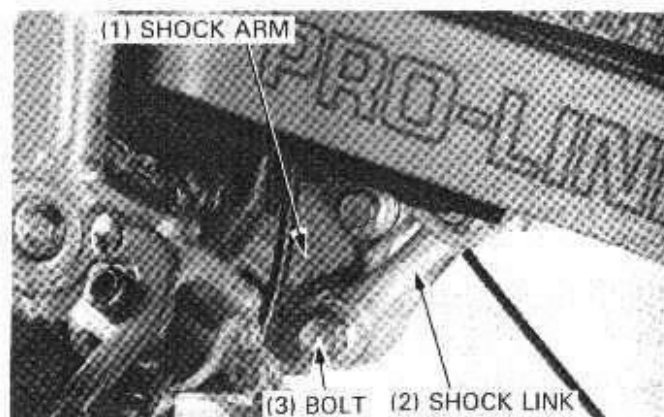
TORQUE: 45 N·m (4.5 kg-m, 33 ft-lb)



REAR WHEEL/BRAKE/SUSPENSION

Connect the shock link-to-shock arm and tighten the bolt.

TORQUE: 105 N·m (10.5 kg·m, 76 ft·lb)

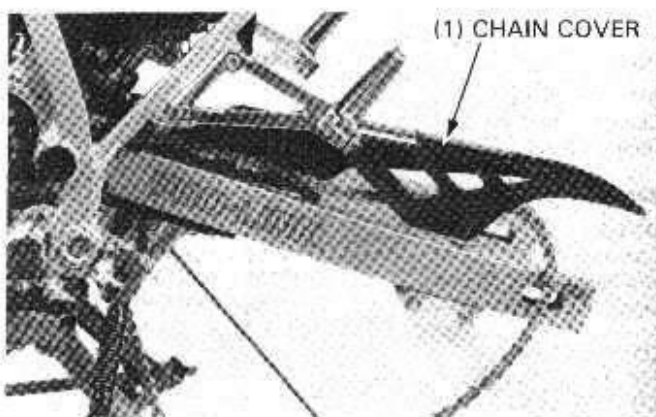


SWINGARM

REMOVAL

Remove the following:

- rear wheel (page 13-3),
- drive chain cover.



Remove the shock arm-to-shock link bolt.

Remove the rear shock absorber lower mounting bolt.



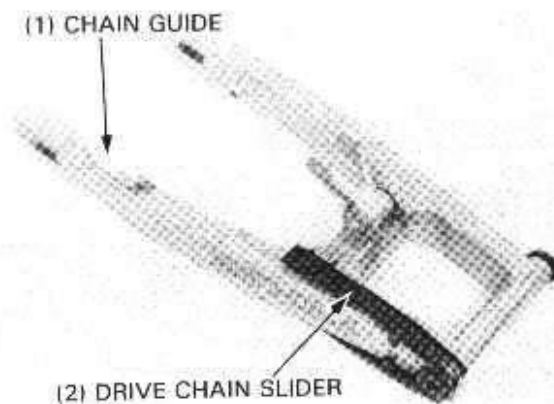
Remove the swingarm pivot bolt caps.

Remove the right and left swingarm pivots, then remove the swingarm.



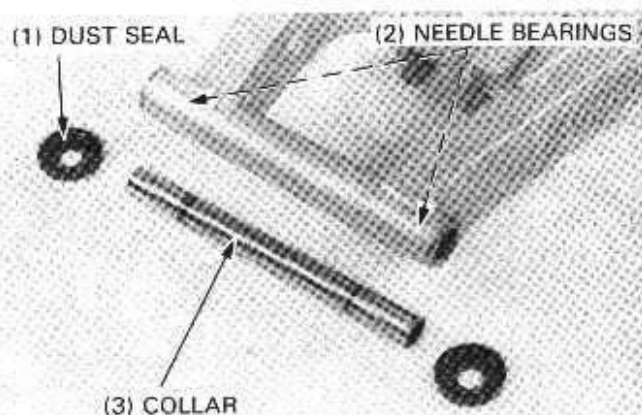
REAR WHEEL/BRAKE/SUSPENSION

Remove the drive chain slider and chain guide.
Check the drive chain slider and chain guide for wear or damage and replace them if necessary.



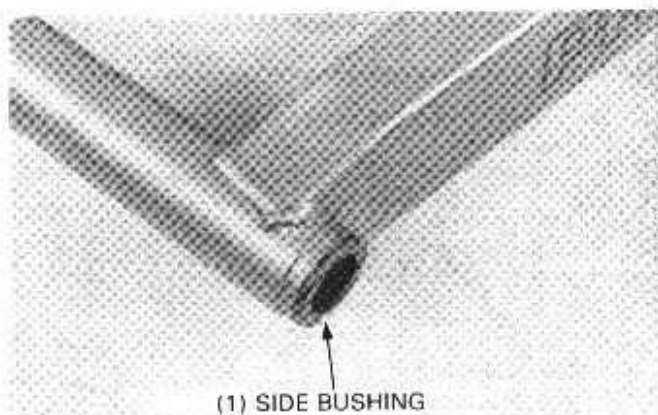
INSPECTION

Inspect the dust seals, needle bearings and collar.
Replace them if they have score marks, scratches, excessive or abnormal wear.



PIVOT BEARING REPLACEMENT

Remove the side bushings.

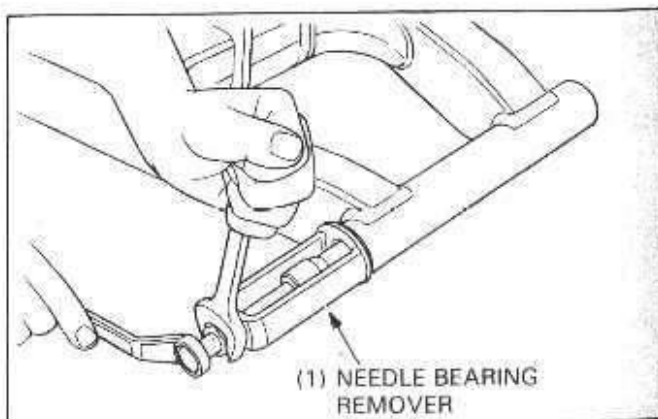


Remove the needle bearing with the needle bearing remover.

TOOLS:

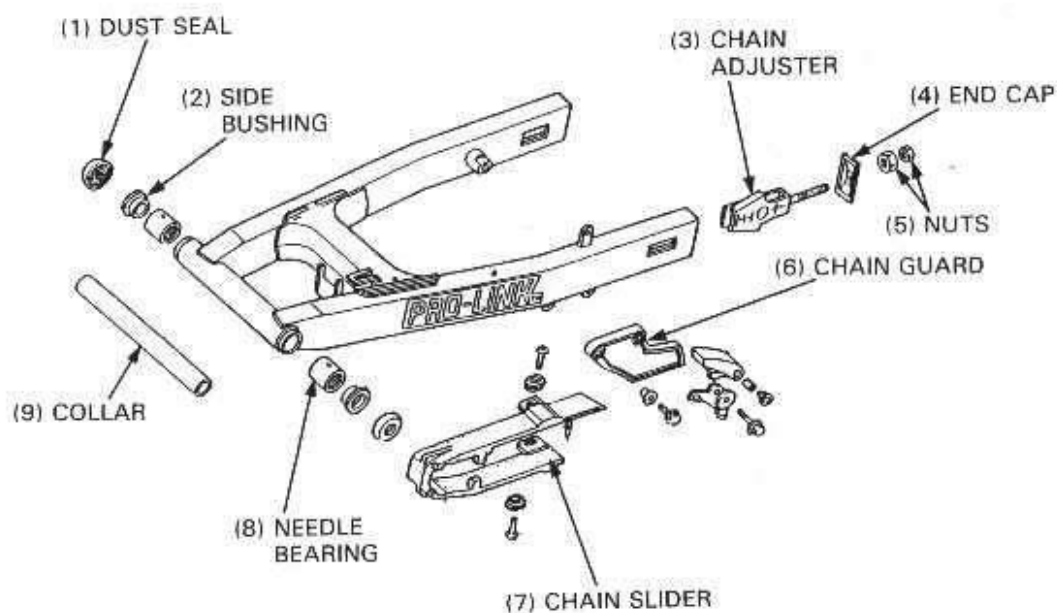
Needle bearing remover

07931-MA70000



REAR WHEEL/BRAKE/SUSPENSION

Apply grease to the needle bearings dust seal lips and collar.



Press each side's bearing and bushing into the swingarm together using hydraulic press.

TOOLS:

Driver

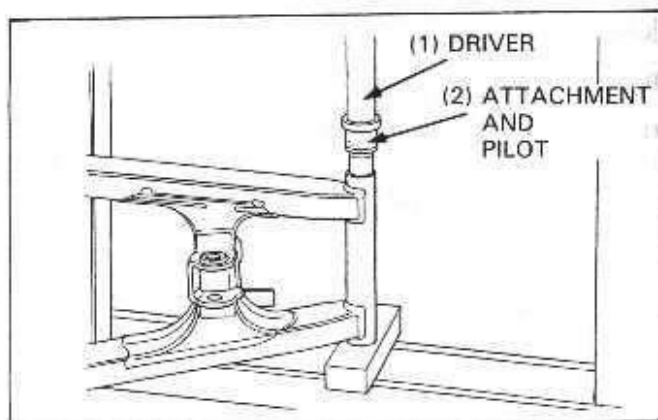
Attachment, 24 x 26 mm

Pilot, 20 mm

07749-0010000

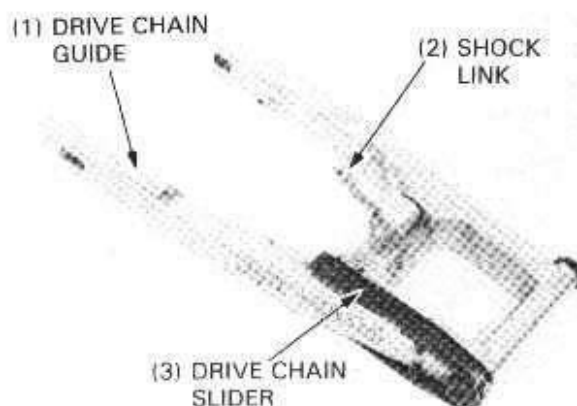
07746-0010700

07746-0040500



INSTALLATION

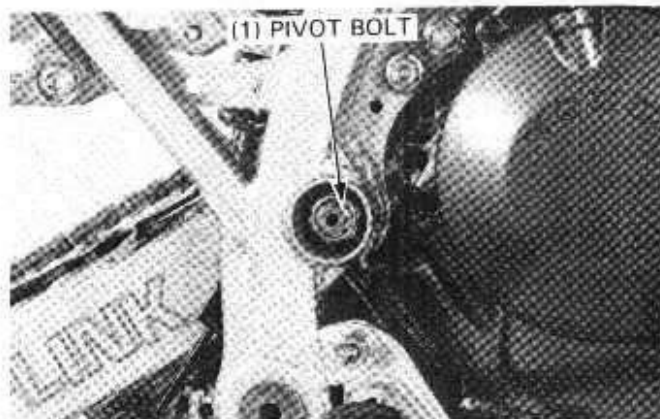
Install the drive chain slider and drive chain guide.
Install the shock link to the swingarm.



REAR WHEEL/BRAKE/SUSPENSION

Set the swingarm in the frame and install and tighten the pivot bolt.

TORQUE: 90 N·m (9.0 kg-m, 65 ft-lb)



Align the shock arm with the shock absorber lower mount and tighten the lower mounting bolt.

TORQUE: 45 N·m (4.5 kg-m, 33 ft-lb)

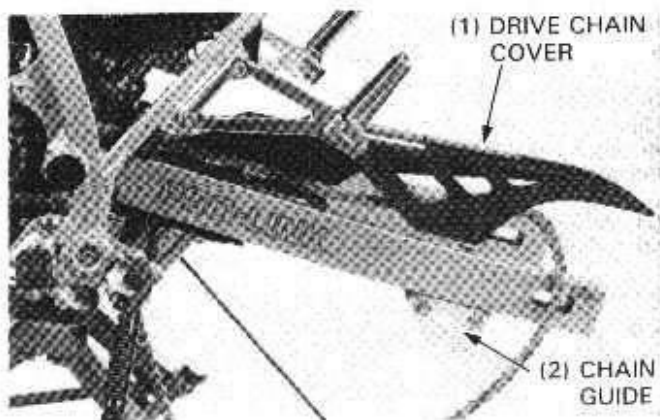
Connect the shock arm-to-shock link and tighten the bolt.

TORQUE: 105 N·m (10.5 kg-m, 76 ft-lb)

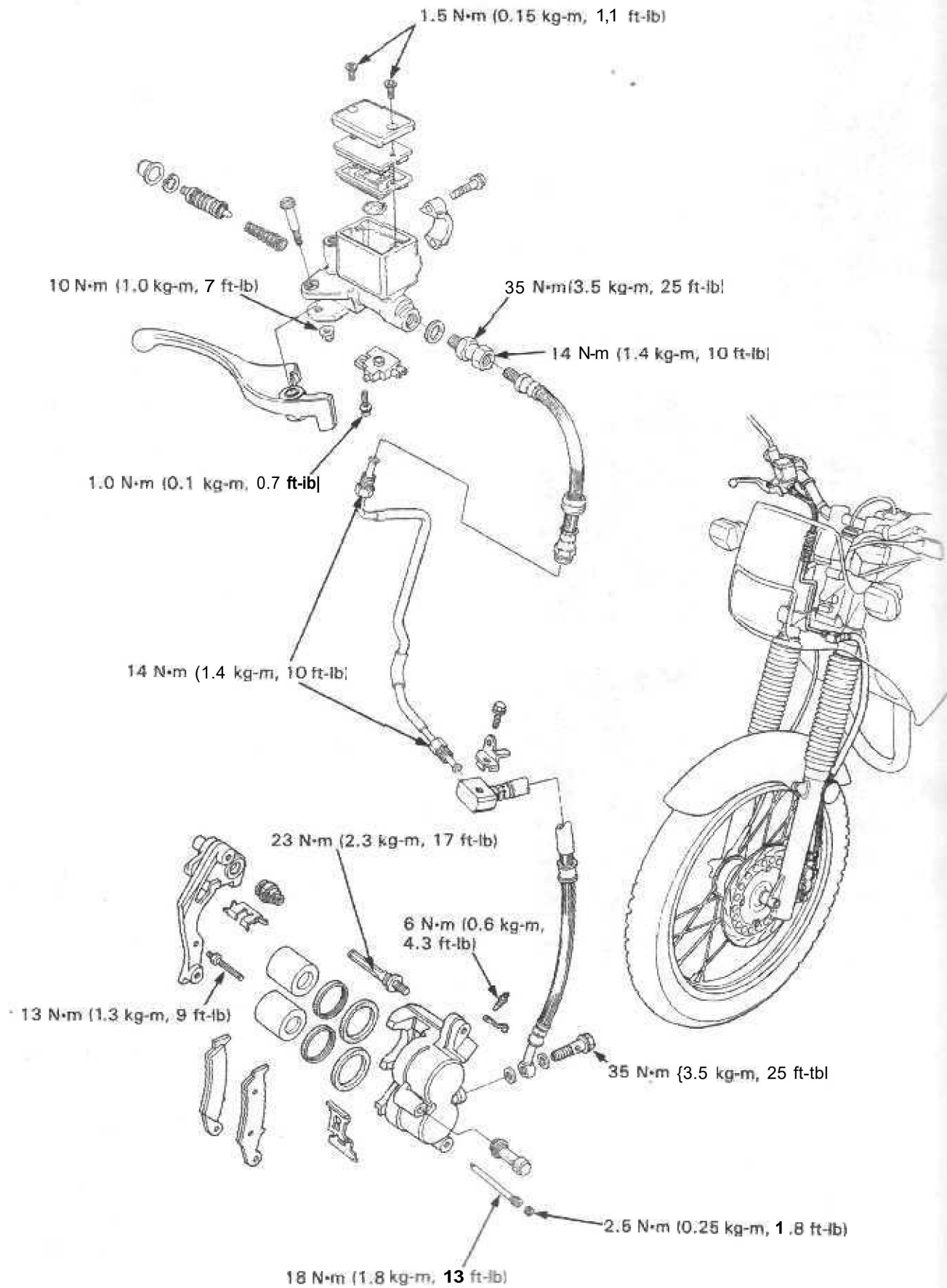


Install the drive chain cover and chain guide.
Install the rear wheel (page 13-8).

Check the rear brake pedal free play (page 3-13).



HYDRAULIC BRAKE



14. HYDRAULIC BRAKE

SERVICE INFORMATION	14-1	BRAKE PAD/DISC	14-4
TR OUBL ES HO OTIN G	14-2	MASTER CYLINDER	14-6
BRAKE FLUID RE PLACEMENT/BLEEDING	14-3	BRAKE CALIPER	14-8

SERVICE INFORMATION

GENERAL

- The brake pads can be removed without disconnecting the hydraulic system.
- Bleed the hydraulic system if it has been **disassembled** or if the brake feels **spongy**.
- Do not allow foreign material to enter the **system** when filling the reservoir.
- Brake fluid will damage painted, plastic and rubber parts. Whenever handling brake fluid, protect the **painted**, plastic and rubber parts by covering them with a rag. If fluid does get on these parts, wipe it off with a clean cloth.
- Always **check brake operation** before riding the motorcycle.
- If the metal brake pipe has to be removed, loosen the **brake pipe nut** while holding the brake hose nut to prevent the brake hose or brake hose stay from twisting or bending.

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**.
- **Inhaled asbestos fibers** have been **found** to cause respiratory disease and cancer. **Never use an air hose or dry brush to clean brake assemblies**. Use an **OSHA-approved vacuum cleaner or alternate method approved by OSHA** designed to **minimize the hazard caused by airborne asbestos fibers**.

SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Front disc thickness	3.3–3.7 (0.13–0.15)	3.0 (0.12)
Front disc runout	—	0.3 (0.01)
Front master cylinder I.D.	11.000–11.043 (0.4331–0.4348)	11.055 (0.4352)
Front master piston O.D.	10.957–10.984 (0.4314–0.4324)	10.945 (0.4309)
Front caliper cylinder I.D.	27.000–27.950 (1.0630–1.0650)	27.06 (1.065)
Front caliper cylinder O.D.	26.900–26.950 (1.0591–1.061)	26.89 (1.0587)
Specified brake fluid	DOT 4 only	—

TORQUE VALUES

Brake hose oil bolt	35 N·m (3.5 kg-m, 25 ft-lb)
Brake hose joint (master cylinder side)	35 N·m (3.5 kg-m, 25 ft-lb)
(brake hose side)	14 N·m (1.4 kg-m, 10 ft-lb)
Brake pipe nut	14 N·m (1.4 kg-m, 10 ft-lb) Apply oil to the threads
Caliper mounting bolt	25 N·m (2.5 kg-m, 18 ft-lb)
Master cylinder cover screw	1.5 N·m (0.15 kg-m, 1.1 ft-lb)
Brake lever pivot nut	10 N·m (1.0 kg-m, 7 ft-lb)
Front brake light switch screw	1.0 N·m (0.1 kg-m, 0.7 ft-lb)
Caliper pin bolt	23 N·m (2.3 kg-m, 17 ft-lb) Apply a locking agent to the threads
Caliper bracket pin bolt	13 N·m (1.3 kg-m, 9 ft-lb)
Brake pad pin	18 N·m (1.8 kg-m, 13 ft-lb)
Brake pad pin plug	2.5 N·m (0.25 kg-m, 1.8 ft-lb)
Bleed valve	6 N·m (0.6 kg-m, 4.3 ft-lb)

TOOL

Special
Snap ring pliers

07914-3230001 or equivalent commercially available in U.S.A.

TROUBLESHOOTING

Brake lever soft or spongy

- Air bubbles in hydraulic system
- Low fluid level
- Hydraulic system leaking

Brake lever too hard

- Sticking piston
- Clogged hydraulic system
- Pads glazed or excessively worn

Brake drag

- Hydraulic system sticking
- Sticking piston(s)
- Clogged hydraulic system
- Caliper slide pin sticking
- Disc or wheel misaligned

Brake grab or pull to one side

- Pads contaminated
- Uneven pad wear
- * Disc or wheel misaligned

Brake chatter or squeal

- Pads contaminated
- Excessive disc runout
- Caliper installed incorrectly
- Disc or wheel misaligned

BRAKE FLUID REPLACEMENT/BLEEDING

⚠ WARNING

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean the disc with a high quality brake degreasing agent.

CAUTION

- Do not let foreign material to enter the system when filling the reservoir.
- Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.

BRAKE FLUID DRAINING

With the fluid reservoir parallel to the ground, remove the reservoir cover, set plate and diaphragm.

Connect a bleed hose to the caliper bleed valve. Loosen the bleed valve and pump the brake lever until no more fluid flows out of the bleed valve.

BRAKE FLUID FILLING/BLEEDING

Fill the master cylinder reservoir with DOT 4 brake fluid from a sealed container.

CAUTION

- Do not mix different types of fluid. They are not compatible.

Connect a commercially available brake bleeder to the bleed valve.

Pump the brake bleeder and loosen the bleed valve. Add fluid when the fluid level in the master cylinder reservoir is low.

NOTE

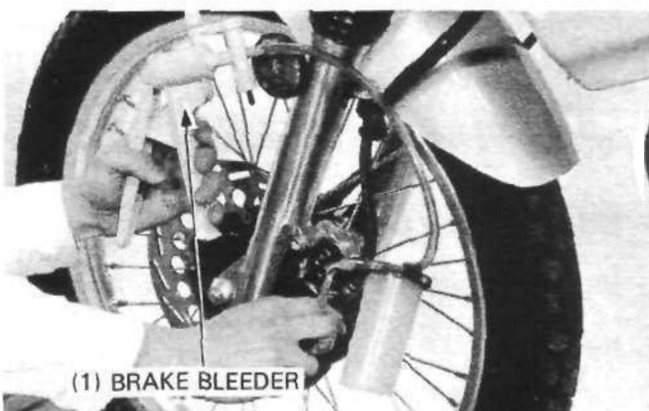
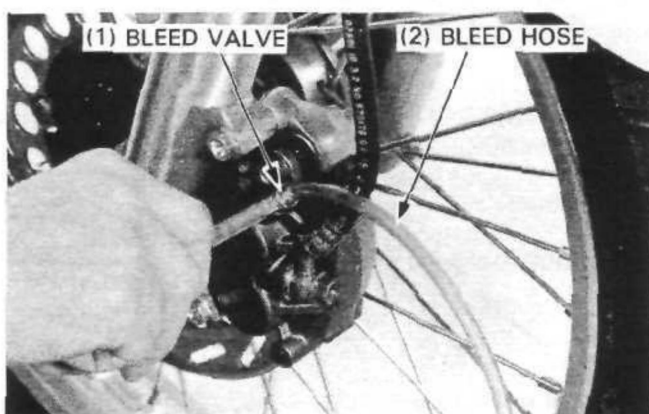
- Check the fluid level often while bleeding the brake to prevent air from being pumped into the system.
- Use only DOT 4 brake fluid from a sealed container.
- When using a brake bleeding tool, follow the manufacturer's operating instruction.

Repeat the above procedures until air bubbles do not appear in the plastic hose.

NOTE

- If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Close the bleed valve and operate the brake lever. If it still feels spongy, repeat the above procedure.



HYDRAULIC BRAKE

If a brake bleeder is not **available**, use the following procedure: Pump up the system pressure with the brake lever until there are no air bubbles in the fluid flowing out of the reservoir **small** hole.

Connect the bleed hose to the bleed valve and bleed the system as follows:

1. Squeeze the brake lever, open the bleed valve 1/4 turn and **then** close the **bleed** valve.

NOTE

- Do **not** release the brake lever until the bleed valve has been closed.

2. Release the brake lever slowly and wait several seconds after it reaches the end of its travel.

Repeat steps 1 and 2 until air bubbles cease to appear in the fluid coming out of the bleed valve.

Tighten the bleed valve.

TORQUE: 6 **N·m** (0.6 **kg·m**, 4.3 **ft-lb**)

Fill the **master** cylinder reservoir to the upper level mark with DOT 4 brake fluid from a sealed container.

Install the diaphragm, **set** plate and reservoir cover.

Tighten the reservoir cover screws.

TORQUE: 1.5 **N·m** (0.15 **kg·m**, 1.1 **ft-lb**)

BRAKE PAD/DISC

BRAKE PAD REPLACEMENT

NOTE

- Always replace the brake pads in pairs to assure even disc pressure.

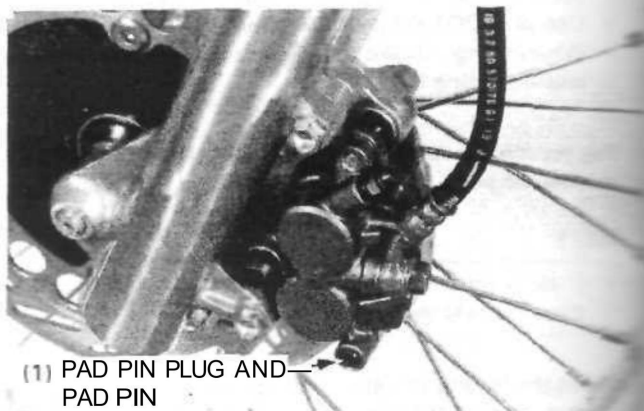
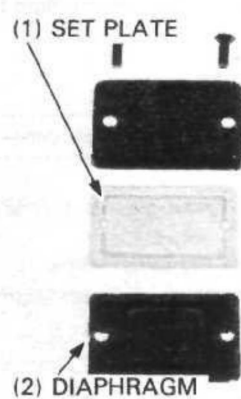
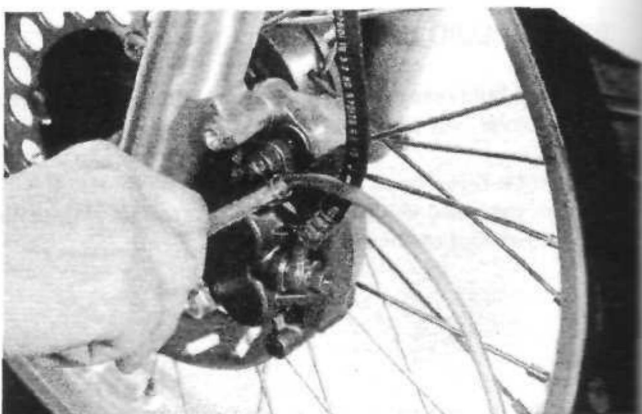
Push the caliper pistons all the way into caliper to gain clearance for the new pads.

CAUTION

- Be careful **that** the master cylinder does **not** overflow when the caliper pistons are compressed.
- * Brake fluid can cause damage to **painted**, plastic or rubber surface.

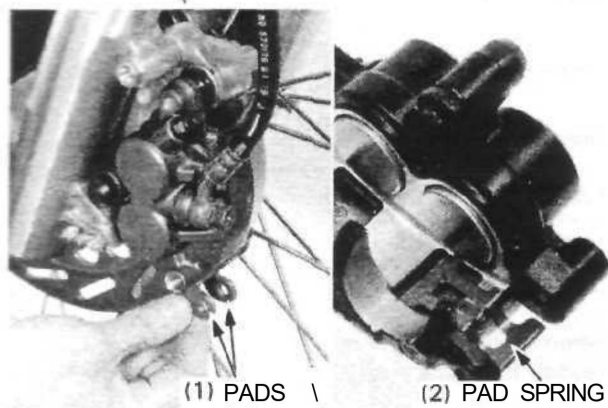
Remove the following:

- pad pin plug
- pad pin
- pads



Make sure that the pad spring is installed in the position shown.

Install new pads in the caliper.



Install the pad pin and tighten it to the specified torque.

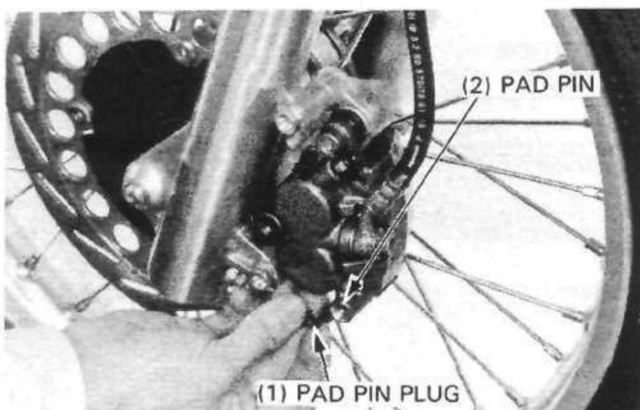
TORQUE: 18 N·m (1.8 kg-m, 13 ft-lb)

Tighten the pad pin plug to the specified torque.

TORQUE: 2.5 N·m (0.25 kg-m, 1.8 ft-lb)

NOTE

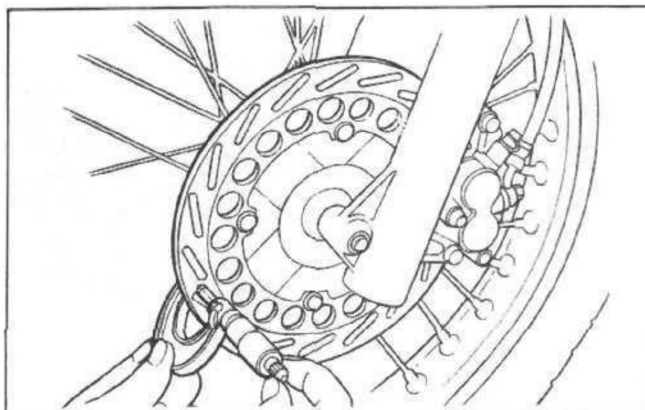
- Operate the brake lever to seat the caliper pistons against the pads.



DISC THICKNESS

Measure the disc thickness.

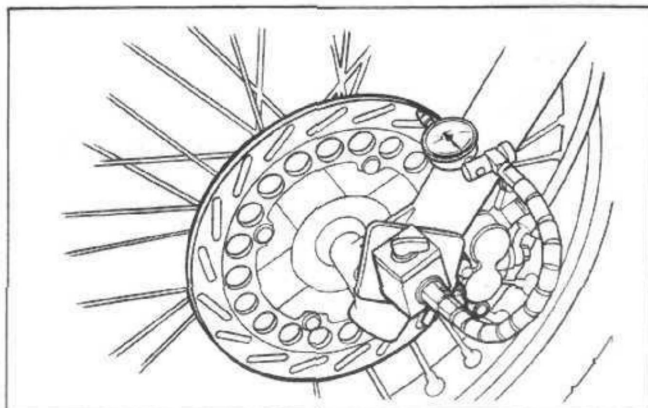
SERVICE LIMIT: 3.0 mm (0.12 in)



DISC WARPAGE

Measure the brake disc for runout.

SERVICE LIMIT: 0.3 mm (0.01 in)



MASTER CYLINDER

DISASSEMBLY

Drain brake fluid **from** the hydraulic system (page 14-3).

CAUTION

** Avoid spilling fluid on **painted**, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.*

Remove the **rear** view mirror.

Loosen the brake hose joint nut and disconnect the brake hose from the joint.

Disconnect the front brake light switch wires.

Remove the master cylinder.

CAUTION

• When removing the brake hose cover the end of the hose to prevent contamination.

Remove the brake lever by removing the pivot nut and bolt.

Remove the brake light switch by removing the screw.

Remove the piston boot.

Remove the snap ring from the master cylinder.

TOOL:

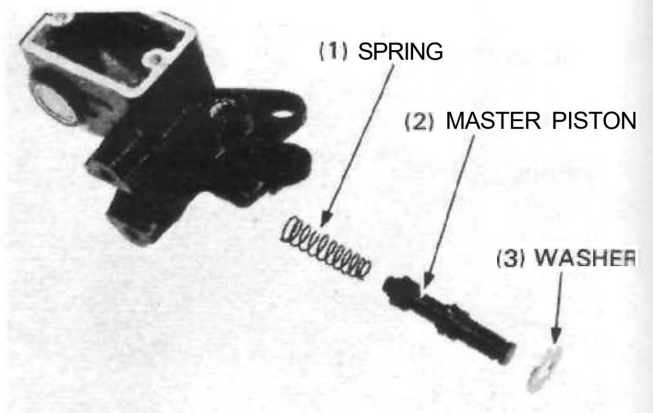
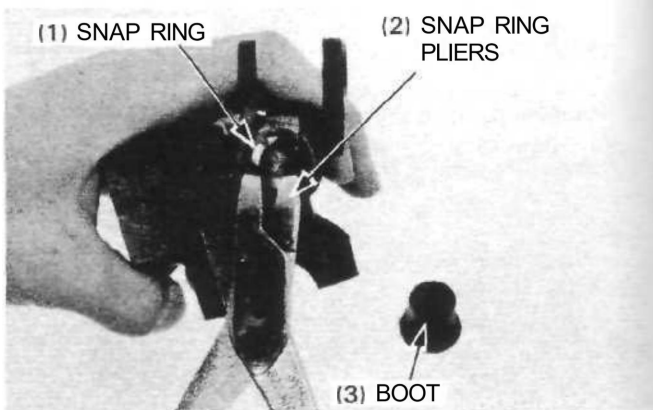
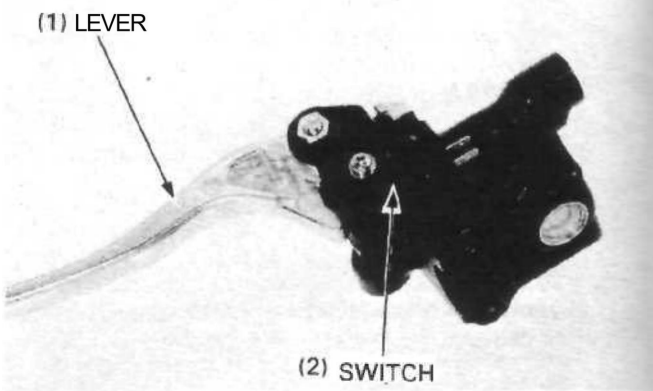
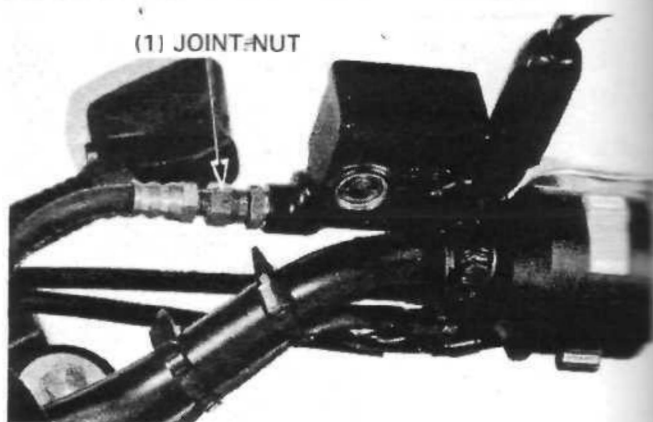
Snap ring pliers

07914-3230001 or
equivalent commercially
available in U.S.A.

Remove the following:

- washer
- master piston
- spring

Clean the master cylinder, reservoir and master piston in clean brake **fluid**.



INSPECTION

Check the primary and secondary cups for wear, **deterioration** or damage.

Check the master cylinder and piston for scoring or other **dam-**
age.

Measure the master cylinder inside diameter.

SERVICE LIMIT: 11.05b mm (0.4352 in)

Measure the master piston outside diameter.

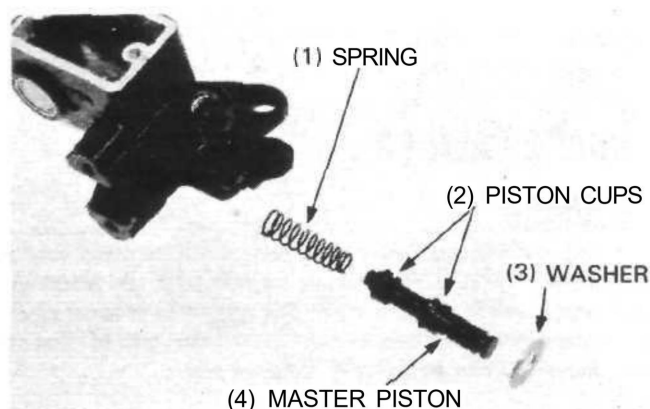
SERVICE LIMIT: 10.945 mm (0.4309 in)

NOTE

- The master **piston**, piston cups and spring must be replaced as a set.

ASSEMBLY

Coat the master piston and primary and secondary cups with clean brake fluid, then install the spring, master piston and washer into the master cylinder.



Install the snap ring and piston boot.

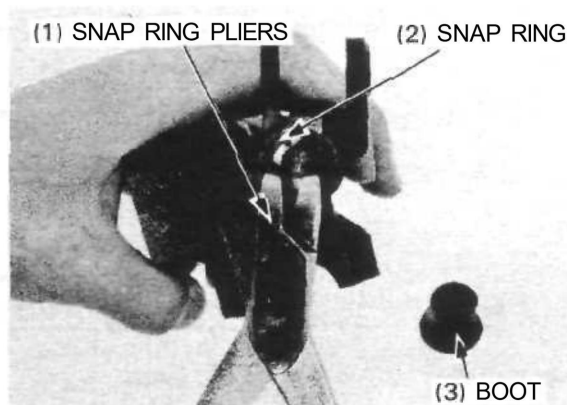
CAUTION

- Do not allow the lips of the cups to turn inside out and be certain the snap ring is **firmly** seated in the groove.*

TOOL:

Snap ring pliers

07914-3230001 or
equivalent commercially
available in U.S.A.



Install the brake light switch.

Tighten the screw to the specified torque.

TORQUE: 1.0 N·m (0.1 kg-m, 0.7 ft-lb)

Install the brake lever and tighten the pivot nut.

TORQUE: 10 N·m (1.0 kg-m, 7 ft-lb)

HYDRAULIC BRAKE

Place the front brake master cylinder on the handlebar and install the holder with the "UP" mark facing up. Align the end of the master cylinder with the punch mark on the handlebar, and tighten the upper bolt first, then tighten the lower bolt.

Install the brake hose joint with new sealing washer to the master cylinder, then tighten the joint nut (master cylinder side).

TORQUE: 35 N·m (3.5 kg-m, 25 ft-lb)

Connect the brake hose to the brake hose joint and tighten the joint nut (brake hose side) holding the end of the brake hose.

TORQUE: 14 N·m (1.4 kg-m, 10 ft-lb)

Connect the brake light switch wires to the switch. Fill and bleed the hydraulic system (page 14-3).

BRAKE CALIPER

▲ WARNING

- **Inhaled** asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies. Use an **OSHA-approved** vacuum cleaner or alternate method approved by **OSHA** designed to minimize the hazard caused by airborne asbestos fibers.

DISASSEMBLY

Drain the brake fluid from the front brake hydraulic system (page 14-3).

Remove the brake pads (page 14-4).

Remove the front brake hose from the caliper.

CAUTION

- Avoid spilling brake fluid on **painted**, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.

Remove the caliper mounting bolts and caliper.

Remove the following:

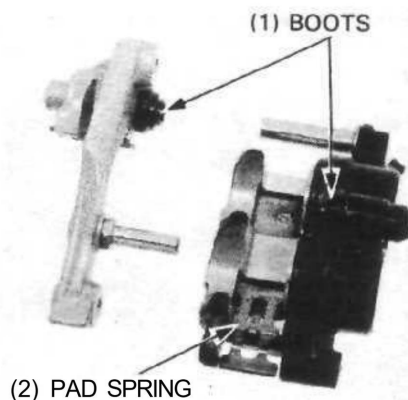
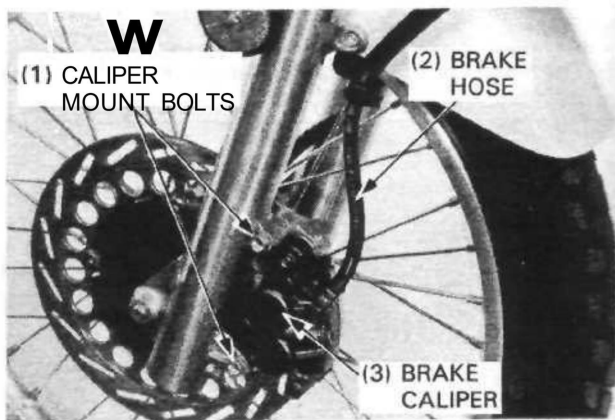
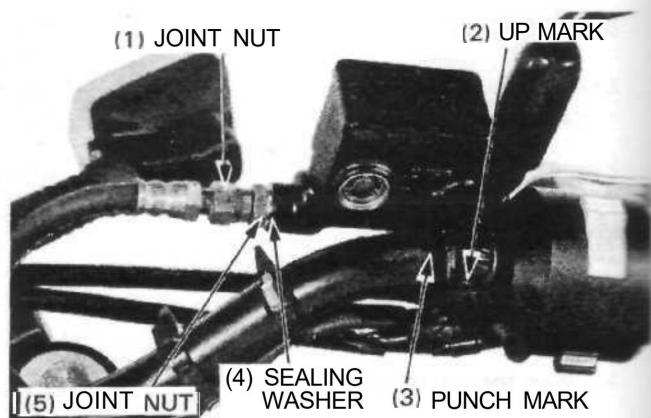
- bracket
- pivot boot
- pad spring

Check the pivot boots for wear or damage and replace them if necessary.

Position the caliper 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.
- Place a shop towel over the pistons to prevent them from becoming projectiles.
- Use adequate eye protection.

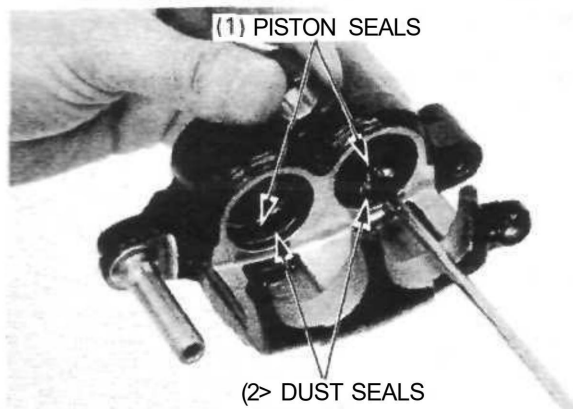


Push the dust and piston seals in and lift them out.

Coat the seal grooves with clean brake fluid.

CAUTION

- Be careful not to damage the piston sliding surfaces.



INSPECTION

Check the caliper pistons for scoring or other damage.

Measure the caliper piston outside diameter.

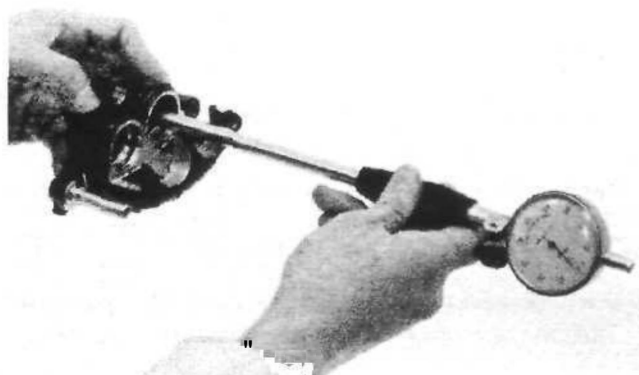
SERVICE LIMIT: 26.89 mm (1.0587 in)



Check the caliper cylinder bores for scoring or other damage.

Measure the caliper cylinder inside diameter.

SERVICE LIMIT: 27.06 mm (1.065 in)

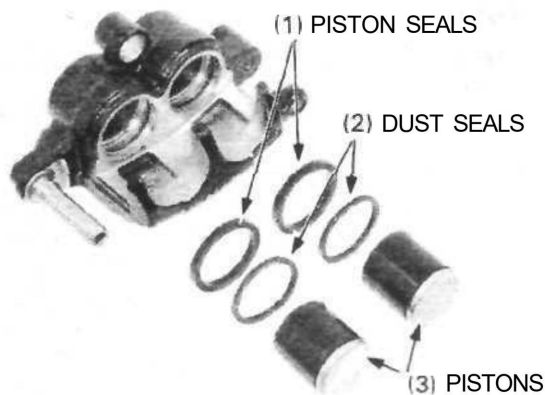


ASSEMBLY

The dust and piston seals must be replaced with new ones whenever they are removed.

Coat new dust and piston seals with clean brake fluid and install them in the seal grooves in the caliper.

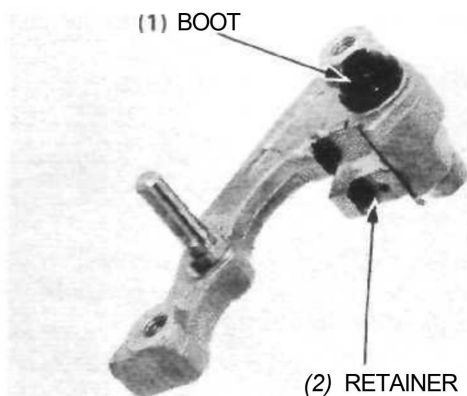
Lubricate the caliper cylinders and pistons with clean brake fluid and install the pistons into the caliper cylinders as shown.



HYDRAULIC BRAKE

Install the pivot boot on the caliper bracket and make sure that the boot is seated in the groove properly.

Make sure that the pad retainer is attached on the bracket properly.

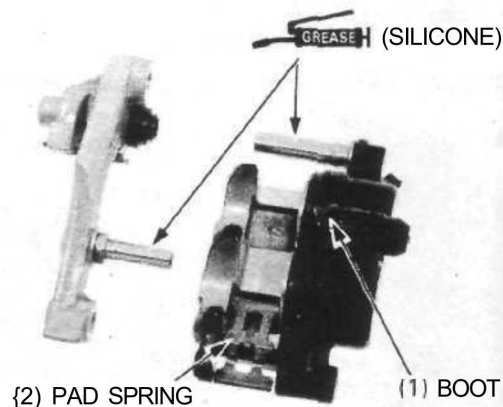


Install the pivot boot on the caliper and make sure that the boot is seated in the groove properly.

Install the pad spring.

Apply silicone grease to the pivot pins and install the bracket on the caliper.

Install the pads (page 14-5).



Install the caliper on the fork leg and over the brake disc so that the disc is positioned between the pads.

NOTE

- Use care not to damage the pads.

Tighten the caliper mounting bolts to the specified torque.

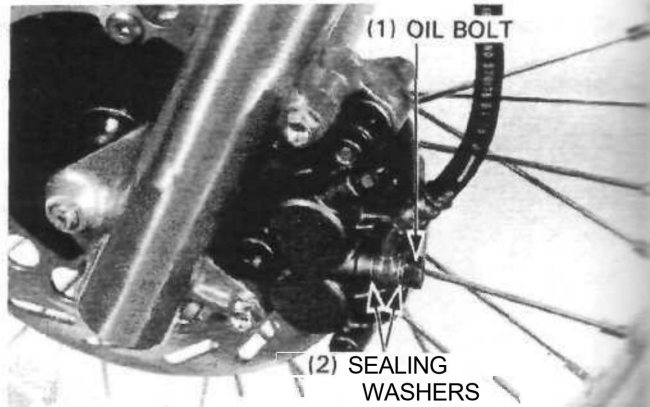
TORQUE: 25 N·m (2.5 kg-m, 18 ft-lb)

Install the brake hose to the caliper with new sealing washers. Tighten the brake hose oil bolt to the specified torque.

TORQUE: 35 N·m (3.5 kg-m, 25 ft-lb)

CAUTION

- Do not *twist* the brake hose. Be sure the brake hose is straight, then connect it to the caliper.



Fill and bleed the hydraulic system (page 14-3).

15. FAIRING/EXHAUST SYSTEM

EXHAUST PIPE/MUFFLER

15-1 REAR CARRIER (AFTER '88)

15-3

SEAT & FAIRINGS

15-2

EXHAUST PIPE/MUFFLER

WARNING

- Do **not** service the exhaust pipe or muffler while they are hot.

REMOVAL/INSTALLATION

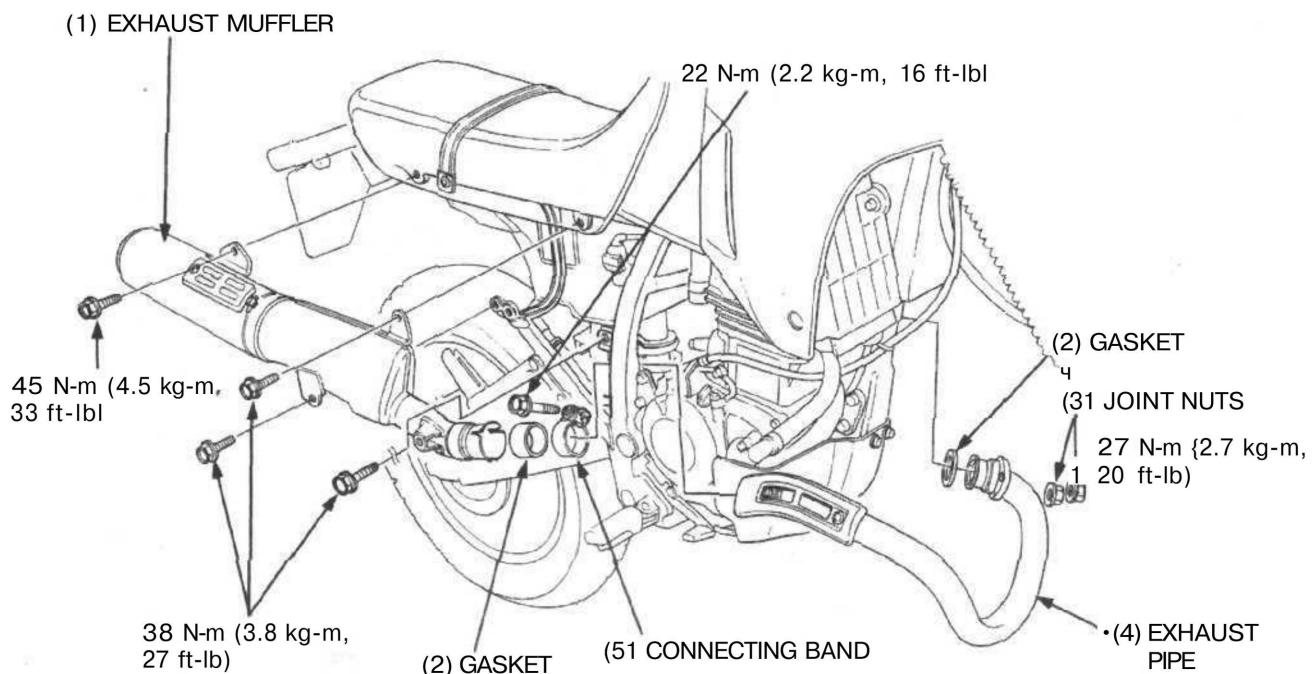
Remove the following:

- right side cover (page 15-2)
- joint nuts
- connecting band bolt
- exhaust muffler bolts

CAUTION

- Do not sit on the seat, after removing the muffler.

Install the exhaust pipe/muffler in the reverse order of removal.



NOTE

- After installing, make sure that there are no exhaust leaks.

SEAT & FAIRINGS

REMOVAL/INSTALLATION

SEAT

Unlock the seat lock from the hook latch while turning the key clockwise.

Remove the seat by pulling it backward.

Install the seat in the reverse order of removal.

SIDE COVER

Remove the side cover mounting bolt and unhook the cover hooks from the frame, then remove the side cover.

FAIRING INNER COVERS

Remove the inner cover mounting bolts and covers.

Install the inner covers in the reverse order of removal.

SIDE FAIRING

Remove the inner covers.

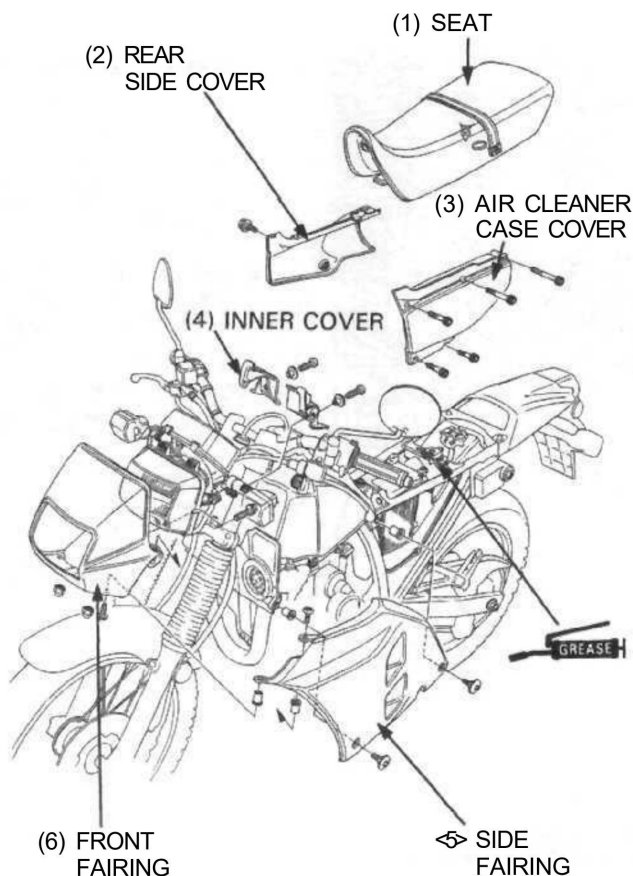
Remove the side fairing mounting bolts then pull out the prongs.

Carefully pull the fairing down and off the frame.

FRONT FAIRING

Remove the inner covers and side fairings.

Remove the cap nuts and bolts, then remove the front fairing.



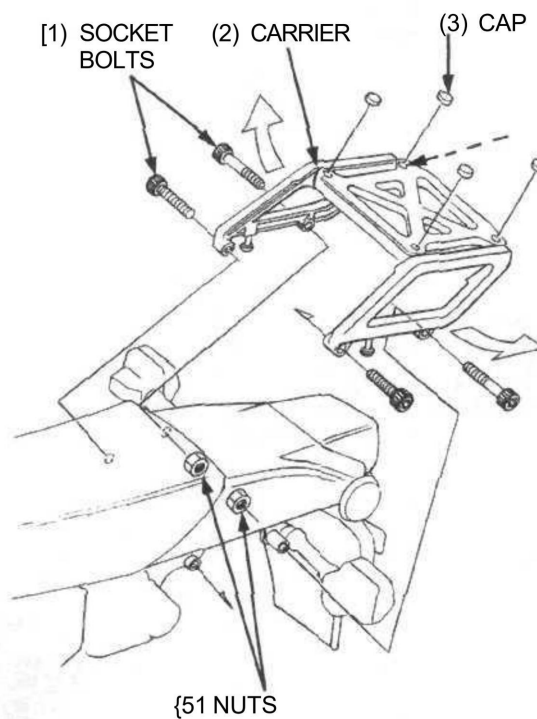
REAR CARRIER (AFTER'88)

REMOVAL

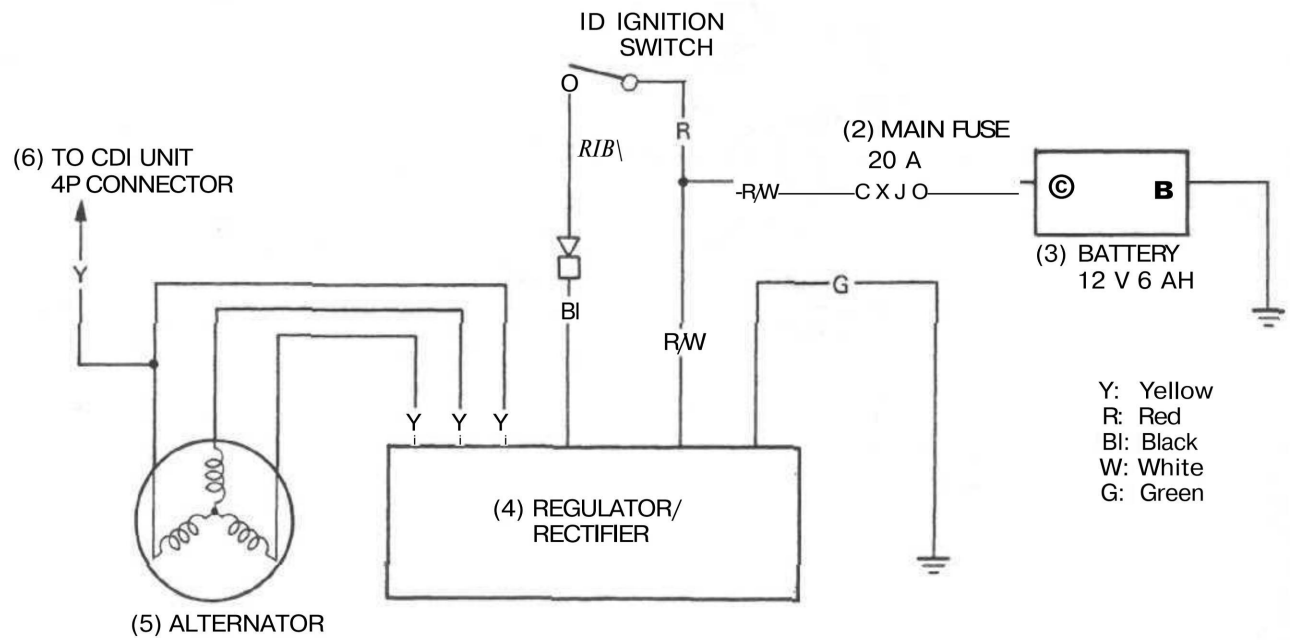
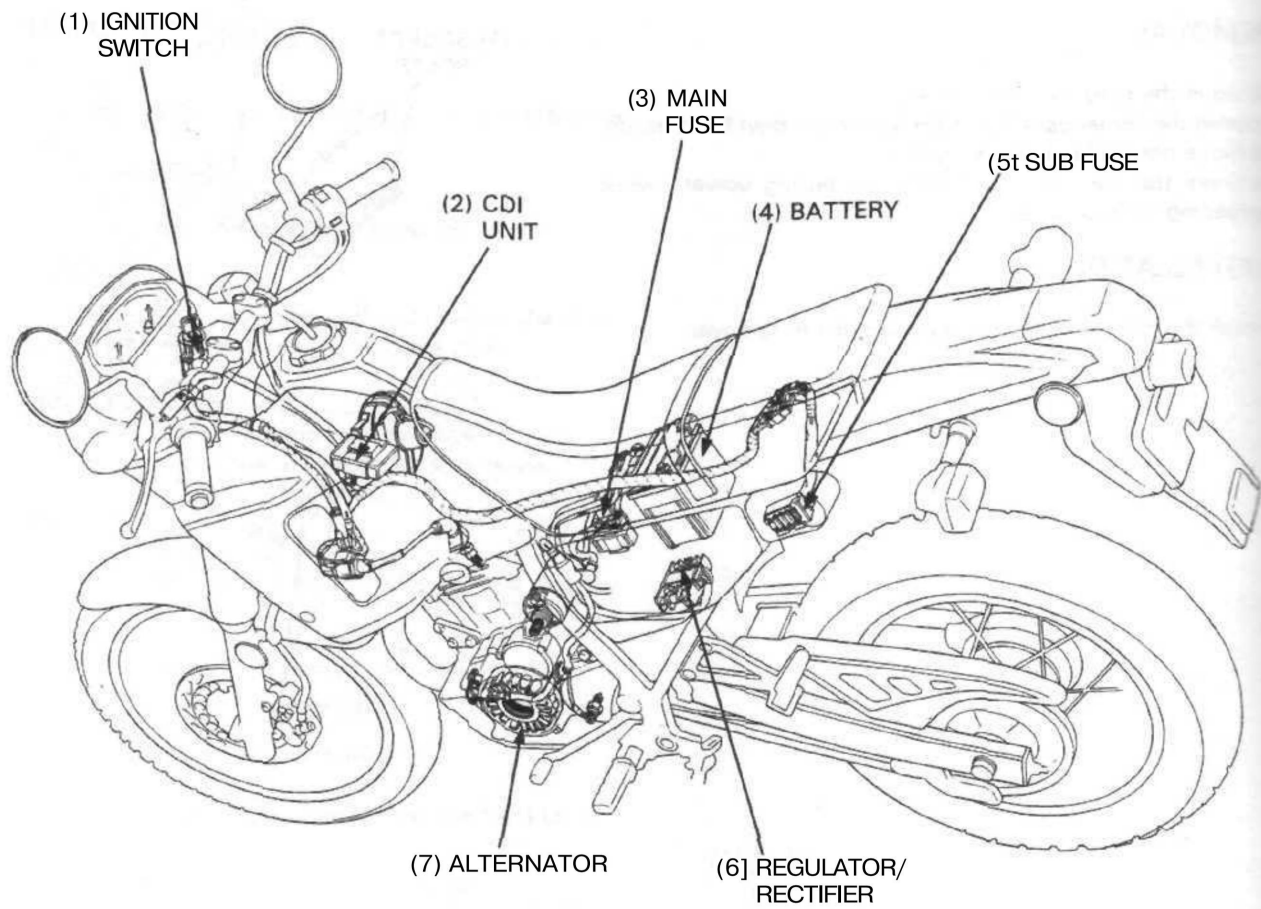
- Remove the caps from the carrier
- Loosen the carrier base 6 mm SH bolts more than five threads.
- Remove the socket bolts and nuts.
- Remove the rear carrier assembly by pulling upward while spreading both lower ends.

INSTALLATION

- Install the rear carrier in the reverse order of removal.



BATTERY /CHARGING SYSTEM



16. BATTERY/CHARGING SYSTEM

SERVICE INFORMATION	16-1	CHARGING SYSTEM	16-5
TROUBLESHOOTING	16-3	ALTERNATOR	16-5
BATTERY	16-4	REGULATOR/RECTIFIER	16-6

SERVICE INFORMATION

GENERAL

⚠ WARNING

- // 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.
- 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.
 - 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 magnesia or vegetable oil and call a physician.

CAUTION

- For battery charging, do not exceed the charging current and time specified on the battery (and shown below). Use of excessive current or charging time may damage the battery.
- Quick charge a battery only in an emergency. Slow-charging is preferred.
- Remove the battery from the frame for charging. If the battery must be charged in the frame, disconnect the battery cables.
- The battery on this motorcycle is a permanently sealed type. Never remove the filler hole caps even when the battery is being charged.
- Be sure to charge the battery with the amount of current and for the time indicated on the battery label and as given below. Charging with excessive current and/or too fast may cause battery failure.

Battery charging

NOTE

- Refer to the instruction in the Operation Manual for the Honda Battery Tester and Christie Battery Charger for detailed battery charging steps.

16

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 Charger (#MC 1012/2) 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

The Christie Battery Charger (#MC 1012/2) 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).

BATTERY/CHARGING SYSTEM

SPECIFICATIONS

ITEM			STANDARD
Battery	Capacity		12 V-6 AH
	Voltage at 20°C (68°F)	Fully charged	13.0-13.2 V (at 25°C)
		Needs charging	12.3 V
	Charging current		0.6 amperes
	Charging time		10 Hr
Regulator/rectifier	Type		Three-phase/full-wave rectify
	Regulated voltage		13.5-15.5 V/5,000rpm
Alternator	Charging coil resistance at 20°C (68°F)		0.1 -1.0Ω
	Output		0.2 kw/5,000 rpm
	Charging start rpm		1,000 ± 100 rpm

TOOLS

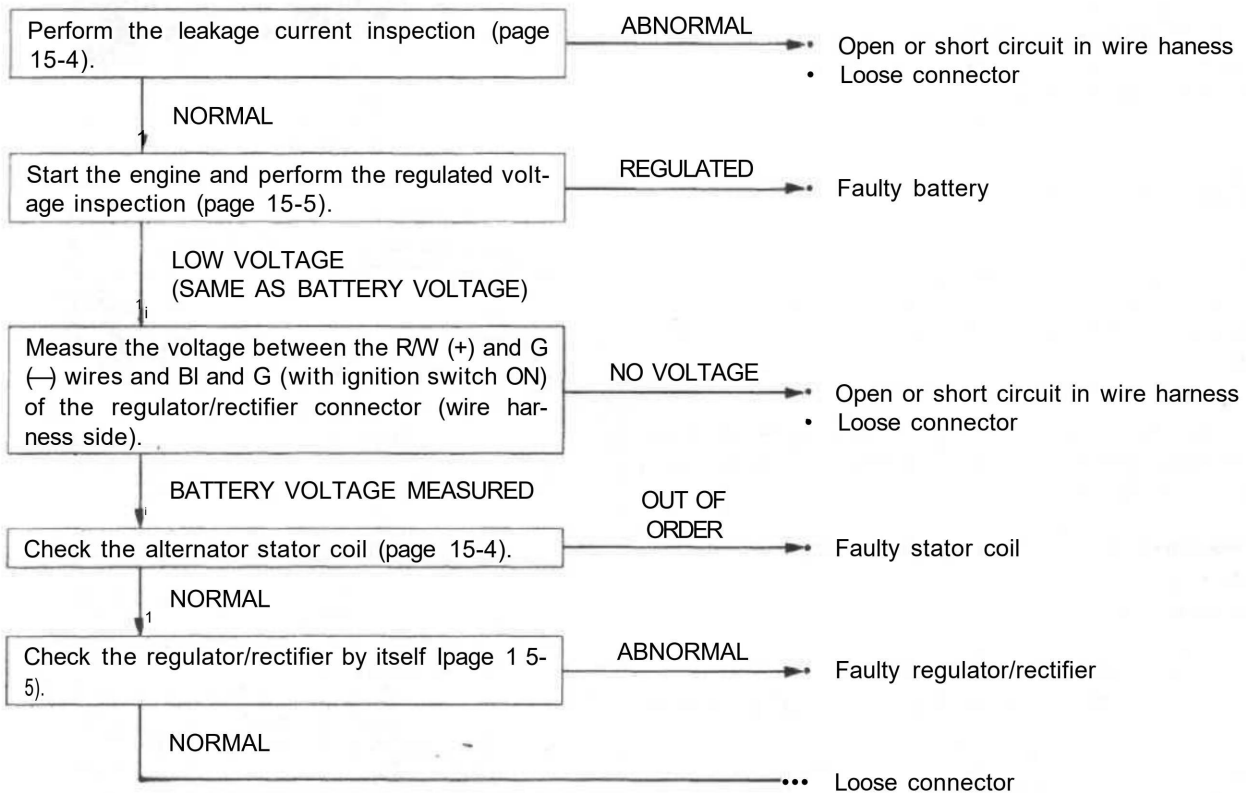
Digital multimeter	07411 -0020000 or KS-AHM-32-003 (U.S.A. only)
Circuit tester (SANWA)	0730S-0020001
or	
Circuit tester (KOWA)	TH-5H
Christie battery charger	MC1012/2 (U.S.A. only)
Honda battery tester	07GMJ-0010000 (U.S.A. only)

TROUBLESHOOTING

NOTE

- If the battery is overcharged, check for —
- Loose or poorly connected black wire terminal at the regulator/rectifier 3P connector
- Open circuit in black wire
- Faulty regulator/rectifier

Battery undercharged



BATTERY/CHARGING SYSTEM

BATTERY

REMOVAL

Remove the seat.

Disconnect the negative terminal from the battery.

Remove the holder plate.

Pull out the battery and disconnect the positive terminal.

Remove the battery.

NOTE

- Refer to the instructions in the Operation Manual for the Honda Battery Tester and Christie Battery Charger for detailed battery testing steps.

CHARGING

NOTE

- Refer to the Operation Manual for the Honda Battery Tester and Christie Battery Charger for details on battery charging steps.

Turn the power switch OFF. Set the Battery Amp. Hr. selector switch for the size of the battery and set the timer to the position indicated by the Honda Battery Tester,

Attach the clamps to the battery terminals — RED to positive, SLACK to negative.

Turn the power switch ON.

After charging is complete,, retest the battery and recharge if necessary.

A WARNING

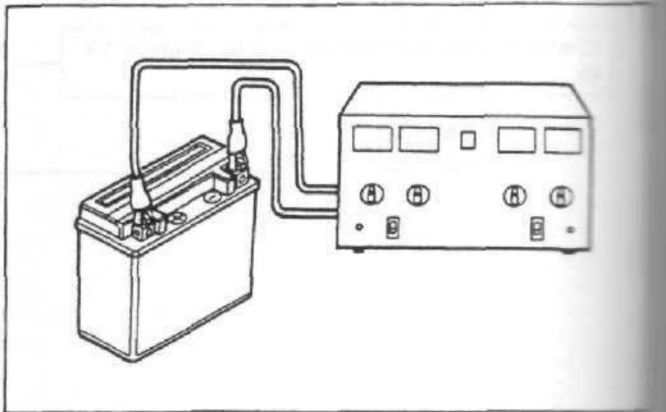
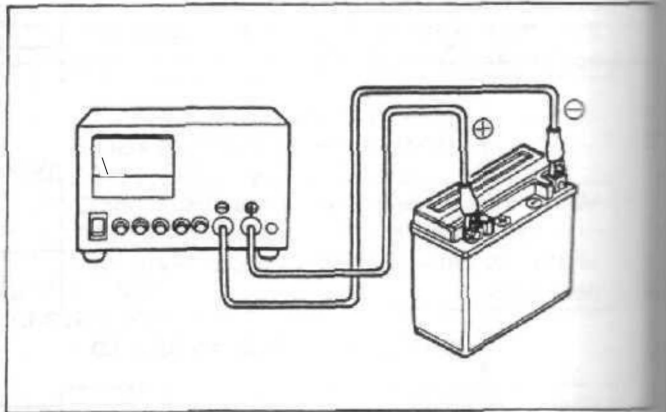
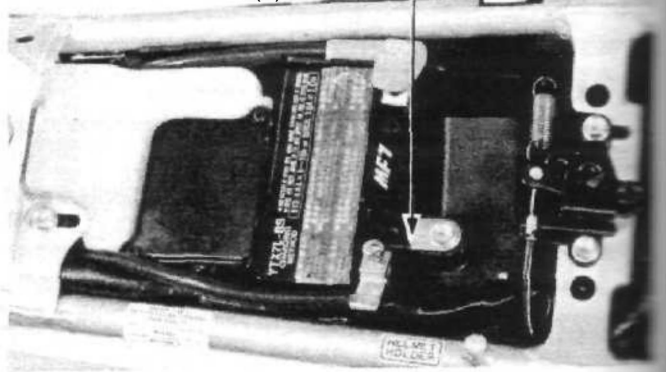
- The battery generates hydrogen gas which can be highly explosive. Do not smoke or allow flames or sparks near the battery, especially while charging.
- If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that can cause loss of consciousness and may lead to death.
- Turn power ON/OFF at the charger, not at the battery terminals.

CAUTION

- Quick-charging should only be done in an emergency; slow charging is preferred.
- Be sure to charge the battery with the correct current and for the time indicated.
- Charging with excessive current and/or too fast may cause battery failure.

After installing the battery, coat the terminals with clean grease.

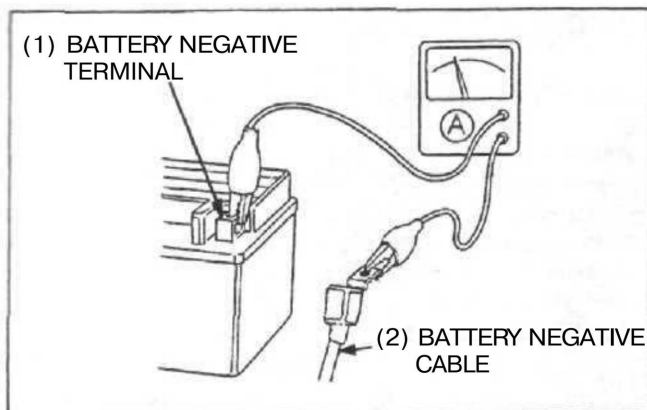
(1) BATTERY HOLDER PLATE



CHARGING SYSTEM

LEAKAGE CURRENT INSPECTION

- Check the battery for ampere leakage before making an charging output inspection.
- Turn the ignition switch OFF. Remove the negative cable from the battery.
- Connect ammeter between the negative cable and battery negative (-) terminal.
- The ammeter should indicate below 1 mA with the ignition switch OFF.



REGULATED VOLTAGE INSPECTION

NOTE

- In order to obtain accurate test readings when checking the charging system, the battery must be fully charged and in good condition before performing this test.

WARNING

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

Warm up the engine to normal operating temperature, Stop the engine, and connect the voltmeter as shown, Connect the tachometer and restart the engine, Allow the engine to idle, and increase the engine speed gradually.

The voltage should be controlled to 13.5—15.5 V at 5,000 rpm. If it is not; check the regulator/rectifier.

CAUTION

- Be careful not to allow the battery positive cable to touch the frame while testing.

ALTERNATOR

NOTE

- It is not necessary to remove the stator coil to make this test.

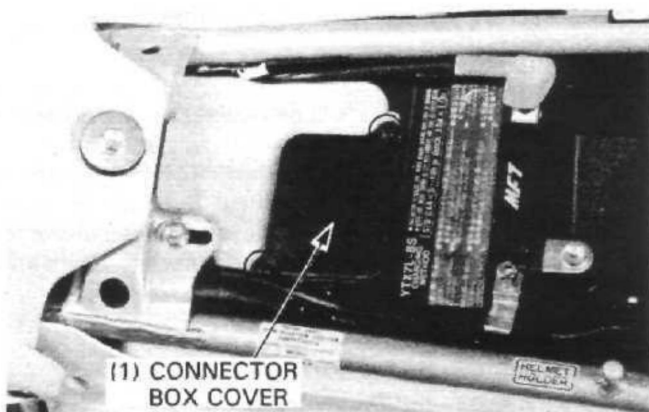
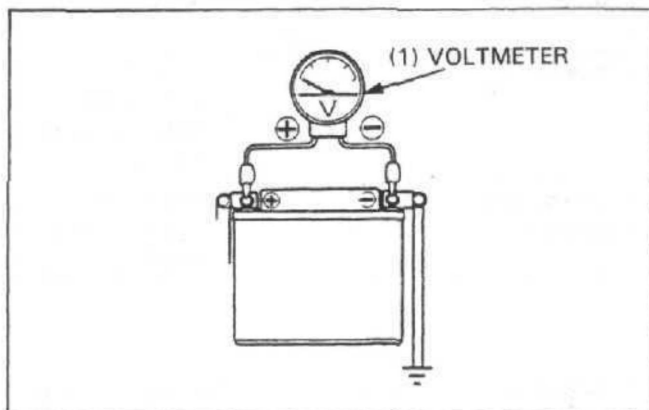
INSPECTION

Disconnect the regulator/rectifier (alternator) 3P connector. Check the resistance between the connector terminals.

STANDARD: 0.1 - 1.0 Q (at 20°C/68°F)

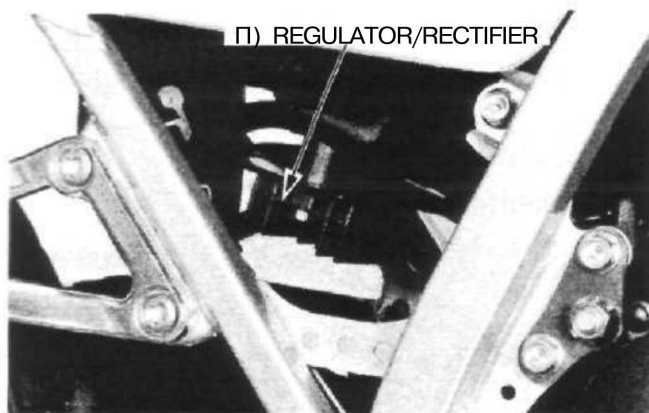
Check for continuity between the connector terminals and ground. There should be no continuity.

Replace the alternator stator if readings are far beyond the standard, or if any wire has continuity to ground. Refer to section 8 for stator removal.



REMOVAL/INSTALLATION

Disconnect the connector and remove the bolts and regulator/rectifier from the air cleaner case.



IGNITION SYSTEM

CIRCUIT D'ALLUMAGE

ZÜNDSYSTEM

- (1) INTERRUPTEUR D'ARRET DU MOTEUR
- (2) UNITE CDI
- (3) BATTERIE
- (4) LATERNATEUR
- (5) GENERATEUR D'IMPULSIONS
- (6) BOBINE D'ALLUMAGE

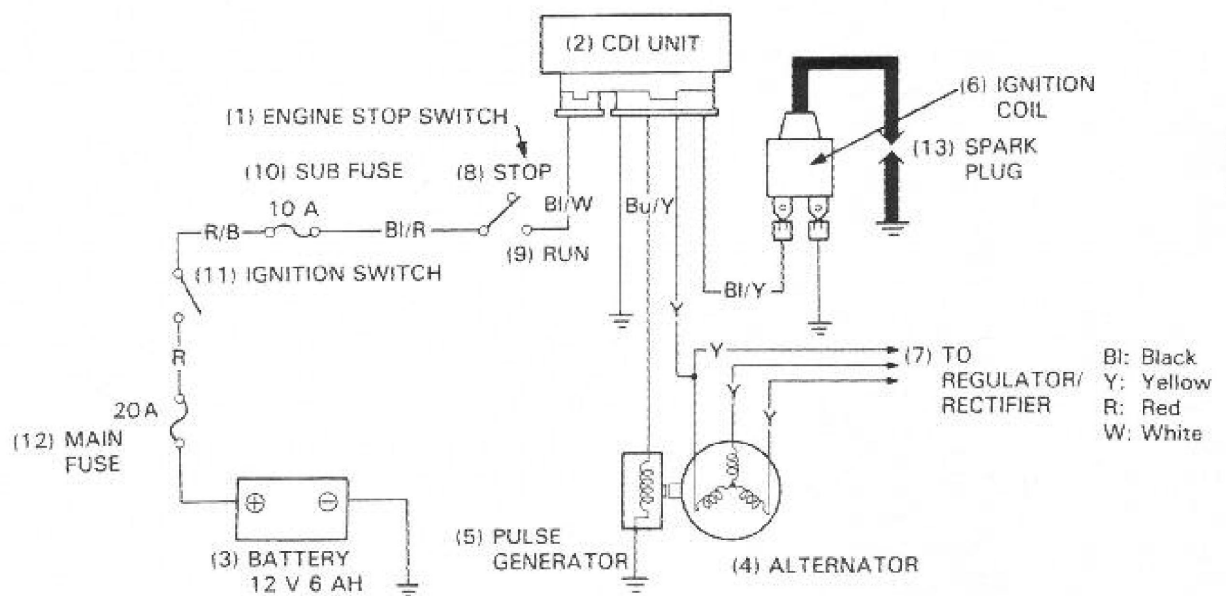
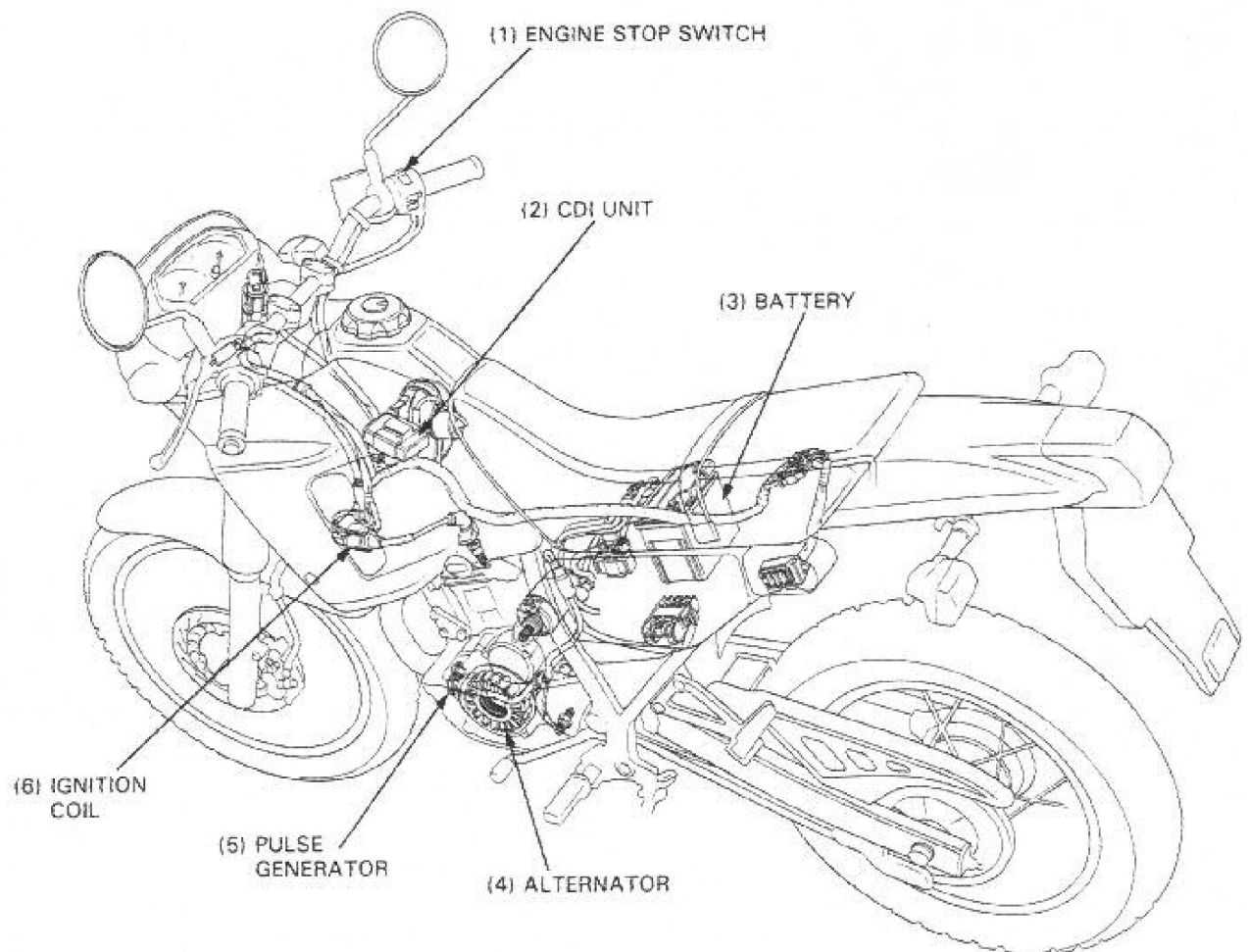
- (1) INTERRUPTEUR D'ARRET DU MOTEUR
- (2) UNITE CDI
- (3) BATTERIE 12 V 6 AH
- (4) ALTERNATEUR
- (5) GENERATEUR D'IMPULSIONS
- (6) BOBINE D'ALLUMAGE
- (7) VERS REGULATEUR/REDRESSEUR
- (8) ARRET
- (9) MARCHE
- (10) FUSIBLE AUXILIAIRE
- (11) CONTACTEUR D'ALLUMAGE
- (12) FUSIBLE PRINCIPAL

Bl : Noir
Y : Jaune
R : Rouge
W : Blanc

- (1) MOTORSTOPPSCHALTER
- (2) CDI-EINHEIT
- (3) BATTERIE
- (4) LICHTMASCHINE
- (5) IMPULSGEBER
- (6) ZÜNDSPULE

- (1) MOTORSTOPPSCHALTER
- (2) CDI-EINHEIT
- (3) BATTERIE
- (4) LICHTMASCHINE
- (5) IMPULSGEBER
- (6) ZÜNDSPULE
- (7) ZUM REGLER/GLEICHRICHTER
- (8) ABSTELLEN
- (9) ANLASSEN
- (10) NEBENSICHERUNG 10 A
- (11) ZÜNDSCHALTER
- (12) HAUPTSICHERUNG
- (13) ZÜNDKERZE

Bl : Schwarz
Y : Gelb
R : Rot
W : Weiß



IGNITION SYSTEM

SERVICE INFORMATION	17-1	CDI UNIT	17-4
TROUBLESHOOTING	17-2	PULSE GENERATOR	17-5
IGNITION COIL	17-3	IGNITION TIMING	17-5

SERVICE INFORMATION

GENERAL

- Ignition timing does not normally need to be adjusted since the CDI (Capacitive Discharge Ignition) unit is factory preset.
- For spark plug inspection, refer to page 3-6.
- For alternator or pulse generator removal/installation, see section 8.
- When inspecting the ignition system, check the system components and lines step-by-step according to the troubleshooting sequence on the next page.

SPECIFICATION

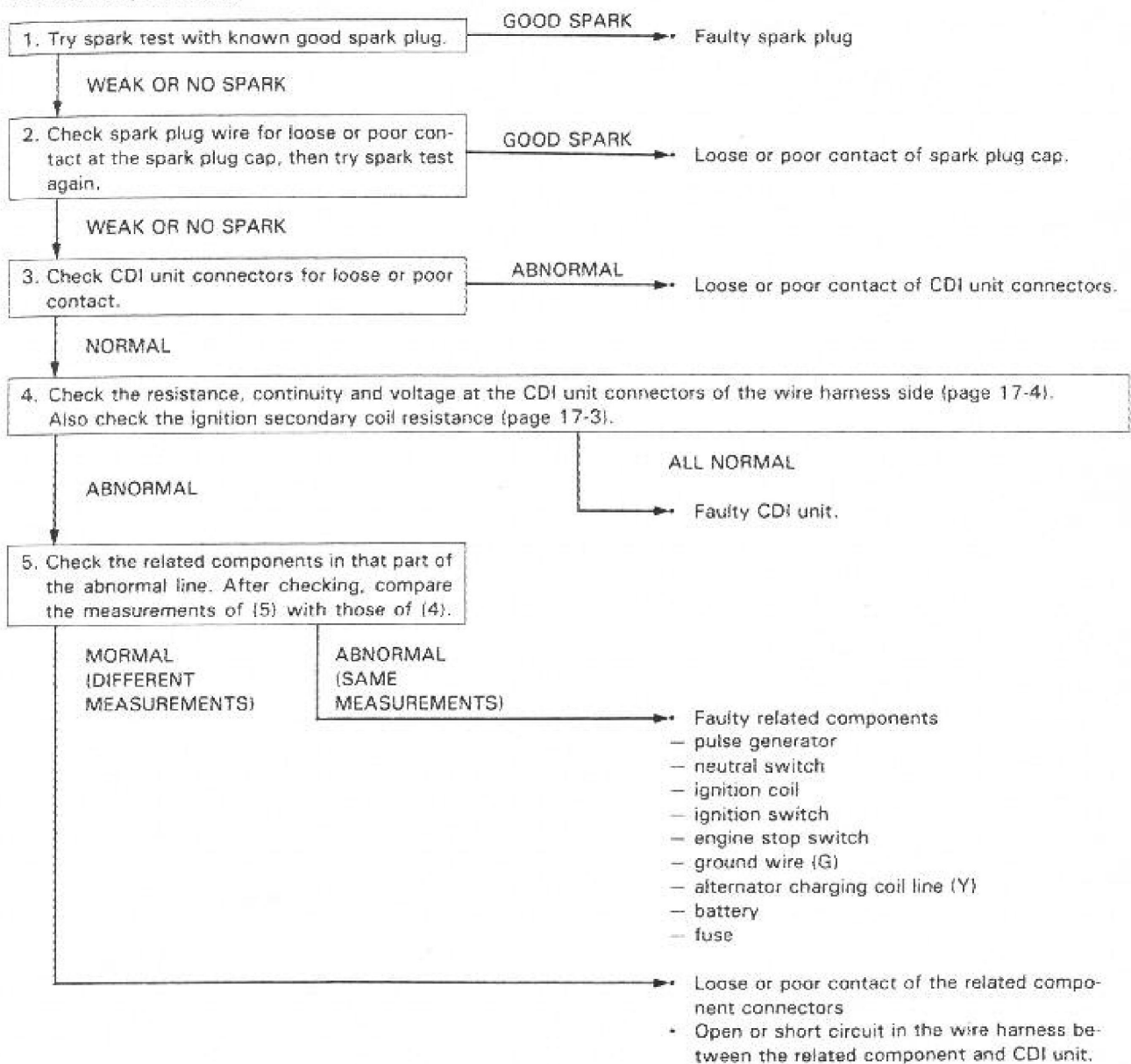
ITEM		STANDARD
Spark plug		CR9EH9 (NGK), U27FER9 (ND)
Spark plug gap		0.8–0.9 mm (0.031–0.035 in)
Ignition timing	At idle (F mark)	8° BTDC at 1,300 ± 100 min ⁻¹ (rpm)
	Full advance	30° BTDC at 4,500 ± 100 min ⁻¹ (rpm)
Ignition coil (20°C/68°F)	Primary coil resistance	0.1–0.2 Ω
	Secondary coil resistance (Without spark plug cap) (With spark plug cap)	3.5–4.7 kΩ
		7.3–11.0 kΩ
Pulse generator resistance (20°C/68°F)		290–360 Ω

TOOLS

Digital multimeter	07411–0020000
or	
Circuit tester (SANWA)	07308–0020001
or	
Circuit tester (KOWA)	TH–5H

TROUBLESHOOTING

Weak or no spark at plug



IGNITION SYSTEM

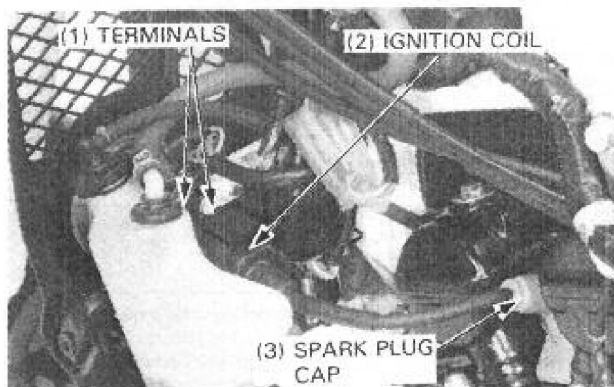
IGNITION COIL

REMOVAL

Remove the fuel tank (page 4-3).

Remove the spark plug cap from the spark plug.

Disconnect the ignition coil wire (B/Y and G) terminals and remove the ignition coil.



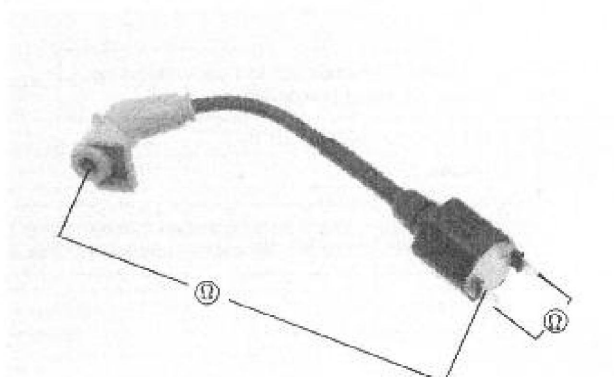
INSPECTION

Measure the resistance of the primary coil.

STANDARD (at 20°C/68°F): 0.1–0.2 Ω

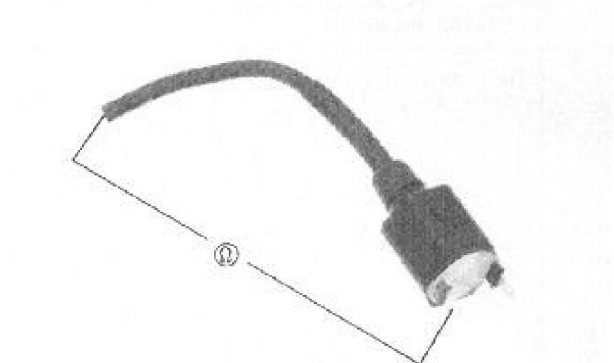
Measure the resistance of the secondary coil with the plug cap in place.

STANDARD (at 20°C/68°F): With cap 7.3–11.0 k Ω



If the measured resistance is not within standard values, remove the spark plug cap and measure the secondary coil resistance again.

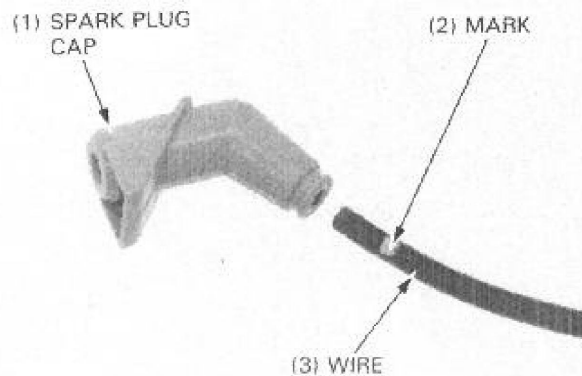
STANDARD (at 20°C/68°F): Without cap 3.5–4.7 k Ω



Install the spark plug cap, making sure that the mark on the wire is completely covered by the end of the cap.

INSTALLATION

Install the ignition coil in the reverse order of removal.
Install the fuel tank (page 4-3).



IGNITION SYSTEM

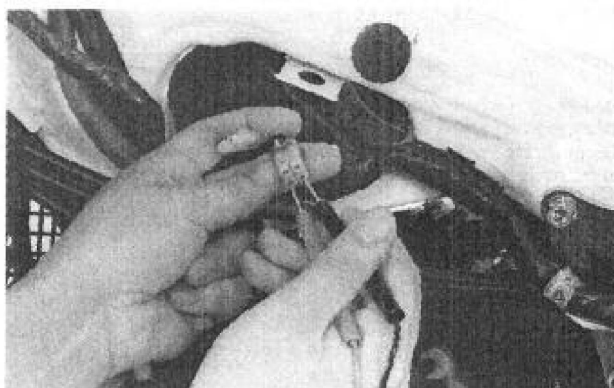
CDI UNIT

INSPECTION

Remove the fuel tank (page 4-3).

Disconnect the CDI unit connectors and check them for loose contact or corroded terminals.

Measure the resistance, continuity and voltage between connector terminals of the wire harness side as follows:



ITEM	TERMINAL	STANDARD
Ignition coil primary coil	Bl/Y and G	0.1—0.2 Ω (at 20°C/68°F)
Pulse generator coil	Bu/Y and G	290—360 Ω (at 20°C/68°F)
Ignition switch and engine stop switch (Turn the ignition switch ON and the engine stop switch to RUN)	Bl/W and G	The battery voltage should register.
Ground line	G and ground	Continuity
AC sensor line	Y and G	No continuity

If any one item does not meet the standard, test the individual component and replace it or repair open or short circuit in wire or loose connector as required.

IGNITION SYSTEM

PULSE GENERATOR

INSPECTION

NOTE

- It is not necessary to remove the left crankcase cover to make this test.

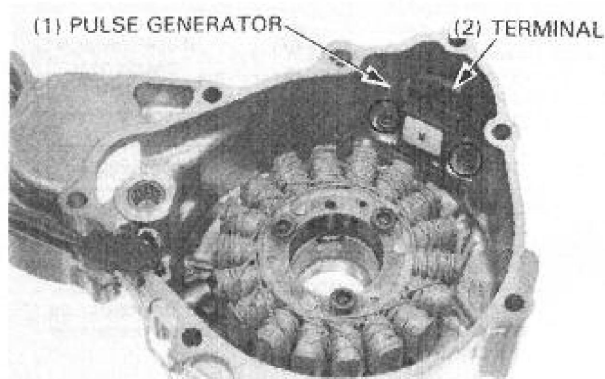
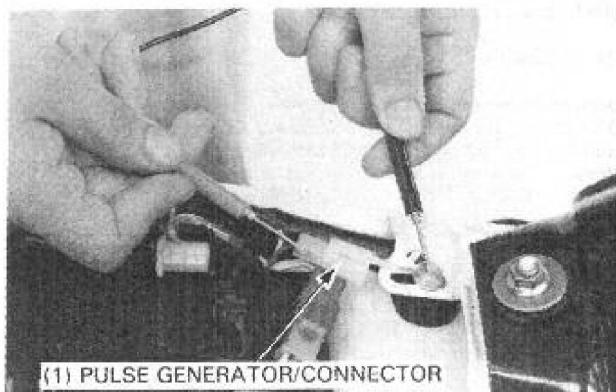
Remove the fuel tank (page 4-3).

Remove the connector box cover (page 8-2) and disconnect the pulse generator (2P White) connector.

Measure the resistance between the Bu/Y wire and frame ground.

STANDARD: (at 20°C/68°F) 290—360 Ω

If the reading is far beyond the standard, remove the left crankcase cover (page 8-2), disconnect the pulse generator wire connector from the pulse generator terminal and measure the resistance between the terminal and frame ground. Replace the pulse generator if necessary.



IGNITION TIMING

NOTE

- The Capacitive Discharge Ignition (CDI) system is factory pre-set and does not require adjustment. To inspect the function of the CDI components, ignition timing inspection procedures are given here.

Warm up the engine to the operating temperature.

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.*

Remove the timing hole cap.

Connect a tachometer and timing light.

Start the engine and allow it to idle.

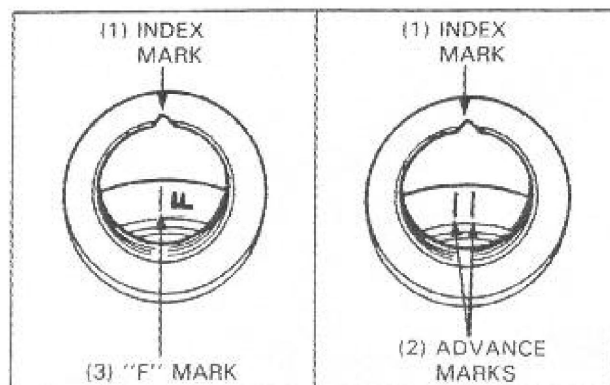
IDLE SPEED: 1,300 $\pm$ 100 min⁻¹ (rpm)

Inspect the ignition timing.

Timing is correct if the "F" mark on the alternator rotor is aligned with the index mark on the left crankcase cover at idle.

To check the advance, raise the engine speed to 4,500 $\pm$ 100 min⁻¹ (rpm). The index mark should be between the advance marks.

If the ignition timing is incorrect, perform the system inspection (page 17-2).



ELECTRIC STARTER

DEMARREUR ELECTRIQUE

ELEKTRISCHER ANLASSER

- (1) CONTACTEUR D'ALLUMAGE
- (2) INTERRUPTEUR D'ARRET DU MOTEUR
- (3) CONTACTEUR DE DEMARREUR
- (4) DEMARREUR
- (5) BATTERIE
- (6) FUSIBLE AUXILIAIRE
- (7) DIODE D'EMBRAYAGE
- (8) RELAIS DE DEMARREUR, FUSIBLE PRINCIPAL
- (9) CONTACTEUR DE POINT MORT
- (10) CONTACTEUR D'EMBRAYAGE

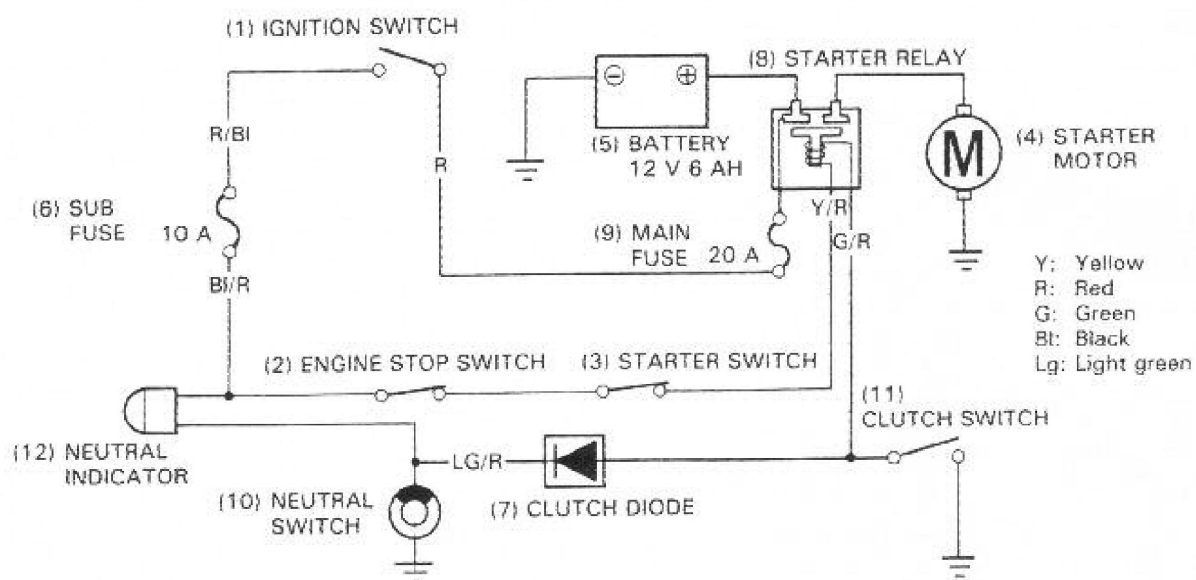
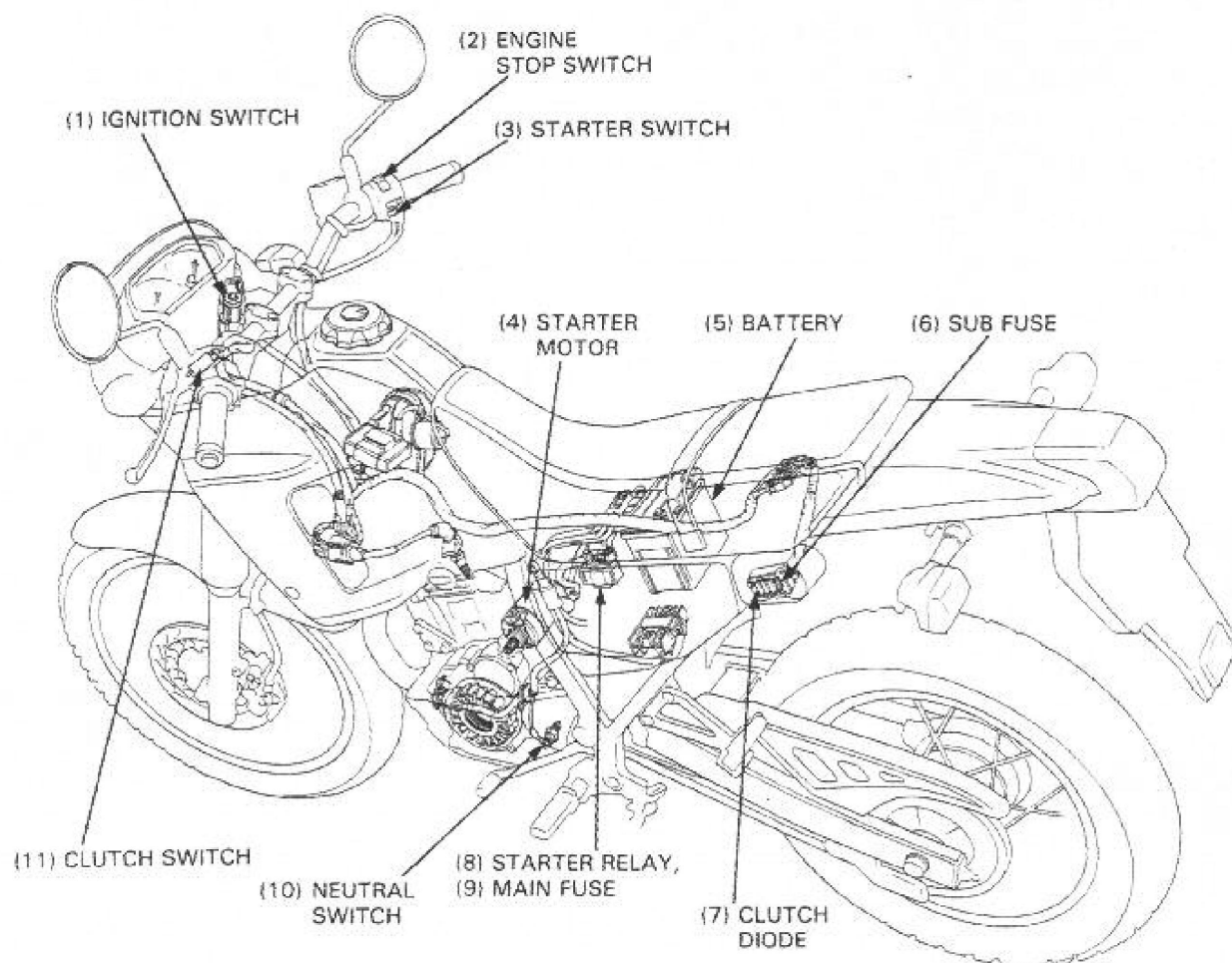
- (1) CONTACTEUR D'ALLUMAGE
- (2) INTERRUPTEUR D'ARRET DU MOTEUR
- (3) CONTACTEUR DE DEMARREUR
- (4) DEMARREUR
- (5) BATTERIE 12 V 6 AH
- (6) FUSIBLE AUXILIAIRE
- (7) DIODE
- (8) RELAIS DE DEMARREUR
- (9) FUSIBLE PRINCIPAL 20 A
- (10) CONTACTEUR DE POINT MORT
- (11) CONTACTEUR D'EMBRAYAGE
- (12) TEMOIN DE POINT MORT

Y : Jaune
R : Rouge
G : Vert
Bl : Noir
Lg : Vert clair

- (1) ZÜNDSCHALTER
- (2) MOTORSTOPPSCHALTER
- (3) ANLASSERSCHALTER
- (4) ANLASSER
- (5) BATTERIE
- (6) NEBENSICHERUNG
- (7) KUPPLUNGSDIODE
- (8) ANLASSERRELAIS, HAUPTSICHERUNG
- (9)
- (10) LEERLAUFSCHALTER
- (11) KUPPLUNGSSCHALTER

- (1) ZÜNDSCHALTER
- (2) MOTORSTOPPSCHALTER
- (3) ANLASSERSCHALTER
- (4) ANLASSER
- (5) BATTERIE 12 V 6 AH
- (6) NEBENSICHERUNG 10 A
- (7) DIODE
- (8) ANLASSERRELAIS
- (9) HAUPTSICHERUNG 20 A
- (10) LEERLAUFSCHALTER
- (11) KUPPLUNGSSCHALTER
- (12) LEERLAUFANZEIGE

Y : Gelb
R : Rot
G : Grün
Bl : Schwarz
Lg : Hellgrün



ELECTRIC STARTER

SERVICE INFORMATION	18-1	STARTER MOTOR	18-3
TROUBLESHOOTING	18-2	STARTER RELAY SWITCH	18-6

SERVICE INFORMATION

GENERAL

- The starter motor can be removed with the engine in the frame.
- For the starter reduction gear removal/installation, see section 8.

SPECIFICATIONS

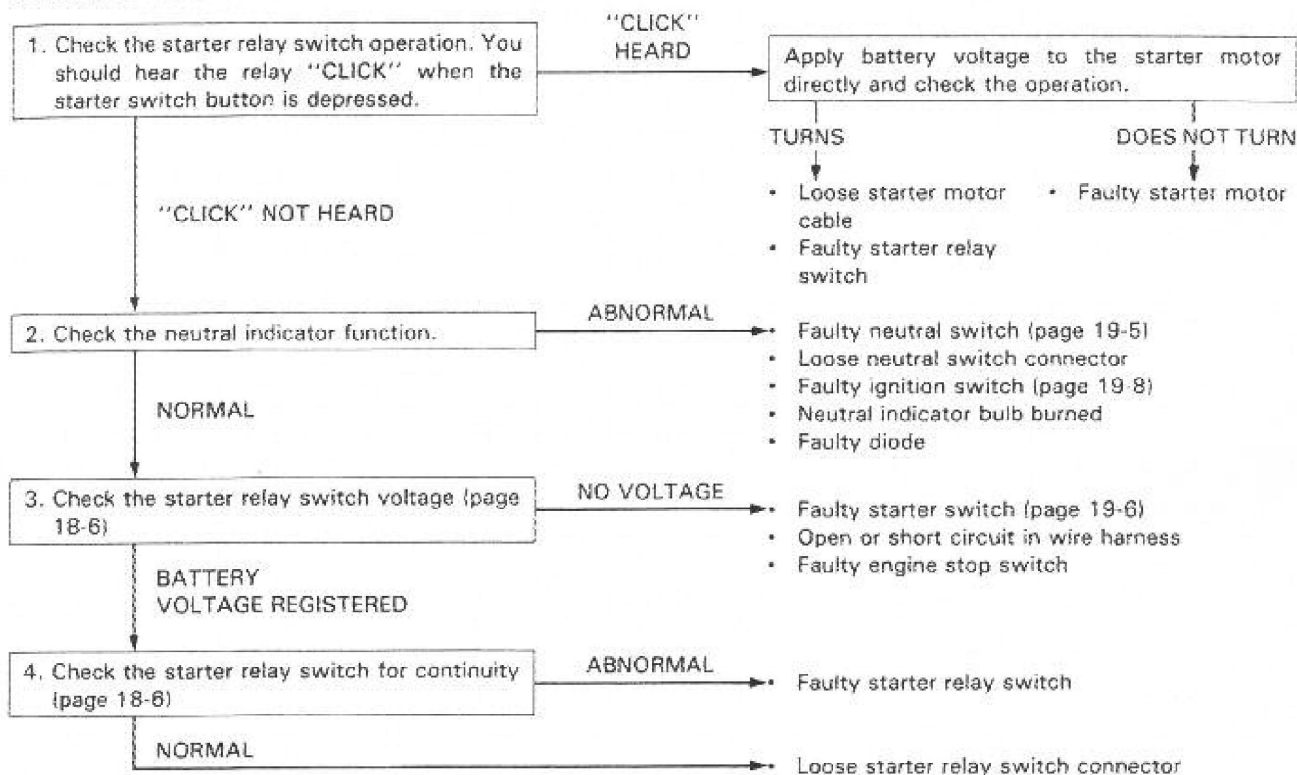
ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	12.5 mm (0.49 in)	8.5 mm (0.33 in)

TROUBLESHOOTING

NOTE

- The starter motor could turn when the transmission is in neutral.
- Check the following items before troubleshooting the system.
 - Burned fuse.
 - Battery and starter motor cables for loose connection.
 - Battery discharged.

Starter motor does not turn



Starter motor turns engine slowly

- Battery undercharged
- Excessive resistance in circuit
- Binding in starter motor

Starter motor turns, but engine does not turn

- Faulty starter clutch
- Faulty starter reduction gears

Starter motor and engine turns, but engine does not start

- Faulty ignition system
- Engine problems
 - Low compression
 - Fouled spark plugs

ELECTRIC STARTER

STARTER MOTOR

REMOVAL

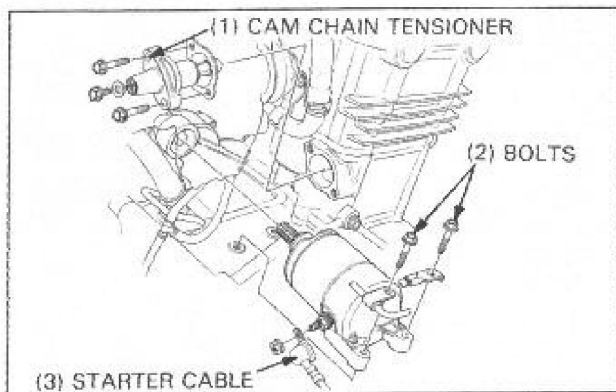
⚠ WARNING

- *With the ignition switch OFF, remove the negative cable at the battery before servicing the starter motor.*

Remove the following:

- exhaust pipe (page 15-1).
- cam chain tensioner (page 9-3).

Disconnect the starter cable from the starter motor.
Remove the two mounting bolts and the starter motor.

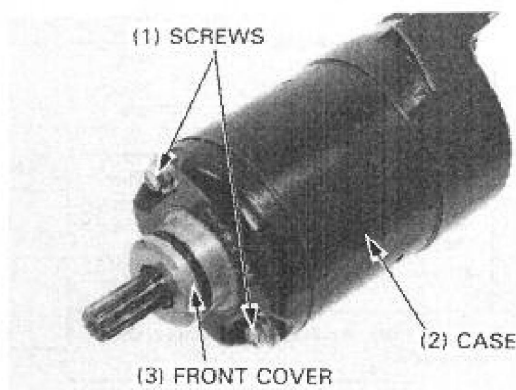


DISASSEMBLY

Remove the two starter motor case screws and remove the front cover, motor case and armature coil.

NOTE

- Record the number and location of shims for correct assembly.



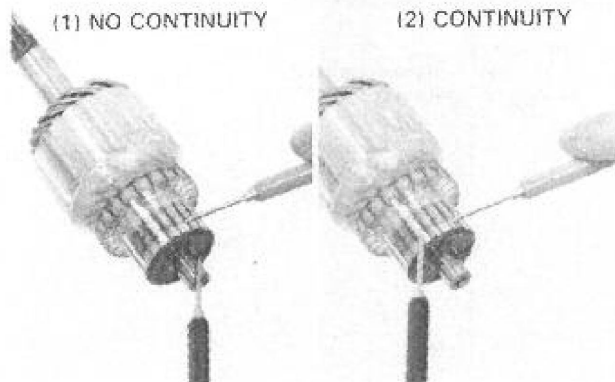
INSPECTION

Inspect the commutator bars for discoloration. Bars discolored in pairs indicate grounded armature coils, in which case the starter motor must be replaced.



Check for continuity between individual commutator bars and the armature shaft; there should be no continuity.

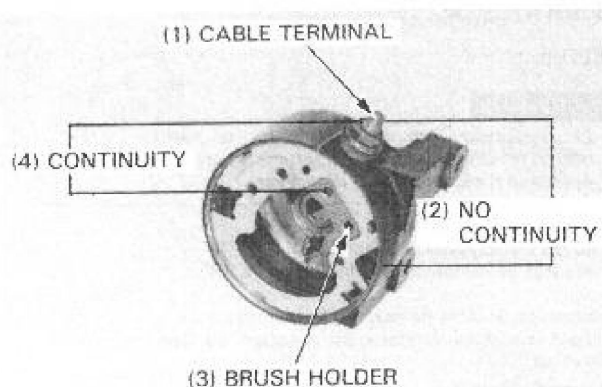
Also, check for continuity between pair of commutator bars; there should be continuity.



ELECTRIC STARTER

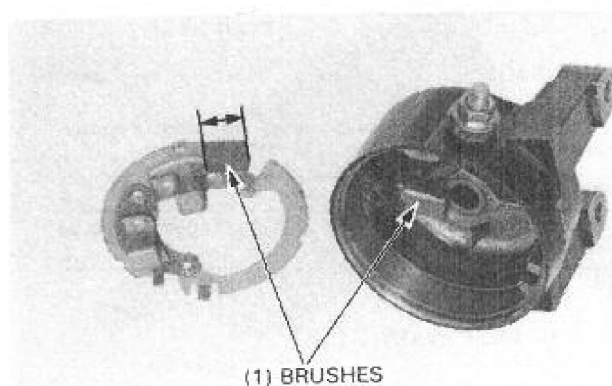
Check for continuity between the cable terminal and the brush wire (the indigo colored wire or the insulated brush holder). There should be continuity.

Check for continuity between the rear cover and the brush wire (the indigo colored wire or the insulated brush holder). There should be no continuity.

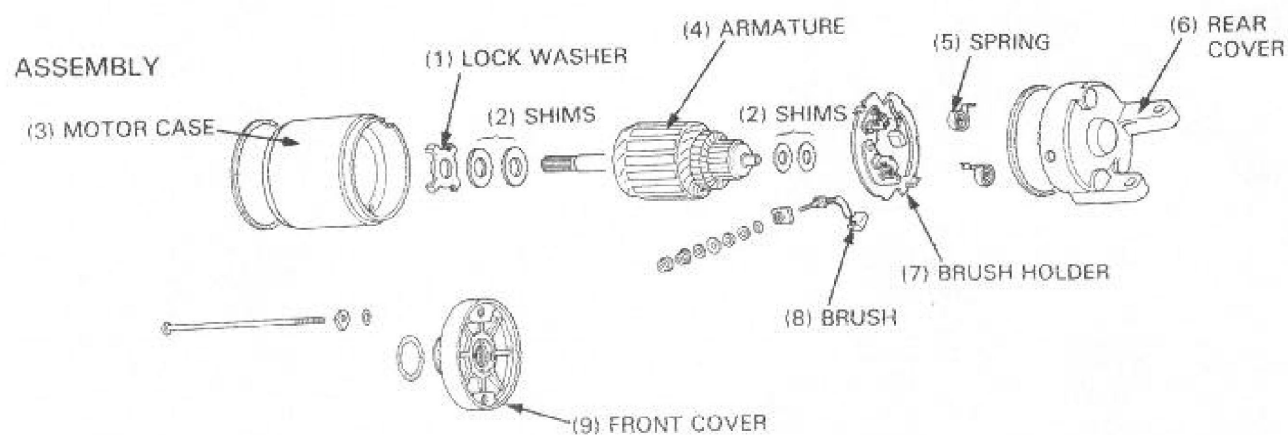
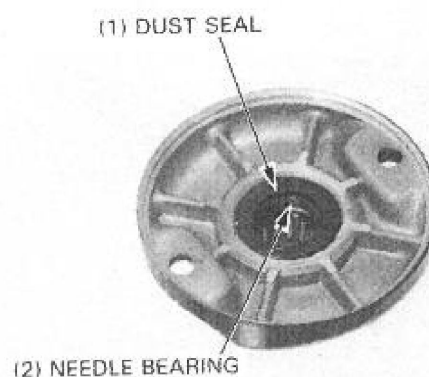


Disassemble the rear cover.
Inspect the brushes for damage and measure the brush length.

SERVICE LIMIT: 8.5 mm (0.33 in)



Check the needle bearing of the front cover for smooth rotation.
Check the dust seal for wear or damage.

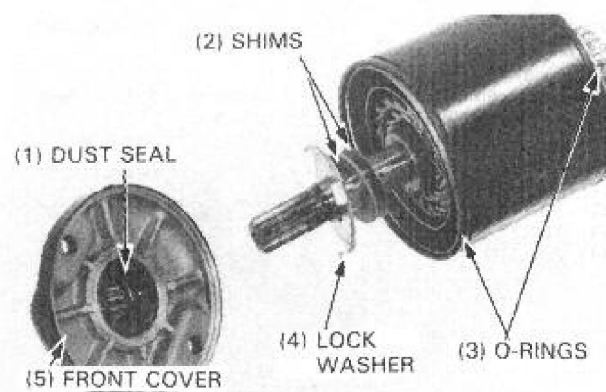


ELECTRIC STARTER

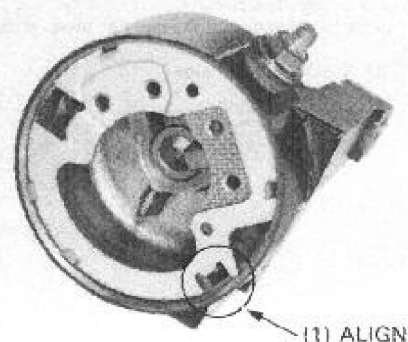
Install a new O-ring onto the starter motor case and insert the armature in the case as shown.
Apply grease to the front cover dust seal.
Install the lock washer and shims to the shaft then install the front cover.

NOTE

- Install the shims in the correct positions as recorded.
- Do not damage the front cover dust seal at installation.



Install the brushes in the brush holder then install the holder assembly to the rear cover, aligning the tab of the holder with the groove of the rear cover.

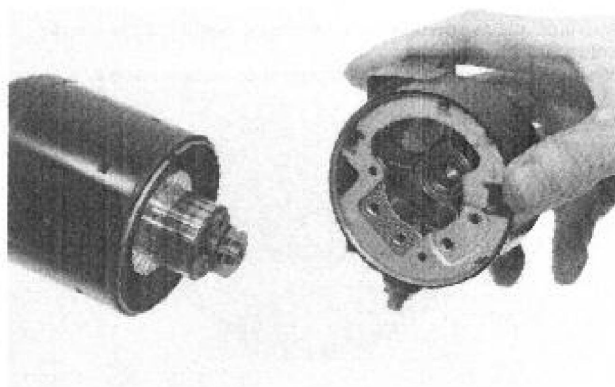


Install the shims to the shaft of the armature coil.

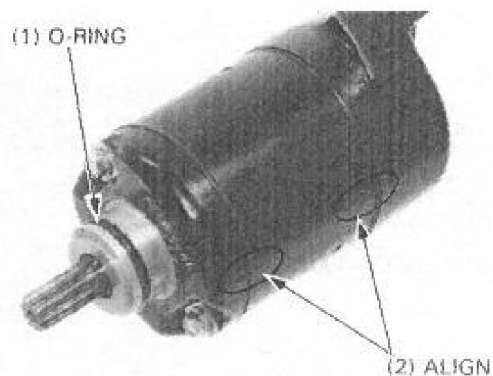
NOTE

- Install the shims in the correct positions as recorded.

Install the rear cover to the armature, aligning the pin with the groove in the case.



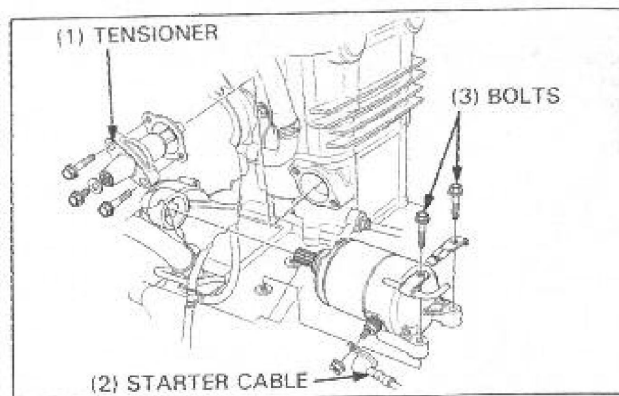
Align the index marks of the front cover, motor case and rear cover.
Install the screws securely.
Apply oil to the O-ring and install it on the front cover.



ELECTRIC STARTER

INSTALLATION

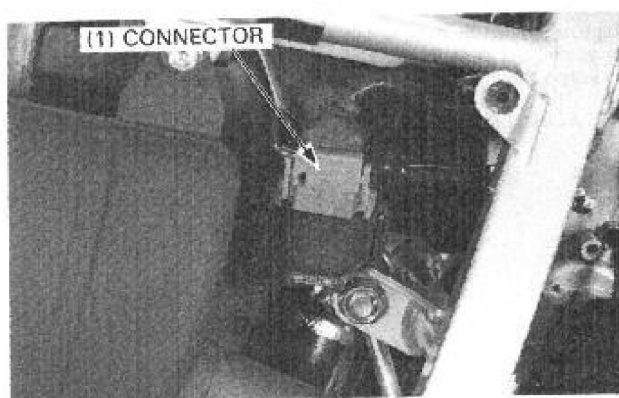
Install the starter motor with the two mounting bolts.
Connect the starter cable to the motor.
Install the cam chain tensioner.
Connect the negative cable to the battery.



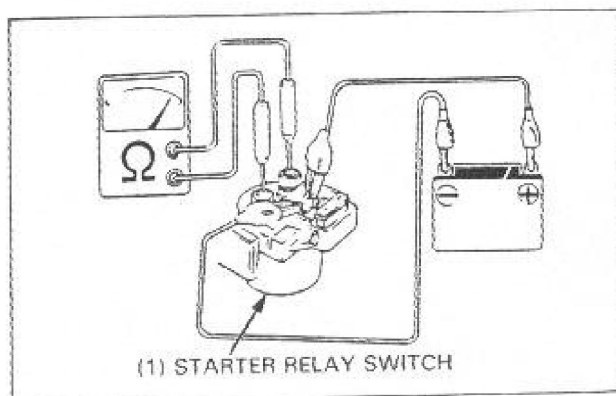
STARTER RELAY SWITCH

INSPECTION

Shift the transmission into the neutral.
Disconnect the connector from the starter relay.
Measure the voltage between the yellow/red and green/red wire terminals of the connector at the harness side.
Turn the ignition switch "ON" and the engine stop switch to "RUN".
There should be battery voltage while the starter switch is depressed.
If there is no voltage, check for loose contact of the neutral switch, sub fuse and connector, or an open circuit in the wire harness.



Connect an ohmmeter to the starter relay switch terminals.
Connect a 12 V battery to the switch connector terminals with the positive wire to the yellow/red wire terminal and the negative wire to the green/red wire terminal. The switch is normal if there is continuity.



19. LIGHTS/METERS/SWITCHES

SERVICE INFORMATION	19-1	REAR BRAKE LIGHT SWITCH	19-6
TROUBLESHOOTING	19-2	CLUTCH SWITCH	19-6
HEADLIGHT	19-3	HANDLEBAR SWITCH	19-7
INSTRUMENT CASE	19-4	HORN	19-7
TURN SIGNAL/TAIL LIGHT BULB	19-5	IGNITION SWITCH	19-8
NEUTRAL SWITCH	19-5	THERMOSTATIC SWITCH	19-9
FRONT BRAKE LIGHT SWITCH	19-6	TEMPERATURE SENSOR	19-9

SERVICE INFORMATION

GENERAL

- Some wires have different colored bands around them near the connector. These are connected to other wires which have the same color band.
- All plastic connectors have locking tabs that must be released before disconnecting, and must be aligned when reconnecting.
- The following color codes used are indicated throughout this section and on the wiring diagram.

Bu = Blue	G = Green	Lg = Light Green	R = Red
Bl = Black	Gr = Grey	O = Orange	W = White
Br = Brown	Lb = Light Blue	P = Pink	Y = Yellow

- To isolate an electrical failure, check the continuity of the electrical path through the part. A continuity check can usually be made without removing the part from the motorcycle. Simply disconnect the wires and connect a continuity tester or volt-ohmmeter to the terminals or connections.
- A continuity tester is useful when checking to find out whether or not there is an electrical connection between the two points. An ohmmeter is needed to measure the resistance of a circuit, such as when there is a specific coil resistance involved, or when checking for high resistance caused by corroded connections.

TORQUE VALUES

Thermostatic switch	18N-m<1.8kg-m, 13 ft-lb)
Ignition switch screw	7 N-m (0.7 kg-m, 5 ft-lb)
Temperature sensor	10N-m (1.0 kg-m, 7 ft-lb) Apply sealant to the threads

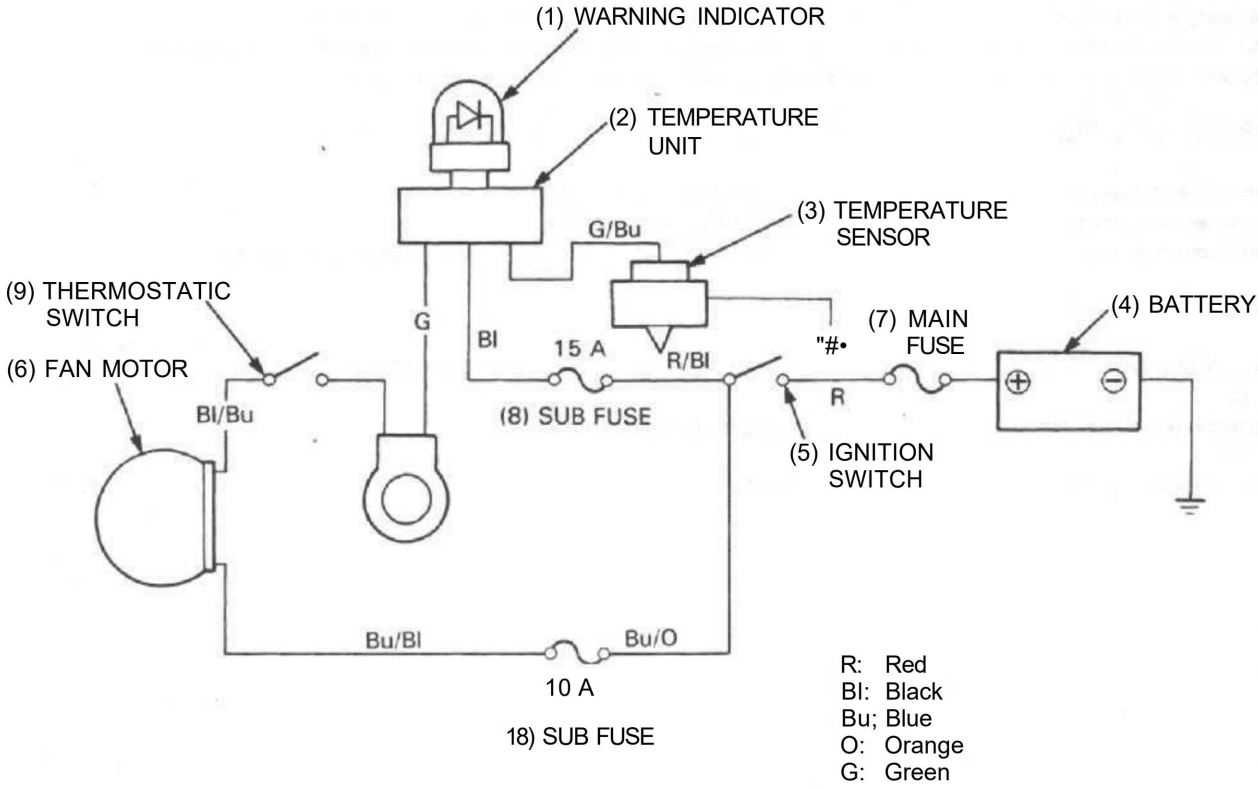
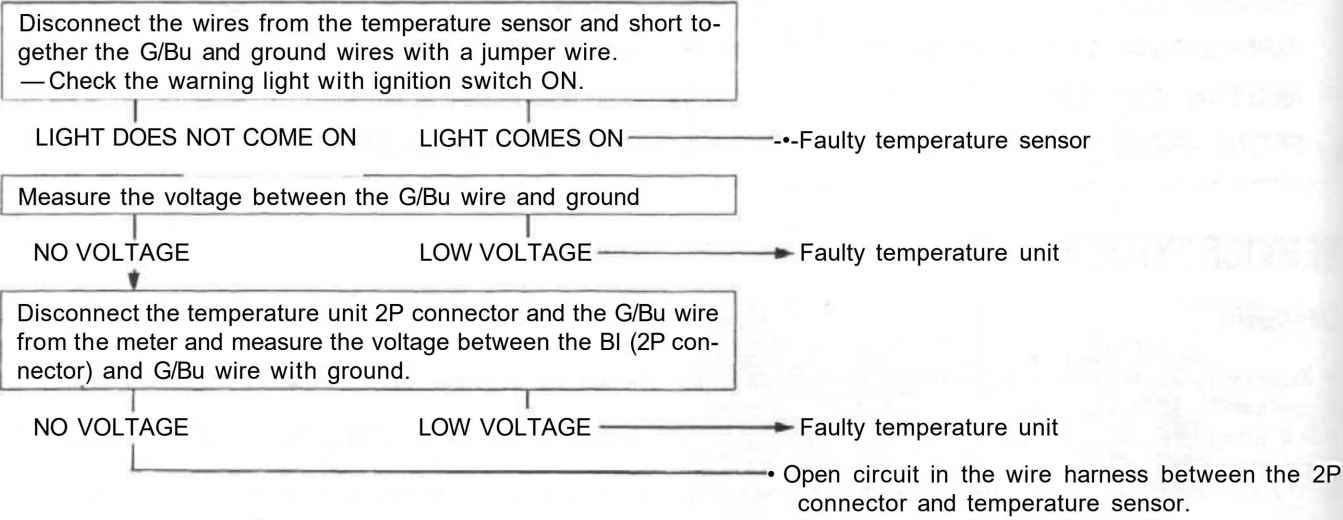
TOOLS

Digital Multitester	07411 -0020000 or KS-AHM-32-003 (U.S.A. only)
or	
Circuit tester (SANWA)	07308-0020000
or	
Circuit tester (KOWA)	TH-5H

TROUBLESHOOTING

TEMPERATURE WARNING SYSTEM

If the temperature warning light does not come on:



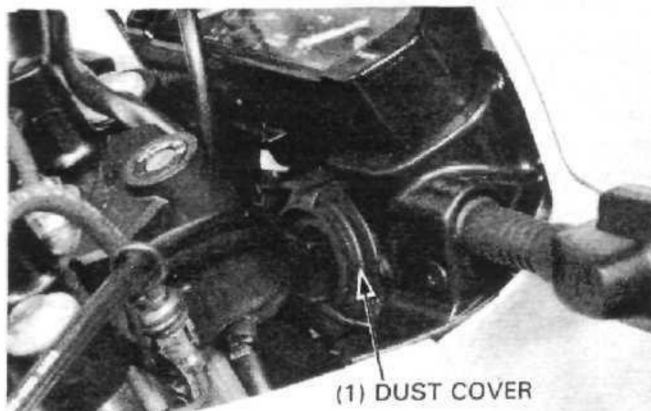
HEADLIGHT

CAUTION

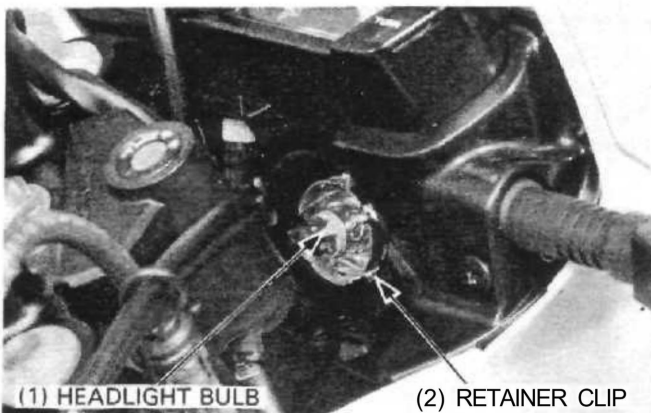
- *Do not leave fingerprints on the bulb; they may create hot spots. Wear clean gloves when installing the halogen bulb. If you do touch the bulb with bare hands, clean it with an alcohol-moistened cloth before installing it in the case.*

BULB REPLACEMENT

Remove the dust cover.

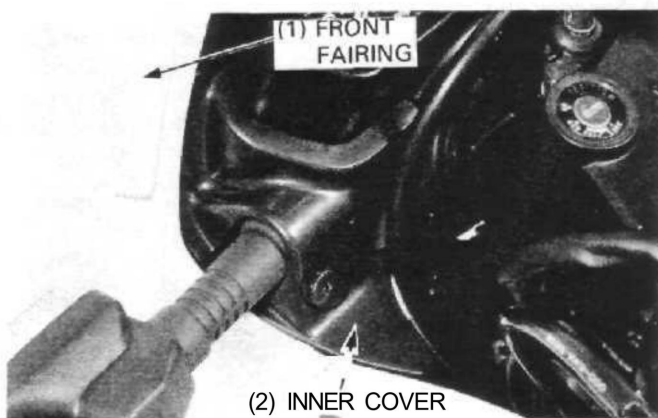


Remove the retainer clip and headlight bulb.

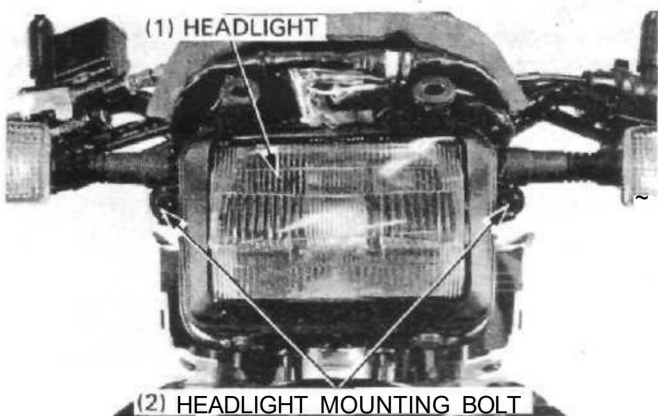


CASE REMOVAL

Remove the inner covers and the front fairing.



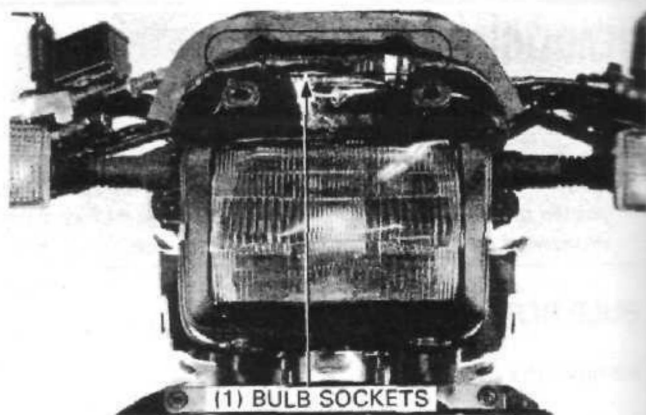
Disconnect the headlight connectors.
Remove the headlight mounting bolts and headlight.



INSTRUMENT CASE

BULB REPLACEMENT

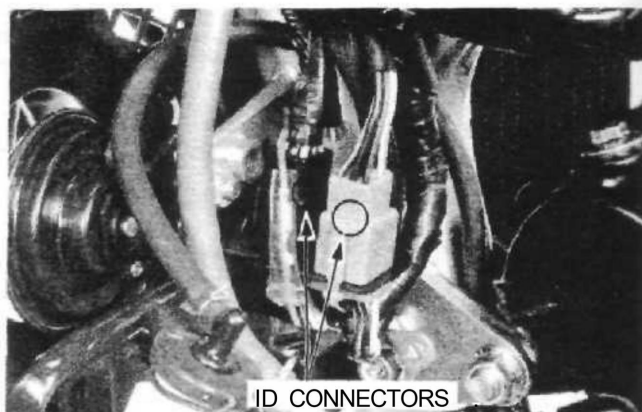
Remove the front fairing and the headlight case (page 1 9-3). Remove the bulb socket from the case then replace the bulb with a new one.



METER REPLACEMENT

Remove the fuel tank (page 4-3).

Remove the connector box cover and disconnect the meter connectors.



• Speedometer

Disconnect the speedometer cable from the meter and disconnect the turn signal relay connectors from the relay.

Remove the mounting bolts and free the case from the fairing bracket, then remove the speedometer.

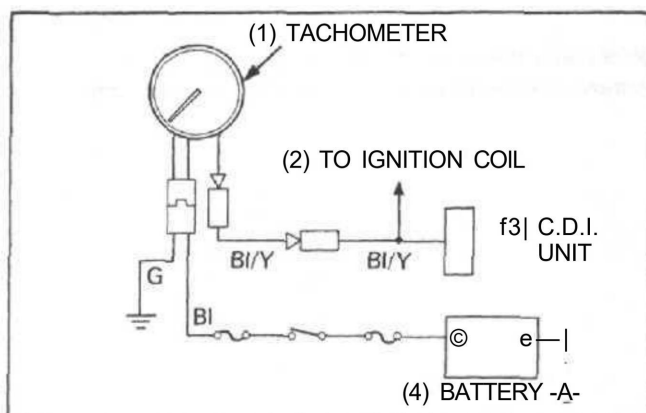


• Tachometer

If the tachometer does not work properly turn the ignition switch ON and check the voltage between the Black and Green wires at the 2P connector. There should be battery voltage. If not, check the continuity between the meter Black/Yellow wire and the Black/Yellow wire at the CDI unit. If the circuit is OK, check for a loose connector. If the connector is OK, the tachometer is faulty.

If there is no voltage:

- Black wire open circuit
- Faulty tachometer



TURN SIGNAL/TAIL LIGHT BULB

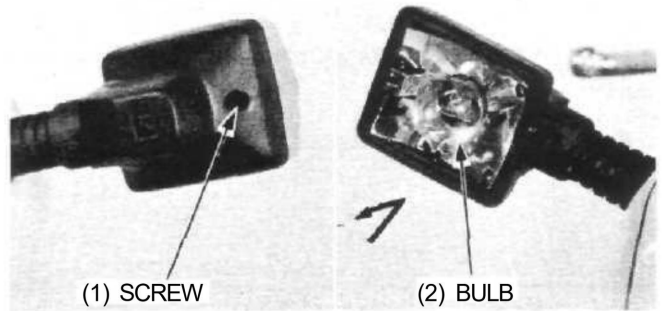
TURN SIGNAL LIGHT BULB REPLACEMENT

Remove the turn signal lens attaching screw.
While pushing in, turn the bulb counterclockwise to remove.
Replace the bulb, if necessary.

Install in the reverse order of removal.

NOTE

- Seat the rubber gasket properly.



TAIL LIGHT/LICENSE LIGHT BULB REPLACEMENT

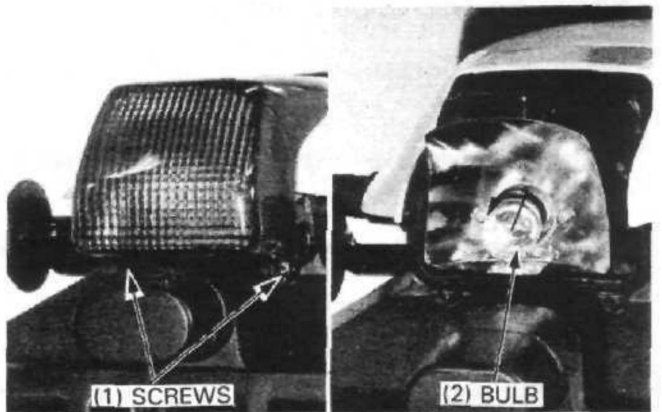
Remove the tail light lens attaching screws and lens.

While pushing in, turn the bulb counterclockwise to remove.
Replace the bulb, if necessary.

Install in the reverse order of removal.

NOTE

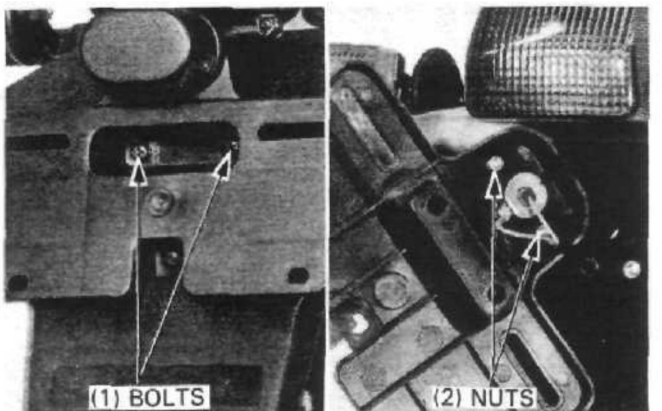
- Seat the rubber gasket properly.



Remove the license light cover mounting nuts and cover.
Remove the lens and bulb.

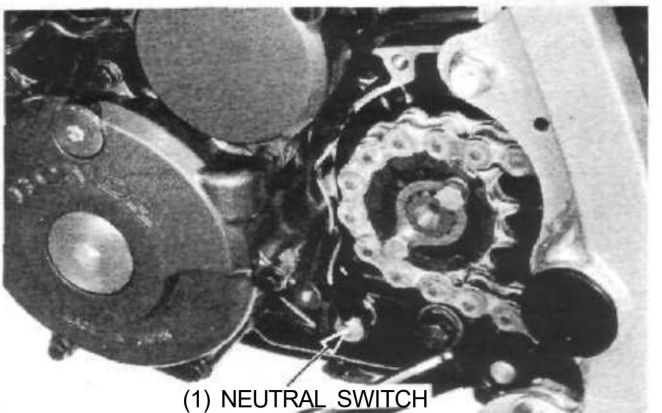
While pushing in, turn the bulb counterclockwise to remove.
Replace the bulb, if necessary.

Install the bulb and lens in the reverse order of removal.



NEUTRAL SWITCH

Remove the drive sprocket cover (page 8-2).
Check the neutral switch for continuity between the switch terminal and ground.
There should be continuity when the transmission is in neutral.
There should be no continuity with the transmission in any gear.



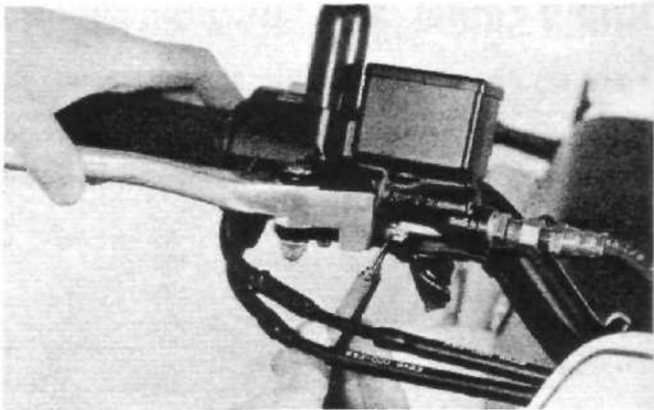
LIGHTS/METERS/SWITCHES

FRONT BRAKE LIGHT SWITCH

Disconnect the front brake light switch connectors and check for continuity.

The switch should show continuity with the front brake applied.

Replace the switch if necessary.



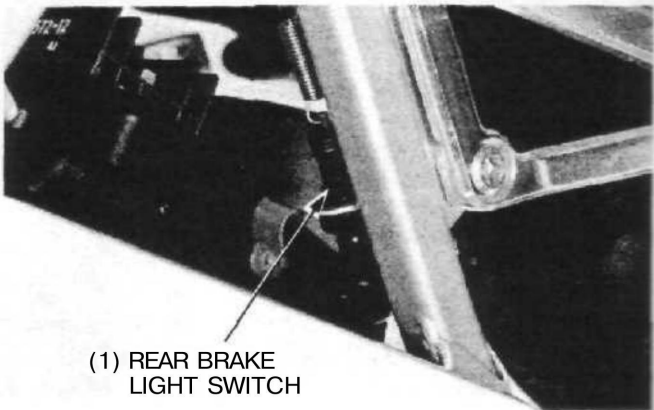
REAR BRAKE LIGHT SWITCH

Disconnect the rear brake light switch and check for continuity.

The switch should have continuity with the rear brake applied and no continuity with the released.

Replace or readjust the rear brake light switch if necessary.

See page 3-14 for adjustment procedures.

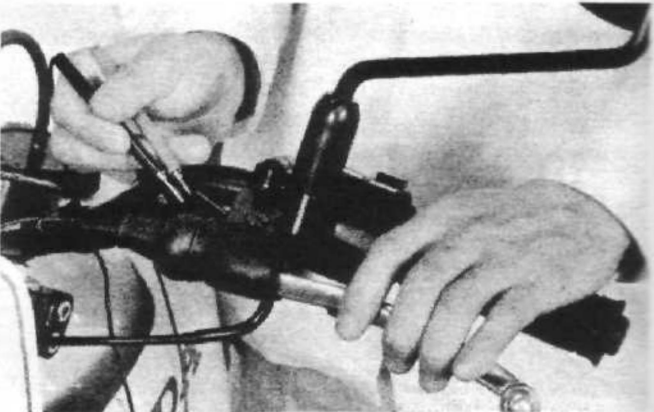


CLUTCH SWITCH

Disconnect the clutch switch connectors and check for continuity.

The switch should have continuity with the clutch lever applied.

Replace the clutch switch if necessary.



HANDLEBAR SWITCH

RIGHT HANDLEBAR SWITCH

Remove the front fairing (page 15-2).

Disconnect the right handlebar switch connector (9P) and check for continuity between terminals. Continuity should exist between the color coded wires in each chart.

Starter Button

	IG	ST	HLi	HL2
FREE				
PUSH				
COLOR	Bl/W	Y/R	W/G Br	Bu/W

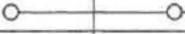
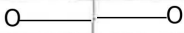
Engine Stop Switch

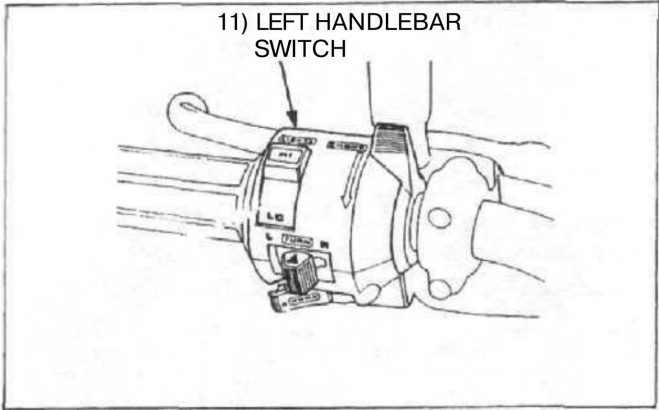
	IG	BATe
OFF		
RUN		
COLOR	Bl/W	Bl/R

LEFT HANDLEBAR SWITCH

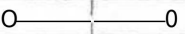
Disconnect the left handlebar switch connector (9P) and check for continuity between terminals. Continuity should exist between the color coded wires in each chart.

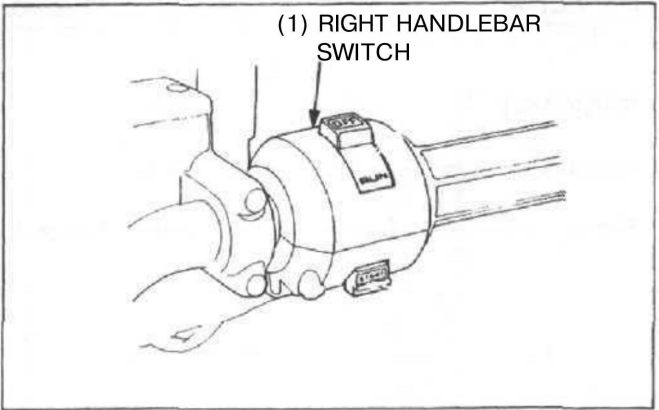
Dimmer Switch

	Hi	HL	Lo
Hi			
(N)			
Lo			
COLOR	Bu	Bu/W	W

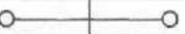


Turn Signal Switch

	R	W	L
R			
N			
L			
COLOR	Lb	Gr	O

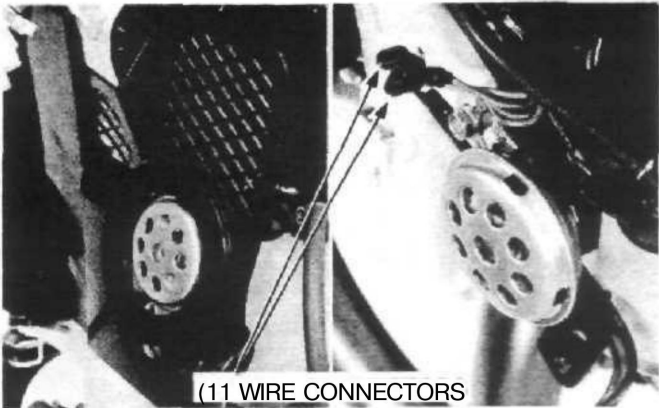


Horn Switch

	BAT3	Ho
FREE		
PUSH		
COLOR	Bl	Lg

HORN

Disconnect the wire connectors from the horn and connect a 12V battery to the horn wire terminals. The horn is normal if it sounds when the 12 V battery is connected across the horn terminals.



IGNITION SWITCH

INSPECTION

Remove the fuel tank (page 4-3).
Disconnect the ignition switch wire connector.

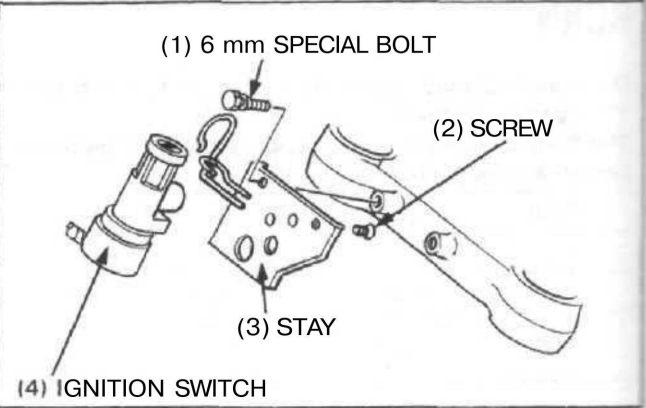
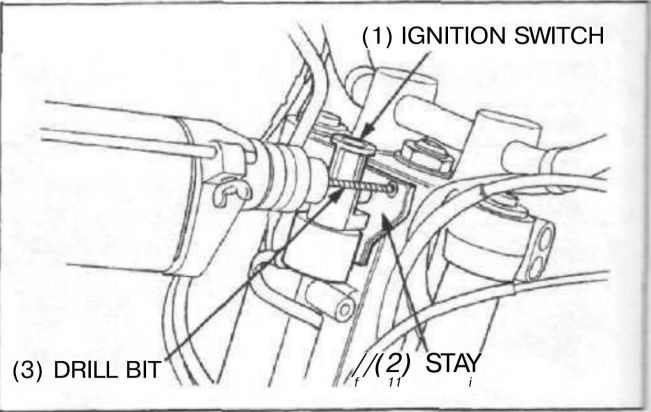
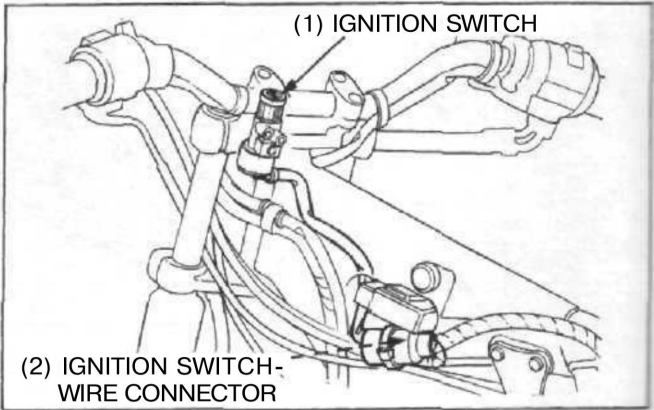
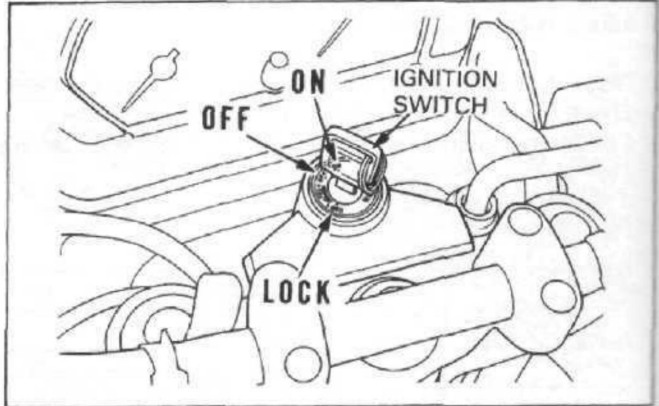
Check for continuity should exist between the terminals in each switch position. Continuity should register as shown:

	BAT1	BAT2	FAN
ON	O — 1 — O	O	O
OFF			
LOCK			
COLOR	R	R/Bl	Bu/O

REMOVAL

Disconnect the ignition switch wire connectors.

Remove the headlight (page 19-3) and instrument (page 19-4).



Remove the ignition switch cover.
Drill the ignition switch stay special mounting bolts out with a sharp 4 mm (5/32 in) drill bit.

Remove the ignition switch stay.

Remove the screws and ignition switch from the stay.

Install a new ignition switch on the stay with the screws.

TORQUE: 7 N-m (0.7 kg-m, 5 ft-lb)

Clean the threads of the fork bridge thoroughly.

Install the ignition switch stay and tighten new 6 mm special bolts until the bolt heads break off.

NOTE

- The bolt heads are painted black.

Connect the ignition switch wire connectors.
Install the removed parts.

THERMOSTATIC SWITCH

The cooling fan motor is actuated by the thermostatic switch located in the bottom of the radiator.

If the fan motor does not start, disconnect the 2P: Black connector from the switch.

Connect together Black/Blue and Green terminals of the 2P connector with a suitable jumper wire.

Turn the ignition switch ON. The cooling fan motor should start running. If it does not start, check for battery voltage from the Black/Blue lead of the fan motor connector and ground with ignition switch ON.

If there is no voltage, check for a blown fuse, loose terminals or connectors, or an open circuit.

If there is voltage, inspect the thermostatic switch as follows: Drain the coolant (page 5-4) and remove the thermostatic switch.

Connect one lead of an ohmmeter to the connector of the thermostatic switch and the other to the body.

Suspend the thermostatic switch in a pan of coolant (50—50 mixture) and check the temperatures at which the switch opens and closes.

Make sure that there is no continuity at room temperature and then gradually raise the coolant temperature. The switch should show continuity (close) at 93°—97°C (199°—207°F).

NOTE

- Keep the temperature for 3 minutes to confirm continuity. A sudden change of temperature will cause an incorrect temperature reading between the thermometer and switch.
- Do not let the switch or thermometer touch the pan as it will give a false reading.
- Immerse the switch in coolant up to its threads.

Install the thermostatic switch.

TORQUE: 18 N·m (1.8 kg-m, 13ft-lb)

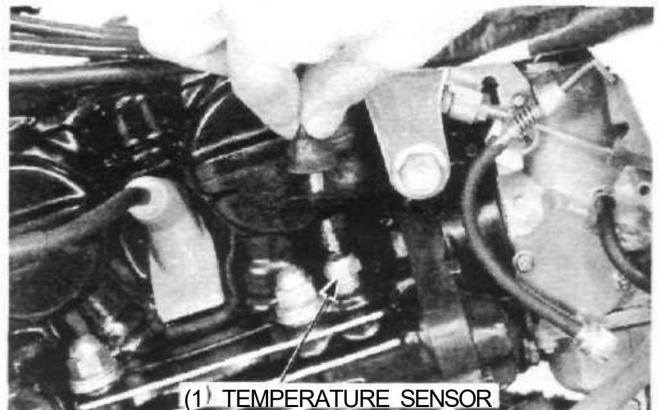
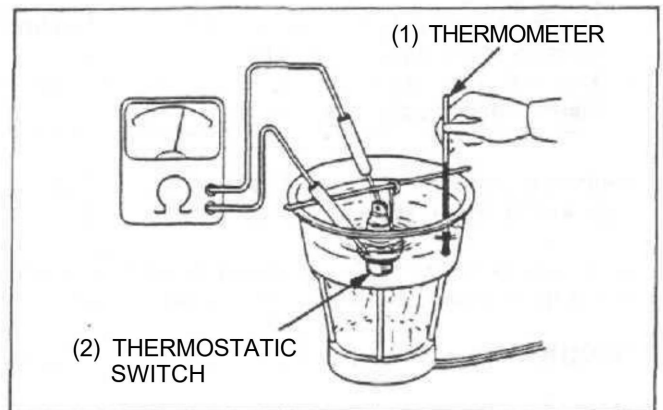
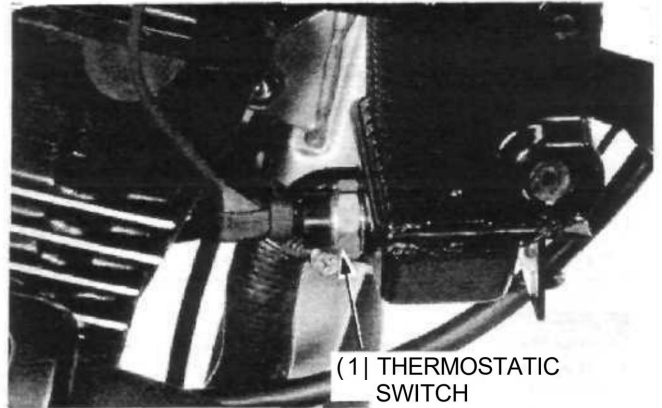
Fill the cooling system (page 5-4),

TEMPERATURE SENSOR

Disconnect the Green/Blue wire from the temperature sensor.

Check for continuity between the sensor body and ground. There should be continuity.

If there is no continuity, check the thermostat housing for looseness and recheck.



LIGHTS/METERS/SWITCHES

Drain the coolant (page 5-4) and remove the temperature sensor.
Suspend the temperature sensor in a pan of coolant over a heater and measure the resistance through the sensor as the coolant heats up.

Temperature	50°C (122°F)	100°C (212°F)
Resistance	130-180 fl	25-30 Й

AWARNING

- Wear gloves and eye protection.

NOTE

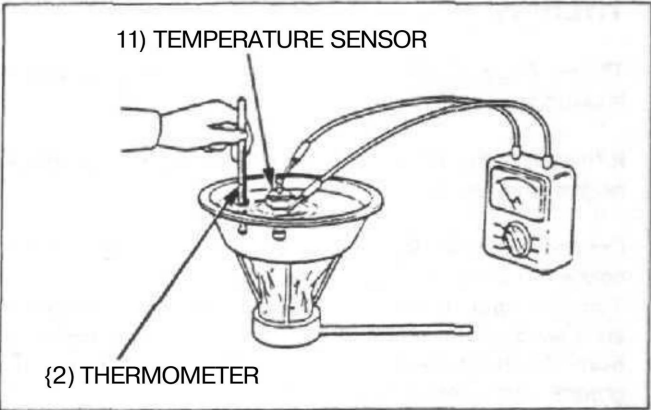
- The coolant must be used as the heated liquid to check the function above 100°C (212°Fh
- You will get false readings if either the sensor or thermometer touches the pan.

Replace the sensor if it is out of specifications by more than 10% at any temperature listed.

Apply sealant to the temperature sensor threads.
Install the temperature sensor to the cylinder head.

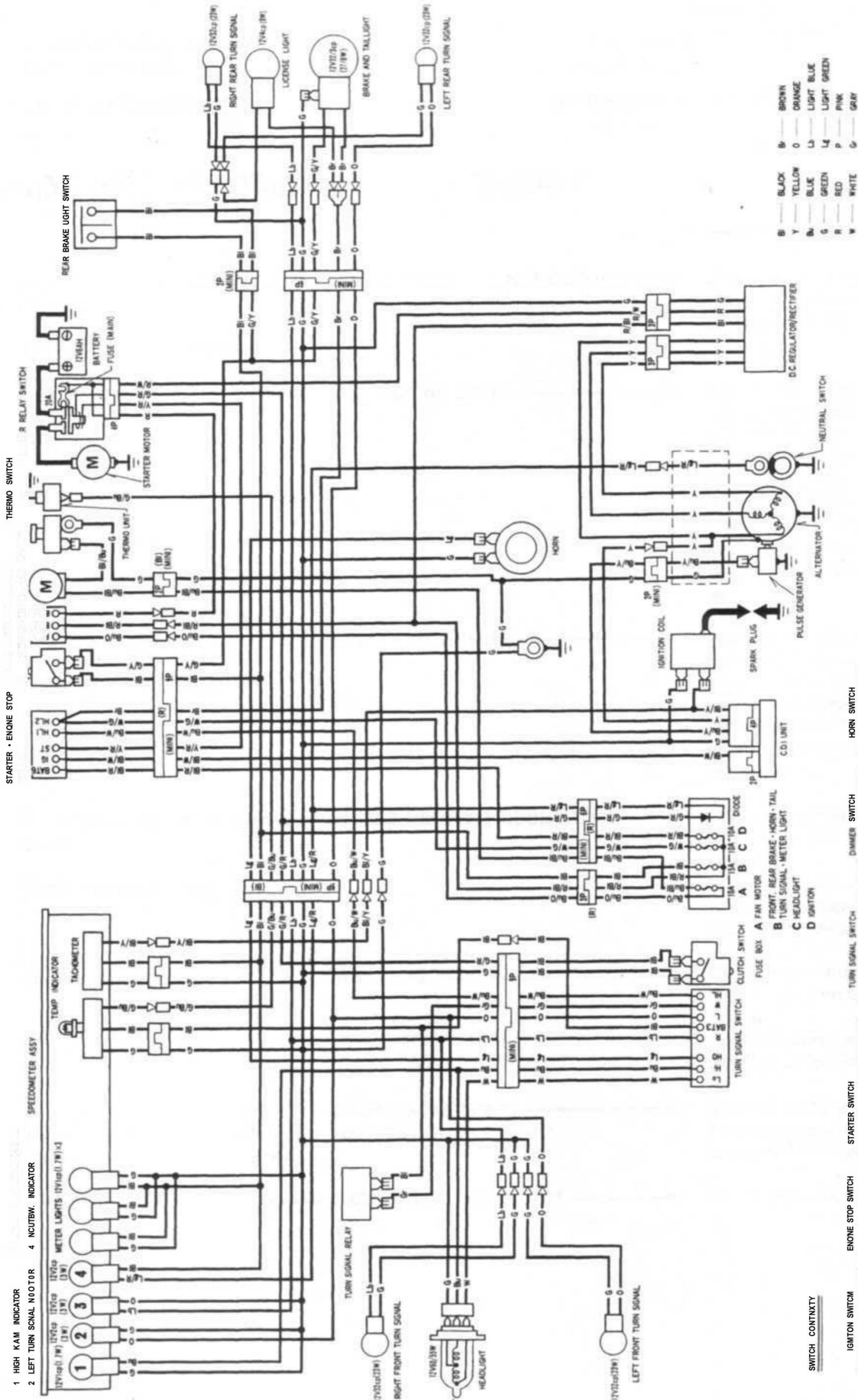
TORQUE: 10 N-m (1.0 kg-m, 7 ft-lb)

Connect the Green/Blue wire to the temperature sensor.
Fill the cooling system (page 5-4).



20. WIRING DIAGRAM

0030Z-KW3-6700



21. TROUBLESHOOTING

**ENGINE DOES NOT START OR IS
HARD TO START**

21-1

**POOR PERFORMANCE AT LOW
AND IDLE SPEEDS**

21-3

ENGINE LACKS POWER

21-2

POOR PERFORMANCE AT HIGH SPEED

21-4

ENGINE DOES NOT START OR IS HARD TO START

Probable Cause

1. Check to see if fuel is getting to the carburetor.

NOT GETTING TO CARBURETOR

- Clogged fuel tube or fuel strainer
- Clogged float valve
- Clogged fuel tank cap breather tube

GETTING TO CARBURETOR

2. Try spark test.

WEAK OR NO SPARK

- Faulty spark plug
- Fouled spark plug
- Faulty CDI unit
- Broken or shorted spark plug wire
- Faulty alternator
- Broken or shorted ignition coil
- Faulty engine stop switch
- Faulty pulse generator
- Poorly connected, broken or shorted wires

SPARKS JUMP

3. Test cylinder compression

LOW COMPRESSION

- Insufficient valve clearance
- Valve stuck open
- Worn cylinder and piston
- Damaged cylinder head gasket
- Improper valve timing
- Improper valve and seat contact
- Seized valve

COMPRESSION NORMAL

4. Start by following normal starting procedure.

ENGINE FIRES BUT SOON STOPS

- Choke excessively open
- Carburetor pilot screw excessively closed
- Air leaking past intake pipe
- Improper ignition timing (CDI unit or pulse generator faulty)

ENGINE DOES NOT FIRE

5. Remove spark plug.

WET PLUG

- Carburetor flooded
- Carburetor choke excessively closed
- Throttle valve excessively open
- Clogged air cleaner element

DRY

6. Pour small amount of fuel into cylinder from the spark plug hole, install plug and try to start engine

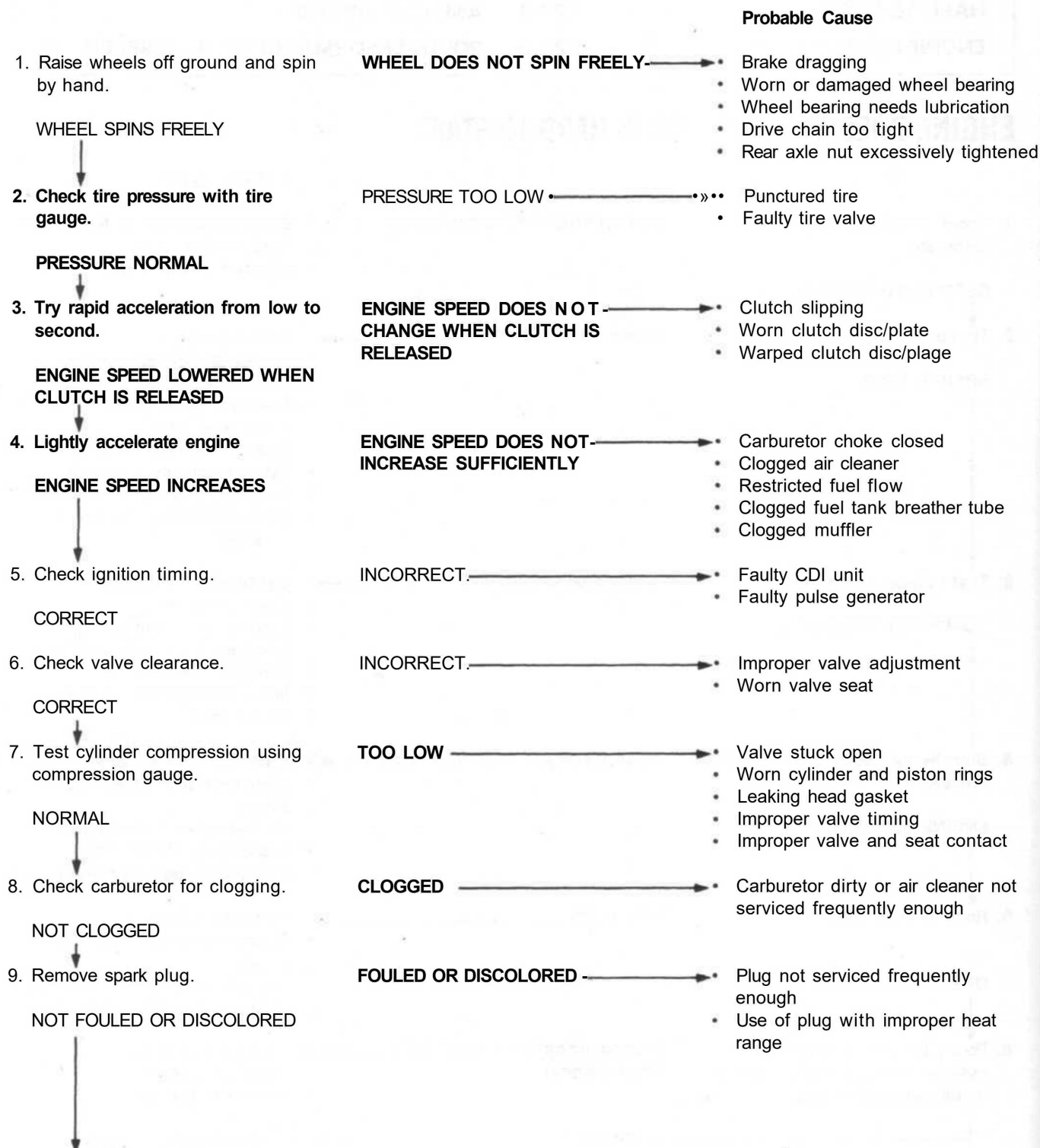
ENGINE STARTS BUT
STOPS SOON

- Clogged carburetor
- Faulty carburetor
- Restricted fuel line

ENGINE DOES NOT START

- Incorrect ignition timing

ENGINE LACKS POWER



10. Remove oil level gauge and check oil level.

OIL LEVEL INCORRECT

- Oil level too high
- Oil level too low

CORRECT

11. Remove and inspect lubrication.

VALVE TRAIN NOT
LUBRICATED PROPERLY

- Clogged oil passage
- Clogged oil control orifice
- Contaminated oil

VALVE TRAIN LUBRICATED
PROPERLY

12. Check if engine overheats.

OVERHEATED

- Excessive carbon build-up in combustion chamber
- Improper quality fuel
- Clutch slips
- Fuel air mixture too lean

NORMAL

13. Accelerate or run at high speed.

ENGINE KNOCKS

- Worn piston and cylinder
- Fuel/air mixture too lean
- Use of improper grade of fuel
- Excessive carbon build-up in combustion chamber
- Ignition timing too advanced (Faulty CDI unit)

ENGINE DOES NOT KNOCK

POOR PERFORMANCE AT LOW AND IDLE SPEEDS

Probable Cause

1. Check ignition timing and valve clearance.

INCORRECT

- Improper valve clearance
- Improper ignition timing (Faulty CDI unit or pulse generator)

CORRECT

2. Check carburetor pilot screw adjustment.

INCORRECT

- Fuel-air mixture too lean
- Fuel-air mixture too rich

CORRECT

3. Check if air is leaking past manifold.

LEAKING

- Deteriorated insulator O-ring
- Loose carburetor

NOT LEAKING

4. Try spark test.

WEAK OR INTERMITTENT
SPARK

- Faulty, carbon or wet fouled spark plug
- Faulty CDI unit
- Faulty alternator
- Faulty ignition coil
- Faulty pulse generator
- Loose or bare wires

GOOD SPARK

POOR PERFORMANCE AT HIGH SPEED

