HONDA

SHOP MANUAL



CB600Fw

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IMPORTANT SAFETY NOTICE

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

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

NOTE: Gives helpful information.

Detailed descriptions of standard workshop procedures, safety principles and service operations are not included. It is important to note that this manual contains some warnings and cautions against some specific service methods which could cause **PERSONAL INJURY** to service personnel or could damage a vehicle or render it unsafe. Please understand that those warnings could not cover all conceivable ways in which service, whether or not recommended by Honda, might be done or of the 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.

TYPE CODE

• Throughout this manual, the following abbreviations are used to identify individual model.

CODE	AREA TYPE	CODE	AREA TYPE
ED	EUROPEAN DIRECT SALES (Italy, Germany, Portugal, Norway, Finland, Denmark, Austria)	II H	NETHERLANDS TYPE II (Limited power/25 kw (34 PS); Spain)
II ED	EUROPEAN DIRECT SALES TYPE II (Limited power/37 kw (50 PS); Sweden, Germany)	E	U. K.
		F	FRANCE
III ED	EUROPEAN DIRECT SALES TYPE III (Limited power/25 kw (34 PS); Germany, Portugal)	G	GERMANY
		SW	SWITZERLAND
H	NETHERLANDS (Belgium, Spain)	U	AUSTRALIA

HOW TO USE THIS MANUAL

This service manual describes the service procedures for the CB600F.

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 and 3 apply to the whole motorcycle. Section 2 illustrates procedures for removal/installation of components that may be required to perform service described in the following sections. Sections 4 through 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 the first page of the section.

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

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

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

HONDA MOTOR CO., LTD.
SERVICE PUBLICATION OFFICE

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SYMBOLS

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

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

1. GENERAL INFORMATION

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GENERAL SAFETY

CARBON MONOXIDE

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

⚠WARNING

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

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

GASOLINE

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

⚠WARNING

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

HOT COMPONENTS

⚠WARNING

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

USED ENGINE OIL

⚠WARNING

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

BRAKE DUST

Never use an air hose or dry brush to clean the brake assemblies.

⚠WARNING

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

BRAKE FLUID

CAUTION:

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

COOLANT

Under some condition, the ethylene glycol in engine coolant is combustible and its flame is not visible. If the ethylene glycol does ignite, you will not see any flame, but you can be burned.

⚠WARNING

- ***Avoid spilling engine coolant on the exhaust system or engine parts. They may be hot enough to cause the coolant to ignite and burn without a visible flame.***
- ***Coolant (ethylene glycol) can cause some skin irritation and is poisonous if swallowed. KEEP OUT OF REACH OF CHILDREN.***
- ***Do not remove the radiator cap when the engine is hot. The coolant is under pressure and could scald you.***
- ***Keep hands and clothing away from the cooling fan, as it starts automatically.***

BATTERY HYDROGEN GAS & ELECTROLYTE

⚠WARNING

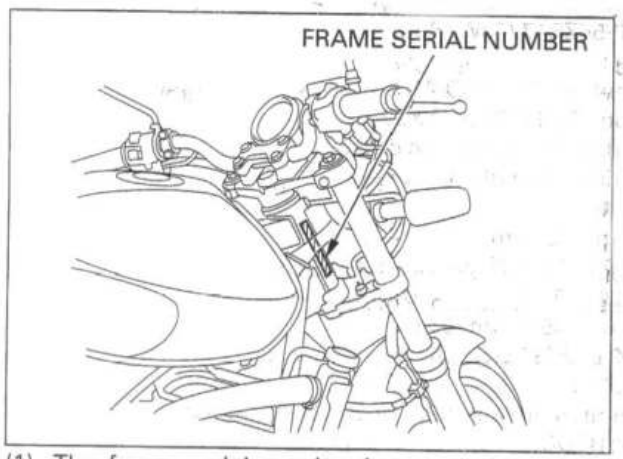
- ***The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.***
- ***The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.***
  - ***If electrolyte gets on your skin, flush with water.***
  - ***If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.***
- ***Electrolyte is poisonous.***
  - ***If swallowed, drink large quantities of water or milk and follow with milk of magnesia or vegetable oil and call a physician. KEEP OUT OF REACH OF CHILDREN.***

SERVICE RULES

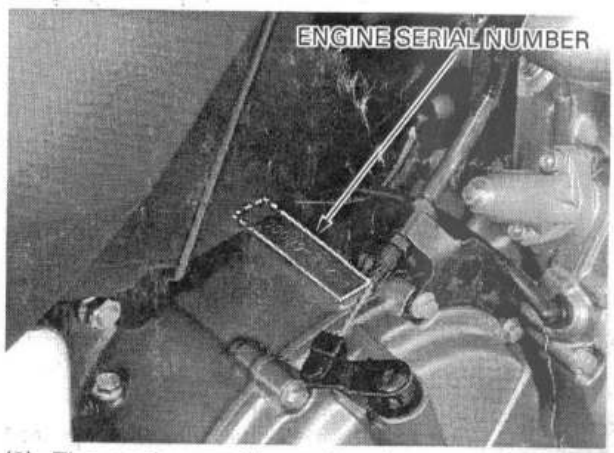
1. Use genuine HONDA or HONDA-recommended parts and lubricants or their equivalents. Parts that don't meet HONDA's design specifications may cause damage to the motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the motorcycle. Metric bolts, nuts and screws are not interchangeable with English fasteners.
4. Install new gaskets, O-rings, cotter pins, and lock plates when reassembling.
5. When tightening bolts or nuts, begin with the larger diameter or inner bolt first. Then tighten to the specified torque diagonally in incremental steps unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all electrical wires as show on pages 1-22 through 1-31, Cable and Harness Routing.

MODEL IDENTIFICATION

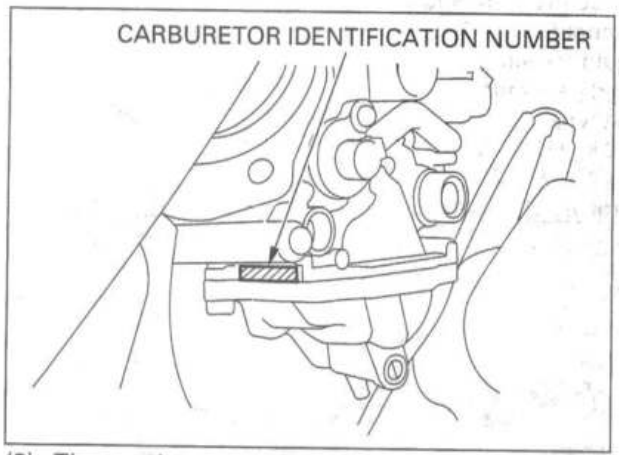




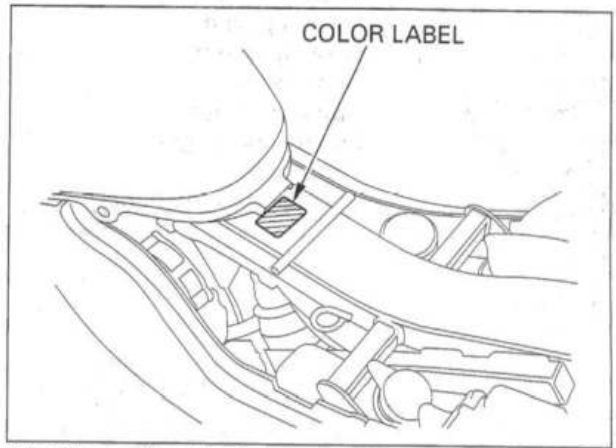
(1) The frame serial number is stamped on the right side of the steering head.



(2) The engine serial number is stamped on the lower right side of the crankcase.



(3) The carburetor identification number is stamped on the intake side of the carburetor body as shown.



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

SPECIFICATIONS

GENERAL

ITEM		SPECIFICATIONS
DIMENSIONS	Overall length	2,080 mm (81.9 in)
	Overall width	740 mm (29.1 in)
	Overall height	1,055 mm (41.5 in)
	Wheelbase	1,420 mm (55.9 in)
	Seat height	795 mm (31.3 in)
	Footpeg height	344 mm (13.5 in)
	Ground clearance	135 mm (5.3 in)
	Dry weight	176 kg (388 lbs)
	Curb weight	196 kg (432 lbs)
	Maximum weight capacity	188 kg (414 lbs)
FRAME	Frame type	Diamond
	Front suspension	Telescopic fork
	Front wheel travel	112 mm (4.4 in)
	Front axle travel	112 mm (4.4 in)
	Rear suspension	Swingarm
	Rear wheel travel	127 mm (5.0 in)
	Rear axle travel	127 mm (5.0 in)
	Rear damper	Nitrogen gas filled damper
	Front tire size	130/70ZR16 (61W) Radial
	Rear tire size	180/55ZR17 (73W) Radial
	Tire brand	
	Bridgestone	Front: BT-50F RADIAL G /Rear: BT-50R RADIAL G
	Michelin	Front: TX11/Rear: TX23
	Front brake	Hydraulic double disc brake
	Rear brake	Hydraulic single disc brake
	Caster angle	25°40′
	Trail length	98 mm (3.9 in)
	Fuel tank capacity	16.0 ℓ (4.23 US gal , 3.52 Imp gal)
	Fuel reserve capacity	3.0 ℓ (0.79 US gal , 0.66 Imp gal)
ENGINE	Bore and stroke	65.0 × 45.2 mm (2.56 × 1.78 in)
	Displacement	599 cm³ (36.5 cu-in)
	Compression ratio	12.0 : 1
	Valve train	Silent multi-link chain driven DOHC, 4 valves per cylinder
	Intake valve opens (at 1 mm (0.04 in) lift)	15° BTDC
	Intake valve closes (at 1 mm (0.04 in) lift)	35° ABDC
	Exhaust valve opens (at 1 mm (0.04 in) lift)	38° BBDC
	Exhaust valve closes (at 1 mm (0.04 in) lift)	7° ATDC
	Lubrication system	Forced pressure and wet sump
	Oil pump type	Trochoid
	Cooling system	Liquid cooled
	Air filtration	Oiled paper filter
	Crankshaft type	Unit type
	Engine dry weight	61.9 kg (136.5 lbs)
	Firing order	1 − 2 − 4 − 3
	Cylinder arrangement	Vertical 30° inline four

GENERAL (Cont'd)

ITEM			SPECIFICATIONS
CARBURETOR	Type		Constant velocity
	Throttle bore		34 mm (1.3 in)
DRIVE TRAIN	Clutch system		Multi-plate, wet
	Clutch operation system		Cable operated type
	Transmission		Constant mesh, 6-speed
	Primary reduction		1.863 (82/44)
	Final reduction		2.800 (42/15)
	Gear ratio	1st	2.928 (41/14)
		2nd	2.062 (33/16)
		3rd	1.647 (28/17)
		4th	1.368 (26/19)
		5th	1.200 (24/20)
		6th	1.086 (25/23)
	Gearshift pattern		Left foot operated return system, 1 — N — 2 — 3 — 4 — 5 — 6
ELECTRICAL	Ignition system		Full transistorized ignition
	Starting system		Electric starter motor
	Charging system		Triple phase output alternator
	Regulator/rectifier		SCR shorted/triple phase, full wave rectification
	Lighting system		Battery

LUBRICATION SYSTEM

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	At draining	3.5 ℓ (3.7 US qt , 3.1 Imp qt)	———
	At disassembly	4.2 ℓ (4.4 US qt , 3.7 Imp qt)	———
	At oil filter change	3.8 ℓ (4.0 US qt , 3.3 Imp qt)	———
Recommended engine oil		HONDA 4-stroke oil or equivalent motor oil API service classification SE, SF or SG Viscosity: SAE 10 W−40	———
Oil pressure at oil pressure switch		490 kPa (5.0 kgf/cm², 71 psi) at 6,000 min⁻¹ (rpm)/(80 °C/176 °F)	———
Oil pump rotor	Tip clearance	0.15 (0.006) max.	0.20 (0.008)
	Body clearance	0.15−0.22 (0.006−0.009)	0.35 (0.014)
	Side clearance	0.02−0.07 (0.001−0.003)	0.10 (0.004)
Oil pump drive sprocket collar O. D.		34.050−34.075 (1.3405−1.3415)	34.03 (1.340)
Oil pump drive sprocket I. D.		35.025−35.075 (1.3789−1.3809)	35.10 (1.382)

FUEL SYSTEM

ITEM		SPECIFICATIONS
Carburetor identification number	Except SW type	VP49A
	SW type	VP49B
Main jet		No.1/4; #100, No.2/3; #102
Slow jet		#40
Jet needle		J7SL
Pilot screw initial opening	Except SW type	1 3/4 turns out
	SW type	2 1/8 turns out
Float level		13.7 mm (0.54 in)
Idle speed		1,300 ± 100 min⁻¹ (rpm)
Carburetor vacuum difference		Within 30 mm Hg (1.2 in Hg)
Base carburetor for synchronization		No.3 carburetor

COOLING SYSTEM

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	2.0 ℓ (2.1 US qt, 1.8 Imp qt)
	Reserve tank	0.20 ℓ (0.21 US qt, 0.18 Imp qt)
Radiator cap relief pressure		108–137 kPa (1.1–1.4 kgf/cm², 16–20 psi)
Thermostat	Begin to open	80–84 °C (176–183 °F)
	Fully open	95 °C (203 °F)
	Valve lift	8 mm (0.3 in) minimum

CYLINDER HEAD/VALVES

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			1,275–1,314 kPa (13.0–13.4 kgf/cm², 185–191 psi) at 300 min⁻¹ (rpm)	———
Cylinder head warpage			———	0.10 (0.004)
Valve, valve guide	Valve clearance	IN	0.16 ± 0.03 (0.006 ± 0.001)	———
		EX	0.22 ± 0.03 (0.009 ± 0.001)	———
	Valve stem O. D.	IN	3.975–3.990 (0.1565–0.1571)	3.965 (0.1561)
		EX	3.965–3.980 (0.1561–0.1567)	3.955 (0.1557)
	Valve guide I. D.	IN	4.000–4.012 (0.1575–0.1580)	4.04 (0.159)
		EX	4.000–4.012 (0.1575–0.1580)	4.04 (0.159)
	Stem-to-guide clearance	IN	0.010–0.037 (0.0004–0.0015)	0.075 (0.0030)
		EX	0.020–0.047 (0.0008–0.0019)	0.085 (0.0033)
	Valve guide projection above cylinder head	IN	13.10–13.30 (0.516–0.524)	———
		EX	11.30–11.50 (0.445–0.453)	———
	Valve seat width	IN/EX	0.90–1.10 (0.035–0.043)	1.5 (0.06)
Valve spring free length		IN/EX	35.36 (1.392)	33.86 (1.333)
Valve lifter	Valve lifter O. D.	IN/EX	25.978–25.993 (1.0228–1.0233)	25.97 (1.022)
	Valve lifter bore I. D.	IN/EX	26.010–26.026 (1.0240–1.0246)	26.04 (1.025)
Camshaft	Cam lobe height	IN	36.140–36.380 (1.4228–1.4323)	36.11 (1.422)
		EX	35.300–35.540 (1.3898–1.3992)	35.27 (1.389)
	Journal O. D.		23.959–23.980 (0.9433–0.9441)	24.955 (0.9825)
	Runout		———	0.05 (0.002)
	Oil clearance		0.020–0.062 (0.0008–0.0024)	0.10 (0.004)

CLUTCH/GEARSHIFT LINKAGE

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Clutch lever free play		10–20 (3/8–13/16)	———
Clutch spring free length		49.7 (1.96)	48.3 (1.90)
Clutch disc thickness		2.92–3.08 (0.115–0.121)	2.60 (0.102)
Clutch plate warpage		———	0.30 (0.012)
Clutch outer guide	I. D.	21.994–22.007 (0.8659–0.8664)	22.017 (0.8668)
	O. D.	34.975–34.991 (1.3770–1.3776)	34.965 (1.3766)
Mainshaft O. D. at clutch outer guide		21.980–21.993 (0.8654–0.8659)	21.95 (0.864)

ALTERNATOR/STARTER CLUTCH

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter driven gear O. D.	51.699–51.718 (2.0354–2.0361)	51.684 (2.0348)

CRANKCASE/PISTON/CYLINDER

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I. D.		65.000–65.015 (2.5591–2.5596)	65.10 (2.563)
	Out of round		———	0.10 (0.004)
	Taper		———	0.10 (0.004)
	Warpage		———	0.10 (0.004)
Piston, piston rings	Piston mark direction		"IN" mark facing toward the intake side	———
	Piston O. D.		64.970–64.990 (2.5579–2.5587)	64.90 (2.555)
	Piston O. D. measurement point		11 mm (0.4 in) from bottom of skirt	———
	Piston pin bore 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-to-piston pin clearance		0.002–0.014 (0.0001–0.0006)	0.04 (0.002)
	Piston ring-to-ring groove clearance	Top	0.025–0.060 (0.0010–0.0024)	0.08 (0.003)
		Second	0.015–0.050 (0.0006–0.0020)	0.08 (0.003)
	Piston ring end gap	Top	0.20–0.35 (0.008–0.014)	0.5 (0.02)
		Second	0.35–0.50 (0.014–0.020)	0.7 (0.03)
		Oil (side rail)	0.20–0.70 (0.008–0.028)	1.0 (0.04)
Cylinder-to-piston clearance			0.010–0.045 (0.0004–0.0018)	0.10 (0.004)
Connecting rod small end I. D.			17.016–17.034 (0.6699–0.6706)	17.04 (0.671)
Connecting rod-to-piston pin clearance			0.016–0.040 (0.0006–0.0016)	———
Crank pin oil clearance			0.028–0.052 (0.0011–0.0020)	0.06 (0.002)

CRANKSHAFT/TRANSMISSION

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Side clearance		0.10 – 0.25 (0.004 – 0.010)	0.30 (0.012)
	Runout		———	0.05 (0.002)
	Main journal oil clearance		0.020 – 0.045 (0.0008 – 0.0018)	0.05 (0.002)
Transmission	Gear I. D.	M5, M6	28.000 – 28.021 (1.1024 – 1.1032)	28.04 (1.104)
		C2, C3, C4	31.000 – 31.025 (1.2205 – 1.2215)	31.04 (1.222)
	Bushing O. D.	M5, M6	27.959 – 27.980 (1.1007 – 1.1016)	27.94 (1.100)
		C2	30.959 – 30.980 (1.2189 – 1.2197)	30.94 (1.218)
		C3, C4	30.950 – 30.975 (1.2185 – 1.2195)	30.93 (1.218)
	Bushing I. D.	M5	24.985 – 25.006 (0.9837 – 0.9845)	25.016 (0.9849)
		C2	27.985 – 28.006 (1.1018 – 1.1026)	28.021 (1.1032)
	Gear-to-bushing clearance	M5, M6	0.020 – 0.062 (0.0008 – 0.0024)	———
		C2, C3, C4	0.020 – 0.070 (0.0008 – 0.0028)	———
	Mainshaft O. D.	M5	24.967 – 24.980 (0.9830 – 0.9835)	24.960 (0.9827)
		Clutch outer guide	21.980 – 21.993 (0.8654 – 0.8659)	21.95 (0.864)
	Countershaft O. D.	C2	27.967 – 27.980 (1.1011 – 1.1016)	27.96 (1.101)
	Bushing-to-shaft clearance	M5	0.005 – 0.039 (0.0002 – 0.0015)	———
		C2	0.005 – 0.039 (0.0002 – 0.0015)	———
Shift fork, fork shaft	Shift fork	Fork I. D.	12.000 – 12.021 (0.4724 – 0.4733)	12.030 (0.4736)
		Claw thickness	5.93 – 6.00 (0.233 – 0.236)	5.90 (0.232)
	Fork shaft O. D.		11.957 – 11.968 (0.4707 – 0.4712)	11.95 (0.470)

FRONT WHEEL/SUSPENSION/STEERING

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		—	1.5 (0.06)
Cold tire pressure	Driver only	250 kPa (2.50 kgf/cm², 36 psi)	—
	Driver and passenger	250 kPa (2.50 kgf/cm², 36 psi)	—
Axle runout		—	0.20 (0.008)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Fork	Spring free length	309.2 (12.17)	303.0 (11.93)
	Spring direction	With the tapered end facing down	—
	Tube runout	—	0.20 (0.008)
	Recommended fork fluid	Fork fluid	—
	Fluid level	102 (4.0)	—
	Fluid capacity	486 ± 2.5 cm³ (16.4 ± 0.08 US oz, 17.1 ± 0.09 Imp oz)	—
Steering head bearing pre-load		0.98–1.47 N (0.10–0.15 kgf, 0.22–0.33 lbf)	—

REAR WHEEL/SUSPENSION

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Minimum tire tread depth			—	2.0 (0.08)
Cold tire pressure	Driver only		290 kPa (2.90 kgf/cm², 42 psi)	—
	Driver and passenger		290 kPa (2.90 kgf/cm², 42 psi)	—
Axle runout			—	0.20 (0.008)
Wheel rim runout	Radial		—	2.0 (0.08)
	Axial		—	2.0 (0.08)
Drive chain	Size/link	DID	525VM2–110LE	—
		RK	525RO–110LE	—
	Slack		30–40 (1.2–1.6)	50 (2.0)
Shock absorber pre-load adjuster standard position			2nd groove	—

HYDRAULIC BRAKE

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Front	Specified brake fluid	DOT 4	———
	Brake disc thickness	4.5 (0.18)	3.5 (0.14)
	Brake disc runout	———	0.30 (0.012)
	Master cylinder I. D.	14.000 – 14.043 (0.5512 – 0.5529)	14.055 (0.5533)
	Master piston O. D.	13.957 – 13.984 (0.5495 – 0.5506)	13.945 (0.5490)
	Caliper cylinder I. D.	27.000 – 27.050 (1.0630 – 1.0650)	27.060 (1.0654)
	Caliper piston O. D.	26.935 – 26.968 (1.0604 – 1.0617)	26.910 (1.0594)
Rear	Specified brake fluid	DOT 4	———
	Brake pedal height	67.5 (2.66)	———
	Brake disc thickness	5.0 (0.20)	4.0 (0.16)
	Brake disc runout	———	0.30 (0.012)
	Master cylinder I. D.	14.000 – 14.043 (0.5512 – 0.5529)	14.055 (0.5533)
	Master piston O. D.	13.957 – 13.984 (0.5495 – 0.5506)	13.945 (0.5490)
	Caliper cylinder I. D.	38.18 – 38.23 (1.503 – 1.505)	38.24 (1.506)
	Caliper piston O. D.	38.098 – 38.148 (1.4999 – 1.5019)	38.09 (1.500)

BATTERY/CHARGING SYSTEM

ITEM			SPECIFICATIONS
Battery	Capacity		12V – 6Ah
	Current leakage		1.2 mA max.
	Voltage (20°C/68°F)	Fully charged	13.0 – 13.2V
		Needs charging	Below 12.3V
	Charging current	Normal	0.9 A/5 – 10 h
		Quick	4.0 A/1.0 h
Alternator	Capacity		0.34 kW/5,000 min^{-1} (rpm)
	Charging coil resistance (20°C/68°F)		0.1 – 1.0 Ω
Regulator/rectifier regulated voltage			13.0 – 15.5 V/5,000 min^{-1} (rpm)

IGNITION SYSTEM

ITEM	SPECIFICATIONS
Spark plug	CR9EH – 9 (NGK)
	U27FER9 (DENSO)
Spark plug gap	0.8 – 0.9 mm (0.03 – 0.04 in)
Ignition coil peak voltage	100 V minimum
Ignition pulse generator peak voltage	0.7 V minimum
Ignition timing ("F" mark)	7° BTDC at idle

ELECTRIC STARTER

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	12.0 – 13.0 (0.47 – 0.51)	4.5 (0.18)

LIGHTS/METERS/SWITCHES

ITEM			SPECIFICATIONS
Bulbs	Headlight (Hi/Lo)		12V−60/55W
	Position light (Except U type)		12V−4W
	Brake/taillight		12V−21/5W × 2
	Turn signal light		12V−21W × 4
	Instrument light		12V−1.7W × 3
	Turn signal indicator		12V−1.7W × 2
	High beam indicator		12V−1.7W
	Neutral indicator		12V−1.7W
	Oil pressure indicator		12V−1.7W
Fuse	Main fuse		30 A
	Sub fuse		10 A × 4
Fan motor switch	Start to close (ON)		98−102 °C (208−216 °F)
	Stop to open		93−97 °C (199−207 °F)
Coolant temperature sensor resistance		at 80°C/176°F	45−60 Ω
		at 120°C/248°F	10−20 Ω

TORQUE VALUES

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

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

NOTES: 1. Apply sealant to the threads.
2. Apply a locking agent to the threads.
3. Apply grease to the threads.
4. Stake.
5. Apply oil to the threads and flange surface.
6. Apply clean engine oil to the O-ring.
7. U-nut
8. ALOC bolt: replace with a new one.
9. CT bolt

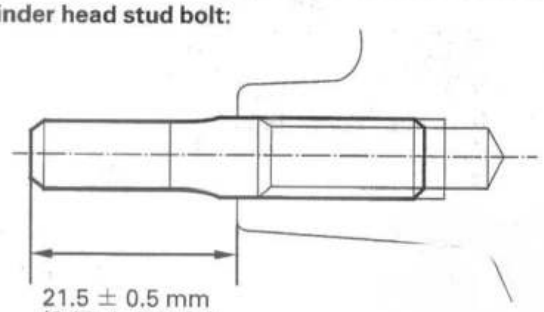
ENGINE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
MAINTENANCE:				
Spark plug	4	10	12 (1.2 , 9)	
Timing hole cap	1	45	18 (1.8 , 13)	NOTE 3
Oil drain bolt	1	12	29 (3.0 , 22)	
Oil filter cartridge	1	20	10 (1.0 , 7)	NOTE 6
LUBRICATION SYSTEM:				
Oil filter boss	1	20	18 (1.8 , 13)	NOTE 2
Oil pump driven sprocket bolt	1	6	15 (1.5 , 11)	NOTE 2
Oil pump assembly bolt	1	6	8 (0.8 , 5.8)	NOTE 9
Oil cooler sealing bolt	1	18	49 (5.0 , 36)	NOTE 2
FUEL SYSTEM:				
Carburetor assembly bolt/nut, 5 mm	1	5	5 (0.5 , 3.6)	
6 mm	1	6	10 (1.0 , 7)	
Boost joint for synchronization	3	5	2 (0.25 , 1.8)	
Insulator band screw	8	5	—	See page 1-14
COOLING SYSTEM:				
Water pump cover bolt	2	6	13 (1.3 , 9)	NOTE 9
Coolant temperature sensor unit	1	PT 1/8	10 (1.0 , 7)	NOTE 1
Water hose joint	1	12	29 (3.0 , 22)	
Sealing special bolt	1	10	12 (1.2 , 9)	

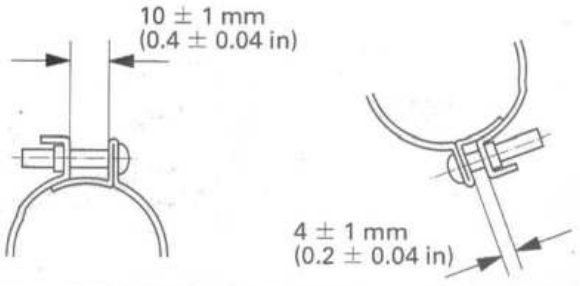
ENGINE (Cont'd)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
CYLINDER HEAD/VALVES:				
Cylinder head sealing bolt	1	18	32 (3.3 , 24)	NOTE 2
Cylinder head socket bolt	10	9	47 (4.8 , 35)	NOTE 5
No.1 intake vacuum port plug	1	5	3 (0.3 , 2.2)	
Cylinder head cover bolt	6	6	10 (1.0 , 7)	
Camshaft holder flange bolt	20	6	12 (1.2 , 9)	NOTE 5
Breather plate flange bolt	2	6	12 (1.2 , 9)	NOTE 2
Cam sprocket bolt	4	7	20 (2.0 , 14)	NOTE 2
Cylinder head stud bolt	8	8	———	See below
Cam chain tensioner cap nut	1	6	12 (1.2 , 9)	
Cam chain lifter sealing bolt	1	6	10 (1.0 , 7)	
CLUTCH/GEARSHIFT LINKAGE:				
Clutch center lock nut	1	20	108 (11.0 , 80)	NOTE 4, 5
Clutch spring bolt	4	6	12 (1.2 , 9)	
Shift drum center socket bolt	1	8	23 (2.3 , 17)	NOTE 2
Shift drum stopper pivot bolt	1	6	12 (1.2 , 9)	
Gearshift return spring pin	1	8	23 (2.3 , 17)	
ENGINE REMOVAL/INSTALLATION:				
Drive sprocket special bolt	1	10	54 (5.5 , 40)	
CRANKCASE/PISTON/CYLINDER:				
Main journal bolt	10	8	25 (2.6 , 19)	NOTE 5
Crankcase bolt, 10 mm	1	10	39 (4.0 , 29)	
8 mm	1	8	24 (2.4 , 17)	
Lower crankcase sealing bolt, 20 mm	1	20	29 (3.0 , 22)	NOTE 2
Lower crankcase sealing bolt, 14 mm	1	14	25 (2.5 , 18)	NOTE 2
Connecting rod nut	8	7	25 (2.6 , 19)	NOTE 5
ALTERNATOR:				
Flywheel flange bolt	1	10	103 (10.5 , 76)	NOTE 5
Stator mounting socket bolt	4	6	12 (1.2 , 9)	
Alternator wire clamp socket bolt	1	6	10 (1.0 , 7)	
Starter clutch outer socket bolt	6	6	16 (1.6 , 12)	NOTE 2
IGNITION SYSTEM:				
Ignition pulse generator rotor special bolt	1	10	59 (6.0 , 43)	
ELECTRIC STARTER/STARTER CLUTCH:				
Starter motor terminal nut	1	6	10 (1.0 , 7)	
LIGHTS/METERS/SWITCHES:				
Oil pressure switch	1	PT 1/8	12 (1.2 , 9)	NOTE 1
Oil pressure switch terminal screw	1	4	2 (0.2 , 1.4)	
Neutral switch	1	10	12 (1.2 , 9)	

Cylinder head stud bolt:



Connecting tube clamp: **Insulator clamp:**



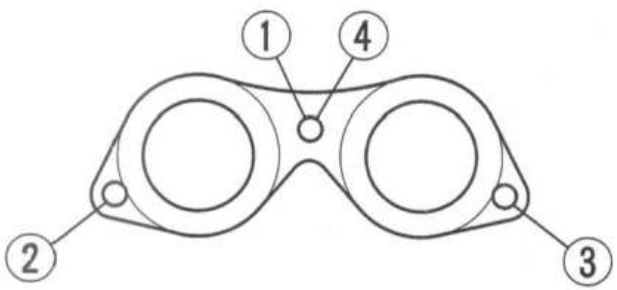
FRAME

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
FRAME BODY PANELS/EXHAUST SYSTEM:				
Side stand pivot bolt	1	10	15 (1.5 , 11)	
Side stand pivot lock nut	1	10	39 (4.0 , 29)	
Footpeg holder bolt	4	8	26 (2.7 , 20)	
Exhaust pipe joint nut	6	7	20 (2.0 , 14)	See page 1-16
Muffler/exhaust pipe stay bolt	2	8	22 (2.2 , 16)	
Muffler protector bolt	1	6	12 (1.2 , 9)	
Muffler band bolt	2	8	22 (2.2 , 16)	
Grab rail mounting bolt	4	8	26 (2.7 , 20)	
Front fender mounting bolt	2	6	12 (1.2 , 9)	
Rearview mirror mounting nut	2	10	34 (3.5 , 25)	
Rear reflector mounting nut	1	5	5 (0.5 , 3.6)	
Side cover upper mounting bolt	2	5	1 (0.15 , 1.1)	
Side cover lower mounting bolt	2	5	4 (0.4 , 2.9)	
Rear turn signal unit mounting nut	2	10	5 (0.5 , 3.6)	
Taillight mounting nut	2	6	7 (0.7 , 5.1)	
Fuel valve nut	1	22	34 (3.5 , 25)	
Fuel tank stay bolt	2	6	12 (1.2 , 9)	
COOLING SYSTEM:				
Coolant temperature sensor	1	PT 1/8	9 (0.9 , 6.5)	
Fan motor switch	1	16	18 (1.8 , 13)	NOTE 1
Fan motor mounting nut	3	6	5 (0.5 , 3.6)	
Cooling fan motor nut	1	6	3 (0.28 , 2.0)	NOTE 2
ENGINE MOUNTING:				
Front engine hanger nut	2	10	54 (5.5 , 40)	
Engine hanger bracket bolt	2	8	22 (2.2 , 16)	
Rear engine hanger nut (upper)	1	10	54 (5.5 , 40)	
Rear engine hanger nut (lower)	1	10	54 (5.5 , 40)	
GEARSHIFT LINKAGE:				
Gearshift pedal link bolt (gearshift pedal side)	1	8	26 (2.7 , 20)	
Gearshift pedal link bolt (gearshift spindle side)	1	6	20 (2.0 , 14)	
FRONT WHEEL/SUSPENSION/STEERING:				
Handlebar holder bolt	4	8	26 (2.7 , 20)	
Steering stem nut	1	24	103 (10.5 , 76)	See page 13-30
Top thread A	1	26	———	
Top thread B	1	26	———	
Fork top bridge pinch bolt	2	8	23 (2.3 , 17)	
Fork bottom bridge pinch bolt	2	10	39 (4.0 , 29)	
Front axle bolt	1	14	59 (6.0 , 43)	
Front axle holder bolt	2	8	22 (2.2 , 16)	
Front brake disc mounting bolt	12	6	20 (2.0 , 14)	NOTE 8
Fork cap	2	37	23 (2.3 , 17)	
Fork socket bolt	2	8	20 (2.0 , 14)	NOTE 2
REAR WHEEL/SUSPENSION:				
Rear axle nut	1	16	88 (9.0 , 65)	NOTE 7
Rear brake disc mounting nut	4	8	42 (4.3 , 31)	NOTE 8
Final driven sprocket nut	5	12	108 (11.0 , 80)	NOTE 7
Swingarm pivot nut	1	14	88 (9.0 , 65)	NOTE 7
Drive chain case bolt	2	6	12 (1.2 , 9)	
Drive chain slider bolt	2	6	9 (0.9 , 6.5)	
Drive chain adjuster lock nut	2	8	21 (2.1 , 15)	
Rear shock absorber upper mounting nut	1	10	37 (3.8 , 27)	NOTE 7
Rear shock absorber lower mounting nut	1	10	37 (3.8 , 27)	NOTE 7

FRAME (Cont'd)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
HYDRAULIC BRAKE:				
Front brake master cylinder holder bolt	2	6	12 (1.2 , 9)	
Front brake master cylinder cap screw	2	4	1 (0.15 , 1.1)	
Brake lever pivot bolt	1	6	1 (0.1 , 0.7)	
Brake lever pivot nut	1	6	6 (0.6 , 4.3)	
Front brake switch screw	1	4	1 (0.12 , 0.9)	
Front brake caliper mounting bolt	4	8	30 (3.1 , 22)	NOTE 8
Front brake caliper slide pin (main)	2	12	23 (2.3 , 17)	NOTE 2
Front brake caliper slide pin (sub)	2	8	13 (1.3 , 9)	NOTE 2
Pad pin	3	10	18 (1.8 , 13)	
Pad pin plug	3	10	2 (0.25 , 1.8)	
Front brake hose clamp bolt	2	6	12 (1.2 , 9)	NOTE 8
Brake caliper bleeder	3	8	6 (0.6 , 4.3)	
Rear master cylinder mounting bolt	2	6	12 (1.2 , 9)	
Rear master cylinder hose joint screw	1	4	1 (0.15 , 1.1)	NOTE 2
Rear master cylinder push rod nut	1	8	18 (1.8 , 13)	
Rear brake caliper slide pin (main)	2	12	27 (2.8 , 20)	NOTE 2
Rear brake caliper slide pin (sub)	1	8	23 (2.3 , 17)	NOTE 8
Rear brake hose clamp bolt	1	6	9 (0.9 , 6.5)	NOTE 8
Brake hose oil bolt	5	10	34 (3.5 , 25)	
LIGHTS/METERS/SWITCHES:				
Ignition switch mounting bolt	2	8	25 (2.5 , 18)	NOTE 2

Exhaust pipe joint nut tightening sequence:



TOOLS

NOTES: 1. Equivalent commercially available.
2. Alternative tool.
3. SW type only.

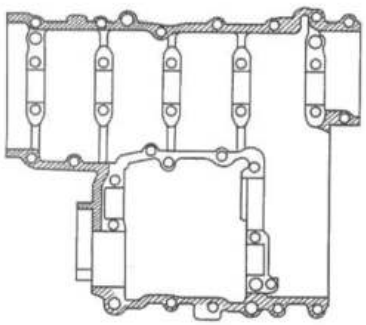
DESCRIPTION	TOOL NUMBER	REMARKS	REF. SEC.
Float level gauge	07401-0010000		5
Oil pressure gauge attachment	07406-0030000	NOTE 1	4
Oil pressure gauge	07506-3000000	NOTE 1	4
Flywheel holder	07725-0040000	NOTE 1	10
Rotor puller	07733-0020001	NOTE 2: 07933-3950000	10
Adjustable valve guide driver	07743-0020000		8
Attachment, 32 × 35 mm	07746-0010100		14
Attachment, 37 × 40 mm	07746-0010200		9
Attachment, 42 × 47 mm	07746-0010300		9, 13, 14
Attachment, 52 × 55 mm	07746-0010400		13, 14
Attachment, 28 × 30 mm	07746-1870100		14
Driver 40 mm I. D.	07746-0030100		12
Attachment, 25 mm (IN)	07746-0030200		12
Attachment, 30 mm (IN)	07746-0030300		12
Pilot, 15 mm	07746-0040300		14
Pilot, 17 mm	07746-0040400		14
Pilot, 20 mm	07746-0040500		14
Pilot, 35 mm	07746-0040800		9
Pilot, 22 mm	07746-0041000		14
Bearing remover shaft	07746-0050100		13, 14
Bearing remover head, 17 mm	07746-0050500		14
Bearing remover head, 20 mm	07746-0050600		13
Driver	07749-0010000		9, 13, 14
Valve spring compressor	07757-0010000		8
Valve seat cutter		NOTE 1	8
Seat cutter, 27.5 mm (45° IN)	07780-0010100		
Seat cutter, 24.5 mm (45° EX)	07780-0010200		
Flat cutter, 27 mm (32° IN)	07780-0013300		
Flat cutter, 24 mm (32° EX)	07780-0012500		
Interior cutter, 26 mm (60° IN)	07780-0014500		
Interior cutter, 22 mm (60° EX)	07780-0014202		
Cutter holder, 4.0 mm	07781-0010500		
Pilot screw wrench	07908-4730002		5
Snap ring pliers	07914-SA50001	NOTE 2: 07914-3230001	15
Steering stem socket	07916-3710101		13
Driver attachment, 28 × 30 mm	07946-1870100		14
Bearing race remover	07946-3710500		13
Steering stem driver	07946-MB00000		13
Driver shaft	07946-MJ00100		14
Slider weight	07947-KA50100		13
Oil seal driver attachment	07947-KF00100		13
Driver attachment	07953-MJ10100		13
Driver handle	07953-MJ10200		13
Valve spring compressor attachment	07959-KM30101		8
Valve guide driver	07GMD-KT70100		8
Needle bearing remover attachment	07GMD-KT70200		14
Inspection adaptor	07GMJ-ML80100		17
Oil filter wrench	07HAA-PJ70100		4
Peak voltage adaptor	07HGJ-0020100	NOTE 2: Imrie diagnostic tester (model 625)	17, 19
Tappet hole protector	07HMG-MR70002		8
Drive chain tool set	07HMH-MR10103		3
Clutch center holder	07JMB-MN50301		9

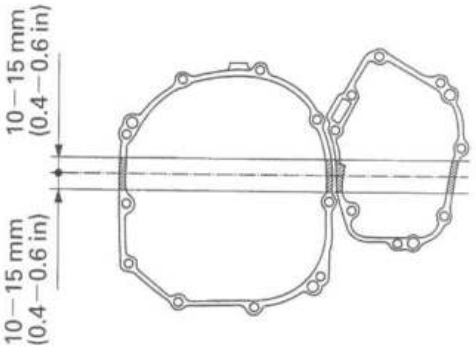
DESCRIPTION	TOOL NUMBER	REMARKS	REF. SEC.
Pilot screw wrench	07KMA-MS60101	NOTE 3	5
Needle bearing remover	07LMC-KV30100		14
Valve guide reamer, 4.008 mm	07MMH-MV90100		8
Pilot screw wrench elbo	07PMA-MZ20110	NOTE 3	5
Compression gauge attachment	07RMJ-MY50100	NOTE 1	8

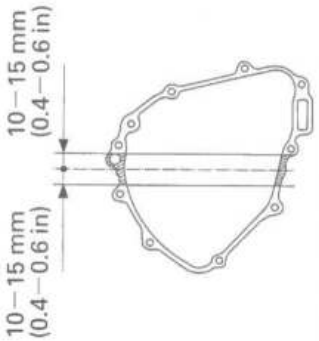
LUBRICATION & SEAL POINTS

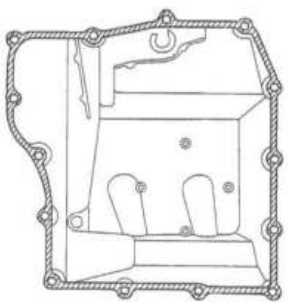
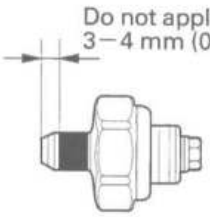
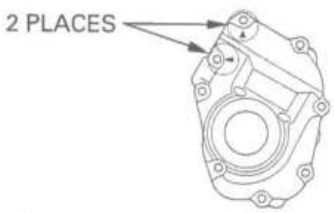
ENGINE

LOCATION	MATERIAL	REMARKS
Crankcase mating surface	Liquid sealant (Three Bond 1207B or equivalent)	

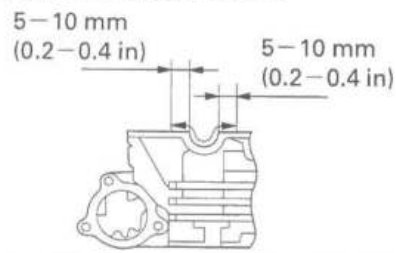






Oil pan mating surface 		
Oil pressure switch threads 	Sealant	
Ignition pulse generator cover bolt threads 		"▲" marked bolts
Ignition pulse generator grommet		Crankcase mating surface
Thermosensor threads Lower crankcase sealing bolt threads Cylinder head sealing bolt threads Alternator grommet		Crankcase mating surface

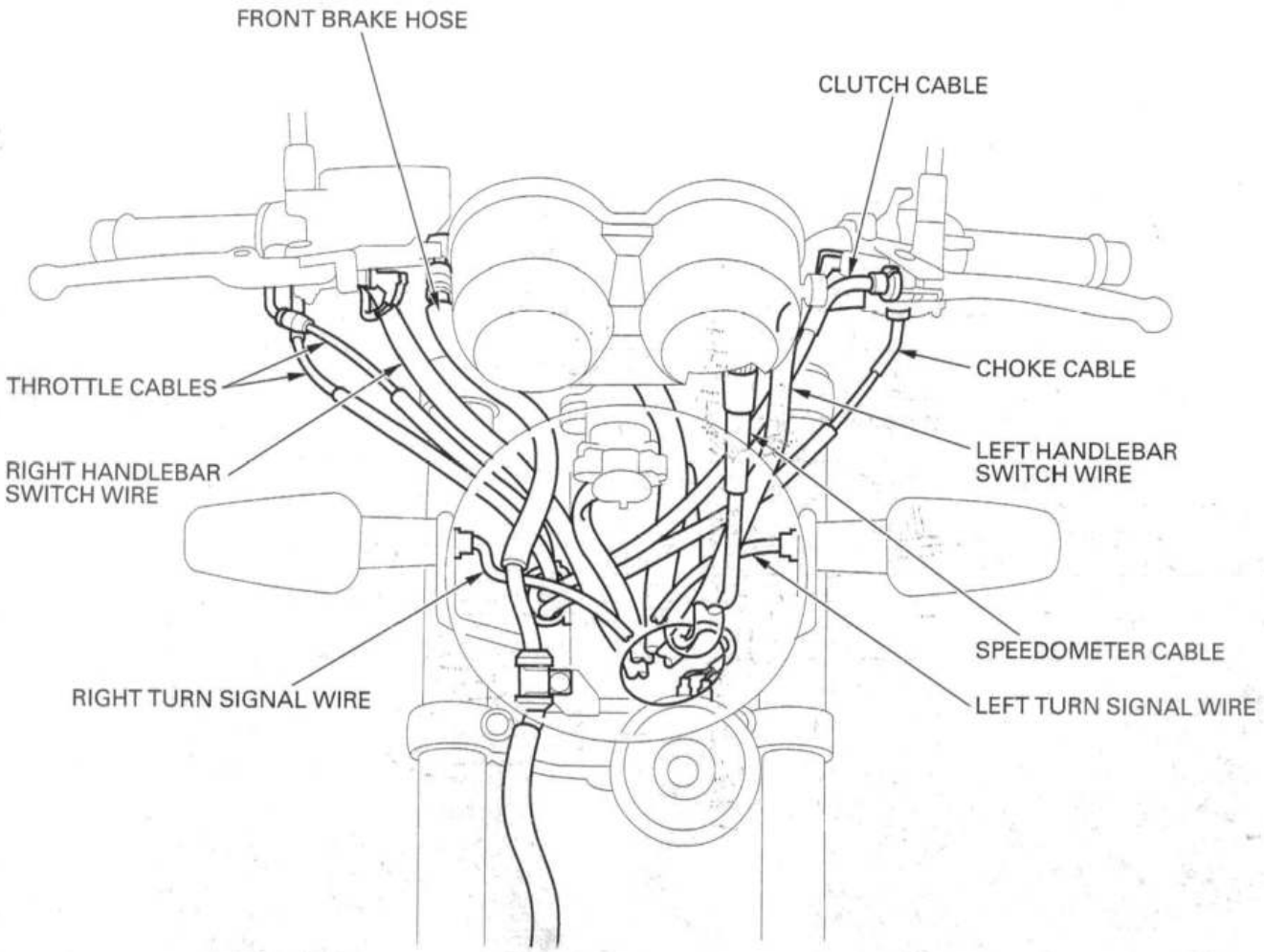
ENGINE (Cont'd)

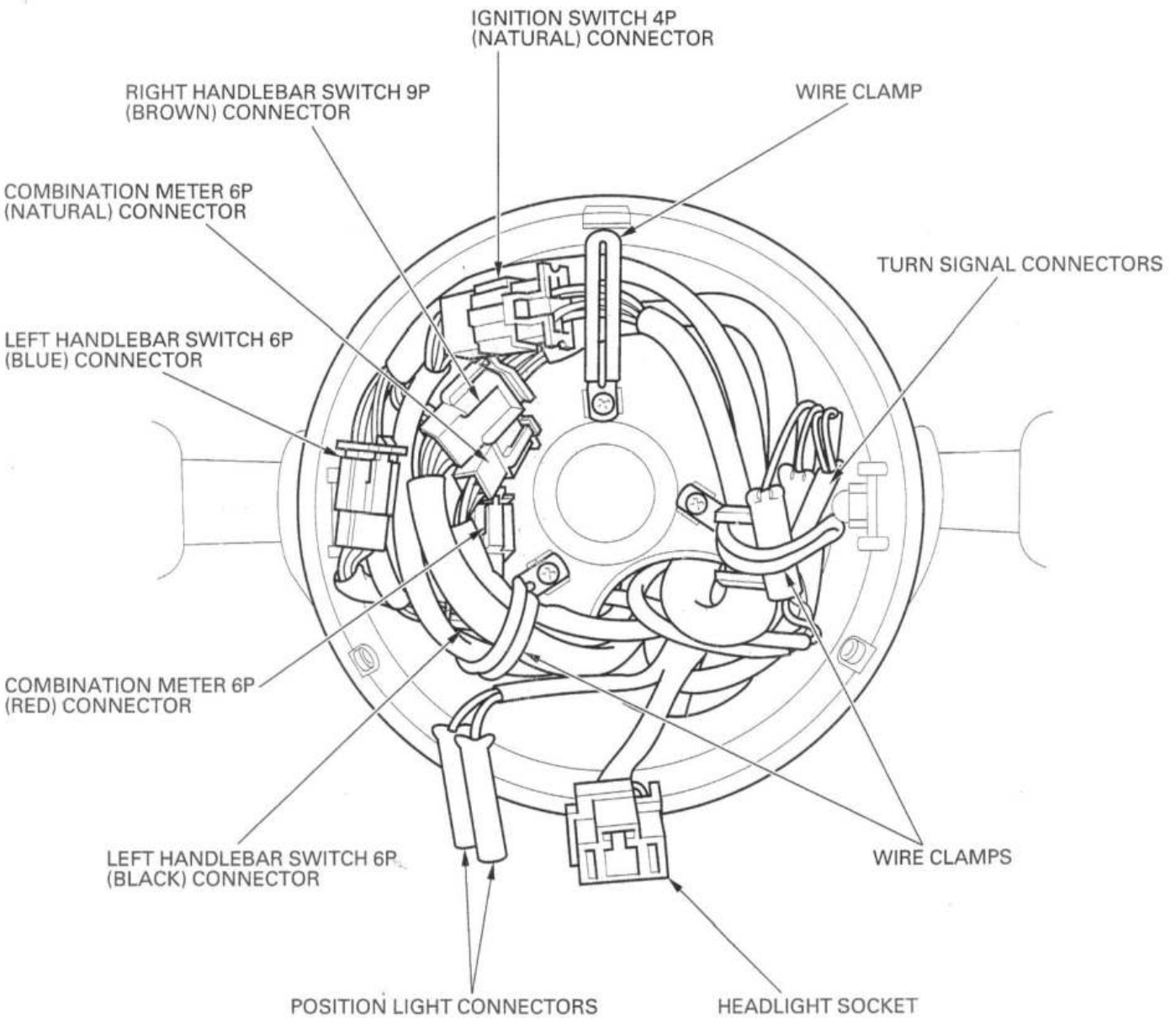
LOCATION	MATERIAL	REMARKS
Cylinder head semi-circular cut-out 	Sealant	
Camshaft lobes/ journals Valve lifter outer sliding surface Valve stem (valve guide sliding surface) Connecting rod small end bore Main journal bearing surface Connecting rod bearing surface M3/4, C5, C6 shifter gear (shift fork grooves) Cylinder head bolt threads and seating surface Crankshaft thrust surface Clutch outer sliding surface Starter idle gear shaft sliding surface	Molybdenum disulfide oil (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease)	Clean anti-rust oil and apply to the threads and seating surface.
Clutch center lock nut threads Starter clutch sliding surface Piston surface Piston pin bore Piston ring grooves Piston pin surface Piston ring surface Main journal 8 mm bolt threads and seating surface Connecting rod bolt/nut threads Camshaft holder bolt threads and seating surface Flywheel bolt threads Cam chain tensioner collar sliding surface Cam chain tensioner and slipper surface Each gear teeth and rotating surface Oil seal lip (without dust lip) Each O-ring Each bearing Clutch friction disc lining surface Oil filter cartridge threads and mating surface Other rotating area and sliding surface	Engine oil	
Timing hole cap threads Each oil seal lips (with dust lip)	Multi- purpose grease	
Cylinder head cover breather plate bolt threads Cam sprocket bolt threads Oil pump driven sprocket bolt threads Shift drum bearing set plate bolt threads Starter clutch outer torx bolt threads Shift drum center bolt threads Mainshaft bearing set plate bolt threads Gearshift spindle oil seal set plate bolt threads Oil filter boss threads Oil cooler sealing bolt threads	Locking agent	Coating width 6.5 ± 1 mm

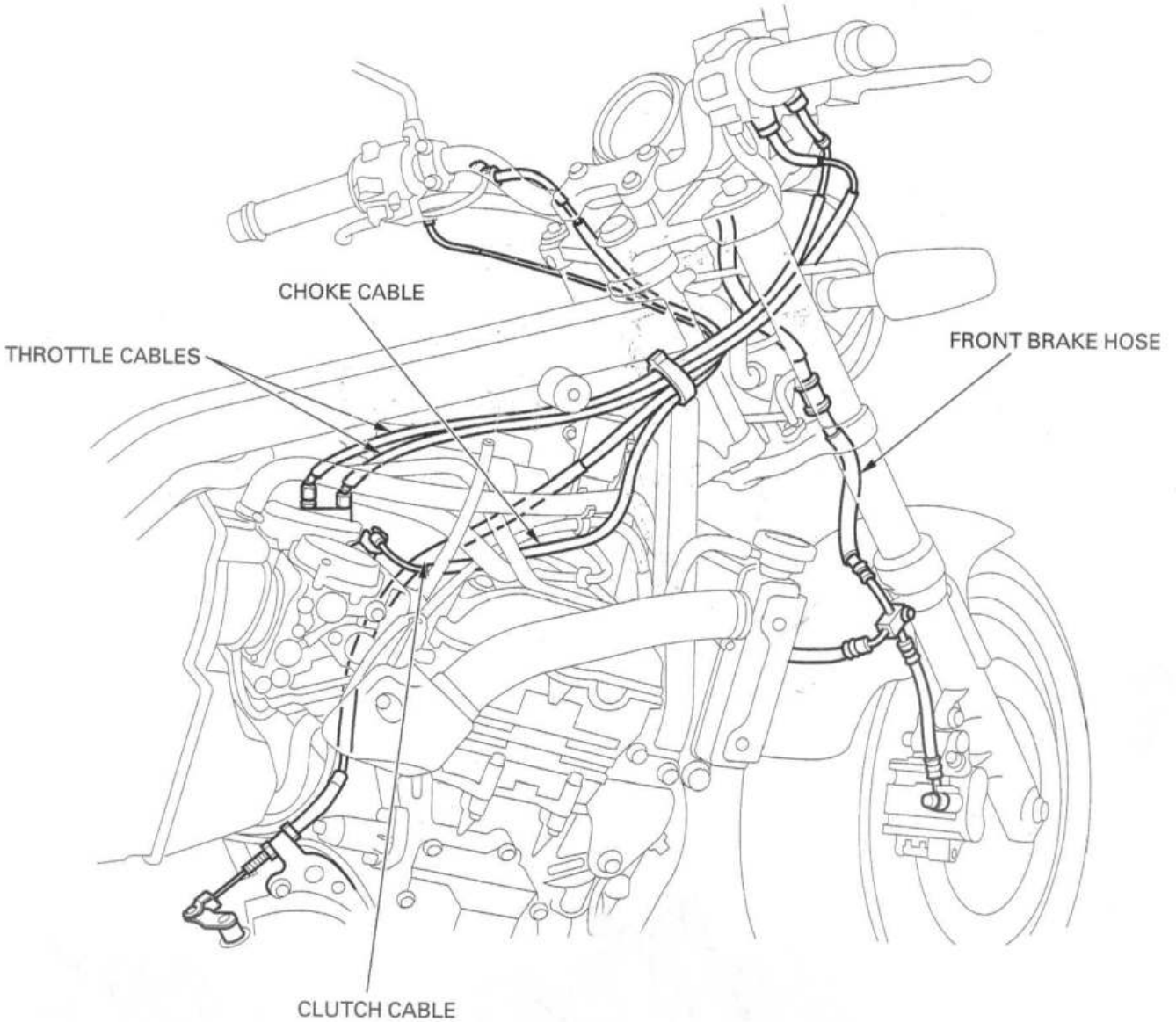
FRAME

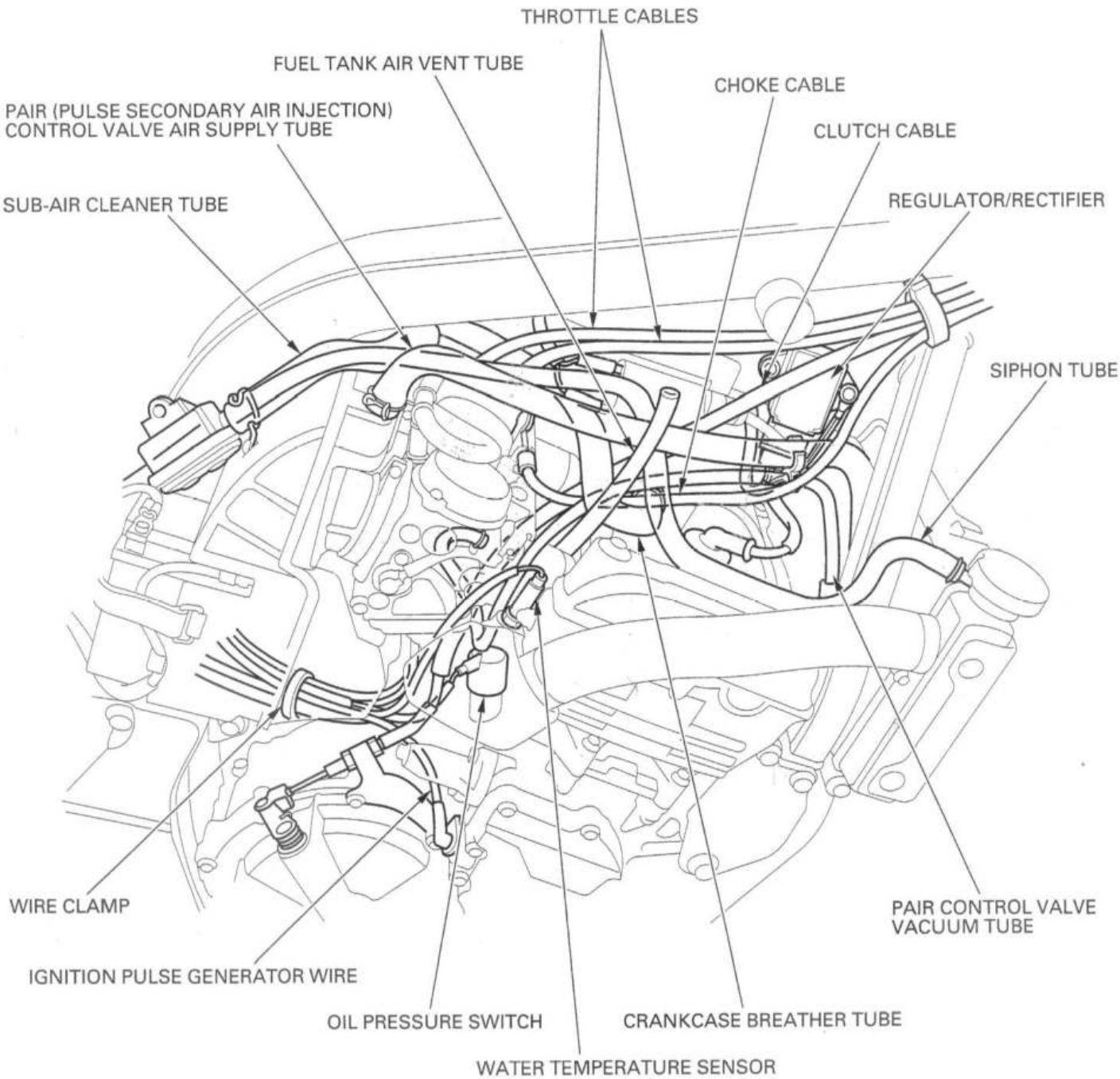
LOCATION	MATERIAL	REMARKS
Steering head bearing sliding surface Steering head dust seal lips Swingarm pivot needle bearing Rear wheel sleeve sliding surface Rear wheel hub O-ring Side stand pivot sliding surface Clutch lever pivot sliding surface Throttle pipe sliding area Footpeg pivot sliding area Gearshift pedal link sliding area Swingarm dust seal lips Rear brake pedal sliding surface Each oil seal lips Each dust seal lips	Multi-purpose grease	
Steering stem top thread Driven sprocket nut threads and seating surface	Engine oil	
Drive chain	#80—90 gear oil	
Brake master cylinder cups Brake caliper piston seals	DOT 4 brake fluid	
Speedometer gearbox pinion gear	Molybdenum disulfide Grease	
Brake caliper dust seals Front brake lever pivot and piston tips Rear master cylinder boot inside and push rod tips Brake caliper slide pin surface	Silicone grease	
Brake lever adjuster stopper bolt threads Fork socket bolt threads Brake caliper slide pin threads	Locking agent	
Fan motor switch threads and O-ring	Sealant	
Handle grip rubber inside	Honda Bond A	
Fork cap O-ring Fork oil seal lips	Fork fluid	

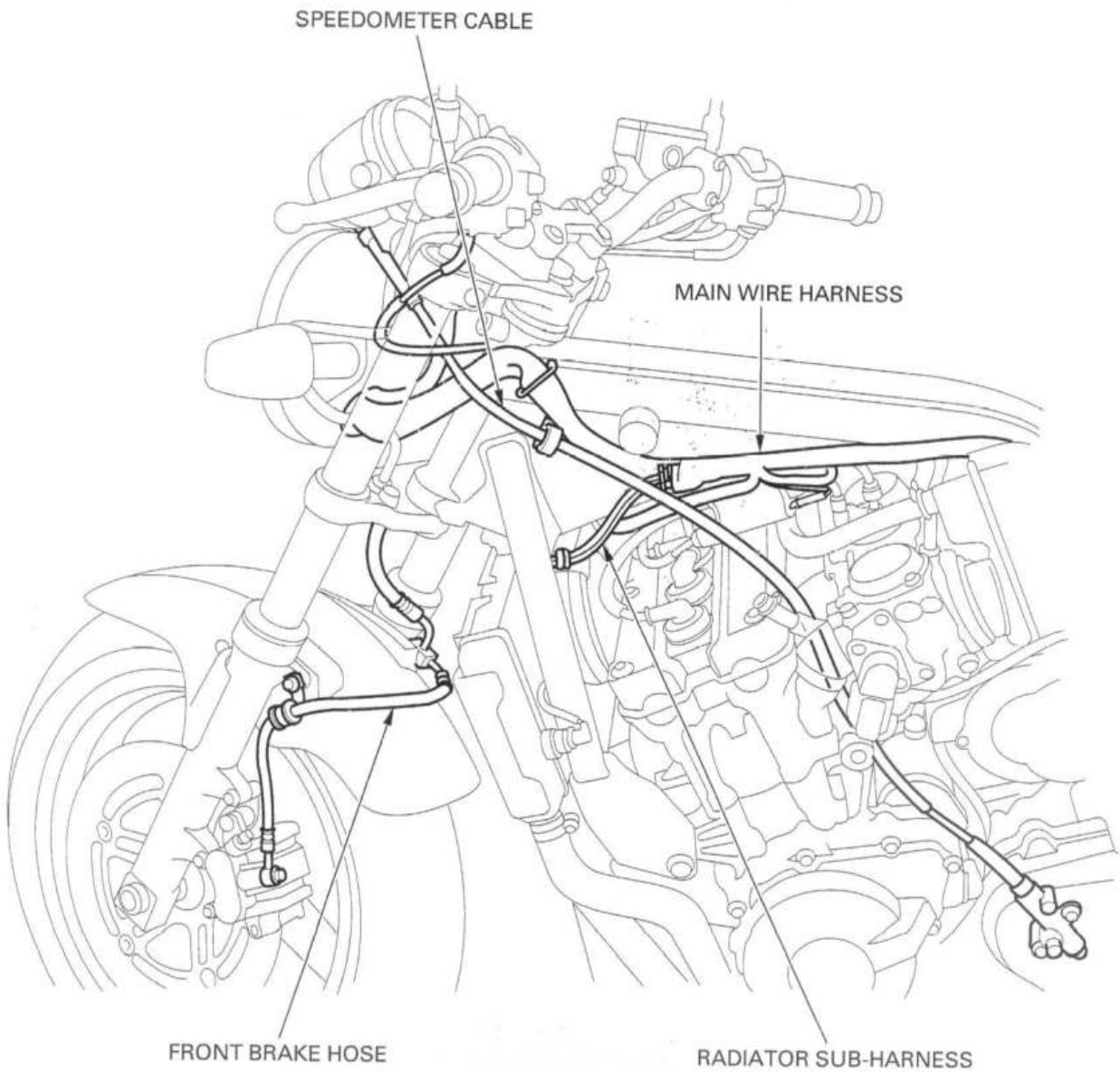
CABLE & HARNESS ROUTING

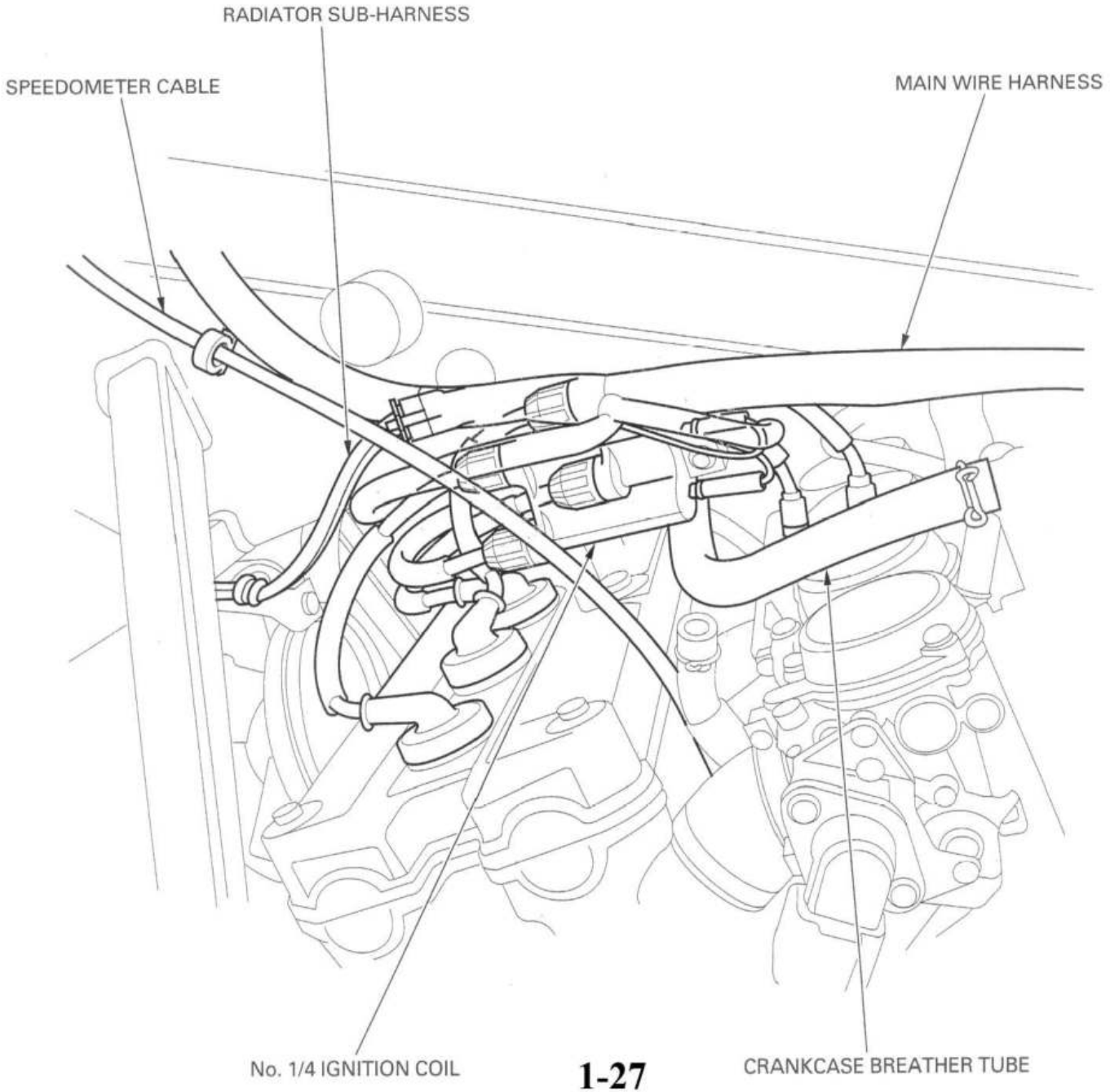


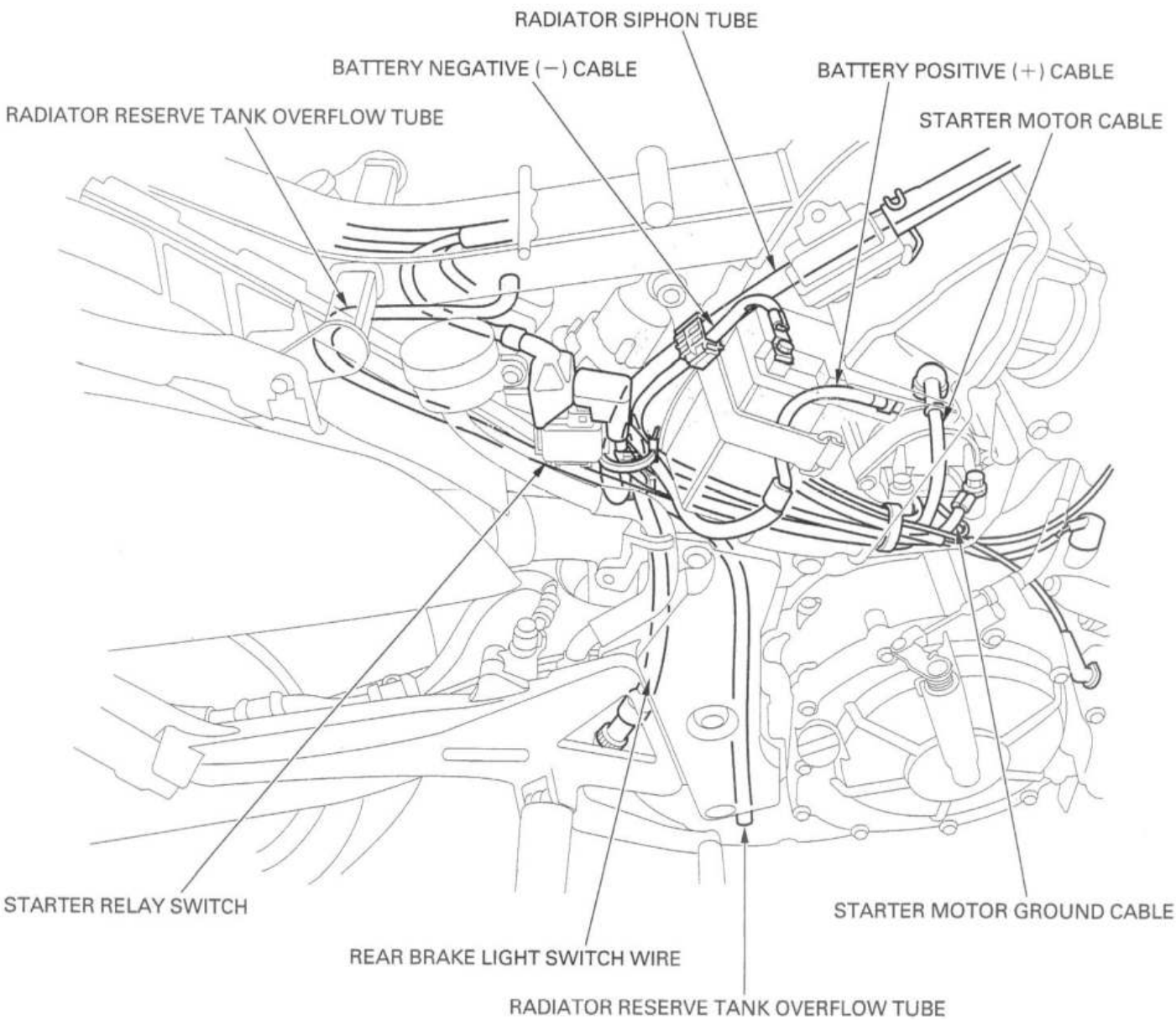

IGNITION SWITCH 4P
(NATURAL) CONNECTOR
RIGHT HANDLEBAR SWITCH 9P
(BROWN) CONNECTOR
WIRE CLAMP
COMBINATION METER 6P
(NATURAL) CONNECTOR
TURN SIGNAL CONNECTORS
LEFT HANDLEBAR SWITCH 6P
(BLUE) CONNECTOR
COMBINATION METER 6P
(RED) CONNECTOR
LEFT HANDLEBAR SWITCH 6P
(BLACK) CONNECTOR
WIRE CLAMPS
POSITION LIGHT CONNECTORS
HEADLIGHT SOCKET

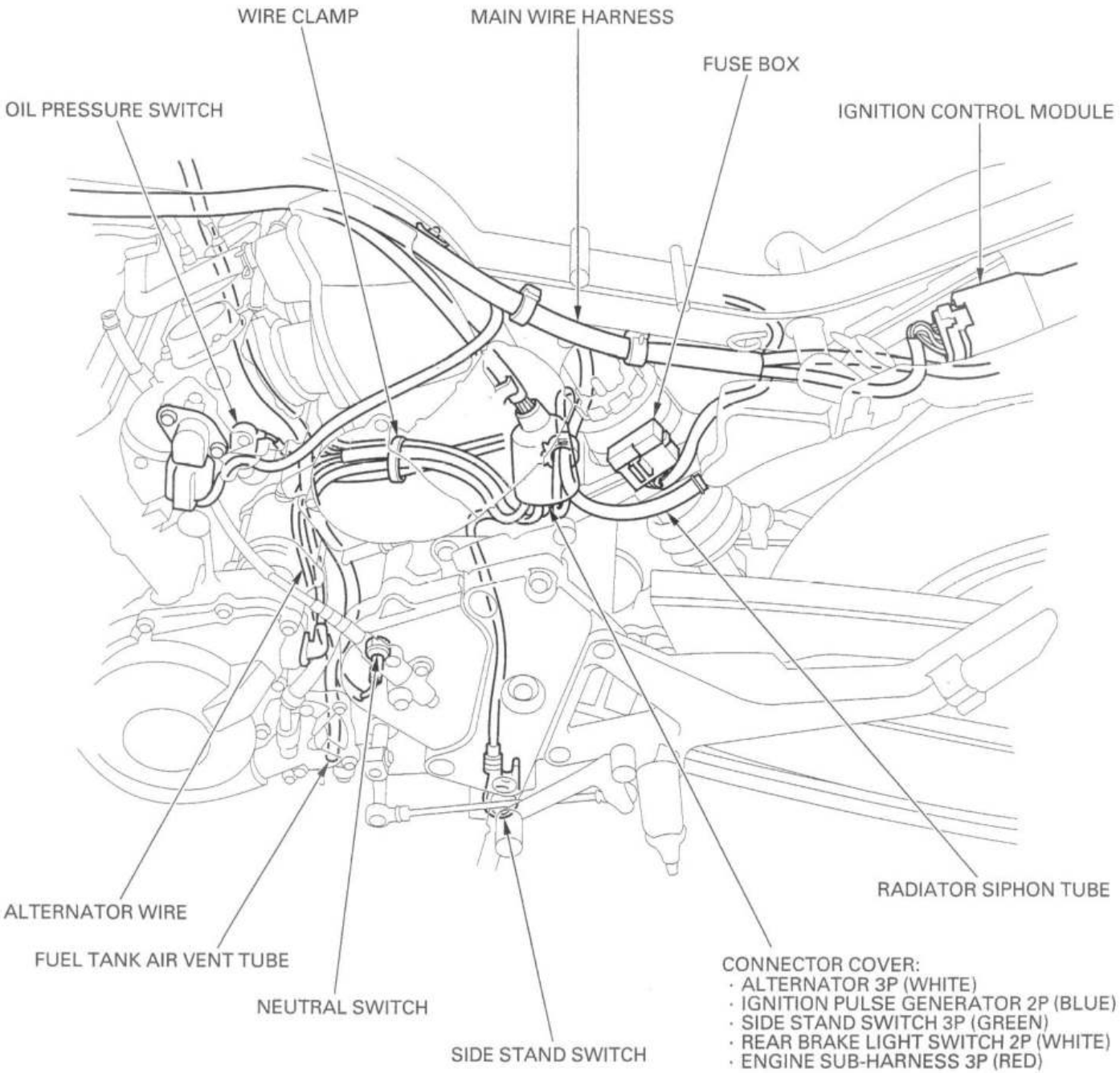

CHOKE CABLE
THROTTLE CABLES
FRONT BRAKE HOSE
CLUTCH CABLE

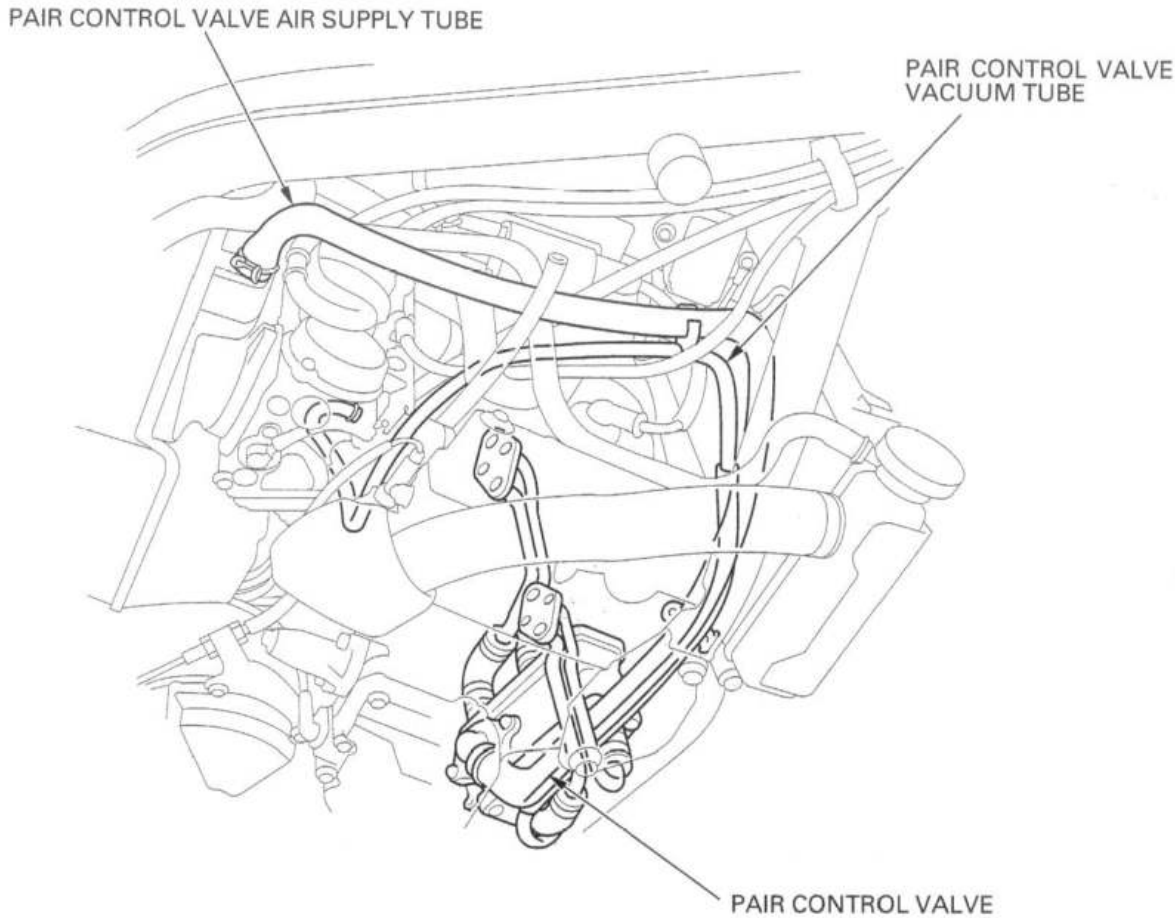

THROTTLE CABLES
FUEL TANK AIR VENT TUBE
CHOKE CABLE
PAIR (PULSE SECONDARY AIR INJECTION) CONTROL VALVE AIR SUPPLY TUBE
CLUTCH CABLE
SUB-AIR CLEANER TUBE
REGULATOR/RECTIFIER
SIPHON TUBE
WIRE CLAMP
PAIR CONTROL VALVE VACUUM TUBE
IGNITION PULSE GENERATOR WIRE
OIL PRESSURE SWITCH
CRANKCASE BREATHER TUBE
WATER TEMPERATURE SENSOR

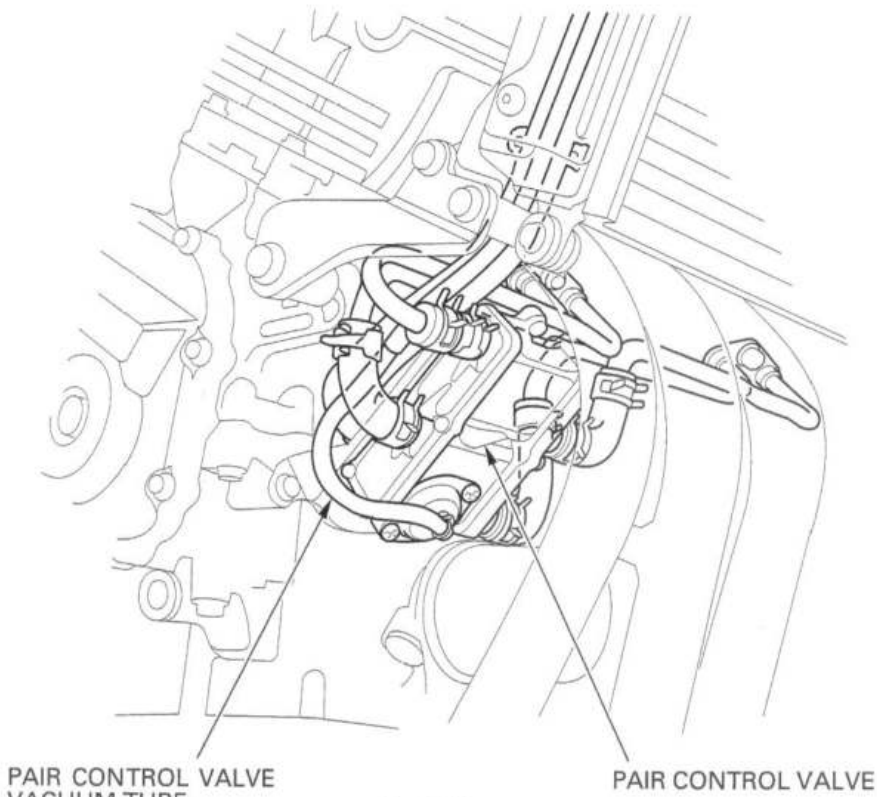

SPEEDOMETER CABLE
MAIN WIRE HARNESS
FRONT BRAKE HOSE
RADIATOR SUB-HARNESS

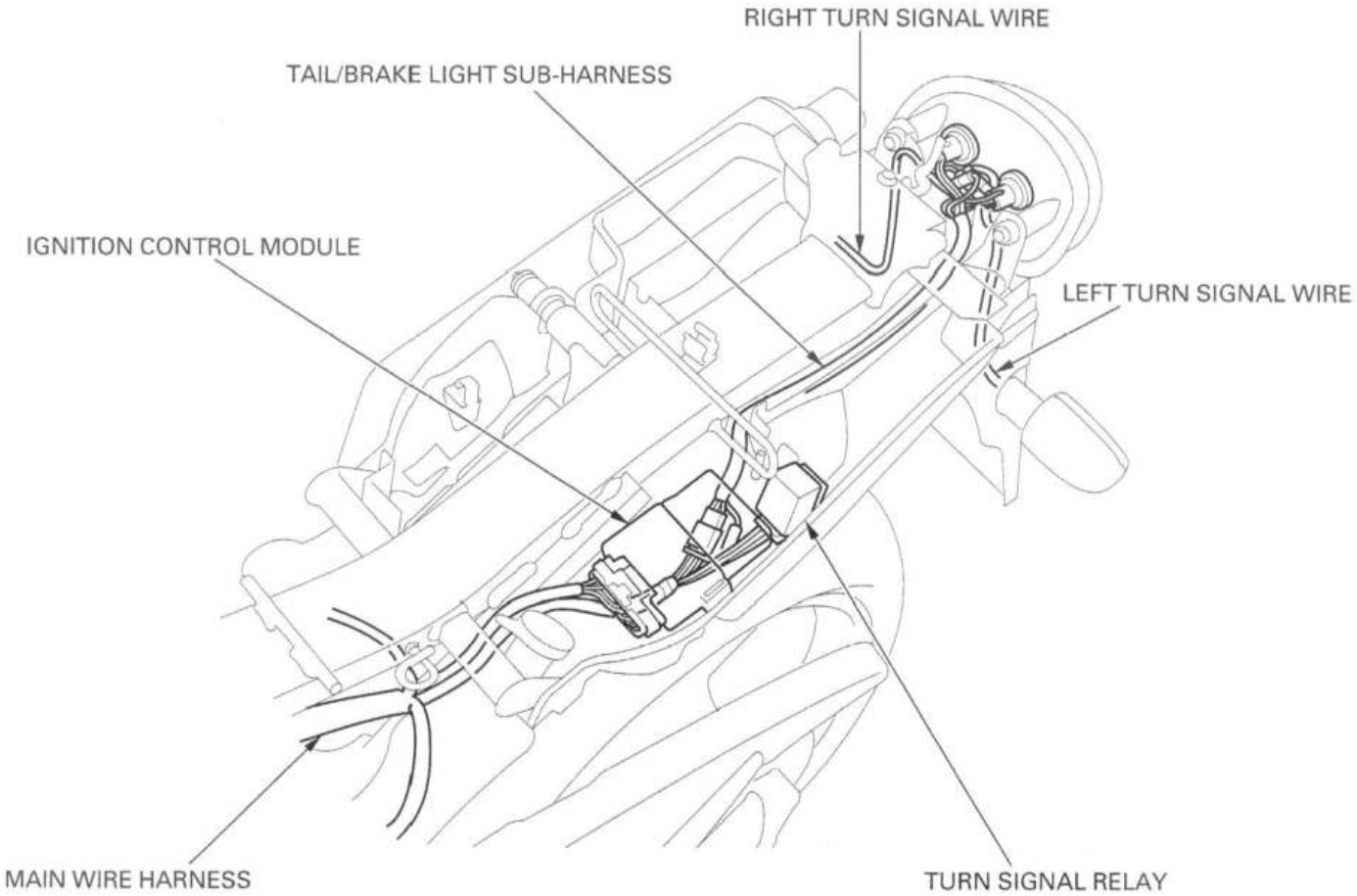

RADIATOR SUB-HARNESS
SPEEDOMETER CABLE
MAIN WIRE HARNESS
No. 1/4 IGNITION COIL
CRANKCASE BREATHER TUBE

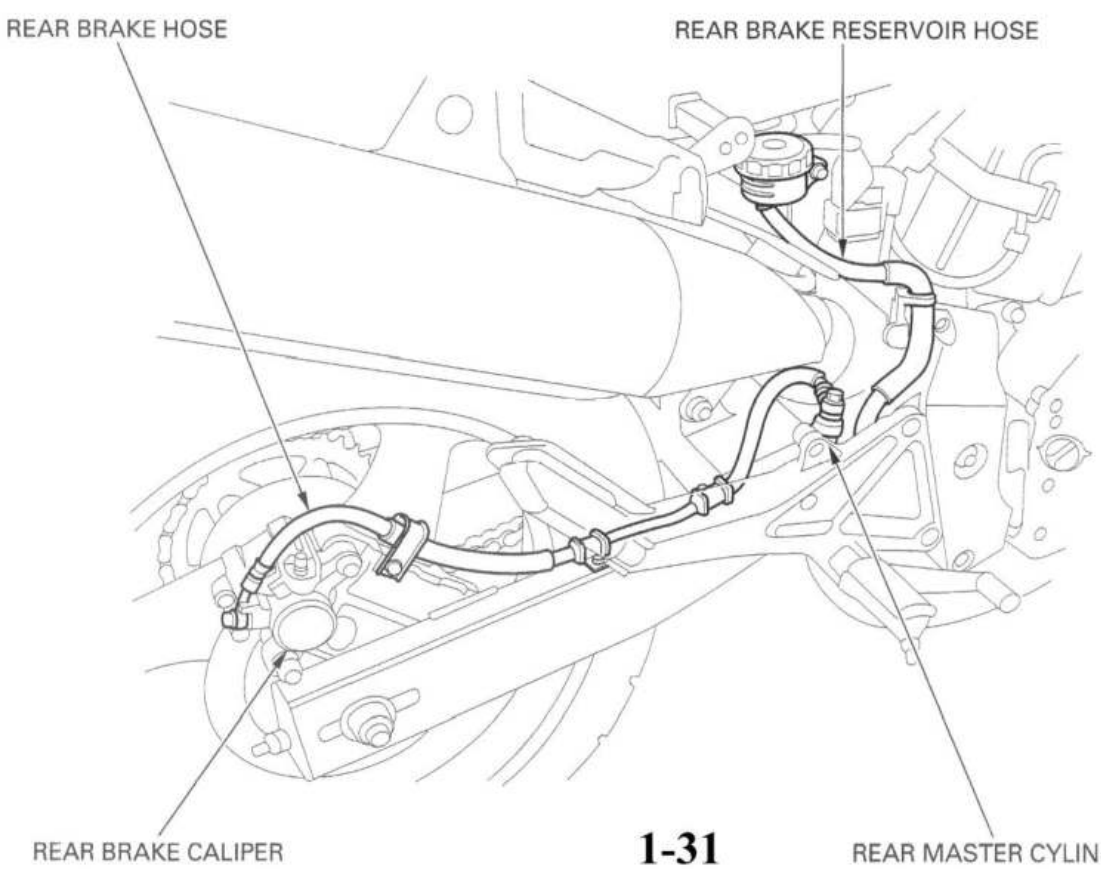

RADIATOR SIPHON TUBE
BATTERY NEGATIVE (−) CABLE
BATTERY POSITIVE (+) CABLE
RADIATOR RESERVE TANK OVERFLOW TUBE
STARTER MOTOR CABLE
STARTER RELAY SWITCH
STARTER MOTOR GROUND CABLE
REAR BRAKE LIGHT SWITCH WIRE
RADIATOR RESERVE TANK OVERFLOW TUBE


WIRE CLAMP
MAIN WIRE HARNESS
FUSE BOX
OIL PRESSURE SWITCH
IGNITION CONTROL MODULE
RADIATOR SIPHON TUBE
ALTERNATOR WIRE
FUEL TANK AIR VENT TUBE
NEUTRAL SWITCH
SIDE STAND SWITCH
CONNECTOR COVER:
· ALTERNATOR 3P (WHITE)
· IGNITION PULSE GENERATOR 2P (BLUE)
· SIDE STAND SWITCH 3P (GREEN)
· REAR BRAKE LIGHT SWITCH 2P (WHITE)
· ENGINE SUB-HARNESS 3P (RED)


PAIR CONTROL VALVE AIR SUPPLY TUBE
PAIR CONTROL VALVE VACUUM TUBE
PAIR CONTROL VALVE


PAIR CONTROL VALVE VACUUM TUBE
PAIR CONTROL VALVE


RIGHT TURN SIGNAL WIRE
TAIL/BRAKE LIGHT SUB-HARNESS
IGNITION CONTROL MODULE
LEFT TURN SIGNAL WIRE
MAIN WIRE HARNESS
TURN SIGNAL RELAY


REAR BRAKE HOSE
REAR BRAKE RESERVOIR HOSE
REAR BRAKE CALIPER
REAR MASTER CYLINDER

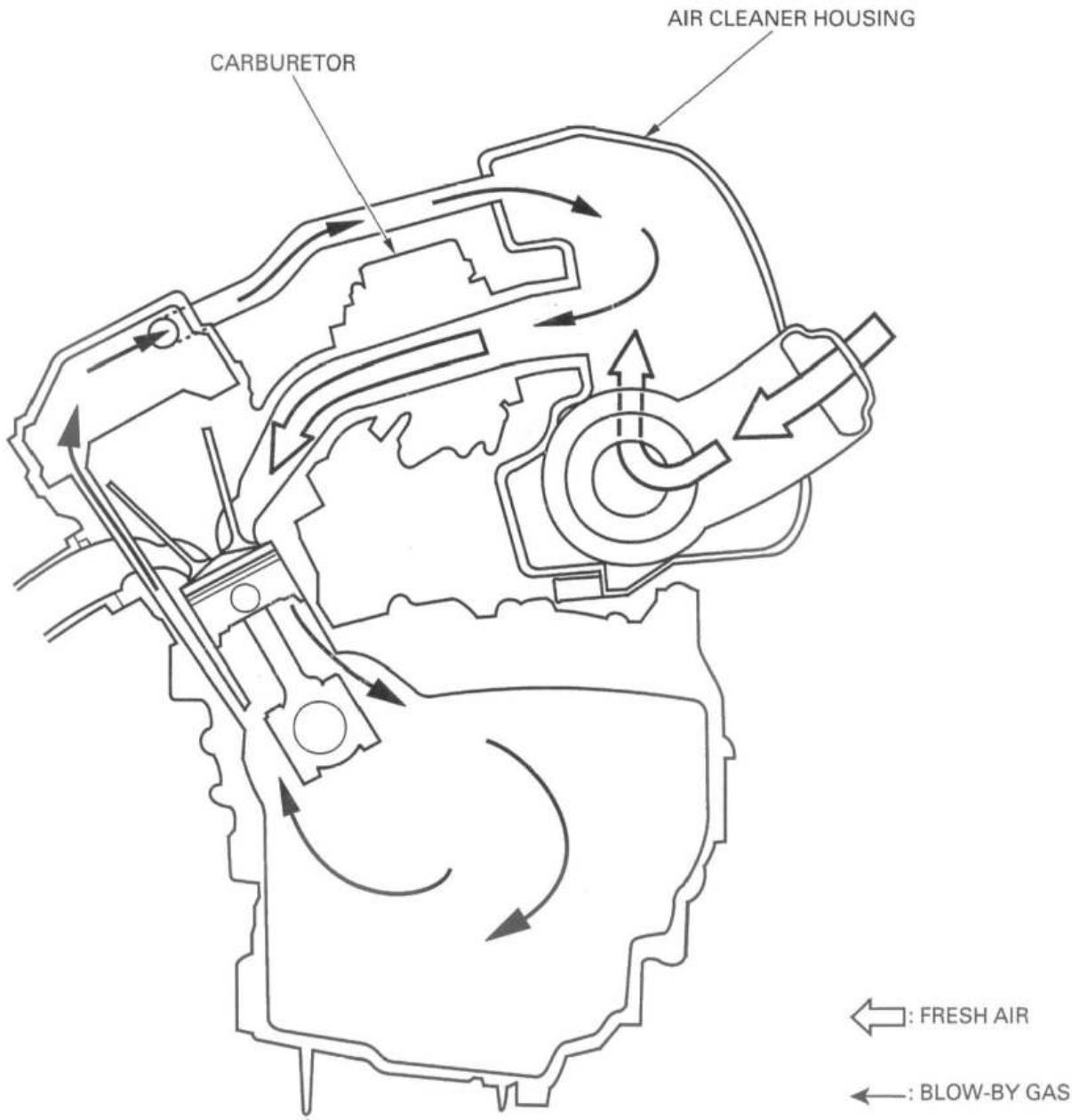
EMISSION CONTROL SYSTEMS

SOURCE OF EMISSIONS

The combustion process produces carbon monoxide and hydrocarbons. Control of hydrocarbons is very important because, under certain conditions, they react to form photochemical smog when subjected to sunlight. Carbon monoxide does not react in the same way, but it is toxic.
Honda Motor Co., Ltd. utilizes lean carburetor settings as well as other systems, to reduce carbon monoxide and hydrocarbons.

CRANKCASE EMISSION CONTROL SYSTEM

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



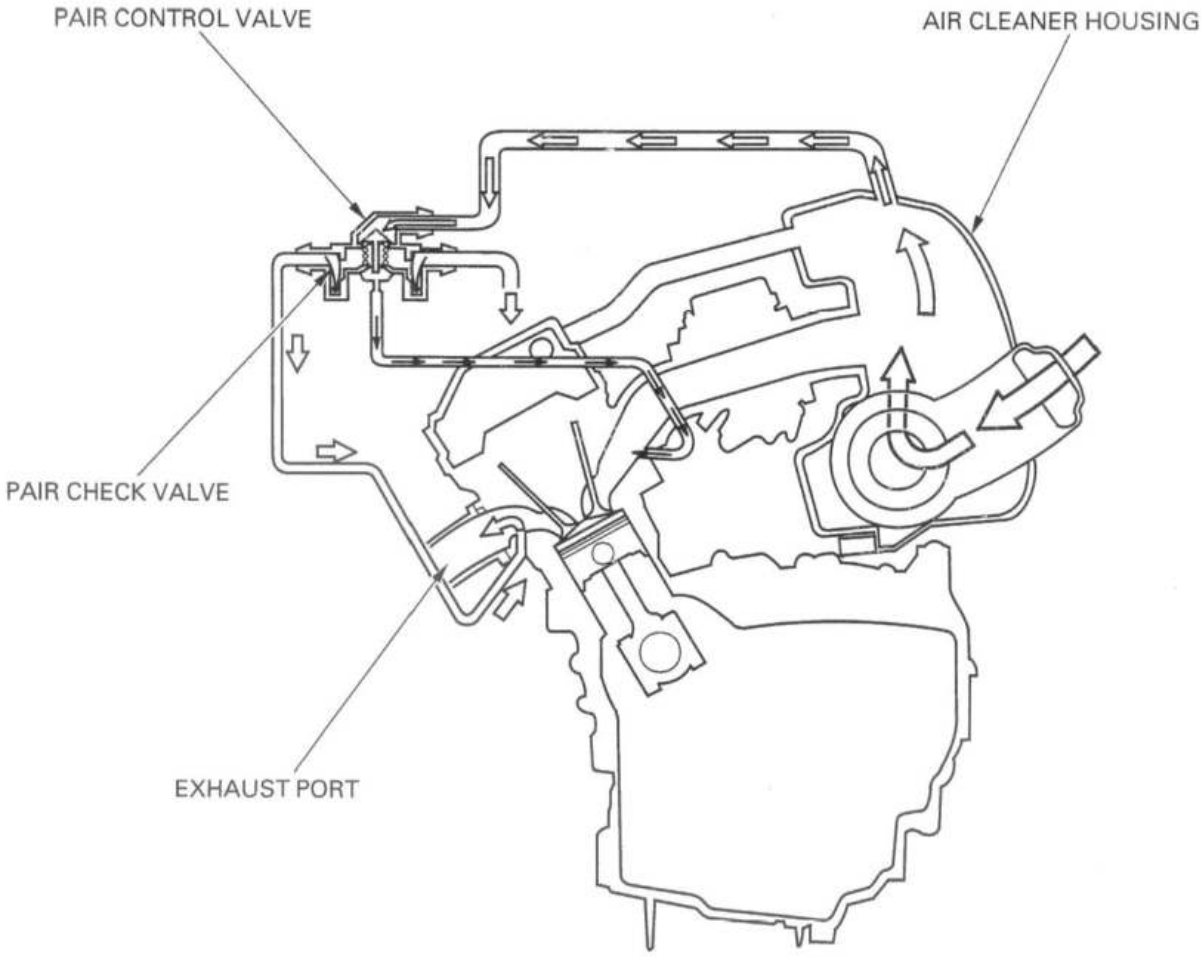
EXHAUST EMISSION CONTROL SYSTEM (SECONDARY AIR SUPPLY SYSTEM)

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

The exhaust emission control system consists of a secondary air supply system which introduces filtered air into the exhaust gases in the exhaust port. Fresh air is drawn into the exhaust port by the function of the PAIR (Pulse secondary air injection) control valve.
This charge of fresh air promotes burning of the unburned exhaust gases and changes a considerable amount of hydrocarbons and carbon monoxide into relatively harmless carbon dioxide and water vapor.

This model has the pulse secondary air injection (PAIR) control valve; it consists of check valves built into the PAIR control valve. A PAIR check valve prevents reverse air flow through the system. The PAIR control valve reacts to high intake manifold vacuum pressure will cut off the supply of fresh air during engine deceleration, thereby preventing afterburn in the exhaust system.

No adjustments to the secondary air supply system should be made, although periodic inspection of the components is recommended.



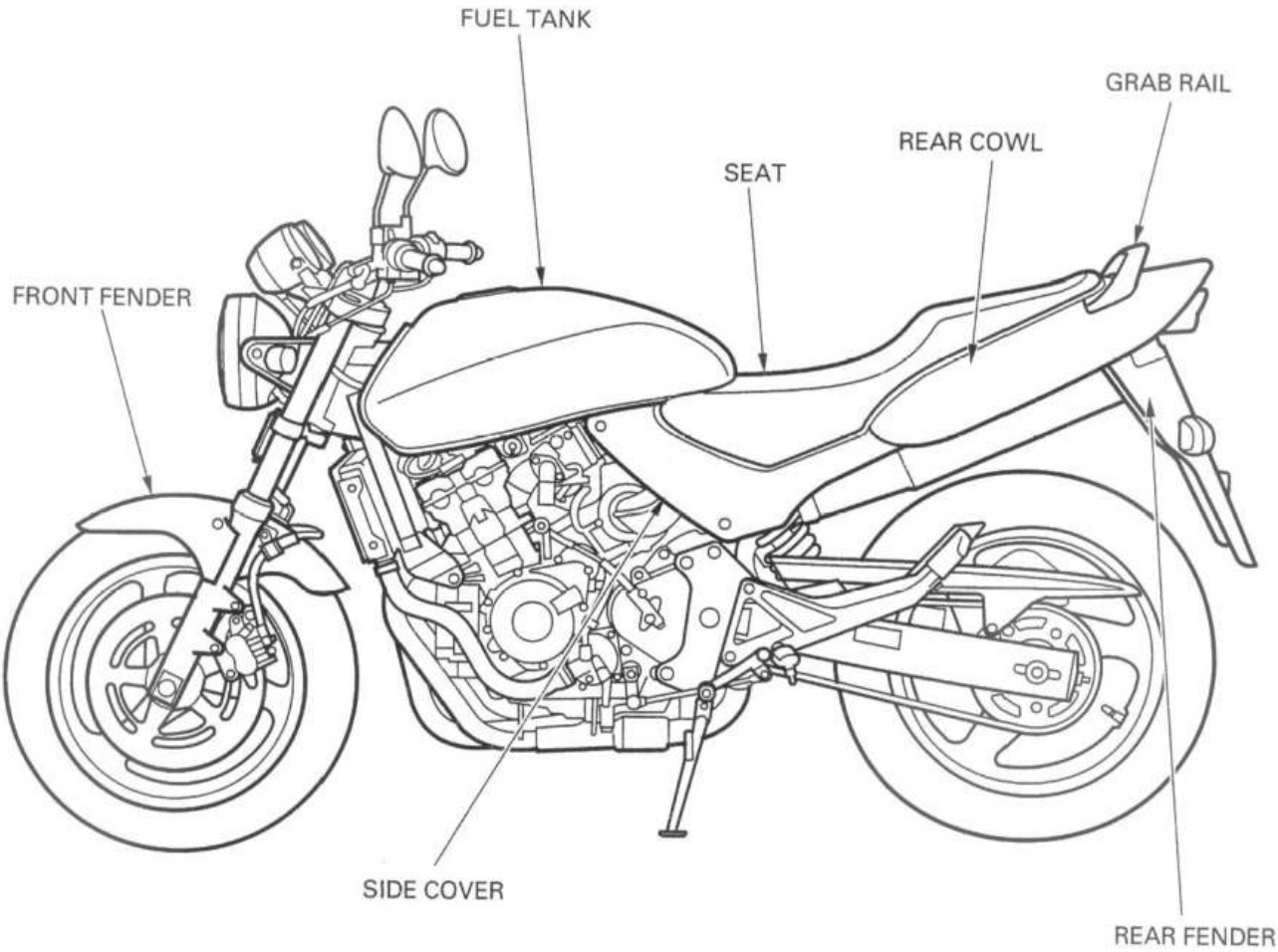
NOISE EMISSION CONTROL SYSTEM

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

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

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

BODY PANEL LOCATIONS



2. FRAME/BODY PANELS/EXHAUST SYSTEM

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

SERVICE INFORMATION

GENERAL

⚠WARNING

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

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

TORQUE VALUES

Side stand pivot bolt	15 N·m (1.5 kgf·m , 11 lbf·ft)
Side stand pivot lock nut	39 N·m (4.0 kgf·m , 29 lbf·ft)
Footpeg holder bolt	26 N·m (2.7 kgf·m , 20 lbf·ft)
Exhaust pipe joint nut	20 N·m (2.0 kgf·m , 14 lbf·ft)
Muffler/exhaust pipe stay bolt	22 N·m (2.2 kgf·m , 16 lbf·ft)
Muffler protector bolt	12 N·m (1.2 kgf·m , 9 lbf·ft)
Muffler band bolt	22 N·m (2.2 kgf·m , 16 lbf·ft)
Grab rail mounting bolt	26 N·m (2.7 kgf·m , 20 lbf·ft)
Front fender mounting bolt	12 N·m (1.2 kgf·m , 9 lbf·ft)
Front brake hose clamp bolt	12 N·m (1.2 kgf·m , 9 lbf·ft)
Rearview mirror mounting nut	34 N·m (3.5 kgf·m , 25 lbf·ft)
Rear reflector mounting nut	5 N·m (0.5 kgf·m , 3.6 lbf·ft)
Side cover upper mounting bolt	1 N·m (0.15 kgf·m , 1.1 lbf·ft)
Side cover lower mounting bolt	4 N·m (0.4 kgf·m , 2.9 lbf·ft)
Rear turn signal mounting nut	5 N·m (0.5 kgf·m , 3.6 lbf·ft)
Taillight mounting nut	7 N·m (0.7 kgf·m , 5.1 lbf·ft)
Fuel valve nut	34 N·m (3.5 kgf·m , 25 lbf·ft)
Fuel tank stay bolt	12 N·m (1.2 kgf·m , 9 lbf·ft)

TROUBLESHOOTING

Excessive exhaust noise
- Broken exhaust system
- Exhaust gas leak

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

SEAT

REMOVAL

Unlock the seat lock using the ignition key.

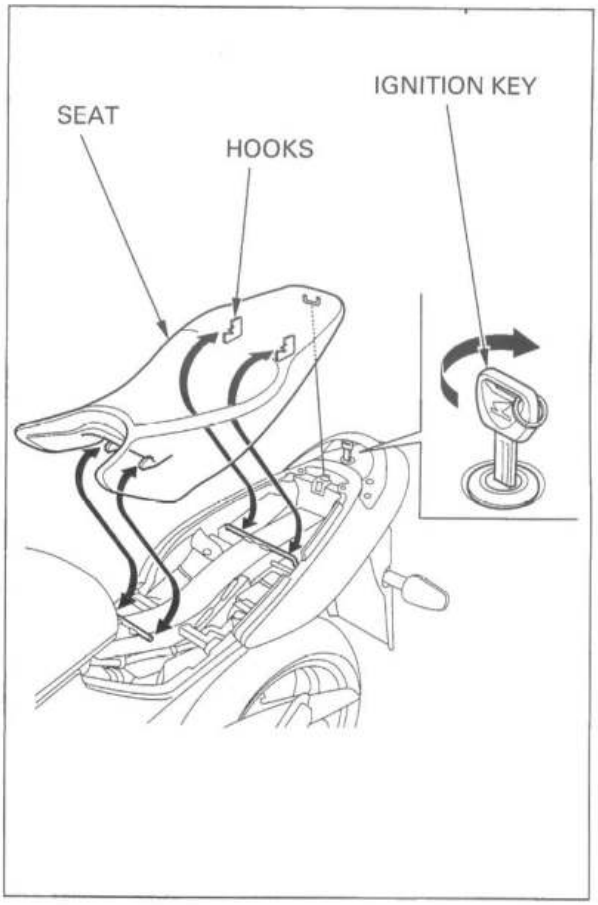
Remove the seat backward while releasing the seat hooks from the frame hooks.

INSTALLATION

Install the seat while aligning its hooks with the frame hooks.
Push the seat forward, lock it securely.

CAUTION:

- ***Be careful not to damage the wire harness.***
- ***After installation, make sure that the seat is installed properly by moving the seat.***



SIDE COVER

REMOVAL

Remove the seat (see above).

Remove the two side cover mounting screws.

NOTE:

The upper mounting bolt is screwed into the rubber nut. If the rubber nut is turn together with the mounting bolt, hold the rubber nut with your finger.

Release the rear tabs from the rear cowl grooves, then remove the side cover.

INSTALLATION

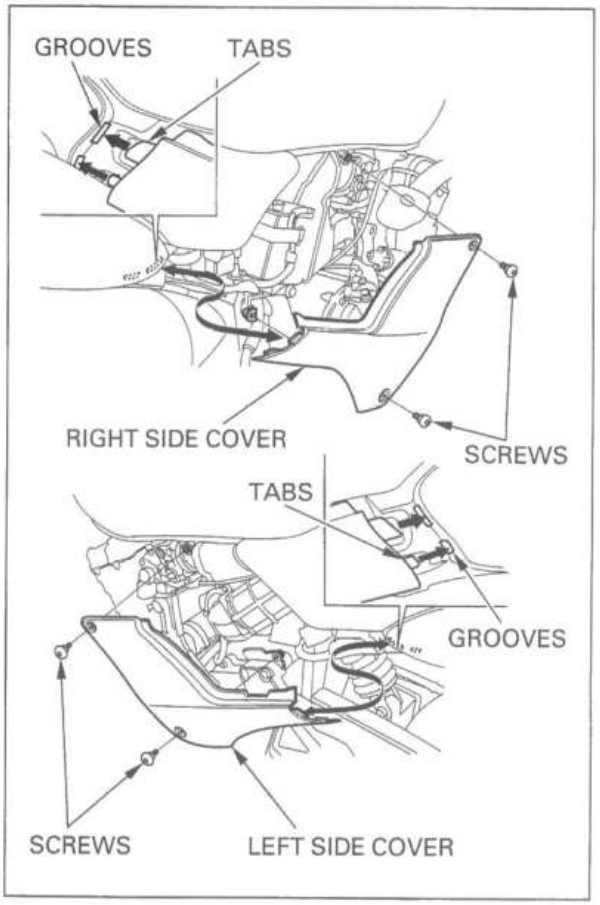
Install the side cover aligning its tabs with the grooves in the rear cowl.

Install and tighten the upper mounting screw to the specified torque.

TORQUE: 1 N·m (0.15 kgf·m , 1.1 lbf·ft)

Install and tighten the lower mounting screw to the specified torque.

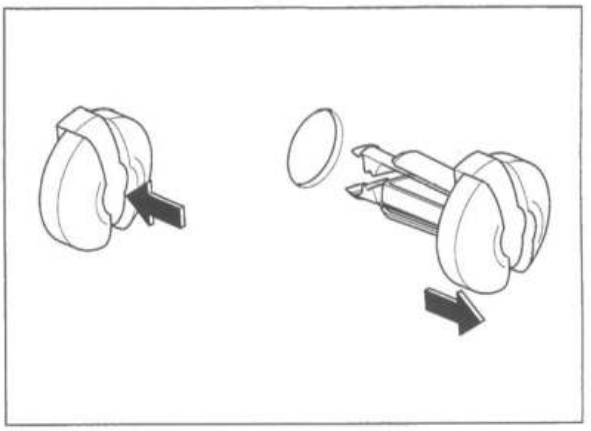
TORQUE: 4 N·m (0.4 kgf·m , 2.9 lbf·ft)



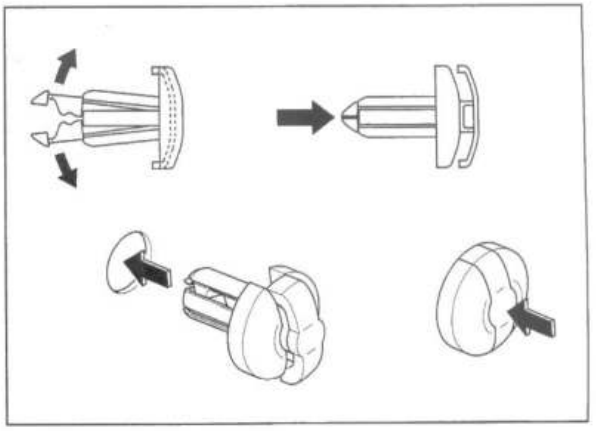
REAR COWL

TRIM CLIP REMOVAL/INSTALLATION

Remove the trim clip.



Raise the center pin by pushing the retaining tabs back.
Install the trim clip.
Push the center pin until the pin flush with the outer casing.



REMOVAL

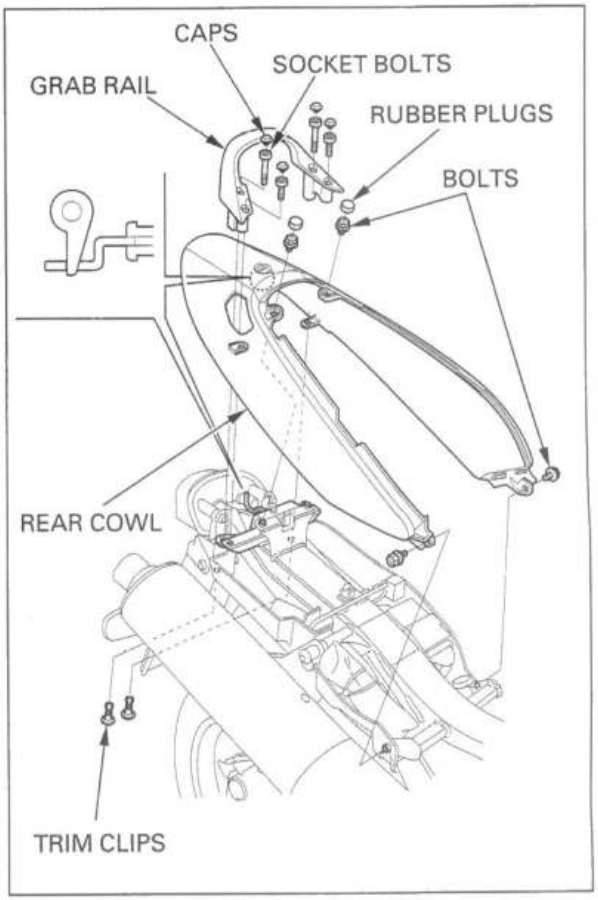
Remove the seat and side covers (see previous page).

Remove the four caps from the grab rail.
Remove the four socket bolts and grab rail.

Remove the two trim clips.

Remove the two rubber plugs.
Remove the rear cowl mounting bolts.

Release the left side of the rear cowl from the frame, then remove the right side of the rear cowl between the muffler and frame.



INSTALLATION

Installation is in the reverse order of removal.

NOTE:

Always install the trim clips first.

TORQUE:
Grab rail mounting bolt:
26 N·m (2.7 kgf·m , 20 lbf·ft)

FUEL TANK

⚠WARNING

- ***Gasoline is extremely flammable and is explosive under certain conditions.***
- ***Wipe up spilled gasoline at once.***

REMOVAL

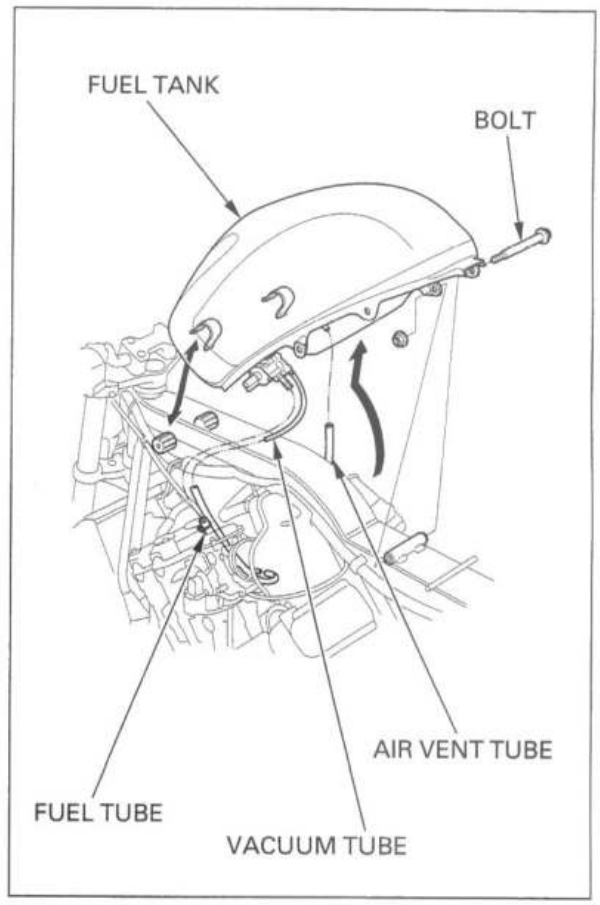
Remove the seat and side covers (page 2-2).

Turn the fuel valve OFF.
Remove the fuel tank mounting bolt and nut.
Disconnect the fuel valve vacuum tube from the intake port.
Swing the rear end of the fuel tank and disconnect the fuel tube from the fuel valve.
Disconnect the fuel tank air vent tube.

Release the fuel tank from the mounting rubbers, then remove the fuel tank upward.

NOTE:

Be careful not to damage the No.1 carburetor vacuum chamber by the fuel valve.



INSTALLATION

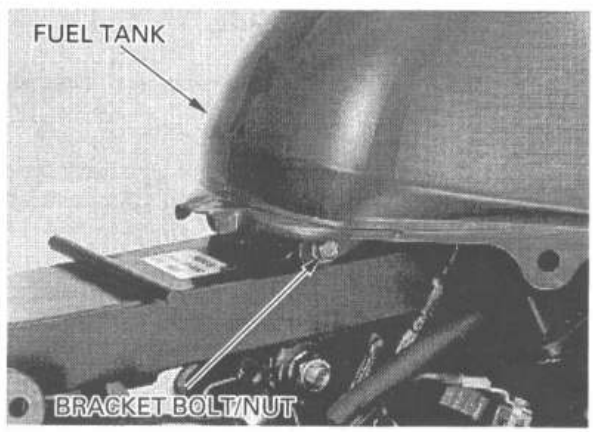
Install the fuel tank in the reverse order of removal.

Tighten the fuel tank bracket bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

NOTE:

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



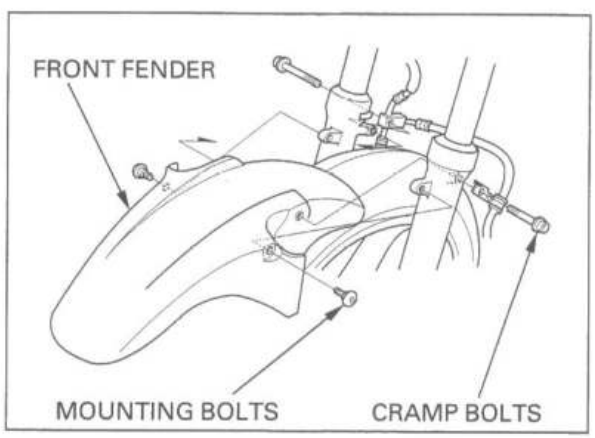
FRONT FENDER

REMOVAL/INSTALLATION

Remove the front brake hose clamp bolts.
Remove the front fender mounting bolts and front fender.

Installation is in the reverse order of removal.
Tighten the front fender mounting bolts and brake hose clamp bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)



REAR FENDER

REMOVAL

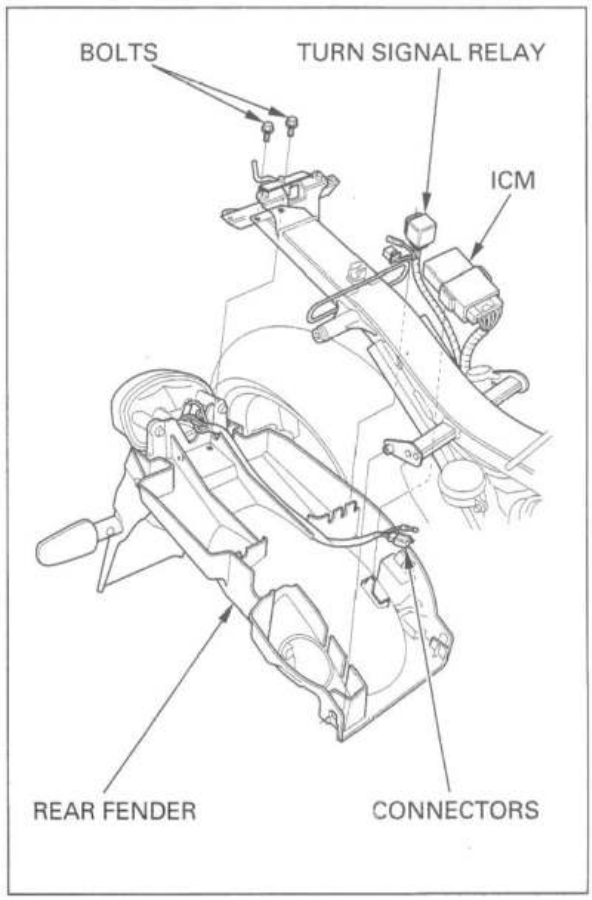
Remove the rear cowl (page 2-3).
Remove the muffler (see below).

Remove the turn signal relay and ICM (Ignition Control Module) from the rear fender.
Disconnect the brake/tail light connectors.

Remove the rear fender mounting bolts and rear fender from the frame.

INSTALLATION

Installation is in the reverse order of removal.



MUFFLER/EXHAUST PIPE

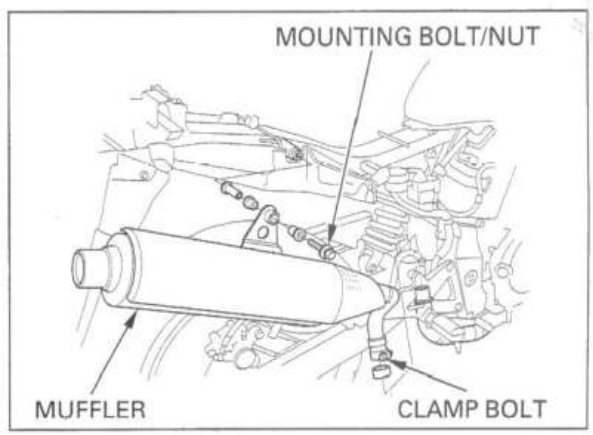
MUFFLER REMOVAL/INSTALLATION

⚠WARNING

Do not service the exhaust system while it is hot.

Remove the rear cowl (page 2-3).

Loosen the exhaust pipe clamp bolt.
Remove the mounting bolt/nut and muffler.
Remove the muffler packing.

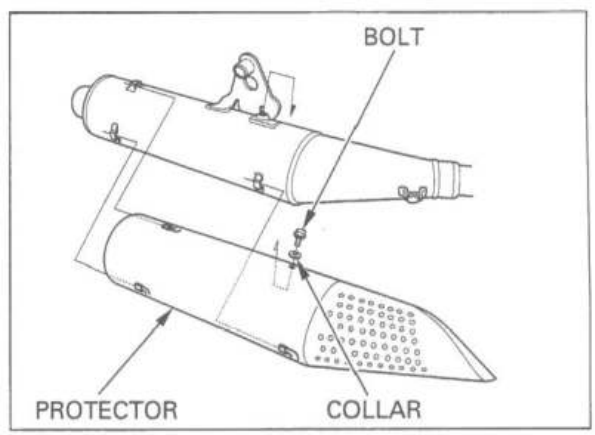


Remove the bolt, collar and muffler protector from the muffler.

Install the muffler in the reverse order of removal.

NOTE:

Always replace the muffler packing with a new one.



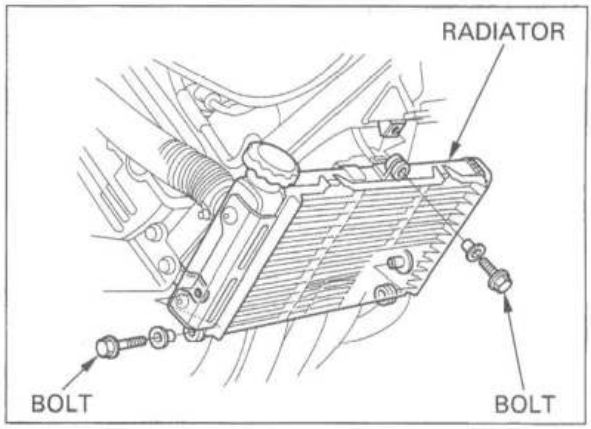
TORQUE:

Muffler mounting bolt/nut:
22 N·m (2.2 kgf·m , 16 lbf·ft)

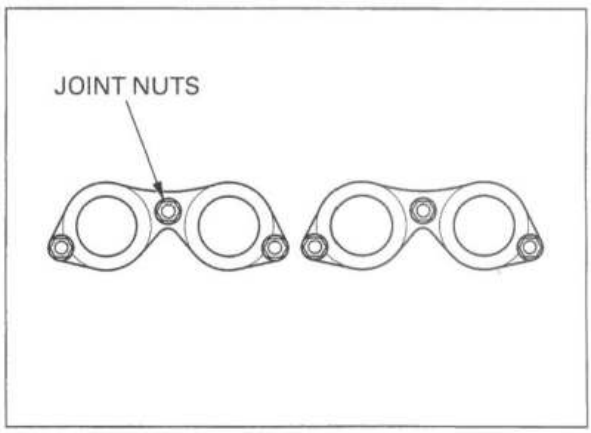
Exhaust band bolt:
22 N·m (2.2 kgf·m , 16 lbf·ft)

EXHAUST PIPE REMOVAL/INSTALLATION

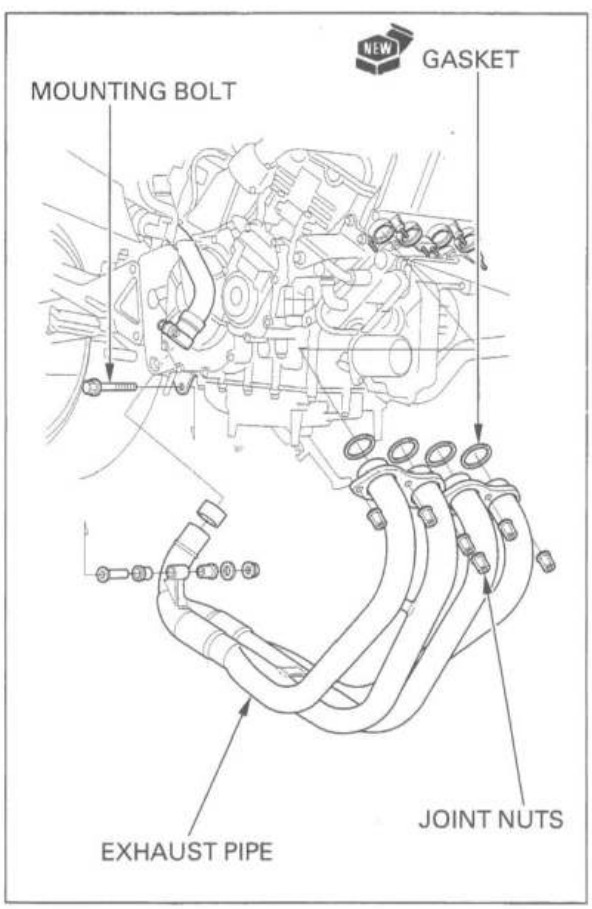
Remove the muffler.
For ease of exhaust pipe removal, remove the radiator mounting bolts.



Remove the exhaust pipe joint nuts.



Remove the exhaust pipe mounting bolt/nut, washer and exhaust pipe.
Remove the exhaust pipe gaskets.



Install the new exhaust pipe gaskets into the exhaust ports of the cylinder head.

NOTE:

- Always replace the exhaust pipe gaskets and exhaust pipe joint gaskets with new ones.
- Prevent falling the gasket, apply grease to the exhaust pipe gaskets.

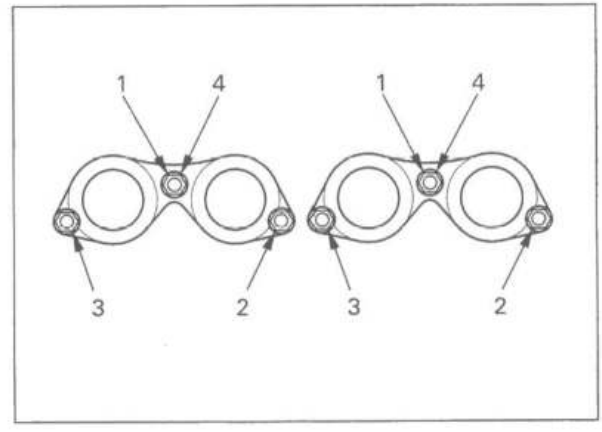
Install the exhaust pipe, and temporarily install exhaust pipe joint nuts and muffler mounting bolt/nut.

First tighten the exhaust pipe joint nuts to the specified torque.

NOTE:

Tighten the exhaust pipe joint nuts in numerical order shown in the illustration.

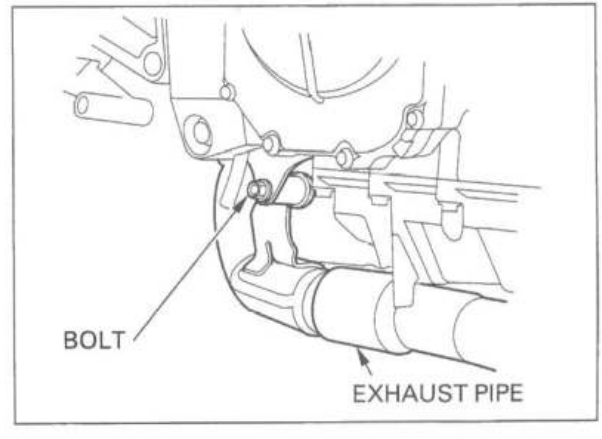
TORQUE: 20 N·m (2.0 kgf·m , 14 lbf·ft)



Install the exhaust pipe mounting bolt/nut and tighten the nut to the specified torque.

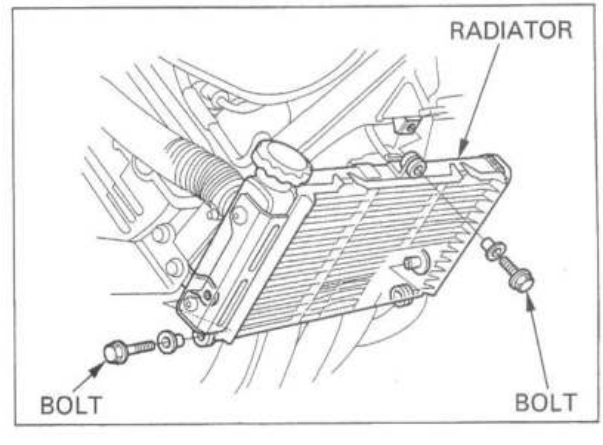
TORQUE: 22 N·m (2.2 kgf·m , 16 lbf·ft)

Install the muffler.



Install the radiator and tighten the mounting bolts.

Install the removed parts in the reverse order of removal.



3. MAINTENANCE

SERVICE INFORMATION	3-1	DRIVE CHAIN	3-17
MAINTENANCE SCHEDULE	3-3	DRIVE CHAIN SLIDER	3-22
FUEL LINE	3-4	BRAKE FLUID	3-22
THROTTLE OPERATION	3-4	BRAKE PAD WEAR	3-23
CARBURETOR CHOKE	3-5	BRAKE SYSTEM	3-23
AIR CLEANER	3-5	BRAKE LIGHT SWITCH	3-24
SPARK PLUG	3-5	HEADLIGHT AIM	3-24
VALVE CLEARANCE	3-7	CLUTCH SYSTEM	3-25
ENGINE OIL/OIL FILTER	3-12	SIDE STAND	3-25
CARBURETOR SYNCHRONIZATION	3-14	SUSPENSION	3-26
ENGINE IDLE SPEED	3-15	NUTS, BOLTS, FASTENERS	3-27
RADIATOR COOLANT	3-16	WHEELS/TIRES	3-27
COOLING SYSTEM	3-16	STEERING HEAD BEARINGS	3-28
SECONDARY AIR SUPPLY SYSTEM	3-17		

SERVICE INFORMATION

GENERAL

⚠WARNING

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

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

SPECIFICATIONS

ITEM		SPECIFICATIONS
Throttle grip free play		2−6 mm (1/16−1/4 in)
Spark plug		CR9EH−9 (NGK)
		U27FER9 (DENSO)
Spark plug gap		0.8−0.9 mm (0.03−0.04 in)
Valve clearance	IN	0.16 ± 0.03 mm (0.006 ± 0.001 in)
	EX	0.22 ± 0.03 mm (0.009 ± 0.001 in)

ITEM			SPECIFICATIONS
Engine oil capacity	At draining		3.5 ℓ (3.7 US qt , 3.1 Imp qt)
	At oil filter change		3.8 ℓ (4.0 US qt , 3.3 Imp qt)
Recommended engine oil			HONDA 4-stroke oil or equivalent motor oil API service classification SE, SF or SG Viscosity: SAE 10W−40
Engine idle speed			1,300 ± 100 min^{-1} (rpm)
Drive chain slack			30−40 mm (1.2−1.6 in)
Recommended brake fluid			DOT 4
Tire size		Front	130/70ZR16 (61W)
		Rear	180/55ZR17 (73W)
Tire brand	Bridgestone	Front	BT-50F RADIAL G
		Rear	BT-50R RADIAL G
	Michelin	Front	TX11
		Rear	TX23
Tire air pressure	Driver only	Front	250 kPa (2.50 kgf/cm^2 , 36 psi)
		Rear	290 kPa (2.90 kgf/cm^2 , 42 psi)
	Driver and passenger	Front	250 kPa (2.50 kgf/cm^2 , 36 psi)
		Rear	290 kPa (2.90 kgf/cm^2 , 42 psi)
Minimum tire tread depth		Front	1.5 mm (0.06 in)
		Rear	2.0 mm (0.08 in)

TORQUE VALUES

Spark plug	12 N·m (1.2 kgf·m , 9 lbf·ft)	
Timing hole cap	18 N·m (1.8 kgf·m , 13 lbf·ft)	Apply grease to the threads
Oil drain bolt	29 N·m (3.0 kgf·m , 22 lbf·ft)	
Oil filter cartridge	10 N·m (1.0 kgf·m , 7 lbf·ft)	Apply clean engine oil to the O-ring
Cylinder head cover bolt	10 N·m (1.0 kgf·m , 7 lbf·ft)	
Camshaft holder flange bolt	12 N·m (1.2 kgf·m , 9 lbf·ft)	Apply oil to the threads and seating surface
Rear axle nut	88 N·m (9.0 kgf·m , 65 lbf·ft)	U-nut
Drive chain adjuster lock nut	21 N·m (2.1 kgf·m , 15 lbf·ft)	

TOOL

Oil filter wrench	07HAA-PJ70100

MAINTENANCE SCHEDULE

Perform the Pre-ride inspection in the Owner's Manual at each scheduled maintenance period.
I: Inspect and Clean, Adjust, Lubricate or Replace if necessary. C: Clean. R: Replace. A: Adjust. L: Lubricate.
The following items require some mechanical knowledge. Certain items (particularly those marked * and **) may require more technical information and tools. Consult their authorized HONDA dealer.

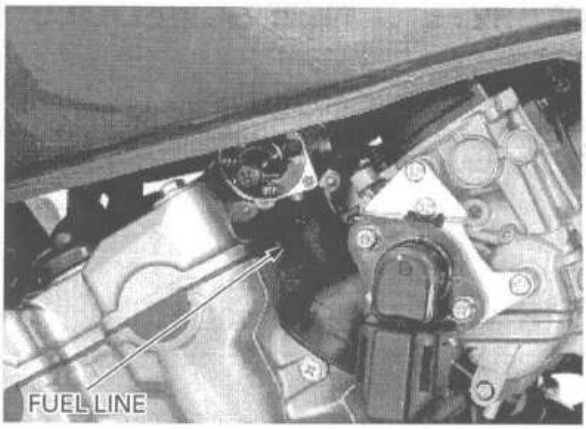
	ITEMS \ FREQUENCY	WHICHEVER COMES FIRST ⇩	⇨ ODOMETER READING (NOTE 1)							REFER TO PAGE
			× 1,000 km	1	6	12	18	24	30	36	
			× 1,000 mi	0.6	4	8	12	16	20	24	
			Months		6	12	18	24	30	36	
*	FUEL LINE					I		I		I	3-4
*	THROTTLE OPERATION					I		I		I	3-4
*	CARBURETOR CHOKE					I		I		I	3-5
	AIR CLEANER	NOTE 2					R			R	3-5
	SPARK PLUG					I		R		I	3-5
*	VALVE CLEARANCE							I			3-7
	ENGINE OIL			R		R		R		R	3-12
	ENGINE OIL FILTER			R		R		R		R	3-12
*	CARBURETOR SYNCHRONIZATION					I		I		I	3-14
*	ENGINE IDLE SPEED			I	I	I	I	I	I	I	3-15
	RADIATOR COOLANT	NOTE 3				I		I		R	3-16
*	COOLING SYSTEM					I		I		I	3-16
*	SECONDARY AIR SUPPLY SYSTEM					I		I		I	3-17
	DRIVE CHAIN			EVERY 1,000 km (600 mi) I,L							3-17
	DRIVE CHAIN SLIDER					I		I		I	3-22
	BRAKE FLUID	NOTE 3			I	I	R	I	I	R	3-22
	BRAKE PAD WEAR				I	I	I	I	I	I	3-23
	BRAKE SYSTEM			I		I		I		I	3-23
*	BRAKE LIGHT SWITCH					I		I		I	3-24
*	HEADLIGHT AIM					I		I		I	3-24
	CLUTCH SYSTEM					I		I		I	3-25
	SIDE STAND					I		I		I	3-25
*	SUSPENSION					I		I		I	3-26
*	NUTS, BOLTS, FASTENERS			I		I		I		I	3-27
**	WHEELS/TIRES					I		I		I	3-27
**	STEERING HEAD BEARINGS			I		I		I		I	3-28

* Should be serviced by an authorized HONDA dealer, unless the owner has proper tools and service data and is mechanically qualified.
** In the interest of safety, we recommend these items be serviced only by an authorized HONDA dealer.

NOTES:
1. At higher odometer reading, repeat at the frequency interval established here.
2. Service more frequently when riding in unusually wet or dusty areas.
3. Replace every 2 years, or at indicated odometer interval, whichever comes first. Replacement requires mechanical skill.

FUEL LINE

Check the fuel lines for deterioration, damage or leakage.
Replace the fuel line if necessary.
Also check the fuel line fittings for leakage.
Check the fuel valve vacuum tube for damage or pinched tube.

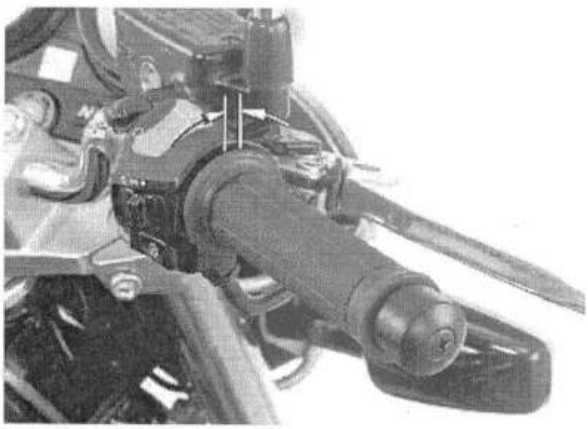


THROTTLE OPERATION

Check for smooth throttle grip full opening and automatic full closing in all steering positions.
Check the throttle cables and replace them if they are deteriorated, kinked or damaged.
Lubricate the throttle cables, if throttle operation is not smooth.

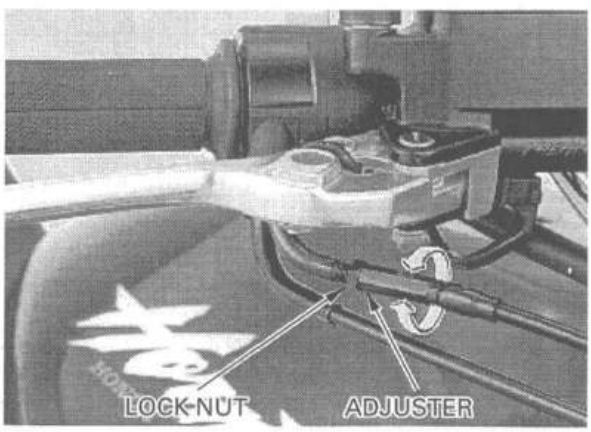
Measure the free play at the throttle grip flange.

FREE PLAY: 2—6 mm (1/16—1/4 in)



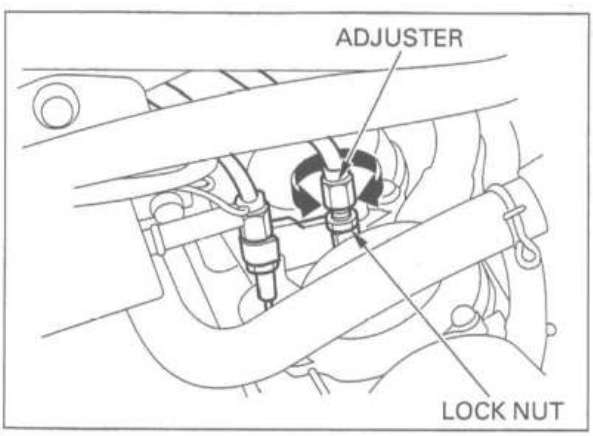
Throttle grip free play can be adjusted at either end of the throttle cable.

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



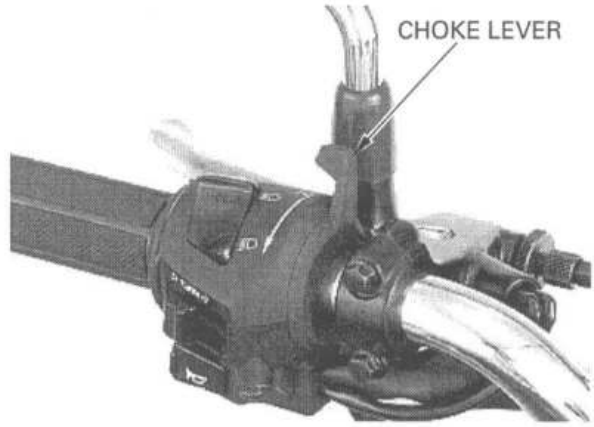
Major adjustments are made with the lower adjuster on the carburetor.

Adjust the free play by loosening the lock nut and turning the adjuster.
After adjustment, tighten the lock nut securely.
Recheck the throttle operation.
Replace any damaged parts, if necessary.



CARBURETOR CHOKE

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



AIR CLEANER

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

Remove the three screws and air cleaner housing cover.



Remove and discard the air cleaner element in accordance with the maintenance schedule (page 3-3).
Also replace the air cleaner element any time it is excessively dirty or damage.

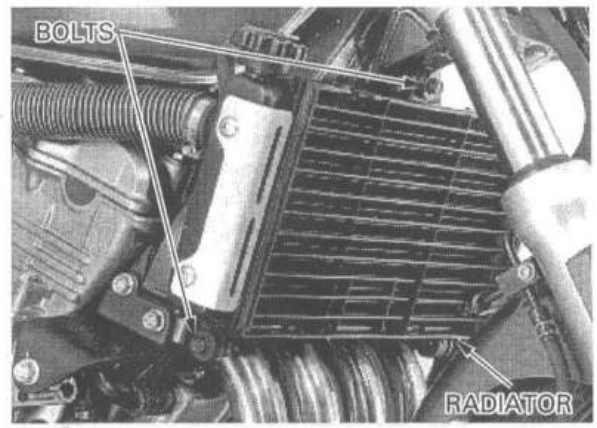
Install the removed parts in the reverse order of removal.



SPARK PLUG

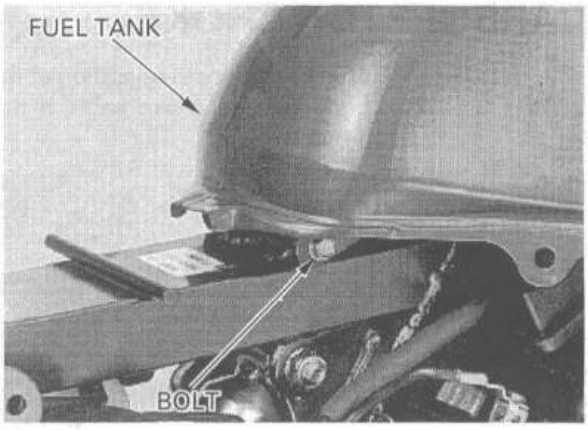
REMOVAL

Remove the radiator mounting bolts, then release the radiator from the grommet.



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

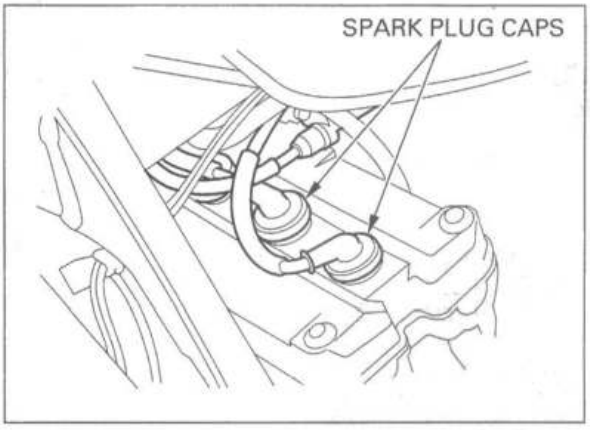
Remove the fuel tank mounting bolt/nut and remove the fuel tank from the frame grommets. Place the fuel tank brackets onto the frame grommets as shown.



Remove the spark plug caps.

NOTE:

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



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

Always use specified spark plugs on this motorcycle.

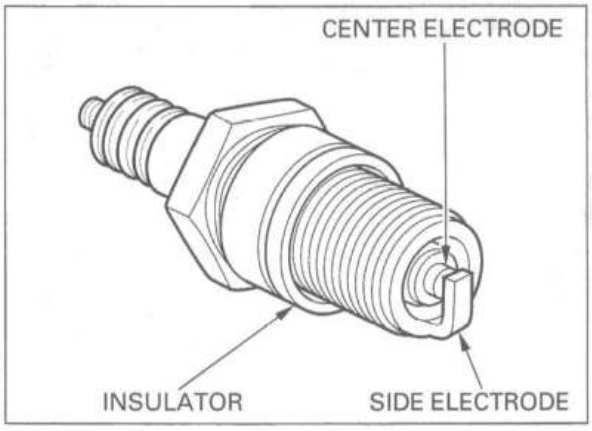
Inspect or replace as described in the maintenance schedule (page 3-3).



INSPECTION

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

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



REUSING A SPARK PLUG

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

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

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

CAUTION:

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

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

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

REPLACING A SPARK PLUG

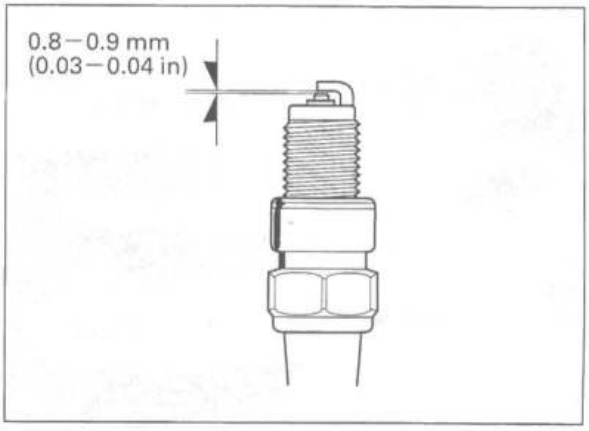
Set the plug gap to specification with a wire-type feeler gauge (see above).

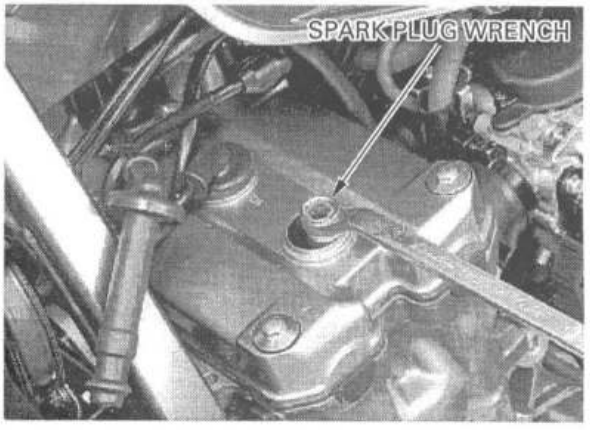
CAUTION:

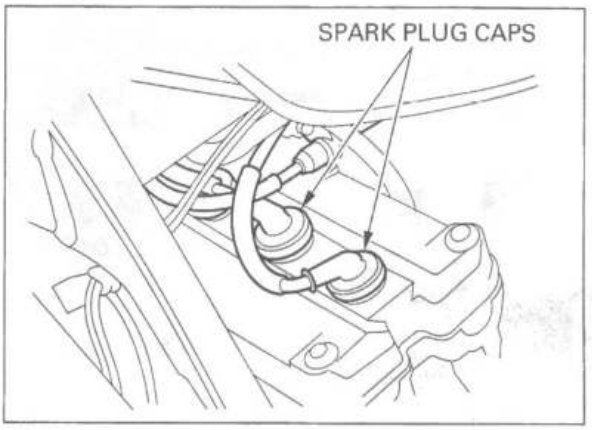
Do not overtighten the plug.

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

Install the spark plug caps.







VALVE CLEARANCE

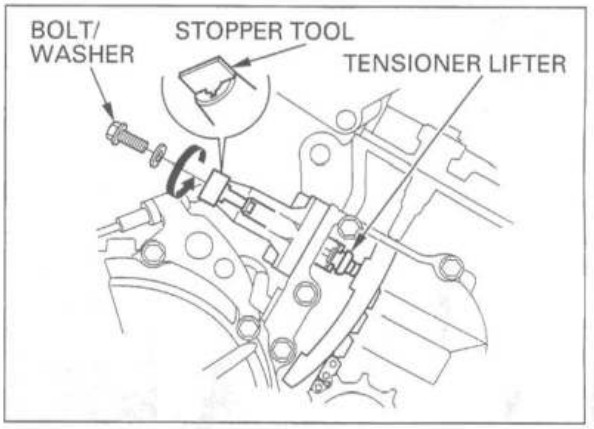
INSPECTION

NOTE:

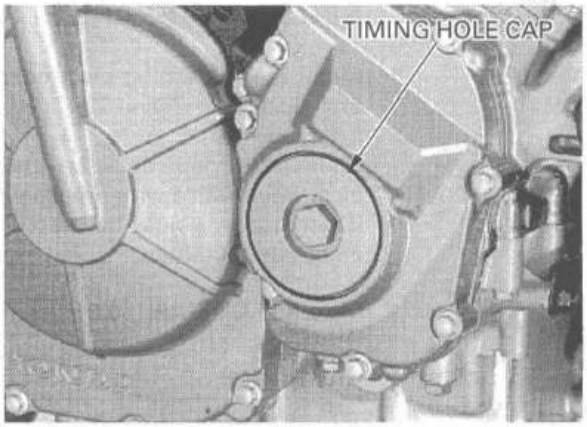
Inspect and adjust the valve clearance while the engine is cold (below 35 °C/95 °F).

Remove the cylinder head cover (page 8-4).

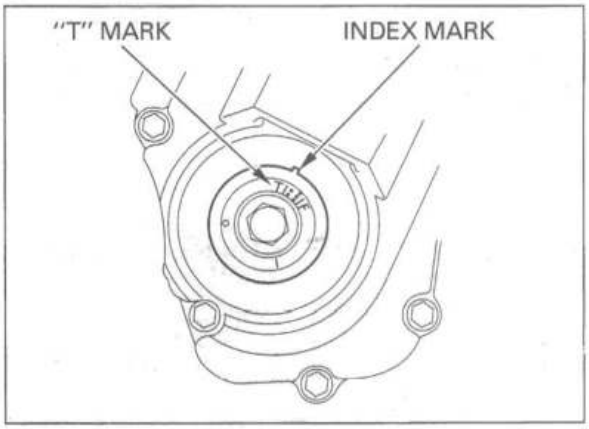
Remove the cam chain tensioner lifter sealing bolt and washer.
Turn the cam chain tensioner lifter shaft clockwise fully and secure it using the mechanic's tensioner stopper tool (page 8-5).



Remove the timing hole cap and O-ring.

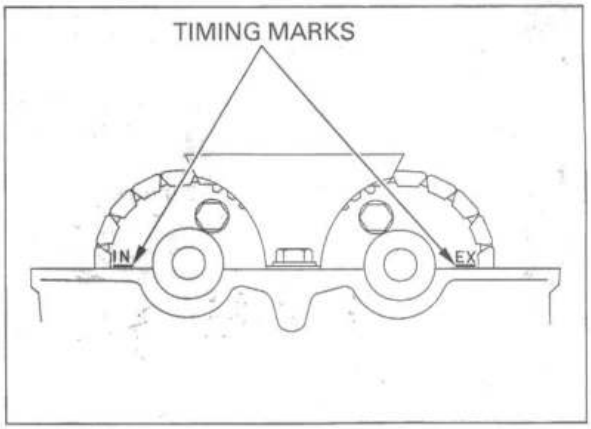


Turn the crankshaft clockwise, align the "T" mark on the ignition pulse generator rotor with the index mark on the ignition pulse generator rotor cover.



The timing marks ("IN" and "EX") on the cam sprockets must be flush with the cylinder head surface and facing outward as shown.

If the timing marks on the cam sprocket facing inward, turn the crankshaft clockwise one full turn (360°) and realign the timing marks with the cylinder head surface so they are facing outward.



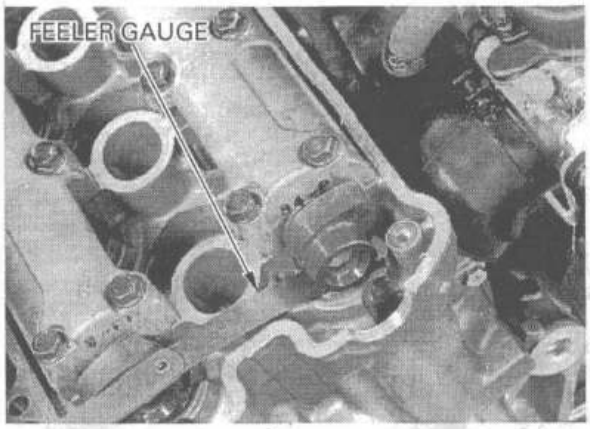
Record the clearance for each valve for reference in shim selection if adjustment is required.

Insert the feeler gauge between the valve lifter and the cam lobe.
Check the valve clearance for the No.1 and No.3 cylinder intake valves using a feeler gauge.

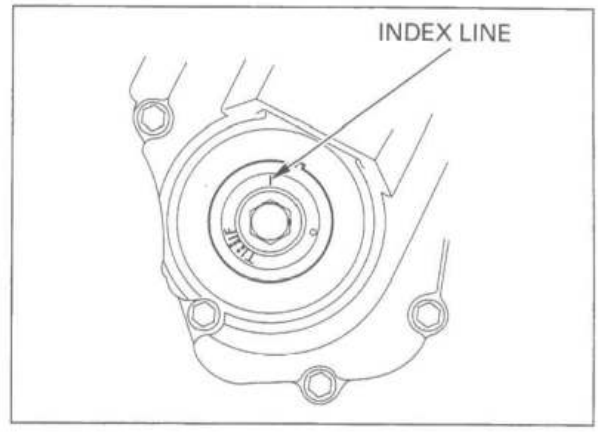
VALVE CLEARANCE:
IN: 0.16 ± 0.03 mm (0.006 ± 0.001 in)

NOTE:

Record the clearance for each valve for reference in shim selection if adjustment is required.



Turn the crankshaft clockwise 1/2 turn (180°), align the index line on the ignition pulse generator rotor so that it is facing up as shown.

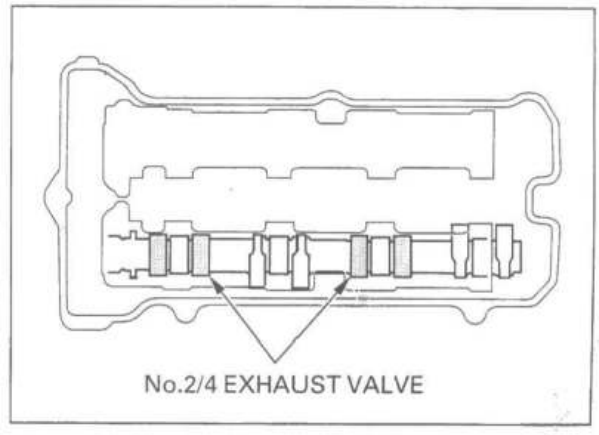


Check the valve clearance for the No.2 and No.4 cylinder exhaust valves using a feeler gauge.

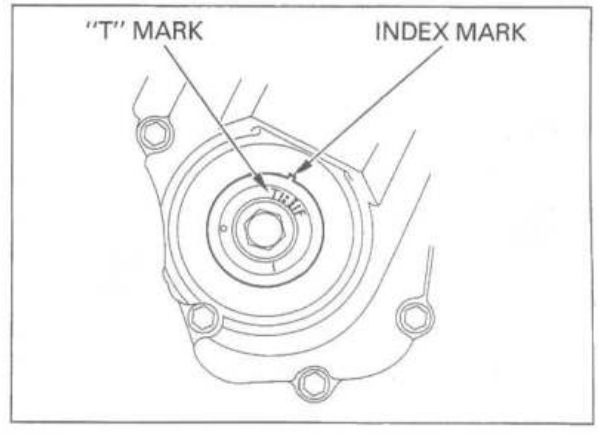
VALVE CLEARANCE:
EX: 0.22 ± 0.03 mm (0.009 ± 0.001 in)

NOTE:

Record the clearance for each valve for reference in shim selection if adjustment is required.

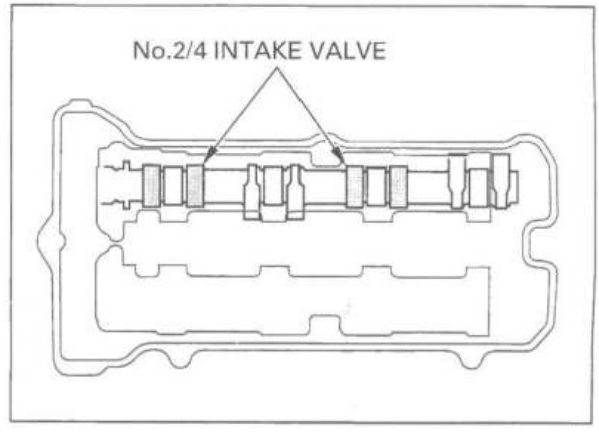


Turn the crankshaft clockwise 1/2 turn (180°), align the "T" mark on the ignition pulse generator rotor with the index mark on the ignition pulse generator rotor cover.

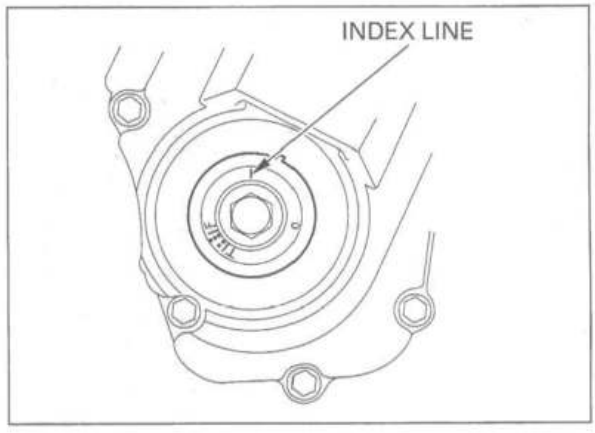


Check the valve clearance for the No.2 and No.4 cylinder intake valves using feeler gauge.

VALVE CLEARANCE:
IN: 0.16 ± 0.03 mm (0.006 ± 0.001 in)

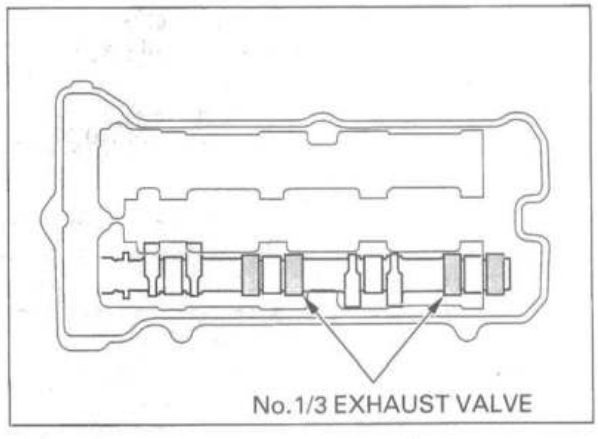


Turn the crankshaft clockwise 1/2 turn (180°), align the index line on the ignition pulse generator rotor facing up as shown.



Check the valve clearance for the No.1 and No.3 cylinder exhaust valves using a feeler gauge.

VALVE CLEARANCE:
EX: 0.22 ± 0.03 mm (0.009 ± 0.001 in)

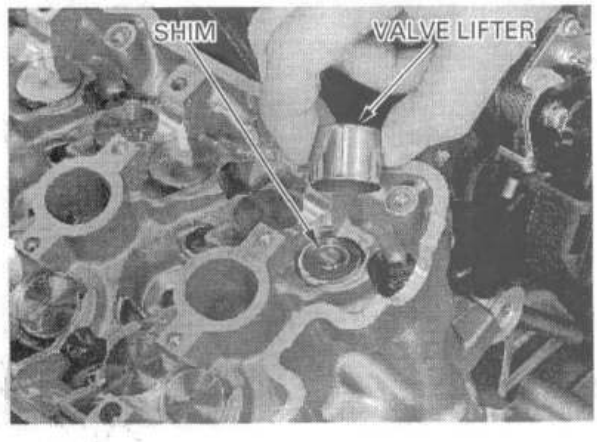


ADJUSTMENT

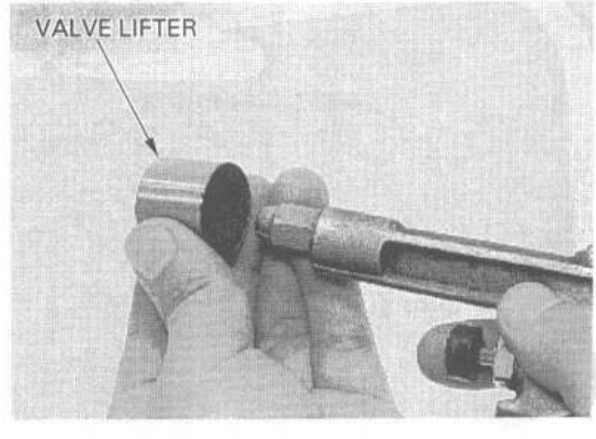
Remove the camshaft (page 8-5).
Remove the valve lifters and shims.

NOTE:

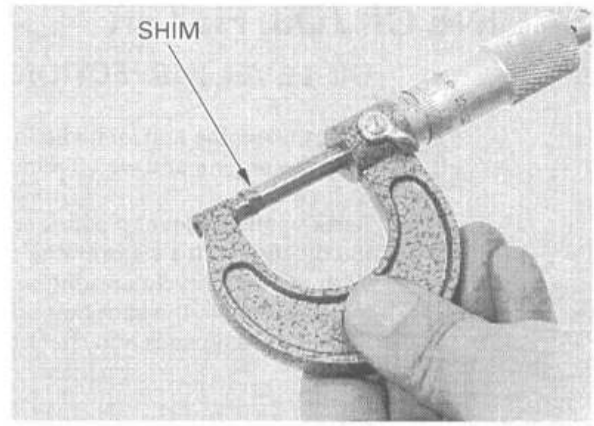
- Shim may stick to the inside of the valve lifter. Do not allow the shims to fall into the crankcase.
- Mark all valve lifters and shims to ensure correct reassembly in their original locations.
- The valve lifter can be easily removed with a valve lapping tool or magnet.
- The shims can be easily removed with a tweezers or magnet.



Clean the valve shim contact area in the valve lifter with compressed air.



Measure the shim thickness and record it.



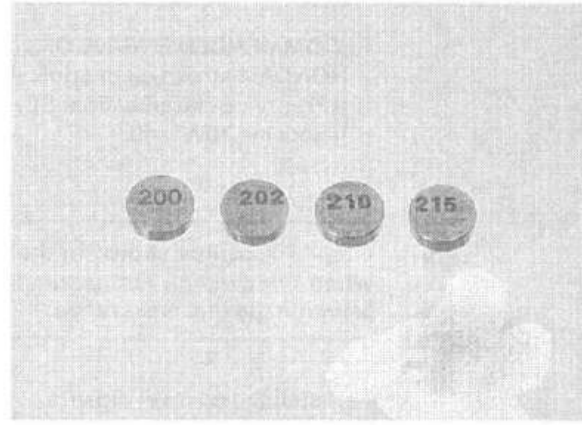
NOTE:

Sixty-five different thickness shims are available from the thinness 1.200 mm thickness shim to the thickest 2.800 mm thickness shim in intervals of 0.025 mm.

Calculate the new shim thickness using the equation below.

$A = (B - C) + D$

A: New shim thickness
B: Recorded valve clearance
C: Specified valve clearance
D: Old shim thickness



NOTE:

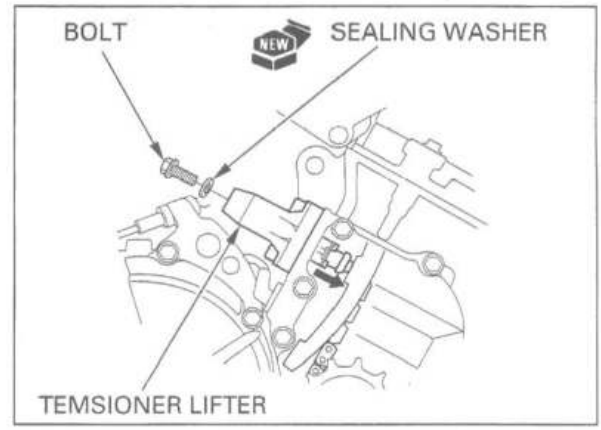
- Make sure of the correct shim thickness by measuring the shim by micrometer.
- Reface the valve seat if carbon deposit result in a calculated dimension of over 2.800 mm.

Install the shims and valve lifters in their original locations.

Install the newly selected shim on the valve retainer.
Apply molybdenum disulfide oil to the valve lifters.
Install the valve lifters into the valve lifter holes.

Install the camshaft (page 8-20).

Rotate the camshafts by rotating the crankshaft clockwise several times.
Recheck the valve clearance.

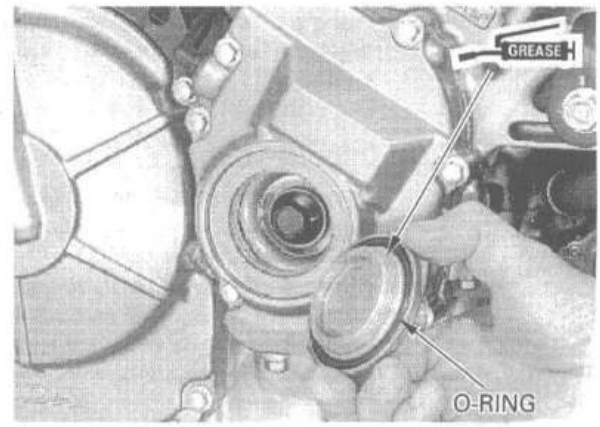


Remove the cam chain tensioner stopper tool.

Install the new sealing washer and cam chain tensioner sealing bolt.
Tighten the bolt securely.

Check that the timing hole cap O-ring is in good condition, replace if necessary.
Apply grease to the timing hole cap threads.
Install and tighten the timing hole cap to the specified torque.

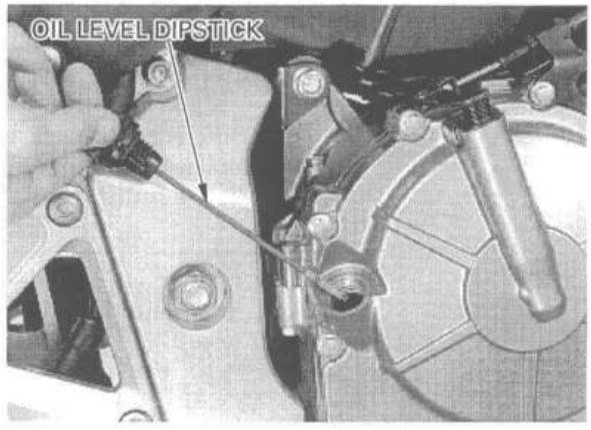
TORQUE: 18 N·m (1.8 kgf·m , 13 lbf·ft)



Install the removed parts in the reverse order of removal.

ENGINE OIL/OIL FILTER

OIL LEVEL INSPECTION



Start the engine and let it idle for 2—3 minutes.
Stop the engine and wait 3 minutes.

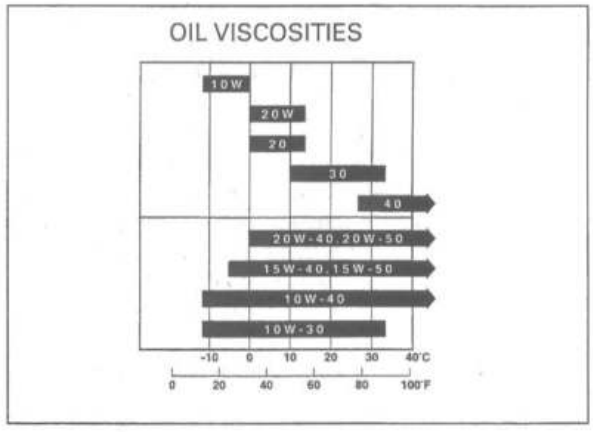
Remove the oil level dipstick and wipe the oil from the dipstick with a clean cloth.
With the motorcycle upright on level ground, insert the dipstick into the stick hole without screwing it in.
Remove the dipstick and check for the oil level.

If the level is below the lower line, fill the crankcase with recommended oil up to the upper level line.

RECOMMENDED ENGINE OIL:
HONDA 4-stroke oil or equivalent motor oil
API service classification: SE, SF or SG
Viscosity: 10W—40

NOTE:

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



Reinstall the oil level dipstick.

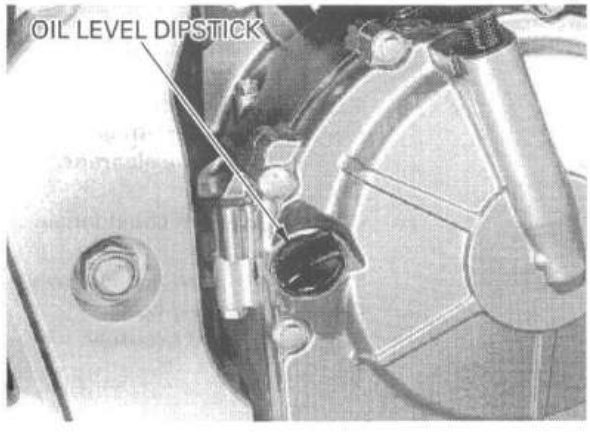
ENGINE OIL & FILTER CHANGE

⚠WARNING

A warm-up engine and the oil in it are hot, be careful not to burn yourself.

NOTE:

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

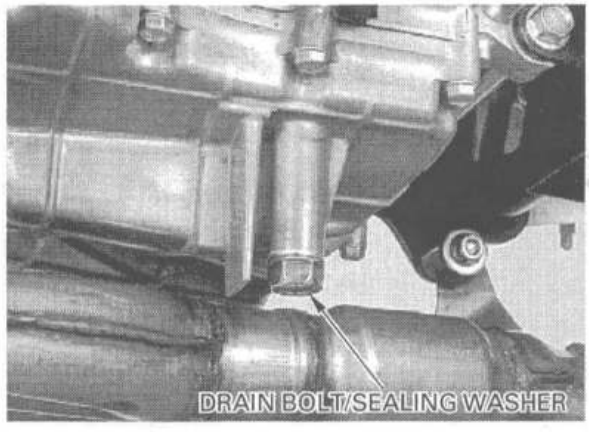


Remove the oil level dipstick.

Place a oil drain pan under the engine to catch the oil, then remove the oil drain bolt and sealing washer.
Drain the oil completely.

CAUTION:

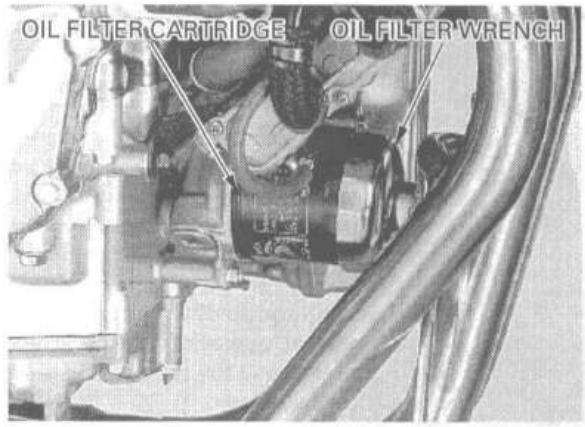
Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods.
Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.



Loosen the oil filter cartridge using the special tool.

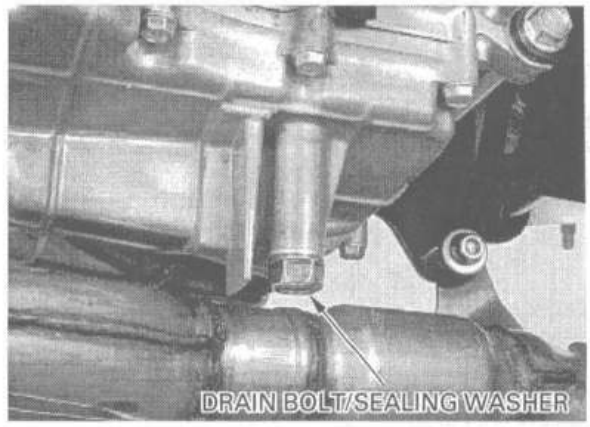
TOOL:
Oil filter wrench 07HAA-PJ70100

Pull the oil filter cartridge forward, then remove from the right side and discard it.



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

TORQUE: 29 N·m (3.0 kgf·m , 22 lbf·ft)



Apply oil to the new oil filter cartridge O-ring.

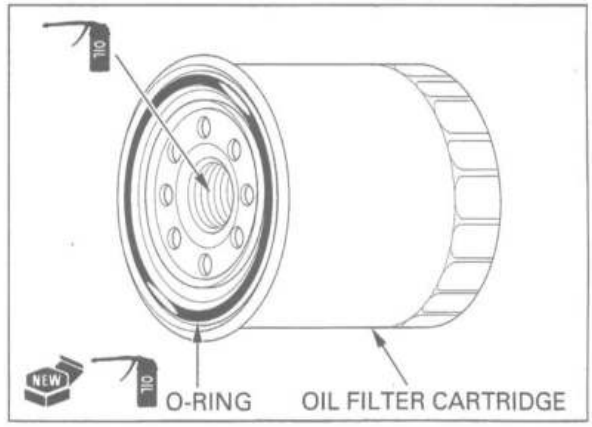
Install the new oil filter cartridge and tighten it to the specified torque.

TOOL:
Oil filter wrench 07HAA-PJ70100

TORQUE: 10 N·m (1.0 kgf·m , 7 lbf·ft)

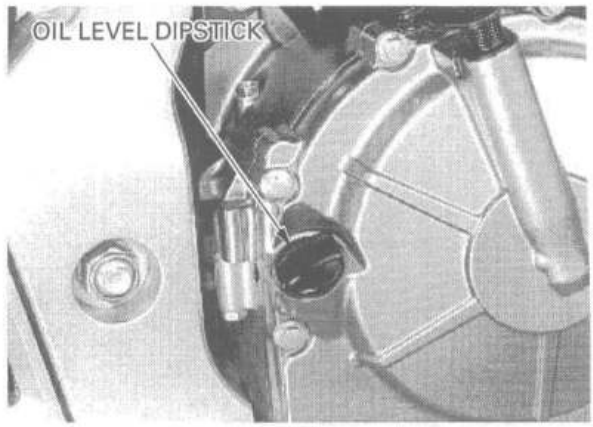
Fill the crankcase with recommended engine oil.

OIL CAPACITY:
3.5 ℓ (3.7 US qt , 3.1 Imp qt) at draining
3.8 ℓ (4.0 US qt , 3.3 Imp qt) at oil filter change



Install the oil level dipstick.

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



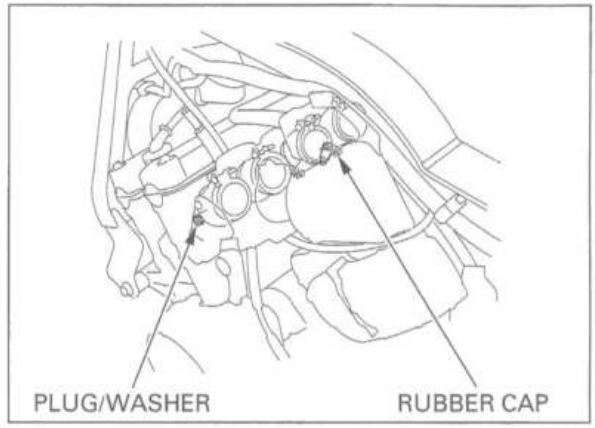
CARBURETOR SYNCHRONIZATION

⚠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.

NOTE:

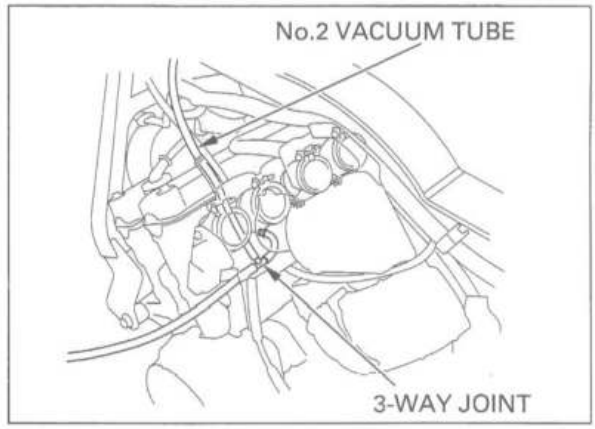
Synchronize the carburetors with the engine at normal operating temperature, transmission is in neutral and the motorcycle supported securely on a level surface.



Remove the fuel tank (page 2-3).

Remove the plug and washer from the No.1 intake port.
Remove the rubber cap from No.4 intake ports.

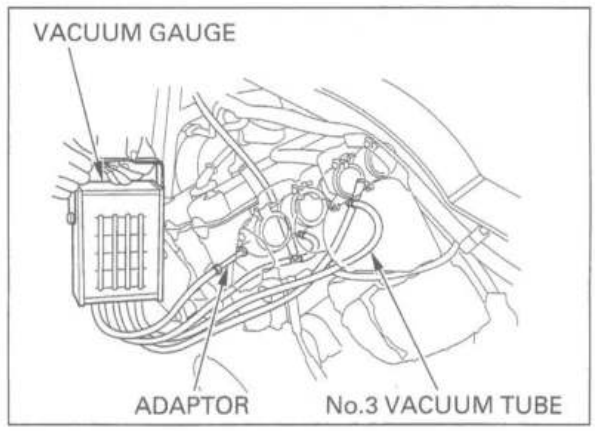
Install the 3-way joint to the fuel valve vacuum tube (No.2 vacuum tube).
Connect the fuel tube and vacuum tube to the fuel valve.



Disconnect the No.3 vacuum tube from the PAIR (Pulse secondary air injection) control valve.

Screw the adaptor into the No.1 intake port.

Connect the vacuum gauge tubes to the adaptors and 3-way joint.



Start the engine and adjust the idle speed by turning the throttle stop screw.

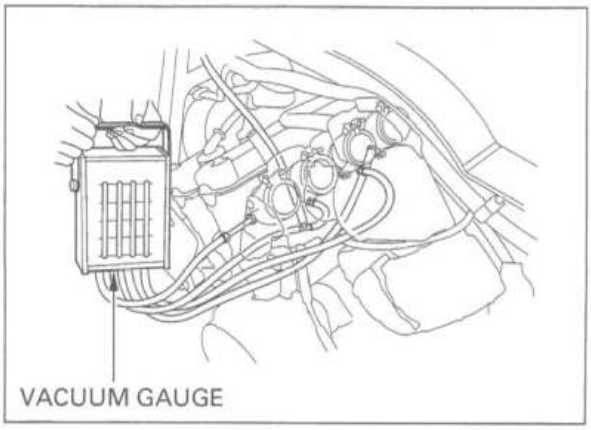
IDLE SPEED: 1,300 ± 100 min^{-1} (rpm)



Check the each carburetor intake vacuum pressure is within 30 mm (1.2 in) Hg of the base carburetor.

NOTE:

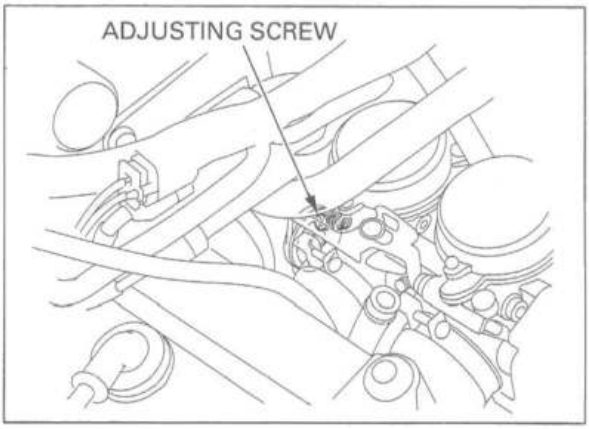
- The No.3 carburetor cannot be adjusted; it is the base carburetor.
- The No.3 cylinder intake vacuum pressure is the base vacuum pressure.



Synchronize to specification by turning the adjusting screw with the philips screwdriver.

Recheck the idle speed and each cylinder intake vacuum pressure so it is within 30 mm (1.2 in) Hg of the base carburetor reading after snapping the throttle grip 3–4 times.

Remove the vacuum gauge tubes.
Connect the fuel valve vacuum tube and PAIR control valve tube.
Install the rubber cap to the No.4 intake port.
Install the vacuum plug into the No.1 intake port, and tighten it securely.



ENGINE IDLE SPEED

⚠WARNING

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

NOTE:

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



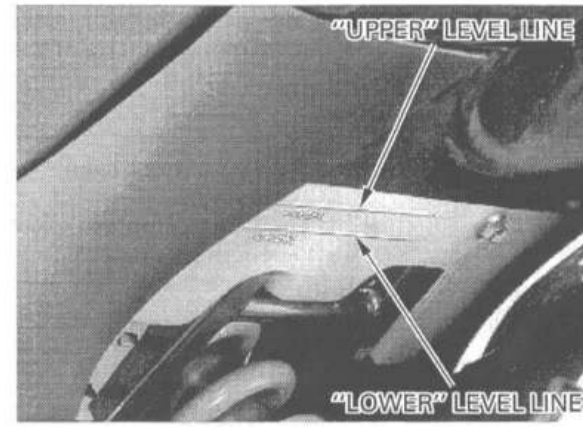
Warm up the engine and shift the transmission into neutral.

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

IDLE SPEED: 1,300 ± 100 min^{-1} (rpm)

RADIATOR COOLANT

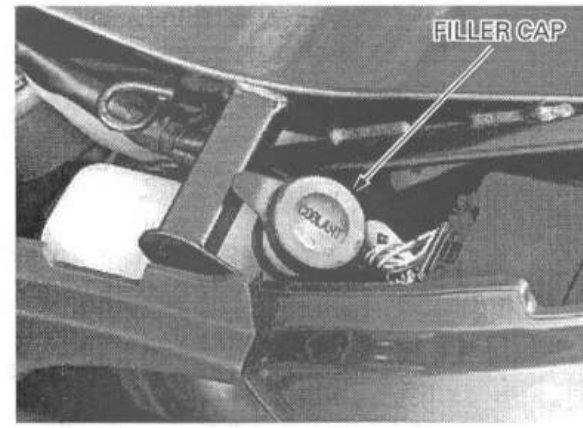
Check the coolant level of the reserve tank with the engine running at normal operating temperature.
The level should be between the "UPPER" and "LOWER" level lines.



If necessary, add recommended coolant.

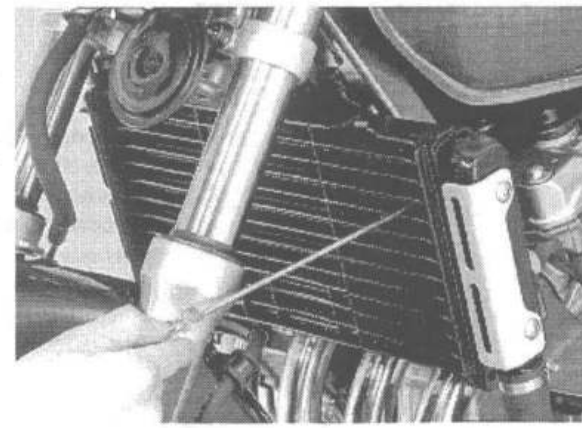
Remove the seat (page 2-2).

Remove the reserve tank filler cap and fill to the "UPPER" level line with 50/50 mixture of distilled water and antifreeze.
Reinstall the filler cap.

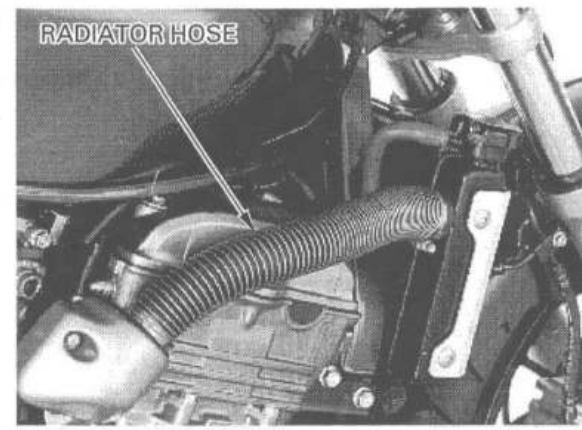


COOLING SYSTEM

Check the radiator air passages for clogging or damage.
Straighten bend fins, and remove insects, mud or other obstructions with compressed air or low water pressure.
Replace the radiator if the air flow is restricted over more than 20% of the radiating surface.



Inspect the radiator hoses for cracks or deterioration, and replace if necessary.
Check the tightness of all hose clamps and fasteners.



SECONDARY AIR SUPPLY SYSTEM



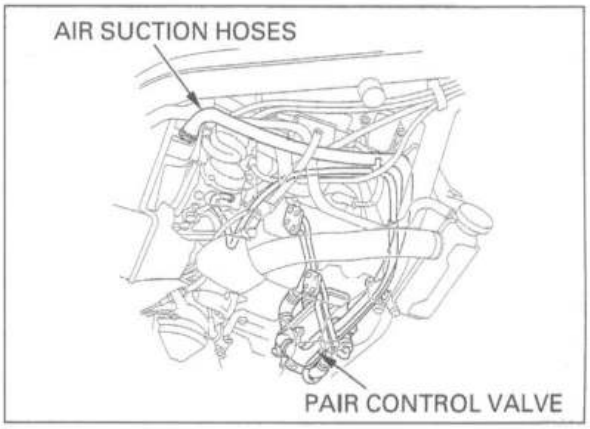
NOTE:

The secondary air supply system introduces filtered air into exhaust gases in the exhaust port. The secondary air is drawn into the exhaust port whenever there is negative pressure pulse in the exhaust system. This charged secondary air promotes burning of the unburned exhaust gases and changes a considerable amount of hydrocarbons and carbon monoxide into relatively harmless carbon dioxide and water.

Check the air injection hoses between the PAIR (pulse secondary air injection) control valve and cylinder head for deterioration, damage or loose connections.
Make sure that the hoses are not cracked.

NOTE:

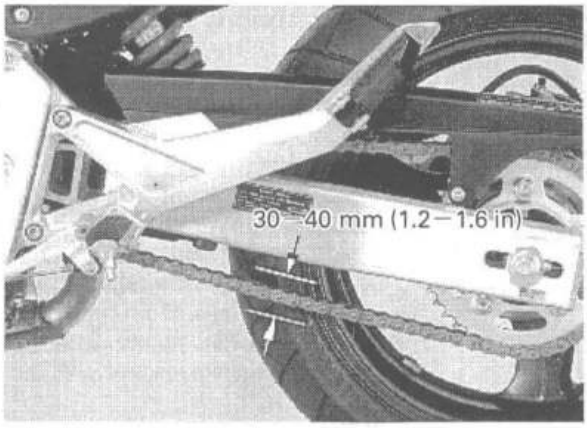
If the hoses show any signs of heat damage, inspect the PAIR check valve for damage.



Check the air suction hose between the air filter and PAIR control valve for deterioration, damage or loose connections. Make sure that the hoses are not kinked, pinched or cracked.

DRIVE CHAIN

DRIVE CHAIN SLACK INSPECTION



⚠WARNING

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

Turn the ignition switch OFF, support the motorcycle on its side stand and shift the transmission into neutral.
Check the slack in the drive chain lower run midway between the sprockets.

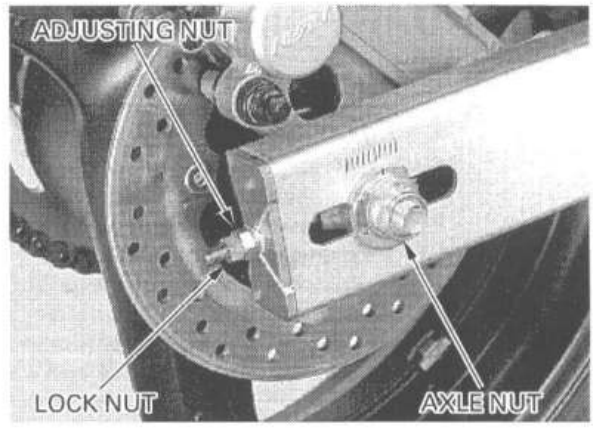
CHAIN SLACK: 30 – 40 mm (1.2 – 1.6 in)

CAUTION:

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

Lubricate the drive chain with #80 – #90 gear oil or drive chain lubricant designed specifically for use with O-ring chains. Wipe off excess oil or chain lubricant.

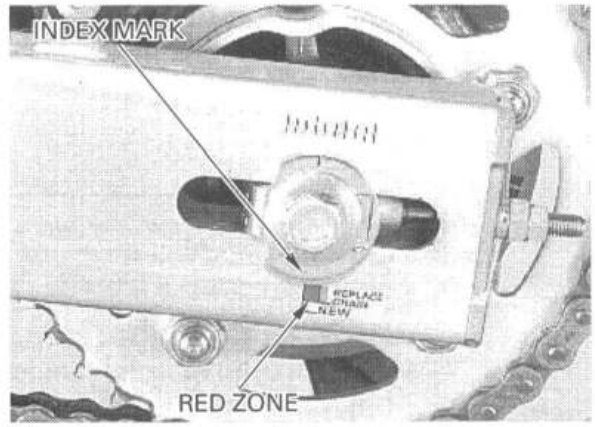
ADJUSTMENT



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

Make sure the index marks on the both axle washers are aligned with the index marks on the swingarm.

After adjustment, check the drive chain wear indicator label attached on the swingarm.
If the red zone of the indicator label reaches the index mark on the rear axle washer, replace the drive chain with a new one (page 3-19).



Tighten the both drive chain adjuster lock nuts.

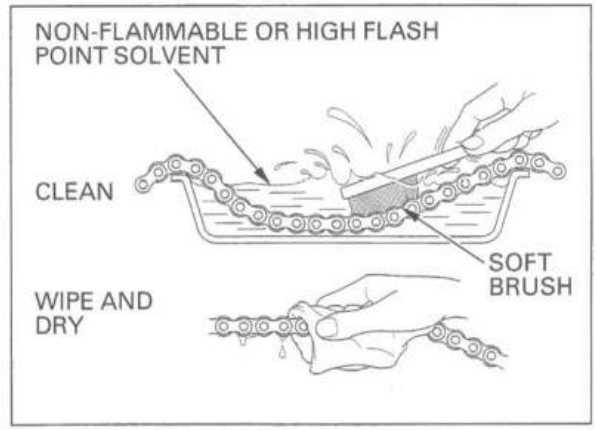
TORQUE: 21 N·m (2.1 kgf·m , 15 lbf·ft)

Tighten the rear axle nut to the specified torque.

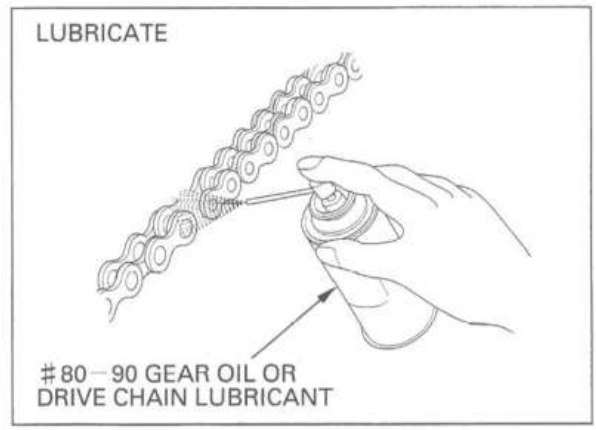
TORQUE: 88 N·m (9.0 kgf·m , 65 lbf·ft)

Recheck the drive chain slack and free wheel rotation.
Lubricate the drive chain.

CLEANING AND LUBRICATION



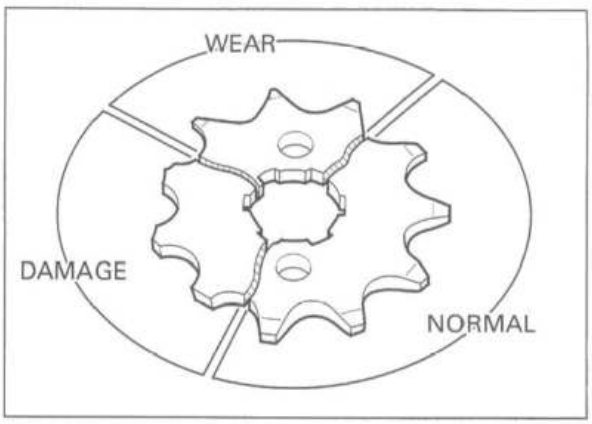
Clean the chain with non-flammable or high flash point solvent and wipe it dry.
Be sure the chain has dried completely before lubricating.
Inspect the drive chain for possible damage or wear.
Replace any chain that has damaged rollers, loose fitting links, or otherwise appears unserviceable.
Installing a new chain on badly worn sprockets will cause the new chain to wear quickly.
Inspect and replace sprocket as necessary.



Lubricate the drive chain with #80 – 90 gear oil or drive chain lubricant designed specifically for use with O-ring chains. Wipe off the excess oil or chain lubricant.

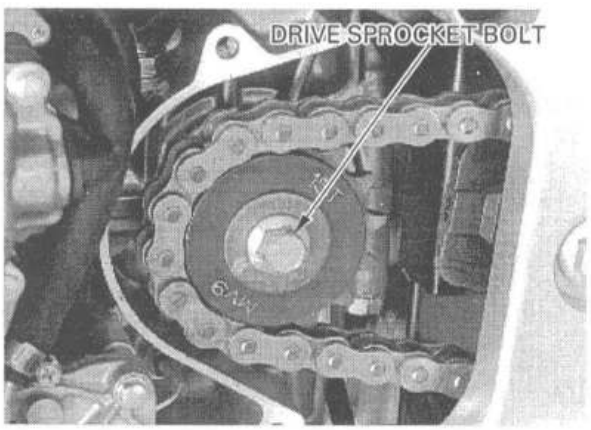
SPROCKETS INSPECTION

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



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

TORQUE:
Drive sprocket bolt: 54 N·m (5.5 kgf·m , 40 lbf·ft)
Driven sprocket nut:
108 N·m (11.0 kgf·m , 80 lbf·ft)



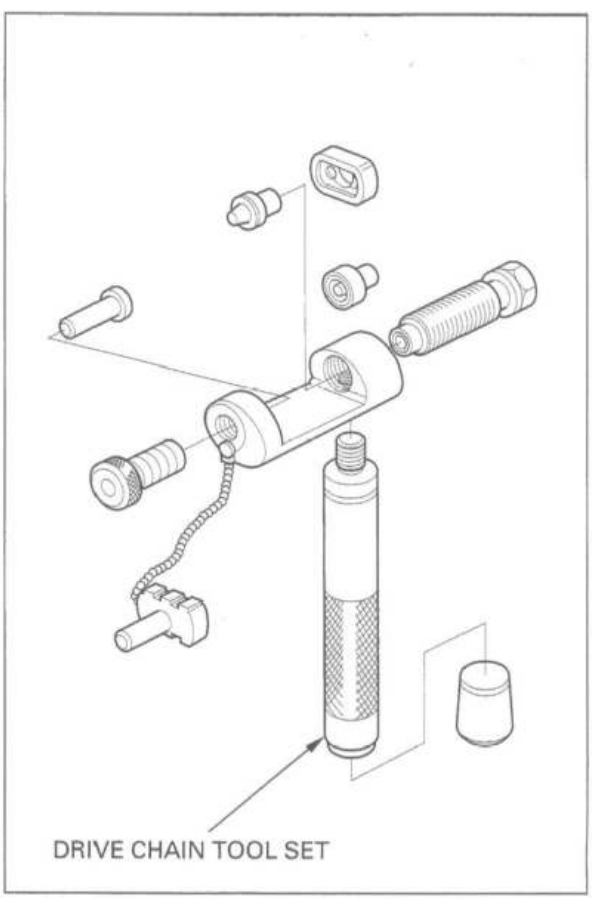
REPLACEMENT

This motorcycle uses a drive chain with a staked master link.
Loosen the drive chain (page 3-18).
Assemble the special tool as shown.

TOOL:
Drive chain tool set 07HMH-MR10103

NOTE:

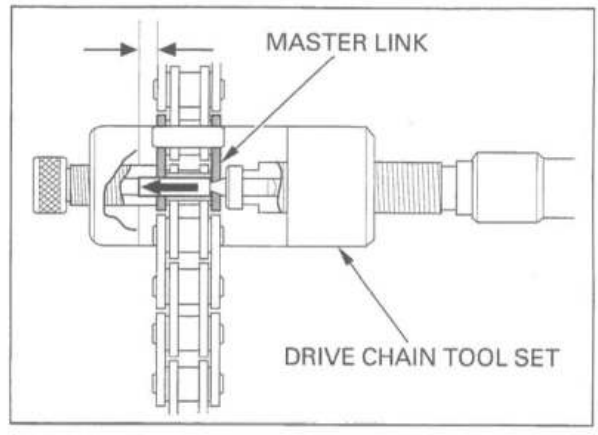
When using the special tool, follow the manufacturer's instruction.



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

TOOL:
Drive chain tool set 07HMH-MR10103

Remove the drive chain.

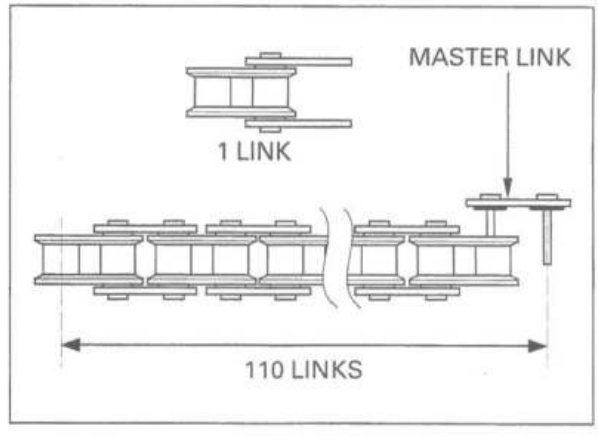


Remove the excess drive chain links from the new drive chain with the drive chain tool set.

NOTE:

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

STANDARD LINKS: 110 links
REPLACEMENT CHAIN:
DID: DID525VM2－120ZB
RK: RK525RO－120LJ－FZ



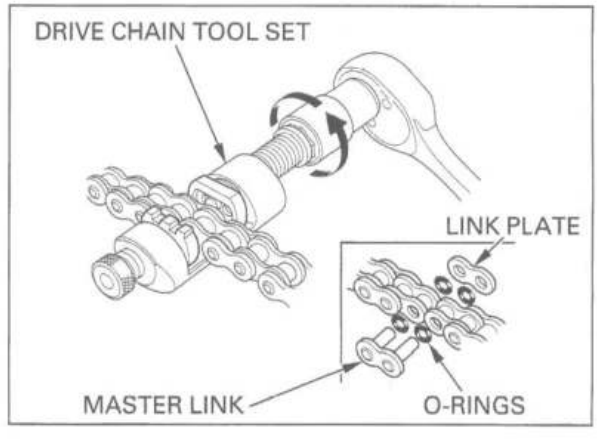
CAUTION:

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

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

CAUTION:

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



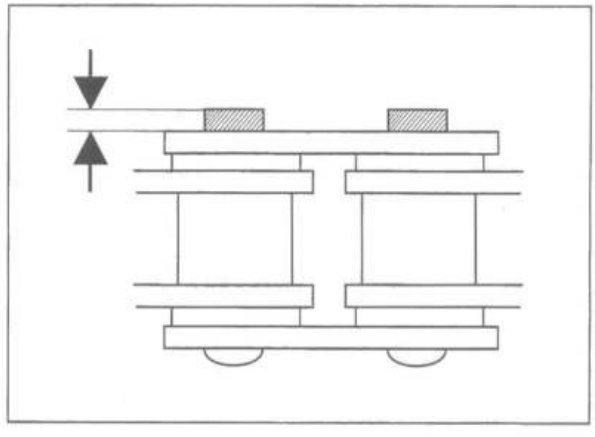
Assemble and set the drive chain tool set.

TOOL:
Drive chain tool set 07HMH-MR10103

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

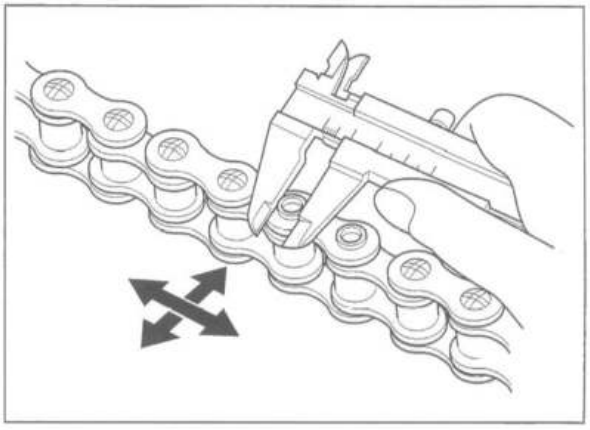
STANDARD LENGTH:
DID: 1.15－1.55 mm (0.045－0.061 in)
RK: 1.2－1.4 mm (0.05－0.06 in)

Stake the master link pins.



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

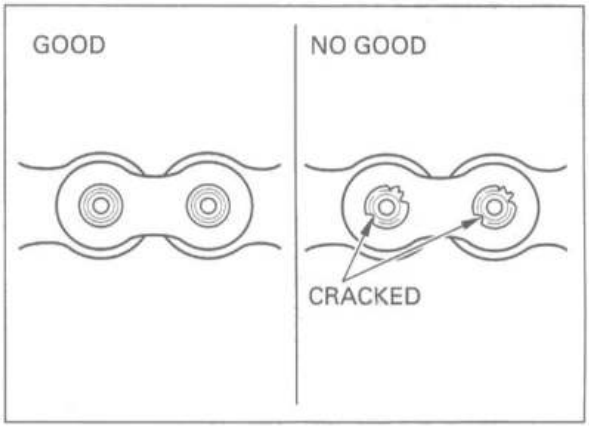
DIAMETER OF THE STAKED AREA:
DID: 5.50—5.80 mm (0.217—0.228 in)
RK: 5.50—5.80 mm (0.217—0.228 in)



After staking, check the staked area of the master link for cracks.
If there is any cracking, replace the master link, O-rings and plate.

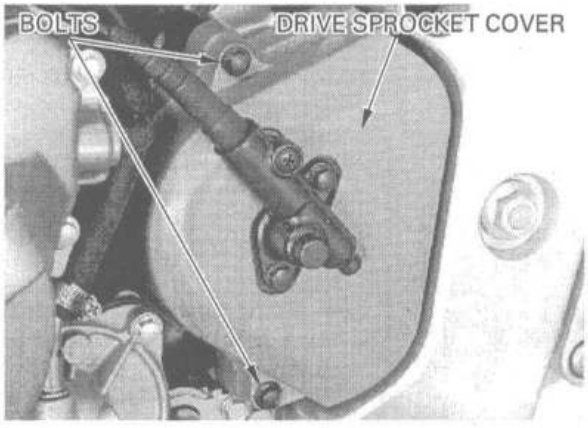
CAUTION:

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



DRIVE CHAIN GUIDE PLATE INSPECTION

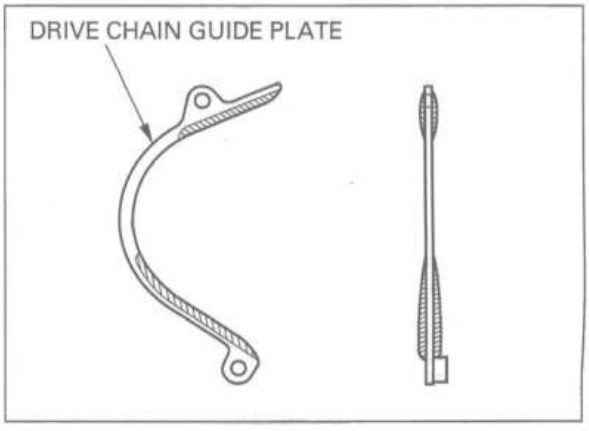
Remove the screw and speedometer cable.
Remove the bolts, drive sprocket cover and drive chain guide plate.



Check the drive chain guide plate for wear or damage.
If the drive chain guide plate is excessively wear or damage, replace it with a new one.

CAUTION:

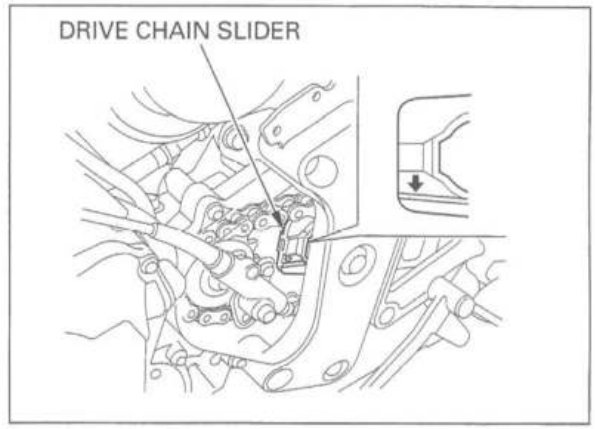
Avoid damaging the crankcase, periodically inspect the drive chain guide plate, replace if necessary.



DRIVE CHAIN SLIDER

Inspect the drive chain slider for excessive wear or damage.

If it is worn to the wear indicator, replace the drive chain slider.



BRAKE FLUID

CAUTION:

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

NOTE:

When the fluid level is low, check the brake pads for wear (see next page). A low fluid level may be due to wear of the brake pads. If the brake pads are worn, the caliper piston is pushed out, and this accounts for a low reservoir level. If the brake pads are not worn and the fluid level is low, check entire system for leaks (page 3-23).



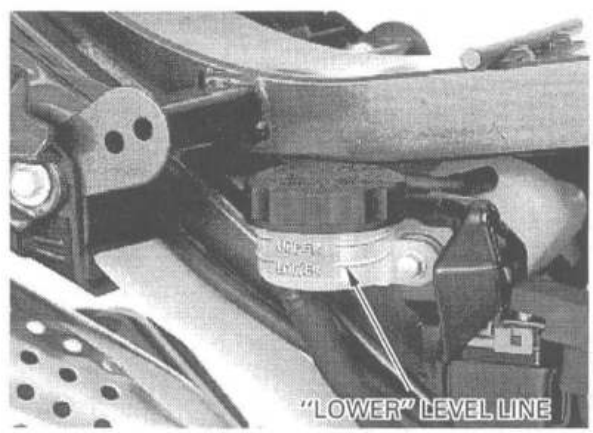
FRONT BRAKE

Turn the handlebar to the left so that the reservoir is level and check the front brake fluid reservoir level through the sight glass.
If the level is near the lower level line, check the brake pad wear (see next page).

REAR BRAKE

Place the motorcycle on level surface, and support it upright position.
Remove the seat (page 2-2).

Check the rear brake fluid reservoir level.
If the level is near the lower level line, check the brake pad wear (see next page).

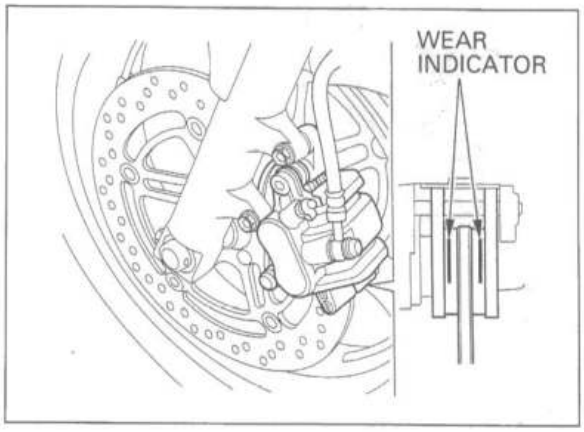


BRAKE PAD WEAR

FRONT BRAKE PADS

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

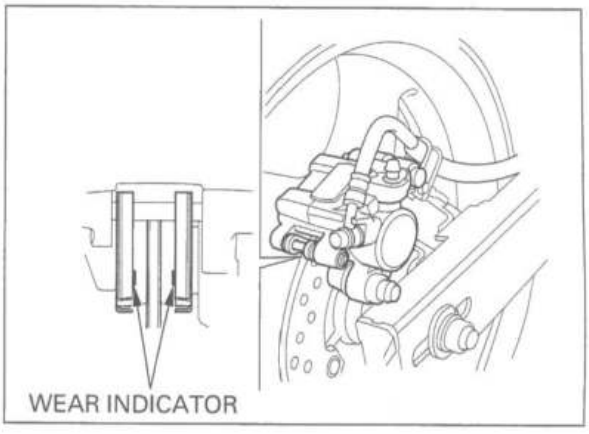
Refer to page 15-6 for brake pad replacement.



REAR BRAKE PADS

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

Refer to page 15-7 for brake pad replacement.



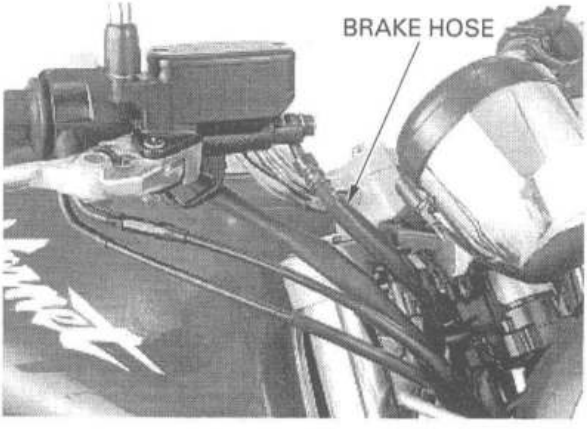
BRAKE SYSTEM

INSPECTION

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

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

Refer to page 15-4 for brake bleeding procedures.



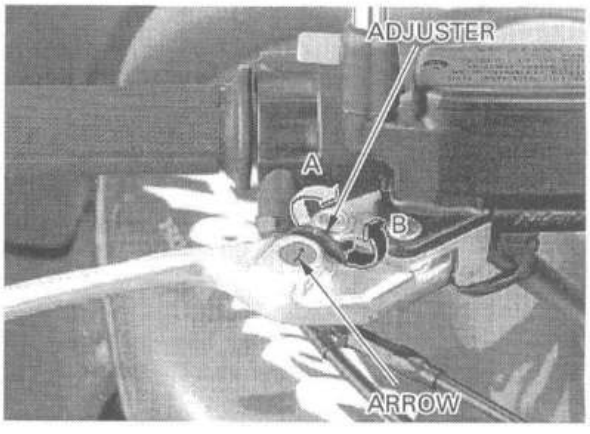
BRAKE LEVER ADJUSTMENT

The distance between the tip of the brake lever and the grip can be adjusted by turning the adjuster.

DIRECTION A: Brake lever further away from the grip
DIRECTION B: Brake lever closer to the grip

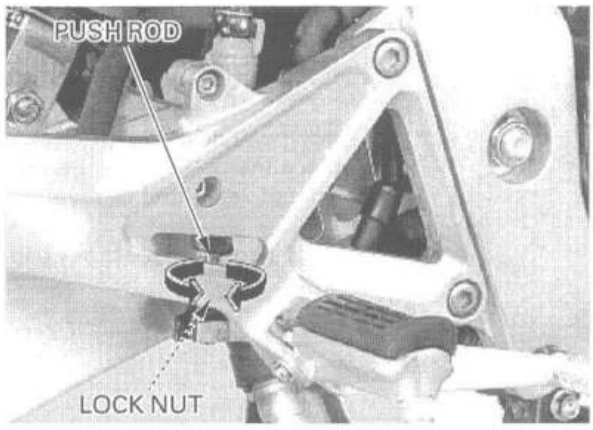
CAUTION:

Align the allowance on the brake lever with the index mark on the adjuster.



BRAKE PEDAL HEIGHT ADJUSTMENT

Loosen the lock nut and turn the push rod until the correct pedal height is obtained.

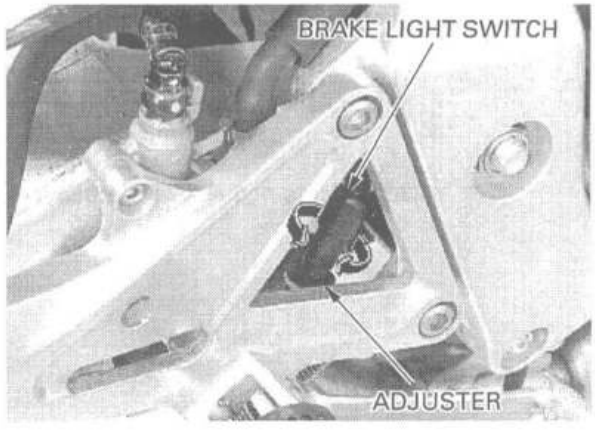


BRAKE LIGHT SWITCH

NOTE:

The front brake light switch does not require adjustment.

Adjust the rear brake light switch so that the brake light comes on just prior to the brake actually being engaged.
If the light fails to come on, adjust the switch so that the light comes on at the proper time.
Hold the switch body and turn the adjuster. Do not turn the switch body.



HEADLIGHT AIM

⚠WARNING

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

NOTE:

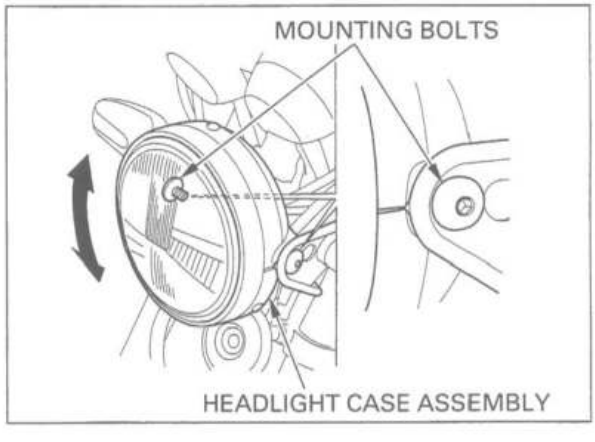
Adjust the headlight beam as specified by local laws and regulations.



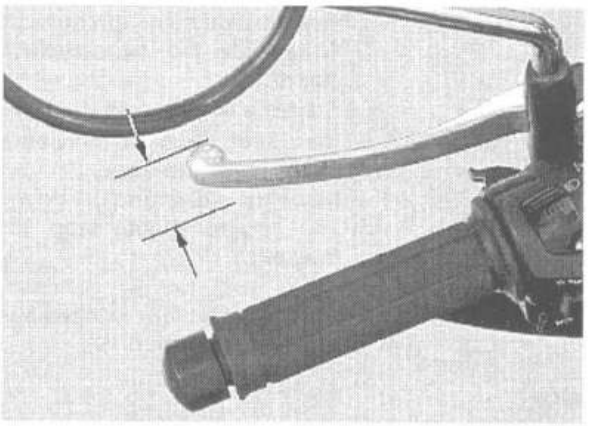
Place the motorcycle on a level surface.

Adjust the headlight beam horizontally beam adjustment are made using the horizontal beam adjusting screw.
A clockwise rotation moves the beam toward the right side of the rider.

Adjust the headlight beam vertically by move the headlight case assembly.
Remove the rubber plugs from the headlight case mounting bolts.
Loosen the headlight case mounting bolts and adjust the vertical beam by moving the headlight case assembly.

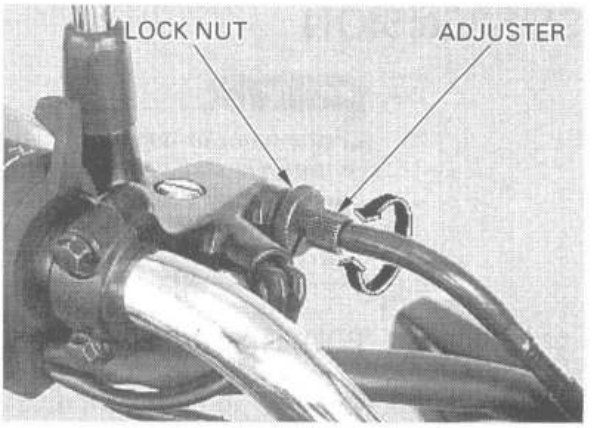


CLUTCH SYSTEM



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

FREE PLAY: 10 – 20 mm (3/8 – 13/16 in)

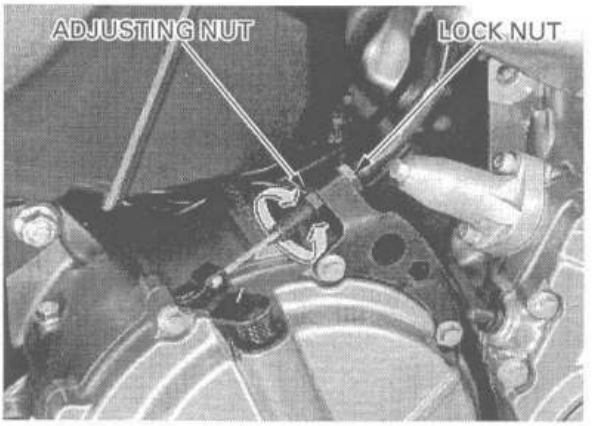


Minor adjustment are made with the upper adjuster at the clutch lever.
Loosen the lock nut and turn the adjuster.

CAUTION:

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

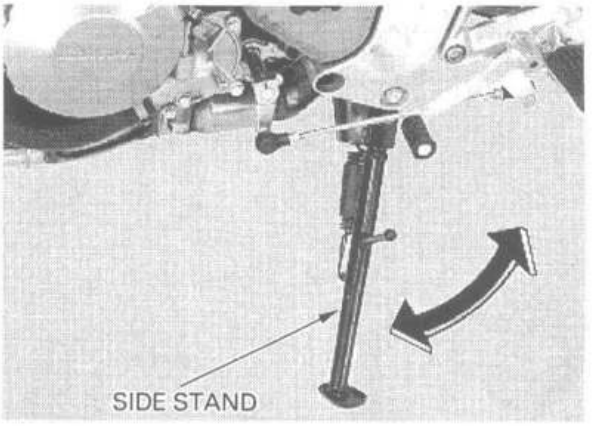
If the adjuster is threaded out near its limit and the correct free play cannot be obtained, turn the adjuster all the way in and back out one turn.
Tighten the lock nut and make a major adjustment as described below.



Major adjustment is performed at the clutch arm.
Loosen the lock nut and turn the adjusting nut to adjust free play.
Hold the adjusting nut securely while tightening the lock nut.

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

SIDE STAND

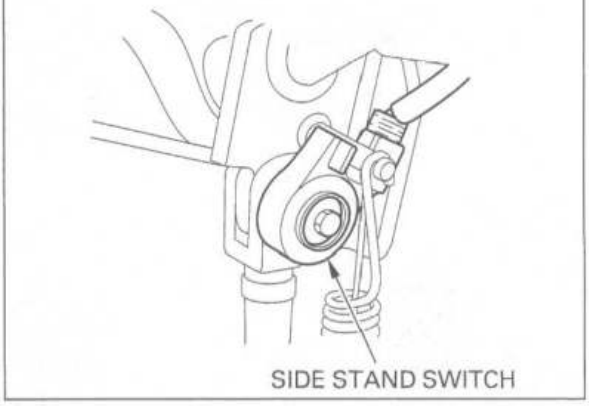


Support the motorcycle on a level surface.

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

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

If there is a problem with the system, check the side stand switch (section 19).

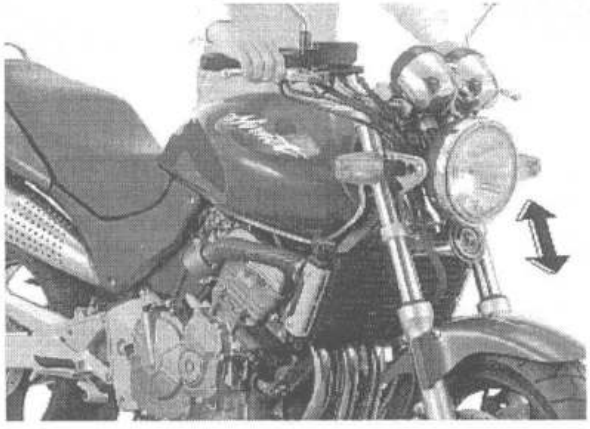


SUSPENSION

⚠WARNING

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

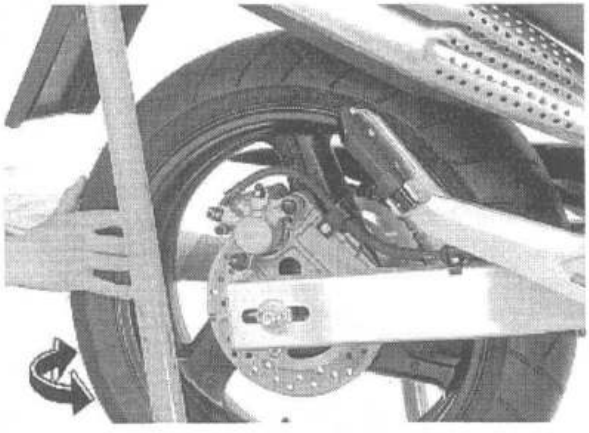
FRONT SUSPENSION INSPECTION



Check the action of the forks by operating the front brakes and compressing the front suspension several times.
Check the entire assembly for signs of leaks, damage or loose fasteners.
Replace damaged components which cannot be repaired.
Tighten all nuts and bolts.

Refer to section 13 for fork service.

REAR SUSPENSION INSPECTION



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

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



Check for worn swingarm bearings by grabbing the rear swingarm and attempting to move the swingarm side to side.
Replace the bearings if any looseness is noted.

Check the action of the shock absorber by compressing it several times.
Check the entire shock absorber assembly for signs of leaks, damage or loose fasteners.
Replace damaged components which cannot be repaired.
Tighten all nuts and bolts.

Refer to section 14 for shock absorber service.



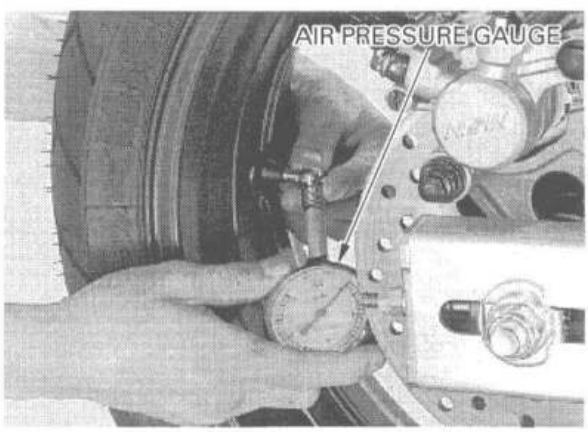
NUTS, BOLTS, FASTENERS

Check that all chassis nuts and bolts are tightened to their correct torque values (page 1-13).
Check that all safety clips, hose clamps and cable stays are in place and properly secured.

WHEELS/TIRES

NOTE:

Tire pressure should be checked when the tires are COLD.



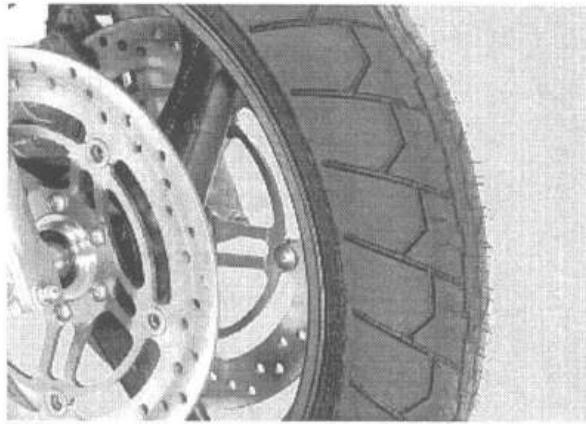
RECOMMENDED TIRE PRESSURE AND TIRE SIZE:

		FRONT	REAR
Tire pressure kPa (kgf/cm², psi)		250 (2.50 , 36)	290 (2.90 , 42)
Tire size		130/70ZR16 (61W)	180/55ZR17 (73W)
Tire bland	Bridgestone	BT-50F RADIAL G	BT-50R RADIAL G
	Michelin	TX11	TX23

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

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)



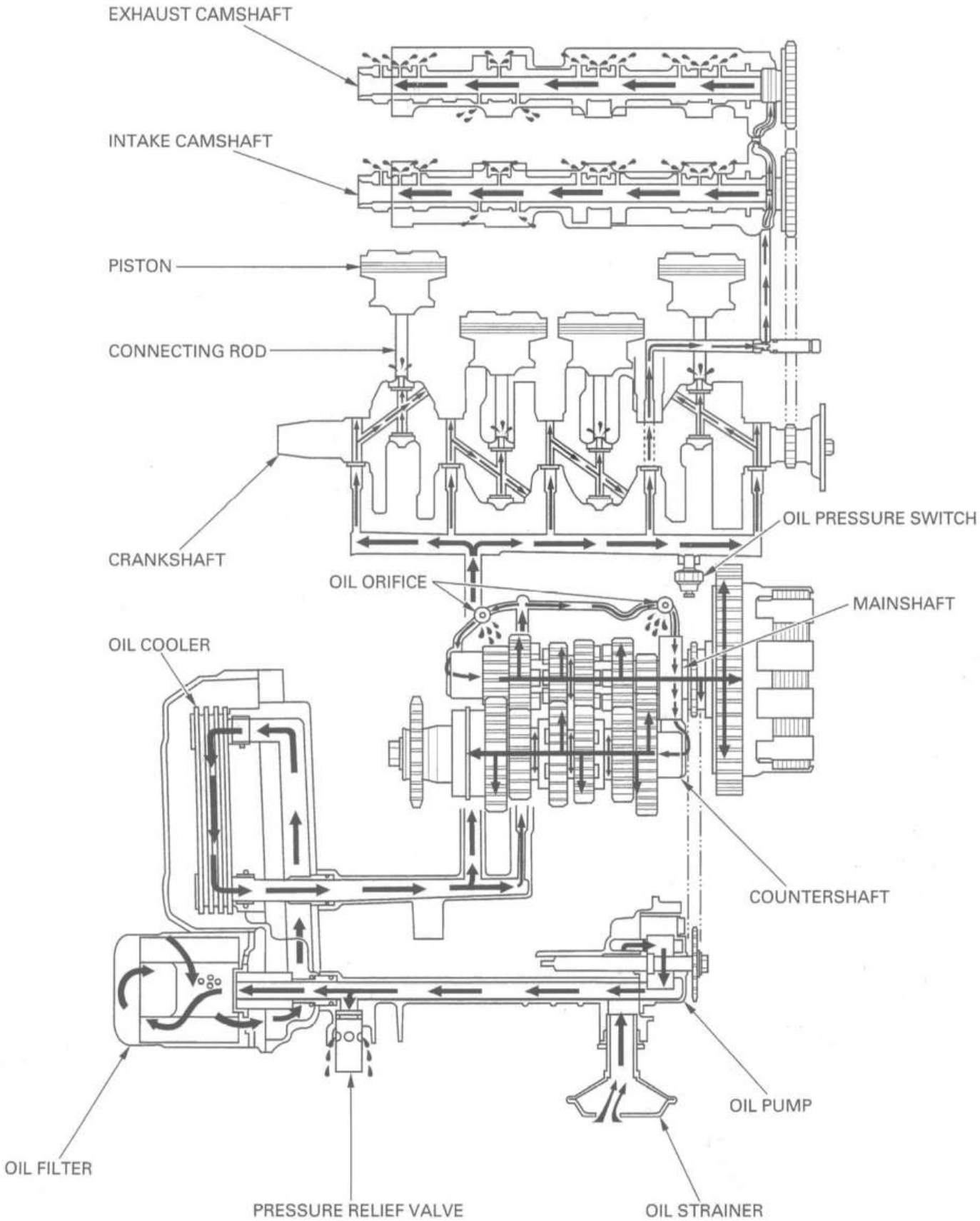
STEERING HEAD BEARINGS

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

Support the motorcycle securely and raise the front wheel off the ground.
Check that the handlebar moves freely from side to side.
If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (Section 13).



LUBRICATION SYSTEM DIAGRAM



4. LUBRICATION SYSTEM

LUBRICATION SYSTEM DIAGRAM	4-0	OIL STRAINER/PRESSURE RELIEF VALVE	4-4
SERVICE INFORMATION	4-1	OIL PUMP	4-6
TROUBLESHOOTING	4-2	OIL COOLER	4-10
OIL PRESSURE INSPECTION	4-3		

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

- The oil pump can be serviced with the engine installed in the frame.
- The service procedures in this section must be performed with the engine oil drained.
- When removing and installing the oil pump, use care not to allow dust or dirt to enter the engine.
- If any portion of the oil pump is worn beyond the specified service limits, replace the oil pump as an assembly.
- After the oil pump has been installed, check that there are no oil leaks and that oil pressure is correct.
- Refer to section 19 for oil pressure indicator inspection.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	At draining	3.5 ℓ (3.7 US qt , 3.1 Imp qt)	———
	At disassembly	4.2 ℓ (4.4 US qt , 3.7 Imp qt)	———
	At oil filter change	3.8 ℓ (4.0 US qt , 3.3 Imp qt)	———
Recommended engine oil		HONDA 4-stroke oil or equvalent motor oil API service classification SE, SF or SG Viscosity: SAE 10W – 40	———
Oil pressure at oil pressure switch		490 kPa (5.0 kgf/cm², 71 psi) at 6,000 min⁻¹ (rpm)/(80 °C/176 °F)	———
Oil pump rotor	Tip clearance	0.15 (0.006) max.	0.20 (0.008)
	Body clearance	0.15 – 0.22 (0.006 – 0.009)	0.35 (0.014)
	Side clearance	0.02 – 0.07 (0.001 – 0.003)	0.10 (0.004)
Oil pump drive sprocket collar O.D.		34.050 – 34.075 (1.3405 – 1.3415)	34.03 (1.340)
Oil pump drive sprocket I.D.		35.025 – 35.075 (1.3789 – 1.3809)	35.10 (1.382)

TORQUE VALUES

Oil drain bolt	29 N·m (3.0 kgf·m , 22 lbf·ft)	
Oil pump cover bolt	8 N·m (0.8 kgf·m , 5.8 lbf·ft)	CT bolt
Oil pump driven sprocket bolt	15 N·m (1.5 kgf·m , 11 lbf·ft)	Apply a locking agent to the threads
Oil filter cartridge	10 N·m (1.0 kgf·m , 7 lbf·ft)	Apply clean engine oil to the O-ring

TOOLS

Oil pressure gauge	07506-3000000
Oil pressure gauge attachment	07406-0030000
Oil filter wrench	07HAA-PJ70100

TROUBLESHOOTING

Engine oil level too low
- Oil consumption
- External oil leak
- Worn piston ring or incorrect piston ring installation
- Worn valve guide or seal

Low or no oil pressure
- Clogged oil orifice
- Incorrect oil being used

No oil pressure
- Oil level too low
- Oil pump drive sprocket broken
- Oil pump damaged (pump shaft)
- Internal oil leak

Low oil pressure
- Clogged oil strainer screen
- Oil pump worn or damaged
- Internal oil leak
- Incorrect oil being used
- Low oil level

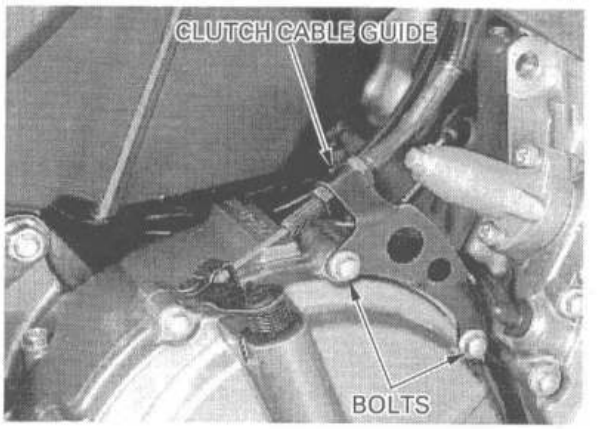
High oil pressure
- Plugged oil filter, gallery, or metering orifice
- Incorrect oil being used

OIL PRESSURE INSPECTION

NOTE:

If the oil pressure indicator light remains on a few seconds, check the indicator system before checking the oil pressure.

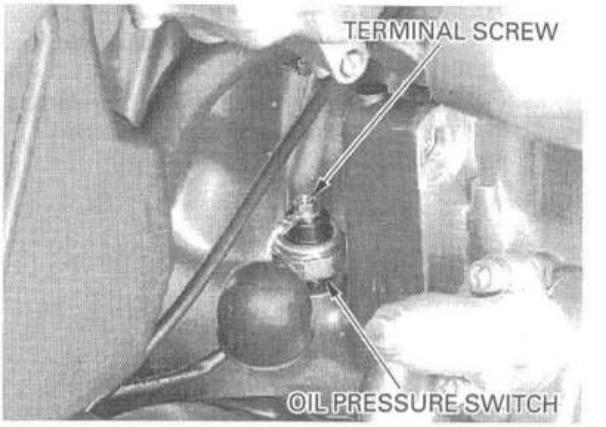
Remove the two bolts and clutch cable guide.



Remove the oil pressure switch terminal screw and terminal eyelet.
Remove the oil pressure switch.
Install the oil pressure gauge attachment and oil pressure gauge to the oil pressure switch hole.

TOOLS:

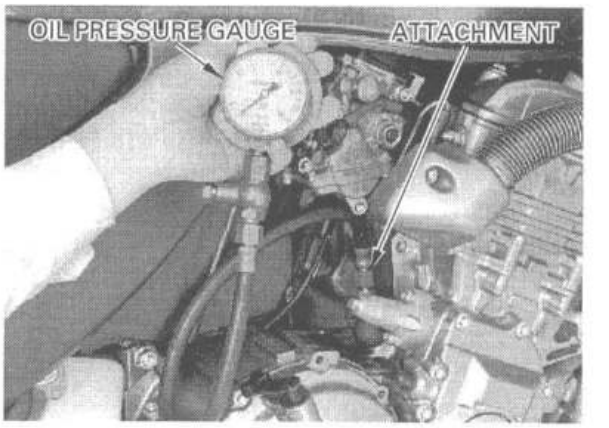
Oil pressure gauge	07506-3000000 (Equivalent commercially available)
Oil pressure gauge attachment	07510-4220100 (Equivalent commercially available)



Check the oil level (page 3-12)

Warm up the engine to normal operating temperature (approximately 80 °C/176 °F) and increase the rpm to 6,000 min^{-1} (rpm) and read the oil pressure.

OIL PRESSURE:
490 kPa (5.0 kgf/cm^2 , 71 psi) at 6,000 min^{-1} (rpm)
(80 °C/176 °F)

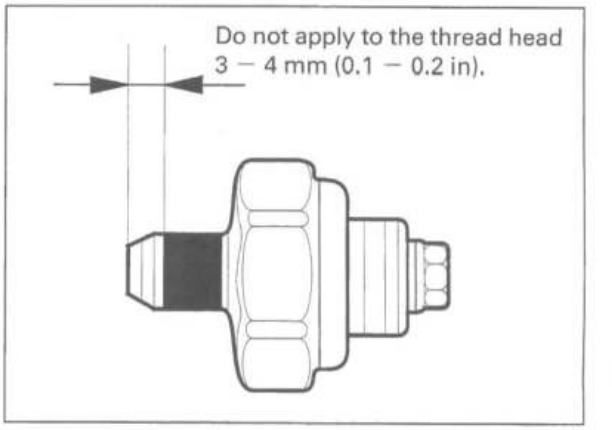


Apply sealant to the pressure switch threads as shown.
Install and tighten the oil pressure switch to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

Connect the oil pressure cord terminal eyelet and tighten the screw to the specified torque.

TORQUE: 2 N·m (0.2 kgf·m , 1.4 lbf·ft)



Install the rubber cover.

Install the clutch cable guide and tighten the bolts.

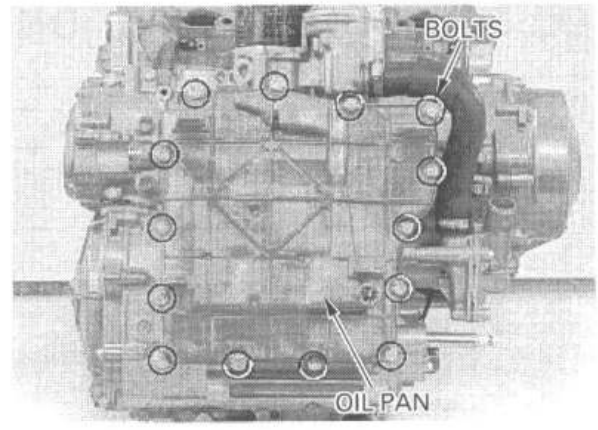
Start the engine.
Check that the oil pressure indicator goes out after one or two seconds. If the oil pressure indicator stays on, stop the engine immediately and determine the cause (page 19-12).

OIL STRAINER/PRESSURE RELIEF VALVE

REMOVAL

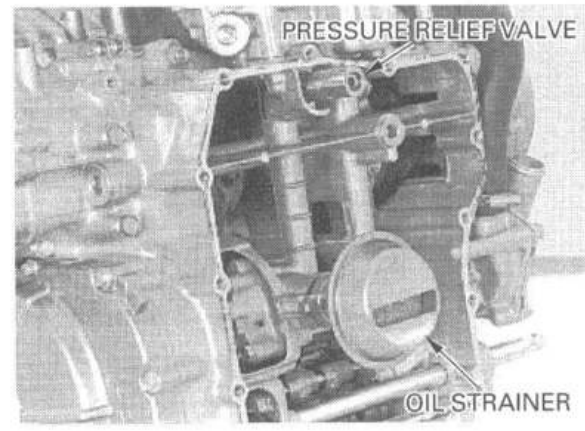
Drain the engine oil (page 3-12).
Remove the exhaust pipe (page 2-5).

Remove the oil pan flange bolts and oil pan.



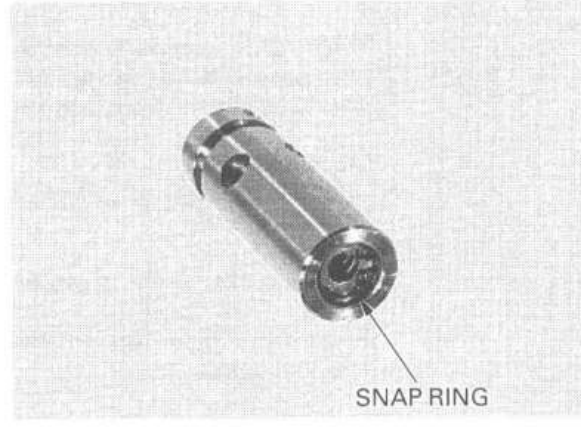
Remove the pressure relief valve and O-ring.
Remove the oil strainer and gasket.

Check the oil strainer for damage or clogging.
Clean the oil strainer screen.



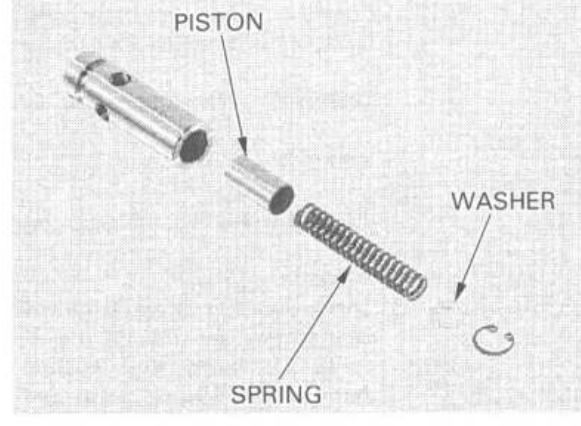
INSPECTION

Check the operation of the pressure relief valve by pushing on the piston.
Disassemble the relief valve by removing the snap ring.



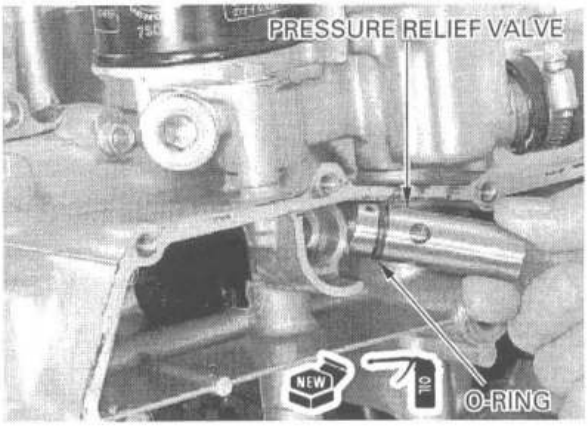
Inspect the piston for wear, sticking or damage.
Inspect the spring for weakness or damage.

Assemble the relief valve in the reverse order of disassembly.

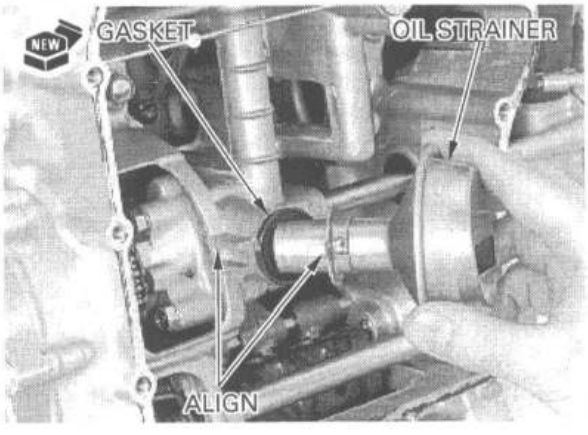


INSTALLATION

Apply oil to the new O-ring and install it onto the relief valve.
Install the relief valve into the crankcase.



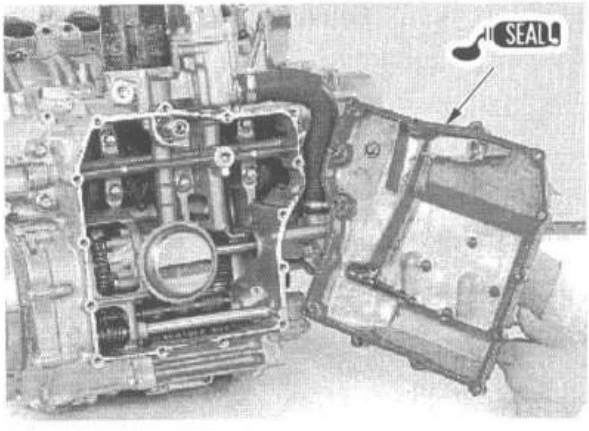
Apply oil to the new gasket and install it onto the oil strainer.
Install the oil strainer into the crankcase while aligning its tab with the slot on the crankcase.



Clean the oil pan mating surface thoroughly.
Apply Three Bond 1207B or an equivalent to the mating surface.

CAUTION:

Do not apply sealant more than necessary.

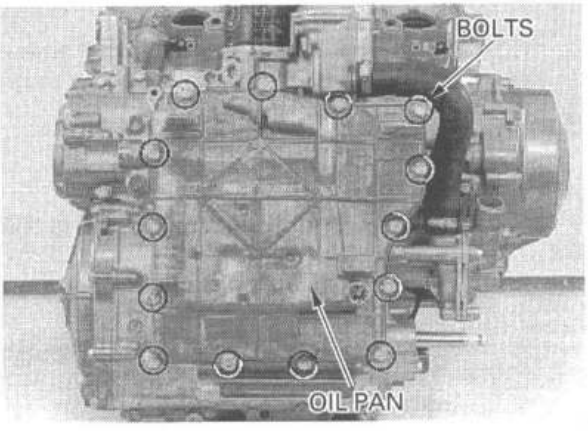


Carefully install the oil pan and tighten the flange bolts in a crisscross pattern in 2−3 steps.

Install the exhaust pipe (page 2-5).
Fill the crankcase with recommended oil (page 3-12).

NOTE:

After installation, check that there are no oil leaks.

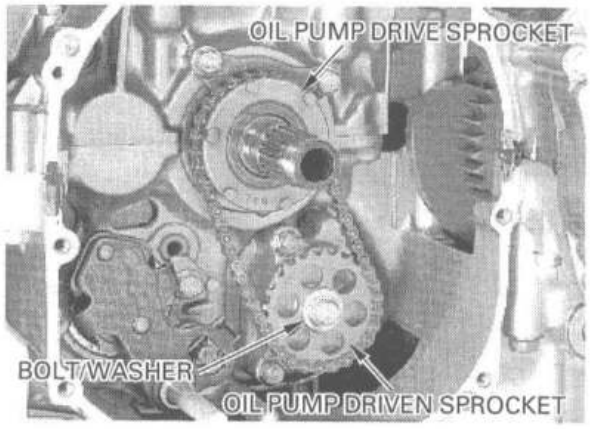


OIL PUMP

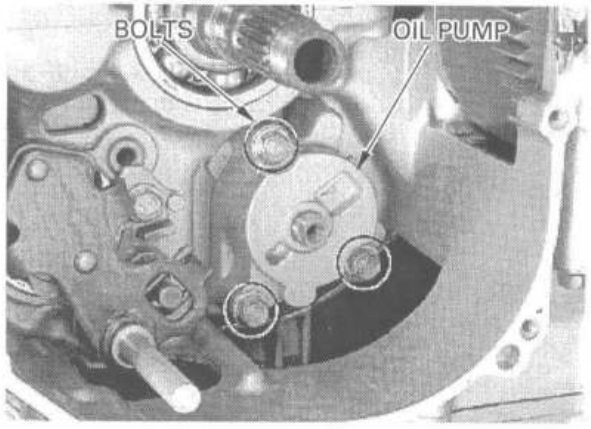
REMOVAL

Remove the following:
- Clutch assembly (page 9-4)
- Oil strainer and pressure relief valve (page 4-4)

Remove the bolt/washer, then remove the oil pump drive/driven sprocket and drive chain as an assembly.



Remove the three flange bolts and oil pump assembly.

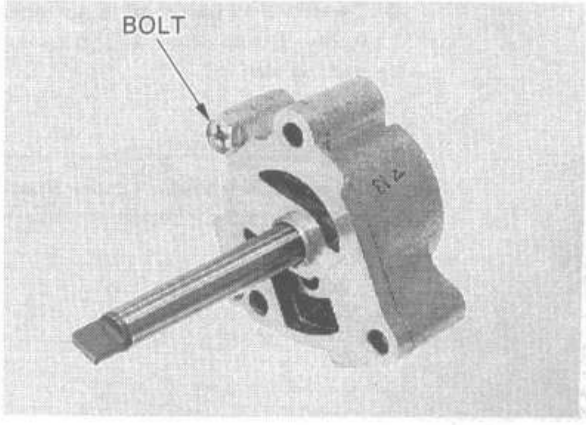


DISASSEMBLY

NOTE:

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

Remove the oil pump cover bolt and cover.
Remove the dowel pin.
Disassemble the oil pump and clean the removed parts.



INSPECTION

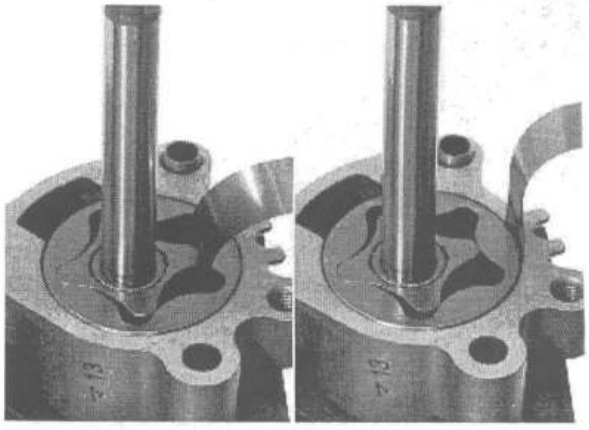
Temporarily install the oil pump shaft.
Install the outer and inner rotors into the oil pump body.

Measure the tip clearance.

SERVICE LIMIT: 0.20 mm (0.008 in)

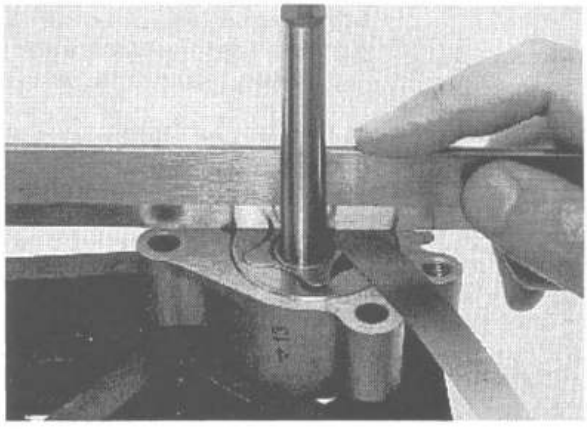
Measure the pump body clearance.

SERVICE LIMIT: 0.35 mm (0.014 in)



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

SERVICE LIMIT: 0.10 mm (0.004 in)

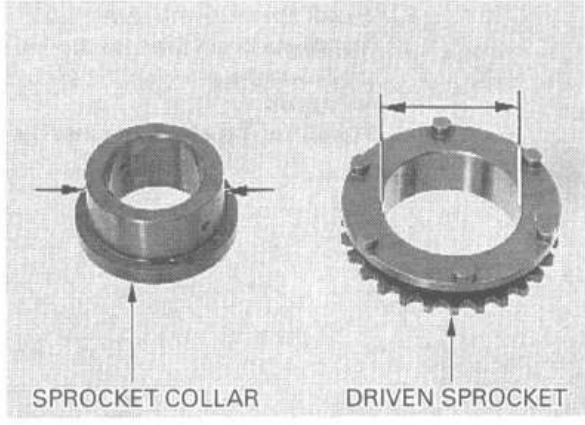


Measure the oil pump driven sprocket collar O.D.

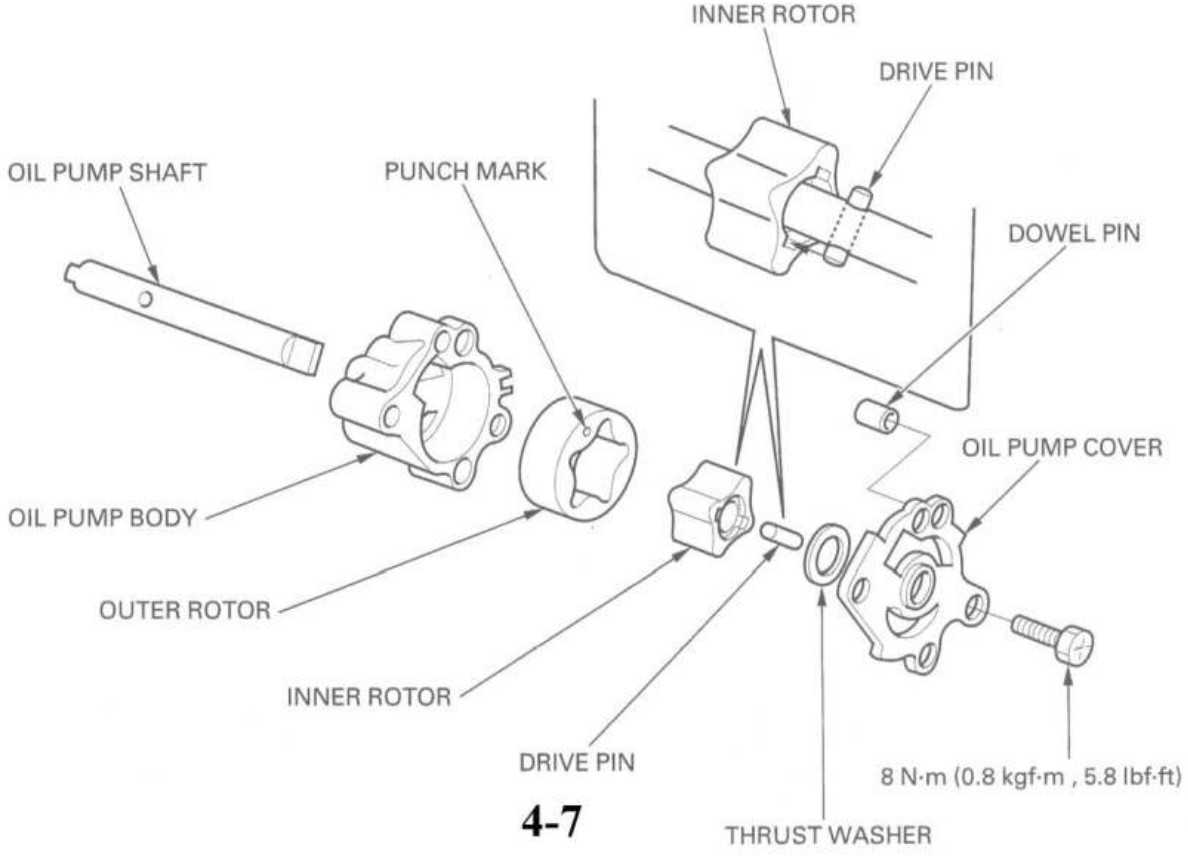
SERVICE LIMIT: 34.03 mm (1.340 in)

Measure the oil pump drive sprocket I.D.

SERVICE LIMIT: 35.10 mm (1.382 in)

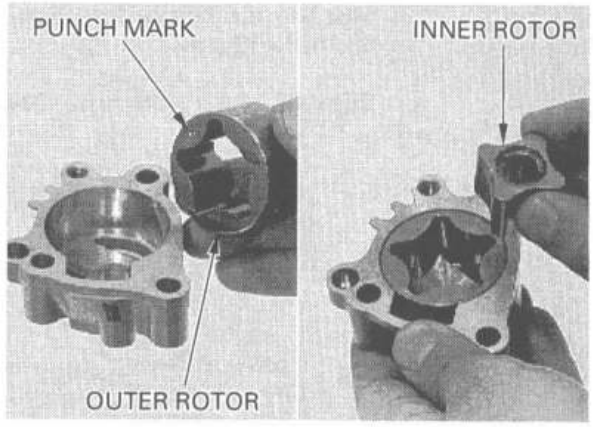


ASSEMBLY

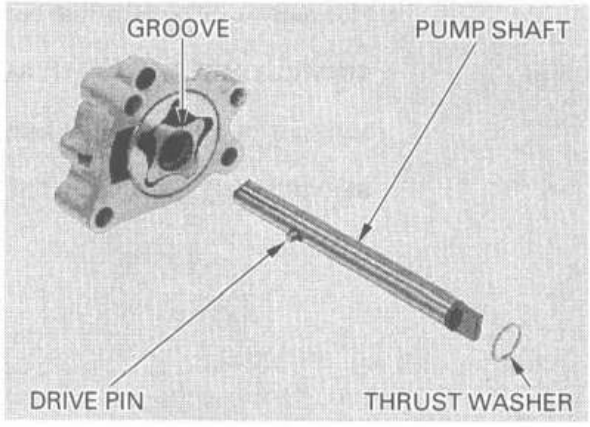


Before assembly, clean all disassembled parts thoroughly in solvent, wipe and dry.
Apply clean engine oil to the all sliding area.

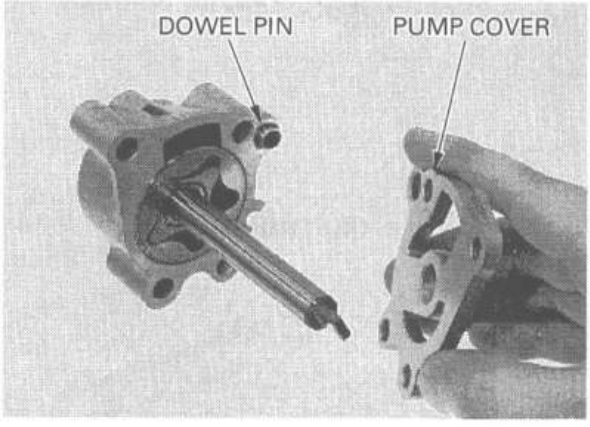
Install the outer and inner rotors into the oil pump body with the outer rotor punch mark facing the pump cover.



Install the oil pump shaft.
Install the drive pin into the hole in the pump shaft and align the pin with the grooves in the inner rotor as shown.
Install the thrust washer into the inner rotor groove.

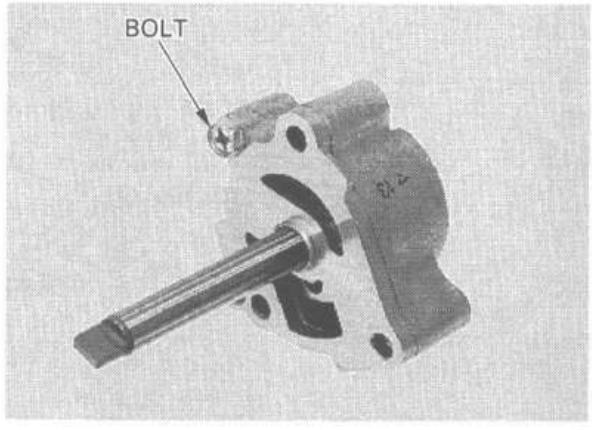


Install the dowel pin to the oil pump body.
Install the oil pump cover.



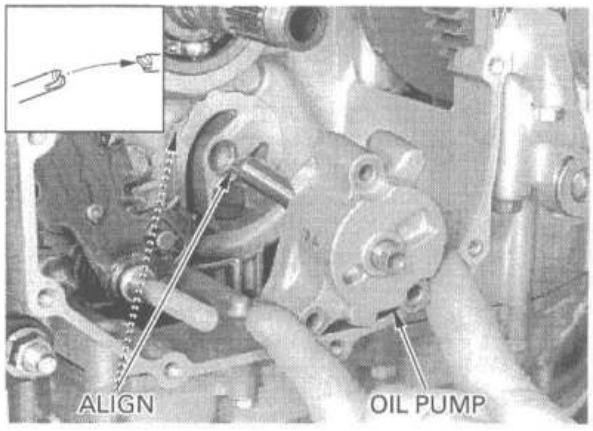
Install and tighten the oil pump cover bolt to the specified torque.

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

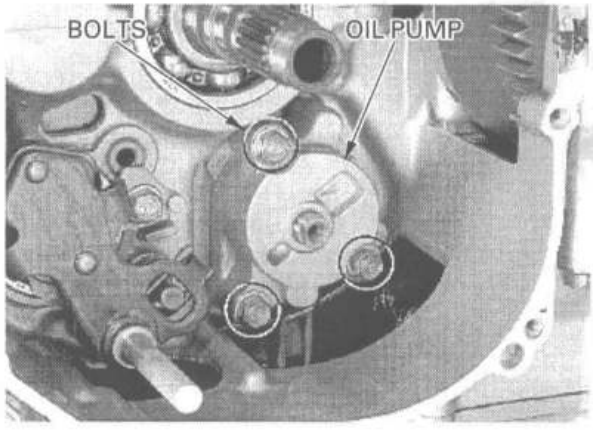


INSTALLATION

Install the oil pump into the crankcase while aligning the pump shaft lug with the water pump shaft groove.

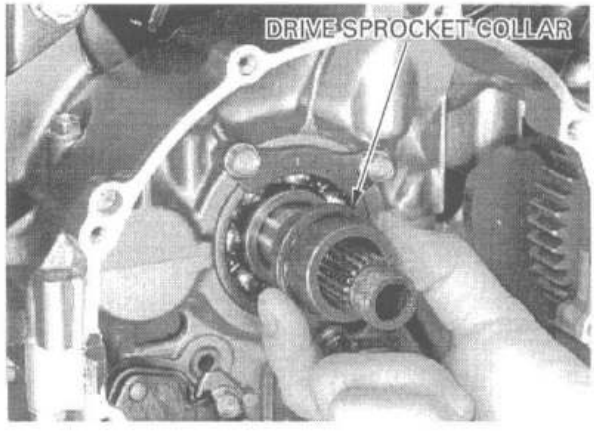


Install and tighten the three flange bolts securely.



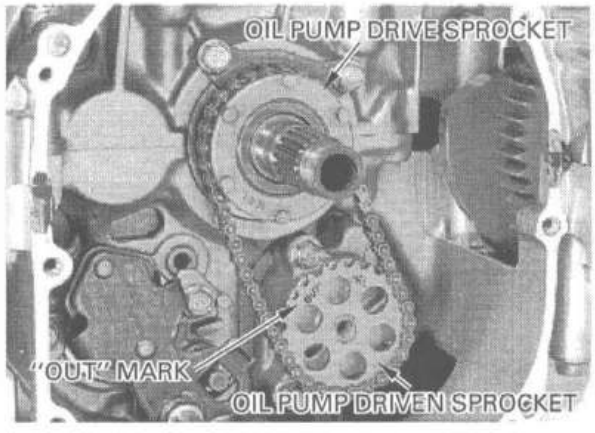
Apply oil to the oil pump drive sprocket collar, drive sprocket and drive chain.

Install the drive sprocket collar onto the mainshaft.



Align the flat surfaces of the driven sprocket with the oil pump drive shaft end.

Install the drive/driven sprocket and drive chain as an assembly with the "OUT" mark on the driven sprocket facing out.

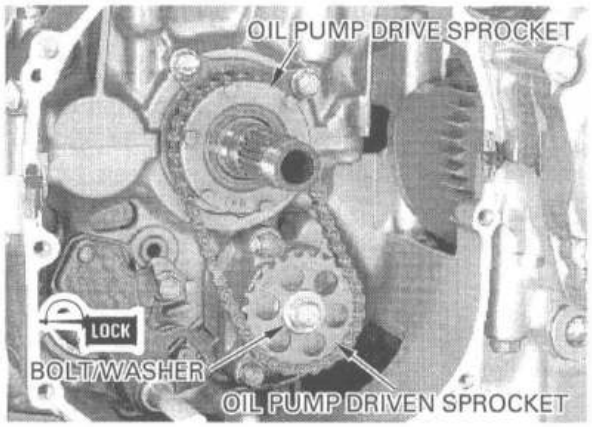


Apply a locking agent to the oil pump driven sprocket bolt threads.

Install and tighten the driven sprocket bolt/washer to the specified torque.

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

Install the clutch (page 9-8).
Fill the crankcase with recommended engine oil (page 3-12), and check for oil leaks.
Check the oil pressure (page 4-3).



OIL COOLER

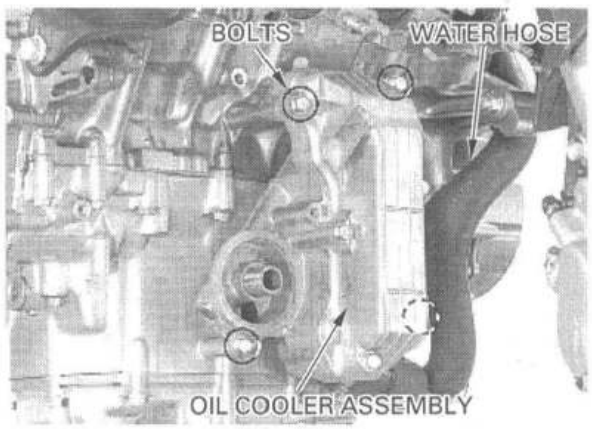
REMOVAL

Drain the engine oil (page 3-12).

Remove the following:
- Exhaust pipe (page 2-5)
- PAIR control valve assembly (page 5-27)
- Oil filter cartridge (page 3-13)



Remove the water hose.
Remove the oil cooler assembly mounting bolts.

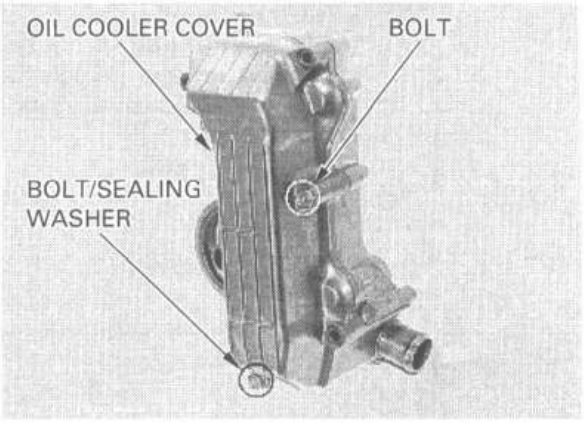


Remove the oil cooler assembly and O-ring.
Remove the joint collars/O-rings from the crankcase.

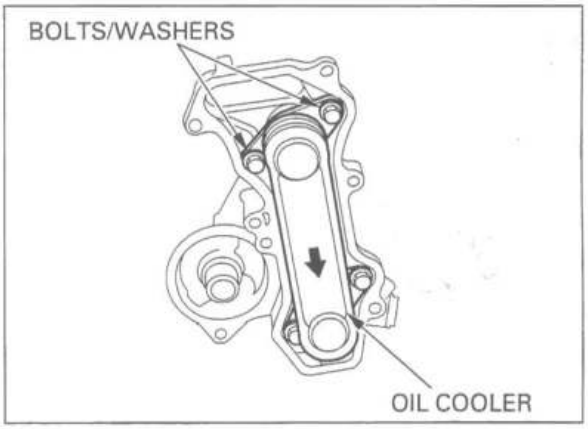


DISASSEMBLY

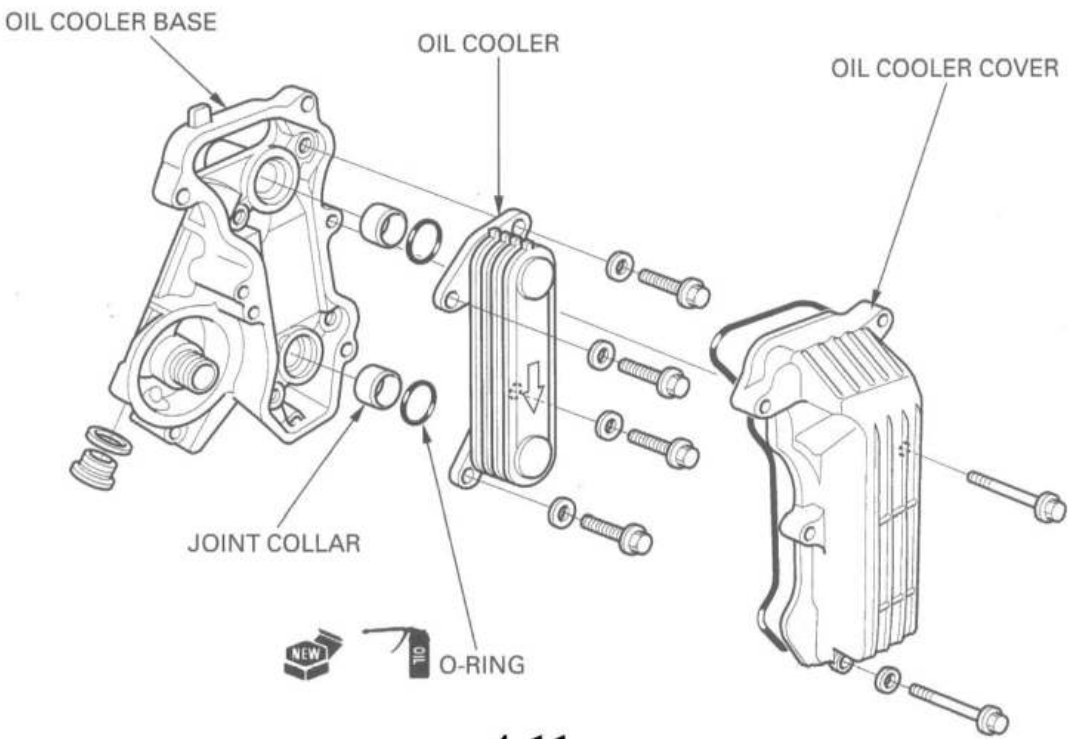
Remove the oil cooler cover bolts and sealing washer.
Remove the oil cooler cover and O-ring.



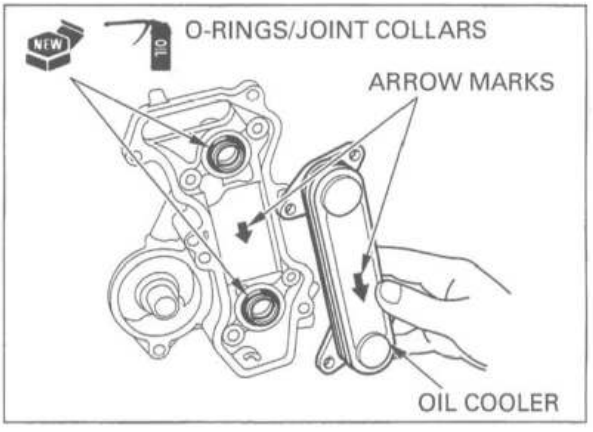
Remove the bolts, washers and oil cooler.
Remove the O-rings and joint collars from the oil cooler base.



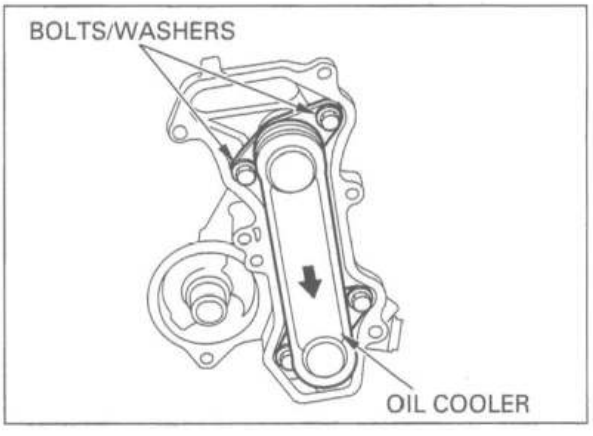
ASSEMBLY



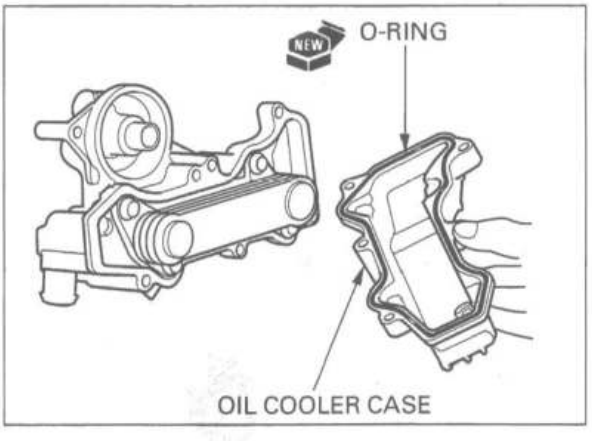
Install the joint collars into the oil cooler base holes.
Apply clean engine oil to the new O-rings and install them into the oil cooler base.
Install the oil cooler with its arrow mark facing down.



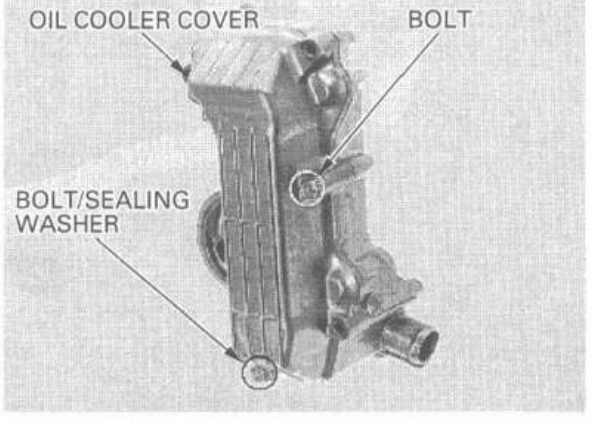
Install the washers and bolts, tighten the bolts securely.



Apply oil to the new O-ring and install it into the groove of the oil cooler case.

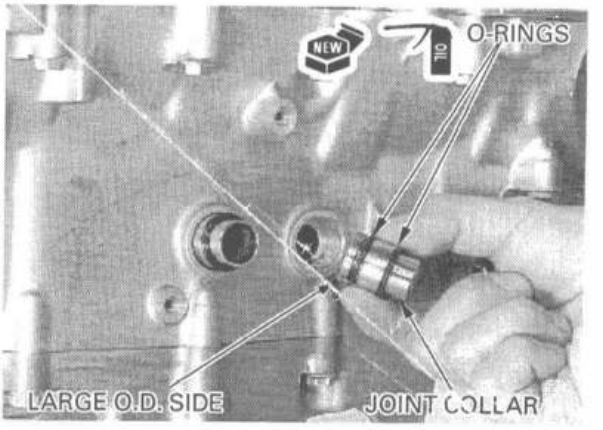


Assemble the oil cooler case and oil cooler base, then install the sealing washer and bolts.
Tighten the bolts securely.

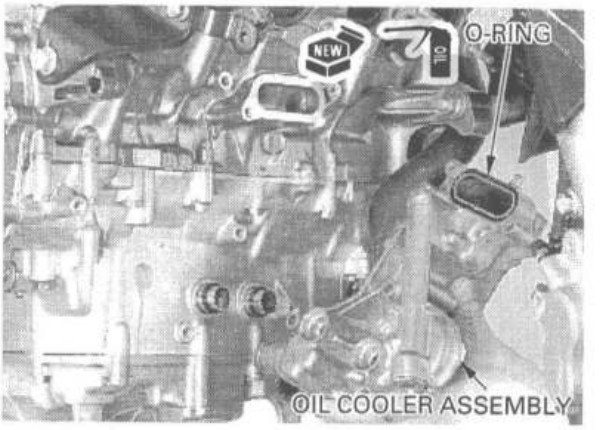


INSTALLATION

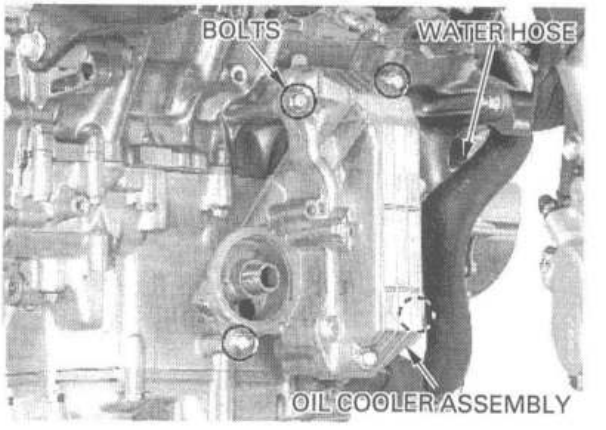
Apply clean engine oil to the new O-rings, and install them onto the joint collars.
Install the joint collars to the crankcase with its large O.D. side facing the crankcase.



Apply oil to the new O-ring and install it into the groove of the oil cooler base.
Install the oil cooler assembly onto the crankcase.

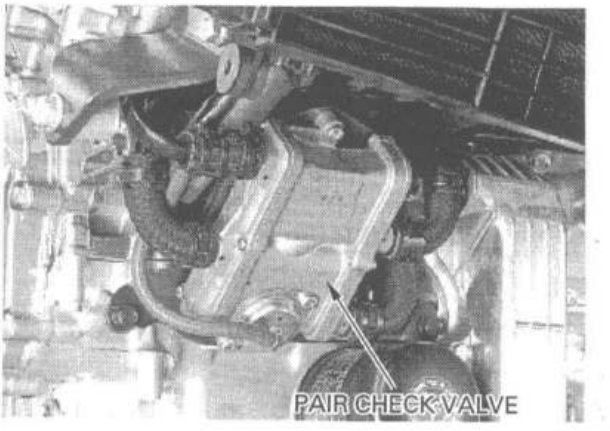


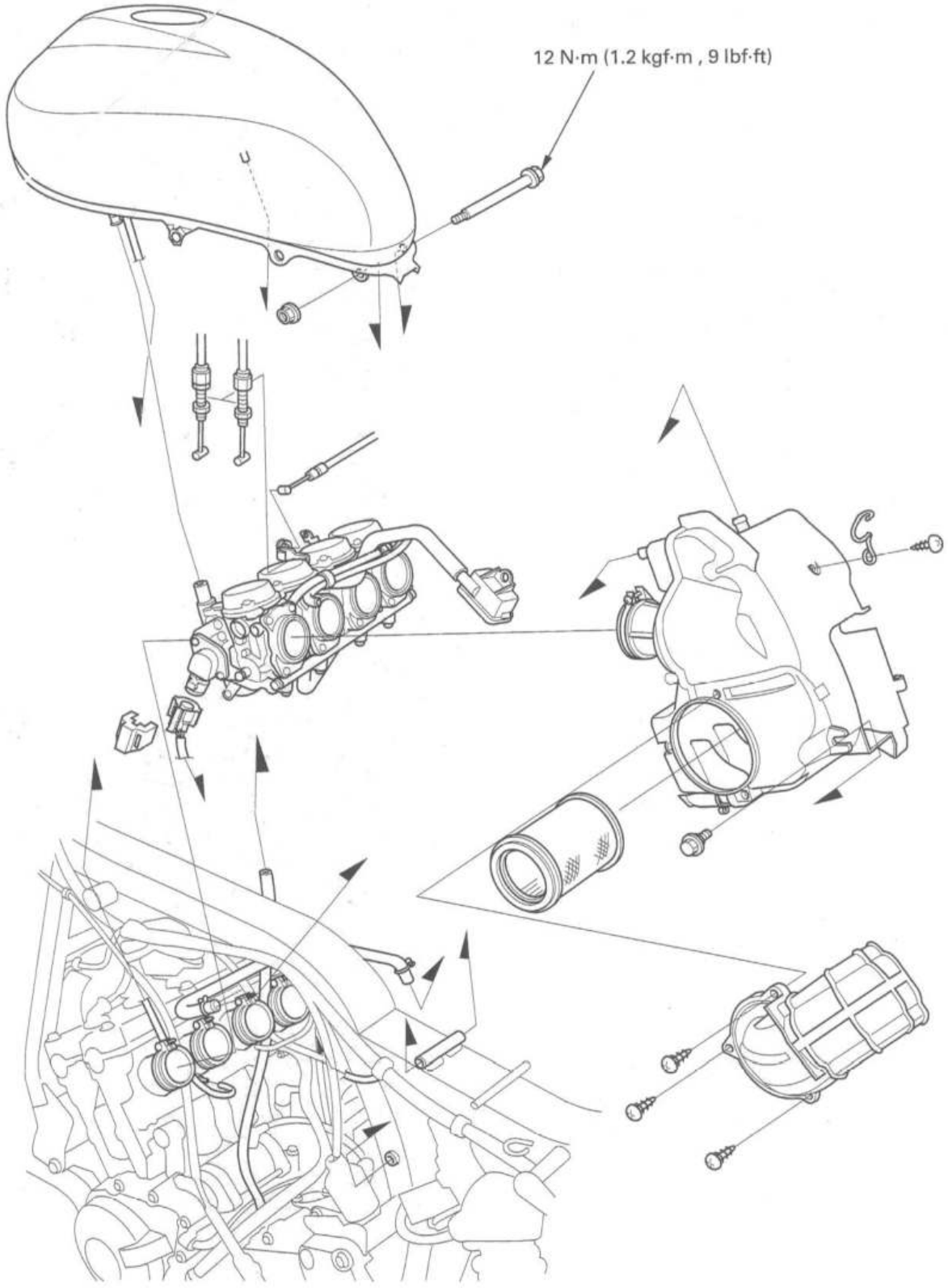
Install and tighten the oil cooler assembly mounting bolts.
Connect the water hose to the oil cooler and tighten the clamp screw securely.



Install the following:
- PAIR control valve assembly (page 5-27)
- Exhaust pipe (page 2-5)
- Oil filter cartridge (page 3-13)

Fill the crankcase with recommended engine oil (page 3-12), and check for oil leaks.
Fill the cooling system and bleed the air (page 6-4).




12 N·m (1.2 kgf·m , 9 lbf·ft)

5. FUEL SYSTEM

SERVICE INFORMATION	5-1	CARBURETOR ASSEMBLY	5-15
TROUBLESHOOTING	5-3	CARBURETOR COMBINATION	5-20
AIR CLEANER HOUSING	5-4	CARBURETOR INSTALLATION	5-24
CARBURETOR REMOVAL	5-8	PILOT SCREW ADJUSTMENT	5-25
CARBURETOR SEPARATION	5-9	SECONDARY AIR SUPPLY SYSTEM	5-26
CARBURETOR DISASSEMBLY	5-11	FUEL VALVE	5-28

SERVICE INFORMATION

GENERAL

⚠WARNING

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

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.

CAUTION:

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

- Refer to section 2 for fuel tank removal and installation.
- When disassembling fuel system parts, note the location of the O-rings. Replace them with new ones on reassembly.
- Before disassembling the carburetor, place the suitable container under the carburetor drain tube. loosen the bolt and drain the carburetor.
- After removing the carburetor, wrap the intake ports of the engine with a shop towel or cover it with piece of tape to prevent any foreign material from dropping into the engine.
- The vacuum chamber and float chamber can be serviced with the carburetors assembled.

NOTE:

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

SPECIFICATIONS

ITEM		SPECIFICATIONS
Carburetor identification number	Except SW type	VP49A
	SW type	VP49B
Main jet		No.1/4; #100, No.2/3; #102
Slow jet		#40
Jet needle		J7SL
Pilot screw initial opening	Except SW type	1 3/4 turns out
	SW type	2 1/8 turns out
Float level		13.7 mm (0.54 in)
Idle speed		1,300 ± 100 min^{-1} (rpm)
Carburetor vacuum difference		Within 30 mm Hg (1.2 in Hg)
Base carburetor for synchronization		No.3 carburetor

TORQUE VALUES

Boost joint for synchronization	2 N·m (0.25 kgf·m , 1.8 lbf·ft)
Insulator band screw	See page 1-14
Carburetor assembly bolt/nut, 5 mm	5 N·m (0.5 kgf·m , 3.6 lbf·ft)
6 mm	10 N·m (1.0 kgf·m , 7 lbf·ft)
Fuel valve nut	34 N·m (3.5 kgf·m , 25 lbf·ft)
Fuel tank stay bolt/nut	12 N·m (1.2 kgf·m , 9 lbf·ft)

TOOLS

Carburetor float level gauge		07401-0010000
Pilot screw wrench	Except SW type	07908-4730002
	SW type	07KMA-MS60101 with 07PMA-MZ20110

TROUBLESHOOTING

Engine won't to start
- Too much fuel getting to the engine
  - —Air cleaner clogged
  - —Flooded carburetors
- Intake air leak
- Fuel contaminated/deteriorated
- No fuel to carburetor
  - —Fuel strainer clogged
  - —Fuel tube clogged
  - —Fuel valve vacuum tube clogged
  - —Disconnected fuel valve vacuum tube
  - —Float level misadjusted
  - —Fuel tank breather tube clogged

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

Rich mixture
- Starting enrichment valve in ON position
- Float valve faulty
- Float level too high
- Air jets clogged
- Air cleaner element contaminated
- Flooded carburetor

Engine stall, hard to start, rough idling
- Fuel line restricted
- Ignition malfunction
- Fuel mixture too lean/rich
- Fuel contaminated/deteriorated
- Intake air leak
- Idle speed misadjusted
- Float level misadjusted
- Fuel tank breather tube clogged
- Pilot screw misadjusted
- Slow circuit or starting enrichment circuit clogged
- Emission control system malfunction

Afterburn when engine braking is used
- Lean mixture in slow circuit
- Air cut-off valve malfunction
- Emission control system is malfunction
  - —Secondary air supply system faulty
  - —Loose, disconnected or deteriorated hoses of the emission control system

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

Poor performance (driveability) and poor fuel economy
- Fuel system clogged
- Ignition system malfunction
- Emission control system malfunction
  - —Secondary air supply system faulty
  - —Loose, disconnected or deteriorated hoses of the emission control system

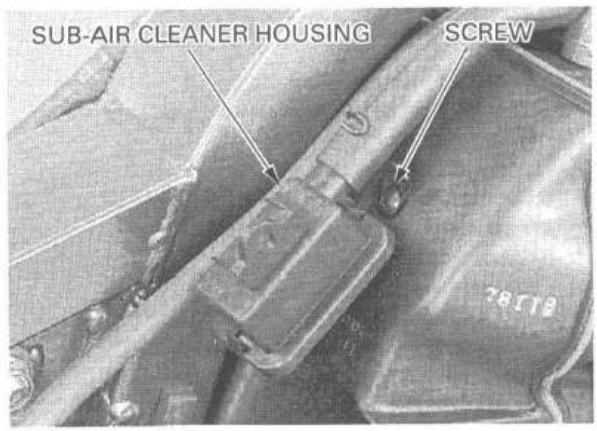
AIR CLEANER HOUSING

REMOVAL

NOTE:

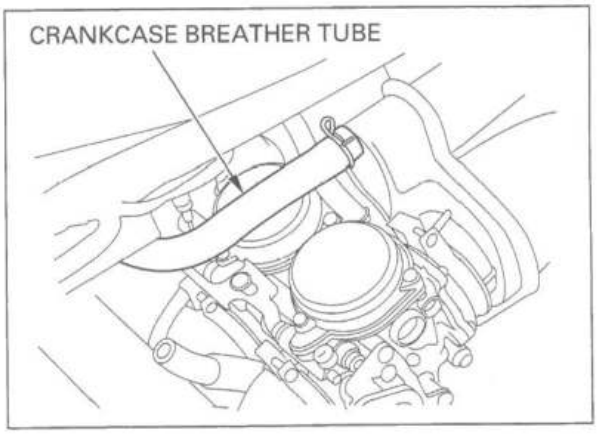
Refer to page 3-5 for air cleaner element replacement.

Remove the following:
- Fuel tank (page 2-4)
- Air cleaner element (page 3-5)
- Battery (page 16-5)

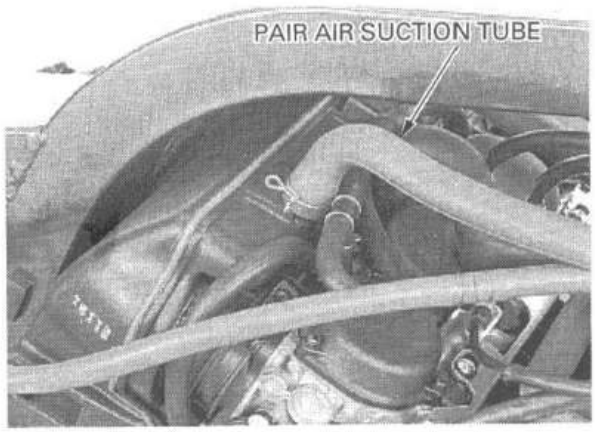


Remove the sub-air cleaner housing clamp mounting screw.

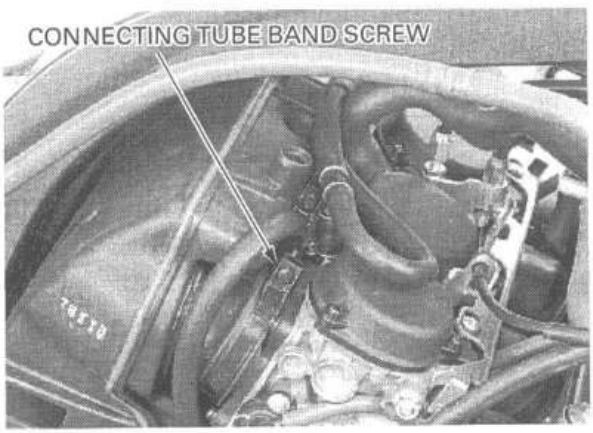
Disconnect the crankcase breather tube from the air cleaner housing.



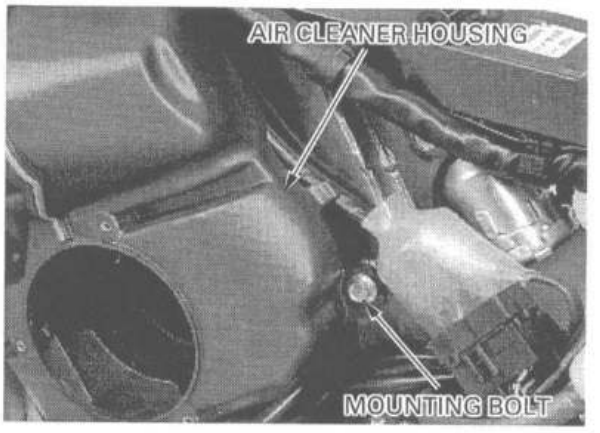
Disconnect the PAIR (Pulse secondary air injection) air suction tube from the air cleaner housing.



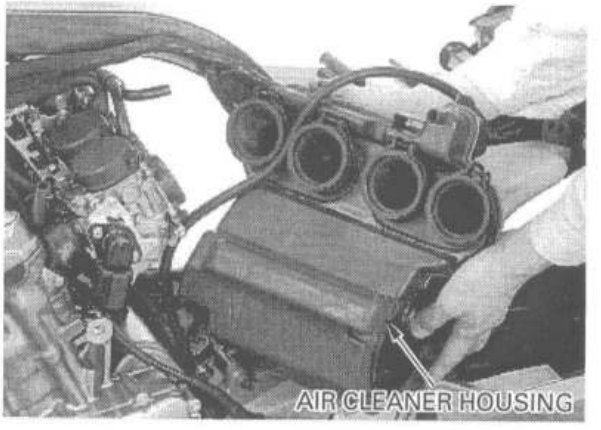
Loosen the carburetor connecting tube band screws.



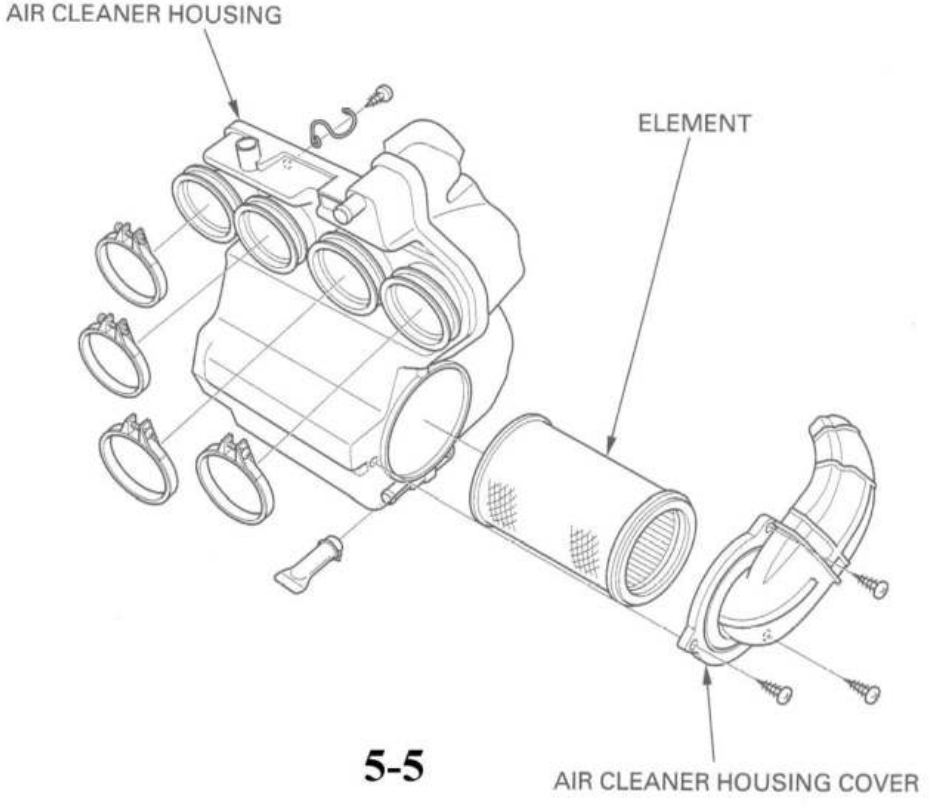
Remove the air cleaner housing mounting bolt.



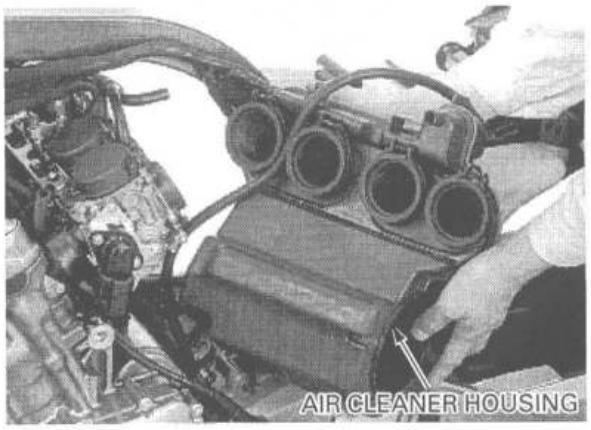
Remove the air cleaner housing out of the frame to the left side.



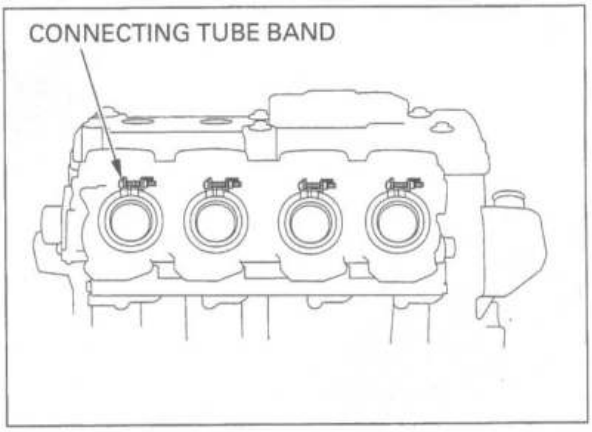
INSTALLATION



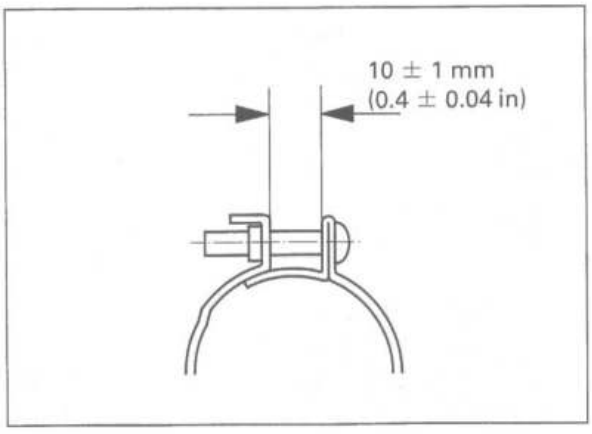
Install the air cleaner housing into the frame from the left side.



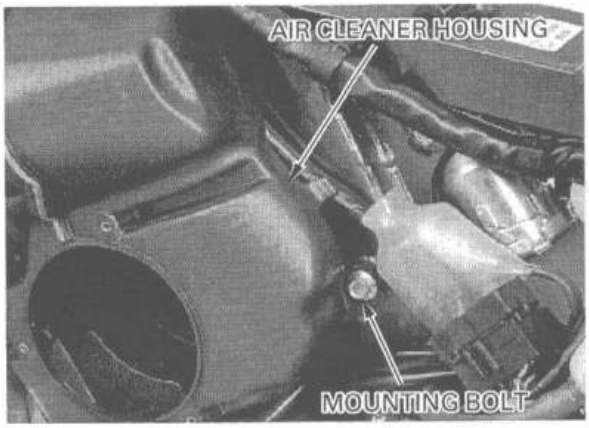
Adjust the connecting tube band angle.



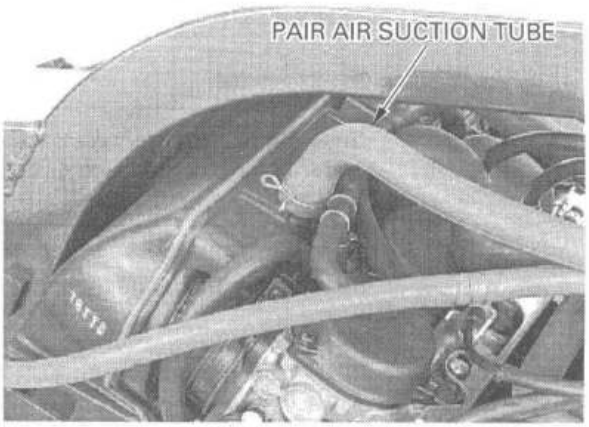
Tighten the connecting tube band screws so that the band ends clearance is 10 ± 1 mm (0.4 ± 0.04 in).



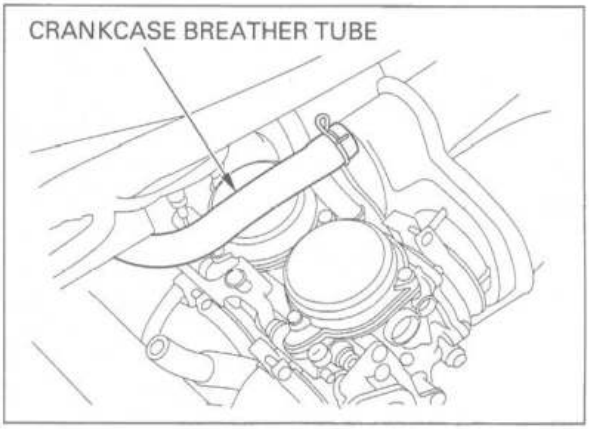
Install and tighten the air cleaner housing mounting bolt.



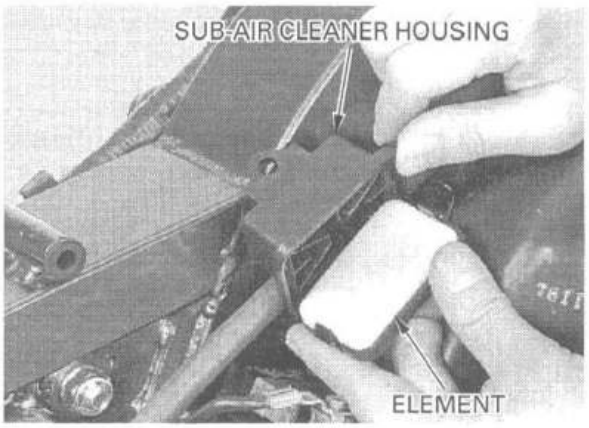
Connect the PAIR air suction tube to the air cleaner housing.



Connect the crankcase breather tube to the air cleaner housing.



Clean the sub-air cleaner element.



Install the sub-air cleaner housing clamp, tighten the screw securely.

Install the following:
- Battery (page 16-5)
- Air cleaner element (page 3-5)
- Fuel tank (page 2-4)



CARBURETOR REMOVAL

⚠WARNING

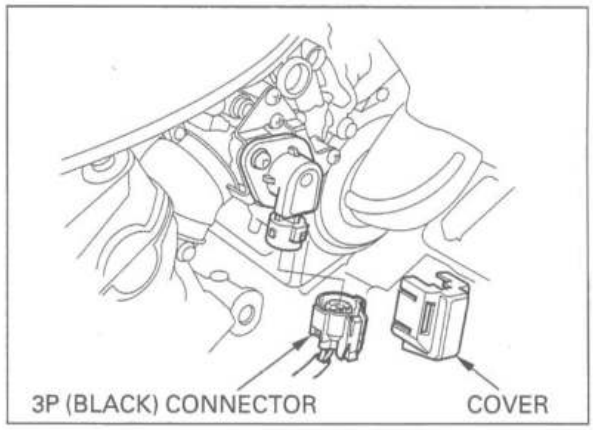
Gasoline is extremely flammable and is explosive under certain conditions. KEEP OUT OF REACH OF CHILDREN.

Remove the air cleaner housing (page 5-4).

Loosen the carburetor drain screws and catch the fuel with approved gasoline container.



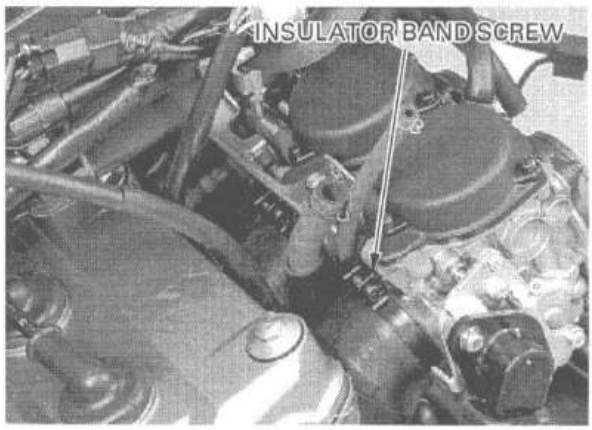
Remove the throttle sensor connector cover.
Disconnect the throttle sensor 3P (Black) connector.



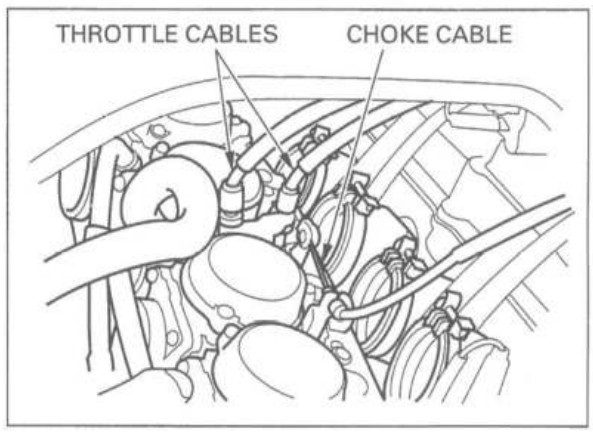
Loosen the carburetor side insulator band screws.

NOTE:

- After removing the carburetor assembly, do not place it up side down or the air intake might be deformed.
- Seal the cylinder head intake ports with a shop towel or cover it with piece of tape to prevent any foreign material from dropping into the engine.



Remove the carburetor assembly.
Disconnect the choke cable from the carburetor.
Remove the throttle cables from the cable holder and disconnect the throttle cables from the throttle drum.

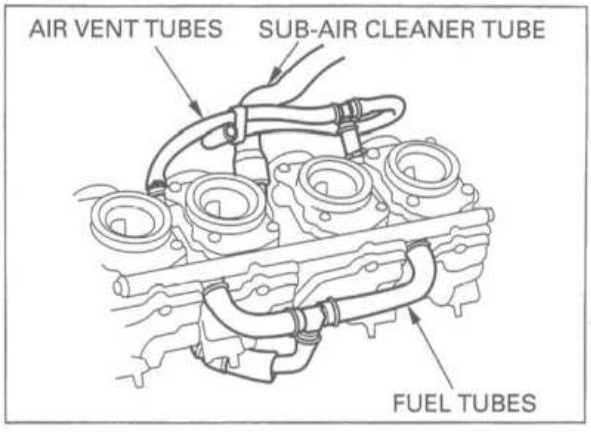


CARBURETOR SEPARATION

NOTE:

The vacuum chamber and float chamber can be serviced without separating the carburetors.

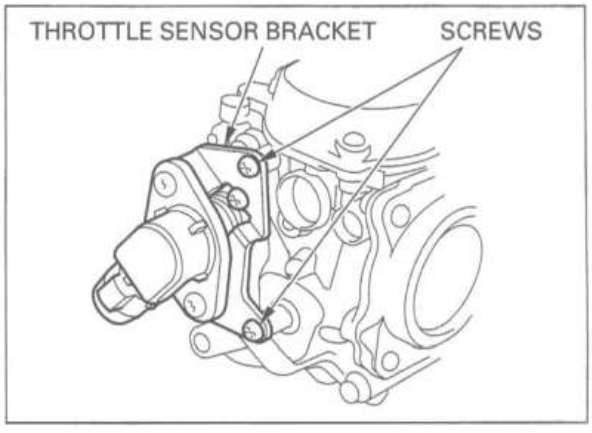
Disconnect the fuel tube from the fuel joint.
Disconnect the air vent tubes and sub-air cleaner tube.



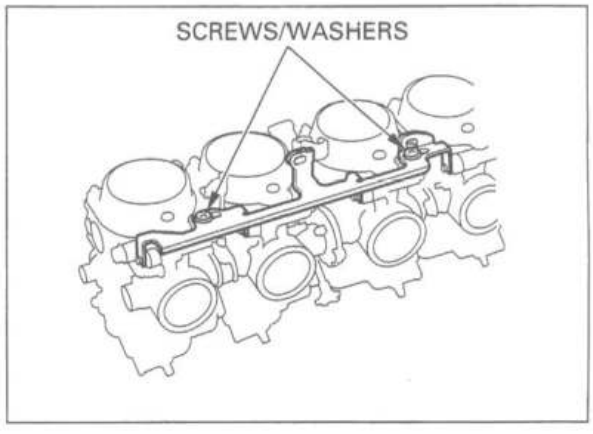
NOTE:

At carburetor separation, it is not necessary to remove the throttle sensor from the carburetor body.

If necessary, remove the screws and throttle sensor bracket assembly from the carburetor body.



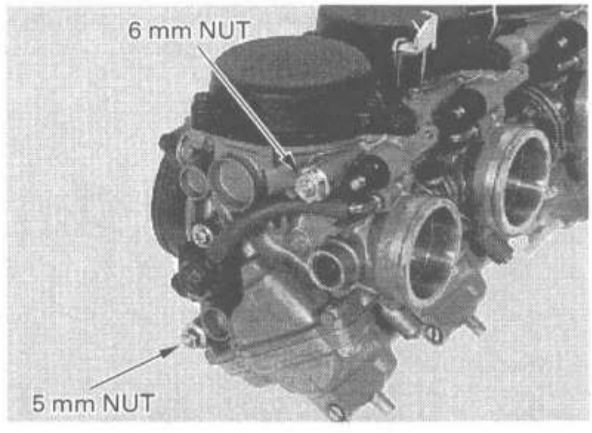
Remove the starting enrichment (SE) valve arm screws and washers.
Remove the SE valve arm and plastic collars.



Loosen and remove the carburetor connecting 6 mm nut and 5 mm nut.

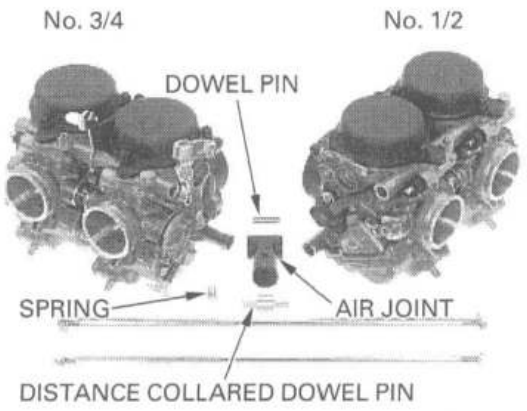
NOTE:

Loosen the nuts gradually and alternately.



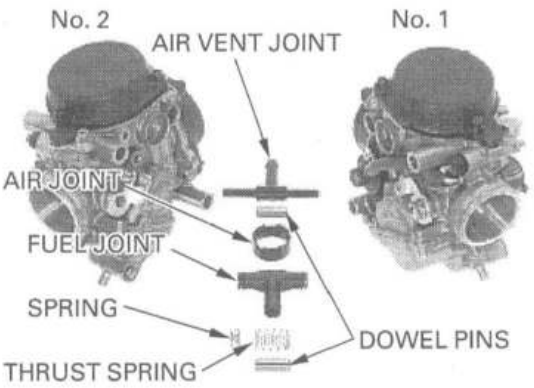
Separate the No. 3/4 carburetors from the No. 1/2 carburetors.

Remove the following:
- No.2 carburetor synchronization spring
- 3-way air joint pipe/O-rings
- Dowel pin (5 mm bolt side)
- Distance collared dowel pin (6 mm bolt side)



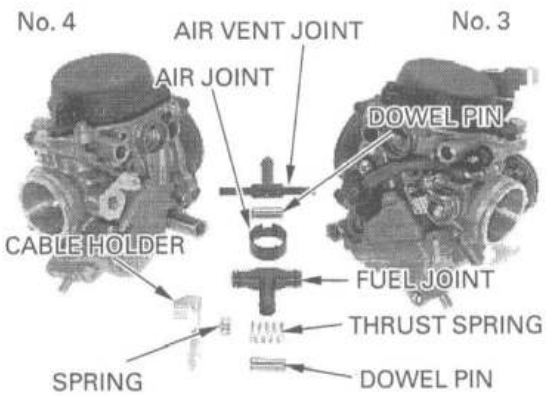
Separate the No.1 carburetor from the No.2 carburetor.

Remove the following:
- No.1 carburetor synchronization spring
- Thrust spring
- Air joint rubber pipe
- 3-way air vent joint pipe/O-rings
- 3-way fuel joint pipe/O-rings
- Dowel pin (5 mm bolt side)
- Dowel pin (6 mm bolt side)

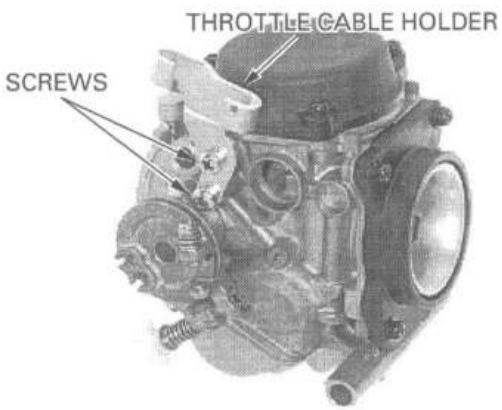


Separate the No.3 carburetor from the No.4 carburetor.

Remove the following:
- Choke cable holder
- No.4 carburetor synchronization spring
- Thrust spring
- Air joint rubber pipe
- 3-way air vent joint pipe/O-rings
- 3-way fuel joint pipe/O-rings
- Dowel pin (5 mm bolt side)
- Dowel pin (6 mm bolt side)



Remove the screws and throttle cable holder from the No.3 carburetor.



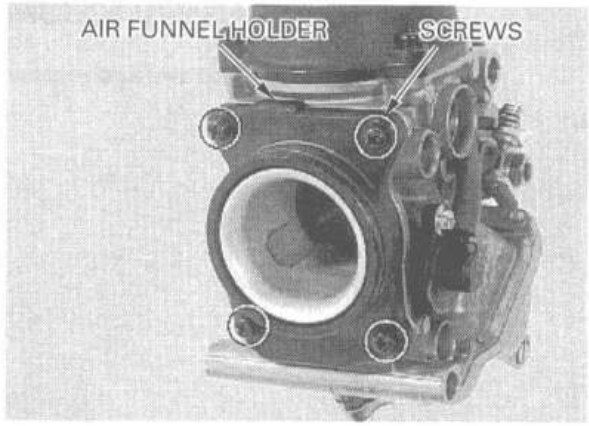
CARBURETOR DISASSEMBLY

NOTE:

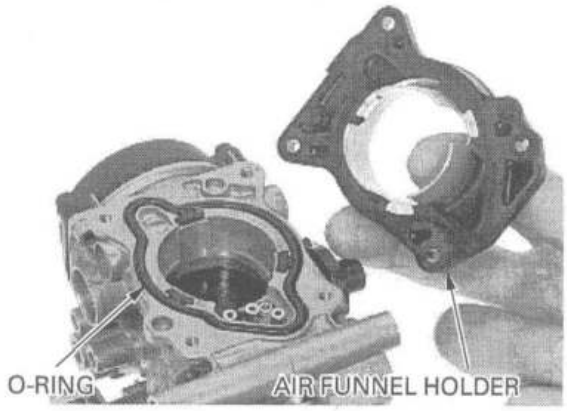
Note the location of each carburetor part so they can be replaced in their original locations.

AIR FUNNEL

Remove the screws and air funnel holder.

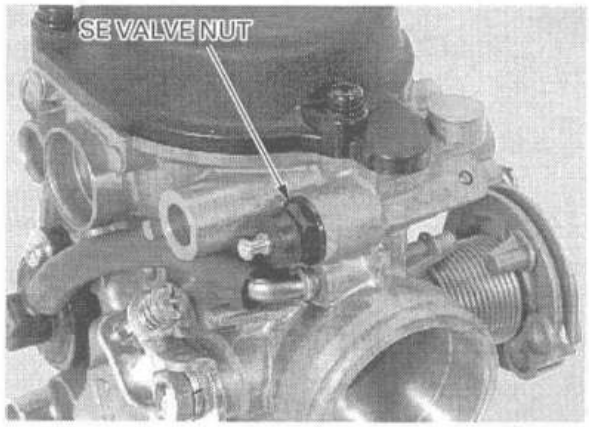


Remove the air funnel from the holder.
Remove the O-ring from the carburetor body.

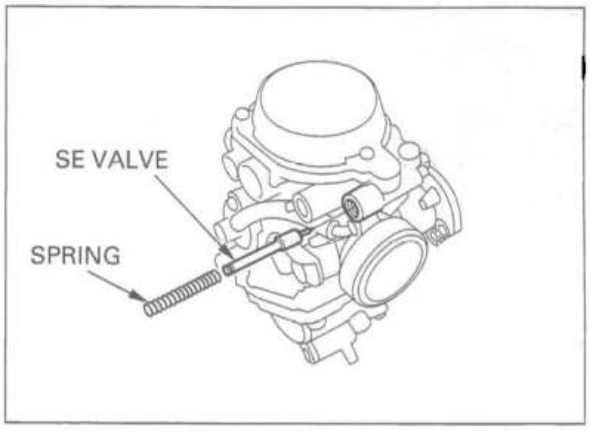


STARTING ENRICHMENT VALVE

Remove the SE valve nut.

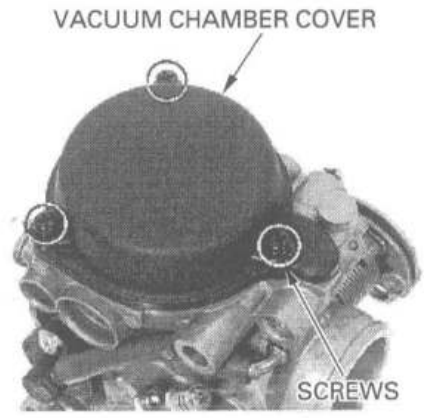


Remove the SE valve and spring.

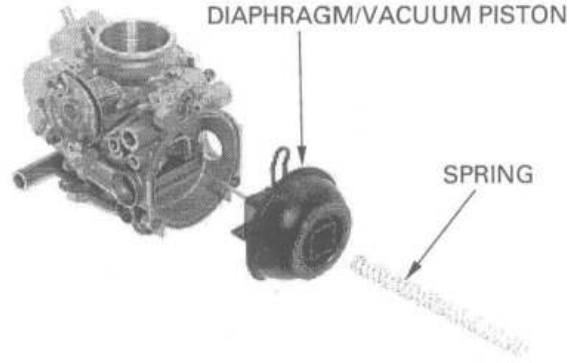


DIAPHRAGM/VACUUM PISTON

Remove the screws and vacuum chamber cover.



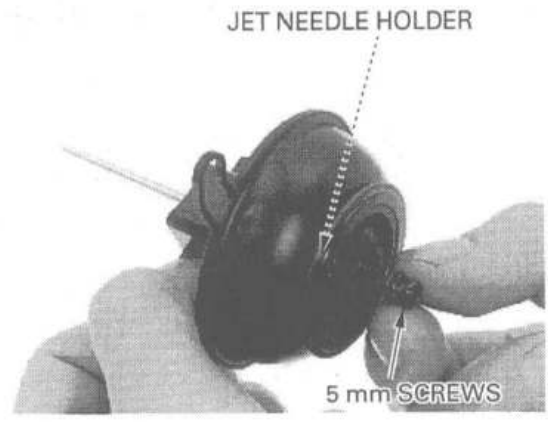
Remove the diaphragm spring and diaphragm/ vacuum piston from the carburetor body.



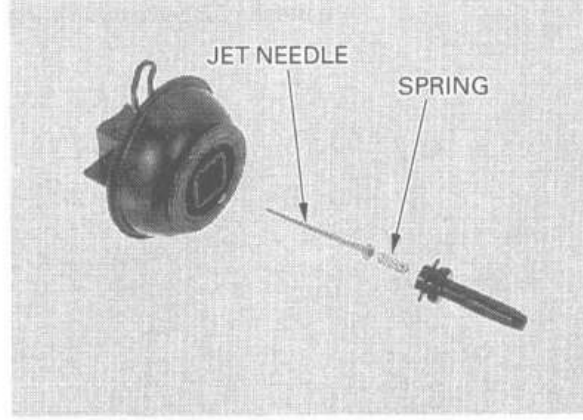
Temporarily install a 4 mm screw (example; vacuum chamber screw) into the jet needle holder. Pull the screw and remove the jet needle holder.

CAUTION:

- ***Be careful not to damage the diaphragm.***
- ***Do not remove the jet needle holder by pushing the jet needle.***

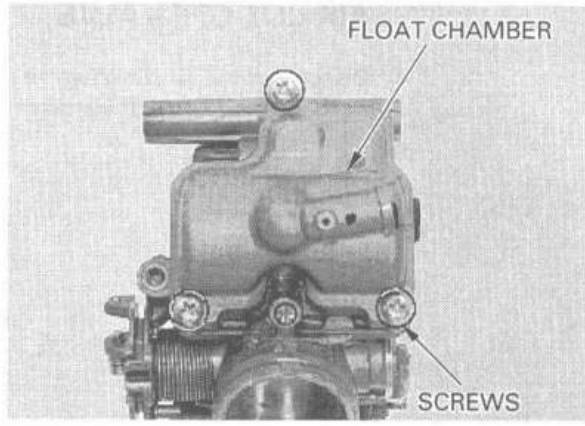


Remove the spring and jet needle from the vacuum piston.



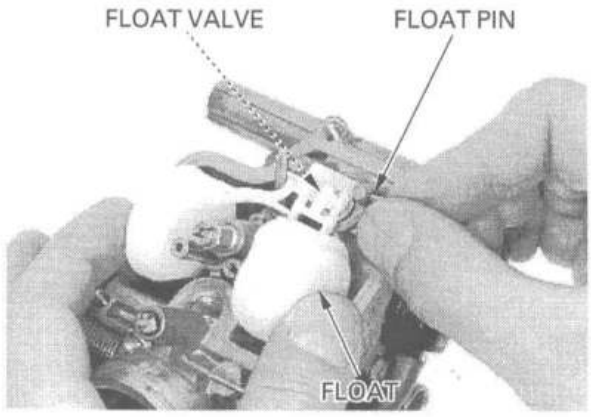
FLOAT AND JETS

Remove the screws and float chamber.



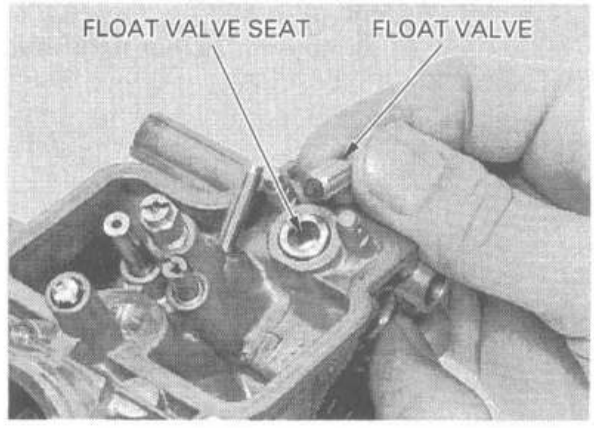
Remove the float pin, float and float valve.

Inspect the float for deformation or damage.



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

Check the operation of the float valve.

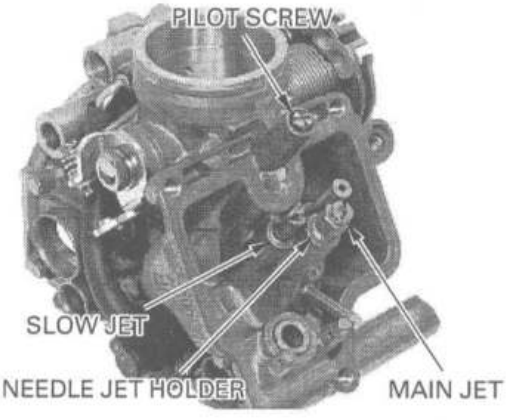


Remove the following:
- Main jet
- Needle jet holder
- Slow jet

Turn the pilot screw in and record the number of turns it takes before it seats lightly.
Remove the pilot screw, spring, washer and O-ring.

CAUTION:

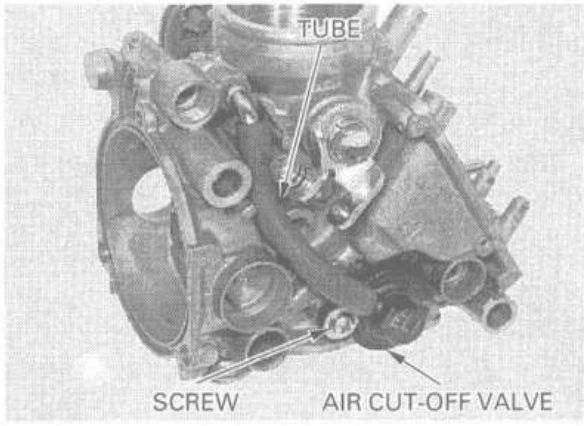
Damage to the pilot screw seat will occur if the pilot screw is tightened against the seat.



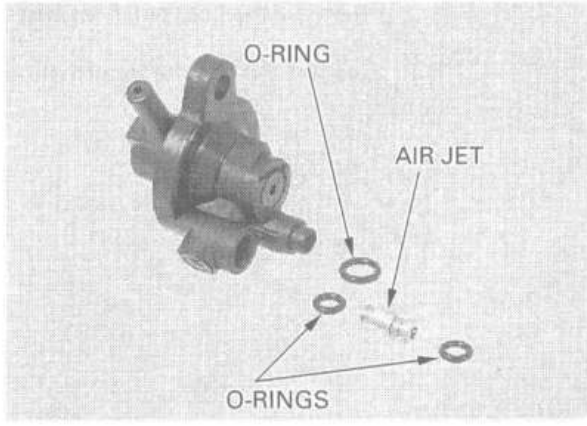
Inspect each jet for wear or damage and replace if necessary.

AIR CUT-OFF VALVE

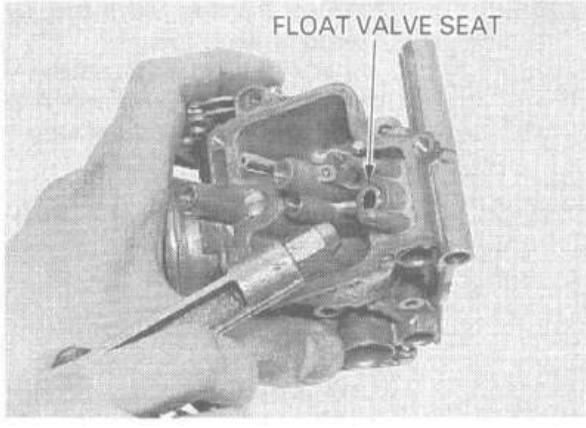
Disconnect the air cut-off valve tube.
Remove the air cut-off valve mounting screw.



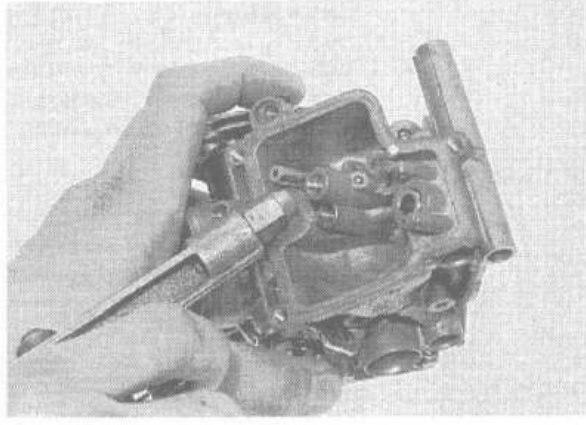
Remove the air cut-off valve, air jet and O-rings.



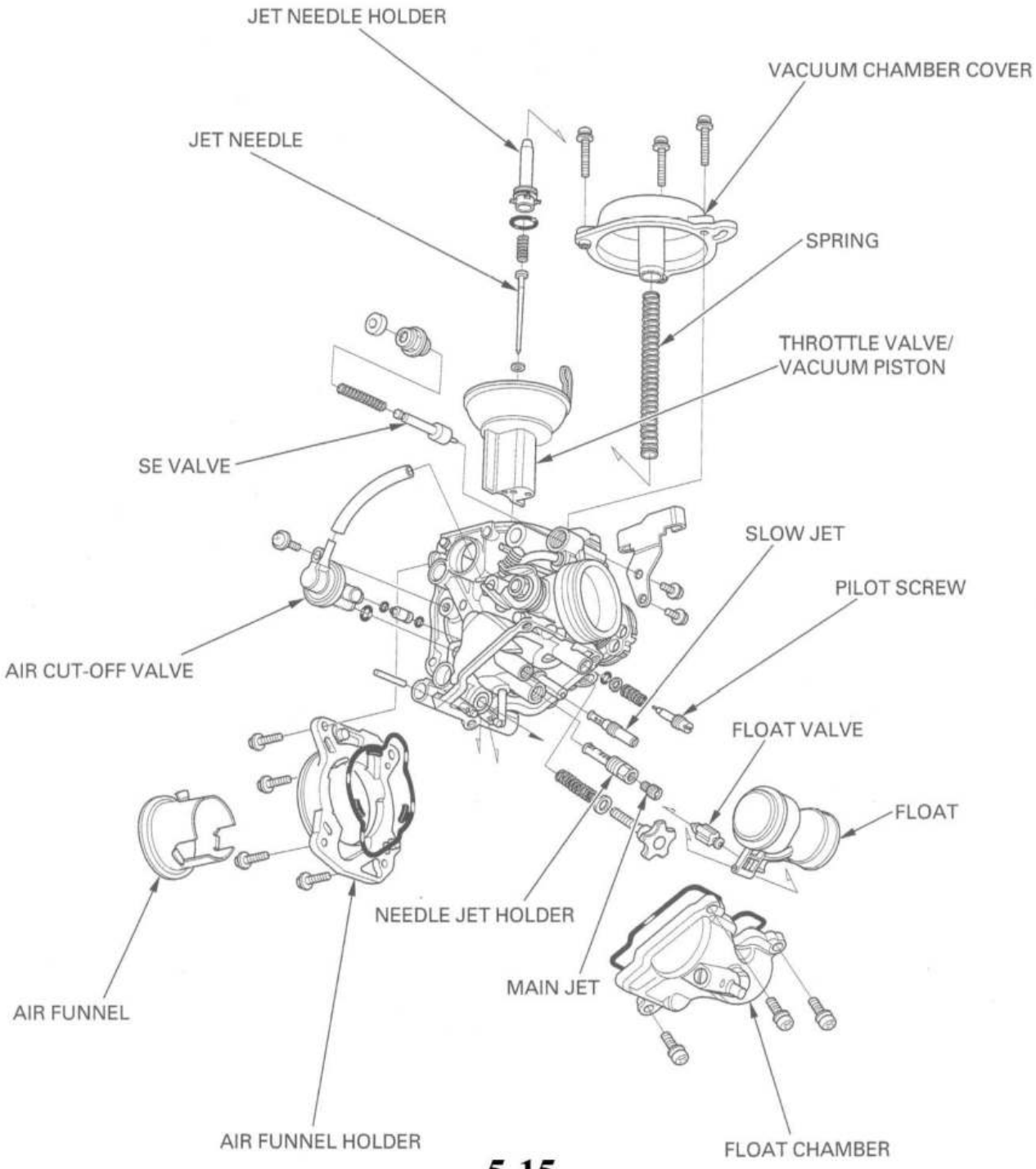
Clean the fuel strainer in the float valve seat using compressed air from the float valve seat side.



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



CARBURETOR ASSEMBLY

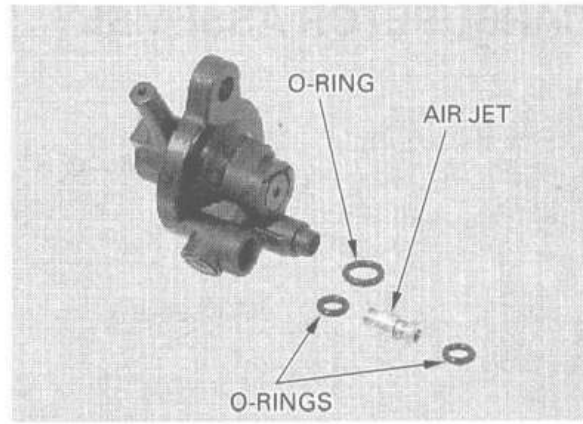


AIR CUT-OFF VALVE

Install the O-ring onto the air jet and air cut-off valve as shown.

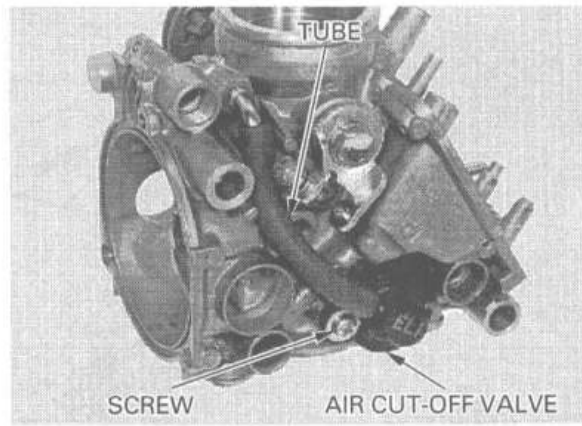
NOTE:

Install the air jet with its small end facing the air cut-off valve.



Install the air jet and air cut-off valve onto the carburetor.

Install and tighten the mounting screw.
Connect the air cut-off valve tube.



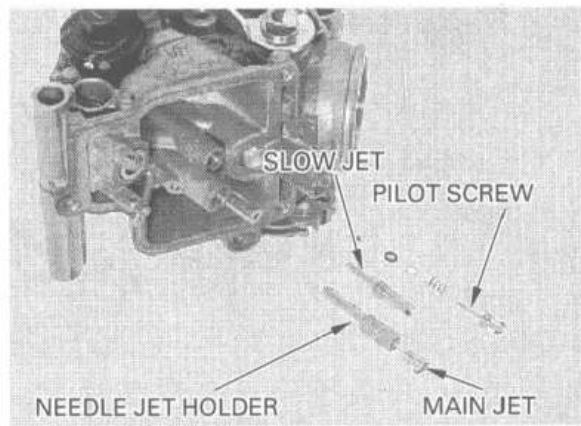
FLOAT AND JETS

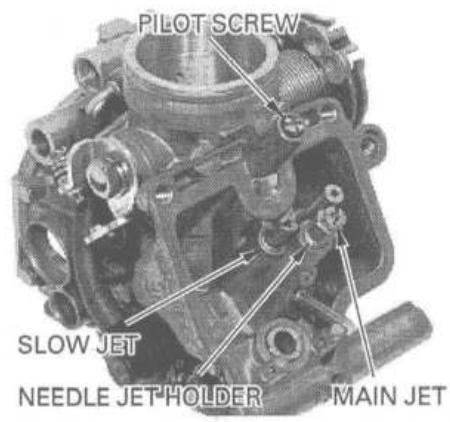
Install the following:
- Slow jet
- Needle jet holder
- Main jet

CAUTION:

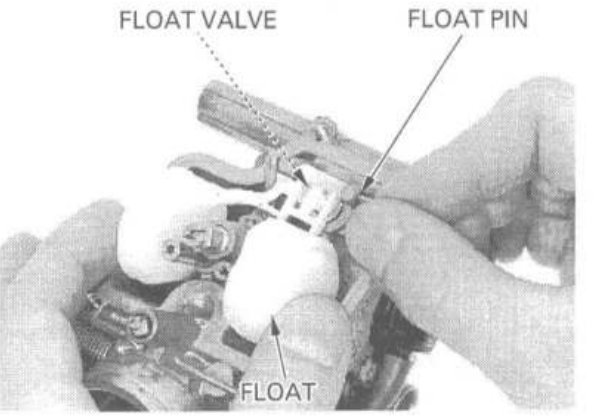
Handle all jets with care. They can easily be scored or scratched.

Install the pilot screw and return it to its original position as noted during removal.
Perform the pilot screw adjustment procedure if a new pilot screw is installed (page 5-25).





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



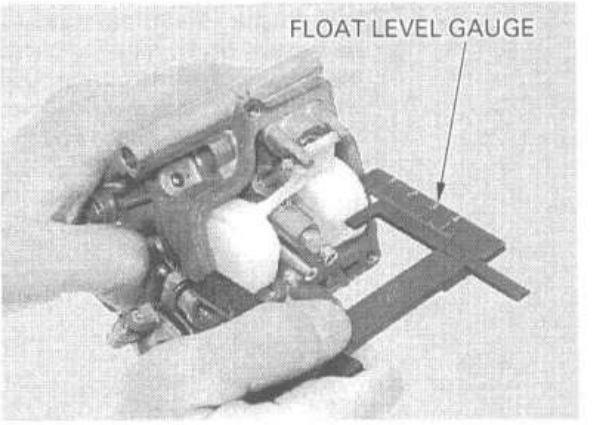
FLOAT LEVEL INSPECTION

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

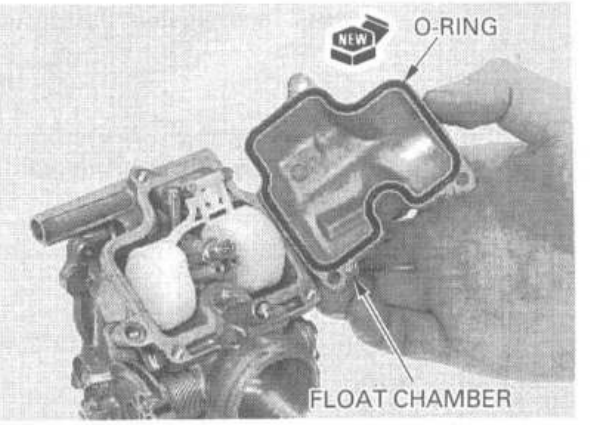
FLOAT LEVEL: 13.7 mm (0.54 in)

TOOL:
Carburetor float level gauge 07401-0010000

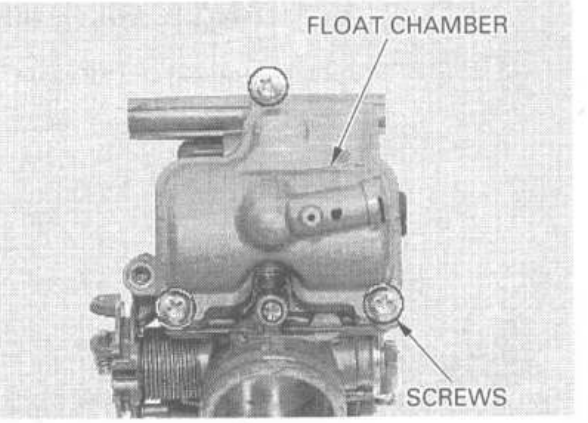
The float cannot be adjusted.
Replace the float assembly if the float level is out of specification.



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



Install and tighten the three float chamber screws.

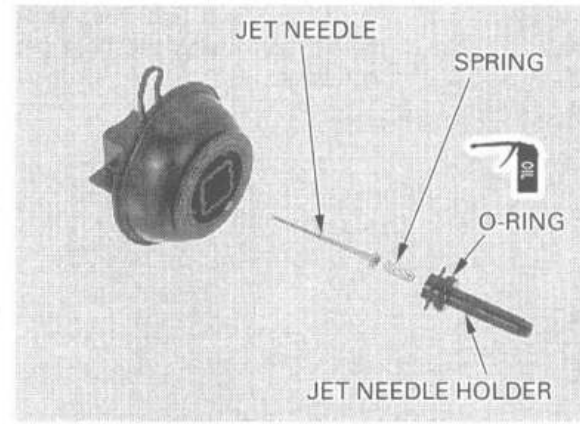


DIAPHRAGM/VACUUM PISTON

Check the condition of the O-ring on the jet needle holder, replace if necessary.
Apply oil to the O-ring.

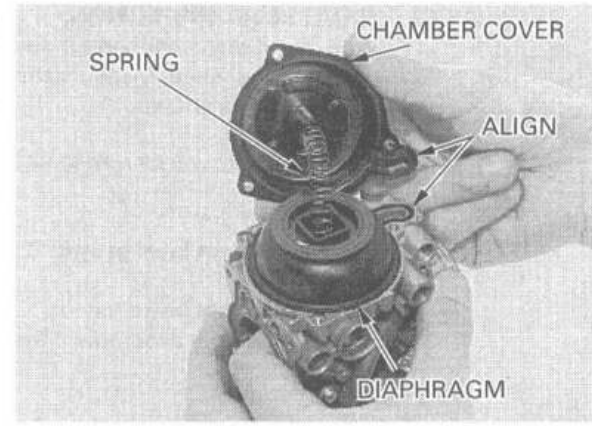
Install the jet needle and spring into the vacuum piston.

Press the jet needle holder into the vacuum piston until you feel a click indicating that the O-ring is seated into the groove in the vacuum piston.



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

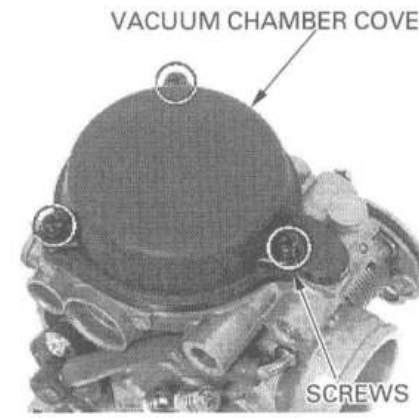
Install the chamber cover with the spring, being careful not to damage the spring.



Install and tighten the vacuum chamber cover screws.

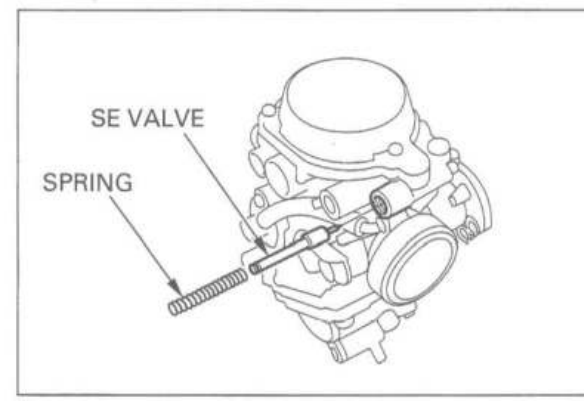
CAUTION:

Do not pinch the diaphragm under the chamber cover.

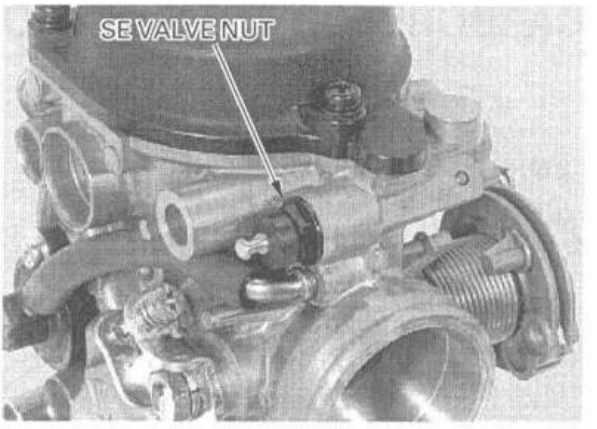


STARTING ENRICHMENT VALVE

Install the spring and SE valve.

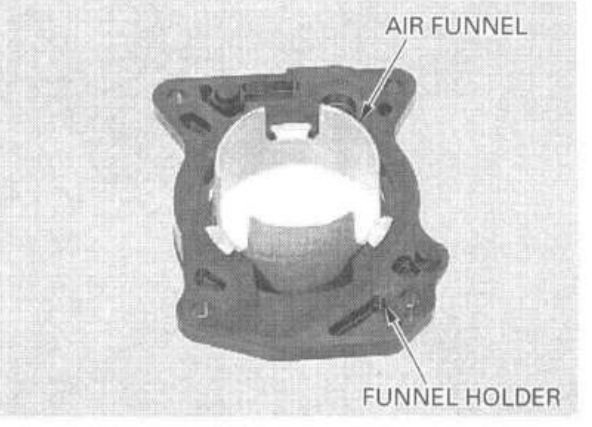


Install the SE valve nut and tighten it securely.



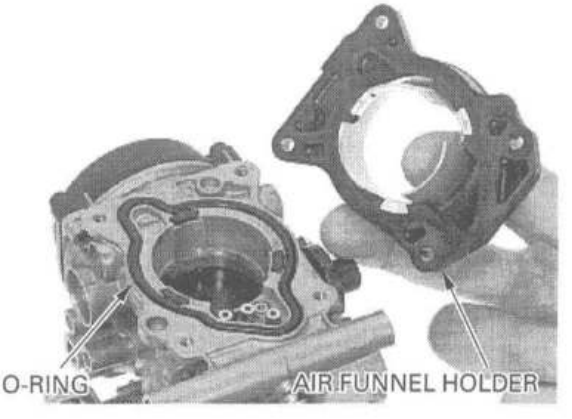
AIR FUNNEL

Install the air funnel into the holder as shown.

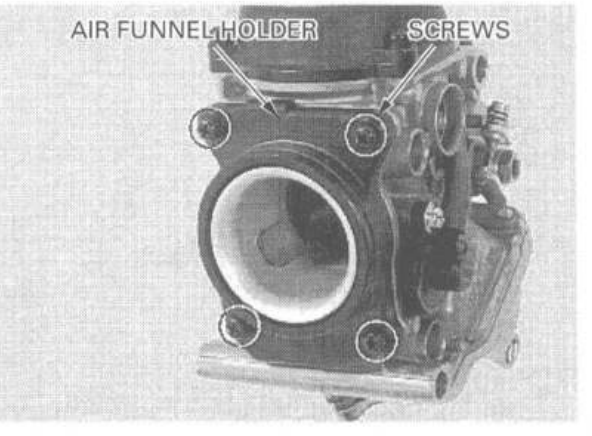


Check that the O-ring is in good condition, replace if necessary.
Install the O-ring into the groove of the carburetor body.

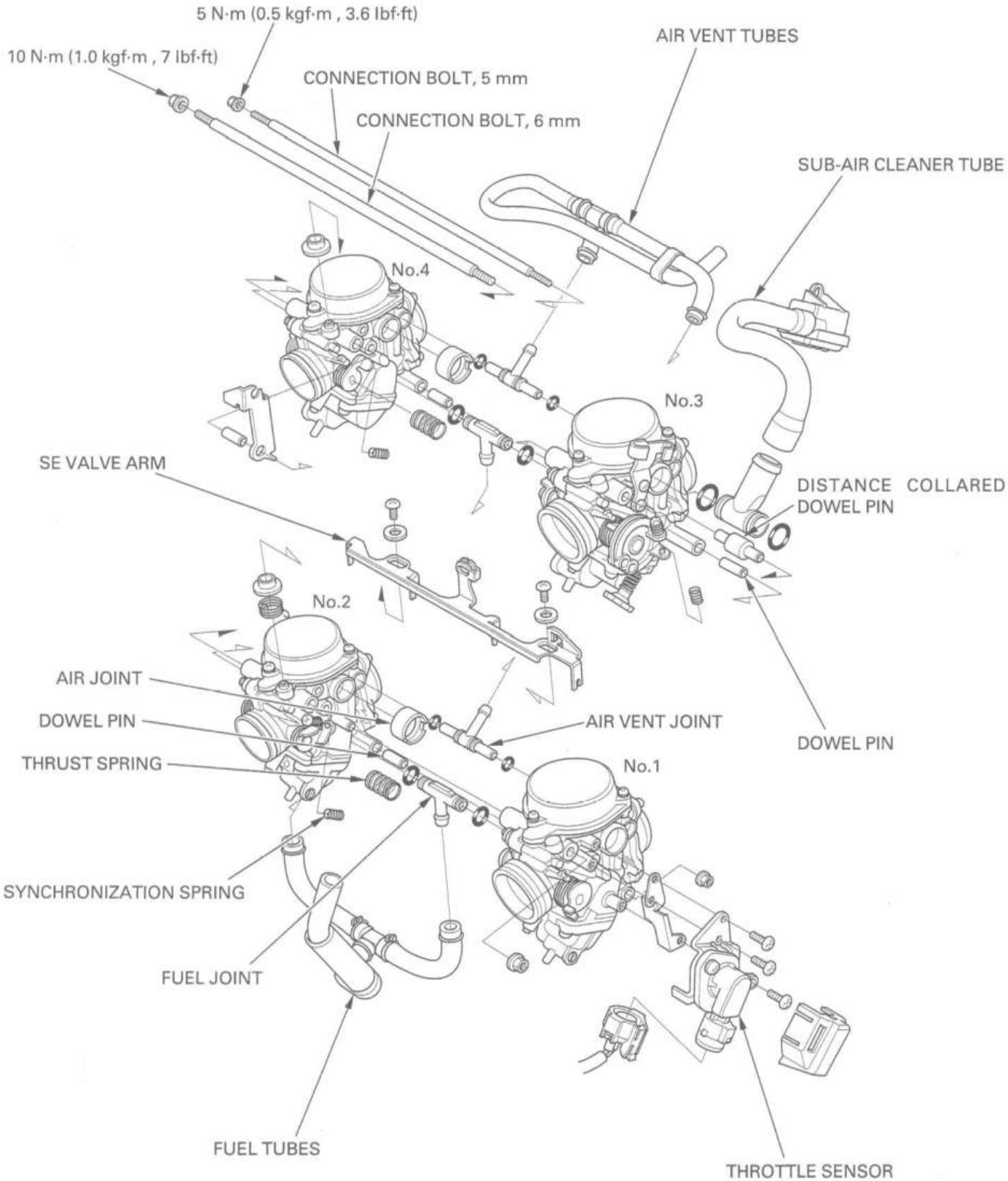
Align the cut-out on the air funnel with the groove in the carburetor body, then install the air funnel/ holder.



Install and tighten the holder screws.



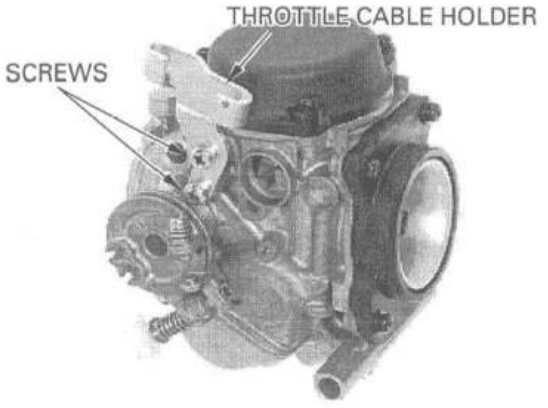
CARBURETOR COMBINATION



NOTE:

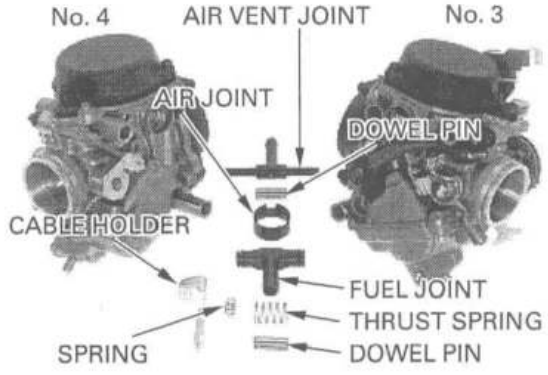
Always replace the O-ring with new ones.

Install the throttle cable holder to the No.3 carburetor and tighten the screws securely.



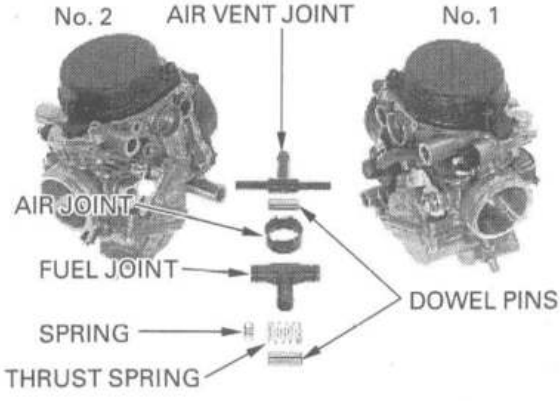
Install the following:
- Dowel pin (5 mm bolt side)
- Dowel pin (6 mm bolt side)
- 3-way fuel joint pipe/new O-rings
- 3-way air vent joint pipe/new O-rings
- Air joint rubber pipe
- Thrust spring
- No.4 carburetor synchronization spring
- Choke cable holder

Assemble the No.3 and the No.4 carburetors.



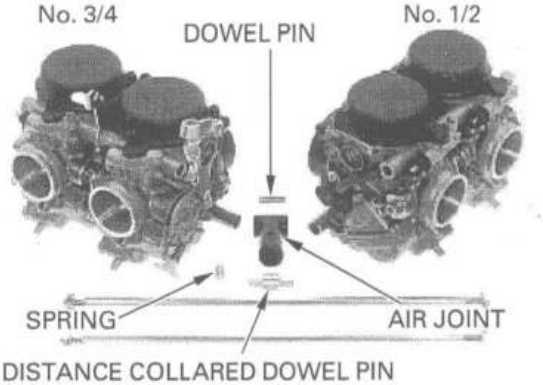
Install the following:
- Dowel pin (5 mm bolt side)
- Dowel pin (6 mm bolt side)
- 3-way fuel joint pipe/new O-rings
- 3-way air vent joint pipe/new O-rings
- Air joint rubber pipe
- Thrust spring
- No.1 carburetor synchronization spring

Assemble the No.1 and the No.2 carburetors.



Install the following:
- Dowel pin (5 mm bolt side)
- Distance collared dowel pin (6 mm bolt side)
- 3-way air joint pipe/O-rings
- No.2 carburetor synchronization spring

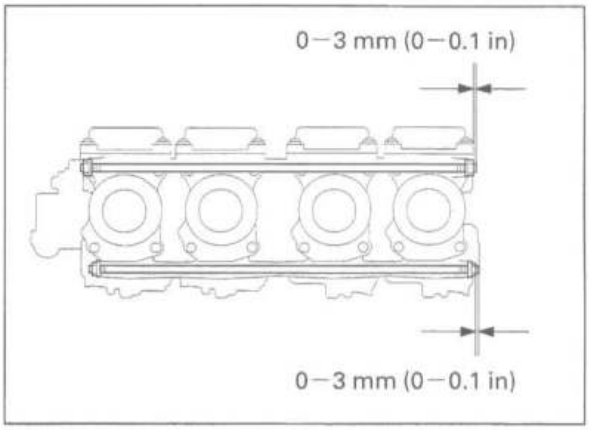
Assemble the No.3/4 and the No.1/2 carburetors.



Install the 5 mm and 6 mm carburetor connecting bolts through the carburetors.

NOTE:

Before tightening the carburetor connecting nuts, check there is no clearance between each of the carburetor joints.

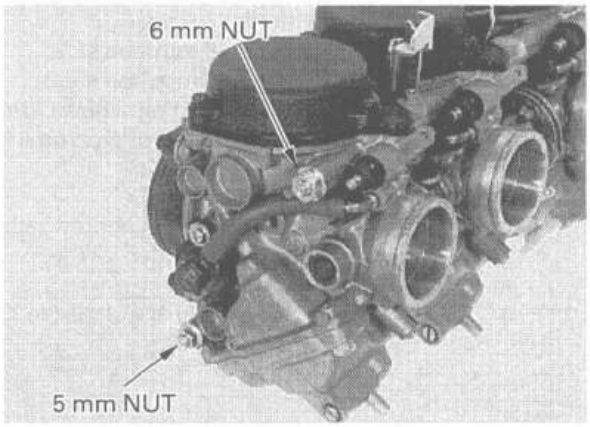


Tighten each connecting nuts gradually and alternately, be sure the bolt thread projections are equal height.

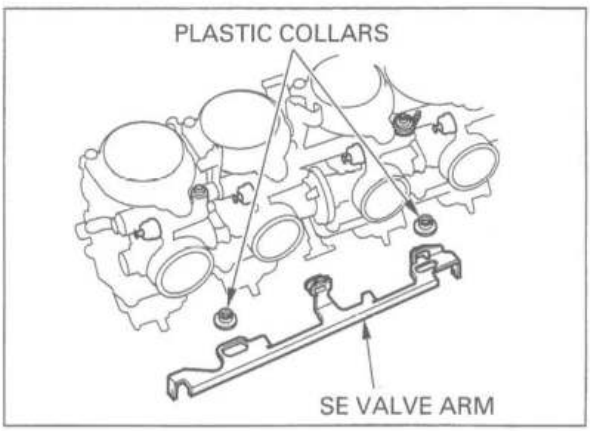
Hold the nut and tighten the nut on other side to the specified torque.

TORQUE:

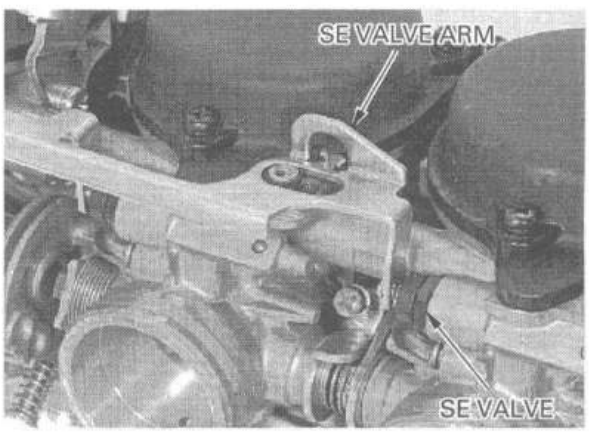
5 mm nut: 5 N·m (0.5 kgf·m , 3.6 lbf·ft)
6 mm nut: 10 N·m (1.0 kgf·m , 7 lbf·ft)



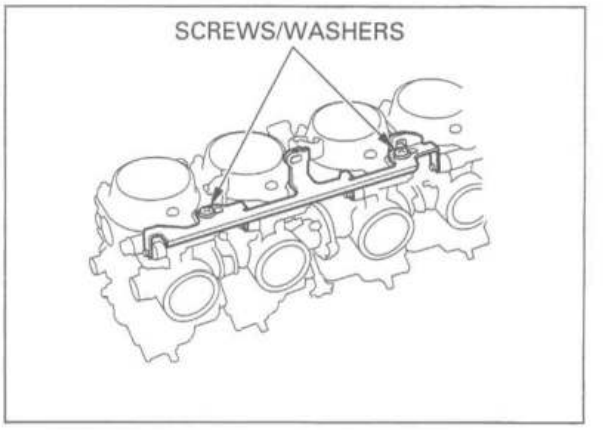
Install the plastic collars onto the No.2 and No.4 carburetor bodies.



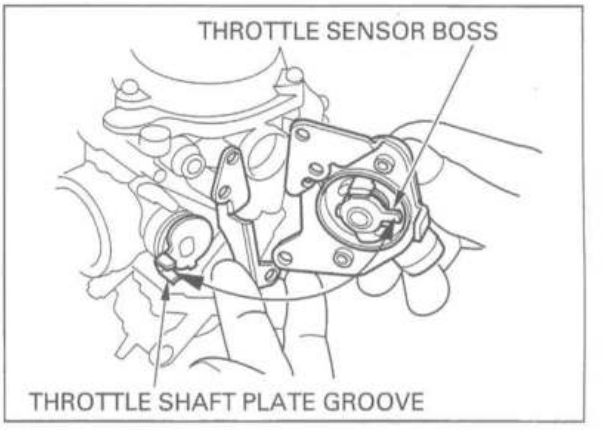
Install the SE valve arm aligning its ends with the SE valve heads.



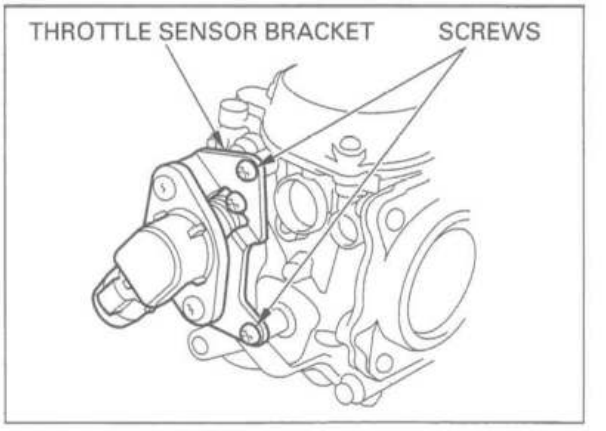
Install the plastic washers and tighten the SE valve arm screw securely.



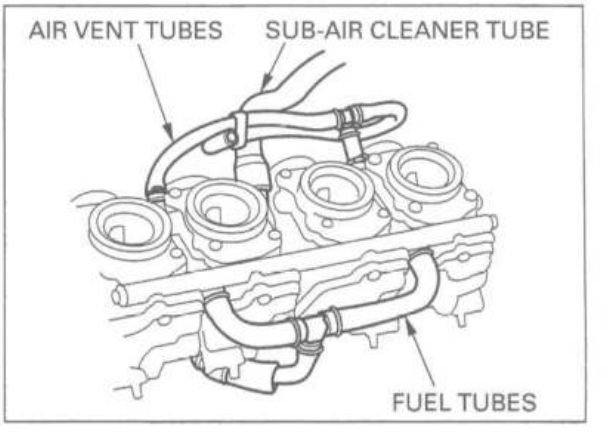
If the throttle sensor is removed, install the throttle sensor aligning its boss with the groove on the throttle shaft plate.



Install and tighten the throttle sensor bracket mounting screws.



Install the air vent tubes, sub-air cleaner tube and fuel tube.

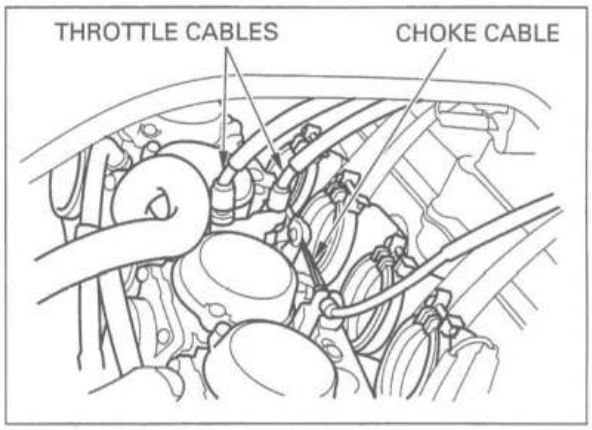


CARBURETOR INSTALLATION

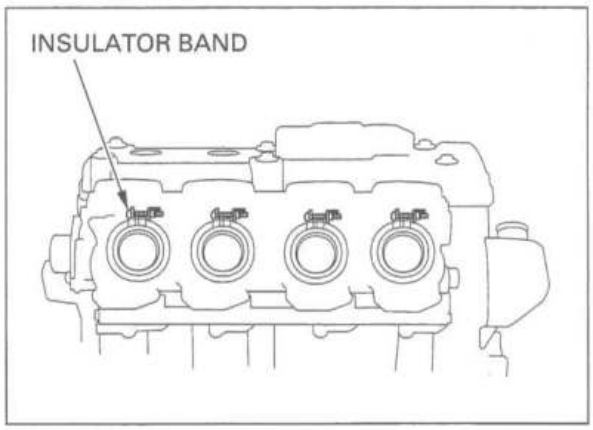
Connect the throttle cable ends to the throttle drum and install the throttle cables on to the cable holder. Connect the choke cable end to the starting enrichment valve arm.

Coat the inside of the carburetor insulators with clean engine oil for ease of installation.

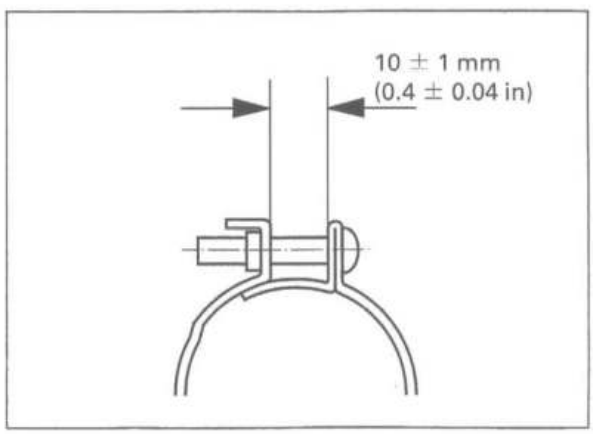
Install the carburetor assembly onto the carburetor insulators.



Adjust the insulator band angle.

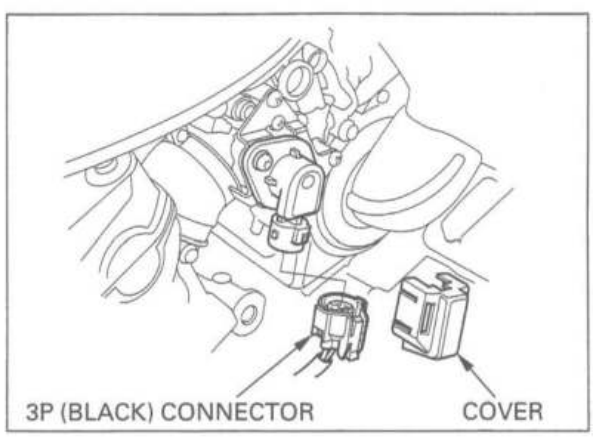


Tighten the insulator band screws so that the band ends clearance is 10 ± 1 mm (0.4 ± 0.04 in).



Connect the throttle sensor 3P (Black) connector. Install the throttle sensor connector cover.

Install the removed parts in the reverse order of removal.



PILOT SCREW ADJUSTMENT

IDLE DROP PROCEDURE

⚠WARNING

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

NOTE:

- Make sure the carburetor synchronization is within specification before pilot screw adjustment (page 3-16).
- The pilot screws are factory pre-set. Adjustment is not necessary unless the carburetors are overhauled or new pilot screws are installed.
- Then engine must be warm for accurate adjustment. Ten minutes of stop-and-go riding is sufficient.
- Use a tachometer with graduations of 50 min^{-1} (rpm) or smaller that will accurately indicate 50 min^{-1} (rpm) change.

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

CAUTION:

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

TOOLS:

Pilot screw wrench

Except SW type	07908-4730002 or
SW type	07KMA-MS60101 with 07PMA-MZ20110

INITIAL OPENING:

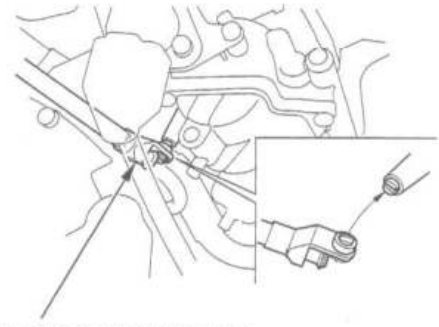
Except SW type:	1 3/4 turns out
SW type:	2 1/8 turns out

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

IDLE SPEED: 1,300 ± 100 min^{-1} (rpm)

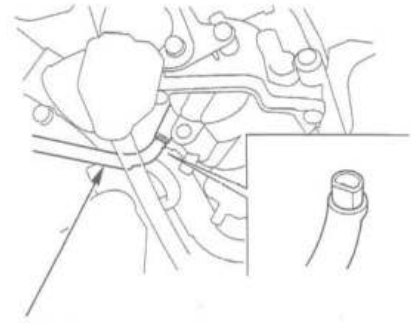
5. Turn the No.3 pilot screw in or out slowly to obtain the highest engine speed.
6. Perform step 5 for all the carburetor pilot screws.
7. Lightly open the throttle 2—3 times, adjust the idle speed with the throttle stop screw.

EXCEPT SW TYPE:



PILOT SCREW WRENCH

SW TYPE:



PILOT SCREW WRENCH

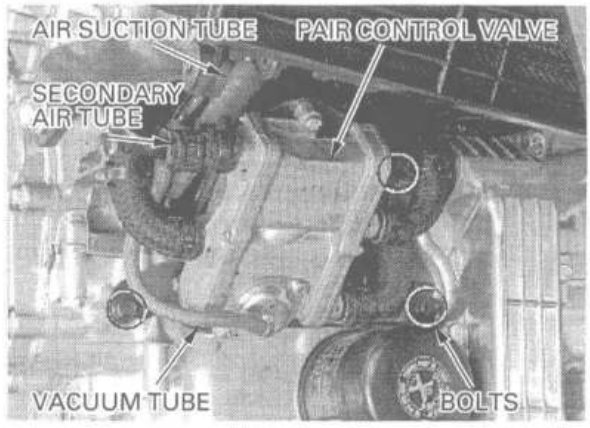


REMOVAL

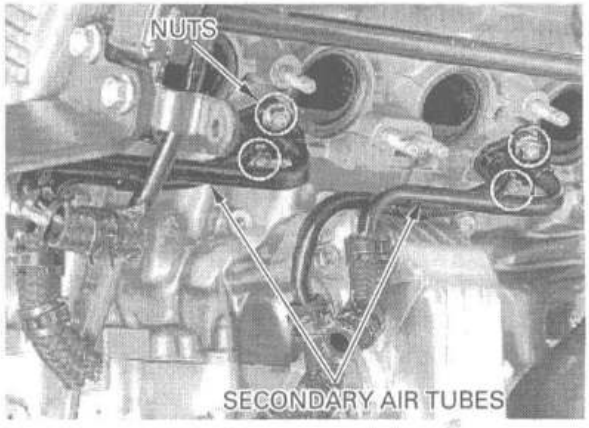
Remove the exhaust pipe (page 2-5).

Disconnect the following:
- PAIR control valve vacuum tube
- Secondary air tubes

Remove the three bolts and PAIR control valve assembly.
Disconnect the air suction tube from the PAIR control valve.

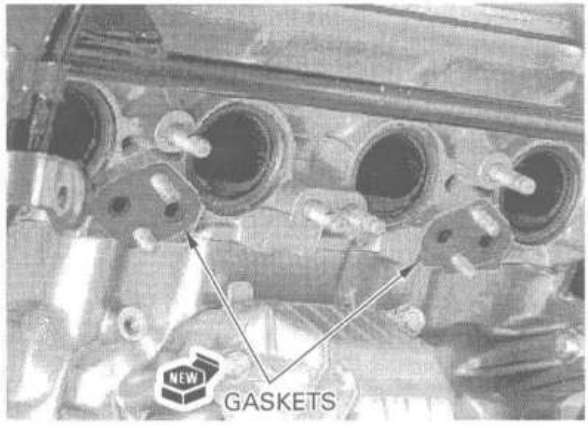


Remove the nuts and secondary air tubes from the cylinder head.
Remove the gaskets.

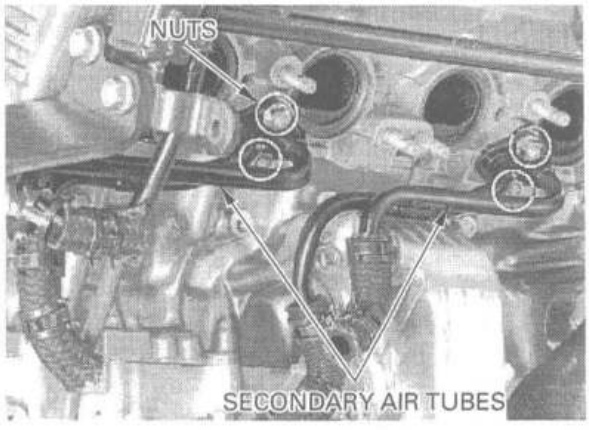


INSTALLATION

Install the new gasket onto the secondary air ports.



Install the secondary air supply tubes to the cylinder head, tighten the four nuts securely.

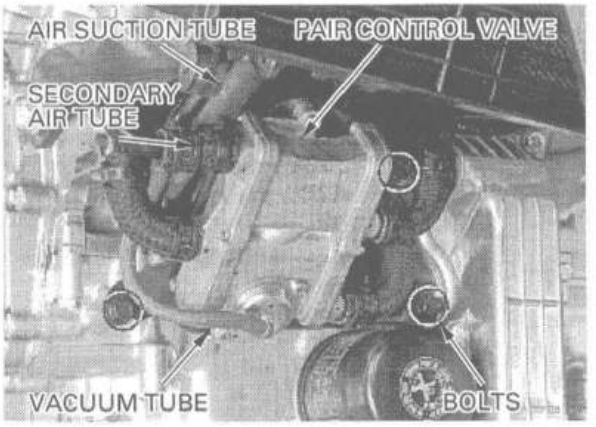


Connect the air suction tube to the PAIR control valve.

Install the PAIR control valve and tighten the three mounting bolts securely.

Connect the following:
– Secondary air tubes
– PAIR control valve vacuum tube

Install the removed parts in the reverse order of removal.



FUEL VALVE

INSPECTION

Remove the fuel tank (page 2-4).

Connect the fuel tube to the fuel valve and place the suitable gasoline container under the fuel tube.
Turn the fuel valve on.
If the fuel comes out of the fuel tube, replace the diaphragm.

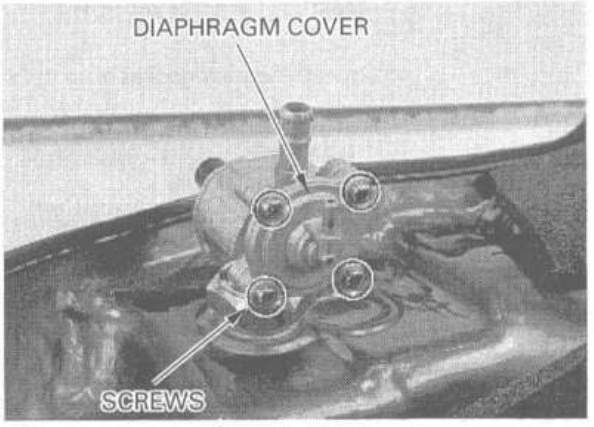
Connect a commercially available vacuum pump to the diaphragm vacuum outlet.
Fuel should flow out from the fuel tube when vacuum is applied.
If fuel flow is restricted, replace the diaphragm.



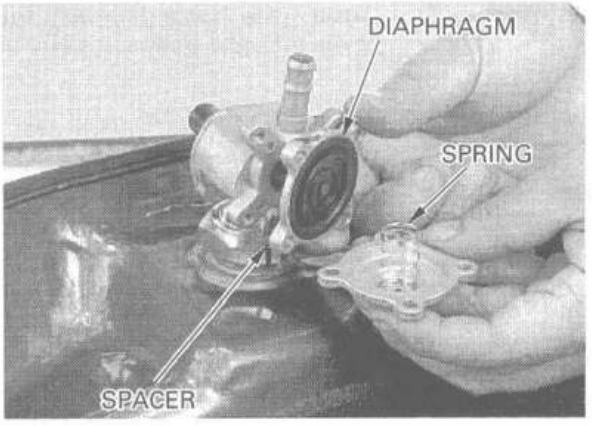
DISASSEMBLY

Drain the fuel from the fuel tank.

Remove the four screws and diaphragm cover.



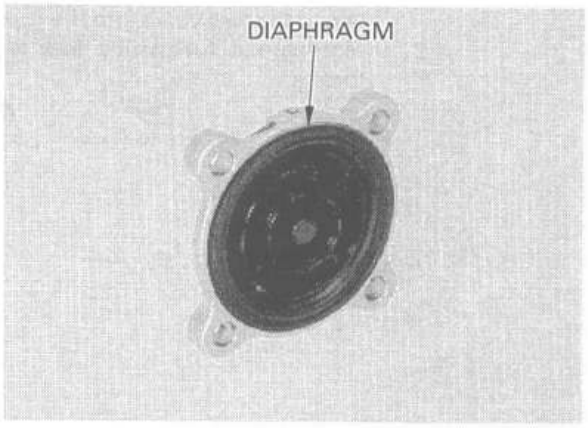
Remove the spring, diaphragm and spacer.



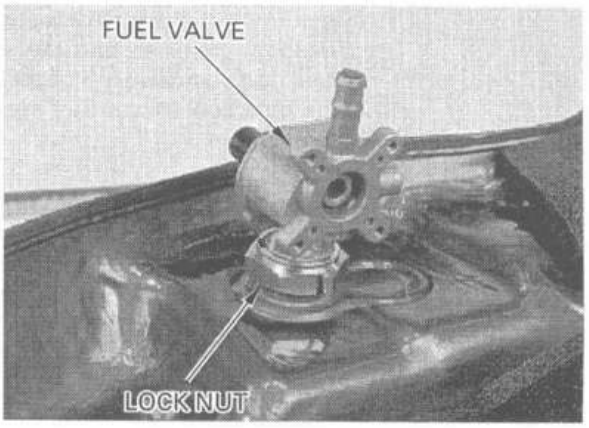
Check the diaphragm for tears or other damage.

NOTE:

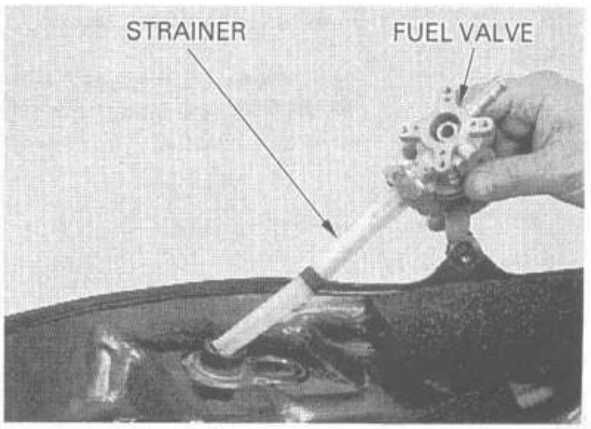
Replace the diaphragm cover, spring, diaphragm and spacer as a set.



Loosen the lock nut and remove the fuel valve assembly from the fuel tank.

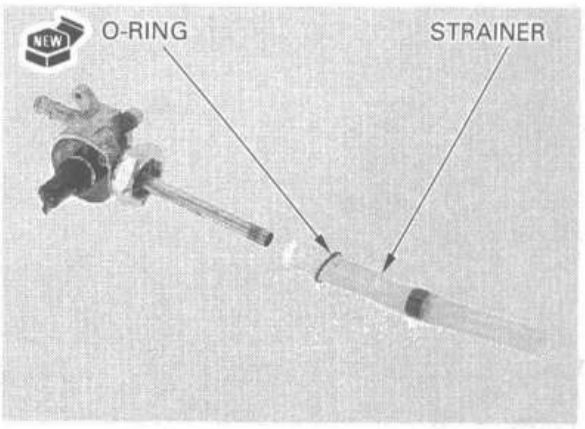


Remove the fuel strainer and O-ring from the fuel valve.
Clean the fuel strainer with compressed air.



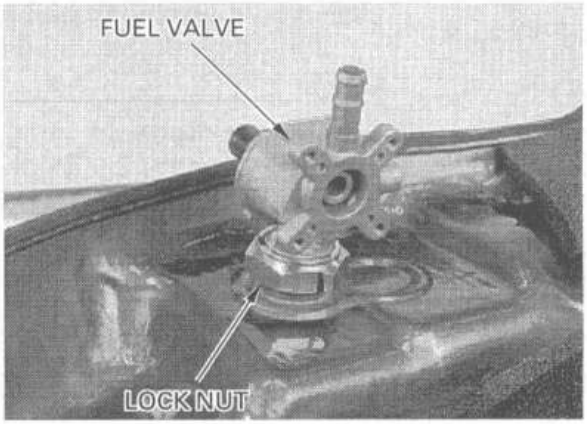
ASSEMBLY

Install a new O-ring and fuel strainer onto the fuel valve.

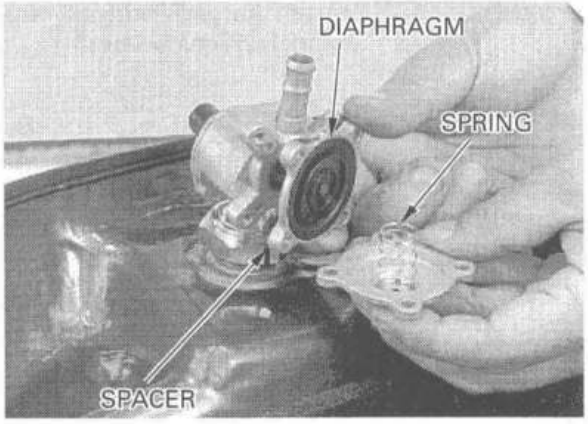


Install the fuel valve into the fuel tank.
Tighten the fuel valve lock nut to the specified torque.

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

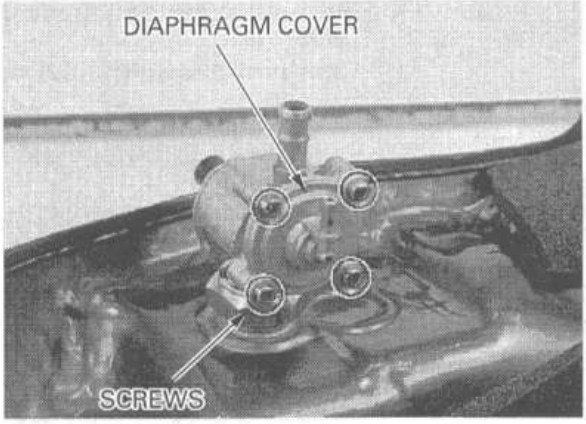


Install the diaphragm assembly, spring and diaphragm cover so that the air vent hole of the spacer and vacuum pipe of the cover facing to the same direction as the fuel pipe of the fuel valve body.

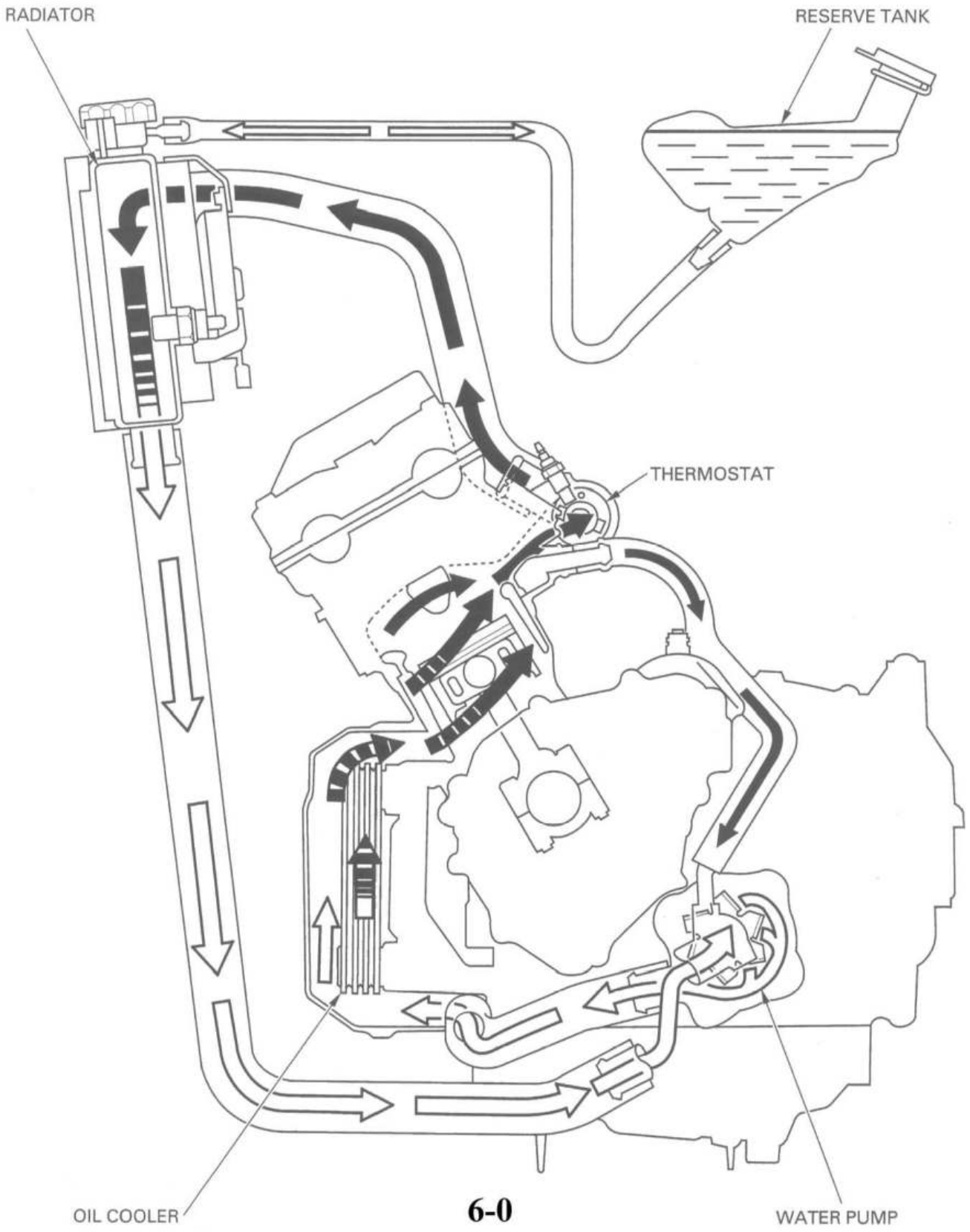


Install and tighten the screws.

Install the fuel tank (page 2-4).
Fill the fuel tank and make sure there are no fuel leaks.



SYSTEM FLOW PATTERN



6. COOLING SYSTEM

SYSTEM FLOW PATTERN	6-0	THERMOSTAT	6-6
SERVICE INFORMATION	6-1	RADIATOR	6-9
TROUBLESHOOTING	6-2	RADIATOR RESERVE TANK	6-14
SYSTEM TESTING	6-3	WATER PUMP	6-14
COOLANT REPLACEMENT	6-4		

SERVICE INFORMATION

GENERAL

⚠WARNING

- ***Wait until the engine is cool before slowly removing the radiator cap. Removing the cap while the engine is hot and the coolant is under pressure may cause serious scalding.***
- ***Radiator coolant is toxic. Keep it away from eyes, mouth, skin and clothes.***
  - ***If any coolant gets in your eyes, rinse them with water and consult a doctor immediately.***
  - ***If any coolant is swallowed, induce vomiting, gargle and consult a physician immediately.***
  - ***If any coolant gets on your skin or clothes, rinse thoroughly with plenty of water.***
- ***KEEP OUT OF REACH OF CHILDREN.***

- Use only distilled water and ethylene glycol in the cooling system. A 50−50 mixture is recommended for maximum corrosion protection. Do not use an alcohol-based antifreeze.
- Add coolant to the cooling system at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system services can be done 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 switch and coolant temperature sensor inspection.

SPECIFICATIONS

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	2.0 ℓ (2.1 US qt , 1.8 Imp qt)
	Reserve tank	0.20 ℓ (0.21 US qt , 0.18 Imp qt)
Radiator cap relief pressure		108−137 kPa (1.1−1.4 kgf/cm², 16−20 psi)
Thermostat	Begin to open	80−84 °C (176−183 °F)
	Fully open	95 °C (203 °F)
	Valve lift	8 mm (0.3 in) minimum

TORQUE VALUES

Water pump cover bolt	13 N·m (1.3 kgf·m , 9 lbf·ft)	CT bolt
Thermo sensor unit	10 N·m (1.0 kgf·m , 7 lbf·ft)	Apply sealant to the threads
Fan motor switch	18 N·m (1.8 kgf·m , 13 lbf·ft)	Apply sealant to the threads
Fan motor nut	5 N·m (0.5 kgf·m , 3.6 lbf·ft)	
Fan motor mounting nut	3 N·m (0.28 kgf·m , 2.0 lbf·ft)	Apply a locking agent to the threads

TROUBLESHOOTING

Engine temperature too high
- Faulty radiator cap
- Insufficient coolant
- Passages blocked in radiator, hoses or water jacket
- Air in system
- Faulty water pump
- Thermostat stuck closed
- Faulty temperature gauge or coolant temperature sensor
- Faulty cooling fan motor
- Faulty fan motor switch

Engine temperature too low
- Faulty temperature gauge or coolant temperature sensor
- Thermostat stuck open
- Faulty cooling fan motor switch

Coolant leak
- Faulty water pump mechanical seal
- Deteriorated O-rings
- Damaged or deteriorated gasket
- Loose hose connection or clamp
- Damaged or deteriorated hose
- Faulty radiator cap

SYSTEM TESTING

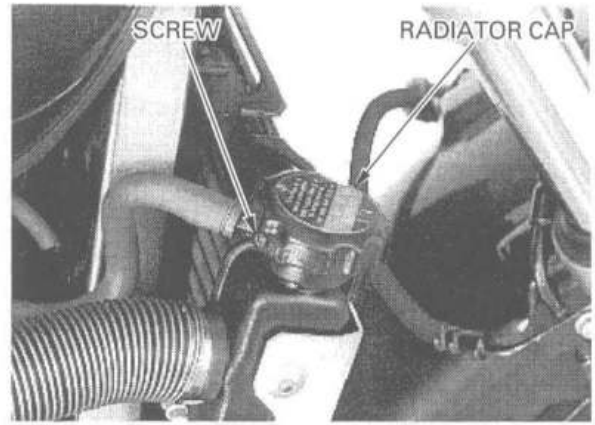
⚠WARNING

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

COOLANT (HYDROMETER TEST)

Remove the fuel tank (page 2-4).

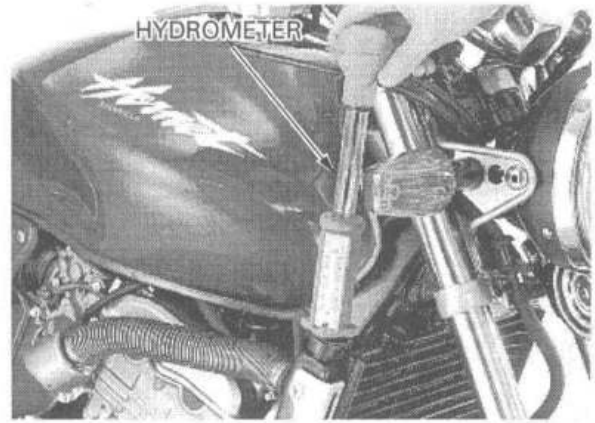
Remove the screw and radiator cap.



Test the coolant gravity using a hydrometer.

STANDARD COOLANT CONCENTRATION: 50%

Look for contamination and replace the coolant if necessary.



COOLANT SPECIFIC GRAVITY

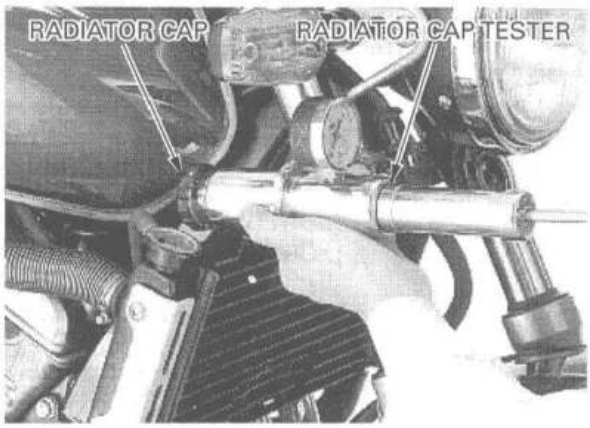
Coolant temperature °C (°F) / Coolant ratio %	0 (32)	5 (41)	10 (50)	15 (59)	20 (68)	25 (77)	30 (86)	35 (95)	40 (104)	45 (113)	50 (122)
5	1.009	1.009	1.008	1.008	1.007	1.006	1.005	1.003	1.001	0.999	0.997
10	1.018	1.017	1.017	1.016	1.015	1.014	1.013	1.011	1.009	1.007	1.005
15	1.028	1.027	1.026	1.025	1.024	1.021	1.020	1.018	1.016	1.014	1.012
20	1.036	1.035	1.034	1.033	1.031	1.029	1.027	1.025	1.023	1.021	1.019
25	1.045	1.044	1.043	1.042	1.040	1.038	1.036	1.034	1.031	1.028	1.025
30	1.053	1.052	1.051	1.047	1.046	1.045	1.043	1.041	1.038	1.035	1.032
35	1.063	1.062	1.060	1.058	1.056	1.054	1.052	1.049	1.046	1.043	1.040
40	1.072	1.070	1.068	1.066	1.064	1.062	1.059	1.056	1.053	1.050	1.047
45	1.080	1.078	1.076	1.074	1.072	1.069	1.066	1.063	1.060	1.057	1.054
50	1.086	1.084	1.082	1.080	1.077	1.074	1.071	1.068	1.065	1.062	1.059
55	1.095	1.093	1.091	1.088	1.085	1.082	1.079	1.076	1.073	1.070	1.067
60	1.100	1.098	1.095	1.092	1.089	1.086	1.083	1.080	1.077	1.074	1.071

RADIATOR CAP/SYSTEM PRESSURE INSPECTION

Before installing the cap in the tester, wet the sealing surfaces.

Pressure test the radiator cap using the radiator cap tester.
Replace the radiator cap if it does not hold pressure, or if relief pressure is too high or too low.
It must hold specified pressure for at least 6 seconds.

RADIATOR CAP RELIEF PRESSURE:
108 – 137 kPa (1.1 – 1.4 kgf/cm², 16 – 20 psi)



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

CAUTION:

Excessive pressure can damage the cooling system components. Do not exceed 137 kPa (1.4 kgf/cm², 20 psi).

Repair or replace components if the system will not hold specified pressure for at least 6 seconds.



COOLANT REPLACEMENT

PREPARATION

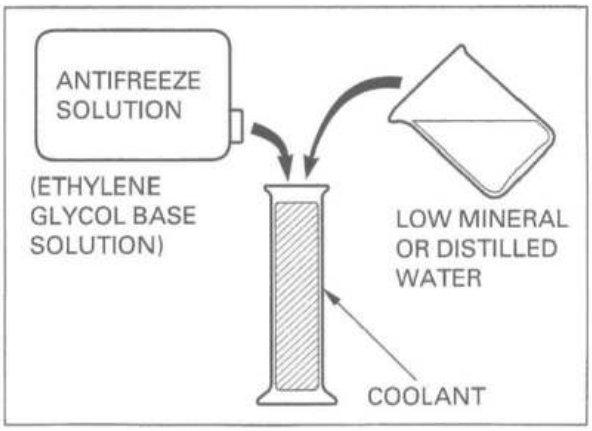
⚠WARNING

- ***Radiator coolant is toxic. Keep it away from eyes, mouth, skin and clothes.***
  - ***If any coolant gets in your eyes, rinse them with water and consult a doctor immediately.***
  - ***If any coolant is swallowed, induce vomiting, gargle and consult a physician immediately.***
  - ***If any coolant gets on your skin or clothes, rinse thoroughly with plenty of water.***
- ***KEEP OUT OF REACH OF CHILDREN.***

NOTE:

- The effectiveness of coolant decreases with the accumulation of rust or if there is a change in the mixing proportion during usage. Therefore, for best performance change the coolant regularly as specified in the maintenance schedule.
- Mix only distilled, low mineral water with the antifreeze.

RECOMMENDED MIXTURE:
50 – 50 (Distilled water and antifreeze)



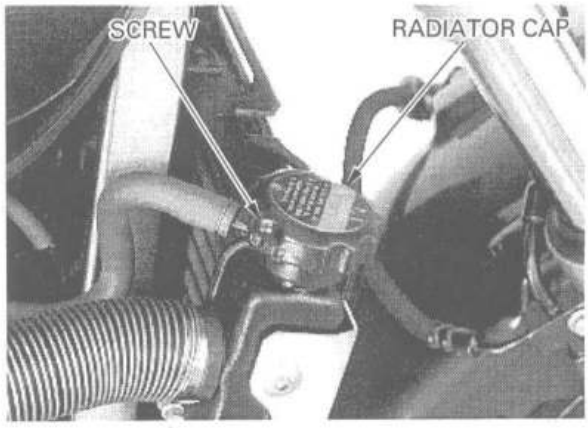
REPLACEMENT/AIR BLEEDING

⚠WARNING

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

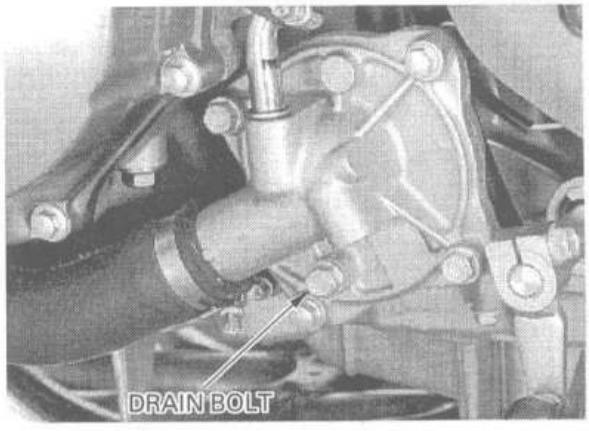
NOTE:

When filling the system or reserve tank with a coolant (checking coolant level), place the motorcycle in a vertical position on a flat, level surface.



Remove the screw and radiator cap.

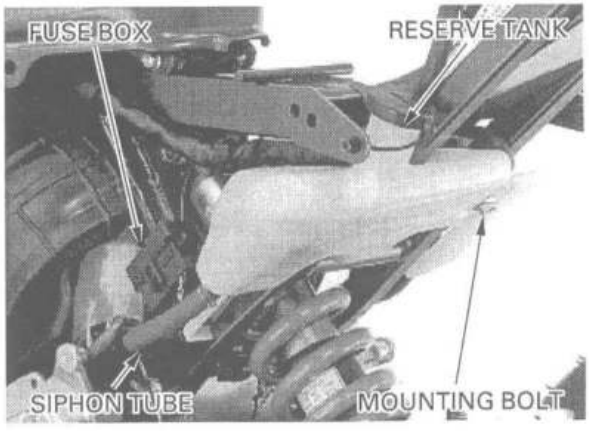
Remove the drain bolt on the water pump cover and drain the system coolant.



Remove the rear fender (page 2-4).

Remove the fuse box.
Disconnect the radiator reserve tank siphon tube and drain the reserve tank coolant.
Empty the coolant and rinse the inside of the reserve tank with water.

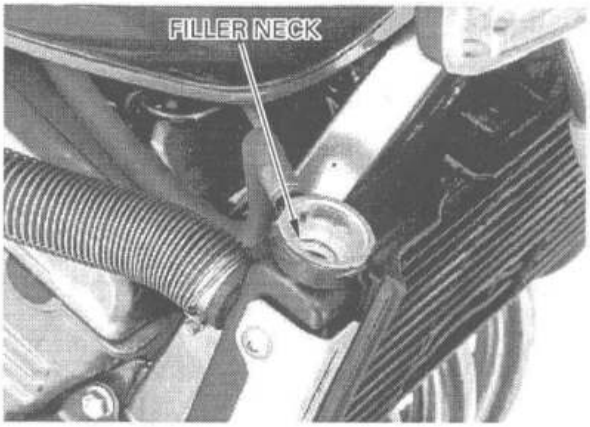
Connect the siphon tube to the radiator reserve tank.



Install the water pump cover drain bolt with a new sealing washer, tighten the bolt securely.



Fill the system with the recommended coolant through the filler opening up to filler neck.

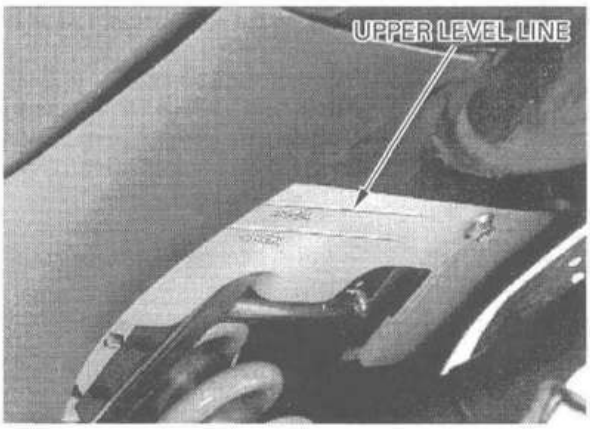


Remove the radiator reserve tank cap and fill the reserve tank to the upper level line.



Bleed air from the system as follow:

1. Shift the transmission into neutral. Start the engine and let it idle for 2—3 minutes.
2. Snap the throttle 3—4 times to bleed air from the system.
3. Stop the engine and add coolant up to the proper level if necessary. Reinstall the radiator cap.
4. Check the level of coolant in the reserve tank and fill to the upper level if it is low.

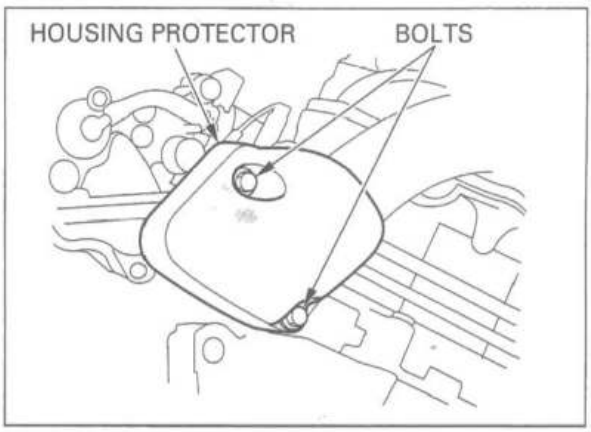


THERMOSTAT

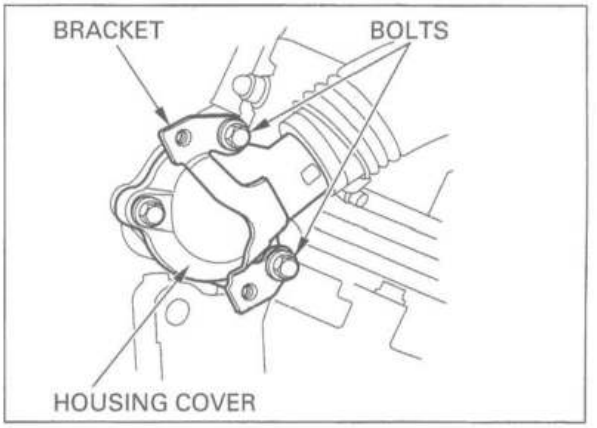
REMOVAL

Drain the coolant (page 6-5).

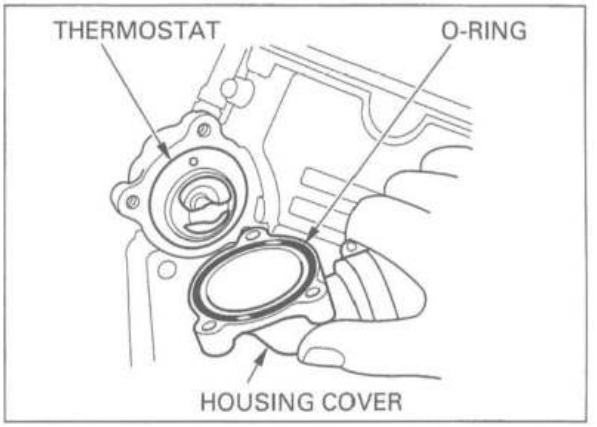
Remove the bolts and thermostat housing protector.



Remove the three bolts, protector bracket and thermostat housing cover.



Remove the O-ring from the thermostat housing cover.
Remove the thermostat from the housing.



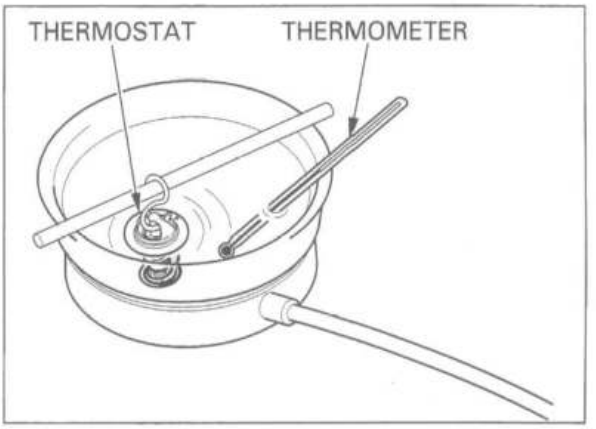
INSPECTION

⚠WARNING

- ***Wear insulated gloves and adequate eye protection.***
- ***Keep flammable materials away from the electric heating element.***

Visually inspect the thermostat for damage.

Heat the water with an electric heating element to operating temperature for 5 minutes.
Suspend the thermostat in heated water to check its operation.



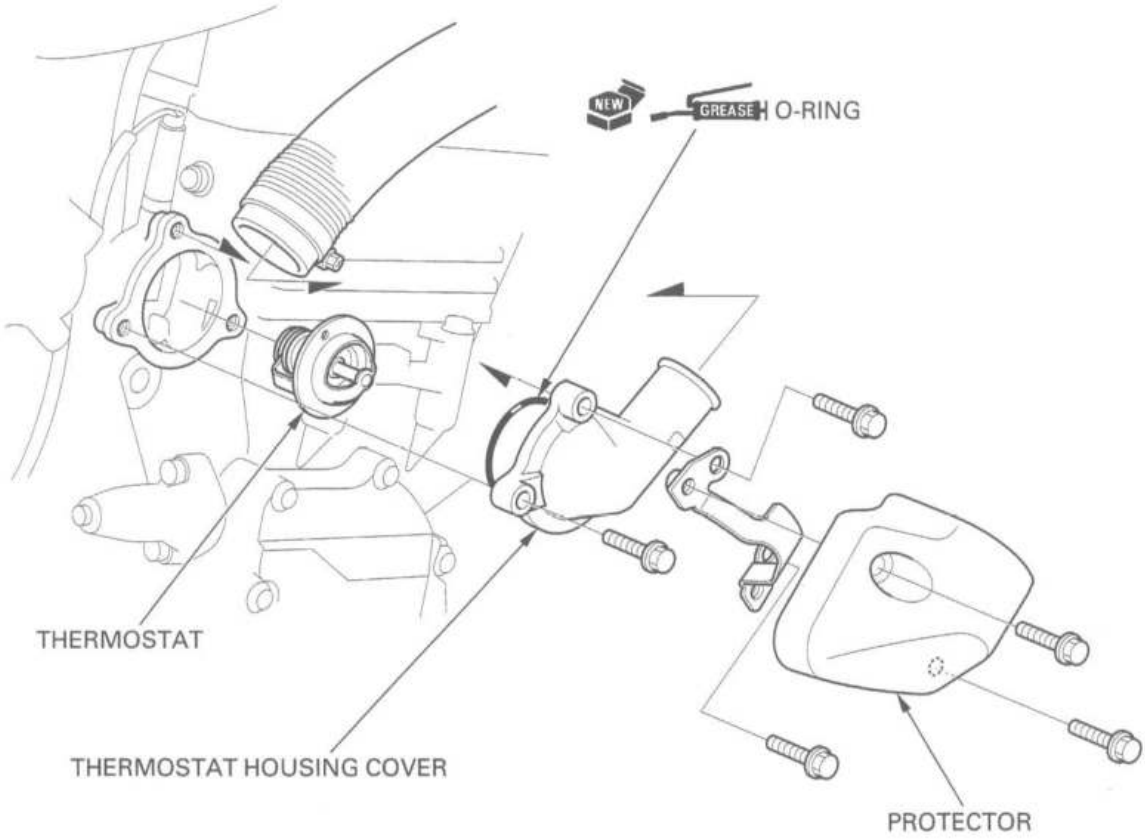
NOTE:

Do not let the thermostat or thermometer touch the pan, or you will get false reading.

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

THERMOSTAT BEGIN TO OPEN:
80–84 °C (176–183 °F)
VALVE LIFT:
8 mm (0.3 in) minimum at 95 °C (230 °F)

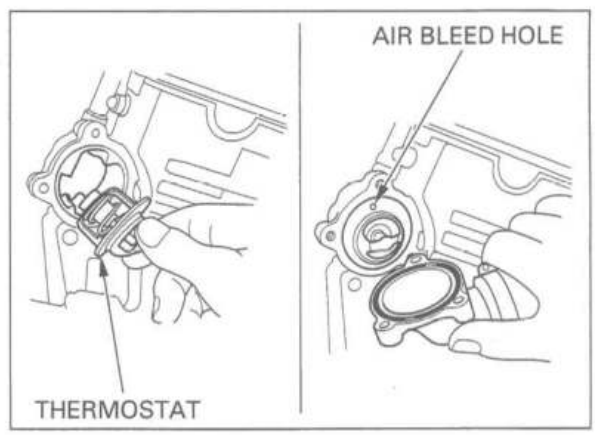
INSTALLATION



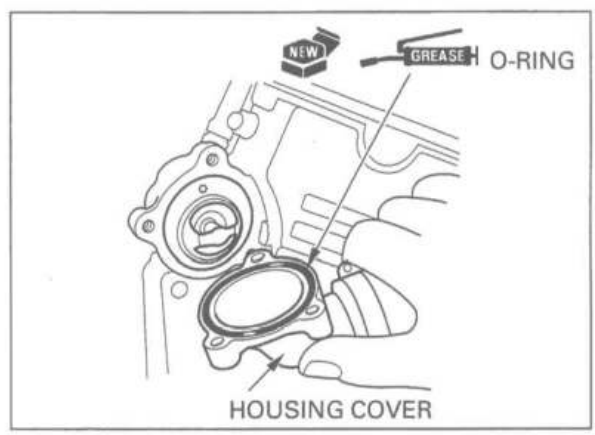
Install the thermostat into the housing with its air bleed hole facing up.

NOTE:

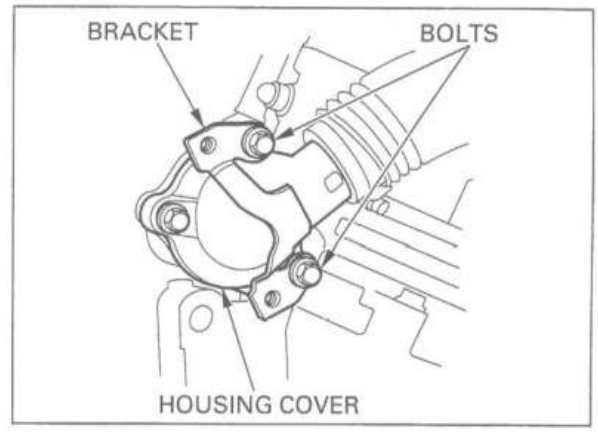
Align the thermostat body with the groove of the housing.



Apply grease to the new O-ring and install it into the thermostat housing cover groove.
Install the thermostat housing cover onto the housing.

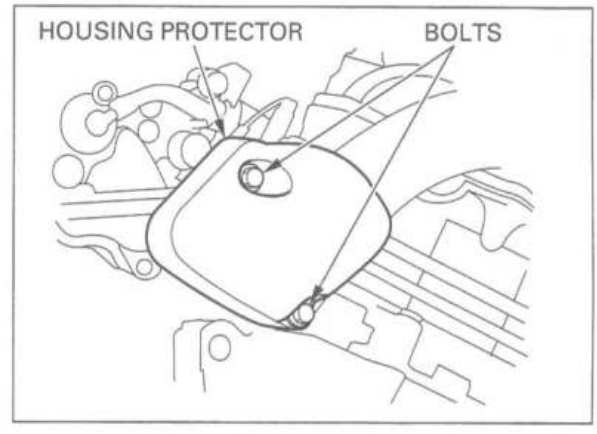


Install the thermostat housing protector bracket and bolts, tighten the housing cover bolts.



Install the thermostat housing protector and tighten the two bolts.

Fill the system with recommended coolant and bleed the air (page 6-5).



RADIATOR

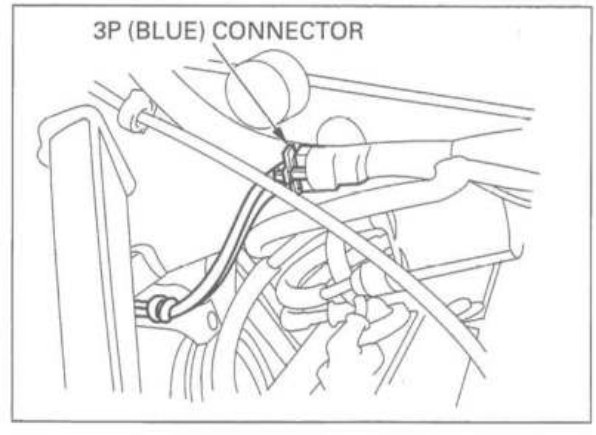
CAUTION:

Be careful not to damage the radiator fins while servicing the radiator.

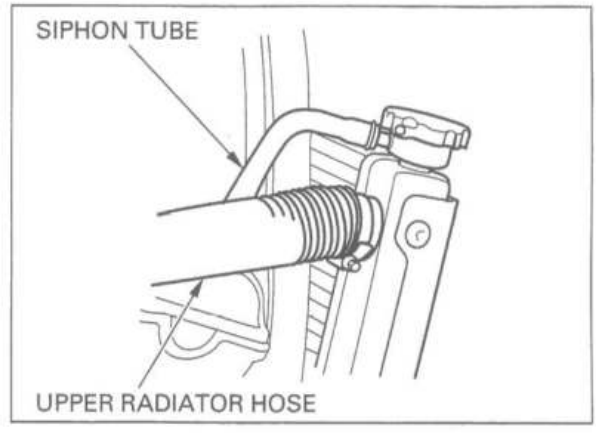
REMOVAL

Drain the coolant (page 6-4).
Remove the fuel tank (page 2-4).

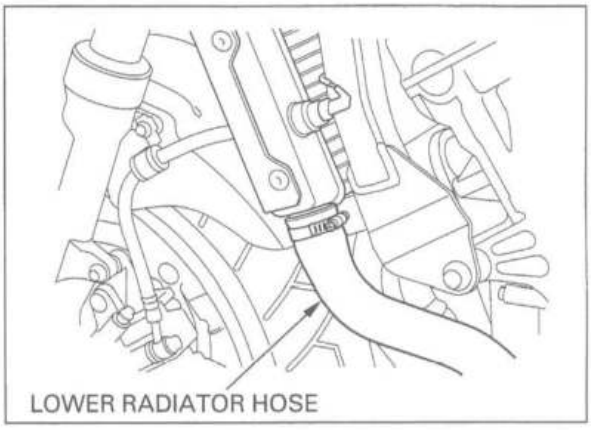
Disconnect the radiator sub-harness 3P (Blue) connector.



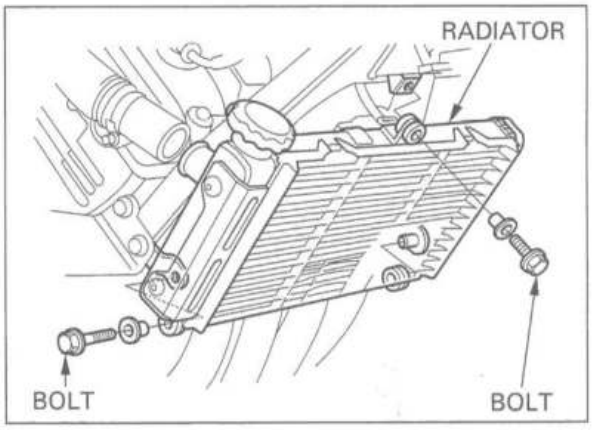
Disconnect the siphon tube and upper radiator hose from the right side of the radiator.



Disconnect the lower radiator hose from the left side of the radiator.

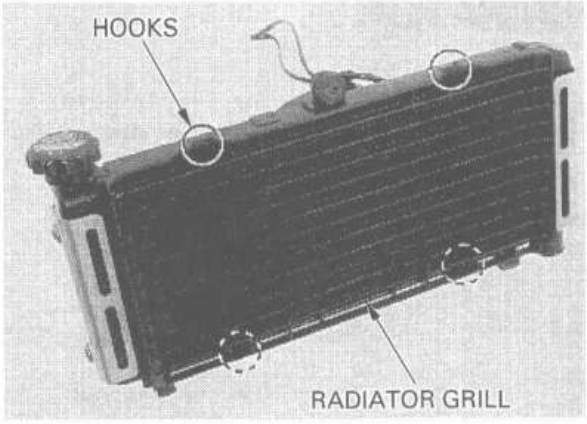


Remove the radiator mounting bolts.
Remove the radiator from the right side.

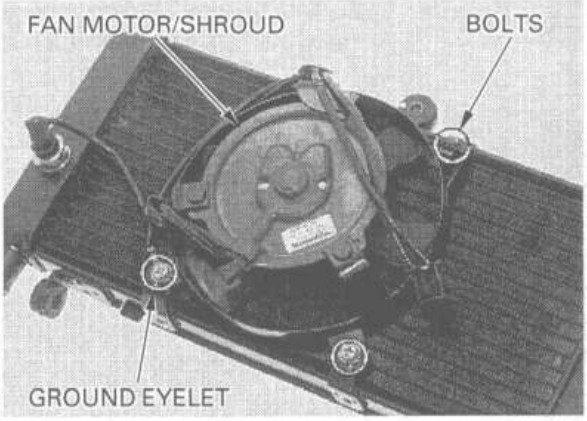


COOLING FAN DISASSEMBLY

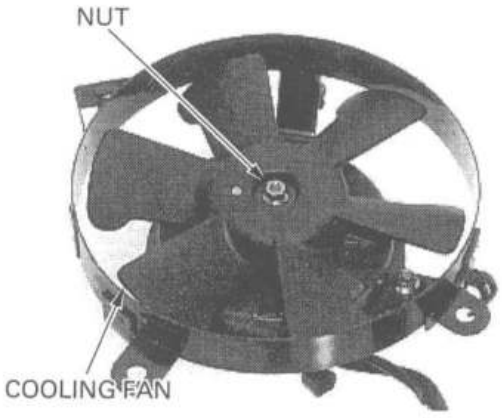
Release the hooks and remove the radiator grill.



Disconnect the fan motor switch connector and release the sub-harness from the clamp.
Remove the three bolts, ground eyelet and fan motor/shroud assembly.

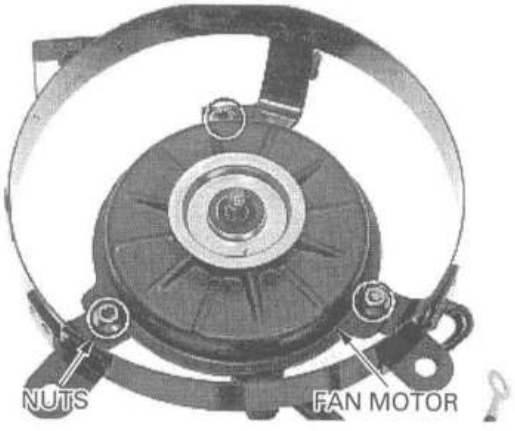


Remove the nut and cooling fan.

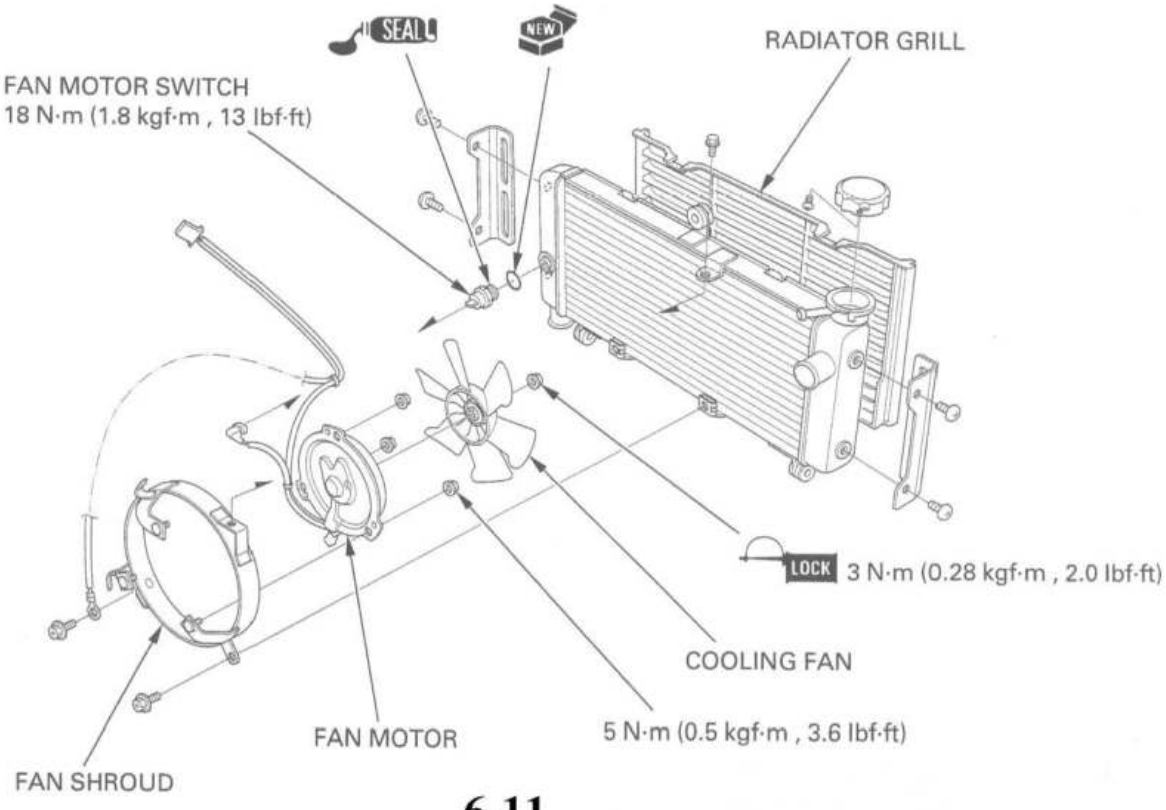


Remove the flange nuts and fan motor.

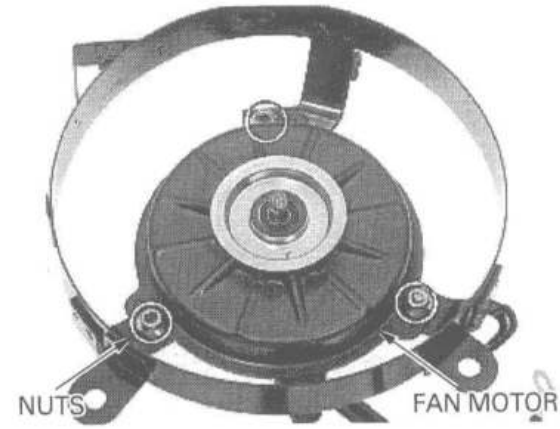
For fan motor switch information, refer to page 19-11.



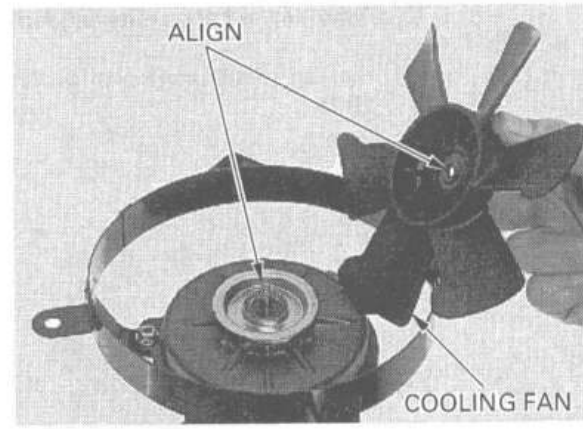
COOLING FAN ASSEMBLY



Install the fan motor onto the shroud and tighten the three flange nuts.

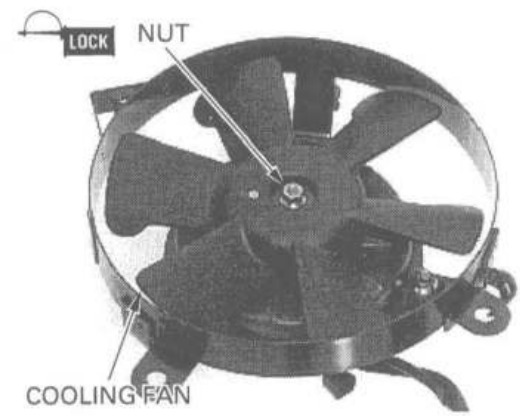


Install the cooling fan onto the fan motor shaft by aligning the flat surfaces.



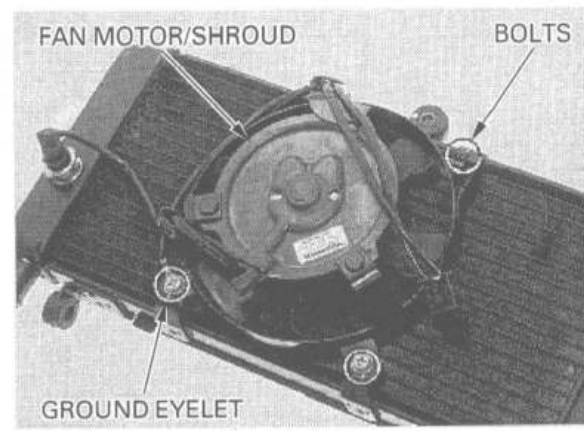
Apply a locking agent to the cooling fan nut threads.
Install and tighten the nut to the specified torque.

TORQUE: 3 N·m (0.28 kgf·m , 2.0 lbf·ft)

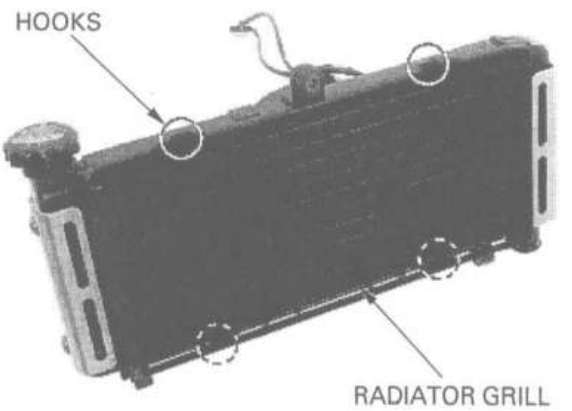


Install the fan motor/shroud assembly onto the radiator.
Route the fan motor switch cord and ground eyelet properly.
Install and tighten the three mounting bolts.

Route the sub-harness, and connect the fan motor switch cord to the switch as shown.
Clamp the sub-harness to the wire clamp.



Install the radiator grill while aligning the tabs to the hooks on the radiator.

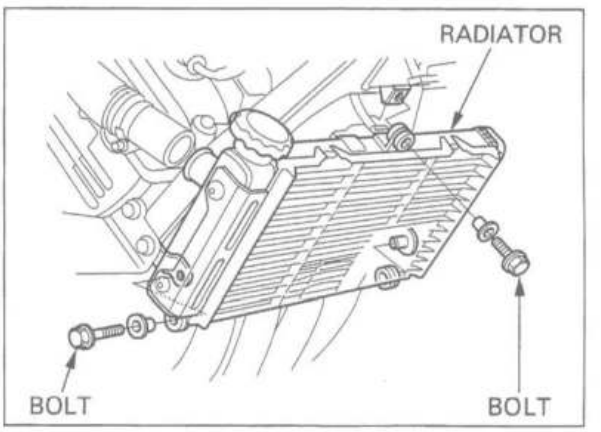


INSTALLATION

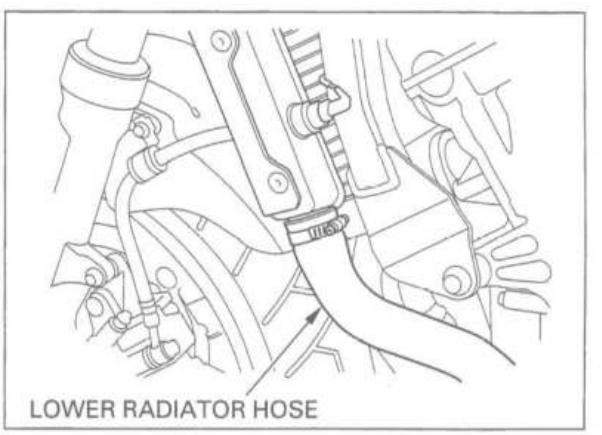
CAUTION:

Be careful not to damage the radiator core.

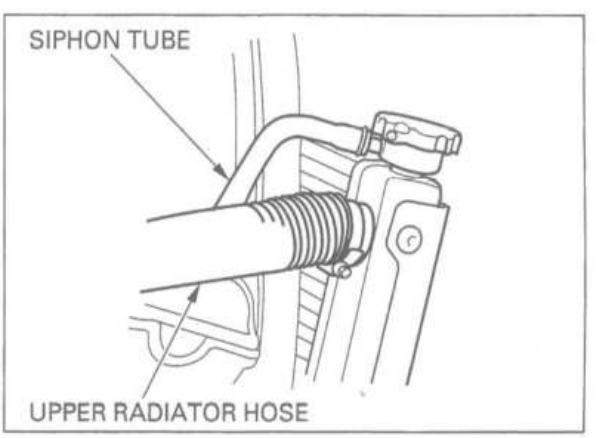
Install the radiator from the right side and align the boss on the engine hanger with the grommet of the radiator.
Install and tighten the two mounting bolts.



Connect the lower radiator hose and tighten the hose clamp screw securely.

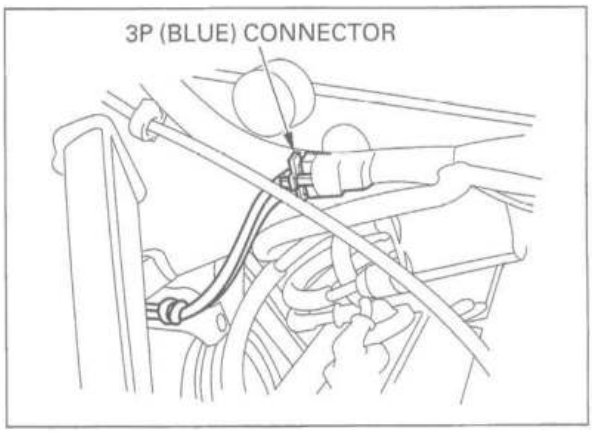


Connect the upper radiator hose and siphon tube, tighten the hose clamp screws securely.



Connect the radiator sub-harness 3P (Blue) connector.

Fill the system with recommended coolant (page 6-5).
Install the fuel tank (page 2-4).

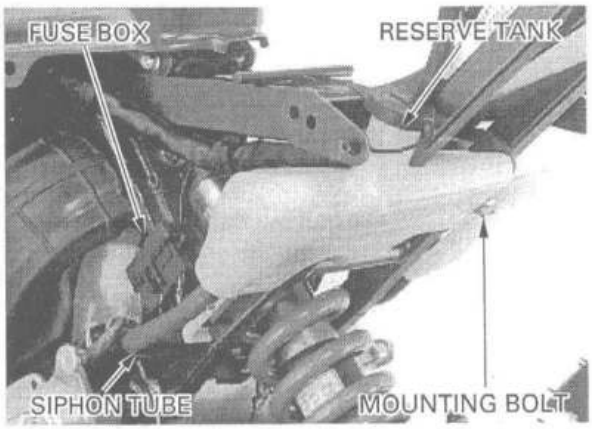


RADIATOR RESERVE TANK

REMOVAL/INSTALLATION

Remove the rear fender (page 2-4).

Remove the fuse box.
Disconnect the siphon tube.
Remove the bolt and radiator reserve tank.



Installation is in the reverse order of removal.

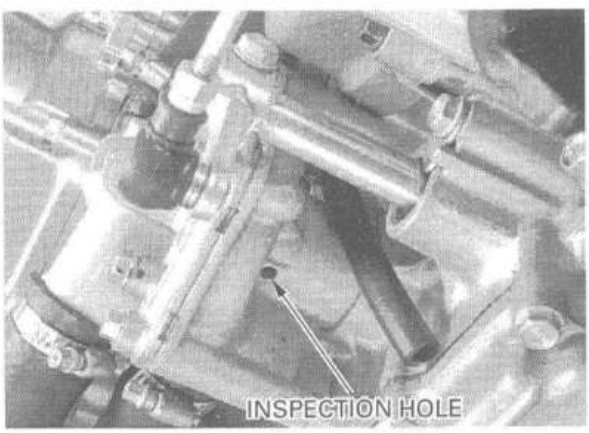
Fill the system with recommended coolant and bleed the air (page 6-5).



WATER PUMP

MECHANICAL SEAL INSPECTION

Inspect the inspection hole for signs of coolant leakage.
If there is leakage, the mechanical seal is defective and replace the water pump as an assembly.

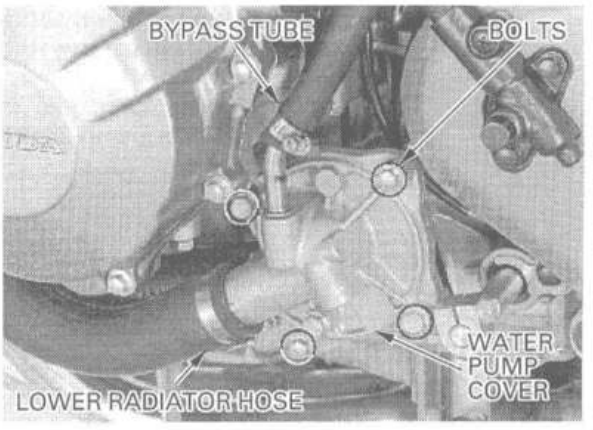


REMOVAL

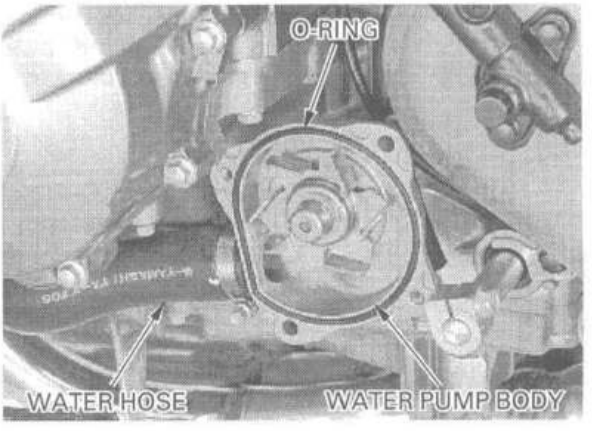
Drain the coolant (page 6-5).

Disconnect the lower radiator hose and bypass tube from the water pump cover.

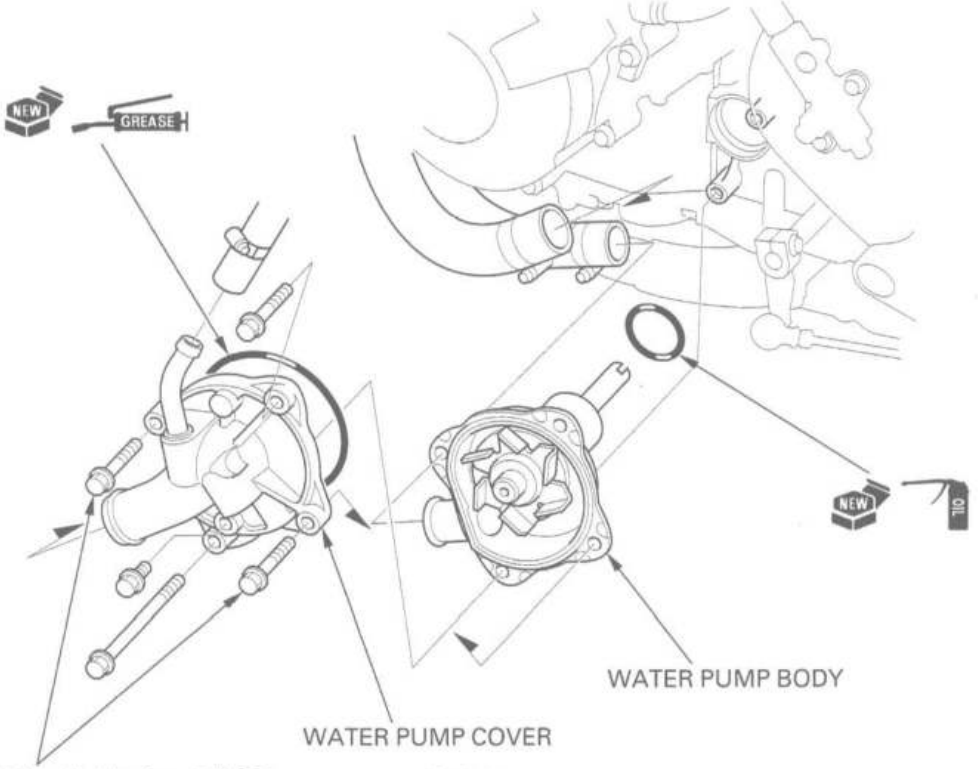
Remove the two flange bolts, two SH bolts and water pump cover.



Remove the O-ring from the water pump body.
Remove the water hose from the water pump body.
Remove the water pump body from the crankcase.

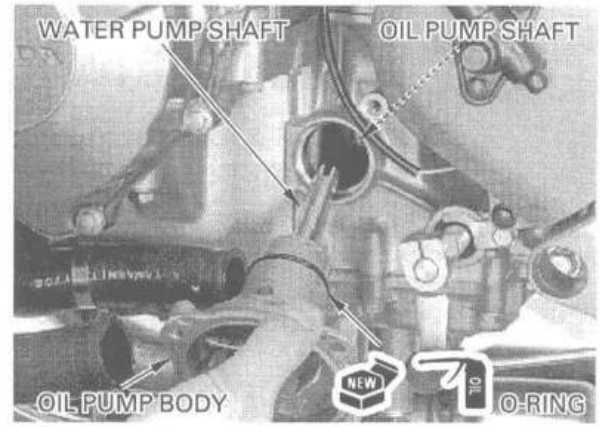


INSTALLATION



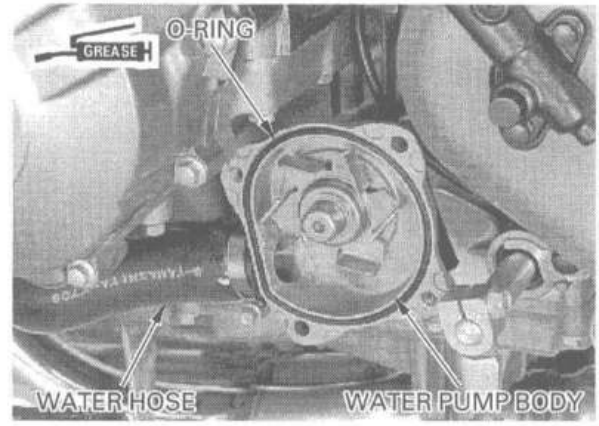
Apply engine oil to a new O-ring and install it onto the stepped portion of the water pump body.

Install the water pump into the crankcase while aligning the water pump shaft groove with the oil pump shaft end.



Connect the water hose to the water pump body and tighten the clamp screw.
Align the mounting bolt holes in the water pump and crankcase and make sure the water pump is securely installed.

Apply grease to a new O-ring and install it into the groove in the water pump body.

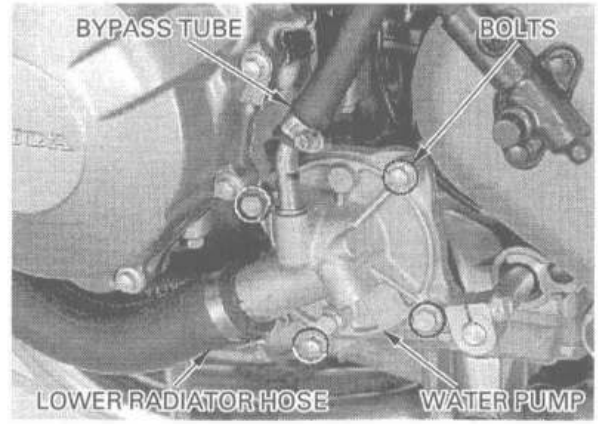


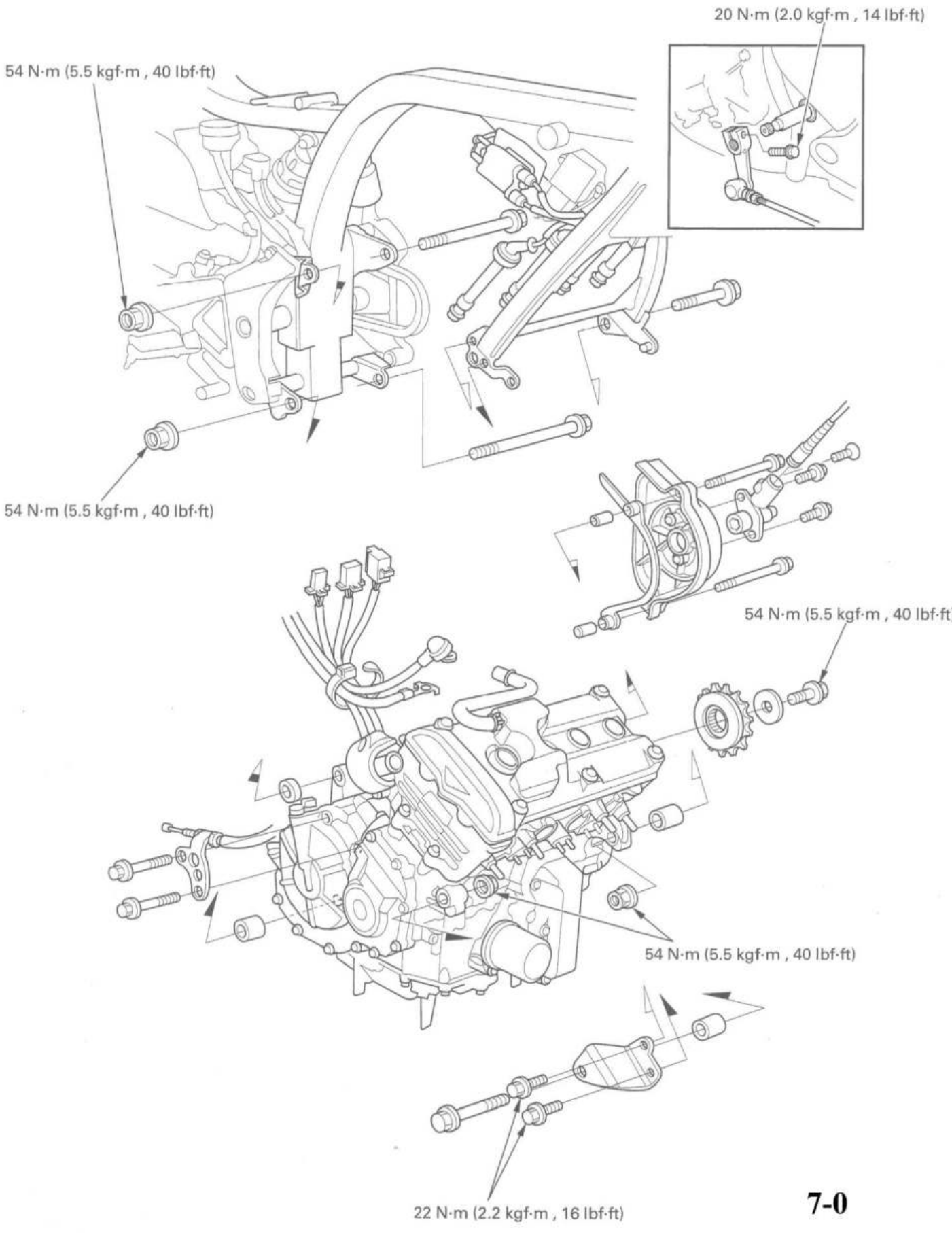
Install the water pump cover.
Tighten the two SH bolts first, then two flange bolts to the specified torque.

TORQUE: 13 N·m (1.3 kgf·m , 9 lbf·ft)

Connect the lower radiator hose and bypass tube, then tighten the clamp screws.

Fill the system with recommended coolant (page 6-5).




20 N·m (2.0 kgf·m , 14 lbf·ft)
54 N·m (5.5 kgf·m , 40 lbf·ft)
54 N·m (5.5 kgf·m , 40 lbf·ft)
54 N·m (5.5 kgf·m , 40 lbf·ft)
54 N·m (5.5 kgf·m , 40 lbf·ft)
22 N·m (2.2 kgf·m , 16 lbf·ft)

7. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION	7-1	ENGINE INSTALLATION	7-6
ENGINE REMOVAL	7-2		

SERVICE INFORMATION

GENERAL

- During engine removal and installation, support the motorcycle using a hoist or an equivalent.
- Support the engine using a jack or other adjustable support to ease of engine hanger bolts removal.

CAUTION:

Do not use the oil filter as a jacking point.

- The following components can be serviced with the engine installed in the frame.
  - Alternator/starter clutch (Section 10)
  - Clutch (Section 9)
  - Cylinder head/valves (Section 8)
  - Gearshift linkage (Section 9)
  - Oil cooler (Section 4)
  - Oil pump (Section 4)
  - Water pump (Section 6)

- The following components require engine removal for service.
  - Crankshaft/transmission (Section 12)
  - Piston/cylinder (Section 11)

SERVICE DATA

ITEM		SPECIFICATIONS
Engine dry weight		61.9 kg (136.5 lbs)
Coolant capacity	Radiator and engine	2.0 ℓ (2.1 US qt , 1.8 Imp qt)
Engine oil capacity	At disassembly	4.2 ℓ (4.4 US qt , 3.7 Imp qt)

TORQUE VALUES

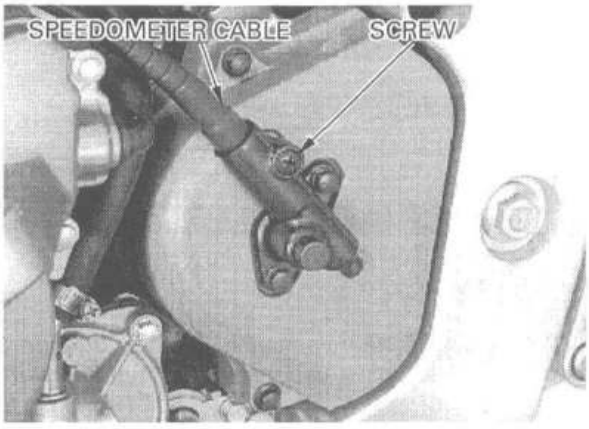
Drive sprocket special bolt	54 N·m (5.5 kgf·m , 40 lbf·ft)
Front engine hanger bolt/nut	54 N·m (5.5 kgf·m , 40 lbf·ft)
Engine hanger bracket bolt	22 N·m (2.2 kgf·m , 16 lbf·ft)
Rear engine hanger bolt/nut (upper)	54 N·m (5.5 kgf·m , 40 lbf·ft)
Rear engine hanger bolt/nut (lower)	54 N·m (5.5 kgf·m , 40 lbf·ft)
Gearshift pedal link bolt (gearshift spindle side)	20 N·m (2.0 kgf·m , 14 lbf·ft)

ENGINE REMOVAL

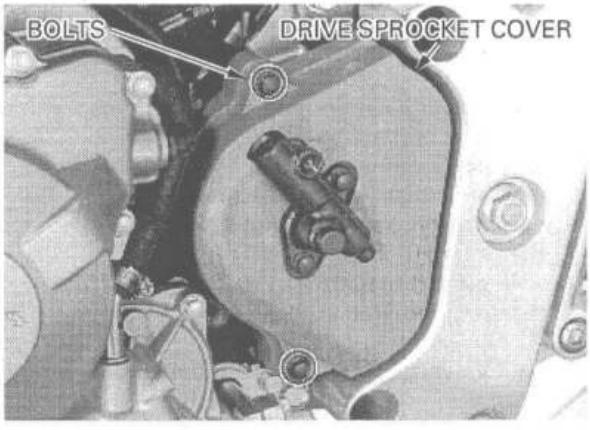
Support the motorcycle securely using a hoist or equivalent.

Remove the following:
- Side cover (page 2-2)
- Fuel tank (page 2-4)
- Carburetor (page 5-8)
- Exhaust pipe (page 2-5)
- PAIR control valve (page 5-27)

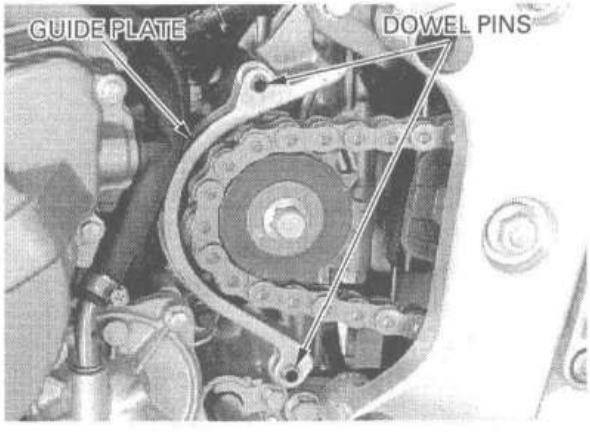
Remove the screw and speedometer cable.



Remove the two bolts and drive sprocket cover.

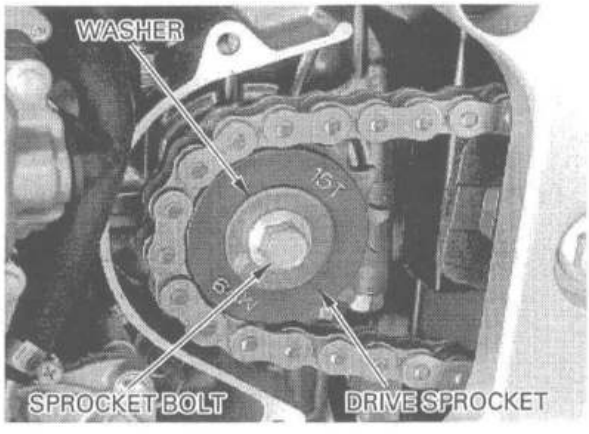


Remove the drive chain guide plate and dowel pins.

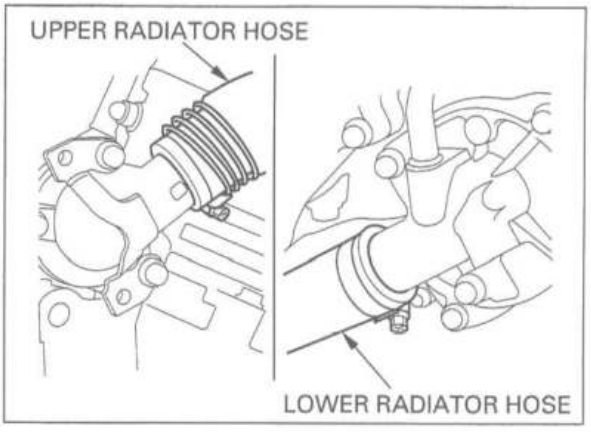


Loosen the drive chain (page 3-18).

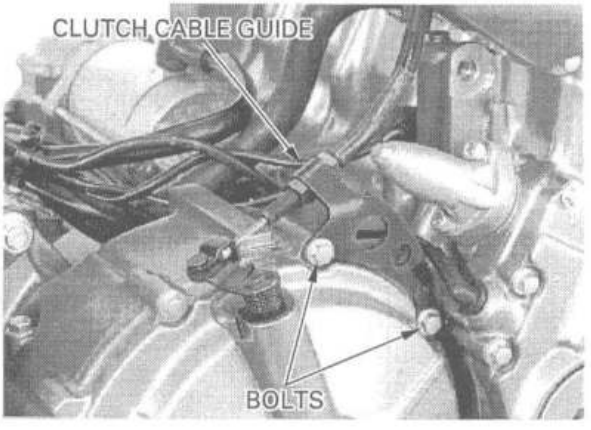
Remove the drive sprocket special bolt, washer and drive sprocket.



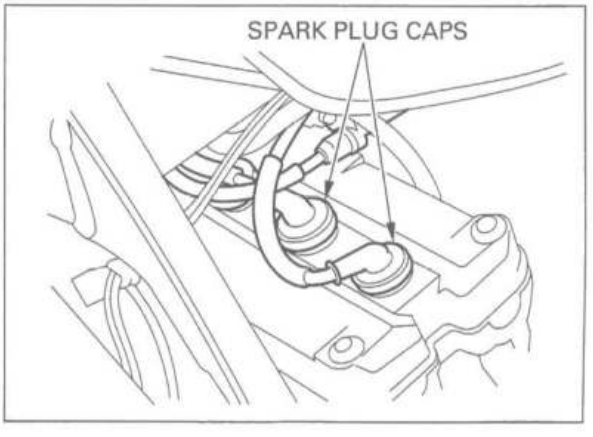
Disconnect the lower radiator hose from the water pump cover.
Disconnect the upper radiator hose from the thermostat housing.



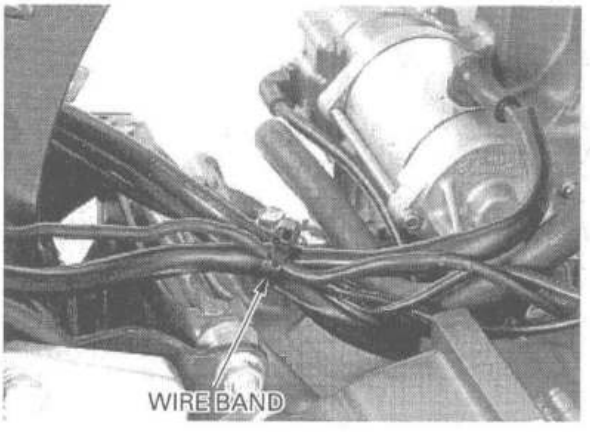
Remove the bolts and clutch cable guide.



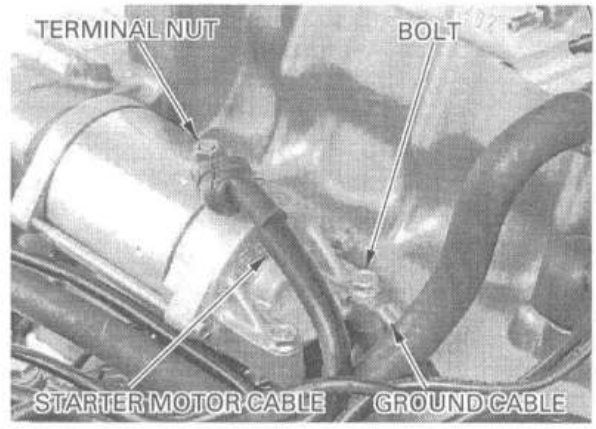
Remove the spark plug caps.



Remove the wire band.



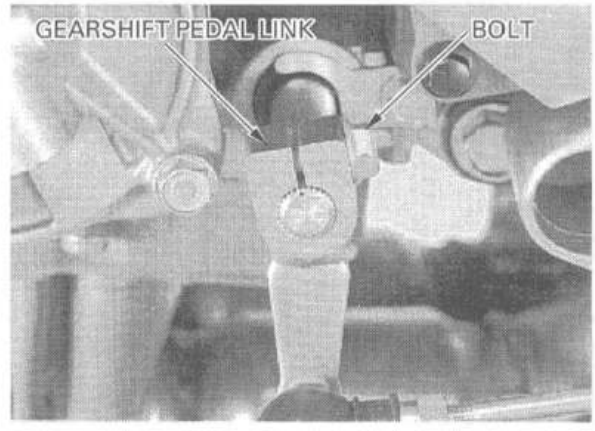
Remove the terminal nut and starter motor cable from the starter motor.
Remove the starter motor mounting bolt and ground terminal.



Disconnect the following connectors:
- Engine sub-harness 3P (Brown) connector
- Ignition pulse generator 2P (Blue) connector
- Alternator 3P (White) connector

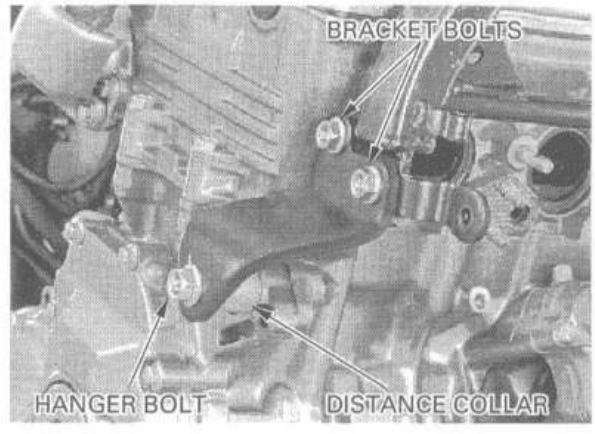


Remove the bolt and gearshift pedal link.

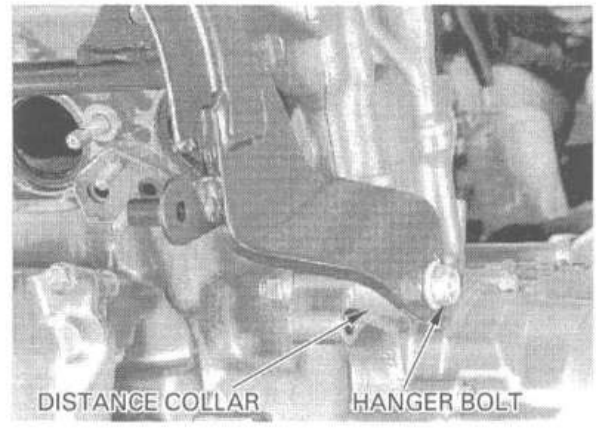


Support the engine using a jack or other adjustable support to ease of engine hanger bolts removal.

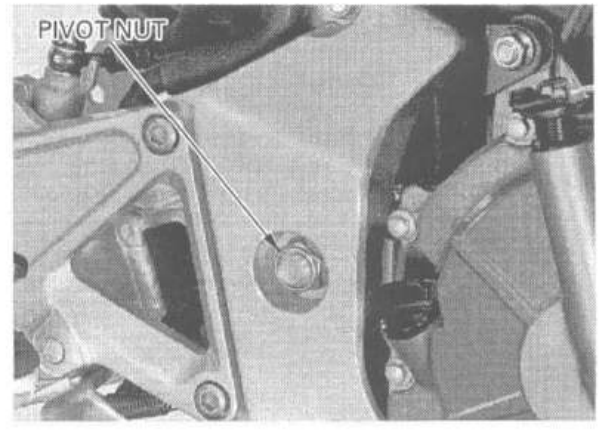
Remove the front right engine hanger bolt/nut and distance collar.
Remove the bolts and engine hanger bracket.



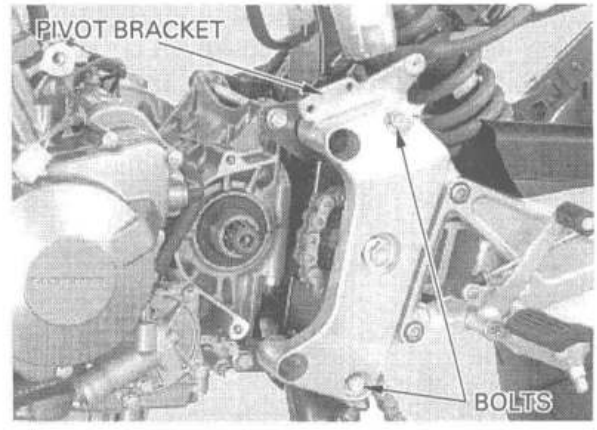
Remove the front left engine hanger bolt/nut and distance collar.



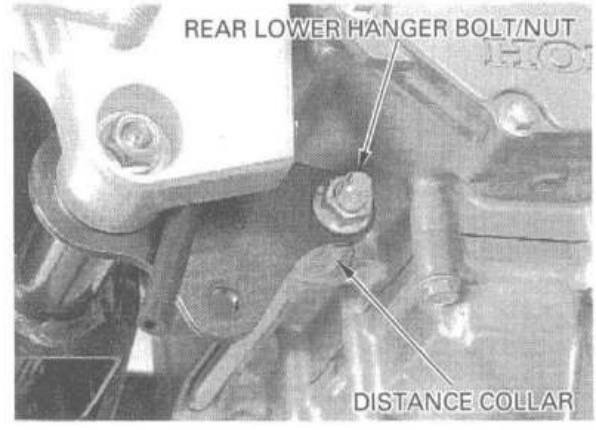
Remove the swingarm pivot nut.



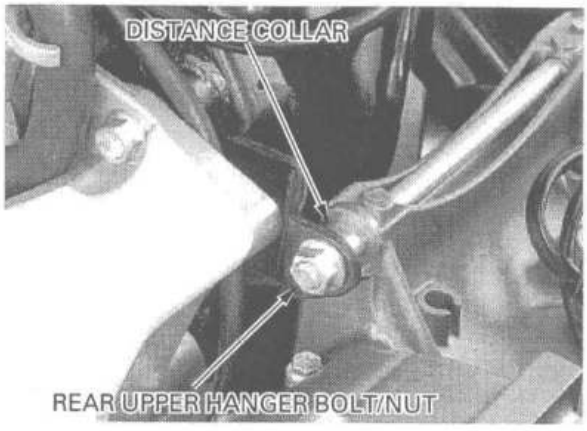
Remove the left pivot bracket mounting bolts. Slightly pull the pivot bracket outward and tilt it so that the lower engine hanger bolt can be removed.



Remove the rear lower engine hanger bolt/nut and distance collar.



Remove the rear upper engine hanger bolt/nut and distance collar.
Carefully lower the adjustable support, then remove the engine from the frame.

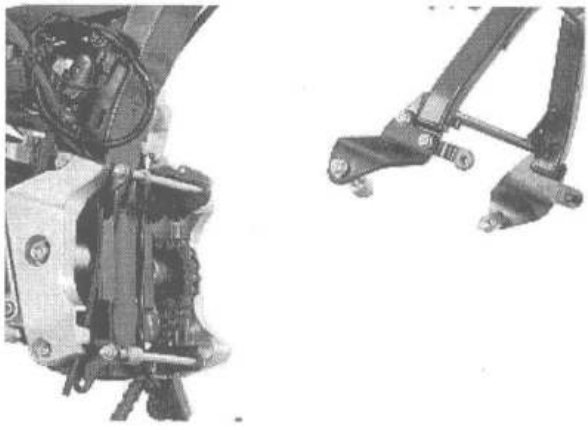


ENGINE INSTALLATION

NOTE:

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

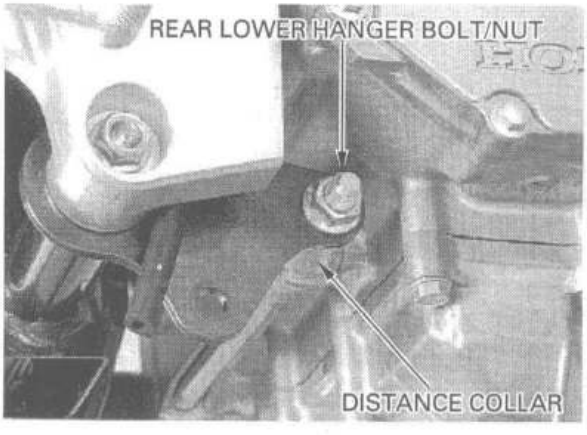
Install the engine into the frame.



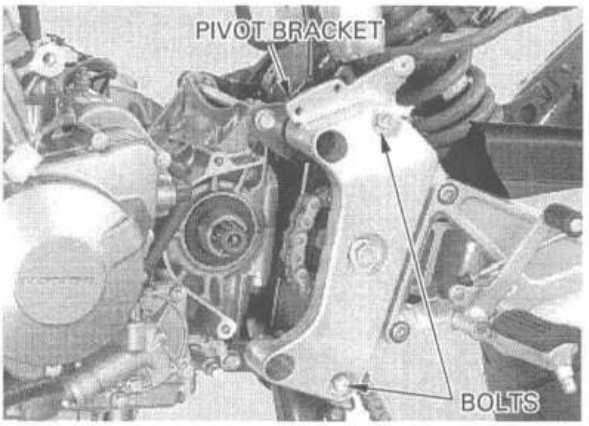
Install the rear upper engine hanger bolt/nut and distance collar.



Install the rear lower engine hanger bolt/nut and distance collar.

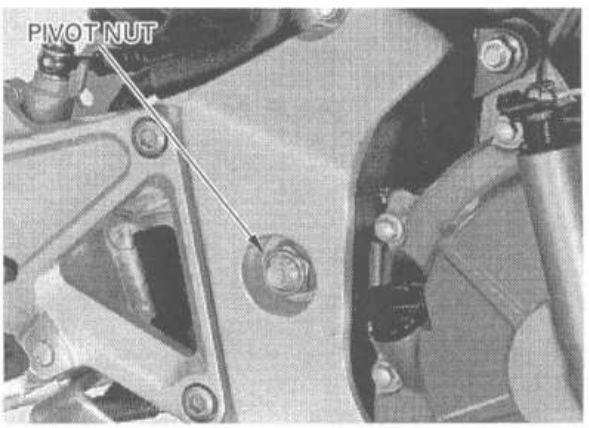


Install the left pivot bracket, then tighten the bracket bolts.

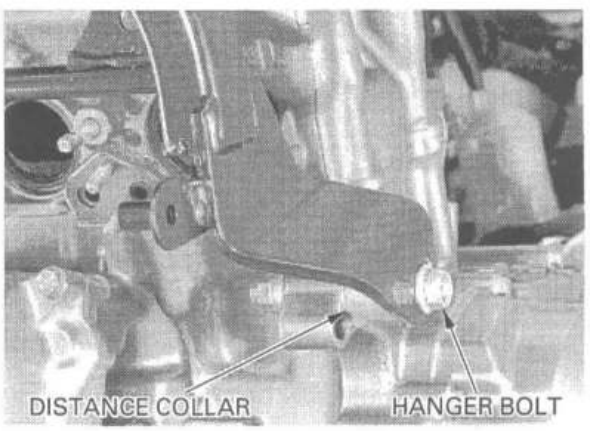


Install and tighten the swingarm pivot bolt to the specified torque.

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



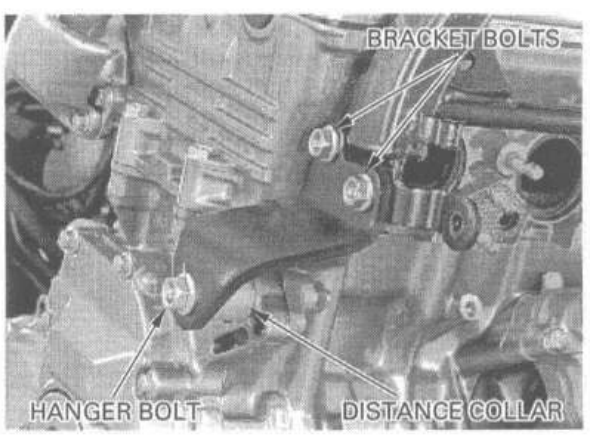
Install the front left engine hanger bolt/nut and distance collar.



Install the front right engine hanger bracket and tighten the bolts to the specified torque.

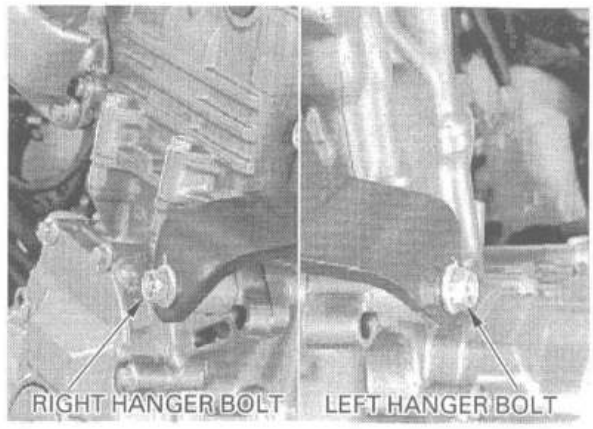
TORQUE: 22 N·m (2.2 kgf·m , 16 lbf·ft)

Install the front right engine hanger bolt/nut and distance collar.



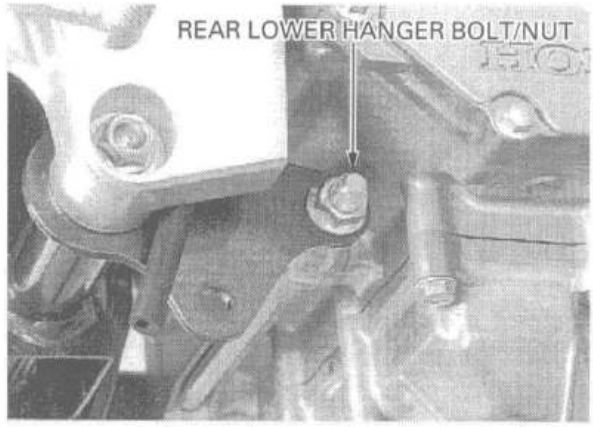
Tighten the front engine hanger nuts to the specified torque.

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



Tighten rear lower engine hanger nut to the specified torque.

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



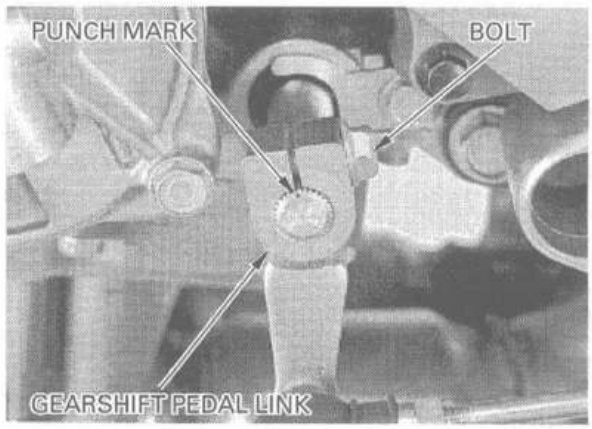
Tighten rear upper engine hanger nut to the specified torque.

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

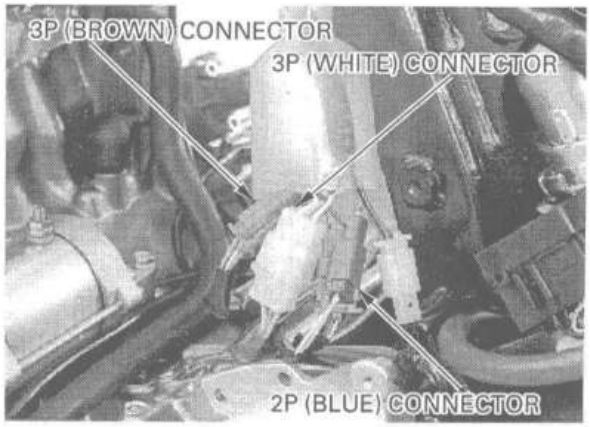


Install the gearshift pedal link aligning its slit with the punch mark on the gearshift spindle.
Install and tighten the pinch bolt to the specified torque.

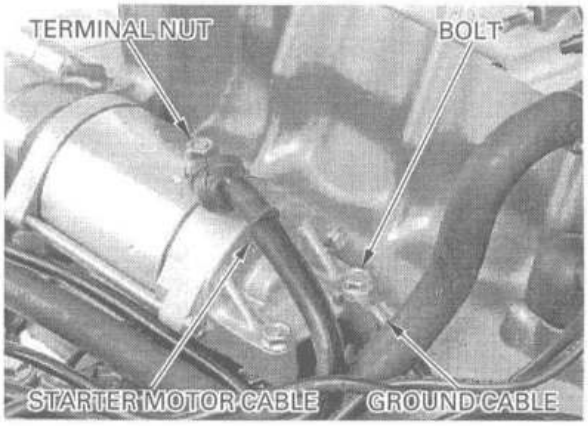
TORQUE: 20 N·m (2.0 kgf·m , 14 lbf·ft)



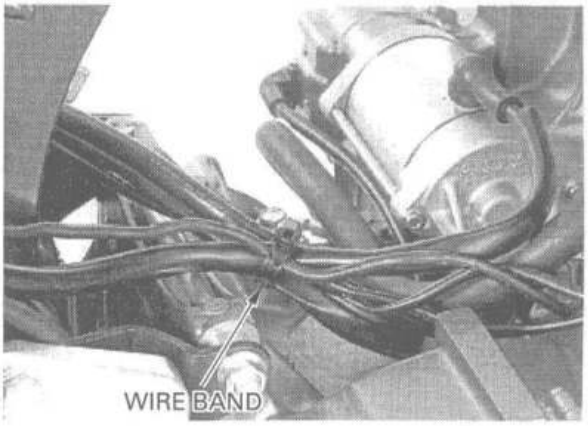
Connect the following connectors:
- Engine sub-harness 3P (Brown) connector
- Ignition pulse generator 2P (Blue) connector
- Alternator 3P (White) connector



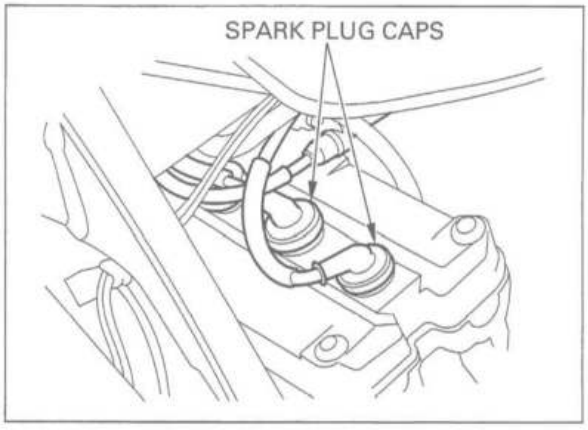
Install the starter ground cable and tighten the bolt. Connect the starter motor cable to the starter motor terminal, tighten the nut securely.



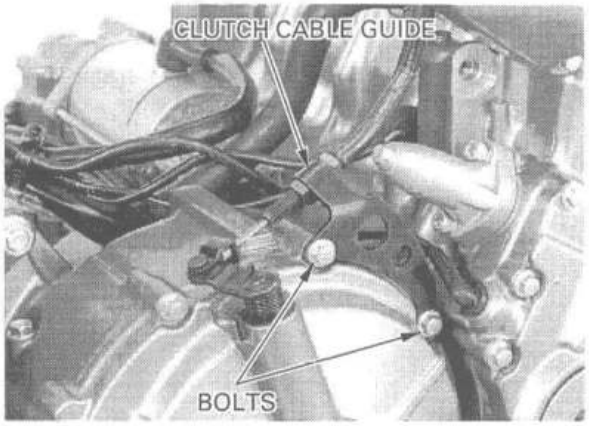
Install the wire band.



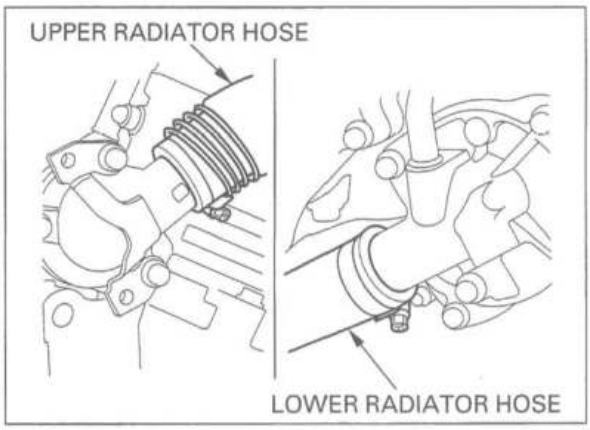
Install the spark plug caps.



Connect the clutch cable to the clutch lifter arm.
Install the clutch cable guide onto the right crankcase cover and tighten the bolts securely.

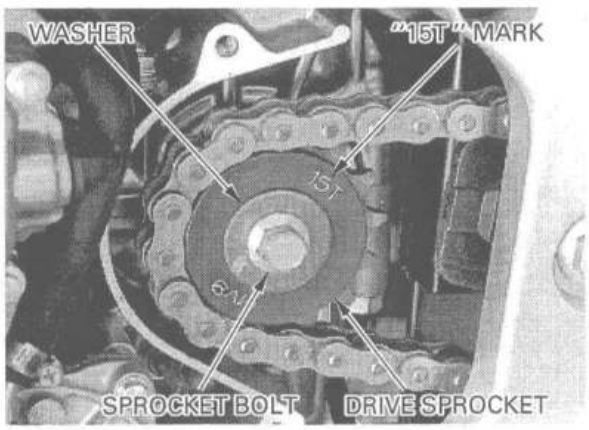


Connect the lower radiator hose to the water pump cover and tighten the clamp screw securely.
Connect the upper radiator hose to the thermostat housing and tighten the clamp screw securely.

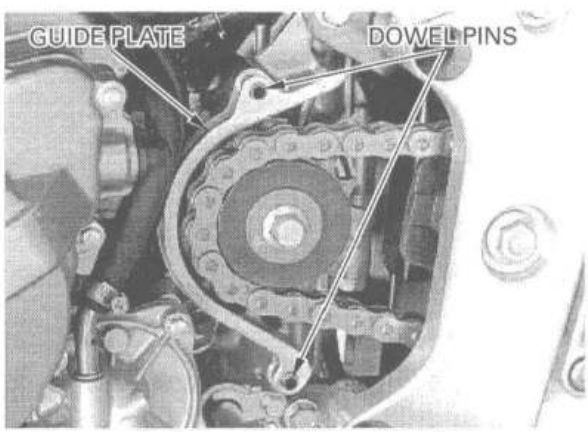


Install the drive sprocket with its "15T" mark facing outward.
Install the washer and tighten the special bolt to the specified torque.

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



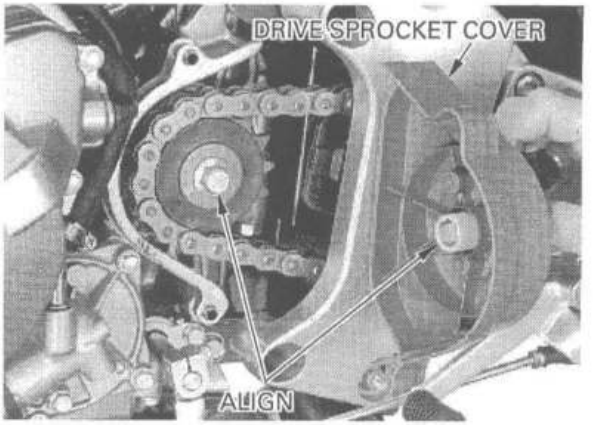
Install dowel pins and drive chain guide plate.



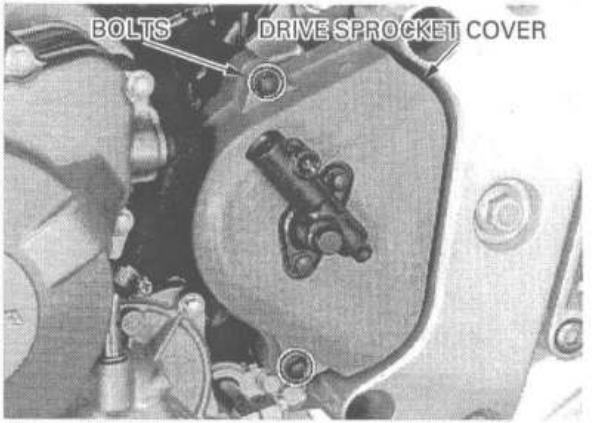
Install the drive sprocket cover.

NOTE:

Align the hexagonal portion of the speedometer gearbox with the drive sprocket bolt head.



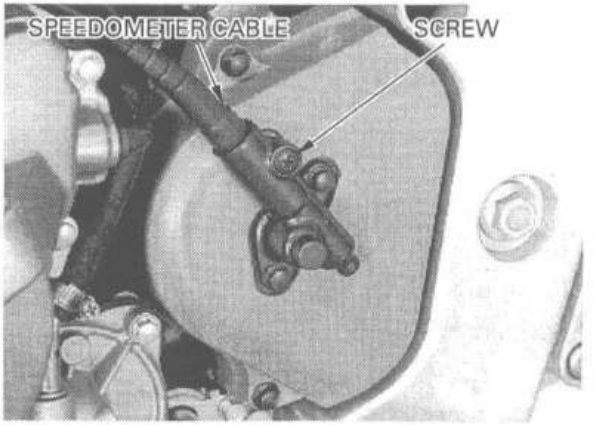
Tighten the drive sprocket cover bolts.

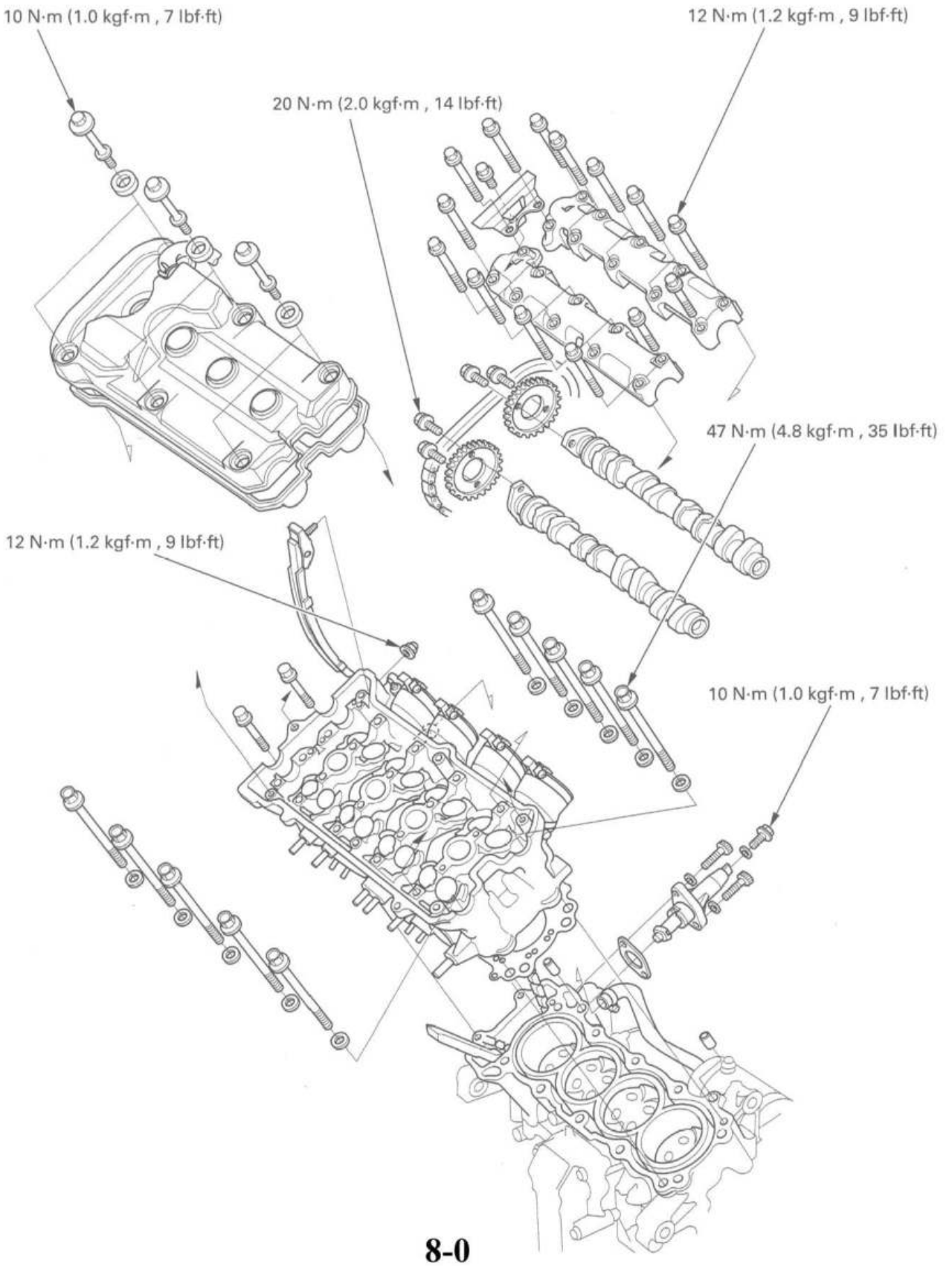


Install the speedometer cable and tighten the screw securely.

Install the following:
- PAIR control valve (page 5-27)
- Exhaust pipe (page 2-5)
- Carburetor (page 5-24)
- Fuel tank (page 5-4)
- Side cover (page 2-2)

Pour recommended engine oil up to the proper level (page 3-12).
Fill the cooling system with recommended coolant and bleed the air (page 6-5).




10 N·m (1.0 kgf·m , 7 lbf·ft)
12 N·m (1.2 kgf·m , 9 lbf·ft)
20 N·m (2.0 kgf·m , 14 lbf·ft)
47 N·m (4.8 kgf·m , 35 lbf·ft)
12 N·m (1.2 kgf·m , 9 lbf·ft)
10 N·m (1.0 kgf·m , 7 lbf·ft)

8. CYLINDER HEAD/VALVES

SERVICE INFORMATION	8-1	VALVE SEAT INSPECTION/ REFACING	8-15
TROUBLESHOOTING	8-3	CYLINDER HEAD ASSEMBLY	8-17
CYLINDER COMPRESSION TEST	8-4	CYLINDER HEAD INSTALLATION	8-19
CYLINDER HEAD COVER REMOVAL	8-4	CAMSHAFT INSTALLATION	8-20
CAMSHAFT REMOVAL	8-5	CYLINDER HEAD COVER INSTALLATION	8-23
CYLINDER HEAD REMOVAL	8-8	CAM CHAIN TENSIONER LIFTER	8-25
CYLINDER HEAD DISASSEMBLY	8-10		
CYLINDER HEAD INSPECTION	8-11		
VALVE GUIDE REPLACEMENT	8-14		

SERVICE INFORMATION

GENERAL

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

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			1,275 – 1,314 kPa (13.0 – 13.4 kgf/cm², 185 – 191 psi) at 300 min⁻¹ (rpm)	———
Cylinder head warpage			———	0.10 (0.004)
Valve, valve guide	Valve clearance	IN	0.16 ± 0.03 (0.006 ± 0.001)	———
		EX	0.22 ± 0.03 (0.009 ± 0.001)	———
	Valve stem O.D.	IN	3.975 – 3.990 (0.1565 – 0.1571)	3.965 (0.1561)
		EX	3.965 – 3.980 (0.1561 – 0.1567)	3.955 (0.1557)
	Valve guide I.D.	IN	4.000 – 4.012 (0.1575 – 0.1580)	4.04 (0.159)
		EX	4.000 – 4.012 (0.1575 – 0.1580)	4.04 (0.159)
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)	0.075 (0.0030)
		EX	0.020 – 0.047 (0.0008 – 0.0019)	0.085 (0.0033)
	Valve guide projection above cylinder head	IN	13.10 – 13.30 (0.516 – 0.524)	———
		EX	11.30 – 11.50 (0.445 – 0.453)	———
	Valve seat width	IN/EX	0.90 – 1.10 (0.035 – 0.043)	1.5 (0.06)
Valve spring free length		IN/EX	35.36 (1.392)	33.86 (1.333)
Valve lifter	Valve lifter O.D.	IN/EX	25.978 – 25.993 (1.0228 – 1.0233)	25.97 (1.022)
	Valve lifter bore I.D.	IN/EX	26.010 – 26.026 (1.0240 – 1.0246)	26.04 (1.025)
Camshaft	Cam lobe height	IN	36.140 – 36.380 (1.4228 – 1.4323)	36.11 (1.422)
		EX	35.300 – 35.540 (1.3898 – 1.3992)	35.27 (1.389)
	Journal O.D.		23.959 – 23.980 (0.9433 – 0.9441)	24.955 (0.9825)
	Runout		———	0.05 (0.002)
	Oil clearance		0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)

TORQUE VALUES

Cylinder head sealing bolt	32 N·m (3.3 kgf·m, 24 lbf·ft)	Apply a locking agent to the threads
Cylinder head socket bolt	47 N·m (4.8 kgf·m, 35 lbf·ft)	Apply oil to the threads
No.1 intake vacuum port plug	3 N·m (0.3 kgf·m, 2.2 lbf·ft)	
Cylinder head cover bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Camshaft holder flange bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply oil to the threads
Breather plate flange bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply a locking agent to the threads
Cam sprocket bolt	20 N·m (2.0 kgf·m, 14 lbf·ft)	Apply a locking agent to the threads
Cylinder head stud bolt	See page 1-14	
Cam chain tensioner cap nut	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Cam chain tensioner lifter sealing bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Timing hole cap	18 N·m (1.8 kgf·m, 13 lbf·ft)	Apply grease to the threads

TOOLS

Compression gauge attachment	07RMJ-MY50100	Equivalent commercially available
Valve spring compressor	07757-0010000	
Valve spring compressor attachment	07959-KM30101	
Tappet hole protector	07HMG-MR70002	
Valve guide driver	07743-0020000	
Valve guide reamer, 4.008 mm	07MMH-MV90100	
Valve seat cutters		—these are commercially available
Seat cutter, 27.5 mm (45° IN)	07780-0010200	
Seat cutter, 24.5 mm (45° EX)	07780-0010100	
Flat cutter, 27 mm (32° IN)	07780-0013300	
Flat cutter, 24 mm (32° EX)	07780-0012500	
Interior cutter, 26 mm (60° IN)	07780-0014500	
Interior cutter, 22 mm (60° EX)	07780-0014202	
Cutter holder, 4.0 mm	07781-0010500	

TROUBLESHOOTING

- Engine top-end problems usually affect engine performance. These problem can be diagnosed by a compression test or by tracing engine noises to the top-end with a sounding rod or stethoscope.
- If the performance is poor at low speeds, check for white smoke in the crankcase breather tube. If the tube is smoky, check for a seized piston ring (Section 11).

Compression too low, hard starting or poor performance at low speed
- Valves:
  - —Incorrect valve adjustment
  - —Burned or bent valve
  - —Incorrect valve timing
  - —Broken valve spring
  - —Uneven valve seating
- Cylinder head:
  - —Leaking or damaged head gasket
  - —Warped or cracked cylinder head
- Worn cylinder, piston or piston rings (section 11)

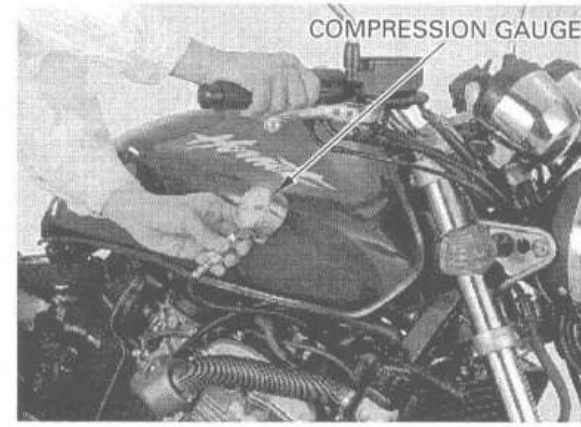
Compression too high, overheating or knocking
- Excessive carbon build-up on piston crown or on combustion chamber

Excessive smoke
- Cylinder head:
  - —Worn valve stem or valve guide
  - —Damaged stem seal
- Worn cylinder, piston or piston rings (section 11)

Excessive noise
- Cylinder head:
  - —Incorrect valve adjustment
  - —Sticking valve or broken valve spring
  - —Damaged or worn camshaft
  - —Worn or damaged cam chain
  - —Worn cam sprocket teeth
- Worn cylinder, piston or piston rings (section 11)

Rough idle
- Low cylinder compression

CYLINDER COMPRESSION TEST



⚠WARNING

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

Warm up the engine to normal operating temperature.
Stop the engine and remove the all spark plug caps and spark plugs (page 3-5).

Install a compression gauge into the spark plug hole.

TOOL:

Compression gauge attachment	07RMJ-MY50100 (Equivalent commercially available)

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

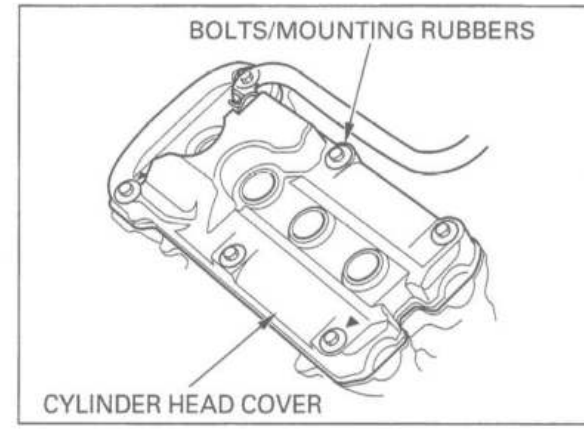
NOTE:

To avoid discharging the battery, do not operate the starter motor for more than seven seconds.

Compression pressure:
1,275—1,314 kPa (13.0—13.4 kgf/cm², 185—191 psi) at 300 min^{-1} (rpm)

Low compression can be caused by:
—Blown cylinder head gasket
—Improper valve adjustment
—Valve leakage
—Worn piston ring or cylinder
High compression can be caused by:
—Carbon deposits in combustion chamber or on piston head

CYLINDER HEAD COVER REMOVAL



Remove the following:
—Ignition coil (page 17-6)
—Spark plug caps (page 3-5)

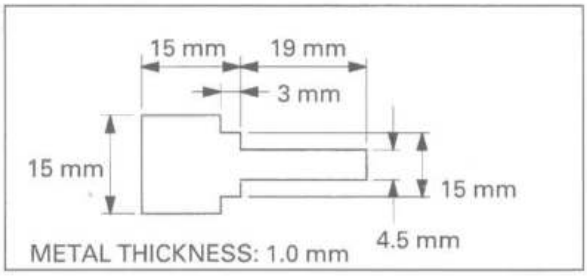
Disconnect the crankcase breather tube.
Remove the bolts, mounting rubbers and cylinder head cover.

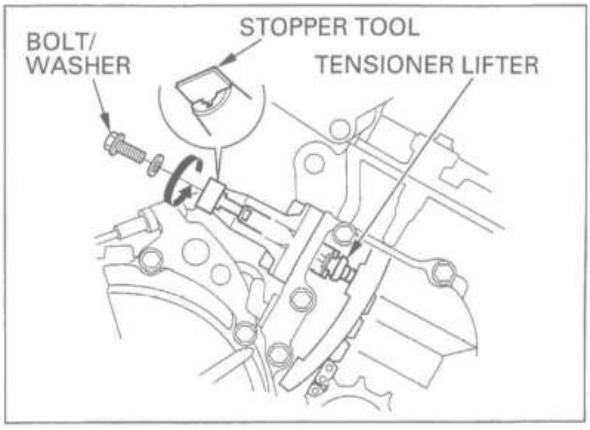
CAMSHAFT REMOVAL

Remove the cylinder head cover (page 8-4).

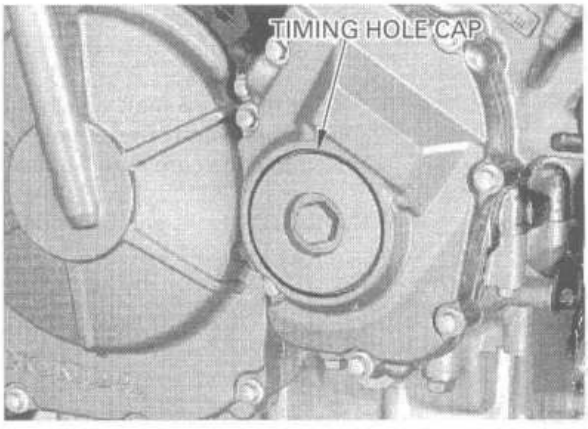
Remove the cam chain tensioner lifter sealing bolt and sealing washer.

Turn the tensioner lifter shaft fully in (clockwise) and secure it using the stopper tool.
This tool can easily be made from a thin (1 mm thickness) piece of steel.

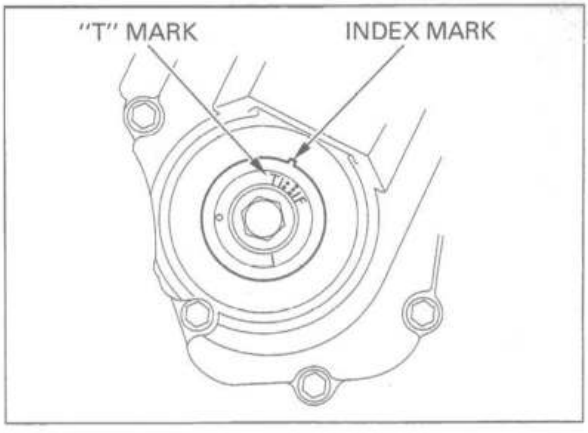




Remove the timing hole cap and O-ring.

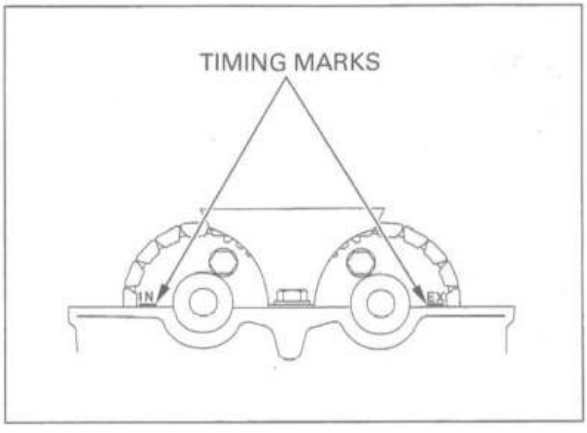


Turn the crankshaft clockwise, align the "T" mark on the ignition pulse generator rotor with the index mark on the ignition pulse generator rotor cover.



The timing marks ("IN" and "EX") on the cam sprockets must be flush with the cylinder head surface and facing outward as shown.

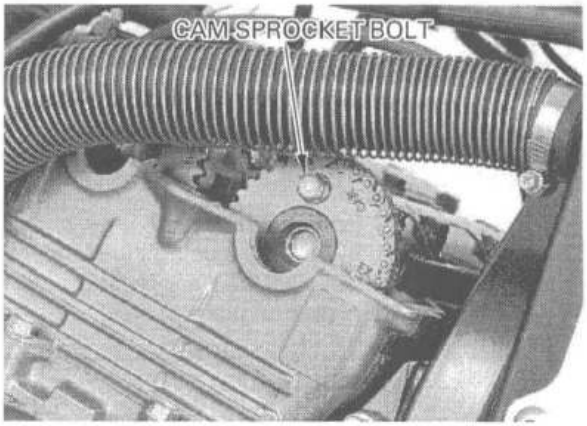
If the timing marks on the cam sprocket facing inward, turn the crankshaft clockwise one full turn (360°) and realign the timing marks with the cylinder head surface so they are facing outward.



If you plan to replace the camshaft and/or cam sprocket, loosen the cam sprocket bolts as follow:

NOTE:

It is not necessary to remove the cam sprocket from the camshaft except when replacing the camshaft and/or cam sprocket.



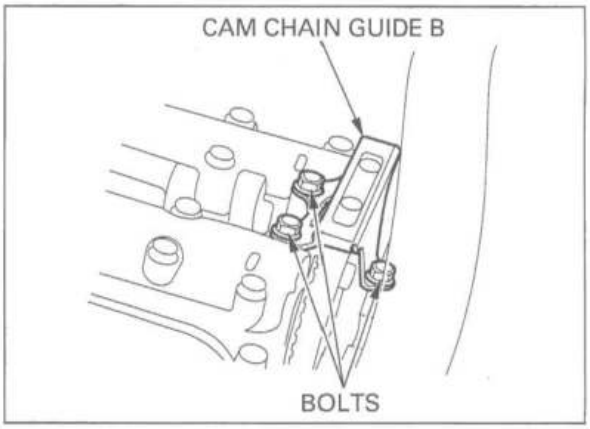
—Remove the cam sprocket bolt from intake and exhaust camshafts.

NOTE:

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

—Turn the crankshaft one full turn (360°), remove the other cam sprocket bolt from the camshafts.
—Remove the cam sprocket from the camshaft.

Remove the bolts and cam chain guide B.



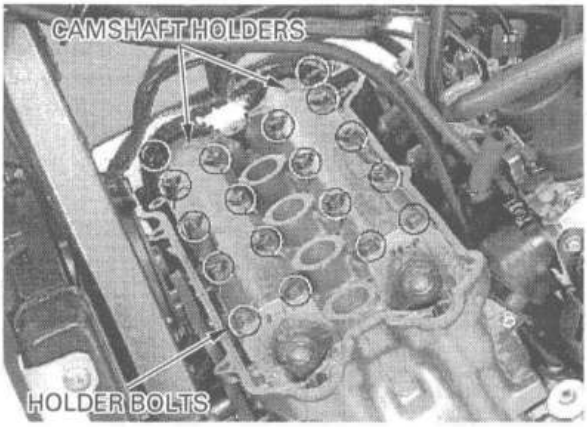
Loosen and remove the camshaft holder bolts, then remove the camshaft holders and camshafts.

CAUTION:

From outside to inside, loosen the bolts in a crisscross pattern in several steps or the camshaft holder might break.

NOTE:

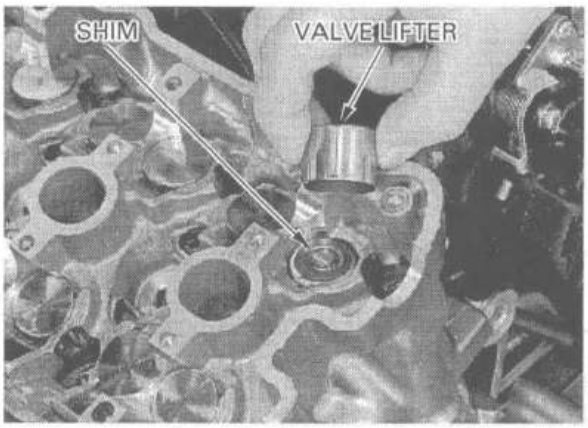
- Suspend the cam chain with a piece of wire to prevent the chain from falling into the crankcase.
- It is not necessary to remove the dowel pins from the camshaft holders.



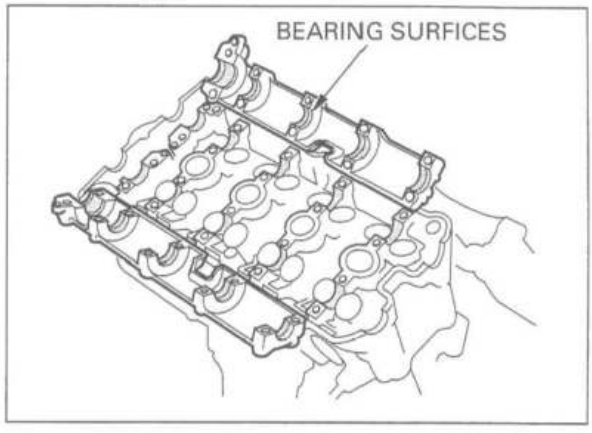
Remove the valve lifters and shims.

NOTE:

- Be careful not to damage the valve lifter bore.
- Shim may stick to the inside of the valve lifter. Do not allow the shims to fall into the crankcase.
- Mark all valve lifters and shims to ensure correct reassembly in their original locations.
- The valve lifter can be easily removed with a valve lapping too or magnet.
- The shims can be easily removed with a tweezers or magnet.



INSPECTION



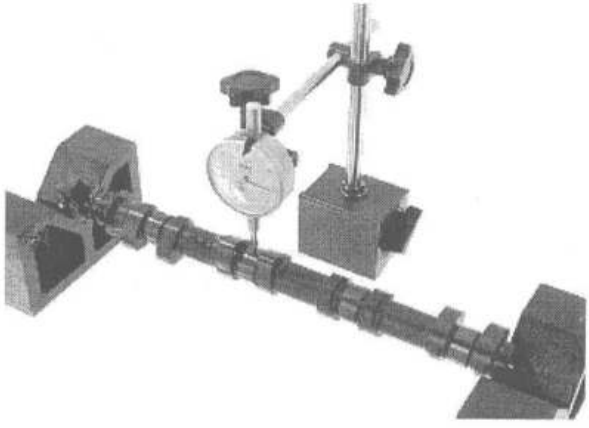
CAMSHAFT HOLDER

Inspect the bearing surface of the camshaft holder for scoring, scratches, or evidence of insufficient lubrication.
Inspect the oil orifices of the holders for clogging.

CAMSHAFT RUNOUT

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

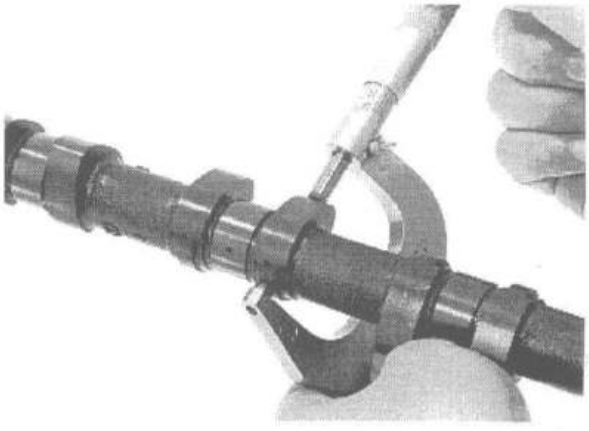
SERVICE LIMIT: 0.05 mm (0.002 in)



CAM LOBE HEIGHT

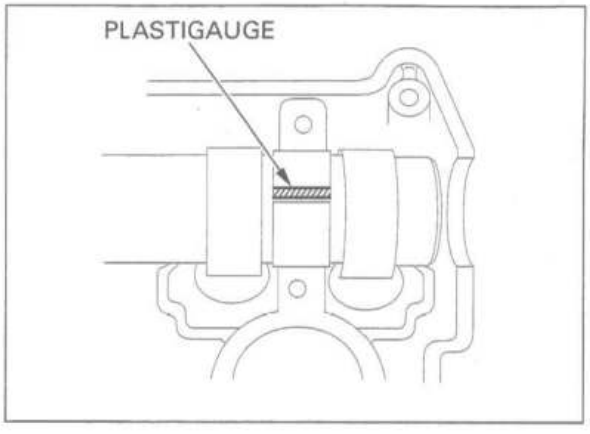
Using a micrometer, measure each cam lobe height.

SERVICE LIMITS:
IN: 36.11 mm (1.422 in)
EX: 35.27 mm (1.389 in)



CAMSHAFT OIL CLEARANCE

Wipe any oil from the journals of the camshaft, cylinder head and camshaft holders.
Lay a strip of plastigauge lengthwise on top of each camshaft journal.

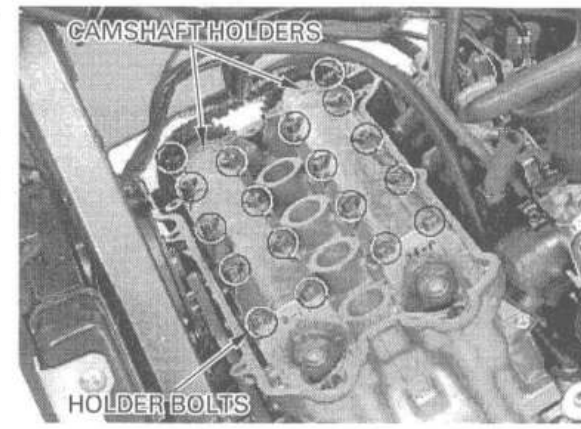


Install the camshaft holders and tighten the bolts in a crisscross pattern in 2—3 steps.

NOTE:

Do not rotate the camshaft when using plastigauge.

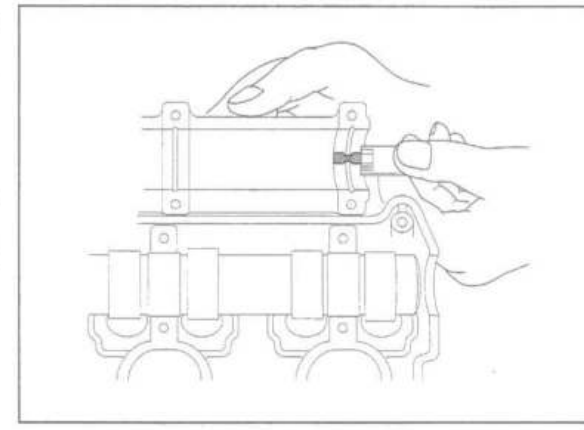
TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)



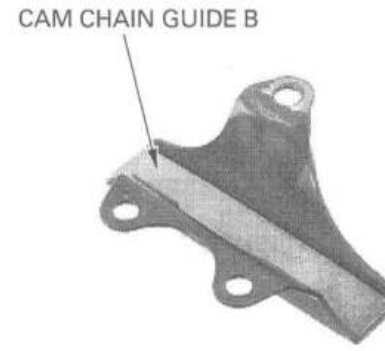
Remove the camshaft holders and measure the width of each plastigauge.
The widest thickness determines the oil clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)

When the service limits are exceeded, replace the camshaft and recheck the oil clearance.
Replace the cylinder head and camshaft holders as a set if the clearance still exceeds the service limit.



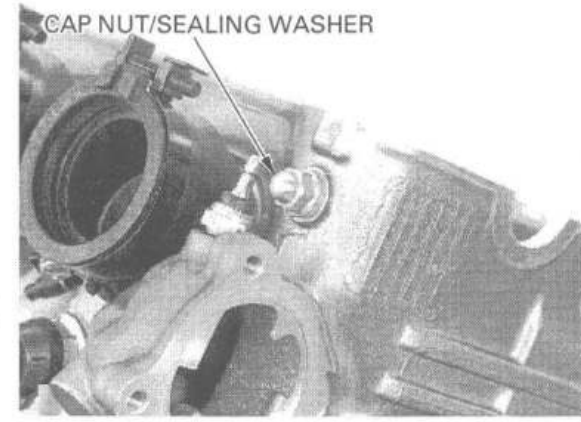
CAM CHAIN GUIDE B
Inspect the cam chain slipper surface of the cam chain guide B for wear or damage.



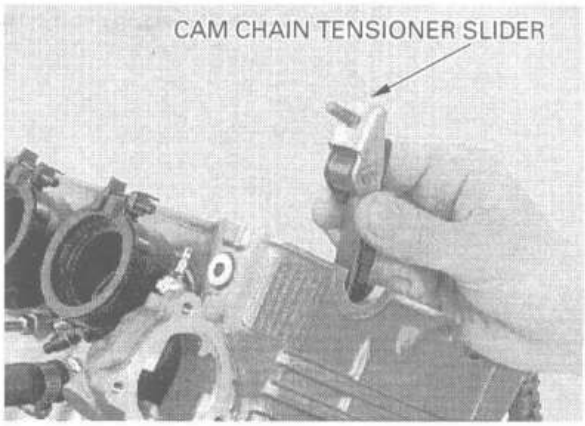
CYLINDER HEAD REMOVAL

Remove the following:
- —Exhaust system (page 2-5)
- —Carburetor (page 5-8)
- —Radiator (page 6-9)
- —PAIR control valve (page 5-7)
- —Thermostat (page 6-6)
- —Camshaft (page 8-6)

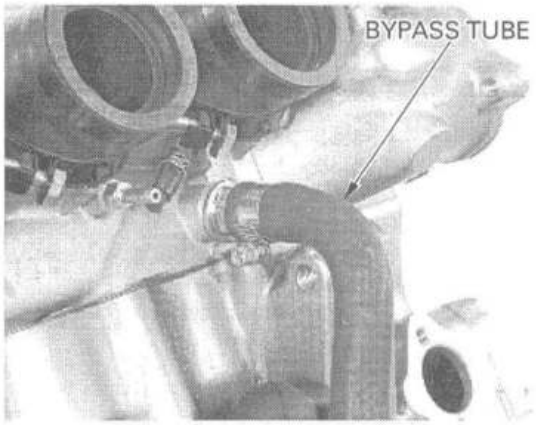
Remove the cam chain tensioner slider mounting cap nut and sealing washer.



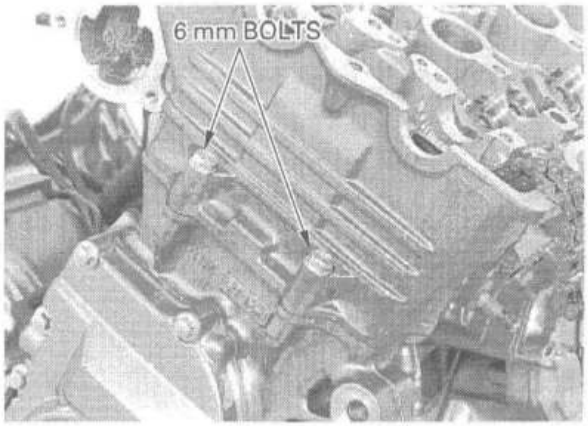
Remove the cam chain tensioner slider.



Remove the following:
- Bypass tube
- Thermo sensor connector (page 19-10)
- PAIR control valve tubes (page 5-27)



Remove the cylinder head 6 mm bolts.

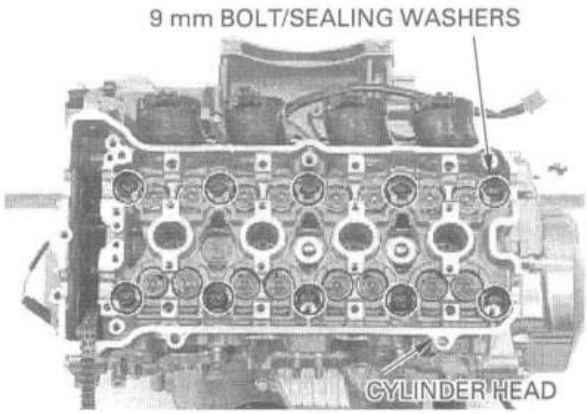


Remove the ten 9 mm special bolts.

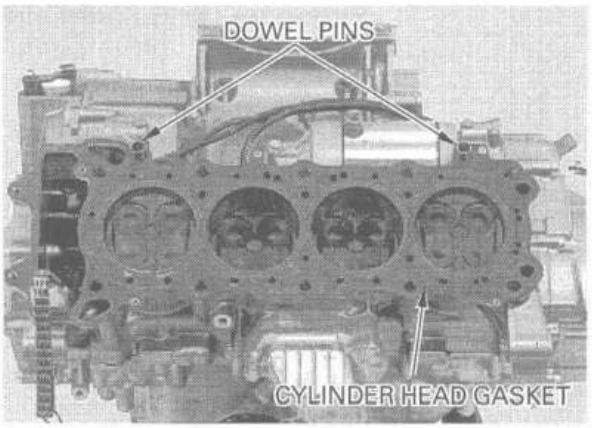
NOTE:

Loosen the 9 mm special bolts in a crisscross pattern in 2–3 steps.

Remove the cylinder head.



Remove the dowel pins and cylinder head gasket.

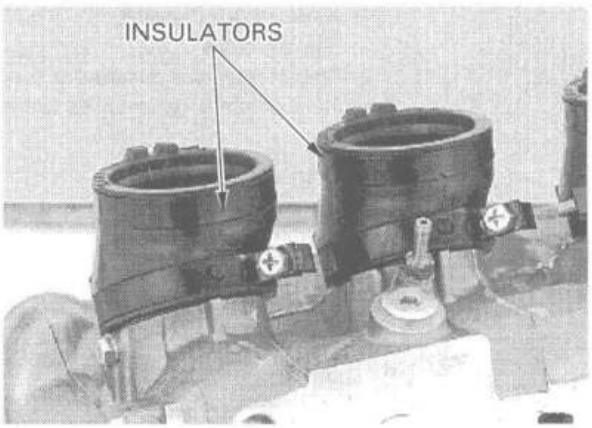


CYLINDER HEAD DISASSEMBLY

NOTE:

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

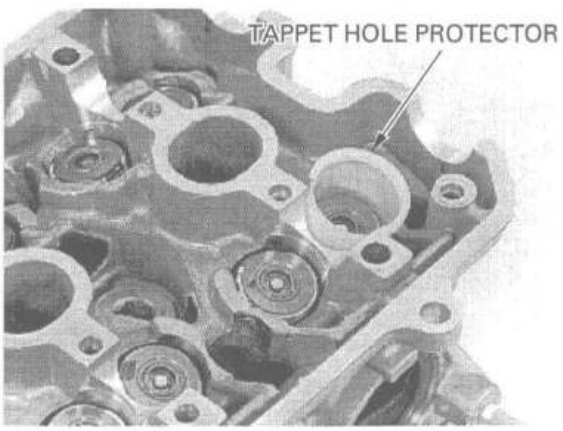
Remove the carburetor insulators from the cylinder head.
Remove the spark plugs from the cylinder head.



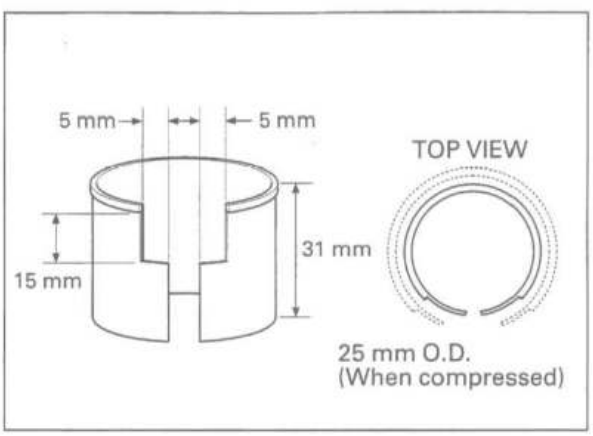
Remove the valve lifters and shims.

Install the tappet hole protector into the valve lifter bore.

TOOL:
Tappet hole protector 07HMG-MR70002

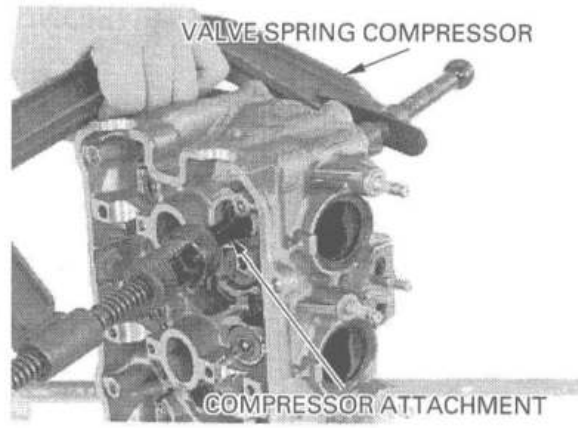


An equivalent tool can easily be made from a plastic 35 mm film container as shown.



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

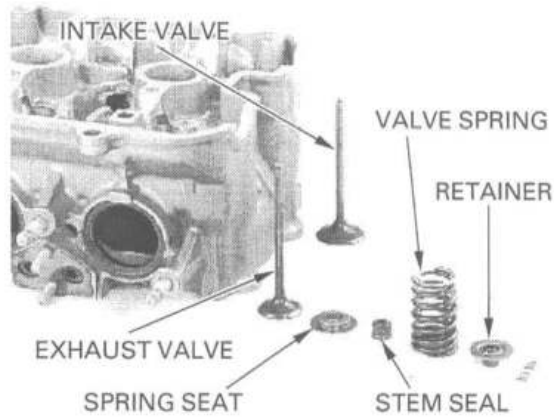
TOOLS:
Valve spring compressor 07757-0010000
Valve spring compressor attachment
07959-KM30101



CAUTION:

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

Remove the following:
- Spring retainer
- Valve spring
- Valve
- Stem seal
- Spring seat



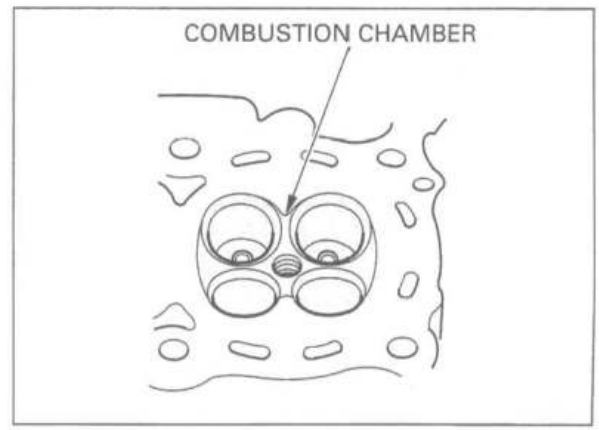
NOTE:

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

CYLINDER HEAD INSPECTION

CYLINDER HEAD

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

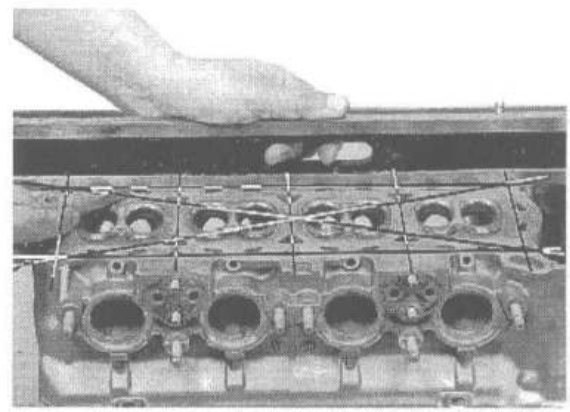


CAUTION:

Avoid damaging the gasket surface.

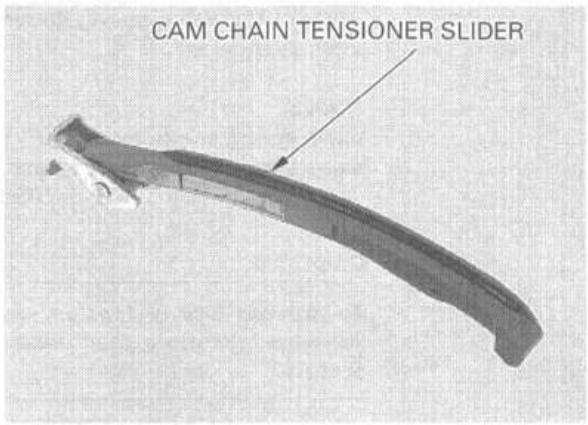
Check the cylinder head for warpage with a straight edge and feeler gauge.

SERVICE LIMIT: 0.10 mm (0.004 in)



CAM CHAIN TENSIONER/CAM CHAIN GUIDE

Inspect the cam chain tensioner and guide for excessive wear or damage, replace if necessary.

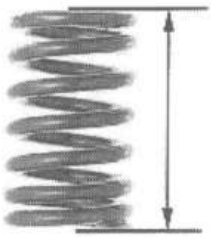


VALVE SPRING

Measure the free length of the valve spring.

SERVICE LIMIT: 33.86 mm (1.333 in)

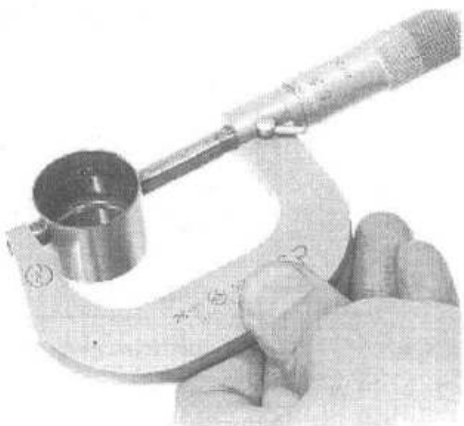
Replace the spring if it is shorter than the service limit.



VALVE LIFTER

Inspect each valve lifter for scratches or abnormal wear.
Measure the each valve lifter O.D.

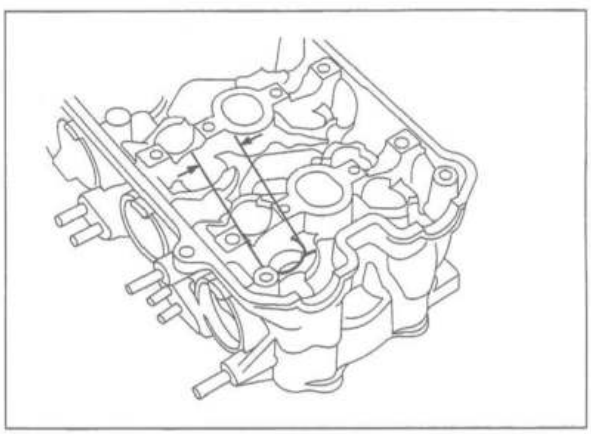
SERVICE LIMIT: 25.97 mm (1.022 in)



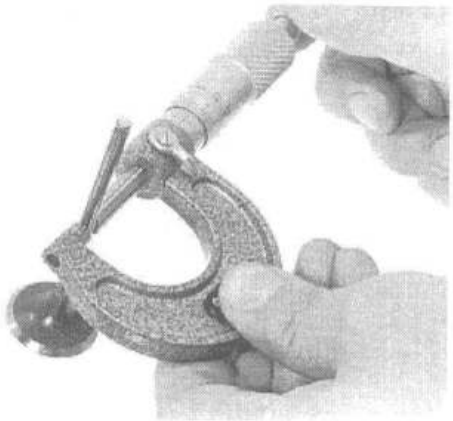
VALVE LIFTER BORE

Inspect each valve lifter bore for scratches or abnormal wear.
Measure the each valve lifter bore I.D.

SERVICE LIMIT: 26.04 mm (1.025 in)



VALVE/VALVE GUIDE

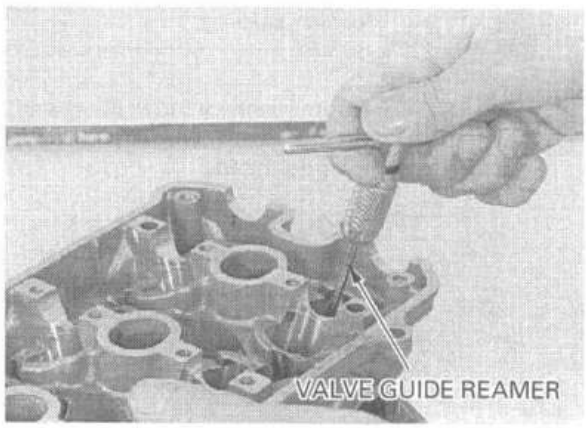


Inspect each valve for bending, burning or abnormal stem wear.
Check valve movement in the guide, measure and record each valve stem O.D.

SERVICE LIMITS:
IN: 3.965 mm (0.1561 in)
EX: 3.955 mm (0.1557 in)

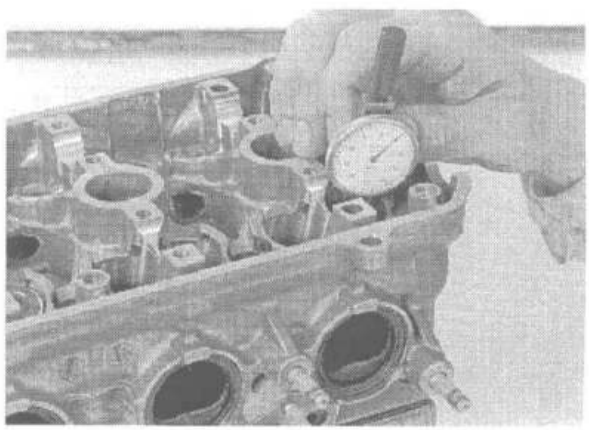
Ream the guides to remove any carbon deposits before checking clearances.
Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise.

TOOL:
Valve guide reamer, 4.008 mm 07MMH-MV90100



Measure and record each valve guide I.D.

SERVICE LIMIT: IN/EX: 4.04 mm (0.159 in)



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

SERVICE LIMITS:
IN: 0.075 mm (0.0030 in)
EX: 0.085 mm (0.0033 in)

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

NOTE:

Reface the valve seats whenever the valve guides are replaced (page 8-15).

VALVE GUIDE REPLACEMENT

Chill the replacement valve guides in the freezer section of a refrigerator for about an hour.
Heat the cylinder head to 100–150 °C (212–300 °F) with a hot plate or oven.

⚠WARNING

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

CAUTION:

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

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

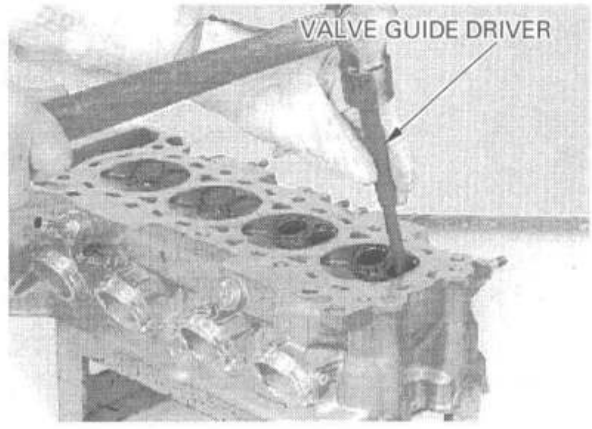
TOOL:
Adjustable valve guide driver 07743-0020000

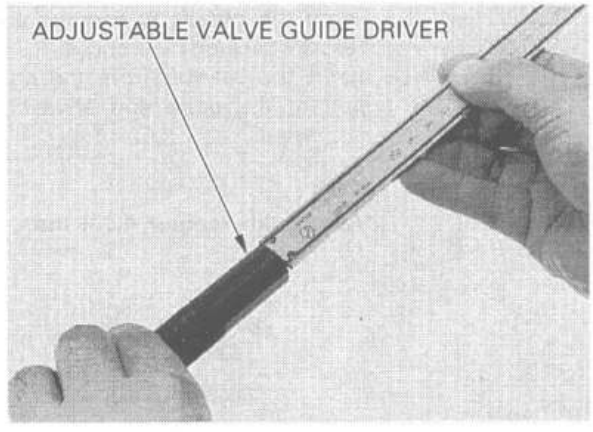
Adjust the tool setting depth with a pair of vernier calipers as shown.

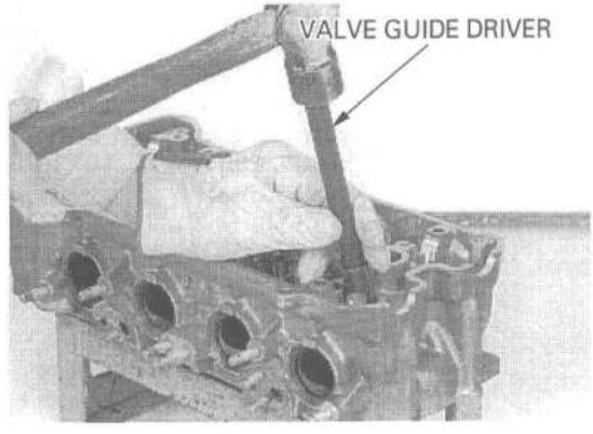
DEPTH:
IN: 13.10–13.30 mm (0.516–0.524 in)
EX: 11.30–11.50 mm (0.445–0.453 in)

TOOL:
Adjustable valve guide driver 07743-0020000

Drive in the guide from the top of the head.







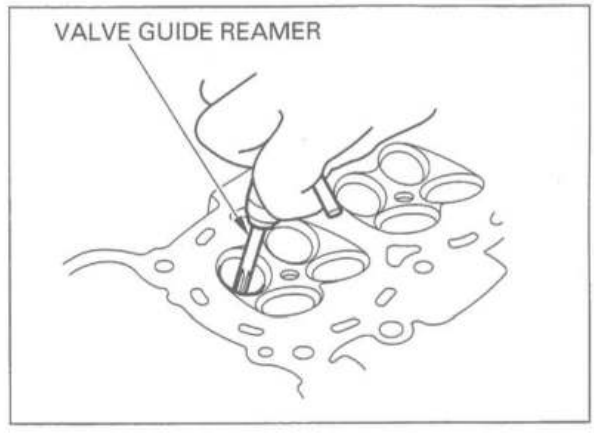
Let the cylinder head cool to room temperature.

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

TOOL:
Valve guide reamer, 4.008 mm 07MMH-MV90100

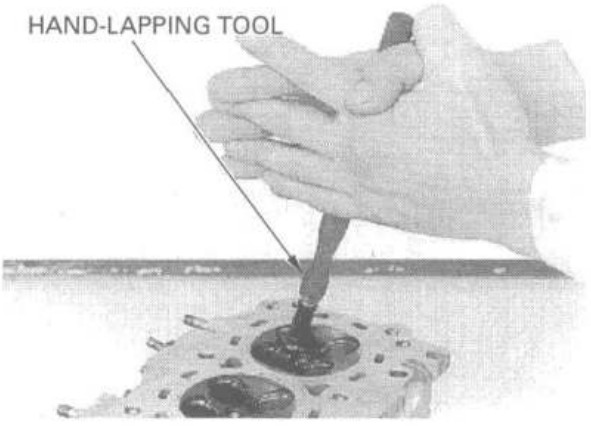
NOTE:

Use cutting oil on the reamer during this operation.



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

VALVE SEAT INSPECTION/REFACING



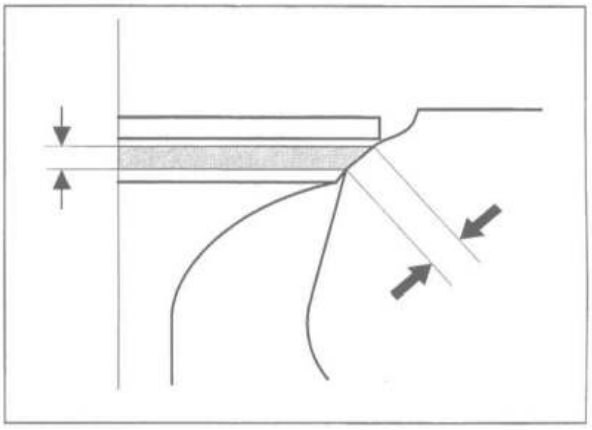
Clean the intake and exhaust valves thoroughly to remove carbon deposits.
Apply a light coating of Prussian Blue to the valve seats. Lap the valves and seats using a rubber hose or other hand-lapping tool.
Remove and inspect the valves.

CAUTION:

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

Inspect the width of each valve seat.

STANDARD: 0.90—1.10 mm (0.035—0.043 in)
SERVICE LIMIT: 1.5 mm (0.06 in)

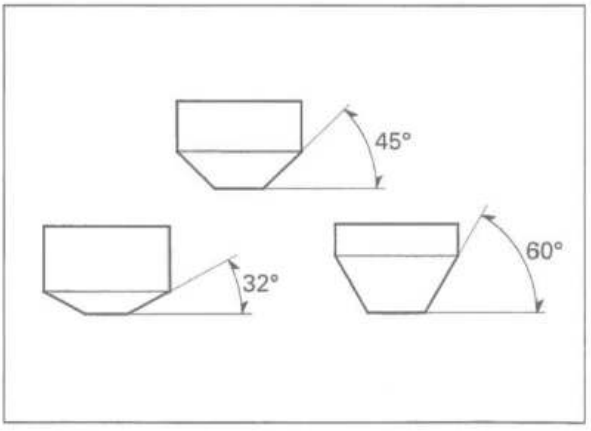


If the seat is too wide, too narrow or has low spots, the seat must be ground.

VALVE SEAT REFACING

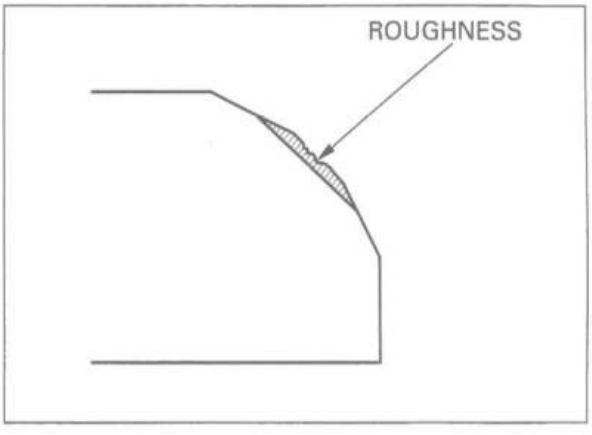
Follow the refacing manufacturer's operating instructions.

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

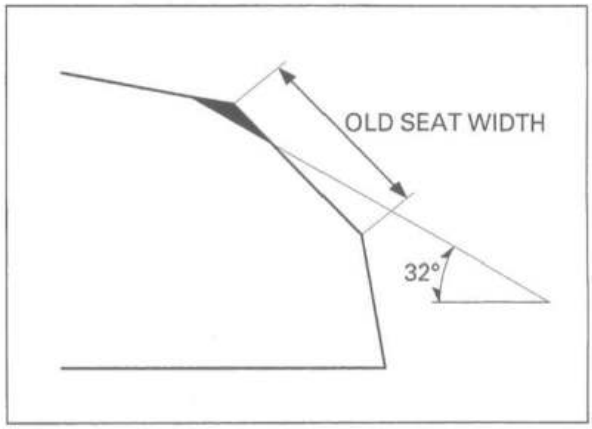


Reface the seat with a 45-degree cutter whenever a valve guide is replaced.

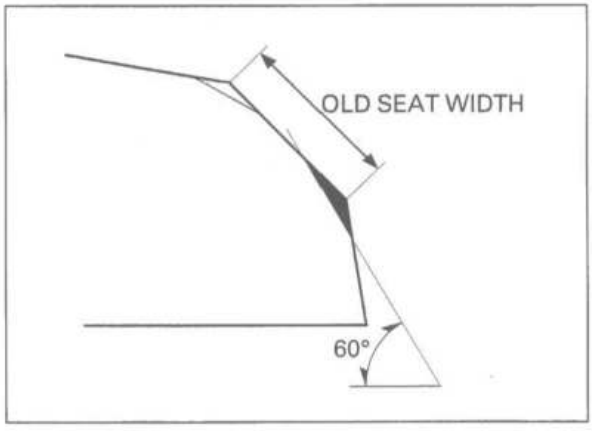
Use a 45-degree cutter to remove any roughness or irregularities from the seat.



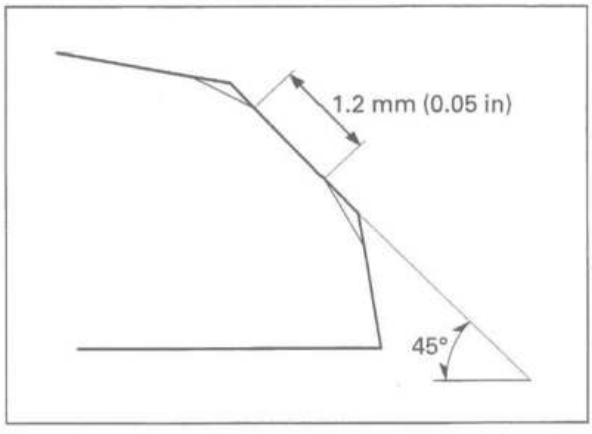
Use a 32-degree cutter to remove the top 1/4 of the existing valve seat material.



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



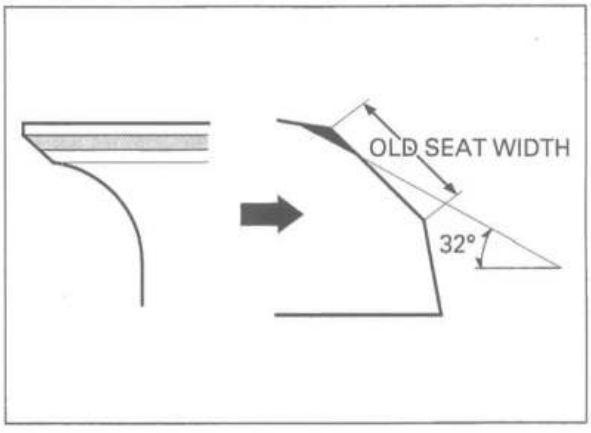
Install a 45-degree finish cutter and cut the seat to the proper width.
Make sure that all pitting and irregularities are removed.
Refinish if necessary.



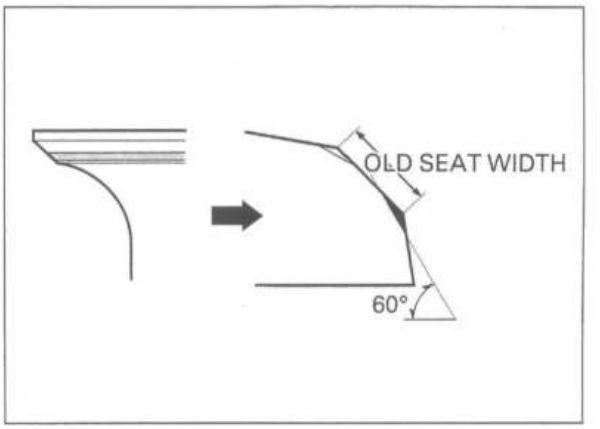
The location of the valve seat in relation to the valve face is very important for good sealing.

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.

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



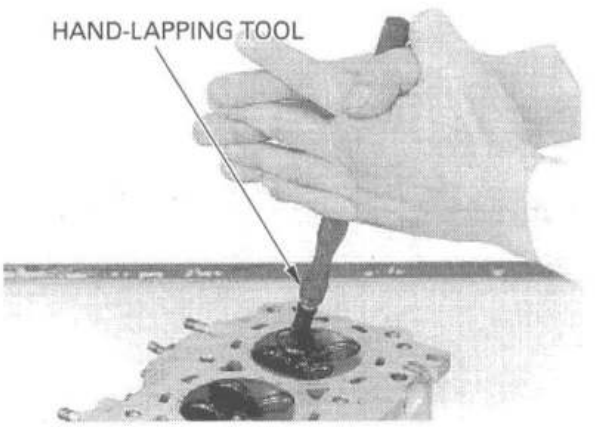
If the contact area is too low on the valve, the seat must be raised using a 60-degree inner cutter.



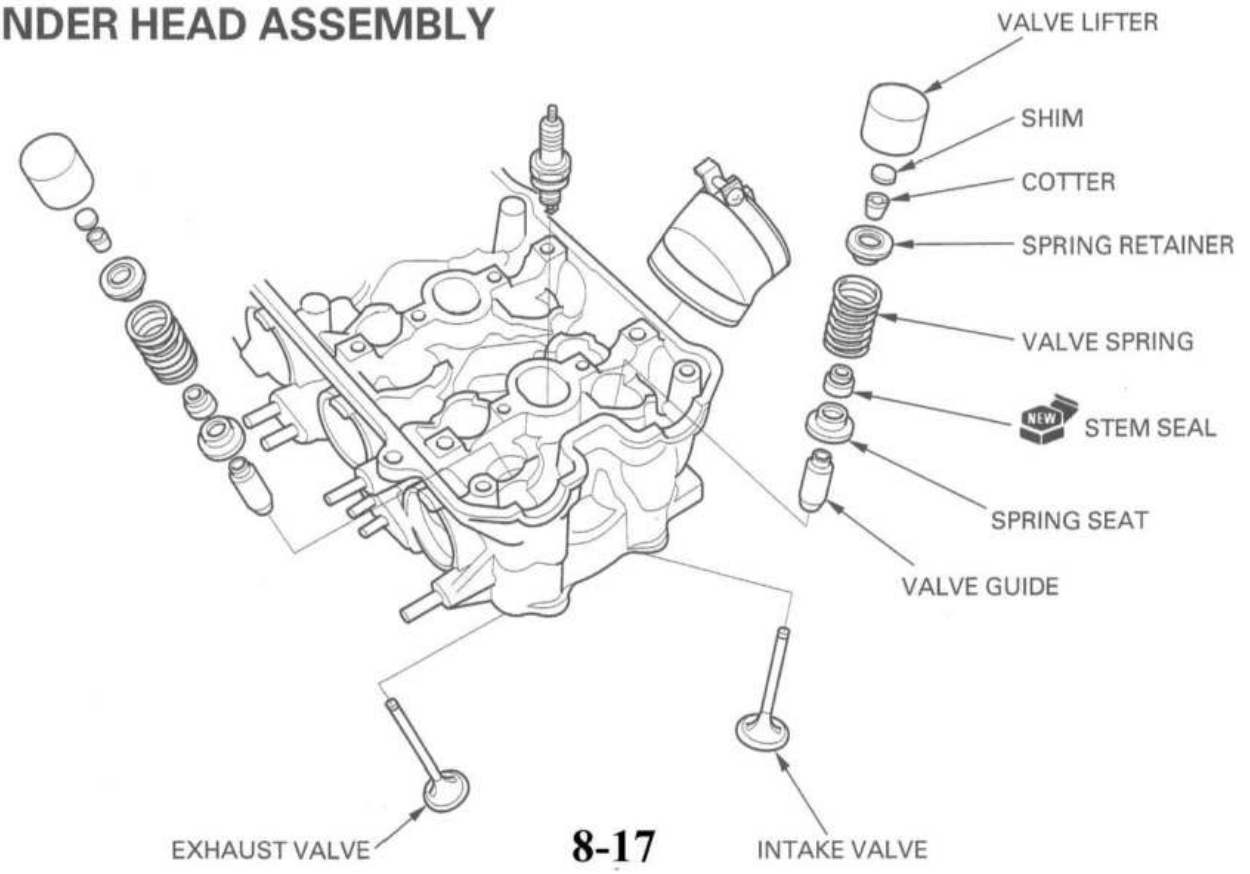
Refinish the seat to specifications, using a 45-degree finish cutter.
After cutting the seat, apply lapping compound to the valve face, and lap the valve using light pressure.

Do not allow lapping compound to enter the guides.

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



CYLINDER HEAD ASSEMBLY

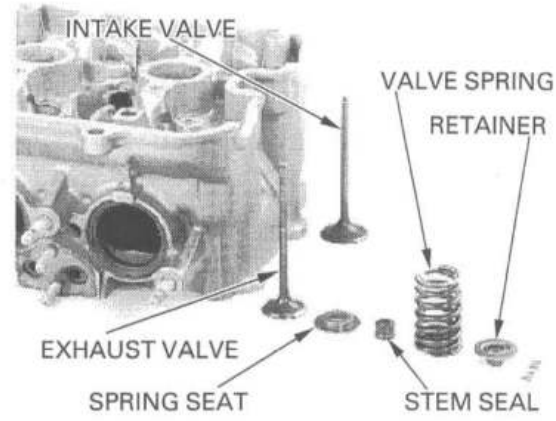


Clean the cylinder head assembly with solvent and blow through all oil passages with compressed air.

Install the valve spring seat.
Install the new stem seal.

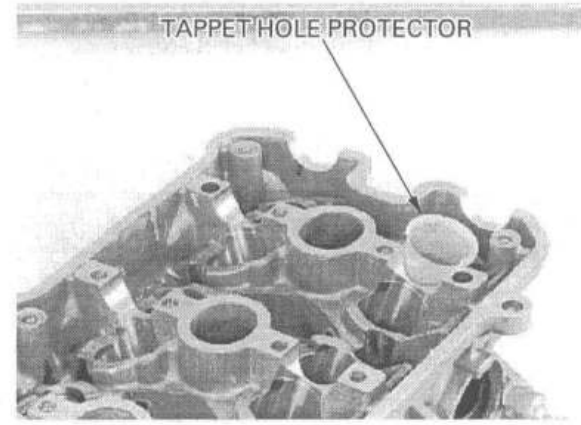
Lubricate the valve stem with molybdenum disulfide oil and insert the valve into the valve guide.

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



Install the tappet hole protector into the valve lifter bore.

TOOL:
Tappet hole protector 07HMG-MR70002

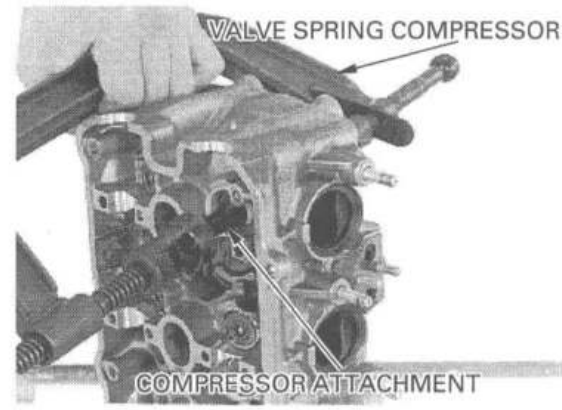


Install the valve spring with the tightly wound coils facing the combustion chamber.
Install the valve spring retainer.

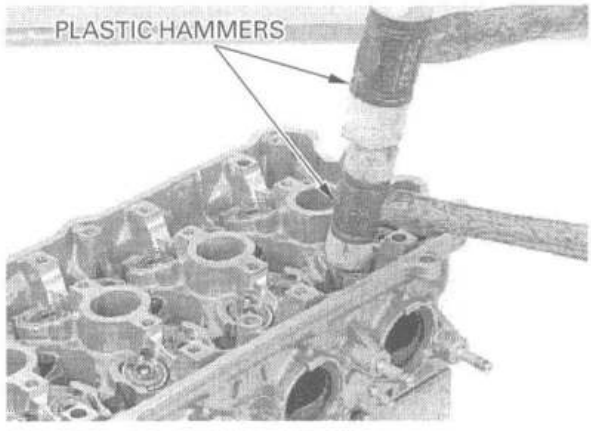


Install the valve cotters using the special tool as shown.
To prevent loss of tension, do not compress the valve spring more than necessary.

TOOL:
Valve spring compressor 07757-0010000
Valve spring compressor attachment
07959-KM30101



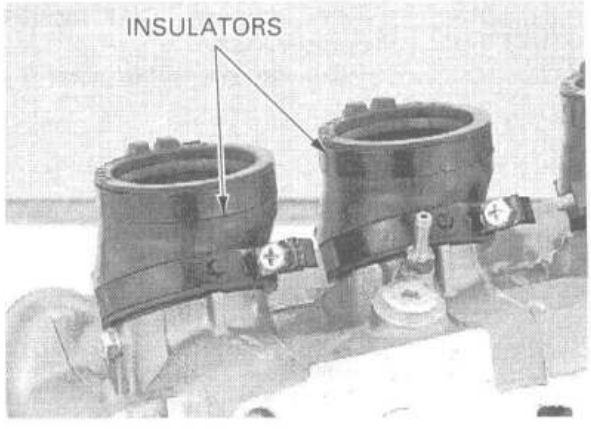
Tap the valve stems gently with two plastic hammers as shown to seat the cotters firmly.



CAUTION:

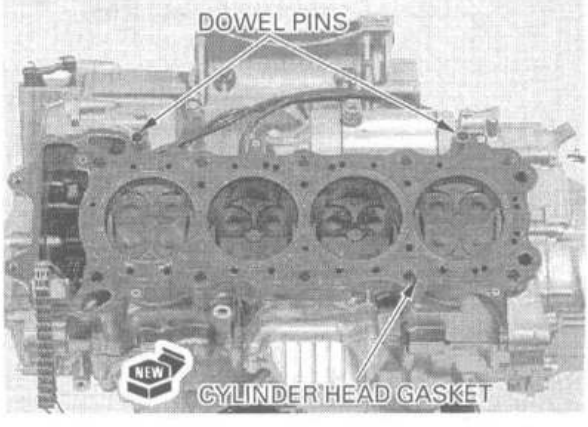
Support the cylinder head above the work bench surface to prevent possible valve damage.

Install the insulators aligning their grooves with the bosses on the cylinder head.



CYLINDER HEAD INSTALLATION

Install the dowel pins and a new cylinder head gasket as shown.



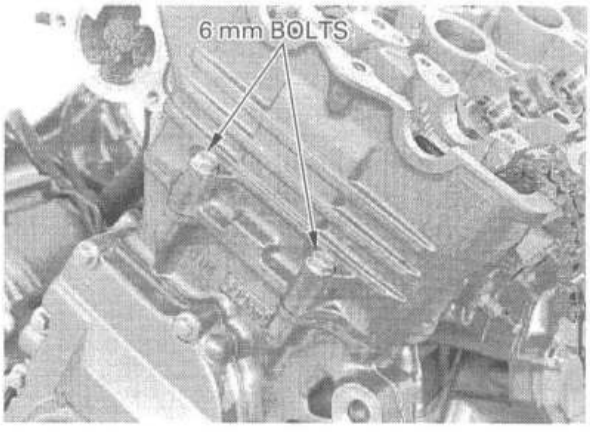
Install the cylinder head.

Apply oil to the threads and seating surface of the 9 mm special bolts/washers and install them.
Tighten the 9 mm socket bolts in a crisscross pattern in 2—3 steps to the specified torque.

TORQUE: 47 N·m (4.8 kgf·m , 35 lbf·ft)



Install and tighten the 6 mm flange bolts.

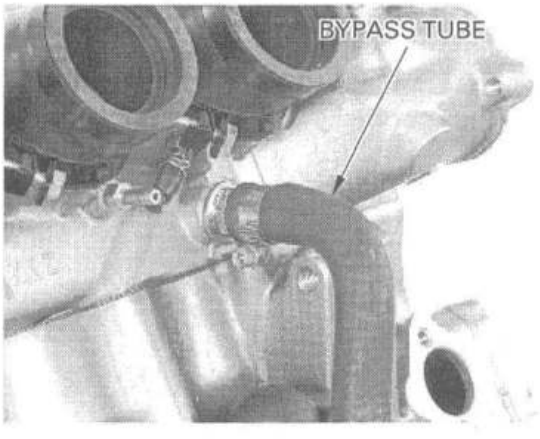


Install the cam chain tensioner slider into the cylinder head.
Install the new sealing washer and tighten the cap nut.



Connect the bypass tube.

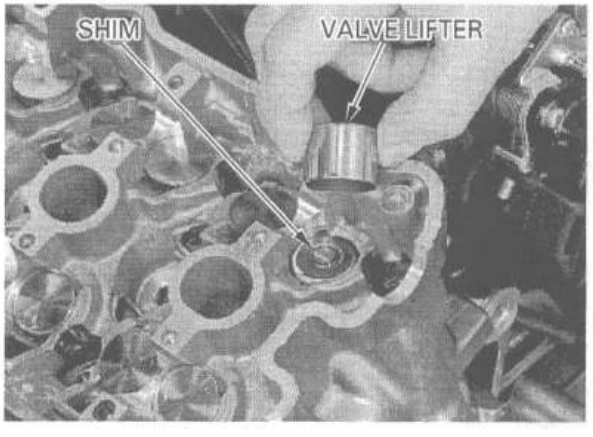
Install the following:
- Coolant temperature sensor (page 19-10)
- Camshaft (see below)
- PAIR control valve (page 5-27)
- Thermostat (page 6-8)
- Radiator (page 6-13)
- Carburetor (page 5-24)
- Exhaust system (page 2-5)



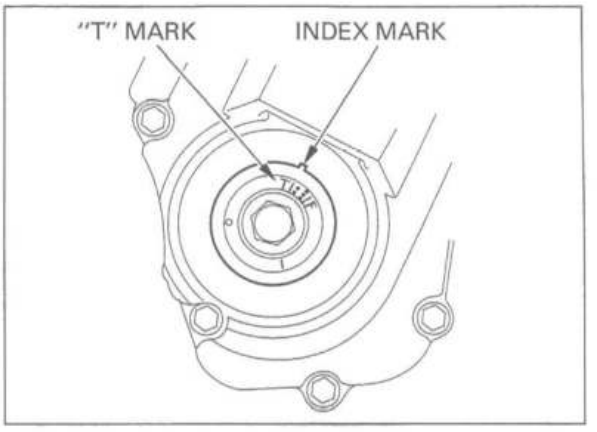
CAMSHAFT INSTALLATION

Apply molybdenum disulfide oil to the outer surface of the each valve lifter.

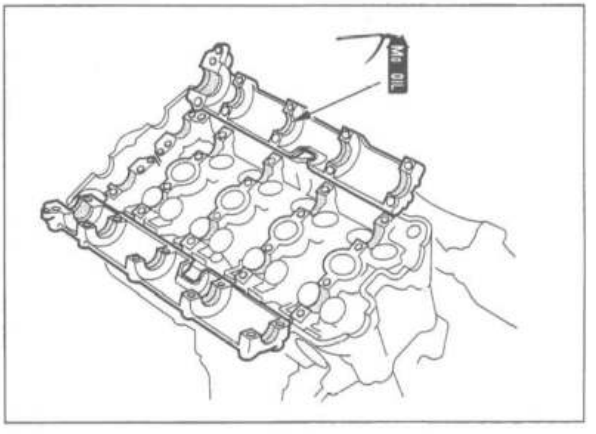
Install the shims and valve lifters into the valve lifter bores.



Turn the crankshaft and align the "T" mark on the ignition pulse generator rotor with the index mark on the ignition pulse generator rotor cover.



Apply molybdenum disulfide oil to the camshaft journals of the cylinder head and camshaft holder.

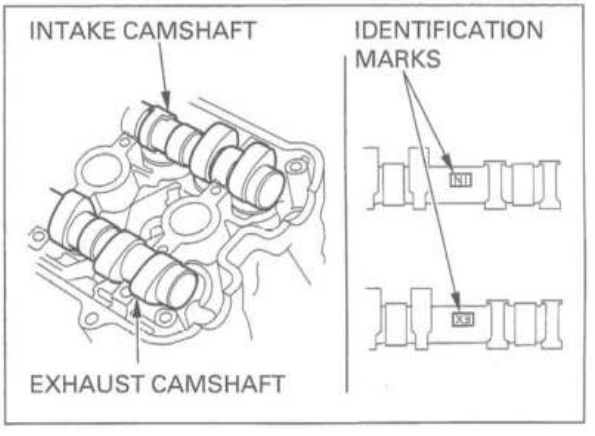


Install the camshafts onto the cylinder head with the cam lobes for the No.1 cylinder facing up as shown.

NOTE:

Install the each camshaft to the correct locations with the identification marks.
"IN": Intake camshaft
"EX": Exhaust camshaft

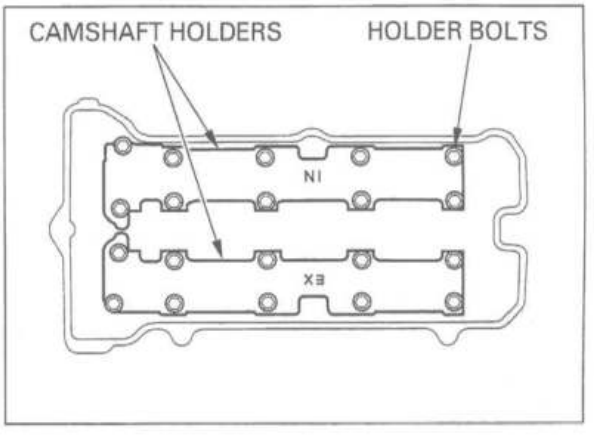
Apply molybdenum disulfide oil to the cam lobes and journals.



Install the camshaft holders onto the camshafts.

NOTE:

Install the each camshaft holder to the correct locations with the identification marks.
"IN": Intake camshaft holder
"EX": Exhaust camshaft holder



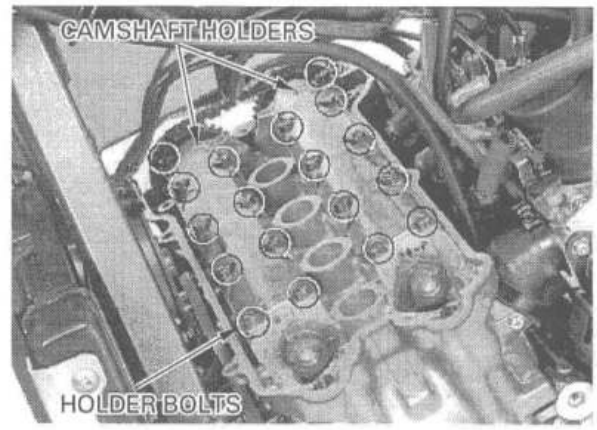
Temporarily install the ten holder bolts until the cam holders lightly contact the cylinder head surface.

CAUTION:

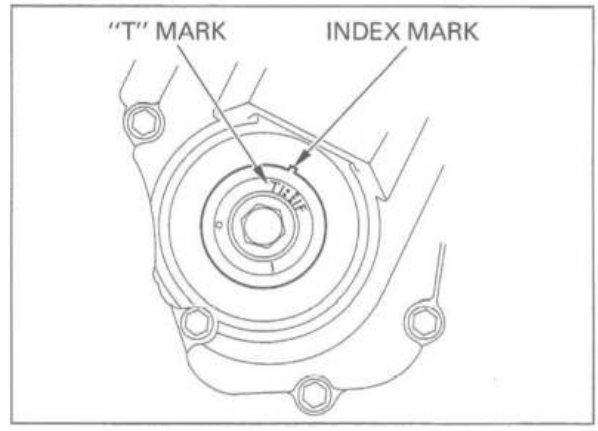
Tightening the camshaft holder bolts on only oneside might cause a camshaft holder to break.

Tighten all camshaft holder bolts in the numerical order casted on the camshaft holder.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)



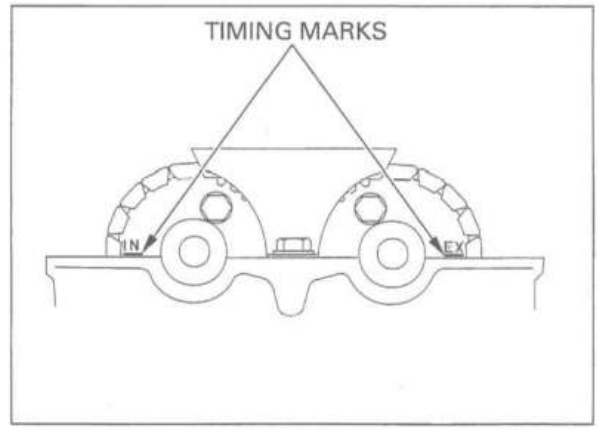
Make sure that the "T" mark on the ignition pulse generator rotor aligns with the index mark on the ignition pulse generator rotor cover.



Install the cam chain over the cam sprockets.
Install the cam sprockets onto the camshaft flange with their timing marks on the cam sprockets are flush with the cylinder head surface and facing outward.

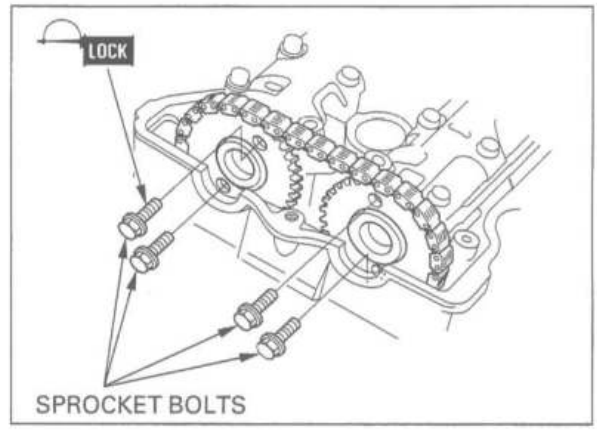
NOTE:

Install the each cam sprocket to the correct locations with the identification marks.
"IN": Intake cam sprocket
"EX": Exhaust cam sprocket



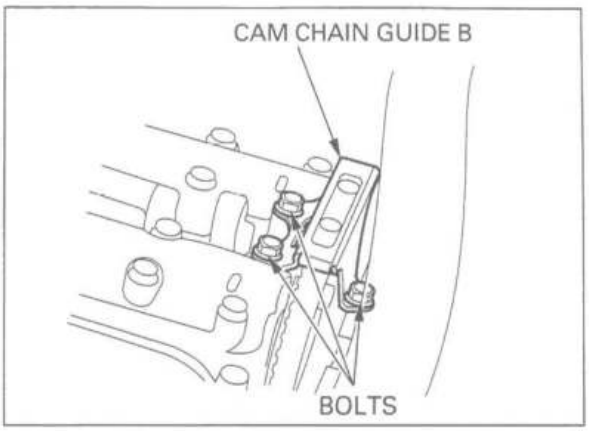
Clean and apply a locking agent to the threads of the cam sprocket bolt.
Install the cam sprocket bolts.
Turn the crankshaft clockwise one full turn (360°) and tighten the other cam sprocket bolts.

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

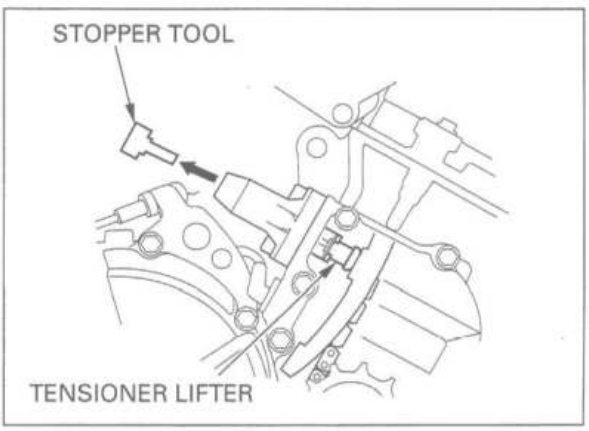


Remove the two camshaft holder bolts (casted No.10).
Install the cam chain guide B, reinstall and tighten the bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

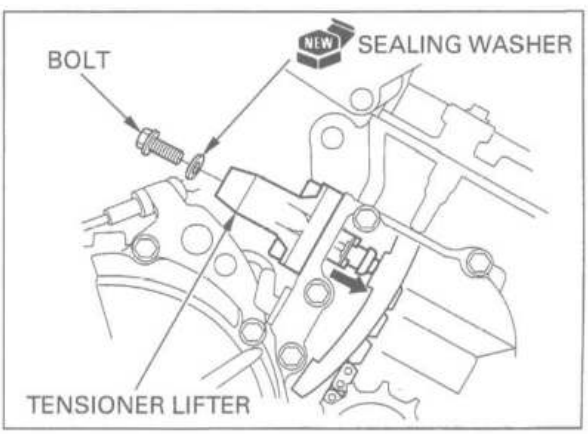


Remove the stopper tool from the cam chain tensioner lifter.



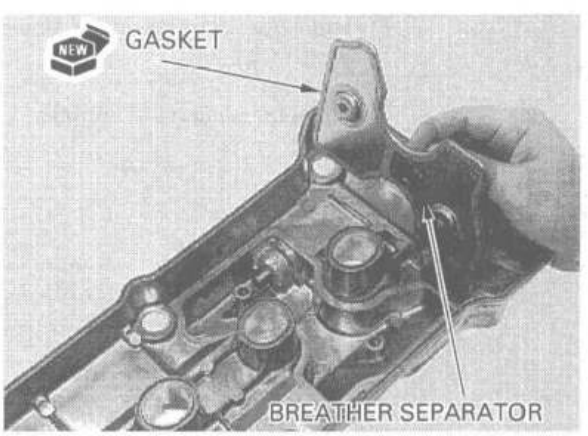
Install a new sealing washer and tighten the sealing bolt.

Recheck the valve timing.



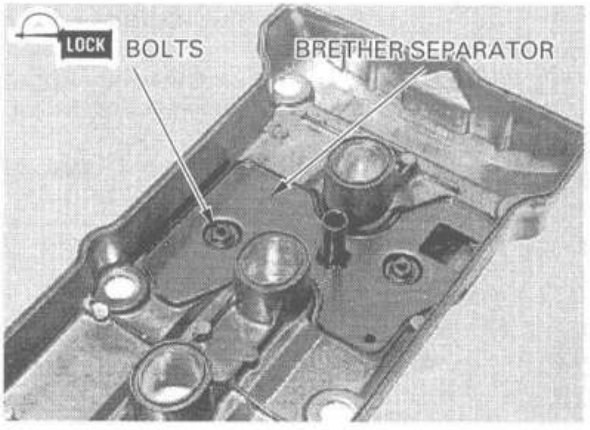
CYLINDER HEAD COVER INSTALLATION

Install the new gasket and crankcase breather separator to the cylinder head cover.

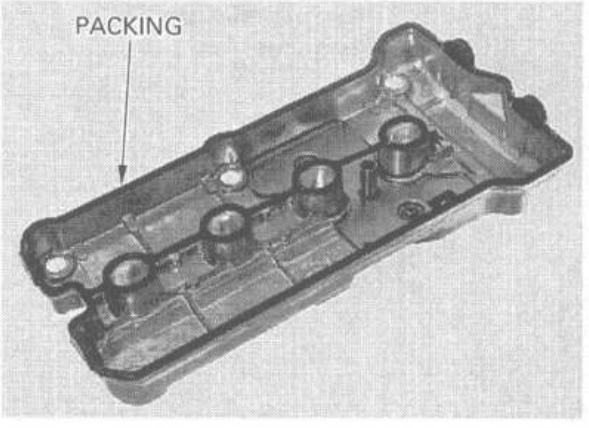


Apply a locking agent to the crankcase breather separator mounting bolt threads.
Tighten the bolts to the specified torque.

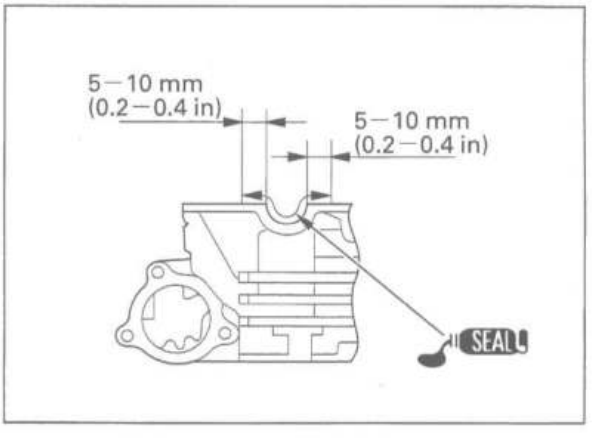
TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)



Install the cylinder head packing into the groove of the cylinder head cover.

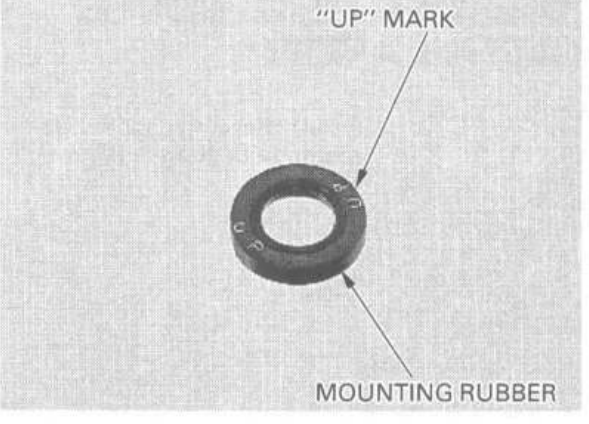


Apply sealant to the cylinder head semi-circular cut-outs as shown.



Install the cylinder head cover onto the cylinder head.

Install the washers with their "UP" mark facing up.



Install and tighten the cylinder head cover special bolts to the specified torque.

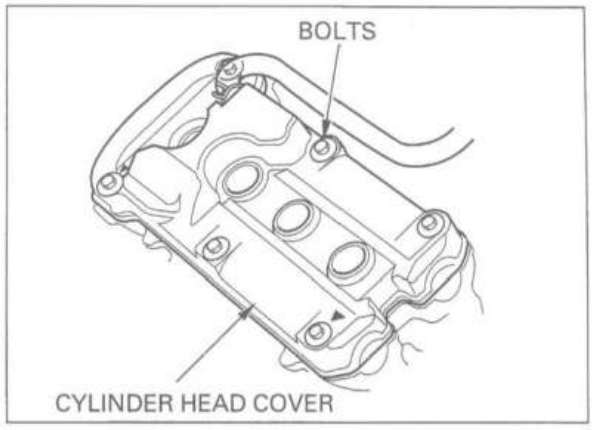
NOTE:

Tighten the "△" marked side bolts first.

TORQUE: 10 N·m (1.0 kgf·m , 7 lbf·ft)

Connect the crankcase breather tube.
Install the ignition coil and spark plug caps.

Install the following:
– Carburetor (page 5-24)
– Air cleaner housing (page 5-5)

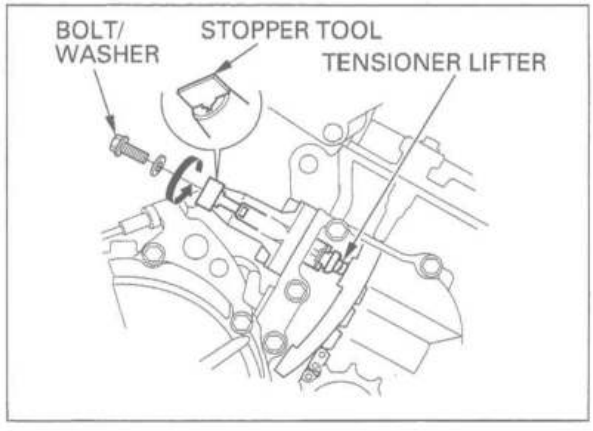


CAM CHAIN TENSIONER LIFTER

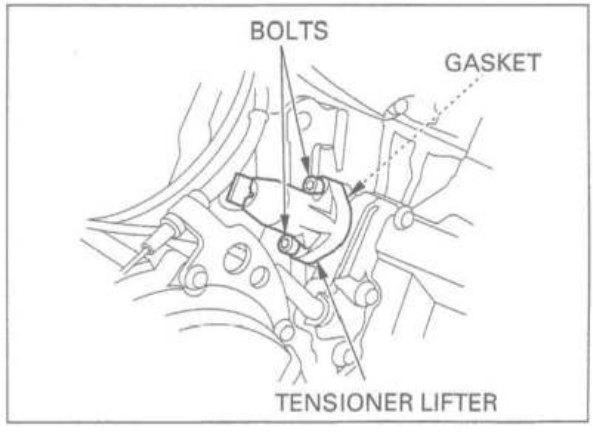
REMOVAL

Remove the cam chain tensioner sealing bolt and sealing washer.

Turn the tensioner shaft fully in (clockwise) and secure it using the stopper tool to prevent damaging the cam chain.
See page 8-5 for detail of the tool.



Remove the bolts, sealing washers and cam chain tensioner lifter.
Remove the gasket.

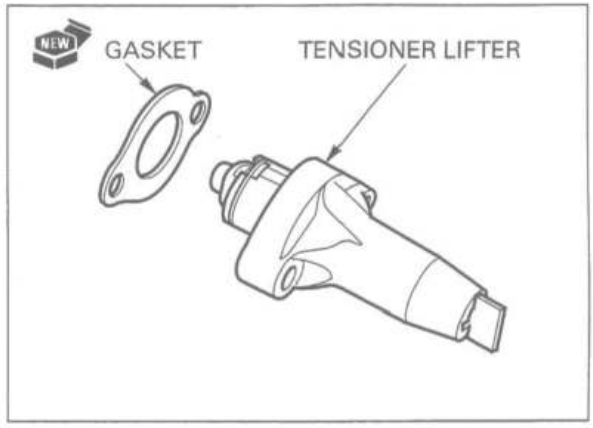


INSTALLATION

Install the new gasket onto the cam chain tensioner lifter.

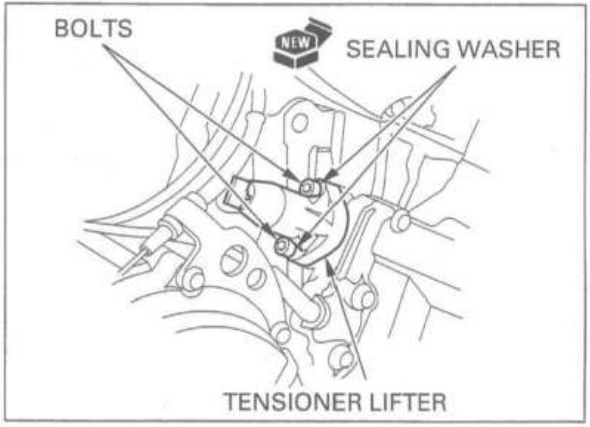
NOTE:

Note the direction of the gasket.

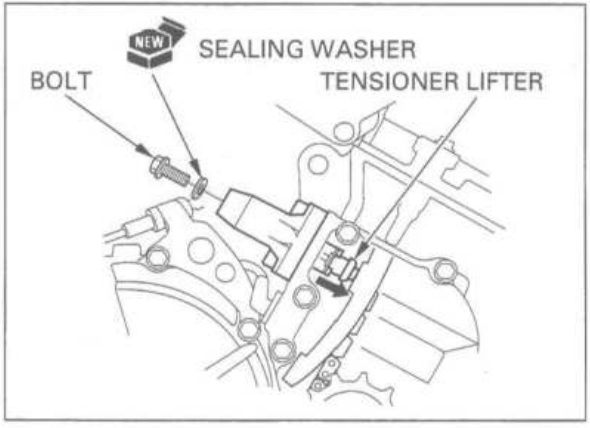


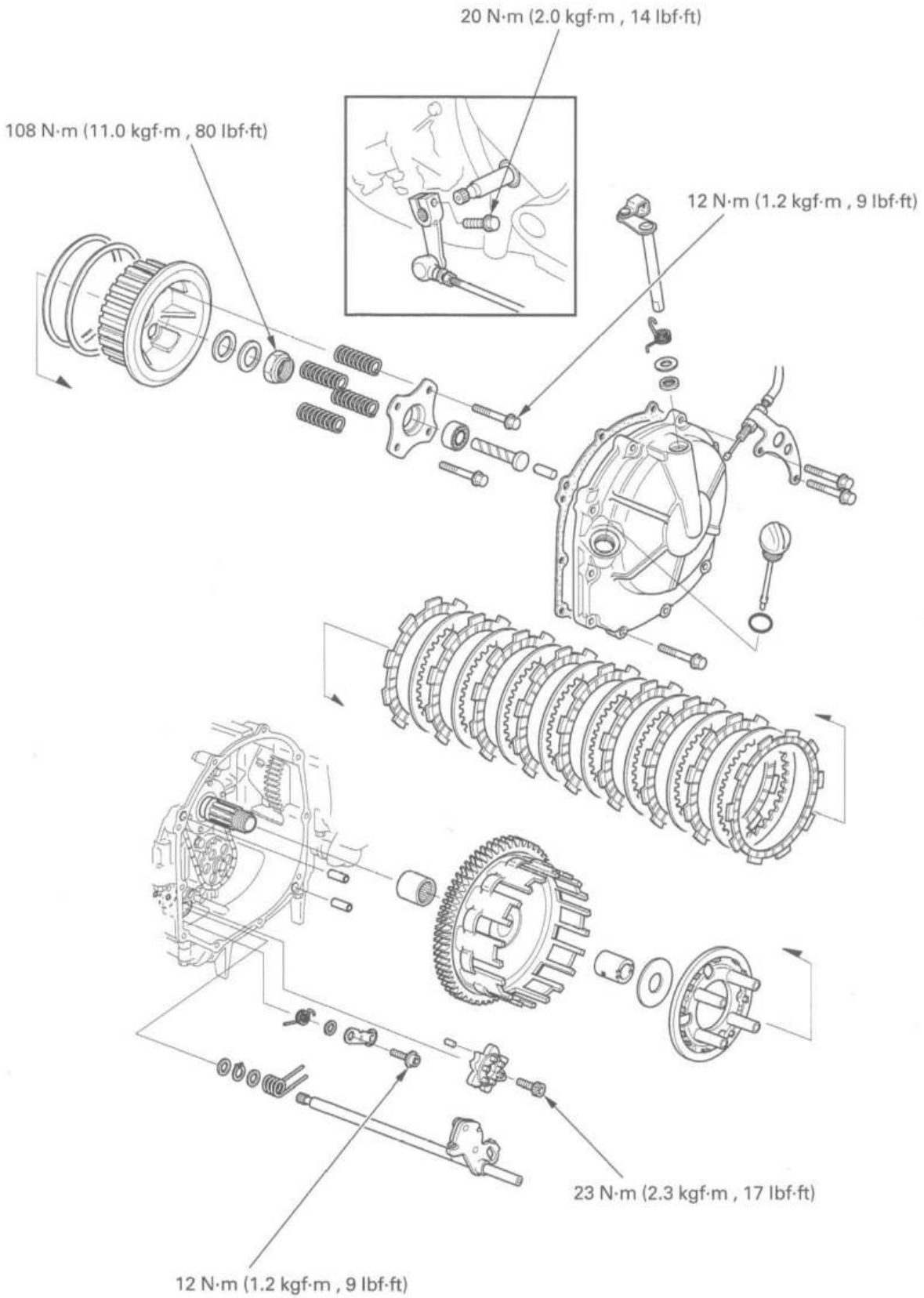
Install the cam chain tensioner lifter into the cylinder block.
Install the new sealing washers and bolts, then tighten the bolts to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m , 7 lbf·ft)



Remove the stopper tool.
Install a new sealing washer and tighten the sealing bolt securely.




20 N·m (2.0 kgf·m , 14 lbf·ft)
108 N·m (11.0 kgf·m , 80 lbf·ft)
12 N·m (1.2 kgf·m , 9 lbf·ft)
23 N·m (2.3 kgf·m , 17 lbf·ft)
12 N·m (1.2 kgf·m , 9 lbf·ft)

9. CLUTCH/GEARSHIFT LINKAGE

SERVICE INFORMATION	9-1	CLUTCH	9-4
TROUBLESHOOTING	9-2	GEARSHIFT LINKAGE	9-11
RIGHT CRANKCASE COVER REMOVAL	9-3	RIGHT CRANKCASE COVER INSTALLATION	9-14

SERVICE INFORMATION

GENERAL

- This section covers service of the clutch and gearshift linkage. All service can be done with the engine installed in the frame.
- Transmission oil viscosity and level have an effect on clutch disengagement. When the clutch does not disengage or the motorcycle creeps with clutch disengaged, inspect the transmission oil level before servicing the clutch system.
- See section 12 for shift forks, shift fork shaft, shift drum and transmission service.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Clutch lever free play		10 – 20 (3/8 – 13/16)	———
Clutch spring free length		49.7 (1.96)	48.3 (1.90)
Clutch disc thickness		2.92 – 3.08 (0.115 – 0.121)	2.60 (0.102)
Clutch plate warpage		———	0.30 (0.012)
Clutch outer guide	I.D.	21.994 – 22.007 (0.8659 – 0.8664)	22.017 (0.8668)
	O.D.	34.975 – 34.991 (1.3770 – 1.3776)	34.965 (1.3766)
Mainshaft O.D. at clutch outer guide		21.980 – 21.993 (0.8654 – 0.8659)	21.95 (0.864)

TORQUE VALUES

Clutch center lock nut	108 N·m (11.0 kgf·m , 80 lbf·ft)	Apply oil to the threads and flange surface Stake the nut
Clutch spring bolt	12 N·m (1.2 kgf·m , 9 lbf·ft)	
Shift drum center socket bolt	23 N·m (2.3 kgf·m , 17 lbf·ft)	
Shift drum stopper pivot bolt	12 N·m (1.2 kgf·m , 9 lbf·ft)	
Gearshift return spring pin	23 N·m (2.3 kgf·m , 17 lbf·ft)	
Gearshift pedal link bolt (gearshift spindle side)	20 N·m (2.0 kgf·m , 14 lbf·ft)	

TOOLS

Clutch center holder	07JMB-MN50301
Driver	07749-0010000
Attachment, 37 × 40 mm	07746-0010200
Attachment, 42 × 47 mm	07746-0010300
Pilot, 35 mm	07746-0040800

TROUBLESHOOTING

Hard to shift
- Incorrect clutch adjustment
- Improper oil viscosity
- Bent shift fork
- Bent shift fork shaft
- Bent fork claw
- Damaged shift drum cam groove
- Loose stopper plate bolt
- Damaged stopper plate and pin
- Damaged gearshift spindle

Transmission jumps out of gear
- Worn shift drum stopper arm
- Weak or broken shift arm return spring
- Loose stopper plate bolt
- Bent shift fork shaft
- Damaged shift drum cam groove
- Damaged or bent shift forks
- Worn gear engagement dogs or slots

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

Clutch lever too hard to pull in
- Damaged, kinked or dirty clutch cable
- Damaged clutch lifter mechanism
- Faulty clutch lifter bearing
- Clutch lifter piece installed improperly

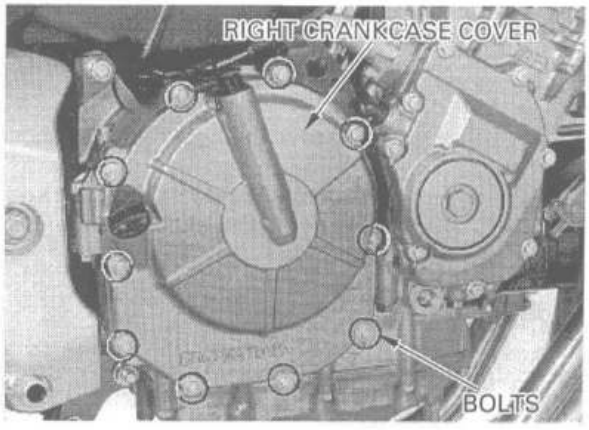
Clutch slips when accelerating
- Incorrect clutch adjustment
- Worn clutch disc
- Weak clutch springs
- Transmission oil mixed with molybdenum or graphite additive

Motorcycle creeps with the engine idling
- Incorrect clutch adjustment
- Clutch plate warped
- Loose clutch lock nut
- Oil level too high
- Improper oil viscosity
- Damaged clutch lifter mechanism
- Clutch lifter piece installed improperly

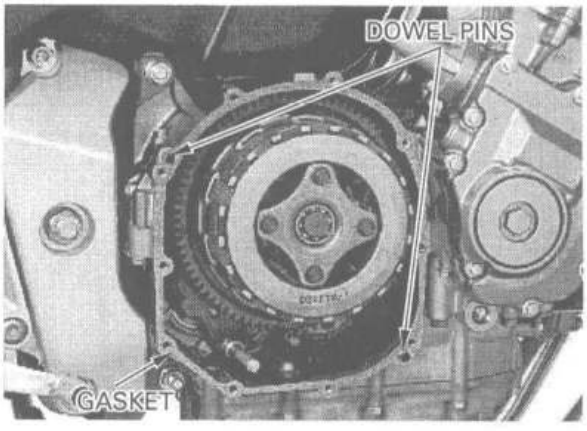
RIGHT CRANKCASE COVER REMOVAL

Drain the engine oil (page 3-12).

Remove the clutch cable holder SH bolts and clutch cable holder, then disconnect the clutch cable from the clutch arm.
Remove the oil filler cap/dipstick.
Remove the right crankcase cover SH bolts and right crankcase cover.



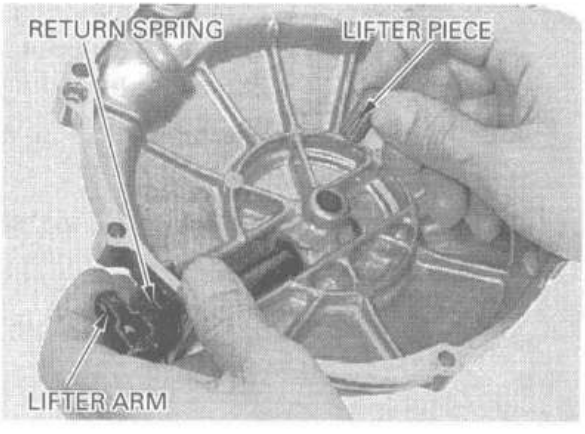
Remove the gasket and dowel pins.



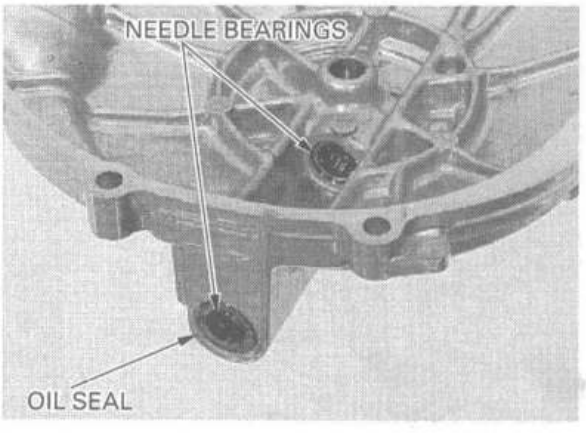
CLUTCH LIFTER INSPECTION

Remove the clutch lifter piece.
Remove the clutch lifter arm, return spring and washer.

Check the return spring for fatigue or damage.
Check the clutch lifter arm shaft for wear or bending.



Check the needle bearings for wear, damage or loose fit.
Check the oil seal for fatigue or damage.

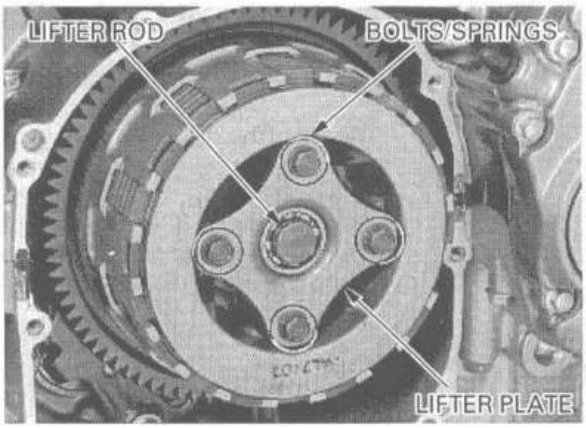


CLUTCH

REMOVAL

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

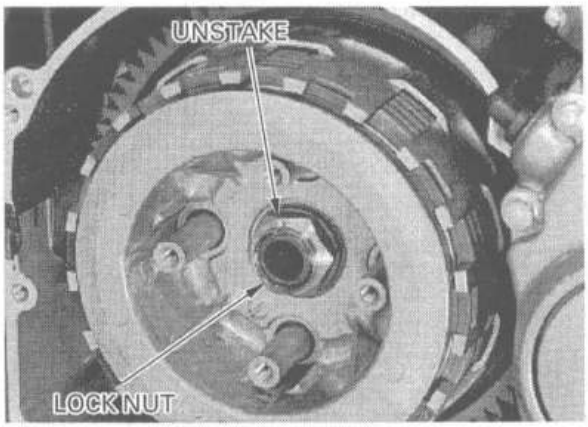
Remove the clutch lifter rod and bearing.
Remove the clutch flange bolts, lifter plate and springs.



Unstake the clutch center lock nut.

CAUTION:

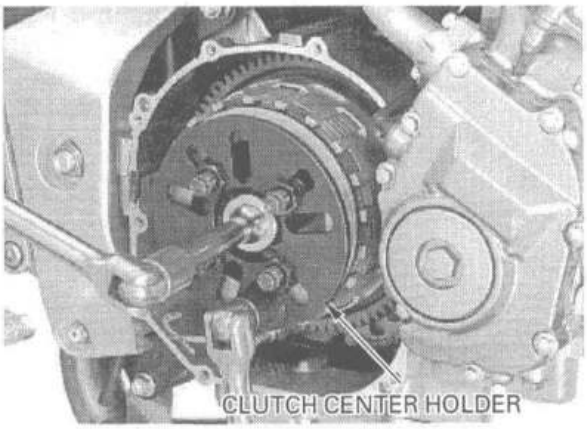
Be careful not to damage the mainshaft threads.



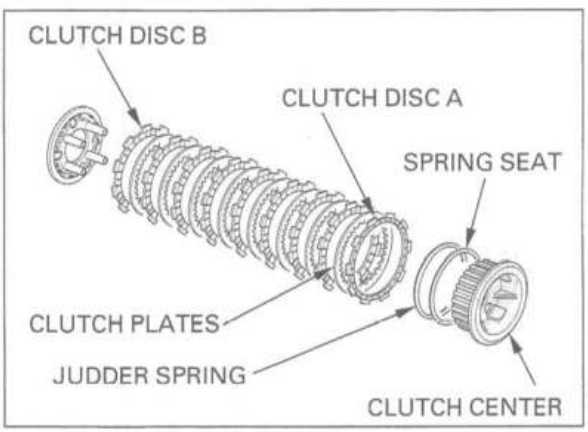
Hold the pressure plate with the clutch center holder, then remove the lock nut.

TOOL:
Clutch center holder 07724-0050002

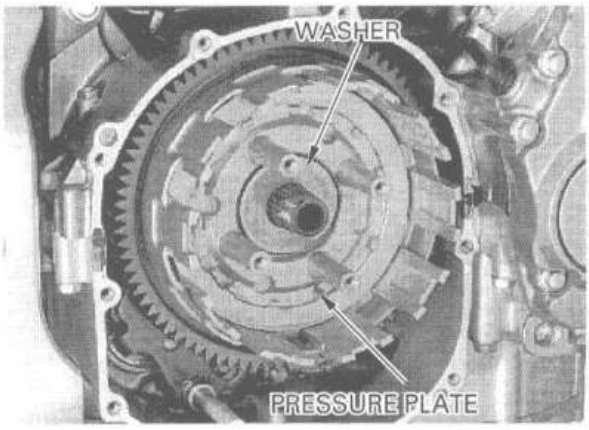
Discard the lock nut.
Remove the lock washer and thrust washer.



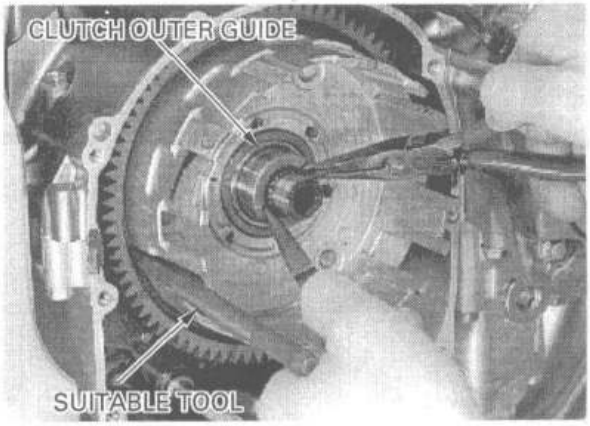
Remove the following:
- Clutch center
- Judder spring
- Spring seat
- Clutch disc A
- Clutch plates
- Clutch disc B



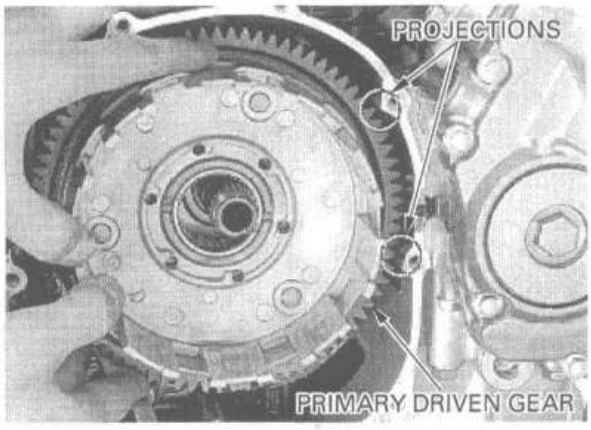
Remove the pressure plate and thrust washer.



Insert a 5 mm pin (or suitable tool) into the holes in the primary driven gears to align the gear teeth.
Pull the clutch outer guide out by pinching the ribs on the clutch outer guide and sliding the guide forward.

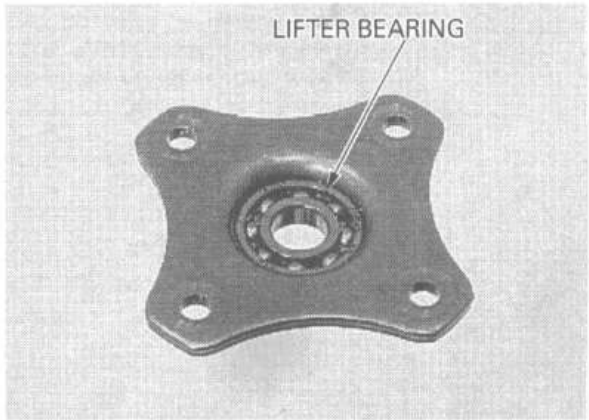


Remove the clutch outer from the mainshaft by positioning the projections of the crankcase between the teeth of the primary driven gears.



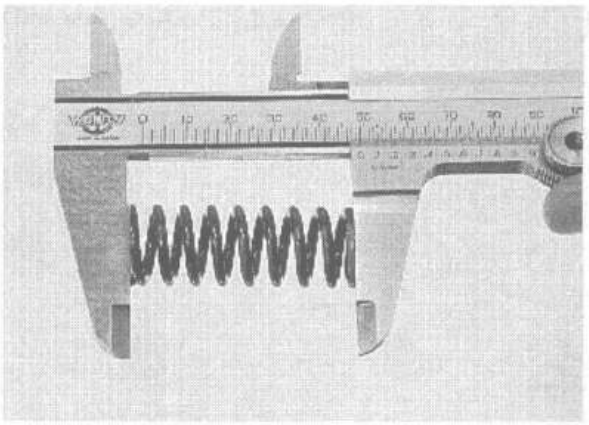
INSPECTION

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



Clutch spring
Measure the clutch spring free length.

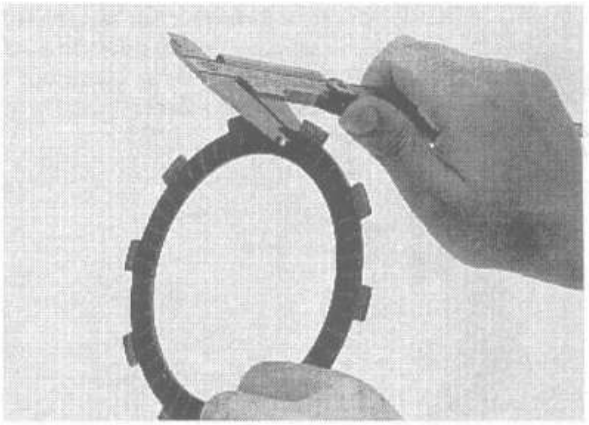
SERVICE LIMIT: 48.3 mm (1.90 in)



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

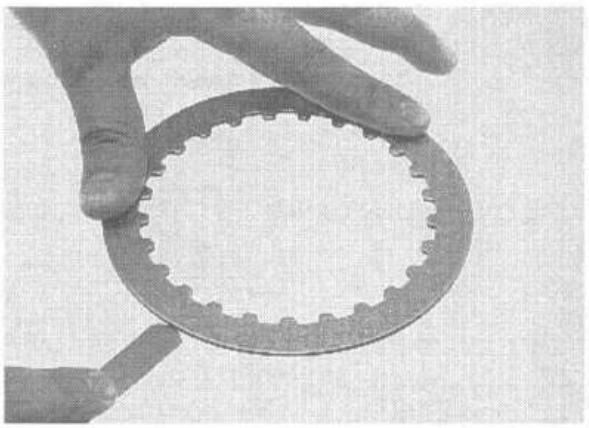
Measure the disc thickness of each disc.

SERVICE LIMIT: 2.60 mm (0.102 in)

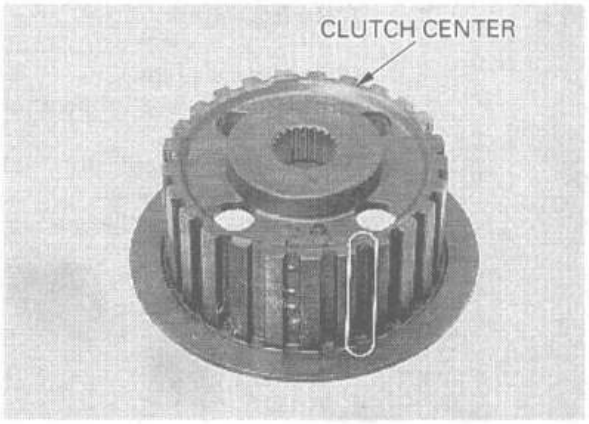


Clutch plate
Check each disc plate for warpage on a surface plate using a feeler gauge.

SERVICE LIMIT: 0.30 mm (0.012 in)

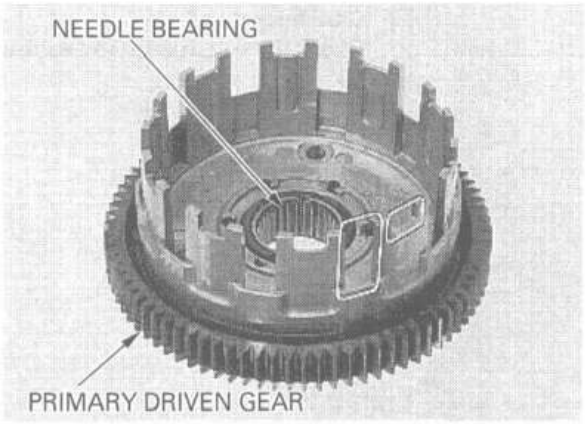


Clutch center
Check the grooves of the clutch center for damage or wear caused by the clutch plates.
Replace if necessary.

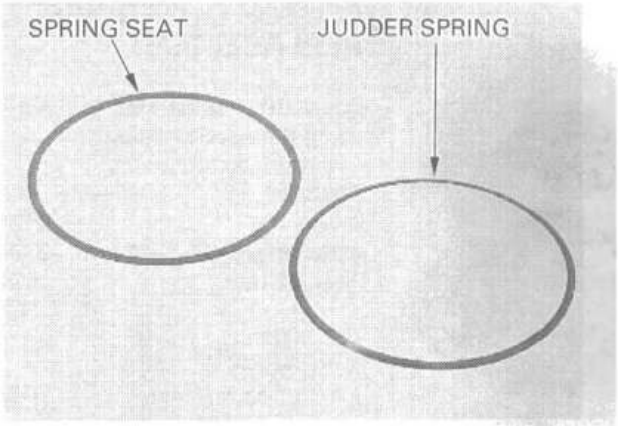


Clutch outer
Check the slots of the clutch outer for damage or wear caused by the clutch discs.
Replace if necessary.

Check the serrated teeth of the primary driven gear for wear or damage.
Check the needle bearing for wear or damage.

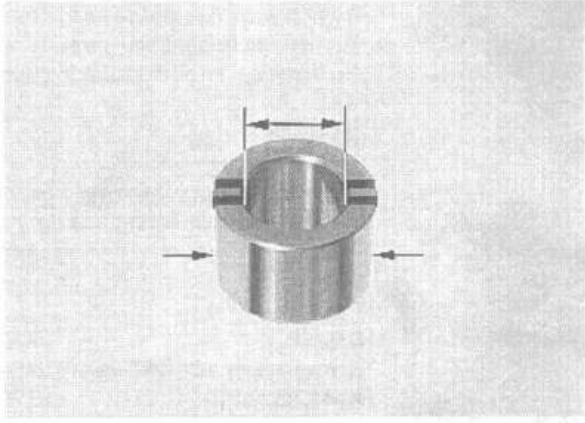


Judder spring/spring seat
Check the judder spring and seat for damage or warpage.



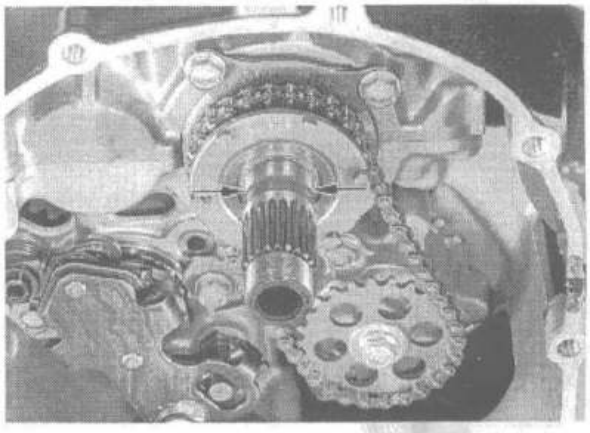
Clutch outer guide
Measure the O.D. and I.D. of the clutch outer guide.

SERVICE LIMITS: O.D.: 34.965 mm (1.3766 in)
I.D.: 22.017 mm (0.8668 in)

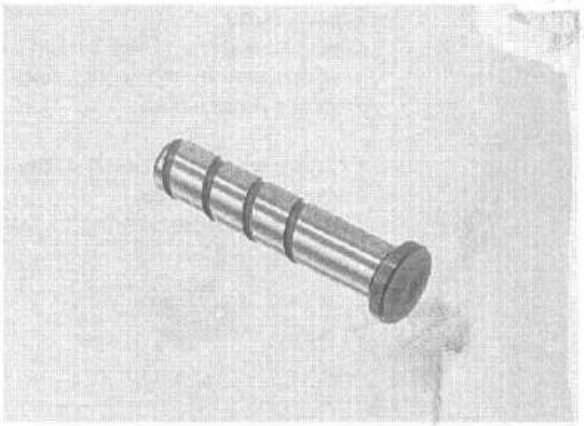


Mainshaft
Measure the mainshaft O.D. at clutch outer guide sliding surface.

SERVICE LIMIT: 21.95 mm (0.864 in)



Clutch lifter rod
Check the clutch lifter rod for wear or damage.

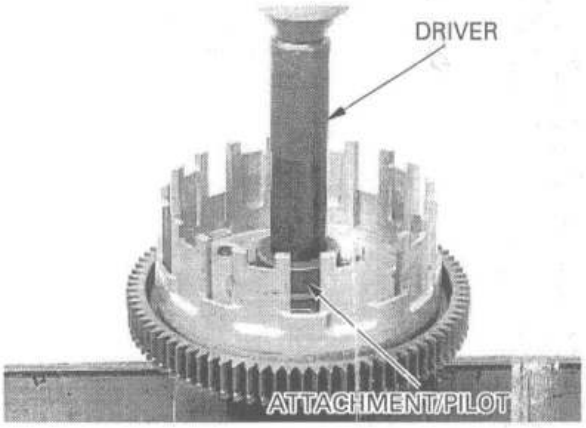


CLUTCH OUTER NEEDLE BEARING REPLACEMENT

Press the needle bearing out of the clutch outer using the special tools.

TOOLS:

Driver	07749-0010000
Attachment, 37 × 40 mm	07746-0010200
Pilot, 35 mm	07746-0040800



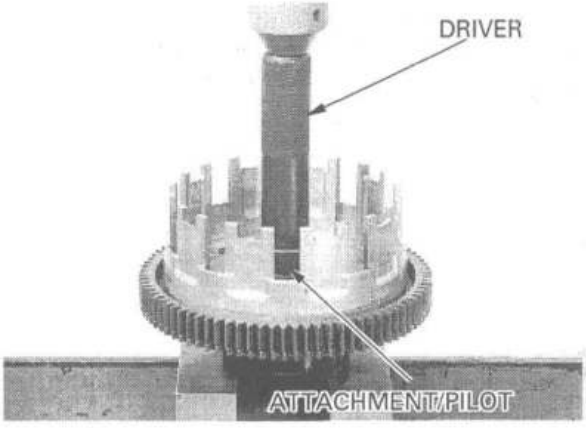
Press a new needle bearing into the clutch outer so that the casing of the needle bearing is flush with the inner edge of the clutch outer as shown.

NOTE:

Press the needle bearing into the clutch outer with the marked side facing up.

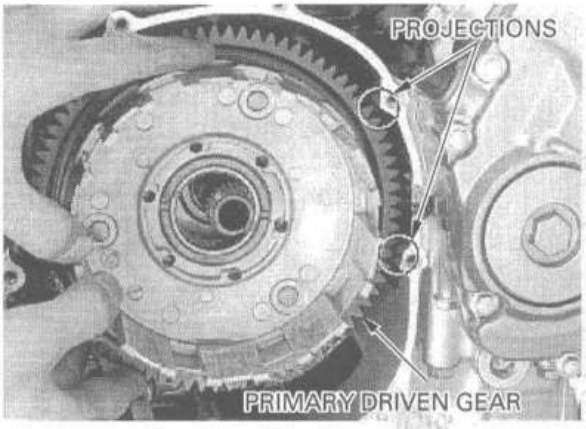
TOOLS:

Driver	07749-0010000
Attachment, 42 × 47 mm	07746-0010300
Pilot, 35 mm	07746-0040800



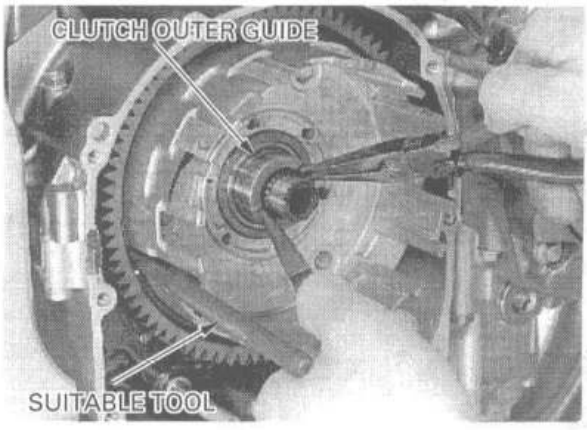
INSTALLATION

Apply molybdenum disulfide oil to the clutch outer needle bearing.
Install the clutch outer onto the mainshaft by positioning the projections of the crankcase between the teeth of the primary driven gears.

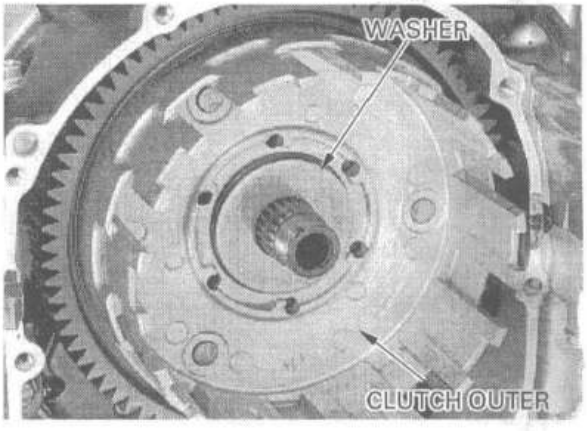


Line up the gear teeth of the primary driven gears with a 5 mm pin (or suitable tool).
Apply molybdenum disulfide oil to the clutch outer guide.
Install the clutch outer guide with the ribbed side facing out.
Install the clutch outer, aligning the clutch outer holes with the oil pump driven sprocket pushing in on the clutch outer lightly.

After installing the clutch outer guide, remove the 5 mm pin (or suitable tool) from the primary driven gear.



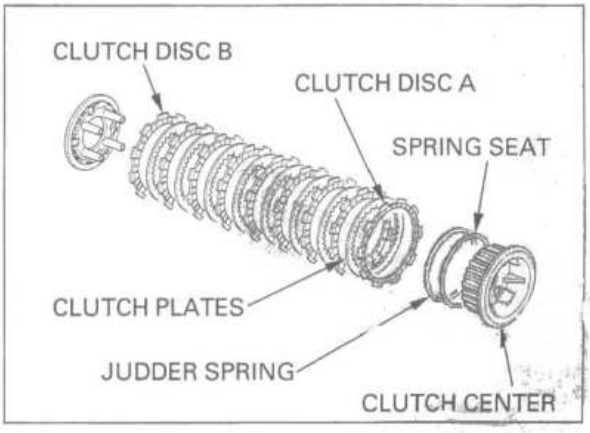
Install the washer onto the mainshaft.



Coat the clutch discs, plates with clean engine oil.

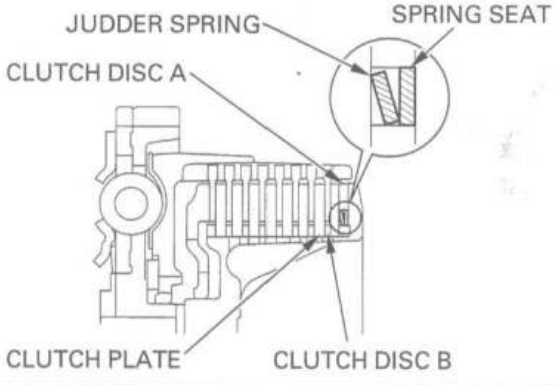
Install the spring seat and judder spring onto the clutch center as shown.
Install the clutch disc A (larger I.D. disc) into the clutch outer.

Stack the clutch discs and plates alternately.

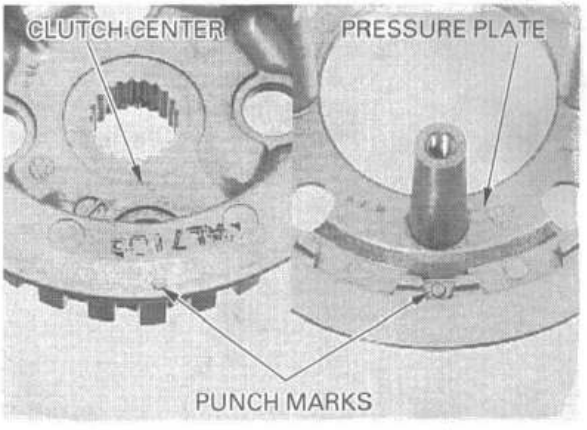


NOTE:

Note the direction of the judder spring.



Install the pressure plate to the clutch center aligning the punch marks between the clutch center and pressure plate.

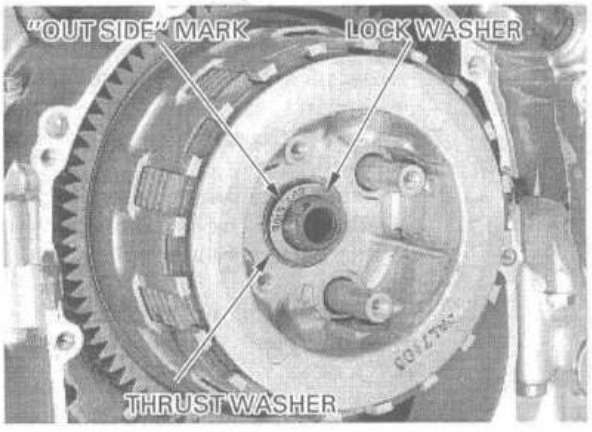


Install the clutch center assembly into the clutch outer.

NOTE:

Install the outer clutch disc A in the shallow slot on the clutch outer.

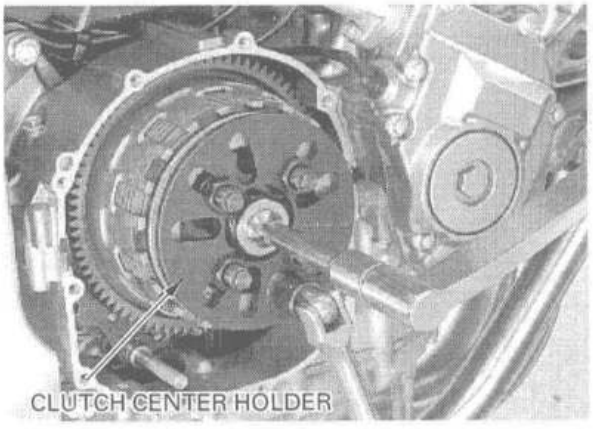
Install the thrust washer onto the mainshaft.
Install the cone washer onto the mainshaft with its "OUTSIDE" mark facing out.



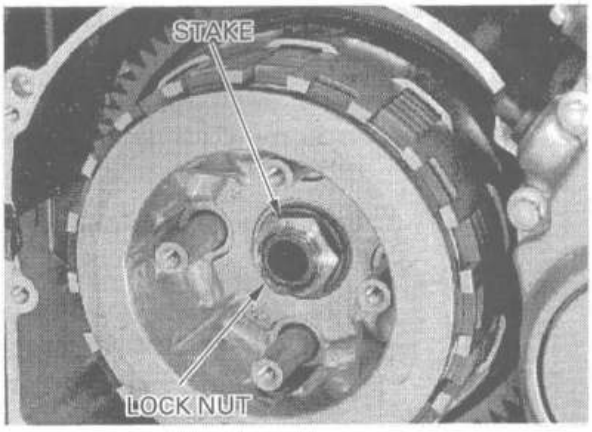
Apply oil to the new clutch center lock nut threads, then install it onto the mainshaft.

Hold the pressure plate with the clutch center holder and tighten the lock nut to the specified torque.

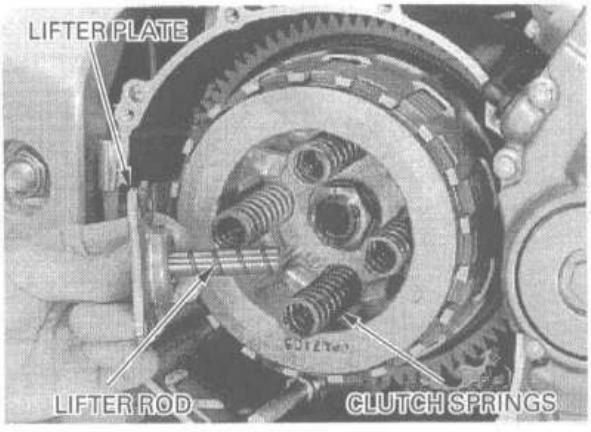
TORQUE: 108 N·m (11.0 kgf·m , 80 lbf·ft)



Stake the lock nut into the mainshaft groove.



Install the clutch springs onto the pressure plate bosses.
Install the clutch lifter bearing and lifter rod into the clutch lifter plate.
Install the clutch lifter plate assembly.

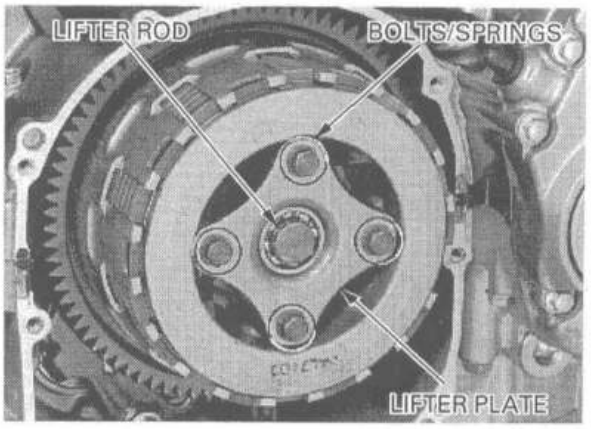


Tighten the bolts in a crisscross pattern in several steps, then tighten them to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

NOTE:

If the clutch lifter rod comes out while tightening the clutch lifter plate bolts, push the rod all the way in to prevent the rod from being bent or damaged.



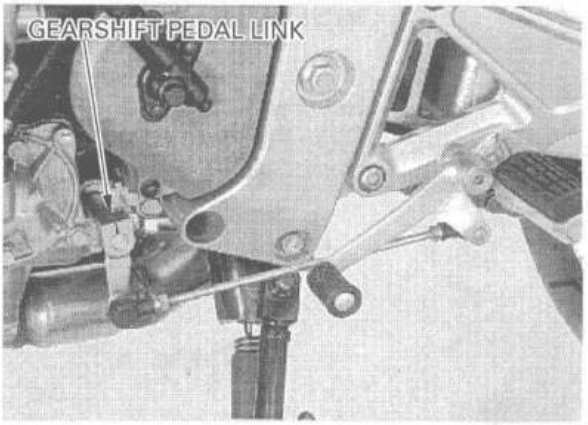
Install the right crankcase cover (page 9-14).

GEARSHIFT LINKAGE

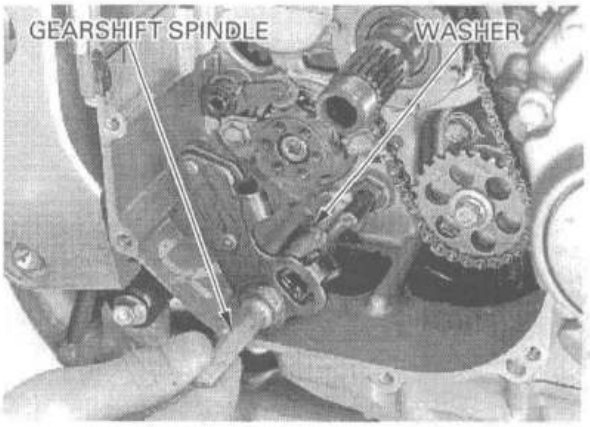
REMOVAL

Remove the following:
- Right crankcase cover (page 9-3)
- Clutch assembly (page 9-4)

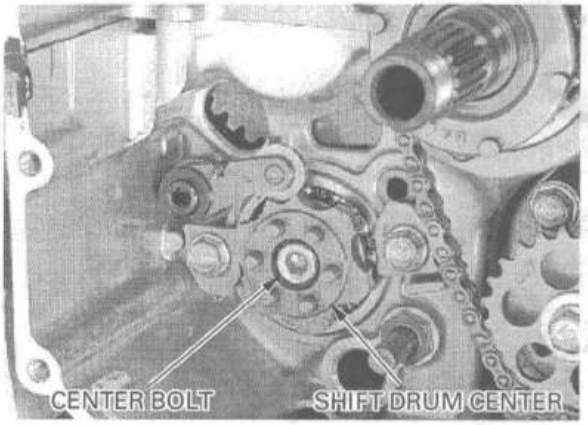
Remove the bolt and gearshift pedal link.



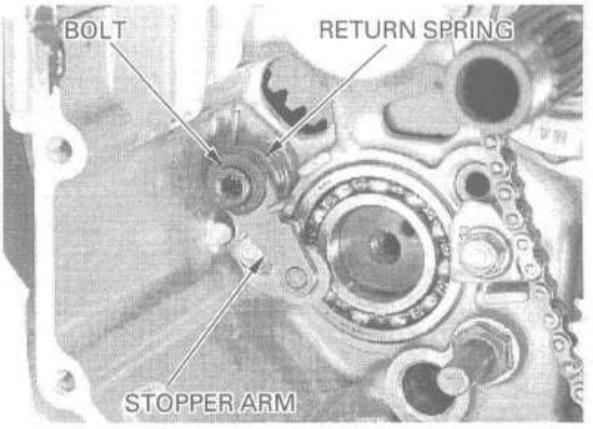
Pull the gearshift spindle assembly and thrust washer out of the crankcase.



Remove the shift drum center bolt, shift drum center and dowel pin.

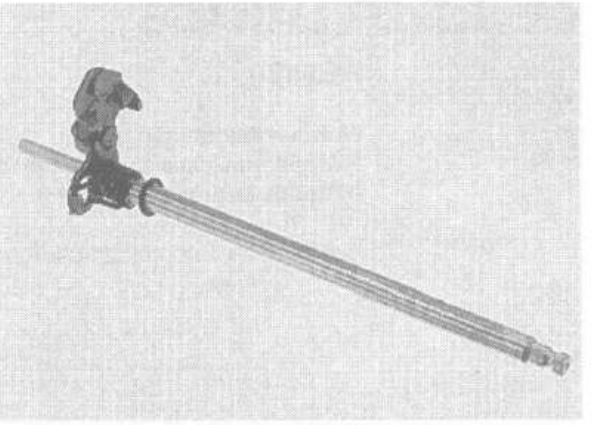


Remove the stopper arm bolt, stopper arm, washer and return spring.

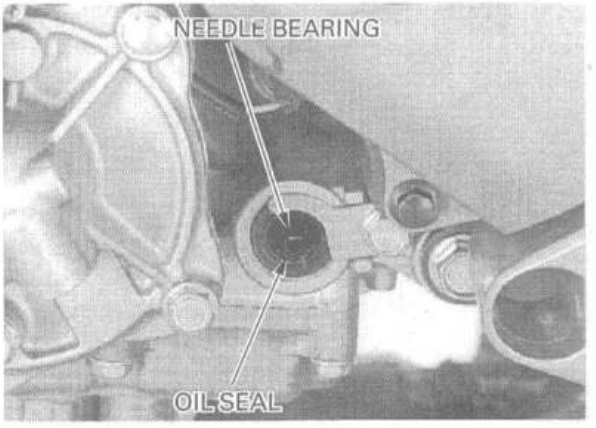


INSPECTION

Check the gearshift spindle for wear, damage or bending.
Check the return spring for fatigue or damage.



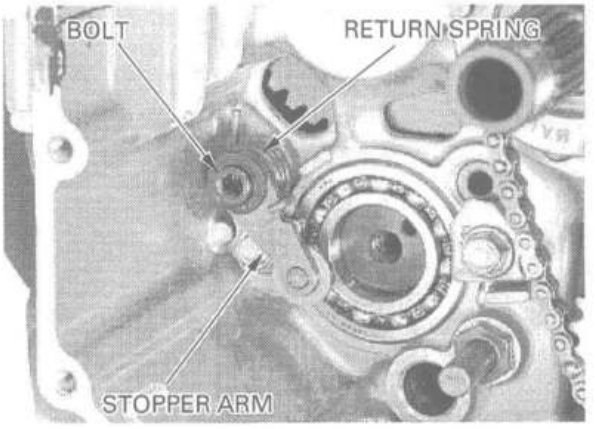
Check the needle bearing for wear or damage.
Check the oil seal for fatigue or damage.



INSTALLATION

Install the following:
- Washer
- Return spring
- Stopper arm

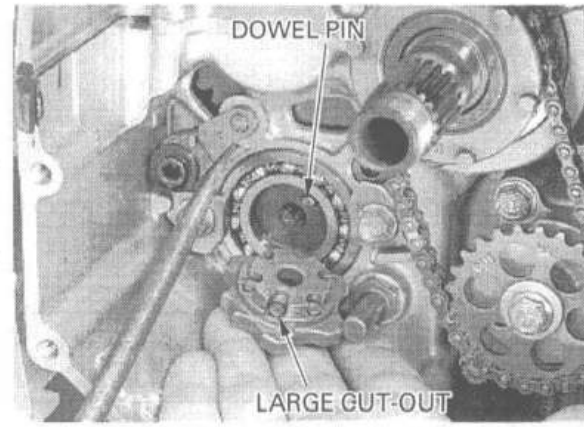
Tighten the stopper arm bolt.



Install the dowel pin onto the shift drum.
Install the gearshift cam while holding the stopper arm using a screwdriver as shown.

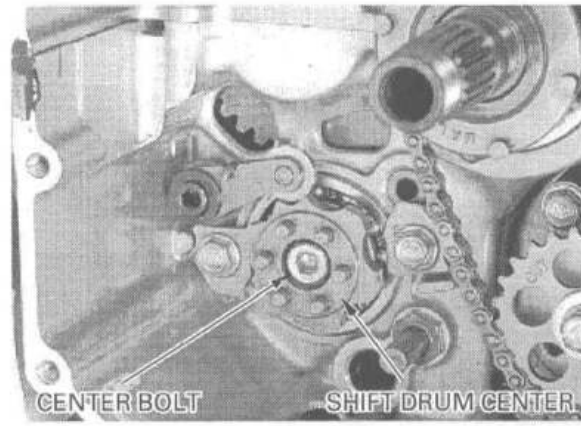
NOTE:

Align the large cut out of the shift drum center with the dowel pin on the shift drum.

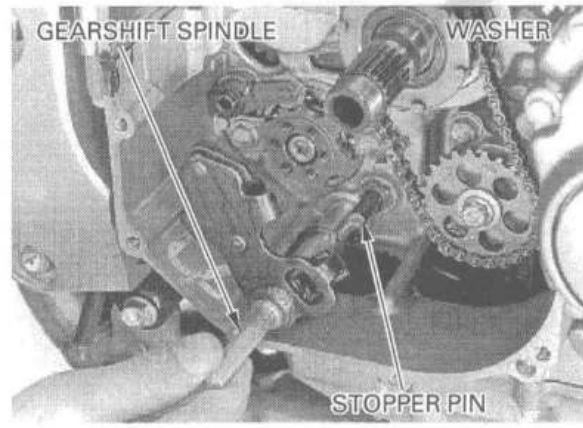


Apply a locking agent to the shift drum center socket bolt threads.
Install and tighten the center bolt to the specified torque.

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



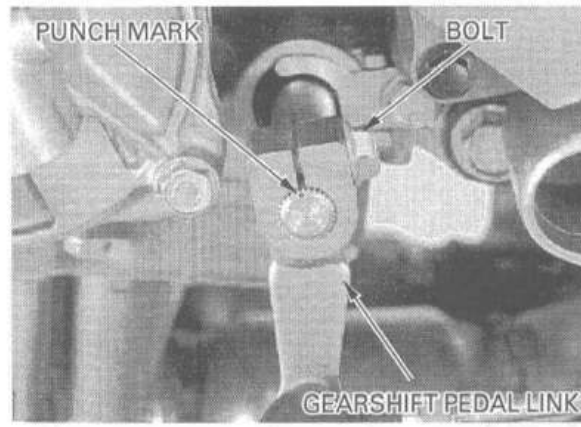
Install the thrust washer and gearshift spindle assembly into the crankcase while aligning the spring ends with the crankcase stopper pin.



Install the gearshift pedal link aligning its slit with the punch mark on the gearshift spindle.
Install and tighten the pinch bolt to the specified torque.

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

Install the following:
- Clutch assembly (page 9-8)
- Right crankcase cover (page 9-14)

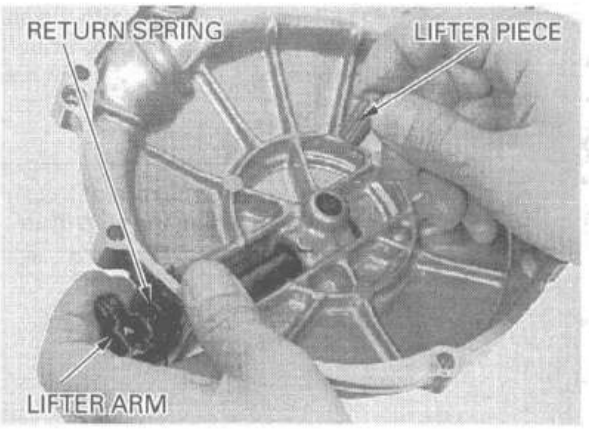


RIGHT CRANKCASE COVER INSTALLATION

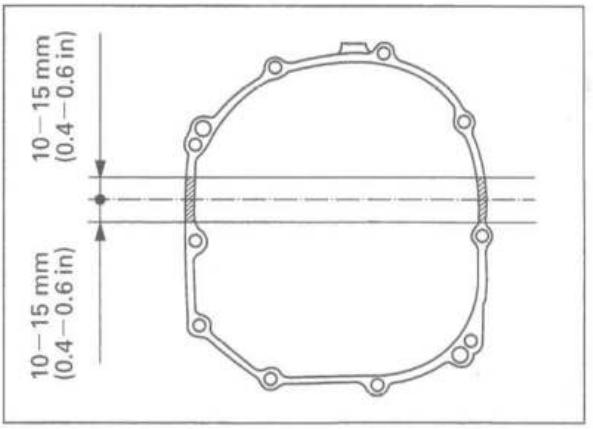
Install the following:
- Dust seal
- Washer
- Return spring
- Clutch lifter arm

NOTE:

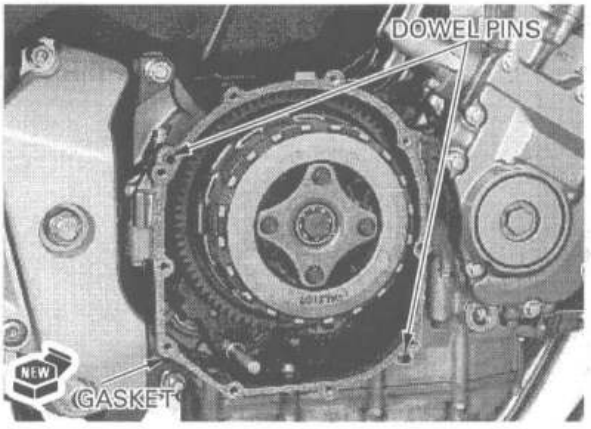
Hook the return spring end onto the right crankcase cover.



Apply a sealant to the mating surfaces of the crankcase as shown.

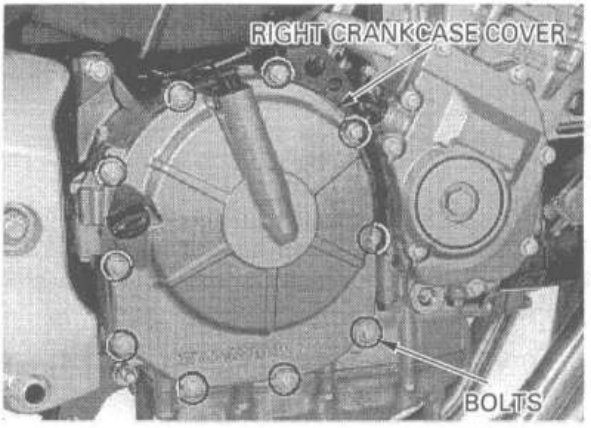


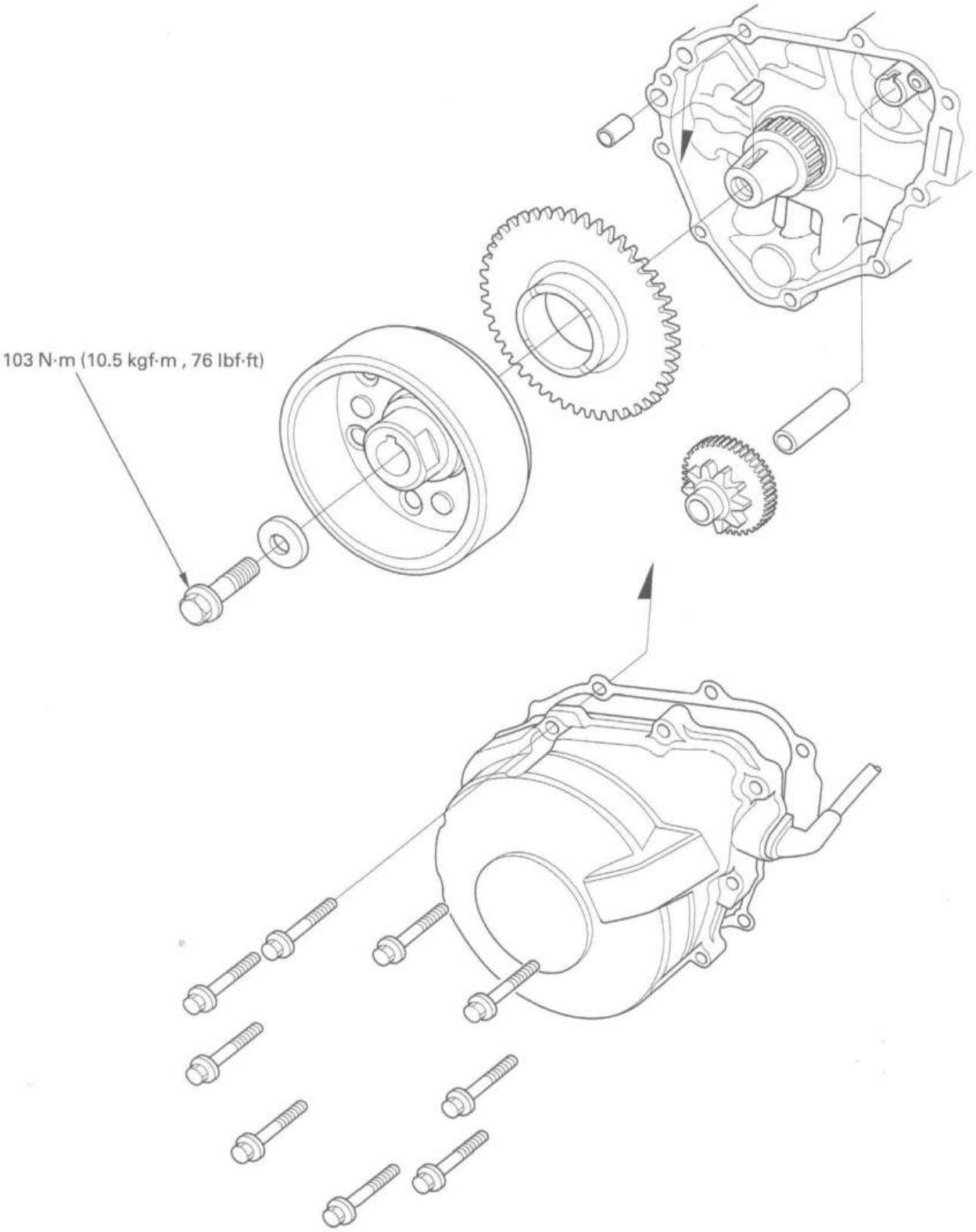
Install the dowel pins and new gasket.



Install the right crankcase cover.
Connect the clutch cable to the clutch lifter arm and set the bracket, then install and tighten the right crankcase cover bolts.

Pour the recommended engine oil (page 3-12).




103 N·m (10.5 kgf·m , 76 lbf·ft)

10. ALTERNATOR/STARTER CLUTCH

SERVICE INFORMATION	10-1	FLYWHEEL REMOVAL	10-4
TROUBLESHOOTING	10-1	STARTER CLUTCH	10-5
ALTERNATOR COVER REMOVAL	10-2	FLYWHEEL INSTALLATION	10-8
STATOR	10-3	ALTERNATOR COVER INSTALLATION	10-9

SERVICE INFORMATION

GENERAL

- This section covers service of the alternator, flywheel and starter clutch. All service can be done with the engine installed in the frame.
- Refer to section 16 for alternator stator inspection.

SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter driven gear O.D.	51.699 – 51.718 (2.0354 – 2.0361)	51.684 (2.0348)

TORQUE VALUES

Flywheel flange bolt	103 N·m (10.5 kgf·m , 76 lbf·ft)	Apply oil to the threads
Stator mounting socket bolt	12 N·m (1.2 kgf·m , 9 lbf·ft)	
Alternator wire clamp socket bolt	10 N·m (1.0 kgf·m , 7 lbf·ft)	
Starter clutch outer socket bolt	16 N·m (1.6 kgf·m , 12 lbf·ft)	Apply a locking agent to the threads

TOOLS

Flywheel holder	07725-0040000
Rotor puller	07733-0020001

TROUBLESHOOTING

Engine does not turn
- Faulty starter clutch
- Damaged idle gear/shaft

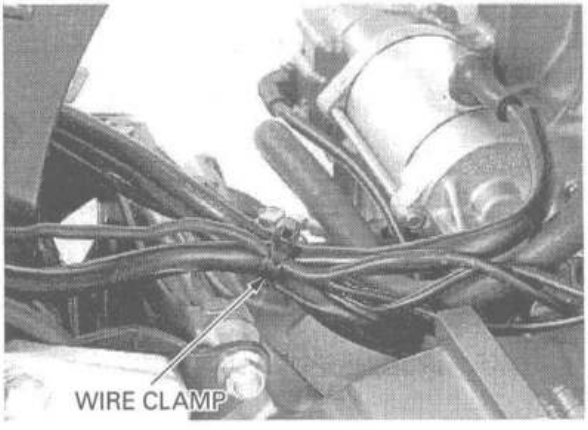
ALTERNATOR COVER REMOVAL

Remove the air cleaner housing (page 5-4).

Disconnect the alternator 3P (White) connector.



Release the alternator wire from the wire clamp.



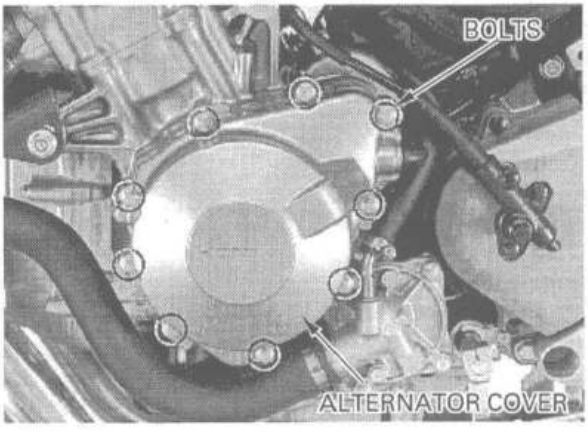
Remove the alternator cover SH bolts and alternator cover.

CAUTION:

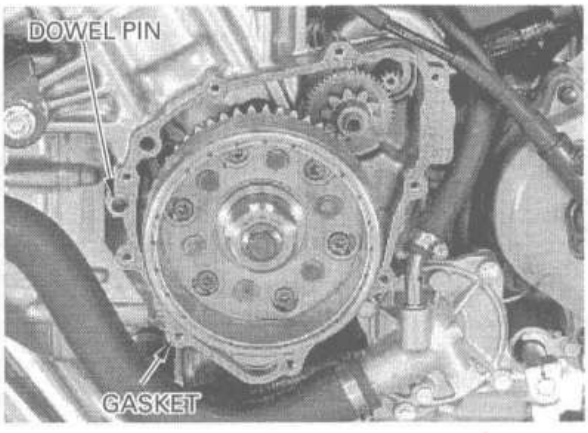
The alternator cover (stator) is magnetically attached to the flywheel, be careful during removal.

NOTE:

The engine oil will run out when the alternator cover is removed. Set a clean oil pan under the engine and add the recommended oil to the specified level after installation.



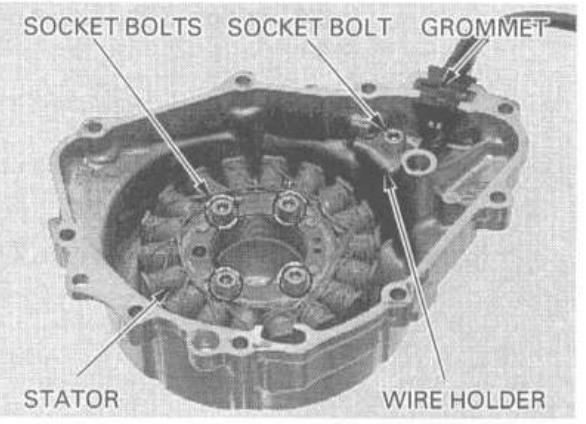
Remove the gasket and dowel pin.



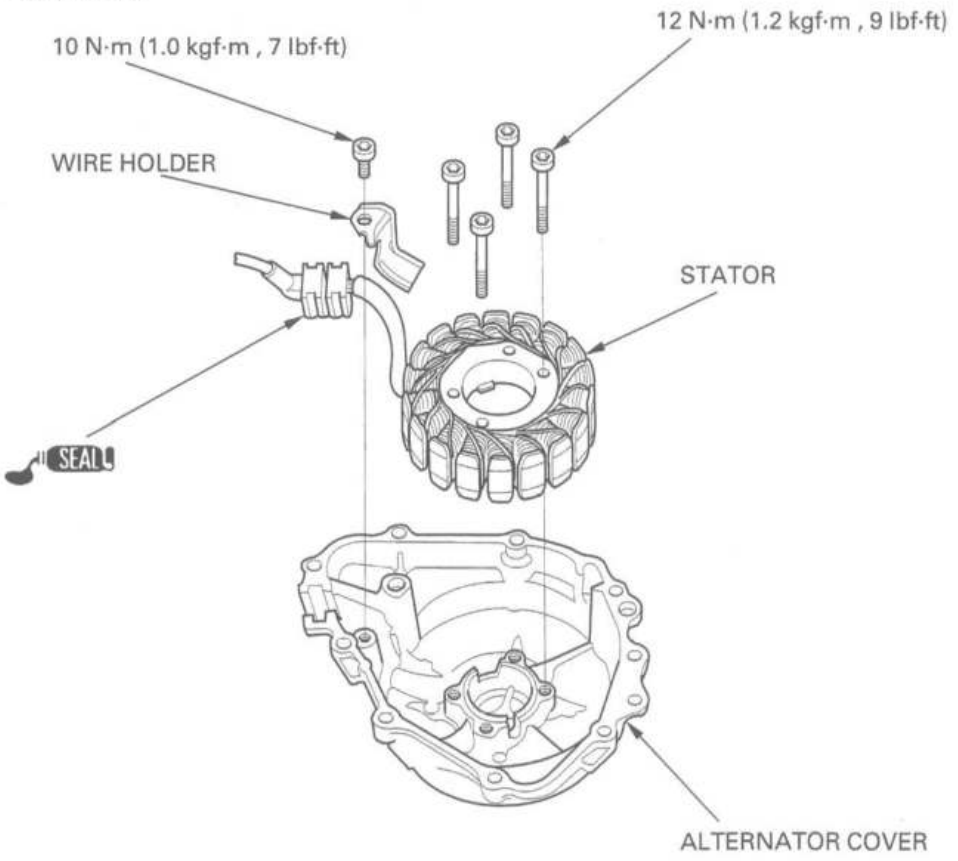
STATOR

REMOVAL

Remove the alternator wire grommet from the alternator cover.
Remove the socket bolt and stator wire holder.
Remove the socket bolts and stator.

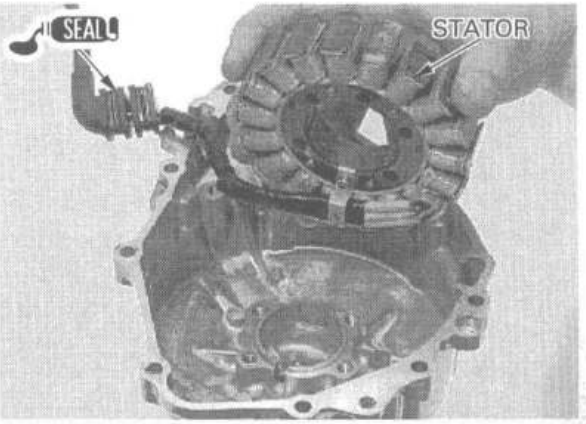


INSTALLATION



Install the stator into the alternator cover.

Apply sealant to the wire grommet, then install the wire grommet into the alternator cover groove securely.

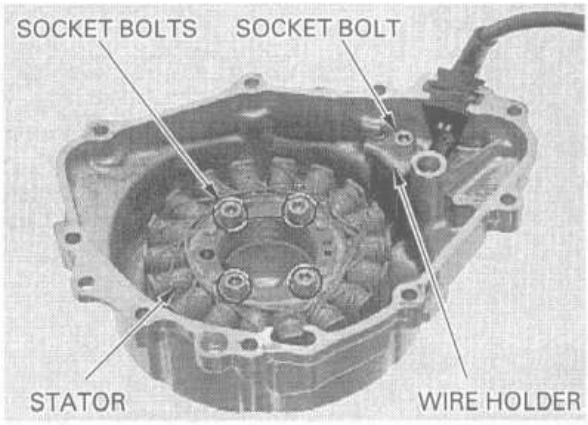


Install and tighten the socket bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

Install the wire holder and tighten the socket bolt to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m , 7 lbf·ft)



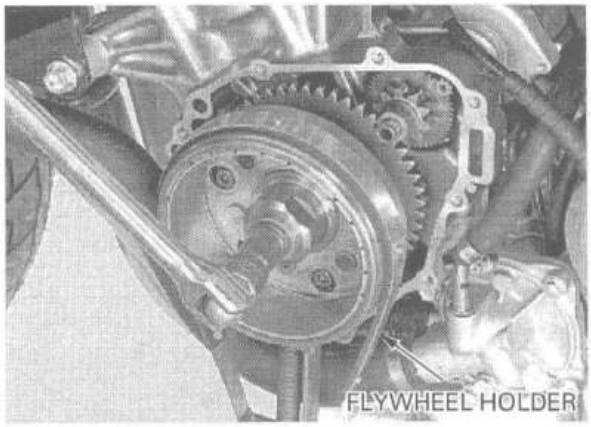
FLYWHEEL REMOVAL

Remove the alternator cover (page 10-2).

Hold the flywheel using the flywheel holder, then remove the flywheel bolt.

TOOL:
Flywheel holder 07725-0040000

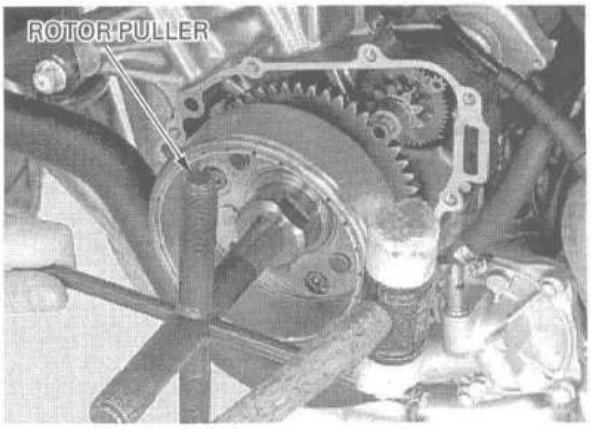
Remove the washer.



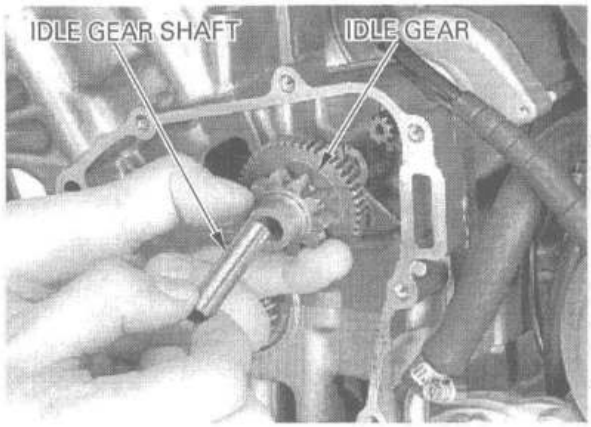
Remove the flywheel using the special tool.

TOOL:
Rotor puller 07733-0020001

Remove the woodruff key.



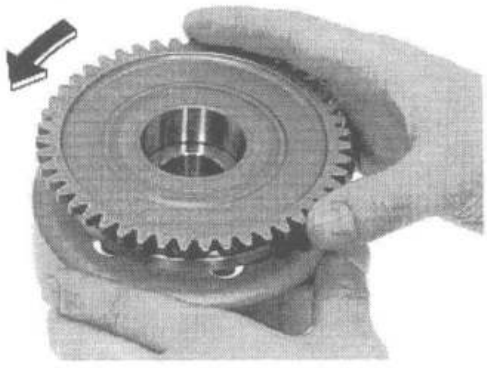
Remove the starter idle gear shaft and idle gear.



STARTER CLUTCH

INSPECTION

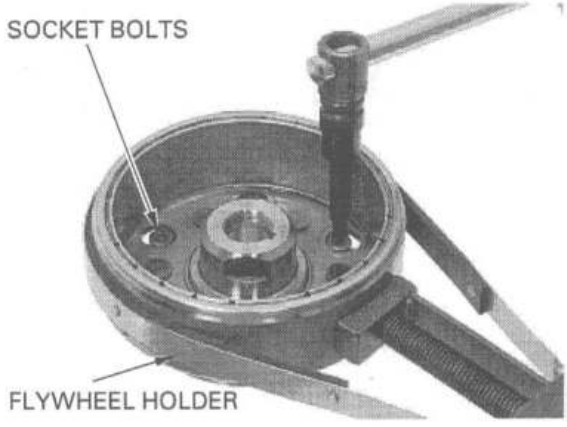
Check the operation of the one-way clutch by turning the driven gear.
You should be able to turn the driven gear counter-clockwise smoothly, but the gear should not turn clockwise.



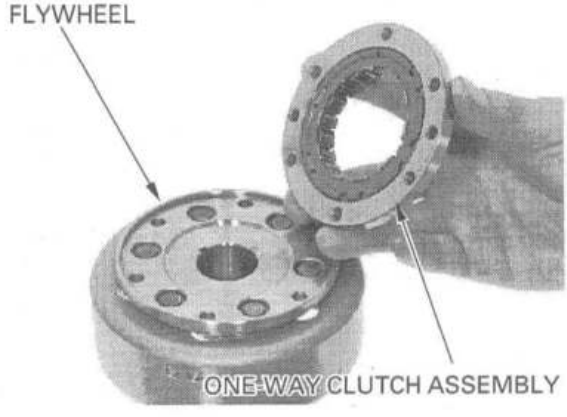
DISASSEMBLY

Remove the starter driven gear by turning it counterclockwise.
Hold the flywheel with a flywheel holder, and remove the starter clutch mounting socket bolts.

TOOL:
Flywheel holder 07725-0040000



Remove the starter one-way clutch assembly.

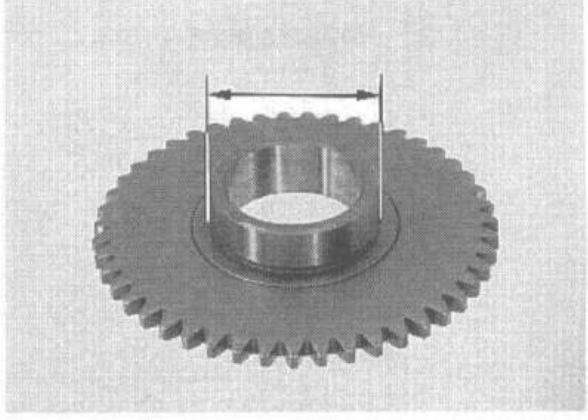


INSPECTION

Check the starter driven gear for abnormal wear or damage.

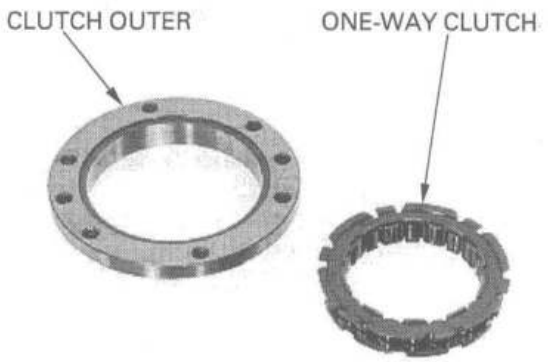
Measure the starter driven gear boss O.D.

SERVICE LIMIT: 51.684 mm (2.0348 in)

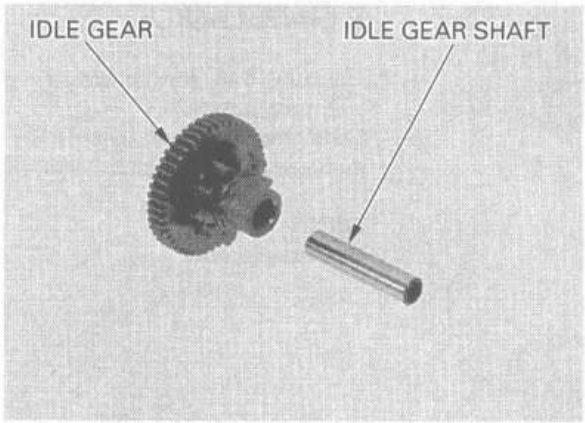


Check the one-way clutch sprag for abnormal wear, damage or irregular movement.

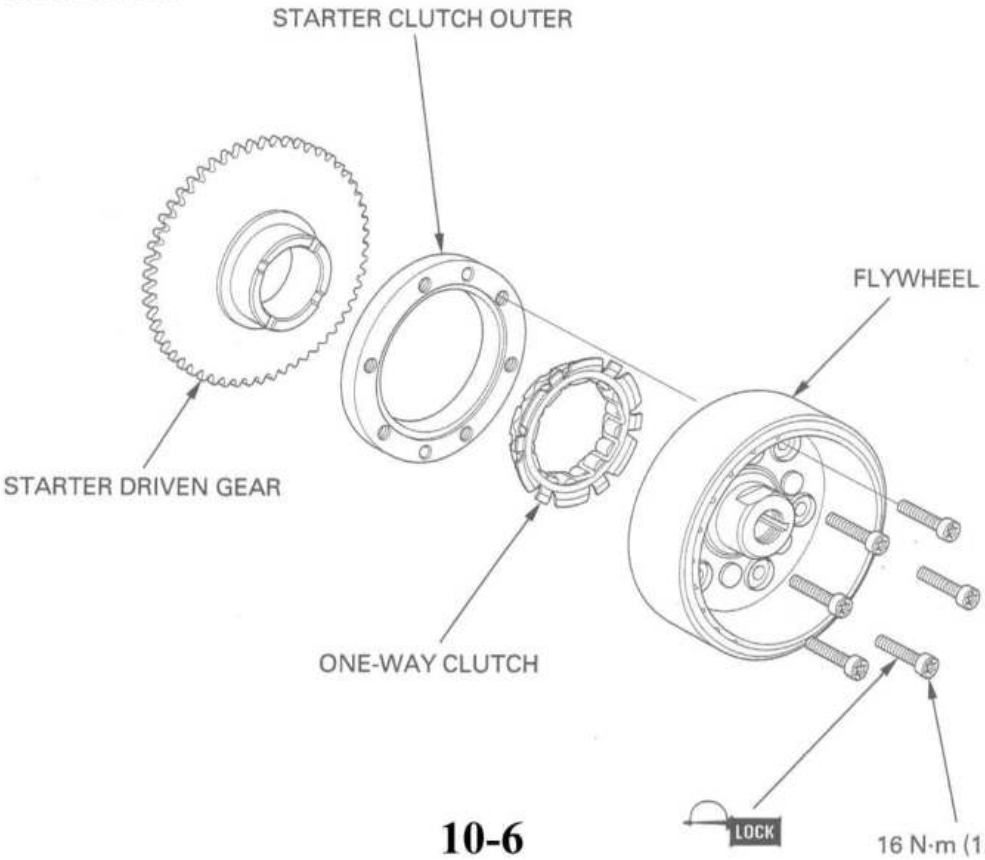
Check the one-way clutch roller contact surface of the clutch outer for abnormal wear or damage, replace if necessary.



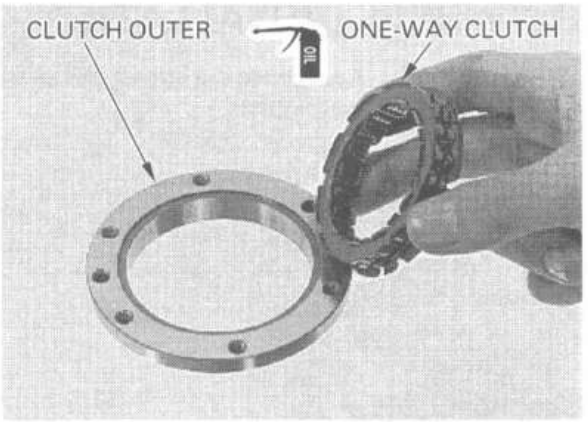
Check the starter idle gear shaft, gear and shaft journal for wear or damage, replace if necessary.



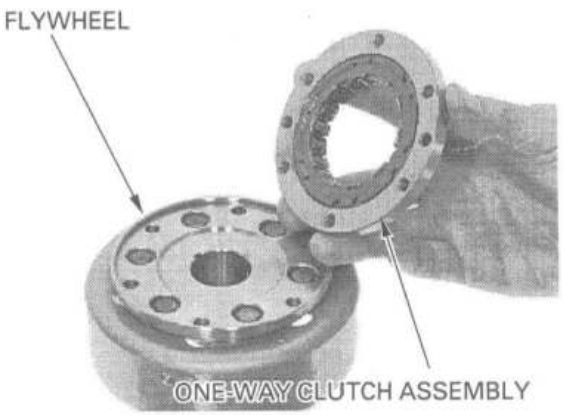
ASSEMBLY



Apply oil to the starter one-way clutch.
Install the one-way clutch into the clutch outer with the flange side facing the flywheel.



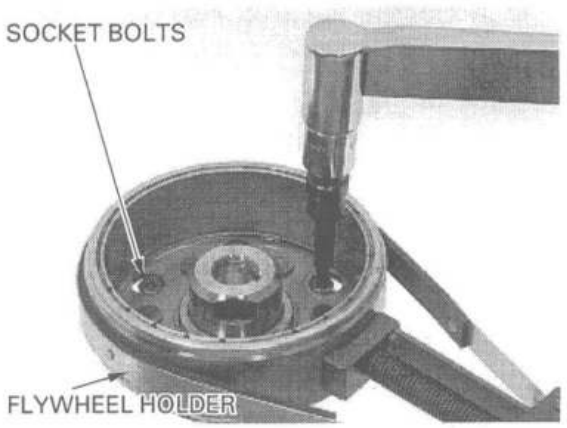
Install the starter one-way clutch assembly onto the flywheel.



Clean and apply a locking agent to the starter clutch outer mounting bolt threads.
Hold the flywheel with a flywheel holder, and tighten the starter clutch mounting socket bolts.

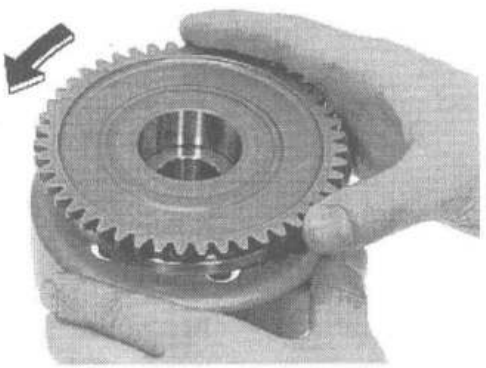
TOOL:
Flywheel holder 07725-0040000

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



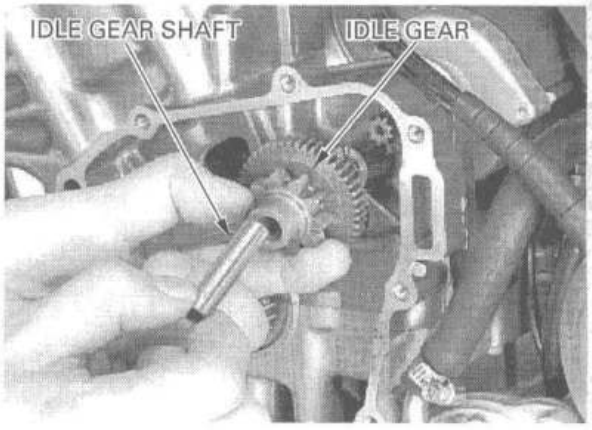
Install the starter driven gear into the one-way clutch.

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

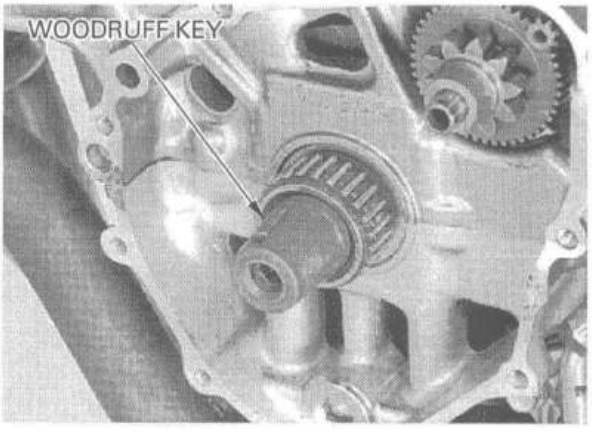


FLYWHEEL INSTALLATION

Apply oil to the starter idle gear and gear shaft, and install them.

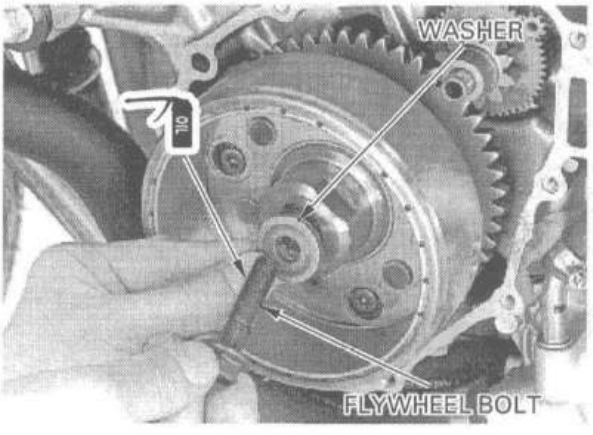


Clean any oil from the crankshaft taper.
Install the woodruff key on the crankshaft.



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

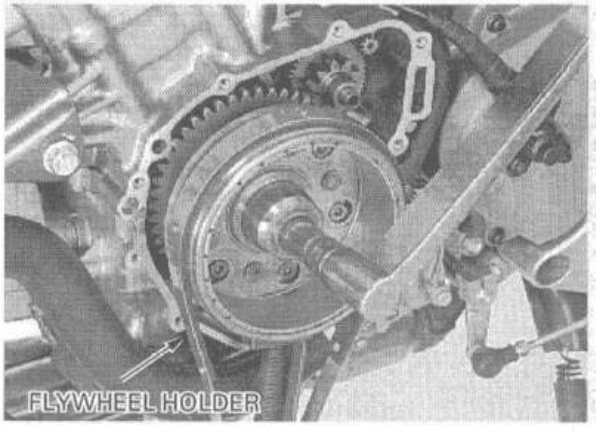
Apply oil to the flywheel bolt threads and seating surface.
Install the washer and flywheel bolt.



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

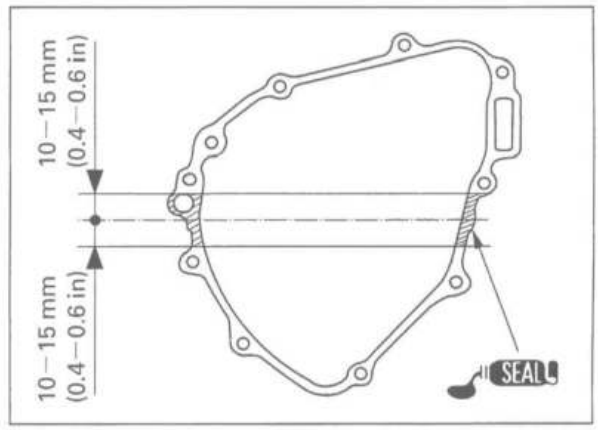
TOOL:
Flywheel holder 07725-0040000

TORQUE: 103 N·m (10.5 kgf·m , 76 lbf·ft)

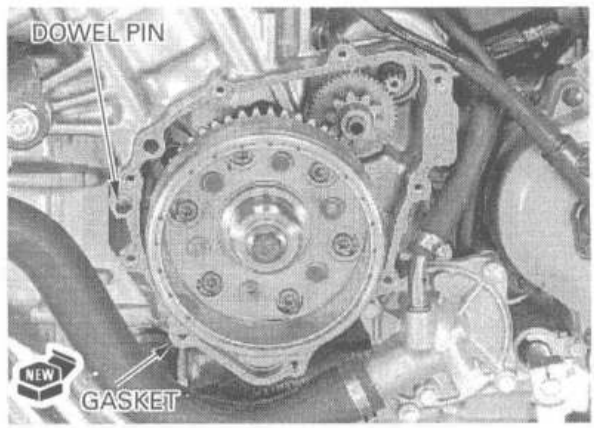


ALTERNATOR COVER INSTALLATION

Apply sealant to the mating surface of the crankcase as shown.



Install the dowel pin and new gasket.

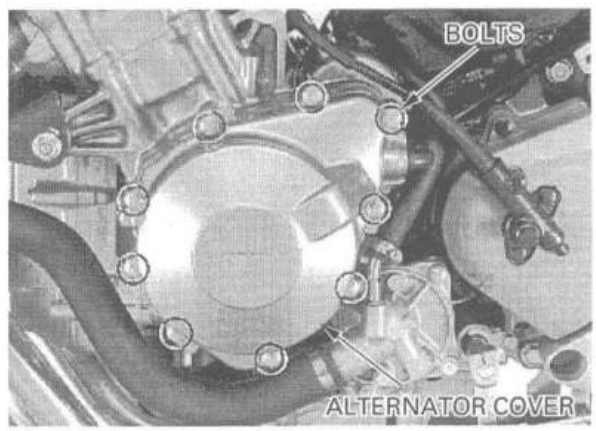


Install the alternator cover.

CAUTION:

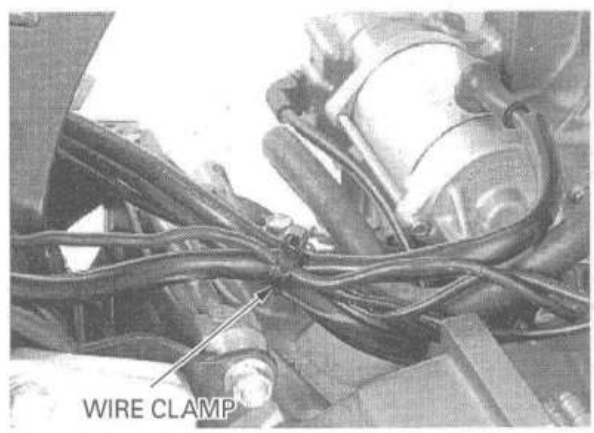
The alternator cover (stator) is magnetically attached to the flywheel, be careful during installation.

Install and tighten the SH bolts.



Route the alternator wire properly (page 1-22).

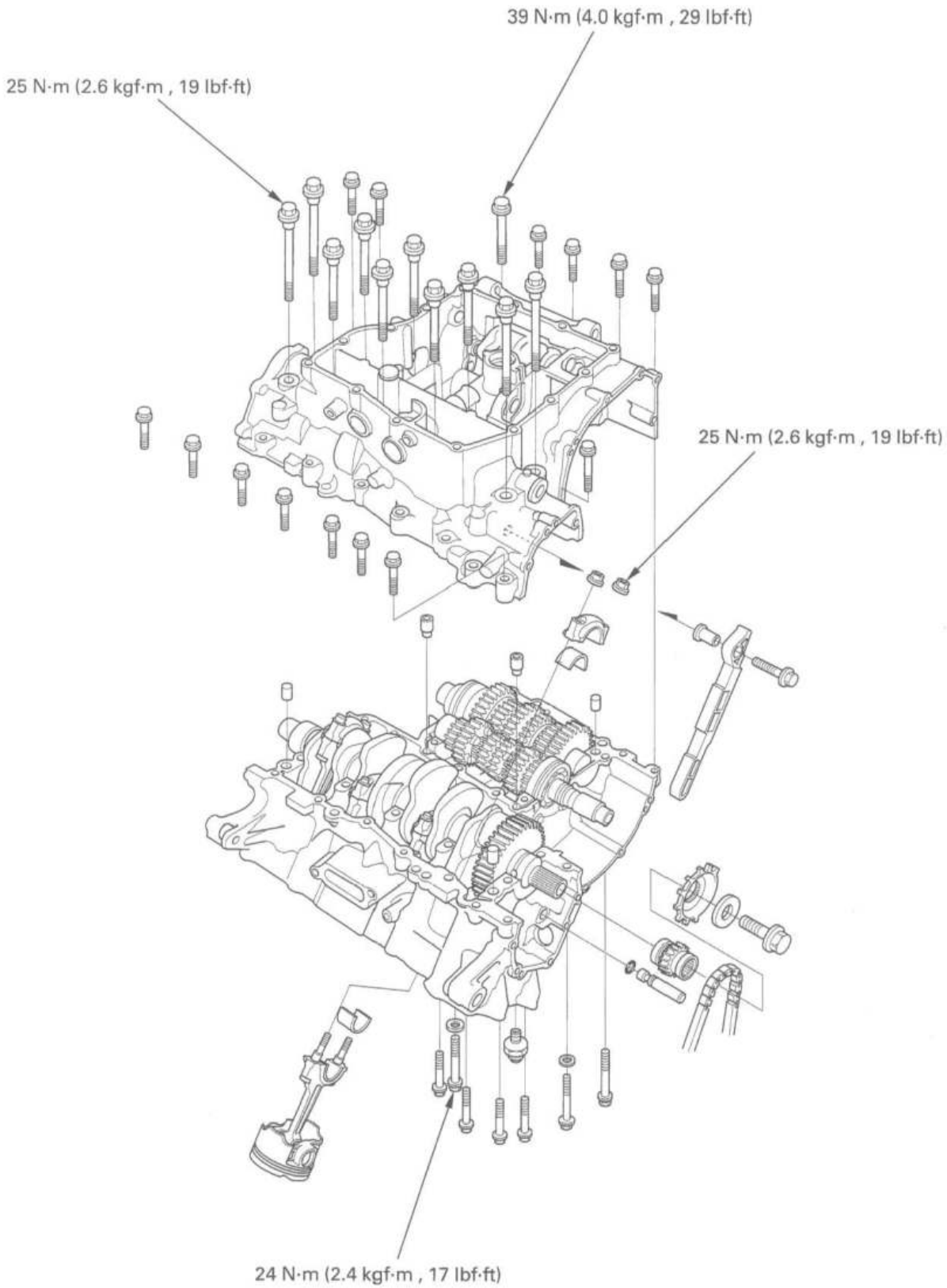
Clamp the alternator wire with a wire clamp.



Connect the alternator 3P (White) connector.

Install the air cleaner housing (page 5-5).
Add the recommended oil up to proper level (page 3-12).




39 N·m (4.0 kgf·m , 29 lbf·ft)
25 N·m (2.6 kgf·m , 19 lbf·ft)
25 N·m (2.6 kgf·m , 19 lbf·ft)
24 N·m (2.4 kgf·m , 17 lbf·ft)

11. CRANKCASE/PISTON/CYLINDER

SERVICE INFORMATION	11-1	PISTON/CONNECTING ROD	11-4
TROUBLESHOOTING	11-2	CRANKCASE COMBINATION	11-11
CRANKCASE SEPARATION	11-3		

SERVICE INFORMATION

GENERAL

- The crankcase must be separated to service the crankshaft, piston, cylinder and transmission.
- The following parts must be removed before separating the crankcase.
  - Alternator/flywheel (Section 10)
  - Clutch (Section 9)
  - Cylinder head (Section 8)
  - Engine (Section 7)
  - Gearshift linkage (Section 10)
  - Oil pump (Section 4)
- Mark and store the disassembled parts to ensure that they are installed in their original locations.
- Mark and store the bearing inserts to be sure of their correct locations for reassembly. If the inserts are improperly installed, they will block the oil hole, causing insufficient lubrication and eventual engine seizure.
- The connecting rod bearing inserts are select fit and are identified by color codes. Select replacement bearings from the code tables. After installing new bearings, recheck them with plastigauge to verify clearance. Apply molybdenum disulfide oil to the crank pin during assembly.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder	I.D.		65.000–65.015 (2.5591–2.5596)	65.10 (2.563)
	Out of round		—	0.10 (0.004)
	Taper		—	0.10 (0.004)
	Warpage		—	0.10 (0.004)
Piston, piston rings	Piston mark direction		"IN" mark facing toward the intake side	—
	Piston O.D.		64.970–64.990 (2.5579–2.5587)	64.90 (2.555)
	Piston O.D. measurement point		11 mm (0.4 in) from bottom of skirt	—
	Piston pin bore 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-to-piston pin clearance		0.002–0.014 (0.0001–0.0006)	0.04 (0.002)
	Piston ring-to-ring groove clearance	Top	0.025–0.060 (0.0010–0.0024)	0.08 (0.003)
		Second	0.015–0.050 (0.0006–0.0020)	0.08 (0.003)
	Piston ring end gap	Top	0.20–0.35 (0.008–0.014)	0.5 (0.02)
		Second	0.35–0.50 (0.014–0.020)	0.7 (0.03)
		Oil (side rail)	0.20–0.70 (0.008–0.028)	1.0 (0.04)
Cylinder-to-piston clearance			0.010–0.045 (0.0004–0.0018)	0.10 (0.004)
Connecting rod small end I.D.			17.016–17.034 (0.6699–0.6706)	17.04 (0.671)
Connecting rod-to-piston pin clearance			0.016–0.040 (0.0006–0.0016)	—
Crank pin oil clearance			0.028–0.052 (0.0011–0.0020)	0.06 (0.002)

TORQUE VALUES

Main journal bolt	25 N·m (2.6 kgf·m , 19 lbf·ft)	Apply oil to the threads
Crankcase bolt, 10 mm	39 N·m (4.0 kgf·m , 29 lbf·ft)	
8 mm	24 N·m (2.4 kgf·m , 17 lbf·ft)	
Lower crankcase sealing bolt, 20 mm	29 N·m (3.0 kgf·m , 22 lbf·ft)	Apply a locking agent to the threads
Lower crankcase sealing bolt, 14 mm	25 N·m (2.5 kgf·m , 18 lbf·ft)	Apply a locking agent to the threads
Connecting rod nut	25 N·m (2.6 kgf·m , 19 lbf·ft)	Apply oil to the threads
Oil pressure switch terminal screw	2 N·m (0.2 kgf·m , 1.4 lbf·ft)	

TROUBLESHOOTING

Cylinder compression is too low, or engine is hard to start
- Blown cylinder head gasket
- Worn, stuck or broken piston ring
- Worn or damaged cylinder or piston
- Bent valve, or bent and deteriorated valve seat

Cylinder compression is too high, or engine overheats or knocks
- Carbon deposites on the cylinder head and/or piston crown

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

Excessive smoke
- Worn, stuck or broken piston ring
- Worn valve stem seal

Excessive noise
- Worn connecting rod big end bearing
- Bent connecting rod
- Worn crankshaft main journal bearing
- Worn transmission bearing

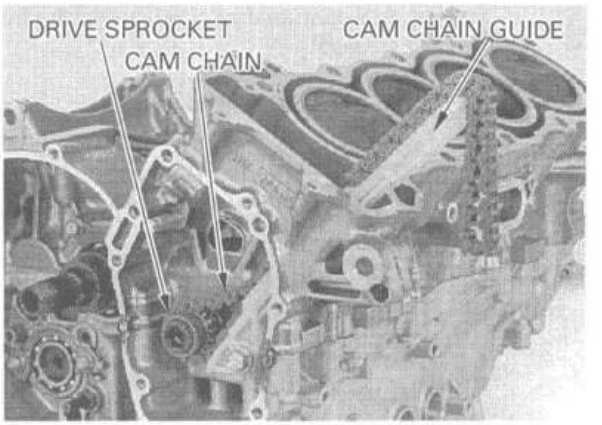
Engine vibration
- Excessive crankshaft runout

CRANKCASE SEPARATION

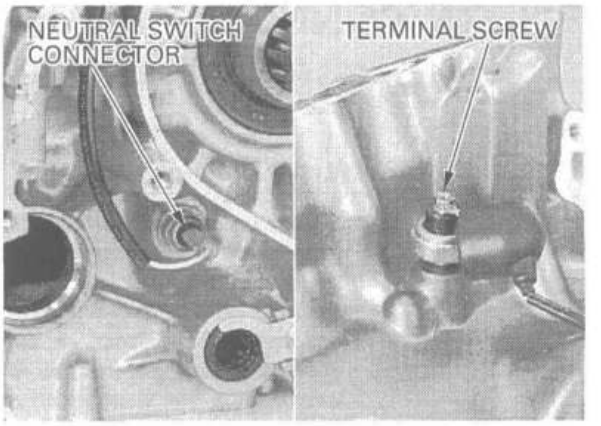
NOTE:

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

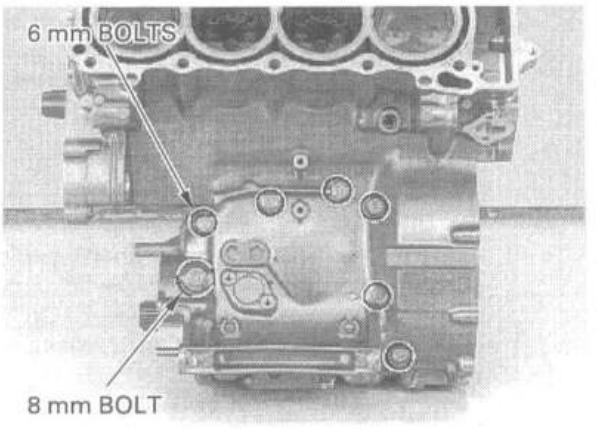
Remove the bolt, collar and cam chain guide.
Remove the cam chain and cam chain drive sprocket.



Disconnect the neutral switch connector from the switch.
Remove the oil pressure switch terminal screw, then remove the engine sub-harness from the engine.

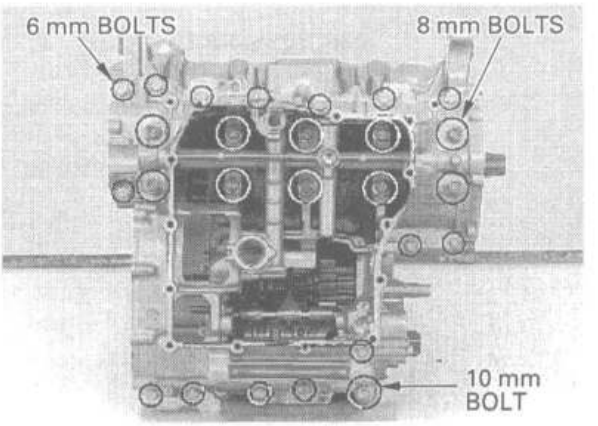


Remove the upper crankcase 6 mm bolts, sealing washer and 8 mm bolt.



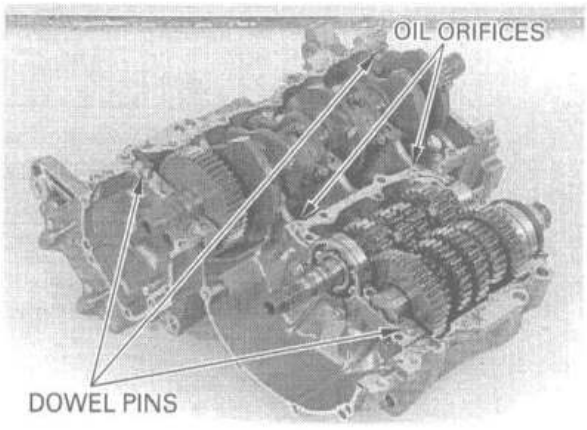
Remove the lower crankcase 6 mm and 10 mm bolts.

Loosen the main journal 8 mm bolts in a crisscross pattern in 2–3 steps, then remove the 8 mm bolts.



Separate the lower crankcase from the upper crankcase.

Remove the dowel pins and oil orifices.



PISTON/CONNECTING ROD

PISTON/CONNECTING ROD REMOVAL

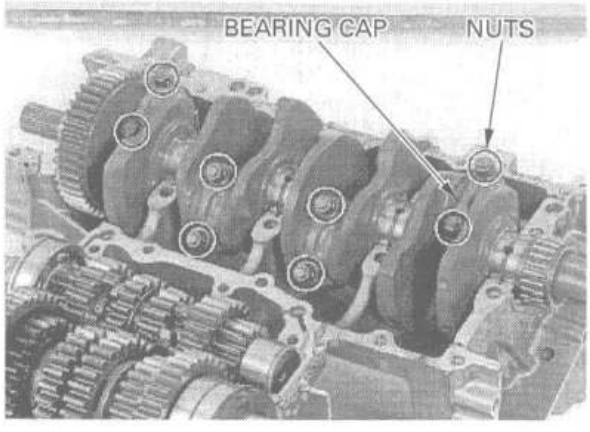
CAUTION:

- ***Before piston removal, place a clean shop towel around the connecting rod to prevent damaging the cylinder sleeve.***
- ***Do not try to remove the piston/connecting rod assembly from bottom of the cylinder; the assembly will be sticked so that the oil ring expands in the gap between the cylinder liner and the upper crankcase.***
- ***Do not interchange the bearing inserts, They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.***

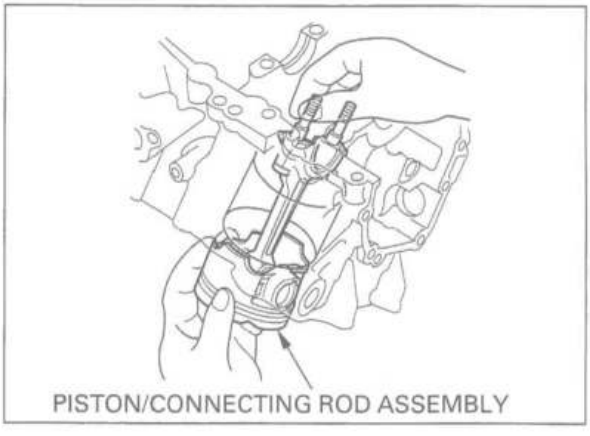
NOTE:

Mark all parts during removal so they can be replaced in their original locations.

Remove the nuts and connecting rod bearing cap.

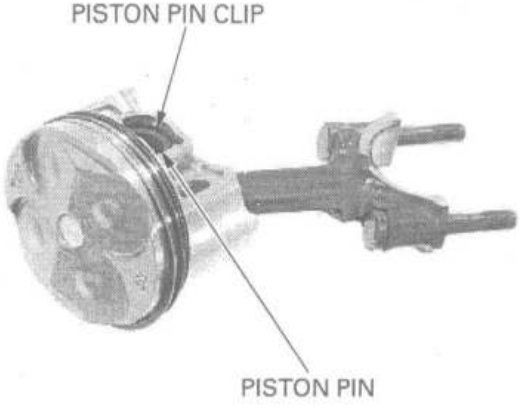


Remove the piston/connecting rod assembly from the top of the cylinder.



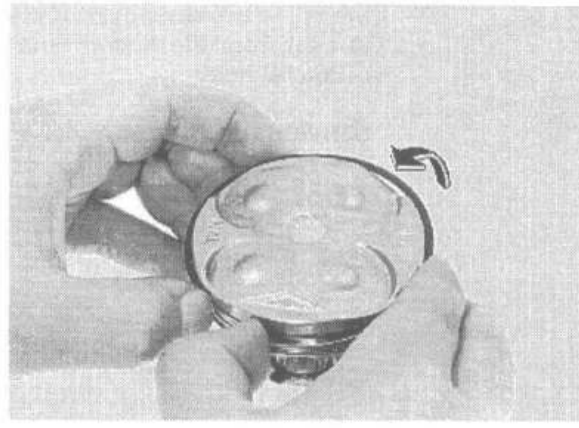
PISTON REMOVAL

Remove the piston pin clip with pliers.
Press the piston pin out of the piston and remove the piston from the connecting rod.



PISTON DISASSEMBLY

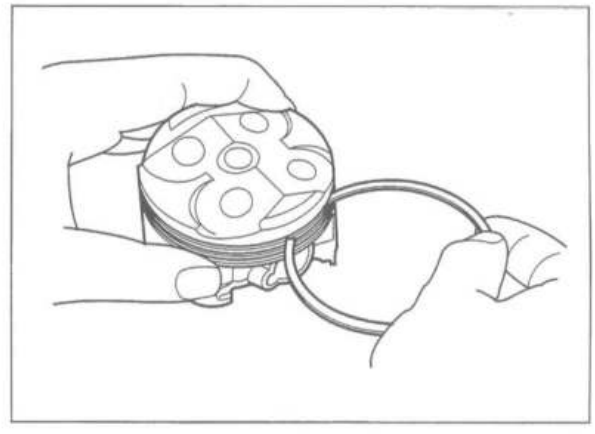
Remove the piston rings.



NOTE:

Do not damage the piston rings during removal.

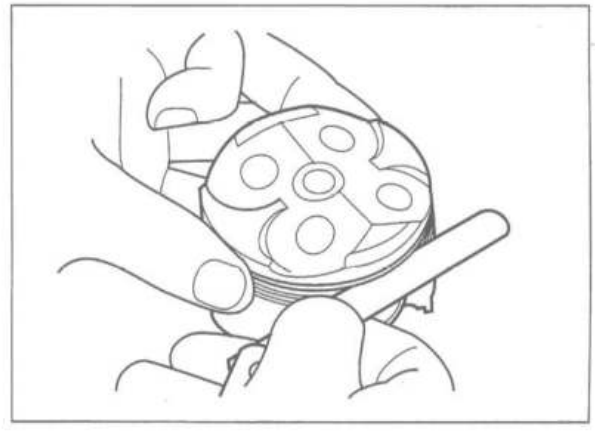
Remove any carbon deposits from the piston ring grooves, using an old piston ring as shown.



PISTON INSPECTION

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

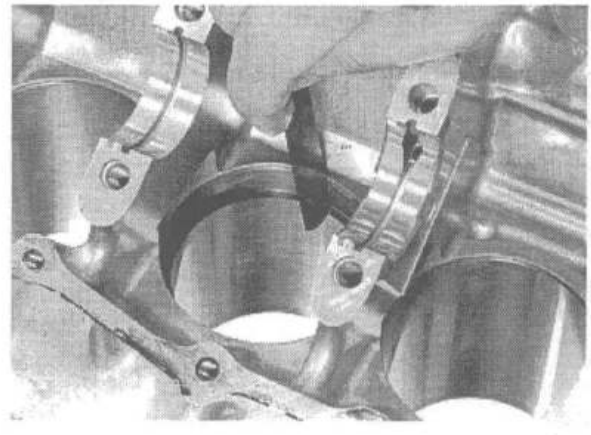
Measure the piston ring-to-ring groove clearance with the rings pushed into the grooves.



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

Inspect the piston for wear or damage.

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



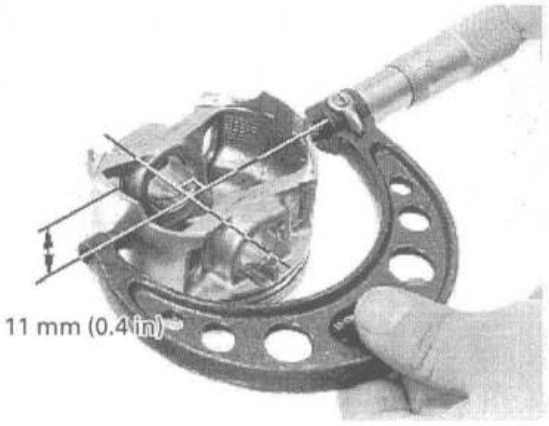
NOTE:

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

SERVICE LIMITS:
Top: 0.5 mm (0.02 in)
Second: 0.7 mm (0.03 in)
Oil (side rail): 1.0 mm (0.04 in)

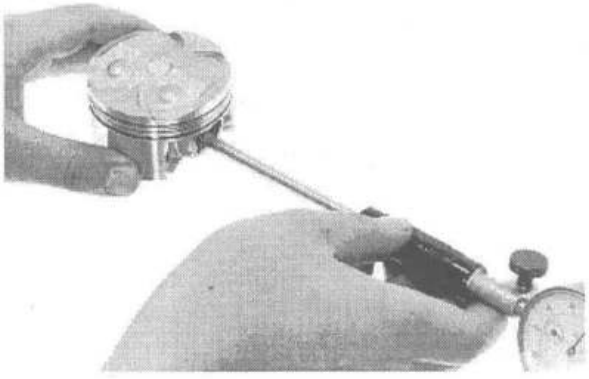
Measure the diameter of the piston at 11 mm (0.4 in) from the bottom and 90 degrees to the piston pin hole.

SERVICE LIMIT: 64.90 mm (2.555 in)



Measure the piston pin bore.

SERVICE LIMIT: 17.02 mm (0.670 in)

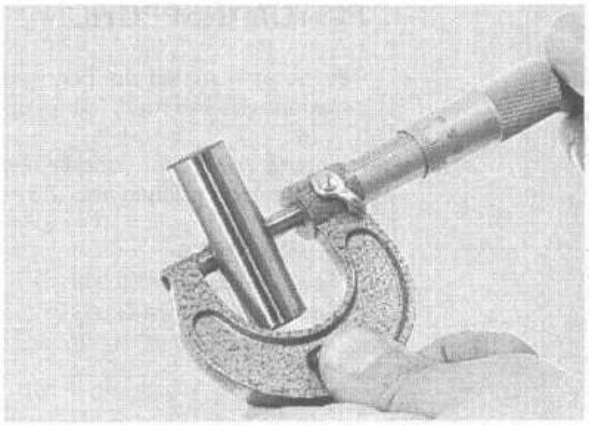


Measure the O.D. of the piston pin.

SERVICE LIMIT: 16.98 mm (0.669 in)

Calculate the piston-to-piston pin clearance.

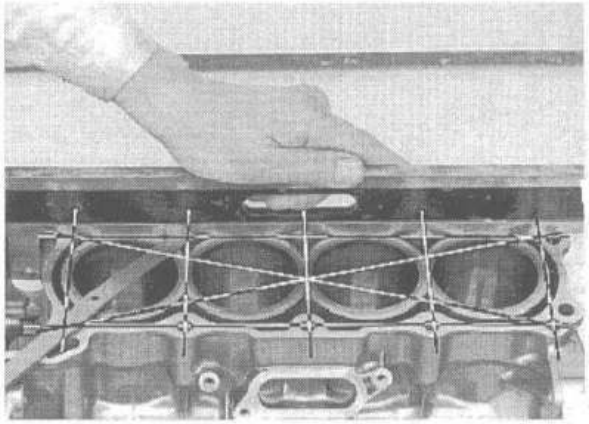
SERVICE LIMIT: 0.04 mm (0.002 in)



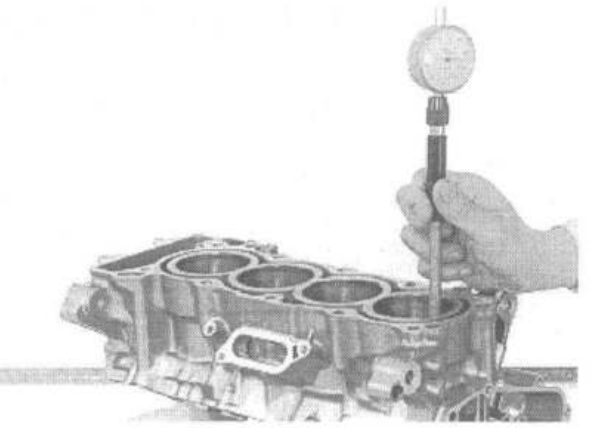
CYLINDER INSPECTION

Inspect the top of the cylinder for warpage.

SERVICE LIMIT: 0.10 mm (0.004 in)



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

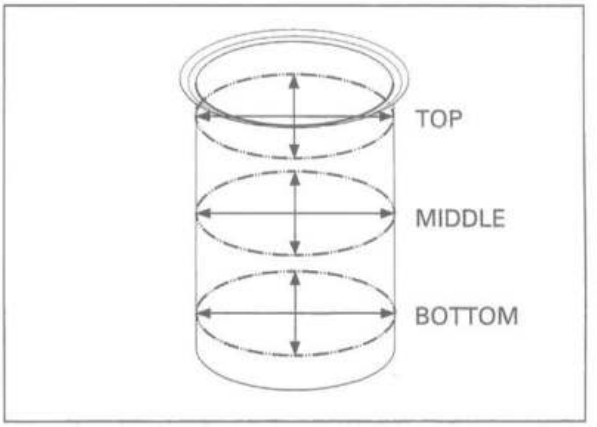


SERVICE LIMIT: 65.10 mm (2.563 in)

Calculate the piston-to-cylinder clearance.
Take a maximum reading to determine the clearance.
Refer to page 11-6 for measurement of the piston O.D.

SERVICE LIMIT: 0.10 mm (0.004 in)

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



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

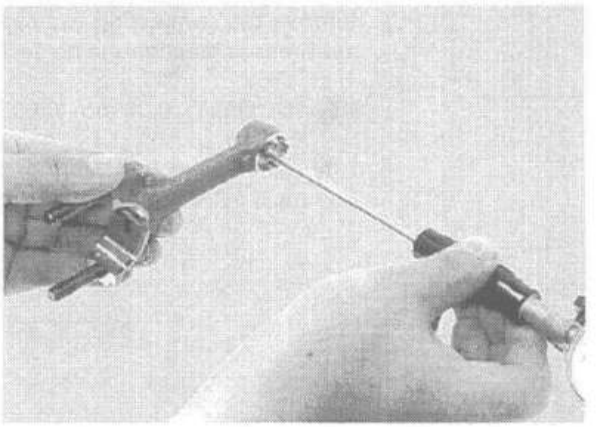
The cylinder must be rebored and an oversize piston fitted if the service limits are exceeded.

The following oversize pistons are available:
0.75 mm (0.030 in)
1.00 mm (0.039 in)

The piston to cylinder clearance for the oversize piston must be: 0.015—0.050 mm (0.0006—0.0020 in).

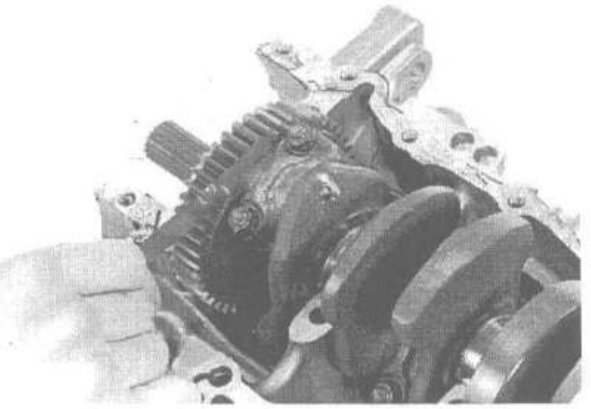
CONNECTING ROD INSPECTION

Measure the connecting rod small end I.D.



SERVICE LIMIT: 17.04 mm (0.671 in)

Temporarily install the connecting rod to the crankshaft.
Install the bearing inserts and bearing cap, and tighten the bolts.
Measure the connecting rod side clearance.



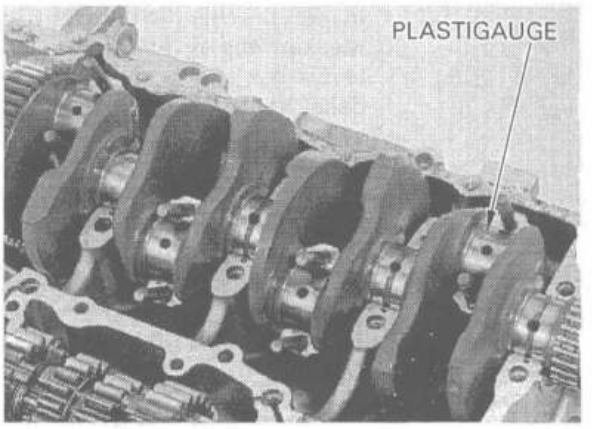
SERVICE LIMIT: 0.30 mm (0.012 in)

CRANK PIN BEARING INSPECTION

Wipe all oil from the bearing inserts and carnk pins. Put a piece of plastigauge on each crank pin.

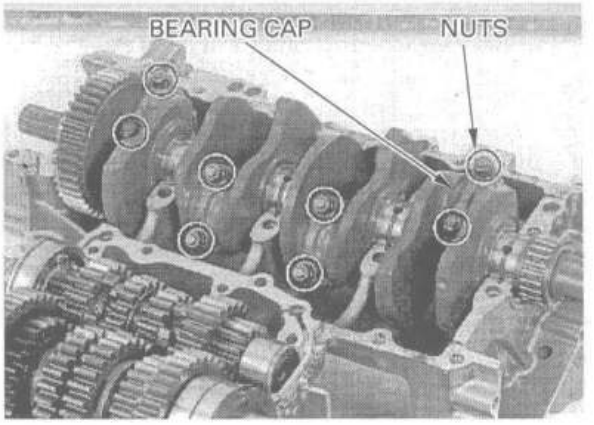
NOTE:

- Do not put the plastigauge over the oil hole in the crank pin.
- Do not rotate the crankshaft during inspection.



Install the bearing caps and connecting rods on a correct crank pins, and tighten the cap nuts to the specified torque.

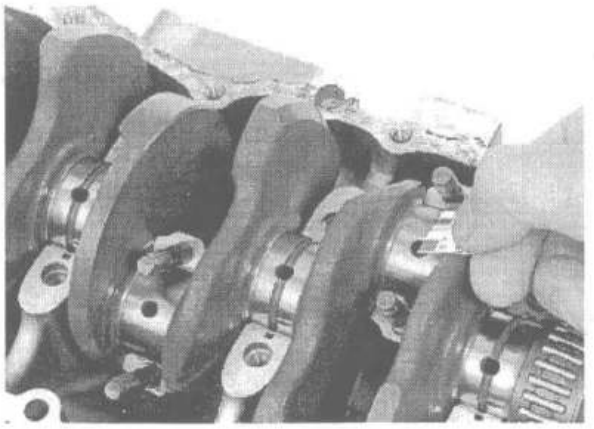
TORQUE: 25 N·m (2.6 kgf·m , 19 lbf·ft)



Remove the connecting rod caps and measure the compressed plastigauge on each crank pin.

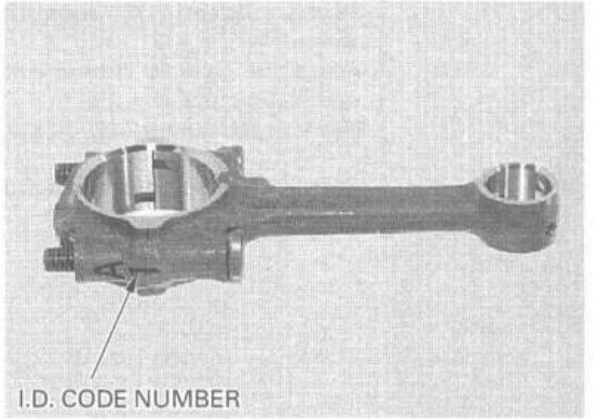
SERVICE LIMIT: 0.06 mm (0.002 in)

If the connecting rod bearing clearance is beyond tolerance, selects replacement bearing.

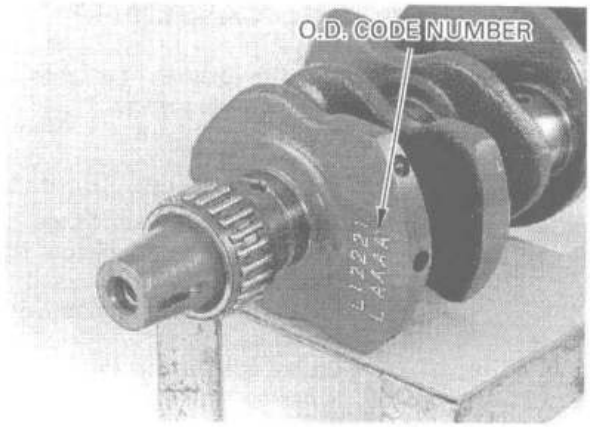


CRANK PIN BEARING SELECTION

Record the connecting rod I.D. code number (1 or 2) or measure the I.D. with the bearing cap installed without bearing inserts.



If you are replacing the crankshaft, record the corresponding crank pin O.D. code number (A or B).

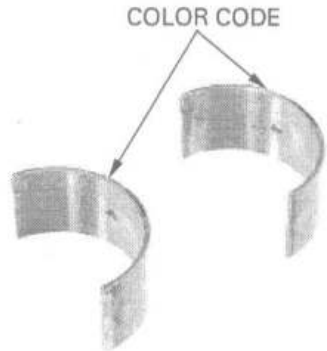


NOTE:

Numbers (A or B) on the crank weight are the codes for the crank pin O.D.s starting from the left.

If you are reusing the crankshaft, measure the crank pin O.D. with the micrometer.

Cross-reference the crank pin and rod codes to determine the replacement bearing color.



BEARING THICKNESS:

A (Brown) : Thick
B (Green) : ⁞
C (Yellow) : Thin

CRANK PIN BEARING SELECTION TABLE

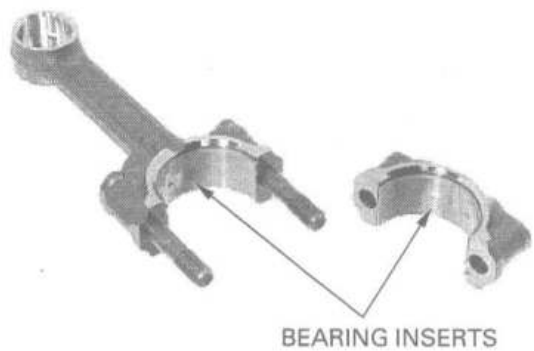
Unit: mm (in)

			CONNECTING ROD I.D. CODE	
			1	2
			34.000 – 34.008 (1.3386 – 1.3389)	34.008 – 34.016 (1.3389 – 1.3392)
CRANK PIN O.D. CODE LETTER	A	31.492 – 31.500 (1.2398 – 1.2402)	C (Yellow)	B (Green)
	B	31.484 – 31.492 (1.2395 – 1.2398)	B (Green)	A (Brown)

Install the bearing inserts into the connecting rod and bearing cap.

NOTE:

Align the oil hole between the connecting rod and bearing, and also align the bearing tabs with the grooves in the connecting rod and bearing cap.



PISTON ASSEMBLY

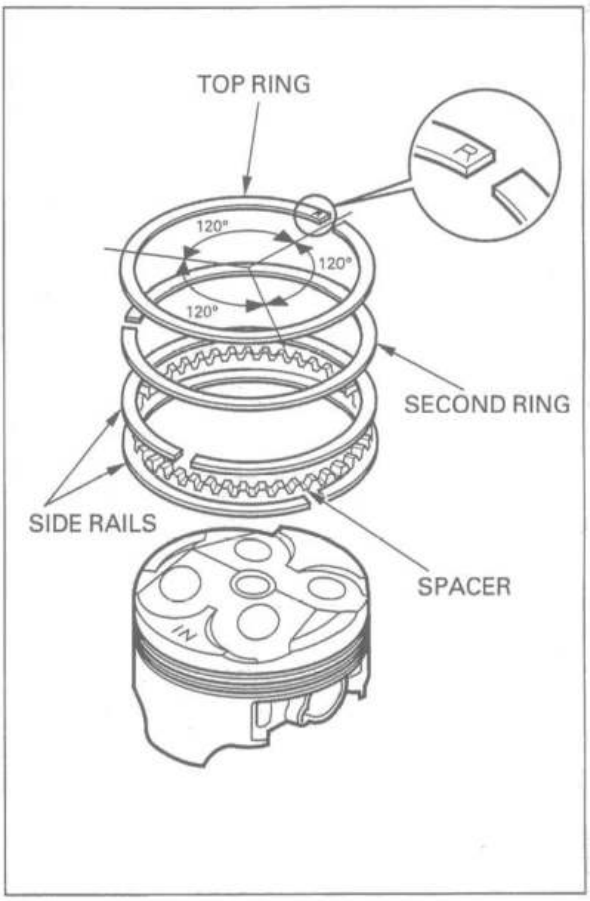
Clean the piston ring grooves thoroughly and install the piston rings.

NOTE:

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

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

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

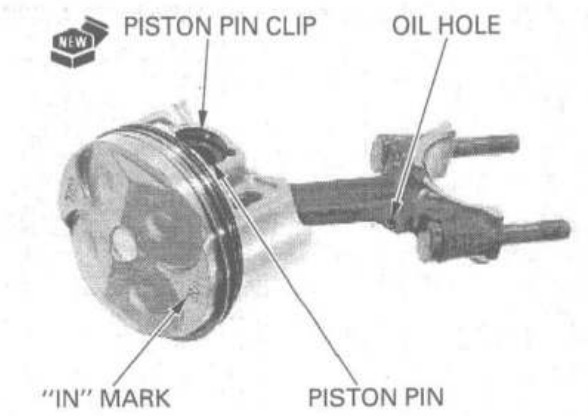


PISTON INSTALLATION

Apply molybdenum disulfide oil to the connecting rod small end.
Assemble the piston and connecting rod.

NOTE:

Install the connecting rod with its oil hole side facing the "IN" mark on the piston crown.



Do not align the piston pin clip end gap with the piston cut-out .

Apply oil to the piston pin outer surface.
Install the piston pin, and secure it using a new piston pin clip.

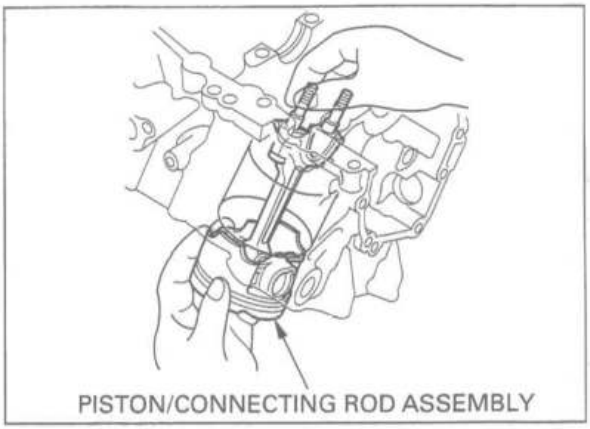
Apply oil to the cylinder sleeve and piston rings.

Install the piston/connecting rod assembly with the piston "IN" mark facing to the intake side.

Install the piston/connecting rod assembly into the cylinder using a commercially available piston ring compressor tool.

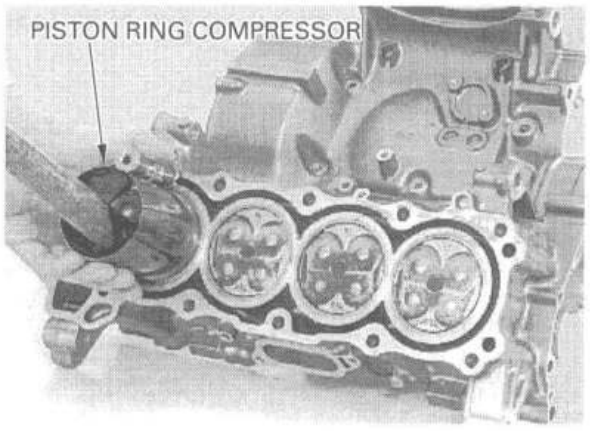
CAUTION:

- ***While installing the piston, being careful not to damage the top surface of the cylinder, especially around the cylinder bore.***
- ***Be careful not to damage the cylinder sleeve and crank pin with the connecting rod bolt threads.***

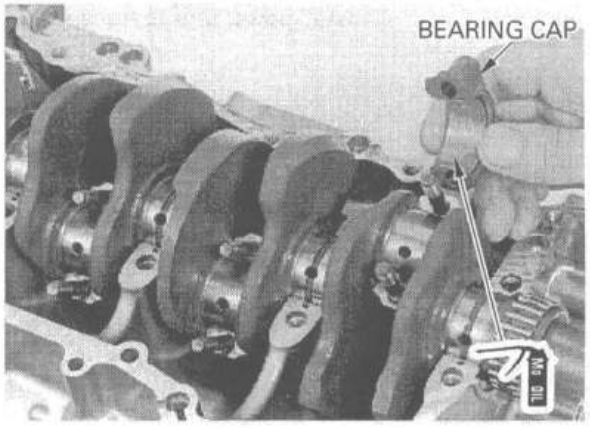


Make sure ring compressor tool sits flush with top surface of the cylinder.

Use the handle of a plastic hammer to tap the piston into the cylinder.

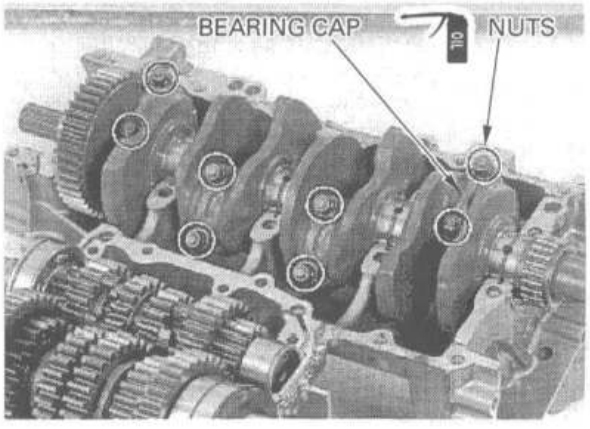


Apply molybdenum disulfide oil to the crankpin bearing surfaces.
Install the bearing cap.



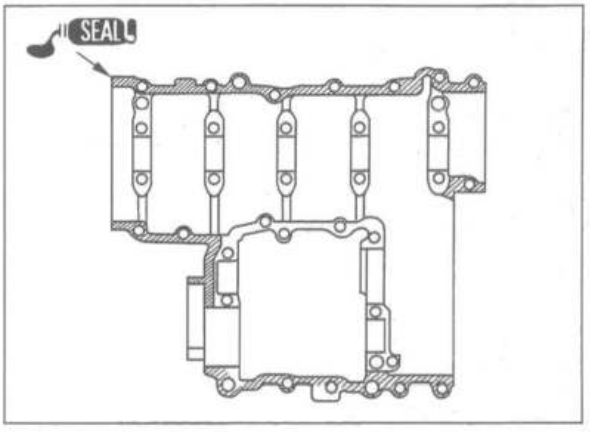
Apply oil to the connecting rod nut threads and seating surfaces.
Install the nuts and tighten them gradually and alternately.

TORQUE: 25 N·m (2.6 kgf·m , 19 lbf·ft)



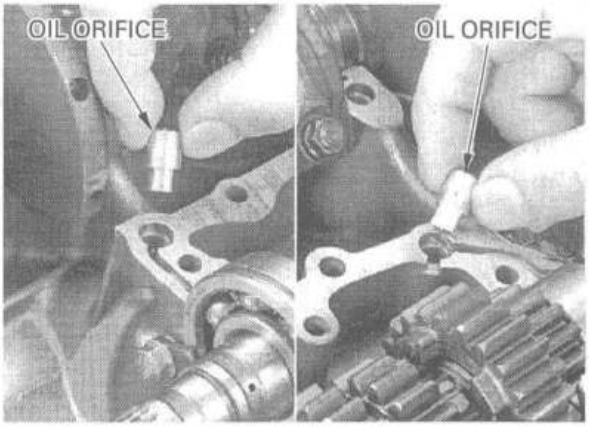
CRANKCASE COMBINATION

Apply a light, but through, coating of liquid sealant to the crankcase mating surface except to the main bearing journal bolt (lower crankcase bolt, 8 mm) area and the oil passage area as shown.

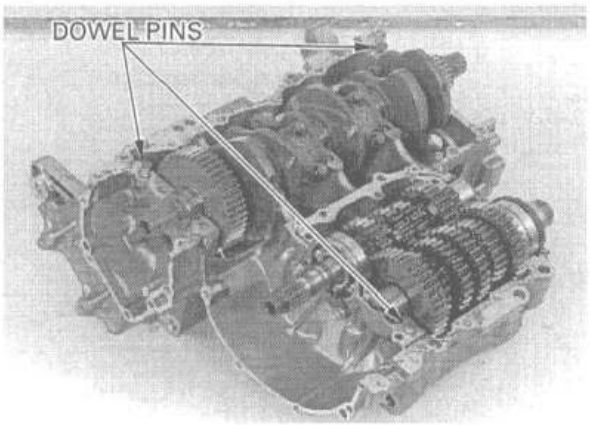


Install the oil orifices with their cut-out with the upper crankcase grooves.

Install the oil orifices to the upper crankcase.

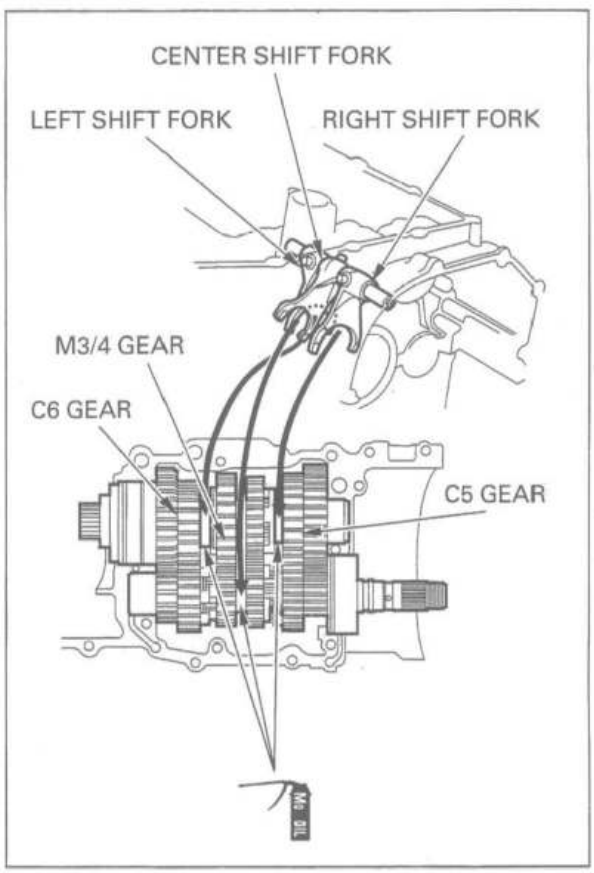


Install dowel pins in the upper crankcase.



Assemble the crankcase halves, aligning the shift fork claws with the shifter gear grooves.

Check for smooth transmission operation.



Apply oil to the main journal bolt threads and seating surfaces.
Install the main journal 8 mm bolts.
Loosely install all the lower crankcase bolts.

Make sure the upper and lower crankcase are seated securely.

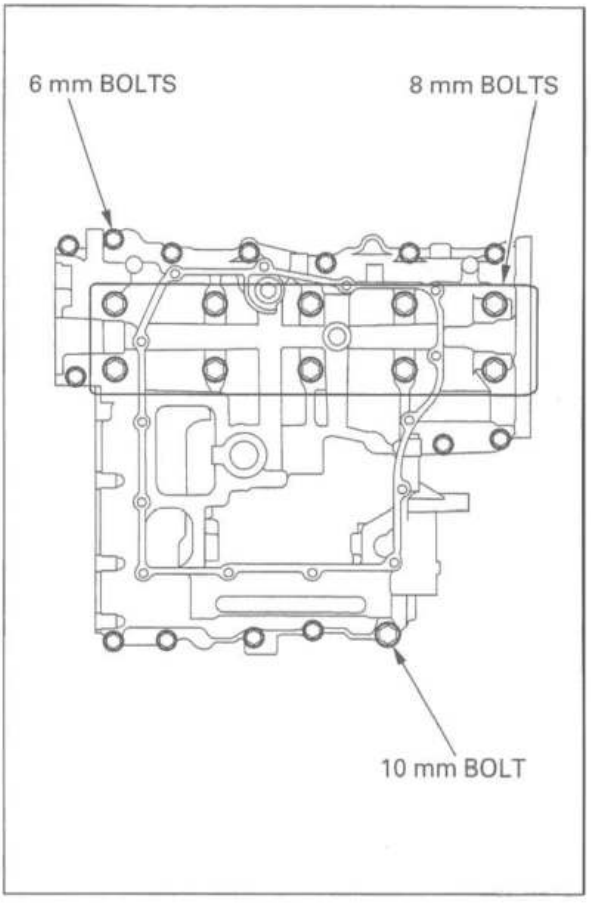
Tighten the main journal 8 mm bolts in numerical order casted on the lower crankcase in several steps, then tighten them to the specified torque.

TORQUE: 25 N·m (2.6 kgf·m , 19 lbf·ft)

Tighten the lower crankcase 10 mm bolt.

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

Tighten the 6 mm bolts.



Install a new sealing washer and upper crankcase 8 mm bolt.
Install a new sealing washer and 6 mm bolts.

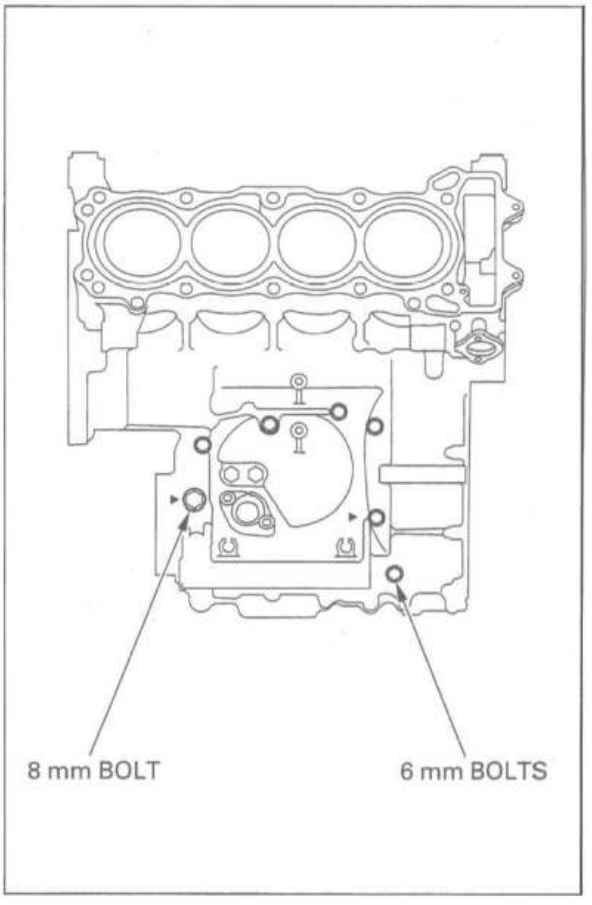
NOTE:

The sealing washer location is indicated on the upper crankcase using the "△" mark.

Tighten the 6 mm bolts in a crisscross pattern in 2 or 3 steps.

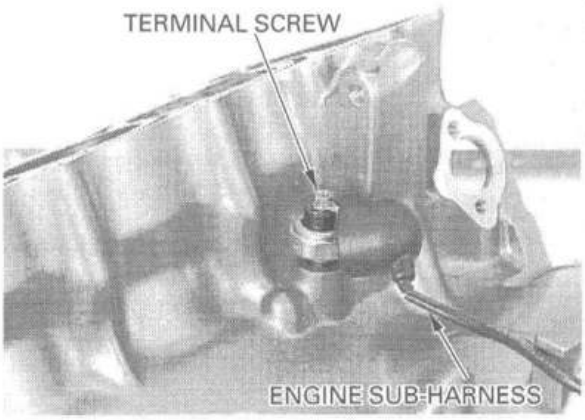
Tighten the 8 mm bolt to the specified torque.

TORQUE: 24 N·m (2.4 kgf·m , 17 lbf·ft)

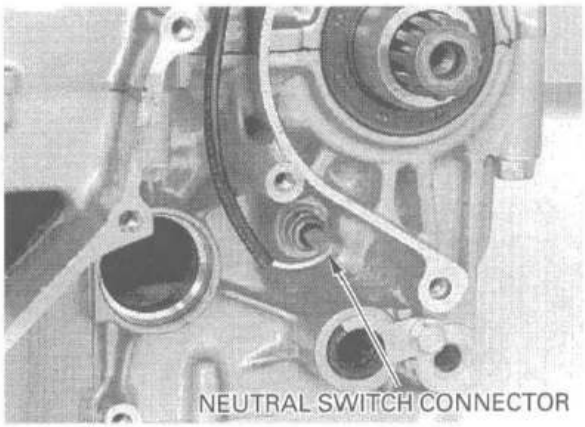


Route the engine sub-harness, install the oil pressure switch terminal to the switch.
Tighten the oil pressure switch terminal screw to the specified torque.

TORQUE: 2 N·m (0.2 kgf·m , 1.4 lbf·ft)



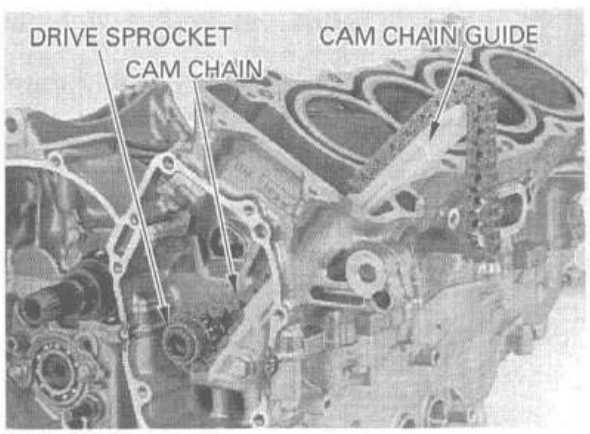
Install the neutral switch connector.

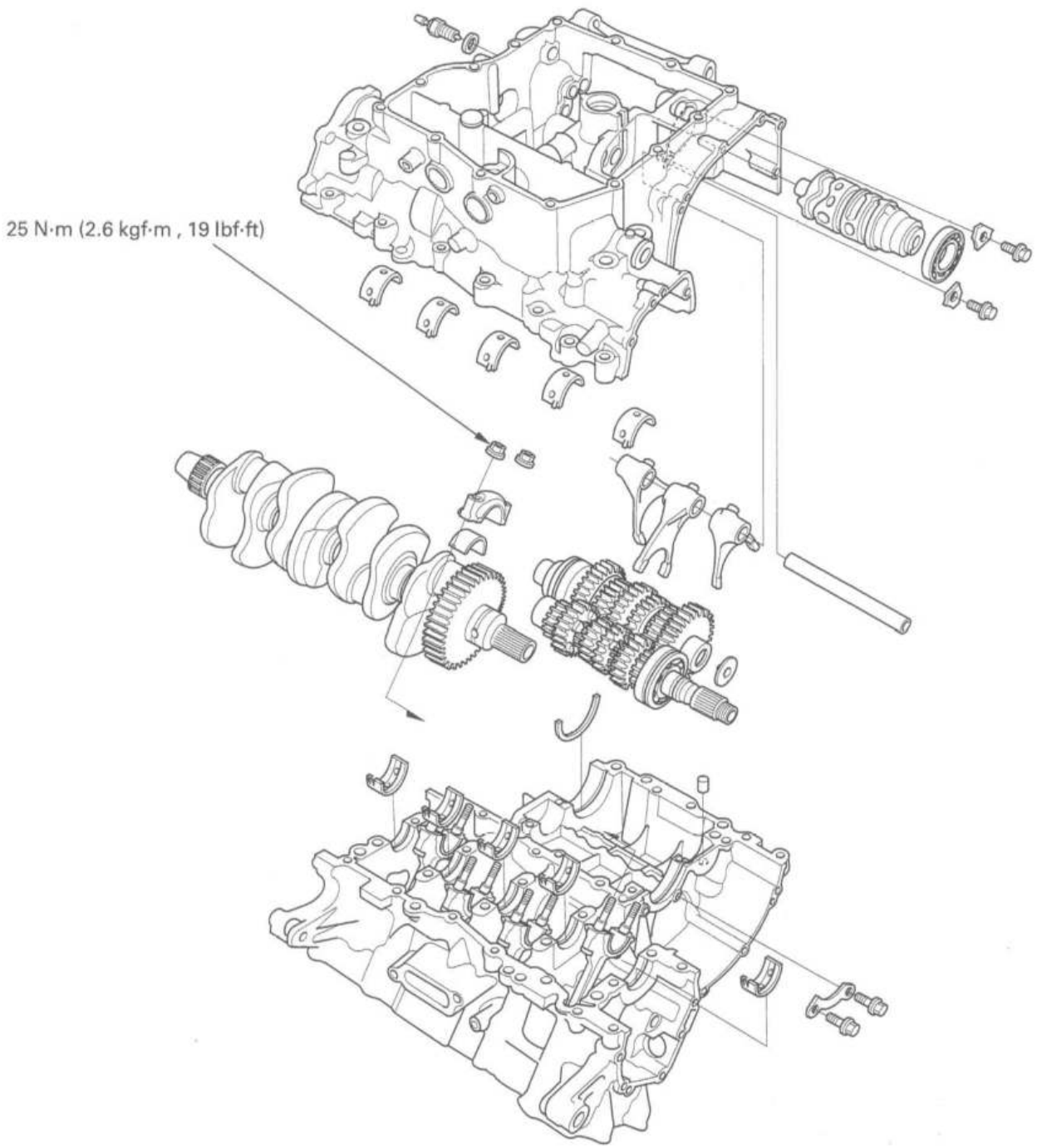


Install the cam chain drive sprocket aligning its wide groove with the wide teeth of the crankshaft.
Install the cam chain through the crankcase.

Install the cam chain guide, collar and bolt.

Install the removed parts in the reverse order of removal.




25 N·m (2.6 kgf·m , 19 lbf·ft)

12. CRANKSHAFT/TRANSMISSION

SERVICE INFORMATION	12-1	CRANKSHAFT	12-3
TROUBLESHOOTING	12-2	TRANSMISSION	12-7

SERVICE INFORMATION

GENERAL

- The crankcase must be separated to service the crankshaft and transmission. Refer to section 11 for crankcase separation/assembly.
- Be careful not to damage the crankshaft main journal and journal bearing while removing or installing the crankshaft.
- Mark and store the disassembled parts to ensure that they are installed in their original locations.
- Mark and store the bearing inserts to ensure that the parts are in their correct locations during reassembly. If the inserts are improperly installed, they will block the oil hole, causing insufficient lubrication and eventual engine seizure.
- The main journal bearing inserts are a select fit and are identified by color codes. Select replacement bearings from the code tables. After installing new bearings, recheck them with a plastigauge to verify clearance. Apply molybdenum disulfide oil to the main journal during assembly.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Side clearance		0.10–0.25 (0.004–0.010)	0.30 (0.012)
	Runout		—	0.05 (0.002)
	Main journal oil clearance		0.020–0.045 (0.0008–0.0018)	0.05 (0.002)
Transmission	Gear I.D.	M5, M6	28.000–28.021 (1.1024–1.1032)	28.04 (1.104)
		C2, C3, C4	31.000–31.025 (1.2205–1.2215)	31.04 (1.222)
	Bushing O.D.	M5, M6	27.959–27.980 (1.1007–1.1016)	27.94 (1.100)
		C2	30.959–30.980 (1.2189–1.2197)	30.94 (1.218)
		C3, C4	30.950–30.975 (1.2185–1.2195)	30.93 (1.218)
	Bushing I.D.	M5	24.985–25.006 (0.9837–0.9845)	25.016 (0.9849)
		C2	27.985–28.006 (1.1018–1.1026)	28.021 (1.1032)
	Gear-to-bushing clearance	M5, M6	0.020–0.062 (0.0008–0.0024)	—
		C2, C3, C4	0.020–0.070 (0.0008–0.0028)	—
	Mainshaft O.D.	M5	24.967–24.980 (0.9830–0.9835)	24.960 (0.9827)
		Clutch outer guide	21.980–21.993 (0.8654–0.8659)	21.95 (0.864)
	Countershaft O.D.	C2	27.967–27.980 (1.1011–1.1016)	27.96 (1.101)
	Bushing-to-shaft clearance	M5	0.005–0.039 (0.0002–0.0015)	—
		C2	0.005–0.039 (0.0002–0.0015)	—
Shift fork, fork shaft	Shift fork	Fork I.D.	12.000–12.021 (0.4724–0.4733)	12.030 (0.4736)
		Claw thickness	5.93–6.00 (0.233–0.236)	5.90 (0.232)
	Fork shaft O.D.		11.957–11.968 (0.4707–0.4712)	11.95 (0.470)

TORQUE VALUES

Connecting rod nut	25 N·m (2.6 kgf·m , 19 lbf·ft)	Apply oil to the threads and seating surface

TOOLS

Driver, 40 mm I.D.	07746-0030100
Attachment, 25 mm (IN)	07746-0030200
Attachment, 30 mm (IN)	07746-0030300

TROUBLESHOOTING

Excessive noise
- Worn connecting rod big end bearing
- Bent connecting rod
- Worn crankshaft main journal bearing
- Worn transmission bearing

Hard to shift
- Improper clutch operation
- Incorrect transmission oil weight
- Incorrect clutch adjustment
- Bent shift fork
- Bent fork shaft
- Bent fork claw
- Damaged shift drum cam groove
- Bent shift spindle

Transmission jumps out of gear
- Worn gear dogs and slots
- Bent fork shaft
- Broken shift drum stopper
- Worn or bent shift forks
- Broken shift linkage return spring

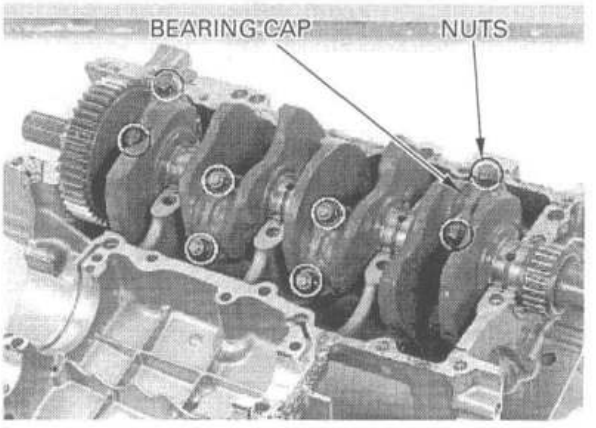
Engine vibration
- Excessive crankshaft runout

CRANKSHAFT

REMOVAL

Separate the crankcase halves (page 11-3).

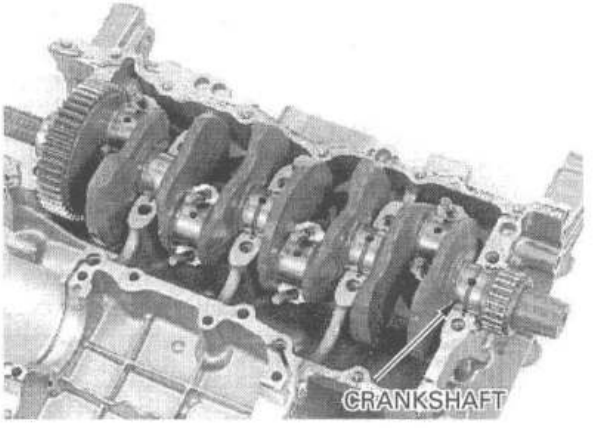
Remove the connecting rod bearing cap nuts and bearing caps.



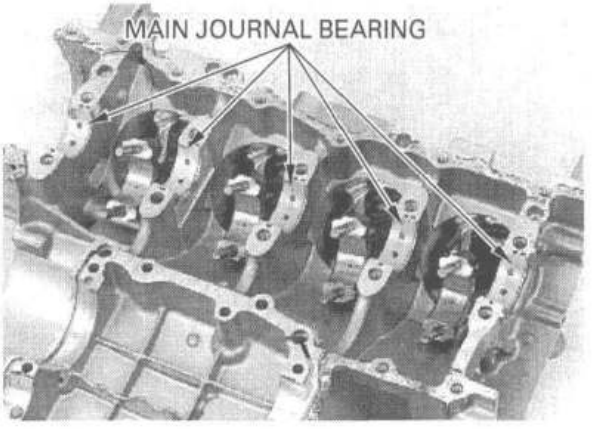
CAUTION:

Before removal, position all the pistons at TDC (Top Dead Center) to prevent damaging the crank pin with the connecting rod bolt threads.

Remove the crankshaft.



Remove the main journal bearings from both the crankcase halves.



INSPECTION

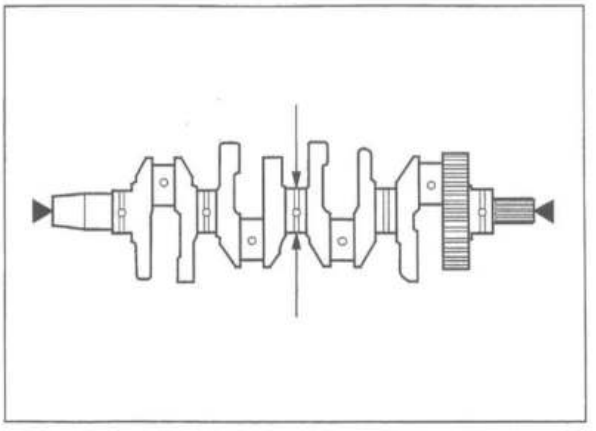
CRANKSHAFT RUNOUT

Hold the crankshaft both end.

Set a dial indicator on the center main journal of the crankshaft.

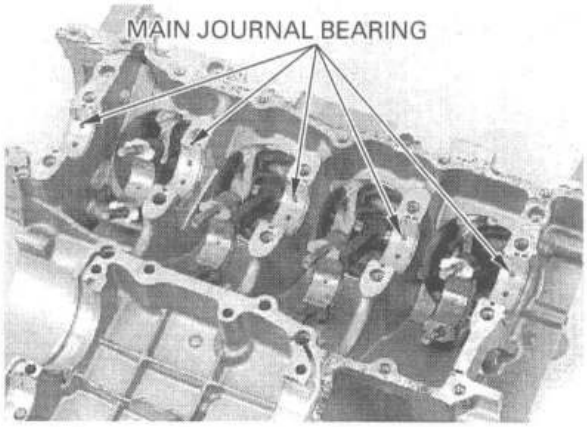
Rotate the crankshaft two revolutions and read runout at the center journal.

SERVICE LIMIT: 0.05 mm (0.002 in)



MAIN JOURNAL BEARING

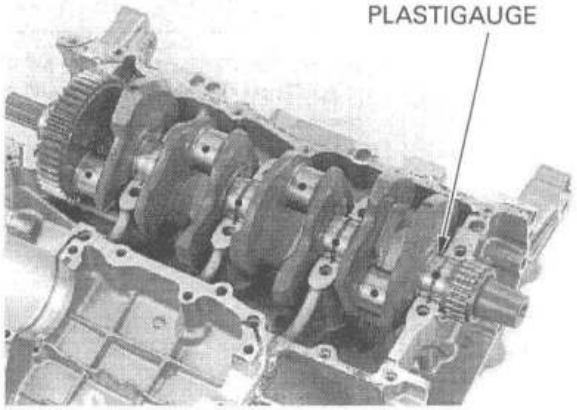
Inspect the main journal bearing inserts for damage or separation.



Wipe the oil from the bearing inserts and journals.
Reinstall the upper crankcase's main journal bearing inserts, then carefully lower the crankshaft in place.
Put a piece of plastigauge on each journals.

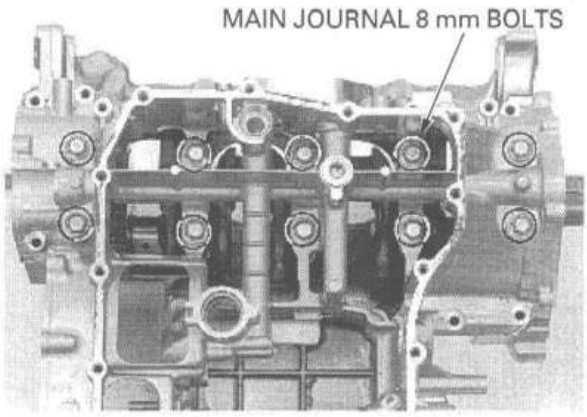
NOTE:

- Do not put the plastigauge over the oil hole in the main bearing journal of the crankshaft.
- Do not rotate the crankshaft during inspection.



Assemble the crankcase halves.
Tighten the main journal bolts in numerical order casted on the lower crankcase in several steps, then tighten them to the specified torque.

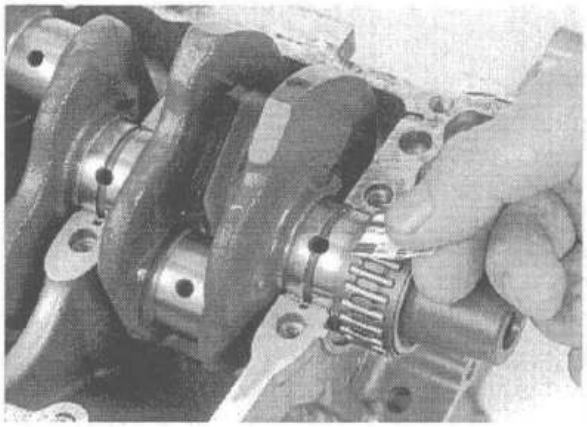
TORQUE: 25 N·m (2.6 kgf·m , 19 lbf·ft)



Remove the main journal bolts and lower crankcase.
Measure the compressed plastigauge on each journal.

SERVICE LIMIT: 0.05 mm (0.002 in)

If the main bearing clearance is beyond tolerance, select a replacement bearing.



MAIN JOURNAL BEARING SELECTION

Record the crankcase I.D. letters from the pad on the left side of the upper crankcase as shown.



NOTE:

The letters (A, B or C) on the upper crankcase are the codes for the main journal I.D.s from left to right.

Record the corresponding main journal O.D. code numbers from the crank weight.

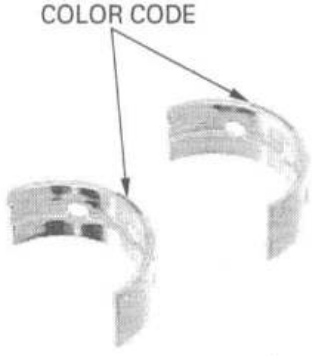


NOTE:

The numbers (1 or 2) on the crank weight are the codes for the main journal O.D.s from left to right.

Cross reference the case and journal codes to determine the replacement bearing color codes.

BEARING THICKNESS:
A (Brown): Thick
B (Green):
C (Yellow):
D (Pink): Thin



CAUTION:

After selecting new bearings, recheck the clearance with a plastigauge. Incorrect clearance can cause severe engine damage.

MAIN JOURNAL BEARING SELECTION TABLE

Unit: mm (in)

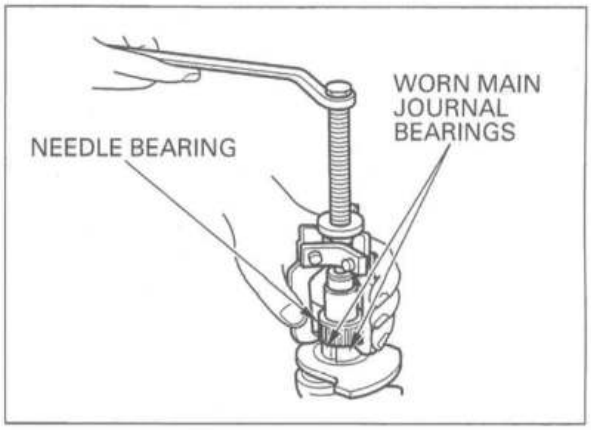
			CRANKCASE I.D. CODE		
			A	B	C
			36.000−36.007 (1.4173−1.4176)	36.007−36.014 (1.4176−1.4179)	36.014−36.021 (1.4179−1.4181)
CRANKSHAFT O.D. CODE	1	32.993−33.000 (1.2989−1.2992)	D (Pink)	C (Yellow)	B (Green)
	2	32.986−32.993 (1.2986−1.2989)	C (Yellow)	B (Green)	A (Brown)

STARTER CLUTCH NEEDLE BEARING REPLACEMENT

Remove the needle bearing with a commercially available universal bearing puller.

CAUTION:

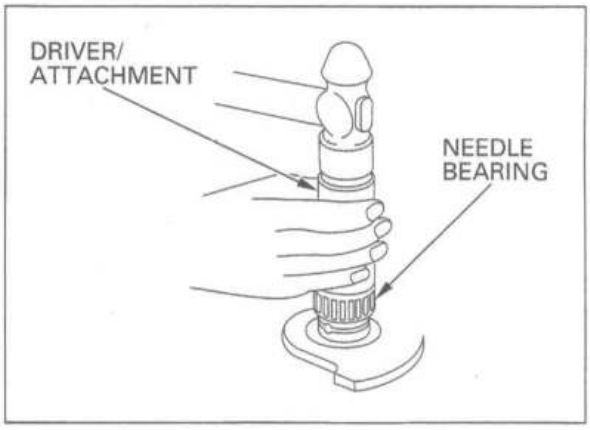
To protect the crankshaft main journal from the bearing puller claws, cover the main journal properly; worn main journal bearings are usable as protectors.



Drive a new needle bearing onto the crankshaft.

TOOLS:

Driver, 40 mm I.D.	07746-0030100
Attachment, 30 mm I.D.	07746-0030300

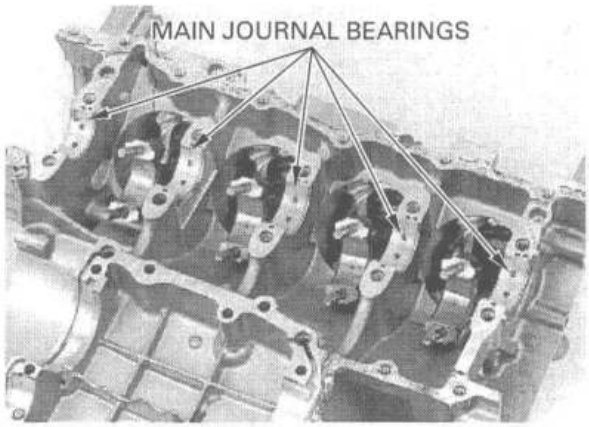


INSTALLATION

Install the main journal bearings into the upper and lower crankcase.

NOTE:

The bearing tabs should be aligned with the grooves in the case.

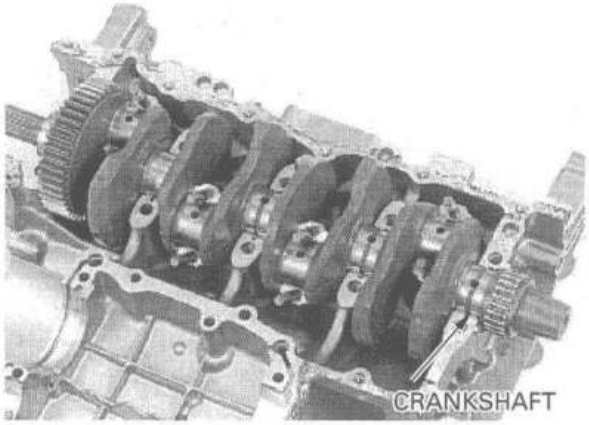


Apply molybdenum disulfide oil to the upper and lower main journal bearings.

Install the crankshaft.

CAUTION:

Before installation, position all the pistons at TDC (Top Dead Center) to prevent damaging the crank pin with the connecting rod bolt threads.



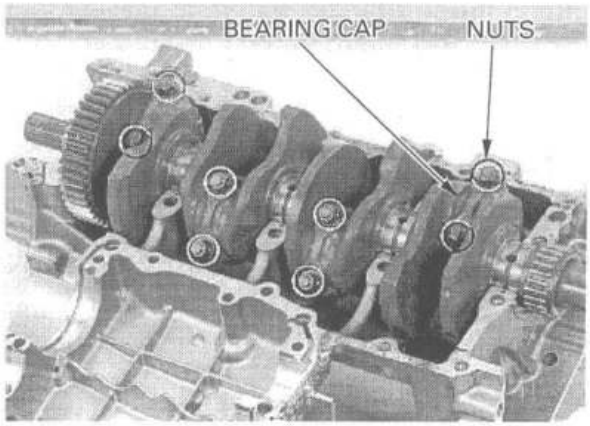
Install the connecting rod bearing caps.

Apply oil to the connecting rod nut threads and seating surfaces.

Install and tighten the nuts gradually and alternately.

TORQUE: 25 N·m (2.6 kgf·m , 19 lbf·ft)

Assemble the upper and lower crankcase (page 11-11).

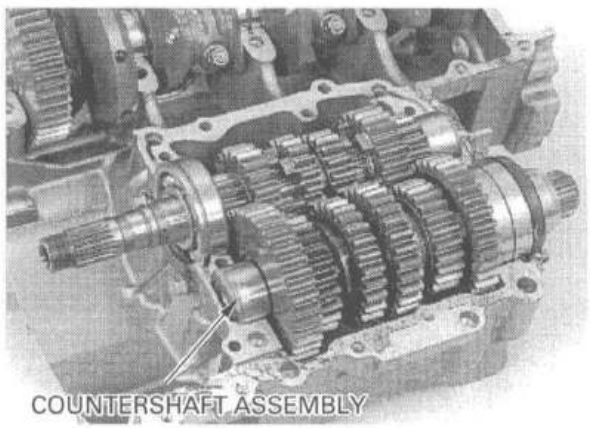


TRANSMISSION

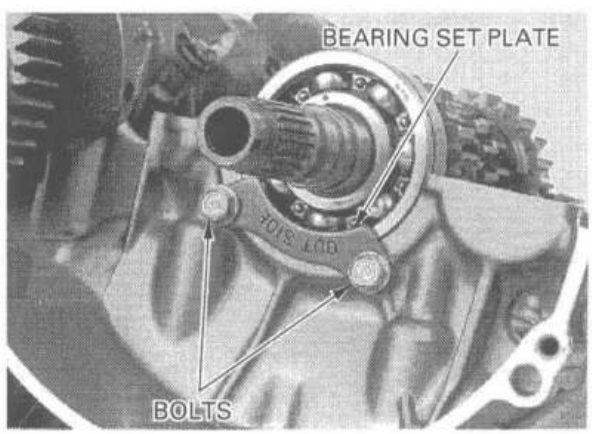
REMOVAL/DISASSEMBLY

Separate the crankcase (page 11-3).

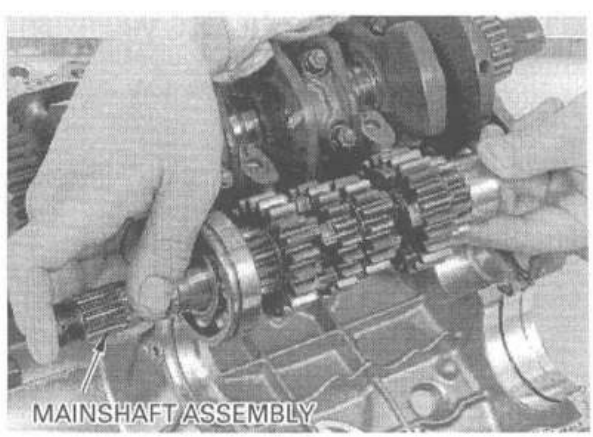
Remove the countershaft assembly from the upper crankcase.
Remove the bearing set ring and dowel pin.



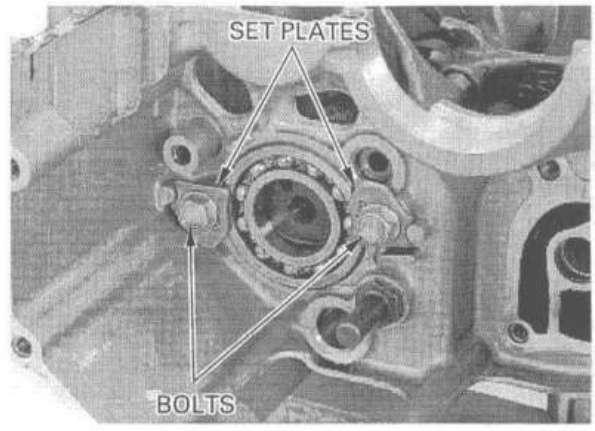
Remove the bolts and mainshaft bearing set plate.



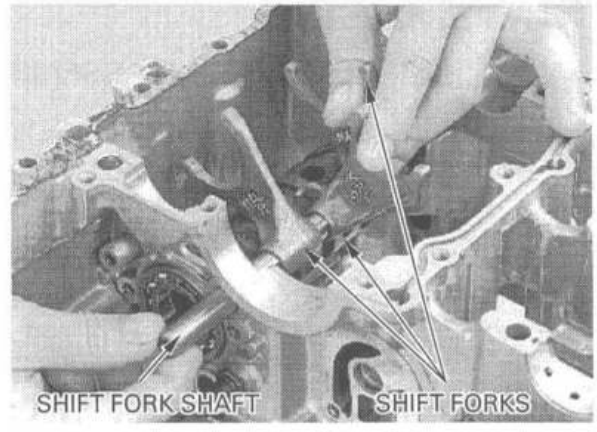
Remove the mainshaft assembly.



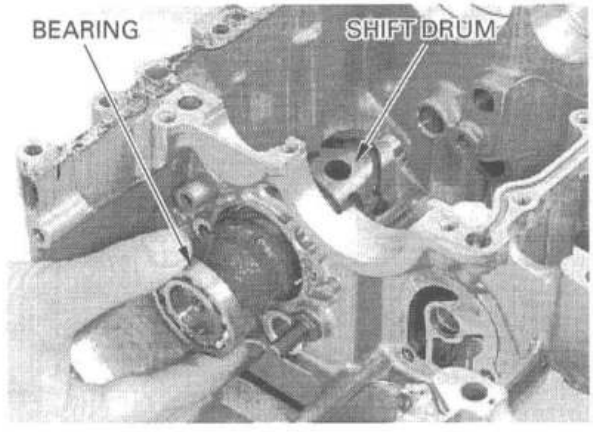
Remove the bolts and shift drum bearing set plate.



Remove the shift fork shaft and shift forks.

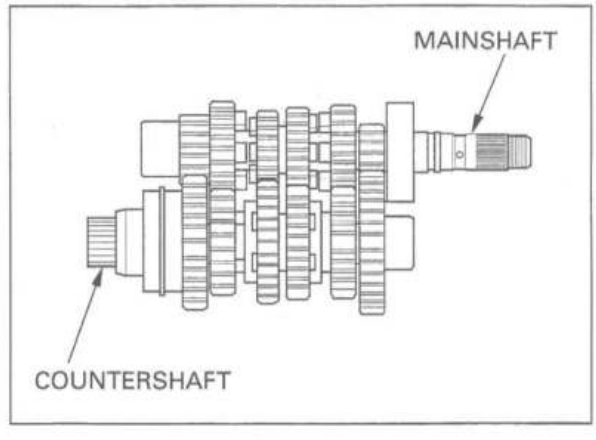


Remove the shift drum bearing and shift drum.



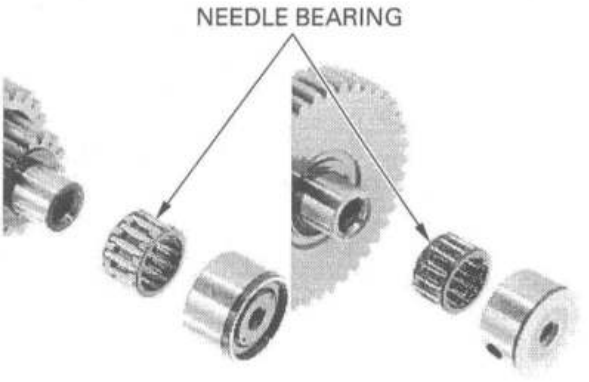
DISASSEMBLY

Disassemble the mainshaft and countershaft.



INSPECTION

Check the mainshaft and countershaft needle bearings for damage or excessive wear.

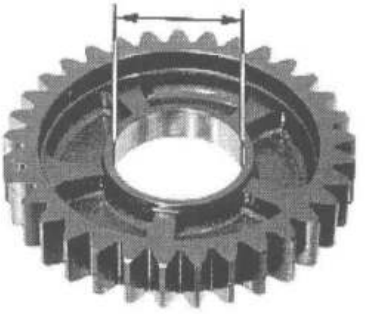


Check the gear dogs, dog holes and teeth for abnormal wear or lack of lubrication.
Measure the I.D. of each gear.

SERVICE LIMITS:

M5, M6:	28.04 mm (1.104 in)
C2, C3, C4:	31.04 mm (1.222 in)

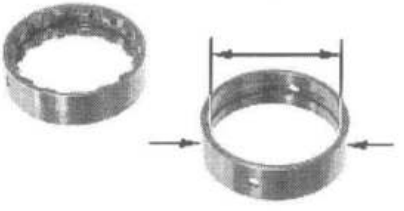
Check the shift fork groove of the shifter gear for excessive wear or damage.



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

SERVICE LIMITS:

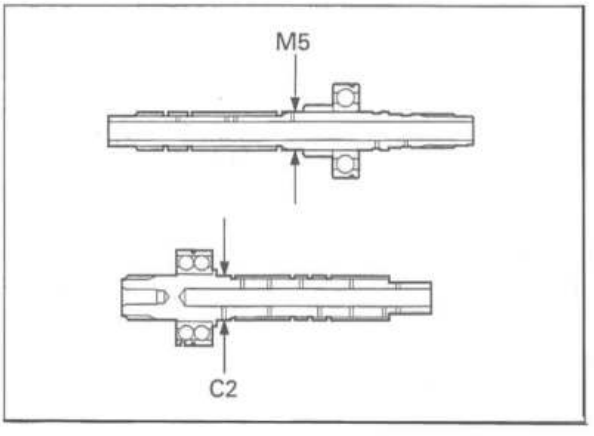
O.D.:	**M5, M6:**	27.94 mm (1.100 in)
	C2:	30.94 mm (1.218 in)
	C3, C4:	30.93 mm (1.218 in)
I.D.:	**M5:**	25.016 mm (0.9849 in)
	C2:	28.021 mm (1.1032 in)



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

SERVICE LIMITS:

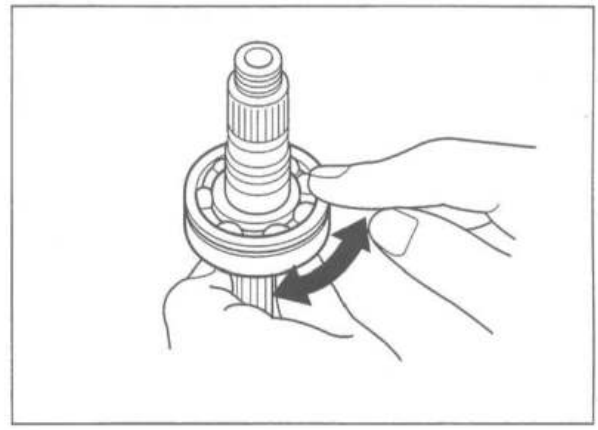
M5:	24.960 mm (0.9827 in)
C2:	27.96 mm (1.101 in)



MAINSHAFT BEARING REPLACEMENT

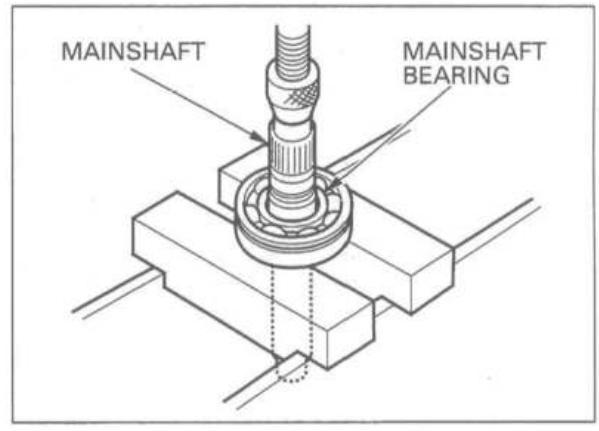
NOTE:

Do not try to remove the countershaft bearing from the shaft. If the bearing is worn or damaged, replace the countershaft as an assembly.



Turn the outer race of each bearing with your finger. The bearings should turn smoothly and quietly.
Also check that the bearing inner race fits tightly on the shaft.
Remove and discard the mainshaft bearing, if the race does not turn smoothly, quietly, or fits loosely on the mainshaft.
Replace the countershaft, collar, and bearing as an assembly, if the race does not turn smoothly, quietly, or fits loosely on the countershaft.

Press out the mainshaft from the bearing using a hydraulic press.



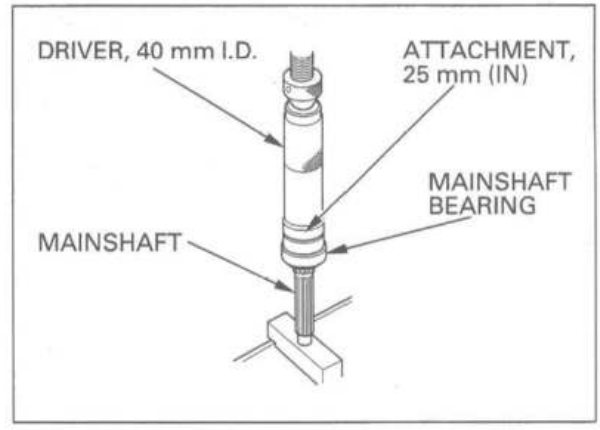
Install a new mainshaft bearing onto the mainshaft by pressing the mainshaft bearing inner race using the special tools.

TOOLS:

Driver, 40 mm I.D.	07746-0030100
Attachment, 25 mm (IN)	07746-0030200

NOTE:

Install the bearing with its marking facing out.



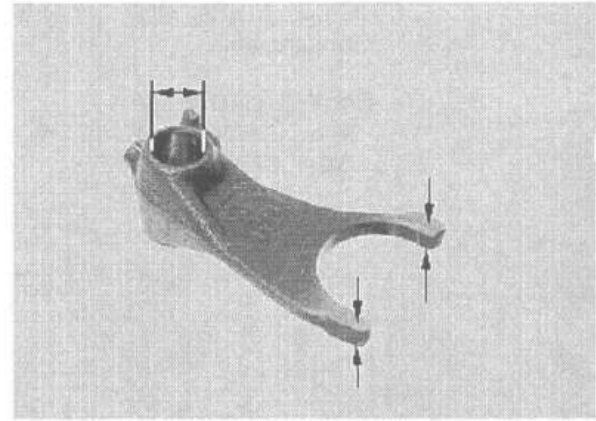
Check the shift fork and fork shaft for wear or damage.

Measure the I.D. of the shift fork.

SERVICE LIMIT: 12.030 mm (0.4736 in)

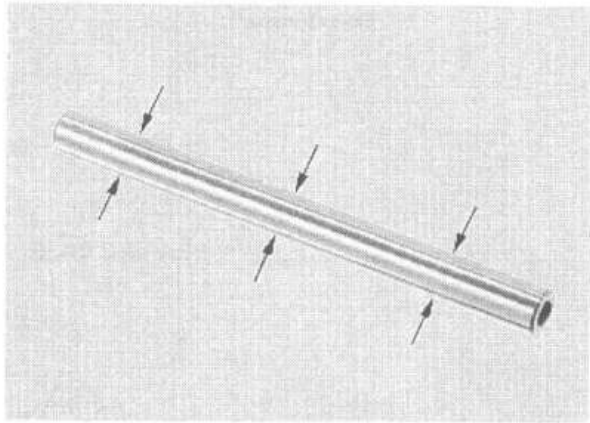
Measure the shift fork claw thickness.

SERVICE LIMIT: 5.90 mm (0.232 in)



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

SERVICE LIMIT: 11.95 mm (0.470 in)



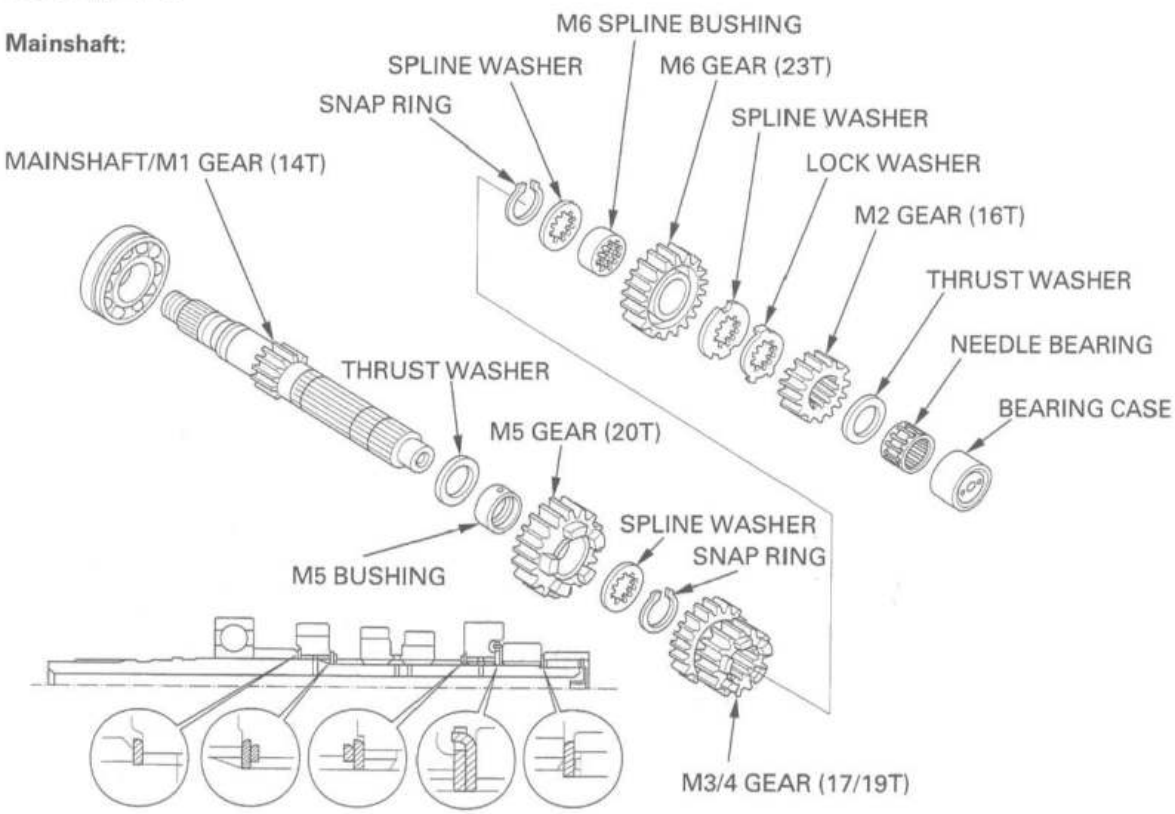
Inspect the shift drum grooves for wear or damage.

Turn the outer race of the shift drum bearing with your finger.
The bearing should turn smoothly and freely without excessive play.
If necessary, replace the bearing.

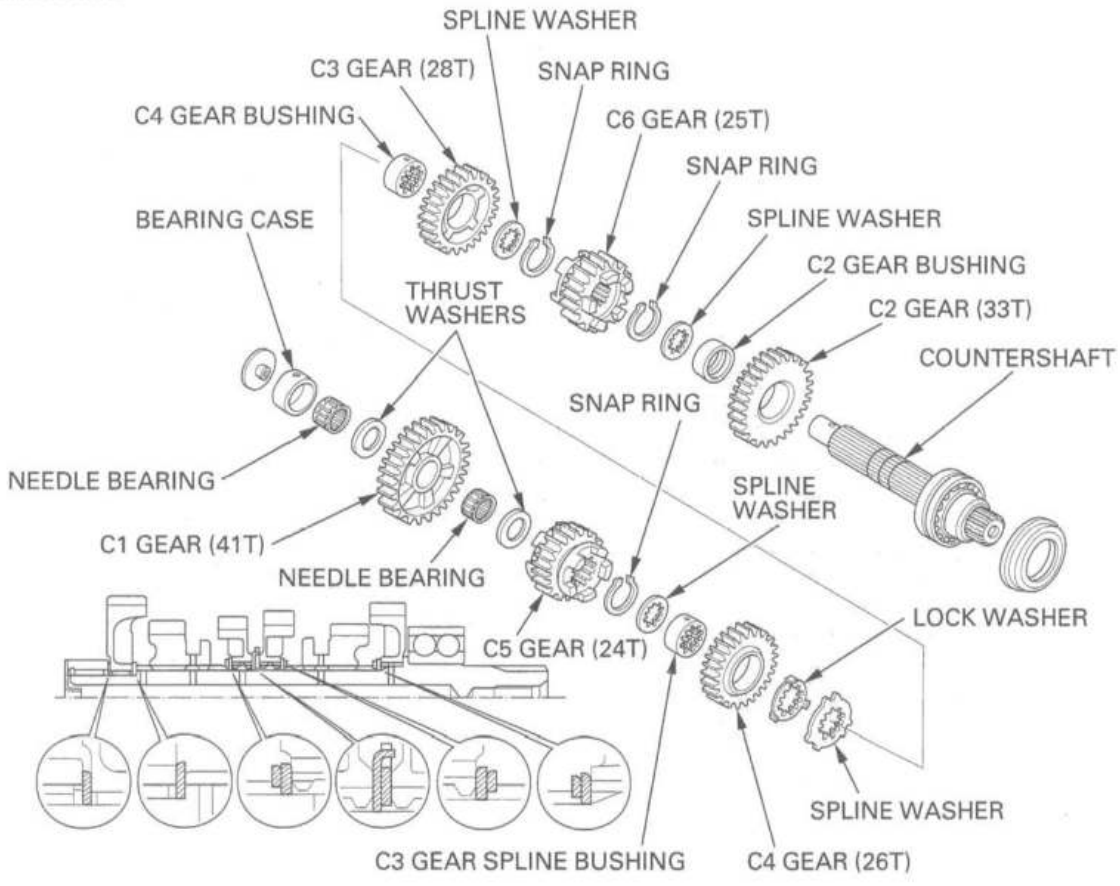


ASSEMBLY

Mainshaft:

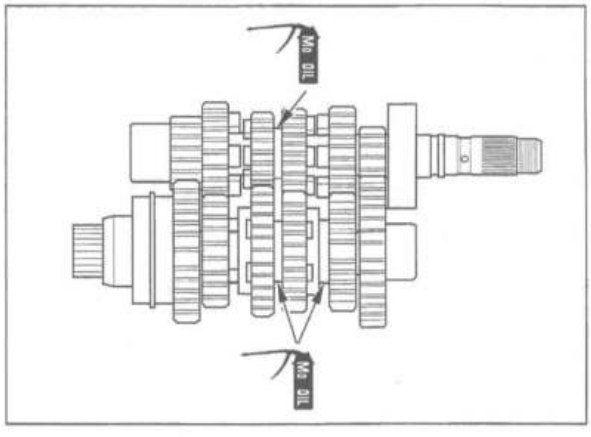


Countershaft:



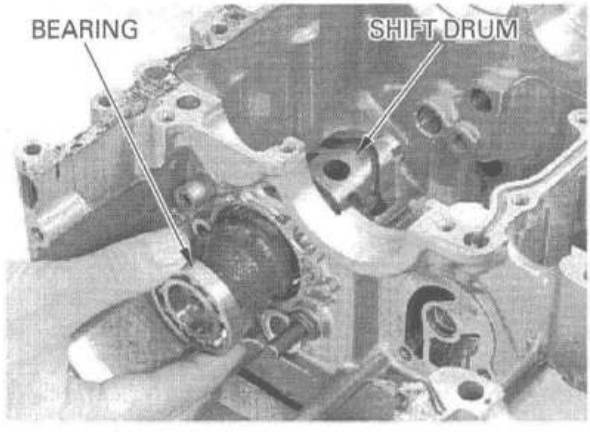
Assemble the transmission gear and shafts.
Coat each gear with clean engine oil and check for smooth movement.

Apply molybdenum disulfide oil to the shift fork grooves in the M3/4, C5 and C6 gear.



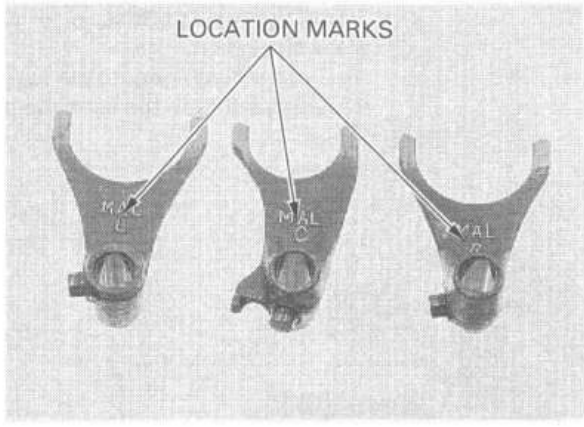
INSTALLATION

Install the shift drum and bearing into the lower crankcase.



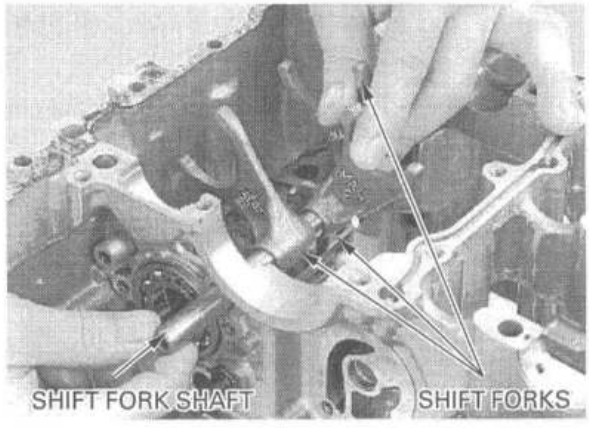
NOTE:

The shift forks have location marks.
"R" for right
"C" for center
"L" for left

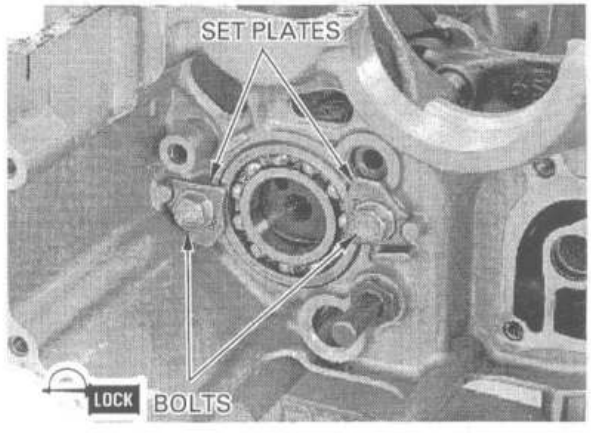


Face the shift fork identification marks to the clutch side.

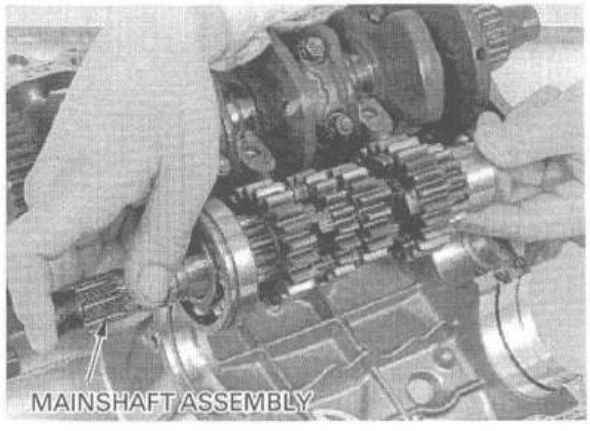
Install the shift forks and shift fork shaft.



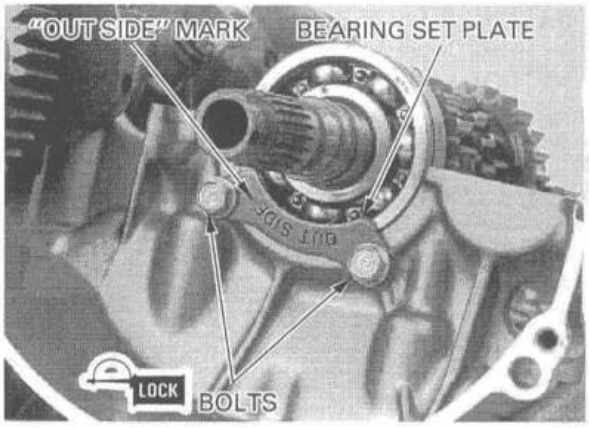
Apply a locking agent to the shift drum bearing set plate bolt threads.
Install the shift drum bearing set plate with their "OUT" mark facing out.
Install and tighten the set plate bolts securely.



Install the mainshaft assembly onto the upper crankcase.

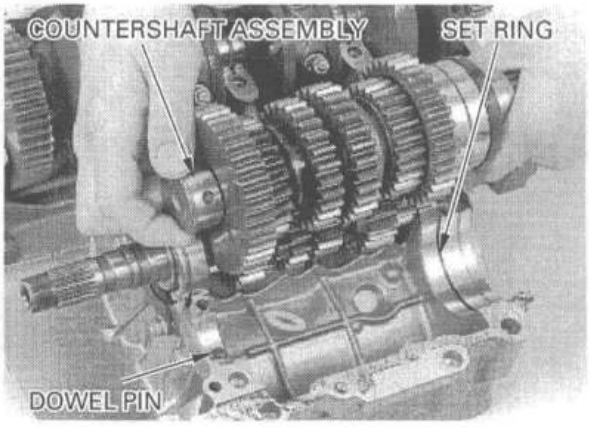


Install the mainshaft set plate with its "OUT SIDE" mark facing out.
Apply a locking agent to the set plate bolt threads.
Install and tighten the set plate bolts.



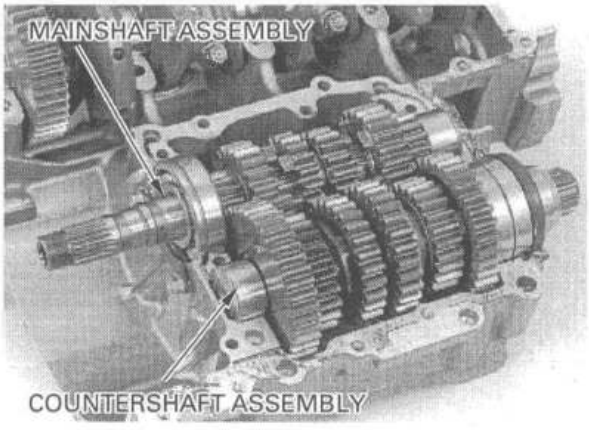
Install the dowel pin and bearing set ring on the upper crankcase.

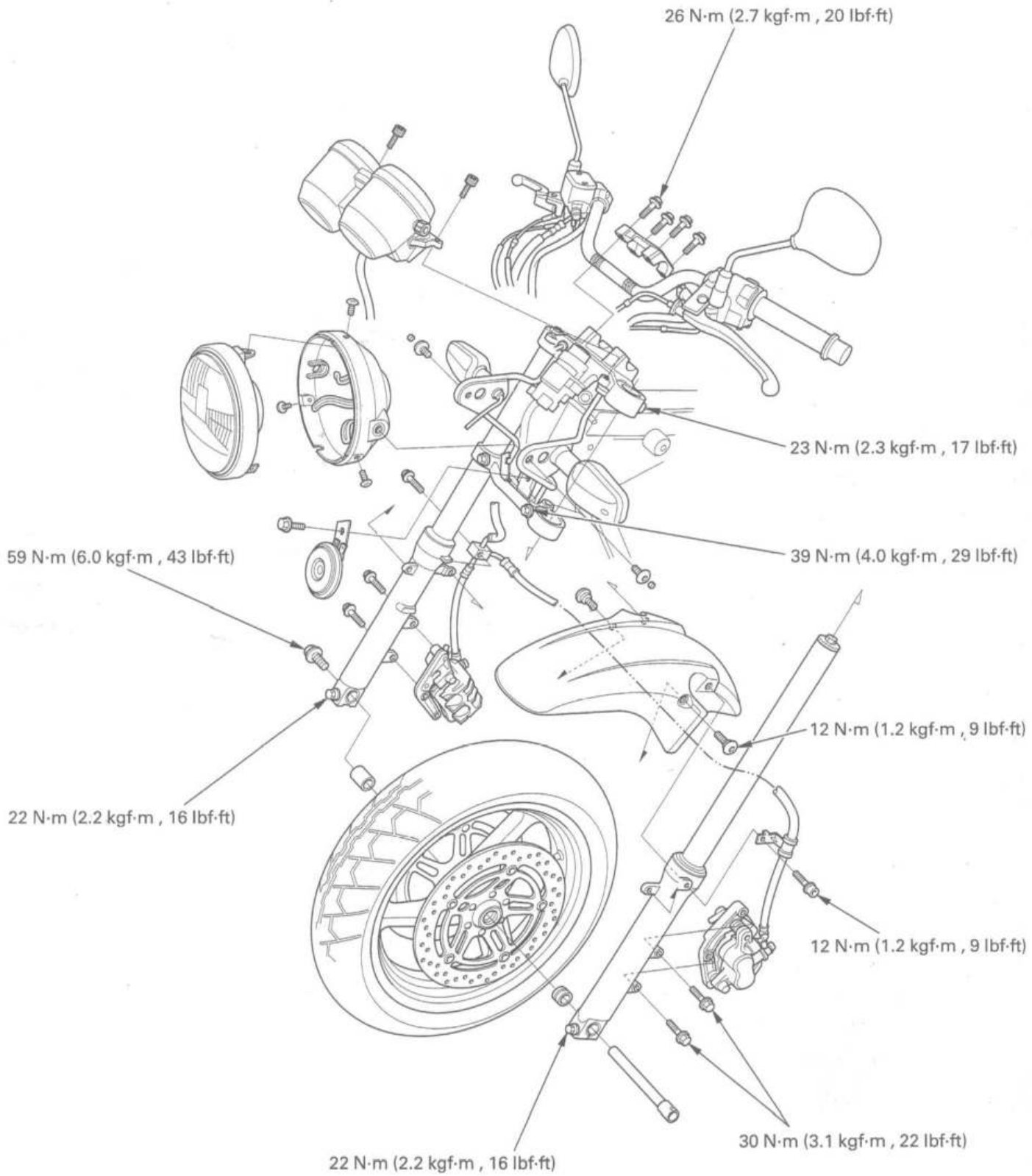
Install the countershaft by aligning the countershaft bearing set ring with the groove on the countershaft bearing, and aligning the bearing cap hole with the dowel pin.



After installation, check for smooth transmission operation.

Assemble the crankcase halves (page 11-11).




26 N·m (2.7 kgf·m , 20 lbf·ft)
23 N·m (2.3 kgf·m , 17 lbf·ft)
39 N·m (4.0 kgf·m , 29 lbf·ft)
59 N·m (6.0 kgf·m , 43 lbf·ft)
12 N·m (1.2 kgf·m , 9 lbf·ft)
22 N·m (2.2 kgf·m , 16 lbf·ft)
12 N·m (1.2 kgf·m , 9 lbf·ft)
30 N·m (3.1 kgf·m , 22 lbf·ft)
22 N·m (2.2 kgf·m , 16 lbf·ft)

13. FRONT WHEEL/SUSPENSION/STEERING

SERVICE INFORMATION	13-1	FRONT WHEEL	13-9
TROUBLESHOOTING	13-2	FORK	13-16
HANDLEBAR	13-3	STEERING STEM	13-25

SERVICE INFORMATION

GENERAL

⚠WARNING

A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.

- When servicing the front wheel, fork or steering stem, support the motorcycle using a safety stand or hoist.
- Refer to section 15 for brake system information.
- Use only tires marked "TUBELESS" and tubeless valves on rim marked "TUBELESS TIRE APPLICABLE".

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		—	1.5 (0.06)
Cold tire pressure	Driver only	250 kPa (2.50 kgf/cm², 36 psi)	—
	Driver and passenger	250 kPa (2.50 kgf/cm², 36 psi)	—
Axle runout		—	0.20 (0.008)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Fork	Spring free length	309.2 (12.17)	303.0 (11.93)
	Spring direction	With the tapered end facing down	—
	Tube runout	—	0.20 (0.008)
	Recommended fork fluid	Fork fluid	—
	Fluid level	102 (4.0)	—
	Fluid capacity	486 ± 2.5 cm³ (16.4 ± 0.08 US oz, 17.1 ± 0.09 Imp oz)	—
Steering head bearing pre-load		0.98–1.47 N (0.10–0.15 kgf, 0.22–0.33 lbf)	—

TORQUE VALUES

Handlebar holder bolt	26 N·m (2.7 kgf·m , 20 lbf·ft)	
Steering stem nut	103 N·m (10.5 kgf·m , 76 lbf·ft)	See page 13-30
Top thread A	—	
Top thread B	—	
Fork top bridge pinch bolt	23 N·m (2.3 kgf·m , 17 lbf·ft)	
Fork bottom bridge pinch bolt	39 N·m (4.0 kgf·m , 29 lbf·ft)	
Front axle bolt	59 N·m (6.0 kgf·m , 43 lbf·ft)	
Front axle holder bolt	22 N·m (2.2 kgf·m , 16 lbf·ft)	
Front brake disc mounting bolt	20 N·m (2.0 kgf·m , 14 lbf·ft)	ALOC bolt
Fork cap	23 N·m (2.3 kgf·m , 17 lbf·ft)	
Fork socket bolt	20 N·m (2.0 kgf·m , 14 lbf·ft)	Apply a locking agent to the threads

TOOLS

Bearing remover shaft	07746-0050100
Bearing remover head, 20 mm	07746-0050600
Driver	07749-0010000
Attachment, 42 × 47 mm	07746-0010300
Attachment, 52 × 55 mm	07746-0010400
Pilot, 20 mm	07746-0040500
Slider weight	07947-KA50100
Oil seal driver attachment	07947-KF00100
Steering stem socket	07916-3710101
Ball race remover	07946-3710500
Steering stem driver	07946-MB00000

TROUBLESHOOTING

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

Steers to one side or does not track straight
- Unevenly adjusted right and left fork legs
- Bent fork
- Bent axle
- Wheel installed incorrectly
- Faulty steering head bearings
- Bent frame
- Worn wheel bearing
- Worn swingarm pivot components

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

Wheel turns hard
- Faulty wheel bearing
- Bent front axle
- Brake drag

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

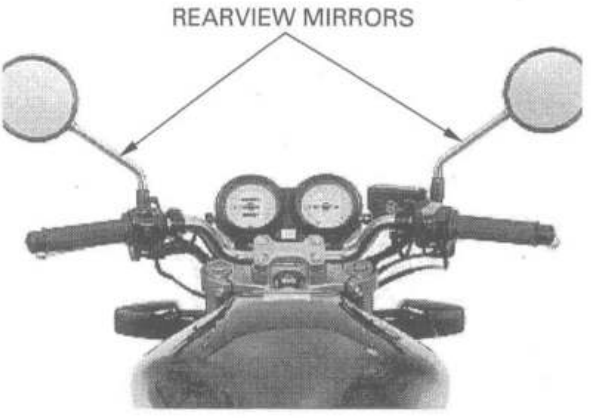
Hard suspension
- Incorrect fluid weight
- Bent fork tubes
- Clogged fork fluid passage

Front suspension noisy
- Insufficient fluid in fork
- Loose fork fasteners

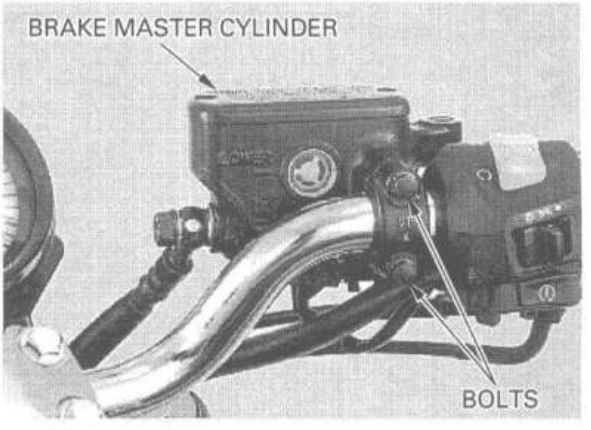
HANDLEBAR

REMOVAL

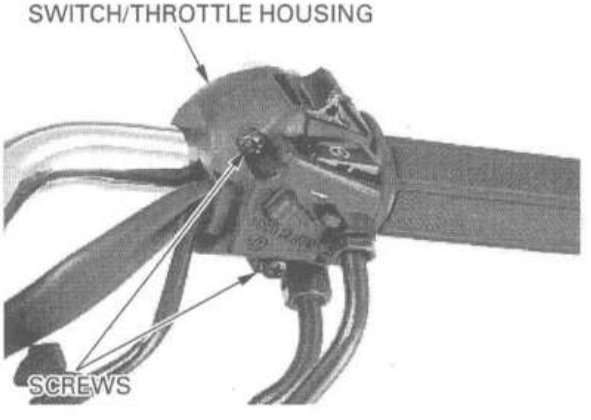
Remove the rearview mirrors.



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

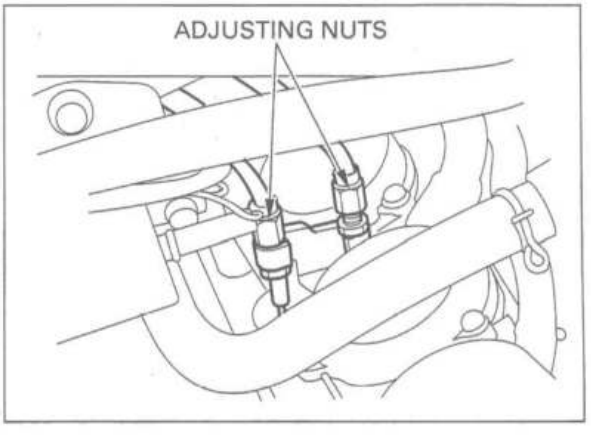


Remove the right handlebar switch/throttle housing screws.

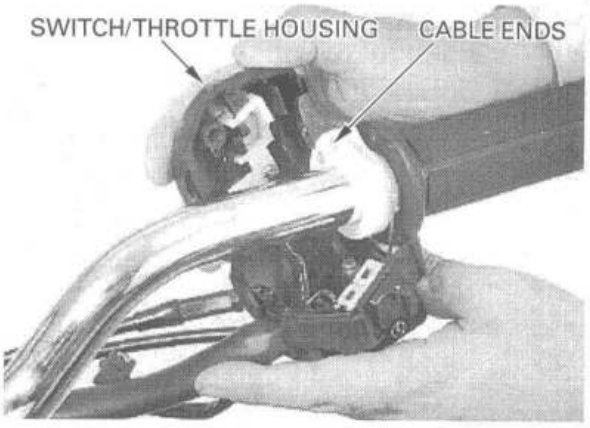


Remove the fuel tank (page 2-4).

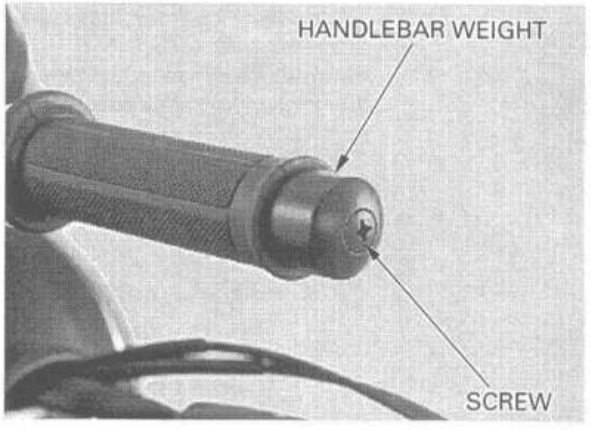
Loosen the throttle cable lock nuts at the carburetor and loosen the adjusting nuts.



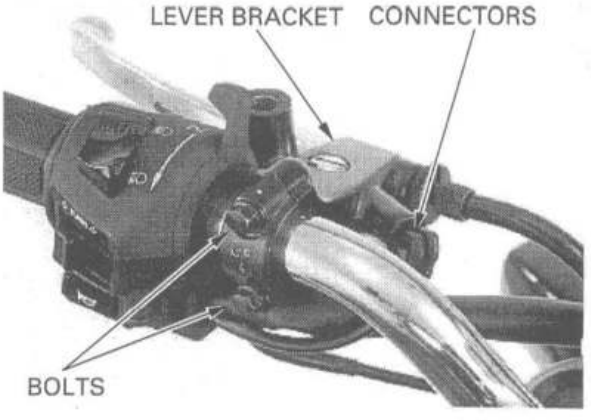
Disconnect the throttle cable ends from the throttle pipe and remove the right handlebar switch/throttle housing.



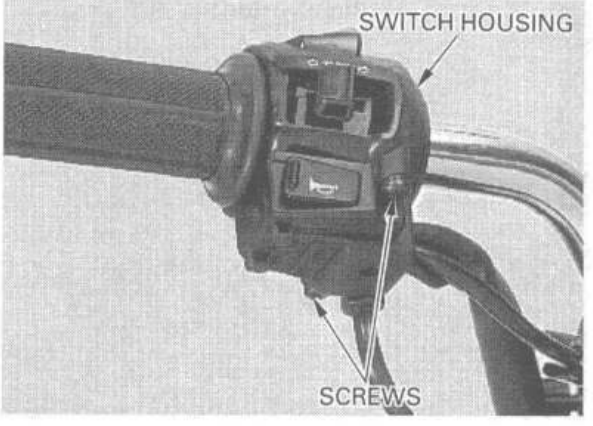
Remove the screw and the handlebar weight.



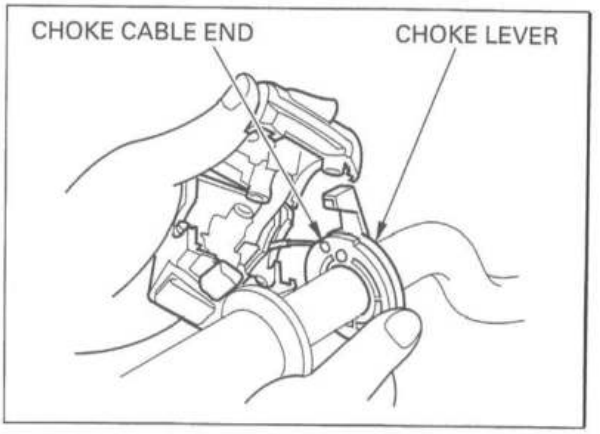
Disconnect the clutch switch wire connectors from the switch.
Remove the clutch lever bracket holder bolts, holder and clutch lever bracket assembly.



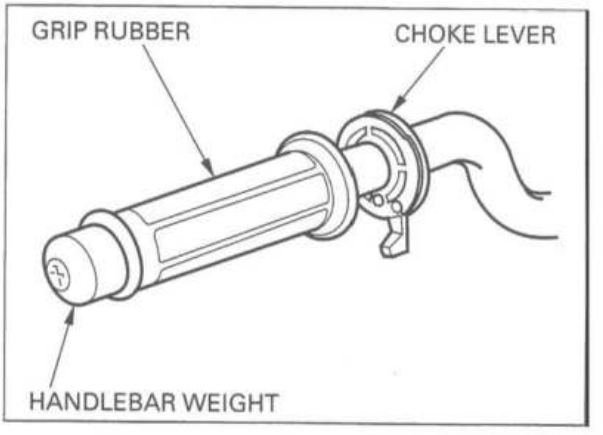
Remove the left handlebar switch screws.



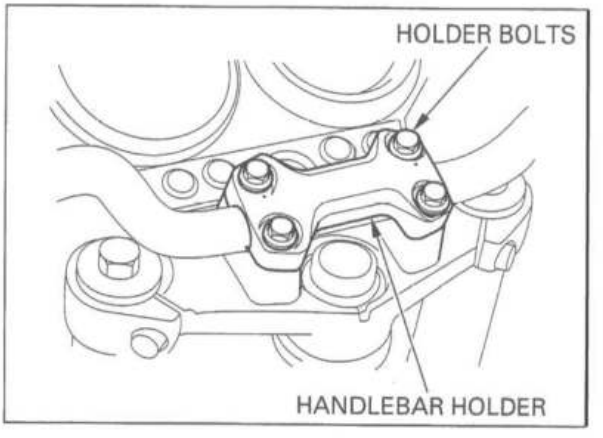
Disconnect the choke cable from the choke lever and remove the left handlebar switch.



Remove the left handlebar weight, handlebar grip rubber and choke lever.



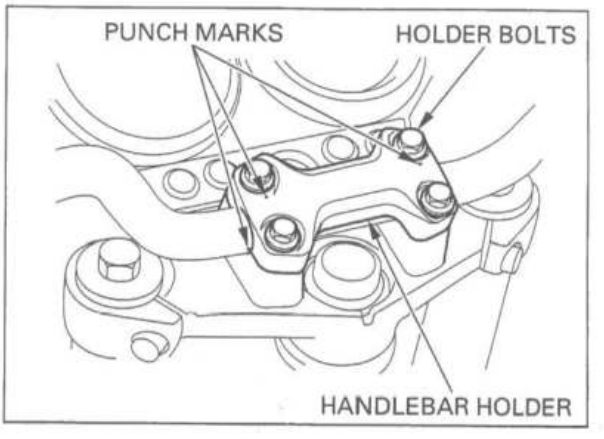
Remove the upper holder bolts, holder and handlebar.



INSTALLATION

Place the handlebar on the lower holders aligning the punch marks on the handlebar with the top surface of the lower holders.
Install the upper holder with its punch mark facing forward.
Install the upper holder bolts.
Tighten the front bolts first, then tighten the rear bolts.

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

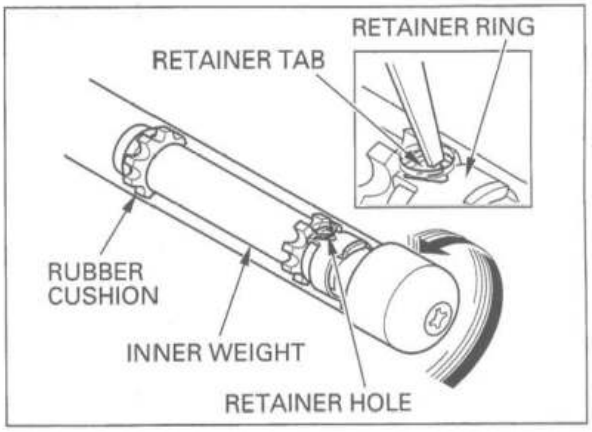


HANDLEBAR WEIGHT REPLACEMENT

Remove the grip from the handlebar.
Straighten the weight retainer tab by the screwdriver or punch.
Temporarily install the handlebar weight and screw, then remove the inner weight by turning the handlebar weight.

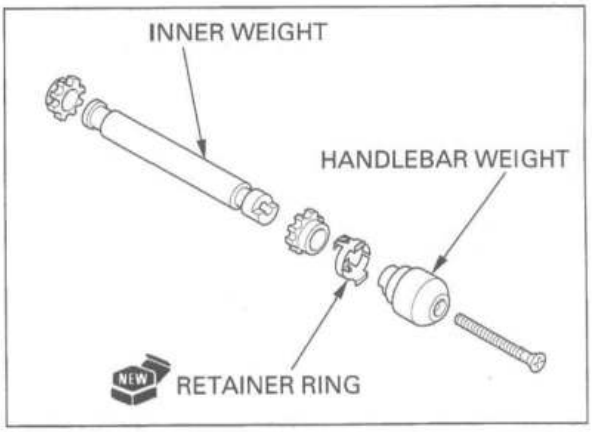
NOTE:

Apply lubricant splay (CRC 5-56 or an equivalent) through the tab retainer hole to the rubber for easy removal.



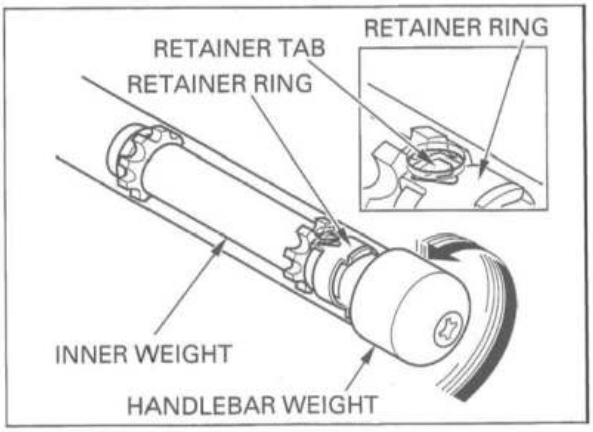
Remove the handlebar weight front the inner weight.
Discard the retainer.

Install the new retainer onto the handlebar inner weight.
Install the handlebar weight onto the inner weight aligning its boss with the slot in the inner weight.
Install a new mounting screw.

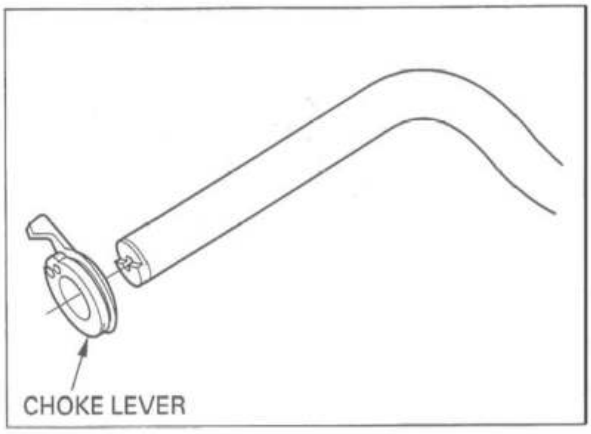


For easey installation, apply soapy water to the rubber cushions.

Insert the handlebar weight assembly into the handlebar.
Turn the handlebar weight and hook the retainer tab with the hole in the handlebar.



Install the choke lever onto the left side of the handlebar.

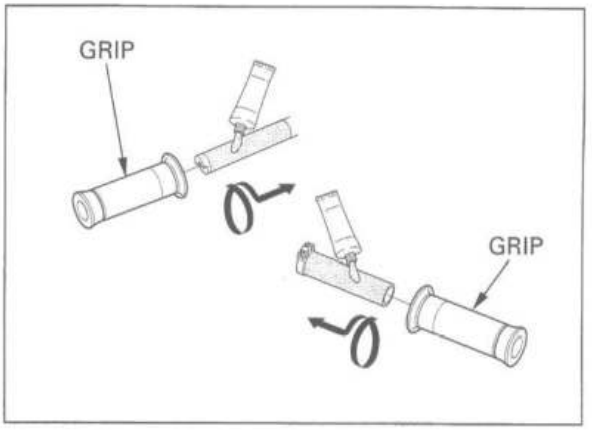


If the handlebar grips were removed, apply Honda Bond A or equivalent to the inside of the grip and to the clean surfaces of the right and left handlebar.

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

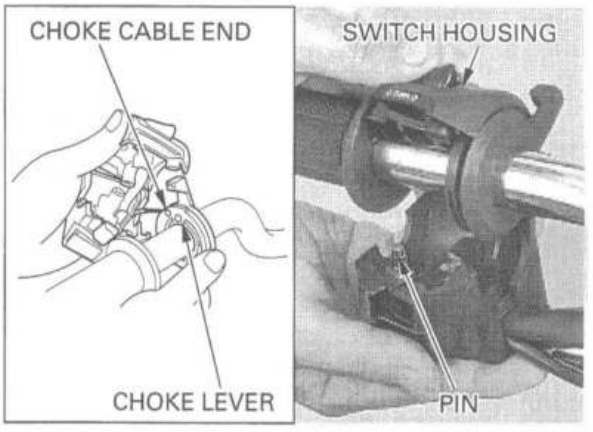
NOTE:

Allow the adhesive to dry for an hour before using.

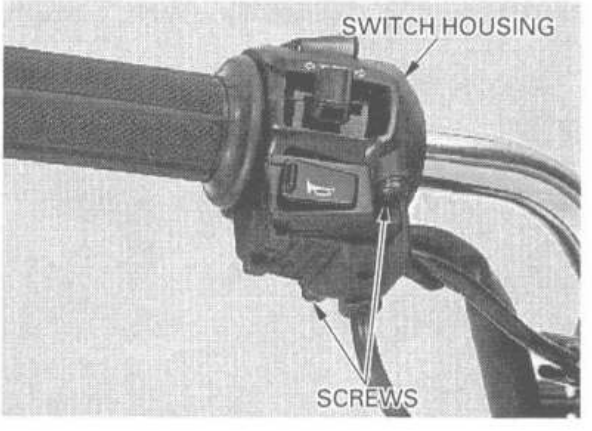


Connect the choke cable to the choke lever.

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



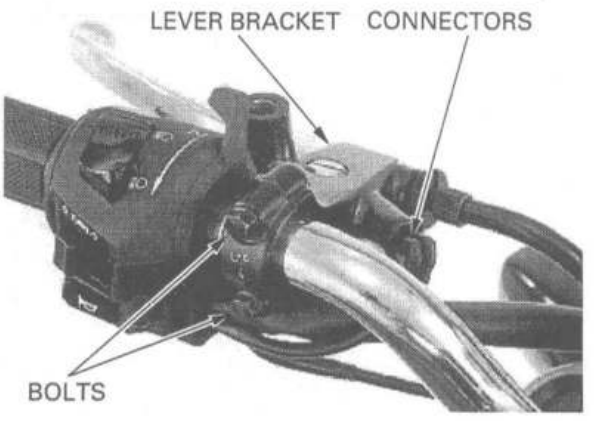
Tighten the forward screw first, then the rear screw.



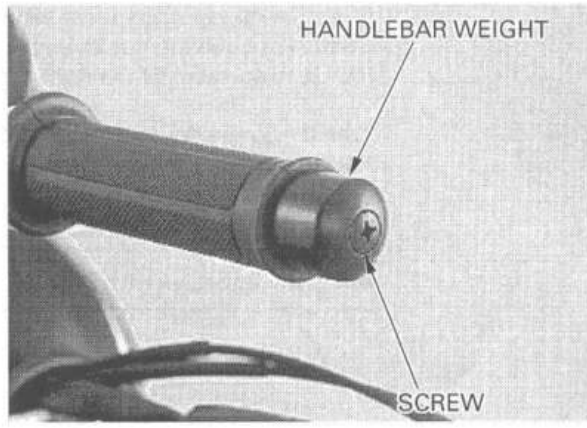
Install the clutch lever bracket assembly aligning the end of the bracket with the punch mark on the handlebar.
Install the clutch lever bracket holder with the "UP" mark facing up.
Tighten the upper bolt first, then the lower bolt.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

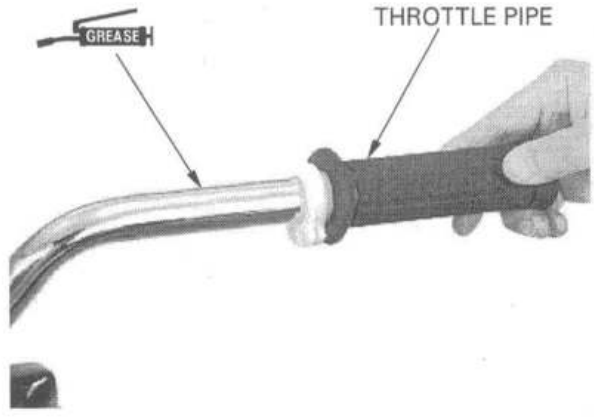
Connect the clutch switch wire connectors.



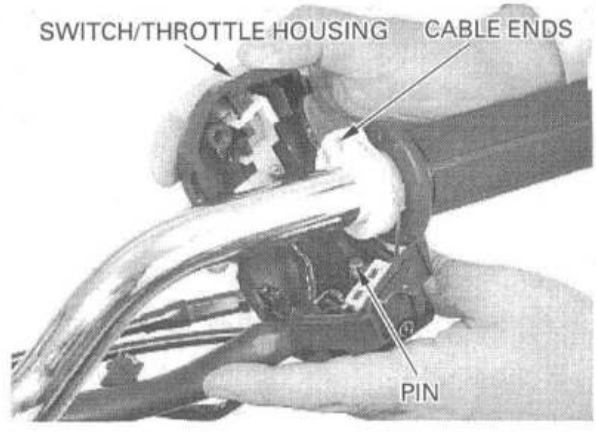
Install the handlebar weight and tighten the screw securely.



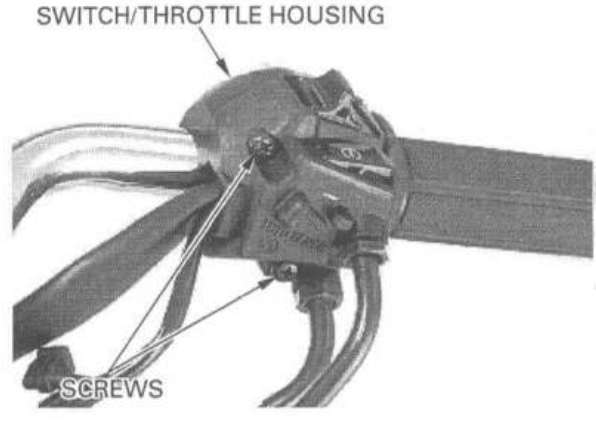
Apply grease to the throttle pipe sliding surface, then install the throttle pipe onto the handlebar.



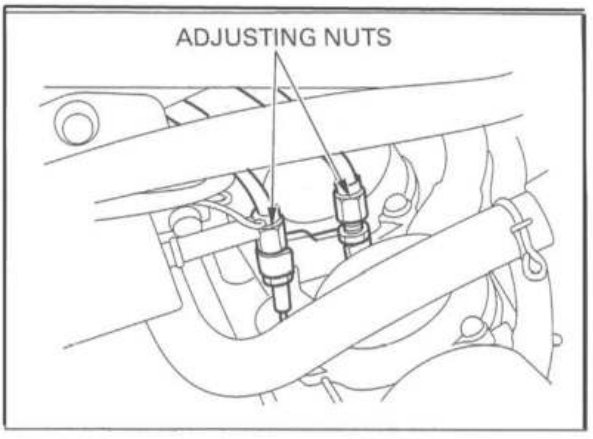
Connect the throttle cables to the throttle grip flange.
Install the right handlebar switch/throttle housing aligning its locating pin with the hole in the handlebar.



Tighten the forward screw first, then the rear screw.



Connect the throttle cables to the carburetor bracket, adjust the throttle grip free play (page 3-4).



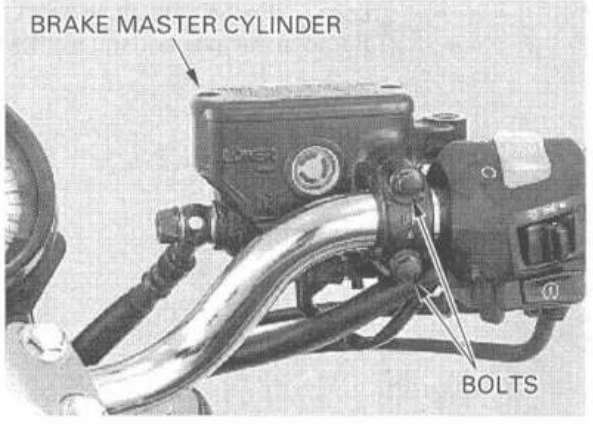
Install the master cylinder aligning the end of the master cylinder with the punch mark on the handlebar.
Install the master cylinder holder with the "UP" mark facing up.
Tighten the upper bolt first, then the lower bolt.

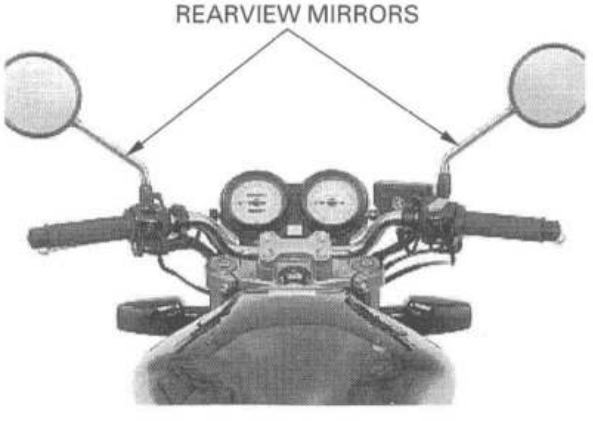
TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

Connect the brake switch wire connectors.

Install the rearview mirrors and tighten the nuts to the specified torque.

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





FRONT WHEEL

REMOVAL

⚠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.

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

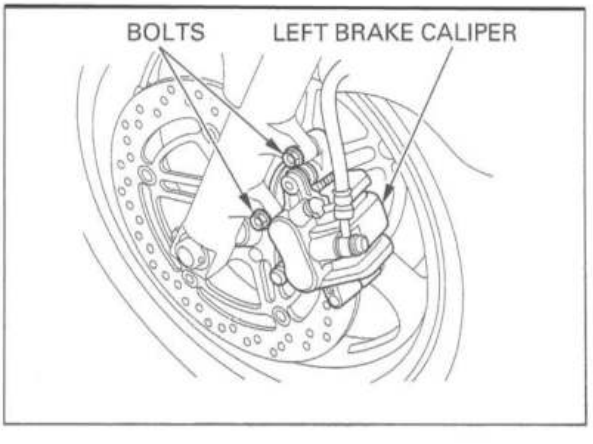
Remove the mounting bolts and left brake caliper.

CAUTION:

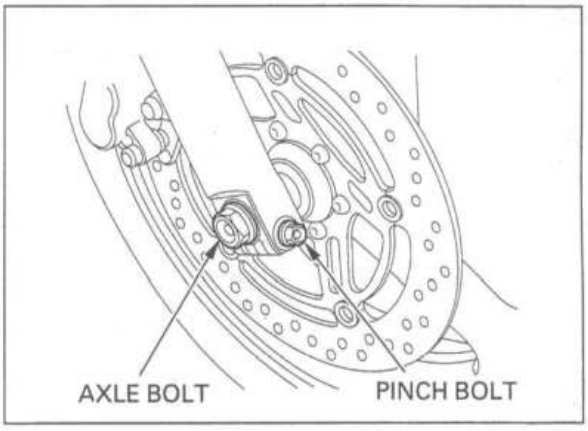
Support the brake caliper with a piece of wire so that it does not hang from the brake hose. Do not twist the brake hose

NOTE:

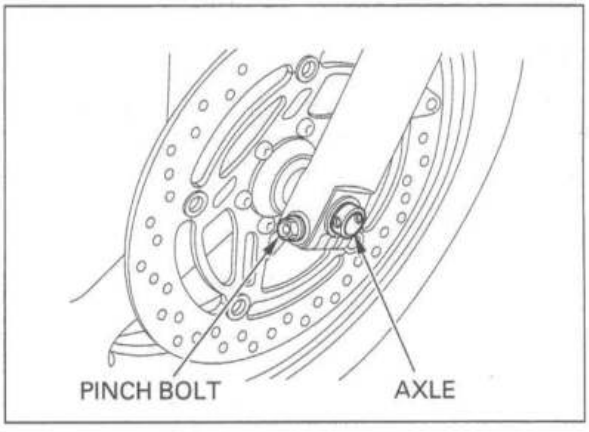
Do not operate the brake lever after the brake caliper is removed.



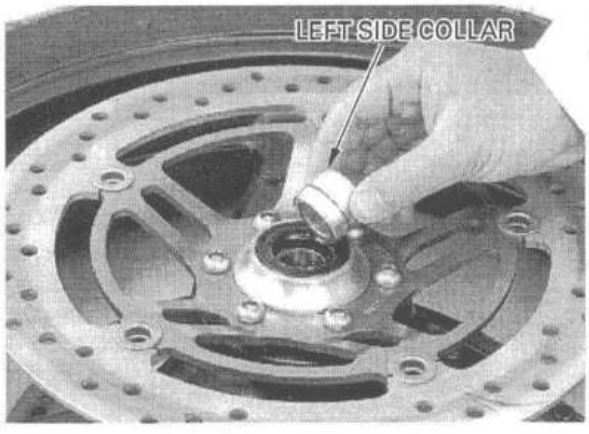
Loosen the right axle pinch bolt.
Remove the axle bolt.



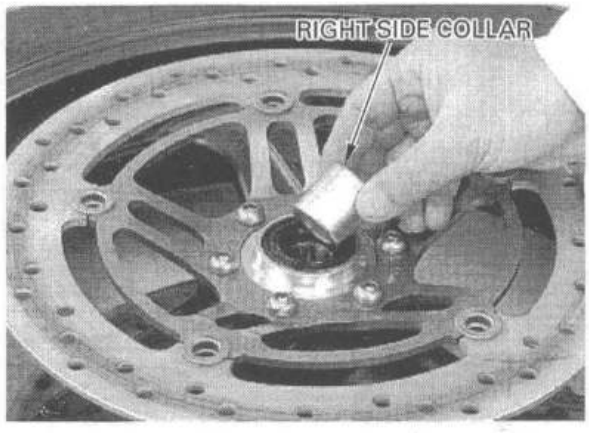
Loosen the left axle pinch bolt.
Remove the axle and the front wheel.



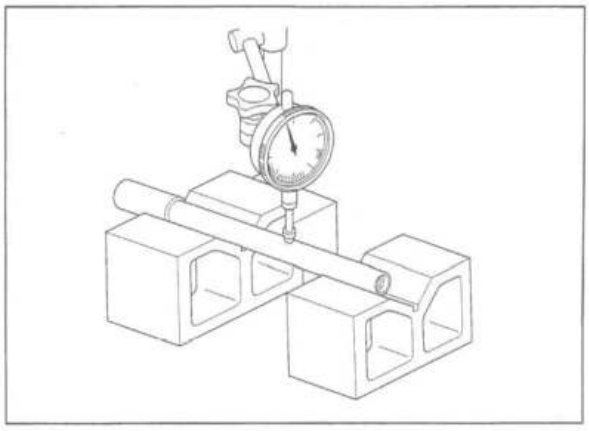
Remove the left side collar.



Remove the right side collar.

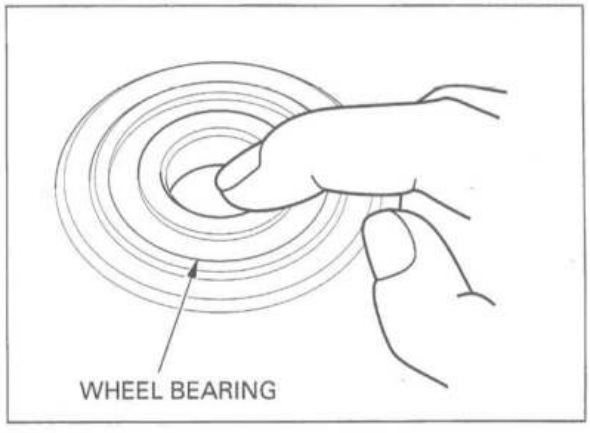


INSPECTION



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

SERVICE LIMIT: 0.20 mm (0.008 in)



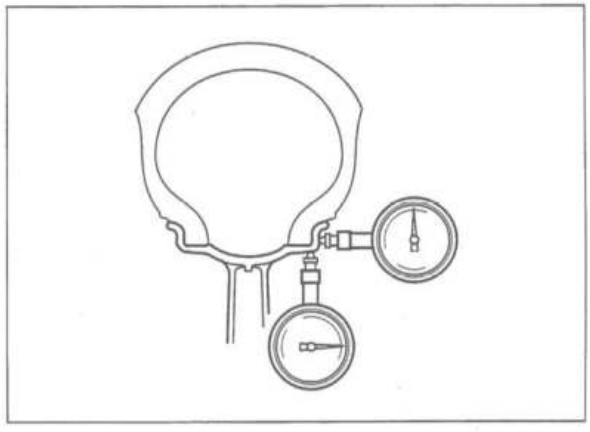
Wheel bearing
Turn the inner race of each bearing with your finger.
The bearings should turn smoothly and quietly.
Also check that the bearing outer race fits tightly in the hub.

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

NOTE:

Replace the bearings in pairs.

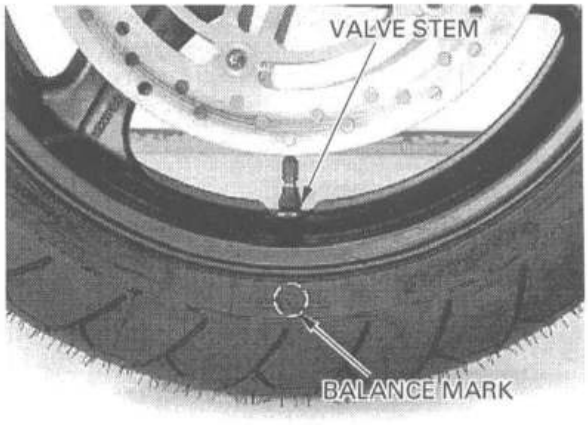
Install the new bearings into the hub using the special tools (page 13-12).



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

SERVICE LIMITS:
Radial: 2.0 mm (0.08 in)
Axial: 2.0 mm (0.08 in)

Wheel balance



CAUTION:

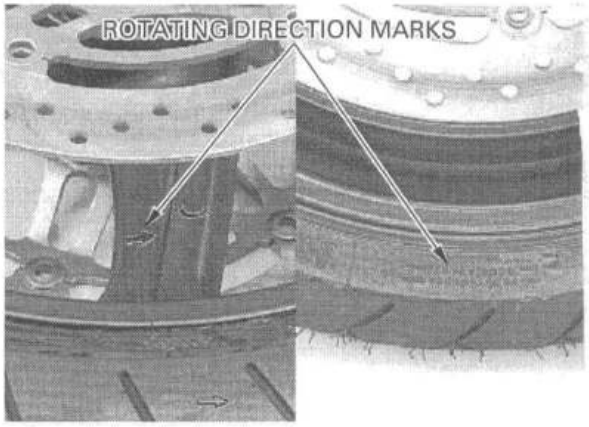
Wheel balance directly affects the stability, handling and over all safety of the motorcycle. Always check balance when the tire has been removed from the rim.

NOTE:

Except Michelin tire: For optimum balance, the tire balance mark (a paint dot on the side wall) must be located next to the valve stem. Remount the tire if necessary.

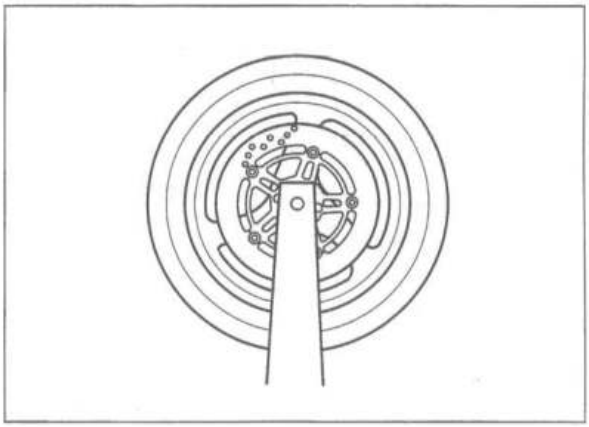
NOTE:

Note the rotating direction marks on the wheel and tire.



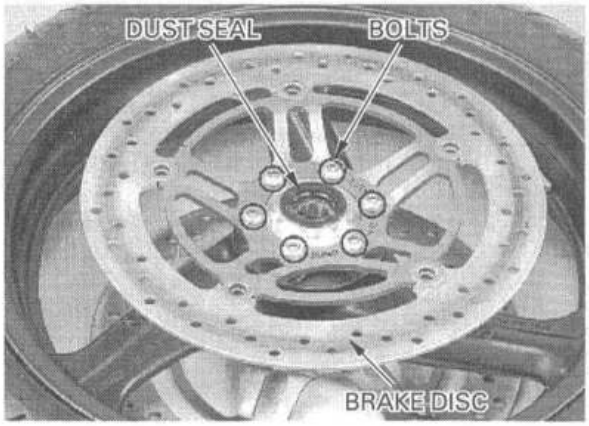
Remove the dust seals from the wheel.
Mount the wheel, tire and brake discs assembly in an inspection stand.
Spin the wheel, allow it to stop, and mark the lowest (heaviest) point of the wheel with a chalk.
Do this two or three times to verify the heaviest area.
If the wheel is balanced, it will not stop consistently in the same position.

To balance the wheel, install wheel weights on the highest side of the rim, the side opposite the chalk marks. Add just enough weight so the wheel will no longer stop in the same position when it is spun. Do not add more than 60 grams to the wheel.



DISASSEMBLY

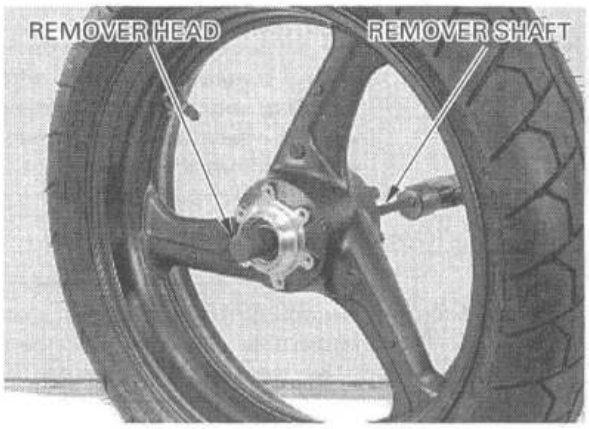
Remove the bolts and brake discs.
Remove the dust seals.



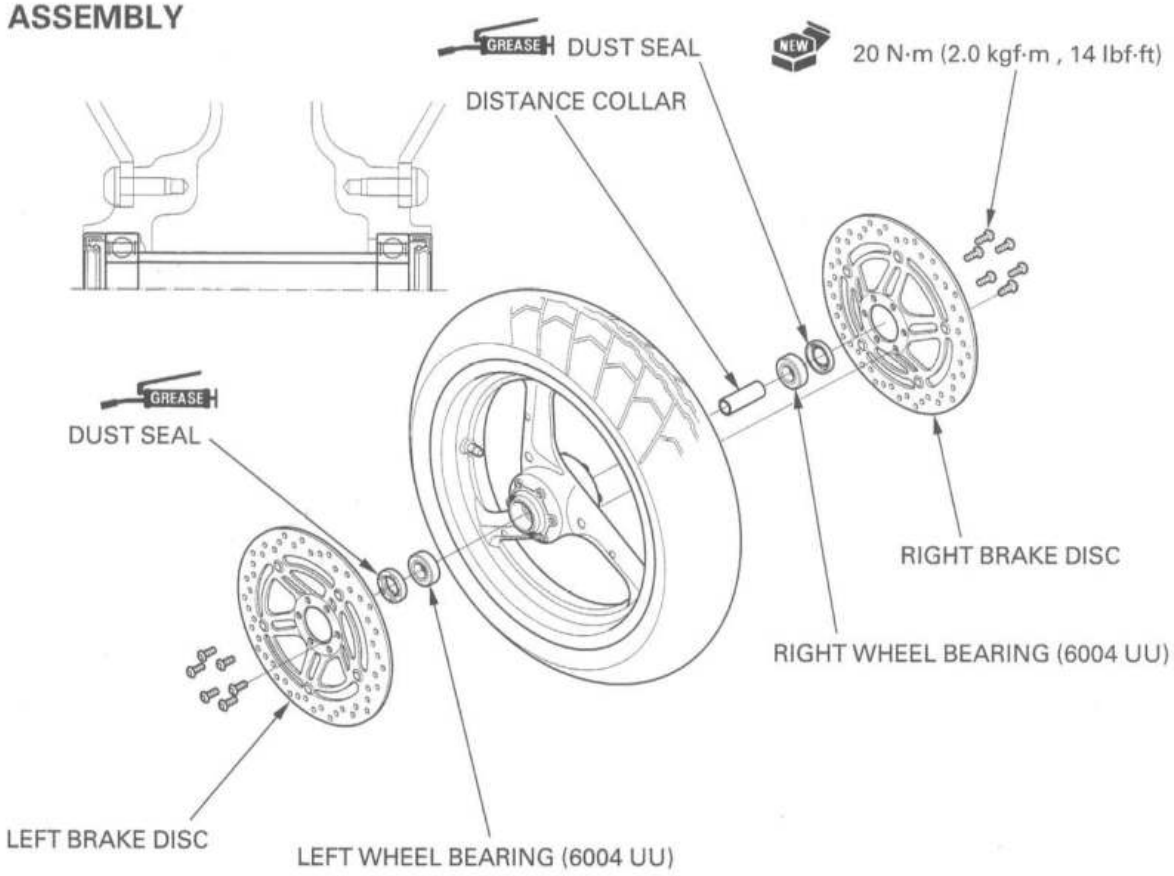
Install the bearing remover head into the bearing.
From the opposite side, install the bearing remover shaft and drive the bearing out of the wheel hub.
Remove the distance collar and drive out the other bearing.

TOOLS:

Bearing remover head, 20 mm	07746-0050600
Bearing remover shaft	07746-0050100



ASSEMBLY



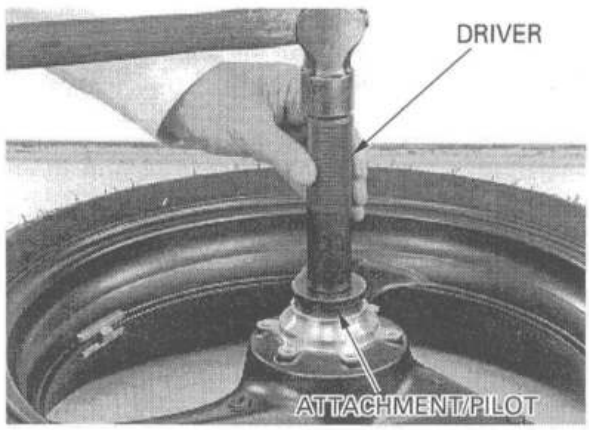
CAUTION:

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

Drive in a new right bearing squarely.
Install the distance collar, then drive in the left bearing using the special tools.

TOOLS:

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



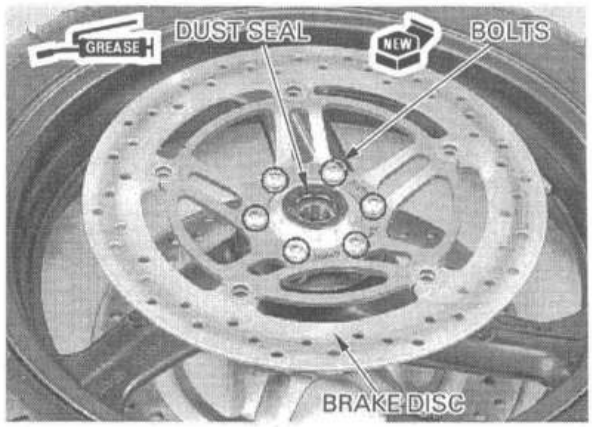
⚠WARNING

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

Install the brake discs on the wheel hub.
Install and tighten the new mounting bolts to the specified torque.

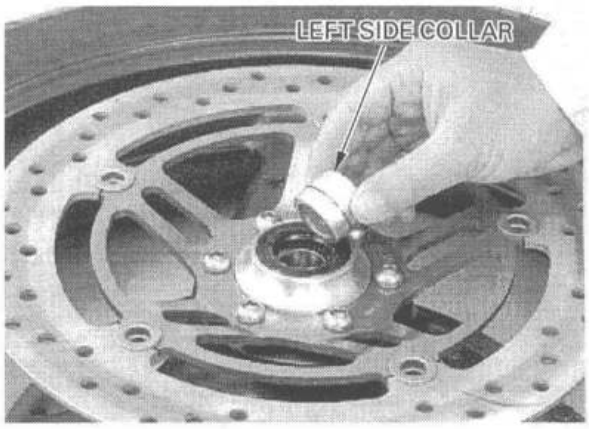
TORQUE: 20 N·m (2.0 kgf·m , 14 lbf·ft)

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

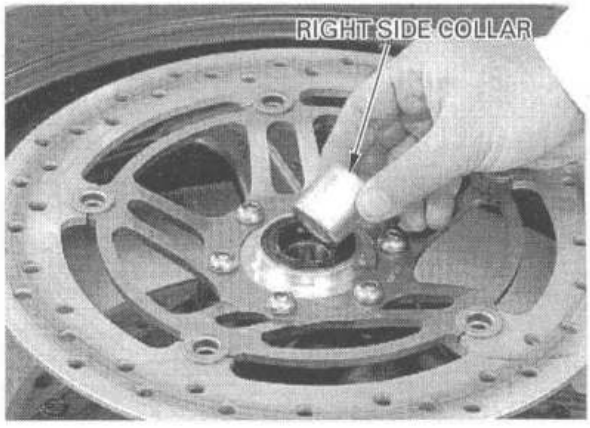


INSTALLATION

Install the left side collar.

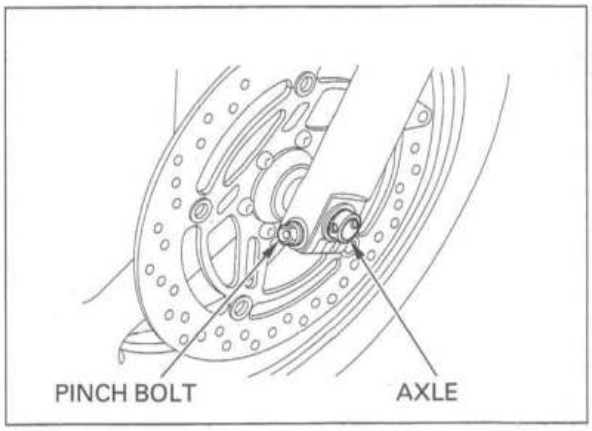


Install the right side collar.



Install the front wheel between the fork legs while aligning the left brake disc between the left brake caliper pads.

Apply thin layer of grease to the front axle surface. Install the front axle from the left side.

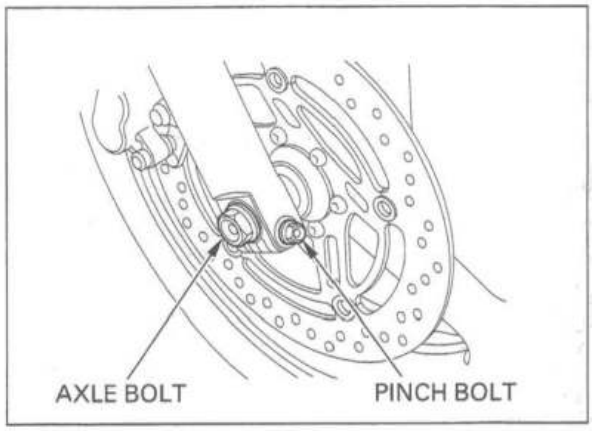


Hold the axle and tighten the axle bolt to the specified torque.

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

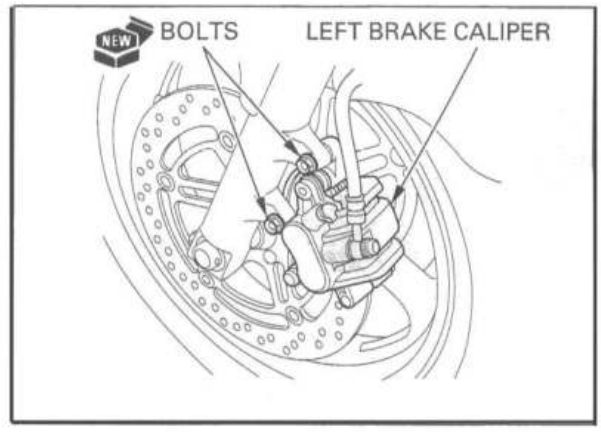
Tighten the right axle pinch bolt to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m , 16 lbf·ft)

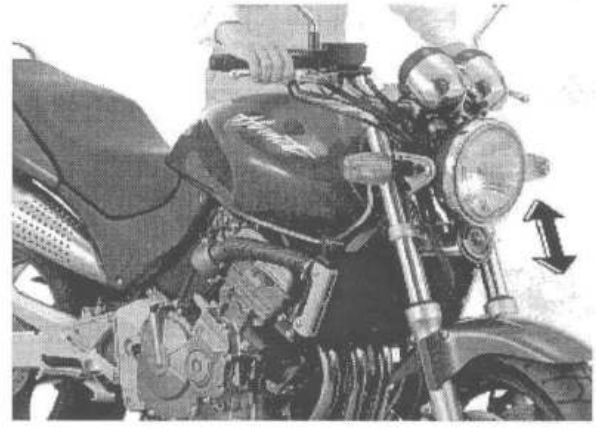


Install the left brake caliper and tighten the new mounting bolts to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m , 22 lbf·ft)

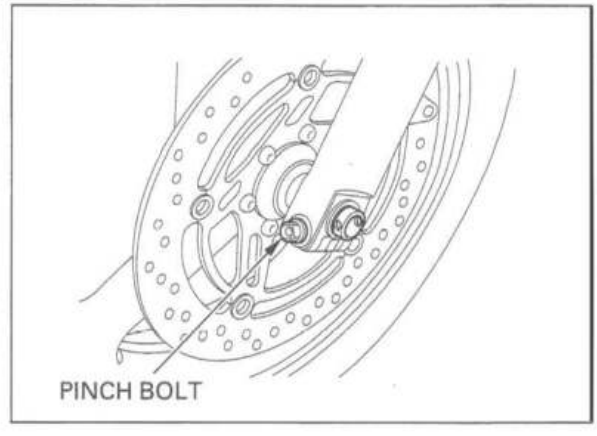


With the front brake applied, pump the fork up and down several times to seat the axle and check brake operation.

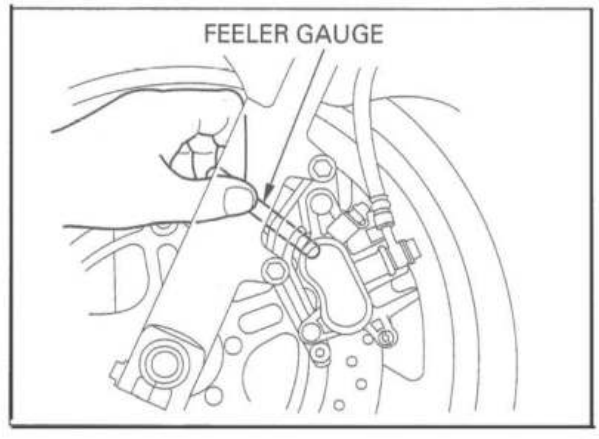


Tighten the left axle pinch bolt to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m , 16 lbf·ft)



Check the clearance between the brake disc and caliper bracket on each side after installation.
The clearance should be at least 0.7 mm (0.03 in).



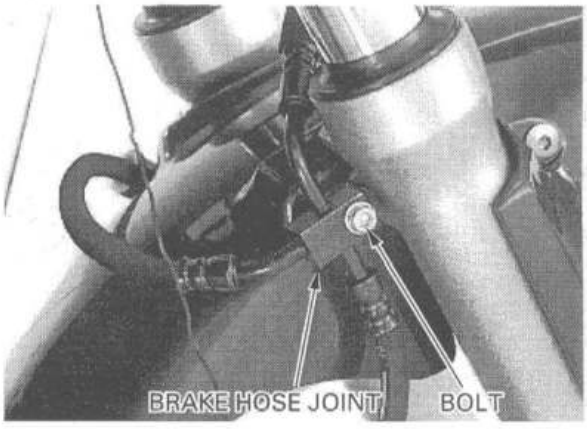
FORK

REMOVAL

Remove the front wheel (page 13-9).
Remove the bolts and left brake caliper (page 15-18).

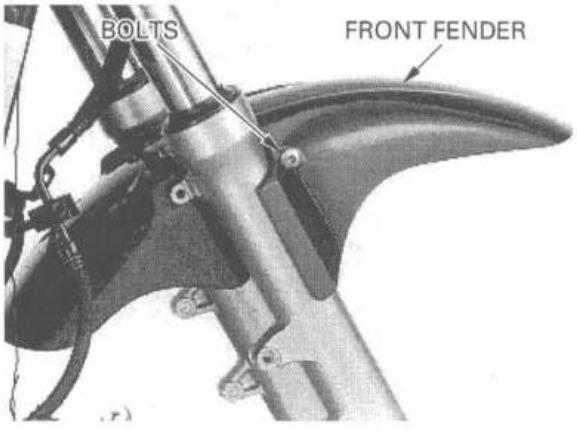
CAUTION:

Do not hang the brake caliper from the brake hose.

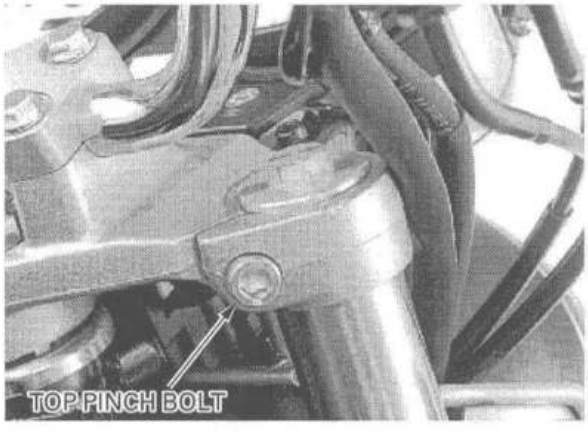


Remove the bolt and brake hose joint on each side.

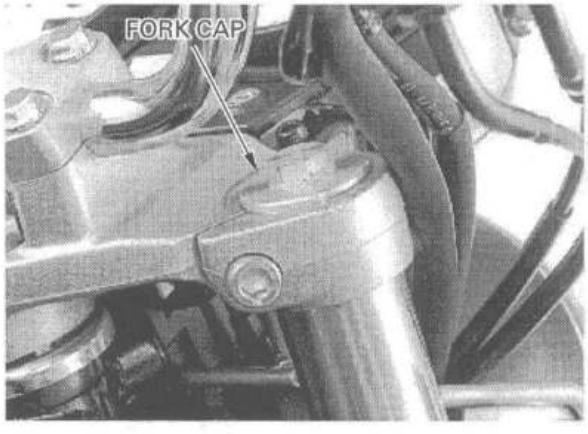
Remove the bolts and front fender.



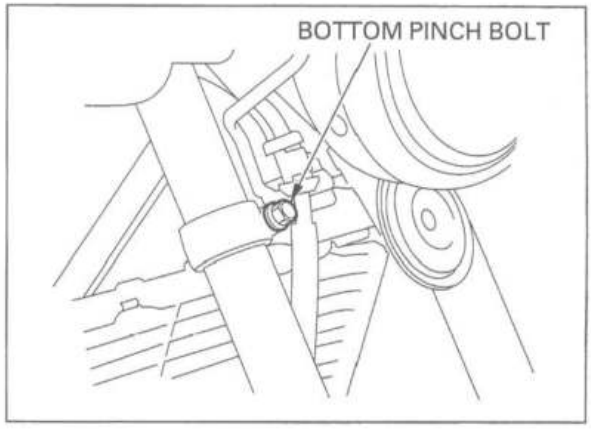
Loosen the fork top pinch bolt.



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



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



DISASSEMBLY

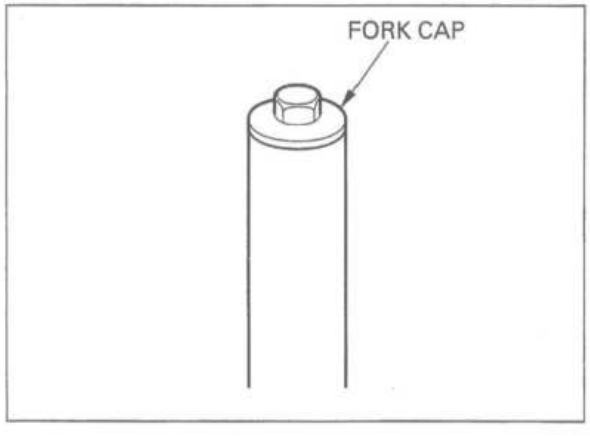
Hold the fork slider in a vice with soft jaws or a shop towel.
Remove the fork socket bolt with a hex wrench.



Remove the fork cap.

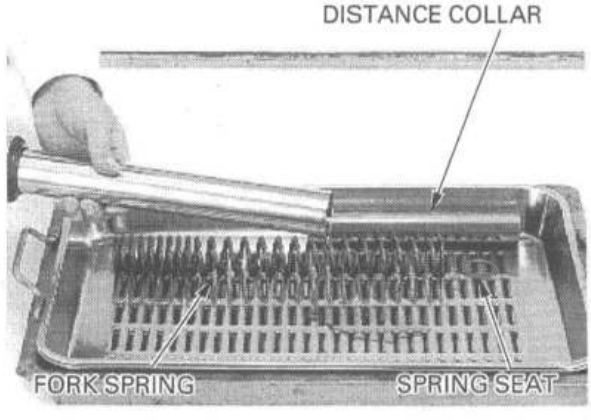
⚠WARNING

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

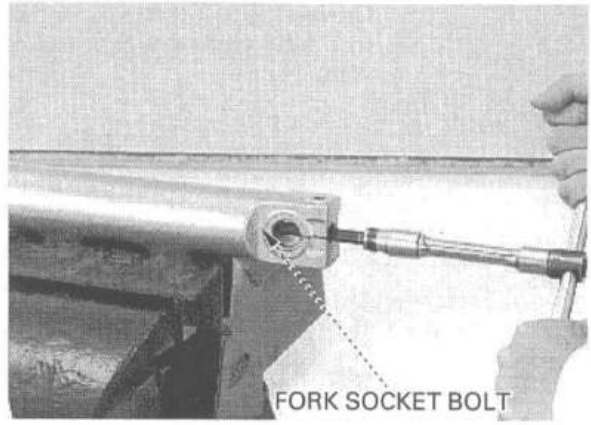


Remove the distance collar, spring seat and fork spring.

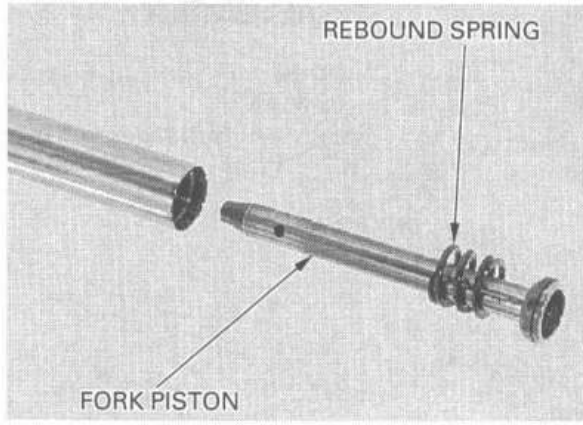
Pour out the fork fluid by pumping the fork tube up and down several times.



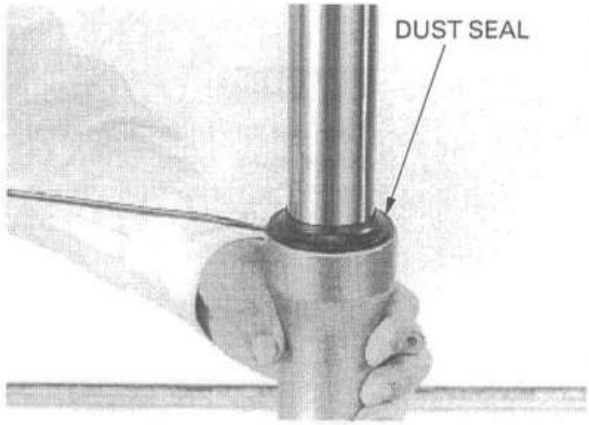
Remove the fork socket bolt and sealing washer.



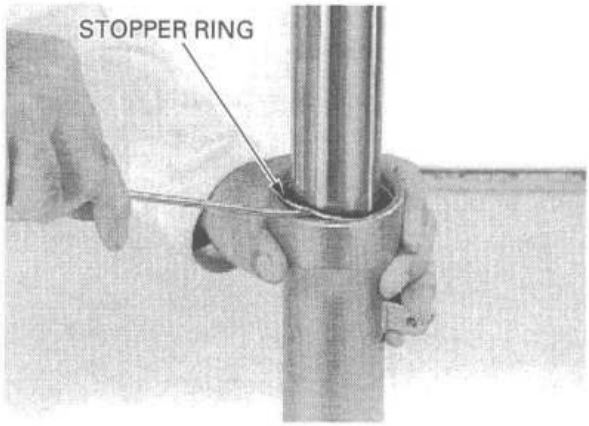
Remove the fork piston and rebound spring from the fork tube.



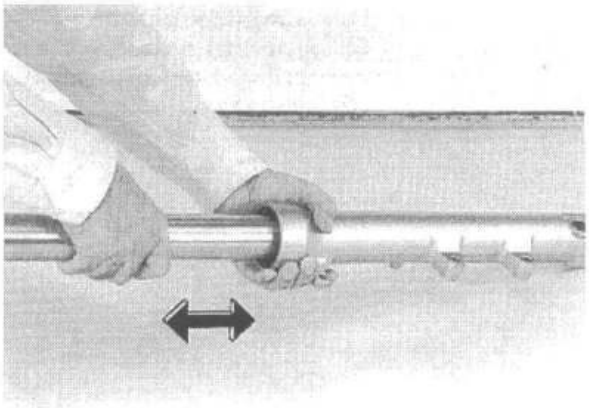
Remove the dust seal.



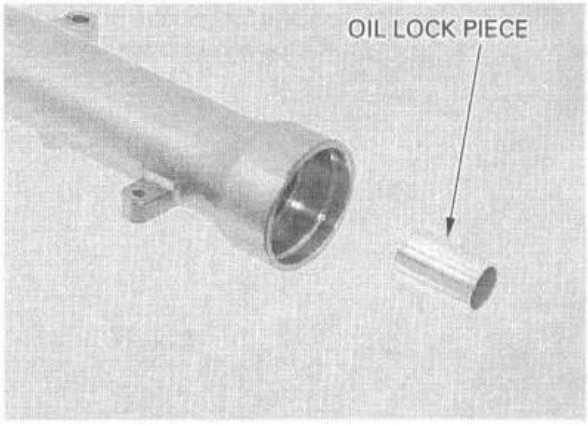
Remove the oil seal stopper ring.



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



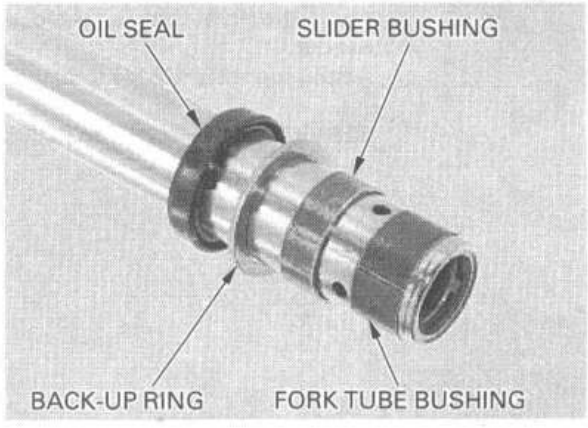
Remove the oil lock piece from the fork slider.



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

NOTE:

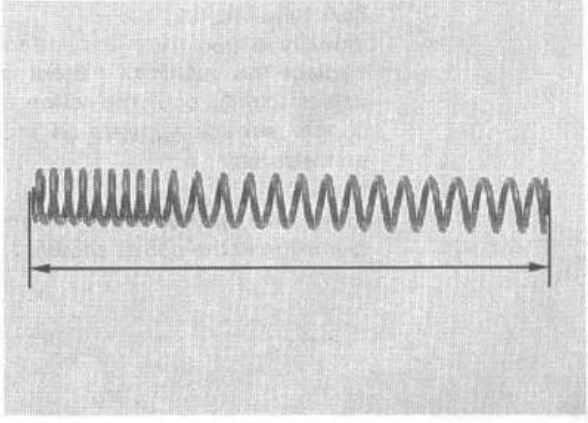
Do not remove the fork tube bushing unless it is necessary to replace it with a new one.



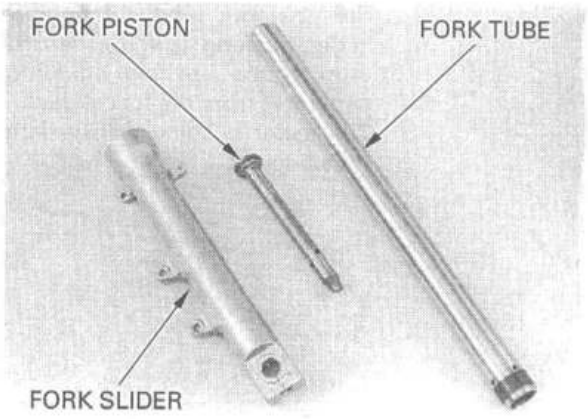
INSPECTION

Fork spring
Measure the fork spring free length.

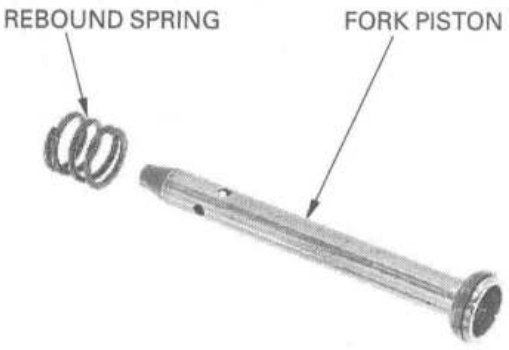
SERVICE LIMIT: 303.0 mm (11.93 in)



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

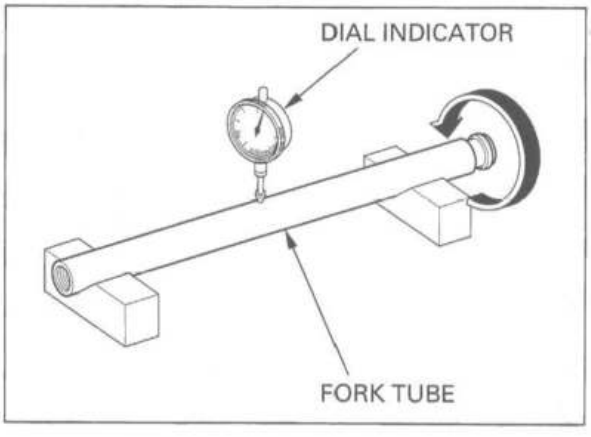


Check the fork piston ring for wear or damage.
Check the rebound spring for fatigue or damage.



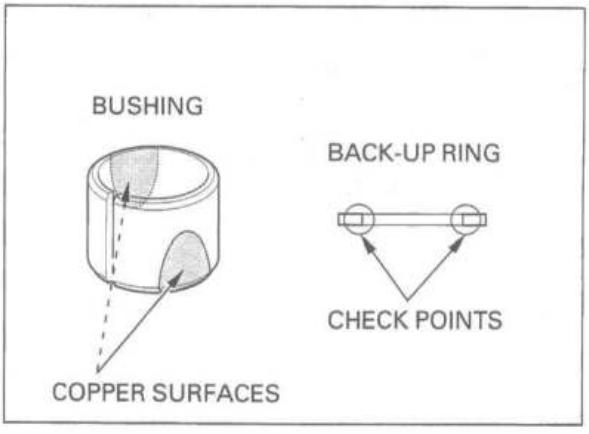
Place the fork tube in V-block and measure the runout.
Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.20 mm (0.008 in)

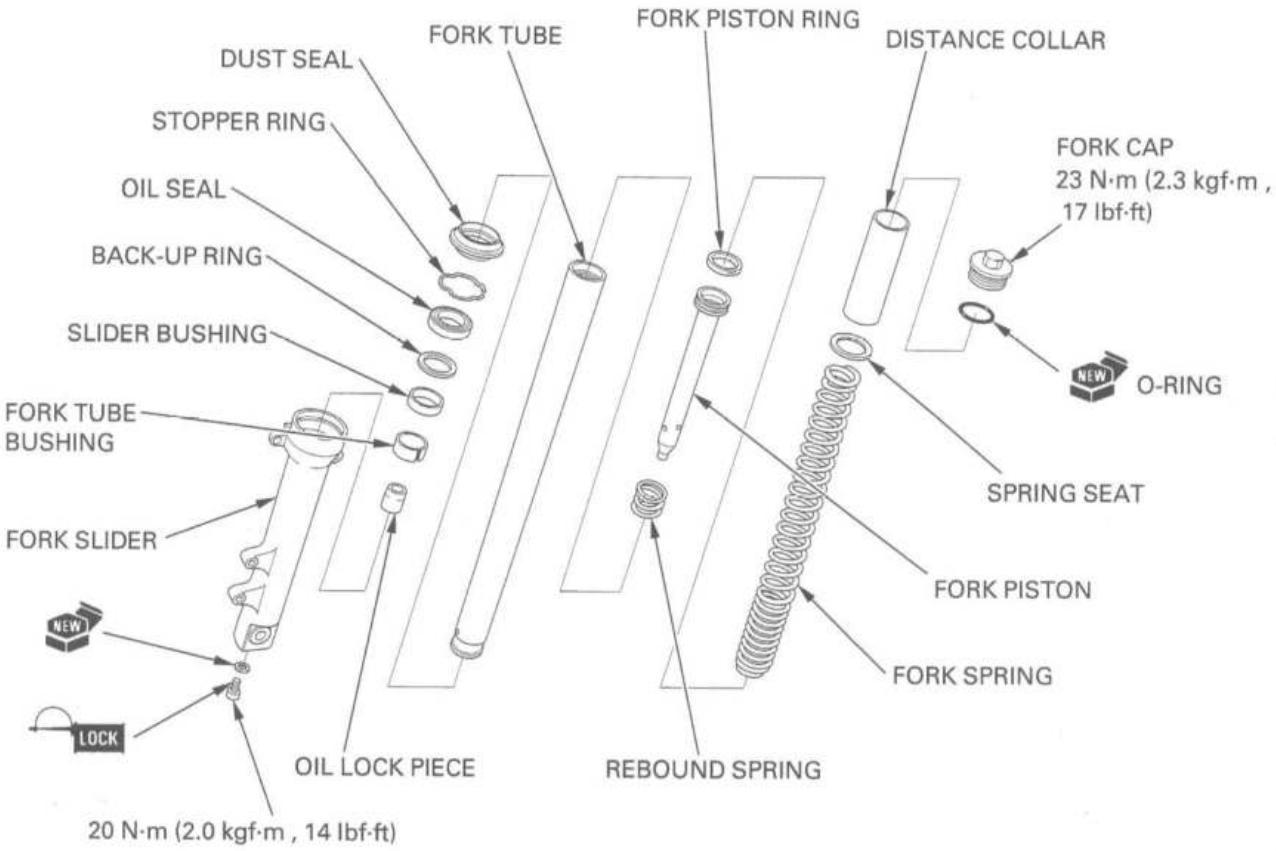


Fork tube bushing
Visually inspect the slider and for tube bushings. Replace the bushings if there is excessive scoring or scratching, or if the teflon is worn so that the copper surface appears on more than 3/4 of the entire surface.

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

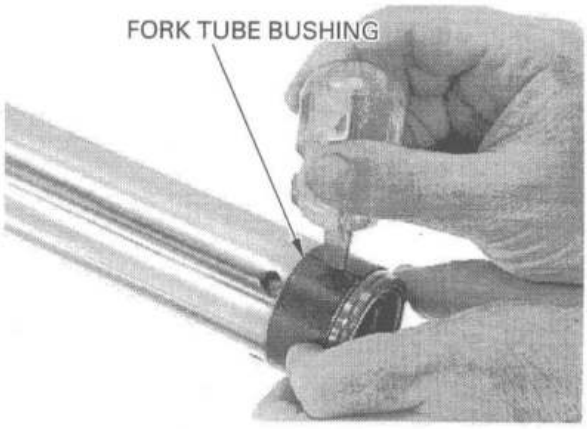


ASSEMBLY



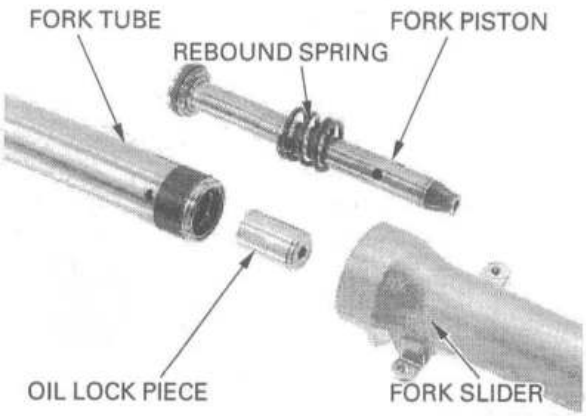
Before assembly, wash all parts with a high flash or non-flammable solvent and wipe them dry.

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



Install the rebound spring to the fork piston.
Install the rebound spring and fork piston into the fork tube.
Install the oil lock piece onto the fork piston end.

Apply recommended fork fluid to the fork tube bushing, then install the fork tube into the fork slider.

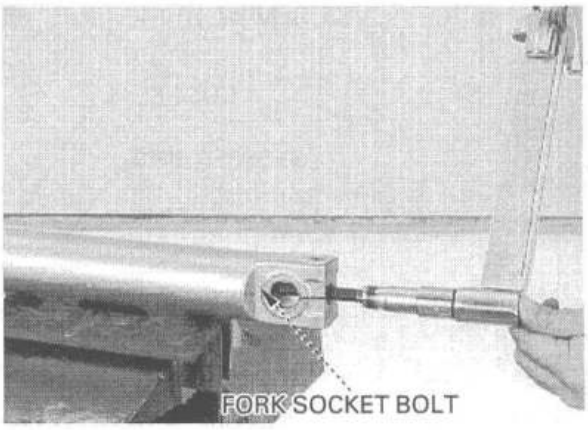


Hold the fork slider in a vise with soft jaws or a shop towel.
Apply a locking agent to the for socket bolt threads and install and tighten the socket bolt with a new sealing washer into the fork piston.

NOTE:

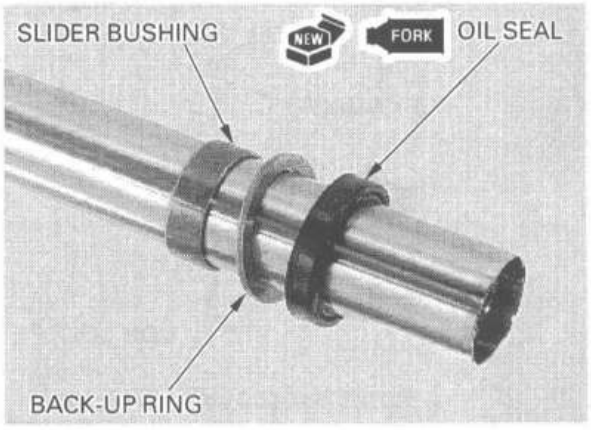
If the fork piston turns with the socket bolt, temporarily install the fork spring and fork cap.

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



Install the oil seal with its marked side facing up.

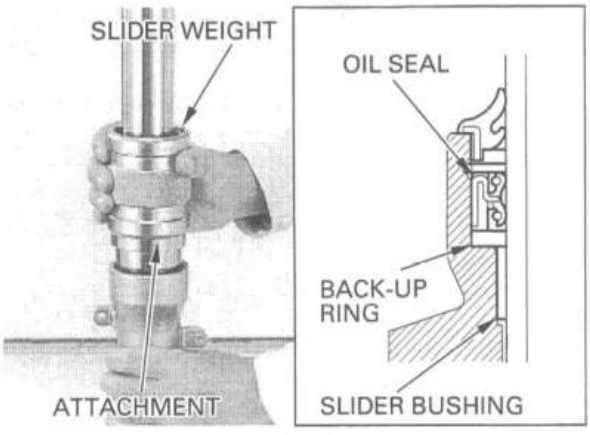
Apply recommended fork fluid to the guide bushing, and new fork oil seal lips.
Install the fork oil seal, back-up ring and guide bushing onto the fork tube.



Drive the oil seal in using the special tools.

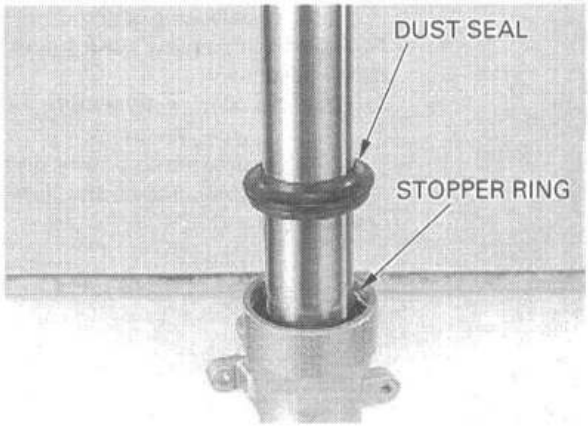
TOOLS:

Slider weight	07947-KA50100
Oil seal driver attachment	07947-KF00100



Install the stopper ring into the fork slider groove securely.

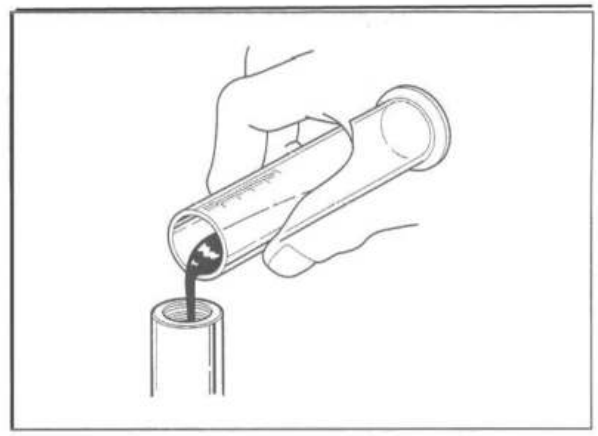
Install the dust seal.



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

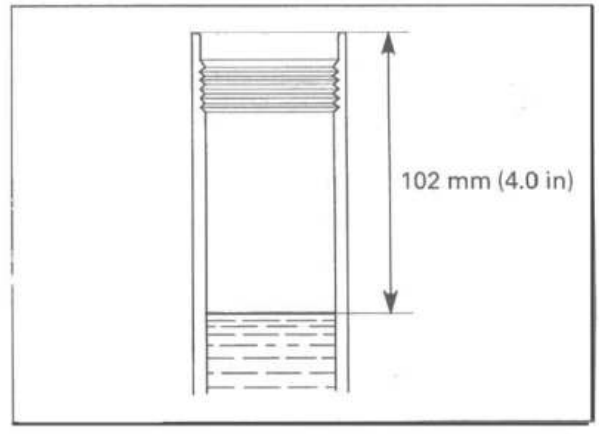
RECOMMENDED FORK FLUID: Fork fluid
FORK FLUID CAPACITY:
486 ± 2.5 cm^3 (16.4 ± 0.08 US oz, 17.1 ± 0.09 Imp oz)

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



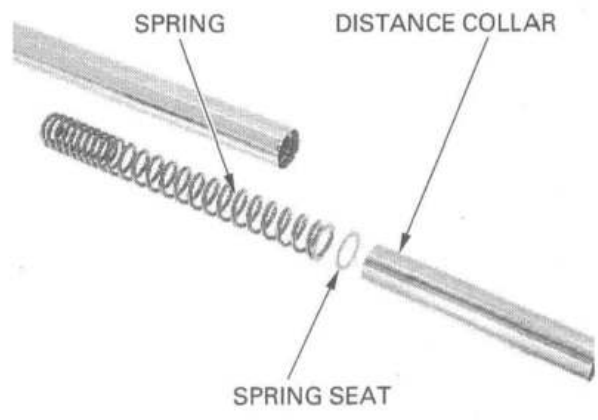
Compress the fork leg fully and measure the oil level from the top of the fork tube.

FORK OIL LEVEL: 102 mm (4.0 in)

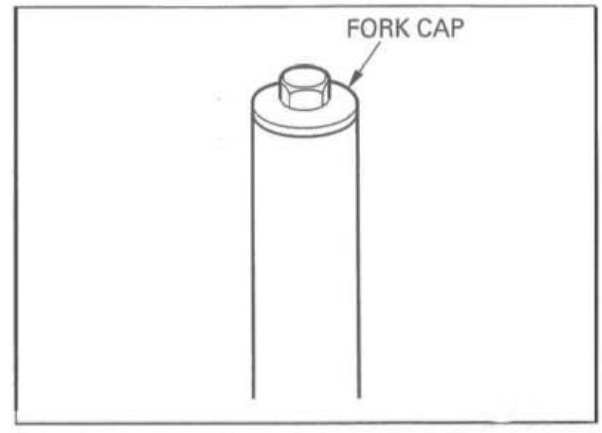


Pull the fork tube up and install the fork spring with the tightly wound coil end facing down.

Install the fork spring seat and distance collar.

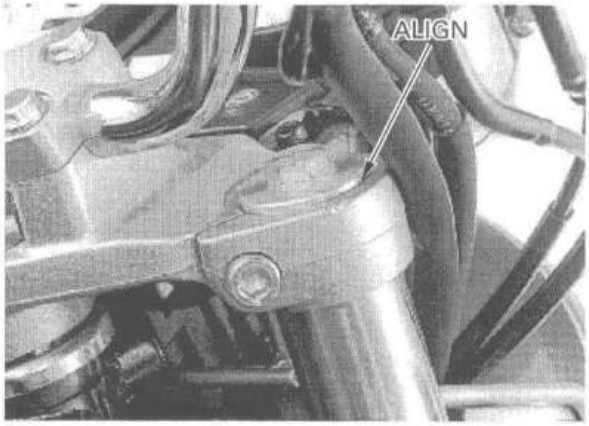


Apply fork fluid to the new O-ring.
Install a O-ring onto the fork cap.
Install the fork cap onto the fork tube.



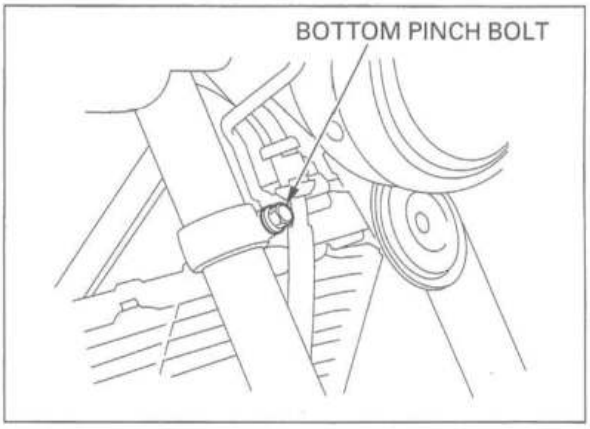
INSTALLATION

Install the fork tube into the steering stem and fork top bridge.
Align the top end of the fork tube with the upper surface of the top bridge as shown.



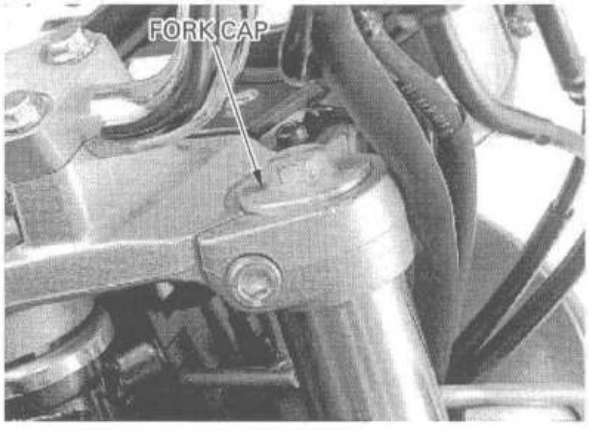
Tighten the bottom bridge pinch bolt.

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



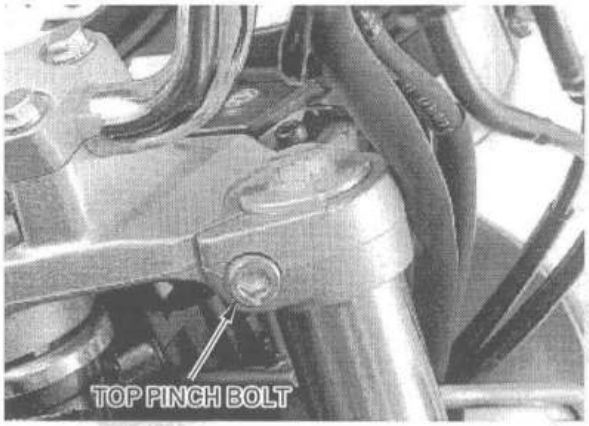
Tighten the fork cap to the specified torque if it was removed.

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



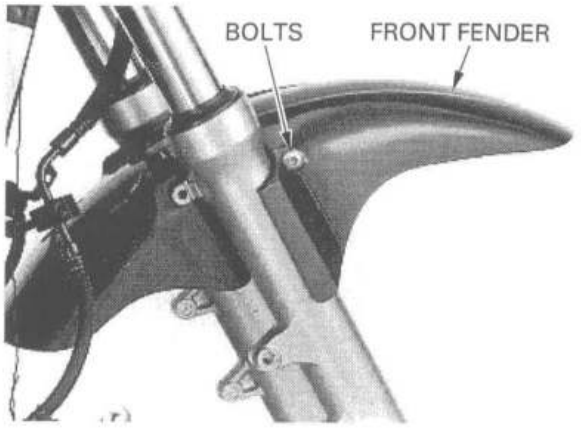
Tighten the fork top pinch bolt to the specified torque.

TORQUE: 11 N·m (1.1 kgf·m , 8 lbf·ft)



Install the front fender and tighten the bolts to the specified torque.

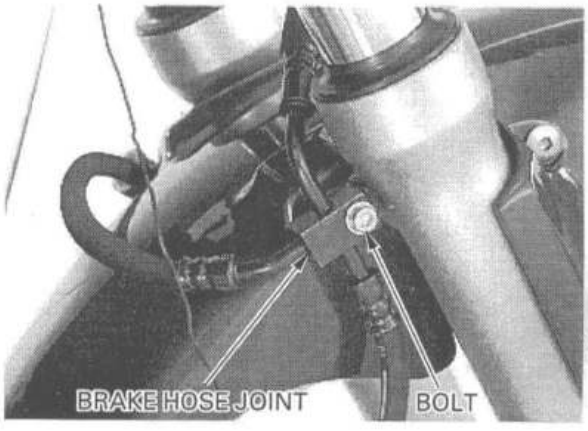
TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)



Install the both brake hose joint and tighten the bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

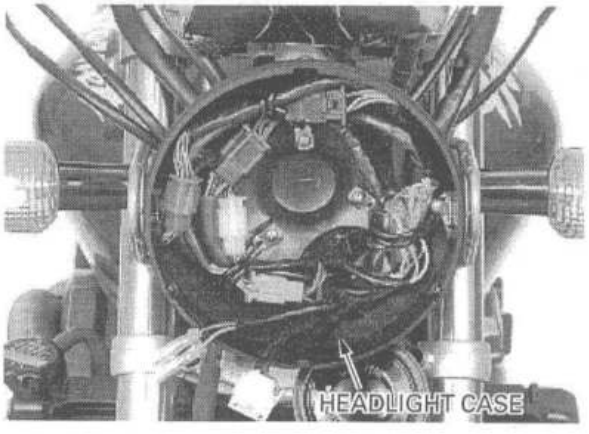
Install the front wheel (page 13-14).
Install the brake calipers (page 15-20)



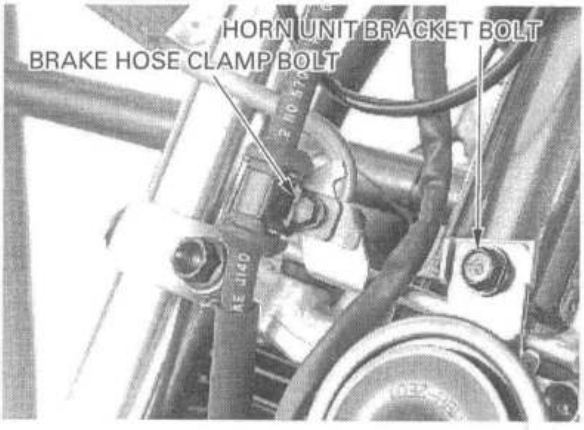
STEERING STEM

REMOVAL

Remove the following:
- Handlebar (page 13-3)
- Front wheel (page 13-9)
- Headlight case (page 19-3)
- Combination meter (page 19-5)
- Front brake calipers (page 15-18)

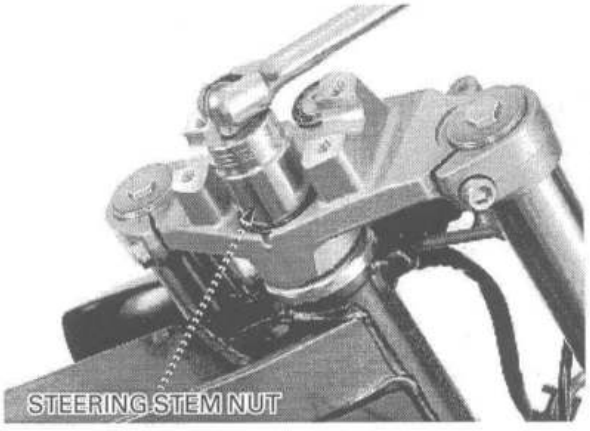


Remove the bolt and front brake hose clamp.
Remove the bolt and horn unit.

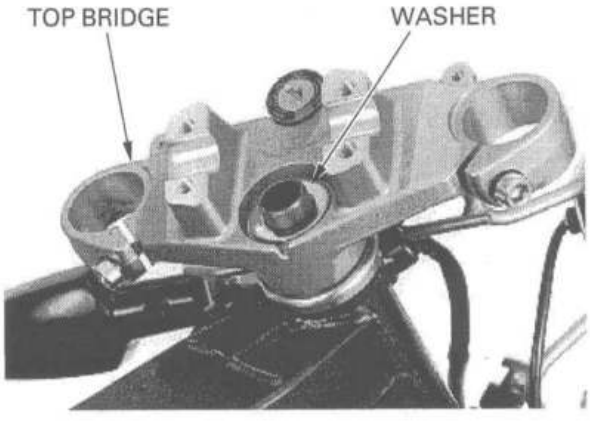


Loosen and remove the steering stem nut.

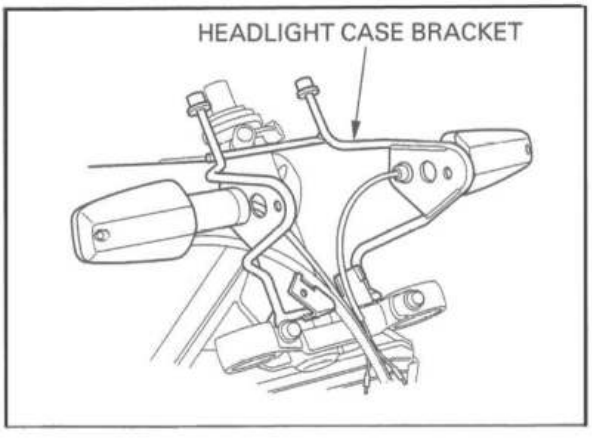
Remove the fork legs (page 13-16).



Remove the washer and the top bridge.

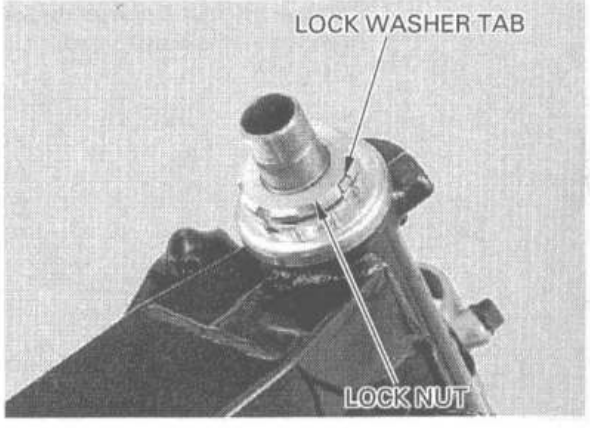


Remove the headlight case bracket assembly from the steering stem.



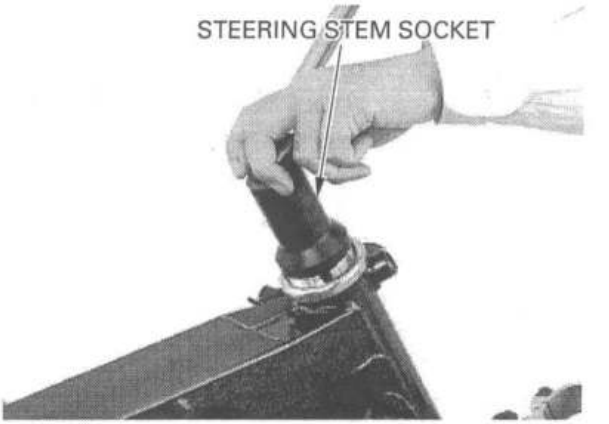
Straighten the tabs of the lock washer.

Remove the lock nut and lock washer.

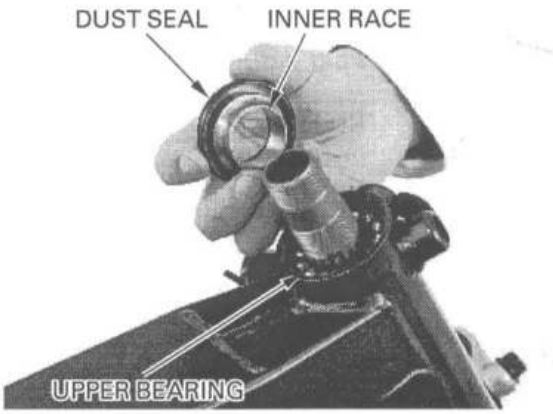


Remove the steering stem bearing adjusting nut using the special tool.

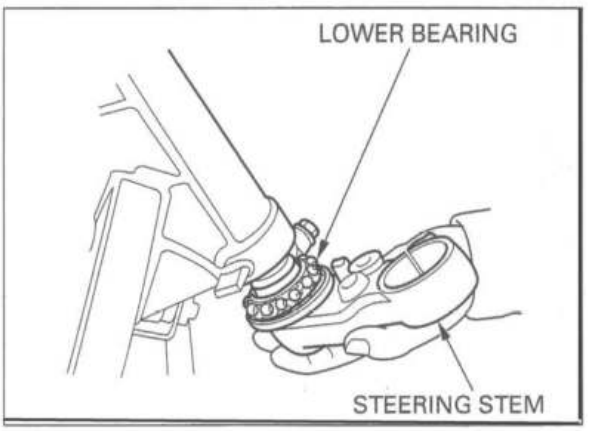
TOOL:
Steering stem socket 07916-3710101



Remove the following:
- Dust seal
- Upper bearing inner race
- Upper bearing



- Steering stem
- Lower bearing



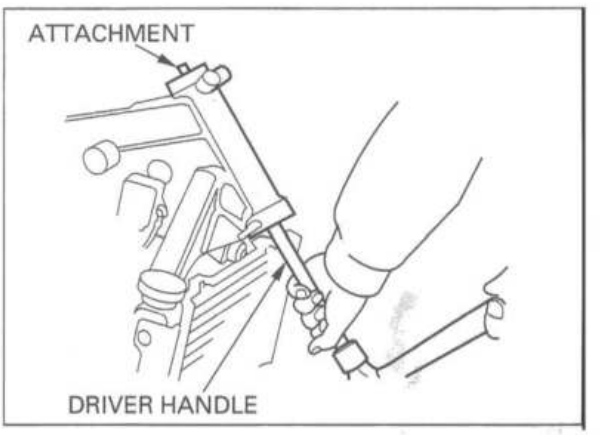
BEARING REPLACEMENT

NOTE:

Always replace the bearings and races as a set.

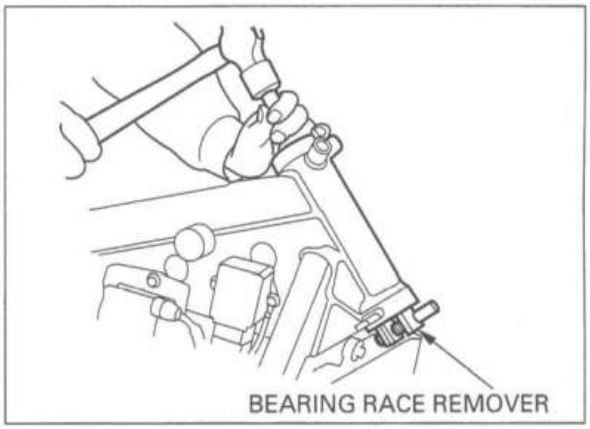
Remove the upper bearing outer races using the special tools.

TOOLS:
Driver attachment 07953-MJ10100
Driver handle 07953-MJ10200

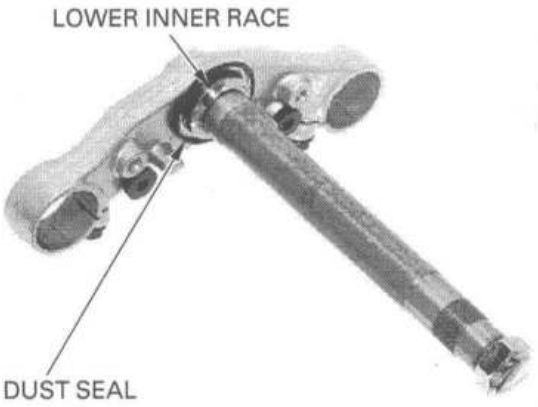


Remove the lower bearing outer races using the special tool.

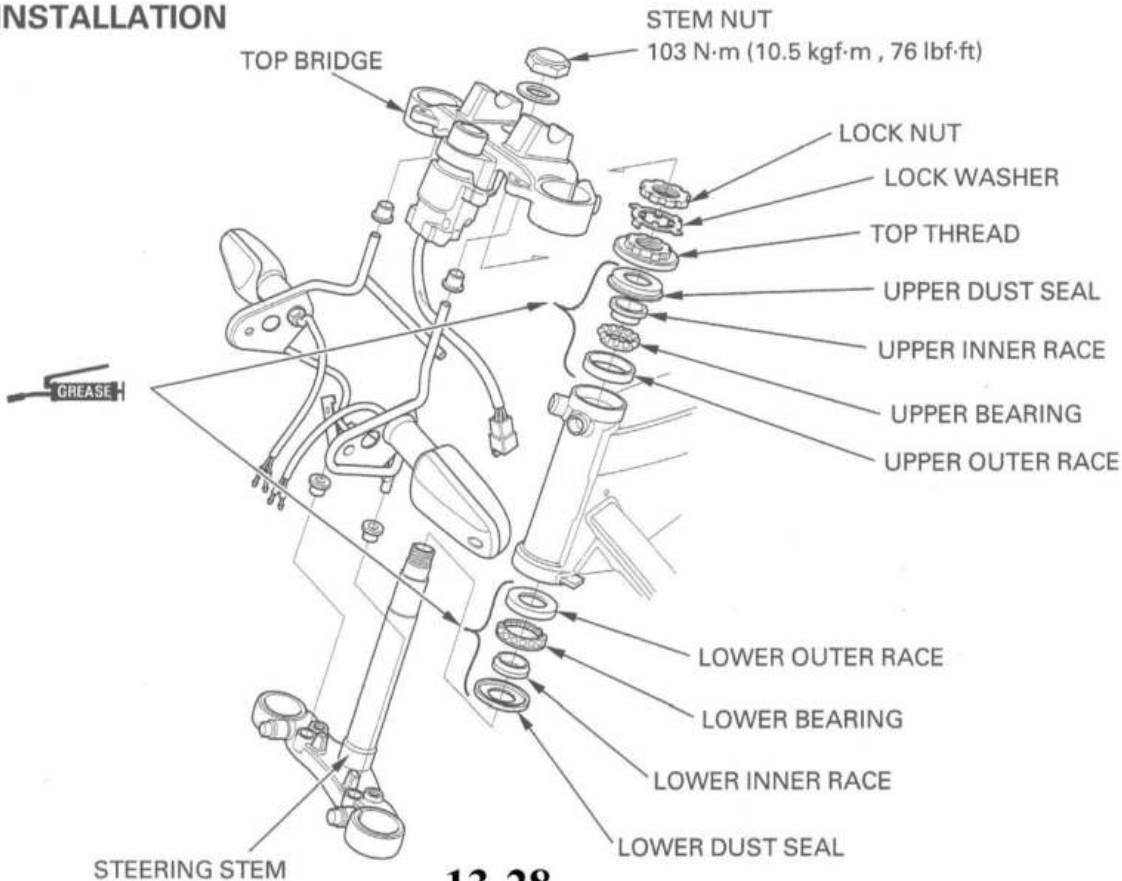
TOOL:
Bearing race remover 07946-3710500



Install the steering stem nut onto the stem to prevent the threads from being damaged when removing the lower bearing inner race from the stem.
Remove the lower bearing inner race with a chisel or equivalent tool, being careful not to damage the stem.
Remove the dust seal.

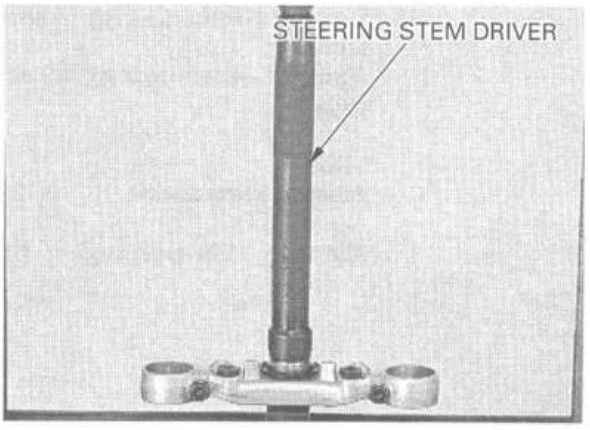


INSTALLATION



Apply grease to new dust seal lips and install it over the steering stem.
Install a new lower bearing inner race using a special tool and a hydraulic press.

TOOL:
Steering stem driver 07946-MB00000

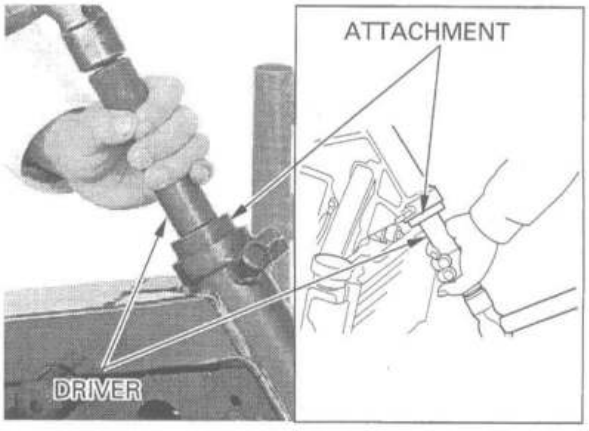


Drive a new upper bearing outer race into the steering head pipe.

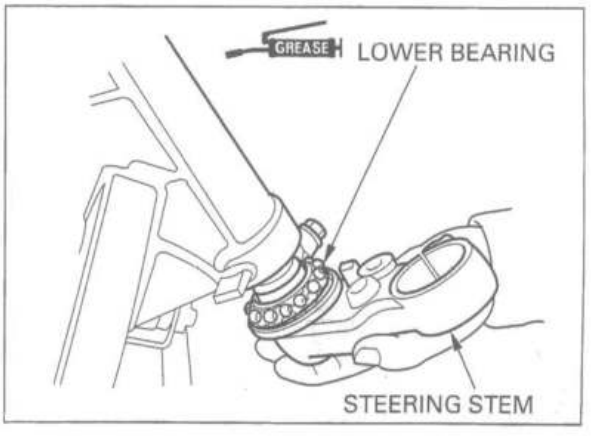
TOOLS:
Driver 07749-0010000
Attachment, 42 × 47 mm 07746-0010300

Drive a new lower bearing outer race into the steering head pipe.

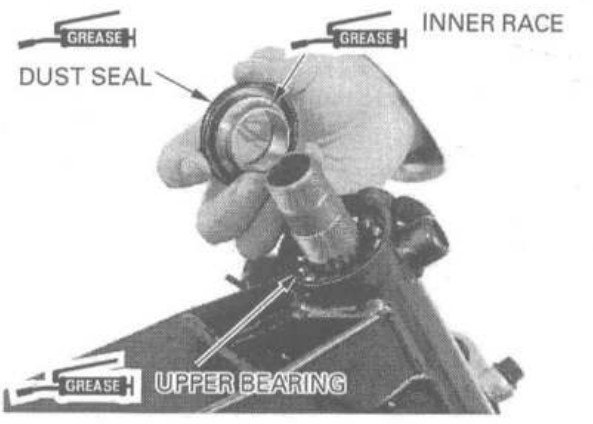
TOOLS:
Driver 07749-0010000
Attachment, 52 × 55 mm 07746-0010400



Apply grease to the lower bearing, then install it onto the steering stem.
Insert the steering stem into the steering head pipe.



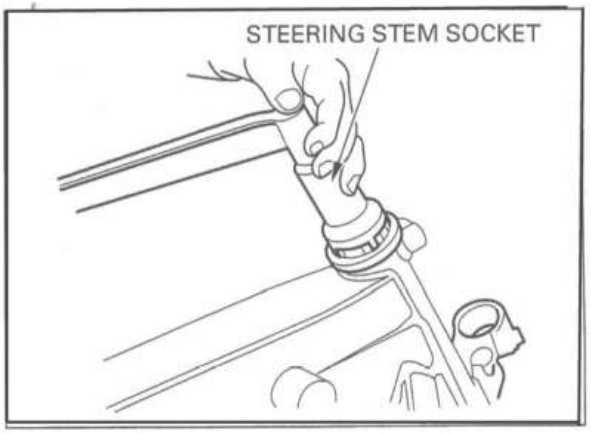
Apply grease to the upper bearing, upper inner race and dust seal lips.
Install upper bearing, inner race and dust seal.



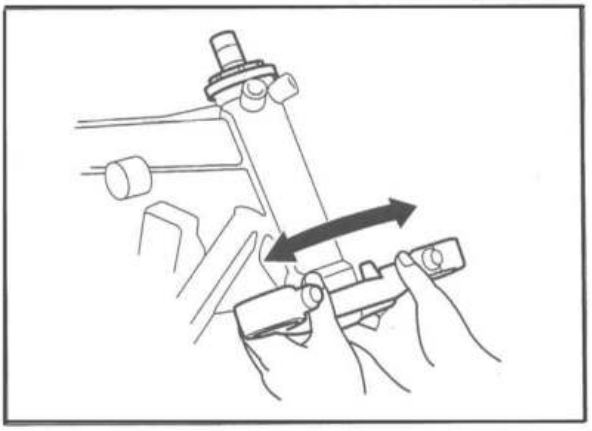
Install the stem bearing adjusting nut and hand tighten.
Tighten the stem bearing adjusting nut to the initial torque.

TOOL:
Steering stem socket 07916-3710101

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



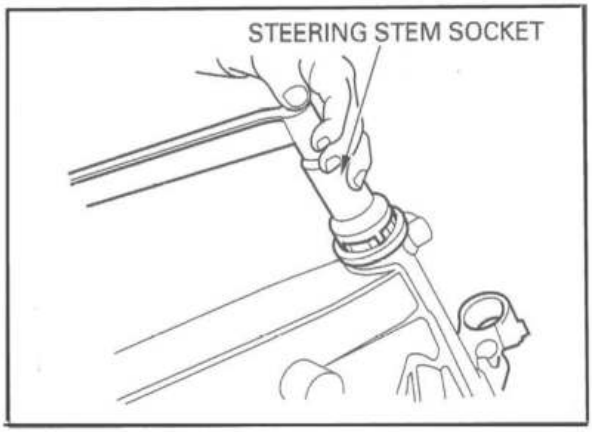
Move the steering stem right and left, lock-to-lock, five times to seat the bearings.
Make sure that the steering stem moves smoothly, without play or binding.



Retighten the bearing adjusting nut to the specified torque.

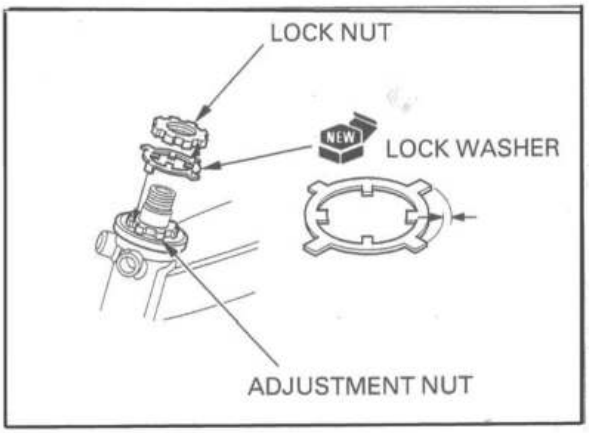
TORQUE: 25 N·m (2.5 kgf·m , 18 lbf·ft)

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



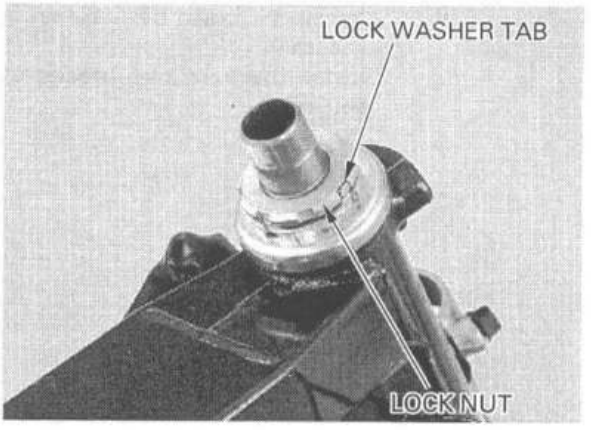
Install the new lock washer onto the steering stem.

Align the tabs of the lock washer with the grooves in the adjustment nut and bend two opposite tabs (shorter) down into the adjustment nut groove.



Install and finger tighten the lock nut.
Hold the bearing adjusting nut and further tighten the lock nut within 1/4 turn (90°) enough to align its grooves with the lock washer tabs.

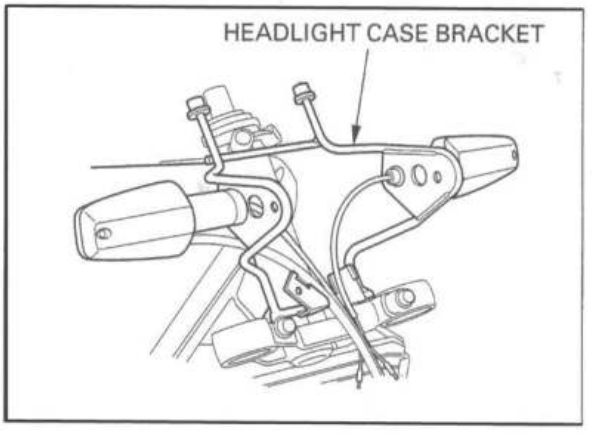
Bend the lock washer tabs up into the lock nut groove.



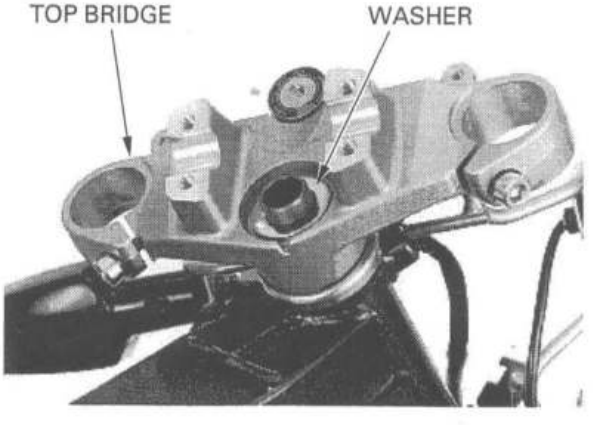
Install the headlight case bracket onto the steering stem.

NOTE:

Route the wires, cables properly (page 1-22).



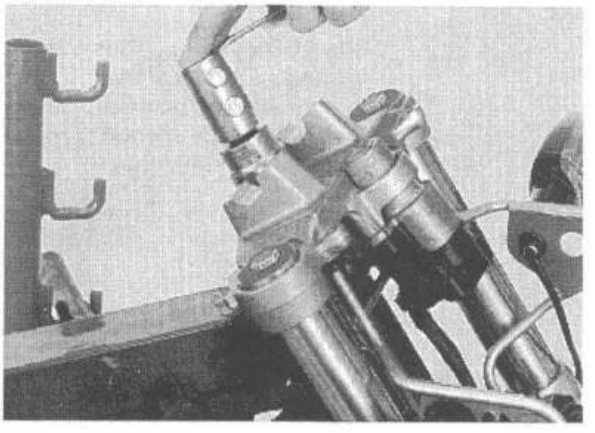
Install the top bridge and washer.



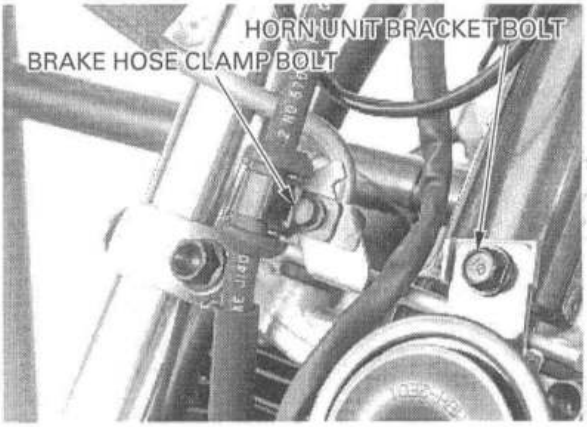
Install the fork legs (page 12-24).

Install the stem nut.
Tighten the steering stem nut to the specified torque.

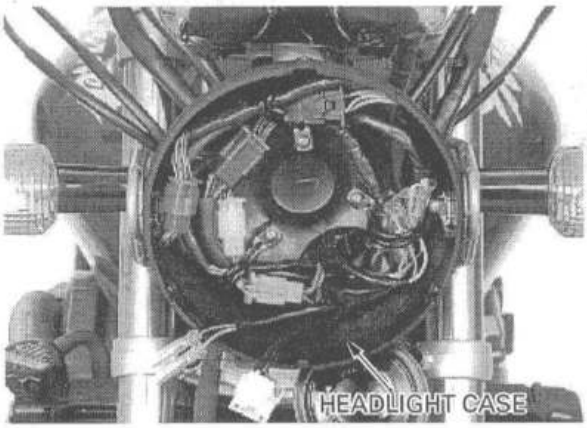
TORQUE: 103 N·m (10.5 kgf·m , 76 lbf·ft)



Install the brake hose clamp and tighten the bolt securely.
Install the horn unit bracket and tighten the bolt securely.



Install the following:
- Handlebar (page 13-5)
- Front wheel (page 13-14)
- Headlight case (page 19-3)
- Combination meter (page 19-8)
- Front brake calipers (page 15-20)



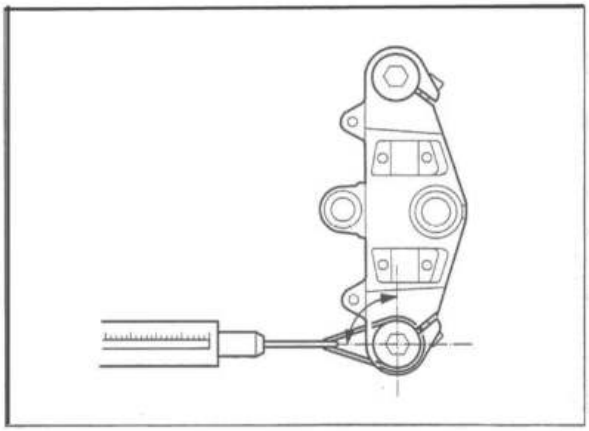
STEERING HEAD BEARING PRELOAD

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

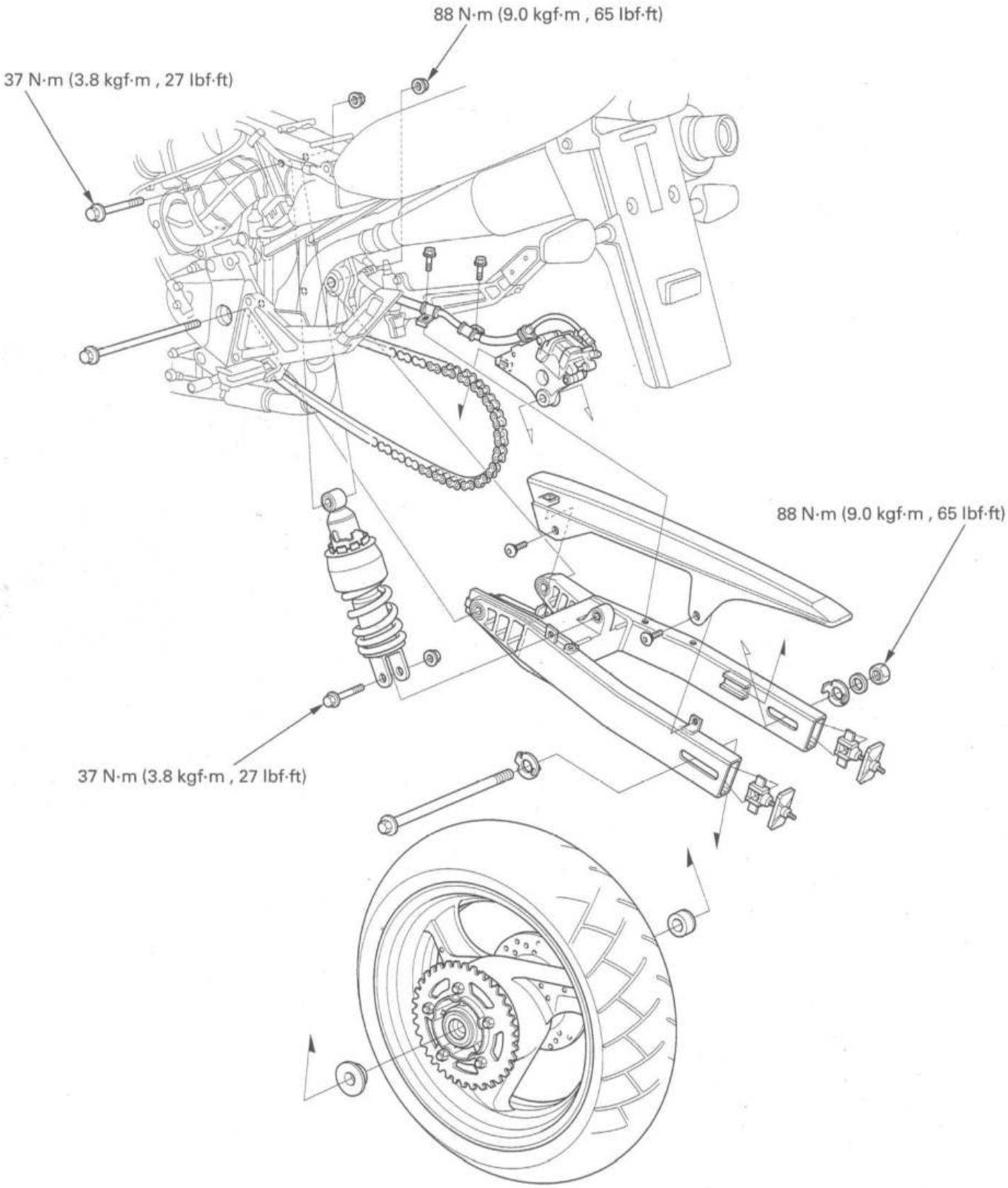
Position the steering stem to the straight ahead position.
Hook a spring scale to the fork tube and measure the steering head bearing preload.

NOTE:

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



The preload should be within 0.98 – 1.47 N (0.10 – 0.15 kgf, 0.22 – 0.33 lbf).
If the reading do not fall within the limits, lower the front wheel on the ground and adjust the steering bearing adjusting nut.


88 N·m (9.0 kgf·m , 65 lbf·ft)
37 N·m (3.8 kgf·m , 27 lbf·ft)
88 N·m (9.0 kgf·m , 65 lbf·ft)
37 N·m (3.8 kgf·m , 27 lbf·ft)

14. REAR WHEEL/SUSPENSION

SERVICE INFORMATION	14-1	SHOCK ABSORBER	14-10
TROUBLESHOOTING	14-2	SWINGARM	14-12
REAR WHEEL	14-3		

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.***
- ***The shock absorber contains nitrogen under high pressure. Do not allow fire or heat near the shock absorber.***
- ***Before disposal of the shock absorber, release the nitrogen (page 14-11).***

- When servicing the swingarm or shock absorber, support the motorcycle using a safety stand or hoist.
- Refer to section 15 for brake system information.
- Use only tires marked "TUBELESS" and tubeless valves on rim marked "TUBELESS TIRE APPLICABLE".
- Use genuine Honda replacement bolts and nuts for all suspension pivot and mounting point.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Minimum tire tread depth			—	2.0 (0.08)
Cold tire pressure	Driver only		290 kPa (2.90 kgf/cm², 42 psi)	—
	Driver and passenger		290 kPa (2.90 kgf/cm², 42 psi)	—
Axle runout			—	0.20 (0.008)
Wheel rim runout	Radial		—	2.0 (0.08)
	Axial		—	2.0 (0.08)
Drive chain	Size/link	DID	525VM2−110LE	—
		RK	525RO−110LE	—
	Slack		30−40 (1.2−1.6)	50 (2.0)
Shock absorber pre-load adjuster standard position			2nd groove	—

TORQUE VALUES

Rear axle nut	88 N·m (9.0 kgf·m, 65 lbf·ft)	U-nut
Rear brake disc mounting bolt	42 N·m (4.3 kgf·m, 31 lbf·ft)	ALOC bolt
Final driven sprocket nut	108 N·m (11.0 kgf·m, 80 lbf·ft)	U-nut
Swingarm pivot nut	88 N·m (9.0 kgf·m, 65 lbf·ft)	U-nut
Drive chain case bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Drive chain slider bolt	9 N·m (0.9 kgf·m, 6.5 lbf·ft)	
Drive chain adjuster lock nut	21 N·m (2.1 kgf·m, 15 lbf·ft)	
Rear shock absorber upper mounting nut	37 N·m (3.8 kgf·m, 27 lbf·ft)	U-nut
Rear shock absorber lower mounting nut	37 N·m (3.8 kgf·m, 27 lbf·ft)	U-nut

TOOLS

Bearing remover shaft	07746-0050100
Bearing remover head, 17 mm	07746-0050500
Driver	07749-0010000
Attachment, 32 × 35 mm	07746-0010100
Attachment, 42 × 47 mm	07746-0010300
Attachment, 52 × 55 mm	07746-0010400
Pilot, 15 mm	07746-0040300
Pilot, 17 mm	07746-0040400
Pilot, 22 mm	07746-0041000
Attachment, 28 × 30 mm	07946-1870100
Driver shaft	07946-MJ00100
Needle bearing remover attachment	07GMD-KT70200
Needle bearing remover	07LMC-KV30100

TROUBLESHOOTING

Soft suspension
- Weak shock absorber spring
- Incorrect suspension adjustment
- Oil leakage from damper unit
- Tire pressure too low

Hard suspension
- Damaged shock absorber mounting bearing
- Bent damper rod
- Damaged swingarm pivot bearings
- Bent swingarm pivot
- Incorrect suspension adjustment
- Tire pressure too high

Steers to one side or does not track straight
- Bent rear axle
- Axle alignment/chain adjustment not equal on both sides

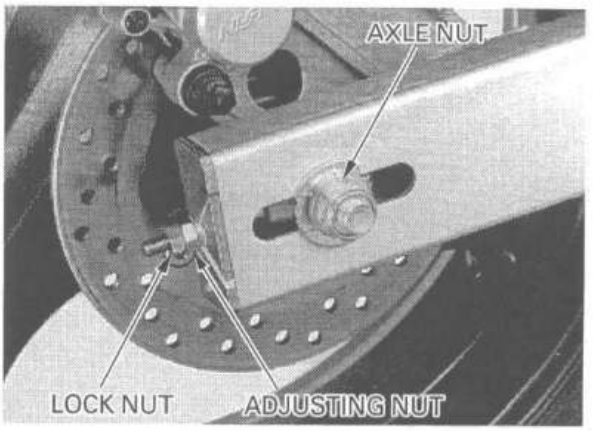
Rear wheel wobbling
- Bent rim
- Worn rear wheel bearings
- Faulty tire
- Unbalanced tire and wheel
- Tire pressure too low
- Faulty swingarm pivot bearings

REAR WHEEL

REMOVAL

Loosen the rear axle nut.
Loosen the lock nut and drive chain adjusting nut and make a drive chain slack fully.

Support the motorcycle securely using a hoist or equivalent.

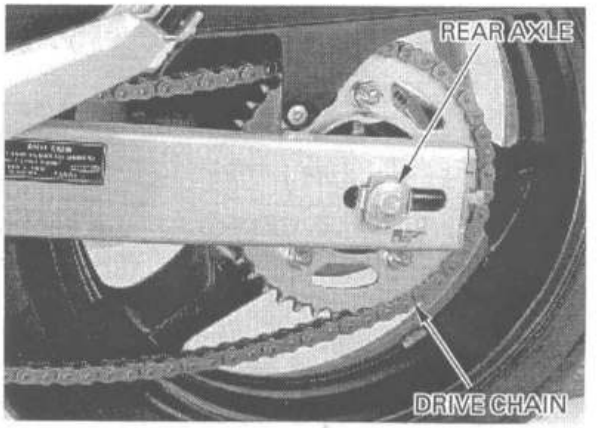


Remove the axle nut, washer and rear axle washer.

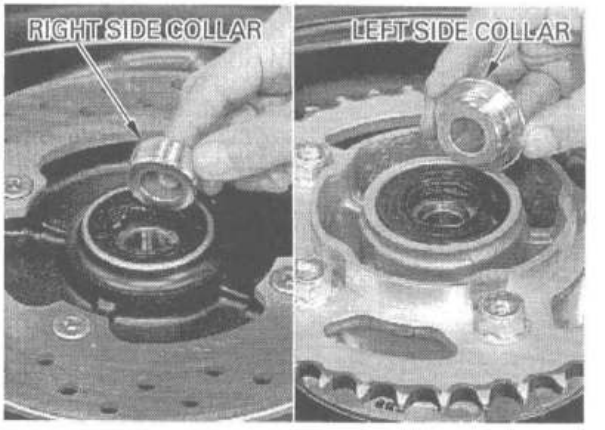


Do not operate the brake pedal after the rear wheel is removed.

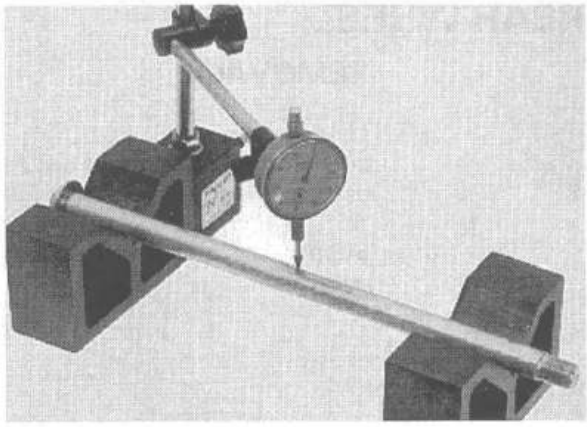
Derail the drive chain from the driven sprocket.
Remove the axle and rear axle washer from the left side and remove the rear wheel.



Remove the side collars.



INSPECTION



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

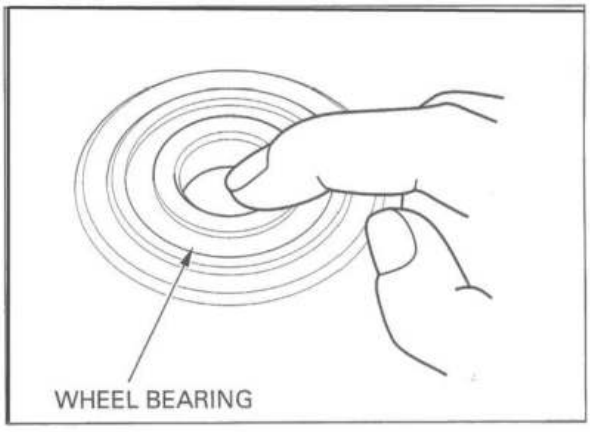
SERVICE LIMIT : 0.20 mm (0.008 in)

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

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

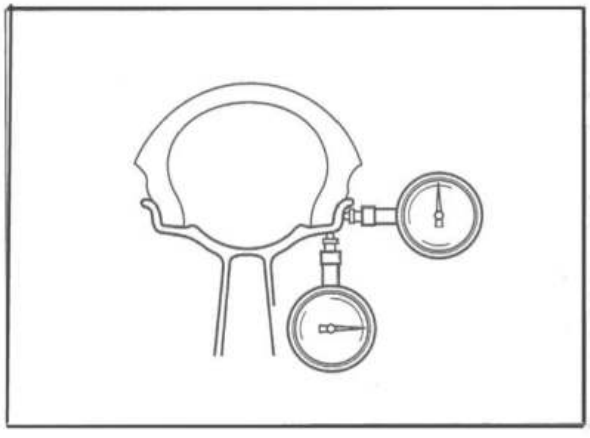
NOTE:

Replace the wheel bearings in pairs.



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

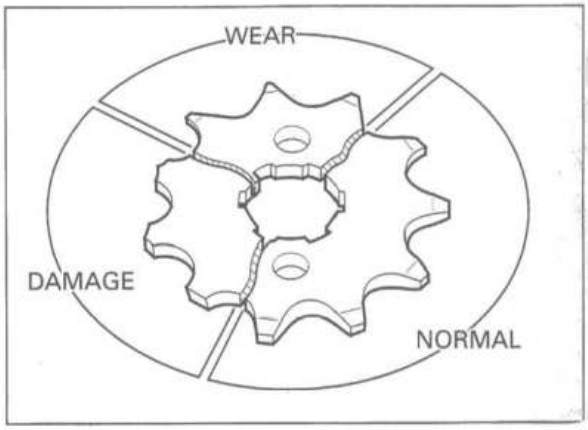
SERVICE LIMITS: Radial: 2.0 mm (0.08 in)
Axial: 2.0 mm (0.08 in)



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

NOTE:

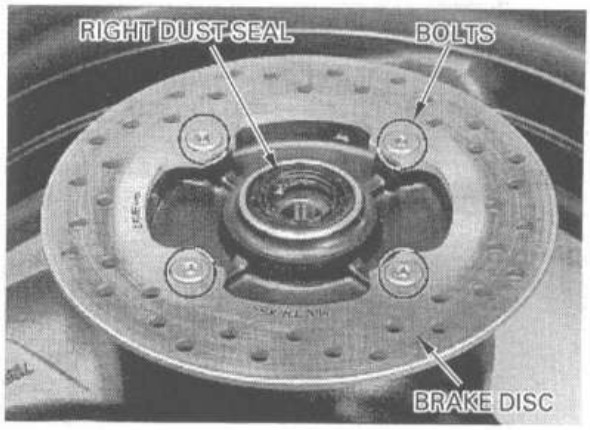
- If the final driven sprocket requires replacement, inspect the drive chain and drive sprocket.
- Never install a new drive chain on a worn sprocket or a worn chain on new sprockets. Both chain and sprocket must be in good condition or the replacement chain or sprocket will wear rapidly.



Wheel balance
See Page 13-10 for wheel balance.

DISASSEMBLY

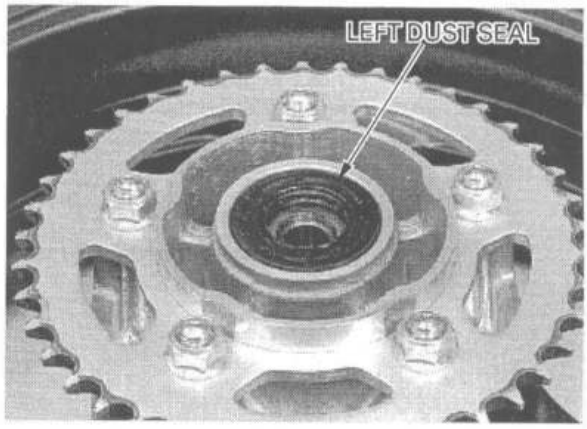
Remove the bolts and brake disc.
Remove the right dust seal.



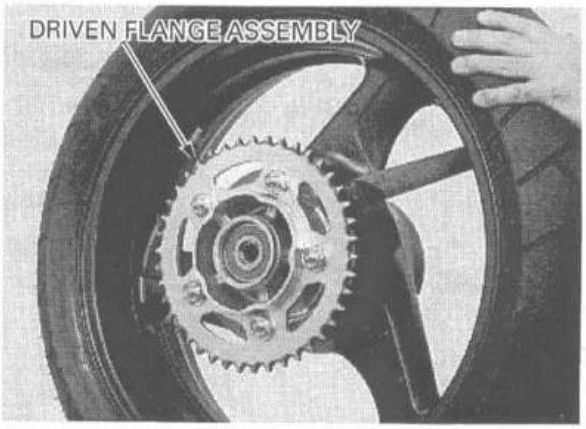
Remove the left dust seal.

NOTE:

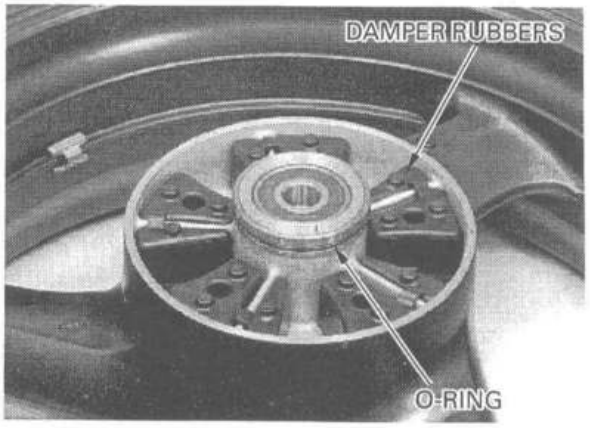
If you will be disassemble the driven flange, loosen the driven sprocket nuts before removing the driven flange from the wheel hub.



Remove the driven flange assembly from the left wheel hub.



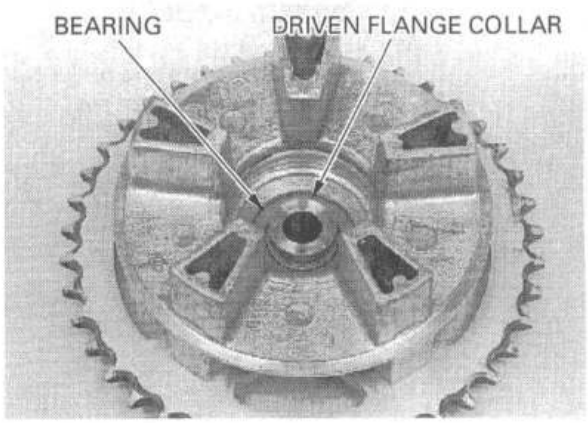
Remove the wheel damper rubbers.
Remove the O-ring.



Driven flange bearing removal

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

Remove the driven flange collar.
Drive out the driven flange bearing.



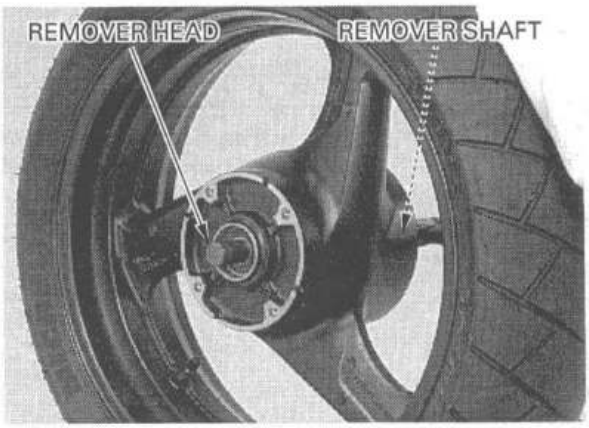
Wheel bearing removal

Always replace the bearings in pairs.

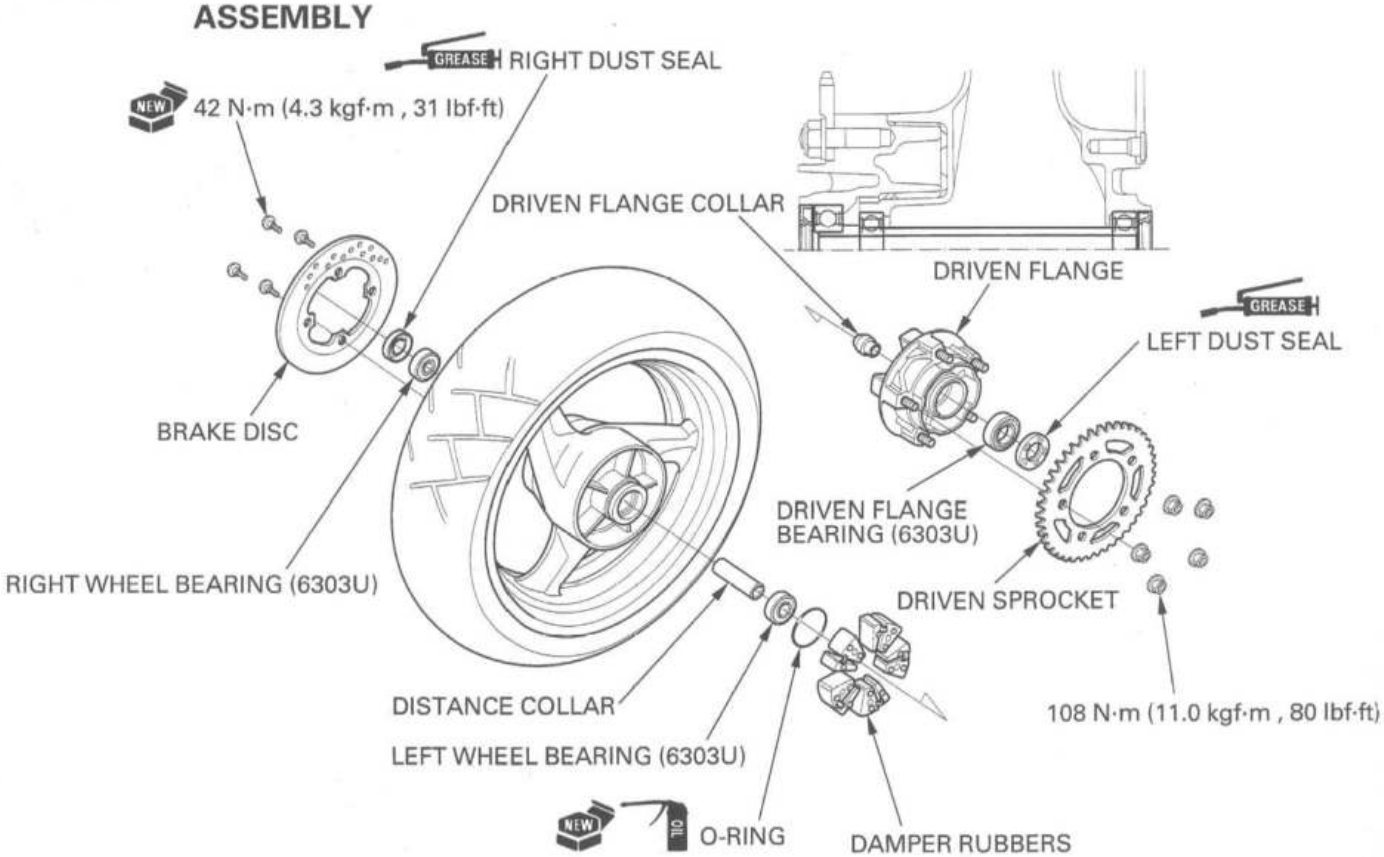
Install the bearing remover head into the bearing.
From the opposite side install the bearing remover shaft and drive the bearing out of the wheel hub.
Remove the distance collar and drive out the other bearing.

TOOLS:

Bearing remover head, 17 mm	07746-0050500
Bearing remover shaft	07746-0050100



ASSEMBLY



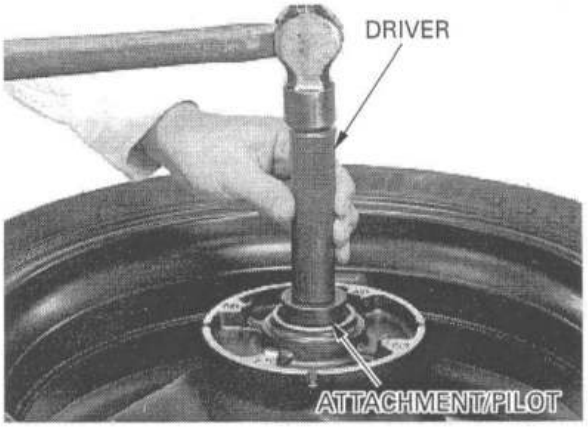
Wheel bearing installation

Install the bearing with the making facing out

Drive in a new right bearing squarely.
Install the distance collar, then drive in the left side bearing.

TOOLS:

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

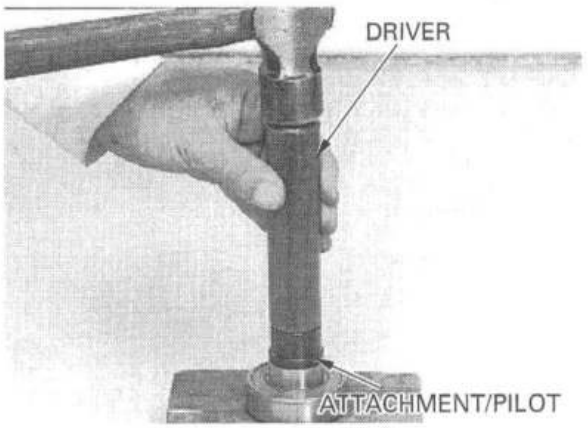


Driven flange bearing installation

Place the bearing onto the suitable base with its marking facing down.
Drive the collar to the driven flange bearing using the special tools.

TOOLS:

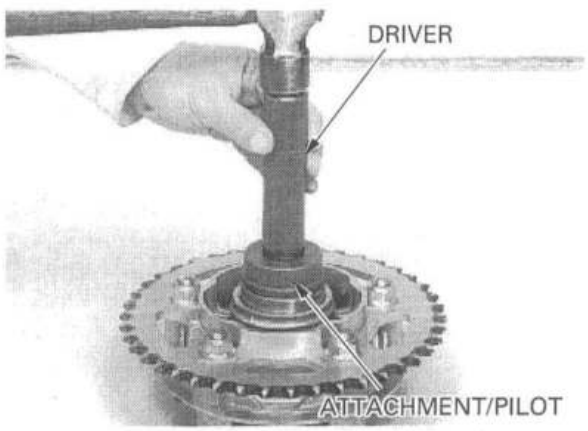
Driver	07749-0010000
Attachment, 28 × 30 mm	07946-1870100
Pilot, 17 mm	07746-0040200



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

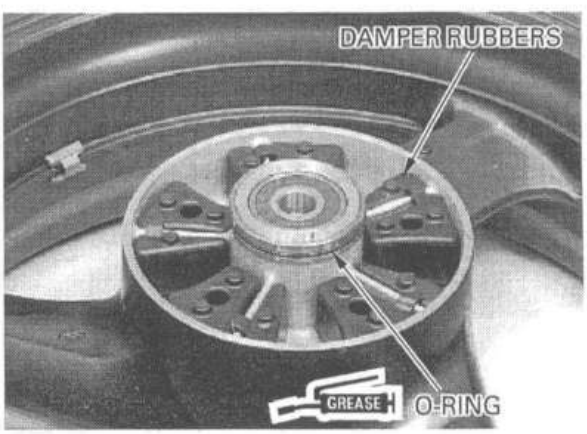
TOOLS:

Driver	07749-0010000
Attachment, 52 × 55 mm	07746-0010400
Pilot, 17 mm	07746-0040200

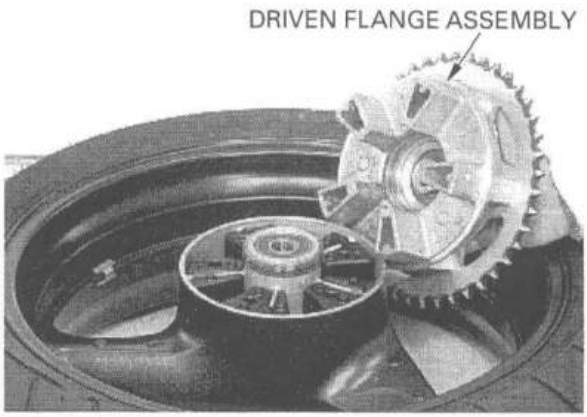


Replace the damper rubbers as a set.

Install the wheel damper rubbers into the wheel hub.
Apply grease to the new O-ring and install it into the groove of the wheel hub.

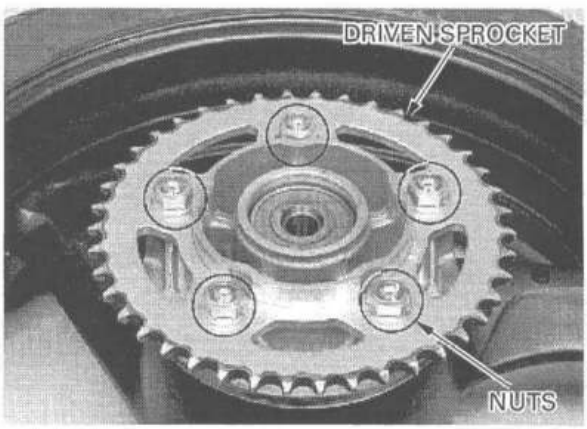


Apply grease to the driven flange and rear wheel hub contact area.
Install the driven flange assembly into the left wheel hub.



If the driven sprocket was removed, install the driven sprocket and tighten the nuts.

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



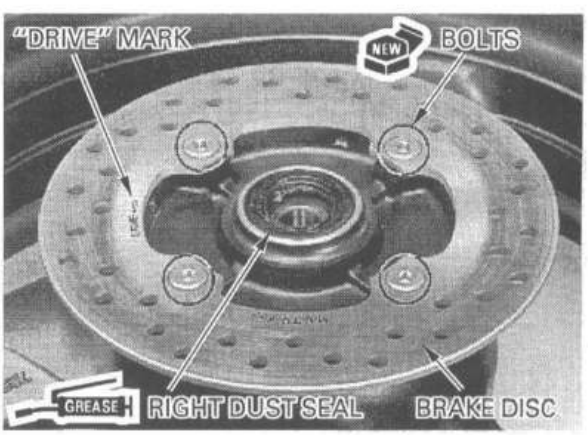
Apply grease to the left dust seal lips, then install it into the driven flange.



Install the brake disc with its "DRIVE" mark facing out.
Install and tighten the new bolts to the specified torque.

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

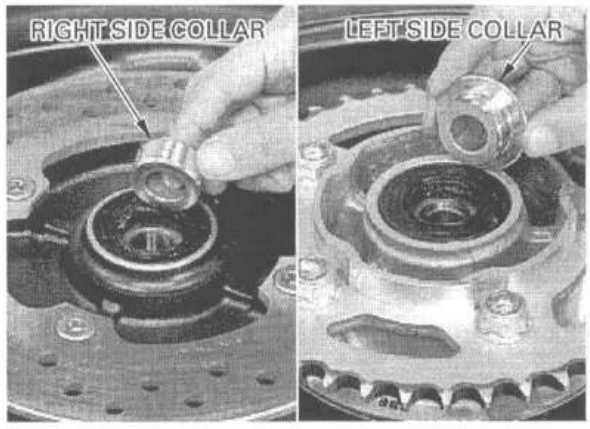
Apply grease to the dust seal lips, then install it into the right wheel hub.



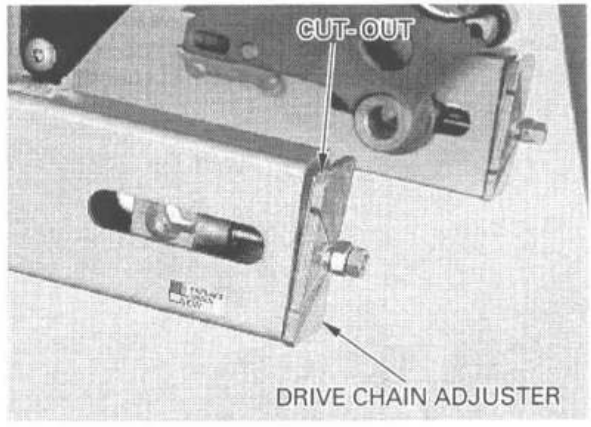
INSTALLATION

Apply grease to the side collar inside and grooves.

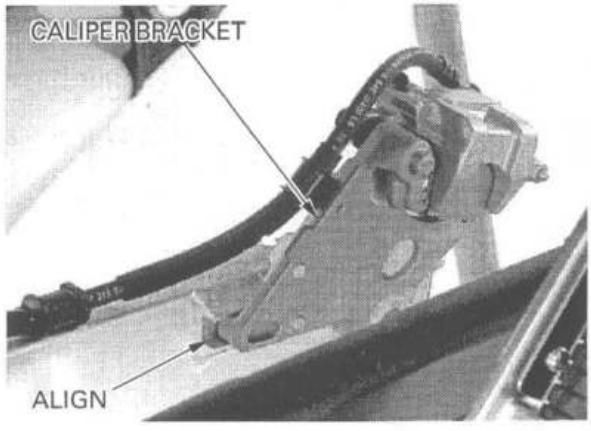
Install the side collars.



If the drive chain adjusters has been removed, install the drive chain adjusters into the swingarm with their cut-out side facing outward.

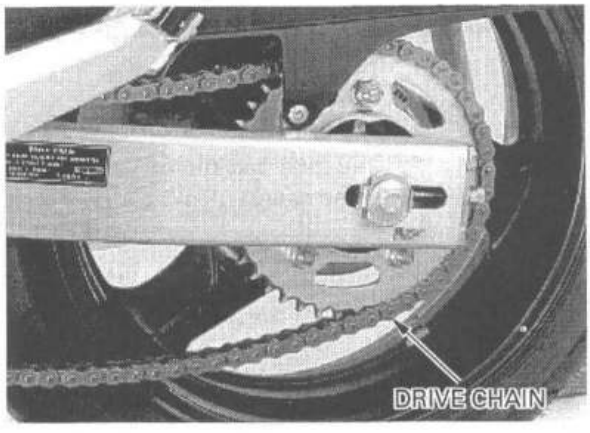


Install the rear brake caliper bracket onto the guide of the swingarm.

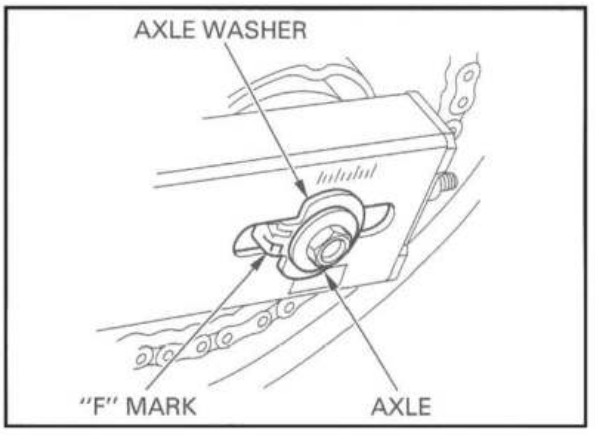


Be careful not to damage the brake pads.

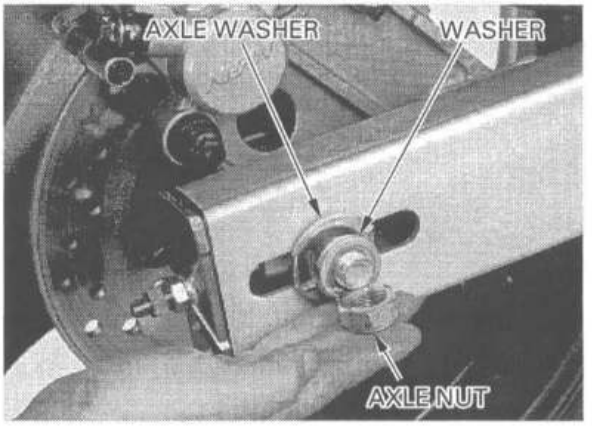
Place the rear wheel into the swingarm carefully aligning the brake disc between the brake pads.
Install the drive chain over the driven sprocket.



Install the axle washer with its "F" mark facing forward.
Install the axle from the left side.



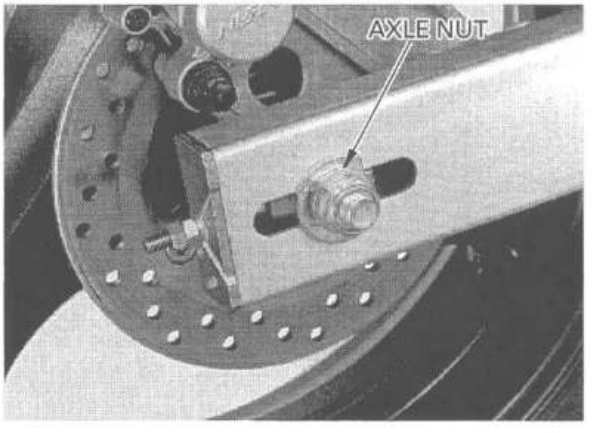
Install the axle washer with its "F" mark facing forward.
Install the plain washer and loosely install the axle nut.



Adjust the drive chain slack (page 3-17).

Tighten the axle nut to the specified torque.

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



SHOCK ABSORBER

REMOVAL

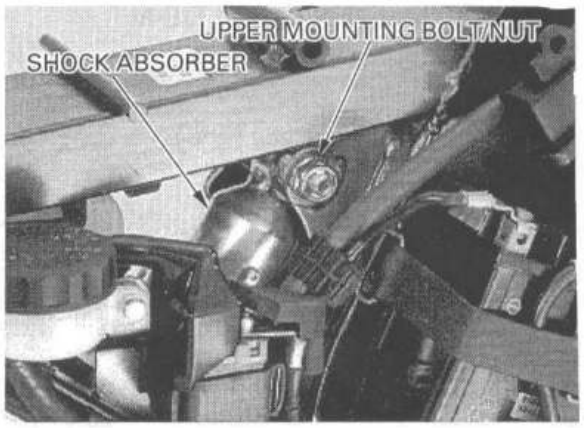
Support the motorcycle securely using a hoist or equivalent.

Remove the following:
– Rear wheel (page 14-3)
– Side covers (page 2-2)

Remove the shock absorber lower mounting bolt/nut.



Remove the shock absorber upper mounting bolt/nut and shock absorber.

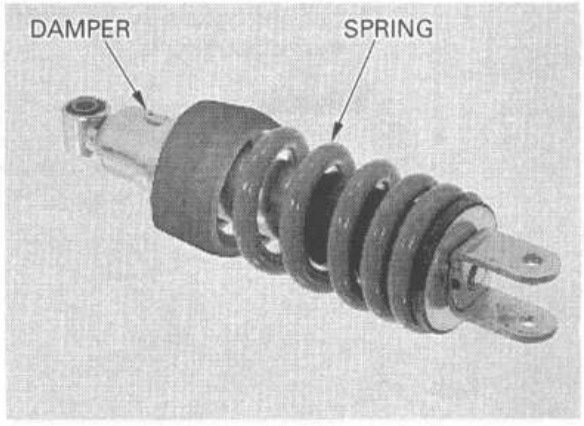


INSPECTION

Visually inspect the damper unit for damage.

Check for the:
- Damper rod for bend or damage
- Damper unit for deformation or oil leaks
- Bump rubber for wear or damage
- Spring for damage

Inspect all the other parts for wear or damage.
If necessary, replace the shock absorber as an assembly.



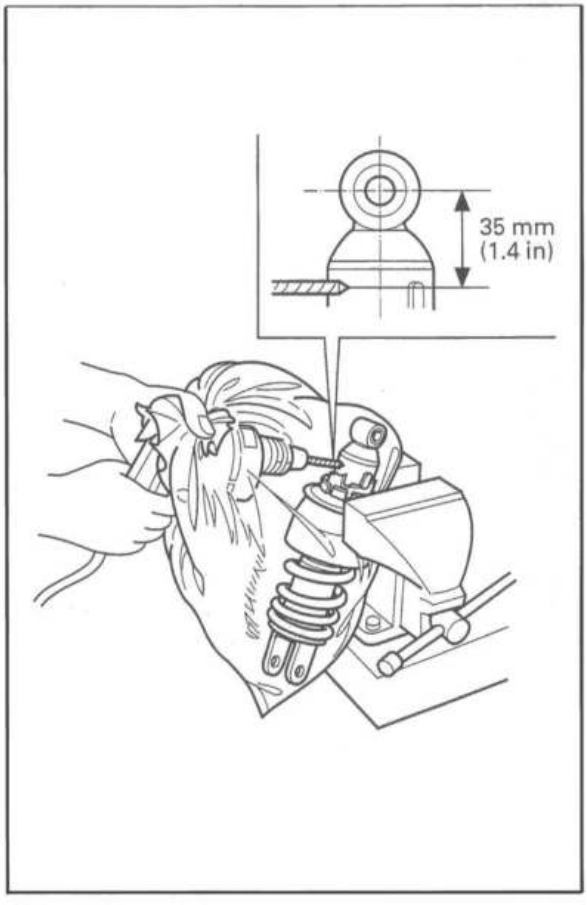
SHOCK ABSORBER DISPOSAL PROCEDURE

Center punch the damper to mark the drilling point.

Wrap the damper unit inside a plastic bag.
Support the damper 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 shaving 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.

INSTALLATION

Install the shock absorber into the frame.

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

TORQUE: 37 N·m (3.8 kgf·m , 27 lbf·ft)



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

TORQUE: 37 N·m (3.8 kgf·m , 27 lbf·ft)

Install the removed parts in the reverse order of removal.



SWINGARM

REMOVAL

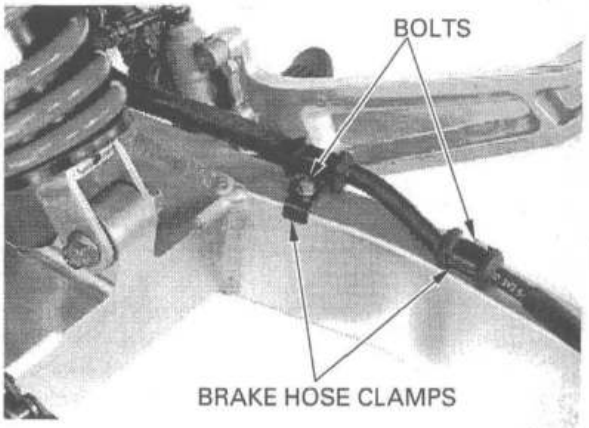
Support the motorcycle securely using a hoist or equivalent.

Remove the rear wheel (page 14-3).

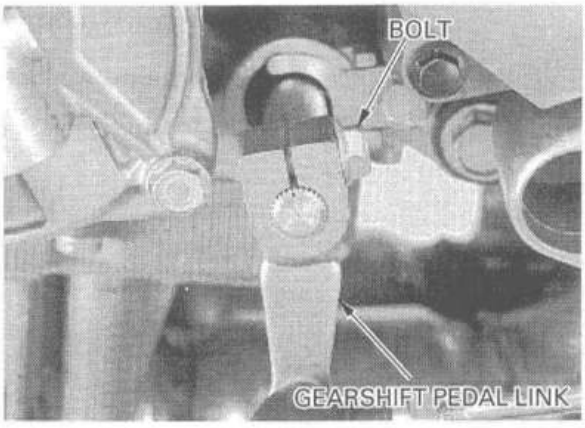
Remove the shock absorber lower mounting bolt/nut.



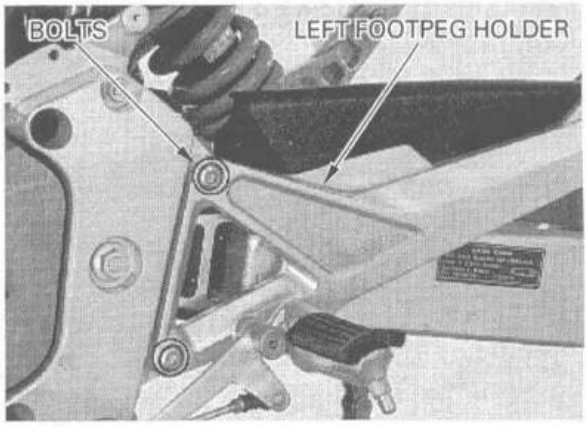
Remove the two brake hose clamp bolts.



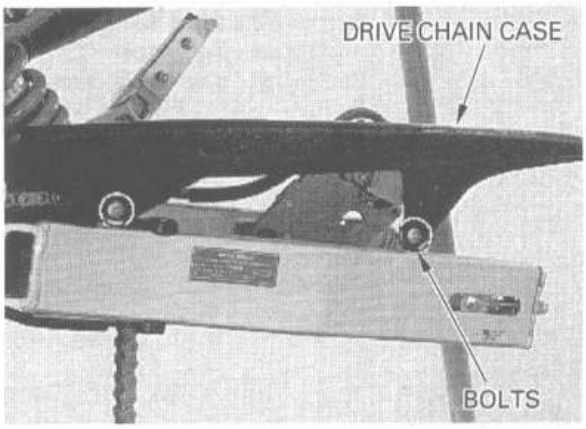
Remove the gearshift pedal link pinch bolt and gearshift pedal link from the spindle.



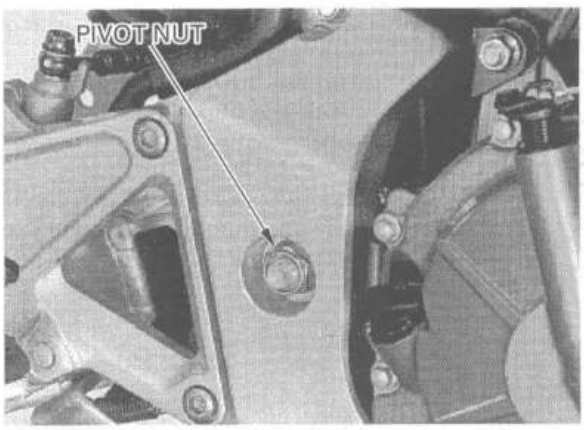
Remove the bolts and left footpeg holder.



Remove the bolts and drive chain case.

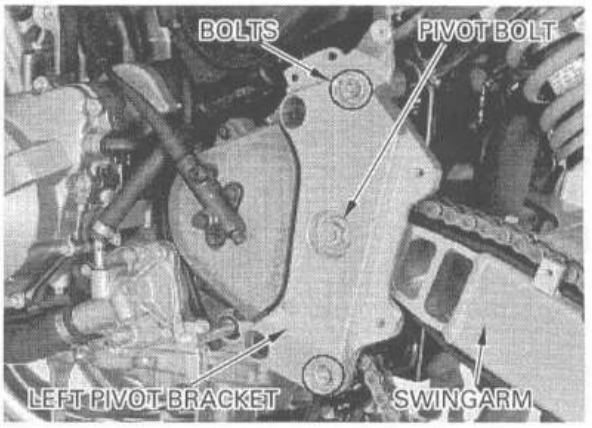


Remove the swingarm pivot nut.



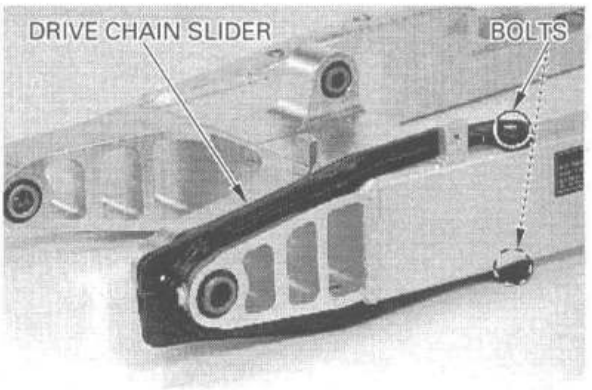
Remove the left pivot bracket mounting bolts.

Remove the swingarm pivot bolt and swingarm.



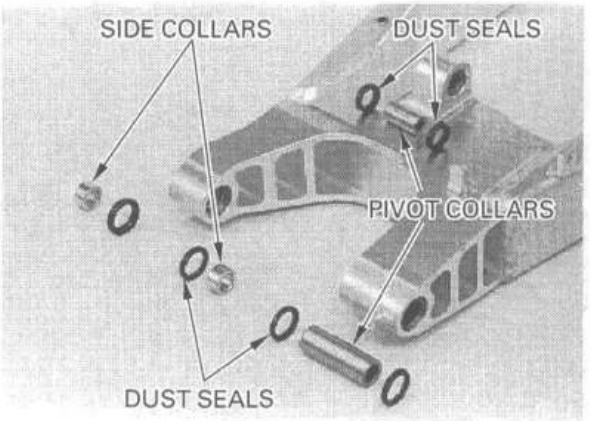
DISASSEMBLY/INSPECTION

Remove the bolts and drive chain slider.



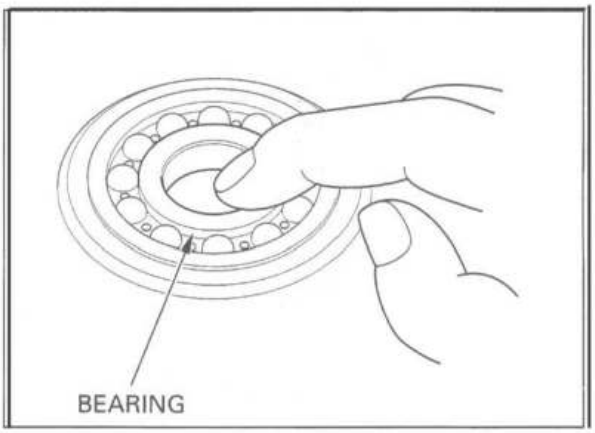
Remove the pivot collar, side collars and dust seals from the swingarm pivot.
Check the dust seals and collar for damage or fatigue.

Remove the shock absorber pivot dust seals and collar.
Check the dust seals and collar for damage or fatigue.
Check the needle bearing for damage.



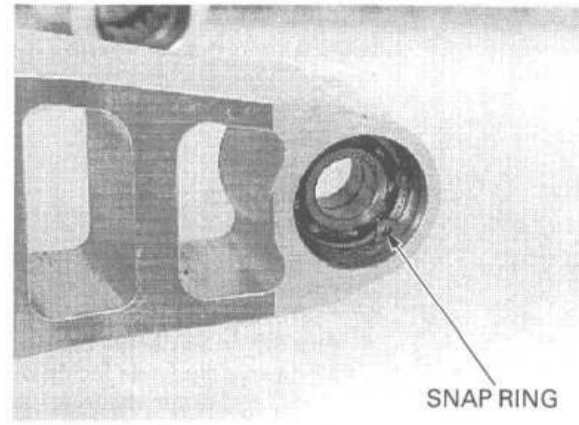
Turn the inner race of right pivot bearings with your finger.
Bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the hub.

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



PIVOT BEARING REPLACEMENT

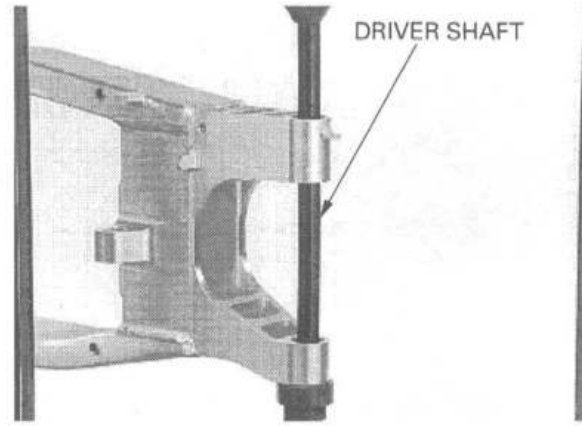
Remove the snap ring.



Press the right pivot bearings (radial ball bearings) out from the swingarm pivot using the special tool.

TOOL:

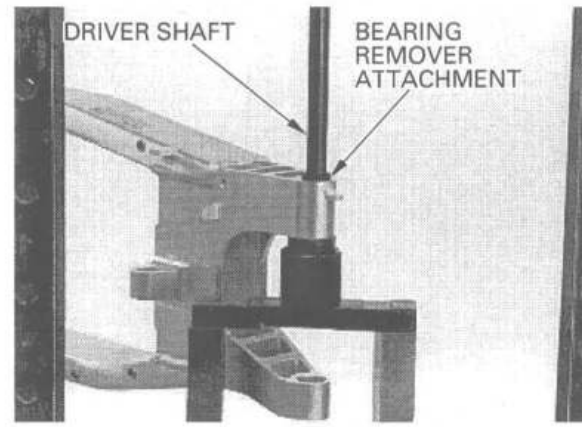
Driver shaft	07946-MJ00100



Press the left pivot bearing (needle bearing) out of the swingarm pivot using the special tools.

TOOLS:

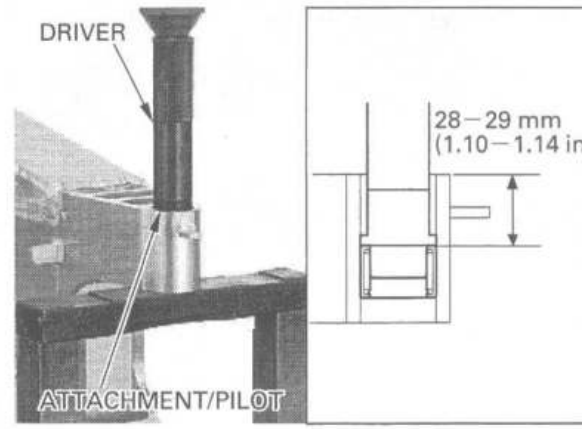
Bearing remover attachment	07GMD-KT70200
Driver shaft	07946-MJ00100



Press a new left pivot inner bearing (needle bearing) into the swingarm pivot using the special tools.

TOOLS:

Driver	07749-0010000
Attachment, 28 × 30 mm	07746-1870100
Pilot, 22 mm	07746-0041000



NOTE:

- Press the inner needle bearing into the swingarm with the marked side facing out.
- Install the inner bearing so that the needle bearing surface is lower 28–29 mm (1.10–1.14 in) from the end of the swingarm pivot surface.

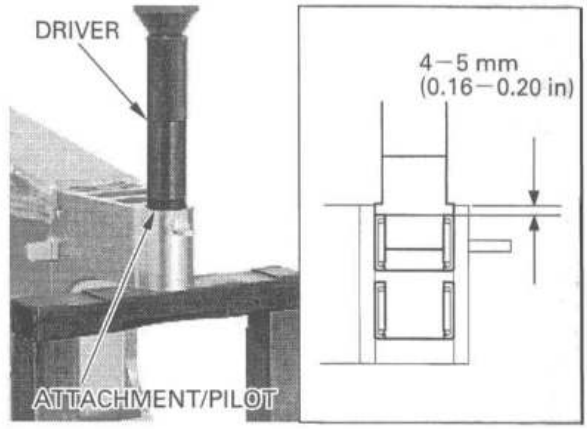
Press a new left pivot outer bearing (needle bearing) into the swingarm pivot using the special tools.

TOOLS:

Driver	07749-0010000
Attachment, 28 × 30 mm	07746-1870100
Pilot, 22 mm	07746-0041000

NOTE:

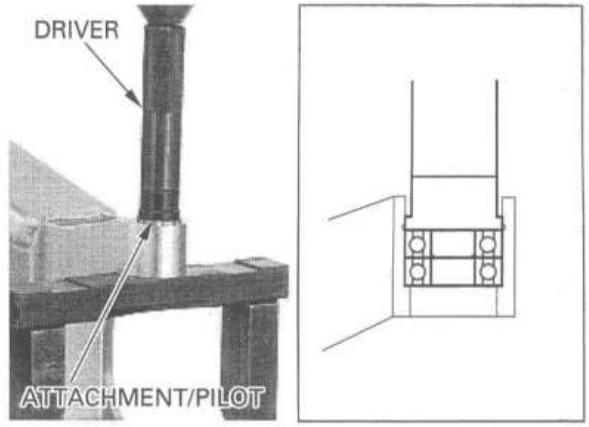
- Press the outer needle bearing into the swingarm with the marked side facing out.
- Install the outer bearing so that the needle bearing surface is lower 4–5 mm (0.16–0.20 in) from the end of the swingarm pivot surface.



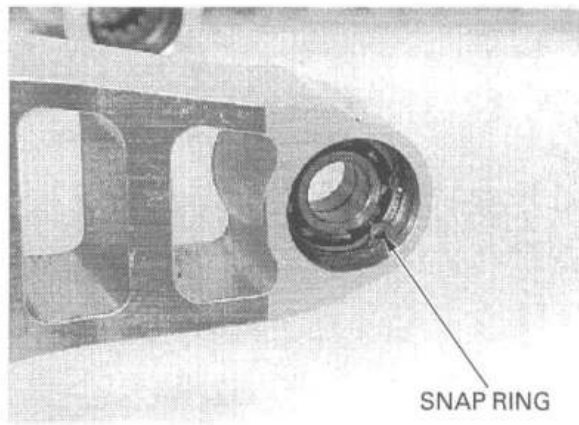
Press new right pivot bearings (radial ball bearing) into the swingarm pivot one at a time.

TOOLS:

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



Install the snap ring into the swingarm pivot groove securely.

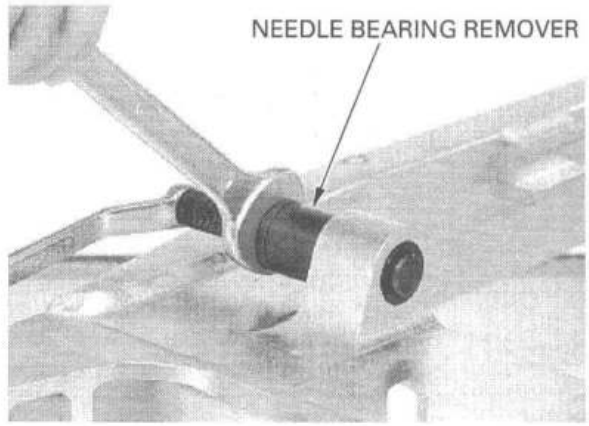


SHOCK LINK PIVOT BEARING REPLACEMENT

Remove the needle bearing out of the shock link using special tool.

TOOL:

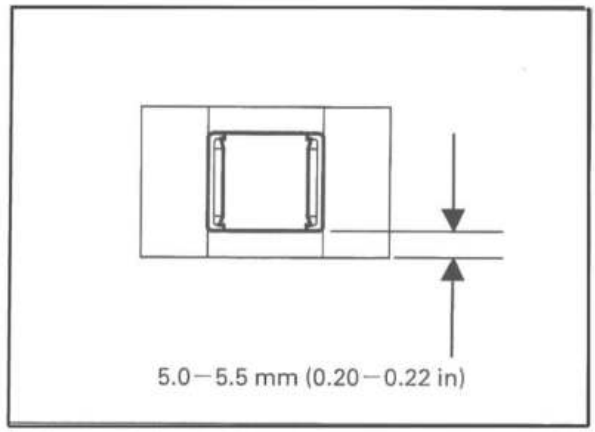
Needle bearing remover	07LMC-KV30100



Pack a new needle bearing with multi-purpose grease.
Install a new needle bearing into the shock link so that the needle bearing surface is lower 5.0−5.5 mm (0.20−0.22 in) from the end of the shock link surface.

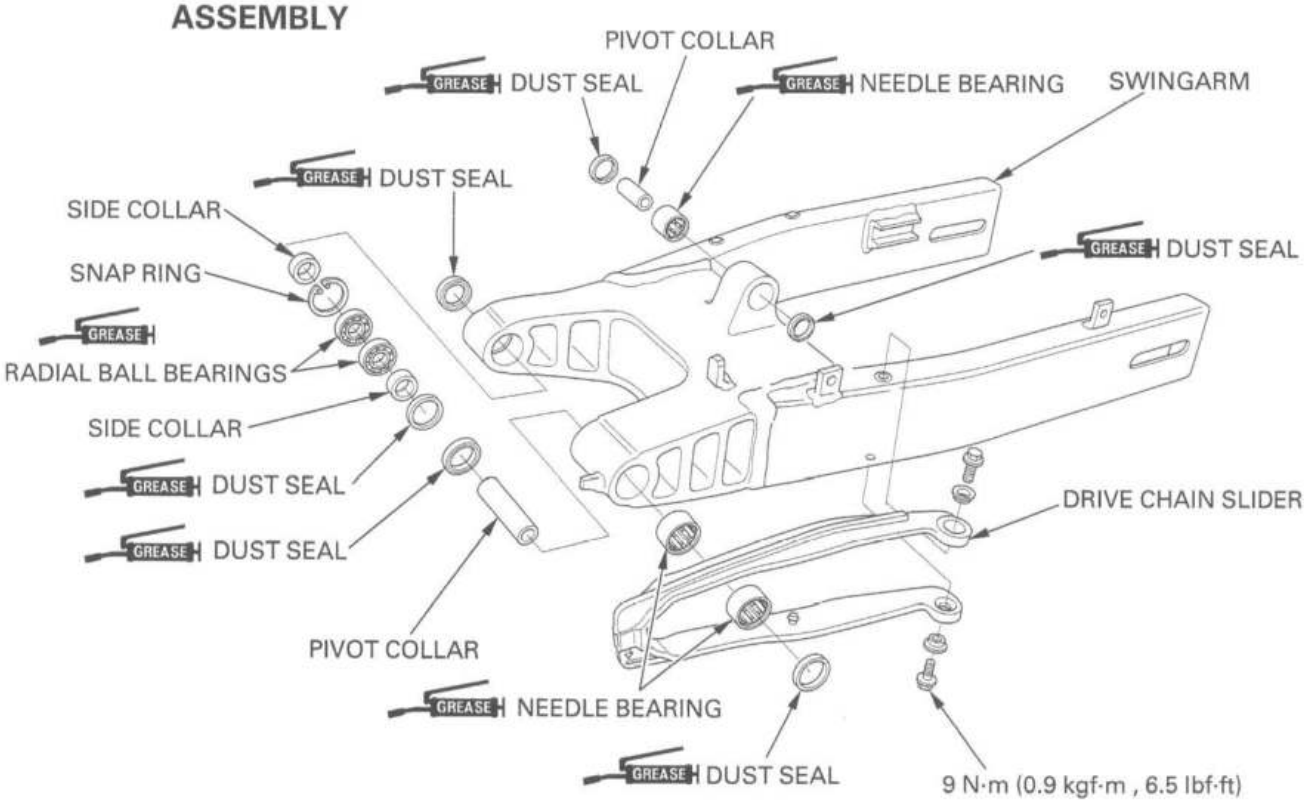
NOTE:

Press the needle bearing into the shock link with the marked side facing out.



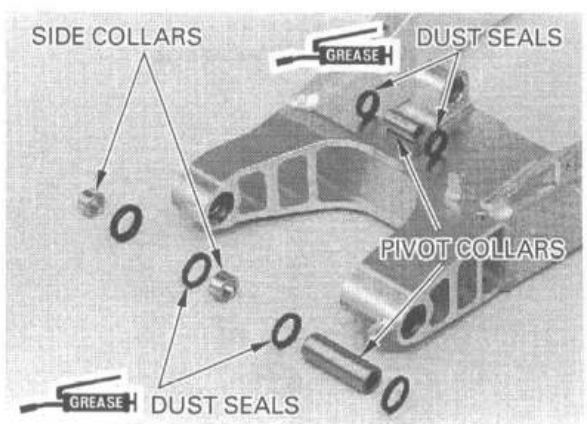
TOOL:
Needle bearing remover 07LMC-KV30100

ASSEMBLY

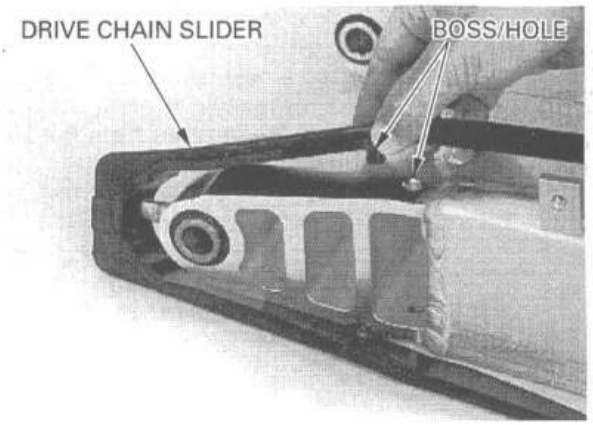


Apply grease to the dust seal lips, then install the dust seals and pivot collar into the shock absorber pivot.

Apply grease to the dust seal lips, then install the dust seals, side collars and pivot collar into the swingarm pivot.

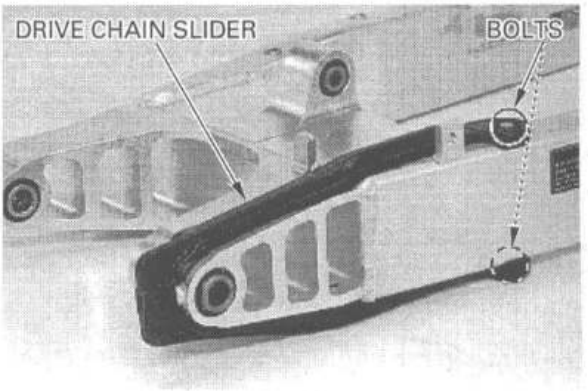


Install the drive chain slider onto the swingarm aligning its bosses with the holes in the swingarm.



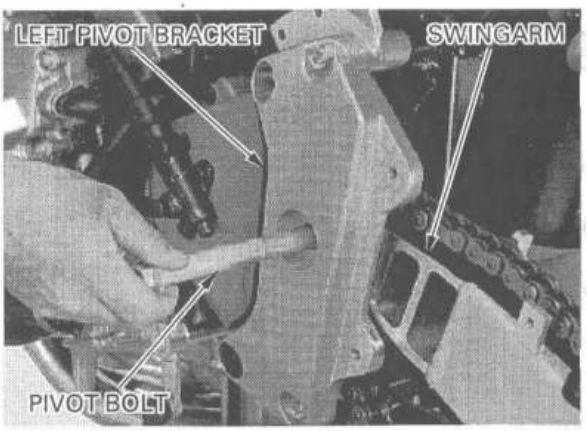
Install the collars and bolts, then tighten the bolts to the specified torque.

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

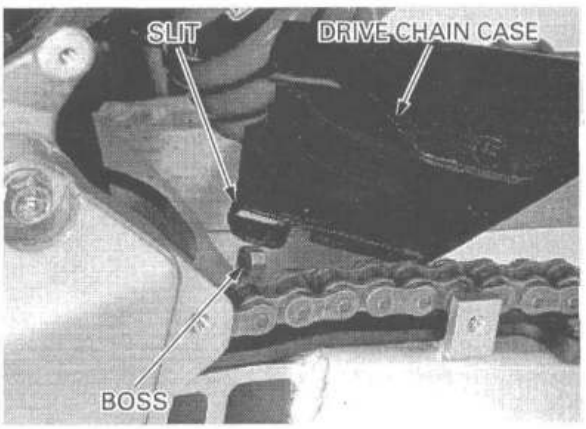


INSTALLATION

Apply thin coat of grease to the swingarm pivot bolt surface.
Install the swingarm into the frame.
Install the left pivot bracket and swingarm pivot bolt from the left side.
Install the left pivot bracket mounting bolts.

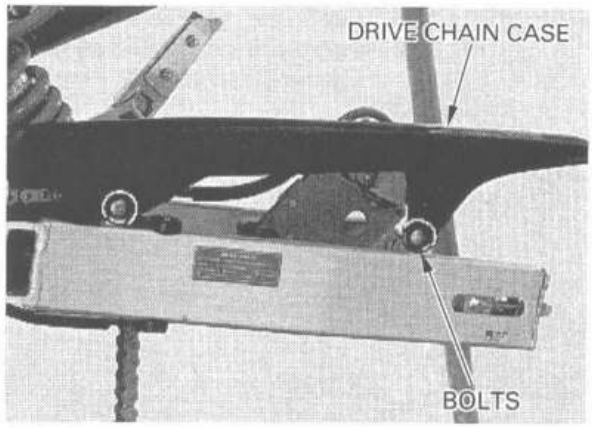


Install the drive chain case aligning its slit with the boss on the swingarm.



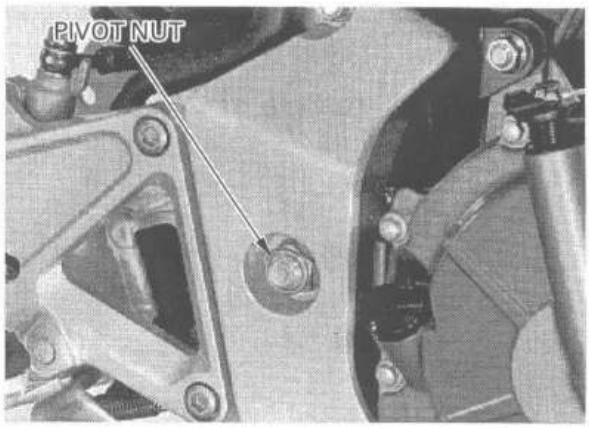
Install and tighten the drive chain case mounting bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

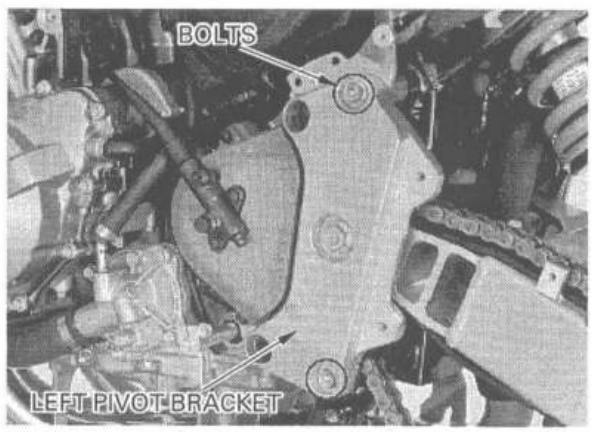


Install and tighten the swingarm pivot nut to the specified torque.

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

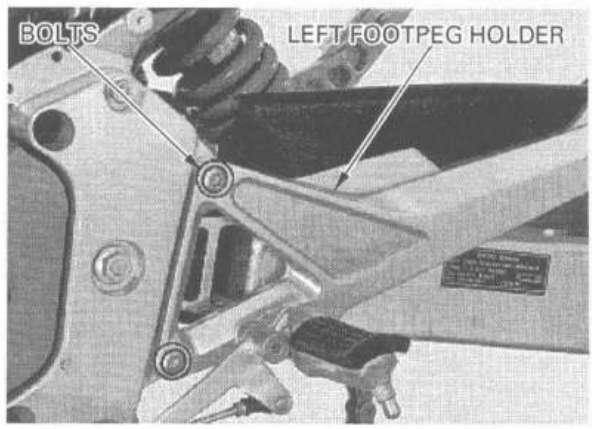


Tighten the left pivot bracket mounting bolts.

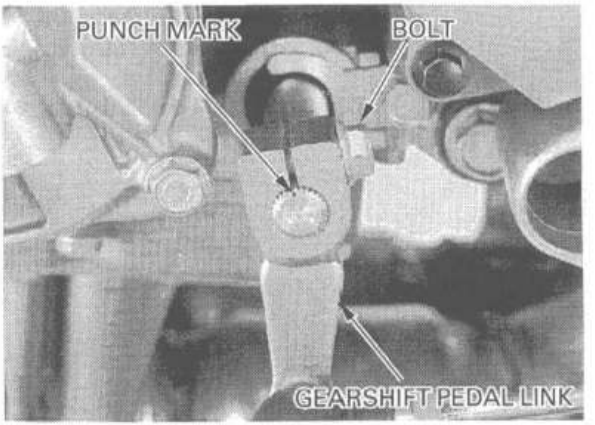


Install the left footpeg holder and tighten the mounting bolts to the specified torque.

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

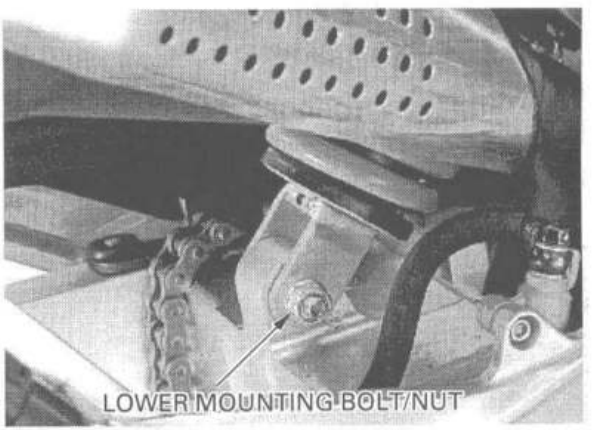


Install the gearshift pedal link to the spindle aligning its slit with the punch mark on the spindle. Tighten the pinch bolt.



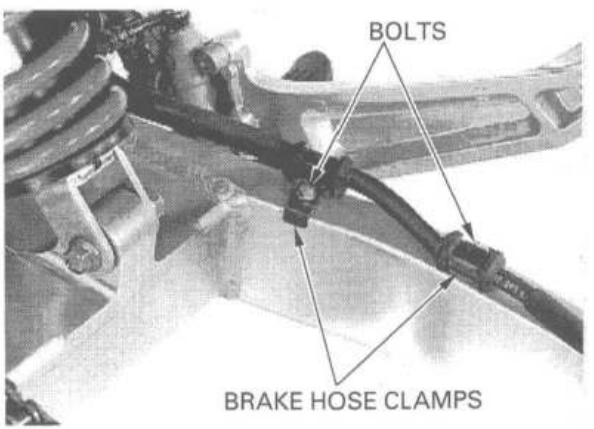
Install the shock absorber lower mounting bolt/nut, tighten the nut to the specified torque.

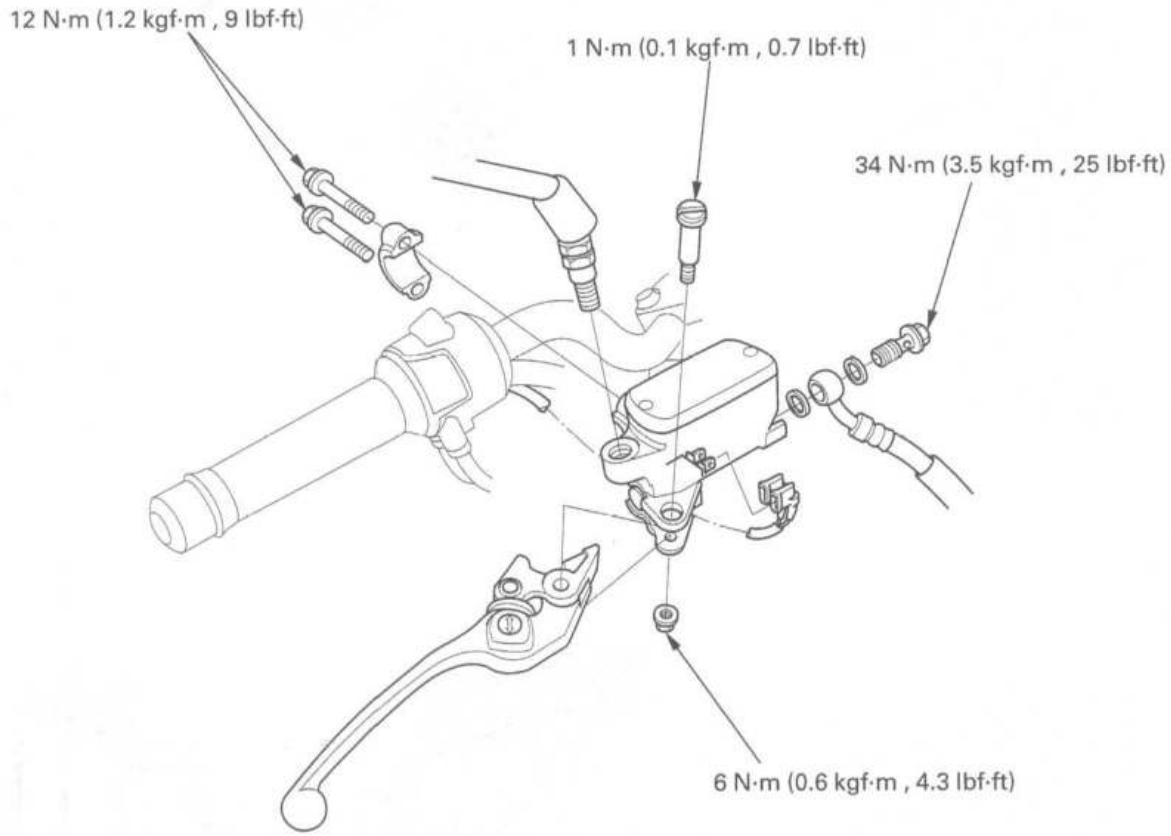
TORQUE: 37 N·m (3.8 kgf·m , 27 lbf·ft)

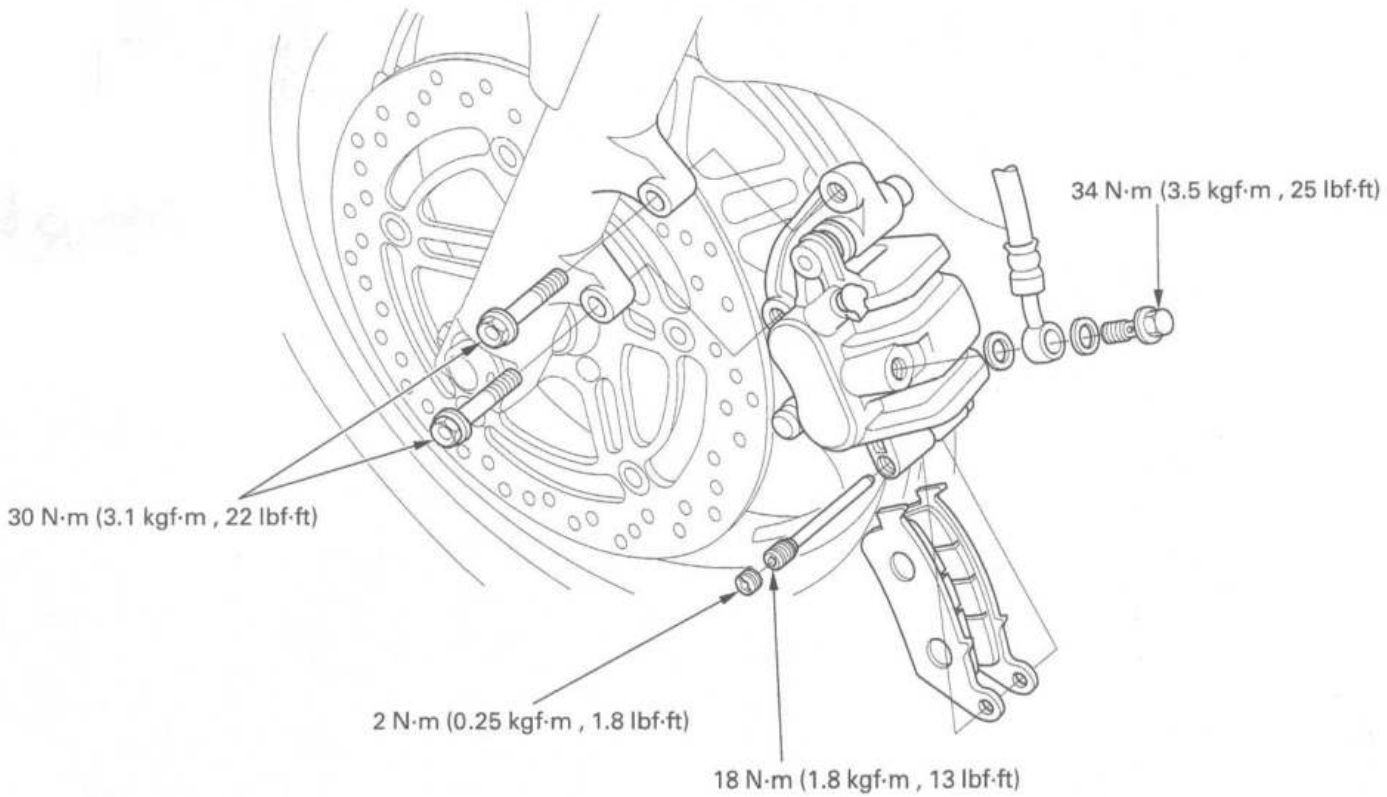


Route the brake hose properly, tighten the brake hose clamp bolts.

Install the rear wheel (page 14-9).

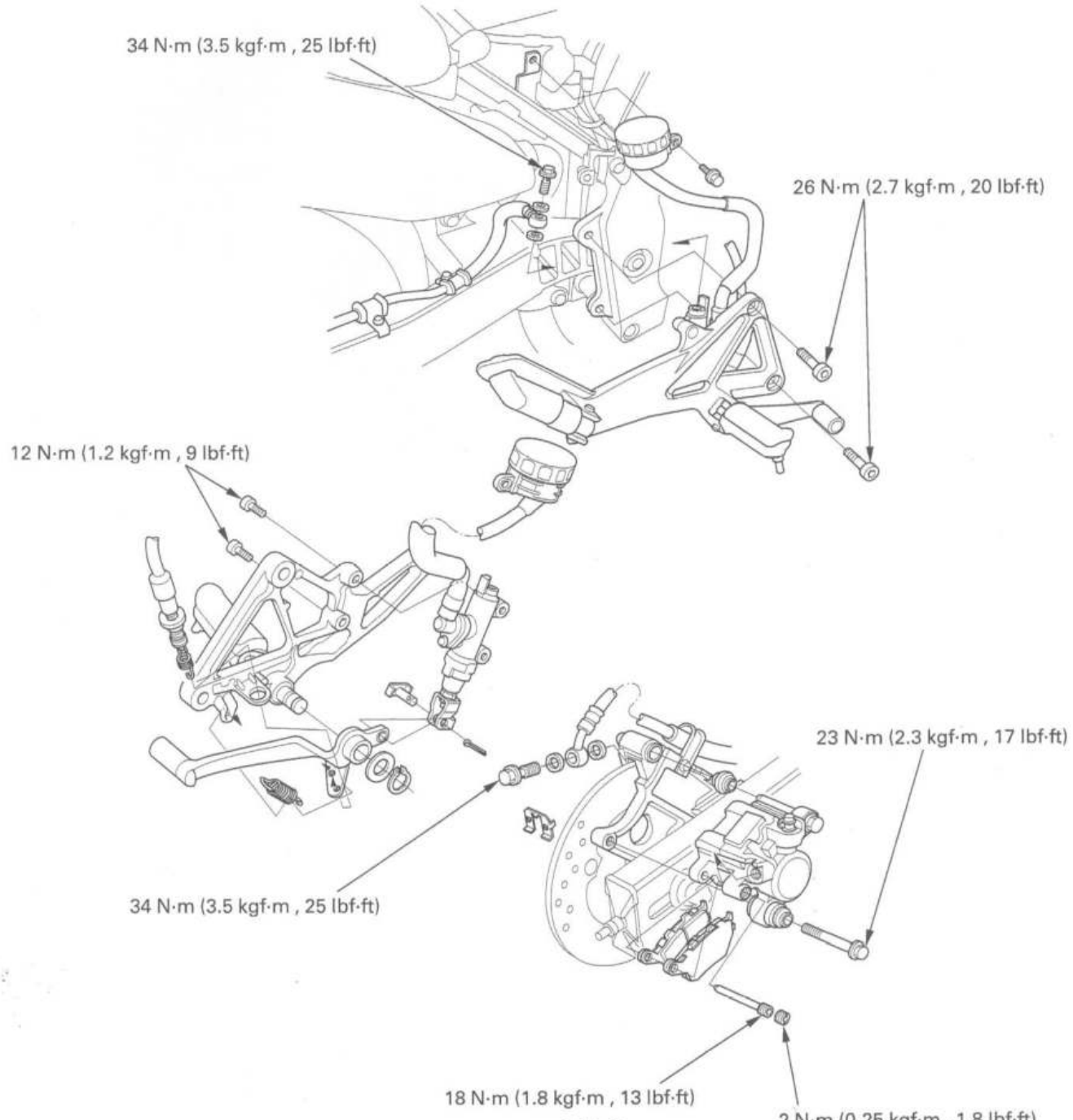



12 N·m (1.2 kgf·m , 9 lbf·ft)
1 N·m (0.1 kgf·m , 0.7 lbf·ft)
34 N·m (3.5 kgf·m , 25 lbf·ft)
6 N·m (0.6 kgf·m , 4.3 lbf·ft)


34 N·m (3.5 kgf·m , 25 lbf·ft)
30 N·m (3.1 kgf·m , 22 lbf·ft)
2 N·m (0.25 kgf·m , 1.8 lbf·ft)
18 N·m (1.8 kgf·m , 13 lbf·ft)

15. HYDRAULIC BRAKE

SERVICE INFORMATION	15-2	REAR MASTER CYLINDER	15-13
TROUBLESHOOTING	15-3	FRONT BRAKE CALIPER	15-18
BRAKE FLUID REPLACEMENT/ AIR BLEEDING	15-4	REAR BRAKE CALIPER	15-21
BRAKE PAD/DISC	15-6	BRAKE PEDAL	15-24
FRONT MASTER CYLINDER	15-9		



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.***
- ***Check the brake system by applying the brake lever or pedal.***

- Spilled brake fluid will severely damage instrument lenses and painted surfaces. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap; make sure the front reservoir is harizontal first.
- Never allow contaminates (dirt, water, etc.) to get into an open reservoir.
- Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled.
- Always use fresh DOT 4 brake fluid from a sealed container when servicing the system. Do not mix different types of fluid they may not be compatible.
- Always check brake operation before riding the motorcycle.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Front	Specified brake fluid	DOT 4	———
	Brake disc thickness	4.5 (0.18)	3.5 (0.14)
	Brake disc runout	———	0.30 (0.012)
	Master cylinder I. D.	14.000 – 14.043 (0.5512 – 0.5529)	14.055 (0.5533)
	Master piston O. D.	13.957 – 13.984 (0.5495 – 0.5506)	13.945 (0.5490)
	Caliper cylinder I. D.	27.000 – 27.050 (1.0630 – 1.0650)	27.060 (1.0654)
	Caliper piston O. D.	26.935 – 26.968 (1.0604 – 1.0617)	26.910 (1.0594)
Rear	Specified brake fluid	DOT 4	———
	Brake pedal height	67.5 (2.66)	———
	Brake disc thickness	5.0 (0.20)	4.0 (0.16)
	Brake disc runout	———	0.30 (0.012)
	Master cylinder I. D.	14.000 – 14.043 (0.5512 – 0.5529)	14.055 (0.5533)
	Master piston O. D.	13.957 – 13.984 (0.5495 – 0.5506)	13.945 (0.5490)
	Caliper cylinder I. D.	38.18 – 38.23 (1.503 – 1.505)	38.24 (1.506)
	Caliper piston O. D.	38.098 – 38.148 (1.4999 – 1.5019)	38.09 (1.500)

TORQUE VALUES

Front brake master cylinder holder bolt	12 N·m (1.2 kgf·m , 9 lbf·ft)	
Front brake master cylinder cap screw	1 N·m (0.15 kgf·m , 1.1 lbf·ft)	
Brake lever pivot bolt	1 N·m (0.1 kgf·m , 0.7 lbf·ft)	
Brake lever pivot nut	6 N·m (0.6 kgf·m , 4.3 lbf·ft)	
Front brake switch screw	1 N·m (0.12 kgf·m , 0.9 lbf·ft)	
Front brake caliper mounting bolt	30 N·m (3.1 kgf·m , 22 lbf·ft)	ALOC bolt
Front brake caliper slide pin (main)	23 N·m (2.3 kgf·m , 17 lbf·ft)	Apply a locking agent to the threads
Front brake caliper slide pin (sub)	13 N·m (1.3 kgf·m , 9 lbf·ft)	Apply a locking agent to the threads
Pad pin	18 N·m (1.8 kgf·m , 13 lbf·ft)	
Pad pin plug	2 N·m (0.25 kgf·m , 1.8 lbf·ft)	
Front brake hose clamp bolt	12 N·m (1.2 kgf·m , 9 lbf·ft)	
Brake caliper bleeder	6 N·m (0.6 kgf·m , 4.3 lbf·ft)	
Rear master cylinder mounting bolt	12 N·m (1.2 kgf·m , 9 lbf·ft)	
Rear master cylinder hose joint screw	1 N·m (0.15 kgf·m , 1.1 lbf·ft)	Apply a locking agent to the threads
Rear master cylinder push rod nut	18 N·m (1.8 kgf·m , 13 lbf·ft)	
Rear brake caliper slide pin (main)	27 N·m (2.8 kgf·m , 20 lbf·ft)	Apply a locking agent to the threads
Rear brake caliper slide pin (sub)	23 N·m (2.3 kgf·m , 17 lbf·ft)	ALOC bolt
Rear brake hose clamp bolt	9 N·m (0.9 kgf·m , 6.5 lbf·ft)	ALOC bolt
Brake hose oil bolt	34 N·m (3.5 kgf·m , 25 lbf·ft)	

TOOLS

Snap ring pliers	07914-SA50001	or 07914-3230001

TROUBLESHOOTING

Brake lever/pedal soft or spongy
- Air in hydraulic system
- Leaking hydraulic system
- Contaminated brake pad/disc
- Worn caliper piston seal
- Worn master cylinder piston cups
- Worn brake pad/disc
- Contaminated caliper
- Caliper not sliding properly
- Low brake fluid level
- Clogged fluid passage
- Warped/deformed brake disc
- Sticking/worn caliper piston
- Sticking/worn master cylinder piston
- Contaminated master cylinder
- Bent brake lever/pedal

Brake lever/pedal hard
- Clogged/restricted brake system
- Sticking/worn caliper piston
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Worn caliper piston seal
- Sticking/worn master cylinder piston
- Bent brake lever/pedal

Brake grab or pull to one side
- Contaminated brake pad/disc
- Misaligned wheel
- Clogged/restricted brake hose joint
- Warped/deformed brake disc
- Caliper not sliding properly

Brake drag
- Contaminated brake pad/disc
- Misaligned wheel
- Worn brake pad/disc
- Warped/deformed brake disc
- Caliper not sliding properly

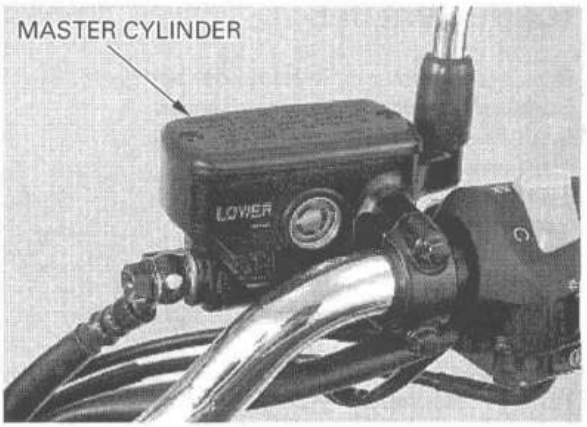
BRAKE FLUID REPLACEMENT/AIR BLEEDING

⚠WARNING

A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.

CAUTION:

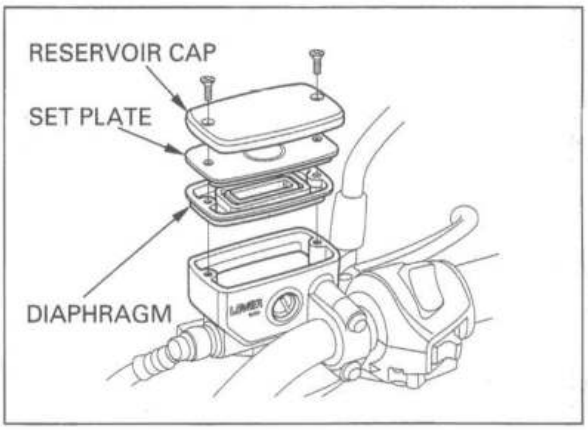
- ***Do not allow foreign material to enter the system when filling the reservoir.***
- ***Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.***



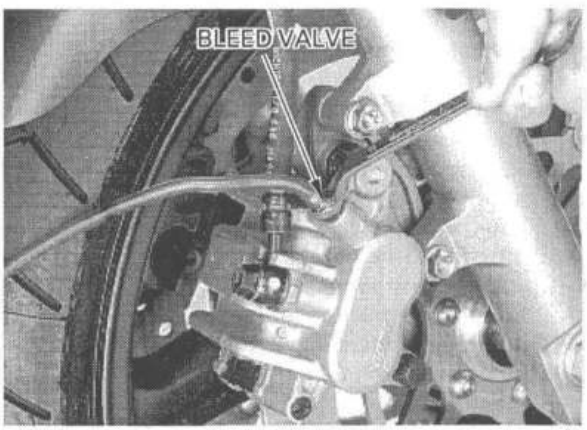
BRAKE FLUID DRAINING

For the front brake, turn the handlebar to the left until the reservoir is parallel to the ground, before removing the reservoir cap.
Remove the screws, reservoir cap, set plate and diaphragm.

For the rear brake, remove the reservoir cap, set plate and diaphragm.



Connect a bleed hose to the caliper bleed valve.
Loosen the bleed valve and pump the brake lever or pedal.
Stop pumping the lever when no more fluid flows out of the bleed valve.



BRAKE FLUID FILLING

Fill the reservoir with DOT 4 brake fluid from a sealed container.

CAUTION:

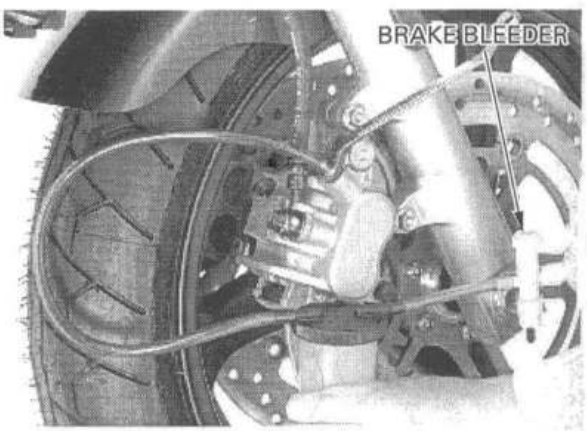
- ***Use only DOT 4 brake fluid from a sealed container.***
- ***Do not mix different types of fluid. There are not compatible.***

When using a brake bleeder, follow the manufacturer's operating instructions.

Connect a commercially available brake bleeder to the bleed valve.
Pump the brake bleeder and loosen the bleed valve, adding fluid when the fluid level in the master cylinder reservoir is low.

NOTE:

Check the fluid level often while bleeding the brakes to prevent air from being pumped into the system.



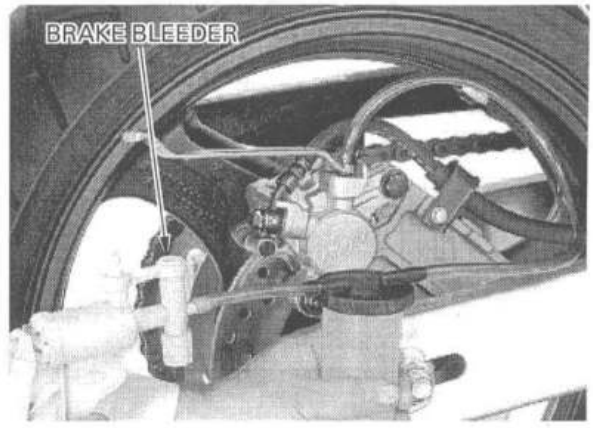
If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Repeat the previous step procedures until air bubbles do not appear in the plastic hose.

NOTE:

If a brake bleeder is not available, fill the master cylinder and operate the brake lever or pedal to fill the system.

Close the bleed valve. Next, perform the available BLEEDING procedure.



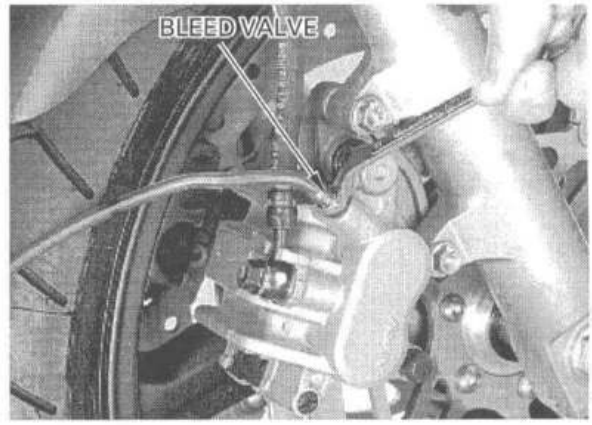
BRAKE BLEEDING

Connect a clear bleed hose to the bleed valve. Pump up the system pressure with the lever or pedal until there are no air bubbles in the fluid flowing out of the master cylinder and lever resistance is felt.

1. Squeeze the brake lever or push the brake pedal, open the bleed valve 1/2 turn and then close the valve.

NOTE:

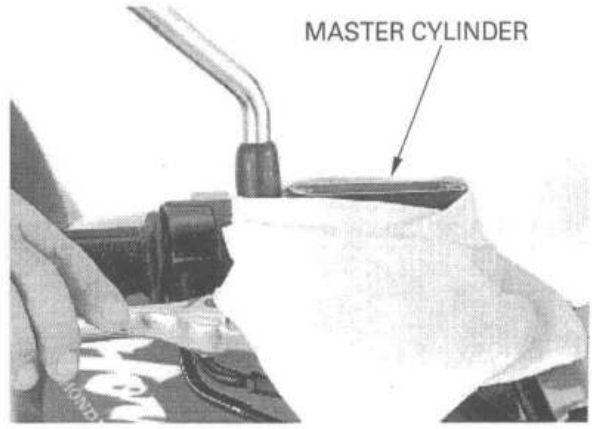
Do not release the brake lever or pedal until the bleed valve has been closed.



2. Release the brake lever or pedal until the bleed valve has been closed.

Repeat steps 1 and 2 until bubbles cease to appear in the fluid coming out of the bleed valve.
Tighten the bleed valve.

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

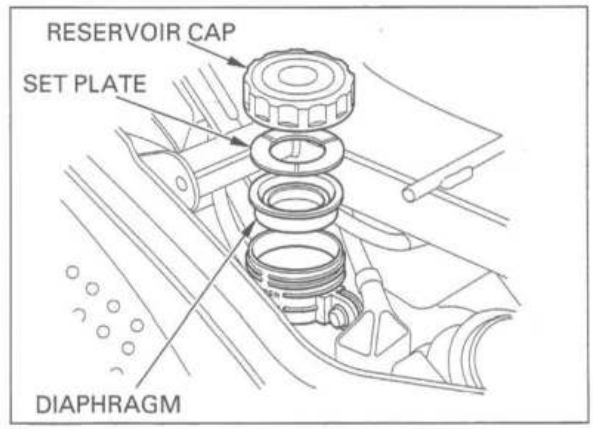


Fill the fluid reservoir to the upper level.

Reinstall the diaphragm and diaphragm plate.

On the front brake, install the reservoir cap, and tighten the screws.

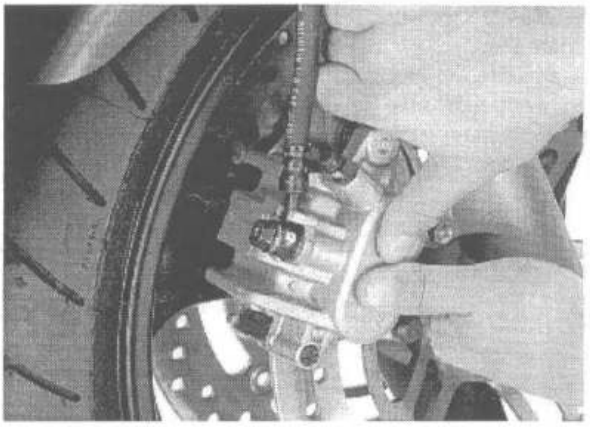
On the rear brake, install the reservoir cap securely.



BRAKE PAD/DISC

FRONT BRAKE PAD REPLACEMENT

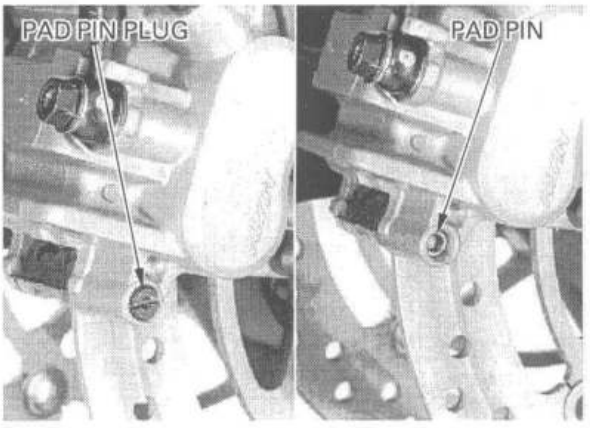
Push the caliper pistons all the way in to allow installation of new brake pad.



NOTE:

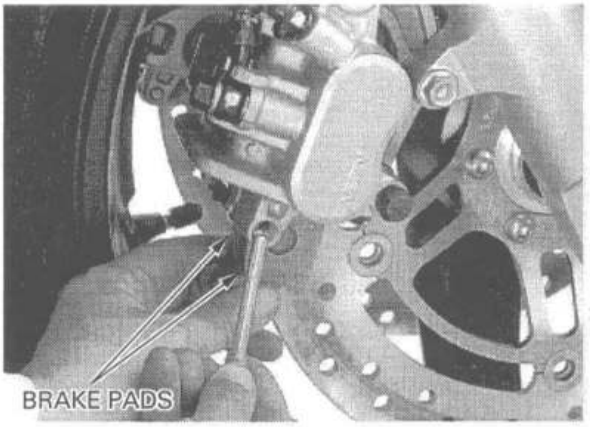
Check the brake fluid level in the brake master cylinder reservoir as this operation causes the level to rise.

Remove the pad pin plugs and loosen the pad pins.



Remove the pad pins and brake pads.

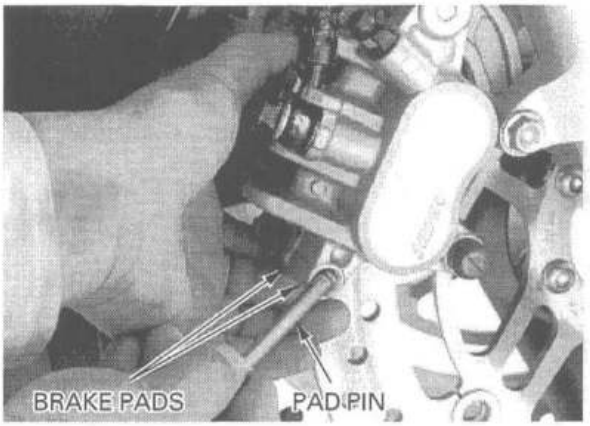
Clean the brake caliper inside especially around the pistons.



Make sure that the pad spring is in place.

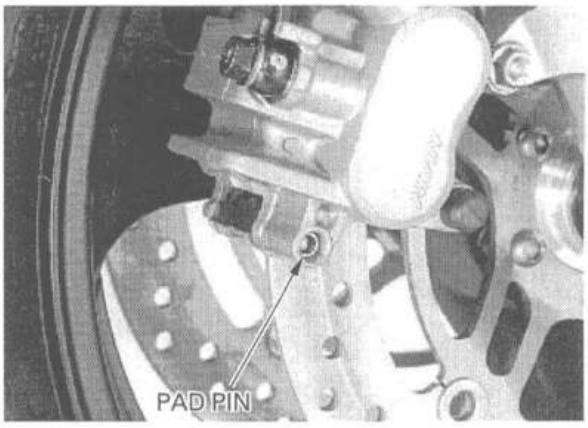
Always replace the brake pads in paris to assure even disc pressure.

Install the new brake pads.
Push the brake pads against the pad spring, then install the pad pins.



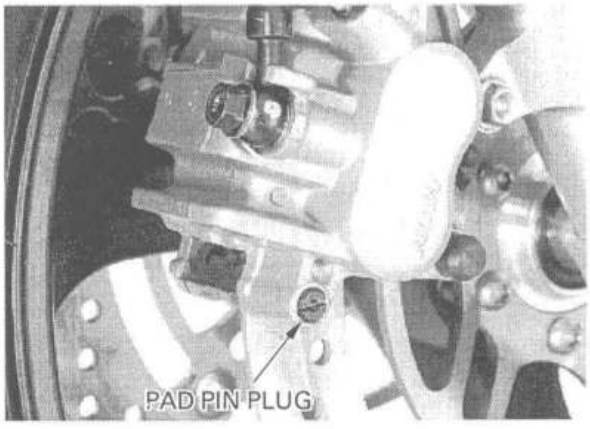
Tighten the pad pins.

TORQUE: 18 N·m (1.8 kgf·m , 13 lbf·ft)



Install and tighten the pad pins.

TORQUE: 2 N·m (0.25 kgf·m , 1.8 lbf·ft)

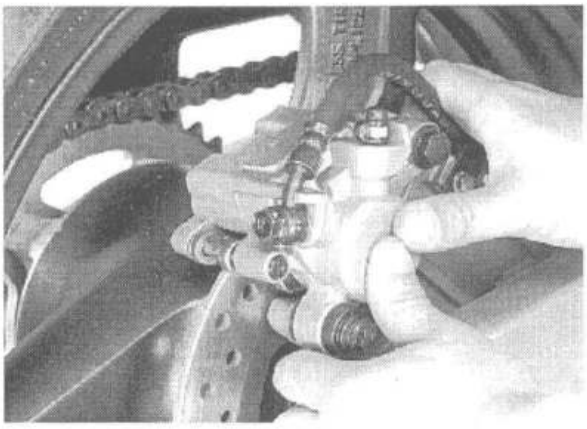


REAR BRAKE PAD REPLACEMENT

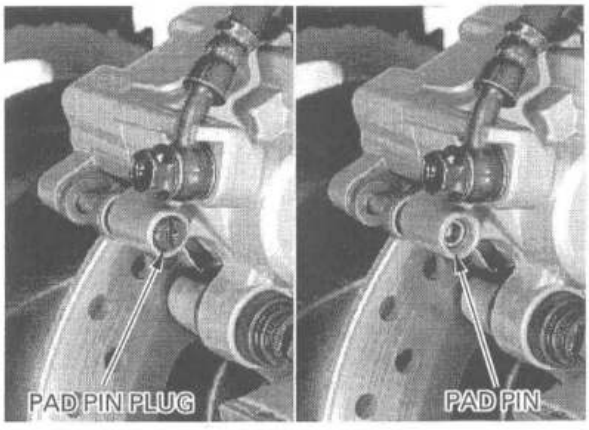
Push the caliper pistons all the way in by pushing the caliper body inward to allow installation of new brake pads.

NOTE:

Check the brake fluid level in the brake master cylinder reservoir as this operation causes the level to rise.

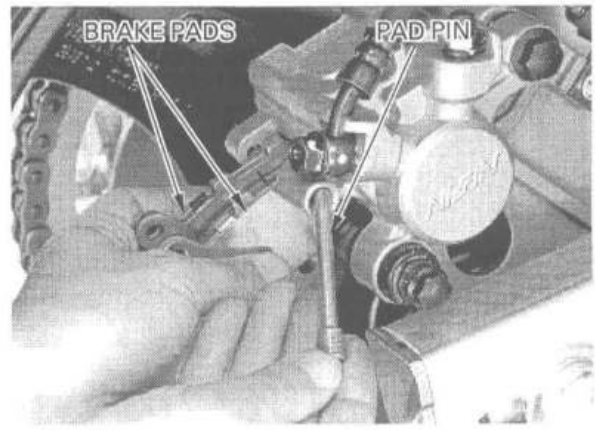


Remove the pad pin plug and loosen the pad pin.



Remove the pad pin and brake pads.

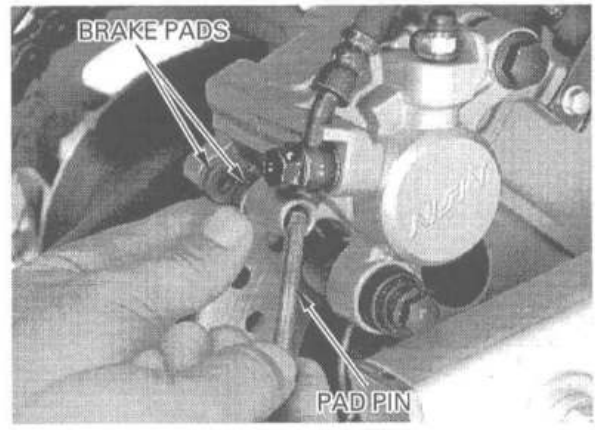
Clean the brake caliper inside especially around the pistons.



Always replace the brake pads in paris to assure even disc pressure.

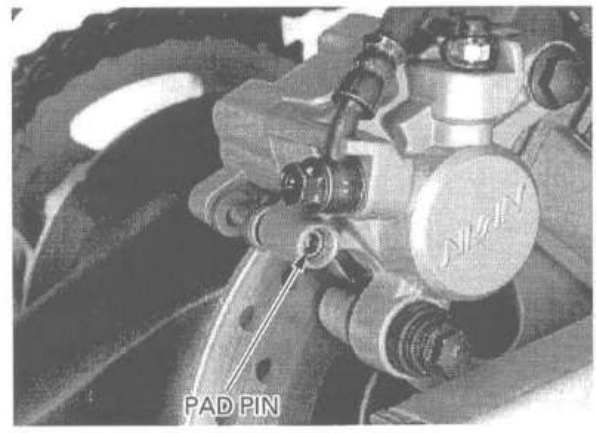
Make sure the brake pad spring is in place.
Install the new brake pads.

Install the pad pin while pushing the pads against the pad spring so that the pad ends are positioned onto the retainer on the caliper bracket.



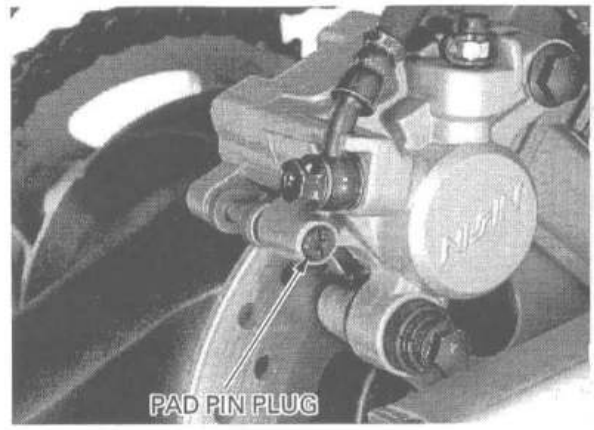
Install and tighten the pad pin.

TORQUE: 18 N·m (1.8 kgf·m , 13 lbf·ft)

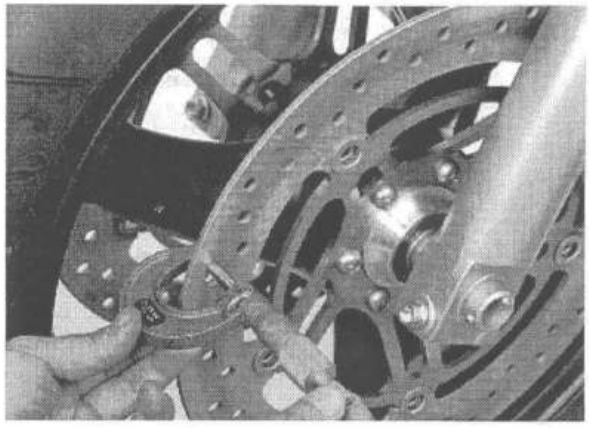


Install and tighten the pad pin plug.

TORQUE: 2 N·m (0.25 kgf·m , 1.8 lbf·ft)



BRAKE DISC INSPECTION

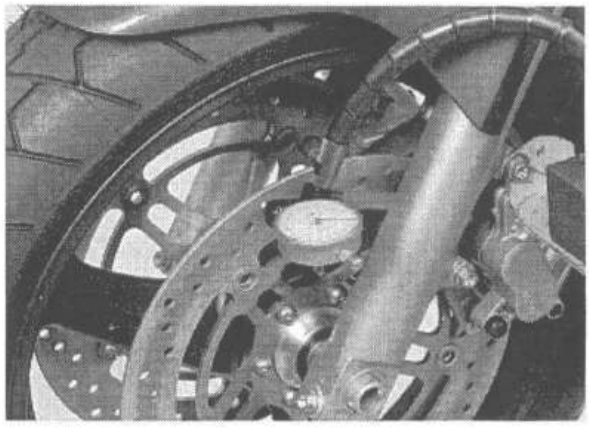


Visually inspect the brake disc for damage or cracks.

Measure the brake disc thickness with a micrometer.

SERVICE LIMITS: FRONT: 3.5 mm (0.14 in)
REAR: 4.0 mm (0.16 in)

Replace the brake disc if the smallest measurement is less than the service limit.



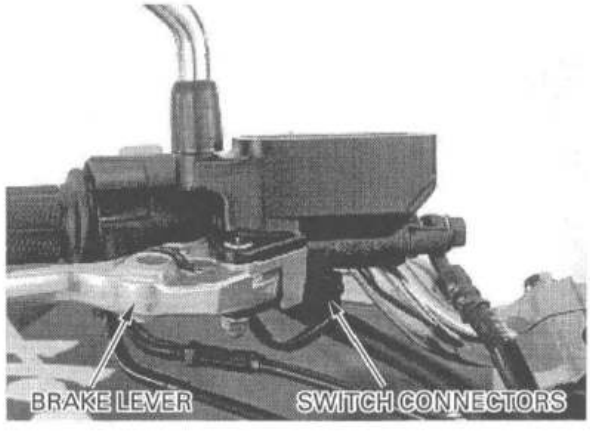
Measure the brake disc warpage with a dial indicator.

SERVICE LIMIT: 0.30 mm (0.012 in)

Check the wheel bearings for excessive play, if the warpage exceeds the service limit.
Replace the brake disc if the wheel bearings are normal.

FRONT MASTER CYLINDER

REMOVAL



Drain the front hydraulic system (page 15-3).

Remove the rearview mirror from the master cylinder.
Disconnect the brake light switch wire connectors.
Remove the pivot nut/bolt and brake lever.



Remove the brake hose oil bolt, sealing washers and brake hose eyelet.

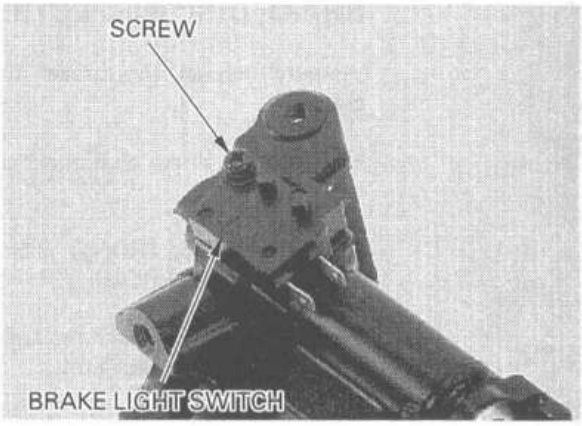
CAUTION:

Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.

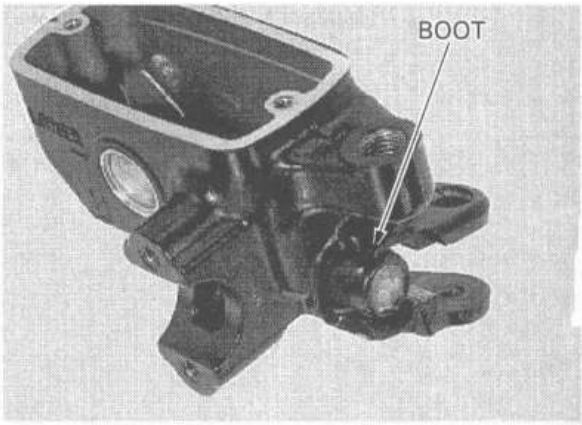
Remove the bolts from the master cylinder holder and remove the master cylinder assembly.

DISASSEMBLY

Remove the screw and brake light switch.



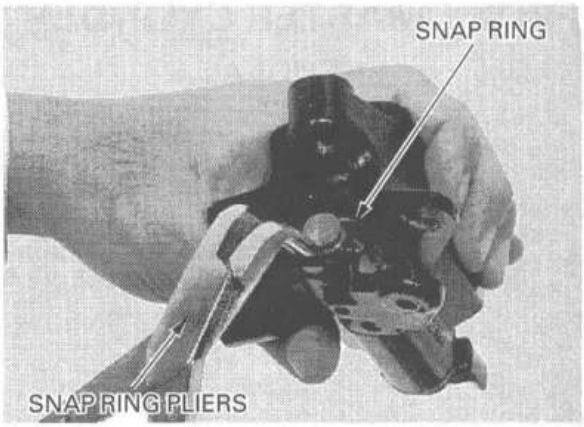
Remove the boot.



Remove the snap ring from the master cylinder body using the special tool as shown.

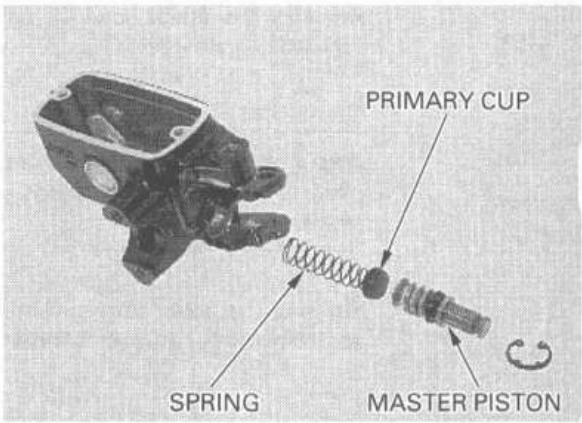
TOOL:

Snap ring pliers	07914-SA50001 or 07914-3230001



Remove the master piston primary cup and spring.

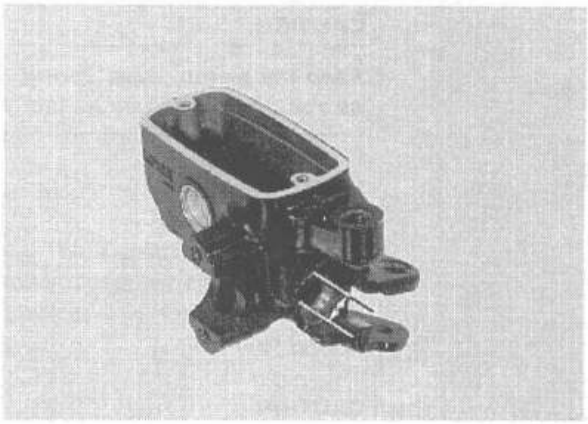
Clean the inside of the cylinder and reservoir with brake fluid.



INSPECTION

Check the piston boot, primary cup and secondary cup for fatigue or damage.
Check the master cylinder and piston for abnormal scratches.
Measure the master cylinder I. D.

SERVICE LIMIT: 14.055 mm (0.5533 in)

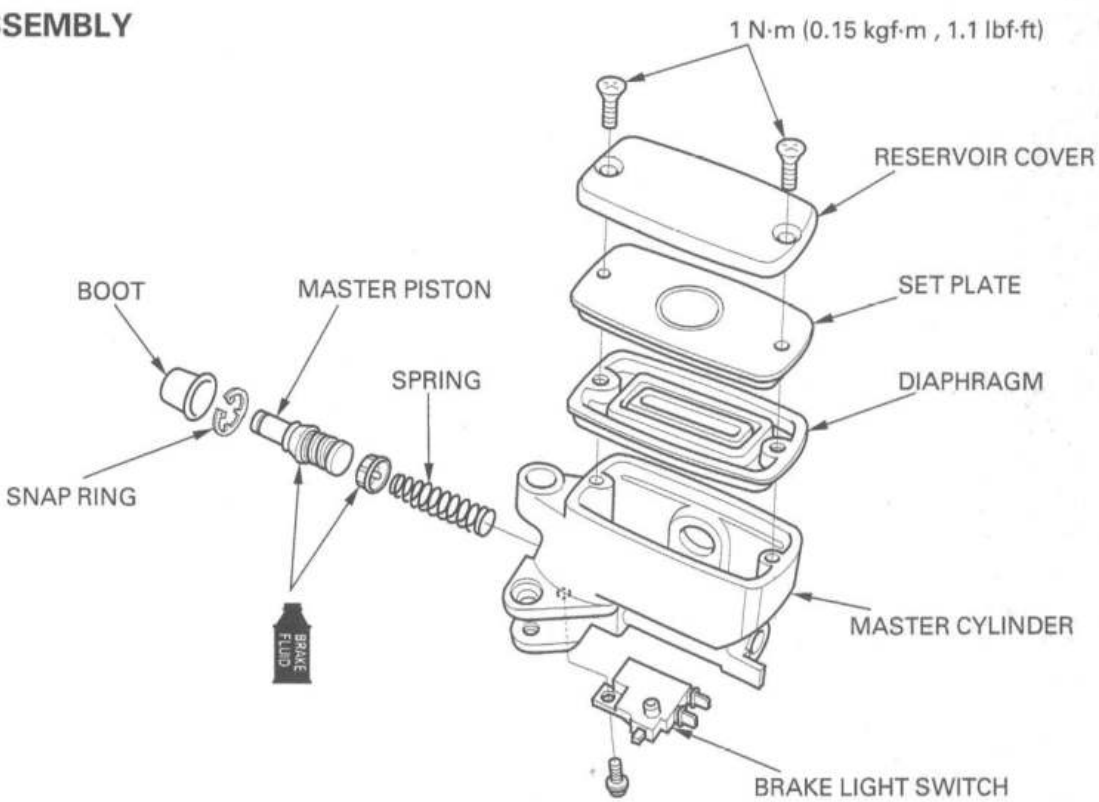


Measure the master cylinder piston O. D.

SERVICE LIMIT: 13.945 mm (0.5490 in)



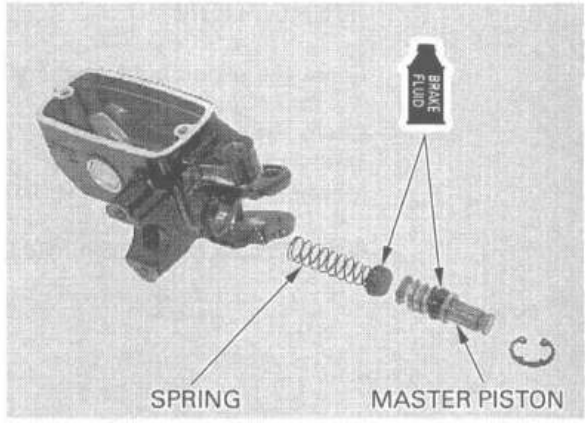
ASSEMBLY



CAUTION:

Keep the piston, cups, spring, snap ring and boot as a set; do not substitute individual parts.

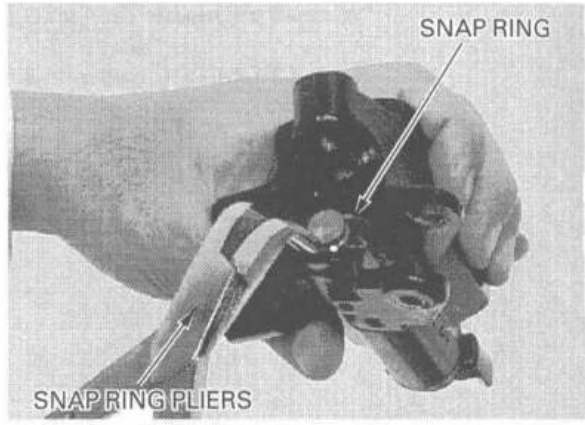
Coat all parts with clean brake fluid before assembly.
Dip the piston in brake fluid.
Install the primary cup to the spring.
Install the spring and piston assembly into the master cylinder.



CAUTION:

When installing the cups, do not allow the lips to turn inside out.

Install the snap ring using the special tool.



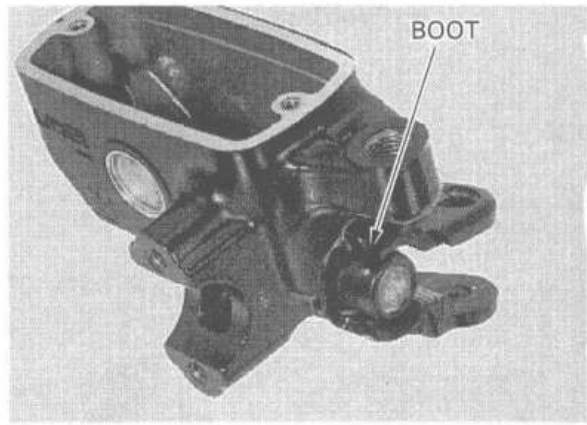
CAUTION:

Be certain the snap ring is firmly seated in the groove.

TOOL:

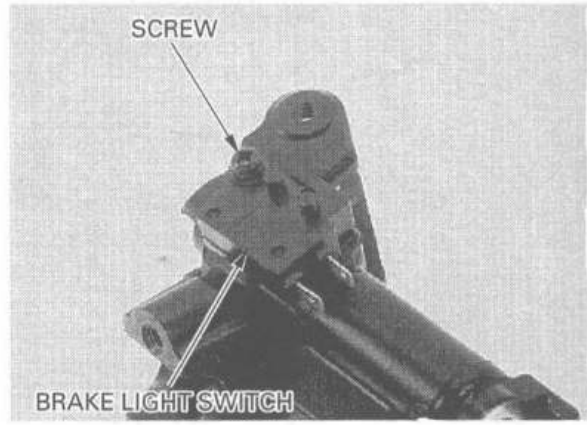
Snap ring pliers	07914-SA50001 or 07914-3230001

Install the boot.



Install the brake light switch and tighten the screw to the specified torque.

TORQUE: 1 N·m (0.12 kgf·m , 0.9 lbf·ft)



Place the master cylinder assembly on the handlebar.
Align the end of the master cylinder with the punch mark on the handlebar.

Install the master cylinder holder with the "UP" mark facing up.
Tighten the upper bolt first, then the lower bolt.

Install the brake hose eyelet with the oil bolt and new sealing washers.
Push the brake hose against the stopper, tighten the oil bolt to the specified torque.

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



Connect the brake light switch wire connectors.

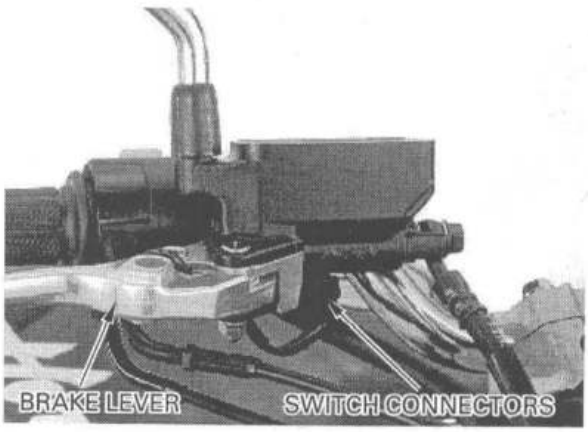
Install the brake lever assembly, tighten the pivot bolt.

TORQUE: 1 N·m (0.1 kgf·m , 0.7 lbf·ft)

Hold the pivot bolt and tighten the pivot nut.

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

Install the rearview mirror.
Fill the reservoir to the upper level and bleed the brake system (page 15-3).



REAR MASTER CYLINDER

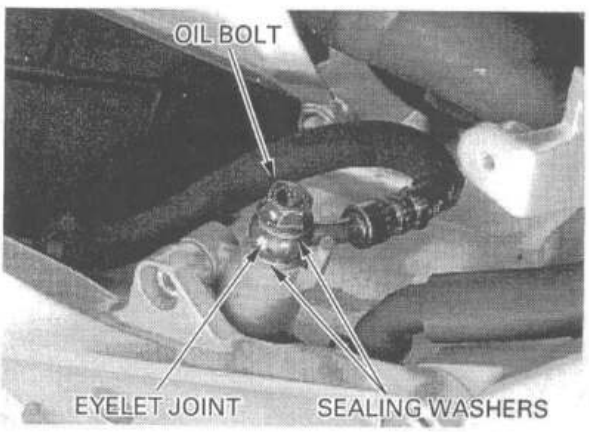
REMOVAL

Drain the rear hydraulic system (page 15-3).

Remove the brake hose oil bolt, sealing washers and brake hose eyelet joint.

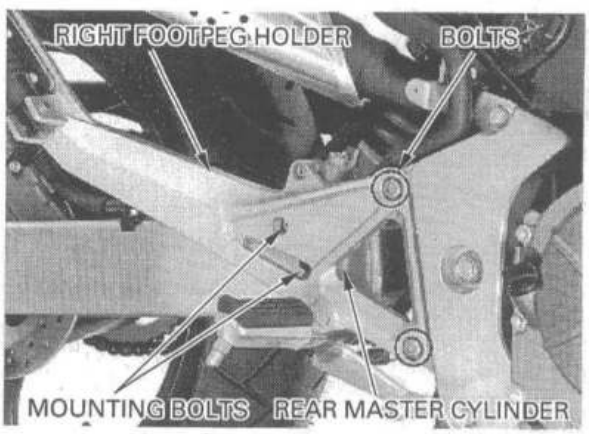
CAUTION:

Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.

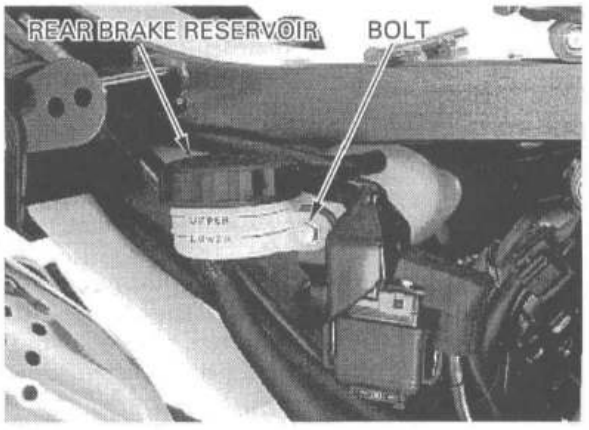


Loosen the rear master cylinder mounting bolts.

Remove the bolts and right footpeg holder.

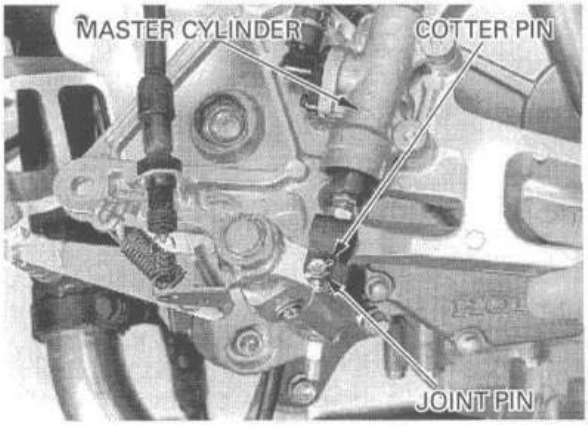


Remove the bolt and rear brake reservoir from the frame.



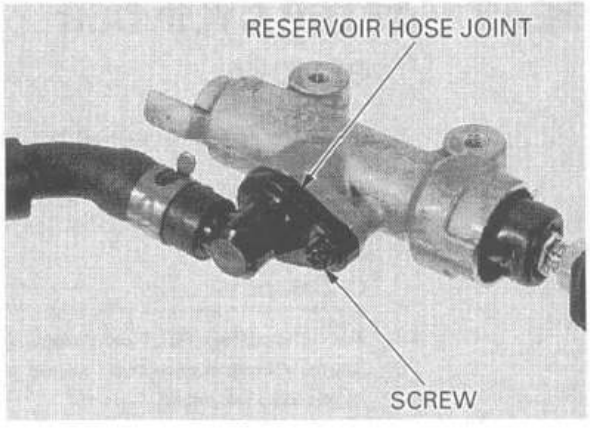
Remove and discard the brake pedal joint cotter pin. Remove the joint pin.

Remove the mounting bolts and rear master cylinder from the footpeg holder.



DISASSEMBLY

Remove the screw and reservoir hose joint and O-ring from the master cylinder.



Remove the boot.

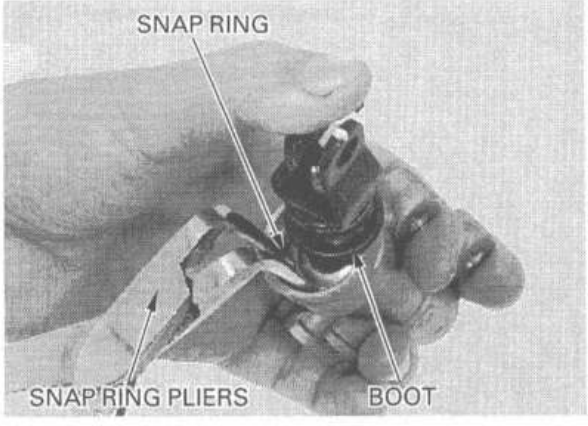
Remove the snap ring from the master cylinder body using the special tool as shown.

TOOL:

Snap ring pliers	07914-SA50001 or 07914-3230001

Remove the push rod, master piston and spring.

Clean the inside of the cylinder with brake fluid.



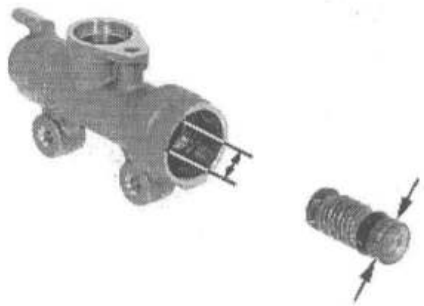
INSPECTION

Check the piston boot, primary cup and secondary cup for fatigue or damage.
Check the master cylinder and piston for abnormal scratches.
Measure the master cylinder I. D.

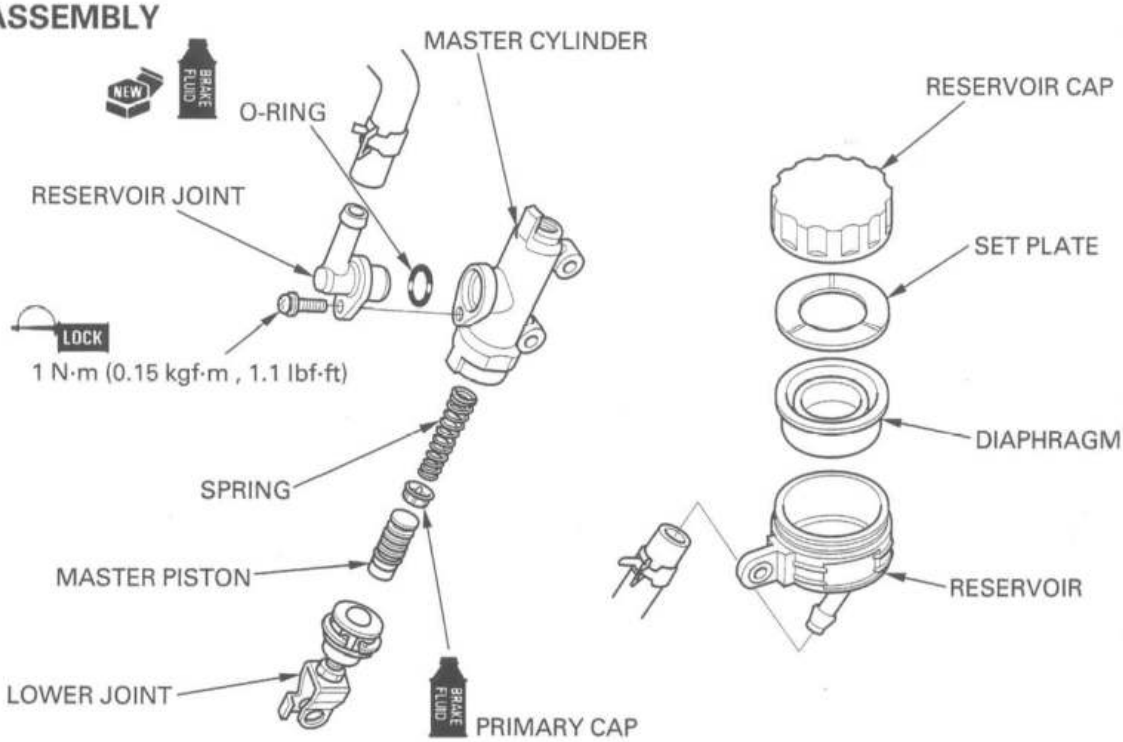
SERVICE LIMIT: 14.055 mm (0.5533 in)

Measure the master cylinder piston O. D.

SERVICE LIMIT: 13.945 mm (0.5490 in)



ASSEMBLY



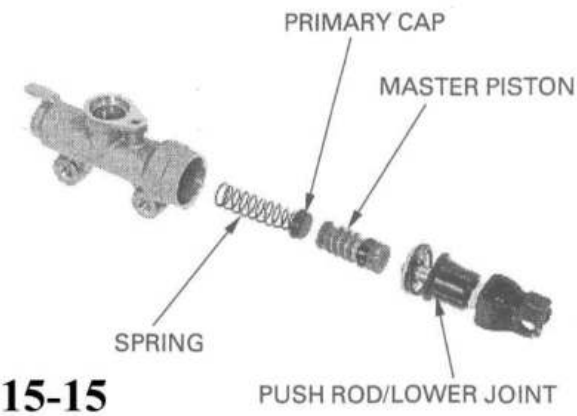
CAUTION:

Keep the piston, cups, spring, snap ring and boot as a set; do not substitute individual parts.

Coat all parts with clean brake fluid before assembly.
Dip the piston in brake fluid.
Install the primary cup to the spring.
Install the spring and piston assembly into the master cylinder.
Apply grease to the piston contact area of the push rod.

CAUTION:

When installing the cups, do not allow the lips to turn inside out.



Install the push rod into the master cylinder.
Install the snap ring using the special tool.

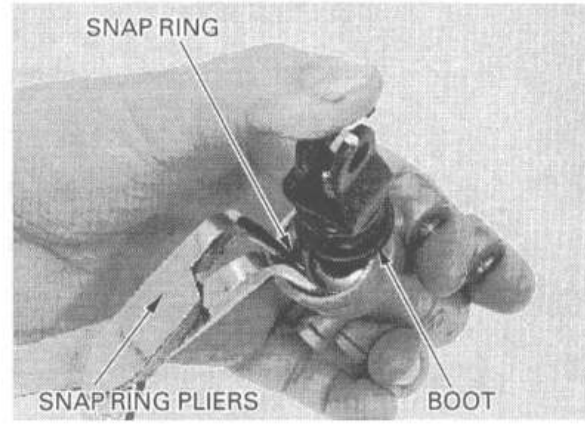
CAUTION:

Be certain the snap ring is firmly seated in the groove.

TOOL:

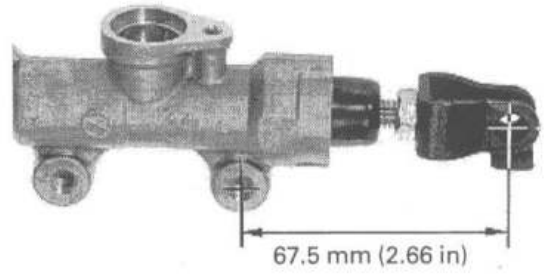
Snap ring pliers	07914-SA50001 or 07914-3230001

Install the boot.



If the push rod is disassembled, adjust the push rod length as shown.
After adjustment, tighten the lock nut to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m , 13 lbf·ft)

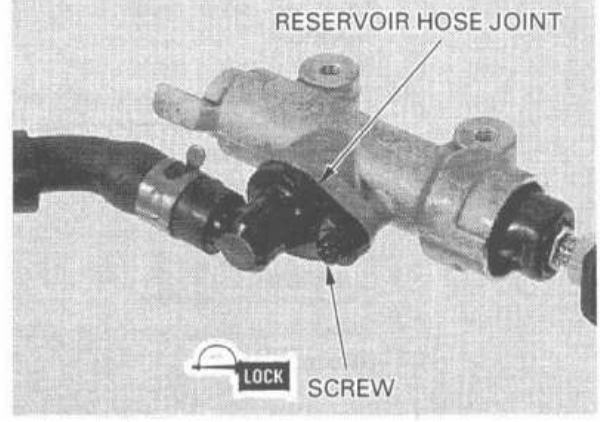


Apply brake fluid to a new O-ring and install it onto the reservoir joint.
Install the reservoir joint into the master cylinder.



Apply a locking agent to the reservoir joint screw threads.
Install and tighten the screw to the specified torque.

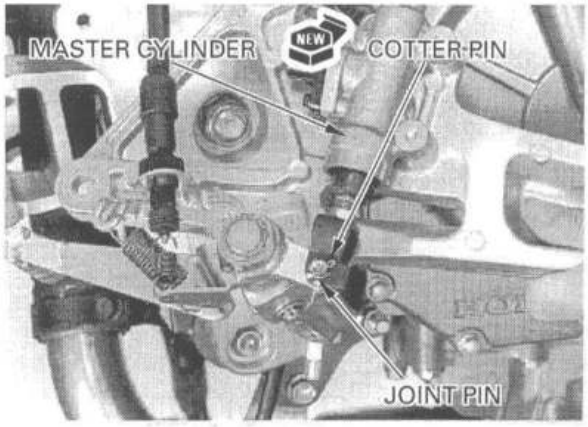
TORQUE: 1 N·m (0.15 kgf·m , 1.1 lbf·ft)



INSTALLATION

Place the master cylinder onto the right footpeg holder.

Connect the brake pedal to the push rod lower joint. Install the joint pin and secure it with a new cotter pin.

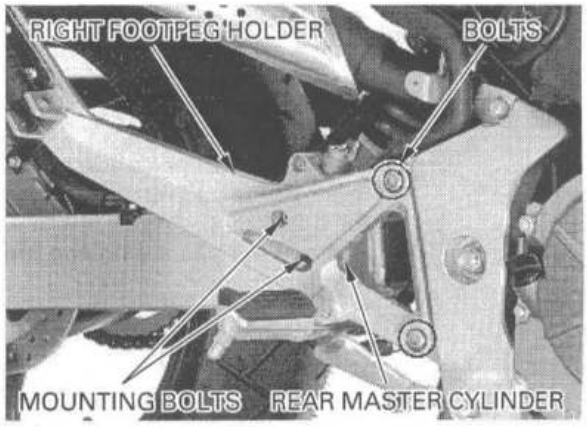


Install the right footpeg holder onto the frame and tighten the two mounting bolts to the specified torque.

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

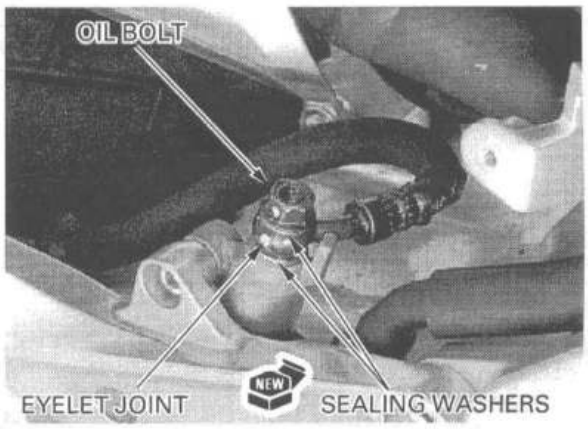
Install and tighten the rear master cylinder mounting bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)



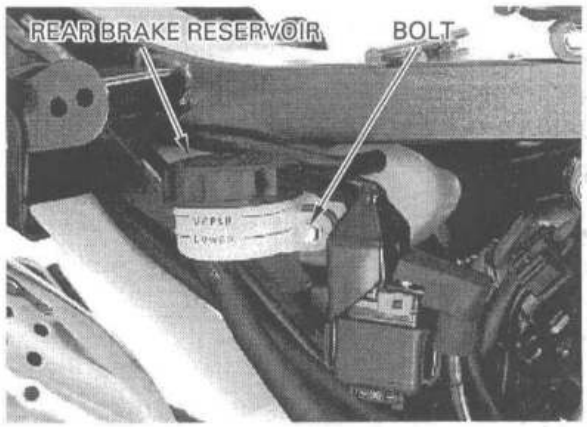
Install the brake hose eyelet joint with the oil bolt and new sealing washers.
Push the eyelet joint against the stopper, then tighten the oil bolt to the specified torque.

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



Install and tighten the brake reservoir mounting bolt.

Fill the reservoir to the upper level and bleed the brake system (page 15-3).

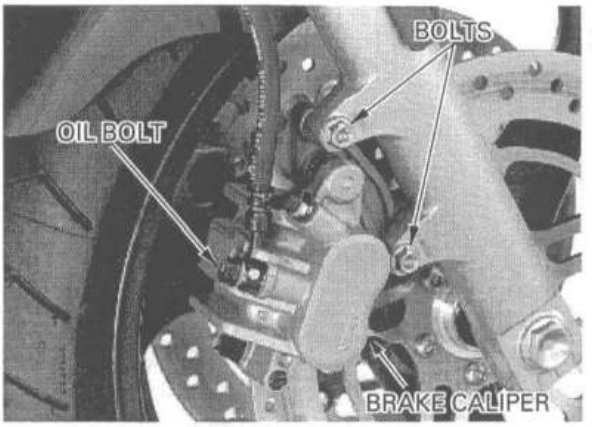


FRONT BRAKE CALIPER

REMOVAL

Drain the brake system (page 15-3).
Remove the brake pads (page 15-6).

Remove the oil bolt, sealing washers and brake hose eyelet joint.
Remove the caliper mounting bolts and front brake caliper.

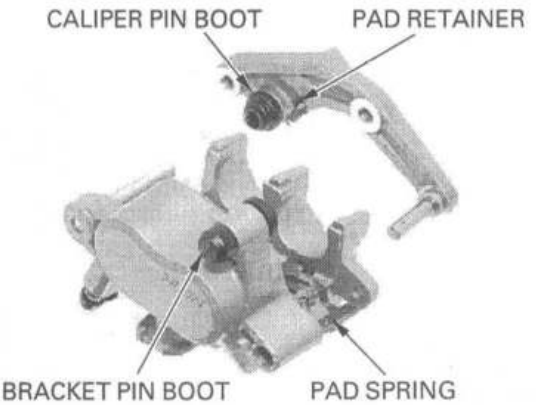


CAUTION:

Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.

DISASSEMBLY

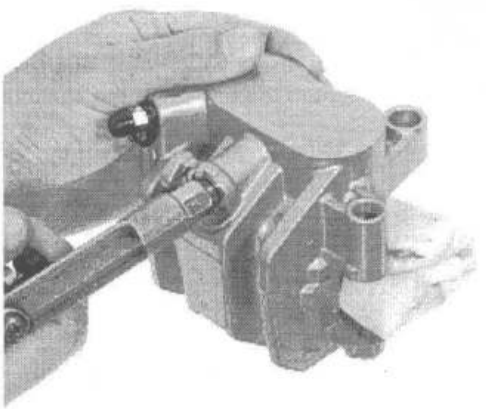
Remove the caliper bracket from the caliper body.
Remove the pad retainer and caliper pin boot from the bracket.
Remove the pad spring and bracket pin boot from the caliper body.



Place a shop towel over the piston.
Position the caliper body with the pistons down and apply small squirts of air pressure to the fluid inlet to remove the pistons.

⚠WARNING

Do not use high pressure air or bring the nozzle too close to the inlet.

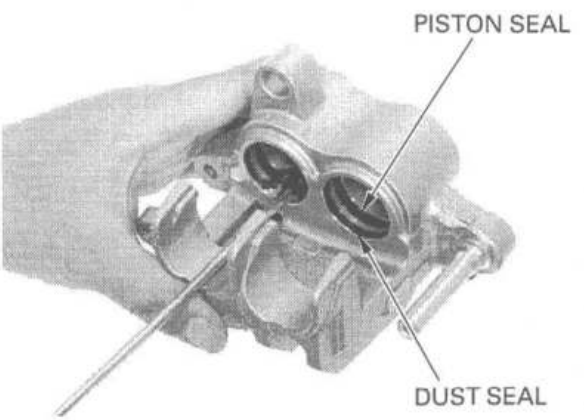


Push the dust and piston seals in and lift them out.

CAUTION:

Be careful not to damage the piston sliding surface.

Clean the seal grooves with clean brake fluid.

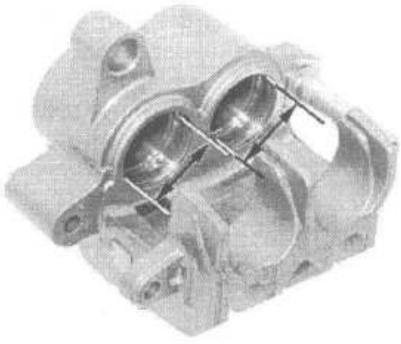


INSPECTION

Check the caliper cylinder for scoring or other damage.

Measure the caliper cylinder I. D.

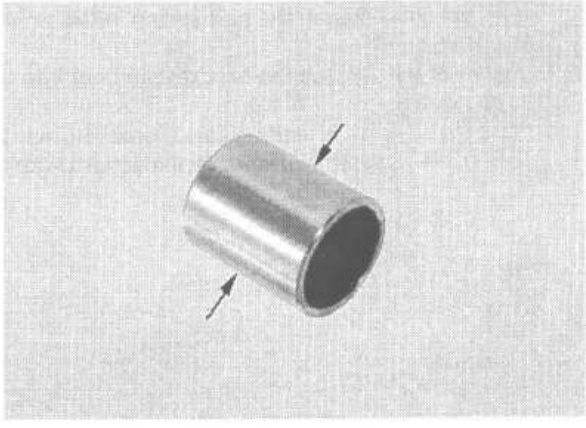
SERVICE LIMIT: 27.060 mm (1.0654 in)



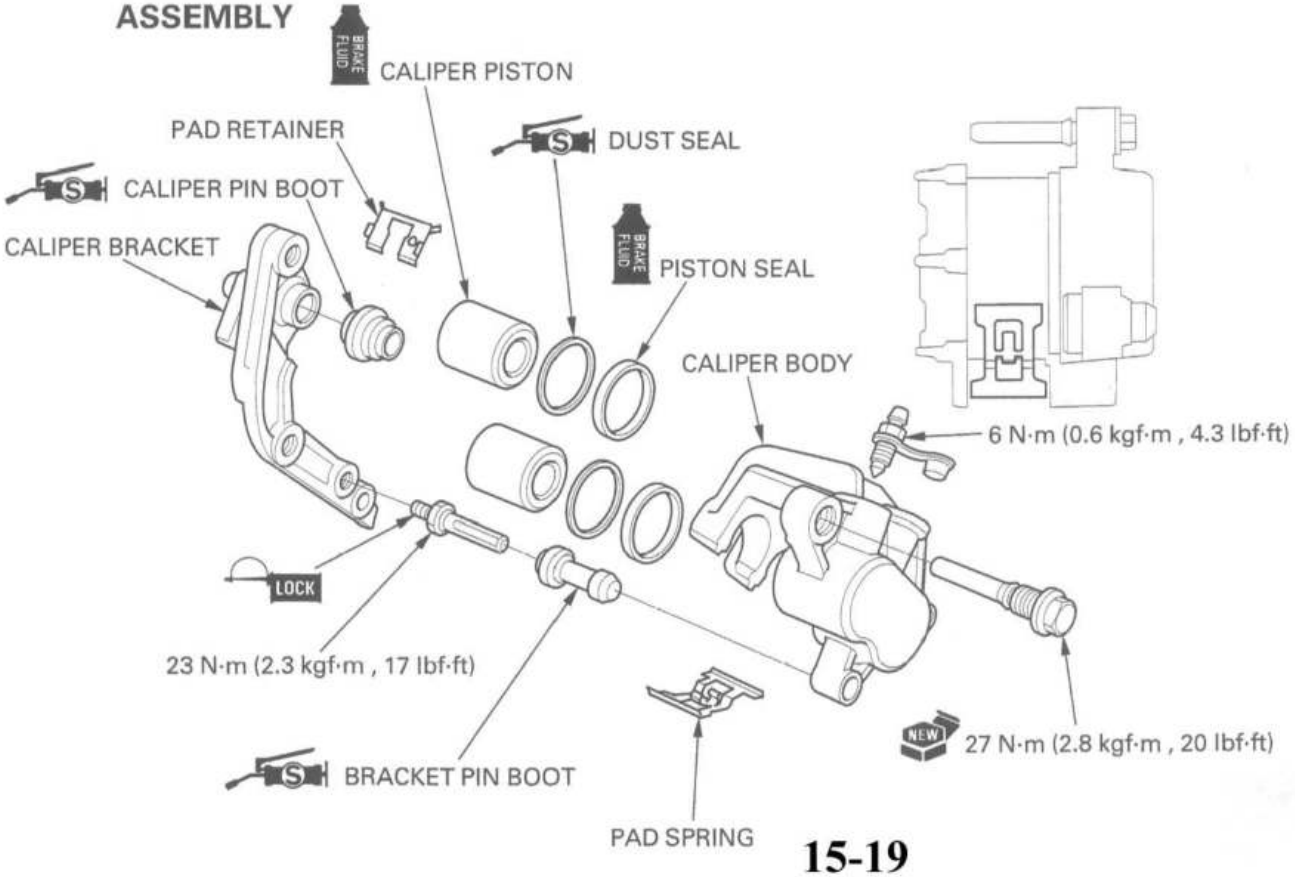
Check the caliper pistons for scratches, scoring or other damage.

Measure the caliper piston O. D.

SERVICE LIMIT: 26.910 mm (1.0594 in)

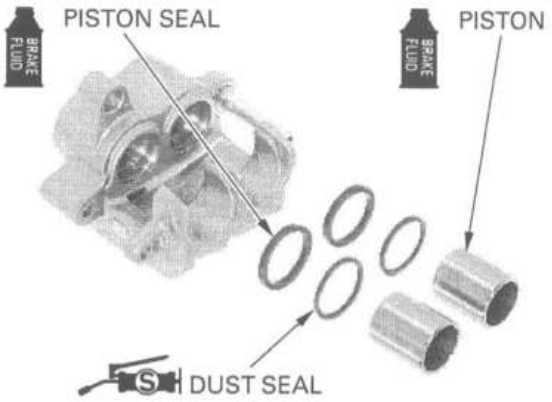


ASSEMBLY



Coat the new piston seals with clean brake fluid.
Coat the new dust seal with silicone grease.
Install the piston and dust seal into the groove of the caliper body.

Coat the caliper pistons with clean brake fluid and install them into the caliper cylinder with their opening ends toward the pad.

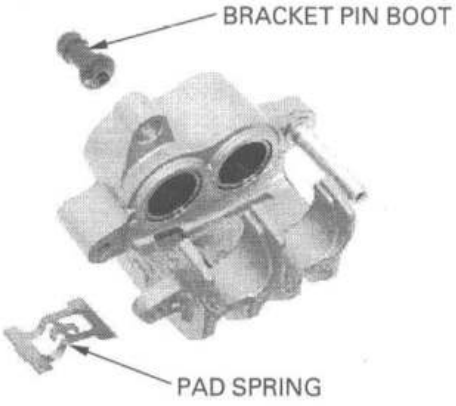


Note the installation direction of the pad spring.

Install the pad spring in the caliper body.

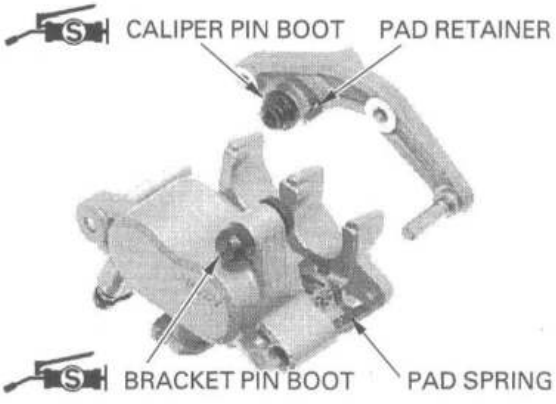
Install the bracket pin boot into the caliper body.

If a caliper and bracket pin boots are hard or deteriorated, replace them with new ones.



Install the brake pad retainer and caliper pin boot into the caliper bracket.

Apply silicone grease to the caliper and bracket pins and install the caliper bracket over the caliper body.



INSTALLATION

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

TORQUE: 30 N·m (3.1 kgf·m , 22 lbf·ft)

Install the brake hose eyelet joint to the caliper body with two new sealing washers and oil bolt.
Align the brake hose eyelet to the stopper on the caliper, then tighten the oil bolt to the specified torque.

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

Fill and bleed the brake hydraulic system (page 15-3).



REAR BRAKE CALIPER

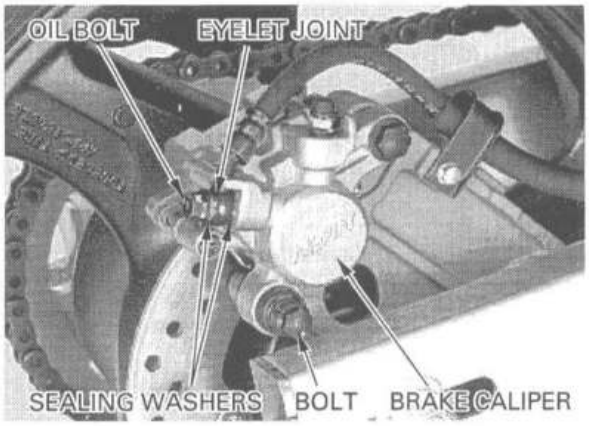
REMOVAL

Drain the rear brake hydraulic system (page 15-3).
Remove the rear brake pads (page 15-7).

Remove the oil bolt, sealing washers and brake hose eyelet joint.

CAUTION:

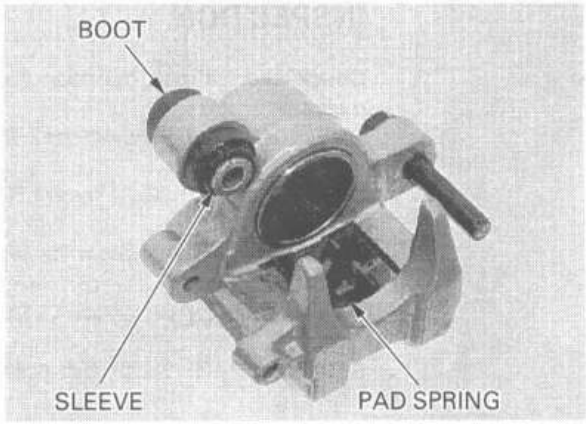
Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.



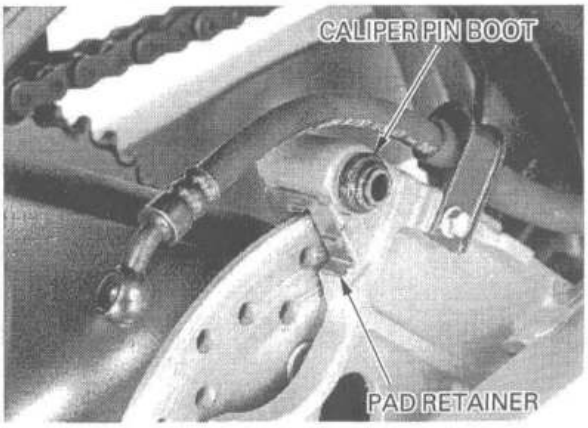
Remove the caliper mounting bolt.
Pivot the caliper up and remove it.

DISASSEMBLY

Remove the pad spring, sleeve and boot from the caliper body.



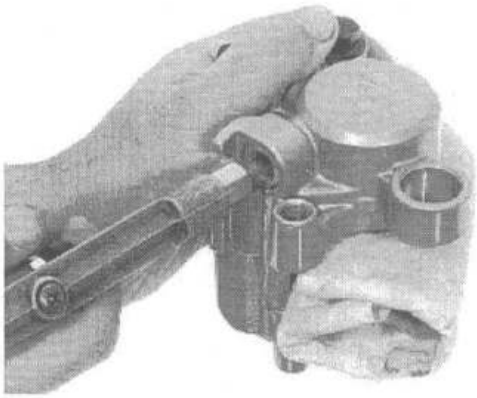
Remove the brake pad retainer and caliper pin boot from the caliper bracket.



Place a shop towel over the piston.
Position the caliper body with the piston down and apply small squirts of air pressure to the fluid inlet to remove the piston.

⚠WARNING

Do not use high pressure air or bring the nozzle too close to the inlet.

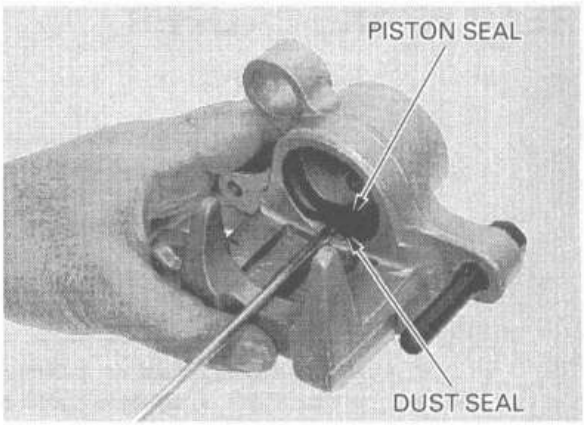


Push the dust seal and piston seal in and lift them out.

CAUTION:

Be careful not to damage the piston sliding surface.

Clean the seal grooves with clean brake fluid.



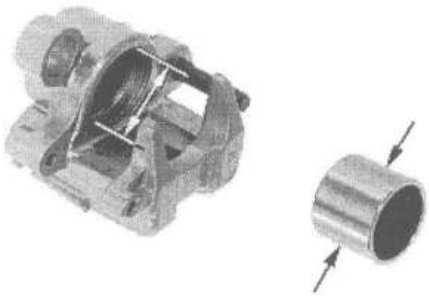
INSPECTION

Check the caliper cylinder for scoring or other damage.
Measure the caliper cylinder I. D.

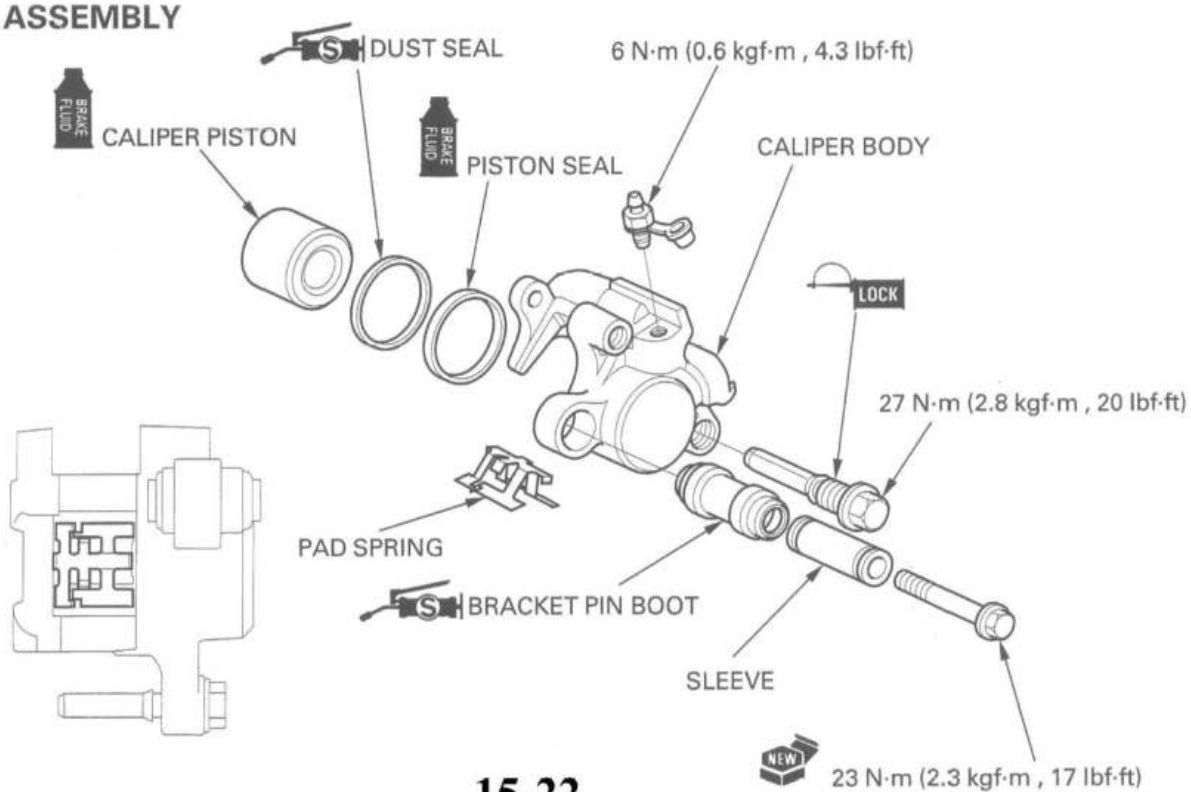
SERVICE LIMIT: 38.24 mm (1.506 in)

Check the caliper piston for scratches, scoring or other damage.
Measure the caliper piston O. D.

SERVICE LIMIT: 38.09 mm (1.500 in)



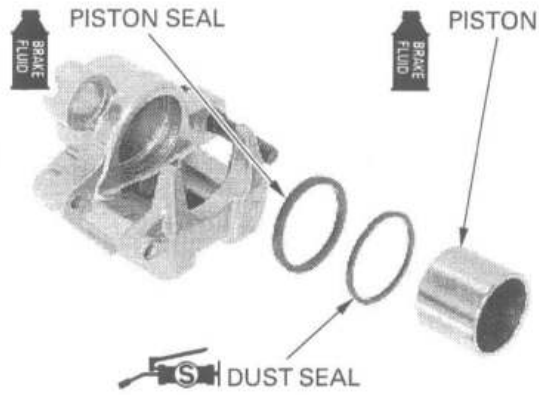
ASSEMBLY



Coat the new piston seal with clean brake fluid. Coat the new dust seal with silicone grease.

Install the piston seal and dust seal into the groove of the caliper body.

Coat the caliper piston with clean brake fluid and install it into the caliper cylinder with its opening end toward the pad.



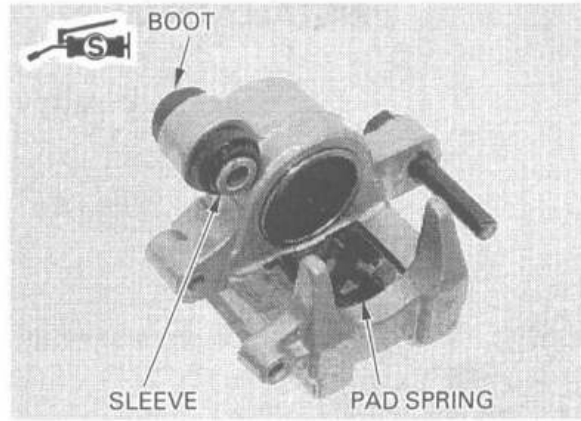
If the caliper and bracket pin boots are hard or deteriorated, replace them with new ones.

Install the pad retainer and caliper pin boot into the caliper bracket.



Install the pad spring into the caliper body.

Apply silicone grease to the inside of the bracket pin boot.
Install the bracket pin boot and sleeve into the caliper.



INSTALLATION

Apply silicone grease to the caliper pin and install the caliper onto the bracket.
Install and tighten the new rear brake caliper mounting bolt to the specified torque.

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

Install the brake hose eyelet to the caliper body with two new sealing washers and oil bolt.
Push the brake hose eyelet to the stopper on the caliper, then tighten the oil bolt to the specified torque.

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

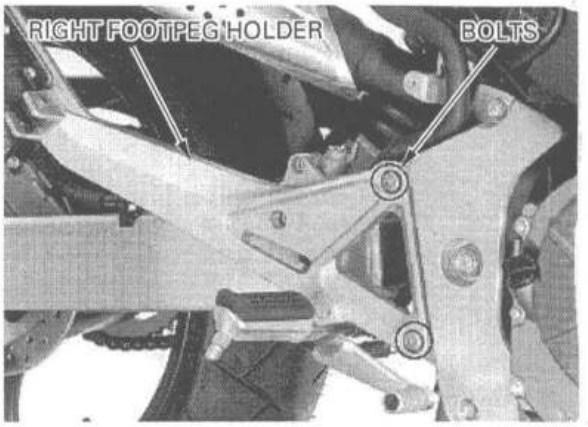
Install the brake pads (page 15-7).
Fill and bleed the rear brake hydraulic system (page 15-3).



BRAKE PEDAL

REMOVAL

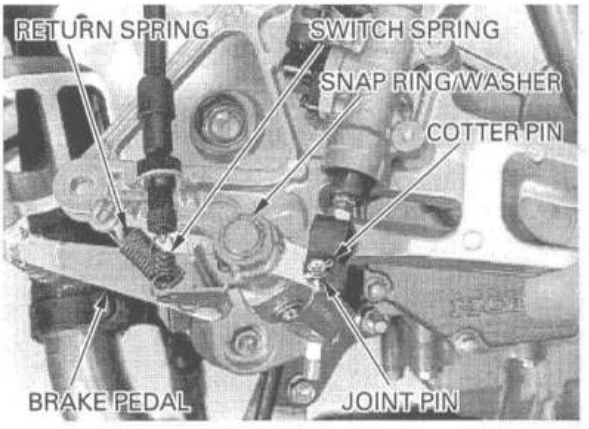
Remove the right footpeg holder mounting bolts.



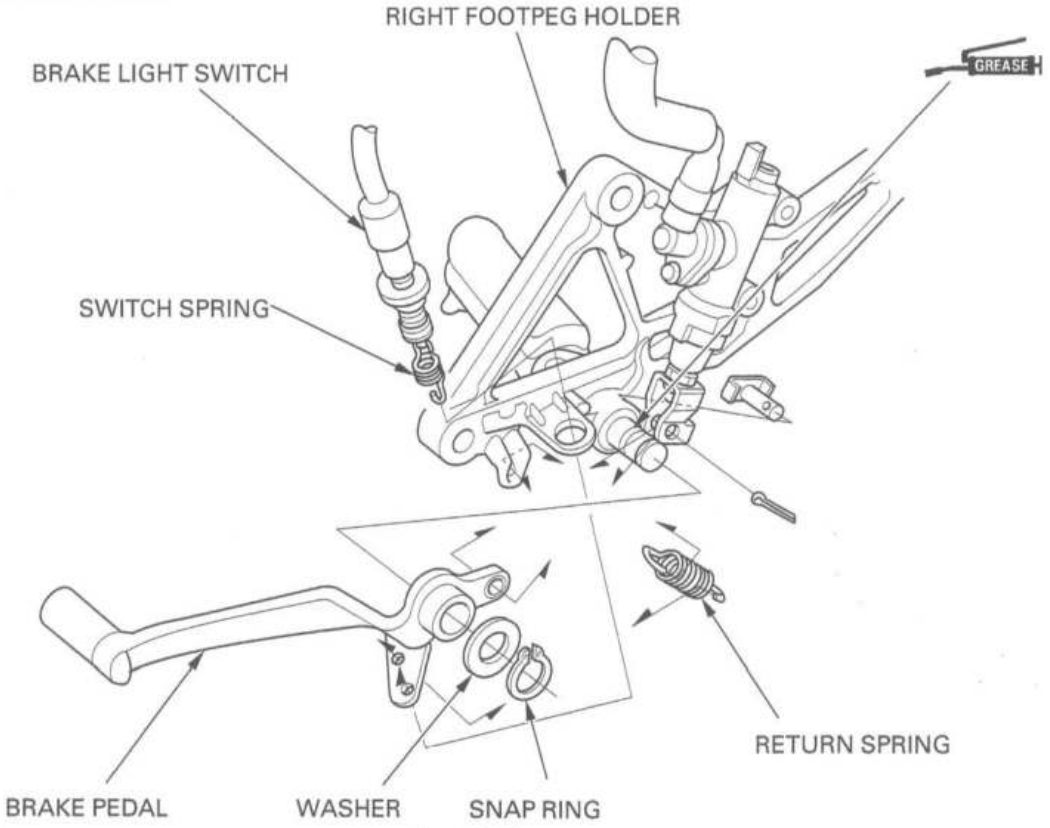
Remove and discard the brake pedal joint cotter pin.
Remove the joint pin.

Unhook the return spring and remove the brake light switch from the step holder.
Unhook the brake pedal return spring.

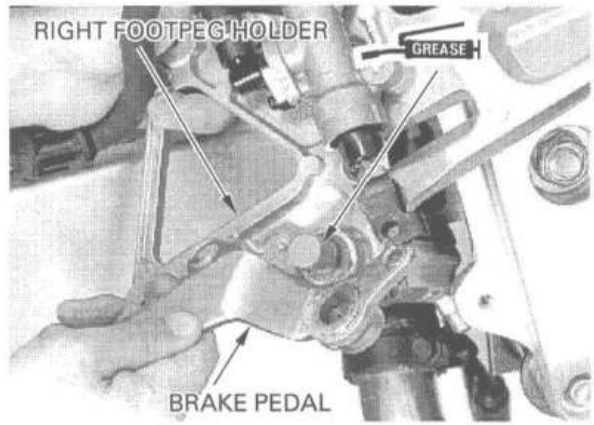
Remove the snap ring, washer and brake pedal.



INSTALLATION

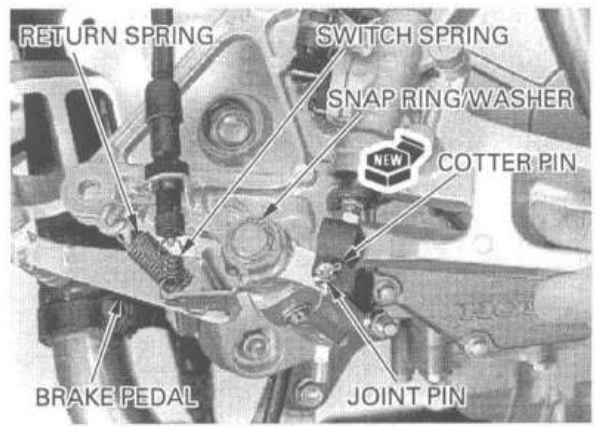


Apply grease to the sliding surface of the brake pedal and footpeg holder.
Install the brake pedal.



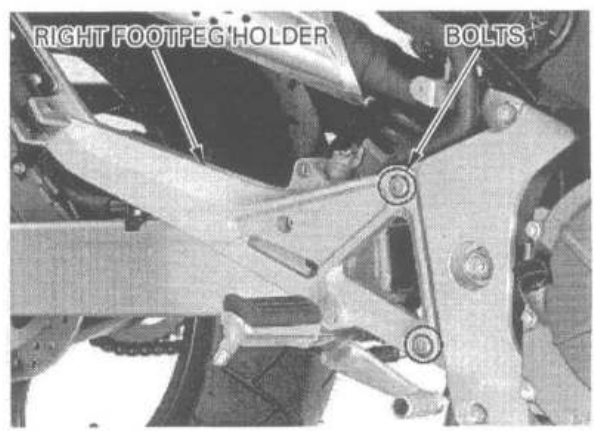
Install the washer, then install the snap ring into the groove securely.

Hook the brake pedal return spring.
Install the brake light switch and hook the switch spring.
Connect the brake pedal to the push rod lower joint.
Install the joint pin and secure it with a new cotter pin.

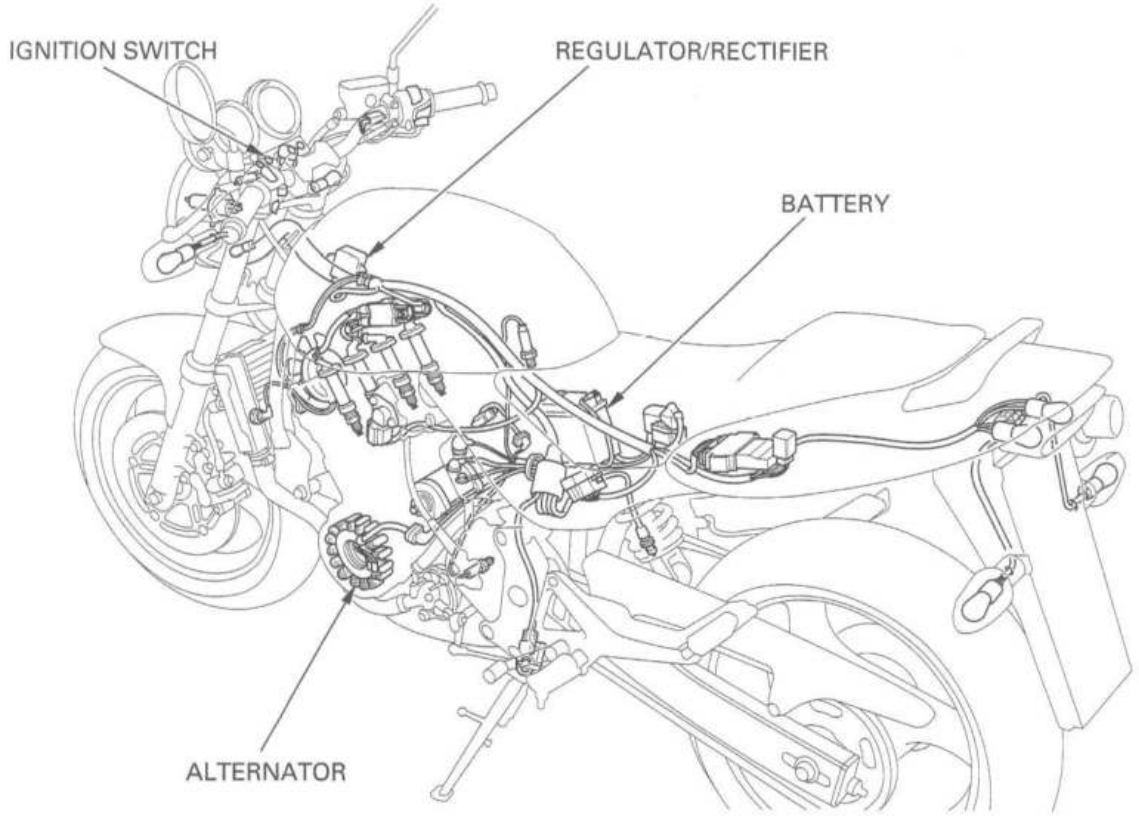


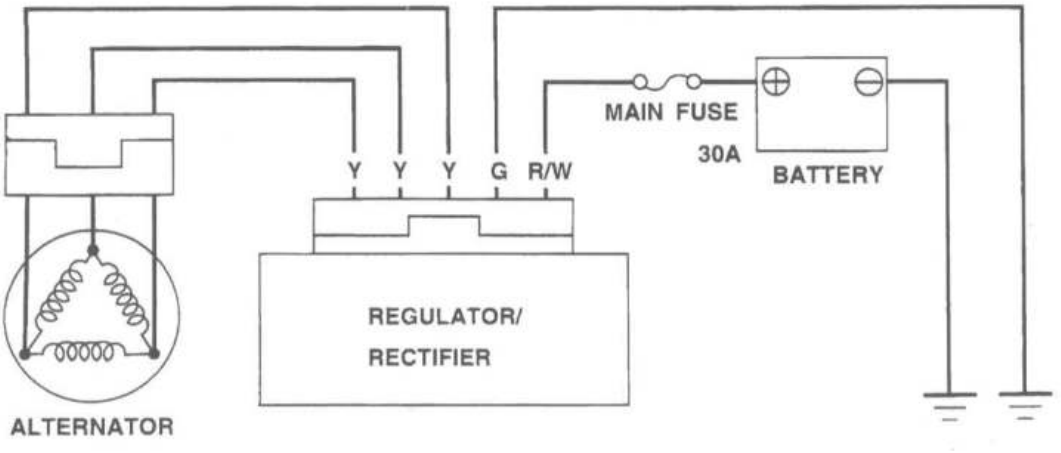
Install the right footpeg holder and tighten the mounting bolts to the specified torque.

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



SYSTEM DIAGRAM





Y ..... YELLOW
G ..... GREEN
R ..... RED
W ..... WHITE

16. BATTERY/CHARGING SYSTEM

SYSTEM DIAGRAM	16-0	CHARGING SYSTEM INSPECTION	16-6
SERVICE INFORMATION	16-1	ALTERNATOR INSPECTION	16-8
TROUBLESHOOTING	16-3	REGULATOR/RECTIFIER	16-8
BATTERY	16-5		

SERVICE INFORMATION

GENERAL

⚠WARNING

- ***The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.***
- ***The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.***
  - ***If electrolyte gets on your skin, flush with water.***
  - ***If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.***
- ***Electrolyte is poisonous.***
  - ***If swallowed, drink large quantities of water or milk and follow with milk of magnesia or vegetable oil and call a physician.***
- ***KEEP OUT OF REACH OF CHILDREN.***

- Always turn off the ignition switch before disconnecting any electrical component.

CAUTION:

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

- For extended storage, remove the battery, give it a full charge, and store it in a cool, dry space. For maximum service life, charge the stored battery every two weeks.
- For a battery remaining in a stored motorcycle, disconnect the negative battery cable from the battery terminal.

16

NOTE:

The maintenance free battery must be replaced when it reaches the end of its service life.

CAUTION:

The battery caps should not be removed. Attempting to remove the sealing caps from the cells may damage the battery.

- The battery can be damaged of overcharged or undercharged, or if left to discharge for long period. These same conditions contribute to shortening the "life span" of the battery. Even under normal use, the performance of the battery deteriorates after 2—3 years.
- Battery voltage may recover after battery charging, but under heavy load, battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected as the problem. Battery overcharge often results from problems in the battery itself, which may appear to be an overcharging symptom. If one of the battery cells is shorted and battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level goes down quickly.
- Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under heavy load, such as having the headlight and taillight ON for long periods of time without riding the motorcycle.

- The battery will self-discharge when the motorcycle is not in use. For this reason, charge the battery every two weeks to prevent sulfation from occurring.
- Filling a new battery with electrolyte will produce some voltage, but in order to achieve its maximum performance, always charge the battery. Also, the battery life is lengthened when it is initially charged.
- When checking the charging system, always follow the steps in the troubleshooting flow chart (page 16-3).

Battery charging

This model comes with a maintenance -free (MF) battery. Remember the following about MF batteries.

- Use only the electrolyte that comes with the battery
- Use all of the electrolyte
- Seal the battery properly
- Never open the seals again

CAUTION:

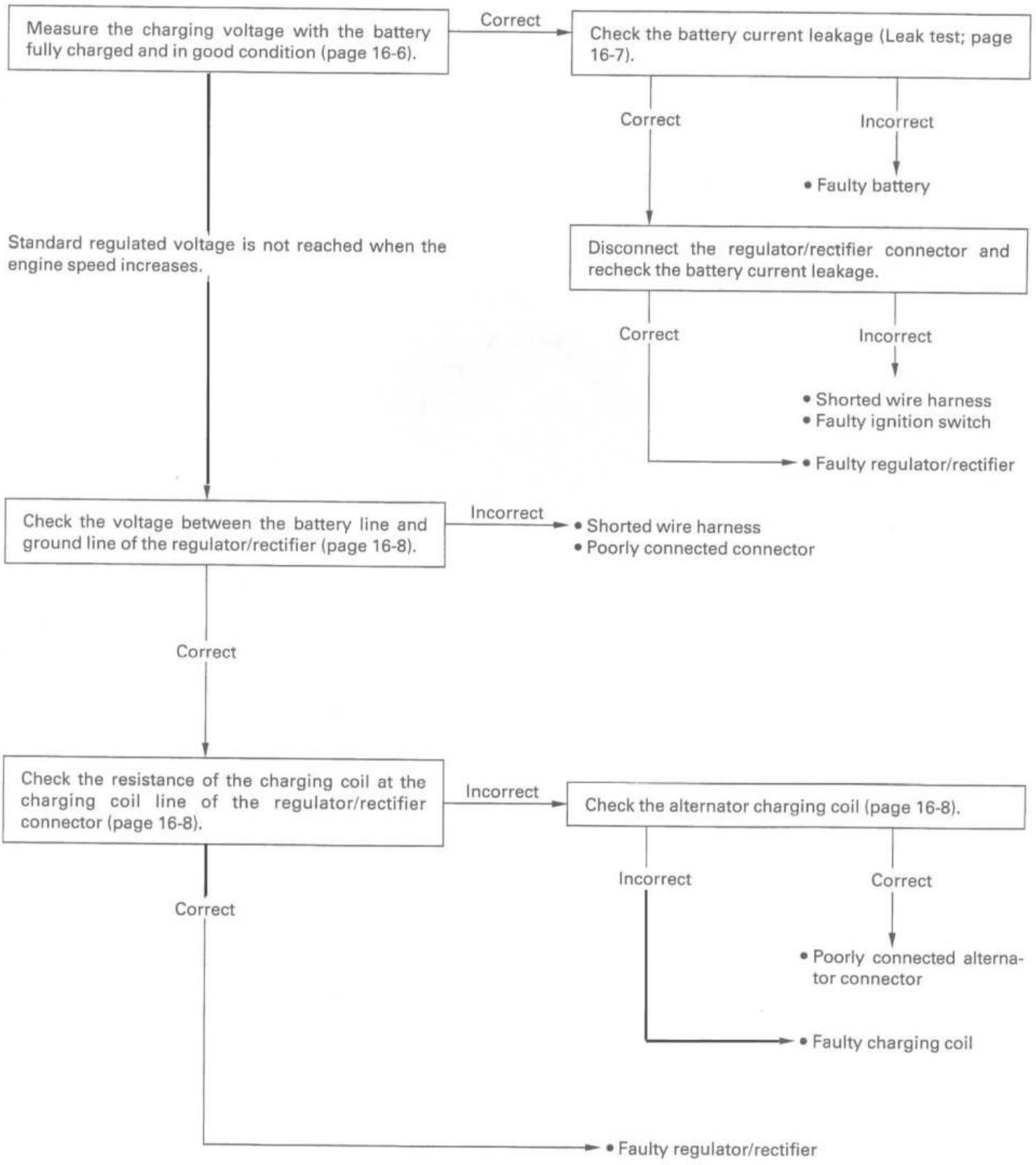
For battery charging, do not exceed the charging current and time specified on the battery. Use of excessive current or charging time may damage the battery.

SPECIFICATIONS

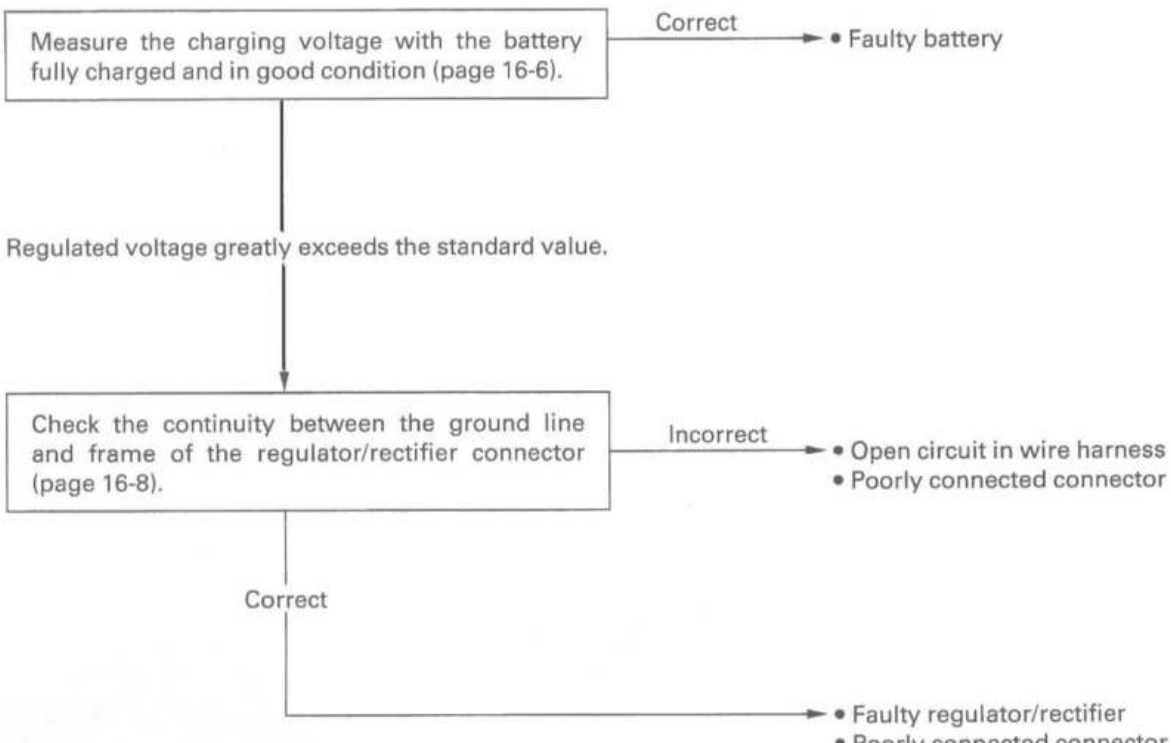
ITEM			SPECIFICATIONS
Battery	Capacity		12V−6Ah
	Current leakage		1.2 mA max.
	Voltage (20 °C/68 °F)	Fully charged	13.0−13.2V
		Needs charging	Below 12.3V
	Charging current	Normal	0.9 A/5−10 h
		Quick	4.0 A/1.0 h
Alternator	Capacity		0.34 kW/5,000 min^{-1} (rpm)
	Charging coil resistance (20 °C/68 °F)		0.1−1.0 Ω
Regulator/rectifier regulated voltage			13.0−15.5 V/5,000 min^{-1} (rpm)

TROUBLESHOOTING

1. Battery undercharging (Voltage not raised to regulated voltage).



2. Battery overcharging (regulated voltage too high).



BATTERY

REMOVAL/INSTALLATION

Always turn the ignition switch OFF before removing the battery.

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

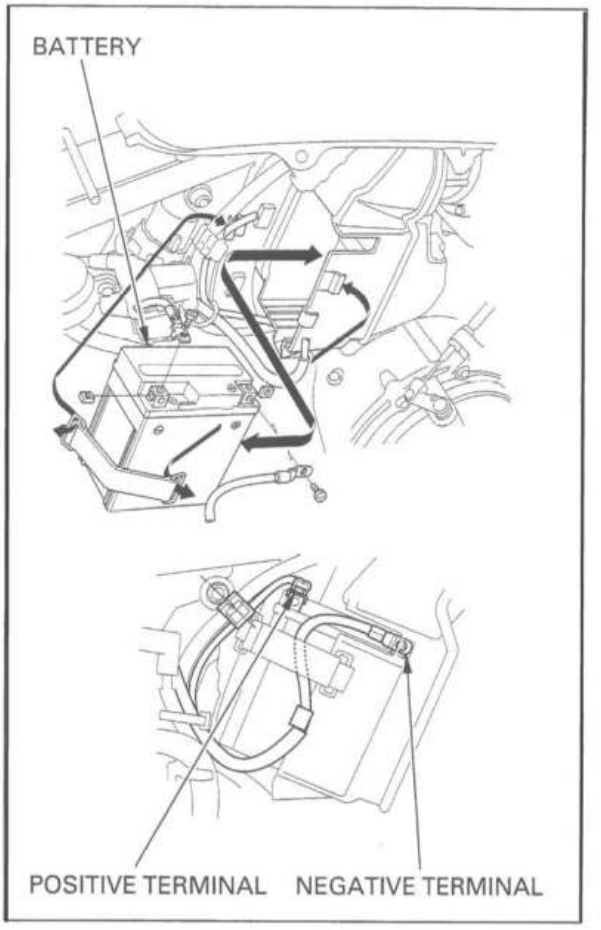
Remove the holder band and pull the battery out. Disconnect the negative cable and then the positive cable, and remove the battery.

Install the battery in the reverse order of removal with the proper wiring as shown.

NOTE:

Connect the positive terminal first and then the negative cable.

After installing the battery, coat the terminals with clean grease.
Reinstall the removed parts.



VOLTAGE INSPECTION

Measure the battery voltage using a digital multimeter.

VOLTAGE:
Fully charged: 13.0−13.2V
Under charged: Below 12.3V

TOOL:
Digital multimeter Commercially available

BATTERY CHARGING

⚠WARNING

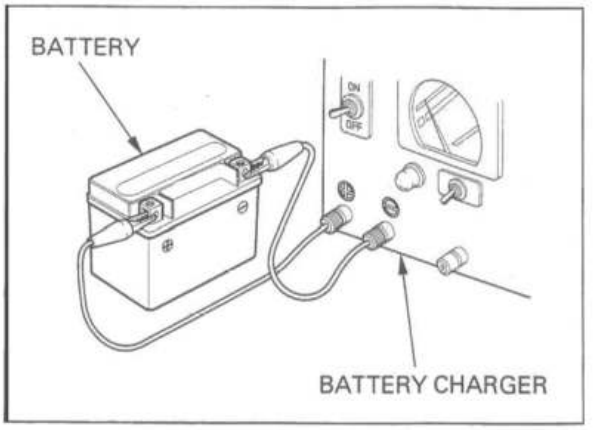
- ***The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.***
- ***Turn power ON/OFF at the charger, not at the battery terminal.***

Remove the battery (see above).

Connect the charger positive (+) cable to the battery positive (+) terminal.
Connect the charger negative (−) cable to the battery negative (−) terminal.

CAUTION:

- ***Quick-charging should only be bone in an emergency; slow charging is preferred.***
- ***For battery charging, do not exceed the charging current and time specified on the battery. Using excessive current or extending the charging time may damage the battery.***



CHARGING SYSTEM INSPECTION

NOTE:

- When inspecting the charging system, check the system components and lines step-by-step according to the troubleshooting on page 16-3.
- Measuring circuits with a large capacity that exceeds the capacity of the tester may cause damage to the tester. Before starting each test, set the tester at the highest capacity range first, then gradually lower the capacity ranges until you have the correct range.
- When measuring small capacity circuits, keep the ignition switch off. If the switch is suddenly turned on during a test, the tester fuse may blow.

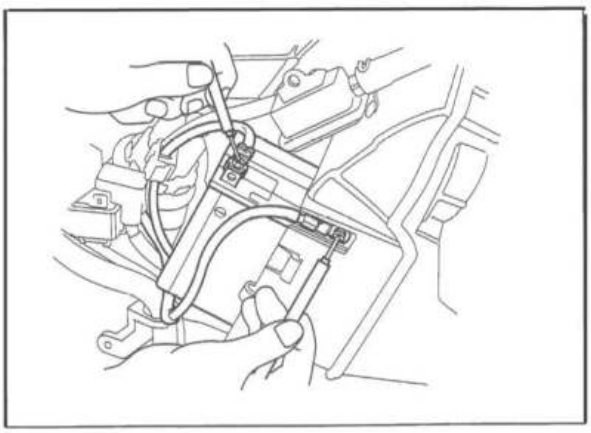
REGULATED VOLTAGE INSPECTION

⚠WARNING

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

Be sure the battery is in good condition before performing this test.

Warm up the engine to normal operating temperature.
Stop the engine, and connect the multimeter as shown.



CAUTION:

- ***To prevent a short, make absolutely certain which are the positive and negative terminals or cable.***
- ***Do not disconnect the battery or any cable in the charging system without first switching off the ignition switch. Failure to follow this precaution can damage the tester or electrical components.***

Restart the engine.
With the headlight on Hi beam, measure the voltage on the multimeter when the engine runs at 5,000 min^{-1} (rpm).

STANDARD: 13.0 – 15.5 V at 5,000 min^{-1} (rpm)

The battery is normal if the specified regulated voltage is displayed on the multimeter.

NOTE:

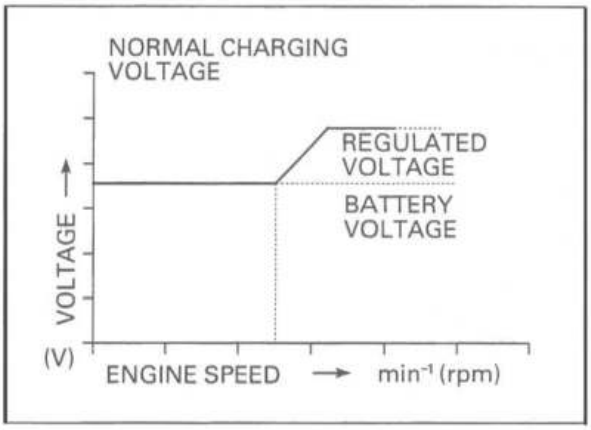
The speed at which the voltage starts to rise cannot be checked as it varies with the temperature and loads of the generator.

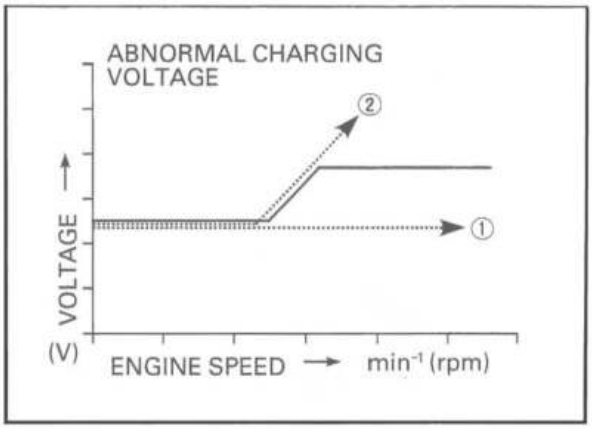
A frequently discharged battery is an indication that it is deteriorated even if it proves normal in the regulated voltage inspection.

The charging circuit may be abnormal if any of the following symptoms is encountered.

①Voltage not raised to regulated voltage (page 16-3):
- Open or short circuit in the charging system wire harness or poorly connected connector.
- Open or short of the alternator.
- Faulty regulator/rectifier.

②Regulated voltage too high (page 16-4):
- Poorly grounded voltage regulator/rectifier.
- Faulty battery.
- Faulty regulator/rectifier.





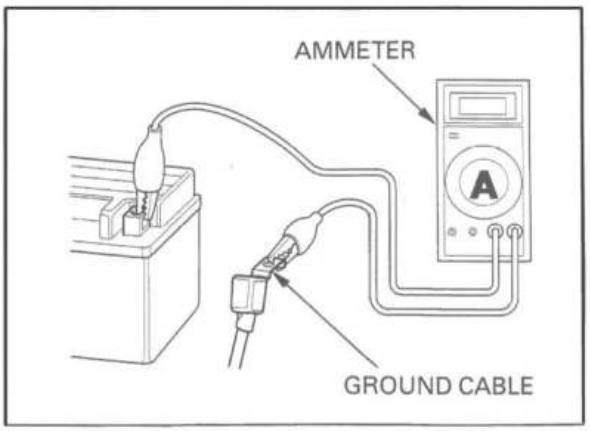
CURRENT LEAKAGE INSPECTION

Turn the ignition switch off and disconnect the negative battery cable from the battery.
Connect the ammeter (+) probe to the ground cable and the ammeter (−) probe to the battery (−) terminal.
With the ignition switch off, check for current leakage.

NOTE:

- When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher than the range selected may blow out the fuse in the tester.
- While measuring current, do not turn the ignition switch on. A sudden surge of current may blow out the fuse in the tester.

SPECIFIED CURRENT LEAKAGE: 1.2 mA max.



If current leakage exceeds the specified value, a shorted circuit is likely.
Locate the short by disconnecting connections one by one and measuring the current.

ALTERNATOR INSPECTION

It is not necessary to remove the stator coil to make this test.

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

Disconnect the alternator 3P (Natural) connector.

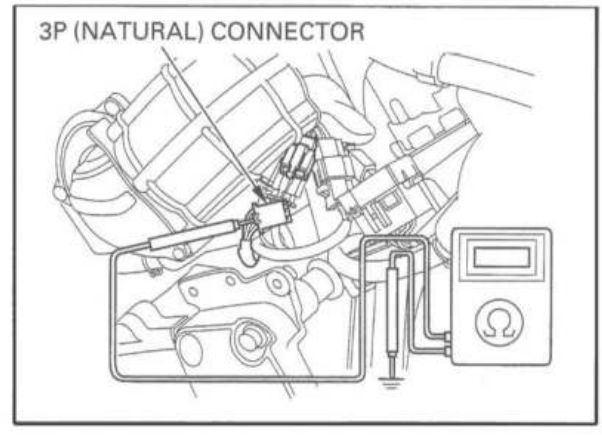


Check the resistance between all three Yellow terminals.

STANDARD: 0.1 – 1.0 Ω (at 20 °C/68 °F)

Check for continuity between all three Yellow terminals and Ground.
There should be no continuity.

If readings are still far beyond the standard, or if any wire has continuity to ground, replace the alternator stator.



REGULATOR/RECTIFIER

SYSTEM INSPECTION

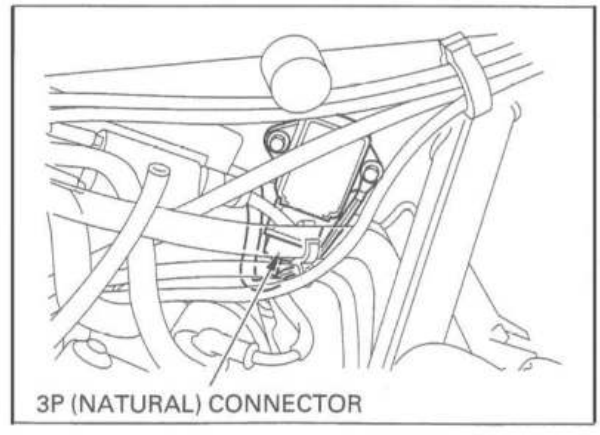
Remove the fuel tank (page 2-4).

Disconnect the regulator/rectifier 3P (Natural) connector, and check it for loose contact or corroded terminals.

If the regulated voltage reading (see page 16-6) is out of the specification, measure the voltage between connector terminals (wire harness side) as follows:

Item	Terminal	Specification
Battery charging line	Red/White (+) and ground (–)	Battery voltage should register
Charging coil line	Yellow and Yellow	0.1 – 1.0 Ω (at 20 °C/68 °F)
Ground line	Green and ground	Continuity should exist

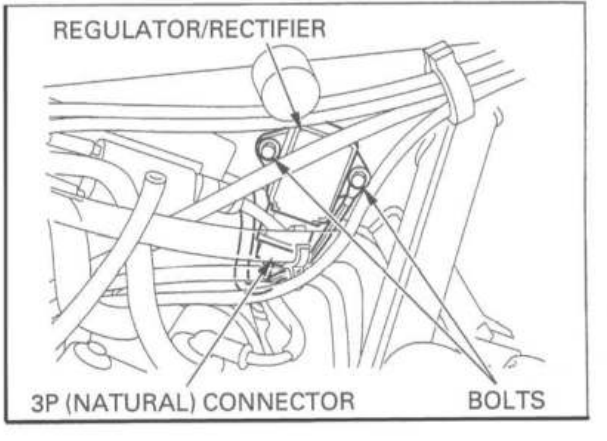
If all components of the charging system are normal and there are no loose connections at the regulator/rectifier connectors, replace the regulator /rectifier unit.



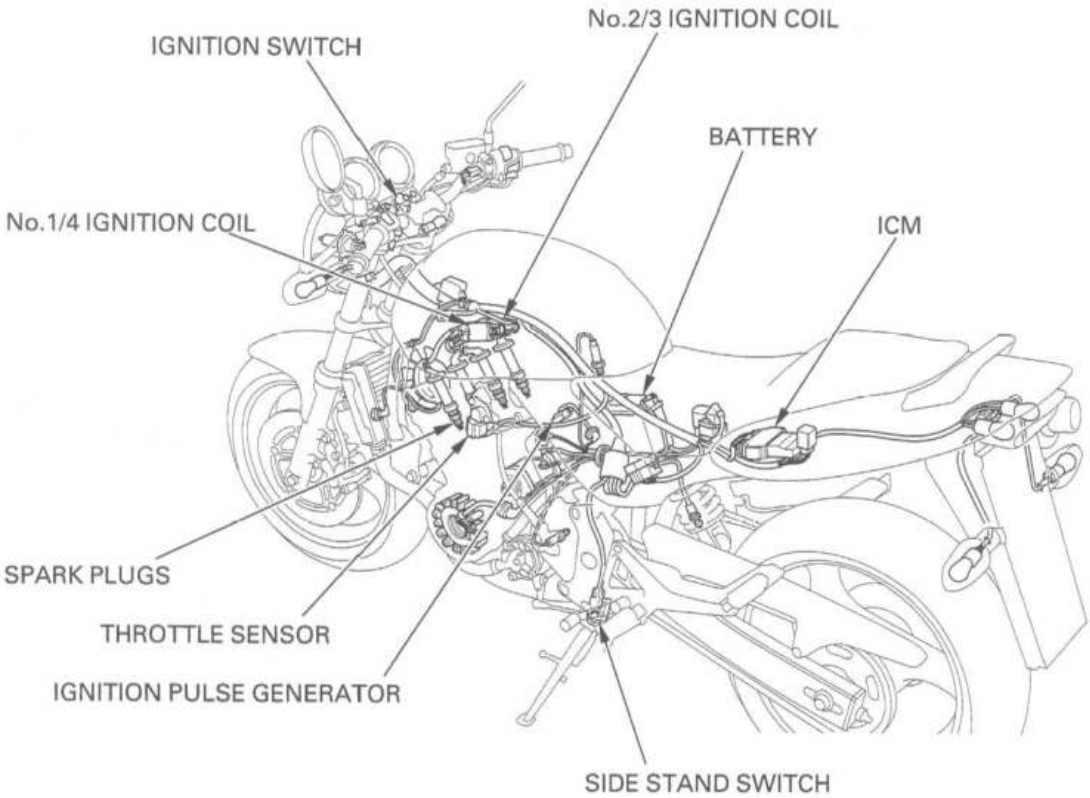
REMOVAL/INSTALLATION

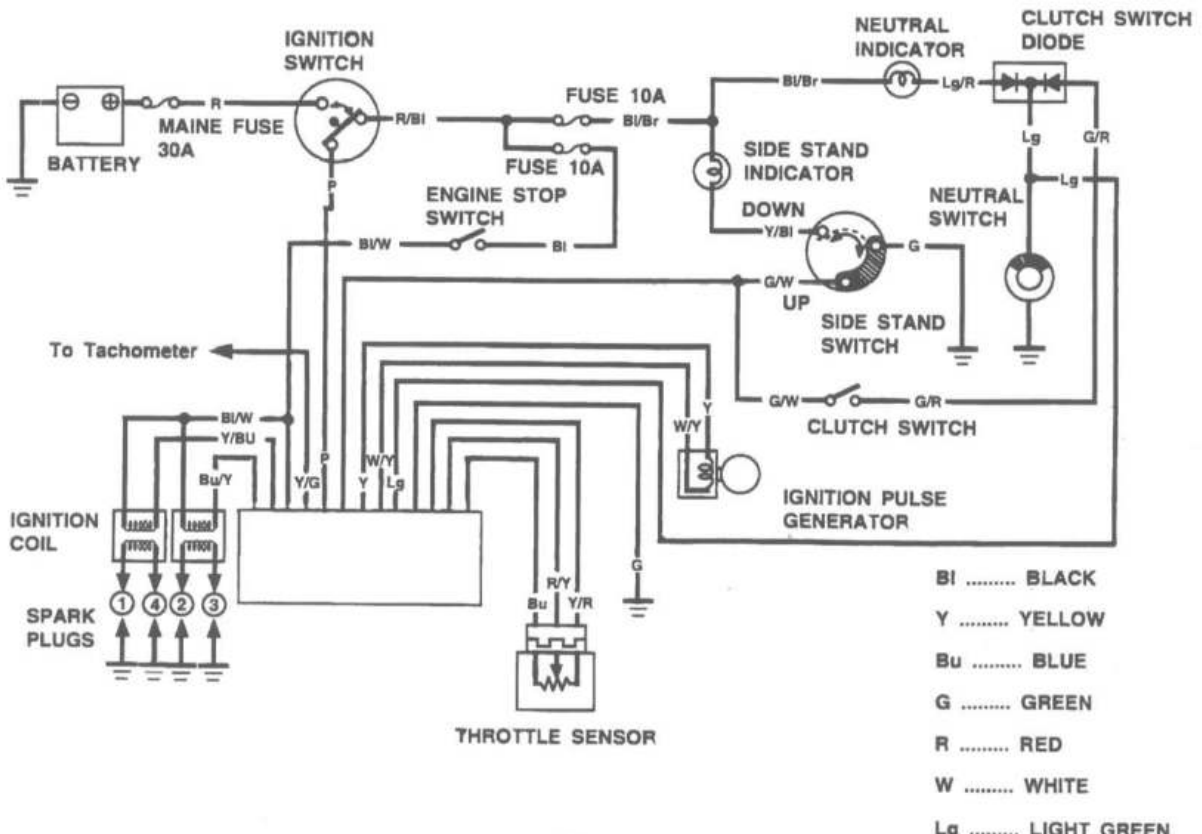
Disconnect the regulator/rectifier 3P (Natural) connector.
Remove the regulator/rectifier unit mounting bolts, ground eyelet and regulator/rectifier.

Install the regulator/rectifier unit in the reverse order of removal.



SYSTEM DIAGRAM





17. IGNITION SYSTEM

SYSTEM DIAGRAM	17-0	IGNITION PULSE GENERATOR	17-6
SERVICE INFORMATION	17-1	THROTTLE SENSOR	17-10
TROUBLESHOOTING	17-3	IGNITION CONTROL MODULE	17-11
IGNITION SYSTEM INSPECTION	17-4	IGNITION TIMING	17-12
IGNITION COIL	17-6		

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

CAUTION:

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

- When servicing the ignition system, always follow the steps in the troubleshooting sequence on page 17-3.
- The ignition timing does not normally need to be adjusted since the Ignition Control Module (ICM) is factory preset.
- The ICM may be damaged if dropped. Also if the connector is disconnected when current is flowing, the excessive voltage may damage the module. Always turn off the ignition switch before servicing.
- A faulty ignition system is often related to poor connections. Check those connections before proceeding. Make sure the battery is adequately charged. Using the starter motor with a weak battery results in a slower engine cranking speed as well as no spark at the spark plug.
- Use spark plug of the correct heat range. Using spark plug with an incorrect heat range can damage the engine.

SPECIFICATIONS

ITEM	SPECIFICATIONS
Spark plug	CR9EH−9 (NGK)
	U27FER9 (DENSO)
Spark plug gap	0.8−0.9 mm (0.03−0.04 in)
Ignition coil peak voltage	100 V minimum
Ignition pulse generator peak voltage	0.7 V minimum
Ignition timing ("F" mark)	7° BTDC at idle

TORQUE VALUES

Spark plug	12 N·m (1.2 kgf·m , 9 lbf·ft)	
Timing hole cap	18 N·m (1.8 kgf·m , 13 lbf·ft)	Apply grease to the threads
Ignition pulse generator rotor bolt	59 N·m (6.0 kgf·m , 43 lbf·ft)	Apply oil to the threads

TOOLS

Imrie diagnostic tester (model 625) or Peak voltage adaptor	07HGJ-0020100 with Commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

TROUBLESHOOTING

- Inspect the following before diagnosing the system.
  - —Faulty spark plug
  - —Loose spark plug cap or spark plug wire connection
  - —Water got into the spark plug cap (leaking the ignition coil secondary voltage)
- If there is no spark at either cylinder, temporarily exchange the ignition coil with the other good one and perform the spark test. If there is spark, the exchanged ignition coil is faulty.
- "Initial voltage" of the ignition primary coil is the battery voltage with the ignition switch ON and engine stop switch at RUN (The engine is not cranked by the starter motor).

No spark at all plugs

Unusual condition		Probable cause (Check in numerical order)
Ignition coil primary voltage	No initial voltage with ignition and engine stop switches ON. (Other electrical components are normal)	1. Faulty engine stop switch. 2. An open circuit in Black/White wire between the ignition coil and engine stop switch. 3. Loose primary terminal or an open circuit in primary coil. 4. Faulty ICM (in case when the initial voltage is normal while disconnecting ICM connector.
	Initial voltage is normal, but it drops down to 2—4 V while cranking the engine.	1. Incorrect peak voltage adaptor connections. 2. Undercharged battery. 3. No voltage between the Black/White (+) and Body ground (—) at the ICM multi-connector or loosen ICM connection. 4. An open circuit or loose connection in Green wire. 5. An open circuit or loose connection in Yellow/Blue and Blue/Yellow wires between the ignition coils and ICM. 6. Short circuit in ignition primary coil. 7. Faulty side stand switch or neutral switch. 8. An open circuit or loose connection in No. 7 related circuit wires. · Side stand switch line: Green/White wire · Neutral switch line: Light Green and Light Green/Red wire 9. Faulty ignition pulse generator (measure the peak voltage). 10. Faulty ICM (in case when above No. 1—9 are normal).
	Initial voltage is normal, but no peak voltage while cranking the engine.	1. Faulty peak voltage adaptor connections. 2. Faulty peak voltage adaptor. 3. Faulty ICM (in case when above No. 1, 2 are normal).
	Initial voltage is normal, but peak voltage is lower than standard value.	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too low (battery under-charged). 3. The sampling timing of the tester and measured pulse were not synchronised (system is normal if measured voltage is over the standard voltage at least once). 4. Faulty ICM (in case when above No. 1—3 are normal).
	Initial and peak voltage are normal, but does not spark.	1. Faulty spark plug or leaking ignition coil secondary current ampere. 2. Faulty ignition coil.
Ignition pulse generator	Peak voltage is lower than standard value.	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too low (battery under charged). 3. The sampling timing of the tester and measured pulse were not synchronised (system is normal if measured voltage is over the standard voltage at least once). 4. Faulty ICM (in case when above No. 1—3 are normal).
	No peak voltage.	1. Faulty peak voltage adaptor. 2. Faulty ignition pulse generator.
Ignition switch	There is a continuity between Black and Pink terminals in either of the directions.	1. Faulty ignition switch. 2. Specified tester is not used.
	There is no continuity between Black and Pink terminals in either of the directions.	1. Blown fuse (B) 10 A. 2. Faulty engine stop switch. 3. Faulty ignition switch. 4. Specified tester is not used.

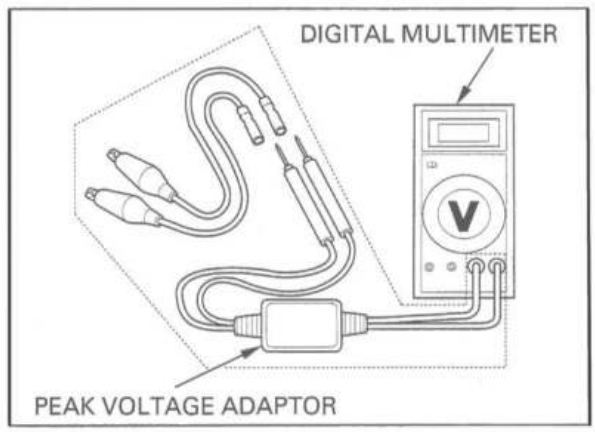
IGNITION SYSTEM INSPECTION

NOTE:

- If there is no spark at any plug, check all connections for loose or poor contact before measuring each peak voltage.
- Use recommended digital multimeter or commercially available digital multimeter with an impedance of 10 MΩ/DCV minimum.
- The display value differs depending upon the internal impedance of the multimeter.
- If using Imrie diagnostic tester (model 625), follow the manufacturer's instructions.

Connect the peak voltage adaptor to the digital multimeter, or use the Imrie diagnostic tester.

TOOLS:
Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100
with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)



IGNITION COIL PRIMARY PEAK VOLTAGE

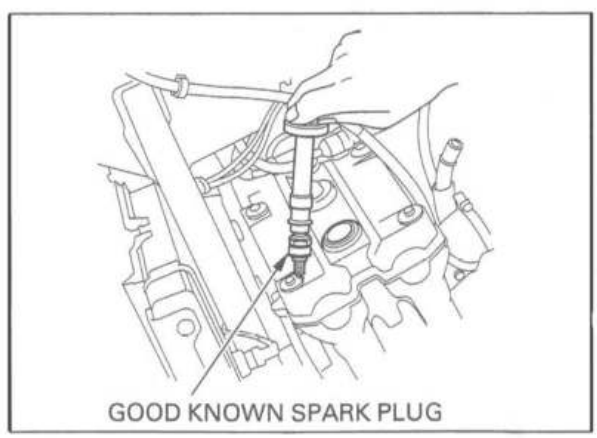
⚠WARNING

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

NOTE:

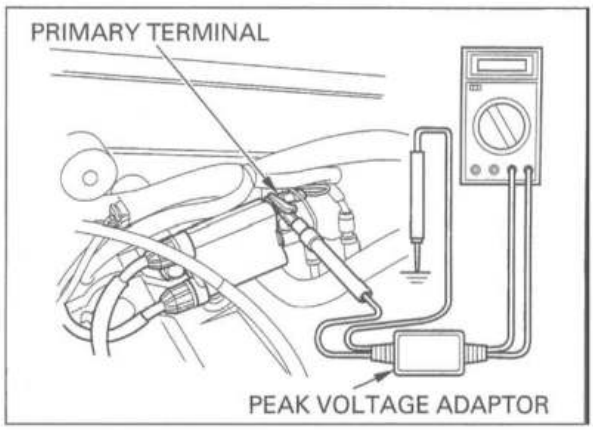
- Check all system connections before inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check cylinder compression and check that the spark plugs are installed correctly.

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



Do not disconnect the ignition coil primary wires.

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



CONNECTION:
No. 1/4 coil: Black/White terminal (+) —Bodyground (—)
No. 2/3 coil: Blue/Yellow terminal (+) —Bodyground (—)

Turn the ignition switch "ON" and engine stop switch to "RUN".
Check for initial voltage at this time.
The battery voltage should be measured.
If the initial voltage cannot be measured, check the power supply circuit (refer to the troubleshooting, page 17-3).

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

PEAK VOLTAGE: 100 V minimum

If the peak voltage is abnormal, check for an open circuit or poor connection in Yellow/Blue and Black/White wires.
If not defects are found in the harness, refer to the troubleshooting chart on page 17-3.

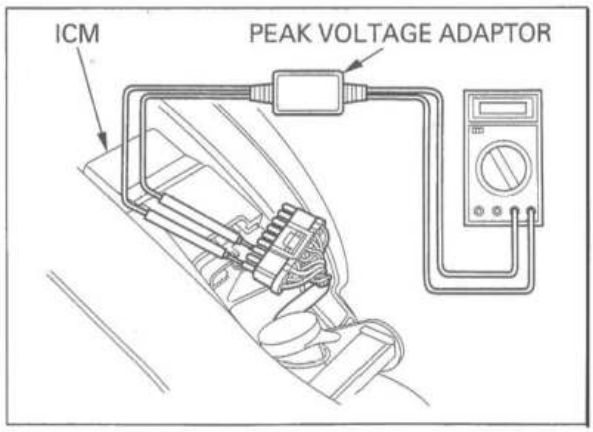
IGNITION PULSE GENERATOR PEAK VOLTAGE

NOTE:

Check cylinder compression and check that the spark plugs are installed correctly.

Remove the seat (page 2-2).

Disconnect the multi-connector from the ICM.
Connect the peak voltage adaptor or Imrie tester probes to the connector terminals of the wire harness side.



TOOLS:
Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100
with commercially available digital multimeter (impedance 10 MΩ /DCV minimum)

CONNECTION:
Yellow (+) —White/Yellow (—)

Crank the engine with the starter motor and read the peak voltage.

PEAK VOLTAGE: 0.7 V minimum

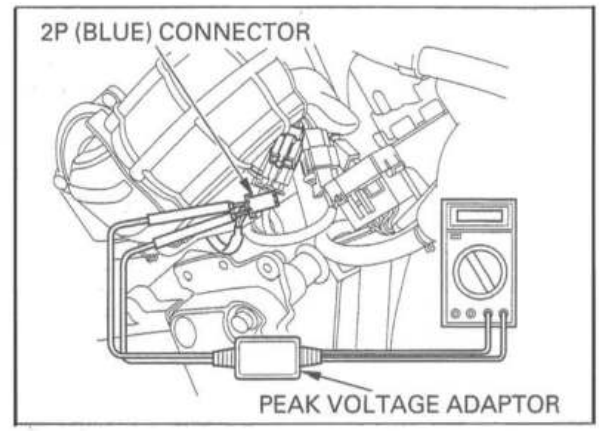
⚠WARNING

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

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

Remove the left side cover (page 2-2).
Disconnect the ignition pulse generator 2P (Blue) connector and connect the tester probes to the terminal (Yellow and White/Yellow).
In the same manner as at the ICM connector, measure the peak voltage and compare it to the voltage measured at the ICM connector.

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

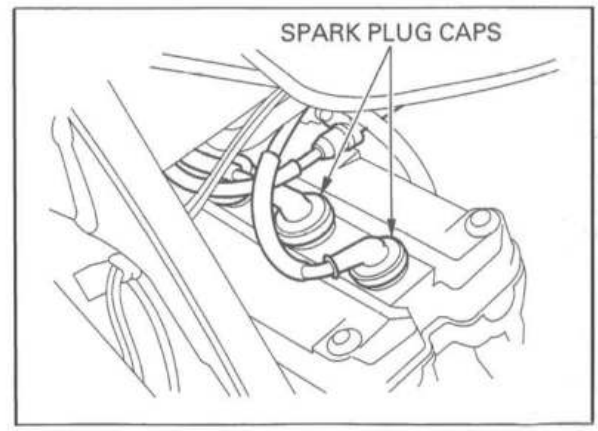


IGNITION COIL

REMOVAL/INSTALLATION

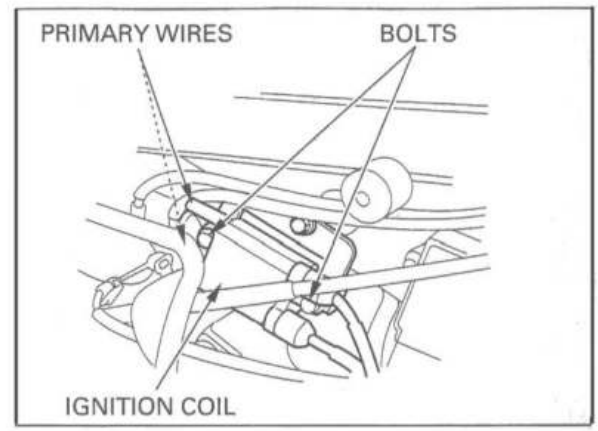
Remove the fuel tank (page 2-4).

Disconnect the spark plug caps from the plugs.



Disconnect the primary wires from the ignition coils.
Remove the bolts and ignition coil.

Installation is in the reverse order of removal.

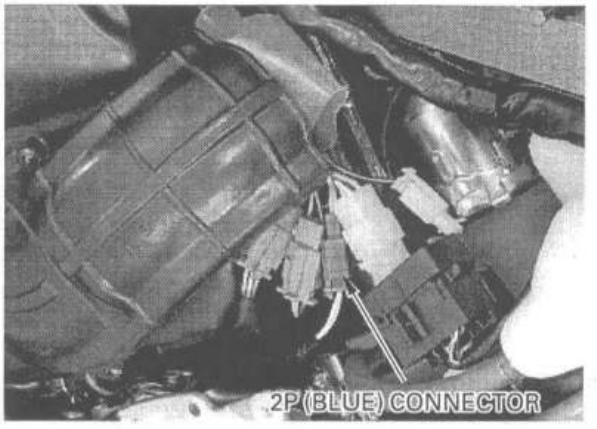


IGNITION PULSE GENERATOR ROTOR

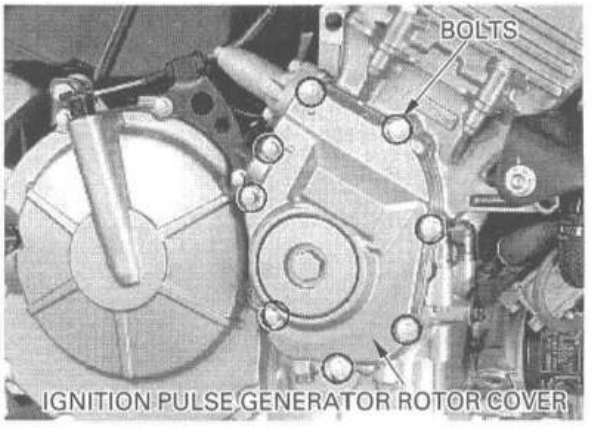
REMOVAL

Remove the air cleaner housing (page 5-4).

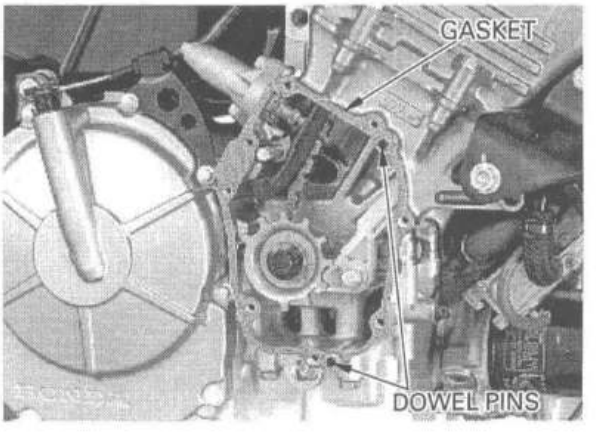
Remove the ignition pulse generator 2P (Blue) connector.
Release the wire from the wire clamp.



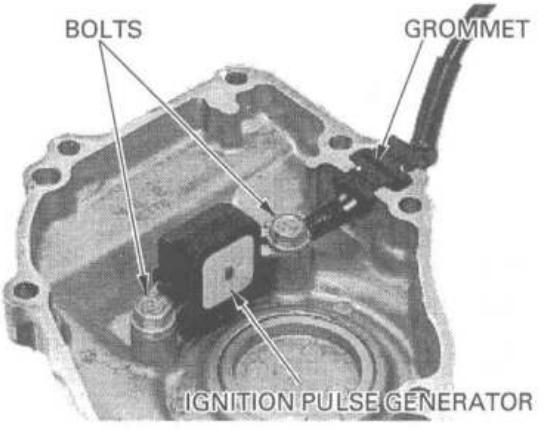
Remove the SH bolts and ignition pulse generator rotor cover.



Remove the gasket and dowel pins.



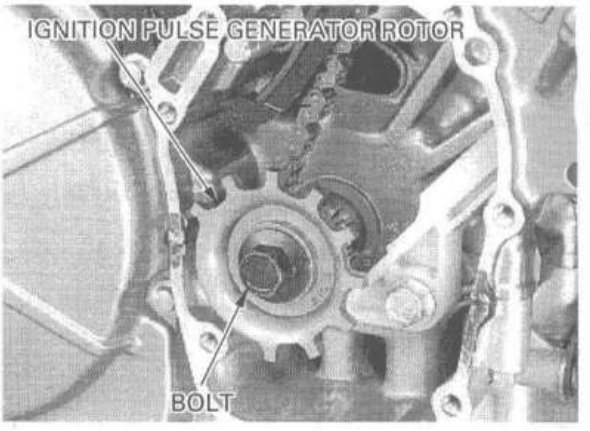
Remove the wire grommet from the cover.
Remove the bolts and ignition pulse generator.



Shift the transmission into 6th gear and apply rear brake.
Remove the ignition pulse generator rotor bolt.

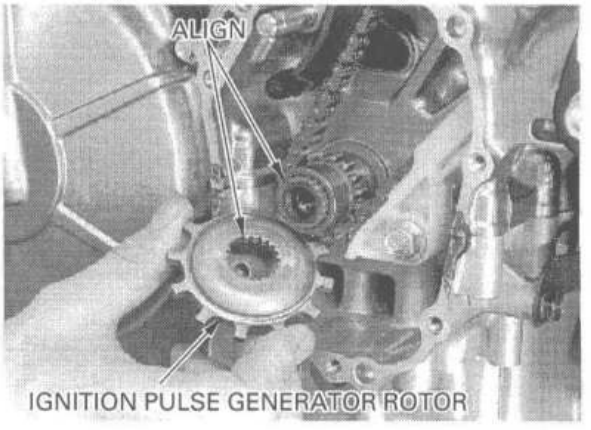
NOTE:

If the engine is out of the frame, remove the alternator cover (page 10-2) and hold the flywheel with the flywheel holder (07725-0040000), then remove the bolt.

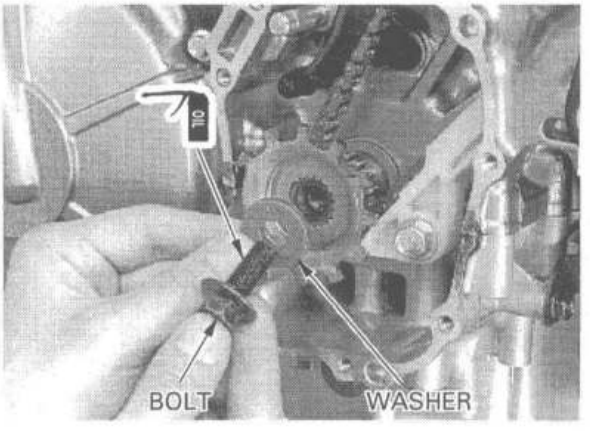


INSTALLATION

Install the ignition pulse generator rotor by aligning the wide groove with the wide teeth of the crankshaft.



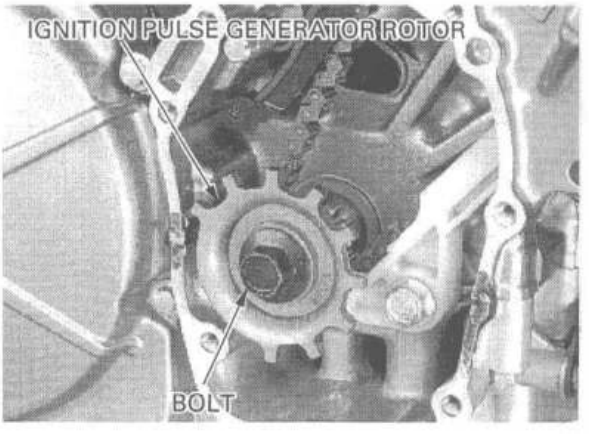
Apply oil to the ignition pulse generator rotor bolt threads, then install the washer and rotor bolt.



Shift the transmission into 6th gear and apply rear brake.
Tighten the ignition pulse generator rotor bolt to the specified torque.

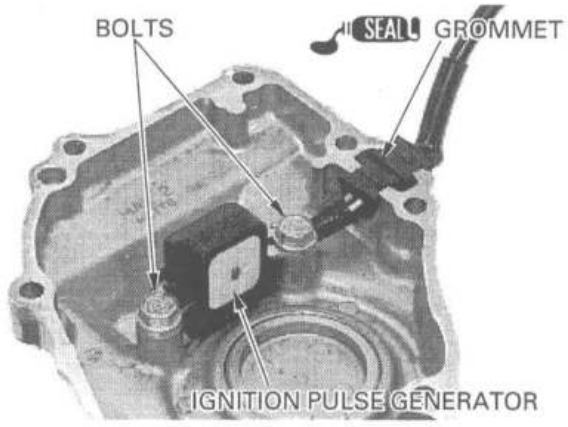
NOTE:

If the engine is out of frame, remove the alternator cover (page 10-2) and hold the flywheel with the flywheel holder (07725-0040000), then tighten the bolt.

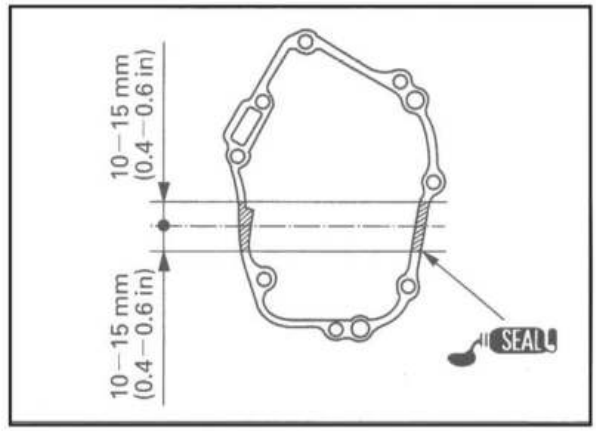


TORQUE: 59 N·m (6.0 kgf·m , 43 lbf·ft)

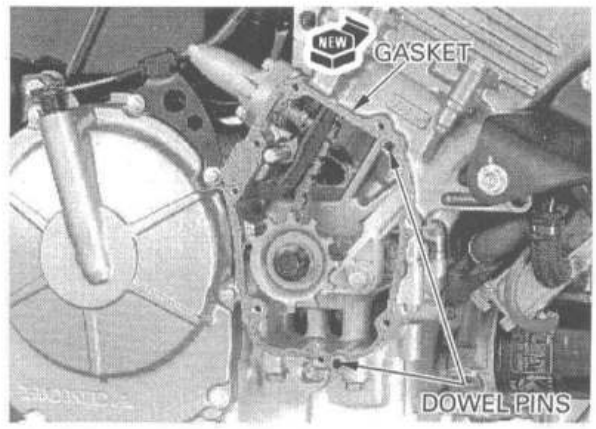
Install the ignition pulse generator into the cover.
Apply sealant to the wire grommet, then install it into the groove of the cover.
Install and tighten the ignition pulse generator bolts.



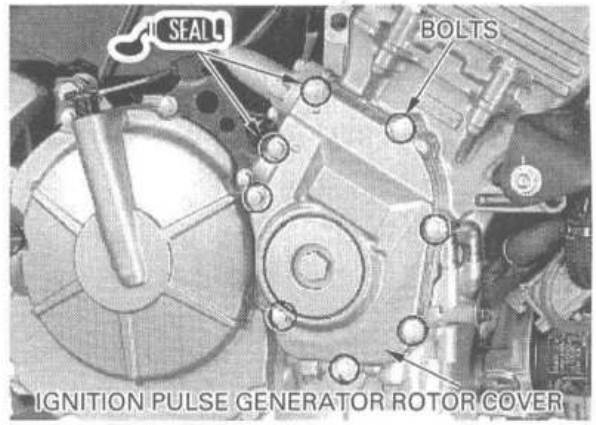
Apply liquid sealant to the mating surface of the crankcase as shown.



Install the dowel pins and a new gasket.



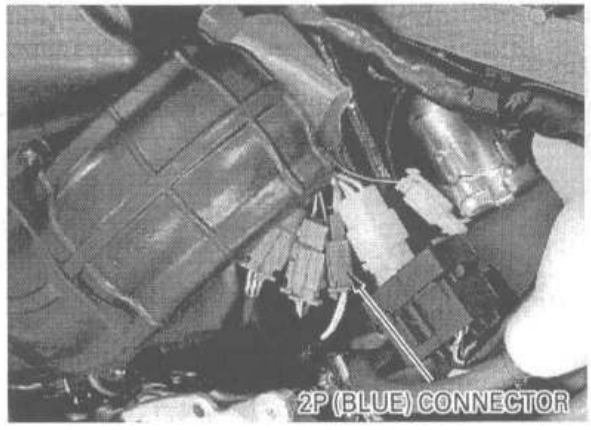
Apply sealant to the threads of the two bolts indicated by "△" mark on the cover.
Install the ignition pulse generator rotor cover and tighten the SH bolt.



Route the ignition pulse generator wire properly, connect the 2P (Blue) connector.

Clamp the wire with the wire band.

Install the removed parts in the reverse order of removal.



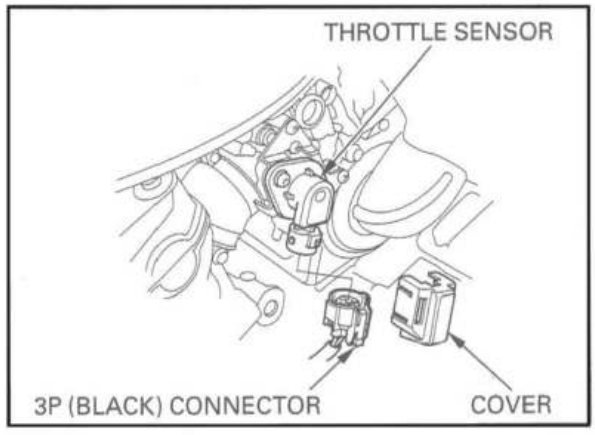
THROTTLE SENSOR

OPERATION INSPECTION

Remove the throttle sensor connector cover.

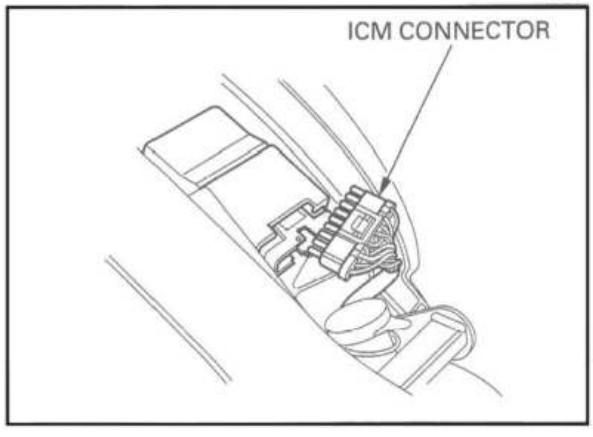
Disconnect the throttle sensor 3P (Black) connector. Check the connector for loose or corroded terminals.

Start the engine.
Connect the throttle sensor connector when the engine speed is 3,500 min^{-1} (rpm) or above (throttle angle is 4 – 12°).
The engine speed should increase.



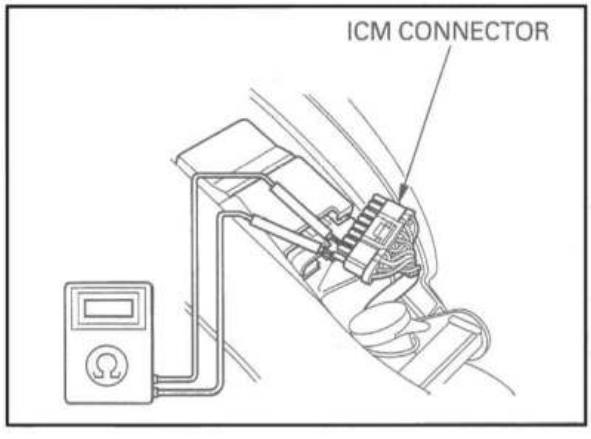
SYSTEM INSPECTION

Disconnect the ICM connector.



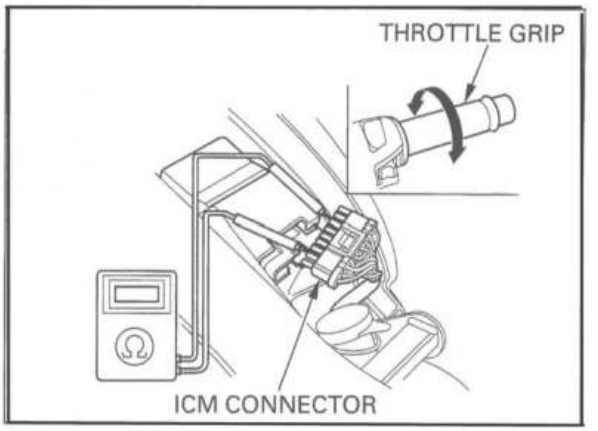
Measure the resistance between the Yellow/Red and Blue wire terminals of the wire harness side connector.

STANDARD: 4 – 6 KΩ (20 °C/68 °F)



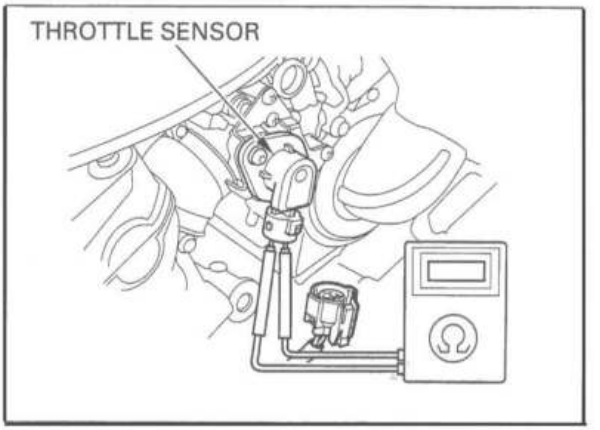
Check that the resistance between the Red/Yellow and Blue wire terminals varies with the throttle position while operating the throttle grip.

Fully open – Fully closed position:
Resistance decreases
Fully closed – Fully open position:
Resistance increases



If the correct measurements cannot be obtained, disconnect the throttle sensor 3P (Black) connector and perform the same inspections at the sensor terminals.

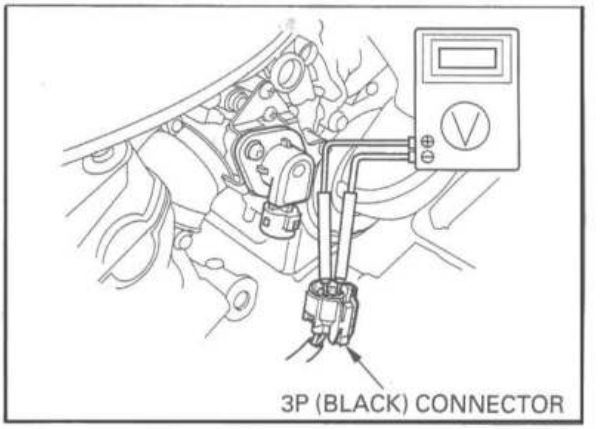
- If the measurement at the ICM is abnormal and the one at the throttle sensor is normal, check for open or short circuit, or loose or poor connections in the wire harness.
- If both measurements are abnormal, replace the throttle sensor.



Connect the ICM connector.
Turn the engine stop switch to RUN and the ignition switch ON.
Measure the input voltage between the Yellow/Red (+) and Blue (–) wire terminals of the wire harness side throttle sensor connector.

STANDARD: 4.7 – 5.3 V

If the input voltage is abnormal, or if there is no input voltage, check for open or short circuit in the wire harness, or loose or poor ICM connector contact.



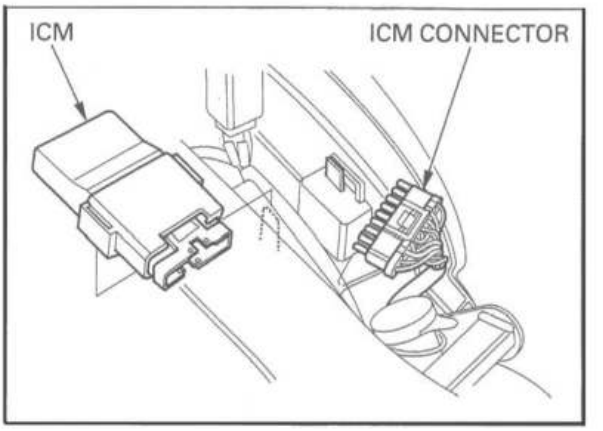
IGNITION CONTROL MODULE

REMOVAL/INSTALLATION

Remove the seat (page 2-2).

Disconnect the ICM (Ignition Control Module) multi-connector.
Remove the ICM from the rear fender.

Installation is in the reverse order of removal.



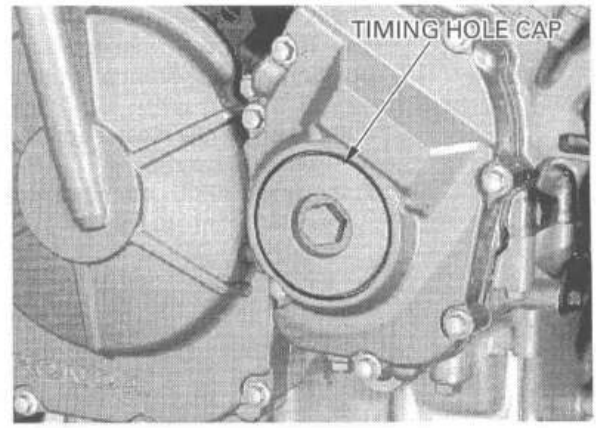
IGNITION TIMING

⚠WARNING

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

NOTE:

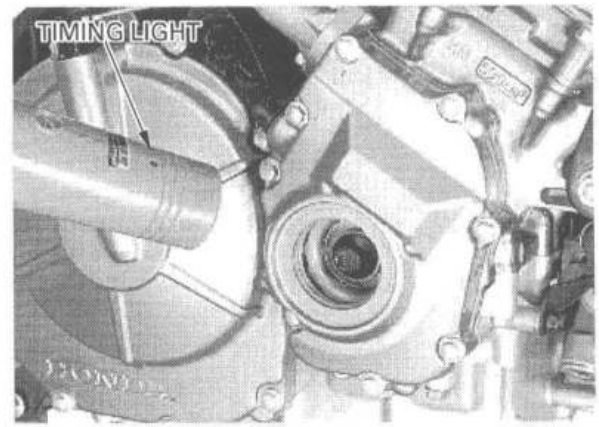
Read the instructions for timing light operation.



Warm up the engine.
Stop the engine and remove the timing hole cap.

Read the instructions for timing light operation.

Connect the timing light to the No.1 spark plug wire.

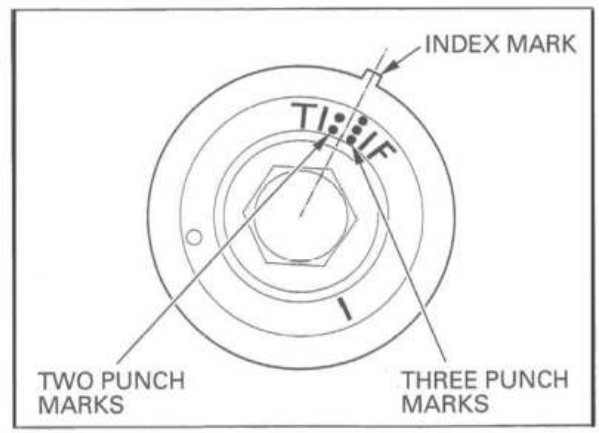


Start the engine and let it idle.

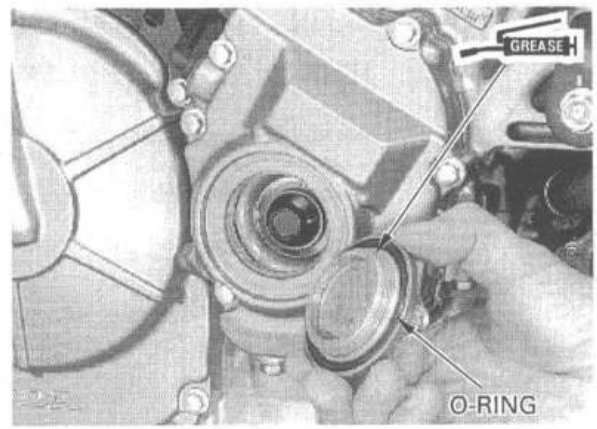
IDLE SPEED: 1,300 ± 100 min^{-1} (rpm)

The ignition timing is correct if the index mark on the ignition pulse generator rotor cover aligns with the center position of the three punch marks and two punch marks on the ignition pulse generator rotor as shown.

Increase the engine speed by turning the throttle stop screw and make sure the punch marks begins to move counterclockwise when the engine speed at approximately 1,500 min^{-1} (rpm).

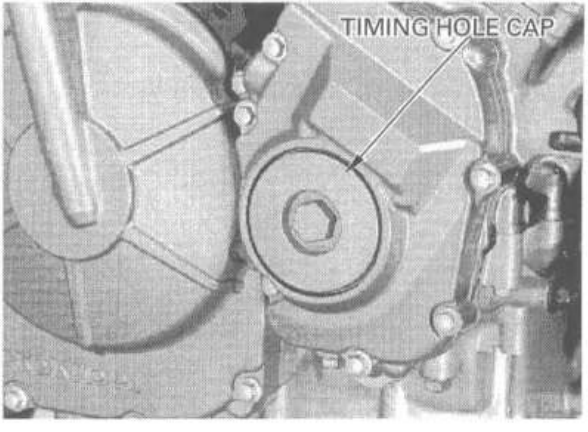


Check that the O-ring is in good condition, replace if necessary.
Apply grease to the timing hole cap threads.

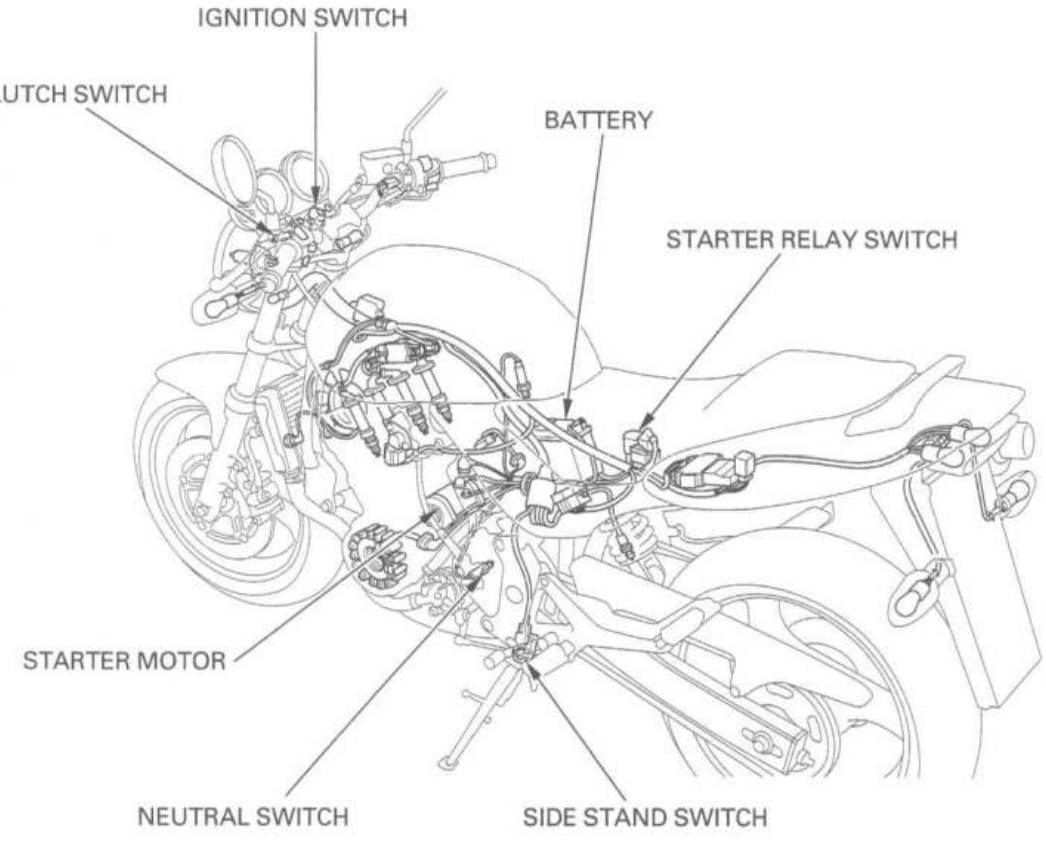


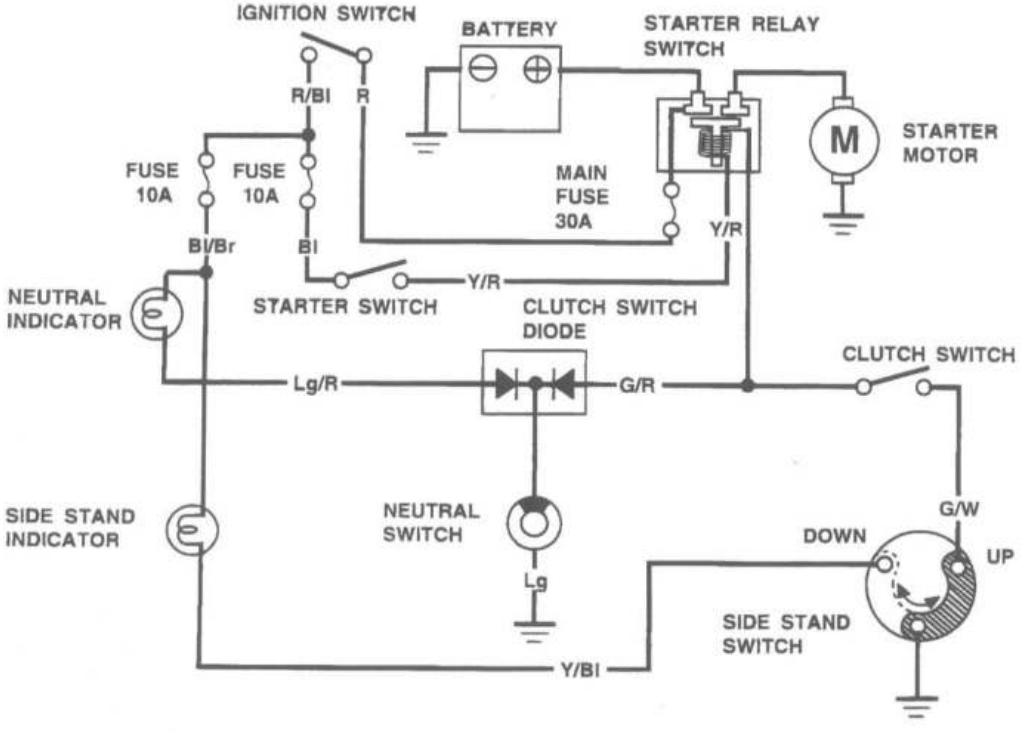
Tighten the timing hole cap to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m , 13 lbf·ft)



SYSTEM DIAGRAM





Bl ..... BLACK
Y ..... YELLOW
Br ..... BROWN
G ..... GREEN
R ..... RED
W ..... WHITE
Lg ..... LIGHT GREEN

18. ELECTRIC STARTER

SYSTEM DIAGRAM	18-0	STARTER MOTOR	18-4
SERVICE INFORMATION	18-1	STARTER RELAY SWITCH	18-10
TROUBLESHOOTING	18-2	DIODE	18-11

SERVICE INFORMATION

GENERAL

- The starter motor can be removed with the engine in the frame.

SPECIFICATION

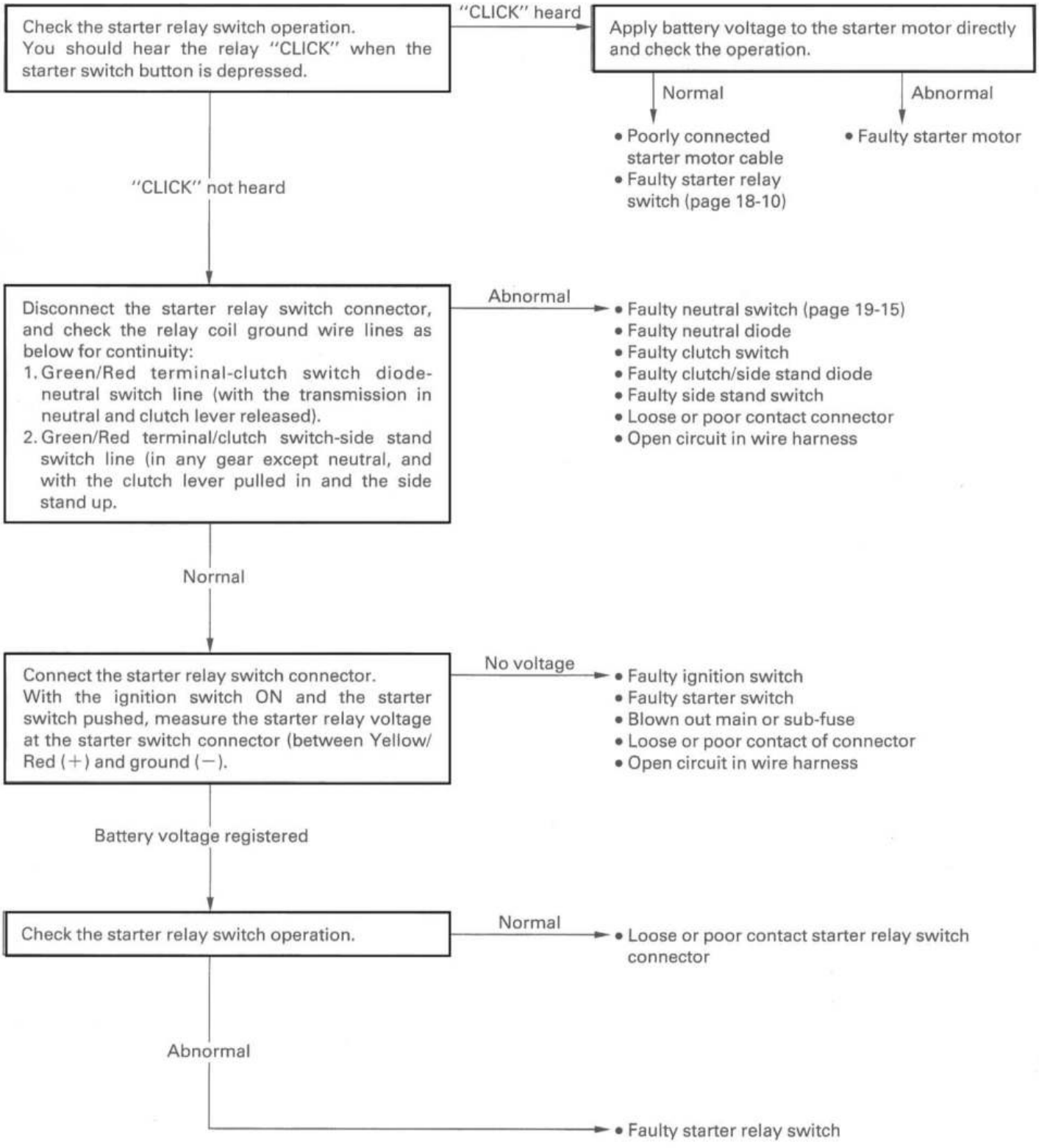
Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	12.0 – 13.0 (0.47 – 0.51)	4.5 (0.18)

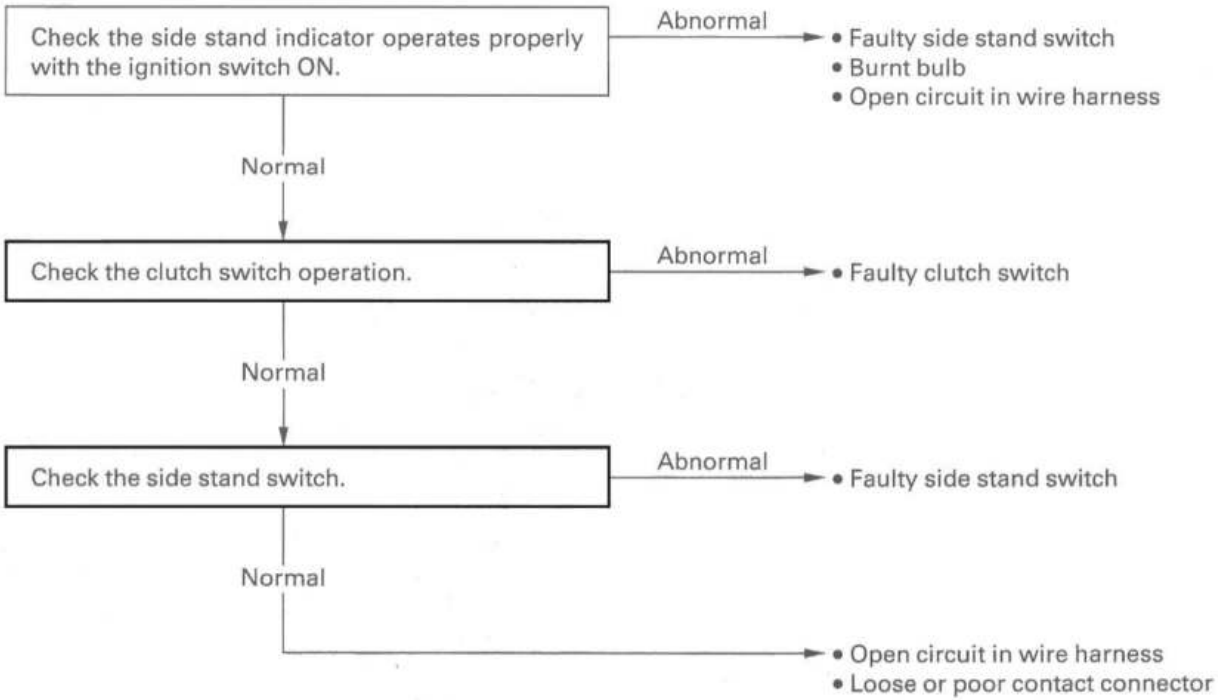
TROUBLESHOOTING

Starter motor does not turn

- Check for a blown main or sub fuses before servicing.
- Make sure the battery is fully charged and in good condition.



The starter motor turns when the transmission is in neutral, but does not turn with the transmission in any position except neutral, with the side stand up and the clutch lever pulled in.



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

Starter motor turns, but engine does not turn
- Starter motor is running backwards
  - —Case assembled improperly
  - —Terminals connected improperly
- Faulty starter clutch
- Damaged or faulty starter drive gear

Starter relay switch "Clicks", but engine does not turn over
- Crankshaft does not turn due to engine problems

STARTER MOTOR

REMOVAL

⚠WARNING

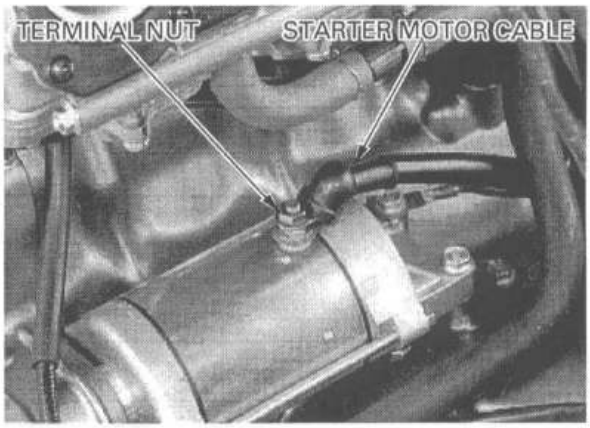
With the ignition switch OFF, remove the negative cable at the battery before servicing the starter motor.

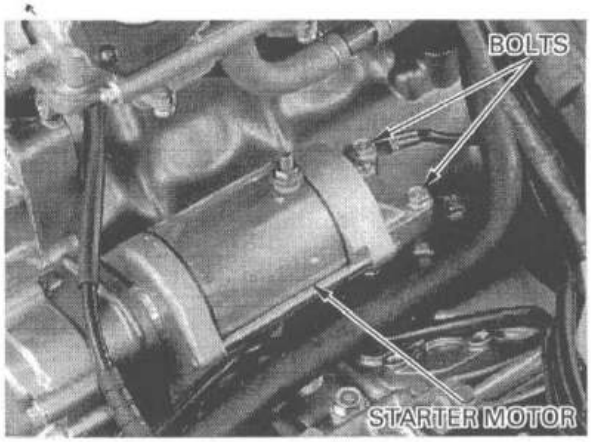
Remove the air cleaner housing (page 5-4).

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

Remove the starter motor mounting bolts and ground cable.

Pull the starter motor out of the crankcase.



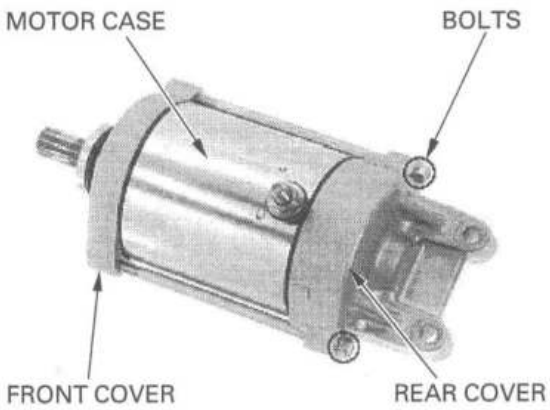


DISASSEMBLY

NOTE:

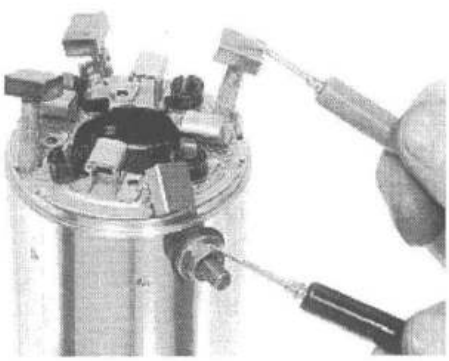
Record the location and number of shims.

Remove the following:
- Starter motor case bolts
- Front and rear covers
- Armature

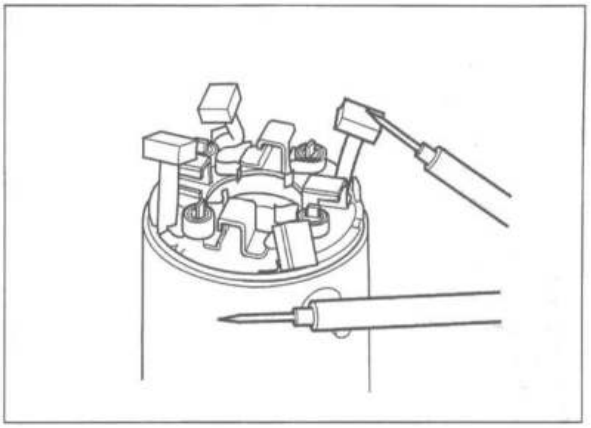


INSPECTION

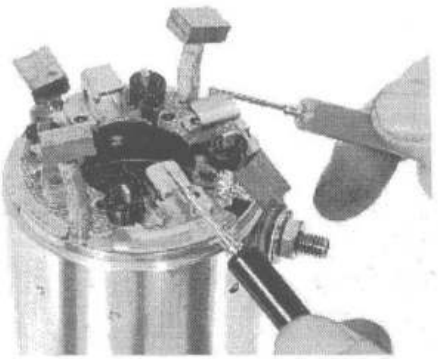
Check for continuity between the cable terminal and the brush wire (the indigo colored wire or the insulated brush holder).
There should be continuity.



Check for continuity between the motor case and the cable terminal.
There should be no continuity.

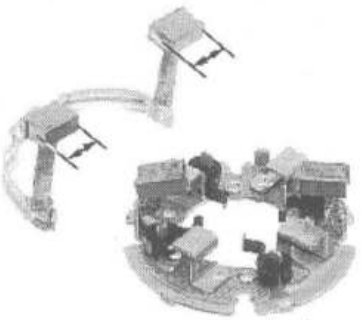


Check for continuity between (+) and (−) terminals of the brush holder.
There should be no continuity.

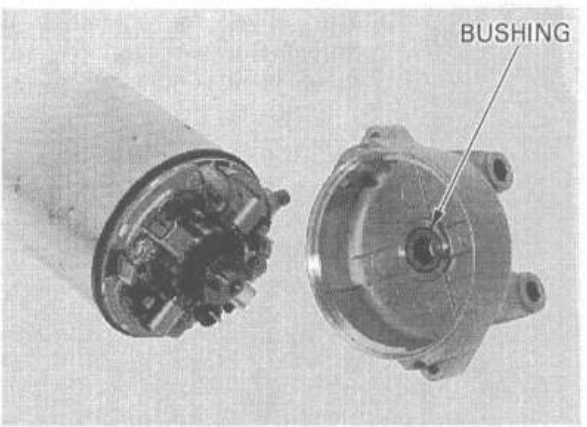


Inspect the brushes for damage and measure the brush length.

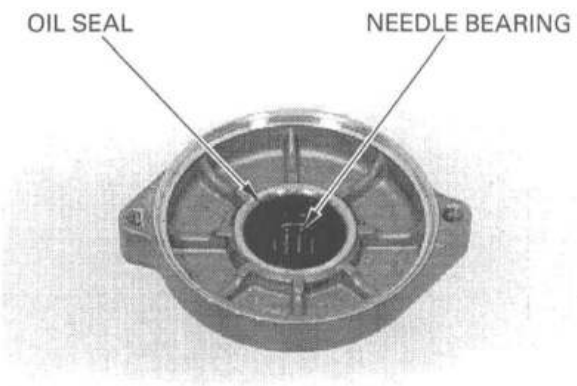
SERVICE LIMIT: 4.5 mm (0.18 in)



Check the bushing of the rear cover for wear or damage.



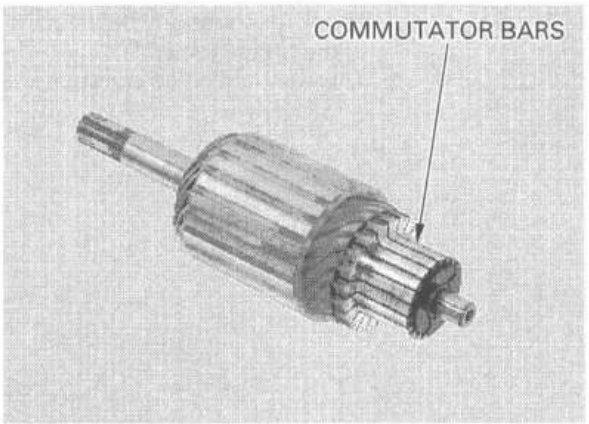
Check the front cover oil seal for fatigue or other damage.
Check the needle bearing for damage.



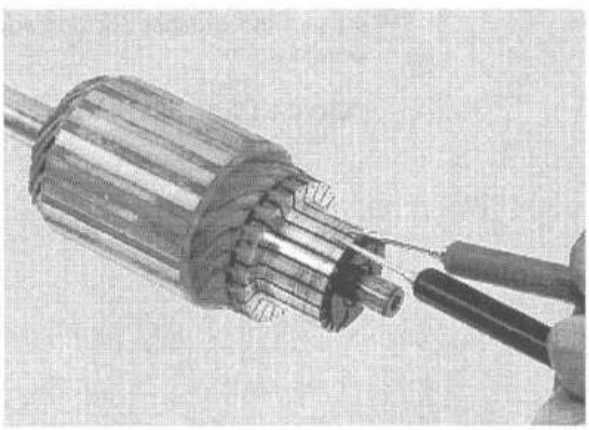
Inspect the commutator bars for discoloration.
Bars discolored in pairs indicate grounded armature coils, in which case the starter motor must be replaced.

NOTE:

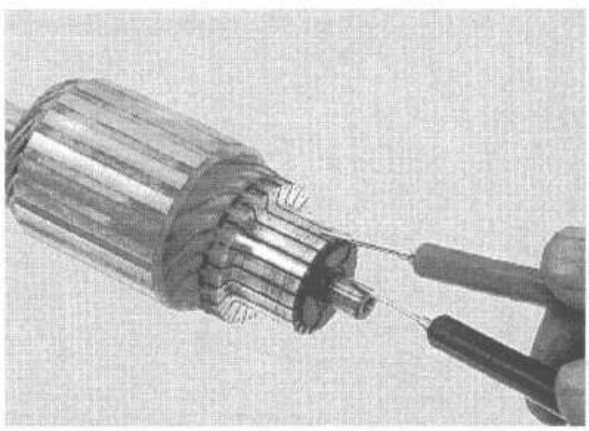
Do not use emery or sand paper on the commutator.



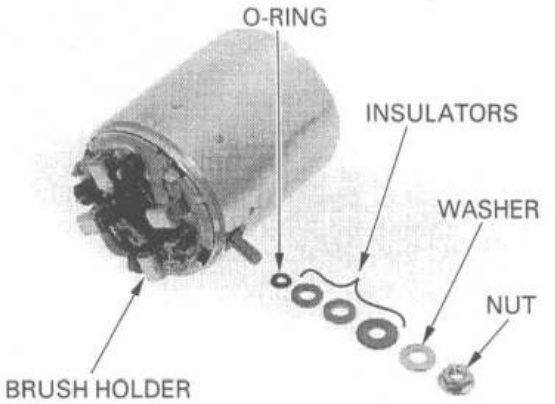
Check for continuity between individual commutator bars; there should be continuity.



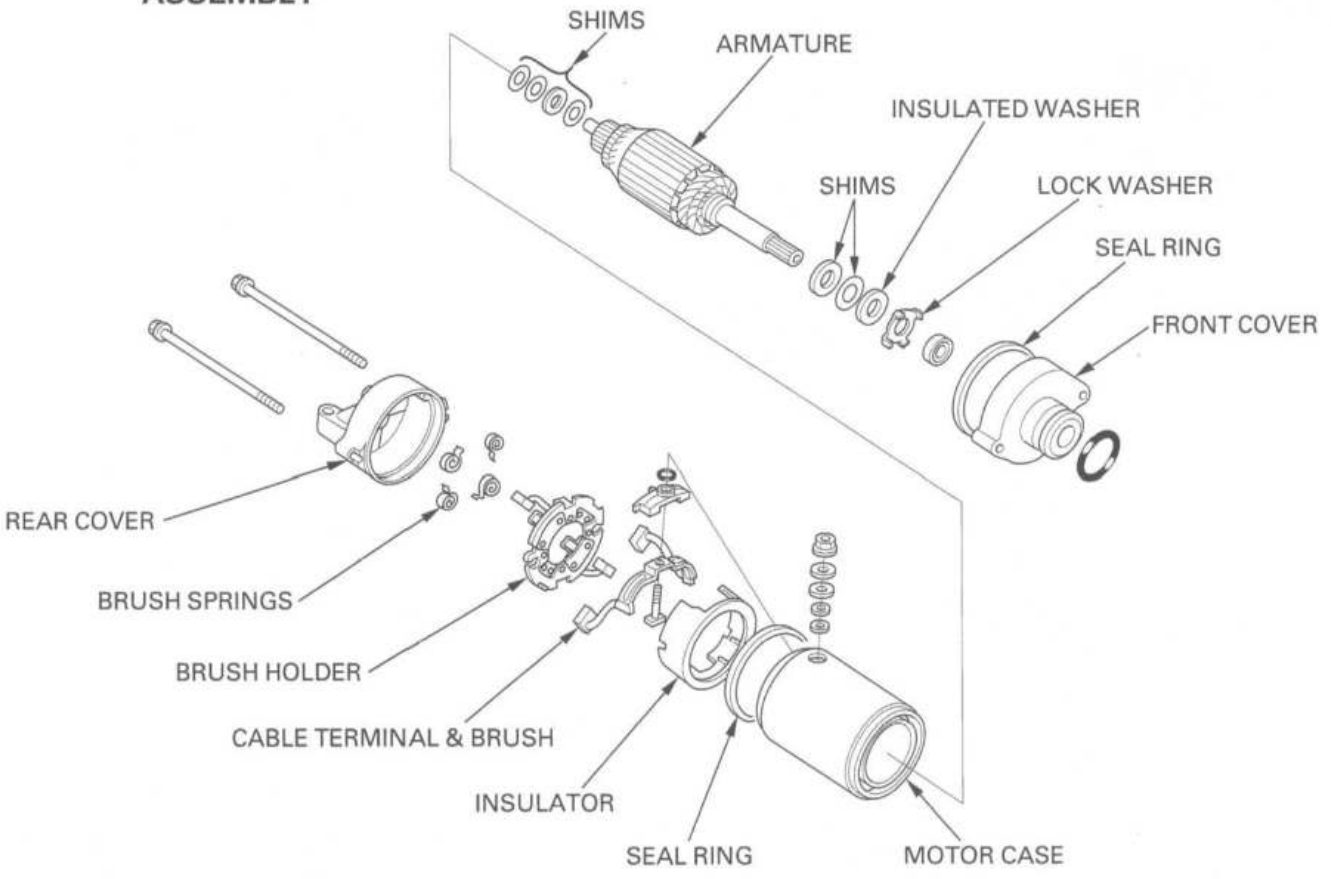
Also, check for continuity between individual commutator bars and the armature shaft; there should be no continuity.



Remove the following:
- Nut
- Washer
- Insulators
- O-ring
- Brush holder assembly
- Brush/terminal

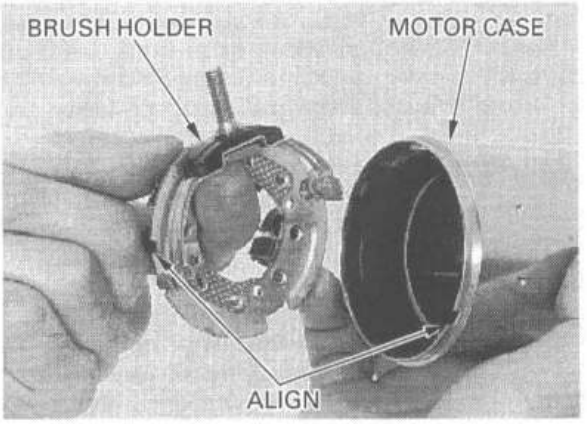


ASSEMBLY



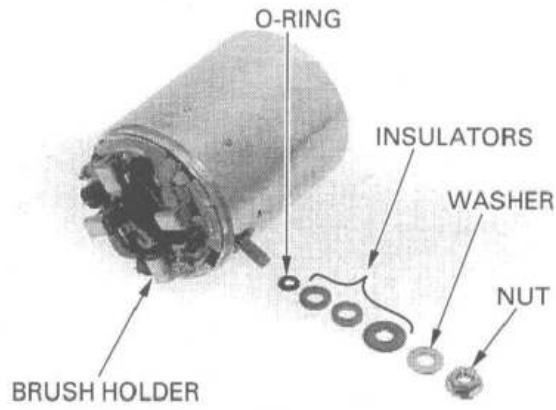
Set the brushes on the brush holder.
Install the brush holder onto the motor case.

Align the terminal of the brush holder with the motor case insulator.



Install the insulators properly as noted during removal.

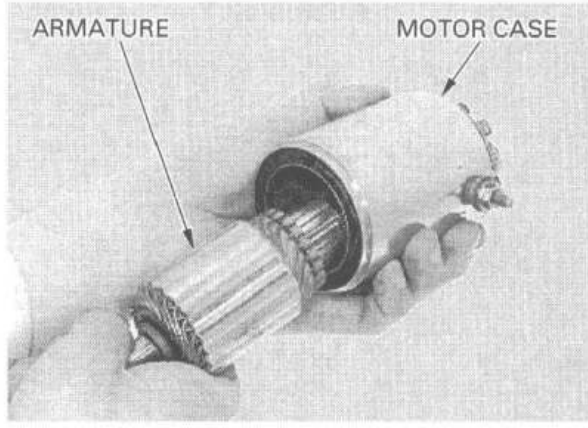
Install the following:
—O-ring
—Insulators
—Washer
—Nut



Push and hold the brush inside the brush holder, and install the armature through the brush holder. When installing the armature into the motor case, hold the armature tightly to keep the magnet from pulling the armature against the motor case.

CAUTION:

- ***The coil may be damaged if the magnet pulls the armature against the case.***
- ***The sliding surfaces of the brushes can be damaged if they are not installed properly.***

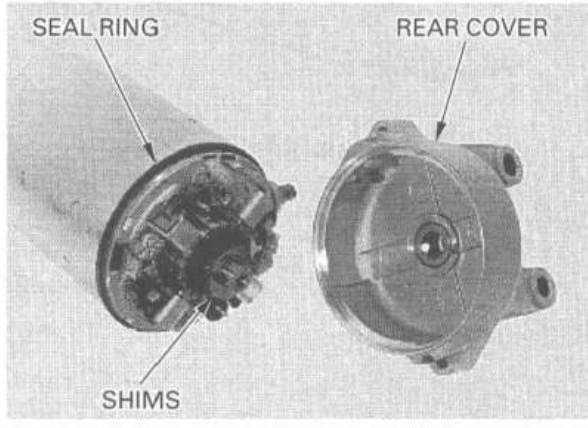


Set the brush springs.

Install the shims properly as noted during removal.

Install the seal ring on the motor case.
Install the same number of rear shims in the same locations as when disassembled.
Apply thin coat of grease to the armature shaft end.
Install the shims on the armature shaft.

Install the rear cover aligning its groove with the brush holder tab.

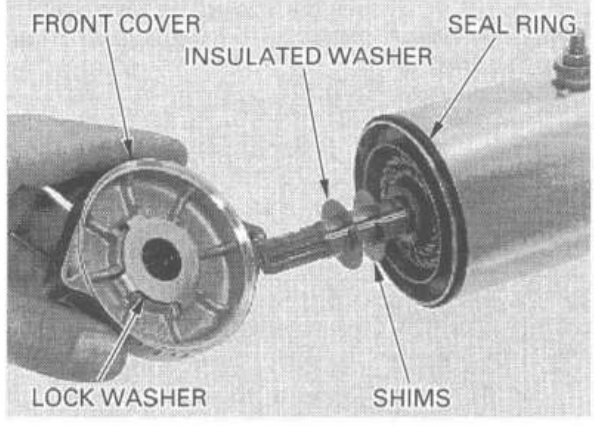


Install the shims properly as noted during removal.

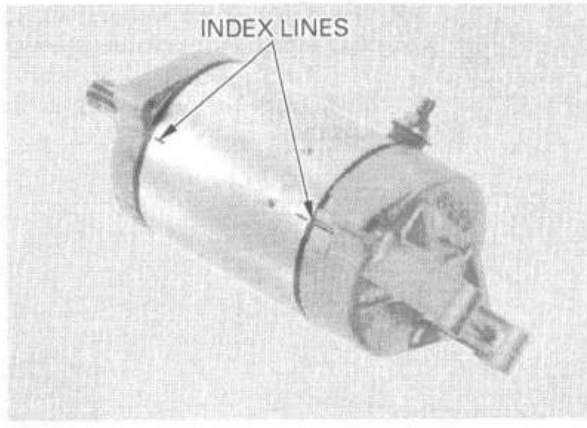
Install the seal ring on the motor case.
Install the same number of front shims in the same locations as when disassembled.
Install the insulated washer.
Apply grease to the front cover oil seal and needle bearing.
Install the lock washer on the front cover.
Install the front cover to the motor case.

CAUTION:

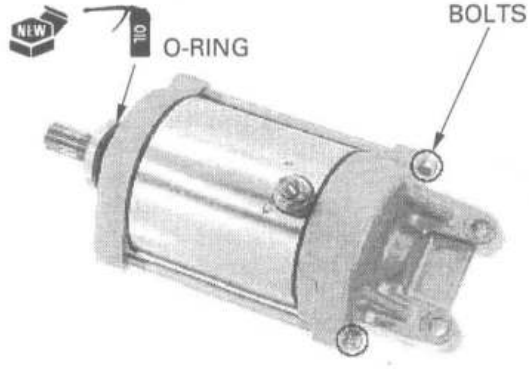
When installing the cover, take care to prevent damaging the oil seal lip with the shaft.



Align the marks between the motor case and cover.

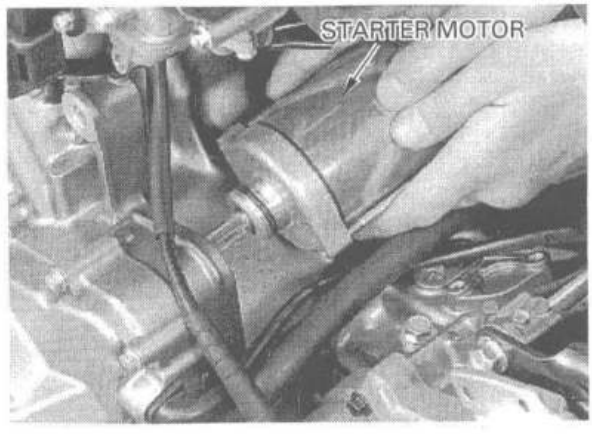


Install and tighten the motor case bolts securely.
Apply clean engine oil to the new O-ring.
Install a new O-ring onto the starter motor boss.

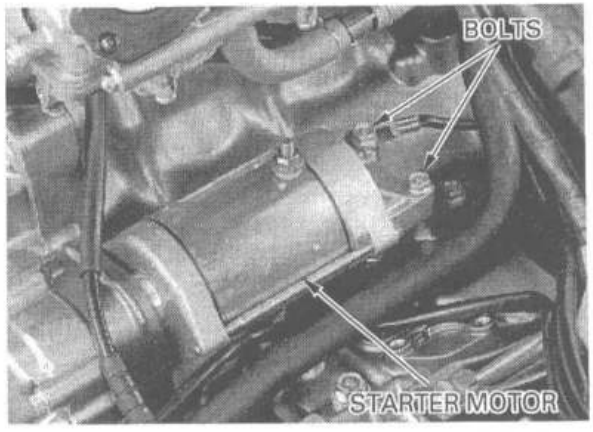


INSTALLATION

Install the starter motor onto the crankcase.
Route the starter motor cable and ground cable properly.

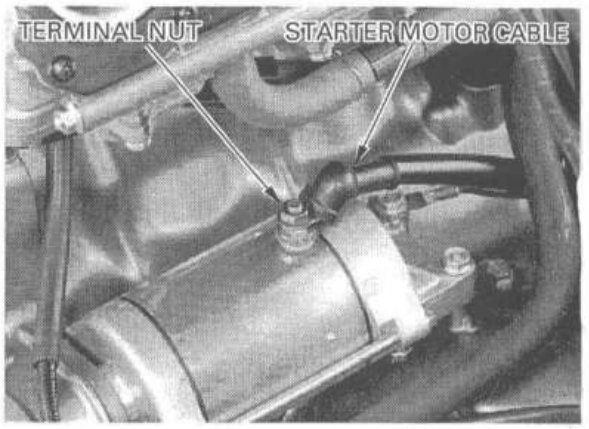


Install the ground cable and tighten the starter motor mounting bolts.



Install the starter motor cable to the terminal, then tighten the terminal nut securely.

Install the removed parts in the reverse order of removal.



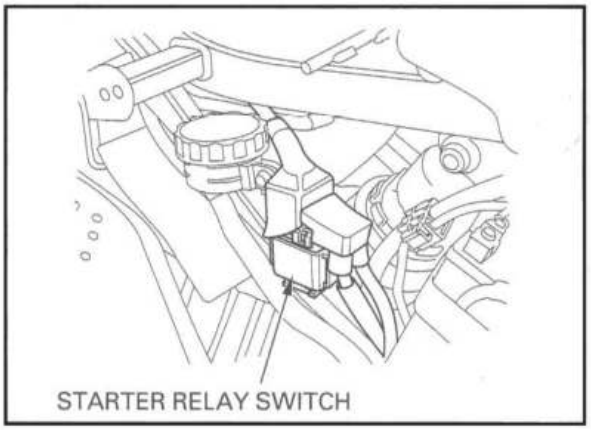
STARTER RELAY SWITCH

OPERATION INSPECTION

Remove the rear cowl (page 2-3).

Shift the transmission into neutral.
Turn the ignition switch ON and depress the starter switch button.
The coil is normal if the starter relay switch clicks.

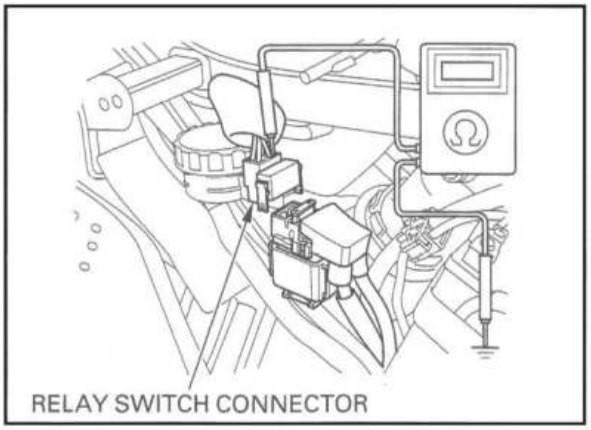
If the switch "CLICK" is not heard, inspect the relay switch using the procedure below.



GROUND LINE INSPECTION

Disconnect the relay connector.

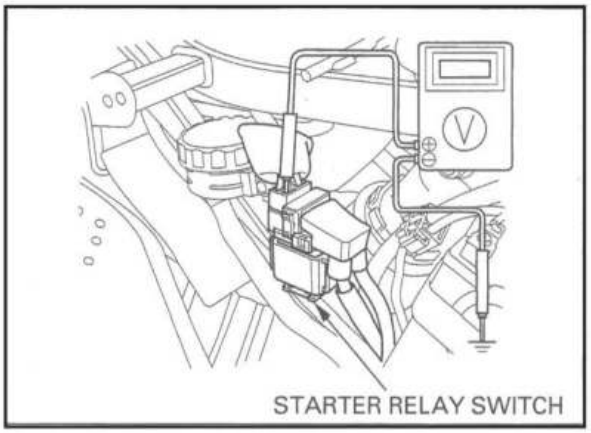
Check for continuity between the Green/Red wire and ground.
If there is continuity when the transmission is in neutral or when the clutch is disengaged and the side stand switch is up, the ground circuit is normal (in neutral, there is a slight resistance due to the diode).



VOLTAGE INSPECTION

Connect the starter relay switch connector.
Shift the transmission into neutral.

Measure the voltage between the Yellow/Red wire (+) and ground at the starter relay switch connector.
There should be battery voltage only when the starter switch button is depressed with the ignition switch is ON.

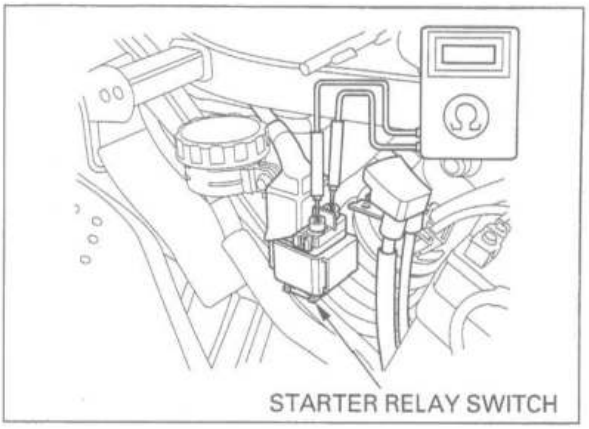


CONTINUITY INSPECTION

Disconnect the starter cables from the starter relay switch.

Connect an ohmmeter to the starter relay switch large terminals.
Check for continuity between the starter relay switch terminals.

There should be continuity while the starter switch botton is depressed and should be no continuity when the starter switch botton is released.

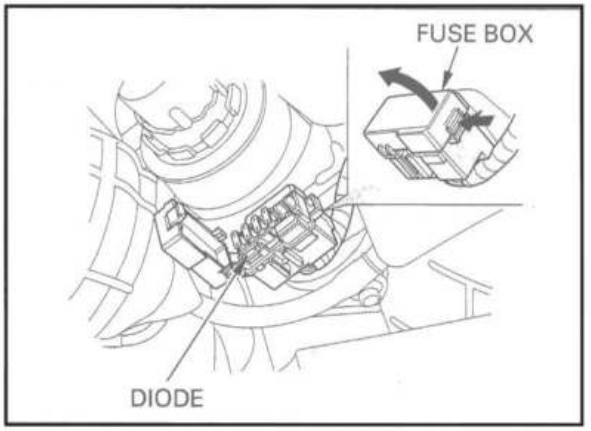


DIODE

REMOVAL

Remove seat (page 2-2).

Open the fuse box and remove the diode.



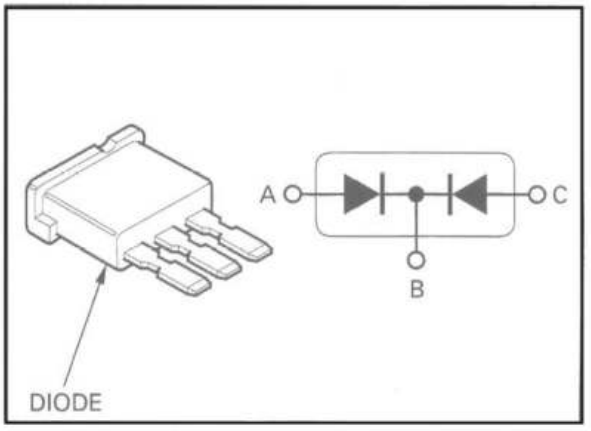
INSPECTION

Check for continuity with an ohmmeter.

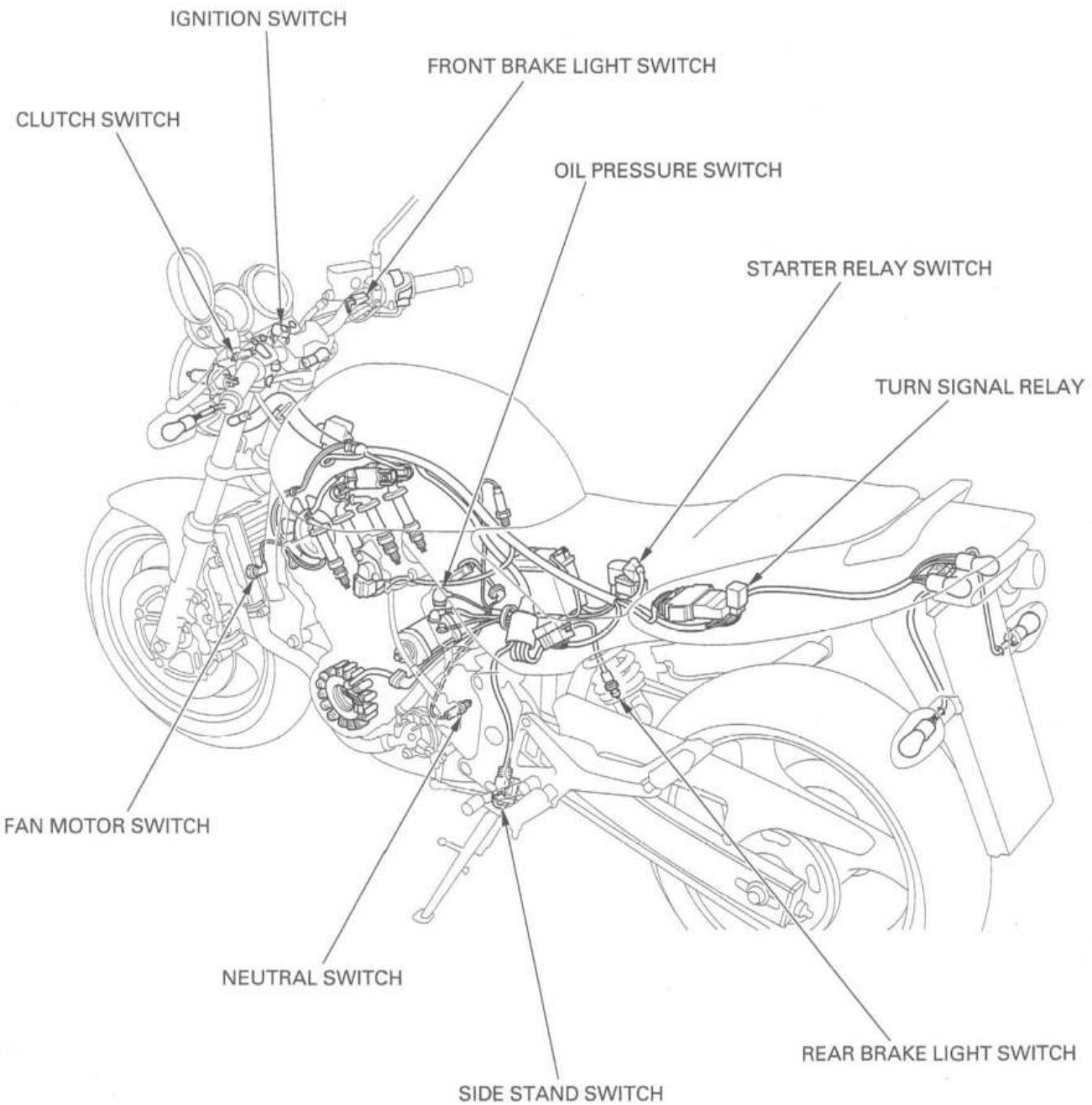
Normal direction: Continuity
Reverse direction: No continuity

INSTALLATION

Install the diode in the reverse order of removal.



SYSTEM LOCATION



19. LIGHTS/METERS/SWITCHES

SYSTEM LOCATION	19-0	OIL PRESSURE SWITCH	19-12
SERVICE INFORMATION	19-1	IGNITION SWITCH	19-13
HEADLIGHT	19-3	HANDLEBAR SWITCHES	19-14
POSITION LIGHT	19-4	BRAKE LIGHT SWITCH	19-15
TURN SIGNAL	19-4	CLUTCH SWITCH	19-15
TAIL/BRAKE LIGHT	19-5	NEUTRAL SWITCH	19-15
COMBINATION METER	19-5	SIDE STAND SWITCH	19-16
TACHOMETER	19-9	HORN	19-17
COOLANT TEMPERATURE GAUGE/ SENSOR	19-10	TURN SIGNAL RELAY	19-17
COOLING FAN MOTOR SWITCH	19-11		

SERVICE INFORMATION

GENERAL

⚠WARNING

- ***A halogen headlight bulb becomes very hot while the headlight is ON, and remains hot for a while after it is turned OFF. Be sure to let it cool down before servicing.***
- ***Use an electric heating element to heat the water/coolant mixture for the fan motor switch inspection. Keep all flammable materials away from the electric heating element. Wear protective clothing, insulated gloves and eye protection.***

- Note the following when replacing the halogen headlight bulb.
  - —Wear clean gloves while replacing the bulb. Do not put finger prints on the headlight bulb, as they may create hot spots on the bulb and cause is to fail.
  - —If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent its early failure.
  - —Be sure to install the dust cover after replacing the bulb.
- Check the battery condition before performing any inspection that requires proper battery voltage.
- A continuity test can be made with the switches installed on the motorcycle.
- The following color codes are used throughout this section.

Bu = Blue	G = Green	Lg = Light Green	R = Red	Sb = Sky Blue
Bl = Black	Gr = Gray	O = Orange	W = White	
Br = Brown	Lb = Light Blue	P = Pink	Y = Yellow	

SPECIFICATIONS

ITEM			SPECIFICATIONS
Bulbs	Headlight (Hi/Lo)		12V−60/55W
	Position light (Except U type)		12V−4W
	Brake/taillight		12V−21/5W × 2
	Turn signal light		12V−21W × 4
	Instrument light		12V−1.7W × 3
	Turn signal indicator		12V−1.7W × 2
	High beam indicator		12V−1.7W
	Neutral indicator		12V−1.7W
	Oil pressure indicator		12V−1.7W
Fuse	Main fuse		30 A
	Sub fuse		10 A × 4
Fan motor switch	Start to close (ON)		98−102 °C (208−216 °F)
	Stop to open		93−97 °C (199−207 °F)
Coolant temperature sensor resistance		at 80 °C/176 °F	45−60 Ω
		at 120 °C/248 °F	10−20 Ω

TORQUE VALUES

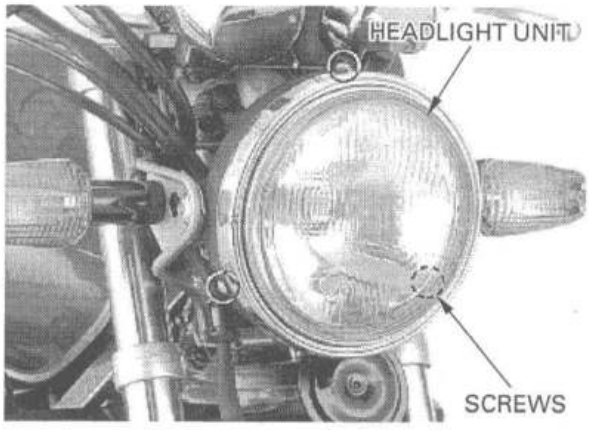
Oil pressure switch	12 N·m (1.2 kgf·m , 9 lbf·ft)	Apply sealant to the threads
Oil pressure switch terminal screw	2 N·m (0.2 kgf·m , 1.4 lbf·ft)	
Neutral switch	12 N·m (1.2 kgf·m , 9 lbf·ft)	
Side stand pivot bolt	15 N·m (1.5 kgf·m , 11 lbf·ft)	
Side stand pivot lock nut	39 N·m (4.0 kgf·m , 29 lbf·ft)	
Side stand switch mounting bolt	10 N·m (1.0 kgf·m , 7 lbf·ft)	ALOC bolt
Ignition switch mounting bolt	25 N·m (2.5 kgf·m , 18 lbf·ft)	Apply a locking agent to the threads
Coolant temperature sensor unit	10 N·m (1.0 kgf·m , 7 lbf·ft)	Apply sealant to the threads

HEADLIGHT

BULB REPLACEMENT

⚠WARNING

A halogen headlight bulb becomes very hot while the headlight is ON, and remains hot for a while after it is turned OFF. Be sure to let it cool down before servicing.

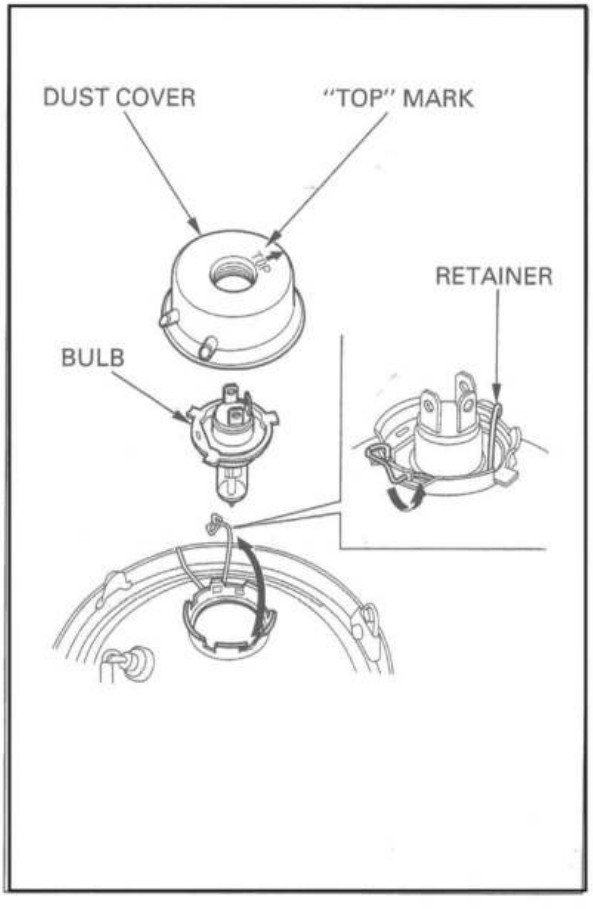


Remove the screws and headlight unit.

Remove the headlight bulb socket and dust cover.
Unhook the bulb retainer and remove the headlight bulb.

CAUTION:

Avoid touching halogen headlight bulb. Finger prints can create hot spots that cause a bulb to break.



If you touch the bulb with your bare hands, clean it with cloth moistened with denatured alcohol to prevent early bulb failure.

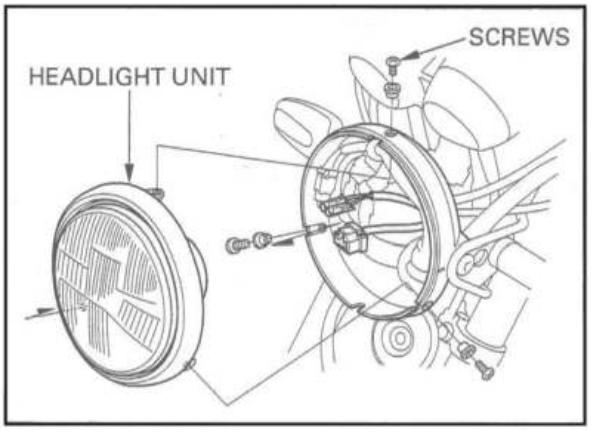
Install a new bulb into the headlight unit.

Install the headlight bulb aligning its tabs with the grooves in the headlight unit.
Hook the bulb retainer.

Install the dust cover tightly against the headlight with its "TOP" mark facing up.

Connect the headlight socket.

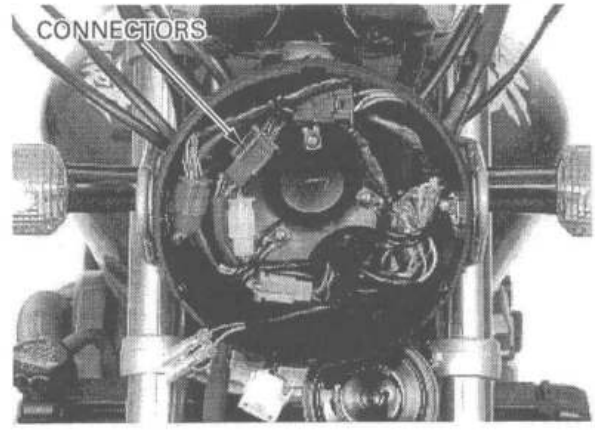
Install the headlight unit and tighten the screws securely.



HEADLIGHT CASE REMOVAL/INSTALLATION

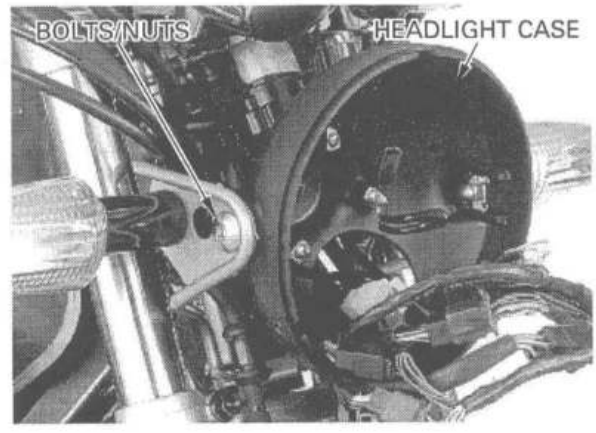
Remove the headlight unit (see precious page).

Disconnect the connectors and remove the wires from the headlight case.



Remove the rubber plugs from the headlight case mounting bolts.
Remove the headlight case mounting bolts/nuts and headlight case.

Installation is in the reverse order of removal.



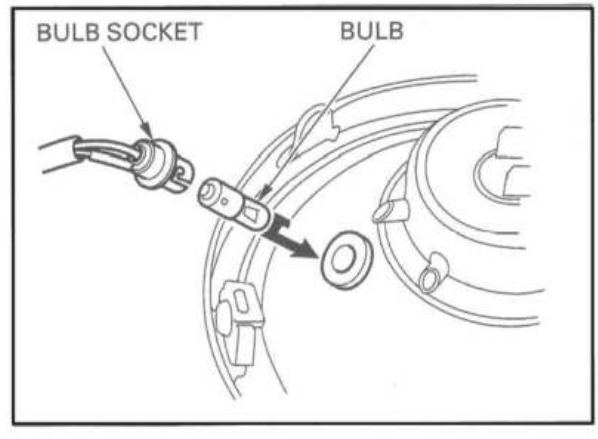
POSITION LIGHT

BULB REPLACEMENT

Remove the headlight unit (see previous page).

Pull out the position light bulb socket.
Push the bulb in and turn it counterclockwise, then remove the bulb and replace it with a new one.

Install the position light bulb in the reverse order of removal.



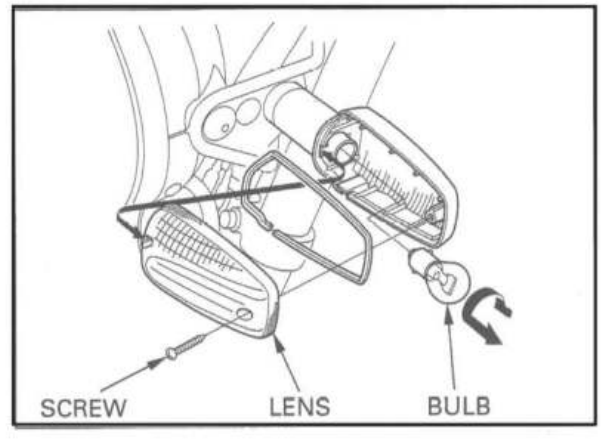
TURN SIGNAL

BULB REPLACEMENT

Remove the screw, turn signal lens and packing.

Push the bulb in and turn it counterclockwise, then remove the bulb and replace it with a new one.

Install the bulb in the reverse order of removal.



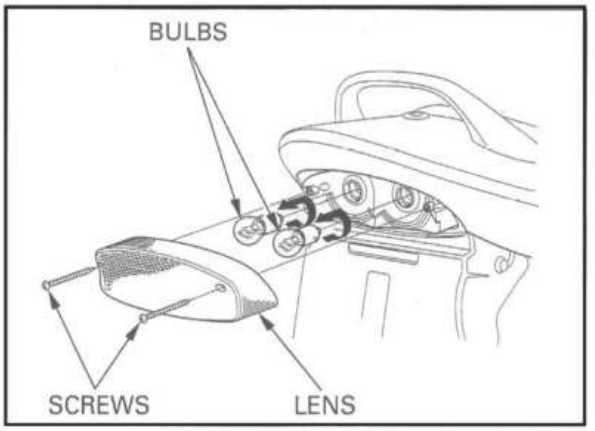
TAIL/BRAKE LIGHT

BULB REPLACEMENT

Remove the screw and tail/brake light lens.

Push the bulb in and turn it counterclockwise, then remove the bulb and replace it with a new one.

Install the bulb in the reverse order of removal.

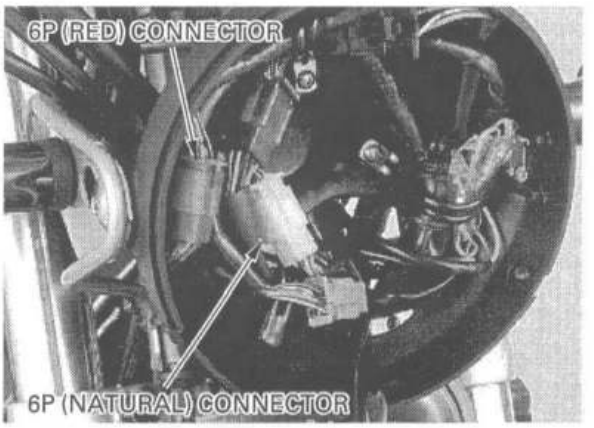


COMBINATION METER

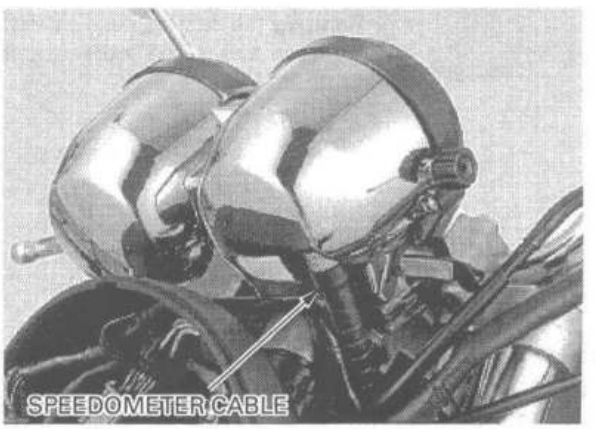
REMOVAL

Remove the headlight unit (see previous page).

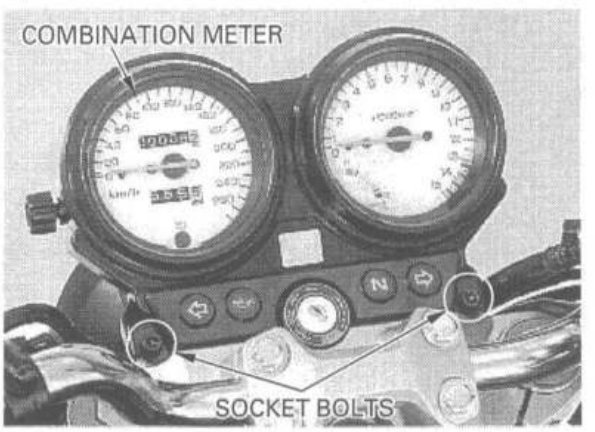
Disconnect the combination meter 6P (Natural) and 6P (Red) connectors.



Disconnect the speedometer cable from the speedometer.

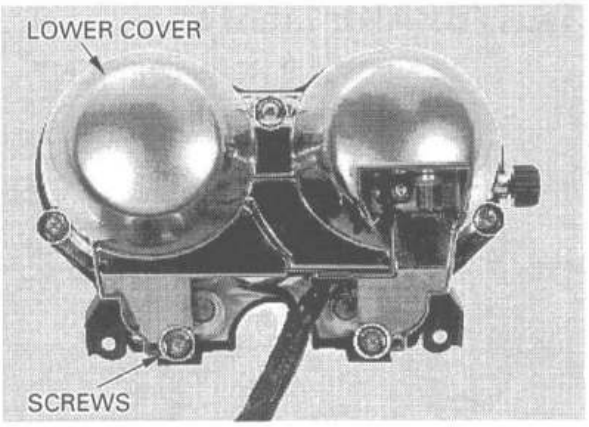


Remove the two socket bolts and combination meter assembly.

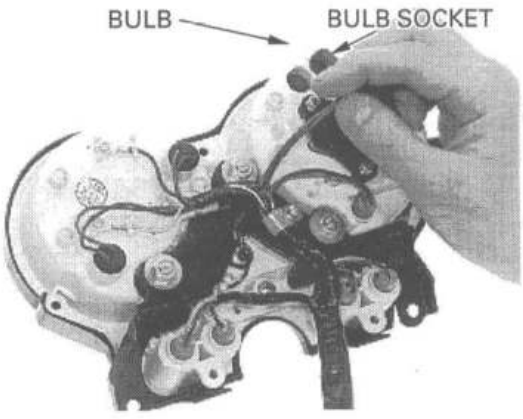


DISASSEMBLY/BULB REPLACEMENT

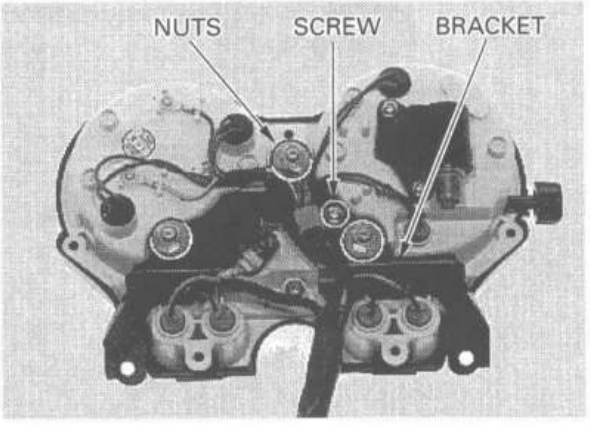
Remove the screws and lower cover.



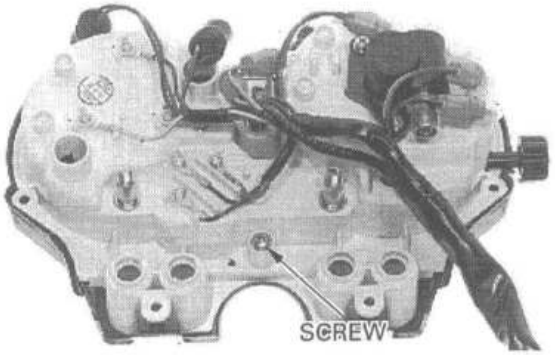
Remove the bulb sockets.
Replace the bulb with a new one if necessary.



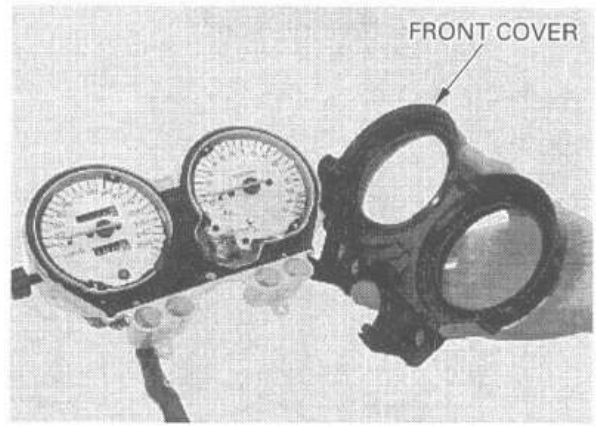
Remove the sub-harness clamp screw.
Remove the three nuts and combination meter bracket.



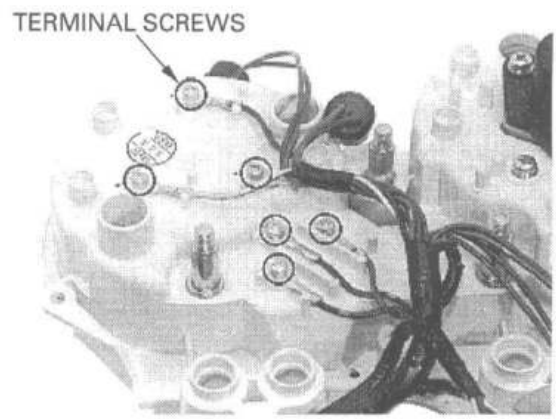
Remove the front cover mounting screw.



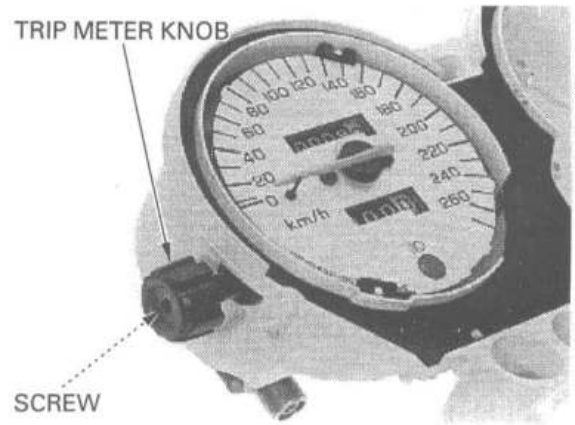
Remove the front cover from the combination meter case.



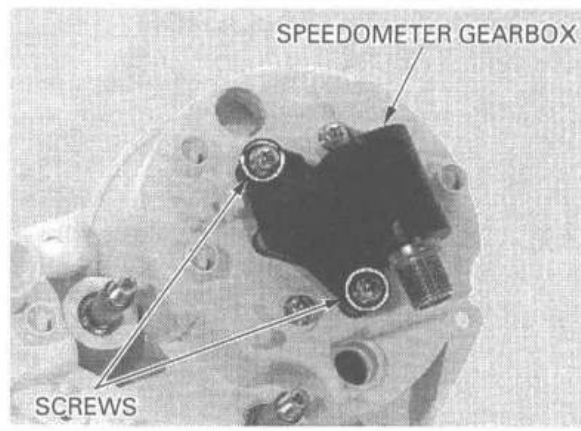
Remove the six terminal screws and tachometer/ indicator unit.



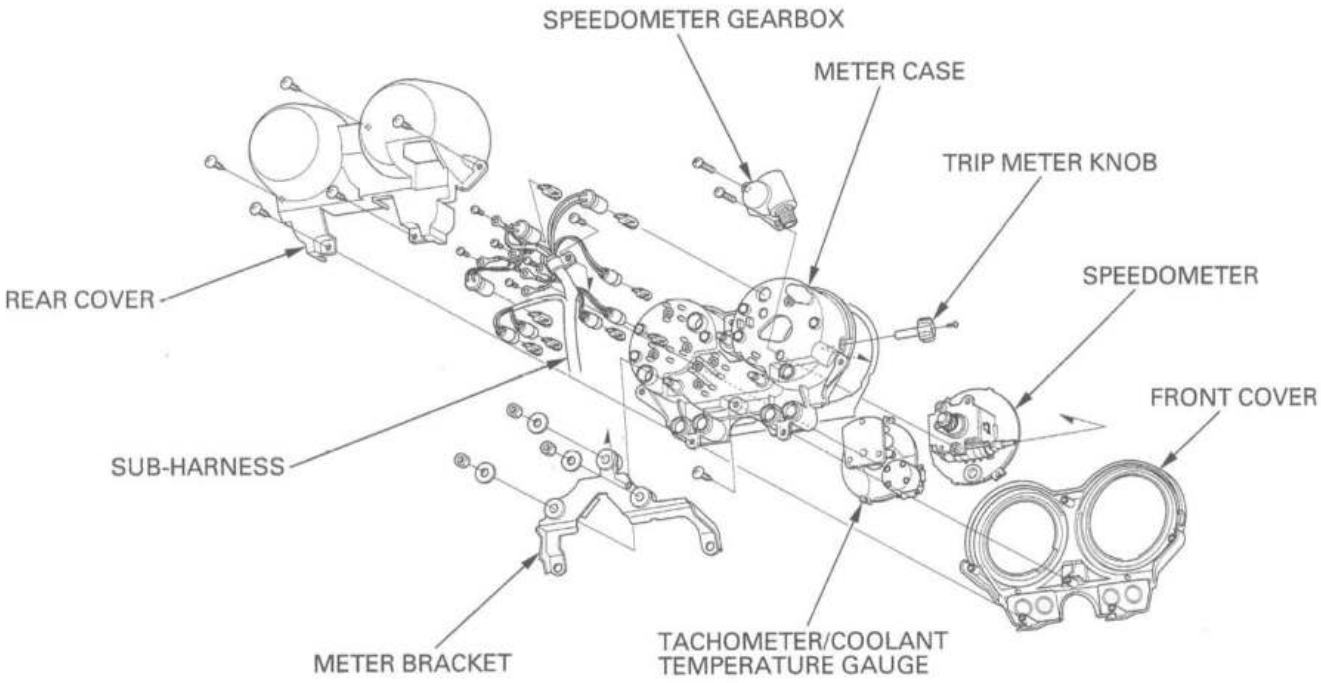
Remove the screw and trip meter knob.



Remove the two speedometer gearbox screw, then remove the speedometer unit.



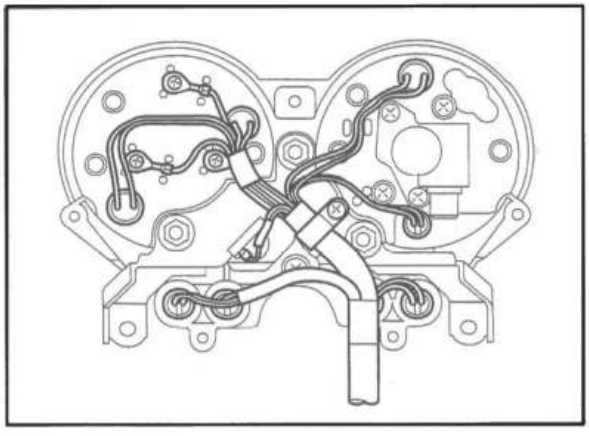
ASSEMBLY



Assemble the combination meter in the reverse order of removal.

NOTE:

Route the combination meter wires properly.

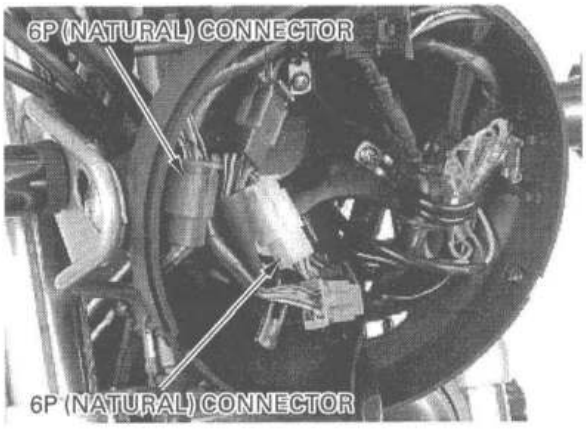


INSTALLATION

Install the combination meter in the reverse order of removal.

NOTE:

Route the combination meter sub-harness properly (page 1-22).



TACHOMETER

INSPECTION

Remove the headlight unit (page 19-3).

Check for loose or poor contact terminals of the combination meter connectors.

Disconnect the combination meter 6P (Natural) connector, connect the peak voltage adaptor to the tachometer Yellow/Green terminal and ground.

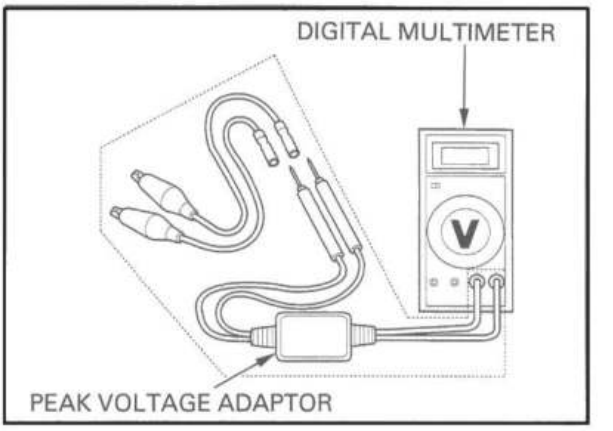
TOOLS:
Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100
with commercially available digital multimeter (impedance 10 MΩ /DCV minimum)

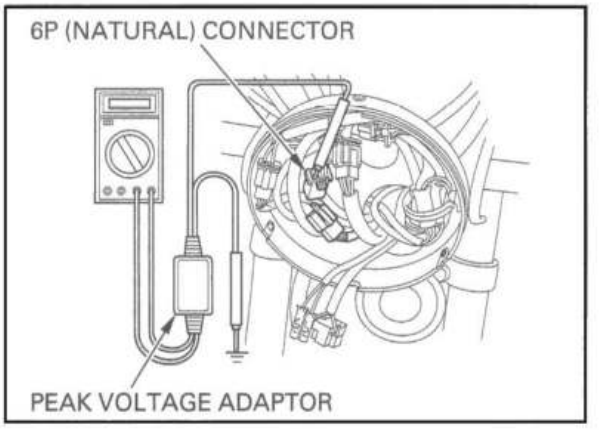
CONNECTION: Yellow/Green (+) and Ground (−)

Start the engine and measure the tachometer input voltage.

PEAK VOLTAGE: 10.5 V minimum

If the value is normal, replace the tachometer.
If the measured value is below 10.5 V, replace the ICM.



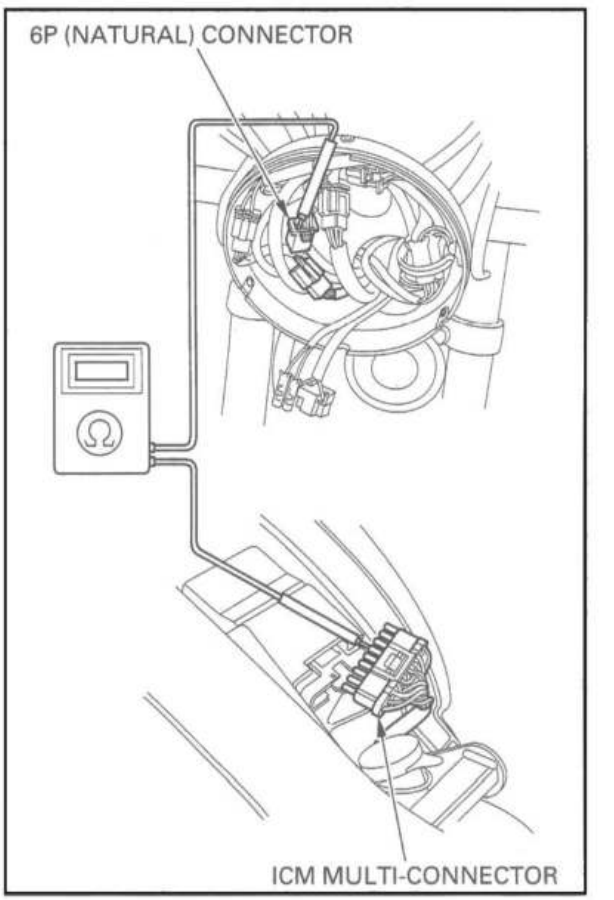


If the value is 0 V, perform the following:
Remove the seat (page 2-2) and disconnect the ICM multi-connector.

Check for continuity between the tachometer connector terminal and the ICM multi-connector Yellow/Green terminals.
If there is no continuity, check the wire harness for an open circuit.

If there is continuity, replace the tachometer unit.

For tachometer replacement, see 19-4; combination meter disassembly and assembly.

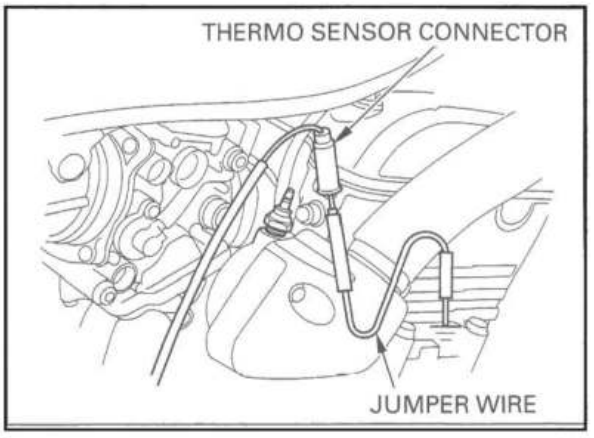


COOLANT TEMPERATURE GAUGE/SENSOR

INSPECTION

Disconnect the thermo sensor wire connector from the sensor.

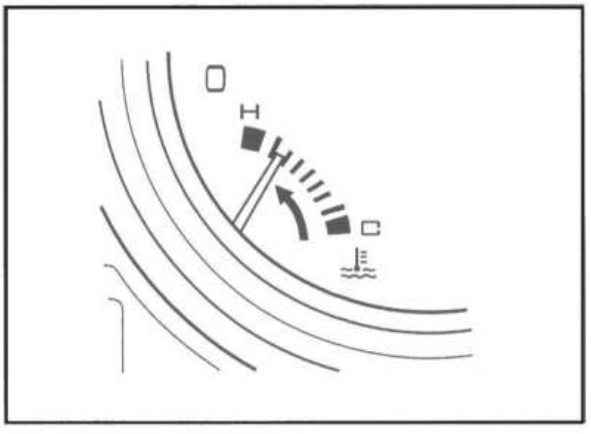
Ground the thermo sensor wire with a jumper wire.



Turn the ignition switch ON and check the coolant temperature gauge.
Disconnect the thermo sensor wire connector from the ground immediately if the gauge needle moves fully to H.

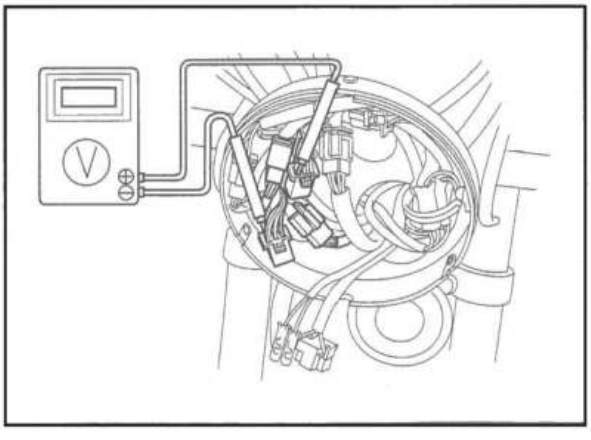
CAUTION:

Immediately disconnect the sensor wire connector from the ground when the needle moves to H (hot) to prevent damage to the gauge.



If the needle moves, check the thermo sensor unit.

If the needle does not move, check for voltage between the sensor wire connector and ground.



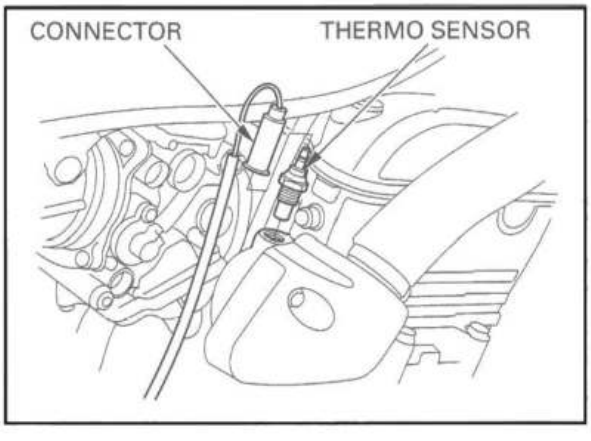
If the voltage is measured, the coolant temperature gauge unit is faulty.
If there is no voltage, check for voltage between the Black/Brown and Green/Blue wire terminals.

If there is no voltage between the terminal, coolant temperature gauge unit is faulty.
If a voltage is measured, check the wire harness.

THERMO SENSOR UNIT INSPECTION

⚠WARNING

- ***Wear insulated gloves and adequate eye protection.***
- ***Keep flammable materials away from the electric heating element.***



Drain the coolant (page 6-4).

Disconnect the wire connector from the coolant temperature sensor and remove the sensor.

Suspend the thermo sensor in a pan of coolant (50−50 mixture) an electric heating element and measure the resistance through the sensor as the coolant heats up.

NOTE:

- Soak the thermo sensor in coolant up to its threads with at least 40 mm (1.57 in) from the bottom of the pan to the bottom of the sensor.
- Keep the temperature constant for 3 minutes before testing. A sudden change of temperature will result in incorrect readings. Do not let the thermometer or thermo sensor touch the pan.

Temperature	80 °C (68 °F)	120 °C (248 °F)
Resistance	2.1 – 2.6 kΩ	0.62 – 0.76 kΩ

Replace the sensor if it is out of specification by more than 10% at any temperature listed.

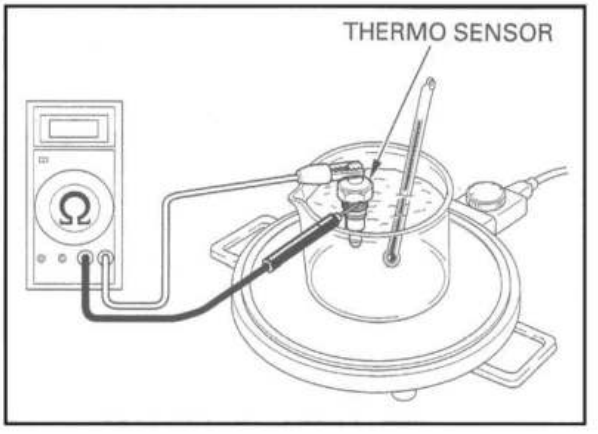
Apply sealant to the thermo sensor threads.
Do not apply sealant to the sensor head.

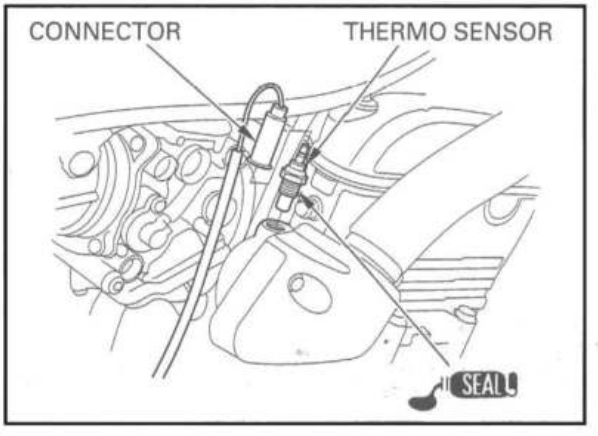
Install and tighten the thermo sensor.

TORQUE: 10 N·m (1.0 kgf·m , 7 lbf·ft)

Connect the thermo sensor connector.

Fill the system and bleed the air (page 6-4).





COOLANT FAN MOTOR SWITCH

INSPECTION

Check for a blown fuse before inspection.

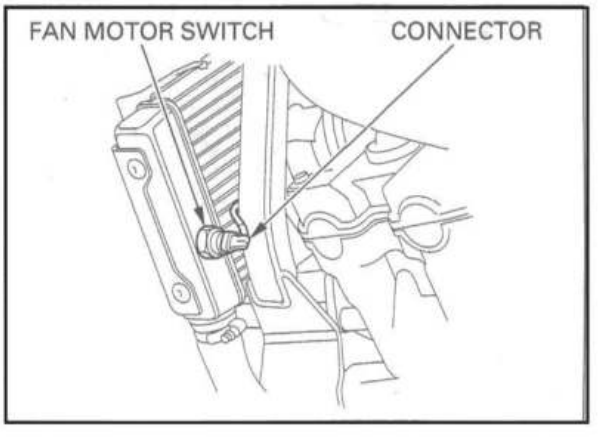
Fan motor does not stop
Turn the ignition switch OFF, disconnect the connector from the fan motor switch and turn the ignition switch ON again.

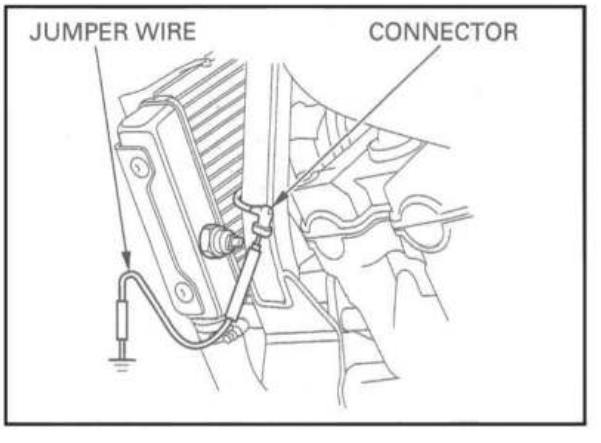
If the fan motor does not stop, check for a shorted wire between the fan motor and switch.
If the fan motor stops, replace the fan motor switch.

Fan motor does not start
Before testing, warm up the engine to operating temperature.

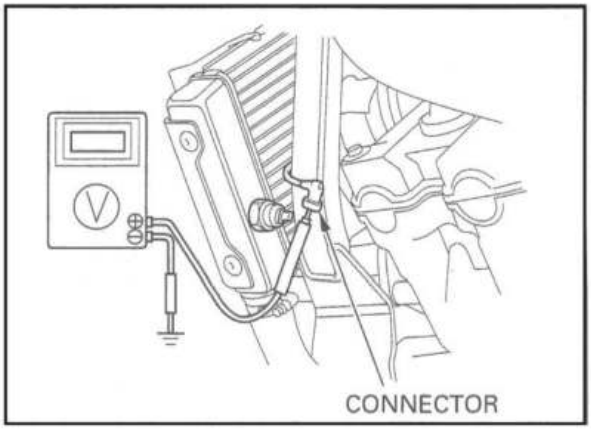
Disconnect the connector from the fan motor switch and ground the connector to the body with a jumper wire.
Turn the ignition switch ON and check the fan motor.

If the motor starts, check the connection at the fan motor switch terminal.
It is OK, replace the fan motor switch.





If the motor does not start, check for voltage between the fan motor switch connector and ground.
If battery voltage is measured, replace fan motor.
If there is no battery voltage, check for poor connection of the connector or broken wire harness.

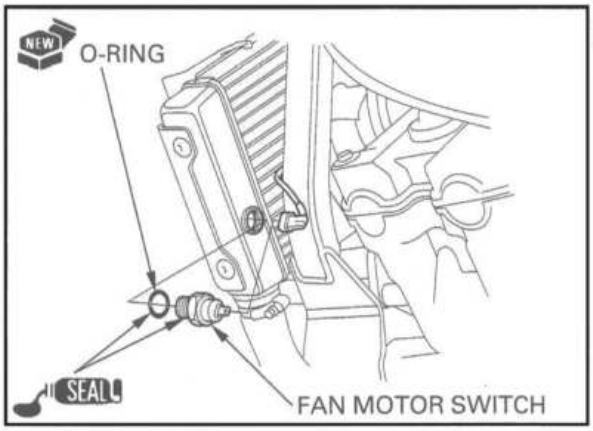


REMOVAL/INSTALLATION

Disconnect the fan motor switch connector and remove the switch.

Install a new O-ring onto the fan motor switch.
Apply sealant to the fan motor switch threads and O-ring.
Install and tighten the fan motor switch to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m , 13 lbf·ft)

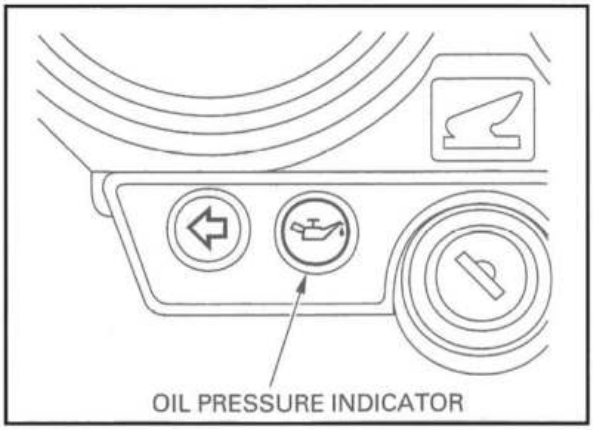


OIL PRESSURE SWITCH

INSPECTION

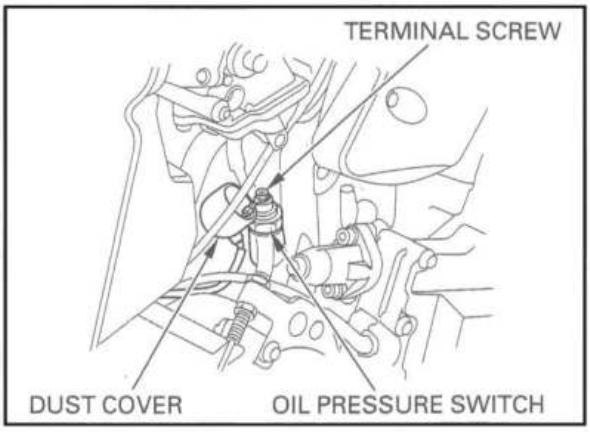
If the oil pressure warning indicator stays on while the engine running, check the engine oil level before inspection.

Make sure that the oil pressure warning indicator come on with the ignition switch ON.



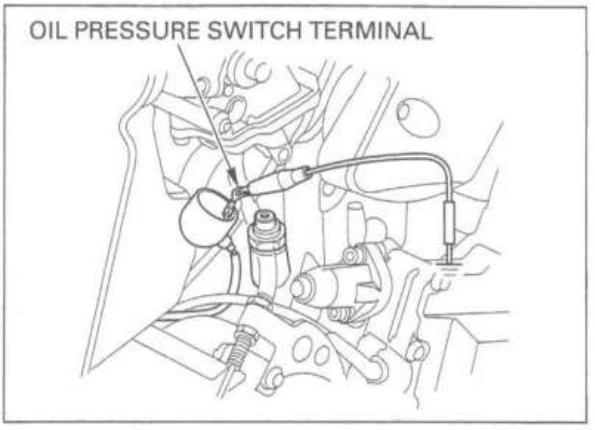
If the indicator does not come on, inspect as follow:

Remove the dust cover.
Remove the screw and oil pressure switch terminal.



Short the oil pressure switch wire terminal with the ground using a jumper wire.
The oil pressure warning indicator comes on with the ignition switch in ON.
If the light does not comes on, check the sub-fuse (10A) and wires for a loose connection or an open circuit.

Start the engine and make sure that the light goes out.
If the light does not go out, check the oil pressure (page 4-3).
If the oil pressure is normal, replace the oil pressure switch (page 4-3).



IGNITION SWITCH

INSPECTION

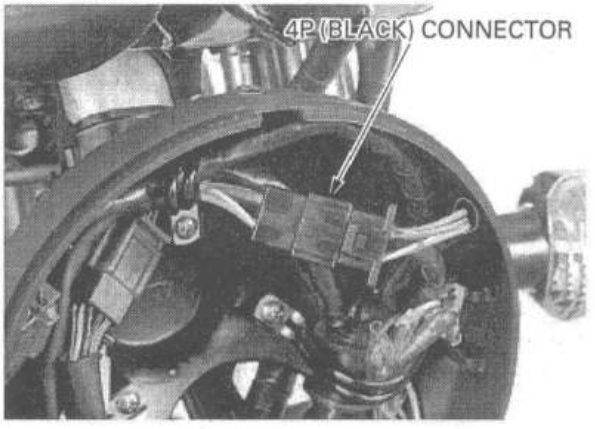
Remove the headlight unit (page 19-3).

Disconnect the ignition switch wire 4P (Black) connector.

Check for continuity between the wire terminals of the ignition switch connector in each switch position.
Continuity should exist between the color coded wires as follows:

IGNITION SWITCH

	FAN	IG	BAT1	KEY
ON	○	○	○	KEY ON
OFF				KEY OFF
LOCK				KEY OFF LOCK PIN
COLOR	Bu/O	R/Bl	R	——



REMOVAL/INSTALLATION

Remove the headlight unit (page 19-3).

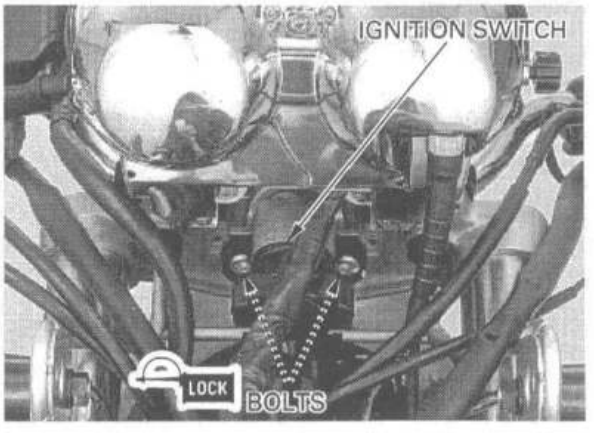
Disconnect the ignition switch wire 4P (Black) connector.
Remove the headlight case (page 19-4).

Remove the bolts and ignition switch.

Install the ignition switch in the reverse order of removal.

NOTE:

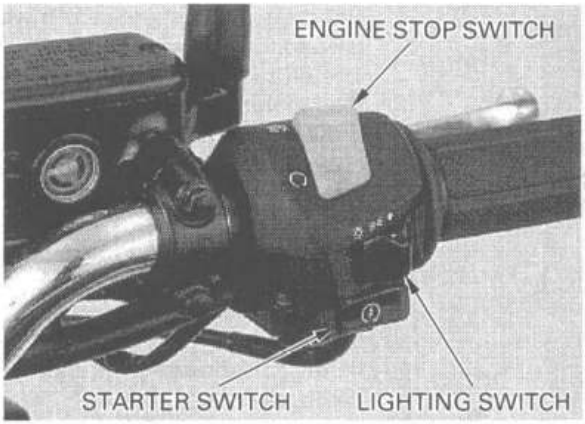
Apply a locking agent to the mounting bolt threads.



HANDLEBAR SWITCHES

Disconnect the handlebar switch connectors.

Check for continuity between the wire terminals of the handlebar switch connector.
Continuity should exist between the color coded wire terminals as follows:



ENGINE STOP SWITCH

	IG	BAT2
OFF		
RUN	○	○
COLOR	Bl	Bl/W

STARTER SWITCH (Except U type)

	ST	IG
FREE		
PUSH	○	○
COLOR	Y/R	Bl/W

STARTER SWITCH (U type)

	ST	IG	HL	HL1
FREE			○	○
PUSH	○	○		
COLOR	Y/R	Bl	Bl/R	Bu/W

LIGHTING SWITCH (Except U type)

	BAT3	TL	BAT4	HL
•				
P	○	○		
H	○	○	○	○
COLOR	Bl/Br	Br	Bl/R	Bu/W•

TURN SIGNAL SWITCH

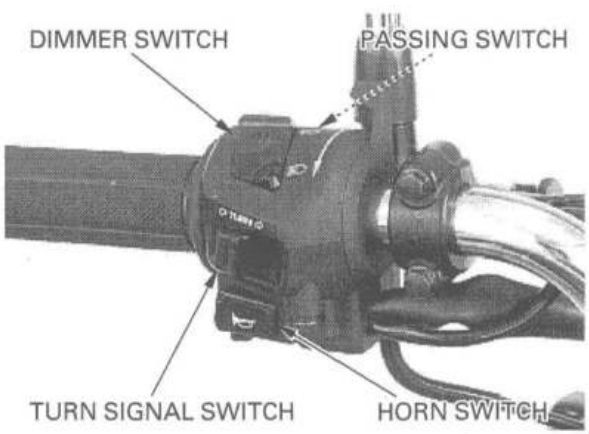
	W	R	L
R	○	○	
N			
L	○		○
COLOR	Gr	Sb	O

PASSING SWITCH

	BAT2	HI
FREE		
PUSH	○	○
COLOR	Bl/R	•

DIMMER SWITCH

	HL	Lo	HI
Lo	○	○	
(N)	○	○	○
Hi	○		○
COLOR	Bu/W•	W	Bu•



HORN SWITCH

	Ho	BAT3
FREE		
PUSH	○	○
COLOR	Lg	Bl/Br

BRAKE LIGHT SWITCH

FRONT

Disconnect the front brake light switch connectors.

There should be continuity with the brake lever applied, and there should be no continuity with the brake lever is released.

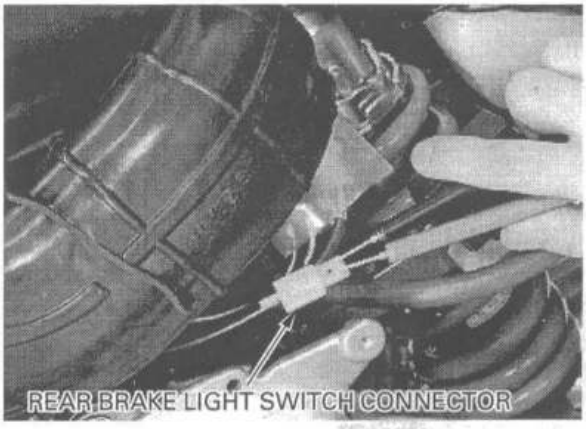


REAR

Remove the rear cowl (page 2-3).

Disconnect the rear brake light switch connectors and check for continuity between the terminals.

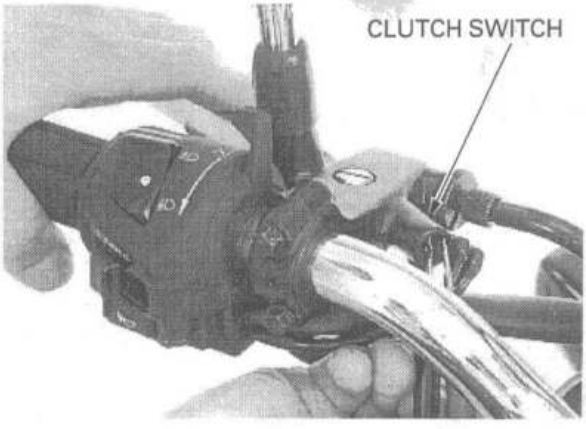
There should be continuity with the brake pedal applied, and there should be no continuity with the brake pedal is released.



CLUTCH SWITCH

Disconnect the clutch switch connectors.

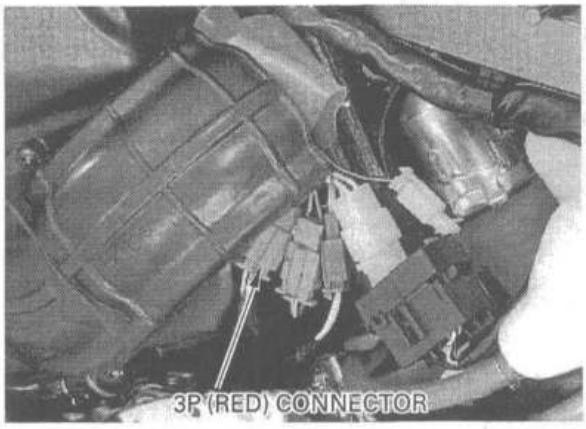
There should be continuity with the clutch lever applied, and there should be no continuity with the clutch lever is released.



NEUTRAL SWITCH

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

Disconnect the engine sub-harness 3P (Red) connector.
Shift the transmission into neutral and check for continuity between the Light Green wire terminal and ground.
There should be continuity with the transmission is in neutral, and no continuity when the transmission is into gear.

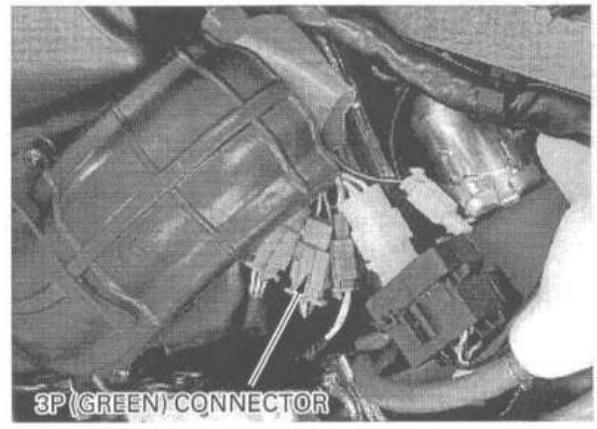


SIDE STAND SWITCH

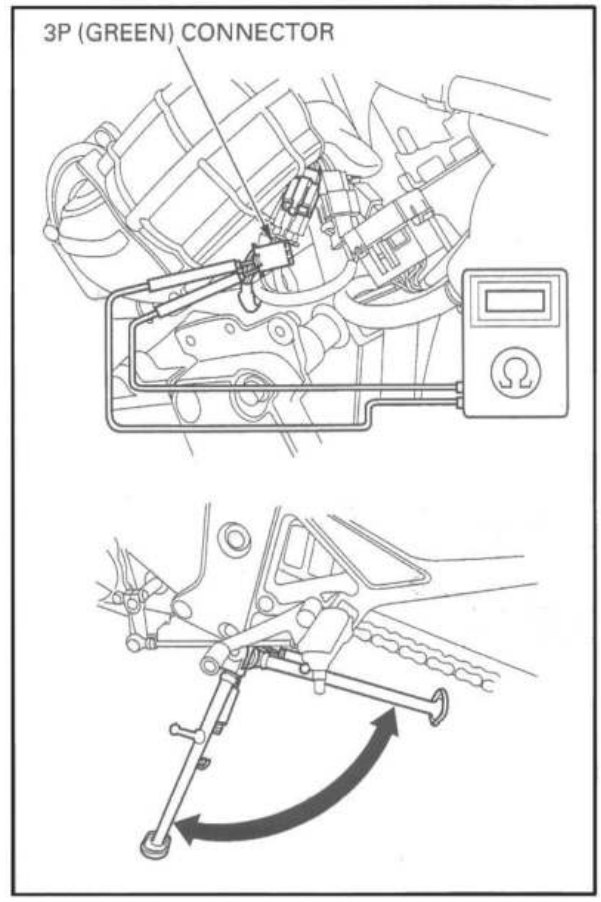
INSPECTION

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

Disconnect the side stand switch 3P (Green) connector.



Check for continuity between the wire terminals of the side stand switch connector.
There should be continuity with the side stand UP and there should be no continuity with the side stand DOWN.

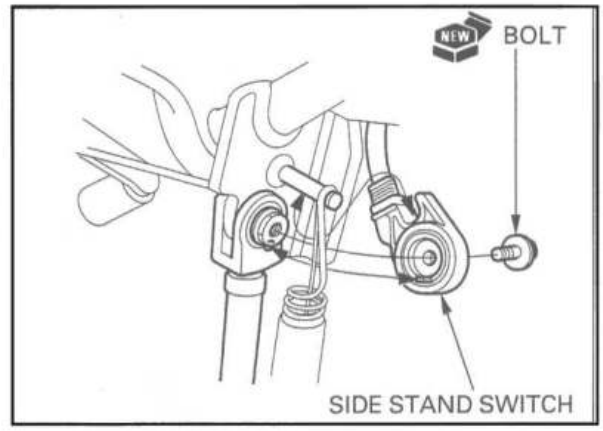


REMOVAL/INSTALLATION

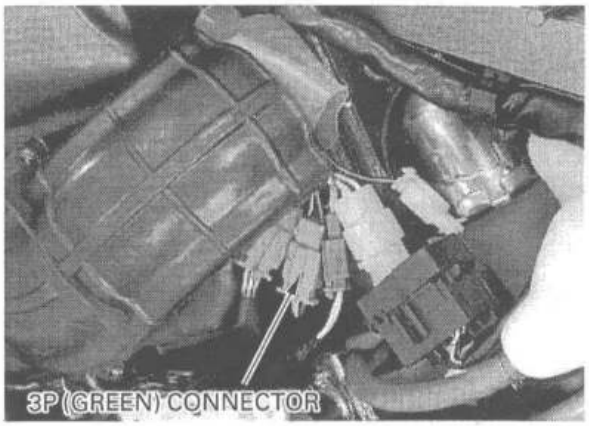
Disconnect the side stand switch 3P (Green) connector.
Remove the bolt and side stand switch.

Install the side stand switch by aligning the switch pin with the side stand hole and the switch groove with the return spring holding pin.
Install and tighten a new side stand switch bolt.

TORQUE: 10 N·m (1.0 kgf·m , 7 lbf·ft)



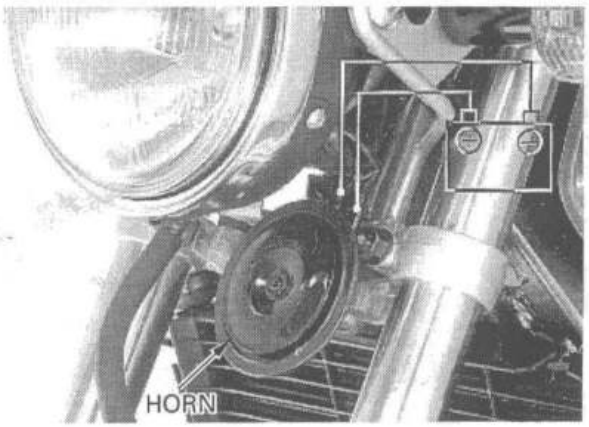
Connect the side stand switch 3P (Green) connector.



HORN

Disconnect the wire connectors from the horn.

Connect the 12 V battery to the horn terminal directly.
The horn is normal if it sounds when the 12 V battery is connected across the horn terminals.

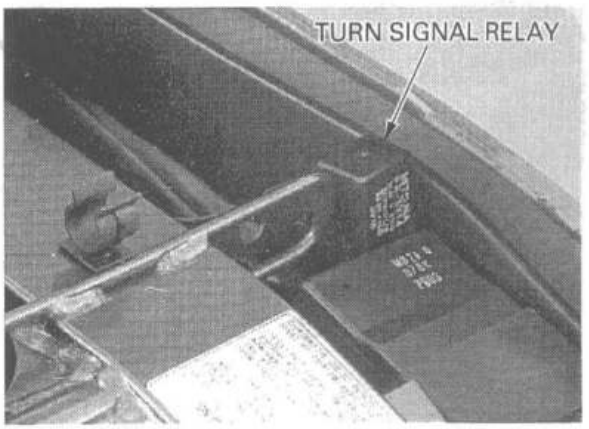


TURN SIGNAL RELAY

INSPECTION

Check the following:
- Battery condition
- Burned out bulb or non-specified wattage
- Burned fuse
- Ignition switch and turn signal switch function
- Loose connectors

If the above items are all normal, check the following:
Disconnect the turn signal connectors from the relay.



1. Short the Black/Brown and Gray terminals of the turn signal relay connector with a jumper wire. Start the engine and check the turn signal light by turning the switch ON.

↓ Light comes on

↓ Light does not come on

↓ • Broken wire harness

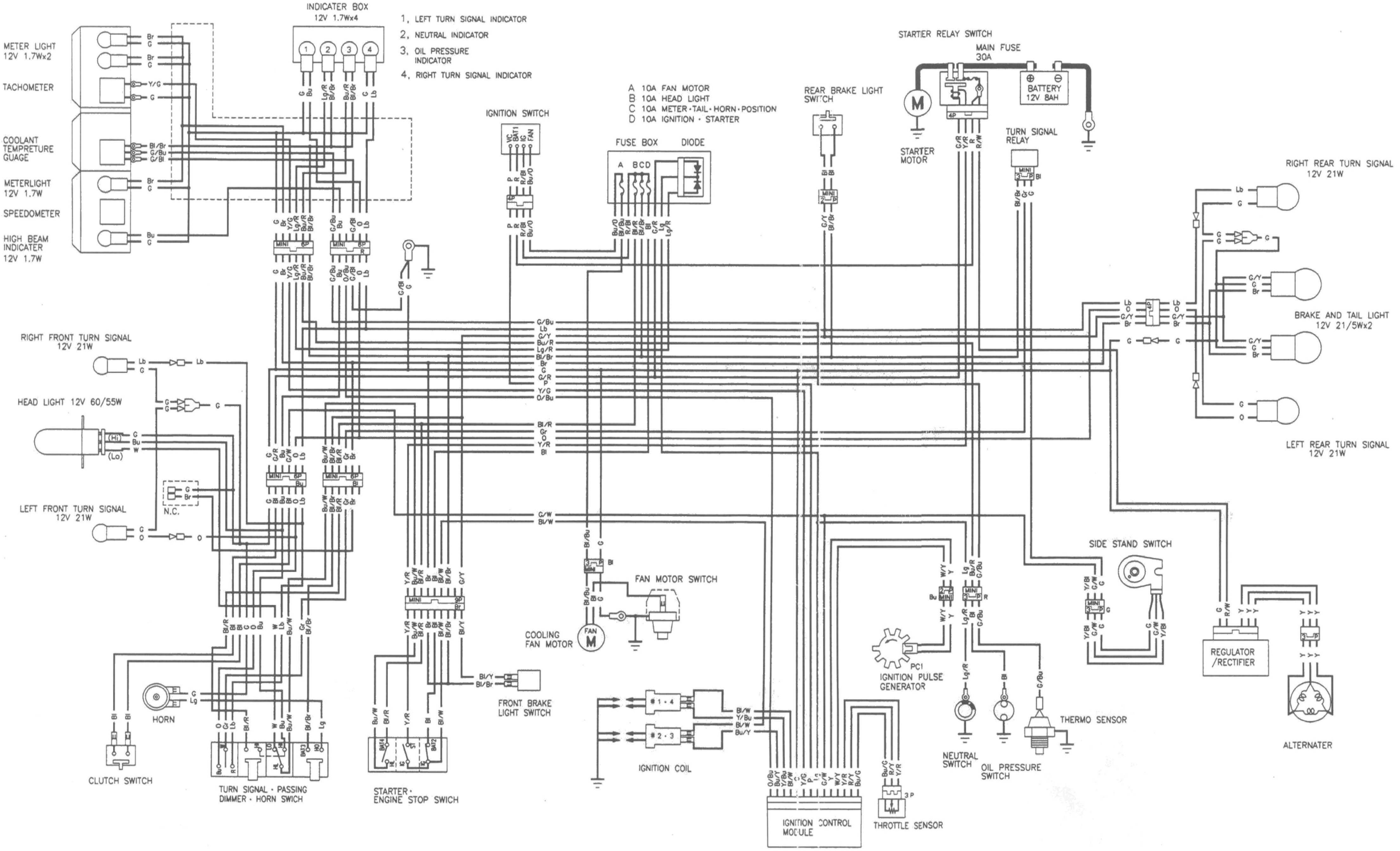
2. Check for continuity between the Green terminal of the relay connector and ground.

↓ Continuity

↓ No continuity

↓ • Broken ground wire

• Faulty turn signal relay.
• Poor connection of the connector.



SWITCH CONTINUITY

IGNTION SWITCH (OTHERS)	FAN	IG	BAT1
ON	○	○	○
OFF			
LOCK			

TURN SIGNAL SWITCH	W	R	L
R	○	○	
N			
L	○		○

PASSING SWITCH	BAT2	Hi
FREE		
PUSH	○	○

DIMMER SWITCH	HL	Lo	Hi
Lo	○		
(N)	○	○	
Hi	○		○

HORN SWITCH	HO	HAT3
FREE		
PUSH	○	○

ENGINE STOP SWITCH	BAT2	IG
↻	○	○

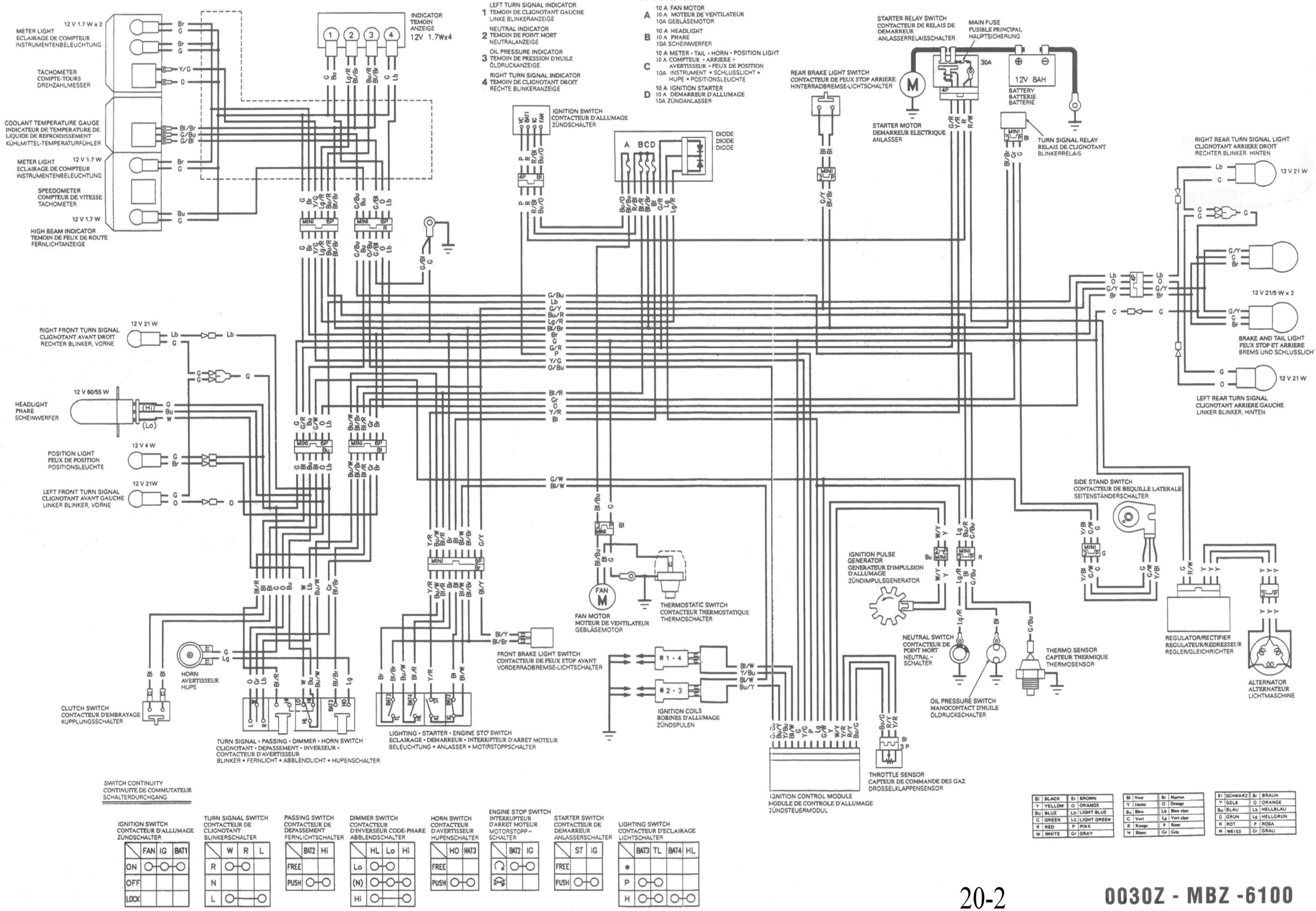
STARTER SWITCH	ST	IG	HL	HL1
FREE			○	○
PUSH	○	○		

Bl	BLACK	Br	BROWN
Y	YELLOW	O	ORANGE
Bu	BLUE	Lb	LIGHT BLUE
G	GREEN	Lg	LIGHT GREEN
R	RED	P	PINK
W	WHITE	Gr	GRAY

U TYPE:

0030Z - MBZ -6500

EXCEPT U YTPE:



21. TROUBLESHOOTING

ENGINE DOES NOT START OR IS HARD TO START	21-1	POOR PERFORMANCE AT HIGH SPEED	21-4
ENGINE LACKS POWER	21-2	POOR HANDLING	21-4
POOR PERFORMANCE AT LOW AND IDLE SPEED	21-3		

ENGINE DOES NOT START OR IS HARD TO START

		Possible cause
1. Check the fuel flow to carburetor	Not reaching carburetor	• Clogged fuel line and filter • Pinched fuel valve vacuum tube • Clogged fuel tank breather
Reaching carburetor		
2. Perform a spark test	Weak or no spark	• Faulty spark plug • Fouled spark plug • Faulty ignition control module • Broken or shorted spark plug wire • Faulty ignition switch • Faulty ignition pulse generator • Faulty engine stop switch • Loose or disconnected ignition system wires
Good spark		
3. Remove and inspect spark plugs	Wet plug	• Flooded carburetor • SE valve ON position • Throttle valve open • Air cleaner dirty
Good		
4. Start by following normal procedure	Engine starts but stops	• Improper choke operation • Carburetor incorrectly adjusted • Intake pipe leaking • Improper ignition timing (Faulty ignition coil or ignition pulse generator) • Fuel contaminated
Engine does not start		
5. Test cylinder compression	Low compression	• Valve clearance too small • Valve stuck open • Worn cylinder and piston ring • Damaged cylinder head gasket • Seized valve • Improper valve timing

ENGINE LACKS POWER

		Possible cause
1. Raise wheel off the ground and spin by hand Wheel pins freely	Wheels do not spin freely	• Brake dragging • Worn or damaged wheel bearing
2. Check tire pressure Pressure normal	Pressure low	• Faulty tire valve • Punctured tire
3. Accelerate rapidly from low to second Engine speed reduced when clutch is released	Engine speed doesn't change accordingly when clutch is released	• Clutch slipping • Worn clutch discs/plates • Warped clutch discs/plates • Weak clutch spring • Additive in engine oil
4. Accelerate lightly Engine speed increase	Engine speed does not increase	• SE valve ON position • Clogged air cleaner • Restricted fuel flow • Clogged muffler • Pinched fuel tank breather
5. Check ignition timing Correct	Incorrect	• Faulty ignition control module • Faulty ignition pulse generator
6. Test cylinder compression Normal	Incorrect	• Valve stuck open • Worn cylinder and piston rings • Leaking head gasket • Improper valve timing
7. Check carburetor for clogging Not clogged	Clogged	• Carburetor not serviced frequently enough
8. Remove spark plugs Not fouled or discolored	Fouled or discolored	• Plugs not serviced frequently enough • Spark plugs are the incorrect heat range
9. Check oil level and condition Correct	Incorrect	• Oil level too high • Oil level too low • Contaminated oil
10. Remove cylinder head cover and inspect lubrication Valve train lubricated properly	Valve train not lubricated properly	• Clogged oil passage • Clogged oil control orifice

		Possible cause
11. Check for engine overheating	Overheating	• Coolant level low • Fan motor not working (faulty fan motor switch) • Thermostat stuck close • Excessive carbon build-up in combustion chamber • Use of poor quality fuel • Clutch slipping • Lean fuel mixture • Wrong type of fuel
Not overheating		
12. Accelerate or run at high speed	Engine knocks	• Worn piston and cylinder • Wrong type of fuel • Excessive carbon build-up in combustion chamber • Ignition timing to advanced (faulty ignition control module) • Lean fuel mixture
Engine does not knock		

POOR PERFORMANCE AT LOW AND IDLE SPEED

		Possible cause
1. Check carburetor pilot screw adjustment	Incorrect	• See section 5
Correct		
2. Check for leaking intake pipe	Leaking	• Loose insulator clamps • Damaged insulator
Not leak		
3. Perform spark test	Weak or intermittent spark	• Faulty carbon or wet fouled spark plug • Faulty ignition control module • Faulty ignition coil • Broken or shorted spark plug wire • Faulty engine stop switch • Faulty ignition pulse generator • Faulty ignition switch • Loose or disconnected ignition system wires
Good spark		
4. Check ignition timing	Incorrect	• Improper ignition timing (faulty ignition control module)

POOR PERFORMANCE AT HIGH SPEED

		Possible cause
1. Disconnect fuel tube at carburetor and pump the vacuum line Fuel flows freely	Fuel flow restricted	• Clogged fuel line • Clogged fuel tank breather • Faulty fuel valve • Clogged fuel filter
2. Remove the carburetor and check for clogging Not clogged	Clogged	• Clean
3. Check valve timing Correct	Incorrect	• Cam sprocket not installed properly
4. Check ignition timing Correct	Incorrect	• Faulty ignition control module • Faulty ignition pulse generator
5. Check valve spring Not weak	Weak	• Faulty spring

POOR HANDLING

	Possible cause
1. If steering is heavy	• Steering stem adjusting nut too tight • Damaged steering head bearings
2. If either wheel is wobbling	• Excessive wheel bearing play • Bent rim • Improper installed wheel hub • Swingarm pivot bearing excessively worn • Bent frame
3. If the motorcycle pulled to one side	• Faulty shock absorber • Front and rear wheel not aligned • Bent fork • Bent swingarm • Bent axle

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