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
E	U.K.
ED	European direct sales

CODE	AREA TYPE
F	France
U	Australia

HOW TO USE THIS MANUAL

This service manual describes the service procedures for the VTR1000SP.

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. Use a vacuum cleaner or alternate method to minimize the hazard caused by air borne asbestos fibers.

⚠WARNING

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

BRAKE FLUID

CAUTION:

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

COOLANT

Under some conditions, 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

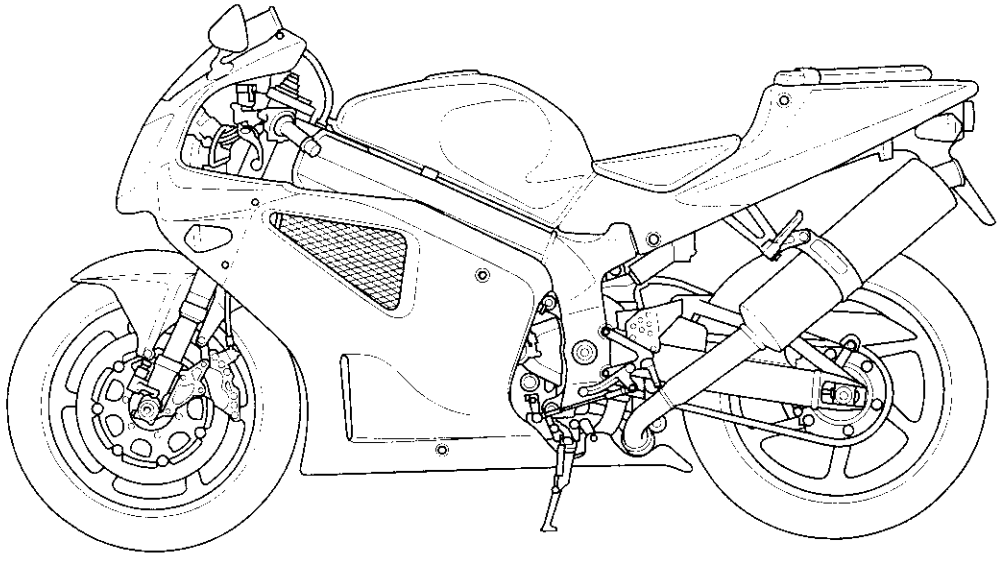
⚠WARNING

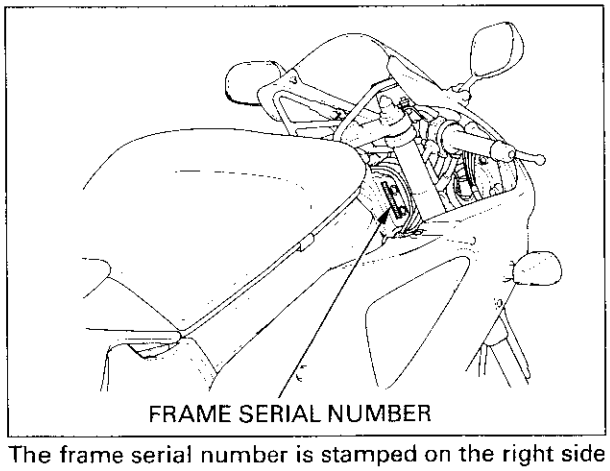
- ***The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging or using the battery in an enclosed space.***
- ***The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing 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

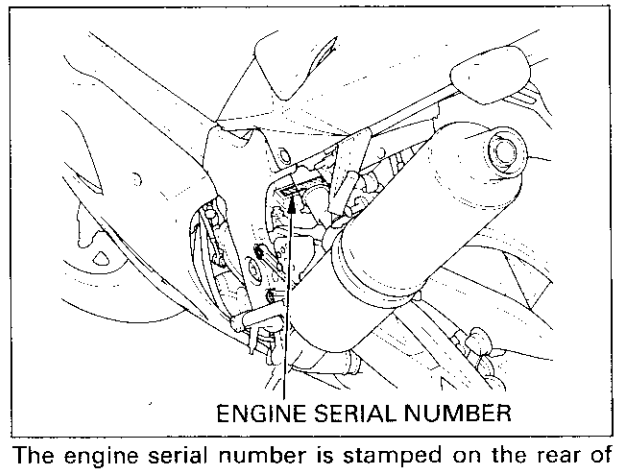
1. Use genuine HONDA or HONDA-recommended parts and lubricants or their equivalents. Parts that don't meet HONDA's design specifications may cause damage to the motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing 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 shown on pages 1-20 through 1-28, Cable & Harness Routing.

MODEL IDENTIFICATION

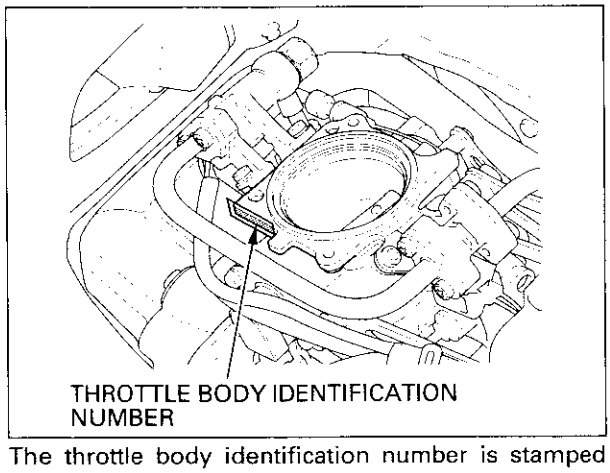




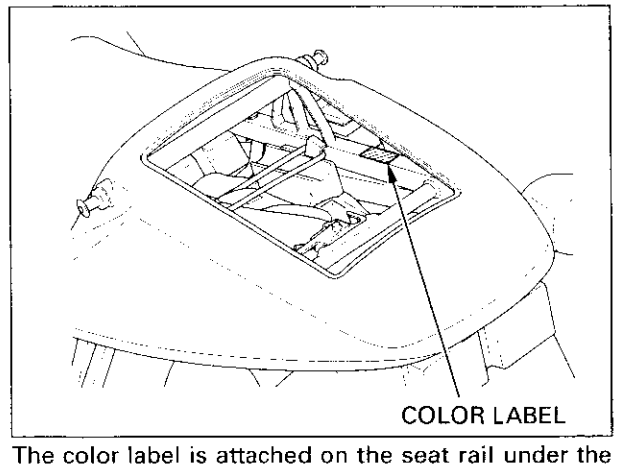
The frame serial number is stamped on the right side of the steering head.



The engine serial number is stamped on the rear of the upper crankcase.



The throttle body identification number is stamped on the left front side of the throttle body.



The color label is attached on the seat rail under the seat. When ordering color-coded parts, always specify the designated color code.

SPECIFICATIONS

GENERAL

ITEM		SPECIFICATIONS
DIMENSIONS	Overall length	2,025 mm (79.7 in)
	Overall width	725 mm (28.5 in)
	Overall height	1,120 mm (44.1 in)
	Wheelbase	1,410 mm (55.5 in)
	Seat height	815 mm (32.1 in)
	Footpeg height	384 mm (15.1 in)
	Ground clearance	135 mm (5.3 in)
	Dry weight	199 kg (439 lbs)
	Curb weight	222 kg (489 lbs)
	Maximum weight capacity	180 kg (397 lbs)
FRAME	Frame type	Diamond
	Front suspension	Telescopic fork
	Front axle travel	118 mm (4.6 in)
	Front fork stroke	130 mm (5.1 in)
	Rear suspension	Swingarm
	Rear axle travel	120 mm (4.7 in)
	Front tire size	120/70ZR17 (58W)
	Rear tire size	190/50ZR17 (73W)
	Front tire brand	D207FR (DUNLOP), MEZ3H FRONT RACING (METZELER)
	Rear tire brand	D207P (DUNLOP), MEZ3H RACING (METZELER)
	Front brake	Hydraulic double disc
	Rear brake	Hydraulic single disc
	Caster angle	24°30'
	Trail length	101 mm (4.0 in)
	Fuel tank capacity	18.0 ℓ (4.76 US gal , 3.96 Imp gal)
ENGINE	Cylinder arrangement	2 cylinders 90° V transverse
	Bore and stroke	100.0 × 63.6 mm (3.90 × 2.50 in)
	Displacement	999 cm^3 (60.9 cu-in)
	Compression ratio	10.8 : 1
	Valve train	Gear driven, DOHC
	Intake valve opens	20° BTDC (At 1 mm lift)
	Intake valve closes	50° ABDC (At 1 mm lift)
	Exhaust valve opens	50° BBDC (At 1 mm lift)
	Exhaust valve closes	20° ATDC (At 1 mm lift)
	Lubrication system	Forced pressure and wet sump
	Oil pump type	Trochoid
	Cooling system	Liquid cooled
	Air filtration	Paper element
	Engine dry weight	70.5 kg (155.4 lbs)
	Firing order	Front – 270° – Rear – 450° – Front

GENERAL (Cont'd)

ITEM		SPECIFICATIONS
CARBURETION	Type	Programmed Fuel Injection (PGM-FI)
	Throttle bore	54 mm (2.1 in)
DRIVE TRAIN	Clutch system	Multi-plate, wet
	Clutch operation system	Hydraulic operating
	Transmission	Constant mesh, 6-speeds
	Primary reduction	1.700 (68/40)
	Final reduction	2.500 (40/16)
	Gear ratio 1st	2.461 (32/13)
	2nd	1.812 (29/16)
	3rd	1.428 (30/21)
	4th	1.240 (31/25)
	5th	1.080 (27/25)
	6th	0.962 (25/26)
	Gearshift pattern	Left foot operated return system, 1−N−2−3−4−5−6
ELECTRICAL	Ignition system	Computer-controlled digital transitorized
	Starting system	Electric starter motor
	Charging system	Triple phase output alternator
	Regulator/rectifier	SCR shorted, triple phase full wave rectification
	Lighting system	Battery

LUBRICATION

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	3.5 ℓ (3.7 US qt , 3.1 Imp qt)	———
	After draining/filter change	3.9 ℓ (4.1 US qt , 3.4 Imp qt)	———
	After disassembly	4.3 ℓ (4.5 US qt , 3.8 Imp qt)	———
Recommended engine oil		Honda 4-stroke oil or equivalent motor oil API service classification SE, SF or SG Viscosity: SAE 10W-40	———
Oil pressure (at oil filter)		431 kPa (4.4 kgf/cm², 63 psi) at 5,000 min⁻¹ (rpm)/80°C (176°F)	———
Oil pump	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.21 (0.006 – 0.008)	0.35 (0.014)
	Side clearance	0.02 – 0.09 (0.001 – 0.004)	0.12 (0.005)

FUEL SYSTEM (Programmed Fuel Injection)

ITEM	SPECIFICATIONS
Throttle body identification number	GQ50A
Base starter valve for synchronization	Rear
Idle speed	1,300 ± 100 min⁻¹ (rpm)
Throttle grip free play	2 – 6 (1/16 – 1/4)
Intake air temperature sensor resistance (at 20°C/68°F)	1 – 4 kΩ
Engine coolant temperature sensor resistance (at 20°C/68°F)	2.3 – 2.6 kΩ
Fuel injector resistance (at 20°C/68°F)	11.1 – 12.3 Ω
Cam pulse generator peak voltage	0.7 V minimum
Ignition pulse generator peak voltage	0.7 V minimum
Manifold absolute pressure at idle	200 – 250 mm Hg (7.9 – 9.8 in Hg)
Fuel pressure at idle	343 kPa (3.5 kgf/cm², 50 psi)
Fuel pump flow (at 12 V)	190 cm³ (6.4 US oz , 6.7 Imp oz) minimum/10 seconds

COOLING SYSTEM

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	2.5 ℓ (2.6 US qt , 2.2 Imp qt)
	Reserve tank	0.43 ℓ (0.45 US qt , 0.38 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/VALVE

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression at 350 min^{-1} (rpm)			1,216 kPa (12.4 kgf/cm^2, 176 psi)	———
Valve clearance		IN	0.16 (0.006)	———
		EX	0.31 (0.012)	———
Camshaft	Cam lobe height	IN	39.180 – 39.340 (1.5425 – 1.5488)	38.880 (1.5307)
		EX	38.730 – 38.890 (1.5248 – 1.5311)	38.430 (1.5130)
	Runout		———	0.05 (0.002)
	Oil clearance		0.020 – 0.062 (0.0008 – 0.0024)	0.100 (0.0039)
Valve lifter	Valve lifter O.D.		33.978 – 33.993 (1.3377 – 1.3383)	33.97 (1.337)
	Valve lifter bore I.D.		34.010 – 34.026 (1.3390 – 1.3396)	34.04 (1.340)
Valve, Valve guide	Valve stem O.D.	IN	5.975 – 5.990 (0.2352 – 0.2358)	5.965 (0.2348)
		EX	5.965 – 5.980 (0.2348 – 0.2354)	5.955 (0.2344)
	Valve guide I.D.	IN/EX	6.000 – 6.012 (0.2362 – 0.2367)	6.040 (0.2378)
	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		14.0 – 14.2 (0.55 – 0.56)	———
	Valve seat width	IN	1.1 – 1.3 (0.04 – 0.05)	1.7 (0.07)
		EX	1.3 – 1.5 (0.05 – 0.06)	1.9 (0.07)
Valve spring	Free length	Inner	41.0 (1.61)	40.0 (1.57)
		Outer	45.8 (1.80)	44.8 (1.76)
Cylinder head warpage			———	0.10 (0.004)

CLUTCH/GEARSHIFT LINKAGE

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Specified clutch fluid		DOT 4 brake fluid	———
Clutch master cylinder	Cylinder I.D.	12.700 – 12.743 (0.5000 – 0.5017)	12.755 (0.5022)
	Piston O.D.	12.657 – 12.684 (0.4983 – 0.4994)	12.645 (0.4978)
Clutch	Spring free length	60.9 (2.40)	57.9 (2.28)
	Disc thickness	3.72 – 3.88 (0.146 – 0.153)	3.5 (0.14)
	Plate warpage	———	0.30 (0.012)
Clutch outer guide	I.D.	28.000 – 28.021 (1.1024 – 1.1032)	28.031 (1.1036)
	O.D.	34.997 – 35.013 (1.3778 – 1.3785)	34.987 (1.3774)
Mainshaft O.D. at clutch outer guide		27.980 – 27.993 (1.1016 – 1.1021)	27.970 (1.1012)

ALTERNATOR/STARTER CLUTCH

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter driven gear boss O.D.	57.749 – 57.768 (2.2736 – 2.2743)	57.639 (2.2692)
Torque limiter slip torque	53 – 84 N·m (5.4 – 8.6 kgf·m, 39 – 62 lbf·ft)	———

CRANKCASE/TRANSMISSION

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Shift fork	I.D.	Left, Right	12.000 – 12.021 (0.4724 – 0.4733)	12.03 (0.474)
		Center	12.000 – 12.018 (0.4724 – 0.4731)	12.03 (0.474)
	Claw thickness		5.93 – 6.00 (0.233 – 0.236)	5.9 (0.23)
Shift fork shaft	O.D.		11.957 – 11.968 (0.4707 – 0.4712)	11.95 (0.470)
Transmission	Gear I.D.	M5	31.000 – 31.025 (1.2205 – 1.2215)	31.05 (1.222)
		M6	31.000 – 31.016 (1.2205 – 1.2211)	31.04 (1.222)
		C2, C3, C4	33.000 – 33.025 (1.2992 – 1.3002)	33.05 (1.301)
	Gear bushing O.D.	M5, M6	30.955 – 30.980 (1.2187 – 1.2197)	30.93 (1.218)
		C2	32.955 – 32.980 (1.2974 – 1.2984)	32.93 (1.296)
		C3, C4	32.950 – 32.975 (1.2972 – 1.2982)	32.93 (1.296)
	Gear-to-bushing clearance	M5	0.020 – 0.070 (0.0008 – 0.0028)	0.11 (0.004)
		M6	0.020 – 0.061 (0.0008 – 0.0024)	0.10 (0.004)
		C2	0.020 – 0.070 (0.0008 – 0.0028)	0.11 (0.004)
		C3, C4	0.025 – 0.075 (0.0010 – 0.0030)	0.11 (0.004)
	Gear bushing I.D.	M5	27.985 – 28.006 (1.1018 – 1.1026)	28.02 (1.103)
		C2	29.985 – 30.006 (1.1805 – 1.1813)	30.02 (1.182)
	Mainshaft O.D.	at M5	27.967 – 27.980 (1.1011 – 1.1016)	27.94 (1.100)
	Countershaft O.D.	at C2	29.950 – 29.975 (1.1791 – 1.1801)	29.92 (1.178)
	Bushing-to-shaft clearance	M5	0.005 – 0.039 (0.0002 – 0.0015)	0.06 (0.002)
		C2	0.010 – 0.056 (0.0004 – 0.0022)	0.06 (0.002)

CRANKSHAFT/PISTON/CYLINDER

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod side clearance		0.10 – 0.30 (0.004 – 0.012)	0.40 (0.016)
	Crankpin bearing oil clearance		0.032 – 0.050 (0.0013 – 0.0020)	0.060 (0.0024)
	Main journal bearing oil clearance		0.020 – 0.038 (0.0008 – 0.0015)	0.048 (0.0019)
	Runout		———	0.10 (0.004)
Piston, piston pin, piston ring	Piston O.D. at 10 (0.4) form bottom		99.970 – 99.990 (3.9358 – 3.9366)	99.900 (3.9331)
	Piston pin hole I.D.		23.002 – 23.008 (0.9056 – 0.9058)	23.03 (0.907)
	Piston pin O.D.		22.994 – 23.000 (0.9053 – 0.9055)	22.984 (0.9049)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.046 (0.0018)
	Piston rig end gap	Top	0.20 – 0.30 (0.008 – 0.012)	0.45 (0.018)
		Second	0.30 – 0.40 (0.012 – 0.016)	0.55 (0.022)
		Oil (side rail)	0.10 – 0.50 (0.004 – 0.020)	0.65 (0.026)
	Piston ring-to-ring groove clearance	Top	0.065 – 0.100 (0.0026 – 0.0039)	0.115 (0.0045)
		Second	0.035 – 0.070 (0.0014 – 0.0028)	0.085 (0.0033)
Cylinder	I.D.		100.005 – 100.025 (3.9372 – 3.9380)	100.100 (3.9409)
	Out of round		———	0.10 (0.004)
	Taper		———	0.10 (0.004)
	Warpage		———	0.05 (0.002)
Cylinder-to-piston clearance			0.015 – 0.055 (0.0006 – 0.0022)	0.200 (0.0079)
Connecting rod small end I.D.			23.020 – 23.041 (0.9063 – 0.9071)	23.051 (0.9075)
Connecting rod-to-piston pin clearance			0.020 – 0.047 (0.0008 – 0.0019)	0.067 (0.0026)

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)
Wheel balance weight		—	60 g (2.1 oz) max.
Fork	Spring free length	255.6 (10.06)	250.5 (9.86)
	Tube runout	—	0.20 (0.008)
	Recommended fluid	Fork fluid	—
	Fluid level	135 (5.3)	—
	Fluid capacity	513 ± 2.5 cm³ (17.3 ± 0.08 US oz, 18.1 ± 0.09 Imp oz)	—
Steering head bearing preload		1.4–2.1 kgf (3.1–4.6 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)
Wheel balance weight		—	60 g (2.1 oz) max.

HYDRAULIC BRAKE

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Front	Specified brake fluid		DOT 4	—
	Brake disc thickness		4.4–4.6 (0.17–0.18)	3.5 (0.14)
	Brake disc runout		—	0.30 (0.012)
	Master cylinder I.D.		19.050–19.093 (0.7500–0.7517)	19.105 (0.7522)
	Master piston O.D.		19.018–19.043 (0.7487–0.7497)	19.006 (0.7483)
	Caliper cylinder I.D.	A	33.96–34.01 (1.337–1.339)	34.02 (1.339)
		B	32.030–32.080 (1.2610–1.2630)	32.090 (1.2634)
	Caliper piston O.D.	A	33.878–33.928 (1.3338–1.3357)	33.87 (1.333)
		B	31.948–31.998 (1.2578–1.2598)	31.94 (1.257)
Rear	Specified brake fluid		DOT 4	—
	Brake disc thickness		4.8–5.2 (0.19–0.20)	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		12 V−10 AH
	Current leakage		0.1 mA max.
	Voltage (20°C/68°F)	Fully charged	13.0−13.2 V
		Needs charging	Below 12.3 V
	Charging current	Normal	1.2 A × 5−10 h
		Quick	5.0 A × 1.0 h
Alternator	Capacity		0.329 kW/5,000 min^{-1} (rpm)
	Charging coil resistance (20°C/68°F)		0.2−0.5 Ω

IGNITION SYSTEM

ITEM		SPECIFICATIONS
Spark plug	Standard	FR9BI-11 (NGK) , IK27C11 (DENSO)
	For cold climate (below 5°C/41°F)	FR8BI-11 (NGK) , IK24C11 (DENSO)
Spark plug gap		1.00−1.10 mm (0.039−0.043 in)
Ignition coil primary peak voltage		100 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Ignition timing ("F" mark)		15° BTDC at idle

Unit: mm (in)

ELECTRIC STARTER

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	12.0−13.0 (0.47−0.51)	6.5 (0.26)

LIGHTS/METERS/SWITCHES

ITEM		SPECIFICATIONS
Bulbs	Headlight (High beam)	12 V−55 W
	Headlight (Low beam)	12 V−55 W
	Position light (Except U type)	12 V−5 W × 2
	Brake/taillight	12 V−21/5 W × 2
	Turn signal light	12 V−21 W × 4
Fuse	Main fuse	30 A
	FI fuse	30 A
	Sub-fuse	10 A × 5, 20 A × 1
Thermosensor resistance	At 80°C (176°F)	47−57 Ω
	At 120°C (248°F)	14−18 Ω
Fan motor switch	Starts to close (ON)	98−102 °C (208−216 °F)
	Stop to open (OFF)	93−97 °C (199−207 °F)

TORQUE VALUES

STANDARD

FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)	FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)
5 mm bolt and nut	5 (0.5 , 3.6)	5 mm screw	4 (0.4 , 2.9)
6 mm bolt and nut	10 (1.0 , 7)	6 mm screw	9 (0.9 , 6.5)
8 mm bolt and nut	22 (2.2 , 16)	6 mm flange bolt (8 mm head, small flange)	10 (1.0 , 7)
10 mm bolt and nut	34 (3.5 , 25)	6 mm flange bolt (8 mm head, large flange)	12 (1.2 , 9)
12 mm bolt and nut	54 (5.5 , 40)	6 mm flange bolt (10 mm head) and nut	12 (1.2 , 9)
		8 mm flange bolt and nut Engine	23 (2.3 , 17)
		Frame	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 locking agent to the threads.
3. Plastic region torque bolt; replace with a new one
4. Stake.
5. Apply oil to the threads and seating surface.
6. Apply oil to the O-ring.
7. U-nut.
8. ALOC bolt/screw: replace with a new one.
9. Apply grease to the threads.

ENGINE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
MAINTENANCE:				
Spark plug	2	14	18 (1.8 , 13)	
Crankshaft hole cap	1	30	15 (1.5 , 11)	NOTE 9
Timing hole cap	1	14	10 (1.0 , 7)	NOTE 9
Engine oil filter cartridge	1	20	25 (2.6 , 19)	NOTE 5, 6
Engine oil drain bolt	1	12	29 (3.0 , 22)	
LUBRICATION SYSTEM:				
Oil pump bolt	1	6	8 (0.8 , 5.8)	
FUEL SYSTEM (Programmed Fuel Injection):				
Throttle body insulator band bolt	4	5	1 (0.1 , 0.7)	
PAIR check valve cover bolt	4	5	5 (0.5 , 3.6)	NOTE 2
Pressure regulator nut	1	18	27 (2.8 , 20)	
Pipe stay bolt	8	5	5 (0.5 , 3.6)	
Fuel feed pipe bolt	12	5	5 (0.5 , 3.6)	
Starter valve nut	2	10	2 (0.2 , 1.4)	
Throttle stop screw cable stay screw	2	4	2 (0.2 , 1.4)	
MAP sensor stay screw	2	5	3 (0.3 , 2.2)	
Throttle cable stay screw	2	5	3 (0.3 , 2.2)	
ENGINE MOUNTING:				
Drive sprocket bolt	1	10	54 (5.5 , 40)	
CYLINDER HEAD/VALVE:				
Cylinder head cover bolt	6	6	10 (1.0 , 7)	
Camshaft holder bolt	16	7	23 (2.3 , 17)	NOTE 5
Cylinder head bolt	8	11	64 (6.5 , 47)*	NOTE 5
Cam gear train setting bolt	2	8	25 (2.5 , 18)	
Cam gear train mounting bolt	8	6	12 (1.2 , 9)	
Cylinder head sealing bolt	2	14	18 (1.8 , 13)	NOTE 2

*Torque for new bolt; 70 N·m (7.1 kgf·m , 51 lbf·ft) for used bolt.

ENGINE (Cont'd)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
CLUTCH/GEARSHIFT LINKAGE:				
Clutch slave cylinder bleed valve	1	8	9 (0.9 , 6.5)	
Clutch bolt	6	6	12 (1.2 , 9)	
Clutch center lock nut	1	25	127 (13.0 , 94)	NOTE 4, 5
Oil pump driven sprocket bolt	1	6	15 (1.5 , 11)	NOTE 2
Gearshift cam bolt	1	8	23 (2.3 , 17)	NOTE 2
Shift drum stopper arm pivot bolt	1	6	12 (1.2 , 9)	
Gearshift spindle return spring pin	1	8	23 (2.3 , 17)	
Primary drive gear bolt	1	12	88 (9.0 , 65)	NOTE 5
Right crankcase cover sealing bolt	1	8	23 (2.3 , 17)	NOTE 2
Clutch cover plate bolt	1	6	12 (1.2 , 9)	NOTE 2
ALTERNATOR/STARTER CLUTCH:				
Flywheel bolt	1	12	157 (16.0 , 116)	NOTE 5
Starter clutch bolt	6	8	23 (2.3 , 17)	NOTE 2
Alternator stator bolt	3	6	12 (1.2 , 9)	
CRANKCASE/TRANSMISSION:				
Crankcase flange bolt	3	10	39 (4.0 , 29)	NOTE 5
Crankcase special bolt (black)	4	10	52 (5.3 , 38)	NOTE 5
Crankcase special bolt (gray)	4	10	20 (2.0 , 14) + 120°	NOTE 3, 5
Shift drum bearing washer/bolt	2	6	12 (1.2 , 9)	NOTE 2
Crankcase sealing bolt	1	14	18 (1.8 , 13)	NOTE 2
CRANKSHAFT/PISTON/CYLINDER:				
Connecting rod bolt	4	9	29 (3.0 , 22) + 120°	NOTE 3, 5
Oil jet	2	5	2 (0.2 , 1.4)	NOTE 2
IGNITION SYSTEM:				
Ignition pulse generator bolt	2	6	12 (1.2 , 9)	NOTE 2
ELECTRIC STARTER:				
Starter motor terminal nut	1	6	10 (1.0 , 7)	
LIGHTS/METERS/SWITCHES:				
Neutral switch	1	10	12 (1.2 , 9)	
Engine coolant temperature (ECT)/thermosensor	1	12	23 (2.3 , 17)	
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)	

FRAME

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
FRAME/BODY PANELS/EXHAUST SYSTEM:				
Lower fairing-to-upper fairing bolt	6	5	2 (0.2 , 1.4)	
Lower inner fairing-to-lower fairing bolt	2	5	2 (0.2 , 1.4)	
Wind screen attaching bolt	6	5	2 (0.2 , 1.4)	
Exhaust pipe joint nut	4	7	12 (1.2 , 9)	
Muffler band bolt	4	8	26 (2.7 , 20)	
Driver footpeg bracket bolt	4	8	26 (2.7 , 20)	
Passenger footpeg bracket bolt	4	8	26 (2.7 , 20)	
Seat rail mounting bolt	4	10	44 (4.5 , 33)	
FUEL SYSTEM:				
Fuel feed hose banjo bolt	1	12	22 (2.2 , 16)	
Fuel feed hose nut	1	12	22 (2.2 , 16)	
Fuel pump unit mounting nut	7	6	12 (1.2 , 9)	
Fuel fill cap mounting bolt	3	4	2 (0.2 , 1.4)	
ENGINE MOUNTING:				
Center engine hanger bolt	2	12	64 (6.5 , 47)	
Front/rear upper engine hanger nut	2	12	64 (6.5 , 47)	
Rear lower engine hanger nut	1	10	39 (4.0 , 29)	
Front engine hanger adjusting bolt	1	20	4 (0.4 , 2.9)	
Center/rear engine hanger adjusting bolt	3	20	10 (1.0 , 7)	
Engine hanger adjusting bolt lock nut	4	20	54 (5.5 , 40)	
CLUTCH/GEARSHIFT LINKAGE:				
Clutch reservoir mounting screw	1	4	2 (0.2 , 1.4)	NOTE 2
Clutch reservoir cap stopper plate screw	1	4	1 (0.1 , 0.7)	
Clutch lever pivot bolt	1	6	1 (0.1 , 0.7)	
Clutch lever pivot nut	1	6	6 (0.6 , 4.3)	
Clutch hose oil bolt	2	10	34 (3.5 , 25)	
FRONT WHEEL/SUSPENSION/STEERING:				
Handlebar weight mounting screw	2	6	10 (1.0 , 7)	NOTE 8
Front axle bolt	1	14	59 (6.0 , 43)	
Front axle holder bolt	4	8	22 (2.2 , 16)	
Front brake disc bolt	12	6	20 (2.0 , 14)	NOTE 8
Fork cap	2	46	34 (3.5 , 25)	
Fork center bolt	2	22	34 (3.5 , 25)	
Fork top bridge pinch bolt	2	8	26 (2.7 , 20)	
Fork bottom bridge pinch bolt	4	8	26 (2.7 , 20)	
Front brake hose clamp nut (front fender side)	2	6	10 (1.0 , 7)	
Front brake caliper bracket bolt	4	10	49 (5.0 , 36)	NOTE 2
Steering stem nut	1	24	103 (10.5 , 76)	Page 13-29
Steering bearing adjustment nut	1	26	32 (3.3 , 24)	
Steering bearing adjustment nut lock nut	1	26		
Front brake hose clamp bolt (stem side)	1	6	10 (1.0 , 7)	
Front brake hose 3-way joint bolt	1	6	10 (1.0 , 7)	
REAR WHEEL/SUSPENSION:				
Rear axle nut	1	22	127 (13.0 , 94)	
Rear brake disc bolt	4	8	42 (4.3 , 31)	NOTE 8
Final driven sprocket nut	6	10	64 (6.5 , 47)	
Shock absorber upper mounting nut	1	10	44 (4.5 , 33)	NOTE 7
Shock absorber lower mounting nut	1	10	44 (4.5 , 33)	NOTE 7
Shock arm-to-swingarm nut	1	10	44 (4.5 , 33)	NOTE 7
Shock arm-to-shock link nut	1	10	44 (4.5 , 33)	NOTE 7
Shock link-to-frame nut	1	10	44 (4.5 , 33)	NOTE 7
Swingarm pivot adjusting bolt	2	36	15 (1.5 , 11)	
Swingarm pivot adjusting bolt lock nut	2	36	64 (6.5 , 47)	
Swingarm pivot nut	1	22	127 (13.0 , 94)	NOTE 7
Drive chain slider bolt	2	6	9 (0.9 , 6.5)	NOTE 2
Rear brake hose clamp bolt	1	6	12 (1.2 , 9)	NOTE 2

FRAME (Cont'd)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
HYDRAULIC BRAKE:				
Brake caliper bleed valve	3	8	6 (0.6 , 4.3)	
Rear brake reservoir cap screw	2	4	2 (0.2 , 1.4)	
Rear brake caliper pad pin plug	1	10	3 (0.3 , 2.2)	
Pad pin	3	10	18 (1.8 , 13)	
Brake hose oil bolt	5	10	34 (3.5 , 25)	
Front brake lever pivot bolt	1	6	1 (0.1 , 0.7)	
Front brake lever pivot nut	1	6	6 (0.6 , 4.3)	
Front brake reservoir mounting nut	1	6	6 (0.6 , 4.3)	NOTE 7
Front brake reservoir stay bolt	1	6	12 (1.2 , 9)	
Front brake light switch screw	1	4	1 (0.1 , 0.7)	
Front master cylinder holder bolt	2	6	12 (1.2 , 9)	
Rear brake reservoir mounting bolt	1	6	9 (0.9 , 6.5)	
Rear master cylinder mounting bolt	2	6	10 (1.0 , 7)	
Rear master cylinder joint nut	1	8	18 (1.8 , 13)	
Rear brake reservoir hose joint screw	1	4	2 (0.2 , 1.4)	NOTE 2
Front brake caliper mounting bolt	4	8	30 (3.1 , 22)	NOTE 2
Front brake caliper assembly bolt	8	8	23 (2.3 , 17)	NOTE 2
Rear brake caliper bolt	1	8	23 (2.3 , 17)	
Rear brake caliper pin bolt	1	12	27 (2.8 , 20)	
LIGHTS/METERS/SWITCHES:				
Side stand switch bolt	1	6	10 (1.0 , 7)	
Ignition switch mounting bolt	2	8	25 (2.5 , 18)	
Fan motor switch	1	16	18 (1.8 , 13)	
OTHERS:				
Side stand pivot bolt	1	10	10 (1.0 , 7)	
Side stand pivot lock nut	1	10	29 (3.0 , 22)	
Side stand bracket bolt	2	10	44 (4.5 , 33)	NOTE 8
Bank sensor bolt	2	6	10 (1.0 , 7)	
Gearshift pedal pivot bolt	1	8	26 (2.7 , 20)	
Rear shock absorber upper mounting bracket nut	1	16	93 (9.5 , 69)	NOTE 7

TOOLS

DESCRIPTION	TOOL NUMBER	REF. SECTION
Fuel pressure gauge	07406-0040002	5
Oil pressure gauge	07506-3000000	4
Oil pressure gauge attachment	07510-4220100	4
Gear holder	07724-0010100	9
Flywheel holder	07725-0040000	10
Rotor puller	07733-0020001	10
Bearing remover weight	07741-0010201	10, 14
Clutch center holder	07742-0050002	9
Valve guide driver	07743-0020000	8
Attachment, 32 × 35 mm	07746-0010100	9
Attachment, 37 × 40 mm	07746-0010200	9, 14
Attachment, 42 × 47 mm	07746-0010300	9, 13, 14
Attachment, 52 × 55 mm	07746-0010400	14
Attachment, 24 × 26 mm	07746-0010700	10, 14
Attachment, 22 × 24 mm	07746-0010800	14
Attachment, 40 × 42 mm	07746-0010900	14
Inner driver C	07746-0030100	11
Attachment, 30 mm I.D.	07746-0030300	11
Attachment, 35 mm I.D.	07746-0030400	13
Pilot, 10 mm	07746-0040100	10
Pilot, 17 mm	07746-0040400	9, 14
Pilot, 25 mm	07746-0040600	14
Pilot, 35 mm	07746-0040800	9
Pilot, 22 mm	07746-0041000	13
Bearing remover shaft	07746-0050100	13, 14
Bearing remover head, 22 mm	07746-0050700	13
Bearing remover head, 25 mm	07746-0050800	14
Driver	07749-0010000	9, 10, 13, 14
Valve spring compressor	07757-0010000	8
Valve seat cutter, 35 mm (EX 45°)	07780-0010400	8
Valve seat cutter, 42 mm (IN 45°)	07780-0010900	8
Flat cutter, 42 mm (IN 32°)	07780-0013000	8
Flat cutter, 36 mm (EX 32°)	07780-0013500	8
Interior cutter, 37.5 mm (EX 60°)	07780-0014100	8
Interior cutter, 42 mm (IN 60°)	07780-0014400	8
Snap ring pliers	07914-3230001	9, 15
Steering stem socket	07916-3710101	13
Bearing remover handle	07936-3710100	14
Bearing remover, 17 mm	07936-3710300	14
Bearing remover shaft	07936-GE00100	10
Bearing remover head, 10 mm	07936-GE00200	10
Valve guide remover	07942-6570100	8
Driver attachment A	07946-KM90100	13
Driver shaft assembly	07946-KM90300	13
Race remover A	07946-KM90401	13
Assembly base	07946-KM90600	13
Driver	07949-3710001	14
Oil filter wrench	07HAA-PJ70100	3
Oil filter wrench	07HAA-PJ70100	4
Peak voltage adaptor	07HGJ-0020100	5, 17, 19
Driver chain tool set	07HMH-MR10103	3
Pilot, 32 mm	07MAD-PR90200	14

DESCRIPTION	TOOL NUMBER	REF. SECTION
Race remover B	07NMF-MT70110	13
Driver attachment B	07NMF-MT70120	13
Fork rod holder handle	07TMB-001010A	13
Lock nut wrench	07VMA-MBB0100	7
Cutter holder, 6 mm	07VMH-MBB0100	8
Valve guide reamer	07VMH-MBB0200	8
Inspection adaptor	07VMJ-0020100	17
Lock nut wrench	07YMA-MCF0100	7, 14
Fork damper holder attachment	07YMB-MCF0100	13
Fork seal driver	07YMD-MCF0100	13
ECM test harness	07YMZ-0010100	5

LUBRICATION & SEAL POINTS

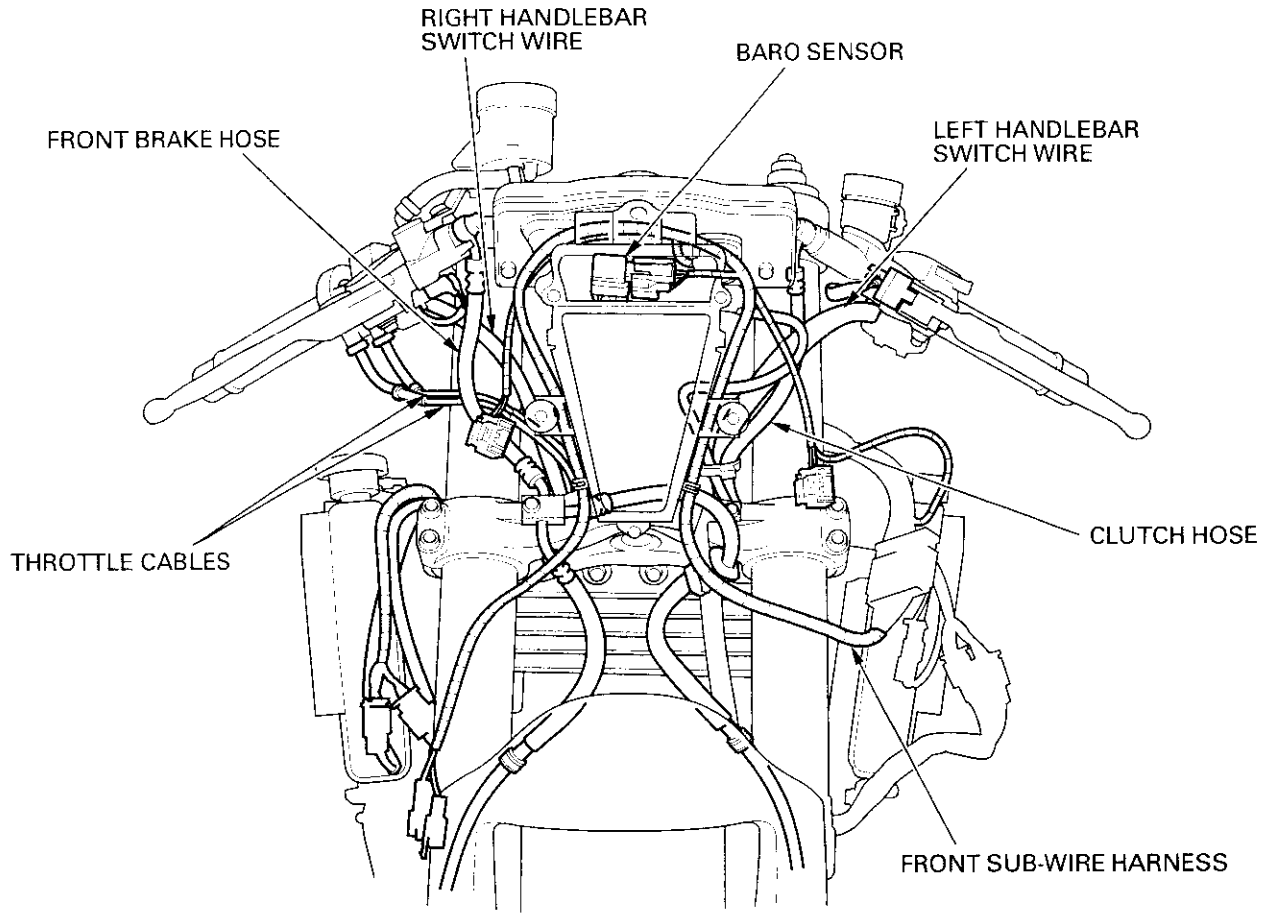
ENGINE

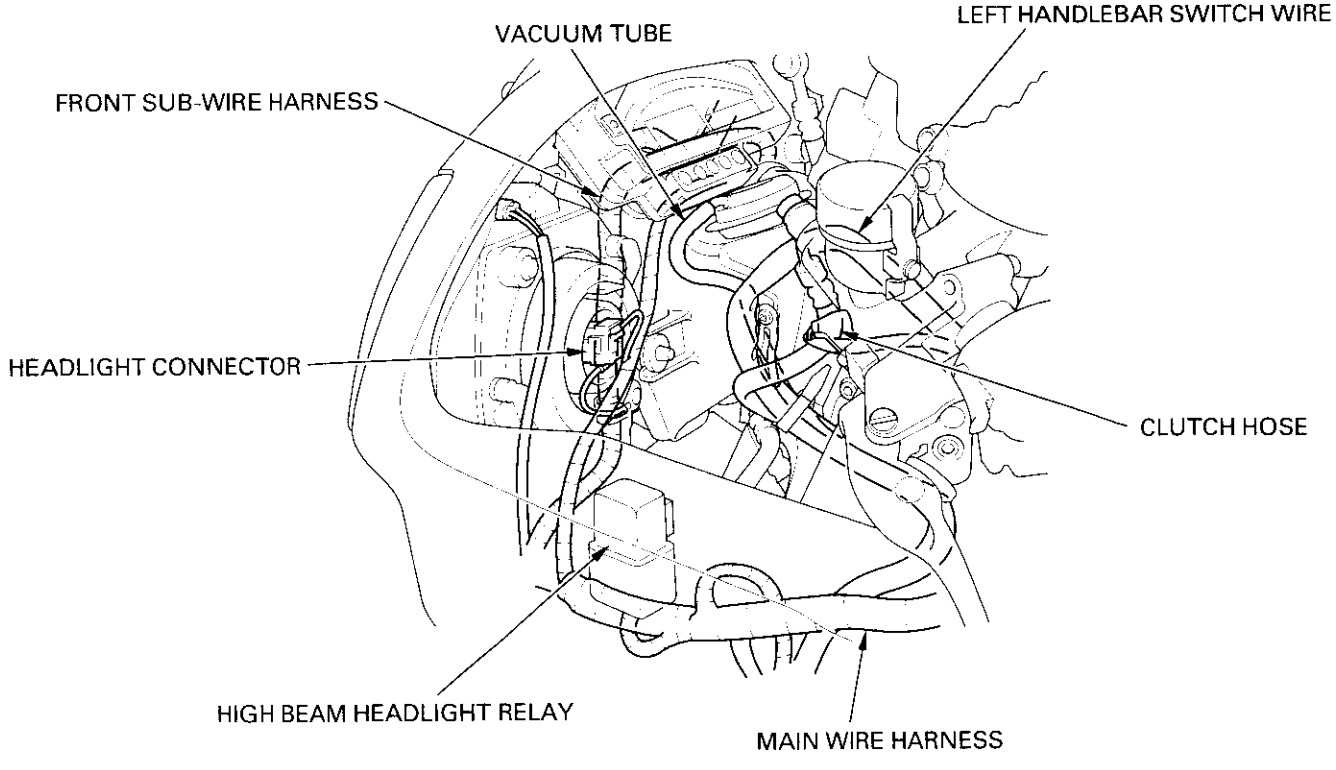
LOCATION	MATERIAL	REMARKS
Crankcase mating surfaces	Sealant	See page 11-9
Right crankcase cover mating surfaces		See page 6-13
Crankcase mating surfaces (left side)		See page 10-3
Oil pan mating surface		
Cylinder head semi-circular area		
Cylinder head cover gasket mating surface (cover side)		
Oil pressure switch threads		Do not apply to the sensor head.
Ignition pulse generator wire grommet seating surface		
Alternator stator wire grommet seating surface		
Crankshaft main journal bearing sliding surface	Molybdenum oil solution (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease)	
Crankpin bearing sliding surface		
Connecting rod small end inner surface		
Valve stem sliding surface		
Valve lifer outer surface		
Camshaft journals and cam lobes		
Clutch outer sliding surface		
M3/4, C5, C6 gear shift fork grooves		
Primary drive gear and sub gear sliding surface		
Piston pin		
Piston pin holes		
Each gear teeth and sliding surface		
Other rotating and sliding area		
Engine oil filter cartridge threads and seating surface	Engine oil	
Camshaft holder bolt threads and seating surface		
Cylinder head bolt threads and seating surface		
Clutch disc lining surface		
Clutch center lock nut threads and seating surface		
Primary drive gear bolt threads and seating surface		
Piston outer surface		
Piston ring whole surface		
Connecting rod bolt threads and seating surface		
Flywheel bolt threads and seating surface		
10 mm crankcase bolt threads and seating surface		
Each bearing rotating area		
Each O-ring whole surface		
Timing hole cap threads	Multi-purpose grease	
Crankshaft hole cap threads		
Each oil seal lips		
Reed valve cover bolt threads	Locking agent	
Oil filter boss threads		
Cylinder head 14 mm sealing bolt threads		
Oil pump driven sprocket bolt threads		
Gearshift cam bolt threads		
Right crankcase cover sealing bolt threads		
Clutch cover plate bolt threads		
Starter clutch bolt threads		
Ignition pulse generator bolt threads		
Alternator wire clamp bolt threads		
Crankcase 14 mm sealing bolt threads		
Mainshaft bearing set plate bolt threads		
Shift drum bearing washer/bolt threads		
Oil jet threads		

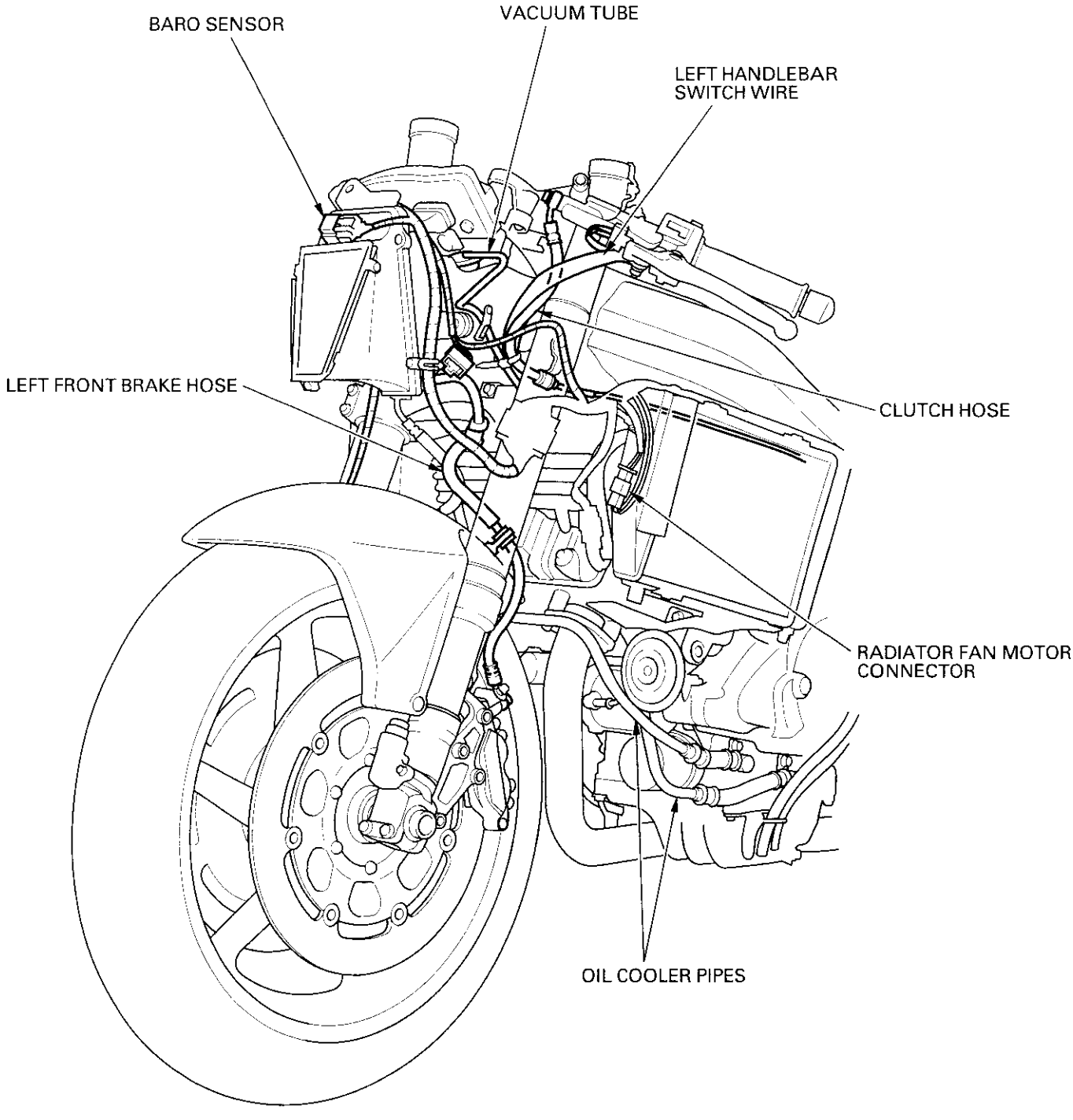
FRAME

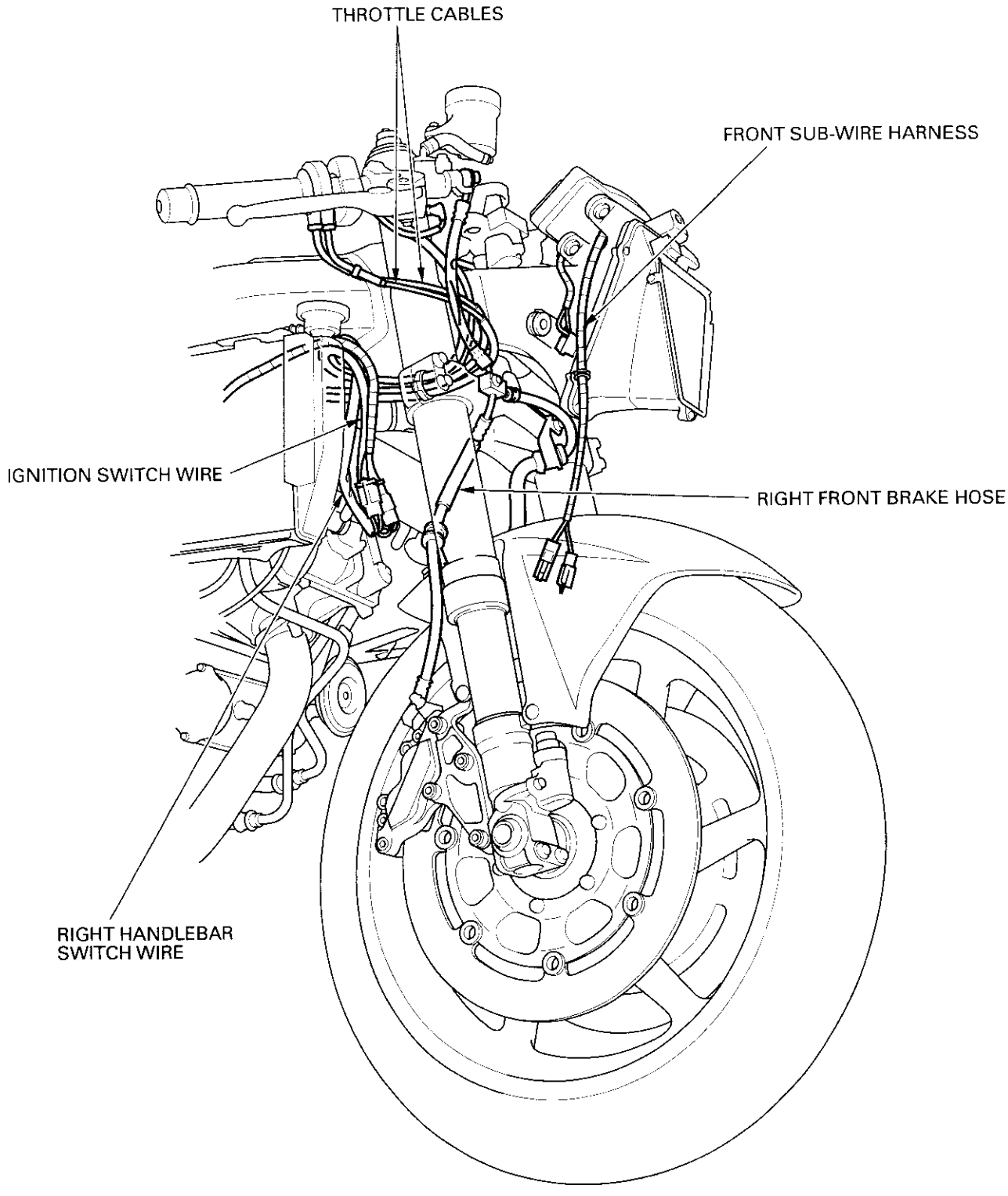
LOCATION	MATERIAL	REMARKS
Side stand pivot Driver footpeg sliding area Passenger footpeg sliding area Throttle grip pipe flange Seat catch hook sliding area Gearshift pedal link tie-rod ball joints Gearshift pedal pivot Rear brake pedal pivot Front wheel dust seal lips Rear wheel dust seal lips Rear wheel side collar inner surfaces	Multi-purpose grease	
Steering head bearings Steering head bearing dust seal lips Shock arm and link dust seal lips Shock arm and link needle bearings Swingarm pivot bearings Swingarm pivot dust seal lips	Molybdenum disulfide grease	
Throttle cable outer inside Choke cable outer inside	Cable lubricant	
Handlebar grip rubber inside	Honda bond A or equivalent	
Steering bearing adjustment nut threads	Engine oil	
Clutch lever pivot Clutch lever joint piece-to-push rod contacting area Clutch master piston-to-push rod contacting area Front brake lever-to-master piston contacting area Front brake lever pivot Rear brake caliper pin bolt sliding surfaces Rear brake master piston-to-push rod contacting area	Silicone grease	
Clutch master piston and cups Brake master piston and cups Brake caliper piston and piston seals	DOT 4 brake fluid	
Fork dust seal and oil seal lips	Fork fluid	
Oil hose joint bolt threads Oil pipe joint bolt threads Clutch fluid reservoir mounting screw threads Front brake caliper bracket bolt threads Drive chain slider bolt threads Rear brake hose clamp bolt threads Rear brake reservoir hose joint screw threads Front brake caliper assembly bolt threads Front brake caliper mounting bolt threads Caliper bracket retainer seating surface	Locking agent	

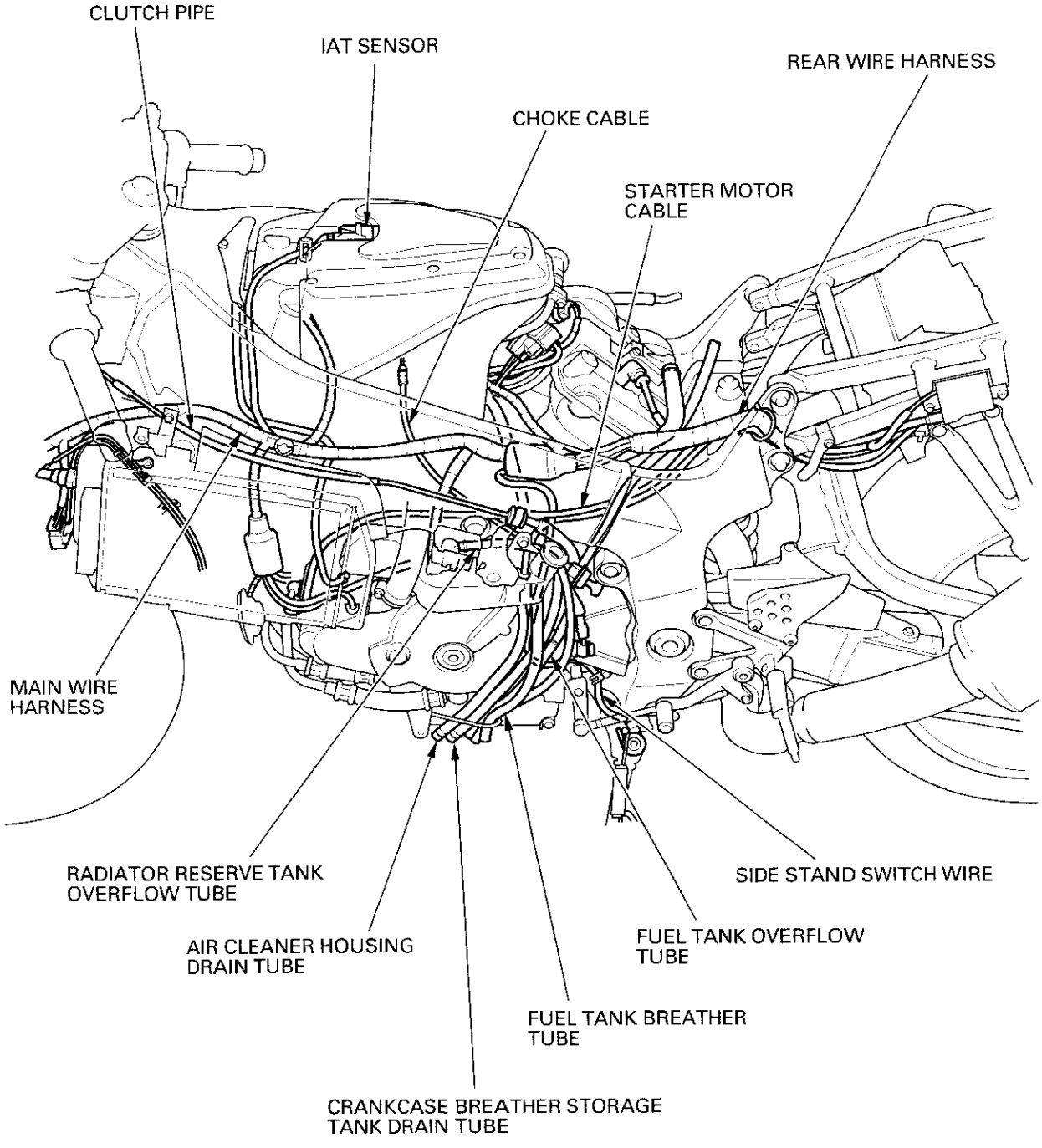
CABLE & HARNESS ROUTING

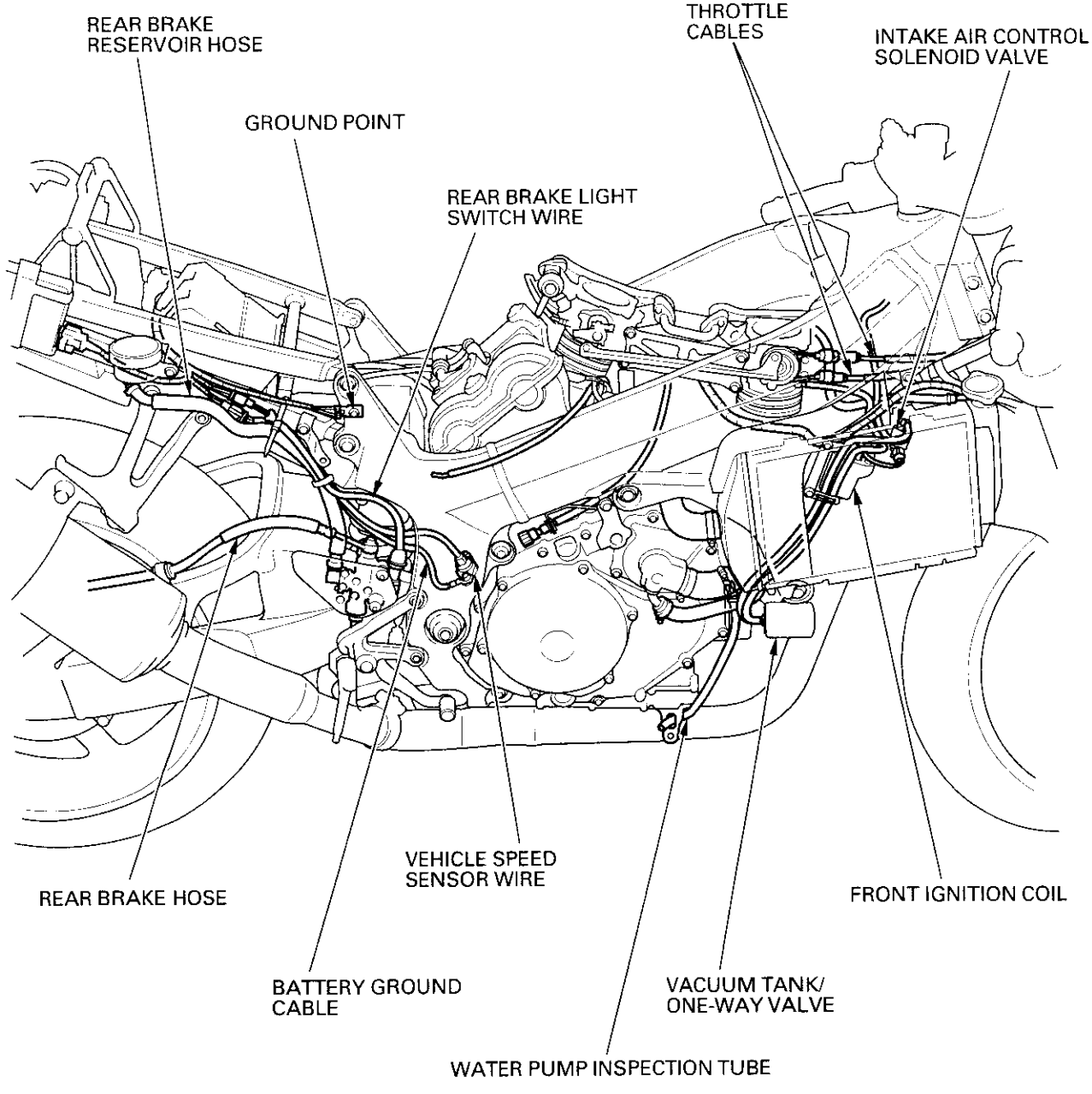


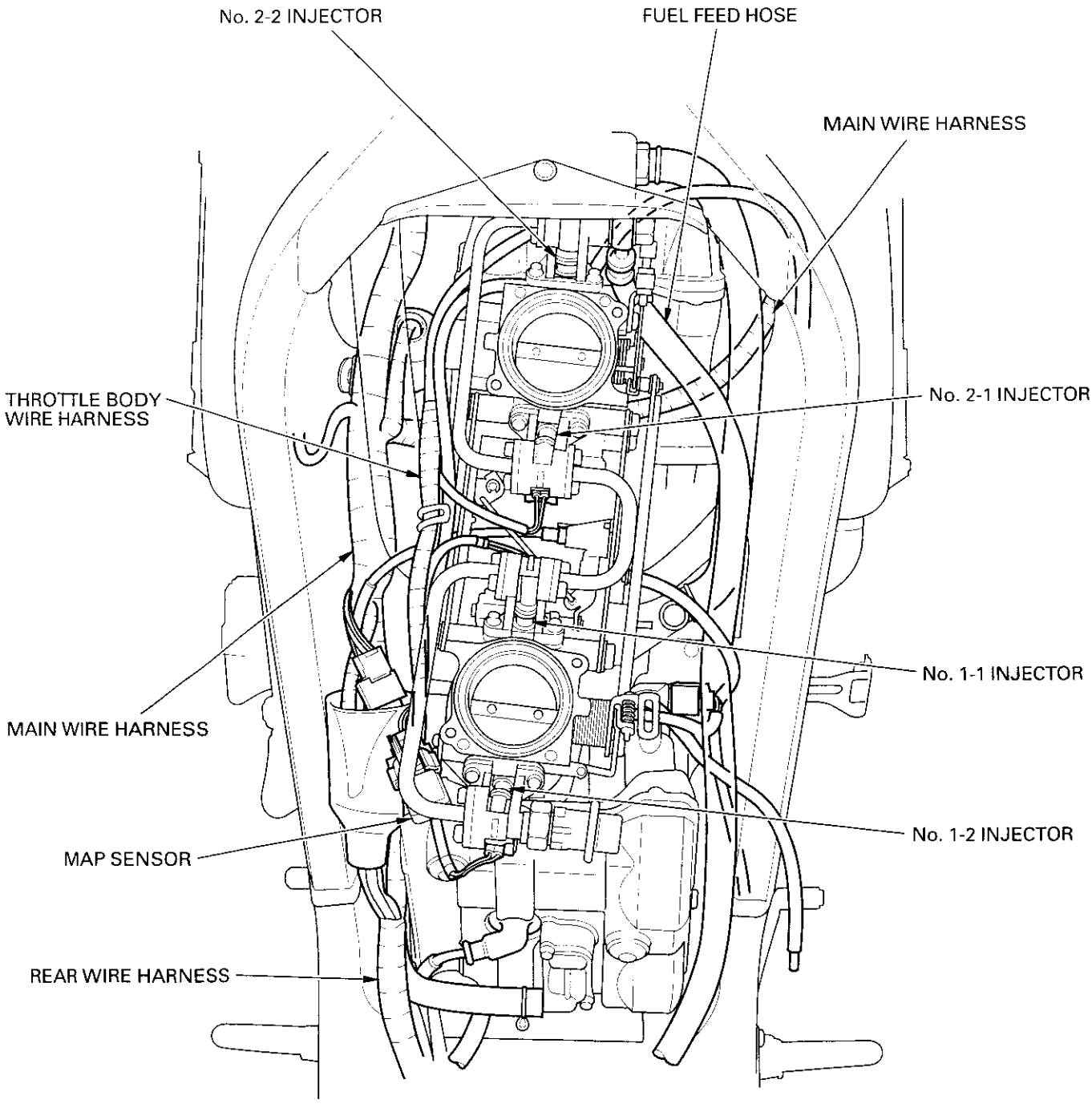


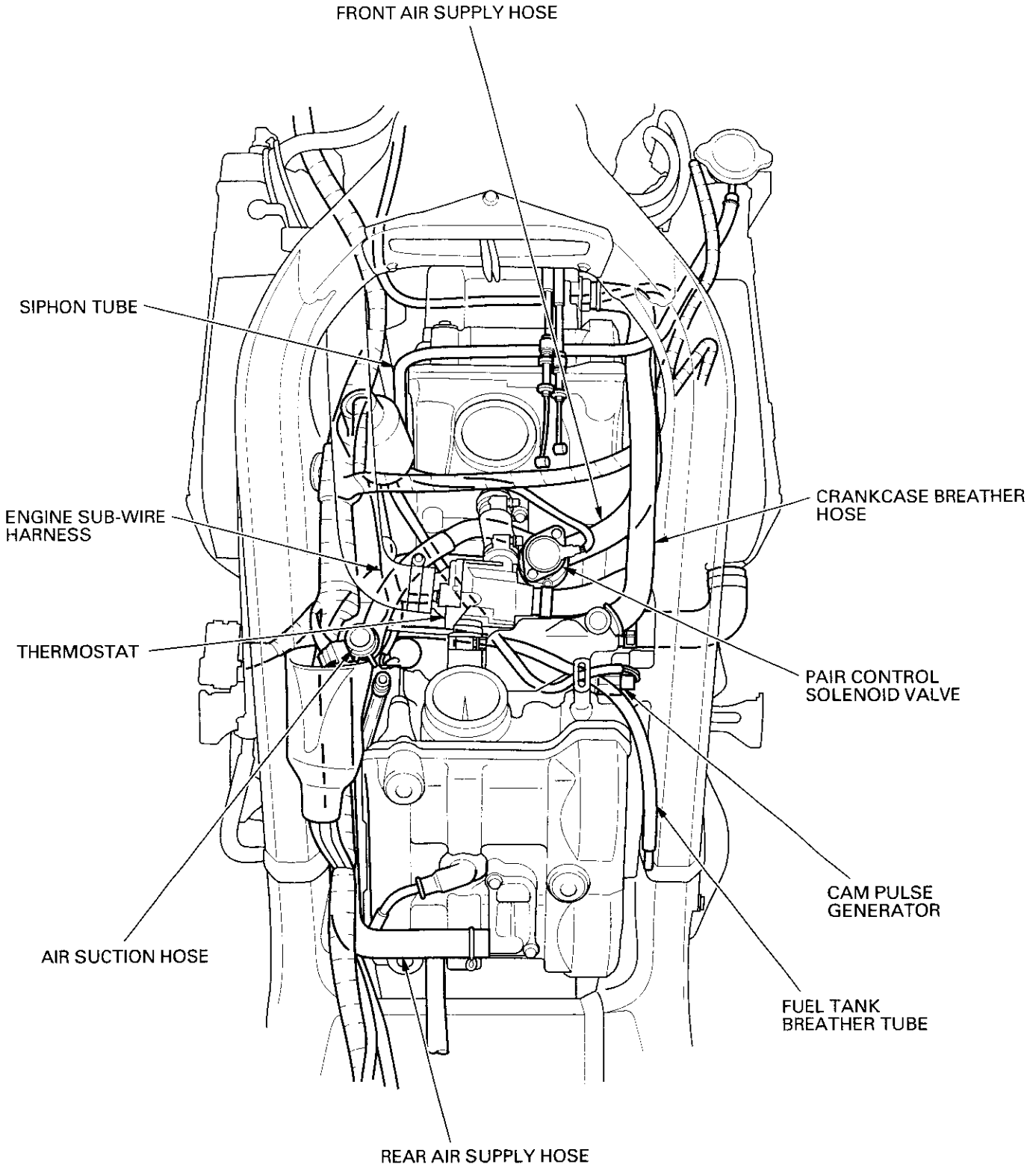

BARO SENSOR
VACUUM TUBE
LEFT HANDLEBAR SWITCH WIRE
LEFT FRONT BRAKE HOSE
CLUTCH HOSE
RADIATOR FAN MOTOR CONNECTOR
OIL COOLER PIPES

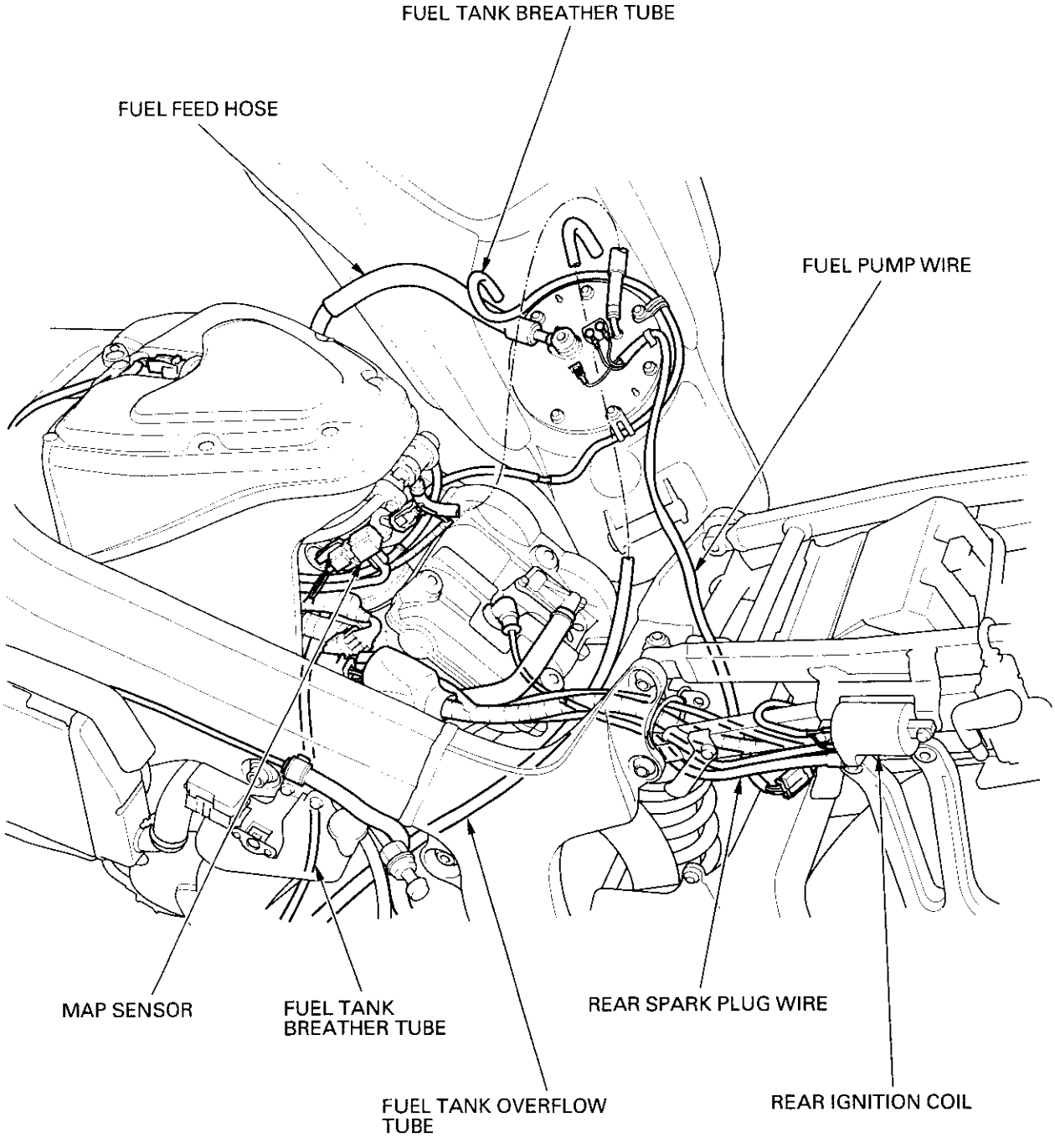

THROTTLE CABLES
FRONT SUB-WIRE HARNESS
IGNITION SWITCH WIRE
RIGHT FRONT BRAKE HOSE
RIGHT HANDLEBAR
SWITCH WIRE

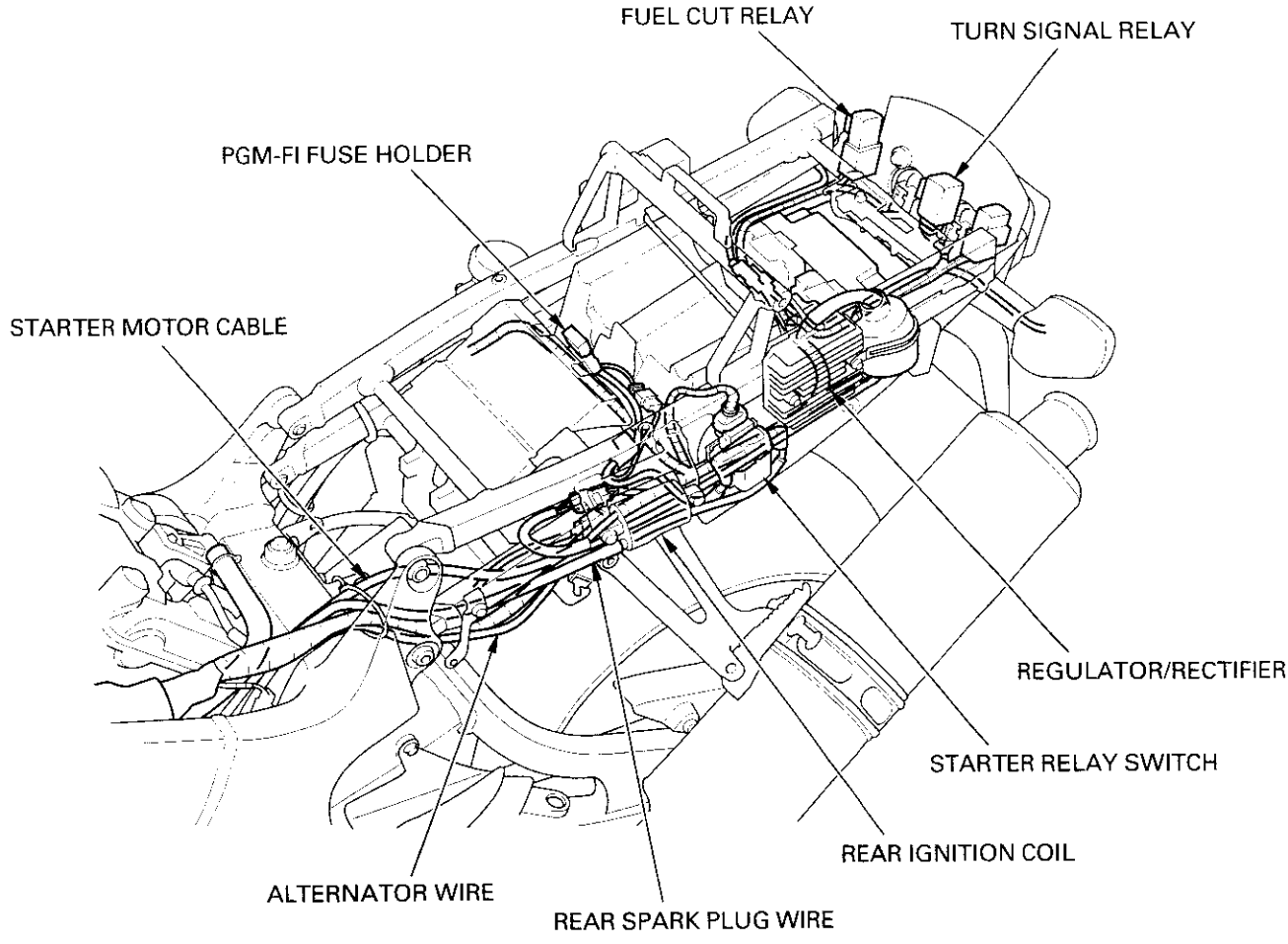

CLUTCH PIPE
IAT SENSOR
REAR WIRE HARNESS
CHOKE CABLE
STARTER MOTOR CABLE
MAIN WIRE HARNESS
RADIATOR RESERVE TANK OVERFLOW TUBE
SIDE STAND SWITCH WIRE
AIR CLEANER HOUSING DRAIN TUBE
FUEL TANK OVERFLOW TUBE
FUEL TANK BREATHER TUBE
CRANKCASE BREATHER STORAGE TANK DRAIN TUBE

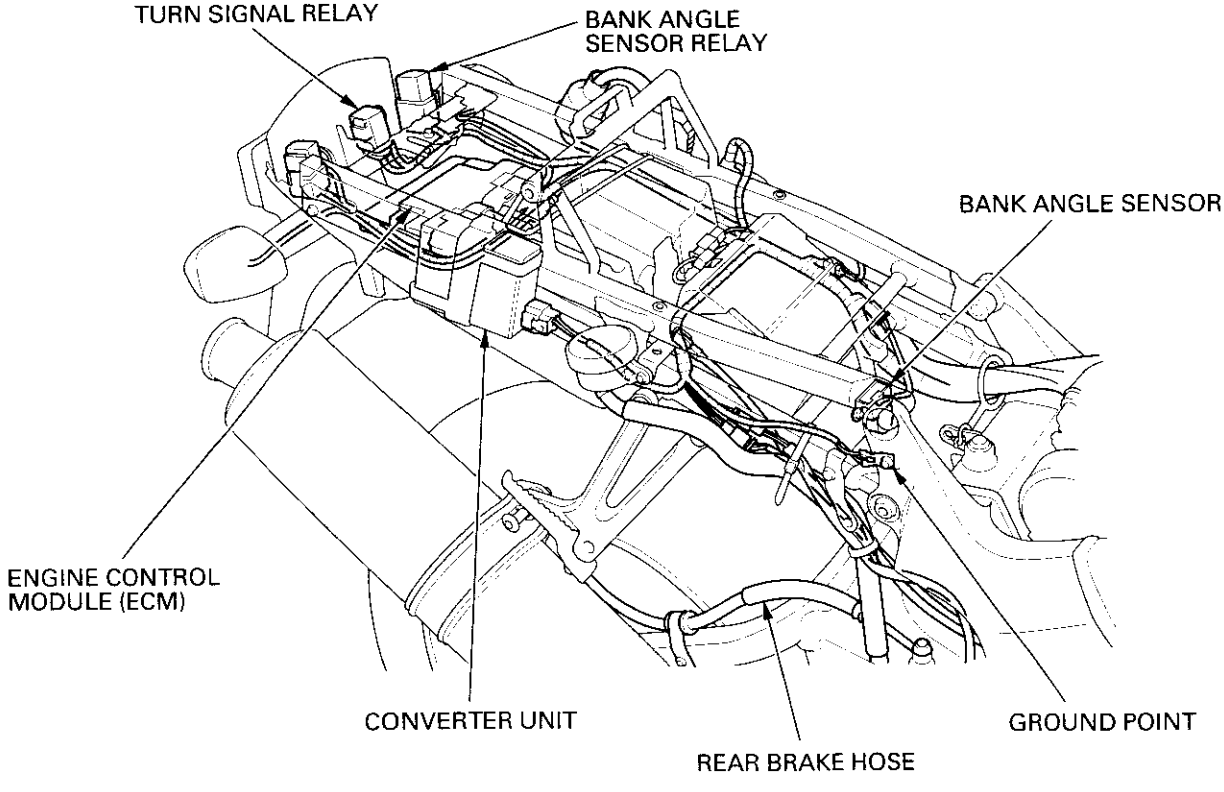

REAR BRAKE RESERVOIR HOSE
GROUND POINT
THROTTLE CABLES
INTAKE AIR CONTROL SOLENOID VALVE
REAR BRAKE LIGHT SWITCH WIRE
VEHICLE SPEED SENSOR WIRE
REAR BRAKE HOSE
FRONT IGNITION COIL
BATTERY GROUND CABLE
VACUUM TANK/ ONE-WAY VALVE
WATER PUMP INSPECTION TUBE


No. 2-2 INJECTOR
FUEL FEED HOSE
MAIN WIRE HARNESS
THROTTLE BODY WIRE HARNESS
No. 2-1 INJECTOR
No. 1-1 INJECTOR
MAIN WIRE HARNESS
No. 1-2 INJECTOR
MAP SENSOR
REAR WIRE HARNESS


FRONT AIR SUPPLY HOSE
SIPHON TUBE
ENGINE SUB-WIRE HARNESS
THERMOSTAT
AIR SUCTION HOSE
CRANKCASE BREATHER HOSE
PAIR CONTROL SOLENOID VALVE
CAM PULSE GENERATOR
FUEL TANK BREATHER TUBE
REAR AIR SUPPLY HOSE


FUEL TANK BREATHER TUBE
FUEL FEED HOSE
FUEL PUMP WIRE
MAP SENSOR
FUEL TANK BREATHER TUBE
REAR SPARK PLUG WIRE
FUEL TANK OVERFLOW TUBE
REAR IGNITION COIL


FUEL CUT RELAY
TURN SIGNAL RELAY
PGM-FI FUSE HOLDER
STARTER MOTOR CABLE
REGULATOR/RECTIFIER
STARTER RELAY SWITCH
REAR IGNITION COIL
ALTERNATOR WIRE
REAR SPARK PLUG WIRE


TURN SIGNAL RELAY
BANK ANGLE SENSOR RELAY
BANK ANGLE SENSOR
ENGINE CONTROL MODULE (ECM)
CONVERTER UNIT
REAR BRAKE HOSE
GROUND POINT

EMISSION CONTROL SYSTEMS

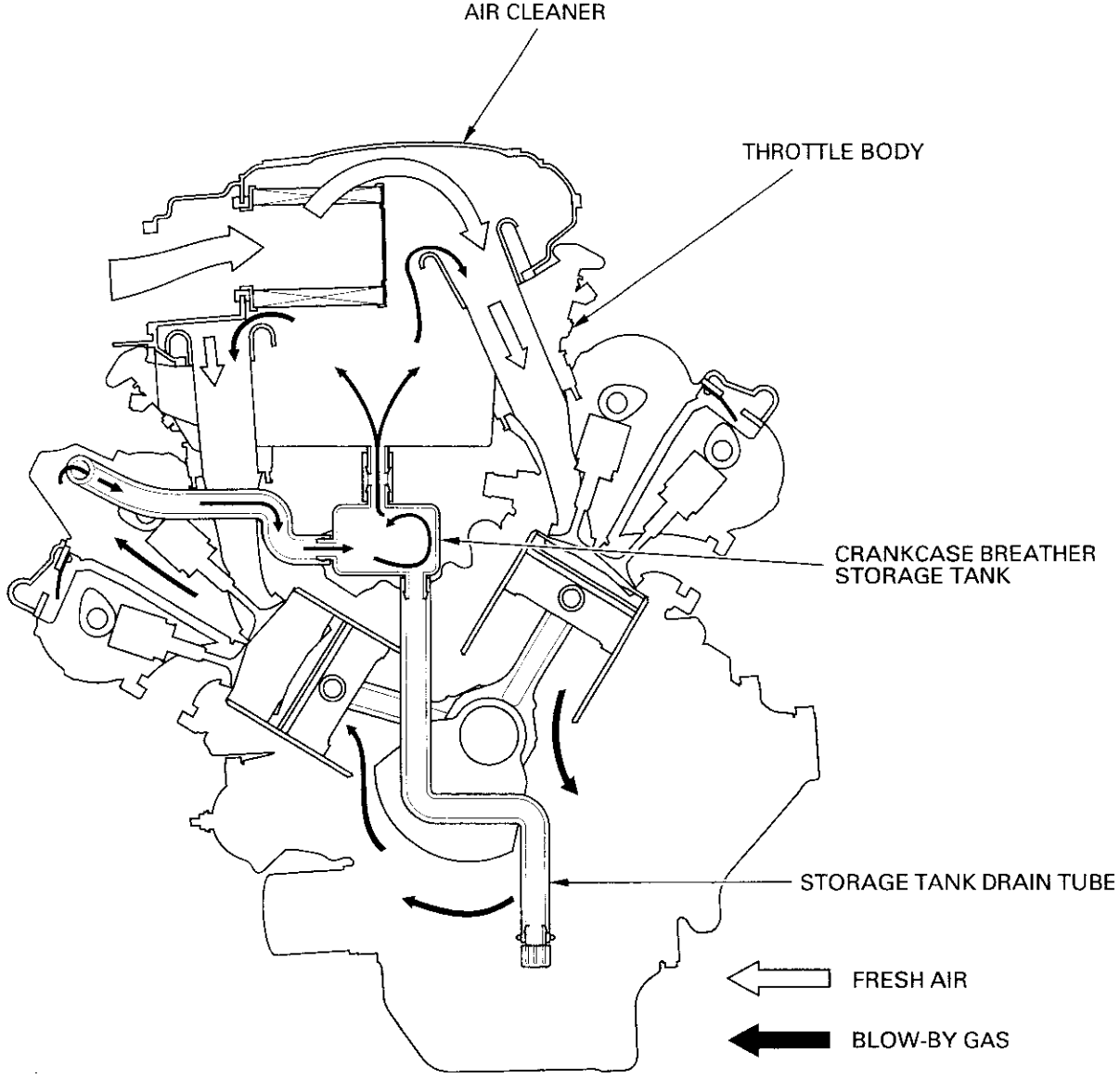
SOURCE OF EMISSIONS

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

Honda Motor Co., Ltd. utilized lean fuel injection settings as well as other systems, to reduce carbon monoxide and hydrocarbons.

CRANKCASE EMISSION CONTROL SYSTEM

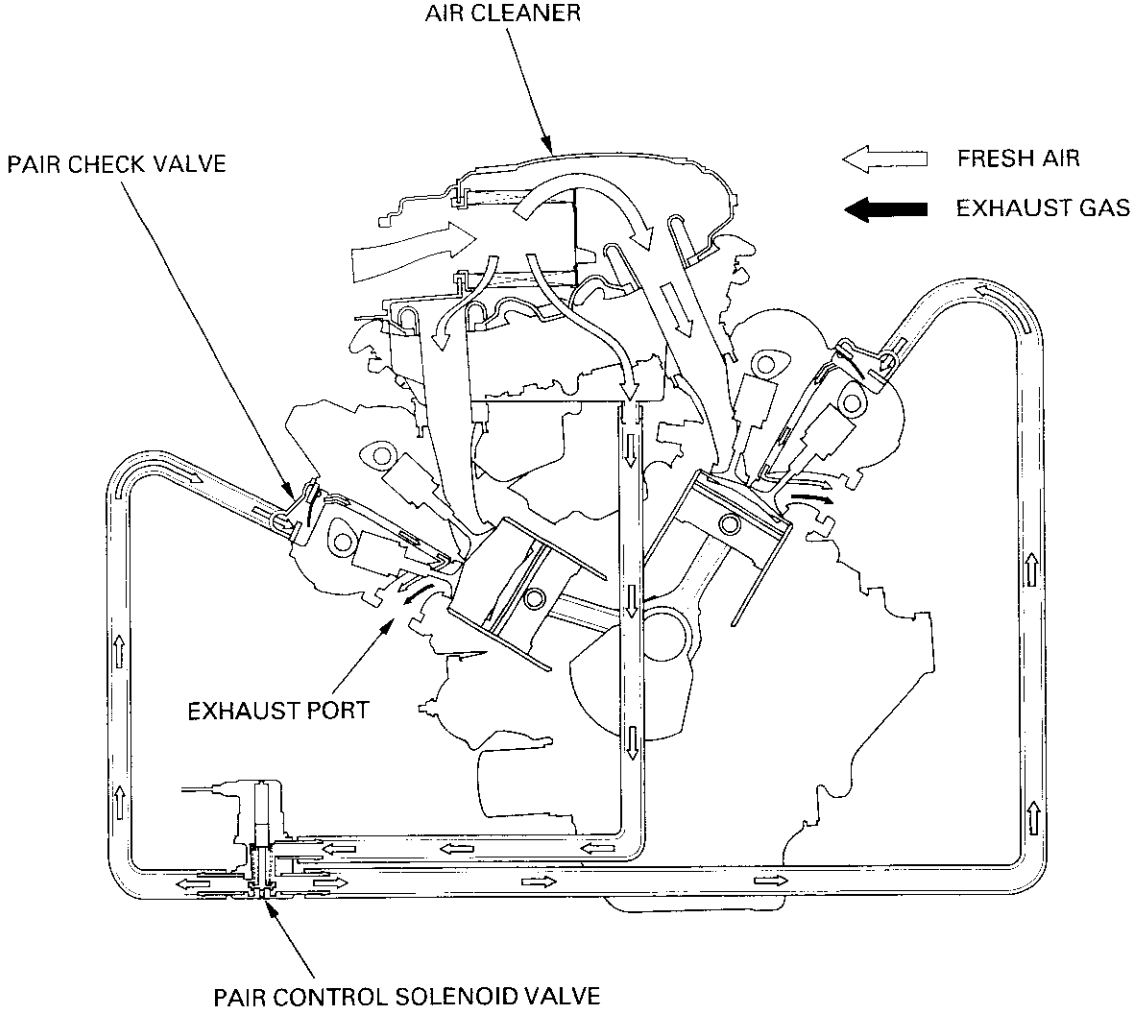
The engine is equipped with a closed crankcase system to prevent discharging crankcase emissions into the atmosphere. Blow-by gas is returned to the combustion chamber through the air cleaner and throttle body.



EXHAUST EMISSION CONTROL SYSTEM (PULSE SECONDARY AIR INJECTION SYSTEM) (Except U type)

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 whenever there is a negative pressure pulse in the exhaust system. 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) check valves and the PAIR control solenoid valve which is controlled by the engine control module (ECM). PAIR check valve prevents reverse air flow through the system. The ECM signals the PAIR control solenoid valve in accordance with the running conditions (engine coolant temperature, intake air temperature, throttle position, manifold absolute pressure and engine revolution) and the PAIR control solenoid valve cut off the supply of fresh air.

No adjustment to the pulse secondary air injection system should be made, although periodic inspection of the components is recommended.



NOISE EMISSION CONTROL SYSTEM (U type only)

TAMPERING WITH THE NOISE CONTROL SYSTEM IS PROHIBITED: law may prohibit: (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.

2. FRAME/BODY PANELS/EXHAUST SYSTEM

SERVICE INFORMATION	2-1	LOWER FAIRING	2-3
TROUBLESHOOTING	2-1	UPPER FAIRING	2-4
SEAT	2-2	EXHAUST SYSTEM	2-4
SEAT COWL	2-2	REAR FENDER	2-7
LOWER INNER FAIRING	2-3	SEAT RAIL	2-8

SERVICE INFORMATION

GENERAL

⚠WARNING

Serious burns may result if the exhaust system is not allowed to cool before components are removed or serviced.

- This section covers removal and installation of the body panels, exhaust system and seat rail.
- Always replace the exhaust pipe gasket when removing the exhaust pipe from the engine.
- Always inspect the exhaust system for leaks after installation.

TORQUE VALUES

Lower fairing-to-upper fairing bolt	2 N·m (0.2 kgf·m , 1.4 lbf·ft)
Lower inner fairing-to-lower fairing bolt	2 N·m (0.2 kgf·m , 1.4 lbf·ft)
Driver footpeg holder bolt	26 N·m (2.7 kgf·m , 20 lbf·ft)
Exhaust pipe joint nut	12 N·m (1.2 kgf·m , 9 lbf·ft)
Muffler band bolt	26 N·m (2.7 kgf·m , 20 lbf·ft)
Seat rail mounting bolt	44 N·m (4.5 kgf·m , 33 lbf·ft)
Passenger footpeg holder bolt	26 N·m (2.7 kgf·m , 20 lbf·ft)
Rear brake reservoir mounting bolt	9 N·m (0.9 kgf·m , 6.5 lbf·ft)

TROUBLESHOOTING

Excessive exhaust noise
- Broken exhaust system
- Exhaust gas leaks

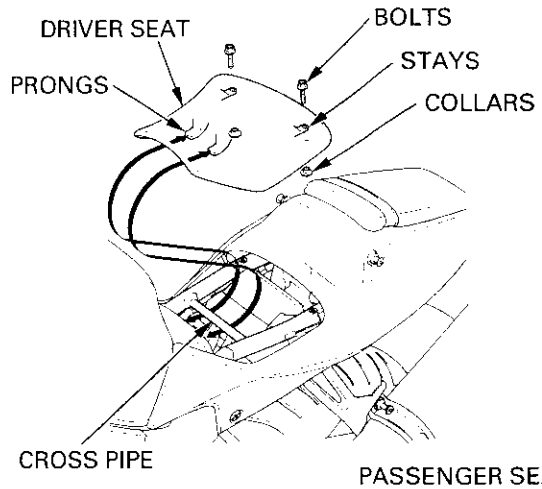
Poor performance
- Deformed exhaust system
- Exhaust gas leaks
- Clogged muffler

SEAT

DRIVER SEAT

Remove the two mounting bolts and collars.
Raise the rear of the seat, being careful not to damage the seat cowl, and remove the seat rearward.

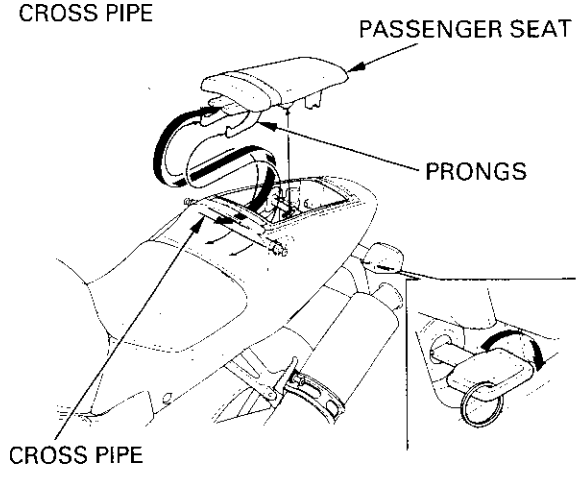
Install the seat while hooking the prongs under the cross pipe as shown.
Set the seat mounting stays with the collars, and install and tighten the mounting bolts.



PASSENGER SEAT

Unlock the seat with the ignition key.
Raise the rear of the seat and remove the seat rearward.

Install the seat while hooking the prongs to the cross pipe as shown.
Push the seat down to lock it.

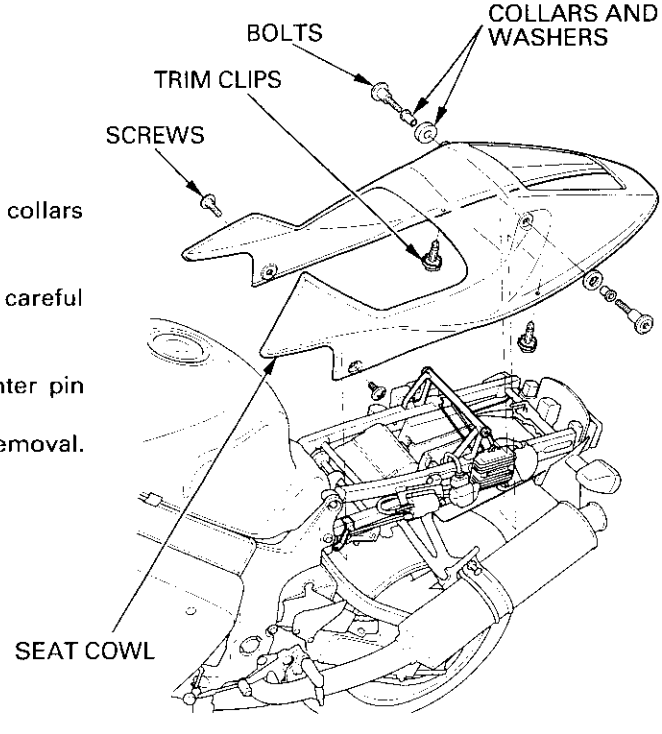


SEAT COWL

Remove the driver and passenger seats.

Remove the two trim clips as follows:
—Push the center pin in.
—Pull the clip out.
Remove the two screws, mounting bolts, collars and special washers.
Slightly move the seat cowl rearward.
Spread the center of the seat cowl, being careful not to damage the cowl, and remove it.

Before installing the trim clip, pull the center pin out while spreading the clip ends.
Install the seat cowl in the reverse order of removal.



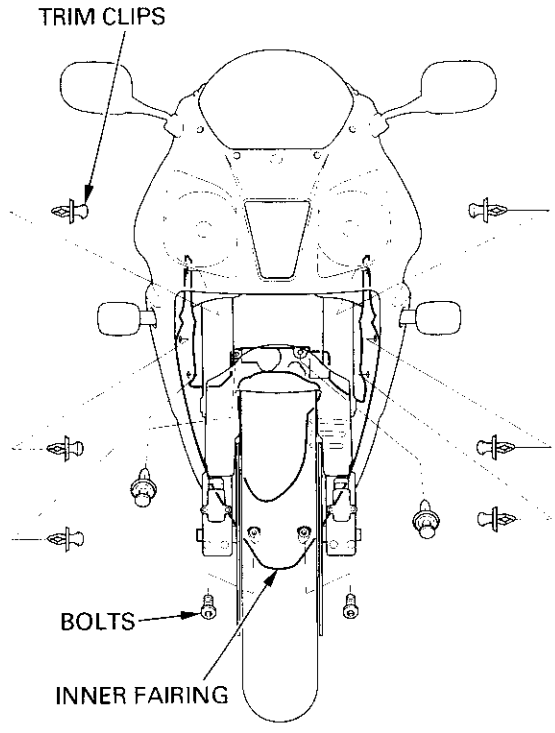
LOWER INNER FAIRING

Disconnect the turn signal wire connectors.
Remove the two lower inner fairing-to-lower fairing bolts.
Remove the eight trim clips as follows:
—Pull the center pin out.
—Pull the clip out.
Remove the lower inner fairing.

Set the lower inner fairing while routing the turn signal wires into the holes in the inner fairing and install the eight trim clips.
Install and tighten the two bolts.

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

Connect the turn signal wire connectors.



LOWER FAIRING

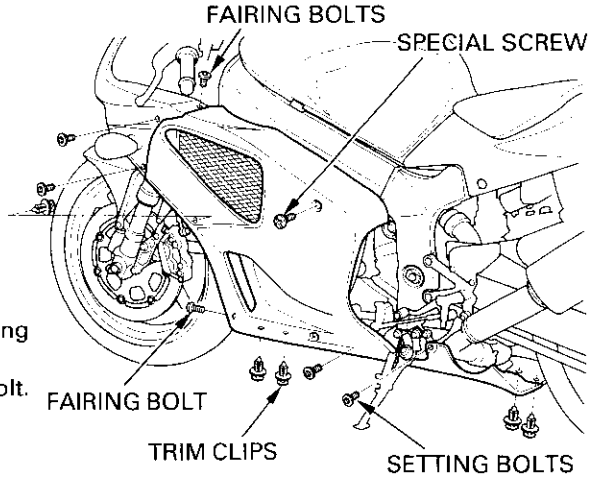
Remove the trim clip attaching the inner fairing.
Remove the four trim clips as follows:
—Loosen the center pin.
—Pull the clip out.
Remove the three lower fairing-to-upper fairing bolts.
Remove the lower inner fairing-to-lower fairing bolt.
Remove the two setting bolts.
Remove the special screw and the lower fairing.

Install the lower fairing and set the special screw.
Install and tighten the two setting bolts.
Install and tighten the fairing-to-fairing bolts.

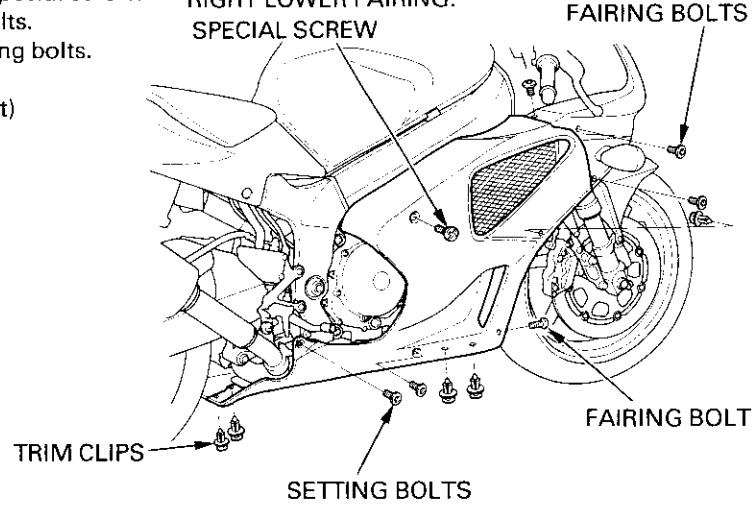
TORQUE: 2 N·m (0.2 kgf·m , 1.4 lbf·ft)

Install the trim clips.

LEFT LOWER FAIRING:



RIGHT LOWER FAIRING:



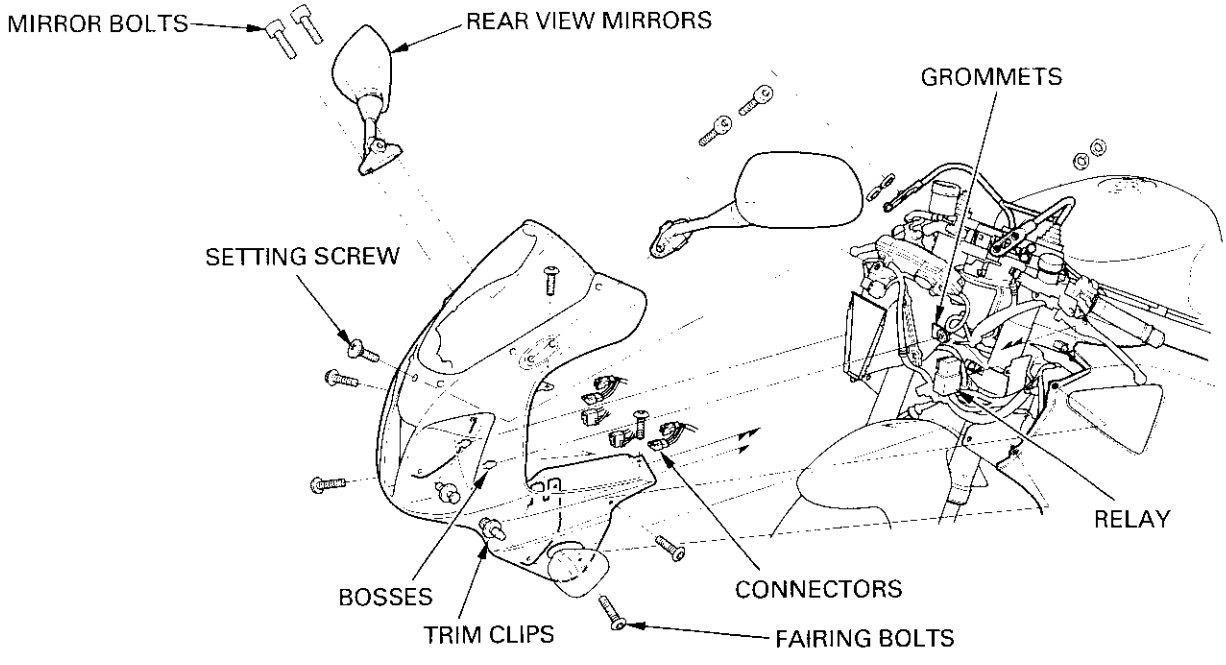
UPPER FAIRING

Remove the headlight relay from the stay of the upper inner fairing.
Disconnect the following:
– headlight connectors
– front turn signal connectors
– position light connectors

Remove the four trim clips attaching the inner fairing.
Remove the six lower fairing-to-upper fairing bolts.
Remove the four bolts and the rear view mirrors.
Remove the setting screw and the upper fairing.

Install the upper fairing, aligning the bosses with the grommets on the stay.
Install the removed parts in the reverse order of removal.

TORQUE:
Fairing-to-fairing bolts: 2 N·m (0.2 kgf·m , 1.4 lbf·ft)



EXHAUST SYSTEM

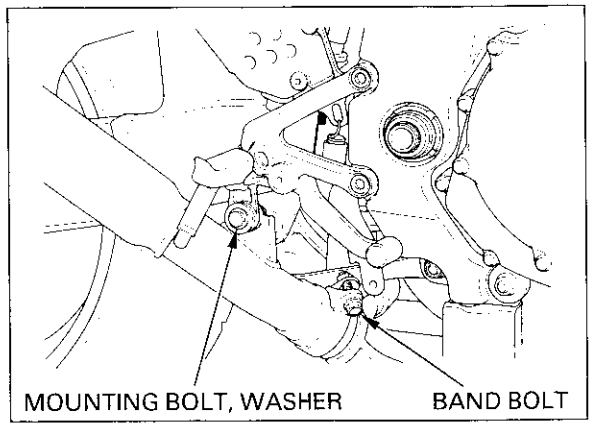
REMOVAL

⚠WARNING

Do not service the exhaust system while it is hot.

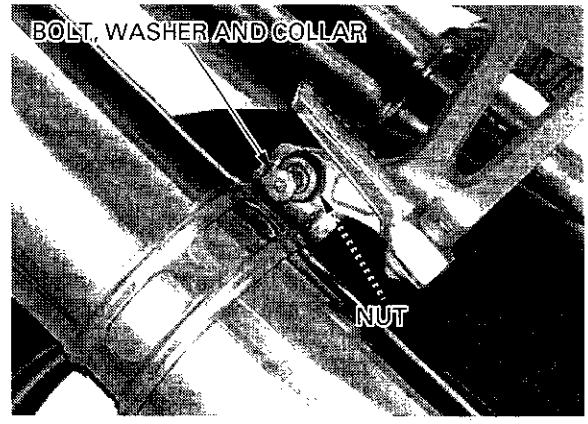
Remove the lower inner fairing and both lower fairings (page 2-3).

Loosen the muffler band bolt.
Remove the muffler lower mounting nut, bolt and washer.

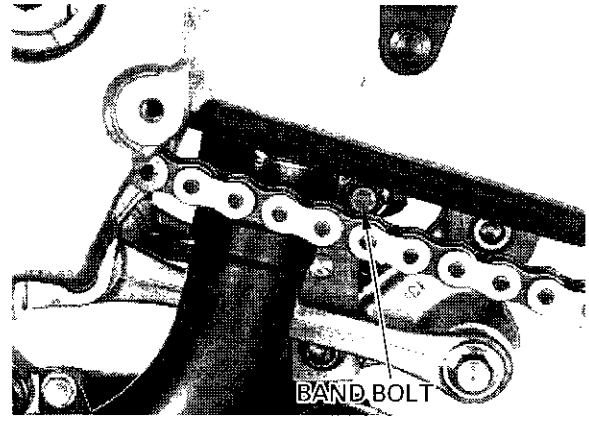


Remove the muffler upper mounting nut, bolt, washer, collar and the muffler.

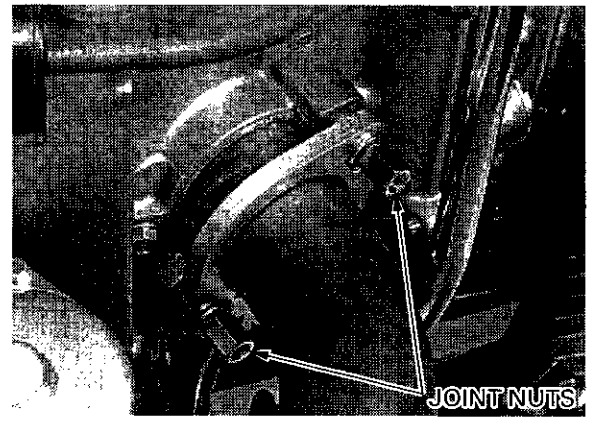
Remove another muffler if the exhaust pipes are removed.



Loosen the front exhaust pipe-to-rear exhaust pipe band bolt.

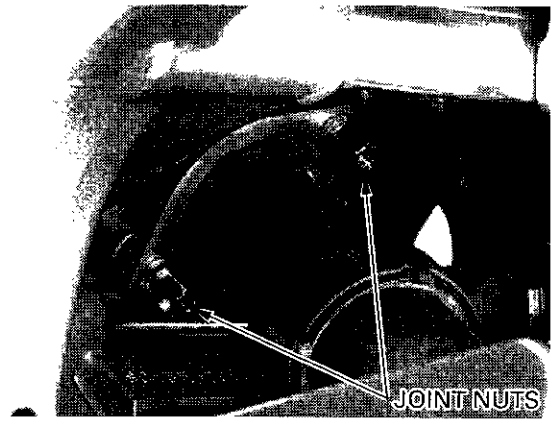


Remove the joint nuts and the front exhaust pipe.



Remove the joint nuts and the rear exhaust pipe.

Remove the exhaust pipe gaskets and muffler gaskets.



INSTALLATION

Install the rear exhaust pipe with a new gasket and temporarily tighten the joint nuts.

Install the front exhaust pipe with a new gasket and temporarily tighten the joint nuts.
Connect the front and rear exhaust pipe with a new gasket and temporarily tighten the band bolt.

Install the collar into the driver footpeg holder.

Install a new muffler gaskets into the exhaust pipe.
Install the muffler with the collar, washer, upper mounting bolt and nut.

Install the muffler lower mounting bolt with the washer and nut, and temporarily tighten the muffler band bolt and lower mounting nut.
Install another muffler.

Tighten the exhaust pipe joint nuts.

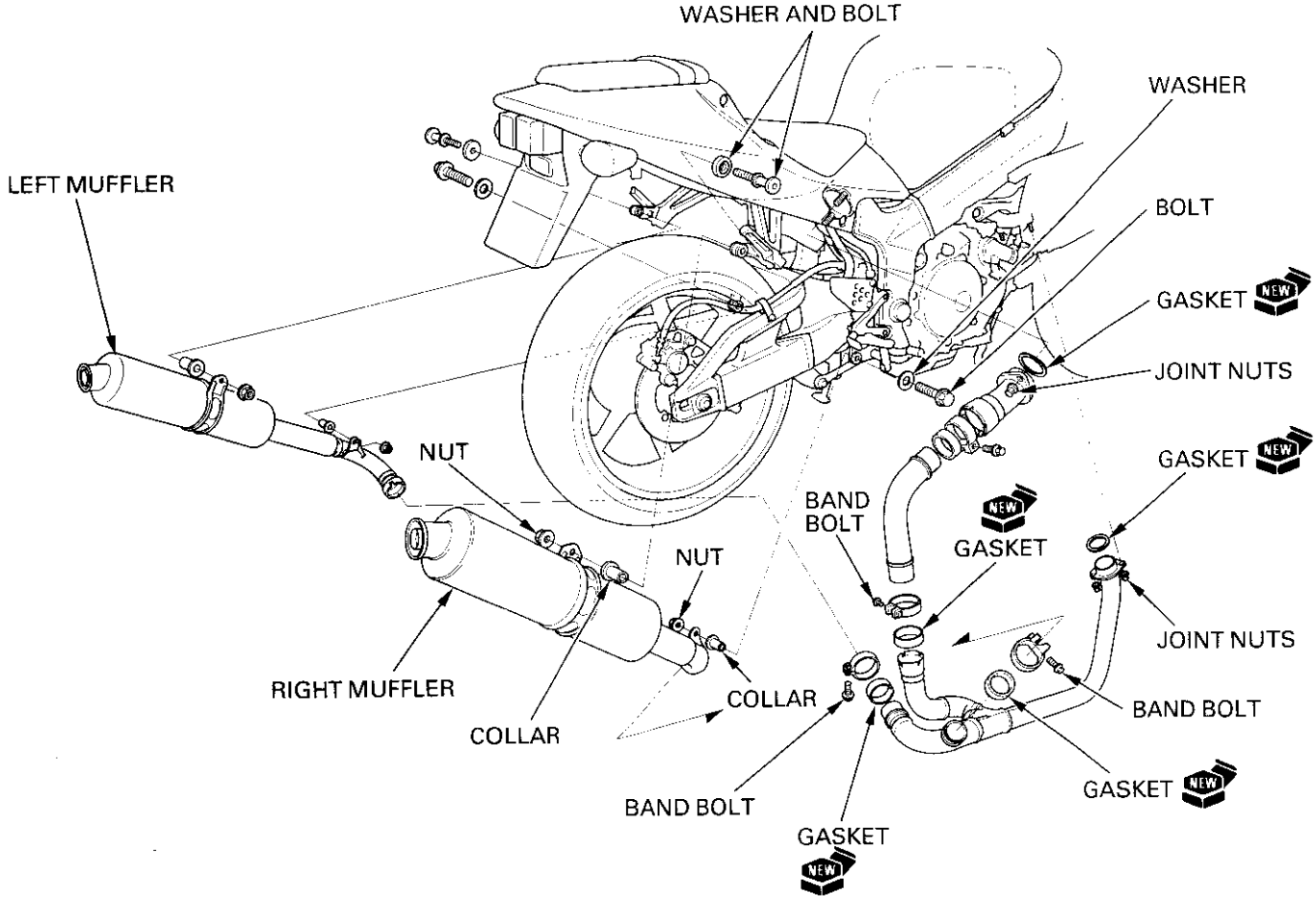
TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

Tighten the front exhaust pipe-to-rear exhaust pipe band bolt and muffler band bolts.

TORQUE: 26 N·m (2.7 kgf·m , 20 lbf·ft)

Tighten the muffler upper and lower mounting nuts securely.

Install the lower fairings and inner fairing (page 2-3).

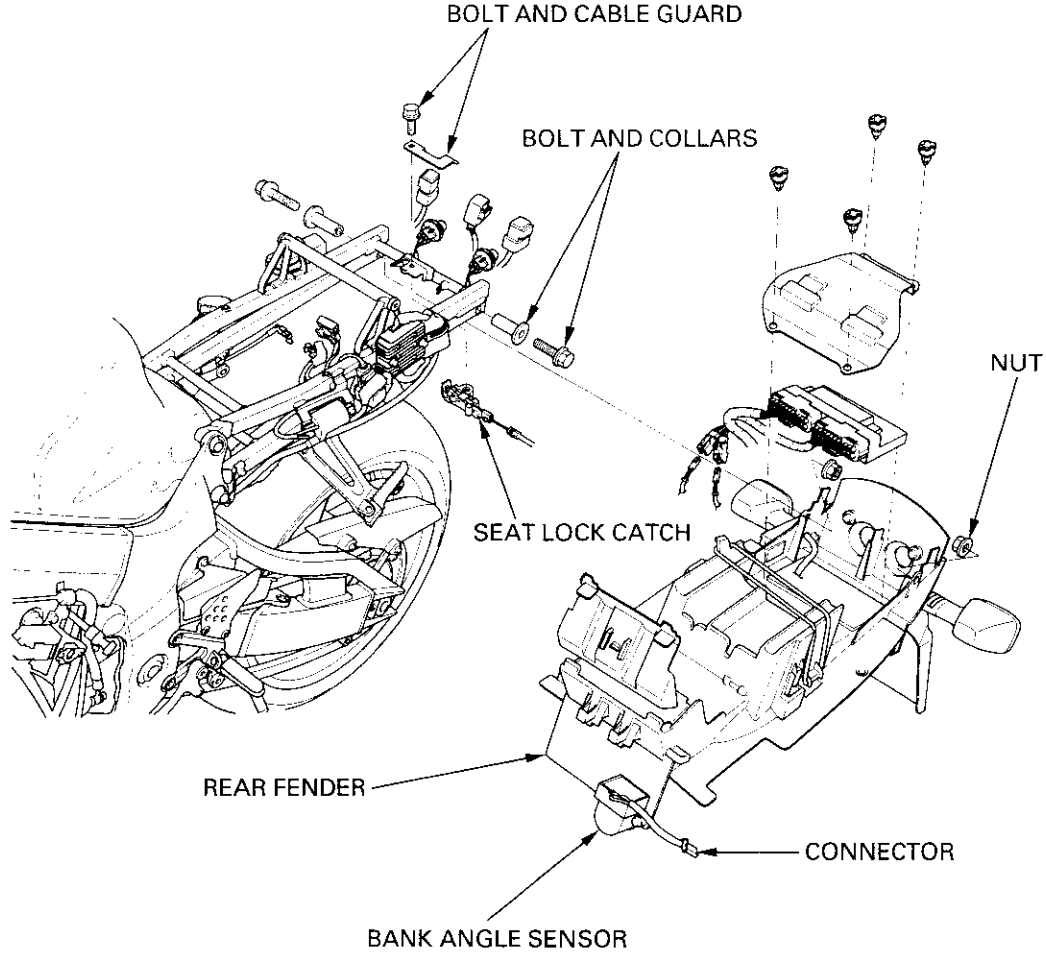


REAR FENDER

Remove the following:
- seat cowl (page 2-2)
- battery (page 16-4)
- engine control module (page 17-5)
- rear turn signal lights (page 19-4)
- bank angle sensor, turn signal and fuel cut relays
- brake/taillight (page 19-4)

Remove the bolt, cable guard and the passenger seat lock catch.
Disconnect the bank angle sensor connector.
Remove the two nuts, bolts and collars.
Remove the rear fender from the seat rail.
Remove the bank angle sensor from the rear fender.

Install the rear fender and removed parts in the reverse order of removal.



SEAT RAIL

Remove the rear fender (page 2-7).

Remove the following from the seat rail:
- converter unit
- bolt and rear brake reservoir
- two bolts, clamp and regulator/rectifier
- starter relay switch
- two bolts and rear ignition coil
- four bolts and passenger footpeg holders

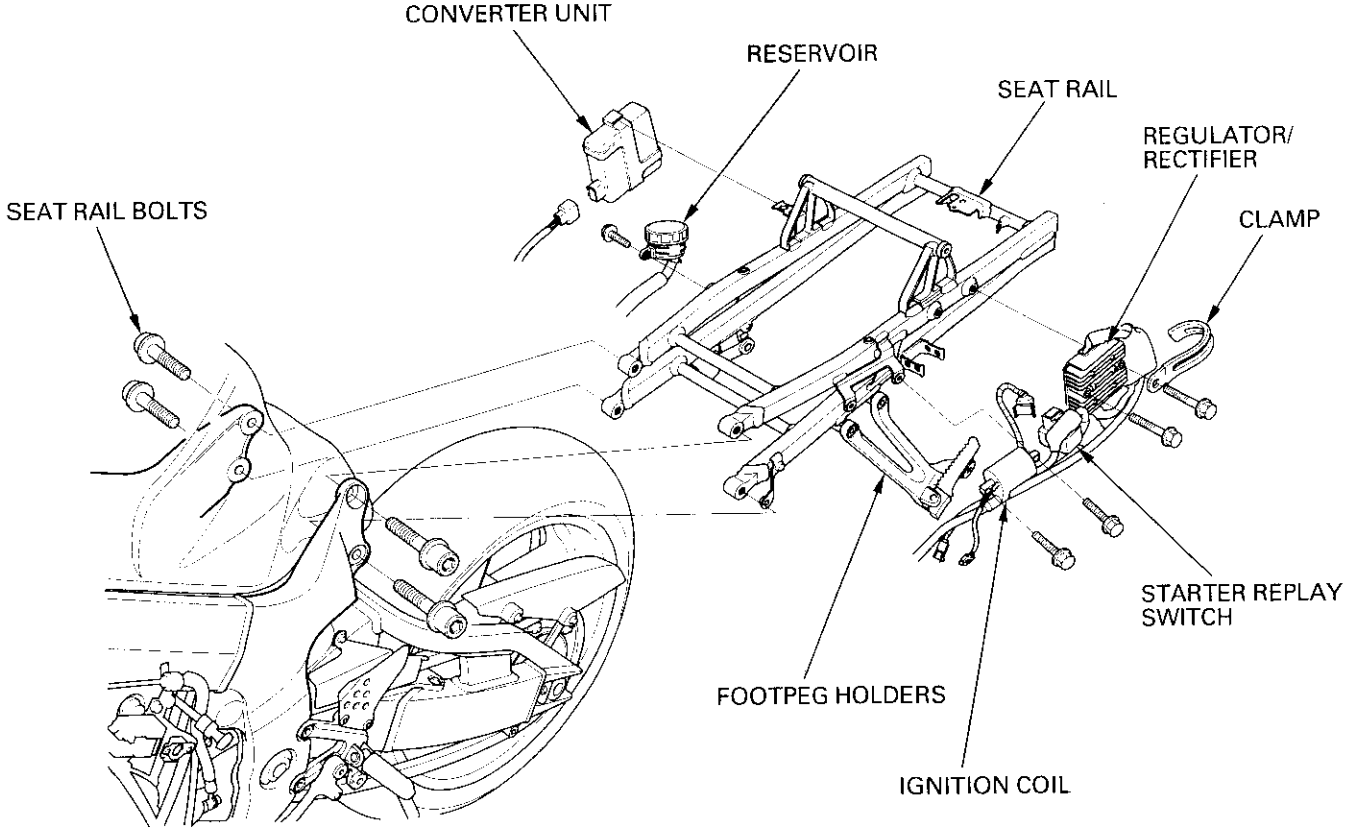
Remove the upper and lower mounting bolts, and the seat rail.

Install the seat rail and removed parts in the reverse order of removal.

TORQUE:
Seat rail mounting bolt: 44 N·m (4.5 kgf·m , 33 lbf·ft)
Rear brake reservoir mounting bolt:
9 N·m (0.9 kgf·m , 6.5 lbf·ft)
Passenger footpeg holder bolt:
26 N·m (2.7 kgf·m , 20 lbf·ft)

CAUTION:

Be careful not to damage the mounting bolt threaded holes in the seat rail.



SERVICE INFORMATION	3-1	DRIVE CHAIN	3-17
MAINTENANCE SCHEDULE	3-3	DRIVE CHAIN SLIDER	3-21
FUEL LINE	3-4	BRAKE FLUID	3-21
THROTTLE OPERATION	3-4	BRAKE PAD WEAR	3-22
CHOKE OPERATION	3-5	BRAKE SYSTEM	3-23
AIR CLEANER	3-6	BRAKE LIGHT SWITCH	3-23
CRANKCASE BREATHER	3-6	HEADLIGHT AIM	3-24
SPARK PLUG	3-6	CLUTCH SYSTEM	3-24
VALVE CLEARANCE	3-8	CLUTCH FLUID	3-24
ENGINE OIL	3-13	SIDE STAND	3-25
ENGINE OIL FILTER	3-15	SUSPENSION	3-25
ENGINE IDLE SPEED	3-15	NUTS, BOLTS, FASTENERS	3-26
RADIATOR COOLANT	3-16	WHEELS/TIRES	3-26
COOLING SYSTEM	3-16	STEERING HEAD BEARINGS	3-27
SECONDARY AIR SUPPLY SYSTEM (Except U type)	3-17		

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.

SPECIFICATIONS

ITEM		SPECIFICATIONS
Throttle grip free play		2 – 6 mm (1/16 – 1/4 in)
Spark plug	Standard	FR9BI-11 (NGK), IK27C11 (DENSO)
	For cold climate (below 5°C/41°F)	FR8BI-11 (NGK), IK24C11 (DENSO)
Spark plug gap		1.00 – 1.10 mm (0.039 – 0.043 in)
Valve clearance	Intake	0.16 mm (0.006 in)
	Exhaust	0.31 mm (0.012 in)
Recommended engine oil		Honda 4-stroke oil or equivalent motor oil API service classification: SE, SF or SG Viscosity: SAE 10W-40
Engine oil capacity	After draining	3.5 ℓ (3.7 US qt , 3.1 Imp qt)
	After draining/filter change	3.9 ℓ (4.1 US qt , 3.4 Imp qt)
	After disassembly	4.3 ℓ (4.5 US qt , 3.8 Imp qt)
Engine idle speed		1,300 ± 100 min^{-1} (rpm)

ITEM			SPECIFICATIONS
Drive chain slack			25 – 35 mm (1.0 – 1.4 in)
Recommended brake fluid			DOT 4 brake fluid
Recommended clutch fluid			DOT 4 brake fluid
Cold tire pressure	Driver only	Front	250 kPa (2.50 kgf/cm², 36 psi)
		Rear	290 kPa (2.90 kgf/cm², 42 psi)
	Driver and passenger	Front	250 kPa (2.50 kgf/cm², 36 psi)
		Rear	290 kPa (2.90 kgf/cm², 42 psi)
Tire size		Front	120/70ZR17 (58W)
		Rear	190/50ZR17 (73W)
Tire brand	DUNLOP	Front	D207FR
		Rear	D207P
	METZELER	Front	MEZ3H FRONT RACING
		Rear	MEZ3H RACING
Minimum tread depth		Front	1.5 mm (0.06 in)
		Rear	2.0 mm (0.08 in)

TORQUE VALUES

Spark plug	18 N·m (1.8 kgf·m , 13 lbf·ft)
Cylinder head cover bolt	10 N·m (1.0 kgf·m , 7 lbf·ft)
Crankshaft hole cap	15 N·m (1.5 kgf·m , 11 lbf·ft)
Timing hole cap	10 N·m (1.0 kgf·m , 7 lbf·ft)
Engine oil drain bolt	29 N·m (3.0 kgf·m , 22 lbf·ft)
Engine oil filter cartridge	25 N·m (2.6 kgf·m , 19 lbf·ft)
Rear axle nut	127 N·m (13.0 kgf·m , 94 lbf·ft)
Front brake reservoir cap screw	2 N·m (0.2 kgf·m , 1.4 lbf·ft)
Clutch reservoir stopper plate screw	1 N·m (0.1 kgf·m , 0.7 lbf·ft)

TOOLS

Oil filter wrench	07HAA-PJ70100
Drive chain tool set	07HMH-MR10103

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 your Honda dealer.

	ITEM \ FREQUENCY	WHICHEVER COMES FIRST ➡ / NOTE ⬇	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
*	CHOKE OPERATION					I		I		I	3-5
*	AIR CLEANER	NOTE 2					R			R	3-6
	CRANKCASE BREATHER	NOTE 3			C	C	C	C	C	C	3-6
	SPARK PLUG		EVERY 12,000 km (8,000 mi) I, EVERY 24,000 km (16,000 mi) R								3-6
*	VALVE CLEARANCE							I			3-8
	ENGINE OIL			R	R	R	R	R	R	R	3-13
	ENGINE OIL FILTER			R		R		R		R	3-15
*	ENGINE IDLE SPEED			I	I	I	I	I	I	I	3-15
	RADIATOR COOLANT	NOTE 4				I		I		R	3-16
*	COOLING SYSTEM					I		I		I	3-16
*	SECONDARY AIR SUPPLY SYSTEM	NOTE 5				I		I		I	3-17
	DRIVE CHAIN		EVERY 1,000 km (600 mi) I, L								3-17
	DRIVE CHAIN SLIDER					I		I		I	3-21
	BRAKE FLUID	NOTE 4			I	I	R	I	I	R	3-21
	BRAKE PAD WEAR				I	I	I	I	I	I	3-22
	BRAKE SYSTEM			I		I		I		I	3-23
*	BRAKE LIGHT SWITCH					I		I		I	3-23
*	HEADLIGHT AIM					I		I		I	3-24
	CLUTCH SYSTEM					I		I		I	3-24
	CLUTCH FLUID	NOTE 4			I	I	R	I	I	R	3-24
	SIDE STAND					I		I		I	3-25
*	SUSPENSION					I		I		I	3-25
*	NUTS, BOLTS, FASTENERS			I		I		I		I	3-26
**	WHEELS/TIRES					I		I		I	3-26
**	STEERING HEAD BEARINGS			I		I		I		I	3-27

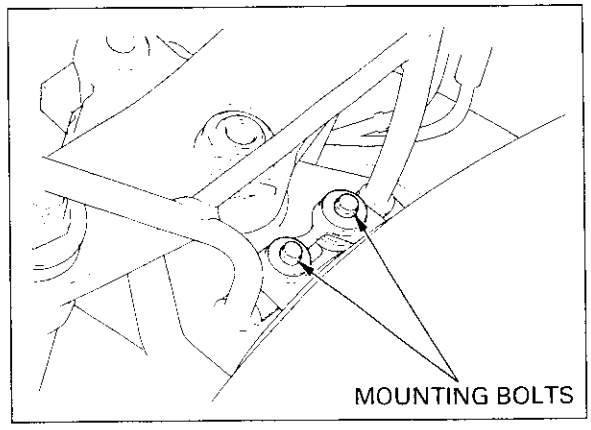
* Should be serviced by your Honda dealer, unless the owner has proper tools and service data and is mechanically qualified.
** In the interest of safety, we recommend these items be serviced only by your Honda dealer.
Honda recommends that your Honda dealer should road test your motorcycle after each periodic maintenance is carried out.

NOTES:
1. At higher odometer readings, repeat at the frequency interval established here.
2. Service more frequently when riding in unusually wet or dusty areas.
3. Service more frequently when riding in rain or at full throttle.
4. Replace every 2 years, or at indicated odometer interval, whichever comes first. Replacement requires mechanical skill.
5. Except U type

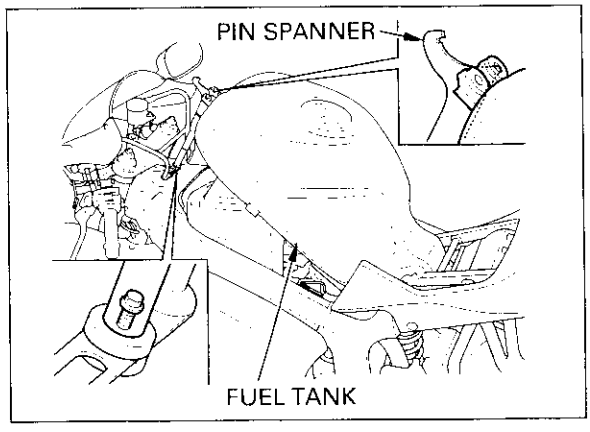
FUEL LINE

Remove the driver seat (page 2-2).

Remove the fuel tank front mounting bolts.



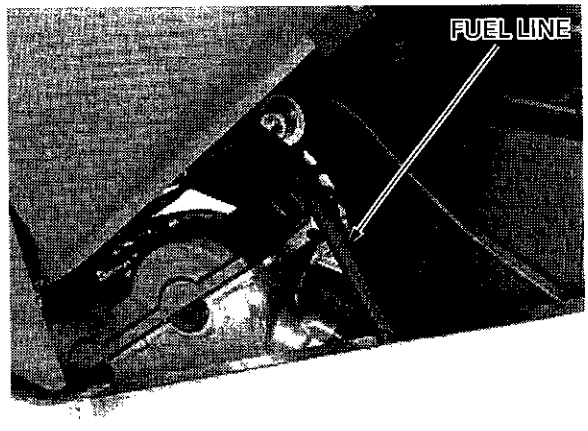
While lightly expanding the front of the seat cowl, raise the front of the fuel tank and support it with the extension and pin spanner in the tool kit as shown.



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

Lower the fuel tank, install the front mounting bolts and tighten them securely.

Install the driver seat (page 2-2).



THROTTLE OPERATION

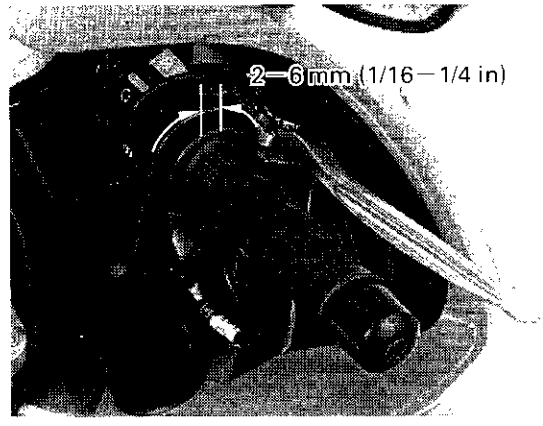
Check for any deterioration or damage to the throttle cables. Check that the throttle grip for smooth operation. Check that the throttle opens and automatically closes in all steering positions.

If the throttle grip does not return properly, lubricate the throttle cables and overhaul and lubricate the throttle grip housing.
For cable lubrication: Disconnect the throttle cables at their upper ends. Thoroughly lubricate the cables and their pivot points with a commercially available cable lubricant or a light weight oil.

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

⚠WARNING

Reusing a damaged or abnormally bent or kinked throttle cable can prevent proper throttle slide operation and may lead to a loss of throttle control while riding.



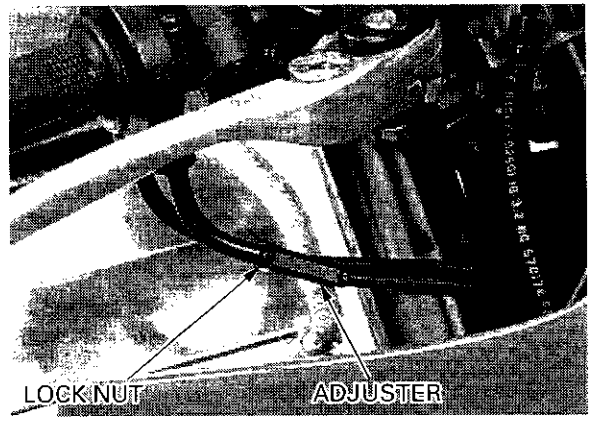
With the engine idling, turn the handlebar all the way to the right and left to ensure that the idle speed does not change. If idle speed increases, check the throttle grip free play and the throttle cable connection.

Measure the throttle grip free play at the throttle grip flange.

THROTTLE GRIP 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 adjustments are made with the upper adjuster.

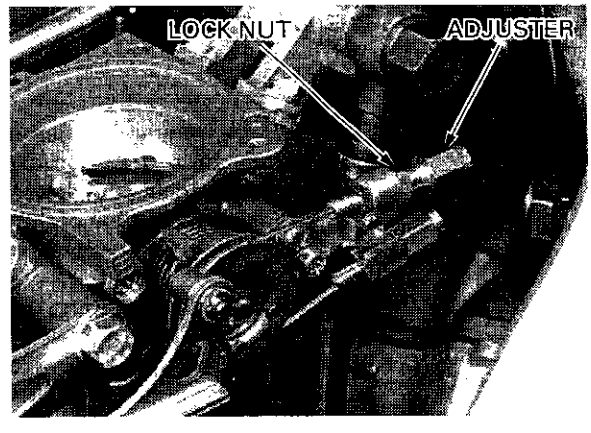
Loosen the lock nut, turn the adjuster as required and tighten the lock nut.



Major adjustments are made with the lower adjuster.

Remove the air cleaner housing (page 5-56).
Loosen the lock nut, turn the adjuster as required and tighten the lock nut.

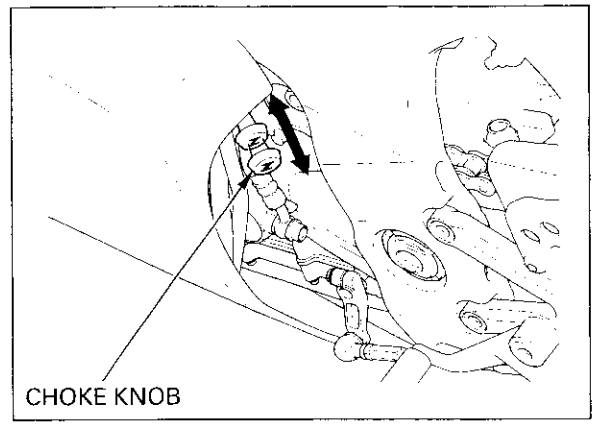
Recheck the throttle operation and install the air cleaner housing (page 5-57).



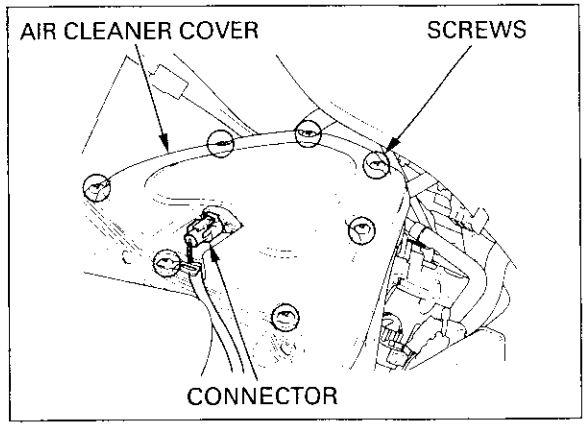
CHOKE OPERATION

This model uses a bypass air volume control choke system controlled by the starter valve.
The starter valve opens the bypass air circuit via a cable when the choke knob on the left side of the frame is pulled out.

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



AIR CLEANER



NOTE:

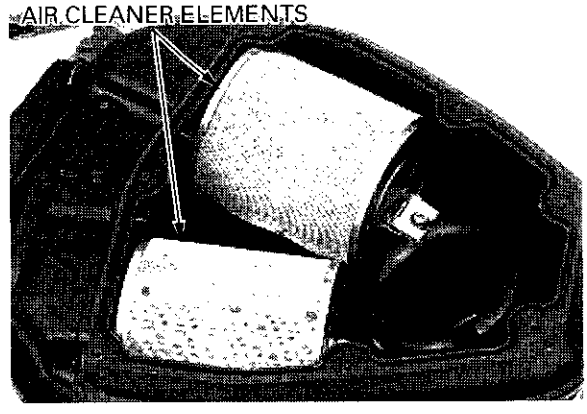
- The paper element type air cleaner cannot be cleaned because the element contains a dust adhesive.
- If the motorcycle is used in unusually wet or dusty areas, more frequent inspections are required.

Raise the front of the fuel tank and support it (page 3-4).

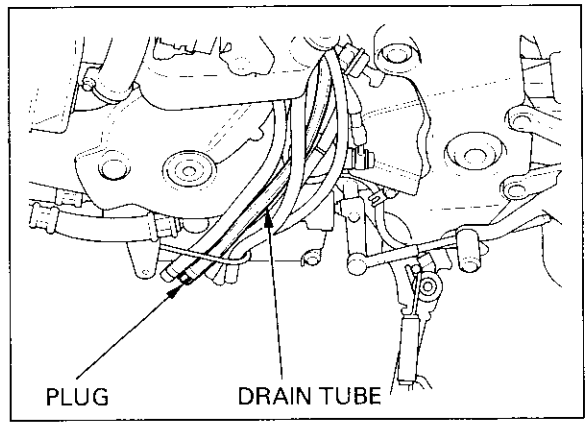
Disconnect the air temperature sensor connector. Remove the seven air cleaner cover screws and cover.

Remove the air cleaner element setting screws, move the element stays out of position by turning the elements outward and remove them rearward. Replace the elements in accordance with the maintenance schedule or any time they are excessively dirty or damaged.

Install the air cleaner elements and removed parts in the reverse order of removal.



CRANKCASE BREATHER



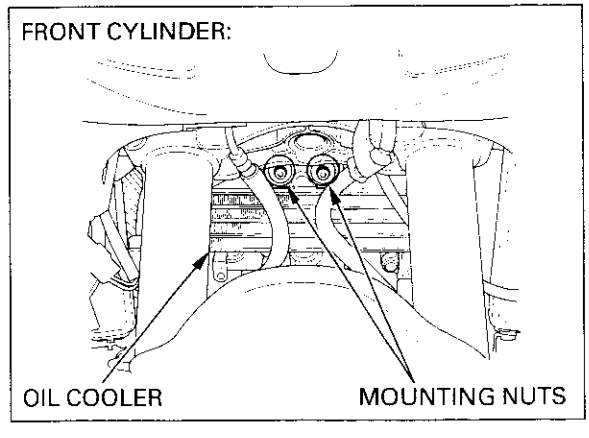
NOTE:

Service more frequently when ridden in rain, at full throttle, or after the motorcycle is washed or overturned. Service if the deposit level can be seen in the transparent section of the drain tube.

Remove the left lower fairing (page 2-3).

Remove the plug from the crankcase breather storage tank drain tube and drain the deposits into a suitable container, then reinstall the plug securely.

SPARK PLUG



Front cylinder:

Remove the lower inner fairing (page 2-3).

Remove the two mounting nuts and oil cooler from the stay and move it forward.

Rear cylinder:

Raise the front of the fuel tank and support it (page 3-4).

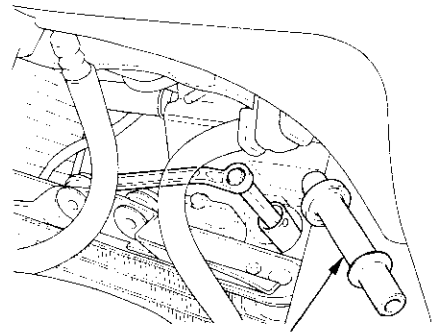
Disconnect the spark plug caps and clean around the spark plug bases.

NOTE:

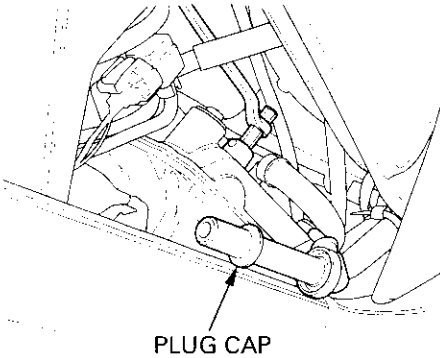
Clean around the spark plug bases with compressed air before removing the plugs, and be sure that no debris is allowed to enter the combustion chamber.

Remove the spark plugs.

FRONT CYLINDER:



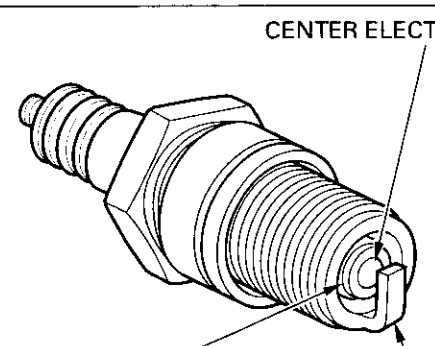
REAR CYLINDER:



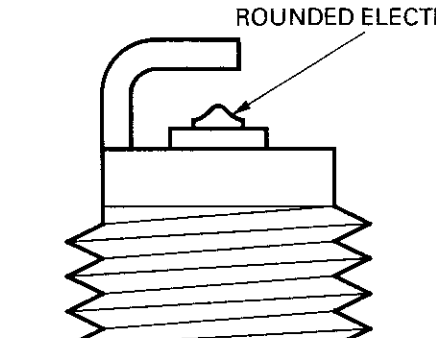
Check the insulator for cracks or damage, and the electrodes for wear, fouling or discoloration. Replace the plug if necessary.

CAUTION:

This motorcycle's spark plug is equipped with iridium type center electrode. Do not clean the electrodes.



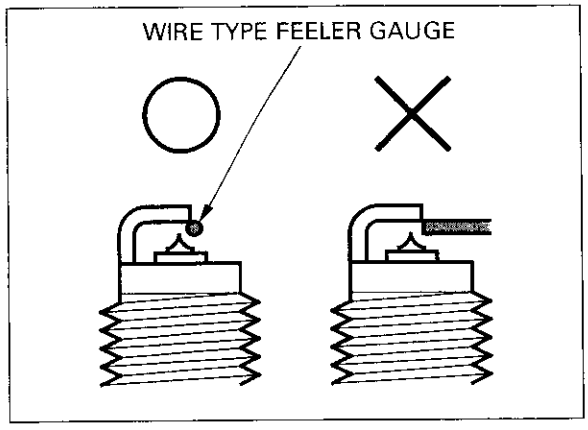
Replace the plug if the center electrode is rounded as shown.



Always use specified spark plugs on this motorcycle.

SPECIFIED SPARK PLUG:
Standard:
FR9BI-11 (NGK), IK27C11 (DENSO)
For cold climate (below 5°C/41°F):
FR8BI-11 (NGK), IK24C11 (DENSO)

Measure the spark plug gap between the center and side electrodes with a wire-type feeler gauge.



CAUTION:

To prevent damaging the iridium coating of the center electrode, use a wire type feeler gauge to check the spark plug gap.

Make sure that the 1.40 mm (0.055 in) wire type feeler gauge cannot be inserted into the gap.
If the gauge can be inserted into the gap, replace the plug with a new one.

CAUTION:

Do not adjust the spark plug gap. If the gap is out of specification, replace the plug with a new one.

Screw the spark plug in the cylinder head by hand to prevent cross-threading.
Tighten the spark plug.

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

Install the removed part in the reverse order of removal.

VALVE CLEARANCE

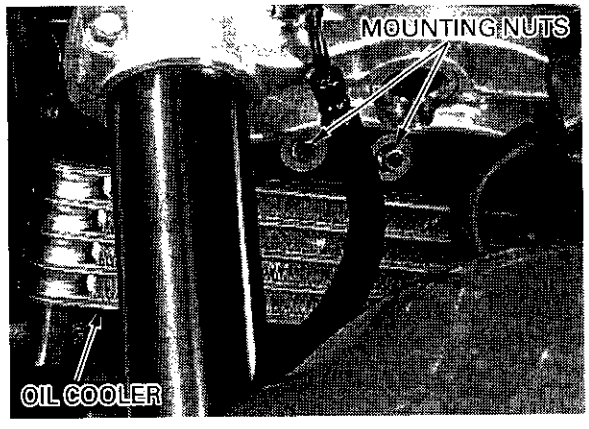
INSPECTION

NOTE:

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

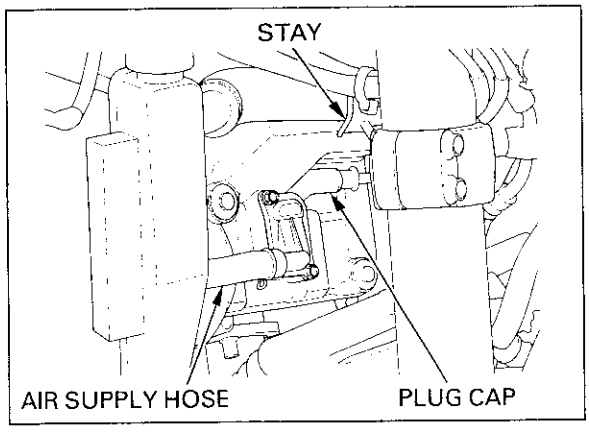
Front cylinder:

Remove the lower inner fairing and lower fairings (page 2-3).



Remove the two mounting nuts and oil cooler from the stay and move it forward.

Remove the two socket bolts and oil cooler stay.
Disconnect the air supply hose from the pulse secondary air injection (PAIR) check valve (except U type).
Disconnect the crankcase breather hose from the cylinder head cover.
Remove the spark plug cap.
Remove the four cylinder head cover bolts, special washers and the cylinder head cover.

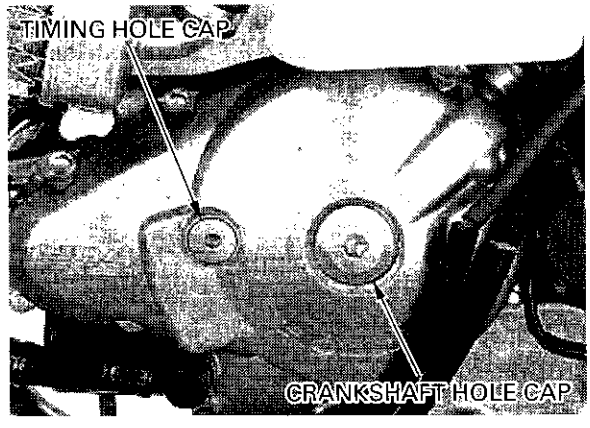


Rear cylinder:
Remove the fuel tank (page 5-46).

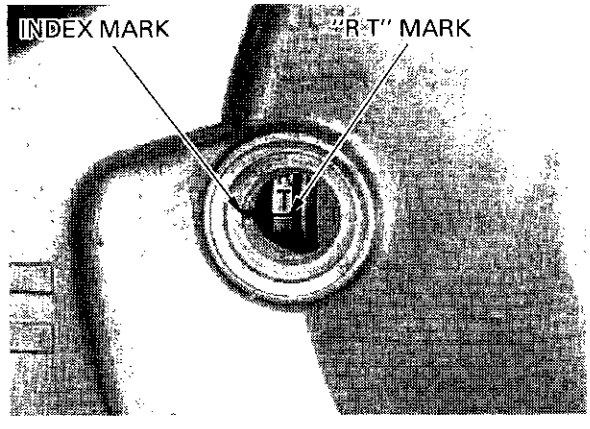
Disconnect the air supply hose from the pulse secondary air injection (PAIR) check valve (except U type).
Remove the spark plug cap.
Remove the four cylinder head cover bolts, special washers and the cylinder head cover.



Remove the timing hole cap and crankshaft hole cap.

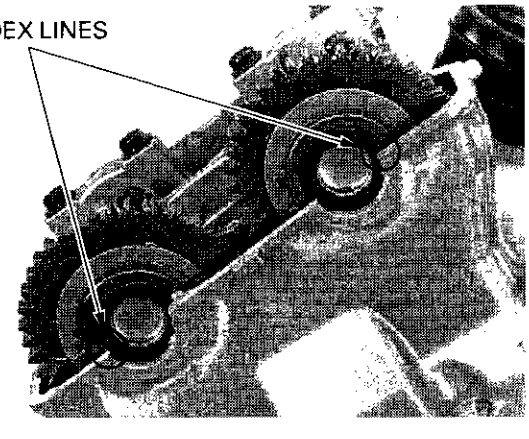


Rotate the crankshaft counterclockwise and align the "R T" mark on the flywheel with the index mark on the left crankcase cover.



The index lines on the rear cylinder camshafts must be flush with the cylinder head surface and facing outward as shown.

If the index lines are facing inward, rotate the crankshaft counterclockwise 360° (1 full turn) and align the "R T" mark with the index mark.

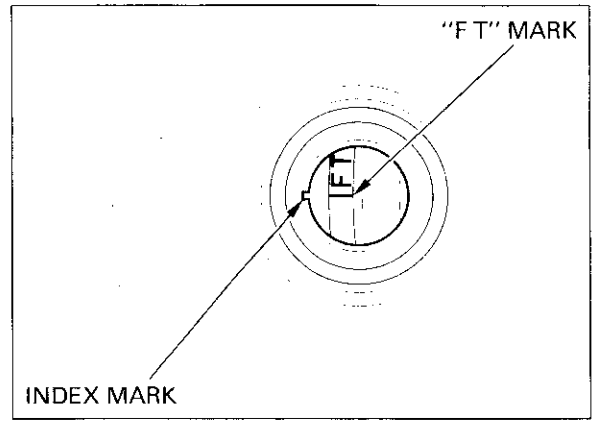


Measure the rear cylinder valve clearance by inserting a feeler gauge between the valve lifter and cam lobe.

VALVE CLEARANCES: **IN:** 0.16 mm (0.006 in)
EX: 0.31 mm (0.012 in)



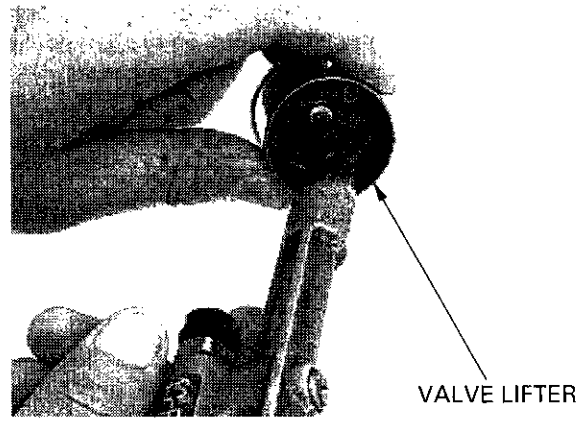
Rotate the crankshaft counterclockwise 450° and align the "F T" mark with index mark.
Check the front cylinder valve clearances.



ADJUSTMENT

Remove the valve lifters and shims (page 8-4).

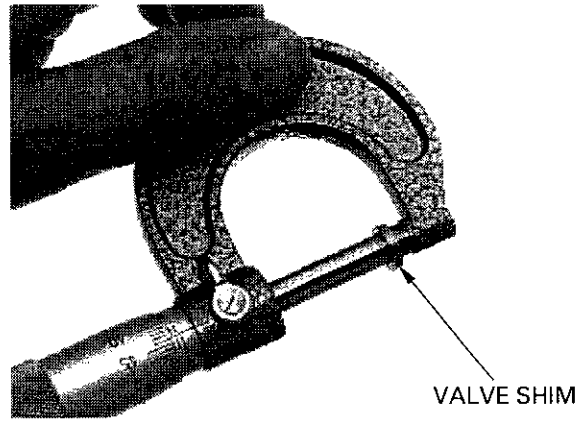
Clean the valve shim contact area in the valve lifter with compressed air.



Measure the shim thickness and record it.

NOTE:

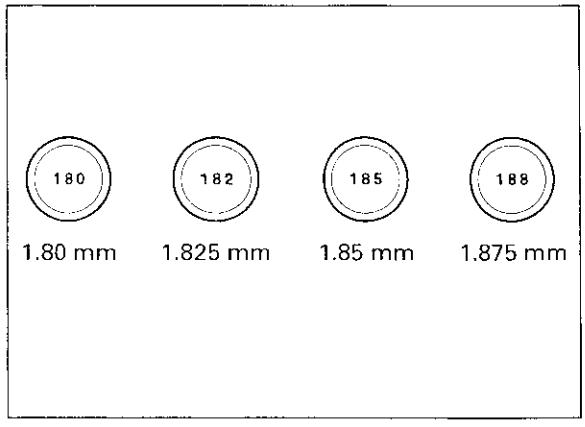
Fifty-one different thickness shims are available from the thinnest (1.200 mm thickness) shim to the thickest (2.450 mm thickness) in intervals of 0.025 mm



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



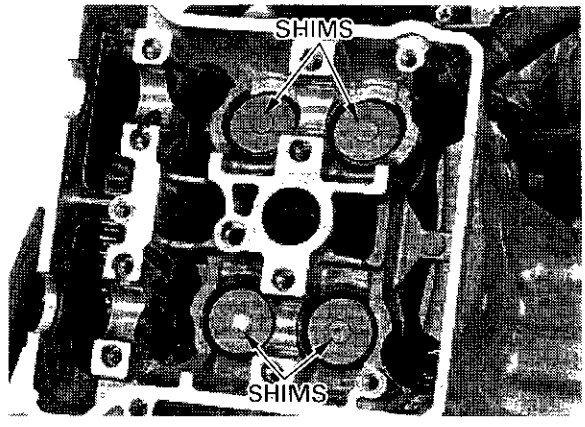
NOTE:

- Make sure of the correct shim thickness by measuring the shim with the micrometer.
- Reface the valve seat if carbon deposits result in a calculated dimension of over 2.450 mm.

Install the newly selected shims on the valve retainers.

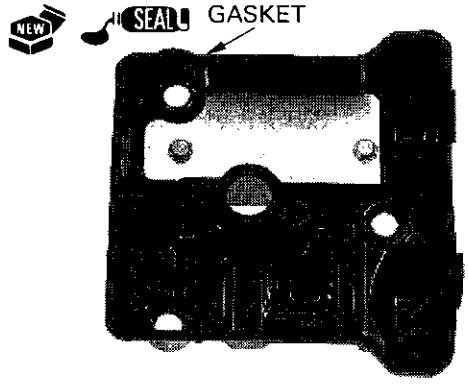
Install the valve lifters and camshafts (page 8-17).

Rotate the camshafts by rotating the crankshaft counterclockwise several times.
Recheck the valve clearances.

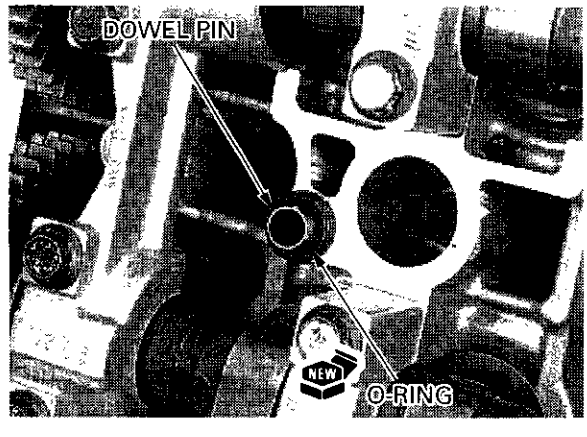


Apply sealant to the cylinder head cover side of a new gasket.
Install the gasket into the groove in the head cover.

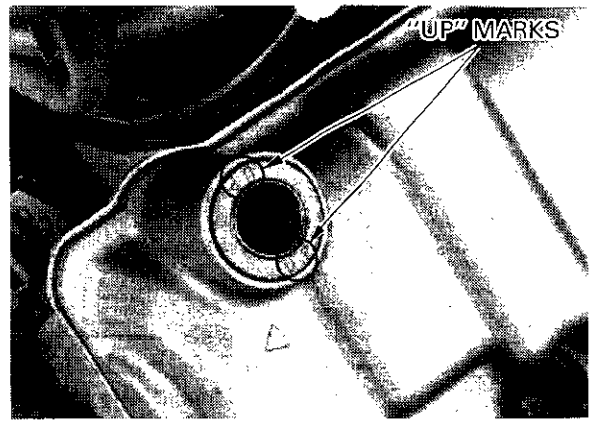
Apply sealant to the cylinder head semi-circular areas.



Install the dowel pin and a new O-ring onto the cylinder head.



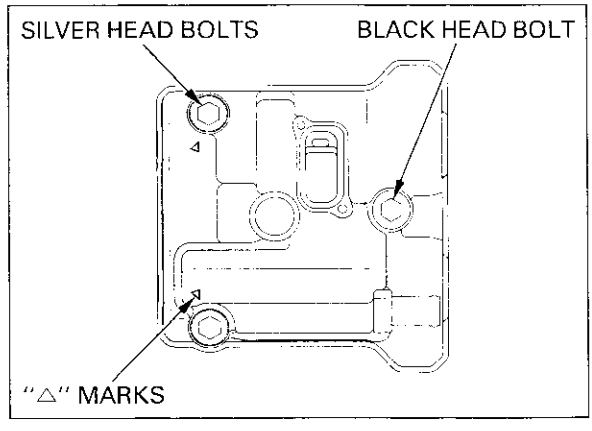
Install the cylinder head cover onto the cylinder head.
Install the special washers with the "UP" marks facing up.



The bolt holes for the silver head bolts are marked "△".

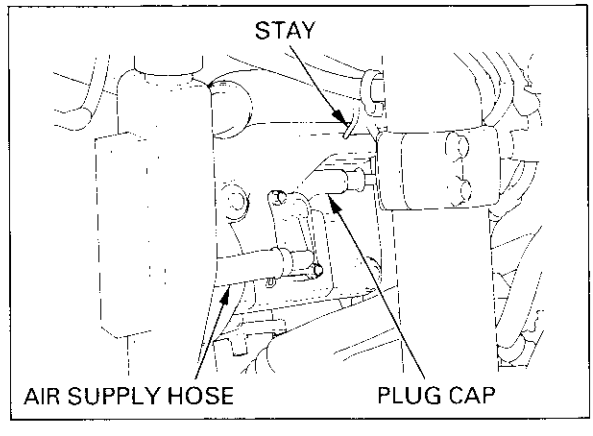
Install and tighten the cylinder head cover bolts.

TORQUE: 10 N·m (1.0 kgf·m , 7 lbf·ft)



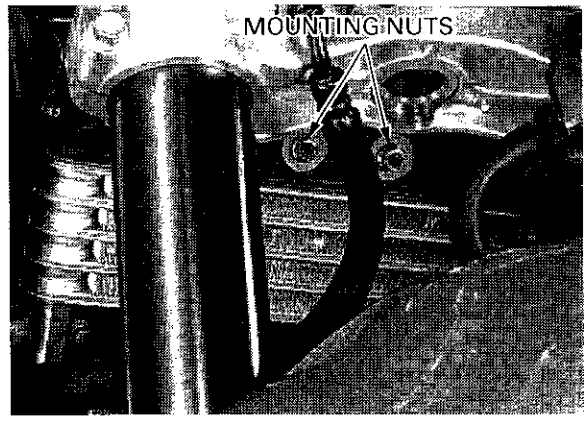
Front cylinder:
Install the spark plug cap onto the plug.
Connect the breather hose to the cylinder head cover.
Connect the air supply hose to the pulse secondary air injection (PAIR) check valve (except U type).

Install the oil cooler stay and tighten the two socket bolts securely.



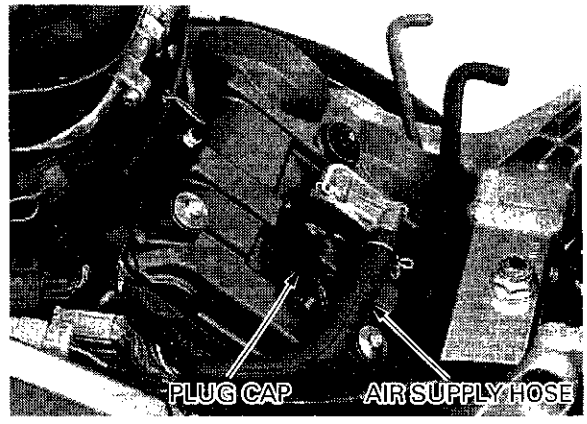
Install the oil cooler onto the stay and tighten the two mounting nuts securely.

Install the lower fairings and lower inner fairing (page 2-3).



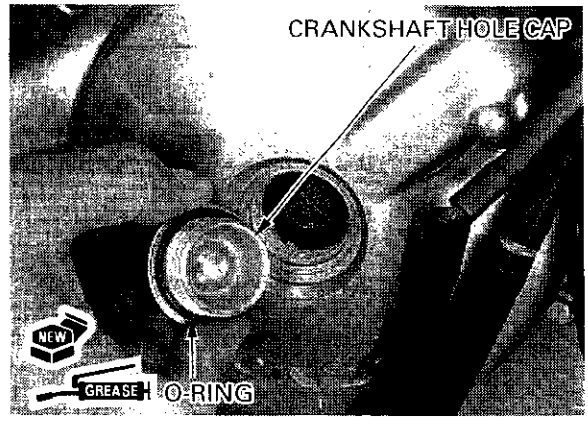
Rear cylinder:
Install the spark plug cap onto the plug.
Connect the air supply hose to the PAIR check valve (except U type).

Install the fuel tank (page 5-47).



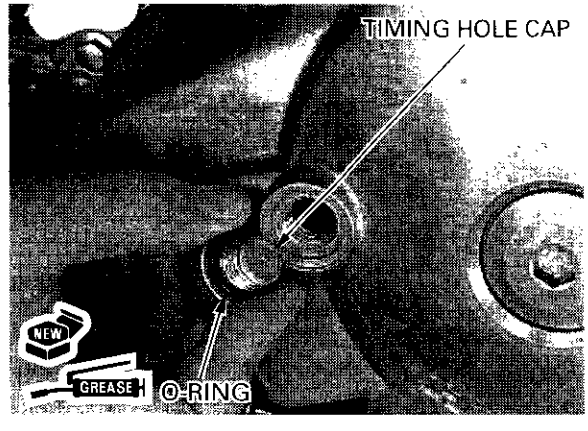
Coat a new O-ring with grease and install it onto the crankshaft hole cap.
Apply grease to the crankshaft hole cap threads.
Install and tighten the crankshaft hole cap.

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



Coat a new O-ring with grease and install it onto the timing hole cap.
Apply grease to the timing hole cap threads.
Install and tighten the timing hole cap.

TORQUE: 10 N·m (1.0 kgf·m , 7 lbf·ft)

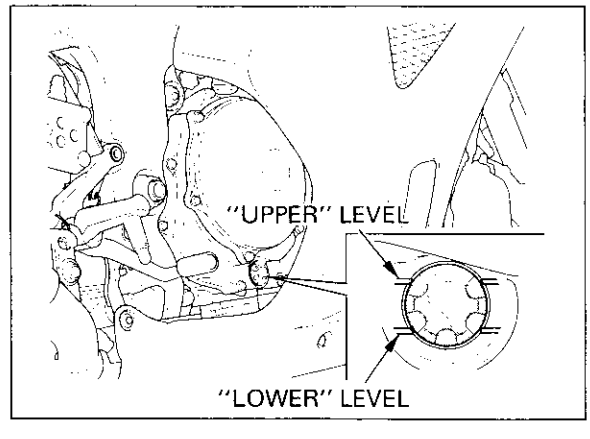


ENGINE OIL

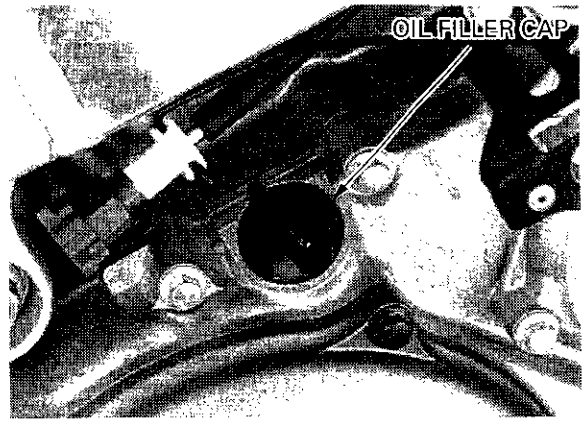
OIL LEVEL CHECK

Start the engine and let it idle for a few minutes.

Stop the engine, support the motorcycle upright on a level surface.
Wait for a few minutes and check that the oil level is between the upper and lower level marks in the inspection window.



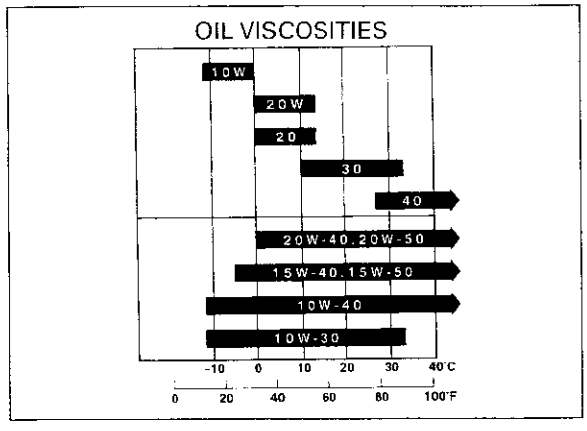
If the oil level is below or near the lower level mark, remove the right lower fairing (page 2-3).
Remove the oil filler cap and add the recommended engine oil up to the upper level mark.



RECOMMENDED ENGINE OIL:
Honda 4-stroke oil or equivalent motor oil
API service classification: SE, SF or SG
Viscosity: SAE 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 filler cap.

Install the right lower fairing (page 2-3).

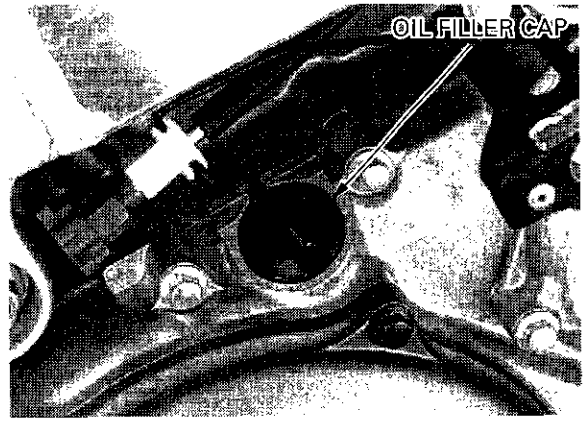
OIL CHANGE

NOTE:

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

⚠WARNING

Engine and exhaust system parts become very hot and remain hot for some time after the engine is run.
Wear insulated gloves.

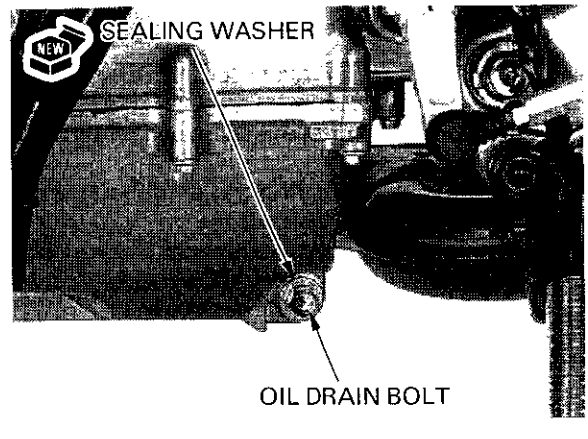


Warm up the engine.
Stop the engine and remove the lower inner fairing and lower fairings (page 2-3).

Remove oil filler cap and drain bolt, and drain the oil.

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.



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

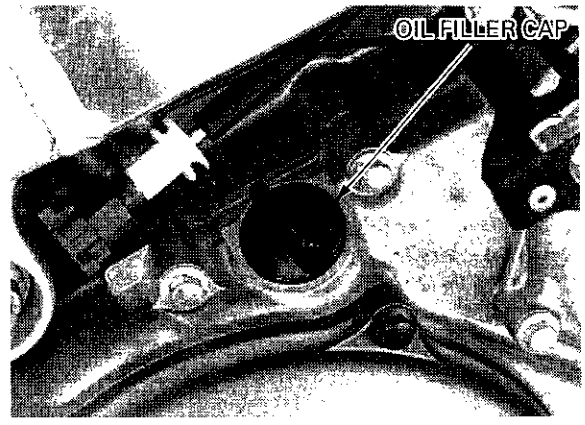
TORQUE: 29 N·m (3.0 kgf·m , 22 lbf·ft)

Fill the crankcase with the recommended oil (page 3-14).

OIL CAPACITY: 3.5 ℓ (3.7 US qt , 3.1 Imp qt) after draining

Reinstall the oil filler cap.
Check the engine oil level (page 3-13).
Make sure there are no oil leaks.

Install the lower fairings and inner fairing (page 2-3).

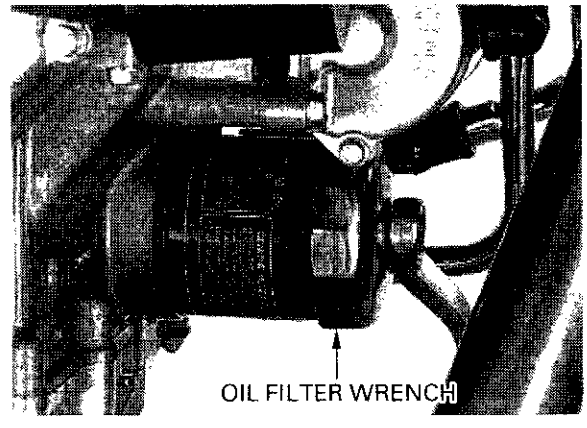


ENGINE OIL FILTER

Drain the engine oil (page 3-14).

Remove the oil filter cartridge and let the remaining oil drain out.

TOOL:
Oil filter wrench 07HAA-PJ70100

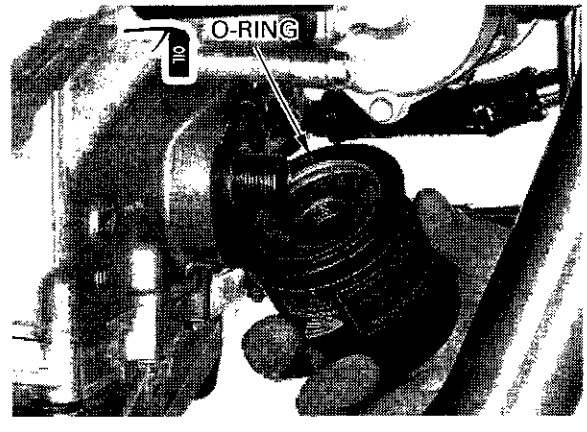


Apply oil to the O-ring and threads of a new oil filter cartridge and install the filter cartridge.

TORQUE: 25 N·m (2.6 kgf·m , 19 lbf·ft)

Install the oil drain bolt and fill the crankcase with the recommended oil (page 3-14).

OIL CAPACITY: 3.9 ℓ (4.1 US qt , 3.4 Imp qt) after filter change
4.3 ℓ (4.5 US qt , 3.8 Imp qt) after disassembly



ENGINE IDLE SPEED

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.

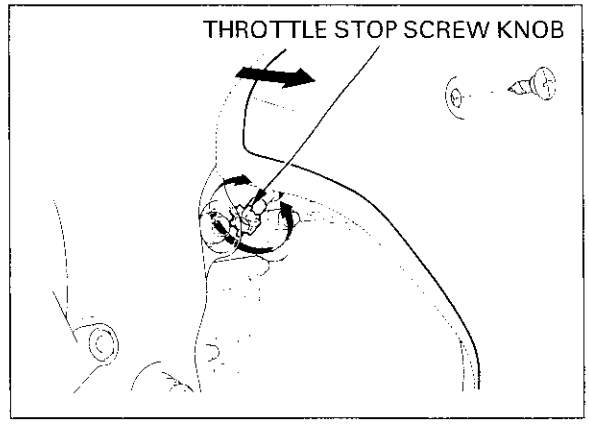
Warm up the engine, shift the transmission into neutral and place the motorcycle on its side stand on a level surface.

Check the idle speed.

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

If the adjustment is necessary, remove the special screw attaching the right lower fairing.
Slightly open the right lower fairing and adjust by turning the throttle stop screw knob as required.

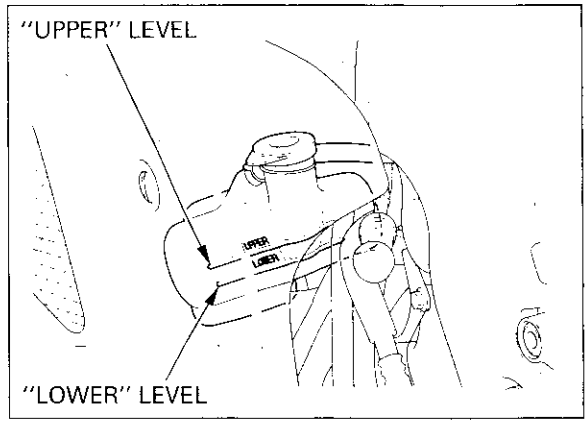
Do not open the lower fairing more than necessary to turn the throttle stop screw knob.



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 with the motorcycle upright on a level surface.

If the level is low, remove the left lower fairing (page 2-3) and the reserve tank cap, and fill the tank to the "UPPER" level line with a 50/50 mixture of distilled water and antifreeze (coolant preparation: page 6-4).

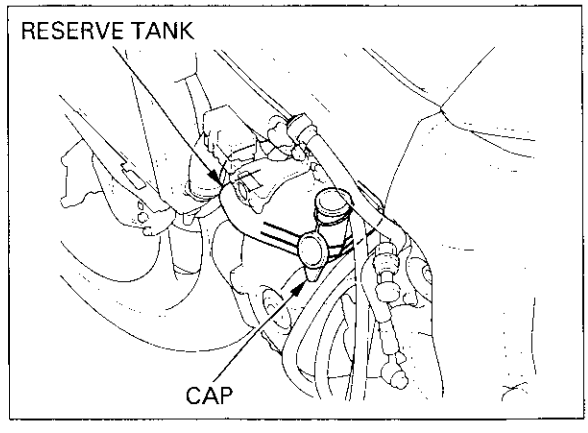


CAUTION:

Using coolant with silicate corrosion inhibitors may cause premature wear of water pump seals or blockage of radiator passages. Using tap water may cause engine damage.

Check to see if there are any coolant leaks when the coolant level decreases very rapidly.

If reserve tank becomes completely empty, there is a possibility of air getting into the cooling system.
Be sure to remove all air from the cooling system (page 6-5).

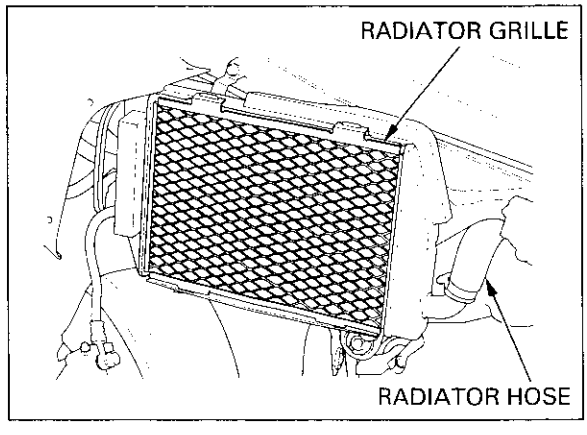


COOLING SYSTEM

Remove the inner lower fairing and lower fairings (page 2-3).

Check for any coolant leakage from the water pump, radiator hoses and hose joints.
Check the radiator hoses for cracks or deterioration and replace if necessary.
Check that all hose clamps are tight.

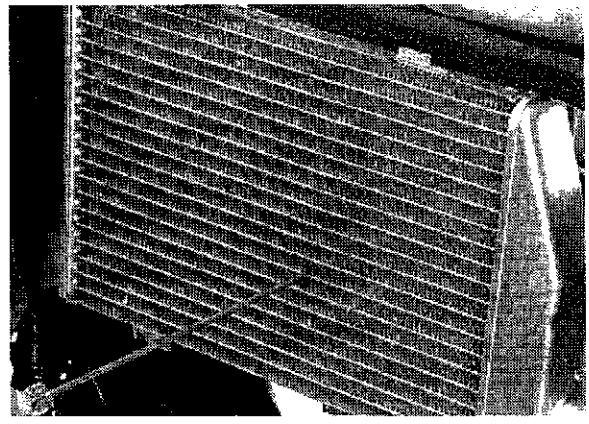
Remove the radiator grilles.



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

Install the radiator grilles.

Install the lower fairings and inner fairing (page 2-3).



SECONDARY AIR SUPPLY SYSTEM (Except U type)

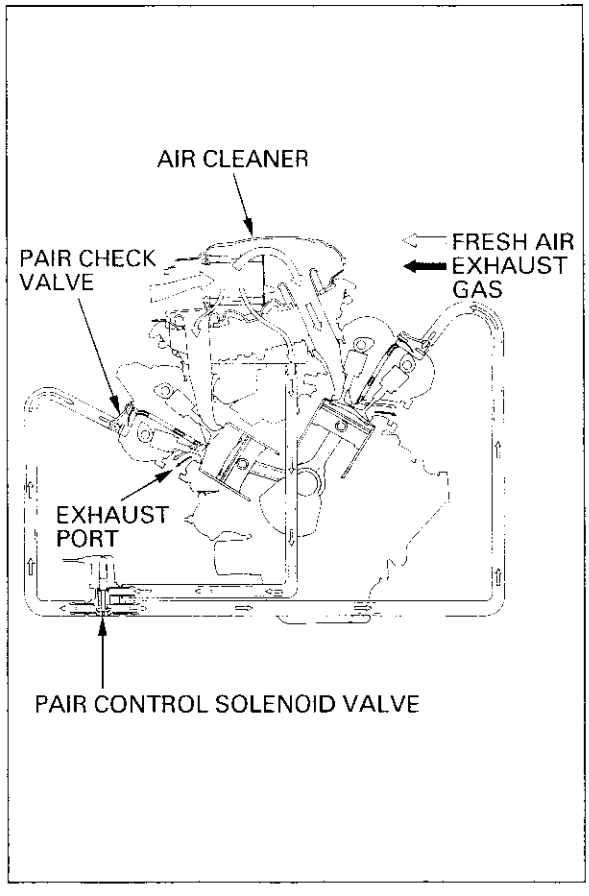
Remove the lower inner fairing (page 2-3).
Raise the front of fuel tank and support it (page 3-4).

Check the air supply hoses between the pulse secondary air injection (PAIR) control solenoid valve and PAIR check valves for damage or loose connections.
Check the air supply hoses for cracks or deterioration.

NOTE:

If the hoses show any signs of heat damage, inspect the PAIR check valves (page 5-72).

For PAIR control solenoid valve inspection, see page 5-71.



DRIVE CHAIN

CHAIN SLACK INSPECTION

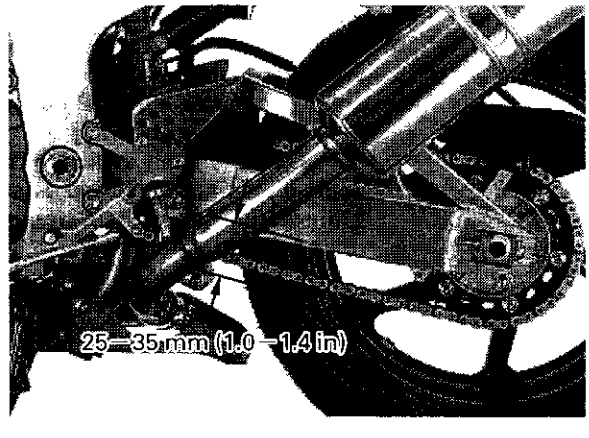
⚠WARNING

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

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

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

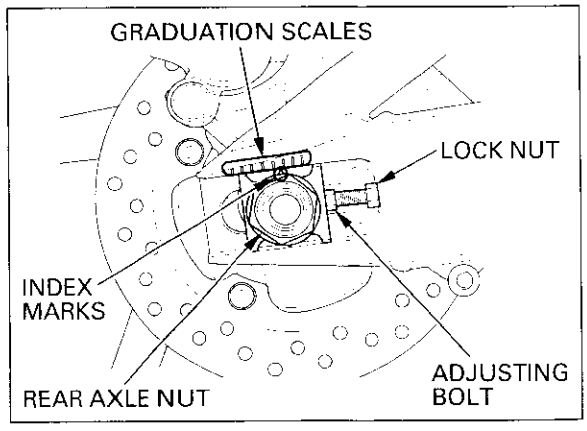
CHAIN SLACK: 25 – 35 mm (1.0 – 1.4 in)



ADJUSTMENT

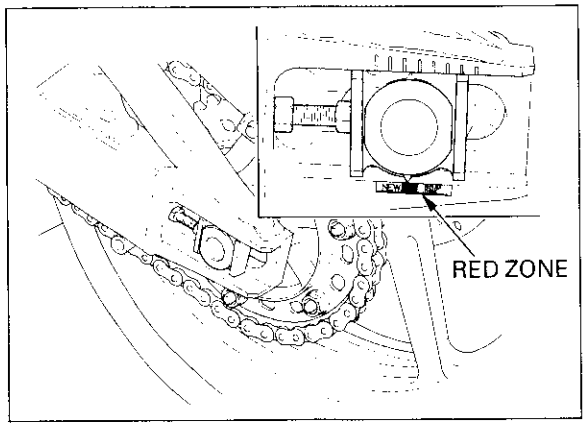
Loosen the rear axle nut.
Loosen the lock nuts and turn both adjusting bolts an equal number of turn until the correct drive chain slack is obtained.
Make sure the index marks on both adjusters are aligned with the same graduation scales on the swingarm.
Tighten the rear axle nut.

TORQUE: 127 N·m (13.0 kgf·m , 94 lbf·ft)



Recheck the drive chain slack and free wheel rotation.

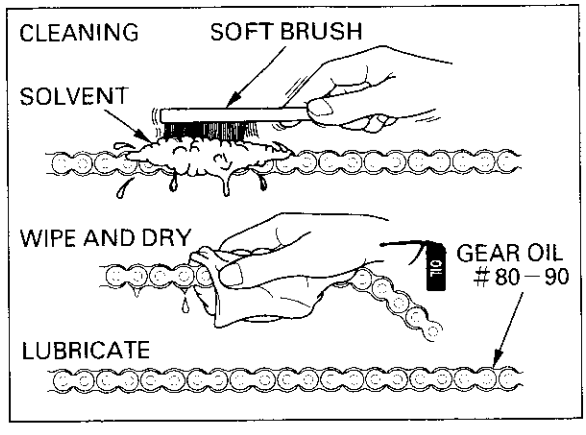
Check the drive chain wear indicator label attached on the left side of the swingarm.
If the index mark on the adjuster reaches the red zone of the indicator label, replace the drive chain with a new one (page 3-19).



CLEANING AND INSPECTION

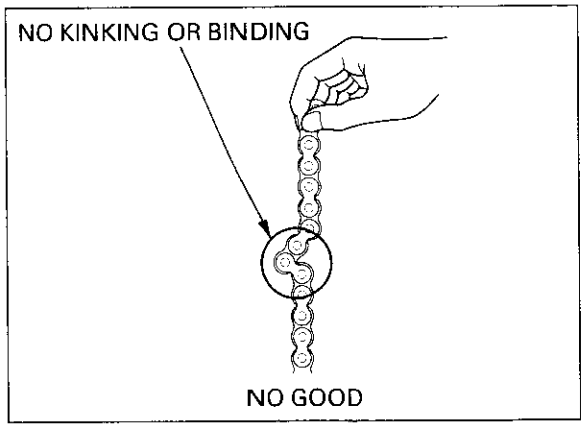
Clean the chain with a soft brush using a non-flammable or high flash point solvent and wipe it dry.
Be sure the chain has dried completely before lubricating.

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 the sprockets as necessary.



LUBRICATION

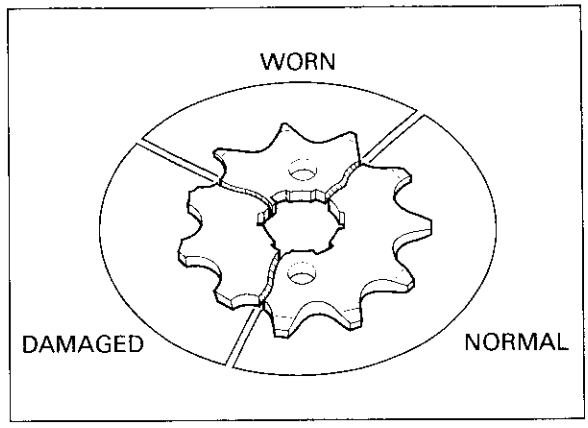
Lubricate the drive chain with #80—90 gear oil or equivalent chain lubricant designed for specifically for use on O-ring chains.
Some commercially available chain lubricants may contain solvents which could damage the O-rings.
Wipe off the excess chain lube.



SPROCKET INSPECTION

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

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



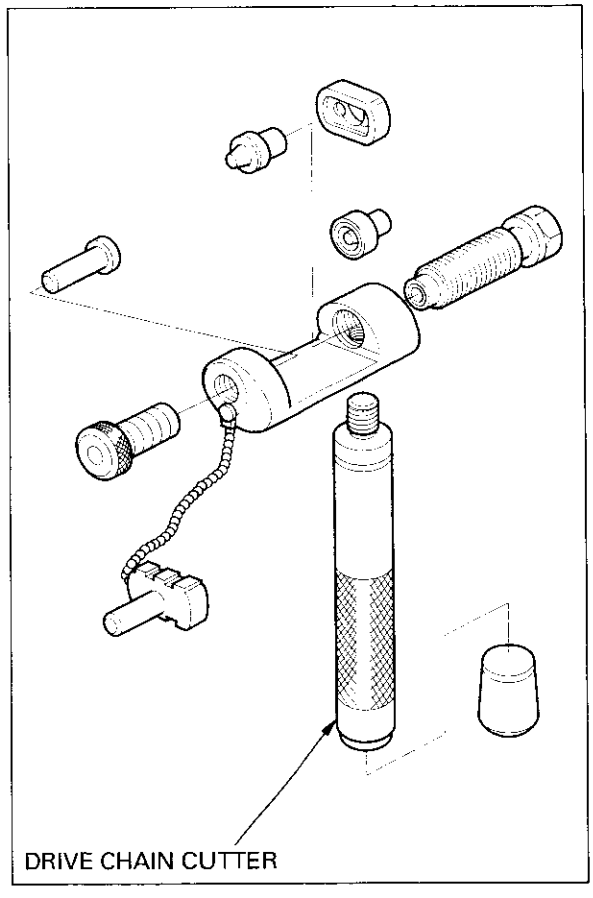
REPLACEMENT

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

Loosen the drive chain.
Assemble the special tool.

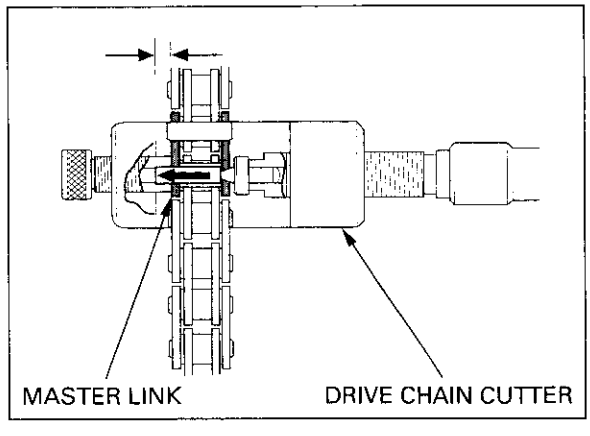
When using the special tool, follow the manufacturer's instruction.

TOOL:
Drive chain tool set 07HMH-MR10103



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.

Remove the drive chain.

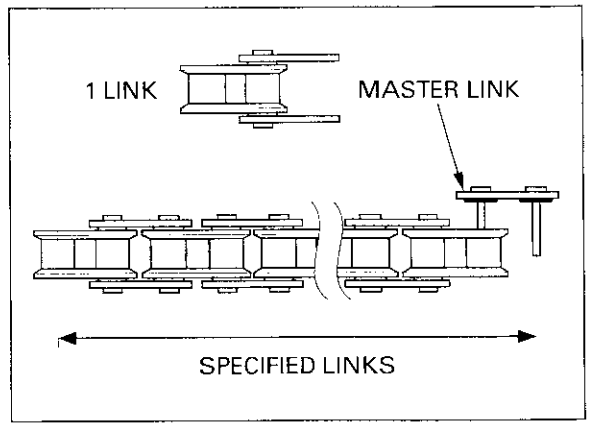


Remove the excess drive chain links from the new drive chain with the drive chain tool set.

NOTE:

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

SPECIFIED LINKS: 104 links
REPLACEMENT CHAIN: DID 50VA8 C1-120ZB
RK GB50 HFOZ5-120LJFZ

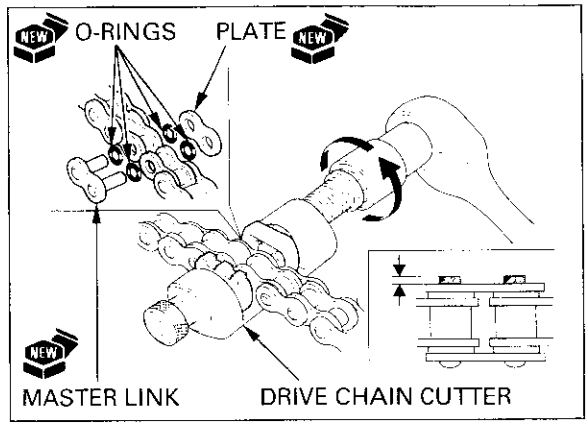


Remove the drive sprocket cover (page 7-4).
Install the new drive chain over the drive and driven sprockets.

Assemble the new master link, O-rings and master link plate with the drive chain tool set.

NOTE:

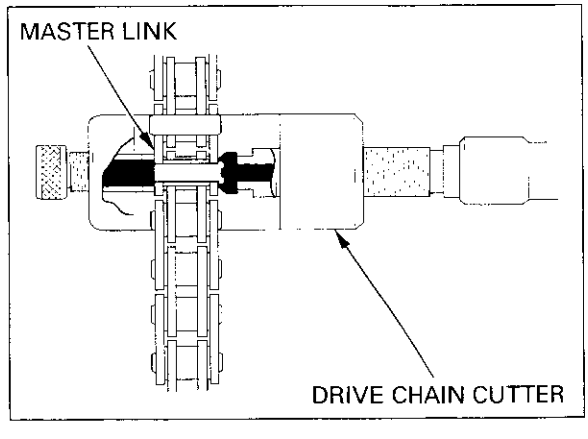
Insert the master link from the inside of the drive chain, and install the plate with the identification mark facing the outside.



Measure the master link pin length projected from the plate.

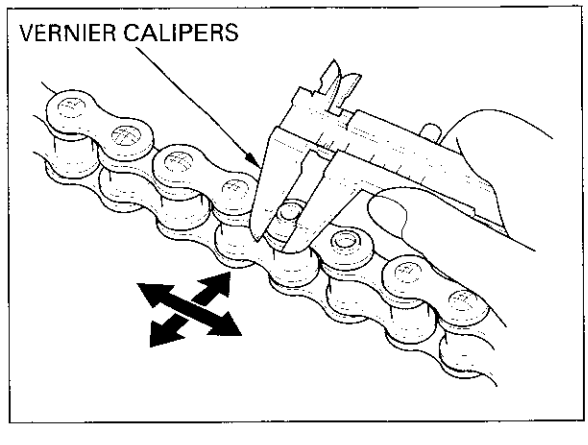
SPECIFIED LENGTH:
DID: 1.30 – 1.50 mm (0.051 – 0.059 in)
RK: 1.25 – 1.35 mm (0.049 – 0.053 in)

Stake the master link pins with the drive chain tool set.



Make sure that the master link pins are staked properly by measuring the diameter of the staked area.

DIAMETER OF THE STAKED AREA:
DID: 5.50 – 5.80 mm (0.217 – 0.228 in)
RK: 5.45 – 5.85 mm (0.215 – 0.230 in)

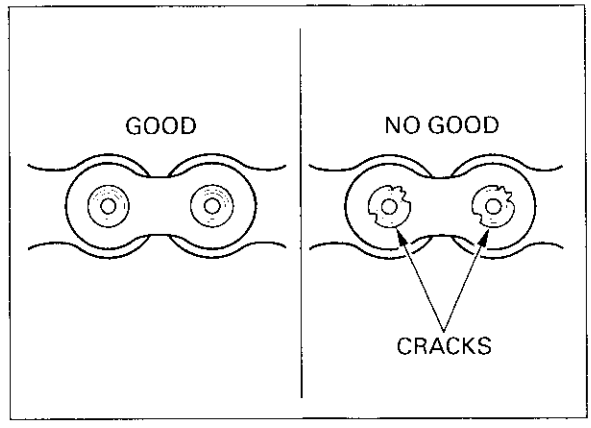


After staking, check the staked area of the master link for cracks.
If there is any cracking, replace the master link, O-rings and plate.

CAUTION:

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

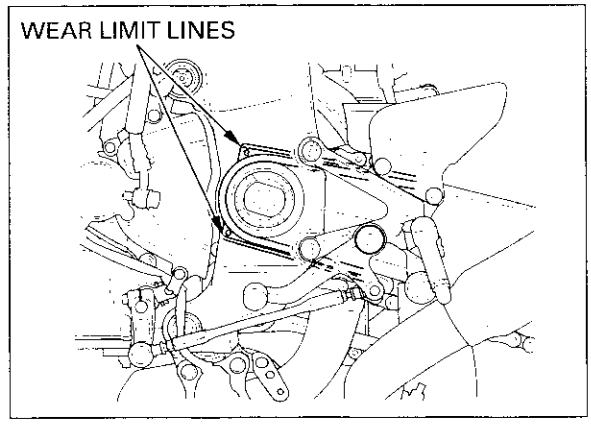
Install the drive sprocket cover (page 7-10).



DRIVE CHAIN SLIDER

Check the drive chain slider for wear.
Replace the chain slider if it is worn to the wear limit line.

Refer to section 14 for drive chain slider replacement.



BRAKE FLUID

CAUTION:

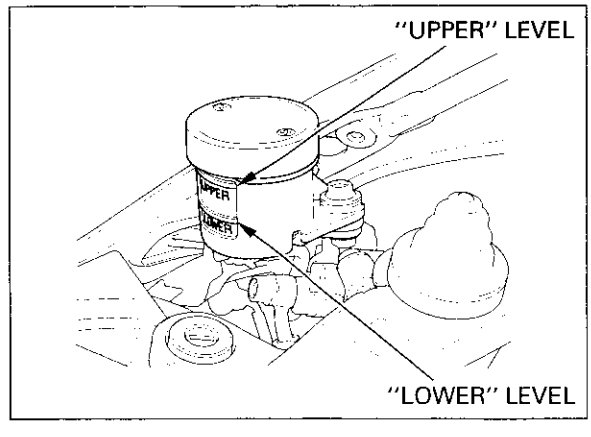
- ***Do not mix different types of fluid, as they are not compatible with each other.***
- ***Do not allow foreign material to enter the system when filling the reservoir.***
- ***Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.***

NOTE:

When the fluid level is low, check the brake pads for wear (page 3-22). A low fluid level may be due to wear of the brake pads. If the brake pads are worn, the caliper pistons are 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

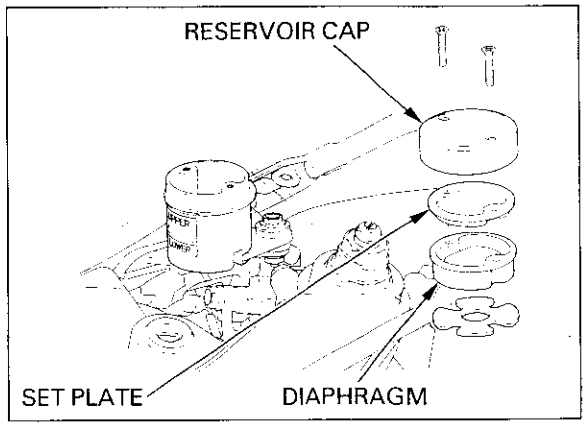
Turn the handlebar to the left side so that the reservoir is level and check the fluid level in the front brake reservoir.



If the level is near the "LOWER" level line, remove the reservoir cap, set plate and diaphragm, and fill the reservoir with DOT 4 brake fluid from a sealed container to the "UPPER" level line.

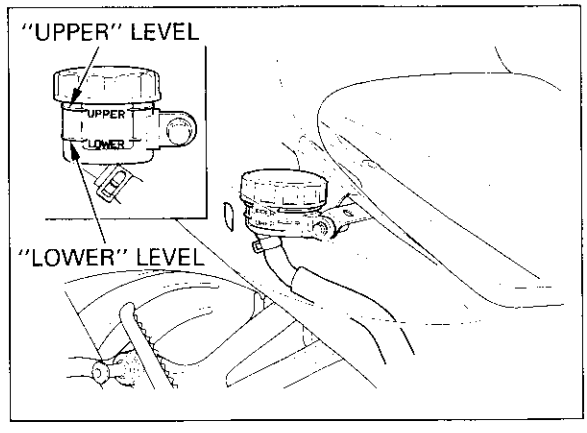
Install the diaphragm, set plate and reservoir cap and tighten the cap screws.

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



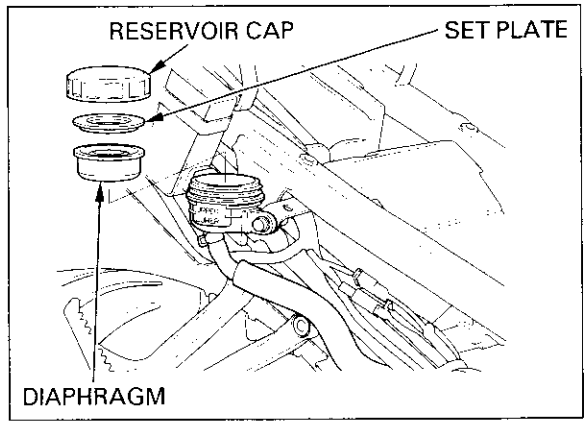
REAR BRAKE

Place the motorcycle on a level surface, and support it upright.
Check the fluid level in the rear brake reservoir through the inspection hole in the seat cowl.



If the level is near the "LOWER" level line, remove the seat cowl (page 2-2). Remove the reservoir cap, set plate and diaphragm, and fill the reservoir with DOT 4 brake fluid from a sealed container to the "UPPER" level line.

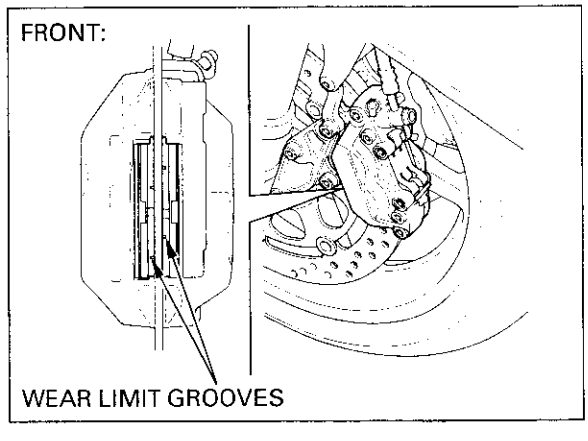
Install the diaphragm, set plate and reservoir cap.
Install the seat cowl (page 2-2).



BRAKE PAD WEAR

FRONT BRAKE PAD

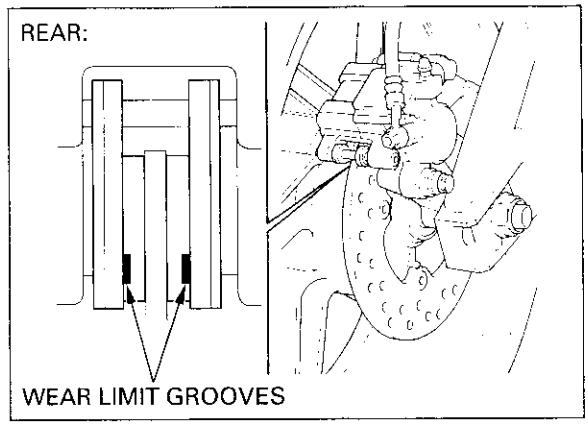
Check the brake pad for wear.
Replace the brake pads if the wear limit groove of either pad is worn out.



REAR BRAKE PAD

Check the brake pad for wear by looking from the rear side of the caliper.
Replace the brake pads if either pad is worn to the bottom of the wear limit groove.

Refer to page 15-5 for brake pad replacement.



BRAKE SYSTEM

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.

Refer to page 15-3 for air bleeding procedures.

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

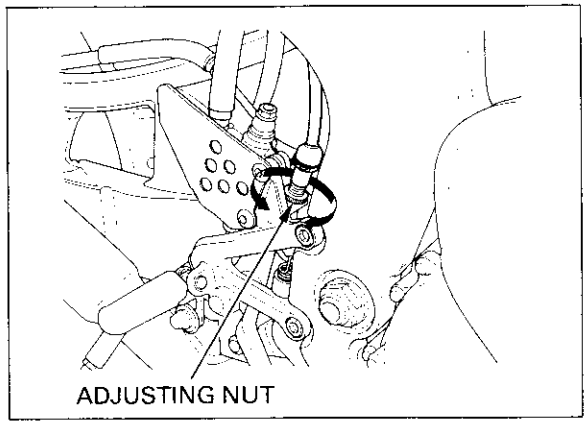


BRAKE LIGHT SWITCH

NOTE:

The brake light switch on the front brake master cylinder cannot be adjusted. If the front brake light switch actuation and brake engagement are off, either replace the switch unit or the malfunctioning parts of the system.

Check 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 proper time.
Hold the switch body and turn the adjusting nut. Do not turn the switch body.



HEADLIGHT AIM



⚠WARNING

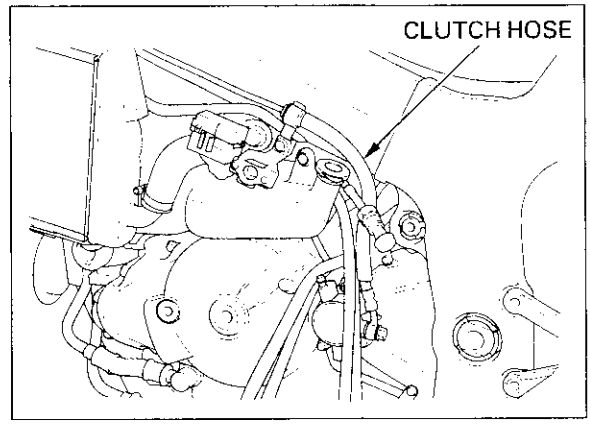
An improperly adjusted headlight may blind oncoming drivers, or it may fail to light the road for a safe distance.

Place the motorcycle on a level surface.

Adjust headlight beam as specified by local laws and regulations.

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

CLUTCH SYSTEM



Operate the clutch lever and check that no air has entered the system.
If the clutch is not disengaged properly, or the lever feels soft or spongy, bleed the air from the system.

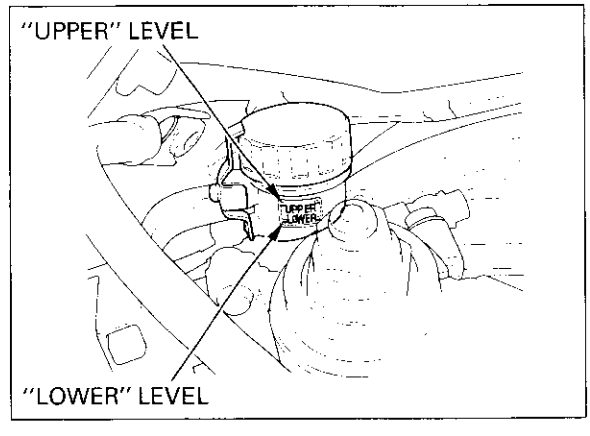
Refer to page 9-4 for air bleeding procedures.

Inspect the clutch hoses, pipe and fittings for damage, deterioration, cracks or signs of leakage.
Tighten any loose fittings.
Replace hoses, pipe and fittings as required.

CLUTCH 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.***



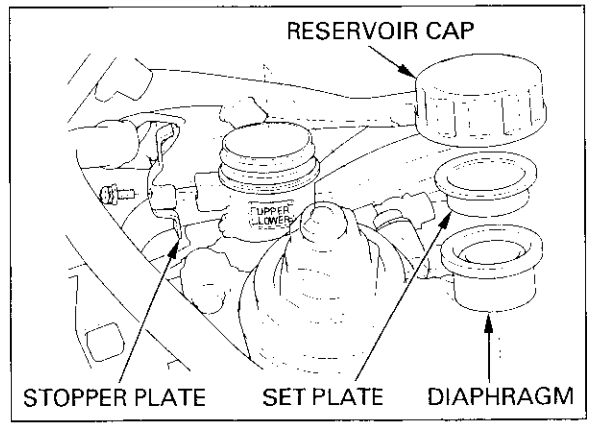
NOTE:

When the fluid level is low, check entire system for leaks.

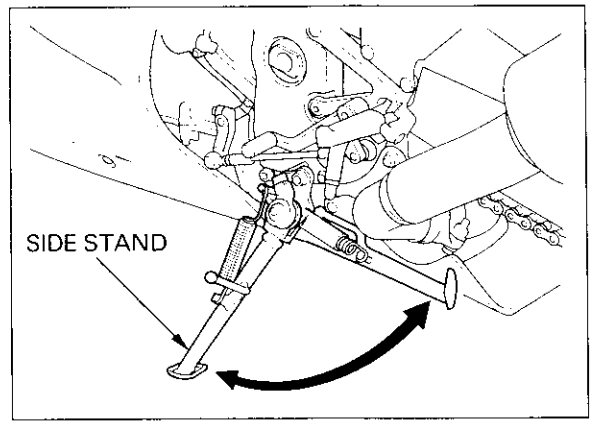
Turn the handlebar to the right side so that the reservoir is level and check the fluid level in the clutch reservoir.
If the level is near the "LOWER" level line, remove the screw, stopper plate, reservoir cap, set plate and diaphragm, and fill the reservoir with DOT 4 brake fluid from a sealed container to the "UPPER" level line.

Install the diaphragm, set plate, reservoir cap and stopper plate, and tighten the stopper plate screw.

TORQUE: 1 N·m (0.1 kgf·m , 0.7 lbf·ft)



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, while squeezing the clutch lever.
- Fully lower the side stand.
- The engine should stop as the side stand is lowered.

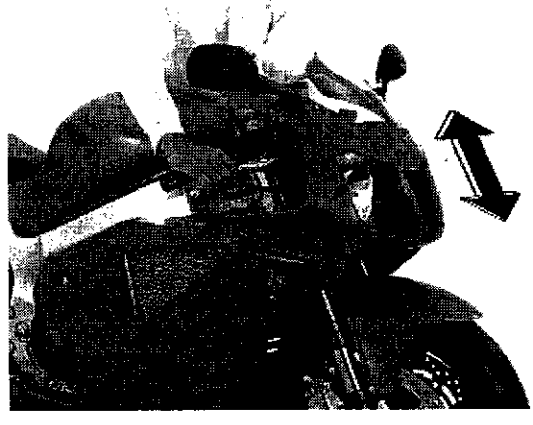
If there is a problem with the system, check the side stand switch (page 19-17).

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.

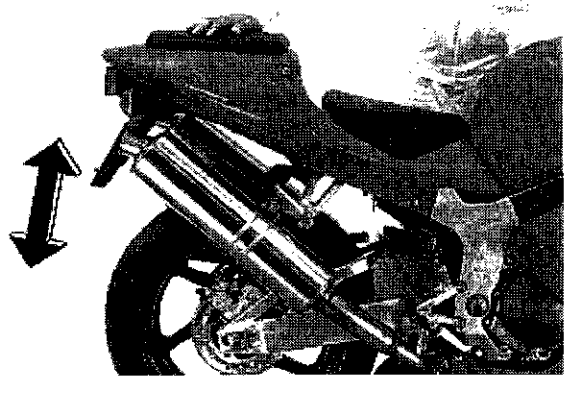
FRONT SUSPENSION INSPECTION



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.

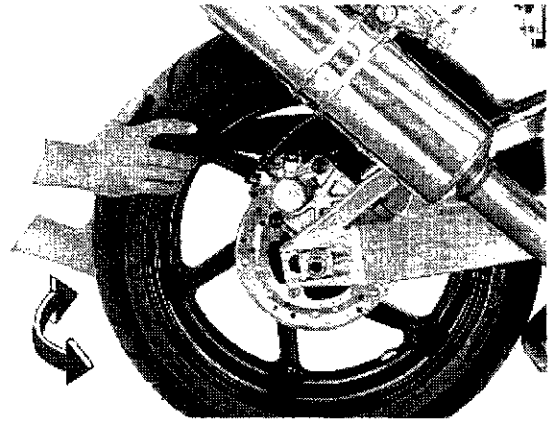
REAR SUSPENSION INSPECTION



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.

Raise the rear wheel off the ground and support the motorcycle securely.
Check for worn swingarm bearings by grabbing the rear wheel and attempting to move the wheel side to side.
Replace the bearings if nay looseness is noted (section 14).



NUTS, BOLTS, FASTENERS

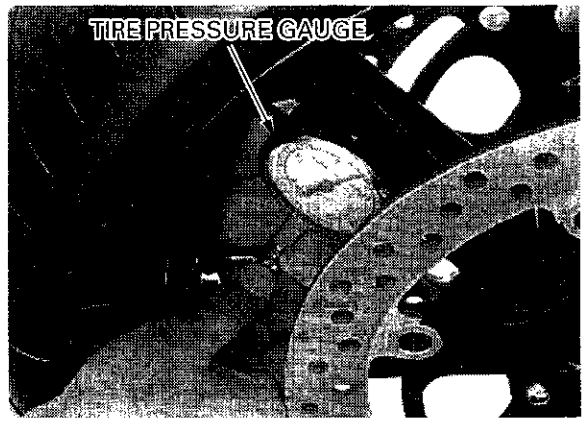
Check that all chassis nuts and bolts are tightened to their correct torque values (page 1-14).
Check that all cotter pins, safety clips, hose clamps and cable stays are in place and properly secured.

WHEELS/TIRES

Tire pressure should be checked when the tires are OOLD.

Check the tire pressure with the tire pressure gauge.

RECOMMENDED TIRE PRESSURE:
Driver only:
Front: 250 kPa (2.50 kgf/cm², 36 psi)
Rear: 290 kPa (2.90 kgf/cm², 42 psi)
Driver and passenger:
Front: 250 kPa (2.50 kgf/cm², 36 psi)
Rear: 290 kPa (2.90 kgf/cm², 42 psi)



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

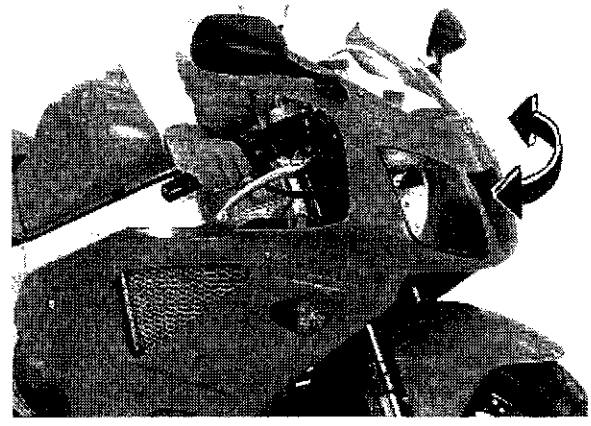
Measure the tread depth at the center of the tires.
Replace the tires when the tread depth reaches the following limits.

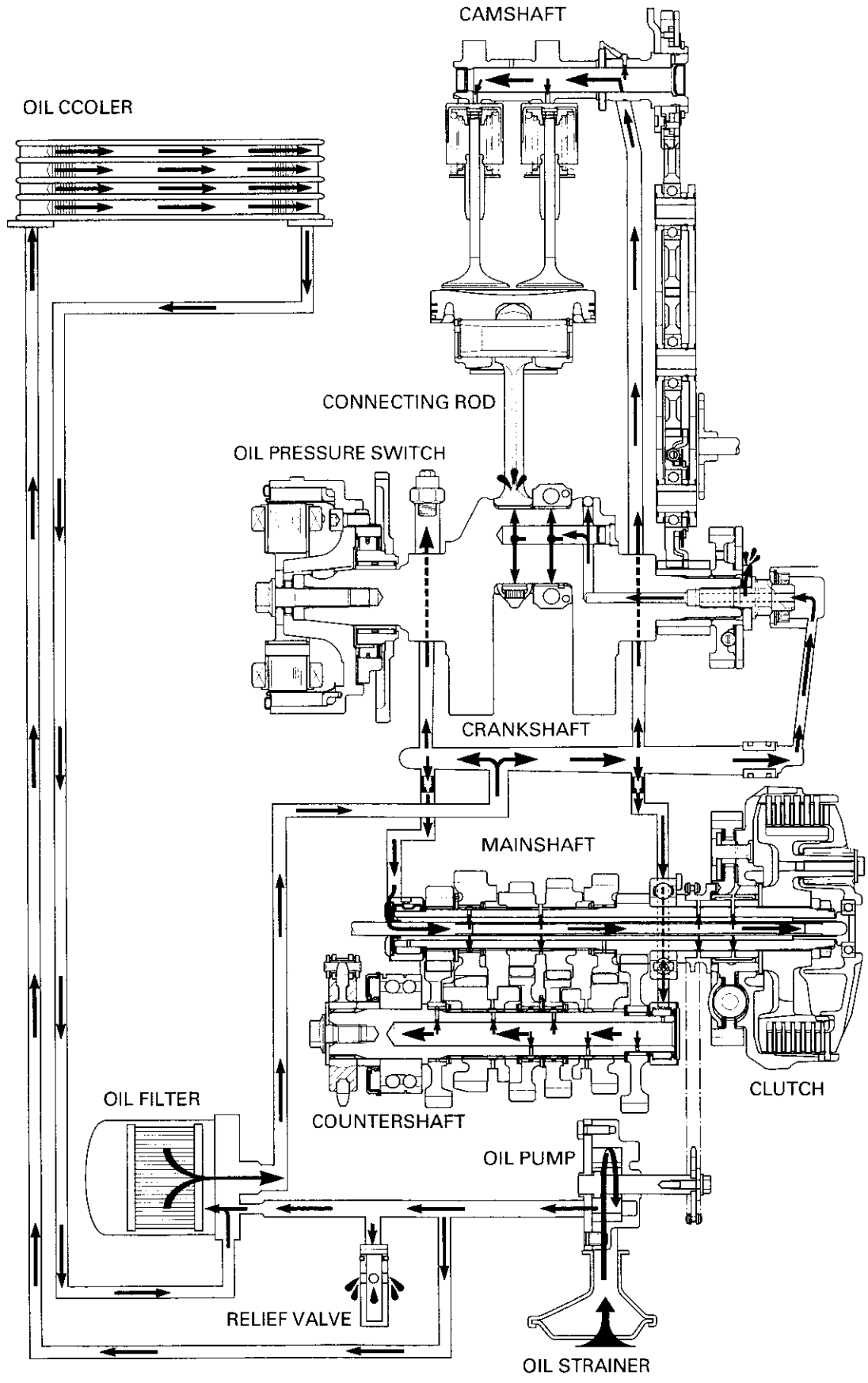
MINIMUM TREAD DEPTH: **Front:** 1.5 mm (0.06 in)
Rear: 2.0 mm (0.08 in)

STEERING HEAD BEARINGS

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

Raise the front wheel off the ground and support the motorcycle securely.
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).




CAMSHAFT
OIL CCOLER
CONNECTING ROD
OIL PRESSURE SWITCH
CRANKSHAFT
MAINSHAFT
CLUTCH
OIL FILTER
COUNTERSHAFT
OIL PUMP
RELIEF VALVE
OIL STRAINER

4. LUBRICATION SYSTEM

SERVICE INFORMATION	4-1	OIL STRAINER/PRESSURE RELIEF VALVE	4-4
TROUBLESHOOTING	4-2	OIL PUMP	4-5
OIL PRESSURE CHECK	4-3	OIL COOLER	4-8

SERVICE INFORMATION

GENERAL

⚠WARNING

- ***If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and may lead to death. Run the engine in an open area or with an exhaust evacuation system in 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.
- For engine oil level check, see page 3-13.
- For engine oil change, see page 3-14.
- For engine oil filter change, see page 3-15.
- For oil pressure indicator inspection, see page 19-12.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	3.5 ℓ (3.7 US qt , 3.1 Imp qt)	———
	After draining/filter change	3.9 ℓ (4.1 US qt , 3.4 Imp qt)	———
	After disassembly	4.3 ℓ (4.5 US qt , 3.8 Imp qt)	———
Recommended engine oil		Honda 4-stroke oil or equivalent motor oil API service classification SE, SF or SG Viscosity: SAE 10W-40	———
Oil pressure (at oil pressure switch)		431 kPa (4.4 kgf/cm², 63 psi) at 5,000 min⁻¹(rpm)/80°C(176°F)	———
Oil pump	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.21 (0.006 – 0.008)	0.35 (0.014)
	Side clearance	0.02 – 0.09 (0.001 – 0.004)	0.12 (0.005)

TORQUE VALUES

Oil filter cartridge	25 N·m (2.6 kgf·m , 19 lbf·ft)
Oil pump bolt	8 N·m (0.8 kgf·m , 5.8 lbf·ft)

TOOLS

Oil pressure gauge	07506-3000000
Oil pressure gauge attachment	07510-4220100
Oil pressure gauge joint adaptor	07RMK-MW40100
Oil filter wrench	07HAA-PJ70100

TROUBLESHOOTING

Oil level too low
- Oil consumption
- External oil leak
- Worn piston rings
- Improperly installed piston rings
- Worn cylinders
- Worn stem seals
- Worn valve guide

Low oil pressure
- Oil level low
- Clogged oil strainer
- Faulty oil pump
- Internal oil leak
- Incorrect oil being used

No oil pressure
- Oil level too low
- Oil pressure relief valve stuck open
- Broken oil pump drive chain
- Broken oil pump drive or driven sprocket
- Damaged oil pump
- Internal oil leak

High oil pressure
- Oil pressure relief valve stuck closed
- Clogged oil gallery or metering orifice
- Incorrect oil being used

Oil contamination
- Oil or filter not changed often enough
- Worn piston rings

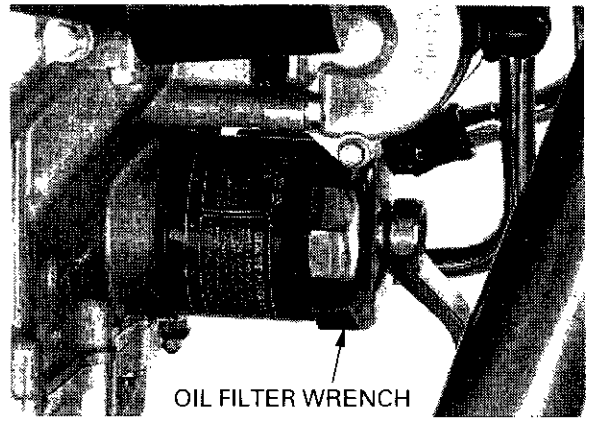
Oil emulsification
- Blown cylinder head gasket
- Leaky coolant passage
- Entry of water

OIL PRESSURE CHECK

Remove the lower inner fairing and lower fairings (page 2-3).

Remove the oil filter cartridge.

TOOL:
Oil filter wrench 07HAA-PJ70100



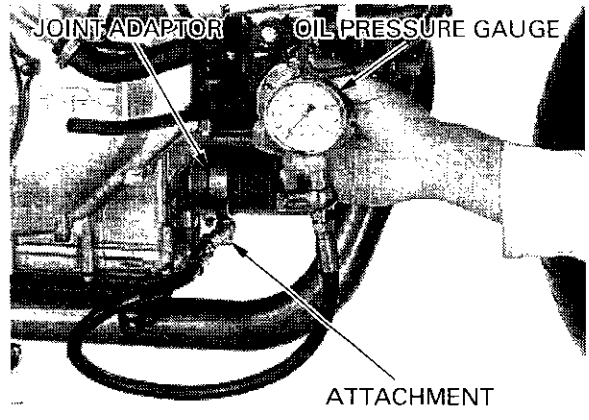
Apply oil to the oil pressure gauge joint adaptor O-ring and install the adaptor onto the oil filter boss.

TOOL:
Oil pressure gauge joint adaptor 07RMK-MW40100

Reinstall the oil filter cartridge and tighten it.

TOOL:
Oil filter wrench 07HAA-PJ70100

TORQUE: 25 N·m (2.6 kgf·m , 19 lbf·ft)



Install the oil pressure gauge and attachment onto the joint adaptor.

TOOLS:
Oil pressure gauge attachment 07510-4220100
Oil pressure gauge 07506-3000000

Check the oil level and add the recommended oil if necessary (page 3-13).

Start the engine, warm it up to normal operating temperature and check the oil pressure.

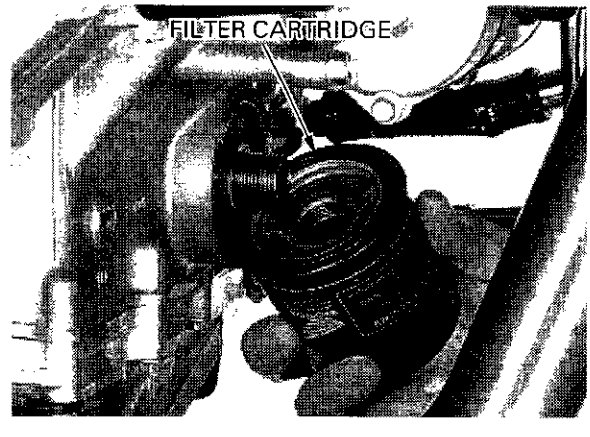
OIL PRESSURE: 431 kPa (4.4 kgf/cm^2 , 63 psi)
at 5,000 min^{-1}(rpm)/80°C(176°F)

Remove the special tools and oil filter cartridge.

Reinstall the oil filter cartridge and tighten it.

TOOL:
Oil filter wrench 07HAA-PJ70100

TORQUE: 25 N·m (2.6 kgf·m , 19 lbf·ft)



Check the engine oil level and add the recommended oil if necessary (page 3-13).
Make sure there are no oil leaks.

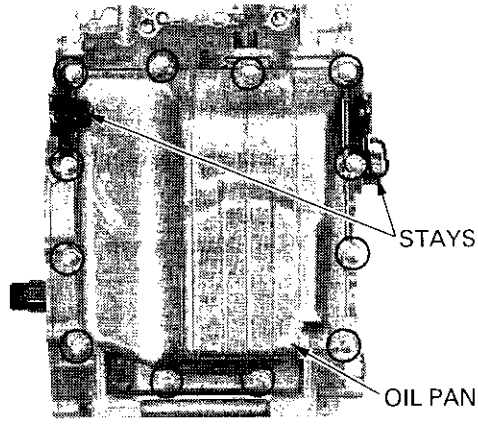
Install the lower fairings and inner fairing (page 2-3).

OIL STRAINER/PRESSURE RELIEF VALVE

OIL PAN REMOVAL

Drain the engine oil (page 3-14).
Remove the exhaust pipe (page 2-4).

Remove the twelve oil pan mounting bolts, lower fairing stays and the oil pan.



CAUTION:

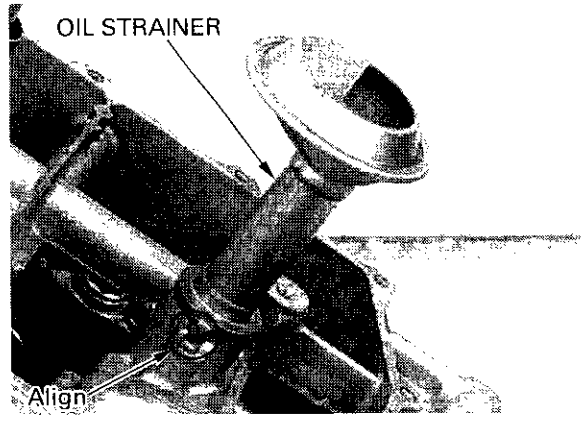
If the engine has been removed from the frame, do not set the engine onto the oil pan mating surface.

OIL STRAINER

Remove the oil strainer and seal rubber from the lower crankcase.

Clean the oil strainer screen thoroughly.

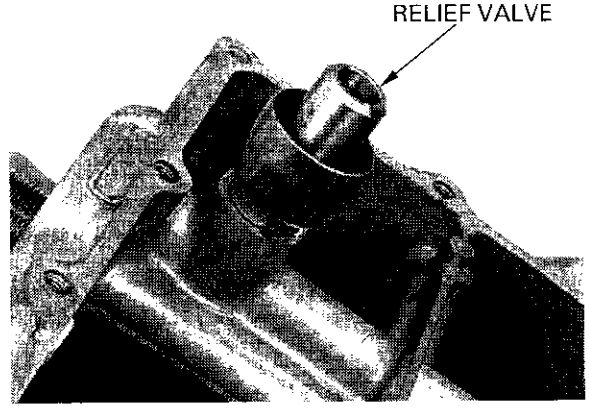
Coat a new seal rubber with oil and install it onto the strainer.
Install the strainer, aligning its tab with the groove in the lower crankcase.



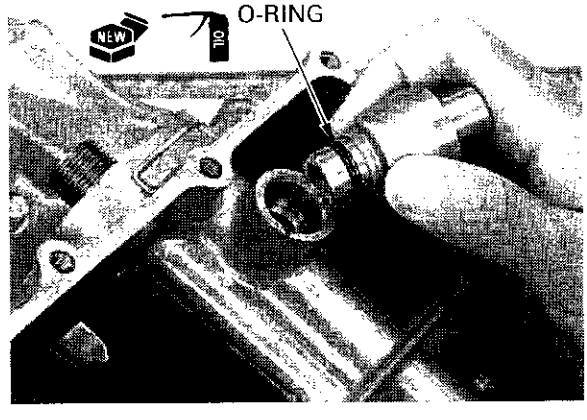
OIL PRESSURE RELIEF VALVE

Remove the oil pressure relief valve from the lower crankcase.
Remove the O-ring from the relief valve body.

Check the operation of the pressure relief valve by pushing on the piston.

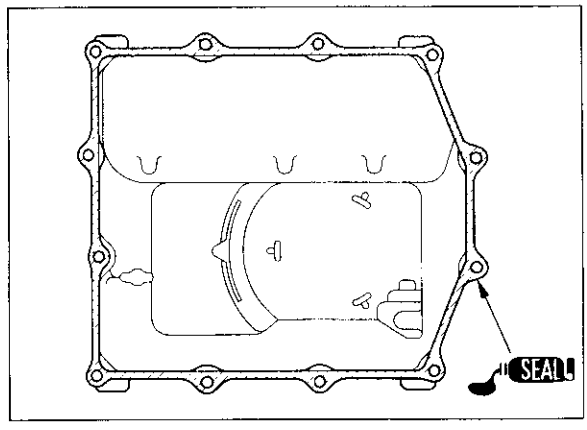


Coat a new O-ring with oil and install it into the relief valve body groove.
Install the relief valve into the lower crankcase.



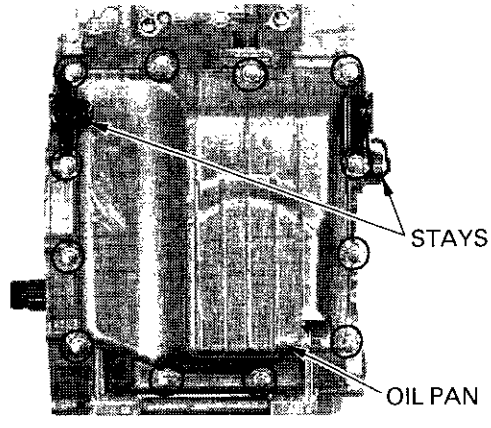
OIL PAN INSTALLATION

Clean the oil pan mating surfaces thoroughly.
Apply sealant to the oil pan mating surface.



Install the oil pan and lower fairing stays, and tighten the twelve bolts in a crisscross pattern in 2 or 3 steps.

Install the exhaust pipe (page 2-6).
Fill the crankcase with recommended engine oil (page 3-14).

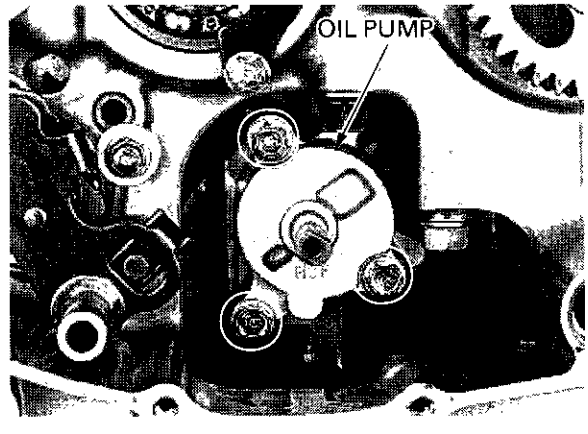


OIL PUMP

REMOVAL

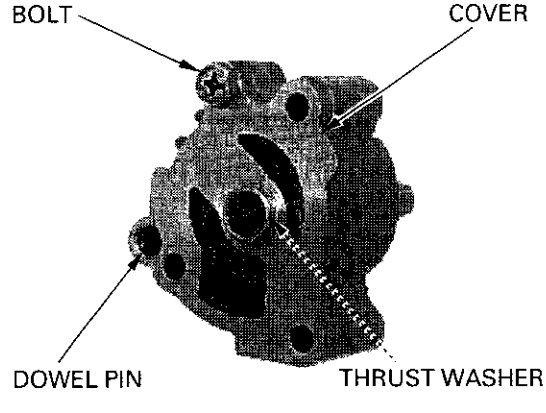
Remove the clutch and oil pump driven sprocket (page 9-12).

Remove the oil pump mounting bolts and the oil pump.



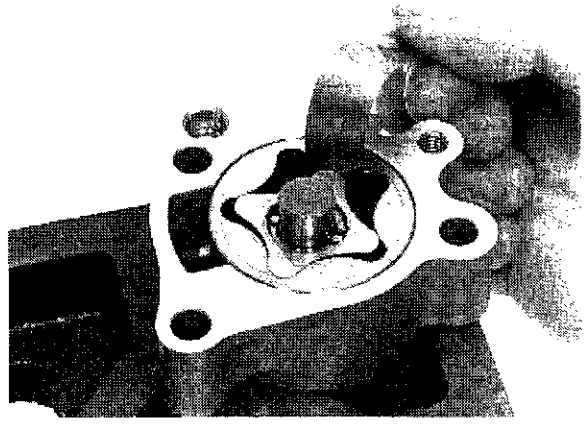
DISASSEMBLY/INSPECTION

Remove the following:
- oil pump bolt
- oil pump cover
- dowel pin
- thrust washer



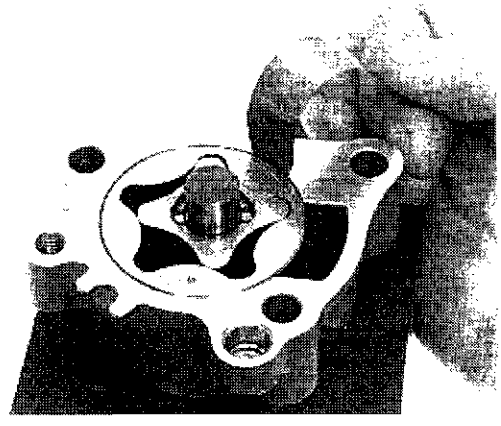
Measure the rotor tip clearance.

SERVICE LIMIT: 0.20 mm (0.008 in)



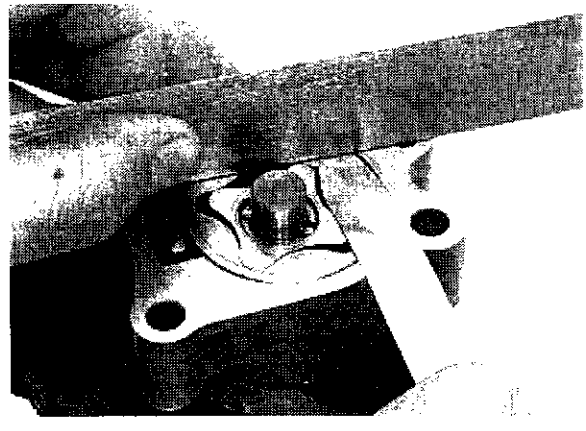
Measure the pump body clearance.

SERVICE LIMIT: 0.35 mm (0.014 in)



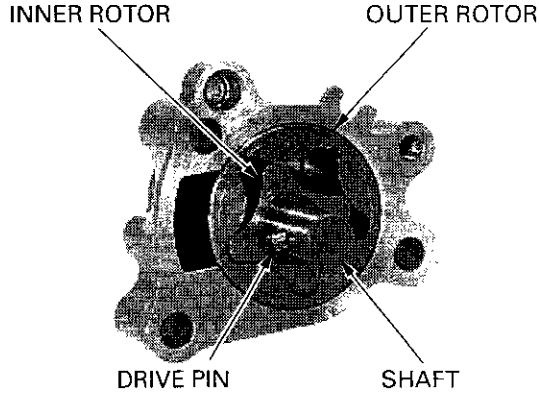
Measure the pump side clearance.

SERVICE LIMIT: 0.12 mm (0.005 in)



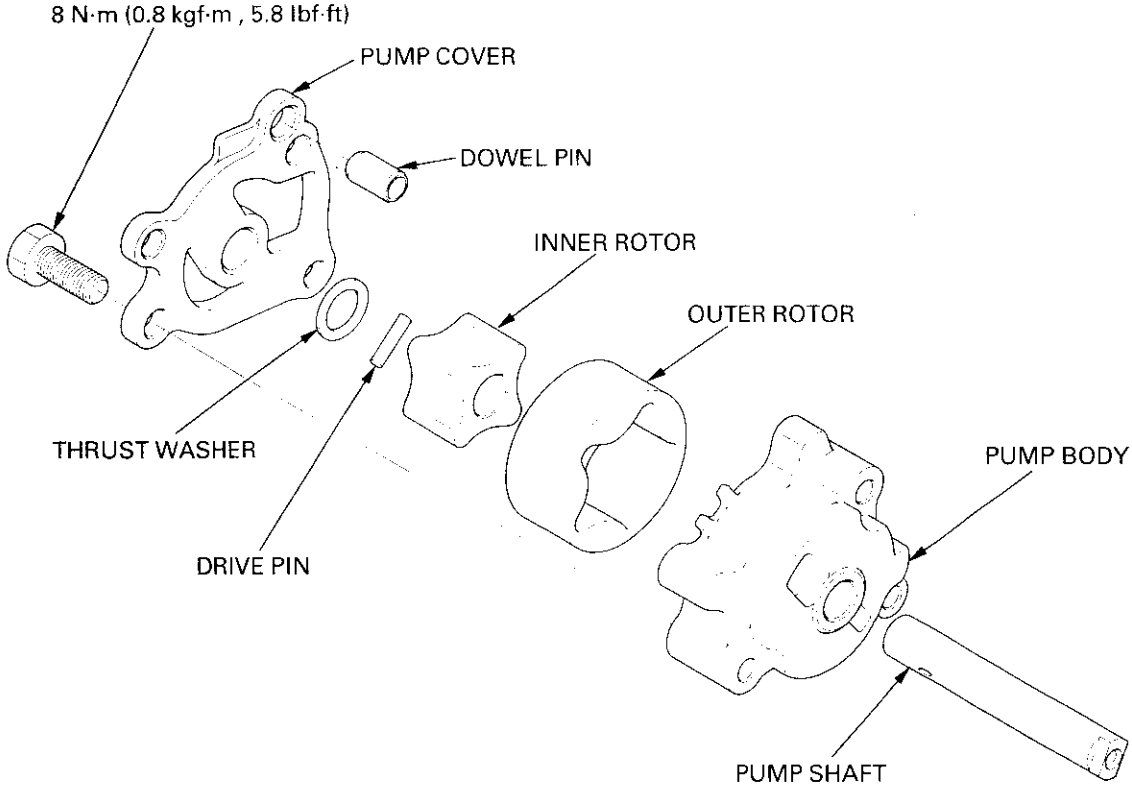
—drive pin
—pump shaft
—inner and outer rotors

Clean the all disassembled parts thoroughly.

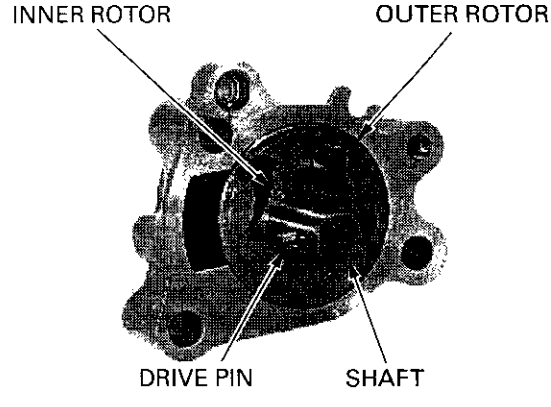


ASSEMBLY

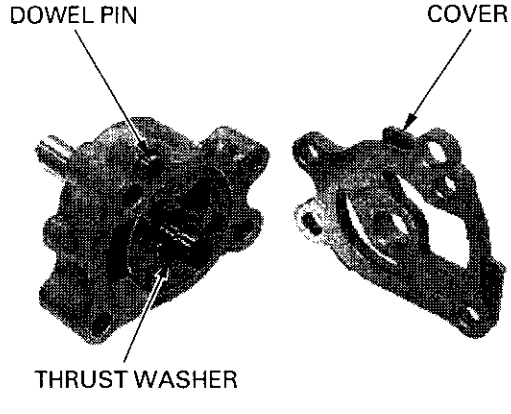
Dip all parts in clean engine oil.



Install the outer rotor with the punch mark facing out.
Install the inner rotor with the drive pin grooves facing out.
Insert the pump shaft into the pump body and inner rotor.
Install the drive pin into the pump shaft and set the drive pin in the inner rotor grooves.

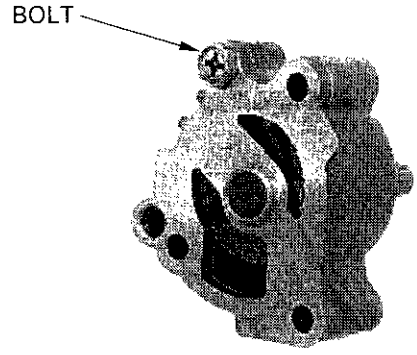


Install the thrust washer onto the pump shaft.
Install the dowel pin into the pump body.
Install the pump cover onto the pump body.



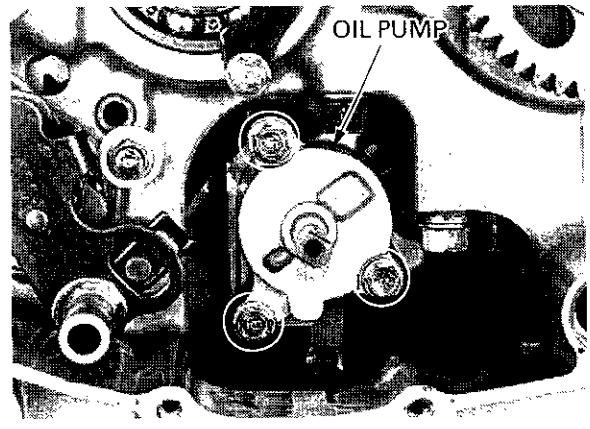
Install the oil pump bolt and tighten it.

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



INSTALLATION

Install the oil pump onto the lower crankcase and tighten the mounting bolts securely.

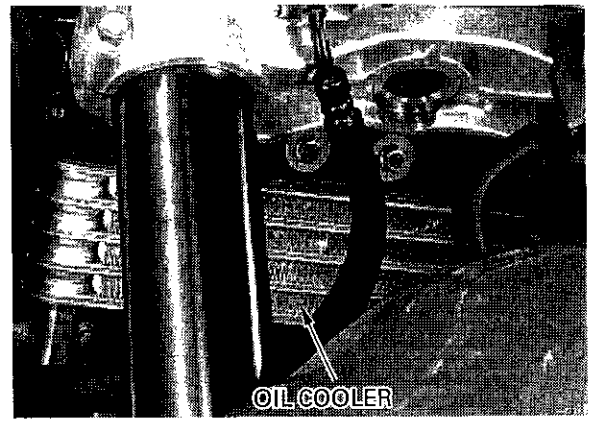


OIL COOLER

INSPECTION

Remove the lower inner fairing (page 2-3).

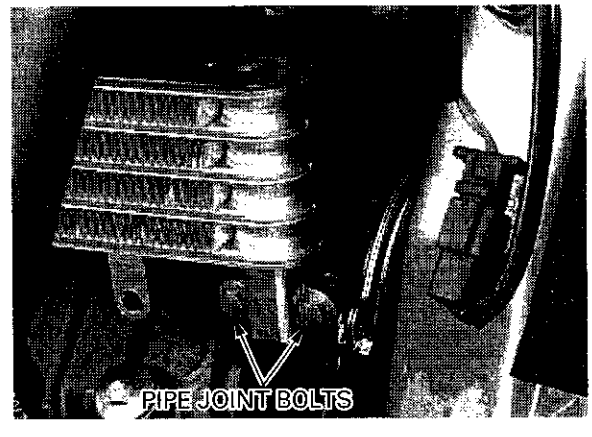
Check the oil cooler pipe joints and seams for leaks.
Check the oil cooler air passage for clogging or damage.
Straighten bent fins with a small, flat blade screwdriver and remove insects, mud or other obstructions with compressed air or low pressure water.



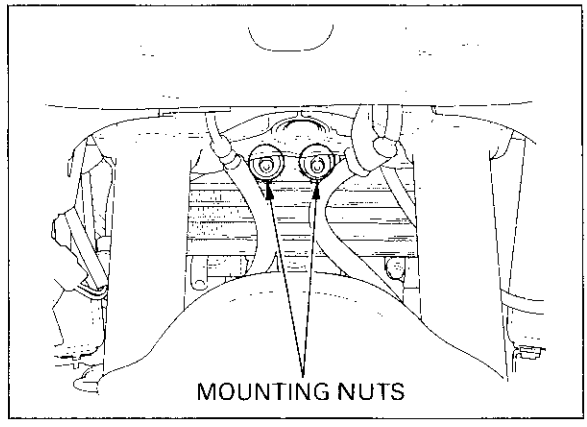
REMOVAL

Drain the engine oil (page 3-14).

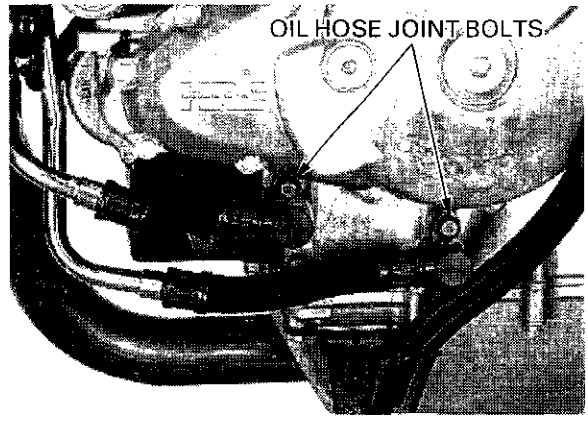
Remove the oil cooler pipe joint bolts and joints from the oil cooler.



Remove the mounting nuts and the oil cooler from the bracket.

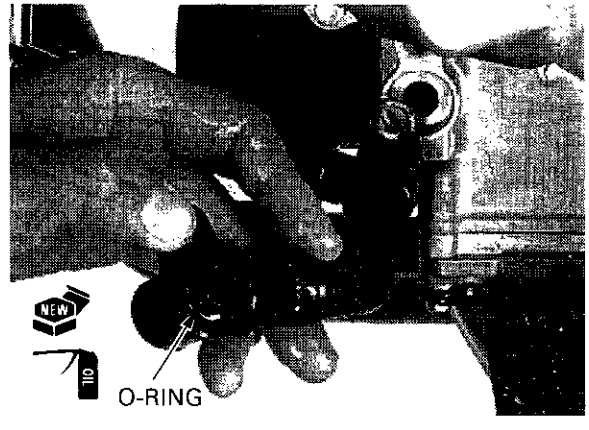


Remove the oil hose joint bolts and joints form the engine, then remove the oil hoses/ pipes.



INSTALLATION

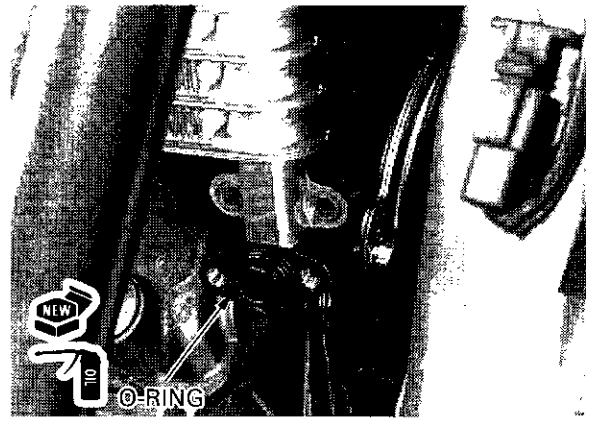
Install the oil hoses/ pipes.
Coat new O-rings with oil and install them onto the oil hose joints.
Apply locking agent to the oil hose joint bolt threads.
Connect the oil hose joints to the engine and tighten the bolts.

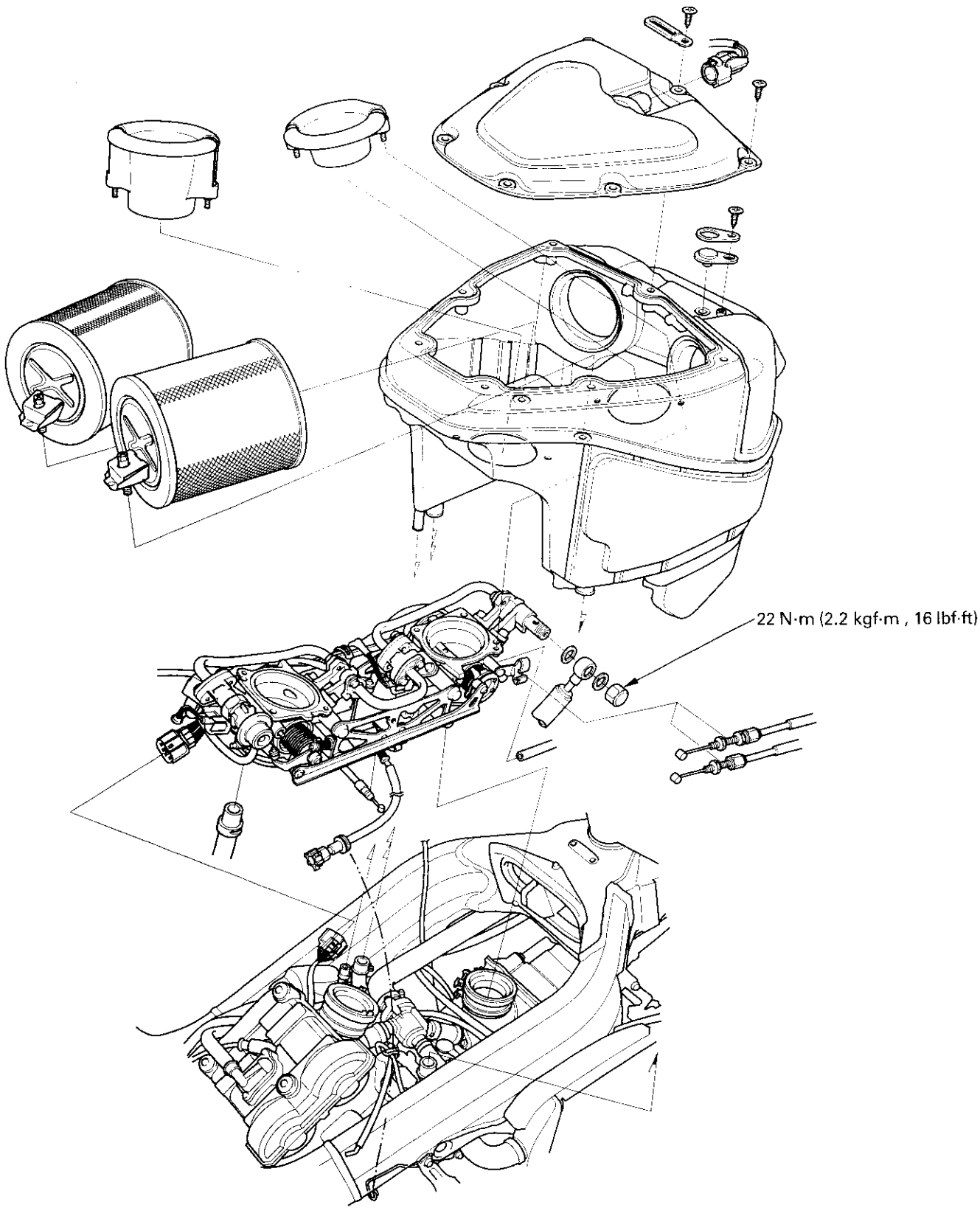


Install the oil cooler onto the bracket and tighten the mounting nuts.
Coat new O-rings with oil and install them onto the oil pipe joints.
Apply locking agent to the oil pipe joint bolt threads.
Connect the oil pipe joints to the oil cooler and tighten the bolts.

Fill the crankcase with recommended engine oil (page 3-14).

Install the lower fairings and inner fairing (page 2-3).




22 N·m (2.2 kgf·m , 16 lbf·ft)

5. FUEL SYSTEM (Programmed Fuel Injection)

SERVICE INFORMATION	5-1	BANK ANGLE SENSOR/RELAY	5-53
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PGM-FI (PROGRAMMED FUEL INJECTION) SYSTEM	5-6	ECM (ENGINE CONTROL MODULE)	5-56
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PGM-FI SELF-DIAGNOSIS MALFUNCTION INDICATOR FAILURE CODES	5-10	INJECTOR	5-57
FUEL TANK	5-46	THROTTLE BODY	5-58
FUEL LINE INSPECTION	5-48	STARTER VALVE SYNCHRONIZATION	5-68
FUEL PUMP	5-50	SECONDARY AIR SUPPLY SYSTEM (Except U type)	5-71
FUEL CUT RELAY	5-52		
		INTAKE AIR CONTROL SYSTEM	5-72

SERVICE INFORMATION

GENERAL

⚠WARNING

- *Gasoline is extremely flammable and is explosive under certain conditions. KEEP OUT OF REACH OF CHILDREN.*
- *If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that 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 to relieve the fuel pressure with the ignition switch OFF.*
- *Bending or twisting the control cables will impair smooth operation and could cause the cables to stick or bind, resulting in loss of vehicle control.*

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

CAUTION:

- *Do not apply commercially available carburetor cleaners to the inside of the throttle bore, which is coated with molybdenum.*
- *Do not snap the throttle valve from full open to full close after the throttle cable has been removed. It may cause incorrect idle operation.*
- *Seal the cylinder head intake ports with tape or a clean cloth to keep dirt and debris from entering the engine after the throttle body has been removed.*
- *Do not damage the throttle body. It may cause incorrect throttle and idle valve synchronization.*
- *Prevent dirt and debris from entering the fuel passages after the throttle body has been removed. Clean them using compressed air if necessary.*
- *The throttle body is factory pre-set. Do not disassemble in a way other than shown in this manual.*
- *Do not loosen or tighten the white painted bolts and screws of the throttle body. Loosening or tightening them can cause throttle and idle valve synchronization failure.*
- *Tighten the bolts and screw of the throttle body to the specified torque. The parts of the throttle body not shown in this manual should not be disassembled.*
- *Do not push the fuel pump base under the fuel tank when the fuel tank is stored.*
- *Always replace the gasket when the fuel pump is removed.*

NOTE:

- The PGM-FI (Programmed Fuel Injection) system is equipped with the self-diagnostic system described on page 5-6.
- When checking the PGM-FI system, always follow the steps in the troubleshooting flow chart (pages 5-12 thru. 5-45).
- The PGM-FI system is provided with fail-safe function to secure a minimum running capability even when there is any trouble in the system. When any abnormality is detected by the self-diagnosis function, running capability is secured by using the preset value in advance in the simulated program map. It must be remembered, however, that when any abnormality is detected in the injector(s), ignition pulse generator and/or cam pulse generator, the fail-safe function stops the engine to protect it.

- A faulty PGM-FI system is often related to poorly connected or corroded connections. Check those connections before proceeding.
- When disassembling the fuel system parts, note the location of the O-rings. Replace them with new ones upon reassembly.
- Always replace the sealing washers when the fuel line banjo bolt is removed or loosened.
- Use a digital tester for PGM-FI system inspection.
- See section 19 for vehicle speed sensor and ECT sensor information.

SPECIFICATIONS

ITEM	SPECIFICATIONS
Throttle body identification number	GQ50A
Base starter valve for synchronization	Rear
Idle speed	1,300 ± 100 min^{-1} (rpm)
Throttle grip free play	2–6 mm (1/16–1/4 in)
Intake air temperature sensor resistance (at 20°C/68°F)	1–4 kΩ
Engine coolant temperature sensor resistance (at 20°C/68°F)	2.3- 2.6 kΩ
Fuel injector resistance (at 20°C/68°F)	11.1–12.3 Ω
Cam pulse generator peak voltage	0.7 V minimum
Ignition pulse generator peak voltage	0.7 V minimum
Manifold absolute pressure at idle	200--250 mm Hg (7.9–9.8 in Hg)
Fuel pressure at idle	343 kPa (3.5 kgf/cm^2, 50 psi)
Fuel pump flow (at 12 V)	190 cm^3 (6.4 US oz, 6.7 Imp oz) minimum/10 seconds

TORQUE VALUES

Fuel feed hose banjo bolt	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Fuel feed hose nut	22 N·m (2.2 kgf·m, 16 lbf·ft)	
Throttle body insulator band bolt	1 N·m (0.1 kgf·m, 0.7 lbf·ft)	
Pressure regulator nut	27 N·m (2.8 kgf·m, 20 lbf·ft)	
Fuel feed pipe bolt	5 N·m (0.5 kgf·m, 3.6 lbf·ft)	
Pipe stay bolt	5 N·m (0.5 kgf·m, 3.6 lbf·ft)	
Fuel pump unit mounting nut	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Starter valve nut	2 N·m (0.2 kgf·m, 1.4 lbf·ft)	
Throttle stop screw cable stay screw	2 N·m (0.2 kgf·m, 1.4 lbf·ft)	
MAP sensor stay screw	3 N·m (0.3 kgf·m, 2.2 lbf·ft)	
Throttle cable stay screw	3 N·m (0.3 kgf·m, 2.2 lbf·ft)	
PAIR check valve cover bolt	5 N·m (0.5 kgf·m, 3.6 lbf·ft)	Apply locking agent to the threads.

TOOLS

Peak voltage adaptor	07HGJ-0020100 with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)
ECM test harness	07YMZ-0010100
Fuel pressure gauge	07406-0040002

TROUBLESHOOTING

Engine cranks but won't start
- No fuel in tank
- No fuel to injector
  - Clogged fuel filter
  - Clogged fuel strainer
  - Pinched or clogged fuel feed hose
  - Pinched or clogged fuel tank breather tube
  - Faulty fuel pump
  - Faulty fuel pump circuits
- Intake air leak
- Contaminated/deteriorated fuel
- Faulty fuel injector
- Improper choke operation
- No spark at plug (faulty ignition system – section 17)

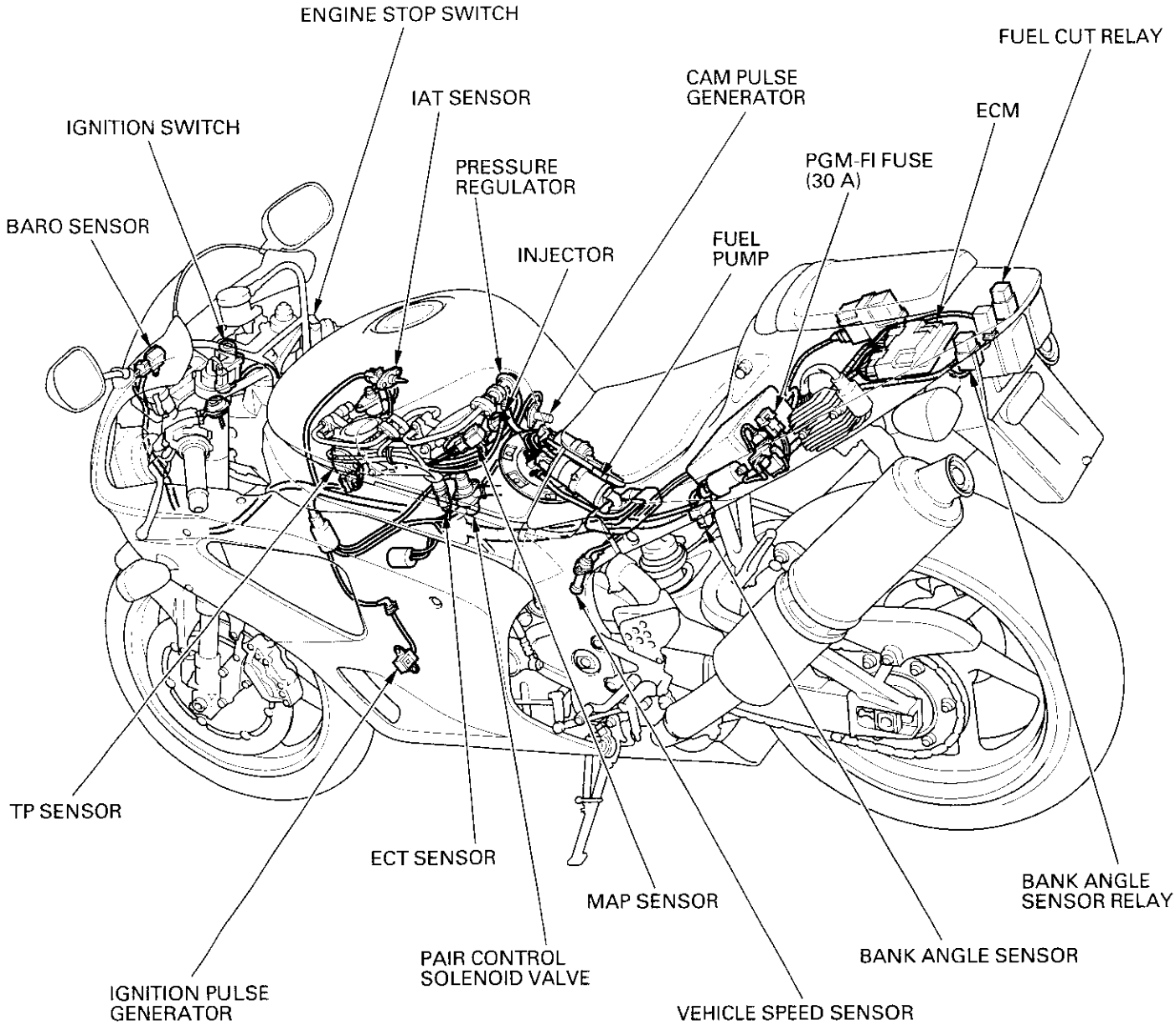
Engine stalls, hard to start, rough idling
- Restricted fuel feed hose
- Contaminated/deteriorated fuel
- Intake air leak
- Misadjusted idle speed
- Restricted fuel tank breather tube
- Misadjusted starter valve synchronization
- Faulty ignition system (section 17)

Afterburn when engine braking is used
- Faulty pulse secondary air injection (PAIR) system (Except U type)
  - Faulty PAIR control solenoid valve
  - Faulty PAIR control solenoid valve related circuit
  - Faulty PAIR check valve
- Faulty ignition system (section 17)

Backfiring or misfiring during acceleration
- Faulty ignition system (section 17)

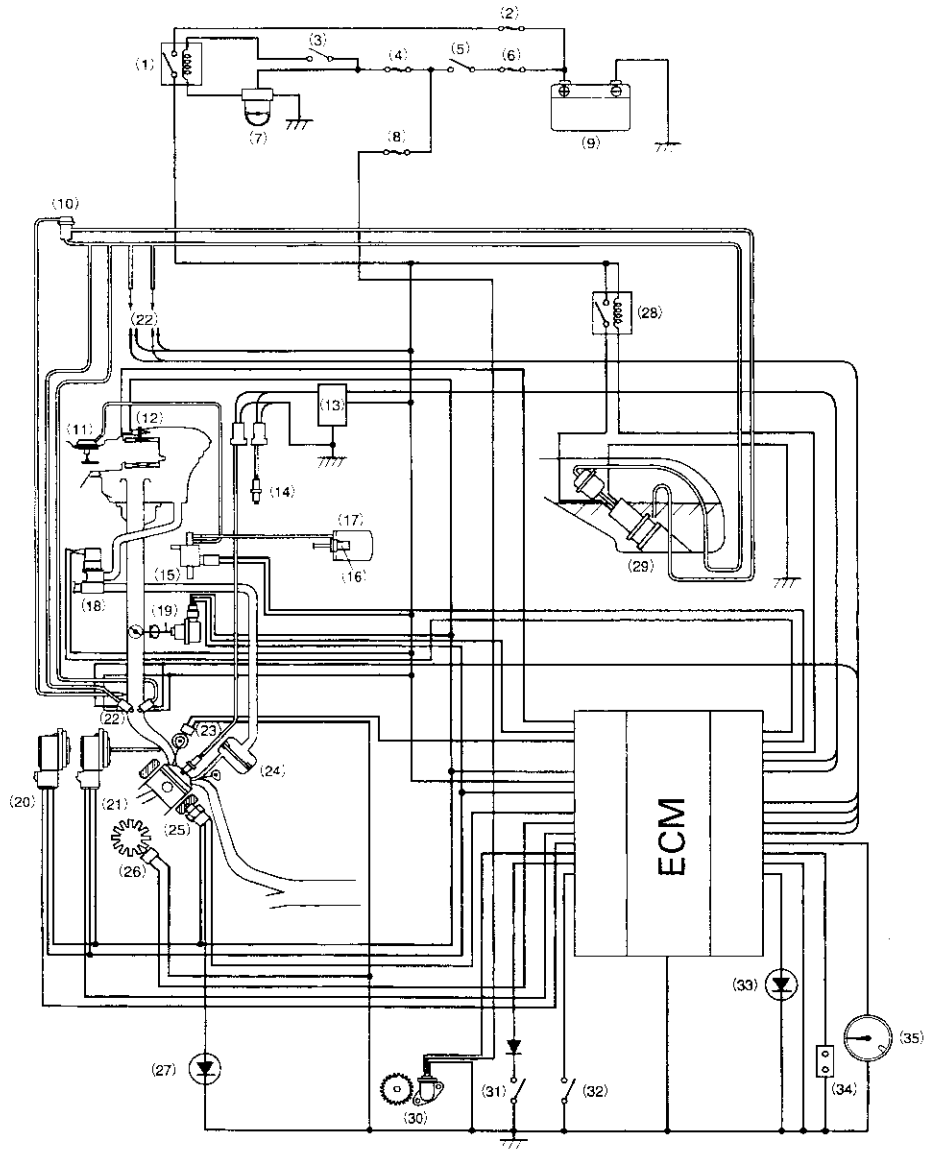
Poor performance (driveability) and poor fuel economy
- Pinched or clogged fuel feed hose
- Faulty pressure regulator
- Faulty ignition system (section 17)

SYSTEM LOCATION



FULL NAME	ABBREVIATIONS
Manifold absolute pressure sensor	MAP sensor
Barometric pressure sensor	BARO sensor
Throttle position sensor	TP sensor
Intake air temperature sensor	IAT sensor
Engine coolant temperature sensor	ECT sensor
Engine control module	ECM

SYSTEM DIAGRAM

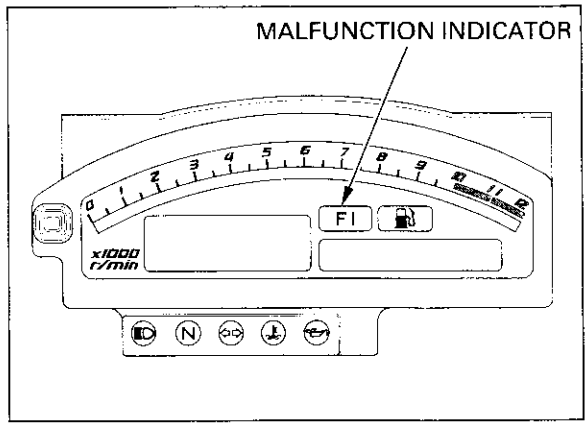


(1)	Bank angle sensor relay
(2)	PGM-FI fuse (30 A)
(3)	Engine stop switch
(4)	Sub-fuse (10 A) (Starter/ignition)
(5)	Ignition switch
(6)	Main fuse (30 A)
(7)	Bank angle sensor
(8)	Sub-fuse (10 A) (Meter/taillight/illumination)
(9)	Battery
(10)	Pressure regulator
(11)	Intake air control diaphragm
(12)	IAT sensor
(13)	Converter unit
(14)	Spark plug
(15)	Intake air control solenoid valve
(16)	One-way valve
(17)	Vacuum chamber
(18)	PAIR control solenoid valve

(19)	TP sensor
(20)	BARO sensor
(21)	MAP sensor
(22)	Fuel injector
(23)	Cam pulse generator
(24)	PAIR check valve
(25)	ECT/Thermosensor
(26)	Ignition pulse generator
(27)	Coolant temperature indicator
(28)	Fuel cut relay
(29)	Fuel pump
(30)	Vehicle speed sensor
(31)	Neutral switch
(32)	Side stand switch
(33)	Malfunction indicator
(34)	Service check connector
(35)	Tachometer

PGM-FI (PROGRAMMED FUEL INJECTION) SYSTEM

SELF-DIAGNOSTIC DATA INDICATION PROCEDURE

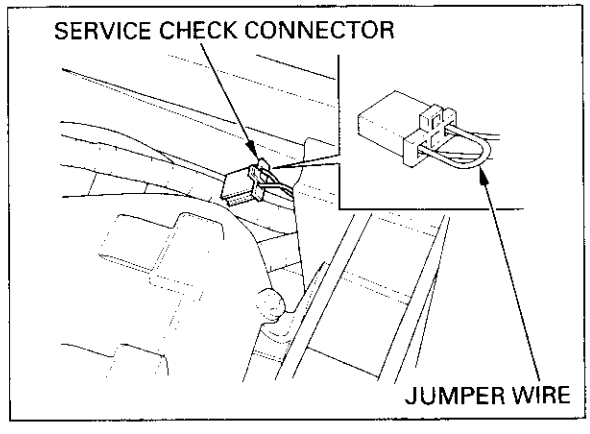


Place the motorcycle on its side stand.
Turn the ignition switch ON.
The malfunction indicator comes on for a few seconds, then goes off.

Start the engine and let it idle.
If the malfunction indicator does not blink, the ECM has no problem data.
If the malfunction indicator blinks, read and record how many times the malfunction indicator blinks, and determine the cause of the problem (page 5-10 thru. 5-45).

NOTE:

The malfunction indicator will start blinking when the side stand is lowered and the engine speed is below 5,000 min^{-1} (rpm). If the side stand is retracted or the engine speed is above 5,000 min^{-1} (rpm), the indicator will light and stay on.



To read the ECM memory of problem data, perform the following:

Turn the ignition switch OFF.
Remove the passenger seat (page 2-2).

Short the service check connector terminals with a jumper wire.

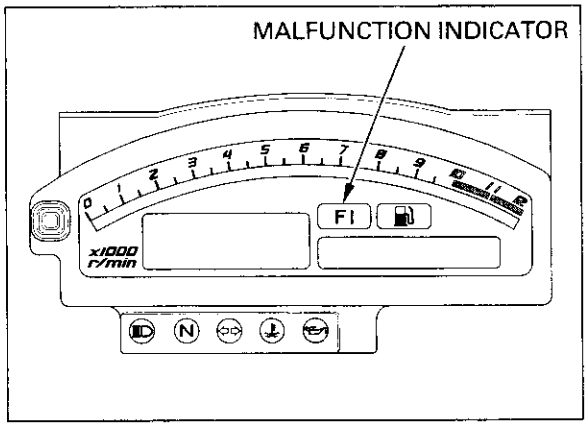
Be sure the engine stop switch is in RUN position.

Turn the ignition switch ON.

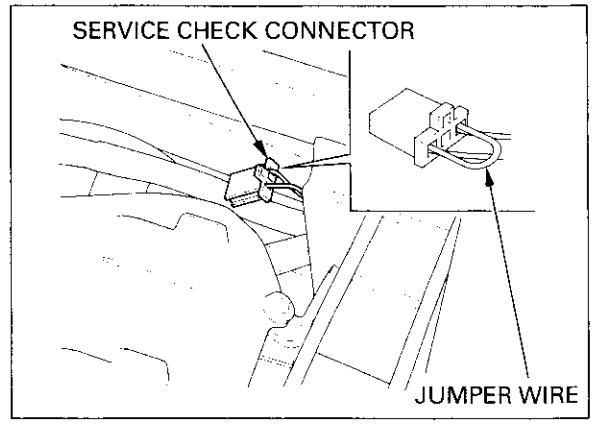
If the ECM has no memory of problem data, the malfunction indicator will come on and stay on.

If the ECM has memory of problem data, the malfunction indicator will start blinking.

Read and record how many times the malfunction indicator blinks, and determine the cause of the problem (page 5-10 thru. 5-45).



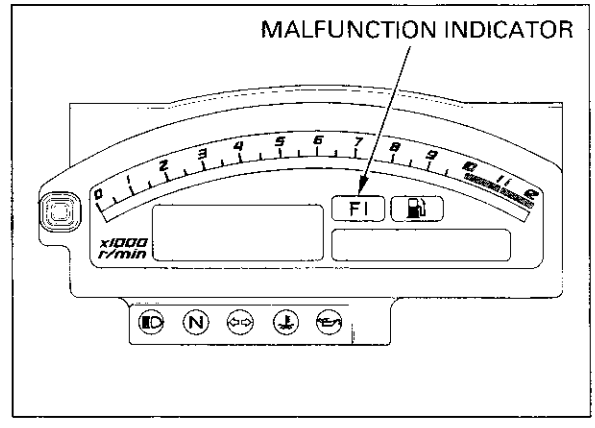
SELF-DIAGNOSTIC MEMORY RESET PROCEDURE



Remove the passenger seat (page 2-2).

Be sure the engine stop switch is in RUN position.

1. Turn the ignition switch OFF.
2. Short the service check connector terminals with a jumper wire.
3. Turn the ignition switch ON.
4. Remove the jumper wire from the service check connector.



5. The malfunction indicator will light for approx. 5 seconds.
   While the indicator lights, short the service check connector terminals again with the jumper wire.
   The self-diagnostic memory is erased if the malfunction indicator goes off and starts blinking.

NOTE:

- The service check connector must be jumped while the malfunction indicator lights. If not, the indicator will not start blinking.
- Note that the self-diagnostic memory cannot be erased if the ignition switch is turned OFF before the malfunction indicator starts blinking.

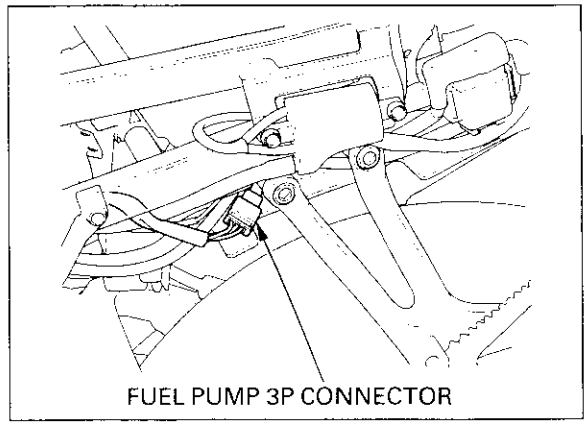
If the malfunction indicator blinks 20 times, the self-diagnostic memory has not been erased.

PEAK VOLTAGE INSPECTION PROCEDURE

NOTE:

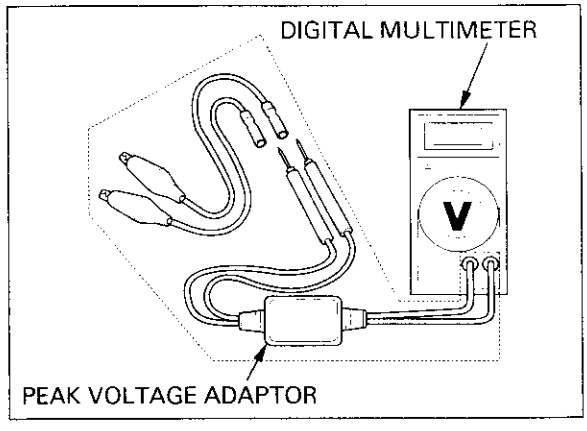
- Use this procedure for the ignition pulse generator and cam pulse generator inspection.
- Use a commercially available digital multimeter (impedance 10 MΩ/DCV minimum).
- The display value differs depending upon the internal impedance of the multimeter.
- If the Imrie diagnostic tester (model 625) is used, follow the manufacturer's instructions.
- Check the cylinder compression at each cylinder and check that the spark plug is installed correctly in each cylinder.

Remove the seat cowl (page 2-2).
Disconnect the fuel pump 3P (black) connector.



Connect the peak voltage adaptor to the digital multimeter.

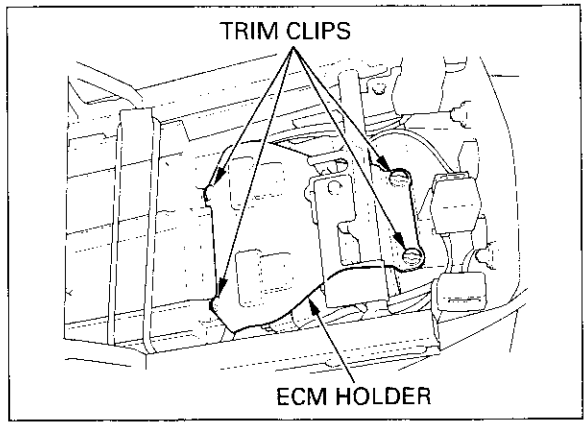
TOOLS:
Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100
with commercially available digital multimeter (impedance 10M Ω /DCV minimum)



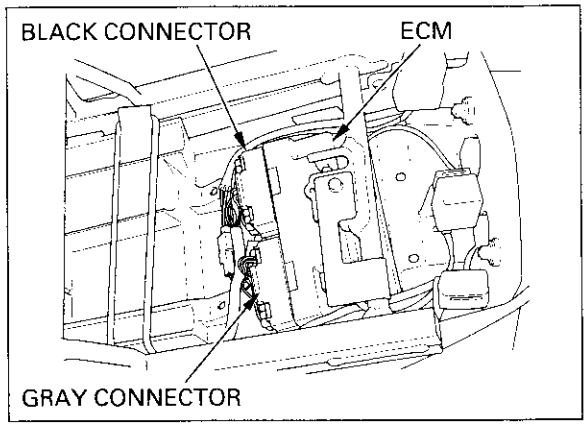
TEST HARNESS CONNECTION

Remove the passenger seat (page 2-2).

Remove the four trim clips and engine control unit (ECM) holder.

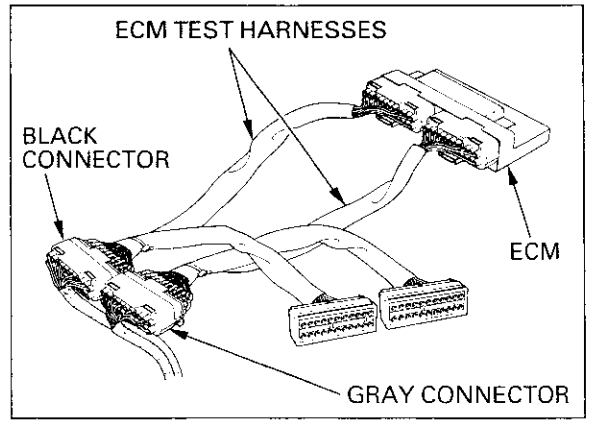


Turn the ignition switch OFF.
Disconnect the 22P black and gray connectors from the ECM.



Connect the test harnesses to the ECM and ECM connectors.

TOOL:
ECM test harness 07YMZ-0010100

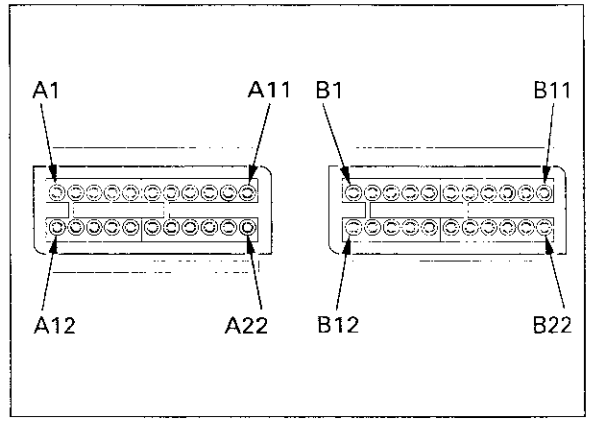


TEST HARNESS TERMINAL LAYOUT

The ECM test harness connector terminals are numbered as shown.

Terminals No. 1 to No. 22 of the test harness connector connected to the ECM black connector are terminals A1 to A22.

Terminals No. 1 to No. 22 of the test harness connector connected to the ECM gray connector are terminals B1 to B22.



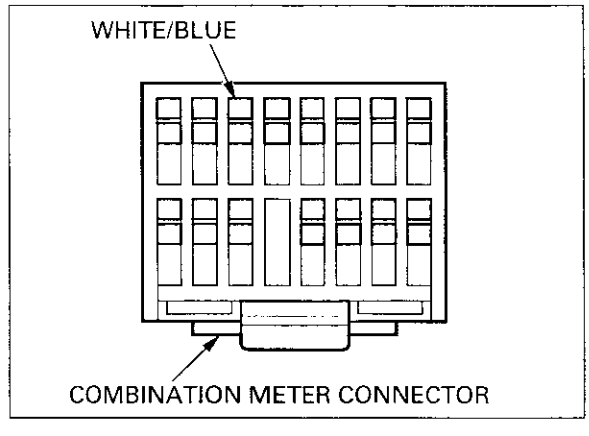
MALFUNCTION INDICATOR CHECK

If the engine can be started but the malfunction indicator does not come on when the ignition switch is turned ON, check as follows:

Check the turn signal and high beam indicators functions properly.

- If they do not function, check the combination meter ground lines (page 19-5).
- If they function properly, disconnect the combination meter connector (page 19-5) and check for voltage between the white/blue wire terminal of the wire harness side connector and ground.
  Turn the ignition switch ON, there should be battery voltage for a few seconds.

– If there is voltage for a few seconds, replace the combination meter.
– If there is no voltage, check for open or short circuit in white/blue wire between the combination meter and ECM.
  If the wire is OK, replace the ECM.



PGM-FI SELF-DIAGNOSIS MALFUNCTION INDICATOR FAILURE CODES

- The PGM-FI malfunction indicator denotes the failure codes (the number of blinks from 0 to 20). When the indicator lights for 1.3 seconds, it is equivalent to ten blinks. For example, when the indicator lights for 1.3 seconds and blinks two times (0.5 second × 2), it indicates failure code 12. Follow the flow chart for failure code 12.
- When the Engine Control Module (ECM) stores some failure codes, the malfunction indicator shows the failure codes in the order from the lowest number to highest number. For example, when the indicator blinks once, then blinks two times, two failure have occurred. Follow the flow charts for failure codes 1 and 2.

Number of PGM-FI malfunction indicator blinks		Cause	Symptoms (Fail-safe contents)	Refer to page
0	○ No blinks	• Open circuit in the power input wire of the ECM • Faulty bank angle sensor • Open circuit in bank angle sensor related wires • Faulty bank angle sensor relay • Open circuit in bank angle sensor relay related wires • Faulty engine stop switch • Open circuit in engine stop switch related wires • Faulty ignition switch • Faulty ECM • Blown PGM-FI fuse (30 A) • Blown sub-fuse (10 A) (Starter/ignition)	• Engine does not start	5-56
	○ No blinks	• Open or short circuit in malfunction indicator wire • Faulty ECM	• Engine operates normally	5-9
	☼ Stays lit	• Short circuit in service check connector wire • Faulty ECM	• Engine operates normally	--
1	☼ Blinks	• Loose or poorly connected MAP sensor connector • Open or short circuit in MAP sensor wire • Faulty MAP sensor	• Engine operates normally	5-12
2	☼ Blinks	• Loose or poor connections of MAP sensor vacuum tubes • Faulty MAP sensor	• Engine operates normally	5-14
7	☼ Blinks	• Loose or poorly connected ECT sensor connector • Open or short circuit in ECT sensor wire • Faulty ECT sensor	• Hard start at a low temperature (ECU controls using preset value; Coolant temperature: 80°C/176°F)	5-16
8	☼ Blinks	• Loose or poorly connected TP sensor connector • Open or short circuit in TP sensor wire • Faulty TP sensor	• Poor engine response when operating the throttle quickly (ECU controls using preset value; Throttle opening: 0°)	5-18
9	☼ Blinks	• Loose or poorly connected IAT sensor connector • Open or short circuit in IAT sensor wire • Faulty IAT sensor	• Engine operates normally (ECU controls using preset value; Intake air temperature: 20°C/68°F)	5-21

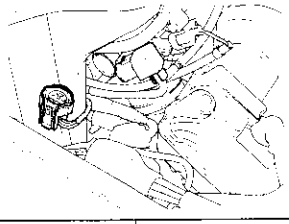
Number of PGM-FI malfunction indicator blinks		Cause	Symptoms (Fail-safe contents)	Refer to page
10	☼ Blinks	• Loose or poorly connected BARO sensor connector • Open or short circuit in BARO sensor wire • Faulty BARO sensor	• Engine operates normally at low altitude • Engine idles roughly at a high altitude (ECU controls using preset value; Barometric pressure: 760 mm Hg/1,013 hPa)	5-23
11	☼ Blinks	• Loose or poorly connected vehicle speed sensor connector • Open or short circuit in vehicle speed sensor wire • Faulty vehicle speed sensor	• Engine operates normally	5-25
12	☼ Blinks	• Loose or poorly connected No. 1-1 injector connector • Open or short circuit in No. 1-1 injector wire • Faulty No. 1-1 injector	• Engine does not start	5-28
13	☼ Blinks	• Loose or poorly connected No. 1-2 injector connector. • Open or short circuit in No. 1-2 injector wire • Faulty No. 1-2 injector	• Engine does not start	5-31
14	☼ Blinks	• Loose or poorly connected No. 2-1 injector connector • Open or short circuit in No. 2-1 injector wire • Faulty No. 2-1 injector	• Engine does not start	5-34
15	☼ Blinks	• Loose or poorly connected No. 2-2 injector connector • Open or short circuit in No. 2-2 injector wire • Faulty No. 2-2 injector	• Engine does not start	5-37
18	☼ Blinks	• Loose or poorly connected cam pulse generator connector • Open or short circuit in cam pulse generator wire • Faulty cam pulse generator	• Engine does not start	5-40
19	☼ Blinks	• Loose or poorly connected ignition pulse generator connector • Open or short circuit in ignition pulse generator wire • Faulty ignition pulse generator	• Engine does not start	5-42
20	☼ Blinks	• Faulty E2-PROM in ECM	• Engine operates normally • ECM does not hold the self-diagnostic data	5-44

PGM-FI MALFUNCTION INDICATOR 1 BLINK (MAP SENSOR)

Raise the front of the fuel tank and support it (page 3-4).
Turn the ignition switch OFF.

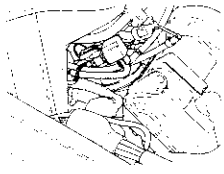
↓

Disconnect the MAP sensor 3P connector.
Check the connector for loose contacts or corroded terminals.



↓

Connect the MAP sensor connector.
Place the motorcycle on its side stand.
Start the engine, let it idle and check the malfunction indicator blinks.



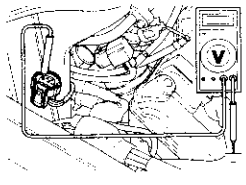
No blinking → • Loose or pooly connected MAP sensor connector

↓ 1 blink

Turn the ignition switch OFF.

↓

Disconnect the MAP sensor 3P connector.
Turn the ignition switch ON.
Measure the voltage at the wire harness side connector.



Connection: Yellow/Red (+) – Ground (–)
Standard: 4.75 – 5.25 V

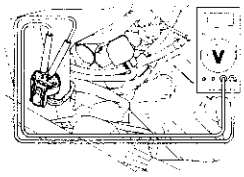
No voltage → • Open or short circuit in Yellow/Red wire
• Loose or pooly connected ECM gray connector

↓ Normal

To page 5-13

From page 5-12

Measure the voltage between the terminals of the wire harness side connector.

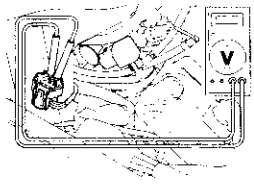


Connection: Yellow/Red (+) – Green/Orange (–)
Standard: 4.75 – 5.25 V

No voltage → • Open circuit in Green/Orange wire
• Loose or pooly connected ECM black connector

Normal

Measure the voltage between the terminals of the wire harness side connector.



Connection:
Light green/Yellow (+) – Green/Orange (–)
Standard: 4.75 – 5.25 V

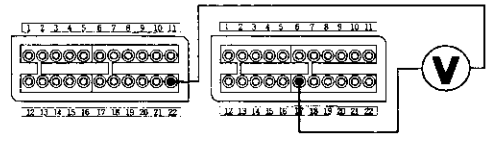
No voltage → • Open or short circuit in Light green/Yellow wire

Normal

Turn the ignition switch OFF.
Connect the MAP sensor connector.

Connect the ECM test harness to the ECM connectors (page 5-8).
Turn the ignition switch ON.

Measure the voltage at the ECM test harness connector terminals.



Connection: B17 (+) – A22 (–)
Standard: 2.7 – 3.1 V (at 760 mm Hg/1,013 hPa)

No voltage → • Faulty MAP sensor

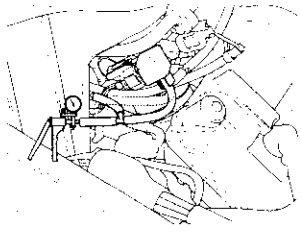
Normal → • Replace the ECM with a new one and inspect again.

PGM-FI MALFUNCTION INDICATOR 2 BLINKS (MAP SENSOR)

Raise the front of the fuel tank and support it (page 3-4).
Turn the ignition switch OFF.

↓

Disconnect the tube from the MAP sensor.
Connect the vacuum gauge between the MAP sensor and tube using a 3-way joint.
Start the engine, let it idle and measure the manifold absolute pressure.

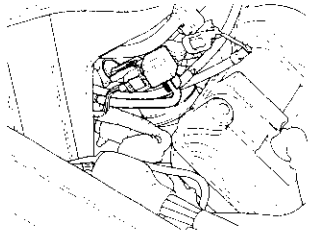


Standard: 200—250 mm Hg (7.9—9.8 in Hg)

Abnormal → • Disconnected, pinched or damaged MAP sensor tube

↓

Disconnect the vacuum gauge and connect the tube to the MAP sensor.



↓

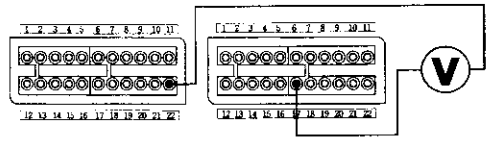
Connect the ECM test harness to the ECM connectors (page 5-8).
Turn the ignition switch ON.

↓

To page 5-15

From page 5-14

Measure the voltage at the ECM test harness connector terminals.

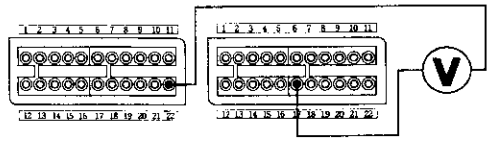


Connection: B17 (+)—A22 (—)
Standard: 2.7—3.1 V (at 760 mm Hg/1,013 hPa)

No voltage → • Faulty MAP sensor

Normal

Start the engine.
Measure the voltage at the ECM test harness connector terminals.



Connection: B17 (+)—A22 (—)
Standard: 2.7 V maximum

No voltage → • Faulty MAP sensor

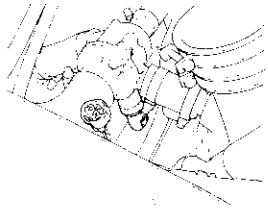
Normal → • Replace the ECM with a new one and inspect again.

PGM-FI MALFUNCTION INDICATOR 7 BLINKS (ECT SENSOR)

Remove the throttle body (page 5-58).
Turn the ignition switch OFF.

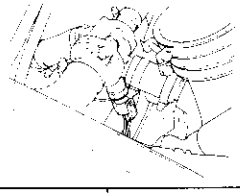
↓

Disconnect the ECT sensor 3P connector.
Check the connector for loose contacts or corroded terminals.



↓

Connect the MAP sensor connector.
Place the motorcycle on its side stand.
Turn the ignition switch ON.
Check the malfunction indicator blinks.



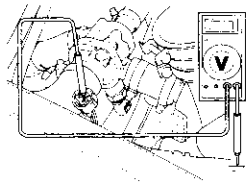
No blinking → • Loose or pooly connected ECT sensor connector

↓ 7 blink

Turn the ignition switch OFF.

↓

Disconnect the ECT sensor 3P connector.
Turn the ignition switch ON.
Measure the voltage at the wire harness side connector.



Connection: Pink/White (+) -- Ground (−)
Standard: 4.75−5.25 V

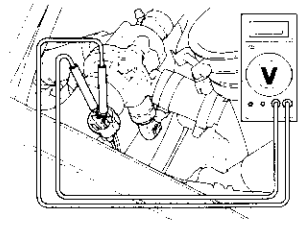
No voltage → • Open or short circuit in Pink/White wire
• Loose or pooly connected ECM gray connector

↓ Normal

To page 5-17

From page 5-16

Measure the voltage between the terminals of the wire harness side connector.



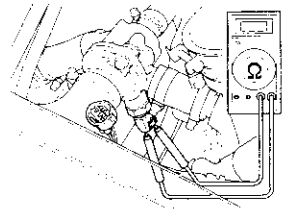
Connection: Pink/White (+) – Green/Orange (–)
Standard: 4.75 – 5.25 V

No voltage → • Open circuit in Green/Orange wire
• Loose or pooly connected ECM black connector

Normal

Turn the ignition switch OFF.

Measure the resistance between the ECT sensor terminals.



Connection: Pink/White – Green/Orange
(Sensor side terminals)
Standard: 2.3 – 2.6 kΩ (at 20°C/68°F)

Abnormal → • Faulty ECT sensor

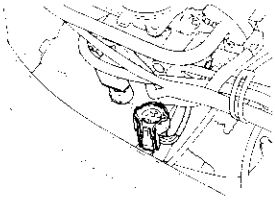
Normal → • Replace the ECM with a new one and inspect again.

PGM-FI MALFUNCTION INDICATOR 8 BLINKS (TP SENSOR)

Raise the front of the fuel tank and support it (page 3-4).
Turn the ignition switch OFF.

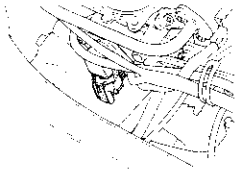
↓

Disconnect the TP sensor 3P connector.
Check the connector for loose contacts or corroded terminals.



↓

Connect the TP sensor connector.
Place the motorcycle on its side stand.
Start the engine, let it idle and check the malfunction indicator blinks.



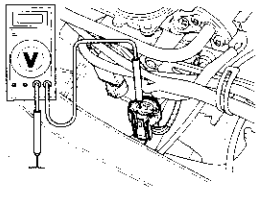
No blinking → • Loose or pooly connected TP sensor connector

↓ 8 blinks

Turn the ignition switch OFF.

↓

Disconnect the TP sensor 3P connector.
Turn the ignition switch ON.
Measure the voltage at the wire harness side connector.



Connection: Yellow/Red (+) – Ground (–)
Standard: 4.75 – 5.25 V

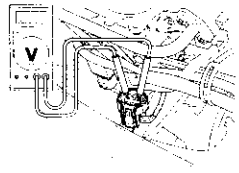
No voltage → • Open or short circuit in Yellow/Red wire
• Loose or pooly connected ECM gray connector

↓ Normal

To page 5-19

From page 5-18

Measure the voltage between the terminals of the wire harness side connector.



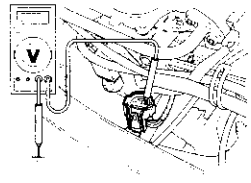
Connection: Yellow/Red (+) – Green/Orange (–)
Standard: 4.75 – 5.25 V

No voltage → • Open circuit in Green/Orange wire
• Loose or pooly connected ECM black connector

Normal

Turn the ignition switch OFF.
Disconnect the ECM 22P gray connector (page 5-8).

Check for continuity between the wire harness side connector terminal of the TP sensor and ground.



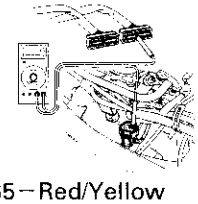
Connection: Red/Yellow – Ground
Standard: No continuity

Continuity → • Short circuit in Red/Yellow wire

No continuity

Connect the ECM test harness to the ECM connectors (page 5-8).

Check for continuity between the ECM test harness connector terminal and wire harness side connector terminal of the TP sensor.



Connection: B5 – Red/Yellow
Standard: Continuity

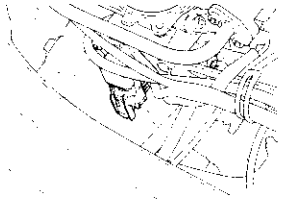
No continuity → • Open circuit in Red/Yellow wire

Continuity

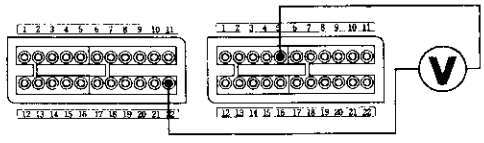
To page 5-20

From page 5-19

Connect the TP sensor 3P connector.



Turn the ignition switch ON.
Measure the voltage at the ECM test harness connector terminals.



Connection: B5 (+) – A22 (–)
Standard: *0.4 – 0.6 V (throttle fully closed)
*4.2 – 4.8 V (throttle fully open)

Abnormal → • Faulty TP sensor

Normal → • Replace the ECM with a new one and inspect again.

A voltage marked * refers to the value when the voltage reading at the TP sensor 3P connector (page 5-19) shows 5 V.
If the reading shows other than 5 V, derive a voltage range at the test harness as follows:

Example:
In the case of a voltage of 4.75 V at the TP sensor 3P connector:

0.4 × 4.75/5.0 = 0.38 V
0.6 × 4.75/5.0 = 0.57 V

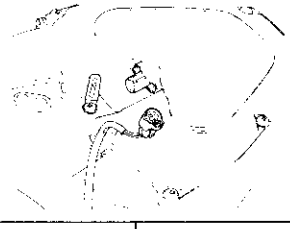
Thus, the valid range is "0.38 – 0.57 V" for throttle fully closed.
Replace this calculation using 4.2 and 4.8 to get the resulting range for the throttle fully open.

PGM-FI MALFUNCTION INDICATOR 9 BLINKS (IAT SENSOR)

Raise the front of the fuel tank and support it (page 3-4).
Turn the ignition switch OFF.

↓

Disconnect the IAT sensor 2P connector.
Check the connector for loose contacts or corroded terminals.



↓

Connect the IAT sensor connector.
Place the motorcycle on its side stand.
Turn the ignition switch ON.
Check the malfunction indicator blinks.



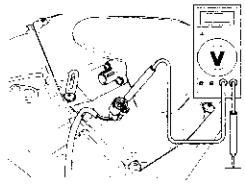
No blinking → • Loose or pooly connected IAT sensor connector

↓ 9 blinks

Turn the ignition switch OFF.

↓

Disconnect the IAT sensor 2P connector.
Turn the ignition switch ON.
Measure the voltage at the wire harness side connector.



Connection: Gray/Blue (+) – Ground (–)
Standard: 4.75 – 5.25 V

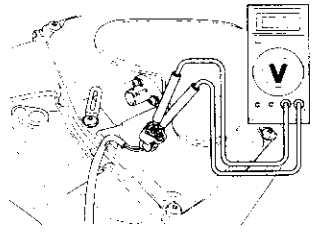
No voltage → • Open or short circuit in Gray/Blue wire
• Loose or pooly connected ECM gray connector

↓ Normal

To page 5-22

From page 5-21

Measure the voltage between the terminals of the wire harness side connector.



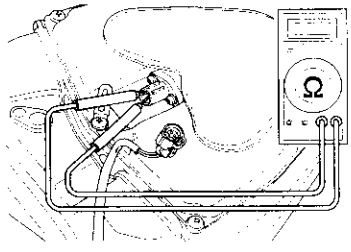
Connection: Gray/Blue (+) – Green/Orange (–)
Standard: 4.75 – 5.25 V

No voltage → • Open circuit in Green/Orange wire
• Loose or pooly connected ECM black connector

Normal

Turn the ignition switch OFF.

Measure the resistance between the IAT sensor terminals (at 20 – 30°C/68 – 86°F).



Standard: 1 – 4 kΩ

Abnormal → • Faulty IAT sensor

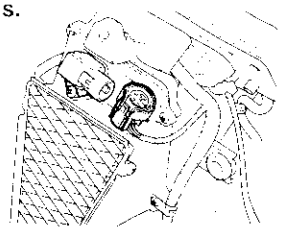
Normal → • Replace the ECM with a new one and inspect again.

PGM-FI MALFUNCTION INDICATOR 10 BLINKS (BARO SENSOR)

Remove the upper fairing (page 2-4).
Turn the ignition switch OFF.

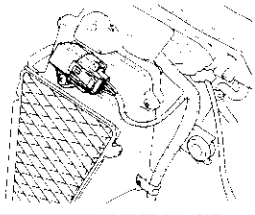
↓

Disconnect the BARO sensor 3P connector.
Check the connector for loose contacts or corroded terminals.



↓

Connect the BARO sensor connector.
Place the motorcycle on its side stand.
Turn the ignition switch ON.
Check the malfunction indicator blinks.



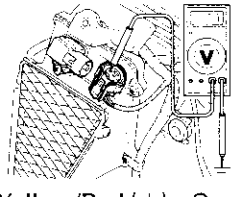
No blinking → • Loose or pooly connected BARO sensor connector

↓ 10 blinks

Turn the ignition switch OFF.

↓

Disconnect the BARO sensor 3P connector.
Turn the ignition switch ON.
Measure the voltage at the wire harness side connector.



Connection: Yellow/Red (+) – Ground (–)
Standard: 4.75 – 5.25 V

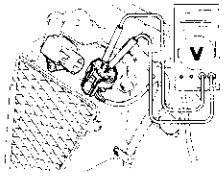
No voltage → • Open or short circuit in Yellow/Red wire
• Loose or pooly connected ECM gray connector

↓ Normal

To page 5-24

From page 5-23

Measure the voltage between the terminals of the wire harness side connector.

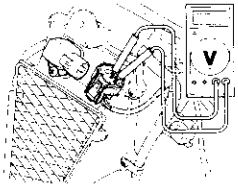


Connection: Yellow/Red (+) – Green/Orange (–)
Standard: 4.75 – 5.25 V

No voltage → • Open circuit in Green/Orange wire
• Loose or pooly connected ECM black connector

Normal

Measure the voltage between the terminals of the wire harness side connector.



Connection:
Light green/Black (+) – Green/Orange (–)
Standard: 4.75 – 5.25 V

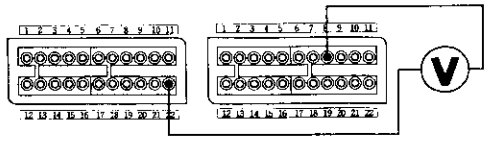
No voltage → • Open or short circuit in Light green/Yellow wire

Normal

Turn the ignition switch OFF.
Connect the BARO sensor connector.

Connect the ECM test harness to the ECM connectors (page 5-8).
Turn the ignition switch ON.

Measure the voltage at the ECM test harness connector terminals.



Connection: B8 (+) – A22 (–)
Standard: 2.7 – 3.1 V (at 760 mm Hg/1,013 hPa)

No voltage → • Faulty BARO sensor

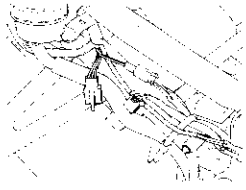
Normal → • Replace the ECM with a new one and inspect again.

PGM-FI MALFUNCTION INDICATOR 11 BLINKS (VEHICLE SPEED SENSOR)

Remove the seat cowl (page 2-2).
Turn the ignition switch OFF.

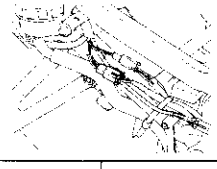
↓

Disconnect the vehicle speed sensor 3P connector.
Check the connector for loose contacts or corroded terminals.



↓

Connect the vehicle speed sensor connector.
Retract the side stand.
Start the engine and keep the engine speed more than 5,000 min^{-1} (rpm) for 20 seconds or more.
Let the engine idle and lower the side stand.
Check the malfunction indicator blinks.



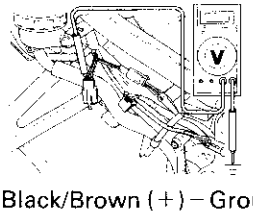
No blinking → • Loose or pooly connected vehicle speed sensor connector

↓ 11 blinks

Turn the ignition switch OFF.

↓

Disconnect the vehicle speed sensor connector.
Turn the ignition switch ON.
Measure the voltage at the wire harness side connector.



Connection: Black/Brown (+) – Ground (–)
Standard: Battery voltage

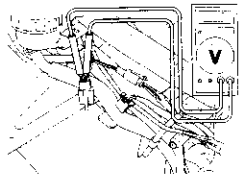
No voltage → • Open circuit in Black/Brown wire

↓ Normal

To page 5-26

From page 5-25

Measure the voltage between the terminals of the wire harness side connector.



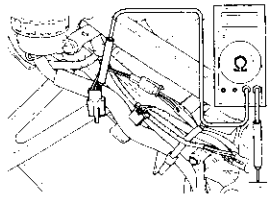
Connection: Black/Brown (+) — Green/Black (−)
Standard: Battery voltage

No voltage → • Open circuit in Green/Black wire

Normal

Turn the ignition switch OFF.
Disconnect the ECM 22P gray connector (page 5-8).

Check for continuity between the wire harness side connector terminal of the vehicle speed sensor and ground.



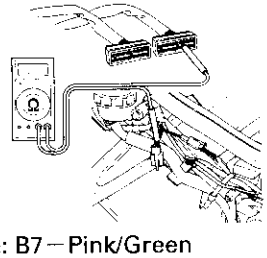
Connection: Pink/Green — Ground
Standard: No continuity

Continuity → • Short circuit in Pink/Green wire

No continuity

Connect the ECM test harness to the ECM connectors (page 5-8).

Check for continuity between the ECM test harness connector terminal and wire harness side connector terminal of the vehicle speed sensor.



Connection: B7 — Pink/Green
Standard: Continuity

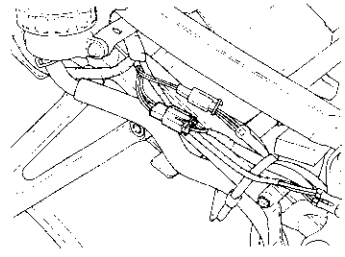
No continuity → • Open circuit in Pink/Green wire

Continuity

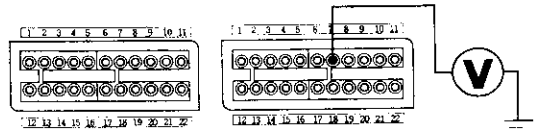
To page 5-27

From page 5-26

Connect the vehicle speed sensor 3P connector.



Shift the transmission in neutral and turn the ignition switch ON.
Measure the voltage at the ECM test harness connector terminal and ground while slowly turning the rear wheel by hand.



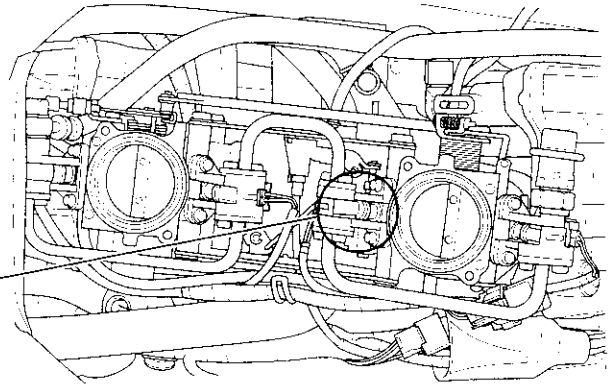
Connection: B7 (+) — Ground
Standard: 0 to 5 V pulse voltage

Abnormal → • Faulty vehicle speed sensor

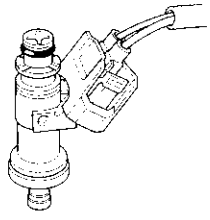
Normal → • Replace the ECM with a new one and inspect again.

PGM-FI MALFUNCTION INDICATOR 12 BLINKS (No. 1-1 INJECTOR)

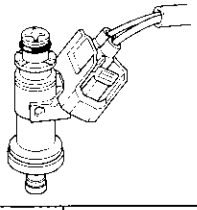
Remove the air cleaner housing (page 5-56).
Turn the ignition switch OFF.



Disconnect the No. 1-1 injector 2P connector.
Check the connector for loose contacts or corroded terminals.



Connect the No. 1-1 injector connector.
Place the motorcycle on its side stand.
Turn the ignition switch ON.
Check the malfunction indicator blinks.

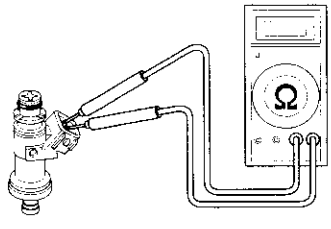


No blinking → • Loose or pooly connected No. 1-1 injector connector

12 blinks

Turn the ignition switch OFF.

Measure the resistance between the No. 1-1 injector terminals.



Connection: Black/White – Pink/Yellow
Standard: 11.1 – 12.3 Ω (at 20°C/68°F)

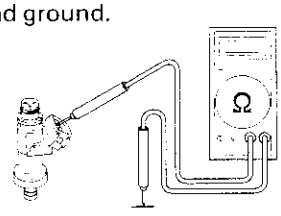
Abnormal → • Faulty No. 1-1 injector

Normal

To page 5-29

From page 5-28

Check for continuity between the No. 1-1 injector terminal and ground.

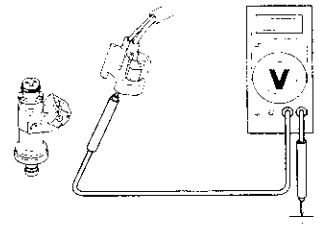


Connection: Black/White -- Ground
Standard: No continuity

Continuity → • Faulty No. 1-1 injector

No continuity

Measure the voltage between the wire harness side connector terminal of the No. 1-1 injector and ground.



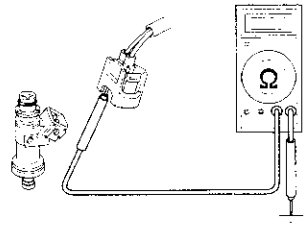
Connection: Black/White (+) — Ground (−)
Standard: Battery voltage

No voltage → • Open circuit in Black/White wire

Normal

Turn the ignition switch OFF.
Disconnect the ECM 22P black connector (page 5-8).

Check for continuity between the wire harness side connector terminal of the No. 1-1 injector and ground.



Connection: Pink/Yellow -- Ground
Standard: No continuity

Continuity → • Short circuit in Pink/Yellow wire

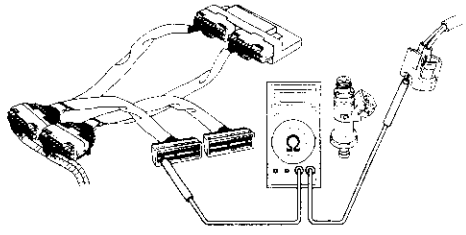
No continuity

To page 5-30

From page 5-29

Connect the ECM test harness to the ECM connectors (page 5-8).

Check for continuity between the ECM test harness connector terminal and wire harness side connector terminal of the No. 1-1 injector terminal.



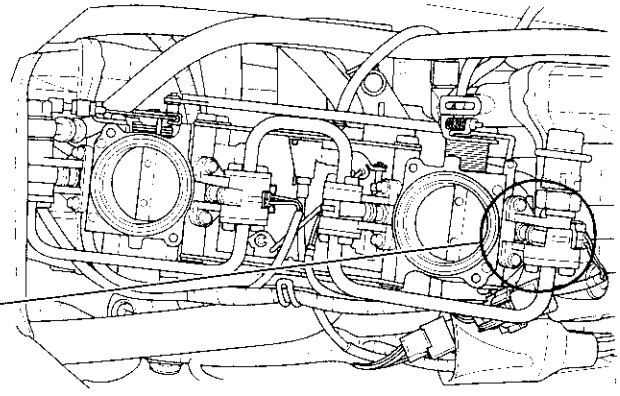
Connection: A1 — Pink/Yellow
Standard: Continuity

No continuity → • Open circuit in Pink/Yellow wire

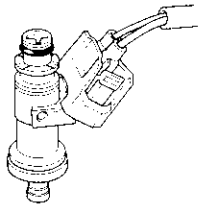
Continuity → • Replace the ECM with a new one and inspect again.

PGM-FI MALFUNCTION INDICATOR 13 BLINKS (No. 1-2 INJECTOR)

Remove the air cleaner housing (page 5-56).
Turn the ignition switch OFF.

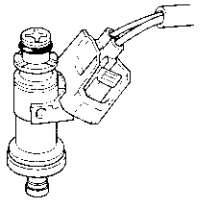


Disconnect the No. 1-2 injector 2P connector.
Check the connector for loose contacts or corroded terminals.



Connect the No. 1-2 injector connector.
Place the motorcycle on its side stand.
Turn the ignition switch ON.
Check the malfunction indicator blinks.

No blinking → • Loose or pooly connected No. 1-2 injector connector

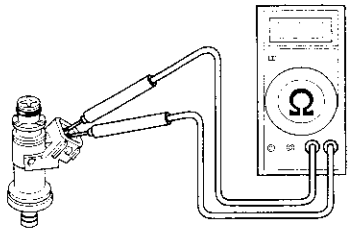


13 blinks

Turn the ignition switch OFF.

Measure the resistance between the No. 1-2 injector terminals.

Abnormal → • Faulty No. 1-2 injector



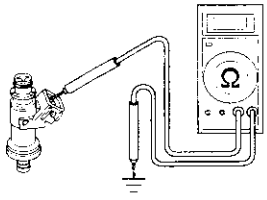
Connection: Black/White – Pink/Blue
Standard: 11.1 – 12.3 Ω (at 20°C/68°F)

Normal

To page 5-32

From page 5-31

Check for continuity between the No. 1-2 injector terminal and ground.

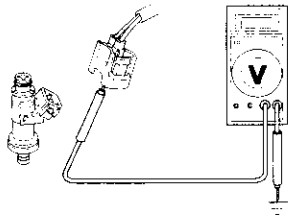


Connection: Black/White – Ground
Standard: No continuity

Continuity → • Faulty No. 1-2 injector

No continuity

Measure the voltage between the wire harness side connector terminal of the No. 1-2 injector and ground.



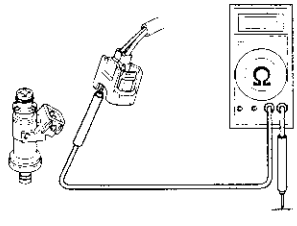
Connection: Black/White (+) – Ground (–)
Standard: Battery voltage

No voltage → • Open circuit in Black/White wire

Normal

Turn the ignition switch OFF.
Disconnect the ECM 22P black connector (page 5-8).

Check for continuity between the wire harness side connector terminal of the No. 1-2 injector and ground.



Connection: Pink/Blue – Ground
Standard: No continuity

Continuity → • Short circuit in Pink/Blue wire

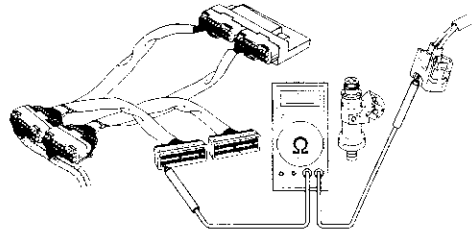
No continuity

To page 5-33

From page 5-32

Connect the ECM test harness to the ECM connectors (page 5-8).

Check for continuity between the ECM test harness connector terminal and wire harness side connector terminal of the No. 1-2 injector terminal.



Connection: A12 – Pink/Blue
Standard: Continuity

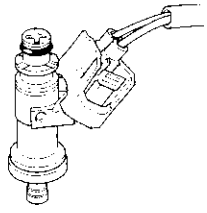
No continuity → • Open circuit in Pink/Blue wire

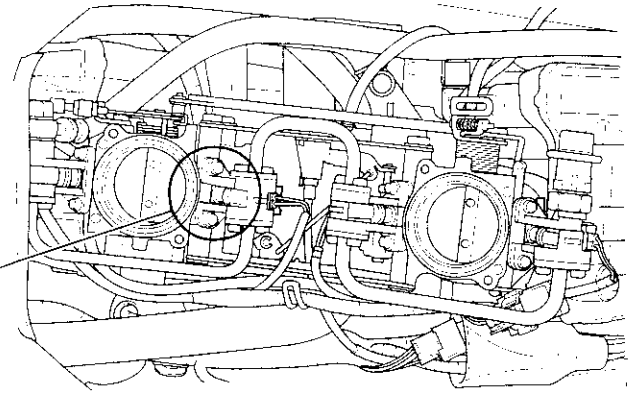
Continuity → • Replace the ECM with a new one and inspect again.

PGM-FI MALFUNCTION INDICATOR 14 BLINKS (No. 2-1 INJECTOR)

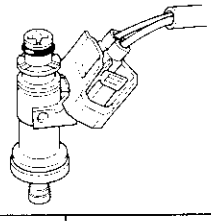
Remove the air cleaner housing (page 5-56).
Turn the ignition switch OFF.

Disconnect the No. 2-1 injector 2P connector.
Check the connector for loose contacts or corroded terminals.





Connect the No. 2-1 injector connector.
Place the motorcycle on its side stand.
Turn the ignition switch ON.
Check the malfunction indicator blinks.

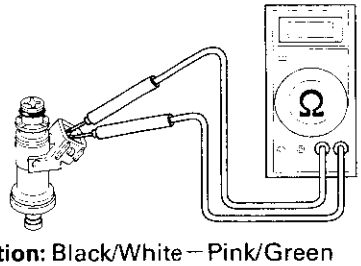


No blinking → • Loose or pooly connected No. 2-1 injector connector

14 blinks

Turn the ignition switch OFF.

Measure the resistance between the No. 2-1 injector terminals.



Connection: Black/White – Pink/Green
Standard: 11.1 – 12.3 Ω (at 20°C/68°F)

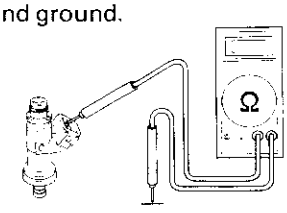
Abnormal → • Faulty No. 2-1 injector

Normal

To page 5-35

From page 5-34

Check for continuity between the No. 2-1 injector terminal and ground.

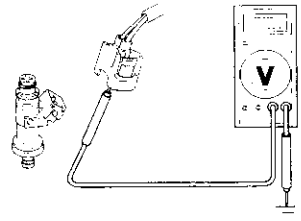


Connection: Black/White – Ground
Standard: No continuity

Continuity → • Faulty No. 2-1 injector

No continuity

Measure the voltage between the wire harness side connector terminal of the No. 2-1 injector and ground



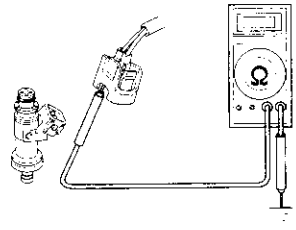
Connection: Black/White (+) – Ground (–)
Standard: Battery voltage

No voltage → • Open circuit in Black/White wire

Normal

Turn the ignition switch OFF.
Disconnect the ECM 22P black connector (page 5-8).

Check for continuity between the wire harness side connector terminal of the No. 2-1 injector and ground.



Connection: Pink/Green – Ground
Standard: No continuity

Continuity → • Short circuit in Pink/Green wire

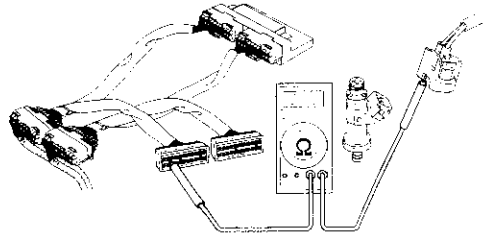
No continuity

To page 5-36

From page 5-35

Connect the ECM test harness to the ECM connectors (page 5-8).

Check for continuity between the ECM test harness connector terminal and wire harness side connector terminal of the No. 2-1 injector terminal.



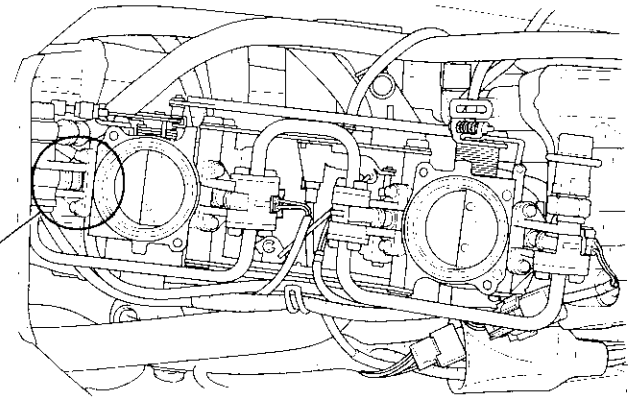
Connection: A2 — Pink/Green
Standard: Continuity

No continuity → • Open circuit in Pink/Green wire

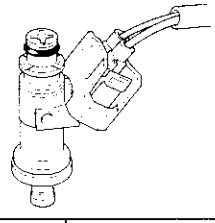
Continuity → • Replace the ECM with a new one and inspect again.

PGM-FI MALFUNCTION INDICATOR 15 BLINKS (No. 2-2 INJECTOR)

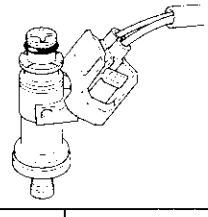
Remove the air cleaner housing (page 5-56).
Turn the ignition switch OFF.



Disconnect the No. 2-2 injector 2P connector.
Check the connector for loose contacts or corroded terminals.



Connect the No. 2-2 injector connector.
Place the motorcycle on its side stand.
Turn the ignition switch ON.
Check the malfunction indicator blinks.

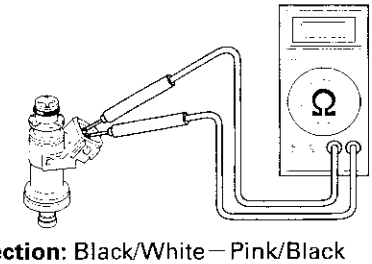


No blinking → • Loose or pooly connected No. 2-2 injector connector

15 blinks

Turn the ignition switch OFF.

Measure the resistance between the No. 2-2 injector terminals.



Connection: Black/White – Pink/Black
Standard: 11.1 – 12.3 Ω (at 20°C/68°F)

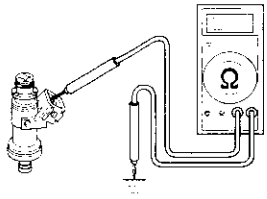
Abnormal → • Faulty No. 2-2 injector

Normal

To page 5-38

From page 5-37

Check for continuity between the No. 2-2 injector terminal and ground.

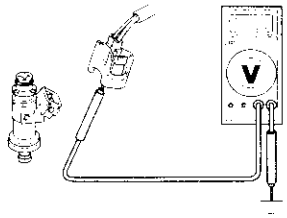


Connection: Black/White – Ground
Standard: No continuity

Continuity → • Faulty No. 2-2 injector

No continuity

Measure the voltage between the wire harness side connector terminal of the No. 2-2 injector and ground.



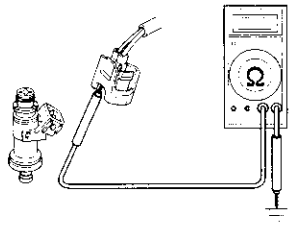
Connection: Black/White (+) – Ground (–)
Standard: Battery voltage

No voltage → • Open circuit in Black/White wire

Normal

Turn the ignition switch OFF.
Disconnect the ECM 22P black connector (page 5-8).

Check for continuity between the wire harness side connector terminal of the No. 2-2 injector and ground.



Connection: Pink/Black – Ground
Standard: No continuity

Continuity → • Short circuit in Pink/Black wire

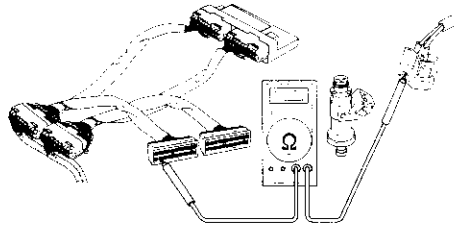
No continuity

To page 5-39

From page 5-38

Connect the ECM test harness to the ECM connectors (page 5-8).

Check for continuity between the ECM test harness connector terminal and wire harness side connector terminal of the No. 2-2 injector terminal.



Connection: A13—Pink/Black
Standard: Continuity

No continuity → • Open circuit in Pink/Black wire

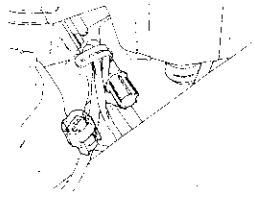
Continuity → • Replace the ECM with a new one and inspect again.

PGM-FI MALFUNCTION INDICATOR 18 BLINKS (CAM PULSE GENERATOR)

Raise the front of the fuel tank and support it (page 3-4).
Turn the ignition switch OFF.

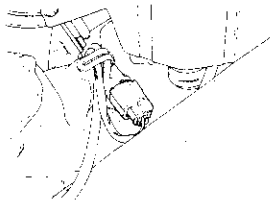
↓

Disconnect the cam pulse generator 2P connector.
Check the connector for loose contacts or corroded terminals.



↓

Connect the cam pulse generator connector.
Check that the engine can be started by cranking it with the starter motor.



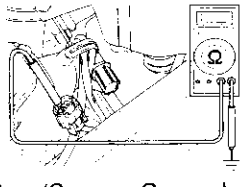
Engine starts → • Loose or pooly connected cam pulse generator connector

↓ Engine does not start

Turn the ignition switch OFF.

↓

Disconnect the cam pulse generator connector.
Check for continuity between the wire harness side connector terminal of the cam pulse generator and ground.



Connection: Gray/Green – Ground
Standard: Continuity

No continuity → • Open circuit in Gray/Green wire

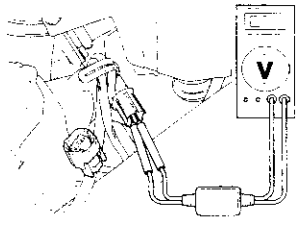
↓ Continuity

To page 5-41

From page 5-40

Connect the peak voltage adaptor to the digital multimeter (page 5-8).

Turn the ignition switch ON.
Crank the engine with the starter motor, and measure the cam pulse generator peak voltage at the cam pulse generator terminals.



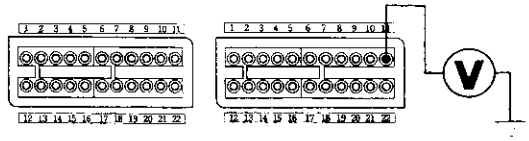
Connection: Gray (+) – Gray/Green ( )
Standard: 0.7 V minimum

Abnormal → • Faulty cam pulse generator

Normal

Connect the ECM test harness to the ECM connectors (page 5-8).
Connect the cam pulse generator connector.

Turn the ignition switch ON.
Crank the engine with the starter motor, and measure the cam pulse generator peak voltage at the ECM test harness connector terminal and ground.



Connection: B11 (+) – Ground (–)
Standard: 0.7 V minimum

Abnormal → • Open or short circuit in Gray wire

Normal → • Replace the ECM with a new one and inspect again.

PGM-FI MALFUNCTION INDICATOR 19 BLINKS (IGNITION PULSE GENERATOR)

Remove the lower inner fairing and left lower fairing (page 2-3).
Turn the ignition switch OFF.

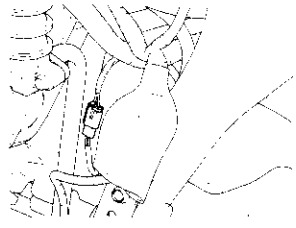
↓

Disconnect the ignition pulse generator 2P connector.
Check the connector for loose contacts or corroded terminals.



↓

Connect the ignition pulse generator connector.
Check that the engine can be started by cranking it with the starter motor.



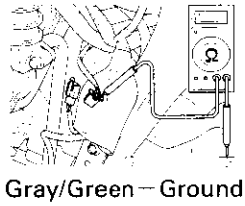
Engine starts → • Loose or pooly connected ignition pulse generator connector

↓ Engine does not start

Turn the ignition switch OFF.

↓

Disconnect the ignition pulse generator connector.
Check for continuity between the wire harness side connector terminal of the ignition pulse generator and ground.



Connection: Gray/Green – Ground
Standard: Continuity

No continuity → • Open circuit in Gray/Green wire

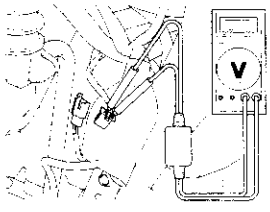
↓ Continuity

To page 5-43

From page 5-42

Connect the peak voltage adaptor to the digital multimeter (page 5-8).

Turn the ignition switch ON.
Crank the engine with the starter motor, and measure the ignition pulse generator peak voltage at the ignition pulse generator connector terminals.



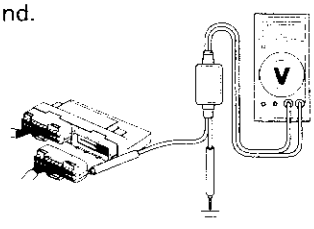
Connection: Yellow (+) – Gray/Green (–)
Standard: 0.7 V minimum

Abnormal → • Faulty ignition pulse generator

Normal

Turn the ignition switch OFF.
Connect the ignition pulse generator connector.
Disconnect the ECM gray connector (page 5-8).

Turn the ignition switch ON.
Crank the engine with the starter motor, and measure the ignition pulse generator peak voltage at the ECM test harness connector terminal and ground.



Connection: B22 (+) – Ground (–)
Standard: 0.7 V minimum

Abnormal → • Open or short circuit in Yellow wire

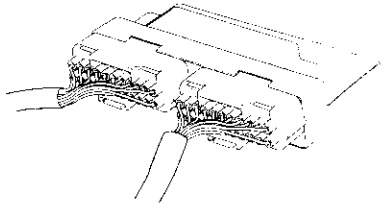
Normal → • Replace the ECM with a new one and inspect again.

PGM-FI MALFUNCTION INDICATOR 20 BLINKS (E^2-PROM)

Remove the passenger seat (page 2-2).
Turn the ignition switch OFF.

↓

Disconnect the ECM 22P connectors.
Check the connector for loose contacts or corroded terminals.



↓

Connect the ECM connectors.
Short the service check connector terminals with a jumper wire (page 5-6).
Turn the ignition switch ON.
Check the malfunction indicator blinks.

20 blinks → Reset the self-diagnostic memory (page 5-7).
Turn the ignition switch ON.
Check the malfunction indicator blinks.

20 blinks → • Faulty ECM

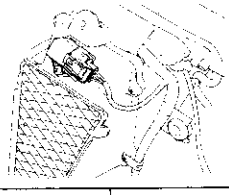
Except 20 blinks → Blinks

↓

Turn the ignition switch OFF.
Remove the jumper wire from the service check connector.

↓

Remove the upper cowl (page 2-4).
Disconnect the BARO sensor 3P connector.



↓

Place the motorcycle on its side stand.
Start the engine, let it idle and check the malfunction indicator blinks.

Except 20 blinks → • No problem

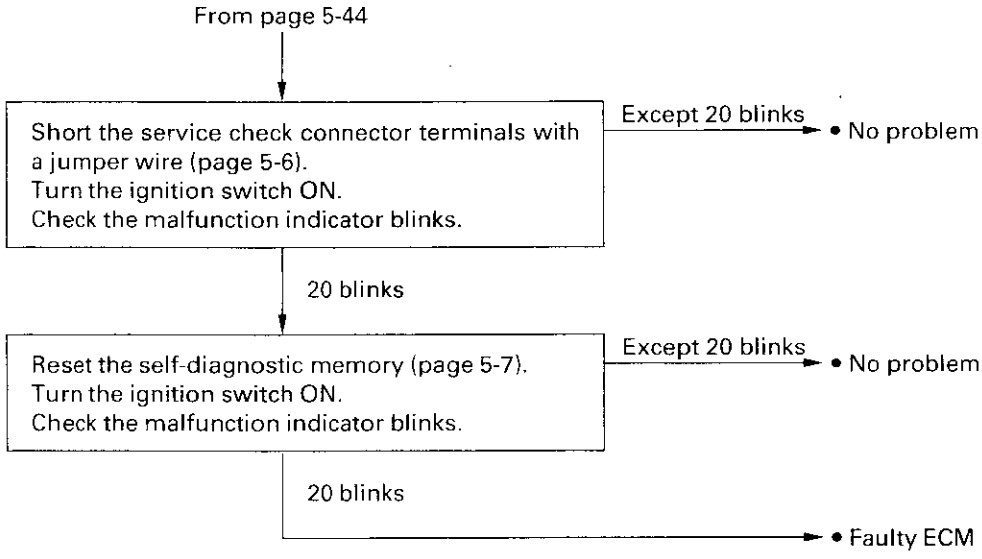
↓ 20 blinks

↓

Turn the ignition switch OFF.

↓

To page 5-45


From page 5-44
Short the service check connector terminals with a jumper wire (page 5-6).
Turn the ignition switch ON.
Check the malfunction indicator blinks.
Except 20 blinks
• No problem
20 blinks
Reset the self-diagnostic memory (page 5-7).
Turn the ignition switch ON.
Check the malfunction indicator blinks.
Except 20 blinks
• No problem
20 blinks
• Faulty ECM

FUEL TANK

REMOVAL

⚠WARNING

- ***Gasoline is extremely flammable and is explosive under certain conditions.***
- ***Be sure to release fuel pressure with the ignition switch OFF.***

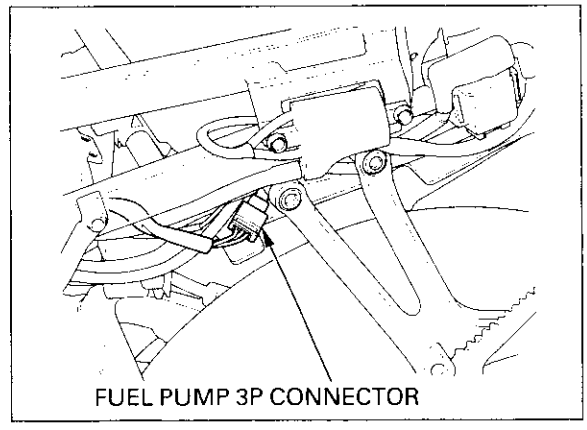
CAUTION:

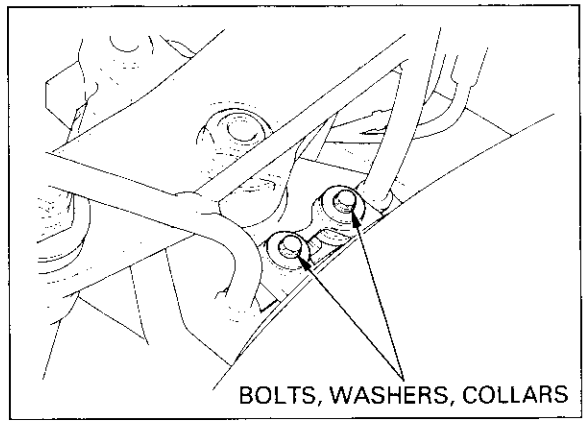
- ***Before disconnecting fuel feed hose, release the fuel pressure by loosening the fuel feed hose banjo bolt at the fuel tank.***
- ***Always replace the sealing washer when the fuel feed hose banjo bolt is removed or loosened.***

Remove the seat cowl (page 2-2).

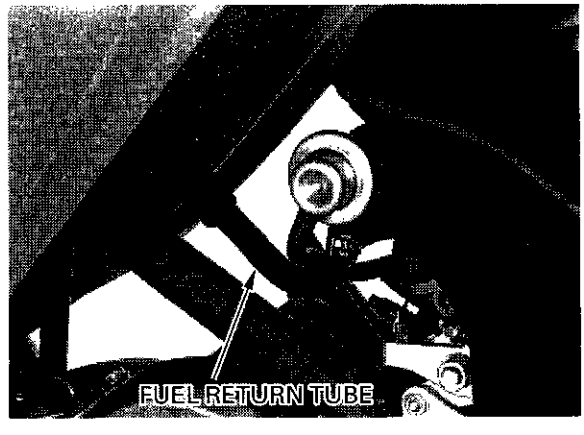
Disconnect the fuel pump 3P (black) connector.

Remove the fuel tank front mounting bolts, washers and collars.
Raise the front of the fuel tank and support it.





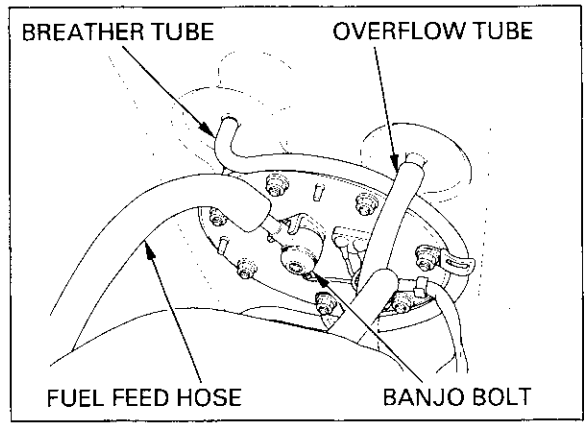
Disconnect the fuel return tube from the pressure regulator and drain the gasoline into an approved gasoline container.
Plug the fuel return tube end.



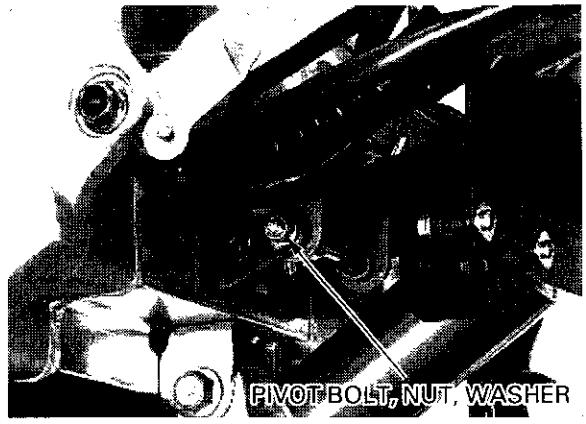
Disconnect the fuel tank breather tube and overflow tube.

Cover the fuel feed hose banjo bolt with a rag or shop towel.

Slowly loosen the banjo bolt and catch the fuel using an approved gasoline container.



Remove the fuel tank pivot nut, washer, bolt and fuel tank.
Remove the banjo bolt, fuel feed hose and sealing washers from the fuel tank.



INSTALLATION

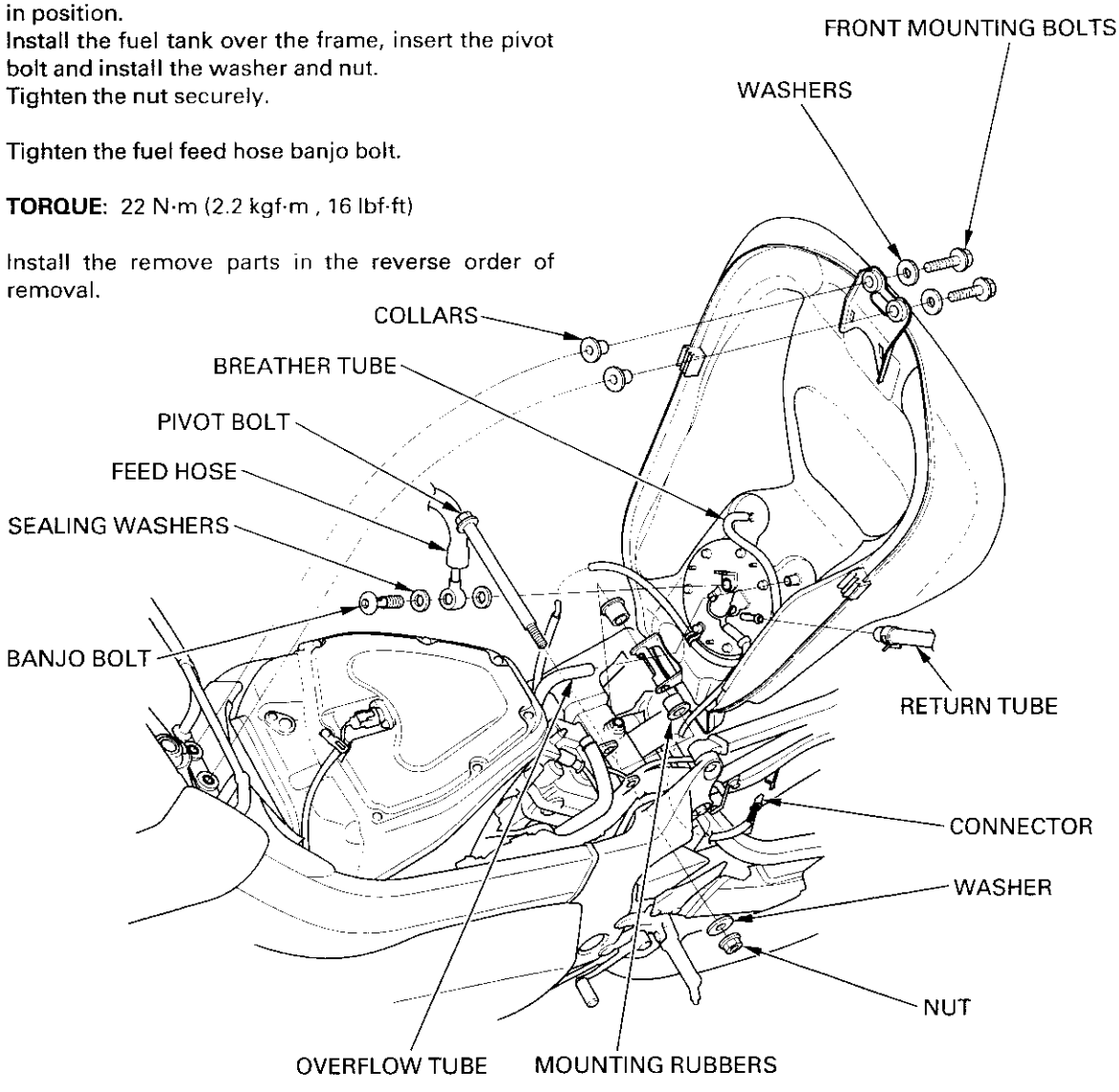
Install the fuel feed hose onto the fuel tank with the banjo bolt and new sealing washers, aligning the feed hose joint neck with the setting groove.

Check that the rear mounting rubbers are installed in position.
Install the fuel tank over the frame, insert the pivot bolt and install the washer and nut.
Tighten the nut securely.

Tighten the fuel feed hose banjo bolt.

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

Install the remove parts in the reverse order of removal.



FUEL LINE INSPECTION

FUEL PRESSURE INSPECTION

⚠WARNING

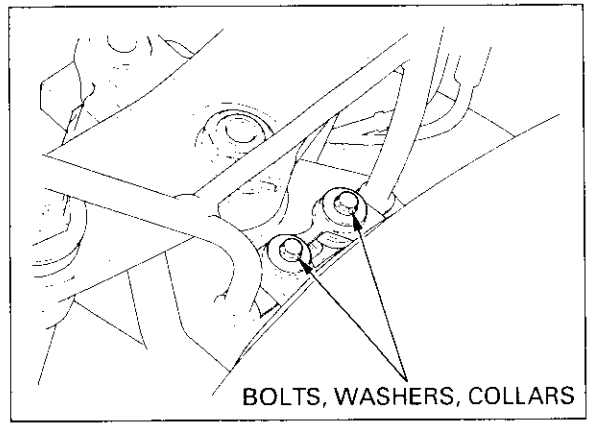
- ***Gasoline is extremely flammable and is explosive under certain conditions.***
- ***Be sure to release fuel pressure with the ignition switch OFF.***

CAUTION:

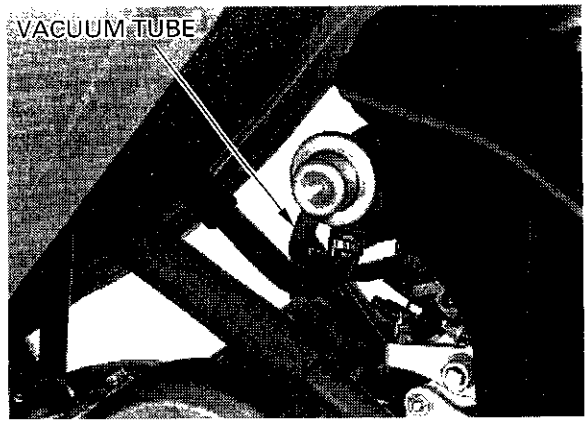
- ***Before disconnecting fuel feed hose, release the fuel pressure by loosening the fuel feed hose banjo bolt at the fuel tank.***
- ***Always replace the sealing washer when the fuel feed hose banjo bolt is removed or loosened.***

Disconnect the battery negative cable (page 16-4).

Remove the fuel tank front mounting bolts, washers and collars.
Raise the front of the fuel tank and support it.

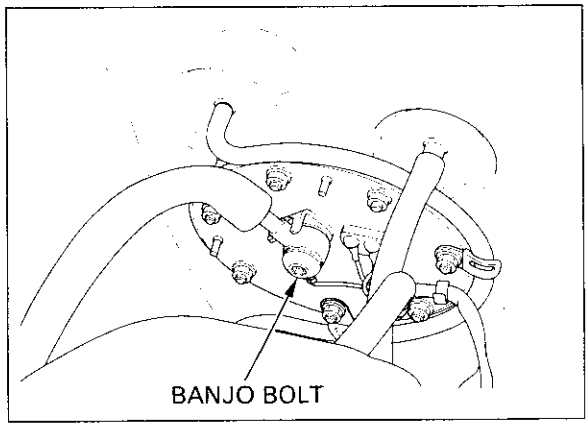


Disconnect the pressure regulator vacuum tube and plug the vacuum tube end.



Cover the fuel feed hose banjo bolt with a rag or shop towel.

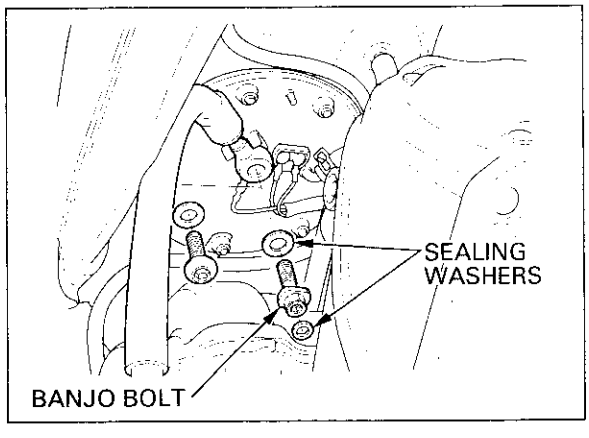
Slowly loosen the banjo bolt and catch the fuel using an approved gasoline container.



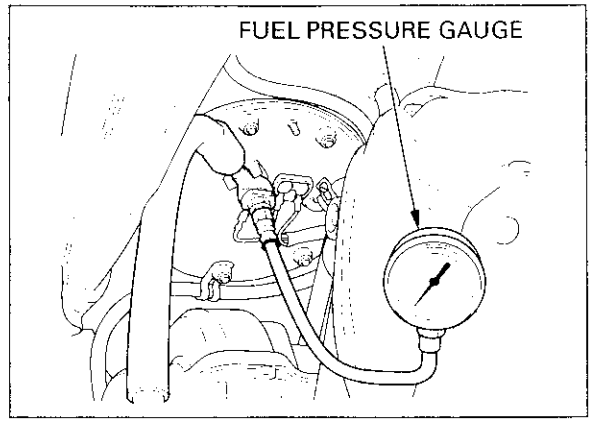
Remove the fuel tank pivot nut, washer and bolt.
Remove the banjo bolt, fuel feed hose and sealing washers.
Attach the following Honda genuine parts:

- Banjo bolt, 12 mm: Part No. 90008-PP4-E02
- Sealing washer, 12 mm: Part No. 90428-PD6-003
- Sealing washer, 6 mm: Part No. 90430-PD6-003

TORQUE:
12 mm banjo bolt: 22 N·m (2.2 kgf·m , 16 lbf·ft)



Connect the fuel pressure gauge.



TOOL:
Fuel pressure gauge 07406-0040002

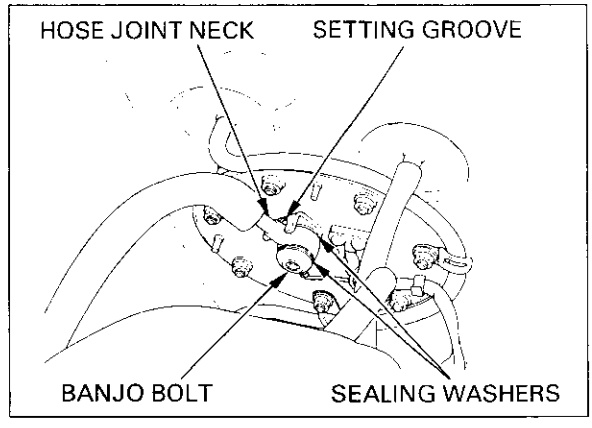
Connect the battery negative cable.
Start the engine, let it idle and read the fuel pressure.

FUEL PRESSURE: 343 kPa (3.5 kgf/cm², 50 psi)

If the pressure is higher than specified pressure, inspect the following:
– clogged fuel return tube
– pressure regulator
– fuel pump (page 5-50)

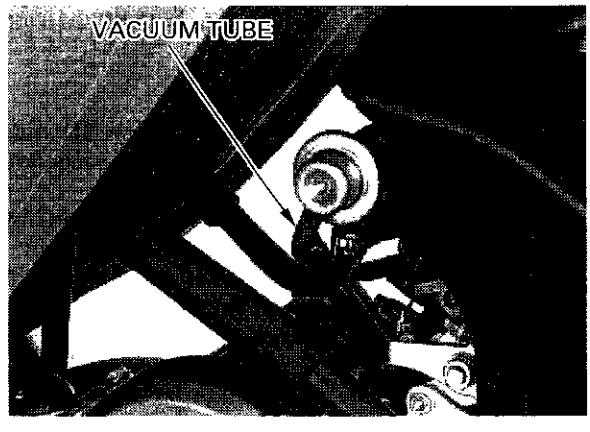
If the pressure is lower than specified pressure, inspect the following:
– clogged fuel filter
– pressure regulator
– fuel pump (page 5-50)

After inspection, remove the fuel pressure gauge and attached parts.
Install the fuel feed hose with the banjo bolt and new sealing washers, aligning the hose joint neck with the setting groove.
Tighten the banjo bolt.



TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

Connect the vacuum tube to the pressure regulator.



Install the removed parts in the reverse order of removal.

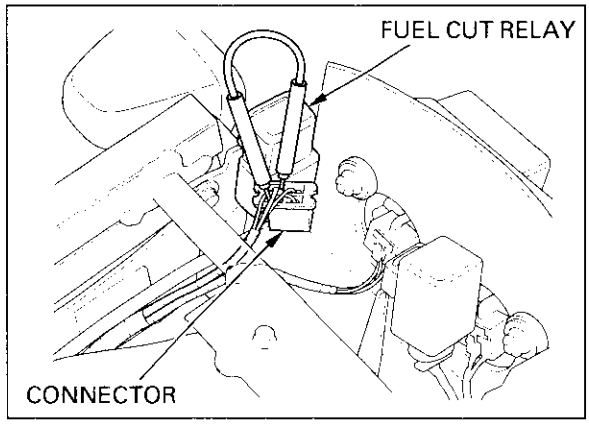
FUEL FLOW INSPECTION

⚠WARNING

Gasoline is extremely flammable and is explosive under certain conditions.

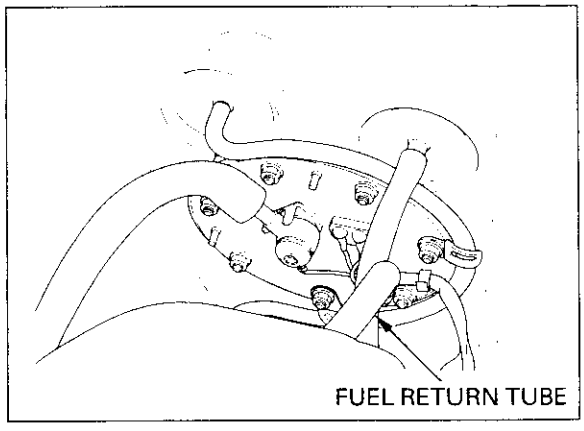
Remove the seat cowl (page 2-2).

Turn the ignition switch OFF and disconnect the fuel cut relay connector.
Connect the brown and black/white wire terminals of the wire harness side connector with a jumper wire.



Remove the fuel tank front mounting bolts, rear pivot bolt and nut.

Disconnect the fuel return tube from the fuel tank and plug the joint pipe of the fuel tank immediately.

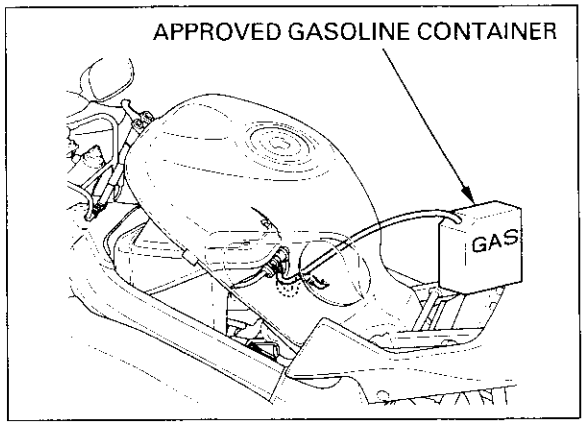


NOTE:

- When the fuel return tube is disconnected, gasoline spill out from the tube. Place an approved gasoline container and drain the gasoline.
- Wipe off spilled gasoline.

Turn the ignition switch ON for 10 seconds.
Measure the amount of fuel flow.

AMOUNT OF FUEL FLOW:
190 cm³ (6.4 US oz , 6.7 Imp oz)/10 seconds



If the fuel flow is less than specified amount, inspect the following:
—clogged fuel feed hose and/or fuel return tube
—clogged fuel filter
—pressure regulator
—fuel pump

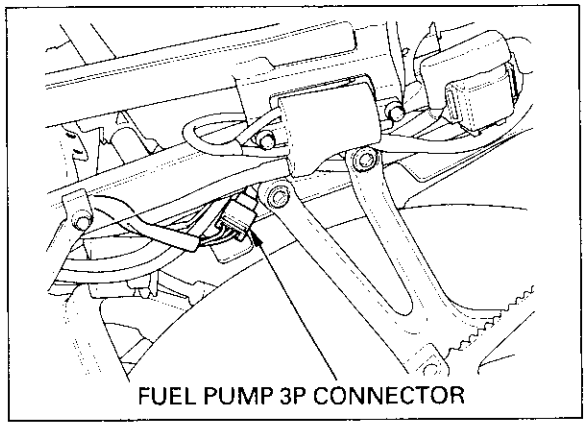
After inspection, connect the fuel return tube and install the removed parts.

FUEL PUMP

INSPECTION

Turn the ignition switch ON and check that the fuel pump operates for a few seconds.

If the fuel pump does not operates, disconnect the fuel pump 3P (black) connector.
Measure the voltage between the brown (+) and green (−) wire terminals of the wire harness side connector.
Turn the ignition switch ON.
There should be battery voltage for a few seconds.



- If there is battery voltage, replace the fuel pump.
- If there is no voltage, check the following:
  —open circuit in green wire between the fuel pump connector and ground terminal
  —open circuit in brown wire between the fuel pump connector and fuel cut relay

If the wires are OK, check the fuel cut relay (page 5-52).

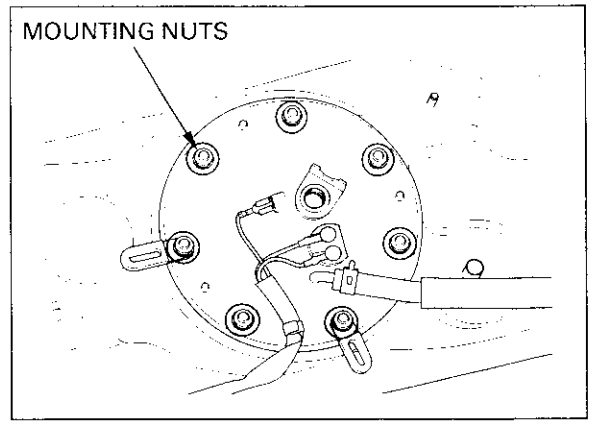
REMOVAL/INSTALLATION

⚠WARNING

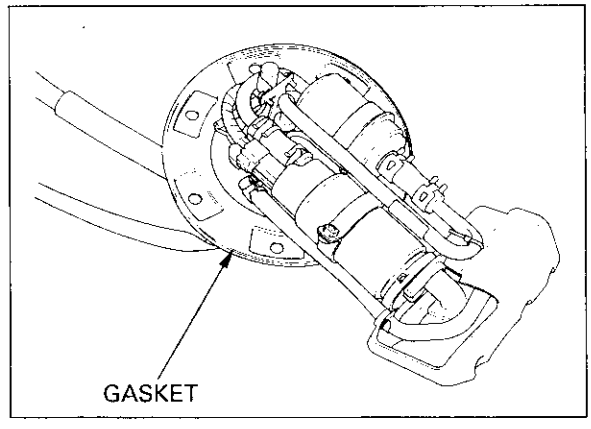
Gasoline is extremely flammable and is explosive under certain conditions.

Remove the fuel tank (page 5-46).

Remove the fuel pump mounting nuts and the fuel pump from the fuel tank.



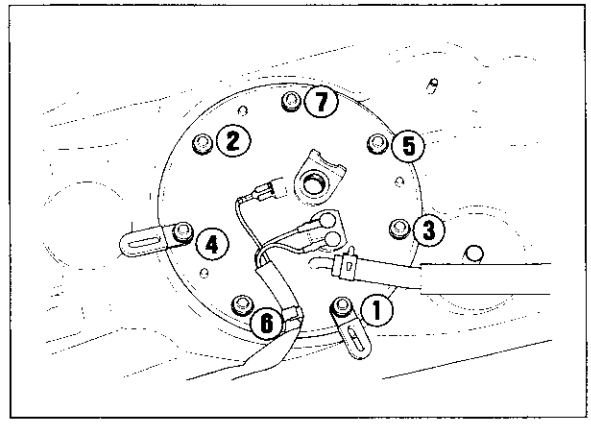
Install a new gasket onto the fuel pump base.
Install the fuel pump into the fuel tank, being careful not to damage the strainer and gasket.



Install the mounting nuts and tighten them in the sequence shown.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

Install the fuel tank (page 5-47).

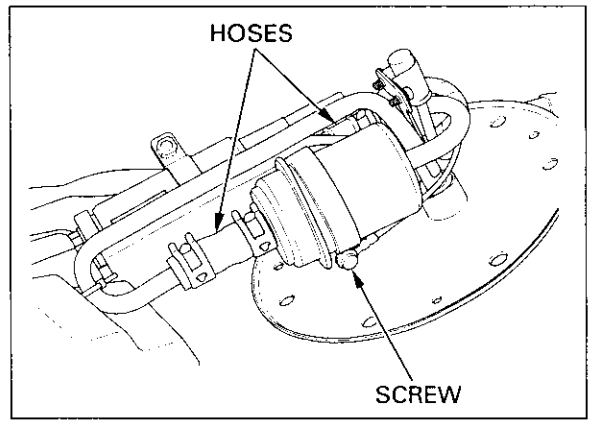


FUEL FILTER REPLACEMENT

Remove the fuel pump.

Remove the screw, disconnect the fuel pump hoses and remove the fuel filter.

Install the fuel filter in the reverse order of removal.



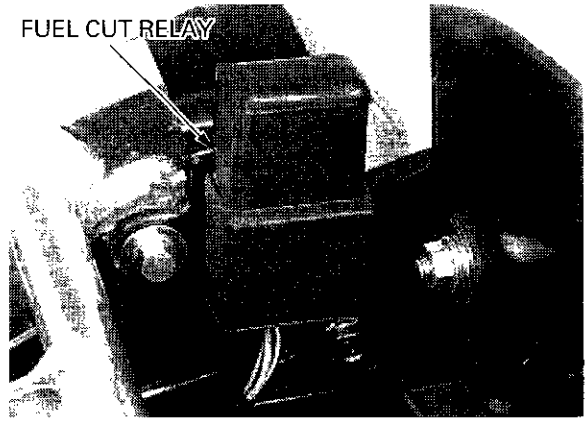
FUEL CUT RELAY

INSPECTION

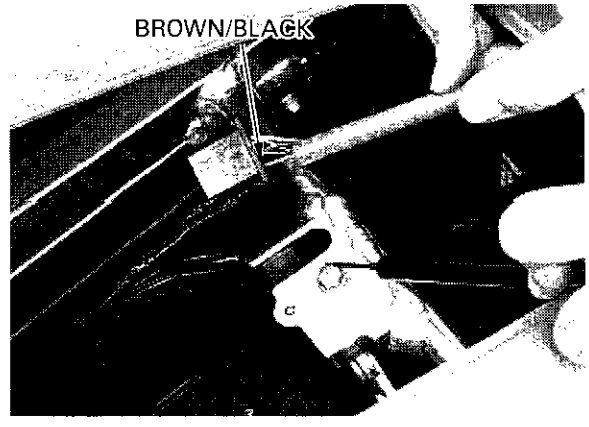
Remove the passenger seat (page 2-2).

Turn the ignition switch ON with the engine stop switch in RUN position.
The coil is normal if the fuel cut relay clicks.

If you don't hear the relay "CLICK", inspect the relay using the procedure below.



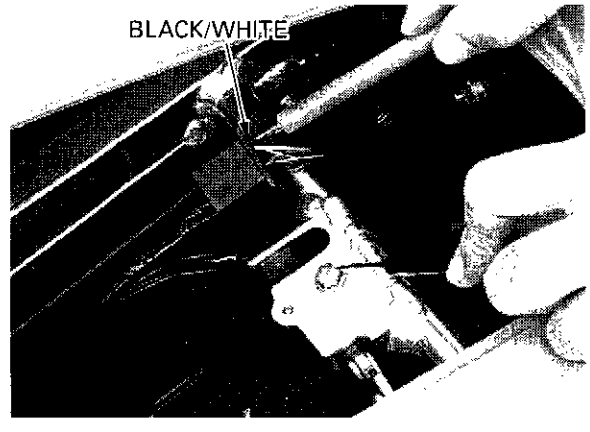
Turn the ignition switch OFF.
Disconnect the fuel cut relay 4P (black) connector.



SIGNAL LINE

Check for continuity between the brown/black wire terminal of the wire harness side connector and ground.

- There should be no continuity with the ignition switch OFF.
  If there is continuity, check for short circuit in brown/black wire between the fuel cut relay and ECM.
- Turn the ignition switch ON with the engine stop switch in RUN position.
  There should be continuity for a few seconds.
  If there is no continuity, check for open circuit in brown/black wire between the relay and ECM.

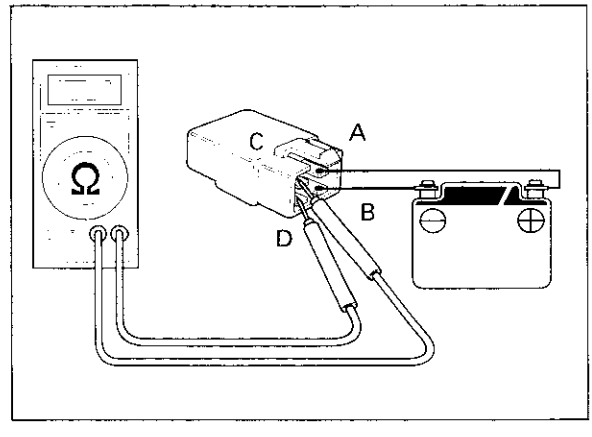


BANK ANGLE SENSOR RELAY LINE

Measure the voltage between the black/white wire terminal (+) of the wire harness side connector and ground (−).
Turn the ignition switch ON with the engine stop switch in RUN position.
There should be battery voltage.
If there is no voltage, check for open circuit in black /white wire between the fuel cut relay and bank angle sensor relay.

OPERATION CHECK

Remove the fuel cut relay.
Connect the 12 V battery to terminal A (+) and terminal B (−).
There should be continuity between terminal C and terminal D when the battery is connected, and no continuity when the battery is disconnected.



BANK ANGLE SENSOR/RELAY

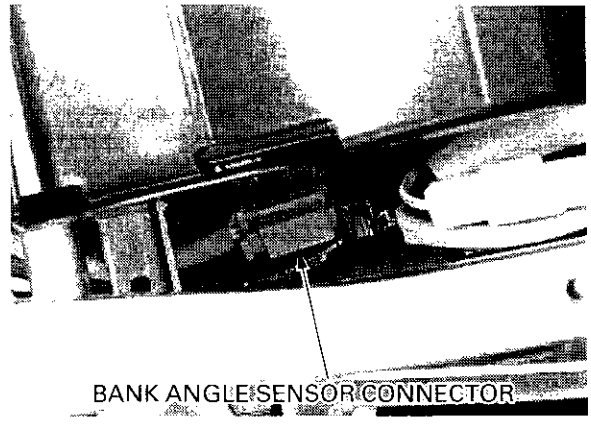
INSPECTION

Remove the seat cowl (page 2-2).

Turn the ignition switch ON with the engine stop switch in RUN position.

Measure the voltage between bank angle sensor connector terminals with the connector connected.

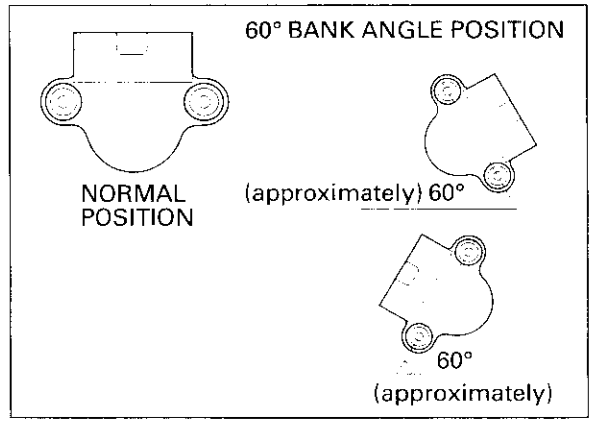
STANDARD:
White/Black (+)—Green ( ): Battery voltage
Red/Orange (+)—Green (−): 0 1 V



Turn the ignition switch OFF.
Remove the two nuts, screws, washers and the bank angle sensor from the rear fender.



Place the bank angle sensor horizontal and turn the ignition switch ON.
The bank angle sensor is normal if the bank angle sensor relay clicks and the power supply line is closed.
Incline the sensor approximately 60 degrees to the left or right with the ignition switch ON.
The bank angle sensor is normal if the bank angle sensor relay clicks and the power supply line is open.

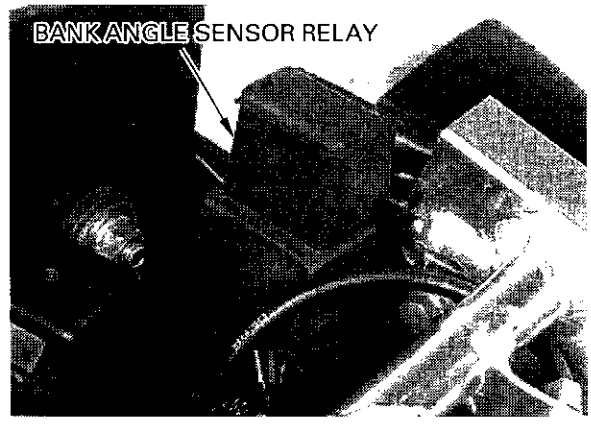


NOTE:

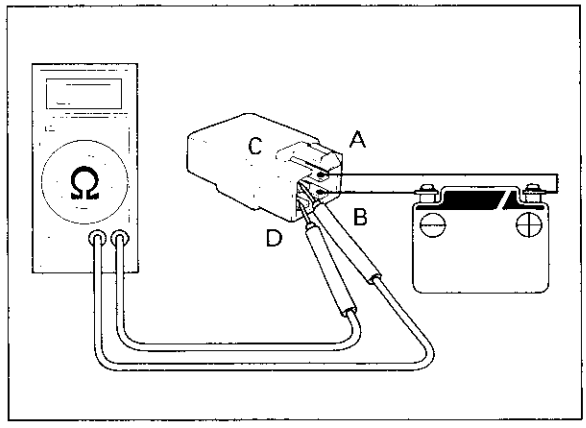
If you repeat this test, first turn the ignition switch OFF, then back to ON before you try the test again.

BANK ANGLE SENSOR RELAY

Remove the bank angle sensor.



Connect the 12 V battery to terminal A (+) and terminal B (−).
There should be continuity between terminal C and terminal D when the battery is connected, and no continuity when the battery is disconnected.



BARO/MAP SENSORS

OUTPUT VOLTAGE INSPECTION

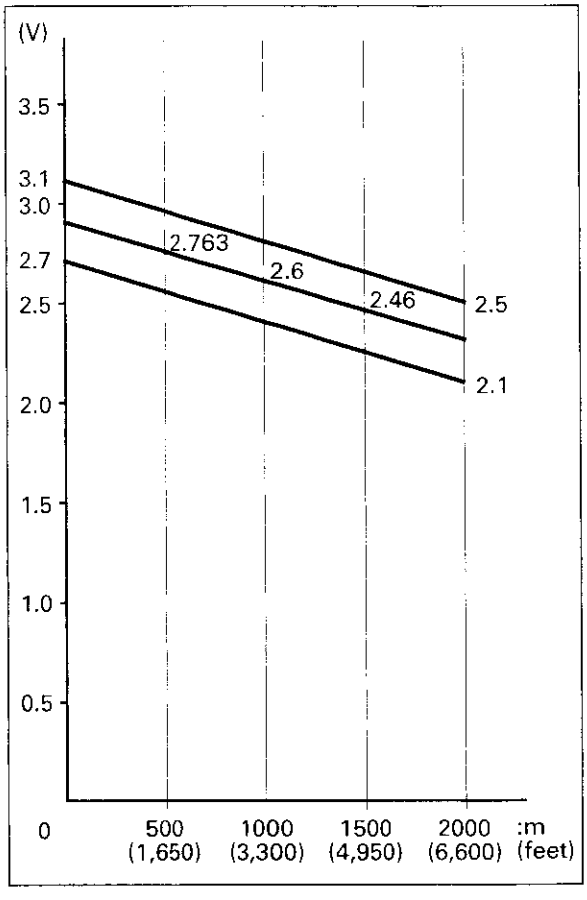
Connect the ECM test harness to the ECM (page 5-8).

Measure the voltage at the ECM test harness connector (page 5-9).

CONNECTION:
BARO sensor: B8 (+)−A22 (−)
MAP sensor: B17 (+)−A22 (−)

STANDARD: 2.7−3.1 V

The output voltage (above) is measured under the standard atmosphere (1 atm = 1,030 hPa).
The output voltage is changed by the altitude as shown in the chart, because it varies in accordance with the atmospheric pressure.

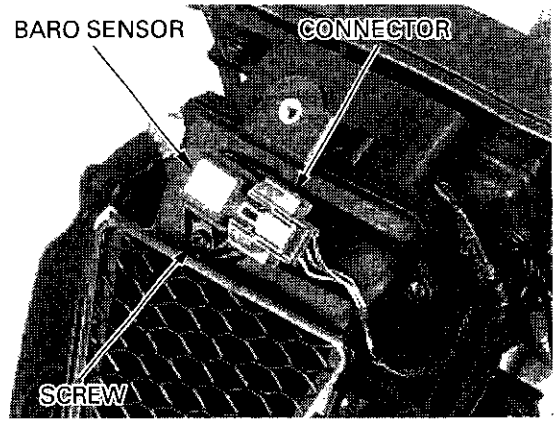


BARO SENSOR REPLACEMENT

Remove the upper cowl (page 2-4).

Disconnect the BARO sensor 3P connector.
Remove the screw and BARO sensor.

Installation is in the reverse order of removal.

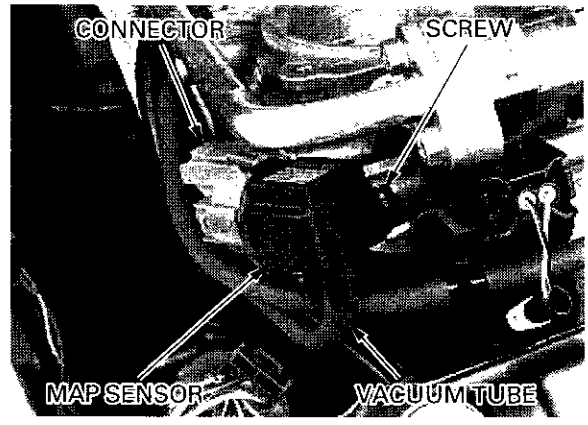


MAP SENSOR REPLACEMENT

Remove the air cleaner housing (page 5-56).

Disconnect the MAP sensor 3P connector.
Disconnect the vacuum tube from the MAP sensor.
Remove the screw and MAP sensor.

Installation is in the reverse order of removal.



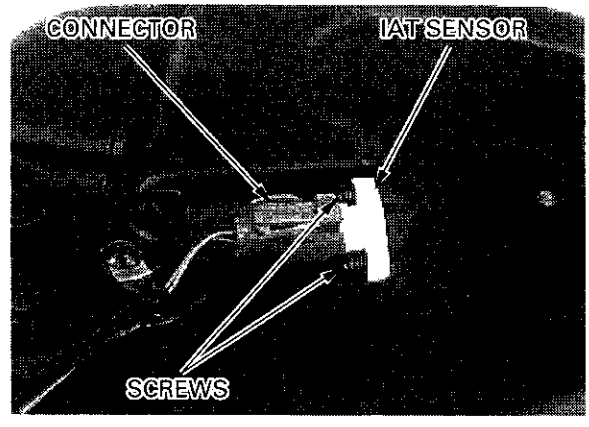
IAT SENSOR

REPLACEMENT

Raise the front of the fuel tank and support it (page 3-4).

Disconnect the IAT sensor 2P connector.
Remove the two screws and IAT sensor.

Installation is in the reverse order of removal.

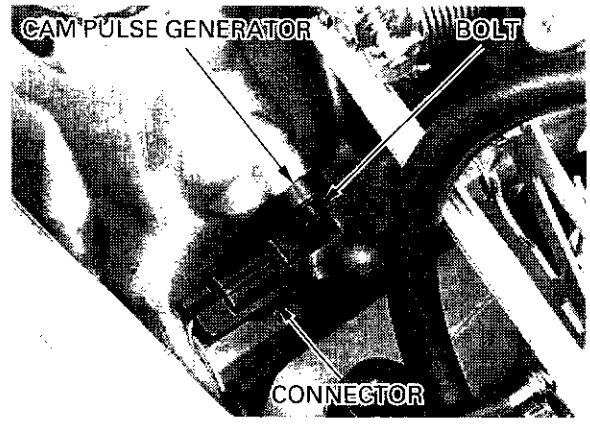


CAM PULSE GENERATOR

REPLACEMENT

Remove the air cleaner housing (page 5-56).

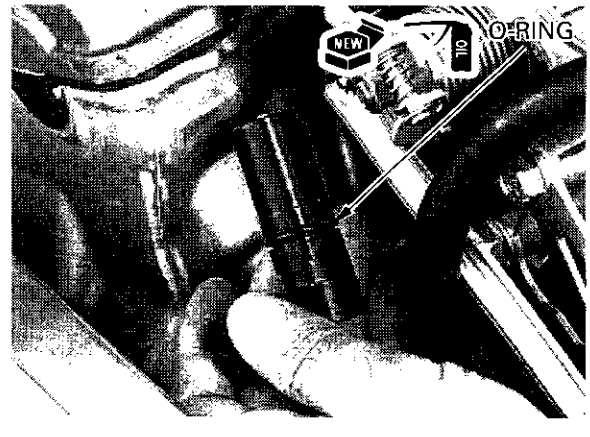
Disconnect the cam pulse generator 2P connector.
Remove the bolt and cam pulse generator.



Coat a new O-ring with engine oil and install it onto the cam pulse generator.

Install the cam pulse generator into the rear cylinder head and tighten the bolt securely.

Install the air cleaner housing (page 5-57).



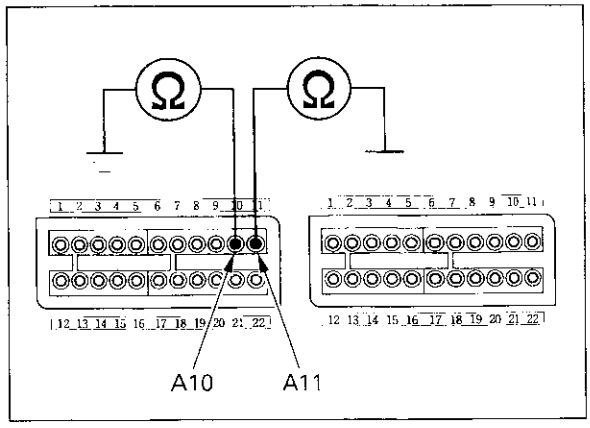
ECM (ENGINE CONTROL MODULE)

POWER/GROUND LINE INSPECTION

Connect the ECM test harness to the ECM connectors (page 5-8).

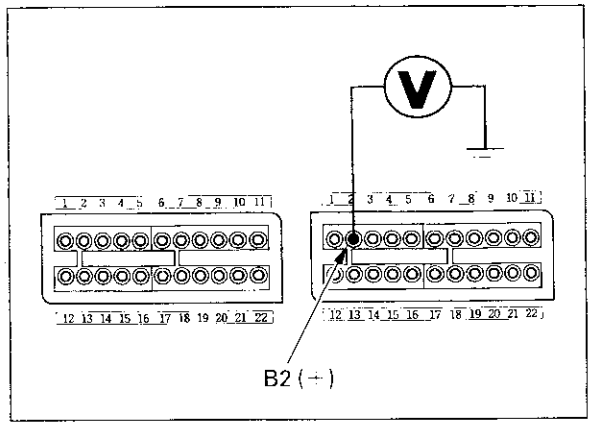
GROUND LINE

Check for continuity between the ECM test harness connector A10 terminal and ground, and between the A11 terminal and ground.
There should be continuity at all times.
If there is no continuity, check for open circuit in green/pink wire and green wire.



POWER INPUT LINE

Turn the ignition switch ON with the engine stop switch in RUN position.
Measure the voltage between the ECM test harness connector B2 terminal (+) and ground.
There should be battery voltage.
If there is no voltage, check for open circuit in black/white wire between the ECM and bank angle sensor relay.
If the wire is OK, check the bank angle sensor/relay (page 5-3).

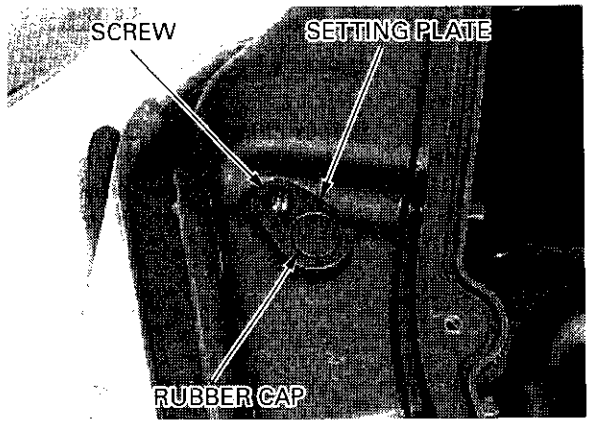


AIR CLEANER HOUSING

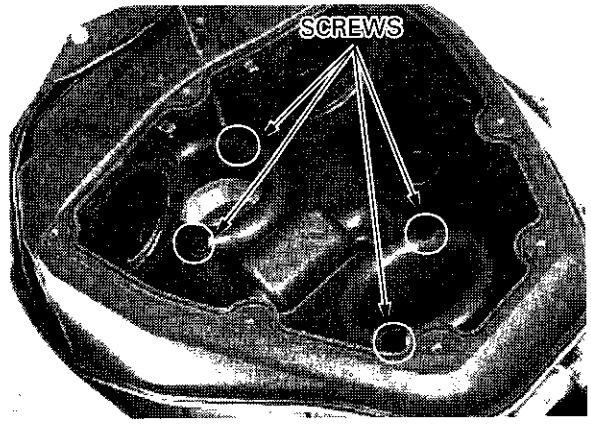
REMOVAL

Remove the fuel tank (page 5-46).
Remove the air cleaner element (page 3-6).

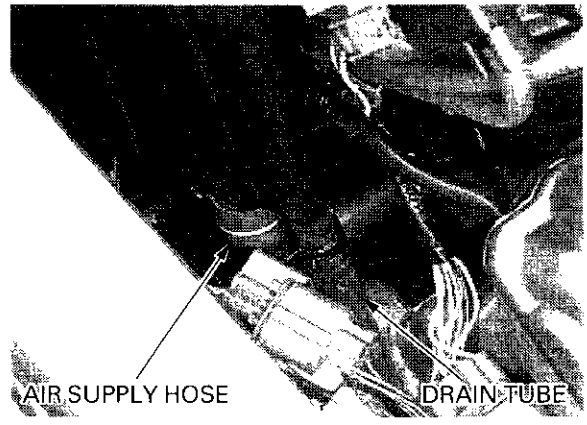
Remove the screw, setting plate and rubber cap.



Remove the air funnel/air cleaner housing mounting screws.

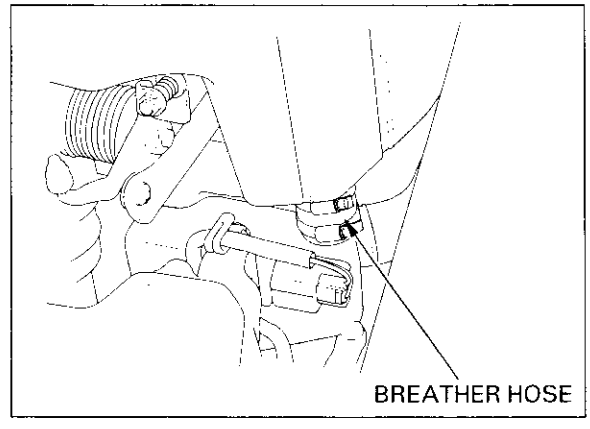


Disconnect the air cleaner housing drain tube and air supply hose of the PAIR system (except U type) from the air cleaner housing.



Disconnect the breather hose from the air cleaner housing.

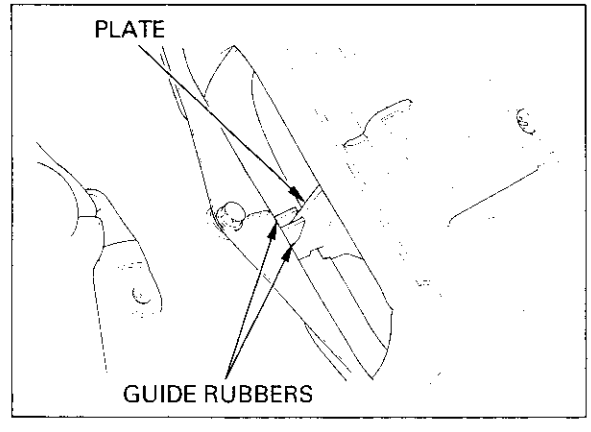
Remove the air cleaner housing with the air funnels.



INSTALLATION

Install the air cleaner housing into the frame, inserting the separator plate between the guide rubbers as shown.

Install the air cleaner housing in the reverse order of removal.



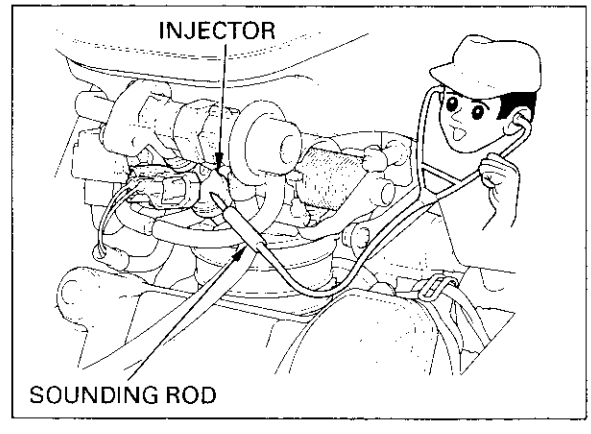
INJECTOR

INSPECTION

Remove the air cleaner housing (page 5-56).
Temporarily install the fuel tank (page 5-47) and raise and support the front of the tank.

Start the engine and let it idle.
Confirm proper injector operating sounds with a sounding rod or stethoscope.

If the injector does not operate, replace the injector.

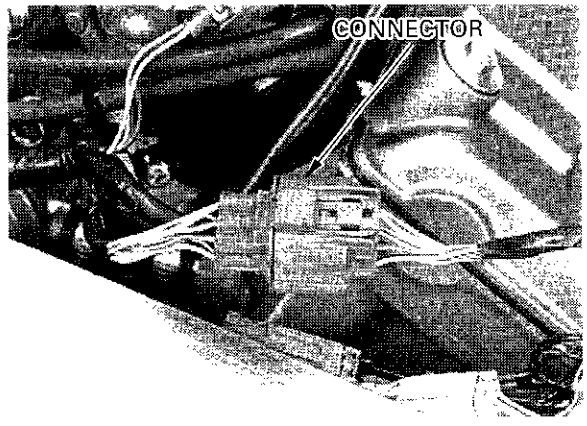


THROTTLE BODY

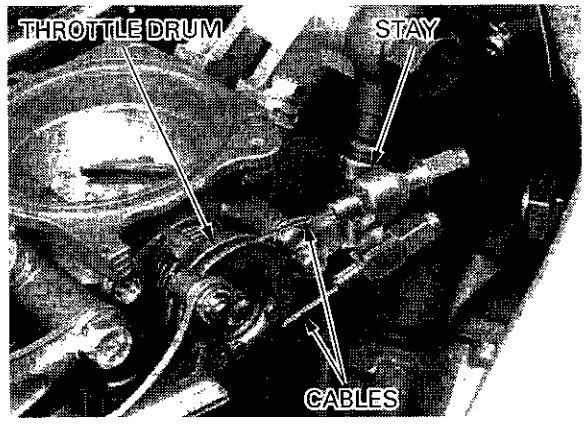
REMOVAL

Remove the air cleaner housing (page 5-56).

Disconnect the throttle body wire harness 10P connector.



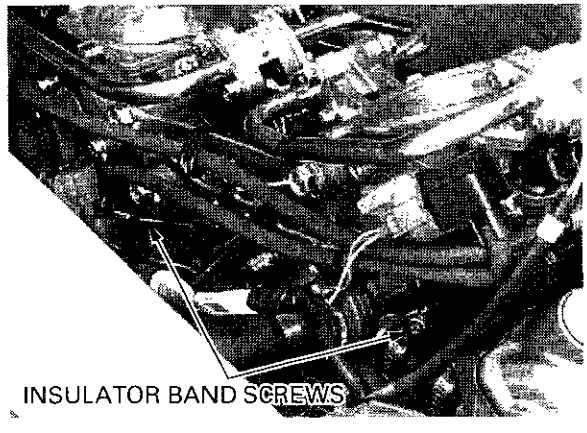
Remove the throttle cables from the cable stay and disconnect them from the throttle drum.



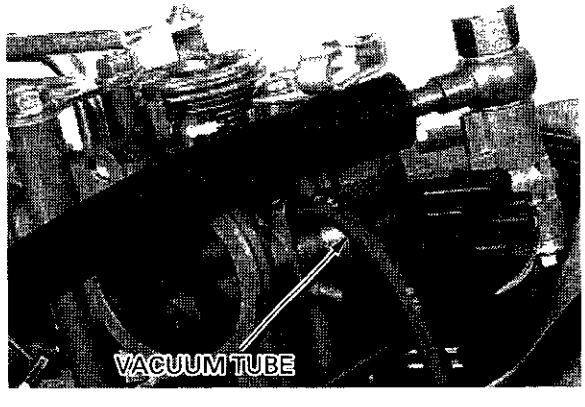
Loosen the insulator band screws and remove the throttle body/insulators from the cylinder heads.

CAUTION:

Do not hold the fuel feed pipe to remove the throttle body.



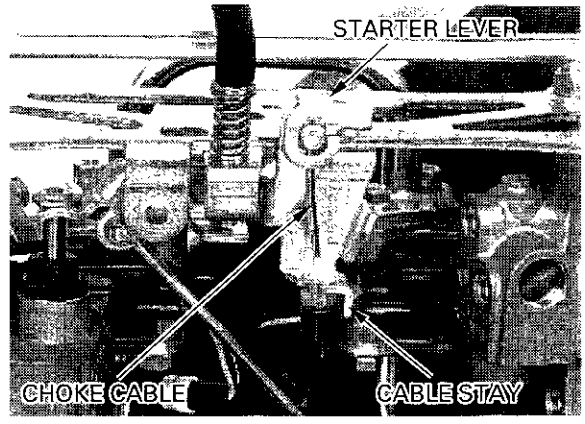
Disconnect the vacuum tube from the throttle body.



Remove the choke cable from the stay and disconnect it from the starter lever.
Remove the throttle body.

CAUTION:

Seal the cylinder head intake ports with tape or a clean cloth to keep dirt and debris from entering the engine after the throttle body has been removed.

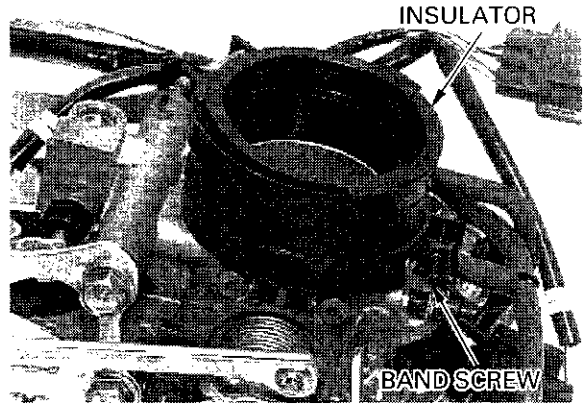


DISASSEMBLY

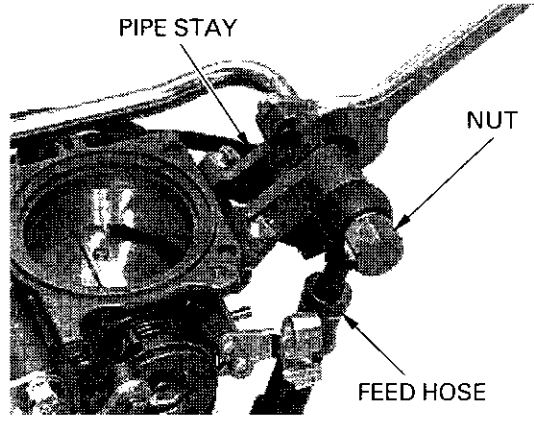
CAUTION:

- ***Do not damage the throttle body. It may cause incorrect throttle and idle valve synchronization.***
- ***The throttle body is factory pre-set. Do not disassemble in a way other than shown in this manual.***

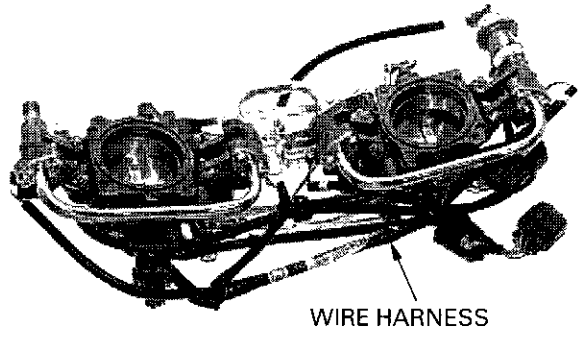
Loosen the insulator band screws and remove the insulators from the throttle body.



Hold the pipe stay with a 17 mm open end wrench and loosen the fuel feed hose nut.
Remove the nut, fuel feed hose and sealing washers.

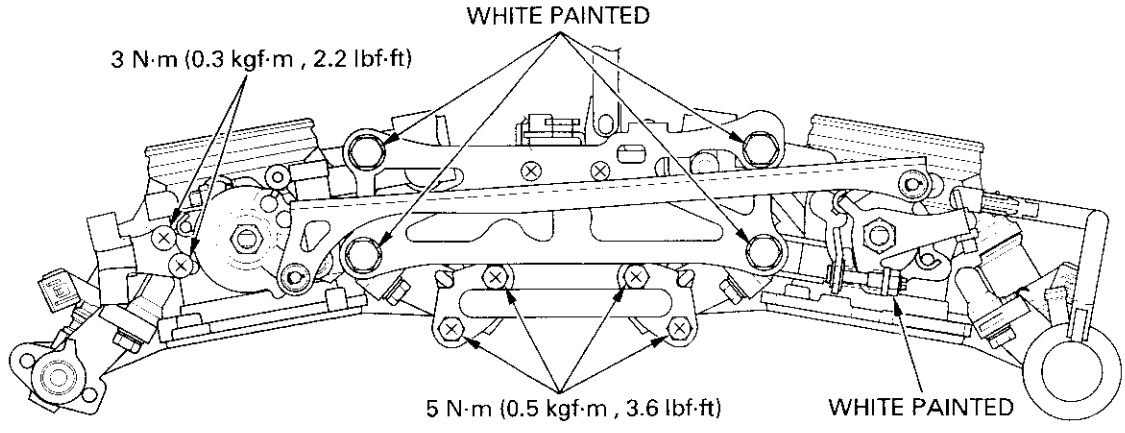


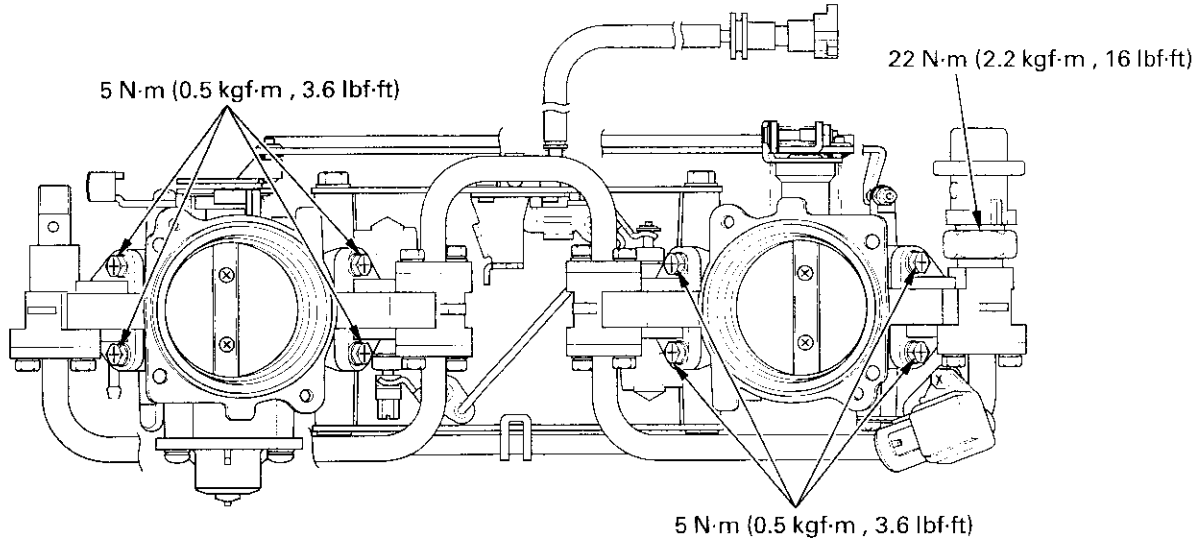
Disconnect the MAP sensor, TP sensor and injector connectors, and remove the throttle body wire harness.

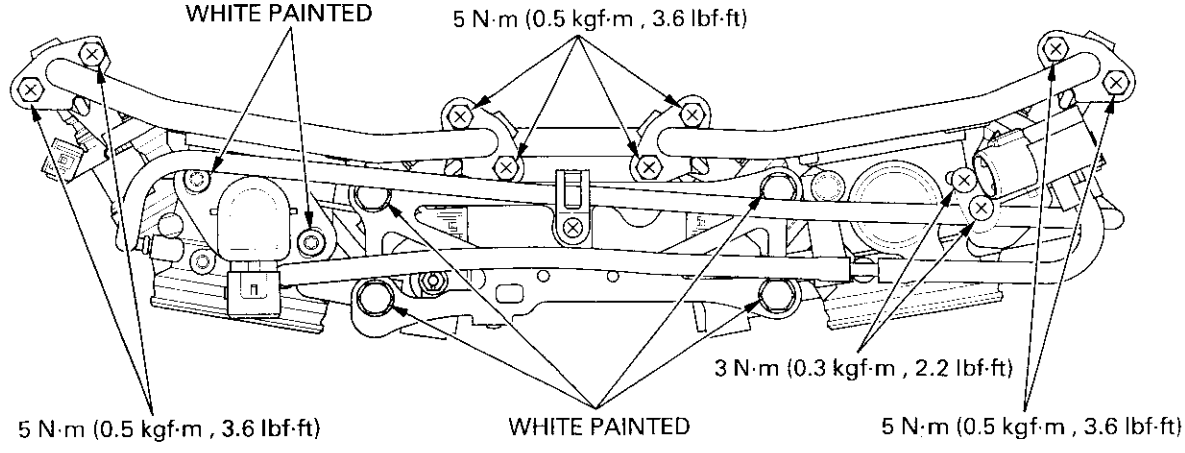


CAUTION:

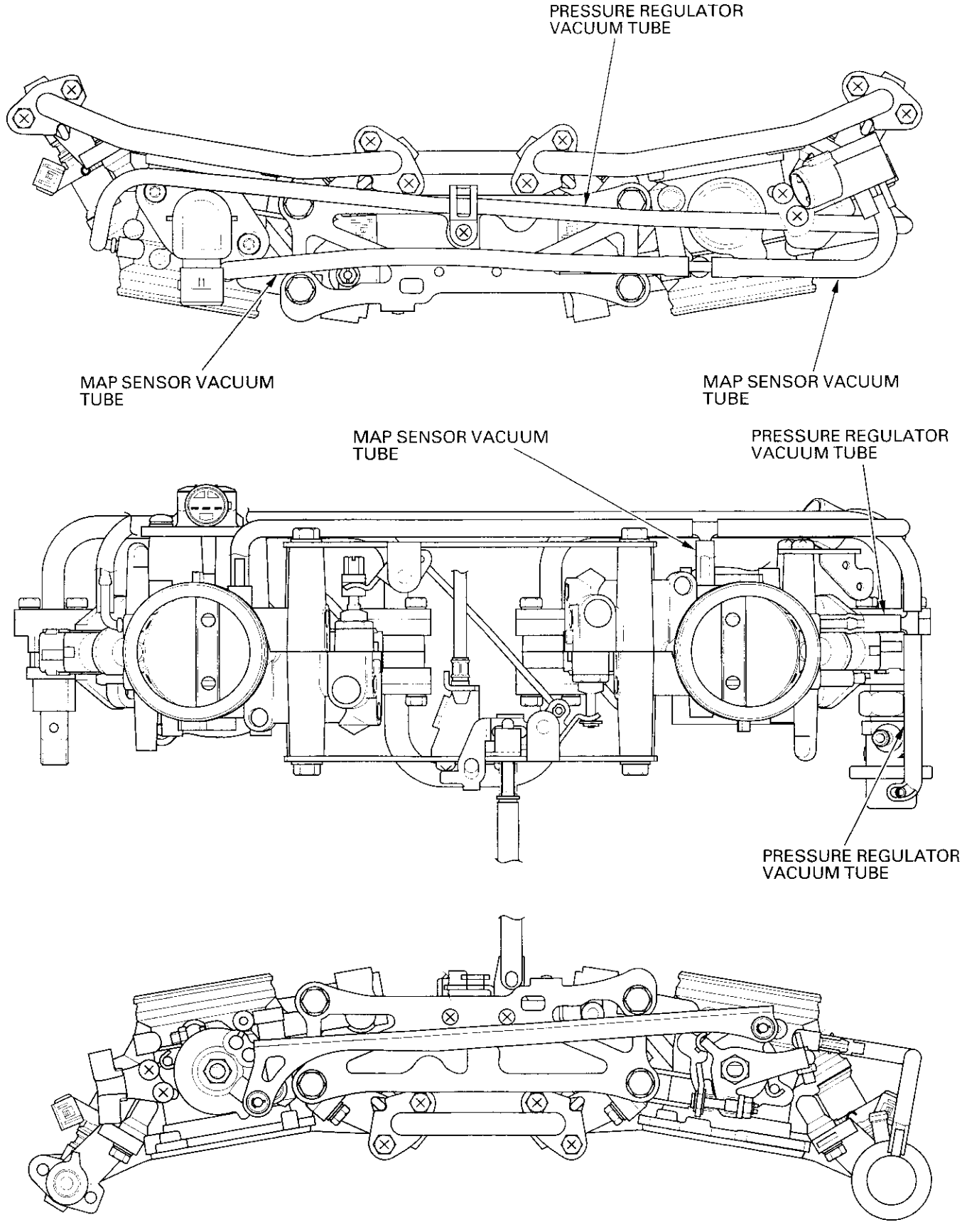
- ***Do not loosen or tighten the white painted bolts and screws of the throttle body. Loosening or tightening them can cause throttle and idle valve synchronization failure.***
- ***Tighten the bolts and screw of the throttle body to the specified torque. The parts of the throttle body not shown in this manual should not be disassembled.***





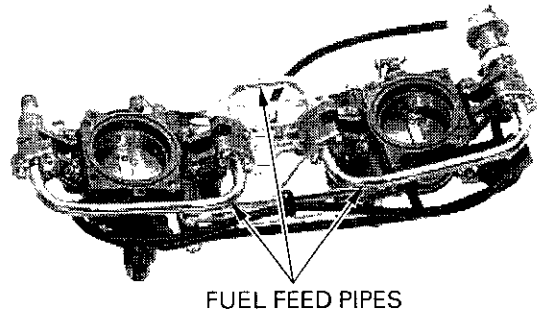


THROTTLE BODY VACUUM TUBE ROUTING

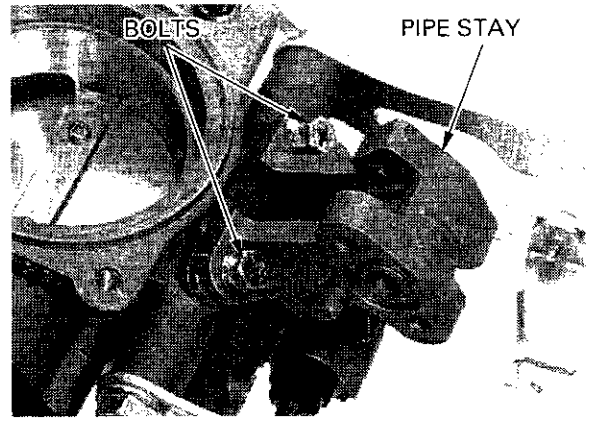


INJECTOR

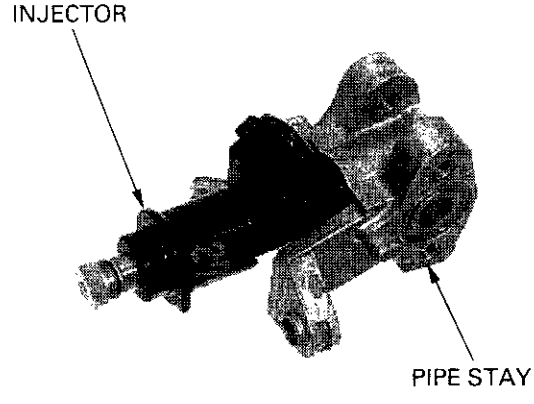
Remove the bolts and fuel feed pipes.



Remove the two bolts and pipe stay with the injector from the throttle body.
Remove the seal ring.

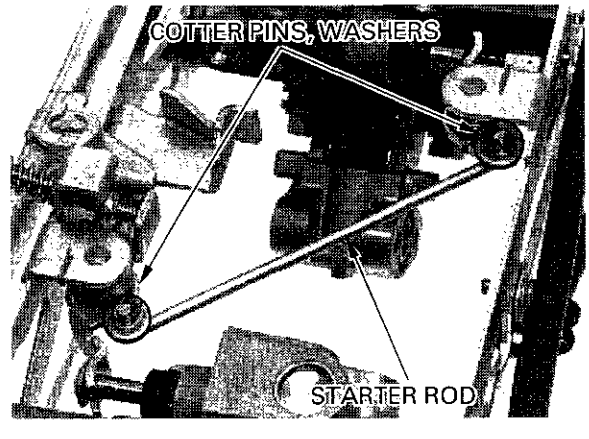


Remove the injector from the pipe stay.
Remove the O-ring and cushion ring from the injector.



STARTER VALVE

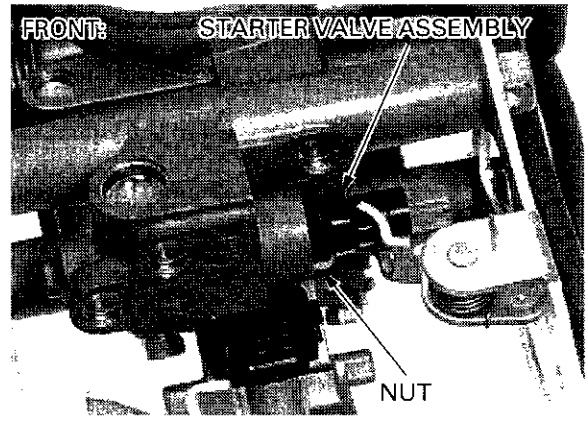
Remove the cotter pins, washers and starter rod.

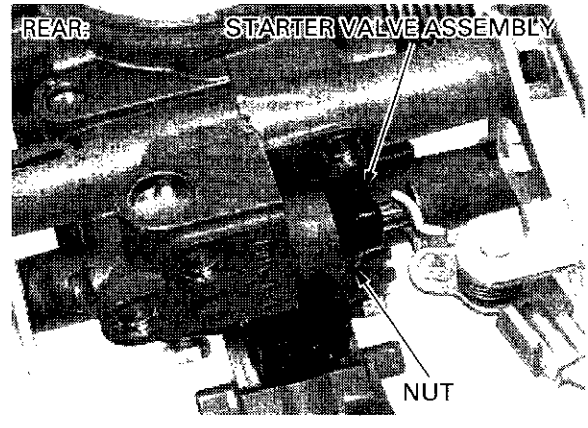


Remove the two screws and the throttle stop screw assembly.



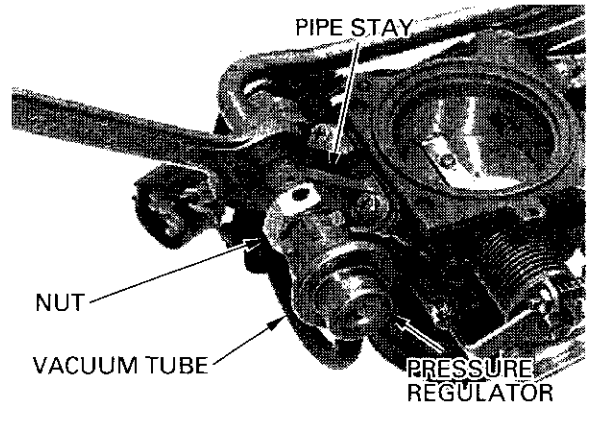
Loosen the starter valve nut and remove the starter valve assembly.



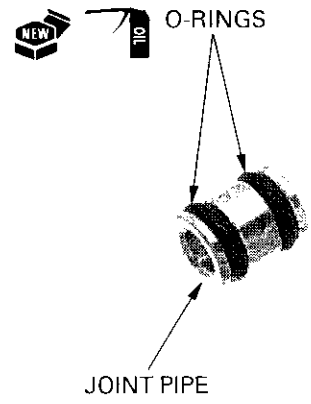


PRESSURE REGULATOR

Disconnect the vacuum tube from the pressure regulator.
Hold the pipe stay with a 17 mm open end wrench and loosen the pressure regulator nut.
Remove the pressure regulator and joint pipe.



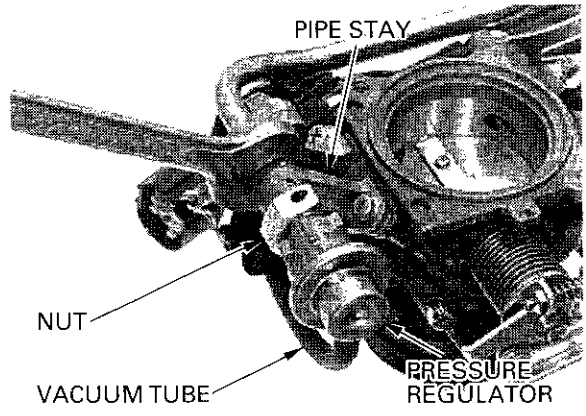
Coat new O-ring with oil and install them onto the joint pipe.



Install the pressure regulator with the joint pipe.
Hold the pipe stay with a 17 mm open end wrench and tighten the pressure regulator nut.

TORQUE: 27 N·m (2.8 kgf·m , 20 lbf·ft)

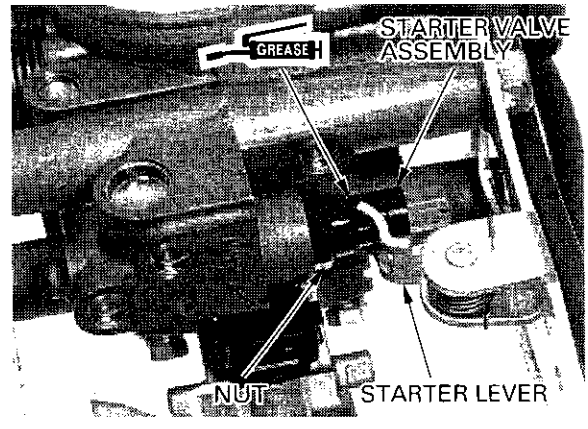
Connect the vacuum tube to the pressure regulator.



STARTER VALVE

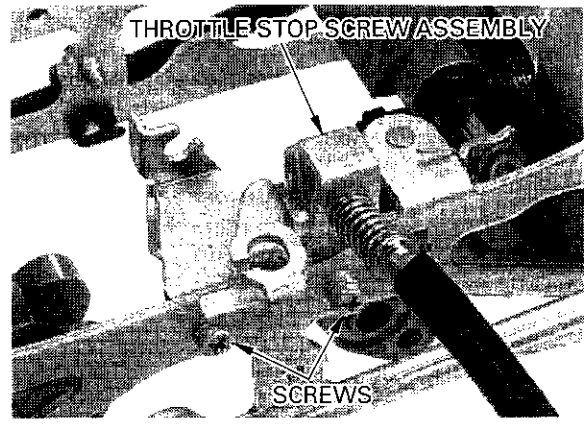
Apply grease to the starter lever contacting areas of the starter valve.
Install the starter valve assembly into the throttle body while hooking the starter lever.
Tighten the starter valve nut.

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

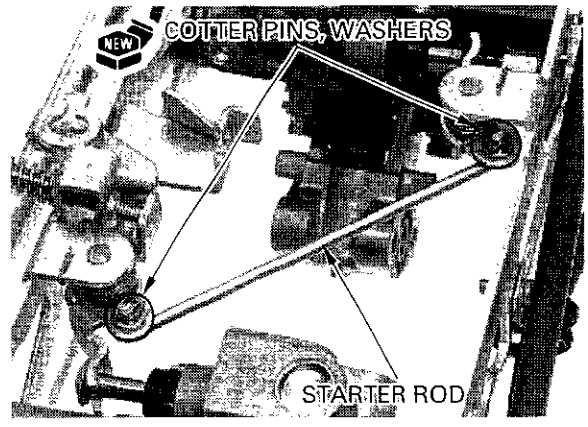


Install the throttle stop screw assembly and tighten the two screws.

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

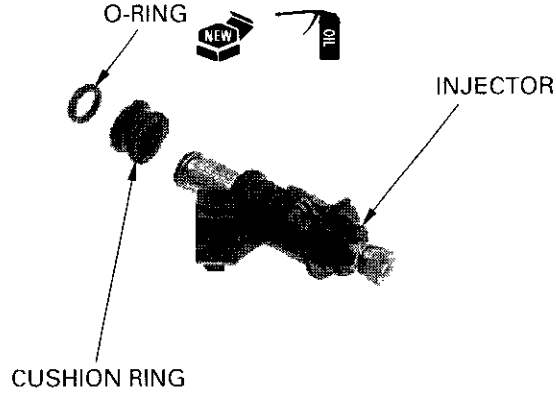


Install the starter rod onto the starter levers and secure it with the washers and new cotter pins.

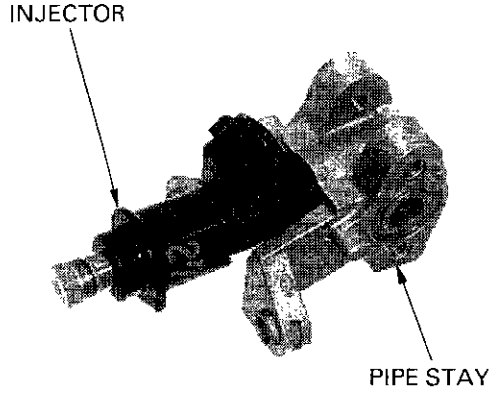


INJECTOR

Install the cushion ring onto the injector.
Coat a new O-ring with oil and install it into the injector groove.

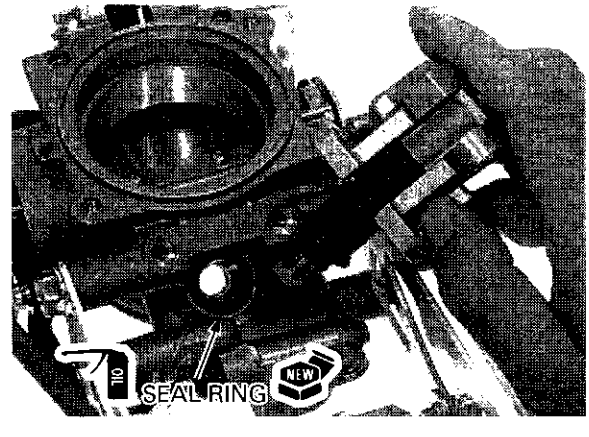


Install the injector into the pipe stay.



Coat a new seal ring with oil and install it into the throttle body.
Install the injector/pipe stay onto the throttle body and tighten the two bolts.

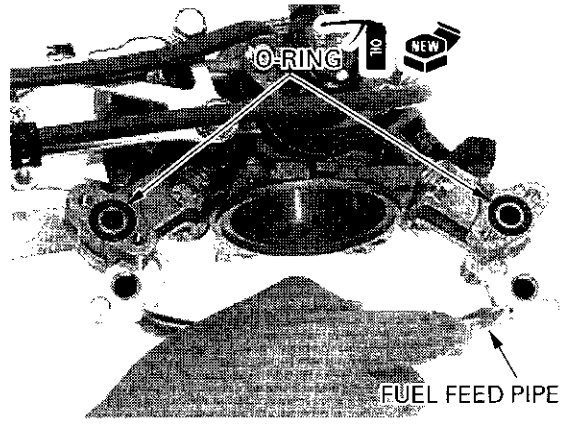
TORQUE: 5 N·m (0.5 kgf·m , 3.6 lbf·ft)



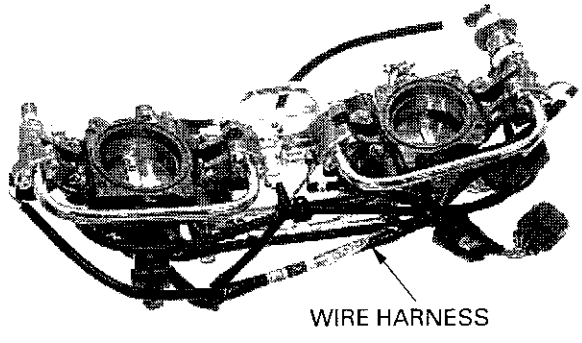
Coat new O-rings with oil and install them into the throttle body.
Install the fuel feed pipe and tighten the four bolts.

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

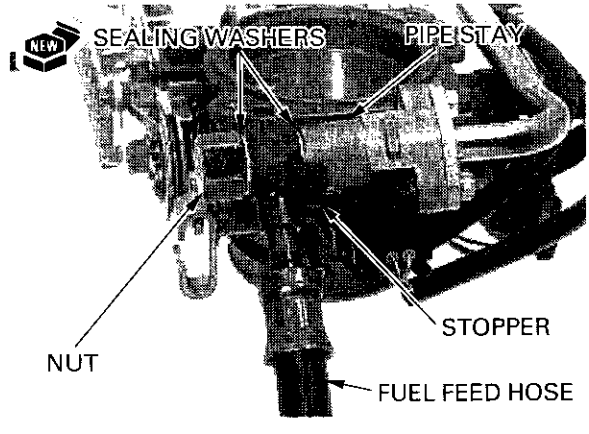
Install the other fuel feed pipes.



Install the throttle body wire harness, and connect the injector, MAP sensor and TP sensor connectors.

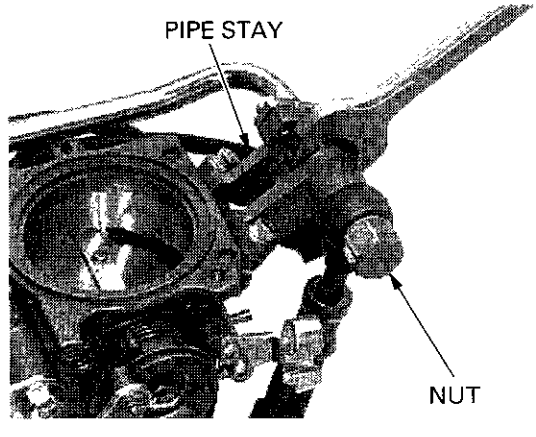


Install the fuel feed hose with new sealing washers and nut.
Rest the hose joint stopper onto the pipe stay.



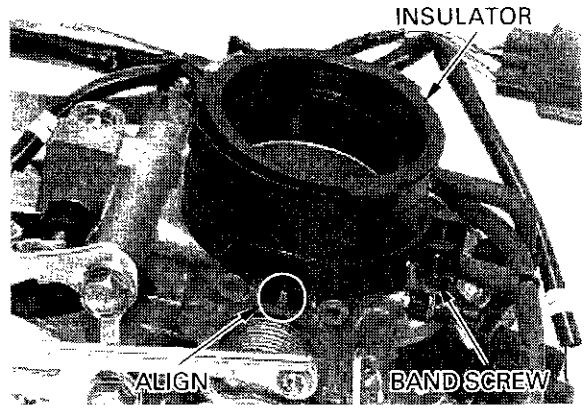
Hold the pipe stay with a 17 mm open end wrench and tighten the fuel feed hose nut.

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



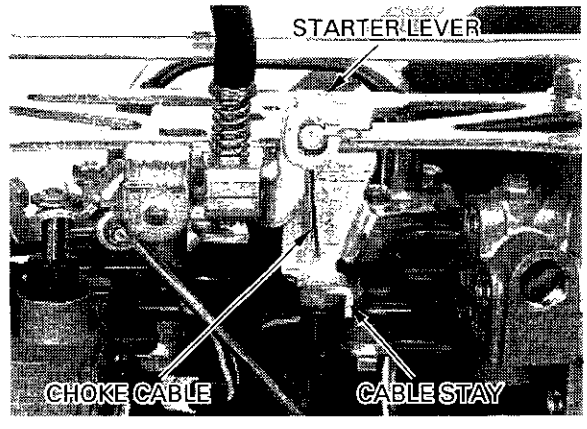
Install the insulators onto the throttle body, aligning the grooves with the tabs on the throttle body.
Tighten the throttle body insulator band screws.

TORQUE: 1 N·m (0.1 kgf·m , 0.7 lbf·ft)

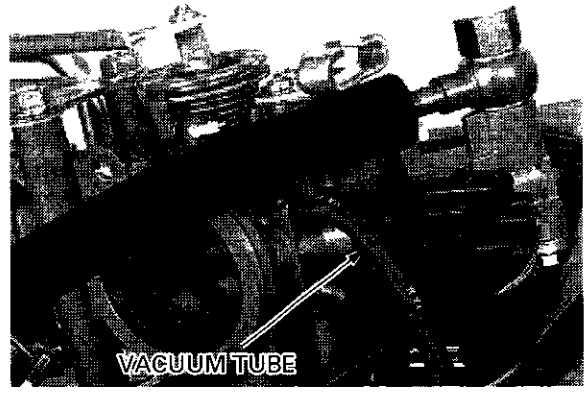


INSTALLATION

Install the throttle body over the cylinder heads.
Connect the choke cable to the choke link and install it onto the cable stay.



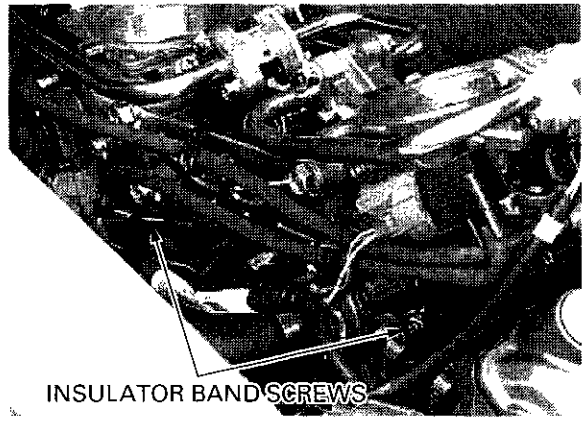
Connect the vacuum tube to the joint pipe of the throttle body.



Apply oil to the insulator inside surfaces for ease of installation.

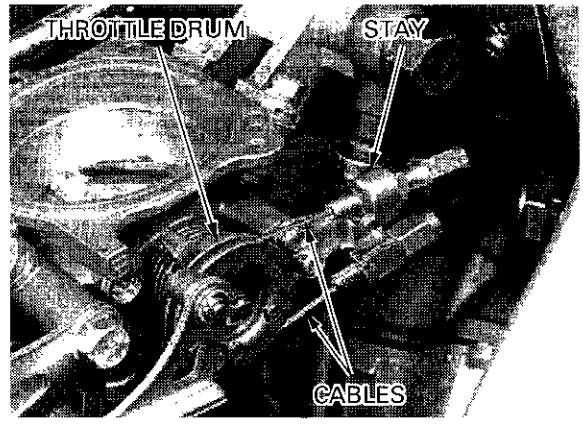
Install the throttle body/insulators onto the cylinder heads.
Tighten the throttle body insulator band screws.

TORQUE: 1 N·m (0.1 kgf·m , 0.7 lbf·ft)



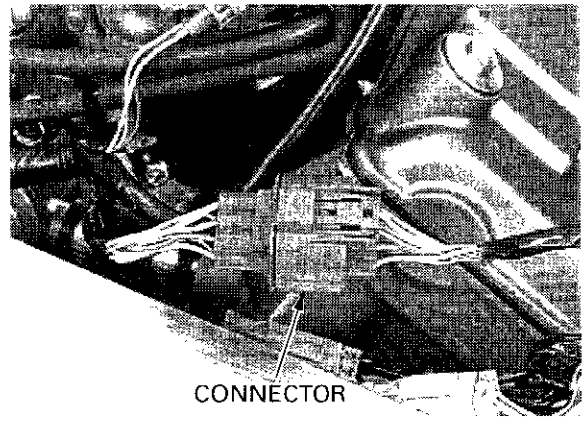
Connect the throttle cables to the throttle drum and install them onto the cable stay.

Adjust the throttle cable (page 3-5).



Connect the throttle body wire harness connector.

Install the air cleaner housing (page 5-57).



STARTER VALVE SYNCHRONIZATION

⚠WARNING

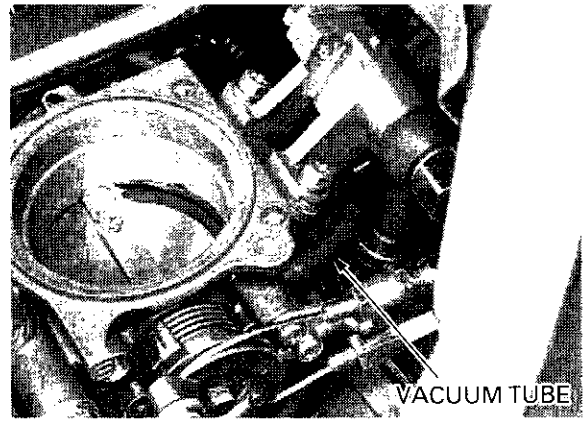
If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and lead to death.

NOTE:

- The starter valve screw is factory pre-set and no adjustment is necessary unless the starter valves are replaced.
- Synchronize the starter valves with the engine at normal operating temperature and with the transmission in neutral.

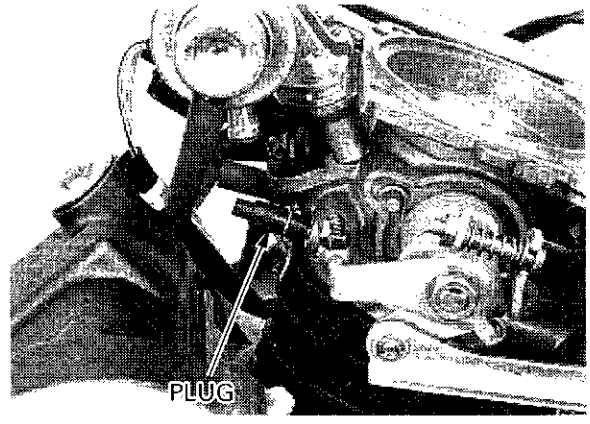
Remove the air cleaner housing (page 5-56).

Disconnect the vacuum tube from the front throttle body vacuum joint pipe.
Connect the vacuum gauge tube to the joint pipe.



Remove the plug from the rear throttle body vacuum joint pipe.
Connect the vacuum gauge tube to the joint pipe.

Temporarily install the fuel tank (page 5-47) and raise and support the front of the tank.

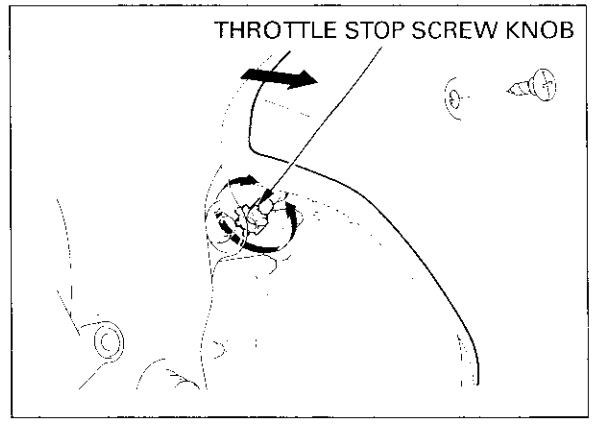


Start the engine and adjust the idle speed with the throttle stop screw.

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

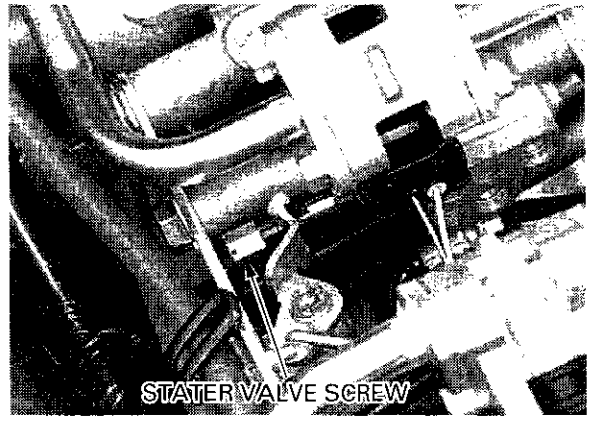
Check the vacuum difference between the front and rear cylinder intake ports.

The front cylinder intake port vacuum should be higher than the rear cylinder intake port vacuum by 20 ± 5 mm Hg (0.8 ± 0.2 in Hg).



The rear starter valve cannot be adjusted; it is the base starter valve.

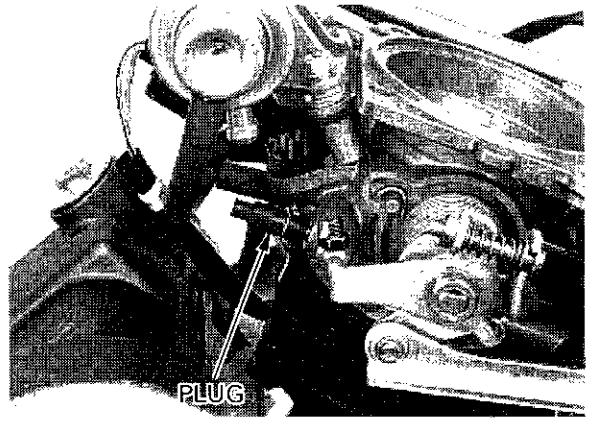
Adjust the vacuum pressure with the front starter valve screw so thet the front vacuum is higher than the rear vacuum by 20 ± 5 mm Hg (0.8 ± 0.2 in Hg).



Stop the engine.

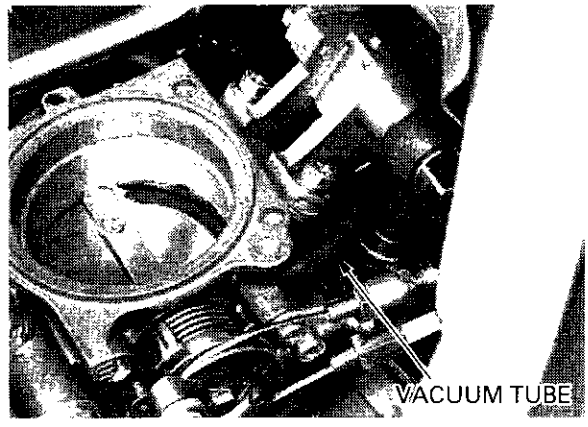
Disconnect the vacuum gauge tubes.

Install the plug onto the rear throttle body vacuum joint pipe.



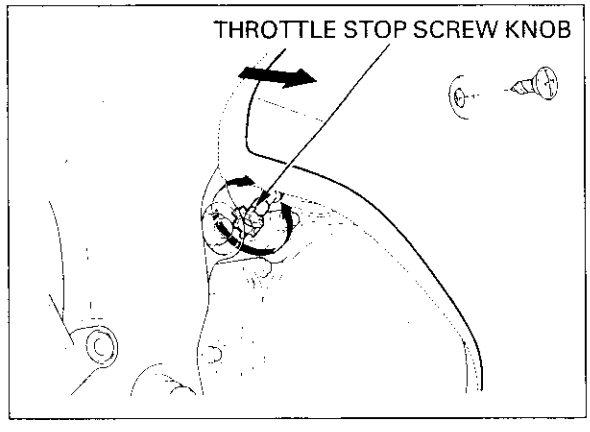
Connect the vacuum tube to the front throttle body vacuum joint pipe.

Install the air cleaner housing (page 5-57).
Install the fuel tank (page 5-47).



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

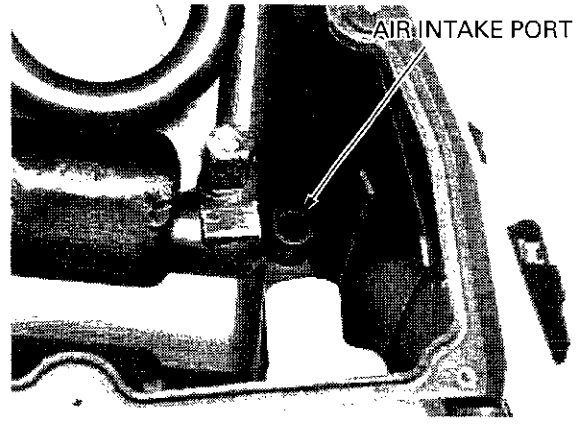
IDLE SPEED: 1,300 ± 100 min^{-1} (rpm)



SECONDARY AIR SUPPLY SYSTEM (Except U type)

SYSTEM INSPECTION

Start the engine and warm it up to normal operating temperature.
Remove the air cleaner cover (page 3-6).
Check that the secondary air intake port is clean and free of carbon deposits.
Check the pulse secondary air injection (PAIR) check valves if the port is carbon fouled.



Remove the lower inner fairing and both lower fairings (page 2-3).

Disconnect the air supply (air cleaner housing-to-PAIR control solenoid valve) hose from the air cleaner housing.



Disconnect the PAIR control solenoid valve connector.

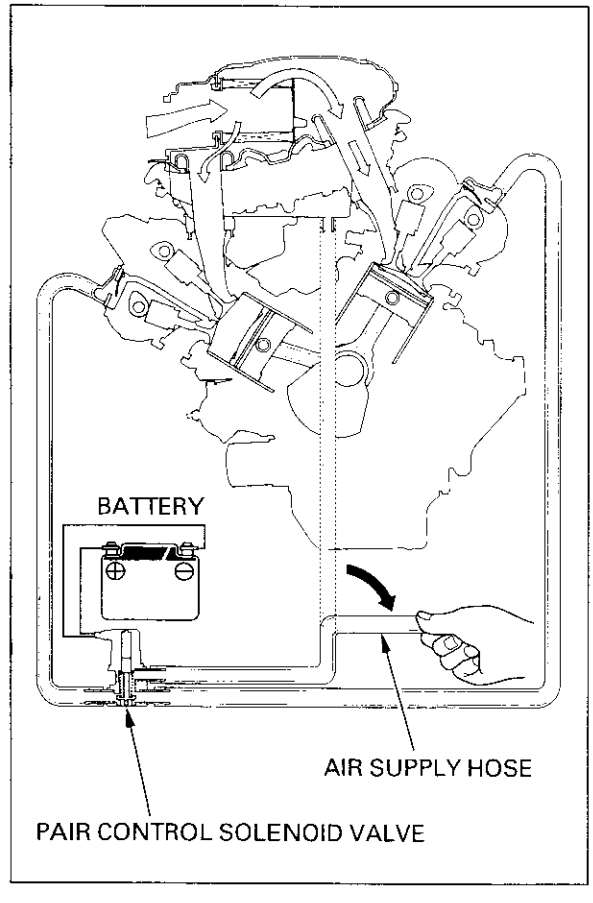
Start the engine and open the throttle slightly to be certain that air is sucked in through the air supply hose.
If the air is not drawn in, check the air supply hoses for clogging.

With the engine running, connect the 12 V battery to the PAIR control solenoid valve connector.

CONNECTION:
Battery (+) terminal—Black/White terminal
Battery (−) terminal—Orange/Black terminal

Check that the air supply hose stops drawing air when the battery is connected.

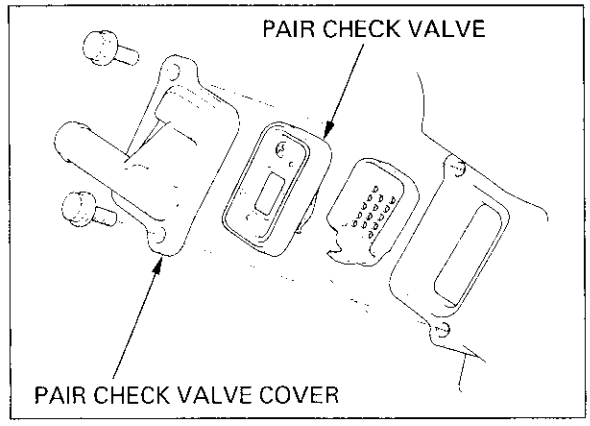
If the air is drawn in, install a new PAIR control solenoid valve.



PAIR CHECK VALVE INSPECTION

Front: Remove the lower inner fairing (page 2-3).
Rear: Remove the fuel tank (page 5-46).

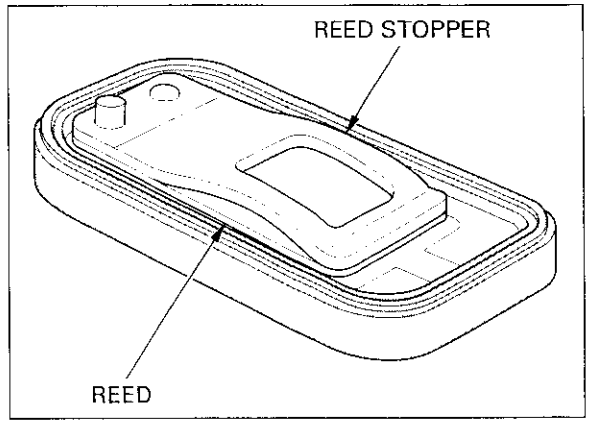
Remove the bolts, PAIR check valve cover and PAIR check valve from the cylinder head cover.



Check the reed for damage or fatigue. Replace if necessary.
Replace the PAIR check valve if the seat rubber is cracked, deteriorated or damaged or if there is clearance between the read and seat.

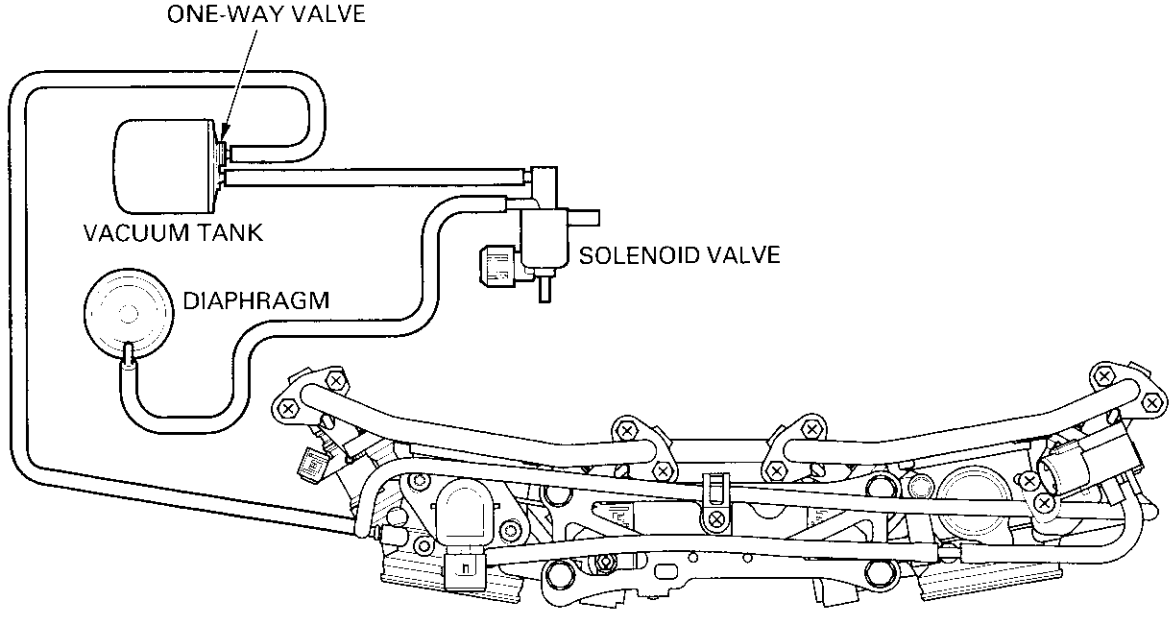
Install the PAIR check valve and cover onto the cylinder head cover.
Apply locking agent to the cover bolt threads.
Install and tighten the bolts.

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



INTAKE AIR CONTROL SYSTEM

VACUUM LINE DIAGRAM



HONDA

VTR1000SP-Y

Shop Manual News

Motorcycle

News Number	Issue Date
2001-2-002	NOV. 2001

Previous Information For VTR1000SP-Y

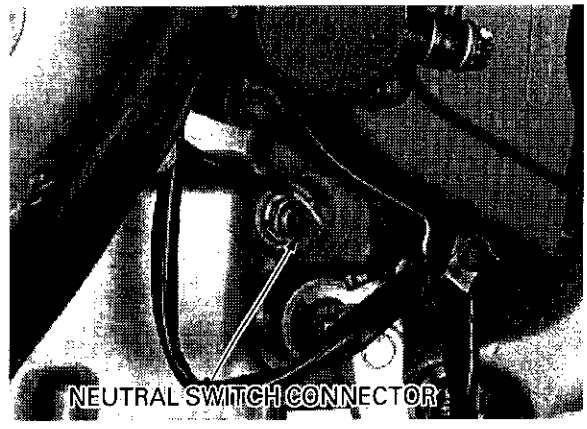
The some description in the VTR1000SP-Y Shop Manual (No. 62MCF00) are incorrect.
The text where corrected are offered in the square enclosure.
Please correct following page 5-73 as follow:

PAGE 5-73 FUEL SYSTEM INSPECTION

INSPECTION

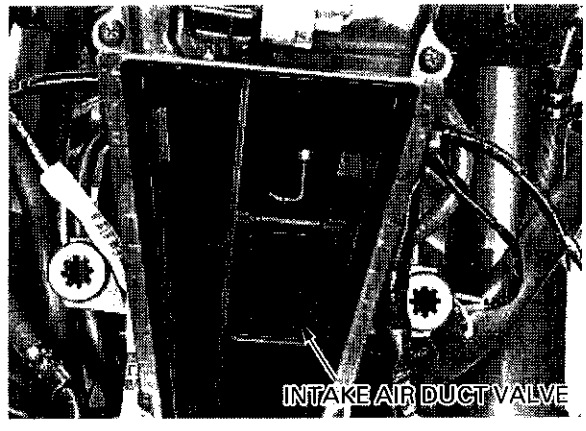
Remove the left lower fairing (page 2-3).

Disconnect the neutral switch connector to simulate that the transmission is in gear.



Shift the transmission in neutral and retract the side stand.
Squeeze the clutch lever and start the engine.
Check that the intake air duct valve is opened.

Check that the intake air duct valve is closed in the following conditions:
– engine speed: more than 4,900 min^{-1} (rpm)
– throttle opening: more than 40°



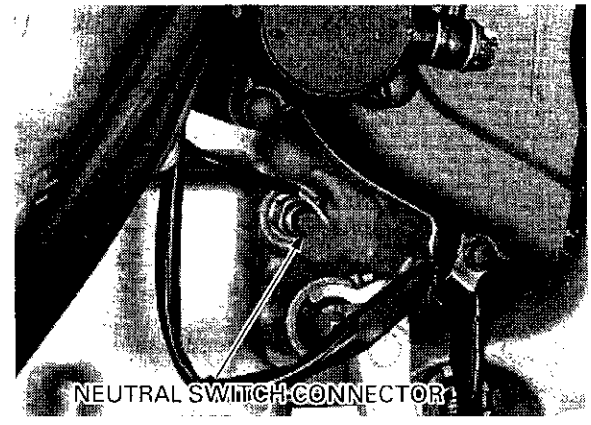
Honda Motor Co., Ltd.
SERVICE PUBLICATION OFFICE

㊥Ⓞ700.2001.11.Y
Printed in japan

INSPECTION

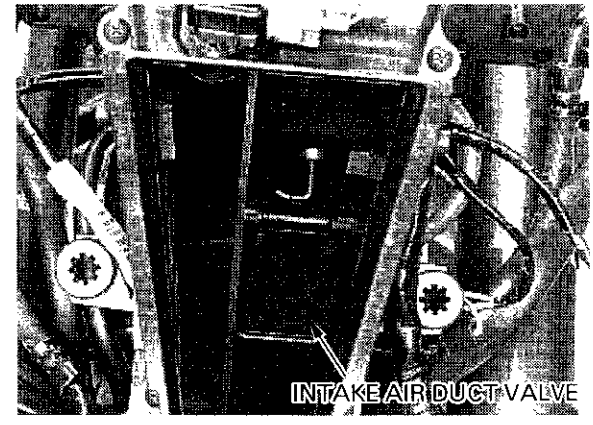
Remove the left lower fairing (page 2-3).

Disconnect the neutral switch connector to simulate that the transmission is in gear.



Shift the transmission in neutral and start the engine.
Check that the intake air duct valve is closed.

Check that the intake air duct valve is opened in the following conditions:
— engine speed: more than 4,900 min^{-1} (rpm)
— throttle opening: more than 40°



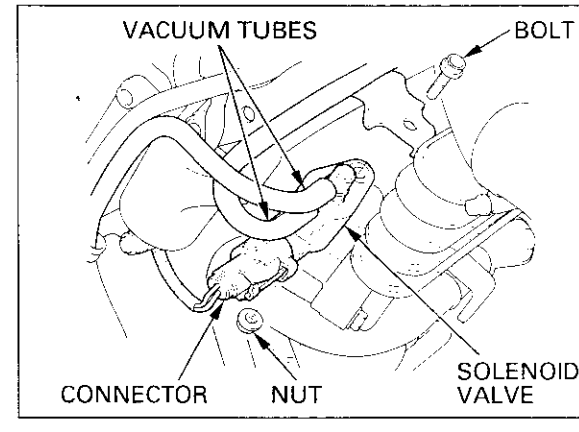
SOLENOID VALVE

REMOVAL/INSTALLATION

Remove the right radiator (page 6-6).

Disconnect the connector and vacuum tubes from the solenoid valve.
Remove the mounting bolt, nut and the solenoid valve from the stay.

Installation is in the reverse order of removal.



INSPECTION

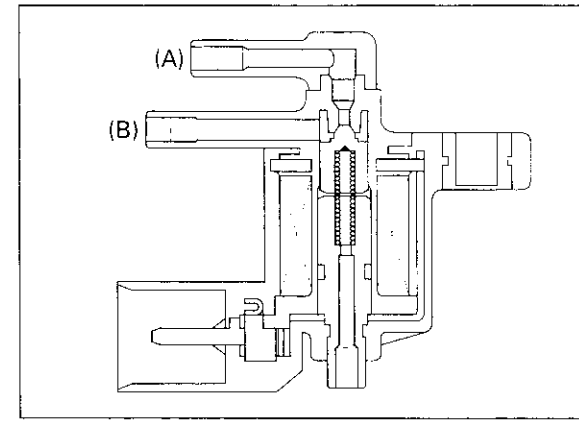
Remove the solenoid valve.

Check air flow from tube fitting (A) (input port) to tube fitting (B) (output port).
Air should not flow out.

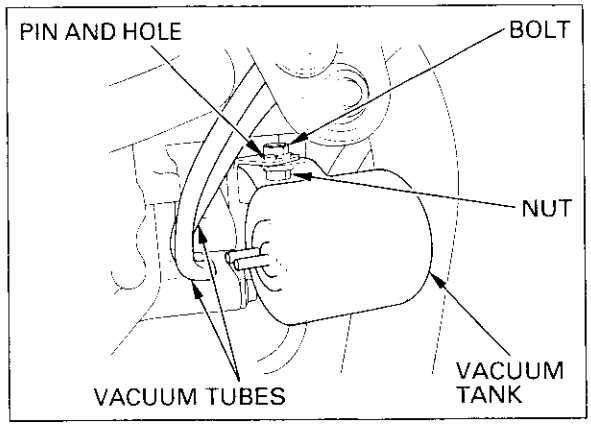
Connect the 12 V battery to the solenoid valve connector.

CONNECTION:
Battery (+) terminal — Black/White terminal
Battery (—) terminal — Yellow/Black terminal

Air should flow when the battery is connected.



VACUUM TANK/ONE-WAY VALVE



REMOVAL/INSTALLATION

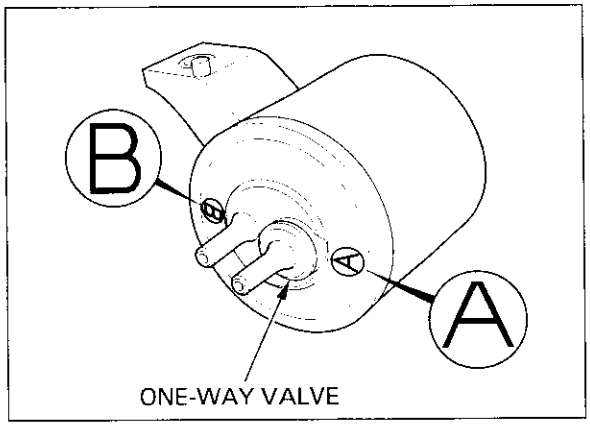
Remove the right lower fairing (page 2-3).

Disconnect the vacuum tubes from the vacuum tank.
Remove the mounting bolt, nut and the vacuum tank from the atay.

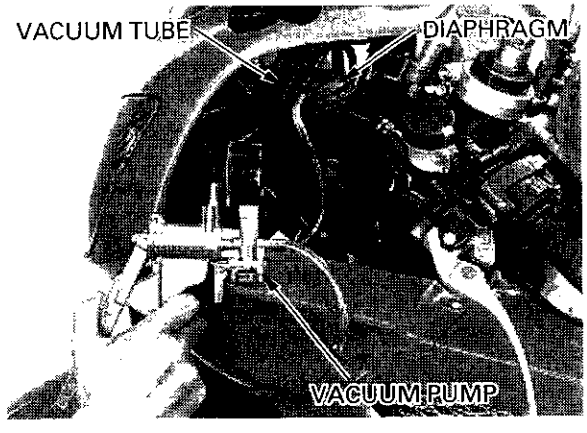
Install the vacuum tank , aligning the pin with the hole in the stay.
Install the removed parts in the reverse order of removal.

INSPECTION

Check air flow through the one-way valve in the vacuum tank as follows:
– air should flow from (B) to (A)
– air should not flow from (A) to (B)



AIR DUCT VALVE CONTROL DIAPHRAGM



INSPECTION

Remove the upper fairing (page 2-4).

Disconnect the vacuum tube from the diaphragm.
Connect a vacuum pump to the diaphragm and apply specified vacuum.

SPECIFIED VACUUM: 250 mm Hg (9.8 in Hg)

The vacuum should hold and the duct valve should remain open.

AIR INTAKE DUCT

REMOVAL

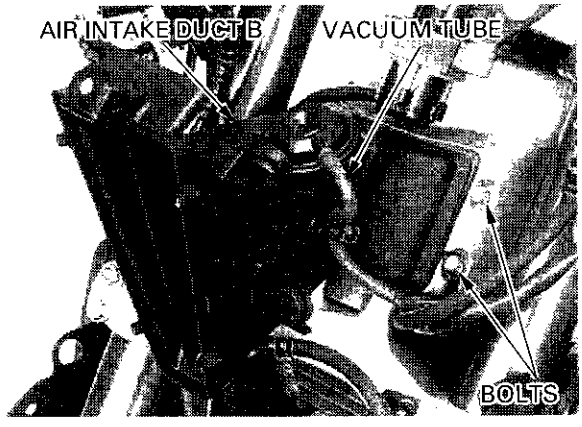
Remove the upper fairing (page 2-4).

Disconnect the BARO sensor connector.
Remove the four screws and air intake duct A.



Remove the combination meter (page 19-5).

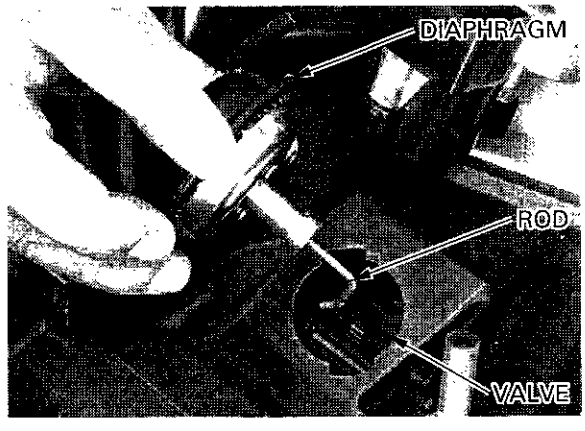
Disconnect the vacuum tube from the air duct valve control diaphragm.
Remove the four bolts and air intake duct B.



DIAPHRAGM REPLACEMENT

Turn the diaphragm counterclockwise and remove it from air intake duct B.
Unhook the diaphragm rod from the air duct valve and remove the diaphragm.

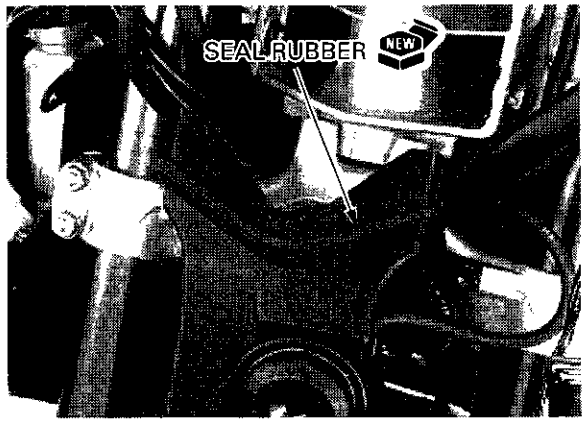
Install the diaphragm in the reverse order of removal.

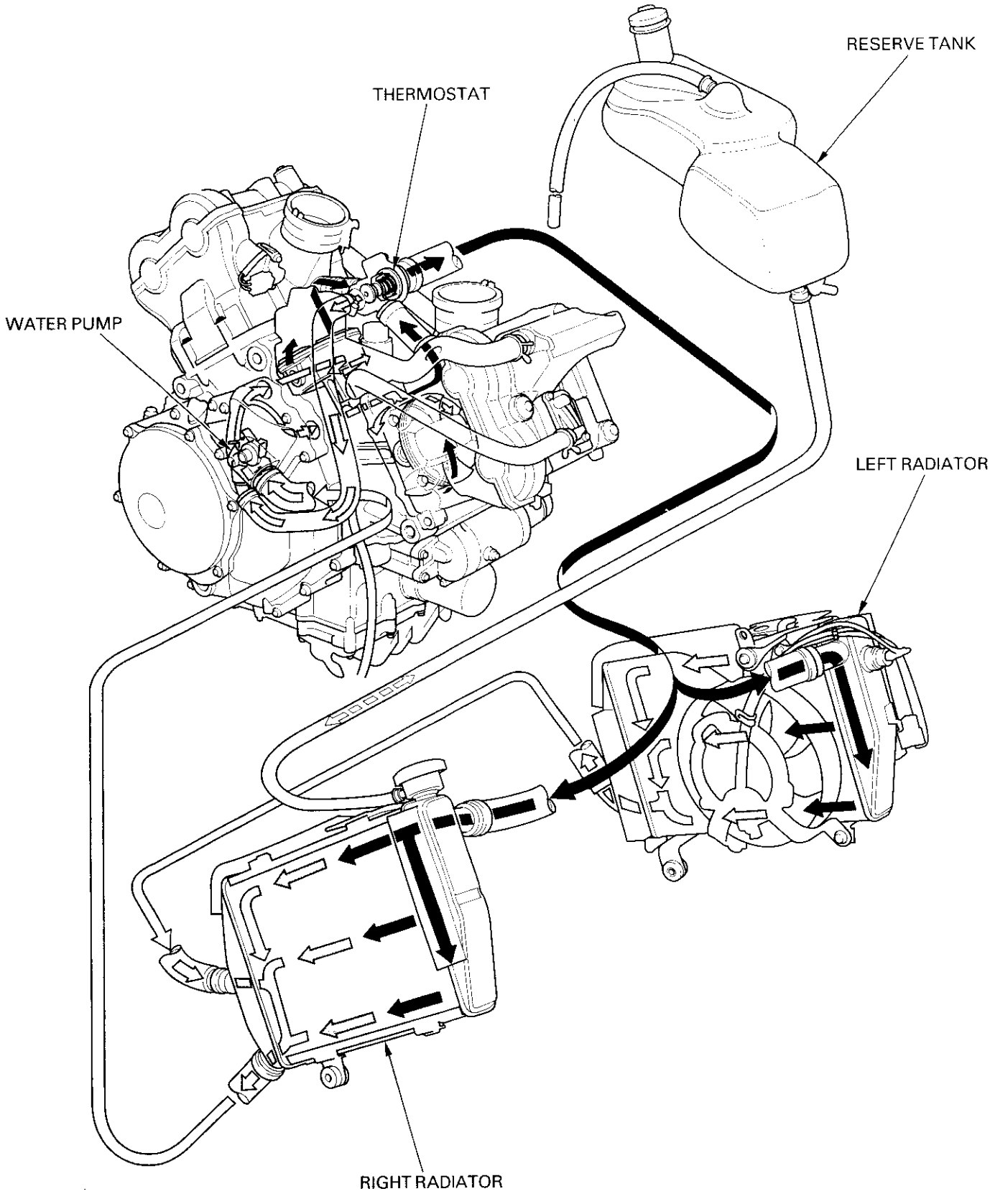


INSTALLATION

Install a new seal rubber onto air intake duct B.

Install air intake duct B, duct A and removed parts in the reverse order of removal.




RESERVE TANK
THERMOSTAT
WATER PUMP
LEFT RADIATOR
RIGHT RADIATOR

6. COOLING SYSTEM

SERVICE INFORMATION	6-1	RADIATOR/COOLING FAN	6-6
TROUBLESHOOTING	6-2	RADIATOR RESERVE TANK	6-9
SYSTEM TESTING	6-3	THERMOSTAT	6-10
COOLANT REPLACEMENT	6-4	WATER PUMP	6-11

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.*

CAUTION:

Using coolant with silicate corrosion inhibitors may cause premature wear of water pump seals or blockage of radiator passage. Using tap water may cause engine damage.

- Add coolant at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system service 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 thermosensor inspection.

SPECIFICATIONS

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	2.5 ℓ (2.6 US qt , 2.2 Imp qt)
	Reserve tank	0.43 ℓ (0.45 US qt , 0.38 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

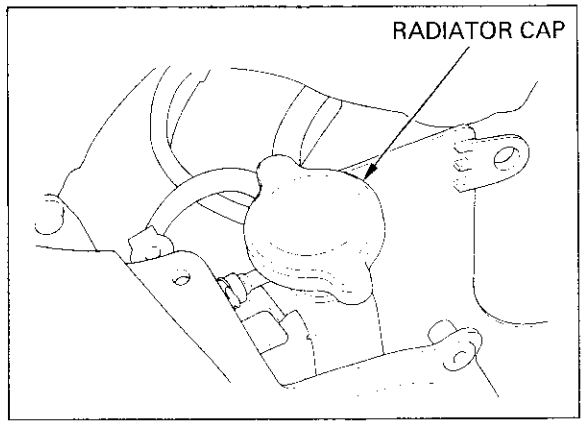
TROUBLESHOOTING

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

Engine temperature too low
- Faulty temperature gauge or thermosensor
- Thermostat stuck open
- Faulty fan motor switch

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

SYSTEM TESTING



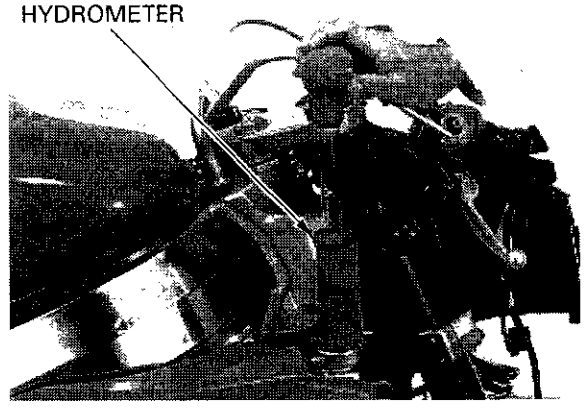
⚠WARNING

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

Remove the upper fairing (page 2-4).

Remove the radiator cap.

COOLANT (HYDROMETER TEST)



Test the coolant gravity using a hydrometer.

STANDARD COOLANT CONCENTRATION: 50%

Look for contamination and replace the coolant if necessary.

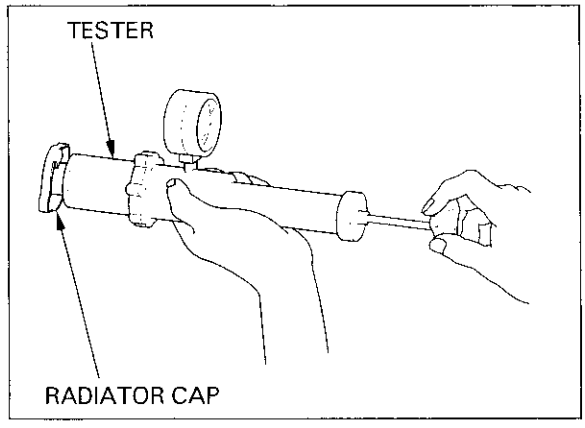
Coolant temperature °C (°F) / Coolant ratio %	0 (32)	5 (41)	10 (50)	15 (59)	20 (68)	25 (77)	30 (86)	35 (95)	40 (104)	45 (113)	50 (122)
5	1.009	1.009	1.008	1.008	1.007	1.006	1.005	1.003	1.001	0.999	0.997
10	1.018	1.017	1.017	1.016	1.015	1.014	1.013	1.011	1.009	1.007	1.005
15	1.028	1.027	1.026	1.025	1.024	1.022	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	1.049	1.047	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 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)

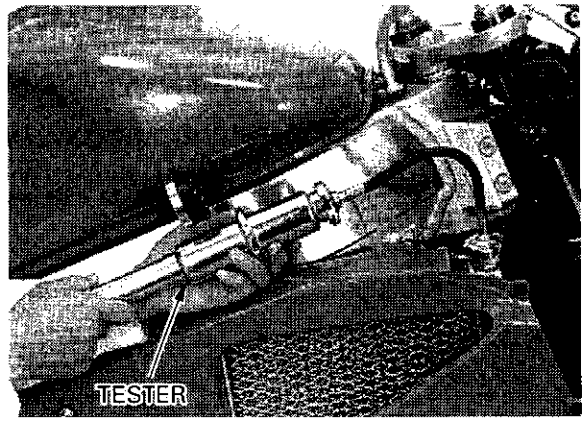


Pressure the radiator, engine and hoses using the tester, and check for leaks.

CAUTION:

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

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.***

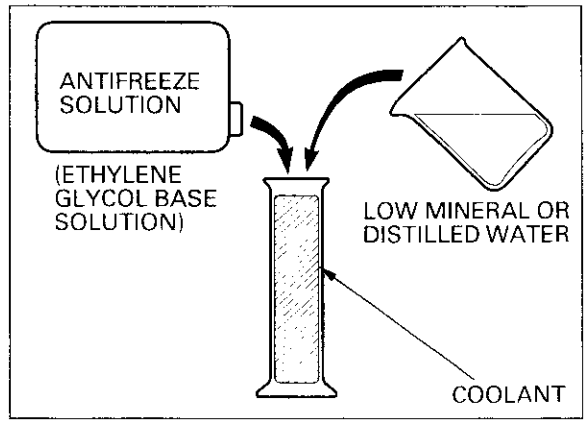
CAUTION:

Using coolant with silicate corrosion inhibitors may cause premature wear of water pump seals or blockage of radiator passage. Using tap water may cause engine damage.

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)



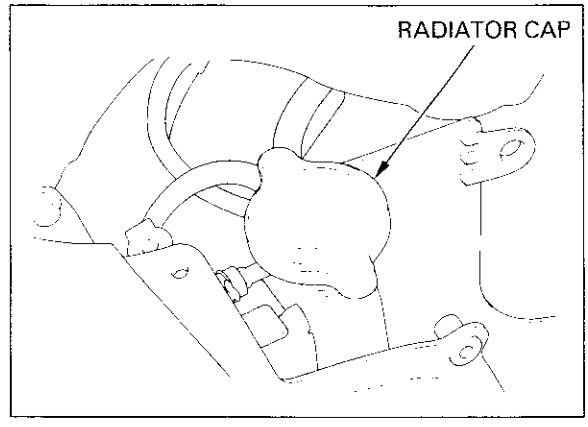
REPLACEMENT/AIR BLEEDING

⚠WARNING

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

NOTE:

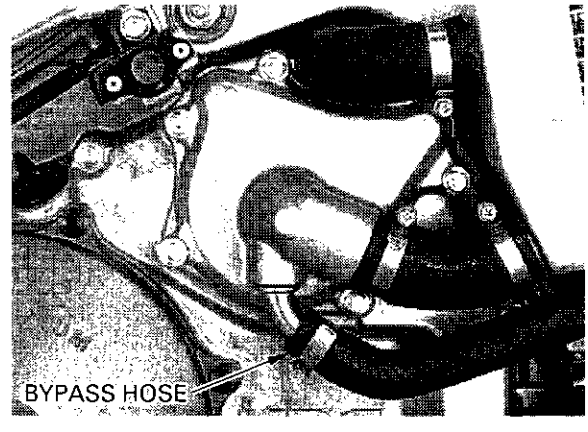
When filling the system with a coolant, place the motorcycle on its side stand on a flat, level surface.



Remove the following:
—lower inner fairing (page 2-3)
—lower fairings (page 2-3)
—Upper fairing (page 2-4)
—radiator cap

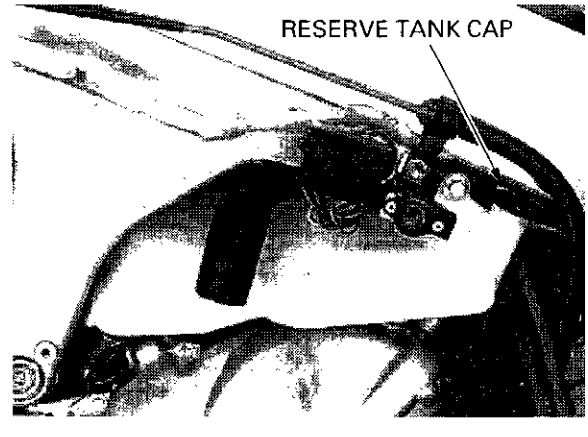
Disconnect the bypass hose from the water pump and drain the coolant from the system.

Connect the bypass hose and tighten the hose band screw.



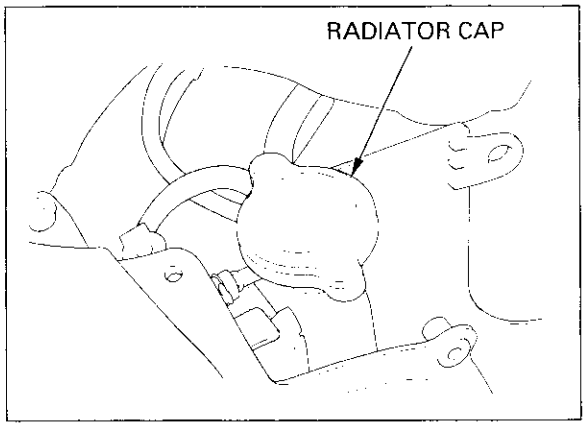
Remove the reserve tank (page 6-9).
Remove the reserve tank cap and drain the coolant from the reserve tank.

Install the reserve tank (page 6-9).



Fill the system with recommended coolant up to the filler neck with the motorcycle on its side stand.

Bleed air from the system as follows:
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 filler neck.
4. Install the radiator cap.



Fill the reserve tank on the upper level line with the motorcycle upright on a flat, level surface.

Install the following:
—upper fairing (page 2-4)
—lower fairings (page 2-3)
—lower inner fairing (page 2-3)

RADIATOR/COOLING FAN

CAUTION:

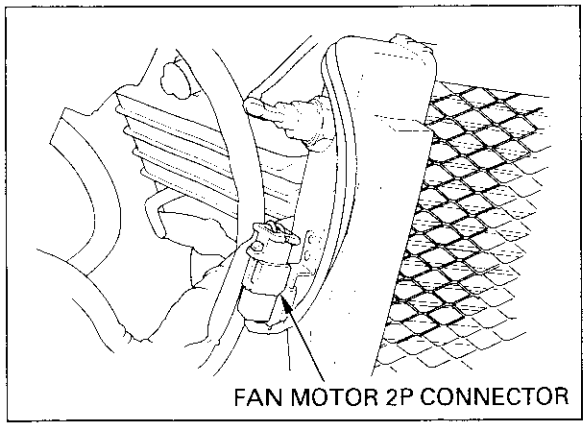
Be careful not to damage the radiator fins while servicing the radiator.

RADIATOR REMOVAL/ INSTALLATION

Drain the coolant front the system (page 6-5).

LEFT RADIATOR

Disconnect the fan motor 2P (black) connector.

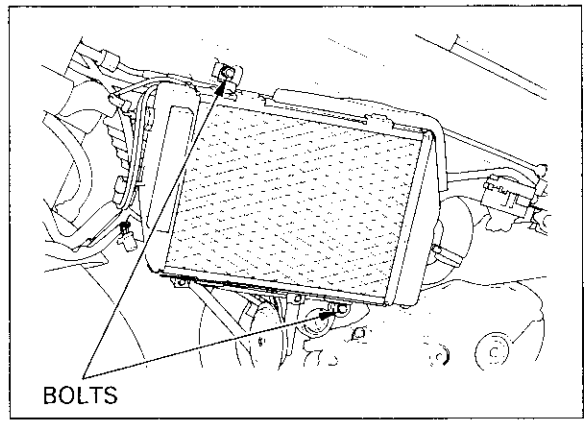


Remove the two mounting bolts and the radiator from the frame.
Disconnect the upper and lower radiator hoses from the radiator.

Remove the radiator inner guide and radiator grille if necessary.

Install the left radiator in the reverse order of removal.

Fill and bleed the cooling system (page 6-5).



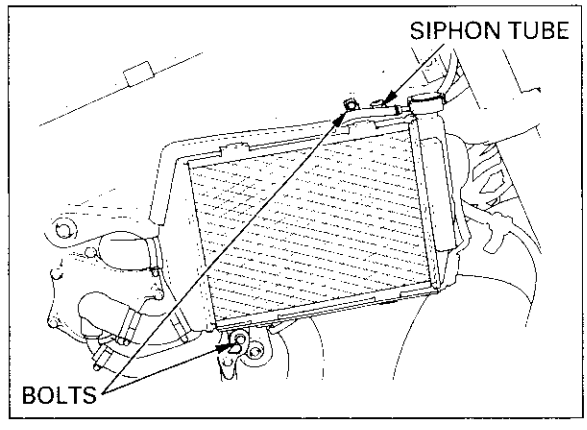
RIGHT RADIATOR

Disconnect the siphon tube from the filler neck.
Remove the two mounting bolts and the radiator from the frame.
Disconnect the upper and lower radiator hoses from the radiator.

Remove the radiator inner guide and radiator grille if necessary.

Install the right radiator in the reverse order of removal.

Fill and bleed the cooling system (page 6-5).

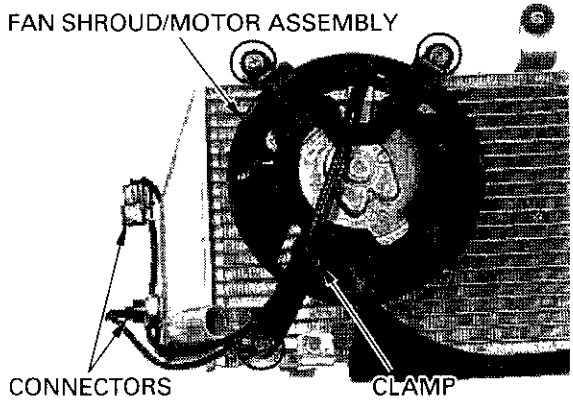


COOLING FAN DISASSEMBLY

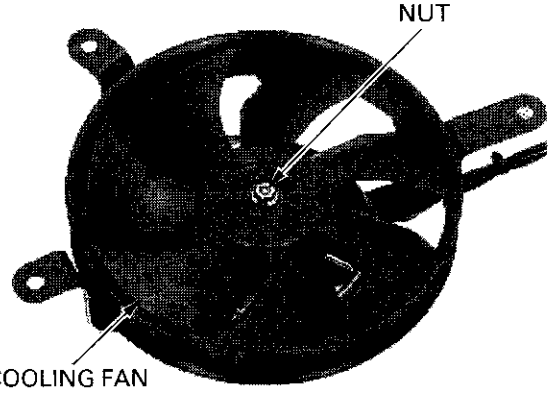
Remove the left radiator (page 6-6).

Disconnect the fan motor switch connector.
Remove the fan motor connector from the stay.
Free the fan motor wires from the clamp.

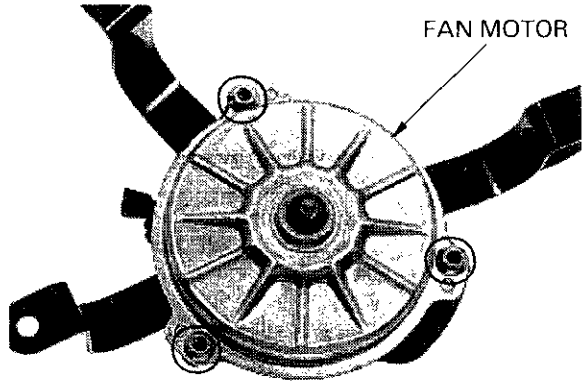
Remove the three bolts, ground wire terminal and fan shroud/motor assembly from the radiator.



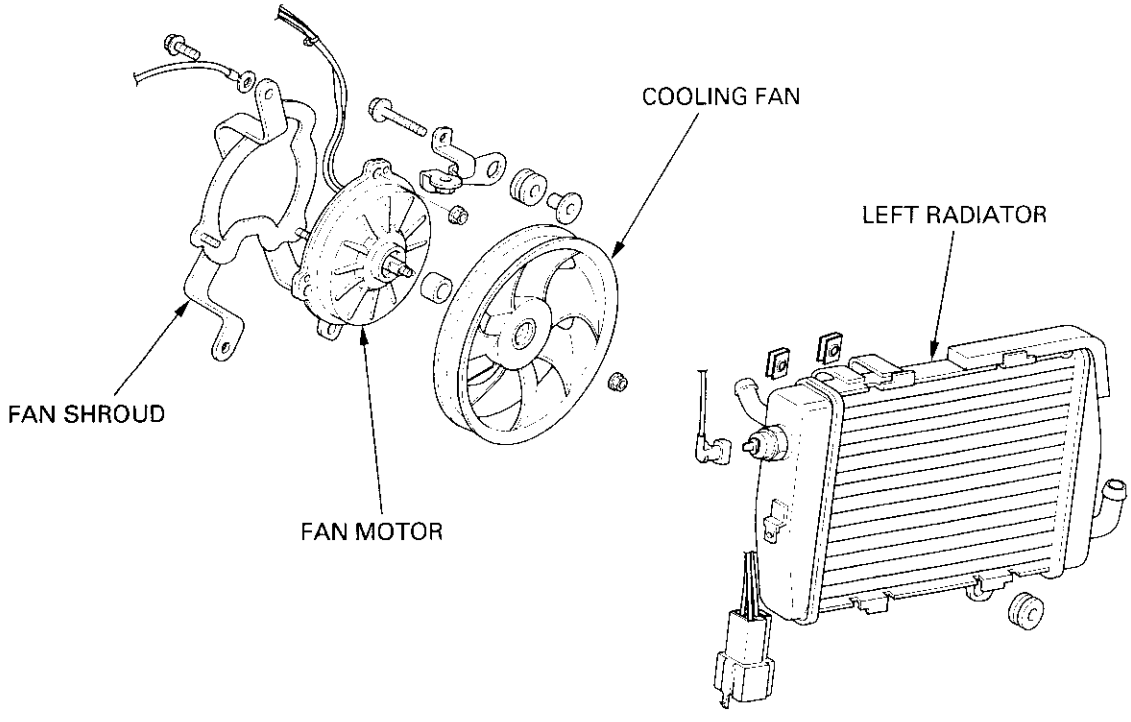
Remove the nut and cooling fan from the motor.



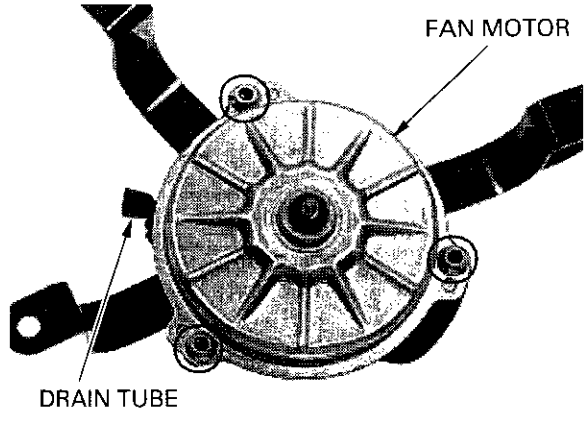
Remove the three nuts and the fan motor from the shroud.



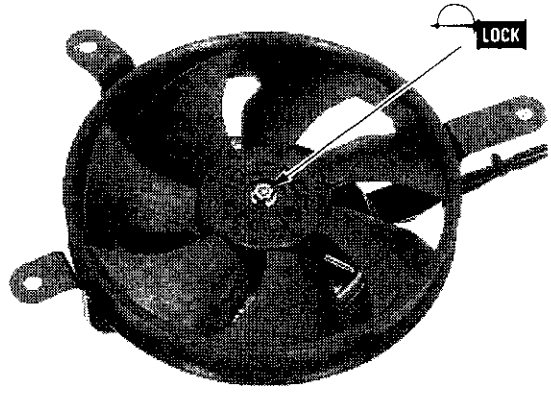
COOLING FAN ASSEMBLY



Install the fan motor onto the shroud with the drain tube facing down as shown, and tighten the three nuts securely.



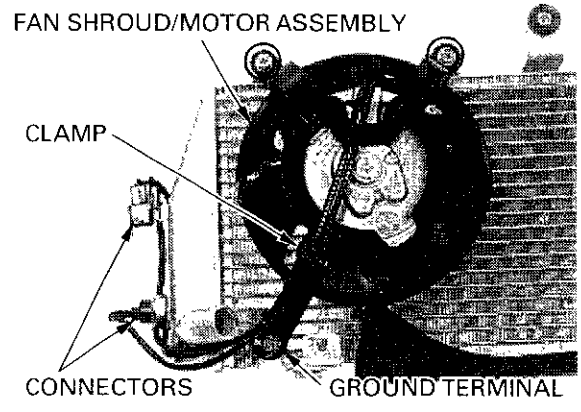
Install the cooling fan onto the motor shaft, aligning the flat surfaces.
Apply locking agent to the motor shaft threads.
Install and tighten the nut.



Install the fan shroud/motor assembly with the ground wire terminal onto the left radiator as shown and tighten the three bolts securely.

Clamp the fan motor wires.
Install the fan motor connector onto the stay.
Connect the fan motor switch connector.

Install the left radiator (page 6-6).

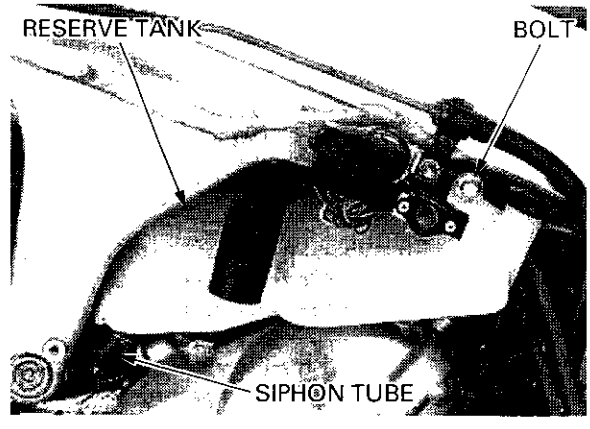


RADIATOR RESERVE TANK

REMOVAL/INSTALLATION

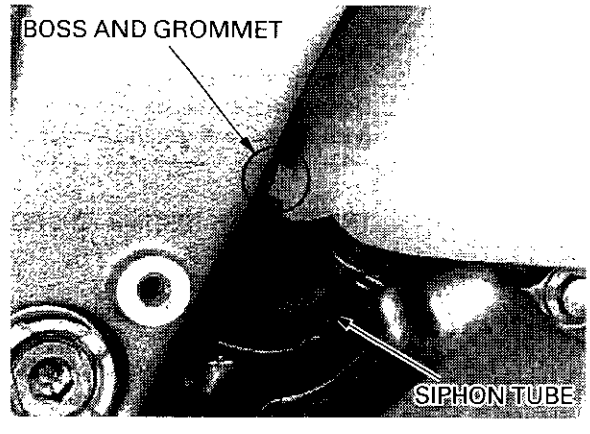
Remove the left radiator (page 6-6).

Remove the mounting bolt and reserve tank from the frame.
Remove the reserve tank cap and drain the coolant from the reserve tank.
Disconnect the siphon tube from the reserve tank.



Connect the siphon tube to the reserve tank.
Insert the reserve tank boss into the grommet in the frame properly.
Install and tighten the mounting bolt.

Install the left radiator (page 6-6).

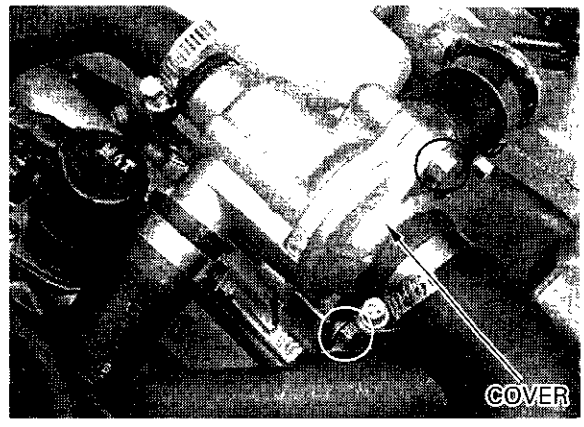


THERMOSTAT

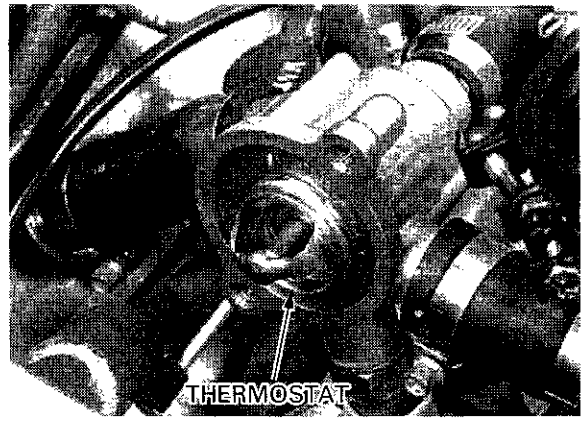
REMOVAL

Drain the coolant from the system (page 6-5).
Remove the throttle body (page 5-58).

Remove the two bolts, ground wire terminal, solenoid stay and 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.
Replace the thermostat if the valve stays open at room temperature.

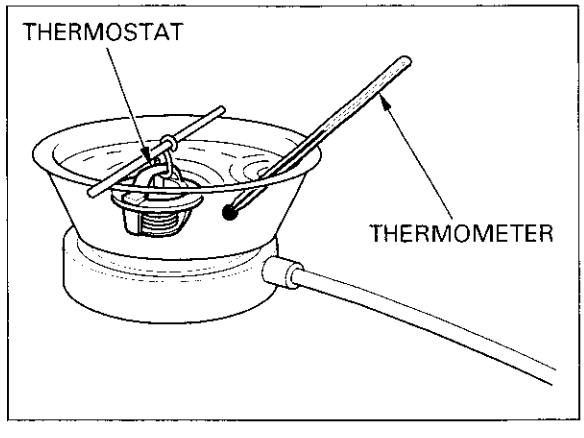
Heat the water with an electric heating element to operating temperature for 5 minutes.
Suspend the thermostat in heated water to check its operation.

NOTE:

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

THERMOSTAT BEGINS TO OPEN:
80–84 °C (176–183 °F)
VALVE LIFT:
8 mm (0.3 in) minimum at 95°C (203°F)

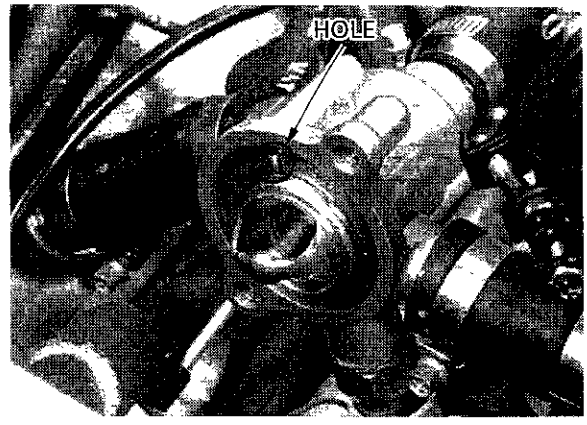
Replace the thermostat if the valve responds at temperature other than those specified.



INSTALLATION

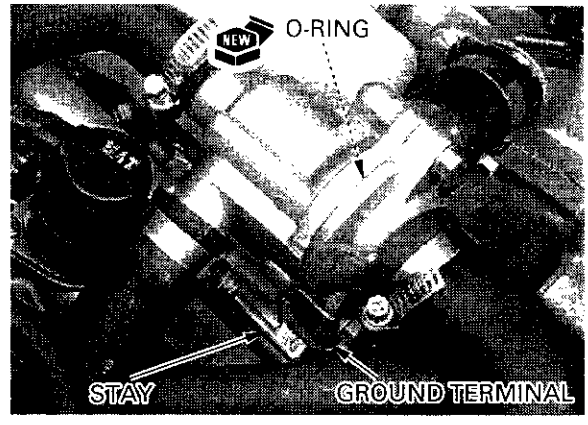
Install the thermostat into the housing with its hole facing up.

Install a new O-ring into the groove in the thermostat housing cover.



Install the thermostat housing cover, solenoid stay, ground wire terminal and two bolts.
Tighten the bolts securely.

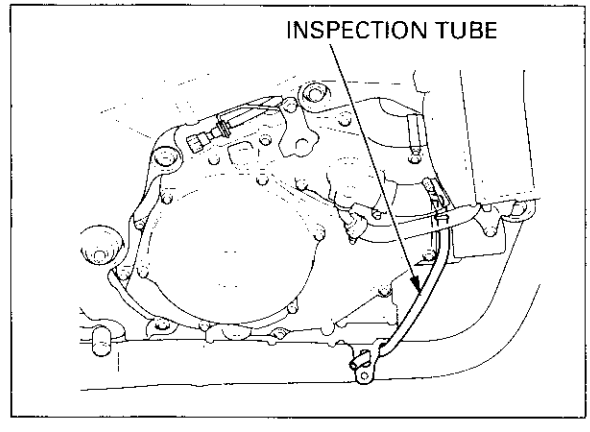
Install the throttle body (page 5-67).
Fill and bleed the cooling system (page 6-5).



WATER PUMP

MECHANICAL SEAL INSPECTION

Check the inspection tube for signs of coolant leakage.
If there is leakage, the water pump mechanical seal is defective, and the right crankcase cover assembly should be replaced.

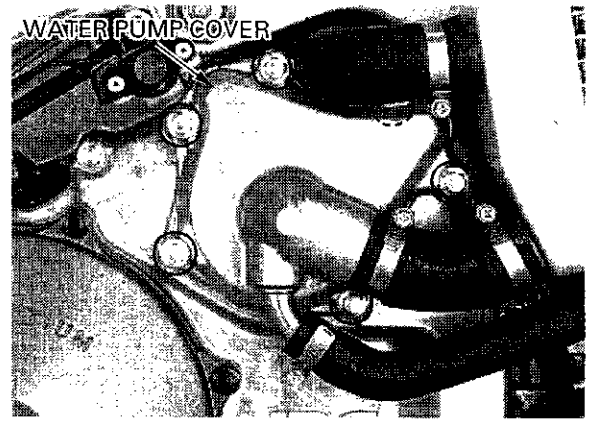


RIGHT CRANKCASE COVER REMOVAL/INSTALLATION

Drain the engine oil (page 3-14).
Drain the coolant from the system (page 6-5).

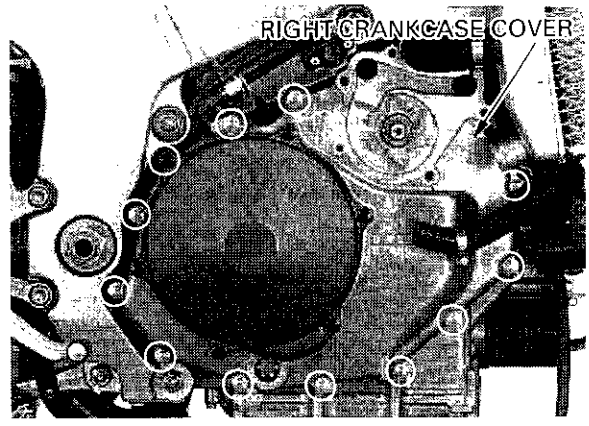
Loosen the lower radiator hose band screw.
Remove the six bolts and water pump cover, and disconnect the lower radiator hose from the radiator.

Remove the dowel pins and O-ring.

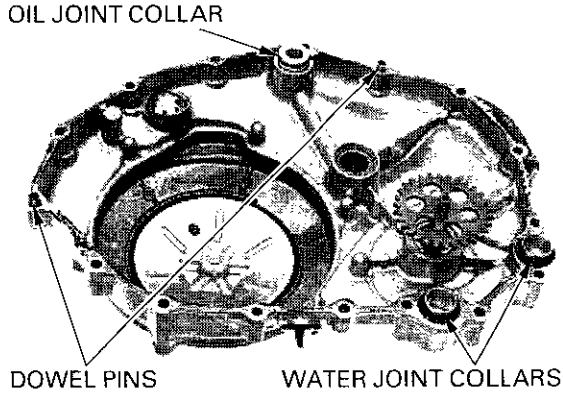


Remove the oil filler cap and clutch cover if the right crankcase cover is replaced.

Remove the twelve bolts and the right crankcase cover.



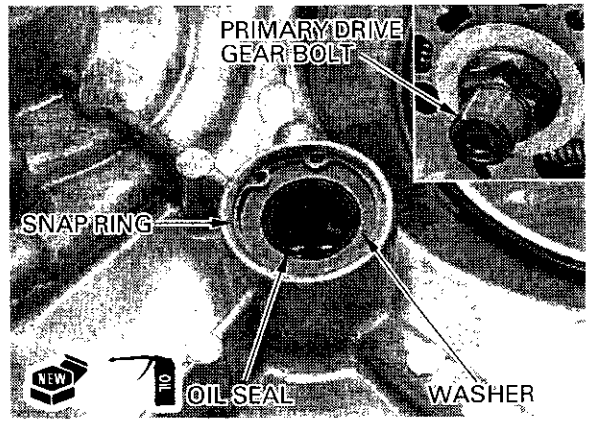
Remove the water joint collars and O-rings.
Remove the dowel pins.
Remove the oil joint collar and O-rings.



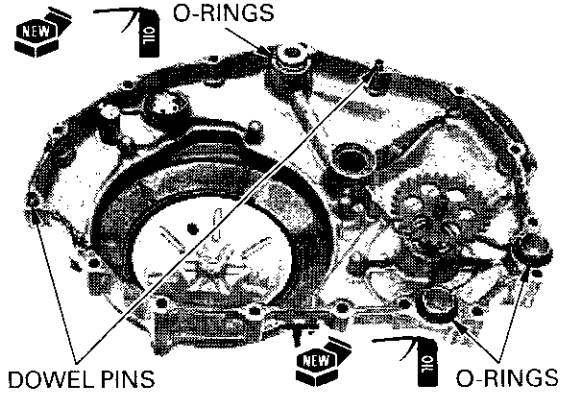
Remove the snap ring, washer and oil seal.

Apply oil to a new oil seal lip.
Install the oil seal into the right crankcase cover and secure it with the washer and snap ring.

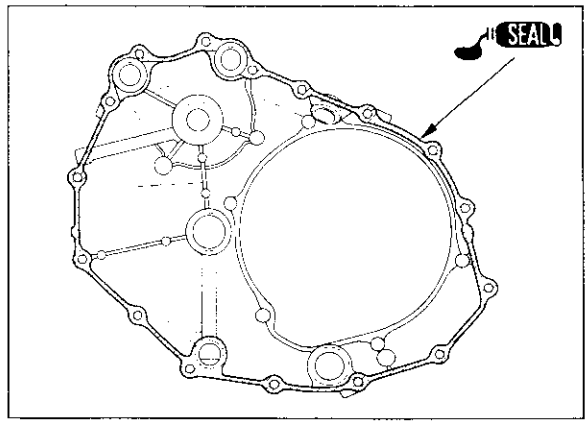
Check that the sealing surface of the primary drive gear bolt is not scratched or scored.



Apply oil to new O-rings and install them into the oil joint collar grooves.
Install the oil joint collar.
Install the water joint collars.
Apply oil to new O-rings and install them onto the water joint collars.
Install the two dowel pins.

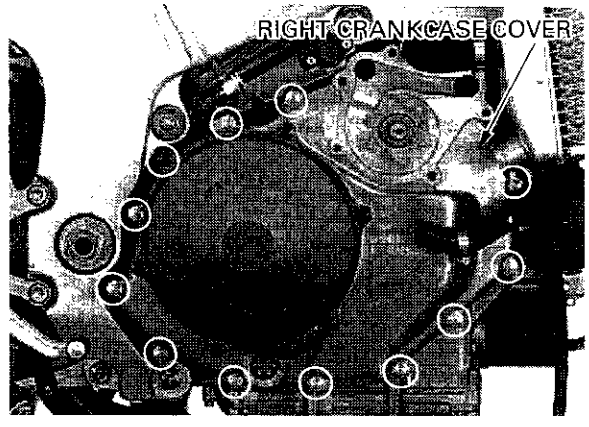


Apply sealant to the crankcase mating surfaces as shown.

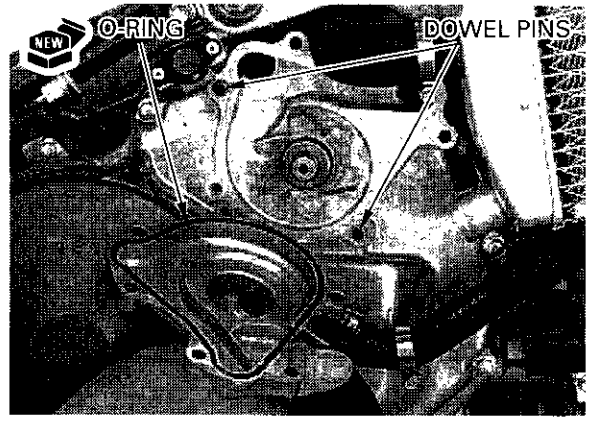


Install the right crankcase cover while turning the water pump impeller to engage the gears and tighten the bolts in a crisscross pattern in 2 or 3 steps.

Install the clutch cover if it was removed (page 9-20).

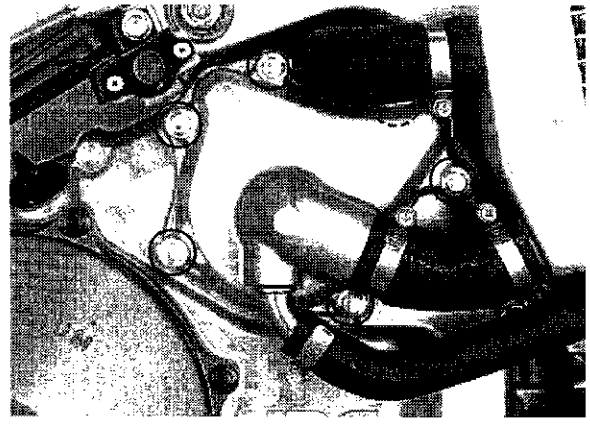


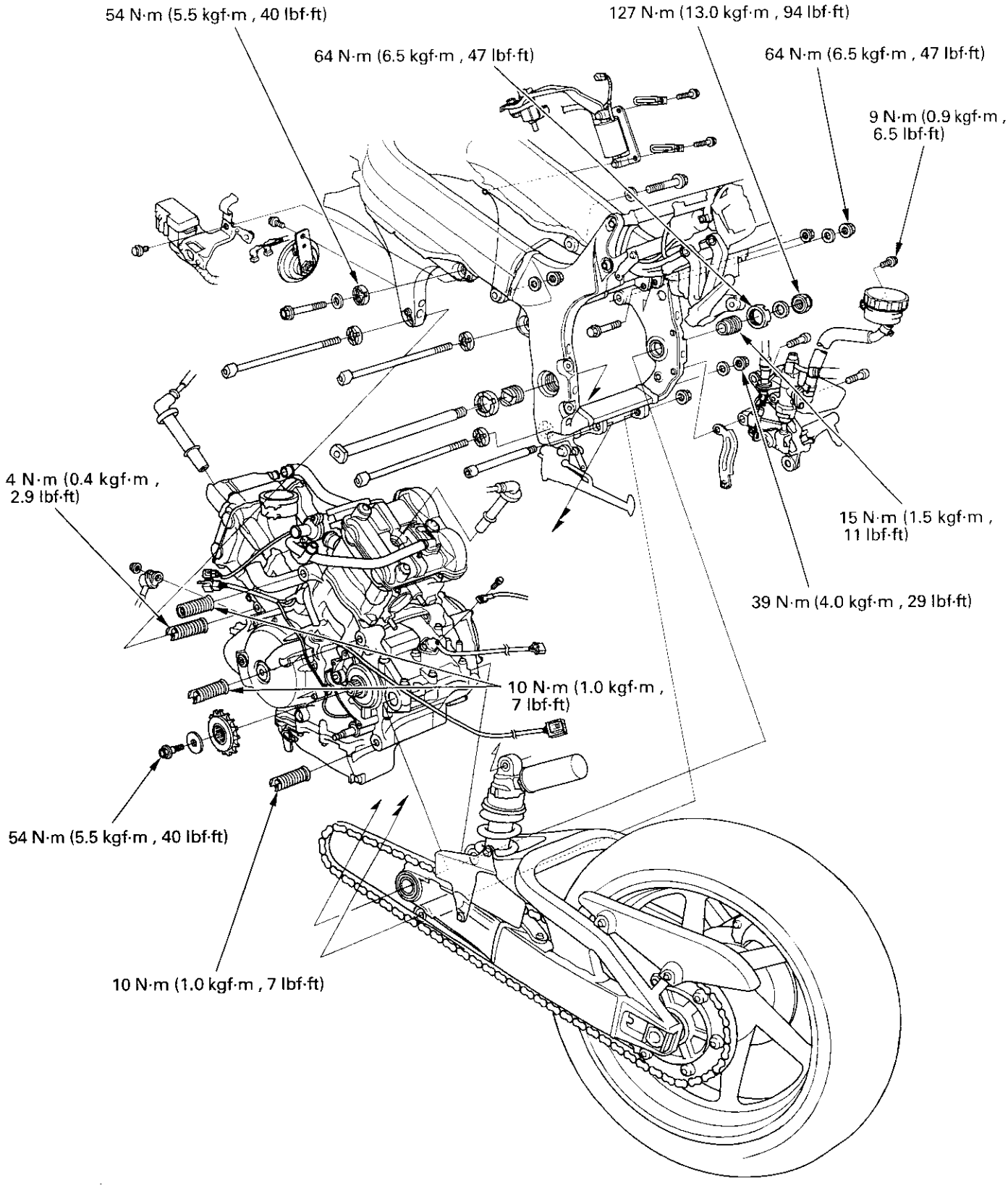
Install a new O-ring into the water pump cover groove.
Install the dowel pins.
Connect the lower radiator hose to the right radiator and install the water pump cover onto the right crankcase cover.



Install and tighten the six bolts.
Tighten the lower radiator hose band screw.

Fill the crankcase with the recommended oil (page 3-15).
Fill and bleed the cooling system (page 6-5).




54 N·m (5.5 kgf·m , 40 lbf·ft)
64 N·m (6.5 kgf·m , 47 lbf·ft)
127 N·m (13.0 kgf·m , 94 lbf·ft)
64 N·m (6.5 kgf·m , 47 lbf·ft)
9 N·m (0.9 kgf·m , 6.5 lbf·ft)
4 N·m (0.4 kgf·m , 2.9 lbf·ft)
15 N·m (1.5 kgf·m , 11 lbf·ft)
39 N·m (4.0 kgf·m , 29 lbf·ft)
10 N·m (1.0 kgf·m , 7 lbf·ft)
54 N·m (5.5 kgf·m , 40 lbf·ft)
10 N·m (1.0 kgf·m , 7 lbf·ft)

7. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION	7-1	ENGINE INSTALLATION	7-7
ENGINE REMOVAL	7-3		

SERVICE INFORMATION

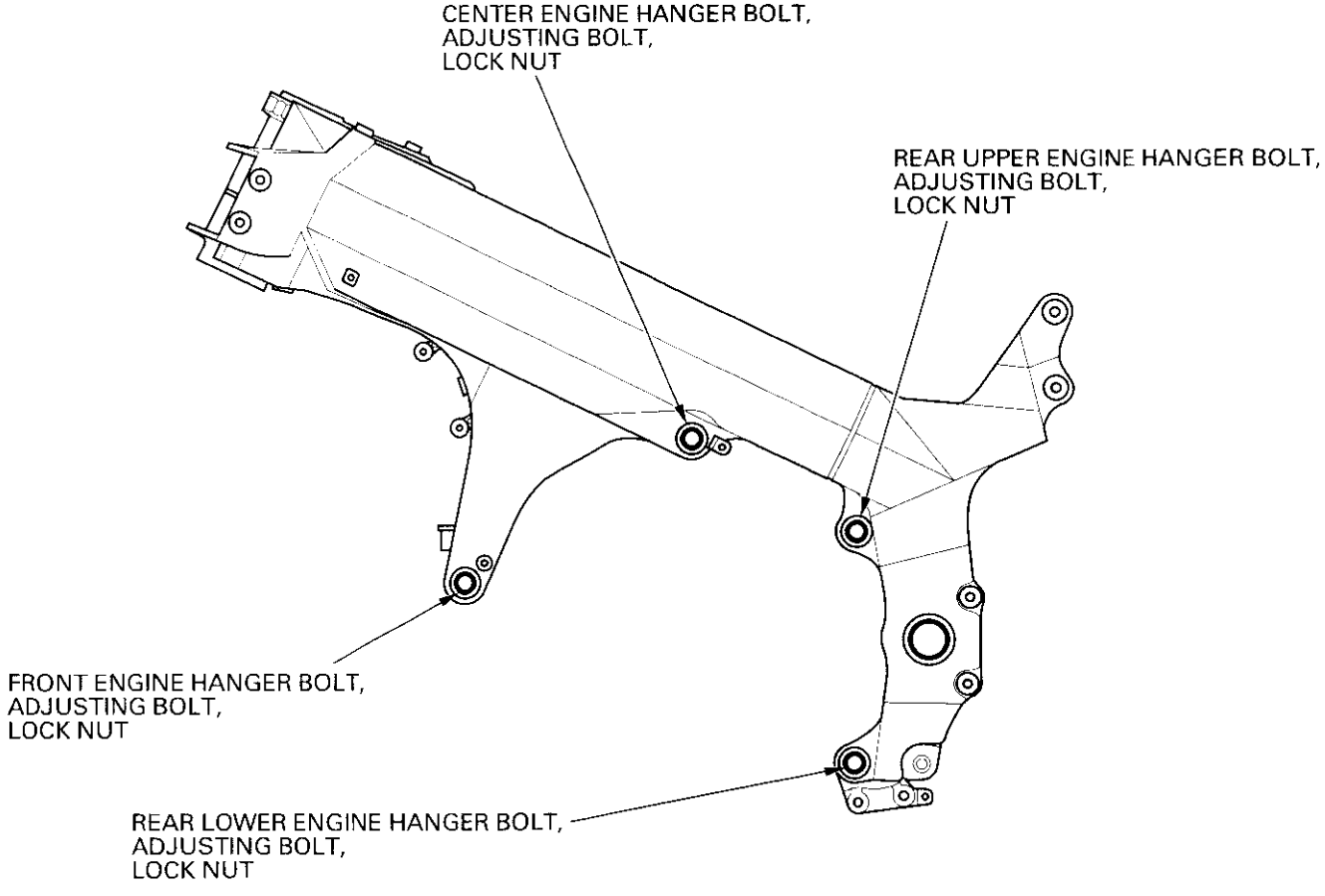
GENERAL

- A hoist or equivalent is required to support the motorcycle when removing and installing the engine.
- A floor jack or other adjustable support is required to support and maneuver the engine.

CAUTION:

Do not use the oil filter as a jacking point.

- When using the lock nut wrench for the adjusting bolt lock nut, use a deflecting beam type torque wrench 20 inches long. The lock nut wrench increases the torque wrench's leverage, so the torque wrench reading will be less than the torque actually applied to the lock nut. The specification given is the actual torque applied to the lock nut, not the reading on the torque wrench. Do not overtighten the lock nut. The specification later in the text gives both actual and indicated.
- The following components require engine removal for service:
  - transmission (section 11)
  - crankshaft/piston/cylinder (section 12)
- When installing the engine, be sure to tighten the engine mounting fasteners to the specified torque in the specified sequence. If you mistake the tightening torque or sequence, loosen all mounting fasteners, then tighten them again to the specified torque in the correct sequence.



SPECIFICATIONS

ITEM	SPECIFICATIONS
Engine dry weight	70.5 kg (155.4 lbs)
Engine oil capacity after disassembly	4.3 ℓ (4.5 US qt , 3.8 Imp qt)
Coolant capacity (radiator and engine)	2.5 ℓ (2.6 US qt , 2.2 Imp qt)

TORQUE VALUES

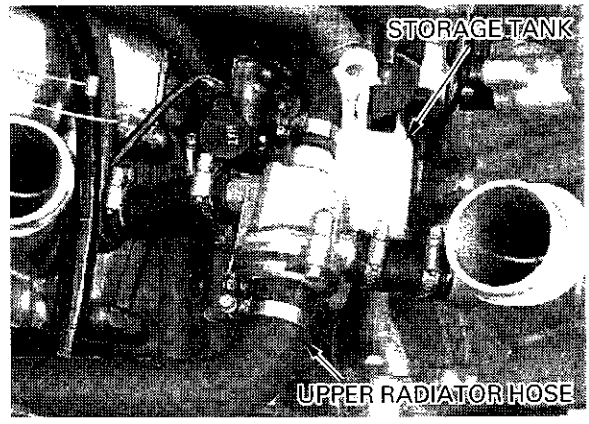
Front engine hanger adjusting bolt	4 N·m (0.4 kgf·m , 2.9 lbf·ft)
Center engine hanger adjusting bolt	10 N·m (1.0 kgf·m , 7 lbf·ft)
Rear engine hanger adjusting bolt	10 N·m (1.0 kgf·m , 7 lbf·ft)
Engine hanger adjusting bolt lock nut	54 N·m (5.5 kgf·m , 40 lbf·ft)
Center engine hanger bolt	64 N·m (6.5 kgf·m , 47 lbf·ft)
Front engine hanger nut	64 N·m (6.5 kgf·m , 47 lbf·ft)
Rear upper engine hanger nut	64 N·m (6.5 kgf·m , 47 lbf·ft)
Rear lower engine hanger nut	39 N·m (4.0 kgf·m , 29 lbf·ft)
Swingarm pivot adjusting bolt	15 N·m (1.5 kgf·m , 11 lbf·ft)
Swingarm pivot adjusting bolt lock nut	64 N·m (6.5 kgf·m , 47 lbf·ft)
Swingarm pivot nut	127 N·m (13.0 kgf·m , 94 lbf·ft)
Shock absorber upper mounting nut	44 N·m (4.5 kgf·m , 33 lbf·ft)
Shock link-to-frame nut	44 N·m (4.5 kgf·m , 33 lbf·ft)
Rear brake reservoir mounting bolt	9 N·m (0.9 kgf·m , 6.5 lbf·ft)
Drive sprocket bolt	54 N·m (5.5 kgf·m , 40 lbf·ft)
Starter motor cable terminal nut	10 N·m (1.0 kgf·m , 7 lbf·ft)

TOOLS

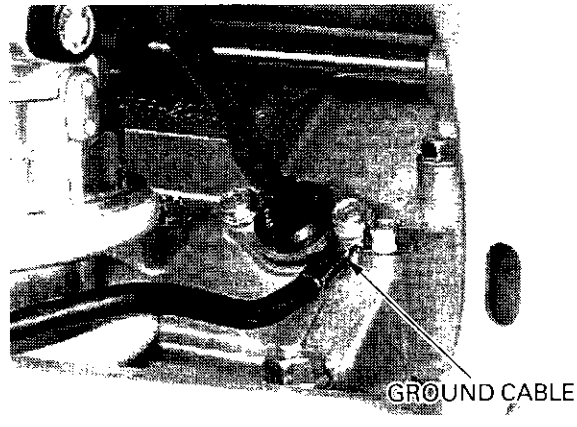
Lock nut wrench	07VMA-MBB0100
Lock nut wrench	07YMA-MCF0100

ENGINE REMOVAL

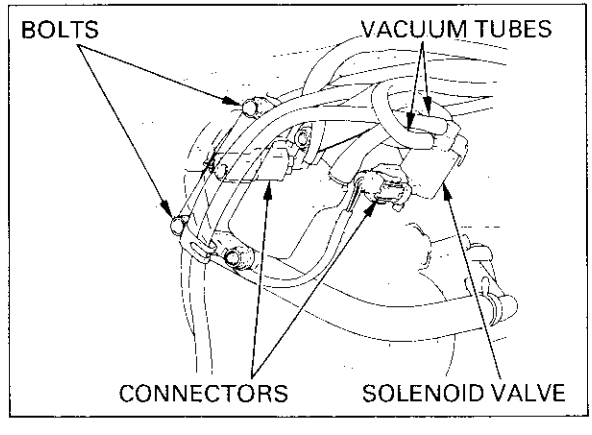
Remove the following:
- exhaust system (page 2-4)
- oil cooler (page 4-8)
- throttle body (page 5-58)
- left and right radiators (page 6-6)
- radiator reserve tank (page 6-9)
- right driver footpeg holder (page 15-12)
- crankcase breather storage tank and hose
- upper radiator hose from the thermostat housing



Remove the bolt and the battery ground cable from the engine.

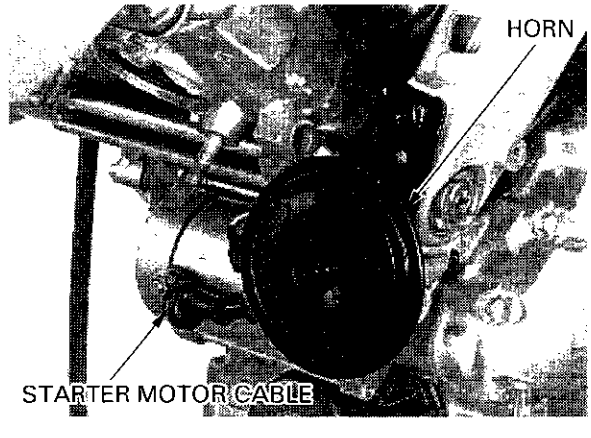


Disconnect the connector and vacuum tubes from the intake air control solenoid valve.
Remove the two ignition coil bracket bolts.
Remove the spark plug cap from the plug, disconnect the front ignition coil connector, and remove the ignition coil/solenoid valve with the brackets.

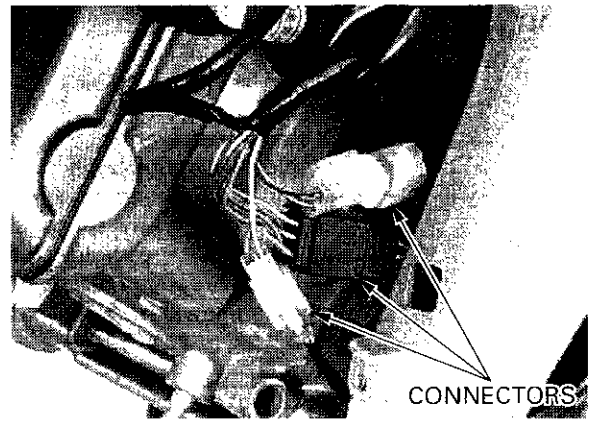


Disconnect the horn wire connectors, and remove the bolt and horn.

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



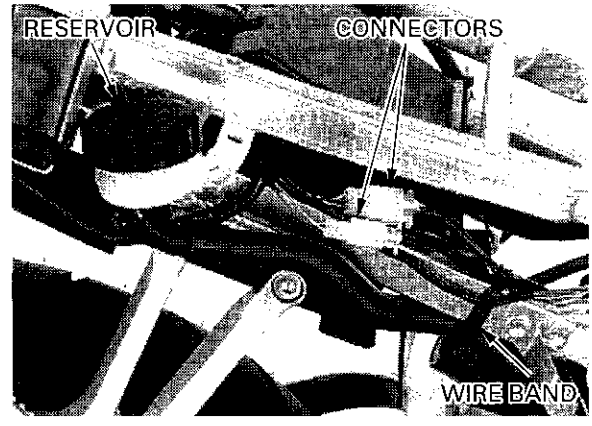
Disconnect the following:
- ignition pulse generator connector
- engine wire harness connector
- pulse secondary air injection (PAIR) control solenoid valve connector



Disconnect the speed sensor 3P connector and rear brake light switch 2P connector.
Remove the wire band.
Remove the bolt and rear brake reservoir.

NOTE:

Keep the brake reservoir upright to prevent air from entering the hydraulic system.



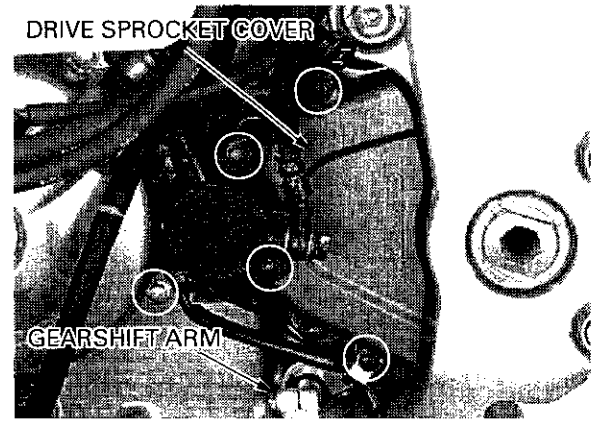
Disconnect the alternator 3P connector and free the alternator wire from the wire band.



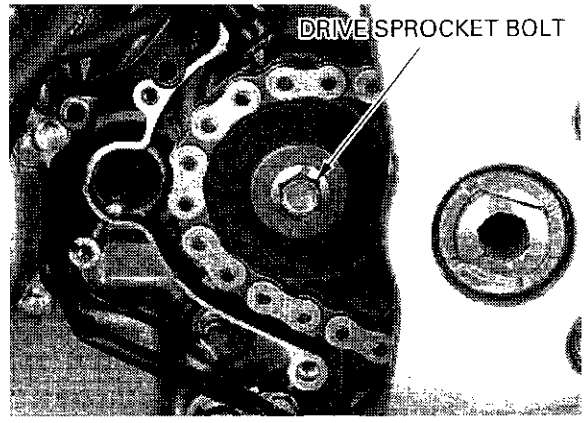
Remove the bolts, choke knob stay, clutch slave cylinder, wire clamp and drive sprocket cover/ guide plate.
Remove the dowel pins.
Remove the bolt and gearshift arm from the spindle.

NOTE:

- Do not disconnect the clutch hose.
- To keep slave cylinder piston from being forced out of the cylinder, squeeze the clutch lever and tie it to the handlebar.

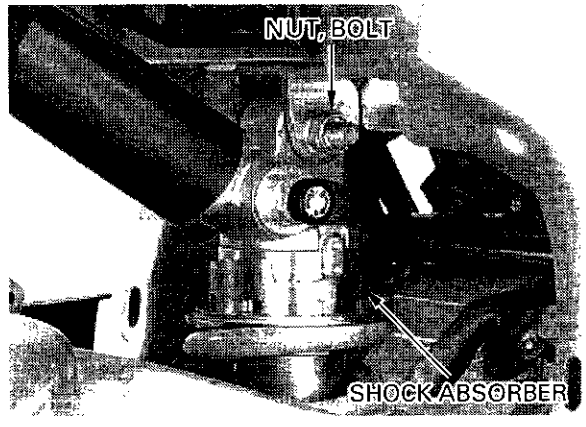


Loosen the rear axle nut, lock nuts and drive chain adjusting bolts.
Remove the drive sprocket bolt, washer and the drive sprocket from the countershaft.

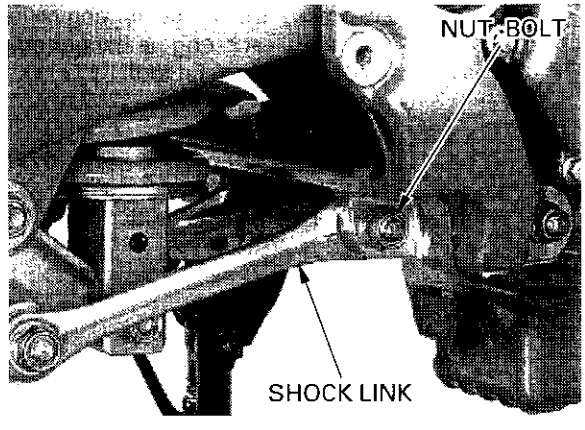


Support the motorcycle securely with a hoist or equivalent.

Remove the shock absorber from the bracket by removing the mounting nut and bolt.

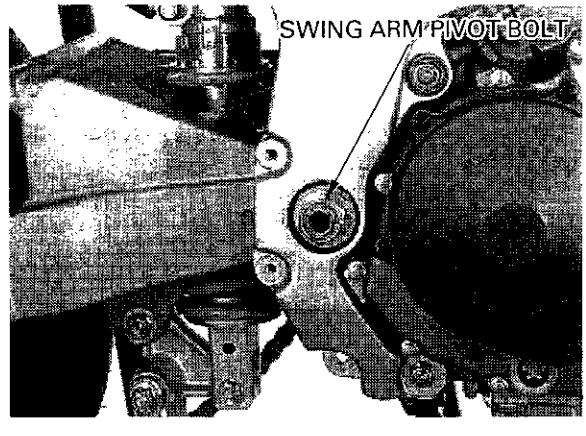


Remove the shock link from the frame by removing the nut and bolt.

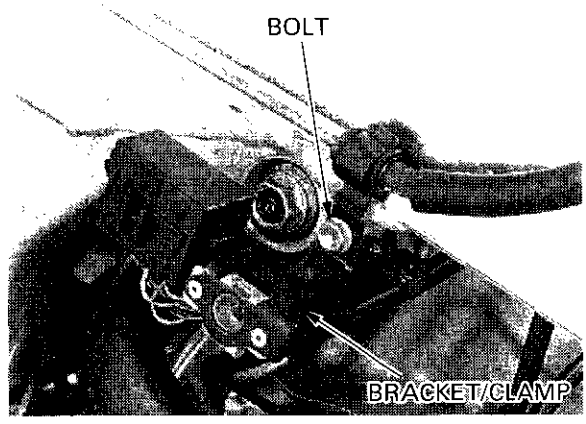


Remove the swingarm pivot bolt (page 14-14).

Remove the swingarm, rear wheel, shock absorber and rear brake system as an assembly.



Remove the bolt and fuse box bracket/clutch pipe clamp.

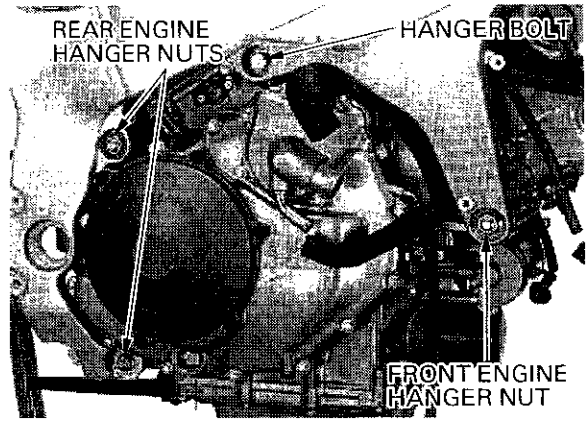


Place a floor jack or other adjustable support under the engine.

NOTE:

The jack height must be continually adjusted to relieve stress for ease of bolt removal.

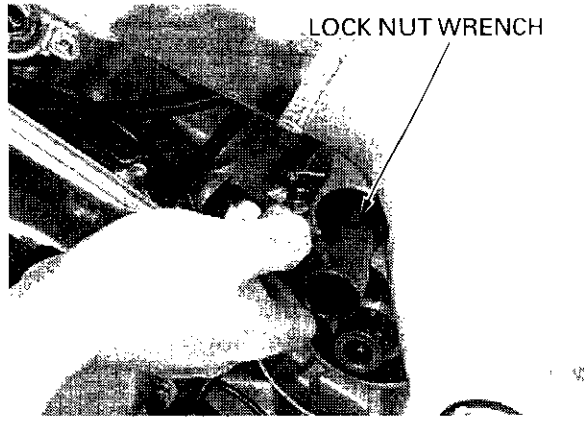
Loosen and remove the right front engine hanger nut, center engine hanger bolt and rear engine hanger nuts.



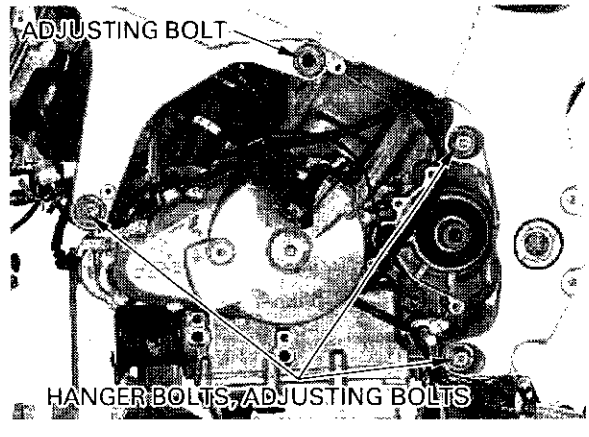
Remove the left center engine hanger bolt.
Loosen each engine hanger adjusting bolt lock nut using the special tool.

TOOL:
Lock nut wrench 07VMA-MBB0100

Remove the lock nuts.



Loose each engine hanger adjusting bolt.
Remove the front, rear lower and rear upper engine hanger bolts, then remove the engine from the frame.
Remove the engine hanger adjusting bolts from the frame.



ENGINE INSTALLATION

NOTE:

- When tightening the lock nut with the lock nut wrench, refer to torque wrench reading information on page 7-1 "SERVICE INFORMATION".
- The jack height must be continually adjusted to relieve stress from the mounting fasteners.

CAUTION:

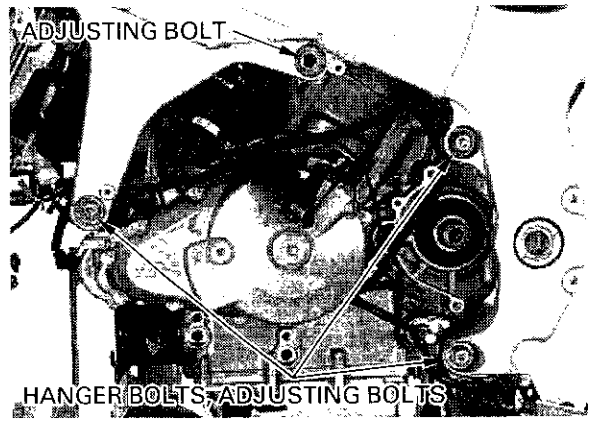
Be sure to tighten all engine mounting fasteners to the specified torque in the specified sequence described below. If you mistake the tightening torque or sequence, loosen all mounting fasteners, then tighten them again to the specified torque in the specified sequence.

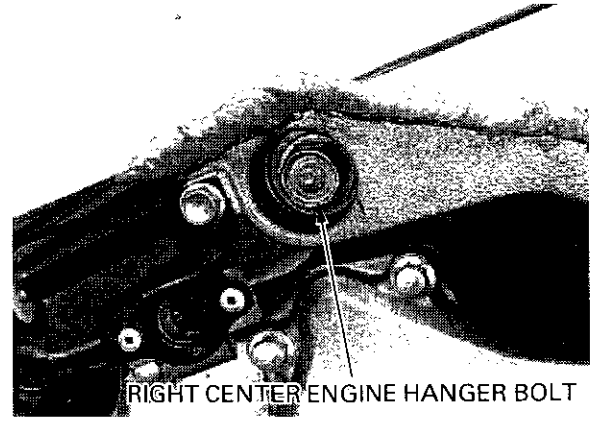
Install the engine hanger adjusting bolts into the left side mounting points from the inside, and screw them fully.

Install the engine in the frame.

1. Temporarily install the rear upper engine hanger bolt, rear lower engine hanger bolt, front engine hanger bolt and right center engine hanger bolt.
2. Temporarily install the left and right swingarm pivot adjusting bolts into the frame.
3. Temporarily install the swingarm pivot bolt from the left side.
4. Tighten the right center engine hanger bolt to the specified torque.

TORQUE: 64 N·m (6.5 kgf·m , 47 lbf·ft)

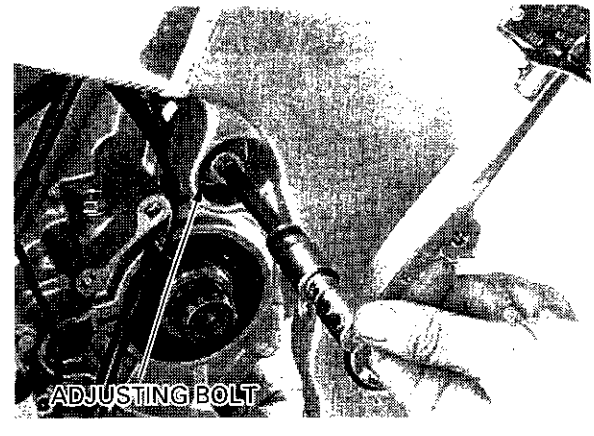




Tighten the front and rear adjusting bolts using the engine hanger bolts.

5. Tighten the adjusting bolts to the specified torque.

TORQUE:
Front: 4 N·m (0.4 kgf·m , 2.9 lbf·ft)
Center, rear: 10 N·m (1.0 kgf·m , 7 lbf·ft)

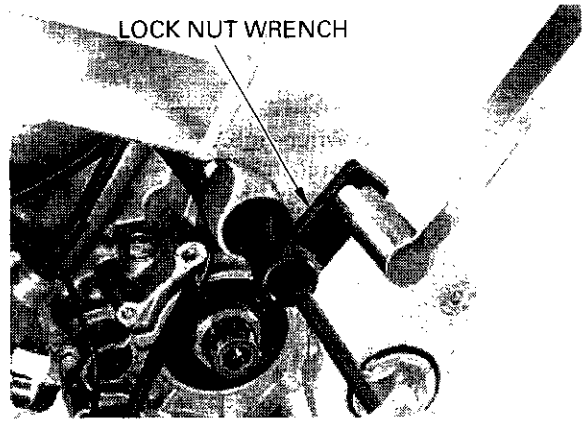


Hold the front and rear adjusting bolts using the engine hanger bolts.

6. Install the engine hanger adjusting bolt lock nuts. Hold the engine hanger adjusting bolts and tighten the lock nut using the special tool.

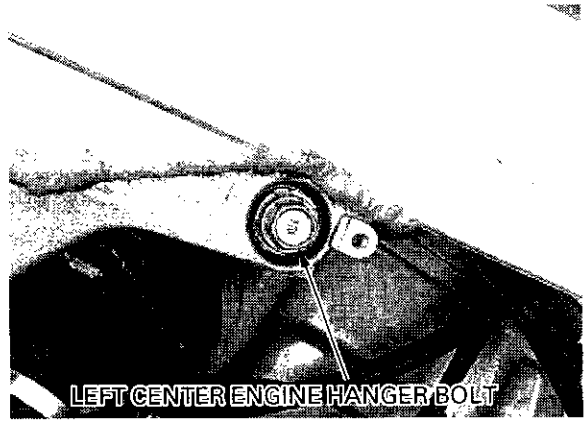
TOOL:
Lock nut wrench 07VMA-MBB0100

TORQUE: **Actual:** 54 N·m (5.5 kgf·m , 40 lbf·ft)
Indicated: 49 N·m (5.0 kgf·m , 36 lbf·ft)



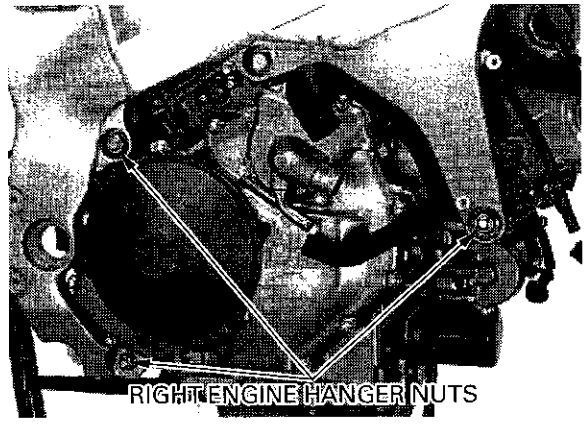
7. Install and tighten the left center engine hanger bolt to the specified torque.

TORQUE: 64 N·m (6.5 kgf·m , 47 lbf·ft)

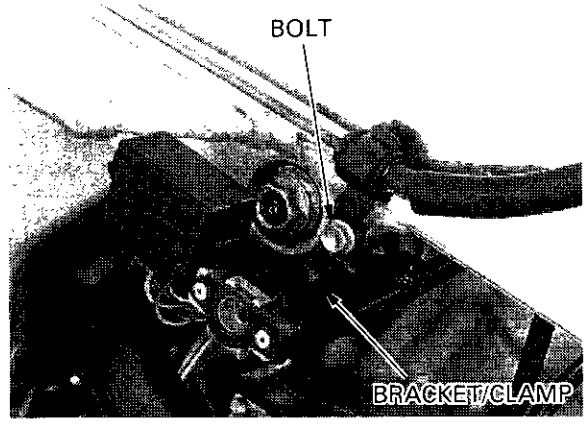


8. Install the right engine hanger nuts and tighten them to the specified torque.

TORQUE:
Front, rear upper: 64 N·m (6.5 kgf·m , 47 lbf·ft)
Rear lower: 39 N·m (4.0 kgf·m , 29 lbf·ft)

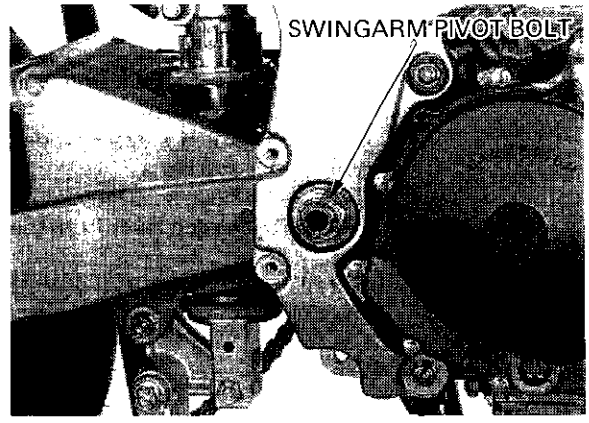


Install the fuse box bracket/clutch pipe clamp and tighten the bolt securely.



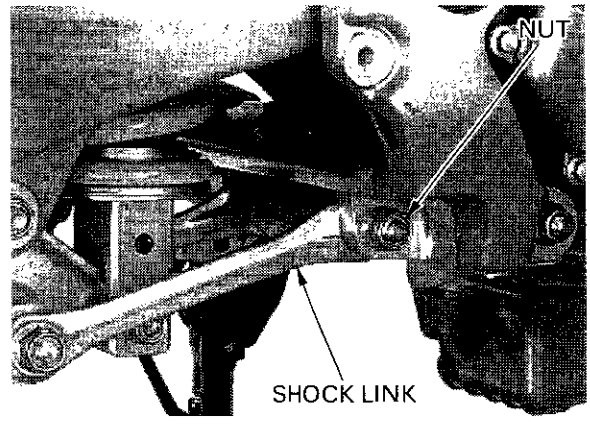
Remove the swingarm pivot bolt.
Install the swingarm, rear wheel, shock absorber and rear brake system as an assembly.

Install the swingarm pivot bolt and tighten the pivot fasteners (page 14-19).



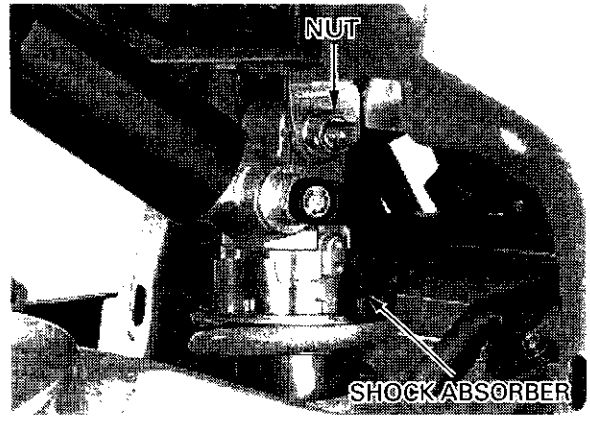
Install the shock link onto the frame with the bolt and nut, and tighten the nut.

TORQUE: 44 N·m (4.5 kgf·m , 33 lbf·ft)



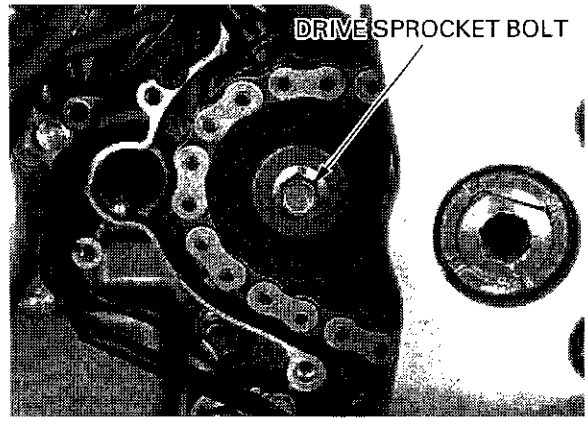
Install the shock absorber onto the upper mounting bracket with the bolt and nut, and tighten the nut.

TORQUE: 44 N·m (4.5 kgf·m , 33 lbf·ft)



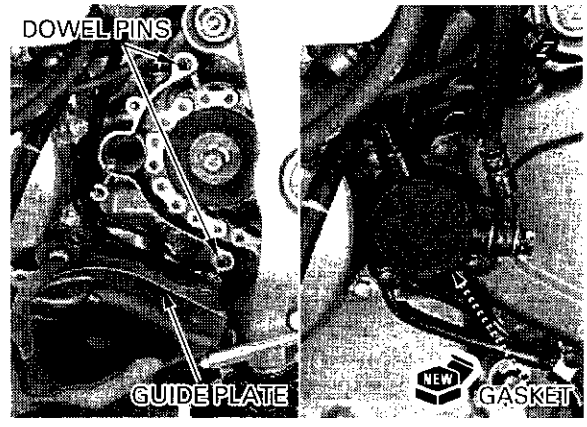
Install the drive sprocket with the drive chain onto the countershaft.
Install the washer and bolt, and tighten the bolt.

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



Install the dowel pins and drive sprocket cover/ guide plate.
Install the dowel pins and a new gasket for the clutch slave cylinder.
Install the clutch slave cylinder, choke knob stay, wire clamp and bolts.
Tighten the bolts securely.
Release the clutch lever from the handlebar.

Install the gearshift arm onto the spindle (page 9-22).



Route the alternator wire properly (page 1-20).

Connect the alternator 3P connector.

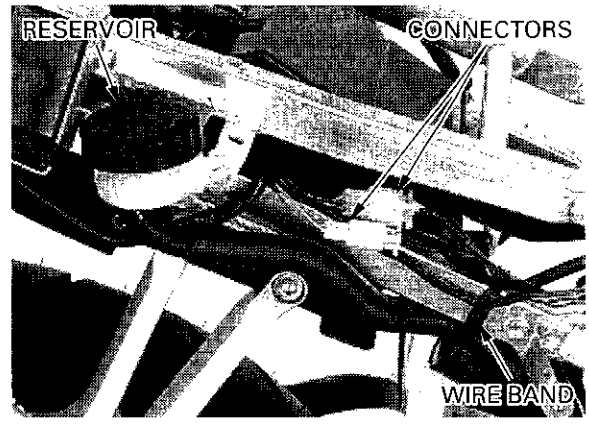


Route the rear brake reservoir hose, brake light switch wire and speed sensor wire properly (page 1-20).

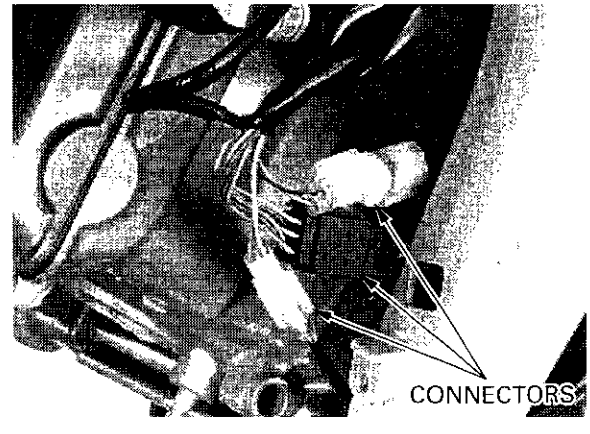
Install the rear brake reservoir and tighten the mounting bolt.

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

Connect the rear brake light switch connector and speed sensor wire connector.
Install the wire band.



Connect the following:
— ignition pulse generator connector
— engine wire harness connector
— pulse secondary air injection (PAIR) control solenoid valve connector

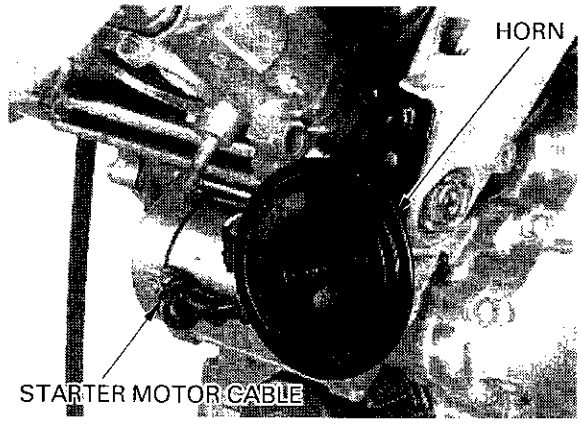


Connect the starter motor cable.
Install and tighten the terminal nut.

TORQUE: 10 N·m (1.0 kgf·m , 7 lbf·ft)

Install the rubber cap securely.

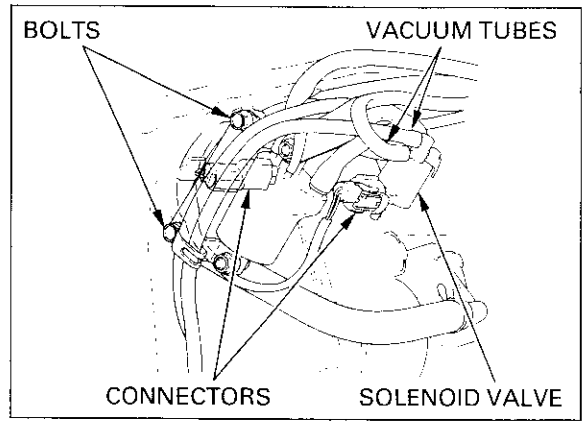
Install the horn, tighten the bolt and connect the horn wire connectors.



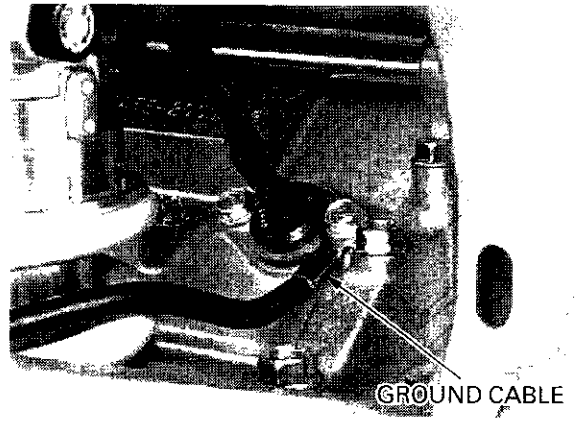
Connect the ignition coil connector.
Install the ignition coil/solenoid valve with the brackets onto the frame and tighten the bracket bolts.
Install the spark plug cap onto the plug.
Connect the connector and vacuum tubes to the intake air control solenoid valve.

NOTE:

Route the wires and tubes properly (page 1-20).



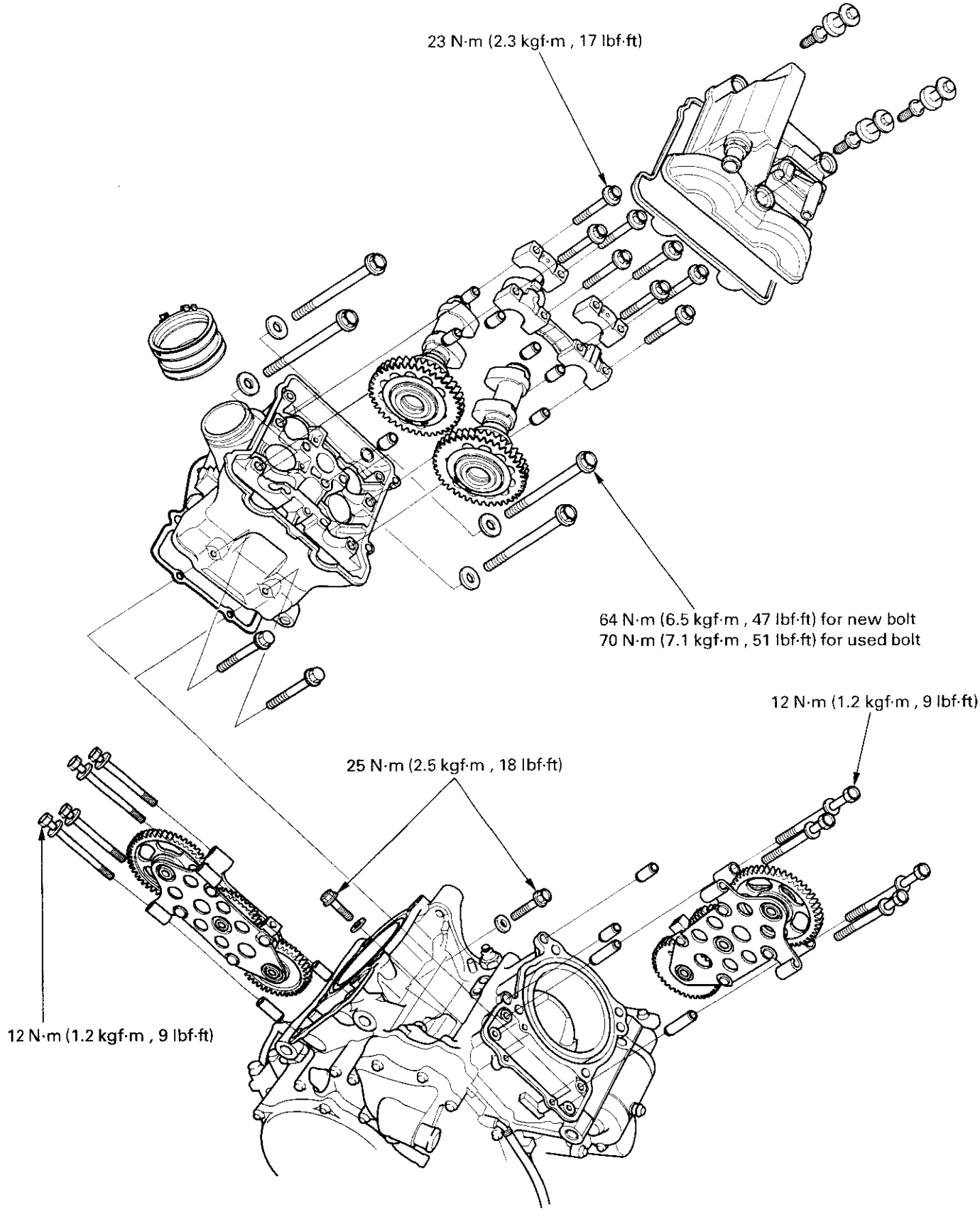
Install the battery ground cable and tighten the bolt.



Install the following:
- upper radiator hose onto the thermostat housing
- crankcase breather storage tank and hose
- right driver footpeg holder (page 15-16)
- radiator reserve tank (page 6-9)
- left and right radiators (page 6-6)
- throttle body (page 5-67)
- exhaust system (page 2-6)
- oil cooler (page 4-9)

Fill the crankcase with the recommended oil (page 3-15).
Fill and bleed the cooling system (page 6-5).
Adjust the drive chain (page 3-18).




23 N·m (2.3 kgf·m , 17 lbf·ft)
64 N·m (6.5 kgf·m , 47 lbf·ft) for new bolt
70 N·m (7.1 kgf·m , 51 lbf·ft) for used bolt
12 N·m (1.2 kgf·m , 9 lbf·ft)
25 N·m (2.5 kgf·m , 18 lbf·ft)
12 N·m (1.2 kgf·m , 9 lbf·ft)

8. CYLINDER HEAD/VALVE

SERVICE INFORMATION	8-1	VALVE GUIDE REPLACEMENT	8-10
TROUBLESHOOTING	8-2	VALVE SEAT INSPECTION/REFACING	8-11
CYLINDER COMPRESSION	8-3	CAM GEAR TRAIN	8-13
CAMSHAFT REMOVAL	8-4	CYLINDER HEAD ASSEMBLY	8-15
CYLINDER HEAD REMOVAL	8-6	CYLINDER HEAD INSTALLATION	8-16
CYLINDER HEAD DISASSEMBLY	8-7	CAMSHAFT INSTALLATION	8-17

SERVICE INFORMATION

GENERAL

- This section covers service of the camshafts, cylinder head and valves.
- The camshafts, cylinder head and valves can be serviced 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 at 350 min^{-1} (rpm)			1,216 kPa (12.4 kgf/cm^2, 176 psi)	———
Valve clearance		IN	0.16 (0.006)	———
		EX	0.31 (0.012)	———
Camshaft	Cam lobe height	IN	39.180 – 39.340 (1.5425 – 1.5488)	38.880 (1.5307)
		EX	38.730 – 38.890 (1.5248 – 1.5311)	38.430 (1.5130)
	Runout		———	0.05 (0.002)
	Oil clearance		0.020 – 0.062 (0.0008 – 0.0024)	0.100 (0.0039)
Valve lifter	Valve lifter O.D.		33.978 – 33.993 (1.3377 – 1.3383)	33.97 (1.337)
	Valve lifter bore I.D.		34.010 – 34.026 (1.3390 – 1.3396)	34.04 (1.340)
Valve, Valve guide	Valve stem O.D.	IN	5.975 – 5.990 (0.2352 – 0.2358)	5.965 (0.2348)
		EX	5.965 – 5.980 (0.2348 – 0.2354)	5.955 (0.2344)
	Valve guide I.D.	IN/EX	6.000 – 6.012 (0.2362 – 0.2367)	6.040 (0.2378)
	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		14.0 – 14.2 (0.55 – 0.56)	———
	Valve seat width	IN	1.1 – 1.3 (0.04 – 0.05)	1.7 (0.07)
		EX	1.3 – 1.5 (0.05 – 0.06)	1.9 (0.07)
Valve spring	Free length	Inner	41.0 (1.61)	40.0 (1.57)
		Outer	45.8 (1.80)	44.8 (1.76)
Cylinder head warpage			———	0.10 (0.004)

TORQUE VALUES

Camshaft holder bolt	23 N·m (2.3 kgf·m , 17 lbf·ft)	Apply oil to the threads and seating surface
Cylinder head bolt (11 mm) New	64 N·m (6.5 kgf·m , 47 lbf·ft)	Apply oil to the threads and seating surface
Used	70 N·m (7.1 kgf·m , 51 lbf·ft)	Apply oil to the threads and seating surface
Cam gear train setting bolt	25 N·m (2.5 kgf·m , 18 lbf·ft)	
Cam gear train mounting bolt	12 N·m (1.2 kgf·m , 9 lbf·ft)	
Spark plug	18 N·m (1.8 kgf·m , 13 lbf·ft)	

TOOLS

Valve spring compressor	07757-0010000
Valve guide remover	07942-6570100
Valve guide driver	07743-0020000
Valve guide reamer	07VMH-MBB0200
Valve seat cutter, 35 mm (EX 45°)	07780-0010400
Valve seat cutter, 42 mm (IN 45°)	07780-0010900
Flat cutter, 42 mm (IN 32°)	07780-0013000
Flat cutter, 36 mm (EX 32°)	07780-0013500
Interior cutter, 37.5 mm (EX 60°)	07780-0014100
Interior cutter, 42 mm (IN 60°)	07780-0014400
Cutter holder, 6 mm	07VMH-MBB0100

TROUBLESHOOTING

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

Compression too low, hard starting or poor performance at low speed
- Valves
  - Incorrect valve adjustment
  - Burned or bent valves
  - Incorrect valve timing
  - Broken valve spring
  - Uneven valve seating
- Cylinder head
  - Leaking or damaged cylinder head gasket
  - Warped or cracked cylinder head
  - Loose spark plug
- Cylinder/piston (section 12)

Compression too high
- Excessive carbon build-up on piston head or combustion chamber

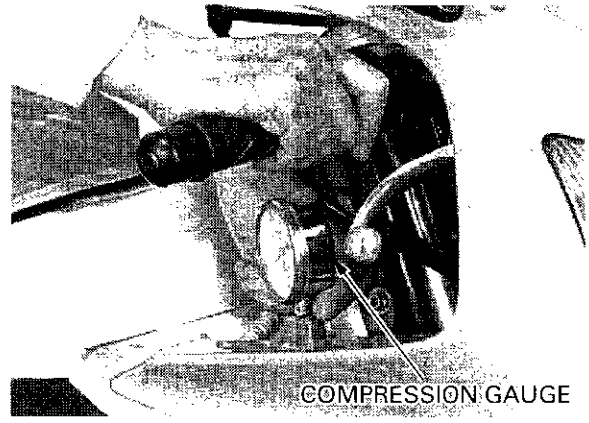
Excessive smoke
- Worn valve stem or valve guide
- Damaged stem seal
- Cylinder/piston problem (section 12)

Excessive noise
- Incorrect valve clearance
- Sticking valve or broken valve spring
- Worn or damaged camshaft
- Worn or damaged valve lifter
- Worn or damaged cam gear train
- Worn camshaft gear
- Cylinder/piston problem (section 12)

Rough idle
- Low cylinder compression

CYLINDER COMPRESSION

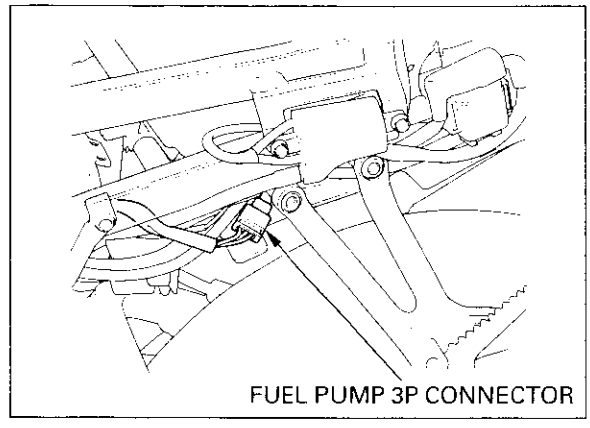
Warm up the engine to normal operating temperature.
Stop the engine and remove the spark plug caps and spark plugs (page 3-6).
Install the compression gauge into the spark plug hole.
Disconnect the fuel pump 3P (black) connector.
Shift the transmission in neutral.
Open the throttle all the way and crank the engine with the starter motor until the gauge reading stops rising. The maximum reading is usually reached within 4—7 seconds.



COMPRESSION PRESSURE:
1,216 kPa (12.4 kgf/cm², 176 psi)
at 350 min⁻¹ (rpm)

Low compression can be caused by:
—blown cylinder head gasket
—improper valve adjustment
—valve leakage
—worn piston ring or cylinder

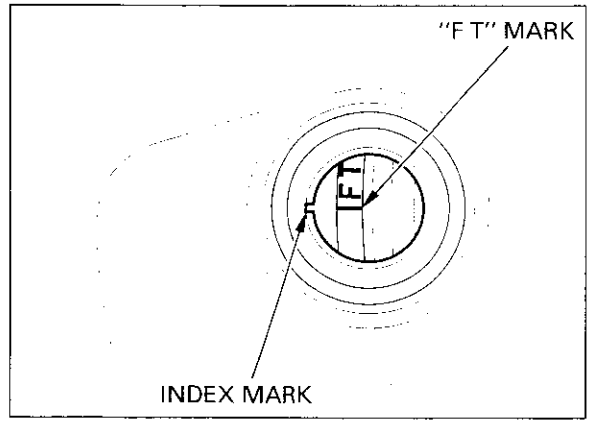
High compression can be caused by:
—carbon deposits in combustion chamber or on piston head



CAMSHAFT REMOVAL

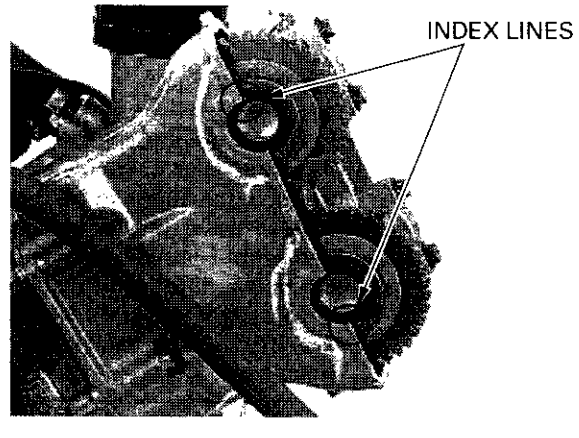
Remove the cylinder head cover, timing hole cap and crankshaft hole cap (page 3-8).

Front cylinder:
Rotate the crankshaft counterclockwise and align the "F T" mark on the flywheel with the index mark on the left crankcase cover.

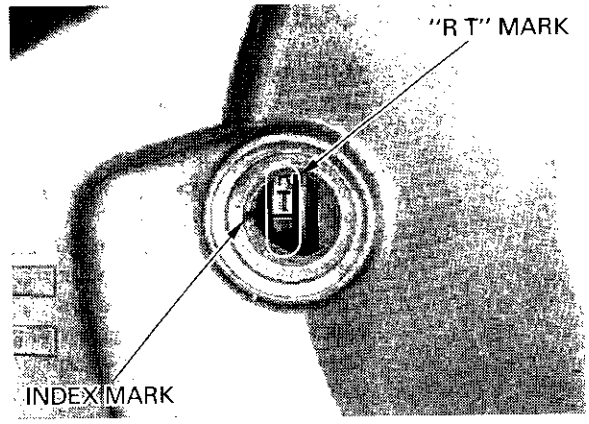


Check that the index lines on the front cylinder camshafts are flush with the cylinder head surface and facing outward as shown.

If the index lines are facing inward, rotate the crankshaft counterclockwise 360° (1 full turn) and align the "F T" mark with the index mark.

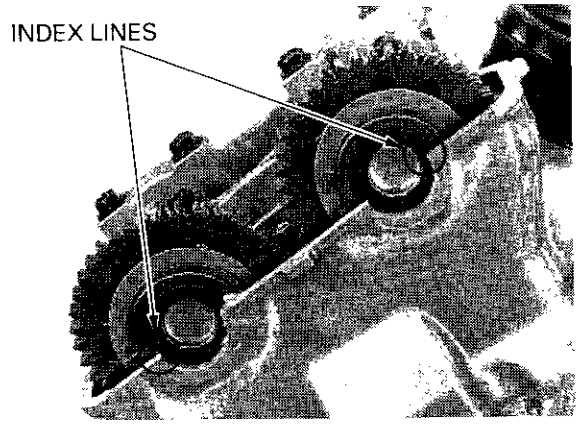


Rear cylinder:
Rotate the crankshaft counterclockwise and align the "R T" mark on the flywheel with the index mark on the left crankcase cover.



The index lines on the rear cylinder camshafts must be flush with the cylinder head surface and facing outward as shown.

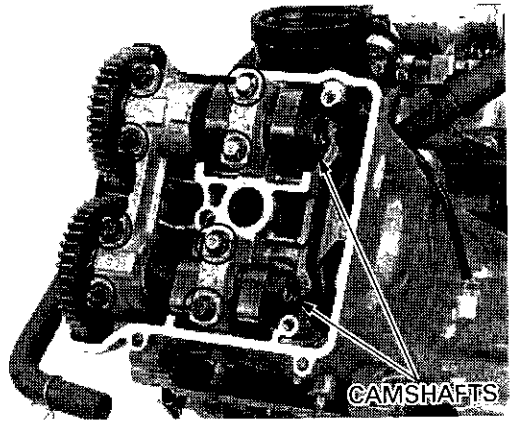
If the index lines are facing inward, rotate the crankshaft counterclockwise 360° (1 full turn) and align the "R T" mark with the index mark.



Remove the camshaft holder bolts, camshaft holders, dowel pins and camshafts.

NOTE:

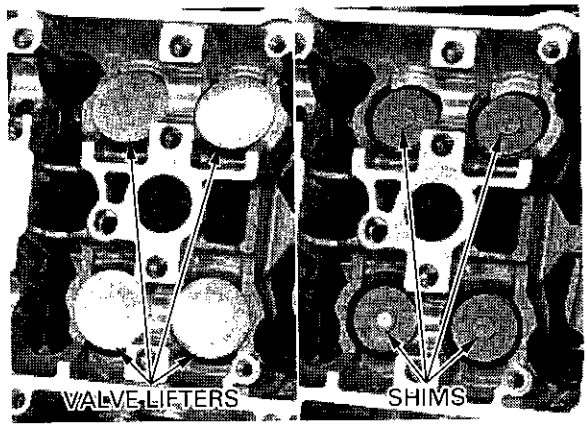
Do not forcibly remove the dowel pins from the camshaft holders.



Remove the valve lifters and shims.

NOTE:

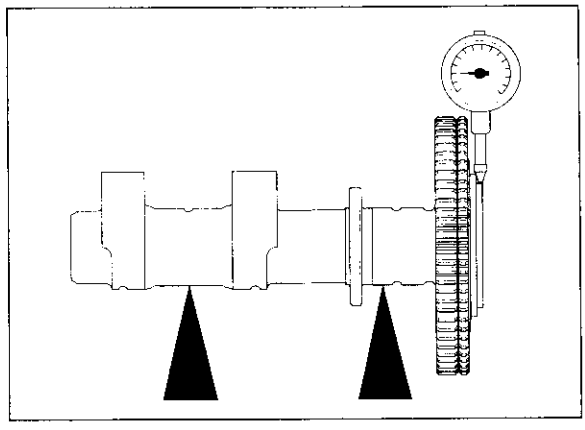
- Be careful not to damage the valve lifter bore.
- Shim may stick to the inside of the valve lifter. Do not allow the shims to fall into the crankcase.
- Mark all valve lifters and shims to ensure correct reassembly in their original locations.
- The valve lifter can be easily removed with a valve lapping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



INSPECTION

CAMSHAFT

Check the cam and journal surfaces of the camshaft for scoring, scratches or evidence of insufficient lubrication.
Check the oil holes in the camshaft for clogging.

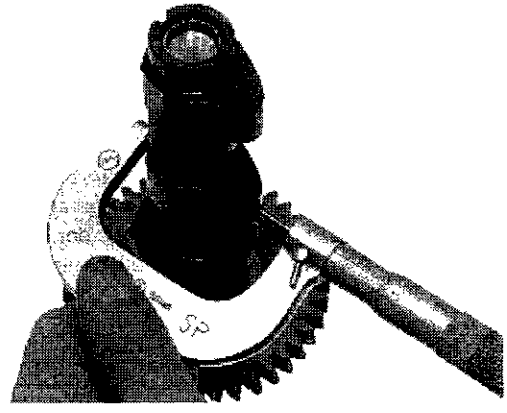


Measure the camshaft runout using a dial indicator.

SERVICE LIMIT: 0.05 mm (0.002 in)

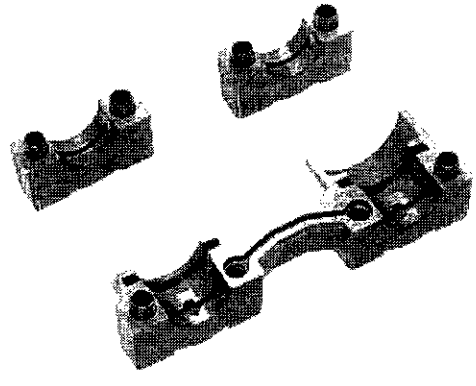
Measure each cam lobe height using a micrometer.

SERVICE LIMITS: IN: 38.880 mm (1.5307 in)
EX:38.430 mm (1.5130 in)



CAMSHAFT JOURNAL

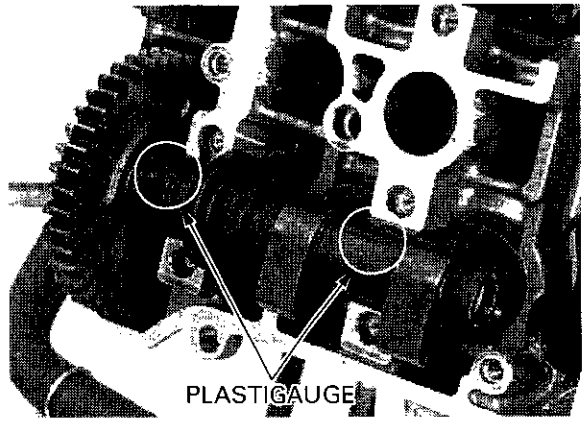
Check the camshaft journal surfaces of the camshaft holders and cylinder head for scoring, scratches or evidence of insufficient lubrication.



Do not rotate the camshaft during inspection.

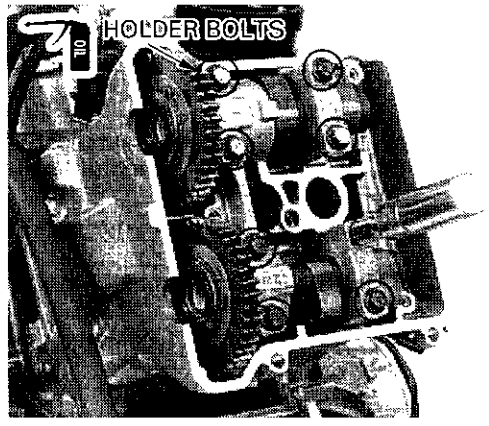
CAMSHAFT OIL CLEARANCE

Wipe any oil from the journals of the cylinder head, camshaft and camshaft holder.
Put the camshaft onto the cylinder head and lay a strip of plastigauge lengthwise on each camshaft journal.



Apply oil to the threads and seating surfaces of the camshaft holder bolts.
Install the camshaft holder and tighten the bolts in a crisscross pattern in 2 or 3 steps.

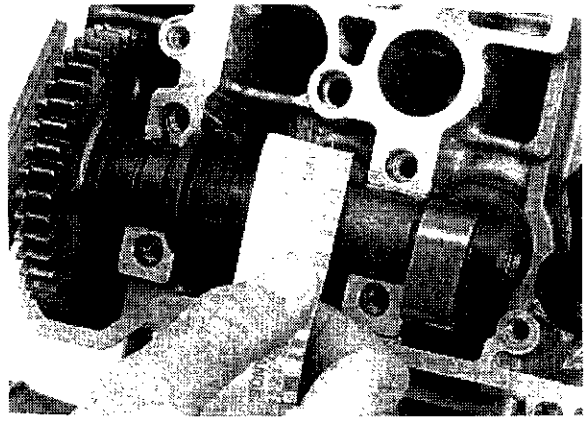
TORQUE: 23 N·m (2.3 kgf·m , 17 lbf·ft)



Remove the camshaft holder and measure the compressed plastigauge at its widest point on the camshaft to determine the oil clearance.

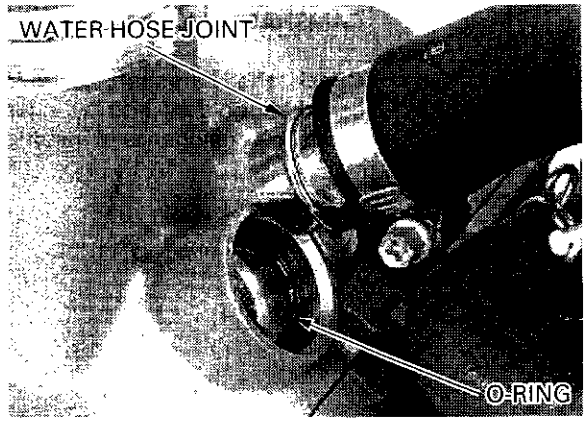
SERVICE LIMIT: 0.100 mm (0.0039 in)

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

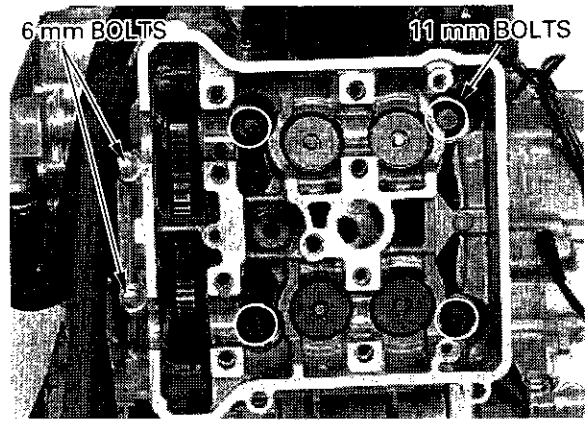


CYLINDER HEAD REMOVAL

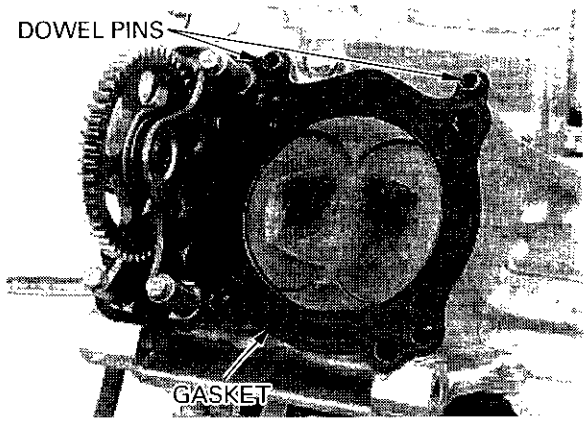
Remove the following:
- exhaust system (page 2-4)
- throttle body assembly (page 5-58)
- camshafts (page 8-3)
- bolt, water hose joint and O-ring



Remove the two 6 mm cylinder head bolts.
Loosen the four 11 mm cylinder head bolts in a crisscross pattern in 2 or 3 steps, and remove them.
Remove the cylinder head.



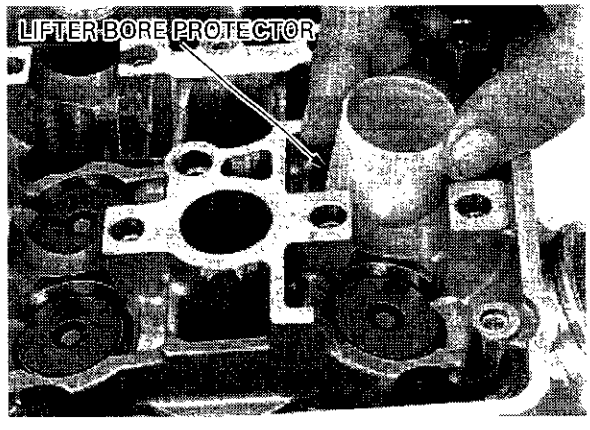
Remove the gasket and dowel pins.



CYLINDER HEAD DISASSEMBLY

Remove the spark plug from the cylinder head.

Make a lifter bore protector from a plastic 35 mm film container by cutting the bottom of the container.
Install the protector into the valve lifter bore.

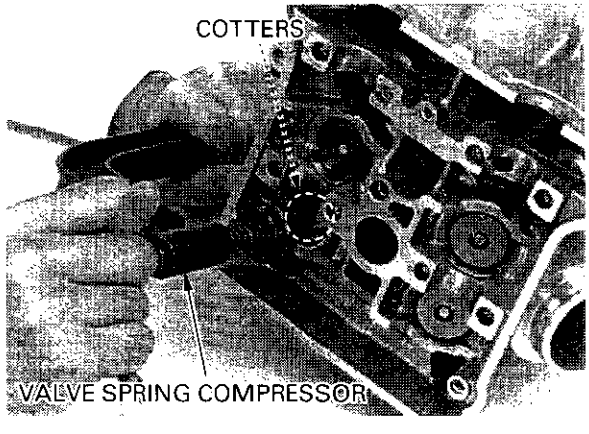


Remove the valve spring cotters using the valve spring compressor.

TOOL:
Valve spring compressor 07757-0010000

CAUTION:

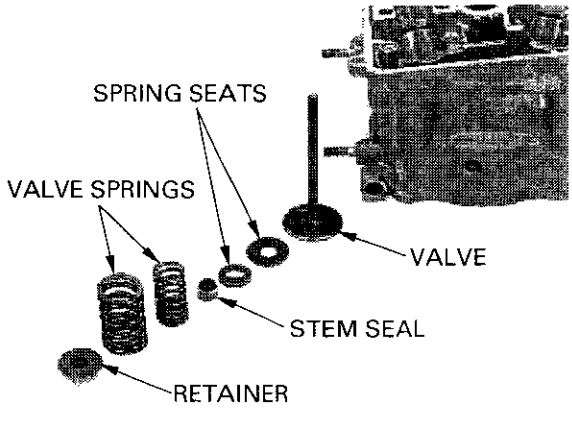
To prevent loss of tension, do not compress the valve springs more than necessary to remove the cotters.



Remove the following:
- spring retainer
- inner and outer valve springs
- valve
- stem seal
- inner and outer valve spring seats

NOTE:

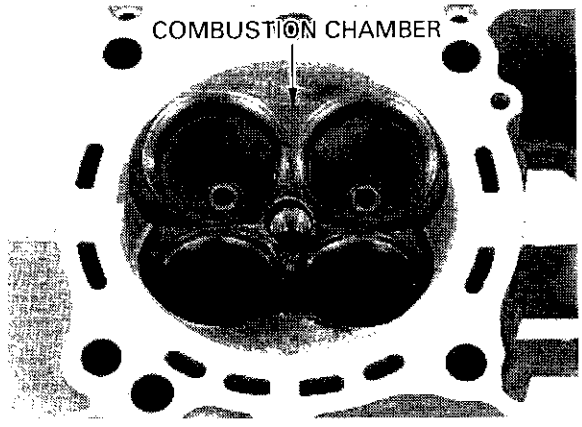
Mark all parts during disassembly so they can be placed back in their original locations.



INSPECTION

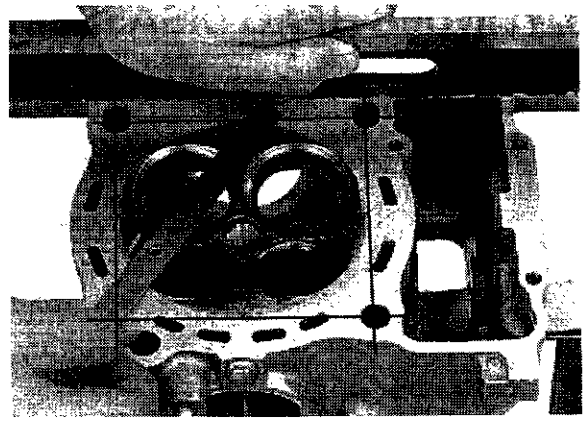
CYLINDER HEAD

Remove the carbon deposits from the combustion chamber, being careful not to damage the gasket surface.
Check the spark plug hole and valve areas for cracks.



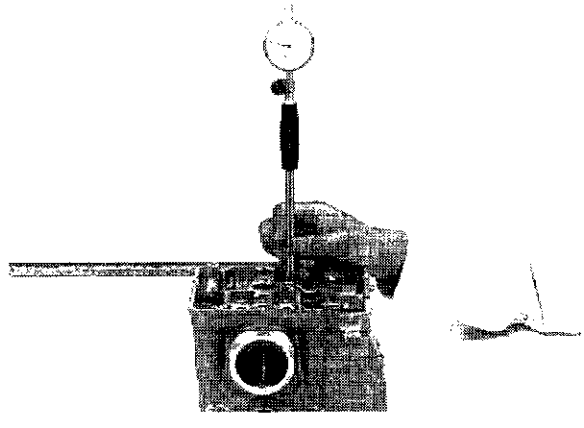
Check the cylinder head for warpage with a straight edge and feeler gauge.

SERVICE LIMIT: 0.10 mm (0.004 in)



Check the valve lifter bore for scoring, scratches or damage.
Measure the each valve lifter bore I.D.

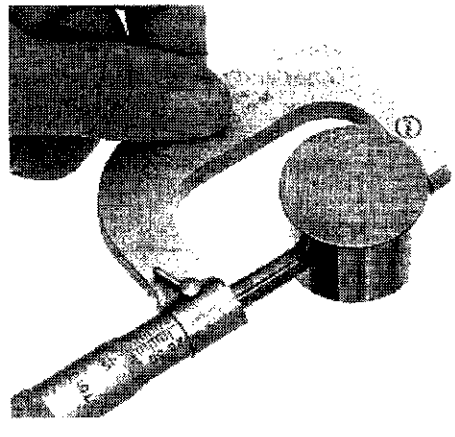
SERVICE LIMIT: 34.04 mm (1.340 in)



VALVE LIFTER

Check the valve lifter for scoring, scratches or damage.
Measure the each valve lifter O.D.

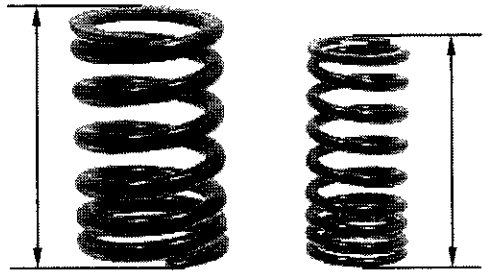
SERVICE LIMIT: 33.97 mm (1.337 in)



VALVE SPRING

Measure the valve spring free length.

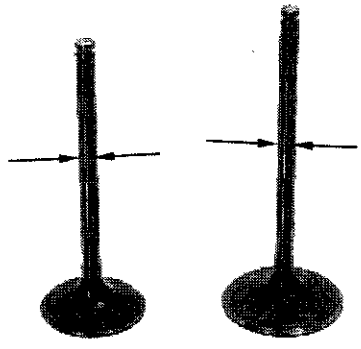
SERVICE LIMITS: Inner: 40.0 mm (1.57 in)
Outer: 44.8 mm (1.76 in)



VALVE/VALVE GUIDE

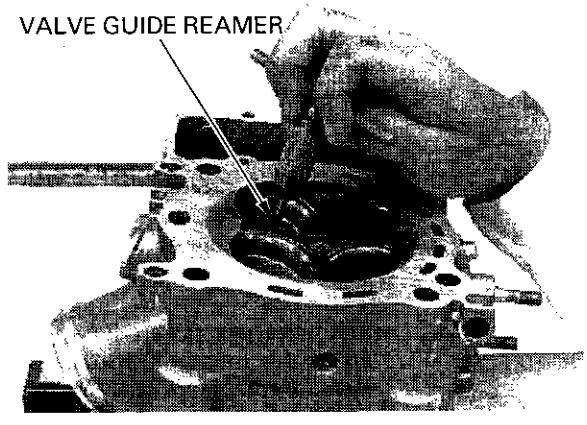
Check that the valve moves smoothly in the guide.
Check the valve for bending, burning or abnormal wear.
Measure each valve stem O.D. and record it.

SERVICE LIMITS: IN: 5.965 mm (0.2348 in)
EX: 5.955 mm (0.2344 in)



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

TOOL:
Valve guide reamer 07VMH-MBB0200



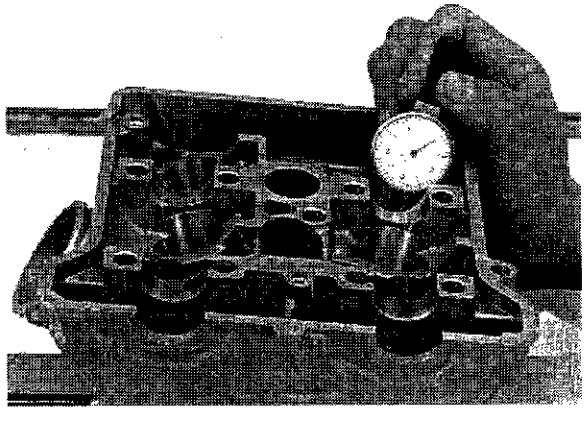
Measure each valve guide I.D. and record it.

SERVICE LIMIT: 6.040 mm (0.2378 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 exceeds the service limit, determine if a new guide with standard dimensions would bring the clearance within tolerance.
If so, replace any guides as necessary and ream to fit.
If the stem-to-guide clearance exceeds the service limit with a new guide, also replace the valve.



NOTE:

Inspect and reface the valve seats whenever the valve guides are replaced (page 8-10).

VALVE GUIDE REPLACEMENT

Chill new valve guides in the freezer section of a refrigerator for about an hour.
Heat the cylinder head to 130 – 140°C (275 – 290°F) with a hot plate or oven.

⚠WARNING

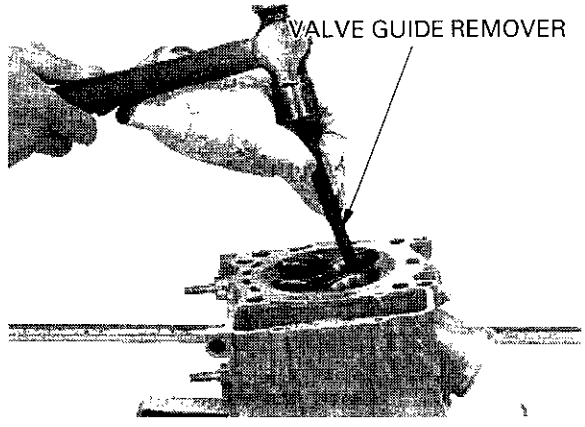
Wear heavy gloves to avoid burns when handling the heated cylinder head.

CAUTION:

Using a torch to heat the cylinder head may cause warpage.

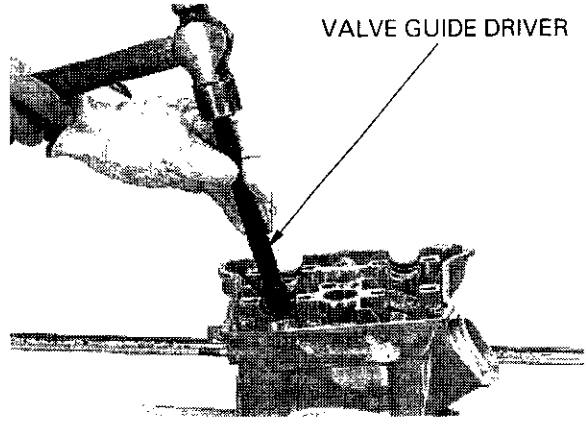
Support the cylinder head and drive the valve guides out of the cylinder head from the combustion chamber side.

TOOL:
Valve guide remover 07942-6570100



While the cylinder head is still heated, drive new valve guides in the cylinder head from the camshaft side until the exposed height is 14.0 – 14.2 mm (0.55 – 0.56 in).

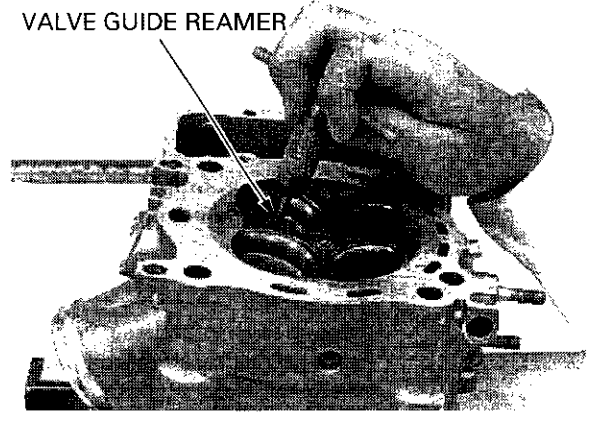
TOOL:
Valve guide driver 07743-0020000



Let the cylinder head cool to room temperature.

Ream the new valve guides.
Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise.

TOOL:
Valve guide reamer 07VMH-MBB0200



NOTE:

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

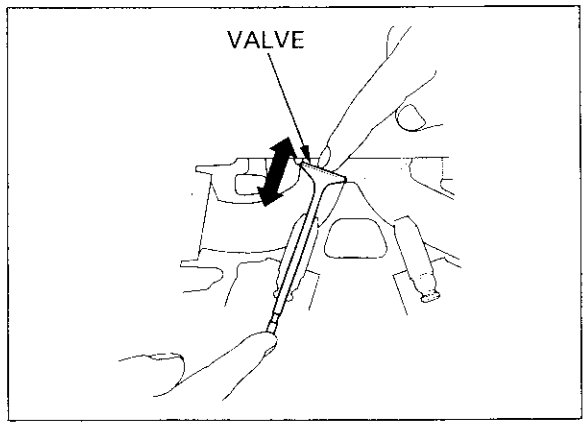
Clean the cylinder head thoroughly to remove any metal particles after reaming and reface the valve seat (page 8-12).

VALVE SEAT INSPECTION/REFACING

INSPECTION

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

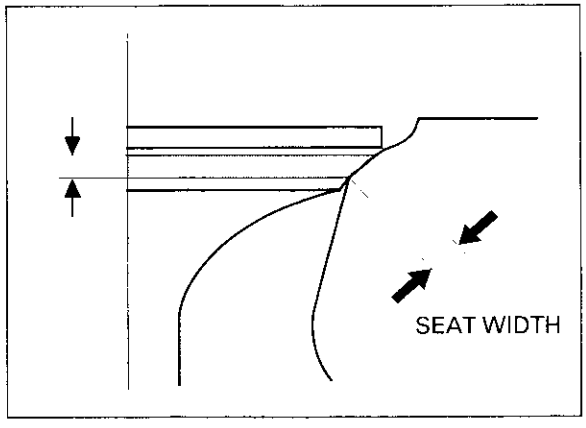
Apply a light coating of Prussian Blue to each valve seat.
Tap the valve against the valve seat several times without rotating the valve, to check for proper valve seat contact.



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

STANDARDS: IN: 1.1—1.3 mm (0.04—0.05 in)
EX: 1.3—1.5 mm (0.05—0.06 in)
SERVICE LIMITS: IN: 1.7 mm (0.07 in)
EX: 1.9 mm (0.07 in)

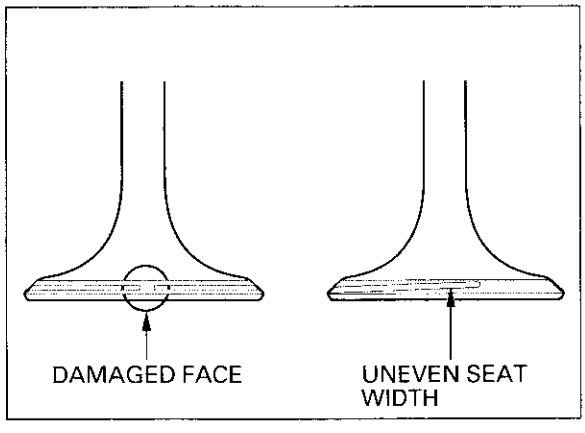
If the valve seat width is not within specification, reface the valve seat (page 8-12).

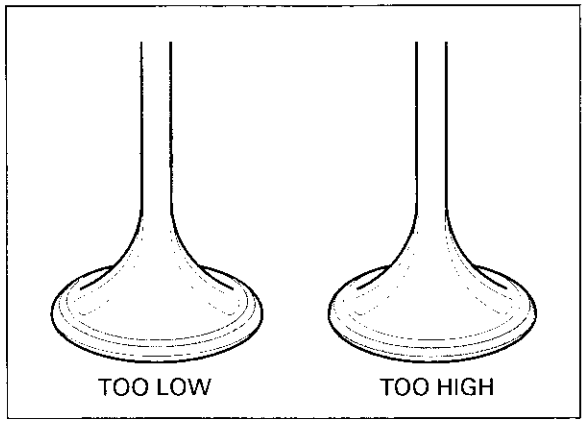


Inspect the valve seat face for:
- Uneven seat width:
  —Replace the valve and reface the valve seat.
- Damaged face:
  —Replace the valve and reface the valve seat.
- Contact area (too high or too low)
  —Reface the valve seat.

NOTE:

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

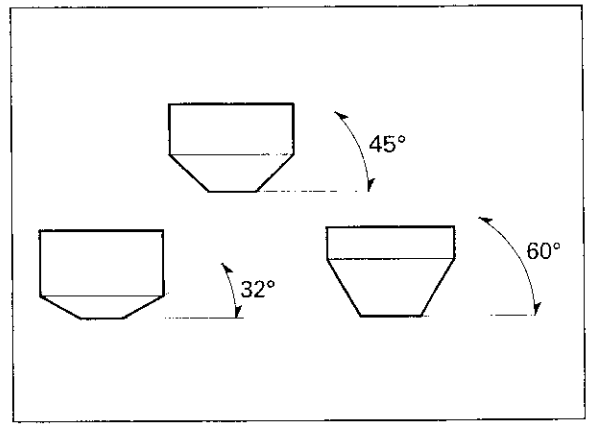




REFACING

NOTE:

- Follow the refacing manufacturer's operating instructions.
- Be careful not to grind the seat more than necessary.



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

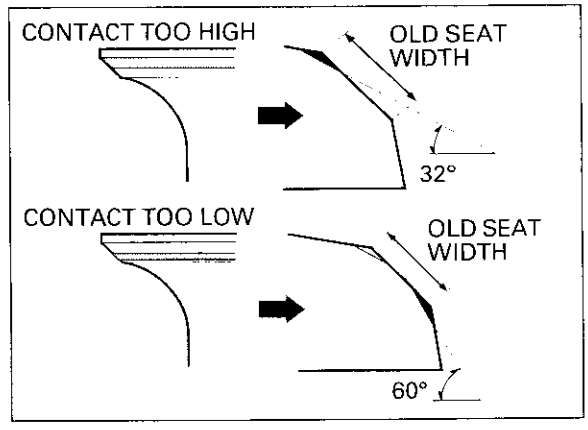
TOOLS:

Flat cutter, 42 mm (IN)	07780-0013000
Flat cutter, 36 mm (EX)	07780-0013500
Cutter holder, 6 mm	07VMH-MBB0100

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

TOOLS:

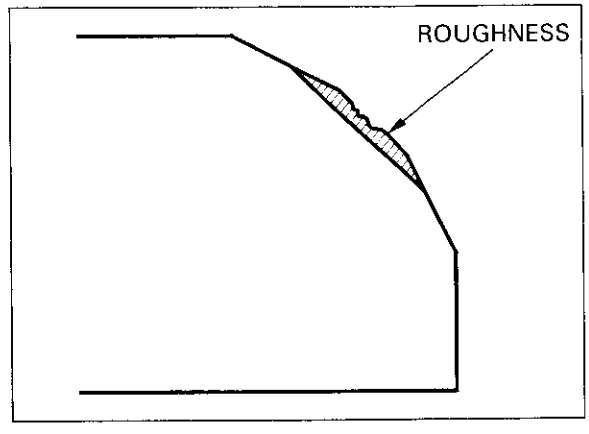
Interior cutter, 42 mm (IN)	07780-0014400
Interior cutter, 37.5 mm (EX)	07780-0014100
Cutter holder, 6 mm	07VMH-MBB0100



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

TOOLS:

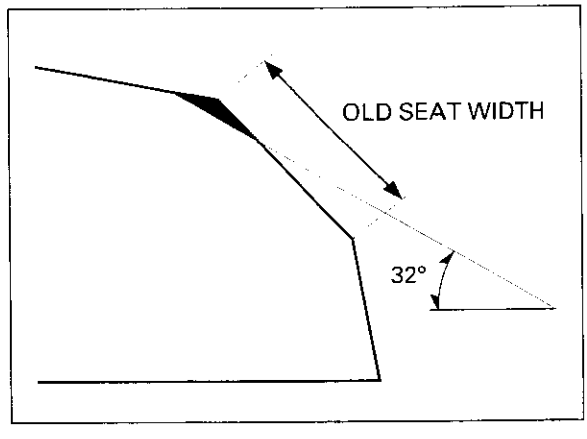
Seat cutter, 42 mm (IN)	07780-0010900
Seat cutter, 35 mm (EX)	07780-0010400
Cutter holder, 6 mm	07VMH-MBB0100



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

TOOLS:

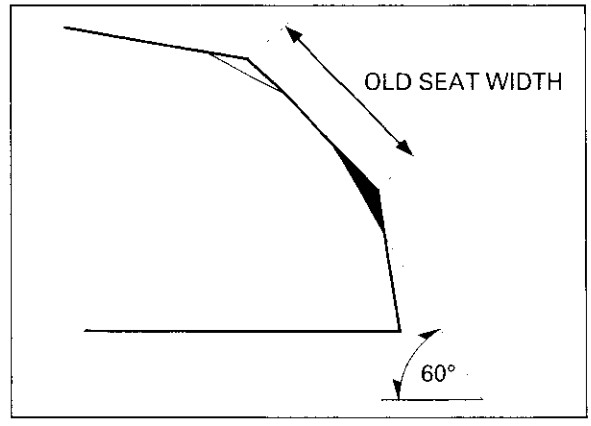
Flat cutter, 42 mm (IN)	07780-0013000
Flat cutter, 36 mm (EX)	07780-0013500
Cutter holder, 6 mm	07VMH-MBB0100



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

TOOLS:

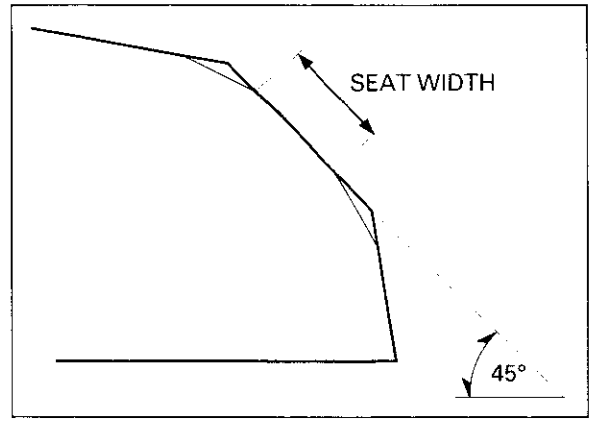
Interior cutter, 42 mm (IN)	07780-0014400
Interior cutter, 37.5 mm (EX)	07780-0014100
Cutter holder, 6 mm	07VMH-MBB0100



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

TOOLS:

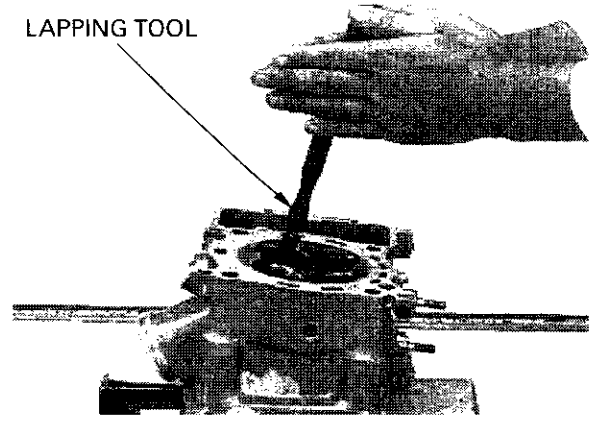
Seat cutter, 42 mm (IN)	07780-0010900
Seat cutter, 35 mm (EX)	07780-0010400
Cutter holder, 6 mm	07VMH-MBB0100



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

CAUTION:

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



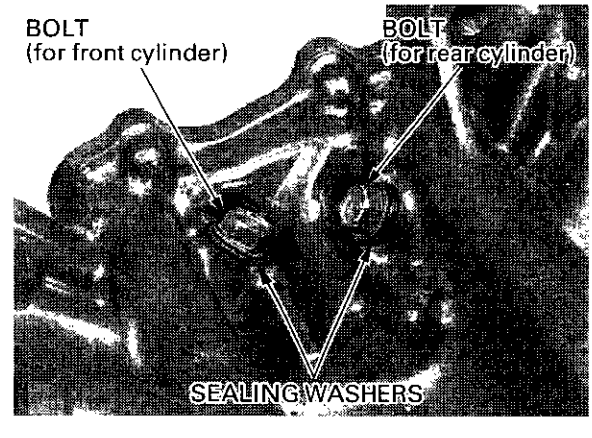
After lapping, wash any residual compound off the cylinder head and valve, and recheck the seat contact.

CAM GEAR TRAIN

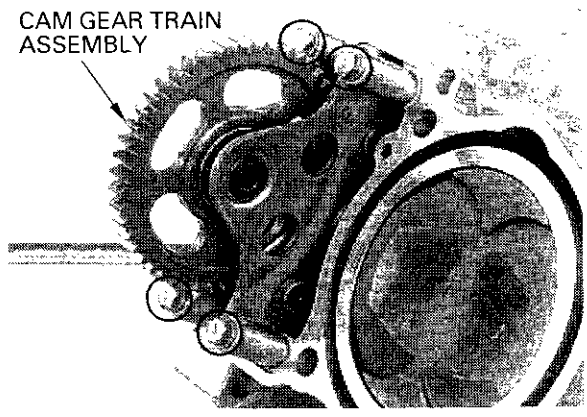
REMOVAL

Remove the cylinder head (page 8-6).

Remove the cam gear train setting bolt and sealing washer.

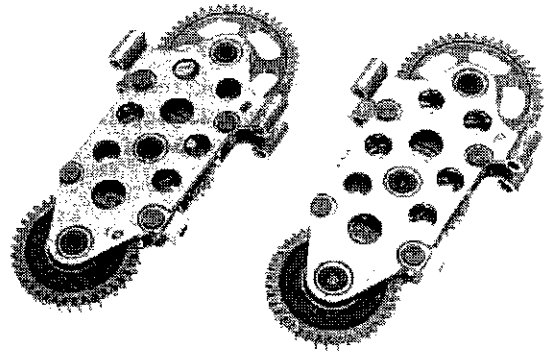


Remove the four cam gear train mounting bolts, washers, cam gear train assembly and two dowel pins.



INSPECTION

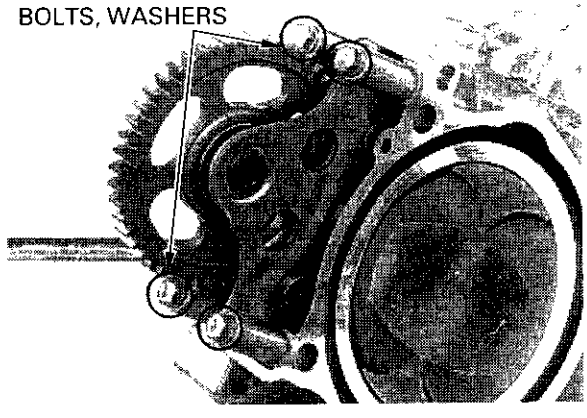
Check the gear teeth for wear or damage.
Check the gear case for deformation or damage.
Replace the cam gear train assembly if necessary.



INSTALLATION

Install the cam gear train assembly with the two dowel pins.
Install the four mounting bolts and washers, and tighten the bolts.

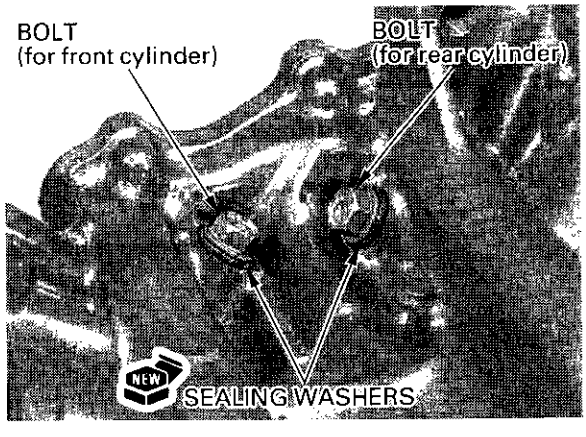
TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)



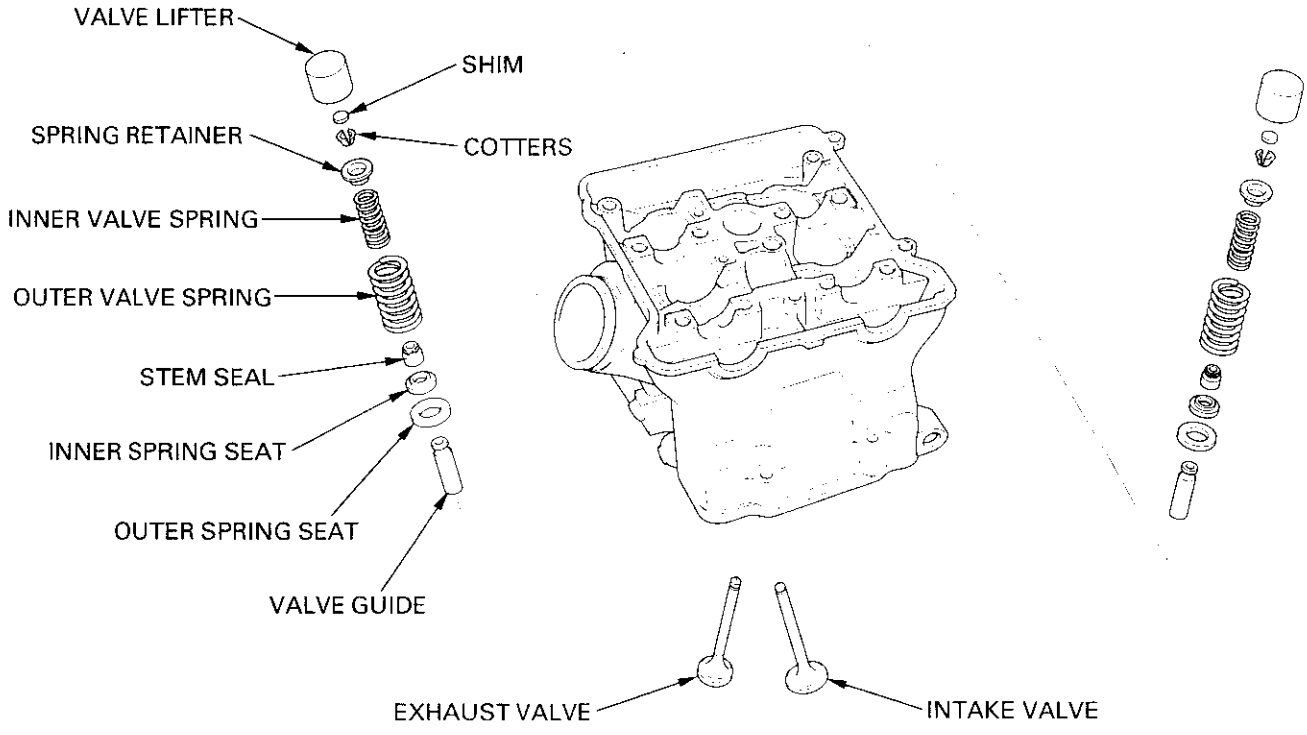
Install the setting bolt with a new sealing washer and tighten it.

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

Install the cylinder head (page 8-16).



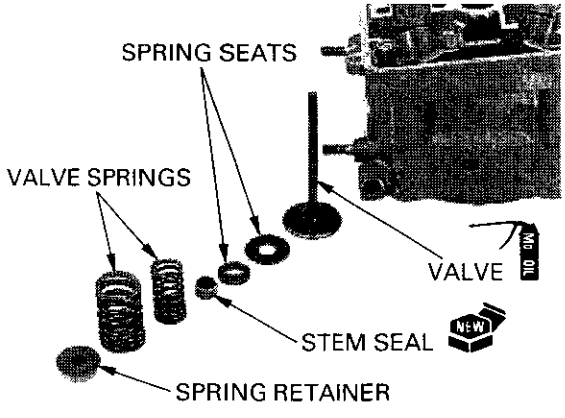
CYLINDER HEAD ASSEMBLY



Blow through all oil passages in the cylinder head with compressed air.
Install the inner and outer valve spring seats.
Install new stem seals.

NOTE:

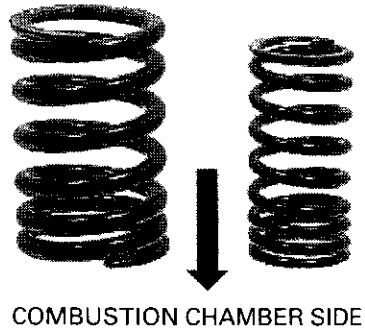
Do not interchange the intake and exhaust stem seals.
The intake stem seal has sliver spring and the exhaust stem seal has black spring.



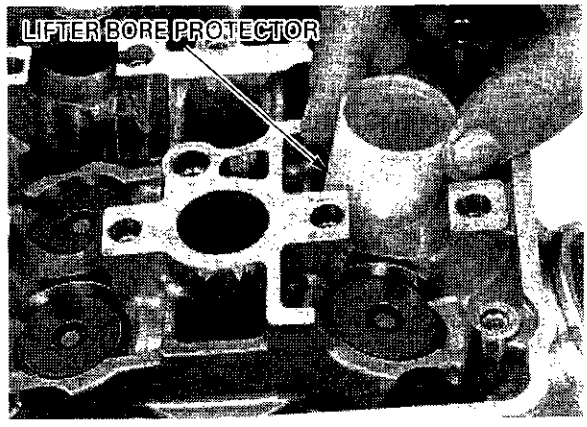
Lubricate the valve stem sliding surface with molybdenum oil solution.
Insert the valve into the guide while turning it slowly to avoid damage to the stem seal.

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

Install the spring retainer.



Install the lifter bore protector made from the film container into the valve lifter bore.



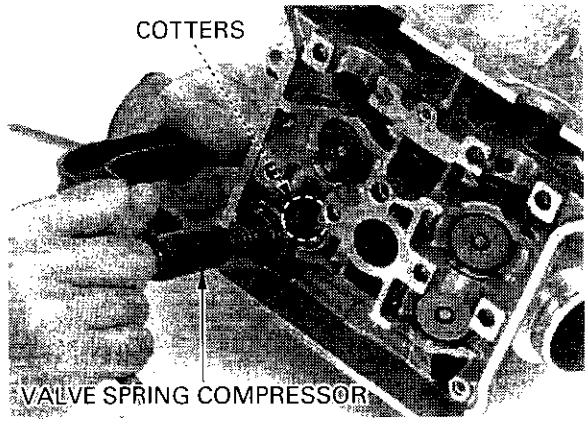
Grease the cotters to ease installation.

Install the valve spring cotters using the valve spring compressor.

TOOL:
Valve spring compressor 07757-0010000

CAUTION:

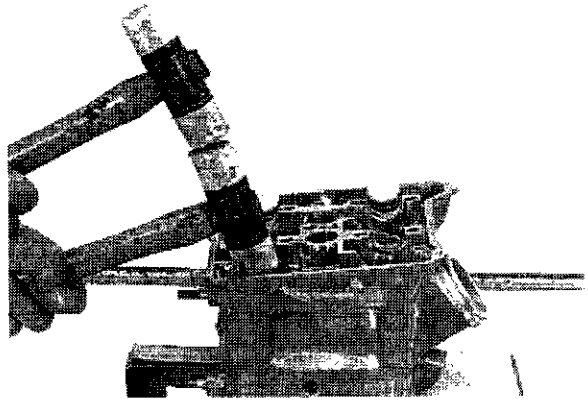
To prevent loss of tension, do not compress the valve springs more than necessary to install the cotters.



Support the cylinder head so that the valve heads will not contact anything that cause damage.
Tap the valve stems gently with two plastic hammers as shown to seat the cotters firmly.

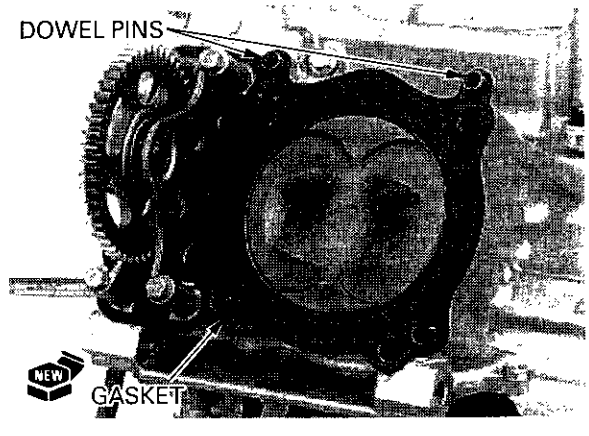
Install and tighten the spark plug.

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



CYLINDER HEAD INSTALLATION

Install the dowel pins and a new gasket.

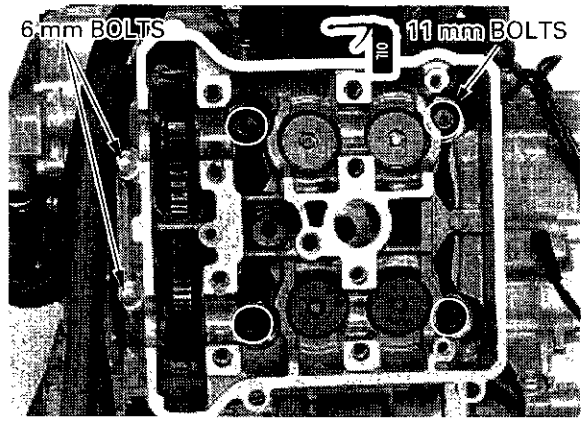


Install the cylinder head onto the cylinder.

Apply oil to the threads and seating surfaces of the 11 mm cylinder head bolts and install them.
Tighten the 11 mm bolts in a crisscross pattern in 2 or 3 steps.

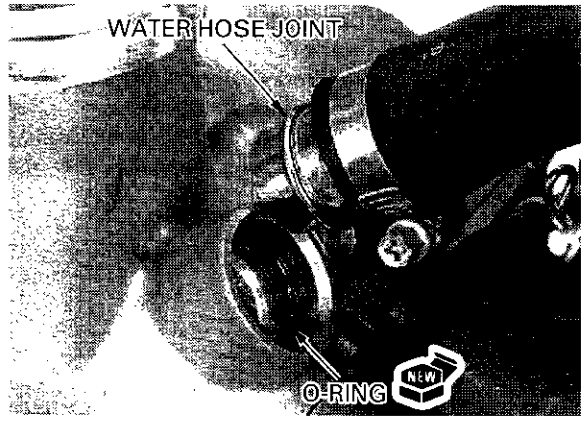
TORQUE: 64 N·m (6.5 kgf·m , 47 lbf·ft)

Install and tighten the two 6 mm bolts securely.



Install a new O-ring into the cylinder head.
Install the water hose joint and tighten the bolt.

Install the following:
camshafts
– throttle body assembly (page 5-67)
– exhaust system (page 2-6)

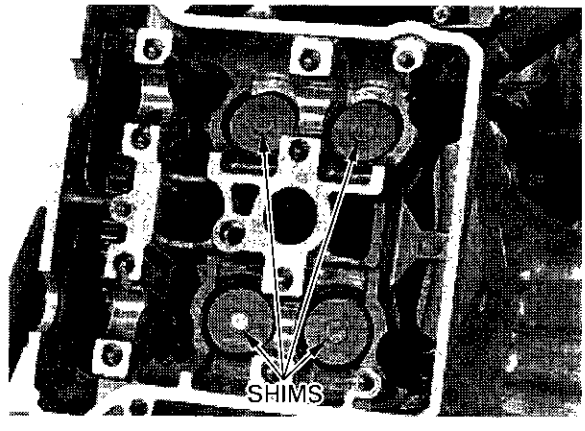


CAMSHAFT INSTALLATION

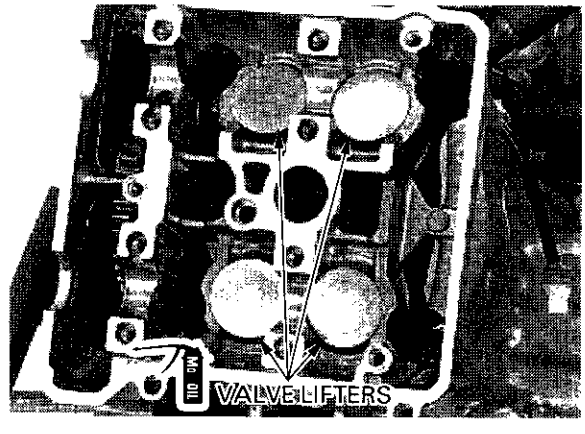
NOTE:

- If both front and rear cylinder camshafts were serviced, install the front cylinder camshafts first, then install the rear cylinder camshafts.
- Even if you are servicing either the front or rear cylinder head, the other cylinder head cover must be removed and the other cylinder camshaft position must be checked.

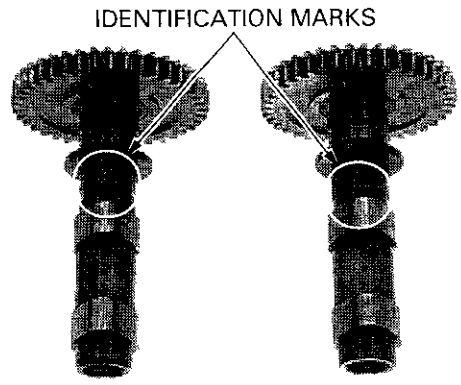
Install the valve shims in their original locations.



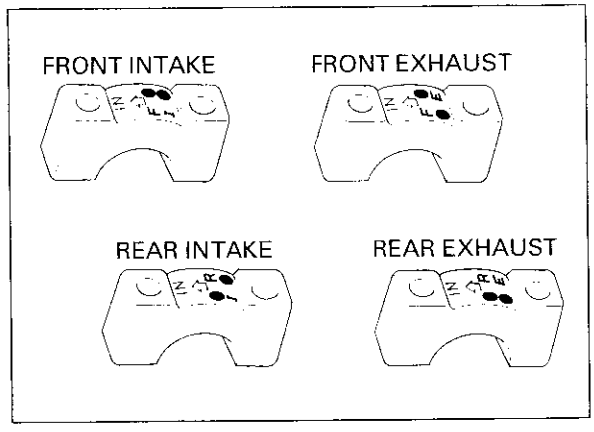
Coat the outer surfaces of the valve lifters with molybdenum oil solution.
Install the valve lifters in their original lifter bores, being careful not to damage the sliding surfaces of the lifters and bores.



The camshaft has the following identification mark:
FR IN: Front cylinder intake camshaft
FR EX: Front cylinder exhaust camshaft
RR IN: Rear cylinder intake camshaft
RR EX: Rear cylinder exhaust camshaft



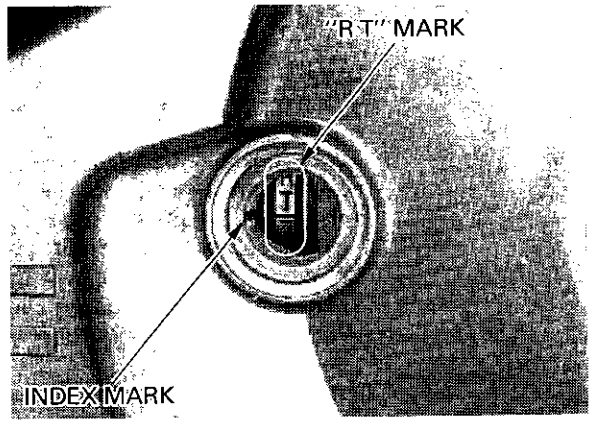
Camshaft holder A has the following identification mark:
F I: Front cylinder intake camshaft holder
F E: Front cylinder exhaust camshaft holder
R I: Rear cylinder intake camshaft holder
R E: Rear cylinder exhaust camshaft holder



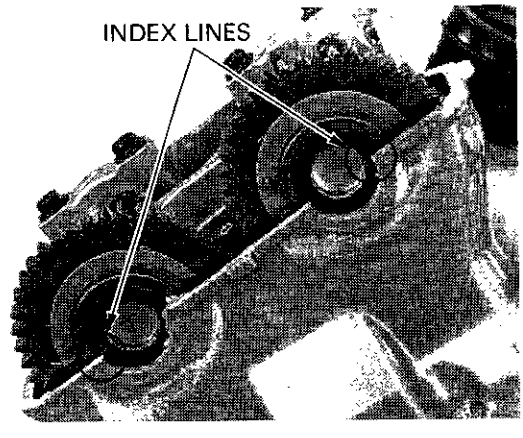
FRONT CYLINDER CAMSHAFTS

If the rear cylinder camshafts have not been serviced, remove the rear cylinder head cover and check the rear cylinder camshaft position as follows:

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



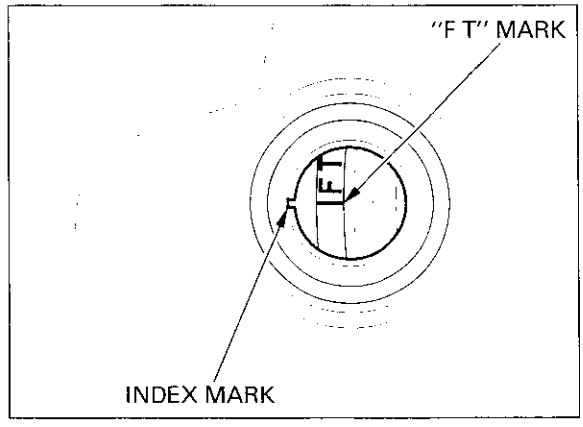
Check the index lines on the rear cylinder camshafts.



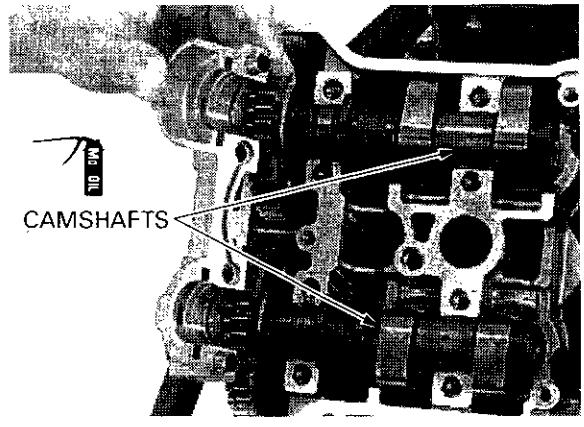
If the index lines are facing outward, turn the crankshaft counterclockwise 1-1/4 turn (450°) and align the "F T" mark with the index mark.

If the index lines are facing inward, turn the crankshaft counterclockwise 1/4 turn (90°) and align the "F T" mark with the index mark.

If the rear cylinder camshafts have been serviced, turn the crankshaft counterclockwise and align the "F T" mark with the index mark.

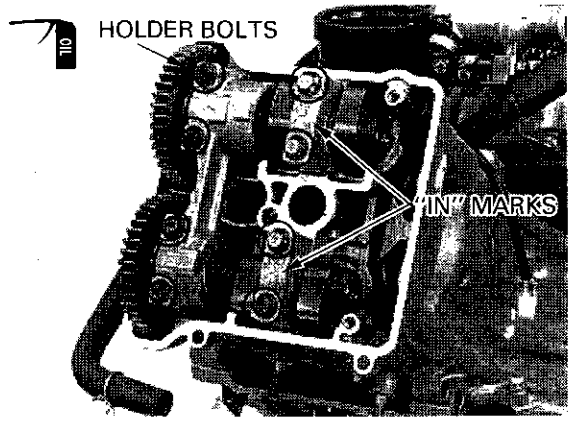


Apply molybdenum oil solution to the camshaft journals and cam lobes.
Install the camshafts in their proper locations so that the index lines on the camshafts are flush with the cylinder head surface and facing outward.



Install the dowel pins and camshaft holder B in its proper location.
Install the dowel pins and camshaft holders A in their proper locations with the "IN" (arrow) mark facing to the intake side.
Apply oil to the threads and seating surfaces of the camshaft holder bolts.
Install the bolts and tighten them in a crisscross pattern in 2 or 3 steps.

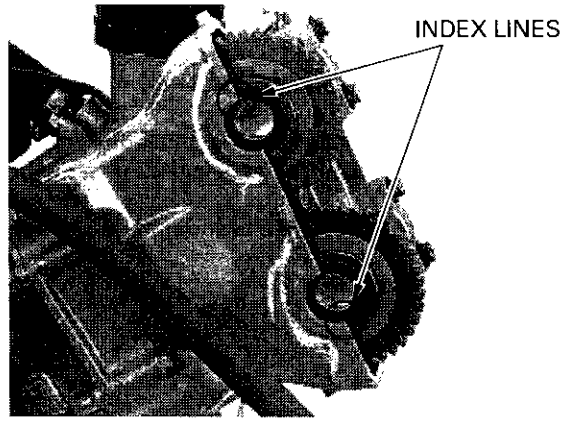
TORQUE: 23 N·m (2.3 kgf·m , 17 lbf·ft)



Make sure that the index lines on the camshafts are flush with the cylinder head surface.

If the rear cylinder camshafts have not been serviced, install the cylinder head covers (page 3-11).

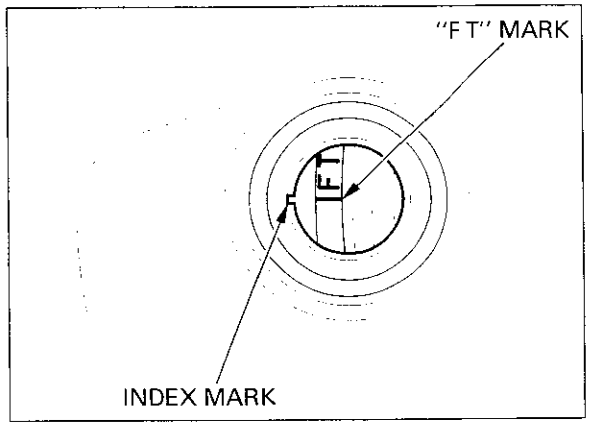
If the rear cylinder camshafts have been serviced, install the rear cylinder camshafts (page 8-20).



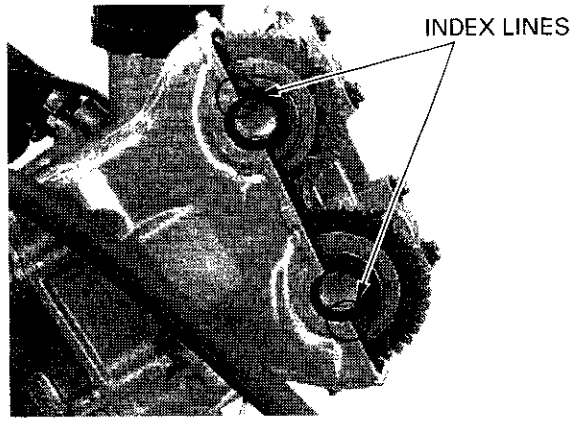
REAR CYLINDER CAMSHAFTS

If the front cylinder camshafts have not been serviced, remove the front cylinder head cover and check the front cylinder camshaft position as follows:

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



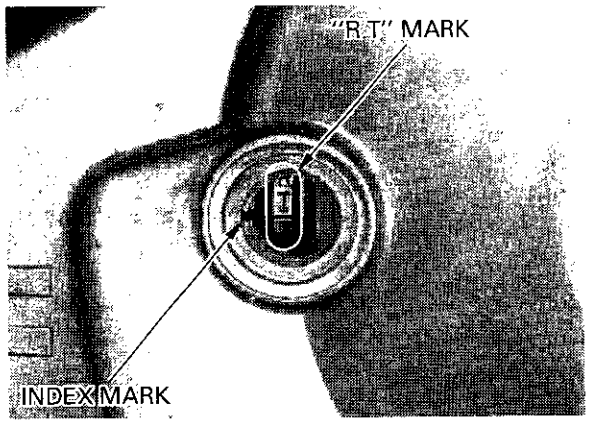
Check the index lines on the front cylinder camshafts.



If the index lines are facing outward, turn the crankshaft counterclockwise 3/4 turn (270°) and align the "R T" mark with the index mark.

If the index lines are facing inward, turn the crankshaft counterclockwise 1-3/4 turn (630°) and align the "R T" mark with the index mark.

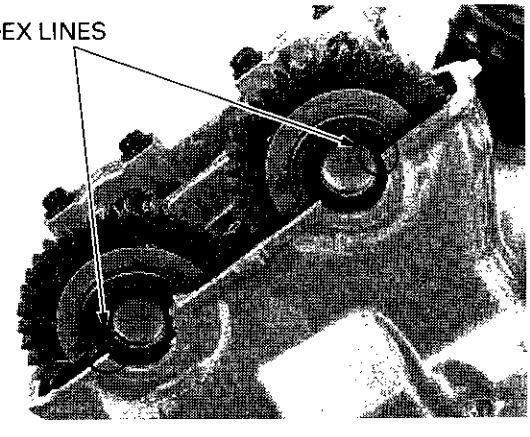
If the front cylinder camshafts have been serviced and installed, turn the crankshaft counterclockwise 3/4 turn (270°) and align the "R T" mark with the index mark.



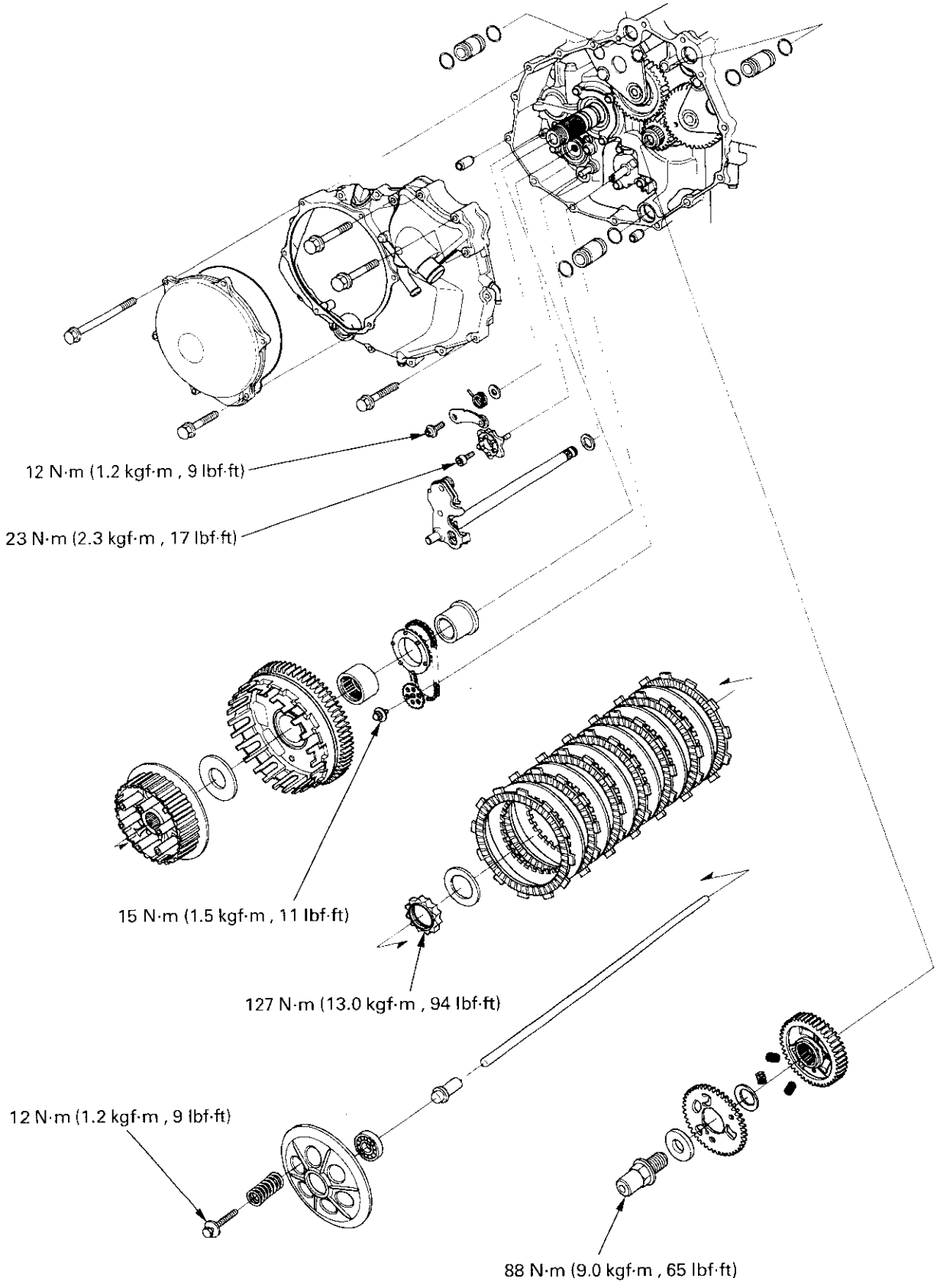
Install the rear cylinder camshafts and camshaft holders in the same procedures as for the front cylinder (page 8-19).

Make sure that the index lines on the camshafts are flush with the cylinder head surface.

Install the cylinder head covers (page 3-11).

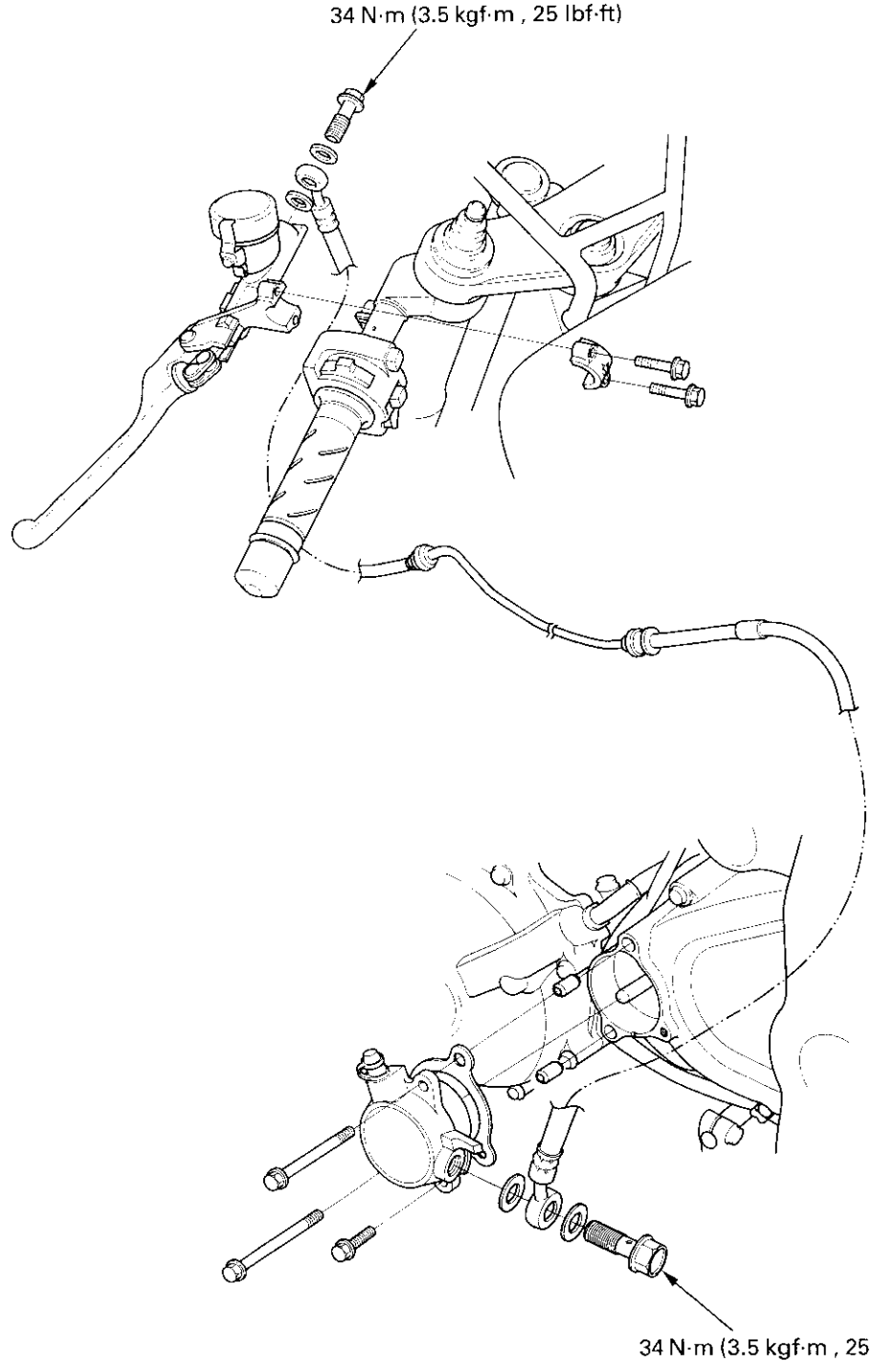


MEMO


12 N·m (1.2 kgf·m , 9 lbf·ft)
23 N·m (2.3 kgf·m , 17 lbf·ft)
15 N·m (1.5 kgf·m , 11 lbf·ft)
127 N·m (13.0 kgf·m , 94 lbf·ft)
12 N·m (1.2 kgf·m , 9 lbf·ft)
88 N·m (9.0 kgf·m , 65 lbf·ft)

9. CLUTCH/GEARSHIFT LINKAGE

SERVICE INFORMATION	9-2	CLUTCH SLAVE CYLINDER	9-10
TROUBLESHOOTING	9-3	CLUTCH	9-12
CLUTCH FLUID REPLACEMENT/ AIR BLEEDING	9-4	GEARSHIFT LINKAGE	9-21
CLUTCH MASTER CYLINDER	9-5	PRIMARY DRIVE GEAR	9-23



SERVICE INFORMATION

GENERAL

- The clutch system can be serviced with the engine in the frame.
- DOT 4 brake fluid is used for the hydraulic clutch and is referred to as clutch fluid in this section. Do not use other types of fluid as they are not compatible.
- Spilled clutch (brake) fluid will severely damage the plastic parts and painted surfaces. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap; make sure the reservoir is horizontal first.
- Never allow contaminants (dirt, water, etc.) to get into an open reservoir.
- Once the hydraulic system has been opened, 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 as they may not be compatible.
- Engine oil viscosity and level and the use of oil additives have an effect on clutch disengagement. Oil additives of any kind are specifically not recommended. When the clutch does not disengage or the motorcycle creeps with the clutch disengaged, inspect the engine oil viscosity and level before servicing the clutch system.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Specified clutch fluid		DOT 4 brake fluid	———
Clutch master cylinder	Cylinder I.D.	12.700 – 12.743 (0.5000 – 0.5017)	12.755 (0.5022)
	Piston O.D.	12.657 – 12.684 (0.4983 – 0.4994)	12.645 (0.4978)
Clutch	Spring free length	60.9 (2.40)	57.9 (2.28)
	Disc thickness	3.72 – 3.88 (0.146 – 0.153)	3.5 (0.14)
	Plate warpage	———	0.30 (0.012)
Clutch outer guide	I.D.	28.000 – 28.021 (1.1024 – 1.1032)	28.031 (1.1036)
	O.D.	34.997 – 35.013 (1.3778 – 1.3785)	34.987 (1.3774)
Mainshaft O.D. at clutch outer guide		27.980 – 27.993 (1.1016 – 1.1021)	27.970 (1.1012)

TORQUE VALUES

Clutch slave cylinder bleed valve	9 N·m (0.9 kgf·m , 6.5 lbf·ft)	
Clutch reservoir cap stopper plate screw	1 N·m (0.1 kgf·m , 0.7 lbf·ft)	
Clutch reservoir mounting screw	2 N·m (0.2 kgf·m , 1.4 lbf·ft)	Apply locking agent to the threads
Clutch lever pivot bolt	1 N·m (0.1 kgf·m , 0.7 lbf·ft)	
Clutch lever pivot nut	6 N·m (0.6 kgf·m , 4.3 lbf·ft)	
Clutch hose oil bolt	34 N·m (3.5 kgf·m , 25 lbf·ft)	
Clutch bolt	12 N·m (1.2 kgf·m , 9 lbf·ft)	
Clutch center lock nut	127 N·m (13.0 kgf·m , 94 lbf·ft)	Apply oil to the threads and seating surface and stake
Oil pump driven sprocket bolt	15 N·m (1.5 kgf·m , 11 lbf·ft)	Apply locking agent to the threads
Gearshift cam bolt	23 N·m (2.3 kgf·m , 17 lbf·ft)	Apply locking agent to the threads
Shift drum stopper arm pivot bolt	12 N·m (1.2 kgf·m , 9 lbf·ft)	
Primary drive gear bolt	88 N·m (9.0 kgf·m , 65 lbf·ft)	Apply oil to the threads and seating surface

TOOLS

Snap ring pliers	07914-SA50001
Clutch center holder	07724-0050002
Driver	07749-0010000
Attachment, 32 × 35 mm	07746-0010100
Pilot, 17 mm	07746-0040400
Attachment, 37 × 40 mm	07746-0010200
Attachment, 42 × 47 mm	07746-0010300
Pilot, 35 mm	07746-0040800
Gear holder	07724-0010100

TROUBLESHOOTING

Clutch lever too hard
- Sticking piston
- Clogged hydraulic system

Clutch slips
- Sticking piston
- Clogged hydraulic system
- Discs worn
- Weak clutch spring

Clutch will not disengage or motorcycle creeps with clutch disengaged
- Air in hydraulic system
- Low clutch fluid level
- Sticking piston
- Leaking hydraulic system
- Warped plates
- Oil level too high, improper oil viscosity or oil additive used.

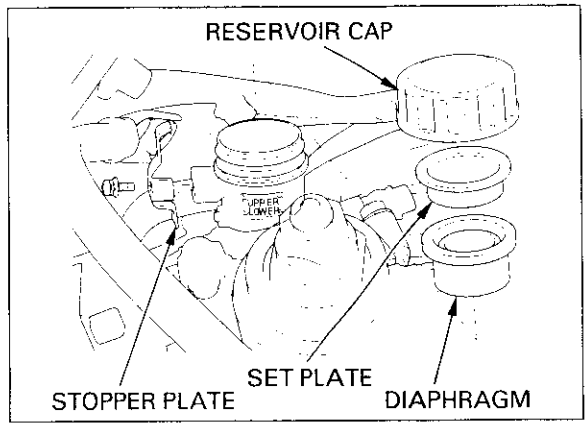
CLUTCH FLUID REPLACEMENT/ AIR BLEEDING

CAUTION:

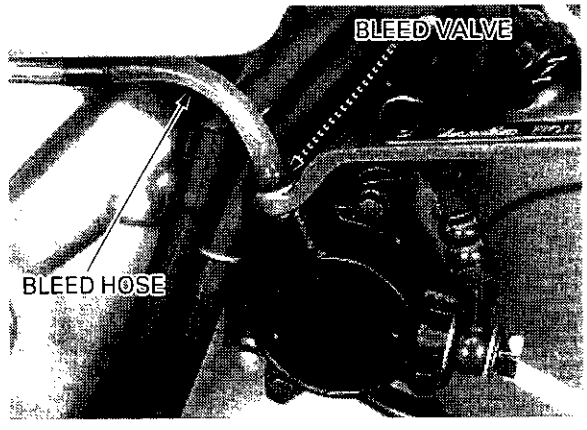
- ***Do not allow foreign material to enter the system when filling the reservoir.***
- ***Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.***

CLUTCH FLUID DRAINING

Turn the handlebar to the right until the reservoir is level, and remove the stopper plate, reservoir cap, set plate and diaphragm.



Connect a bleed hose to the clutch slave cylinder bleed valve.
Loosen the bleed valve and pump the clutch lever until no more fluid flows out of the bleed valve.

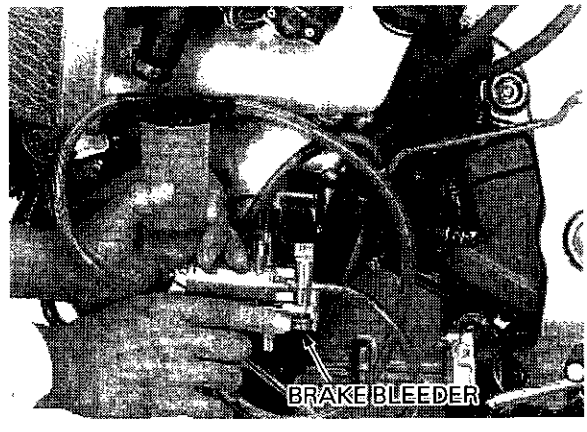


CLUTCH FLUID FILLING/BLEEDING

Fill the reservoir with DOT 4 brake fluid from a sealed container.

CAUTION:

Do not mix different types of fluid. They are not compatible.



Connect a commercially available brake bleeder to the bleed valve.
Loosen the bleed valve and pump the brake bleeder.
Add brake fluid when the fluid level in the reservoir is low.

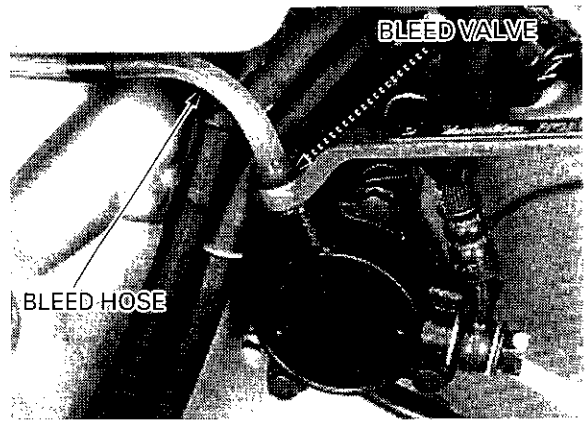
NOTE:

- Check the fluid level often while bleeding the clutch to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.

If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Repeat the above procedures until new fluid appear coming out of the bleed valve and air bubbles do not appear in the plastic hose.

If a brake bleeder is not available, use the following procedure:
Pump up the system pressure with the clutch lever until the lever resistance is felt.



Connect a bleed hose to the bleed valve and bleed the system as follows:
1. Squeeze the clutch lever, open the bleed valve 1/2 turn and then close it.

NOTE:

Do not release the clutch lever until the bleed valve has been closed.

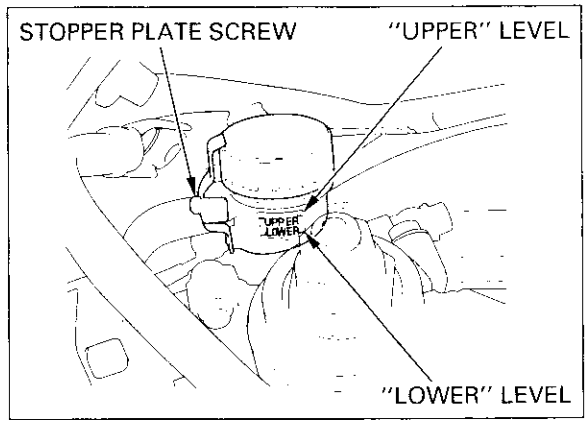
2. Release the clutch lever slowly and wait several seconds after it reaches the end of its travel.

Repeat the steps 1 and 2 until air bubbles do not appear in the bleed hose.

Tighten the bleed valve.

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

Fill the reservoir to the upper level mark with DOT 4 brake fluid from a sealed container.



Install the diaphragm, set plate, reservoir cap and stopper plate, and tighten the stopper plate screw.

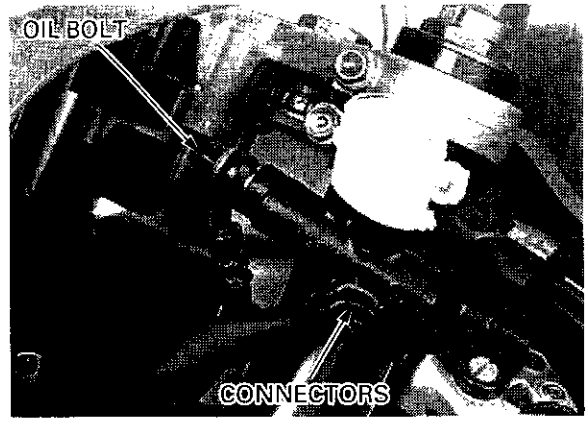
TORQUE: 1 N·m (0.1 kgf·m , 0.7 lbf·ft)

CLUTCH MASTER CYLINDER

CAUTION:

- ***Avoid spilling clutch fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.***
- ***When removing the oil bolt, cover the end of the hose to prevent contamination.***

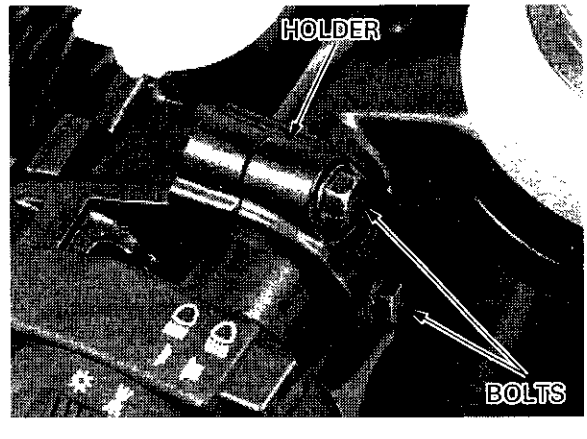
DISASSEMBLY



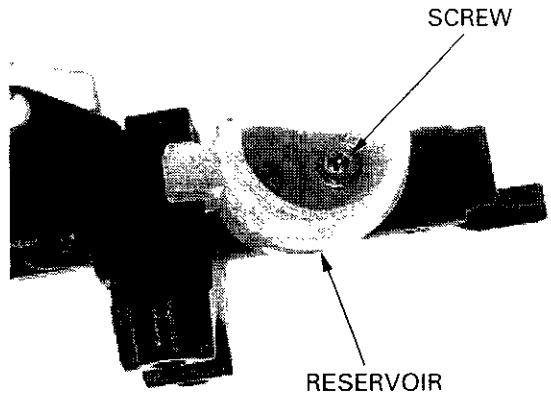
Drain the clutch fluid from the hydraulic system (page 9-4).

Disconnect the clutch switch connectors.
Disconnect the clutch hose from the master cylinder by removing the oil bolt and sealing washers.

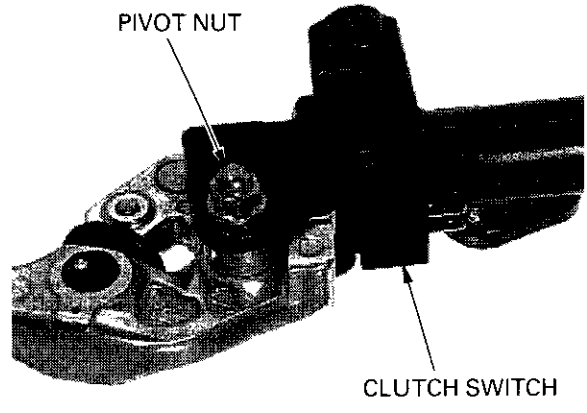
Remove the master cylinder holder bolts, holder and the master cylinder.



Remove the screw, fluid reservoir and O-rings from the master cylinder.

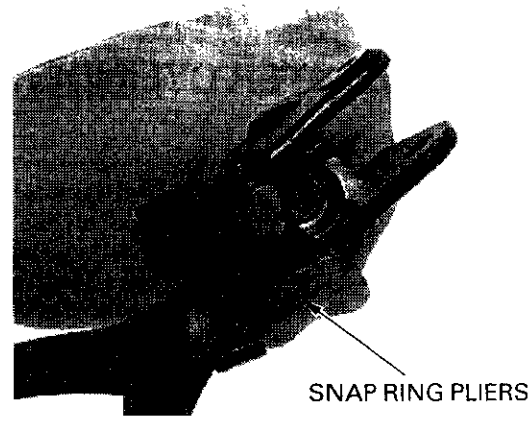


Remove the screw and clutch switch.
Remove the pivot nut, bolt and clutch lever assembly.
Remove the push rod and piston boot.



Remove the snap ring with the special tool.

TOOL:
Snap ring pliers 07914-SA50001



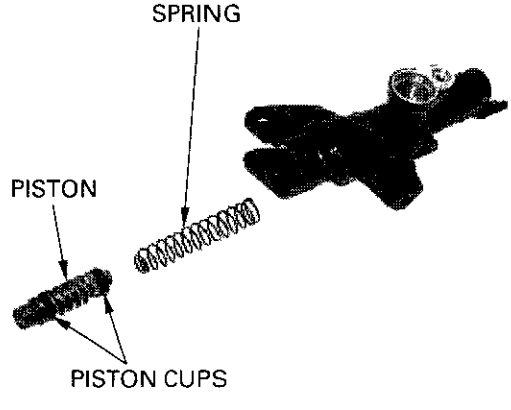
Remove the master piston and spring.

Clean the master cylinder, reservoir and master piston in clean clutch fluid.

INSPECTION

Check the piston cups for wear, deterioration or damage.

Check the spring for damage.



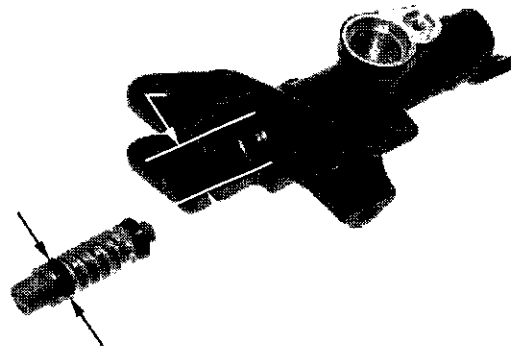
Check the master cylinder and piston for scoring or damage.

Measure the master cylinder I.D.

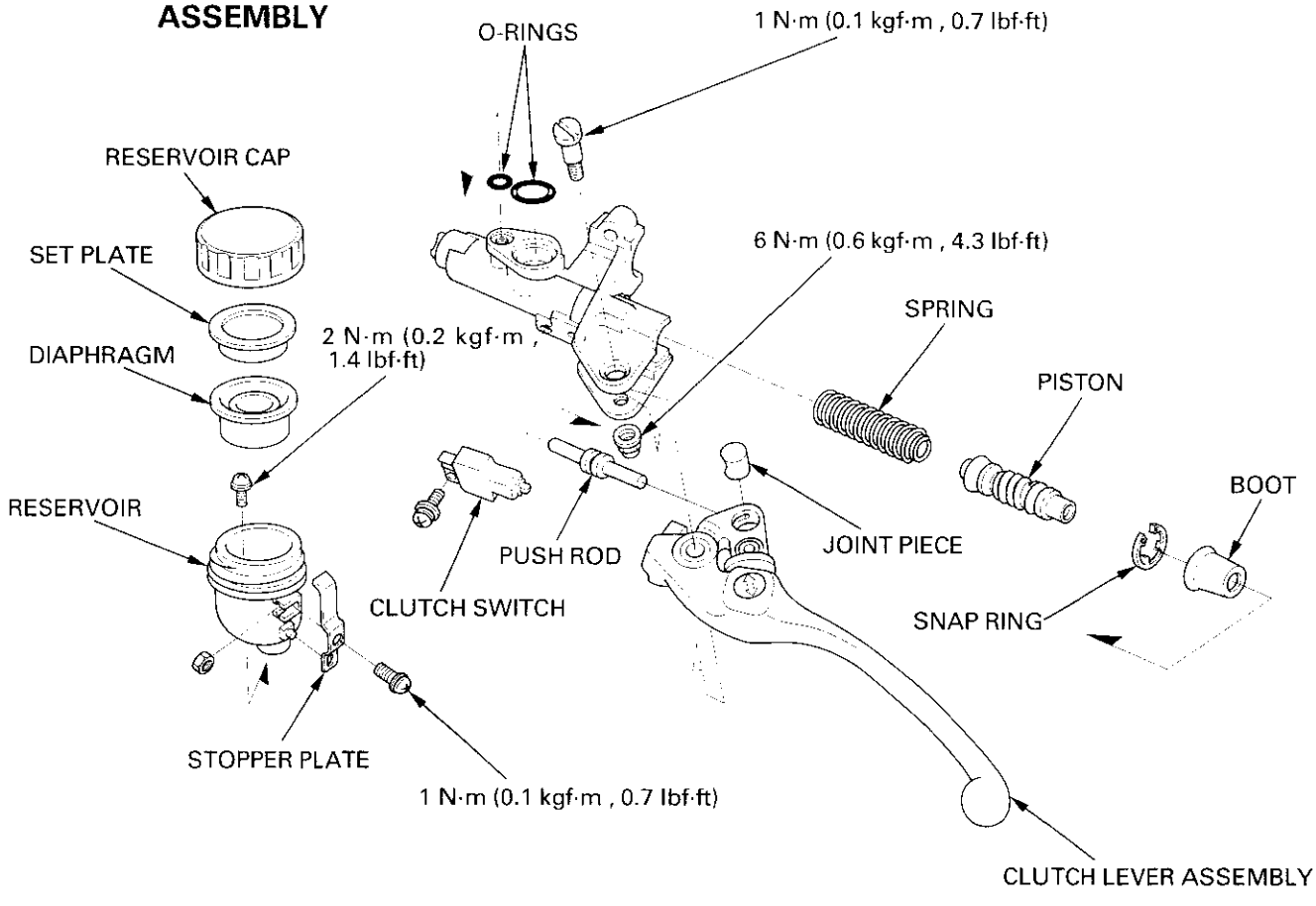
SERVICE LIMIT: 12.755 mm (0.5022 in)

Measure the master piston O.D.

SERVICE LIMIT: 12.645 mm (0.4978 in)



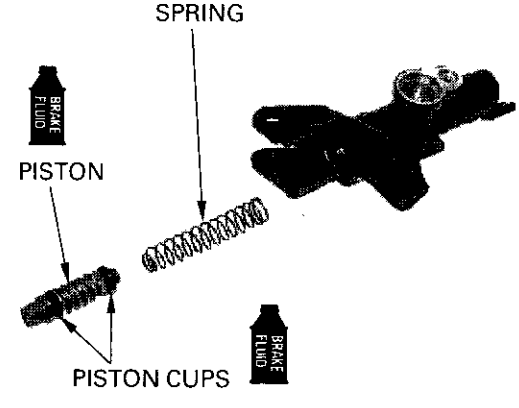
ASSEMBLY



Coat the master piston and piston cups with clean clutch fluid.
Install the spring and master piston into the master cylinder.

CAUTION:

Do not allow the piston cup lips to turn inside out.

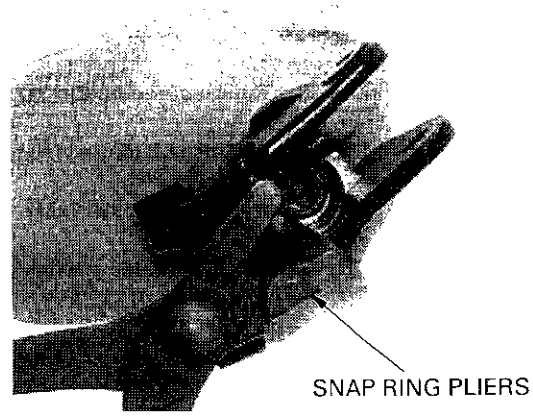


Install the snap ring into the groove in the master cylinder, using the special tool.

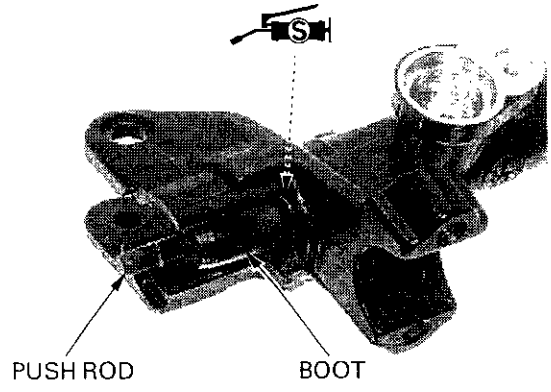
TOOL:
Snap ring pliers 07914-SA50001

CAUTION:

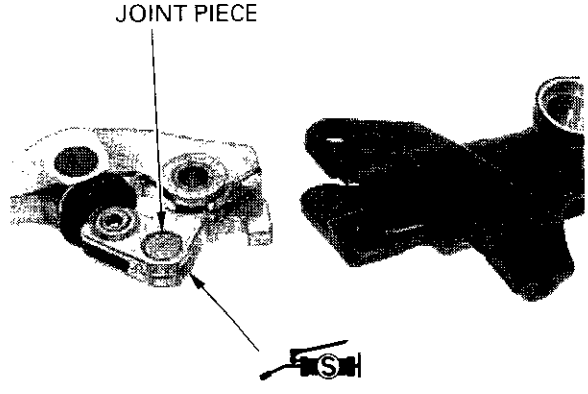
Be certain the snap ring is firmly seated in the groove.



Apply silicone grease to the push rod contacting area of the master piston.
Install the boot onto the push rod.
Install the boot and push rod into the master cylinder.



Apply silicone grease to the push rod hole in the clutch lever joint piece.
Insert the push rod into the hole in the joint piece and install the clutch lever assembly onto the master cylinder.



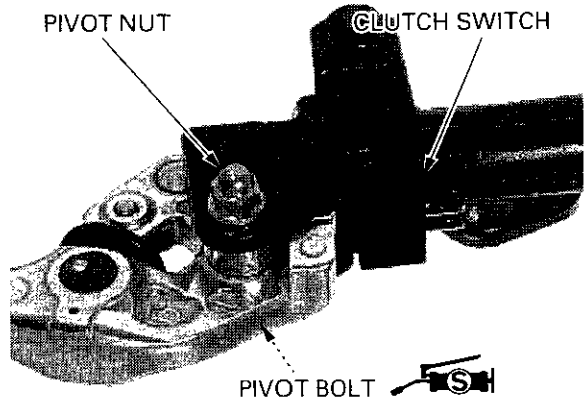
Apply silicone grease to the pivot bolt sliding surface, install and tighten the pivot bolt.

TORQUE: 1 N·m (0.1 kgf·m , 0.7 lbf·ft)

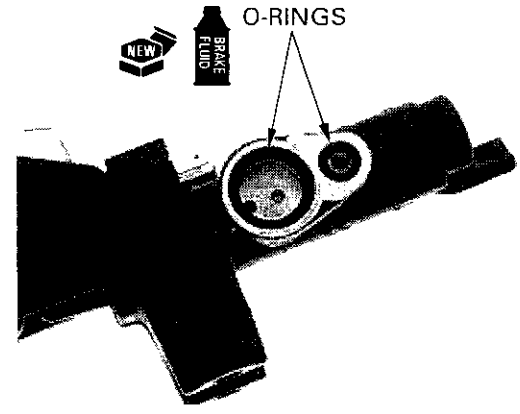
Install and tighten the pivot nut.

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

Install the clutch switch with the screw.

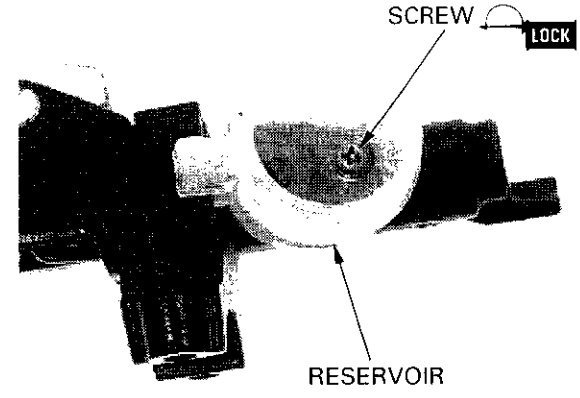


Coat new O-rings with clutch fluid and install them onto the master cylinder.

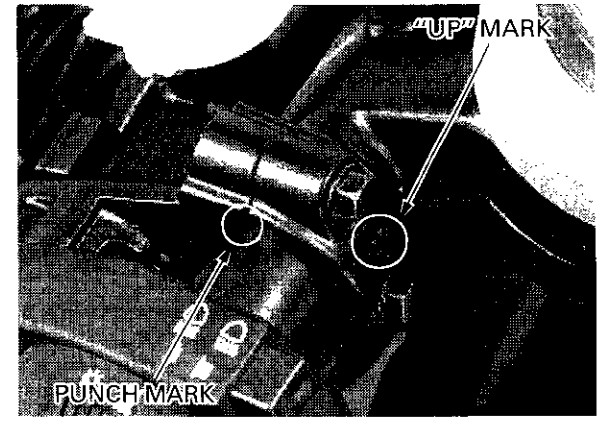


Apply locking agent to the reservoir mounting screw threads.
Install the reservoir and tighten the mounting screw.

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



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



Connect the clutch hose to the master cylinder with the oil bolt and new sealing washers.
Rest the hose joint against the stopper and tighten the oil bolt.

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

Connect the clutch switch connectors.

Fill and bleed the clutch hydraulic system (page 9-4).

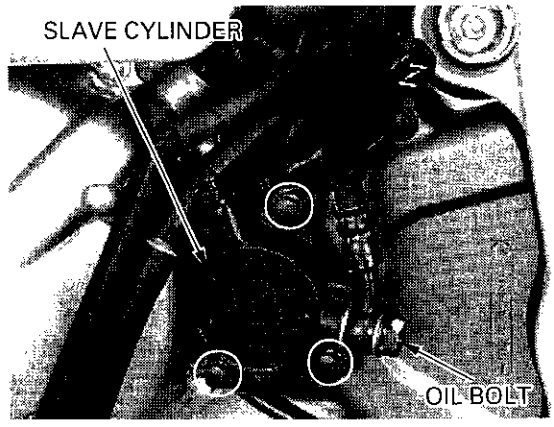


CLUTCH SLAVE CYLINDER

DISASSEMBLY

Drain the clutch fluid from the hydraulic system (page 9-4).

Disconnect the clutch hose from the slave cylinder by removing the oil bolt and sealing washers.

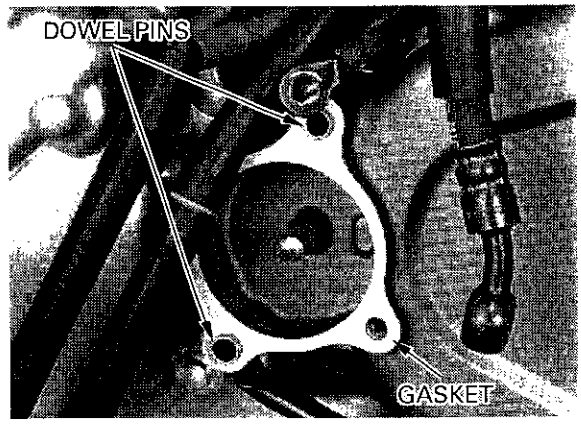


CAUTION:

Avoid spilling clutch fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.

Loosen the upper drive sprocket cover bolt attaching the choke knob stay.
Remove the three mounting bolts and slave cylinder.

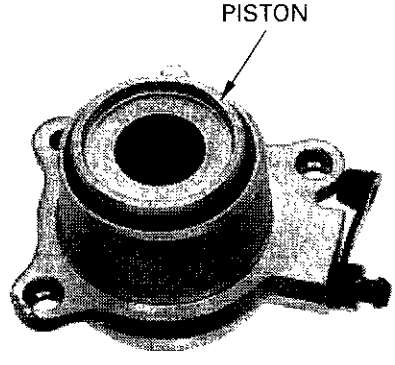
Remove the gasket and dowel pins.



Remove the piston from the slave cylinder.
If piston removal is hard, place a shop towel over the piston, position the cylinder body with the piston down and apply small squirts of air pressure to the fluid inlet.

⚠WARNING

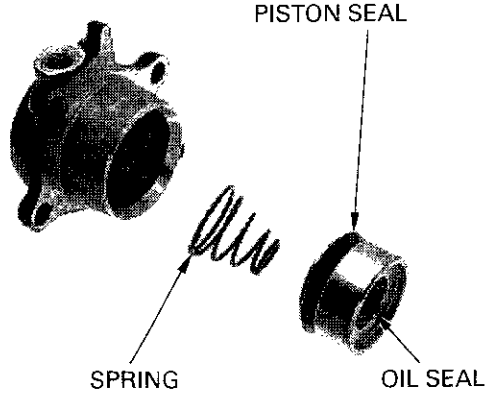
Do not use high pressure air or bring the nozzle too close to the inlet.



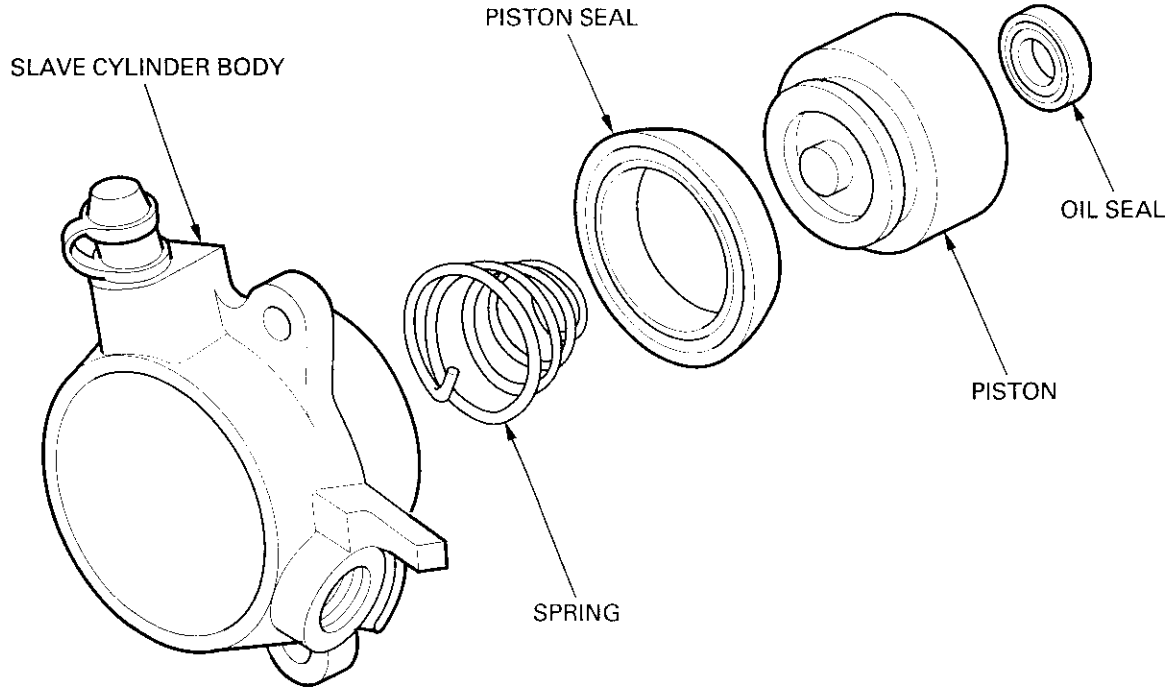
Remove the spring, piston seal and oil seal from the piston.

INSPECTION

Check the piston spring for weakness or damage.
Check the slave cylinder and piston for scoring or damage.

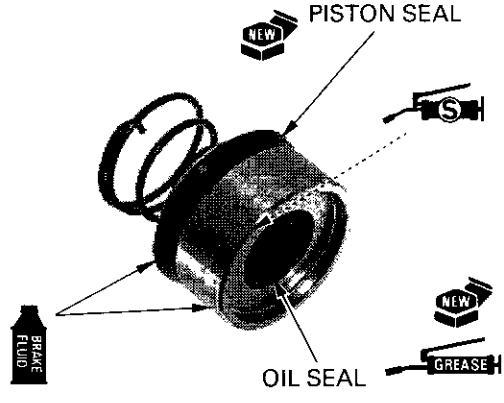


ASSEMBLY

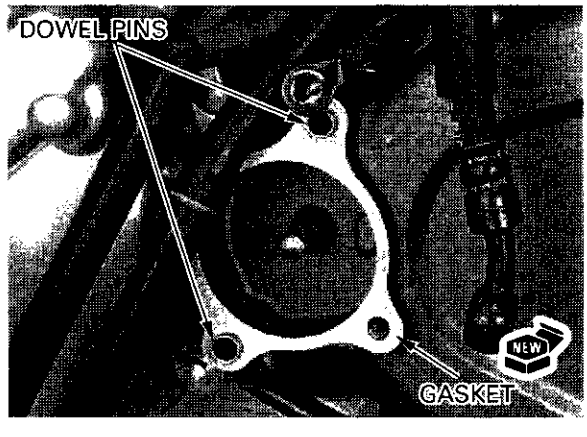


Apply small amount of silicone grease to the lifter rod contacting area of the piston.
Apply grease to new oil seal lips and install the oil seal into the piston.
Install a new piston seal into the piston groove.
Install the piston spring onto the piston.

Coat the piston and piston seal with clutch fluid and install piston and spring into the slave cylinder.



Install the dowel pins and a new gasket onto the drive sprocket cover.

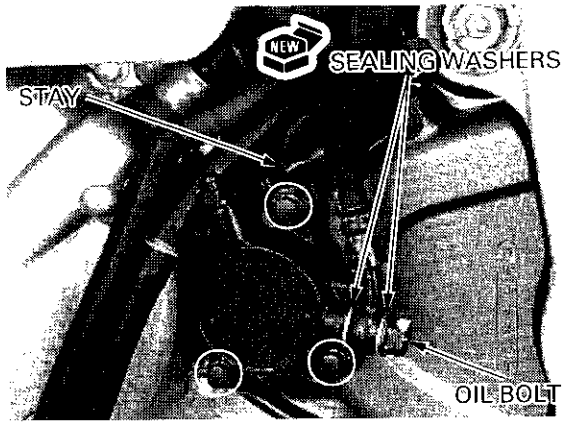


Install the slave cylinder onto the drive sprocket cover with the choke knob stay and tighten the mounting bolts securely.
Tighten the upper drive sprocket cover bolt securely.

Connect the clutch hose to the slave cylinder with the oil bolt and new sealing washers.
Tighten the oil bolt.

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

Fill and bleed the clutch hydraulic system (page 9-4).



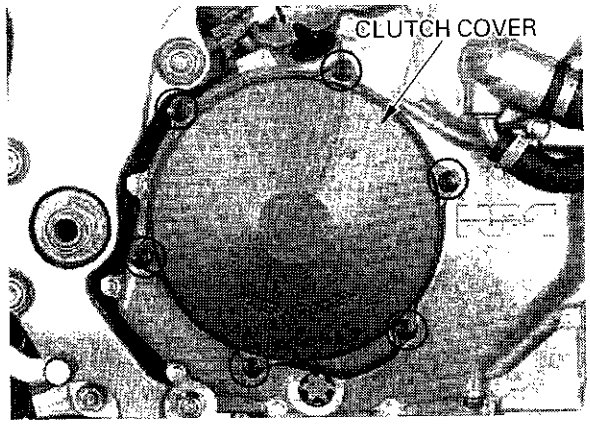
CLUTCH

NOTE:

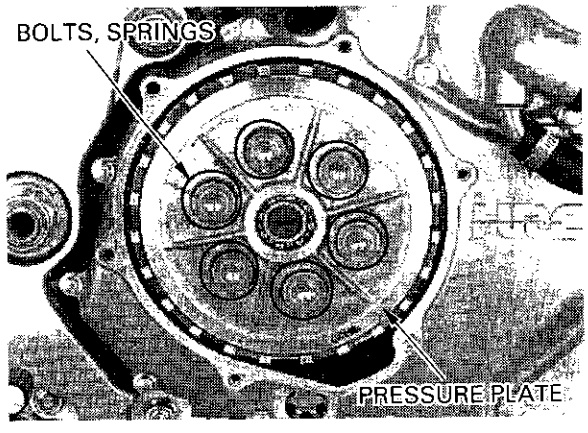
All clutch components except the clutch outer can be serviced by removing the clutch cover. For the clutch outer service, the right crankcase cover must be removed.

DISASSEMBLY

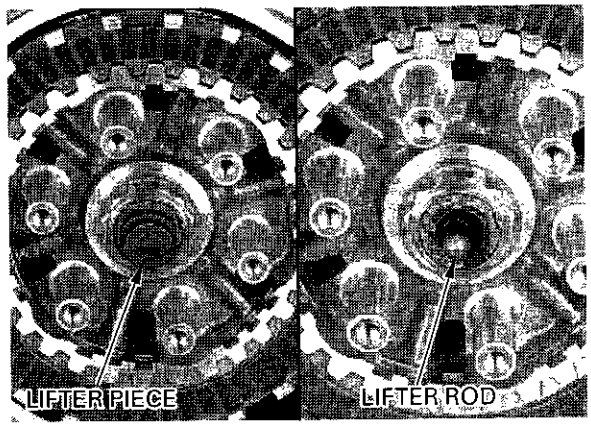
Remove the six bolts and the clutch cover.



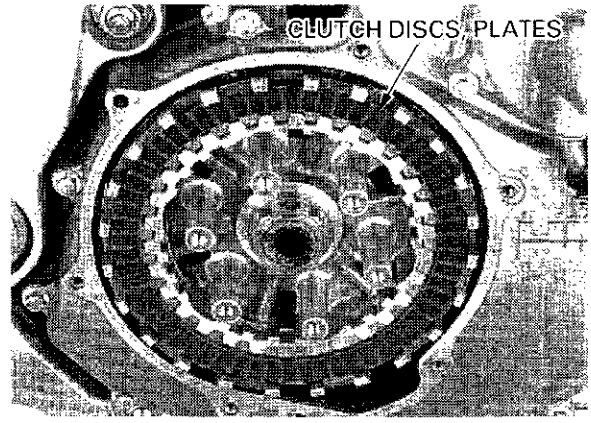
Remove the clutch bolts, springs and pressure plate.



Remove the clutch lifter piece and clutch lifter rod from the mainshaft.

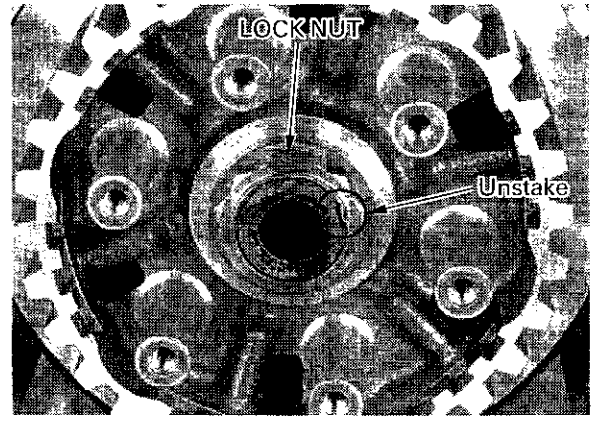


Remove the seven clutch discs and six plates.



Be careful not to damage the mainshaft threads.

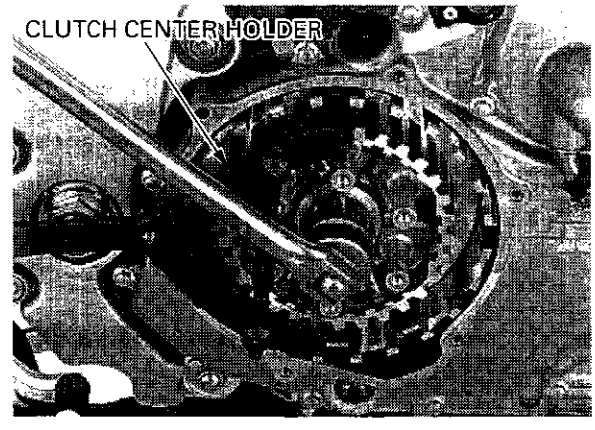
Unstake the clutch center lock nut.



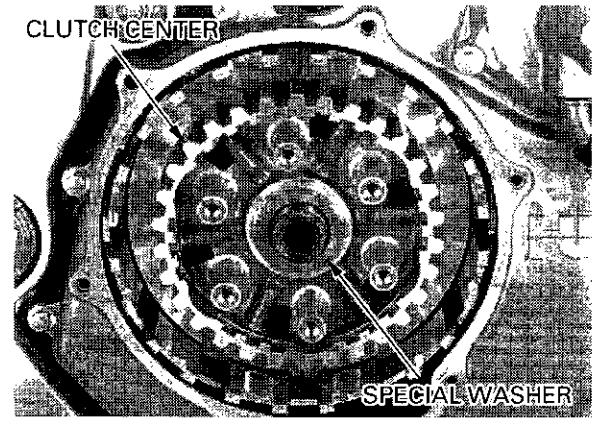
Hold the clutch center with the special tool and remove the clutch center lock nut.

TOOL:

Clutch center holder	07724-0050002

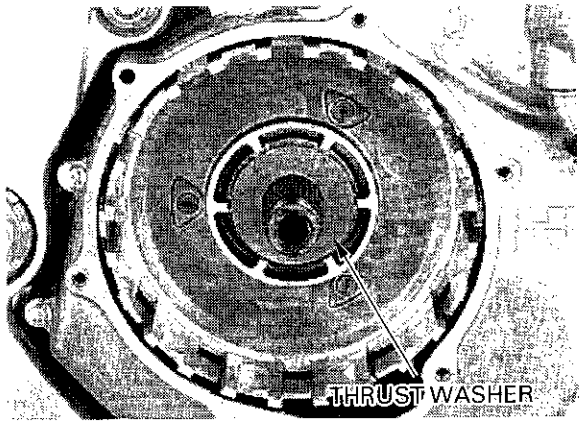


Remove the special washer and clutch center.



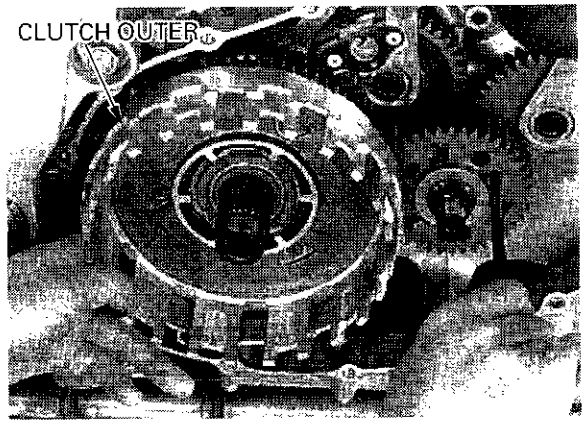
Remove the thrust washer.

Remove the right crankcase cover (page 6-11).

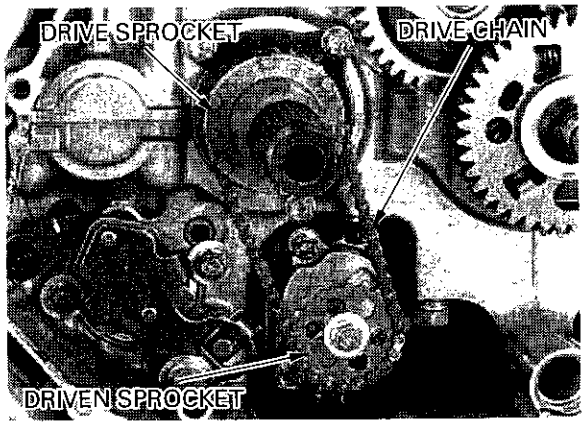


When the oil pump driven sprocket will be removed, loosen the driven sprocket bolt with the clutch outer still installed.

Align the gear teeth of the scissors gears (primary drive gear and sub-gear) by inserting a screwdriver into the gear holes, and remove the clutch outer.



Remove the oil pump driven sprocket bolt and washer.
Remove the oil pump driven sprocket, drive chain and drive sprocket as a set.
Remove the clutch outer guide.



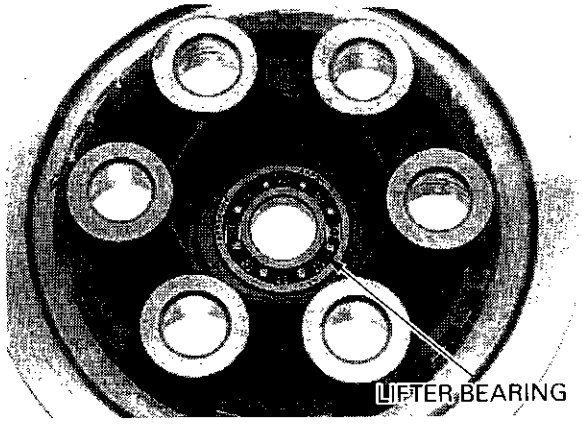
INSPECTION

LIFTER BEARING

Turn the inner race of the lifter bearing with your finger.
The bearing should turn smoothly and quietly.
Also check that the outer race of the bearing fits tightly in the pressure plate.
Replace the bearing if the inner race does not turn smoothly, quietly, or if the outer race fits loosely in the pressure plate.

Drive the bearing out of the pressure plate.

Drive a new bearing into the plate with its mark side facing out.



TOOLS:

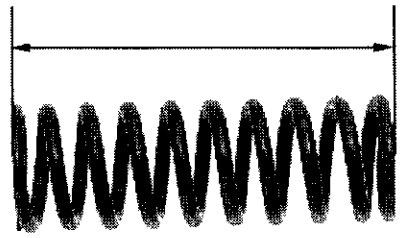
Driver	07749-0010000
Attachment, 32 × 35 mm	07746-0010100
Pilot, 17 mm	07746-0040400

CLUTCH SPRING

Replace the clutch springs as a set

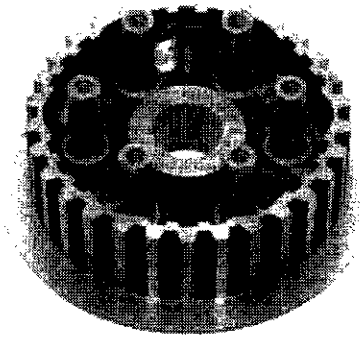
Measure the clutch spring free length.

SERVICE LIMIT: 57.9 mm (2.28 in)



CLUTCH CENTER

Check the clutch center and pressure plate for nicks, indentations or abnormal wear made by the plates.



CLUTCH LIFTER ROD

Check the clutch lifter rod for bending or damage.

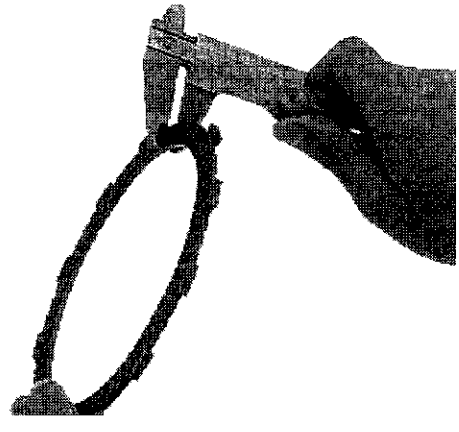


CLUTCH DISC

Replace the clutch discs and plates as a set.

Check the clutch discs for signs of scoring or discoloration.
Measure the clutch disc thickness.

SERVICE LIMIT: 3.5 mm (0.14 in)

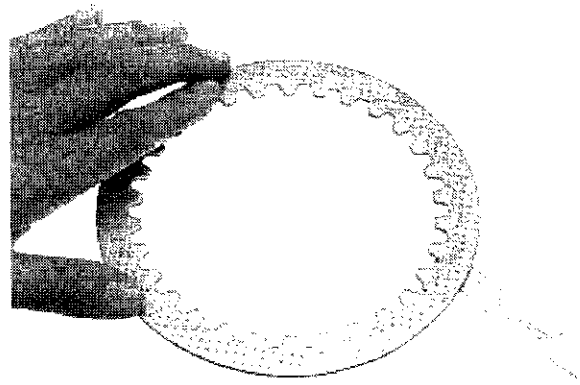


CLUTCH PLATE

Replace the clutch discs and plates as a set.

Check the plates for discoloration.
Check the plate warpage on a surface plate using a feeler gauge.

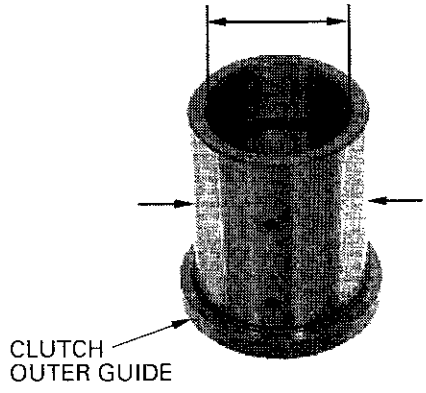
SERVICE LIMIT: 0.30 mm (0.012 in)



CLUTCH OUTER GUIDE

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

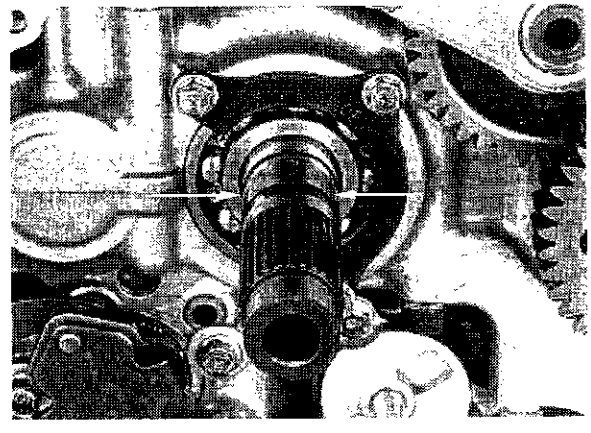
SERVICE LIMITS: I.D. : 28.031 mm (1.1036 in)
O.D. : 34.987 mm (1.3774 in)



MAINSHAFT

Measure the mainshaft O.D. at the clutch outer guide.

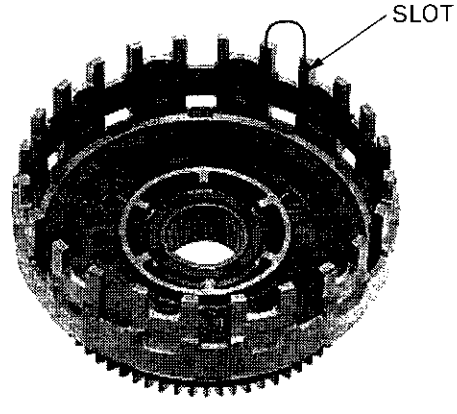
SERVICE LIMIT: 27.970 mm (1.1012 in)



CLUTCH OUTER

Check the slots in the clutch outer for nicks, indentations or abnormal wear made by the clutch discs.

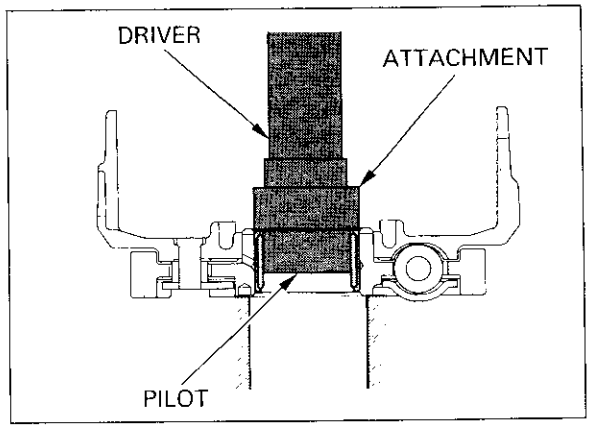
Check the needle bearing for wear or damage. Replace the bearing if necessary.



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

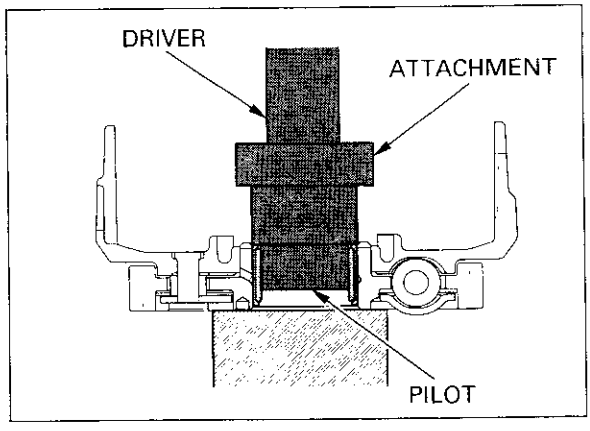


Press in the bearing with the marking side facing up.

Press the needle bearing in the clutch outer until it is flush with the inner edge of the clutch outer, using the special tools.

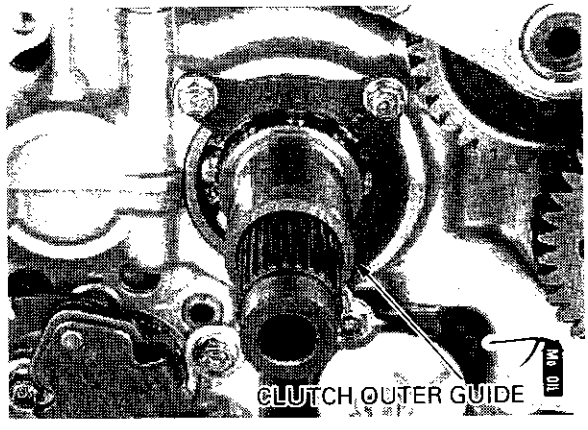
TOOLS:

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



ASSEMBLY

Coat the clutch outer guide with molybdenum oil solution and install it onto the mainshaft with the flange side facing the crankcase.

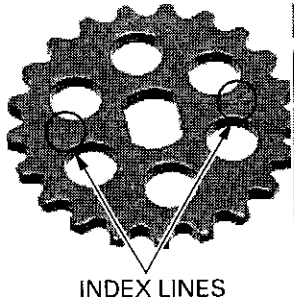


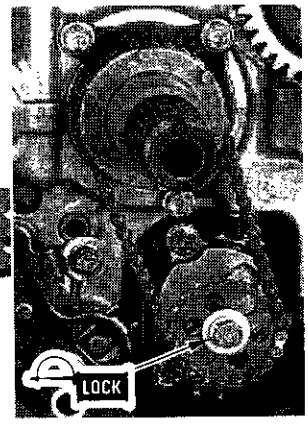
Install the oil pump drive sprocket, drive chain and driven sprocket as a set with the index lines on the driven sprocket facing in.

Apply locking agent to the oil pump driven sprocket bolt threads and install the washer and bolt.

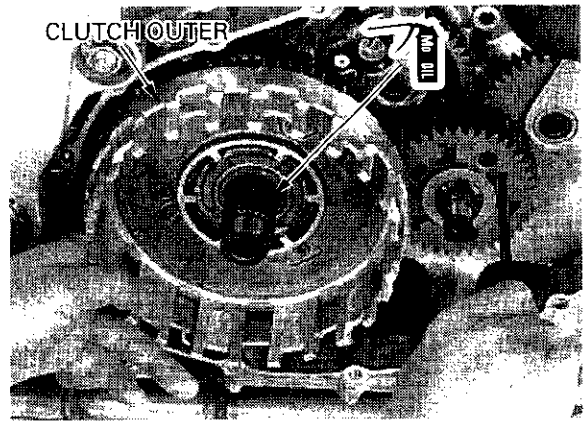
NOTE:

Tighten the driven sprocket bolt to the specified torque after installing the clutch outer.





Apply molybdenum oil solution to the clutch outer needle bearing.
Align the gear teeth of the scissors gears (primary drive gear and sub-gear) by inserting a screwdriver into the gear holes, and install the clutch outer.

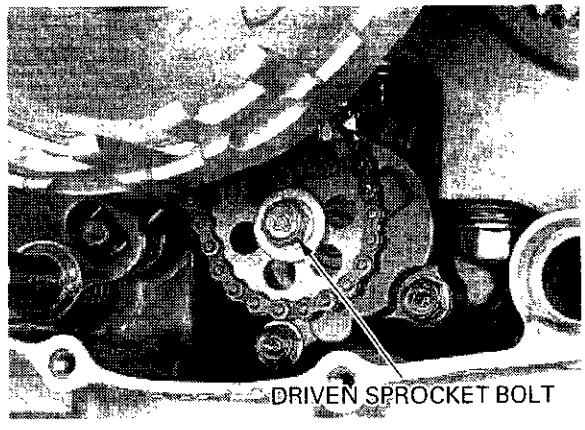


Align the holes in the clutch outer with the pins on the oil pump drive sprocket by turning the oil pump driven sprocket while pushing in the clutch outer.

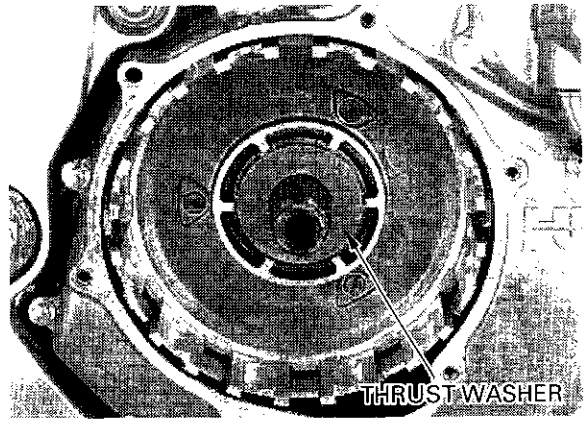
Tighten the oil pump driven sprocket bolt if it was removed.

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

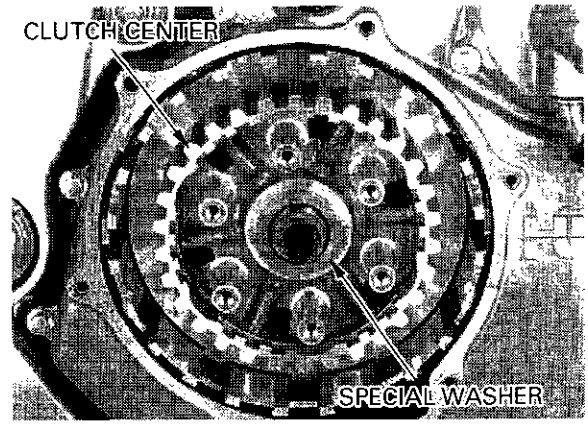
Install the right crankcase cover (page 6-12).



Install the thrust washer.



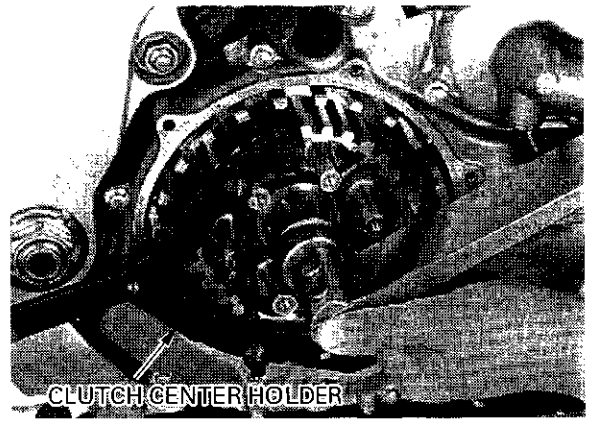
Install the clutch center and special washer.



Apply oil to the threads and seating surface of a new clutch center lock nut and install it onto the mainshaft.
Hold the clutch center with the special tool and tighten the lock nut.

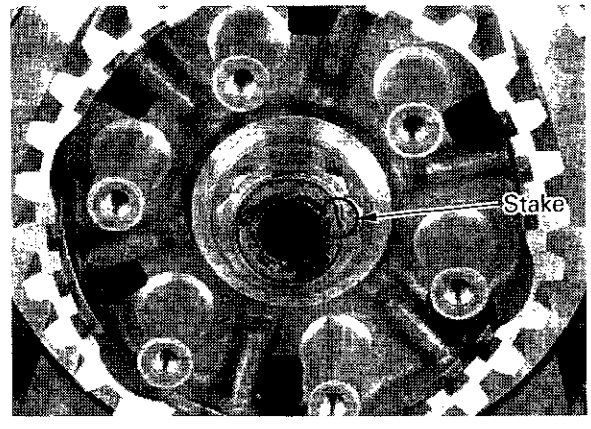
TOOL:
Clutch center holder 07724-0050002

TORQUE: 127 N·m (13.0 kgf·m , 94 lbf·ft)



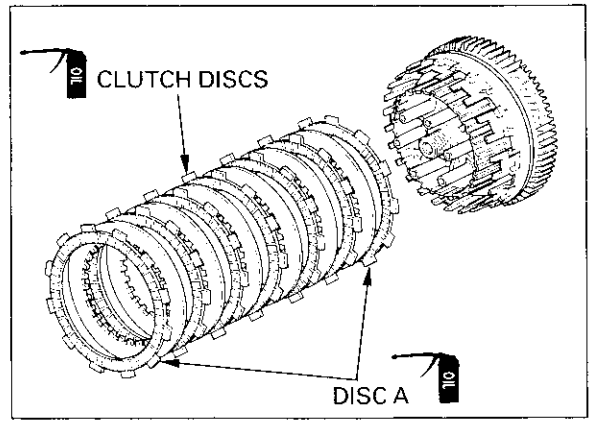
Be careful not to damage the mainshaft threads.

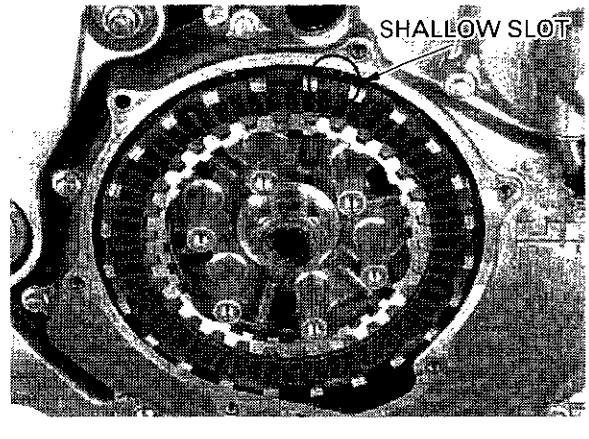
Stake the clutch center lock nut into the mainshaft groove.



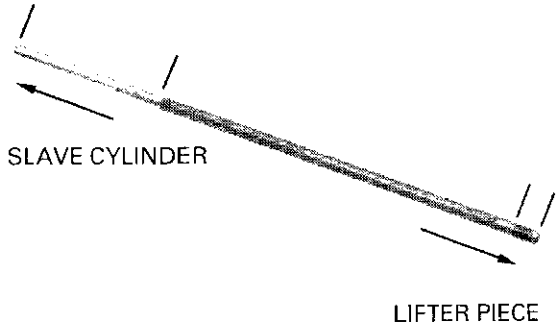
Install the tabs of outside clutch disc A into the shallow slots of the clutch outer.

Coat the clutch discs with clean engine oil.
Install the seven clutch discs and six plates alternately, starting with disc A. (Two clutch discs A are installed onto each ends)

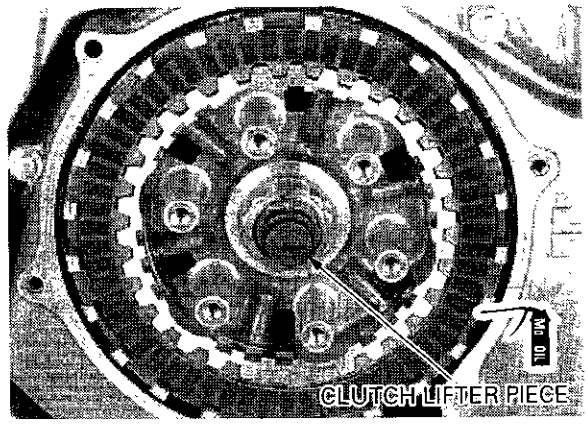




Note the clutch lifter rod installation direction and install it into the mainshaft.

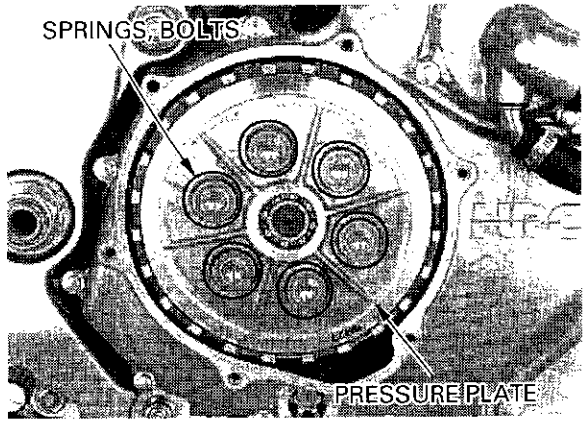


Coat the clutch lifter piece with molybdenum oil solution and install it into the mainshaft.



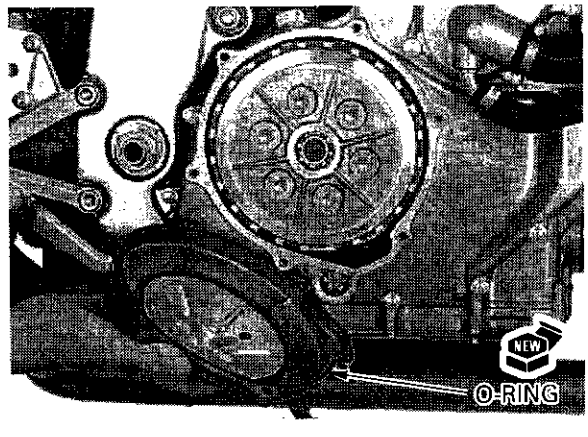
Install the clutch pressure plate, clutch springs and clutch bolts.
Tighten the clutch bolt in a crisscross pattern in several steps.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)



Install a new O-ring into the clutch cover.
Install the clutch cover and tighten the six bolts in a crisscross pattern in 2 or 3 steps.

Check the engine oil level and add recommended engine oil if necessary (page 3-13).

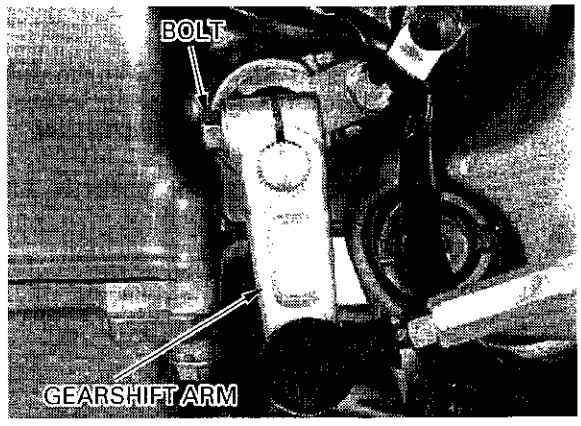


GEARSHIFT LINKAGE

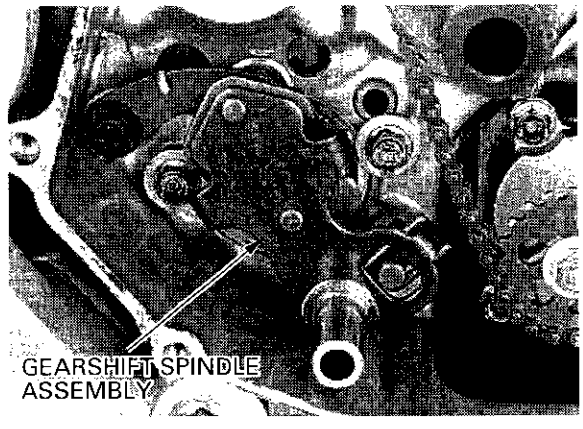
REMOVAL

Remove the right crankcase cover (page 6-11).
Disassemble the clutch to the clutch outer (page 9-12).

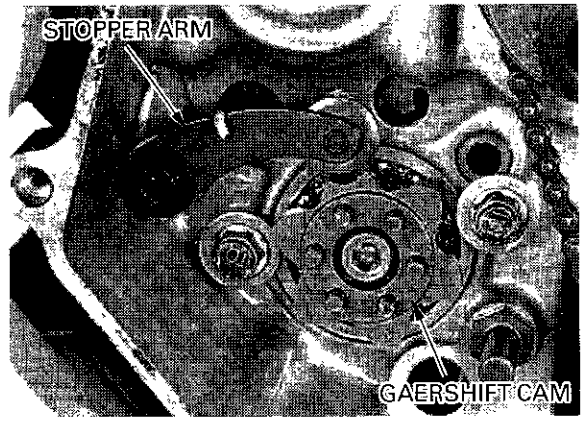
Remove the gearshift arm from the gearshift spindle.



Remove the gearshift spindle assembly and thrust washer.

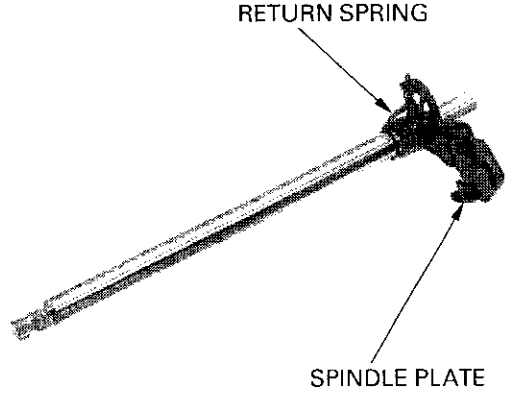


Remove the gearshift cam bolt and gearshift cam.
Remove the stopper arm bolt, arm, washer and return spring.
Remove the dowel pin from the shift drum.



INSPECTION

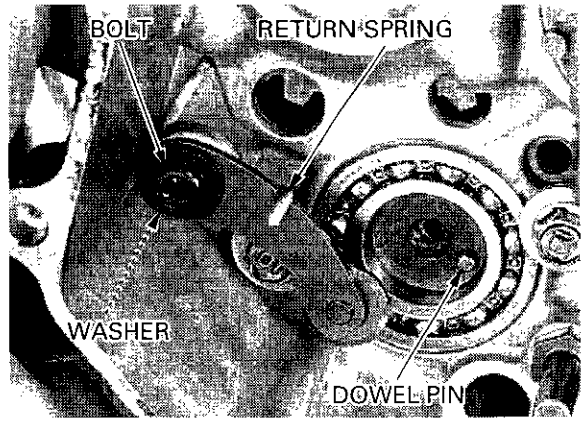
Check the gearshift spindle for bending.
Check the spindle plate for wear or damage.
Check the spindle return spring for fatigue or damage.



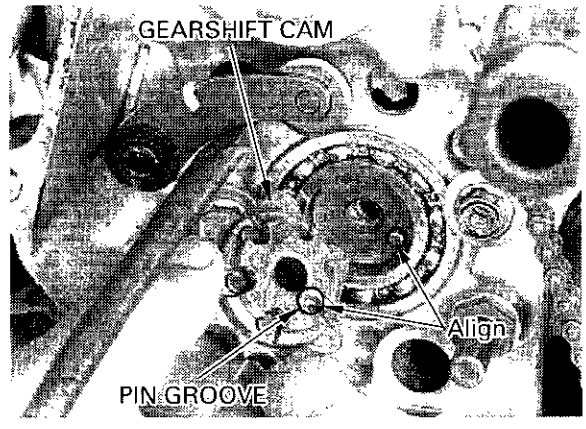
INSTALLATION

Install the dowel pin into the shift drum.
Install the return spring, washer, stopper arm and pivot bolt, and tighten the bolt.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

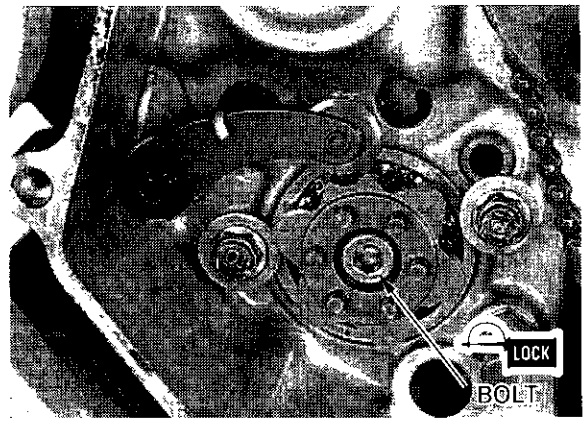


Lift the stopper arm with a screwdriver and install the gearshift cam by aligning the pin groove in the cam with the dowel pin.

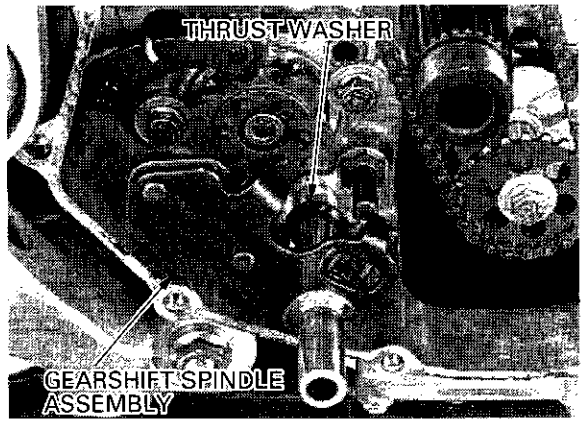


Apply locking agent to the gearshift cam bolt threads.
Install and tighten the bolt.

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

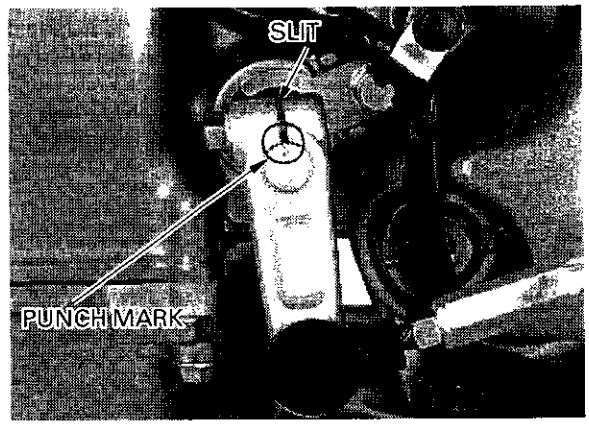


Install the thrust washer onto the gearshift spindle, and insert the spindle into the crankcase, aligning the return spring ends with the spring pin.



Install the gearshift arm onto the spindle, aligning the slit of the arm with the punch mark on the spindle.
Tighten the gearshift arm bolt securely.

Assemble the clutch (page 9-18).
Install the right crankcase cover (page 6-12).



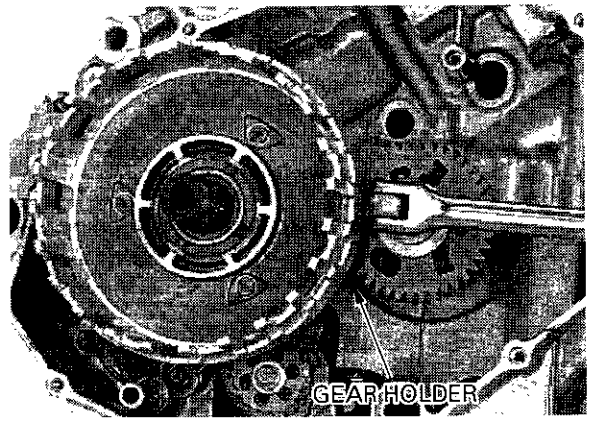
PRIMARY DRIVE GEAR

REMOVAL

Remove the right crankcase cover (page 6-11).
Disassemble the clutch to the clutch center thrust washer (page 9-12).

The primary drive gear bolt has lefthand threads.

Install the special tool between the primary drive and driven gears as shown, loosen the primary drive gear bolt.



CAUTION:

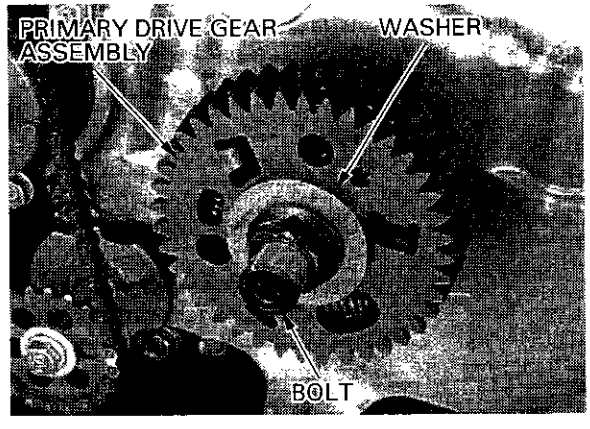
Be careful not to damage the sealing surface of the primary drive gear bolt.

TOOL:
Gear holder 07724-0010100

Remove the clutch outer (page 9-11).

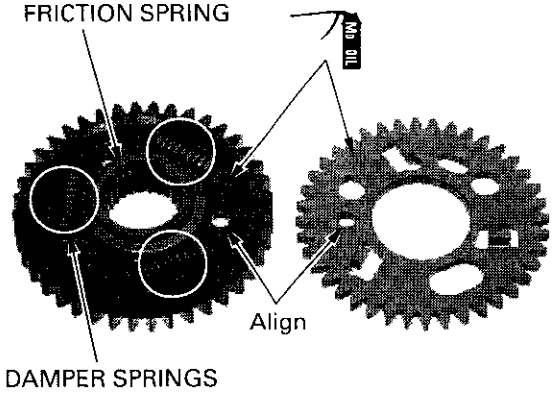
Remove the bolt, special washer and primary drive gear assembly.

To remove the timing gear, remove the front and rear cylinder cam gear train assemblies (page 8-13).



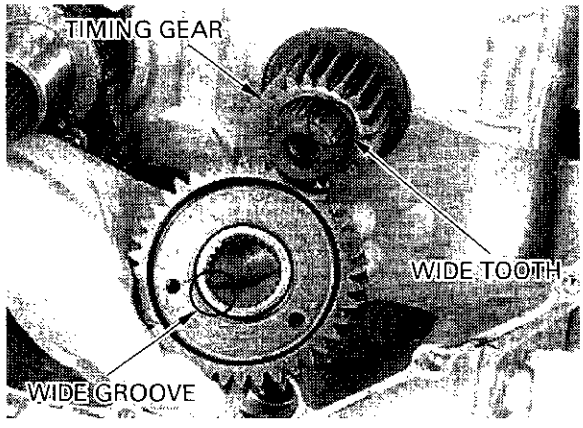
INSTALLATION

Install the damper springs into the primary drive gear grooves.
Install the friction spring onto the primary drive gear with the concaved side facing the sub-gear.
Apply molybdenum oil solution to the primary drive gear and sub-gear sliding surfaces.
Install the sub-gear onto the primary drive gear boss so that the sub-gear tabs are positioned against the damper spring and the holes in the gears are aligned as shown.



Install the timing gear onto the crankshaft, aligning the wide groove with the wide tooth.

Install the primary drive gear assembly, aligning the wide grooves with the wide tooth.

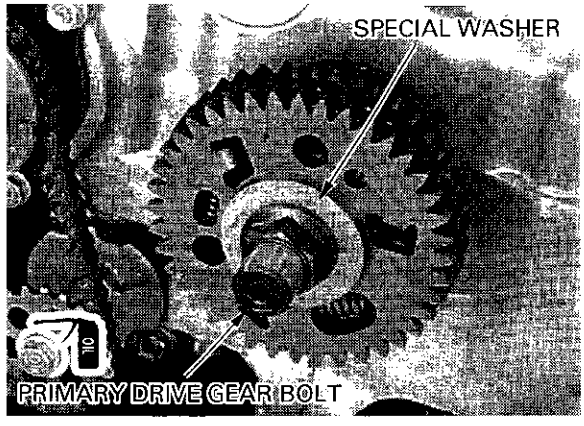


Apply oil to the threads and seating surface of the primary drive gear bolt.
Install the special washer and primary drive gear bolt.

CAUTION:

Be careful not to damage the sealing surface of the primary drive gear bolt.

Install the clutch outer (page 9-17).



The primary drive gear bolt has left hand threads.

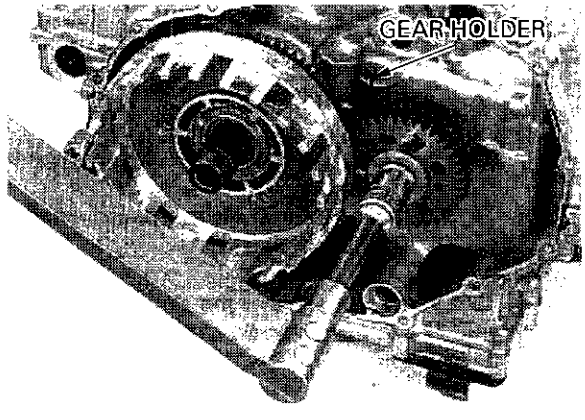
Install the special tool between the primary drive and driven gears as shown and tighten the primary drive gear bolt.

TOOL:
Gear holder 07724-0010100

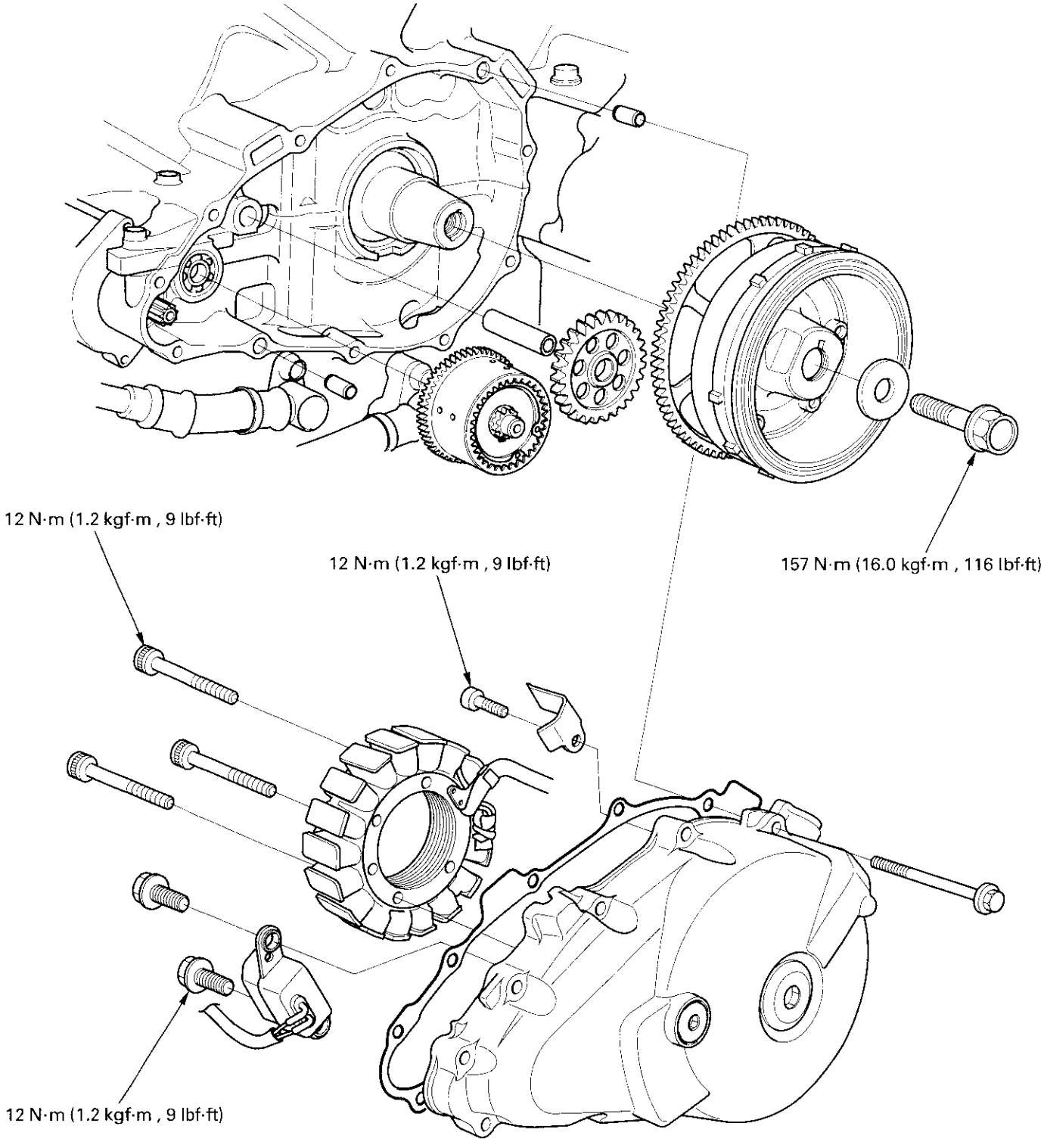
TORQUE: 88 N·m (9.0 kgf·m , 65 lbf·ft)

Install the front and rear cylinder cam gear train assemblies if they were removed (page 8-14).

Assemble the clutch (page 9-17).



MEMO


12 N·m (1.2 kgf·m , 9 lbf·ft)
12 N·m (1.2 kgf·m , 9 lbf·ft)
157 N·m (16.0 kgf·m , 116 lbf·ft)
12 N·m (1.2 kgf·m , 9 lbf·ft)

10. ALTERNATOR/STARTER CLUTCH

SERVICE INFORMATION	10-1	STARTER CLUTCH	10-5
TROUBLESHOOTING	10-1	FLYWHEEL INSTALLATION	10-7
ALTERNATOR STATOR	10-2	TORQUE LIMITER/STARTER IDLE GEAR	10-7
FLYWHEEL REMOVAL	10-4		

SERVICE INFORMATION

GENERAL

- This section covers service of the alternator stator, flywheel, starter clutch and starter gears. These parts can be removed with the engine installed in the frame.
- Refer to section 16 for alternator stator inspection.
- Refer to section 18 for starter motor servicing.

SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter driven gear boss O.D.	57.749–57.768 (2.2736–2.2743)	57.639 (2.2692)
Torque limiter slip torque	53–84 N·m (5.4–8.6 kgf·m, 39–62 lbf·ft)	———

10

TORQUE VALUES

Flywheel bolt	157 N·m (16.0 kgf·m, 116 lbf·ft)	Apply oil to the threads and seating surface.
Starter clutch bolt	23 N·m (2.3 kgf·m, 17 lbf·ft)	Apply locking agent to the threads.
Alternator stator bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	

TOOLS

Flywheel holder	07725-0040000
Rotor puller	07733-0020001
Bearing remover shaft	07936-GE00100
Bearing remover head, 10 mm	07936-GE00200
Bearing remover weight	07741-0010201
Driver	07749-0010000
Attachment, 24 × 26 mm	07746-0010700
Pilot, 10 mm	07746-0040100

TROUBLESHOOTING

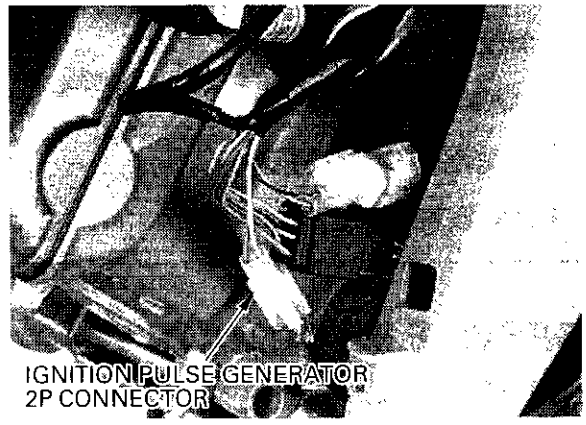
Engine does not turn
- Faulty starter clutch
- Damaged torque limiter/starter reduction gear
- Damaged starter idle gear

ALTERNATOR STATOR

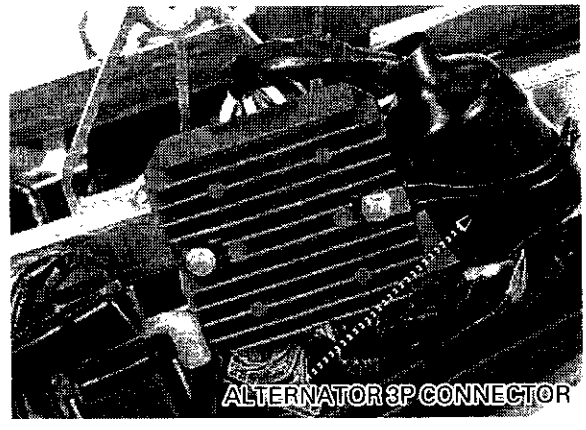
LEFT CRANKCASE COVER REMOVAL

Remove the following:
- lower inner fairing (page 2-3)
- left lower fairing (page 2-3)
- seat cowl (page 2-2)

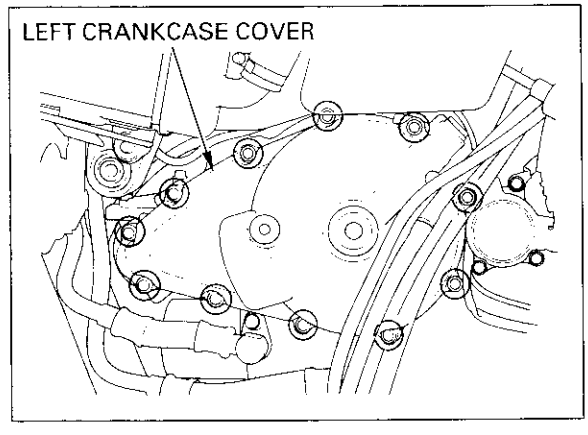
Disconnect the ignition pulse generator 2P connector.



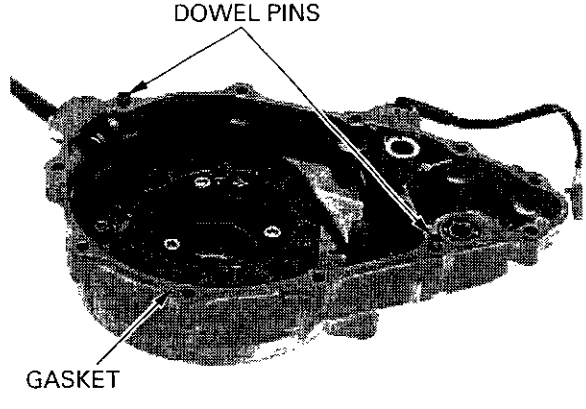
Disconnect the alternator 3P connector.



Remove the eleven bolts and the left crankcase cover.

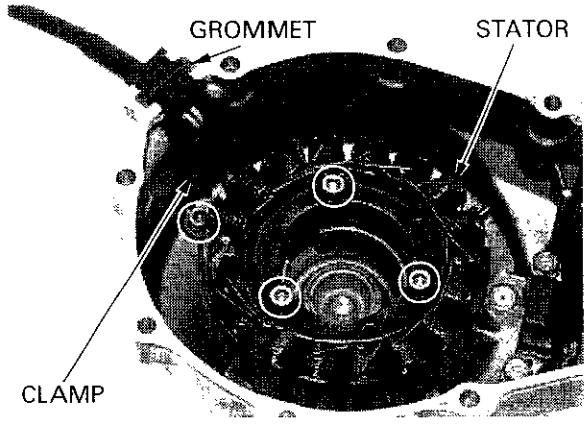


Remove the dowel pins and gasket.



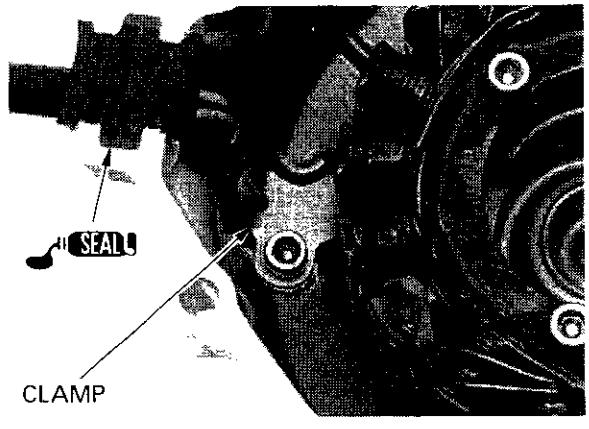
STATOR REPLACEMENT

Remove the four bolts, wire clamp, grommet and stator from the left crankcase cover.



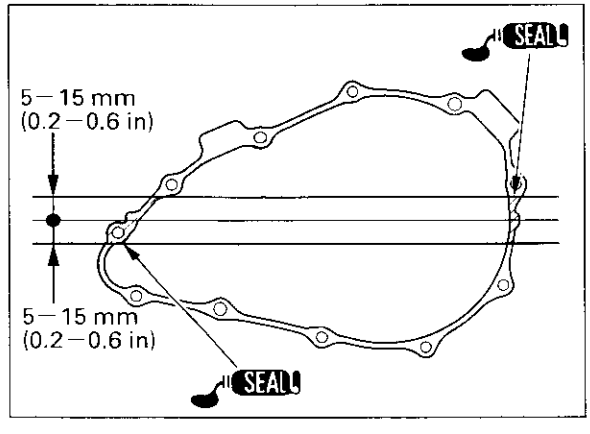
Install a new stator onto the left crankcase cover.
Apply sealant to the grommet seating surface and install it into the cover groove properly.
Install the wire clamp properly as shown.
Tighten the four bolts.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

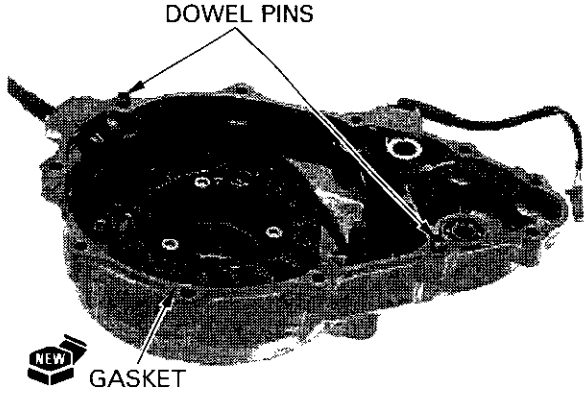


LEFT CRANKCASE COVER INSTALLATION

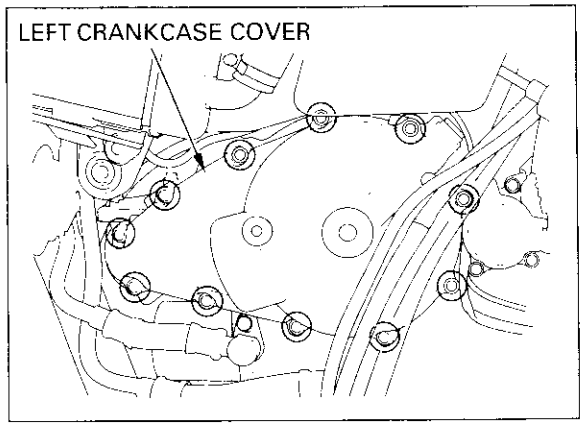
Apply sealant to the crankcase mating surfaces as shown.



Install the dowel pins and a new gasket.

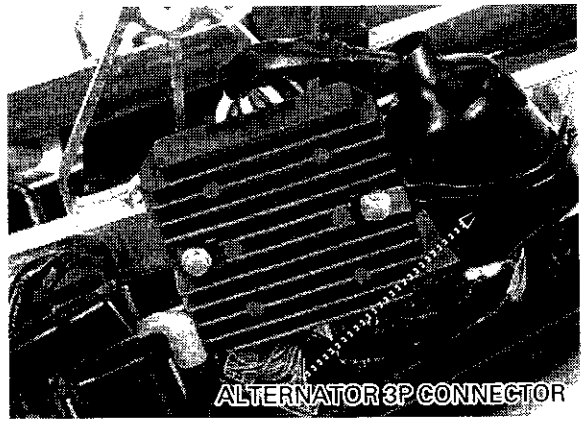


Install the left crankcase cover and tighten the eleven bolts securely.



Route the alternator wire and ignition pulse generator wire properly (page 1-20).

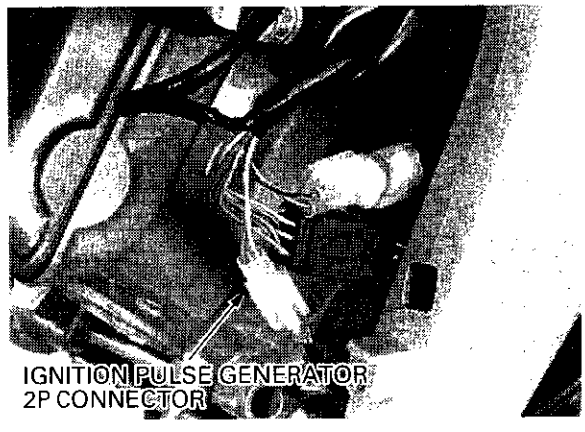
Connect the alternator 3P connector.



Connect the ignition pulse generator 2P connector.

Install the following:
– left lower fairing (page 2-3)
– lower inner fairing (page 2-3)
– seat cowl (page 2-2)

Check the oil level and add recommended engine oil if necessary (page 3-13).



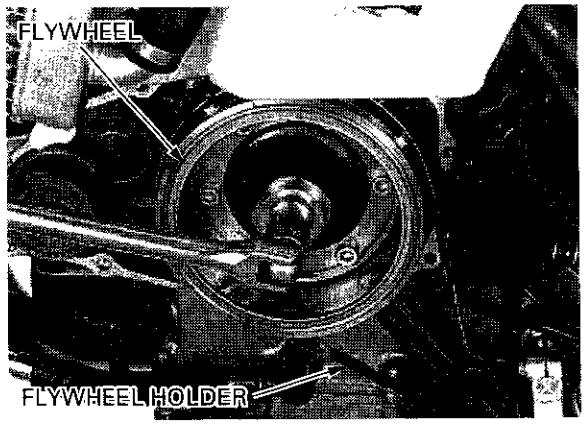
FLYWHEEL REMOVAL

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

Hold the flywheel with the special tool and loosen the flywheel bolt.

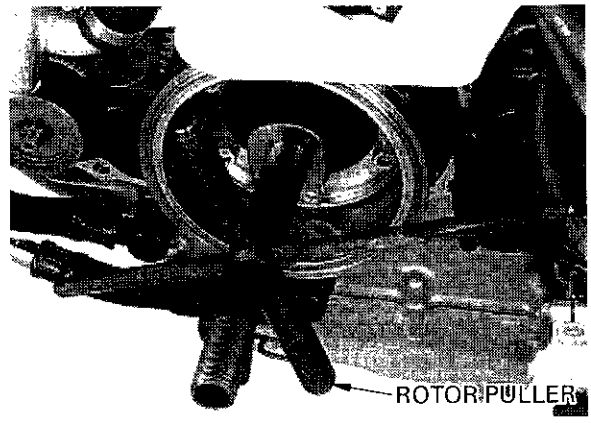
TOOL:
Flywheel holder 07725-0040000

Remove the flywheel bolt and special washer.

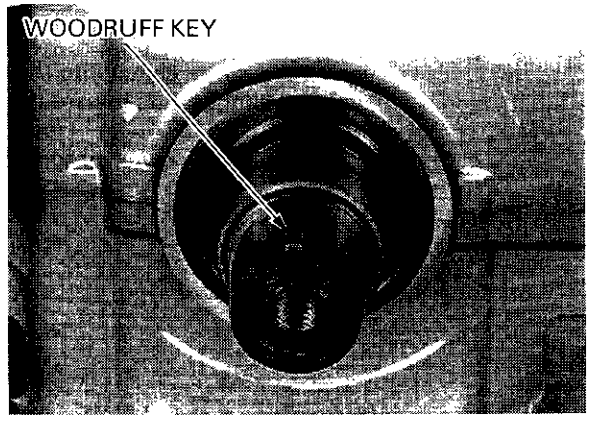


Remove the flywheel using the special tool.

TOOL:
Rotor puller 07733-0020001



Remove the woodruff key from the crankshaft.

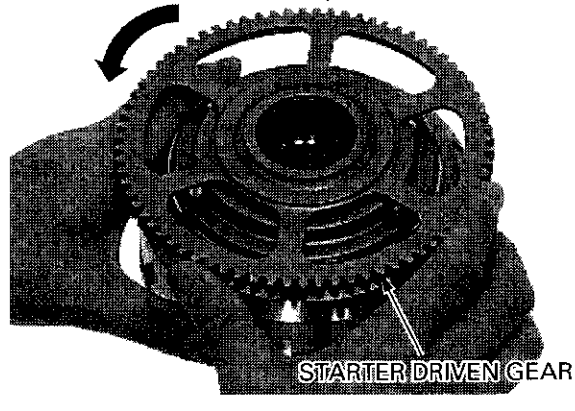


STARTER CLUTCH

REMOVAL

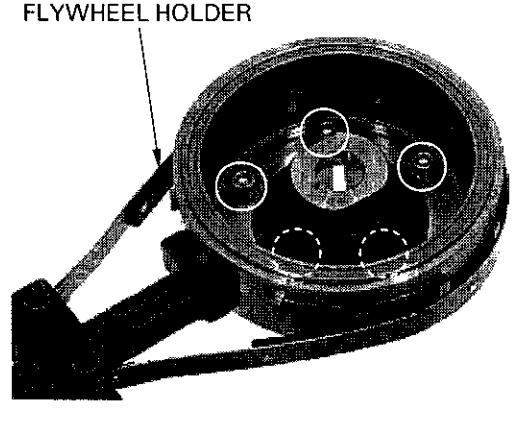
Remove the flywheel (page 10-4).

Remove the starter driven gear while turning it counterclockwise.



Hold the flywheel with the special tool and remove the starter clutch bolts.

TOOL:
Flywheel holder 07725-0040000



Remove the starter clutch assembly from the flywheel.

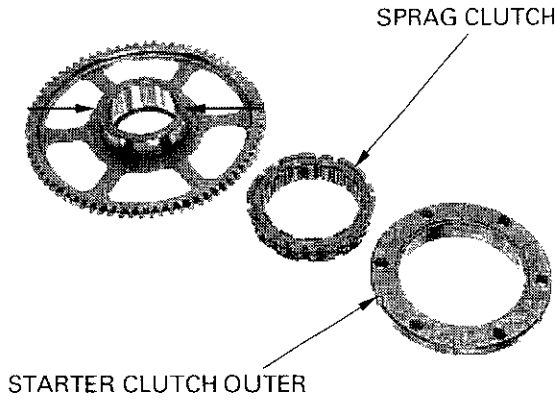
Remove the sprag clutch from the starter clutch outer.

INSPECTION

Check the starter driven gear, sprag clutch and clutch outer for abnormal wear or damage.

Measure the starter driven gear O.D.

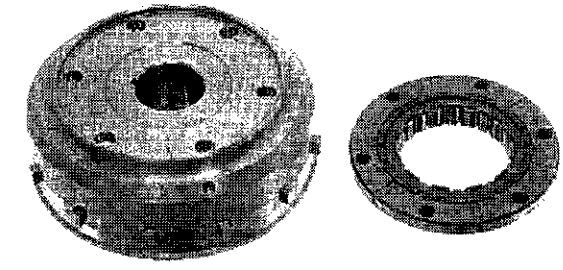
SERVICE LIMIT: 57.639 mm (2.2692 in)



INSTALLATION

Install the sprag clutch into the starter clutch outer with the flanged side toward the flywheel.

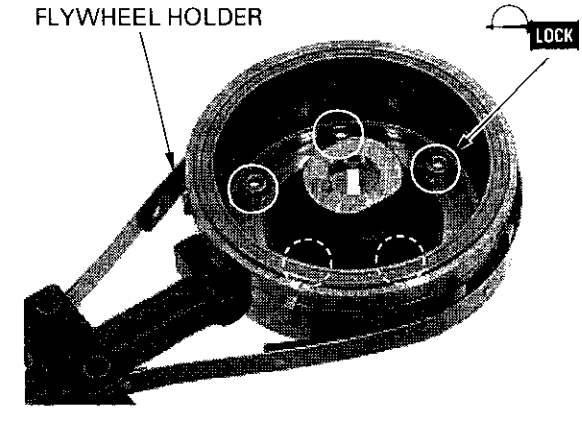
Install the starter clutch onto the flywheel.



Apply locking agent to the starter clutch bolt threads and install the bolts.
Hold the flywheel with the special tool and tighten the bolts.

TOOL:
Flywheel holder 07725-0040000

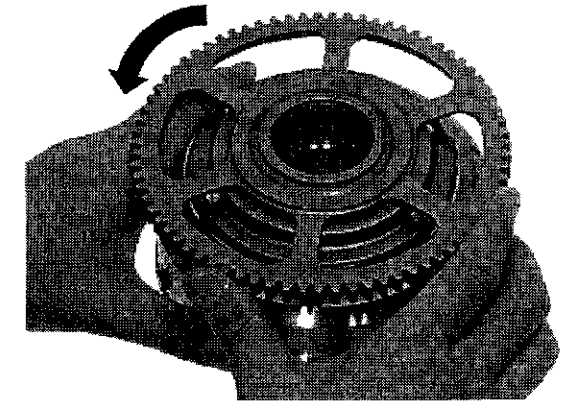
TORQUE: 23 N·m (2.3 kgf·m , 17 lbf·ft)



Install the starter driven gear while turning it counterclockwise.

Make sure that the starter driven gear turns counterclockwise smoothly and does not turn clockwise.

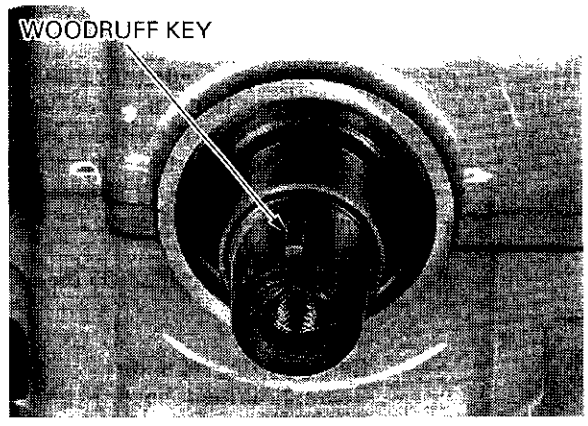
Install the flywheel (page 10-7).



FLYWHEEL INSTALLATION

Clean any oil from the tapered portion of the crankshaft and flywheel.

Install the woodruff key in the crankshaft key groove.

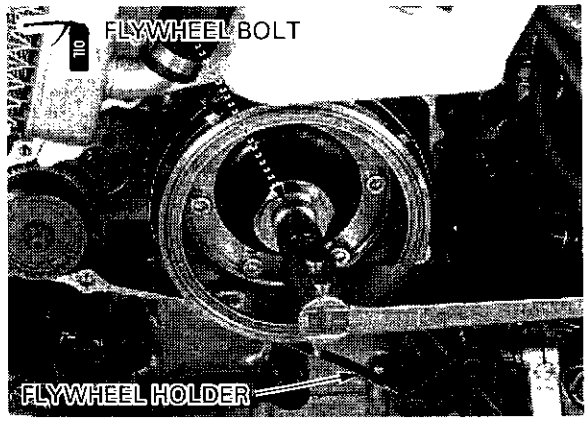


Apply oil to the needle bearing in the starter driven gear.
Install the flywheel on the crankshaft, aligning the key way with the woodruff key, and mesh the starter driven and idle gears.

Apply oil to the flywheel bolt threads and seating surface and install the special washer and bolt.
Hold the flywheel with the special tool and tighten the bolt.

TOOL:
Flywheel holder 07725-0040000

TORQUE: 157 N·m (16.0 kgf·m , 116 lbf·ft)



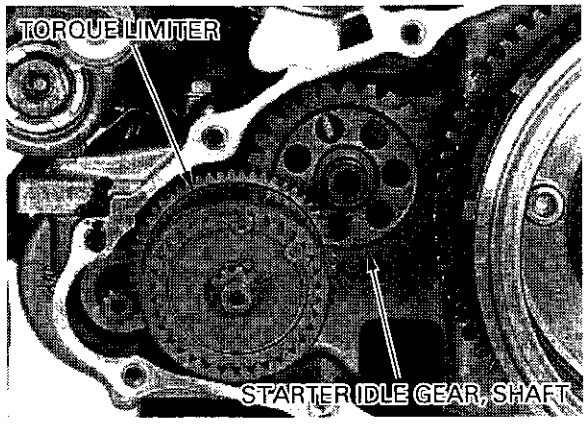
Install the left crankcase cover (page 10-3).

TORQUE LIMITER/ STARTER IDLE GEAR

REMOVAL

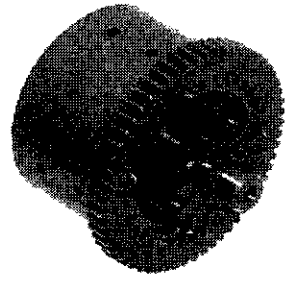
Remove the left crankcase cover (page 10-2).

Remove the torque limiter, starter idle gear and shaft.

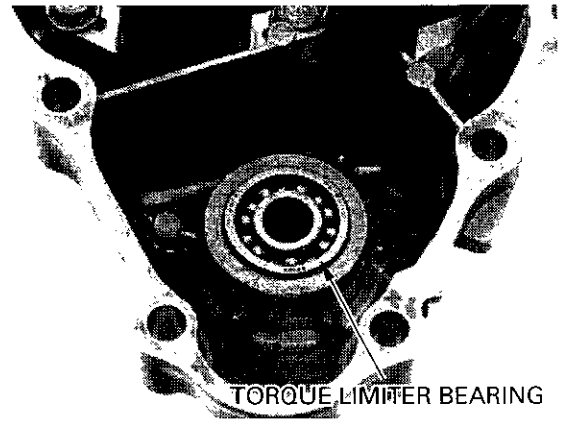


INSPECTION

Check the torque limiter, starter idle gear and shaft for wear or damage.



Turn the inner race of the torque limiter bearing with your finger.
The bearing should turn smoothly and quietly.
Also check that the outer race of the bearing fits tightly in the left crankcase cover.
Replace the bearing if the inner race does not turn smoothly, quietly, or if the outer race fits loosely in the left crankcase cover.



Remove the bearing with the special tools.

TOOLS:

Bearing remover shaft	07936-GE00100
Bearing remover head, 10 mm	07936-GE00200
Bearing remover weight	07741-0010201

Drive a new bearing in the left crankcase cover with the special tools.

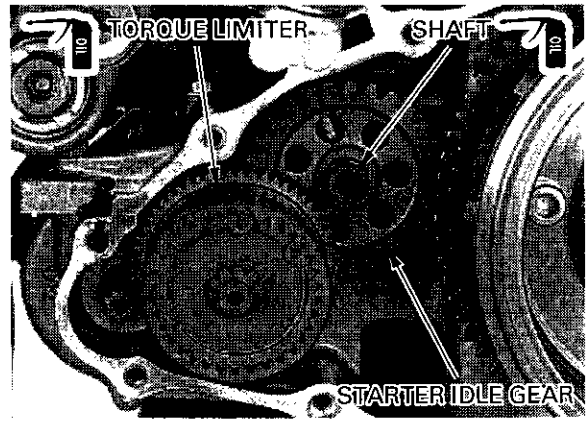
TOOLS:

Driver	07749-0010000
Attachment, 24 × 26 mm	07746-0010700
Pilot, 10 mm	07746-0040100

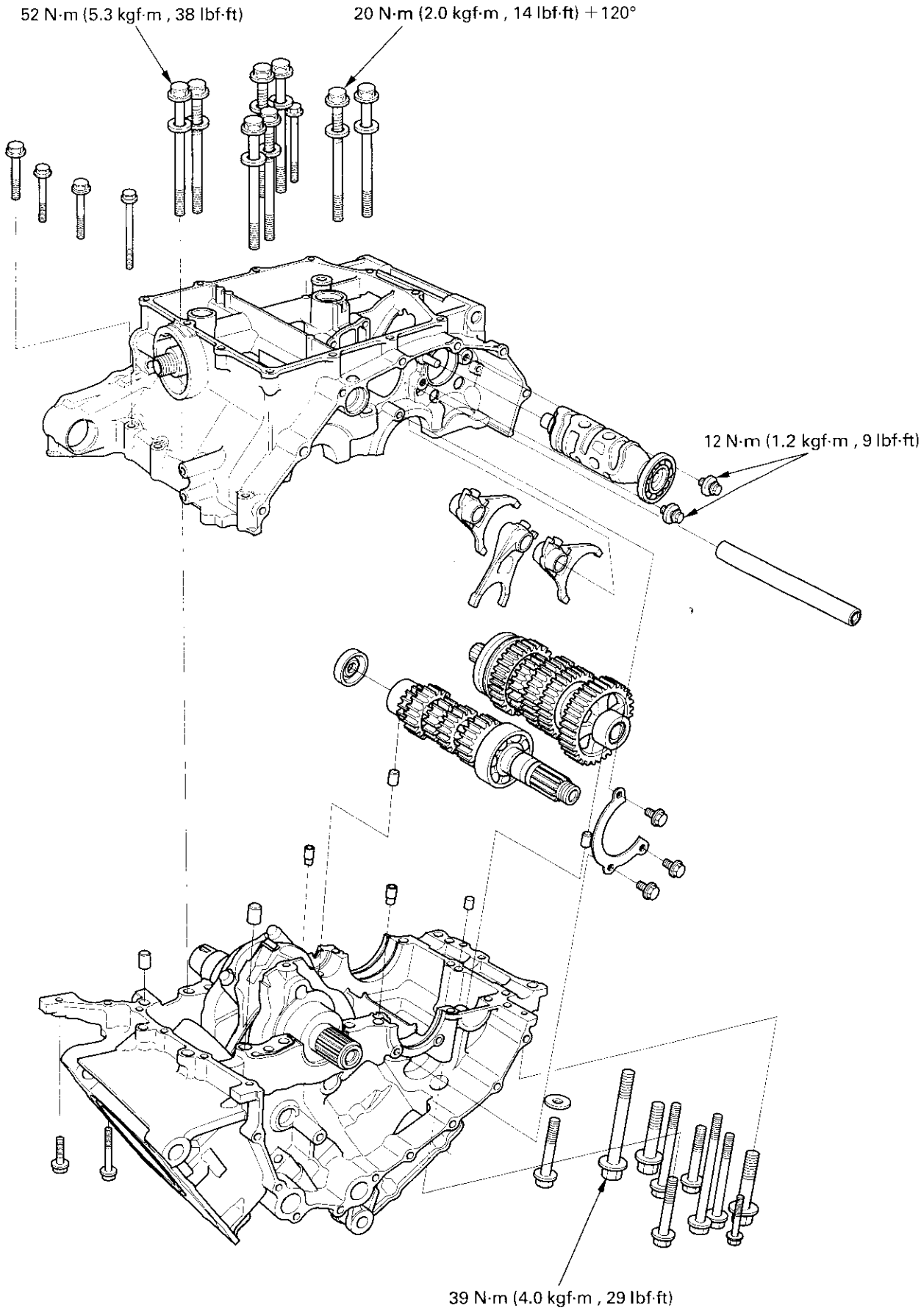
INSTALLATION

Coat the starter idle gear shaft with oil.
Install the starter idle gear and shaft.
Coat the torque limiter with oil and install it.

Install the left crankcase cover (page 10-3).



MEMO


52 N·m (5.3 kgf·m , 38 lbf·ft)
20 N·m (2.0 kgf·m , 14 lbf·ft) +120°
12 N·m (1.2 kgf·m , 9 lbf·ft)
39 N·m (4.0 kgf·m , 29 lbf·ft)

11. CRANKCASE/TRANSMISSION

SERVICE INFORMATION	11-1	SHIFT FORK/SHIFT DRUM	11-4
TROUBLESHOOTING	11-2	TRANSMISSION	11-5
CRANKCASE SEPARATION	11-3	CRANKCASE ASSEMBLY	11-9

SERVICE INFORMATION

GENERAL

- The crankcase must be separated to service the following:
  - transmission
  - crankshaft (section 12)
  - piston/connecting rod (section 12)
- Be careful not to damage the crankcase mating surfaces when servicing.
- Prior to assembling the crankcase halves, apply sealant to their mating surfaces. Wipe off excess sealant thoroughly.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Shift fork	I.D.	Left, Right	12.000 – 12.021 (0.4724 – 0.4733)	12.03 (0.474)
		Center	12.000 – 12.018 (0.4724 – 0.4731)	12.03 (0.474)
	Claw thickness		5.93 – 6.00 (0.233 – 0.236)	5.9 (0.23)
Shift fork shaft	O.D.		11.957 – 11.968 (0.4707 – 0.4712)	11.95 (0.470)
Transmission	Gear I.D.	M5	31.000 – 31.025 (1.2205 – 1.2215)	31.05 (1.222)
		M6	31.000 – 31.016 (1.2205 – 1.2211)	31.04 (1.222)
		C2, C3, C4	33.000 – 33.025 (1.2992 – 1.3002)	33.05 (1.301)
	Gear bushing O.D.	M5, M6	30.955 – 30.980 (1.2187 – 1.2197)	30.93 (1.218)
		C2	32.955 – 32.980 (1.2974 – 1.2984)	32.93 (1.296)
		C3, C4	32.950 – 32.975 (1.2972 – 1.2982)	32.93 (1.296)
	Gear-to-bushing clearance	M5	0.020 – 0.070 (0.0008 – 0.0028)	0.11 (0.004)
		M6	0.020 – 0.061 (0.0008 – 0.0024)	0.10 (0.004)
		C2	0.020 – 0.070 (0.0008 – 0.0028)	0.11 (0.004)
		C3, C4	0.025 – 0.075 (0.0010 – 0.0030)	0.11 (0.004)
	Gear bushing I.D.	M5	27.985 – 28.006 (1.1018 – 1.1026)	28.02 (1.103)
		C2	29.985 – 30.006 (1.1805 – 1.1813)	30.02 (1.182)
	Mainshaft O.D.	at M5	27.967 – 27.980 (1.1011 – 1.1016)	27.94 (1.100)
	Countershaft O.D.	at C2	29.950 – 29.975 (1.1791 – 1.1801)	29.92 (1.178)
	Bushing-to-shaft clearance	M5	0.005 – 0.039 (0.0002 – 0.0015)	0.06 (0.002)
		C2	0.010 – 0.056 (0.0004 – 0.0022)	0.06 (0.002)

TORQUE VALUES

Crankcase 10 mm flange bolt	39 N·m (4.0 kgf·m , 29 lbf·ft)	Apply oil to the threads and seating surface.
Crankcase 10 mm special bolt (black)	52 N·m (5.3 kgf·m , 38 lbf·ft)	Apply oil to the threads and seating surface.
Crankcase 10 mm special bolt (gray)	20 N·m (2.0 kgf·m , 14 lbf·ft) + 120°	Apply oil to the threads and seating surface.
Shift drum bearing setting plate bolt	12 N·m (1.2 kgf·m , 9 lbf·ft)	Apply locking agent to the threads.

TOOLS

Inner driver C	07746-0030100
Attachment, 30 mm I.D.	07746-0030300

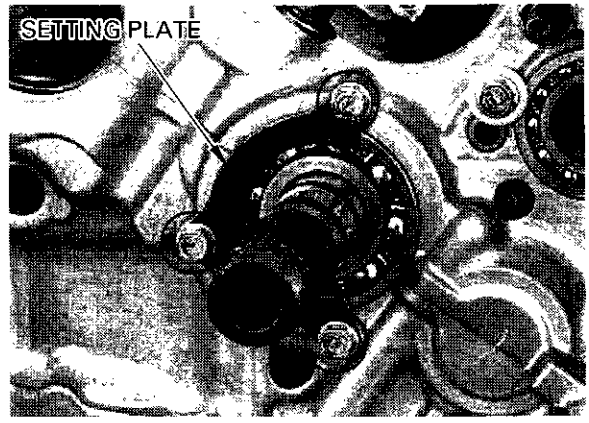
TROUBLESHOOTING

Hard to shift
- Improper clutch operation (section 9)
- Incorrect engine oil weight
- Bent shift forks
- Bent shift fork shaft
- Bent shift fork claw
- Damaged shift drum cam grooves
- Bent gearshift spindle

Transmission jumps out of gear
- Worn gear dogs
- Worn gear shifter groove
- Bent shift fork shaft
- Broken shift drum stopper arm
- Worn or bent shift forks
- Broken drum stopper arm spring
- Broken gearshift spindle return spring

Excessive engine noise
- Worn or damaged transmission gears
- Worn or damaged transmission bearings

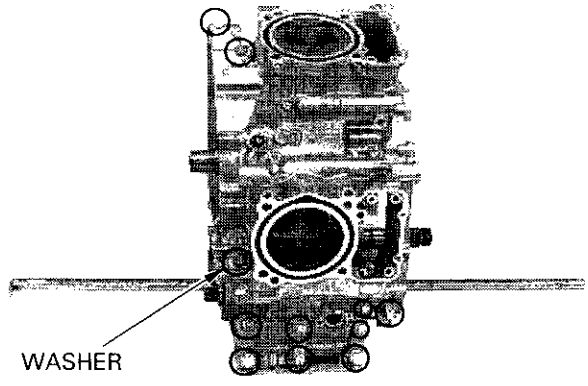
CRANKCASE SEPARATION



Remove the following:
- engine (section 7)
- cylinder heads and cam gear train assemblies (section 8)
- clutch, gearshift linkage, primary drive gear and timing gear (section 9)
- oil pump, strainer and pressure relief valve (section 4)
- flywheel and starter gears (section 10)
- starter motor (section 18)
- three bolts and mainshaft bearing setting plate

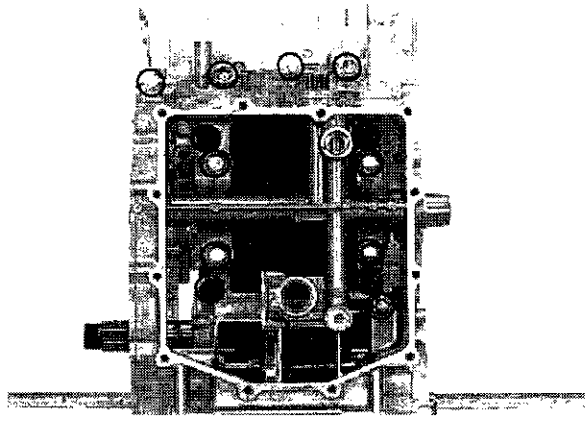
Note that the one 8 mm bolt has the copper washer.

Loosen the three 6 mm bolts, six 8 mm bolts and three 10 mm bolts in a crisscross pattern in 2 or 3 steps and remove them from the upper crankcase.



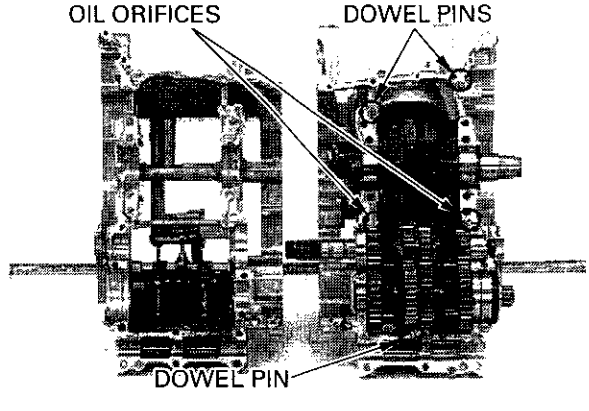
Place the engine with the upper side down.
Loosen the two 6 mm bolts, three 8 mm bolts and eight 10 mm bolt in a crisscross pattern in 2 or 3 steps and remove them from the lower crankcase.

Separate the lower crankcase from the upper crankcase.



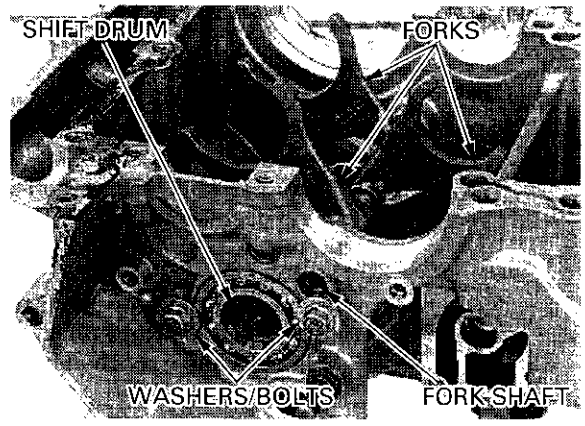
Remove the three dowel pins and two oil orifices.

Clean any sealant from the crankcase mating surfaces.



SHIFT FORK/SHIFT DRUM

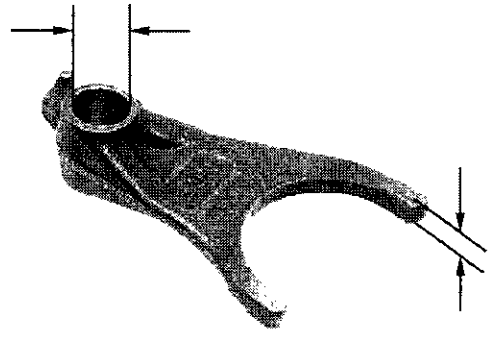
REMOVAL



Separate the crankcase halves (page 11-3).

Remove the two washers/bolts.
Remove the shift fork shaft, shift forks and shift drum.

INSPECTION



Check the shift fork guide pins for abnormal wear or damage.

Measure the shift fork I.D.

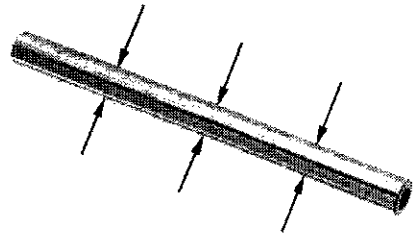
SERVICE LIMIT: 12.03 mm (0.474 in)

Measure the shift fork claw thickness.

SERVICE LIMIT: 5.9 mm (0.23 in)

Measure the shift fork shaft O.D.

SERVICE LIMIT: 11.95 mm (0.470 in)



Check the shift drum guide groove for abnormal wear or damage.

Check the shift drum bearings for smooth rotation.

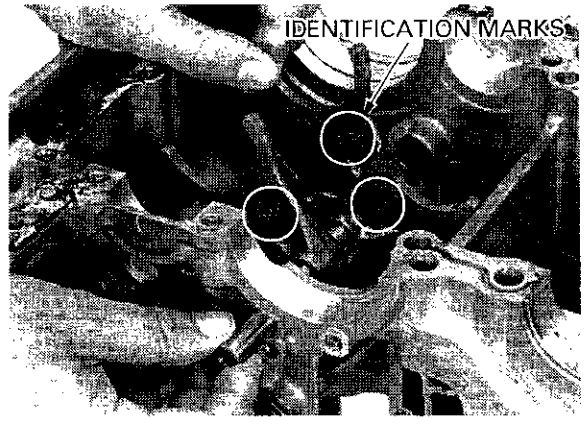


INSTALLATION

Install the shift drum.

Check the shift fork identification mark.
MCF: right and left shift forks
MBB C: center shift fork

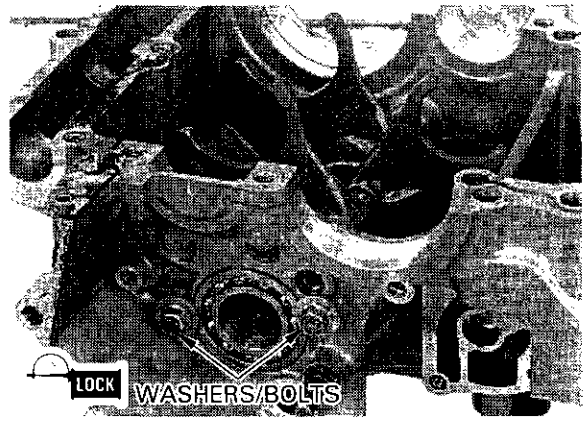
Install the shift forks into the shift drum guide groove with the identification marks facing toward the right side of the engine and insert the fork shaft.



Apply locking agent to the washer/bolt threads.
Install the washers/bolts and tighten them.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

Assemble the crankcase halves (page 11-9).



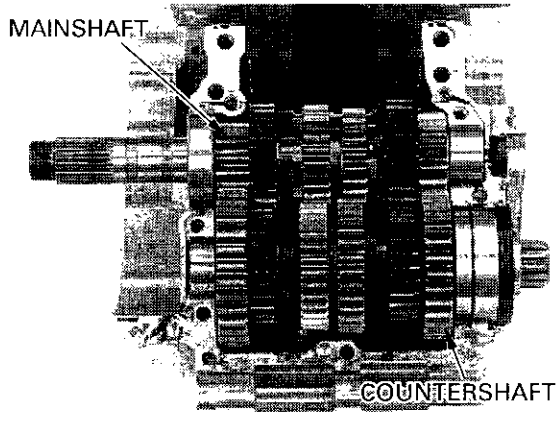
TRANSMISSION

DISASSEMBLY

Separate the crankcase halves (page 11-3).

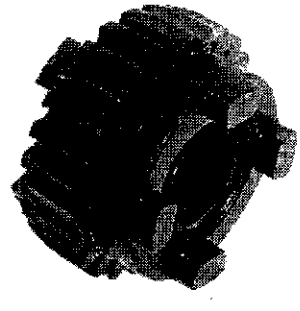
Remove the mainshaft and countershaft assemblies.
Disassemble the mainshaft and countershaft.

Clean all disassembled parts in solvent thoroughly.

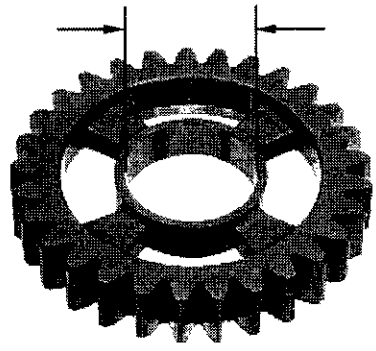


INSPECTION

Check the gear shifter groove for abnormal wear or damage.



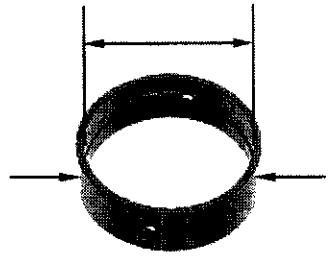
Check the gear dogs and teeth for abnormal wear or damage.



Measure the gear I.D.

SERVICE LIMITS: M5: 31.05 mm (1.222 in)
M6: 31.04 mm (1.222 in)
C2, C3, C4,: 33.05 mm (1.301 in)

Measure the gear bushing O.D.



SERVICE LIMITS: M5, M6: 30.93 mm (1.218 in)
C2, C3, C4: 32.93 mm (1.296 in)

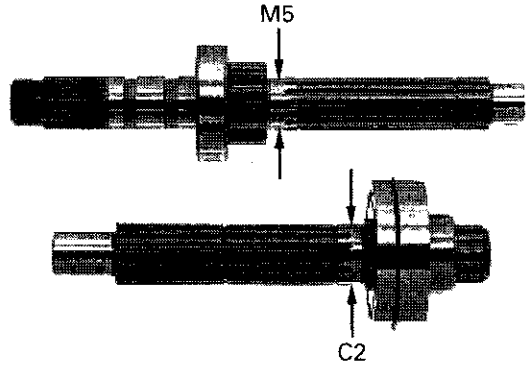
Calculate the gear-to-bushing clearance.

SERVICE LIMITS: M6: 0.10 mm (0.004 in)
M5, C2, C3, C4: 0.11 mm (0.004 in)

Measure the gear bushing I.D.

SERVICE LIMITS: M5: 28.02 mm (1.103 in)
C2: 30.02 mm (1.182 in)

Check the mainshaft and countershaft for abnormal wear or damage.



Measure the mainshaft O.D. at the M5 gear.

SERVICE LIMIT: 27.94 mm (1.100 in)

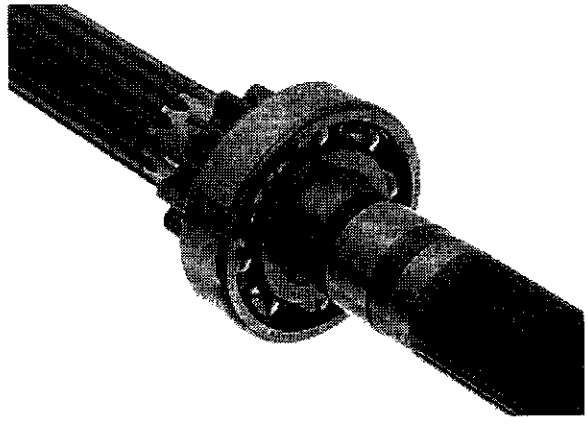
Measure the countershaft O.D. at the C2 gear.

SERVICE LIMIT: 29.92 mm (1.178 in)

Calculate the gear bushing-to-shaft clearance.

SERVICE LIMIT: 0.06 mm (0.002 in)

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



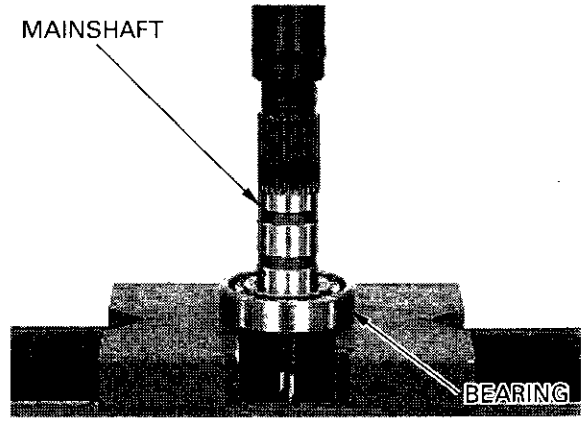
Replace the bearing if the outer race does not turn smoothly, quietly, or if the inner race fits loosely on the shaft.

NOTE:

The countershaft bearing cannot be replaced. If the countershaft bearing is faulty, replace the countershaft.

MAINSHAFT BEARING REPLACEMENT

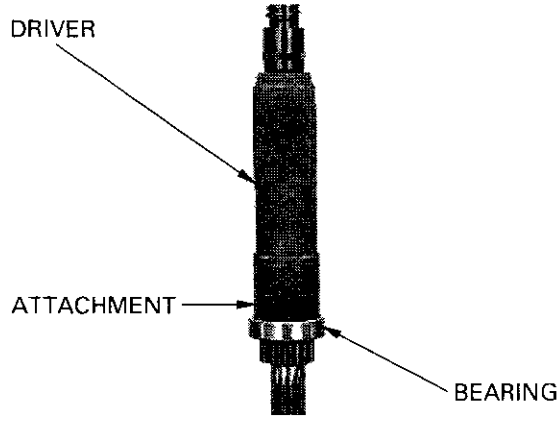
Press the mainshaft out of the bearing.



Press a new bearing onto the mainshaft with the special tools.

TOOLS:

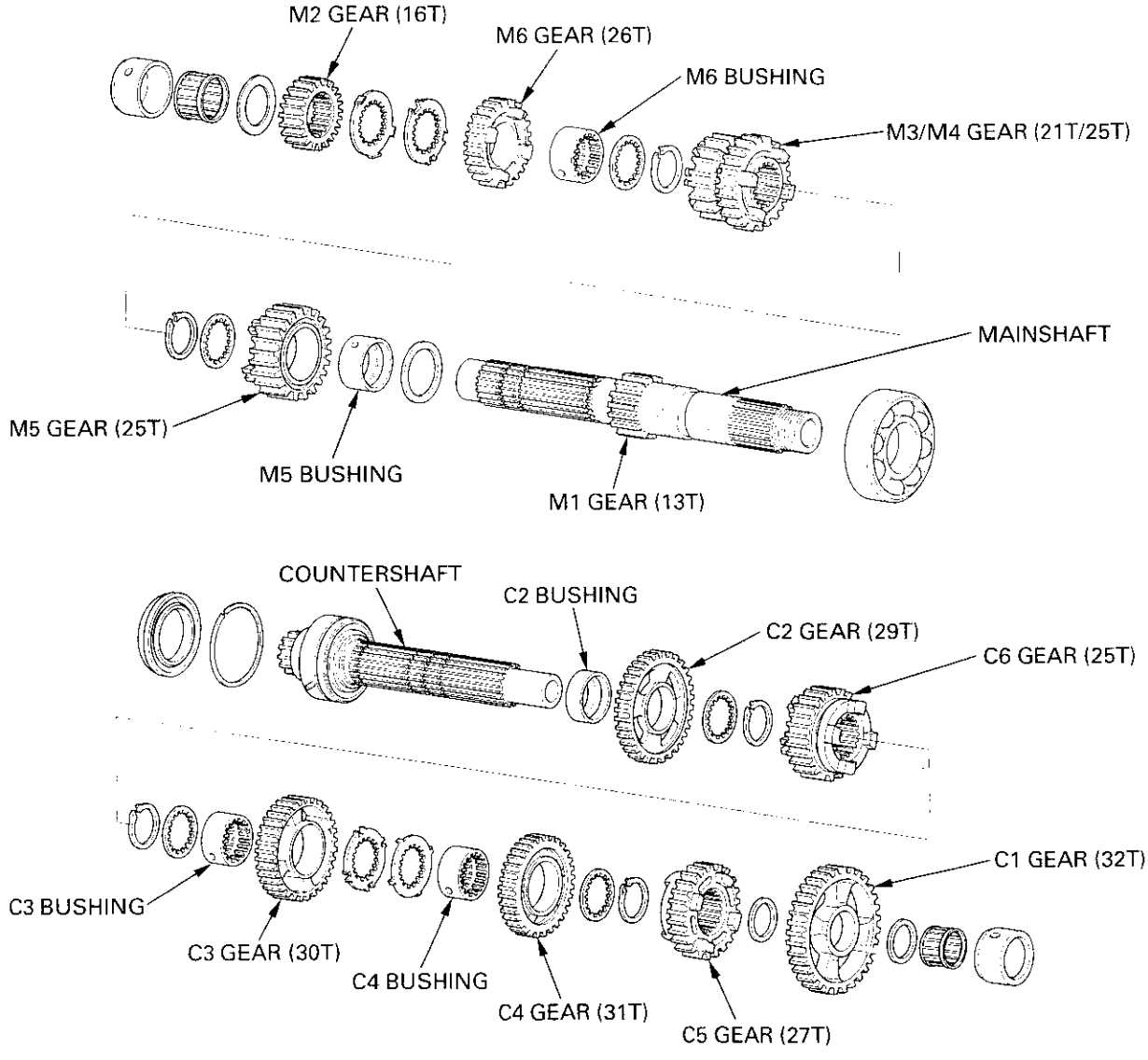
Inner driver C	07746-0030100
Attachment, 30 mm I.D.	07746-0030300

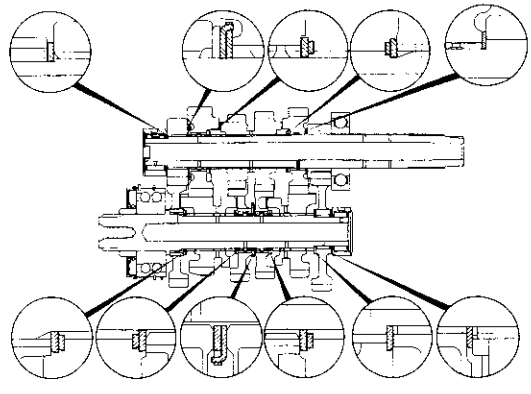


ASSEMBLY

Apply molybdenum oil solution to the gear teeth, sliding surface, shifter grooves and bushings.

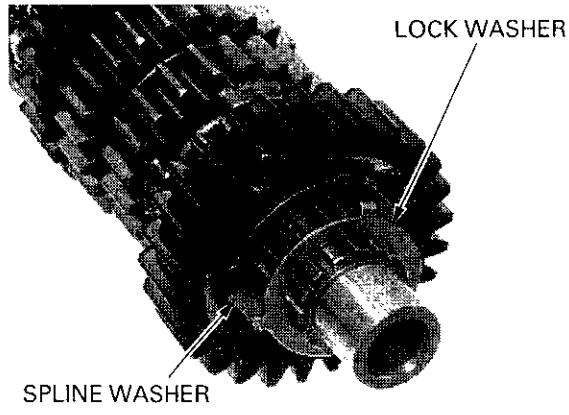
Assemble the mainshaft and countershaft.



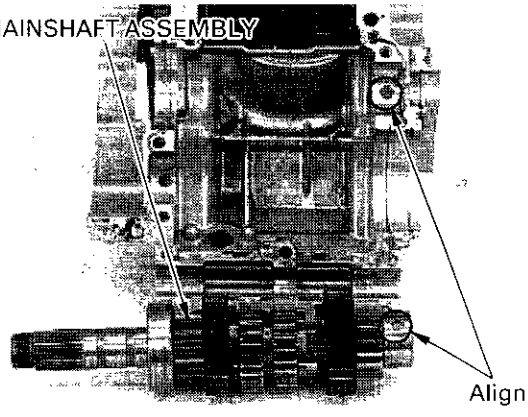


NOTE:

- Align the lock washer tabs with the spline washer grooves.
- Always install the thrust washer and snap ring with the chamfered (rolled) edge facing away from the thrust load.
- Install the snap ring so that its end gap aligns with the groove in the splines.
- Make sure that the snap ring is fully seated in the shaft groove after installing it.

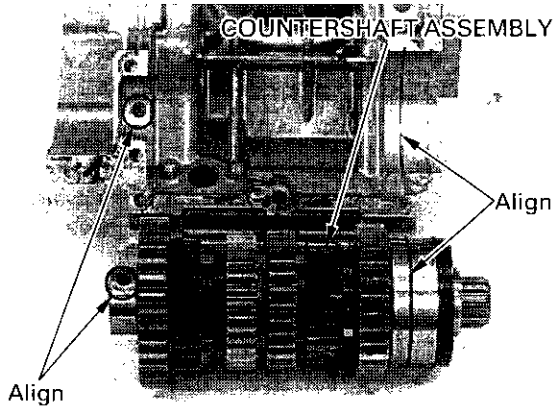


Install the mainshaft assembly, aligning the hole in the needle bearing outer race with the dowel pin.



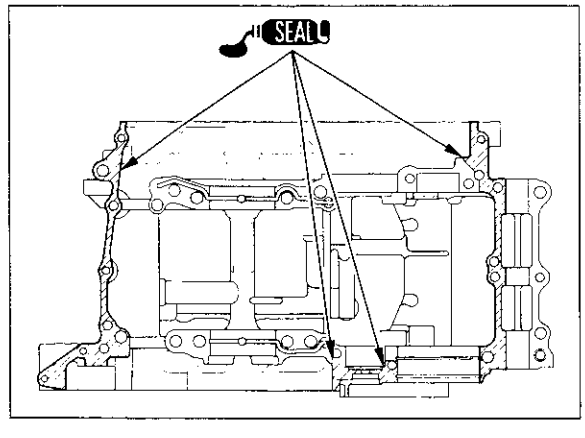
Install the countershaft assembly, aligning the hole in the needle bearing outer race with the dowel pin, and the set ring with the ring groove.
Rest the pin on the ball bearing into the pin groove.

Assemble the crankcase halves.

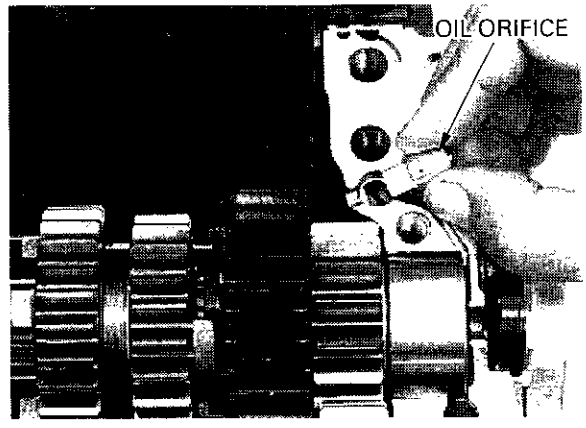


CRANKCASE ASSEMBLY

Apply sealant to the crankcase mating surfaces as shown.

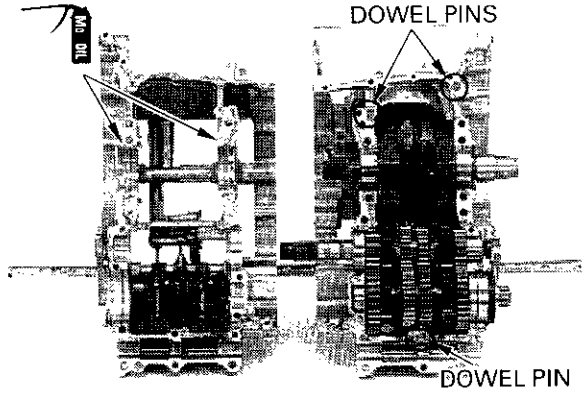


Install the two oil orifices into the upper crankcase, aligning the flat surfaces.



Install the three dowel pins.

Apply molybdenum oil solution to the main journal bearing surfaces on the lower crankcase.
Install the lower crankcase onto the upper crankcase, aligning the shift forks with the gear shifter grooves.



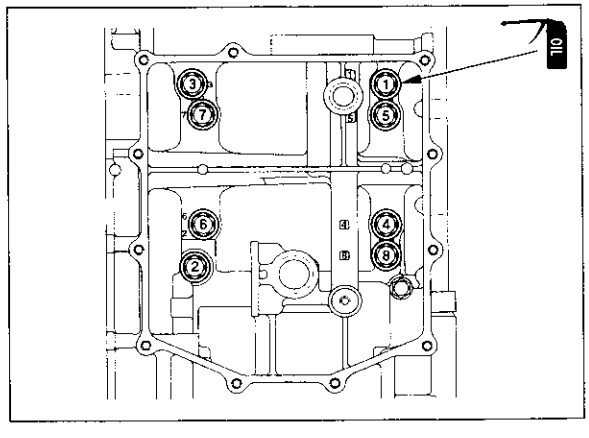
Apply oil to the threads and seating surfaces of the four special black bolts and new four special gray bolts, and install them.

CAUTION:

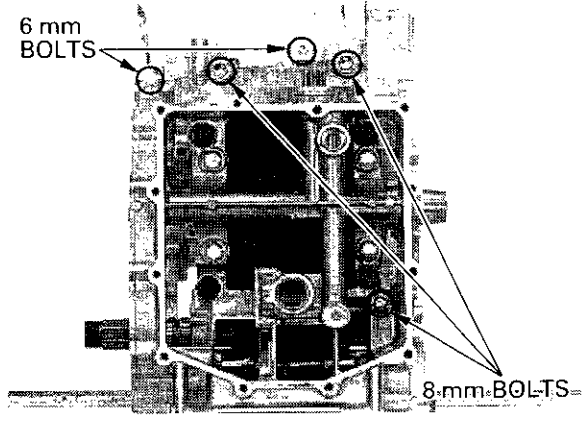
The special gray bolts cannot be reused. Once the special gray bolts have been loosened, replace them with new ones.

Tighten the eight special bolts in 2 or 3 steps in the order shown on the lower crankcase.

TORQUE:
Black bolt: 52 N·m (5.3 kgf·m , 38 lbf·ft)
Gray bolt: 20 N·m (2.0 kgf·m , 14 lbf·ft) + 120°



Install the three 8 mm bolts and two 6 mm bolts, and tighten them in a crisscross pattern in 2 or 3 steps.

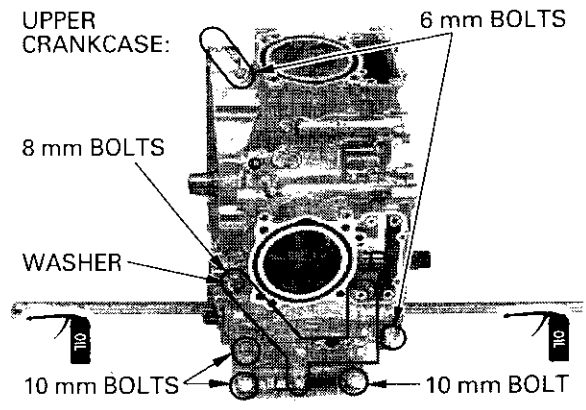


Apply oil to the three 10 mm bolt threads and seating surfaces.

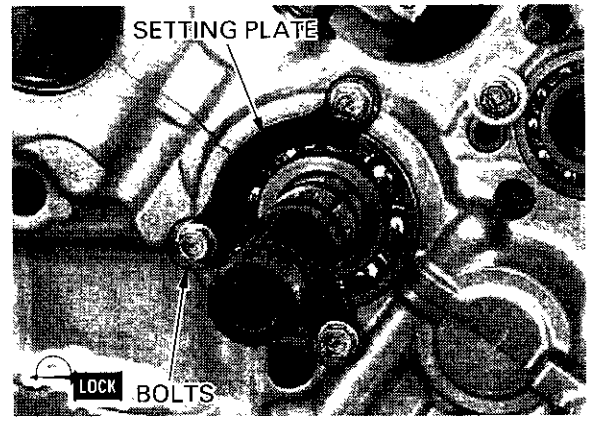
Install the one 8 mm bolt with the copper washer.

Install the three 10 mm bolts, six 8 mm bolts and three 6 mm bolts, and tighten them in a crisscross pattern in 2 or 3 steps.

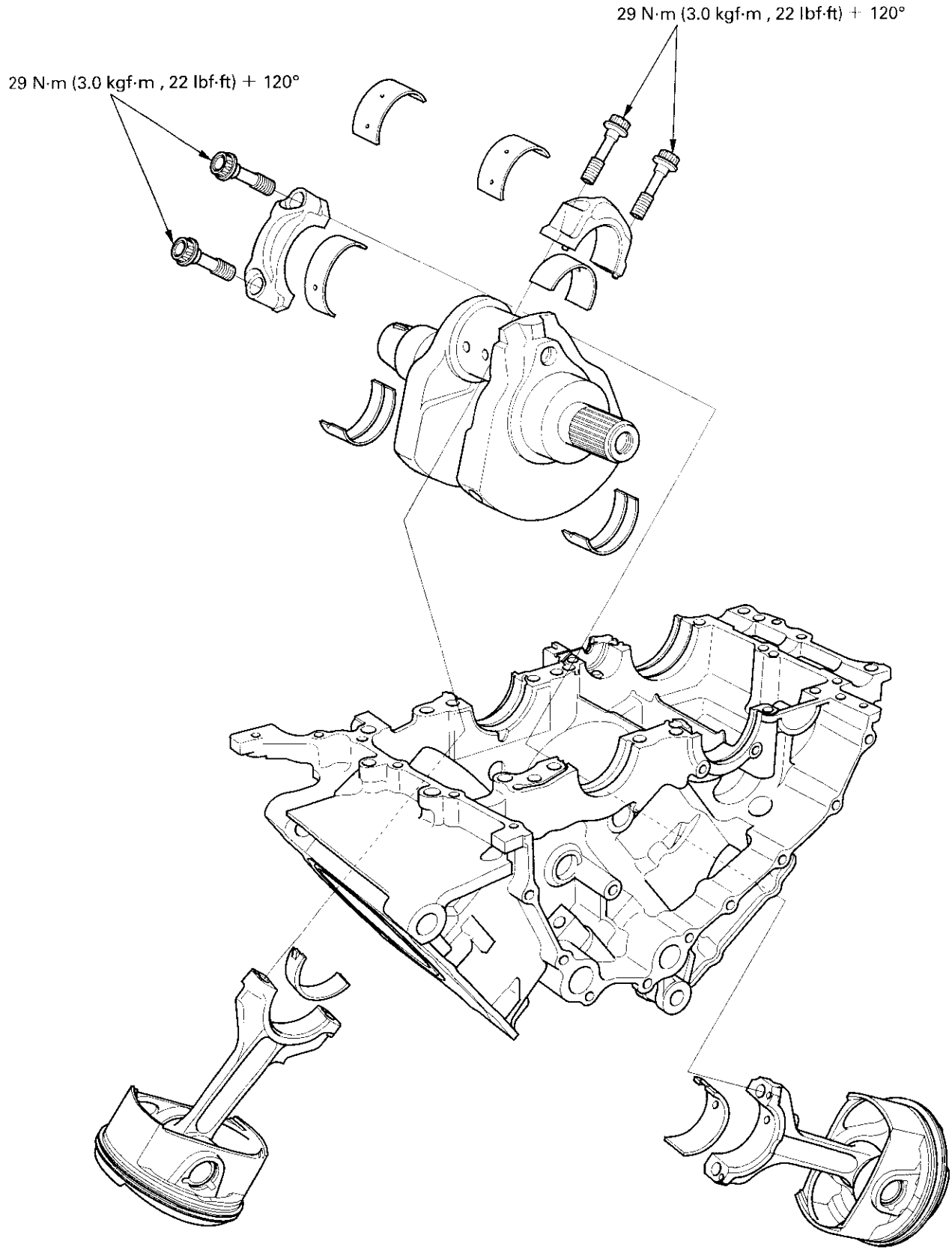
TORQUE: 10 mm bolt: 39 N·m (4.0 kgf·m , 29 lbf·ft)



Apply locking agent to the mainshaft bearing setting plate bolt threads.
Install the setting plate and tighten the bolts securely.



Install the following:
- oil pump, strainer and pressure relief valve (section 4)
- clutch, gearshift linkage, primary drive gear and timing gear (section 9)
- flywheel and starter gears (section 10)
- starter motor (section 18)
- cylinder heads and cam gear train assemblies (section 8)
- engine (section 7)


29 N·m (3.0 kgf·m , 22 lbf·ft) + 120°
29 N·m (3.0 kgf·m , 22 lbf·ft) + 120°

12. CRANKSHAFT/PISTON/CYLINDER

SERVICE INFORMATION	12-1	MAIN JOURNAL BEARING	12-4
TROUBLESHOOTING	12-2	CRANKPIN BEARING	12-6
CRANKSHAFT	12-3	PISTON/CYLINDER	12-8

SERVICE INFORMATION

GENERAL

- The crankcase must be separated to service the crankshaft and piston/connecting rod. Refer to section 11 for crankcase separation and assembly.
- Mark and store the connecting rods, bearing caps and bearing inserts to be sure of their correct locations for reassembly.
- The crankpin and main journal bearing inserts are select fit and are identified by color codes. Select replacement bearings from the code tables. After selecting new bearings, recheck the oil clearance with a plastigauge. Incorrect oil clearance can cause major engine damage.
- Clean the oil jets in the upper crankcase with compressed air before installing the pistons.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod side clearance		0.10 – 0.30 (0.004 – 0.012)	0.40 (0.016)
	Crankpin bearing oil clearance		0.032 – 0.050 (0.0013 – 0.0020)	0.060 (0.0024)
	Main journal bearing oil clearance		0.020 – 0.038 (0.0008 – 0.0015)	0.048 (0.0019)
	Runout		—	0.10 (0.004)
Piston, piston pin, piston ring	Piston O.D. at 10 (0.4) from bottom		99.970 – 99.990 (3.9358 – 3.9366)	99.900 (3.9331)
	Piston pin hole I.D.		23.002 – 23.008 (0.9056 – 0.9058)	23.03 (0.907)
	Piston pin O.D.		22.994 – 23.000 (0.9053 – 0.9055)	22.984 (0.9049)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.046 (0.0018)
	Piston ring end gap	Top	0.20 – 0.30 (0.008 – 0.012)	0.45 (0.018)
		Second	0.30 – 0.40 (0.012 – 0.016)	0.55 (0.022)
		Oil (side rail)	0.10 – 0.50 (0.004 – 0.020)	0.65 (0.026)
	Piston ring-to-ring groove clearance	Top	0.065 – 0.100 (0.0026 – 0.0039)	0.115 (0.0045)
		Second	0.035 – 0.070 (0.0014 – 0.0028)	0.085 (0.0033)
Cylinder	I.D.		100.005 – 100.025 (3.9372 – 3.9380)	100.100 (3.9409)
	Out of round		—	0.10 (0.004)
	Taper		—	0.10 (0.004)
	Warpage		—	0.05 (0.002)
Cylinder-to-piston clearance			0.015 – 0.055 (0.0006 – 0.0022)	0.200 (0.0079)
Connecting rod small end I.D.			23.020 – 23.041 (0.9063 – 0.9071)	23.051 (0.9075)
Connecting rod-to-piston pin clearance			0.020 – 0.047 (0.0008 – 0.0019)	0.067 (0.0026)

TORQUE VALUES

Connecting rod bolt	29 N·m (3.0 kgf·m , 22 lbf·ft) + 120°	Apply oil to the threads and seating surface.
Crankcase 10 mm special bolt (black)	52 N·m (5.3 kgf·m , 38 lbf·ft)	Apply oil to the threads and seating surface.
Crankcase 10 mm special bolt (gray)	20 N·m (2.0 kgf·m , 14 lbf·ft) + 120°	Apply oil to the threads and seating surface.

TROUBLESHOOTING

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

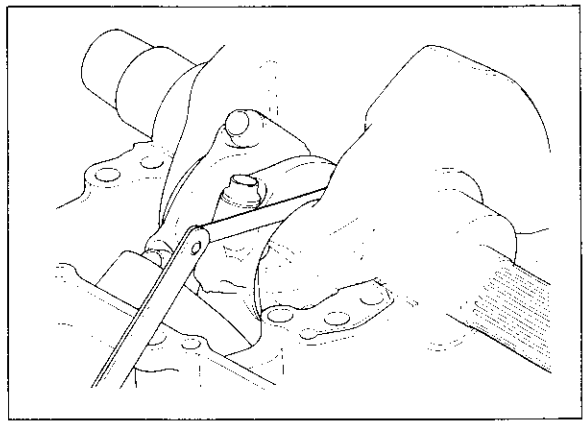
Compression too high, overheating or knocking
- Excessive carbon built-up on piston head or combustion chamber

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

Abnormal noise
- Worn piston pin or piston pin hole
- Worn connecting rod small end
- Worn cylinder, piston or piston rings
- Worn main journal bearings
- Worn crankpin bearings

CRANKSHAFT

Separate the crankcase halves (page 11-3).



SIDE CLEARANCE INSPECTION

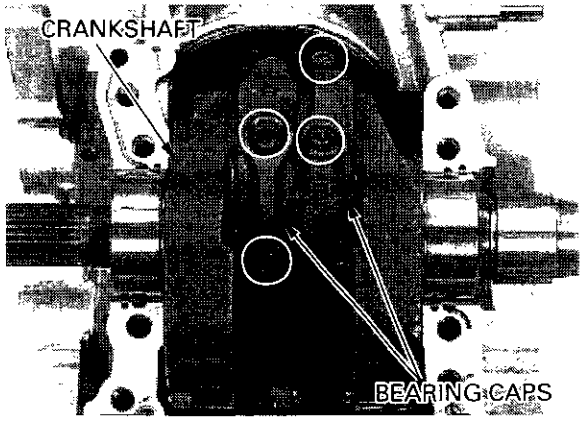
Measure the connecting rod side clearance.

SERVICE LIMIT: 0.40 mm (0.016 in)

If the clearance exceeds the service limit, replace the connecting rod.
Recheck and if still out of limit, replace the crankshaft.

REMOVAL

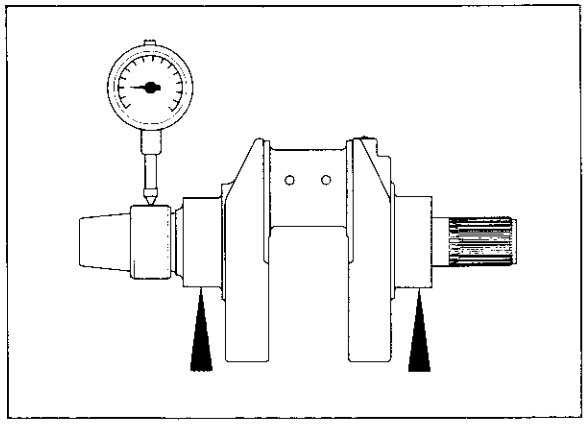
Remove the connecting rod bolts and bearing caps.
Remove the crankshaft.



INSPECTION

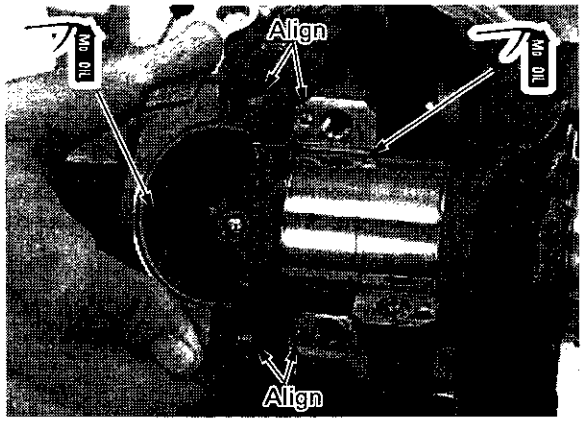
Place the crankshaft on a stand or V-blocks.
Rotate the crankshaft two revolutions and read the runout using a dial indicator.

SERVICE LIMIT: 0.10 mm (0.004 in)



INSTALLATION

Apply molybdenum oil solution to the main journal bearing sliding surfaces on the upper crankcase, and crankpin bearing sliding surfaces on the connecting rods and bearing caps.
Install the crankshaft onto the upper crankcase.
Set the connecting rods onto the crankpin.
Install the bearing caps, aligning the dowel pins with the holes in the connecting rods.



Apply oil to new connecting bolt threads and seating surfaces, and install the bolts.

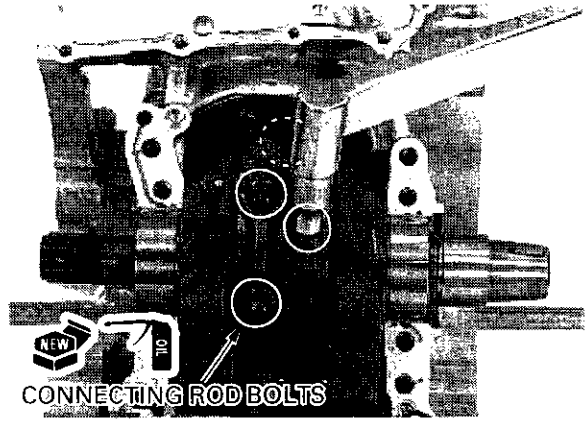
CAUTION:

The connecting rod bolts cannot be reused. Once the connecting rod bolts have been loosened replace them with new ones.

Tighten the bolts in 2 or 3 steps alternately.

TORQUE: 29 N·m (3.0 kgf·m , 22 lbf·ft) + 120°

Assemble the crankcase halves (page 11-10).

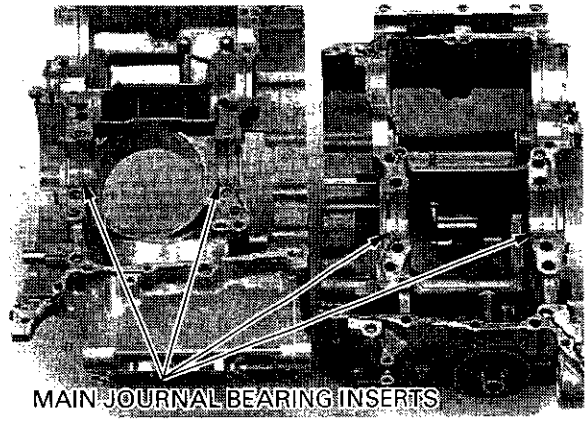


MAIN JOURNAL BEARING

Remove the crankshaft (page 12-3).

BEARING INSPECTION

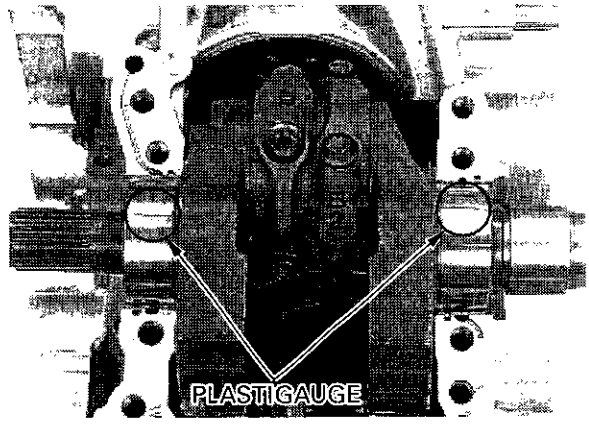
Check the bearing inserts for unusual wear or peeling.
Check the bearing tabs for damage.



OIL CLEARANCE INSPECTION

Do not rotate the crankshaft during inspection.

Clean off any oil from the bearing inserts and main journals.
Install the crankshaft onto the upper crankcase.
Put a strip of plastigauge lengthwise on each main journal avoiding the oil hole.

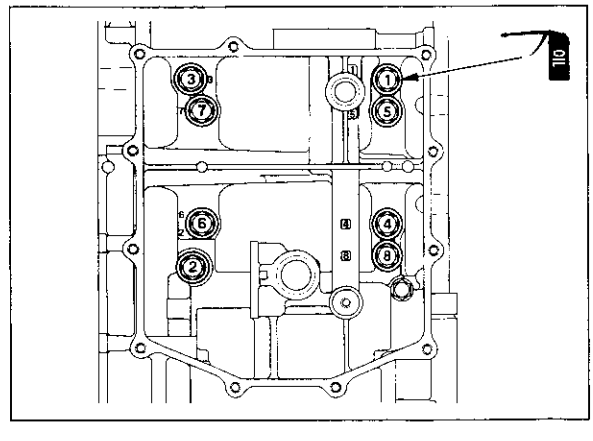


Install the three dowel pins.
Carefully install the lower crankcase onto the upper crankcase, aligning the shift forks with the gear shifter grooves.

Use the removed gray special bolts when checking the oil clearance.

Apply oil to the 10 mm special bolt threads and seating surfaces and install them.
Tighten the 10 mm special bolts in 2 or 3 steps in the order shown on the lower crankcase.

TORQUE:
Black bolt:52 N·m (5.3 kgf·m , 38 lbf·ft)
Gray bolt: 20 N·m (2.0 kgf·m , 14 lbf·ft) + 120°



Remove the lower crankcase and measure the compressed plastigauge at its widest point on each main journal to determine the oil clearance.

SERVICE LIMIT: 0.048 mm (0.0019 in)

If the oil clearance exceeds the service limit, select the correct replacement bearings.

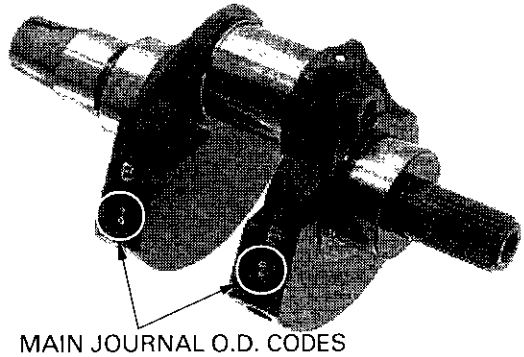


BEARING SELECTION

Record the main journal O.D. code numbers.

NOTE:

Number 1, 2 or 3 on the crank weight is the code for the main journal O.D.

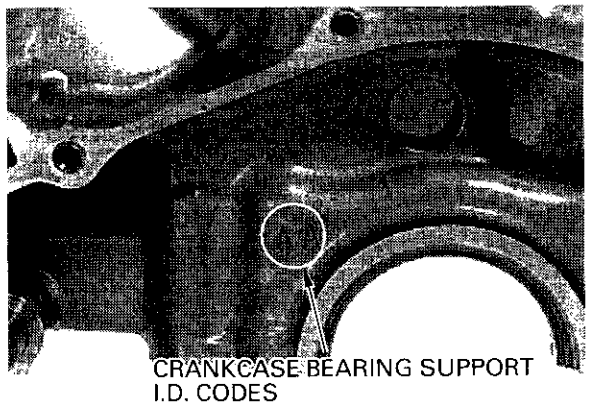


MAIN JOURNAL O.D. CODES

Record the crankcase bearing support I.D. code letters.

NOTE:

Letter A, B or C on the left side of the upper crankcase is the code for the bearing support I.D.

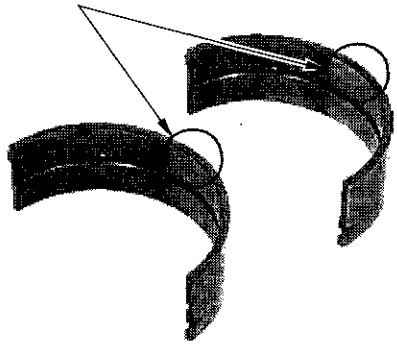


CRANKCASE BEARING SUPPORT I.D. CODES

Cross reference the main journal and bearing support codes to determine the replacement bearing color code.

Bearing support I.D. code / Main journal O.D. code	A	B	C
1	Yellow	Green	Brown
2	Green	Brown	Black
3	Brown	Black	Blue

COLOR CODES

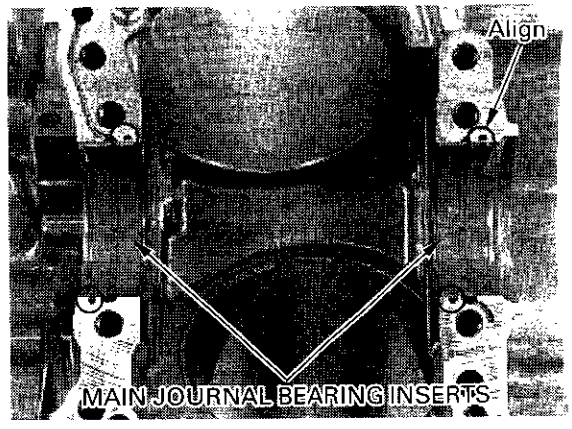


CAUTION:

After selecting new bearings, recheck the oil clearance with plastigauge. Incorrect oil clearance can cause major engine damage.

BEARING INSTALLATION

Clean the bearing outer surfaces and crankcase bearing supports.
Install the main journal bearing inserts onto the crankcase bearing supports, aligning each tab with each groove.

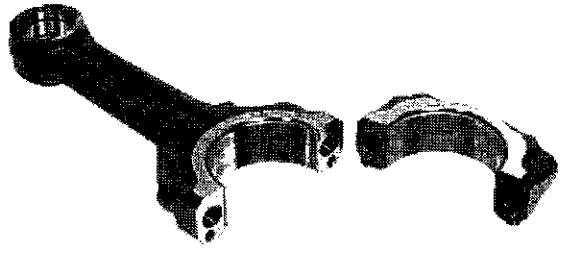


CRANKPIN BEARING

Remove the crankshaft (page 12-3).

BEARING INSPECTION

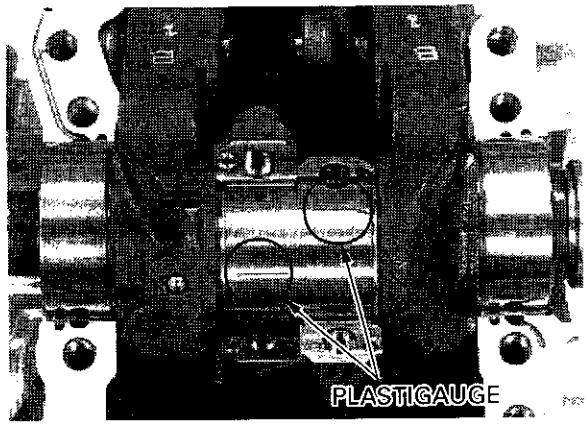
Check the bearing inserts for unusual wear or peeling.
Check the bearing tabs for damage.



OIL CLEARANCE INSPECTION

Do not rotate the crankshaft during inspection.

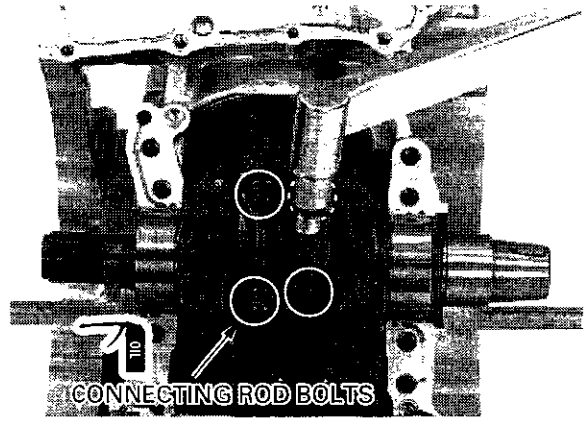
Clean off any oil from the bearing inserts and crankpin.
Install the crankshaft onto the upper crankcase.
Set the connecting rods onto the crankpin.
Put strips of plastigauge lengthwise on the crankpin avoiding the oil hole.



Use the removed connecting rod bolts when checking the oil clearance.

Carefully install the bearing caps, aligning the dowel pins with the holes in the connecting rods. Apply oil to the connecting bolt threads and seating surfaces and install the bolts. Tighten the bolts in 2 or 3 steps alternately.

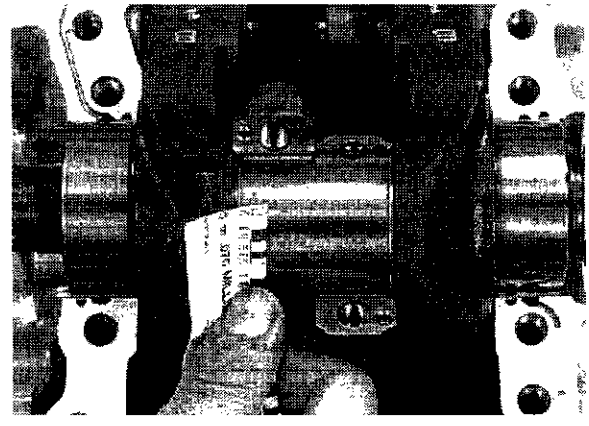
TORQUE: 20 N·m (2.0 kgf·m , 14 lbf·ft) + 120°



Remove the bearing caps and measure the compressed plastigauge at its widest point on the crankpin to determine the oil clearance.

SERVICE LIMIT: 0.060 mm (0.0024 in)

If the oil clearance exceeds the service limit, select the correct replacement bearings.

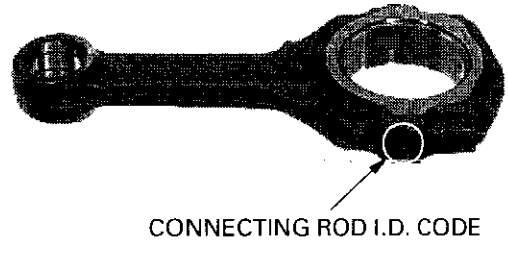


BEARING SELECTION

Record the connecting rod I.D. code number.

NOTE:

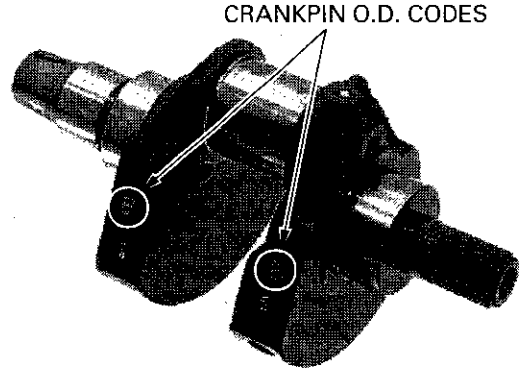
Number 1, 2 or 3 on the connecting rod is the code for the connecting rod I.D.



Record the crankpin O.D. code letter.

NOTE:

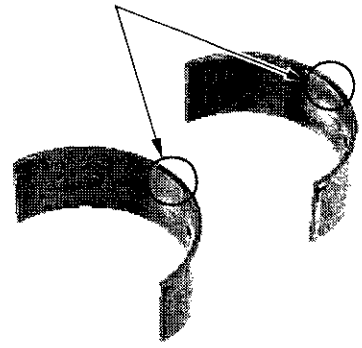
Letter A, B or C on the crank weight is the code for the crankpin O.D.



Cross reference the connecting rod and crankpin codes to determine the replacement bearing color code.

Connecting rod I.D. code / Crankpin O.D. code	1	2	3
A	Yellow	Green	Brown
B	Green	Brown	Black
C	Brown	Black	Blue

COLOR CODES



NOTE:

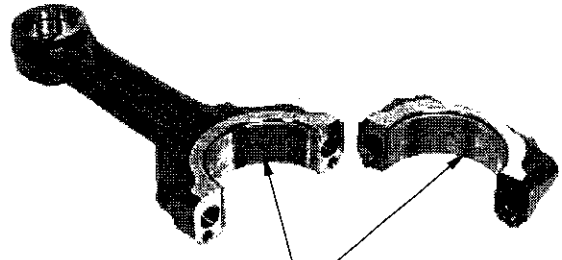
There are one painted mark on the bearing insert for the front connecting rod, and two painted marks for the rear connecting rod. Use correct bearing inserts.

CAUTION:

After selecting new bearings, recheck the oil clearance with plastigauge. Incorrect oil clearance can cause major engine damage.

BEARING INSTALLATION

Clean the bearing outer surfaces, bearing cap and connecting rod.
Install the crankpin bearing inserts onto the bearing cap and connecting rod aligning each tab with each groove.



CRANKPIN BEARING INSERTS

PISTON/CYLINDER

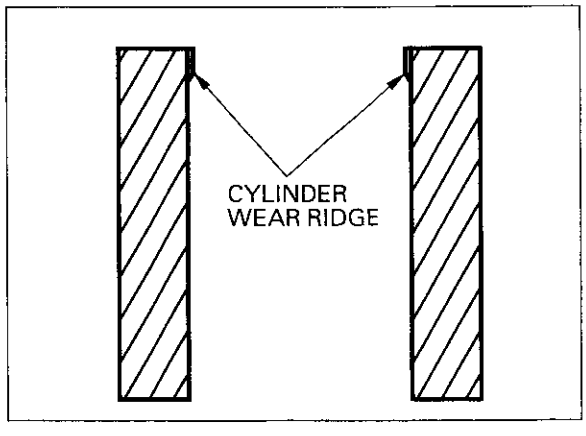
PISTON REMOVAL

Remove the transmission (page 11-5).
Remove the crankshaft (page 12-3).

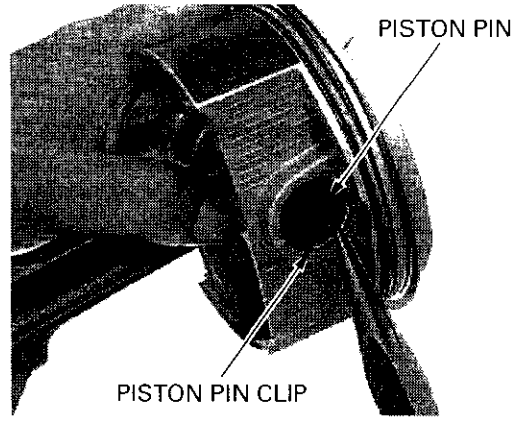
Push each piston/connecting rod out through the top of the cylinder bore.

CAUTION:

On engines with high mileage, inspect the cylinders for a ridge just above the highest point of ring travel.
Any ridge must be removed with an automotive type ridge reamer before removing the pistons to allow the pistons and rings to pass through the cylinder.



Remove the piston pin clips with the pliers.
Push the piston pin out of the piston and connecting rod, and remove the piston.

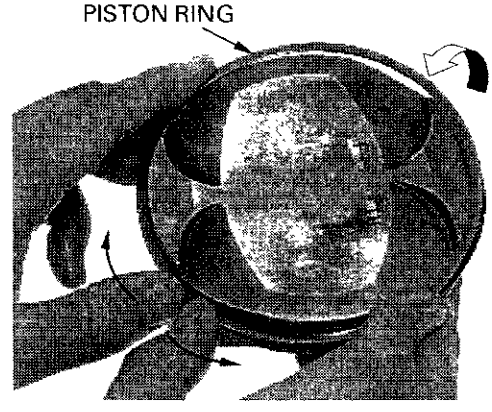


PISTON RING REMOVAL

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

CAUTION:

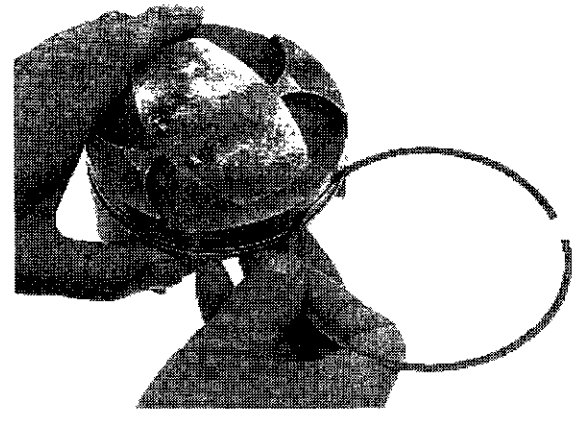
Do not damage the piston ring by spreading the ends too far.



Clean carbon deposits from the piston.

CAUTION:

Clean carbon deposits from the ring grooves with a ring that will be discarded. Never use a wire brush; it will scratch the groove.

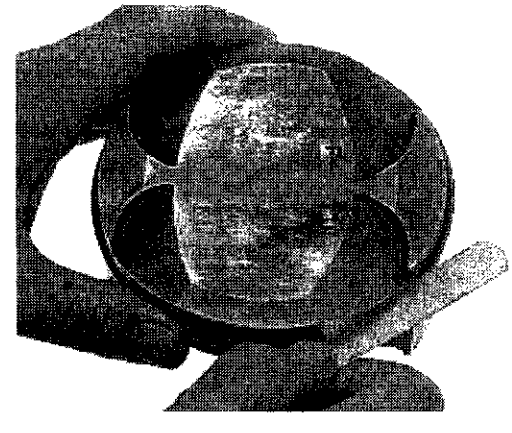


PISTON INSPECTION

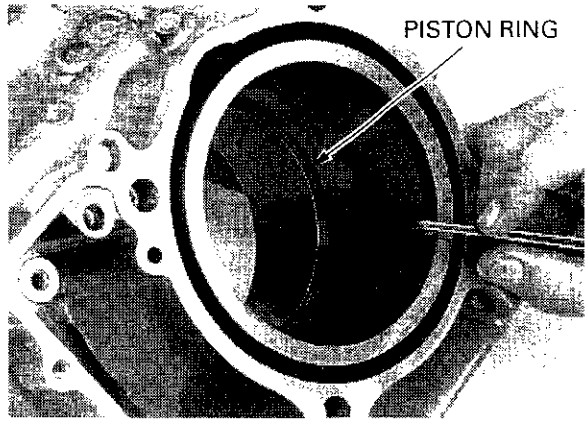
Inspect the piston rings for movement by rotating the rings. The rings should be able to move in their grooves without catching.

Push the ring until the outer surface of the piston ring is nearly flush with the piston and measure the ring-to-ring groove clearance.

SERVICE LIMITS: Top: 0.115 mm (0.0045 in)
Second: 0.085 mm (0.0033 in)



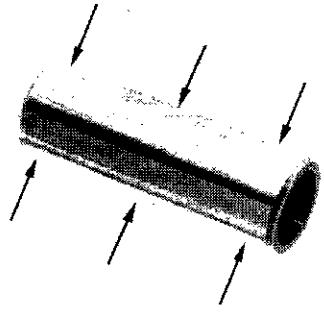
Insert each piston ring into the bottom of the cylinder squarely using the piston.
Measure the ring end gap.



SERVICE LIMITS: Top: 0.45 mm (0.018 in)
Second: 0.55 mm (0.022 in)
Oil (side rail): 0.65 mm (0.026 in)

Measure the piston pin O.D. at piston and connecting rod sliding areas.

SERVICE LIMIT: 22.984 mm (0.9049 in)

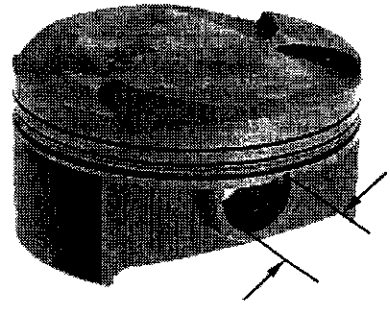


Measure the piston pin hole I.D.

SERVICE LIMIT: 23.03 mm (0.907 in)

Calculate the piston-to-piston pin clearance.

SERVICE LIMIT: 0.046 mm (0.0018 in)

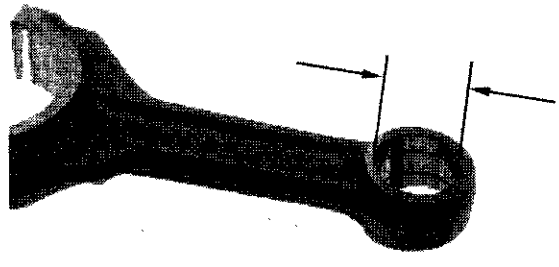


Measure the connecting rod small end I.D.

SERVICE LIMIT: 23.051 mm (0.9075 in)

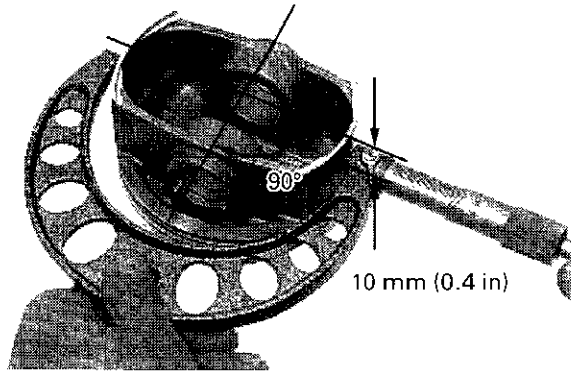
Calculate the connecting rod-to-piston pin clearance.

SERVICE LIMIT: 0.067 mm (0.0026 in)



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

SERVICE LIMIT: 99.900 mm (3.9331 in)



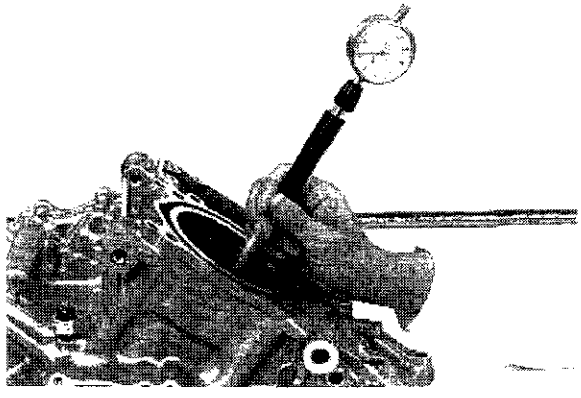
CYLINDER INSPECTION

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

SERVICE LIMIT: 100.100 mm (3.9409 in)

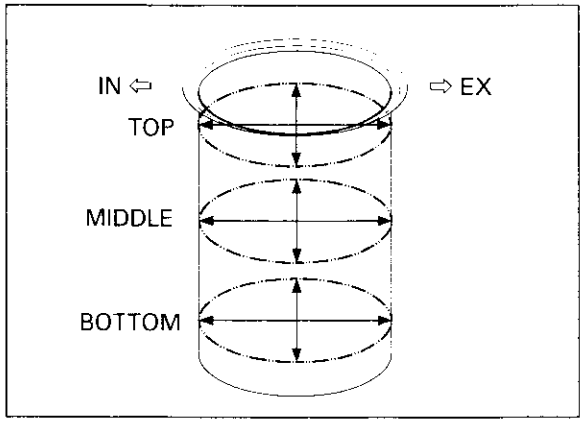
Calculate the cylinder-to-piston clearance.

SERVICE LIMIT: 0.200 mm (0.0079 in)



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

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



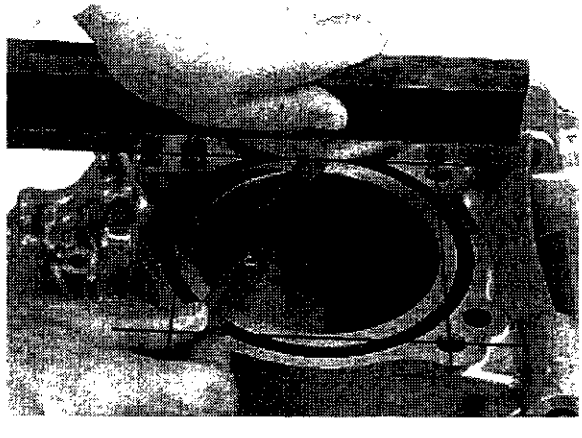
The cylinder must be rebored and an oversize piston fitted if the service limits are exceeded.

The following oversize pistons are available: 0.25 mm (0.010 in), 0.50 mm (0.020 in)

The cylinder must be rebored so that the clearance for an oversize piston is 0.015—0.055 mm (0.0006—0.0022 in)

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

SERVICE LIMIT: 0.05 mm (0.002 in)



PISTON RING INSTALLATION

Carefully install the piston rings into the piston ring grooves with the marking facing up.

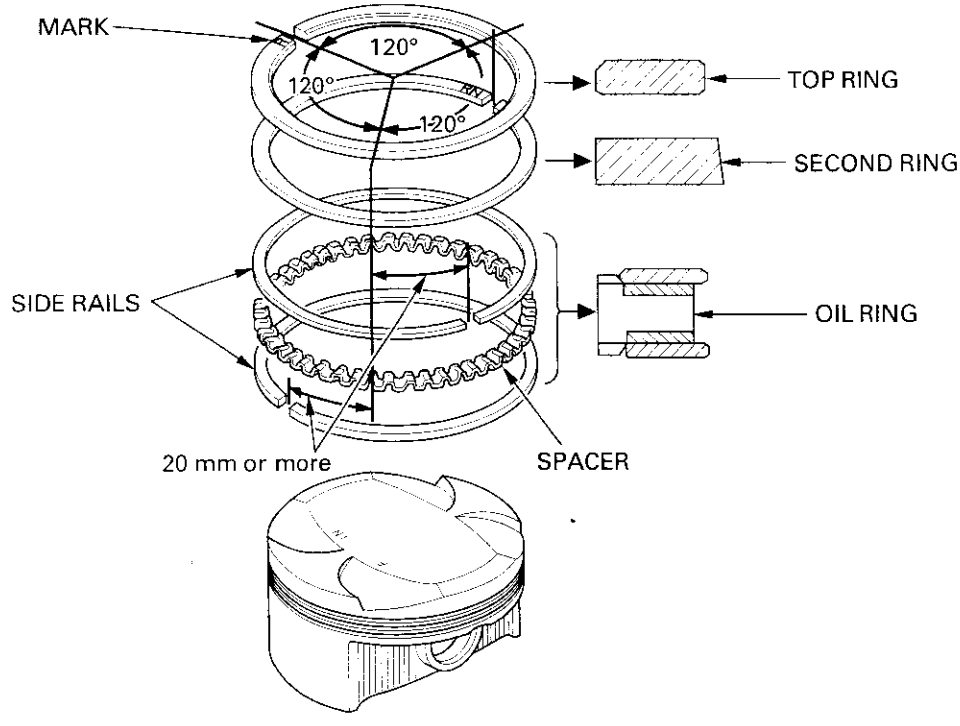
CAUTION:

Be careful not to damage the piston and rings during installation.

NOTE:

To install the oil ring, install the spacer first, then install the side rails.

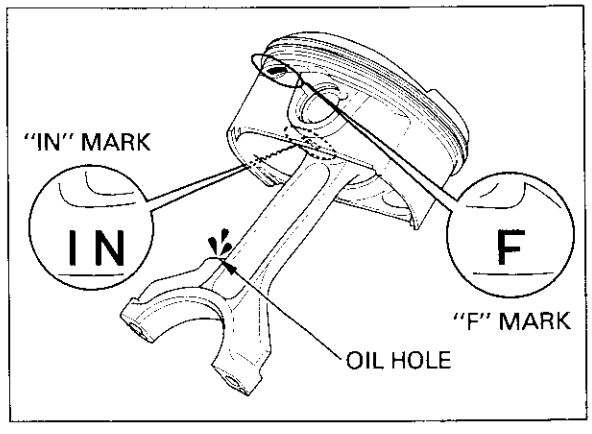
Stagger the piston ring end gaps 120 degrees apart from each other.
Stagger the side rail end gaps as shown.



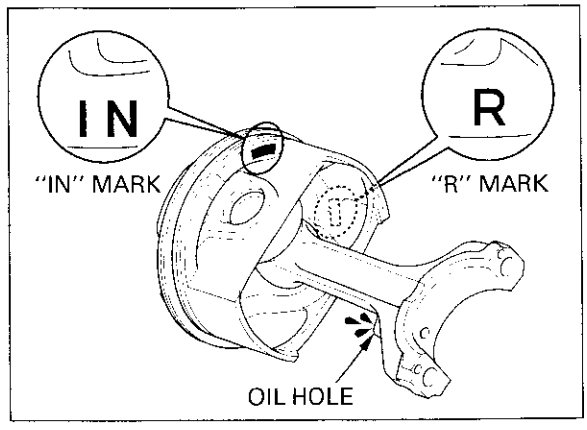
PISTON INSTALLATION

Apply molybdenum oil solution to the connecting rod small end inner surfaces, piston pin holes and piston pin.

Front cylinder piston:
Note that the connecting rod has "MCFF" mark.
Install the piston on the connecting rod so that the "F" and "IN" marks are facing the same direction as the oil hole in the rod.



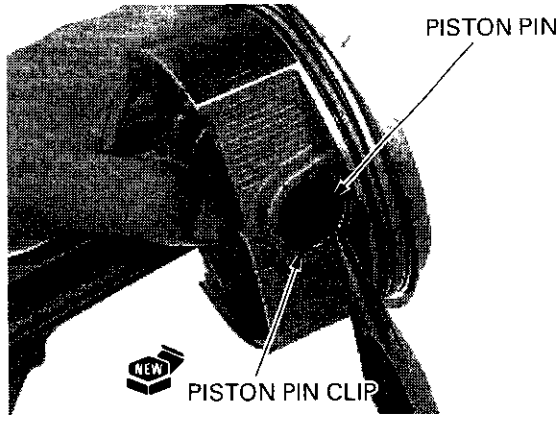
Rear cylinder piston:
Note that the connecting rod has "MCFR" mark.
Install the piston on the connecting rod so that the "R" and "IN" marks are opposite the oil hole in the rod.



Install the piston pin into the piston and connecting rod.
Install new piston pin clips into the groove of the piston pin hole.

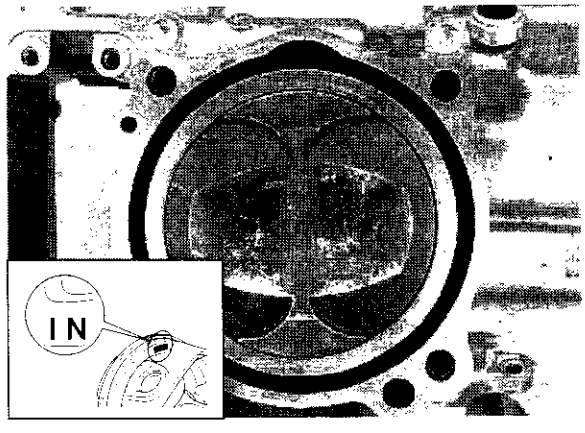
NOTE:

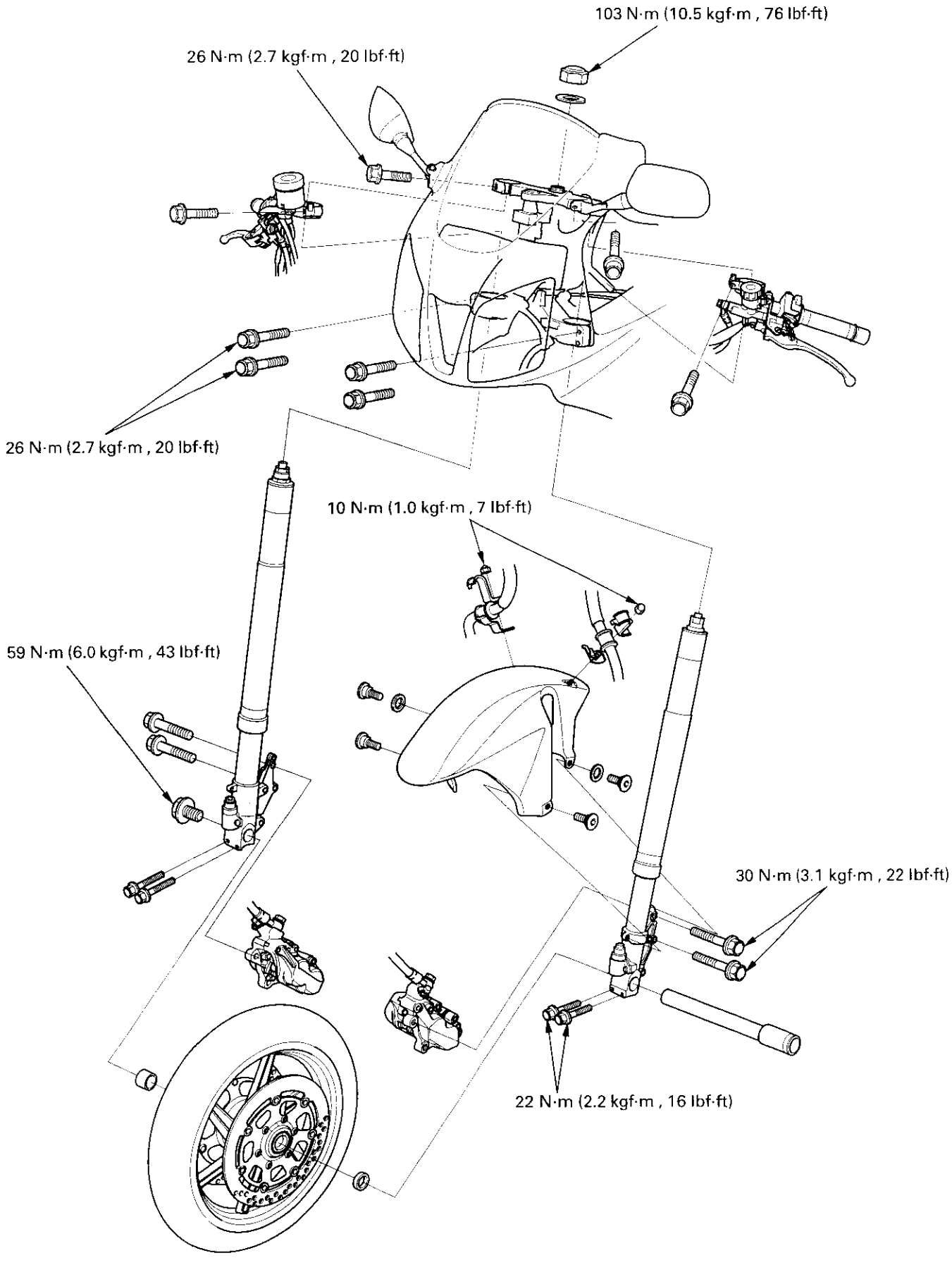
- Make sure that the piston pin clips are seated securely.
- Do not align the piston pin clip end gap with the piston cutout.



Coat the piston and piston rings with engine oil.
Install the piston/connecting rod in the cylinder with the "IN" mark toward the intake side, using a commercially available piston ring compressor tool.

Install the crankshaft (page 12-3).
Install the transmission (page 11-9).




103 N·m (10.5 kgf·m , 76 lbf·ft)
26 N·m (2.7 kgf·m , 20 lbf·ft)
26 N·m (2.7 kgf·m , 20 lbf·ft)
10 N·m (1.0 kgf·m , 7 lbf·ft)
59 N·m (6.0 kgf·m , 43 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	FORK	13-8
TROUBLESHOOTING	13-2	HANDLEBAR	13-21
FRONT WHEEL	13-3	STEERING STEM	13-24

SERVICE INFORMATION

GENERAL

⚠WARNING

- ***Riding on damaged rims impairs safe operation of the vehicle.***
- ***A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.***

- A hoist or equivalent is required to support the motorcycle when servicing the front wheel, fork and steering stem.
- Refer to section 15 for brake system service.

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)
Wheel balance weight		—	60 g (2.1 oz)max.
Fork	Spring free length	255.6 (10.06)	250.5 (9.86)
	Tube runout	—	0.20 (0.008)
	Recommended fluid	Fork fluid	—
	Fluid level	135 (5.3)	—
	Fluid capacity	513 ± 2.5 cm³ (17.3 ± 0.08 US oz, 18.1 ± 0.09 Imp oz)	—
Steering head bearing preload		1.4–2.1 kgf (3.1–4.6 lbf)	—

13

TORQUE VALUES

Handlebar weight mounting screw	10 N·m (1.0 kgf·m, 7 lbf·ft)	ALOC screw
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 bolt	20 N·m (2.0 kgf·m, 14 lbf·ft)	ALOC bolt
Front brake caliper mounting bolt	30 N·m (3.1 kgf·m, 22 lbf·ft)	Apply locking agent to the threads.
Fork cap	34 N·m (3.5 kgf·m, 25 lbf·ft)	
Fork center bolt	34 N·m (3.5 kgf·m, 25 lbf·ft)	
Fork top bridge pinch bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)	
Fork bottom bridge pinch bolt	26 N·m (2.7 kgf·m, 20 lbf·ft)	
Front brake hose clamp nut (fender side)	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Front brake caliper bracket bolt	49 N·m (5.0 kgf·m, 36 lbf·ft)	Apply locking agent to the threads.
Steering stem nut	103 N·m (10.5 kgf·m, 76 lbf·ft)	
Steering bearing adjustment nut	32 N·m (3.3 kgf·m, 24 lbf·ft)	Apply oil to the threads.
Front brake hose clamp bolt (stem side)	10 N·m (1.0 kgf·m, 7 lbf·ft)	
Front brake hose 3-way joint bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	

TOOLS

Bearing remover shaft	07746-0050100
Bearing remover head, 22 mm	07746-0050700
Driver	07749-0010000
Attachment, 42 × 47 mm	07746-0010300
Pilot, 22 mm	07746-0041000
Fork seal driver	07YMD-MCF0100
Fork rod holder handle	07TMB-001010A
Fork damper holder attachment	07YMB-MCF0100
Steering stem socket	07916-3710101
Driver attachment A	07946-KM90100
Driver shaft assembly	07946-KM90300
Race remover A	07946-KM90401
Assembly base	07946-KM90600
Race remover B	07NMF-MT70110
Driver attachment B	07NMF-MT70120
Attachment, 35 mm I.D.	07746-0030400

TROUBLESHOOTING

Hard steering
- Steering bearing adjustment nut too tight
- Worn or damaged steering head bearings
- Bent steering stem
- Insufficient tire pressure

Steers one side or does not track straight
- Damaged or loose steering head bearings
- Bent forks
- Bent axle
- Wheel installed incorrectly
- Bent frame
- Worn or damaged wheel bearings
- Worn or damaged swingarm pivot bearings

Front wheel wobbling
- Bent rim
- Worn or damaged front wheel bearings
- Faulty front tire
- Unbalanced front tire and wheel

Front wheel turns hard
- Faulty front wheel bearings
- Bent front axle
- Front brake drag

Soft suspension
- Insufficient fluid in fork
- Incorrect fork fluid weight
- Weak fork springs
- Insufficient tire pressure

Hard suspension
- Bent fork tubes
- Too much fluid in fork
- Incorrect fork fluid weight
- Clogged fork fluid passage

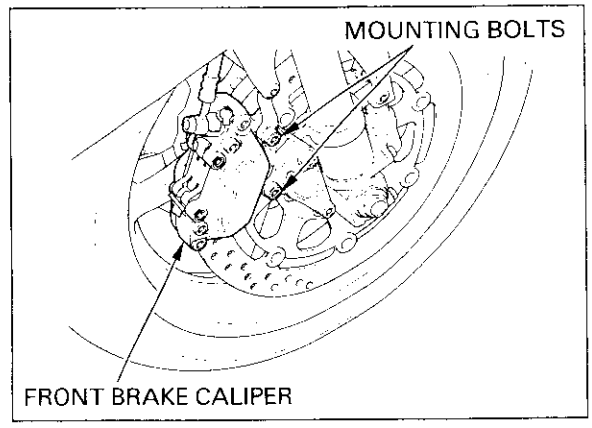
Front suspension noise
- Insufficient fluid in fork
- Loose fork fasteners

FRONT WHEEL

REMOVAL

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

Remove the mounting bolts and front brake calipers from the caliper brackets.



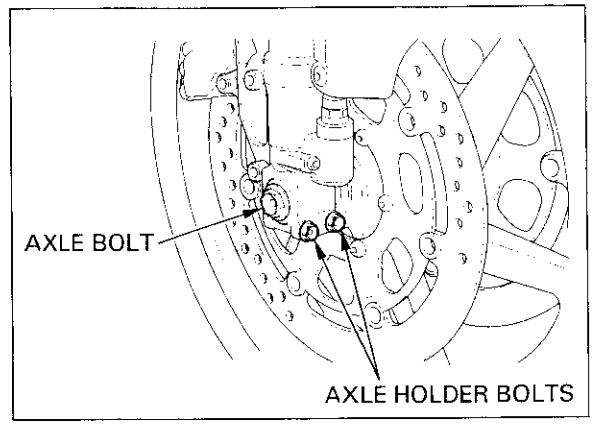
CAUTION:

Support the brake caliper so that it does not hang from the brake hose. Do not twist the brake hose.

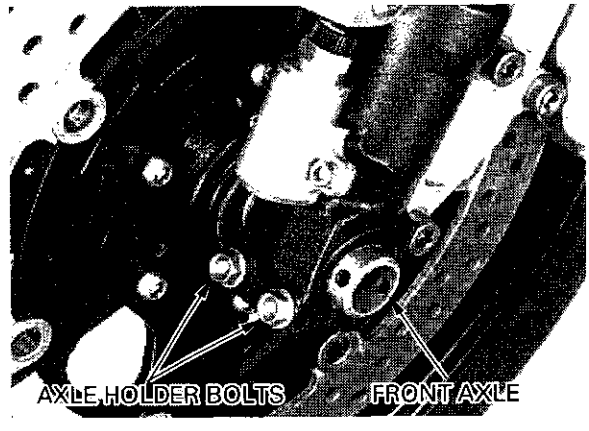
NOTE:

Do not operate the brake lever after removing the brake calipers.

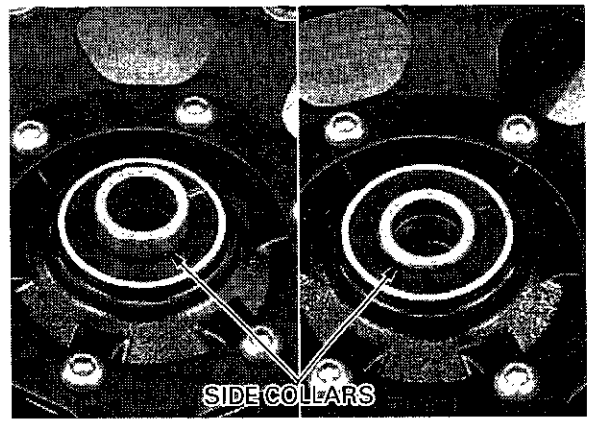
Loosen the right front axle holder bolts.
Remove the front axle bolt.



Loosen the left front axle holder bolts.
Remove the front axle and the front wheel.



Remove the side collars.

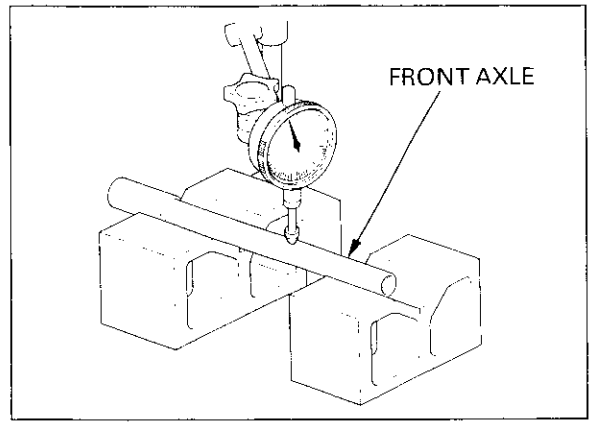


INSPECTION

AXLE

Set the front axle in V-blocks.
Turn the front axle and measure the runout using a dial indicator.
Actual runout is 1/2 the total indicator reading.

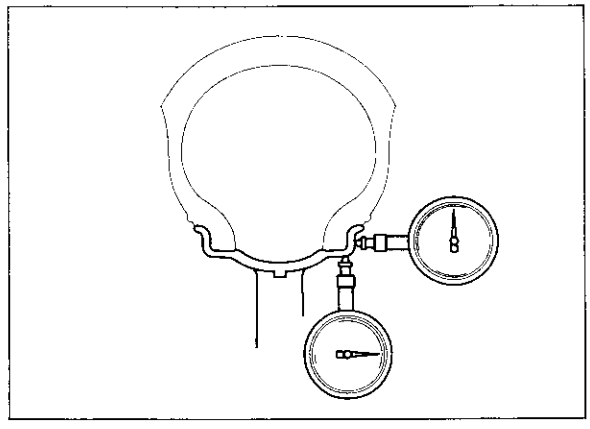
SERVICE LIMIT: 0.20 mm (0.008 in)



WHEEL RIM

Check the rim runout by placing the wheel in a truing 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)

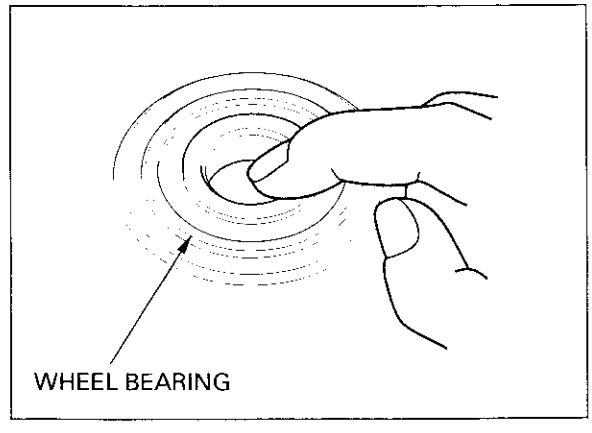


WHEEL BEARING

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.

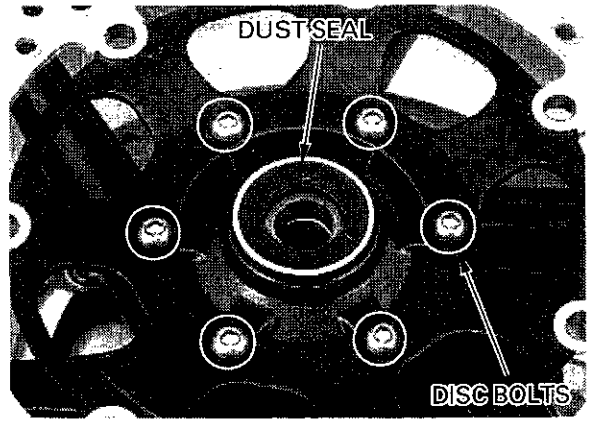
Replace the wheel bearings in pairs.

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



DISASSEMBLY

Remove the dust seals from the wheel hub.
Remove the disc bolts and brake discs from the wheel hub.

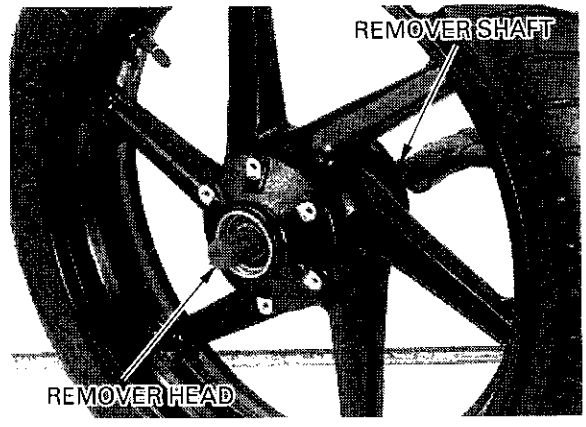


Replace the wheel bearings in pairs. Do not reuse old bearings.

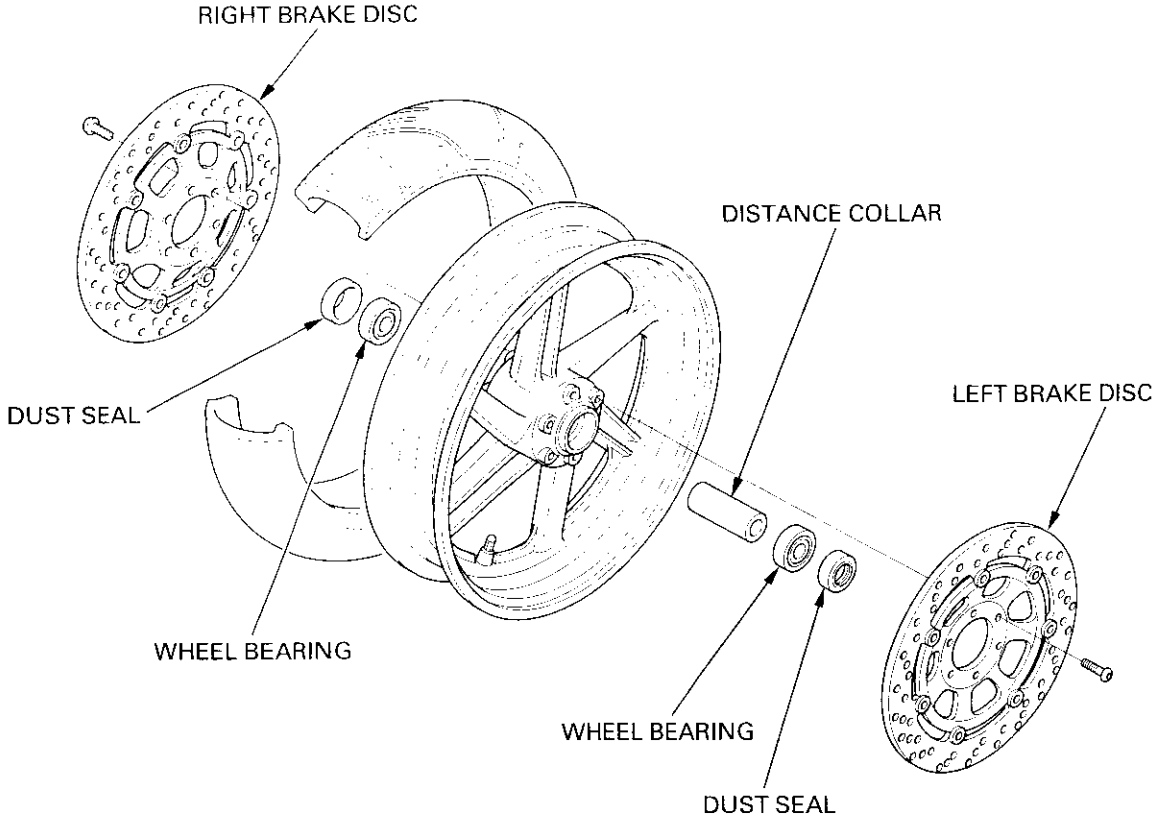
Install the bearing remover head into the bearing. From opposite side, install the bearing remover shaft and drive the bearing out of the wheel hub. Remove the distance collar and drive out the other bearing.

TOOLS:

Bearing remover shaft	07746-0050100
Bearing remover head, 22 mm	07746-0050700



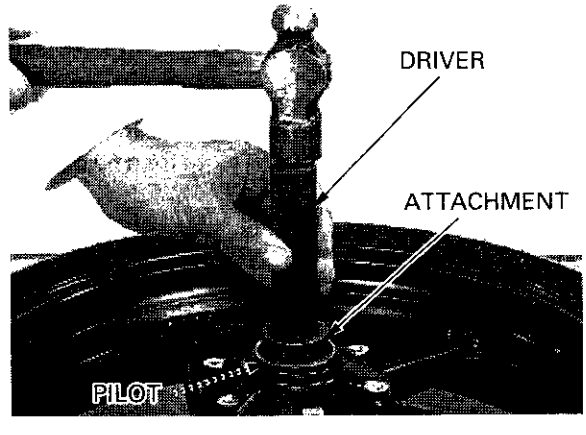
ASSEMBLY



Drive in a new right bearing squarely with the marking side facing up until it is fully seated.
Install the distance collar.
Drive in a new left bearing squarely with the marking side facing up until it is fully seated.

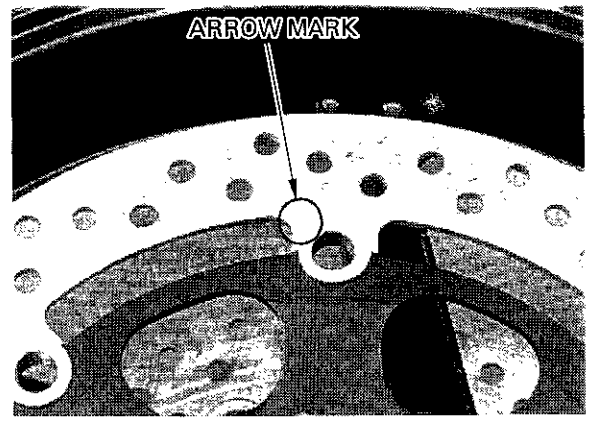
TOOLS:

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



Install the brake discs with the arrow mark facing in the normal rotating direction.
Install new disc bolts and tighten them in a crisscross pattern in 2 or 3 steps.

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



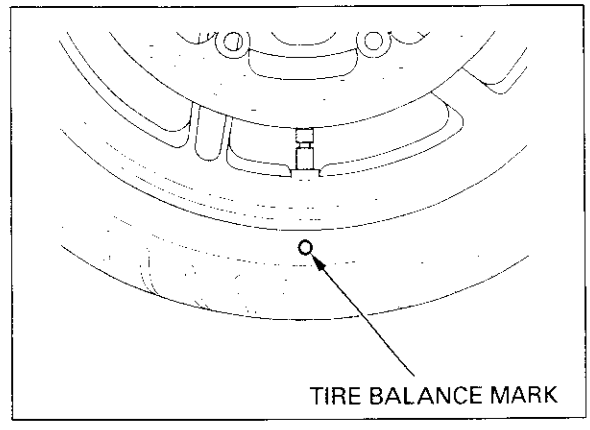
WHEEL BALANCE

⚠WARNING

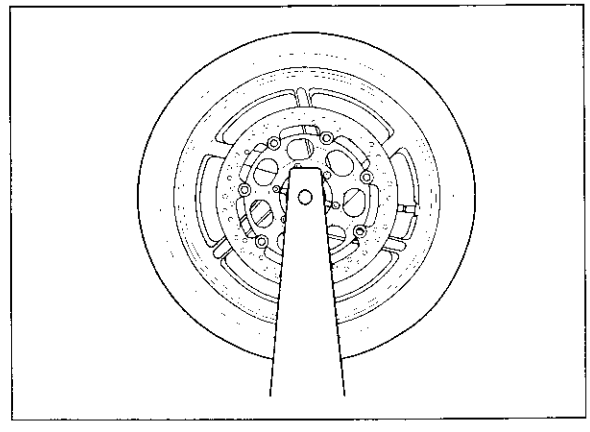
Wheel balance directly affects the stability, handling and overall safety of the motorcycle. Carefully check balance before reinstalling the wheel.

NOTE:

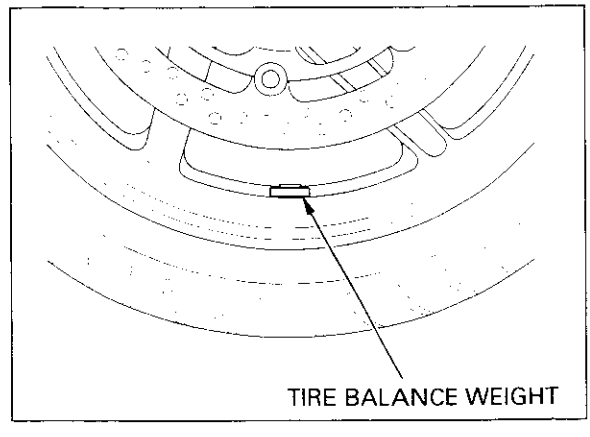
- Mount the tire with the arrow mark facing in the normal rotating direction.
- The wheel balance must be checked when the tire is remounted.
- For optimum balance, the tire balance mark (a paint dot on the side wall) must be located next to the valve stem. Remount the tire if necessary.



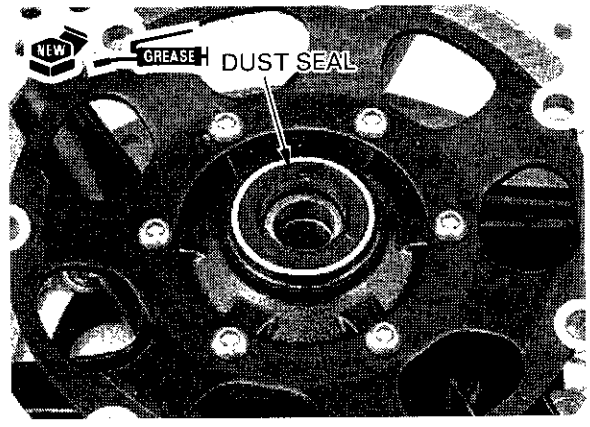
Mount the wheel, tire and brake disc assembly on an inspection stand.
Spin the wheel, allow it to stop, and mark the lowest (heaviest) part of the wheel with chalk.
Do this two or three times to verify the heaviest area.
If wheel is balanced, it will not stop consistently in the same position.



To balance the wheel, install balance weights on the lightest side of rim, the side opposite the chalk mark.
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 g (2.1 oz) to the wheel.



Apply grease to new dust seal lips.
Install the dust seals into the wheel hub.

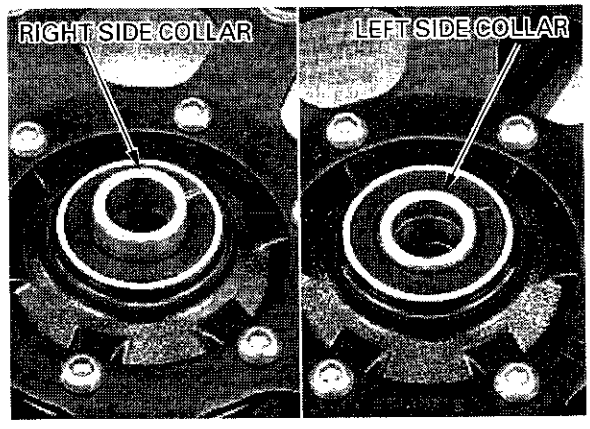


INSTALLATION

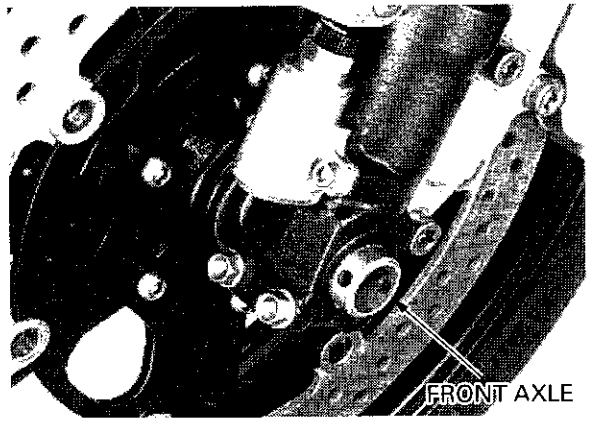
Install the side collars.

NOTE:

The right side collar is longer than the left side collar.



Apply thin coat of grease to the front axle.
Install the front wheel between the fork legs and insert the front axle.

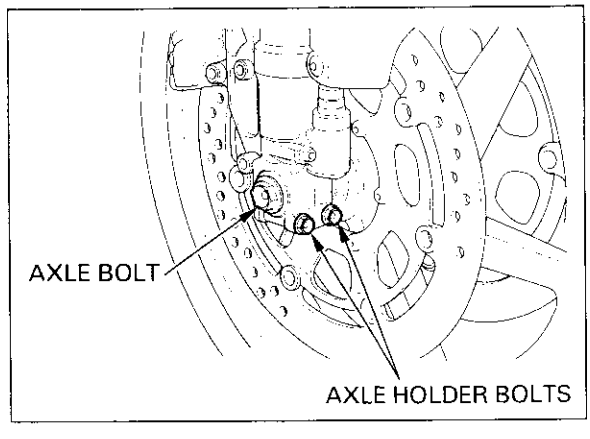


Install the axle bolt and tighten it while holding the axle.

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

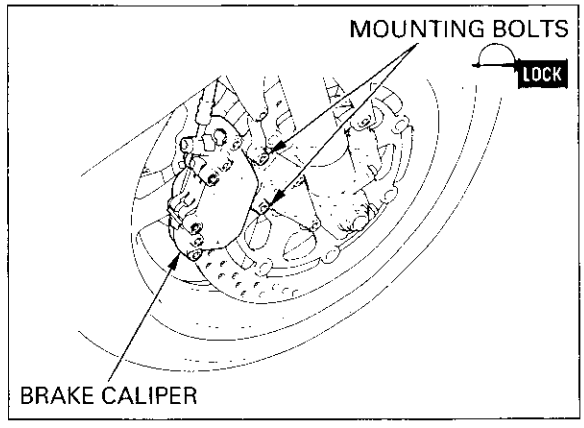
Tighten the right axle holder bolts.

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

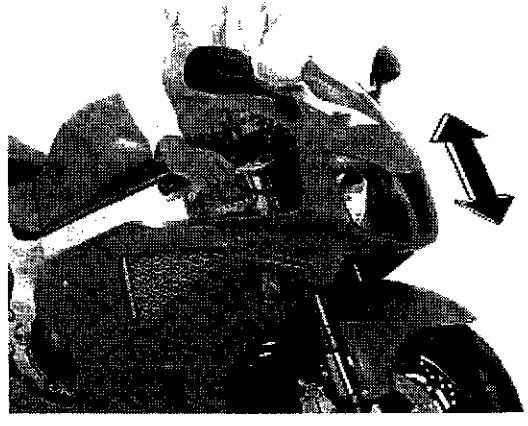


Apply locking agent to the caliper mounting bolt threads.
Install the brake calipers and tighten the mounting bolts.

TORQUE: 30 N·m (3.1 kgf·m , 22 lbf·ft)



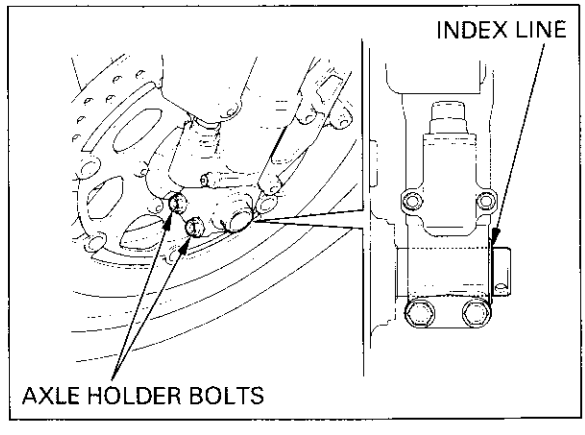
With the front brake applied, pump the forks up and down several times to seat the axle and check brake operation.



Make sure that the index line on the front axle aligns with the outer surface of the left fork leg.

Tighten the left axle holder bolts.

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

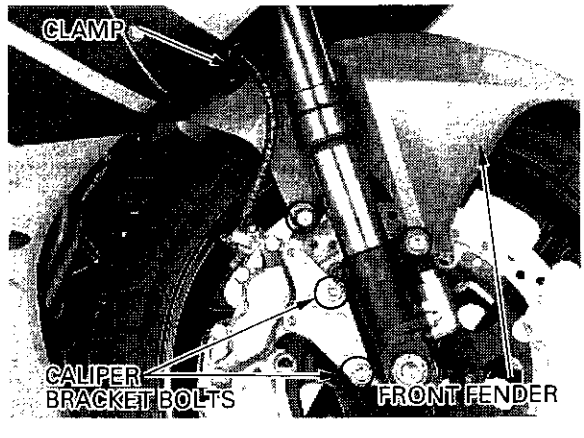


FORK

REMOVAL

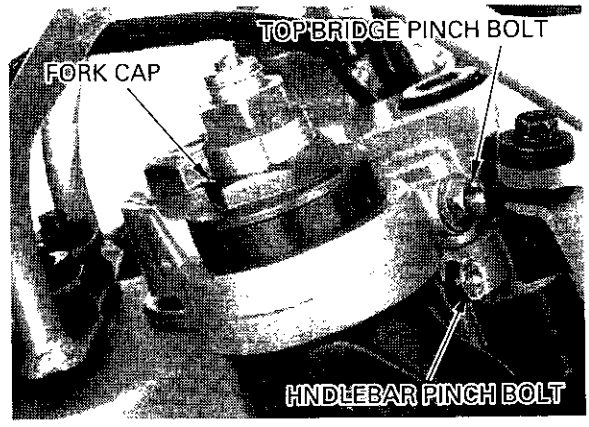
Remove the front brake hose clamps from the front fender.
Remove the four bolts, two rubber washers and the front fender.
Remove the caliper bracket bolts and the bracket with the caliper from the fork leg.

Remove the front wheel (page 13-3).



Loosen the fork top bridge pinch bolt and handlebar pinch bolt.

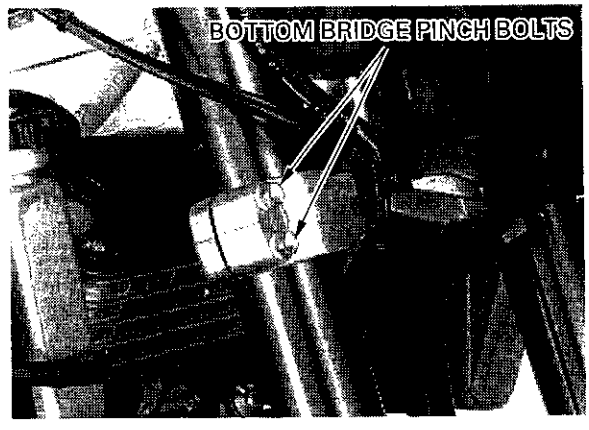
When the fork is ready to be disassembled, loosen the fork cap, but do not remove it.



While holding the fork leg, loosen the fork bottom bridge pinch bolts and remove the fork outer tube from the handlebar and fork bridges.

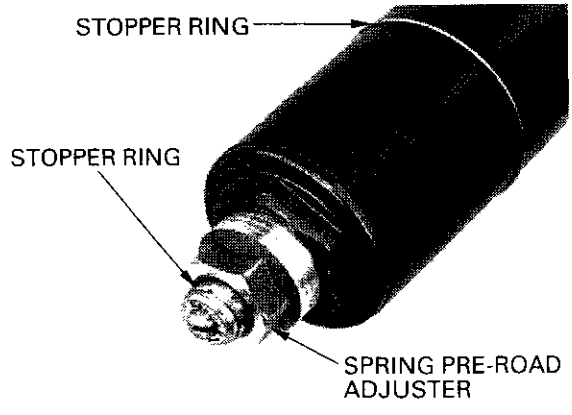
NOTE:

Keep the clutch or brake reservoir upright to prevent air from entering the hydraulic system.



DISASSEMBLY

Remove the stopper ring from the outer tube.
Remove the stopper ring from the damper rod.
Remove the spring pre-load adjuster by turning it counterclockwise.

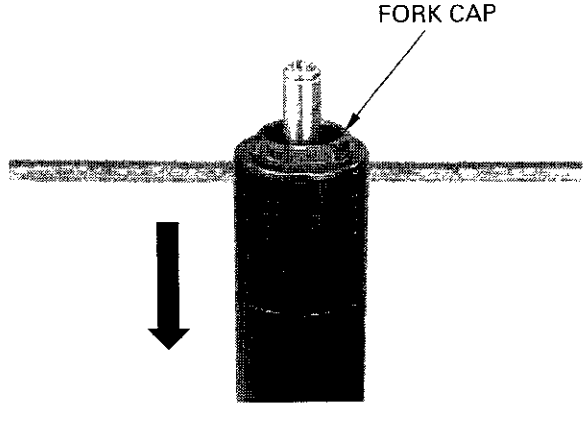


Hold the outer tube and remove the fork cap.

CAUTION:

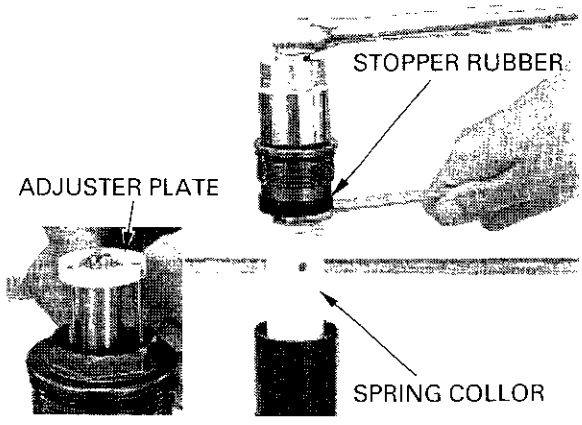
Do not remove the rebound damping adjuster from the damper rod, or the adjuster will damaged.

Slide the outer tube down onto the axle holder of the slide pipe.

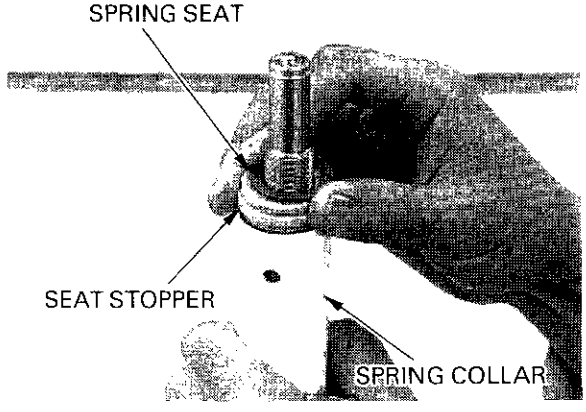


Push the spring collar down, hold the damper rod lock nut with the 17 mm open end wrench and loosen the fork cap.
Remove the fork cap and stopper rubber.

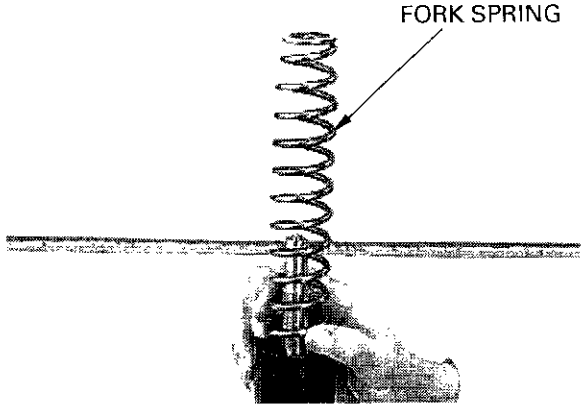
Remove the spring adjuster plate from the fork cap.



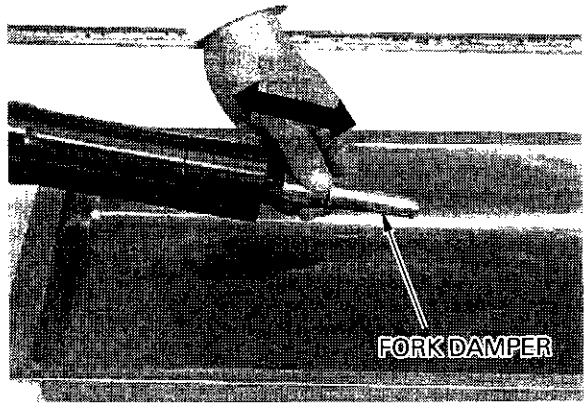
Remove the spring seat, seat stopper and spring collar.



Remove the fork spring.



Pour out the fork fluid by pumping the fork damper several times.

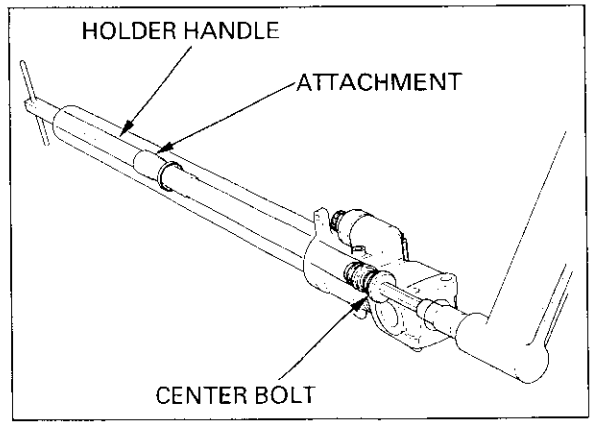


Hold the axle holder of the slide pipe in a vise with a soft jaws or shop towel.
Hold the fork damper with the special tools.

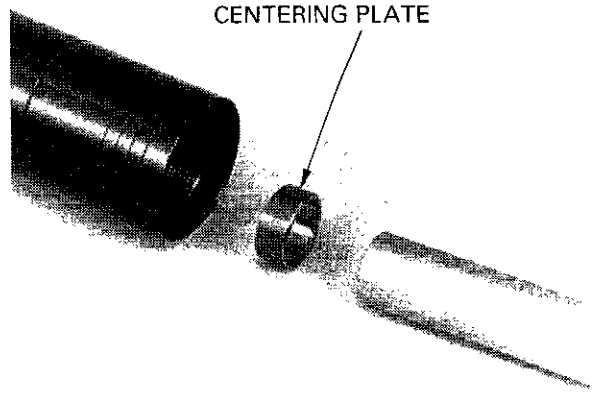
TOOLS:

Fork damper holder attachment	07YMB-MCF0100
Fork rod holder handle	07TMB-001010A

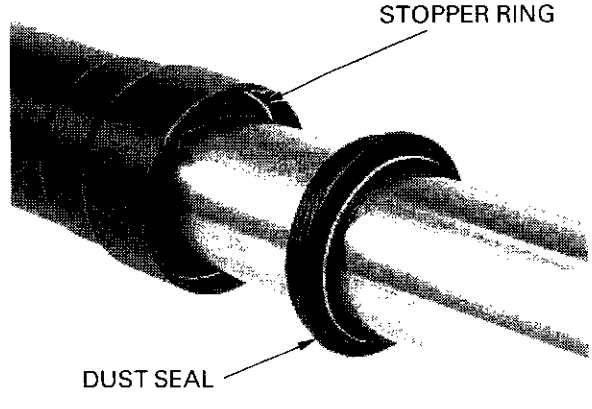
Remove the fork center bolt.



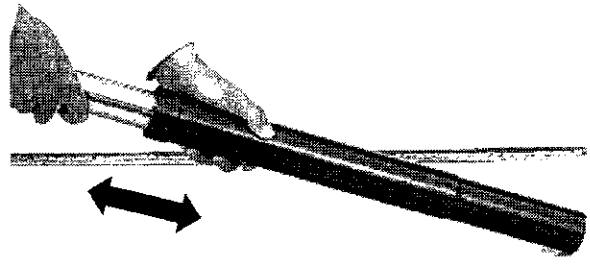
Remove the fork damper and centering plate.



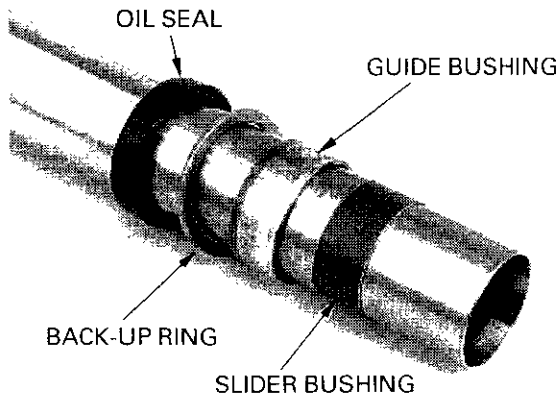
Remove the dust seal and stopper ring from the outer tube, being careful not to scratch the slide pipe sliding surface.



Using quick successive motions, pull the slide pipe out of the outer tube.



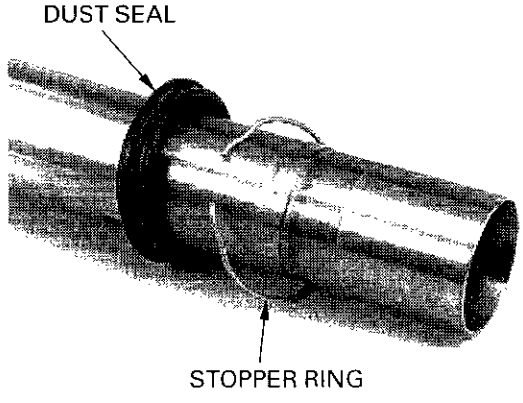
Carefully remove the slider bushing by prying the slot with a screwdriver until the bushing can be pulled off the slide pipe by hand.
Remove the guide bushing, back-up ring and oil seal from the slide pipe.



CAUTION:

- ***Do not pry open the slider bushing more than necessary.***
- ***Be careful not to scratch the teflon coating of the bushings.***

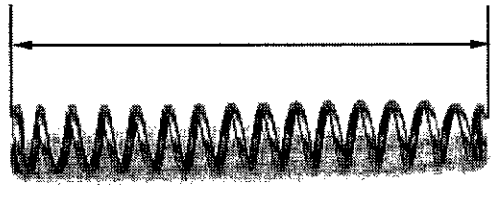
Remove the stopper ring and dust seal from the slide pipe.



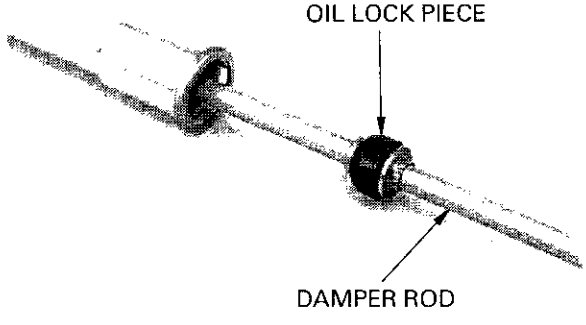
INSPECTION

Measure the fork spring free length.

SERVICE LIMIT: 250.5 mm (9.86 in)



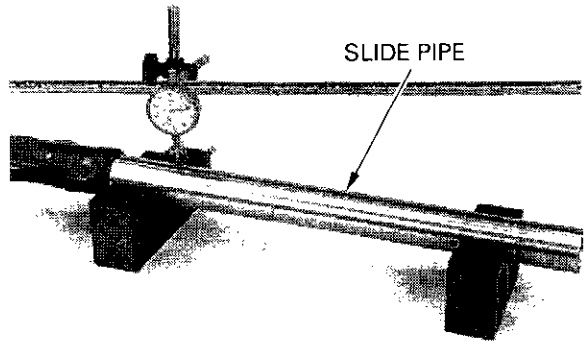
Check the outer tube for damage or deformation.
Check the damper rod for bend or damage.
Check the oil lock piece for wear or damage.



Check the slide pipe for score marks, scratches or abnormal wear.

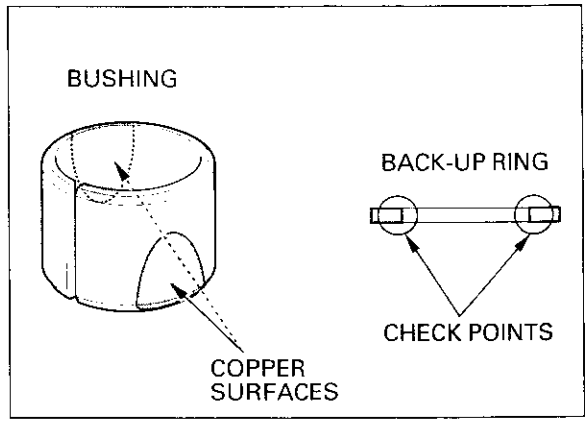
Set the slide pipe in V-blocks and measure the fork tube runout with a dial indicator.
Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.20 mm (0.008 in)



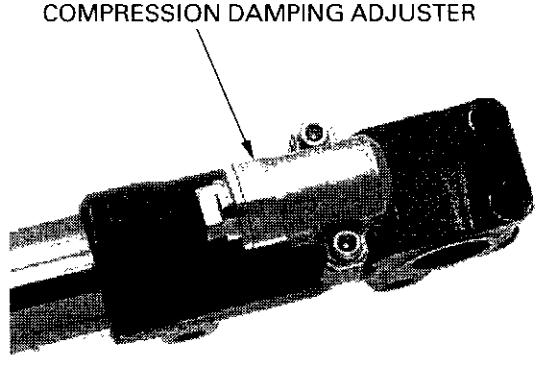
Visually inspect the slider and guide bushings.
Replace the bushings if there is excessive scoring or scratching, or if the teflon is worn so that the copper surface appears on more 3/4 of the entire surface.

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



COMPRESSION DAMPING ADJUSTER REPLACEMENT

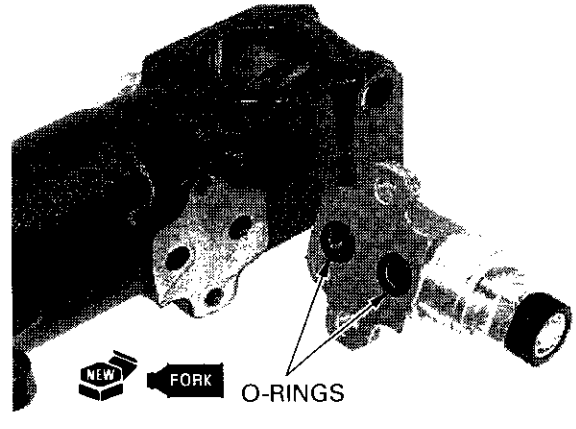
Remove the two bolts and the compression damping adjuster.



Coat new O-rings with fork fluid and install them onto the adjuster.
Apply locking agent to the bolt threads.
Install the adjuster and tighten the bolts securely.

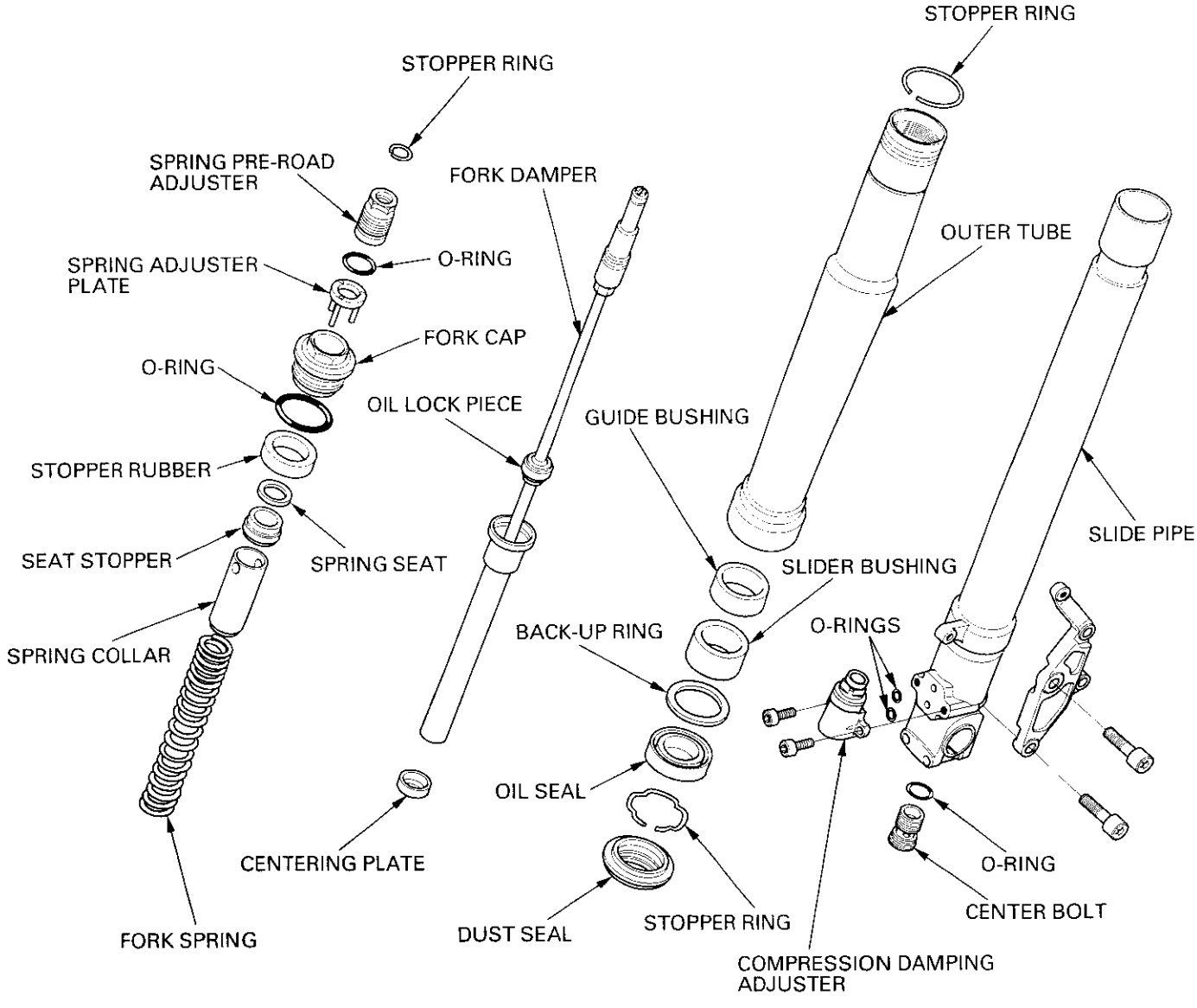
ADJUSTER POSITION

To set the adjuster to the standard position, turn the adjuster clockwise until it stops, then turn it counterclockwise 12 clicks.

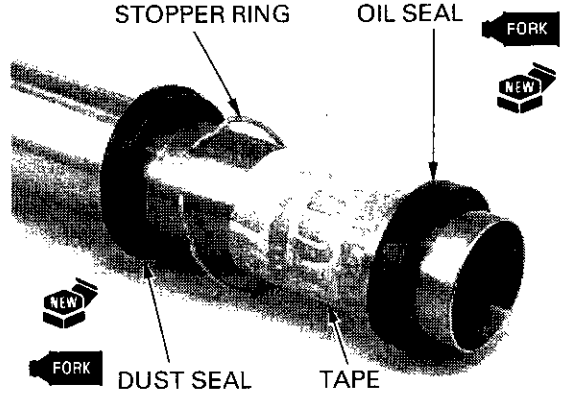


ASSEMBLY

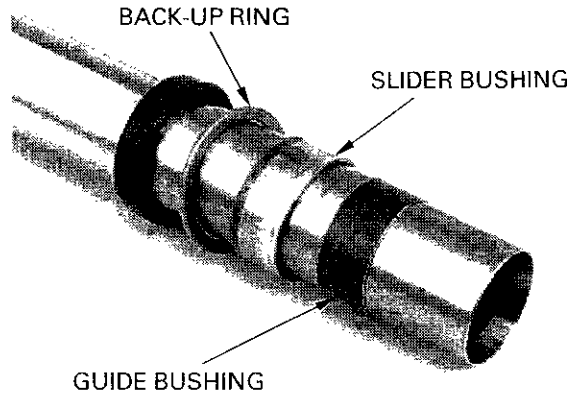
Before assembly, wash all parts with a high flash point or non-flammable solvent and wipe them off completely.



Wrap the slider bushing groove of the slide pipe with a tape.
Apply fork fluid to new dust seal and oil seal lips.
Install the dust seal and stopper ring.
Install the oil seal with the marking side facing toward the axle holder.



Install the back-up ring, guide bushing and slider bushing.



CAUTION:

- ***Be careful not to damage the coating of the bushings.***
- ***Do not open the slider bushing more than necessary.***

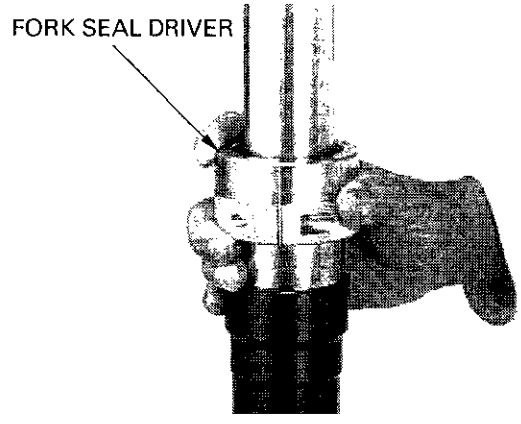
NOTE:

Remove the burrs from the slider bushing mating surface, being careful not to peel off the coating.

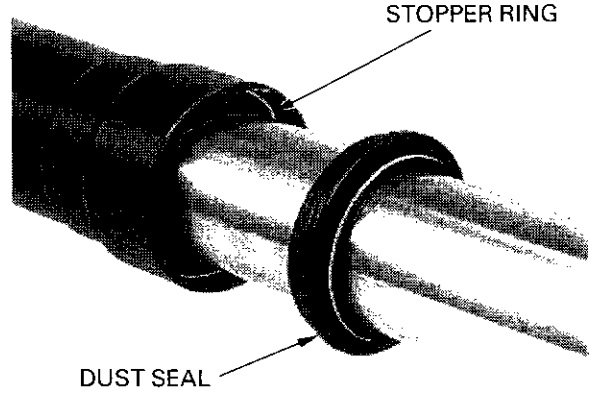
Install the slide pipe in the outer tube.
Drive the guide bushing, back-up ring and oil seal into the outer tube until the stopper ring groove is visible, using the special tool.

TOOL:

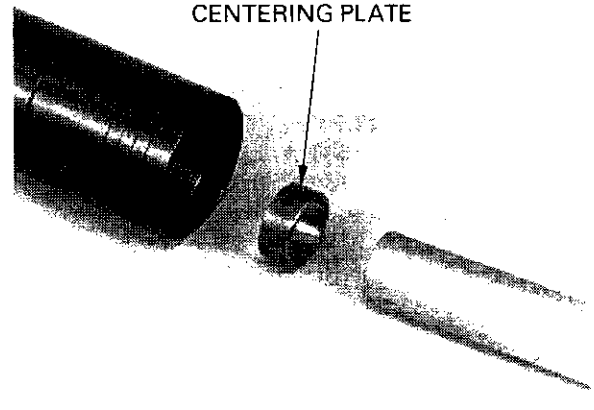
Fork seal driver	07YMD-MCF0100 or 07KMD-KZ30101 and 07NMD-KZ30101



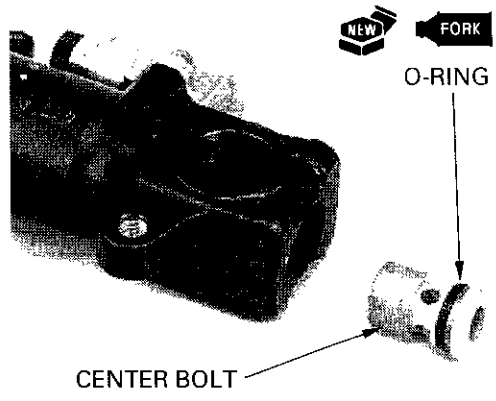
Install the stopper ring into the groove in the outer tube.
Install the dust seal into the outer tube.



Install the centering plate and fork damper into the slide pipe.



Coat a new O-ring with fork fluid and install it into the center bolt groove.



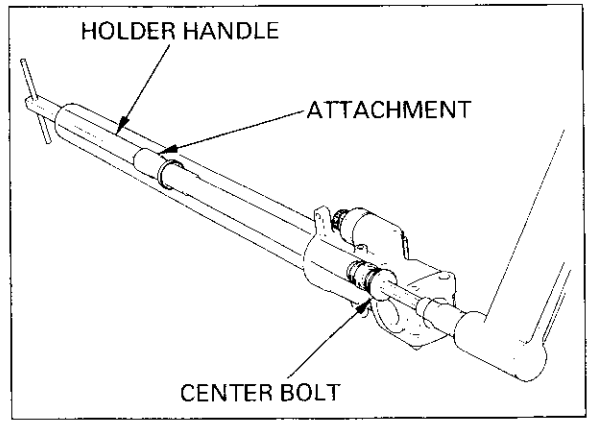
Hold the axle holder of the slide pipe in a vise with a soft jaws or shop towel.
Hold the fork damper with the special tools.

TOOLS:

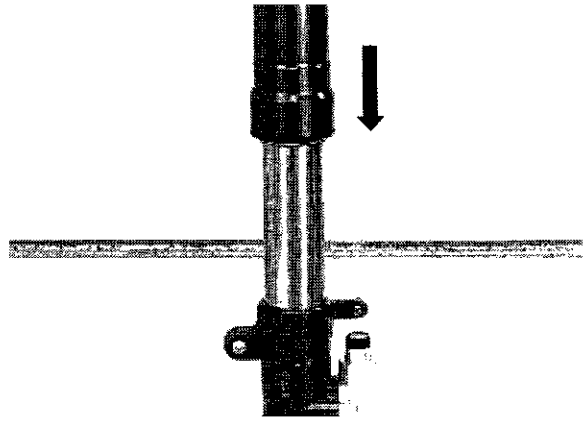
Fork damper holder attachment	07YMB-MCF0100
Fork rod holder handle	07TMB-001010A

Install and tighten the fork center bolt.

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

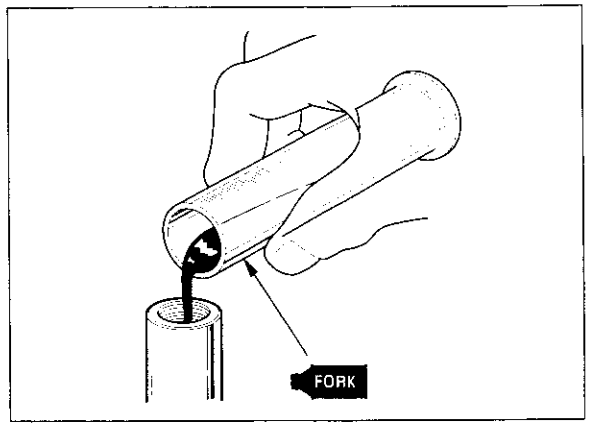


Slide the outer tube down onto the axle holder slowly to avoid damaging the dust seal.
Compress the fork damper fully.



Pour the specified amount of recommended fork fluid in the fork leg.

RECOMMENDED FORK FLUID: Fork fluid
FORK FLUID CAPACITY:
513 ± 2.5 cm³ (17.3 ± 0.08 US oz, 18.1 ± 0.09 Imp oz)

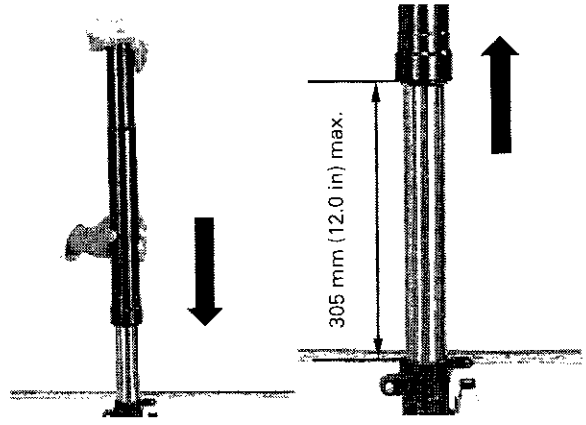


Do not extend the outer tube more than 305 mm (12.0 in) from the axle holder. The fork fluid will spill out of the oil hole in the slide pipe.

Bleed the air from the fork leg as follows:

1. Extend the fork, cover the top of the outer tube with your hand and compress the fork leg slowly.
2. Remove your hand and extend the fork slowly.

Repeat above procedure 2 or 3 times.

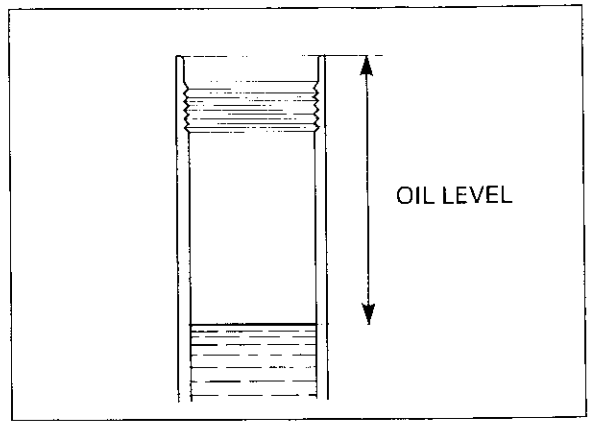


3. Pump the outer tube and damper rod slowly 8–10 times to bleed air.
4. Compress the outer tube and damper rod fully and leave it for 5 minutes.

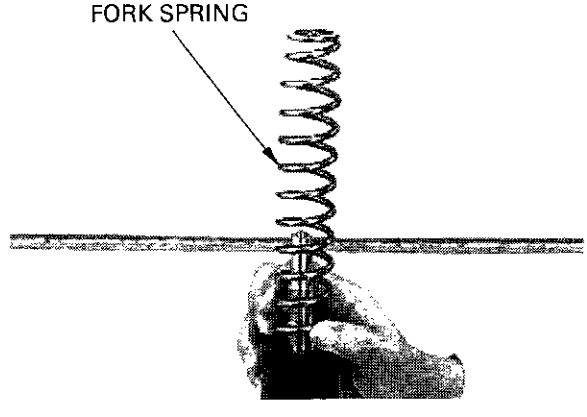
After the oil level stabilizes, measure the oil level from the top of the outer tube with the outer tube and damper rod fully compressed.

OIL LEVEL: 135 mm (5.3 in)

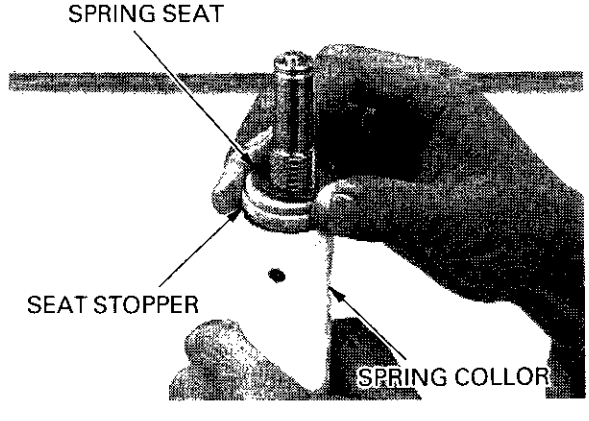
Adjust the oil level as required.



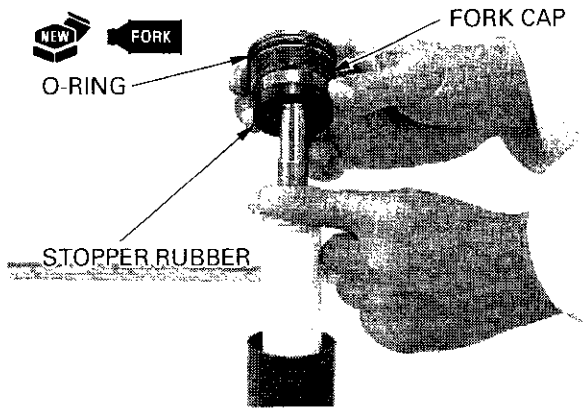
Wipe off any oil from the fork spring and install it into the fork leg with the tapered end facing up.



Extend the damper rod fully and install the spring collar, spring seat stopper and spring seat.

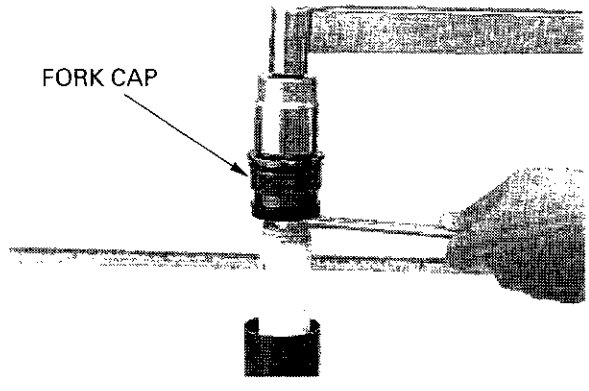


Coat a new O-ring with fork fluid and install it into the fork cap groove.
While holding the damper rod, push the spring collar down and install the stopper rubber and fork cap onto the damper rod.

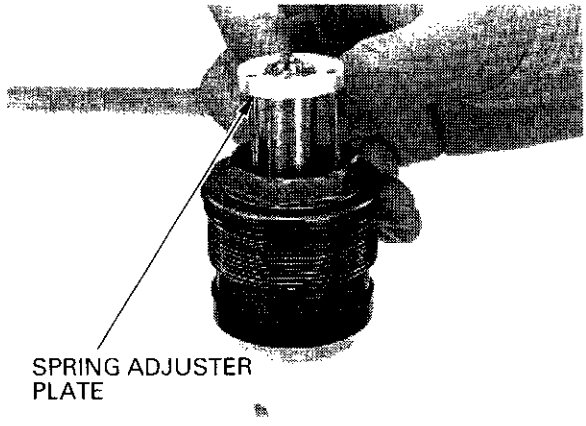


Push the spring collar down, hold the damper rod lock nut with the 17 mm open end wrench and tighten the fork cap.

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



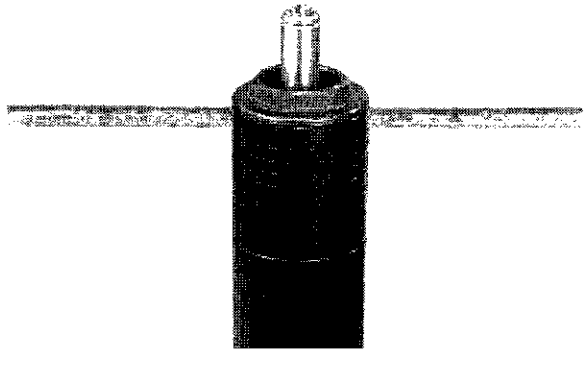
Install the spring adjuster plate into the fork cap, aligning the pins with the holes in the cap.



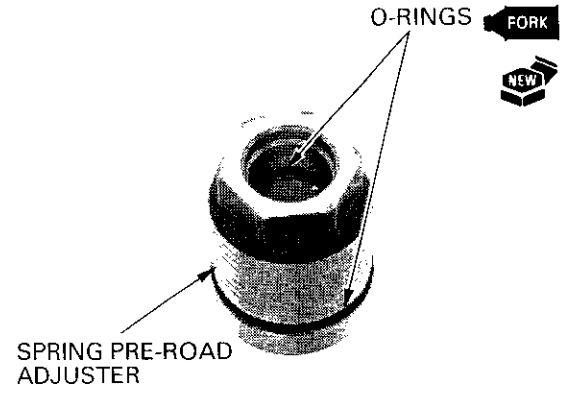
Install the fork cap into the outer tube.

NOTE:

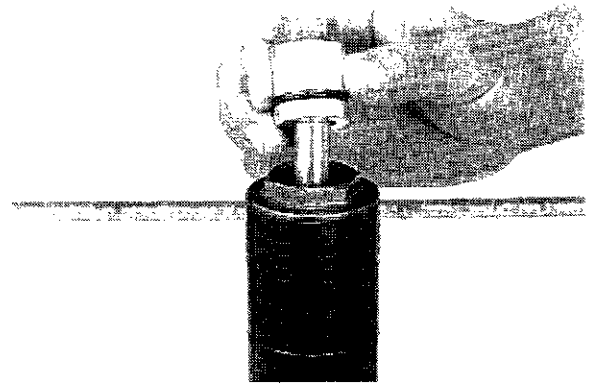
Tighten the fork cap after installing the fork outer tube into the fork bridges.



Coat new O-rings with fork fluid and install them into the grooves in the spring pre-load adjuster.



Install the spring pre-load adjuster into the fork cap and onto the damper rod.

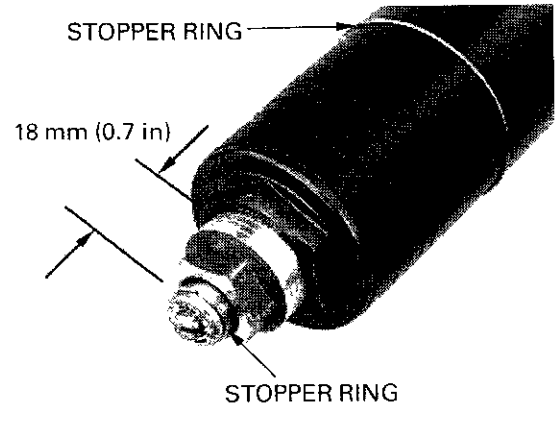


Thread spring pre-load adjuster onto the damper rod so that the height from the fork cap is 18 mm (0.7 in).

Install the stopper ring onto the fork damper.
Install the stopper ring onto the outer tube.

REBOUND DAMPING ADJUSTER POSITION

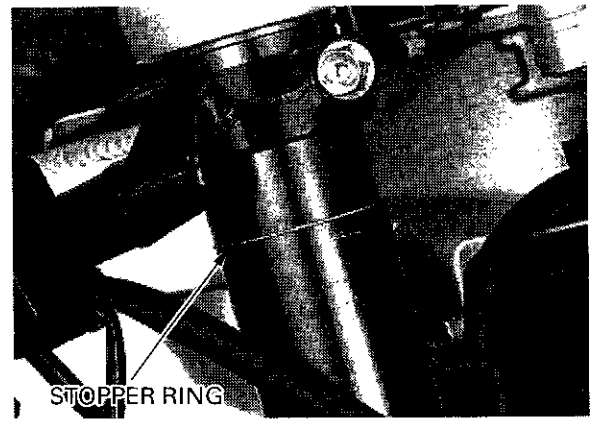
To set the adjuster to the standard position, turn the adjuster clockwise until it stops, then turn it counterclockwise 7 clicks.



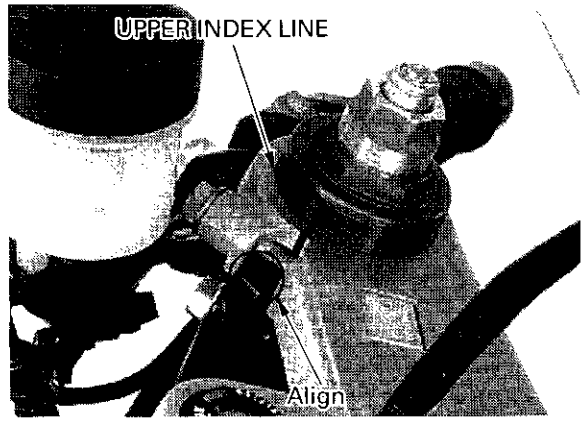
INSTALLATION

Route the cables, wire harnesses and hoses properly (page 1-20).

Install the fork tube into the fork bridges and handlebar.
Make sure that the stopper ring is installed in the outer tube groove properly.

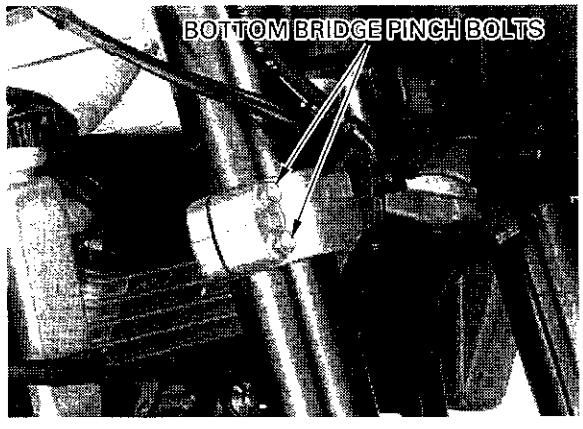


Position the handlebar boss in the fork top bridge groove.
Align the upper index line on the outer tube with the top surface of the fork top bridge.



Tighten the bottom bridge pinch bolts.

TORQUE: 26 N·m (2.7 kgf·m , 20 lbf·ft)



Tighten the fork cap if it was loosened.

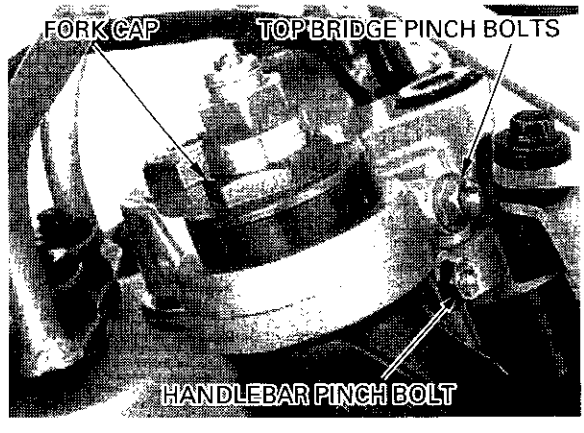
TORQUE: 34 N·m (3.5 kgf·m , 25 lbf·ft)

Tighten the top bridge pinch bolt.

TORQUE: 26 N·m (2.7 kgf·m , 20 lbf·ft)

Tighten the handlebar pinch bolt securely.

Install the front wheel (page 13-7).

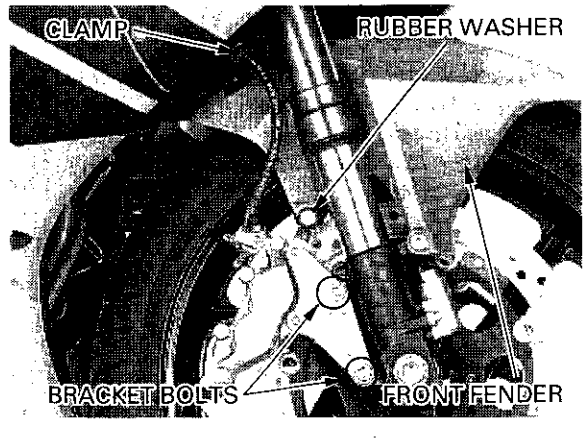


Apply locking agent to the caliper bracket bolt threads.
Install the bracket/caliper assembly onto the fork leg and tighten the bracket bolts.

TORQUE: 49 N·m (5.0 kgf·m , 36 lbf·ft)

Install the front fender with the two rubber washers and tighten the four bolts securely.
Install the front brake hose clamps onto the front fender and tighten the nuts.

TORQUE: 10 N·m (1.0 kgf·m , 7 lbf·ft)



HANDLEBAR

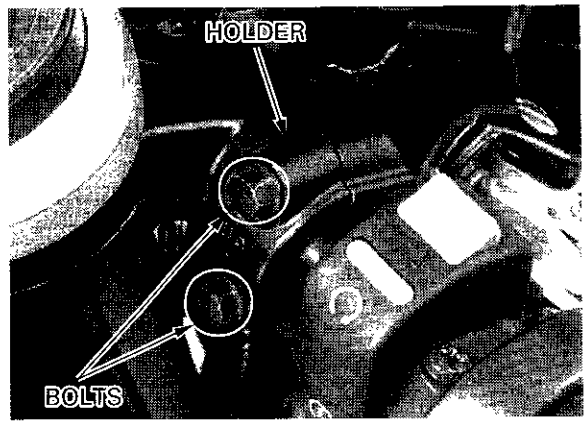
RIGHT HANDLEBAR

REMOVAL

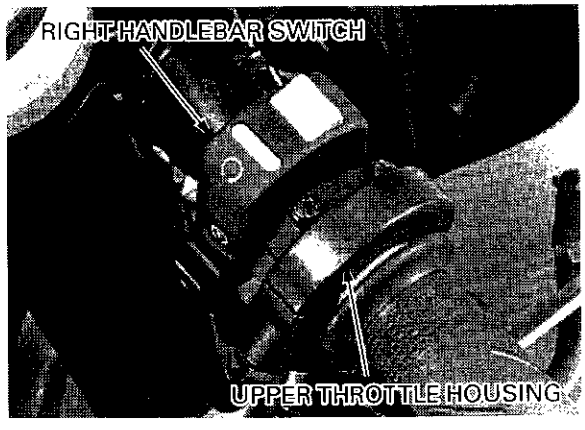
Disconnect the front brake light switch connectors. Remove the two bolts, brake master cylinder holder and master cylinder.

NOTE:

Keep the brake reservoir upright to prevent air from entering the hydraulic system.



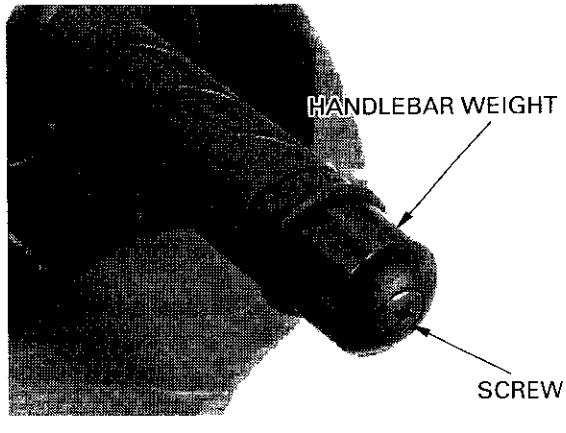
Remove the two screws and right handlebar switch. Remove the two screws and upper throttle housing.



Hold the handlebar weight and remove the mounting screw and the weight.

Remove the right fork (page 13-8).

Remove the throttle grip pipe from the right handlebar.



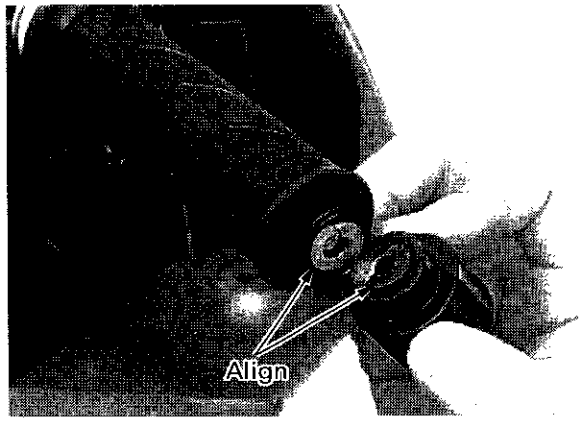
INSTALLATION

Install the throttle grip pipe onto the right handlebar.

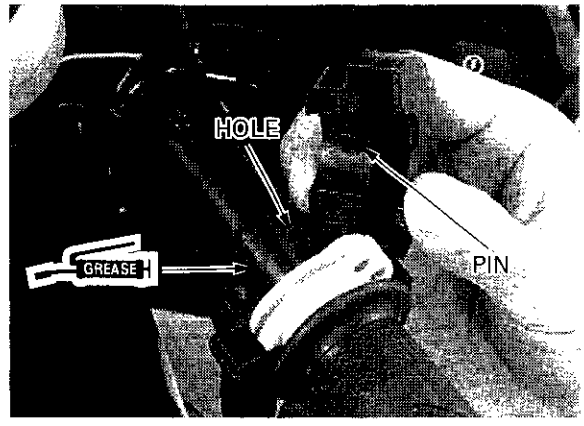
Install the right fork (page 13-19).

Install the handlebar weight onto the inner weight, aligning the bosses and grooves each other.
Install a new mounting screw and tighten it while holding the weight.

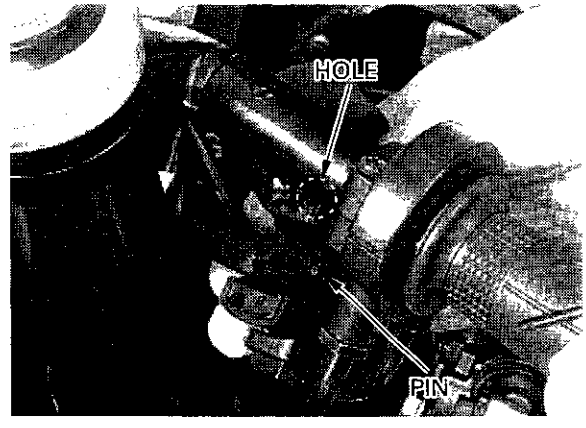
TORQUE: 10 N·m (1.0 kgf·m , 7 lbf·ft)



Apply grease to the throttle grip pipe flange.
Install the upper throttle housing over the throttle grip pipe flange, aligning its locating pin with the hole in the handlebar.
Tighten the forward screw first, then the rear screw.



Install the right handlebar switch, aligning its locating pin with the hole in the handlebar.
Tighten the forward screw first, then the rear screw.

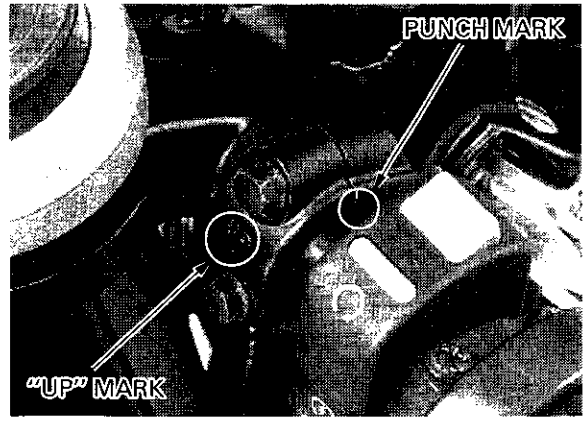


Install the front brake master cylinder and holder with the "UP" mark facing up.
Align the end of the master cylinder with the punch mark on the handlebar, and tighten the upper bolt first, then lower bolt.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

Connect the front brake light switch connectors.

Check the throttle grip operation and free play (page 3-4).



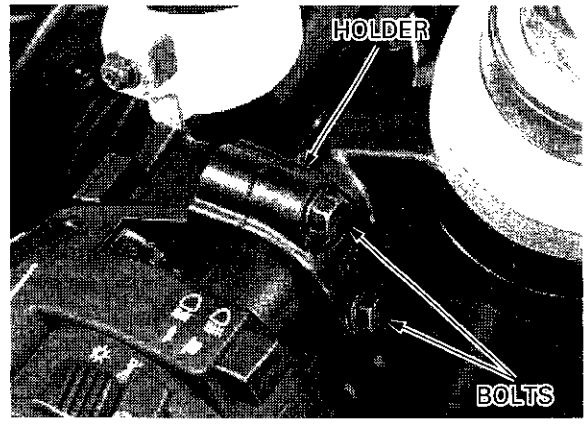
LEFT HANDLEBAR

REMOVAL

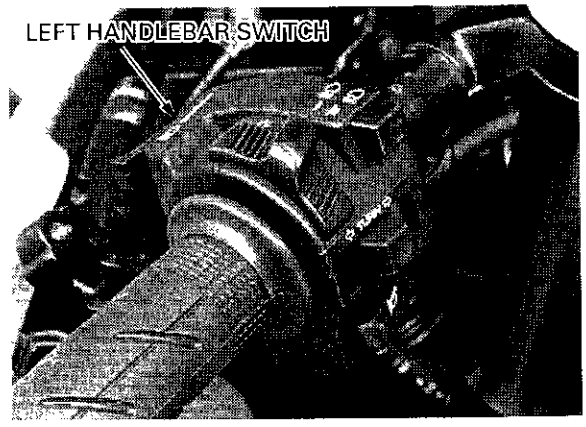
Disconnect the clutch switch connectors.
Remove the two bolts, holder and the clutch master cylinder assembly.

NOTE:

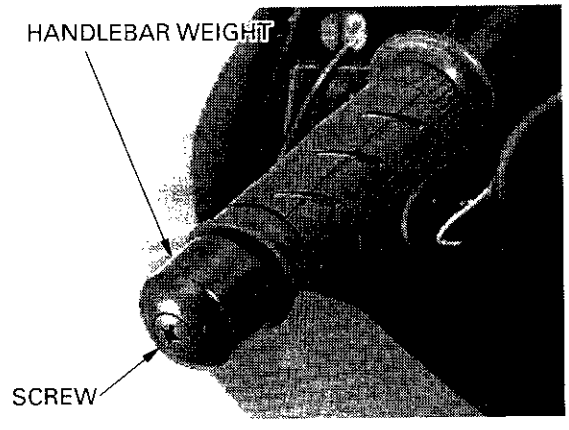
Keep the clutch reservoir upright to prevent air from entering the hydraulic system.



Remove the two screws and left handlebar switch.



Hold the handlebar weight and remove the mounting screw and the weight.
Remove the left handlebar grip.



Remove the left fork (page 13-8).

INSTALLATION

Install the left fork (page 13-19).

Apply Honda Bond A or equivalent to the inside surface of the handlebar grip and to the clean surface of the handlebar. Wait 3—5 minutes and install the grip.
Rotate the grip for even application of the adhesive.

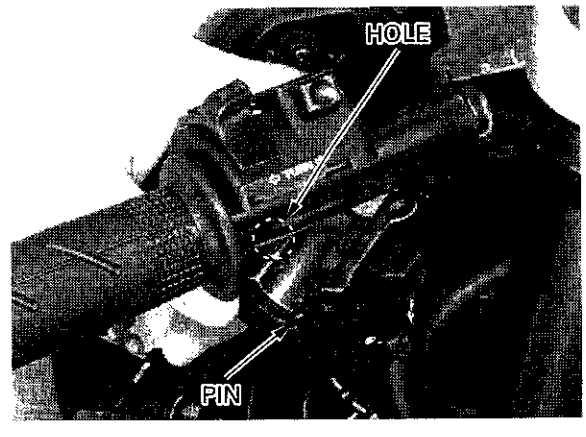
NOTE:

Allow the adhesive to dry for an hour before using.

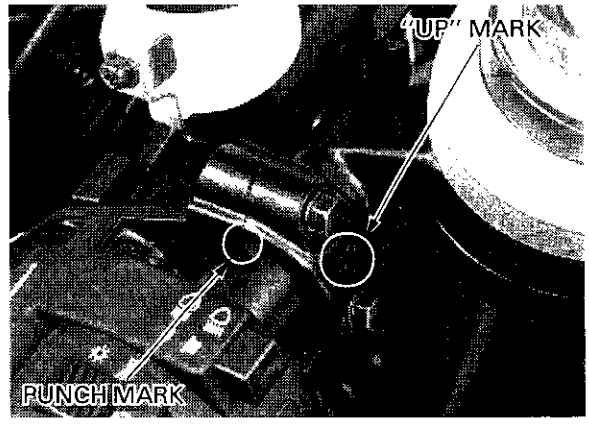
Install the handlebar weight onto the inner weight, aligning the bosses and grooves each other.
Install a new mounting screw and tighten it while holding the weight.

TORQUE: 10 N·m (1.0 kgf·m , 7 lbf·ft)

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 master cylinder and holder with the "UP" mark facing up.
Align the end of the master cylinder with the punch mark on the handlebar, and tighten the upper bolt first, then lower bolt.
Connect the clutch switch connectors.



STEERING STEM

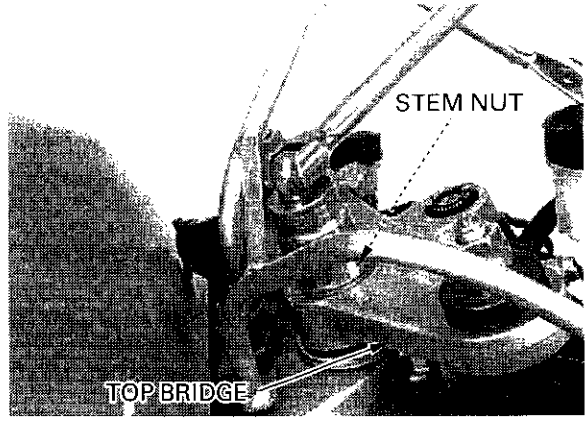
REMOVAL

Remove the upper fairing (page 2-4).

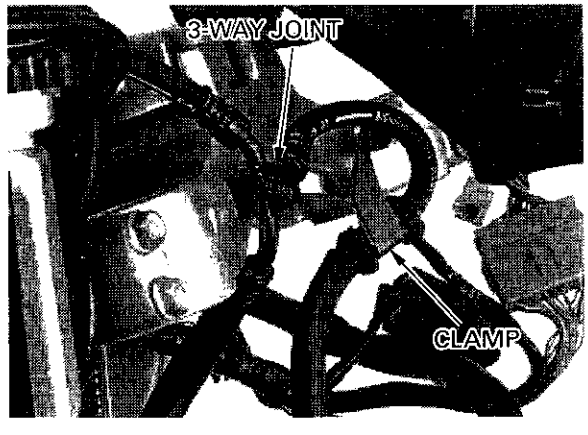
Remove the steering stem nut.

Remove the left and right forks (page 13-8).

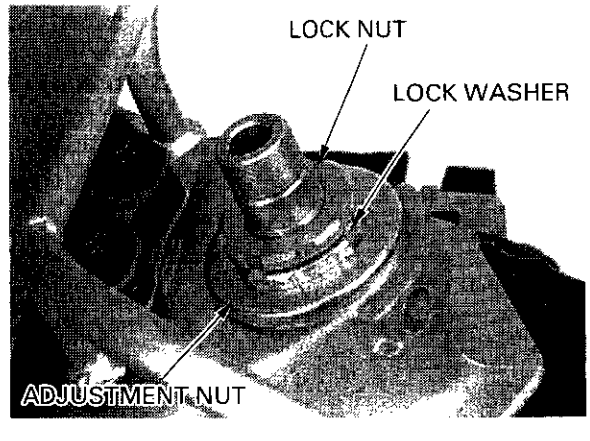
Remove the fork top bridge.



Remove the front brake hose clamp and 3-way joint from the steering stem.



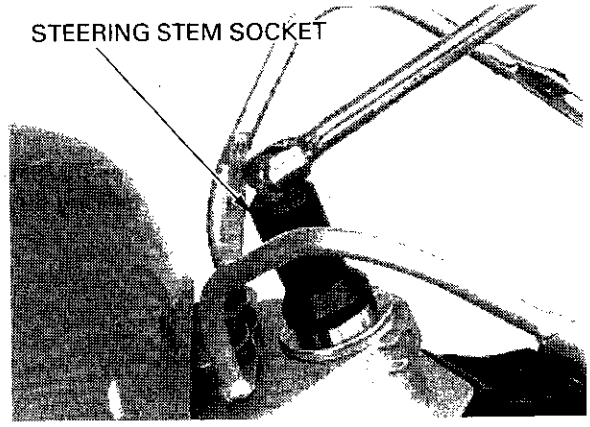
Straighten the lock washer tabs.
Remove the steering bearing adjustment nut lock nut and lock washer.



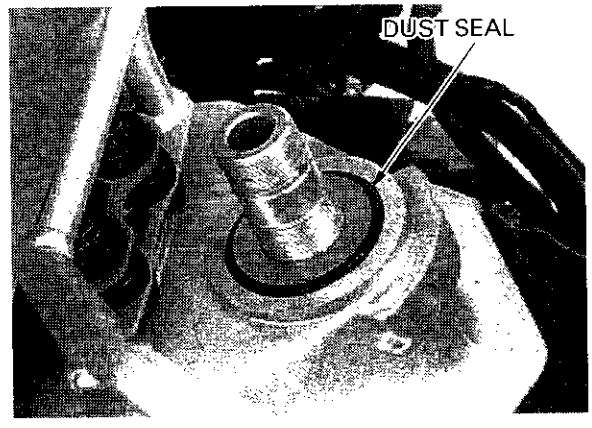
Remove the steering bearing adjustment nut using the special tool.

TOOL:

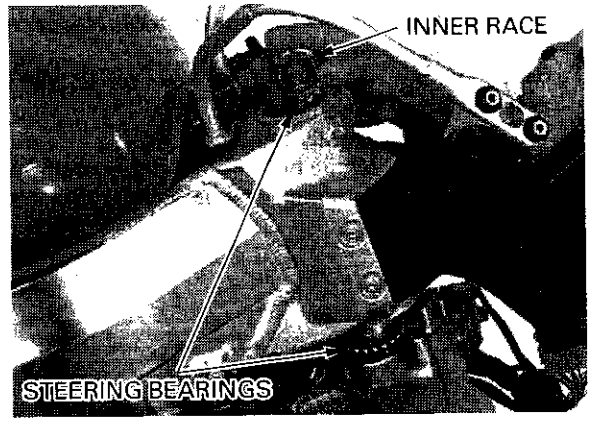
Steering stem socket	07916-3710101



Remove the dust seal.



Remove the upper bearing inner race, steering stem, upper and lower steering bearings.



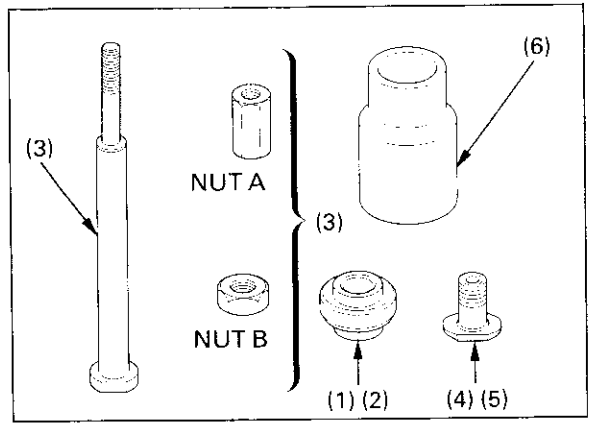
STEERING BEARING REPLACEMENT

Always replace the bearings and races as a set.

Replace the steering bearing outer races using the following special tools:

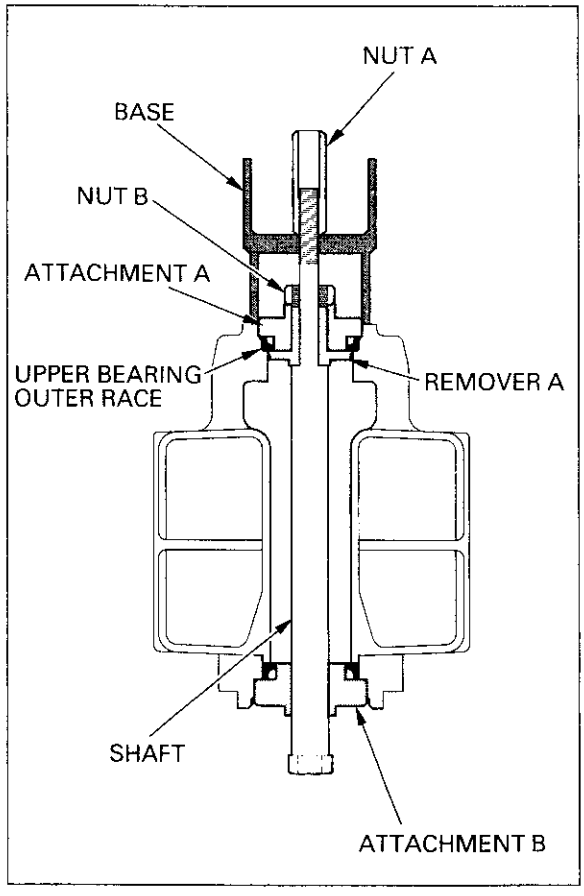
TOOLS:

Driver attachment A (1)	07946-KM90100
Driver attachment B (2)	07NMF-MT70120
Driver shaft assembly (3)	07946-KM90300
Race remover A (4)	07946-KM90401
Race remover B (5)	07NMF-MT70110
Assembly base (6)	07946-KM90600



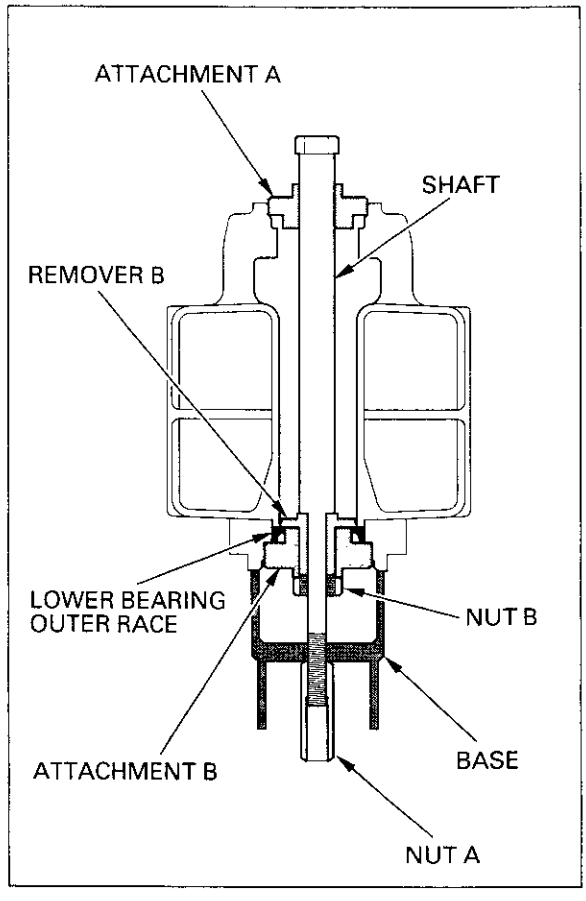
Note the installation direction of the assembly base.

Install the special tools into the steering head pipe as shown.
Align bearing remover A with the grooves in the steering head.
Lightly tighten nut B.
While holding the driver shaft, turn nut A gradually to remove the upper bearing outer race.

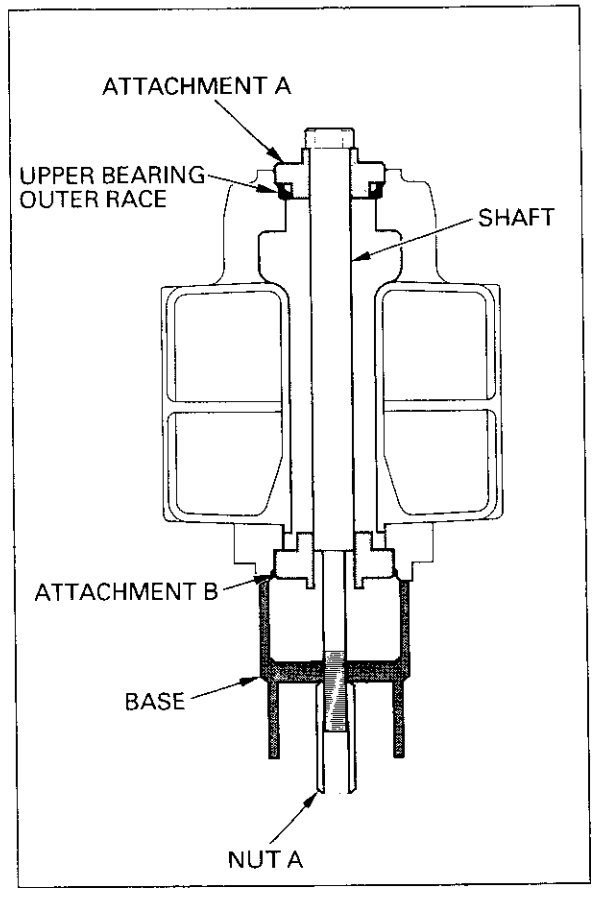


Note the installation direction of the assembly base.

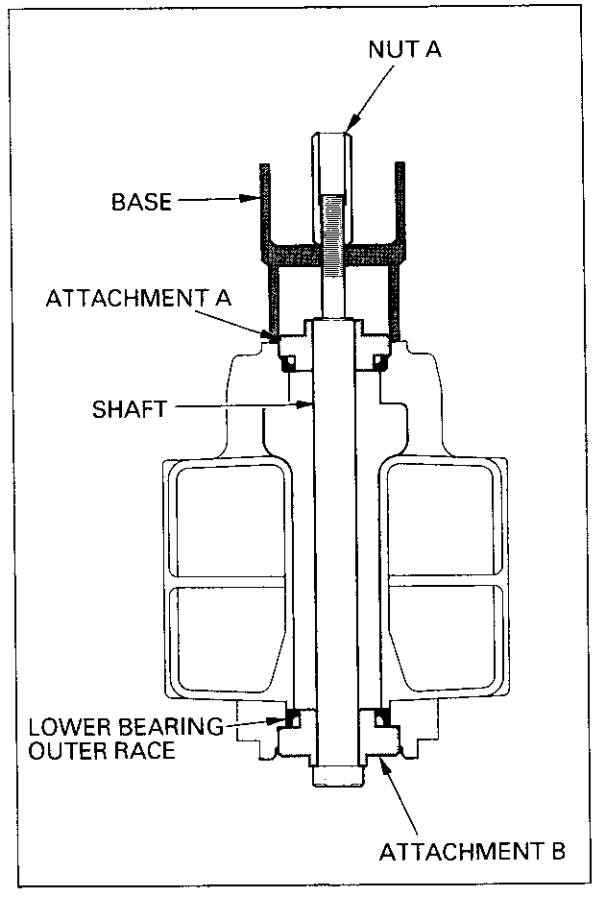
Install the special tools into the steering head pipe as shown.
Align bearing remover B with the groove in the steering head.
Lightly tighten nut B.
While holding the driver shaft, turn nut A gradually to remove the lower bearing outer race.



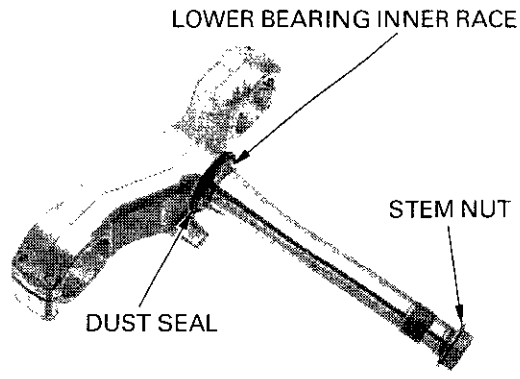
Install a new upper bearing outer race and the special tools as shown.
While holding the driver shaft, turn nut A gradually until the outer race bottoms on the steering head pipe.



Install a new lower bearing outer race and the special tools as shown.
While holding the driver shaft, turn nut A gradually until the outer race bottoms on the steering head pipe.

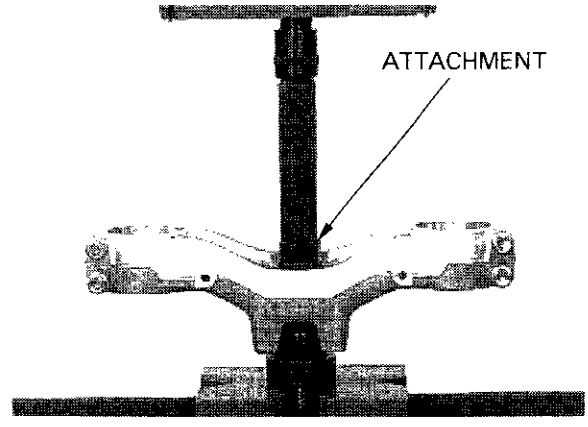


Install the stem nut onto the stem to prevent the threads from being damaged when removing the lower bearing inner race from the stem.
Remove the lower bearing inner race with a chisel or equivalent tool, being careful not to damage the stem.
Remove the dust seal.

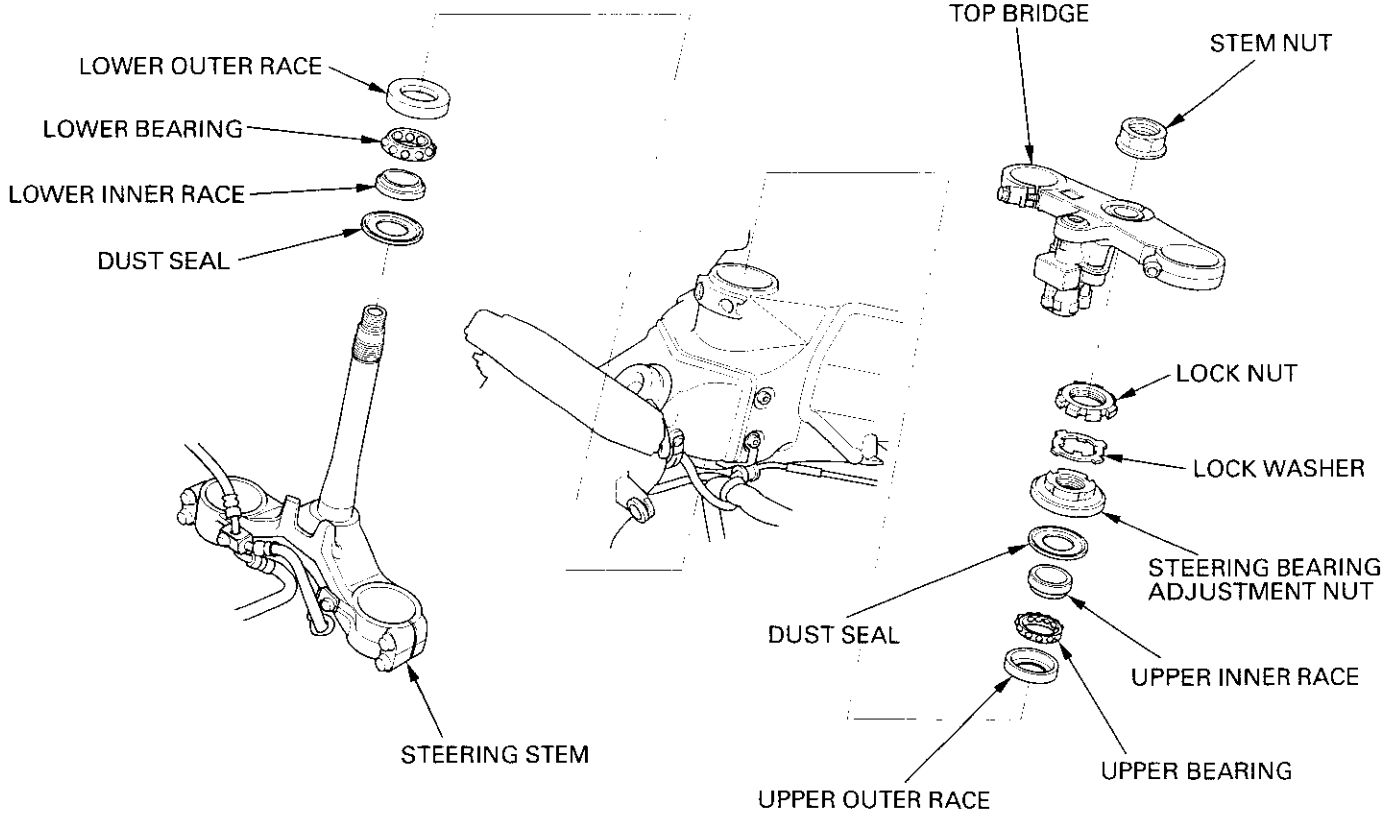


Apply molybdenum disulfide grease to a new dust seal lip and install it onto the steering stem.
Press a new lower bearing inner race onto the steering stem using the special tool.

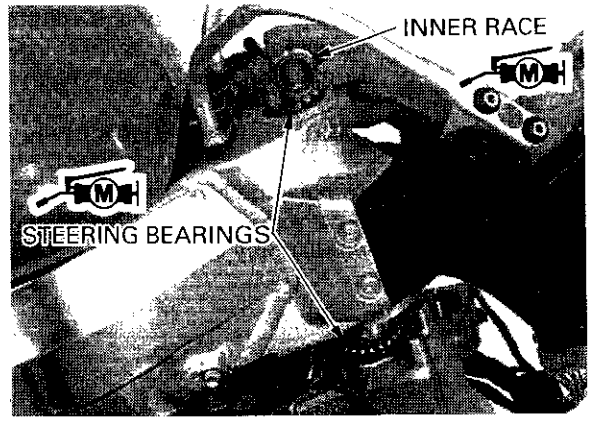
TOOL:
Attachment, 35 mm I.D. 07746-0030400



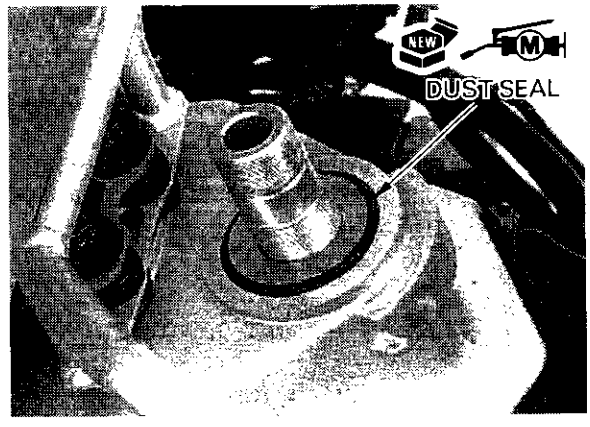
INSTALLATION



Apply molybdenum disulfide grease to the steering bearings and bearing races.
Install the lower bearing onto the steering stem.
Install the steering stem into the steering head pipe.
Install the upper bearing and inner race.



Apply molybdenum disulfide grease to a new dust seal lip and install it.

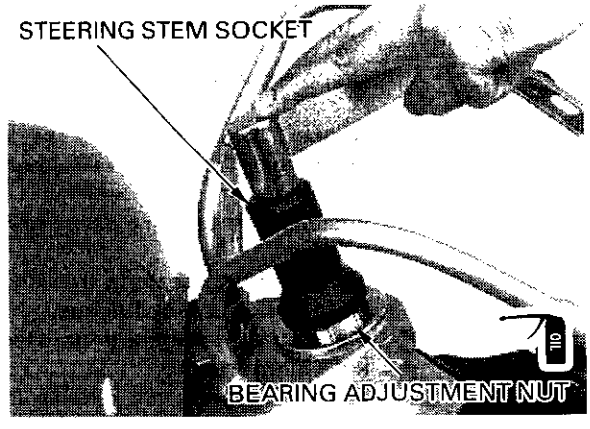


Apply oil to the bearing adjustment nut threads.
Install and tighten the steering bearing adjustment nut.

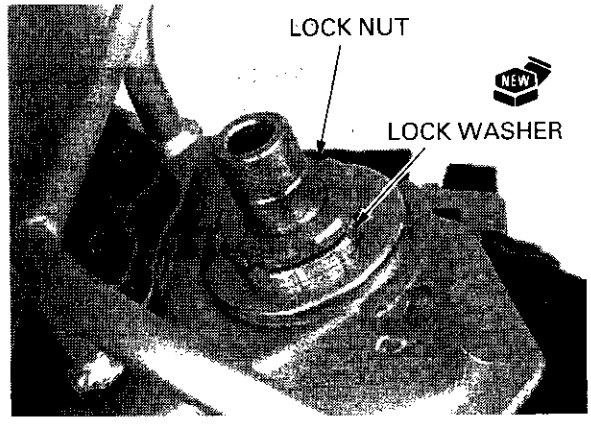
TOOL:
Steering stem socket 07916-3710101

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

Turn the steering stem right and left, lock-to-lock at least five times to seat the bearings.
Retighten the steering bearing adjustment nut to the same torque.



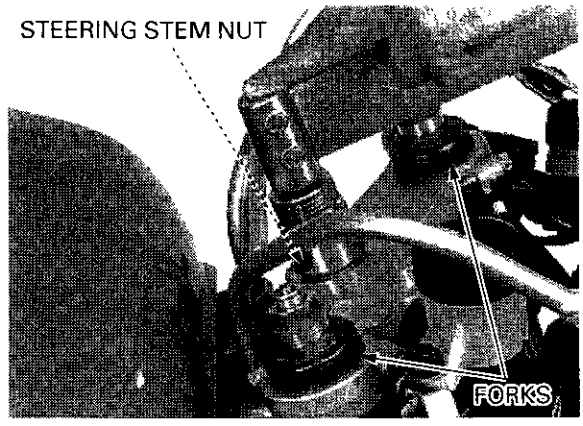
Install a new lock washer and bend the two opposite tabs down into the grooves in the adjustment nut.
Install and finger tighten the lock nut all the way.
Hold the steering bearing adjustment nut and further tighten the lock nut, within 90 degrees, to align its grooves with the tabs of the lock washer.
Bend up the lock washer tabs into the grooves of the lock nut.



Install the fork top bridge and steering stem nut.
Temporarily install the forks into the fork bridges.
Tighten the steering stem nut.

TORQUE: 103 N·m (10.5 kgf·m , 76 lbf·ft)

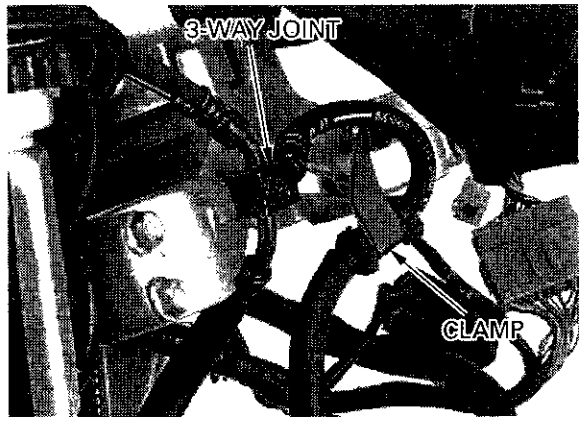
Remove the forks.
Make sure that the steering stem moves smoothly, without play or binding.



Install the front brake hose 3-way joint and clamp, and tighten the bolts.

TORQUE: 10 N·m (1.0 kgf·m , 7 lbf·ft)

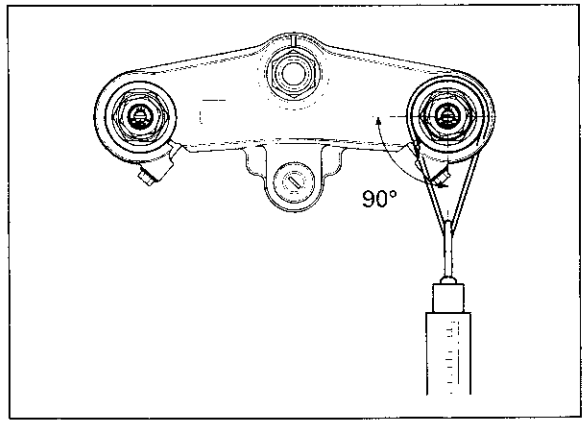
Install the forks (page 13-19).
Install the upper fairing (page 2-4).



STEERING BEARING PRELOAD

Remove the upper fairing (page 2-4).

Support the motorcycle securely using safety stands or a hoist 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 between the fork top and bottom bridges.
Make sure that there is no cable, wire harness or hose interference.
Pull the spring scale keeping it right angle to the steering stem.
Read the scale at the point where the steering stem just starts to move.

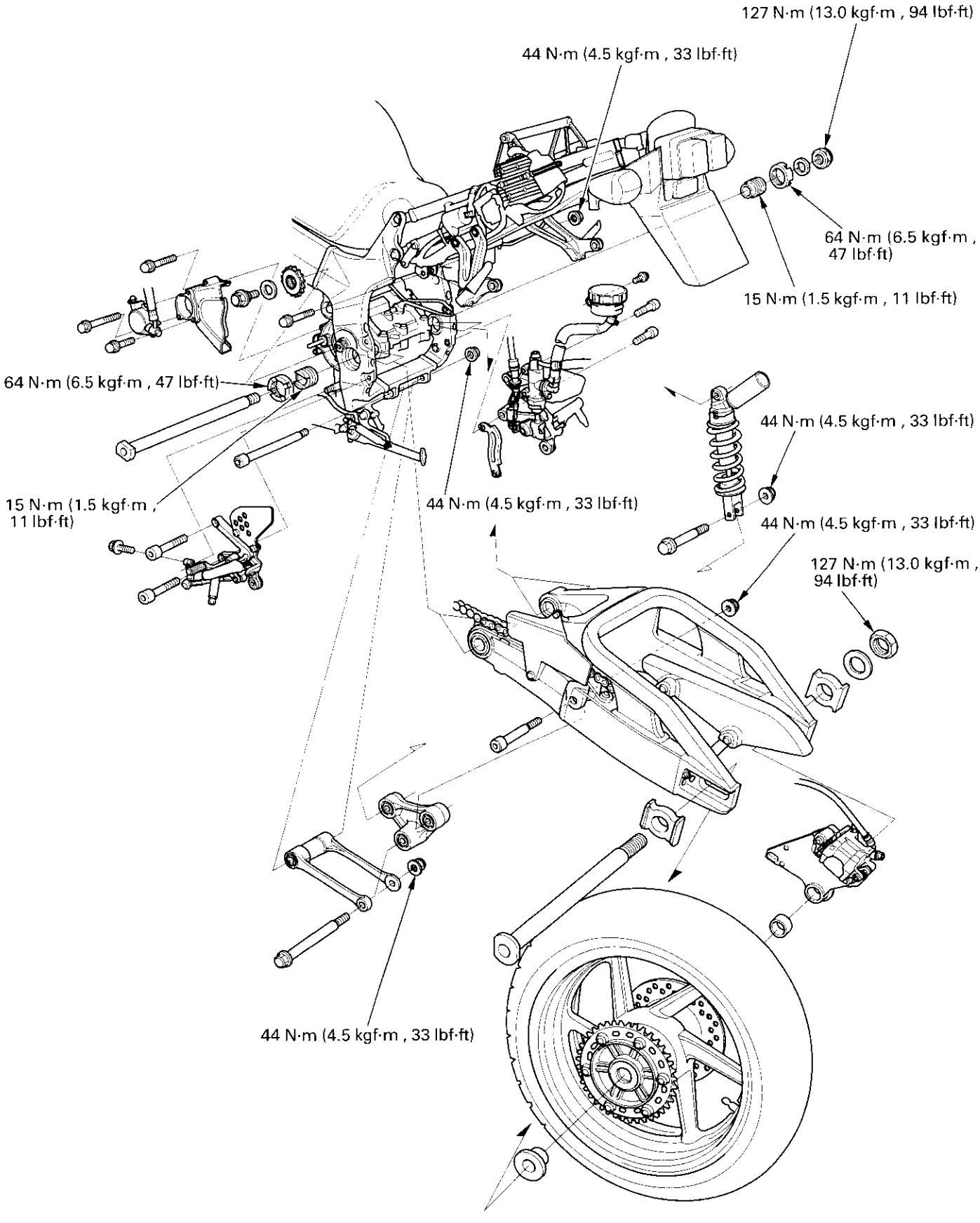


STEERING BEARING PRELOAD:
1.4 – 2.1 kgf (3.1 – 4.6 lbf)

If the readings do not fall within the limits, readjust the steering bearing adjustment.

Install the front fairing (page 2-3).

MEMO


127 N·m (13.0 kgf·m , 94 lbf·ft)
44 N·m (4.5 kgf·m , 33 lbf·ft)
64 N·m (6.5 kgf·m , 47 lbf·ft)
15 N·m (1.5 kgf·m , 11 lbf·ft)
64 N·m (6.5 kgf·m , 47 lbf·ft)
44 N·m (4.5 kgf·m , 33 lbf·ft)
15 N·m (1.5 kgf·m , 11 lbf·ft)
44 N·m (4.5 kgf·m , 33 lbf·ft)
44 N·m (4.5 kgf·m , 33 lbf·ft)
127 N·m (13.0 kgf·m , 94 lbf·ft)
44 N·m (4.5 kgf·m , 33 lbf·ft)

14. REAR WHEEL/SUSPENSION

SERVICE INFORMATION	14-1	SHOCK ABSORBER	14-8
TROUBLESHOOTING	14-2	SUSPENSION LINKAGE	14-10
REAR WHEEL	14-3	SWINGARM	14-13

SERVICE INFORMATION

GENERAL

⚠WARNING

- ***Riding on damaged rims impairs safe operation of the vehicle.***
- ***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 gas under high pressure. Do not allow fire or heat near the shock absorber.***
- ***Before disposal of the shock absorber, release the nitrogen.***
- ***The damper unit is filled with nitrogen gas under high pressure, do not try to disassemble.***

- A hoist or equivalent is required to support the motorcycle when servicing the rear wheel and suspension.
- Use genuine Honda replacement bolts and nuts for all suspension pivots and mounting points.
- When using the lock nut wrench for the adjusting bolt lock nut, use a deflecting beam type torque wrench 20 inches long. The lock nut wrench increases the torque wrench's leverage, so the torque wrench reading will be less than the torque actually applied to the lock nut. The specification given is the actual torque applied to the lock nut, not the reading on the torque wrench. Do not overtighten the lock nut. The specification later in the text gives both actual and indicated.
- Refer to section 15 for brake system service.

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)
Wheel balance weight		—	60 g (2.1 oz) max.

TORQUE VALUES

Rear axle nut	127 N·m (13.0 kgf·m, 94 lbf·ft)	
Rear brake disc bolt	42 N·m (4.3 kgf·m, 31 lbf·ft)	ALOC bolt
Final driven sprocket nut	64 N·m (6.5 kgf·m, 47 lbf·ft)	
Shock absorber upper mounting nut	44 N·m (4.5 kgf·m, 33 lbf·ft)	U-nut
Shock absorber lower mounting nut	44 N·m (4.5 kgf·m, 33 lbf·ft)	U-nut
Shock arm-to-swingarm nut	44 N·m (4.5 kgf·m, 33 lbf·ft)	U-nut
Shock arm-to-shock link nut	44 N·m (4.5 kgf·m, 33 lbf·ft)	U-nut
Shock link-to-frame nut	44 N·m (4.5 kgf·m, 33 lbf·ft)	U-nut
Swingarm pivot adjusting bolt	15 N·m (1.5 kgf·m, 11 lbf·ft)	
Swingarm pivot adjusting bolt lock nut	64 N·m (6.5 kgf·m, 47 lbf·ft)	
Swingarm pivot nut	127 N·m (13.0 kgf·m, 94 lbf·ft)	U-nut
Drive chain slider bolt	9 N·m (0.9 kgf·m, 6.5 lbf·ft)	Apply locking agent to the threads.
Rear brake hose clamp bolt	12 N·m (1.2 kgf·m, 9 lbf·ft)	Apply locking agent to the threads.

TOOLS

Bearing remover shaft	07746-0050100
Bearing remover head, 25 mm	07746-0050800
Driver	07749-0010000
Attachment, 42 × 47 mm	07746-0010300
Pilot, 25 mm	07746-0040600
Attachment, 52 × 55 mm	07746-0010400
Driver	07949-3710001
Attachment, 22 × 24 mm	07746-0010800
Pilot, 17 mm	07746-0040400
Attachment, 24 × 26 mm	07746-0010700
Bearing remover, 17 mm	07936-3710300
Bearing remover handle	07936-3710100
Bearing remover weight	07741-0010201
Attachment, 37 × 40 mm	07746-0010200
Attachment, 40 × 42 mm	07746-0010900
Pilot, 32 mm	07MAD-PR90200

TROUBLESHOOTING

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

Hard suspension
- Incorrect suspension adjustment
- Damaged rear suspension pivot bearings
- Bent damper rod
- Tire pressure too high

Rear wheel wobbling
- Bent rim
- Worn or damaged rear wheel bearings
- Faulty rear tire
- Unbalanced rear tire and wheel
- Insufficient rear tire pressure
- Faulty swingarm pivot bearings

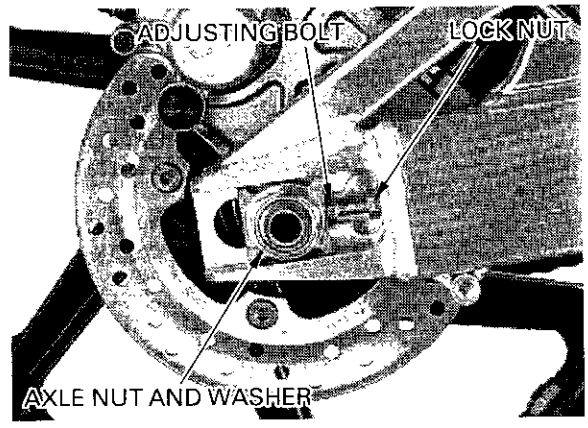
Rear wheel turns hard
- Faulty rear wheel bearings
- Bent rear axle
- Rear brake drag
- Drive chain too tight

Rear suspension noise
- Faulty rear shock absorber
- Loose rear suspension fasteners
- Worn rear suspension pivot bearings

REAR WHEEL

REMOVAL

Loosen the drive chain adjusting bolt lock nuts and bolts.
Loosen the rear axle nut.
Raise the rear wheel off the ground and support the motorcycle securely with a hoist or equivalent.
Remove the rear axle nut and washer.

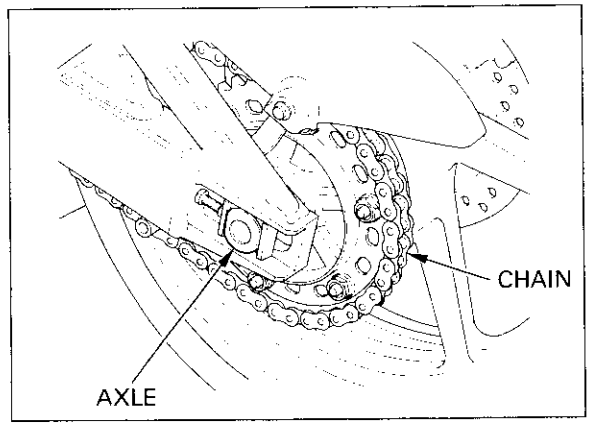


Push the rear wheel forward and derail the drive chain from the final driven sprocket.

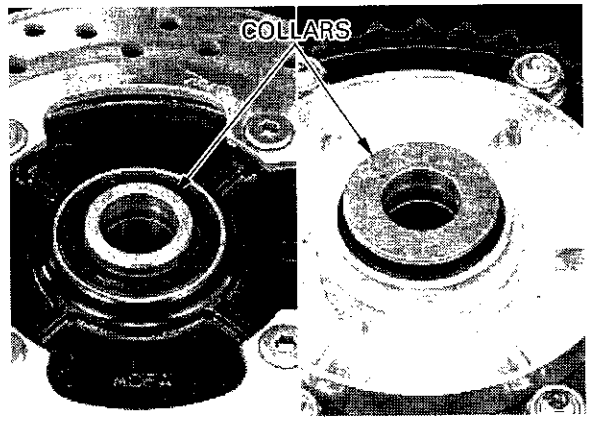
Remove the rear axle and the rear wheel.

NOTE:

Do not operate the brake pedal after removing the rear wheel.



Remove the side collars.

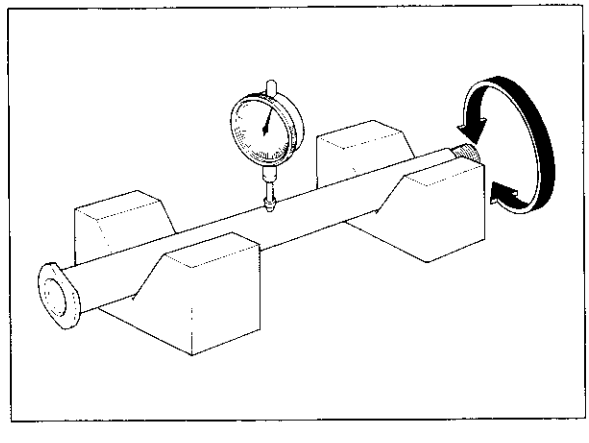


INSPECTION

AXLE

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

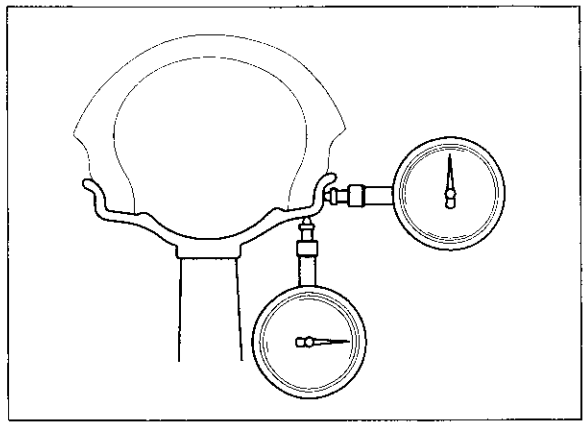
SERVICE LIMIT: 0.20 mm (0.008 in)



WHEEL

Check the rim runout by placing the wheel in a truing 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)

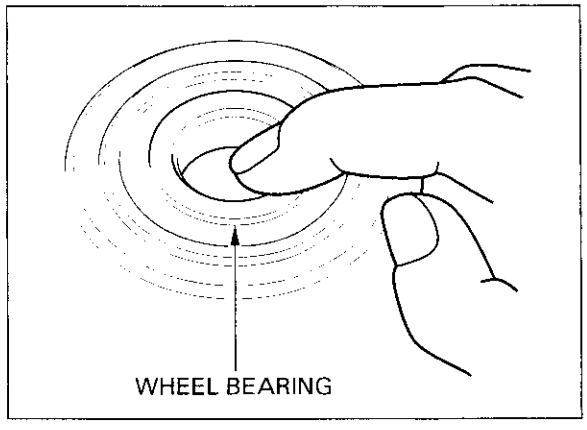


WHEEL BEARING

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.

Replace the wheel bearings in pairs.

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

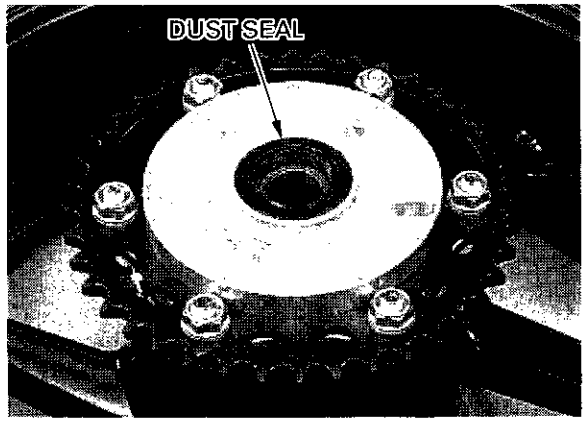


DISASSEMBLY

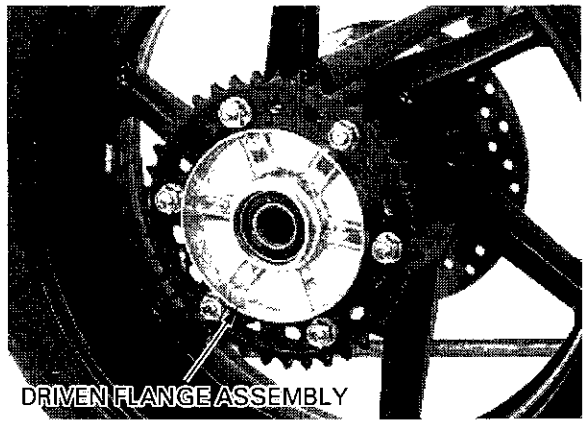
Remove the left dust seal.

NOTE:

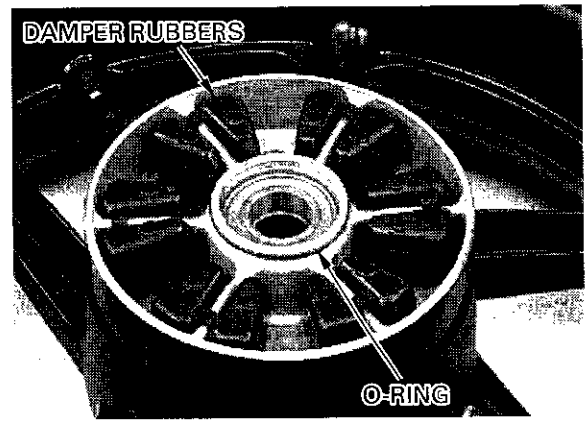
If you will replace the final driven sprocket, loosen the driven sprocket nuts. For driven sprocket inspection, refer to page 3-19.



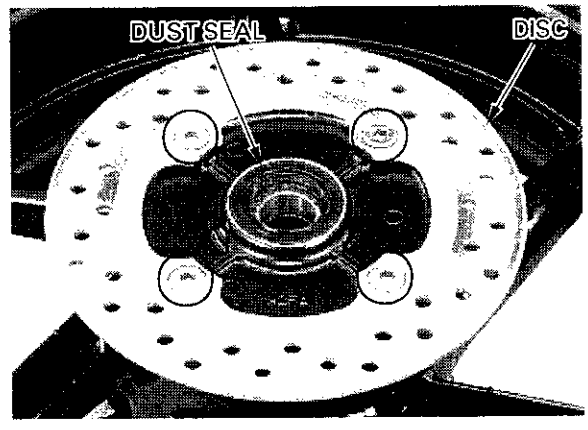
Remove the final driven flange assembly from the left wheel hub.



Remove the damper rubbers and O-ring.



Remove the right dust seal.
Remove the bolts and brake disc.

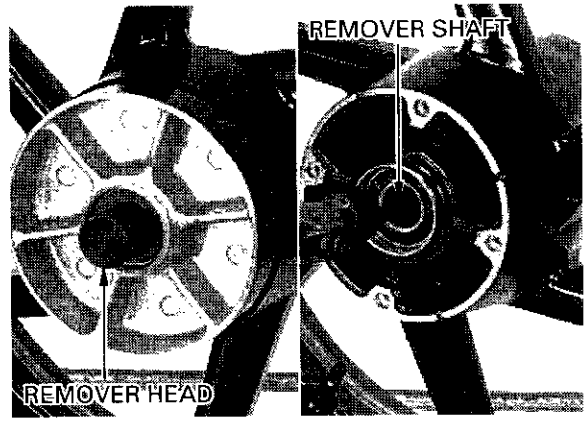


Replace the wheel bearings in pairs. Do not reuse old bearings.

Install the bearing remover head into the bearing. From 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.

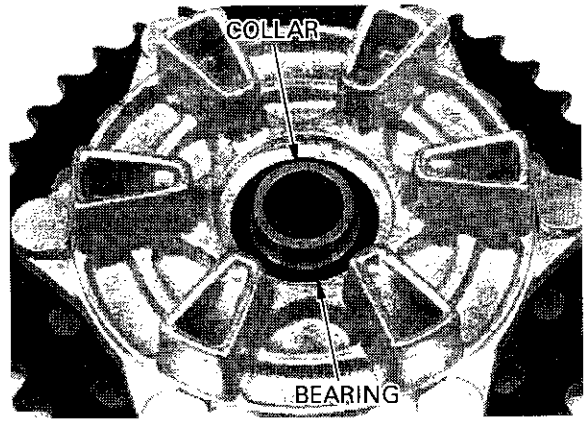
TOOLS:

Bearing remover shaft	07746-0050100
Bearing remover head, 25 mm	07746-0050800



Drive the bearing out of the driven flange.

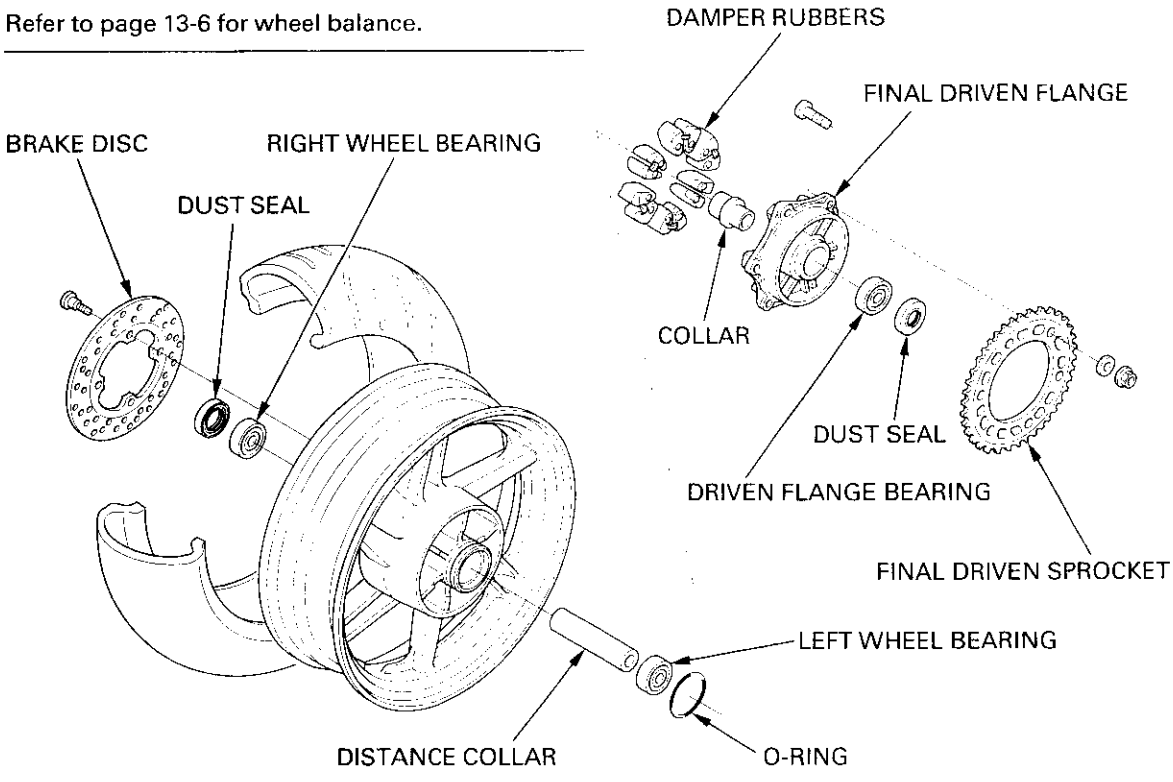
Remove the driven flange collar from the bearing.



ASSEMBLY

NOTE:

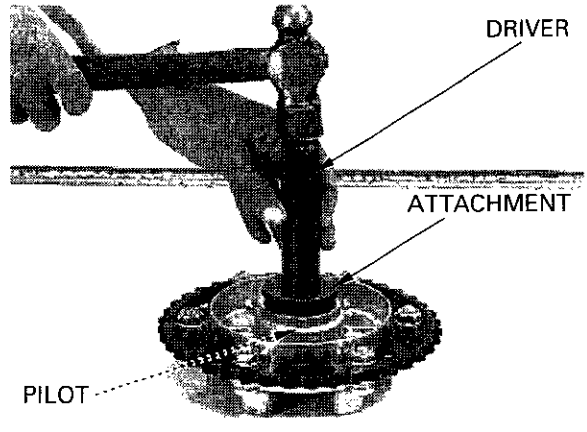
Refer to page 13-6 for wheel balance.



Press the driven flange collar in a new bearing.
Drive in a new driven flange bearing squarely with the marking side facing up until it is fully seated, using the special tools.

TOOLS:

Driver	07749-0010000
Attachment, 52 × 55 mm	07746-0010400
Pilot, 25 mm	07746-0040600



Drive in a new right bearing squarely with the marking side facing up until it is fully seated.

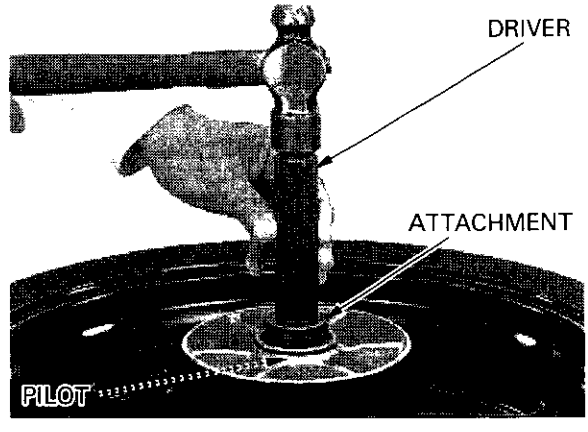
TOOLS:

Driver	07749-0010000
Attachment, 52 × 55 mm	07746-0010400
Pilot, 25 mm	07746-0040600

Install the distance collar.
Drive in a new left bearing squarely with the marking side facing up until it is fully seated.

TOOLS:

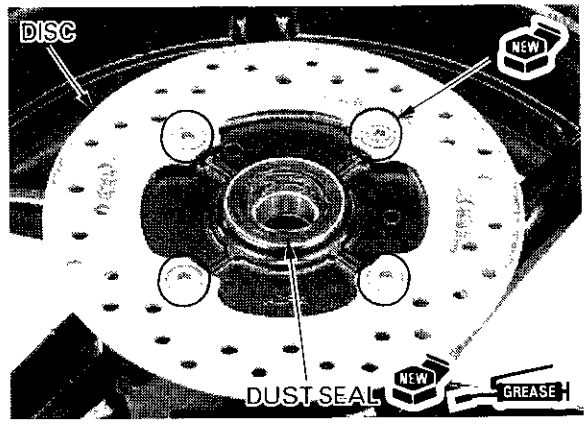
Driver	07749-0010000
Attachment, 42 × 47 mm	07746-0010300
Pilot, 25 mm	07746-0040600



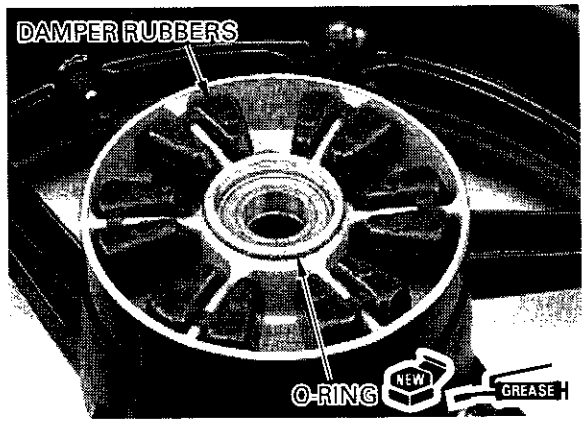
Install the brake disc onto the right wheel hub.
Install new disc bolts and tighten them in a criss-cross pattern in 2 or 3 steps.

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

Apply grease to a new dust seal lip and install it into the right wheel hub.



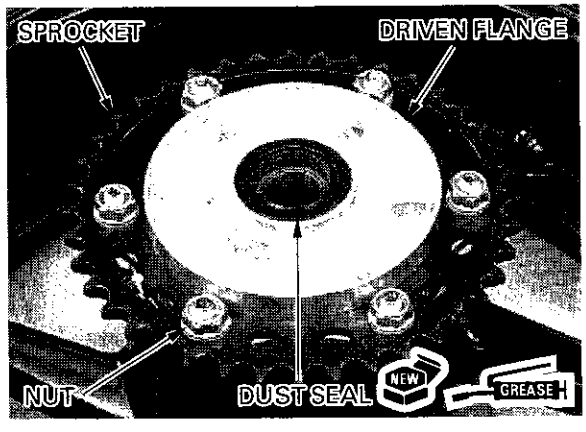
Install the damper rubbers into the left wheel hub.
Coat a new O-ring with grease and install it into the left wheel hub groove.



Install the driven flange assembly into the left wheel hub.
When the driven sprocket is replaced, install a new sprocket and tighten the nuts.

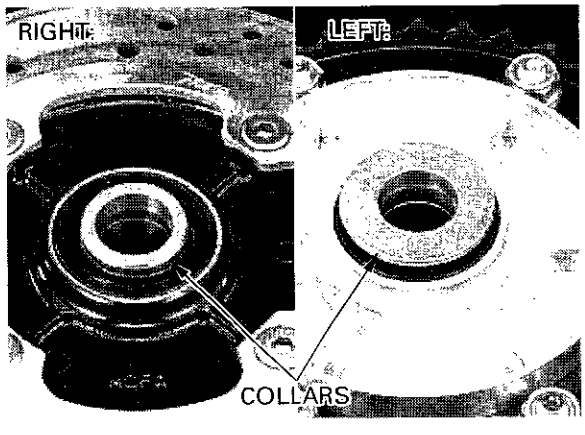
TORQUE: 64 N·m (6.5 kgf·m , 47 lbf·ft)

Apply grease to a new dust seal lip and install it into the driven flange.

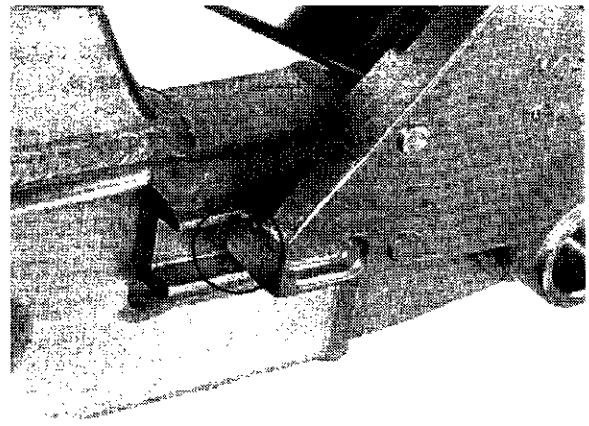


INSTALLATION

Install the side collars.

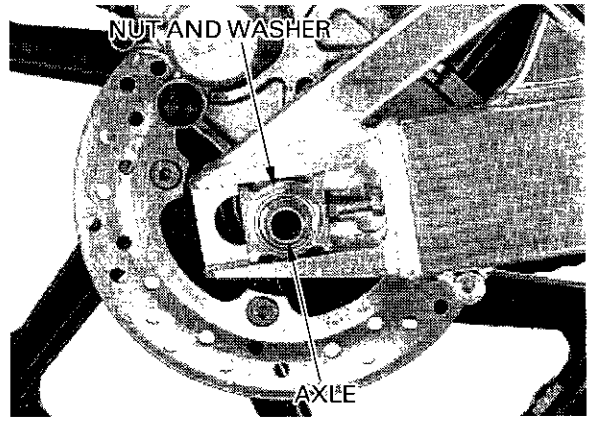


Make sure that the rear brake caliper bracket boss is positioned in the swingarm groove.



Place the rear wheel in the swingarm so that the brake disc is positioned between the pads.
Install the drive chain over the driven sprocket.
Insert the rear axle from the left side through the chain adjusters, swingarm, wheel and caliper bracket.
Install the washer and axle nut.

Adjust the drive chain slack (page 3-17).



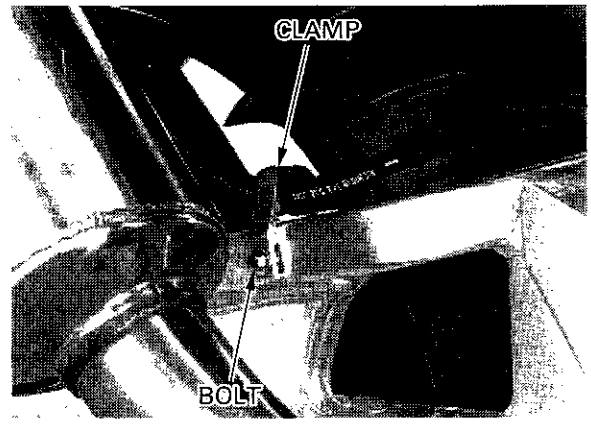
SHOCK ABSORBER

REMOVAL

Remove the following:
— seat cowl (page 2-2)
— lower fairings (page 2-3)

Support the motorcycle securely with a hoist or equivalent.

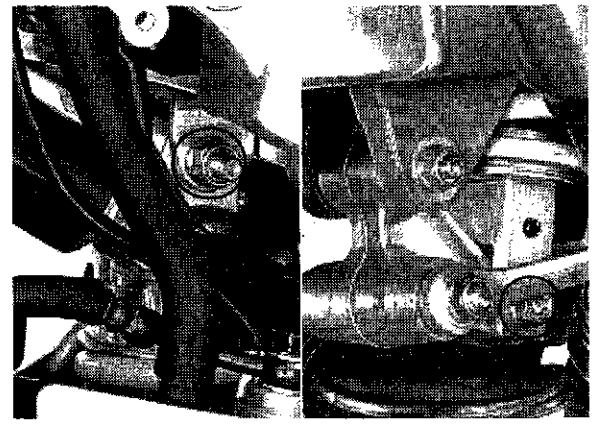
Remove the bolt and rear brake hose clamp from the swingarm.



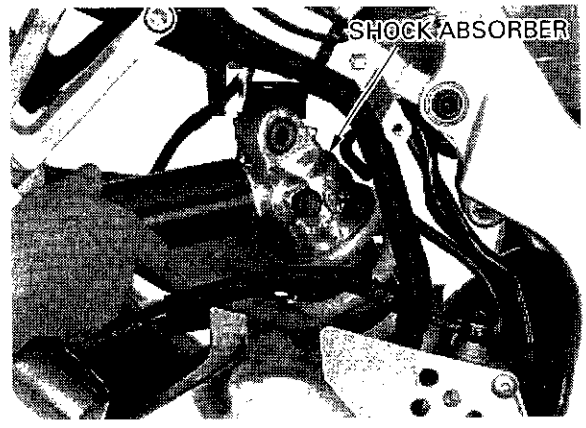
NOTE:

The brake hose is pulled by the swingarm when the shock absorber mounting bolt is removed.

Remove the shock absorber upper and lower mounting nuts and bolts.

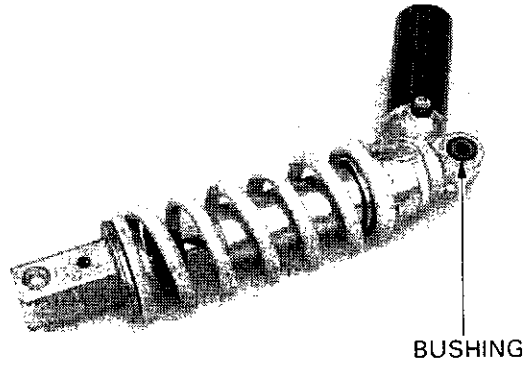


Remove the shock absorber from the right side of the frame as shown.



INSPECTION

Check the damper unit for leakage or other damage.
Check the upper joint bushing for wear or damage.
Replace the shock absorber assembly if necessary.

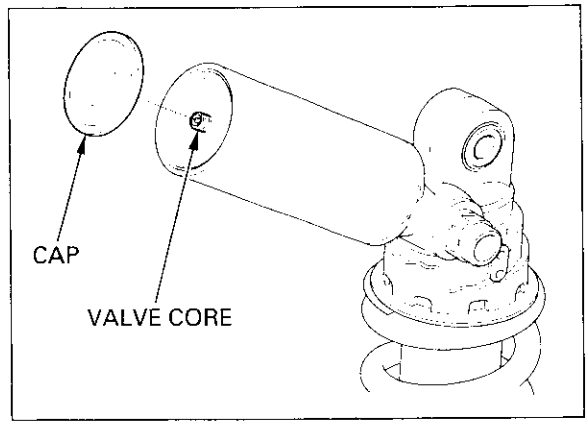


DISPOSAL

⚠WARNING

- ***The shock absorber contains nitrogen gas under high pressure. Do not allow fire or heat near the shock absorber.***
- ***The damper unit is filled with nitrogen gas under high pressure, do not try to disassemble.***

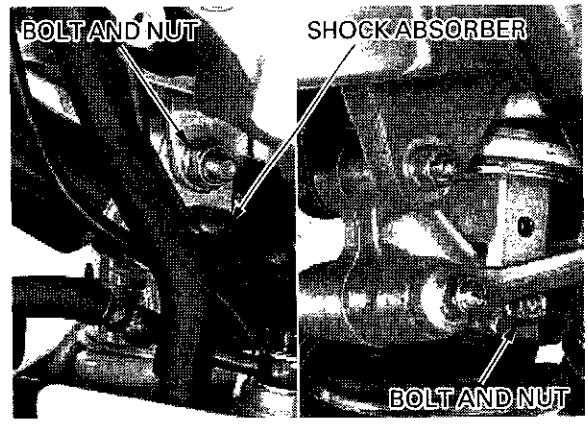
Remove the reservoir cap and release the nitrogen gas by depressing the valve core.
After the nitrogen gas is released completely, remove the valve.



INSTALLATION

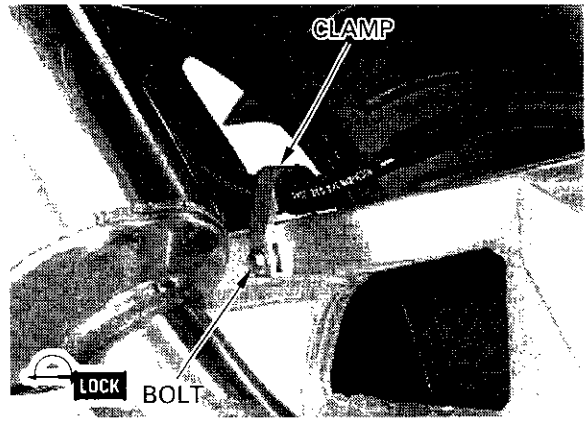
Install the shock absorber in the frame from the right side.
Install the upper and lower mounting bolts and nuts, and tighten the nuts.

TORQUE: 44 N·m (4.5 kgf·m , 33 lbf·ft)



Apply locking agent to the brake hose clamp bolt threads.
Install the brake hose clamp onto the swingarm and tighten the bolt.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)



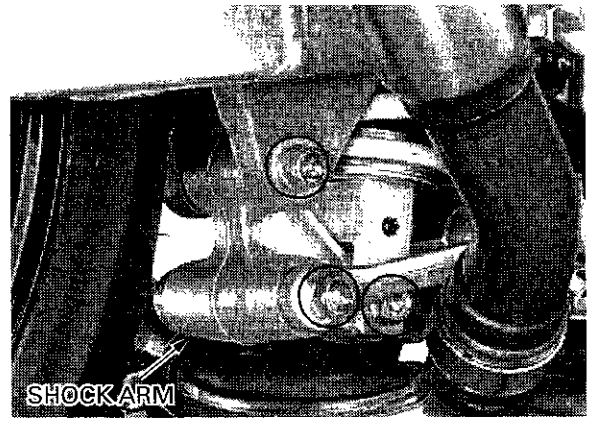
SUSPENSION LINKAGE

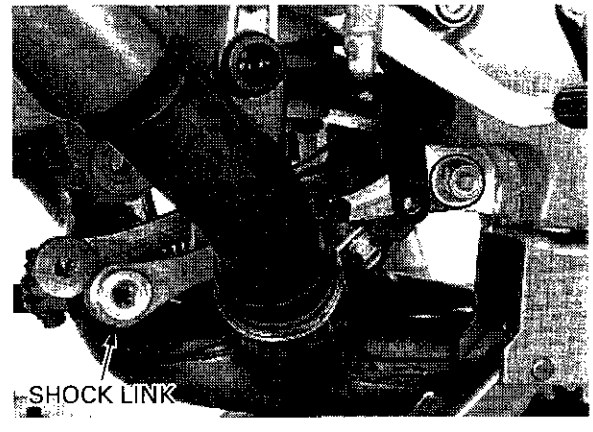
REMOVAL

Remove the lower fairings (page 2-3).

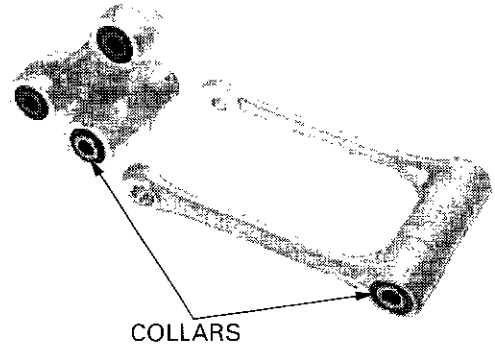
Support the motorcycle securely with a hoist or equivalent.

Remove the following:
- rear brake hose clamp (page 14-8)
- shock arm-to-swingarm nut and bolt
- shock arm-to-shock link nut and bolt
- shock absorber lower mounting nut and bolt
- shock arm
- shock link-to-frame nut and bolt
- shock link



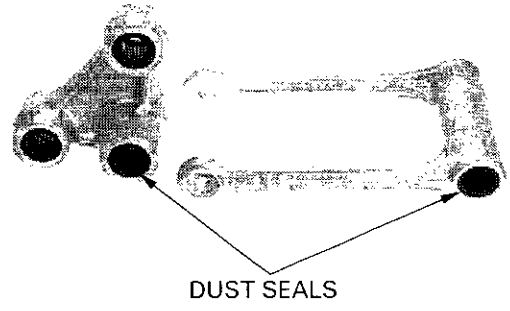


Remove the pivot collars from the shock arm and shock link pivots.



PIVOT BEARING REPLACEMENT

Remove the dust seals from the shock arm and shock link pivots.

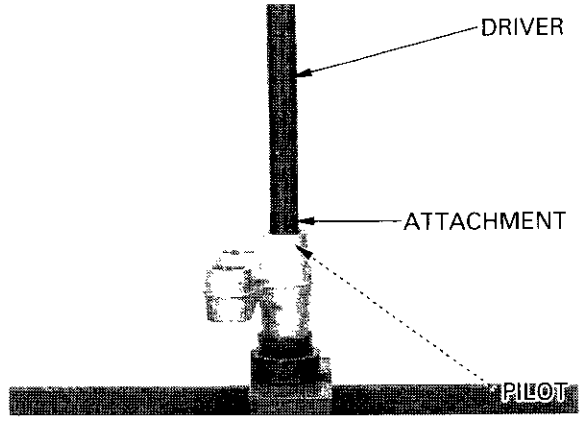


SHOCK ARM

Press the needle bearings out of the shock arm pivots using the special tools.

TOOLS:

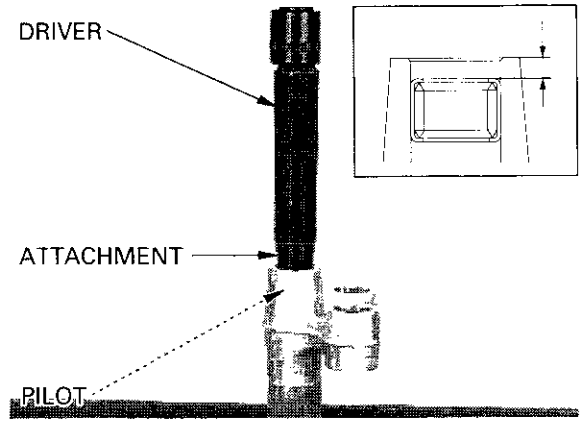
Driver	07949-3710001
Attachment, 22 × 24 mm	07746-0010800
Pilot, 17 mm	07746-0040400



Press in the bearing with the marking side facing up.

Apply molybdenum disulfide grease to the needle rollers of new bearings.
Carefully press the needle bearing in the shock link pivot until the depth from the shock link outer surface is specified value, using the special tool.

SPECIFIED DEPTH:
Shock link side: 5.5 mm (0.22 in)
Shock absorber side: 5.5 mm (0.22 in)
Swingarm side: 6.5 mm (0.26 in)



TOOLS:

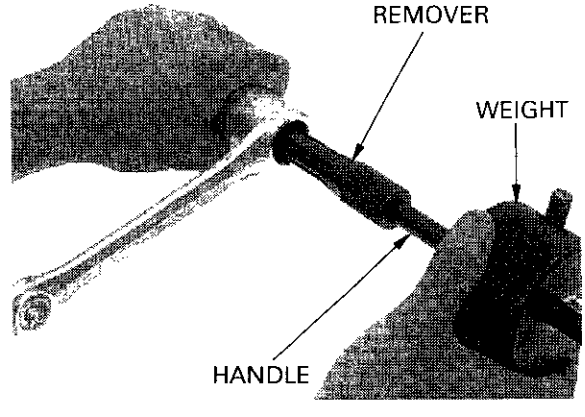
Driver	07749-0010000
Attachment, 24 × 26 mm	07746-0010700
Pilot, 17 mm	07746-0040400

SHOCK LINK

Remove the needle bearings from the shock link pivot using the special tools.

TOOLS:

Bearing remover, 17 mm	07936-3710300
Bearing remover handle	07936-3710100
Bearing remover weight	07741-0010201

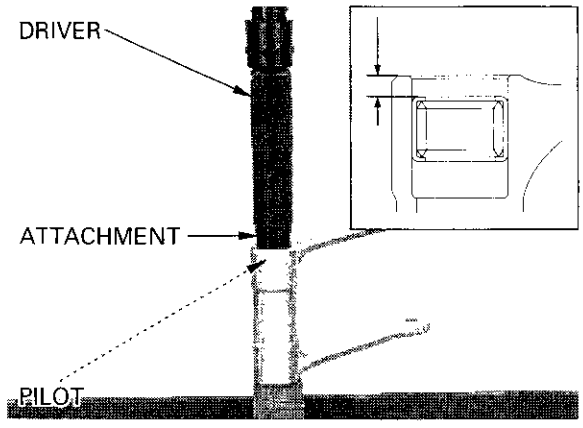


Press in the bearing with the marking side facing up.

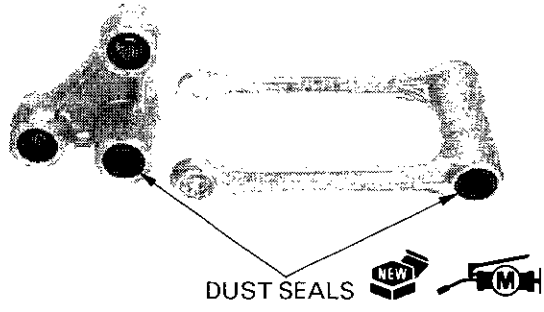
Apply molybdenum disulfide grease to the needle rollers of new bearings.
Carefully press the needle bearing in the shock link pivot until the depth from the shock link outer surface is 5.5 mm (0.22 in), using the special tool.

TOOLS:

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

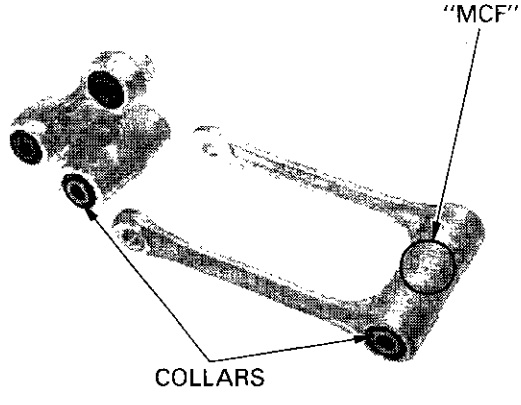


Apply molybdenum disulfide grease to new dust seal lips and install them into the shock arm and shock link pivots until they are seated.



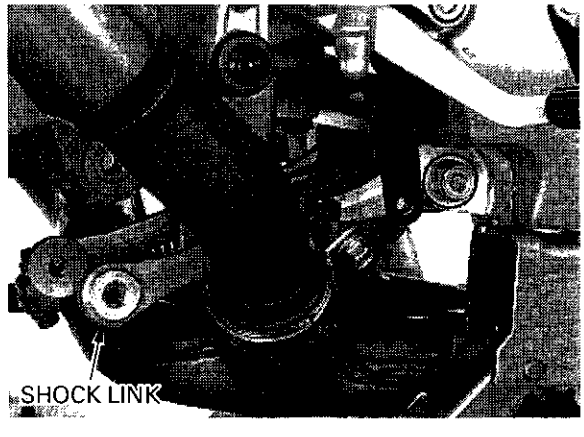
INSTALLATION

Install the pivot collars into the shock arm and shock link pivots.



Install the shock link onto the frame with the "MCF" mark facing up.
Tighten the nut.

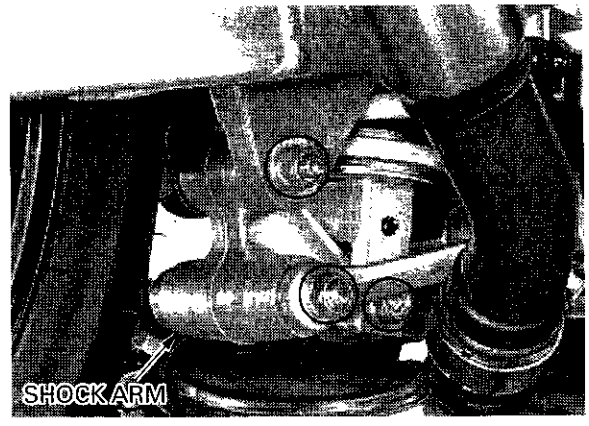
TORQUE: 44 N·m (4.5 kgf·m , 33 lbf·ft)



Install the shock arm into the shock absorber lower mount, swingarm and shock link.
Tighten the nuts.

TORQUE: 44 N·m (4.5 kgf·m , 33 lbf·ft)

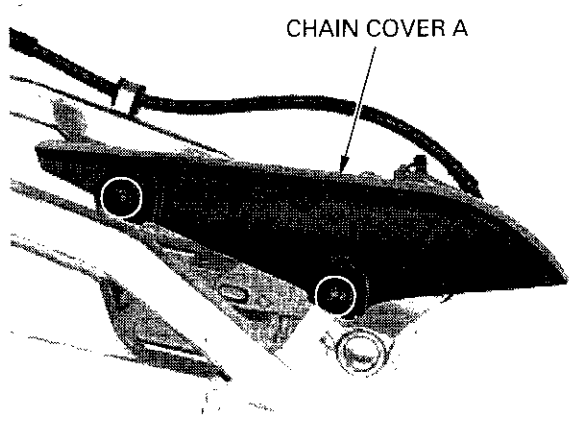
Install the rear brake hose clamp (page 14-10).
Install the lower fairings (page 2-3).



SWINGARM

REMOVAL

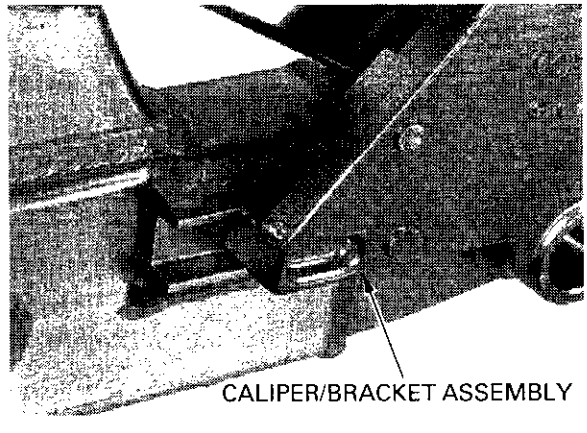
Remove the following:
- exhaust system (page 2-4)
- rear wheel (page 14-3)
- two bolt and drive chain cover A



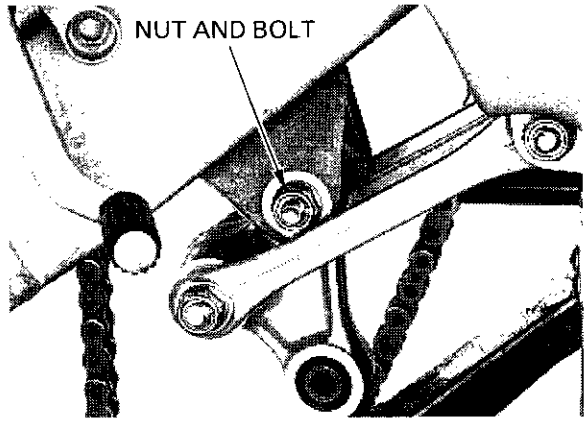
- shock absorber (page 14-8)
- rear brake caliper/bracket assembly

CAUTION:

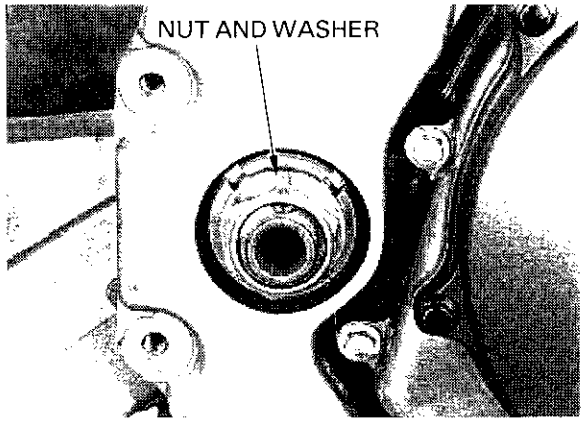
Support the brake caliper so that it does not hang from the brake hose. Do not twist the brake hose.



- shock arm-to-swingarm nut and bolt.
- drive sprocket (page 7-4)

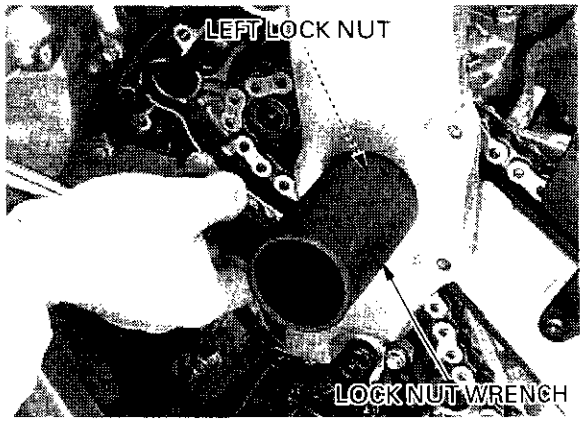


Remove the swingarm pivot nut and washer.

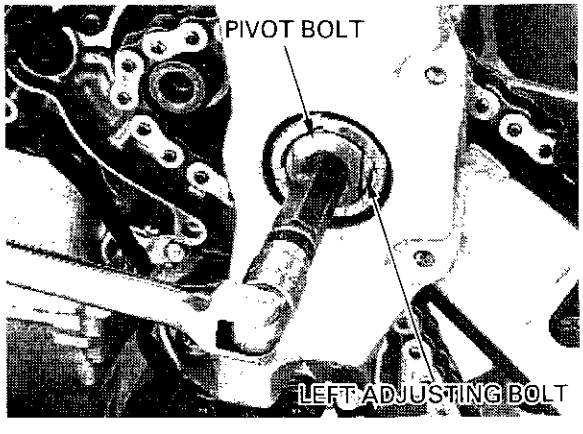


Loosen the left lock nut with the special tool.

TOOL:
Lock nut wrench, 5.8 × 46 mm 07YMA-MCF0100

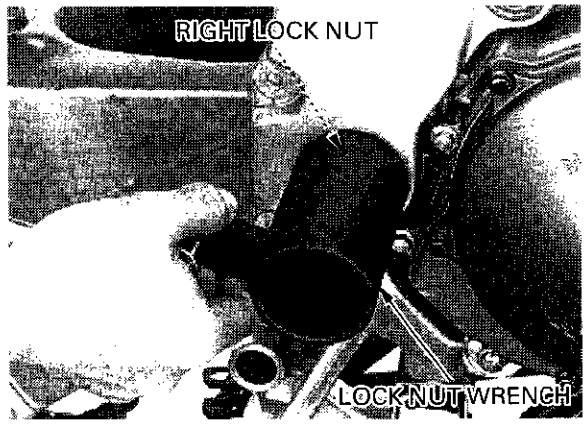


Loosen the left pivot adjusting bolt with the pivot bolt.



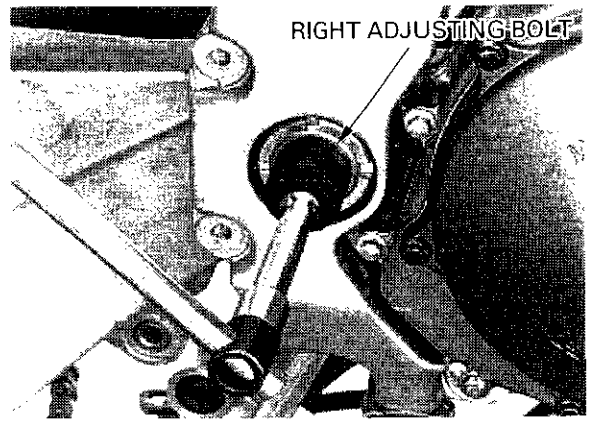
Loosen the right lock nut with the special tool.

TOOL:
Lock nut wrench, 5.8 × 46 mm 07YMA-MCF0100



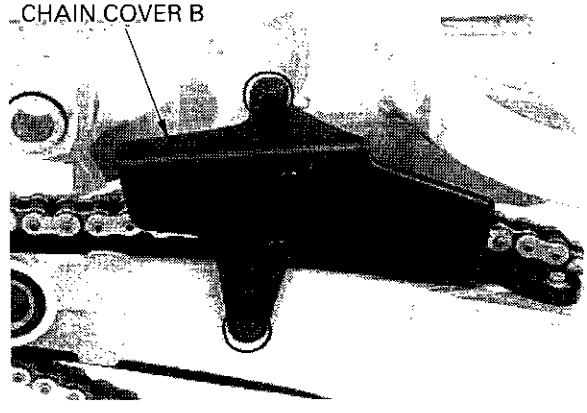
Loosen the right pivot adjusting bolt.

Remove the pivot bolt and the swingarm.

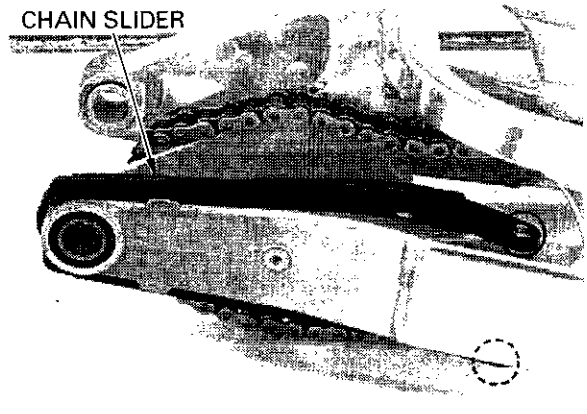


DISASSEMBLY

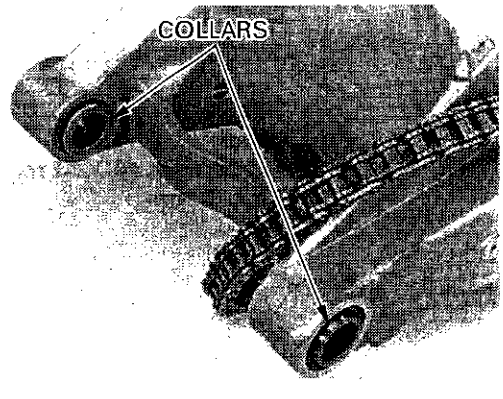
Remove the two bolts and drive chain cover B if necessary.



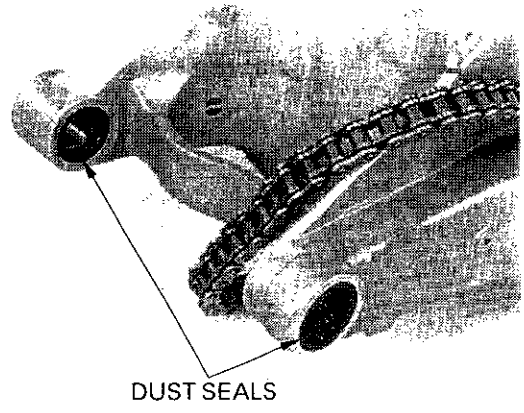
Remove the two bolts, collars and drive chain slider if necessary.



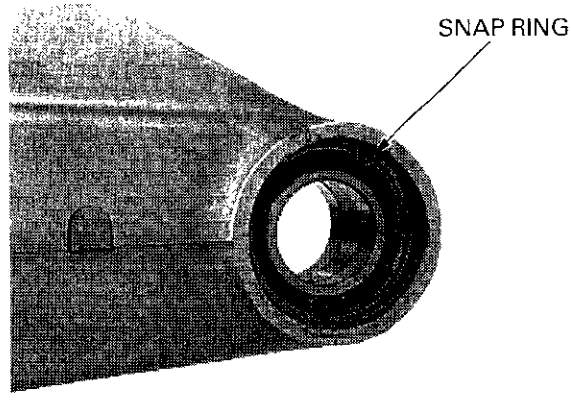
Remove the pivot collars from the swingarm pivots.



Remove the dust seals from the swingarm pivots.



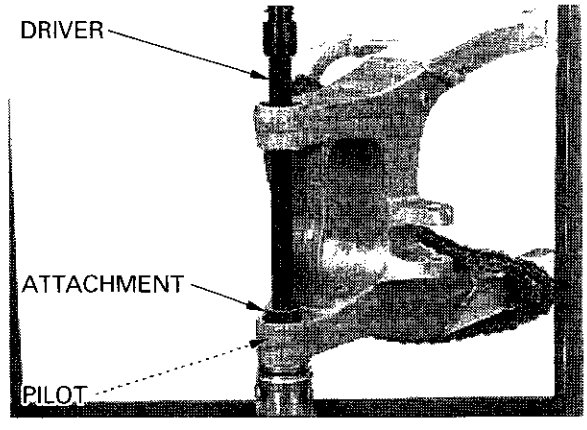
Remove the snap ring from the right swingarm pivot.



Press the right pivot bearings and distance collar out of the swingarm pivot, using the special tools.

TOOLS:

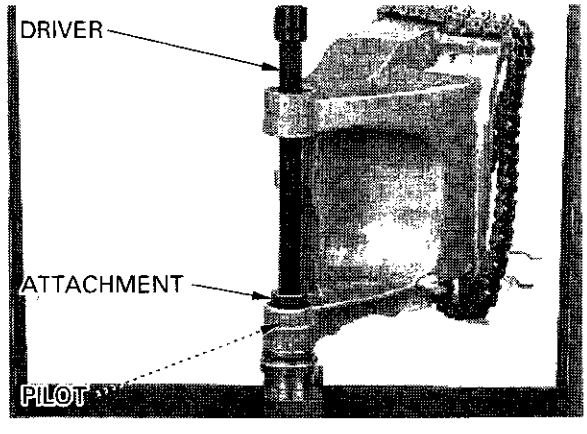
Driver	07949-3710001
Attachment, 37 × 40 mm	07746-0010200
Pilot, 25 mm	07746-0040600



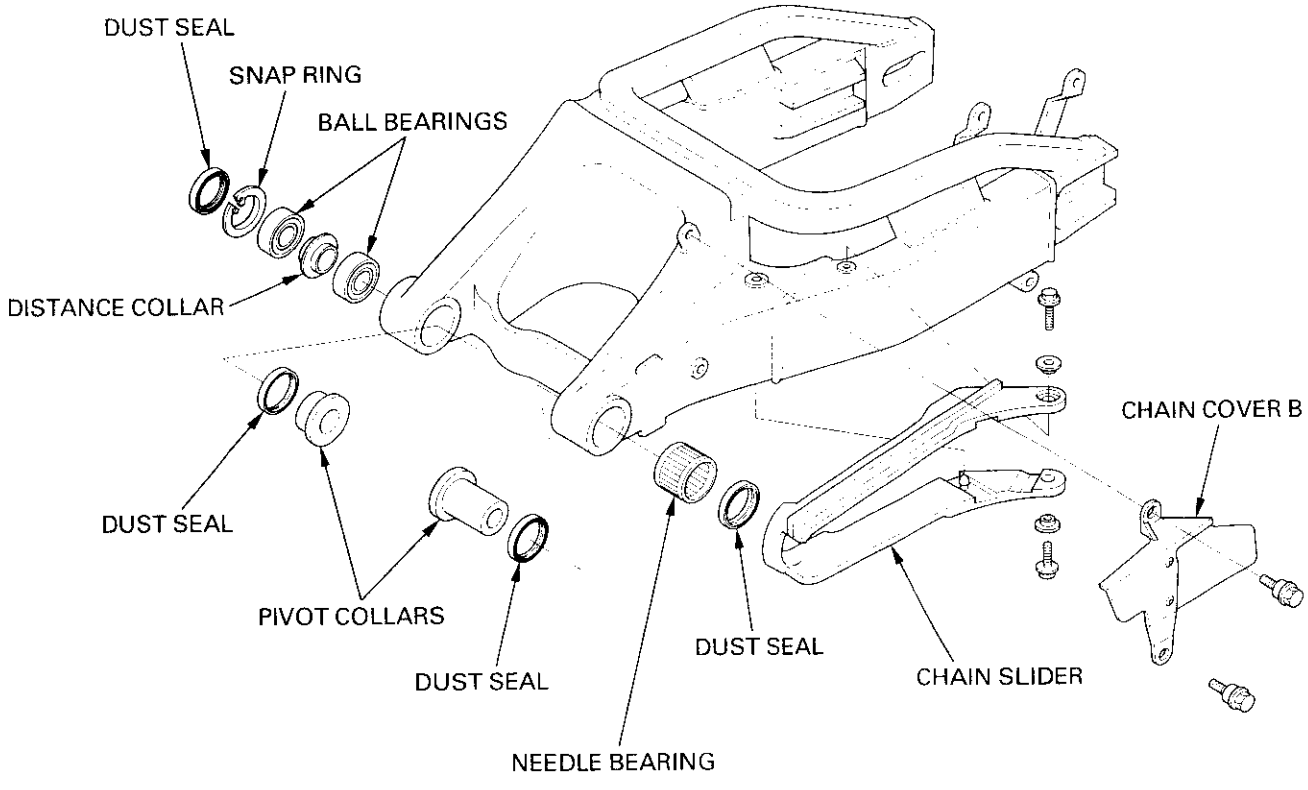
Press the left pivot bearing out of the swingarm pivot, using the special tools.

TOOLS:

Driver	07949-3710001
Attachment, 40 × 42 mm	07746-0010900
Pilot, 25 mm	07746-0040600



ASSEMBLY

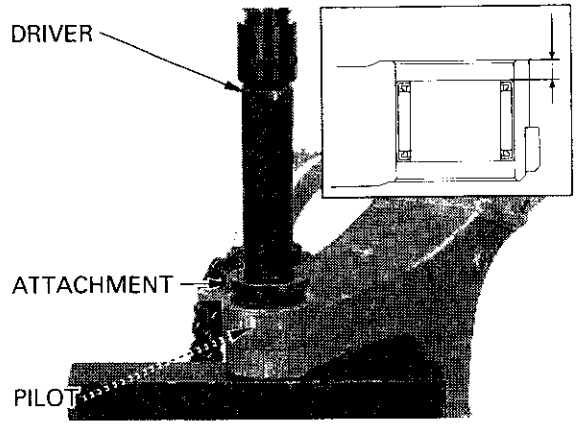


Press in the bearing with the marking side facing up.

Apply molybdenum disulfide grease to the needle rollers of a new bearing.
Carefully press the needle bearing into left swingarm pivot until the depth from the swingarm outer surface is 6.5−7.5 mm (0.26−0.30 in), using the special tool.

TOOLS:

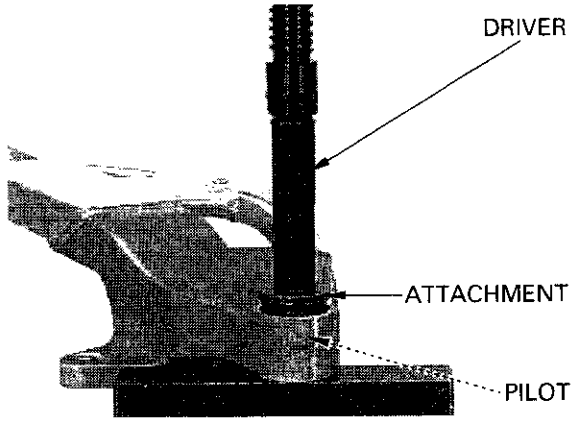
Driver	07749-0010000
Attachment, 40 × 42 mm	07746-0010900
Pilot, 32 mm	07MAD-PR90200



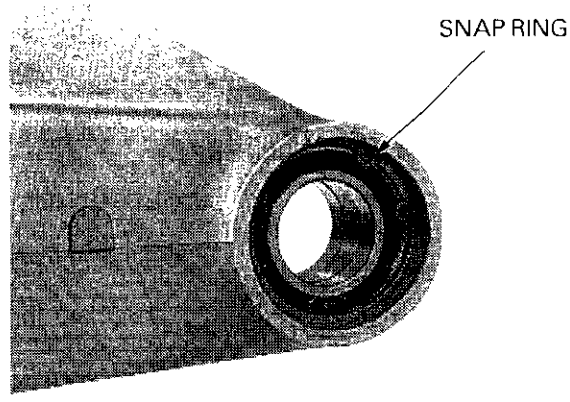
Pack new bearing cavities with molybdenum disulfide grease.
Press the inner bearing into the right swingarm pivot with the sealed side facing down until it is fully seated, using the special tools.
Install the distance collar.
Press the outer bearing into the right swingarm pivot with the sealed side facing up until it is seated, using the special tools.

TOOLS:

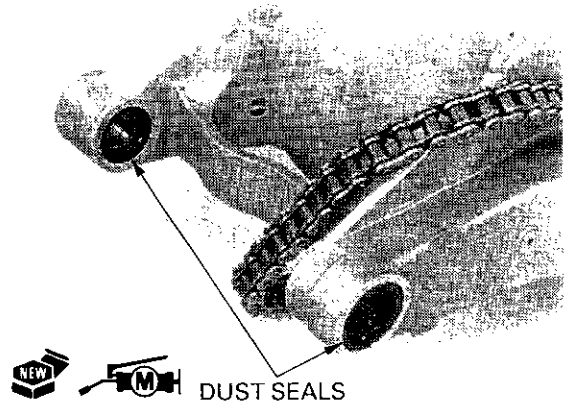
Driver	07749-0010000
Attachment, 40 × 42 mm	07746-0010900
Pilot, 25 mm	07746-0040600



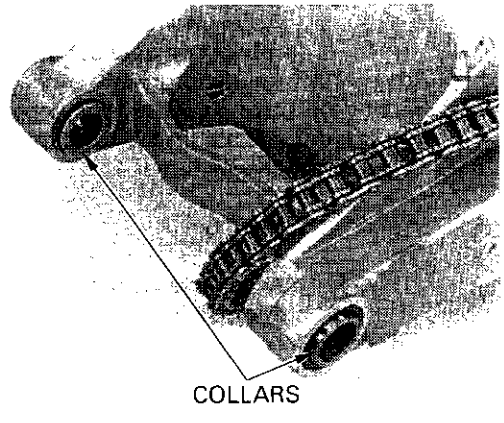
Install the snap ring into the right swingarm pivot.



Apply molybdenum disulfide grease to new dust seal lips and install them into the swingarm pivots.

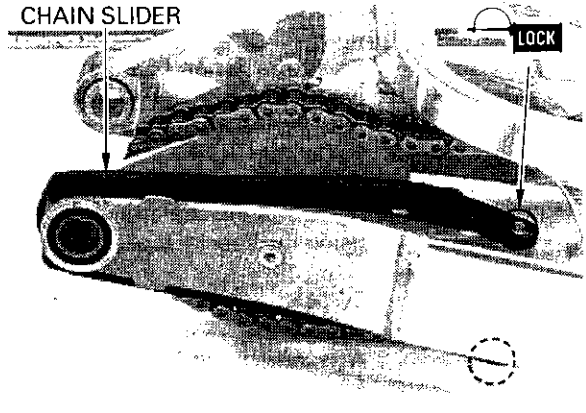


Install the pivot collars into swingarm pivots.

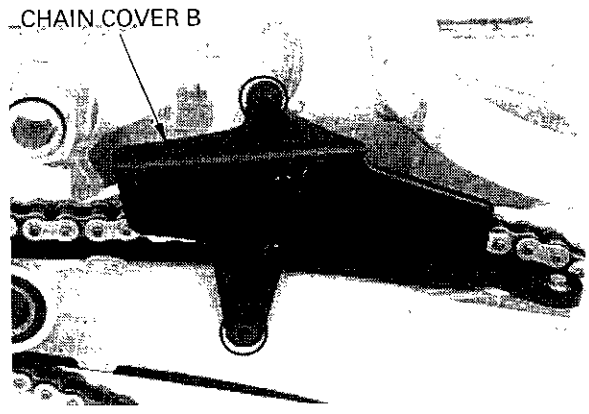


Install the drive chain slider if removed.
Apply locking agent to the slider bolt threads.
Install the collars and slider bolts, and tighten bolts.

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



Install drive chain cover B and tighten the bolts securely if removed.

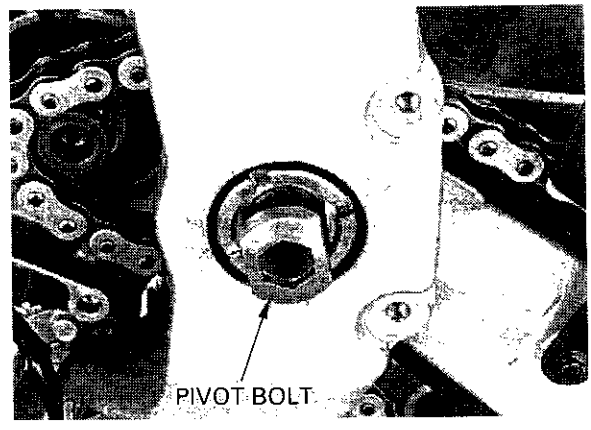


INSTALLATION

NOTE:

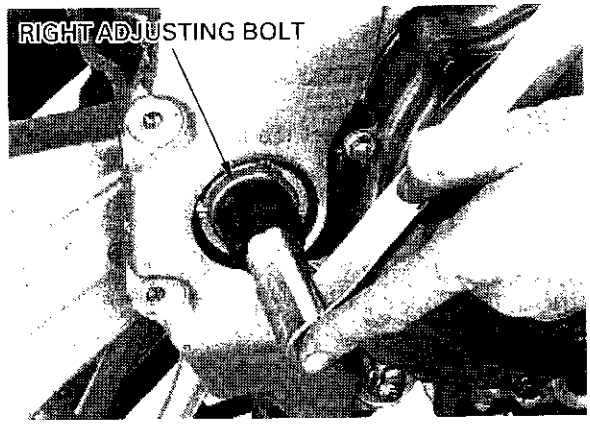
When tightening the lock nut with the lock nut wrench, refer to torque wrench reading information on page 14-1 "SERVICE INFORMATION".

Install the swingarm onto the engine and insert the pivot bolt from the left side.



Tighten the right pivot adjusting bolt.

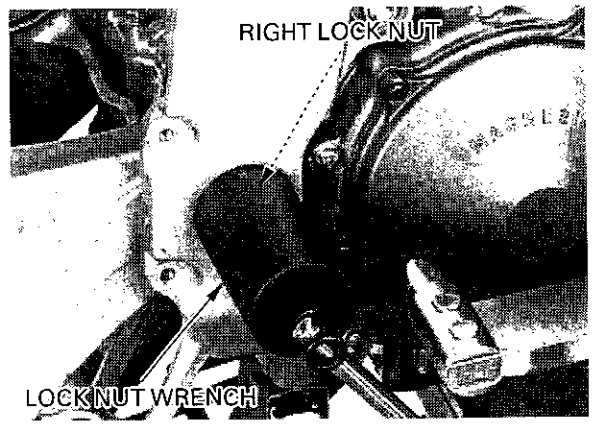
TORQUE: 15 N·m (1.5 kgf·m , 11 lbf·ft)



Hold the right pivot adjusting bolt and tighten the right lock nut, using the special tool.

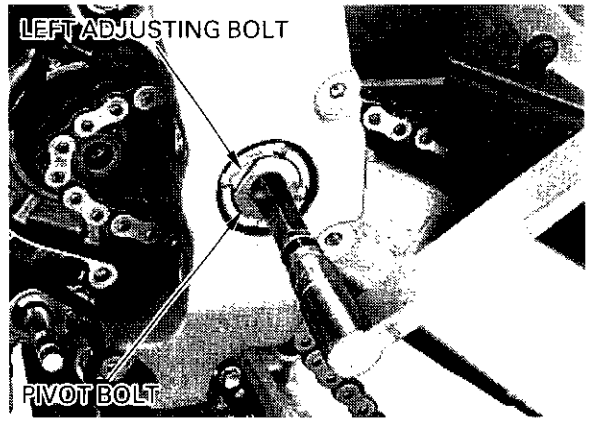
TOOL:
Lock nut wrench, 5.8 × 46 mm 07YMA-MCF0100

TORQUE: **Actual:** 64 N·m (6.5 kgf·m , 47 lbf·ft)
Indicated: 58 N·m (5.9 kgf·m , 43 lbf·ft)



Tighten the left pivot adjusting bolt with the pivot bolt.

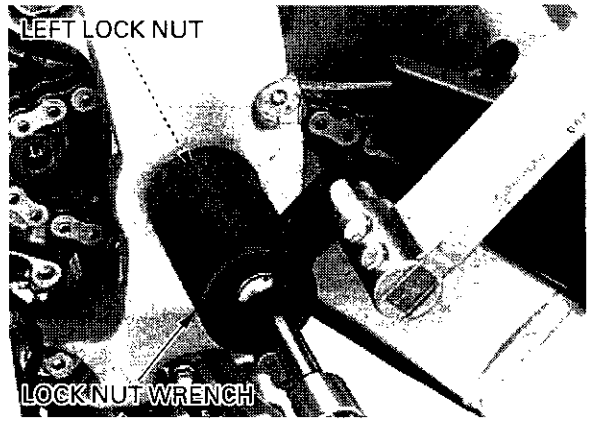
TORQUE: 15 N·m (1.5 kgf·m , 11 lbf·ft)



Hold the pivot bolt and tighten the left lock nut, using the special tool.

TOOL:
Lock nut wrench, 5.8 × 46 mm 07YMA-MCF0100

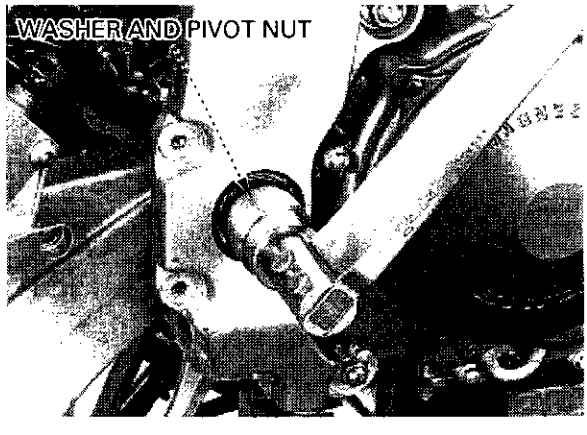
TORQUE: **Actual:** 64 N·m (6.5 kgf·m , 47 lbf·ft)
Indicated: 58 N·m (5.9 kgf·m , 43 lbf·ft)



Install the washer and pivot nut, and tighten the nut.

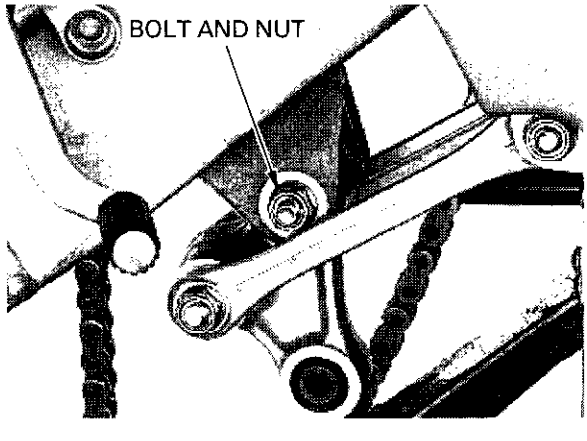
TORQUE: 127 N·m (13.0 kgf·m , 94 lbf·ft)

Install the drive sprocket (page 7-9).



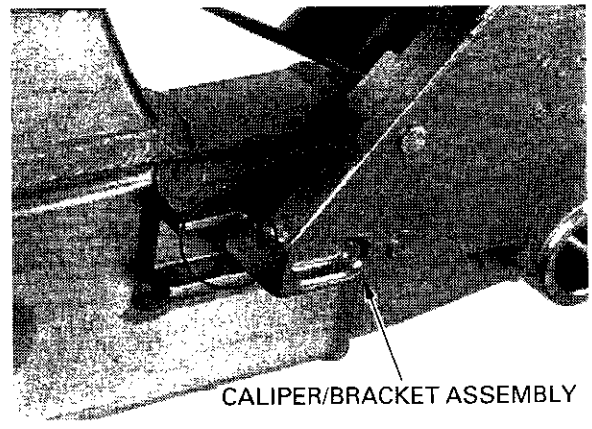
Install the shock arm-to-swingarm bolt and nut, and tighten the nut.

TORQUE: 44 N·m (4.5 kgf·m , 33 lbf·ft)



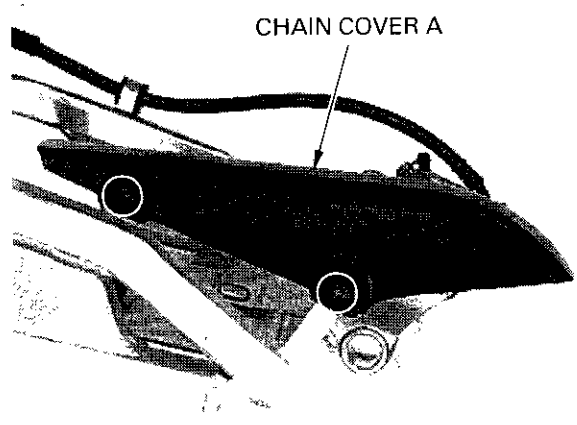
Install the rear brake caliper/bracket assembly onto the swingarm.

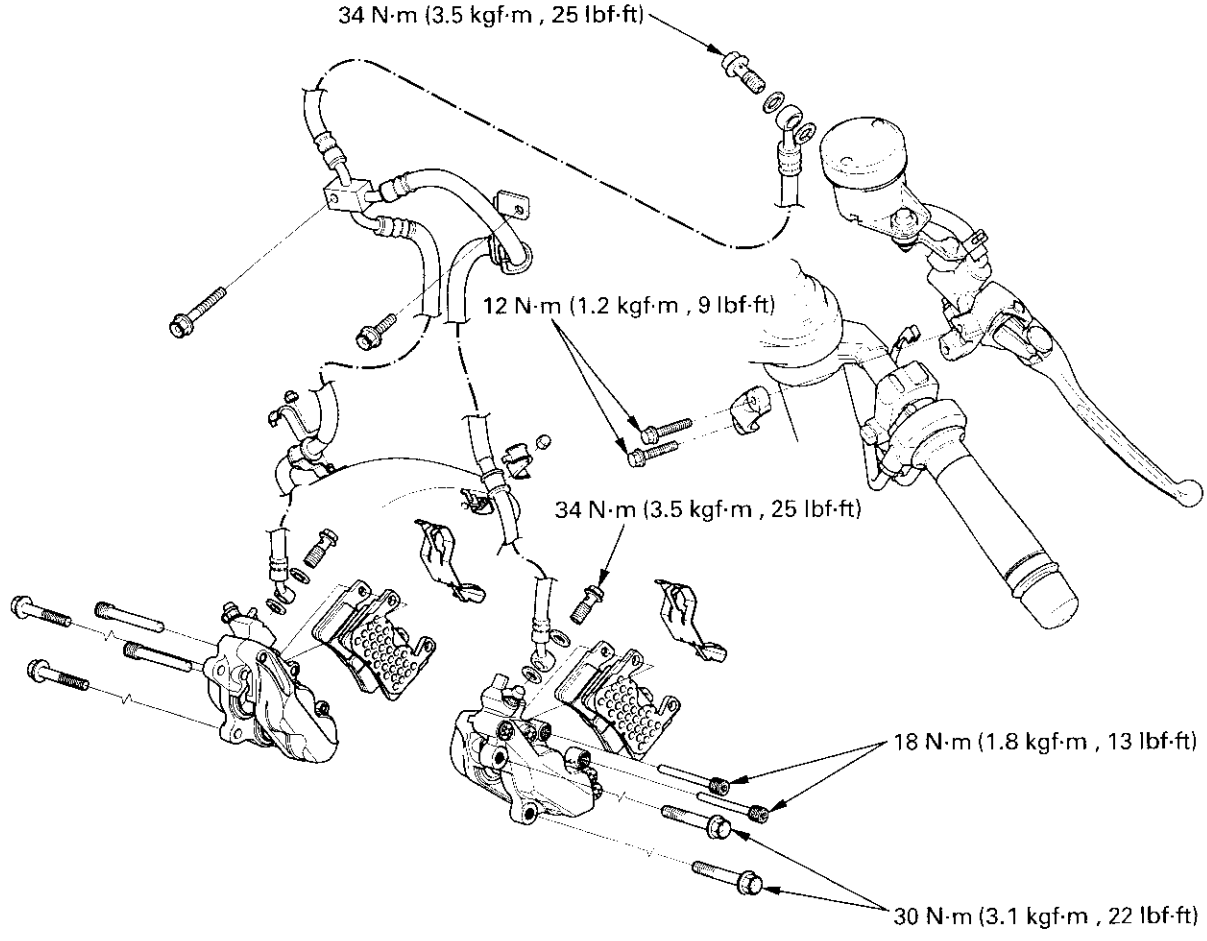
Install the shock absorber (page 14-9).

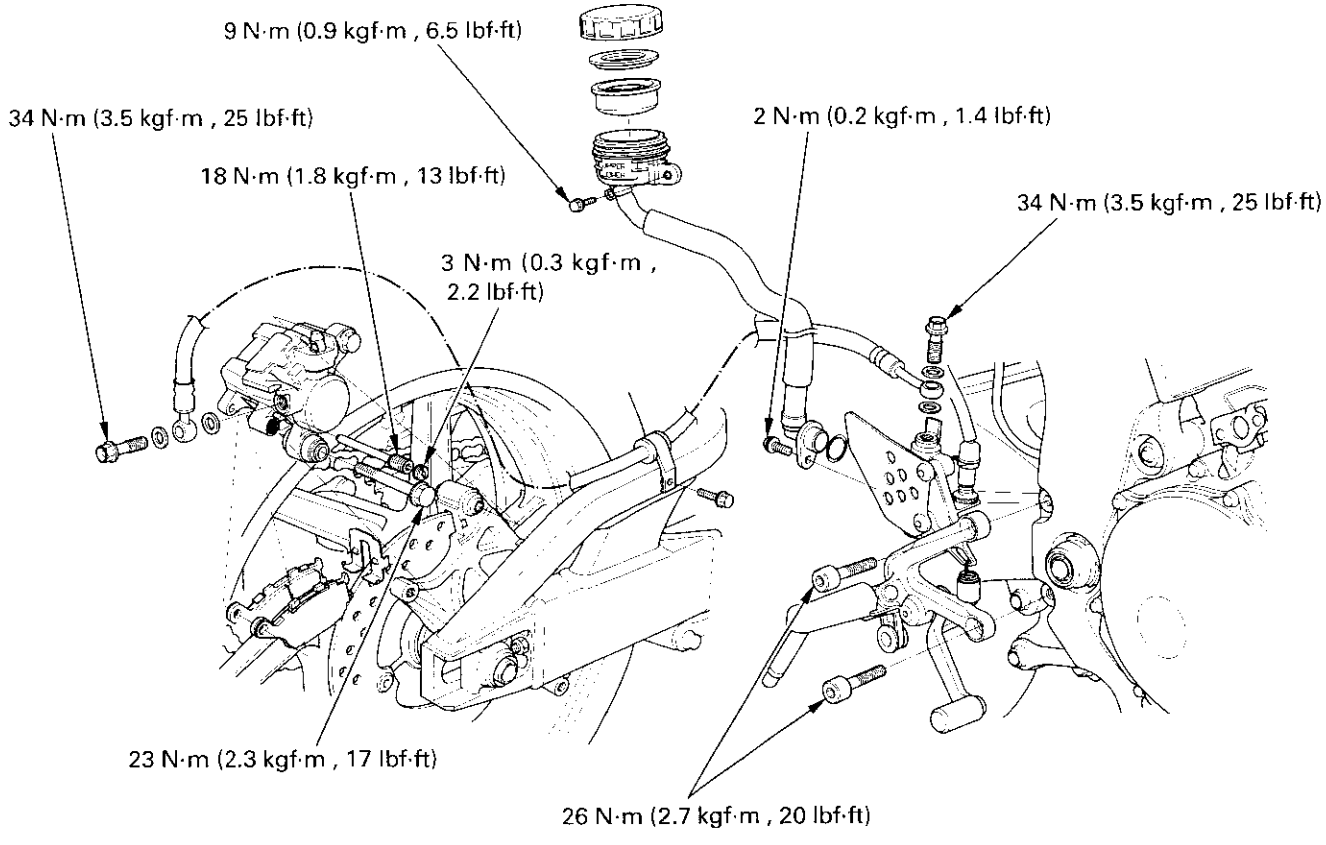


Install drive chain cover A and tighten the two bolts securely.

Install the rear wheel (page 14-7).
Install the exhaust system (page 2-6).




34 N·m (3.5 kgf·m , 25 lbf·ft)
12 N·m (1.2 kgf·m , 9 lbf·ft)
34 N·m (3.5 kgf·m , 25 lbf·ft)
18 N·m (1.8 kgf·m , 13 lbf·ft)
30 N·m (3.1 kgf·m , 22 lbf·ft)


9 N·m (0.9 kgf·m , 6.5 lbf·ft)
34 N·m (3.5 kgf·m , 25 lbf·ft)
18 N·m (1.8 kgf·m , 13 lbf·ft)
2 N·m (0.2 kgf·m , 1.4 lbf·ft)
34 N·m (3.5 kgf·m , 25 lbf·ft)
3 N·m (0.3 kgf·m , 2.2 lbf·ft)
23 N·m (2.3 kgf·m , 17 lbf·ft)
26 N·m (2.7 kgf·m , 20 lbf·ft)

15. HYDRAULIC DISC BRAKE

SERVICE INFORMATION	15-1	FRONT MASTER CYLINDER	15-7
TROUBLESHOOTING	15-2	REAR MASTER CYLINDER/ BRAKE PEDAL	15-12
BRAKE FLUID REPLACEMENT/ AIR BLEEDING	15-3	FRONT BRAKE CALIPER	15-17
BRAKE PAD/DISC	15-5	REAR BRAKE CALIPER	15-20

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.

- Spilled brake fluid will severely damage the plastic parts and painted surfaces. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap; make sure the reservoir is horizontal first.
- Never allow contaminants (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 as 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		4.4–4.6 (0.17–0.18)	3.5 (0.14)
	Brake disc runout		—	0.30 (0.012)
	Master cylinder I.D.		19.050–19.093 (0.7500–0.7517)	19.105 (0.7522)
	Master piston O.D.		19.018–19.043 (0.7487–0.7497)	19.006 (0.7483)
	Caliper cylinder I.D.	A	33.96–34.01 (1.337–1.339)	34.02 (1.339)
		B	32.030–32.080 (1.2610–1.2630)	32.090 (1.2634)
	Caliper piston O.D.	A	33.878–33.928 (1.3338–1.3357)	33.87 (1.333)
		B	31.948–31.998 (1.2578–1.2598)	31.94 (1.257)
Rear	Specified brake fluid		DOT 4	—
	Brake disc thickness		4.8–5.2 (0.19–0.20)	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

Brake caliper bleed valve	6 N·m (0.6 kgf·m , 4.3 lbf·ft)	
Front brake reservoir cap screw	2 N·m (0.2 kgf·m , 1.4 lbf·ft)	
Rear brake caliper pad pin plug	3 N·m (0.3 kgf·m , 2.2 lbf·ft)	
Pad pin	18 N·m (1.8 kgf·m , 13 lbf·ft)	
Brake hose oil bolt	34 N·m (3.5 kgf·m , 25 lbf·ft)	
Front brake lever pivot bolt	1 N·m (0.1 kgf·m , 0.7 lbf·ft)	
Front brake lever pivot nut	6 N·m (0.6 kgf·m , 4.3 lbf·ft)	
Front brake reservoir mounting nut	6 N·m (0.6 kgf·m , 4.3 lbf·ft)	U-nut
Front brake reservoir stay bolt	12 N·m (1.2 kgf·m , 9 lbf·ft)	
Front brake light switch screw	1 N·m (0.1 kgf·m , 0.7 lbf·ft)	
Front master cylinder holder bolt	12 N·m (1.2 kgf·m , 9 lbf·ft)	
Rear brake reservoir mounting bolt	9 N·m (0.9 kgf·m , 6.5 lbf·ft)	
Rear master cylinder mounting bolt	10 N·m (1.0 kgf·m , 7 lbf·ft)	
Rear master cylinder joint nut	18 N·m (1.8 kgf·m , 13 lbf·ft)	
Rear brake reservoir hose joint screw	2 N·m (0.2 kgf·m , 1.4 lbf·ft)	Apply locking agent to the threads.
Driver footpeg bracket bolt	26 N·m (2.7 kgf·m , 20 lbf·ft)	
Front brake caliper mounting bolt	30 N·m (3.1 kgf·m , 22 lbf·ft)	Apply locking agent to the threads.
Front brake caliper assembly bolt	23 N·m (2.3 kgf·m , 17 lbf·ft)	Apply locking agent to the threads.
Rear brake caliper bolt	23 N·m (2.3 kgf·m , 17 lbf·ft)	

TOOL

Snap ring pliers	07914-SA50001

TROUBLESHOOTING

Brake lever/pedal soft or spongy
- Air in hydraulic system
- Leaking hydraulic system
- Contaminated brake pad/disc
- Worn caliper piston seals
- Worn master cylinder piston cups
- Worn brake pad/disc
- Contaminated caliper
- Contaminated master cylinder
- Caliper not sliding properly
- Low brake fluid level
- Clogged fluid passage
- Warped/deformed brake disc
- Sticking/worn caliper piston
- Sticking/worn master piston
- Bent brake lever/pedal

Brake lever/pedal hard
- Clogged/restricted hydraulic system
- Sticking/worn caliper piston
- Sticking/worn master piston
- Caliper not sliding properly
- Bent brake lever/pedal

Brake drag
- Contaminated brake pad/disc
- Misaligned wheel
- Badly worn brake pad/disc
- Warped/deformed brake disc
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Sticking caliper piston

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.

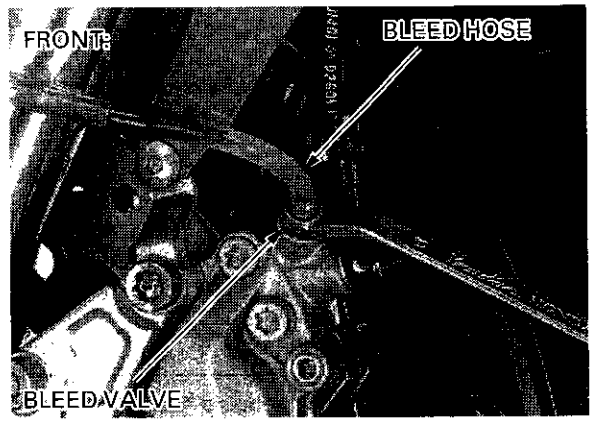
CAUTION:

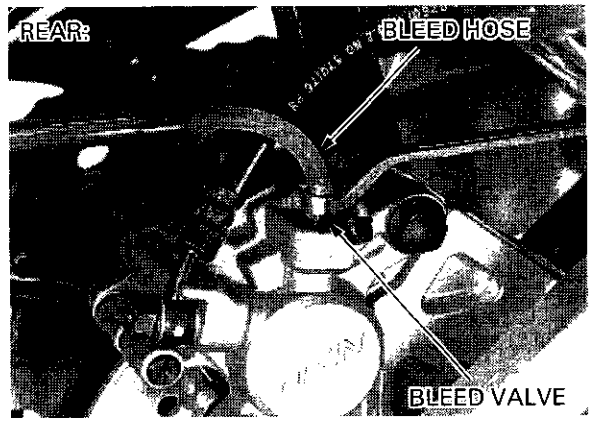
- ***Do not allow foreign material to enter the system when filling the reservoir.***
- ***Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.***
- ***Use only DOT 4 brake fluid from a sealed container.***
- ***Do not mix different types of fluid. They are not compatible.***

BRAKE FLUID DRAINING

Remove the reservoir cap, set plate and diaphragm (page 3-21).

Connect the bleed hose to the bleed valve.
Loosen the bleed valve and pump the brake lever or pedal until no more fluid flows out of the bleed valve.





BRAKE FLUID FILLING/BLEEDING

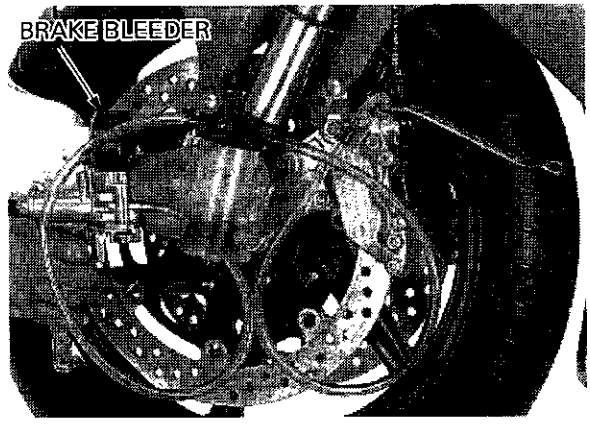
Close the bleed valve.
Fill the reservoir with DOT 4 brake fluid from a sealed container.

Connect a commercially available brake bleeder to the bleed valve.
Pump the brake bleeder and loosen the bleed valve.
Add brake fluid when the fluid level in the reservoir is low.

Check the fluid level often while bleeding the brake to prevent air from being pumped into the system.

NOTE:

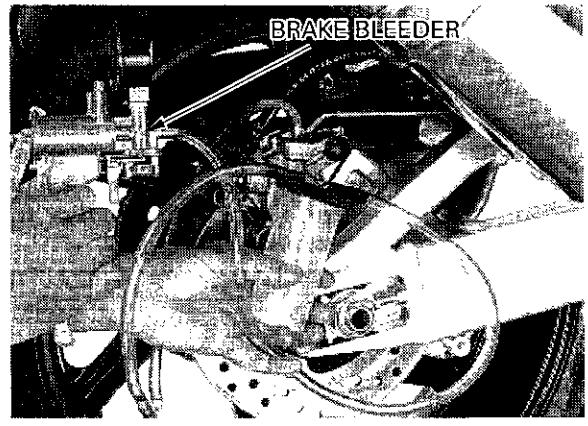
When using a brake bleeding tool, follow the manufacturer's operating instructions.



If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Repeat the above procedures until air bubbles do not appear in the plastic hose.

Close the bleed valve and operate the brake lever or pedal. If it still feels spongy, bleed the system again.



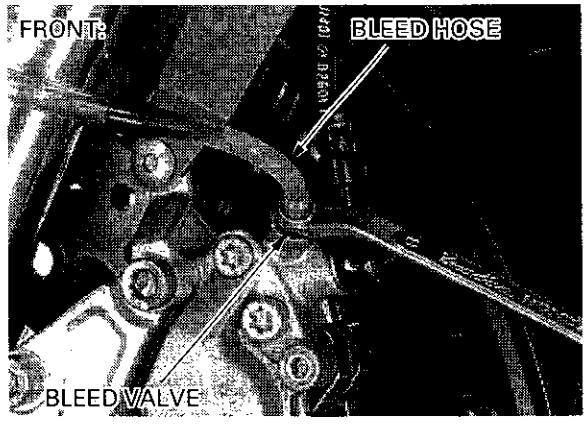
If a brake bleeder is not available, use the following procedure:
Pump up the system pressure with the brake lever or pedal until lever or pedal resistance is felt.

Connect a bleed hose to the bleed valve and bleed the system as follows:

1. Squeeze the brake lever or depress the brake pedal, open the bleed valve 1/2 turn and then close it.

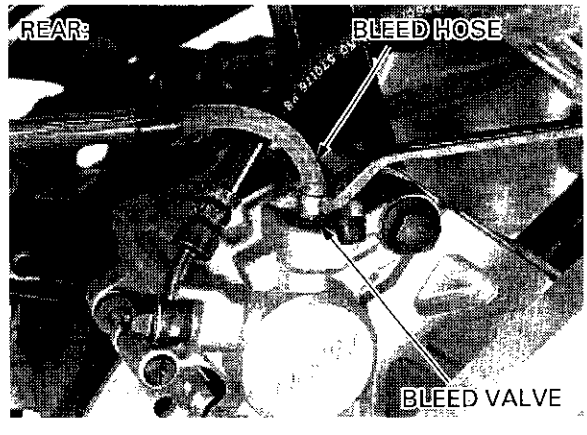
NOTE:

Do not release the brake lever or pedal until the bleed valve has been closed.



2. Release the brake lever or pedal slowly and wait several seconds after it reaches the end of its travel.

Repeat the steps 1 and 2 until air bubbles do not appear in the bleed hose.



Tighten the bleed valve.

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

Fill the reservoir to the upper level line with DOT 4 brake fluid from a sealed container.

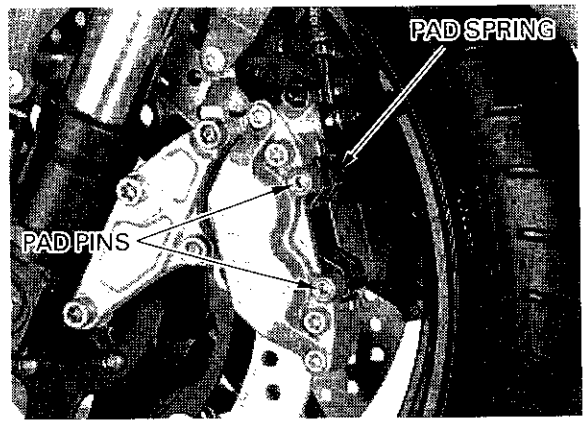
Install the diaphragm, set plate and reservoir cap (page 3-21).

BRAKE PAD/DISC

FRONT BRAKE PAD REPLACEMENT

Always replace the brake pads in pairs to ensure even disc pressure.

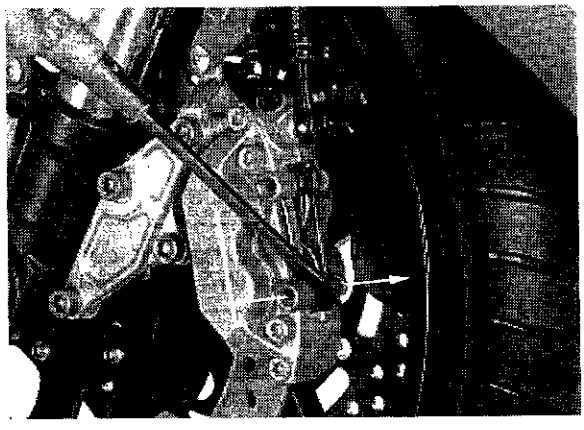
Remove the pad pins and pad spring.



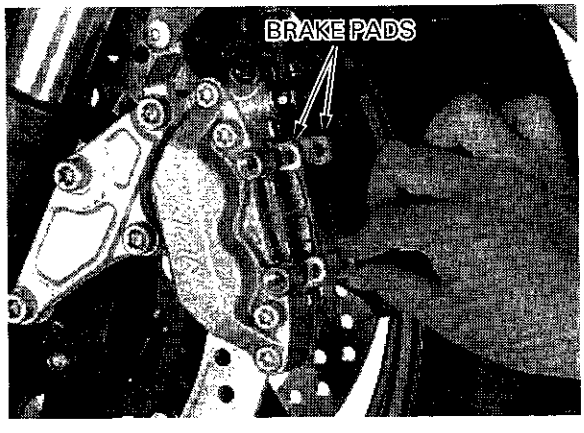
Push the caliper pistons all the way in to allow installation of new brake pads.

NOTE:

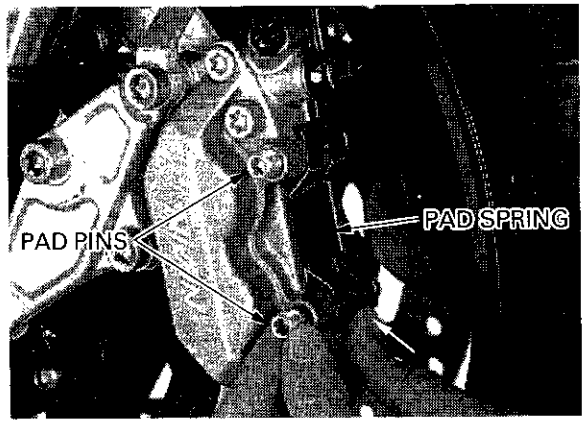
Check the brake fluid level in the brake reservoir as this operation causes the level to rise.



Replace the brake pads with new ones.



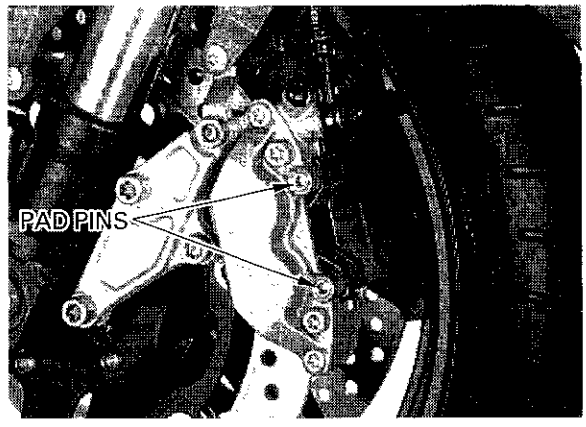
Install the pad spring and one pad pin.
Install the other pad pin while pushing in the pad spring.



Tighten the pad pins.

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

Operate the brake lever to seat the caliper pistons against the pads.



REAR BRAKE PAD REPLACEMENT

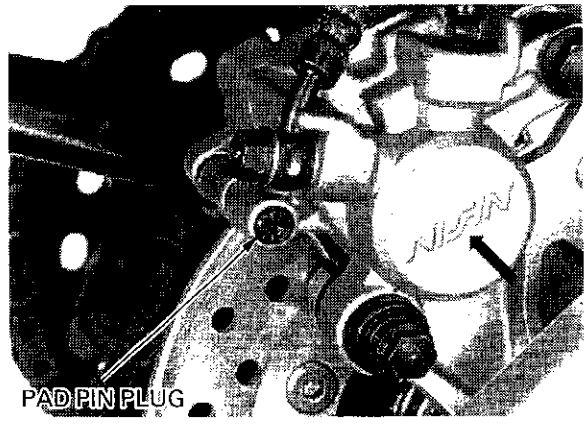
Always replace the brake pads in pairs to ensure even disc pressure.

Push the caliper piston all the way in to allow installation of new brake pads by pushing the caliper body toward the disc.

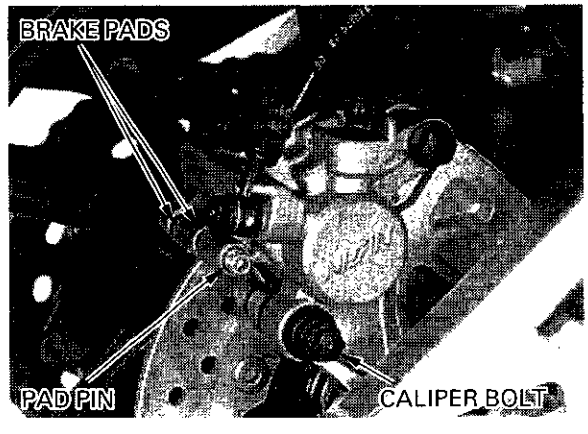
NOTE:

Check the brake fluid level in the brake reservoir as this operation causes the level to rise.

Remove the pad pin plug.

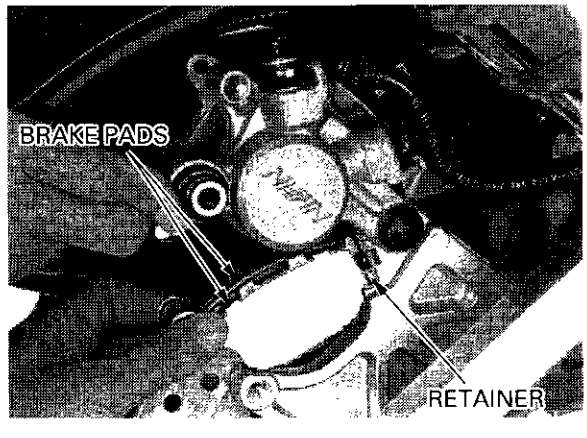


Loosen the pad pin.
Remove the rear brake caliper bolt.
Pivot the caliper up, and remove the pad pin and brake pads.



Make sure that the pad spring is in position.

Install new brake pads so that their ends positioned onto the retainer on the caliper bracket as shown.

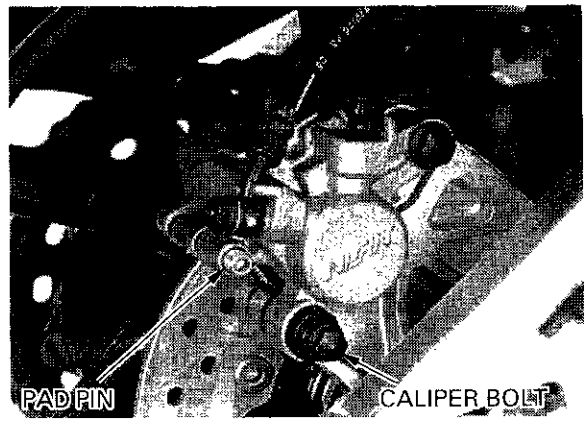


Lower the caliper and install the pad pin.
Install and tighten the rear brake caliper bolt.

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

Tighten the pad pin.

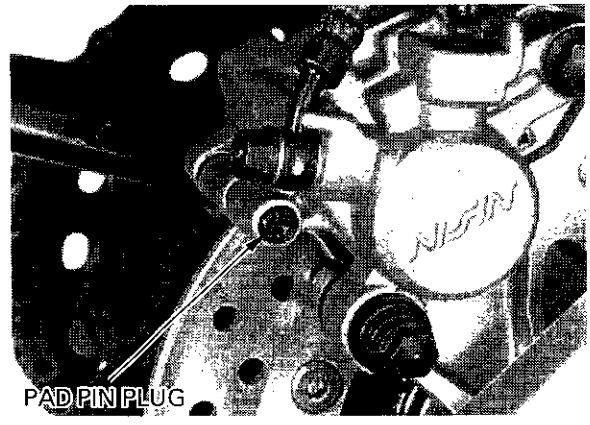
TORQUE: 18 N·m (1.8 kgf·m , 13 lbf·ft)



Install and tighten the pad pin plug.

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

Operate the brake pedal to seat the caliper piston against the pads.

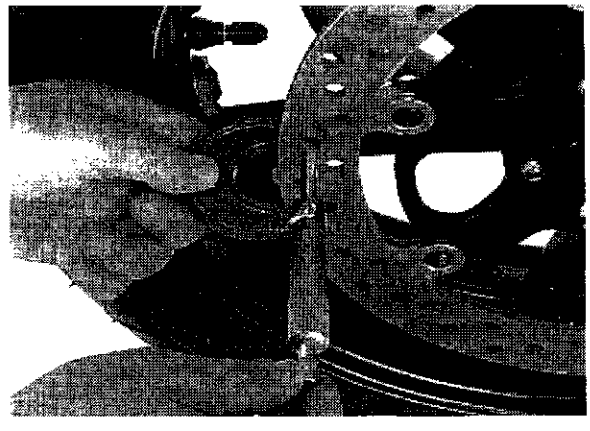


BRAKE DISC INSPECTION

Visually inspect the disc for damage or cracks.

Measure the brake disc thickness at several points.

SERVICE LIMITS: Front: 3.5 mm (0.14 in)
Rear: 4.0 mm (0.16 in)



FRONT MASTER CYLINDER

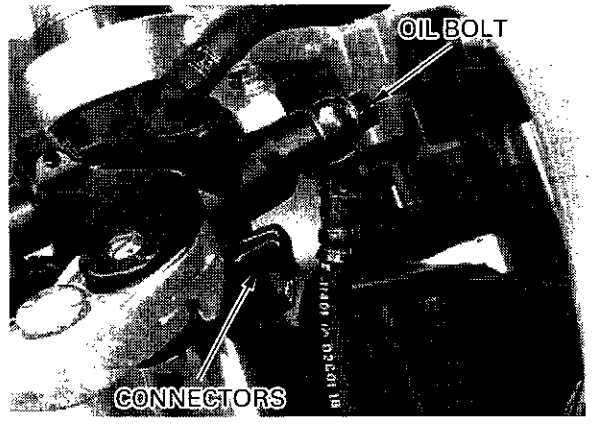
CAUTION:

- ***Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.***
- ***When removing the oil bolt, cover the end of the hose to prevent contamination.***

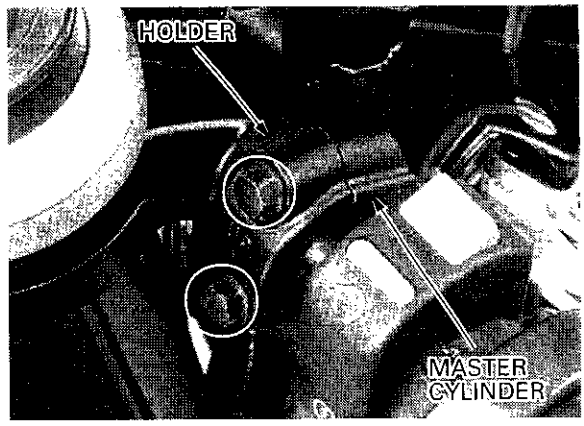
DISASSEMBLY

Drain the brake fluid from the front brake hydraulic system (page 15-3).

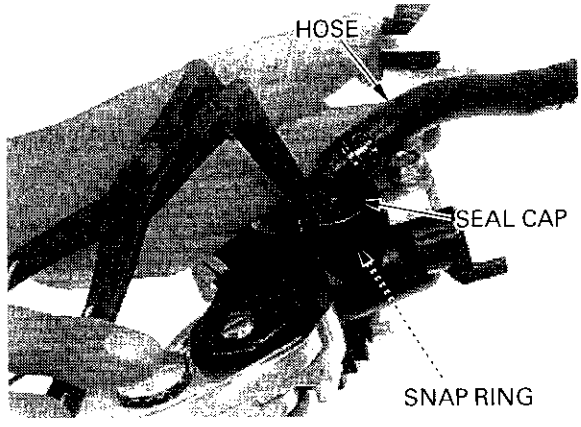
Disconnect the front brake light switch connectors.
Disconnect the brake hose from the master cylinder by removing the oil bolt and sealing washers.



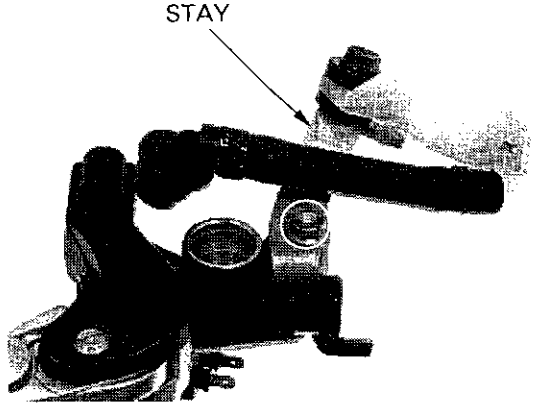
Remove the master cylinder holder bolts, holder and the master cylinder.



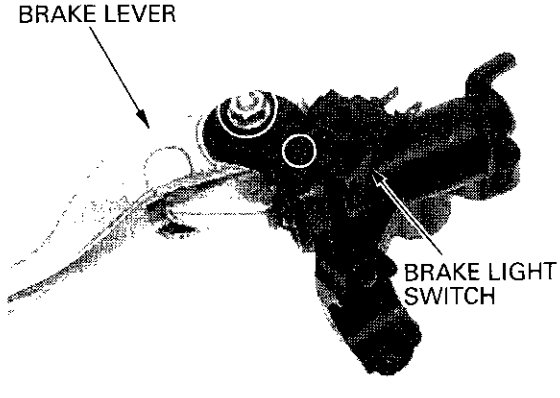
Remove the dust seal cap, snap ring and reseroir hose from the master cylinder.
Remove the O-ring.



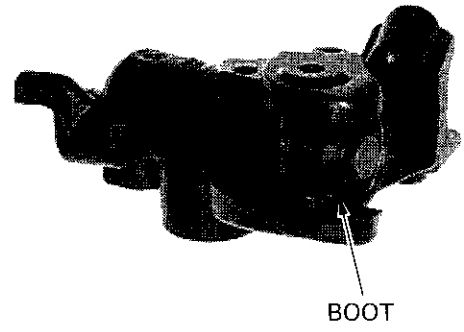
Remove the bolt and reservoir stay with the reservoir and hose.



Remove the pivot nut, bolt and brake lever assembly.
Remove screw and brake light switch.

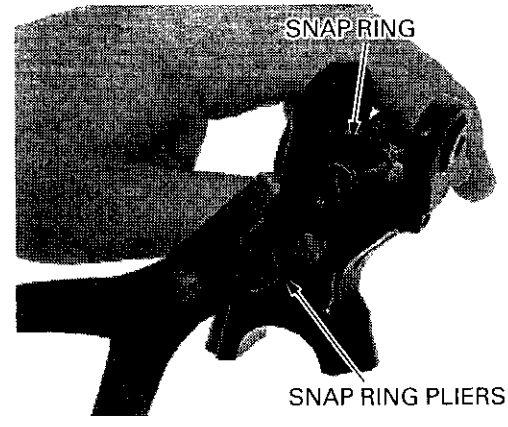


Remove the boot from the master cylinder and master piston.



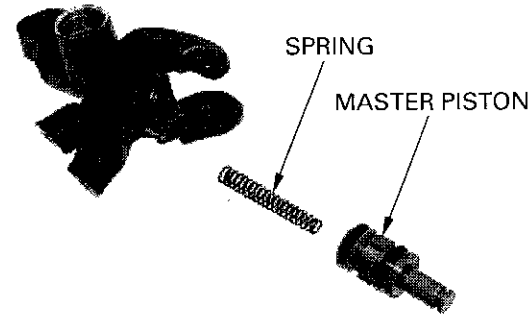
Remove the snap ring using the special tool.

TOOL:
Snap ring pliers 07914-SA50001



Remove the master piston and spring from the master cylinder.

Clean the master cylinder, reservoir and master piston in clean brake fluid.



INSPECTION

Check the piston cups for wear, deterioration or damage.
Check the spring for damage.

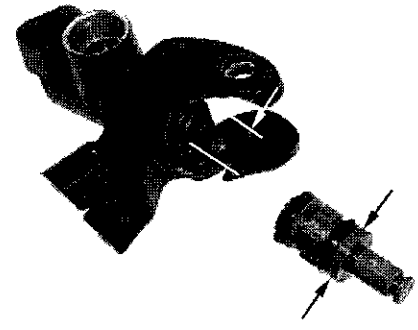
Check the master cylinder and piston for scoring, scratches or damage.

Measure the master cylinder I.D.

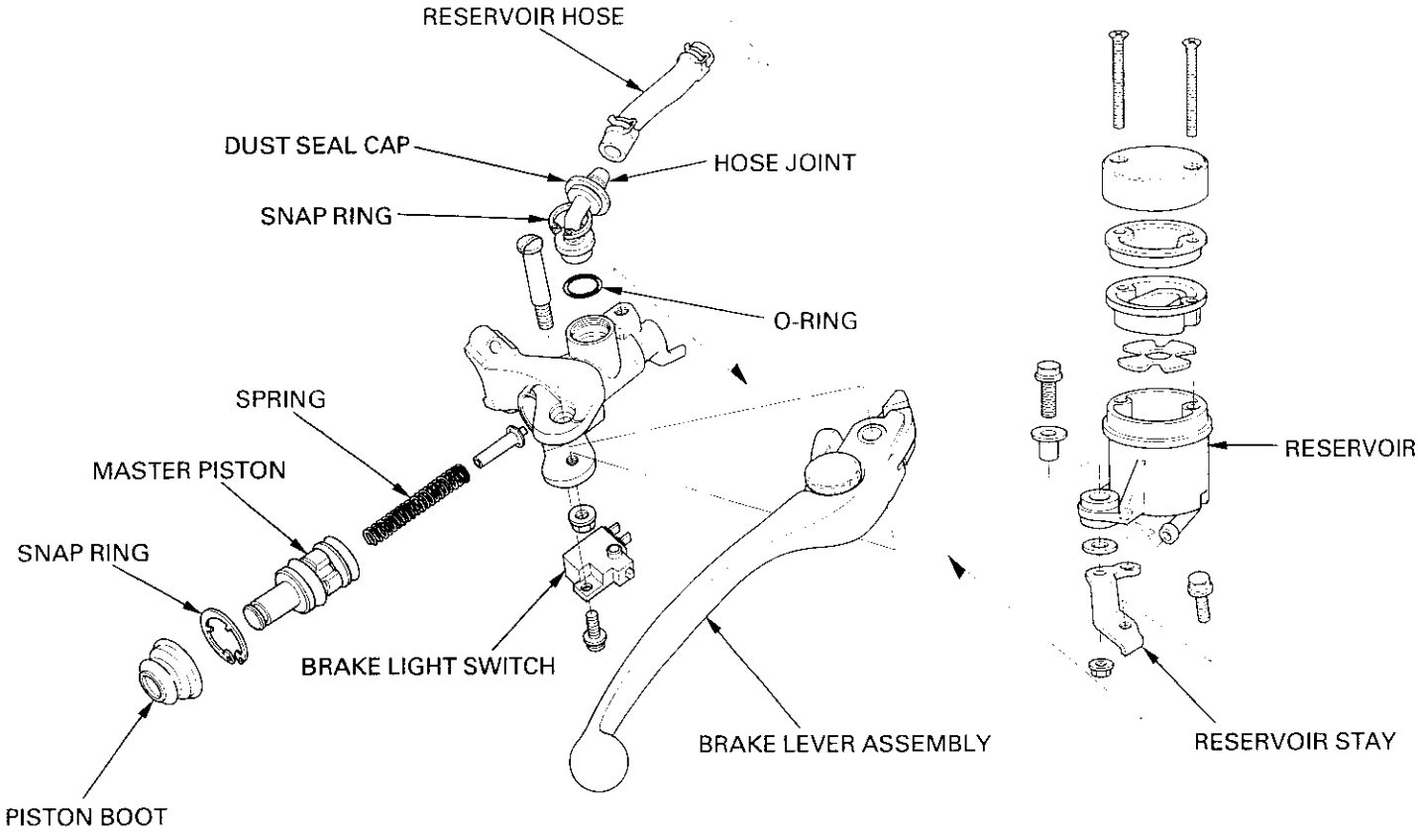
SERVICE LIMIT: 19.105 mm (0.7522 in)

Measure the master piston O.D.

SERVICE LIMIT: 19.006 mm (0.7483 in)



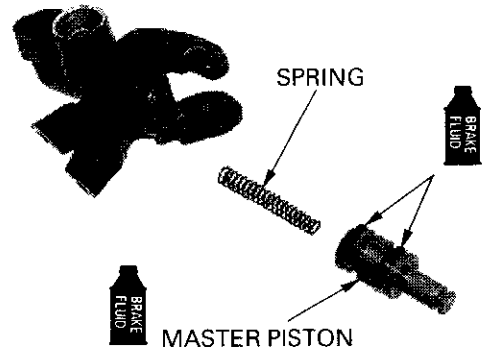
ASSEMBLY



Coat the master piston and piston cups with clean brake fluid.
Install the spring into the master piston.
Install the spring and master piston into the master cylinder.

CAUTION:

Do not allow the piston cup lips to turn inside out.



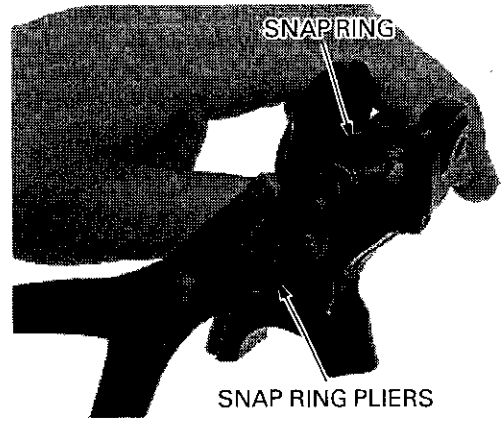
Install the snap ring into the groove in the master cylinder, using the special tool.

TOOL:

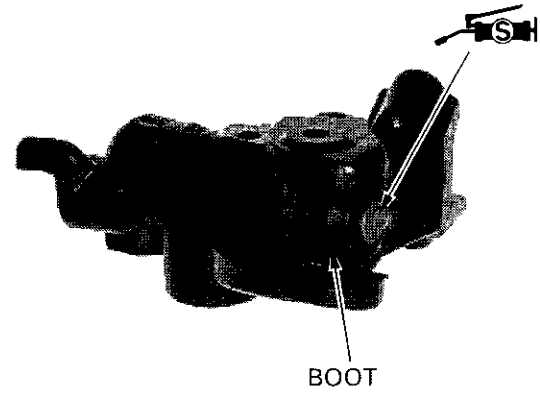
Snap ring pliers	07914-SA50001

CAUTION:

Be certain the snap ring is firmly seated in the groove.



Install the boot onto the piston and into the master cylinder.
Apply silicone grease to the brake lever contacting area of the master piston.



Apply silicone grease to the pivot bolt sliding surface.
Install the brake lever assembly.
Install and tighten the pivot bolt.

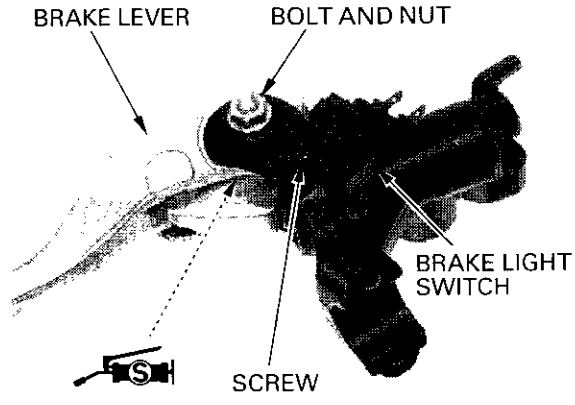
TORQUE: 1 N·m (0.1 kgf·m , 0.7 lbf·ft)

Install and tighten the pivot nut.

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

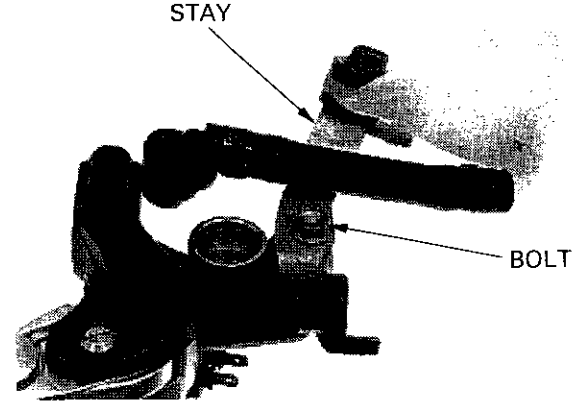
Install the front brake light switch and tighten the screw.

TORQUE: 1 N·m (0.1 kgf·m , 0.7 lbf·ft)

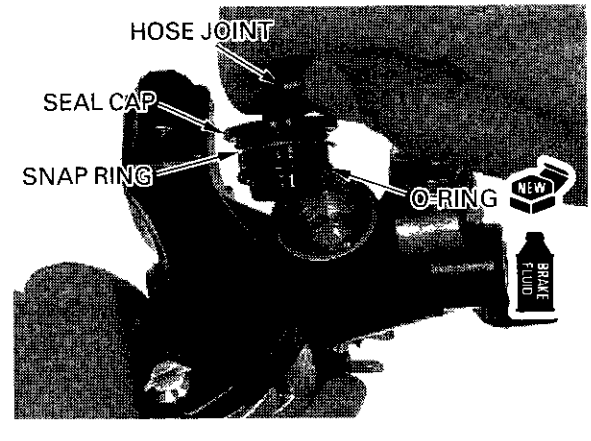


Install the reservoir stay onto the master cylinder and tighten the bolt.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

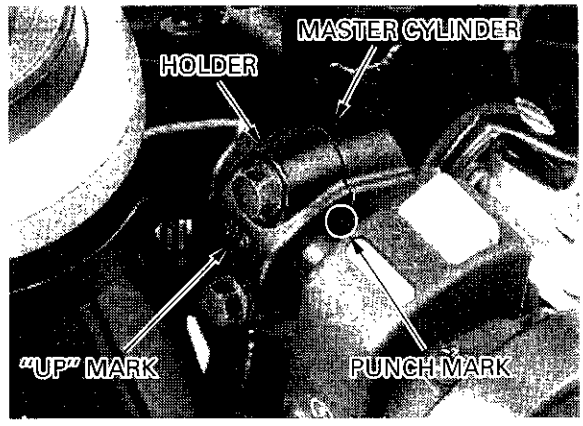


Coat a new O-ring with brake fluid and install it into the master cylinder.
Install the reservoir hose joint, secure it with the snap ring and install the dust seal cap.



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

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)



Connect the brake hose to the master cylinder with the oil bolt and new sealing washers.
Rest the hose joint against the stopper and tighten the oil bolt.

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

Connect the front brake light switch connectors.

Fill and bleed the front brake hydraulic system (page 15-3).



REAR MASTER CYLINDER/ BRAKE PEDAL

CAUTION:

- ***Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.***
- ***When removing the oil bolt, cover the end of the hose to prevent contamination.***

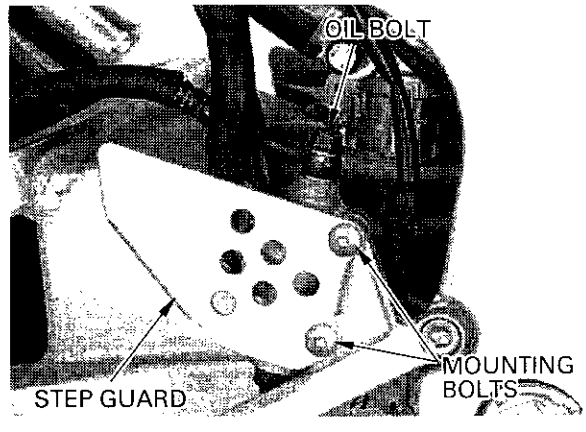
DISASSEMBLY

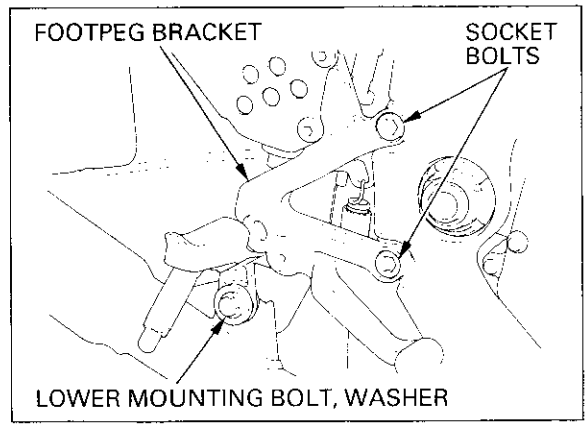
Drain the brake fluid from the rear brake hydraulic system (page 15-3).

Disconnect the brake hose from the master cylinder by removing the oil bolt and sealing washers.
Loosen the master cylinder mounting bolts.

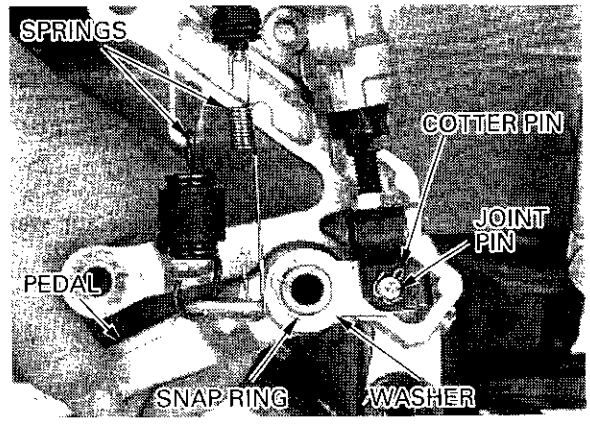
Remove the right muffler lower mounting nut, bolt and washer.
Remove the two socket bolt and right driver footpeg bracket.

Remove the master cylinder mounting bolts and step guard.

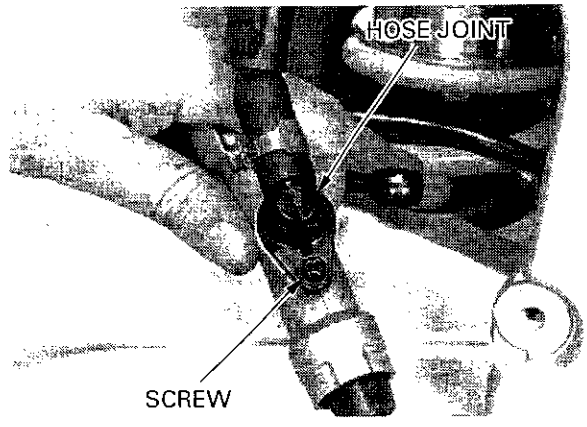




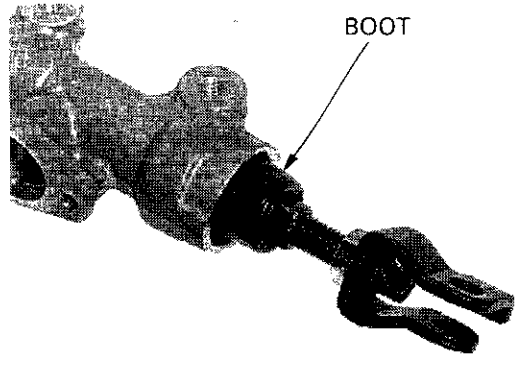
Remove the snap ring, washer and brake pedal from the pedal pivot shaft.
Unhook the return spring and switch spring from the brake pedal.
Remove the cotter pin, joint pin and the master cylinder from the brake pedal.



Remove the screw and reservoir hose joint from the master cylinder.
Remove the O-ring.

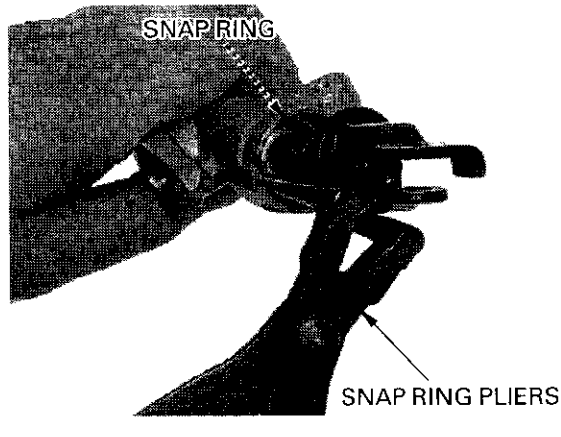


Remove the boot from the master cylinder.



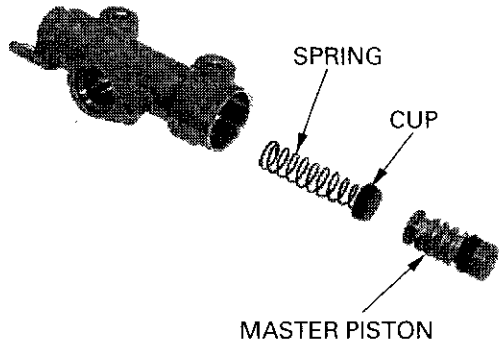
Remove the snap ring using the special tool.

TOOL:
Snap ring pliers 07914-SA50001



Remove the master piston, primary cup and spring.

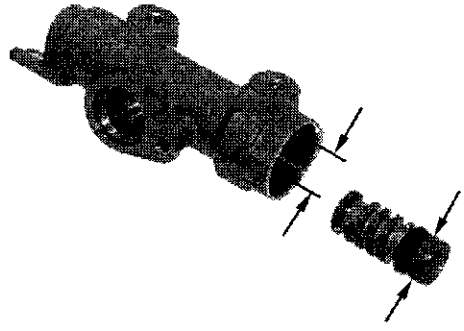
Clean the master cylinder, reservoir and master piston in clean brake fluid.



INSPECTION

Check the piston cups for wear, deterioration or damage.
Check the spring for damage.

Check the master cylinder and piston for scoring or damage.



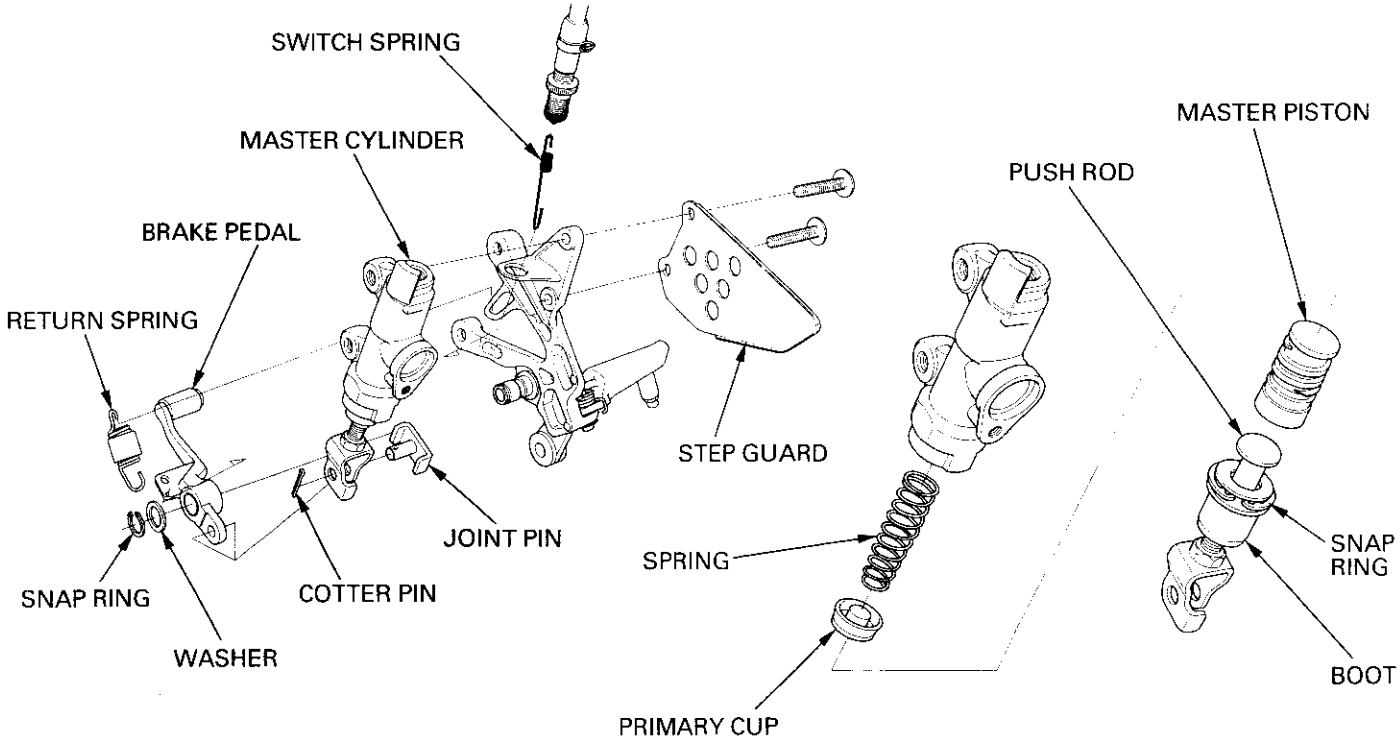
Measure the master cylinder I.D.

SERVICE LIMIT: 14.055 mm (0.5533 in)

Measure the master piston O.D.

SERVICE LIMIT: 13.945 mm (0.5490 in)

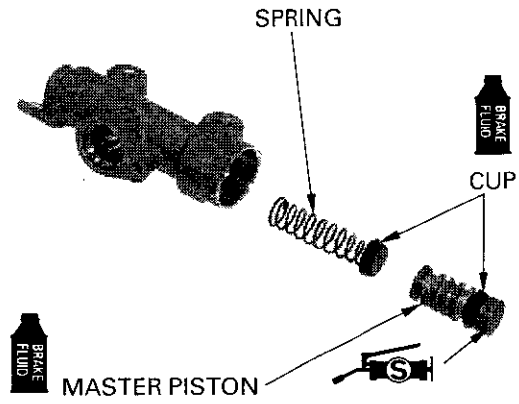
ASSEMBLY



Coat the master piston and piston cups with clean brake fluid.
Install the spring onto the primary cup.
Install the spring, primary cup and master piston into the master cylinder.

CAUTION:

Do not allow the piston cup lips to turn inside out.



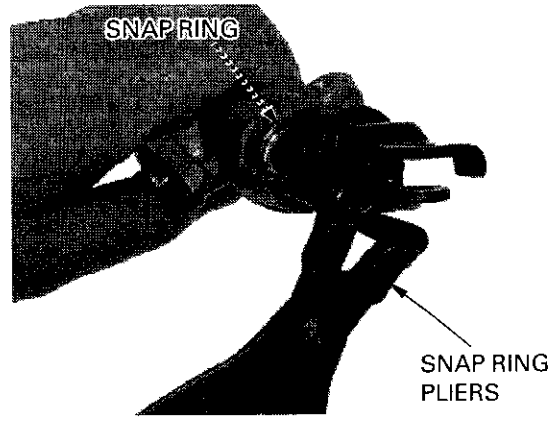
Apply silicone grease to the push rod contacting area of the master piston.

Install the push rod into the master cylinder.
Install the snap ring into the groove in the master cylinder, using the special tool.

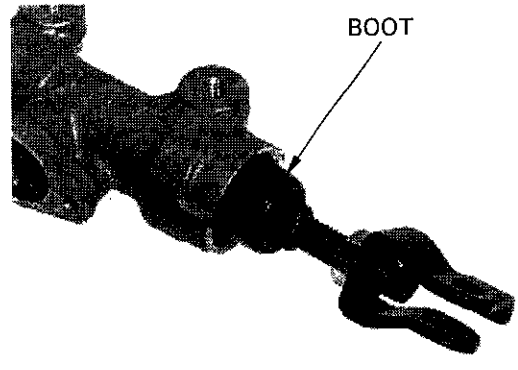
TOOL:
Snap ring pliers 07914-SA50001

CAUTION:

Be certain the snap ring is firmly seated in the groove.

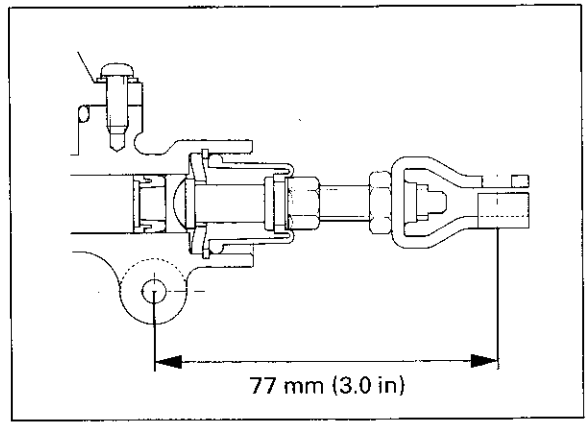


Install the boot into the master cylinder.

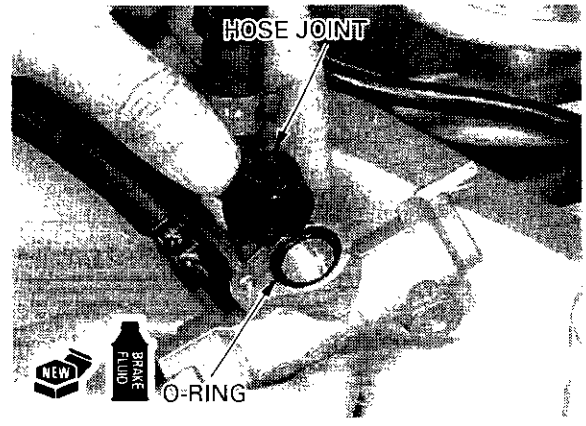


If the push rod joint is reinstalled, adjust the push rod length so that the distance between the centers of the master cylinder lower mounting bolt hole and joint pin hole is 77 mm (3.0 in). After adjustment, tighten the joint nut.

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

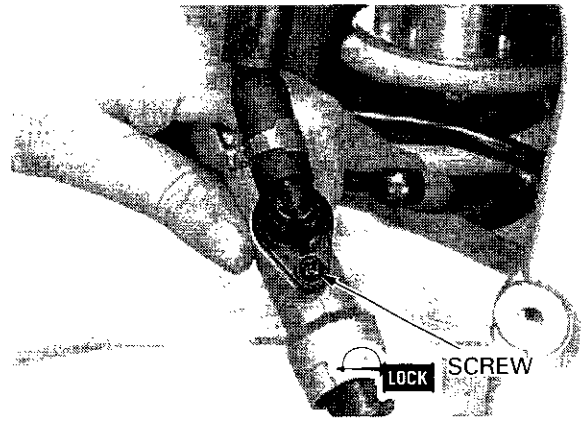


Coat a new O-ring with brake fluid and install it into the master cylinder.
Install the reservoir hose joint onto the master cylinder.

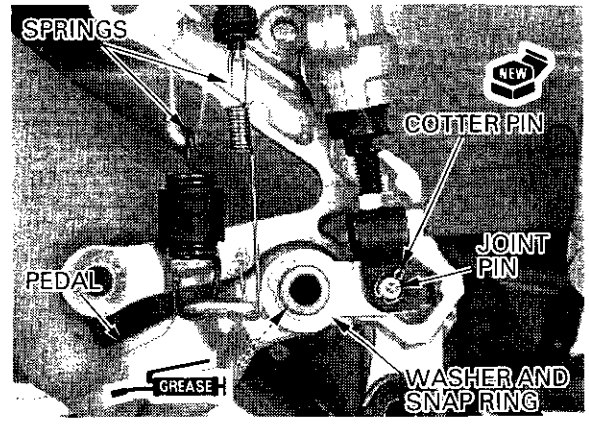


Apply locking agent to the hose joint screw threads.
Install and tighten the screw.

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



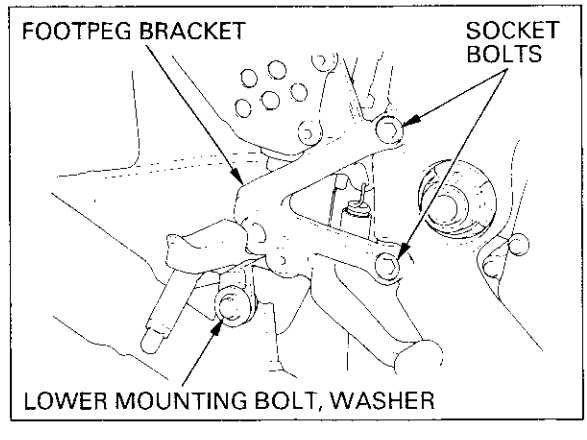
Connect the master cylinder push rod joint to the brake pedal with the joint pin and a new cotter pin.
Apply grease to the brake pedal pivot.
Hook the rear brake light switch spring and return spring to the brake pedal.
Install the brake pedal onto the pivot shaft and secure it with the washer and snap ring.
Install the master cylinder and step guard onto the footpeg bracket with the mounting bolts.



Install the right footpeg bracket onto the frame and muffler.
Tighten the two socket bolts.

TORQUE: 26 N·m (2.7 kgf·m , 20 lbf·ft)

Install the right muffler lower mounting bolt with the washer and nut, and tighten the nut securely.



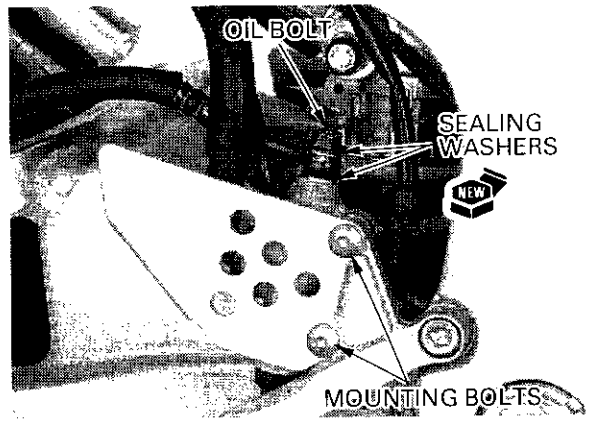
Tighten the master cylinder mounting bolts.

TORQUE: 10 N·m (1.0 kgf·m , 7 lbf·ft)

Connect the brake hose to the master cylinder with the oil bolt and new sealing washers.
Rest the hose joint against the stopper and tighten the oil bolt.

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

Fill and bleed the rear brake hydraulic system (page 15-3).



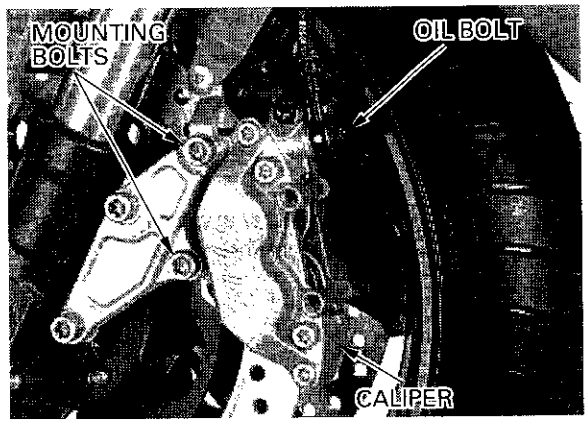
FRONT BRAKE CALIPER

CAUTION:

Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.

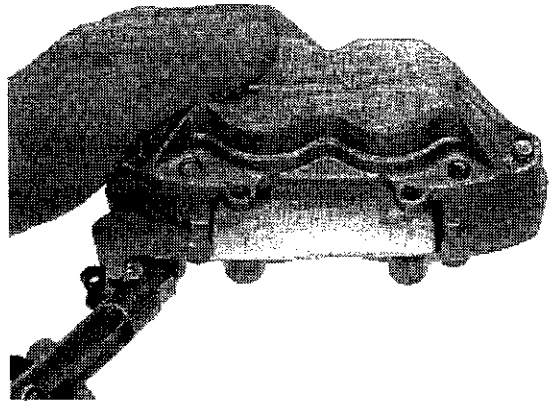
DISASSEMBLY

Drain the brake fluid from the front brake hydraulic system (page 15-3).
Remove the front brake pads (page 15-5).



Disconnect the brake hose from the front brake caliper by removing the oil bolt and sealing washers.
Remove the two mounting bolts and the brake caliper.

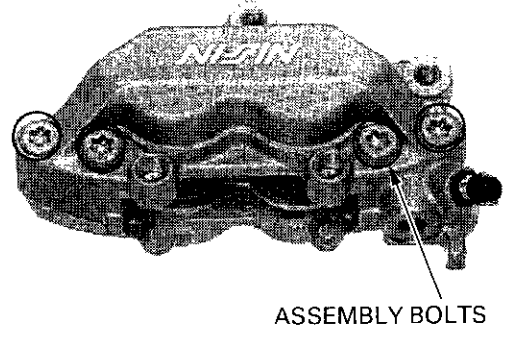
Install a corrugated cardboard or soft wood sheet between the pistons.
Apply small squirts of air pressure to the fluid inlet to remove the pistons.



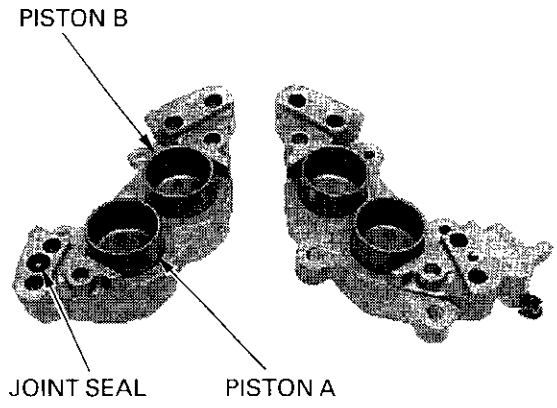
⚠WARNING

Do not use high pressure air or bring the nozzle too close to the inlet.

Remove the four caliper assembly bolts and separate the caliper body halves.



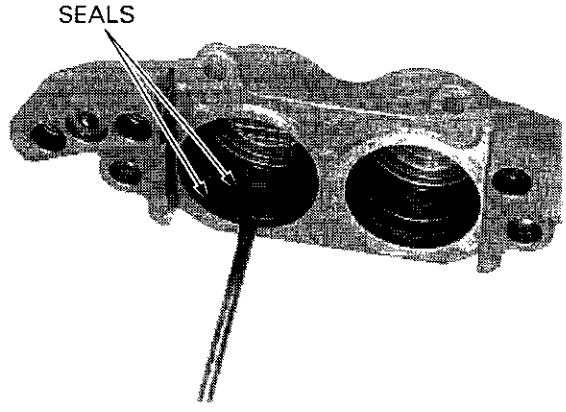
Remove the following:
—joint seal
—caliper pistons A
—caliper pistons B



Push the dust and piston seals in and lift them out.

CAUTION:

Be careful not to damage the piston sliding surface.



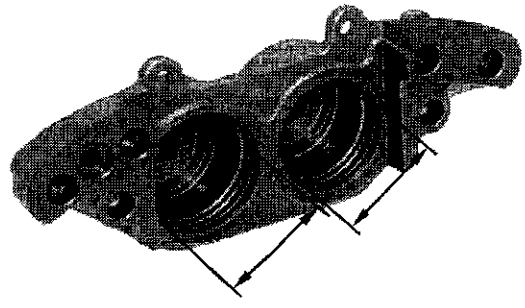
Clean the seal grooves, caliper cylinders and piston with clean brake fluid.

INSPECTION

Check the caliper cylinders and pistons for scoring, scratches or damage.

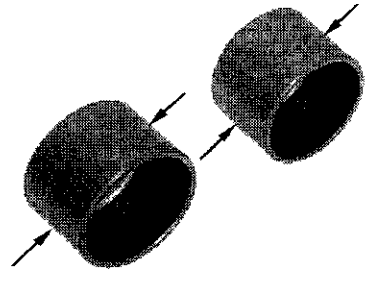
Measure the caliper cylinder I.D.

SERVICE LIMITS: Cylinder A: 34.02 mm (1.339 in)
Cylinder B: 32.090 mm (1.2634 in)

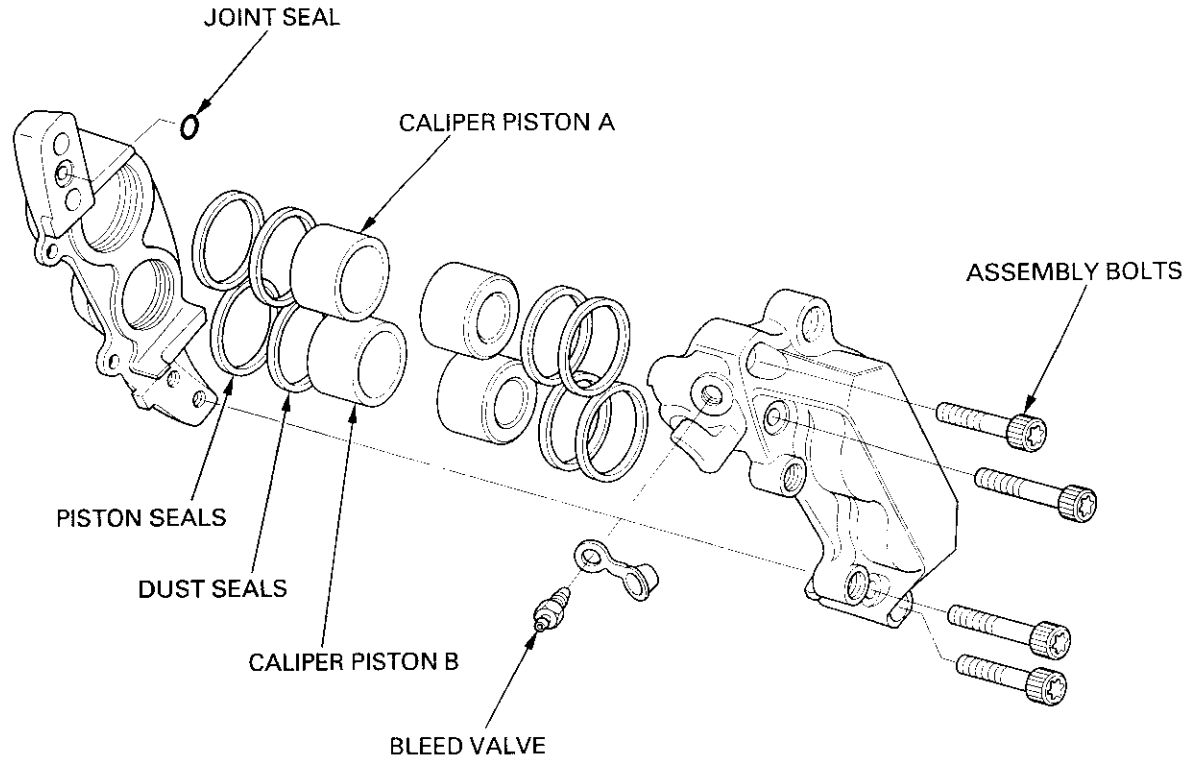


Measure the caliper piston O.D.

SERVICE LIMITS: Piston A: 33.87 mm (1.333 in)
Piston B: 31.94 mm (1.257 in)

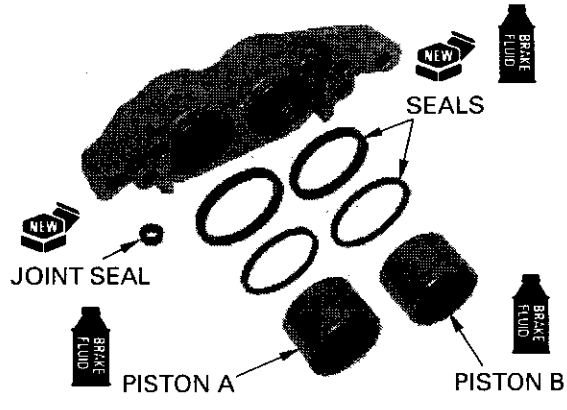


ASSEMBLY



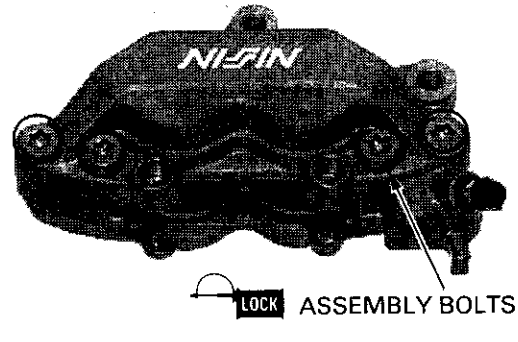
Coat new piston and dust seals with clean brake fluid and install them in the seal grooves in the caliper.
Coat the caliper pistons with clean brake fluid and install them into the caliper cylinders with the opening sides toward the pads.

Install a new joint seal into the fluid passage grooves in the caliper body.



Assemble the caliper body halves.
Apply locking agent to the caliper assembly bolt threads.
Install and tighten the assembly bolts.

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



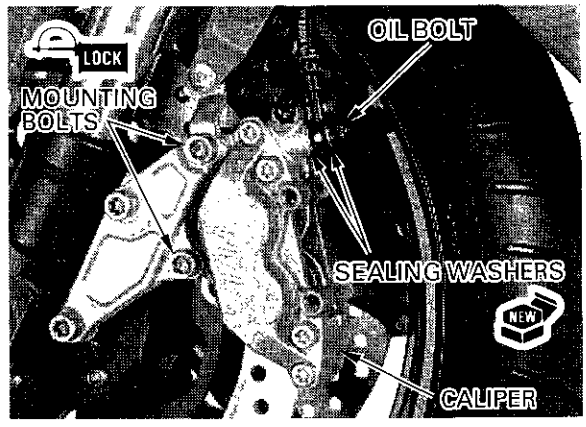
Appyl locking agent to the caliper mounting bolt threads.
Install the brake caliper onto the caliper bracket and tighten the mounting bolts.

TORQUE: 30 N·m (3.1 kgf·m , 22 lbf·ft)

Install the brake pads (page 15-5).

Connect the brake hose to the brake caliper with the oil bolt and new sealing washers.
Rest the hose joint against the stopper and tighten the oil bolt.

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



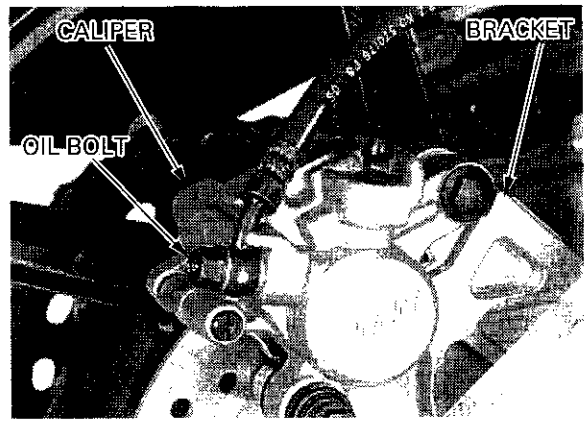
Fill and bleed the front brake hydraulic system (page 15-3).

REAR BRAKE CALIPER

CAUTION:

Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.

DISASSEMBLY



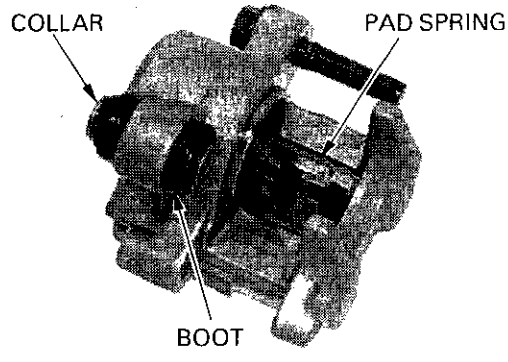
Drain the brake fluid from the rear brake hydraulic system (page 15-3).

Disconnect the brake hose from the rear brake caliper by removing the oil bolt and sealing washers.

Remove the rear brake pads (page 15-6).

Remove the rear brake caliper from the bracket.

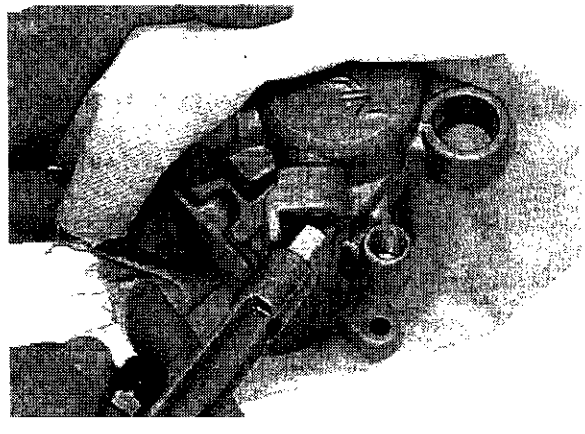
Remove the pad spring, collar and boot from the caliper body.



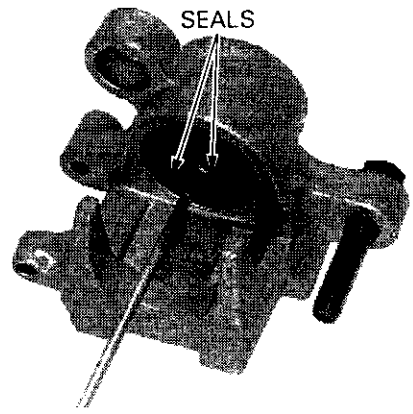
Place a shop towel over the piston.
Position the caliper body with the piston down and apply small squirts of air pressure to the fluid inlet to remove the piston.

⚠WARNING

Do not use high pressure air or bring the nozzle too close to the inlet.



Push the dust and piston seals in and lift them out.

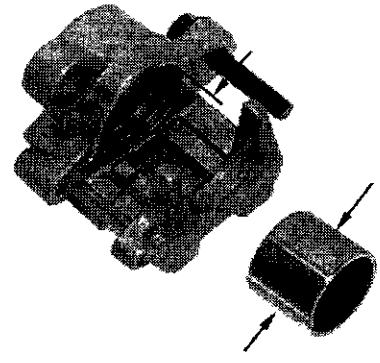


CAUTION:

Be careful not to damage the piston sliding surface.

Clean the seal grooves, caliper cylinder and piston with clean brake fluid.

INSPECTION



Check the caliper cylinder and piston for scoring, scratches or damage.

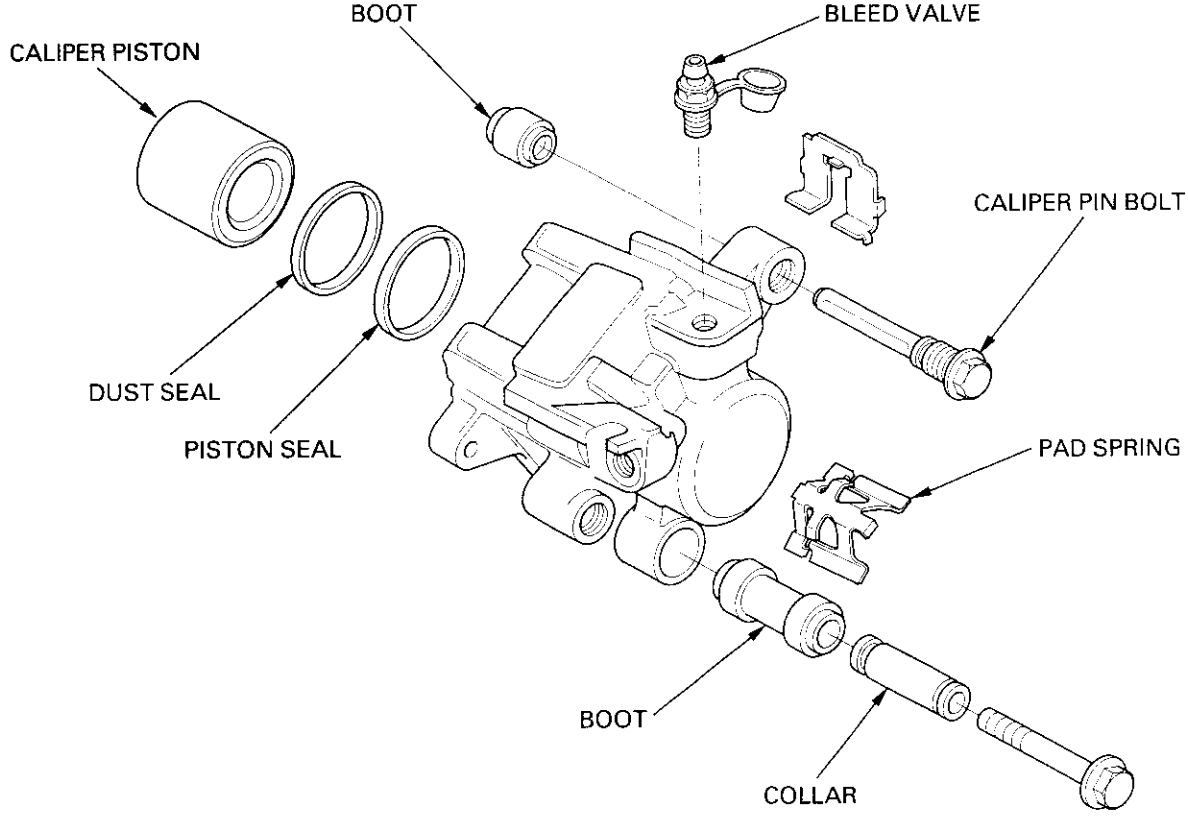
Measure the caliper cylinder I.D.

SERVICE LIMIT: 38.24 mm (1.506 in)

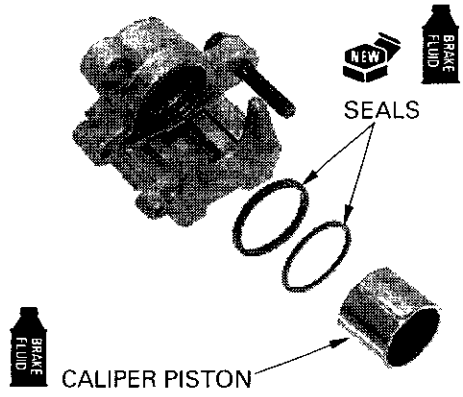
Measure the caliper piston O.D.

SERVICE LIMIT: 38.09 mm (1.500 in)

ASSEMBLY

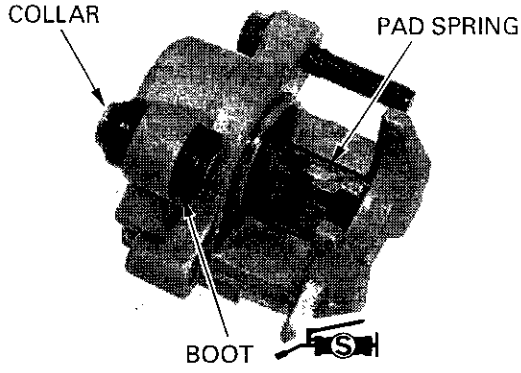


Coat new piston and dust seals with clean brake fluid and install them in the seal grooves in the caliper.
Coat the caliper piston with clean brake fluid and install it into the caliper cylinder with the opening side toward the pads.



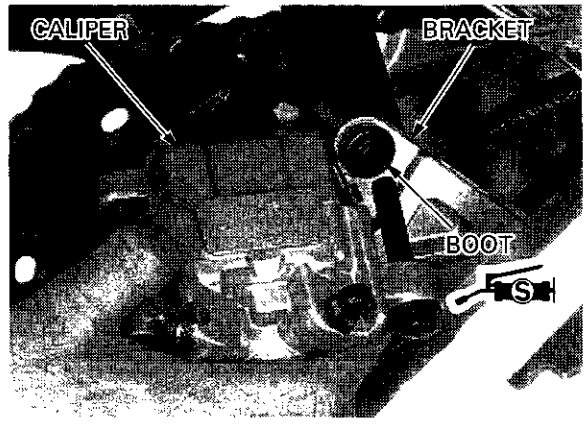
Install the pad spring onto the caliper body as shown.

Check the caliper boot and replace it if it is hard, deteriorated or damaged.
Apply silicone grease to the inside of the boot.
Install the boot and collar into the caliper.



Check the caliper pin boot and replace it if it is hard, deteriorated or damaged.
Apply silicone grease to the inside of the boot and install the caliper onto the bracket.

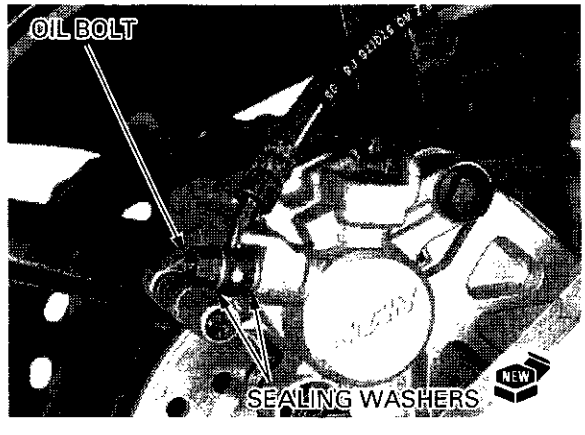
Install the rear brake pads (page 15-6).



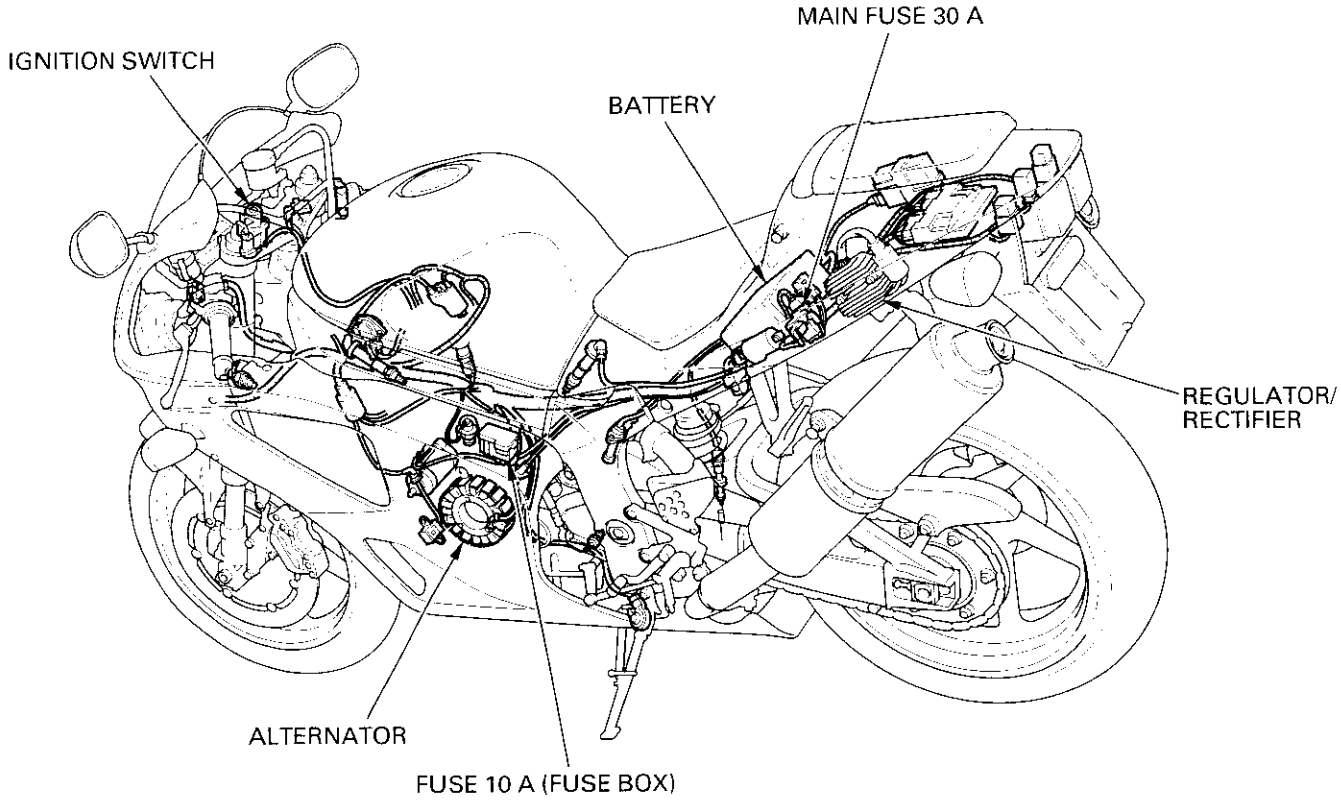
Connect the brake hose to the brake caliper with the oil bolt and new sealing washers.
Rest the hose joint in the stopper groove and tighten the oil bolt.

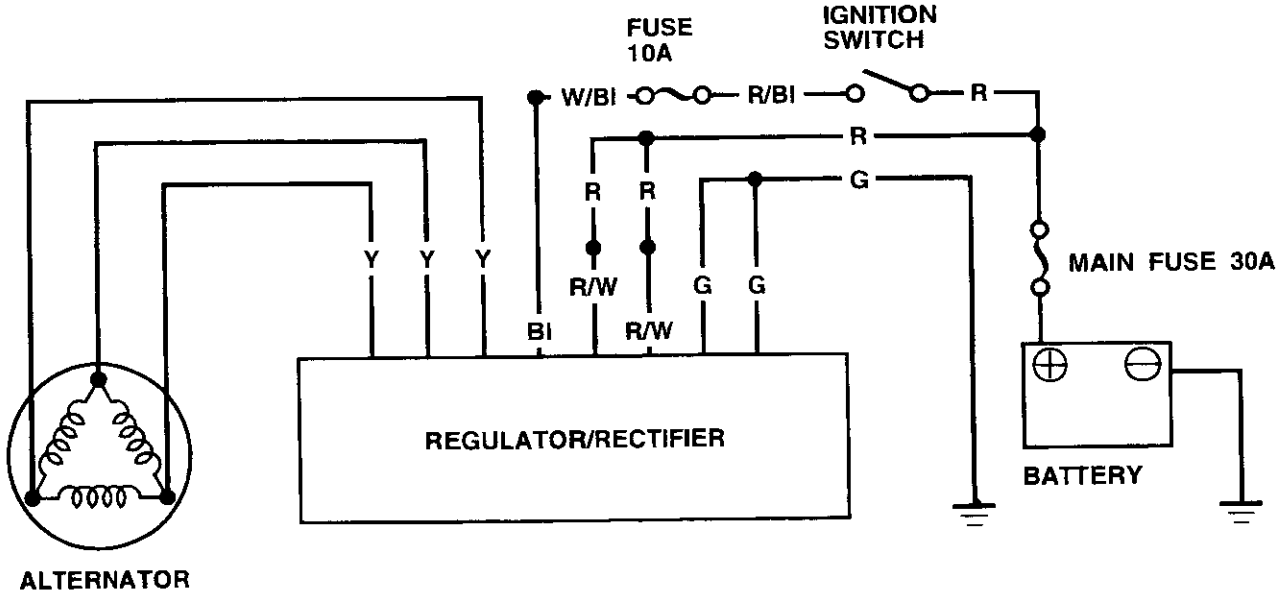
TORQUE: 34 N·m (3.5 kgf·m , 25 lbf·ft)

Fill and bleed the rear brake hydraulic system (page 15-3).



MEMO





Bl ..... Black

Y ..... Yellow

G ..... Green

R ..... Red

W ..... White

16. BATTERY/CHARGING SYSTEM

SERVICE INFORMATION	16-1	CHARGING SYSTEM INSPECTION	16-5
TROUBLESHOOTING	16-3	ALTERNATOR CHARGING COIL	16-6
BATTERY	16-4	REGULATOR/RECTIFIER	16-7

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 place.
- For a battery remaining in a stored motorcycle, disconnect the negative battery cable from the battery.

NOTE:

The maintenance free battery must be replaced when it reaches the end of its service life.

- The battery can be damaged if 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, the 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.
- When checking the charging system, always follow the steps in the troubleshooting flow chart (page 16-3).
- For alternator service, refer to section 10.

BATTERY TESTING

Refer to the instructions in the Operation Manual for the recommended battery tester for details about the battery testing. The recommended battery tester puts a "load" on the battery so that the actual battery condition of the load can be measured.

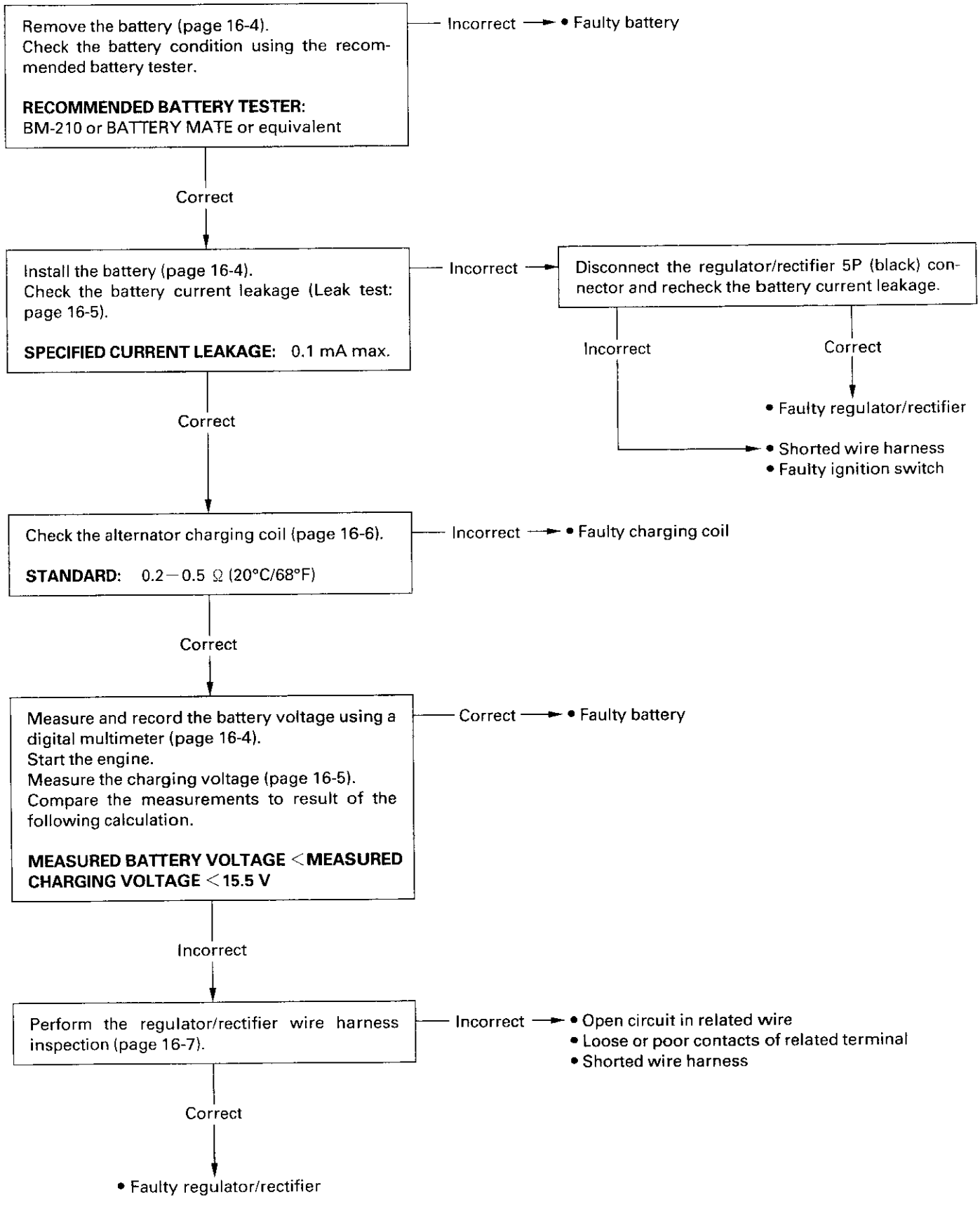
Recommended battery tester BM-210 or BATTERY MATE or equivalent

SPECIFICATIONS

ITEM			SPECIFICATIONS
Battery	Capacity		12 V−10 AH
	Current leakage		0.1 mA max.
	Voltage (20°C/68°F)	Fully charged	13.0 − 13.2 V
		Needs charging	Below 12.3 V
	Charging current	Normal	1.2 A × 5−10 h
		Quick	5.0 A × 1.0 h
Alternator	Capacity		0.329 kW/5,000 min^{-1} (rpm)
	Charging coil resistance (20°C/68°F)		0.2−0.5 Ω

TROUBLESHOOTING

Battery is damaged or weak

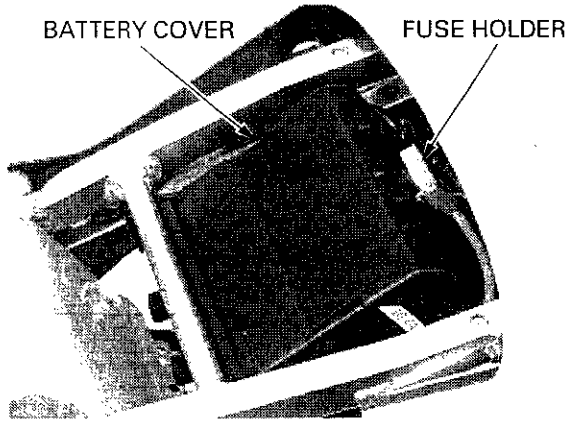


BATTERY

REMOVAL/INSTALLATION

Remove the driver seat (page 2-2).

Remove the PGM-FI fuse holder from the battery cover.
Open the battery cover by releasing the two lock tabs and remove it from battery case of the rear fender.

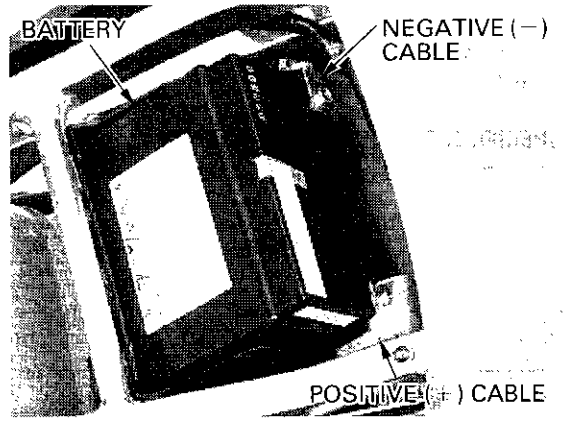


Raise the battery and with the ignition switch OFF, disconnect the negative (−) cable first, then disconnect the positive (+) cable.
Remove the battery from the battery case.

Install the battery in the reverse order of removal.

NOTE:

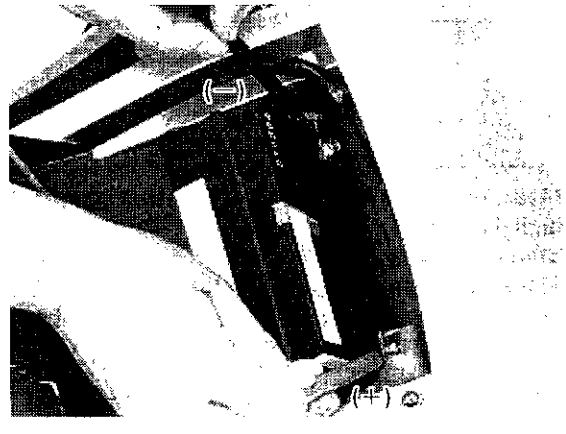
- Connect the positive (+) cable first, then connect the negative (−) cable.
- After connecting the battery cables, coat the terminals with grease.



VOLTAGE INSPECTION

Open the battery cover.
Measure the battery voltage using a commercially available digital multimeter.

VOLTAGE (20°C/68°F): Fully charged: 13.0−13.2 V
Under charged: Below 12.3 V



BATTERY CHARGING

⚠WARNING

- ***The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.***
- ***Turn the power ON/OFF at the charger, not at the battery terminals.***

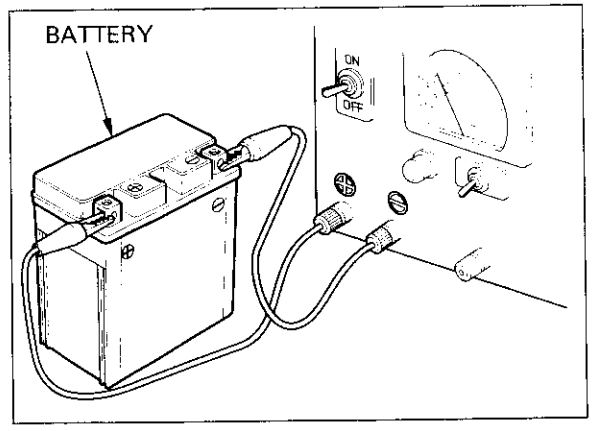
Remove the battery.

Connect the charger positive (+) cable to the battery positive (+) terminal.
Connect the charger negative (−) cable to the battery negative (−) terminal.

CHARGING CURRENT/TIME:
Standard: 1.2 A × 5−10 h
Quick: 5.0 A × 1.0 h

CAUTION:

- ***Quick charging should only be done 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.***

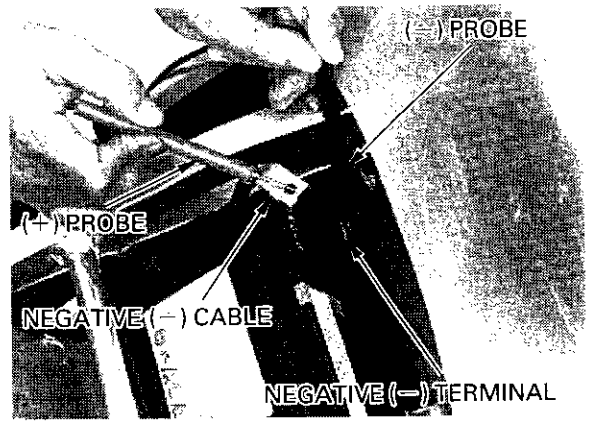


CHARGING SYSTEM INSPECTION

Remove the battery cover (page 16-4).

CURRENT LEAKAGE TEST

Turn the ignition switch OFF, and disconnect the negative (−) cable from the battery.
Connect the ammeter (+) probe to the negative (−) cable and the ammeter (−) probe to the battery (−) terminal.
With the ignition switch OFF, check for current leakage.



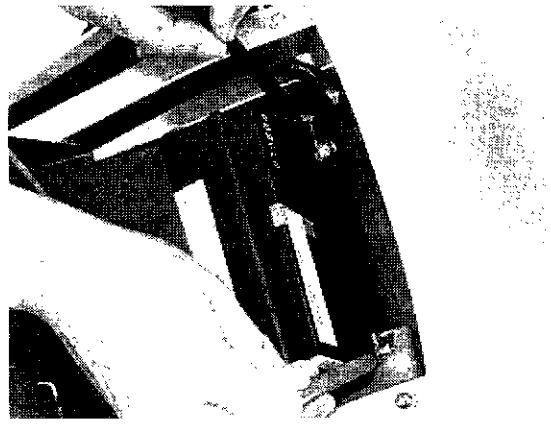
NOTE:

- 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: 0.1 mA max.

If current leakage exceeds the specified value, a shorted circuit is likely.
Locate the short by disconnecting connections one by one and measuring the current.

CHARGING VOLTAGE INSPECTION



⚠WARNING

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

Be sure that the battery is in good condition before performing this test.

Start the engine and warm it up to the operating temperature; stop the engine.
Connect the multimeter between the positive and negative terminals of the battery.

CAUTION:

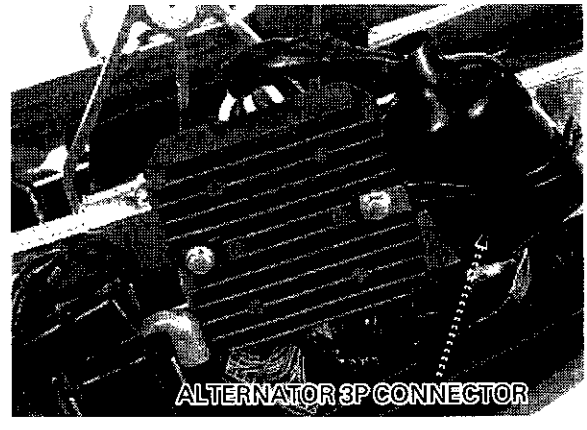
- ***To prevent short, make absolutely certain which are the positive and negative terminals or cable.***
- ***Do not disconnect the battery or any cable in the charging system without first switching off the ignition switch. Failure to follow this precaution can damage the tester or electrical components.***

With the headlight on high beam, restart the engine. Measure the voltage on the multitester when the engine runs at 5,000 min^{-1} (rpm).

STANDARD:
Measured battery voltage (page 16-4) <Measured charging voltage (see above) <15.5 V

ALTERNATOR CHARGING COIL

INSPECTION



Remove the seat cowl (page 2-2).

Disconnect the alternator 3P (white) connector.

Measure the resistance between the wire terminals of the alternator side connector.

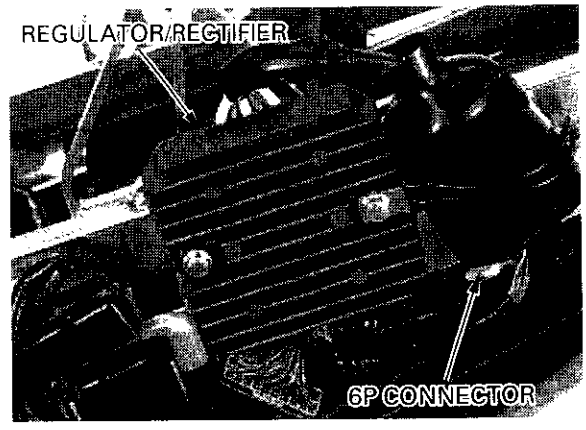
STANDARD: 0.2—0.5 Ω (20°C/68°F)

Check for continuity between each wire terminal of the alternator side connector and ground.
There should not be continuity.

Replace the alternator stator if resistance is out of specification, or if any wire has continuity to ground.

Refer to section 10 for alternator stator replacement.

REGULATOR/RECTIFIER



WIRE HARNESS INSPECTION

Remove the seat cowl (page 2-2).

Disconnect the regulator/rectifier 6P (black) connector.
Check the connector for loose contacts or corroded terminals.
Check the following at the wire harness side connector.

BATTERY LINE

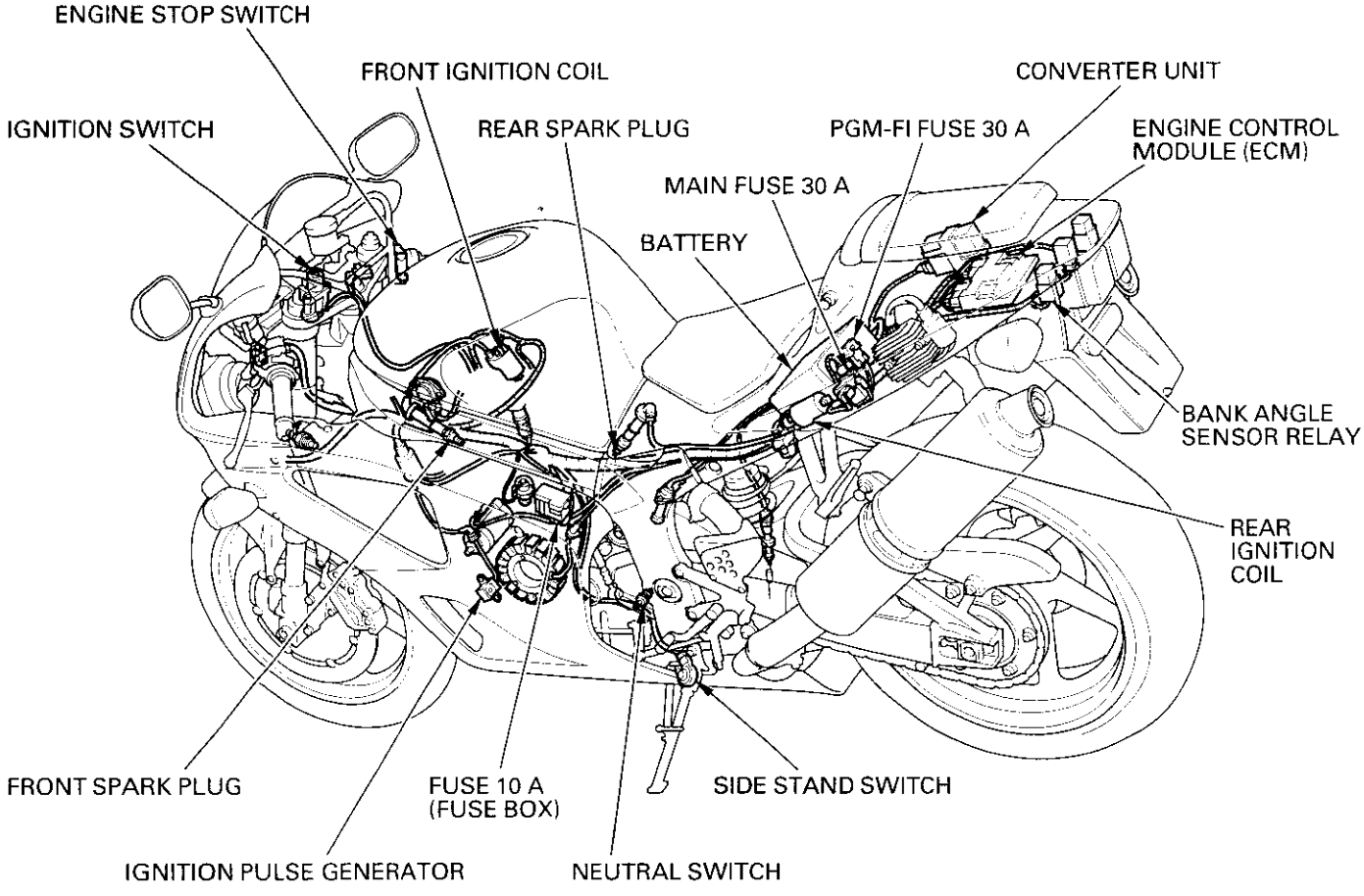
Measure the voltage between the red wire terminal and ground.
There should be battery voltage at all times.

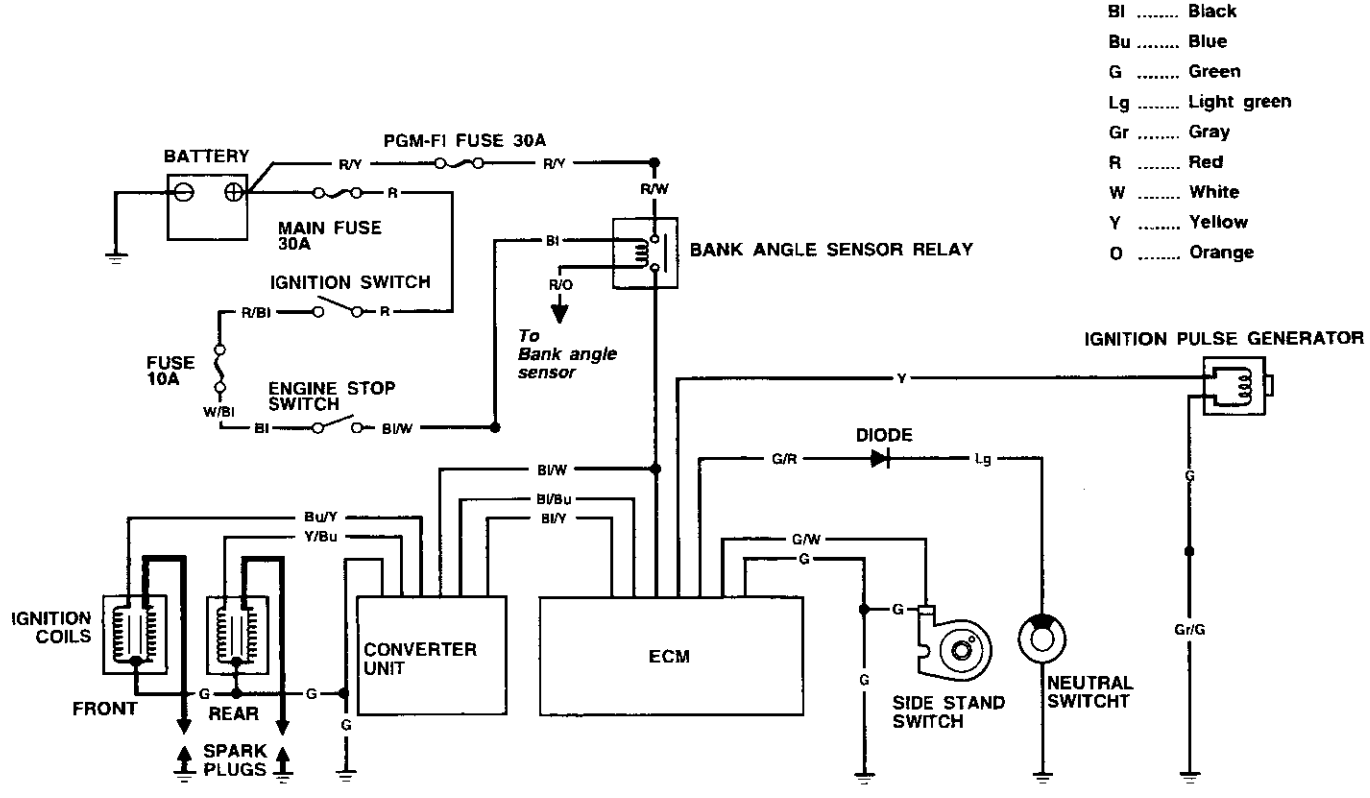
GROUND LINE

Check the continuity between the green wire terminal and ground.
There should be continuity at all times.

BATTERY VOLTAGE LINE

Measure the voltage between the white/black wire terminal and ground.
There should be battery voltage with the ignition switch ON.


ENGINE STOP SWITCH
FRONT IGNITION COIL
CONVERTER UNIT
IGNITION SWITCH
REAR SPARK PLUG
PGM-FI FUSE 30 A
ENGINE CONTROL MODULE (ECM)
MAIN FUSE 30 A
BATTERY
BANK ANGLE SENSOR RELAY
REAR IGNITION COIL
FRONT SPARK PLUG
FUSE 10 A (FUSE BOX)
SIDE STAND SWITCH
IGNITION PULSE GENERATOR
NEUTRAL SWITCH


Bl ..... Black
Bu ..... Blue
G ..... Green
Lg ..... Light green
Gr ..... Gray
R ..... Red
W ..... White
Y ..... Yellow
O ..... Orange
BATTERY
PGM-FI FUSE 30A
R/Y
R/Y
R
R/W
MAIN FUSE 30A
Bl
BANK ANGLE SENSOR RELAY
IGNITION SWITCH
R/O
R/Bl
R
To Bank angle sensor
FUSE 10A
W/Bl
ENGINE STOP SWITCH
Bl
Bl/W
IGNITION PULSE GENERATOR
Y
DIODE
G/R
Lg
Bl/W
Bl/Bu
Bl/Y
Bu/Y
Y/Bu
G/W
G
G
IGNITION COILS
CONVERTER UNIT
ECM
G
G
Gr/G
FRONT
REAR
G
G
G
SIDE STAND SWITCH
NEUTRAL SWITCHT
SPARK PLUGS

17. IGNITION SYSTEM

SERVICE INFORMATION	17-1	IGNITION COIL	17-7
TROUBLESHOOTING	17-3	IGNITION PULSE GENERATOR	17-7
IGNITION SYSTEM INSPECTION	17-4	IGNITION TIMING	17-7

SERVICE INFORMATION

GENERAL

⚠WARNING

If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and 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.
- This motorcycle's Ignition Control Module (ICM) is built in the Engine Control Module (ECM).
- The transistorized ignition system uses an electrically controlled ignition timing system. No adjustments can be made to the ignition timing.
- The ECM varies ignition timing according to the engine speed.
- The ECM may be damaged if dropped. Also, if the connector is disconnected when current is flowing, the excessive voltage may damage the ECM. 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 plugs.
- This motorcycle's spark plug is equipped with iridium type electrode. Do not use spark plugs other than specified.
- For spark plug inspection, see section 3.
- See section 19 for following components:

– Ignition switch
– Engine stop switch
– Neutral switch
– Side stand switch
– Clutch switch
– Diode

17

SPECIFICATIONS

ITEM		SPECIFICATIONS
Spark plug	Standard	FR9BI-11 (NGK), IK27C11 (DENSO)
	For cold climate (below 5°C/41°F)	FR8BI-11 (NGK), IK24C11 (DENSO)
Spark plug gap		1.00 – 1.10 mm (0.039 – 0.043 in)
Ignition coil primary peak voltage		100 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Ignition timing ("F" mark)		15° BTDC at idle

TORQUE VALVES

Ignition pulse generator bolt	12 N·m (1.2 kgf·m , 9 lbf·ft)

TOOL

Peak voltage adaptor	07HGJ-0020100 with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)
Inspection adaptor	07VMJ-0020100

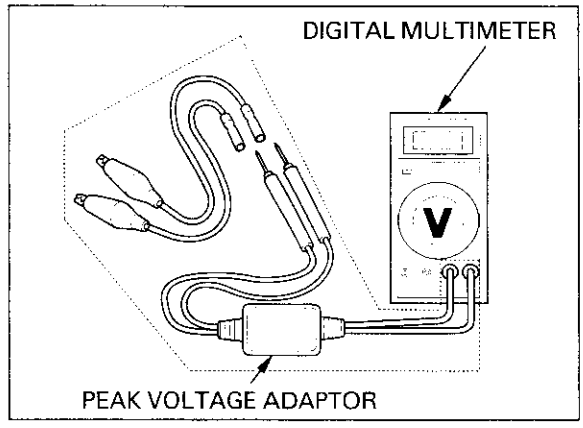
TROUBLESHOOTING

- Inspect the following before diagnosing the system.
  - Faulty spark plug
  - Loose spark plug cap or spark plug wire connections
  - Water got into the spark plug cap (Leaking the ignition coil secondary voltage)
- If there is no spark at one 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.

No spark at spark plugs

UNUSUAL CONDITION		PROBABLE CAUSE (Check in numerical order)
Ignition coil primary voltage	Low peak voltage	1. Incorrect peak voltage adaptor connections. (System is normal if measured voltage is over the specifications with reverse connections.) 2. The multimeter impedance is too low; below 10 MΩ/DCV. 3. Cranking speed is too low. (Battery is undercharged) 4. The sampling timing of the tester and measured pulse were not synchronized. (System is normal if measured voltage is over the standard voltage at least once.) 5. Poorly connected connectors or an open circuit in ignition system. 6. Faulty side stand switch or neutral switch. 7. 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 green/red wires 8. Faulty ignition coil. 9. Faulty engine control module (ECM) and/or converter unit (in case when above No. 1 thru. 8 are normal).
	No peak voltage	1. Incorrect peak voltage adaptor connections. (System is normal if measured voltage is over the specifications with reverse connections.) 2. Battery is under charged. (Voltage drops largely when the engine is started.) 3. Faulty ignition switch or engine stop switch. 4. Loose or poorly connected ECM or converter unit connectors. 5. No voltage at the black/white (power source) wire of the ECM or converter unit. 6. Open circuit or poor connection in green (ground) wire of the ECM or converter unit. 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 green/red wires 9. Faulty peak voltage adaptor. 10. Faulty ignition pulse generator. (Measure peak voltage.) 11. Faulty ECM and/or converter unit (in case when above No. 1 thru. 10 are normal).
	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	Low peak voltage	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too slow. (Battery is undercharged.) 3. The sampling timing of the tester and measured pulse were not synchronized. (System is normal if measured voltage is over the standard voltage at least once.) 4. Faulty ignition pulse generator (in case when above No. 1 thru. 3 are normal).
	No peak voltage	1. Faulty peak voltage adaptor. 2. Faulty ignition pulse generator.

IGNITION SYSTEM INSPECTION



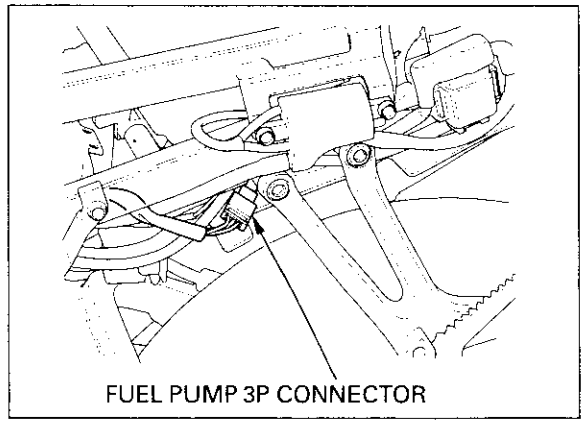
NOTE:

- If no spark jumps at the plugs, check all connections for loose or poor contact before measuring each peak voltage.
- Use a commercially available digital multimeter (impedance 10 MΩ/DCV minimum).
- The display value differs depending upon the internal impedance of the multimeter.
- If the Imrie diagnostic tester (model 625) is used, follow the manufacturer's instructions.

Connect the peak voltage adaptor to the digital multimeter.

TOOLS:
Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100
with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

Remove the seat cowl (page 2-2).
Disconnect the fuel pump 3P (black) connector.

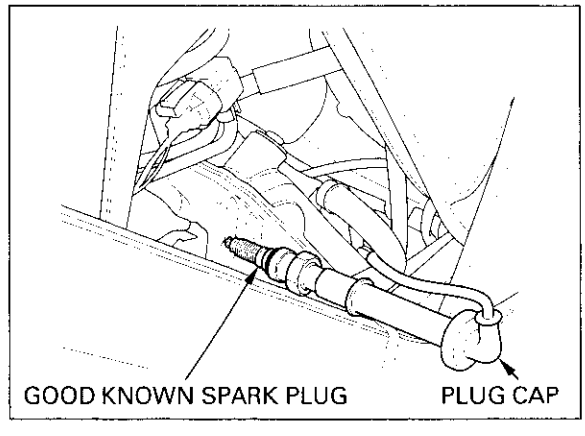


IGNITION PRIMARY PEAK VOLTAGE

NOTE:

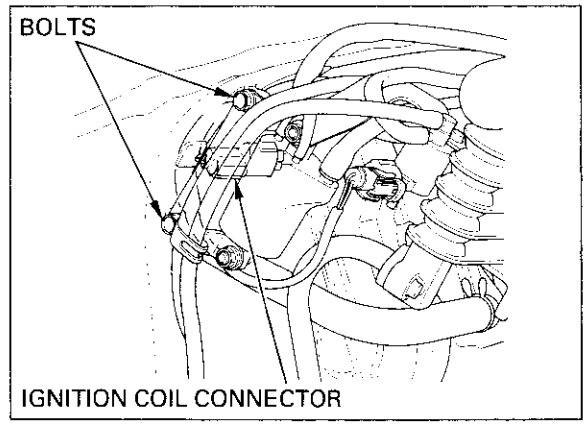
- Check all system connections before this inspection. Poor connected connectors can cause incorrect readings.
- Check the cylinder compression at each cylinder and check that the spark plug is installed correctly in each cylinder.

Disconnect the spark plug caps from the spark plugs (page 3-6).
Connect good known spark plugs to the spark plug caps and ground the spark plugs to the cylinder heads as done in a spark test.



Front:
Remove the right radiator (page 6-6).

Remove the ignition coil bracket bolts.
Disconnect the ignition coil 2P (white) connector.



Rear:
Remove the seat cowl (page 2-2).
Disconnect the ignition coil 2P (white) connector.
Connect the inspection adaptor to the ignition coil connectors.

TOOL:
Inspection adaptor 07VMJ-0020100

Connect the peak voltage adaptor or Imrie diagnostic tester probes to the inspection adaptor.

TOOLS:
Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100
with commercially available digital multimeter (impedance 10 MΩ /DCV minimum)

CONNECTIONS: Red clip (−) – Green clip (+)

Turn the ignition switch ON and engine stop switch to RUN.

Shift the transmission into neutral.
Crank the engine with the starter motor and measure the ignition coil primary peak voltage.

PEAK VOLTAGE: 100 V minimum

⚠WARNING

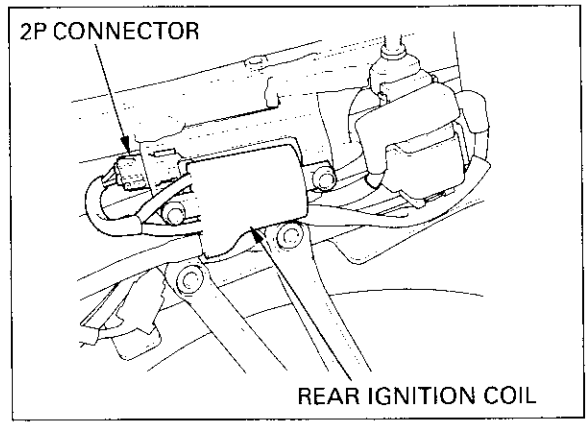
Avoid touching the spark plugs and tester probes to prevent electric shock.

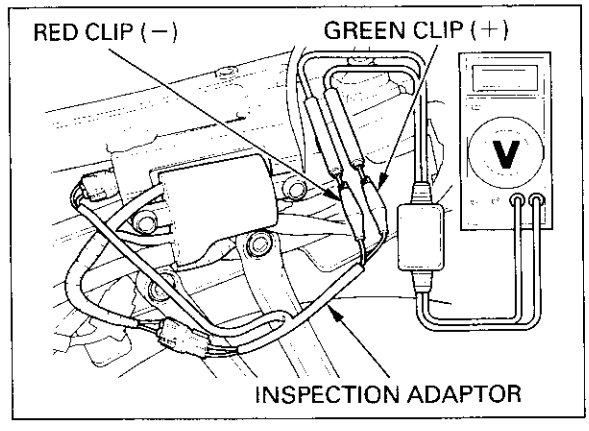
NOTE:

Although measured values are different for each ignition coil, they are normal as long as voltage is higher than the specified value.

If the peak voltage is lower than specified value, follow the checks described in the troubleshooting chart (page 17-3).

Install the removed parts in the reverse order of removal.





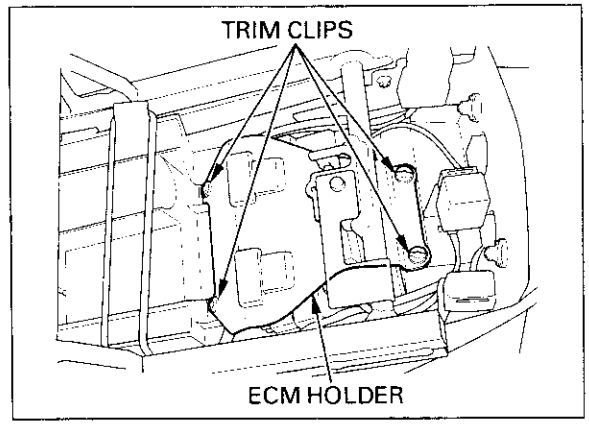
IGNITION PULSE GENERATOR PEAK VOLTAGE

NOTE:

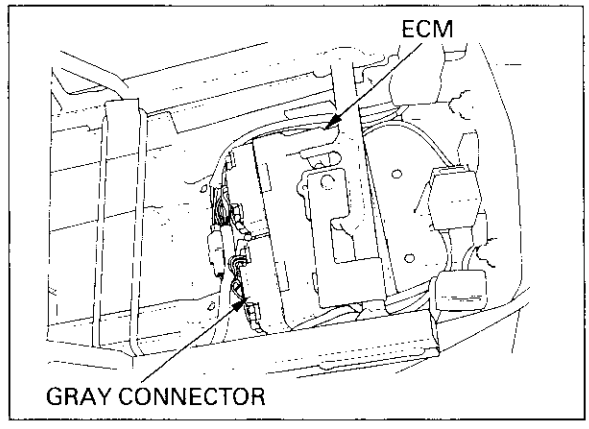
Check cylinder compression at each cylinder and check that the spark plug is installed correctly in each cylinder.

Remove the passenger seat (page 2-2).

Remove the four trim clips and engine control module (ECM) holder.



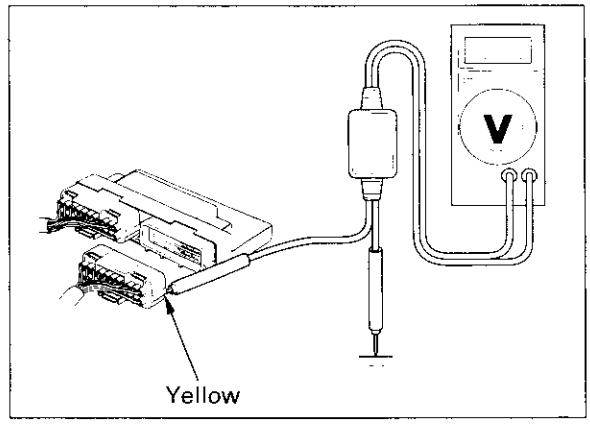
Disconnect the gray connector from the ECM.



Connect the peak voltage adaptor or Imrie diagnostic tester probes to the wire harness side connector terminal and body 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 terminal – body ground

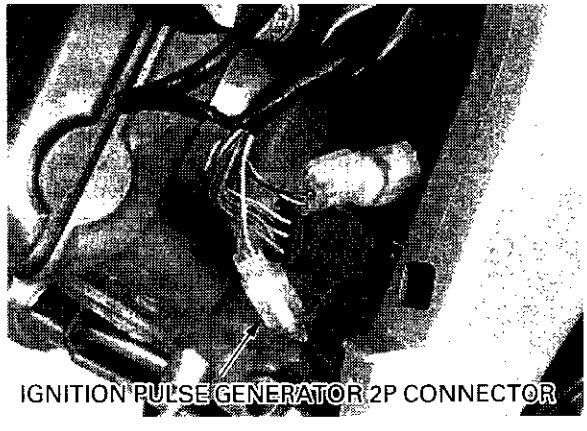


Turn the ignition switch ON and engine stop switch to RUN.
Shift the transmission into neutral.
Crank the engine with the starter motor and measure the ignition pulse generator peak voltage.

PEAK VOLTAGE: 0.7 V minimum

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

Remove the lower inner fairing and left lower fairing (page 2-3).



Disconnect the ignition pulse generator 2P (red) connector and connect the peak voltage adaptor or Imrie diagnostic tester probes to the connector terminals of the ignition pulse generator side.
In the same manner as at the ECM connector, measure the peak voltage and compare it to the voltage measured at the ECM connector.

- If the peak voltage measured at the ECM is abnormal and the one measured at the ignition pulse generator is normal, the wire harness has an open or short circuit, or loose connection.
- If the peak voltage is lower than standard value, follow the checks described in the troubleshooting chart (page 17-3).

Install the removed parts in the reverse order of removal.

IGNITION COIL

REPLACEMENT

Front: Remove the right radiator (page 6-6).
Rear: Remove the seat cowl (page 2-2).

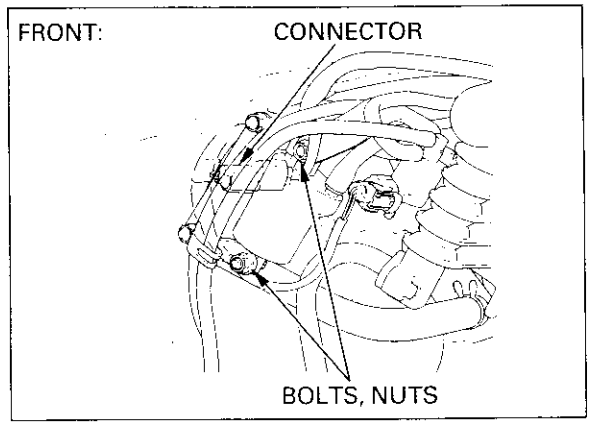
Disconnect the spark plug cap from the plug (page 3-6).

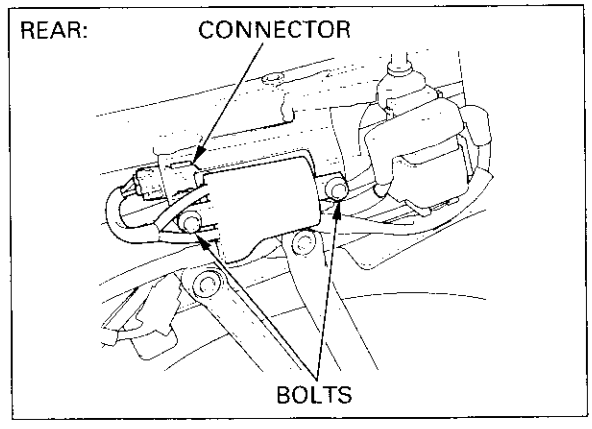
Front: Remove the two bolts, nuts and ignition coil.
Rear: Remove the two bolts and ignition coil.
Disconnect the ignition coil connector.

Install new ignition coil and removed parts in the reverse order of removal.

NOTE:

Route the spark plug wire properly (page 1-20).





IGNITION PULSE GENERATOR

REPLACEMENT

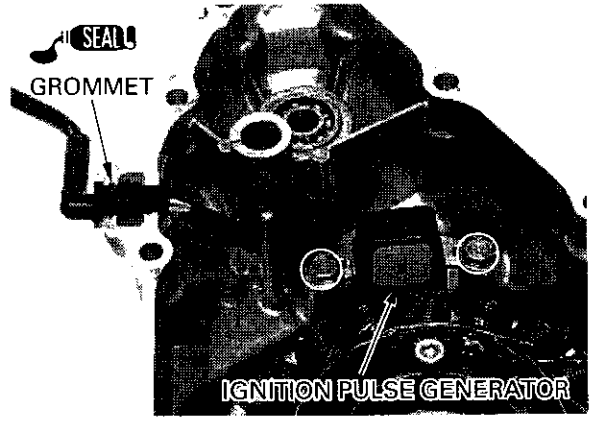
Remove the left crankcase cover (page 10-2).

Remove the two bolts and ignition pulse generator.

Apply sealant to the grommet seating surfaces.
Install a new ignition pulse generator and the grommet into the cover groove properly.
Tighten the bolts.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

Install the left crankcase cover (page 10-3).

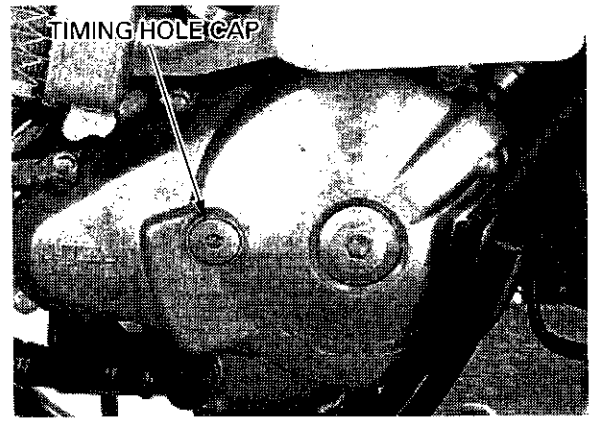


IGNITION TIMING

NOTE:

Read the instructions for timing light operation.

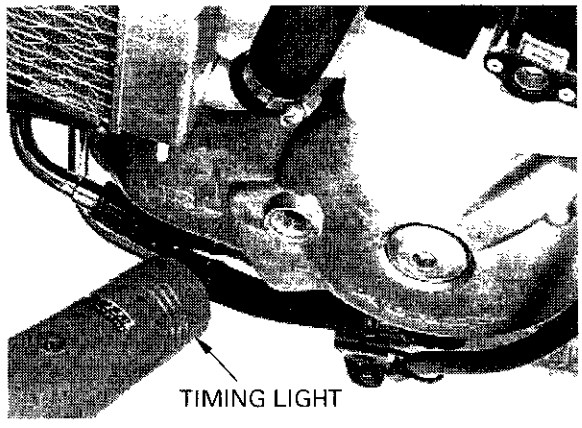
Start the engine and warm it up to operating temperature.
Stop the engine and remove the left lower fairing (page 2-3) and timing hole cap.



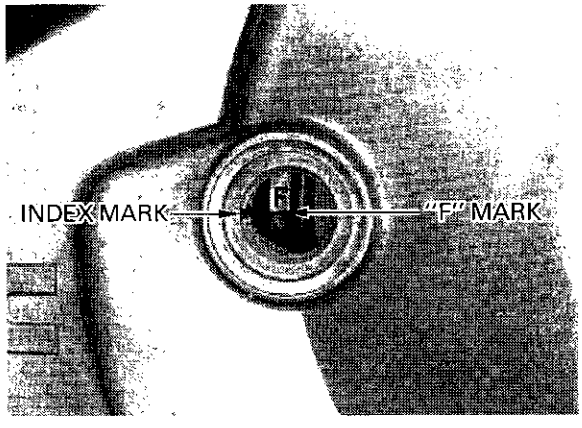
Front: Remove the lower inner fairing (page 2-3).
Rear: Raise the front of the fuel tank and support it (page 3-4).

Connect the timing light to the spark plug wire.

Start the engine, let it idle and check the ignition timing.



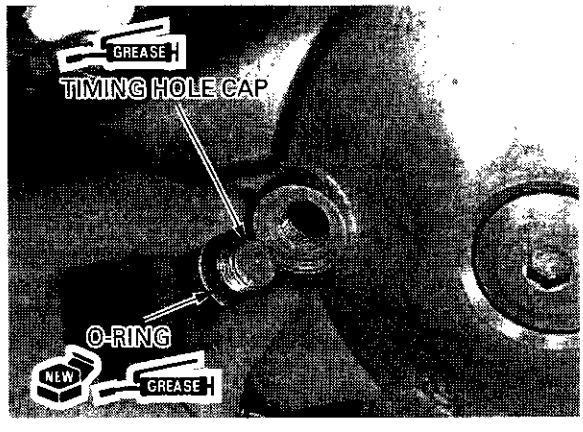
The ignition timing is correct if the "F" mark on the flywheel aligns with the index mark on the left crankcase cover at idle.



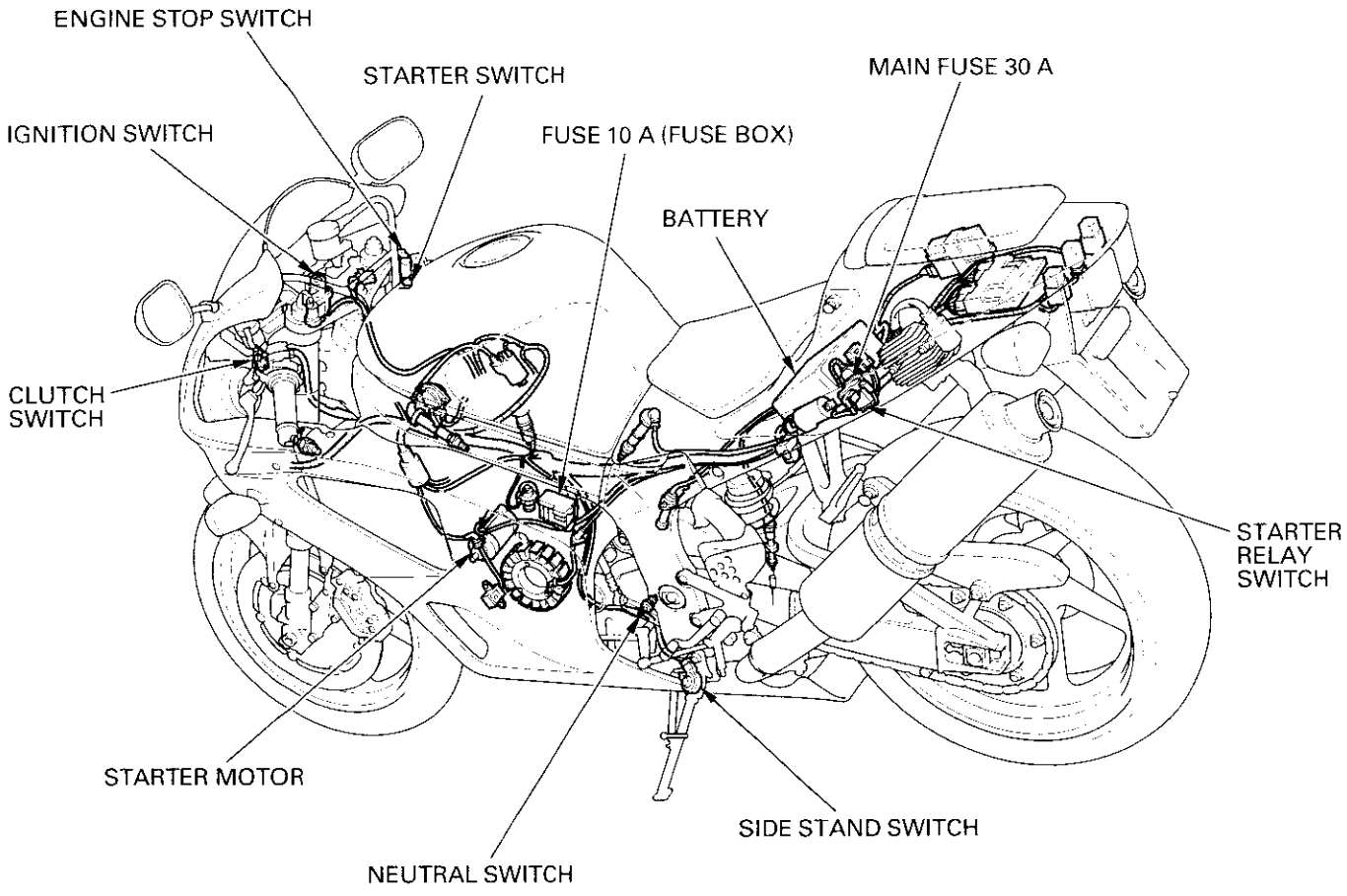
Coat a new O-ring with grease and install it onto the timing hole cap.
Apply grease to the timing hole cap threads.
Install and tighten the timing hole cap.

TORQUE: 10 N·m (1.0 kgf·m , 7 lbf·ft)

Install the removed parts in the reverse order of removal.



MEMO



Bl ..... Black

Y ..... Yellow

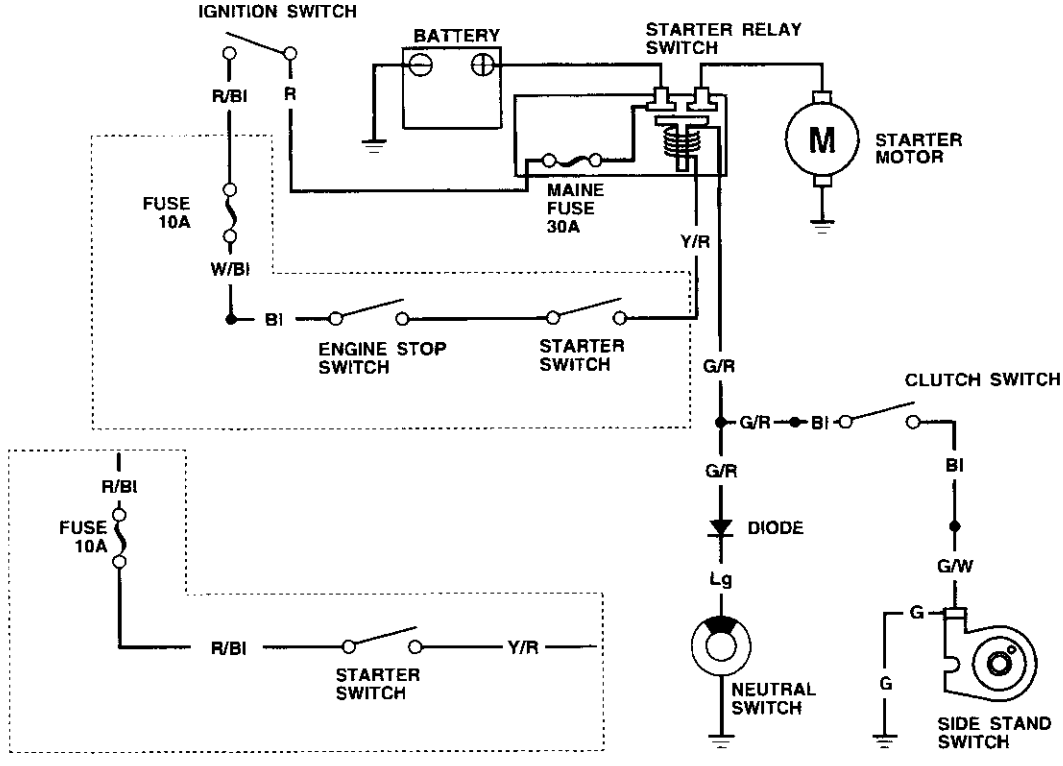
Br ..... Brown

G ..... Green

R ..... Red

W ..... White

Lg ..... Light green



18. ELECTRIC STARTER

SERVICE INFORMATION	18-1	STARTER RELAY SWITCH	18-10
TROUBLESHOOTING	18-2	DIODE	18-11
STARTER MOTOR	18-4		

SERVICE INFORMATION

GENERAL

⚠WARNING

Always turn the ignition switch OFF before servicing the starter motor. The motor could suddenly start, causing serious injury.

- The starter motor can be serviced with the engine in the frame.
- When checking the starter system, always follow the steps in the troubleshooting flow chart (page 18-2).
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- If the current is kept flowing through the starter motor to turn it while the engine is not cranking over, the starter motor may be damaged.
- See section 10 for starter clutch servicing.
- See section 19 for following components:
  - Ignition switch
  - Engine stop switch
  - Starter switch
  - Neutral switch
  - Side stand switch
  - Clutch switch

SPECIFICATION

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	12.0 – 13.0 (0.47 – 0.51)	6.5 (0.26)

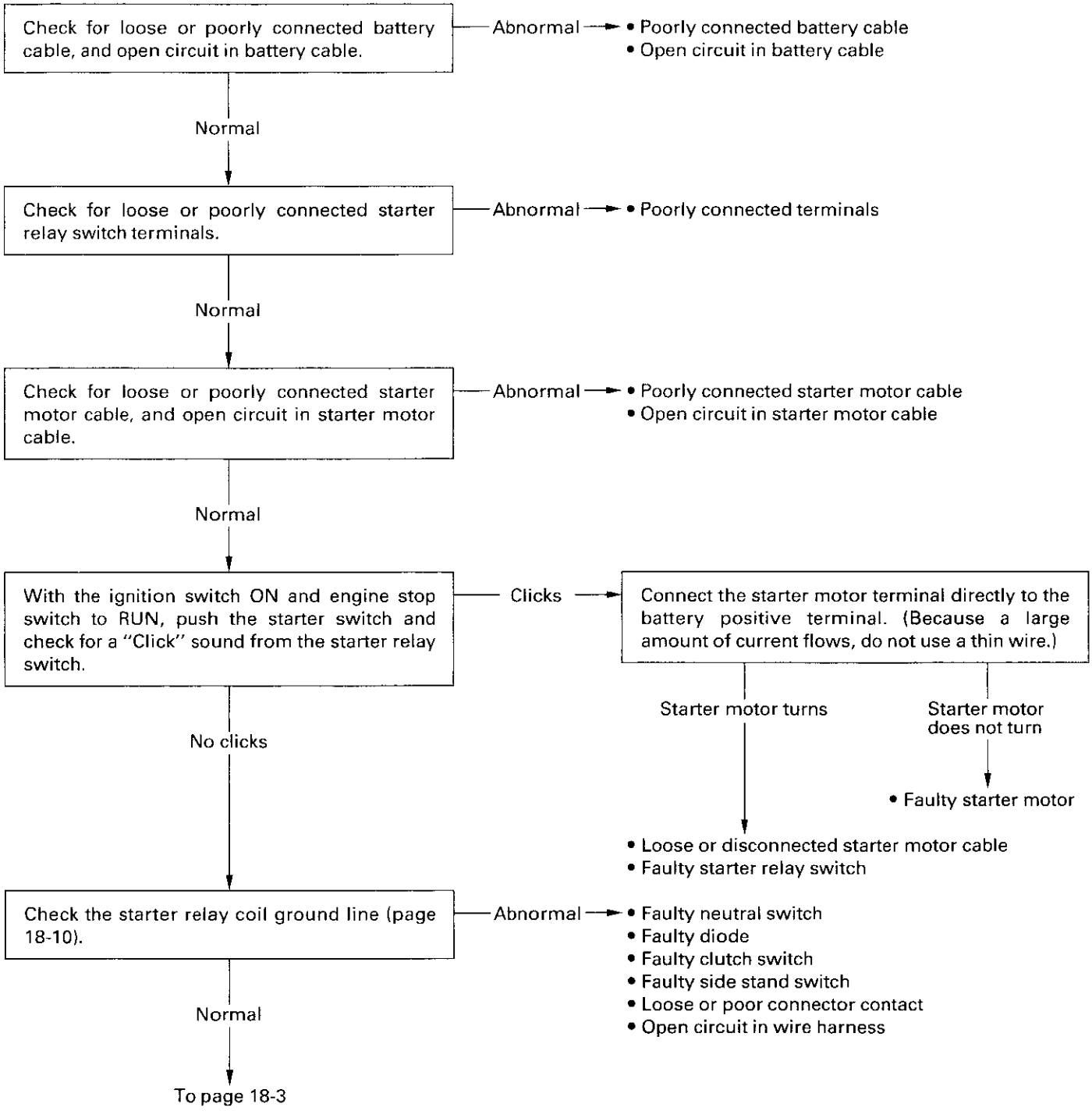
TORQUE VALUE

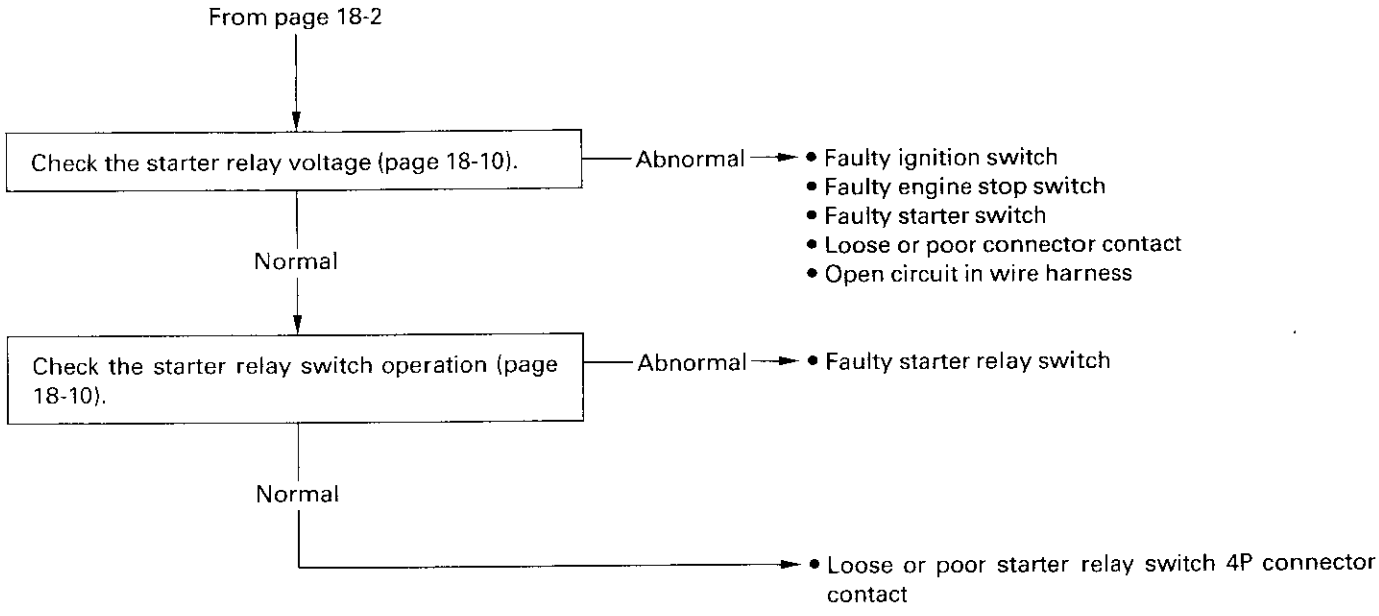
Starter motor terminal nut	10 N·m (1.0 kgf·m , 7 lbf·ft)

TROUBLESHOOTING

Starter motor will not turn

- Check for a blown main fuse (30 A) or sub-fuse (10A) (Starter/ignition)
- Check that the battery is fully charged and in good condition.





Starter motor turns slowly
- Weak battery
- Poorly connected battery cable
- Poorly connected starter motor cable
- Faulty starter motor

Starter motor turns, but engine does not turn
- Faulty starter clutch (section 10)

Starter relay switch "clicks", but engine does not turn over
- Crankshaft does not turn due to engine problem
- Faulty starter clutch (section 10)
- Faulty starter torque limiter or idle gear (section 10)

STARTER MOTOR

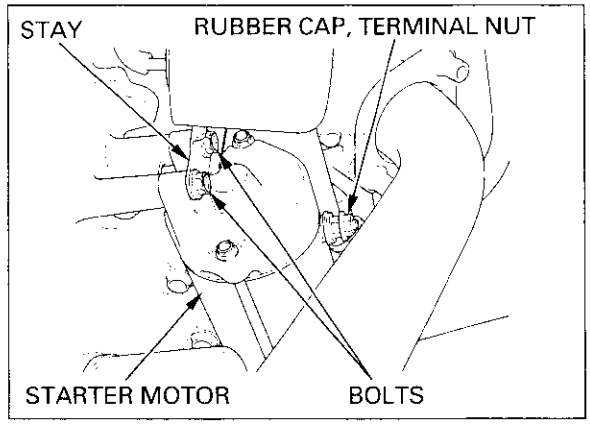
REMOVAL

⚠WARNING

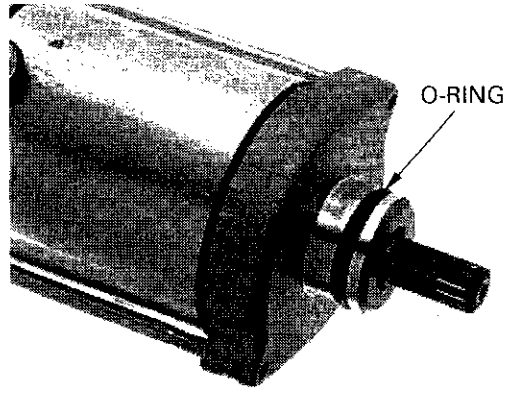
Always turn the ignition switch OFF before servicing the starter motor. The motor could suddenly start, causing serious injury.

Remove the right lower fairing (page 2-3).

Remove the rubber cap, terminal nut and starter motor cable.
Remove the two mounting bolts, vacuum tank stay and the starter motor from the crankcase.

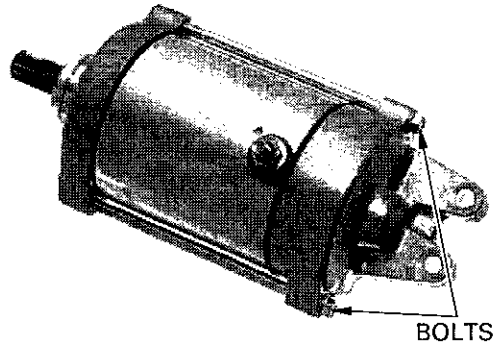


Remove the O-ring from the starter motor.



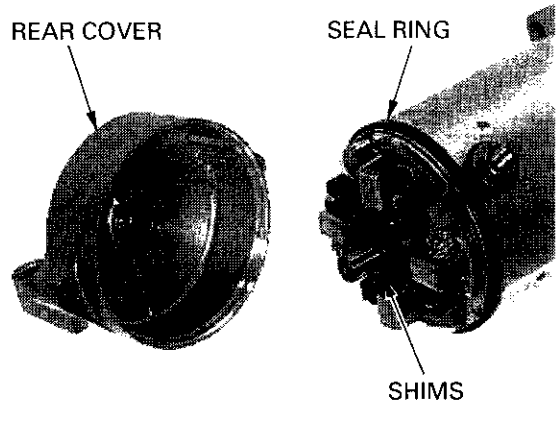
DISASSEMBLY

Remove the starter motor case bolts.

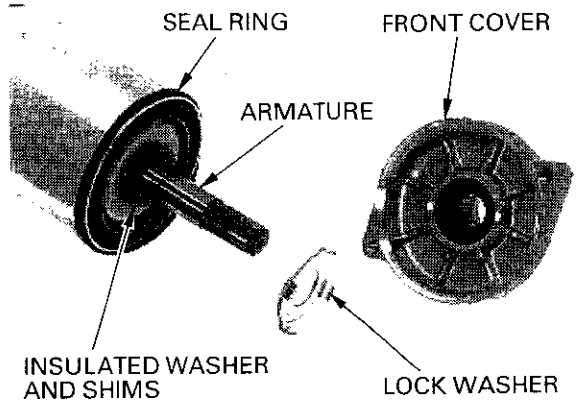


Record the location and number of shims.

Remove the rear cover, seal ring and shims.

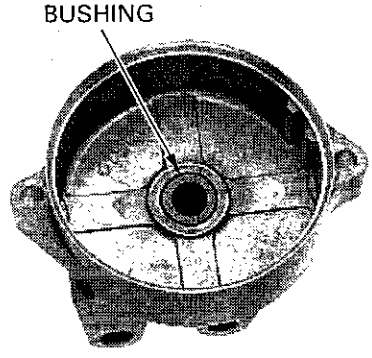


Remove the following:
- front cover
- seal ring
- lock washer
- insulated washer
- shims
- armature

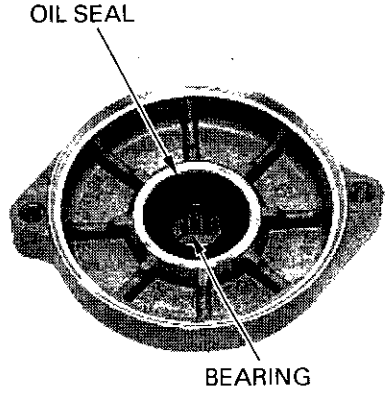


INSPECTION

Check the bushing in the rear cover for wear or damage.



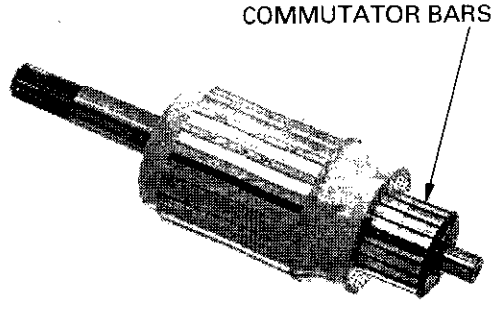
Check the oil seal and needle bearing in the front cover for deterioration, wear or damage.



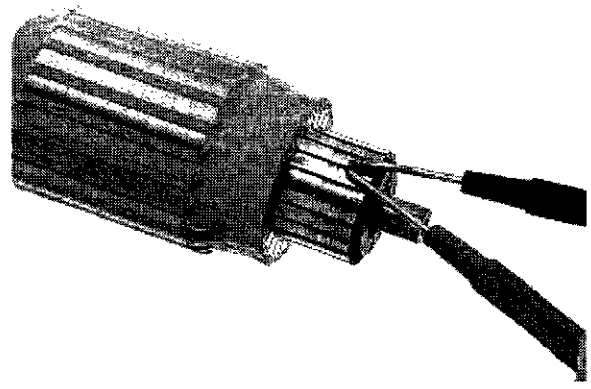
Check the commutator bars of the armature for discoloration.

NOTE:

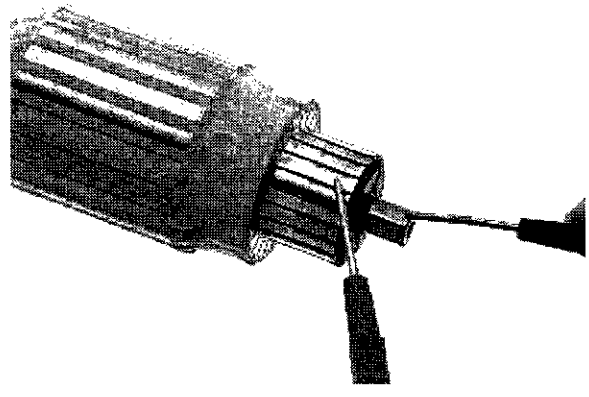
Do not use emery or sand paper on the commutator.



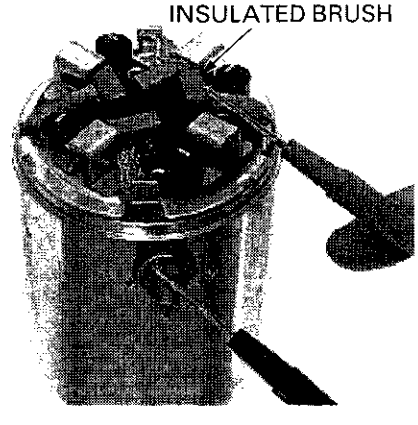
Check for continuity between pairs of commutator bars.
There should be continuity.



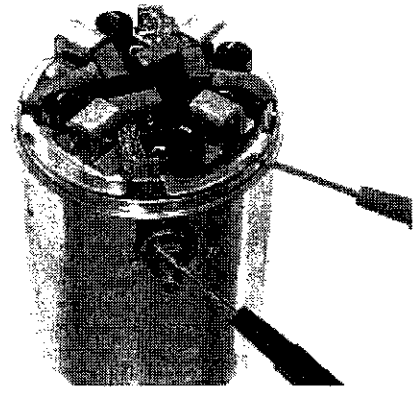
Check for continuity between each commutator bar and the armature shaft.
There should be no continuity.



Check for continuity between the insulated brush and cable terminal.
There should be continuity.



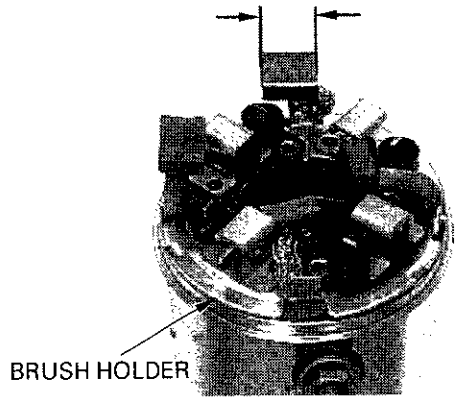
Check for continuity between the cable terminal and motor case.
There should be no continuity.



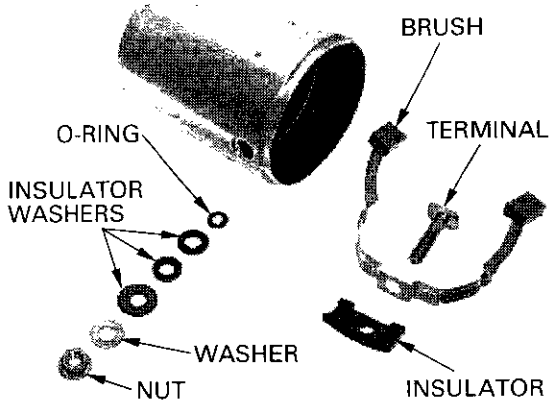
Measure the brush length.

SERVICE LIMIT: 6.5 mm (0.26 in)

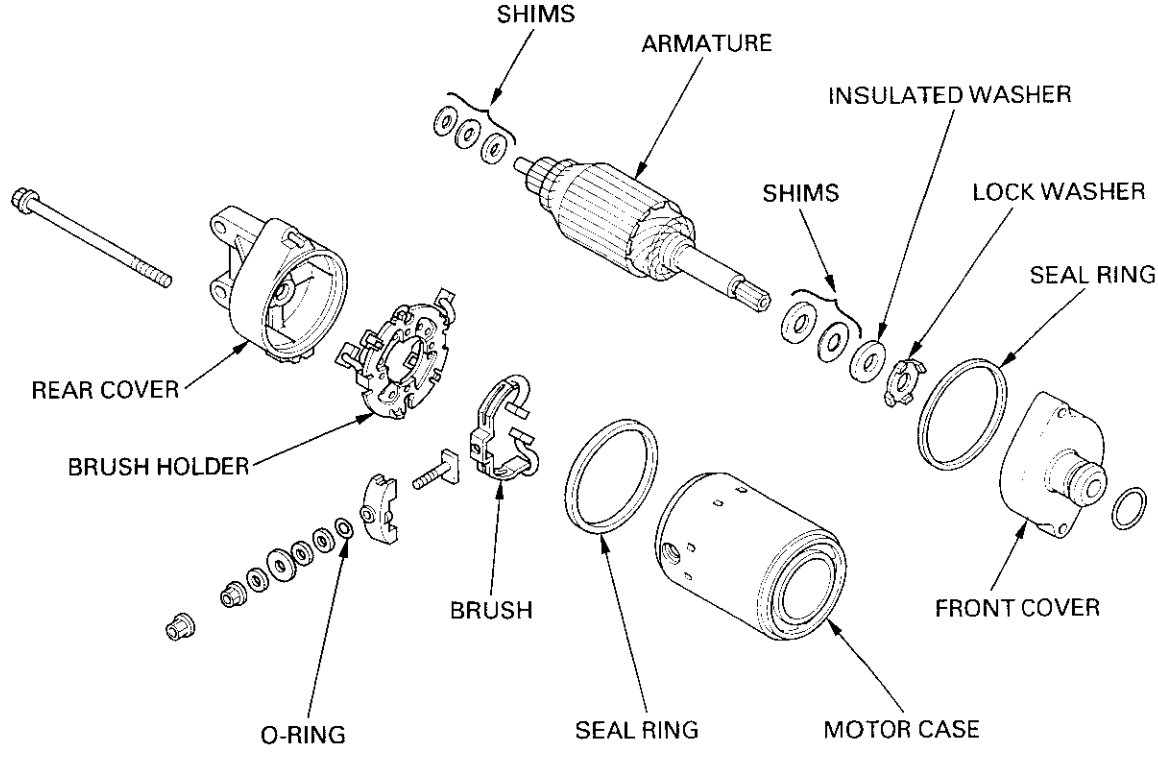
Remove the following if necessary:
– brush holder



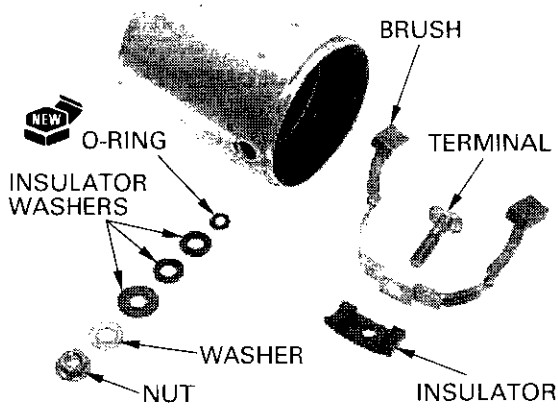
– nut
– washer
– insulator washers
– O-ring
– cable terminal
– insulated brush
– insulator



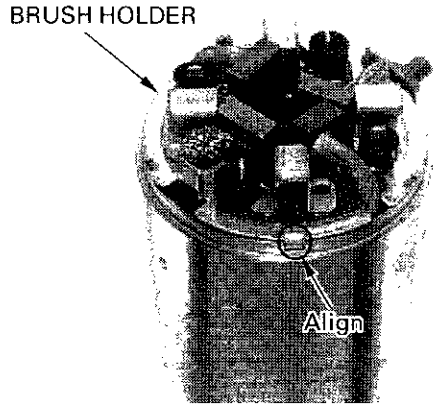
ASSEMBLY



Install the following:
- insulator
- insulated brush
- cable terminal
- new O-ring
- insulator washers
- washer
- nut



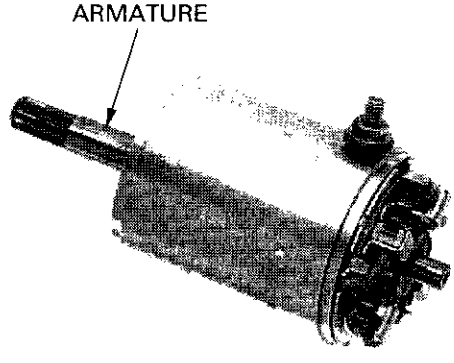
Install the brush holder, aligning the holder tab with the case groove, and the holder grooves with the insulated brush wires.



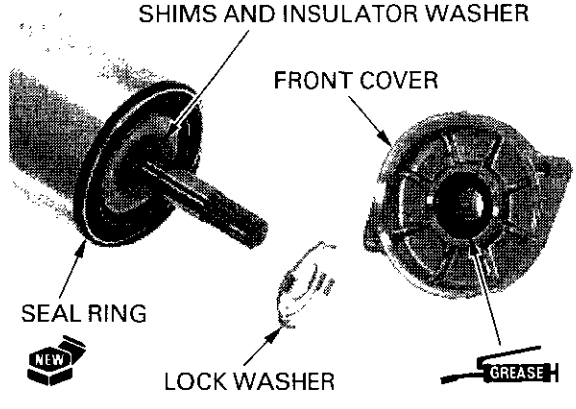
Push and hold the brushes inside the brush holder, and install the armature through the motor case and brush holder.
When installing the armature into the motor case, hold the armature tightly to keep the magnet of the case from pulling the armature against it.

CAUTION:

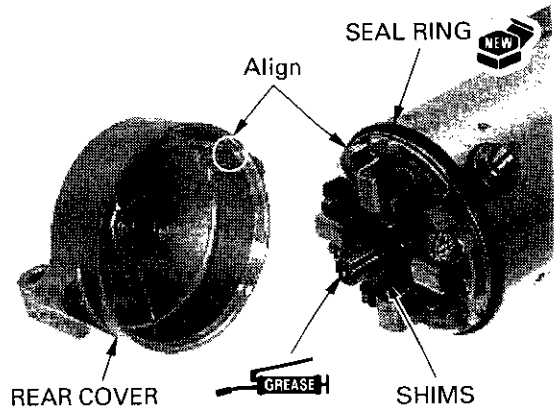
The coil may be damaged if the magnet pulls the armature against the case.



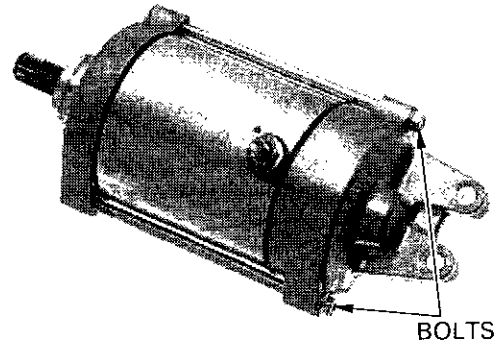
Install the shims and insulated washer onto the armature shaft.
Install a new seal ring onto the motor case.
Apply grease to the oil seal lip and needle bearing in the front cover.
Install the lock washer onto the front cover.
Install the front cover.



Install the same number of shims in the same locations as noted during disassembly.
Install a new seal ring onto the motor case.
Apply thin coat of grease to the armature shaft end.
Install the rear cover, aligning its groove with the brush holder tab.

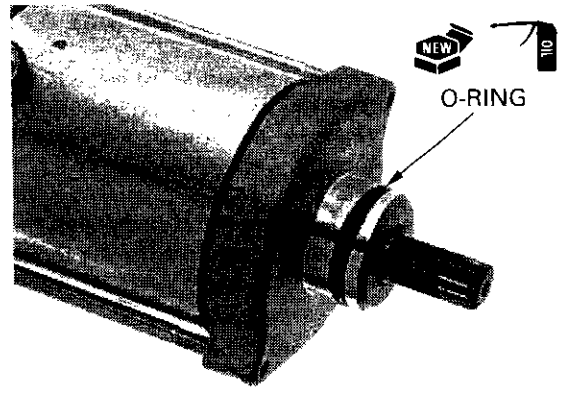


Install and tighten the motor case bolts.



INSTALLATION

Coat a new O-ring with oil and install it into the starter motor groove.

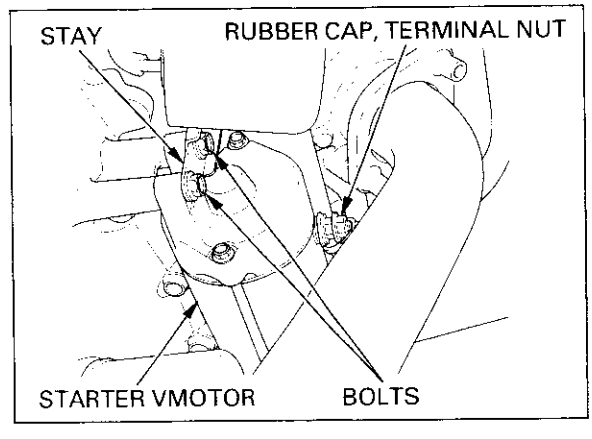


Install the starter motor into the crankcase.
Install the vacuum tank stay and motor mounting bolts, and tighten the bolts securely.
Connect the starter motor cable.
Install and tighten the terminal nut.

TORQUE: 10 N·m (1.0 kgf·m , 7 lbf·ft)

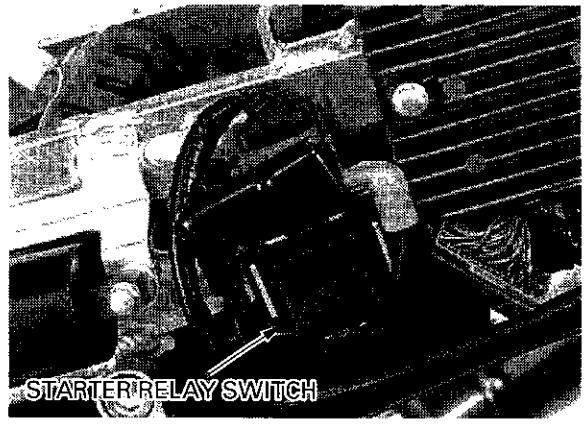
Install the rubber cap securely.

Install the engine right lower fairing (page 2-3).



STARTER RELAY SWITCH

INSPECTION

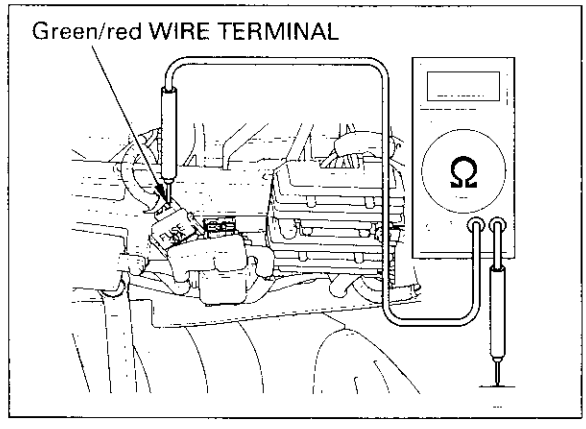


Remove the seat cowl (page 2-2).

Shift the transmission into neutral.
Turn the ignition switch ON and engine stop switch to RUN.
Push the starter switch.
The coil is normal if the starter relay switch clicks.

If you don't hear the switch "CLICK", inspect the relay switch using the procedure below.

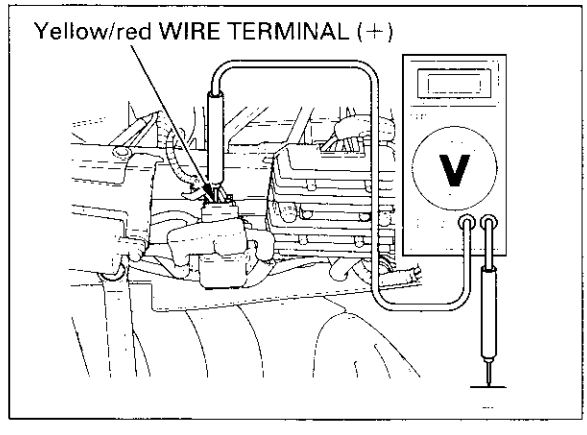
GROUND LINE



Disconnect the starter relay switch 4P connector.
Check for continuity between the green/red wire (ground line) terminal and ground.

If there is continuity when the transmission is in neutral or when the clutch is disengaged and the side stand is retracted, the ground circuit is normal. (In neutral, there is a slight resistance due to the diode.)

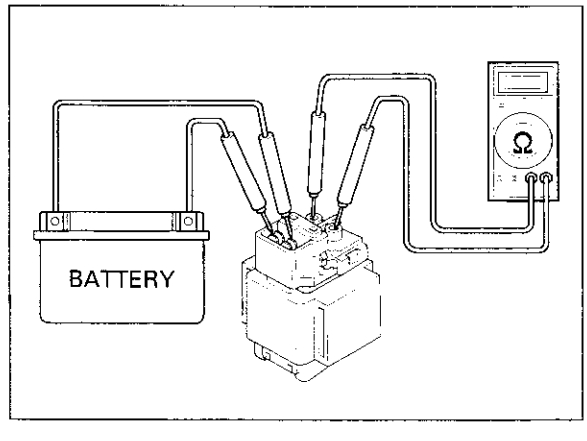
STARTER RELAY VOLTAGE



Connect the starter relay switch 4P connector.
Shift the transmission into neutral.
Measure the voltage between the yellow/red wire terminal (+) and ground (−).

If the battery voltage appears only when the starter switch is pushed with the ignition switch ON and engine stop switch to RUN, it is normal.

OPERATION CHECK



Disconnect the starter relay switch 4P connector and cables.
Connect a fully charged 12 V battery positive wire to the relay switch yellow/red wire terminal and negative wire to the green/red wire terminal.

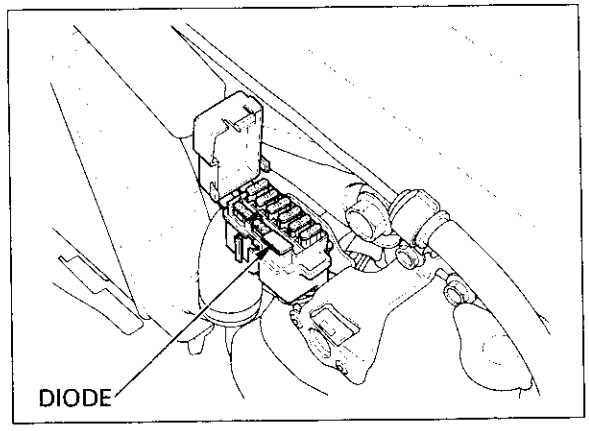
There should be continuity between the large terminals while the battery is connected, and no continuity when the battery is disconnected.

DIODE

INSPECTION

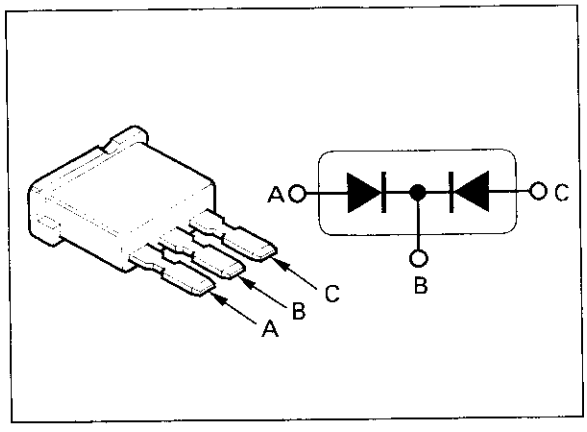
Remove the left lower fairing (page 2-3).

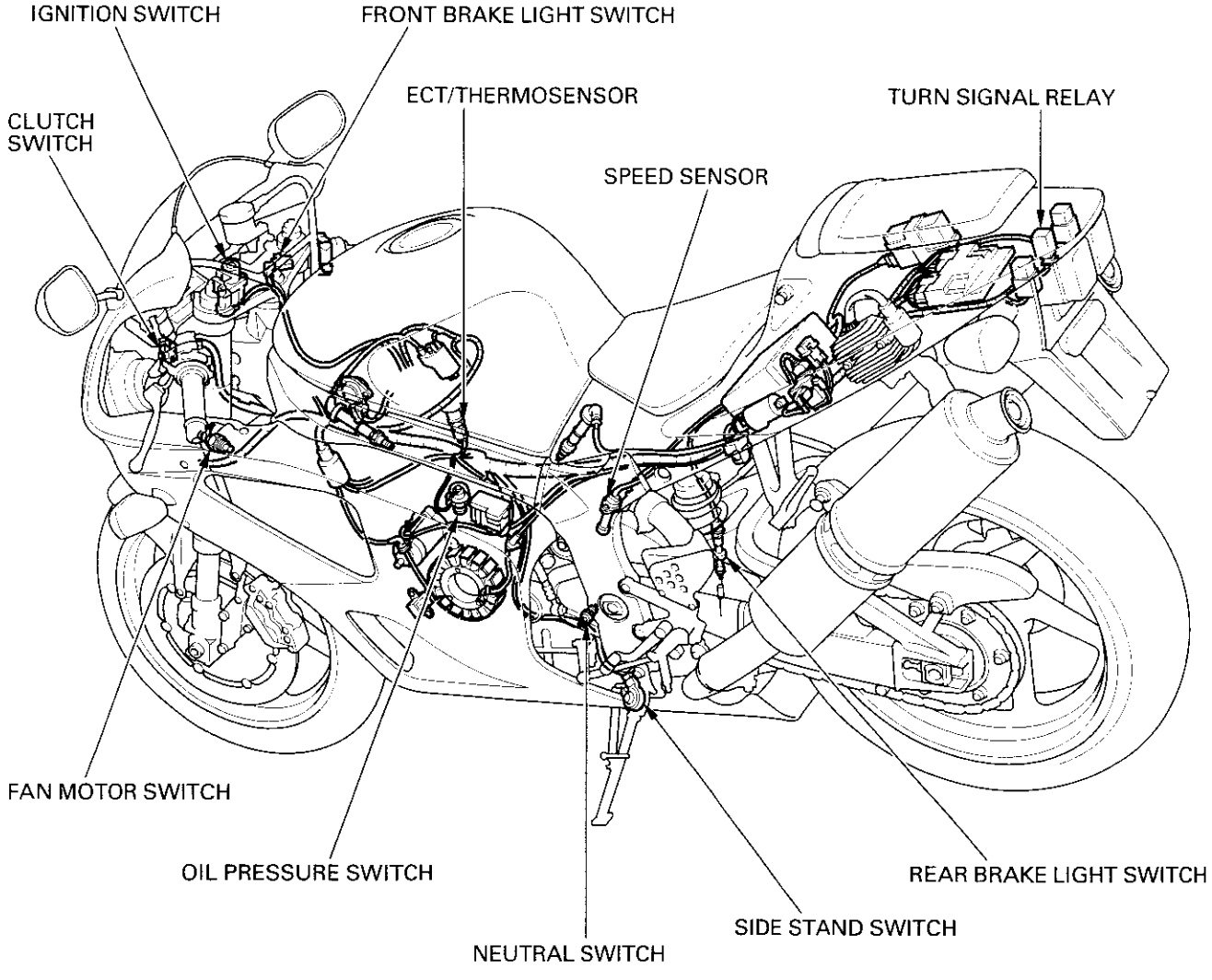
Open the fuse box cover and remove the diode.



Check for continuity between the diode terminals. When there is continuity, a small resistance value will register.

If there is continuity in one direction, the diode is normal.




IGNITION SWITCH
FRONT BRAKE LIGHT SWITCH
ECT/THERMOSENSOR
TURN SIGNAL RELAY
CLUTCH SWITCH
SPEED SENSOR
FAN MOTOR SWITCH
OIL PRESSURE SWITCH
REAR BRAKE LIGHT SWITCH
SIDE STAND SWITCH
NEUTRAL SWITCH

19. LIGHTS/METERS/SWITCHES

HEADLIGHT	19-3	IGNITION SWITCH	19-13
TURN SIGNAL LIGHT	19-4	HANDLEBAR SWITCHES	19-14
BRAKE/TAILLIGHT	19-4	BRAKE LIGHT SWITCH	19-15
COMBINATION METER	19-5	CLUTCH SWITCH	19-16
SPEEDOMETER/SPEED SENSOR	19-6	NEUTRAL SWITCH	19-16
TACHOMETER	19-8	SIDE STAND SWITCH	19-17
COOLANT TEMPERATURE GAUGE/ INDICATOR/THERMOSENSOR	19-8	LOW FUEL INDICATOR	19-17
COOLING FAN MOTOR SWITCH	19-11	HORN	19-18
OIL PRESSURE INDICATOR	19-12	TURN SIGNAL RELAY	19-18

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 thermosensor 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 it 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 used are indicated throughout this section.

Bu: Blue	G: Green	Lg: Light Green	R: Red
Bl: Black	Gr: Gray	O: Orange	W: White
Br: Brown	Lb: Light Blue	P: Pink	Y: Yellow

SPECIFICATIONS

ITEM		SPECIFICATIONS
Bulbs	Headlight (High beam)	12 V−55 W
	Headlight (Low beam)	12 V−55 W
	Position light (Except U type)	12 V−5 W × 2
	Brake/taillight	12 V−21/5 W × 2
	Turn signal light	12 V−21 W × 4
Fuse	Main fuse	30 A
	FI fuse	30 A
	Sub-fuse	10 A × 5, 20 A × 1
Thermosensor resistance	At 80°C (176°F)	47−57 Ω
	At 120°C (248°F)	14−18 Ω
Fan motor switch	Starts to close (ON)	98−102 °C (208−216 °F)
	Stops to open (OFF)	93−97 °C (199−207 °F)

TORQUE VALUES

ECT/thermosensor	23 N·m (2.3 kgf·m, 17 lbf·ft)	
Fan motor switch	18 N·m (1.8 kgf·m, 13 lbf·ft)	
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)	
Ignition switch mounting bolt	25 N·m (2.5 kgf·m, 18 lbf·ft)	
Neutral switch	12 N·m (1.2 kgf·m, 9 lbf·ft)	
Side stand switch bolt	10 N·m (1.0 kgf·m, 7 lbf·ft)	

TOOL

Peak voltage adaptor	07HGJ-0020100 with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

HEADLIGHT

HEADLIGHT BULB REPLACEMENT

⚠WARNING

A halogen headlight bulb becomes very hot while the headlight is ON, and will remain hot for a while after it is turned OFF. Be sure to let it cool down before servicing.

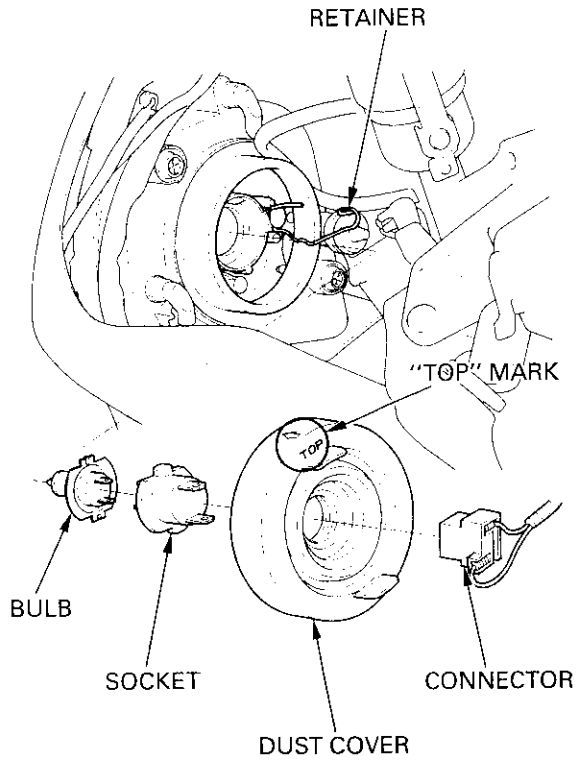
Disconnect the headlight connector.
Remove the dust cover.
Unhook the bulb retainer, remove the bulb socket and replace the headlight bulb with a new one.

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 a cloth moistened with alcohol to prevent its early failure.

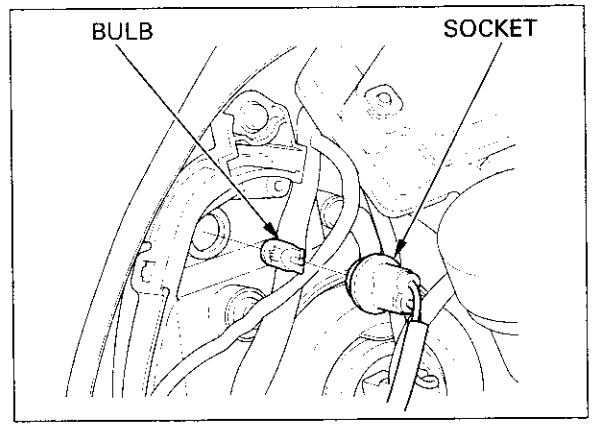
Install the bulb/socket into the headlight and hook the bulb retainer properly.
Install the dust cover properly onto the headlight with the "TOP" mark facing up.
Connect the headlight connector.



POSITION LIGHT BULB REPLACEMENT (Except U type)

Pull the bulb socket out of the headlight.
Pull the position light bulb out of the socket.

Install a new bulb into the socket.
Install the socket into the headlight.

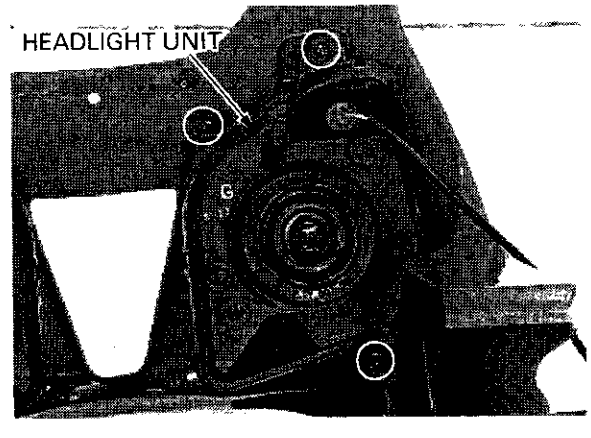


REMOVAL/INSTALLATION

Remove the upper fairing (page 2-4).

Remove the three screws and the headlight unit.

Install the headlight unit in the reverse order of removal.

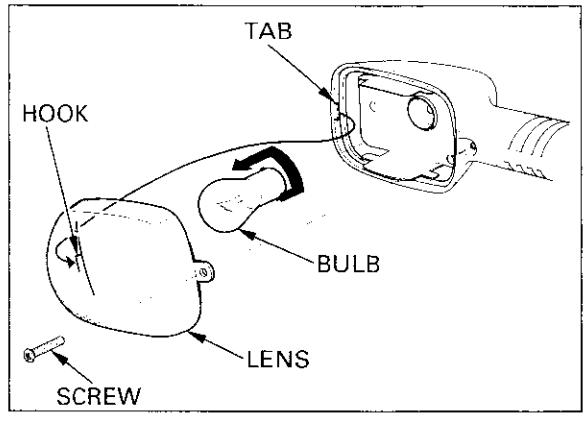


TURN SIGNAL LIGHT

BULB REPLACEMENT

Remove the screw and turn signal light lens.
While pushing the bulb in, turn it counterclockwise to remove it, and replace it with a new one.

Make sure that the seal rubber is installed in position and is in good condition, and replace it with new one if necessary.
Install the lens, aligning the hook with the tab of the turn signal light, and tighten the screw.

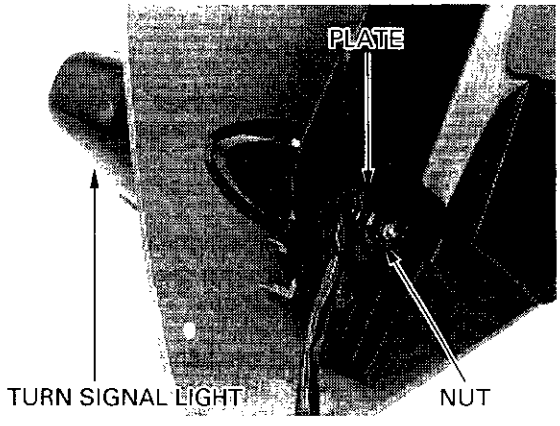


REMOVAL/INSTALLATION

Front: Remove the lower inner fairing (page 2-3).
Rear: Remove the engine control module (ECM) holder and disconnect the turn signal light connector.

Remove the nut, setting plate and the turn signal light.

Install the turn signal light in the reverse order of removal.



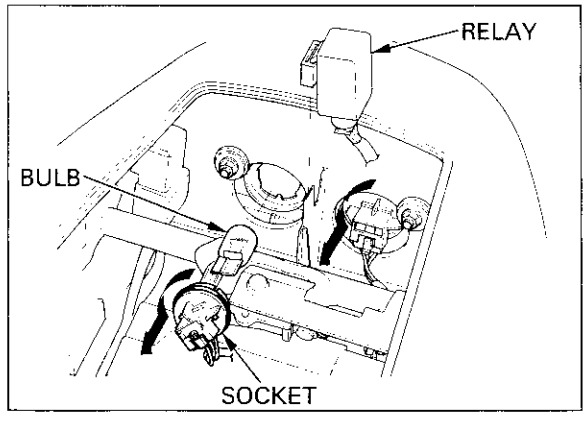
BRAKE/TAILLIGHT

BULB REPLACEMENT

Remove the passenger seat (page 2-2).

Remove the turn signal relay from the stay.
Turn the bulb socket counterclockwise and remove it from the brake/taillight.
Pull the brake/taillight bulb out of the socket and replace it with a new one.
Install the socket by turning it clockwise.

Install the passenger seat (page 2-2).

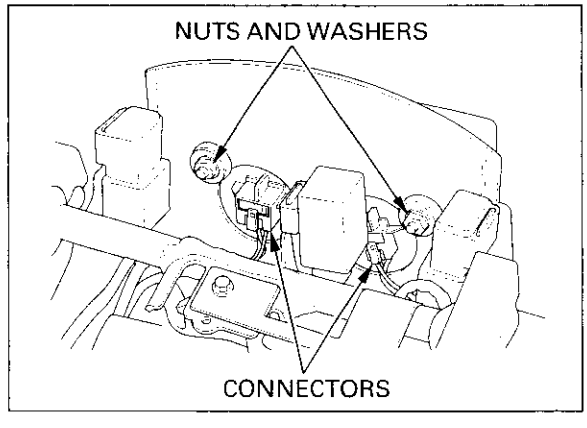


REMOVAL/INSTALLATION

Remove the seat cowl (page 2-2).

Remove the two nuts, washers and the brake/taillight.
Disconnect the brake/taillight connectors.

Install the brake/taillight in the reverse order of removal.



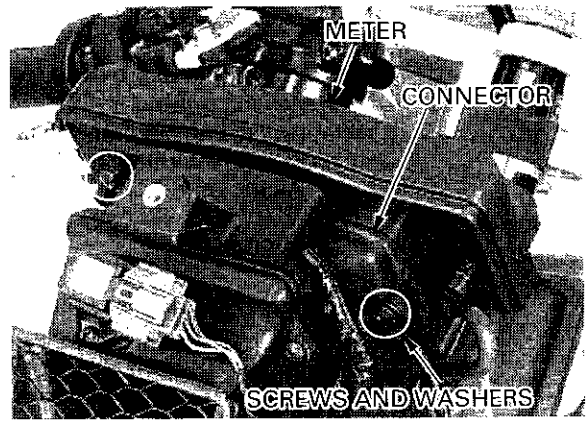
COMBINATION METER

REMOVAL/INSTALLATION

Remove the upper fairing (page 2-4).

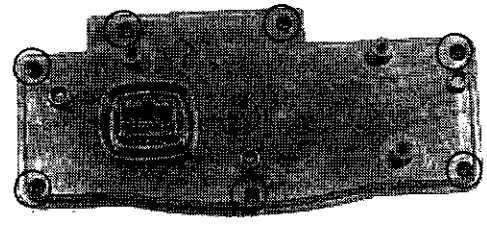
Remove the three mounting screws, washers and the combination meter.
Disconnect the combination meter connector.

Install the combination meter in the reverse order of removal.



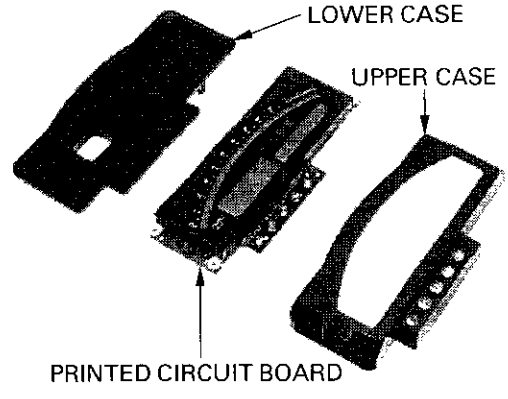
DISASSEMBLY/ASSEMBLY

Remove the seven screws.



Remove the meter upper case, printed circuit board and lower case.

Assemble the meter upper case, printed circuit board and lower case and tighten the seven screws.

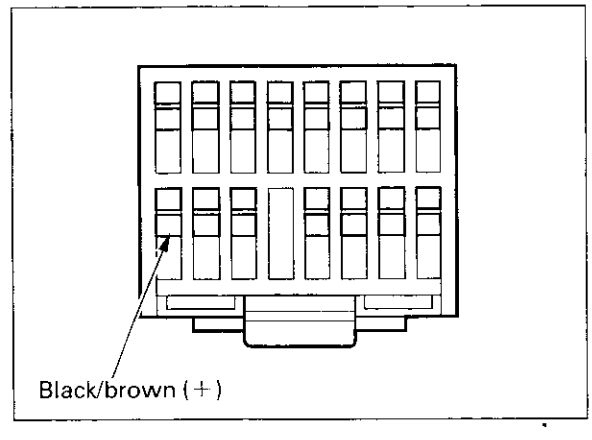


POWER/GROUND LINE INSPECTION

Remove the combination meter.
Check the following at the wire harness side connector of the combination meter:

POWER INPUT LINE

Measure the voltage between the black/brown wire terminal (+) and ground ( ).
There should be battery voltage with the ignition switch ON.
If there is no voltage, check the following:
- open circuit in black/brown wire
- blown sub-fuse (10 A) (Meter/tail/illumination)



METER GROUND LINE

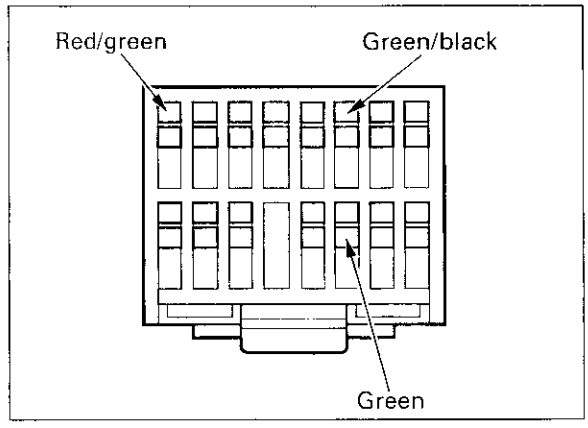
Check for continuity between the green/black wire terminal and ground.
There should be continuity at all times.
If there is no continuity, check for open circuit in green/black wire.

GROUND LINE

Check for continuity between the green wire terminal and ground.
There should be continuity at all times.
If there is no continuity, check for open circuit in green wire.

BACK-UP VOLTAGE LINE

Check this line if the odometer/trip meter does not operate.
Measure the voltage between the red/green wire terminal (+) and ground (−).
There should be battery voltage at all times.
If there is no voltage, check the following:
− open circuit in red/green wire
− blown sub-fuse (10 A) (Odometer)
− open circuit in red wire



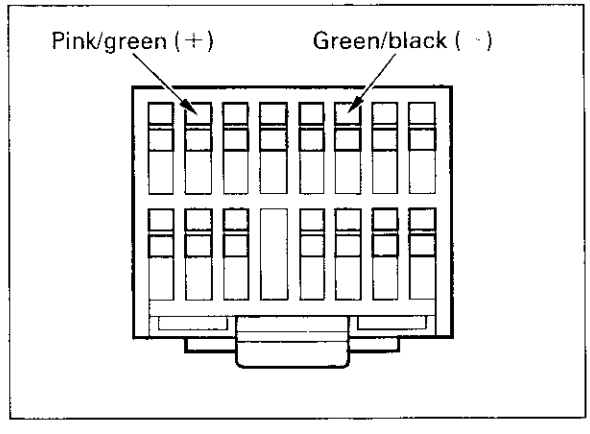
SPEEDOMETER/SPEED SENSOR

SYSTEM INSPECTION

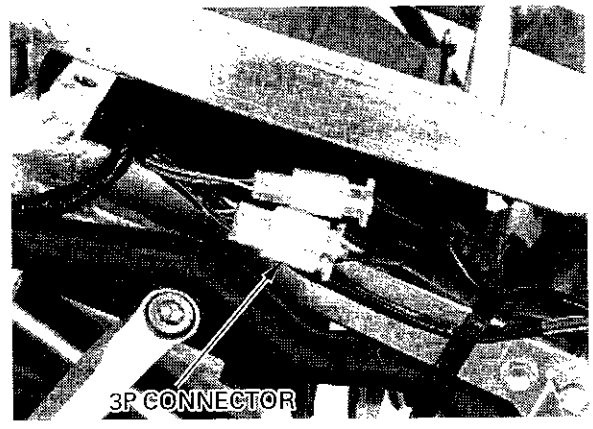
Check that the tachometer and coolant temperature gauge function properly.

- If they do not function, perform the power/ground line inspection of the combination meter.
- If they function, remove the combination meter (page 19-5). Shift the transmission in neutral and turn the ignition switch ON.
  Measure the voltage between the pink/green (+) and green/black (−) wire terminals of the wire harness side combination meter connector.
  Slowly turn the rear wheel by hand.
  There should be 0 V to 5 V pulse voltage.

− If pulse voltage appears, replace the printed cireuit board.
− If pulse voltage does not appear, check for open or short circuit in the pink/green wire. If the pink/green wire is OK, check the speed sensor (page 19-7).



SPEED SENSOR INSPECTION



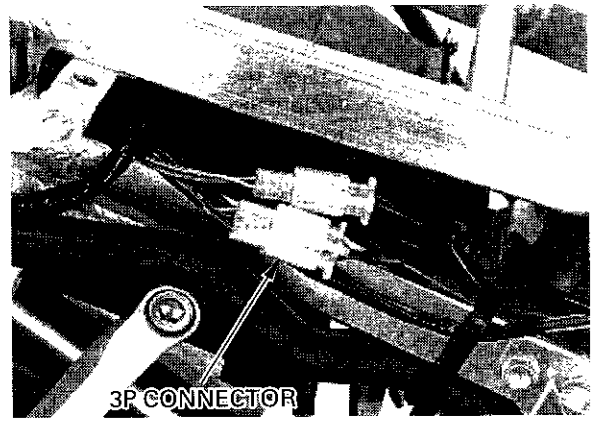
Remove the seat cowl (page 2-2).

Turn the ignition switch ON and measure the voltage between the black/brown (+) and green/black (−) wire terminals of the speed sensor 3P connector with the connector connected.
There should be battery voltage.
If there is no voltage, check for open circuit in black /brown and green/black wires.

Shift the transmission in neutral and turn the ignition switch ON.
Measure the voltage between the pink/green (+) and green/black (−) wire terminal of the sensor connector with the connector connected.
Slowly turn the rear wheel by hand.
There should be 0 to 5 V pulse voltage.

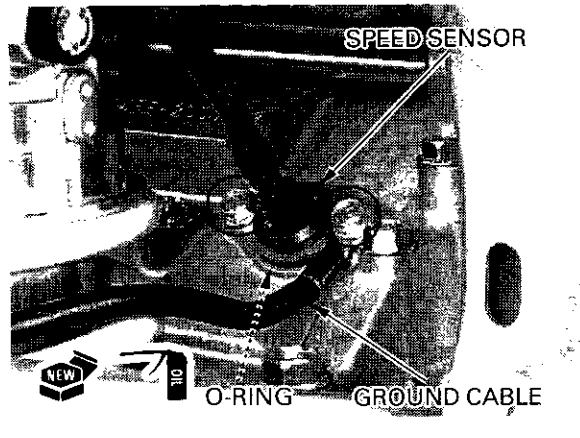
If pulse voltage does not appear, replace the speed sensor.

SPEED SENSOR REPLACEMENT



Remove the seat cowl (page 2-2).
Remove the right lower fairing (page 2-3).

Disconnect the speed sensor 3P connector.



Remove the two bolts, battery ground cable and speed sensor.

Coat a new O-ring with oil and install it onto a new speed sensor.

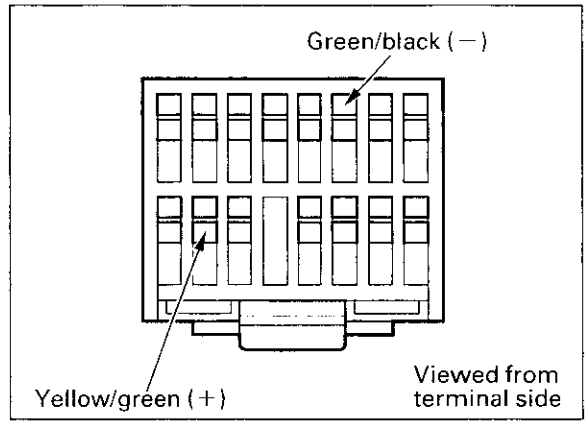
Install the speed sensor in the reverse order of removal.

NOTE:

Route the speed sensor wire properly (page 1-20).

TACHOMETER

SYSTEM INSPECTION



Check that the speedometer and coolant temperature gauge function properly.

- If they do not function, perform the power/ground line inspection of the combination meter (page 19-5).
- If they function, remove the combination meter (page 19-5).

Connect the peak voltage adaptor or Imrie diagnostic tester probes to the yellow/green (+) and green/black (−) wire terminals of the combination meter connector with the connector connected.

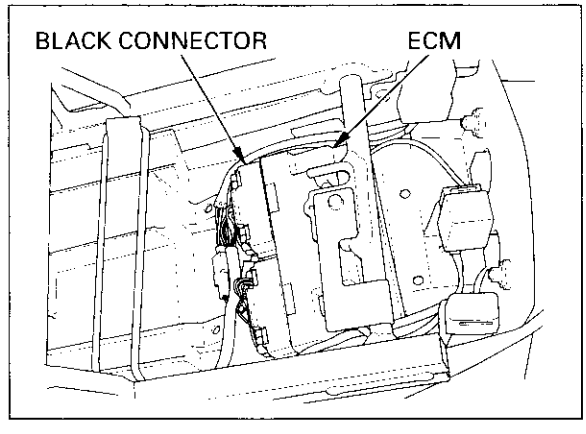
TOOLS:
Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100
with commercially available digital multimeter (impedance 10 MΩ /DCV minimum)

Start the engine and measure the tachometer signal peak voltage.

PEAK VOLTAGE: 10.5 V minimum

– If the measured value is more than 10.5 V, replace the printed circuit board.
– If the measured value is less than 10.5 V, replace the engine control module (ECM).
– If there is no voltage, disconnect the ECM black connector (page 17-5).
Check the yellow/green wire for continuity between the combination meter and ECM connectors.
There should be continuity.
Check for continuity between the yellow/green wire terminal and ground.
There should be no continuity.

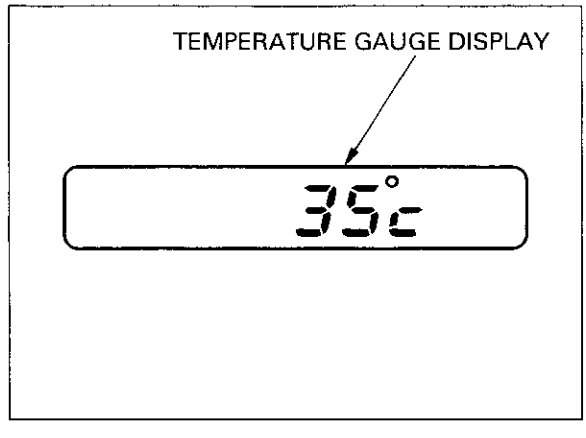
If the yellow/green wire is OK, replace the ECM.



COOLANT TEMPERATURE GAUGE/ INDICATOR/THERMOSENSOR

NOTE:

- The coolant temperature gauge displays "35°C" to "132°C". It displays "– –°C" when the coolant temperature is below 34°C (93°F) and the displayed figures blink when the coolant temperature is above 122°C (252°F).
- The coolant temperature indicator comes on when the coolant temperature is above 122°C (252°F).

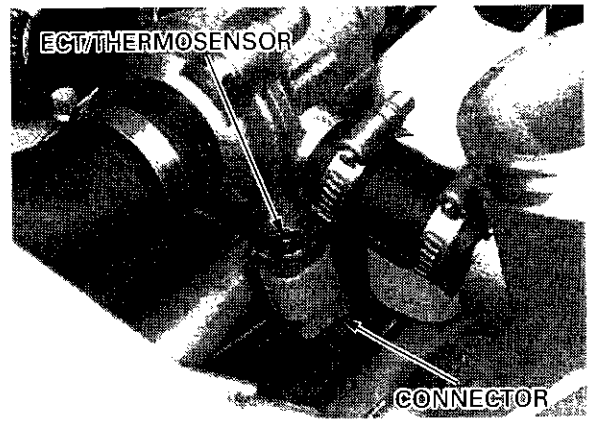


SYSTEM INSPECTION

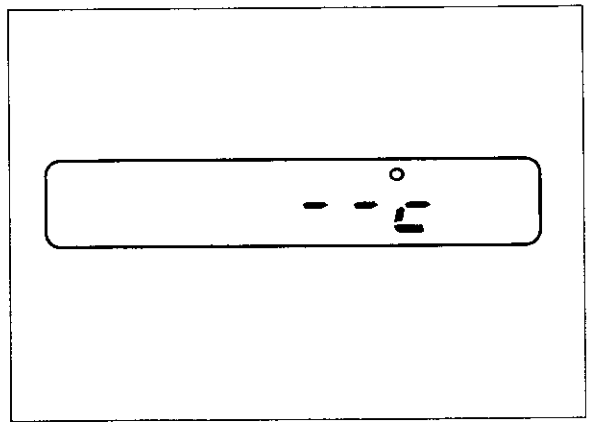
Check that the speedometer and tachometer function properly.
If they do not function, perform the power/ground line inspection of the combination meter (page 19-5).

Remove the throttle body (page 5-58).

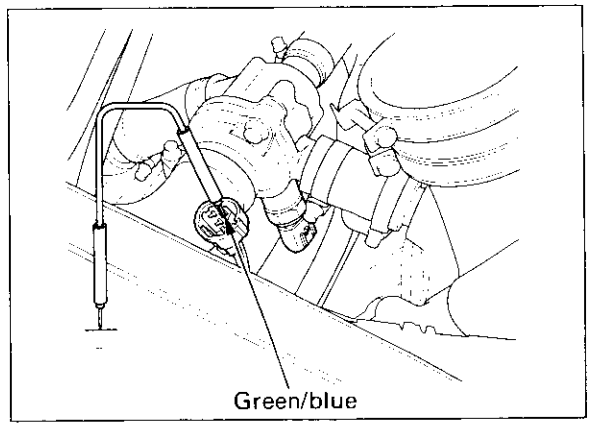
Disconnect the ECT/thermosensor connector.
Turn the ignition switch ON, and check the gauge and indicator.



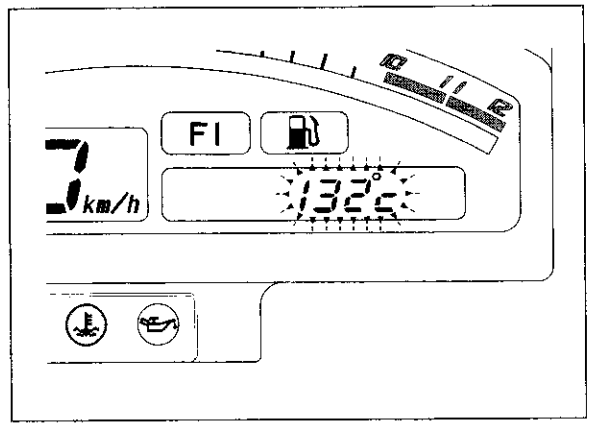
- If the gauge displays "– –°C" and the indicator does not come on, check the thermosensor.
- If the gauge displays "132°C", the figures blink and the indicator comes on, check for short circuit in green/blue wire between the ECT/thermosensor and combination meter.
- If the gauge displays any figures other than "– –°C", or it displays "– –°C" but the indicator comes on, replace the printed circuit board.



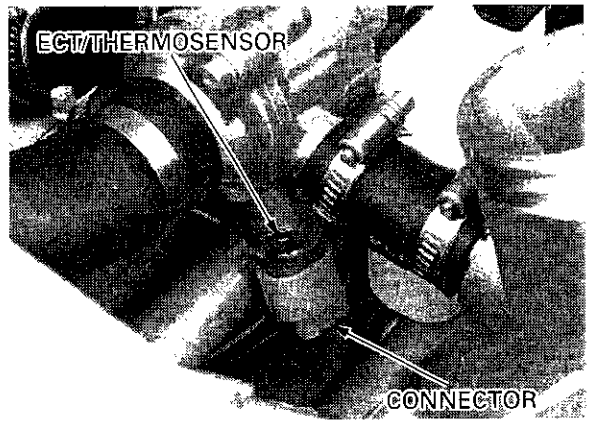
Ground the green/blue wire terminal of the wire harness side connector with a jumper wire.
Turn the ignition switch ON, and check the gauge and indicator.



- If the gauge displays "132°C" and the indicator comes on, check the thermosensor.
- If the gauge displays "– –°C" and the indicator does not come on, check for open circuit in green /blue wire between the ECT/thermosensor and combination meter.
- If the gauge displays any figures other than "132°C", or it displays "132°C" but the indicator does not come on, replace the printed circuit board.



THERMOSENSOR INSPECTION



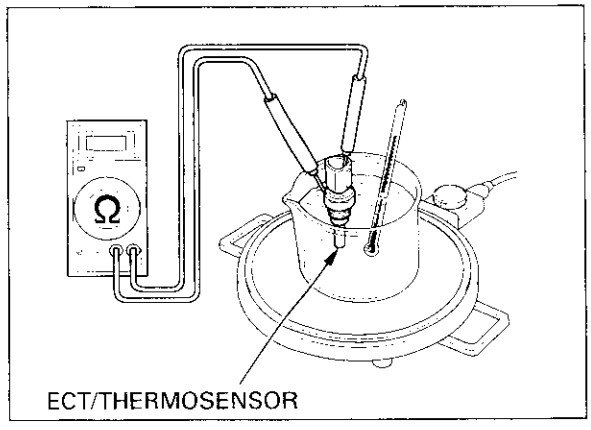
⚠WARNING

Keep all flammable materials away from the electric heating element. Wear protective clothing, insulated gloves and eye protection.

Remove the throttle body (page 5-58).
Drain the coolant from the system (page 6-5).

Disconnect the ECT/thermosensor connector and remove the thermosensor from the thermostat.

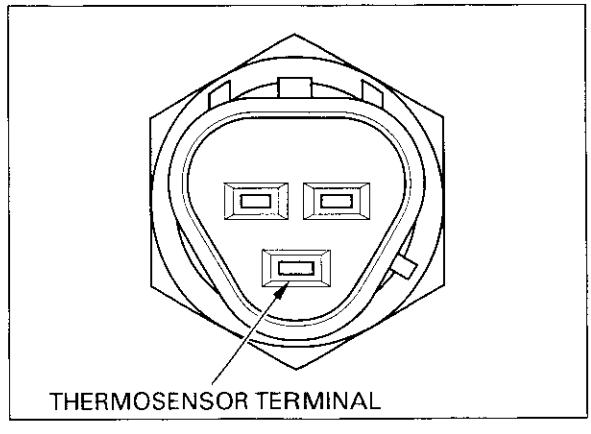
Suspend the ECT/thermosensor in a pan of coolant (50 — 50 mixture) on an electric heating element and measure the resistance between the thermosensor terminal and body as the coolant heats up.



NOTE:

- Soak the ECT/thermosensor 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 ECT/thermosensor touch the pan.

Temperature	80°C (176°F)	120°C (248°F)
Resistance	47 — 57 Ω	14 — 18 Ω



Replace the ECT/thermosensor if it is out of specifications by more than 10% at any temperature listed.

Install the ECT/thermosensor with a new sealing washer and tighten it.

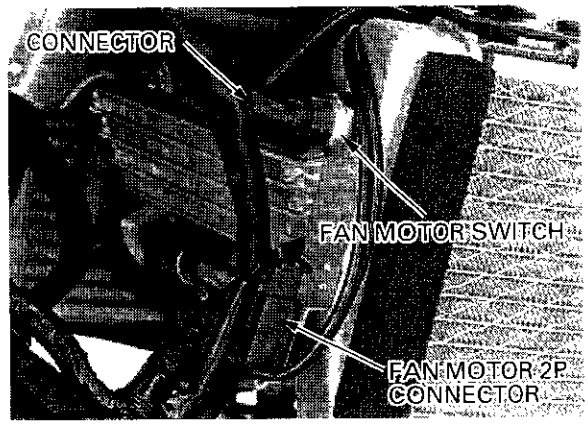
TORQUE: 23 N·m (2.3 kgf·m , 17 lbf·ft)

Connect the thermosensor connector.

Install the throttle body (page 5-67).
Fill and bleed the cooling system (page 6-6).



COOLING FAN MOTOR SWITCH



Remove the left lower fairing (page 2-3).

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 short circuit between the fan motor and switch.
- If the fan motor stops, replace the fan motor switch.

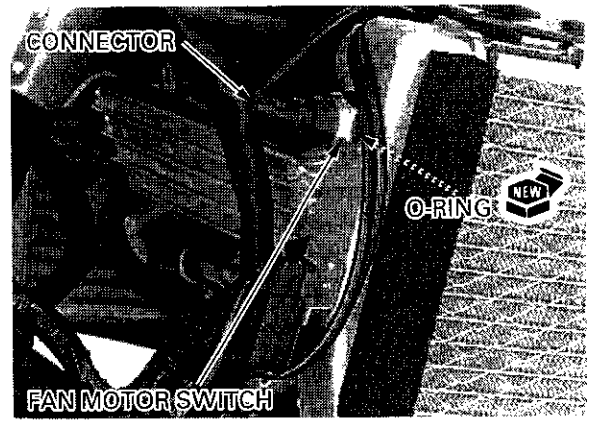
Fan motor does not start
Before testing, check for a blown fan motor fuse.
Warm up the engine to operating temperature.

Disconnect the connector from the fan motor switch and ground the connector 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. If it is OK, replace the fan motor switch.
- If the fan motor does not start, measure the voltage between the black/blue (+) and green (−) wire terminals at the fan motor 2P connector. There should be battery voltage.

− If there is battery voltage, replace the fan motor.
− If there is no voltage, check for open circuit in black/blue and green wires.

REMOVAL/INSTALLATION



Drain the coolant (page 6-5).

Disconnect the fan motor switch connector and remove the switch.

Install a new O-ring onto the fan motor switch.
Install and tighten the fan motor switch.

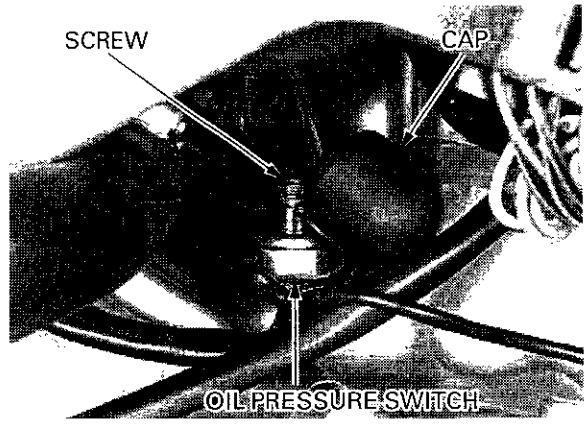
TORQUE: 18 N·m (1.8 kgf·m , 13 lbf·ft)

Connect the fan motor switch connector.

Fill and bleed the cooling system (page 6-5).

OIL PRESSURE INDICATOR

INSPECTION



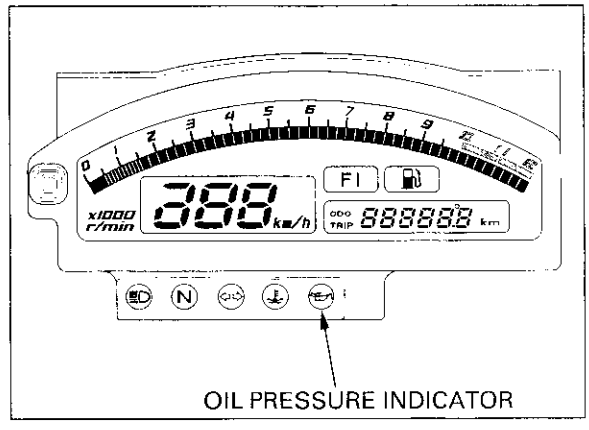
Remove the radiator reserve tank (page 6-9).

Remove the rubber cap, and disconnect the oil pressure switch wire by removing the terminal screw.

Indicator does not come on with the ignition switch turned ON
Ground the wire terminal to the engine with a jumper wire.

Turn the ignition switch ON and check the oil pressure indicator.

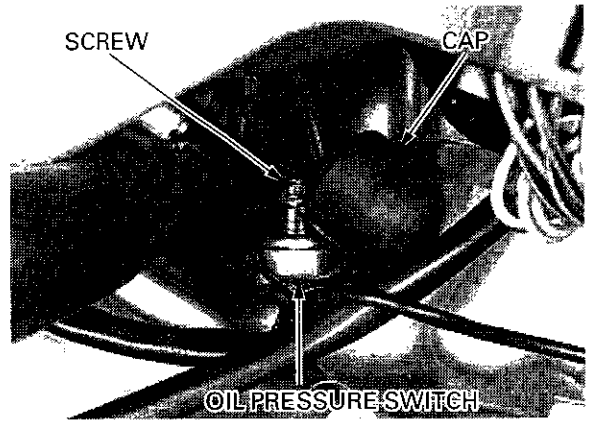
- If the indicator comes on, replace the oil pressure switch.
- If the indicator does not come on, check for open circuit in blue/red wire between the oil pressure switch and combination meter.



Indicator stays on while the engine is running
Check for continuity between the wire terminal and ground.

- If there is continuity, check for short circuit in blue/red wire between the oil pressure switch and combination meter.
- If there is no continuity, check the oil pressure (page 4-4).
  If the oil pressure is normal, replace the oil pressure switch.

REPLACEMENT



Remove the radiator reserve tank (page 6-9).

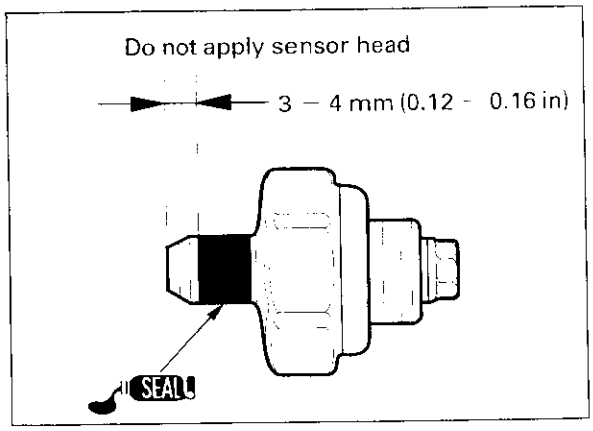
Remove the rubber cap, and disconnect the oil pressure switch wire by removing the terminal screw.
Remove the oil pressure switch.

Apply sealant to the oil pressure switch threads as shown and install it.

TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

CAUTION:

To prevent crankcase damage, do not overtighten the switch.

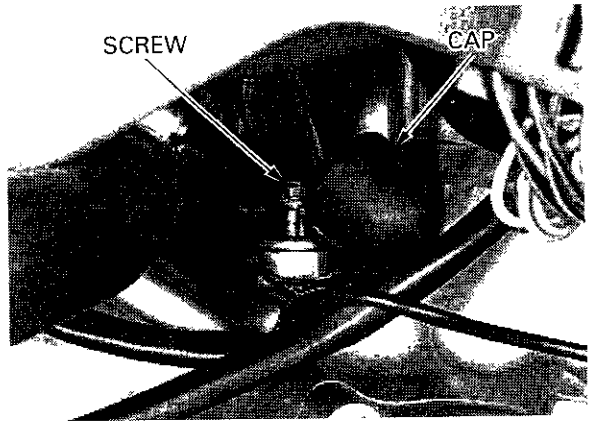


Connect the oil pressure switch wire and tighten the terminal screw.

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

Install the rubber cap properly.

Install the radiator reserve tank (page 6-9).

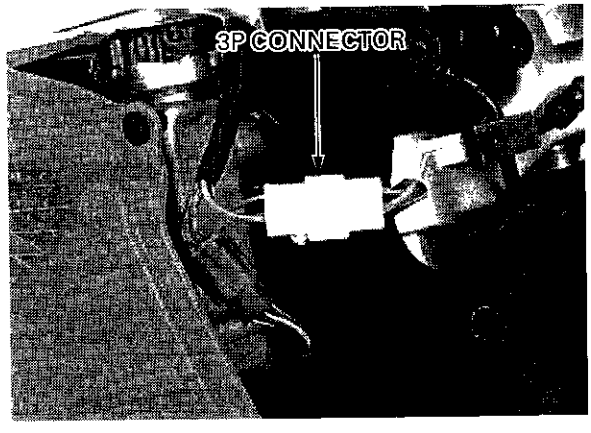


IGNITION SWITCH

INSPECTION

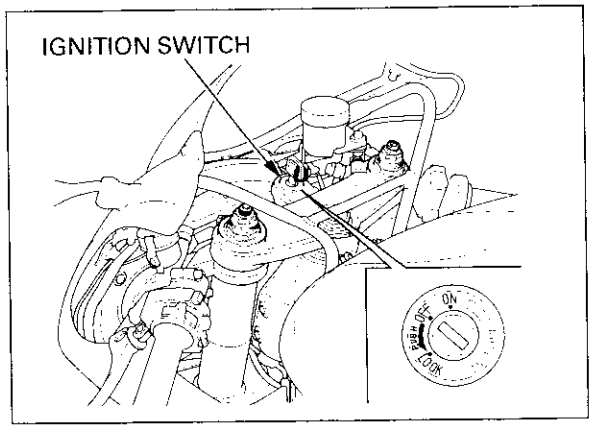
Remove the left upper fairing (page 2-4).

Disconnect the ignition switch 3P (white) connector.

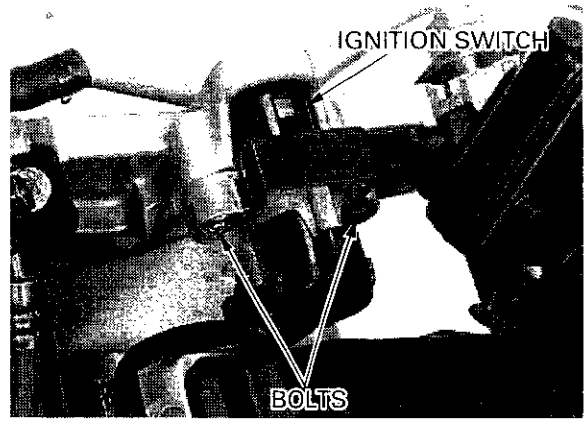


Check for continuity between the connector terminals in each switch position.
Continuity should exist between the color coded wires as follows:

Color / Position	R	R/BI	Bu/O
ON	○	○	○
OFF			
LOCK			



REMOVAL/INSTALLATION



Disconnect the ignition switch 3P (white) connector.

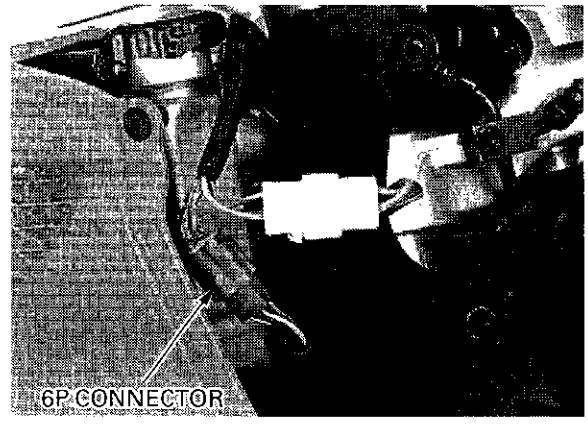
Remove the two mounting bolts and the ignition switch.

Install the ignition switch and tighten the mounting bolts.

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

Install the removed parts in the reverse order.

HANDLEBAR SWITCHES



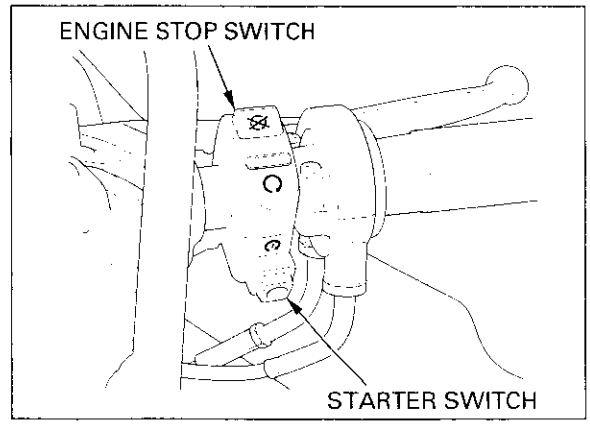
Remove the upper fairing (page 2-4).

Disconnect the right handlebar switch 6P connectors and left handlebar switch 6P connector.
Check for continuity between the connector terminals in each switch position.
Continuity should exist between the color coded wires as shown in the charts below.

RIGHT HANDLEBAR SWITCH

ENGINE STOP SWITCH

Color / Position	Bl	Bl/W
OFF		
RUN	○—○	



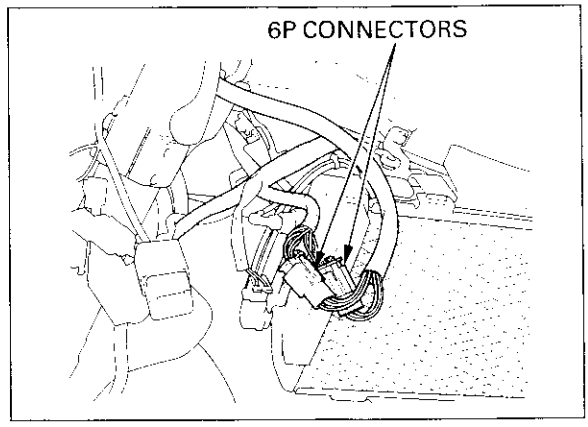
STARTER SWITCH (Except U type)

Color / Position	Bl/W	Y/R
FREE		
PUSH	○—○	

STARTER SWITCH (U type)

Color / Position	Y/R	Bl/R	Bu/W
FREE		○—○	
PUSH	○—○		

LEFT HANDLEBAR SWITCH



LIGHTING SWITCH (Except U type)

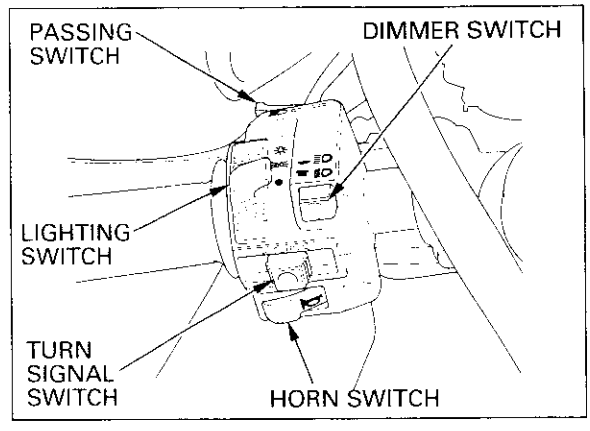
Position \ Color	Bl/Br	Br	Bl/R	Bu/W
•				
P	○—○			
H	○—○		○—○	

TURN SIGNAL SWITCH

Position \ Color	O	Gr	Lb
L	○	○	
(N)			
R		○—○	

DIMMER SWITCH

Position \ Color	Bu	Bu/W
H	○—○	
(N)	○—○	
L		



HORN SWITCH

Position \ Color	W/G	Lg
FREE		
PUSH	○—○	

PASSING SWITCH

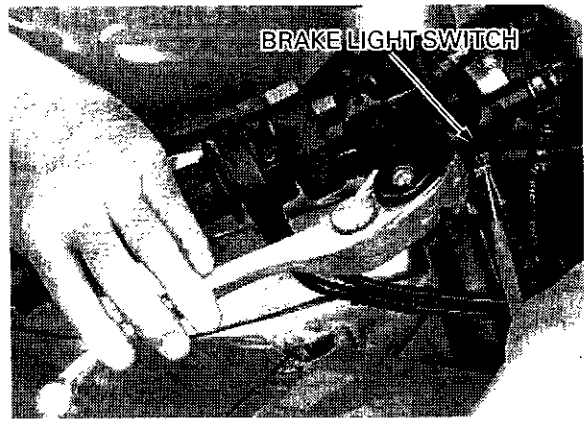
Position \ Color	W/G	Bu
FREE		
PUSH	○—○	

BRAKE LIGHT SWITCH

FRONT

Disconnect the front brake light switch connectors and check for continuity between the switch terminals.

There should be continuity with the front brake lever squeezed and no continuity with the lever released.

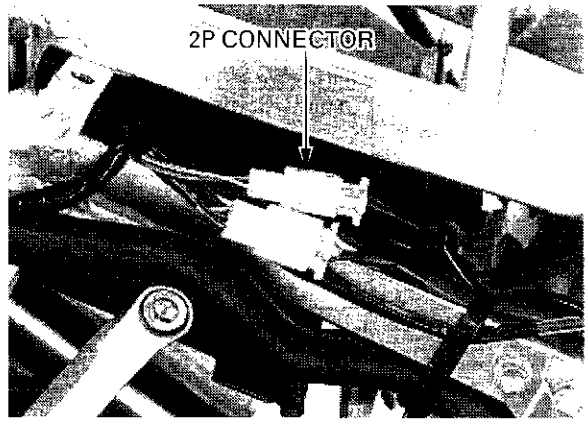


REAR

Remove the seat cowl (page 2-2).

Disconnect the rear brake light switch 2P (white) connector and check for continuity between the connector terminals.

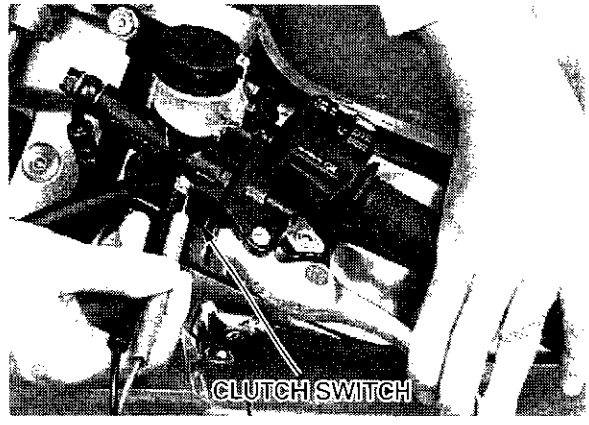
There should be continuity with the rear brake pedal depressed and no continuity with the pedal released.



CLUTCH SWITCH

Disconnect the clutch switch wire connectors and check for continuity between the switch terminals.

There should be continuity with the clutch lever squeezed and no continuity with the lever released.

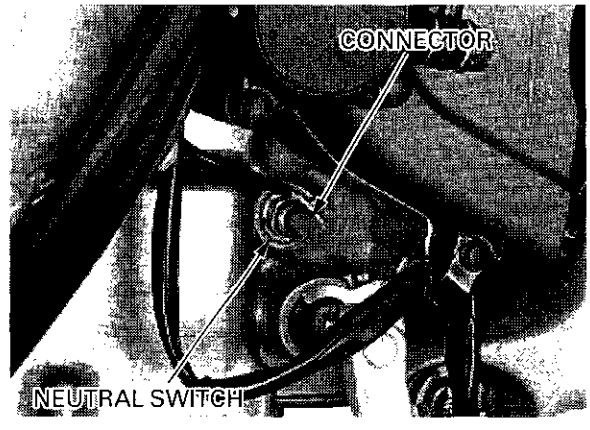


NEUTRAL SWITCH

INSPECTION

Remove the left lower fairing (page 2-3).

Disconnect the neutral switch wire connector.
Check for continuity between the switch terminal and engine ground.
There should be continuity with the transmission in neutral, and no continuity with the transmission in gear except neutral.



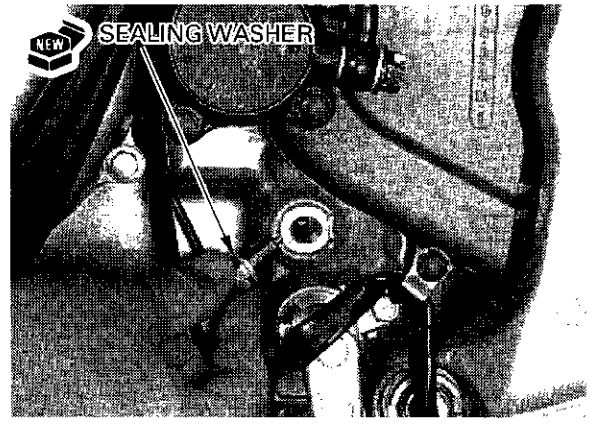
REMOVAL/INSTALLATION

Disconnect the neutral switch wire connector.
Remove the neutral switch from the crankcase.

Install the neutral switch with a new sealing washer and tighten it.

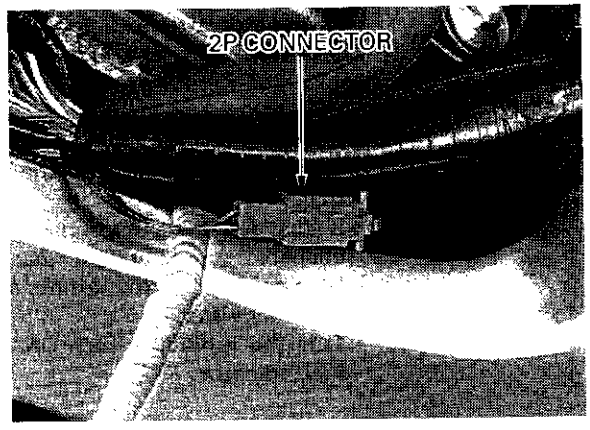
TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

Connect the neutral switch wire connector.



SIDE STAND SWITCH

Raise the front of the fuel tank and support it (page 3-4).



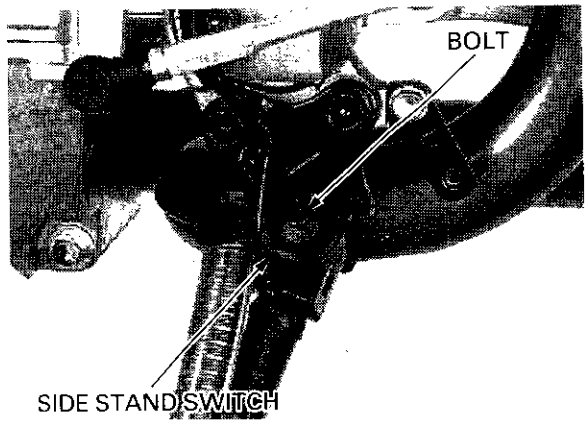
INSPECTION

Disconnect the side stand switch 2P (green) connector.
Check for continuity between the connector terminals.
There should be continuity with the side stand retracted and no continuity with the side stand lowered.

REMOVAL/INSTALLATION

Remove the left lower fairing (page 2-2).

Disconnect the side stand switch 2P (green) connector.
Remove the side stand switch bolt and the switch.



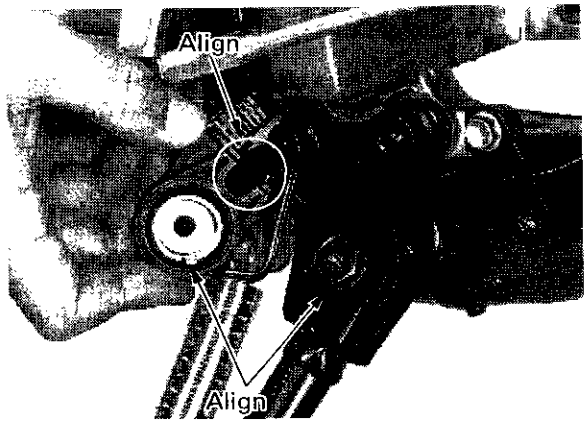
Install the side stand switch by aligning the switch pin with the side stand hole and the switch groove with the bracket pin.
Install the side stand switch bolt and tighten it.

TORQUE: 10 N·m (1.0 kgf·m , 7 lbf·ft)

Install the removed parts in the reverse order.

NOTE:

Route the side stand switch wire properly (page 1-20).

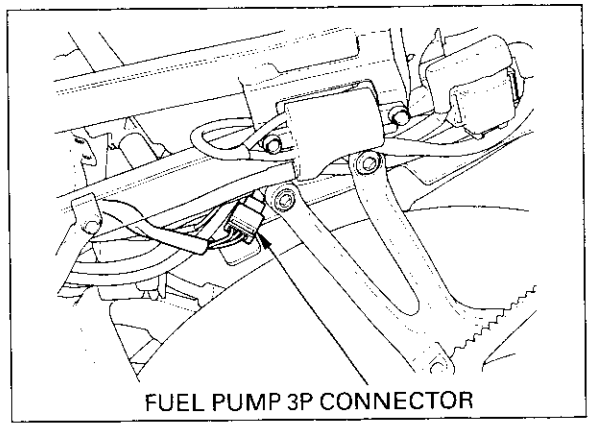


LOW FUEL INDICATOR

Remove the seat cowl (page 2-2).

Low fuel indicator does not go off
Disconnect the fuel pump unit connector.
Turn the ignition switch ON and check the low fuel indicator.

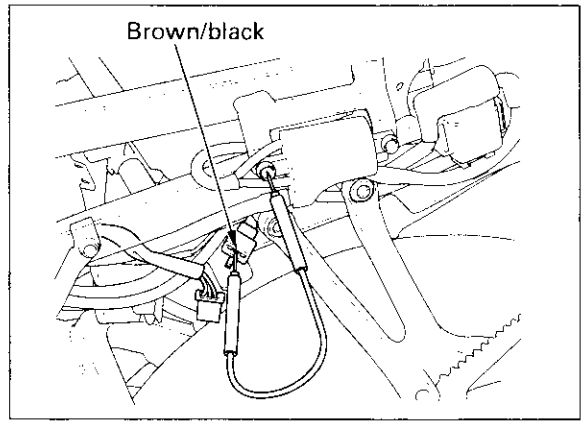
- If the indicator does not come on, replace the fuel pump unit.
- If the indicator comes on, check for short circuit in brown/black wire between the fuel pump unit connector and combination meter.



Low fuel indicator does not come on
Check that the speedometer, tachometer and coolant temperature gauge function properly.

- If they do not function, perform the power/ground line inspection of the combination meter (page 19-5).
- If they function, disconnect the fuel pump unit connector and ground the brown/black wire terminal of the wire harness side connector with a jumper wire.
  Turn the ignition switch ON and check the low fuel indicator.

– If the indicator comes on, replace the fuel pump unit.
– If the indicator does not come on, check for open circuit in brown/black wire between the fuel pump unit connector and combination meter.
  If they are OK, replace the combination meter (page 19-5).

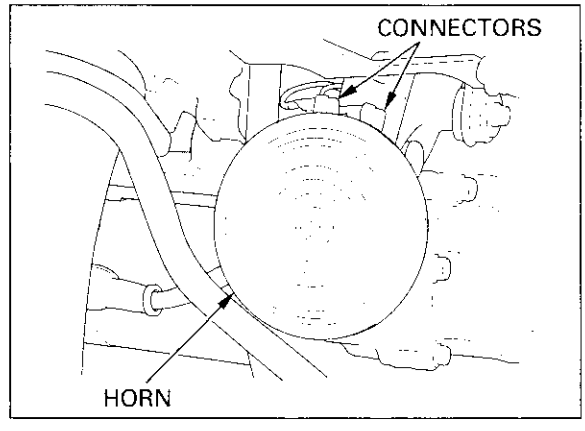


HORN

Remove the lower inner fairing (page 2-3).

Disconnect the wire connectors from the horn.
Connect a 12 V battery to the horn terminals.

The horn is normal if it sounds when the 12 V battery is connected across the horn terminals.



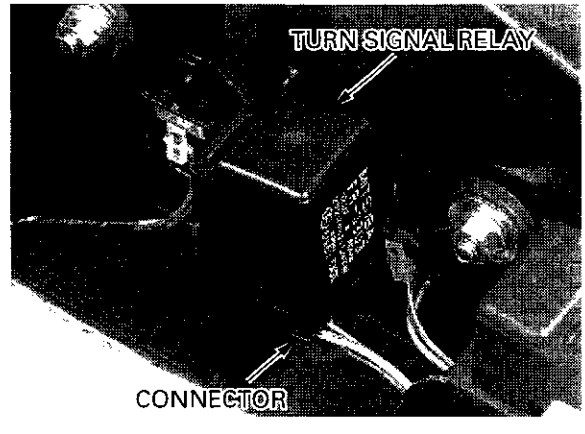
TURN SIGNAL RELAY

Turn signal light does not blink
Remove the seat cowl (page 2-2).

Remove the turn signal relay from the stay and disconnect the connector.
Connect the white/green and gray wire terminals of the wire harness side connector with a jumper wire.
Turn the ignition switch ON and check the turn signal light by operating the turn signal switch.

- If the light does not come on, check for open circuit in white/green and gray wires.
- If the light comes on, check for continuity between the green wire terminal and body ground.

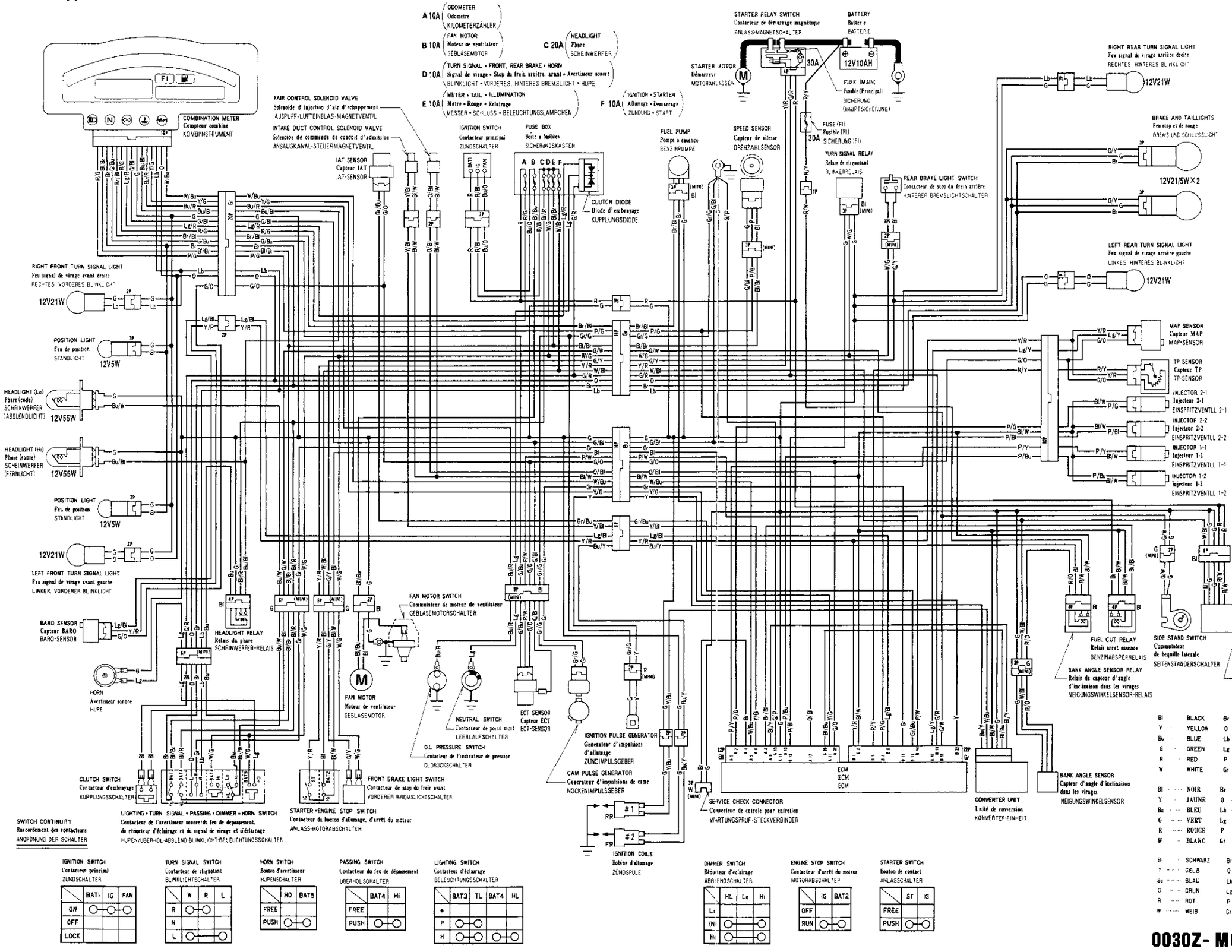
– If there is no continuity, check for open circuit in green wire.
– If there is continuity, check the connector terminals for loose or poor contact.
  If the connector terminals are OK, replace the turn signal relay.



MEMO

MEMO

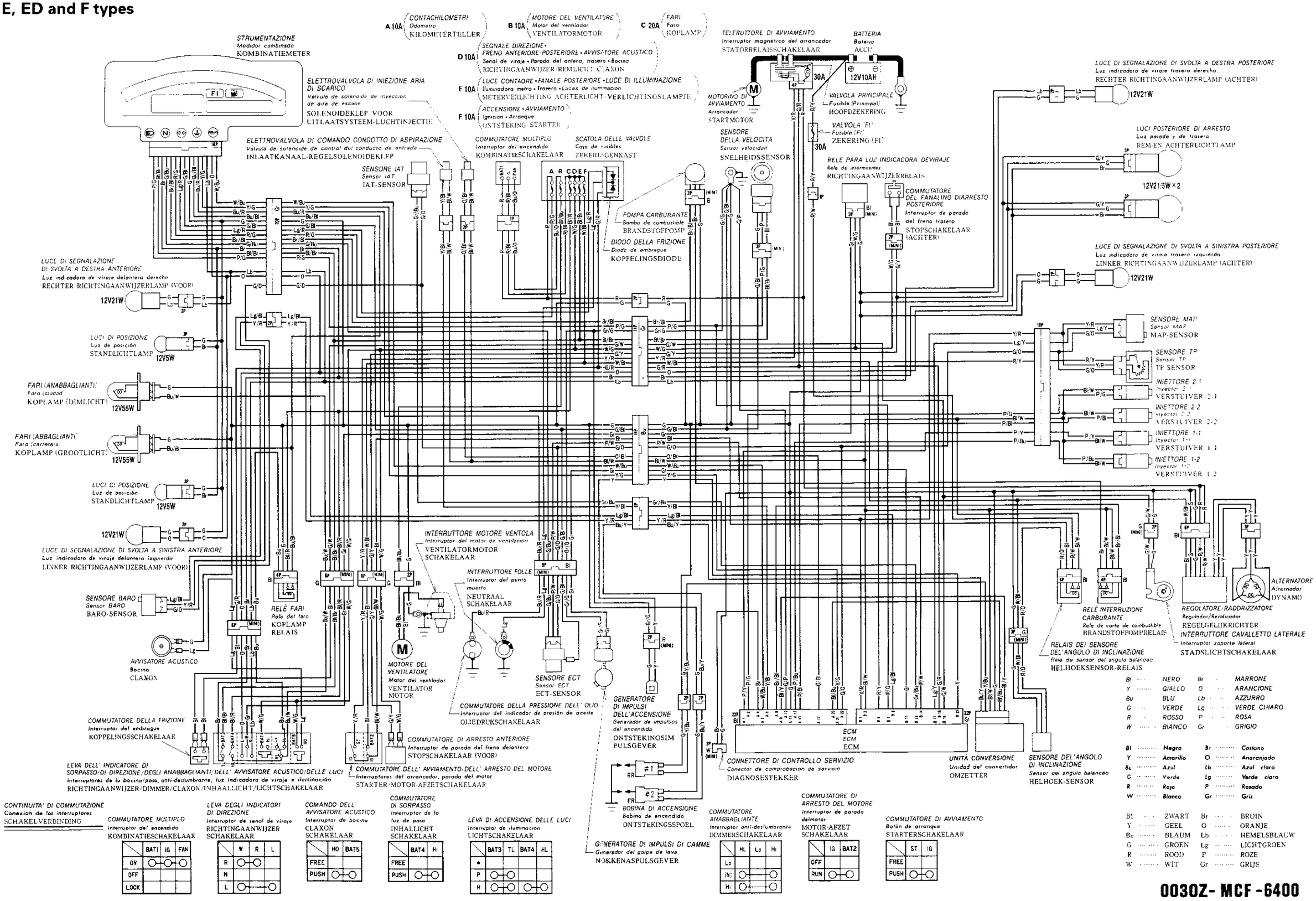
E, ED and F types



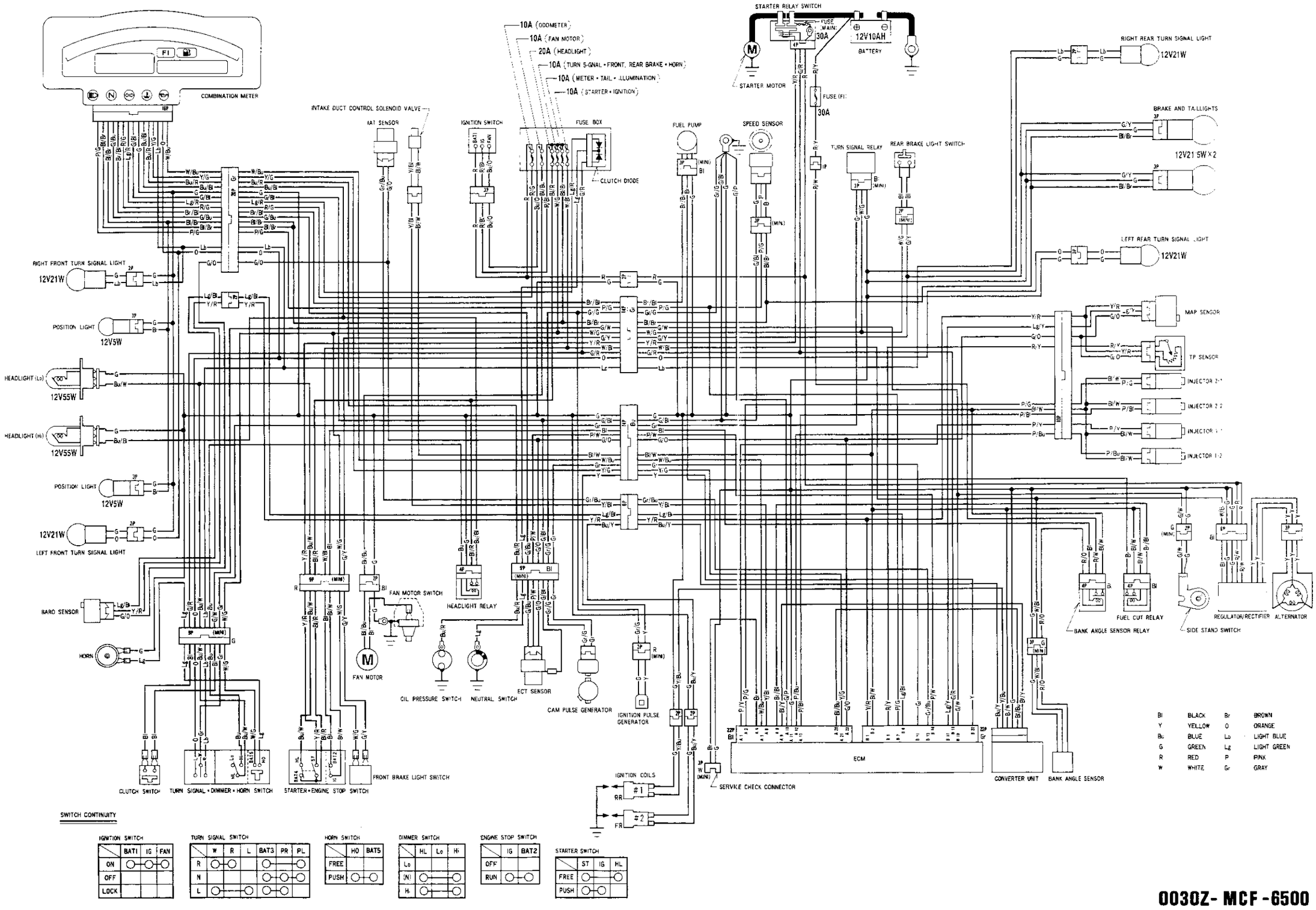
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20

E, ED and F types



U type



SWITCH CONTINUITY

IGNITION SWITCH

	BAT1	IG	FAN
ON	○	○	○
OFF			
LOCK			

TURN SIGNAL SWITCH

	W	R	L	BAT3	PR	PL
R	○	○			○	○
N					○	○
L	○		○		○	○

HORN SWITCH

	HO	BAT5
FREE		
PUSH	○	○

DIMMER SWITCH

	HL	Lo	Hi
Lo			
(N)	○		○
Hi	○		

ENGINE STOP SWITCH

	IG	BAT2
OFF		
RUN	○	○

STARTER SWITCH

	ST	IG	HL
FREE			
PUSH	○	○	

0030Z- MCF -6500

21. TROUBLESHOOTING

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ENGINE DOES NOT START OR IS HARD TO START

		Possible cause
1. Remove and inspect spark plugs	Wet plug	• Starter valve ON position (open) • Throttle valve open • Dirty air cleaner
Good condition		
2. Perform a spark test	Weak or no spark	• Faulty spark plug • Fouled spark plug • Loose or disconnected ignition system wires • Broken or shorted spark plug wire • Faulty ignition pulse generator • Faulty ignition coil • Faulty engine stop switch • Faulty engine control module (ECM) • Faulty converter unit • Faulty ignition switch
Good spark		
3. Check the fuel injection system	Abnormal	• Faulty fuel injection system (section 5)
Normal		
4. Test cylinder compression	Low compression	• Valve stuck open • Worn cylinder and piston rings • Damaged cylinder head gasket • Seized valve • Improper valve timing
Normal compression		
5. Start by following normal procedure	Engine starts but stops	• Improper choke operation • Leaking throttle body insulator • Improper ignition timing (Faulty ECM or ignition pulse generator) • Contaminated fuel

ENGINE LACKS POWER

		Possible cause
1. Raise wheel off the ground and spin by hand Wheel spins freely	Wheel does not spin freely	• Brake dragging • Worn or damaged wheel bearings • Drive chain too tight
2. Check tire pressure Pressure normal	Pressure low	• Faulty tire valve • Punctured tire
3. Accelerate rapidly 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 increases	Engine speed does not increase	• Starter valve ON position (open) • Clogged air cleaner • Restricted fuel flow • Clogged muffler • Restricted fuel tank breather tube
5. Remove and inspect spark plugs Not fouled or discolored	Fouled or discolored	• Plugs not serviced frequentry enough • Incorrect spark plug used
6. Check oil level and condition Correct	Incorrect	• Oil level too high • Oil level too low • Contaminated oil
7. Check ignition timing Correct	Incorrect	• Faulty engine control module (ECM) • Faulty ignition pulse generator
8. Test cylinder compression Normal compression	Low compression	• Valve clearance too small • Worn cylinder and piston rings • Damaged cylinder head gasket • Improper valve timing
9. Check the fuel injection system Normal	Abnormal	• Faulty fuel injection system (section 5)

To page 21-3

From page 21-2

		Possible cause
10. Remove cylinder head cover and inspect lubrication	Valve train not lubricated properly	• Clogged oil passage
Valve train lubricated properly		
11. Check for engine overheating	Overheating	• Coolant level too low • Fan motor not working (Faulty fan motor or fan motor switch) • Thermostat stuck closed • Excessive carbon build-up in combustion chamber • Use of poor quality fuel • Clutch slipping • 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 too advance (Faulty ECM)
Engine does not knock		

POOR PERFORMANCE AT LOW AND IDLE SPEED

		Possible cause
1. Check for leaking throttle body insulator	Leaking	• Loose throttle body insulator bands • Damaged throttle body insulator
No leak		
2. Perform spark test	Weak or intermittent spark	• Faulty spark plug • Fouled spark plug • Loose or disconnected ignition system wires • Broken or shorted spark plug wire • Faulty ignition pulse generator • Faulty ignition coil • Faulty engine stop switch • Faulty engine control module (ECM) • Faulty converter unit • Faulty ignition switch
Good spark		
3. Check ignition timing	Incorrect	• Faulty engine control module (ECM) • Faulty ignition pulse generator
Correct		
4. Check the fuel injection system	Abnormal	• Faulty fuel injection system (section 5)

POOR PERFORMANCE AT HIGH SPEED

		Possible cause
1. Check ignition timing	Incorrect	• Faulty engine control module (ECM) • Faulty ignition pulse generator
Correct ↓		
2. Check the fuel injection system	Abnormal	• Faulty fuel injection system (section 5)
Normal ↓		
3. Check valve timing	Incorrect	• Camshafts not installed properly
Correct ↓		
4. Check valve spring	Weak	• Faulty valve spring
Not weak		

POOR HANDLING

	Possible cause
1. If steering is heavy	• Steering bearing adjustment nut too tight • Damaged steering head bearings
2. If either wheel is wobbling	• Excessive wheel bearing play • Bent rim • Improperly installed wheel hub • Excessively worn swingarm pivot bearings • Bent frame
3. If motorcycle pulls to one side	• Front and rear wheels not aligned • Bent fork • Bent swingarm • Bent axle • Bent frame

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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
E	U.K.
ED	European direct sales

CODE	AREA TYPE
F	France
U	Australia

23. VTR1000SP-2 (2) ADDENDUM

HOW TO USE THIS MANUAL

This addendum contains information for the VTR1000SP-2 (2). Refer to VTR1000SP (Y) SHOP MANUAL (No. 62MCF00) for service procedures and data not included in this addendum.

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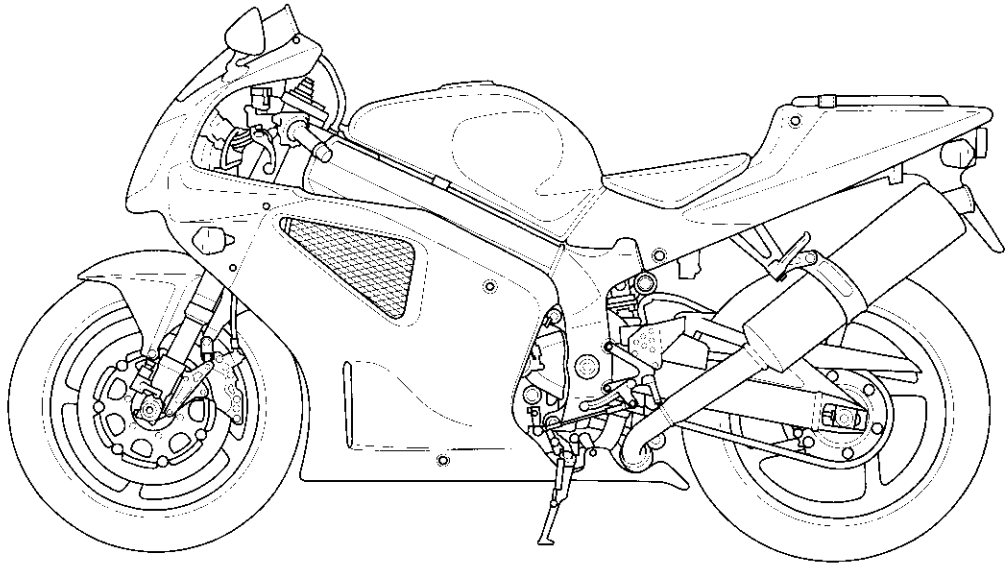
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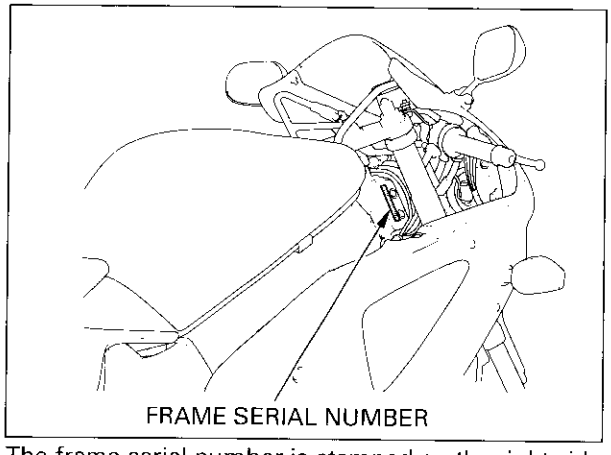
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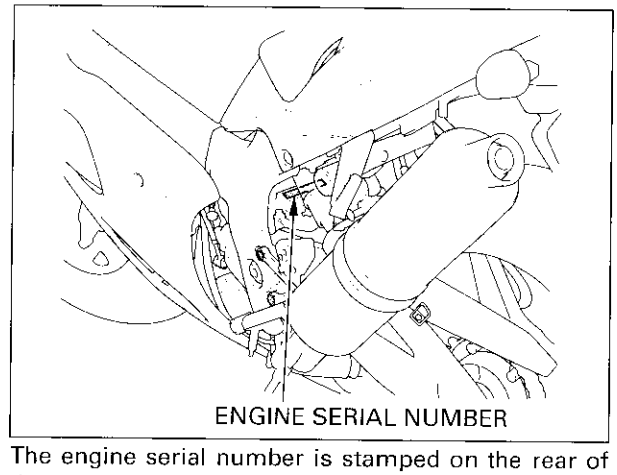
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MODEL IDENTIFICATION

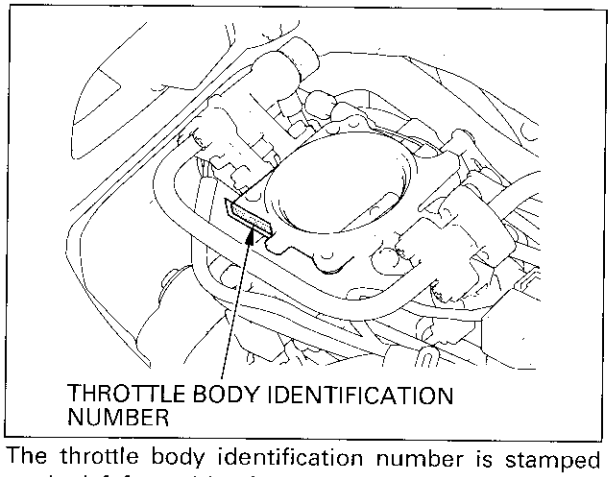




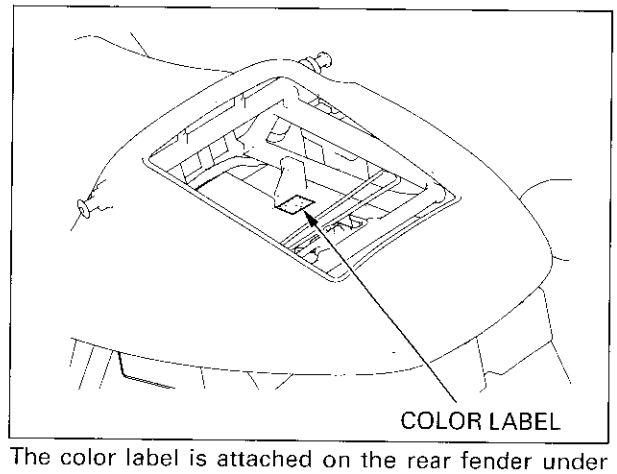
The frame serial number is stamped on the right side of the steering head.



The engine serial number is stamped on the rear of the upper crankcase.



The throttle body identification number is stamped on the left front side of the throttle body.



The color label is attached on the rear fender under the passenger seat. When ordering color-coded parts, always specify the designated color code.

SPECIFICATIONS

GENERAL

ITEM		SPECIFICATIONS
DIMENSIONS	Overall length	2,040 mm (80.3 in)
	Overall width	725 mm (28.5 in)
	Overall height	1,145 mm (45.1 in)
	Wheelbase	1,420 mm (55.9 in)
	Seat height	825 mm (32.5 in)
	Footpeg height	393 mm (15.5 in)
	Ground clearance	130 mm (5.1 in)
	Dry weight	194 kg (428 lbs)
	Curb weight	218 kg (481 lbs)
	Maximum weight capacity	180 kg (397 lbs)
FRAME	Frame type	Diamond
	Front suspension	Telescopic fork
	Front axle travel	119 mm (4.7 in)
	Front fork stroke	130 mm (5.1 in)
	Rear suspension	Swingarm
	Rear axle travel	126 mm (5.0 in)
	Front tire size	120/70ZR17M/C (58W)
	Rear tire size	190/50ZR17M/C (73W)
	Front tire brand	D208FN(DUNLOP), MEZ3H FRONT RACING(METZELER)
	Rear tire brand	D208N (DUNLOP), MEZ3H RACING(METZELER)
	Front brake	Hydraulic double disc
	Rear brake	Hydraulic single disc
	Caster angle	23°30′
	Trail length	95 mm (3.7 in)
	Fuel tank capacity	18.0 ℓ (4.76 US gal , 3.96 Imp gal)
ENGINE	Cylinder arrangement	2 cylinders 90° V transverse
	Bore and stroke	100.0 × 63.6 mm (3.90 × 2.50 in)
	Displacement	999 cm^3 (60.9 cu-in)
	Compression ratio	10.8 : 1
	Valve train	Gear driven, DOHC
	Intake valve opens	20° BTDC (At 1 mm lift)
	Intake valve closes	50° ABDC (At 1 mm lift)
	Exhaust valve opens	50° BBDC (At 1 mm lift)
	Exhaust valve closes	20° ATDC (At 1 mm lift)
	Lubrication system	Forced pressure and wet sump
	Oil pump type	Trochoid
	Cooling system	Liquid cooled
	Air filtration	Paper element
	Engine dry weight	70.5 kg (155.4 lbs)
	Firing order	Front—270°—Rear—450°—Front

GENERAL (Cont'd)

ITEM		SPECIFICATIONS
CARBURETION	Type	Programmed Fuel Injection (PGM-FI)
	Throttle bore	62 mm (2.4 in)
DRIVE TRAIN	Clutch system	Multi-plate, wet
	Clutch operation system	Hydraulic operating
	Transmission	Constant mesh, 6-speeds
	Primary reduction	1.700 (68/40)
	Final reduction	2.500 (40/16)
	Gear ratio 1st	2.461 (32/13)
	2nd	1.812 (29/16)
	3rd	1.428 (30/21)
	4th	1.240 (31/25)
	5th	1.080 (27/25)
	6th	0.962 (25/26)
	Gearshift pattern	Left foot operated return system, 1—N—2—3—4—5—6
ELECTRICAL	Ignition system	Computer-controlled digital transitorized
	Starting system	Electric starter motor
	Charging system	Triple phase output alternator
	Regulator/rectifier	SCR shorted, triple phase full wave rectification
	Lighting system	Battery

LUBRICATION

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	3.5 ℓ (3.7 US qt , 3.1 Imp qt)	—
	After draining/filter change	3.9 ℓ (4.1 US qt , 3.4 Imp qt)	—
	After disassembly	4.3 ℓ (4.5 US qt , 3.8 Imp qt)	—
Recommended engine oil		Honda 4-stroke oil or equivalent motor oil API service classification SE, SF or SG Viscosity: SAE 10W-40	—
Oil pressure (at oil filter)		431 kPa (4.4 kgf/cm², 63 psi) at 5,000 min⁻¹ (rpm)/80°C (176°F)	
Oil pump	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.21 (0.006 – 0.008)	0.35 (0.014)
	Side clearance	0.02 – 0.09 (0.001 – 0.004)	0.12 (0.005)

FUEL SYSTEM (Programmed Fuel Injection)

ITEM	SPECIFICATIONS
Throttle body identification number	GQ76A
Base starter valve for synchronization	Rear
Idle speed	1,300 ± 100 min⁻¹ (rpm)
Throttle grip free play	2 – 6 (1/16 – 1/4)
Intake air temperature sensor resistance (at 20°C/68°F)	1 – 4 kΩ
Engine coolant temperature sensor resistance (at 20°C/68°F)	2.3 – 2.6 kΩ
Fuel injector resistance (at 20°C/68°F)	11.1 – 12.3 Ω
Cam pulse generator peak voltage	0.7 V minimum
Ignition pulse generator peak voltage	0.7 V minimum
Manifold absolute pressure at idle	200 – 250 mm Hg (7.9 – 9.8 in Hg)
Fuel pressure at idle	343 kPa (3.5 kgf/cm², 50 psi)
Fuel pump flow (at 12 V)	190 cm³ (6.4 US oz , 6.7 Imp oz) minimum/10 seconds

COOLING SYSTEM

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	2.9 ℓ (3.1 US qt , 2.6 Imp qt)
	Reserve tank	0.43 ℓ (0.45 US qt , 0.38 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/VALVE

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression at 350 min^{-1} (rpm)			1,216 kPa (12.4 kgf/cm^2, 176 psi)	———
Valve clearance		IN	0.16 (0.006)	———
		EX	0.31 (0.012)	———
Camshaft	Cam lobe height	IN	39.180 – 39.340 (1.5425 – 1.5488)	38.880 (1.5307)
		EX	38.730 – 38.890 (1.5248 – 1.5311)	38.430 (1.5130)
	Runout		———	0.05 (0.002)
	Oil clearance		0.020 – 0.062 (0.0008 – 0.0024)	0.100 (0.0039)
Valve lifter	Valve lifter O.D.		33.978 – 33.993 (1.3377 – 1.3383)	33.97 (1.337)
	Valve lifter bore I.D.		34.010 – 34.026 (1.3390 – 1.3396)	34.04 (1.340)
Valve, Valve guide	Valve stem O.D.	IN	5.975 – 5.990 (0.2352 – 0.2358)	5.965 (0.2348)
		EX	5.965 – 5.980 (0.2348 – 0.2354)	5.955 (0.2344)
	Valve guide I.D.	IN/EX	6.000 – 6.012 (0.2362 – 0.2367)	6.040 (0.2378)
	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		14.0 – 14.2 (0.55 – 0.56)	———
	Valve seat width	IN	1.1 – 1.3 (0.04 – 0.05)	1.7 (0.07)
		EX	1.3 – 1.5 (0.05 – 0.06)	1.9 (0.07)
Valve spring	Free length	Inner	41.0 (1.61)	40.0 (1.57)
		Outer	45.8 (1.80)	44.8 (1.76)
Cylinder head warpage			———	0.10 (0.004)

CLUTCH/GEARSHIFT LINKAGE

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Specified clutch fluid		DOT 4 brake fluid	———
Clutch master cylinder	Cylinder I.D.	12.700 – 12.743 (0.5000 – 0.5017)	12.755 (0.5022)
	Piston O.D.	12.657 – 12.684 (0.4983 – 0.4994)	12.645 (0.4978)
Clutch	Spring free length	60.9 (2.40)	57.9 (2.28)
	Disc thickness	3.72 – 3.88 (0.146 – 0.153)	3.5 (0.14)
	Plate warpage	———	0.30 (0.012)
Clutch outer guide	I.D.	28.000 – 28.021 (1.1024 – 1.1032)	28.031 (1.1036)
	O.D.	34.997 – 35.013 (1.3778 – 1.3785)	34.987 (1.3774)
Mainshaft O.D. at clutch outer guide		27.980 – 27.993 (1.1016 – 1.1021)	27.970 (1.1012)

ALTERNATOR/STARTER CLUTCH

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter driven gear boss O.D.	57.749 – 57.768 (2.2736 – 2.2743)	57.639 (2.2692)
Torque limiter slip torque	53 – 84 N·m (5.4 – 8.6 kgf·m, 39 – 62 lbf·ft)	———

CRANKCASE/TRANSMISSION

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Shift fork	I.D.	Left, Right	12.000 – 12.021 (0.4724 – 0.4733)	12.03 (0.474)
		Center	12.000 – 12.018 (0.4724 – 0.4731)	12.03 (0.474)
	Claw thickness		5.93 – 6.00 (0.233 – 0.236)	5.9 (0.23)
Shift fork shaft	O.D.		11.957 – 11.968 (0.4707 – 0.4712)	11.95 (0.470)
Transmission	Gear I.D.	M5	31.000 – 31.025 (1.2205 – 1.2215)	31.05 (1.222)
		M6	31.000 – 31.016 (1.2205 – 1.2211)	31.04 (1.222)
		C2, C3, C4	33.000 – 33.025 (1.2992 – 1.3002)	33.05 (1.301)
	Gear bushing O.D.	M5, M6	30.955 – 30.980 (1.2187 – 1.2197)	30.93 (1.218)
		C2	32.955 – 32.980 (1.2974 – 1.2984)	32.93 (1.296)
		C3, C4	32.950 – 32.975 (1.2972 – 1.2982)	32.93 (1.296)
	Gear-to-bushing clearance	M5	0.020 – 0.070 (0.0008 – 0.0028)	0.11 (0.004)
		M6	0.020 – 0.061 (0.0008 – 0.0024)	0.10 (0.004)
		C2	0.020 – 0.070 (0.0008 – 0.0028)	0.11 (0.004)
		C3, C4	0.025 – 0.075 (0.0010 – 0.0030)	0.11 (0.004)
	Gear bushing I.D.	M5	27.985 – 28.006 (1.1018 – 1.1026)	28.02 (1.103)
		C2	29.985 – 30.006 (1.1805 – 1.1813)	30.02 (1.182)
	Mainshaft O.D.	at M5	27.967 – 27.980 (1.1011 – 1.1016)	27.94 (1.100)
	Countershaft O.D.	at C2	29.950 – 29.975 (1.1791 – 1.1801)	29.92 (1.178)
	Bushing-to-shaft clearance	M5	0.005 – 0.039 (0.0002 – 0.0015)	0.06 (0.002)
		C2	0.010 – 0.056 (0.0004 – 0.0022)	0.06 (0.002)

CRANKSHAFT/PISTON/CYLINDER

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod side clearance		0.10 – 0.30 (0.004 – 0.012)	0.40 (0.016)
	Crankpin bearing oil clearance		0.032 – 0.050 (0.0013 – 0.0020)	0.060 (0.0024)
	Main journal bearing oil clearance		0.020 – 0.038 (0.0008 – 0.0015)	0.048 (0.0019)
	Runout		—	0.10 (0.004)
Piston, piston pin, piston ring	Piston O.D. at 10 (0.4) form bottom		99.970 – 99.990 (3.9358 – 3.9366)	99.900 (3.9331)
	Piston pin hole I.D.		23.002 – 23.008 (0.9056 – 0.9058)	23.03 (0.907)
	Piston pin O.D.		22.994 – 23.000 (0.9053 – 0.9055)	22.984 (0.9049)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.046 (0.0018)
	Piston rig end gap	Top	0.20 – 0.30 (0.008 – 0.012)	0.45 (0.018)
		Second	0.30 – 0.40 (0.012 – 0.016)	0.55 (0.022)
		Oil (side rail)	0.10 – 0.50 (0.004 – 0.020)	0.65 (0.026)
	Piston ring-to-ring groove clearance	Top	0.065 – 0.100 (0.0026 – 0.0039)	0.115 (0.0045)
		Second	0.035 – 0.070 (0.0014 – 0.0028)	0.085 (0.0033)
Cylinder	I.D.		100.005 – 100.025 (3.9372 – 3.9380)	100.100 (3.9409)
	Out of round		—	0.10 (0.004)
	Taper		—	0.10 (0.004)
	Warpage		—	0.05 (0.002)
Cylinder-to-piston clearance			0.015 – 0.055 (0.0006 – 0.0022)	0.200 (0.0079)
Connecting rod small end I.D.			23.020 – 23.041 (0.9063 – 0.9071)	23.051 (0.9075)
Connecting rod-to-piston pin clearance			0.020 – 0.047 (0.0008 – 0.0019)	0.067 (0.0026)

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)
Wheel balance weight			60 g (2.1 oz) max.
Fork	Spring free length	249.2 (9.81)	244.2 (9.61)
	Tube runout		0.20 (0.008)
	Recommended fluid	Pro Honda suspension fluid SS-8	
	Fluid level	135 (5.3)	
	Fluid capacity	498 ± 2.5 cm³ (16.8 ± 0.08 US oz, 17.6 ± 0.09 Imp oz)	
Steering head bearing preload		1.4–2.1 kgf (3.1–4.6 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)
Wheel balance weight				60 g (2.1 oz)max.
Drive chain	Links		106 links	
	Brand	DID	50VA8 C1–106YB	
		RK	GN50 HFOZ5–106LJF	

HYDRAULIC BRAKE

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Front	Specified brake fluid		DOT 4	
	Brake disc thickness		4.9–5.1 (0.19 0.20)	4.0 (0.16)
	Brake disc runout			0.30 (0.012)
	Master cylinder I.D.		17.460–17.503 (0.6874 0.6891)	17.515 (0.6896)
	Master piston O.D.		17.321–17.367 (0.6819–0.6837)	17.309 (0.6815)
	Caliper cylinder I.D.	A	32.030 32.080 (1.2610–1.2630)	32.092 (1.2635)
		B	30.230–30.280 (1.1902 1.1921)	30.292 (1.1926)
	Caliper piston O.D.	A	31.965–31.998 (1.2585–1.2598)	31.953 (1.2580)
		B	30.165 30.198 (1.1876–1.1889)	30.153 (1.1871)
Rear	Specified brake fluid		DOT 4	
	Brake disc thickness		4.8 5.2 (0.19 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		12 V - 10 AH
	Current leakage		0.1 mA max.
	Voltage (20°C/68°F)	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.3 V
	Charging current	Normal	1.2 A × 5 – 10 h
		Quick	5.0 A × 1.0 h
Alternator	Capacity		0.329 kW/5,000 min^{-1} (rpm)
	Charging coil resistance (20°C/68°F)		0.2 – 0.5 Ω

IGNITION SYSTEM

ITEM		SPECIFICATIONS
Spark plug	Standard	IFR9H-11 (NGK) , VK27PRZ (DENSO)
	For cold climate (below 5°C/41°F)	IFR8H-11 (NGK) , VK24PRZ (DENSO)
Spark plug gap		1.00 – 1.10 mm (0.039 - 0.043 in)
Ignition coil primary peak voltage		100 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Ignition timing ("F" mark)		15° BTDC at idle

ELECTRIC STARTER

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	12.0 – 13.0 (0.47 – 0.51)	6.5 (0.26)

LIGHTS/METERS/SWITCHES

ITEM		SPECIFICATIONS
Bulbs	Headlight (High beam)	12 V 55 W
	Headlight (Low beam)	12 V−55 W
	Position light	12 V−5 W × 2
	Brake/taillight	12 V−21/5 W × 2
	Turn signal light	12 V−21 W × 4
Fuse	Main fuse	30 A
	FI fuse	30 A
	Sub-fuse	10 A × 4, 20 A × 2
Thermosensor resistance	At 80°C (176°F)	47 57 Ω
	At 120°C (248°F)	14−18 Ω
ECT sensor resistance	At 80°C (176°F)	310−326 Ω
Pink/White−Green/Orange	At 110°C (230°F)	139.9−143.5 Ω

TORQUE VALUES

STANDARD

FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)	FASTENER TYPE	TORQUE N·m (kgf·m, lbf·ft)
5 mm bolt and nut	5 (0.5 , 3.6)	5 mm screw	4 (0.4 , 2.9)
6 mm bolt and nut	10 (1.0 , 7)	6 mm screw	9 (0.9 , 6.5)
8 mm bolt and nut	22 (2.2 , 16)	6 mm flange bolt (8 mm head, small flange)	10 (1.0 , 7)
10 mm bolt and nut	34 (3.5 , 25)	6 mm flange bolt (8 mm head, large flange)	12 (1.2 , 9)
12 mm bolt and nut	54 (5.5 , 40)	6 mm flange bolt (10 mm head) and nut	12 (1.2 , 9)
		8 mm flange bolt and nut Engine	23 (2.3 , 17)
		Frame	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 locking agent to the threads.
3. Plastic region torque bolt; replace with a new one
4. Stake.
5. Apply oil to the threads and seating surface.
6. Apply oil to the O-ring.
7. U-nut.
8. ALOC bolt/screw: replace with a new one.
9. Apply grease to the threads.
10. Torx bolt.

ENGINE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
MAINTENANCE:				
Spark plug	2	14	18 (1.8 , 13)	
Crankshaft hole cap	1	30	15 (1.5 , 11)	NOTE 9
Timing hole cap	1	14	10 (1.0 , 7)	NOTE 9
Engine oil filter cartridge	1	20	26 (2.7 , 20)	NOTE 5, 6
Engine oil drain bolt	1	12	30 (3.1 , 22)	
LUBRICATION SYSTEM:				
Oil pump bolt	1	6	8 (0.8 , 5.8)	
FUEL SYSTEM (Programmed Fuel Injection):				
Throttle body insulator band bolt	4	5	1 (0.1 , 0.7)	
PAIR check valve cover bolt	4	5	5 (0.5 , 3.6)	NOTE 2
Pressure regulator nut	1	18	27 (2.8 , 20)	
Pipe stay bolt	8	5	5 (0.5 , 3.6)	
Fuel feed pipe bolt	12	5	5 (0.5 , 3.6)	
Starter valve nut	2	10	2 (0.2 , 1.4)	
Throttle stop screw cable stay screw	2	4	2 (0.2 , 1.4)	
MAP sensor stay screw	2	5	2.1 (0.21 , 1.5)	
Throttle cable stay screw	2	5	3 (0.3 , 2.2)	
ENGINE MOUNTING:				
Drive sprocket bolt	1	10	54 (5.5 , 40)	
CYLINDER HEAD/VALVE:				
Cylinder head cover bolt	6	6	10 (1.0 , 7)	
Camshaft holder bolt	16	7	23 (2.3 , 17)*	NOTE 5
Cylinder head bolt	8	11	64 (6.5 , 47)	NOTE 5
Cam gear train setting bolt	2	8	25 (2.5 , 18)	
Cam gear train mounting bolt	8	6	12 (1.2 , 9)	
Cylinder head sealing bolt	2	14	18 (1.8 , 13)	NOTE 2

*Torque for new bolt; 70 N·m (7.1 kgf·m , 51 lbf·ft) for used bolt.

ENGINE (Cont'd)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
CLUTCH/GEARSHIFT LINKAGE:				
Clutch slave cylinder bleed valve	1	8	9 (0.9 , 6.5)	
Clutch bolt	6	6	12 (1.2 , 9)	
Clutch center lock nut	1	25	127 (13.0 , 94)	NOTE 4, 5
Oil pump driven sprocket bolt	1	6	15 (1.5 , 11)	NOTE 2
Gearshift cam bolt	1	8	23 (2.3 , 17)	NOTE 2
Shift drum stopper arm pivot bolt	1	6	12 (1.2 , 9)	
Gearshift spindle return spring pin	1	8	23 (2.3 , 17)	
Primary drive gear bolt	1	12	88 (9.0 , 65)	NOTE 5
Right crankcase cover sealing bolt	1	8	23 (2.3 , 17)	NOTE 2
Clutch cover plate bolt	1	6	12 (1.2 , 9)	NOTE 2
ALTERNATOR/STARTER CLUTCH:				
Flywheel bolt	1	12	157 (16.0 , 116)	NOTE 5
Starter clutch bolt	6	8	23 (2.3 , 17)	NOTE 2
Alternator stator bolt	3	6	12 (1.2 , 9)	
CRANKCASE/TRANSMISSION:				
Crankcase flange bolt	3	10	39 (4.0 , 29)	NOTE 5
Crankcase special bolt (black)	4	10	52 (5.3 , 38)	NOTE 5
Crankcase special bolt (gray)	4	10	20 (2.0 , 14) + 120°	NOTE 3, 5
Shift drum bearing washer/bolt	2	6	12 (1.2 , 9)	NOTE 2
Crankcase sealing bolt	1	14	18 (1.8 , 13)	NOTE 2
CRANKSHAFT/PISTON/CYLINDER:				
Connecting rod bolt	4	9	29 (3.0 , 22) + 120°	NOTE 3, 5
Oil jet	2	5	2 (0.2 , 1.4)	NOTE 2
IGNITION SYSTEM:				
Ignition pulse generator bolt	2	6	12 (1.2 , 9)	NOTE 2
ELECTRIC STARTER:				
Starter motor terminal nut	1	6	10 (1.0 , 7)	
LIGHTS/METERS/SWITCHES:				
Neutral switch	1	10	12 (1.2 , 9)	
Engine coolant temperature (ECT)/thermosensor	1	12	23 (2.3 , 17)	
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)	

FRAME

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
FRAME/BODY PANELS/EXHAUST SYSTEM:				
Lower fairing-to-upper fairing bolt	6	5	1.5 (0.15 , 1.1)	
Lower inner fairing-to-lower fairing bolt	2	5	1.5 (0.15 , 1.1)	
Wind screen attaching screw	6	5	0.4 (0.04 , 0.3)	
Exhaust pipe joint nut	4	7	12 (1.2 , 9)	
Muffler band bolt	4	8	26 (2.7 , 20)	
Driver footpeg bracket bolt	4	8	26 (2.7 , 20)	
Passenger footpeg bracket bolt	4	8	26 (2.7 , 20)	
Seat rail mounting bolt	4	10	44 (4.5 , 33)	NOTE 10
FUEL SYSTEM:				
Fuel feed hose banjo bolt	1	12	22 (2.2 , 16)	
Fuel feed hose nut	1	12	22 (2.2 , 16)	
Fuel pump unit mounting nut	7	6	12 (1.2 , 9)	
Fuel fill cap mounting bolt	3	4	1.8 (0.18 , 1.3)	
Air cleaner cover screw	7	—	1.1 (0.11 , 0.8)	
ENGINE MOUNTING:				
Center engine hanger bolt	2	12	64 (6.5 , 47)	
Front/rear upper engine hanger nut	2	12	64 (6.5 , 47)	
Rear lower engine hanger nut	1	10	39 (4.0 , 29)	
CLUTCH/GEARSHIFT LINKAGE:				
Clutch reservoir mounting screw	1	4	2 (0.2 , 1.4)	NOTE 2
Clutch reservoir cap stopper plate screw	1	4	1 (0.1 , 0.7)	
Clutch lever pivot bolt	1	6	1 (0.1 , 0.7)	
Clutch lever pivot nut	1	6	6 (0.6 , 4.3)	
Clutch hose oil bolt	2	10	34 (3.5 , 25)	
FRONT WHEEL/SUSPENSION/STEERING:				
Handlebar weight mounting screw	2	6	10 (1.0 , 7)	NOTE 8
Front axle bolt	1	14	59 (6.0 , 43)	
Front axle holder bolt	4	8	22 (2.2 , 16)	
Front brake disc bolt	12	6	20 (2.0 , 14)	NOTE 8
Fork cap	2	46	34 (3.5 , 25)	
Fork center bolt	2	22	34 (3.5 , 25)	
Fork top bridge pinch bolt	2	8	26 (2.7 , 20)	
Fork bottom bridge pinch bolt	4	8	26 (2.7 , 20)	
Front brake hose clamp nut (front fender side)	2	6	10 (1.0 , 7)	
Front brake caliper bracket bolt	4	10	49 (5.0 , 36)	NOTE 2
Steering stem nut	1	33	137 (14.0 , 101)	Page 23-73
Steering bearing adjustment nut	1	35	52 (5.3 , 38)	
Steering bearing adjustment nut lock nut	1	35		
Front brake hose clamp bolt (stem side)	1	6	10 (1.0 , 7)	
Front brake hose 3-way joint bolt	1	6	10 (1.0 , 7)	
REAR WHEEL/SUSPENSION:				
Rear axle nut	1	22	127 (13.0 , 94)	
Rear brake disc bolt	4	8	42 (4.3 , 31)	NOTE 8
Final driven sprocket nut	6	10	64 (6.5 , 47)	
Shock absorber upper mounting nut	1	10	44 (4.5 , 33)	NOTE 7
Shock absorber lower mounting nut	1	10	44 (4.5 , 33)	NOTE 7
Shock arm-to-swingarm nut	1	10	44 (4.5 , 33)	NOTE 7
Shock arm-to-shock link nut	1	10	44 (4.5 , 33)	NOTE 7
Shock link-to-frame nut	1	10	44 (4.5 , 33)	NOTE 7
Swingarm pivot adjusting bolt	2	36	15 (1.5 , 11)	
Swingarm pivot adjusting bolt lock nut	2	36	64 (6.5 , 47)	
Swingarm pivot nut	1	18	93 (9.5 , 69)	NOTE 7
Drive chain slider bolt	2	6	9 (0.9 , 6.5)	NOTE 2
Rear brake hose clamp screw	1	6	4.2 (0.43 , 3.1)	NOTE 2

FRAME (Cont'd)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
HYDRAULIC BRAKE:				
Brake caliper bleed valve	3	8	6 (0.6 , 4.3)	
Rear brake reservoir cap screw	2	4	2 (0.2 , 1.4)	
Rear brake caliper pad pin plug	1	10	2.5 (0.25 , 1.8)	
Pad pin	3	10	18 (1.8 , 13)	
Brake hose oil bolt	5	10	34 (3.5 , 25)	
Front brake lever pivot bolt	1	6	1 (0.1 , 0.7)	
Front brake lever pivot nut	1	6	6 (0.6 , 4.3)	
Front brake reservoir mounting nut	1	6	6 (0.6 , 4.3)	NOTE 7
Front brake reservoir stay bolt	1	6	12 (1.2 , 9)	
Front brake light switch screw	1	4	1.2 (0.12 , 0.9)	
Front master cylinder holder bolt	2	6	12 (1.2 , 9)	
Rear brake reservoir mounting bolt	1	6	9 (0.9 , 6.5)	
Rear master cylinder mounting bolt	2	6	10 (1.0 , 7)	
Rear master cylinder joint nut	1	8	18 (1.8 , 13)	
Rear brake reservoir hose joint screw	1	4	1.5 (0.15 , 1.1)	NOTE 2
Front brake caliper mounting bolt	4	8	30 (3.1 , 22)	NOTE 2
Front brake caliper assembly bolt	8	8	23 (2.3 , 17)	NOTE 2
Rear brake caliper bolt	1	8	23 (2.3 , 17)	
Rear brake caliper pin bolt	1	12	27 (2.8 , 20)	
LIGHTS/METERS/SWITCHES:				
Side stand switch bolt	1	6	10 (1.0 , 7)	
Ignition switch mounting bolt	2	8	25 (2.5 , 18)	
Fan motor switch	1	16	18 (1.8 , 13)	
OTHERS:				
Side stand pivot bolt	1	10	10 (1.0 , 7)	
Side stand pivot lock nut	1	10	29 (3.0 , 22)	
Side stand bracket bolt	2	10	44 (4.5 , 33)	NOTE 8
Bank sensor bolt	2	6	10 (1.0 , 7)	
Gearshift pedal pivot bolt	1	8	26 (2.7 , 20)	
Rear shock absorber upper mounting bracket nut	1	16	93 (9.5 , 69)	NOTE 7

TOOLS

DESCRIPTION	TOOL NUMBER	REF. SECTION
Fuel pressure gauge	07406-0040003	5
Oil pressure gauge	07506-3000001	4
Oil pressure gauge attachment	07510-4220100	4
Gear holder	07724-0010100	9
Flywheel holder	07725-0040000	10
Rotor puller	07733-0020001	10
Bearing remover weight	07741-0010201	10, 14
Clutch center holder	07724-0050002	9
Valve guide driver	07743-0020000	8
Attachment, 32 × 35 mm	07746-0010100	9, 23
Attachment, 37 × 40 mm	07746-0010200	9, 14, 23
Attachment, 42 × 47 mm	07746-0010300	9, 13, 14
Attachment, 52 × 55 mm	07746-0010400	14
Attachment, 24 × 26 mm	07746-0010700	10, 14
Attachment, 22 × 24 mm	07746-0010800	14
Attachment, 40 × 42 mm	07746-0010900	14
Inner driver	07746-0030100	11
Attachment, 30 mm I.D.	07746-0030300	11
Attachment, 35 mm I.D.	07746-0030400	13
Pilot, 10 mm	07746-0040100	10
Pilot, 17 mm	07746-0040400	9, 14
Pilot, 20 mm	07746-0040500	23
Pilot, 25 mm	07746-0040600	14
Pilot, 35 mm	07746-0040800	9
Pilot, 22 mm	07746-0041000	13
Pilot, 28 mm	07746-0041100	23
Bearing remover shaft	07746-0050100	13, 14
Bearing remover head, 22 mm	07746-0050700	13
Bearing remover head, 25 mm	07746-0050800	14
Driver	07749-0010000	9, 10, 13, 14, 23
Valve spring compressor	07757-0010000	8
Valve seat cutter, 35 mm (EX 45°)	07780-0010400	8
Valve seat cutter, 42 mm (IN 45°)	07780-0010900	8
Flat cutter, 42 mm (IN 32°)	07780-0013000	8
Flat cutter, 36 mm (EX 32°)	07780-0013500	8
Interior cutter, 37.5 mm (EX 60°)	07780-0014100	8
Interior cutter, 42 mm (IN 60°)	07780-0014400	8
Snap ring pliers	07914-SA50001	9, 15
Bearing remover handle	07936-3710100	14
Bearing remover, 17 mm	07936-3710300	14
Bearing remover shaft	07936-GE00100	10
Bearing remover head, 10 mm	07936-GE00200	10
Valve guide remover	07942-6570100	8
Attachment, 28 × 30 mm	07946-1870100	23
Driver shaft assembly	07946-KM90300	13, 23
Assembly base	07946-KM90600	13, 23
Driver	07949-3710001	14
Socket wrench, 39 × 41 mm	07GMA-KS40100	23
Oil filter wrench	07HAA-PJ70101	3, 4
Peak voltage adaptor	07HGJ-0020100	5, 17, 19, 23
Lock nut wrench	07HMA-MR70100	23
Driver chain tool set	07HMH-MR10103	3
Pilot, 32 mm	07MAD-PR90200	14

DESCRIPTION	TOOL NUMBER	REF. SECTION
Race remover attachment	07NMF-MT70110	13, 23
Driver attachment	07NMF-MT70120	13, 23 (two required)
Fork rod holder handle	07TMB-001010A	13
Cutter holder, 6 mm	07VMH-MBB0100	8
Valve guide reamer	07VMH-MBB0200	8
Inspection adaptor	07VMJ-0020100	17
Lock nut wrench	07YMA-MCF0100	7, 14, 23
Fork damper holder attachment	07YMB-MCF0101	13
Fork seal driver	07YMD-MCF0100	13
ECM test harness	07YMZ-0010100	5

LUBRICATION & SEAL POINTS

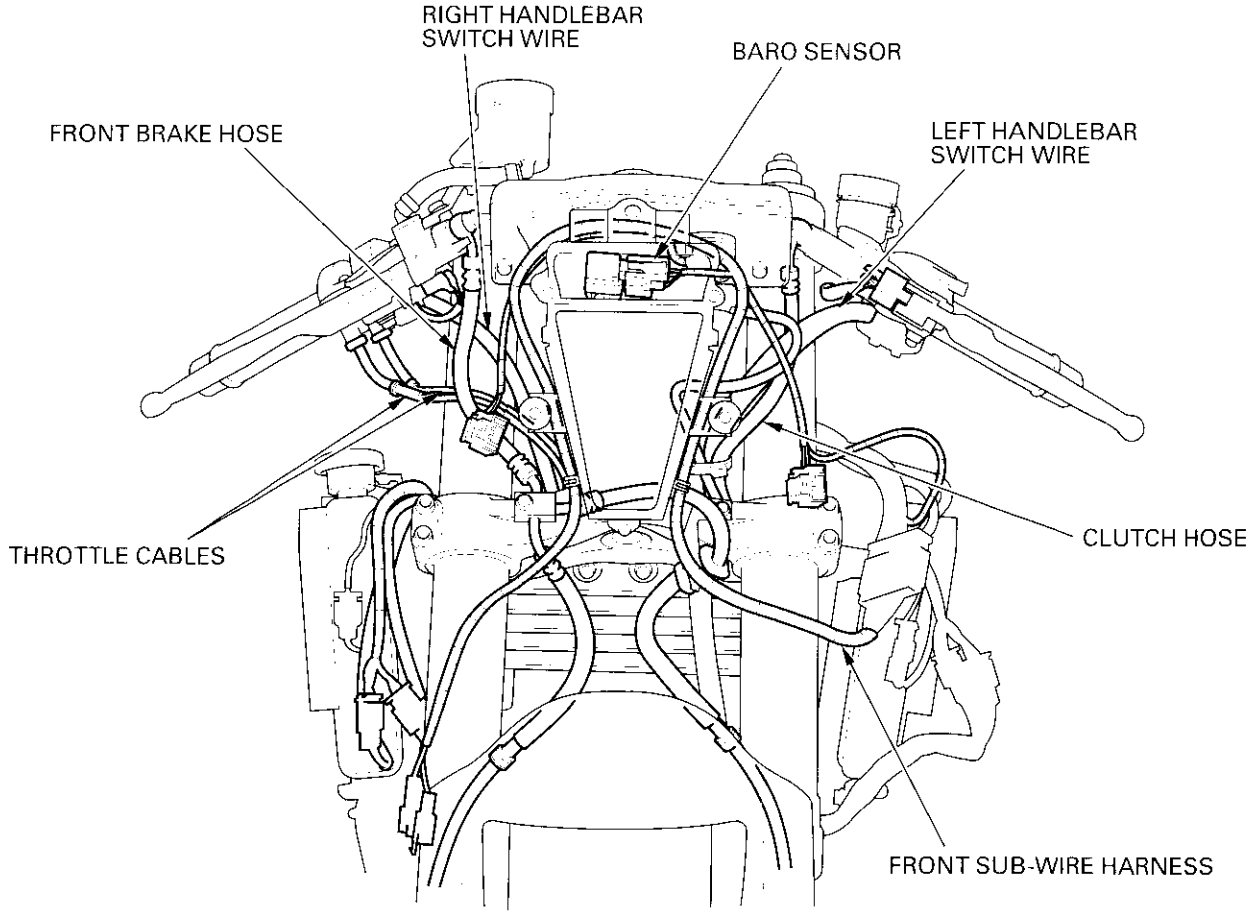
ENGINE

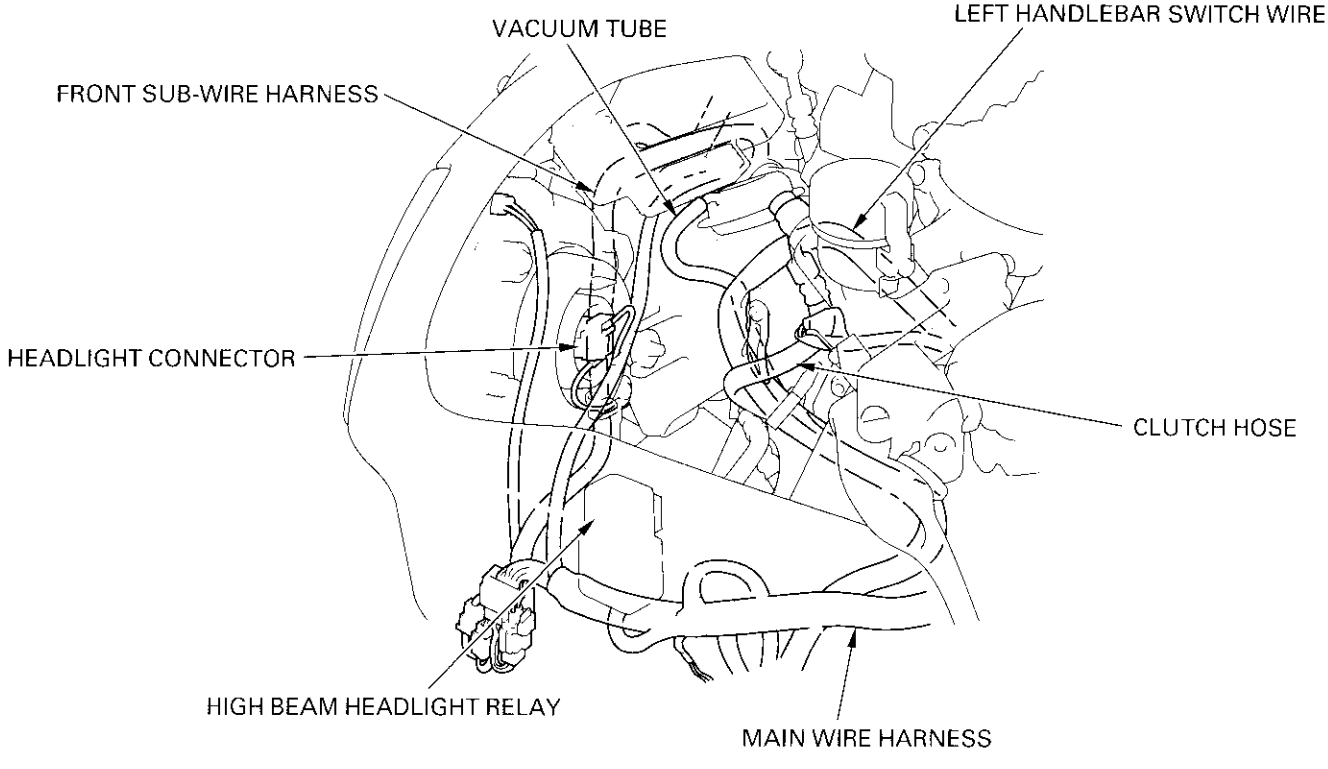
LOCATION	MATERIAL	REMARKS
Crankcase mating surfaces	Sealant	See page 11-9
Right crankcase cover mating surfaces		See page 6-13
Crankcase mating surfaces (left side)		See page 10-3
Oil pan mating surface		
Cylinder head semi-circular area		
Cylinder head cover gasket mating surface (cover side)		
Oil pressure switch threads		Do not apply to the sensor head.
Ignition pulse generator wire grommet seating surface		
Alternator stator wire grommet seating surface		
Crankshaft main journal bearing sliding surface	Molybdenum oil solution (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease)	
Crankpin bearing sliding surface		
Connecting rod small end inner surface		
Valve stem sliding surface		
Valve lifer outer surface		
Camshaft journals and cam lobes		
Clutch outer sliding surface		
M3/4, C5, C6 gear shift fork grooves		
Primary drive gear and sub gear sliding surface		
Piston pin		
Piston pin holes		
Each gear teeth and sliding surface		
Other rotating and sliding area		
Engine oil filter cartridge threads and seating surface	Engine oil	
Camshaft holder bolt threads and seating surface		
Cylinder head bolt threads and seating surface		
Clutch disc lining surface		
Clutch center lock nut threads and seating surface		
Primary drive gear bolt threads and seating surface		
Piston outer surface		
Piston ring whole surface		
Connecting rod bolt threads and seating surface		
Flywheel bolt threads and seating surface		
10 mm crankcase bolt threads and seating surface		
Each bearing rotating area		
Each O-ring whole surface		
Timing hole cap threads	Multi-purpose grease	
Crankshaft hole cap threads		
Each oil seal lips		
Reed valve cover bolt threads	Locking agent	
Oil filter boss threads		
Cylinder head 14 mm sealing bolt threads		
Oil pump driven sprocket bolt threads		
Gearshift cam bolt threads		
Right crankcase cover sealing bolt threads		
Clutch cover plate bolt threads		
Starter clutch bolt threads		
Ignition pulse generator bolt threads		
Alternator wire clamp bolt threads		
Crankcase 14 mm sealing bolt threads		
Mainshaft bearing set plate bolt threads		
Shift drum bearing washer/bolt threads		
Oil jet threads		

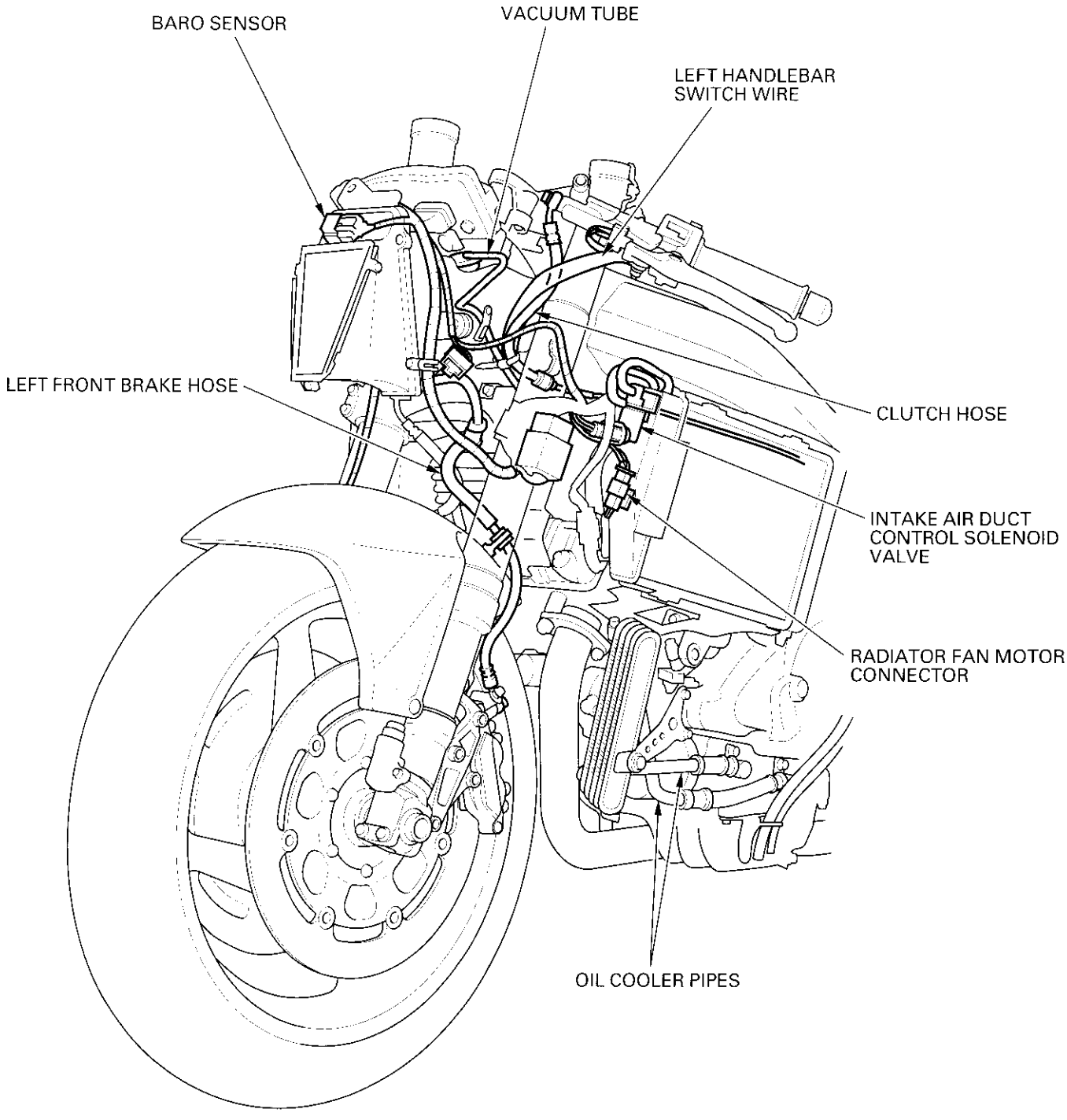
FRAME

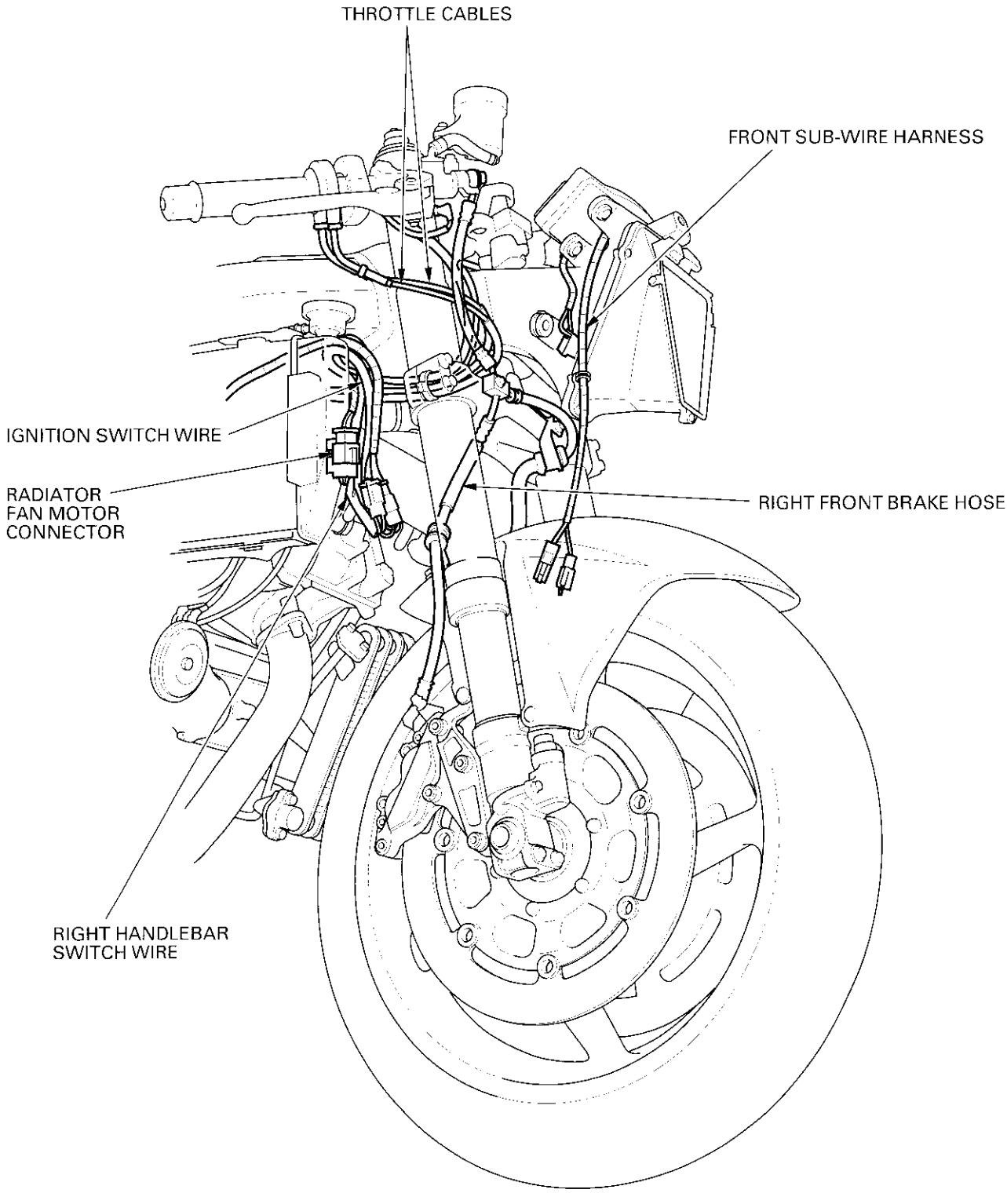
LOCATION	MATERIAL	REMARKS
Side stand pivot Driver footpeg sliding area Passenger footpeg sliding area Throttle grip pipe flange Seat catch hook sliding area Gearshift pedal link tie-rod ball joints Gearshift pedal pivot Rear brake pedal pivot Front wheel dust seal lips Rear wheel dust seal lips Rear wheel side collar inner surfaces	Multi-purpose grease	
Steering head bearings Steering head bearing dust seal lips	Extreme pressure agent mixed water resistant urea grease	
Shock arm and link dust seal lips Shock arm and link needle bearings Swingarm pivot bearings Swingarm pivot dust seal lips	Extreme pressure agent mixed grease	
Throttle cable outer inside Choke cable outer inside	Cable lubricant	
Handlebar grip rubber inside	Honda bond A or equivalent	
Steering bearing adjustment nut threads	Engine oil	
Clutch lever pivot Clutch lever joint piece-to-push rod contacting area Clutch master piston-to-push rod contacting area Front brake lever-to-master piston contacting area Front brake lever pivot Rear brake caliper pin bolt sliding surfaces Rear brake master piston-to-push rod contacting area	Silicone grease	
Clutch master piston and cups Brake master piston and cups Brake caliper piston and piston seals	DOT 4 brake fluid	
Fork dust seal and oil seal lips	Fork fluid	
Oil hose joint bolt threads Oil pipe joint bolt threads Clutch fluid reservoir mounting screw threads Front brake caliper bracket bolt threads Drive chain slider bolt threads Rear brake hose clamp bolt threads Rear brake reservoir hose joint screw threads Front brake caliper assembly bolt threads Front brake caliper mounting bolt threads Caliper bracket retainer seating surface	Locking agent	

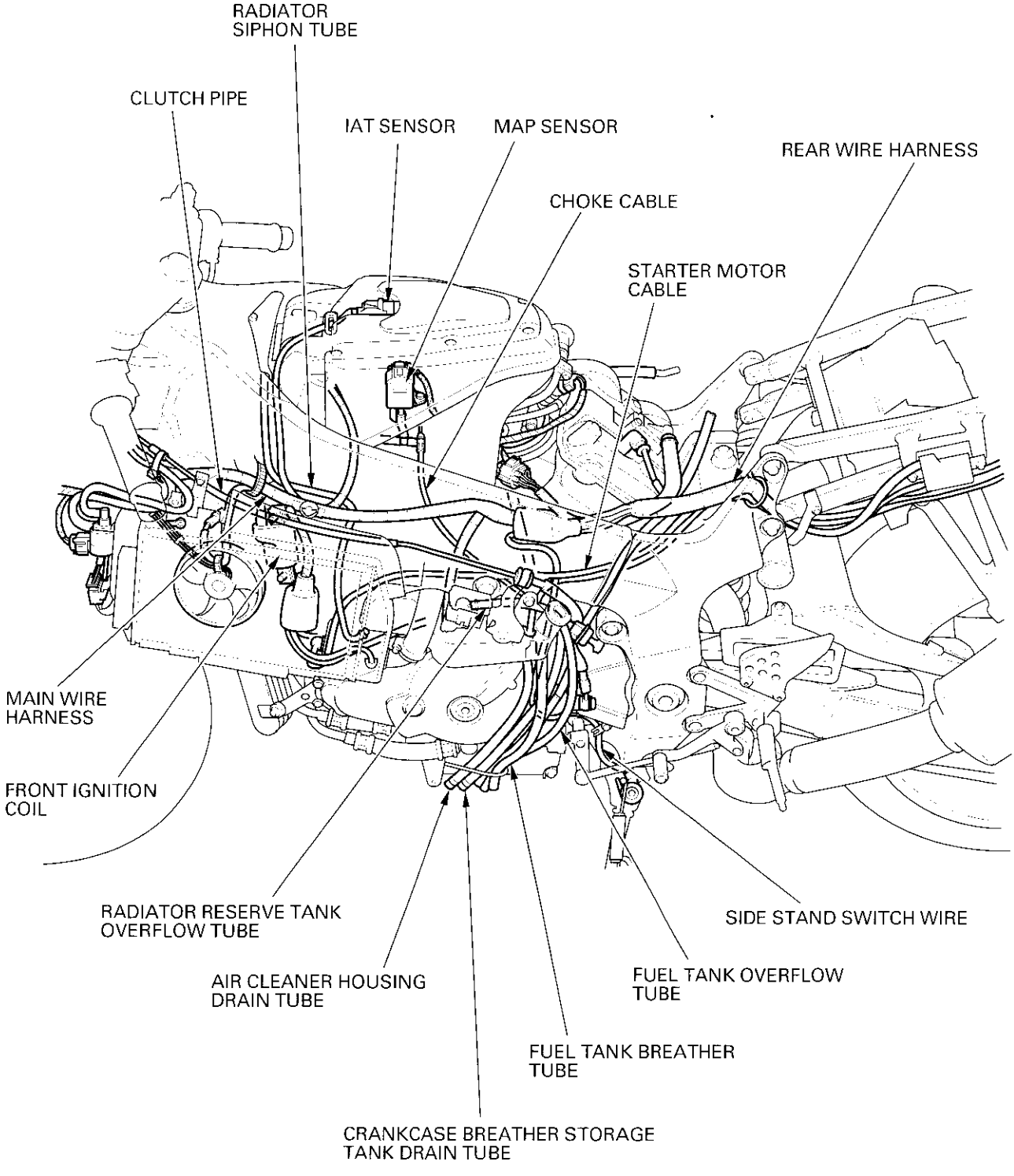
CABLE & HARNESS ROUTING

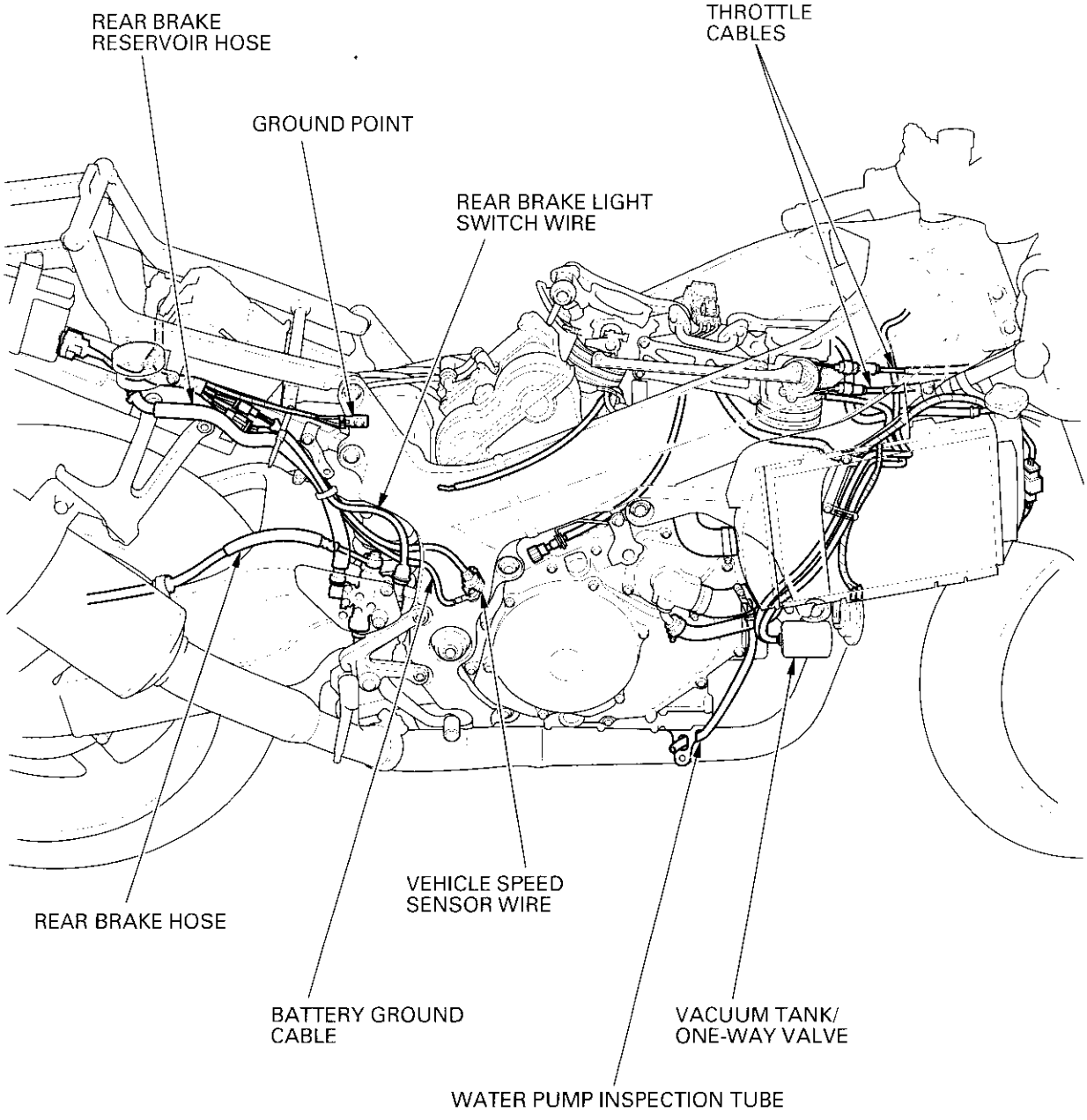


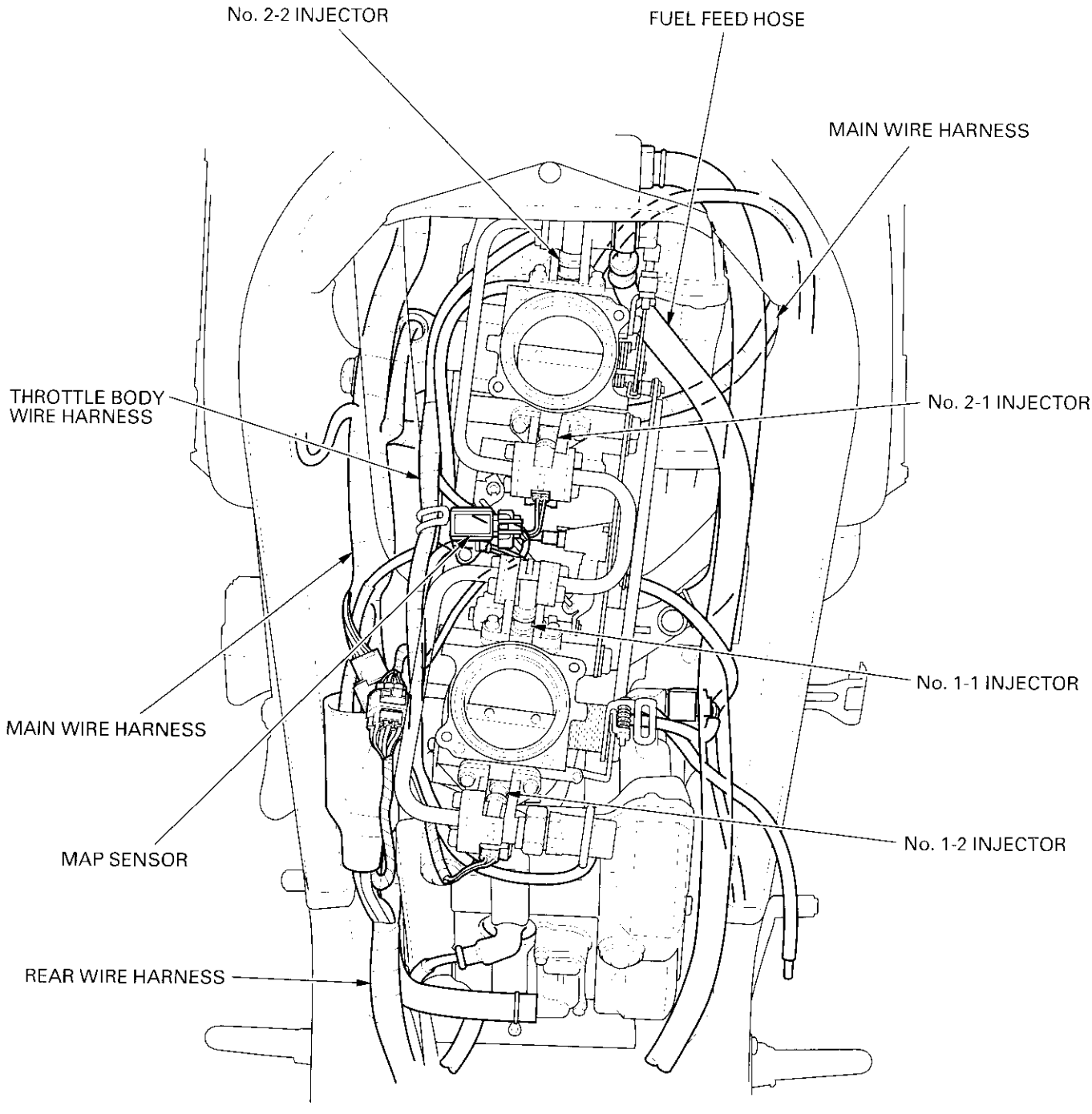


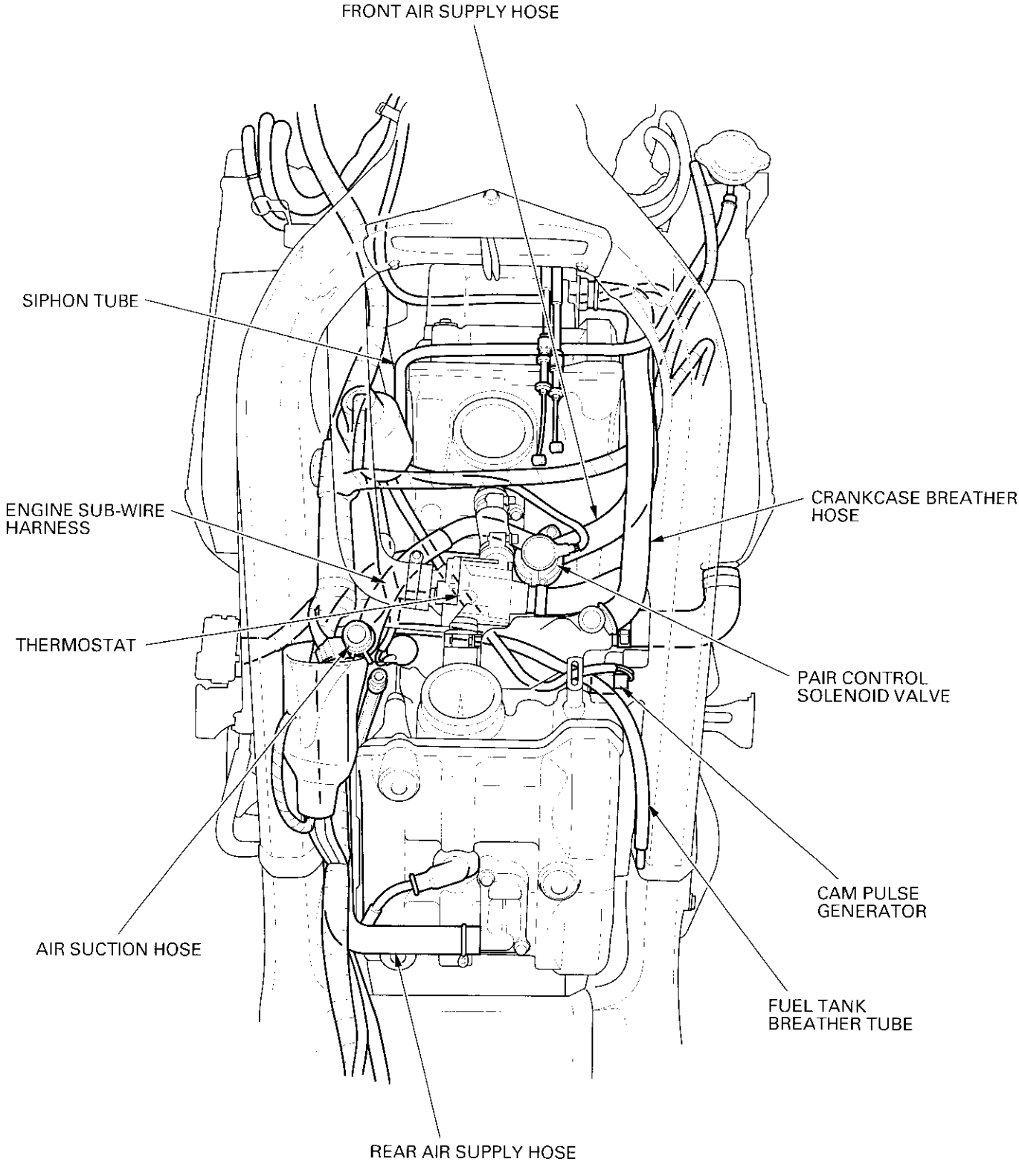

BARO SENSOR
VACUUM TUBE
LEFT HANDLEBAR SWITCH WIRE
LEFT FRONT BRAKE HOSE
CLUTCH HOSE
INTAKE AIR DUCT CONTROL SOLENOID VALVE
RADIATOR FAN MOTOR CONNECTOR
OIL COOLER PIPES

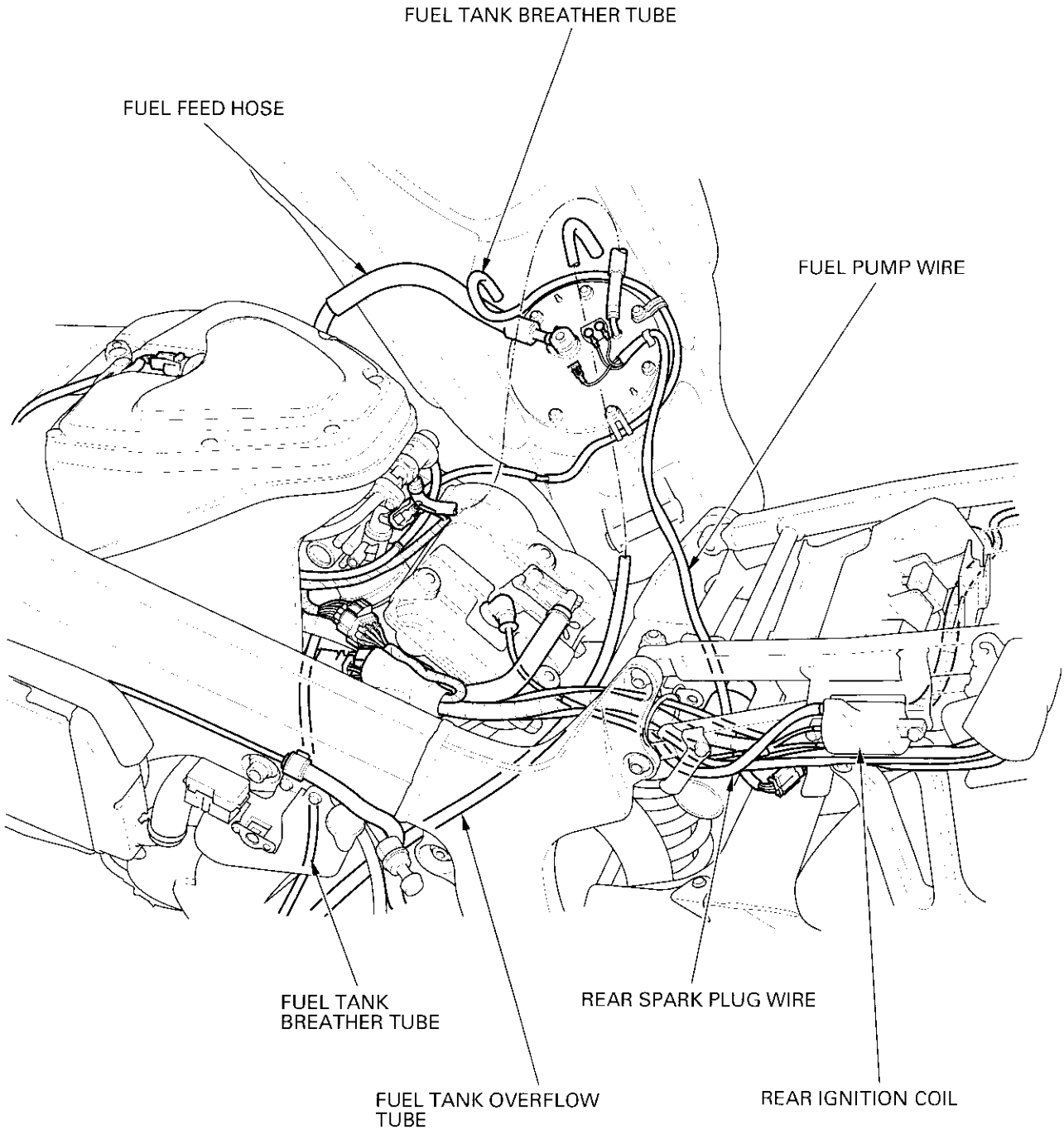

THROTTLE CABLES
FRONT SUB-WIRE HARNESS
IGNITION SWITCH WIRE
RADIATOR
FAN MOTOR
CONNECTOR
RIGHT FRONT BRAKE HOSE
RIGHT HANDLEBAR
SWITCH WIRE

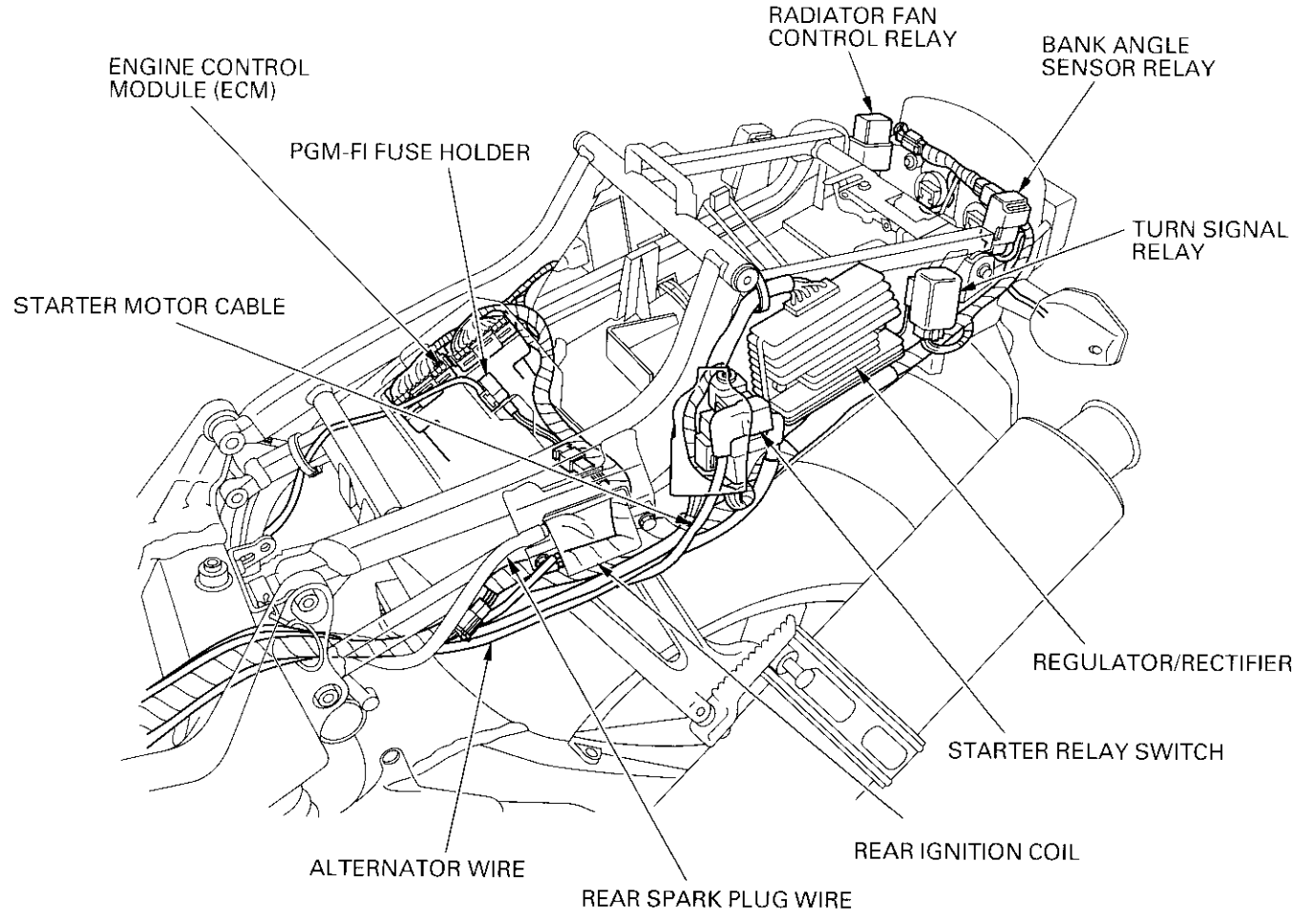

RADIATOR SIPHON TUBE
CLUTCH PIPE
IAT SENSOR
MAP SENSOR
REAR WIRE HARNESS
CHOKE CABLE
STARTER MOTOR CABLE
MAIN WIRE HARNESS
FRONT IGNITION COIL
RADIATOR RESERVE TANK OVERFLOW TUBE
SIDE STAND SWITCH WIRE
AIR CLEANER HOUSING DRAIN TUBE
FUEL TANK OVERFLOW TUBE
FUEL TANK BREATHER TUBE
CRANKCASE BREATHER STORAGE TANK DRAIN TUBE

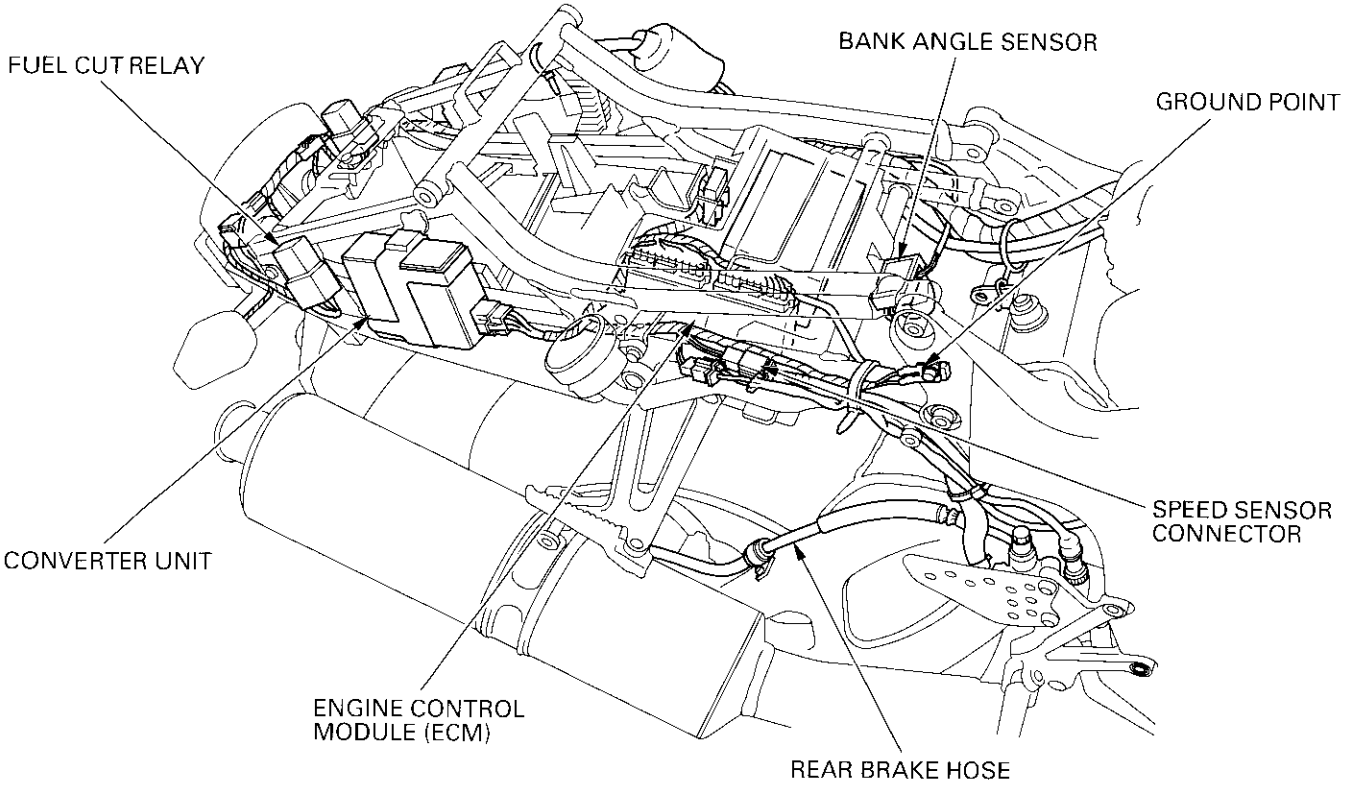

REAR BRAKE
RESERVOIR HOSE
THROTTLE
CABLES
GROUND POINT
REAR BRAKE LIGHT
SWITCH WIRE
VEHICLE SPEED
SENSOR WIRE
REAR BRAKE HOSE
BATTERY GROUND
CABLE
VACUUM TANK/
ONE-WAY VALVE
WATER PUMP INSPECTION TUBE


No. 2-2 INJECTOR
FUEL FEED HOSE
MAIN WIRE HARNESS
THROTTLE BODY WIRE HARNESS
No. 2-1 INJECTOR
No. 1-1 INJECTOR
MAIN WIRE HARNESS
MAP SENSOR
No. 1-2 INJECTOR
REAR WIRE HARNESS


FRONT AIR SUPPLY HOSE
SIPHON TUBE
ENGINE SUB-WIRE HARNESS
CRANKCASE BREATHER HOSE
THERMOSTAT
PAIR CONTROL SOLENOID VALVE
CAM PULSE GENERATOR
AIR SUCTION HOSE
FUEL TANK BREATHER TUBE
REAR AIR SUPPLY HOSE


FUEL TANK BREATHER TUBE
FUEL FEED HOSE
FUEL PUMP WIRE
FUEL TANK
BREATHER TUBE
REAR SPARK PLUG WIRE
FUEL TANK OVERFLOW
TUBE
REAR IGNITION COIL


RADIATOR FAN CONTROL RELAY
BANK ANGLE SENSOR RELAY
ENGINE CONTROL MODULE (ECM)
PGM-FI FUSE HOLDER
TURN SIGNAL RELAY
STARTER MOTOR CABLE
REGULATOR/RECTIFIER
STARTER RELAY SWITCH
REAR IGNITION COIL
ALTERNATOR WIRE
REAR SPARK PLUG WIRE


FUEL CUT RELAY
BANK ANGLE SENSOR
GROUND POINT
SPEED SENSOR CONNECTOR
CONVERTER UNIT
ENGINE CONTROL MODULE (ECM)
REAR BRAKE HOSE

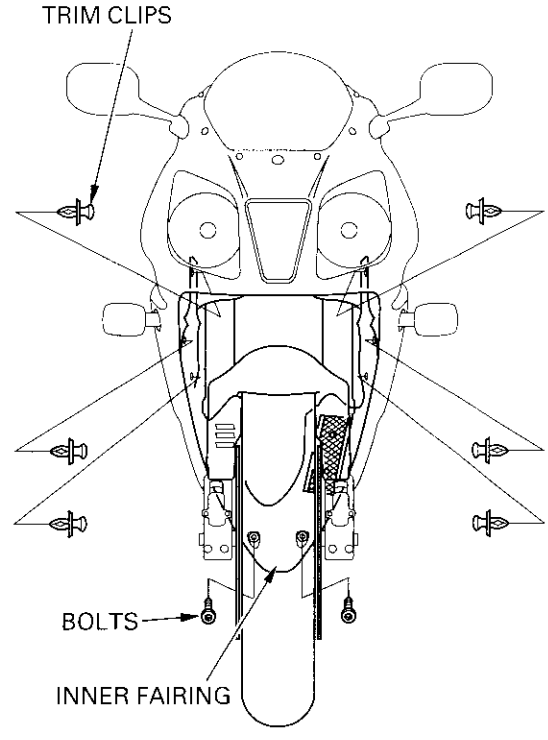
LOWER INNER FAIRING

Disconnect the turn signal wire connectors.
Remove the two lower inner fairing-to-lower fairing bolts.
Remove the six trim clips as follows:
  Pull the center pin out.
– Pull the clip out.
Remove the lower inner fairing.

Set the lower inner fairing while routing the turn signal wires into the holes in the inner fairing and install the six trim clips.
Install and tighten the two bolts.

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

Connect the turn signal wire connectors.



LOWER FAIRING

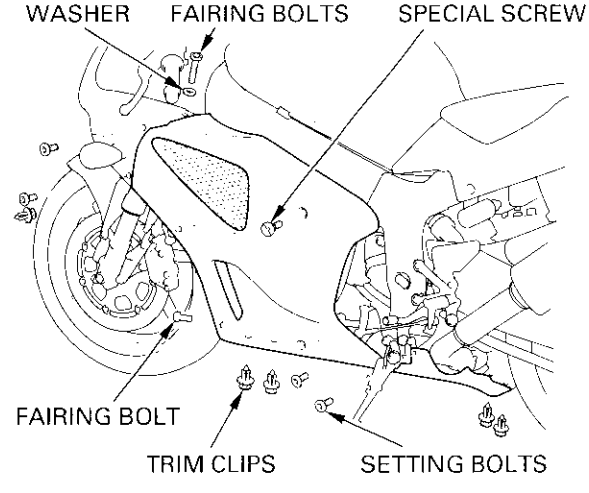
Remove the trim clip attaching the inner fairing.
Remove the four trim clips as follows:
  Loosen the center pin.
– Pull the clip out.
Remove the three lower fairing-to-upper fairing bolts.
Remove the lower inner fairing-to-lower fairing bolt.
Remove the two setting bolts.
Remove the special screw and the lower fairing.

Install the lower fairing and set the special screw.
Install and tighten the two setting bolts.
Install and tighten the fairing-to-fairing bolts.

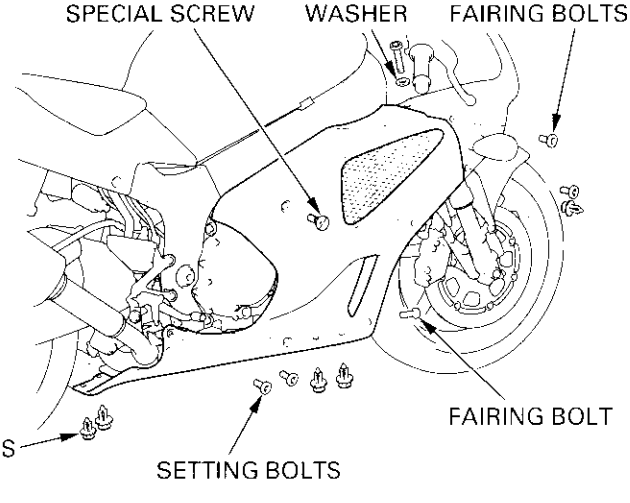
TORQUE: 1.5 N·m (0.15 kgf·m , 1.1 lbf·ft)

Install the trim clips.

LEFT LOWER FAIRING:



RIGHT LOWER FAIRING:



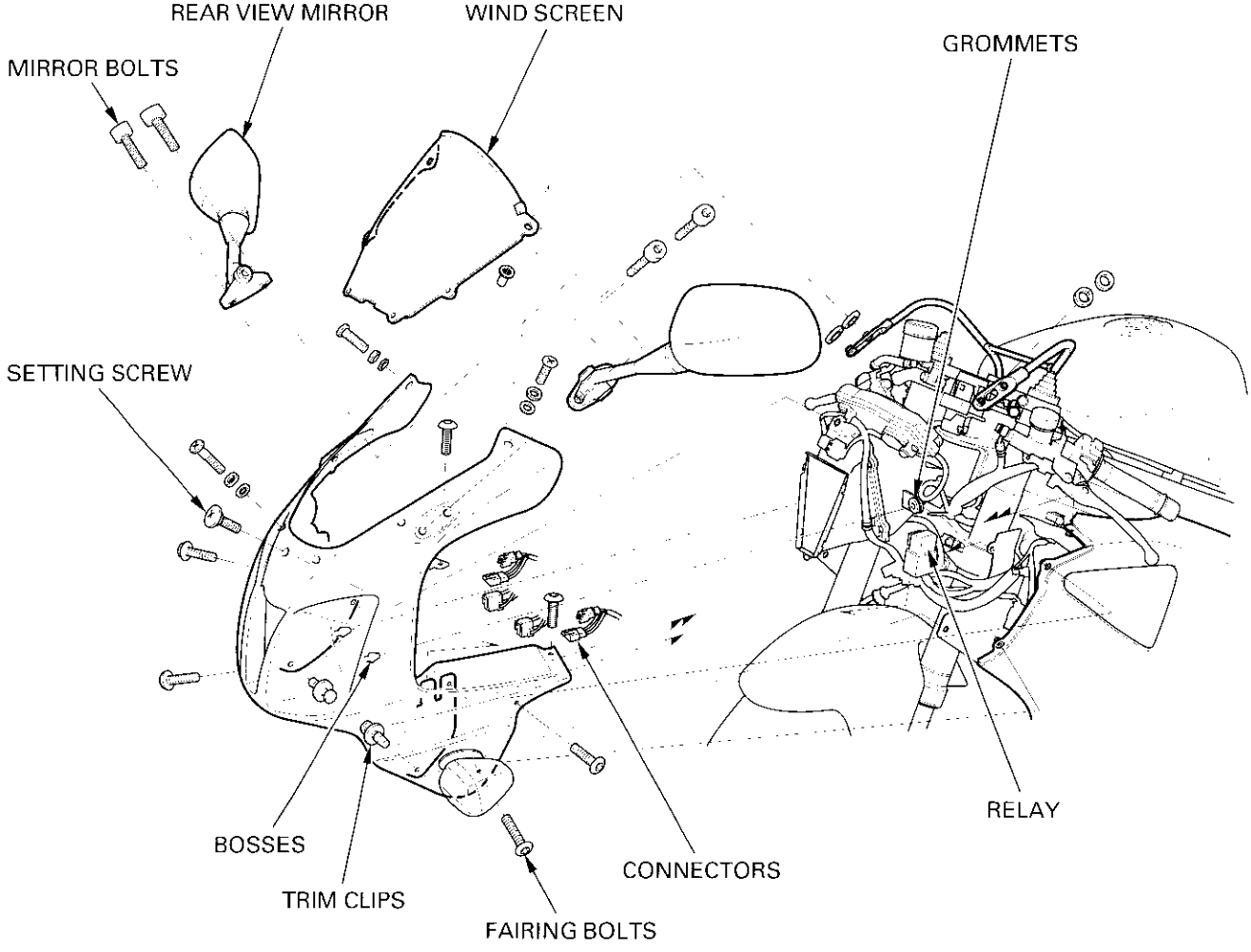
UPPER FAIRING

Remove the headlight relay from the stay of the upper inner fairing.
Disconnect the following:
– headlight connectors
– front turn signal connectors
position light connectors

Remove the four trim clips attaching the inner fairing.
Remove the six lower fairing-to-upper fairing bolts.
Remove the four bolts and the rear view mirrors.
Remove the setting screw and the upper fairing.

Install the upper fairing, aligning the bosses with the grommets on the stay.
Install the removed parts in the reverse order of removal.

TORQUE:
Fairing-to-fairing bolts:
1.5 N·m (0.15 kgf·m , 1.1 lbf·ft)
Wind screen attaching screw:
0.4 N·m (0.04 kgf·m , 0.3 lbf·ft)



EXHAUST SYSTEM

REMOVAL

see page 2-4.

INSTALLATION

Install the rear exhaust pipe with a new gasket and temporarily tighten the joint nuts.

Install the front exhaust pipe with a new gasket and temporarily tighten the joint nuts.
Connect the front and rear exhaust pipe with a new gasket and temporarily tighten the band bolt.

Install the collar into the driver footpeg holder.

Install a new muffler gaskets into the exhaust pipe.
Install the muffler with the collar, washer, upper mounting bolt and nut.

Install the muffler lower mounting bolt with the washer and nut, and temporarily tighten the muffler band bolt and lower mounting nut.
Install another muffler.

Tighten the exhaust pipe joint nuts.

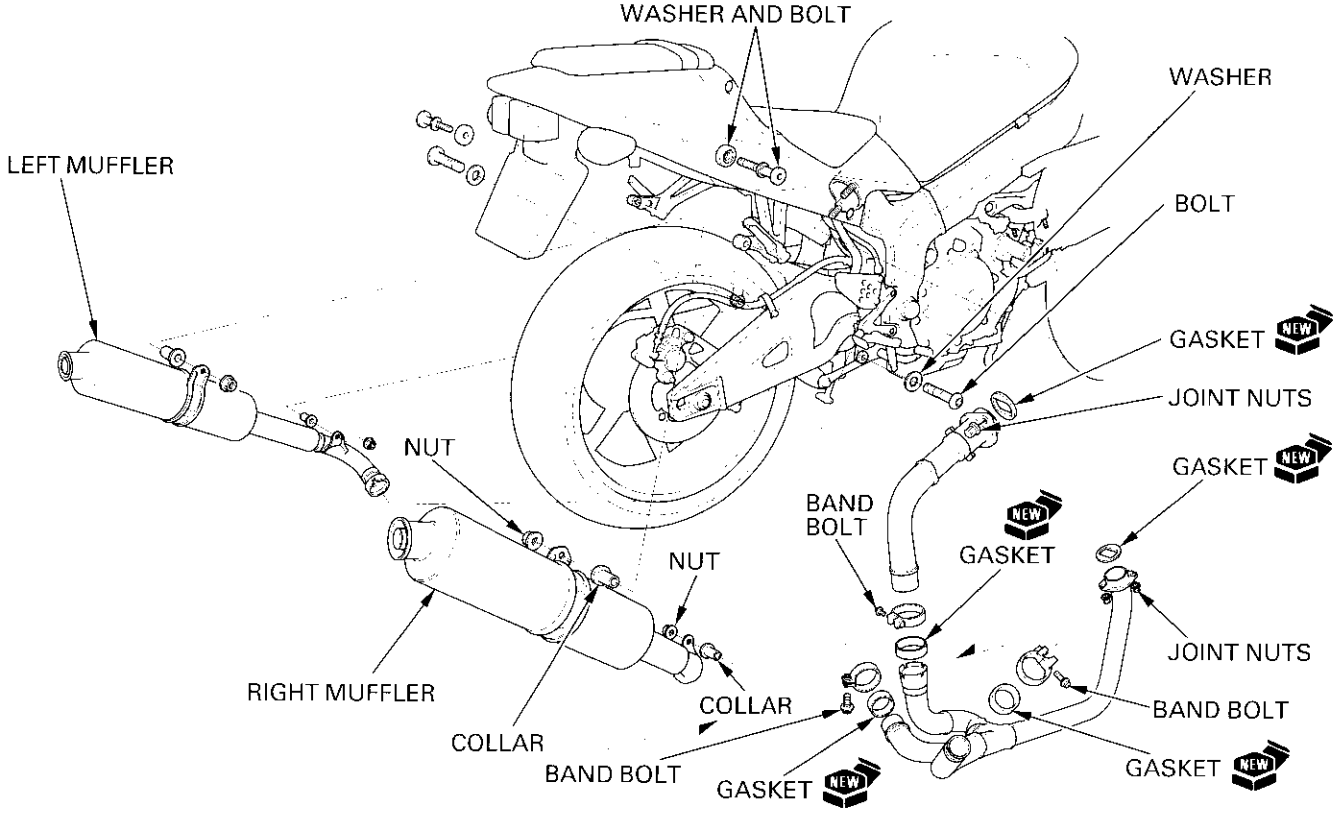
TORQUE: 12 N·m (1.2 kgf·m , 9 lbf·ft)

Tighten the front exhaust pipe-to-rear exhaust pipe band bolt and muffler band bolts.

TORQUE: 26 N·m (2.7 kgf·m , 20 lbf·ft)

Tighten the muffler upper and lower mounting nuts securely.

Install the lower fairings and inner fairing (page 23-27).

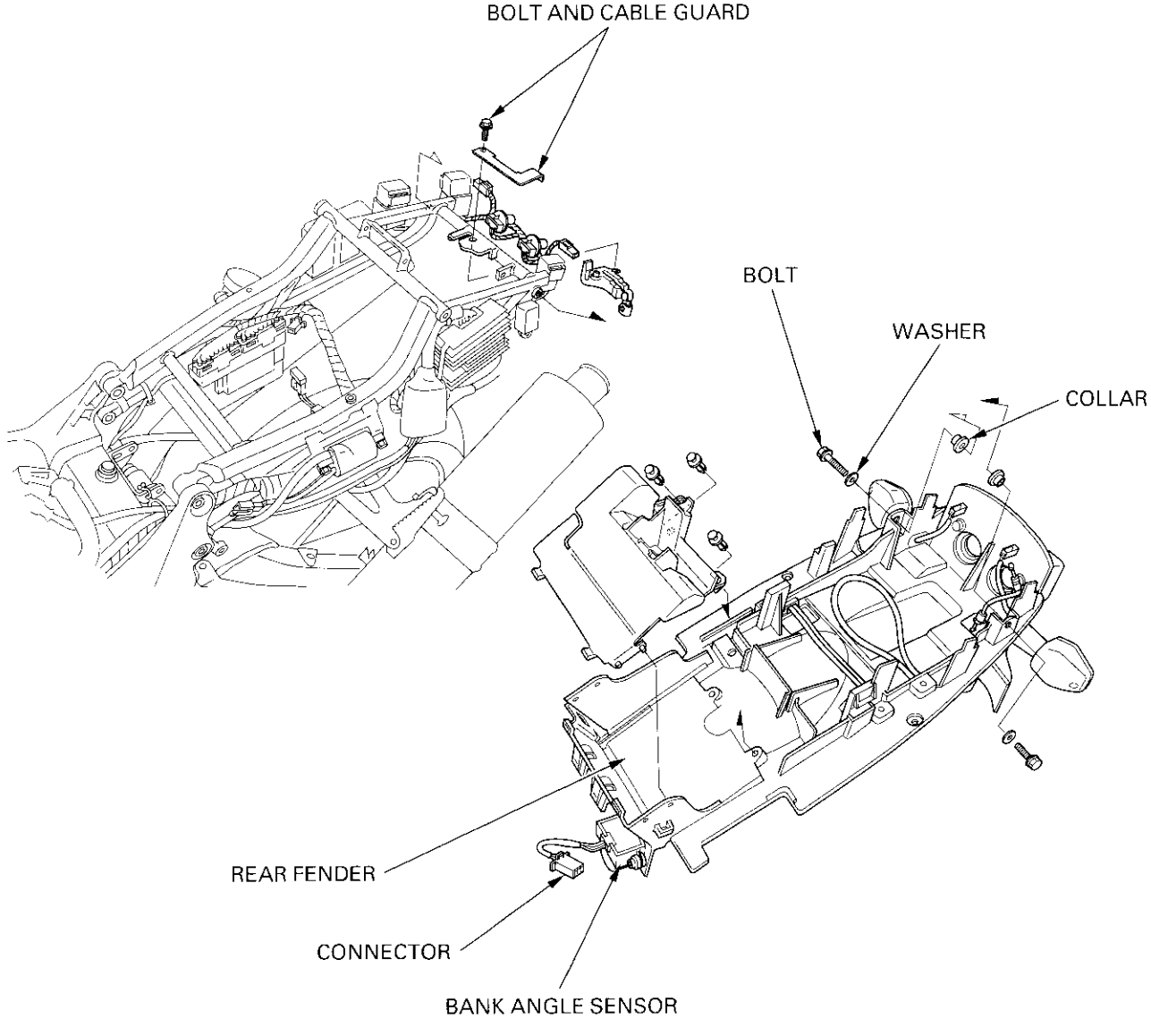


REAR FENDER

Remove the following:
- seat cowl (page 2-2)
- battery (page 23-89)
- engine control module (page 23-40)
- rear turn signal lights (page 23-95)
- bank angle sensor, turn signal, fan control and fuel cut relays
- brake/taillight (page 19-4)

Remove the bolt, cable guard and the passenger seat lock catch.
Disconnect the bank angle sensor connector.
Remove the two bolts, washers and collars.
Remove the rear fender from the seat rail.
Remove the bank angle sensor from the rear fender.

Install the rear fender and removed parts in the reverse order of removal.



SEAT RAIL

Remove the rear fender (page 23-30).

Remove the following from the seat rail:
- converter unit
  bolt and rear brake reservoir
- two bolts and regulator/rectifier
- starter relay switch
  two bolts and rear ignition coil
- four bolts and passenger footpeg holders

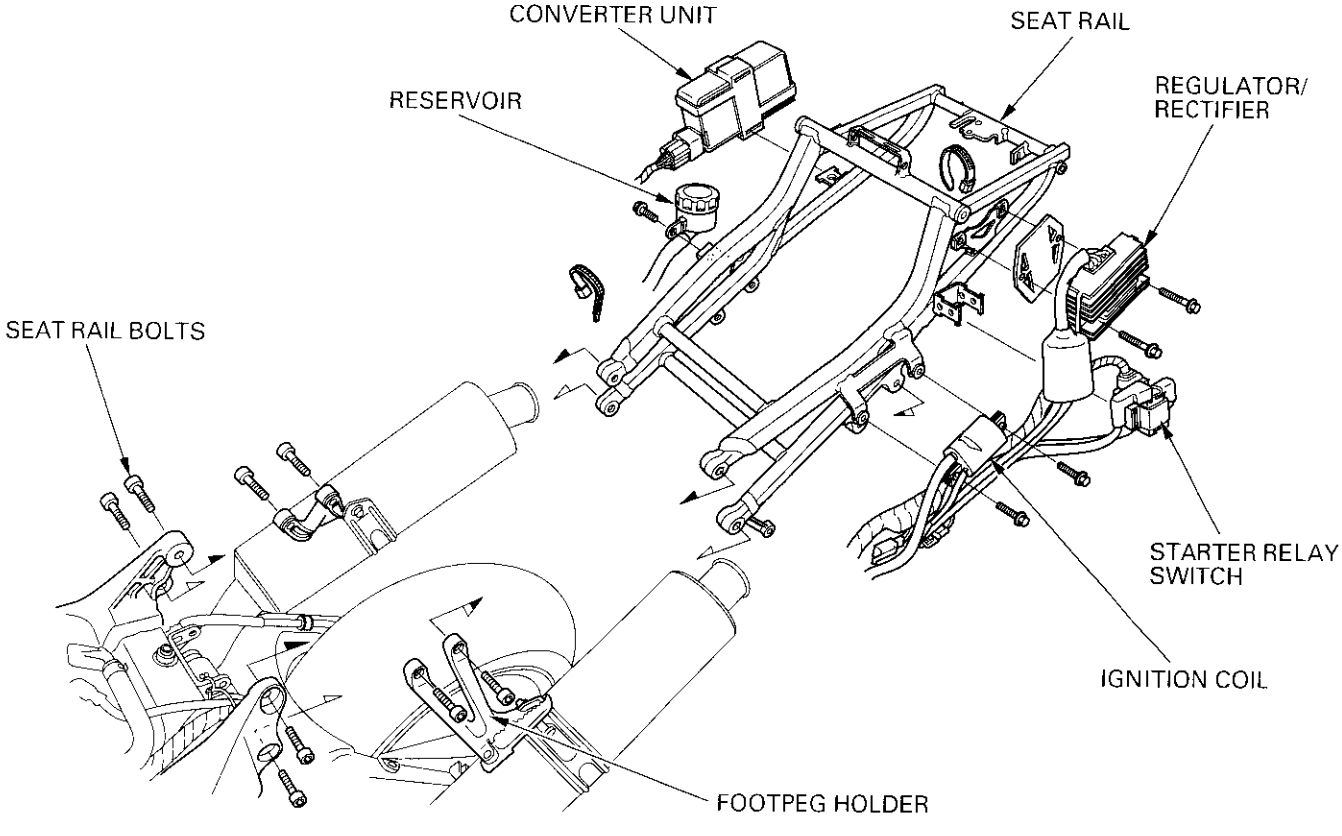
Disconect the ground cable by removing the bolt. Remove the upper and lower mounting bolts, and the seat rail.

Install the seat rail and removed parts in the reverse order of removal.

TORQUE:
Seat rail mounting bolt: 44 N·m (4.5 kgf·m , 33 lbf·ft)
Rear brake reservoir mounting bolt:
9 N·m (0.9 kgf·m , 6.5 lbf·ft)
Passenger footpeg holder bolt:
26 N·m (2.7 kgf·m , 20 lbf·ft)

CAUTION:

Be careful not to damage the mounting bolt threaded holes in the seat rail.



MAINTENANCE SCHEDULE

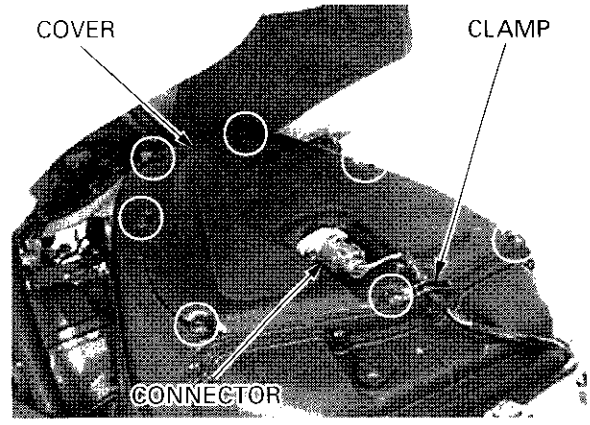
Perform the PRE-RIDE INSPECTION in the Owner's Manual at each scheduled maintenance period.
I: Inspect and clean, adjust, lubricate or replace if necessary.
C: Clean R: Replace A: Adjust L: Lubricate
The following items require some mechanical knowledge. Certain items (particularly those marked * and **) may require more technical information and tools. Consult your Honda dealer.

	ITEM	FREQUENCY / NOTE	WHICHEVER COMES FIRST ➡	ODOMETER READING (NOTE 1) × 1,000 km	1	6	12	18	24	30	36	REFER TO PAGE
				× 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
*	CHOKE OPERATION						I		I		I	3-5
*	AIR CLEANER	NOTE 2						I			I	3-6
	CRANKCASE BREATHER	NOTE 3				C	C	C	C	C	C	3-6, 23-33
	SPARK PLUG			EVERY 24,000 km (16,000 mi) I, EVERY 48,000 km (32,000 mi) R								3-6, 23-33
*	VALVE CLEARANCE								I			3-8, 23-34
	ENGINE OIL				R		R		R		R	3-13
	ENGINE OIL FILTER				R		R		R		R	3-15
*	ENGINE IDLE SPEED				I	I	I	I	I	I	I	3-15
	RADIATOR COOLANT	NOTE 4					I		I		R	3-16
*	COOLING SYSTEM						I		I		I	3-16
*	SECONDARY AIR SUPPLY SYSTEM	NOTE 5					I		I		I	3-17
	DRIVE CHAIN			EVERY 1,000 km (600 mi) I, L								3-17
	DRIVE CHAIN SLIDER						I		I		I	3-21
	BRAKE FLUID	NOTE 4				I	I	R	I	I	R	3-21
	BRAKE PAD WEAR					I	I	I	I	I	I	3-22
	BRAKE SYSTEM				I		I		I		I	3-23
*	BRAKE LIGHT SWITCH						I		I		I	3-23
*	HEADLIGHT AIM						I		I		I	3-24
	CLUTCH SYSTEM						I		I		I	3-24
	CLUTCH FLUID	NOTE 4				I	I	R	I	I	R	3-24
	SIDE STAND						I		I		I	3-25
*	SUSPENSION						I		I		I	3-25
*	NUTS, BOLTS, FASTENERS				I		I		I		I	3-26
**	WHEELS/TIRES						I		I		I	3-26
**	STEERING HEAD BEARINGS				I		I		I		I	3-27

* Should be serviced by your 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 your Honda dealer.
Honda recommends that your Honda dealer should road test your motorcycle after each periodic maintenance is carried out.

NOTES:
1. At higher odometer readings, repeat at the frequency interval established here.
2. Service more frequently when riding in unusually wet or dusty areas.
3. Service more frequently when riding in rain or at full throttle.
4. Replace every 2 years, or at indicated odometer interval, whichever comes first. Replacement requires mechanical skill.
5. Except U type

AIR CLEANER



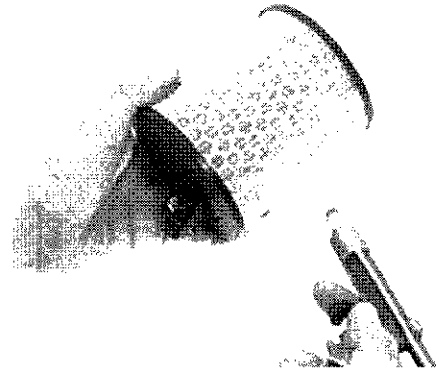
NOTE:

If the motorcycle is used in unusually wet or dusty areas, more frequent inspections are required.

Disconnect the IAT sensor connector.
Remove the seven screws and clamp, then remove the air cleaner cover.

Remove the air cleaner elements (page 3-6).

if the surface of the element is dirty, remove the dust first by tapping the element gently. then, blow away any remaining dust on the surface of the filter with compressed air from the outside toward the inside.



Replace the elements, if the surface of them are still dirty after cleaning.

Install the air cleaner elements. Install the air cleaner cover and tighten the screws to the specified torque.

TORQUE: 1.1 N·m (0.11 kgf·m , 0.8 lbf·ft)

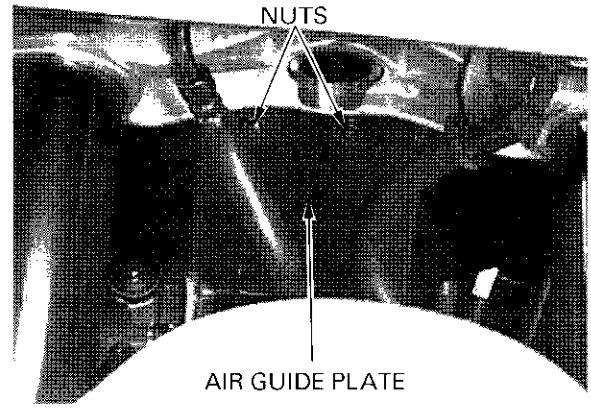
Connect the IAT sensor connector.

SPARK PLUG

FRONT CYLINDER

Remove the lower inner fairing (page 23-27).

Remove the two mounting nuts and air guide plate.

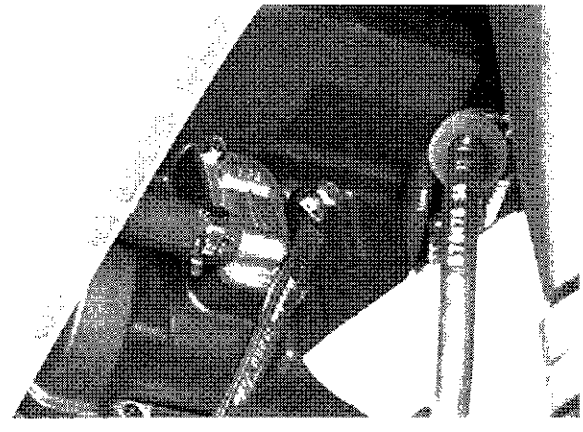


Disconnect the spark plug cap and clean around the spark plug base.

NOTE:

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

Remove the spark plug.

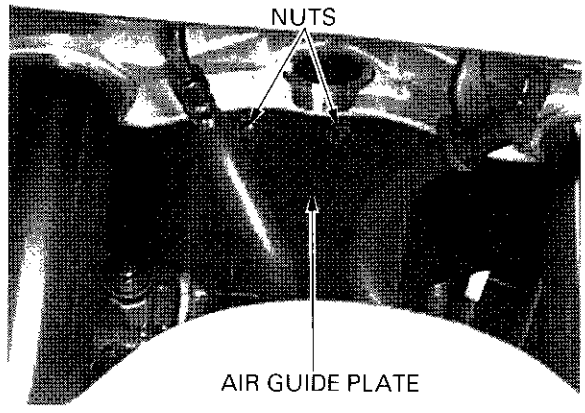


VALVE CLEARANCE

FRONT CYLINDER HEAD COVER

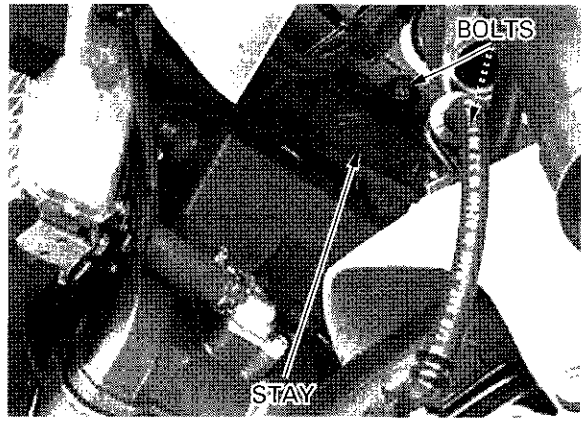
Remove the lower inner fairing and lower fairings (page 23-27).

Remove the two mounting nuts and air guide plate.



Remove the two socket bolts and air guide plate stay.

Remove the front cylinder head cover and inspect the valve clearance (page 3-8).

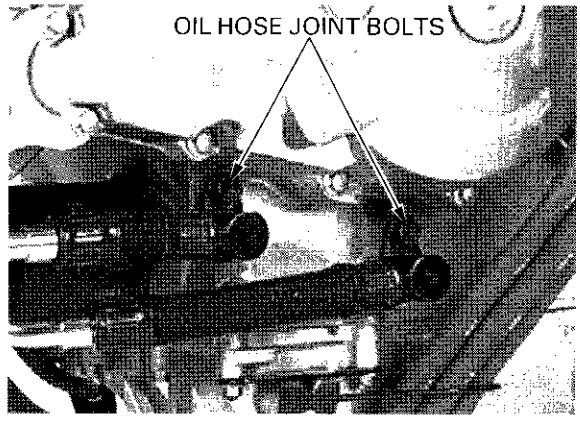


OIL COOLER

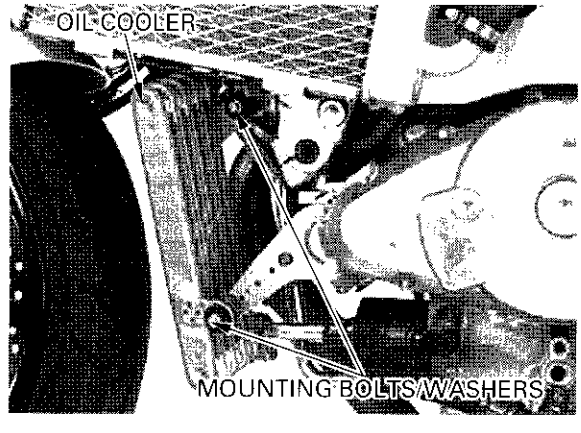
REMOVAL

Remove the lower inner fairing and lower fairings (page 23-27).

Drain the engine oil (page 3-14).
Remove the oil hose joint bolts and joints from the engine.
Remove the O-rings from the joints.

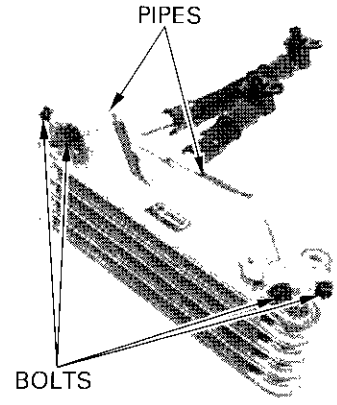


Remove the mounting bolts, washers and oil cooler.



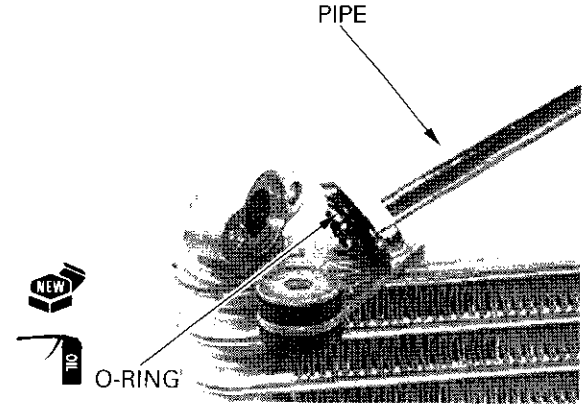
Remove the oil cooler pipe joint bolts and pipes from the oil cooler.

Remove the O-rings from the joints.

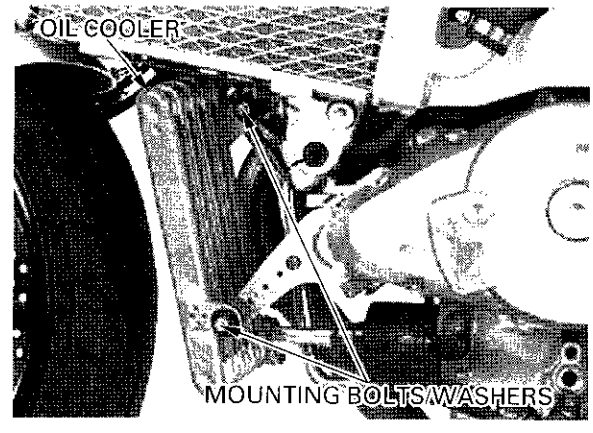


INSTALLATION

Coat new O-rings with engine oil and install them onto the oil cooler pipe joints.
Apply locking agent to the joint bolt threads.
Install the pipes onto the oil cooler and tighten the joint bolts securely.



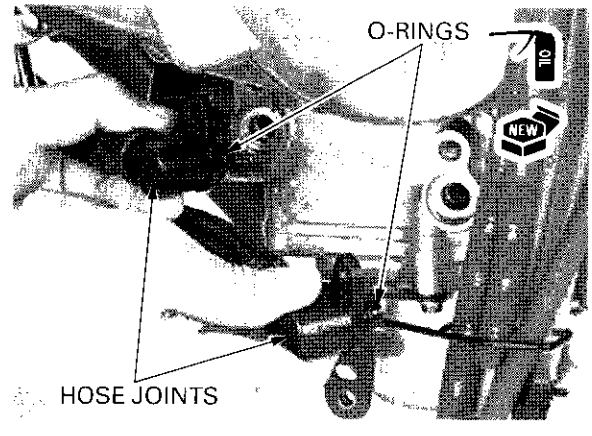
Install the oil cooler and tighten the mounting bolts with washers securely.



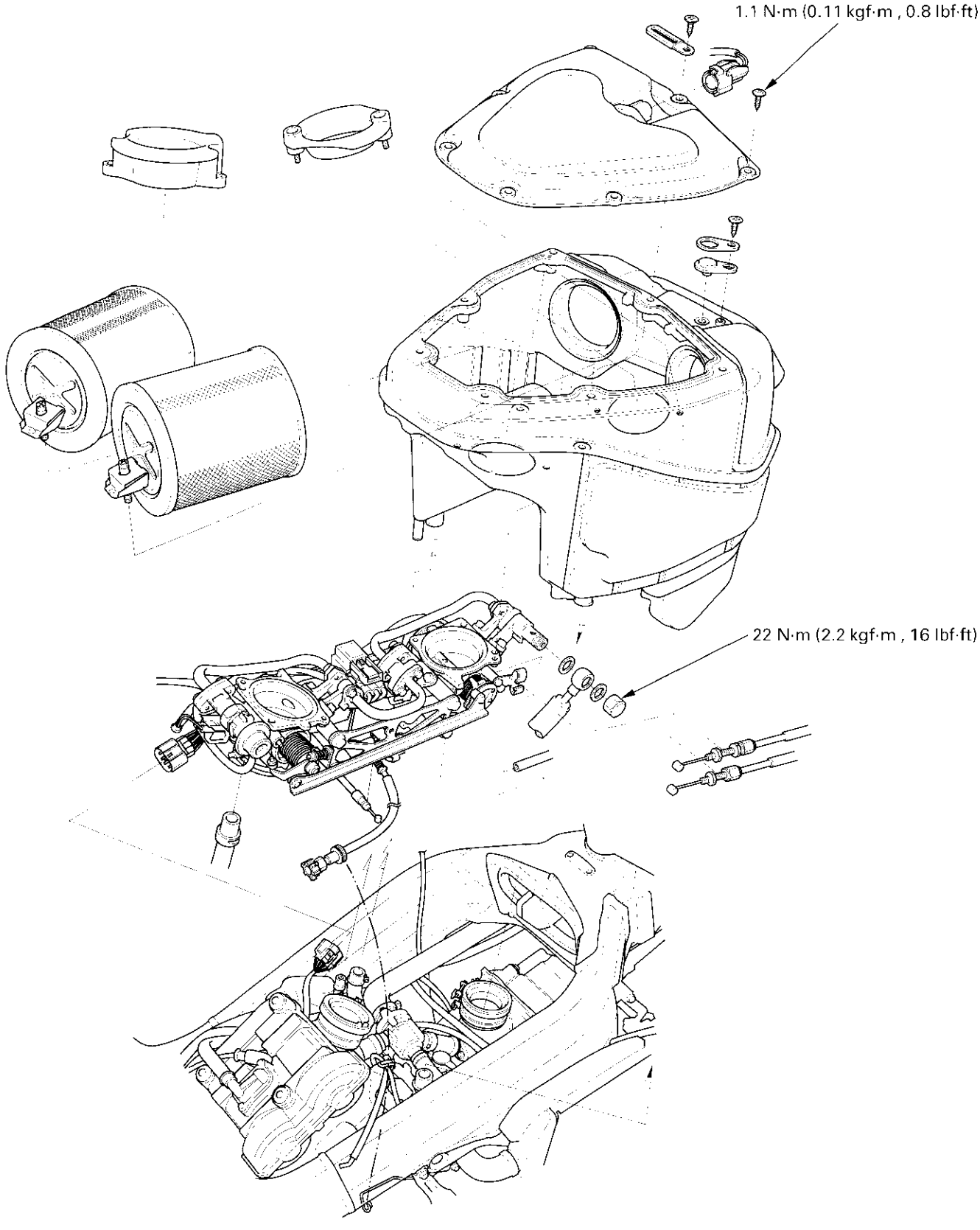
Coat new O-rings with engine oil and install them onto the oil hose joints.
Apply locking agent to the joint bolt threads.
Install the joint to the engine and tighten the joint bolts securely.

Fill the crankcase with recommended engine oil (page 3-14).

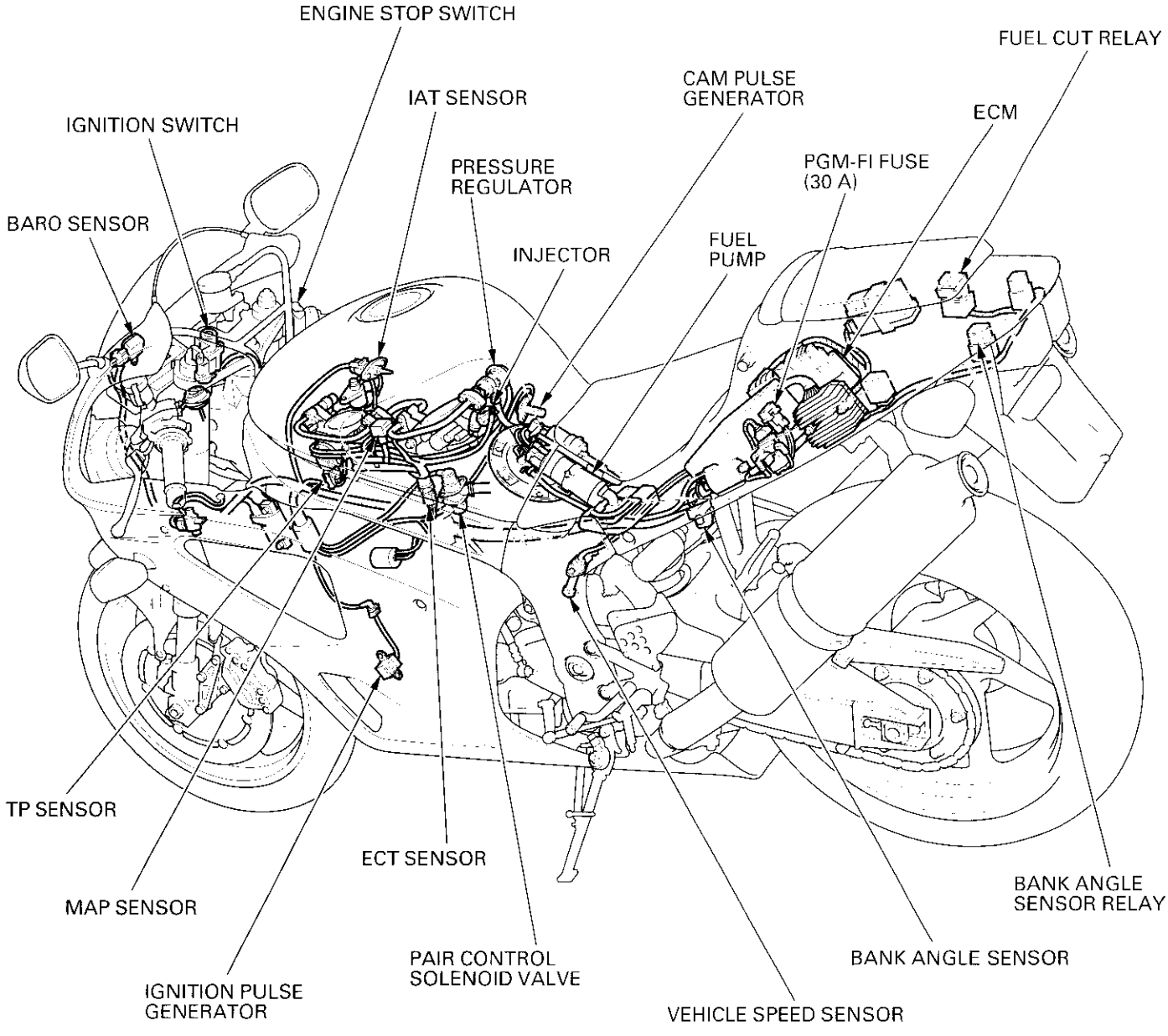
Install the lower fairings and lower inner fairing (page 23-27).



FUEL SYSTEM (Programmed Fuel Injection)



SYSTEM LOCATION

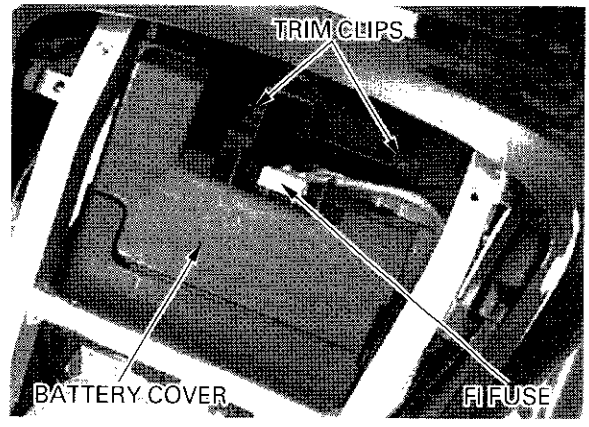


FULL NAME	ABBREVIATIONS
Manifold absolute pressure sensor	MAP sensor
Barometric pressure sensor	BARO sensor
Throttle position sensor	TP sensor
Intake air temperature sensor	IAT sensor
Engine coolant temperature sensor	ECT sensor
Engine control module	ECM

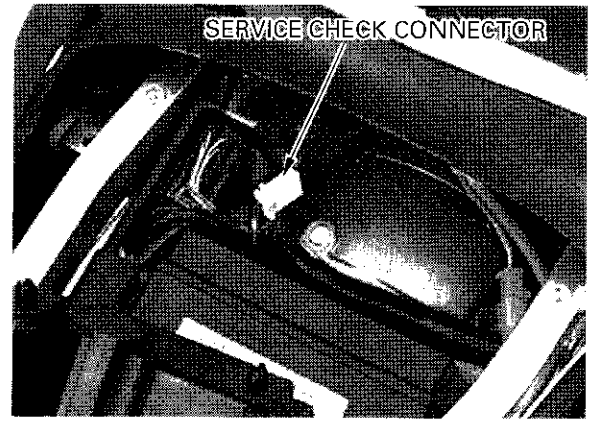
SERVICE CHECK CONNECTOR LOCATION

Remove the driver seat (page 2-2).

Remove the FI fuse (30A) from the battery cover.
Pull the two trim clips out from the rear fender.

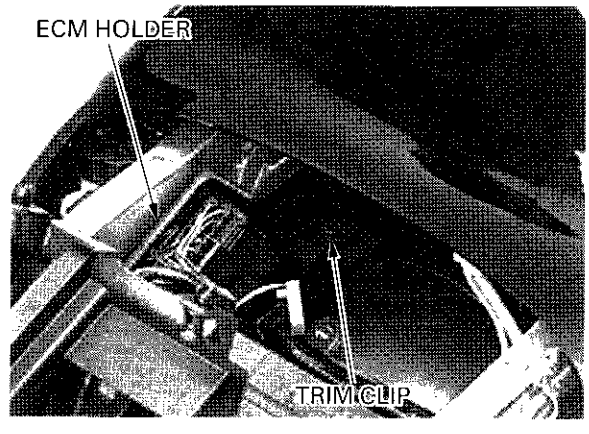


Open the battery cover.
The service check connector is over the battery.

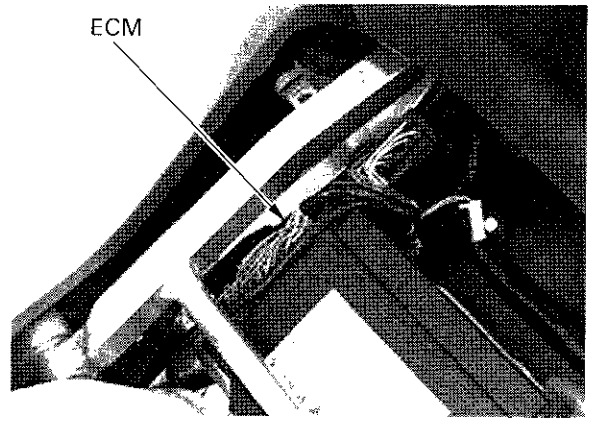


ECM LOCATION

Remove the driver and passenger seats (page 2-2).
Open the battery cover by removing the two trim clips.
Pull the trim clip out from the rear fender.



Open the ECM holder.
Pull the ECM to upward, then remove the ECM from the rear fender.



PGM-FI SELF-DIAGNOSIS MALFUNCTION INDICATOR FAILURE CODES

- The PGM-FI malfunction indicator denotes the failure codes (the number of blinks from 0 to 20). When the indicator lights for 1.3 seconds, it is equivalent to ten blinks. For example, when the indicator lights for 1.3 seconds and blinks two times (0.5 second × 2), it indicates failure code 12. Follow the flow chart for failure code 12.
- When the Engine Control Module (ECM) stores some failure codes, the malfunction indicator shows the failure codes in the order from the lowest number to highest number. For example, when the indicator blinks once, then blinks two times, two failure have occurred. Follow the flow charts for failure codes 1 and 2.

Number of PGM-FI malfunction indicator blinks		Cause	Symptoms (Fail-safe contents)	Refer to page
0	○ No blinks	• Open circuit in the power input wire of the ECM • Faulty bank angle sensor • Open circuit in bank angle sensor related wires • Faulty bank angle sensor relay • Open circuit in bank angle sensor relay related wires • Faulty engine stop switch • Open circuit in engine stop switch related wires • Faulty ignition switch • Faulty ECM • Blown PGM-FI fuse (30 A) • Blown sub-fuse (10 A) (Starter/ignition)	• Engine does not start	5-56
	○ No blinks	• Open or short circuit in malfunction indicator wire • Faulty ECM	• Engine operates normally	5-9
	☼ Stays lit	• Short circuit in service check connector wire • Faulty ECM	• Engine operates normally	—
1	☼ Blinks	• Loose or poorly connected MAP sensor connector • Open or short circuit in MAP sensor wire • Faulty MAP sensor	• Engine operates normally	23-41
2	☼ Blinks	• Loose or poor connections of MAP sensor vacuum tubes • Faulty MAP sensor	• Engine operates normally	23-43
7	☼ Blinks	• Loose or poorly connected ECT sensor connector • Open or short circuit in ECT sensor wire • Faulty ECT sensor	• Hard start at a low temperature (ECU controls using preset value; Coolant temperature: 80°C/176°F)	5-16
8	☼ Blinks	• Loose or poorly connected TP sensor connector • Open or short circuit in TP sensor wire • Faulty TP sensor	• Poor engine response when operating the throttle quickly (ECU controls using preset value; Throttle opening: 0°)	5-18
9	☼ Blinks	• Loose or poorly connected IAT sensor connector • Open or short circuit in IAT sensor wire • Faulty IAT sensor	• Engine operates normally (ECU controls using preset value; Intake air temperature: 20°C/68°F)	5-21

Number of PGM-FI malfunction indicator blinks	Cause	Symptoms (Fail-safe contents)	Refer to page
10 ☼ Blinks	• Loose or poorly connected BARO sensor connector • Open or short circuit in BARO sensor wire • Faulty BARO sensor	• Engine operates normally at low altitude • Engine idles roughly at a high altitude (ECU controls using preset value; Barometric pressure: 760 mm Hg/1,013 hPa)	5-23
11 ☼ Blinks	• Loose or poorly connected vehicle speed sensor connector • Open or short circuit in vehicle speed sensor wire • Faulty vehicle speed sensor	• Engine operates normally	5-25
12 ☼ Blinks	• Loose or poorly connected No. 1-1 injector connector • Open or short circuit in No. 1-1 injector wire • Faulty No. 1-1 injector	• Engine does not start	5-28
13 ☼ Blinks	• Loose or poorly connected No. 1-2 injector connector. • Open or short circuit in No. 1-2 injector wire • Faulty No. 1-2 injector	• Engine does not start	5-31
14 ☼ Blinks	• Loose or poorly connected No. 2-1 injector connector • Open or short circuit in No. 2-1 injector wire • Faulty No. 2-1 injector	• Engine does not start	5-34
15 ☼ Blinks	• Loose or poorly connected No. 2-2 injector connector • Open or short circuit in No. 2-2 injector wire • Faulty No. 2-2 injector	• Engine does not start	5-37
18 ☼ Blinks	• Loose or poorly connected cam pulse generator connector • Open or short circuit in cam pulse generator wire • Faulty cam pulse generator	• Engine does not start	5-40
19 ☼ Blinks	• Loose or poorly connected ignition pulse generator connector • Open or short circuit in ignition pulse generator wire • Faulty ignition pulse generator	• Engine does not start	23-45
20 ☼ Blinks	• Faulty E2-PROM in ECM	• Engine operates normally • ECM does not hold the self-diagnostic data	5-44

PGM-FI MALFUNCTION INDICATOR 1 BLINK (MAP SENSOR)

Remove the air cleaner housing (page 5-56).
Turn the ignition switch OFF.

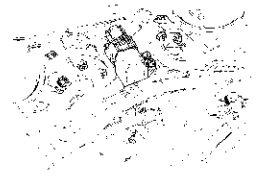
↓

Disconnect the MAP sensor 3P connector.
Check the connector for loose contacts or corroded terminals.



↓

Connect the MAP sensor and IAT sensor connectors.
Place the motorcycle on its side stand.
Start the engine, let it idle and check the malfunction indicator blinks.



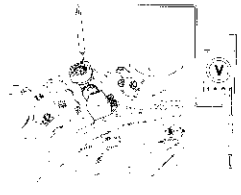
No blinking → • Loose or pooly connected MAP sensor connector

↓ 1 blink

Turn the ignition switch OFF.

↓

Disconnect the MAP sensor 3P connector.
Turn the ignition switch ON.
Measure the voltage at the wire harness side connector.



Connection: Yellow/Red (+) — Ground ( )
Standard: 4.75 — 5.25 V

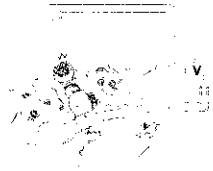
No voltage → • Open or short circuit in Yellow/Red wire
• Loose or pooly connected ECM gray connector

↓ Normal

To page 23-42

From page 23-41

Measure the voltage between the terminals of the wire harness side connector.

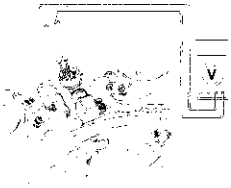


Connection: Yellow/Red (+) – Green/Orange (–)
Standard: 4.75 5.25 V

No voltage → • Open circuit in Green/Orange wire
• Loose or pooly connected ECM black connector

Normal

Measure the voltage between the terminals of the wire harness side connector.



Connection:
Light green/Yellow (+) – Green/Orange (–)
Standard: 4.75 – 5.25 V

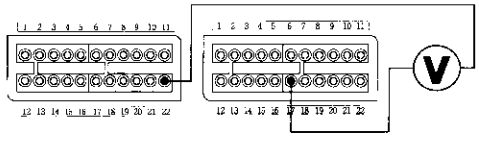
No voltage → • Open or short circuit in Light green/Yellow wire

Normal

Turn the ignition switch OFF.
Connect the MAP sensor connector.

Connect the ECM test harness to the ECM connectors (page 5-8).
Turn the ignition switch ON.

Measure the voltage at the ECM test harness connector terminals.



Connection: B17 (+) – A22 (–)
Standard: 2.7 – 3.1 V (at 760 mm Hg/1,013 hPa)

No voltage → • Faulty MAP sensor

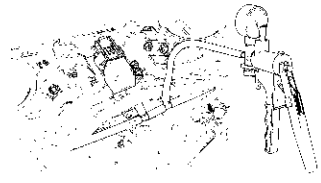
Normal → • Replace the ECM with a new one and inspect again.

PGM-FI MALFUNCTION INDICATOR 2 BLINKS (MAP SENSOR)

Remove the air cleaner housing (page 5-56).
Connect the IAT sensor connector.
Turn the ignition switch OFF.

↓

Disconnect the tube from the MAP sensor.
Connect the vacuum gauge between the MAP sensor and tube using a 3-way joint.
Start the engine, let it idle and measure the manifold absolute pressure.

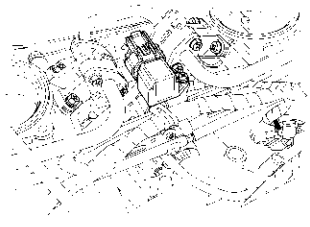


Standard: 200 – 250 mm Hg (7.9 – 9.8 in Hg)

Abnormal → • Disconnected, pinched or damaged MAP sensor tube

↓

Disconnect the vacuum gauge and connect the tube to the MAP sensor.



↓

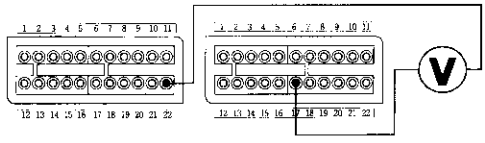
Connect the ECM test harness to the ECM connectors (page 5-8).
Turn the ignition switch ON.

↓

To page 23-44

From page 23-43

Measure the voltage at the ECM test harness connector terminals.

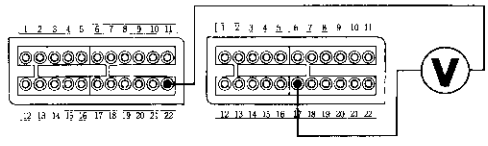


Connection: B17 (+) – A22 (–)
Standard: 2.7 – 3.1 V (at 760 mm Hg/1,013 hPa)

No voltage → • Faulty MAP sensor

Normal

Start the engine.
Measure the voltage at the ECM test harness connector terminals.



Connection: B17 (+) – A22 (–)
Standard: 2.7 V maximum

No voltage → • Faulty MAP sensor

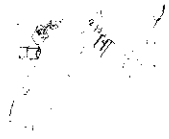
Normal → • Replace the ECM with a new one and inspect again.

PGM-FI MALFUNCTION INDICATOR 19 BLINKS (IGNITION PULSE GENERATOR)

Remove the lower inner fairing and left lower fairing (page 23-27).
Remove the coolant reserve tank mounting bolt, then pull the reserve tank out.
Do not disconnect the hose connections.
Remove the oil cooler mounting bolts.
Turn the ignition switch OFF.

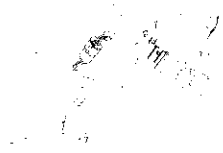
↓

Disconnect the ignition pulse generator 2P connector.
Check the connector for loose contacts or corroded terminals.



↓

Connect the ignition pulse generator connector.
Check that the engine can be started by cranking it with the starter motor.



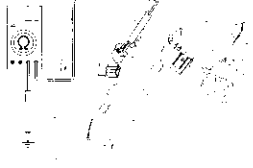
Engine starts → • Loose or pooly connected ignition pulse generator connector

↓ Engine does not start

Turn the ignition switch OFF.

↓

Disconnect the ignition pulse generator connector.
Check for continuity between the wire harness side connector terminal of the ignition pulse generator and ground.



Connection: Gray/Green — Ground
Standard: Continuity

No continuity → • Open circuit in Gray/Green wire

↓ Continuity

To page 23-46

From page 23-45

Connect the peak voltage adaptor to the digital multimeter (page 5-9).

Turn the ignition switch ON.
Crank the engine with the starter motor, and measure the ignition pulse generator peak voltage at the ignition pulse generator connector terminals.



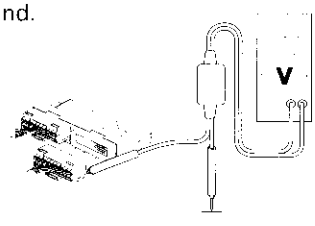
Connection: Yellow (+)—White/Yellow (−)
Standard: 0.7 V minimum

Abnormal → • Faulty ignition pulse generator

Normal

Turn the ignition switch OFF.
Connect the ignition pulse generator connector.
Disconnect the ECM gray connector (page 5-9).

Turn the ignition switch ON.
Crank the engine with the starter motor, and measure the ignition pulse generator peak voltage at the ECM test harness connector terminal and ground.



Connection: B22 (+)—Ground (−)
Standard: 0.7 V minimum

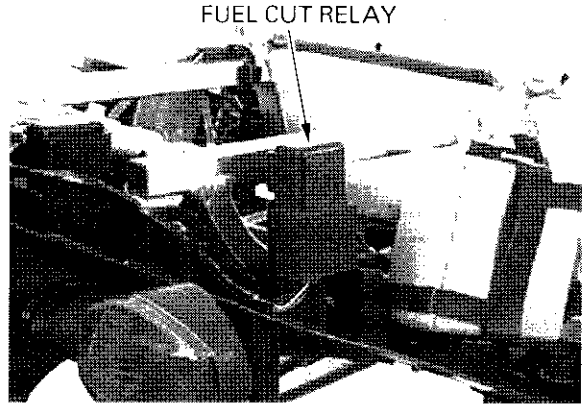
Abnormal → • Open or short circuit in Yellow wire

Normal → • Replace the ECM with a new one and inspect again.

FUEL CUT RELAY LOCATION

Remove the seat cowl (page 2-2).

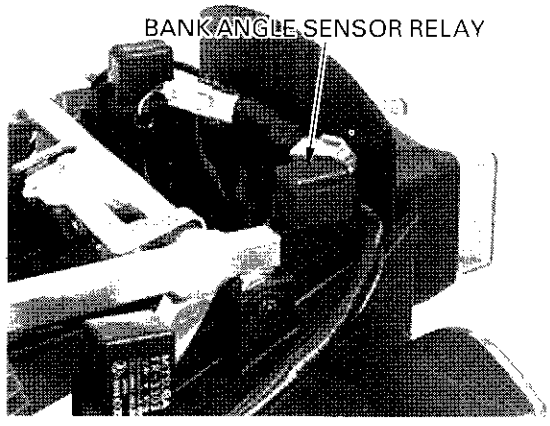
The fuel cut relay is right side of the seat rail near the converter unit.



BANK ANGLE SENSOR RELAY LOCATION

Remove the seat cowl (page 2-2).

The bank angle sensor relay is left side of the seat rail near the brake/taillight.

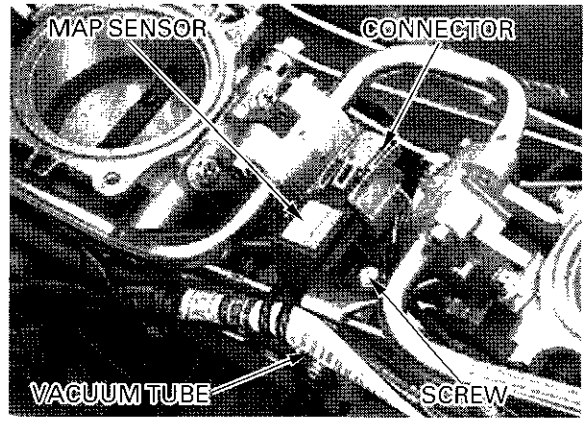


MAP SENSOR REPLACEMENT

Remove the air cleaner housing (page 5-56).

Disconnect the MAP sensor 3P connector.
Disconnect the vacuum tube from the MAP sensor.
Remove the screw and MAP sensor.

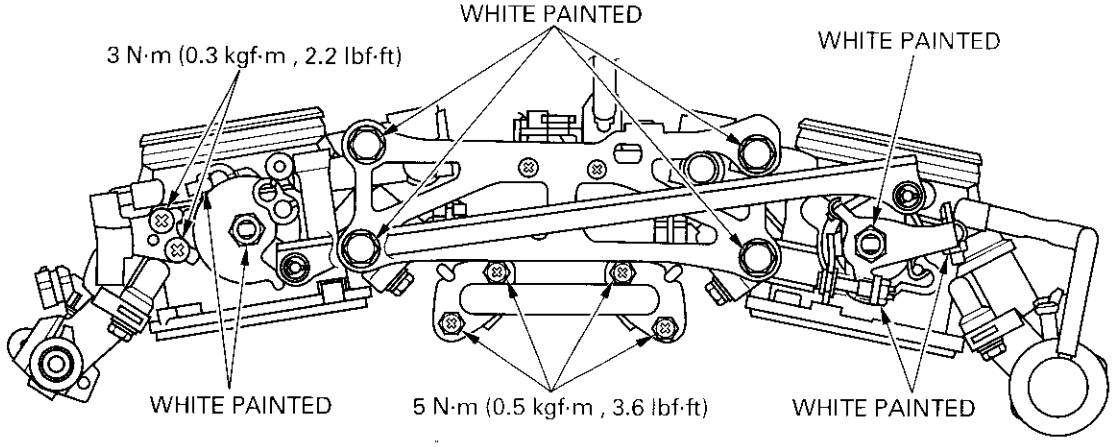
Installation is in the reverse order of removal.

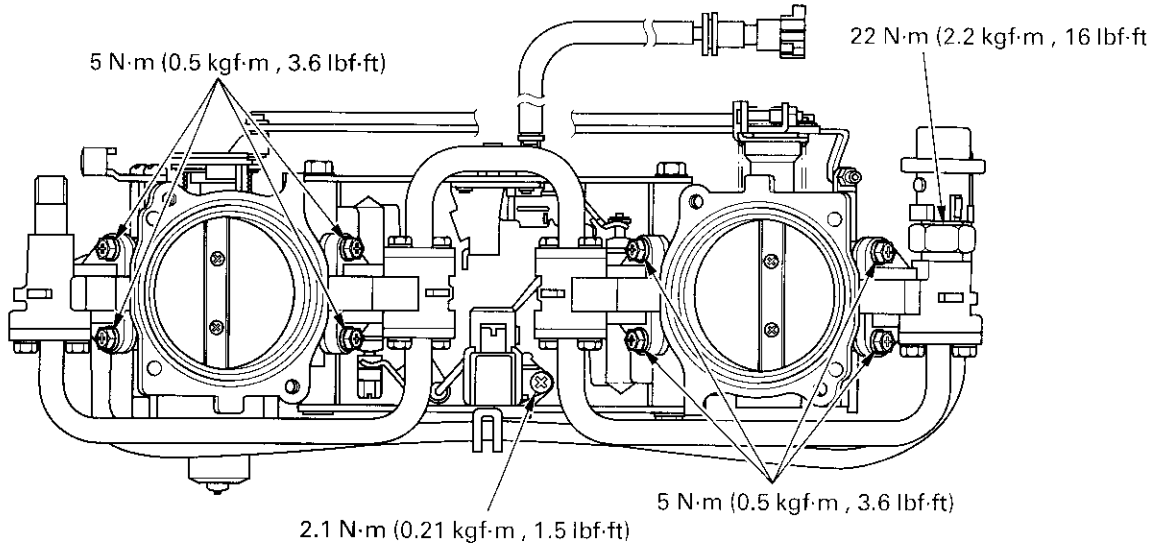


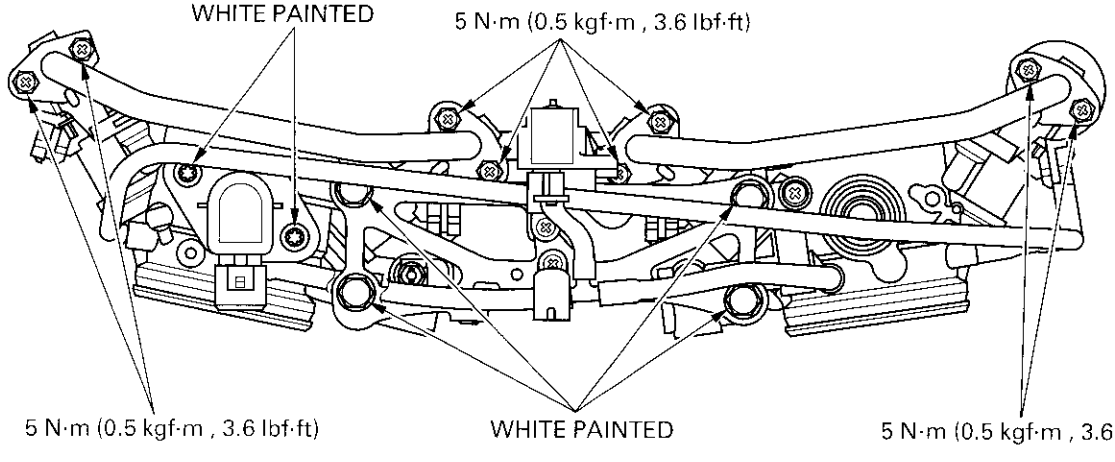
THROTTLE BODY

CAUTION:

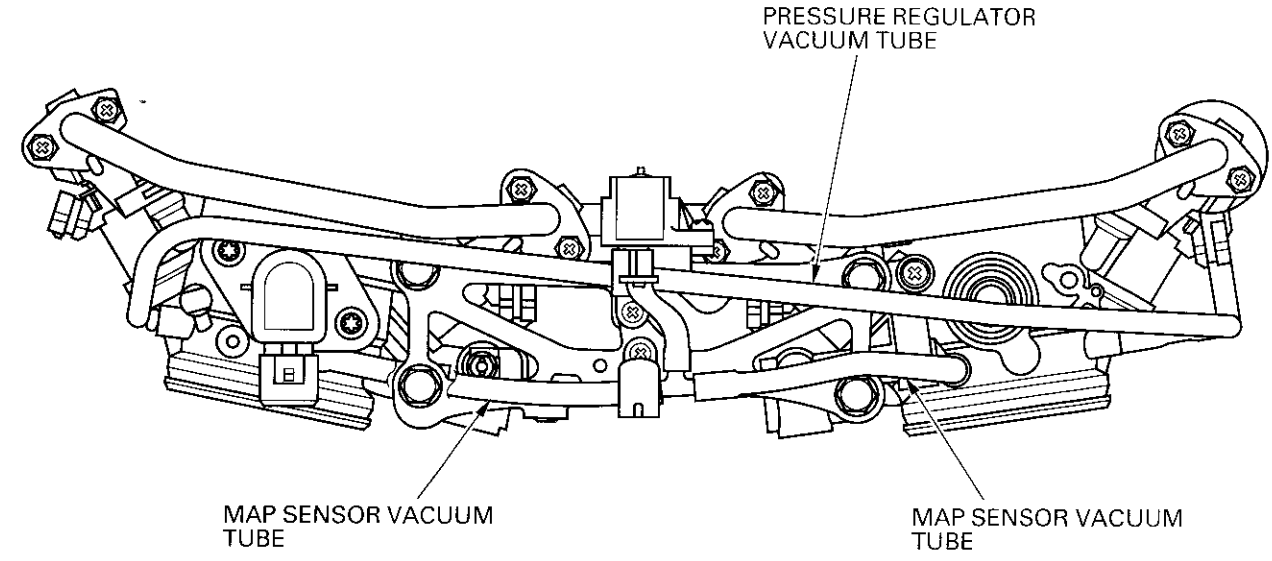
- ***Do not loosen or tighten the white painted bolts and screws of the throttle body. Loosening or tightening them can cause throttle and idle valve synchronization failure.***
- ***Tighten the bolts and screw of the throttle body to the specified torque. The parts of the throttle body not shown in this manual should not be disassembled.***

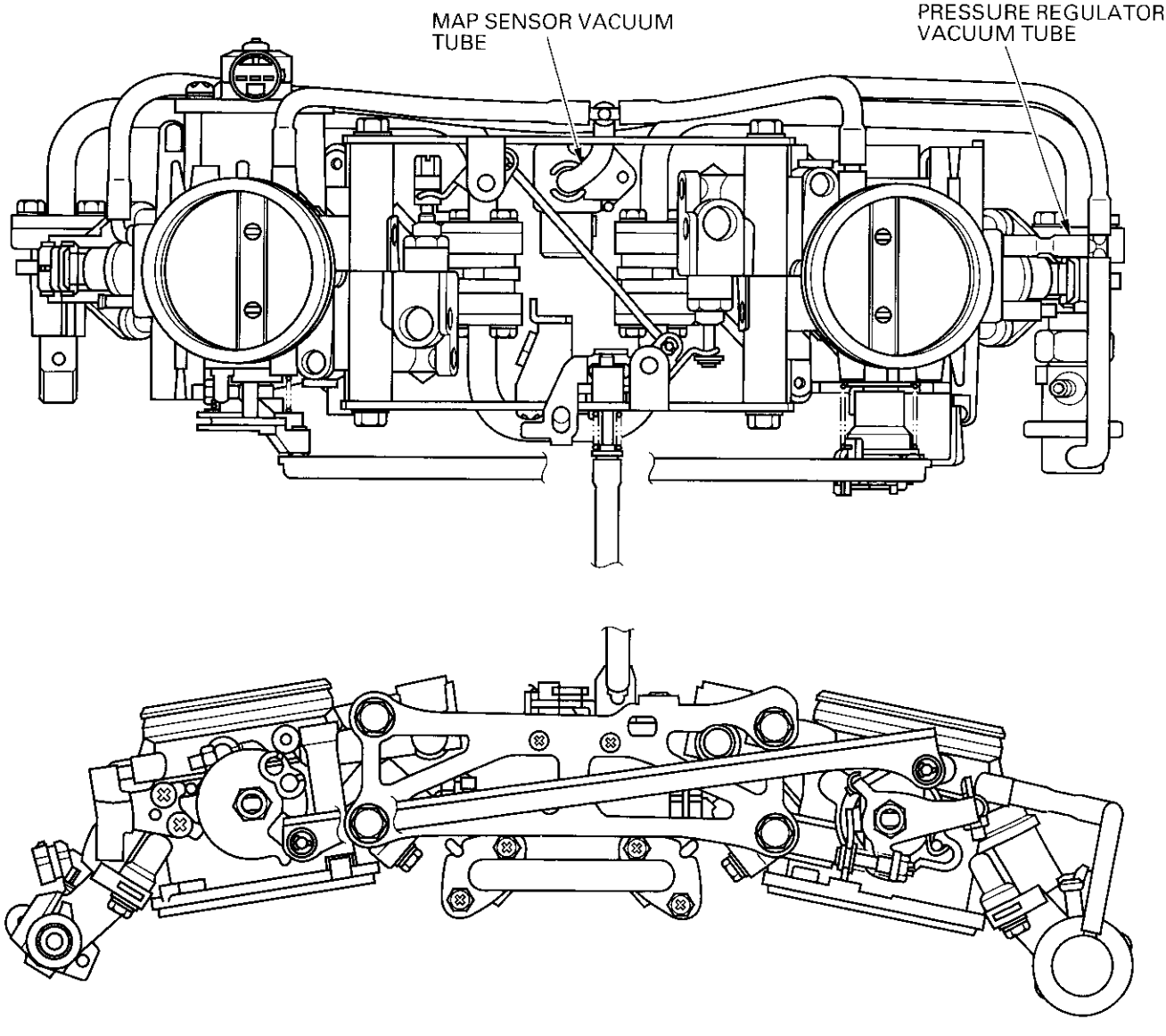




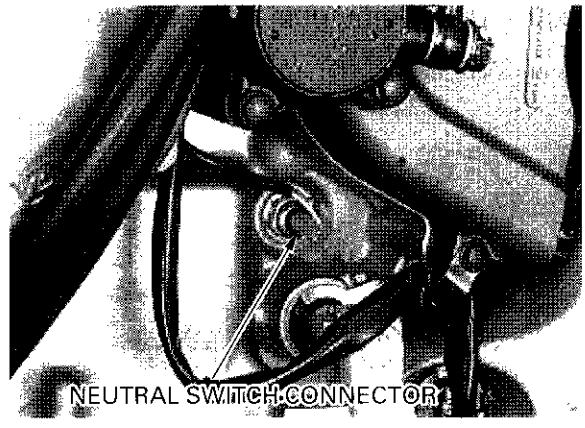


THROTTLE BODY VACUUM TUBE ROUTING





INTAKE AIR CONTROL SYSTEM

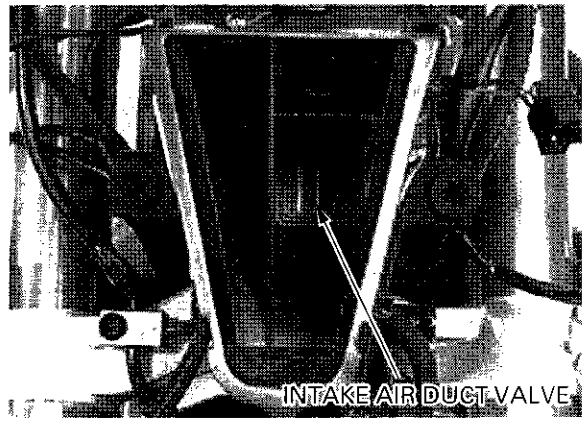


INSPECTION

Remove the left lower fairing (page 23-27).

Disconnect the neutral switch connector to simulate that the transmission is in gear.

Support the motorcycle and retract the side stand.
Shift the transmission in neutral and pull the clutch lever in, then start the engine.
Check that the intake air duct valve is opened.

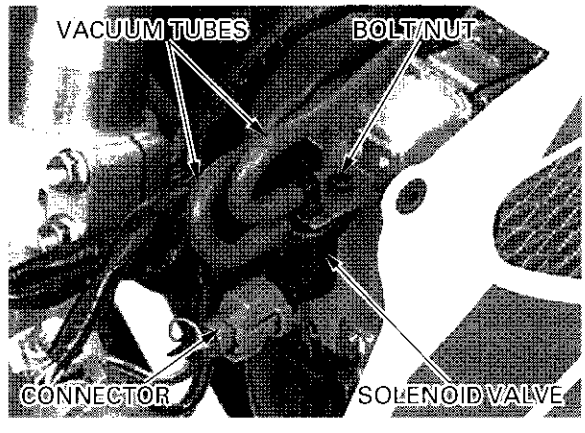


Check that the intake air duct valve is closed in the following conditions:
– engine speed: more than 4,900 min^{-1} (rpm)
– throttle opening: more than 10°

SOLENOID VALVE REPLACEMENT

Remove the upper fairing (page 23-28).

Disconnect the connector and vacuum tubes from the solenoid valve.
Remove the mounting bolt, nut and the solenoid valve from the stay.



Installation is in the reverse order of removal.

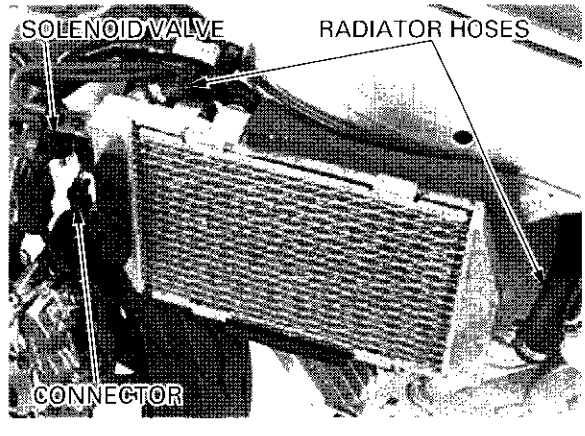
RADIATOR/COOLING FAN

CAUTION:

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

RADIATOR REMOVAL/ INSTALLATION

Drain the coolant from the system (page 6-5).



LEFT RADIATOR

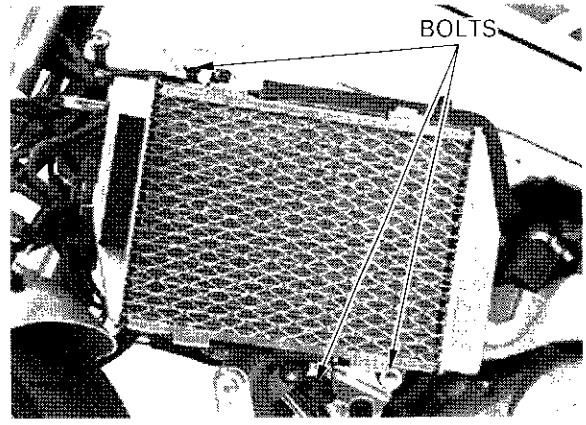
Disconnect the fan motor 2P (black) connector.
Disconnect the upper and lower radiator hoses from the radiator.
Remove the solenoid valve by removing the mounting bolt and nut.

Remove the three mounting bolts and the radiator from the frame.

Remove the radiator grille if necessary.

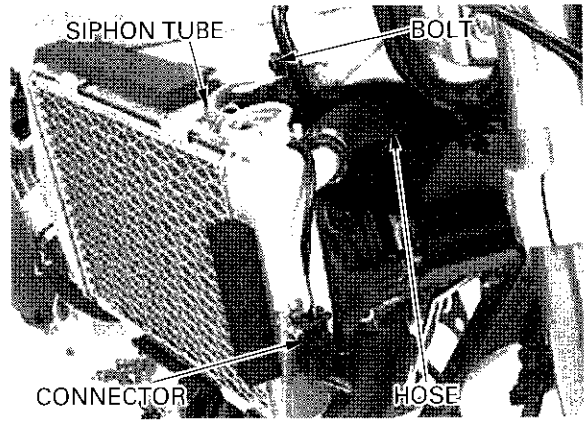
Install the left radiator in the reverse order of removal.

Fill and bleed the cooling system (page 6-5).



RIGHT RADIATOR

Disconnect the siphon tube from the filler neck.
Disconnect the fan motor connector.
Disconnect the upper and lower radiator hoses from the radiator.

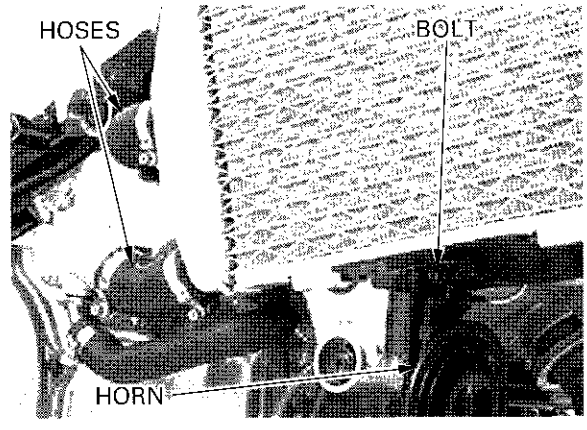


Remove the two mounting bolts, horn stay, horn and the radiator from the frame.

Remove the radiator grille if necessary.

Install the right radiator in the reverse order of removal.

Fill and bleed the cooling system (page 6-5).

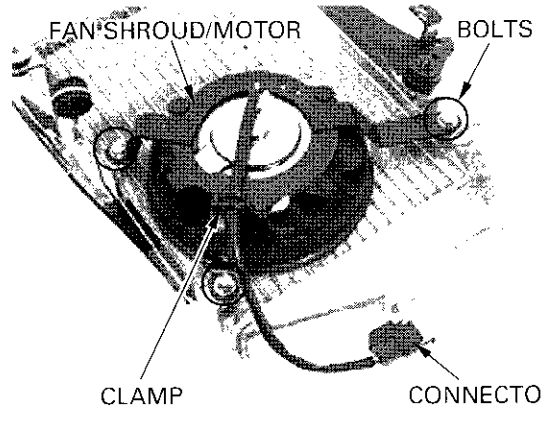


COOLING FAN DISASSEMBLY

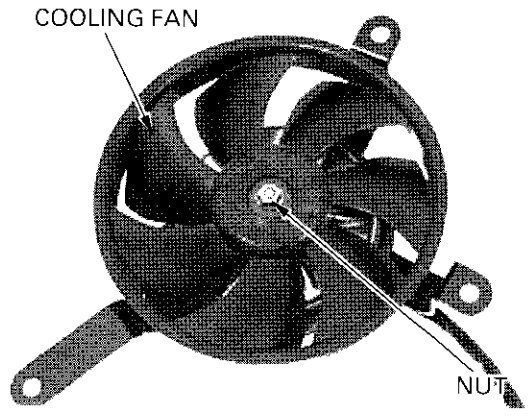
Remove the radiator (page 23-50).

Remove the fan motor connector from the stay.
Free the fan motor wires from the clamp.

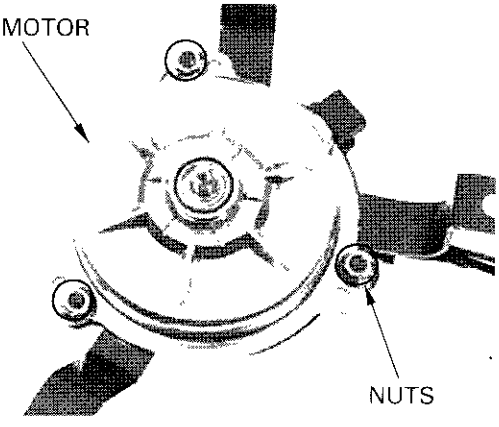
Remove the three bolts and fan shroud/motor assembly from the radiator.



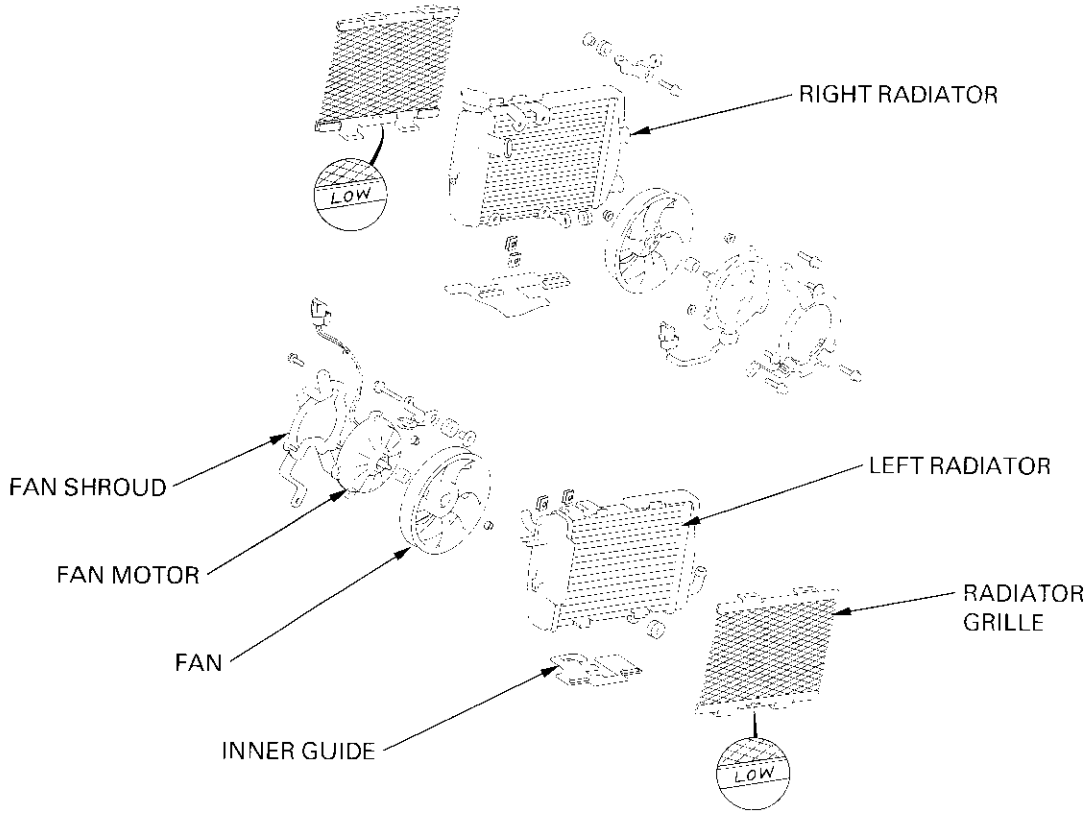
Remove the nut and cooling fan from the motor.



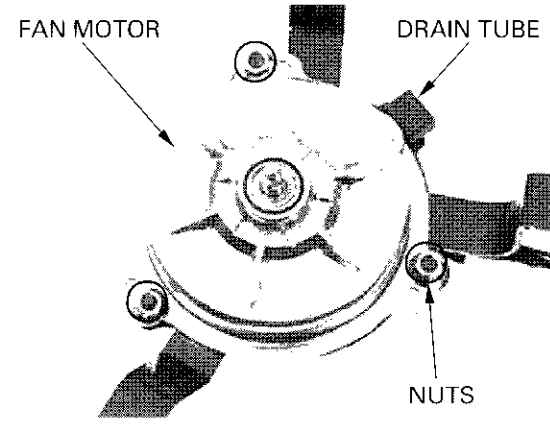
Remove the three nuts and the fan motor from the shroud.



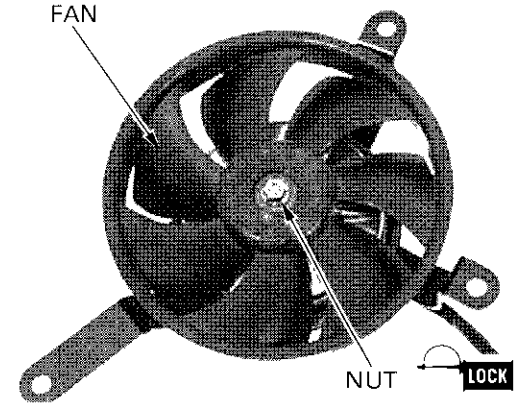
COOLING FAN ASSEMBLY



Install the fan motor onto the shroud with the drain tube facing down as shown, and tighten the three nuts securely.



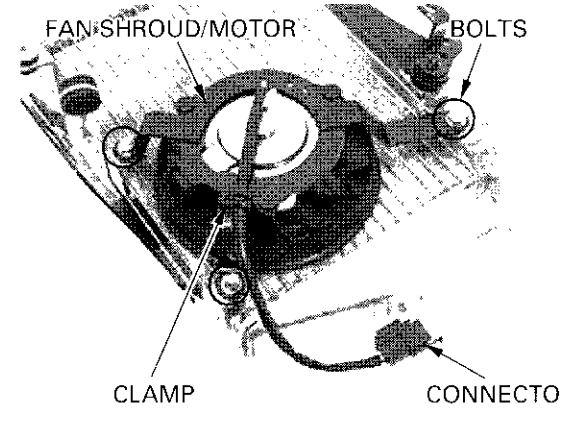
Install the cooling fan onto the motor shaft, aligning the flat surfaces.
Apply locking agent to the motor shaft threads.
Install and tighten the nut.



Install the fan shroud/motor assembly and tighten the three bolts securely.

Clamp the fan motor wires.
Install the fan motor connector onto the stay.

Install the radiator (page 23-50).



RADIATOR RESERVE TANK

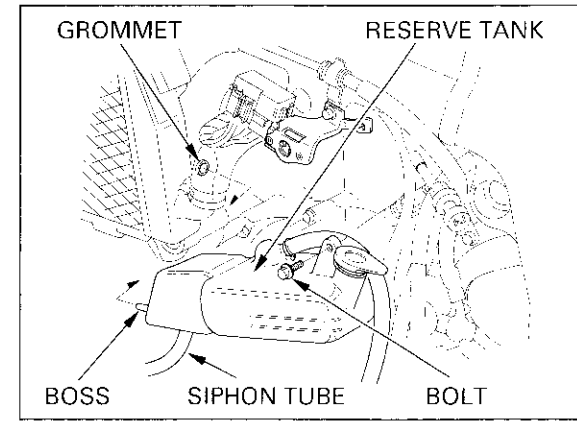
REMOVAL/INSTALLATION

Drain the coolant from the system (page 6-5).

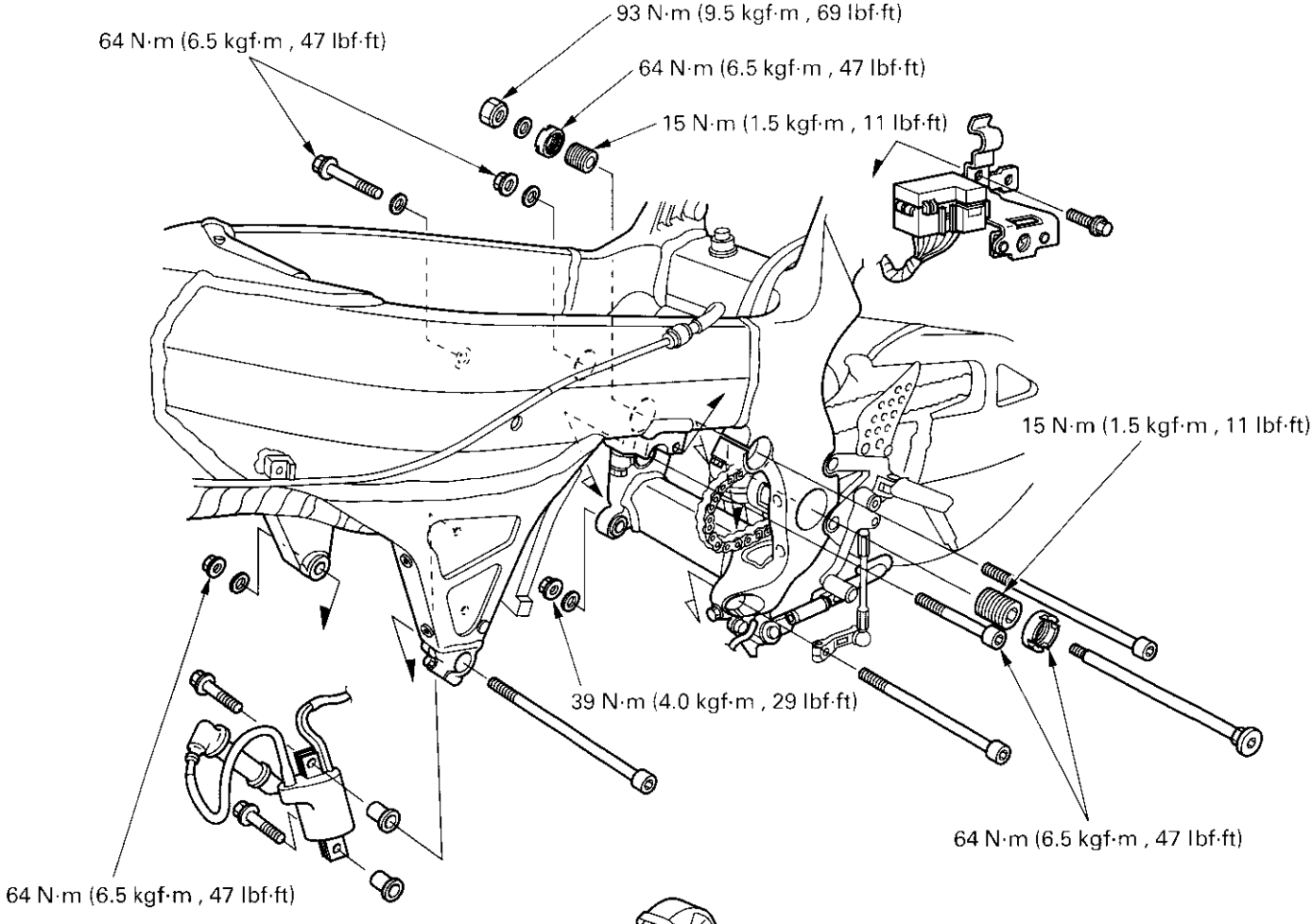
Remove the mounting bolt and reserve tank from the frame.
Remove the reserve tank cap and drain the coolant from the reserve tank.
Disconnect the siphon and overflow tubes from the reserve tank.

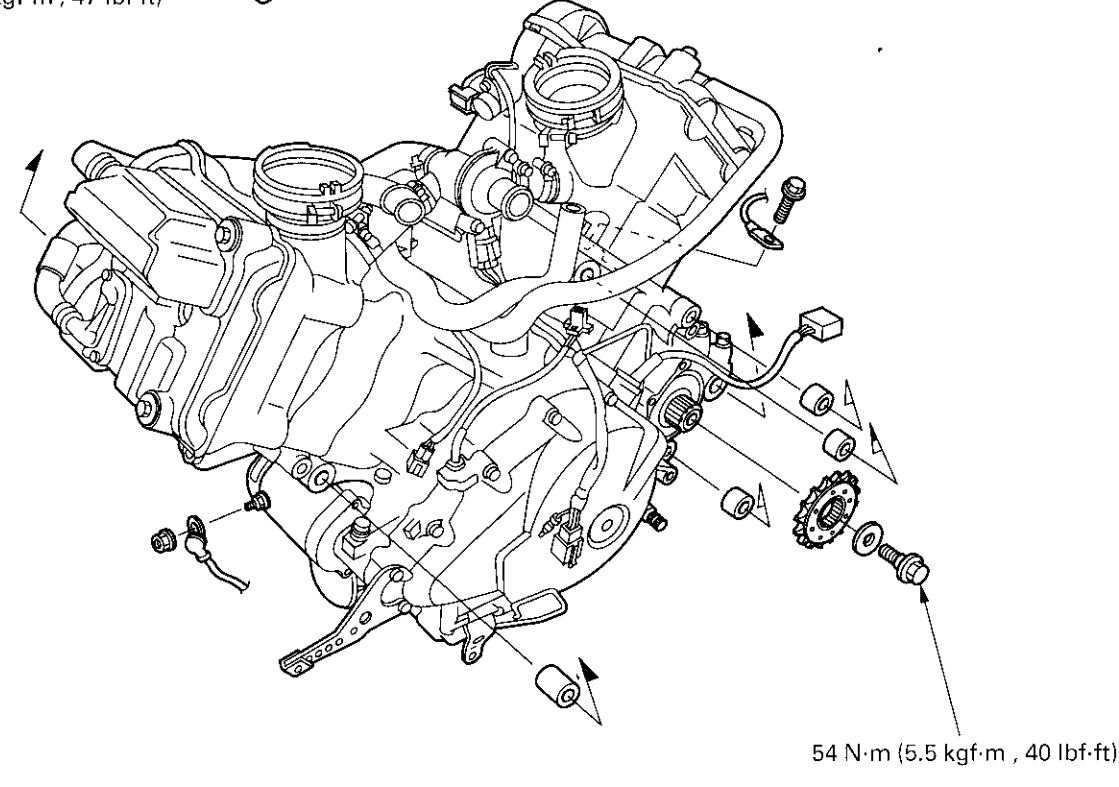
Connect the siphon and overflow tubes to the reserve tank.
Insert the reserve tank boss into the grommet in the frame properly.
Install and tighten the mounting bolt.

Fill and breed the cooling system (page 6-5).



ENGINE REMOVAL/INSTALLATION





SERVICE INFORMATION

GENERAL

- A hoist or equivalent is required to support the motorcycle when removing and installing the engine.
- A floor jack or other adjustable support is required to support and maneuver the engine.

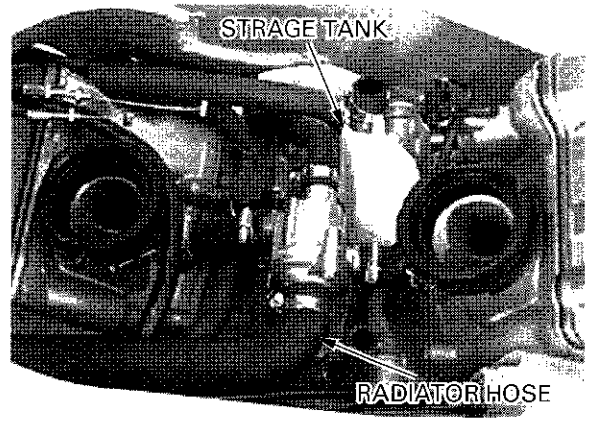
CAUTION:

Do not use the oil filter as a jacking point.

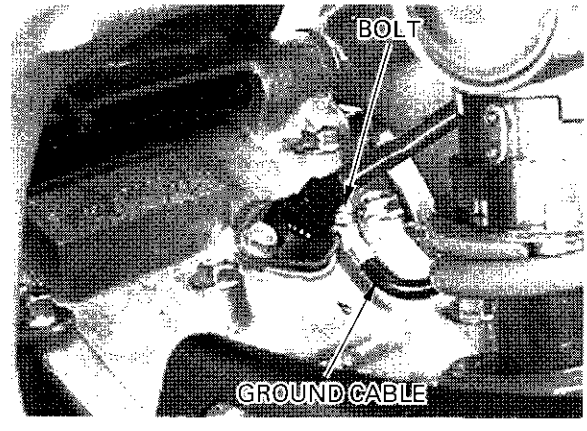
- When using the lock nut wrench for the swingarm pivot adjusting bolt lock nut, use a deflecting beam type torque wrench 20 inches long.
  The lock nut wrench increases the torque wrench's leverage, so the torque wrench reading will be less than the torque actually applied to the lock nut. The specification given is the actual torque applied to the lock nut, not the reading on the torque wrench. Do not overtighten the lock nut. The specification later in the text gives both actual and indicated.
- The following components require engine removal for service:
  – transmission (section 11)
  crankshaft/piston/cylinder (section 12)
- When installing the engine, be sure to tighten the engine mounting fasteners to the specified torque in the specified sequence. If you mistake the tightening torque or sequence, loosen all mounting fasteners, then tighten them again to the specified torque in the correct sequence.

ENGINE REMOVAL

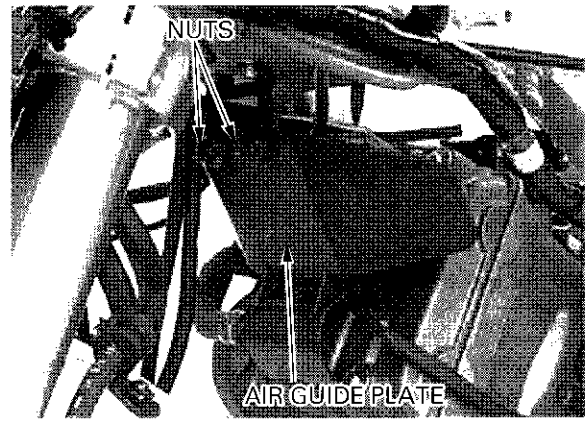
Remove the following:
– exhaust system (page 2-4)
– oil cooler (page 23-34)
– throttle body (page 5-58)
– left and right radiators (page 23-50)
– radiator reserve tank (page 23-53)
– brake hose clamp from the swingarm
– crankcase breather storage tank and hose
– upper radiator hose from the thermostat housing



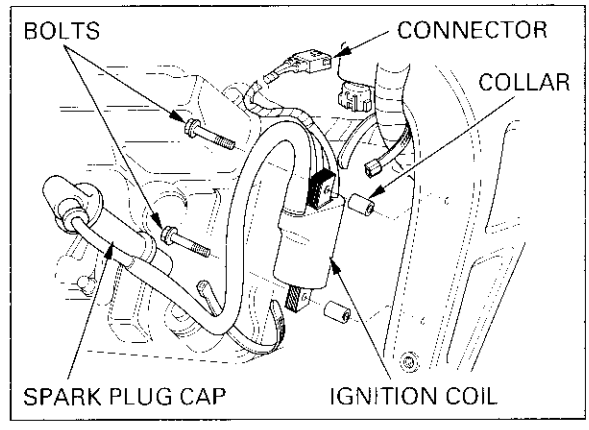
Remove the bolt and the battery ground cable from the engine.



Remove the two nuts and air guide plate.

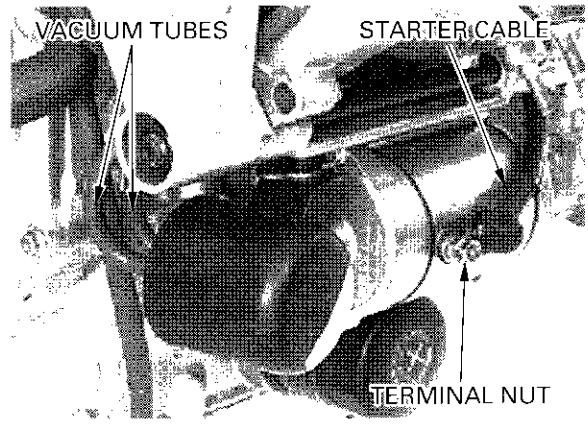


Remove the two ignition coil mounting bolts and collars.
Remove the spark plug cap from the plug, disconnect the front ignition coil connector, and remove the ignition coil.

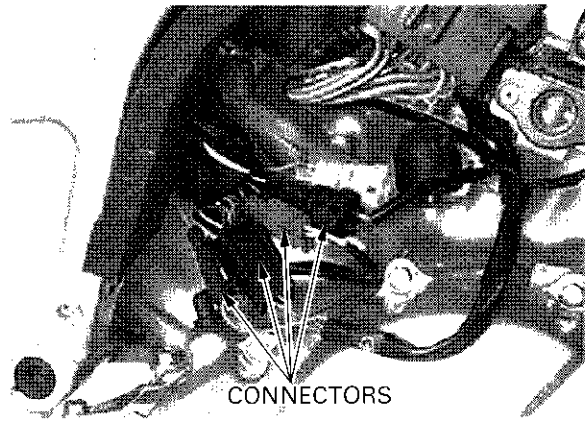


Disconnect the vacuum tubes from the vacuum tank.

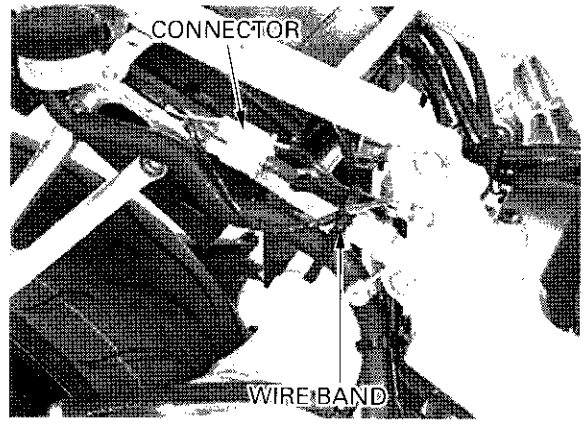
Remove the nut and starter cable from the starter motor terminal.



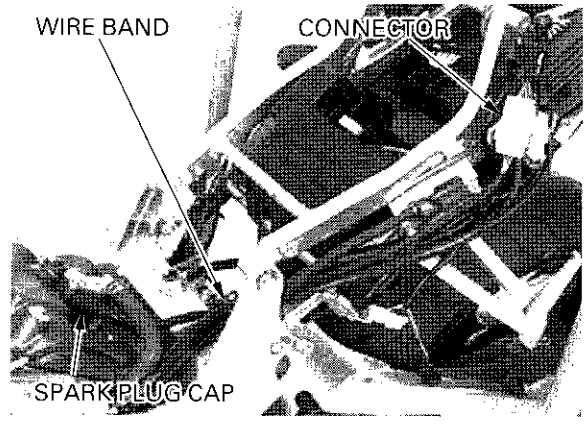
Disconnect the following:
- ignition pulse generator connector
- engine wire harness connector
- pulse secondary air injection (PAIR) control solenoid valve connector
  oil pressure switch connector



Disconnect the speed sensor 3P connector.
Remove the wire band.



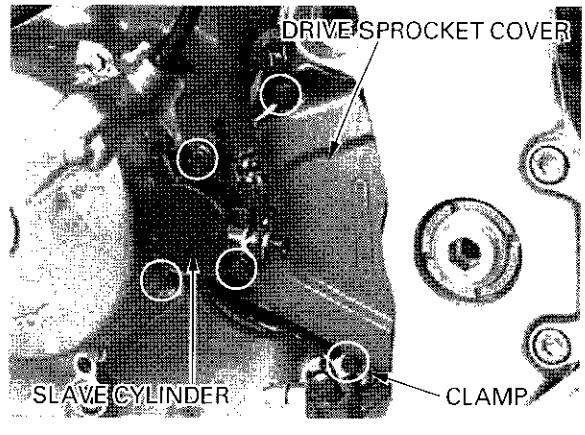
Disconnect the alternator 3P connector and free the alternator wire from the wire band.
Remove the spark plug cap from the rear cylinder head cover.



Remove the bolts, choke knob stay, clutch slave cylinder, wire clamp and drive sprocket cover/ guide plate.
Remove the dowel pins.

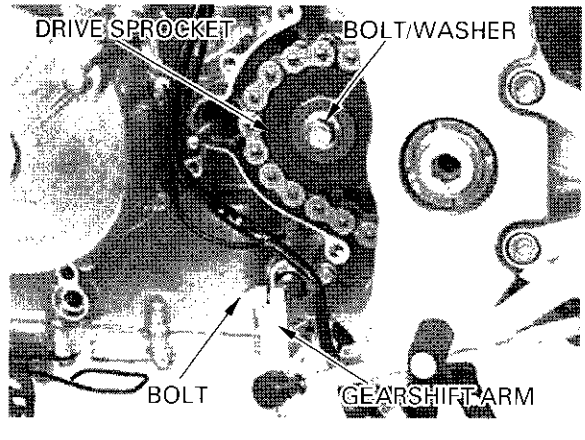
NOTE:

- Do not disconnect the clutch hose.
- To keep slave cylinder piston from being forced out of the cylinder, squeeze the clutch lever and tie it to the handlebar.

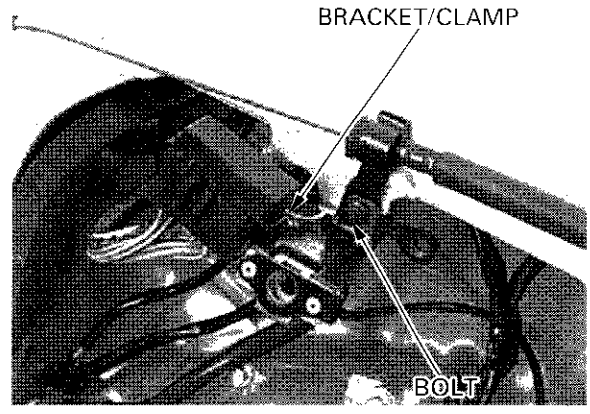


Remove the bolt and gearshift arm from the spindle.

Loosen the rear axle nut, lock nuts and drive chain adjusting bolts.
Remove the drive sprocket bolt, washer and the drive sprocket from the countershaft.

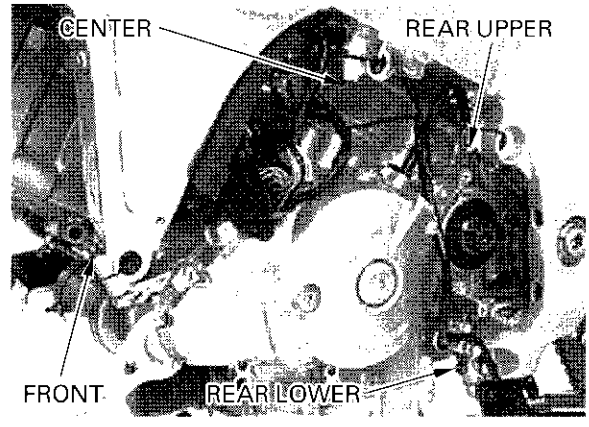


Remove the bolt and fuse box bracket/clutch pipe clamp.

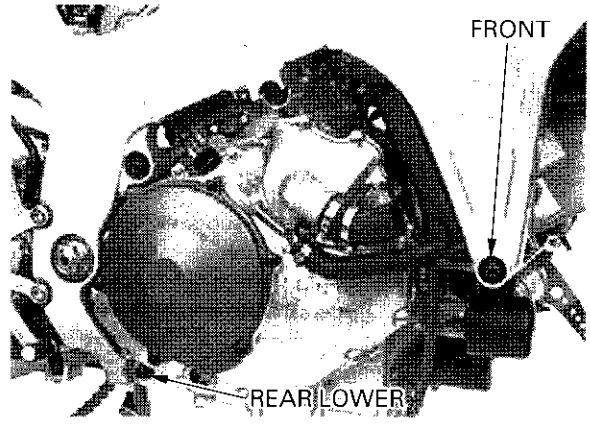


Support the motorcycle securely with a hoist or equivalent.

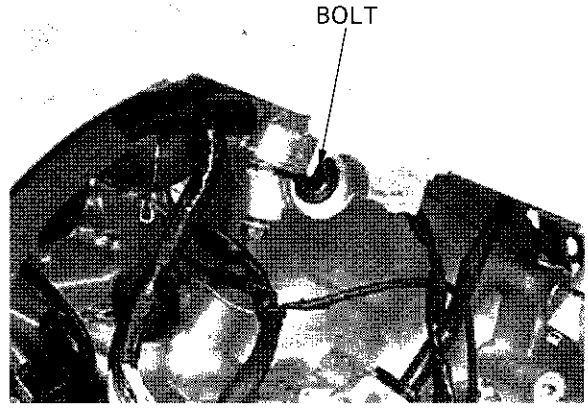
Loosen the engine hanger pinch bolts in the specified sequence as follows:
– rear lower
  rear upper
– front
– center



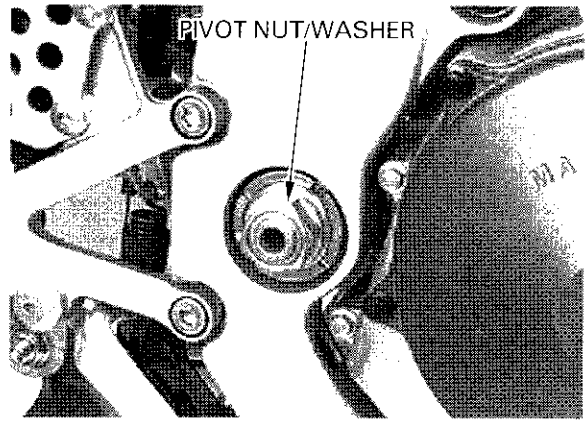
Remove the engine hanger nuts in the specified sequence as follows:
– front
– rear lower



Loosen the left side center engine hanger bolt.

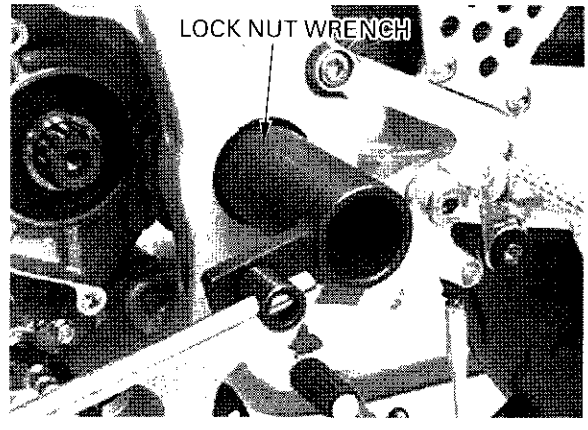


Remove the swingarm pivot nut and washer.

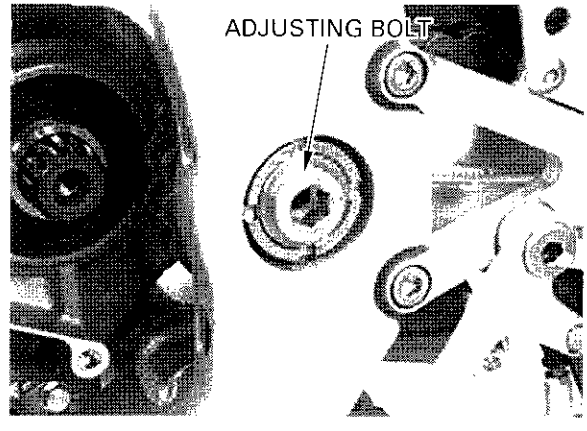


Loosen the left swingarm pivot lock nut.

TOOL:
Lock nut wrench 07YMA-MCF0100



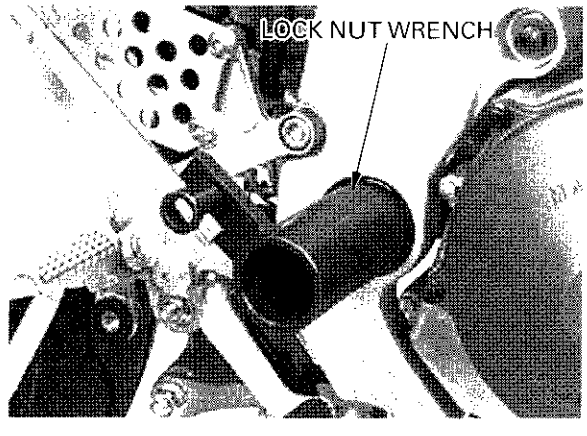
Loosen the swingarm left pivot adjusting bolt.



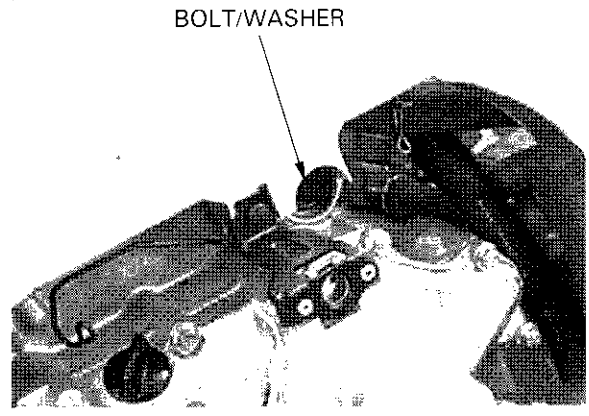
Loosen the swingarm right pivot lock nut.

TOOL:
Lock nut wrench 07YMA-MCF0100

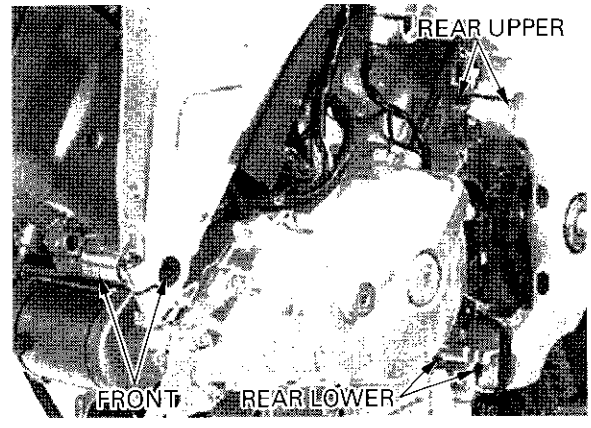
Remove the rear upper engine hanger nut.



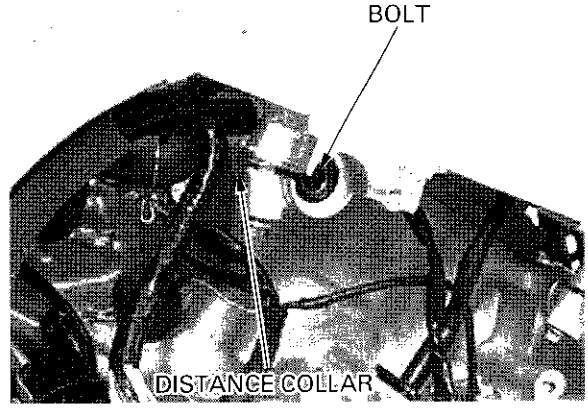
Remove the right center engine hanger bolt and washer.



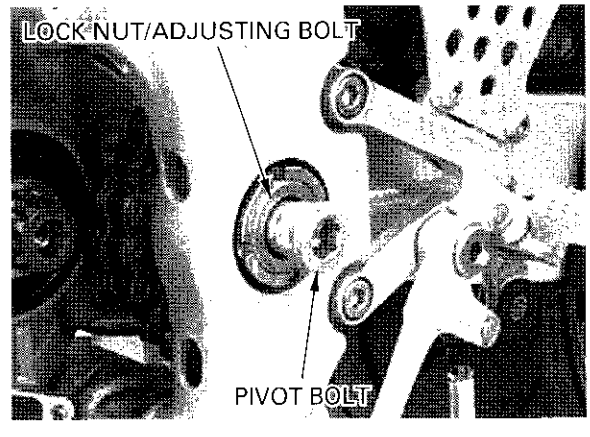
Remove the engine hanger bolts and distance collars in the specified sequence as follows:
front
—rear lower
—rear upper



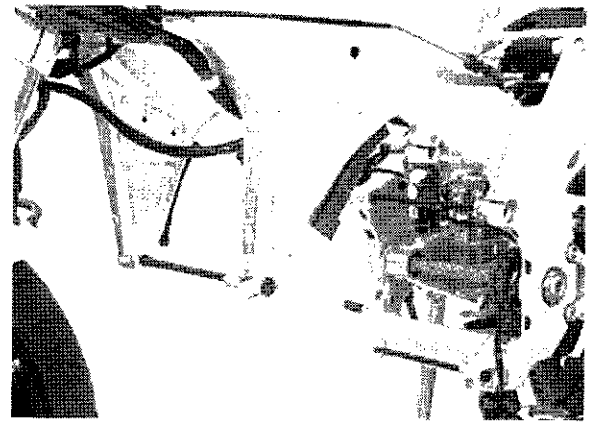
Remove the left center engine hanger bolt and distance collar.



Remove the swingarm pivot bolt, adjusting bolts and lock nuts, then remove the engine from the frame.



ENGINE INSTALLATION



NOTE:

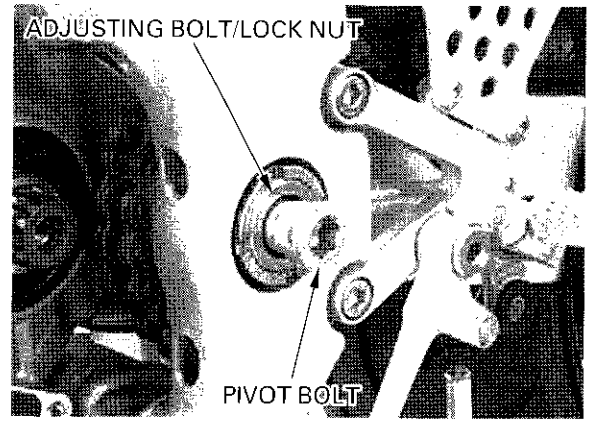
- When tightening the lock nut with the lock nut wrench, refer to torque wrench reading information on page 23-53 "SERVICE INFORMATION".
- The jack height must be continually adjusted to relieve stress from the mounting fasteners.

CAUTION:

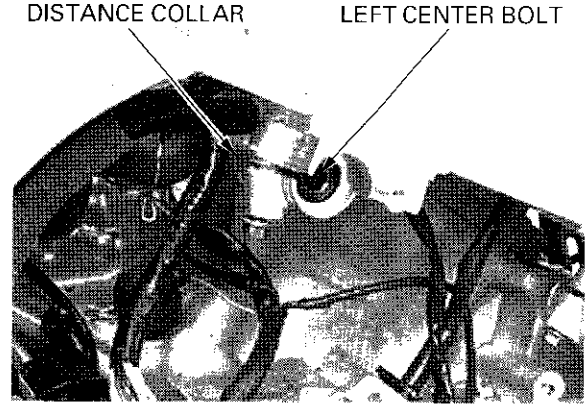
Be sure to tighten all engine mounting fasteners to the specified torque in the specified sequence described below. If you mistake the tightening torque or sequence, loosen all mounting fasteners, then tighten them again to the specified torque in the specified sequence.

Install the engine in the frame.

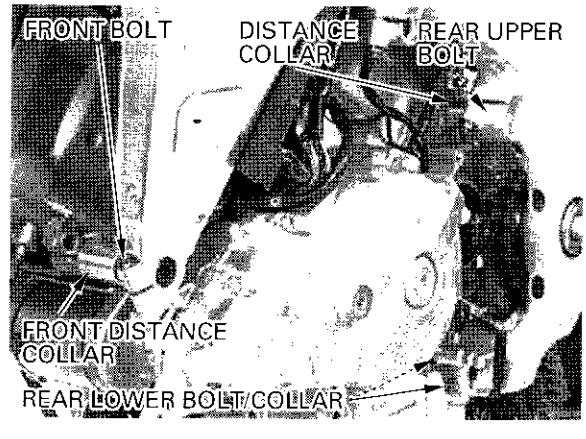
1. Temporarily install the left and right swingarm pivot adjusting bolts and lock nuts into the frame.
2. Temporarily install the swingarm pivot bolt from the left side.



3. Temporarily install the left center engine hanger bolt and distance collar.



4. Temporarily install the engine hanger bolts and distance collars in the specified sequence as follows:
   - rear upper
   - rear lower
   - front

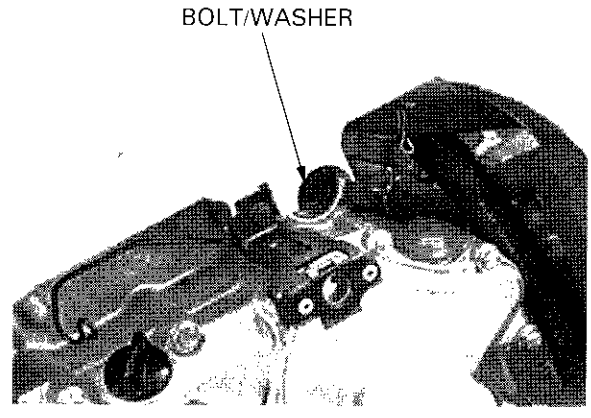


5. Tighten the right center engine hanger bolt with washer to the specified torque.

TORQUE: 64 N·m (6.5 kgf·m , 47 lbf·ft)

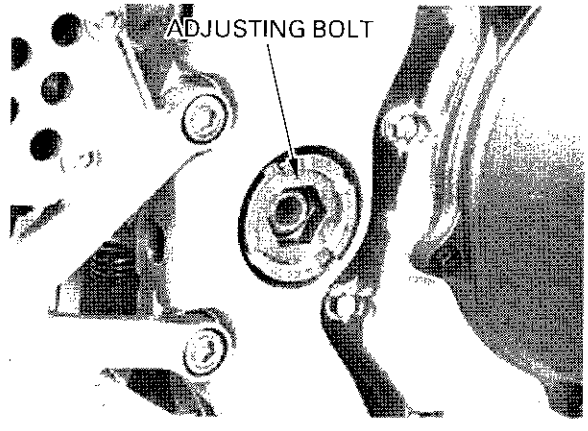
6. Tighten the rear upper engine hanger nut with a washer to the specified torque.

TORQUE: 64 N·m (6.5 kgf·m , 47 lbf·ft)



7. Tighten the swingarm right pivot adjusting bolt to the specified torque.

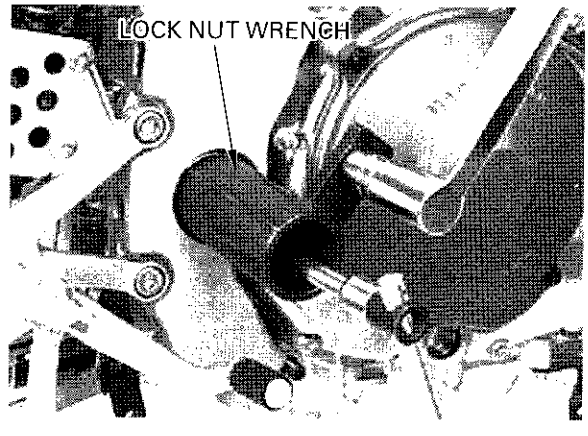
TORQUE: 15 N·m (1.5 kgf·m , 11 lbf·ft)



8. Tighten the swingarm right pivot lock nut while holding the adjusting bolt.

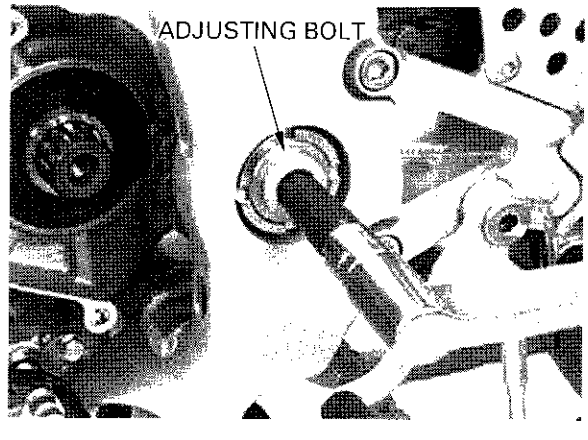
TORQUE: **Actual:** 64 N·m (6.5 kgf·m , 47 lbf·ft)
Indicated: 58 N·m (5.9 kgf·m , 43 lbf·ft)

TOOL:
Lock nut wrench 07YMA-MCF0100



9. Tighten the swingarm left pivot adjusting bolt to the specified torque.

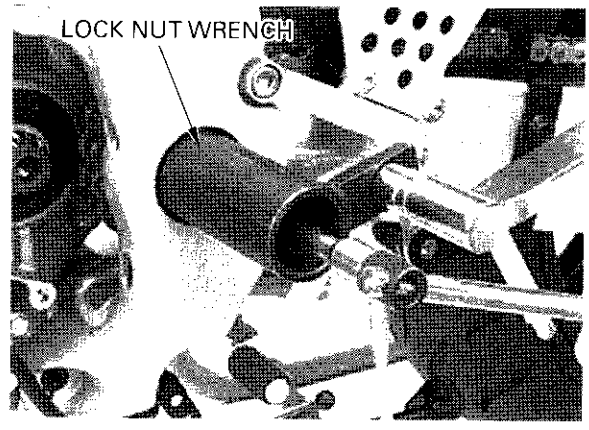
TORQUE: 15 N·m (1.5 kgf·m , 11 lbf·ft)



10. Tighten the swingarm left pivot lock nut to the specified torque while holding the adjusting bolt.

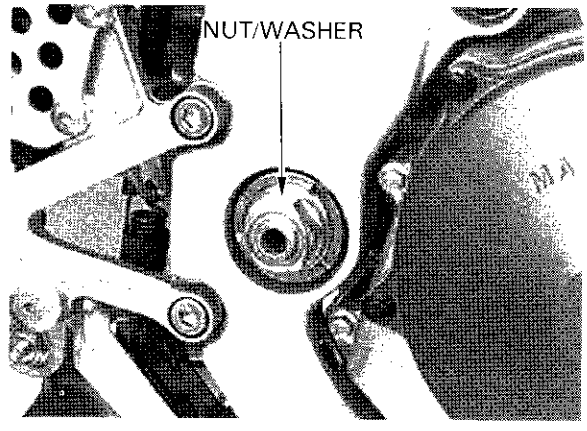
TORQUE: Actual: 64 N·m (6.5 kgf·m , 47 lbf·ft)
Indicated: 58 N·m (5.9 kgf·m , 43 lbf·ft)

TOOL:
Lock nut wrench 07YMA-MCF0100



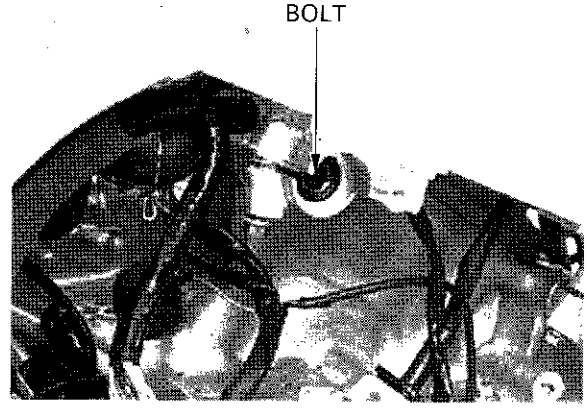
11. Tighten the swingarm pivot nut with washer to the specified torque.

TORQUE: 93 N·m (9.5 kgf·m , 69 lbf·ft)



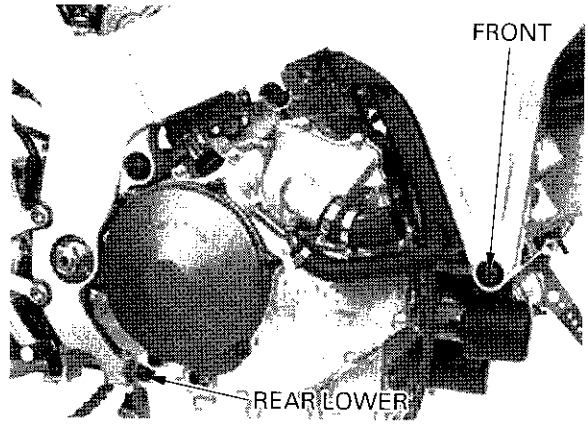
12. Tighten the left center engine hanger bolt to the specified torque.

TORQUE: 64 N·m (6.5 kgf·m , 47 lbf·ft)

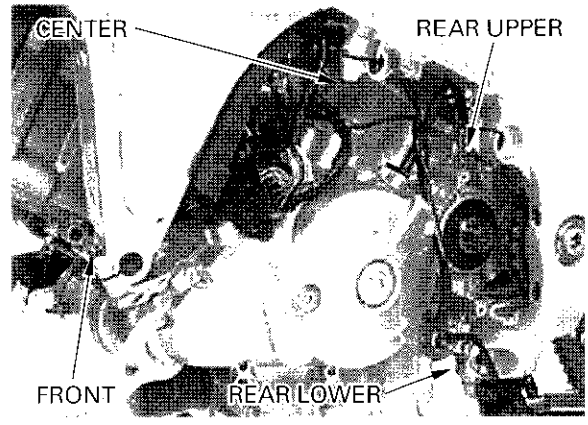


13. Tighten the engine hanger nuts with washers to the specified torque in the specified sequence as follows:
—rear lower
—front

TORQUE:
Front: 64 N·m (6.5 kgf·m , 47 lbf·ft)
Rear lower: 39 N·m (4.0 kgf·m , 29 lbf·ft)



14. Tighten the engine hanger pinch bolts in the specified sequence as follows:
   – center
   – front
   – rear upper
     rear lower

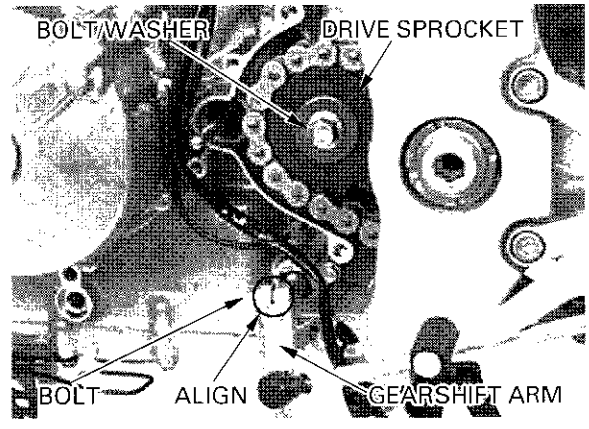


Install the drive sprocket with the drive chain onto the countershaft.

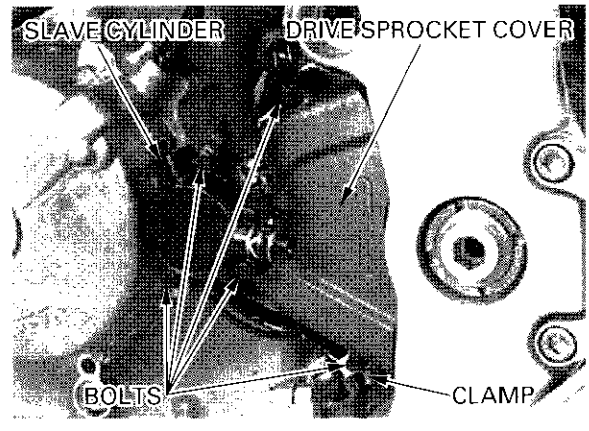
Install the bolt and washer, and tighten the bolt to the specified torque.

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

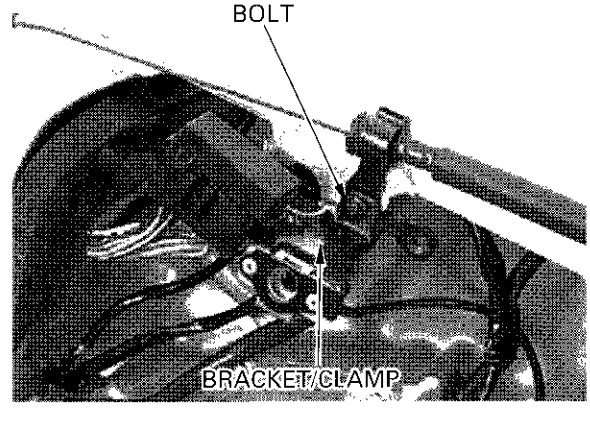
Install the gearshift arm while aligning the slit with the punch mark on the spindle. Tighten the bolt securely.



Install the dowel pins and drive sprocket cover/ guide plate.
Install the dowel pins and a new gasket to the clutch slave cylinder.
Install the clutch slave cylinder, choke knob stay, wire clamp and bolts.
Tighten the bolts securely.
Release the clutch lever from the handlebar.



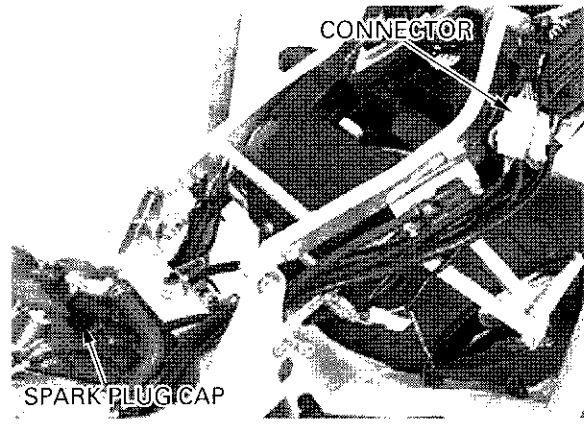
Install the fuse box bracket/clutch pipe clamp and tighten the bolt securely.



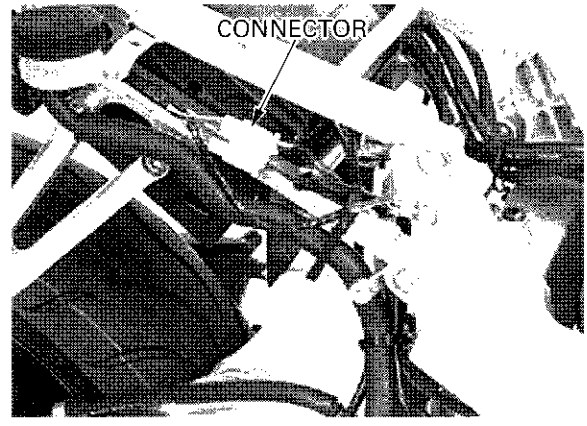
Route the alternator wire properly (page 23-26).

Connect the alternator 3P connector.

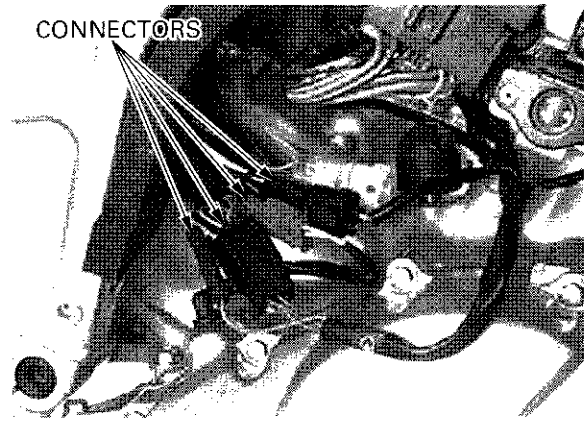
Install the rear spark plug cap.



Route the speed sensor wire properly (page 23-26).
Connect the speed sensor connector.



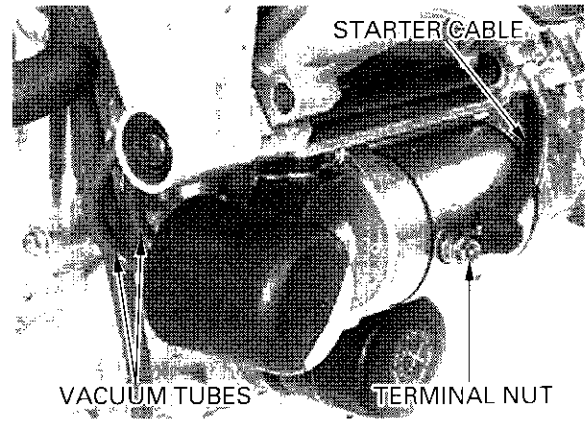
Connect the following:
- ignition pulse generator connector
- engine wire harness connector
- pulse secondary air injection (PAIR) control solenoid valve connector
- oil pressure switch connector



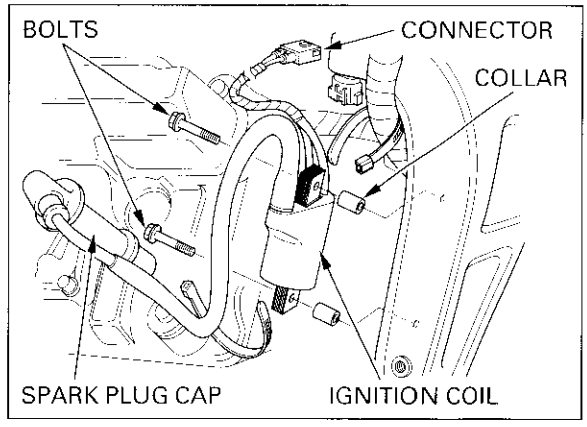
Route the vacuum tubes properly (page 23-21, 22).
Connect the vacuum tubes to the vacuum tank.

Connect the starter cable to the starter motor terminal.
Tighten the terminal nut to the specified torque.

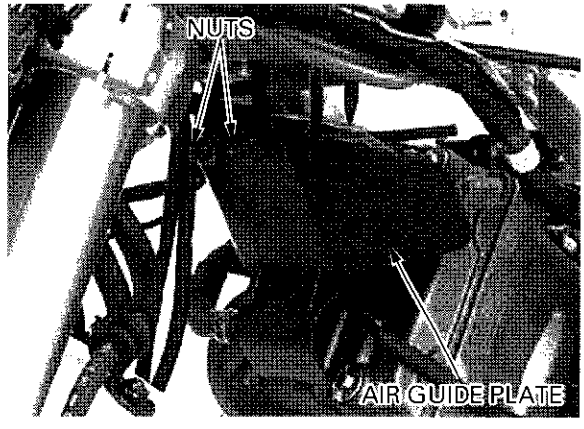
TORQUE: 10 N·m (1.0 kgf·m , 7 lbf·ft)



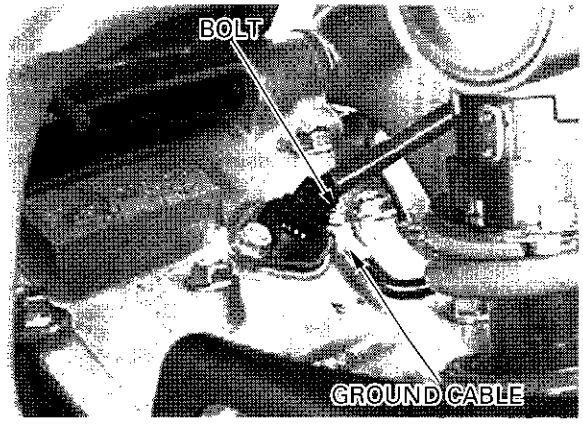
Connect the front ignition coil connector.
Install the ignition coil and tighten the mounting bolts with collars securely.
Install the spark plug cap.



Install the air guide plate and tighten the mounting nuts securely.

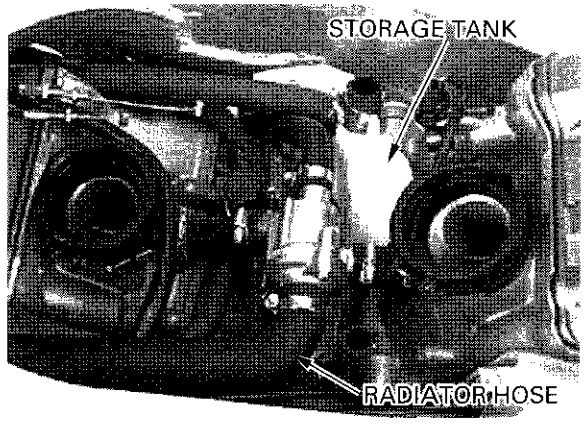


Install the battery ground cable and tighten the bolt securely.

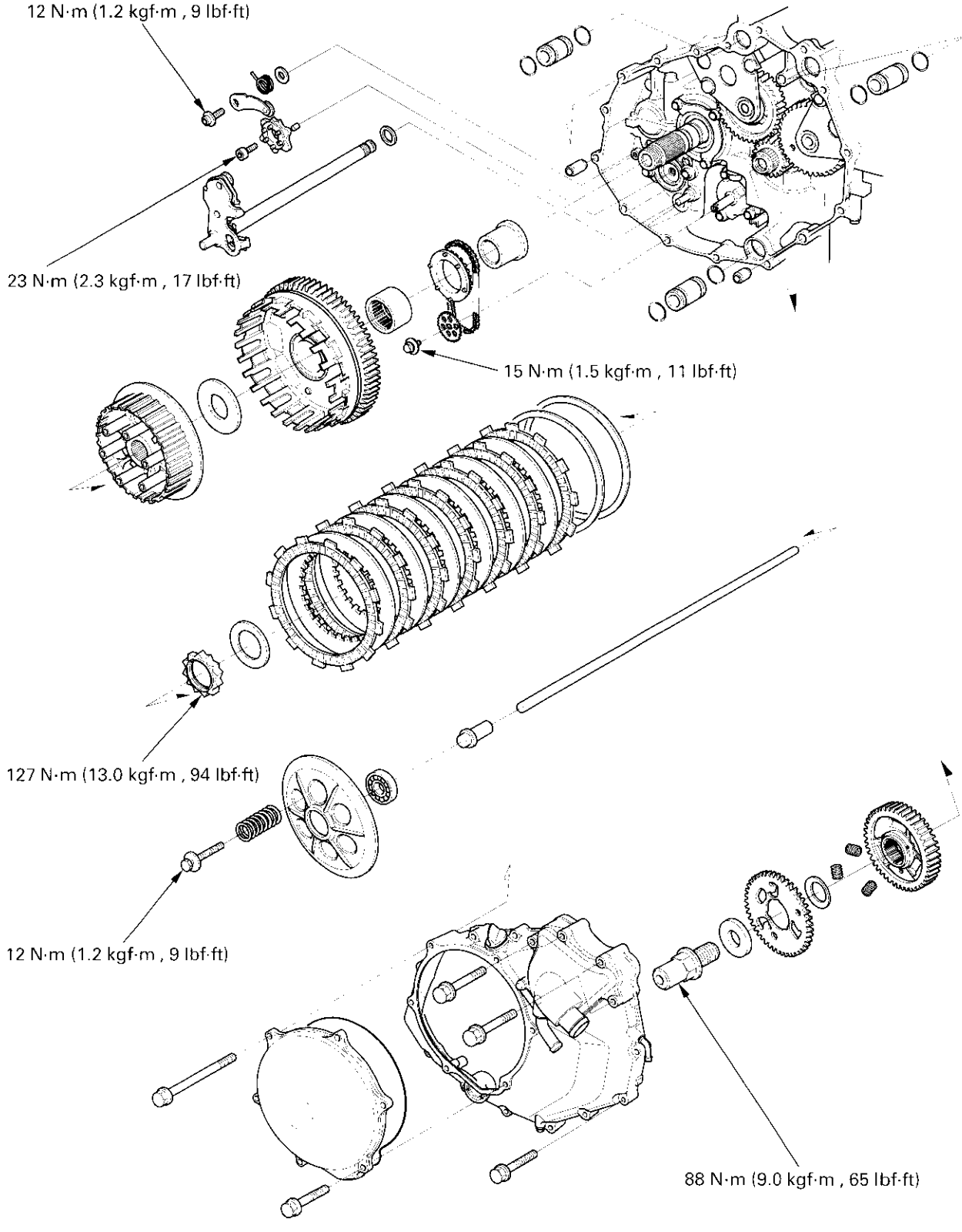


Install the following:
- upper radiator hose onto the thermostat housing
- crankcase breather storage tank and hose
- brake hose clamp to the swingarm
- radiator reserve tank(page 23-53)
- left and right radiators(page 23-50)
- throttle body(page 5-67)
- exhaust system(page 23-29)
- oil cooler(page 23-34)

Fill the crankcase with the recommended oil(page 3-15).
Fill and bleed the cooling system(page 6-5).
Adjust the drive chain(page 3-18).



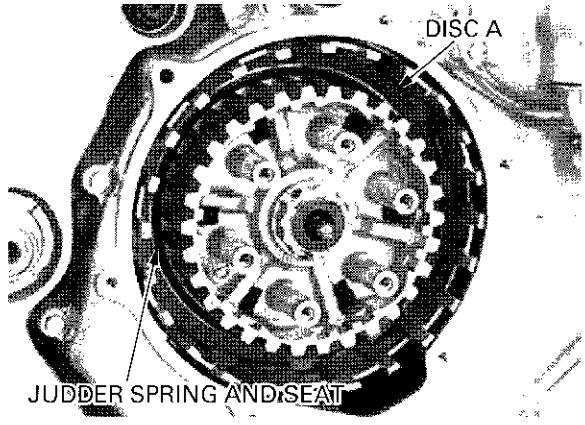
CLUTCH


12 N·m (1.2 kgf·m , 9 lbf·ft)
23 N·m (2.3 kgf·m , 17 lbf·ft)
15 N·m (1.5 kgf·m , 11 lbf·ft)
127 N·m (13.0 kgf·m , 94 lbf·ft)
12 N·m (1.2 kgf·m , 9 lbf·ft)
88 N·m (9.0 kgf·m , 65 lbf·ft)

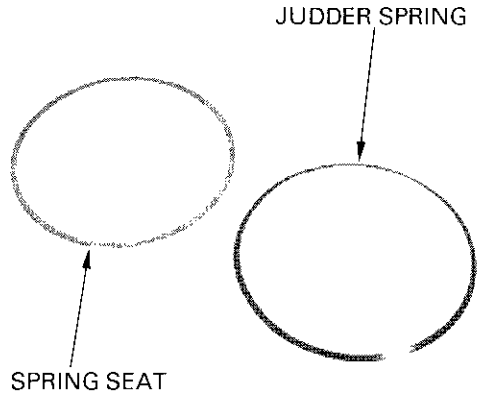
CLUTCH DISCS/PLATES REPLACEMENT

Remove the follows refering to page 9-12:
- clutch cover
  pressure plate
- clutch lifter piece
  clutch lifter rod
- clutch discs and plates

Remove the clutch disc A, judder spring and spring seat.



Check the judder spring and spring seat for damage and bent.
Replace them, if necessary.

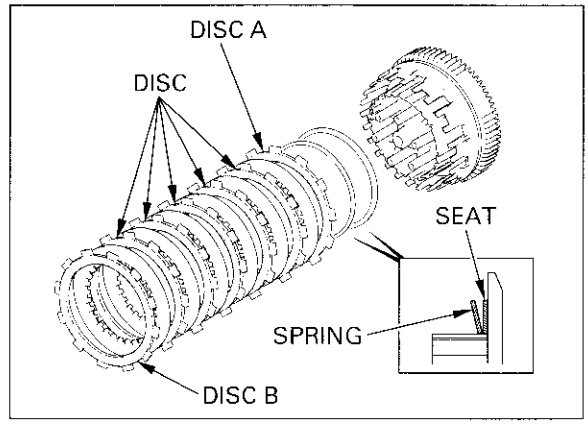


Coat the clutch discs with clean engine oil.
Install the clutch disc A (larger I.D. than others), spring seat and judder spring first.
Install the six clutch plates and five discs. alternately, starting with plate.

install the tabs of disc B into the shallow slots of the clutch outer.

Install the clutch disc B (dark specks on the pads and green paint on one tab).

Install the follows refering to page 9-20:
- clutch lifter rod
- clutch lifter piece
  pressure plate
- clutch cover

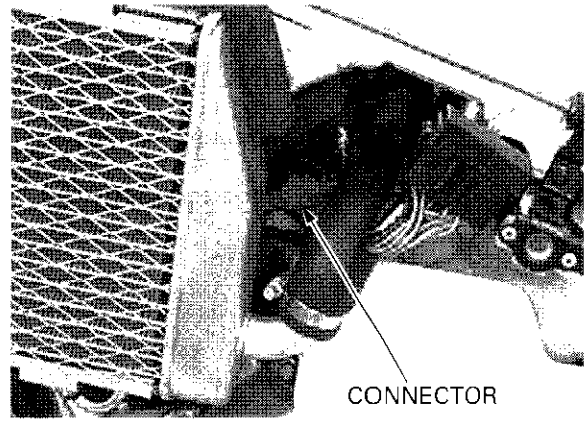


ALTERNATOR STATOR

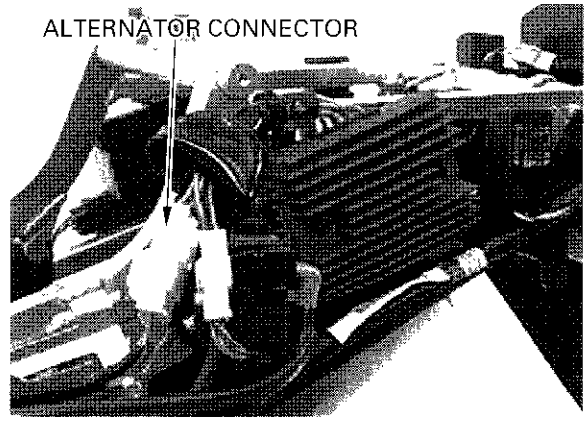
LEFT CRANKCASE COVER REMOVAL

Remove the following:
- lower inner fairing (page 23-27)
- left lower fairing (page 23-27)
- seat cowl (page 2-2)
- radiator reserve tank (page 23-51), but do not drain the coolant and do not disconnect the tubes

Disconnect the ignition pulse generator connector (2P/Red).

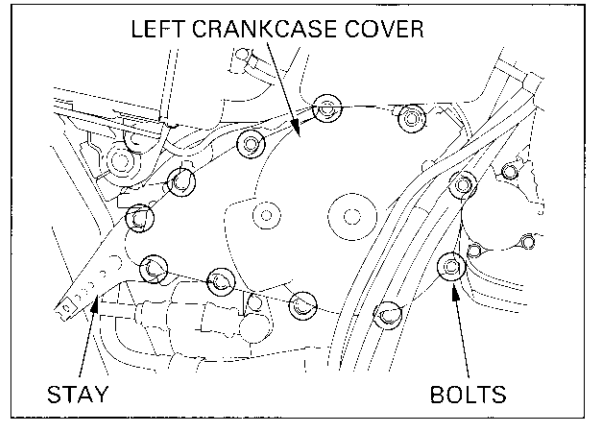


Disconnect the alternator 3P connector.



Remove the eleven bolts.
Take the oil cooler stay out of the way, then remove the left crankcase cover.

Install the left crankcase cover in the reverse order of removal.

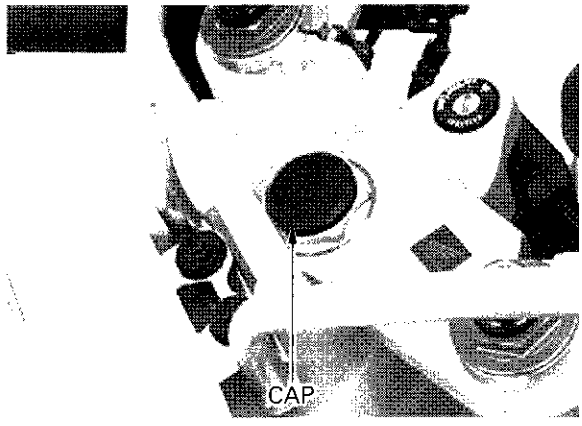


STEERING STEM

STEERING STEM NUT REMOVAL

Remove the upper fairing (page 23-28).

Remove the steering stem nut cap.

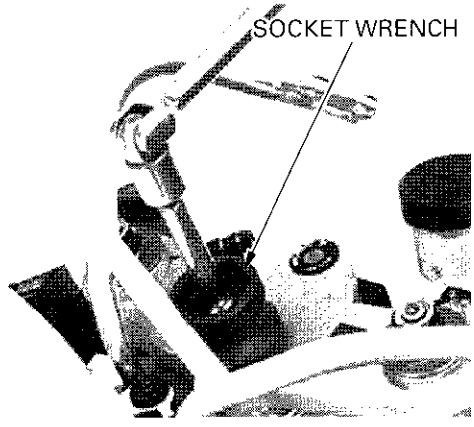


Remove the steering stem nut using the special tool.

TOOL:
Socket wrench, 39 × 41 mm 07GMA-KS40100

Remove the left and right fork legs (page 13-8).

Remove the fork top bridge.
Remove the steering bearing adjustment lock nut and washer (page 13-24).

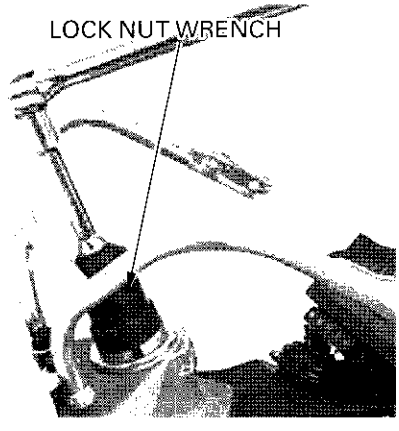


STEERING BEARING ADJUSTMENT NUT REMOVAL

Remove the steering bearing adjustment nut using the special tool.

TOOL:
Lock nut wrench 07HMA-MR70100

Remove the steering stem (page 13-25).



STEERING BEARING REPLACEMENT

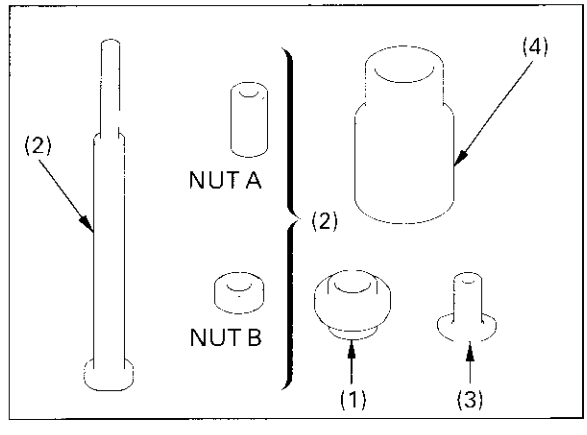
Always replace the bearings and races as a set.

Replace the steering bearing outer races using the following special tools:

Two driver attachments are required.

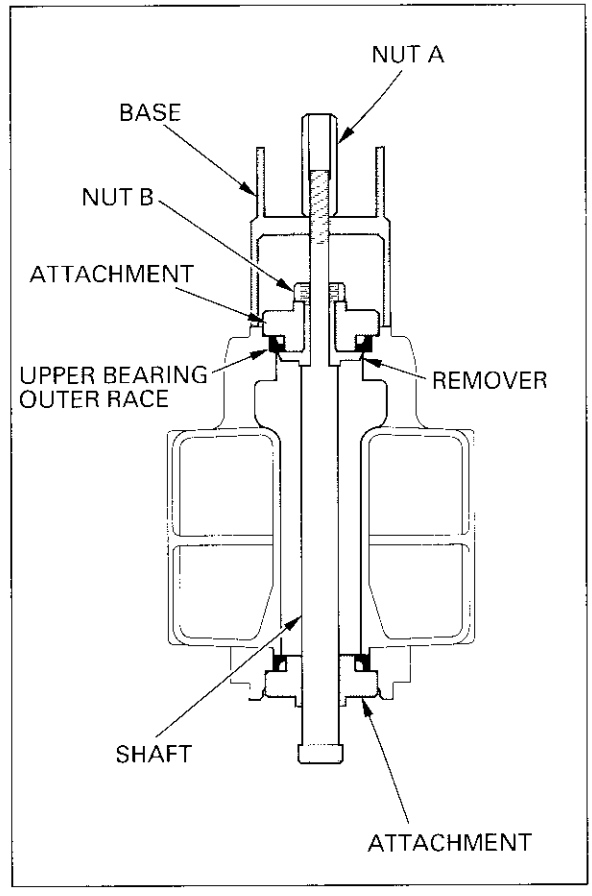
TOOLS:

Driver attachment (1)	07NMF-MT70120
Driver shaft assembly (2)	07946-KM90300
Race remover attachment (3)	07NMF-MT70110
Assembly base (4)	07946-KM90600



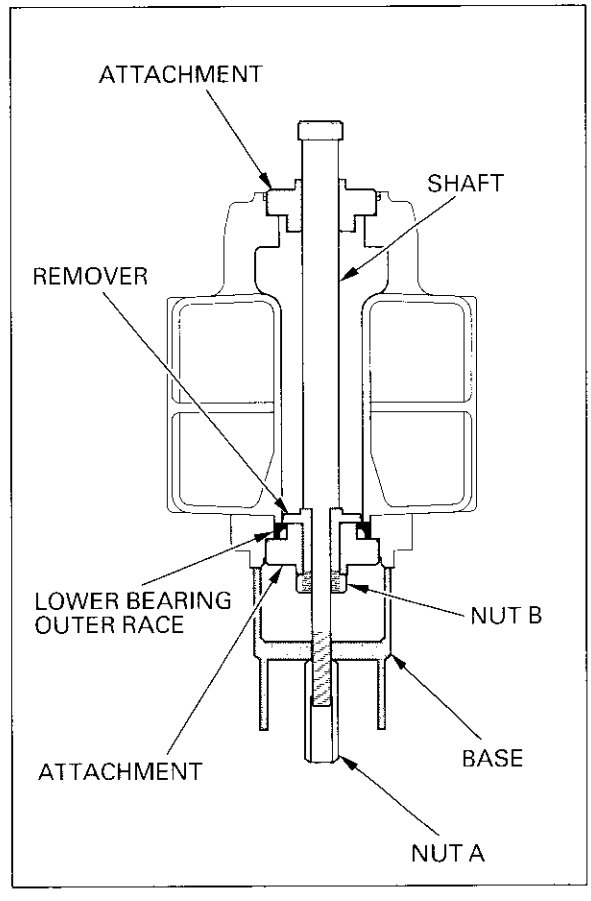
Note the installation direction of the assembly base.

Install the special tools into the steering head pipe as shown.
Align race remover with the grooves in the steering head.
Lightly tighten nut B.
While holding the driver shaft, turn the nut A gradually to remove the upper bearing outer race.

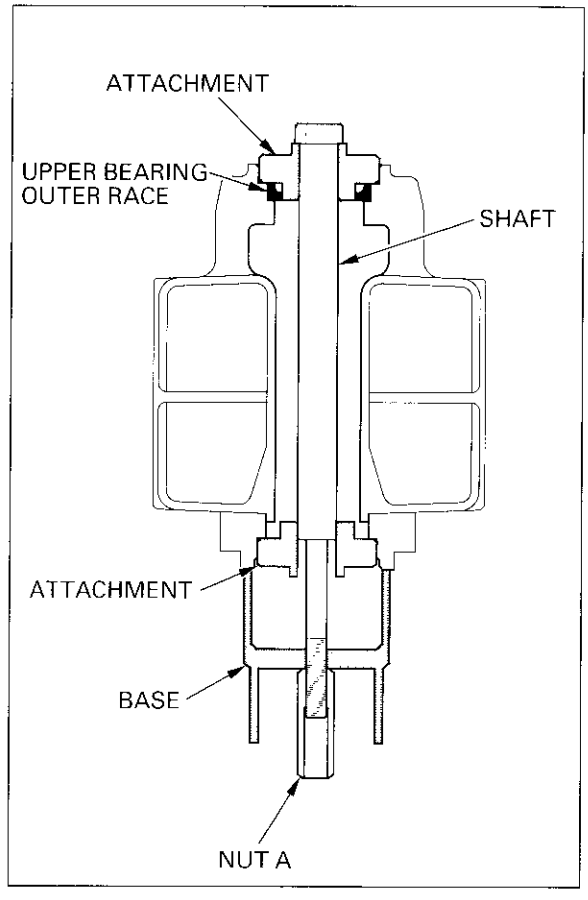


Note the installation direction of the assembly base.

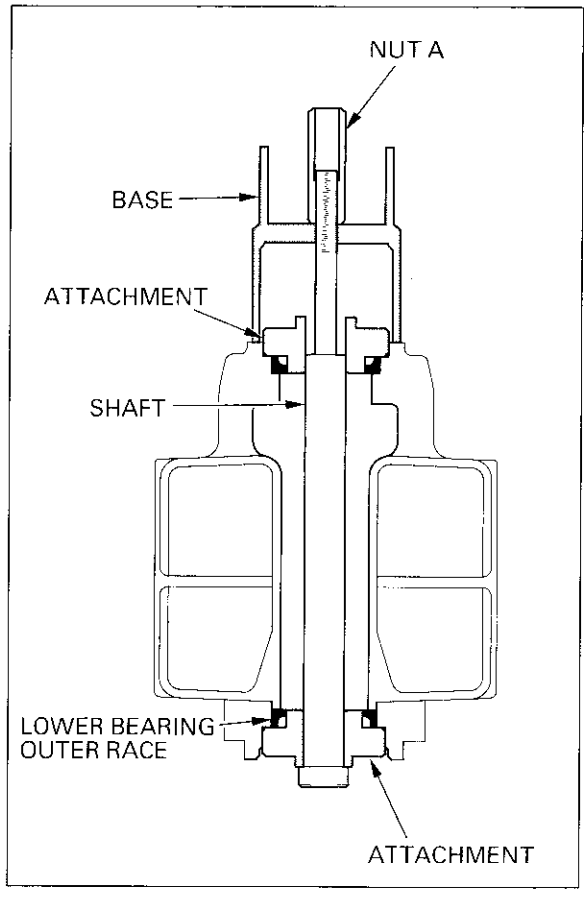
Install the special tools into the steering head pipe as shown.
Align race remover with the groove in the steering head.
Lightly tighten nut B.
While holding the driver shaft, turn the nut A gradually to remove the lower bearing outer race.



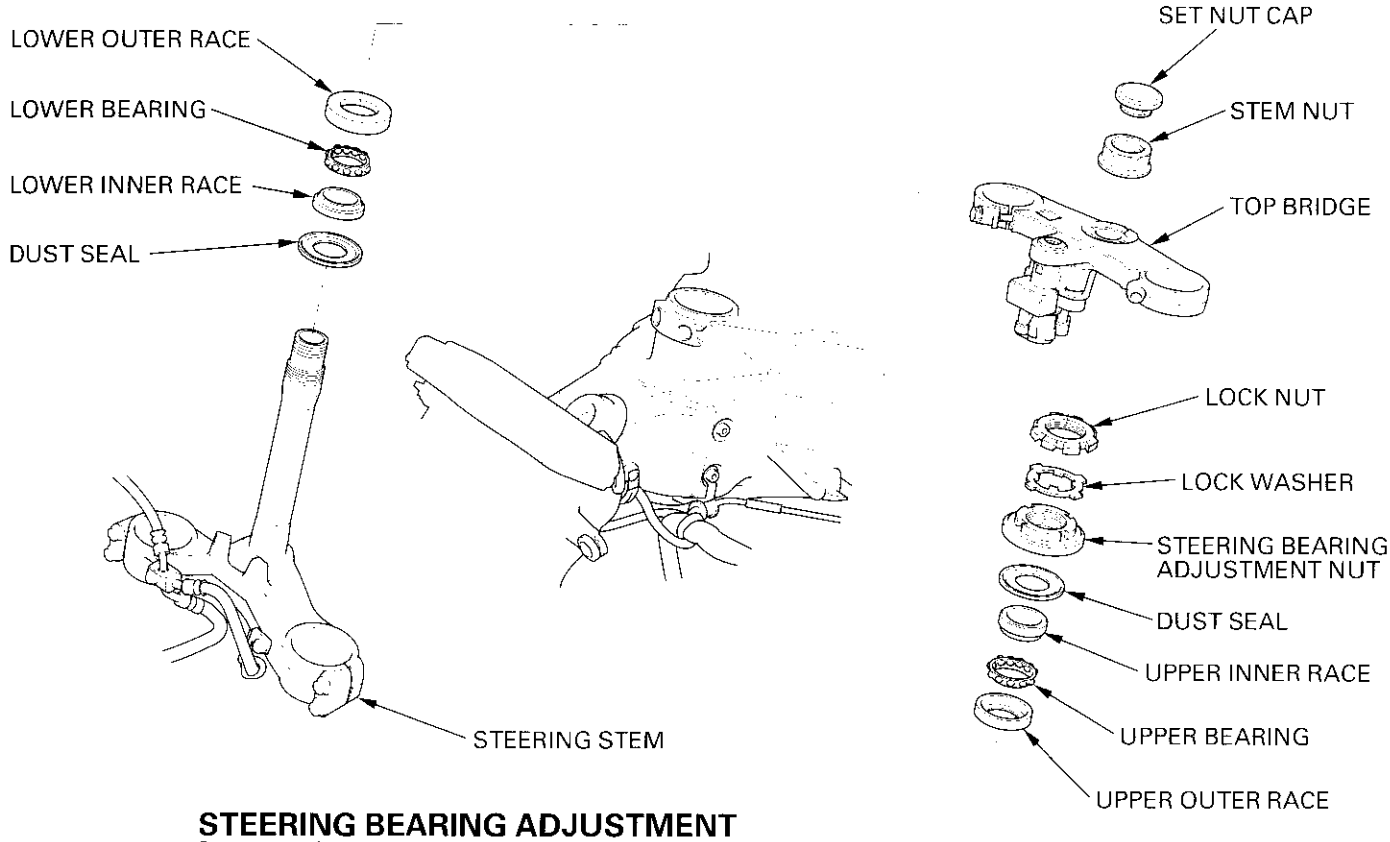
Install a new upper bearing outer race and the special tools as shown.
While holding the driver shaft, turn the nut A gradually until the outer race bottoms on the steering head pipe.



Install a new lower bearing outer race and the special tools as shown.
While holding the driver shaft, turn the nut A gradually until the outer race bottoms on the steering head pipe.



INSTALLATION



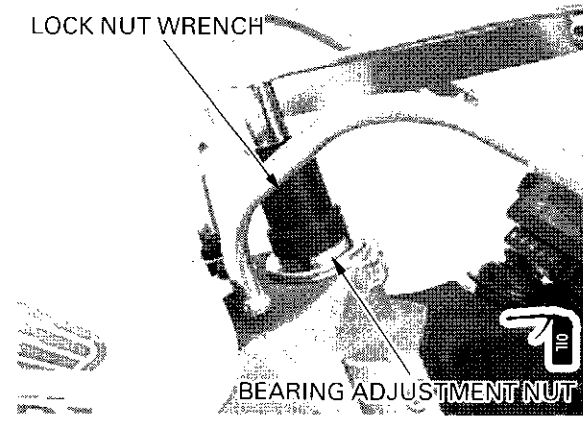
STEERING BEARING ADJUSTMENT NUT INSTALLATION

Apply oil to the bearing adjustment nut threads.
Install and tighten the steering bearing adjustment nut.

TOOL:
Lock nut wrench 07HMA-MR70100

TORQUE: 52 N·m (5.3 kgf·m , 38 lbf·ft)

Turn the steering stem right and left, lock-to-lock at least five times to seat the bearings.
Retighten the steering bearing adjustment nut to the same torque.
Install a new lock washer and lock nut (page 13-29).



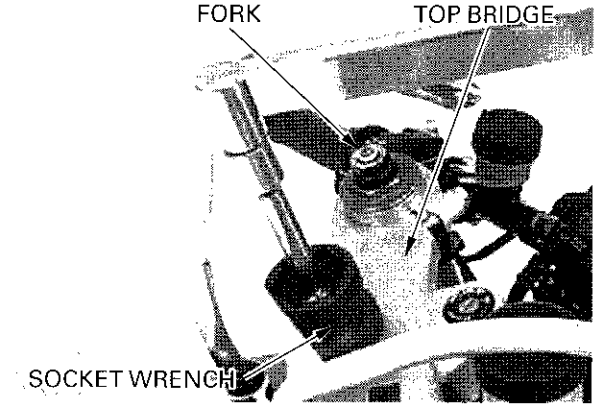
STEERING STEM NUT INSTALLATION

Install the fork top bridge and steering stem nut.
Temporarily install the forks into the bridges.
Tighten the steering stem nut.

TOOL:
Socket wrench, 39 × 41 mm 07GMA-KS40100

TORQUE: 137 N·m (14.0 kgf·m , 101 lbf·ft)

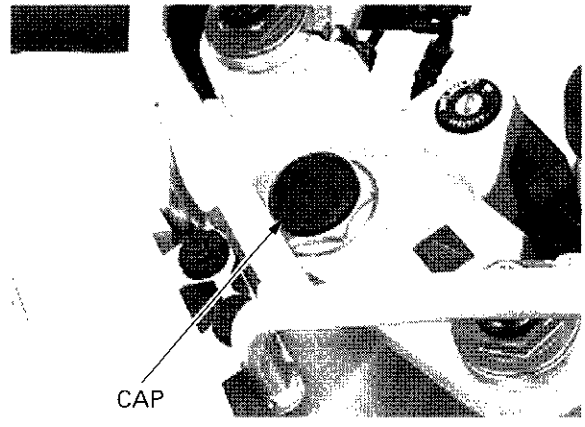
Make sure that the steering stem moves smoothly, without play or binding.
Remove the forks.



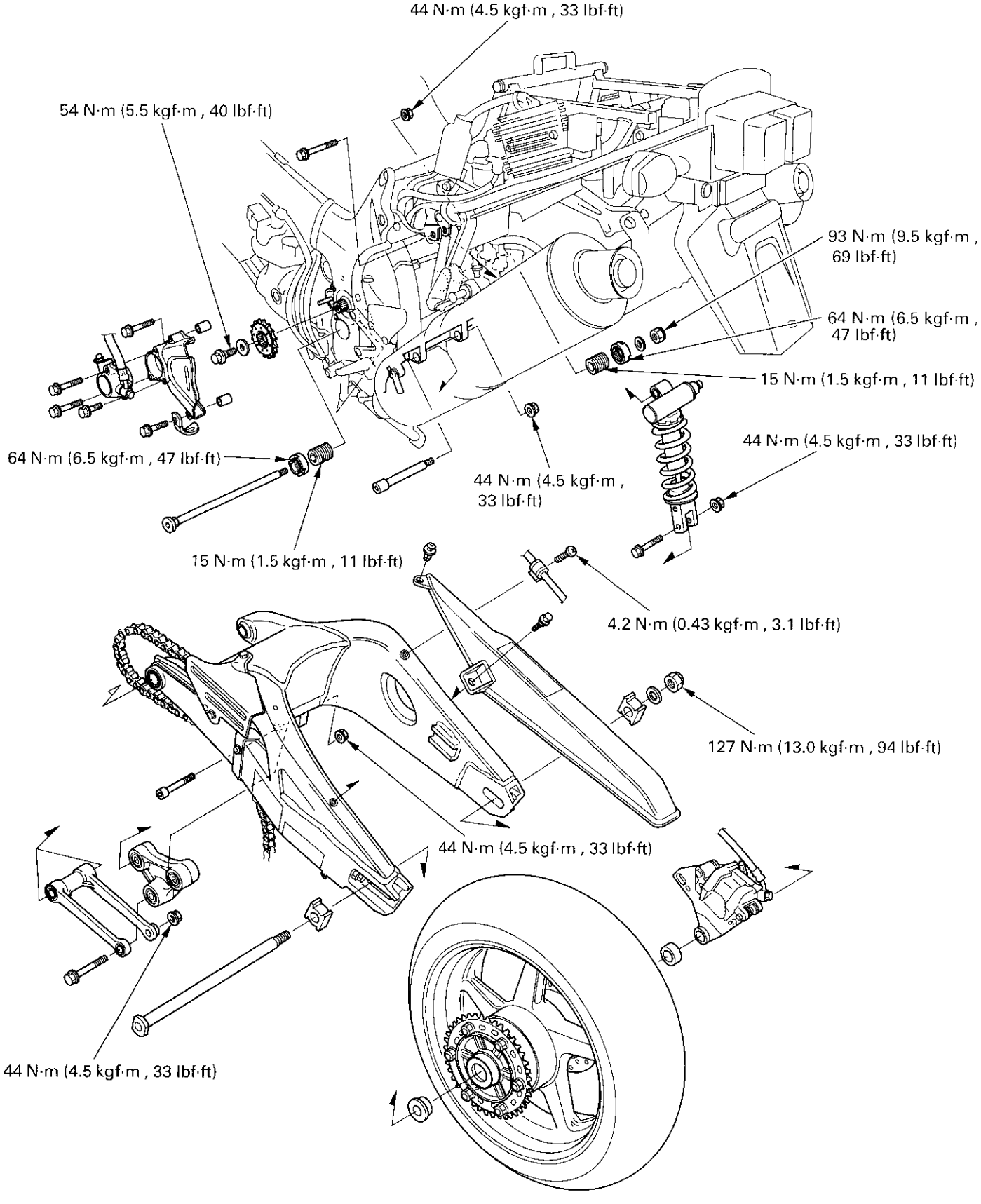
Install the steering stem nut cap.

Install the front brake hose 3-way joint (page 13-30).

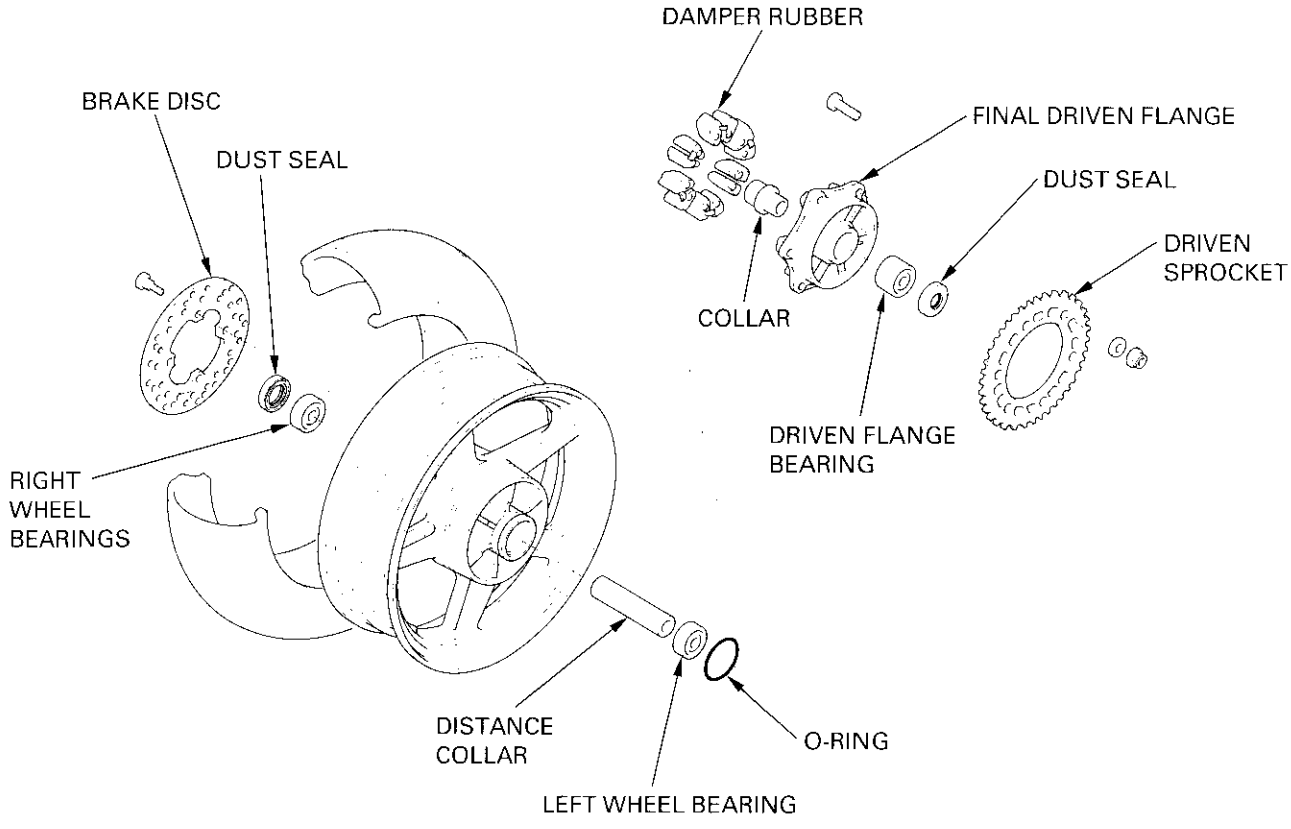
Install the forks (page 13-19).
Install the upper fairing (page 23-28).



REAR WHEEL/SUSPENSION



REAR WHEEL ASSEMBLY



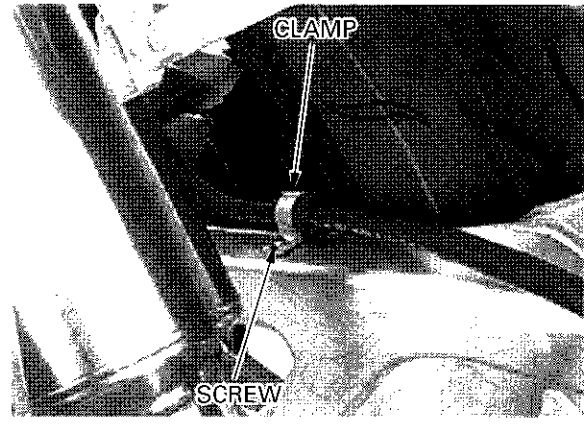
SHOCK ABSORBER

REMOVAL

Remove the following:
– seat cowl (page 2-2)
– lower fairings (page 23-27)

Support the motorcycle securely with a hoist or equivalent.

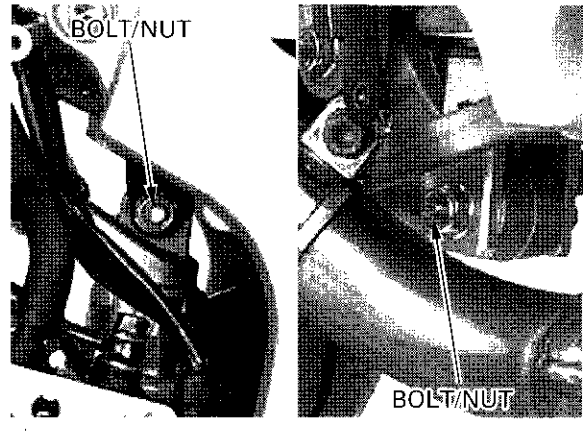
Remove the screw and rear brake hose clamp from the swingarm.



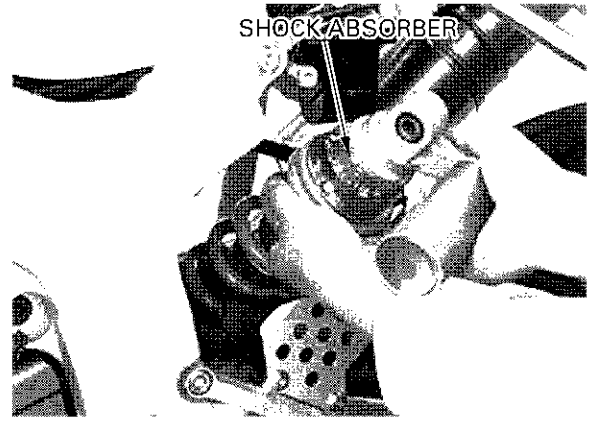
NOTE:

The brake hose is pulled by the swingarm when the shock absorber mounting bolt is removed.

Remove the shock absorber upper and lower mounting nuts and bolts.



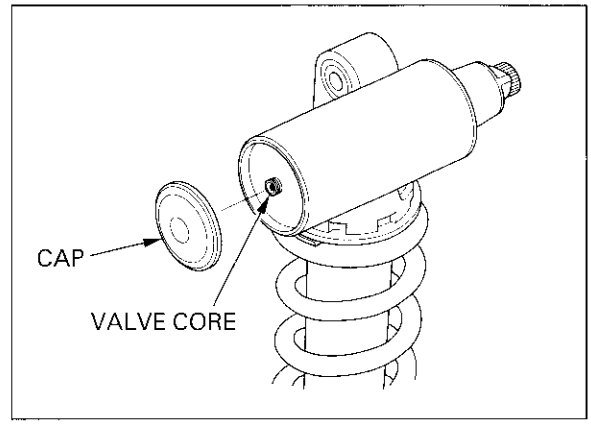
Remove the shock absorber from the left side of the frame as shown.



DISPOSAL

⚠WARNING

- ***The shock absorber contains nitrogen gas under high pressure. Do not allow fire or heat near the shock absorber.***
- ***The damper unit is filled with nitrogen gas under high pressure, do not try to disassemble.***

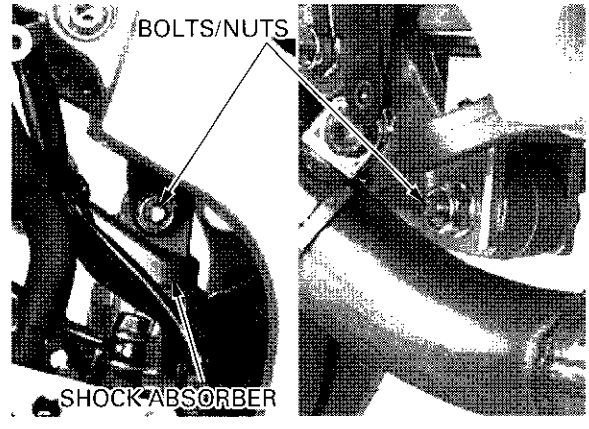


Remove the reservoir cap and release the nitrogen gas by depressing the valve core.
After the nitrogen gas is released completely, remove the valve.

INSTALLATION

Install the shock absorber in the frame from the left side.
Install the upper and lower mounting bolts and nuts, and tighten the nuts.

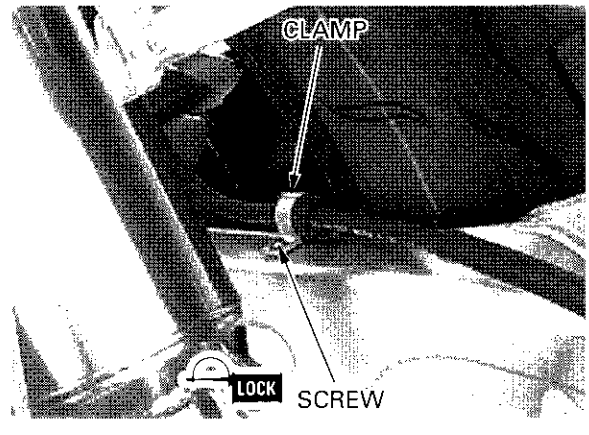
TORQUE: 44 N·m (4.5 kgf·m , 33 lbf·ft)



Apply locking agent to the brake hose clamp screw threads.
Install the brake hose clamp onto the swingarm and tighten the screw to the specified torque.

TORQUE: 4.2 N·m (0.43 kgf·m , 3.1 lbf·ft)

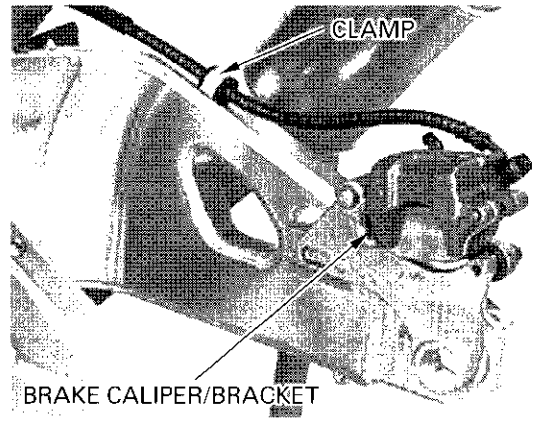
Install the lower fairings (page 23-27).
Install the seat cowl (page 2-2).



SWINGARM

REMOVAL

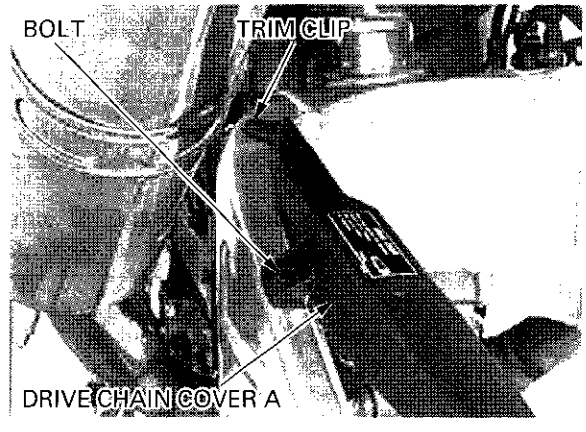
Remove the following:
- lower fairings (page 23-27)
- oil cooler mounting bolts
- radiator reserve tank (page 23-51: but do not disconnect the tubes)
- rear wheel (page 14-3)
- rear brake hose clamp
- rear brake caliper/bracket assembly



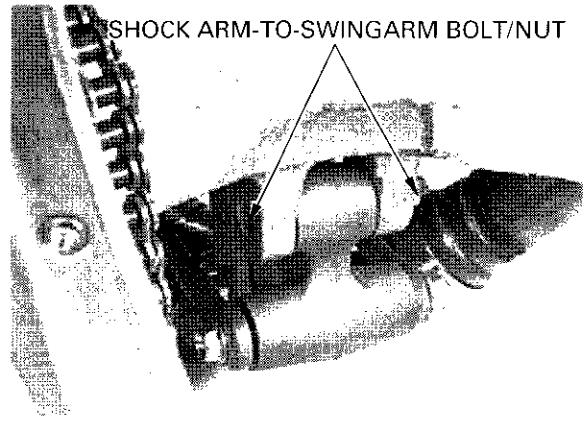
CAUTION:

Support the brake caliper so that it does not hang from the brake hose. Do not twist the brake hose.

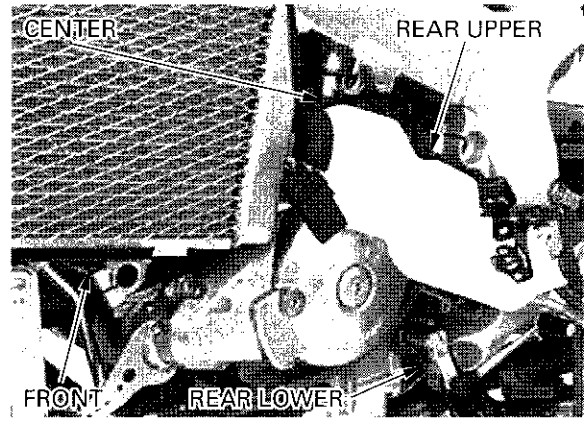
- bolt, trim clip and drive chain cover A
- drive sprocket (page 23-57)



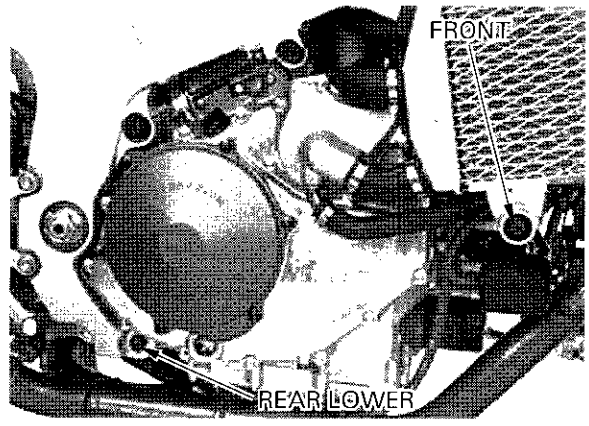
- shock-arm-to-swingarm bolt and nut



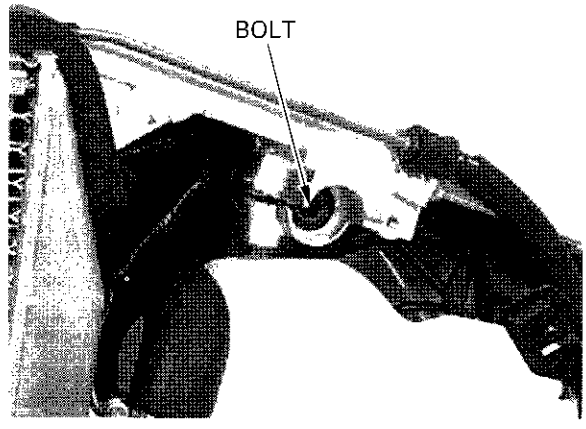
Loosen the engine hanger pinch bolts to the specified sequence as below:
- rear lower
- rear upper
- front
- center



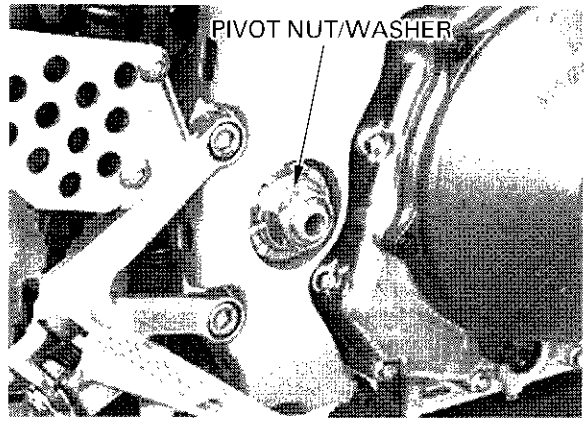
Loosen the engine hanger bolt and nuts to the specified sequence as follows:
– front
– rear lower



Loosen the left center engine hanger bolt.

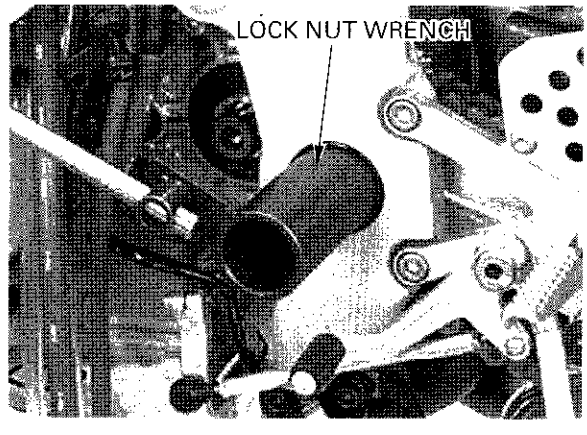


Remove the swingarm pivot nut and washer.

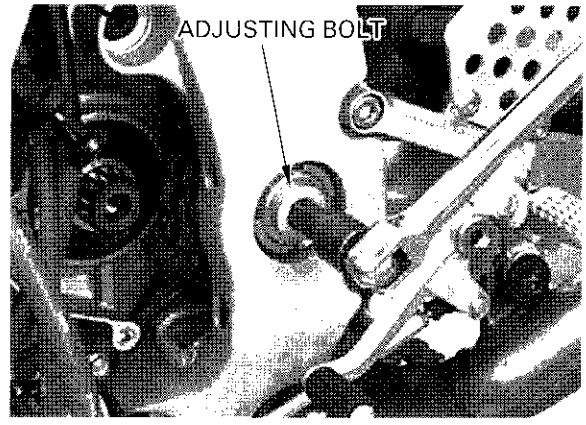


Loosen the swingarm left pivot lock nut using the special tool.

TOOL:
Lock nut wrench 07YMA-MCF0100

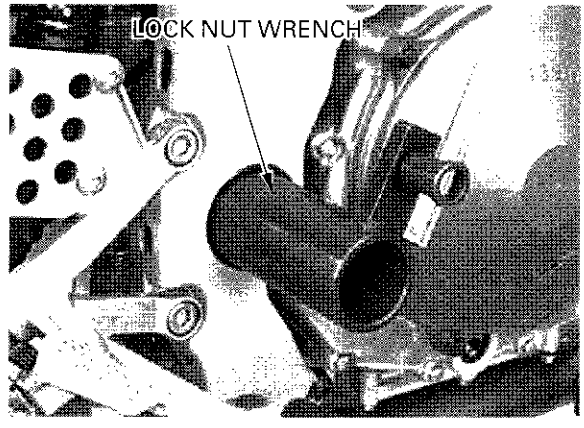


Loosen the swingarm left pivot adjusting bolt.

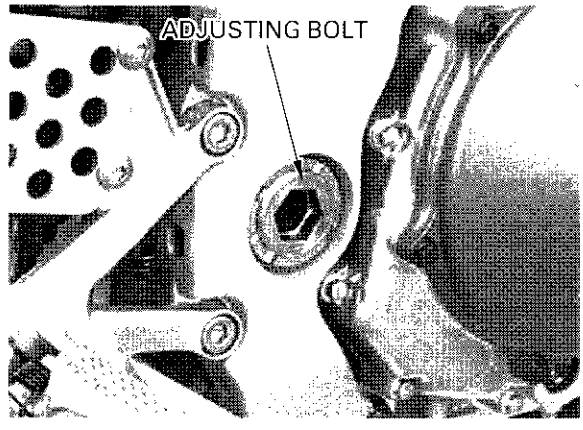


Loosen the swingarm right pivot lock nut using the special tool.

TOOL:
Lock nut wrench 07YMA-MCF0100

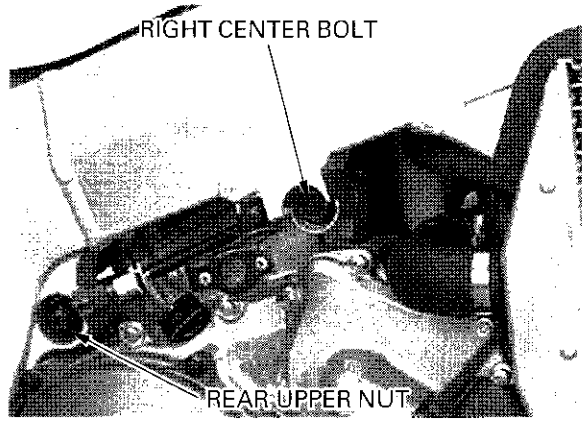


Loosen the swingarm right pivot adjusting bolt.

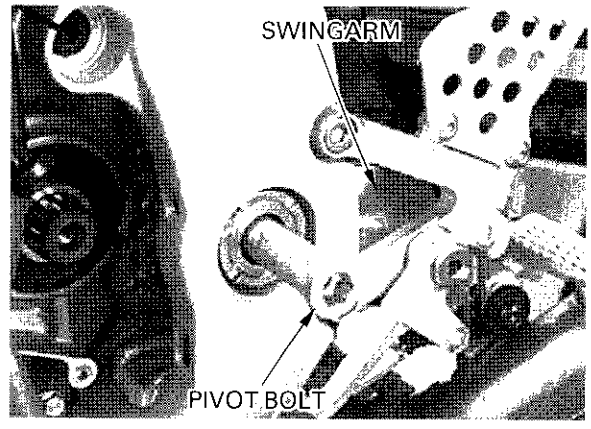


Loosen the rear upper engine hanger nut.

Loosen the right center engine hanger bolt.

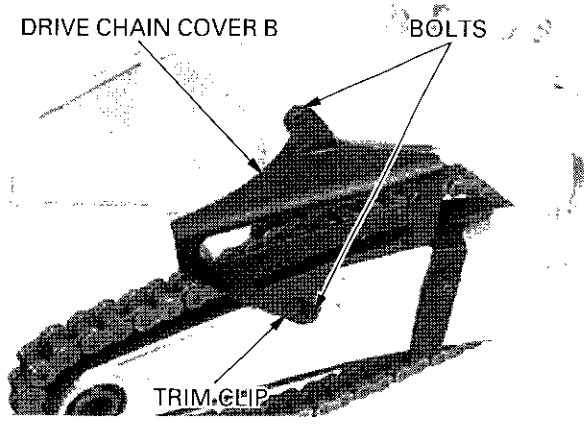


Remove the swingarm pivot bolt and swingarm.

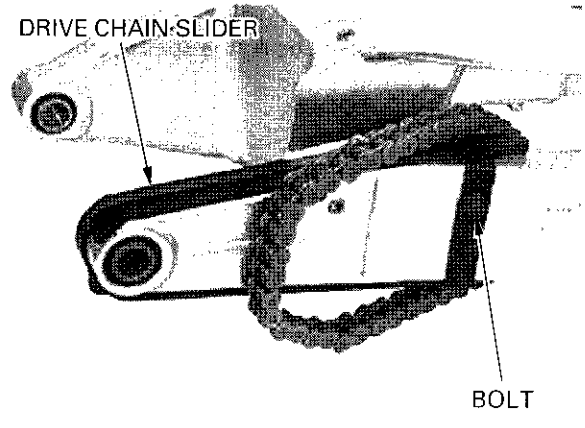


DISASSEMBLY

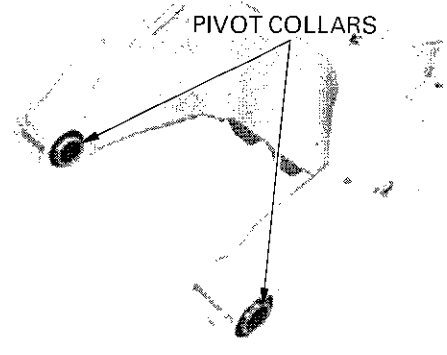
Remove the two bolts, trim clip and drive chain cover B.



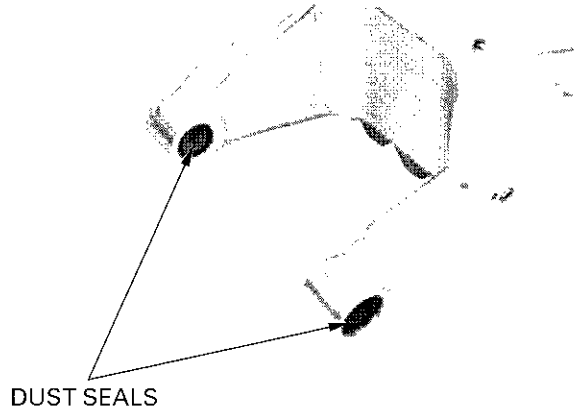
Remove the bolt and drive chain slider.



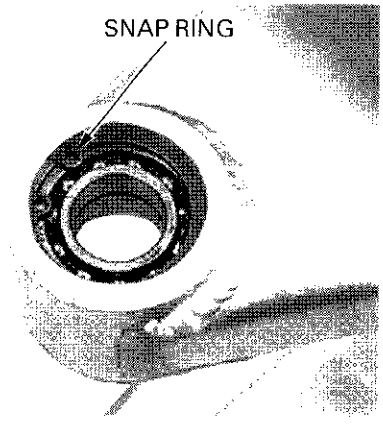
Remove the pivot collars.



Remove the dust seals from the swingarm pivots.



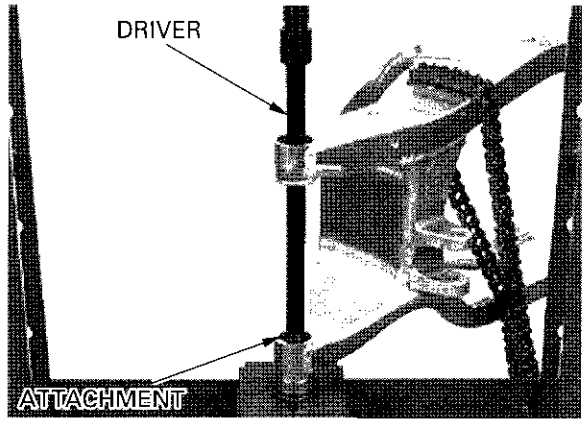
Remove the snap ring from the right swingarm pivot.



Press the right pivot bearings out of the swingarm pivot, using the special tools.

TOOLS:

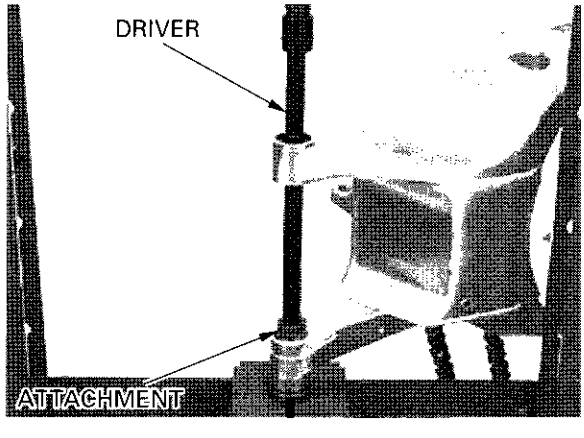
Driver	07949-3710001
Attachment, 28 × 30 mm	07946-1870100
Pilot, 20 mm	07746-0040500



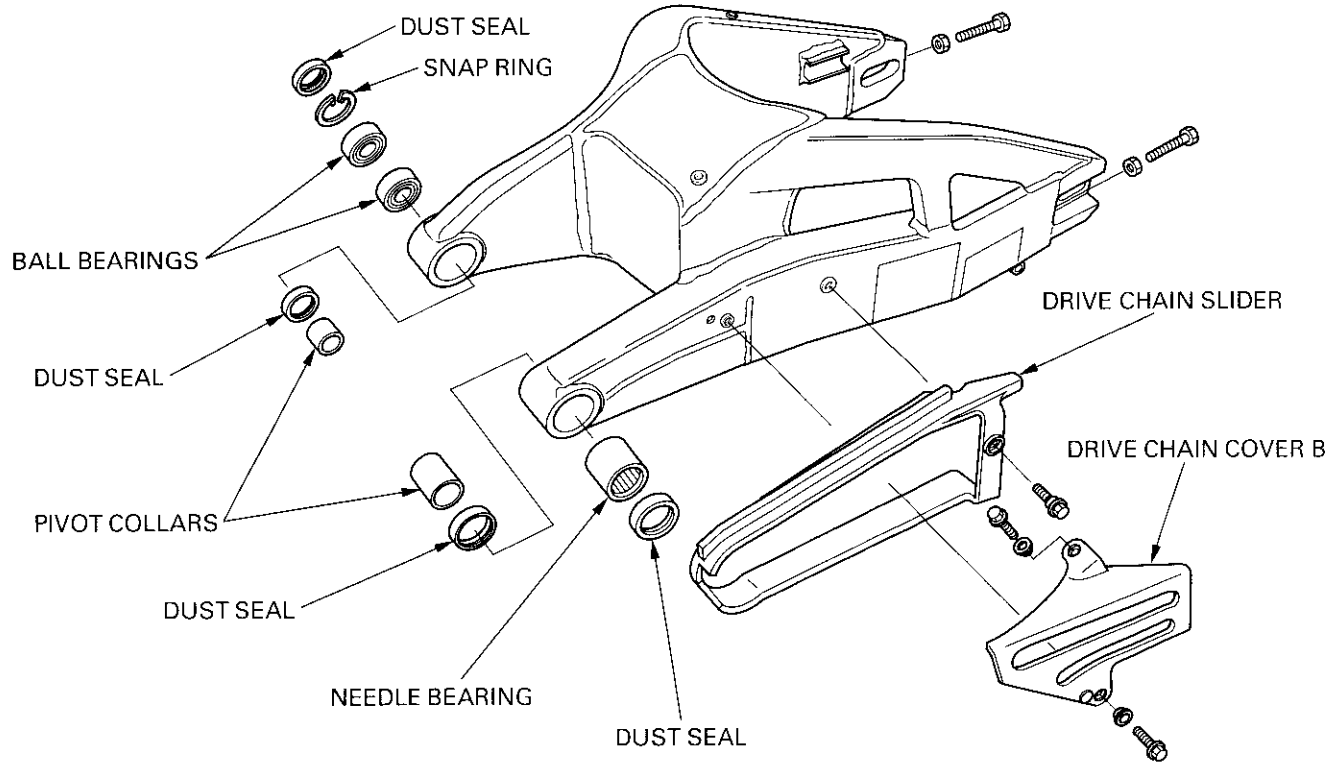
Press the left pivot bearing out of the swingarm pivot, using the special tools.

TOOLS:

Driver	07949-3710001
Attachment, 32 × 35 mm	07746-0010100
Pilot, 28 mm	07746-0041100



ASSEMBLY

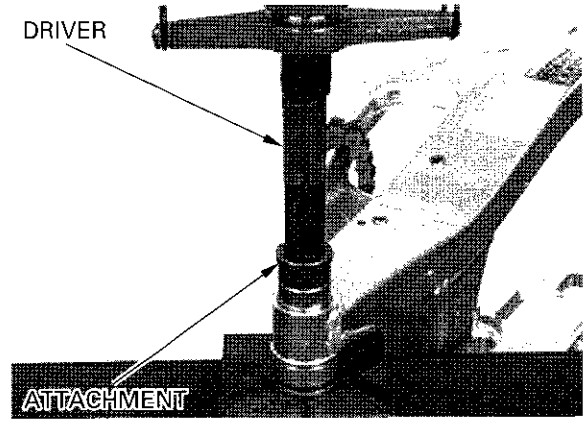


Press in the bearing with the marking side facing up.

Apply extreme pressure agent mixed grease to the needle rollers of a new bearing.
Carefully press the needle bearing into left swingarm pivot until the depth from the swingarm outer surface is 6.5—7.5 mm (0.26—0.30 in), using the special tool.

TOOLS:

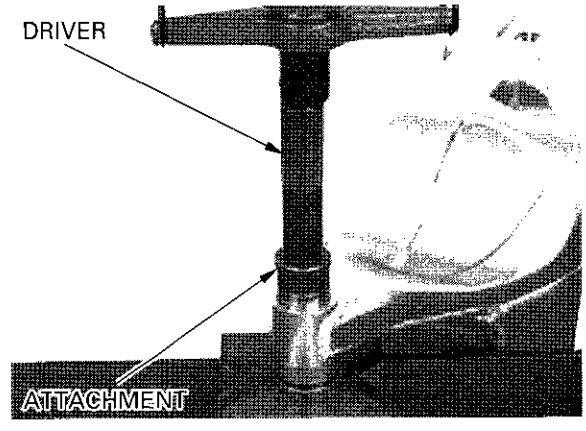
Driver	07749-0010000
Attachment, 37 × 40 mm	07746-0010200
Pilot, 28 mm	07746-0041100



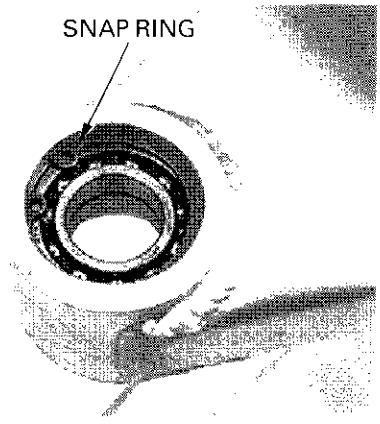
Pack new bearing cavities with extreme pressure agent mixed grease.
Press the inner bearing into the right swingarm pivot with the marking side facing up until it is fully seated, using the special tools.
Press the outer bearing into the right swingarm pivot with the marking side facing up until it is seated, using the special tools.

TOOLS:

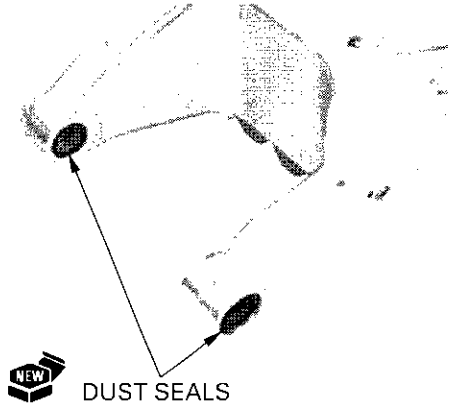
Driver	07749-0010000
Attachment, 37 × 40 mm	07746-0010200
Pilot, 20 mm	07746-0040500



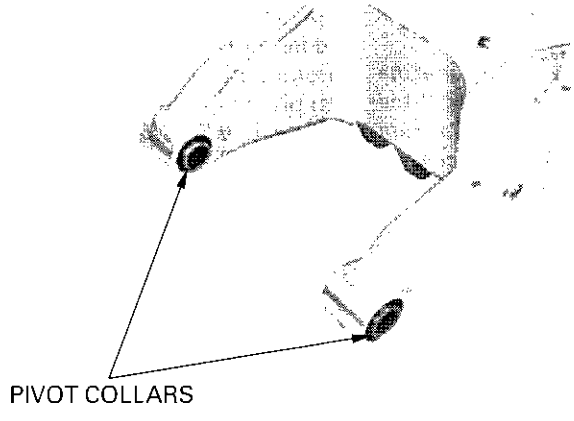
Install the snap ring into the right swingarm pivot.



Apply extreme pressure agent mixed grease to new dust seal lips and install them into the swingarm pivots.

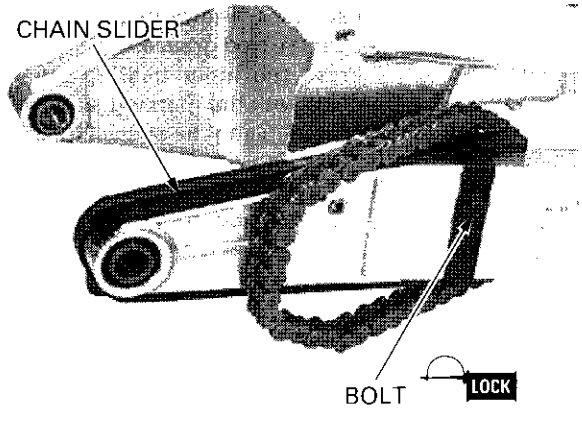


Install the pivot collars into swingarm pivots.

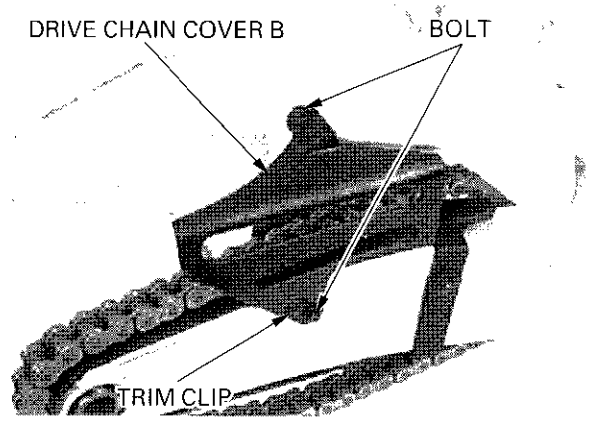


Install the drive chain slider if removed.
Apply locking agent to the slider bolt threads.
Tighten the bolt to the specified torque.

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



Install drive chain cover B and tighten the bolts securely.
Install the trim clip securely.



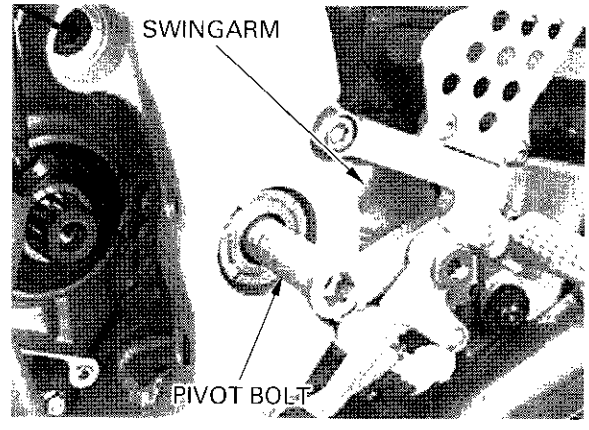
INSTALLATION

NOTE:

When tightening the lock nut with the lock nut wrench, refer to torque wrench reading information on page 23-53 "SERVICE INFORMATION".

CAUTION:

Be sure to tighten all engine mounting fasteners to the specified torque in the specified sequence described below. If you mistake the tightening torque or sequence, loosen all mounting fasteners, then tighten them again to the specified torque in the specified sequence.



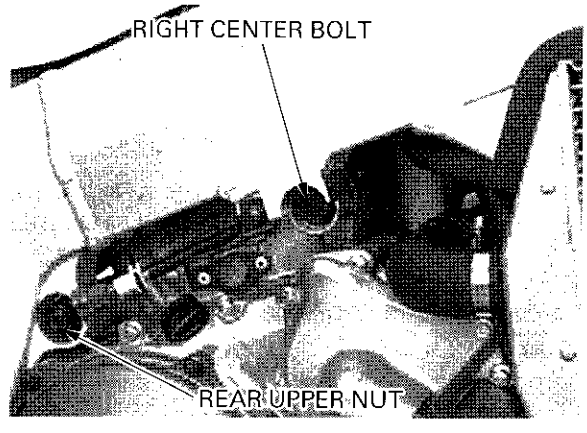
1. Install the swingarm and insert the swingarm pivot bolt from the left side.

2. Tighten the right center engine hanger bolt to the specified torque.

TORQUE: 64 N·m (6.5 kgf·m , 47 lbf·ft)

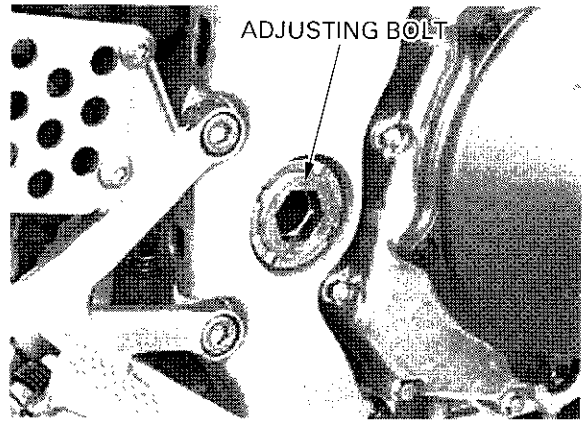
3. Tighten the rear upper engine hanger nut to the specified torque.

TORQUE: 64 N·m (6.5 kgf·m , 47 lbf·ft)



4. Tighten the swingarm right pivot adjusting bolt to the specified torque.

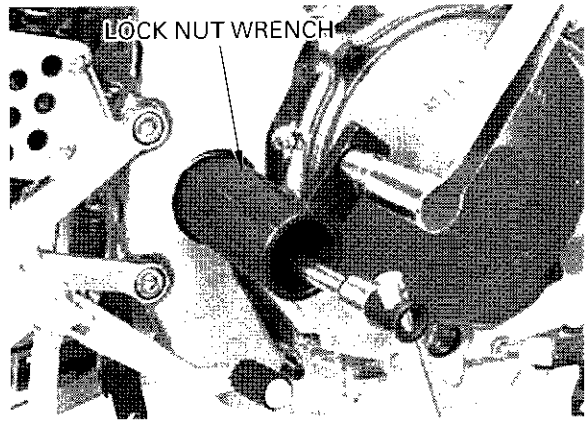
TORQUE: 15 N·m (1.5 kgf·m , 11 lbf·ft)



5. Tighten the swingarm right pivot lock nut while holding the adjusting bolt.

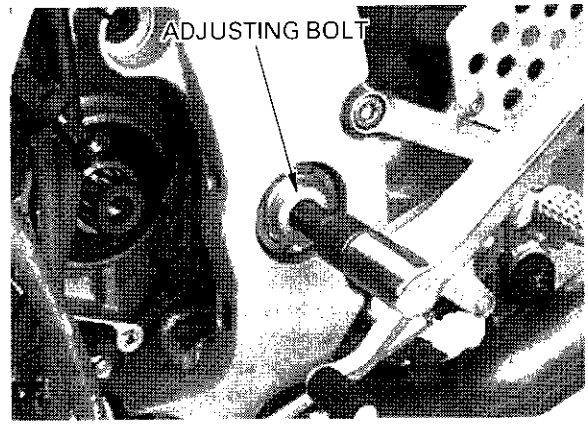
TOOL:
Lock nut wrench 07YMA-MCF0100

TORQUE: **Actual:** 64 N·m (6.5 kgf·m , 47 lbf·ft)
Indicated: 58 N·m (5.9 kgf·m , 43 lbf·ft)



6. Tighten the swingarm left pivot adjusting bolt to the specified torque.

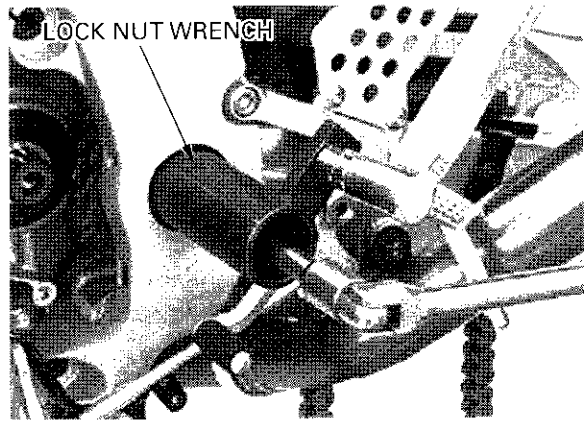
TORQUE: 15 N·m (1.5 kgf·m , 11 lbf·ft)



7. Tighten the swingarm left pivot lock nut while holding the adjusting bolt.

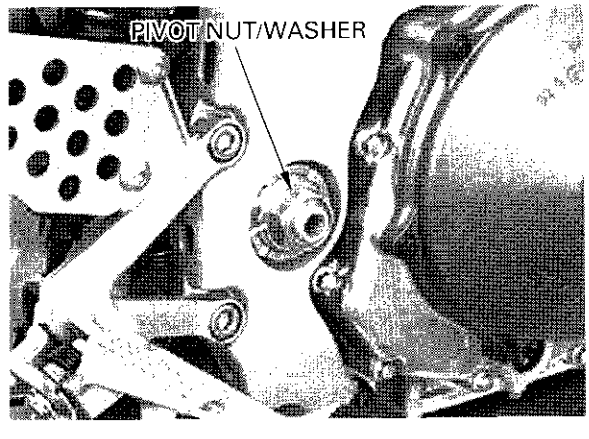
TOOL:
Lock nut wrench 07YMA-MCF0100

TORQUE: **Actual:** 64 N·m (6.5 kgf·m , 47 lbf·ft)
Indicated: 58 N·m (5.9 kgf·m , 43 lbf·ft)



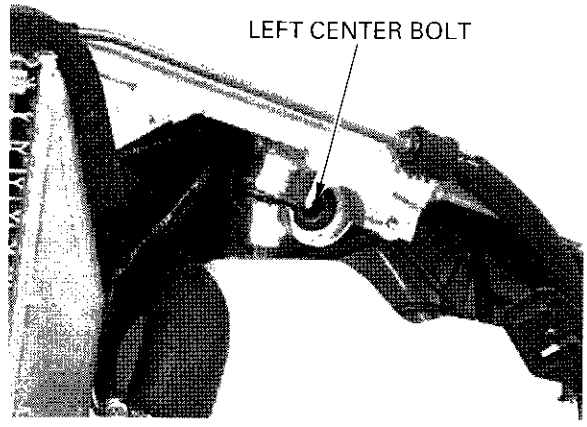
8. Tighten the swingarm pivot nut with washer to the specified torque.

TORQUE: 93 N·m (9.5 kgf·m , 69 lbf·ft)



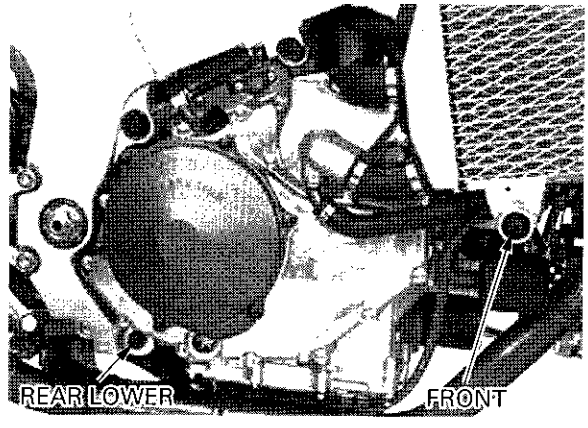
9. Tighten the left center engine hanger bolt to the specified torque.

TORQUE: 64 N·m (6.5 kgf·m , 47 lbf·ft)

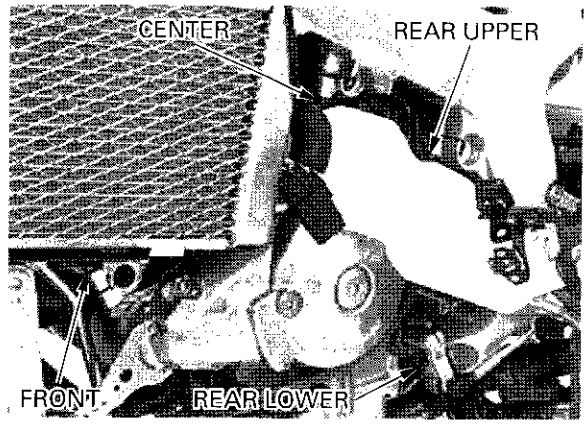


10. Tighten the engine hanger nuts to the specified torque in the specified sequence as follows:
   – rear lower
   – front

TORQUE:
Front: 64 N·m (6.5 kgf·m , 47 lbf·ft)
Rear lower: 39 N·m (4.0 kgf·m , 29 lbf·ft)

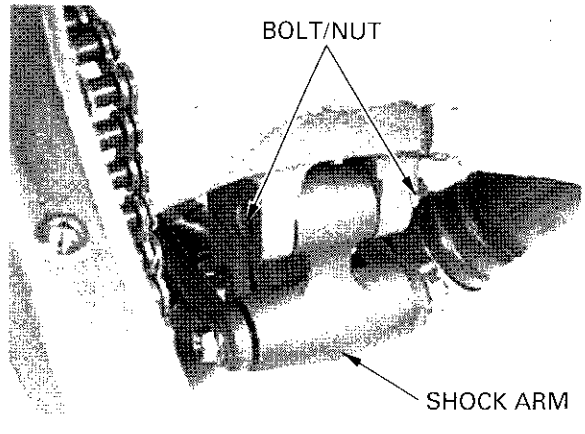


11. Tighten the engine hanger pinch bolts in the specified sequence as follows:
   – center
     front
   – rear upper
   – rear lower

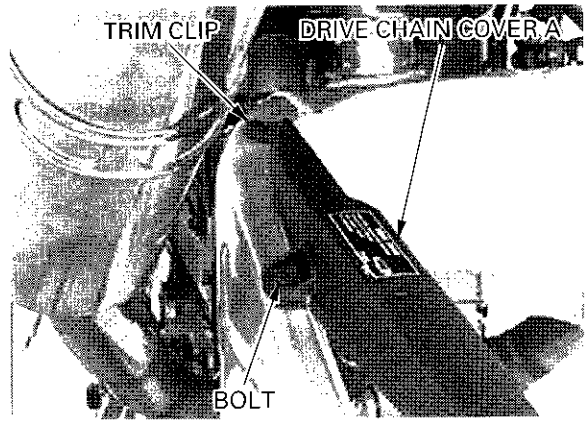


Install the shock arm to the swingarm and tighten the shock arm-to-swingarm bolt and nut to the specified torque.

TORQUE: 44 N·m (4.5 kgf·m , 33 lbf·ft)



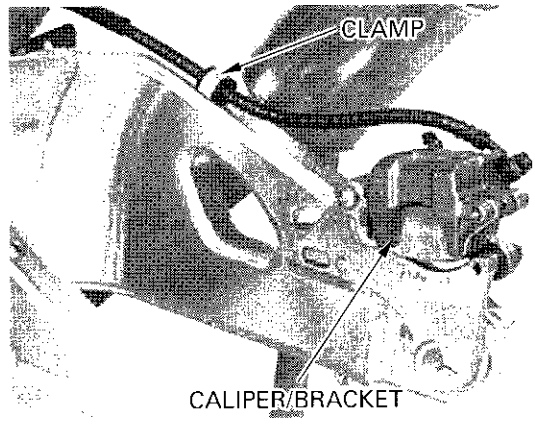
Install the drive chain cover A and tighten the bolt securely.
Install the trim clip securely.



Install the rear brake caliper/bracket assembly onto the swingarm.

Apply a locking agent to the brake hose clamp screw threads.
Install the brake hose clamp and tighten the screw to the specified torque.

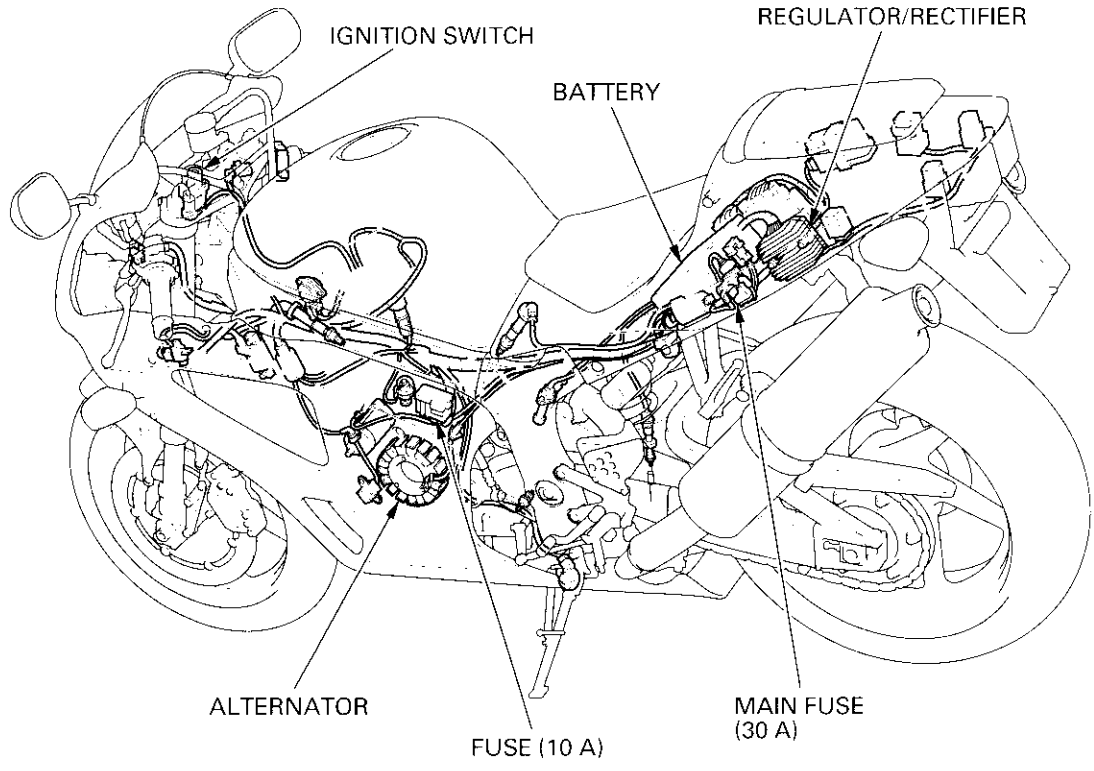
TORQUE: 4.2 N·m (0.43 kgf·m , 3.1 lbf·ft)



Install the following:
— drive sprocket (page 23-62)
  rear wheel (page 14-7)
— oil cooler (page 23-35)
— radiator reserve tank (page 23-53)
  lower fairings (page 23-27)

BATTERY/CHARGING SYSTEM

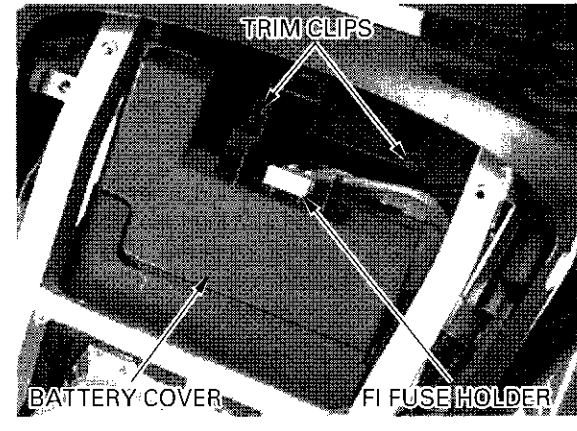
SYSTEM LOCATION



BATTERY REMOVAL/INSTALLATION

Remove the driver seat (page 2-2).

Remove the PGM-FI fuse holder from the battery cover.
Open the battery cover by removing the two trim clips from the rear fender.



Raise the battery and with the ignition switch OFF, disconnect the negative (−) cable first, then disconnect the positive (+) cable.
Remove the battery from the battery case.

Install the battery in the reverse order of removal.

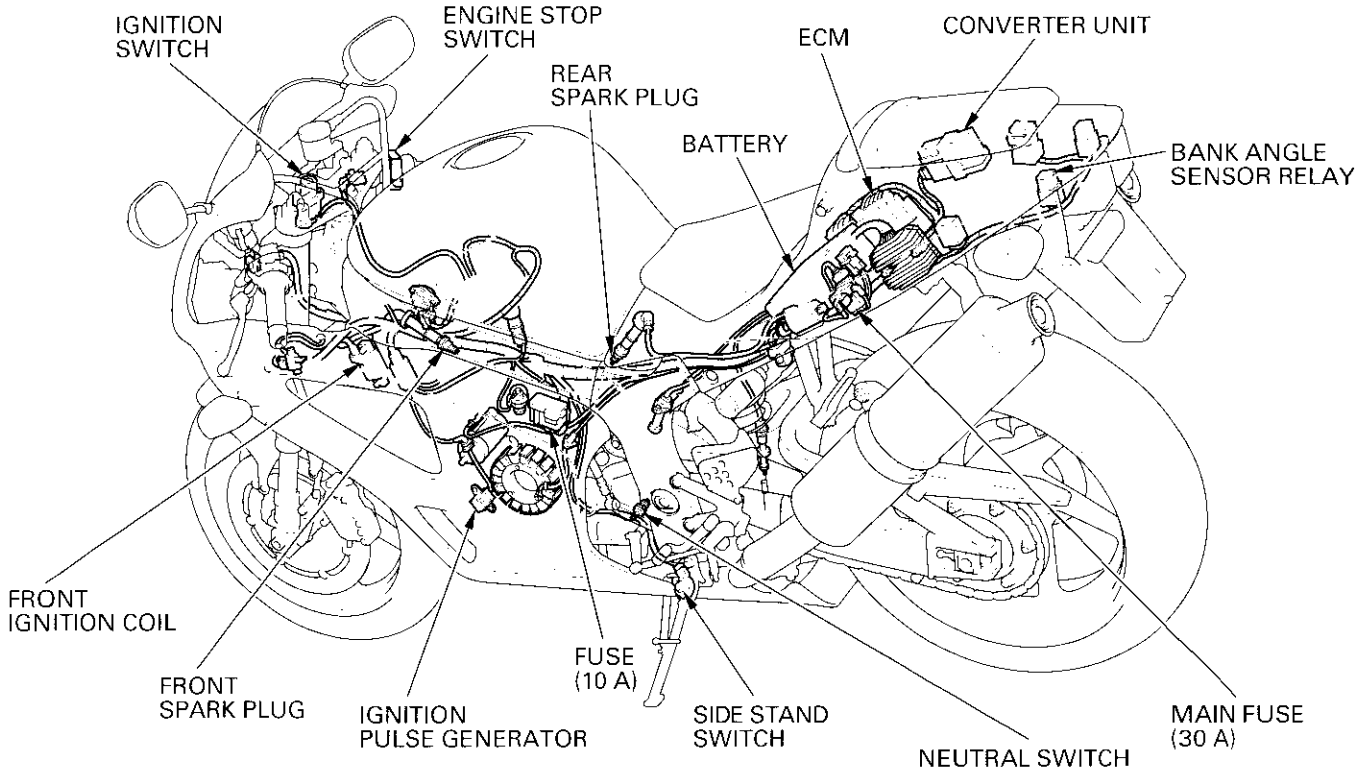
NOTE:

- Connect the positive (+) cable first, then connect the negative (−) cable.
- After connecting the battery cables, coat the terminals with grease.



IGNITION SYSTEM

SYSTEM LOCATION

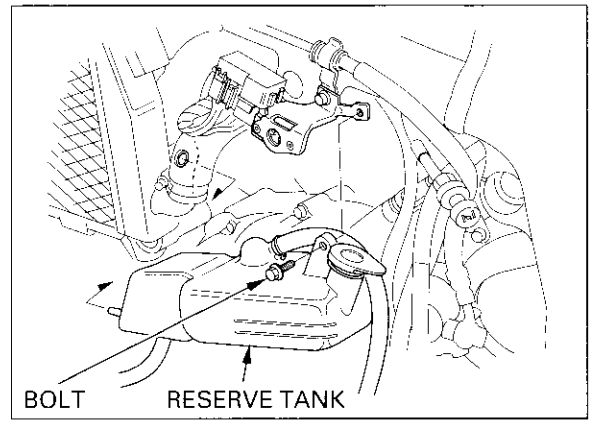


FRONT IGNITION COIL REPLACEMENT

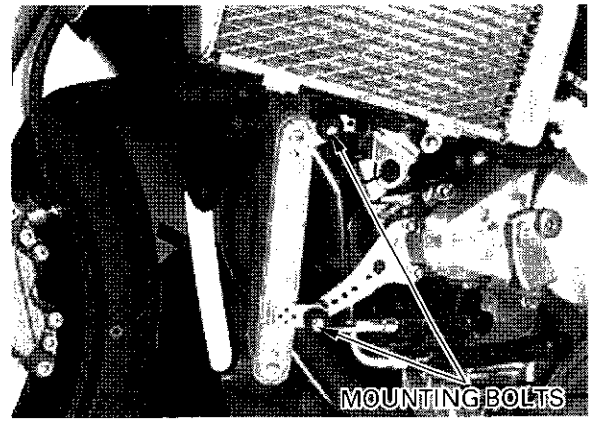
Remove the inner and left lower fairings (page 23-27).

To make a good access to remove the front ignition coil, remove the following parts:

- radiator reserve tank (Do not disconnect the tubes)



- oil cooler mounting bolts



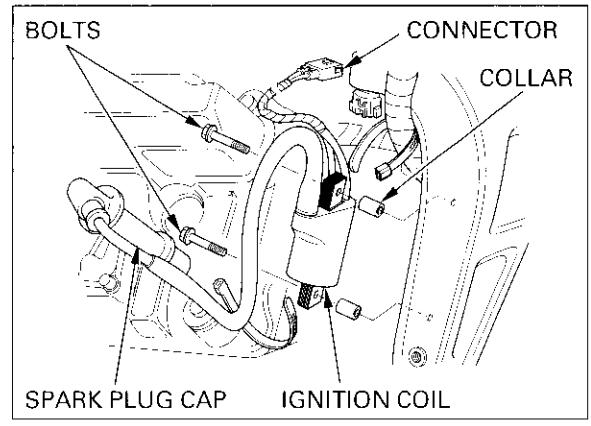
Disconnect the spark plug cap from the spark plug.

Remove the two bolts and ignition coil.
Disconnect the ignition coil connector.

Install a new ignition coil and removed parts in the reverse order of removal.

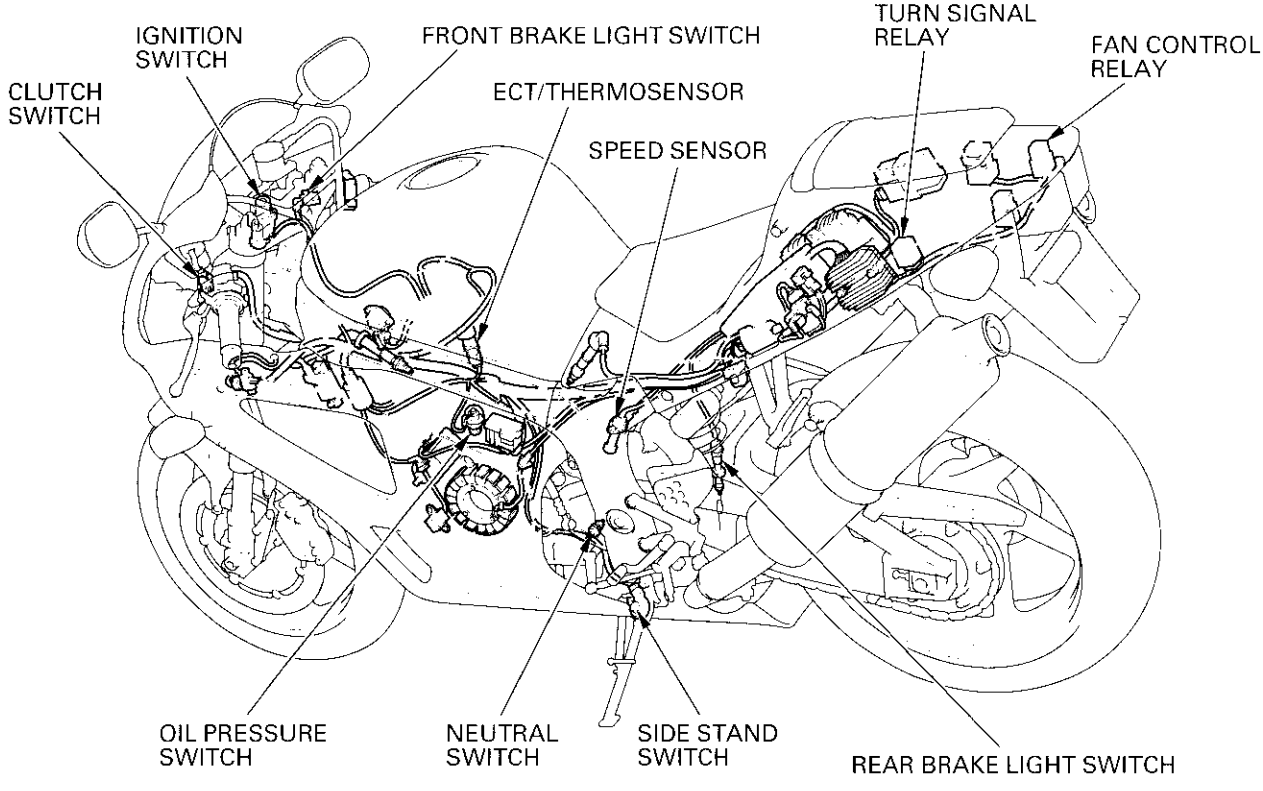
NOTE:

Route the spark plug wire properly (page 23-21).



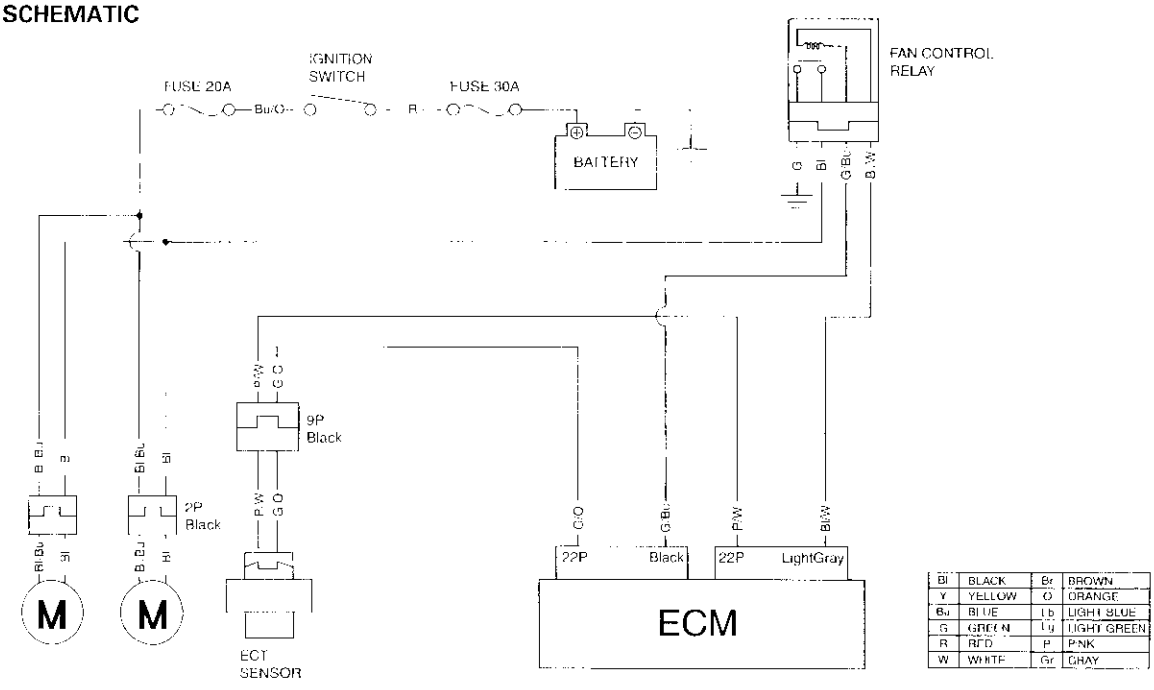
LIGHTS/METERS/SWITCHES

SYSTEM LOCATION



TROUBLESHOOTING OF RADIATOR FAN CONTROLS

CIRCUIT SCHEMATIC

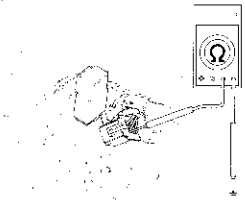


TROUBLESHOOTING

SYMPTOM	DIAGNOSIS
• Radiator fans inoperative	• Blown Fuse (20A) • Perform Test A
• Radiator fans run continuity	• Perform Test B
• Only one radiator fan is operative	• Perform Test C

TEST A

Remove the seat cowl (page 2-2).
Disconnect the fan control relay connector.
Check for continuity between the Green wire on the harness side of the fan control relay and body ground.
Does continuity exist ?



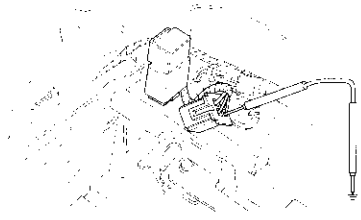
NO → • Repair the open in the Green circuit between the fan control relay and Ground.

YES

To page 23-93

From page 23-92

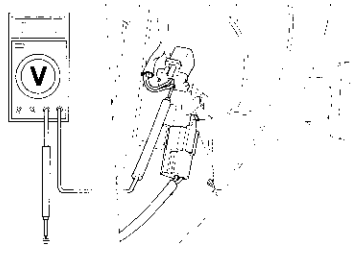
Turn the ignition switch "ON".
Connect a jumper wire between the Black wire and body ground.
Do the radiator fans operate ?



YES → • Perform Test B.

NO

Remove the lower inner fairing (page 23-27).
Disconnect the radiator fan connectors.
Measure the voltage between the Black/Blue wires on the harness side and body ground.
Is battery voltage present ?



YES → • Repair the open or short in the Black circuit between the fan control relay and radiator fans.

NO → • Repair the open or short in the Black/Blue circuit between the radiator fans and fuse (20A) at the fuse box.

TEST B

Check for operation of fan control relay (page 23-96).
Does the relay operated ?

NO → • Replace the fan control relay.

YES

To page 23-94

From page 23-93

Check for continuity between the Black/White circuit on the harness side of the fan control relay and ECM gray connector.
Does continuity exist ?

NO → • Repair the open or short in the Black/White circuit between the fan control relay and ECM.

YES

Check for continuity between the Green/Blue circuit on the harness side of the fan control relay and ECM black connector.
Does continuity exist ?

NO → • Repair the open or short in the Green/Blue circuit between the fan control relay and ECM.

YES

Connect the disconnected connectors.
Start the engine and run until operating temperature is reached.
Stop the engine.
Disconnect the ECM connectors.
Measure the resistance between the Pink/White wire and Green/Orange wire on the harness side.
Is the resistance between 310 – 326 Ω (80°C/176°F) and 139.9 – 143.5 Ω (110°C/230°F) ?

NO → • Repair the open or short in the Pink/White or Green/Orange circuit between the ECM and ECT sensor.
• Replace the ECT sensor.

YES

• Replace the ECM with a good one and inspect again.

TEST C

Disconnect the inoperative radiator fan connector.
Turn the ignition switch "ON".
Measure th voltage between the Black/Blue circuit on the harness side of the inoperative radiator fan connector and body ground.
Is battery voltage present ?

NO → • Repair the open or short in the Black/Blue circuit between the inoperative radiator fan and Fuse (20A) at the fuse box.

YES

To page 23-95

From page 23-94

Disconnect the operative radiator fan connector.

Remove the seat cowl (page 2-2).
Disconnect the fan control relay connector.
Check the continuity between the Black circuit on the harness side of the inoperative radiator fan connector and control relay connector.
Does continuity exist ?

NO → • Repair the open or short in the Black circuit between the inoperative radiator fan connector and fan control relay connector.

YES

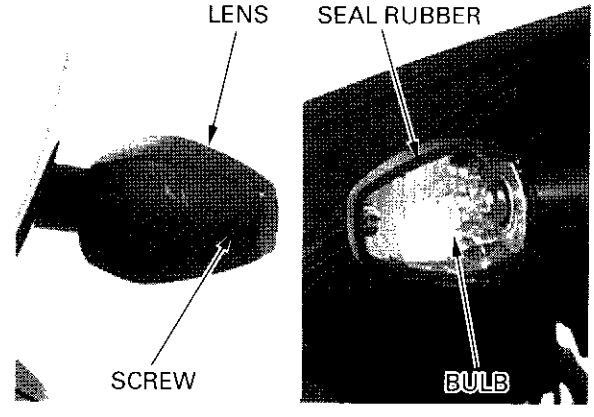
• Replace the inoperative radiator fan.

TURN SIGNAL LIGHT

BULB REPLACEMENT

Remove the screw and turn signal light lens.
While pressing the bulb in, turn it counterclockwise to remove it, and replace it with a new one.

Make sure that the seal rubber is installed in position and is in good condition, and replace it with a new one if necessary.
Install the lens, aligning the hook with the tab of the turn signal light, and tighten the screw.

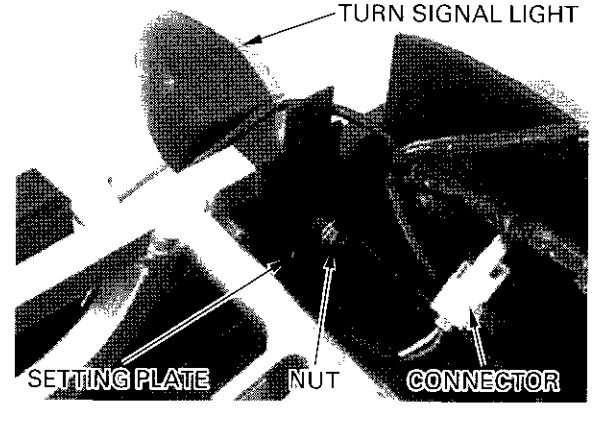


REMOVAL/INSTALLATION

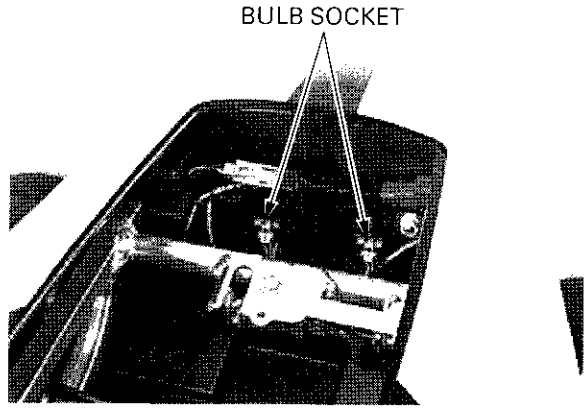
Front: Remove the lower inner fairing (page 23-27).
Rear: Remove the seat cowl (page 2-2) and disconnect the turn signal light connector.

Remove the nut, setting plate and the turn signal light.

Install the turn signal light in the reverse order of removal.



BRAKE/TAILLIGHT



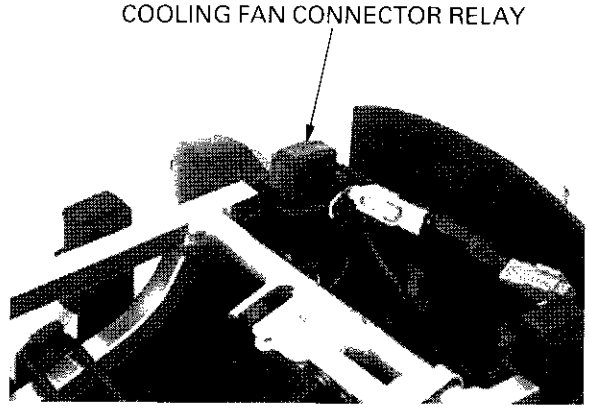
BULB REPLACEMENT

Remove the passenger seat (page 2-2).

Turn the bulb socket counterclockwise and remove it from the brake/taillight.
Pull the brake/taillight bulb out of the socket and replace it with a new one.
Install the socket by turning it clockwise.

Install the passenger seat (page 2-2).

COOLING FAN CONTROL RELAY

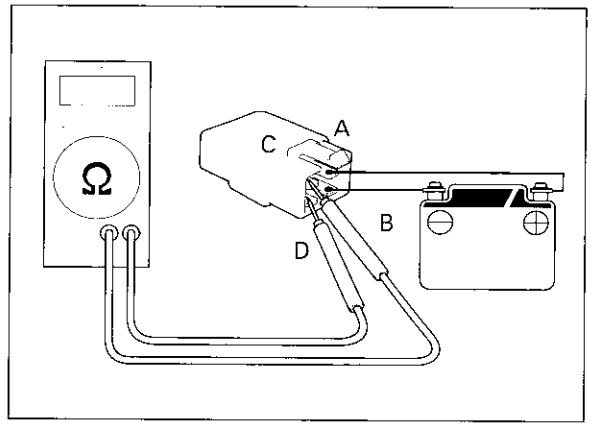


REMOVAL/IONSTALLATION

Remove the seat cowl (page 2-2).
Pull the cooling fan control relay up from the stay and disconnect the connector.

Install the cooling fan control relay in the reverse order of removal.

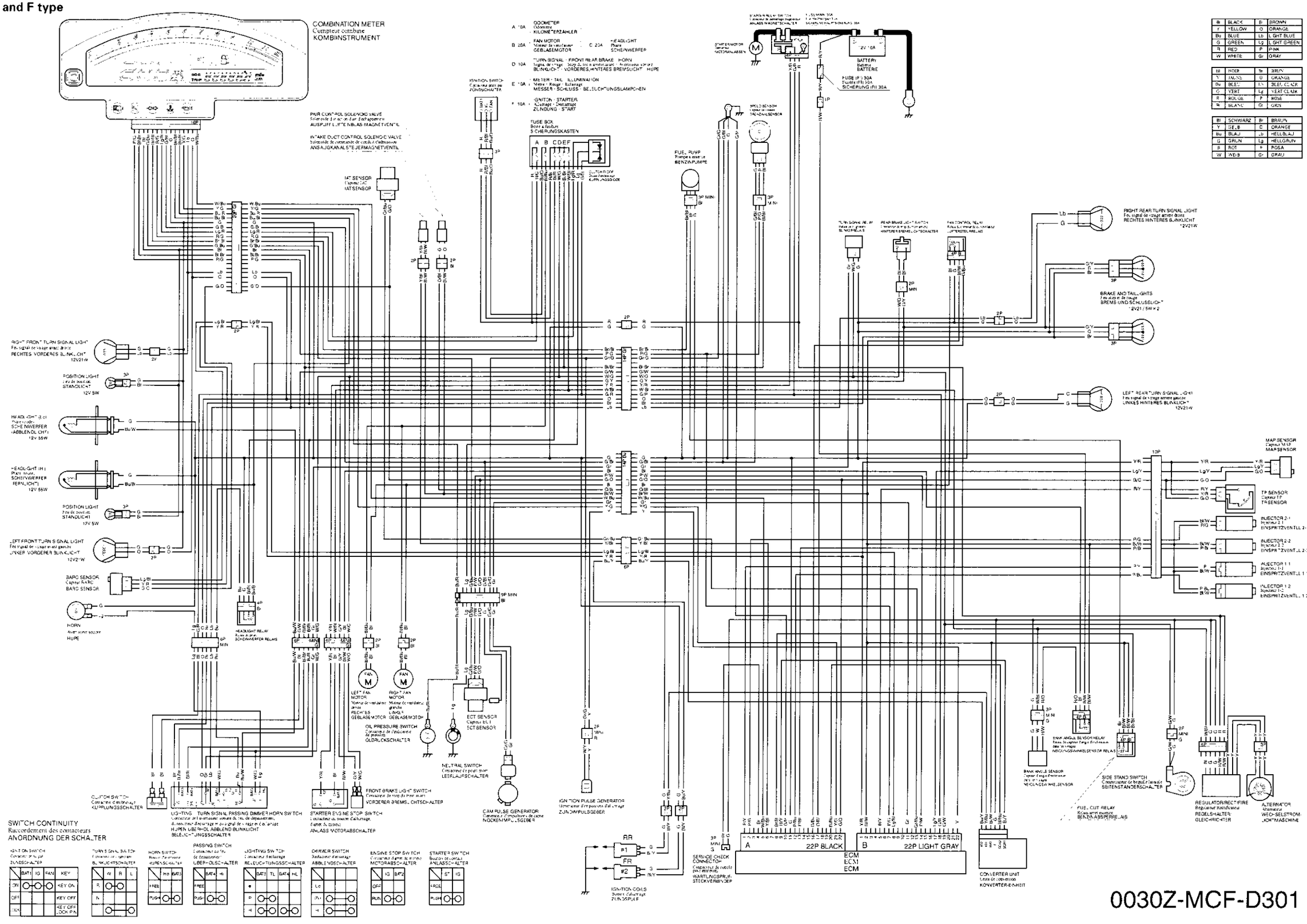
CPERATION CHECK



Remove the cooling fan control relay.
Connect the 12V battery to terminal A (+) and terminal B (−).
There should be continuity between terminal C and terminal D when the battery is connected, and no continuity when the battery is disconnected.

WIRINING DIAGRAM

E, ED and F type



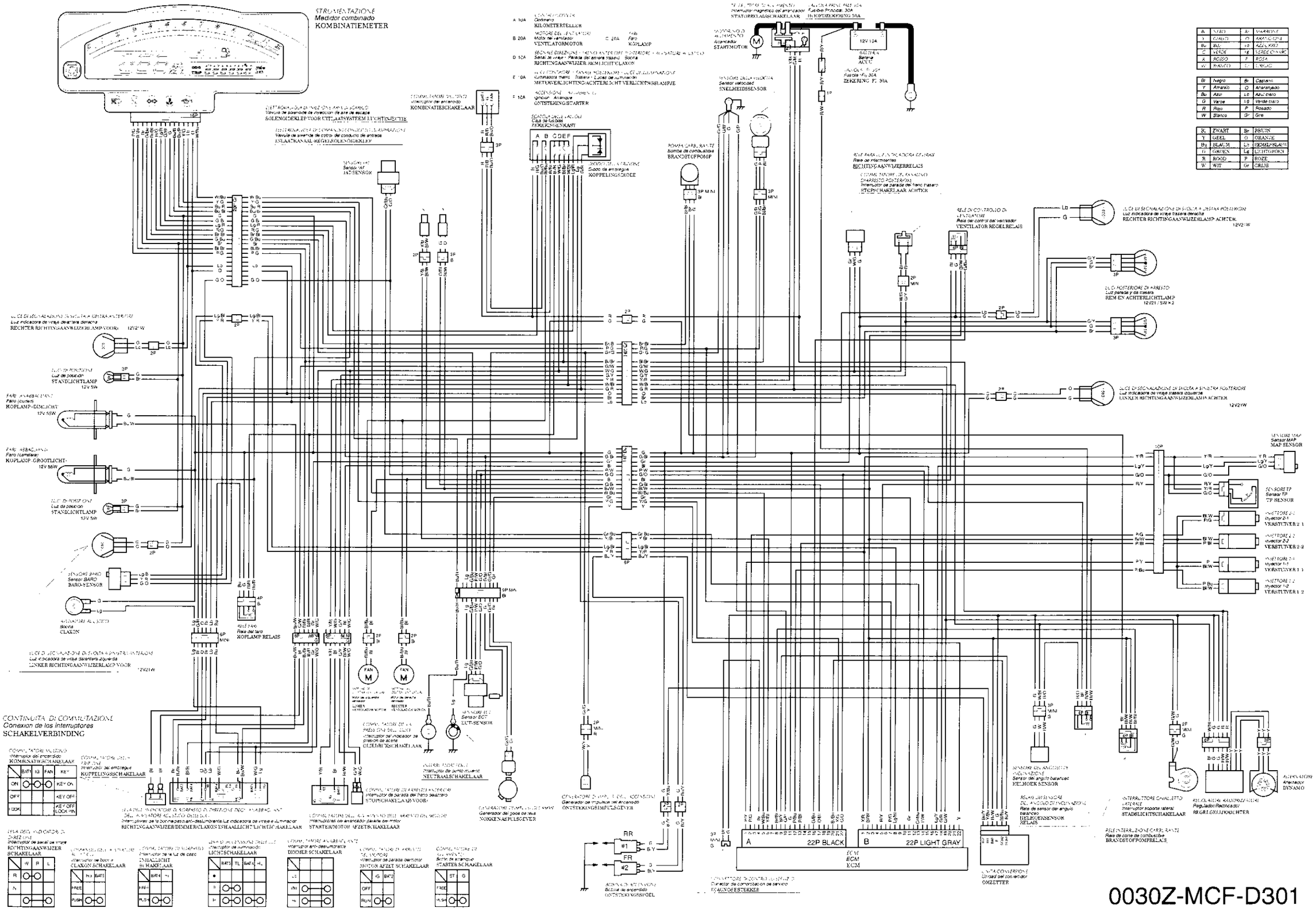
Bl	BLACK	Br	BROWN
Y	YELLOW	O	ORANGE
Bu	BLUE	Lb	LIGHT BLUE
G	GREEN	Lg	LIGHT GREEN
R	RED	P	PINK
W	WHITE	Gr	GRAY

NI	NOIR	Br	BRUN
J	JAUNE	O	ORANGE
Bu	BLEU	Lb	BLEU CLAIR
G	VERT	Lg	VERT CLAIR
R	ROUGE	P	ROSE
W	BLANC	Gr	GRIS

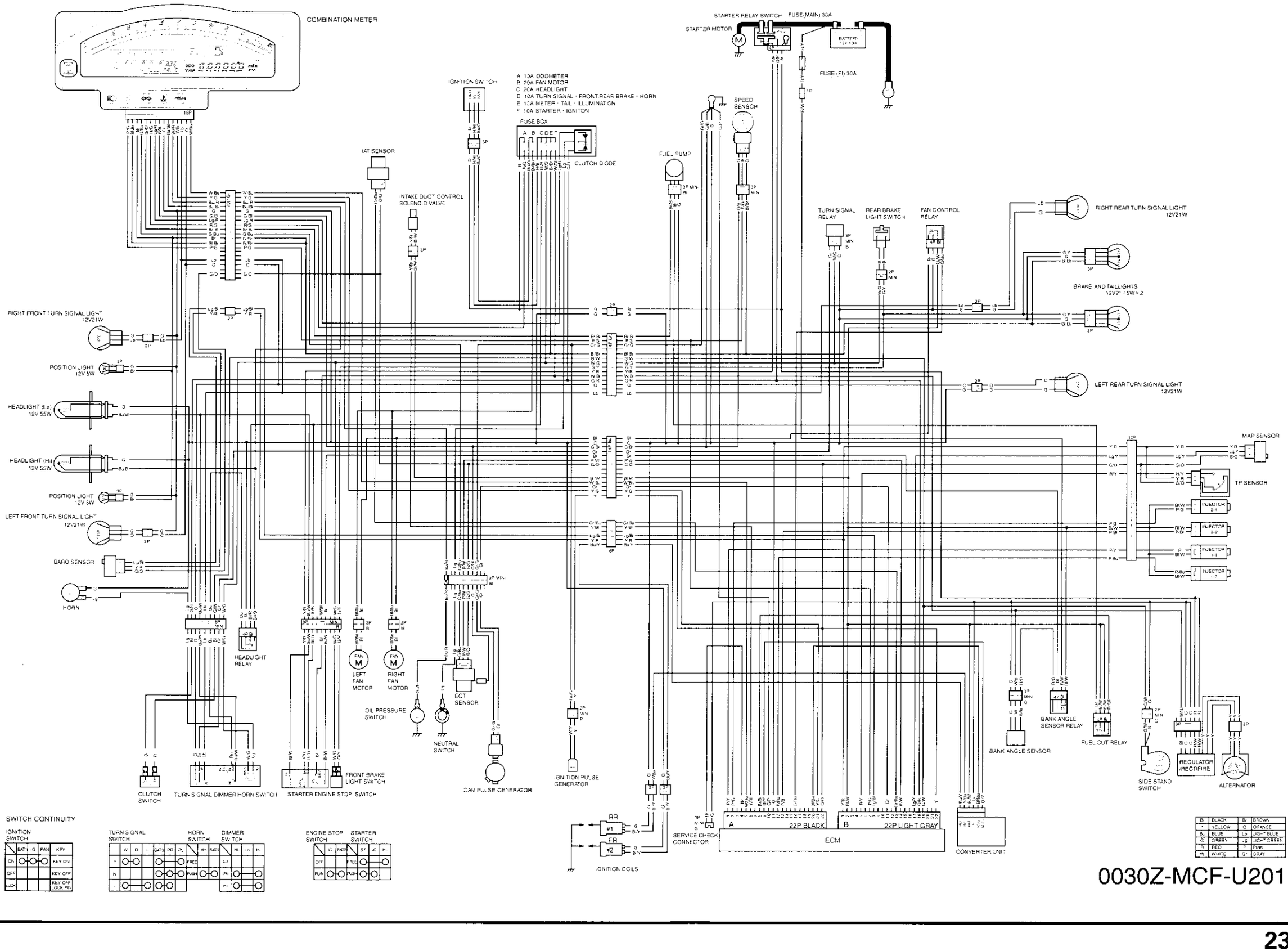
Bl	SCHWARZ	Br	BRAUN
Y	GELB	O	ORANGE
Bu	BLAU	Lb	HELLBLAU
G	GRÜN	Lg	HELLGRÜN
R	ROT	P	ROSA
W	WEIß	Gr	GRAU

0030Z-MCF-D301

E, ED and F type



U type



0030Z-MCF-U201