Paper Book Part No. 67MN500

HOW TO USE THIS MANUAL

This shop manual describes the technical features and servicing procedures for the GL1500.
Follow the Maintenance Schedule (Section 3) recommendations to ensure that the motorcycle is in peak operating condition.
Throughout the manual, the following abbreviations are used to identify individual types.

CODE	AREA (TYPE)	CODE	AREA (TYPE)
E	U.K.	SD	Sweden
G	Germany	IT	Italy
F	France	FI	Finland
ED	Europe	AR	Austria
SW	Switzerland	SP	Spain
B	Belgium	NR	Norway

Performing the first scheduled maintenance is very important. It compensates for the initial wear that occurs during the break-in period.
Sections 1 through 3 apply to the whole motorcycle, while sections 4 through 22 describe parts of the motorcycle, grouped according to location.
Wiring diagram information is found in the appropriate section. Refer to the circuit diagram in Section 4, 5, 14, 17, 18, 19, 20, 21 and 22.
Find the section you want on this page, then turn to the table of contents of that section.
Most sections start with an assembly or system illustration, service information and troubleshooting for the section. The subsequent pages give detailed procedures.
If you are not familiar with this motorcycle, read the TECHNICAL FEATURES in section 23.
If you don't know the source of the trouble, go to section 24, TROUBLESHOOTING.

Wire Color Abbreviations
The following abbreviations are used to identify wire colors in the circuit schematics:

BLK	black	LT GRN	light green
BLU	blue	ORN	orange
BRN	brown	PNK	pink
GRN	green	RED	red
GRY	gray	WHT	white
LT BLU	light blue	YEL	yellow

HONDA MOTOR CO., LTD.
SERVICE PUBLICATIONS OFFICE

CONTENTS

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IMPORTANT SAFETY NOTICE

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

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

NOTE: Gives helpful information.

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

GENERAL SAFETY

⚠WARNING

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

⚠WARNING

The battery generates hydrogen gas which can be highly explosive. Do not smoke or allow flames or sparks near the battery, especially while charging it.

⚠WARNING

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

⚠WARNING

Gasoline is extremely flammable and is explosive under certain conditions. Do not smoke or allow flames or sparks in your work area or where gasoline is stored.

⚠WARNING

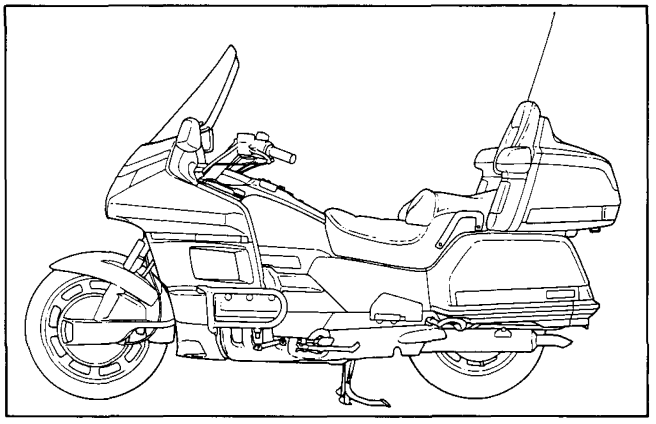
The battery electrolyte contains sulfuric acid. Protect your eyes, skin and clothing. In case of contact, flush thoroughly with water and call a doctor if electrolyte gets in your eyes.

SERVICE RULES

1. Use genuine HONDA or HONDA-recommended parts and lubricants or their equivalents. Parts that do not meet HONDA's design specifications may damage the motorcycle.
2. Use the special tools designed for this product.
3. Use only metric tools when servicing this motorcycle. Metric bolts, nuts, and screws are not interchangeable with English fasteners. The use of incorrect tools and fasteners may damage the motorcyle.
4. Install new gaskets, O-rings, cotter pins, lock plates, etc. when reassembling.
5. When tightening a series of bolts or nuts, begin with the larger-diameter of inner bolts first, and tighten to the specified torque diagonally, 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—13 through 1—20, Cable and Harness Routing.

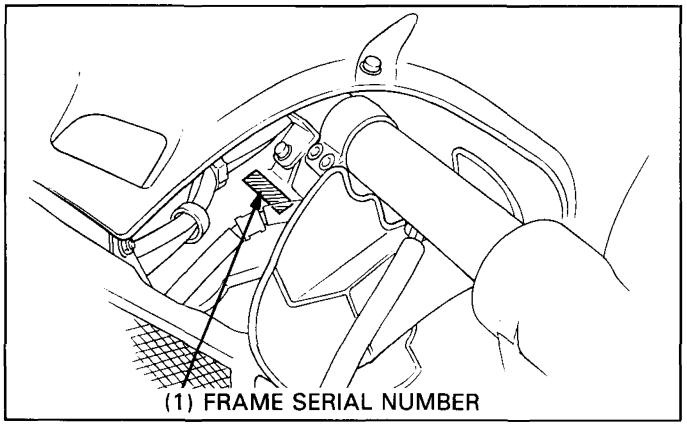
MODEL IDENTIFICATION

GL1500

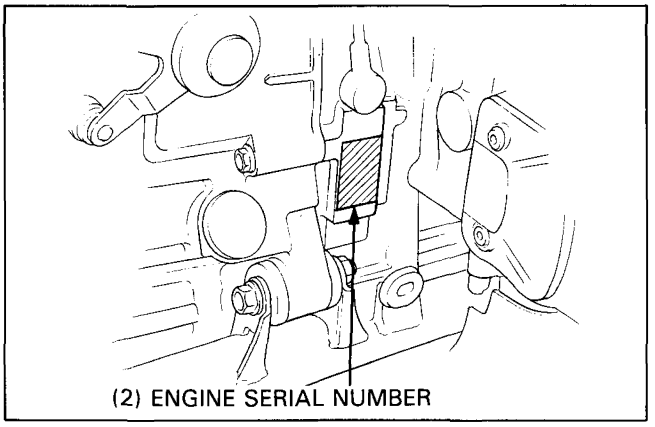


(cont'd)

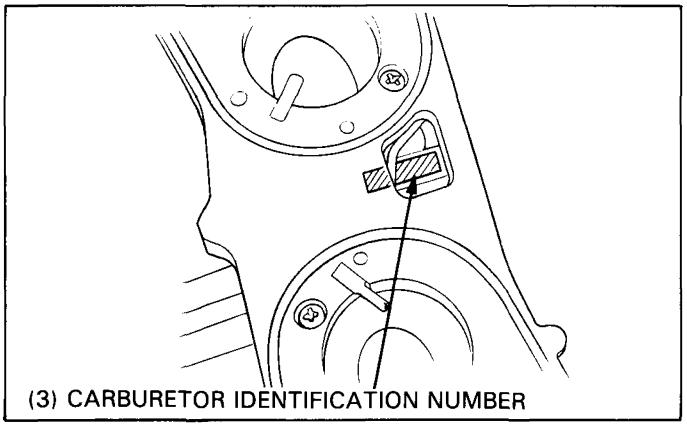
MODEL IDENTIFICATION (cont'd)



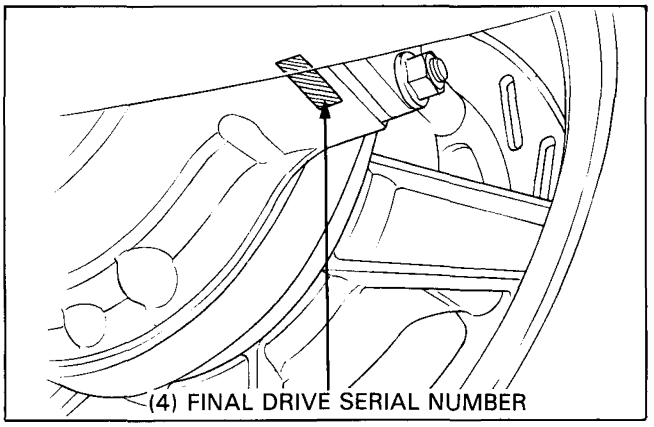
The frame serial number is stamped on the right side of the steering head.



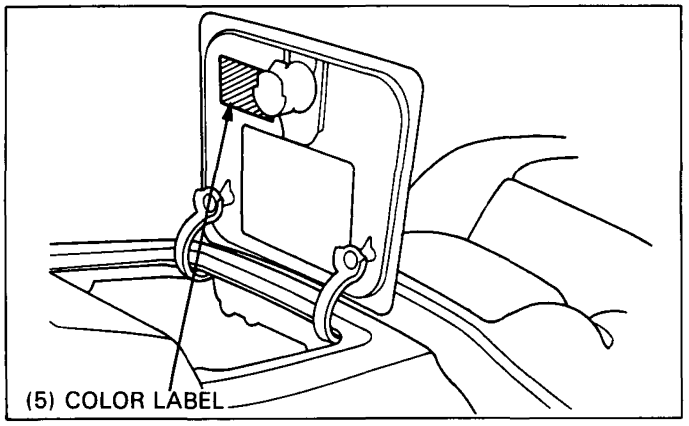
The engine serial number is stamped on the rear right side of the crankcase.



The carburetor identification numbers are stamped on the each carburetor bodies.



The final drive serial number is on the final drive case near the pinion flange as shown.



The color label is attached as shown. When ordering a color-coded part, always specify its designated color.

SPECIFICATIONS

Dimensions	Overall length		2,630 mm (103.5 in) G model: 2,635 mm (103.7 in)
	Overall width		955 mm (37.6 in)
	Overall height		1,525 mm (60.0 in) G, FI model: 1,335 mm (52.6 in)
	Wheelbase		1,700 mm (66.9 in)
	Seat height		770 mm (30.3 in)
	Ground clearance		140 mm (5.5 in) SP model: 135 mm (5.3 in)
	Dry weight		362 kg (798 lbs) G model: 357 kg (787 lbs)
	Curb weight		390 kg (860 lbs) G model: 385 kg (849 lbs)
Frame	Frame type		Double cradle
	Front suspension	Travel	Telescopic, 140 mm (5.5 in)
	Rear suspension	Travel	Swing arm, 105 mm (4.1 in)
		Air pressure	0—400 kPa (0—4.0 kg/cm², 0—57 psi)
	Front tire	Size	130/70—18 63H
		Air pressure	225 kPa (2.25 kg/cm², 33 psi)
	Rear tire	Size	160/80—16 75H
		Air pressure	250 kPa (2.50 kg/cm², 36 psi): Driver only
			280 kPa (2.80 kg/cm², 41 psi): Driver and Passenger
	Front brake		Double disc brake
	Rear brake		Disc brake
	Fuel capacity		24.0 lit. (6.4 US gal, 5.3 Imp gal)
	Caster angle		30°
	Trail length		115 mm (4.5 in)
	Front fork oil capacity	Left	325 cm³ (10.9 US oz, 11.4 Imp oz)
		Right	320 cm³ (10.8 US oz, 11.2 Imp oz)
Engine	Engine type		Water cooled, 4 stroke O.H.C.
	Cylinder arrangement		Flat six
	Bore and stroke		71 x 64 mm (2.8 x 2.5 in)
	Displacement		1,520 cm³ (92.7 cu-in)
	Compression ratio		9.8:1 SW model: 8.6:1
	Valve train		Belt driven over head camshaft
	Oil capacity	At disassembly	4.3 lit. (4.5 US qt, 3.8 Imp qt)
		After draining	3.5 lit. (3.7 US qt, 3.1 Imp qt)
	Lubrication system		Forced and wet sump
	Cooling system capacity		4.1 lit. (4.3 US qt, 3.6 Imp qt)
	Cylinder compression		1,500 kPa (15.0 kg/cm², 213 psi)
	Engine weight		126 kg (278 lbs)
	Camshaft: Intake valve	Opens	5° ATDC (At 1 mm lift)
		Closes	30° ABDC (At 1 mm lift)
	Camshaft: Exhaust valve	Opens	35° BBDC (At 1 mm lift)
		Closes	5° BTDC (At 1 mm lift)
	Valve clearance	Intake/Exhaust	Hydraulic valve adjuster system
	Idle speed		800±80 min⁻¹ (rpm)
		SW model	900±50 min⁻¹ (rpm)

Carburetion	Carburetor type		CV down-draft dual carburetors
	Throttle bore		36 mm (1.4 in)
	Carburetor identification No.		VD GEA SW model: VD GJA
	Pilot screw opening		3-1/8 turns out
	Float level		8 mm (0.3 in)
	Main jet		pri: #70 2nd: #155
	Slow jet		#50
	Throttle grip free play		5—8 mm (3/16—5/16 in)
	Fuel pump flow capacity		640 cm^3 (22.5 Imp oz)/minute
	Carburetor vacuum difference		Within 40 mm (1.6 in) Hg of each other
Drive Train	Clutch type		Wet, multi-plate
	Transmission		5-speed, constant mesh
	Primary reduction ratio		1.592 (78/49)
	Secondary reduction ratio		0.971 (34/35)
	Gear ratio	1st 2nd 3rd 4th OD	2.667 (40/15) 1.722 (31/18) 1.273 (28/22) 0.964 (27/28) 0.759 (22/29)
	Final reduction ratio		2.833 (34/12)
	Gearshift pattern		Left foot operated return system 1—N—2—3—4—OD
	Final gear oil capacity (After disassembly)		170 cm^3 (5.7 US oz, 6.0 Imp oz)
Electrical	Ignition		Battery, Ignition (Full transistor)
	Ignition timing "F" mark		0° BTDC
	Starting system		Starting motor
	Alternator		AC generator, 0.55 kW/5,000 min^{-1} (rpm)
	Battery capacity		12 V—20 AH
	Spark plug: Standard	NGK	DPR7EA-9
		ND	X22EPR-U9
	Spark plug: For cold climate (Below 5°C, 41°F)	NGK	DPR6EA-9
		ND	X20EPR-U9
	Spark plug: For extended high speed riding	NGK	DPR8EA-9
		ND	X24EPR-U9
	Spark plug gap		0.8—0.9 mm (0.031—0.035 in)
	Firing order		1—4—5—2—3—6—1
	Fuses		5 A x 2, 10 A x 4, 15 A x 5 (fuse box) 30 A, 55 A (main fuses) 5 A x 3, 65 A (reverse fuses)
Lights	Headlight		12 V 60 W (R), 60/55 W (L) SW model: 12 V 60/55 W
	Position light		12 V 5W
	Turn signal light		12 V 21 W x 4
	Indicator light		12 V 3.4 W x 5 / 12 V 1.7 W x 4
	Turn signal indicator		12 V 3 W x 2
	Instrument illumination		12 V 3.4 W x 4
	LCD unit illumination		12 V 3 W x 2
	License light		12 V 5 W
	Brake and taillight		12 V 21/5 W x 2

SERVICE DATA

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
Engine weight (including carburetors)				126 kg (278 lbs)	—
Engine oil capacity		at engine assembly		4.3 lit (4.5 US qt, 3.8 Imp qt)	—
		at oil change		3.5 lit (3.7 US qt, 3.1 Imp qt)	—
		at oil filter and oil change		3.7 lit (3.9 US qt, 3.3 Imp qt)	—
Radiator coolant capacity		After disassembly		4.1 lit (4.3 US qt, 3.6 Imp qt)	—
		After draining (including reserve tank)		3.8 lit (4.0 US qt, 3.3 Imp qt)	—
		Reserve tank		0.55 lit (0.6 US qt, 0.5 Imp qt)	—
OIL PUMP	Main oil pump	Tip clearance		0.15 (0.006) max.	0.35 (0.014)
		Pump body clearance		0.15–0.23 (0.006–0.009)	0.43 (0.017)
		Pump side clearance		0.02–0.07 (0.001–0.003)	0.12 (0.005)
	Scavenge pump	Tip clearance		0.15 (0.006) max.	0.35 (0.014)
		Pump body clearance		0.15–0.22 (0.006–0.009)	0.42 (0.017)
		Pump side clearance		0.02–0.07 (0.001–0.003)	0.12 (0.005)
	Pressure relief valve	Relief pressure		470–570 kPa (4.7–5.7 kg/cm², 67–81 psi)	—
		Relief valve spring free length		90.8 (3.57)	84.0 (3.31)
	Oil pressure (at oil pressure switch)	Cold (At 35°C/95°F)	Idle speed	130 kPa (1.3 kg/cm², 18 psi)	—
			5,000 min⁻¹ (rpm)	500 kPa (5.0 kg/cm², 71 psi)	—
		Hot (At 80°C/176°F)	Idle speed	80 kPa (0.8 kg/cm², 11 psi)	—
			5,000 min⁻¹ (rpm)	500 kPa (5.0 kg/cm², 71 psi)	—
COOLING	Radiator cap relief pressure			75–105 kPa (0.75–1.05 kg/cm², 11–15 psi)	—
	Thermostat	Begins to open temperature		80°–84°C (176°–183°F)	—
		Fully opened temperature		93°–97°C (199°–206°F)	—
		Valve lift (heated to 95°C/5 minutes)		8.0 (0.315) min.	—
	Thermo valve		Starts to close	78°–82°C (172°–180°F)	—
	Thermostatic fan motor switch		Starts to close	98°–102°C (208°–216°F)	—
	Coolant temperature sensor resistance		60°C (140°F)	104 ohms	—
			85°C (185°F)	44 ohms	—
			110°C (230°F)	20 ohms	—
			120°C (248°F)	16 ohms	—
CYLINDER HEAD	Cylinder head warpage			—	0.10 (0.004)
	Valve stem O.D.		IN	5.475–5.490 (0.2156–0.2161)	5.45 (0.215)
			EX	5.455–5.470 (0.2148–0.2154)	5.44 (0.214)
	Valve guide I.D.		IN, EX	5.500–5.512 (0.2165–0.2170)	5.55 (0.219)
	Valve stem to guide clearance		IN	0.010–0.037 (0.0004–0.0015)	0.08 (0.003)
			EX	0.030–0.057 (0.0012–0.0022)	0.10 (0.004)
	Valve seat width			1.2 (0.05)	—
	Valve spring free length			44.6 (1.76)	43.3 (1.70)
	Valve spring preload/length			15.6–18.2/37.5 kg/mm (34.39–40.12/1.48 lbs/in)	—
	Rocker arm I.D.			21.000–21.021 (0.8268–0.8276)	21.05 (0.829)
	Rocker arm shaft O.D.			11.966–11.984 (0.4711–0.4718)	11.95 (0.470)
	Rocker arm lobe		I.D.	11.996–12.031 (0.4723–0.4734)	12.07 (0.475)
			O.D.	20.945–20.980 (0.8246–0.8260)	20.93 (0.824)
	Hydraulic valve adjuster compression stroke with kerosene			0–0.30 (0–0.012)	0.30 (0.012) max.

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
CYLINDER HEAD	Camshaft	Cam lobe height		36.110–36.190 (1.4217–1.4248)	35.9 (1.41)
		Runout (at center journal)		—	0.10 (0.004)
		Journal O.D.	Both middles	26.934–26.955 (1.0604–1.0612)	26.91 (1.059)
			Both ends	26.949–26.970 (1.0610–1.0618)	26.91 (1.059)
		Holder journal I.D.		27.000–27.021 (1.0630–1.0638)	27.05 (1.065)
		Journal oil clearance	Both middles	0.045–0.087 (0.0018–0.0034)	0.14 (0.006)
			Both ends	0.030–0.072 (0.0012–0.0028)	0.14 (0.006)
CLUTCH	Clutch master cylinder	Cylinder I.D.		15.870–15.913 (0.6248–0.6265)	15.93 (0.627)
		Piston O.D.		15.827–15.854 (0.6231–0.6242)	15.82 (0.623)
	Clutch	Plate warpage		—	0.30 (0.012)
		Disc thickness	Disc A	3.80–3.88 (0.150–0.153)	3.5 (0.14)
			Disc B	3.72–3.88 (0.146–0.153)	3.5 (0.14)
		Clutch spring free height		5.38 (0.212)	5.1 (0.20)
OUTPUT SHAFT	Damper spring free length			60.82 (2.394)	57.0 (2.24)
	Shaft O.D.			22.008–22.021 (0.8665–0.8670)	21.99 (0.866)
	Collar		I.D.	22.026–22.041 (0.8672–0.8678)	22.05 (0.868)
			O.D.	25.959–25.980 (1.0220–1.0228)	25.95 (1.022)
	Driven gear I.D.			26.000–26.016 (1.0236–1.0242)	26.03 (1.025)
GEAR-SHIFT	Shift fork shaft O.D.			13.966–13.984 (0.5498–0.5506)	13.90 (0.547)
	Shift fork		I.D.	14.000–14.021 (0.5512–0.5520)	14.04 (0.553)
			Claw thickness	5.93–6.00 (0.233–0.236)	5.6 (0.22)
TRANS-MISSION	Gear I.D.		C2, C3, M4, M5	34.000–34.016 (1.3386–1.3392)	34.04 (1.340)
	Gear bushing O.D.		C2, C3, M4/M5	33.940–33.965 (1.3362–1.3372)	33.92 (1.335)
	Gear-to-bushing clearance			0.035–0.076 (0.0014–0.0030)	0.10 (0.004)
CYLINDER, PISTON	Cylinder compression pressure			1300–1700 kPa (13.0–17.0 kg/cm², 185–242 psi)	1000 kPa (10.0 kg/cm², 142 psi)
	Cylinder	I.D.		71.005–71.025 (2.7955–2.7963)	71.1 (2.80)
		Out-of-round		—	0.15 (0.006)
		Taper		—	0.05 (0.002)
		Top warpage		—	0.05 (0.002)
	Piston	O.D. (at skirt)		70.960–70.990 (2.7937–2.7949)	70.85 (2.789)
		Piston pin bore		18.002–18.008 (0.7087–0.7090)	18.06 (0.711)
		Piston-to-cylinder clearance		0.015–0.065 (0.0006–0.0026)	0.10 (0.004)
	Piston ring	End gap	Top and second	0.15–0.30 (0.006–0.012)	0.5 (0.02)
			Oil ring side rail	0.20–0.70 (0.008–0.028)	0.9 (0.04)
		Ring-to-ring land clearance	Top	0.025–0.055 (0.0010–0.0022)	0.10 (0.004)
			Second	0.015–0.045 (0.0006–0.0018)	0.10 (0.004)
	Piston pin	O.D. (at sliding surfaces)		17.994–18.000 (0.7084–0.7087)	18.99 (0.748)
		Pin-to-piston clearance		0.002–0.014 (0.0001–0.0006)	0.04 (0.002)
		Pin-to-rod clearance		0.009–0.033 (0.0004–0.0013)	0.04 (0.002)

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
	Main journal bearing oil clearance			0.028–0.046 (0.0011–0.0018)	0.06 (0.002)
	Crankpin bearing oil clearance			0.027–0.045 (0.0011–0.0018)	0.06 (0.002)
	Crankshaft runout (at center journal)			—	0.03 (0.001)
	Connecting rod side clearance			0.15–0.30 (0.006–0.012)	0.40 (0.016)
	Connecting rod small end I.D.			18.009–18.027 (0.7090–0.7097)	18.04 (0.710)
	Crankpin and main journal		Taper	—	0.003 (0.0001)
			Out-of-round	—	0.005 (0.0002)
WHEELS	Wheel axle runout			—	0.2 (0.01)
	Wheel rim runout		Axial	—	2.0 (0.08)
			Radial	—	2.0 (0.08)
	Tire tread depth		Front	—	1.5 (0.06)
			Rear	—	2.0 (0.08)
SUSPENSION	Rear suspension air pressure			0–400 kPa (0–4.0 kg/cm^2, 0–57 psi)	—
	Front fork spring free length		Spring A	192.9 (7.59)	189.0 (7.44)
			Spring B	386.3 (15.21)	378.6 (14.91)
	Front fork oil capacity		Left	325 cm^3 (10.9 US oz, 11.4 Imp oz)	—
			Right	320 cm^3 (10.8 US oz, 11.2 Imp oz)	—
	Front fork oil level (from the top of tube)			239 (9.4)	—
	Front fork oil			ATF	—
	Fork tube runout			—	0.2 (0.01)
	Left shock absorber spring free length (Rear)			280.7 (11.05)	274.5 (10.81)
	Right shock absorber oil capacity			140 cm^3 (4.7 US oz, 4.9 Imp oz)	—
	Right shock absorber oil			ATF	—
FINAL DRIVE	Final gear oil	Recommended oil		Hypoid gear oil, SAE #80	—
		Capacity	At assembly	170 cm^3 (5.7 US oz, 6.0 Imp oz)	—
			After draining	140 cm^3 (4.7 US oz, 4.9 Imp oz)	—
	Final gear backlash			0.05–0.15 (0.002–0.006)	0.3 (0.01)
		Difference at 3 points		—	0.10 (0.004)
	Ring gear-to-stop pin clearance			0.30–0.60 (0.012–0.024)	—
BRAKES	Front brake master cylinder	Cylinder I.D.		12.700–12.743 (0.5000–0.5017)	12.755 (0.5022)
		Piston O.D.		12.684–12.657 (0.4980–0.4983)	12.645 (0.4978)
	Front brake caliper	Left	Cylinder I.D.	25.400–25.450 (1.0000–1.0020)	25.460 (1.0024)
			Piston O.D.	25.335–25.368 (0.9974–0.9987)	25.310 (0.9965)
		Right	Cylinder I.D.	30.230–30.280 (1.1902–1.1921)	30.290 (1.1925)
			Piston O.D.	30.165–30.198 (1.1876–1.1889)	30.140 (1.1866)
	Front brake disc	Thickness		5.8–6.2 (0.23–0.24)	5.0 (0.20)
		Runout		—	0.3 (0.01)
	Front brake pad thickness			5.5 (0.22)	1.0 (0.04)
	Rear brake master cylinder	Cylinder I.D.		15.870–15.913 (0.6248–0.6265)	15.925 (0.6270)
		Piston O.D.		15.827–15.854 (0.6231–0.6242)	15.815 (0.6226)
		Brake rod clevis installed length		100 (3.9)	—
	Rear brake caliper	Cylinder I.D.		32.030–32.080 (1.2610–1.2630)	32.090 (1.2634)
		Piston O.D.		31.948–31.998 (1.2578–1.2598)	31.940 (1.2575)
	Rear brake disc	Thickness		7.3–7.7 (0.29–0.30)	6.0 (0.24)
		Runout		—	0.3 (0.01)
	Rear brake pad thickness			6.5 (0.26)	1.0 (0.04)
	Brake fluid (front/rear)			DOT 4	—

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
CHARGING	Battery capacity			12 V–20 AH	—
	Battery specific gravity (At 20°C, 68°F)	Full charged		1.270–1.290	—
		Need charging		Below 1.260	—
	Battery charging current			2.0 Amperes max.	—
	Alternator	Capacity		0.55 kW/5,000 min^{-1} (rpm)	—
		Stator coil resistance		0.1–0.3 ohms (20°C, 68°F)	—
		Rotor coil resistance		2.9–4.0 ohms (20°C, 68°F)	—
		Rotor coil slip ring O.D.		27.0 (1.06)	26.0 (1.02)
		Charging start		800–1,000 min^{-1} (rpm)	—
	Regulator/ Rectifier (into alternator)	Type		Transistorized non-adjustable reg./recti.	—
		Regulated voltage (at 20°C/68°F)	900 min^{-1} (rpm)	0–2 A, 13.5–15.5 V	—
			1,850 min^{-1} (rpm)	1.5 A min., 13.5–15.5 V	—
IGNITION	Firing order			1–4–5–2–3–6–1	—
	Ignition timing		F mark	0° BTDC at 900 ± 50 min^{-1} (rpm)	—
		Vacuum advance	Advance start	10–110 mmHg (0.4–4.3 inHg)	—
			Advance cease	280–380 mmHg (11.0–15.0 inHg)	—
	Ignition coil resistance (at 20°C/68°F)	Primary coil		2.6–3.2 ohms	—
		Secondary coil	With spark plug wire	21–29 Kohms	—
			Without spark plug wire	13–17 Kohms	—
	Pulse generator coil resistance (At 20°C, 68°F)			400–500 ohms	—
	Tw sensor/Ta sensor resistance		20°C (68°F)	2.0–3.0 Kohms	—
			80°C (176°F)	200–400 ohms	—
STARTER/ REVERSE	Starter motor brush length			12.5 (0.49)	6.0 (0.24)
	Reverse System	Starter relay regulator/regulated current		0.7–1.0 A	—
		Resister	Between relay and unit terminals	0.06–0.09 ohms	—
			Between relay terminal and ground	0.1–0.2 ohms	—
ELECTRICAL	Oil pressure switch continuity pressure			10–20 kPa (0.1–0.2 kg/cm^2, 1–3 psi)	—
	Fuel level sensor resistance (at 20°C/68°F)		Empty	90–100 ohms	—
			Reserve	66–81 ohms	—
			Full	4–10 ohms	—

TORQUE VALUES

ENGINE

Item	Qty	Thread dia (mm)	Torque N·m	Torque kg-m	Torque ft-lb	Remarks
Spark plug	6	12	16	1.6	12	
Carburetor insulator band screw	4	5	5	0.5	3.6	
Intake manifold vacuum tube joint	3	5	4	0.4	3	
Coolant temperature sensor	1	PT 1/8	12	1.2	9	NOTE 1
Thermostatic fan motor switch	1	12	28	2.8	20	
Tw sensor	1	12	28	2.8	20	
Reverse switch	1	10	12	1.2	9	
Reverse shifter shaft bolt	1	6	14	1.4	10	NOTE 2
LUBRICATION:						
Oil pressure switch	1	PT 1/8	12	1.2	9	NOTE 1
Engine oil drain bolt	1	14	38	3.8	27	
Engine oil filter cartrige	1	20	10	1.0	7	
Engine oil filter boss	1	20	18	1.8	13	NOTE 2
CYLINDER HEAD:						
Cylinder head bolt (9 mm bolt)	16	9	45	4.5	33	NOTE 3
Timing belt driven pulley bolt	2	8	27	2.7	20	
Camshaft holder bolt	16	8	20	2.0	14	
Hydraulic valve adjuster stopper plug	12	14	30	3.0	22	
Cylinder head cover bolt	12	6	12	1.2	9	
Timing belt tensioner bolt	4	8	26	2.6	19	NOTE 2
Cylinder head sealing bolt	6	18	45	4.5	33	NOTE 2
CLUTCH:						
Clutch hose/pipe oil bolt	3	10	30	3.0	22	
Clutch slave cylinder bleed valve	1	8	9	0.9	7	
Clutch bleed pipe bolt	1	6	12	1.2	9	NOTE 2
Clutch center lock nut	1	22	130	13.0	94	
Clutch outer lock nut	1	40	190	19.0	137	NOTE 2/5
ALTERNATOR:						
Front cover attaching screw	3	4	2	0.2	1.4	NOTE 2
Couple A mounting nut	1	14	58	5.8	42	NOTE 2
Couple B mounting nut	1	14	58	5.8	42	
REAR ENGINE CASE:						
Starter one-way clutch socket bolt	6	6	16	1.6	12	NOTE 2
Starter clutch mounting bolt	1	12	75	7.5	54	
Shift drum lock arm bolt (reverse system)	1	6	12	1.2	9	
Alternator drive gear bolt	6	8	27	2.7	20	NOTE 3
Final drive gear lock nut	1	22	190	19.0	137	NOTE 2/4/5
Output shaft lock nut	1	30	190	19.0	137	NOTE 5
Oil pump driven sprocket bolt	1	6	18	1.8	13	NOTE 2
GEARSHIFT:						
Shift arm lock bolt	1	8	25	2.5	18	
Shift drum center bolt	1	8	28	2.8	20	
Shift drum lock cam bolt	1	6	12	1.2	9	NOTE 2
Shift arm return spring pin	1	8	25	2.5	18	
CRANKCASE/CRANKSHAFT/TRANSMISSION:						
Crankcase bolt (10 mm)	8	10	35	3.5	25	NOTE 6
(8 mm)	4	8	26	2.6	19	
(6 mm)	10	6	12	1.2	9	
Crankcase sealing bolt (20 mm)	4	20	45	4.5	33	NOTE 2
(18 mm)	2	18	45	4.5	33	NOTE 2
Mainshaft lock nut	1	22	190	19.0	137	NOTE 5
Crankshaft main bearing cap bolt	8	10	60	6.0	43	NOTE 6
Connecting rod cap nut	8	8	32	3.2	23	NOTE 6
Timing belt drive pulley bolt	1	12	75	7.5	54	

NOTES:
1. Apply sealant to the threads.
2. Apply a locking agent to the threads.
3. Apply molybdenum disulfide oil to the threads and flange surfaces.
4. Left-hand threads.
5. Stake (2 plcs)
6. Apply oil to the threads and flange surfaces.
7. Torque wrench scale reading using a special tool.
8. Apply grease to the threads and flange surfaces.

FRAME

Item	Qty	Thread dia (mm)	Torque N•m	Torque kg-m	Torque ft-lb	Remarks
Engine mount nut	7	10	40	4.0	29	
Engine bracket bolt	4	8	25	2.5	18	
Subframe bolt (10 mm socket bolt)	4	10	40	4.0	29	
(10 mm flange bolt)	1	10	40	4.0	29	
(8 mm flange bolt)	1	8	25	2.5	18	
Exhaust pipe joint nut	12	6	10	1.0	7	
Side stand pivot	1	10	22	2.2	16	
Center stand pivot	1	8	18	1.8	13	
Chamber protector bolt	6	6	10	1.0	7	
Brake disc bolt	18	8	40	4.0	29	
HANDLEBAR:						
Handlebar upper holder bolt	4	8	25	2.5	18	NOTE 8
Front master cylinder holder bolt	2	6	12	1.2	9	
Clutch master cylinder holder bolt	2	6	12	1.2	9	
FRONT:						
Axle pinch bolt	4	8	22	2.2	16	
Axle bolt	1	14	90	9.0	65	
Steering stem nut	1	24	100	10.0	72	
Steering stem adjustment nut	1	26	19	1.9	14	See page 13-26
Anti-dive case socket bolt	8	6	8	0.8	6	NOTE 2
Fork bottom socket bolt	2	8	20	2.0	14	NOTE 2
Fork bolt	2	37	23	2.3	17	
Fork leg upper pinch bolt	2	7	11	1.1	8	
Fork leg lower pinch bolt	4	10	55	5.5	40	
REAR:						
Axle pinch bolt	1	8	32	3.2	23	
Axle nut	1	18	110	11.0	80	
Left shock absorber mount bolt (Upper)	1	8	23	2.3	17	
(Lower)	1	18	70	7.0	51	
Right shock absorber mount bolt (Upper)	1	8	23	2.3	17	
(Lower)	1	8	23	2.3	17	
Air hose bolt	3	10	6	0.6	4	
Air hose special bolt (with seat)	1	10	15	1.5	11	
Outlet air hose joint	2	8	6	0.6	4	
Air pressure sensor	1	8	6	0.6	4	
Air distributor solenoid valve mounting screw	4	5	3	0.3	2	
Swing arm right pivot bolt	1	30	100	10.0	72	
Swing arm left pivot bolt	1	30	19	1.9	14	
Swing arm left pivot lock nut	1	30	90	9.0	65	NOTE 7
FINAL DRIVE:						
Pinion bearing retainer	1	70	150	15.0	108	
Pinion joint nut	1	16	110	11.0	80	NOTE 2
Gear case cover bolt (10 mm)	2	10	63	6.3	46	NOTE 2
(8 mm)	6	8	26	2.6	19	
Final drive gear case mounting nut	4	10	65	6.5	47	
Final drive gear case filler cap	1	30	12	1.2	9	
Final drive gear case drain bolt	1	14	20	2.0	14	
Dust guard plate bolt	1	6	10	1.0	7	
Retainer lock washer bolt	1	6	10	1.0	7	
HYDRAULIC BRAKE:						
Caliper bleed valve	3	7	6	0.6	4	
Front caliper bracket bolt	2	8	23	2.3	17	
Anti-dive piston bolt	2	6	12	1.2	9	
Front pad pin plug	4	10	2.5	0.25	1.8	
Front pad pin	4	10	18	1.8	13	
Brake hose bolt	6	10	30	3.0	22	
Rear master cylinder mounting bolt	2	6	12	1.2	9	
Rear caliper retainer bolt	1	6	11	1.1	8	
Rear caliper bolt	1	8	23	2.3	17	
Rear caliper pin bolt	1	12	28	2.8	20	
Metal brake line nut	4	10	17	1.7	12	
Brake pedal bolt	1	8	25	2.5	18	

Torque specifications listed above are for important fastners. Other should be tightened to standard torque values listed below.

STANDARD TORQUE VALUES

Item	Torque Values N•m (kg-m, ft-lb)	Item	Torque Values N•m (kg-m, ft-lb)
5 mm bolt and nut	4–6 (0.4–0.6, 3–4)	5 mm screw	3–5 (0.3–0.5, 2–4)
6 mm bolt and nut	8–12 (0.8–1.2, 6–9)	6 mm screw and 6 mm flange bolt with 8 mm head	7–11 (0.7–1.1, 5–8)
8 mm bolt and nut	18–25 (1.8–2.5, 13–18)	6 mm flange bolt and nut	10–14 (1.0–1.4, 7–10)
10 mm bolt and nut	30–40 (3.0–4.0, 22–29)	8 mm flange bolt and nut	24–30 (2.4–3.0, 17–22)
12 mm bolt and nut	50–60 (5.0–6.0, 36–43)	10 mm flange bolt and nut	35–45 (3.5–4.5, 25–33)

TOOLS

SPECIAL

DESCRIPTION	TOOL NUMBER	REF. SECTION(S)
Oil filter wrench	07HAA—PJ70100	2
Hydraulic tappet breeder	07973—MJ00000 or 07973—ME90000	7
Valve guide reamer, 5.5 mm	07984—2000001	7
Shim selection gauge	07974—MG90000	7
Snap ring pliers	07914—3230001	8, 16
*Clutch center holder	07JMB—MN50300	8
Oil seal driver attachment	07965—MA10200	8
*Clutch outer holder	07JMB—MN50100	2, 8, 9, 19
*Lock nut wrench, 46 mm	07JMA—MN50100	8
*Mainshaft holder	07JMB—MN50200	9, 10
Lock nut wrench, 30 x 64 mm	07916—MB00001	9
Bearing remover	07936—3710300	9
Remover handle	07936—3710100	9
Remover sliding weight	07741—0010201	9
Attachment, 28 x 30 mm	07946—1870100	9
Bearing driver attachment	07GAD—SD40101	9
*Piston ring compressor	07955—3710000 (2 pcs)	10
*Piston ring compressor	07JMG—MN50300 (1 pc.)	
*Piston base set	07JMG—MN50101	10
—piston base A	07JMG—MN50121 (2 pcs. required)	10
—piston base B	07JMG—MN50111 (1 pc.)	10
*Crankcase assembly guide	07JMG—MN50200	10
Steering stem socket	07916—3710100	13
Steering stem driver	07946—MB00000	13
Ball race remover	07953—4250002	13
Bearing race remover	07946—3710500	13
Fork seal driver	07947—KA50100	14
Fork seal driver attachment	07947—KF00100	14
Shock absorber compressor	07GME—0010000 or 07959—3290001	14
Shock absorber compressor attachment	07959—MB10000	14
Oil seal driver	07965—KE80100	14
Oil seal driver attachment	07965—MA60100	14
Lock nut wrench	07908—4690001	14
Pivot bearing outer race remover	07936—4150000	14
Pinion joint holder attachment	07924—9690100 (Modified) or 07924—9690102	15
Pinion joint holder	07924—ME40000	15
Retainer wrench	07910—MA10100	15
Bearing race insert attachment	07931—4630300	15
Driver shaft	07946—MJ00100	15
Oil seal remover (final drive)	07948—4630100	15
Oil seal driver attachment (final drive)	07965—MB00100	15
Shaft puller	07931—ME40000	15
Attachment (ring gear bearing)	07947—6340100	15
Inner base	07965—3710300	15
Inspection adaptor (P1)	07508—0013600	18
*Tester Harness	07508—0014600	18
Pin driver, 4 mm	07944—SA00000	19

: The tools marked "" are new for this model.

COMMON

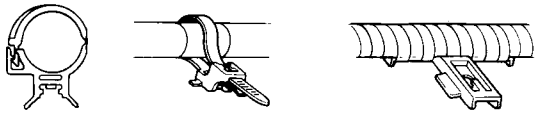
DESCRIPTION	TOOL NUMBER	REF. SECTION(S)
Oil pressure gauge	07506–3000000	2
Oil pressure gauge attachment	07510–4220100	2
Vacuum gauge	07404–0020000 or 07404–0030000	3
Vacuum gauge attachment (except SW model)	07510–3000100	3
Float level gauge	07401–0010000	4
Vacuum pump	equivalent commercially available	4, 14, 18
Pressure pump		4, 14
Valve spring compressor	07757–0010000	7
Valve guide remover, 5.5 mm	07742–0010100	7
Universal holder	07725–0030000	7, 17, 19
Valve seat cutter		7
–seat cutter, 33 mm (45° IN/EX)	07780–0010800	
–flat cutter, 30 mm (32° EX)	07780–0012200	
–flat cutter, 35 mm (32° IN)	07780–0012300	
–interior cutter, 30 mm (60° EX)	07780–0014000	
–interior cutter, 37.5 mm (60° IN)	07780–0014100	
–cutter holder, 5.5 mm	07781–0010101	
Extention bar	07716–0020500	2, 8, 9, 19
Driver	07749–0010000	8, 9, 13, 14, 15, 17, 19
Attachment, 32 x 35 mm	07746–0010100	8, 9
Pilot, 28 mm	07746–0041100	9
Inner driver B	07746–0020100	9
Attachment, 17 mm I.D.	07746–0020300	9
Attachment, 42 x 47 mm	07746–0010300	9, 13
Pilot, 22 mm	07746–0041000	9, 19
Attachment, 62 x 68 mm	07746–0010500	9, 15
Pilot, 30 mm	07746–0040700	9
Pilot, 17 mm	07746–0040400	9
Pilot, 12 mm	07746–0040200	9
Piston ring compressor	Equivalent commercially available	11
Bearing remover shaft	07746–0050100	13
Bearing remover head, 20 mm	07746–0050600	13
Pilot, 20 mm	07746–0040500	13, 17, 19
Lock nut wrench, 30 x 32 mm	07716–0020400	13
Attachment, 52 x 55 mm	07746–0010400	13, 15
Seal remover pump	Equivalent commercially available	14
Socket bit	07703–0020500	14
Attachment, 37 x 40 mm	07746–0010200	14, 19
Universal bearing puller	07631–0010000	15
Inner driver C	07746–0030100	15
Attachment, 25 mm I.D.	07746–0030200	15
Inner driver C	07746–0030100	17
Attachment, 30 mm I.D.	07746–0030300	17
Bearing puller	Equivalent commercially available	17
Soldering iron	Equivalent commercially available	17
Digital multimeter	07411–0020000	4, 5, 14, 17, 18, 19, 20, 21, 22
Circuit tester (SANWA)	07308–0020001	
or circuit tester (KOWA)	TH-5H	
Battery charger	equivalent commercially available	17
Battery tester		17
Attachment, 35 mm I.D.	07746–0030400	19
Torx bit	07703–0010200	19
Flywheel holder	07725–0040000	19
Attachment, 20 mm I.D.	07746–0020400	19
Attachment, 24 x 26 mm	07746–0010700	19

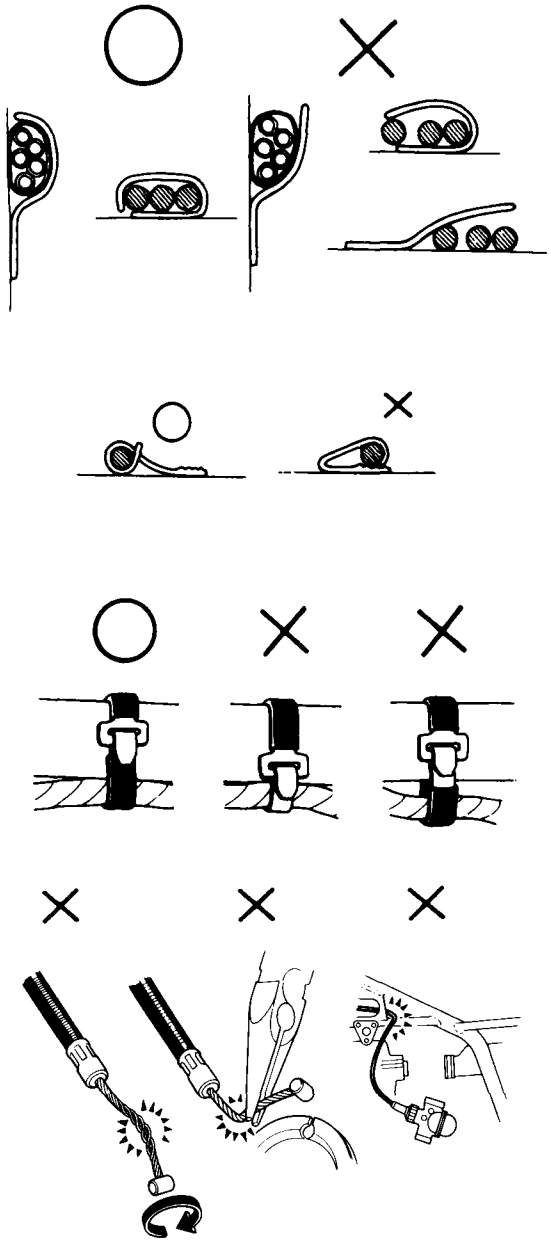
CABLE & HARNESS ROUTING

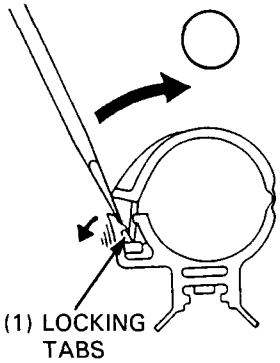
Note the following when routing cables and wire harnesses:

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

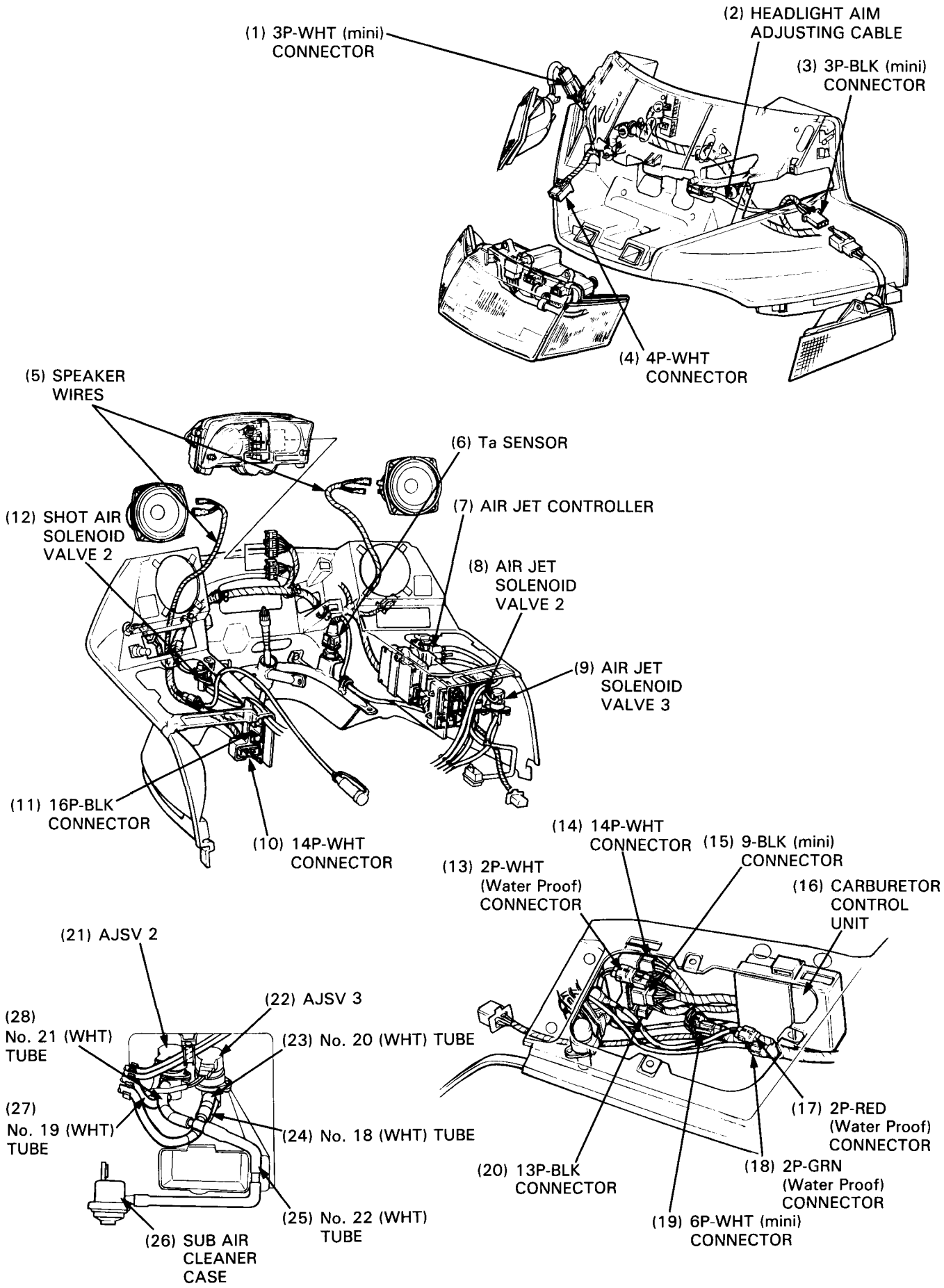
  T-stud clips used on this model:

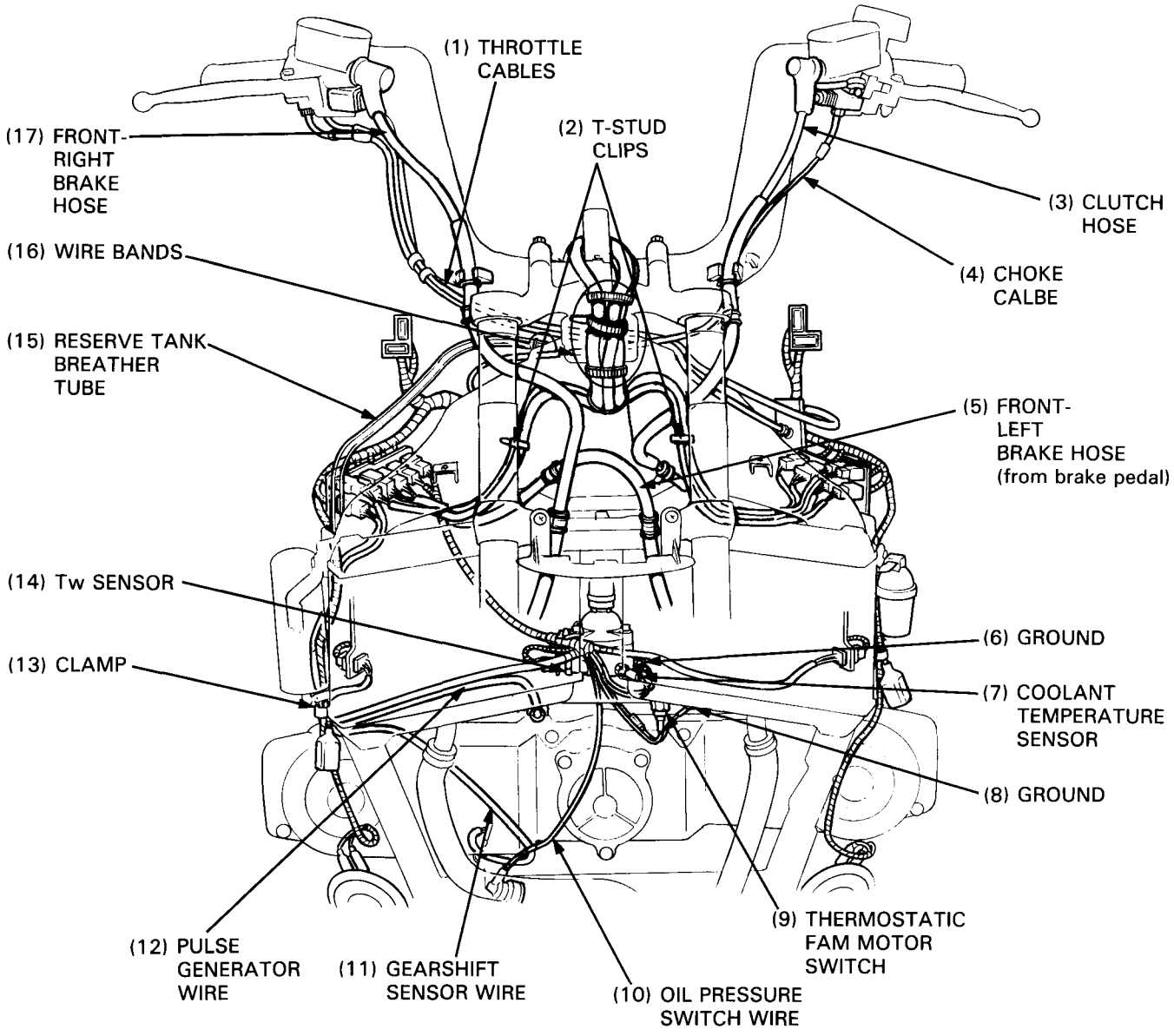


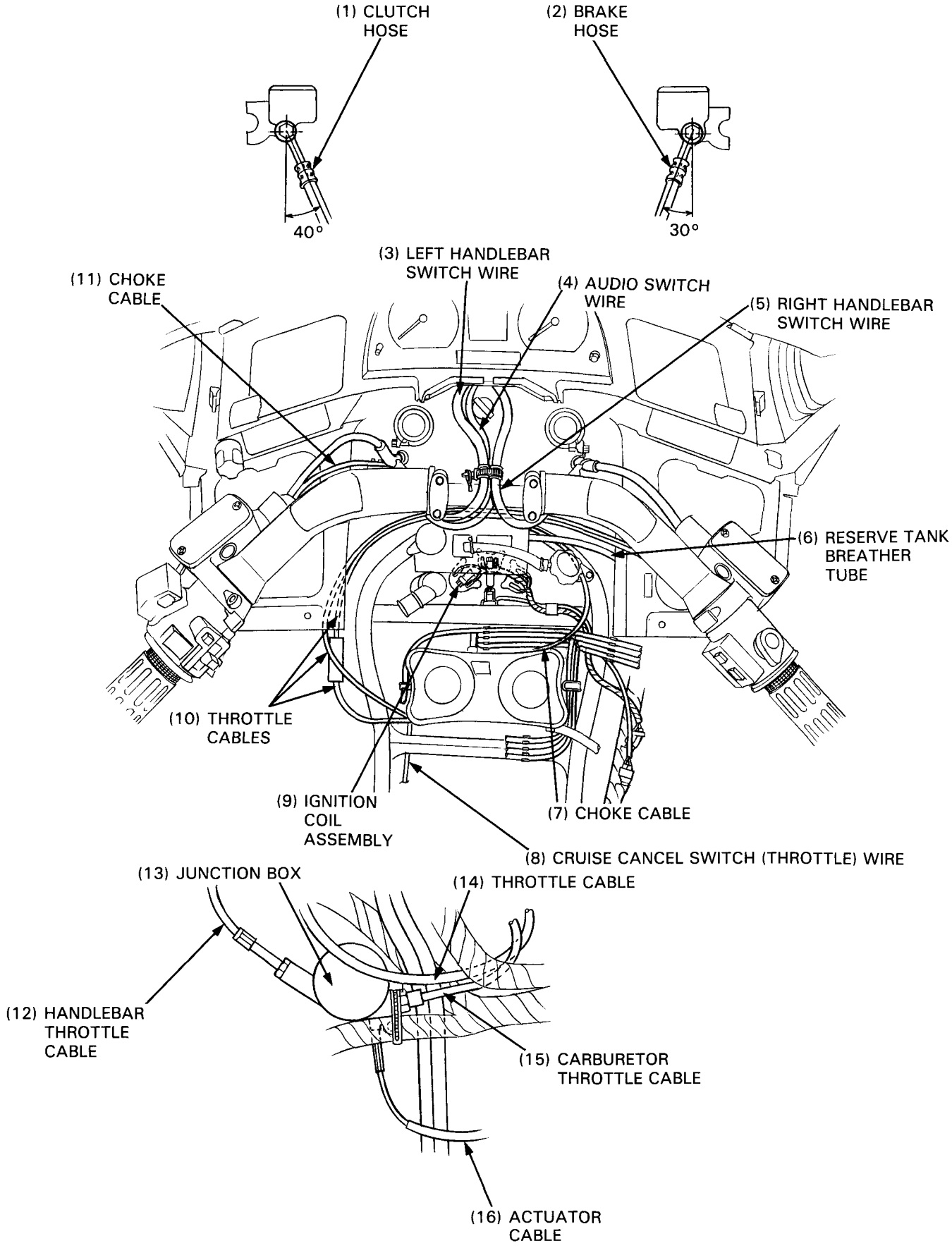


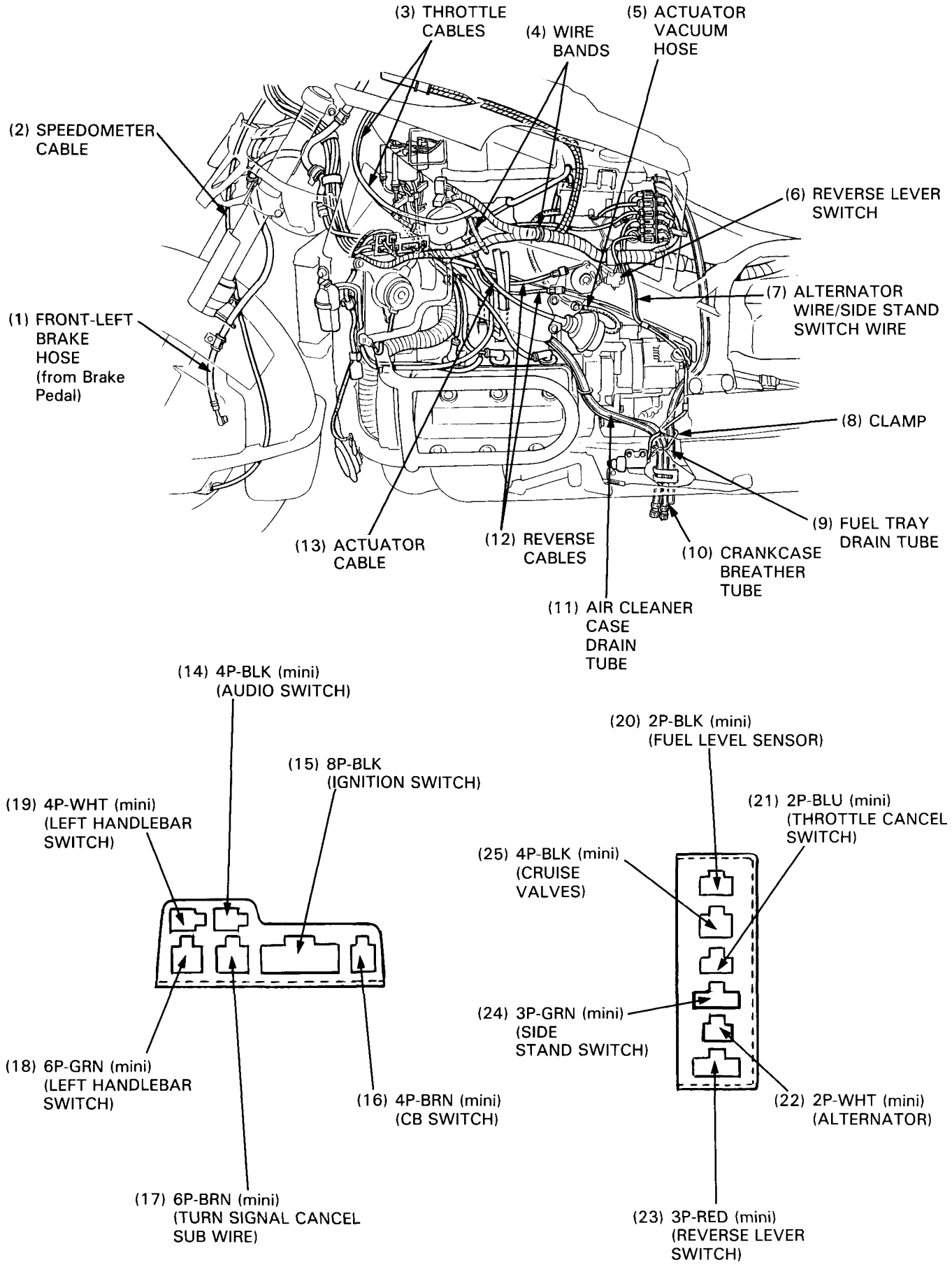


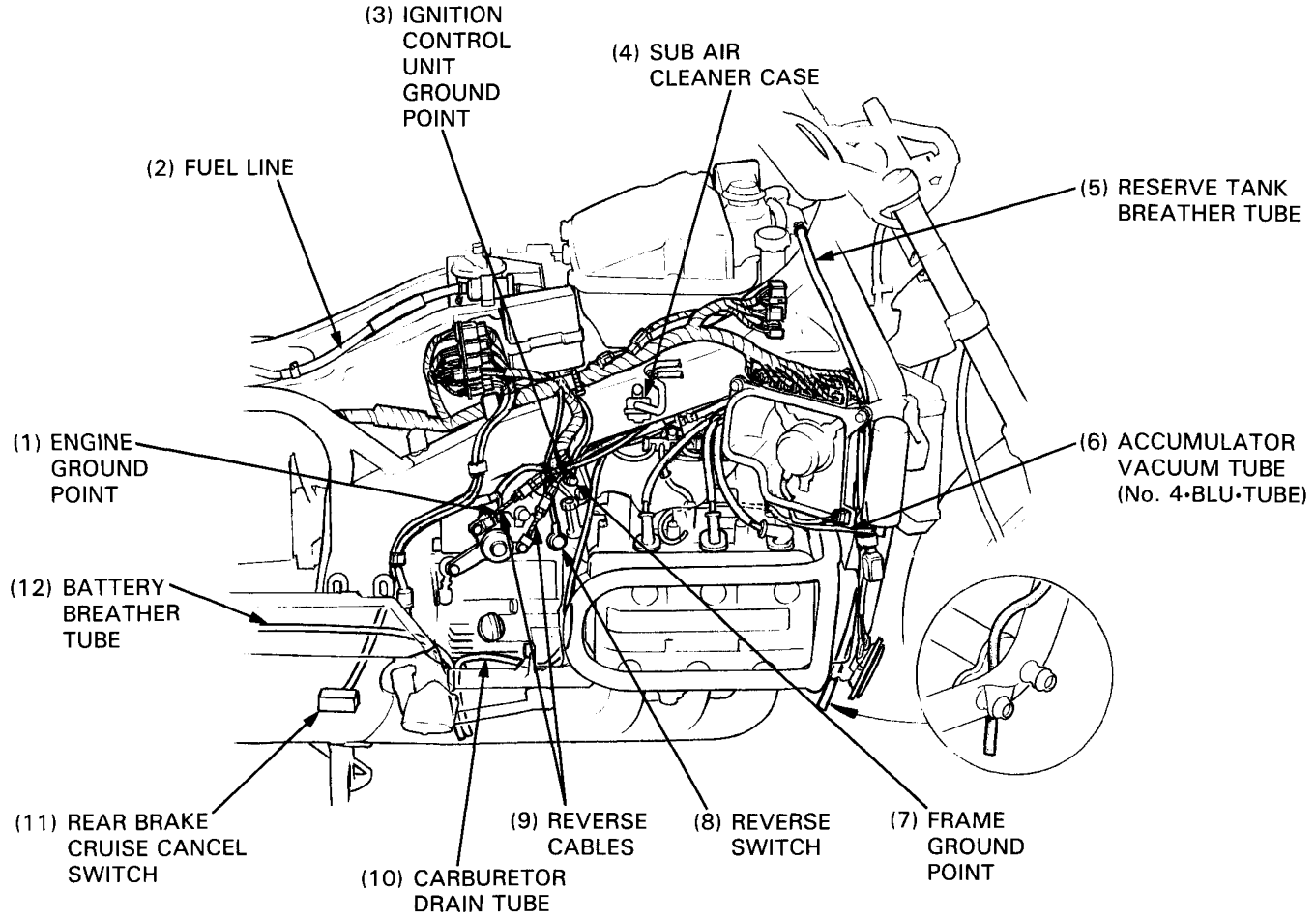
O: CORRECT
X: INCORRECT

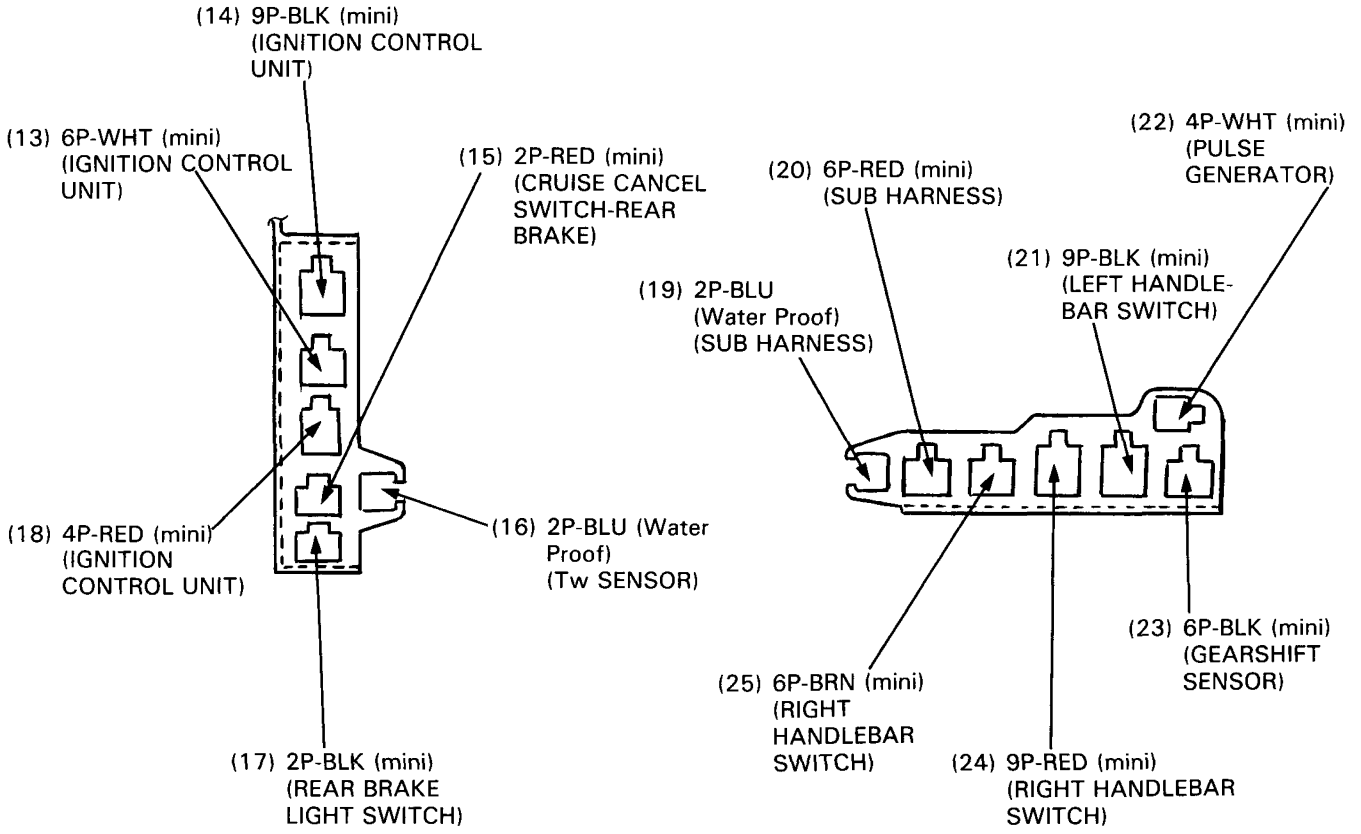

(1) 3P-WHT (mini) CONNECTOR
(2) HEADLIGHT AIM ADJUSTING CABLE
(3) 3P-BLK (mini) CONNECTOR
(4) 4P-WHT CONNECTOR
(5) SPEAKER WIRES
(6) Ta SENSOR
(7) AIR JET CONTROLLER
(8) AIR JET SOLENOID VALVE 2
(9) AIR JET SOLENOID VALVE 3
(10) 14P-WHT CONNECTOR
(11) 16P-BLK CONNECTOR
(12) SHOT AIR SOLENOID VALVE 2
(13) 2P-WHT (Water Proof) CONNECTOR
(14) 14P-WHT CONNECTOR
(15) 9-BLK (mini) CONNECTOR
(16) CARBURETOR CONTROL UNIT
(17) 2P-RED (Water Proof) CONNECTOR
(18) 2P-GRN (Water Proof) CONNECTOR
(19) 6P-WHT (mini) CONNECTOR
(20) 13P-BLK CONNECTOR
(21) AJSV 2
(22) AJSV 3
(23) No. 20 (WHT) TUBE
(24) No. 18 (WHT) TUBE
(25) No. 22 (WHT) TUBE
(26) SUB AIR CLEANER CASE
(27) No. 19 (WHT) TUBE
(28) No. 21 (WHT) TUBE

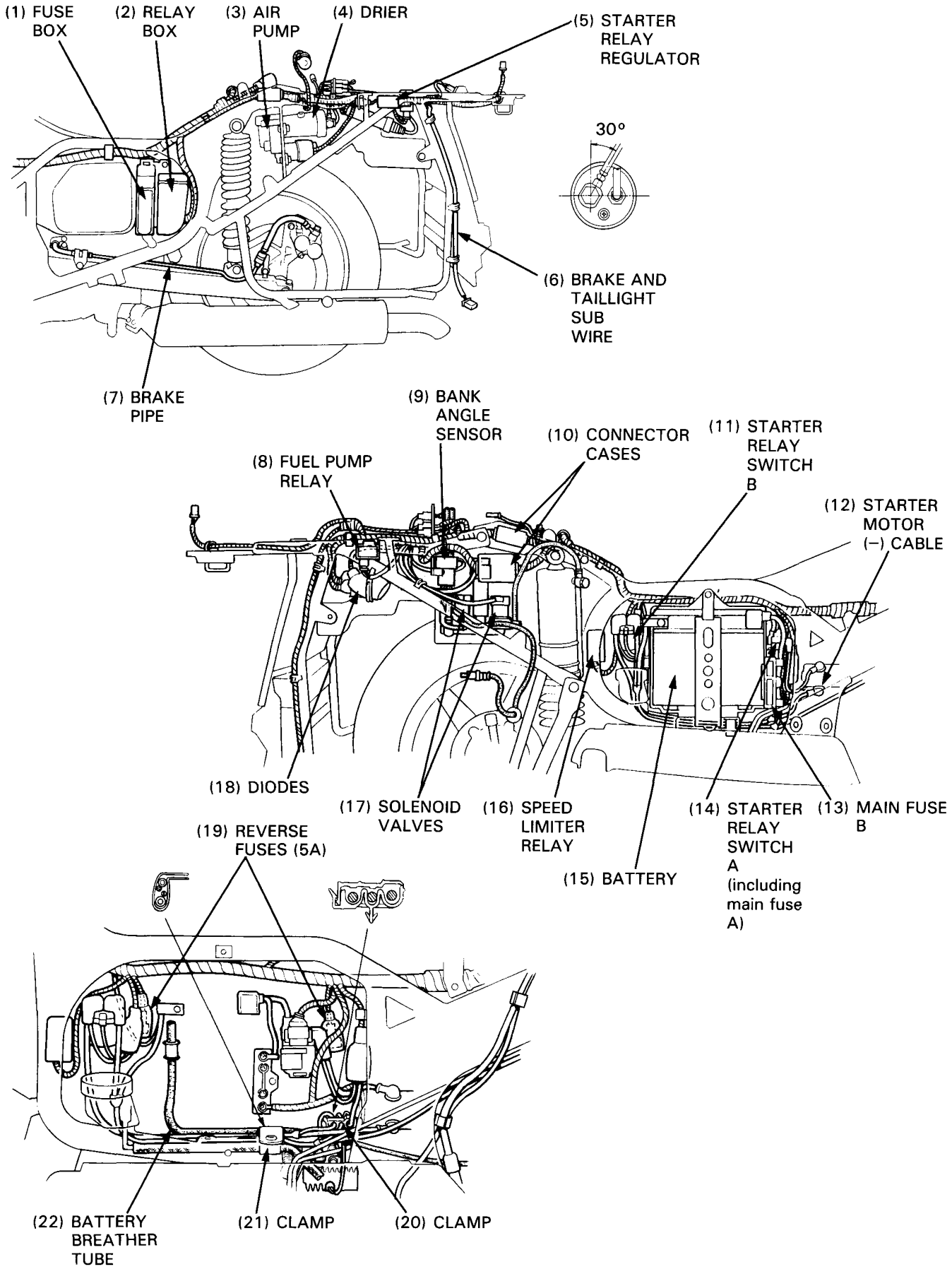

(1) THROTTLE CABLES
(2) T-STUD CLIPS
(3) CLUTCH HOSE
(4) CHOKE CALBE
(5) FRONT-LEFT BRAKE HOSE (from brake pedal)
(6) GROUND
(7) COOLANT TEMPERATURE SENSOR
(8) GROUND
(9) THERMOSTATIC FAM MOTOR SWITCH
(10) OIL PRESSURE SWITCH WIRE
(11) GEARSHIFT SENSOR WIRE
(12) PULSE GENERATOR WIRE
(13) CLAMP
(14) Tw SENSOR
(15) RESERVE TANK BREATHER TUBE
(16) WIRE BANDS
(17) FRONT-RIGHT BRAKE HOSE

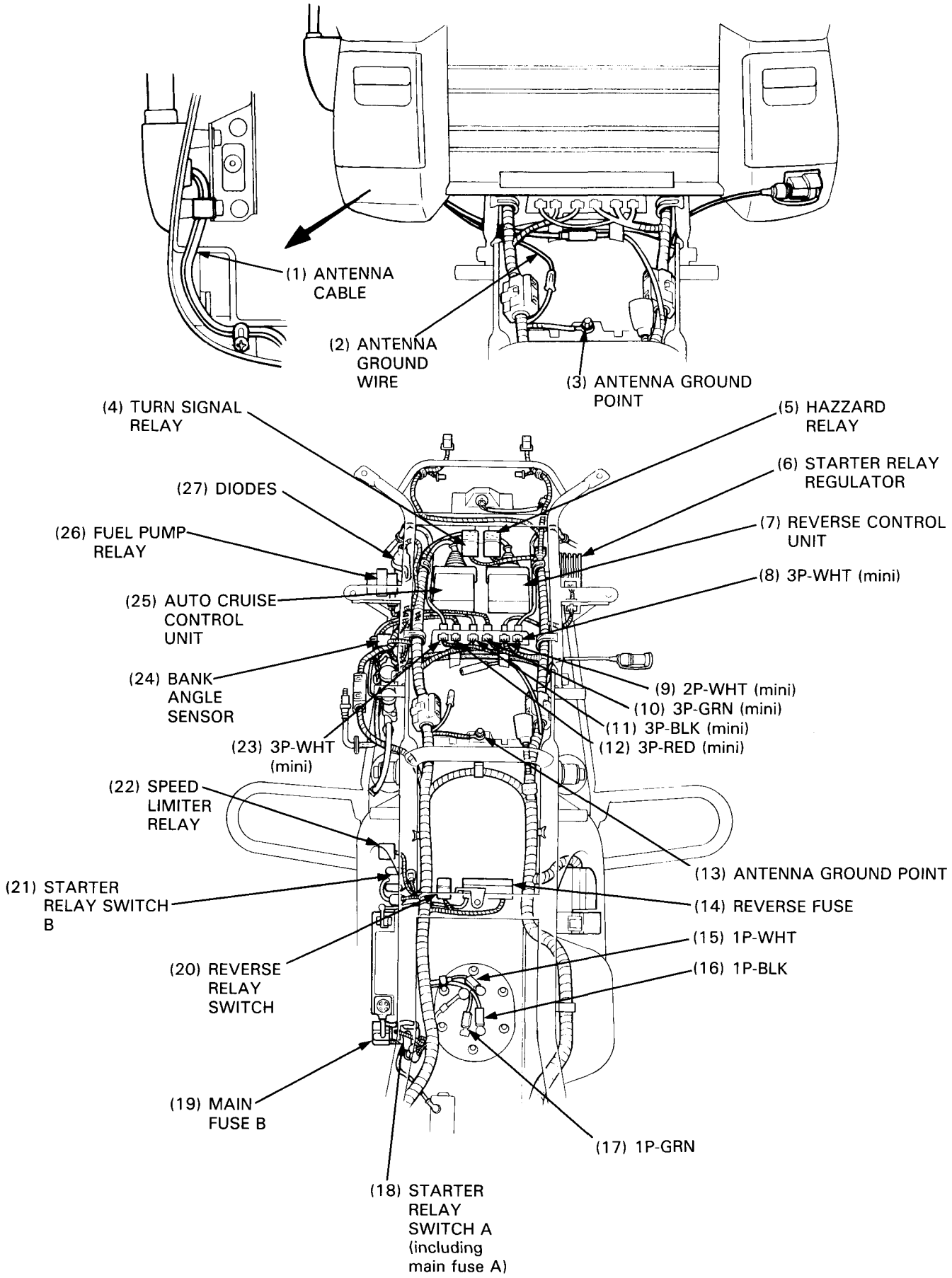

(1) CLUTCH HOSE
(2) BRAKE HOSE
40°
30°
(3) LEFT HANDLEBAR SWITCH WIRE
(4) AUDIO SWITCH WIRE
(5) RIGHT HANDLEBAR SWITCH WIRE
(11) CHOKE CABLE
(6) RESERVE TANK BREATHER TUBE
(10) THROTTLE CABLES
(9) IGNITION COIL ASSEMBLY
(7) CHOKE CABLE
(8) CRUISE CANCEL SWITCH (THROTTLE) WIRE
(13) JUNCTION BOX
(14) THROTTLE CABLE
(12) HANDLEBAR THROTTLE CABLE
(15) CARBURETOR THROTTLE CABLE
(16) ACTUATOR CABLE


(3) THROTTLE CABLES
(4) WIRE BANDS
(5) ACTUATOR VACUUM HOSE
(2) SPEEDOMETER CABLE
(6) REVERSE LEVER SWITCH
(7) ALTERNATOR WIRE/SIDE STAND SWITCH WIRE
(1) FRONT-LEFT BRAKE HOSE (from Brake Pedal)
(8) CLAMP
(9) FUEL TRAY DRAIN TUBE
(13) ACTUATOR CABLE
(12) REVERSE CABLES
(10) CRANKCASE BREATHER TUBE
(11) AIR CLEANER CASE DRAIN TUBE
(14) 4P-BLK (mini) (AUDIO SWITCH)
(20) 2P-BLK (mini) (FUEL LEVEL SENSOR)
(15) 8P-BLK (IGNITION SWITCH)
(19) 4P-WHT (mini) (LEFT HANDLEBAR SWITCH)
(21) 2P-BLU (mini) (THROTTLE CANCEL SWITCH)
(25) 4P-BLK (mini) (CRUISE VALVES)
(24) 3P-GRN (mini) (SIDE STAND SWITCH)
(18) 6P-GRN (mini) (LEFT HANDLEBAR SWITCH)
(16) 4P-BRN (mini) (CB SWITCH)
(22) 2P-WHT (mini) (ALTERNATOR)
(17) 6P-BRN (mini) (TURN SIGNAL CANCEL SUB WIRE)
(23) 3P-RED (mini) (REVERSE LEVER SWITCH)


(3) IGNITION CONTROL UNIT GROUND POINT
(4) SUB AIR CLEANER CASE
(2) FUEL LINE
(5) RESERVE TANK BREATHER TUBE
(1) ENGINE GROUND POINT
(6) ACCUMULATOR VACUUM TUBE (No. 4•BLU•TUBE)
(12) BATTERY BREATHER TUBE
(11) REAR BRAKE CRUISE CANCEL SWITCH
(9) REVERSE CABLES
(8) REVERSE SWITCH
(7) FRAME GROUND POINT
(10) CARBURETOR DRAIN TUBE


(14) 9P-BLK (mini) (IGNITION CONTROL UNIT)
(13) 6P-WHT (mini) (IGNITION CONTROL UNIT)
(15) 2P-RED (mini) (CRUISE CANCEL SWITCH-REAR BRAKE)
(18) 4P-RED (mini) (IGNITION CONTROL UNIT)
(16) 2P-BLU (Water Proof) (Tw SENSOR)
(17) 2P-BLK (mini) (REAR BRAKE LIGHT SWITCH)
(22) 4P-WHT (mini) (PULSE GENERATOR)
(20) 6P-RED (mini) (SUB HARNESS)
(21) 9P-BLK (mini) (LEFT HANDLE-BAR SWITCH)
(19) 2P-BLU (Water Proof) (SUB HARNESS)
(23) 6P-BLK (mini) (GEARSHIFT SENSOR)
(25) 6P-BRN (mini) (RIGHT HANDLEBAR SWITCH)
(24) 9P-RED (mini) (RIGHT HANDLEBAR SWITCH)


(1) FUSE BOX
(2) RELAY BOX
(3) AIR PUMP
(4) DRIER
(5) STARTER RELAY REGULATOR
30°
(6) BRAKE AND TAILLIGHT SUB WIRE
(7) BRAKE PIPE
(8) FUEL PUMP RELAY
(9) BANK ANGLE SENSOR
(10) CONNECTOR CASES
(11) STARTER RELAY SWITCH B
(12) STARTER MOTOR (–) CABLE
(13) MAIN FUSE B
(14) STARTER RELAY SWITCH A (including main fuse A)
(15) BATTERY
(16) SPEED LIMITER RELAY
(17) SOLENOID VALVES
(18) DIODES
(19) REVERSE FUSES (5A)
(20) CLAMP
(21) CLAMP
(22) BATTERY BREATHER TUBE


(1) ANTENNA CABLE
(2) ANTENNA GROUND WIRE
(3) ANTENNA GROUND POINT
(4) TURN SIGNAL RELAY
(5) HAZZARD RELAY
(6) STARTER RELAY REGULATOR
(7) REVERSE CONTROL UNIT
(8) 3P-WHT (mini)
(9) 2P-WHT (mini)
(10) 3P-GRN (mini)
(11) 3P-BLK (mini)
(12) 3P-RED (mini)
(13) ANTENNA GROUND POINT
(14) REVERSE FUSE
(15) 1P-WHT
(16) 1P-BLK
(17) 1P-GRN
(18) STARTER RELAY SWITCH A (including main fuse A)
(19) MAIN FUSE B
(20) REVERSE RELAY SWITCH
(21) STARTER RELAY SWITCH B
(22) SPEED LIMITER RELAY
(23) 3P-WHT (mini)
(24) BANK ANGLE SENSOR
(25) AUTO CRUISE CONTROL UNIT
(26) FUEL PUMP RELAY
(27) DIODES

EMISSION CONTROL SYSTEMS

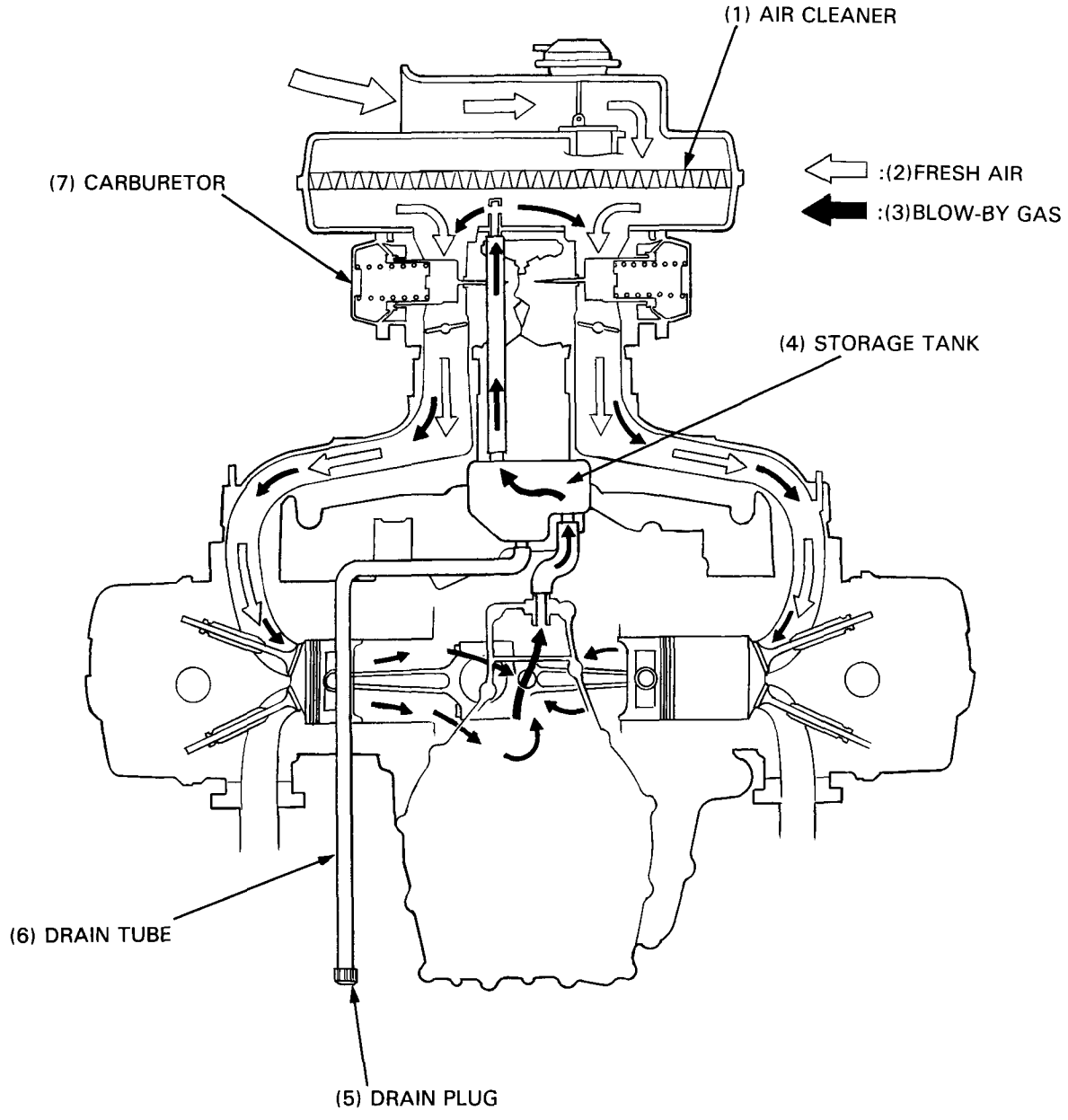
SOURCE OF EMISSIONS

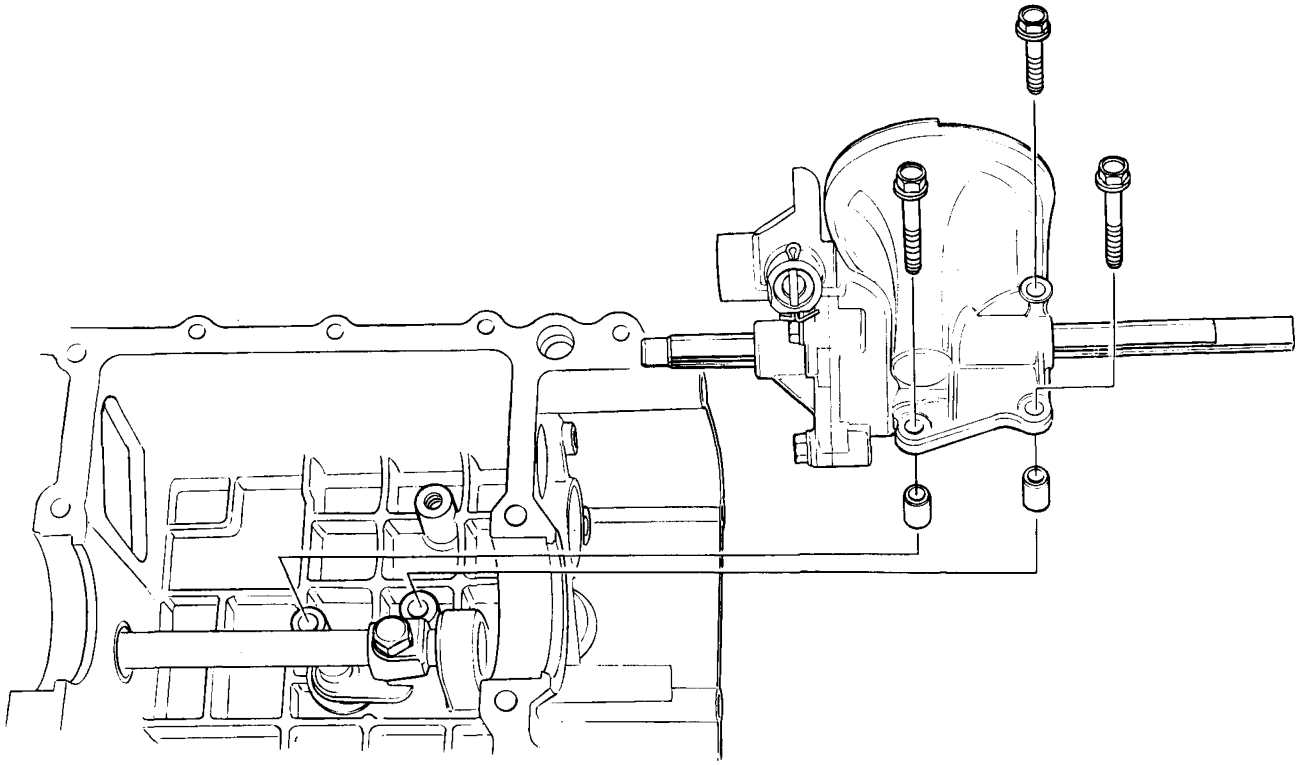
The combustion process produces carbon monoxide and hydrocarbons. Control of hydrocarbons is very important because, under certain conditions, they react to form photochemical smog when subjected to sunlight. Carbon monoxide does not react in the same way, but it is toxic.

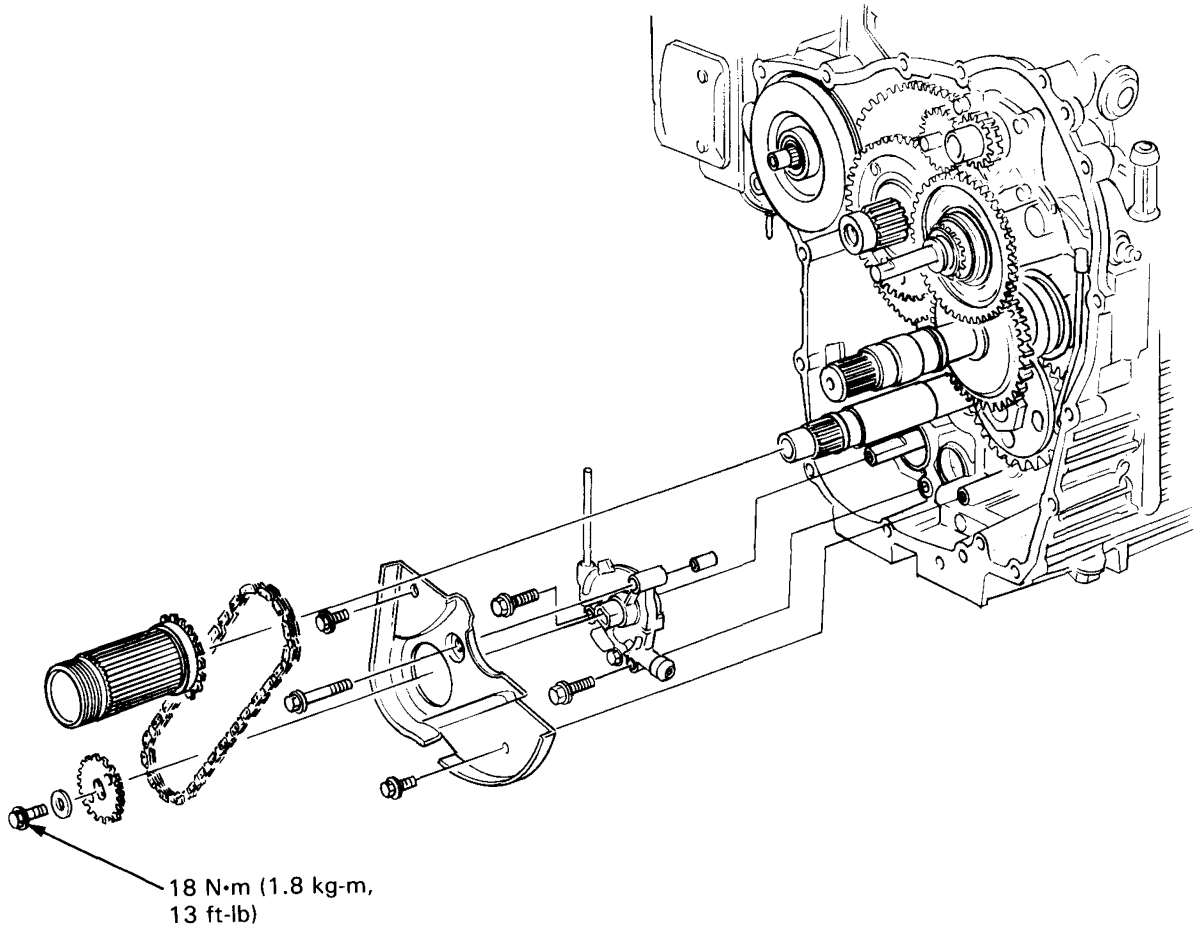
Honda Motor Co., Ltd. utilizes lean carburetor settings as well as other systems, to reduce carbon monoxide and hydrocarbons.

CRANKCASE EMISSION CONTROL SYSTEM

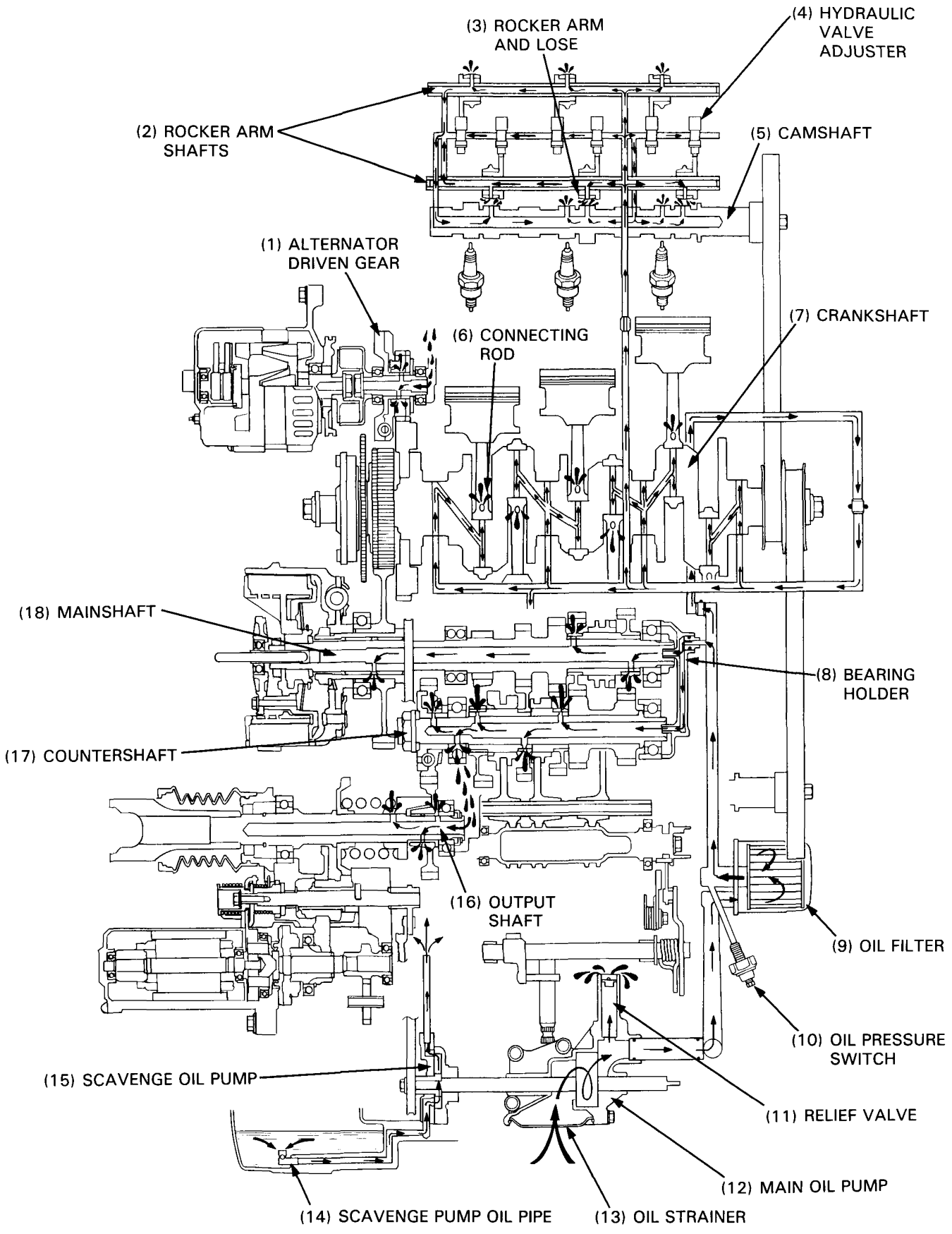
The engine is equipped with a crankcase emission control system which routes crankcase emissions through the air cleaner and into the combustion chamber. Condensed crankcase vapors are accumulated in a storage tank which must be emptied periodically. See the Maintenance Schedule in Section 3.






18 N·m (1.8 kg-m,
13 ft-lb)

LUBRICATION DIAGRAM



SERVICE INFORMATION

GENERAL

- The lubrication system uses two oil pumps; main and scavenging. The main pump sucks up oil from the crankcase and delivers it under pressure to the bearings and other important parts of the engine. It is equipped with a pressure relief valve.
- For oil pressure switch inspection, see page 22-19.
- The scavenging pump draws oil from the clutch housing in the rear engine cover and sends it to the primary drive and driven gears to lubricate and cool them.
- To remove the main oil pump and scavenge pump, perform the following:

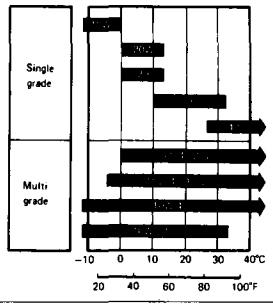
Main oil pump
- Engine removal (section 6)
- Crankcase separation (section 10)

Scavenge pump
- Engine removal (section 6)
- Clutch removal (section 8)
- Rear engine cover removal (section 9)
- Primary driven gear removal (section 9)

SPECIFICATIONS

Engine

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Oil capacity	at engine assembly		4.3 lit (4.5 US qt, 3.8 Imp qt)	—
	at oil change		3.5 lit (3.7 US qt, 3.1 Imp qt)	—
	at oil filter and oil		3.7 lit (3.9 US qt, 3.3 Imp qt)	—
Oil recommendation			HONDA 4-stroke oil or equivalent. API service classification SE or SF. The viscosities shown in the chart may be used when the average temperature in your riding area is within the indicated range.	
Oil pressure (at oil pressure switch)	Cold (At 35°C/95°F)	Idle speed	130 kPa (1.3 kg/cm², 18 psi)	—
		5,000 min⁻¹ (rpm)	500 kPa (5.0 kg/cm², 71 psi)	—
	Hot (At 80°C/176°F)	Idle speed	80 kPa (0.8 kg/cm², 11 psi)	—
		5,000 min⁻¹ (rpm)	500 kPa (5.0 kg/cm², 71 psi)	—
Oil pump	Tip clearance	Main pump	0.15 (0.006) max.	0.35 (0.014)
		Scavenge pump	0.15 (0.006) max.	0.35 (0.014)
	Body clearance	Main pump	0.15—0.23 (0.006—0.009)	0.43 (0.017)
		Scavenge pump	0.15—0.22 (0.006—0.009)	0.42 (0.017)
	Side clearance	Main pump	0.02—0.07 (0.001—0.003)	0.12 (0.005)
		Scavenge pump	0.02—0.07 (0.001—0.003)	0.12 (0.005)
Relief valve spring free length			90.8 (3.57)	84.0 (3.31)

Final drive gear

Oil capacity	170 cm³ (5.7 US oz, 6.0 Imp oz) at assembly 140 cm³ (4.7 US oz, 4.9 Imp oz) after draining
Recommended oil	Hypoid gear oil: SAE #80

TORQUE VALUES

Oil pressure switch	12 N·m (1.2 kg-m, 9 ft-lb) —Apply sealant.
Engine oil drain bolt	38 N·m (3.8 kg-m, 27 ft-lb)
Engine oil filter cartrige	10 N·m (1.0 kg-m, 7 ft-lb)
Oil pump driven sprocket bolt	18 N·m (1.8 kg-m, 13 ft-lb) —Apply locking agent.
Final drive gear case filler cap	12 N·m (1.2 kg-m, 9 ft-lb)

TOOLS

Special

Oil filter wrench	07HAA—PJ70100
Clutch outer holder	07JMB—MN50100

Common

Oil pressure gauge	07506—3000000
Oil pressure gauge attachment	07510—4220100
Extension bar	07716—0020000

TROUBLESHOOTING

Oil level too low
- Oil level not replenished frequently enough
- External oil leaks
- Oil-up
  - worn piston rings
  - improperly installed piston rings
  - worn cylinder
- Oil-down
  - worn stem seal
  - worn valve guide

Oil level too high
- Pressure relief valve stuck closed
- Clogged oil filter, gallery, or metering orifice
- Incorrect oil being used

Low oil pressure
- Oil level low
- Plugged oil filter or screen
- Pressure relief valve stuck open
- Oil pump faulty
- Internal oil leakage
- Incorrect oil being used

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

Oil emulsification
- Entry of radiator coolant
  - blown cylinder head gasket
  - leaky core plug
  - leaky coolant passage
- Entry of water

No oil pressure
- Oil level too low; no oil
- Broken oil pump drive chain
- Broken oil pump drive shaft
- Internal leaks
- Faulty oil pump

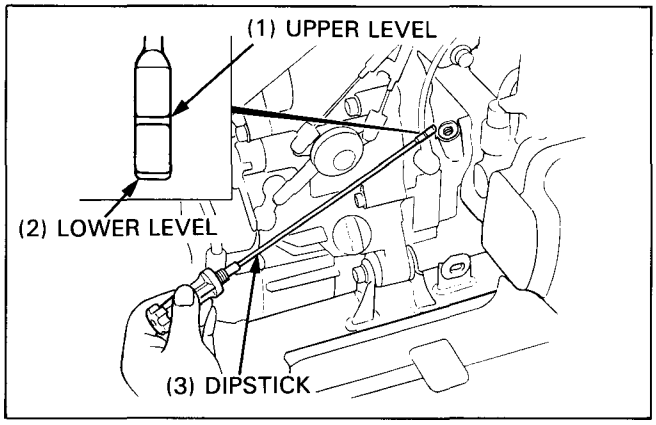
ENGINE OIL LEVEL

Start the engine and let it idle for a few minutes.
Stop the engine and put the motorcycle on it center stand on level ground.
Remove the dipstick, wipe it clean, and insert the dipstick without screwing it in.

Make sure the oil level is at the upper level mark of the dipstick. If required, add the recommended oil up to the upper level mark by removing the oil filler cap.

Reinstall the dipstick and oil filler cap, and check that there are no oil leaks.

Check the oil pressure with the oil pressure indicator light after the engine starts.
The light should go off after one or two seconds.



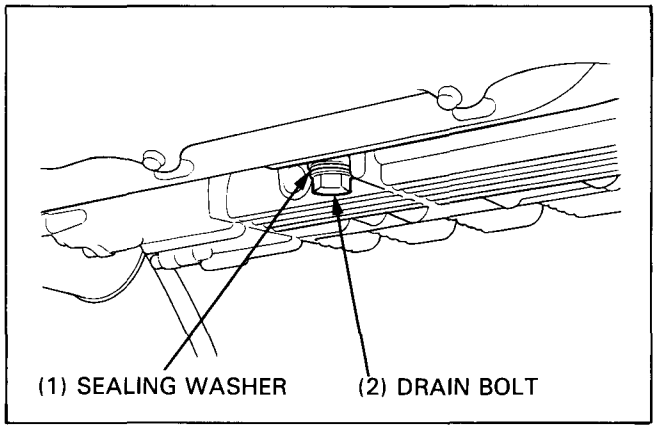
ENGINE OIL & FILTER CHANGE

NOTE

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

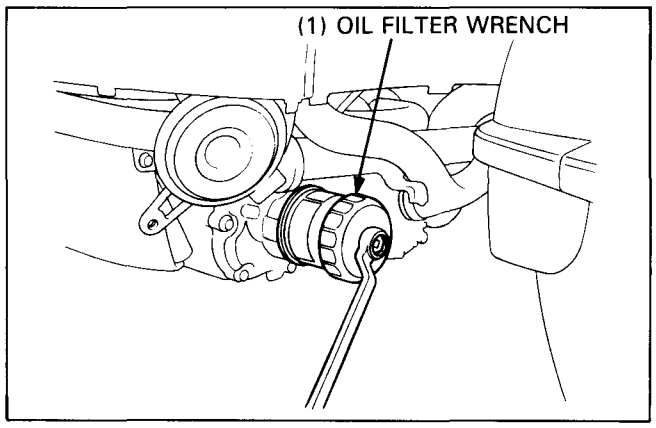
Stop the engine.

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



Remove the under cover (page 12-8).
Remove the oil filter with a filter wrench and let the remaining oil drain out. Discard the oil filter.

TOOL:
Oil filter wrench **07HAA—PJ70100**



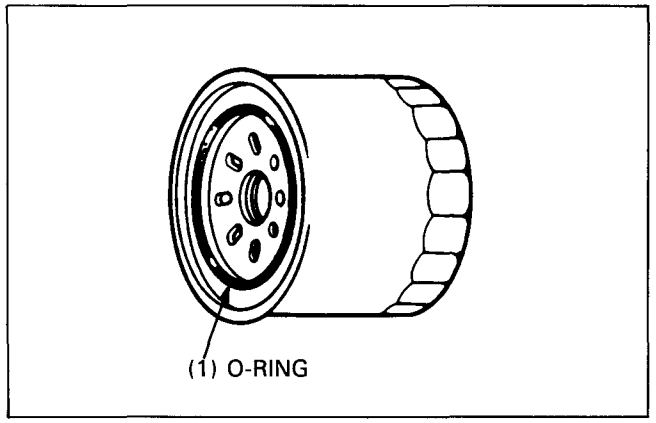
Check that the sealing washer on the drain bolt is in good condition and install the bolt.

TORQUE: 38 N·m (3.8 kg-m, 27 ft-lb)

Replace the oil filter with a new one.
Check that the oil filter O-ring is in good condition, and coat it with oil before installation.
Install and tighten the oil filter.

TORQUE: 10 N·m (1.0 kg-m, 7 ft-lb)

Fill the crankcase with the specified quantity of the recommended oil (page 2-2). Reinstall the oil filler cap and dipstick.
Start the engine and let it idle for few minutes, then stop the engine.
Make sure that the oil level is at the upper level mark on the dipstick.
Make sure that there are no oil leaks.

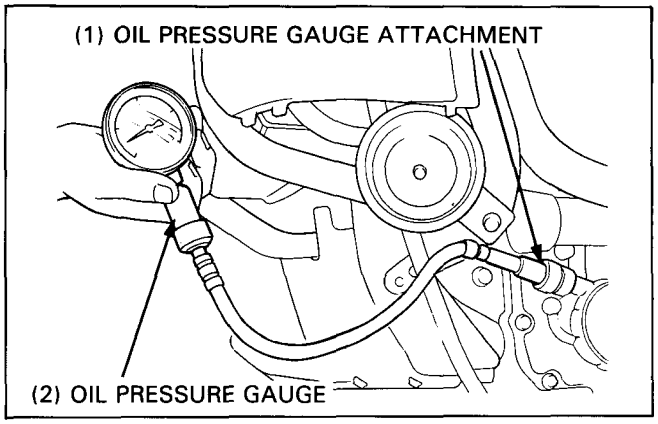


OIL PRESSURE CHECK

Remove the under cover (page 12-8).
Disconnect the oil pressure switch wire.
Remove the oil pressure switch and attach an oil pressure gauge to the pressure switch hole.

TOOLS:

Oil pressure gauge	**07506–3000000**
Oil pressure gauge attachment	**07510–4220100**

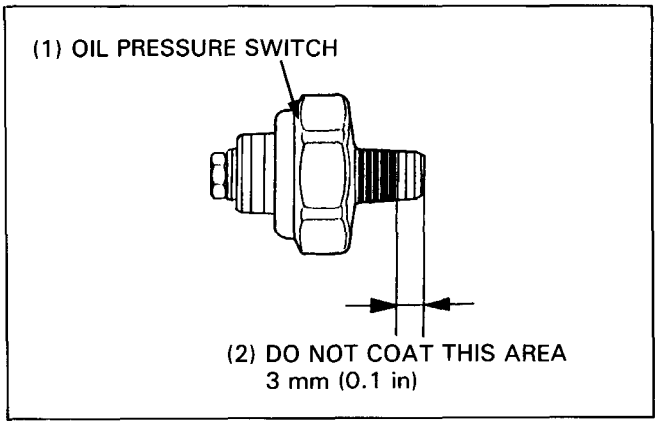


Start the engine and check the oil pressure.

OIL PRESSURE CHART:

Oil pressure kPa (kg/cm², psi)	Idle speed	5,000 min⁻¹ (rpm)
Cold (At 35°C/95°F)	130 (1.3, 18)	500 (5.0, 71)
Hot (At 80°C/176°F)	80 (0.8, 11)	500 (5.0, 71)

Stop the engine.
Apply sealant to the pressure switch as shown and install it.



TORQUE: 12 N·m (1.2 kg-m, 9 ft-lb)

CAUTION

- *To prevent damage to the engine cover threads, do not overtighten the switch.*

Connect the switch wire, and install the rubber cover.

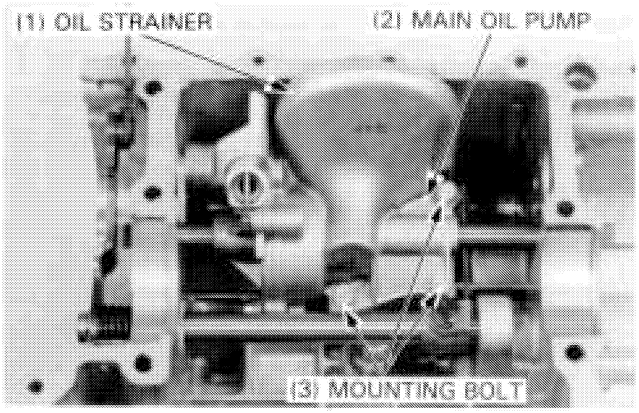
Check the oil pressure indicator light goes out after few seconds when turning the ignition switch ON.

OIL STRAINER & MAIN OIL PUMP

REMOVAL

To remove the main oil pump, perform the following:
– engine removal (section 6)
– crankcase separation (section 10)

Remove the main pump mounting bolts and two dowel pins from the left crankcase.

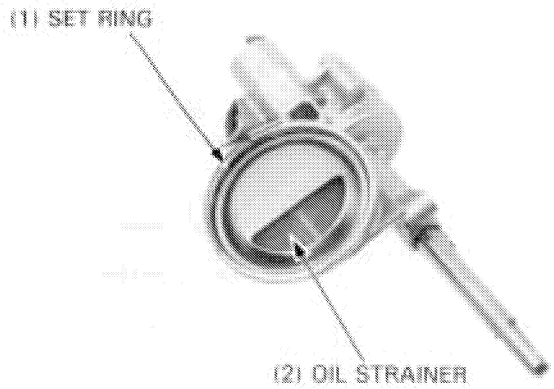


OIL STRAINER CLEANING

Remove the set ring and oil strainer.

Clean the oil strainer with the non-flammable solvent.

Install the oil strainer and set ring to the body securely.



RELIEF VALVE CHECK

Remove the cotter pin, valve seat, spring and relief valve from the pump body.

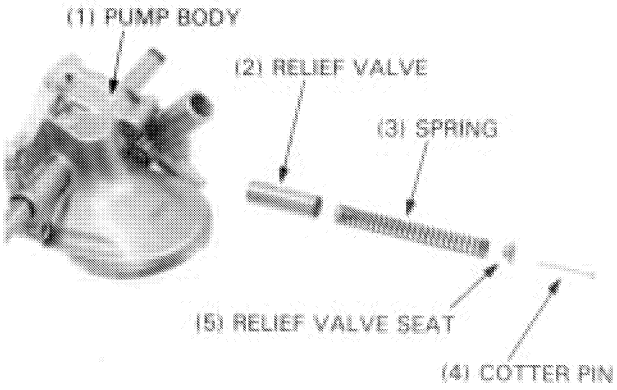
Check the valve for clogging or damage.
Measure the relief valve spring free length.

SERVICE LIMIT: 84.0 mm (3.31 in)

Assemble the relief valve in the reverse order of disassembly.
Use a new cotter pin.

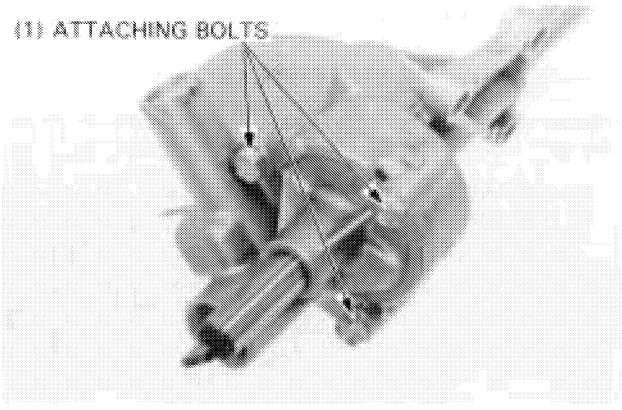
NOTE

- Position the cotter pin as shown.



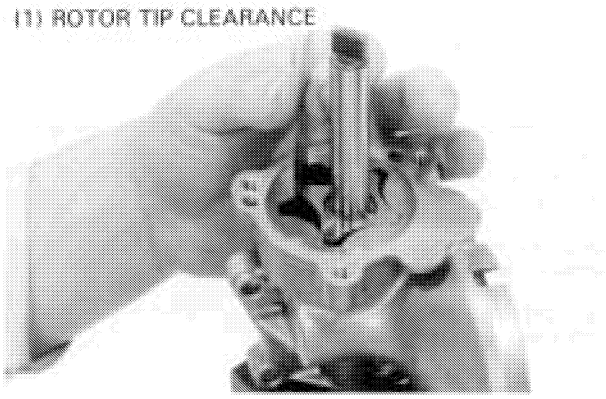
MAIN OIL PUMP DISASSEMBLY

Remove the pump cover from the body by removing the attaching bolts.
Disassemble them and clean all parts thoroughly with clean engine oil.



Measure the rotor tip clearance as shown.

SERVICE LIMIT: 0.35 mm (0.014 in)

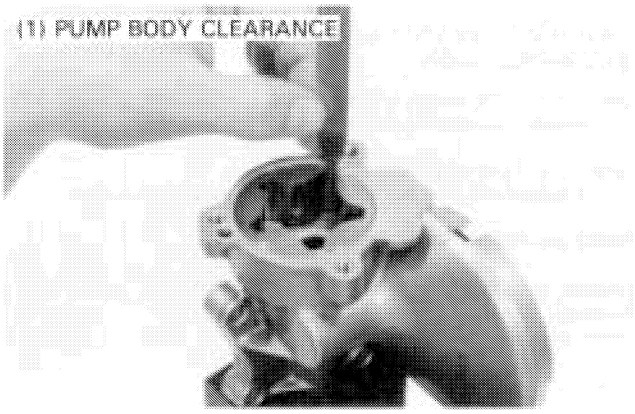


Remove the rotor shaft, spacer and drive pin.
Measure the side clearance.

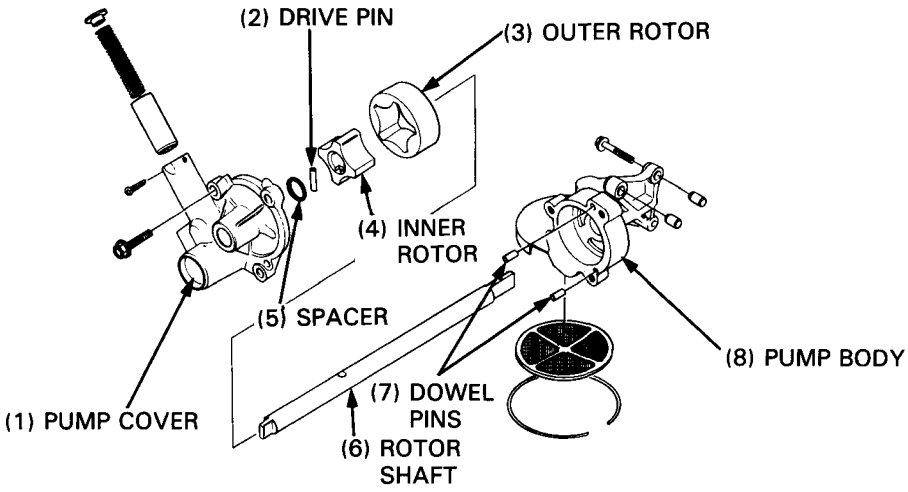
SERVICE LIMIT: 0.12 mm (0.005 in)

Measure the pump body clearance.

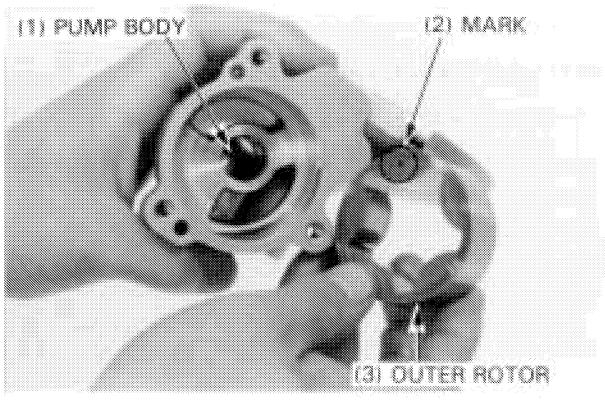
SERVICE LIMIT: 0.43 mm (0.017 in)



ASSEMBLY



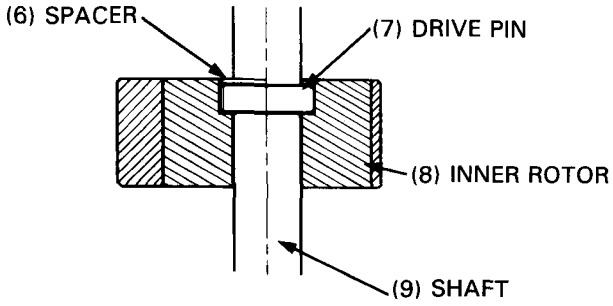
Clean all removed parts thoroughly, then dip them in clean engine oil before reassembly.
Install the outer rotor into the pump body with its punch mark facing toward the body.

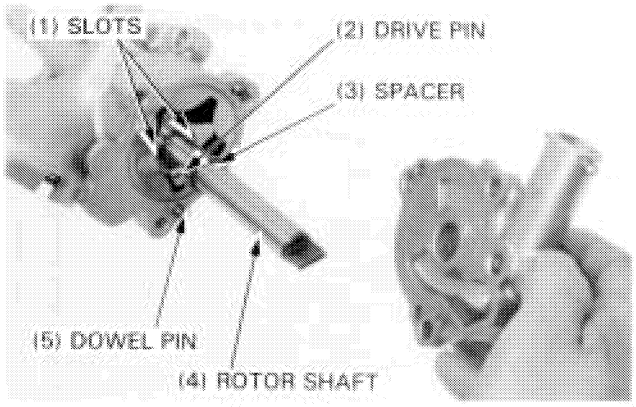


Install the inner rotor.
Insert the drive pin to the rotor shaft.
Align the slots in the inner rotor with the drive pin.
Place the spacer into the inner rotor groove.
Install the dowel pins and pump body.

NOTE

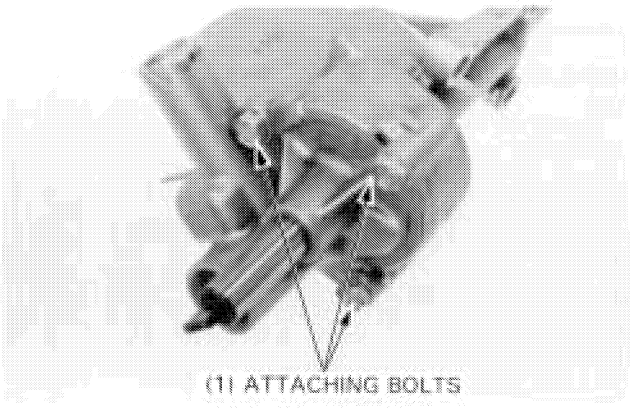
- The shaft, spacer, drive pin and inner rotor are assembled as shown.





Tighten the pump cover attaching bolts.

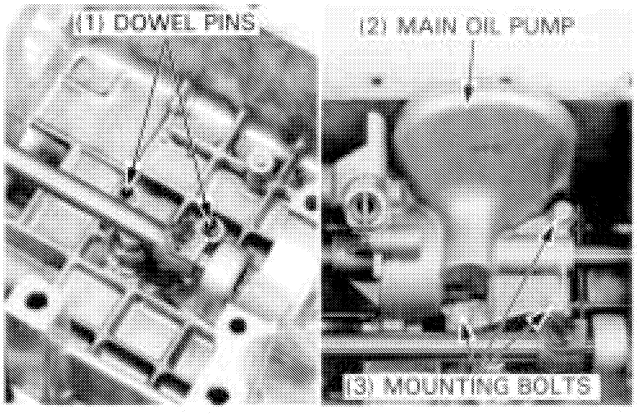
Make sure the rotor shaft is rotating smoothly.



INSTALLATION

Install the dowel pins onto the left crankcase.
Install the main oil pump and tighten the mounting bolts.

Install the removed parts in the reverse order of removal.
Assemble the crankcase (section 10).
Install the engine in the frame (section 6).

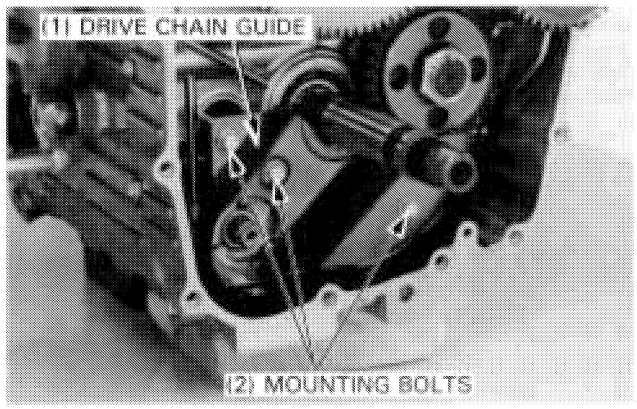


SCAVENGE PUMP

REMOVAL

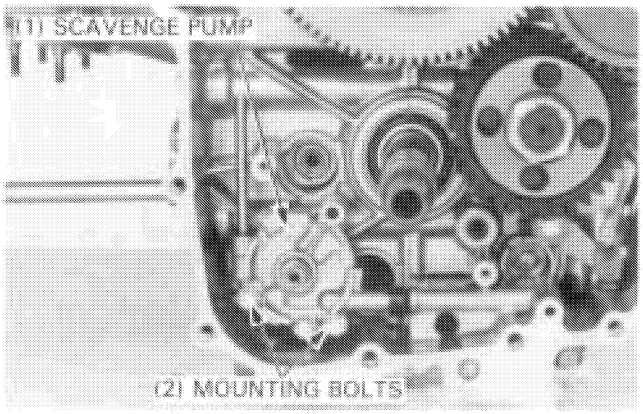
To remove the scavenge pump, perform the following;
– engine removal (section 6).
– clutch removal (section 8).
– rear engine cover removal (section 9).
– primary driven gear removal (section 9).

Remove the drive chain guide by three mounting bolts.



Remove the scavenge pump by removing two mounting bolts.

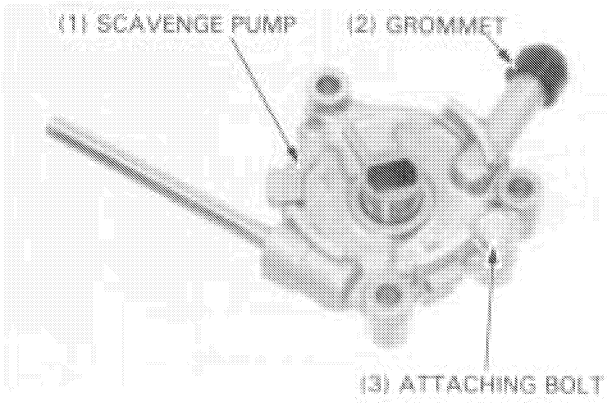
Remove the dowel pin from the left crankcase.



DISASSEMBLY

Remove the following:
- pump cover from the pump body by removing the attaching bolt.
- grommet.
- dowel pins from the pump body.

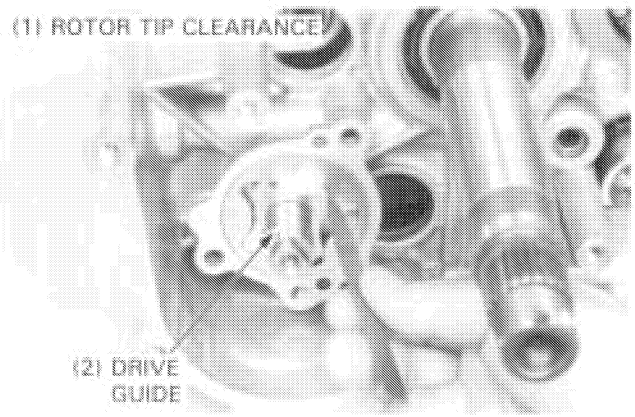
Clean all parts thoroughly with clean engine oil.



Reinstall the scavenge pump as shown.

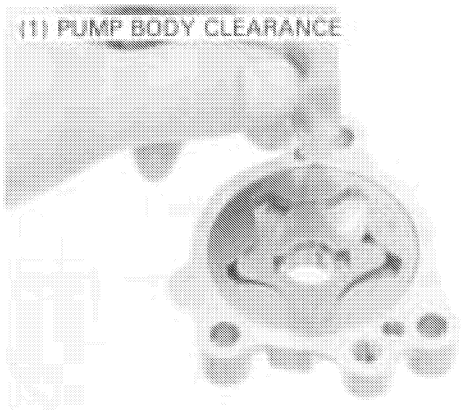
Measure the rotor tip clearance.

SERVICE LIMIT: 0.35 mm (0.014 in)



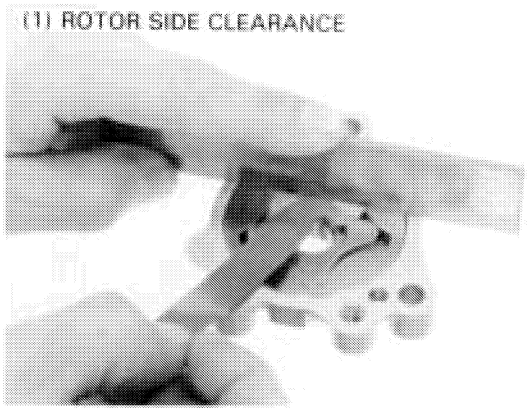
Measure the pump body clearance.

SERVICE LIMIT: 0.42 mm (0.017 in)

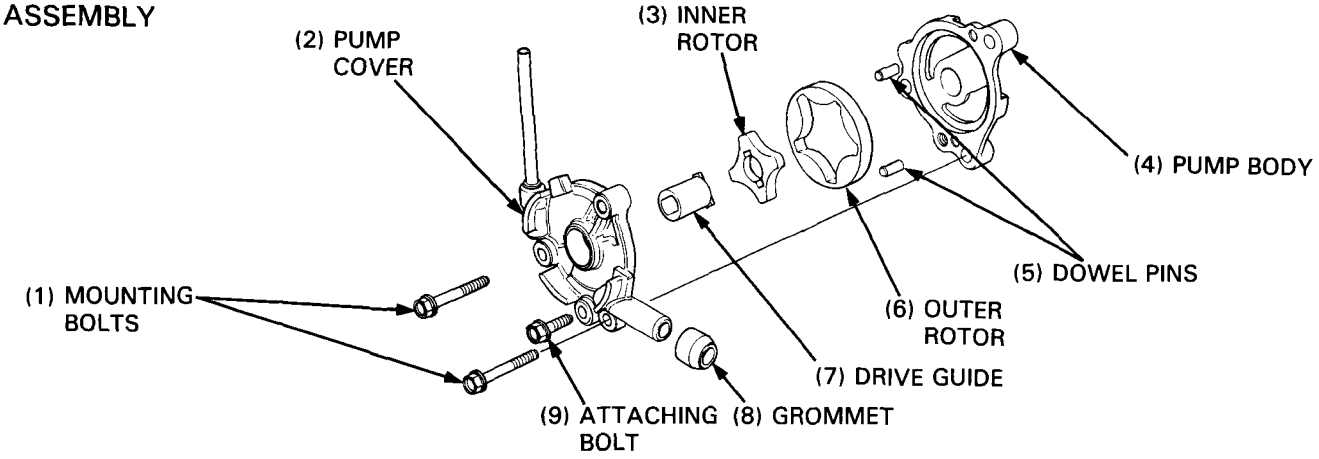


Measure the side clearance.

SERVICE LIMIT: 0.12 mm (0.005 in)



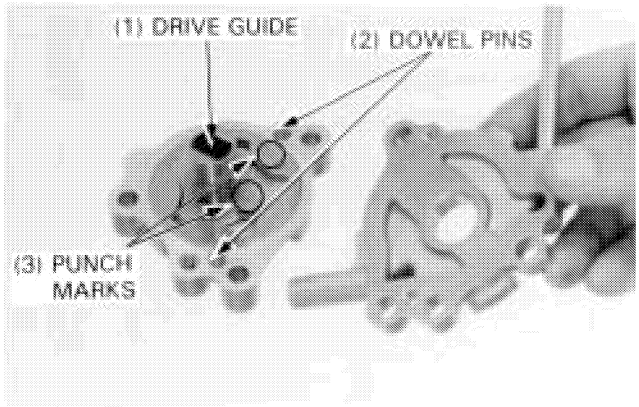
ASSEMBLY



Clean all removed parts thoroughly and dip them in clean engine oil before reassembly.

Install the dowel pins on the pump body.
Install the inner and outer rotors into the pump body with the punch marks facing toward the cover.

Install the drive guide onto the inner rotor.

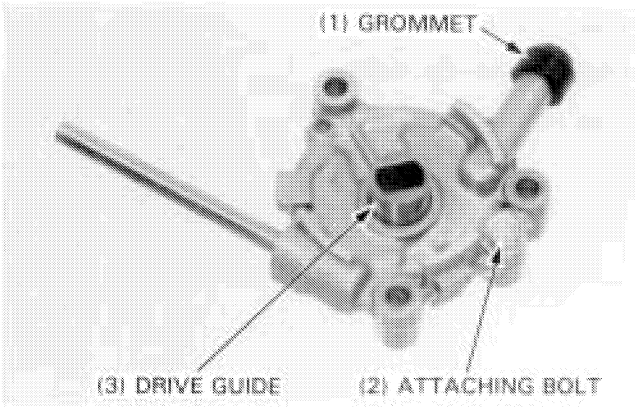


Install and tighten the attaching bolt.
Install the grommet securely.

NOTE

- Be certain the grommet is in position before installing the scavenge pump to the case.

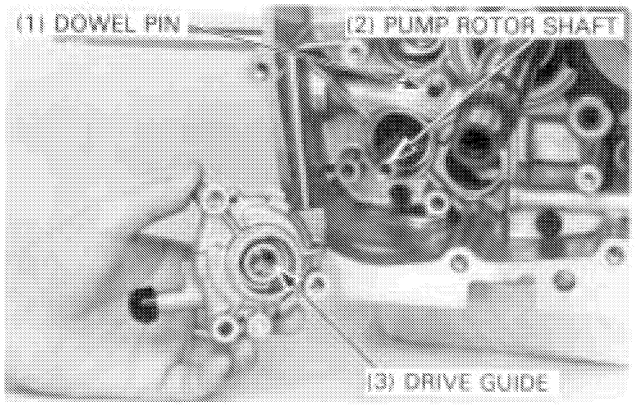
Make sure the drive guide is rotating smoothly.



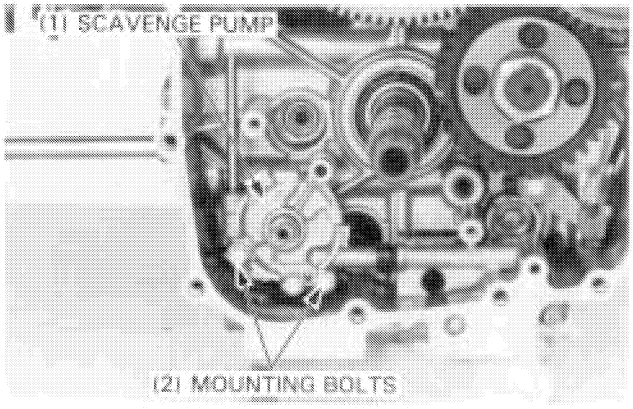
INSTALLATION

Install the dowel pin.

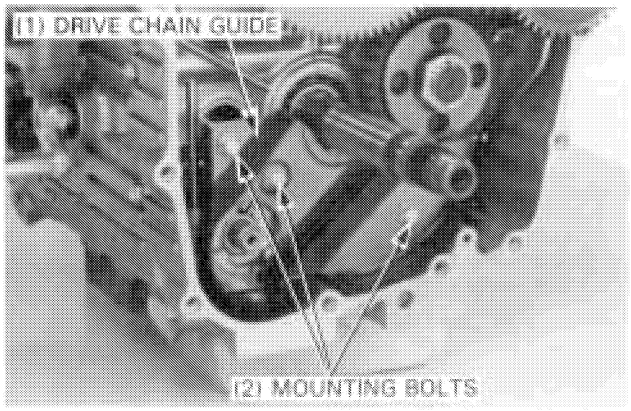
Install the pump on the left crankcase with aligning the flat on the pump rotor shaft with the flat on the drive guide.



Install and tighten the two mounting bolts.



Install the drive chain guide and tighten the three mounting bolts.



Install the oil pump sprocket, drive chain and primary driven gear boss as an assembly.

NOTE

- The sprocket "OUT" mark should face out.

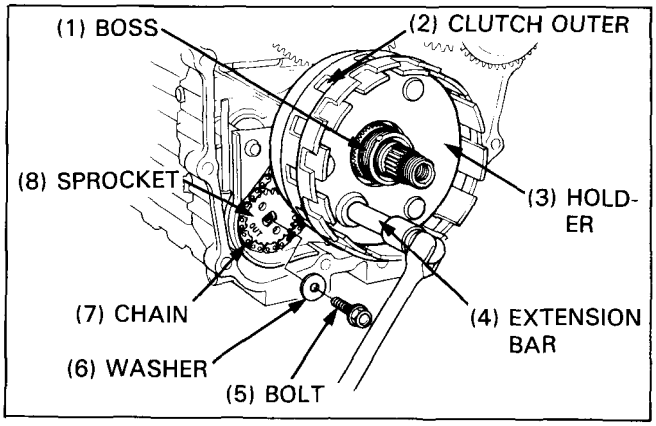
Temporarily install the clutch outer and clutch outer holder so that the oil pump sprocket can not be rotated.

TOOLS:

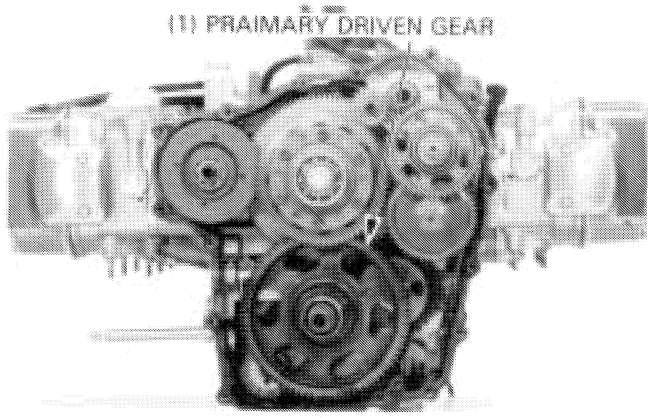
Clutch outer holder	**07JMB–MN50100**
Extension bar	**07716–0020000**

Apply a locking agent to the sprocket bolt threads.
Install and tighten the washer and bolt, holding the clutch outer.

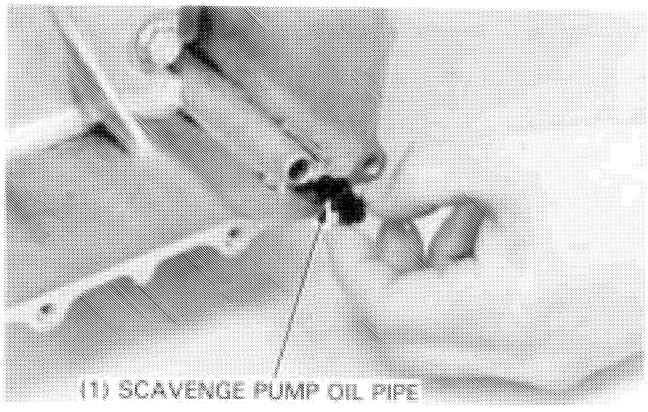
TORQUE: 18 N·m (1.8 kg-m, 13 ft-lb)



Install the primary driven gear (section 9).
Install the starter clutch (section 19).
Assemble the rear engine cover (section 9).



Install the scavenge pump oil pipe to the rear engine cover.
Install the clutch (section 8).
Install the engine (section 6).



FINAL DRIVE OIL

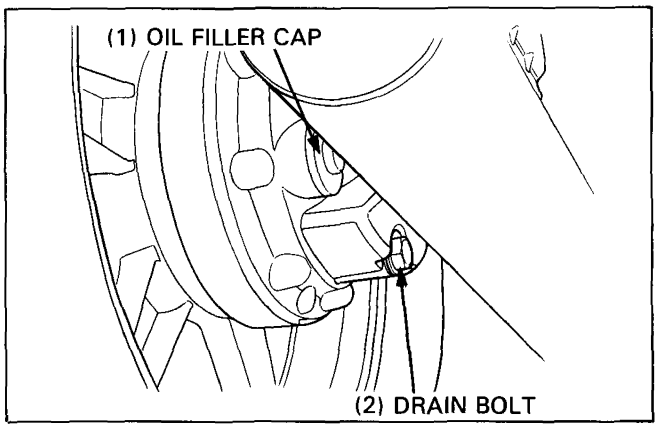
CHECK

Place the motorcycle on its center stand on level ground.

Remove the oil filler cap.

Check that the oil level reaches the lower edge of the oil filler cap hole.

Check for leaks, if the level is low. Pour fresh oil through the oil filler hole until it reaches the lower edge.



CHANGE

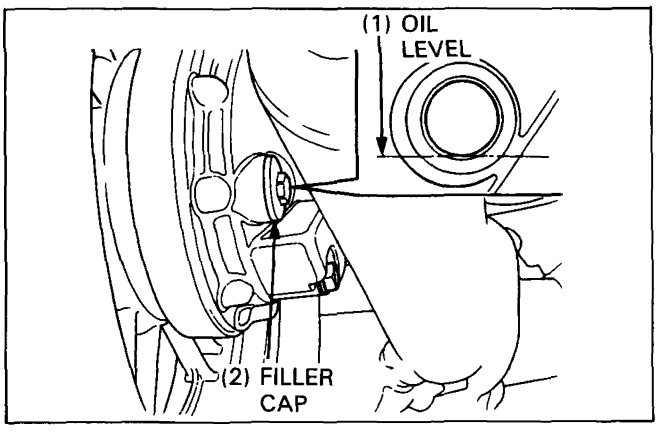
Remove the oil filler cap and drain bolt to drain all oil from the final gear case.
Install the drain bolt securely.

Fill the gear case with the recommended oil up to the correct level (the lower edge of the oil filler cap hole).

OIL CAPACITY: 140 cm³ (4.7 US oz, 4.9 Imp oz) after draining
RECOMMENDED OIL: SAE #80

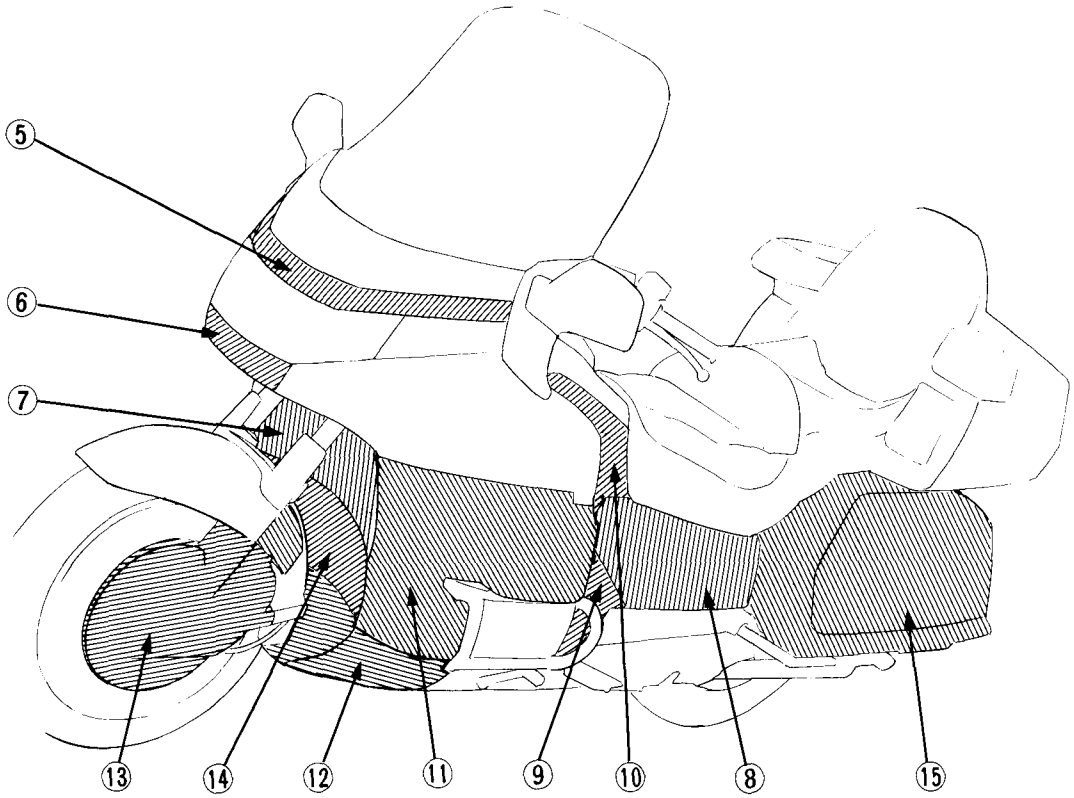
Install and tighten the filler cap.

TORQUE: 12 N·m (1.2 kg-m, 9 ft-lb)



LUBRICATION POINTS

LUBRICATION POINT	LUBRICANT	REMARKS
Engine	HONDA 4-STROKE OIL or equivalent. API service classification: SE or SF	4.3 lit (4.5 US qt, 3.8 Imp qt) at engine assembly 3.5 lit (3.7 US qt, 3.1 Imp qt) at oil change 3.7 lit (3.9 US qt, 3.3 Imp qt) at oil filter and oil change
Final drive gear	Hypoid gear oil, SAE 80	140 cm^3 (4.9 Imp oz) after draining 170 cm^3 (6.0 Imp oz) at assembly
Front fork leg	ATF (Automatic Transmission Fluid)	Left: 325 cm^3 (10.9 US oz, 11.4 Imp oz) Right: 320 cm^3 (10.8 US oz, 11.2 Imp oz)
Rear shock absorber (right)	ATF	140 cm^3 (4.7 US oz, 4.9 Imp oz)
Shock absorber air hose joint O-rings	ATF	—
Brake fluid (clutch fluid)	DOT 4	—
Steering head bearings Steering head bearing dust seal Brake lever pivot Clutch lever pivot Speedometer gearbox Swing arm pivot bearings and dust seals Front and rear wheel bearings Front and rear wheel bearing dust seal lips Throttle grip sliding surface Center stand pivot Side stand pivot Brake pedal pivot Drive shaft, universal joint Drive shaft pinion joint splines and oil seal Final driven flange splines Windshield adjuster tension plate pivot Reverse drum circumference Reverse drum pivot	Multipurpose grease	—
Brake caliper pivot bolts sliding surface Brake caliper side collars	Hi-Temperature silicone grease	—
Speedometer cable Throttle and choke cables Reverse cables	Light weight oil	—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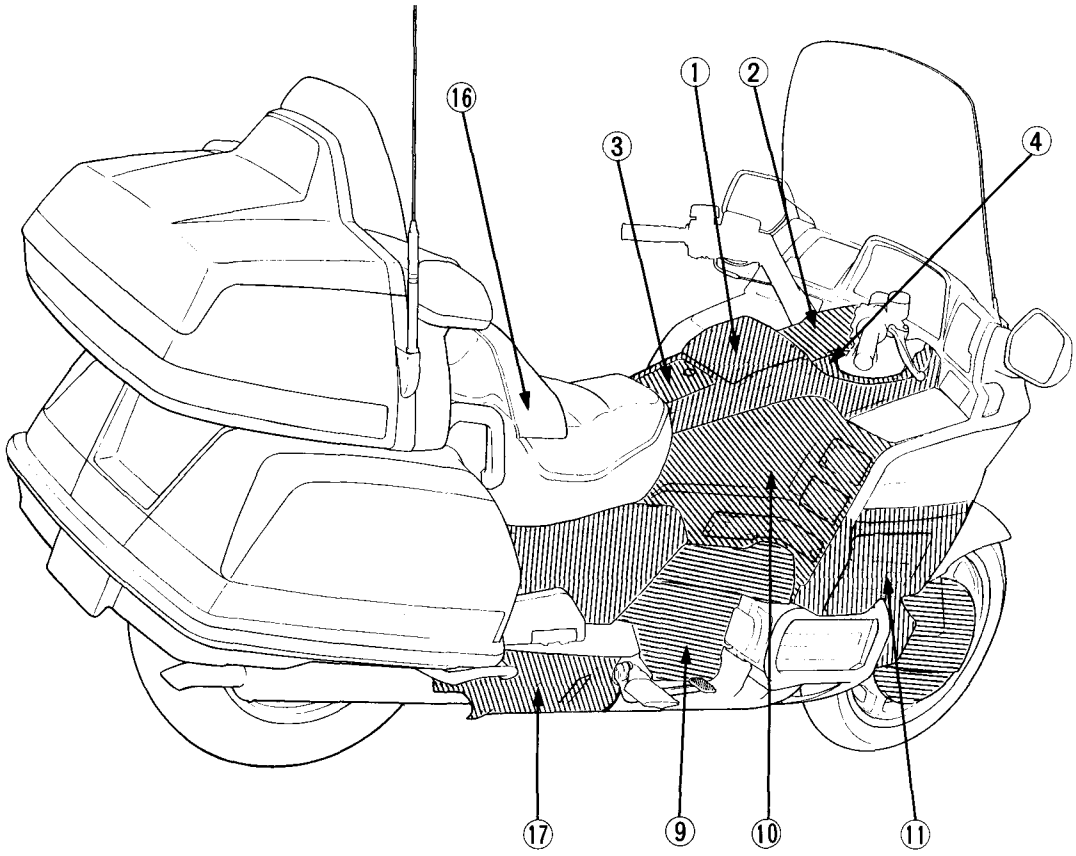
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SERVICE ACCESS GUIDE

Remove the top compartment, trim holder and/or fairing cover pieces as indicated when service is required for one of the following. Refer to section 12 for component removal.

*: Removal parts

Number	Item	Left	Right	Service
1	Top compartment	—	—	Fuel line Air cleaner case
2	Ignition switch cover	—	—	Radiator coolant
3	Top compartment cover	—	—	Carburetor idle speed
4	Top inner cover	—	*	Cooling system (radiator cap and hoses)
5	Trim holder	—	—	Headlight aim (vertical)
6	Front grille	—	—	Headlight aim (horizontal)
7	Radiator shroud	—	—	Cooling system (radiator core)
8	Rear side cover	* *	 * * *	Clutch system (metal line) Battery Brake fluid (left front/rear) Brake system (hoses)
9	Front side cover	* *	 * * *	Clutch system (metal line) Brake light switch Reverse operation (cable adjustment) Brake system (hoses)
10	Fairing inner cover	 * * * * *	* * *	Carburetor synchronization Reverse operation (cable adjustment) Clutch system (metal line) Cruise valve element Brake system (hoses) Secondary air supply system (tubes)
11	Fairing lower cover	* * * * * *	* * * * * *	Cooling system (hoses) Secondary air supply system (tubes) Spark plugs Brake system (hoses) Carburetor synchronization Cylinder compression
12	Under cover	—	—	Engine oil filter Cooling system (hoses)
13	Disc cover	*	*	Brake system (hoses)
14	Fairing front cover	—	—	Cooling system (hoses)
15	Saddlebag	* * *		Air pump element Brake system (hoses) Air drier (desiccant replacement)
16	Seat	—	—	Air drier (inspection window)
17	Chamber protector		*	Brake system (brake pedal height)

SERVICE INFORMATION

GENERAL

⚠ WARNING

- *Support the motorcycle on the center stand on a level surface before starting any work.*
- *When the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in a closed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and lead to death.*

CAUTION

- *Always use the center stand when adjusting air pressures. Do not use the side stand when adjusting the air pressure, as you will get false pressure readings.*

- For the following service, see following page.

Engine oil	See page 2-4
Engine oil filter	See page 2-4
Final drive oil	See page 2-12
Coolant capacity	See page 5-7

SPECIFICATIONS

<ENGINE>

Throttle grip free play: 5—8 mm (3/16—5/16 in)

Spark plugs:

	ND	NGK
Standard	X22EPR-U9	DPR7EA-9
For cold climate (Below 5°C, 41°F)	X20EPR-U9	DPR6EA-9
Extended high speed riding	X24EPR-U9	DPR8EA-9

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

Idle speed: 800 ± 80 min^{-1} (rpm)

SW model: 900 ± 50 min^{-1} (rpm)

Cylinder compression: 1300— 1700 kPa (13.0—17.0 kg-m, 185—242 psi)

Carburetor synchronization: Within 40 mm (1.6 in) Hg of each other

<CHASSIS>

Brake height: 0—10 mm (0—0.4 in)

Reverse engagement lever free play (at index mark B): 2—3 mm (1/16—1/8 in)

Side stand spring force: 2—3 kg (4.4—6.6 lbs)

Rear shock absorber air pressure:

Rear air Pressure	Conditions	
	Rider	Riding Conditions
0 kPa (0 kg/cm^2, 0 psi) ↕ 400 kPa (4.0 kg/cm^2, 57 psi)	One ↕ with Passenger	Ordinary or city road riding ↕ Rough road riding

Tires:

Tire Size		Front	Rear
		130/70-18 63H	160/80-16 75H
Cold tire pressures kPa (kg/cm^2, psi)	Driver and passenger	225 (2.25, 33)	280 (2.80, 41)
	Driver only	225 (2.25, 33)	250 (2.50, 36)
Tire Brand Tubeless Only Dunlop		K177F	K177

Minimum tire tread depth: Front 1.5 mm (0.06 in)
Rear 2.0 mm (0.08 in)

Brake fluid: DOT 4

Clutch fluid: DOT 4

TORQUE VALVE

Spark plug: 16 N·m (1.6 kg-m, 12 ft-lb)

TOOL

Common

Vacuum gauge: 07404—0020000 or 07404—0030000

Vacuum gauge attachment (excepe SW model): 07510—3000100

TROUBLESHOOTING

Engine will not crank
- Battery or charging system faulty (section 17)
- Starter or starter system faulty (section 19)
- Engine seized
- Switches or accessory faulty

Engine cranks but will not start
- Out of fuel or incorrect fuel
- Engine stop switch off
- Ignition system faulty (section 18)
- Fuel filter clogged
- Fuel cap vent clogged

Engine cranks but will not start-cold weather
- Battery weak due to low temperature (section 17)
- Incorrect choke cable adjustment
- Ice in fuel lines, carburetors, fuel tank, or fuel filter
- Incorrect engine oil
- Water pump iced (incorrect antifreeze ratio)

Engine cranks but will not start-engine hot
- Fuel flow stopped by percolation (vapor lock) in lines, carburetor, or fuel pump
- Incorrect starting procedure

Run-on (continues to run with ignition off)
- Excessive carbon build-up in engine
- Intake pipe leak
- Old or incorrect fuel

Lack of power or high speed performance
(See "Engin lacks power" and "Poor performance at high speed" for more detailed troubleshooting information on section 24)
- Alternator voltage low or battery low
- Ignition system faulty (section 17)
  — improper ignition timing
- Intake pipe leaks
- Not enough fuel
- Valve springs weak or broken
- Cylinder head gasket blown
- Carburetor malfunction (section 4)

Misfires at idle
- Dirty air cleaner
- Spark plugs gapped incorrectly
- Spark plug caps faulty
- Ignition cables deteriorated
- Carburetor problems (choke, clogged jets, high float level, air system, etc)

Mid-range performance poor
- Incorrect spark plug heat range
- Faulty spark plugs
- Improper ignition timing (section 17)
- Low engine compression
- Low fuel pump pressure
- Improperly adjusted throttle linkage

Afterfires, explosions in muffler
- Ignition system faulty (section 17)
- Valve timing faulty
- Lean mixture (often due to dirt or water in fuel, or intake air leak)
- Leaky or sticking intake valve or weak or broken intake valve spring
- Faulty hydraulic valve
- Weak or broken exhaust valve spring(s)
- Burnt exhaust valve(s)
- Carburetor malfunction (section 4)

Pre-ignition (mixture ignites before spark plug fires)
- Hot spot in combustion chamber (carbon particle)
- Overheated valve (sticking in guide)
- Overheated engine

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

The following items require some mechanical knowledge. Certain items (particularly those marked * and **) may require more technical information and tools. Consult your authorized Honda dealer.

(cont'd)

MAINTENANCE SCHEDULE (Cont'd)

	ITEM / FREQUENCY	WHICHEVER COMES FIRST / NOTE	ODOMETER READING (NOTE 1)							Refer to page
			x 1000 km	1	6	12	18	24	30	36	
			x 1000 mi	0.6	4	8	12	16	20	24	
			MONTHS		6	12	18	24	30	36	
•	FUEL LINE					I		I		I	3-6
*	THROTTLE OPERATION					I		I		I	3-6
*	CARBURETOR CHOKE					I		I		I	3-7
	AIR CLEANER	(NOTE 2)					R			R	3-7
	CRANKCASE BREATHER	(NOTE 3)			C	C	C	C	C	C	3-8
	SPARK PLUG				I	R	I	R	I	R	3-8
	ENGINE OIL			R		R		R		R	2-4
	ENGINE OIL FILTER			R		R		R		R	2-4
*	CARBURETOR SYNCHRONIZATION					I		I		I	3-9
*	CARBURETOR IDLE SPEED			I	I	I	I	I	I	I	3-10
	RADIATOR COOLANT	(NOTE 4)				I		I		R	3-11
•	COOLING SYSTEM					I		I		I	3-11
*	SECONDARY AIR SUPPLY SYSTEM	(NOTE 5)				I		I		I	3-12
	FINAL DRIVE OIL					I		I		R	2-12
	BATTERY				I	I	I	I	I	I	3-13
	BRAKE FLUID	(NOTE 4)			I	I	R	I	I	R	3-13
	BRAKE PAD WEAR				I	I	I	I	I	I	3-14
	BRAKE SYSTEM			I		I		I		I	3-14
•	BRAKE LIGHT SWITCH					I		I		I	3-15
*	HEADLIGHT AIM					I		I		I	3-15
	CLUTCH SYSTEM					I		I		I	3-16
	CLUTCH FLUID	(NOTE 4)			I	I	R	I	I	R	3-16
*	REVERSE OPERATION					I		I		I	3-17
	SIDE STAND					I		I		I	3-17
*	SUSPENSION					I		I		I	3-18
*	CRUISE VALVE ELEMENT									R	3-19
*	AIR PUMP ELEMENT							C			3-19
*	AIR DRIER					I		I		I	3-20
*	NUTS, BOLTS, FASTENERS			I		I		I		I	3-21
**	WHEELS/TIRES					I		I		I	3-21
**	STEERING HEAD BEARINGS			I		I		I		I	3-22

* SHOULD BE SERVICED BY AN AUTHORIZED HONDA DEALER, UNLESS THE OWNER HAS PROPER TOOLS AND SERVICE DATA AND IS MECHANICALLY QUALIFIED.

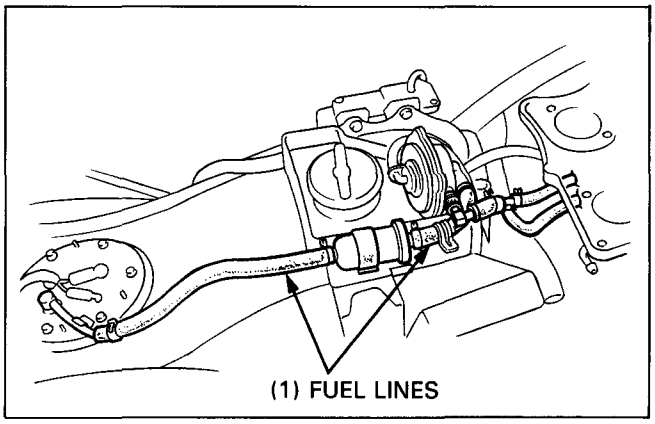
** IN THE INTEREST OF SAFETY, WE RECOMMEND THESE ITEMS BE SERVICED ONLY BY AN AUTHORIZED HONDA DEALER.

NOTES: 1. At higher odometer 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 reguires mechanical skill.
5. Switzerland type only.

FUEL LINE

Remove the seat and top compartment (page 12-7).

Check the fuel lines and replace any that show deterioration, damage or leakage.



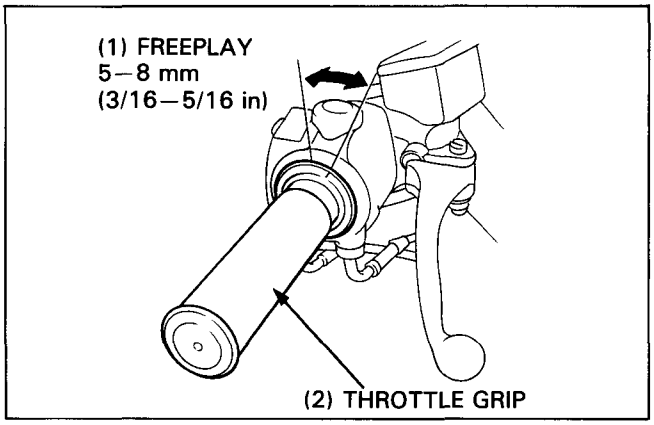
THROTTLE OPERATION

Check for smooth throttle grip full opening and automatic full closing in all steering positons.

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

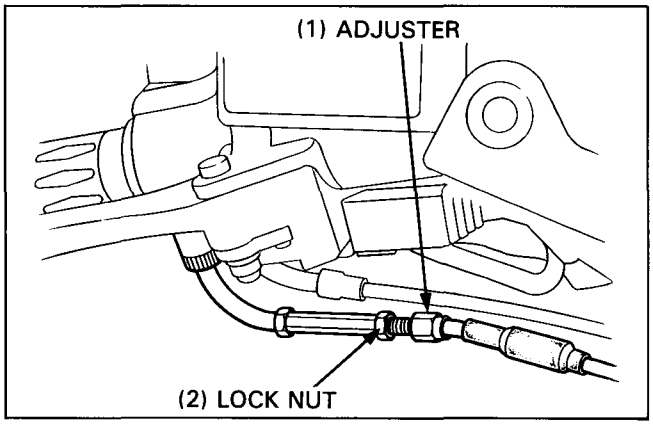
If throttle operation is not smooth, check the inner cable condition. Replace any frayed or kinked cables.

Make sure throttle grip free play is 5—8 mm (3/16—5/16 in) at the throttle grip flange.



Make major throttle grip free play adjustments with the cable adjuster as shown.

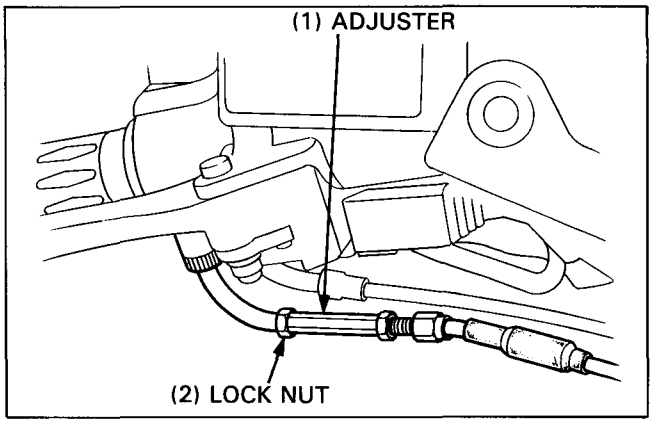
To adjust, loosen the lock nut, turn the adjuster as required, and tighten the lock nut.



Make minor adjustments with the throttle grip adjuster as shown.

To adjust, loosen the lock nut, turn the adjuster as required, and tighten the lock nut.

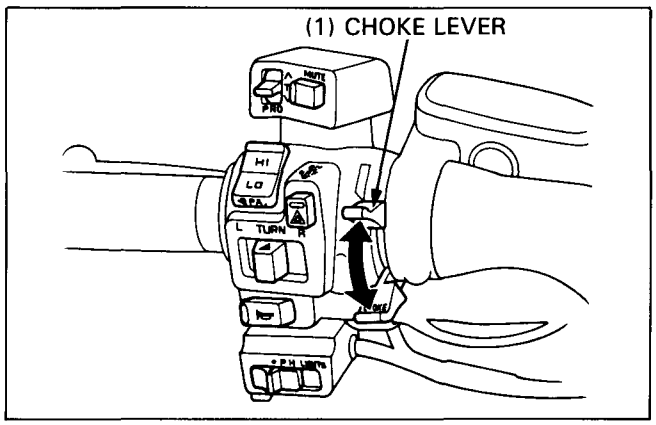
Recheck throttle operation and install all removed parts.



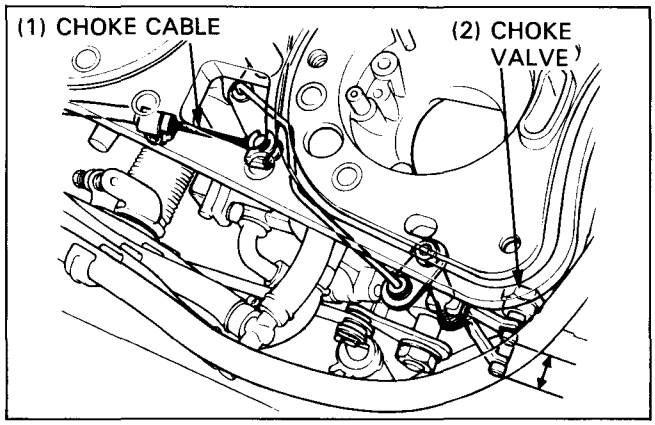
CARBURETOR CHOKE

The GL1500 choke system uses a fuel enriching circuit controlled by a bystarter valve.
The bystarter valve opens the enriching circuit via a cable when the choke lever on the handlebar is pulled down.

Check for smooth choke lever operation. If operation is not smooth, check the inner cable condition. Replace the cable if it is frayed or kinked.

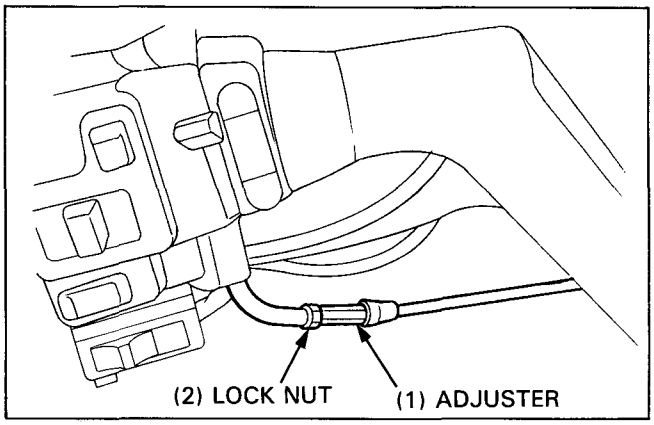


Remove the air cleaner case (page 4-15).
When operating the choke lever, check for smooth choke valve operation between the fully closed and fully open positions.



To adjust, loosen the lock nut and turn the adjuster as required. Tighten the lock nut.

Reinstall the removed parts in the reverse order of disassembly.



AIR CLEANER

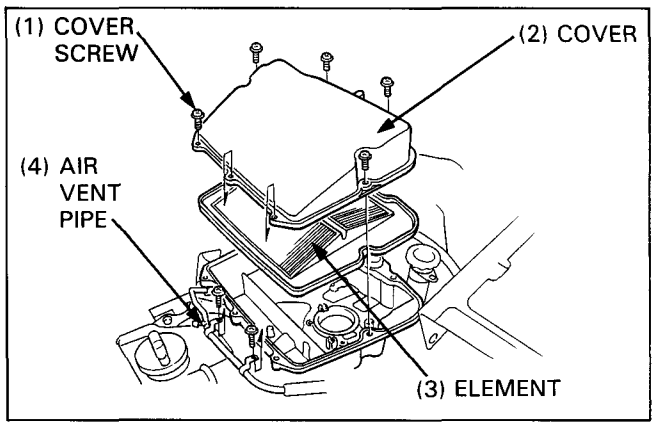
Remove the following:
- top compartment (page 12-7).
- air duct (page 4-15).
- air cleaner case cover.
- air cleaner element.

Discard the air cleaner element in accordance with the maintenace schedule.
Also, replace the element any time it is excessively dirty or damage.

Install the remaining parts in the reverse order of removal.

NOTE

- Install the air vent pipe with screws properly as shown.

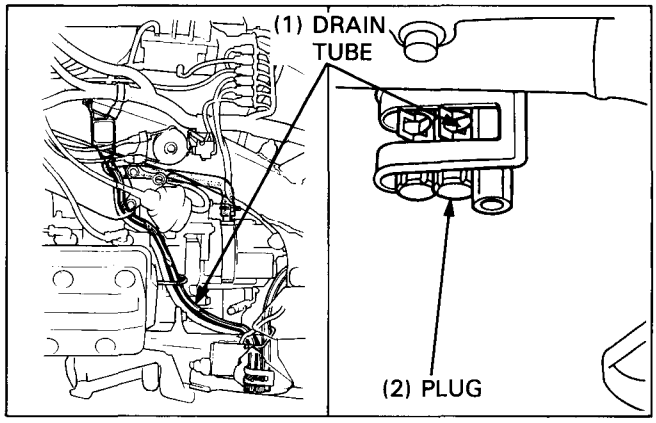


CRANKCASE BREATHER

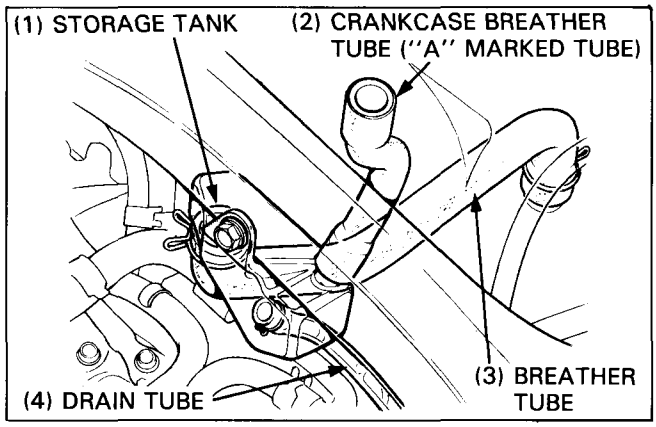
Remove the plug from the drain tube to empty any deposits.

Install the plug.

Remove the carburetor (page 4-17).
Remove the storage tank mounting bolt and storage tank.



Empty any deposits from the tank and reinstall the storage tank.



NOTE

- Make sure that the drain tube is installed to the storage tank.
- Service more frequently when riding in rain, or at full throttle, or if the deposit level can be seen in the transparent section of the drain tube.

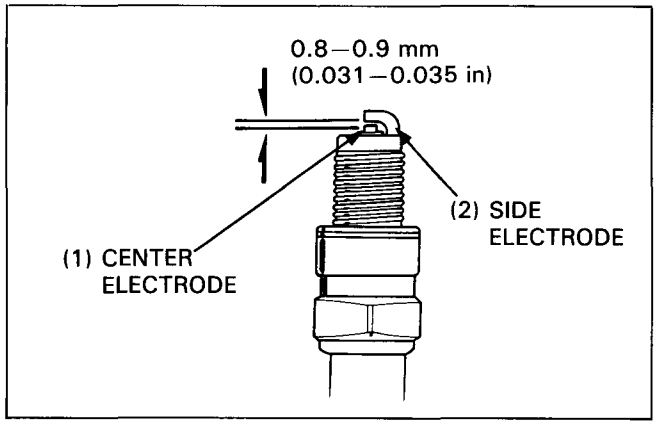
SPARK PLUGS

Remove the fairing lower covers (page 12-9).

Disconnect the spark plug caps and clean any dirt from around the spark plug bases.
Remove the spark plugs.

Recommended Spark Plugs:

	NGK	ND
Standard:	DPR7EA-9	X22EPR-U9
Cold climate (below 5°C, 41°F):	DPR6EA-9	X20EPR-U9
Extended high speed riding:	DPR8EA-9	X24EPR-U9



Visually inspect the spark plug electrodes for wear. The center electrode should have square edges and the side electrode should have a constant thickness. Discard the spark plug if there is apparent wear or if the insulator is cracked or chipped. If the spark plug deposits can be removed by sandblasting, the spark plug can be reused. Measure the spark plug gaps using a wire-type feeler gauge.

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

If necessary adjust the gap by carefully bending the side electrode. With the plug washer attached, thread each spark plug in by hand to prevent cross-threading. Tighten the spark plugs another 1/2 turn with a spark plug wrench to compress the plug washer.

TORQUE: 16 N·m (1.6 kg-m, 12 ft-lb)

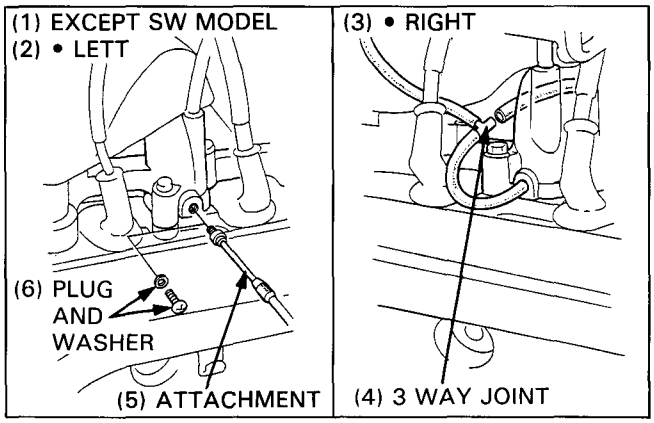
Connect the spark plug caps.

CARBURETOR SYNCHRONIZATION

NOTE

- Synchronize the carburetors with the engine at normal operating temperature, the transmission in neutral and the motorcycle supported on its center stand.

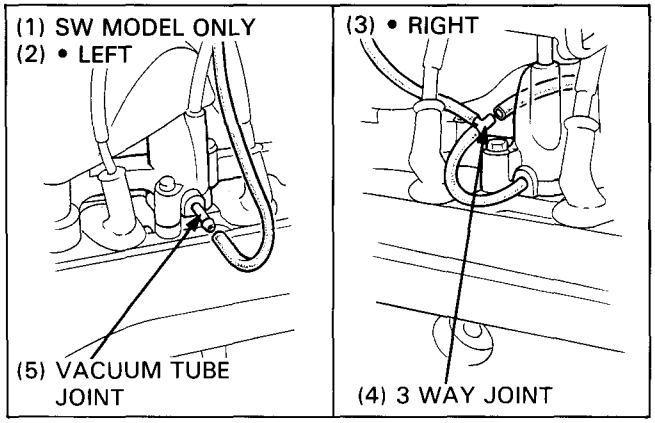
Remove the following:
– fairing lower covers (page 12-9).
– right fairing inner cover (page 12-9).
– No. 2 (BLU) vacuum tube from the 3 way joint behind the right intake manifold.



except SW model:
– plug and washer from the left intake manifold
Install the vacuum gauge attachment onto the left intake manifold.

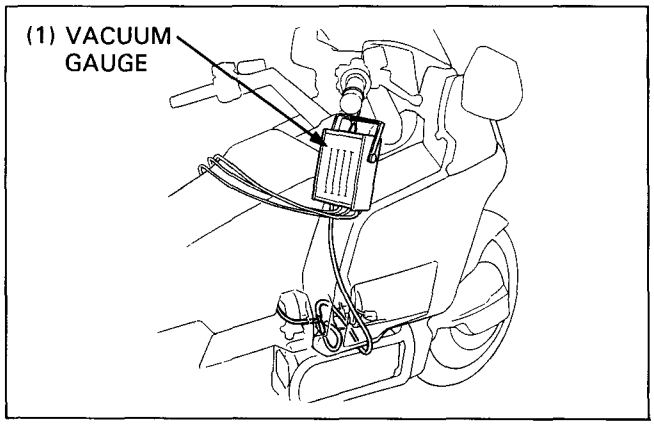
TOOL:
Vacuum gauge attachment **07510–3000100**

SW model only:
Disconnect the No. 6 (GRN) vacuum tube from the left intake manifold vacuum tube joint.



Connect the vacuum gauge tubes onto the left attachment (or tube joint) and right 3 way joint.

TOOL:
Vacuum gauge **07404–0020000 or 07404–0030000**

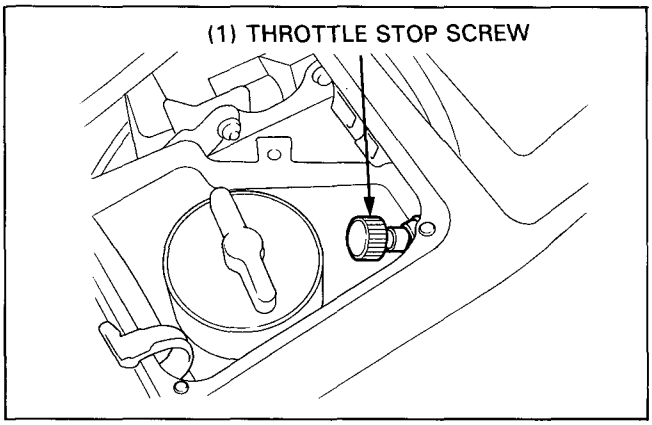


Start the engine and adjust the idle speed with the throttle stop screw.

IDLE SPEED: 800 ± 80 min^{-1} (rpm)

SW model only: 900 ± 50 min^{-1} (rpm)

Check that the difference in vacuum readings is 40 mm (1.6 in) Hg or less.



If adjustment is necessary, remove the access grommet in the right cooling fan shroud and insert a screwdriver into the shroud. Turn the adjusting screw until the vacuum gauge readings are within specification.

NOTE

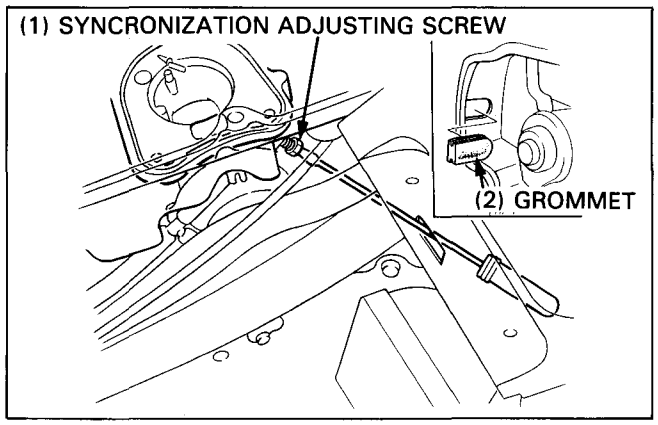
- The left (base) carburetor cannot be adjusted.

Start the engine and rev it up several times.

Recheck the synchronization and idle speed.

CAUTION

- *Take care to avoid injury working in proximity to the fan motor.*



CARBURETOR-IDLE SPEED

Open the top compartment cover.

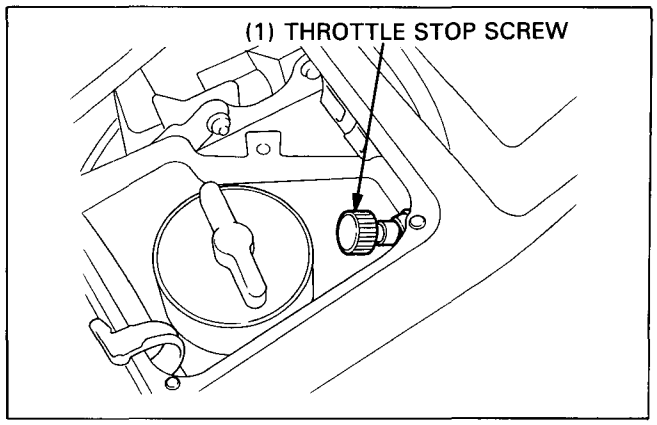
NOTE

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

Warm up the engine, shift to NEUTRAL, and place the motorcycle on its center stand. Turn the throttle stop screw as required to obtain the specified idle speed.

IDLE SPEED: 800 ± 80 min^{-1} (rpm)

SW model: 900 ± 50 min^{-1} (rpm)



CYLINDER COMPRESSION

NOTE

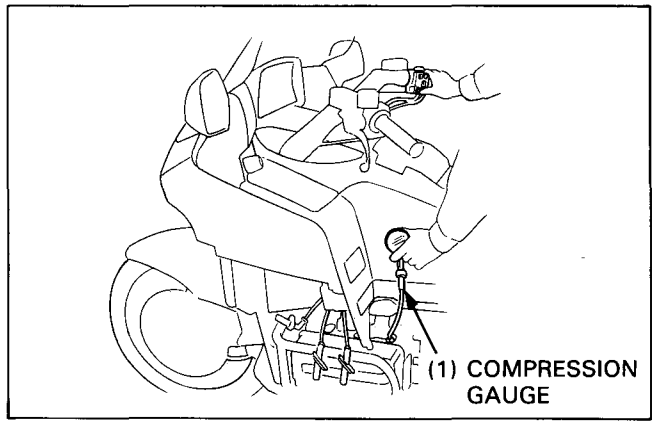
- The engine must be warm for accurate redings.

Stop the engine, then disconnect the spark plug caps and remove the spark plugs.
Turn the engine stop switch OFF.
Insert the compression gauge.
Open the throttle all the way and crank the engine with the starter motor.

NOTE

- Crank the engine until the gauge reading stops rising. The maximum reading is usually reached within 4-7 seconds.

COMPRESSION PRESSURE:
1300—1700 kPa (13.0—17.0 kg/cm^2, 185—242 psi)



If compression is low, check for the following:
— Improper valve clearance
— Leaky valves
— Leaking cylinder head gasket
— Worn piston/ring/cylinder

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

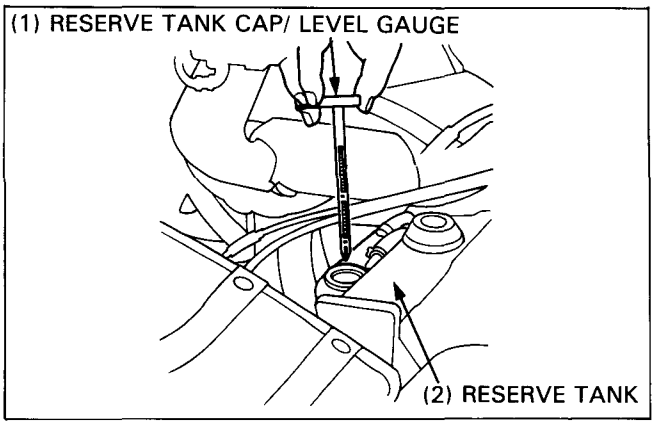
RADIATOR COOLANT

NOTE

- The engine must be run at normal operating temperature.

Stop the engine.
Support the motorcycle on its center stand.

Remove the ignition switch cover (page 12-7).
Remove the reserve tank cap/level gauge.

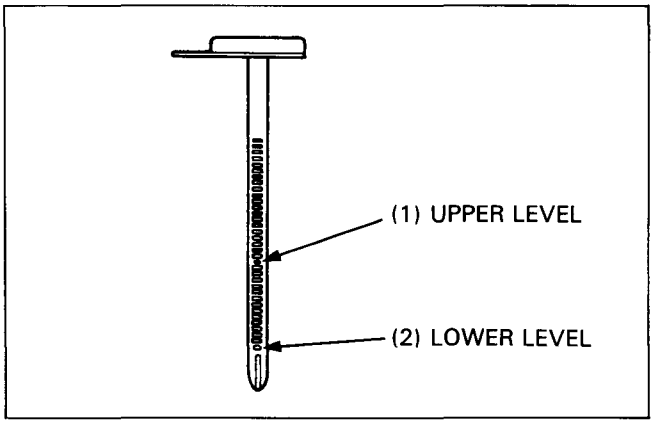


The level should be between the UPPER and LOWER levels.

If necessary, fill to the UPPER level line with a 50/50 mixture of distilled water and antifreeze.

⚠WARNING

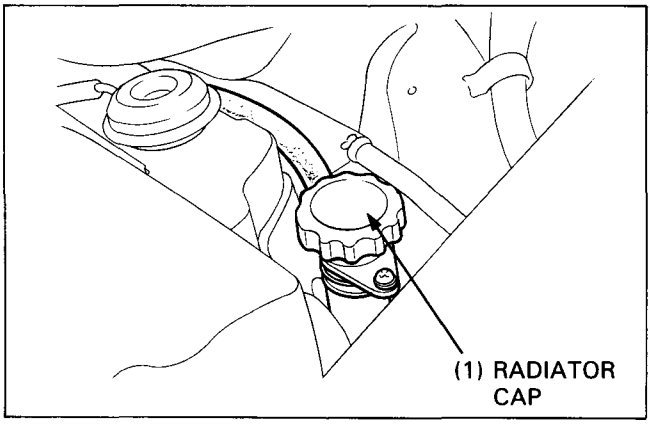
- ***Avoid scalding; never remove the radiator cap when the engine is hot. The coolant is under pressure.***



If the reserve tank is empty, remove the top inner cover and radiator cap (page 5-6).

Run the engine for 2-3 minutes to allow air to escape.

Fill the radiator with coolant and install the cap. Fill the reserve tank to the UPPER level line of the gauge and install the cap.



COOLING SYSTEM

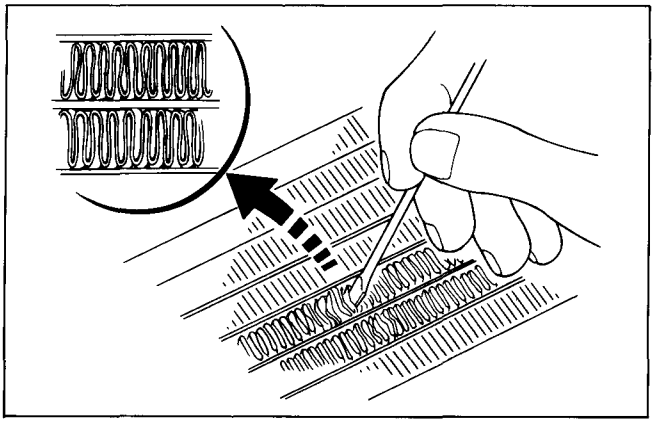
Remove the radiator shroud (page 12-9).

Check the air passages for clogging or damage.

Straighten bent fins or collapsed core tubes.

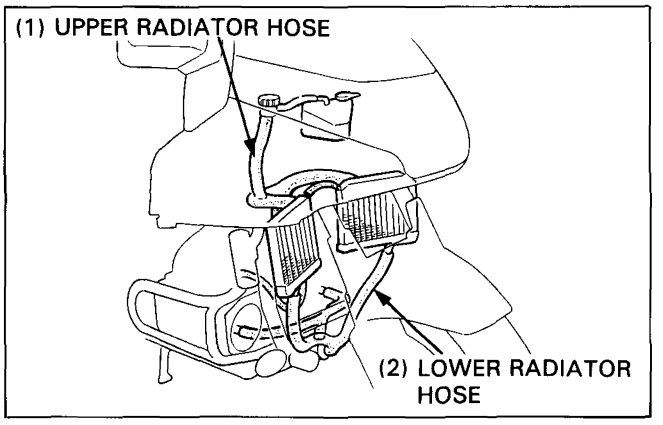
Remove insects, mud or any obstructions with compressed air or low water pressure.

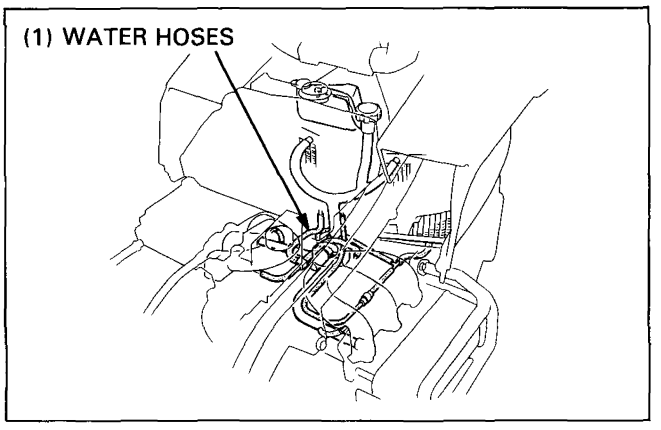
Replace the radiator if the air flow is restricted over more than 20% of the radiating surface.



Remove the following:
– fairing front cover (page 12-8).
– under cover (page 12-8).
– fairing lower covers (page 12-9).
– right top inner cover (page 12-7).

Check the cooling system hoses for cracks, deterioration or other damage using suitable inspection mirror, and replace if necessary.

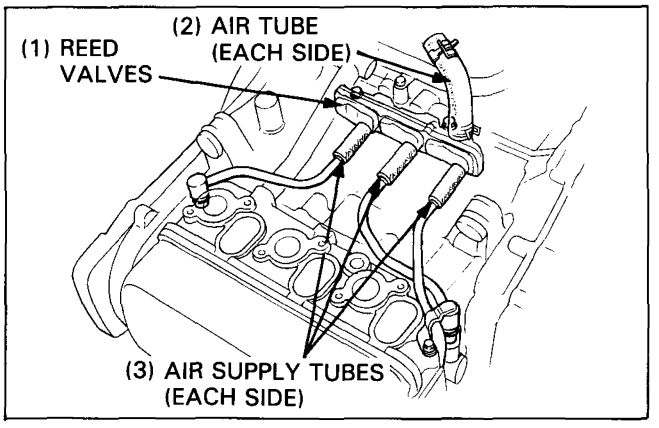




SECONDARY AIR SUUPLY SYSTEM (SW MODEL ONLY)

Remove the following:
– fairing lower covers (page 12-9).
– fairing inner covers (page 12-9).

Move the heat guard forward. Using an inspection mirror, check the air supply tubes between the reed valves and exhaust ports for deterioration, damage or loose connections. Make sure the tubes are not kinked or pinched.



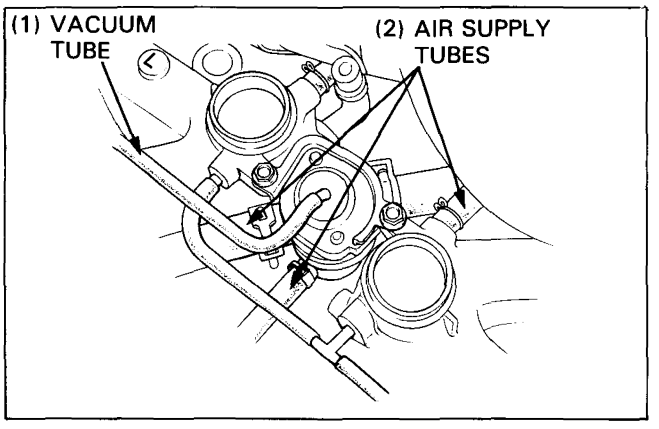
NOTE

- If the tubes shows any signs of heat damage, remove the reed valves and inspect for damage (page 4-54).

Check the vacuum tube between air injection control valve (AICV) and intake manifold through AICV control valve for deterioration, damage or loose connections.

Make sure the tube is not kinked or pinched.

For AICV control valve inspeciton, see page 4-55.



BATTERY

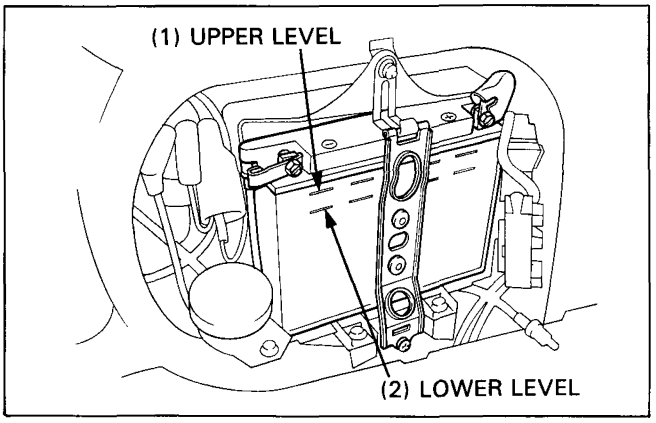
Remove the right rear side cover (page 12-6).

NOTE

- Add only distilled water. Tap water will shorten the service life of the battery.

Inspect the battery fluid level in each cell.

When the fluid level nears the lower level, refill with distilled water to the upper level.



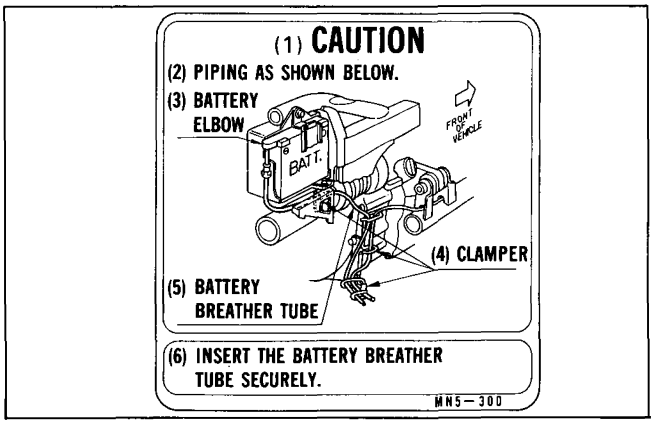
NOTE

- Apply a thin coat of grease to the battery terminals when installing the battery.

Replace the battery if sulfation forms or sediments accumulate on the bottom (page 17-5).
Make sure the battery breather tube is routed as shown by illustration on the battery caution label.

⚠ WARNING

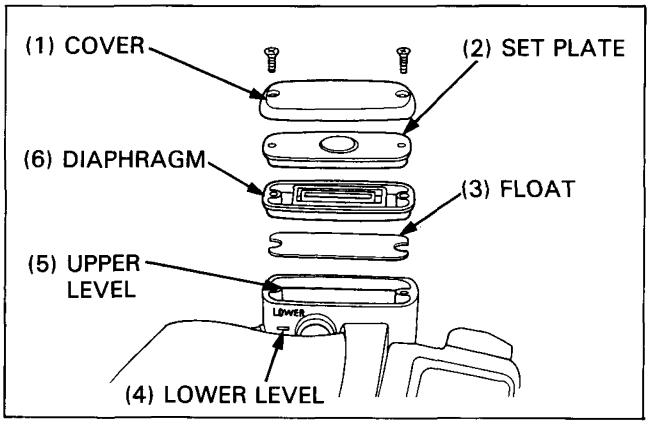
- ***The battery electrolyte contains sulfuric acid. Protect your eyes, skin, and clothing. If electrolyte gets in your eyes; flush them thoroughly with water and get prompt medical attention.***



BRAKE FLUID

Support the motorcycle on its center stand.
Check the brake lever system: front/right brake level with handlebar turned so that the reservoir is level.

Remove the rear right side cover (page 12-6), and check the brake pedal system; front/left, rear brake reservoir level.
If the level nears the lower level mark, remove the cap or cover, set plate, diaphragm and float.
Fill the reservoir with DOT 4 brake fluid to the upper level mark.



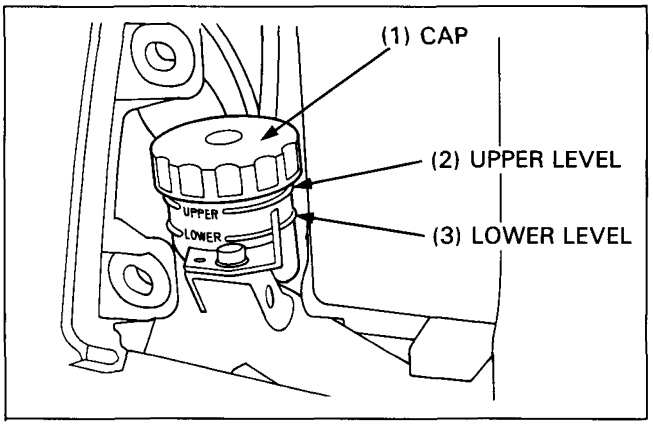
NOTE

- The front reservoir upper level mark is inside the reservoir.

CAUTION

- *Do not remove the reservoir cover until the handlebar has been turned so that the reservoir is level.*
- *Do not mix different types of fluid, as they are not compatible with each other.*
- *Do not allow foreign material to enter the system when filling the reservoir.*
- *Avoid spilling the fluid on painted, plastic or rubber parts.*

If the level is low, check the entire system for leaks.
Refer to section 16 for brake bleeding procedures.



BRAKE PAD WEAR

FRONT BRAKE PAD WEAR INSPECTION

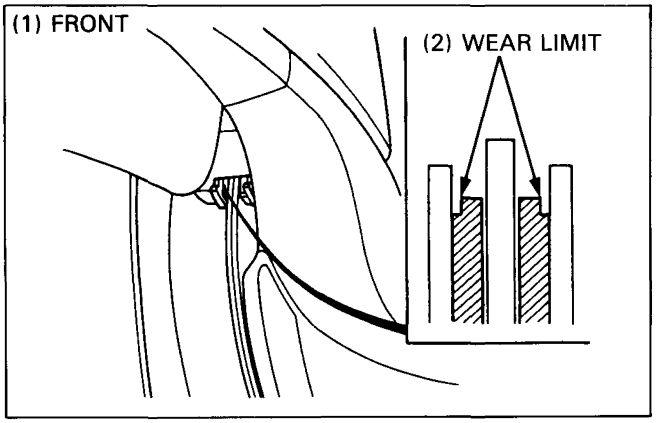
Inspect the pads visually from the rear of the caliper.

Replace the brake pads if the pad wear groove reaches the edge of the brake disc.

CAUTION

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

Refer to page 16-6 for brake pad replacement.



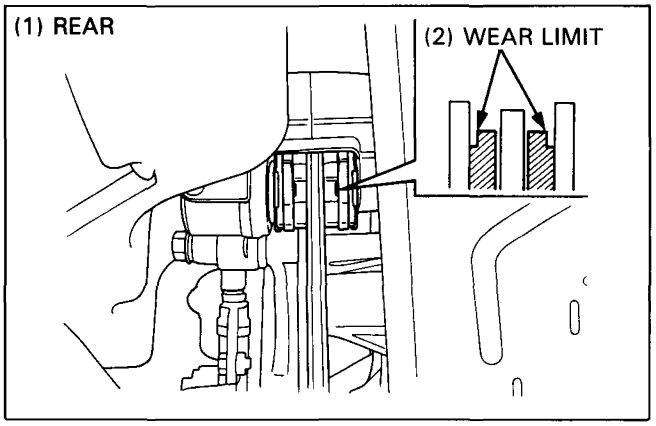
REAR BRAKE PAD INSPECTION

Inspect the pads visually from the back of the caliper.

Replace the brake pads if the pad wear groove reaches the edge of the brake disc.

CAUTION

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



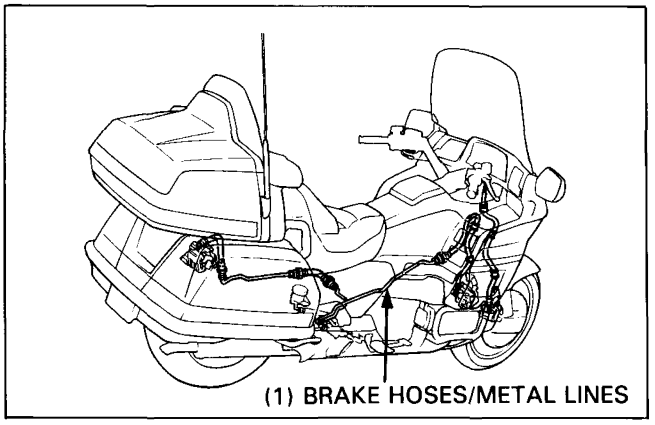
BRAKE SYSTEM

INSPECTION

Remove the folloing:
- disc covers (page 12-13).
- fairing lower covers (page 12-9).
- front side covers (page 12-6).
- rear side covers (page 12-6).
- fairing inner covers (page 12-9).

Inspect the brake hoses, metal lines and fittings for deterioration, cracks and signs of leakage. Tighten any loose fittings.

Replace hoses, metal lines and fittings as required.

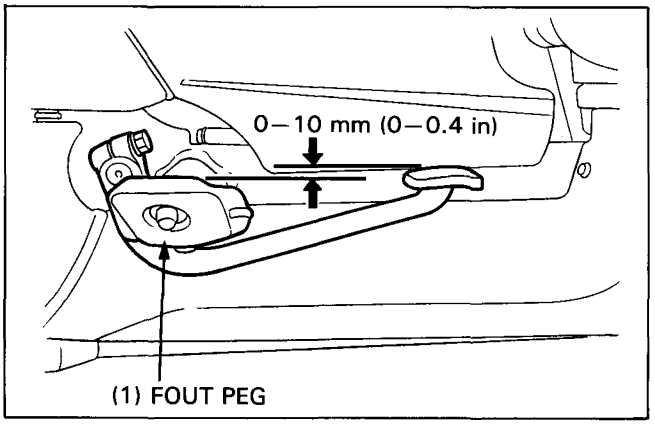


BRAKE PEDAL HEIGHT

Adjust brake pedal height so the pedal is 0—10 mm (0—0.4 in) above the upper surface of the footpeg.

CAUTION

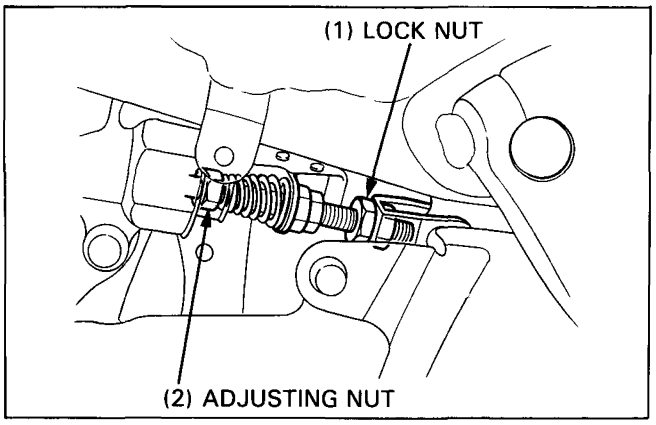
- *Incorrect brake pedal height can cause brake drag.*



To adjust height, romove the right chamber protector (page 12-16).
Loosen the lock nut and turn the master cylinder push rod. Tighten the lock nut.

NOTE

- Adjust the following after adjusting pedal height:
  — brake light switch (below).
  — cruise cancel switch (rear brake) (page 21-12).



BRAKE LIGHT SWITCH

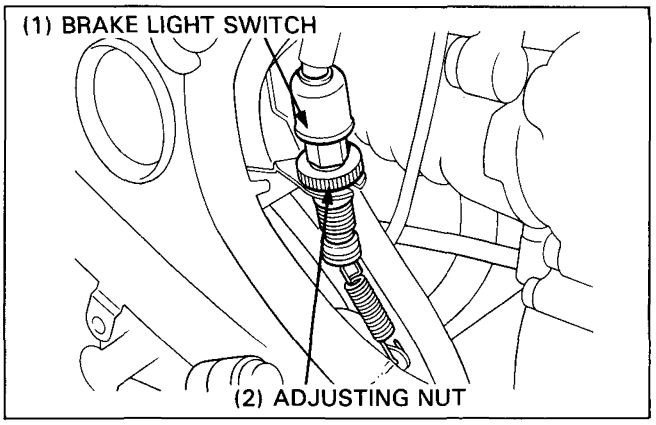
Remove the right front side cover (page 12-6).

NOTE

- The front brakelight switch does not require adjustment.

Adjust the brake light switch so the brake light comes on when the brake pedal is depressed and brake engagement begins.

Adjust by holding the switch body and turning the adjusting nut. Do not turn the switch body.



HEADLIGHT AIM

NOTE

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

⚠WARNING

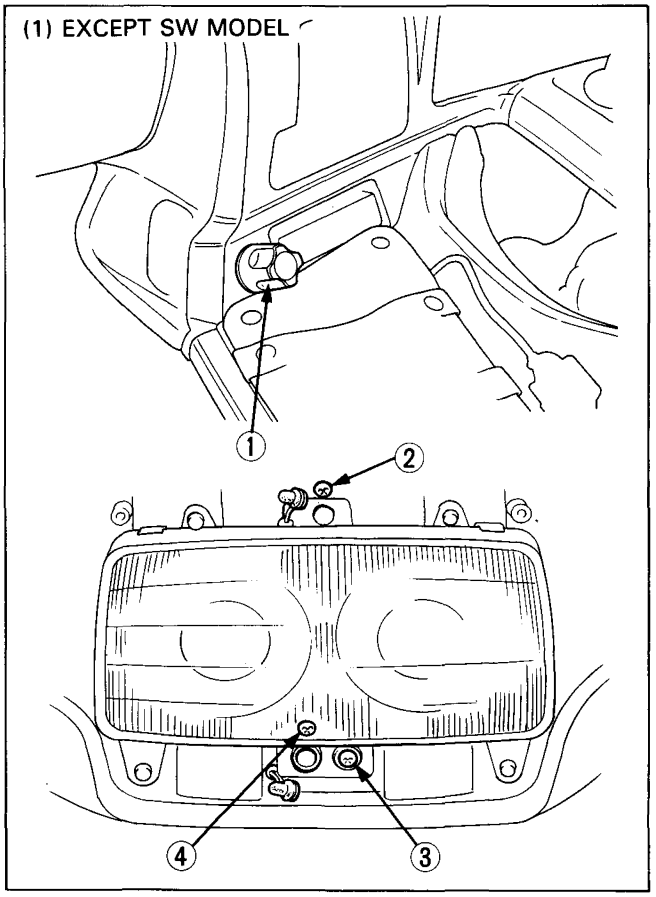
- ***An improperly adjusted headlight may blind oncoming drivers, or it may fail to light the road for a safe distance.***

Except SW model:
Adjust the headlight beam vertically or horizontally with the adjusting kob or screws as shown in the chart.

NOTE

- When making a minor vertical adjustment, remove the trim holder (page 12-1); when making any horizontal adjustment, remove the front grille.

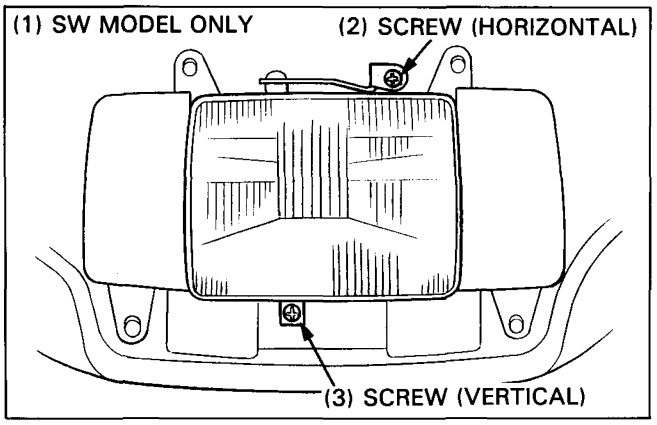
Adjustment	VERTICAL		HORIZONTAL	
	Majar	Minor	Major	Minor
Knob or screws	1	2	3	4
Turn clockwise	Down	Up	Left	Left
Turn counterclockwise	Up	Down	Right	Right



SW model only:
Remove the front grille and trim holder (page 12-1).

To adjust the headlight vertically;
A clockwise rotation of the screw moves the beam to the down, and vice versa.

To adjust the headlight horizontally;
A clockwise rotation of the screw moves the beam to the left, and vice versa.



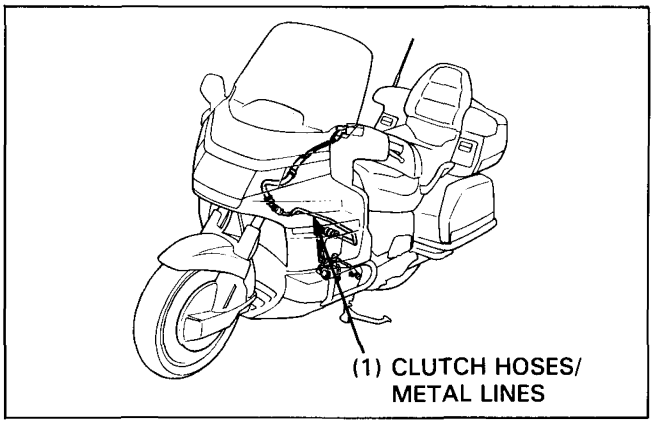
CLUTCH SYSTEM

Remove the following (section 12):
– left rear side cover
– left front side cover
– left fairing inner cover

Inspect the clutch hose, metal line fitting for deterioration, cracks and signs of leakage.

Tighten any loose fittings.
Replace hose, metal line and fitting as required.

For metal line installation, see page 16-22 (brake metal line replacement).
Check the system for leaks.



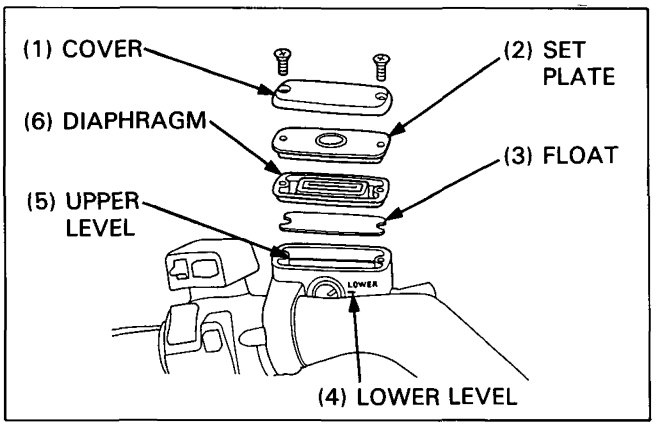
CLUTCH FLUID

Place the motorcycle on its center stand.

Check the clutch fluid level with the handlebar turned so that the reservoir is level.

Check the clutch fluid level.
If the level nears the lower level mark, remove the cover, set plate, diaphragm and float.

Fill the reservoir with DOT4 brake fluid to the upper level mark.

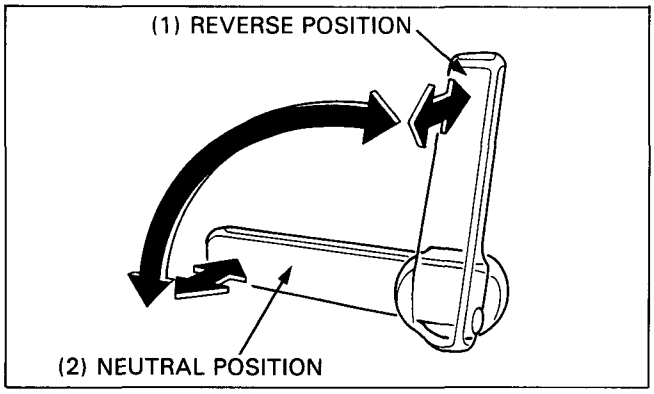


NOTE

- The clutch reservoir upper level mark is inside the reservoir.
- Do not allow foreign material to enter the system when filling the reservoir.
- Avoid spilling fluid on painted, plastic or rubber parts.
- Do not remove the reservoir cover until the handlebar has been turned so that the reservoir is level.
- Do not mix different types of fluid, as they are not compatible with each other.

Refer to sectin 8 for system bleeding procedures.

REVERSE OPERATION

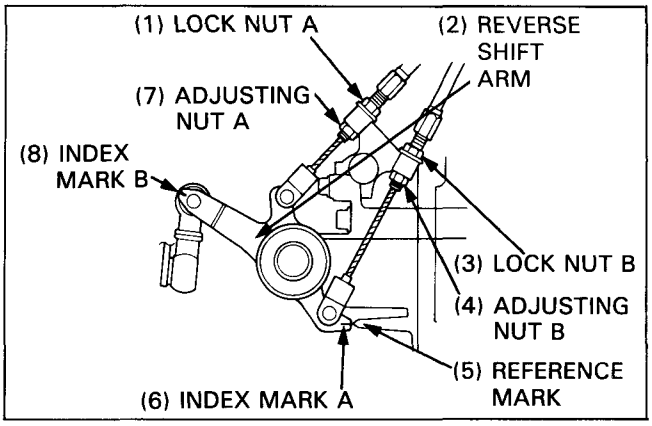


Place the motorcycle on its center stand.

Remove the right front side cover (page 12-6).

Check for smooth operation of the reverse cables.
Lubricate the reverse cables, if the operation is not smooth.

REVERSE ENGAGEMENT INSPECTION



Check the both sides of reverse shift arm alignment and free play in accordance with the maintenance schedule.

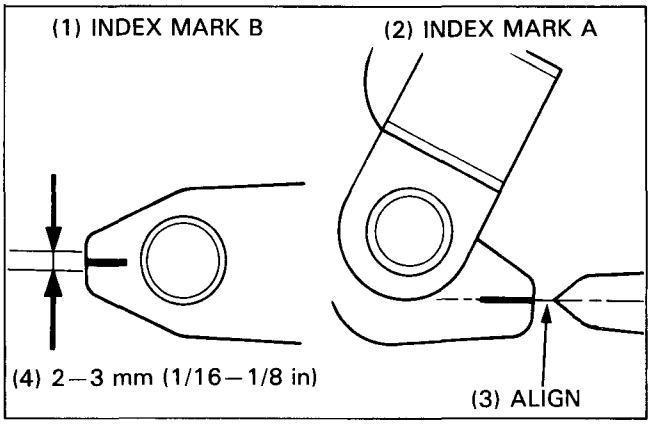
Shift the reverse lever into the reverse position (above).
Make sure that the reverse gear is engaged by attempting to turn the rear wheel by hand. It will not turn when the reverse gear is engaged.

Make sure that the index mark A aligns with the reference mark.

Measure the index mark B free play.

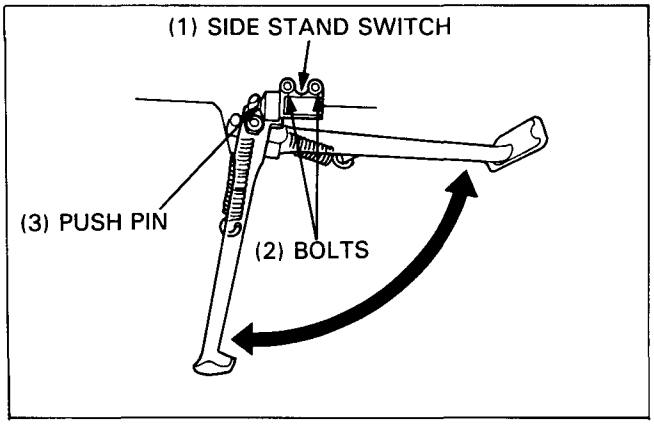
STANDARD: 2—3 mm (1/16—1/8 in)

To adjust:
Loosen the lock nut A and turn the adjusting nut A so that the index mark A aligns with the reference mark. Tighten the lcok nut A.
Next, adjust the free play of the index mark B position. Loosen the lock nut B and turn the adjusting nut B. Make sure the index mark B free play (2—3 mm: 1/16—1/8 in) and tighten the lock nut B.



After adjusting the reverse cable, move the reverse lever and shift into the reverse.
You must try them several times.
Recheck the lever alignment and free play.

SIDE STAND



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

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

Check the side stand switch mounting bolts for looseness.
Check the side stand switch push pin for damage.

SUSPENSION

⚠ WARNING

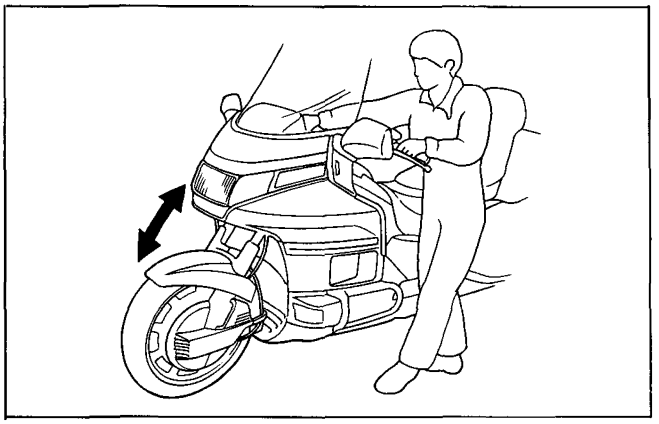
- ***Do not ride a vehicle with faulty suspension. Loose, worn or damaged suspension parts impair vehicle stability and control.***

FRONT

Check the action of the front forks by compressing them several times.

Check the entire fork assembly for leaks or damage. Replace damaged components which cannot be repaired.

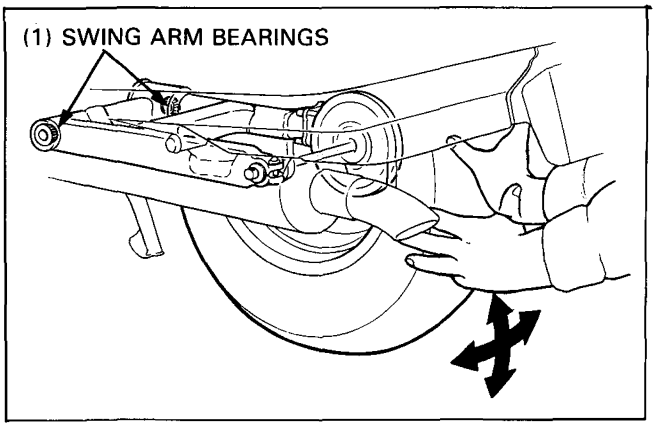
Tighten all nuts and bolts.



REAR

Place the motorcycle on the center stand.

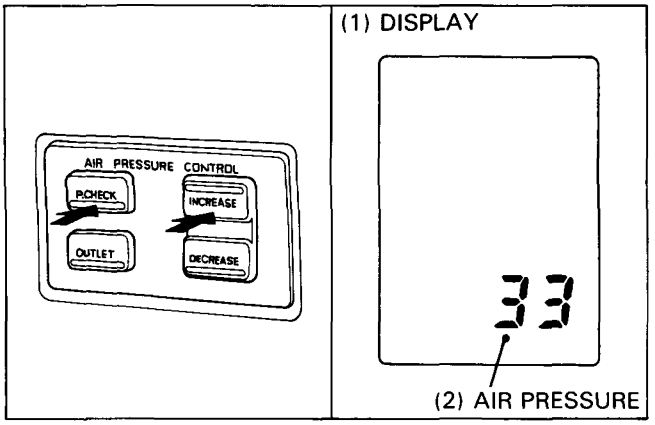
Vigorously push and pull the rear wheel from side to side.
If there is any free play or looseness, inspect the swing arm bearings for damage (page 14-23).



Check the swing arm for damage.
Check the shock absorbers for leaks or damage.
Inspect the air hoses for deterioration and cracks.
Replace parts as required.
Tighten all nuts and bolts.

Inspect the air pressure of the right shock absorber with the instrument panel gauge.

Turn the ignition switch to ON, P or ACC.
The air pressure will be appeared in the display whenever the P. CHECK button is pushed.



NOTE

- Push the INCREASE or DECREASE button to adjust the air pressure while pushing the P. CHECK button.

⚠ WARNING

- ***Never check or decrease air pressure while riding. Keep both hands on the handlebars while riding.***

CAUTION

- *Always use the center stand when adjusting air pressures. Do not use the side stand when adjusting the air pressure, as you will get false pressure readings.*

The usable air pressure range under normal condition is: 0–400 kPa (0–4.0 kg/cm², 0–57 psi).

Rear Air Pressure	Conditions	
	Rider	Riding Conditions
0 kPa (0 kg/cm², 0 psi) ↕ 400 kPa (4.0 kg/cm², 57 psi)	One ↕ with passenger	Ordinary or city road riding ↕ Rough road riding

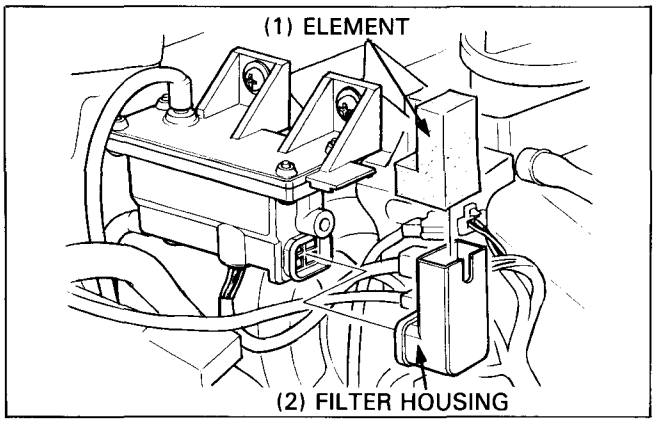
CRUISE VALVE ELEMENT

Remove the left faring inner cover (page 12-9).

Remove the filter housing from the cruise valve element assembly.

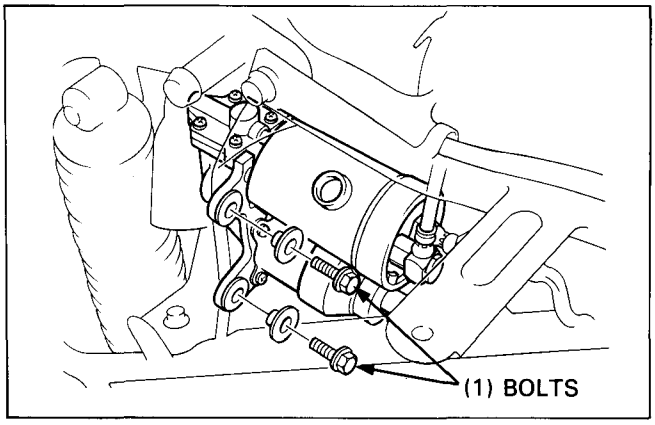
Remove the element from the element housing.

Replace the element in accordance with the maintenance schedule.

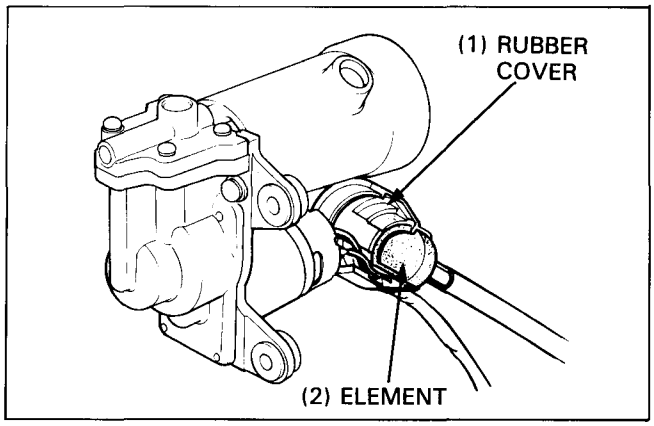


AIR PUMP ELEMENT

Remove the left saddlebag (page 12-13).
Remove the air pump mounting bolts and free the pump from the frame.



Slide the rubber cover from the air pump motor.
Remove the air pump element from the inside of the rubber cover.



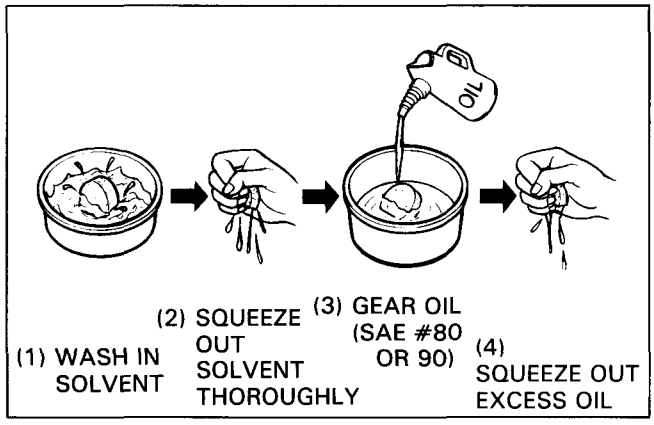
Wash the element in clean non-flammable cleaning solvent and allow it to dry thoroughly.

⚠WARNING

- ***Never use gasoline or low flash point solvents for cleaning the element. A fire or explosion could result.***

Soak the element in clean gear oil (SAE #80 or 90) and spueeze out the excess.

Reinstall the element in the rubber cover and install the cover onto the motor.



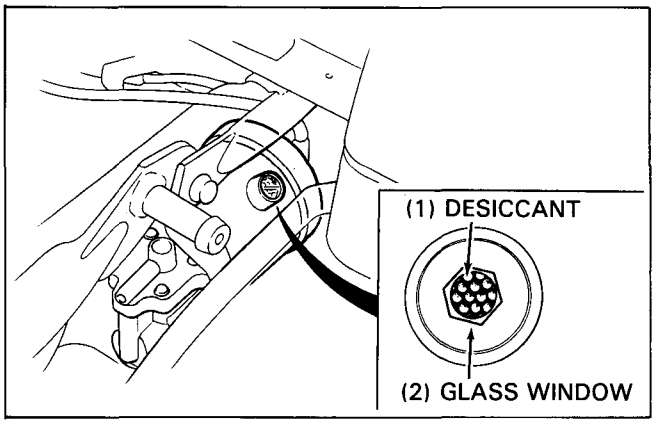
AIR DRIER

INSPECTION

Remove the seat (page 12-6).

Inspect the desiccant color in the inspection window.
The desiccant should be blue.

If the desiccant is colorless, it must be replaced (see below).



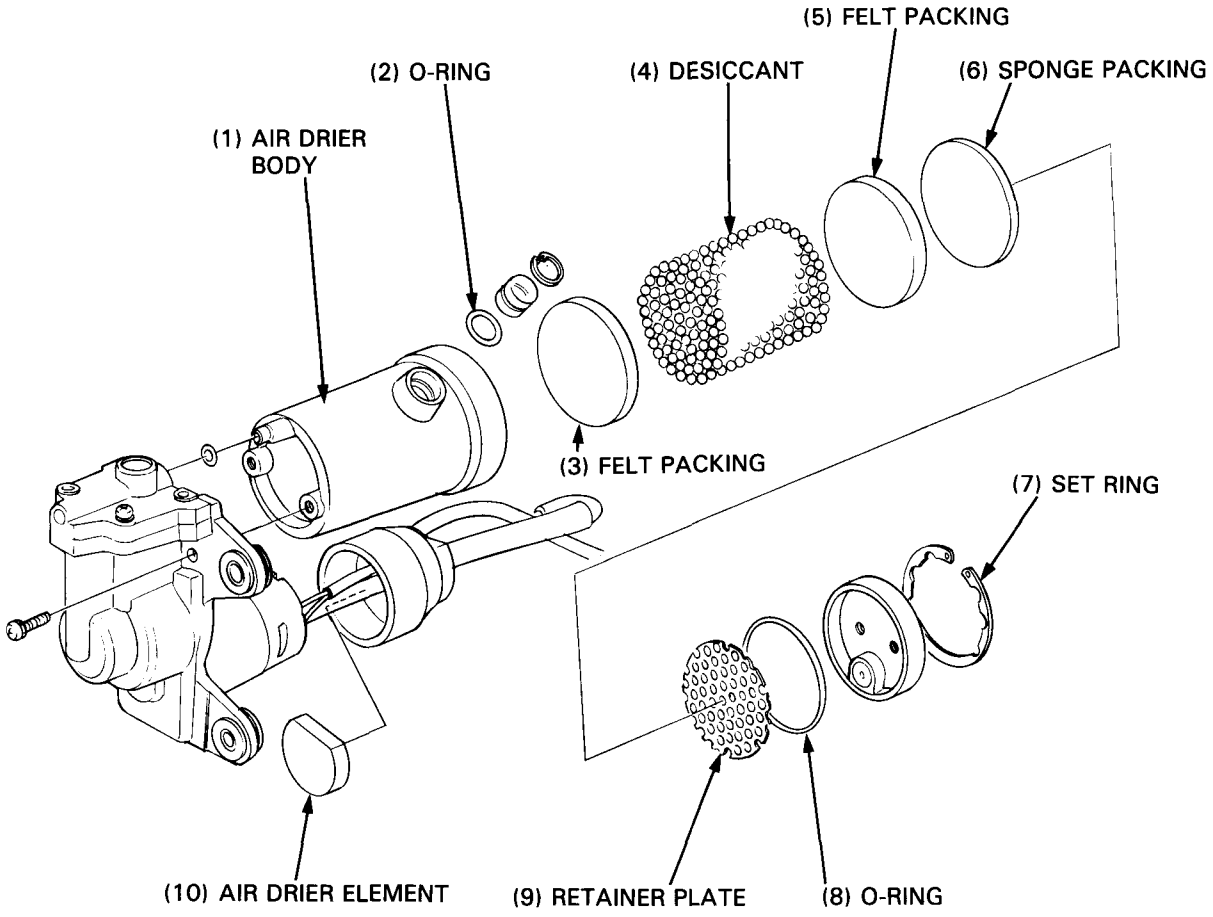
DESICCANT REPLACEMENT

NOTE

- Before disassembling, be sure to release air pressure by operating the air pressure control switch.

Remove the air pump from the frame and disconnect air hoses from the drier (page 14-28).

Remove the set ring from the air drier cover.
Discard the desiccant and clean the inside of the drier body with clean and dry cloth.
Pack new desiccant and install them in the reverse order of removal.



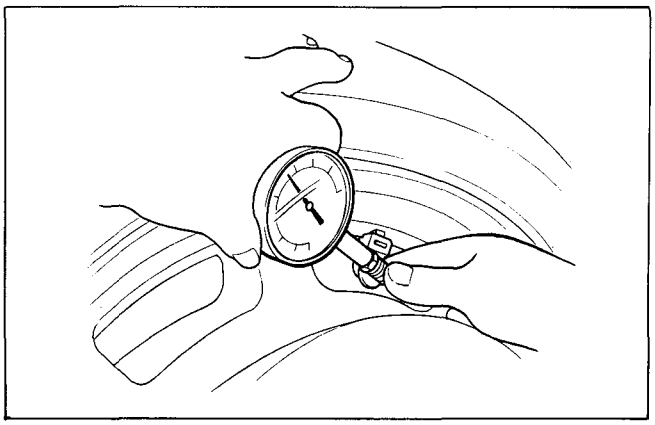
NUTS, BOLTS, FASTENERS

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

WHEELS/TIRES

NOTE

- Tire pressure should be checked when tires are COLD.



Check the tires for cuts, imbedded nails or other sharp objects, and repair or replace as required. Always replace the tire if the sidewall is punctured or damaged.

RECOMMENDED TIRES AND PRESSURES:

Tire Size		Front	Rear
		130/70-18 63H	160/80-16 75H
Cold tire pressures kPa (kg/cm^2, psi)	Driver and Passenger	225 (2.25, 33)	280 (2.80, 41)
	Driver only	225 (2.25, 33)	250 (2.50, 36)
Tire Brand Tubeless Only Dunlop		K177F	K177

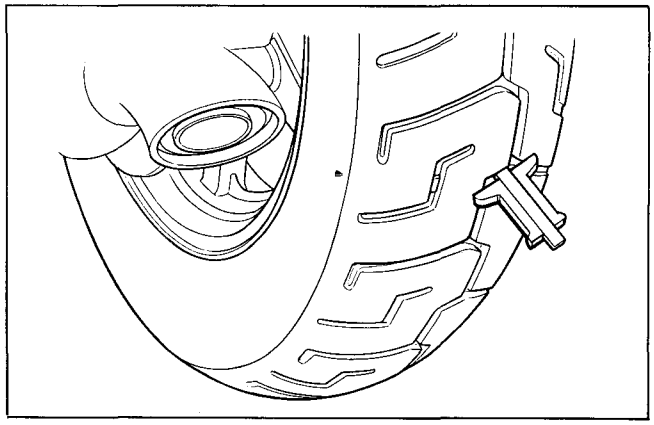
Check the front and rear wheels for rim runout (section 13).

Replace the tires before tread depth at the center of the tire reaches the following limit:

Minimum Tread Depth:
Front: 1.5 mm (0.06 in)
Rear: 2.0 mm (0.08 in)

⚠WARNING

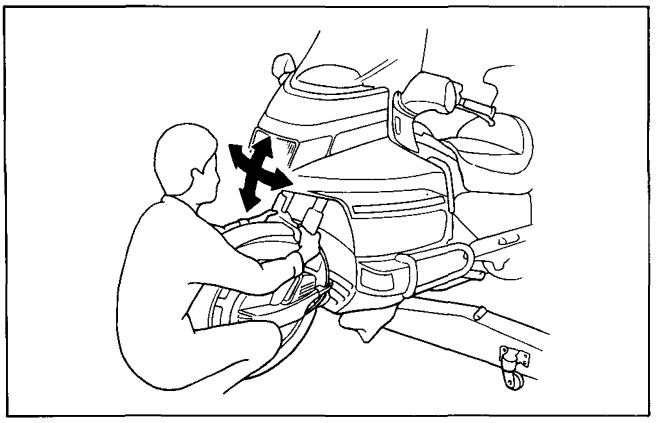
- ***The use of tires other than those listed on the tire information label may adversely affect handling.***
- ***Do not install tube-type tires on tubeless rims. The beads may not seat and the tires could slip on the rims, causing tire deflation.***
- ***Any attempt to mount passenger car tires on a motorcycle rim may cause the tire bead to separate from the rim with enough explosive force to cause serious injury or death.***



CAUTION

- *Do not try to remove tubeless tires without special tools and rim protectors. You may damage the rim sealing surface or disfigure the rim.*

STEERING HEAD BEARING



Raise the front wheel off the ground using a jack under the engine.

CAUTION

- *Do not use the oil filter as a jack point.*

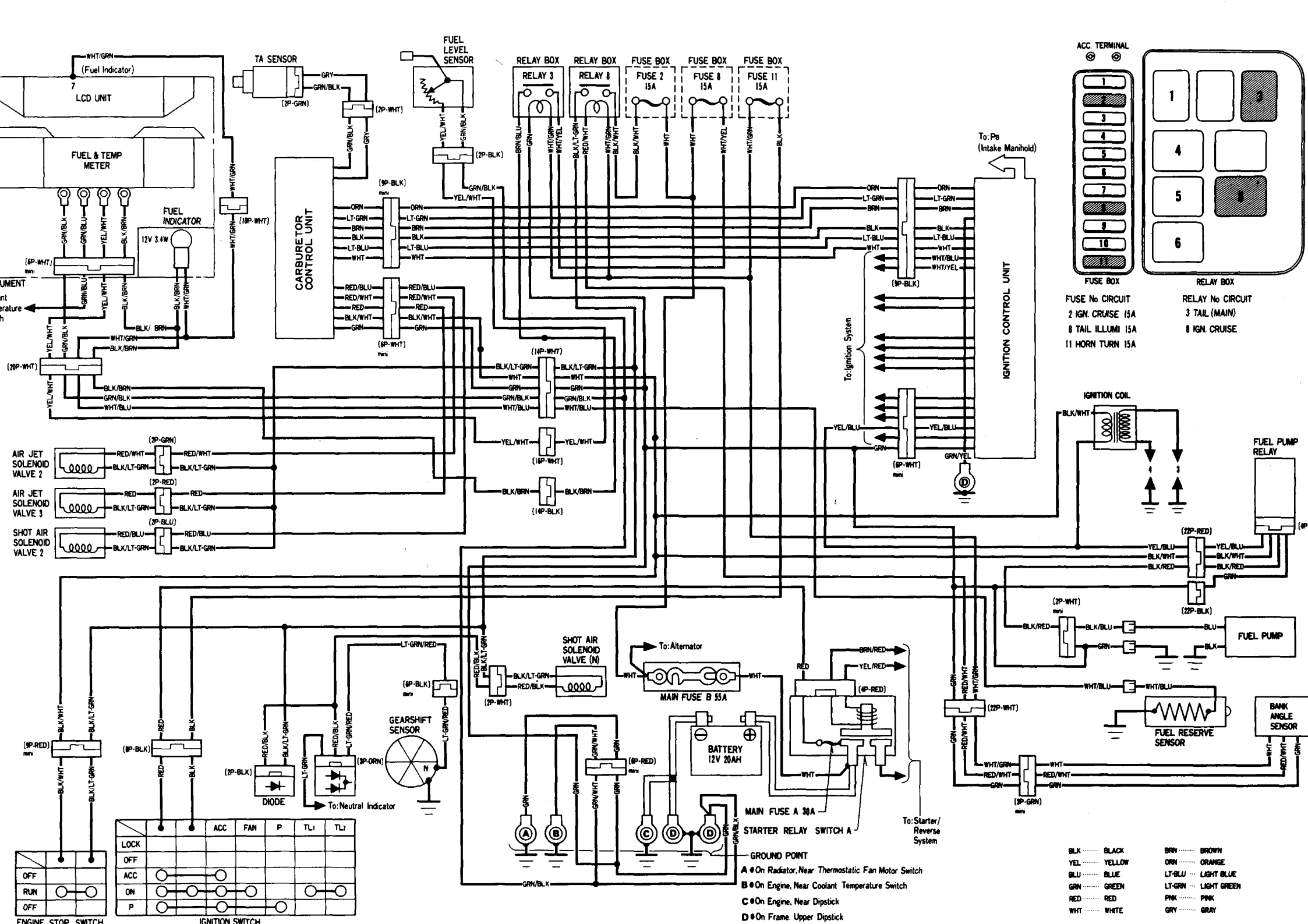
Check that the front wheel turns freely and smoothly from full left to full right.

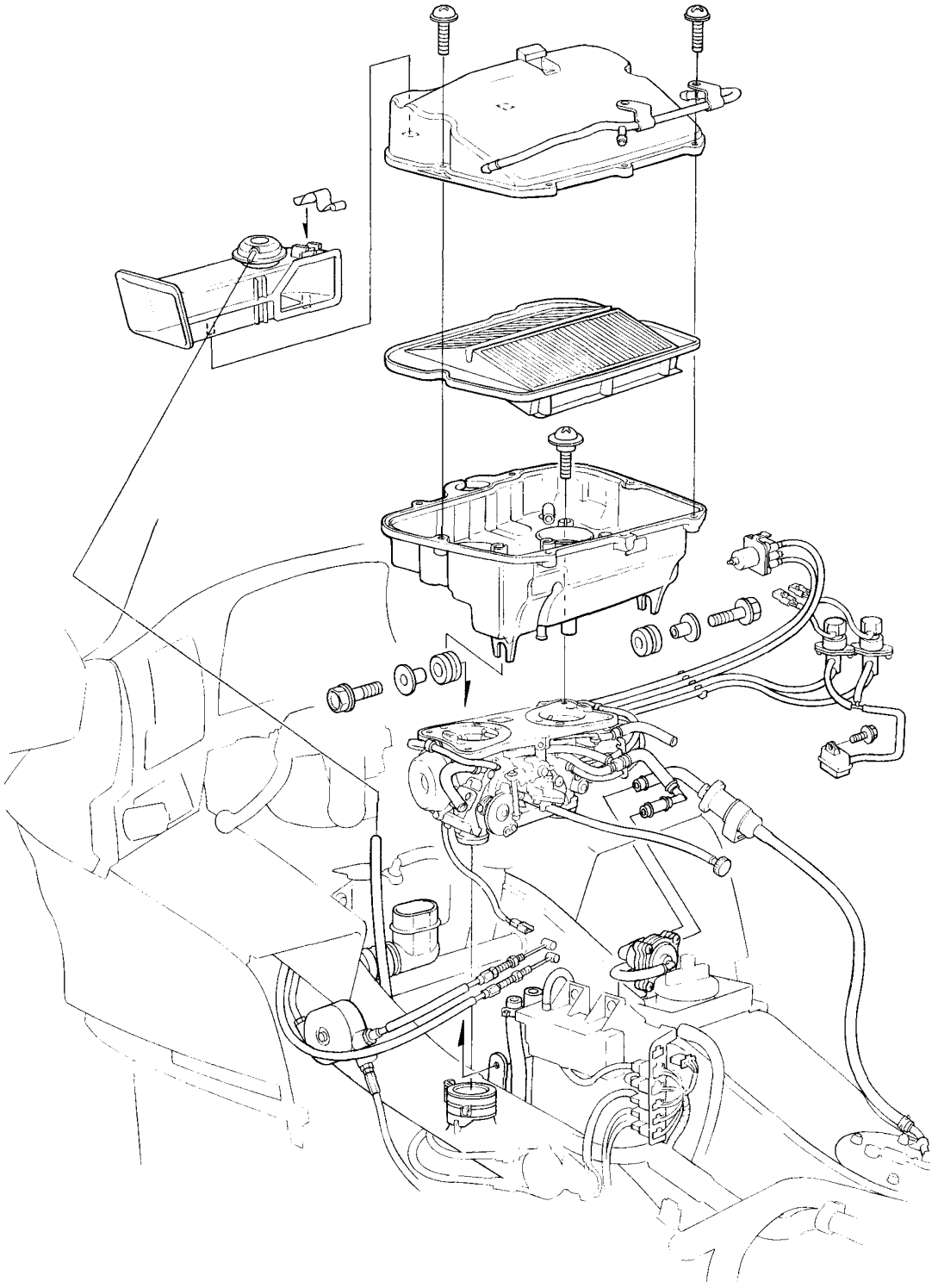
NOTE

- Check that the control cables are routed correctly and do not interfere with steering.

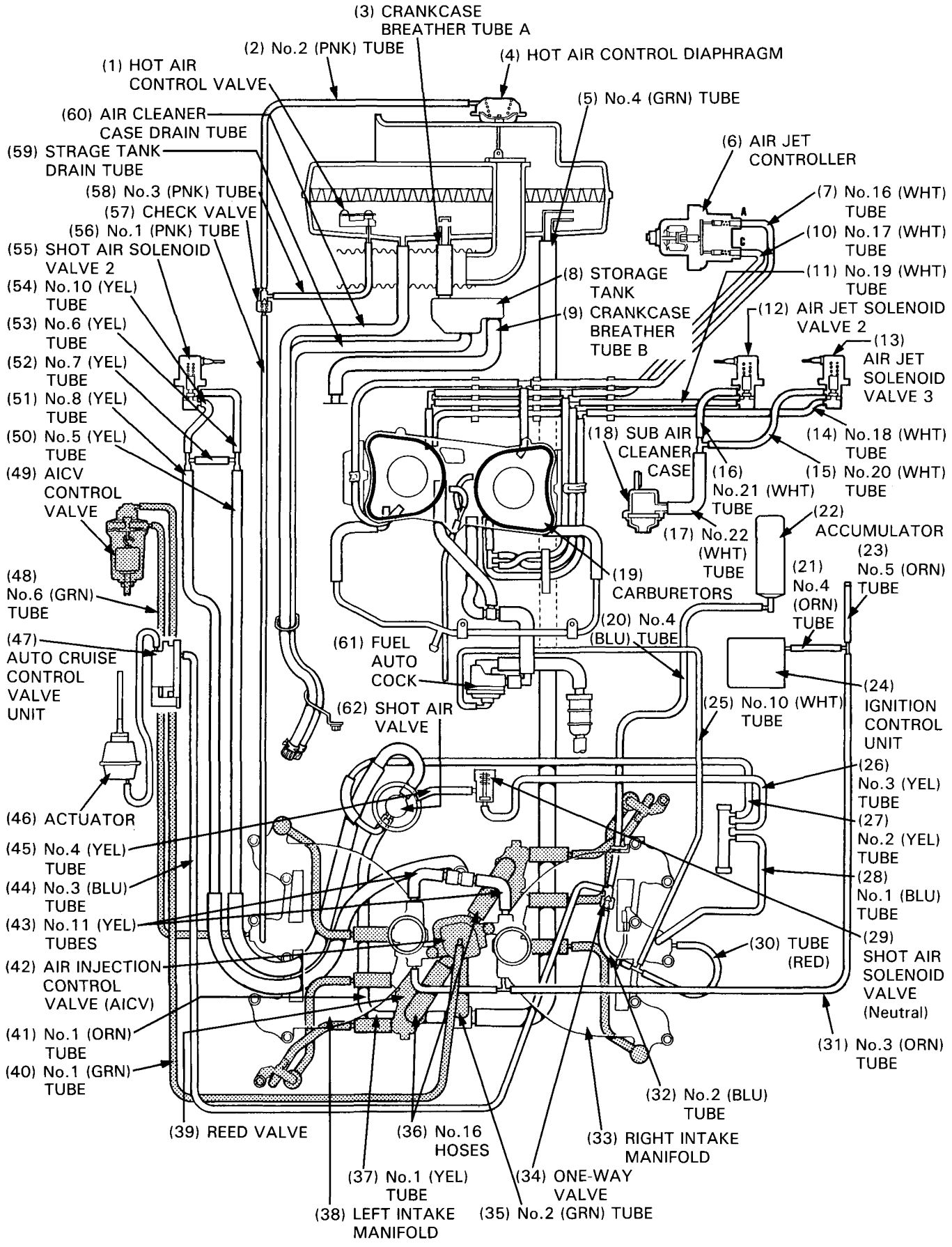
Push and pull on the fork sliders and check that there is no free play or looseness.

If the steering head bearings do not pass these tests, inspect them for damage and proper adjustment (section 13).

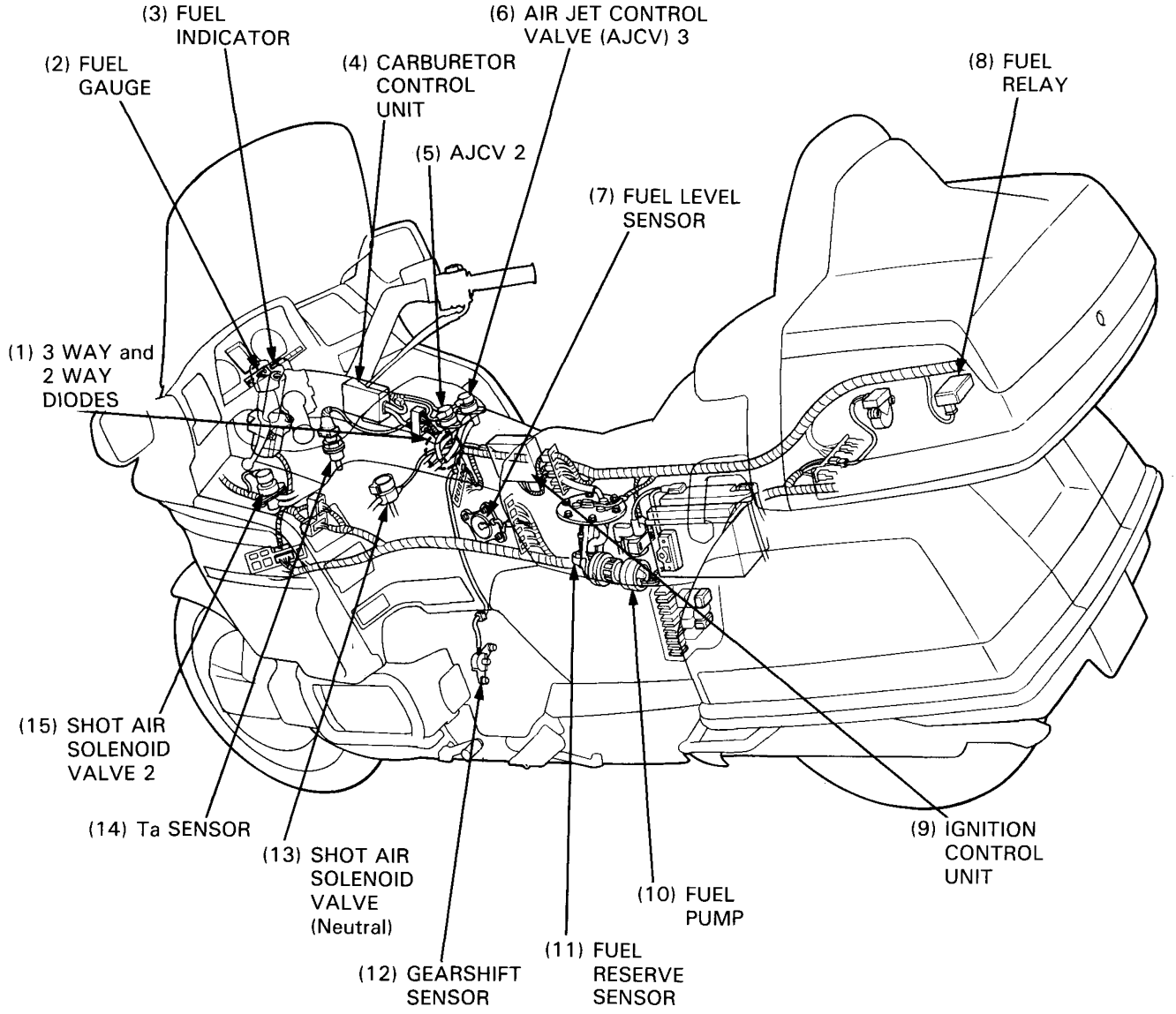

LCD UNIT
(Fuel Indicator)
FUEL & TEMP METER
FUEL INDICATOR
12V 3.4W
TA SENSOR
FUEL LEVEL SENSOR
CARBURETOR CONTROL UNIT
RELAY BOX
RELAY 3
RELAY 8
FUSE BOX
FUSE 2 15A
FUSE 8 15A
FUSE 11 15A
To: Pв (Intake Manihold)
IGNITION CONTROL UNIT
To: Ignition System
ACC. TERMINAL
FUSE BOX
RELAY BOX
FUSE No CIRCUIT
2 IGN. CRUISE 15A
8 TAIL ILLUMI 15A
11 HORN TURN 15A
RELAY No CIRCUIT
3 TAIL (MAIN)
8 IGN. CRUISE
IGNITION COIL
FUEL PUMP RELAY
FUEL PUMP
FUEL RESERVE SENSOR
BANK ANGLE SENSOR
AIR JET SOLENOID VALVE 2
AIR JET SOLENOID VALVE 3
SHOT AIR SOLENOID VALVE 2
SHOT AIR SOLENOID VALVE (N)
To: Alternator
MAIN FUSE B 55A
MAIN FUSE A 30A
STARTER RELAY SWITCH A
To: Starter/ Reverse System
BATTERY 12V 20AH
GEARSHIFT SENSOR
DIODE
To: Neutral Indicator
ENGINE STOP SWITCH
IGNITION SWITCH
LOCK
OFF
ACC
ON
P
FAN
TL1
TL2
GROUND POINT
A ●On Radiator, Near Thermostatic Fan Motor Switch
B ●On Engine, Near Coolant Temperature Switch
C ●On Engine, Near Dipstick
D ●On Frame, Upper Dipstick
BLK ..... BLACK
YEL ..... YELLOW
BLU ..... BLUE
GRN ..... GREEN
RED ..... RED
WHT ..... WHITE
BRN ..... BROWN
ORN ..... ORANGE
LT-BLU ... LIGHT BLUE
LT-GRN ... LIGHT GREEN
PNK ..... PINK
GRY ..... GRAY



HOSES AND TUBES ROUTING/CONNECTION (▒▒: SW MODEL ONLY)



SYSTEM LOCATION



SERVICE INFORMATION

GENERAL

⚠WARNING

- *Gasoline is extremely flammable and is explosive under certain conditions. Work in a well ventilated area. Do not smoke or allow flames or sparks in the work area.*
- *The pressure inside the fuel tank might increase, because the fuel tank cap is equipped with the relief valve. Then, if the fuel line is disconnected, the gasoline would flood out.*
  If so, you must remove the fuel tank cap first.

CAUTION

- *Do not bend or twist control cables. Damaged control cables will not operate smoothly and may stick or bind.*
- *Connect each numbered tube to the correspondingly numbered part of the solenoide valve, or air system will not work properly.*

NOTE

- If vehicle is to be stored for more than one month, drain the float chambers. Fuel left in the float chambers may cause clogged jets resulting in hard starting or poor driveability. To drain the chambers, remove the radiator shroud (page 12-9) to gain access to the drain plugs, and then insert the screwdriver and rotate the drain plugs.

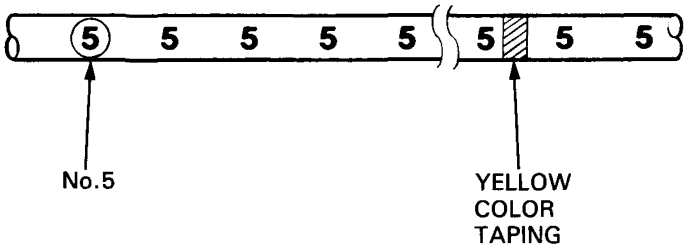
- Refer to section 3 for throttle/choke cable adjustment.
- The vacuum chambers, accelerator pump and starter valve can be removed without removing the carburetor assembly.
- The float chambers must be serviced with carburetors disassembled.
- When inspect the fuel pump, reserve sensor, level sensor and air system, check the system components and lines step-by-step according to the troubleshooting chart.
- For replacement of the fuel gauge, see section 22.
- The following air system have the following components (not including air tubes and hoses):

Intake manifold shot air system	—Shot Air Solenoid Valve (Neutral and 2), Shot Air Valve, One-way Valve, Carburetor Control Unit, Ignition Control Unit, Palse Generator
Primary main air jet control system	—Air Jet Solenoid Valve (2 and 3), Ta Sensor, Carburetor Control Unit, Ignition Control Unit, Palse Generator, Sub Air Cleaner
High altitude compensation system	—Air Jet Controller (A.J.C.)
Hot air system	—Hot Air Control diaphragm, Hot Air Control Valve, Check Valve

- All hoses used in the fuel/air system are numbered for identification. When connecting one of these hoses, compare the hose number with the hoses and tubes routing/connection, page 4-2, and/or carburetor tubes/hoses, page 4-32.
- Always replace used O-rings and cotter pins with new ones.
- For carburetor synchronization, see section 3.

- Tube code example:

No.5 (YEL) TUBE:



SPECIFICATIONS

Fuel tank capacity 24.0 lit (6.4 US gal, 5.3 Imp gal)

Carburetor type		CV down-draft dual carburetors
Identification Number		VD GEA SW model: VD GJA
Throttle bore		36 mm (1.4 in)
Float level		8 mm (0.3 in)
Main jet		Pri: #70, 2nd: #155
Slow jet		#50
Idle speed		800 ± 80 min^{-1} (rpm)
	SW model	900 ± 50 min^{-1} (rpm)
Throttle lever free play		5–8 mm (3/16–5/16 in)
Pilot screw opening		3–1/8 turns out
Fuel pump flow capacity		640 cm^3(22.5 Imp oz)/minute
Ta sensor resistance		2.0–3.0 kohms at 20°C/68°F 200–400 ohms at 80°C/176°F
Fuel reserve sensor resistance		0.9–1.3 kohms at 25°C/77°F

TORQUE VALUE

Carburetor insulator band screw 5 N·m (0.5 kg-m, 3.6 ft-lb)

TOOLS

Common

Float level gauge 07401–0010000
Vacuum pump } equivalent commercially available
Pressure pump }

TROUBLESHOOTING

Engine cranks but won't start
- No fuel in tank
- No fuel to carburetor
  - clogged fuel tube or filter
  - faulty fuel pump or relay (next page)
  - faulty fuel auto cock (page 4-14)
  - faulty vacuum tube of fuel auto cock (page 4-14)
  - faulty vacuum tubes of cruise control system or shot air system (page 4-1)
  - clogged fuel tank cap breather hole
- Engine flooded with fuel
- No spark at plug (ignition system faulty-section 18)
- Air cleaner clogged
- Intake air leak
- Improper choke operation
- Improper throttle operation
- Incorrect choke cable free play
- Fuel tank vent blocked

After buring during deceleration
- Ignition system faulty (section 18)
- Lean mixture
- Faulty secondary air supply system (SW only)
- Faulty hoses of the emission control system (SW only)

Misfiring during acceleration
- Ignition malfunction (section 18)
- Lean mixture

Backfiring
- Ignition malfunction (section 18)
- Carburetor malfunction
- Lean mixture

Lean mixture: Insufficient fuel to cylinders
- Clogged fuel jets
- Piston stuck closed
- Faulty float valve
- Float level too low
- Fuel tank cap vent blocked
- Fuel strainer screen (fuel pump) or fuel filter clogged
- Restricted fuel line
- Intake air leak
- Restricted or faulty fuel pump/or fuel relay
- Faulty A.J.C. (high altitude compensation system/page 4-50)
- Faulty primary main air jet control system (page 4-48)

Rich mixture: Excessive fuel to cylinders
- Clogged air jets
- Faulty float valve
- Float level too high
- Starter valve stack open or damaged
- Dirty air cleaner
- Needle and seat faulty or worn
- Faulty primary main air jet control system (page 4-48)

Engine idles roughly, stalls, or runs poorly
- Air cleaner clogged
- Ignition malfunction (section 18)
- Carburetors not synchronized
- Fuel contaminated
- Intake air leak.
- Idle speed incorrect
- Rich mixture
- Lean mixture
- Low cylinder compression
- Incorrect pilot screw adjustment
- Starter valve stack open
- Faulty hoses of the emission control system (SW only)

Poor performance (driveability) and poor fuel economy
- Fuel system clogged
- Air cleaner clogged
- Ignition malfunction (section 18)
- Faulty primary main air jet control system (page 4-48)
- High altitude,
  —Faulty high altitude compensation system (page 4-50)
- In low temperature,
  —Faulty hot air system (page 4-51)
- Faulty hoses of the emission control system (SW only)

Do not operate the fuel pump for a few seconds, when turning the ignition switch ON.

ENGINE STOP SWITCH:
Check that the engine stop switch is turned to RUN.
- NO → • The engine stop switch is on OFF position. Turn the switch to RUN.
- YES → • Faulty fuel pump relay
  • Loose or poor contact of connectors

The fuel pump will not be operated well.

NOTE

- Be sure that the main fuse B, fuse 2, 8 and 11 are good. Replace any suspect fuses.

CONECTION:
Check the BLK/BLU wire connector at the fuel pump for loose or poorly contact.
- LOOSE OR POOR → • Loose or poor contact of connector
- NOT LOOSE OR POOR ↓

FUEL PUMP:
Perform the fuel pump operation test (page 4-37).
- GOOD → • Faulty fuel pump relay
- ABNORMAL ↓

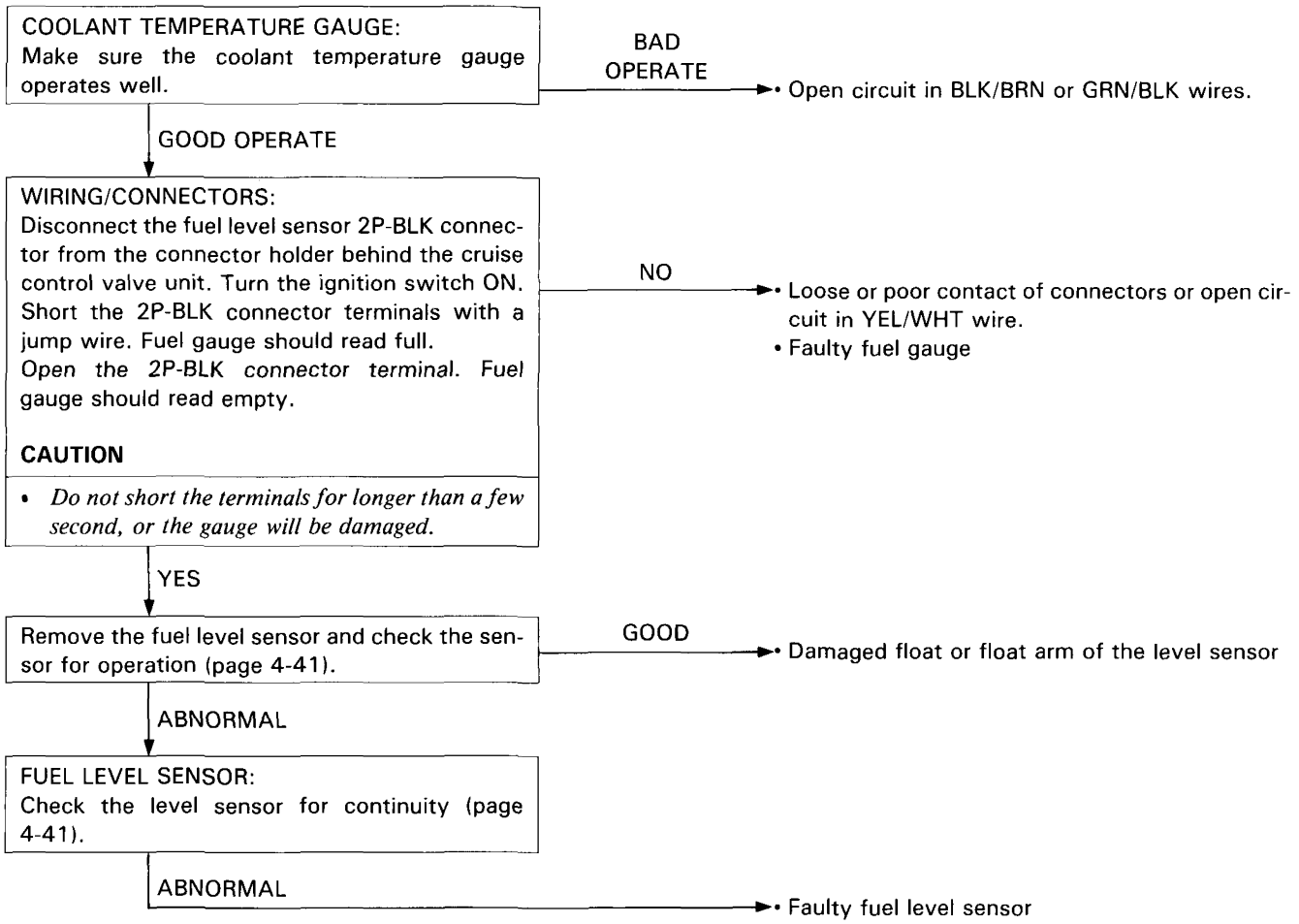
WIRING/RELAY:
Perform the fuel pump relay wiring check (page 4-37).
- ABNORMAL → • Loose or poor contact of connectors
  • Open or short circuit in wire harness
- GOOD → • Faulty fuel pump

Fuel indicator light will not come on within 3 minutes after the ignition switch has been turned ON with less than 4.0 liters (0.8 Imp gal) of fuel in the tank.

FUEL INDICATOR:
Turn the ignition switch ON and check that the fuel indicator light comes on for a few seconds, then go off.
- ABNORMAL → OTHER INDICATORS:
  With the same conditions as previous step, the "R", "CRUISE SET" and "CRUISE ON" indicators should come on and go off.
  - NO → • Faulty LCD unit
    • Loose or poor contact of instrument 10P-WHT connector
  - YES ↓ BULB:
    Check the fuel indicator bulb for burn out.
    - BURN → • Fuel indicator bulb burn out
- NORMAL ↓

FUEL RESERVE SENSOR:
Inspect the fuel reserve sensor (page 4-39).
- NOT BURNT → BULB:
  Check the fuel indicator bulb for burn out.
- GOOD → • Loose or poor contact of connectors
  • Open or short circuit in wire harness

The fuel gauge is not operated properly.

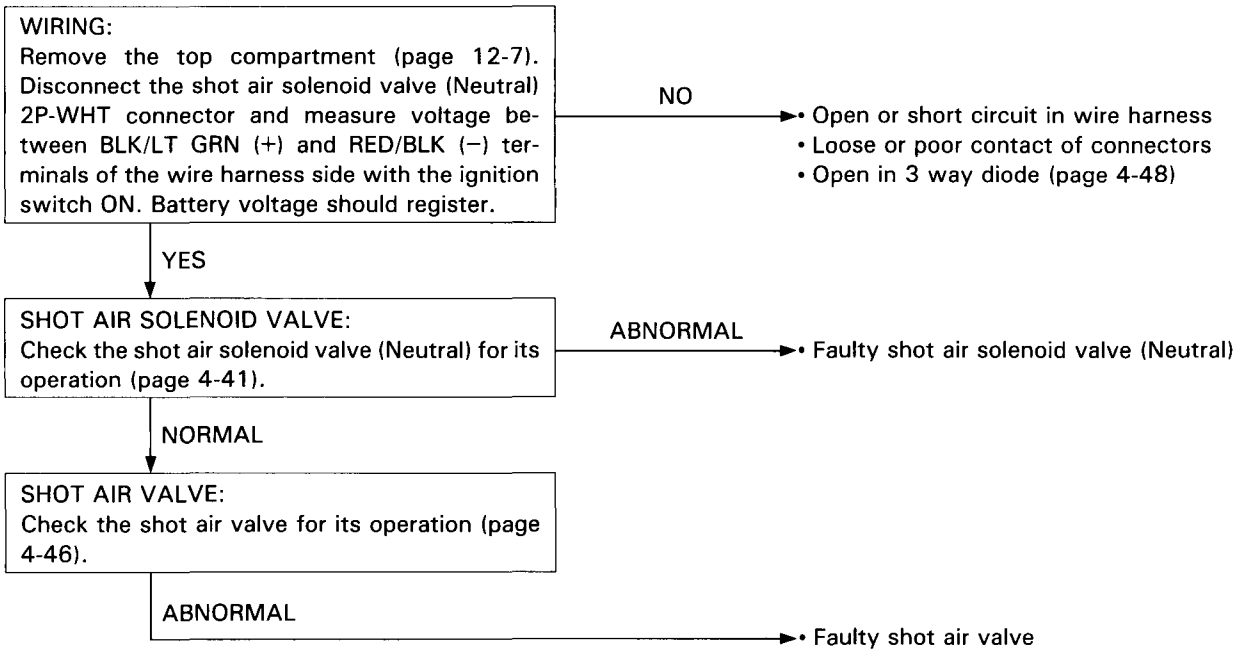


● **Intake manifold Shot Air System**

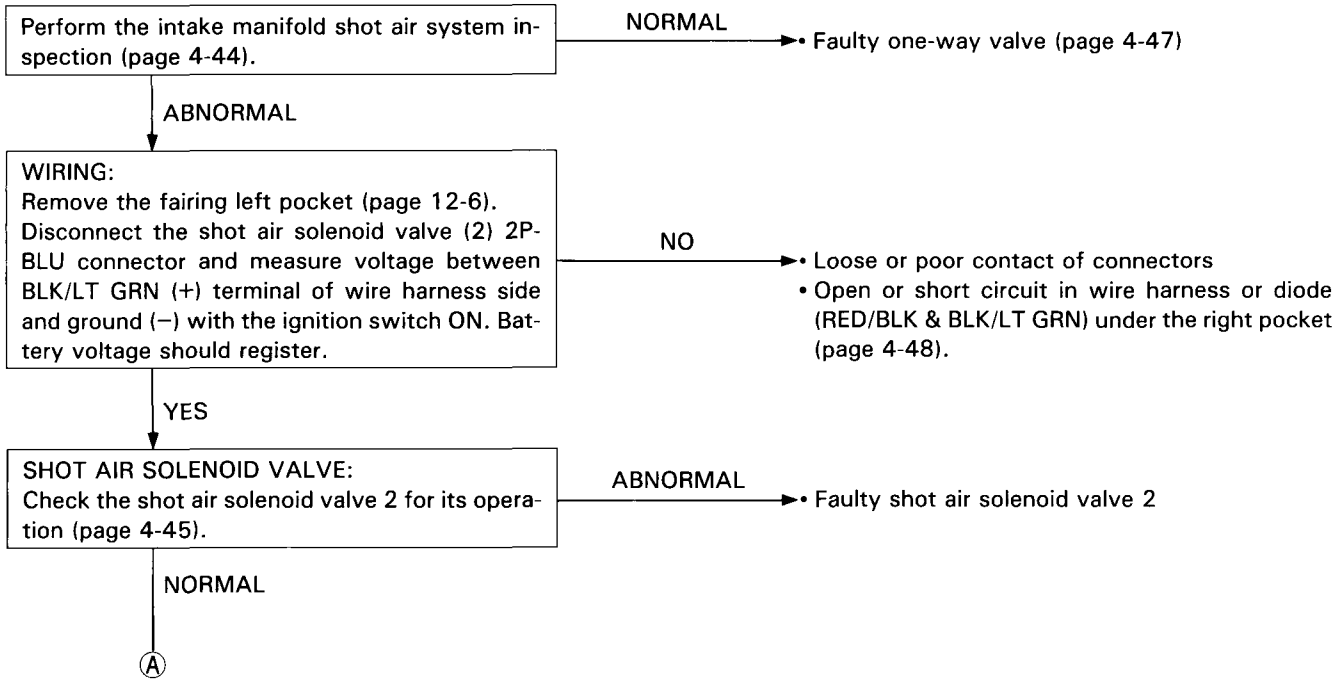
NOTE

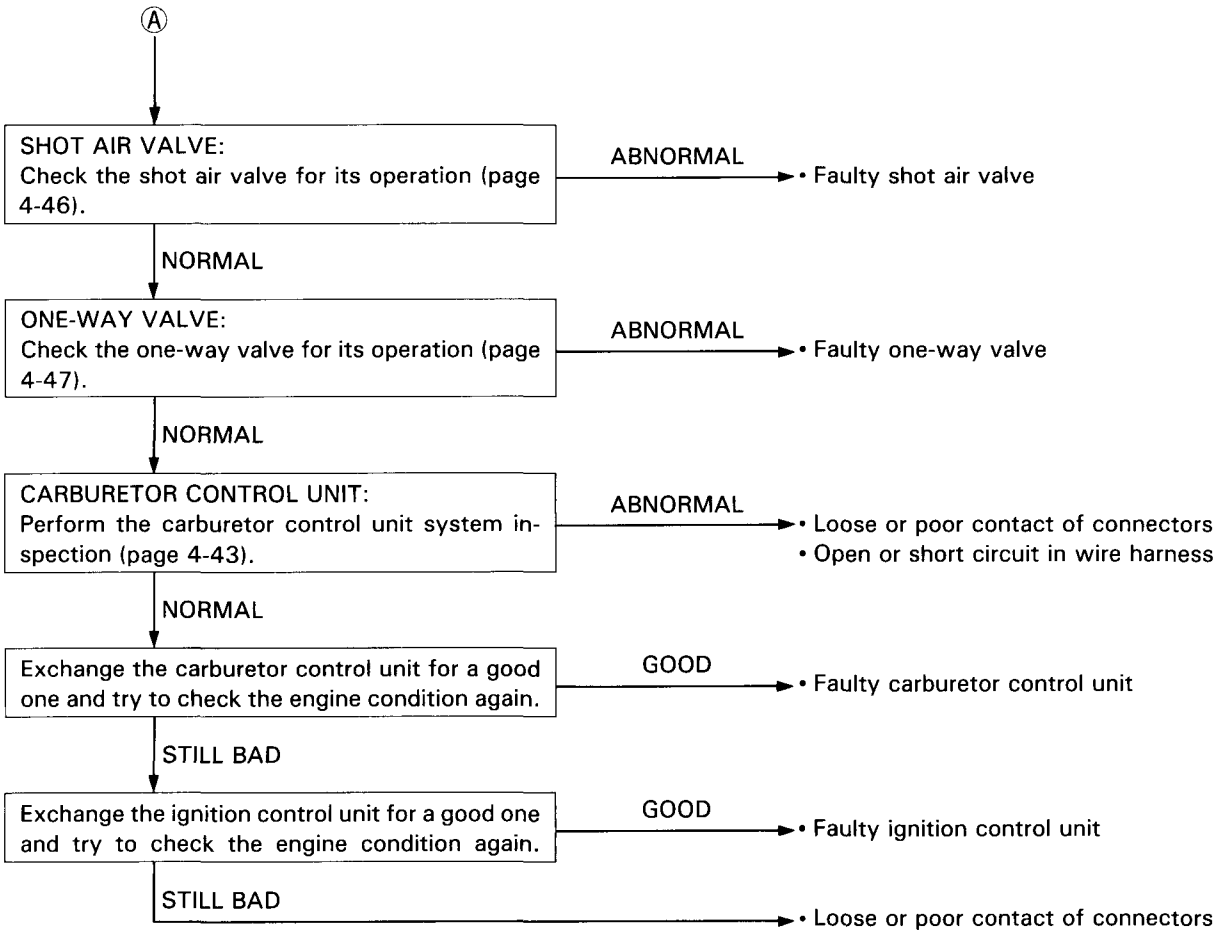
- Check the following tubes for disconnection or deterioration before troubleshooting.
  —No.1 (BLU), No.4 (GRN), No.1 (YEL), No.2 (YEL), No.3 (YEL), No.4 (YEL), No.5 (YEL), No.6 (YEL), No.7 (YEL), No.8 (YEL), No.10 (YEL) and No.11 (YEL).

With the transmission in neutral, the engine speed will not drop smoothly and mildly.



With the transmission in any gear except neutral, the engine speed will not drop smoothly and mildly.



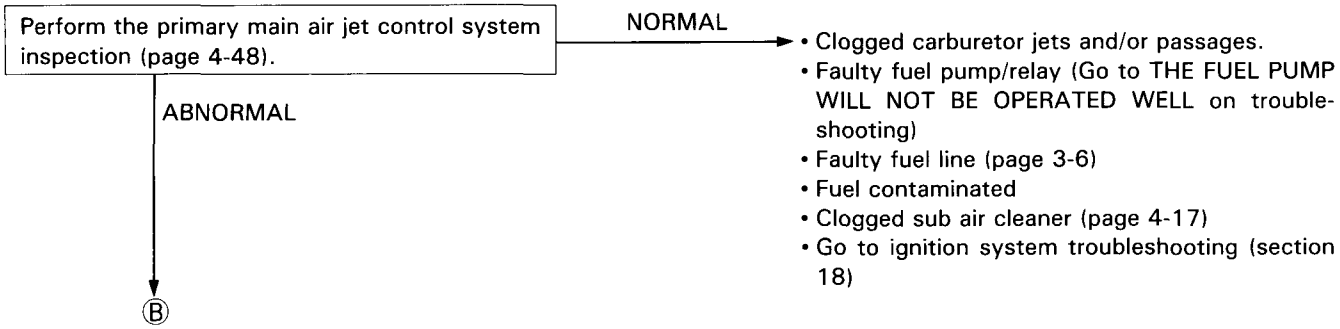


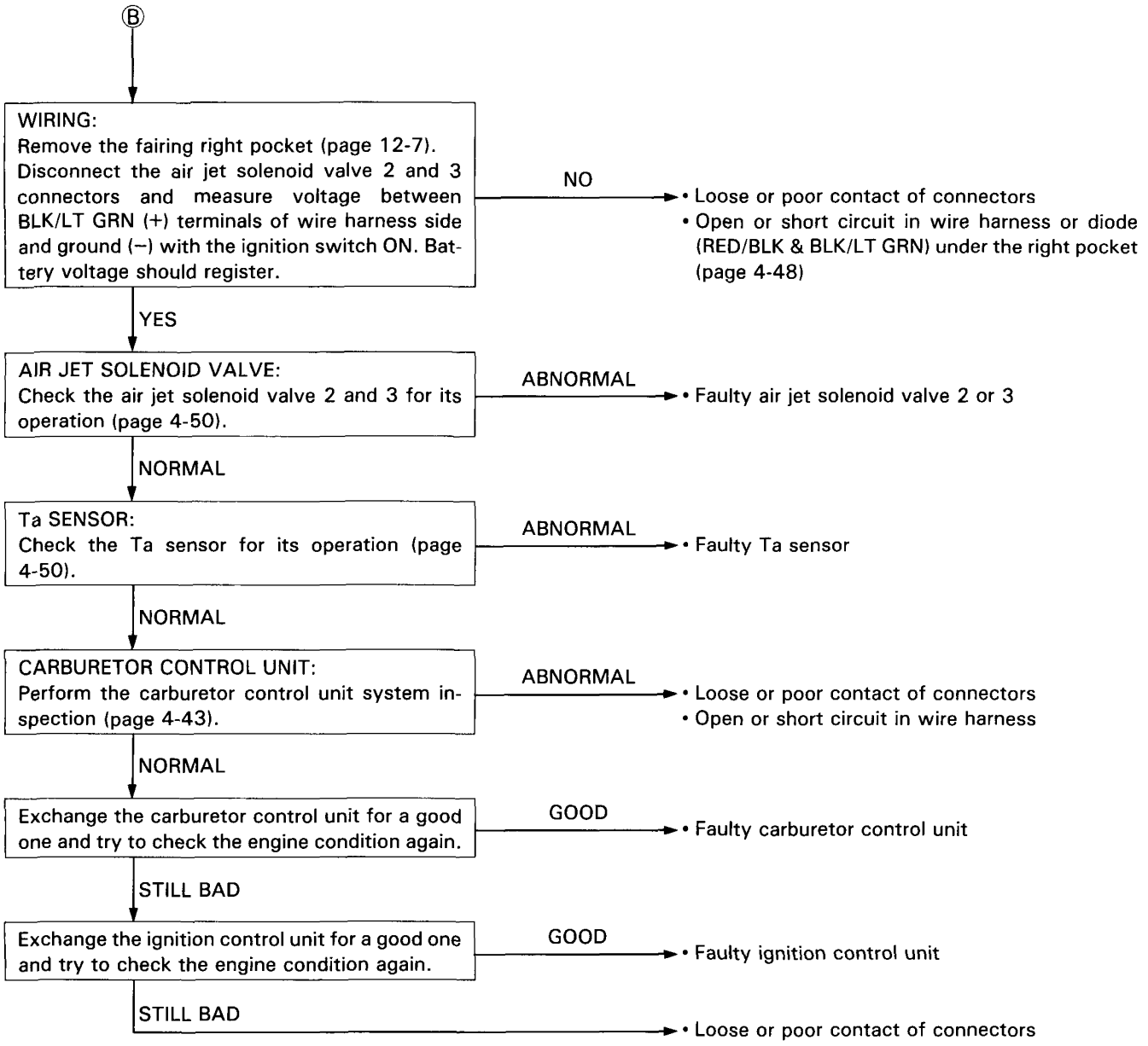
- **Primary Main Air Jet Control System**

NOTE

- *Check the following tubes for disconnection or deterioration before troubleshooting.*
  —No.18 (WHT), No.19 (WHT), No.20 (WHT), No.21 (WHT), No.22 (WHT), No.1 (ORN), No.3 (ORN), No.4 (ORN) and No.5 (ORN).

Poor performance (driveability) and poor fuel economy.




Ⓑ
WIRING:
Remove the fairing right pocket (page 12-7).
Disconnect the air jet solenoid valve 2 and 3 connectors and measure voltage between BLK/LT GRN (+) terminals of wire harness side and ground (−) with the ignition switch ON. Battery voltage should register.
NO
• Loose or poor contact of connectors
• Open or short circuit in wire harness or diode (RED/BLK & BLK/LT GRN) under the right pocket (page 4-48)
YES
AIR JET SOLENOID VALVE:
Check the air jet solenoid valve 2 and 3 for its operation (page 4-50).
ABNORMAL
• Faulty air jet solenoid valve 2 or 3
NORMAL
Ta SENSOR:
Check the Ta sensor for its operation (page 4-50).
ABNORMAL
• Faulty Ta sensor
NORMAL
CARBURETOR CONTROL UNIT:
Perform the carburetor control unit system inspection (page 4-43).
ABNORMAL
• Loose or poor contact of connectors
• Open or short circuit in wire harness
NORMAL
Exchange the carburetor control unit for a good one and try to check the engine condition again.
GOOD
• Faulty carburetor control unit
STILL BAD
Exchange the ignition control unit for a good one and try to check the engine condition again.
GOOD
• Faulty ignition control unit
STILL BAD
• Loose or poor contact of connectors

- **High Altitude Compensation System**

High altitude riding: poor performance (driveability) and poor fuel economy.

AIR TUBES:
Check the No.16 (WHT) and No.17 (WHT) tubes for disconnection or deterioration.
→ ABNORMAL → • Disconnected or deteriorated tubes
↓ NORMAL

AIR TUBES:
Check the No.16 and No.17 tubes for reverse connection (page 4-50).
→ REVERSE CONNECTION → • Reverse connected tubes
↓ NORMAL CONNECTION

CARBURETOR:
Check the carburetor for clogged air jets and passages.
→ CLOGGED → • Clogged carburetor jets and/or passages
↓ NOT CLOGGED → • Faulty air jet controller (A.J.C.)

- **Hot Air System & Accelerator Pump System**

Low temperature riding: poor performance (driveability) and poor fuel economy.

NOTE

- Check the following tubes for disconnection or deterioration before troubleshooting.
  —No.1 (PNK), No.2 (PNK) and No.3 (PNK).

HOT AIR PIPE:
Check the hot air pipe for disconnections of the hot air chamber (left exhaust pipe) and/or air cleaner duct.
→ DISCONNECTION → • Disconnected hot air pipe
↓ CONNECTED

HOT AIR CONTROL DIAPHRAGM:
Check the hot air control diaphragm for its operation (page 4-51).
→ ABNORMAL → • Faulty hot air control diaphragm
• Faulty installed control diaphragm
↓ NORMAL

HOT AIR CONTROL VALVE:
Check the hot air control valve for its operation (page 4-51).
→ ABNORMAL → • Faulty hot air control valve
↓ NORMAL

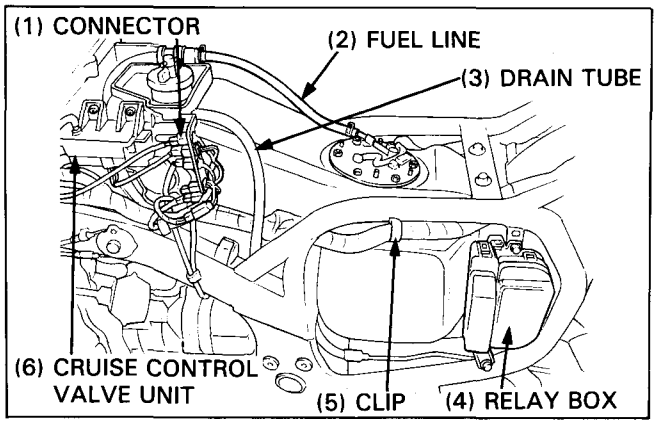
CHECK VALVE:
Check the check valve for its operation (page 4-52).
→ ABNORMAL → • Faulty check valve
↓ NORMAL

HOT AIR PIPE:
Remove the hot air pipe (page 4-52) and check the pipe for damage or deterioration.
→ ABNORMAL → • Faulty hot air pipe
↓ NORMAL → • Clogged intake manifold vacuum pipe
• Faulty accellation pump thermo valve (into the pump cover)

FUEL TANK

REMOVAL

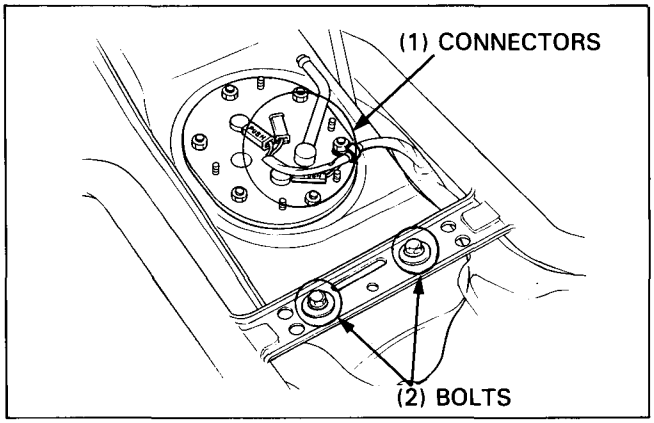
Disconnect the fuel line from the fuel pump.
Remove the auto cruise control valve unit and connector holder from the fuel tank.
Remove the relay box from the frame.
Release the main wire harness from the clip.
Disconnect the fuel unit 2P-BLK connector of the connector holder.
Disconnect the fuel drain tube from the fuel tray.



Disconnect the fuel pump and reserve sensor connectors from the fuel pump.
Remove the fuel tank mounting bolts.

NOTE

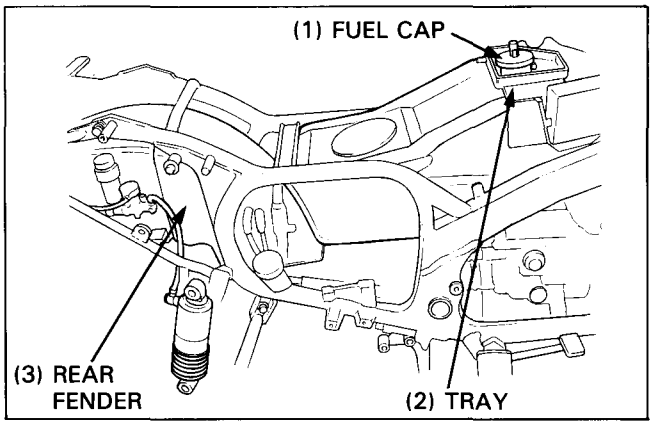
- Disconnect the BLK/BLU and WHT/BLU wire connectors, pushing the "PUSH" marked tabs.



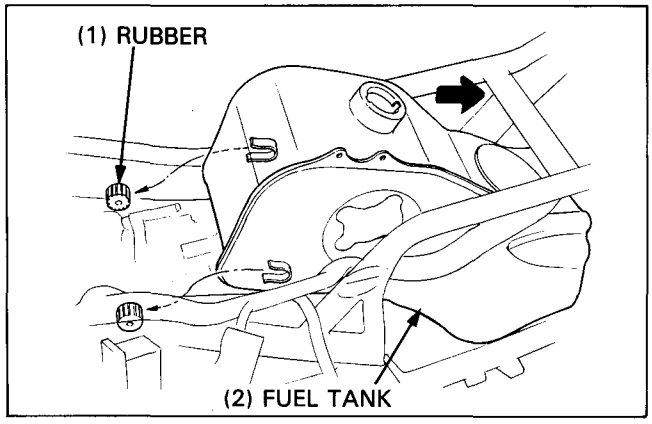
Remove the following:
– rear fenders (page 12-14).
– fuel tank cap.
– fuel tray.

⚠ WARNING

- ***Keep gasoline away from flames or sparks. Wipe up spilled gasoline at once. Empty gasoline out of the fuel tank into the clean tank using the same procedure used for the fuel pump operation test (page 4-37).***



Remove the fuel tank out the rear of the frame.
Remove the fuel tank front rubbers.

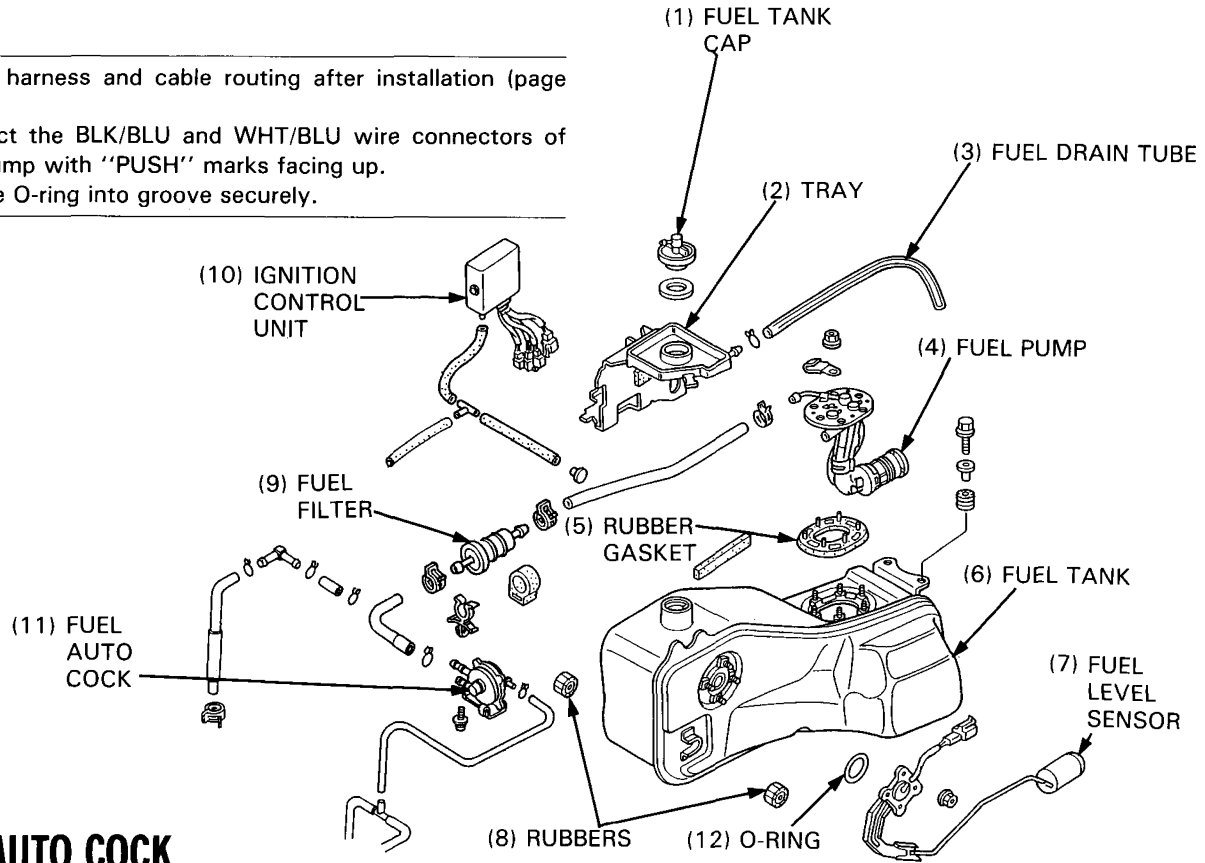


INSTALLATION

Install the fuel tank in the reverse order of removal.

NOTE

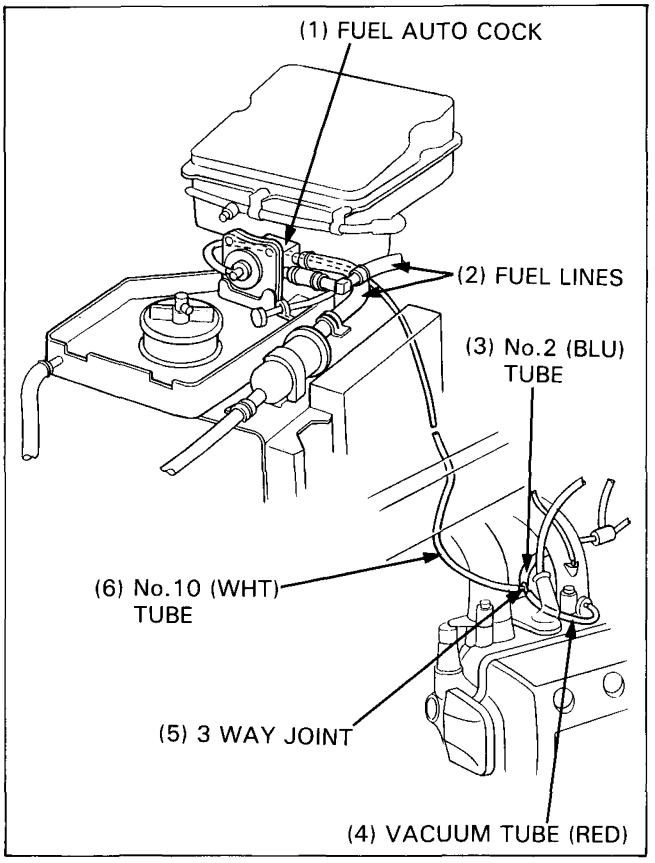
- Check harness and cable routing after installation (page 1-13).
- Connect the BLK/BLU and WHT/BLU wire connectors of fuel pump with "PUSH" marks facing up.
- Set the O-ring into groove securely.



FUEL AUTO COCK

INSPECTION

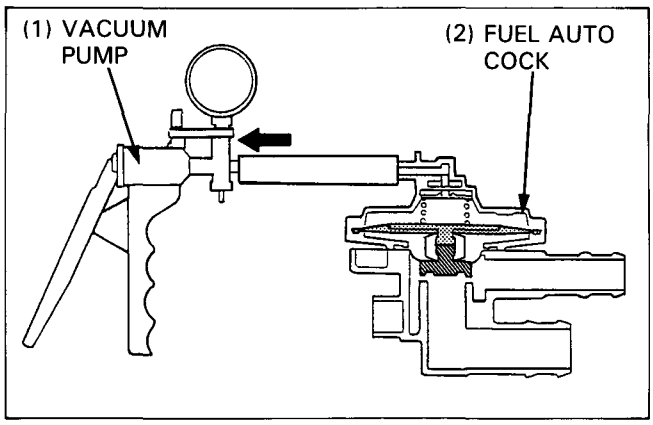
Check No. 10 (WHT) tube, 3 way joint and vacuum tube (RED) for clogging, bend or looseness.
Check the fuel lines for improper connections.



Connect a vacuum pump as shown.
Apply the specified vacuum to the fuel auto cock.

SPECIFIED VACUUM: 200 mmHg (7.9 inHg)

Vacuum should be maintained.
If the vacuum is not held, replace the auto cock.

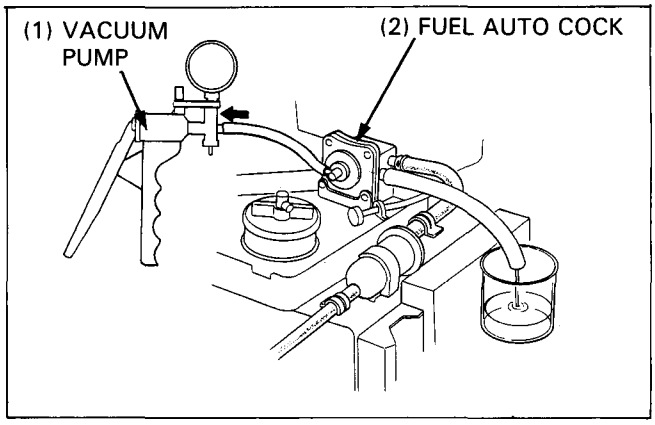


Disconnect the fuel outlet line from the fuel auto cock. Connect a suitable tube to the auto cock outlet port and hold a graduated beaker under the tube.

Short the BLK/WHT and BLK/RED wire connector terminals of fuel pump relay (page 4-37/fuel pump operation test).

Turn the ignition switch ON and the engine stop switch RUN. The gasoline should not flow out.

Then, keeping on above conditions, apply vacuum to the auto clock.
Vacuum should be maintained and the gasoline should flow out smoothly.
Replace the auto cock if necessary.

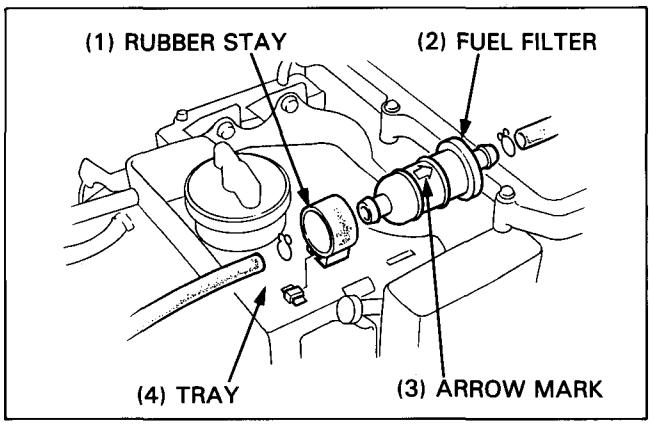


FUEL FILTER

⚠ WARNING

- ***Gasoline is flammable and is explosive under certain conditions. Do not smoke or allow flames or sparks in your working area.***

Remove the seat and top compartment (page 12-7).
Turn the ignition switch OFF.
Remove the fuel filter with rubber stay from the fuel tank tray and check the fuel filter clog.
Loosen the hose clamps at each end of the filter.
Pull the fuel lines off the fuel line.
Replace the fuel filter with a new one, if necessary.
Install the fuel filter with its arrow pointing toward the outlet side (carburetor side).



After installing, turn the ignition switch ON and the engine stop switch RUN, and check for fuel leaks.

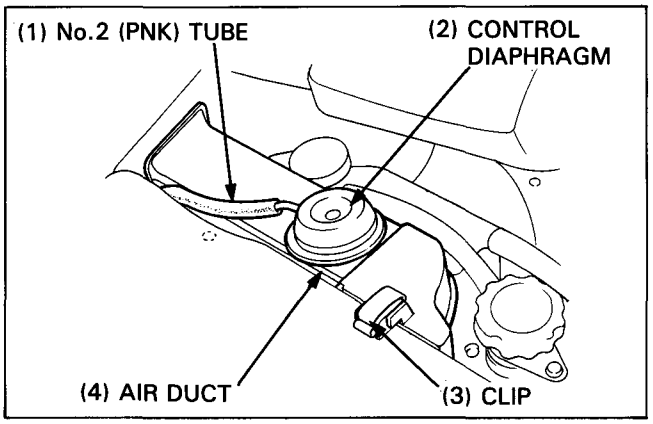
AIR CLEANER CASE

REMOVAL

Remove the top compartment (page 12-7).
Disconnect the No.2 (PNK) tube from the hot air control diaphragm.
Remove the clip and air duct.

NOTE

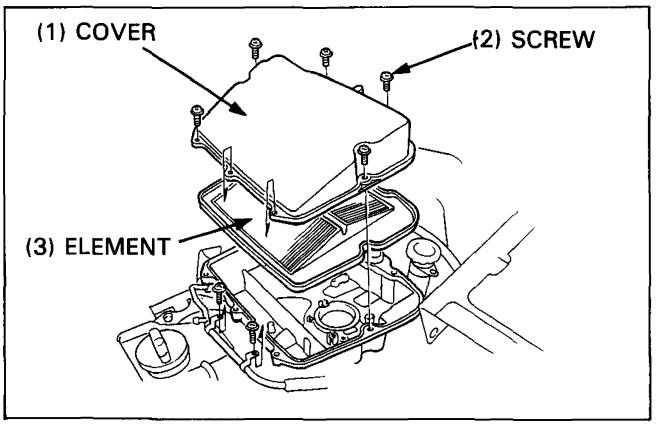
- For control valve removal, see page 4-51.



Remove seven screws and air cleaner case cover.
Remove the air cleaner element.

NOTE

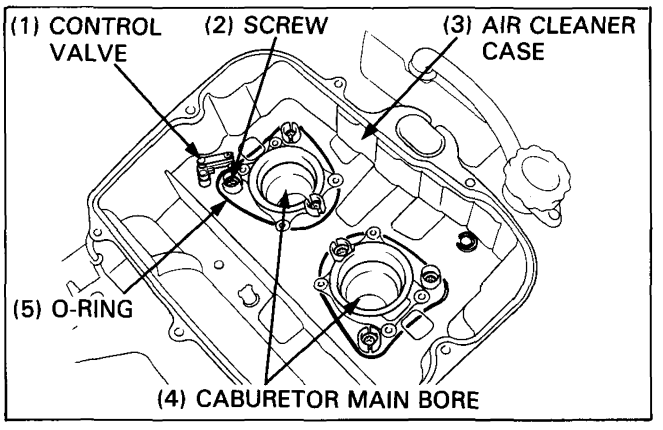
- Do not drop anything into the carburetors.



Remove six screws and air cleaner case.
Remove the O-rings from carburetor.

NOTE

- Cover carburetor main bores with a shop towel to prevent dropping anything into the carburetors.
- For hot air control valve removal, see page 4-51.

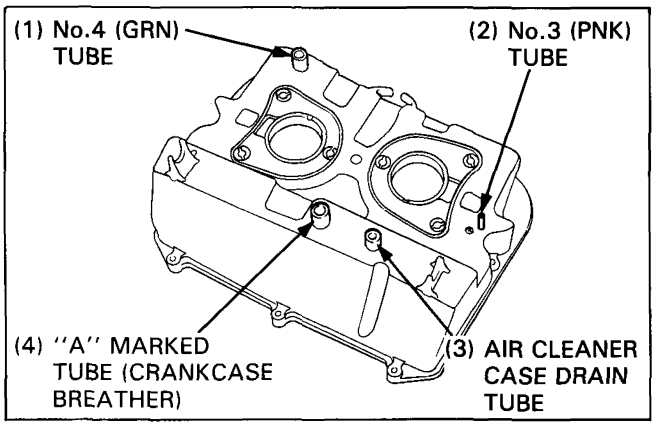


INSTALLATION

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

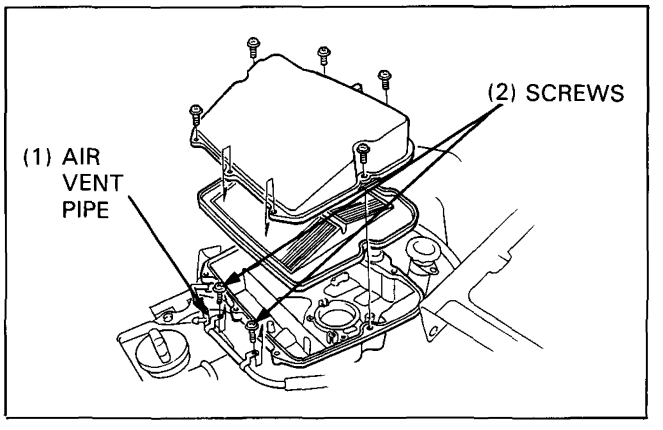
NOTE

- Connect the related hoses to the air cleaner case as shown.



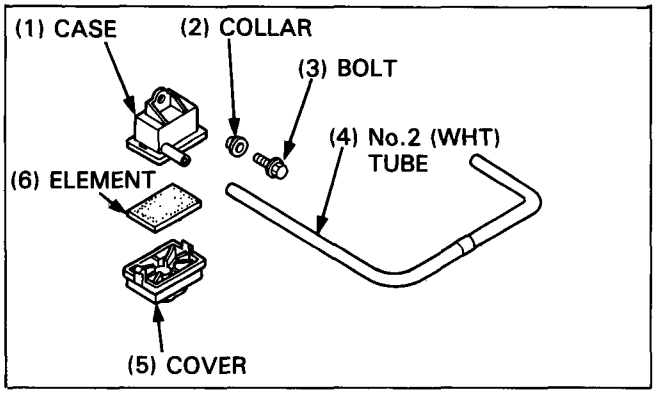
NOTE

- Install the carburetor air vent pipe with two screws properly as shown.



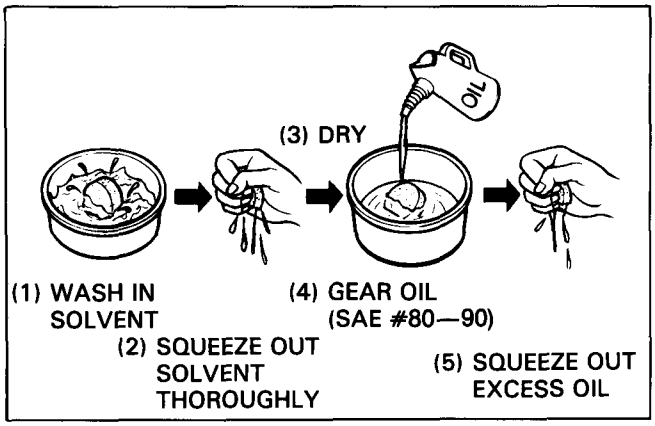
SUB AIR CLEANER CASE

Remove the right fairing inner cover (page 12-9).
Disconnect the No.2 (WHT) tube from the sub air cleaner case.
Remove the bolt and collar and remove the sub air cleaner case from the frame.
Open the case cover and remove the sub air cleaner element.
If necessary, wash up the element as below.



Wash the element in non-flammable or high flash point solvent, squeeze out the solvent thoroughly, and allow the element to dry.
Soak the element in gear oil (SAE #80—90) and squeeze out the excess.

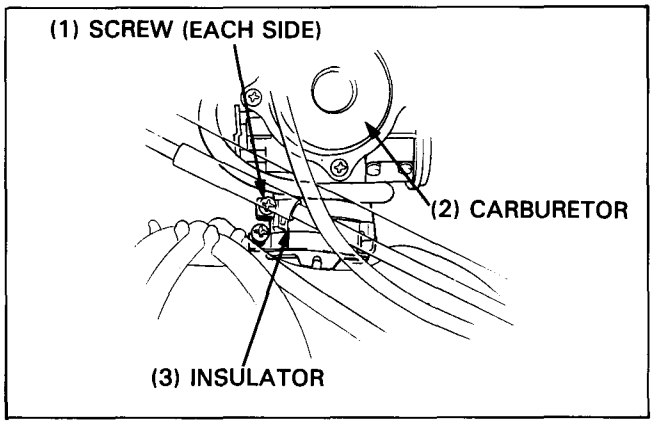
Install the sub air cleaner case in the reverse order of removal.



CARBURETOR REMOVAL

Drain coolant (page 5-7).
Remove the following:
— fairing inner covers (page 12-9).
— air cleaner case (page 4-15).

Loosen the carburetor insulator band screws (upper side, near carburetor) and remove the carburetor from insulators.

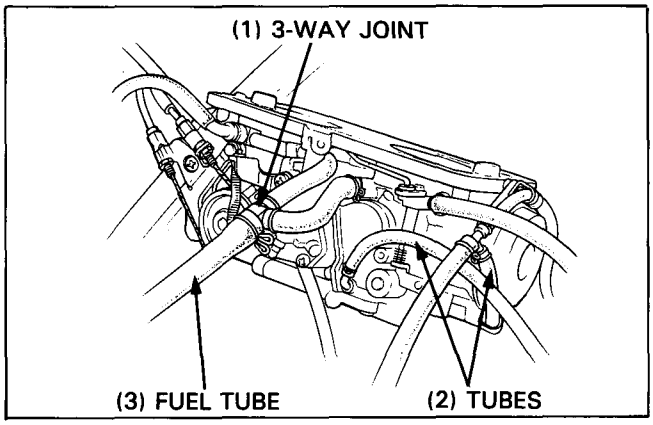


Disconnect the fuel line from the 3 way joint.

⚠ WARNING

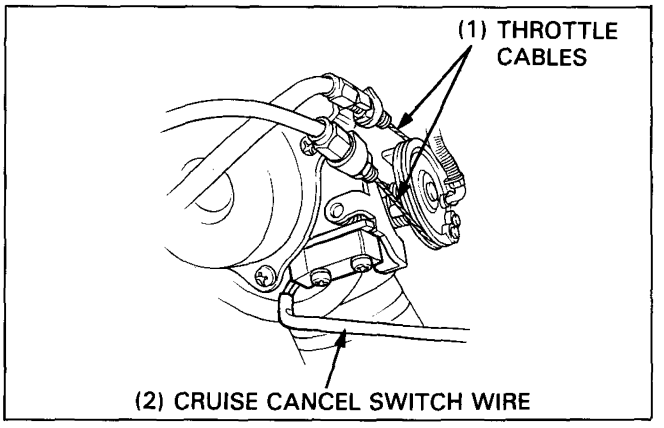
- ***Keep gasoline away from flames or sparks. Wipe up spilled gasoline at once.***

Disconnect all air and fuel vapor tubes from carburetors.

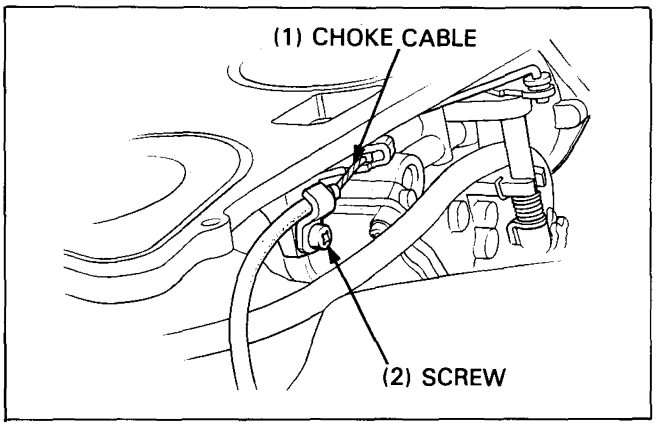


Disconnect the 2P-BLU connector of the cruise cancel switch (throttle) of the connector holder behind the auto cruise control valve.

Disconnect the throttle cables from the throttle drum by loosening the cable lock nuts.



Loosen the choke cable holder screw and disconnect the choke cable.

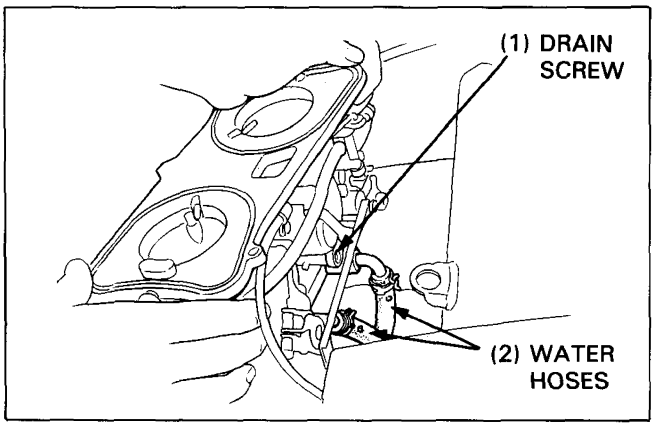


Disconnect water hoses from the carburetor heat riser.
Remove carburetor assembly.

NOTE

- Place a suitable container under the carburetor to catch residual coolant from the carburetor heat riser.
- Cover intake manifold bores with a shop towel to prevent dropping anything into the engine.

After removal, drain fuel out of the float chambers into a suitable container by loosening drain screws.
For intake manifold service, see page 4-34.

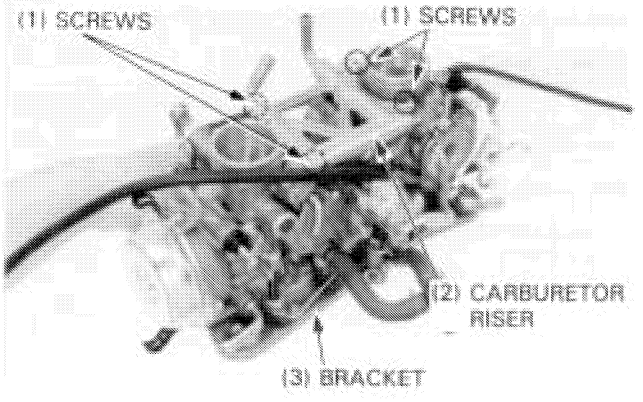


⚠ WARNING

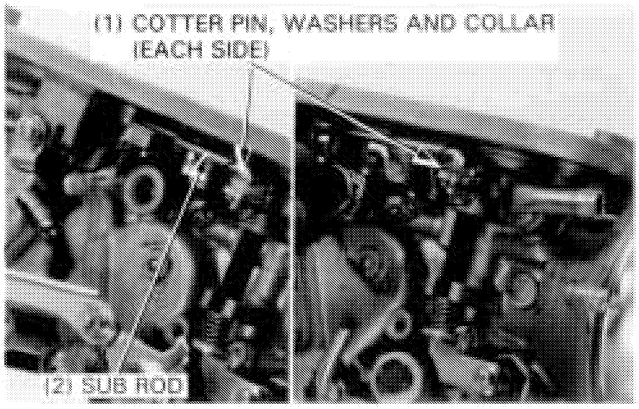
- ***Keep gasoline away from flames or sparks. Wipe up spilled gasoline at once.***

CARBURETOR SEPARATION

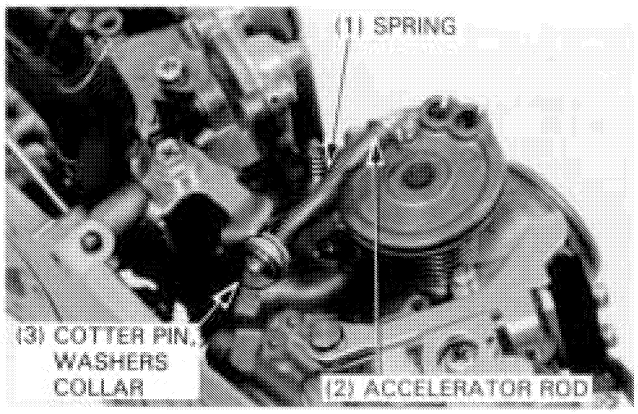
Remove four screws and carburetor heat riser.
Loosen the bracket screws; do not still remove them.



Remove the cotter pin, washers and collar from the choke linkage sub rod at each carburetor.
Disconnect the choke linkage sub rod from the starter valve arm.



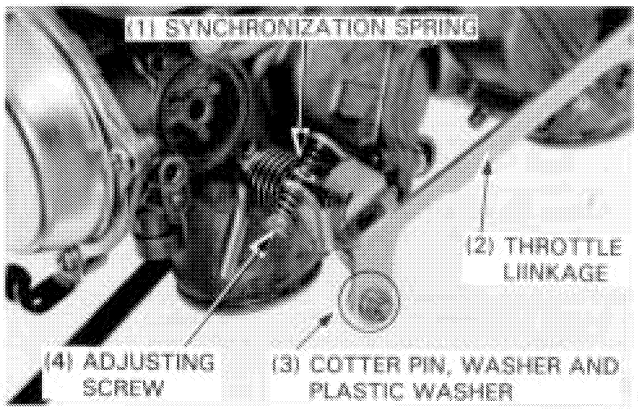
Remove the cotter pin, washers, collar and spring from the accelerator rod.
Disconnect the accelerator rod from the accelerator pump arm.



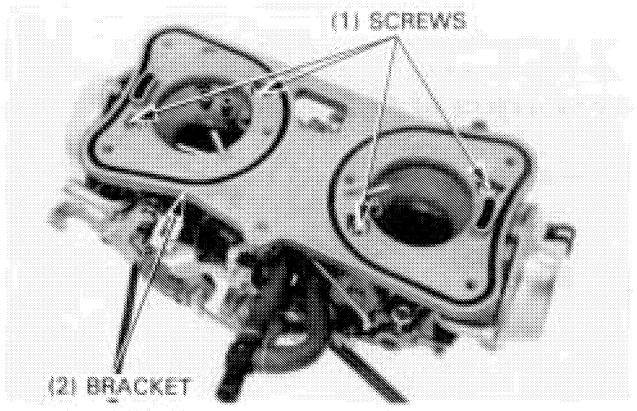
Remove the cotter pin, washer and plastic washers from the throttle linkage of the Right carburetor.

Disconnect the throttle linkage from the carburetor.

Loosen the adjusting screw and remove the synchronization spring.

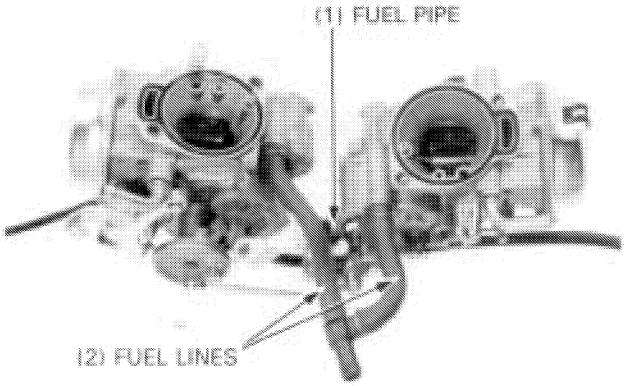


Remove four screws and carburetor bracket.

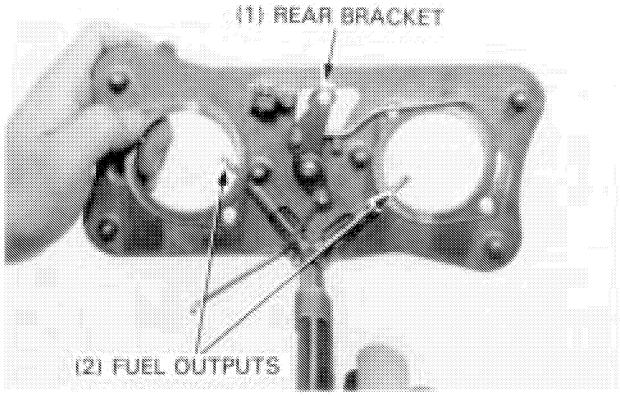


Disconnect fuel lines from each carburetor.
Remove the accelerator pump fuel pipe.

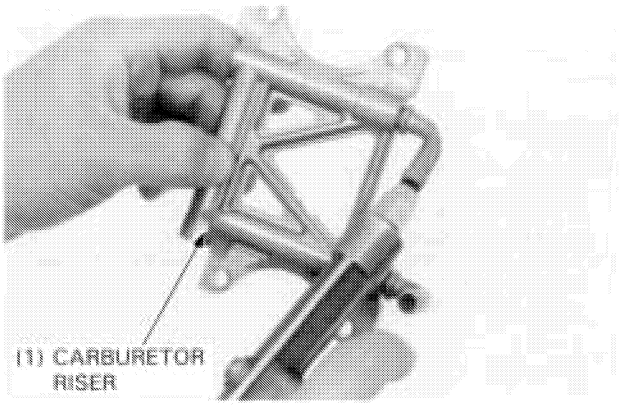
Check O-rings of the pipe for damage or fatigue.



Use compressed air to clean the accelerator pump fuel passages of the rear bracket.



Use compressed air to clean the water passages of the carburetor heat riser.



CARBURETOR DISASSEMBLY

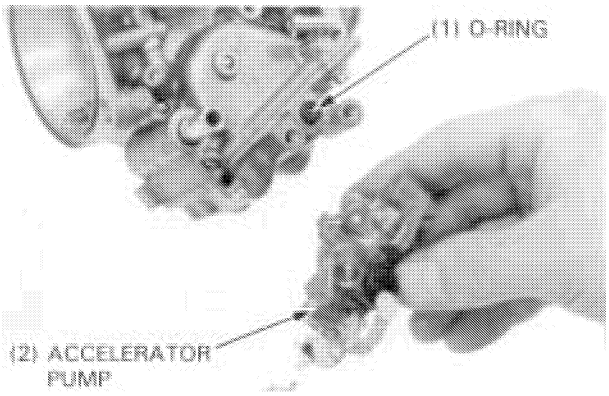
ACCELERATOR PUMP

NOTE

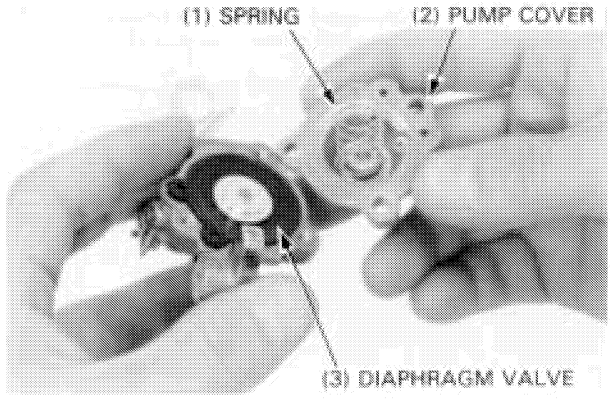
- The accelerator pump can be serviced with carburetors assembled.

Remove two screws and accelerator pump assembly from the right carburetor float chamber.

Remove the O-ring and check it for fatigue or damage.

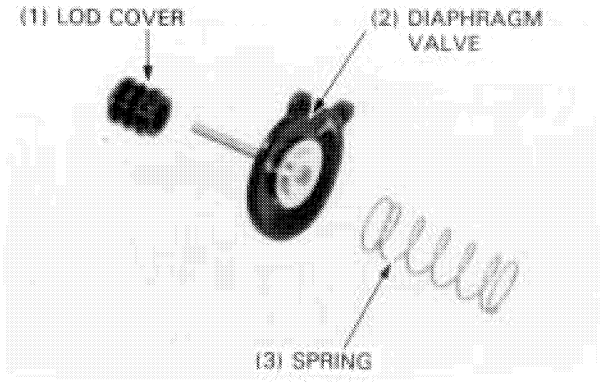


Remove three screws and pump cover.
Remove the spring and diaphragm valve.

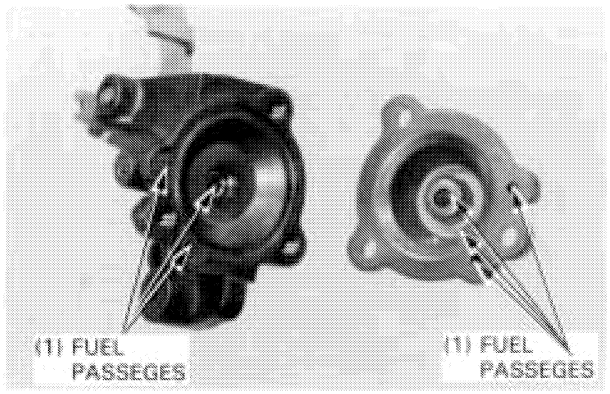


Check the diaphragm rod cover for fatigue or damage.
Check the spring for damage.

Check the diaphragm valve for pin hole or deterioration.



Use compressed air to clean the fuel passages of the pump cover and case.



VACUUM CHAMBER

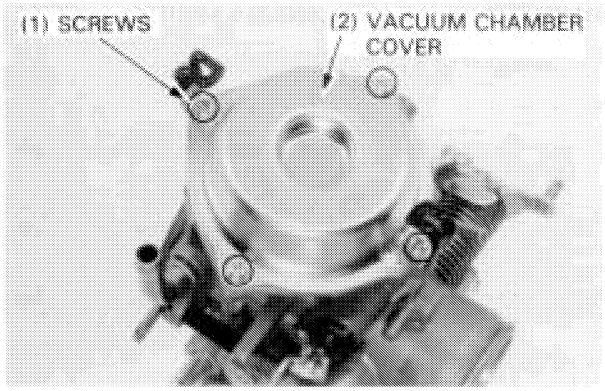
NOTE

- The vacuum chamber can be serviced with carburetors assembled.

Remove the screws and vacuum chamber cover.

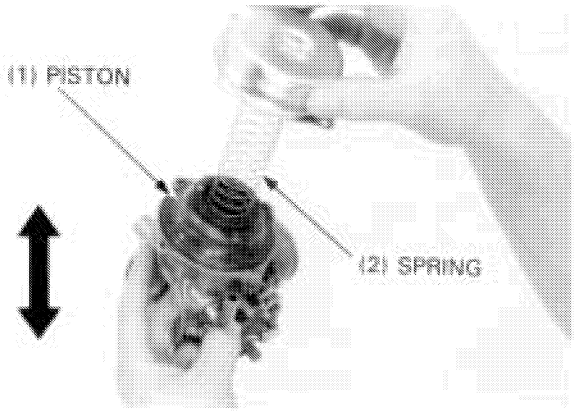
CAUTION

- *Do not interchange vacuum chamber covers, springs, pistons or jet needles between carburetors.*



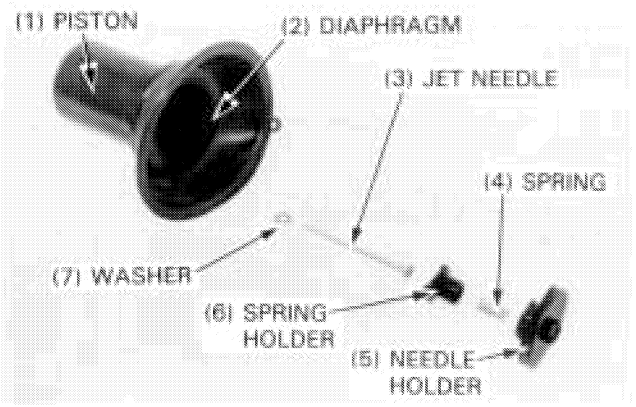
Remove the compression spring and diaphragm/vacuum piston.

Make sure the piston moves up and down freely in the chamber.



Push the jet needle holder down and turn it counterclockwise 90 degrees with an 8 mm socket. Then remove the needle holder, spring, spring holder, jet needle and washer from the vacuum piston.

Inspect the vacuum piston for wear, nicks, or other damage.
Inspect the jet needle for excessive wear at the tip or other damage.
Inpect the diaphragm for pin hole or deterioration.

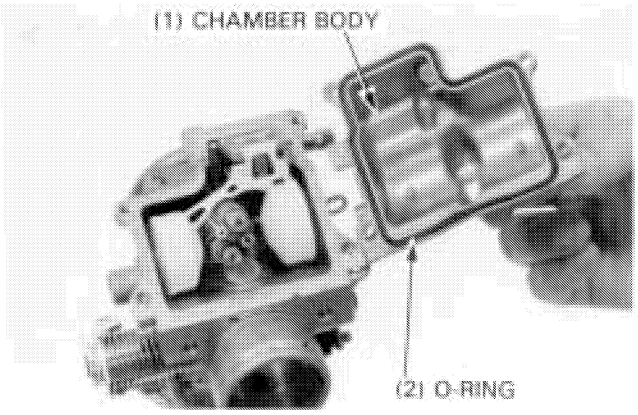


FLOAT CHAMBER

NOTE

- The float chamber must be serviced with carburetors disassembled.

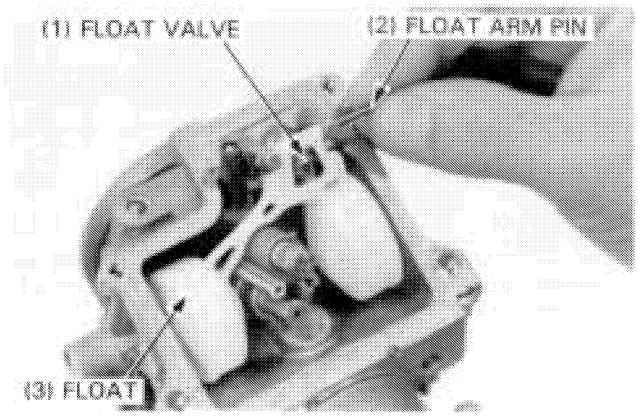
Remove the float chamber body.
Check the O-ring for fatigue or damage.



Pull out the float arm pin.

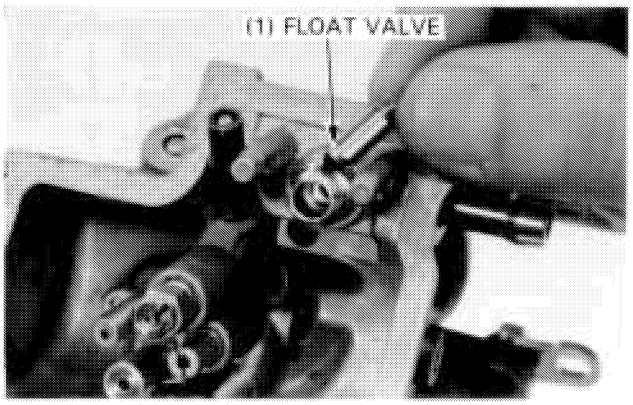
Remove the float and float vavle.

Inspect the float for deformation or damage.



Inspect the float valve for grooves and nicks.

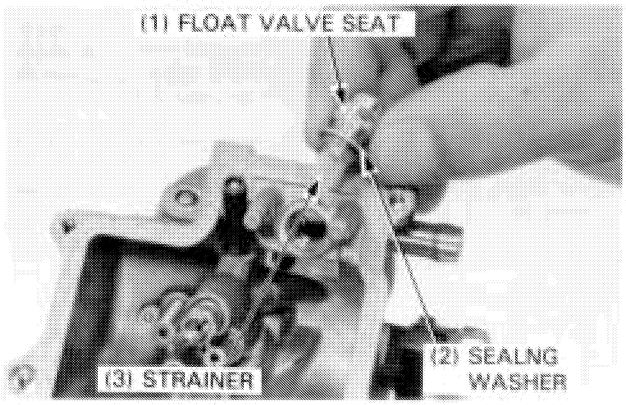
Inspect the operation of the float valve.



Remove the float valve seat from the carburetor body.

Clean the strainer with clean solvent.

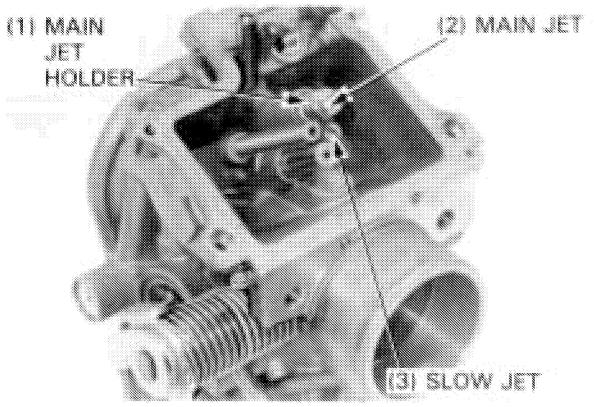
Make sure the sealing washer is in good condition.



Remove the (secondary) main jet, main jet holder and slow jet from the carburetor body.

CAUTION

- *Do not try to remove the needle jet from the carburetor body. The needle jet, primary main jet and by-starter jet are pressed into the body.*

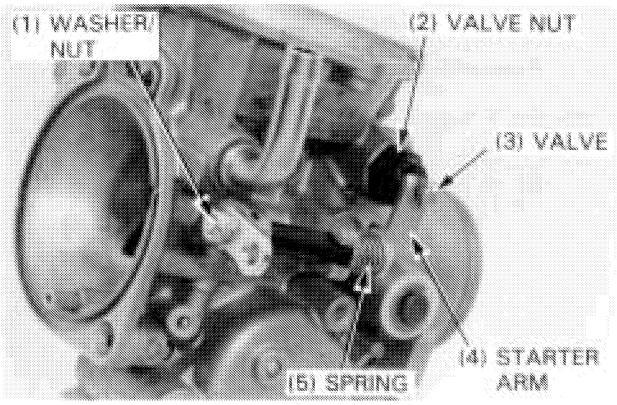


STARTER VALVE

NOTE

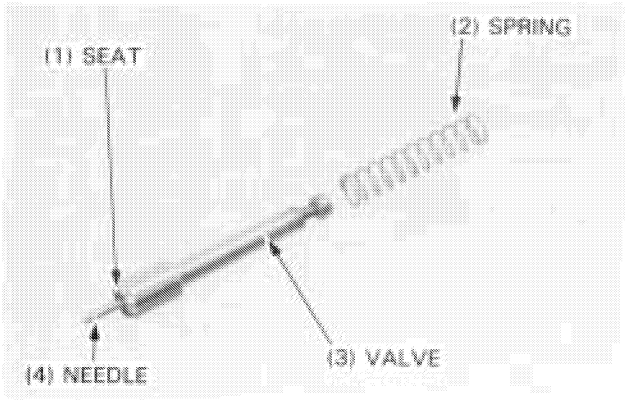
- The starter valve can be serviced with carburetors assembled.

Remove the nut and washer.
Loosen the starter valve nut.
Remove the starter valve with starter arm and spring.



Check the starter valve, valve needle and valve seat for wear or damage.

Check the valve spring for wear or damage.

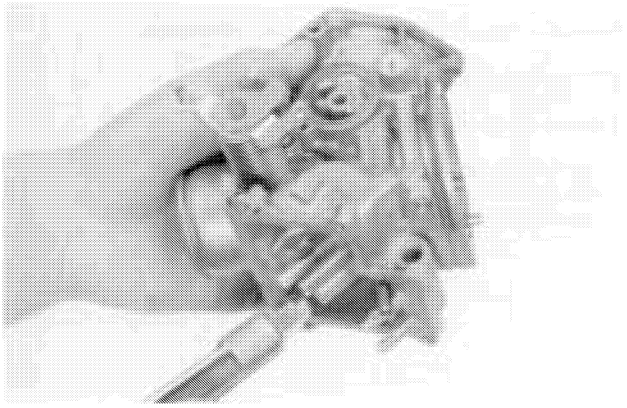


CARBURETOR CLEANING

Use compressed air to clean all the carburetor jets and passages.

CAUTION

- *Never use wire or drill bits to clean carburetor jets. The jets will become enlarged or scratched, disturbing the correct mixture ratio.*



PILOT SCREW

NOTE

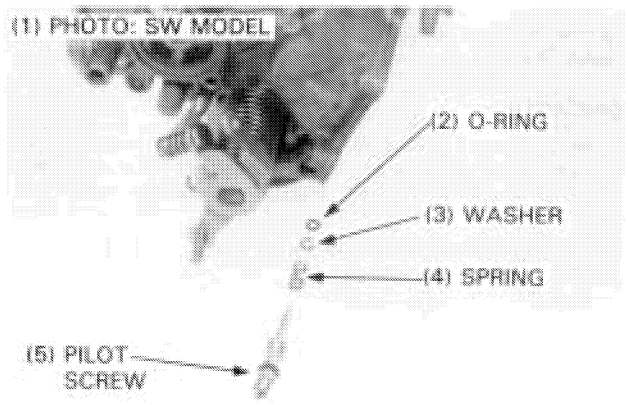
- The pilot screws are factory pre-set and should not be removed unless the carburetors are overhauled.

Turn each pilot screw in and carefully count the number of turns before it seats lightly. Make a note of this to use as a reference when reinstalling the pilot screws.

CAUTION

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

Remove the pilot screws and inspect them. Replace them if worn or damaged.

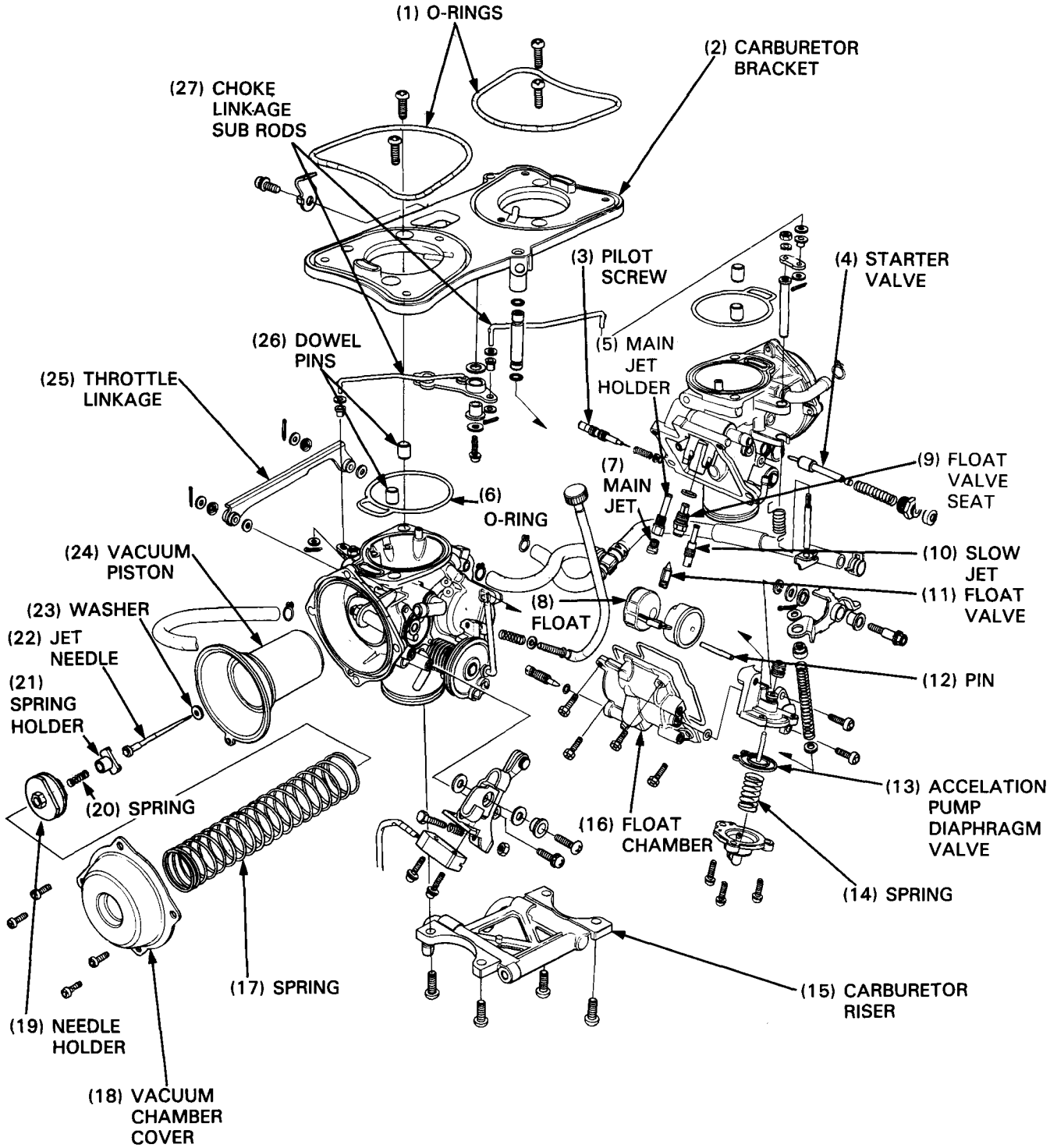


CARBURETOR ASSEMBLY

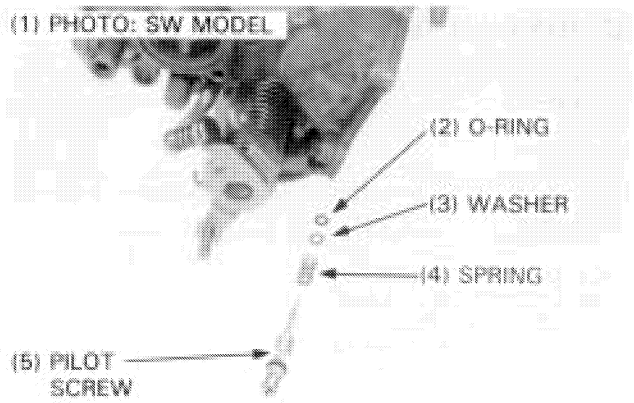
Reassembly is essentially the reverse of disassembly.

NOTE

- Do not overtighten the main jet holder and float valve seat.



PILOT SCREW



Install the pilot screws and return them to their original position as noted during removal.

If new pilot screws are installed, turn the pilot screws out the initial opening.

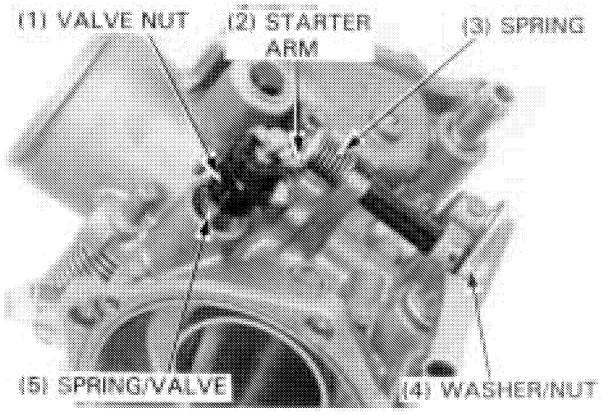
INITIAL OPENING: 3—1/8 turns out

Perform pilot screw adjustment (page 4-36) if new pilot screws are installed.

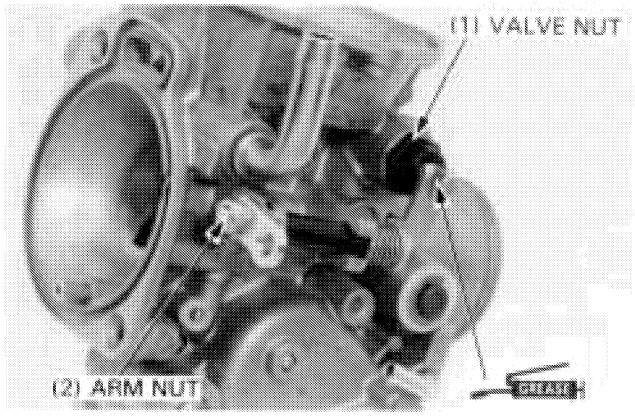
NOTE

- Do not install new limiter cap until adjustment has been completed (SW model only).
- If you replace the pilot screw in one carburetor, you must replace the pilot screws in the other carburetors for proper pilot screw adjustment.

STARTER VALVE



Install the starter valve, spring and valve nut, and do not tighten the nut yet.
Install the starter arm with the spring, aligning the arm with the valve groove as shown.
Install the washer and nut onto the starter arm.

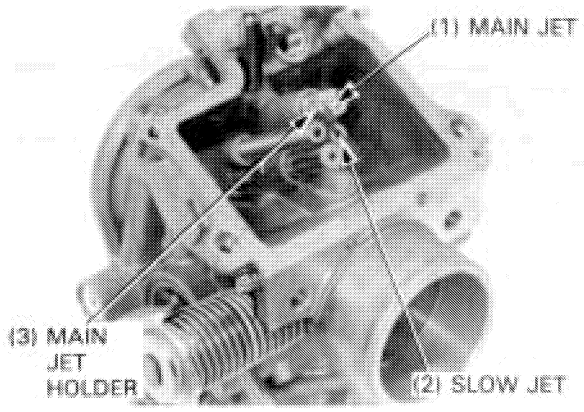


Tighten the starter valve nut and starter arm nut securely.

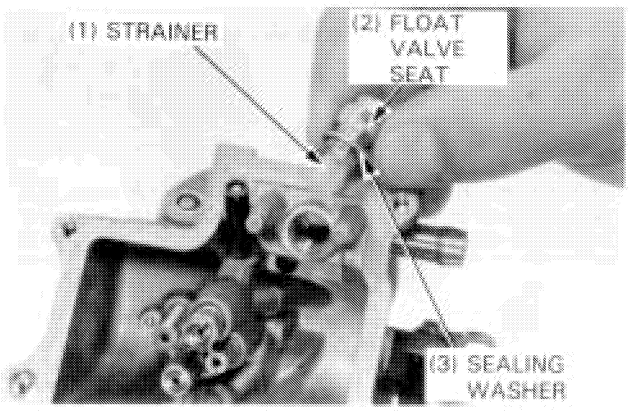
Apply grease to the valve-to-arm groove.

FLOAT CHAMBER

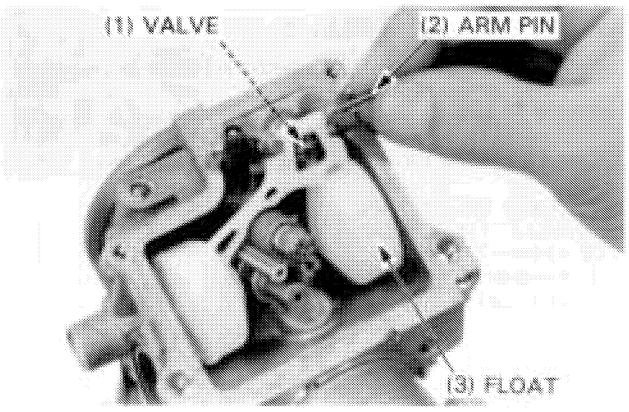
Install the main jet holder, main jet and slow jet onto the carburetor body.



Install the fuel strainer on the float valve seat.
Install the float valve seat with the sealing washer onto the carburetor body.



Install the float valve into the valve seat.
Install the float and float arm pin.



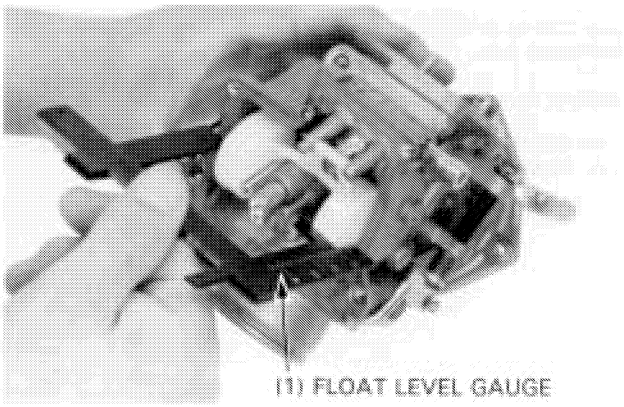
FLOAT LEVEL INSPECTION

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

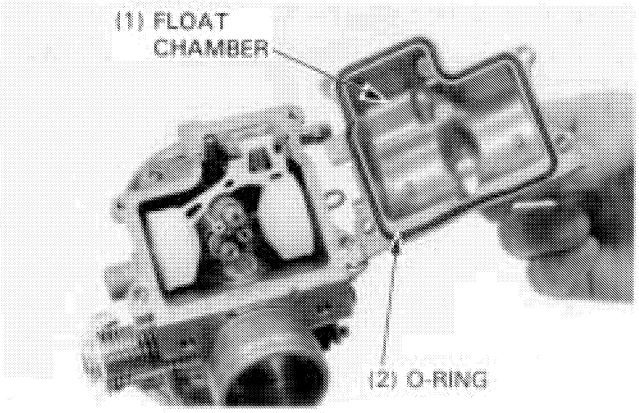
TOOL:
Float level gauge **07401–0010000**

Adjust if necessary by bending the float arm carefully.

FLOAT LEVEL: 8 mm (0.3 in)

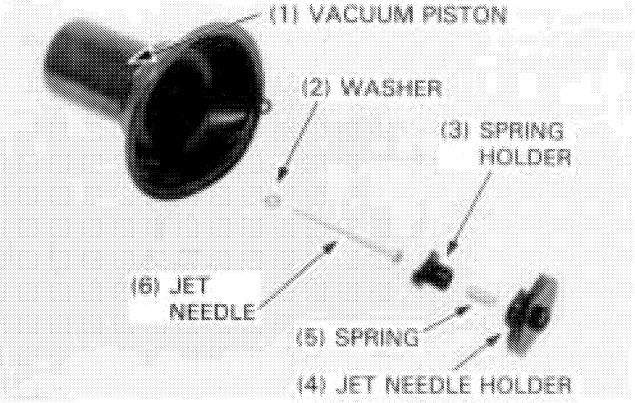


Install the O-ring and float chamber.



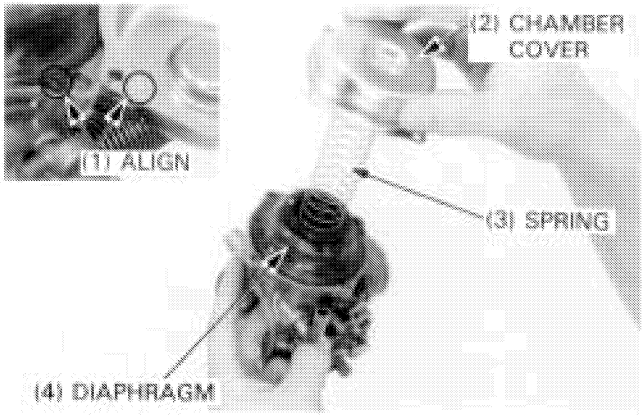
VACUUM CHAMBER

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



Install the vacuum chamber with the tab of the diaphragm aligned with the groove of the carburetor and with the vacuum piston held up to almost full open to prevent pinching the diaphragm between the chamber cover and the carburetor body.

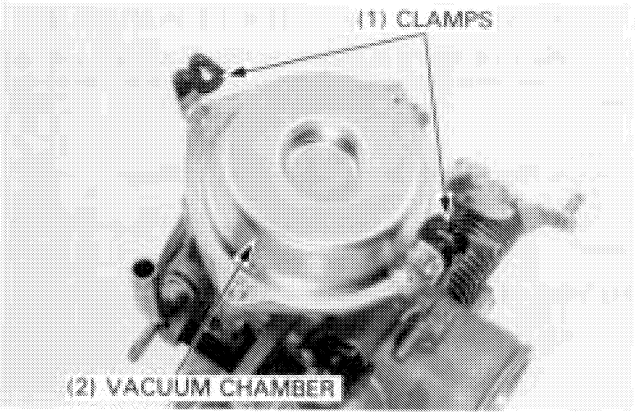
Install the chamber cover with the spring, aligning its cavity with the hole in the carburetor, and secure at least two screws before releasing the vacuum piston.



Install the remaining screws of the vacuum chamber cover.

NOTE

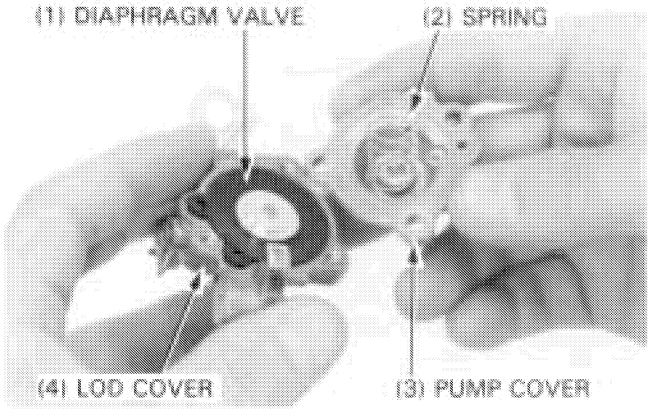
- Do not pinch the diaphragm with the chamber cover.
- Install tube clamps as shown.



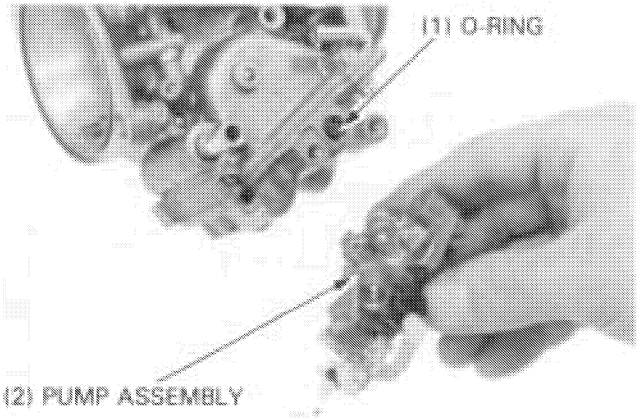
ACCELERATOR PUMP

Install the diaphragm valve, lod cover, spring and pump cover on the pump case.

Tighten the cover screws securely.

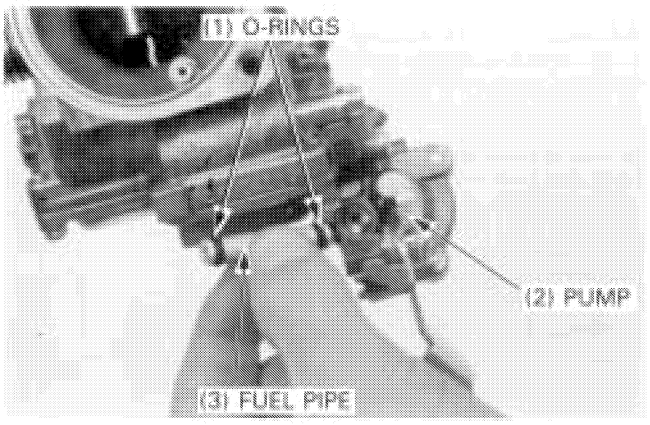


Install the O-ring on the float chamber and install the accelerator pump onto the chamber.
Tighten the screws securely.

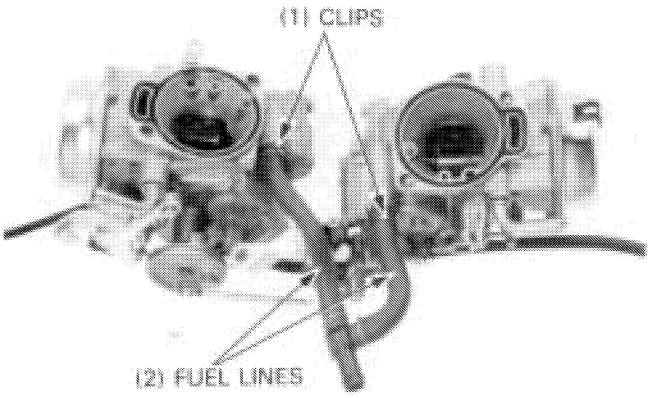


ASSEMBLY

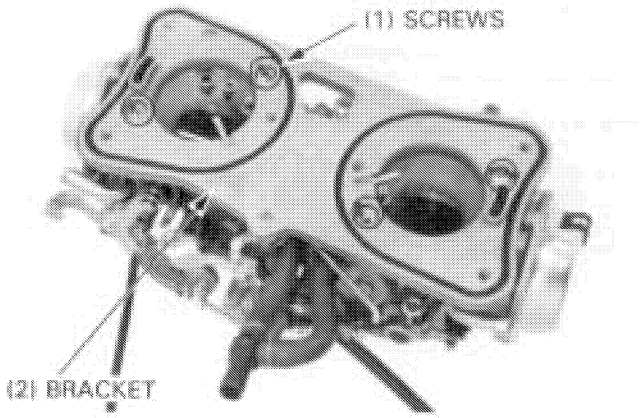
Install O-rings onto the fuel pipe and install the pipe on the accelerator pump.



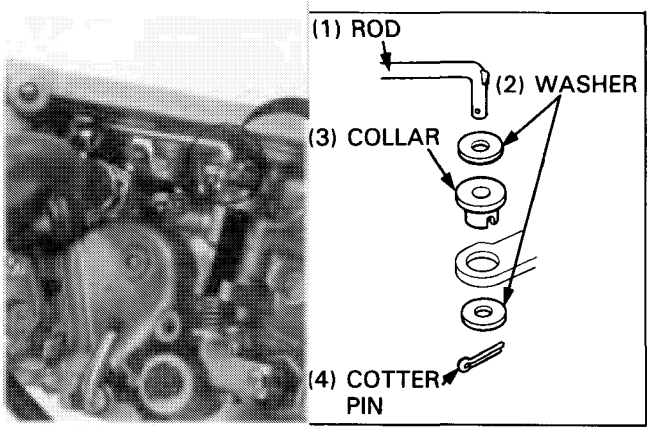
Install the fuel lines as shown and clip them securely.



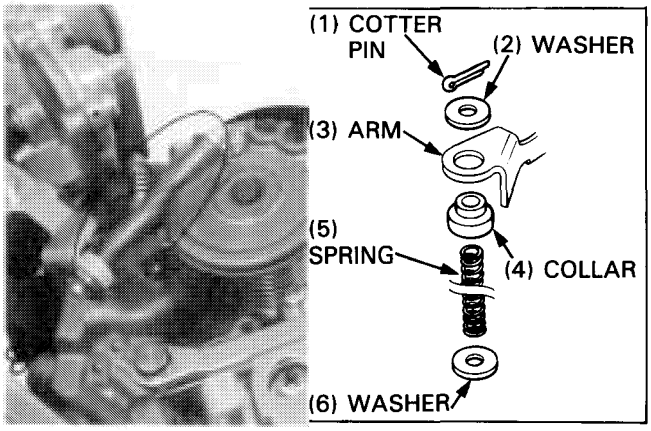
Install the carburetor bracket and screws; do not tighten the screws yet.



Install the washers and collar as shown and insert the choke linkage sub rod into the starter valve; and install a new cotter pin (each sub rod).

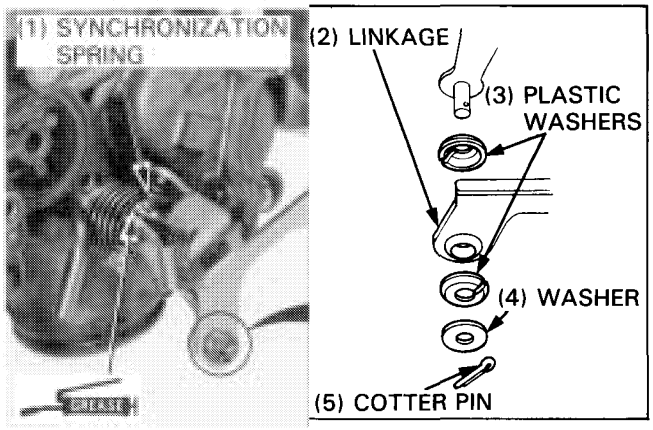


Install the washer, spring, collar, accelerator pump arm, washer and a new cotter pin on the accelerator rod.

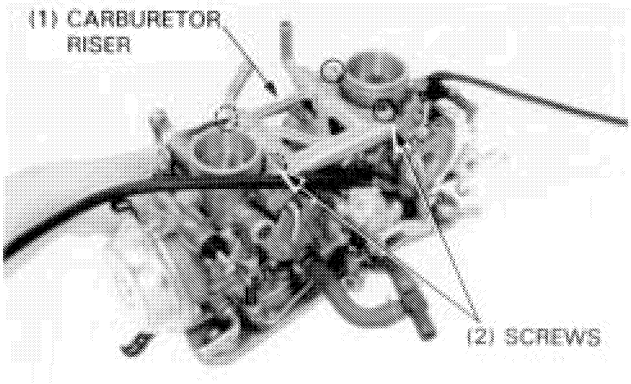


Install the plastic washers, washer and a new cotter pin on the throttle linkage of the Right carburetor.
Apply grease to the synchronization adjusting screw end.

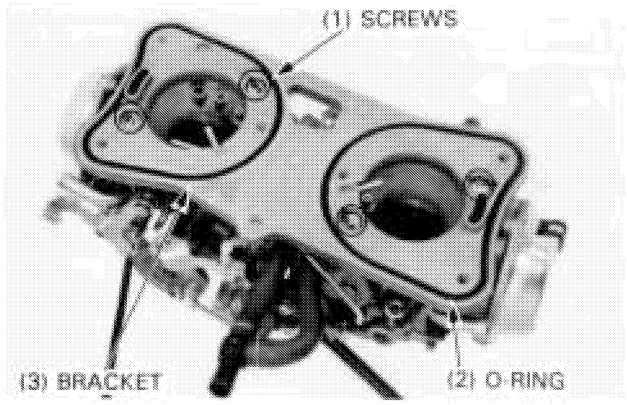
Install the synchronization spring.



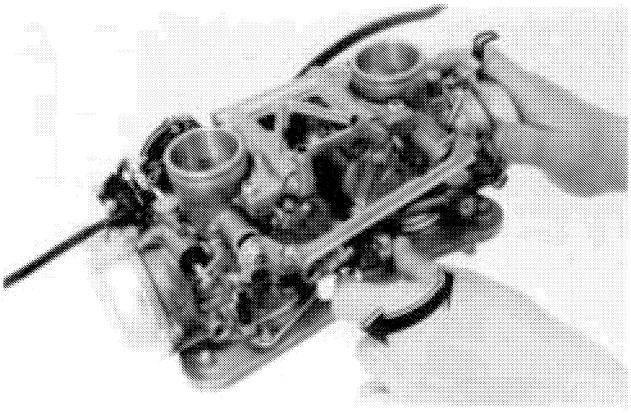
Install the carburetor heat riser and tighten the screws securely.



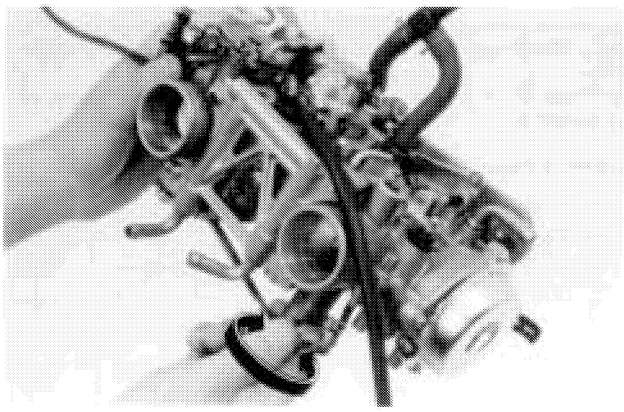
Tighten the carburetor bracket screws securely.
Install the O-rings to the bracket grooves.



Check that the choke linkage is operated smoothly.



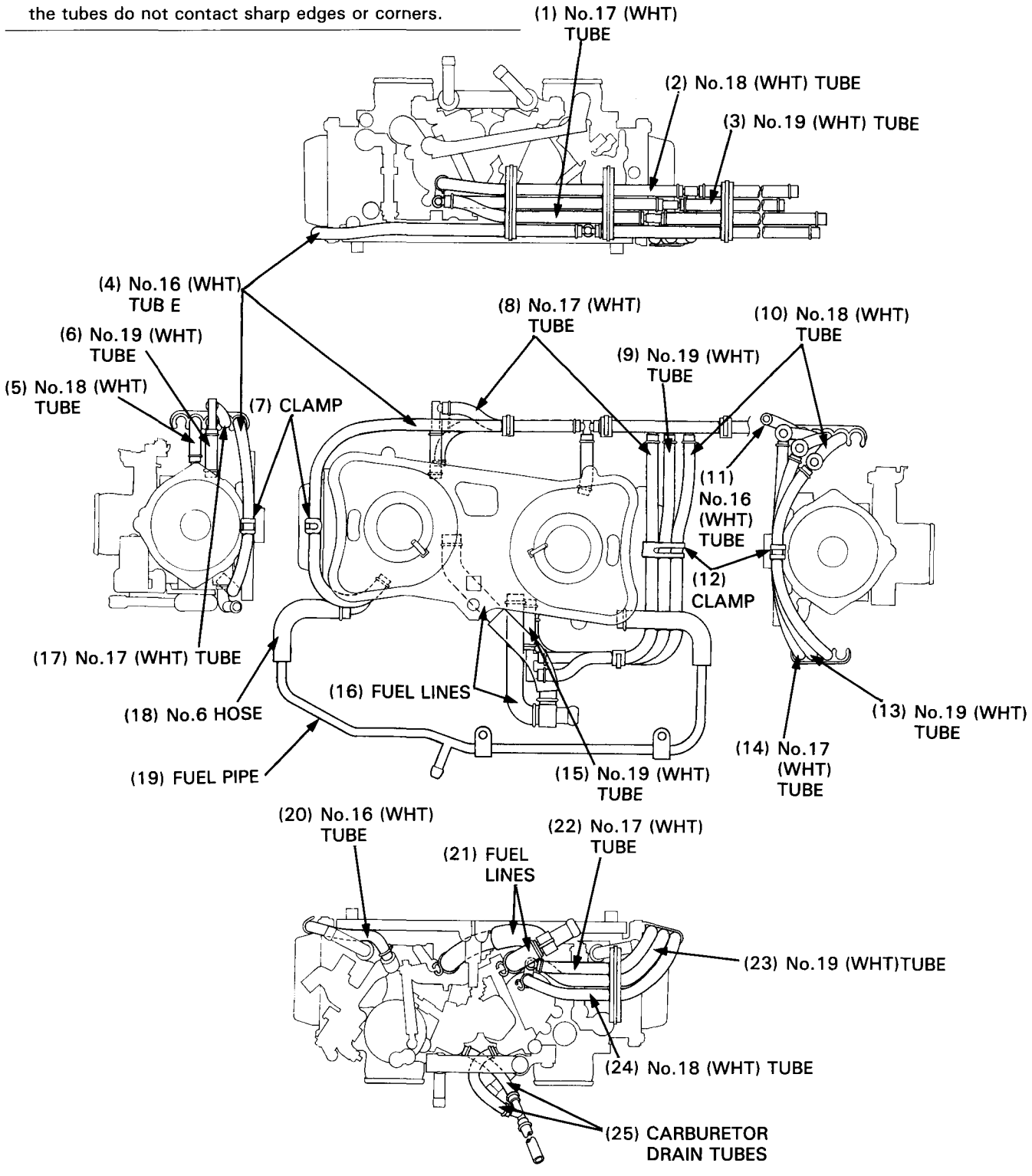
Check that the throttle linkage is operated smoothly.



CARBURETOR TUBES/HOSES

NOTE

- Be careful not to bend, twist or kink the tubes when installing.
- Install new tubes if the current tubes are deteriorated or damaged.
- Slide the end of each tube fully onto its fitting, and secure with a tube clamp.
- After installing the carburetors on the engine, check that the tubes do not contact sharp edges or corners.

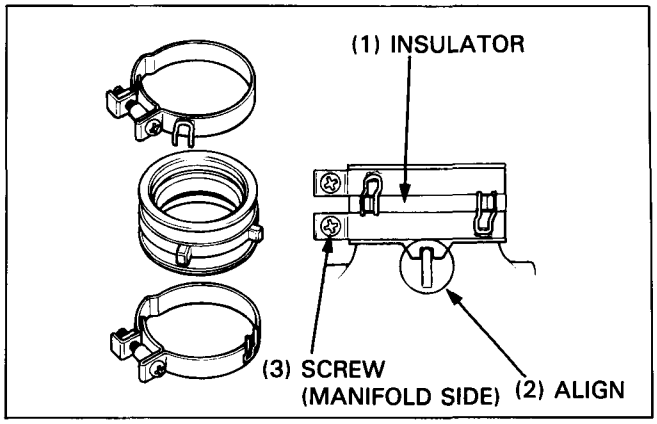


CARBURETOR INSTALLATION

If the carburetor insulator was removed, install the insulator onto the intake manifold, aligning the insulator groove with the manifold rib.

Secure the screw of the manifold side.

TORQUE: 5 N·m (0.5 kg-m, 3.6 ft-lb)

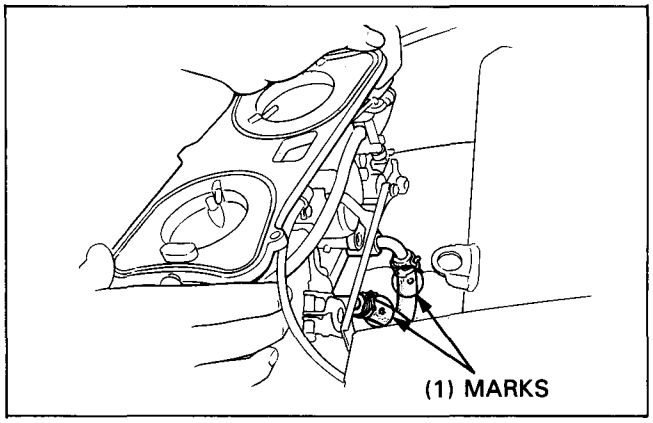


Connect the water hoses to the carburetor heat riser.

NOTE

- Connect the "C" marked hose to the left pipe; "D" marked hose to the right pipe.

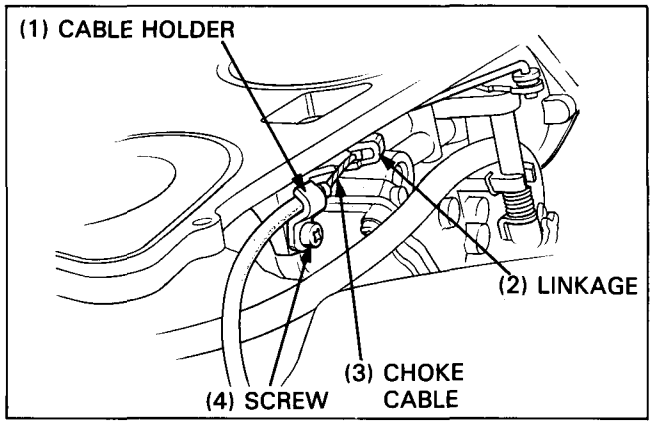
Secure the hoses with clamps.



Connect the choke cable to the choke linkage. Align the end of the cable outer housing with the edge of the cable holder.

Tighten the cable holder screw securely.

Make sure that the choke linkage end does not contact the cable outer housing when the choke lever is fully open.

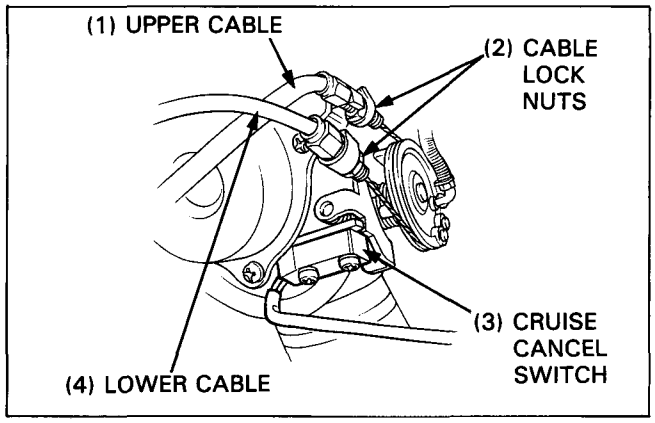


Connect the throttle cables to the throttle drum and tighten the cable lock nuts.

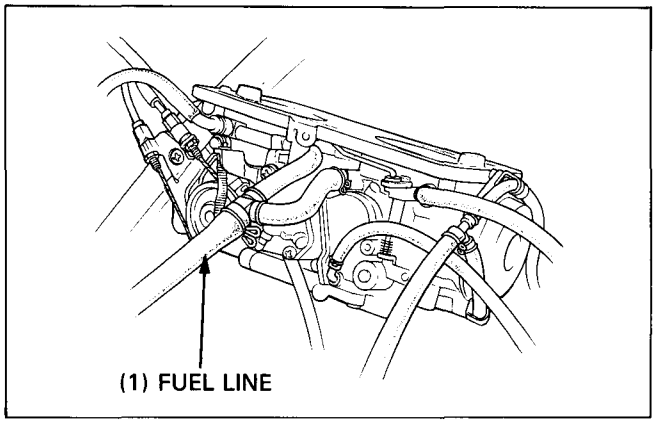
NOTE

- Upper cable: from the junction box.
  Lower cable: from the throttle lever.

Connect the 2P-BLU connector of the cruise cacel switch (throttle) of the connector holder behind the auto cruise control valve.



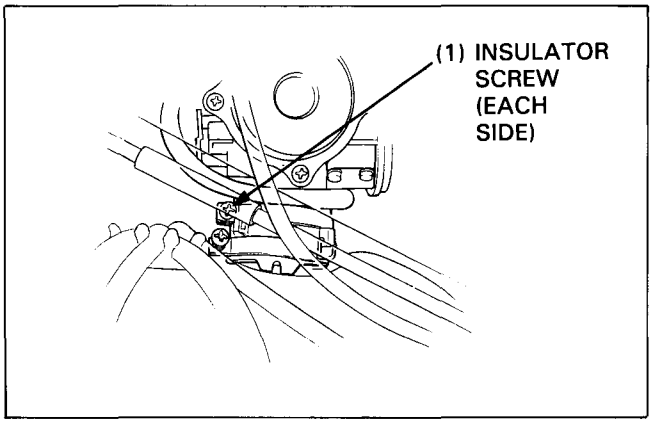
Connect the fuel line to the 3 way joint.



Install the carburetor onto the insulators and secure the screws to the specified torque.

TORQUE: 5 N·m (0.5 kg-m, 3.6 ft-lb)

Connect all hoses and tubes, refering to the hoses and tubes routing/connection (page 4-2).

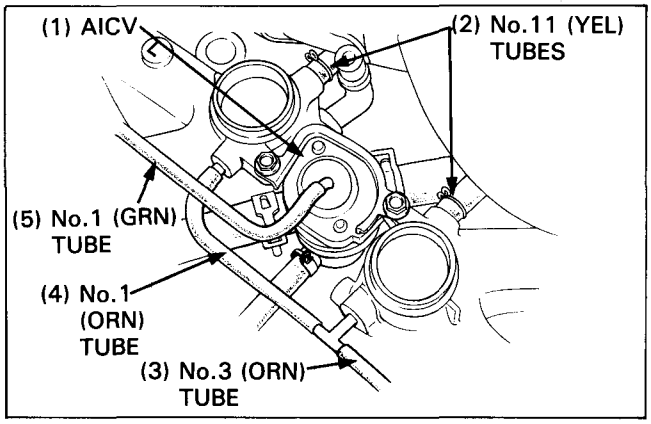


INTAKE MANIFOLD

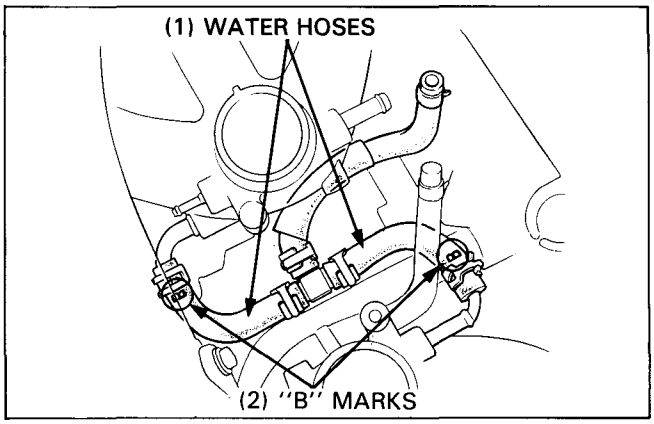
REMOVAL

Remove the following:
—air cleaner case (page 4-15).
—carburetors (page 4-17).
—heat guard.
—insulators.
SW model only:
—air injection control valve (AICV) (page 4-53).

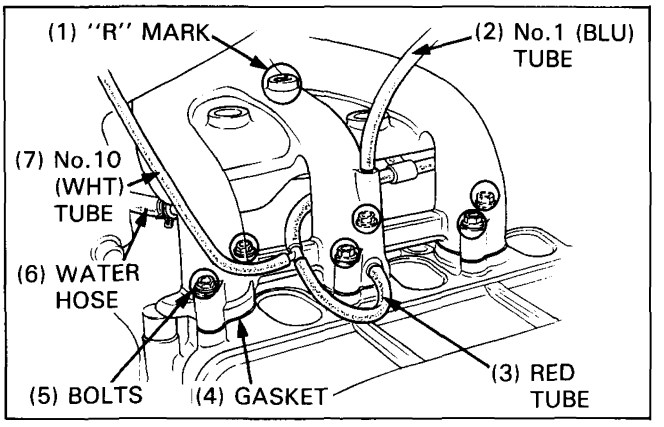
Disconnect vacuum tubes (No.11: YEL, No.1: GRN, No.1: ORN, No.3: ORN) from intake manifolds.



Disconnect water hoses (B marked hoses) from intake manifold riser pipes.



Disconnect vacuum tubes (No.1: BLU, RED) and water hose from the right intake manifold.
Disconnect the No. 10 (WHT) tube from the 3 way joint.
Remove six bolts, right intake manifold and gasket.



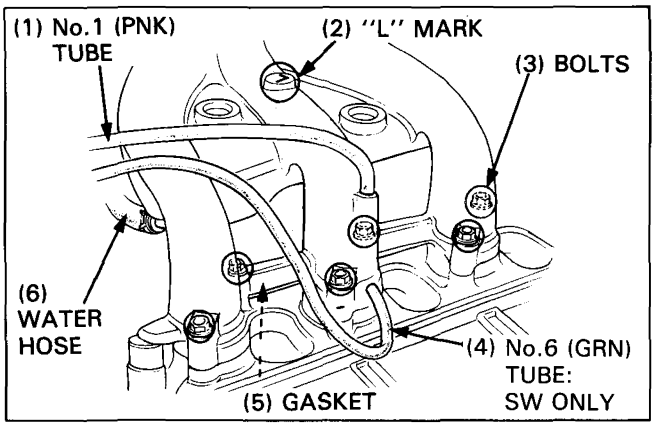
Disconnect vacuum tubes (No.1: PNK, No.6: GRN: SW model only) and water hose from the left intake manifold.
Remove six bolts, left intake manifold and gasket.

INSTALLATION

Install the intake manifolds in the reverse order of removal.

NOTE

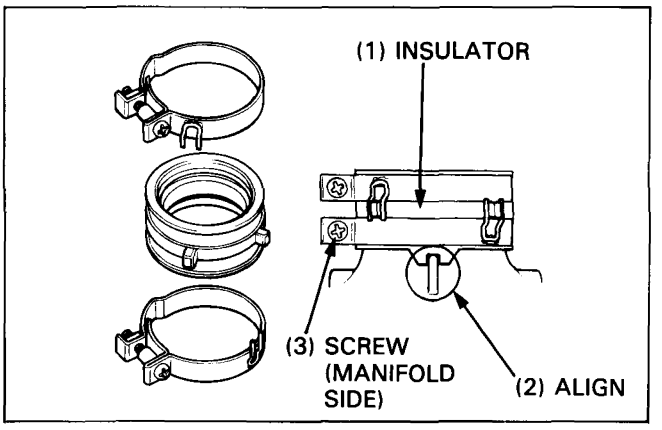
- "L" marked manifold to the left side; and "R" marked to the right.
- For all vacuum tubes connection and routing, refering to the hose and tubes routing/connection (page 4-2).



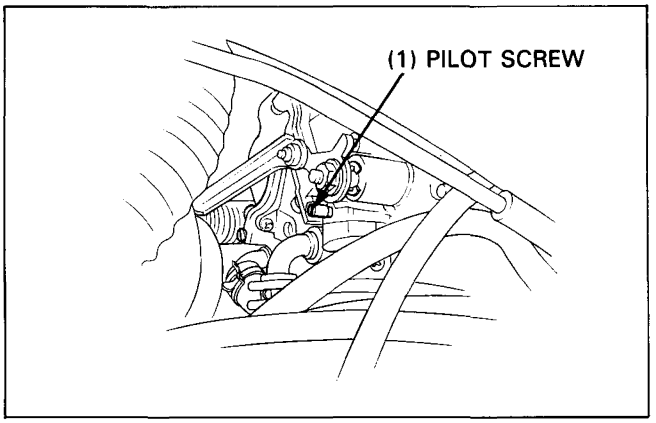
Install the carburetor insulator onto the intake manifolds, aligning the insulator groove with the manifold ribs.

Secure the screws of the manifold side.

TORQUE: 5 N·m (0.5 kg-m, 3.6 ft-lb)



PILOT SCREW ADJUSTMENT

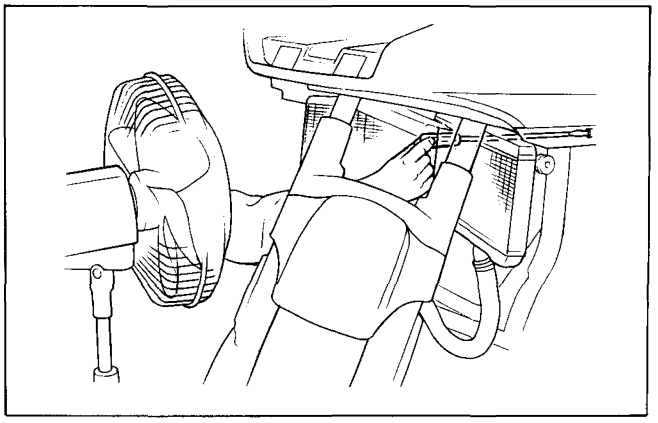


Idle Drop Procedure

NOTE

- The pilot screws are factory pre-set and no adjustment is necessary unless the pilot screws are replaced.
- Use a tachometer with graduations of 50 min^{-1} (rpm) or smaller that will accurately indicate a 50 min^{-1} (rpm) change.
- Turn on an electric fan to cool the coolant.

Remove the coding fan (page 5-10).



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

   Initial Opening: 3—1/8 turns out

CAUTION

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

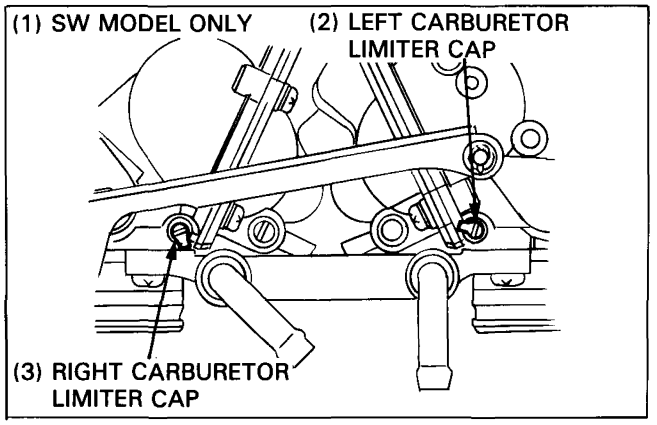
2. Warm up the engine to operating temperature. Stop and go driving for 10 minutes is sufficient.
3. Attach a tachometer according to the manufacturer's instructions.
4. Adjust the idle speed with the throttle stop screw.
5. Turn each pilot screw 1/2 turn out from the initial setting.
6. If the engine speed increases by 50 min^{-1} (rpm) or more, turn each pilot screw out a continual 1/2 turn until engine speed drops by 50 min^{-1} (rpm) or less.
7. Adjust the idle speed with the throttle stop screw.
8. Turn the left carburetor pilot screw in until the engine speed drops 50 min^{-1} (rpm).
9. Turn the left carburetor pilot screw 1 turn out from the position obtained in step 8.
10. Adjust the idle speed with the throttle stop screw.
11. Perform steps 8,9 and 10 for the right carburetor pilot screw.

SW model only:

12. After adjustment, cement the limiter caps cover the screws, using LOCTITE 601 or equivalent. The limiter cap should be placed against its stop as shown preventing further adjustment that would enrich the fuel mixture. The limiter cap position permits clockwise rotation and prevents counterclockwise rotation.

NOTE

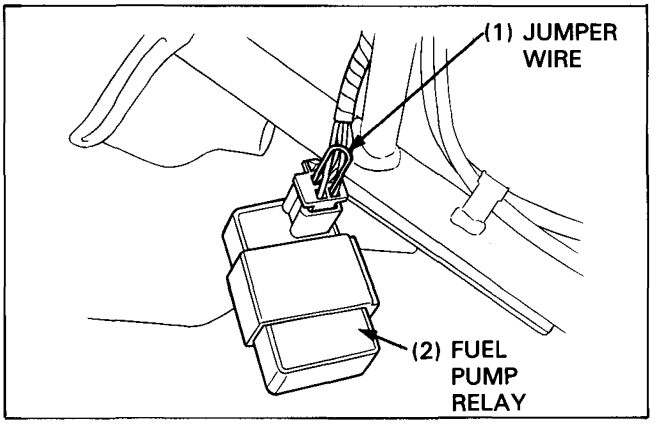
- Do not turn pilot screws when installing the limiter caps.



FUEL PUMP/RELAY

FUEL PUMP OPERATION TEST

Remove the right saddlebag and top compartment (page 12-13, 7).
Turn the ignition switch OFF. Remove the fuel pump relay from the relay stay and short the BLK/WHT and BLK/RED wire connector terminals with a jumper wire.

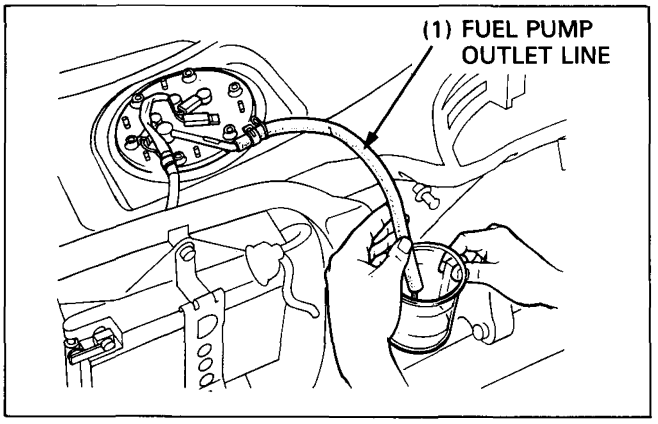


Disconnect the fuel pump outlet line at the fuel filter and hold a graduated beaker under the tube.

Turn the ignition switch ON, engine stop switch RUN and let fuel flow into the beaker for 5 seconds, then turn the ignition switch OFF.

Multiply the amount in the beaker by 12 to determine the fuel pump flow capacity per minute.

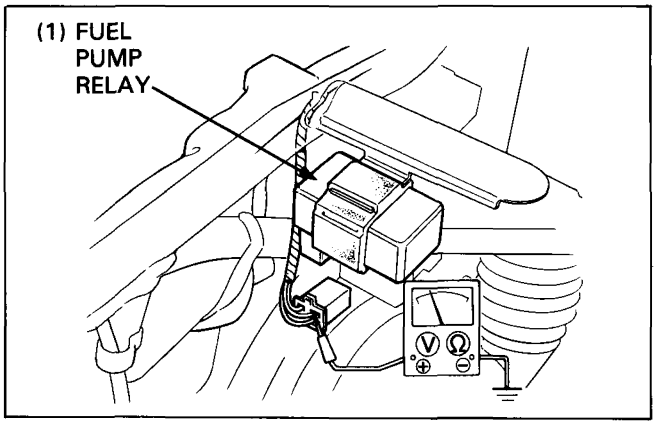
Fuel Pump Minimum Flow: 640 cm³ (22.5 Imp oz)/minute



FUEL PUMP RELAY WIRING CHECK

Disconnect the fuel pump relay 4P-WHT connector and check it for loose contact or corroded terminals.

Measure the following between connector terminal of the wire harness side and body ground.



LINE	COLOR	CONDITION(S)	SPECIFICATION
Battery voltage input	BLK/WHT (+)	Engine stop switch: RUN Ignition switch: ON	Battery voltage should register.
Fuel pump	BLK/RED	at all times	About 4-5 k ohms
Ignition control unit	YEL/BLU (+)	Engine stop switch: RUN Ignition switch: ON	Battery voltage should register.
Ground	GRN	at all times	CONTINUITY should be exsist

FUEL PUMP REMOVAL

⚠WARNING

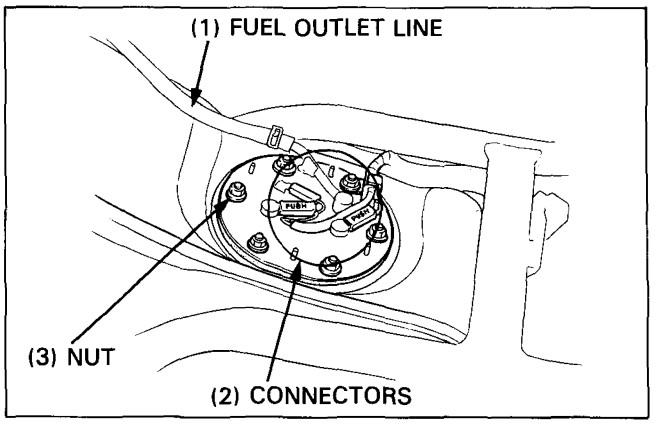
- ***Keep gasoline away from flames or sparks. Wipe up spilled gasoline at once.***

Disconnect the fuel outlet line and connectors.

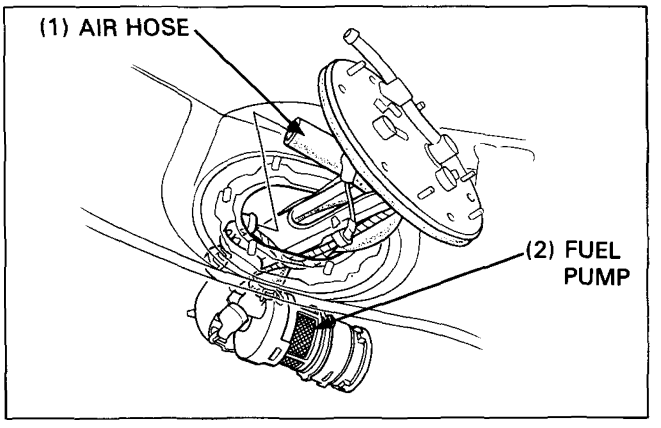
Remove the fuel pump mounting nuts.

NOTE

- Disconnect the BLK/BLU and WHT/BLU wire connectors, pushing the "PUSH" marked tabs.

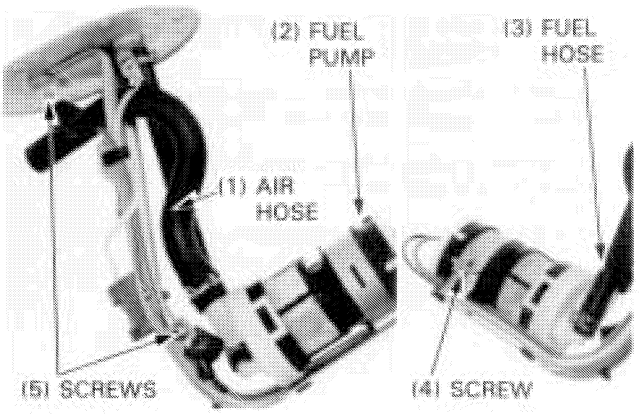


Disconnect the air hose and remove the fuel pump assembly out of the fuel tank.



Release the terminal caps from the fuel pump wire terminals.
Remove the screws and pump wires.
Disconnect the air and fuel hoses from the pump.

Remove the pump pinch screw and fuel pump.

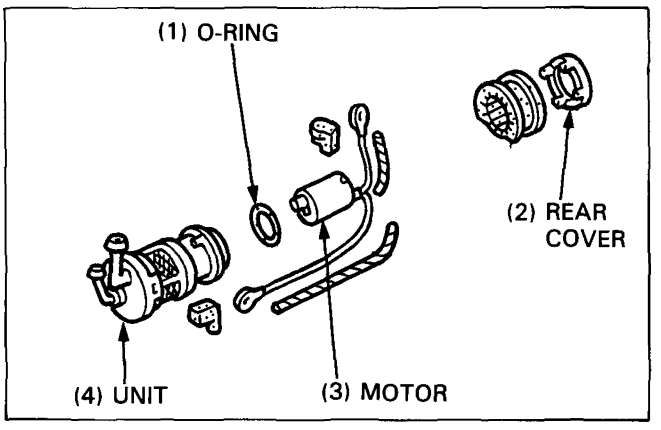


FUEL PUMP DIS/ASSEMBLY

Release claws from projections and remove the rear cover.

Remove the rear cover O-ring.
Remove the motor from the fuel filter/valve unit.

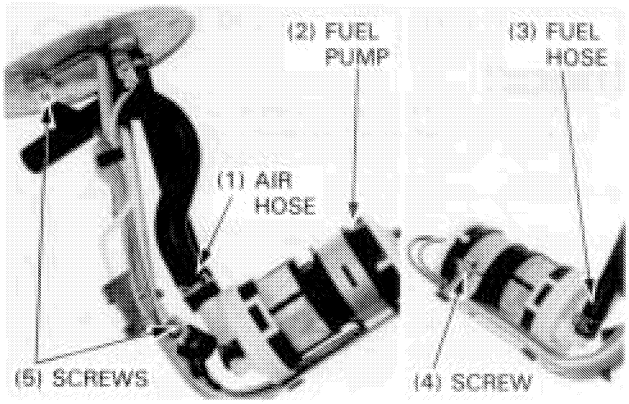
Assemble the fuel pump in the reverse order of removal.



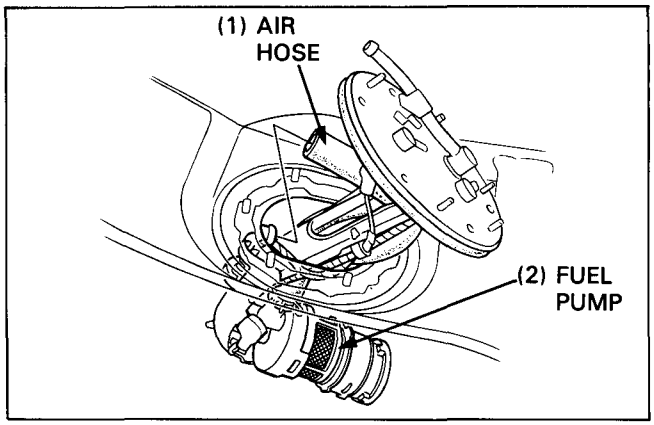
FUEL PUMP INSTALLATION

Install the fuel pump and tighten the screw securely.
Connect the air and fuel hoses to the fuel pump and install the clamps securely.

Route the pump wires properly and secure the screws.
Install the terminal caps.



Install the fuel pump into the fuel tank, connecting the air hose to the air pipe inside the tank.

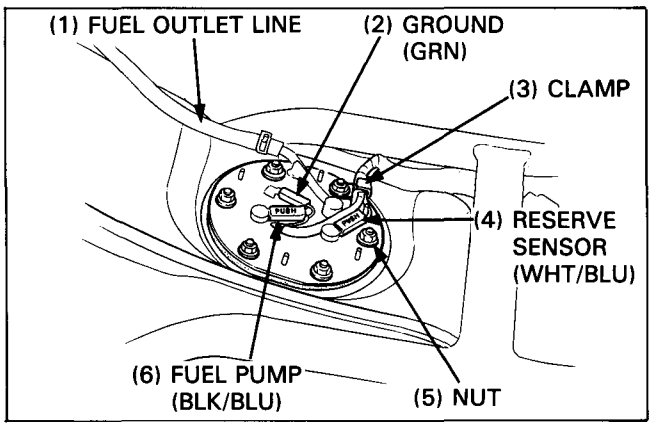


Position the wire clamp over the stud as shown and tighten the nuts securely.
Connect the fuel pump connectors and reserve sensor connector to the pump terminals.

NOTE

- Connect the BLK/BLU and WHT/BLU wire connectors with "PUSH" marks facing up.

Clamp the wires securely.
Connect the fuel outlet line.



FUEL RESERVE SENSOR/INDICATOR

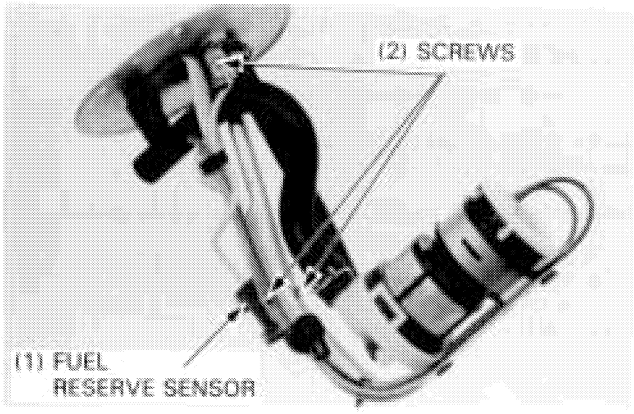
SENSOR REMOVAL/INSTALLATION

Remove the fuel pump (page 4-38).
Remove three screws and fuel reserve sensor from the pump stay.

Install the fuel reserve sensor in the reverse order of removal.

NOTE

- Apply a locking agent to the screw threads of the reserve sensor.

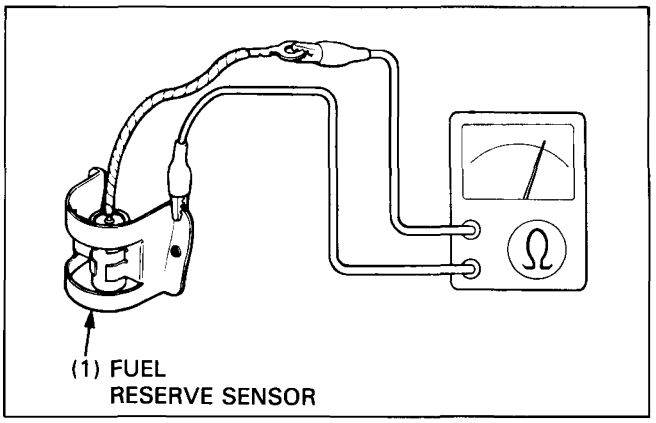


SENSOR INSPECTION

Remove the fuel reserve sensor (page 4-39).

Measure resistance between the WHT/BLU wire terminal (White-colored wire) and ground as shown.

STANDARD: 0.9—1.3 k Ohms (25°C/77°F).

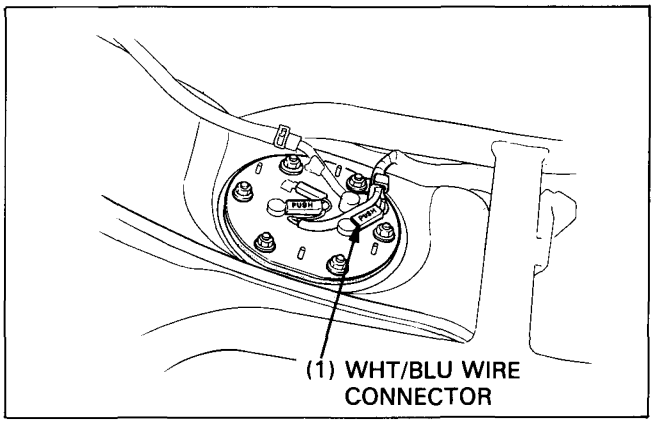


INDICATOR INSPECTION

Place the motorcycle on its center stand.
The fuel indicator light should come on within 3 minutes after the ignition switch has been turned ON with less than 4.0 liters (0.9 Imp gal) of fuel in the tank. Also when turning the ignition switch ON, fuel indicator light should come on for a few seconds, then go off.

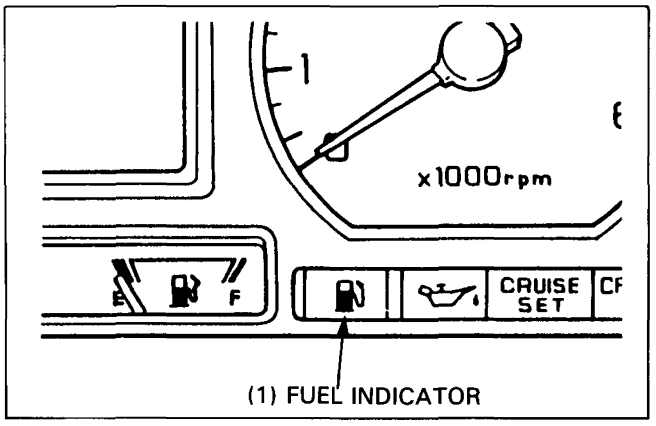
Remove the seat (page 12-6).

Disconnect the WHT/BLU wire connector, pushing the "PUSH" marked tab.



Ground the WHT/BLU wire with a jumper wire.
The fuel indicator should come on.

If the light does not go on, check for a short/open circuit in the WHT/BLU wire harness line or connector.



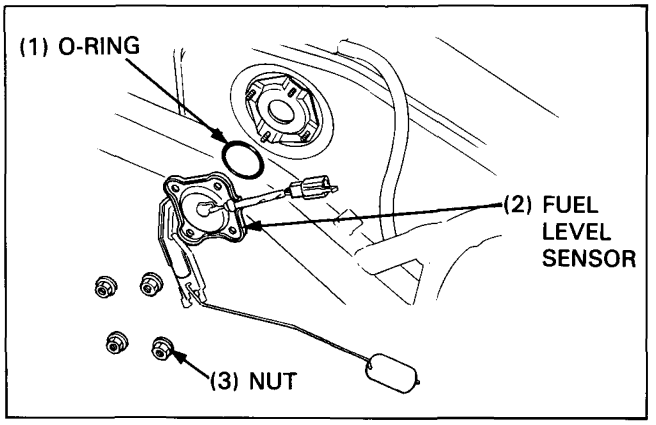
FUEL LEVEL SENSOR/GAUGE

FUEL LEVEL SENSOR REMOVAL

⚠WARNING

- ***Keep gasoline away from flames or sparks. Wipe spilled gasoline at once. Empty gasoline out of the fuel tank into the clean tank using the same procedure used for the fuel pump operation test (page 4-37).***

Remove the auto cruise control valve unit.
Disconnect the level sensor 2P-BLK connector of the connector holder.
Remove four nuts, level sensor and O-ring out of the fuel tank.



OPERATION TEST

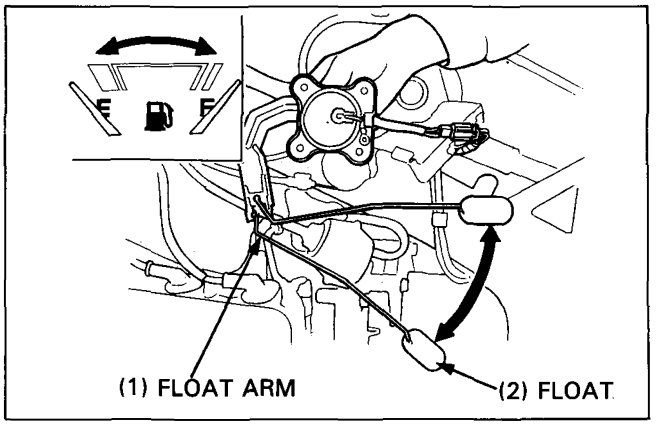
Reconnect the sensor wires to the fuel level sensor.

Turn the ignition switch ON, and inspect the fuel gauge operation by moving the float arm.

Float at bottom: Gauge should read empty
Float at top: Gauge should read full

NOTE

- Do not bend the float arm.
- Allow plenty of time for the gauge to respond.



FLOAT LEVEL SENSOR INSPECTION

Check the resistance of the fuel level sensor with an ohmmeter.

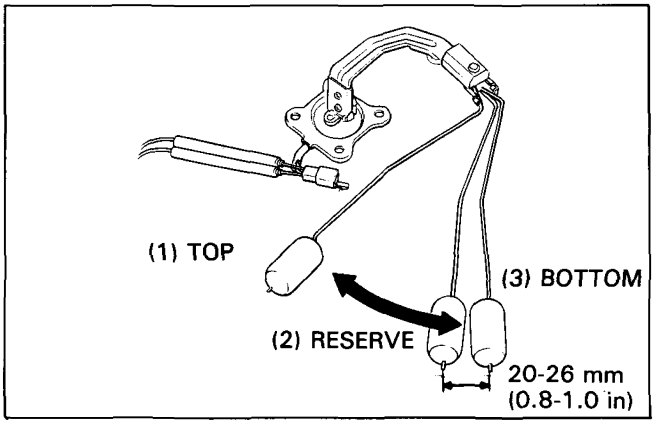
Float at top: 4—10 Ohms (20°C/68°F)

Float at RESERVE (as shown): 66—81 Ohms (20°C/68°F)

Float at bottom: 90—100 Ohms (20°C/68°F)

NOTE

- Check the resistance at top of travel first then move the float arm to the bottom position.

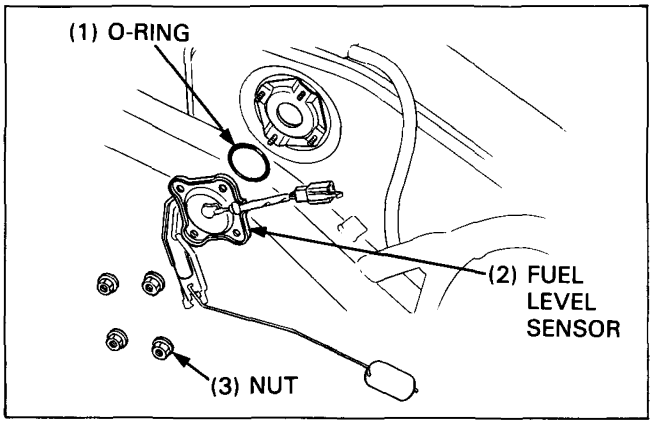


FUEL LEVEL SENSOR INSTALLATION

Apply oil to O-ring.
Install the fuel level sensor with O-ring into the fuel tank and secure four nuts.
Install the remaining parts in the reverse order of removal.

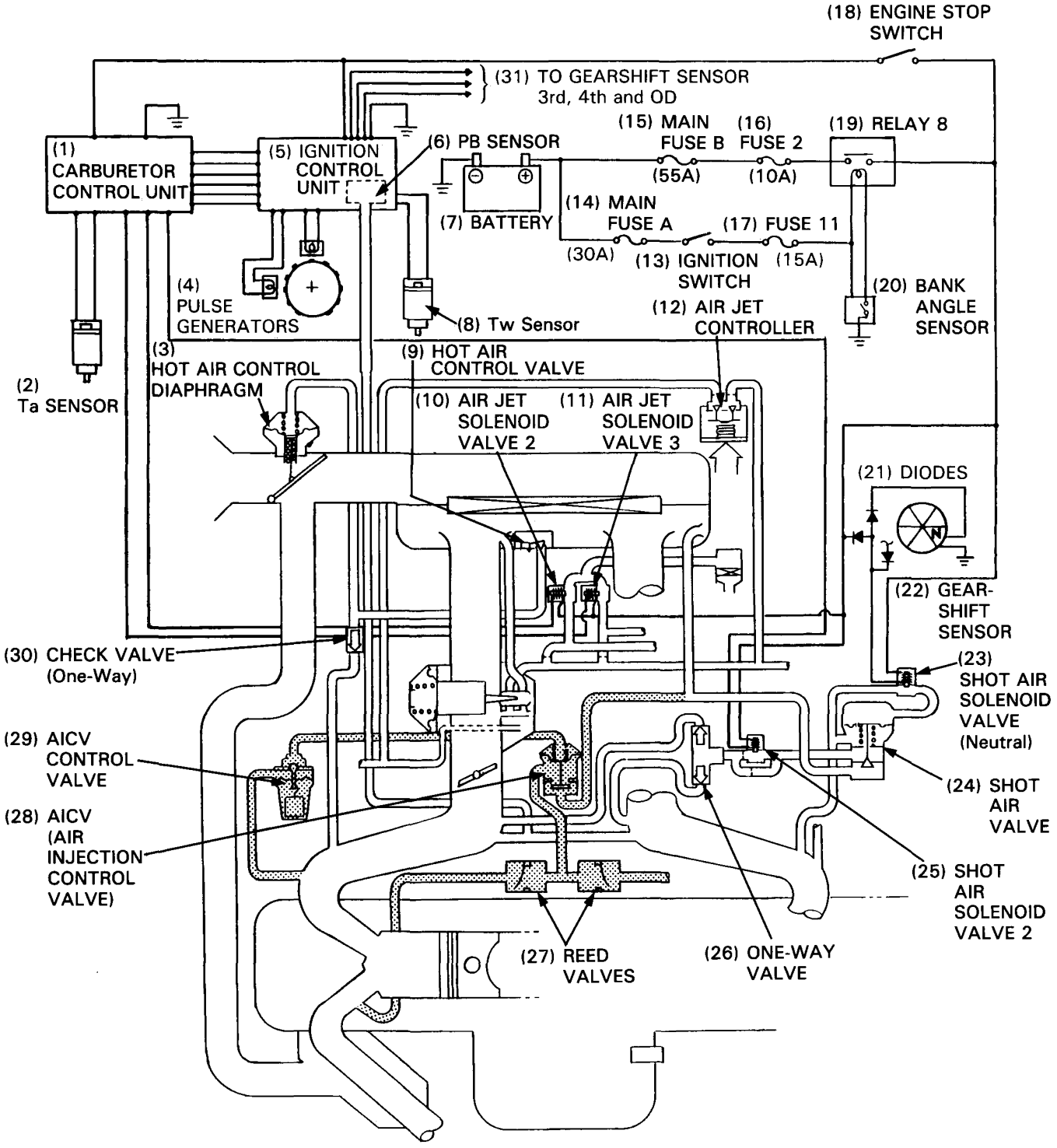
NOTE

- Do not bend the float arm.
- Set the O-ring into groove securely.

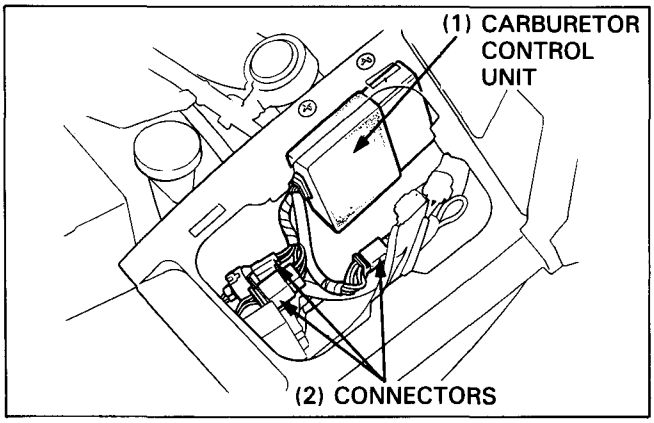


AIR SYSTEM CIRCUIT DIAGRAM

▒▒: SW model only



CARBURETOR CONTROL UNIT



SYSTEM INSPECTION

Remove the fairing right pocket (page 12-7).
Remove te right fairing inner cover (page 12-9).

Disconnect all carburetor control unit connectors and ignition control unit 9P-BLK connector.
Check them for loose contact or corroded terminals.

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

NOTE

- Inspect according to the following conditions:
  Condition 1: Engine stop switch on RUN
  2: Ignition switch in ON
  3: At all times

LINE	TERMINALS	CONDITION(s)	SPECIFICATION
Battery voltage input	BLK/WHT (+) and ground (−)	1,2	Battery voltage should register
Shot air solenoid valve 2	RED/BLU (+) and ground (−)	2	
Air jet solenoid valve 2	RED/WHT (+) and ground (−)	2	
Air jet solenoid valve 3	RED (+) and ground (−)	2	
Ground	GRN and ground	3	CONTINUITY should exist
Ignition control unit	Between same colors of carburetor control unit 9P-BLK connector and ignition control unit 9P-BLK connector (wire harness side)	3	CONTINUITY should exist
Ta sensor	GRY and GRN/BLK	3	2.0—3.0 kohms (20°C/68°F)

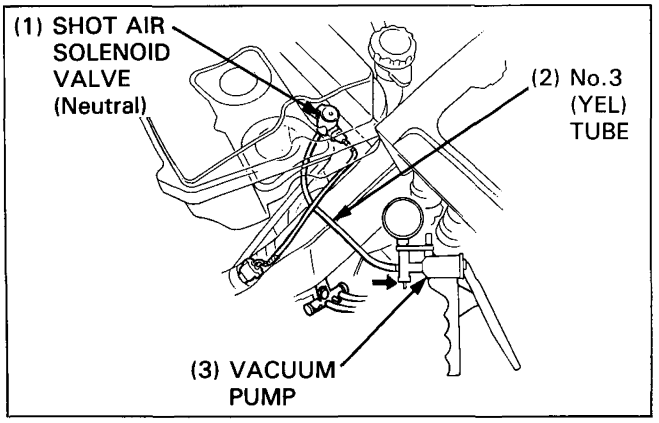
INTAKE MANIFOLD SHOT AIR SYSTEM

SYSTEM INSPECTION

Remove the left and right fairing inner covers (page 12-9).
Disconnect the No.3 (YEL) tube from the 3 Way joint and connect a vacuum pump to the tube.
Apply the specified vacuum to the shot air solenoid valve (Neutral) through the No.3 (YEL) tube.

SPECIFIED VACUUM: 400 mm Hg (15.7 in Hg)

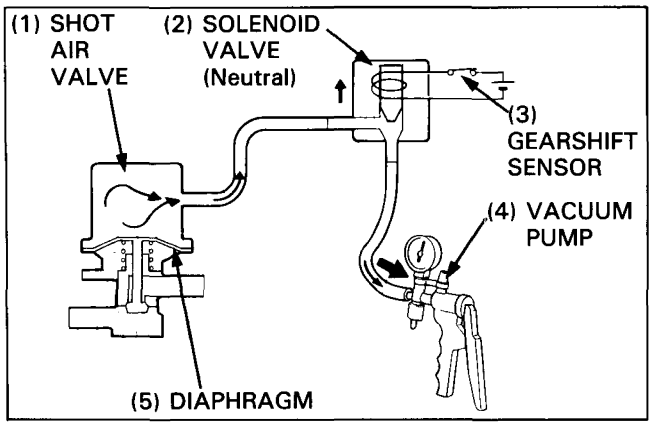
It should be maintained.



Turn the ignition switch ON and shift the transmission in any gear except neutral.
Apply the specified vacuum to same valve, and vacuum should be maintained.

SPECIFIED VACUUM: 400 mm Hg (15.7 in Hg)

Then, shift the transmission in neutral; vacuum should not remain steady.



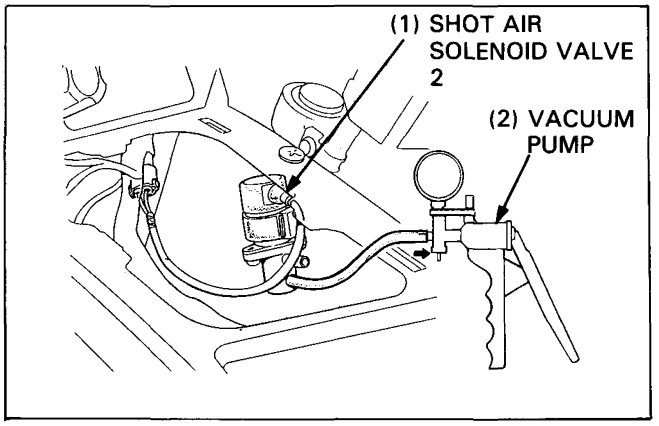
Disconnect the No.6 (YEL) and No.10 (YEL) tubes from the shot air solenoid valve 2.
Connect a vacuum pump as shown and apply the specified vacuum to the valve.

SPECIFIED VACUUM: 200 mm Hg (7.9 in Hg)

Start the engine.

Engine speed: Below 2,000 min^{-1} (rpm)
Air should hold steady.

Engine speed: Over 2,000 min^{-1} (rpm)
Air should flow out.



□ : SW model only

Remove the air cleaner case (page 4-16).

Disconnect the No.6 (GRN) tube from the left intake manifold; install a plug to keep air from entering.
Connect a vacuum pump to the No.6 (GRN) tube and apply the specified vacuum. Hold vacuum.

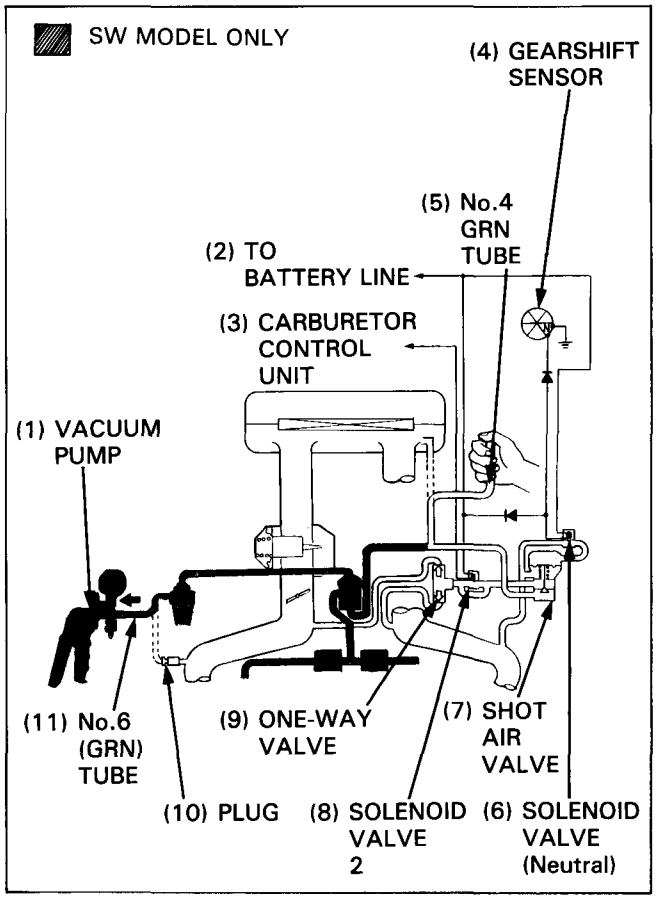
SPECIFIED VACUUM: 600 mm Hg (23.6 in Hg)

Start the engine in neutral and make sure that air should not be drawn in through No.4 (GRN) tube while applying the specified vacuum to the No. 6 (GRN) tube.

With the engine started and with the vacuum applied, shift the transmission in any gear except neutral and open the throttle above 2,000 min^{-1} (rpm); then close the throttle quickly, air should be sucked in through the No.4 (GRN) tube.

CAUTION

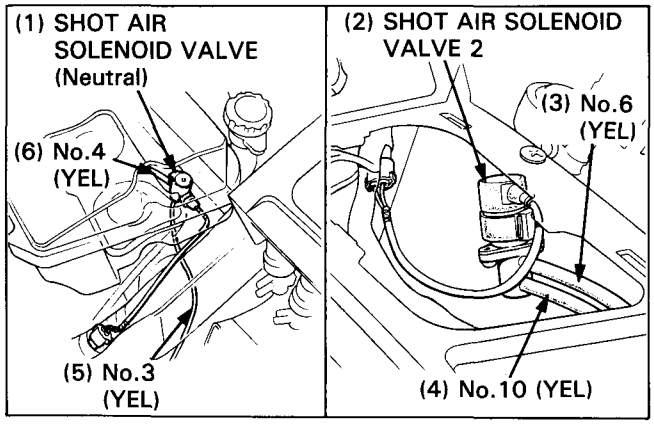
- *When shifting the transmission into gear, the rear wheel is rotated. Take care not to injure yourself.*



SHOT AIR SOLENOID VALVE CHECK

Remove the fairing left pocket.
Disconnect air tubes and 2P-BLU connector.
Remove the shot air solenoid valve 2.

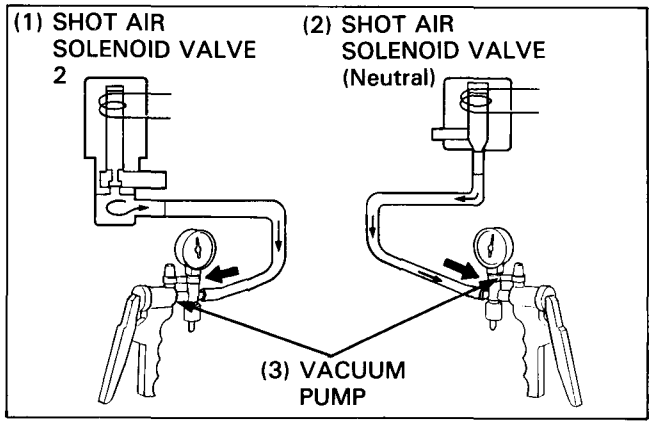
Remove the fairing inner covers and left cooling fan (page 5-10).
Disconnect air tubes and 2P-WHT connector.
Remove the shot air solenoid valve (Neutral).



Remove the solenoid valve. Connect a vacuum pump as shown. Apply the specified vacuum to the valves.
Vacuum should be maintained.

SPECIFIED VACUUM: 400 mm Hg (15.7 in Hg)

Replace the valve if vacuum do not remain steady.



Connect a vacuum pump to valves as shown. Apply the specified vacuum to the valves.

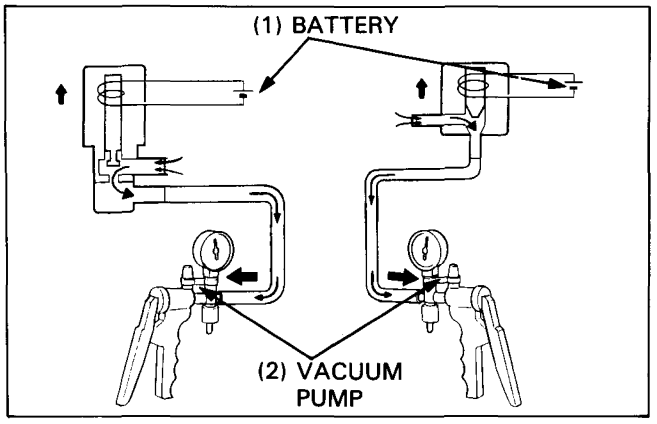
SPECIFIED VACUUM:
Solenoid valve 2: 200 mm Hg (7.9 in Hg)
Solenoid valve (Neutral): 400 mm Hg (15.7 in Hg)

Connect a 12 V battery to the valve wires. Vacuum should be released. Replace the valve if vacuum remain steady.

Install the valves in the reverse order of removal.

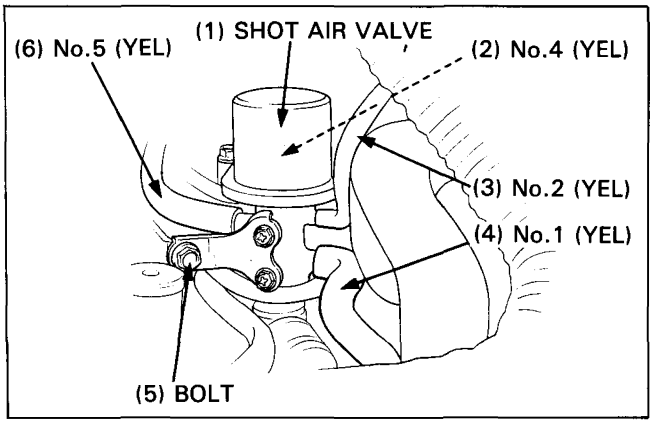
NOTE

- Route the tubes properly (page 4-2) and check the tube connections for loose or poor.



SHOT AIR VALVE CHECK

Remove the left cooling fan (page 5-10).
Remove the bolt and disconnect air tubes from the shot air valve.
Remove the shot air valve.

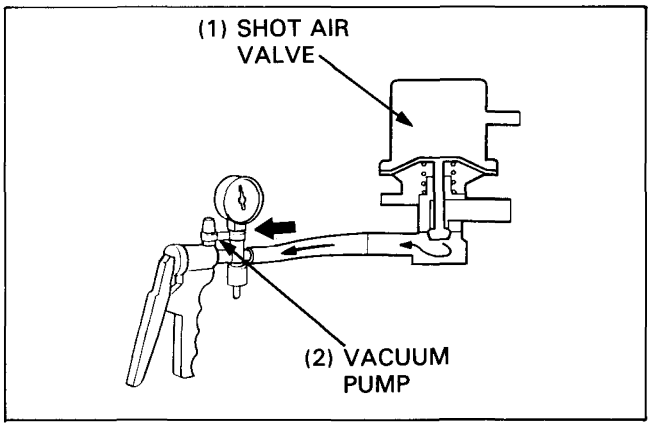


Connect a vacuum pump as shown.

Apply the specified vacuum to the valve. 500 mm Hg (19.7 in Hg) vacuum should should be maintained.

When continuing to apply vacuum, vacuum could not be applied more than approximately 560 mm Hg (22.0 in Hg).

Replace the valve if necessary.



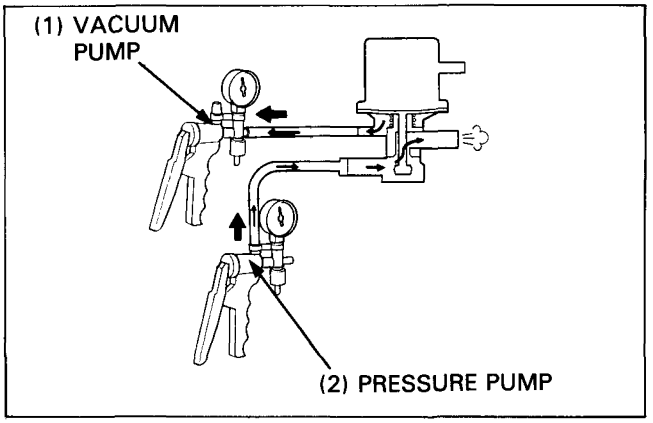
Connect a vacuum pump and pressure pump as shown.

Apply light pressure (approximately 5 psi).
Apply the specified vacuum. The valve should open and the pressure would be released.

SPECIFIED VACUUM: 110–160 mm Hg (4.3–6.3 in Hg)

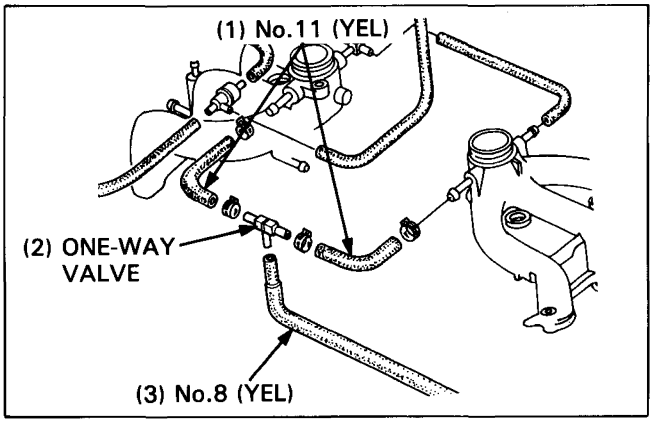
NOTE

- Vacuum should not be maintained.
- Route the tubes properly (page 4-2) and check the tube connections for loose or poor.
- Coat soap water onto valve pipes before connecting tubes.



ONE-WAY VALVE CHECK

Remove the carburetor (page 4-17).
Disconnect the air tubes and remove the one-way valve.

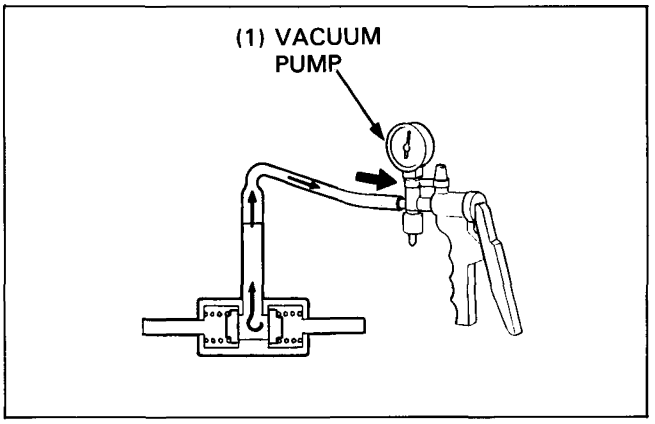


Connect a vacuum pump as shown.

Apply the specified vacuum to the valve.

SPECIFIED VACUUM: 40 mm Hg (1.6 in Hg)

Vacuum should be maintained.
Replace the valve if vacuum do not remain steady.



Connect a vacuum pump as shown.
Apply vacuum, and then vacuum should not be maintained.

NOTE

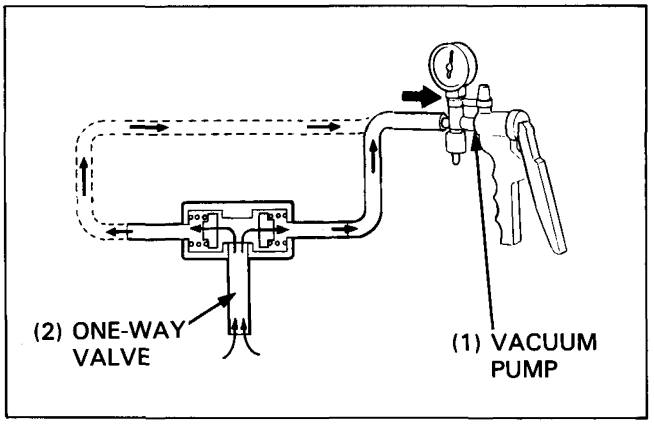
- Do this check for both valves as shown.

Replace the valve if vacuum remain steady.

Install the valve in the reverse order of removal.

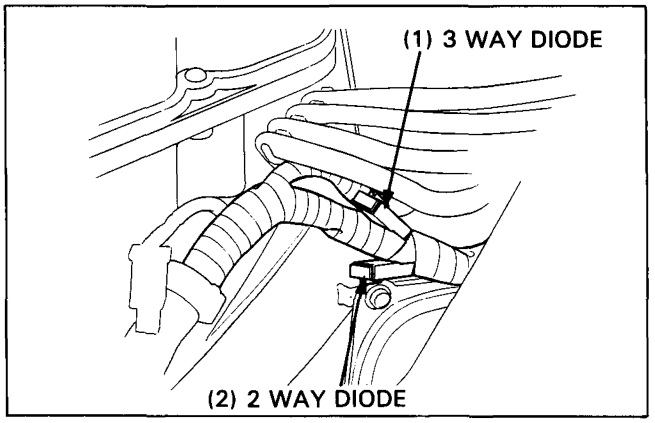
NOTE

- Coat oil onto valve pipes when connecting tubes.



DIODE CHECK

Remove the right fairing inner cover (page 12-9).
Remove the 3 way diode (Neutral) from the 3P-ORN connector of the main wire harness.
Remove the 2 way diode (RED/BLK & BLK/LT GRN) from the 2P-BLK connector of the main wire harness.



NOTE

- The test chart is for a positive ground ohmmeter. The test results will be reversed if a negative ground ohmmeter is used.

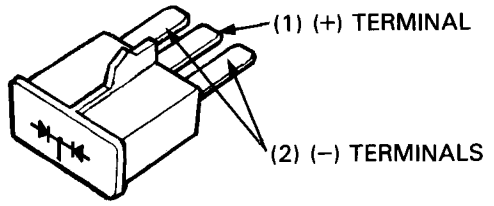
- **3 way diode (Neutral)**
  Normal Direction: Continuity
  + probe: center terminal (+)
  − probe: left or right terminal (−)

  Reverse Direction: No Continuity
  + probe: left or right terminal (−)
  − probe: center terminal (+)

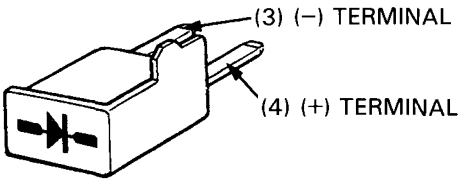
- **2 way diode (RED/BLK & BLK/LT GRN)**
  Normal Direction: Continuity
  + probe: (+) terminal
  − probe: (−) terminal

  Reverse Direction: No Continuity
  + probe: (−) terminal
  − probe: (+) terminal

- 3 way diode



- 2 way diode



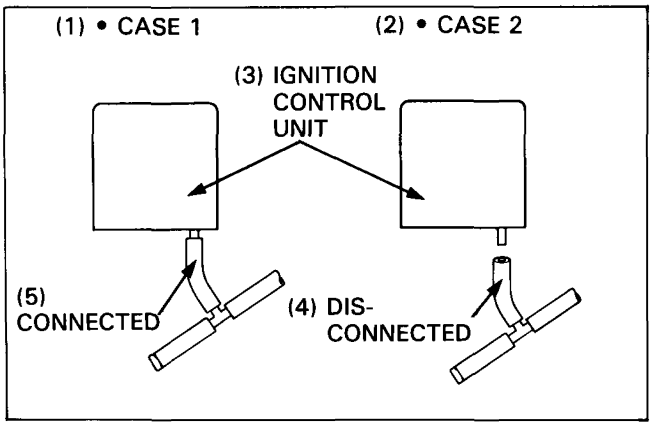
PRIMARY MAIN AIR JET CONTROL SYSTEM

SYSTEM INSPECTION

Remove the right fairing inner cover (page 12-9).
Disconnect the No.18 (WHT), No.19 (WHT), No.20 (WHT) and No.21 (WHT) tubes form the air jet solenoid valve 2 and 3.

Perform the inspection on next page in two conditions of the ignition control unit vacuum tube as illustlated.

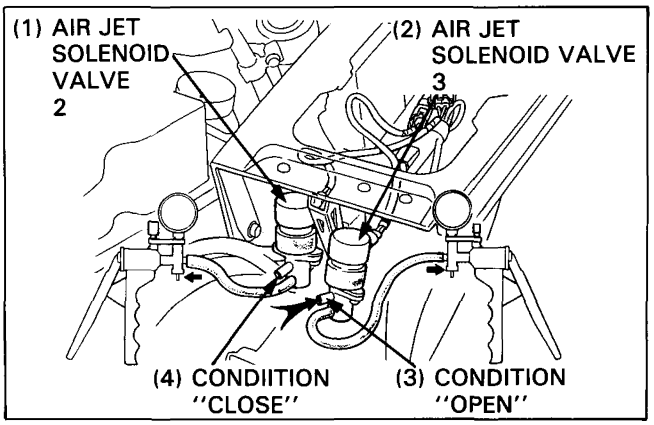
Case 1: With the vacuum tube connected to the ignition control unit
Case 2: With the vacuum tube disconnected from the ignition control unit



NOTE

- "Open" and "Close" in the chart on next page mean that:
  "Open"
  Connect a vacuum pump as shown and apply the specified vacuum. Vacuum should not be maintained.
  "Close"
  Apply the specified vacuum. Vacuum should be maintained.

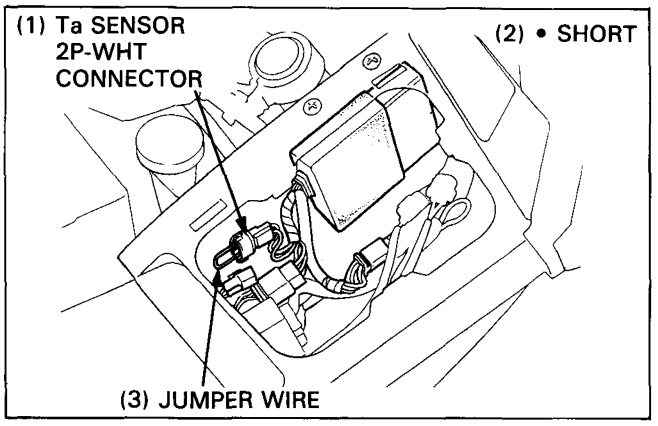
SPECIFIED VACUUM: 200 mm Hg (7.9 in Hg)



NOTE

- When performing the following test, keep the throttle opening fixed to stabilize the vacuum from the intake manifold to the ignition control unit.

1. Disconnect the Ta sensor 2P-WHT connector and connect a jumper wire between connector terminals of the carburetor control unit side as shown.
   Start the engine. By turning the throttle stop screw, the following results should be seen as engine speed is changed.

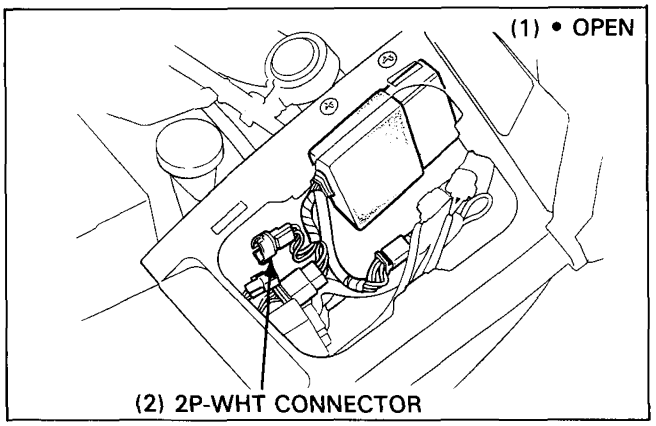


VACUUM TUBE CONDITION	VALVE NUMBER	ENGINE RPM		
		Below 1,550 min^{-1} (rpm)	Between 1,550 and 3,000 min^{-1} (rpm)	Above 3,000 min^{-1} (rmp)
Case 1	2	Valve is "Open"	Open	Open
	3	Open	Open	Open
Case 2	2	Close	Open	Close
	3	Close	Close	Open

Case 1: Vacuum tube connected to the ignition control unit.
Case 2: Vacuum tube not connected.

2. Remove the jumper wire used in the above test from the Ta sensor 2P-WHT connector as shown.

   Start the engine and the following result should be seen as engine speed is changed.



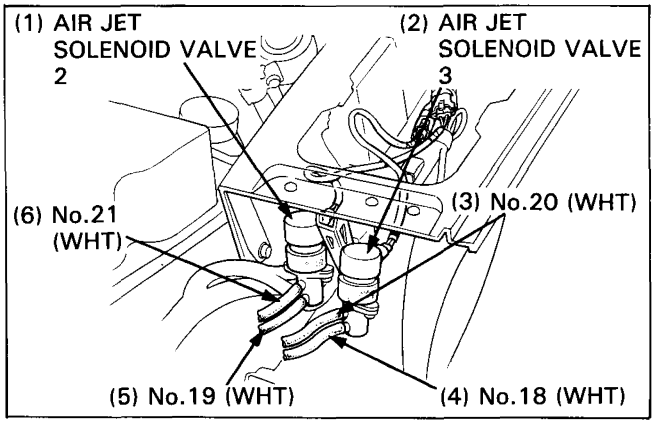
VACUUM TUBE CONDITION	VALVE NUMBER	ENGINE RPM		
		Below 2,000 min^{-1} (rpm)	Between 2,000 and 3,000 min^{-1} (rpm)	Above 3,000 min^{-1} (rmp)
Case 1	2	Valve is "Open"	Open	Open
	3	Close	Close	Open
Case 2	2	Close	Open	Close
	3	Close	Close	Open

Case 1: Vacuum tube connected to the ignition control unit.
Case 2: Vacuum tube not connected.

AIR JET SOLENOID VALVE CHECK

Remove the fairing right pocket.
Disconnect air tubes, 2P-GRN connector and 2P-RED connector.
Remove the air jet solenoid valve 2 and 3.

Check the valves using the same procedure used for the shot air solenoid valve 2 check (page 4-45).



Ta SENSOR CHECK

Remove the nut and Ta sensor from the fairing sub frame.
Remove the fairing right pocket and disconnect the 2P-WHT connector (waterproof).

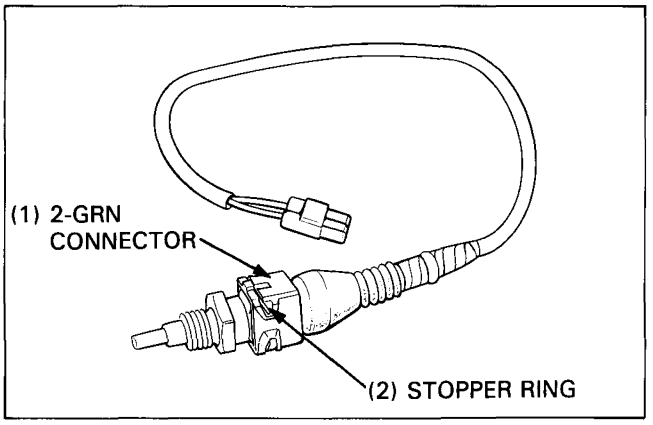
Disconnect the 2P-GRN connector from the Ta sensor by removing the stopper ring of the connector.

Suspend the sensor in cold water. Heat the water slowly.
Measure resistance between the terminals.

STANDARDS:
2.0—3.0 K ohms at 20°C (68°F)
200—400 ohms at 80°C (176°F)

NOTE

- If the sensor or thermometer touches the pan, false readings will result.
- Stir water well.

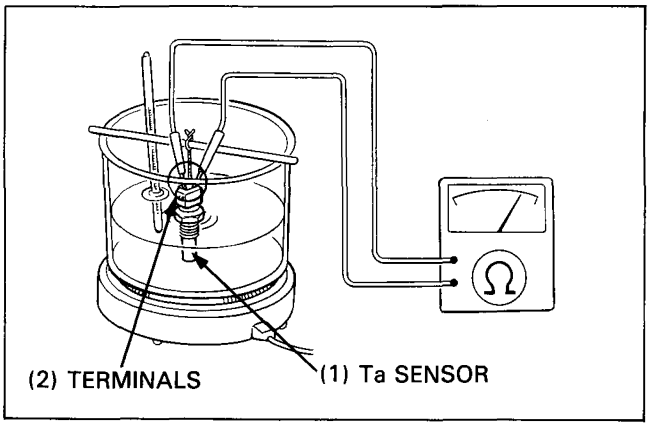


CAUTION

- *Do not attach water onto the sensor terminals.*

If resistance is outside the above ranges, replace the Ta sensor.

Set the connector stopper ring into the groove of the 2P-GRN connector and connect the connector to the Ta sensor properly. Install the Ta sensor in the reverse order of removal.



HIGH ALTITUDE COMPENSATION SYSTEM

AIR JET CONTROLLER INSPECTION

Check the AJC when the fuel/air mixture is lean at low altitude or the mixture is rich at high altitude.

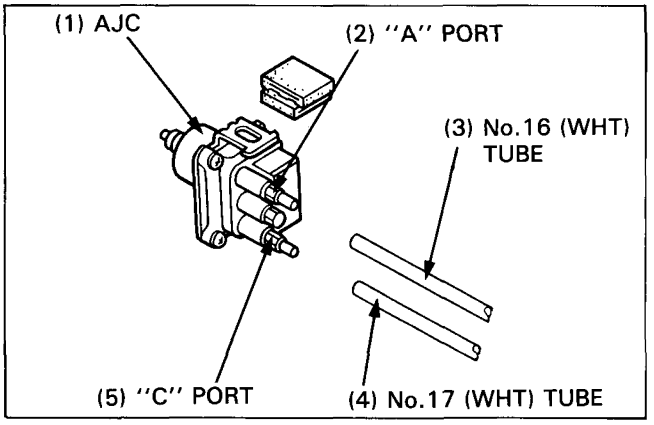
Remove the fairing right pocket (page 12-7).
Disconnect air tubes from the air jet controller and remove the AJC from the stay.

Apply pressure to the air jet A and C. At low altitude, the pressure should hold steady.

CAUTION

- *Do not try to disassemble or adjust the AJC.*

When installing the AJC, be careful of the tube connections.
No.16 (WHT) tube: "A" marked port of AJC
No.17 (WHT) tube: "C" marked port of AJC



HOT AIR SYSTEM

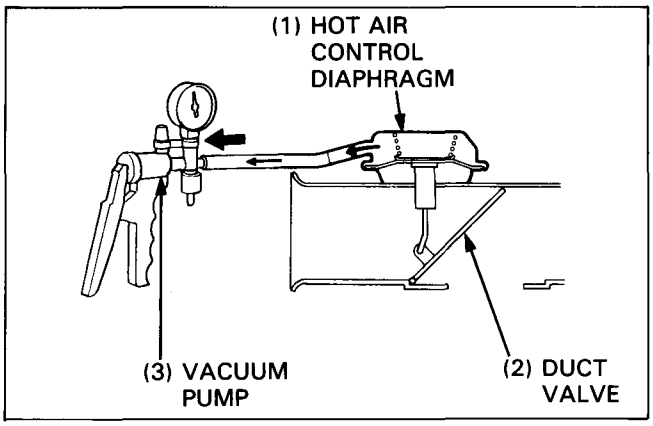
HOT AIR CONTROL DIAPHRAGM CHECK

Remove the air duct (page 4-15).
Connect a vacuum pump to the hot air control diaphragm and apply the specified vacuum to the control diaphragm.

SPECIFIED VACUUM: 200 mm Hg (7.9 in Hg)

The vacuum should be maintained and the duct valve should remain raised.

Replace it if necessary as below.

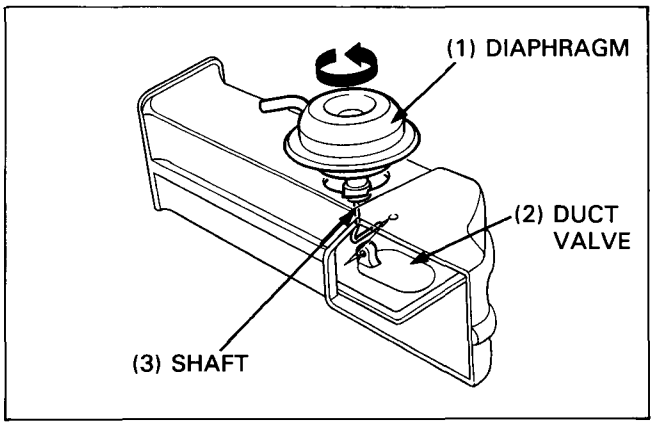


Turn the diaphragm counterclockwise and disconnect the diaphragm shaft from the duct valve.
Remove the diaphragm from the duct.

Install the diaphragm in the reverse order of removal.

NOTE

- Install the diaphragm with its vacuum pipe direction as shown.

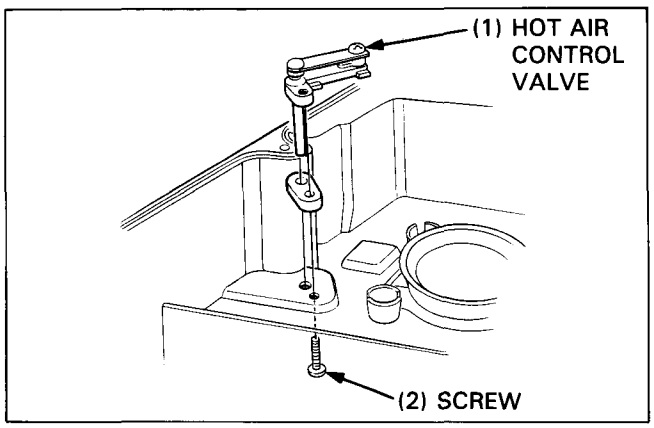


HOT AIR CONTROL VALVE CHECK

Remove the air cleaner case (page 4-15).
Remove the screw and hot air control valve from the air cleaner case.

Connect a vacuum pump to the hot air control valve.
Suspend the valve in cold water.
Heat the water slowly, applying vacuum to the control valve.

SPECIFIED VACUUM: 220 mm Hg (8.7 in Hg)



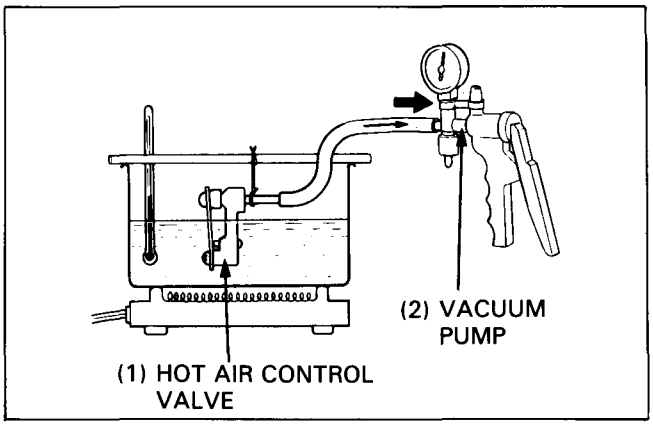
The following results are normal:

Below 11°C (52°F): The vacuum should be maintained.
Above 16°C (61°F): The vacuum should not be maintained.

NOTE

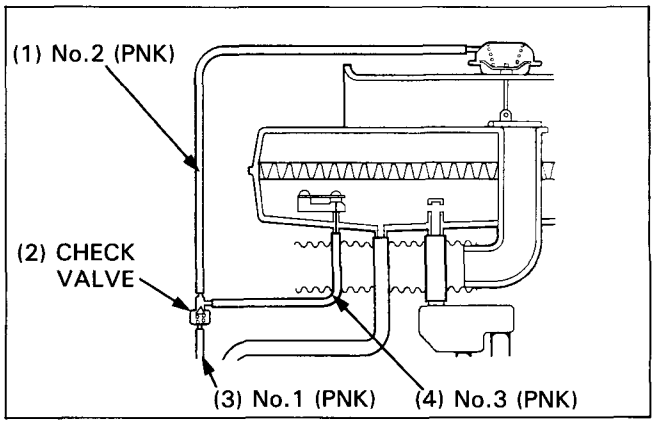
- If the valve or thermometer touches the pan, false readings will result.

Install the hot air control valve in the reverse order of removal.



CHECK VALVE CHECK

Remove the right fairing inner cover (page 12-9).
Remove the check valve from the No.1 (PNK), No.2 (PNK) and No.3 (PNK) air tubes.



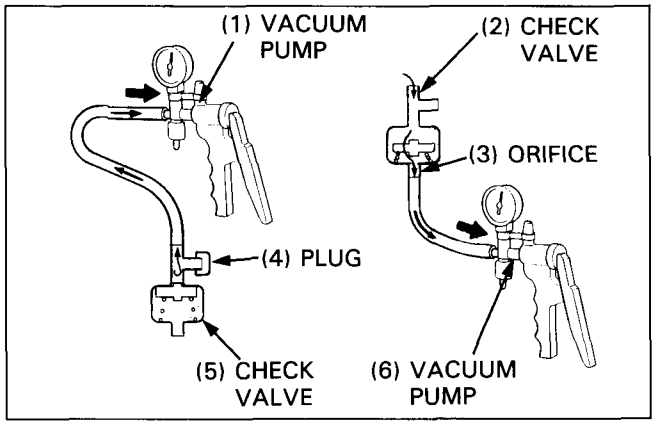
Connect a vacuum pump to the No.2 (PNK) port of valve as shown. Plug the No.3 (PNK) port.

Apply the specified vacuum and vacuum should be maintained.

SPECIFIED VACUUM: 40 mm Hg (1.6 in Hg)

Then, connect a vacuum pump to the No.1 (PNK) port as shown. Apply vacuum.
Vacuum should not remain steady; the vacuum gauge should show a gradual bleed attributable to the valve orifice.

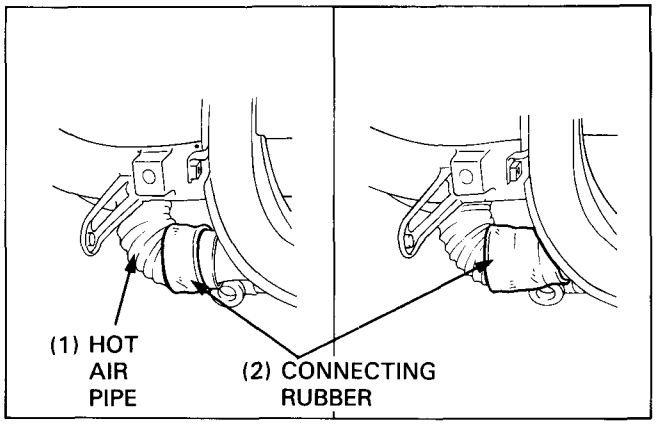
Install the valve in the reverse order of removal.



HOT AIR PIPE

Remove the under cover (page 12-8).
Remove the left cooling fan (page 5-10).
Remove the air cleaner duct (page 4-15).

Disconnect the hot air pipe from the hot air chamber (left exhaust pipe) and remove the pipe.

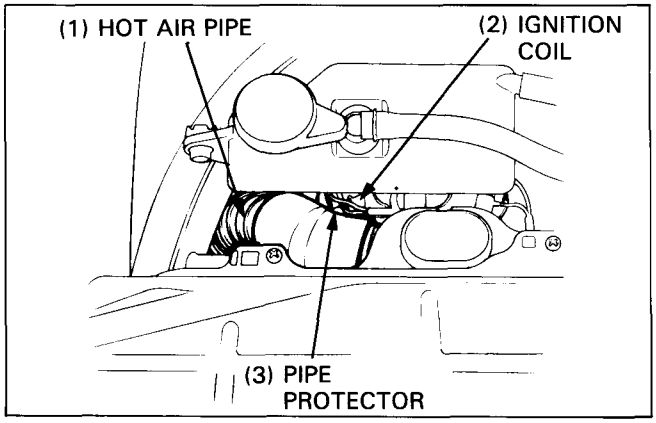


Check it for damage or deterioration.

Install the pipe in the reverse order of removal, being careful to follow the instructions in the following note.

NOTE

- Connect the hot air pipe to the hot air chamber first, then connect the pipe with the connecting rubber.
- Set the pipe so that the pipe protector could be attached to the ignition coil as shown.



SECONDARY AIR SUPPLY SYSTEM (SW MODEL ONLY)

SYSTEM INSPECTION

Start the engine and warm it up to operating temperature.

Stop the engine and remove the air cleaner element (page 4-16).

Check that the secondary air intake port is clean and free of carbon deposits.

Check the reed valves in the secondary air passage if the ports are carbon fouled (page 4-54).

Disconnect the air cleaner-to-air injection control valve No.4 (GRN) tube from the air cleaner case.

Remove the No.6 (GRN) vacuum tube from the left intake manifold; install a plug to keep air from entering. Connect a vacuum pump to the No.6 (GRN) vacuum tube.

Start the engine and open the throttle slightly to be certain that air is sucked in through the No.4 (GRN) tube.

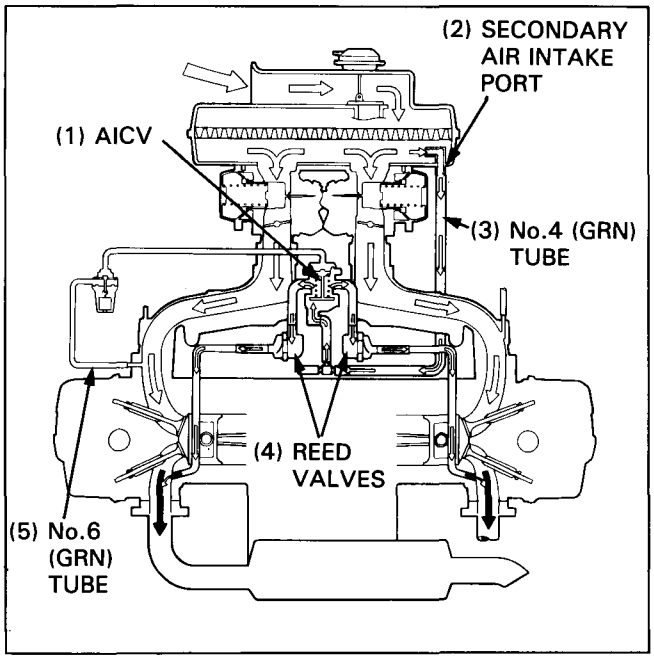
If air is not drawn in, check the No.2 (GRN) and No.4 (GRN) tubes for clogging.

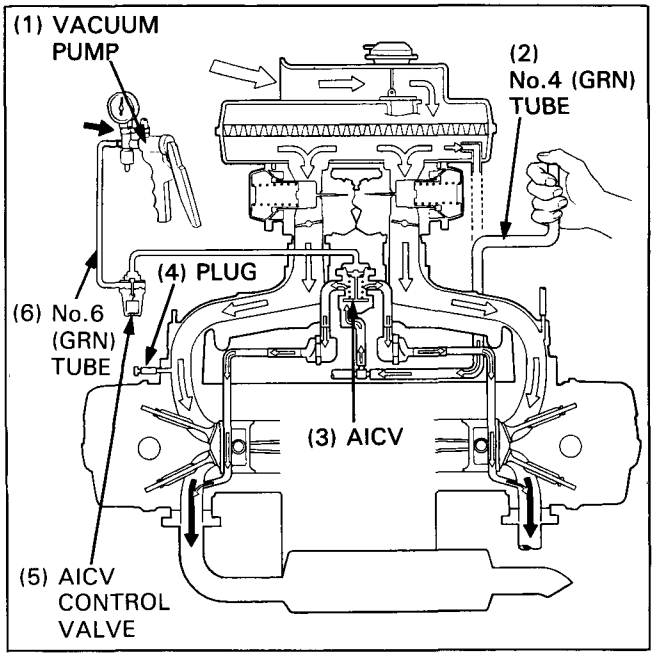
With the engine running, gradually apply vacuum to the No.6 (GRN) tube.

Check that the air intake port stops drawing air, and that the vacuum does not bleed.

SPECIFIED VACUUM: 600 mm Hg (23.6 in Hg)

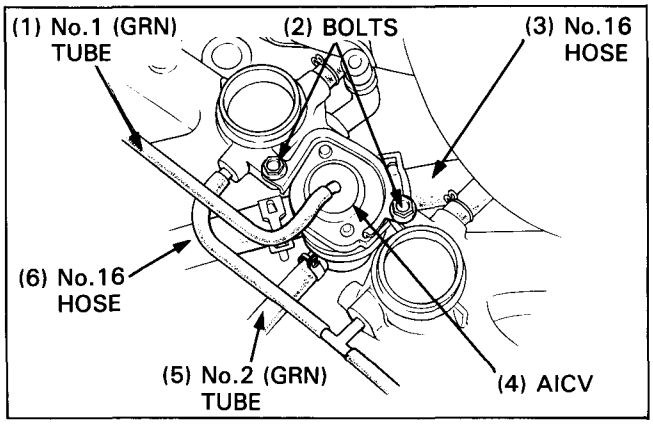
If air is still drawn in, or if the specified vacuum is not maintained, check the AICV control valve (page 4-54) and No.1 (GRN) and No.6 (GRN) tubes for clogging; check the AICV (next page) if necessary.
Check the reed valve joint hoses and air supply pipes (page 4-1).





AICV REMOVAL

Remove the carburetor (page 4-17).
Disconnect the No.1 (GRN), No.2 (GRN) tubes and No.16 hoses from the AICV.
Remove the bolts and AICV.



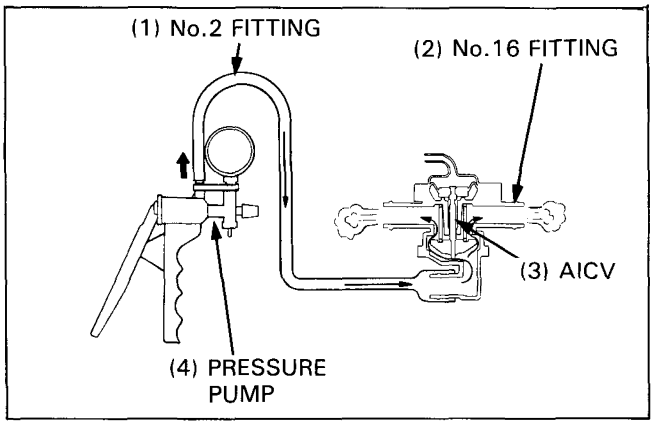
AICV INSPECTION

Remove the AICV (previous page).

CAUTION

- *To prevent damage to the AICV, do not use high air pressure sources. Use a hand operated air pump only.*

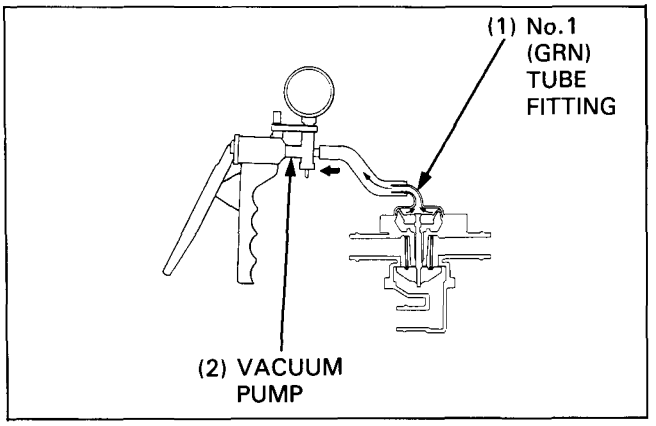
Connect a pressure pump to the No.2 hose fitting.
Apply a light pressure and make sure that air flows through the AICV and out No.16 fittings.
If there is no air flow, inspect the orifices in the No.2 and No.16 fittings for clogging.
If it is not clogged, replace the AICV.



Connect the vacuum pump to the No.1 (GRN) tube fitting and apply the specified vacuum to the AICV.

SPECIFIED VACUUM: 250 mm Hg (9.8 in Hg)

The specified vacuum should be maintained.
If the vacuum is not held, replace the AICV.

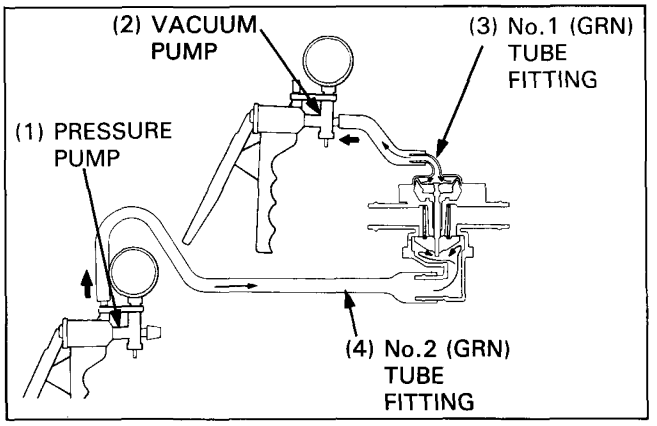


Connect a pressure pump to the No.2 (GRN) tube fitting. Connect a vacuum pump to the No.1 (GRN) tube fitting and apply the specified vacuum.

SPECIFIED VACUUM: 600 mm Hg (23.6 in Hg)

Apply light pressure (approximately 5 psi).

There should be no air flow from the No.16 hose fittings.
If there is air flow, replace the AICV.



AICV INSTALLATION

Install the AICV in the revserse order of removal.

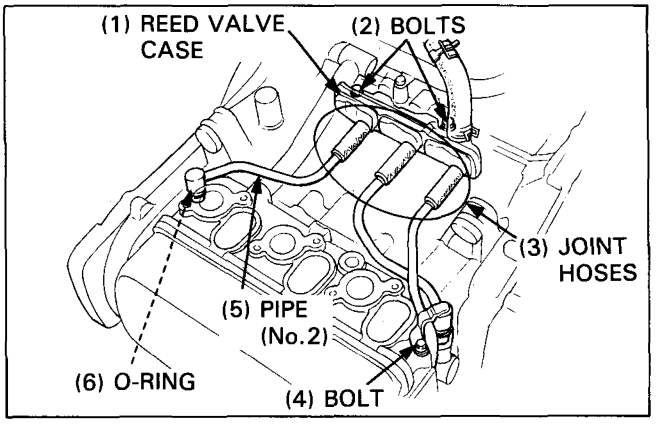
REED VALVE INSPECTION

Remove the AICV (previous page).
Remove the bolts and reed valve case.

Remove the reed valve joint hoses and check them for damage or deterioration.

Remove the air supply pipes of the No.1 and 2 cylinder.
Check the pipes and O-rings for damage or fatigue.

Remove the pipe mounting bolts (No.3 and No.4).

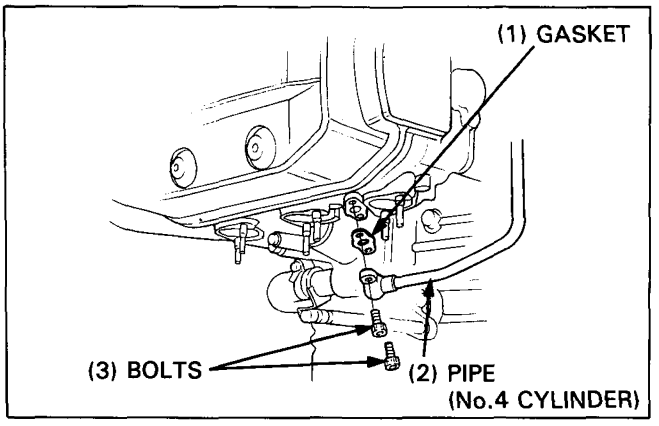


Remove the exhaust pipes (page 12-15).

Left side:
Remove the bolts, gasket and air supply pipe of the No.4 cylinder.
Remove the air supply pipe of the No.6 cylinder.

Right side:
Remove the timing belt shield cover (page 7-5).
Remove the bolts, gasket and air supply pipe of the No.3 cylinder.

Remove the air supply pipes of No.5 and No.6 cylinders.
Check the pipes and O-rings for damage or fatigue.



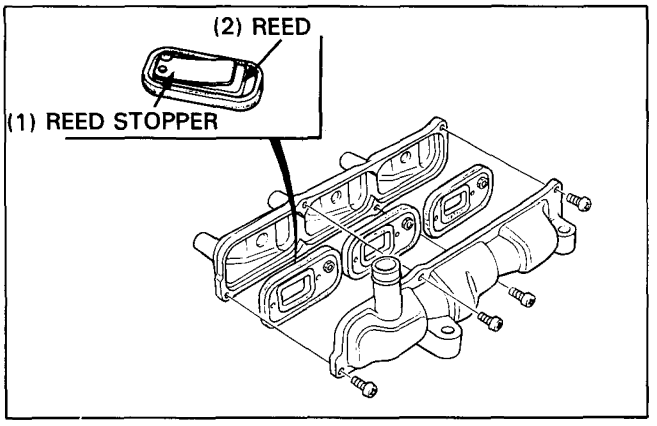
Remove the reed valve cover and reed valves.

Check the reeds for damage or fatigue, and replace if necessary.

Install a new need valve if the seat rubber is cracked or damaged, or if there is clearance between the reed and seat.

CAUTION

- *Do not disassemble or bend the reed stopper.*
- *The reed valve must not be disassembled.*
- *If the stopper, reed or seat is faulty, replace it as a unit.*



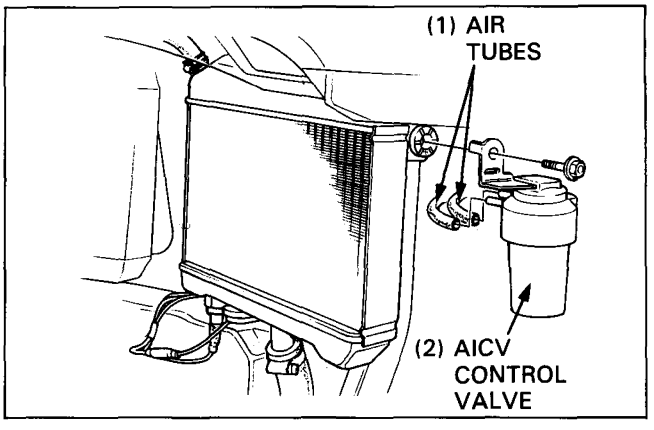
To assemble the reed valve chamber, reverse the removal procedure.

NOTE

- Install new O-rings and gasket on the air supply pipes.
- After assembly, make sure the air and vacuum tubes are correctly connected (page 4-1).

AICV CONTROL VALVE INSPECTION

Remove the left fairing lower cover (page 12-9).
Disconnect air tubes from the control valve and remove the left radiator mounting bolt and AICV control valve.



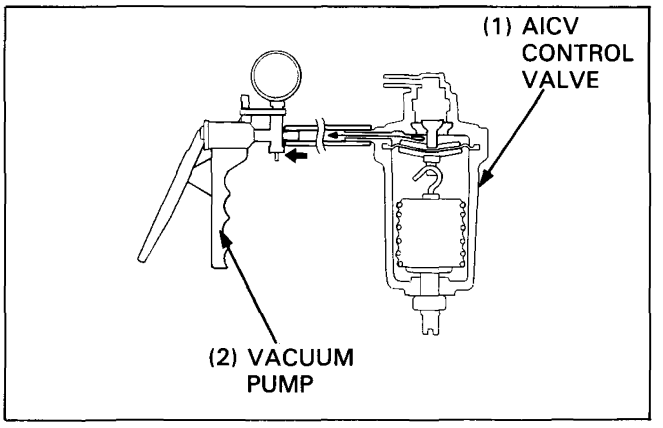
Apply the specified vacuum to the AICV control valve as shown. Vacuum should be maintained.

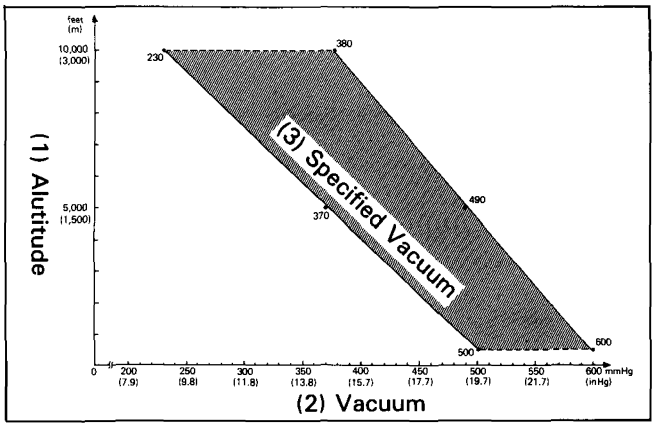
SPECIFIED VACUUM: 500—600 mm Hg (19.7—23.6 in Hg)

When continuing to apply vacuum, do not exceed the specified vacuum.

NOTE

- Altitude changes the specified vacuum. Refer to the following chart to determine your proper vacuum.

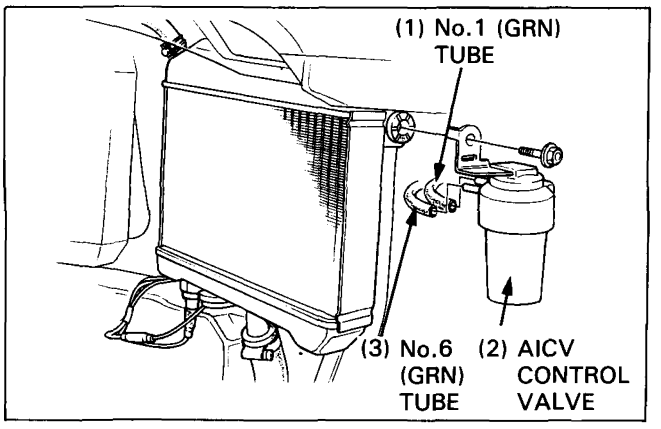


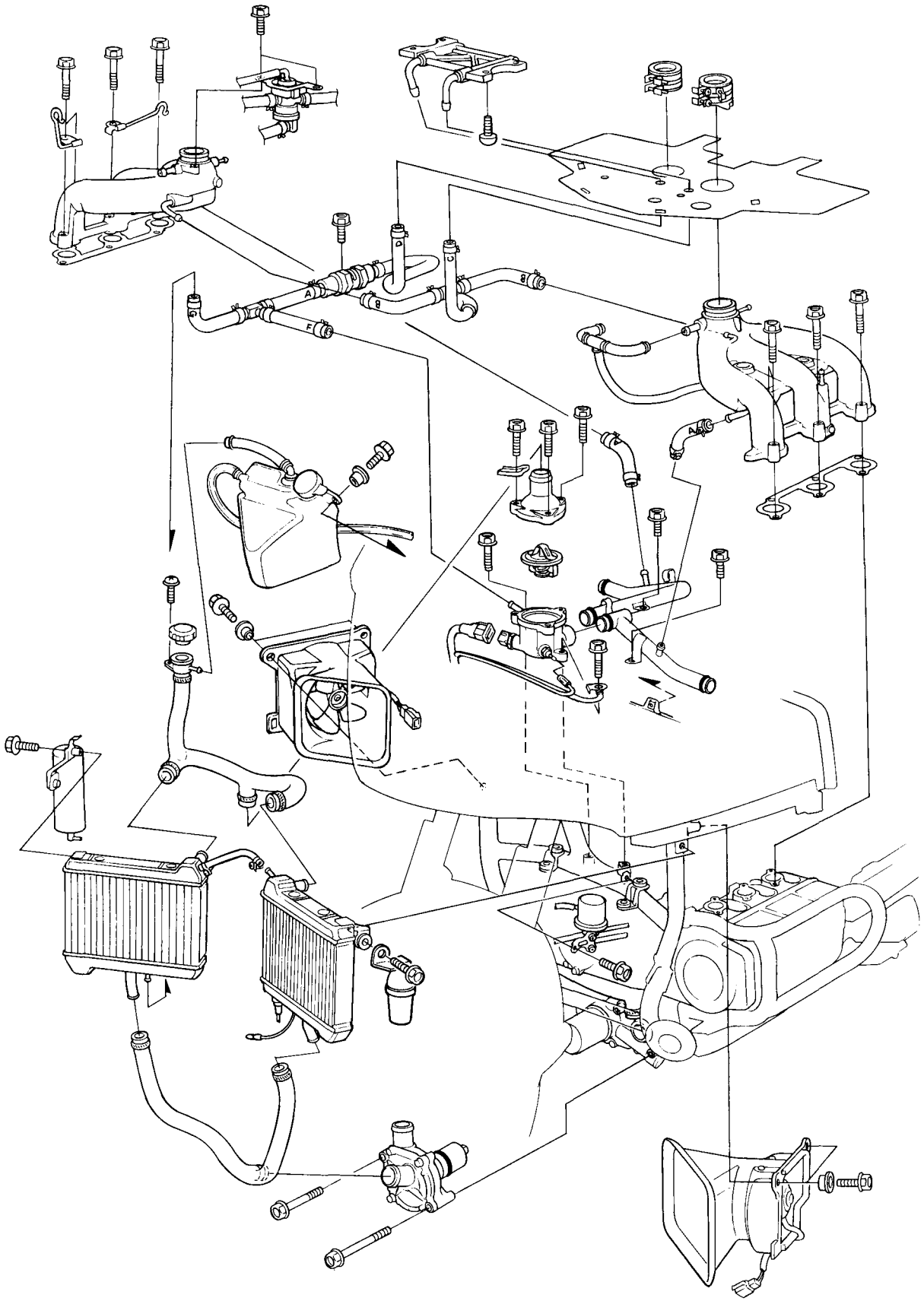


Install the AICV control valve in the reverse order of removal.

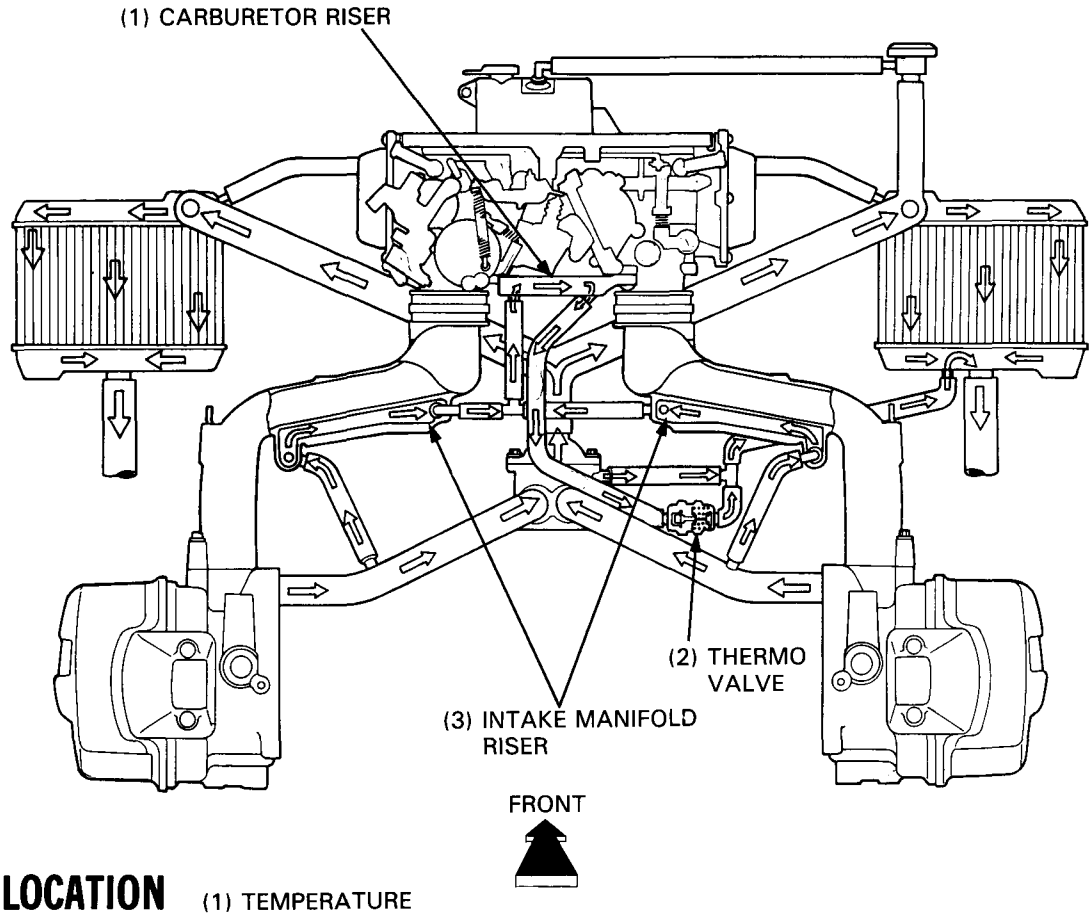
NOTE

- Be careful to reconnect the tubes correctly:
  No.1 (GRN) tube: upper port of the valve
  No.6 (GRN) tube: lower port of the valve

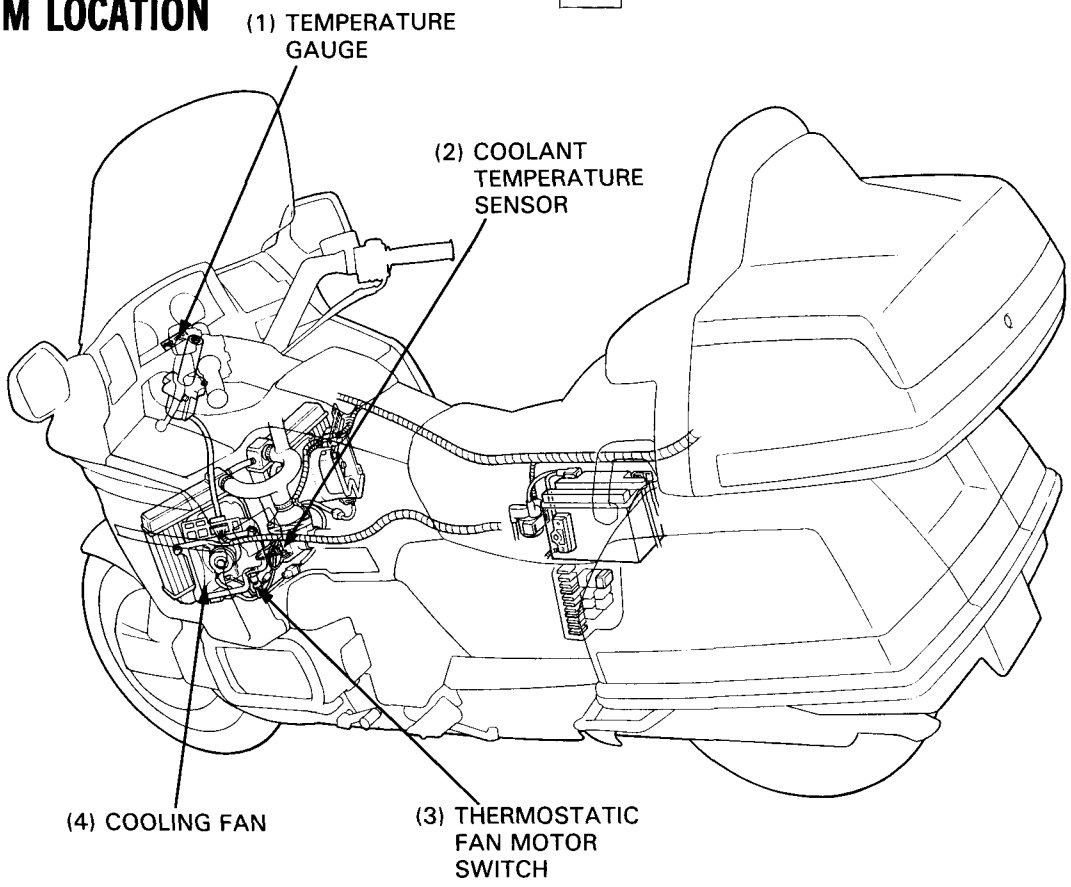




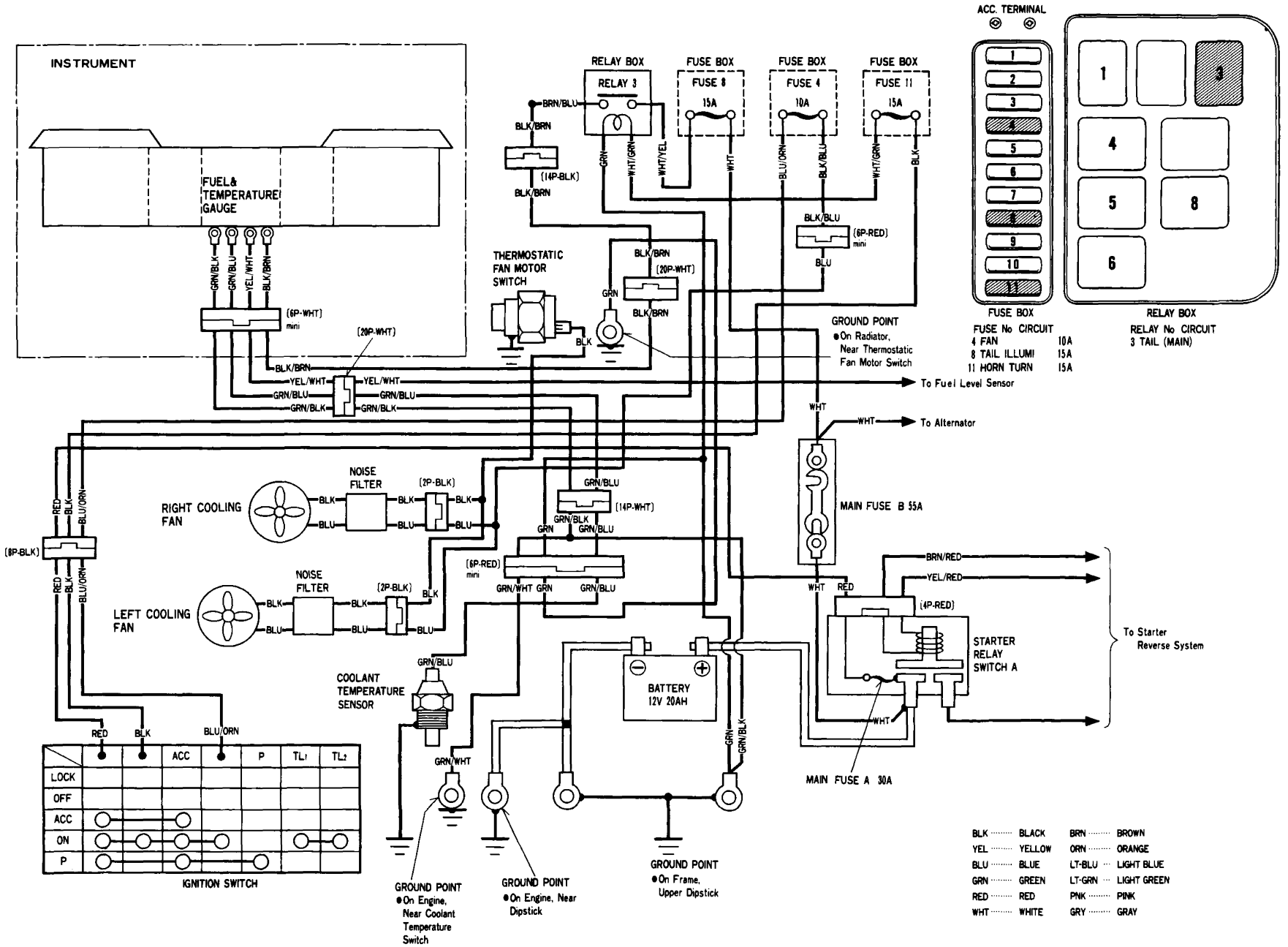
COOLANT COURSE



SYSTEM LOCATION



CIRCUIT DIAGRAM



SERVICE INFORMATION

GENERAL

⚠ WARNING

- ***Do not remove the radiator cap when the engine is hot. The coolant is under pressure and severe scalding could result. The engine must be cool before servicing the cooling system.***

- Use new O-rings when reinstalling or replacing cooling system parts.
- Use only distilled water and ethylene glycol in the cooling system. A 50—50 mixture is recommended for maximum corrosion protection. Do not use alcohol-based antifreeze.
- Add coolant at the reverse 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.
- For Tw sensor removal and inspection, see page 18-14.
- To identify water tubes, see the illustration on page 5-13.
- When inspect the coolant temperature sensor/gauge and thermostatic fan motor switch, check the system components and lines step-by-step according to the troubleshooting.

SPECIFICATIONS

Radiator cap relief pressure	75—105 kPa (0.75—1.05 kg/cm², 11—15 psi)				
Freezing point (Hydrometer test):	55% Distilled water +45% ethylene glycol: −32°C (−26°F) 50% Distilled water +50% ethylene glycol: −37°C (−35°F) 45% Distilled water +55% ethylene glycol: −44.5°C (−48°F)				
Coolant capacity: After disassembly Reserve tank After draining (included reserve tank)	 4.1 liters (4.3 US qt, 3.6 Imp qt) 0.55 liters (0.6 US qt, 0.5 Imp qt) 3.8 liters (4.0 US qt, 3.3 Imp qt)				
Thermostat	Begins to open: 80° to 84°C (176° to 183°F) Fully open: 93° to 97°C (199° to 206°F) Valve lift: Minimum of 8 mm at 95°C (0.31 in at 203°F)				
Boiling point (with 50—50 mixture):	Unpressurized: 107.7°C (226°F) Cap on, pressurized: 125.6°C (258°F)				
Thermo valve	Starts to close: 78° to 82°C (172° to 180°F)				
Thermostatic fan motor switch	Starts to close: 98° to 102°C (208° to 216°F)				
Coolant temperature sensor	Temperature	60°C (140°F)	85°C (185°F)	110°C (230°F)	120°C (248°F)
	Resistance	104 Ohms	44 Ohms	20 Ohms	16 Ohms

TORQUE VALUES

Coolant temperature sensor	12 N·m (1.2 kg-m, 9 ft-lb) —Apply sealant.
Thermostatic fan motor switch	28 N·m (2.8 kg-m, 20 ft-lb)
Tw sensor	28 N·m (2.8 kg-m, 20 ft-lb)

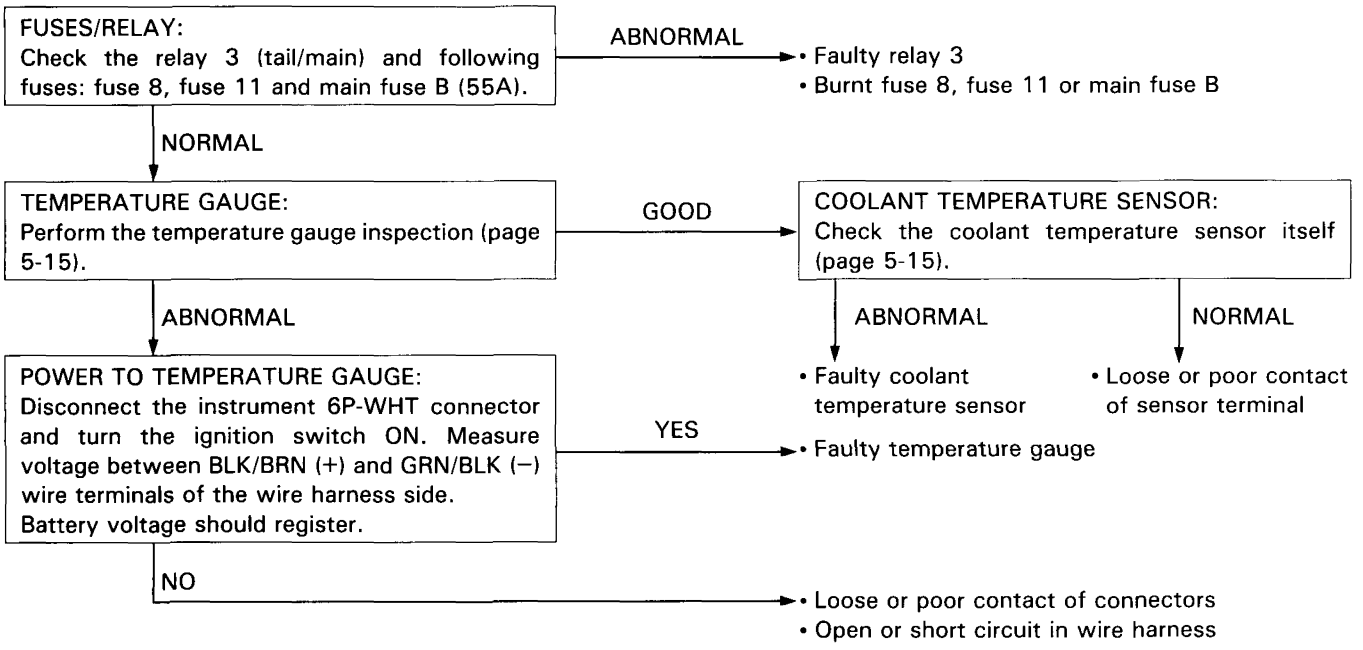
TROUBLESHOOTING

Engine temperature too high
- Faulty temperature gauge or coolant temperature sensor (see below)
- Thermostat stuck closed
- Faulty radiator cap
- Insufficient coolant
- Passages blocked in radiator, hoses, or water jacket
- Fan blades bent
- Faulty fan motor
- Radiator cap not holding pressure
- Fan not working (next page)
  - — Faulty thermostatic fan motor switch
  - — Faulty fan motor
- Leak between the radiator and cooling fan shroud (see page 5-9)
- Water pump not rotating
- Water pump impellers damaged
- Incorrect coolant-water ratio

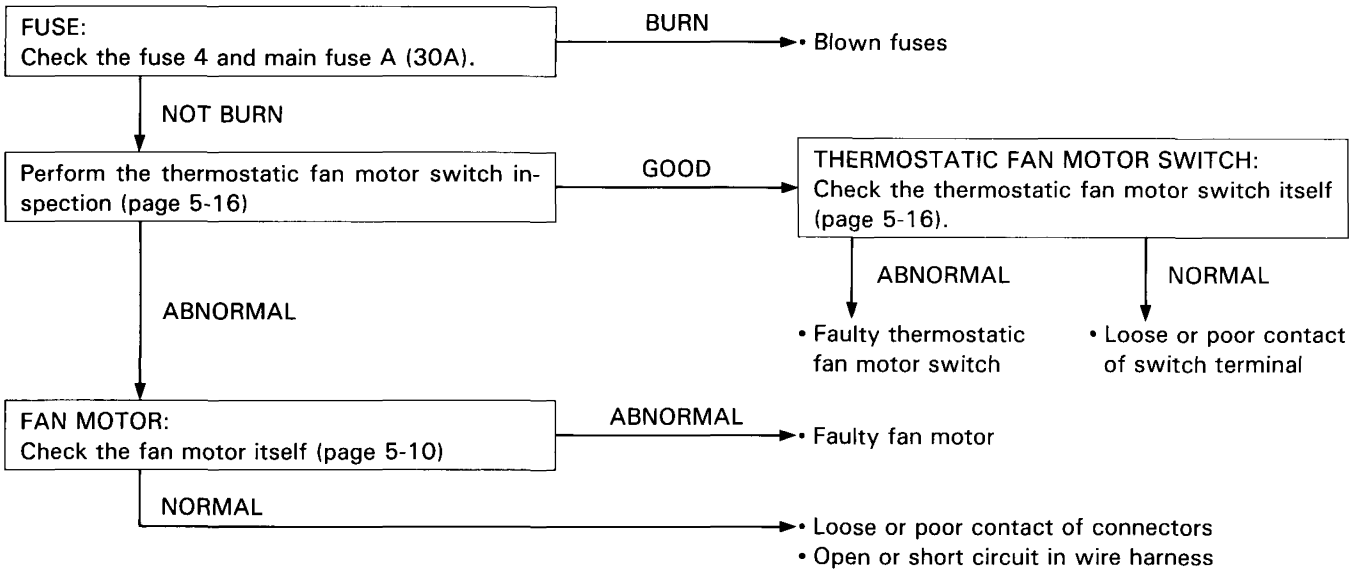
Engine temperature too low
- Faulty temperature gauge or coolant temperature sensor (see below)
- Thermostat stuck open

Coolant leaks
- Faulty pump seal
- Deteriorated O-rings
- Radiator hose damaged
- Loose or overtightened hose clamps

The temperature gauge is not operated properly.



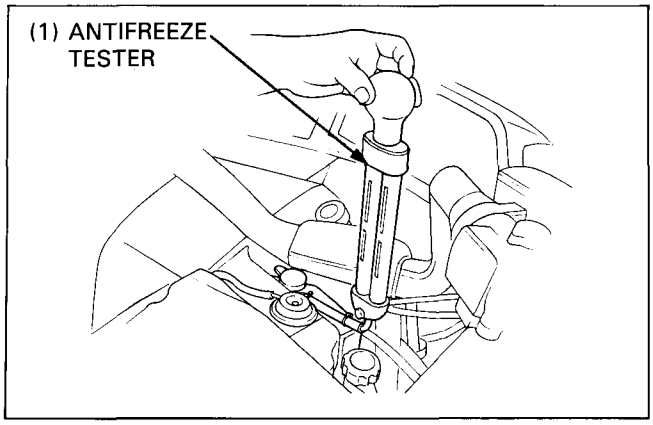
Fan motor not working.



INSPECTION AND TESTING

COOLANT

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

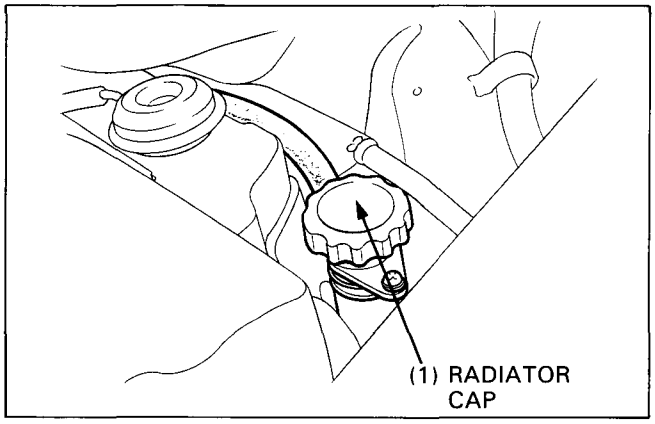


RADIATOR CAP

Remove the right top inner cover (page 12-7) and the radiator cap.

⚠ WARNING

- ***Be sure the engine is cool before removing the cap.***

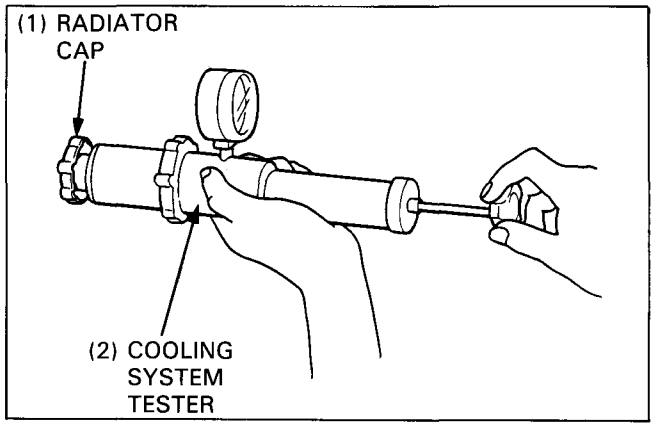


Pressure test the radiator cap. Replace the radiator cap if it does not hold pressure, or if relief pressure is too high or too low. It must hold specified pressure for at least six seconds.

NOTE

- Before installing the cap on the tester, moisten the sealing surfaces.

Relief Pressure: 75—105 kPa
(0.75—1.05 kg/cm², 11—15 psi)



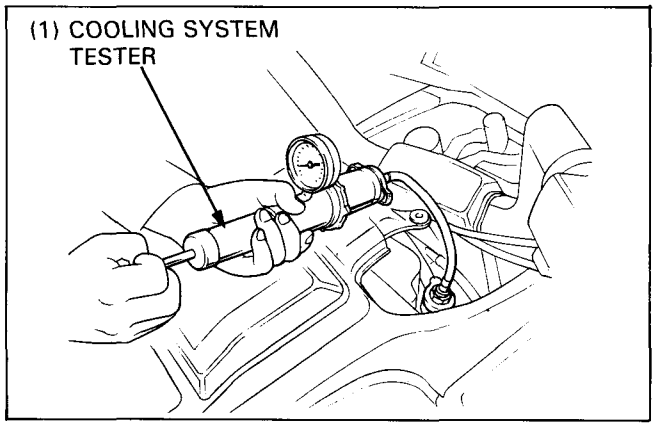
SYSTEM PRESSURE

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

CAUTION

- *Excessive pressure can damage the radiator. Do not exceed 105 kPa (1.05 kg/cm², 15 psi).*

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



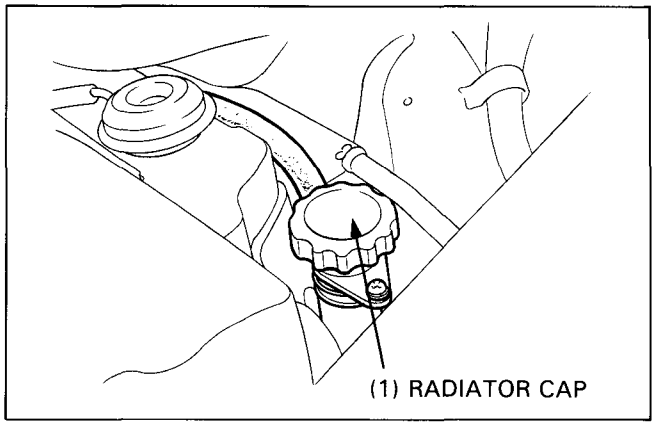
COOLANT REPLACEMENT

⚠ WARNING

- ***To avoid the chance of scalding yourself, replace coolant only when the engine is cool. Never remove the radiator cap when the engine is hot; the coolant is under pressure.***

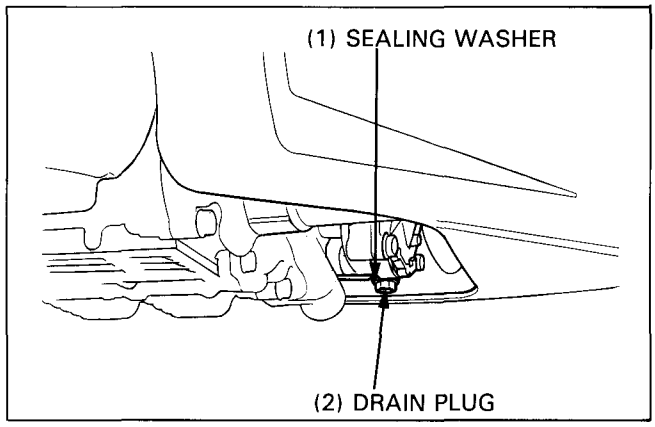
Remove the right top inner cover (page 12-7).

Remove the radiator cap.



Remove the drain plug, and drain the coolant.

Replace the drain plug sealing washer with a new one.



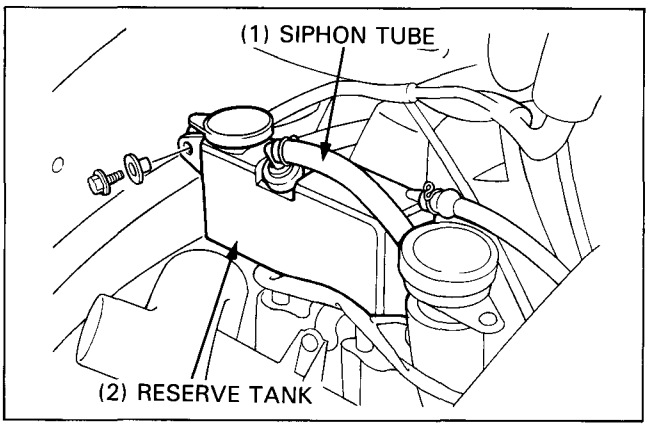
Remove the coolant reserve tank (page 5-11). Empty and rinse the tank, then reinstall it. Connect the siphon tube.

⚠ WARNING

- ***Flushing compounds are usually highly toxic and corrosive. Follow the manufacturer's instructions carefully and observe all precautions.***

Fill the radiator with a flushing compound for aluminum engines. Install the radiator cap, start the engine, and let it run for 10 minutes. Drain the radiator following the original steps.

Fill the radiator with plain water. Run the engine, then drain it following the original steps. Do this twice to ensure that all flushing compound is rinsed out of the system.



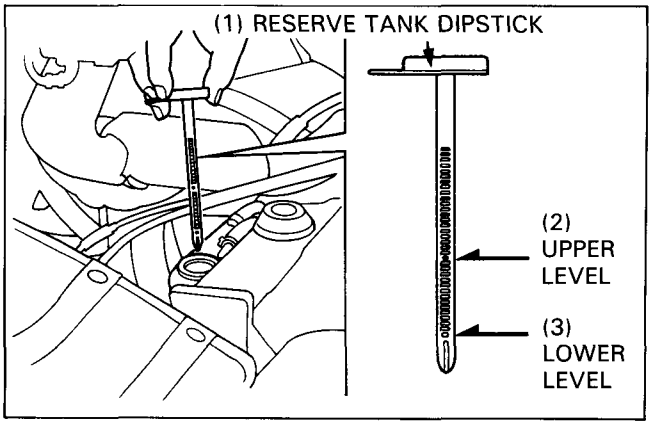
Fill the system with a 50—50 mixture of distilled water and ethylene glycol antifreeze.

Start the engine with the radiator cap off and run until there are no air bubbles in the coolant and the coolant level stabilizes.

Stop the engine and add coolant up to the proper level, if necessary. Install the radiator cap.

Check the reserve tank and fill to the correct level if the level is low.

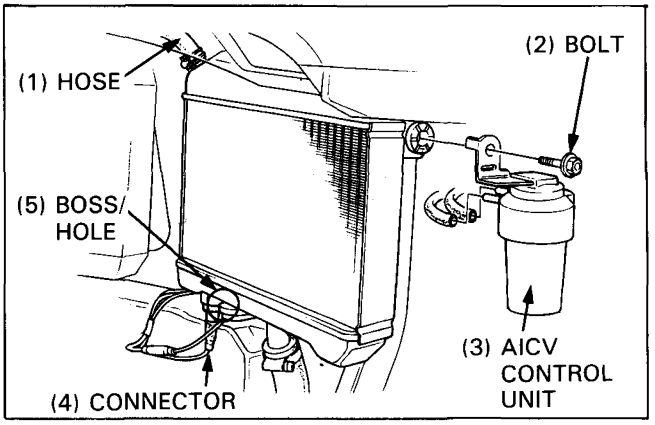
Check for leaks.



RADIATOR

REMOVAL

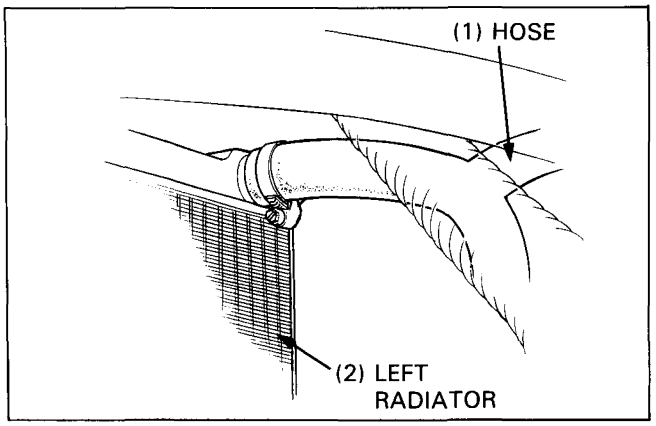
Remove the following:
– radiator shroud (page 12-9).
– fairing front cover (page 12-8).
– fairing lower covers (page 12-9).
Drain the coolant (previous page).
Disconnect the thermostatic fan motor switch connector.
Remove the radiator mounting bolt and release the radiator boss from the frame rubber hole.



Disconnect the radiator water hoses (3 connections) and remove the left radiator from the frame.

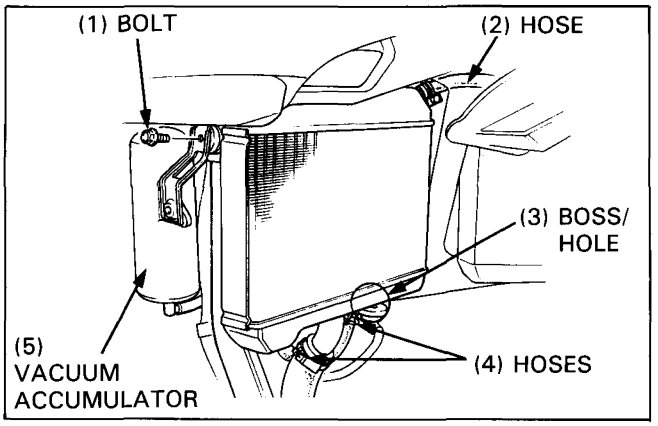
CAUTION

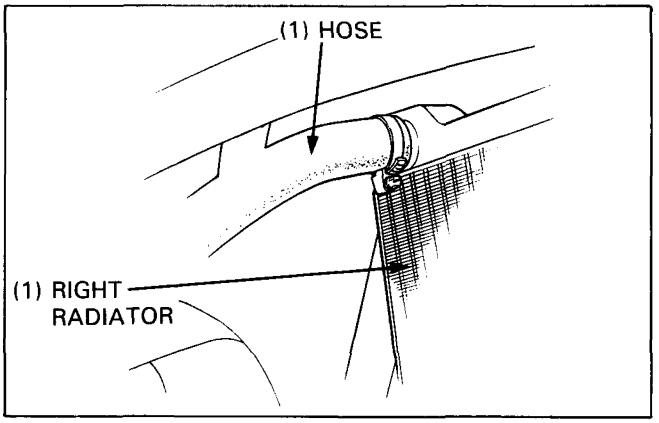
- *Be careful not to damage radiator fins.*



Remove the radiator/auto cruise accumulator mounting bolt and collar.
Release the radiator boss from the frame rubber hole.

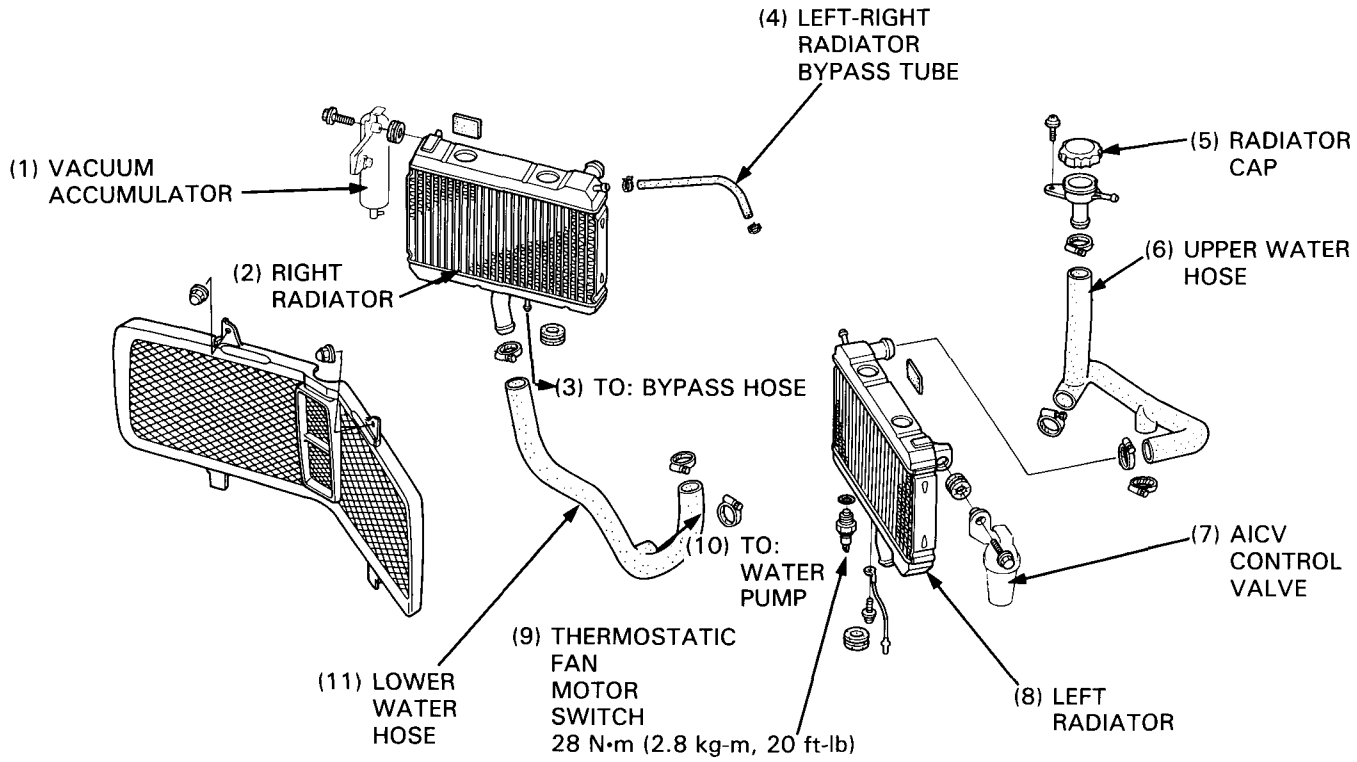
Disconnect the radiator water hoses (4 connections) and remove the right radiator from the frame.





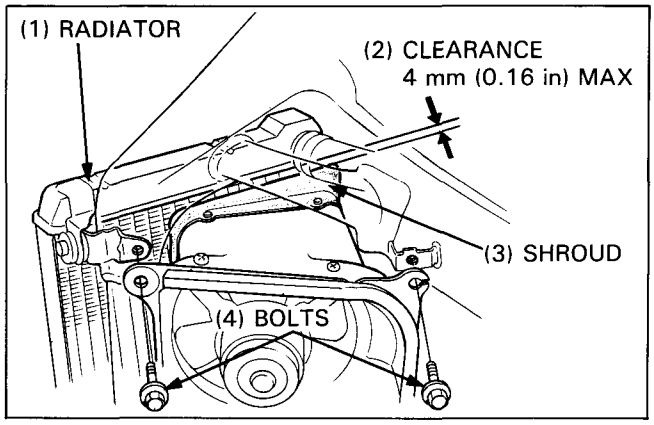
INSTALLATION

Install the radiator in the reverse order of removal.



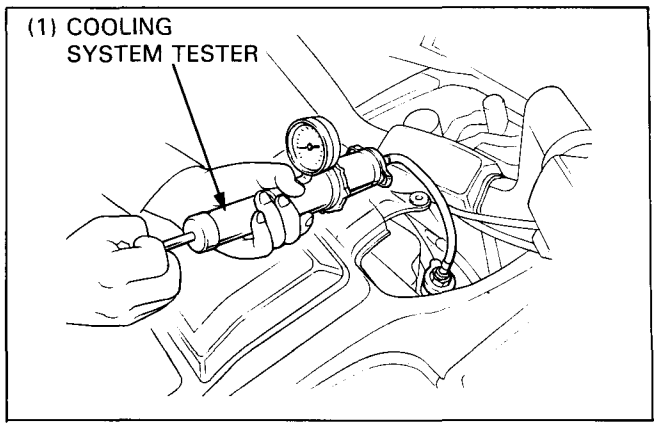
CAUTION

- *Make sure the clearance between the radiator and cooling fan shroud is 4 mm (0.16 in) max. all the way around. An improper clearance will cause the system to lose cooling power. To get the specified clearance, loosen the cooling fan shroud bolts and reset the cooling fan properly.*



Check the radiator for leakage by system pressure test (page 5-6) after installation.

Fill the system with coolant and bleed air from the radiator (page 5-7).



COOLING FAN

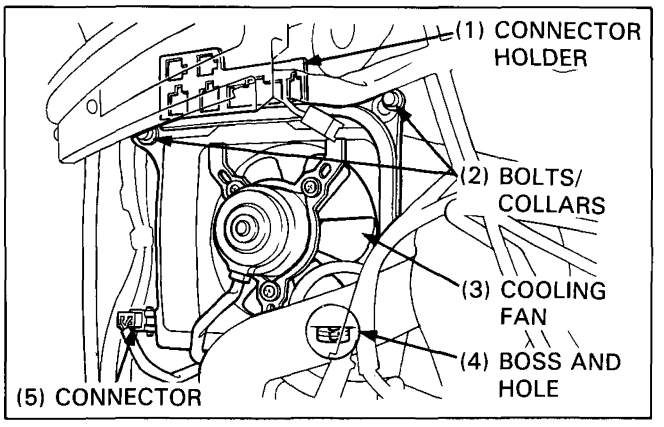
REMOVAL

Remove the radiator mounting bolt and release the radiator under boss from the frame rubber hole (page 5-8).

NOTE

- Do not drain coolant or disconnect water hoses.

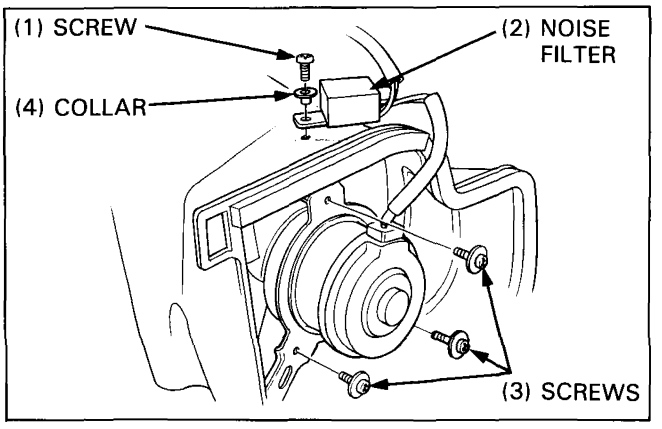
Disconnect the 2P-BLK connectors and remove the connector holder from the shroud.
Remove the cooling fan mounting bolts and collars.
Release the shroud under boss from the frame rubber hole and remove the cooling fan.



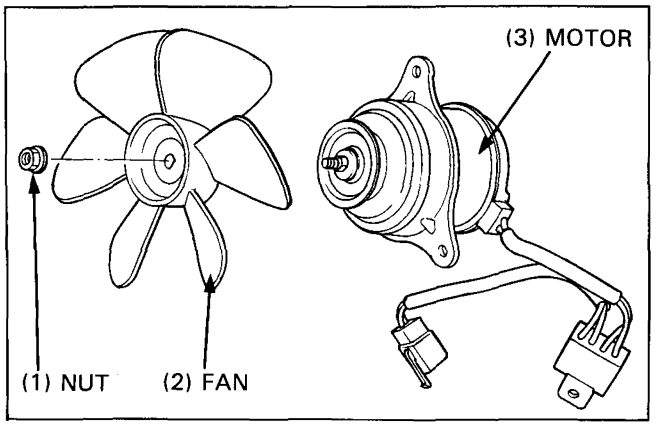
DISASSEMBLY

Remove the screw, collar and noise filter from the shroud.

Remove three screws and fan motor from the shroud.

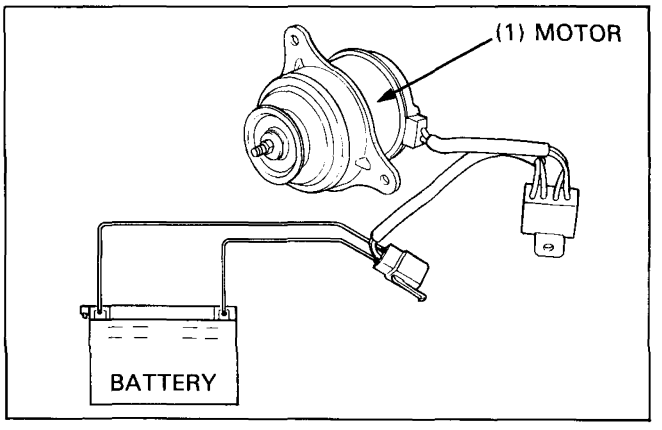


Remove the nut and fan from the fan motor.



FAN MOTOR INSPECTION

Use a 12 V battery to energize the motor and check its operation. The motor should run freely.



ASSEMBLY/INSTALLATION

Install the cooling fan in the reverse order of removal.

CAUTION

- *Make sure the clearance between the radiator and cooling fan shroud is within 4 mm (0.16 in) (previous page).*
- *Do not exchange the left motor for the right. Each motor rotates in a reverse direction.*

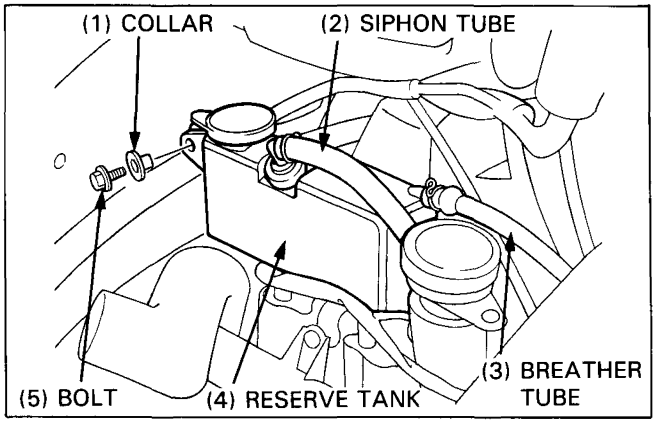
RESERVE TANK

REMOVAL

Remove the ignition coil stay mounting bolts, shift down the coil (page 18-9/Ignition Coil Removal).

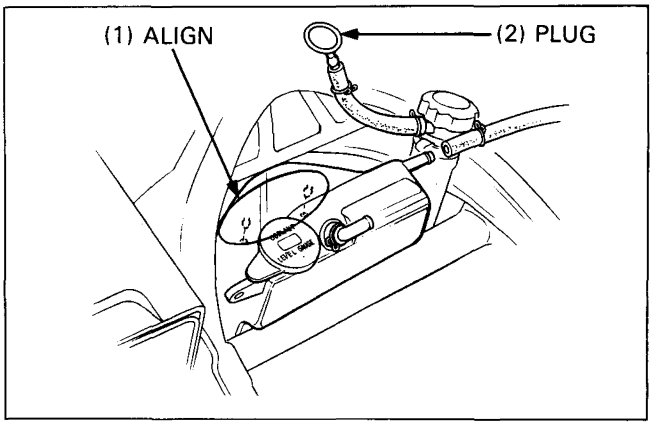
Disconnect the reserve tank breather tube and siphon tube.

Remove the reserve tank mounting bolt and collar.



Plug the siphon tube to prevent the coolant from flowing as shown below.

Remove the reserve tank.



INSTALLATION

Install the reserve tank in the reverse order of removal.

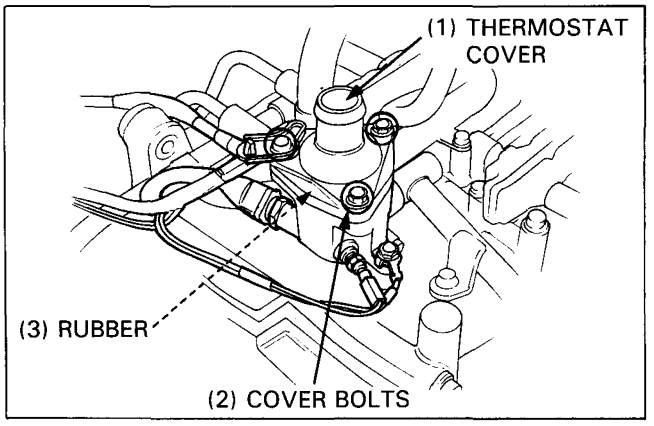
NOTE

- Align the reserve tank under bosses with the frame holes.

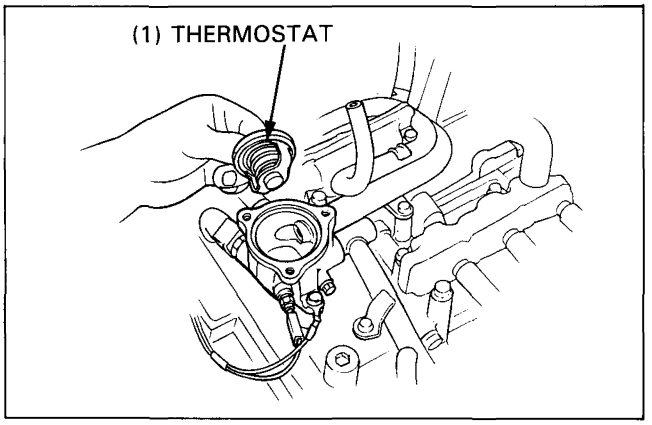
THERMOSTAT, THERMO VALVE AND WATER LINES

THERMOSTAT REMOVAL/INSPECTION

Drain the coolant (page 5-7).
Remove the radiator (page 5-8).
Disconnect the upper water hose from the thermostat cover.
Remove the three bolts, thermostat cover and rubber.



Remove the thermostat from the thermostat housing.



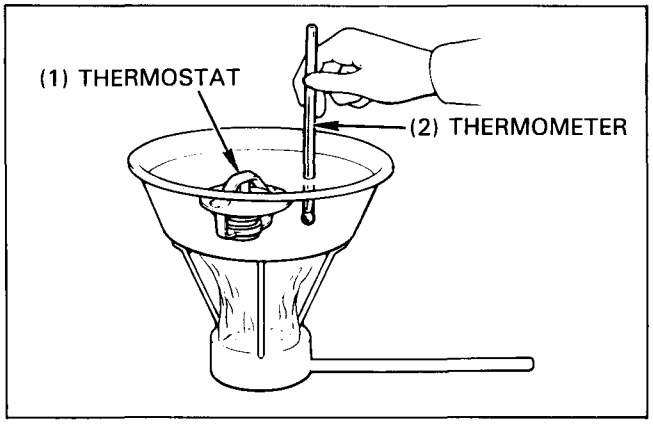
Visually inspect the thermostat for damage.

Suspend the thermostat in heated water and watch for valve opening and closing. Be sure the thermostat does not touch the bottom or sides of the container, or false readings will result.

Apply heat for five minutes.

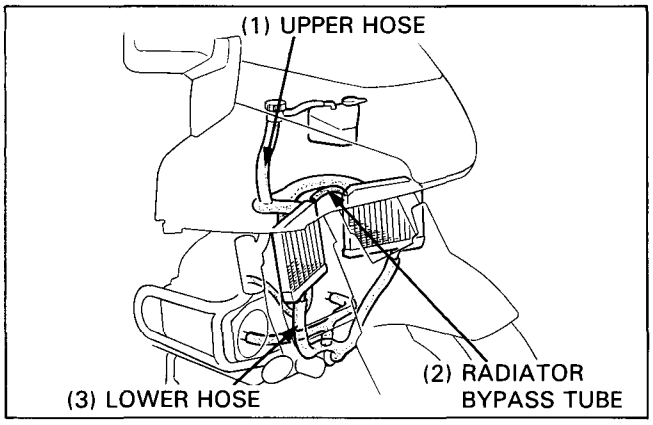
Starts to open: 80—84°C (176—183°F)
Full open: 93—97°C (199—206°F)
Valve lift: 8 mm (0.31 in) minimum

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

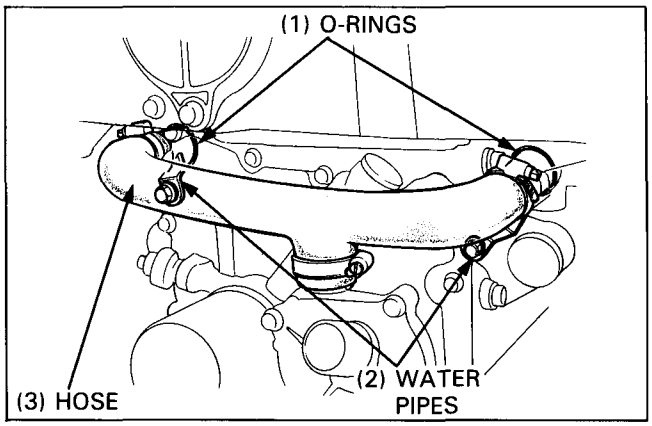


WATER LINE REMOVAL

Remove the radiators (page 5-8).
Remove the upper water hose, lower water hose and left-right radiators bypass tubes.



Remove the water pump hose and water pipes.
Inspect the O-rings for damage or deterioration.

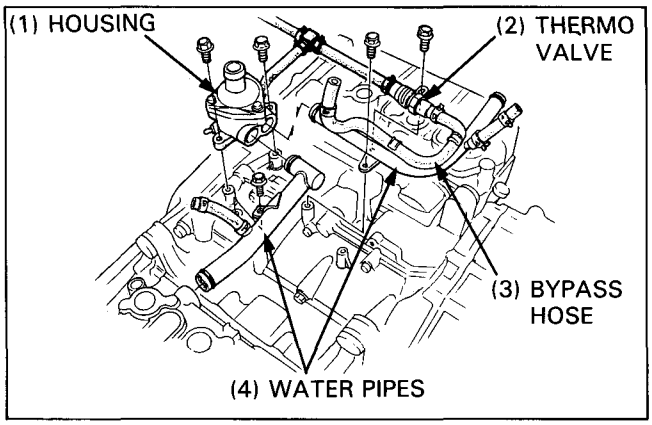


Remove the carburetor and intake manifolds (page 4-34).

Remove two bolts and thermostat housing from the engine.
Remove three bolts and water pipes/bypass hose.

Inspect the O-rings of pipes for damage or deterioration.
Inspect the bypass hoses for damage or deterioration.

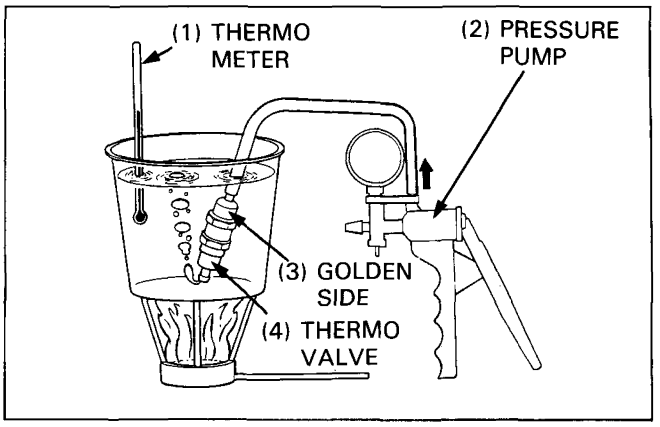
Remove the thermo valve from the bypass hose and inspect as follow (next page).



THERMO VALVE INSPECTION

Visually inspect the thermo valve for damage.

Connect a suitable tube to the thermo valve inlet port (Golden color side).
Connect a pressure tester to the tube as shown.
Suspend the thermo valve completely in heated water.
Be sure the thermo valve does not touch the bottom or sides of the container, or false readings will result.



Apply a light pressure to the thermo valve.

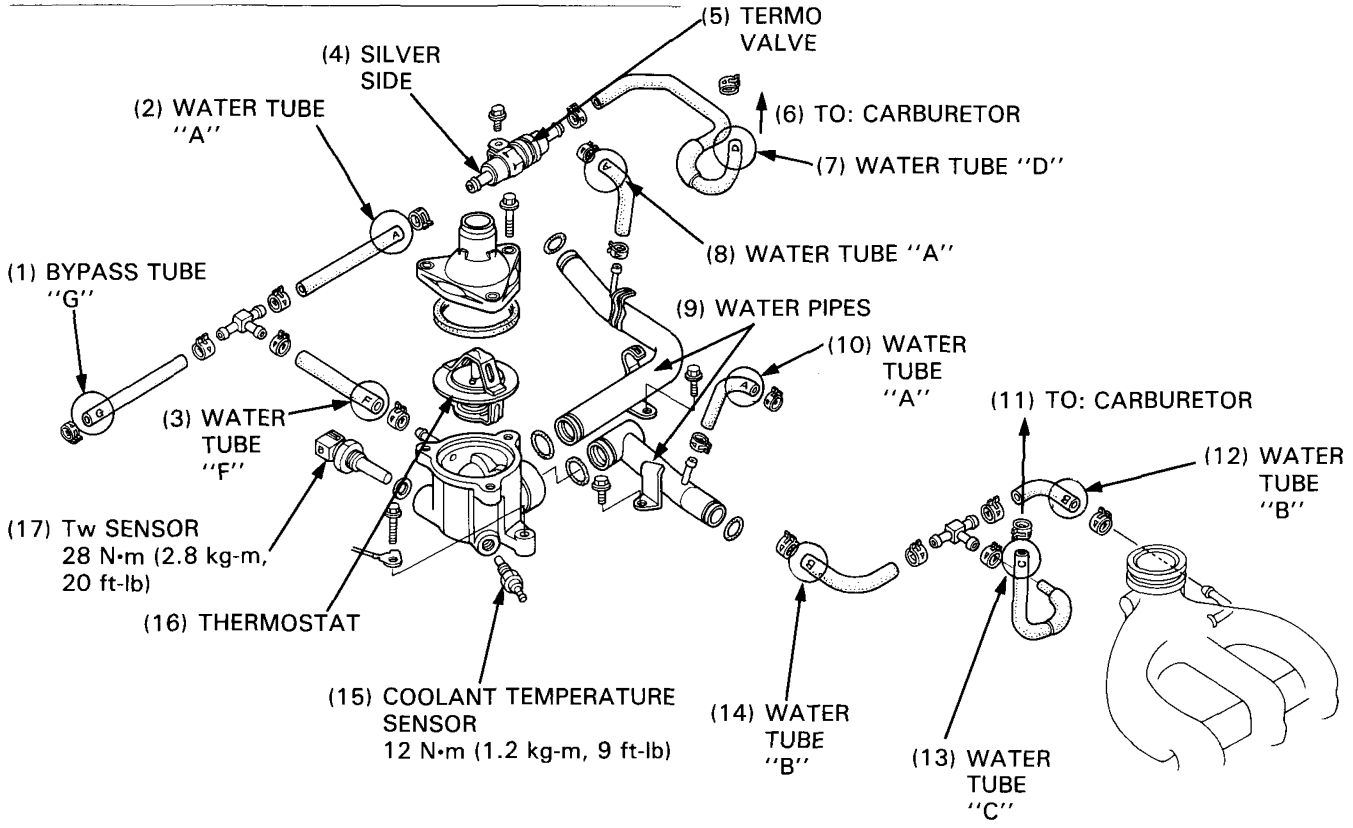
VALVE STARTS TO CLOSE: 78–82°C (172–180°F)

Replace the thermo valve if the passage is blocked at the temperature lower than those listed above, or if it is no restriction at a temperature higher than those listed.

Installation
To install, reverse the removal procedure.

NOTE

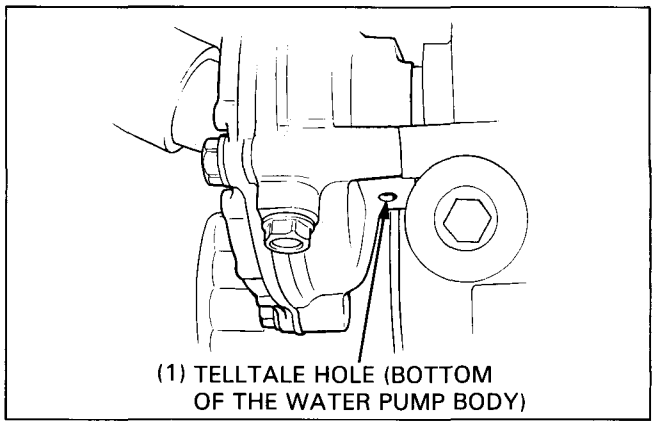
- Apply a sealant such as Honda Silicone Liquid Gasket to the temperature sensor threads before installation.
- Install the thermo valve with its silver color side facing the thermostat housing.
- Install the water tubes properly according to their alphabet as shown.



WATER PUMP

MECHANICAL SEAL INSPECTION

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



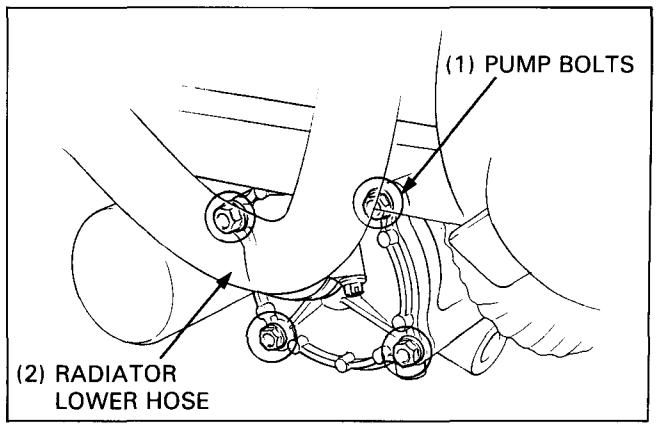
REMOVAL

Remove the subframe (page 6-4).

Drain the engine oil (page 2-4).
Drain the coolant (page 5-7).

Disconnect the radiator lower hose from the water pump cover.

Remove the four bolts and water pump cover from the body.



Disconnect the water pump hose from the water pump body.

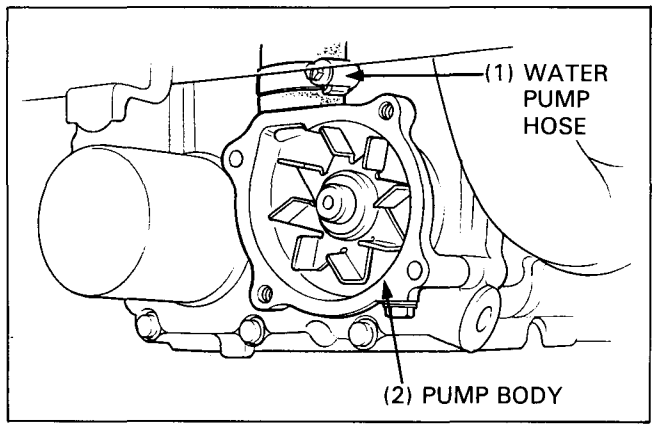
Remove the pump body from the engine.

INSPECTION

Check the water pump rotor for damage.

NOTE

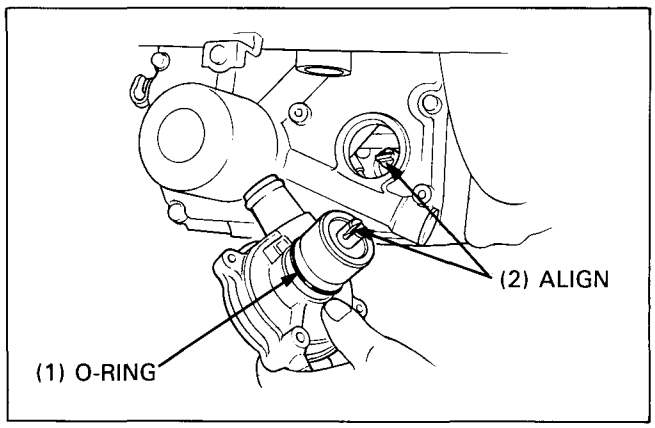
- Do not disassemble the pump rotor.



INSTALLATION

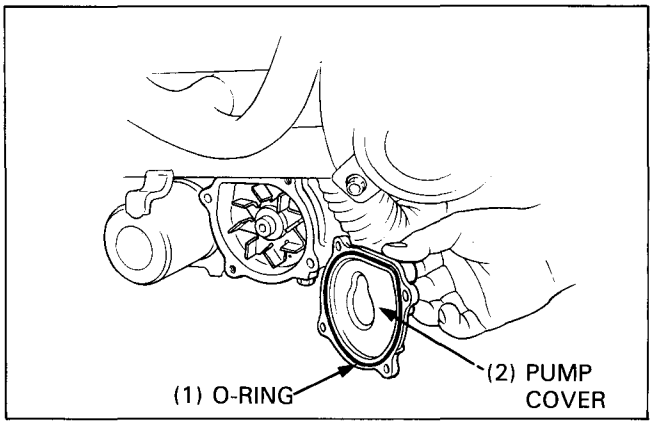
Install a new O-ring to the pump body.

Install pump body onto the engine, aligning the water pump rotor shaft slot with the oil pump shaft.



Install a new O-ring onto the pump cover.

Connect the water pump hose and install the water pump cover to the pump body.
Connect the radiator lower hose to the water pump cover.



COOLANT TEMPERATURE SENSOR/ GAUGE

TEMPERATURE GAUGE INSPECTION

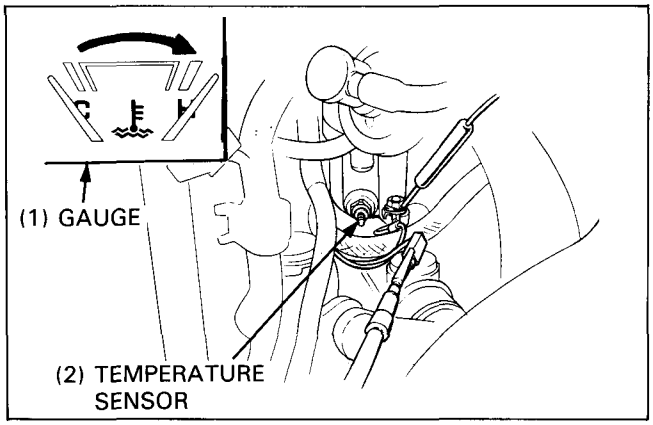
Remove the left cooling fan (page 5-10).
Disconnect the coolant temperature sensor GRN/BLU wire terminal.

Short the GRN/BLU wire to ground.
Turn the ignition switch to ON.

Temperature gauge should move all the way to the right side (H). Upon opening the wire, the gauge should move all the way to the left side (C).

CAUTION

- *Do not leave the temperature sensor wire grounded for longer than a few seconds, or the temperature gauge will be damaged.*

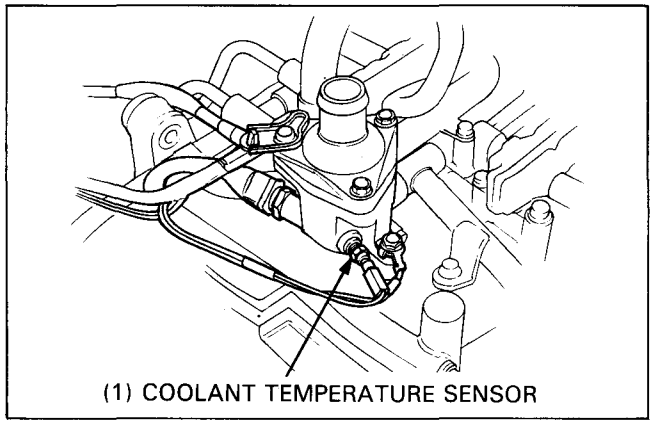


TEMPERATURE SENSOR REMOVAL

Drain the coolant (page 5-7).
Remove the left radiator and left cooling fan.

Disconnect the GRN/BLU wire terminal from the temperature sensor.

Remove the temperature sensor from the thermostat housing.



TEMPERATURE SENSOR INSPECTION

Suspend the unit in oil and measure the resistance through the unit as the oil heats up.

Temperature	60°C	85°C	110°C	120°C
	140°F	185°F	230°F	248°F
Resistance	104 Ohms	44 Ohms	20 Ohms	16 Ohms

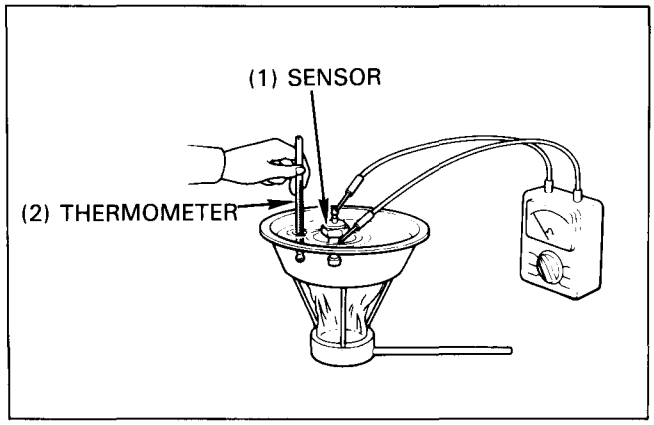
Do not let the unit or thermometer touch the pan or false readings will result.

⚠ WARNING

- ***Wear gloves and eye protection.***

NOTE

- Oil must be used as the heated liquid to check operation above 100°C (212°F).



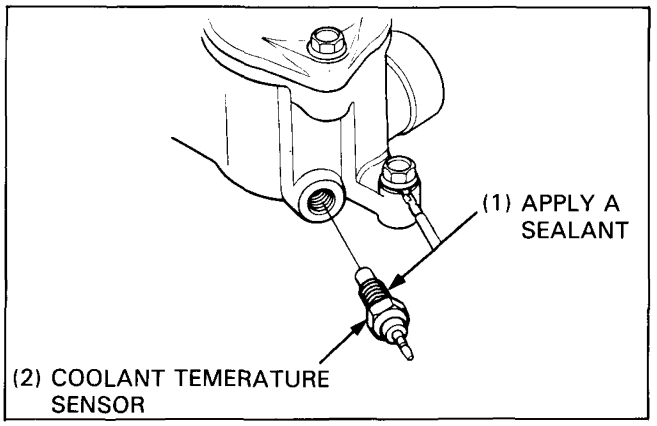
TEMPERATURE SENSOR INSTALLATION

Install the sensor in the reverse order of removal.

NOTE

- Apply a sealant such as Honda Silicone Liquid Gasket to the temperature sensor threads before installation and tighten the sensor to the specified torque.

  TORQUE: 12 N·m (1.2 kg-m, 9 ft-lb)



THERMOSTATIC FAN MOTOR SWITCH

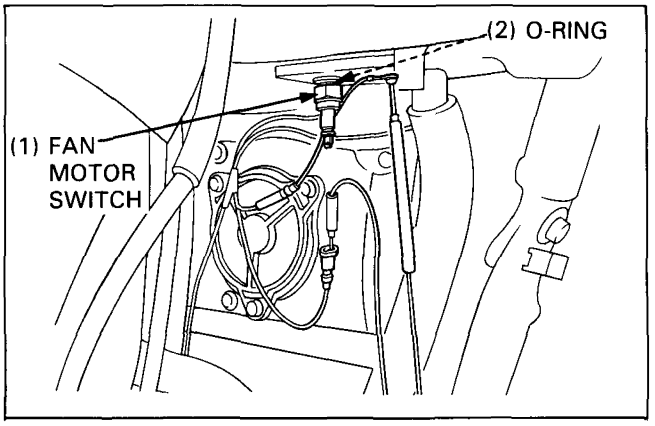
INSPECTION

Remove the fairing front cover (page 12-8).

Disconnect the BLK wire terminal from the thermostatic fan motor switch.

Short the BLK wire to ground.
Turn the ignition switch to ON.

Fan motor should work.

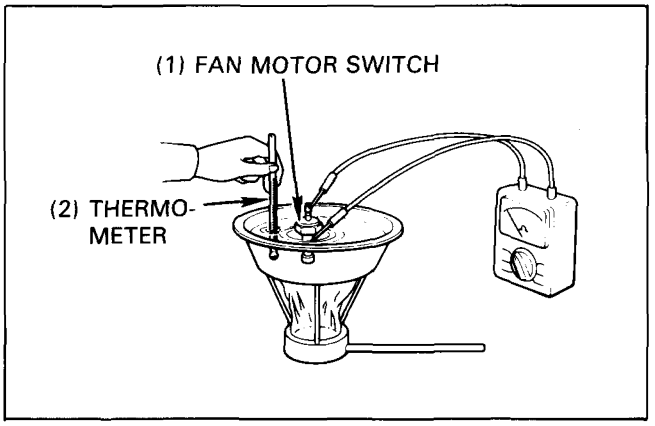


Drain the coolant (page 5-7).
Remove the fan motor switch and O-ring from the left radiator.

Suspend the switch in a pan of coolant (50—50 mixture) and check the temperatures at which the switch opens and closes. Make sure that there is no switch continuity at room temperature and gradually raise the coolant temperature. The switch should have continuity (closed) at 98—102°C (208—216°F).

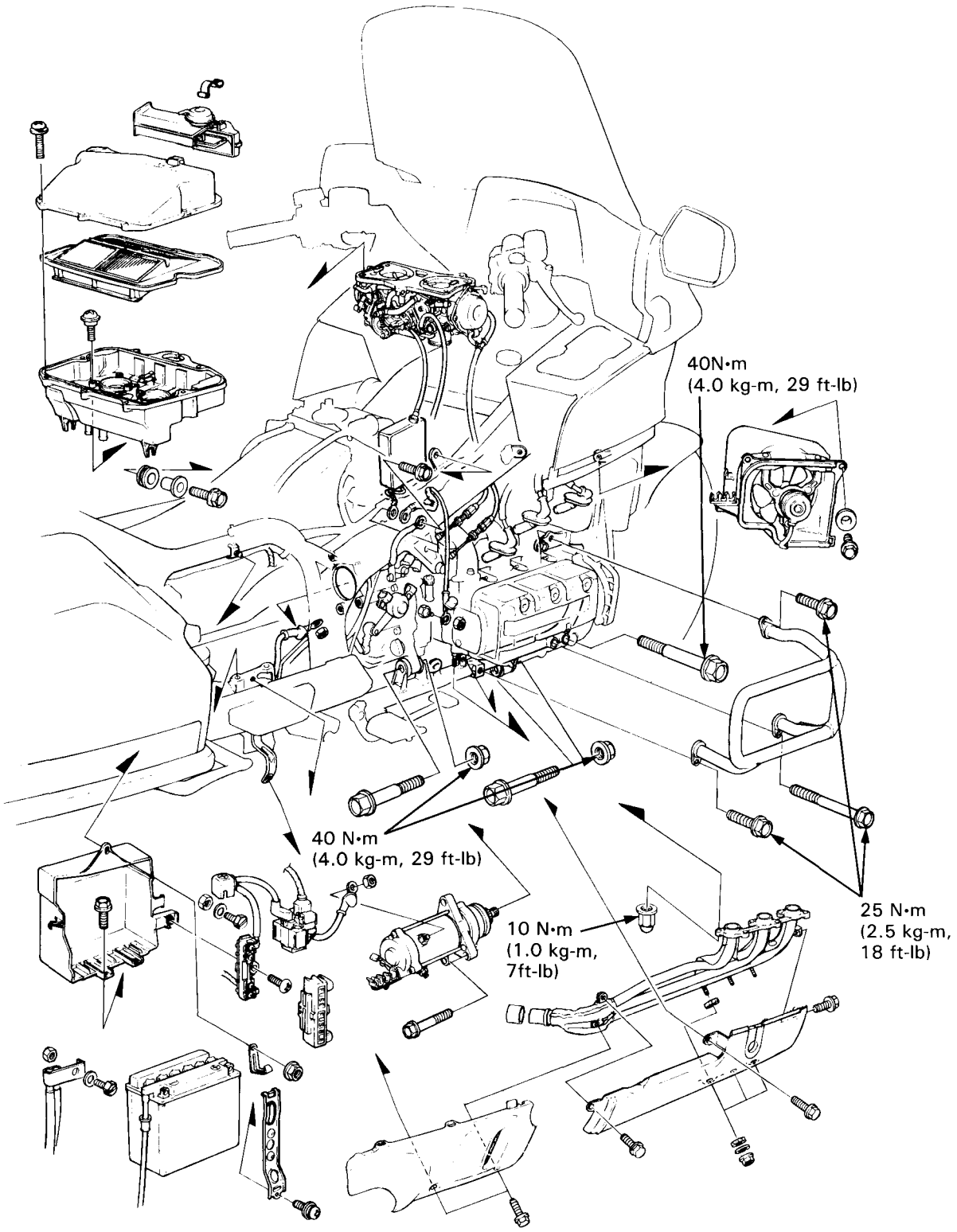
NOTE

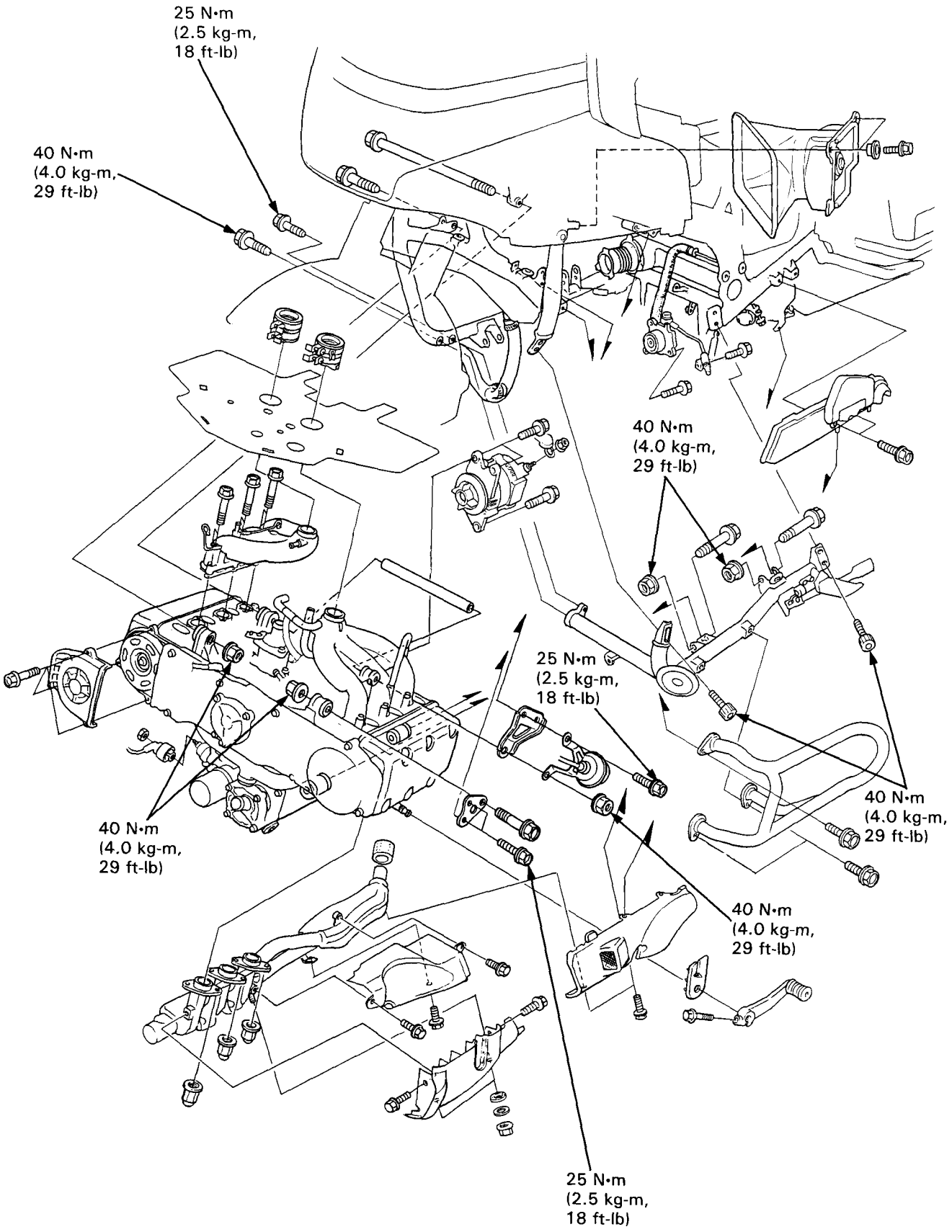
- Keep the temperature a steady for 3 minutes before testing continuity. A sudden change of temperature will cause error of temperature readings between the thermometer and the switch.
- Do not let the thermometer or switch touch the pan as it will cause a false reading.
- Place the switch in coolant up to its threads.



Install the thermostatic fan motor switch with a new O-ring and tighten it to the specified torque.

TORQUE: 28 N·m (2.8 kg-m, 20 ft-lb)


40N•m
(4.0 kg-m, 29 ft-lb)
40 N•m
(4.0 kg-m, 29 ft-lb)
10 N•m
(1.0 kg-m,
7ft-lb)
25 N•m
(2.5 kg-m,
18 ft-lb)


25 N•m
(2.5 kg-m,
18 ft-lb)
40 N•m
(4.0 kg-m,
29 ft-lb)
40 N•m
(4.0 kg-m,
29 ft-lb)
25 N•m
(2.5 kg-m,
18 ft-lb)
40 N•m
(4.0 kg-m,
29 ft-lb)
40 N•m
(4.0 kg-m,
29 ft-lb)
40 N•m
(4.0 kg-m,
29 ft-lb)
25 N•m
(2.5 kg-m,
18 ft-lb)

SERVICE INFORMATION

GENERAL

- Parts requiring engine removal for servicing.
  - oil pumps (section 2).
  - alternator drive gears, primary gears and output shaft (section 9).
  - gearshift arm (section 10).
  - transmission (section 10).
  - crankshaft/piston (section 11).
  - starter clutch and reverse shift system (section 19).

- A floor jack or other adjustable support is required to support and maneuver the engine.
- Right timing belt cover, right intake manifold and alternator are removable to ease engine removal.

SPECIFICATIONS

Engine oil capacity	4.3 lit (4.5 U.S. qt, 3.8 Imp qt) after disassembly
Engine oil recommendation	See page 2-2.
Coolant capacity	4.1 lit (4.3 U.S. qt, 3.6 Imp qt) after disassembly
Engine weight	126 kg (278 lbs)

TORQUE VALUES

Engine mount nut (10 mm) (7 pcs)	40 N·m (4.0 kg-m, 29 ft-lb)
Engine bracket bolt (8 mm) (4 pcs)	25 N·m (2.5 kg-m, 18 ft-lb)
Subframe bolt (10 mm socket bolt)	40 N·m (4.0 kg-m, 29 ft-lb)
(10 mm flange bolt)	40 N·m (4.0 kg-m, 29 ft-lb)
(8 mm flange bolt)	25 N·m (2.5 kg-m, 18 ft-lb)
Exhaust pipe joint cap nut	10 N·m (1.0 kg-m, 7 ft-lb)
Engine oil drain bolt	38 N·m (3.8 kg-m, 27 ft-lb)

ENGINE REMOVAL

Disconnect the battery negative cable.
Drain the coolant (page 5-7).
Drain the engine oil before removing the engine if the front engine cover, rear engine cover or clutch cover are to be removed.

Remove or disconnect the following:
- fairing inner covers (section 12).
- 6P-BLK, 4P-WHT, 6P-RED and 2P-BLU connectors of the connector holder on the right cooling fan.
- reverse cables from the shift arm (section 19).
- reverse switch wire from the switch (section 19).
- engine ground cable near dipstick.
- starter motor (section 19).
- cooling fans (section 5).
- exhaust pipes (section 12).
- spark plug wires.
- engine guards.
- right timing belt cover.
- horn wire terminals.

- alternator (section 17).
- clutch slave cylinder (section 8).

NOTE

- Squeeze the clutch lever once and keep it in this position by tying it to the handlebar grip. This keeps the slave cylinder piston from overextending.

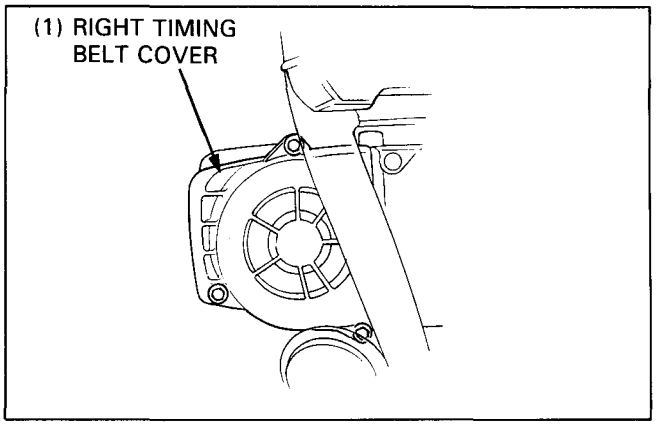
- air cleaner case and carburetor (section 4).
- right intake manihold (section 4).
- radiator upper hose from the thermostat case cover (section 5).
- air tubes from the solenoid valves and air jet controller (section 4).
- vacuum tube from the valve unit and accumulator (section 21).
- crankcase breather tube from the engine.

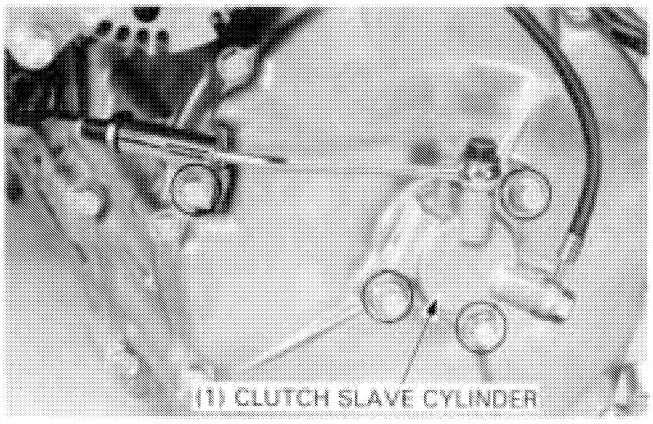
Place a floor jack or other adjustable support under the engine.

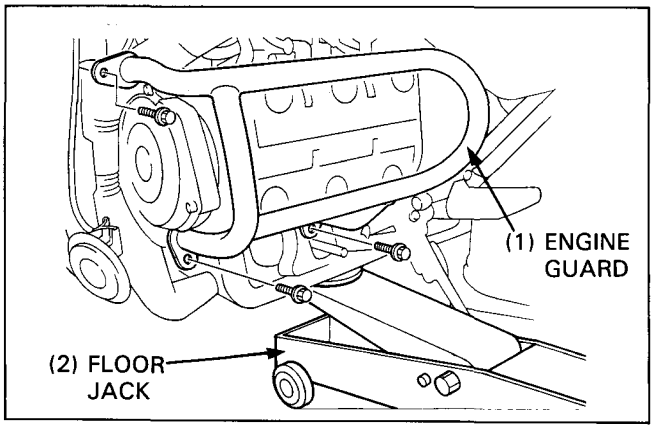
NOTE

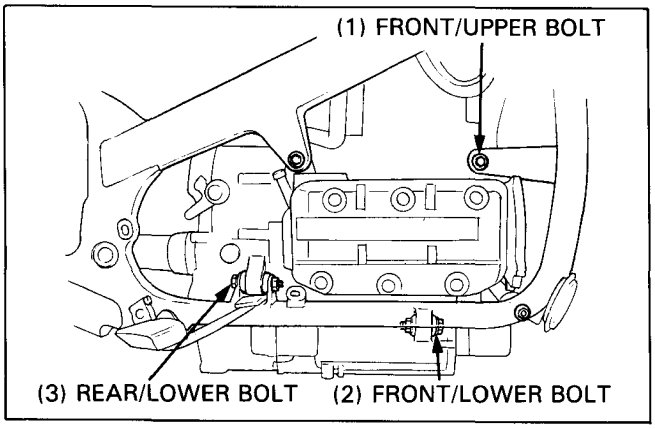
- The jack height must be continuously adjusted so that mounting bolts can be removed, and so stress is relieved from other bolts until they are removed.

Right side:
Remove the Front lower and rear lower engine mounting bolts.
Remove the front upper engine mounting bolt.



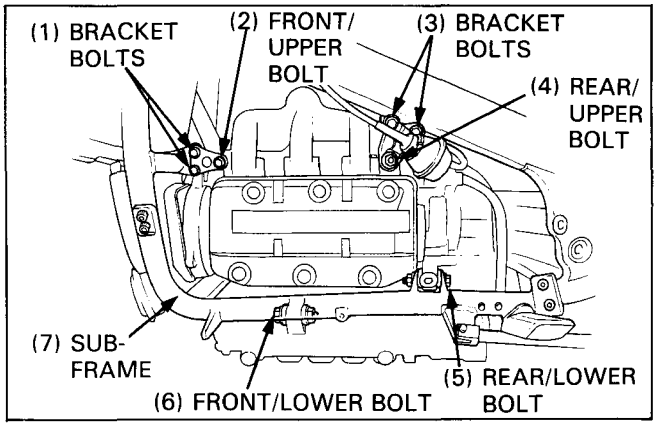




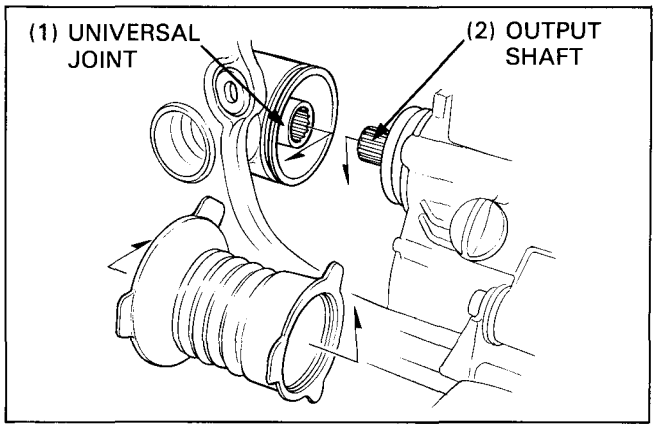


Left side:
Remove the front lower and rear lower engine mounting bolts.
Disconnect the side stand switch 3P-GRN connector, and remove the subframe socket bolts and subframe.
Remove the front upper engine mounting bolt, bracket bolts and front bracket.

Remove the rear upper engine mounting bolt, bracket bolts and rear bracket.



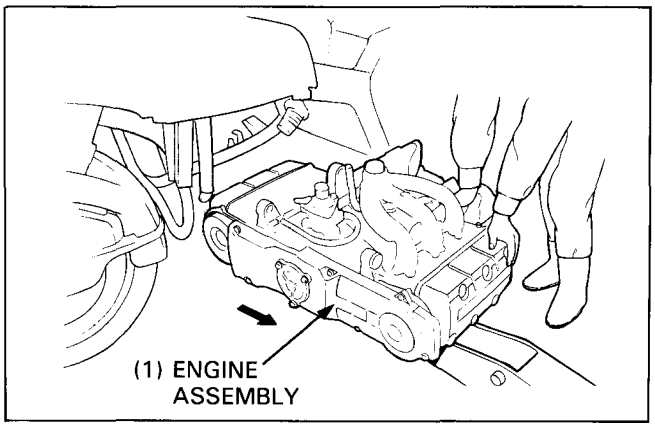
Slide the universal joint out of the output shaft.



Move the engine out of the frame.

CAUTION

- *Be careful not to damage the brake and clutch lines during engine removal.*



ENGINE INSTALLATION

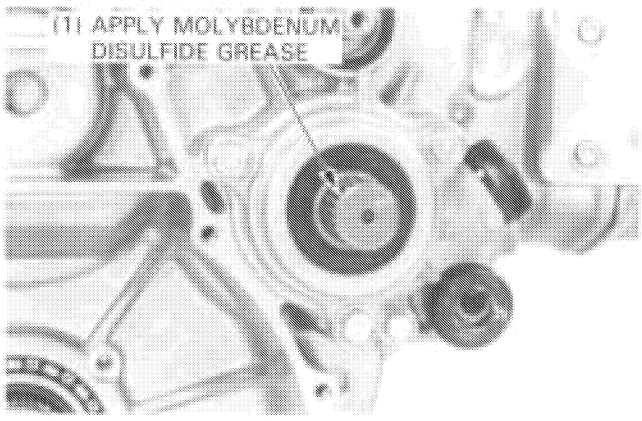
Installation is essentially the reverse order of removal.

Lubricate the output shaft splines with molybdenum disulfide grease.

Carefully maneuver the engine into the frame while aligning the output shaft with the universal joint.

CAUTION

- *Be careful not to damage the brake and clutch lines during engine installation.*



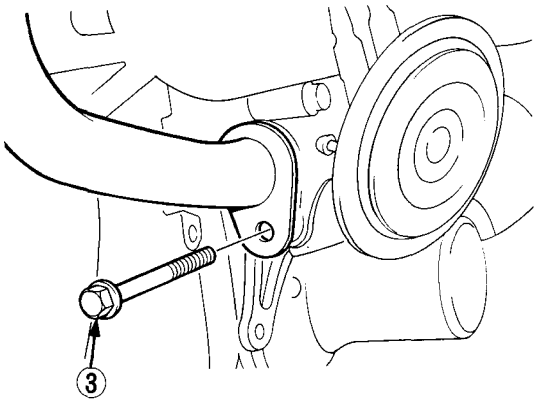
Slide the output shaft back into the universal joint.

CAUTION

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

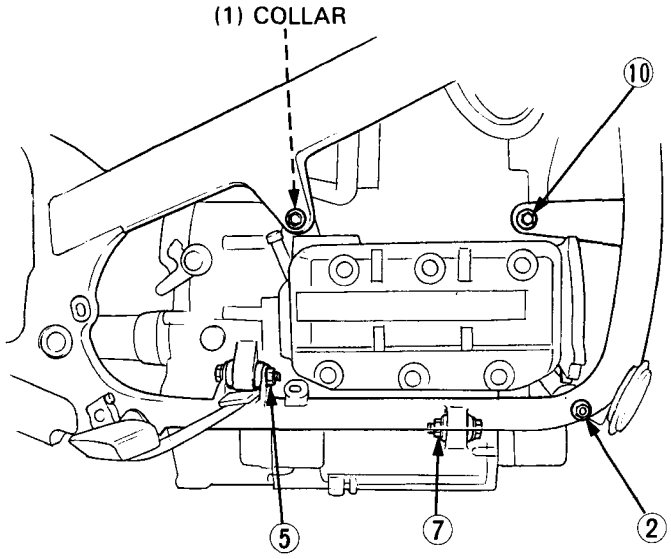
Hand-tighten mounting bolts and nuts (and install parts noted) in this order.

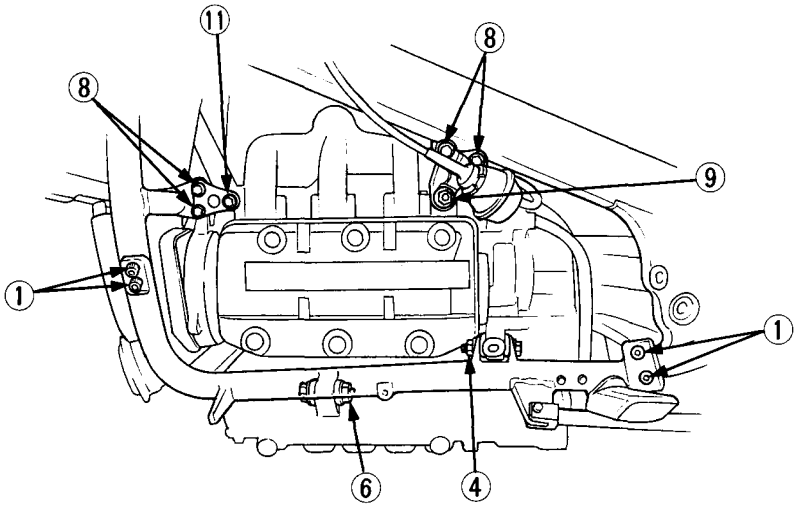
1. Right: rear lower and front lower mount bolts and nuts.
2. Right: front upper mount bolt and nut.
3. Left: front and rear bracket and bracket bolts, with the cruise actuator.
4. Right: rear upper mount bolt and nut with collar.
5. Left: front upper mount bolt and nut.
6. Left: subframe and subframe socket bolts.
7. Right: subframe bolt.
8. Right: engine guard and bolts.
9. Left: rear lower and front lower mount bolts and nuts.

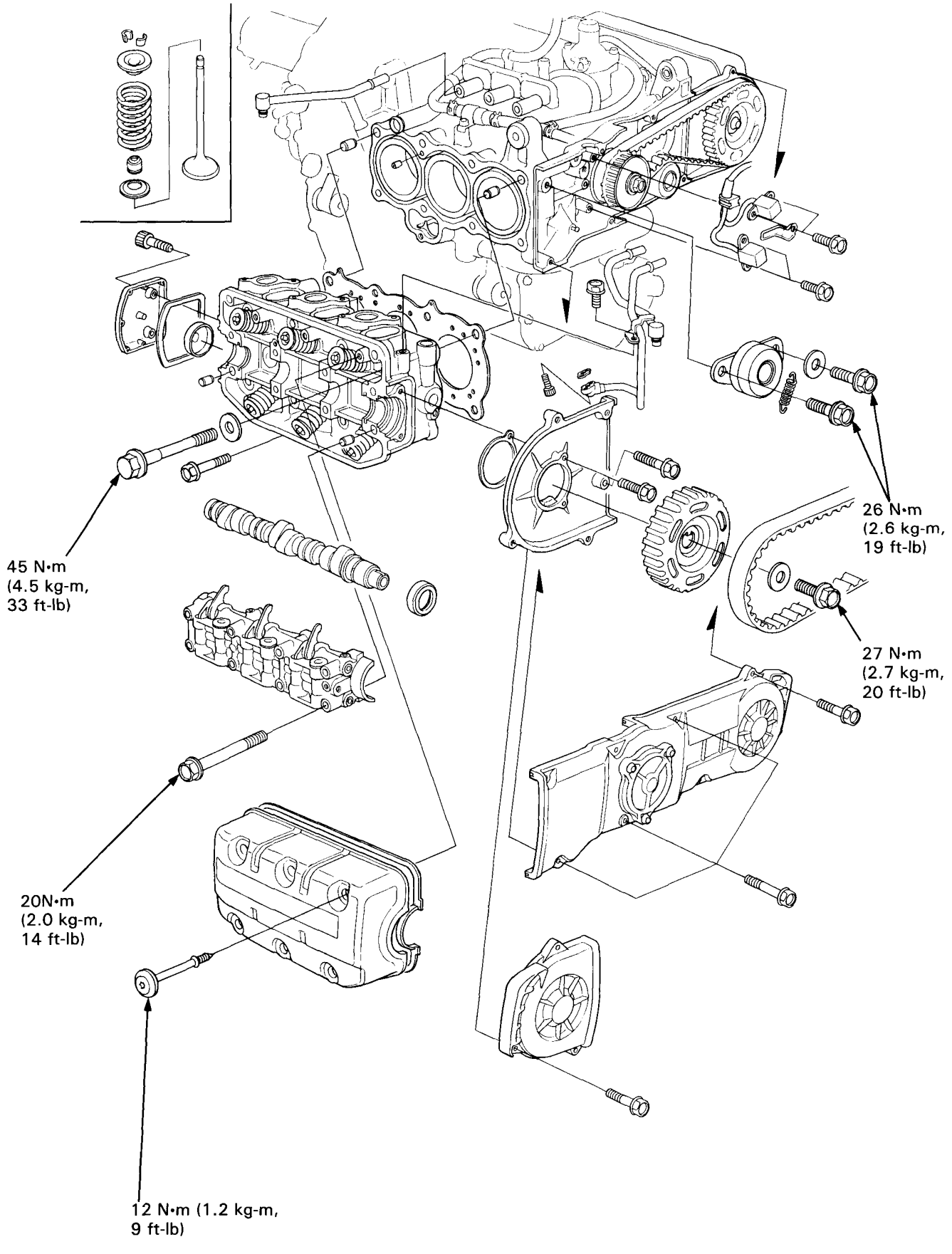


Remove the jack, and torque the bolts and nuts in the sequence as shown.

1. 40 N•m (4.0 kg-m, 29 ft-lb) (4 pcs)
2. 40 N•m (4.0 kg-m, 29 ft-lb)
3. 25 N•m (2.5 kg-m, 18 ft-lb) (3 pcs)
4. 40 N•m (4.0 kg-m, 29 ft-lb)
5. 40 N•m (4.0 kg-m, 29 ft-lb)
6. 40 N•m (4.0 kg-m, 29 ft-lb)
7. 40 N•m (4.0 kg-m, 29 ft-lb)
8. 25 N•m (2.5 kg-m, 18 ft-lb) (4 pcs)
9. 40 N•m (4.0 kg-m, 29 ft-lb)
10. 40 N•m (4.0 kg-m, 29 ft-lb)
11. 40 N•m (4.0 kg-m, 29 ft-lb)






45 N•m
(4.5 kg-m,
33 ft-lb)
26 N•m
(2.6 kg-m,
19 ft-lb)
27 N•m
(2.7 kg-m,
20 ft-lb)
20N•m
(2.0 kg-m,
14 ft-lb)
12 N•m (1.2 kg-m,
9 ft-lb)

SERVICE INFORMATION

GENERAL

- Inspect and adjust timing belt tension while the engine is cold.
- Cylinder head maintenance and inspection can be done with the engine in the frame.
- Camshaft lubricating oil is fed to each cylinder head through an oil control orifice located in the crankcase. Be sure these orifices are not clogged and that the O-rings and dowel pins are in place before installing the cylinder heads.
- Do not contaminate the timing belts with oil, which will cause the rubber to swell and affect the camshaft timing.
- Do not twist the belts, or bend to a radius of less than 25 mm (1 in), to avoid possible fracture of the fiberglass material.
- Air in the hydraulic valve adjuster causes excessive tappet noise. Remove the adjuster and bleed the air out if it is noisy (page 7-8).
- Adjust the hydraulic adjuster holder with shim, if any of the following parts is replaced:
  - Cylinder head/camshaft holder
  - Camshaft
  - Valve/valve seat (refacing)
  - Rocker arm/rocker arm shaft

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			1300—1700 kPa (13.0—17.0 kg/cm², 185—242 psi)	1000 kPa (10.0 kg/cm², 142 psi)
Valve, Valve guide	Stem O.D.	IN	5.475—5.490 (0.2156—0.2161)	5.45 (0.215)
		EX	5.455—5.470 (0.2148—0.2154)	5.44 (0.214)
	Guide I.D.	(IN, EX)	5.500—5.512 (0.2165—0.2170)	5.55 (0.219)
	Valve stem to guide clearance	IN	0.010—0.037 (0.0004—0.0015)	0.08 (0.003)
		EX	0.030—0.057 (0.0012—0.0022)	0.10 (0.004)
	Seat width		1.2 (0.05)	—
Valve spring	Free length		44.6 (1.76)	43.3 (1.70)
	Preload/Length		15.6—18.2/37.5 kg/mm (34.39—40.12/1.48 lbs/in)	—
Rocker arm	Rocker arm shaft O.D.		11.966—11.984 (0.4711—0.4718)	11.95 (0.470)
	Rocker arm I.D.		21.000—21.021 (0.8268—0.8276)	21.05 (0.829)
	Rocker arm lobe	O.D.	20.945—20.980 (0.8246—0.8260)	20.93 (0.824)
		I.D.	11.996—12.031 (0.4723—0.4734)	12.07 (0.475)
Hydraulic valve adjuster compression stroke with kerosene			0—0.30 (0—0.012)	0.30 (0.012) max.

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Camshaft	Cam lobe height		36.110–36.190 (1.4217–1.4248)	35.9 (1.41)
	Runout (at center journal)		—	0.10 (0.004)
	Journal O.D.	Both middles	26.934–26.955 (1.0604–1.0612)	26.91 (1.059)
		Both ends	26.949–26.970 (1.0610–1.0618)	26.91 (1.059)
	Holder journal I.D.		27.000–27.021 (1.0630–1.0638)	27.05 (1.065)
	Journal oil clearance	Both middles	0.045–0.087 (0.0018–0.0034)	0.14 (0.006)
		Both ends	0.030–0.072 (0.0012–0.0028)	0.14 (0.006)
Cylinder head warpage			—	0.10 (0.004)

TORQUE VALUES

Cylinder head bolt (9 mm bolt)	45 N·m (4.5 kg-m, 33 ft-lb) —Apply molybdenum disulfide oil
Timing belt driven pully bolt	27 N·m (2.7 kg-m, 20 ft-lb)
Camshaft holder bolt	20 N·m (2.0 kg-m, 14 ft-lb)
Hydraulic valve adjuster stopper plug	30 N·m (3.0 kg-m, 22 ft-lb)
Cylinder head cover bolt	12 N·m (1.2 kg-m, 9 ft-lb)
Timing belt tensioner bolt	26 N·m (2.6 kg-m, 19 ft-lb) —Apply a locking agent

TOOLS

Special

Hydraulic tappet breeder	07973–MJ00000 or 07973–ME900000
Valve guide reamer, 5.5 mm	07984–2000001
Shim selection gauge	07974–MG90000

Common

Valve spring compressor	07757–0010000
Valve guide remover, 5.5 mm	07742–0010100
Universal holder	07725–0030000

Valve seat cutter

– seat cutter, 33 mm (45° IN/EX)	07780–0010800
– flat cutter, 30 mm (32° EX)	07780–0012200
– flat cutter, 35 mm (32° IN)	07780–0012300
– interior cutter, 30 mm (60° EX)	07780–0014000
– interior cutter, 37.5 mm (60° IN)	07780–0014100
– cutter holder, 5.5 mm	07781–0010101

TROUBLESHOOTING

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

Low compression or uneven compression
- Valves
  - – Sticking hydraulic valve adjuster
  - – Incorrect hydraulic adjuster shim
  - – Incorrect valve clearance
  - – Burned or bent valves
  - – Incorrect valve timing
  - – Sticking valve
  - – Broken valve spring
- Cylinder Head
  - – Leaking or damaged head gasket
  - – Warped or cracked cylinder head
- Camshaft
  - – Worn or damaged timing belt
  - – Loose pulley or drive key
  - – Worn or damaged belt tensioner pulley
- Engine lower end problems (See section 11)

Compression too high
- Excessive carbon build-up on piston head or combustion chamber

Excessive white smoke
- Worn valve guide or valve stem
- Damaged valve stem seal

Excessive noise
- Hydraulic valve Adjuster
  - – Air in hydraulic valve adjuster or improper installation
  - – Worn or sticking adjuster
  - – Clogged cylinder head oil holes or orifices
  - – Loosen adjuster stopper plug
  - – Use of improper shim
- Worn valve stem
- Sticking valve or broken valve spring
- Damaged rocker arm, rocker arm lobe or shaft
- Loose or damaged timing belt
- Loose or damaged belt tensioners or drive pulleys
- Worn or damaged camshaft
- Damaged cylinder head gasket
- Loosen spark plug

Contaminated engine oil or coolant
- Leaking or blown head gasket
- Leaking core plugs
- Damaged or warped cylinder head

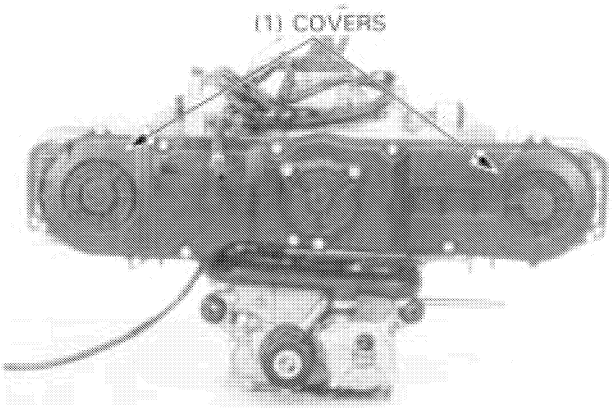
TIMING BELT REMOVAL

NOTE

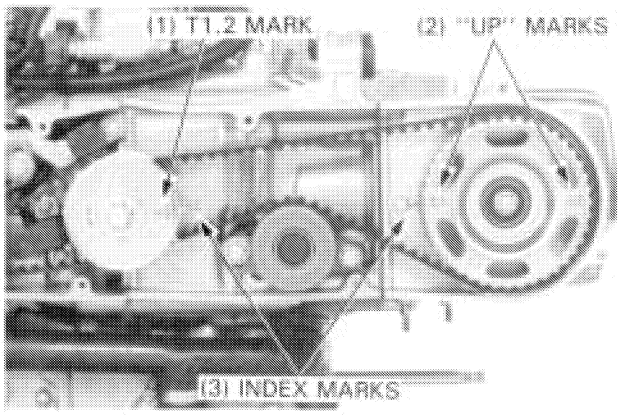
- The top end can be repaired with the engine in the frame.

Remove the fairing front cover and under cover (page 12-8).

Remove the timing belt covers.



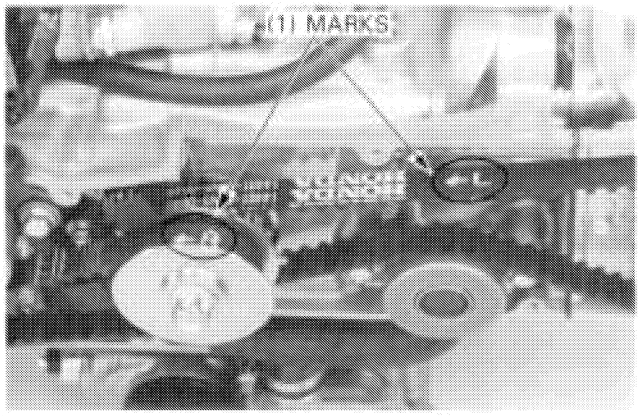
Turn the crankshaft counterclockwise until the T1.2 drive pully mark lines up with the index mark on the crankcase. The "UP" marks on the driven pullys should be facing up.



Mark each belt to identify it as "left" or "right" and to show its direction of rotation.

CAUTION

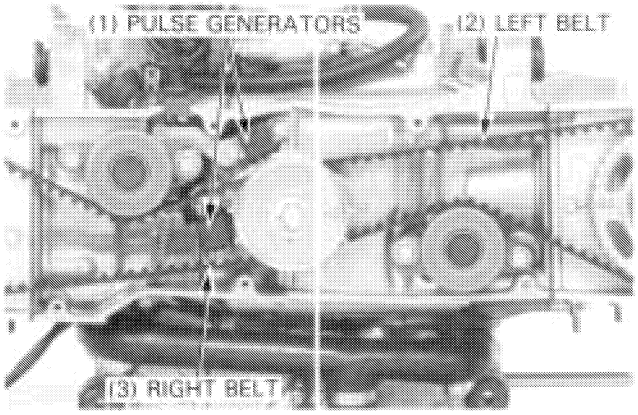
- *If the cylinder head will be removed, loosen the driven pulley bolts temporarily before removing the timing belts.*



Loosen the tensioner bolts, then slip off the right belt.
Remove the pulse generators (page 18-10).
Slip off the left belt.

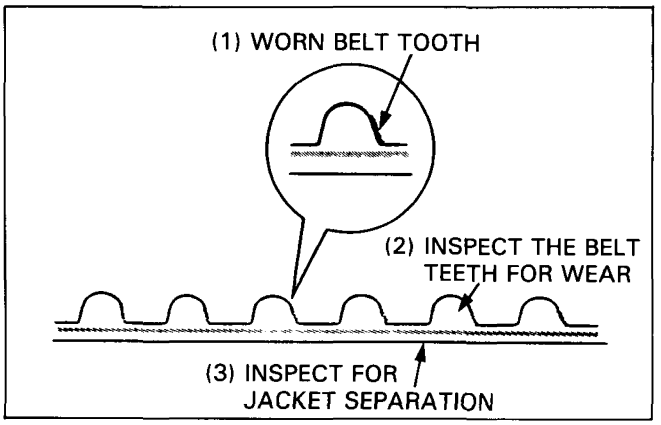
CAUTION

- *To prevent belt damage, do not use a screwdriver other sharp tool to pry off the belts.*
- *Do not turn the camshafts after removing the timing belts, or you may bend the valves.*

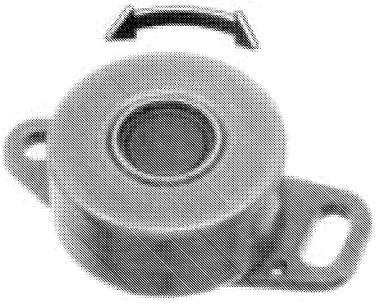


BELT INSPECTION

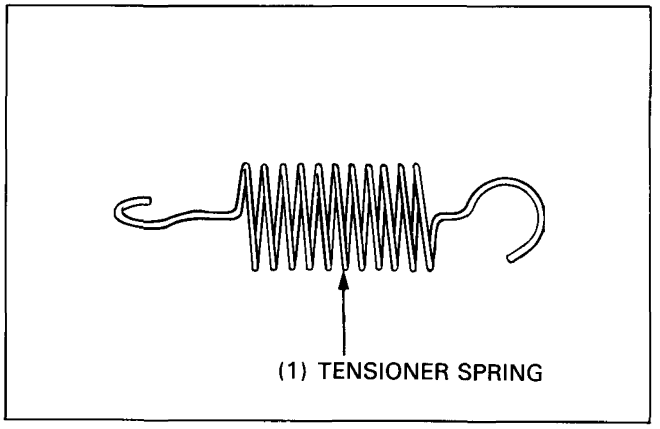
Check the belts for swelling caused by oil contamination. Replace the belts if the material is cracked, teeth are worn, or if swelling is evident.



Inspect the belt tensioners for free movement and smooth bearings.



Check the tensioner spring for fatigue or damage.



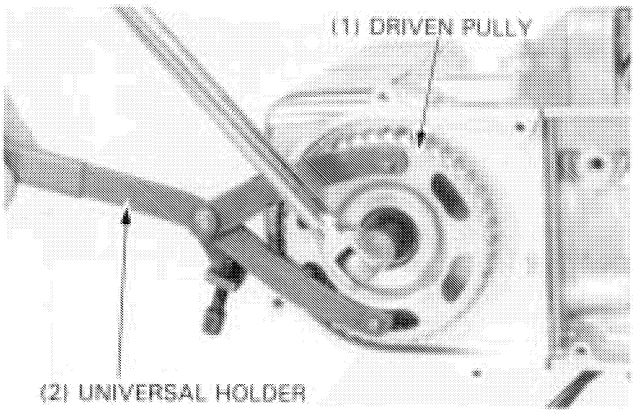
Remove the driven pully bolt, washer and the pully.

TOOL:

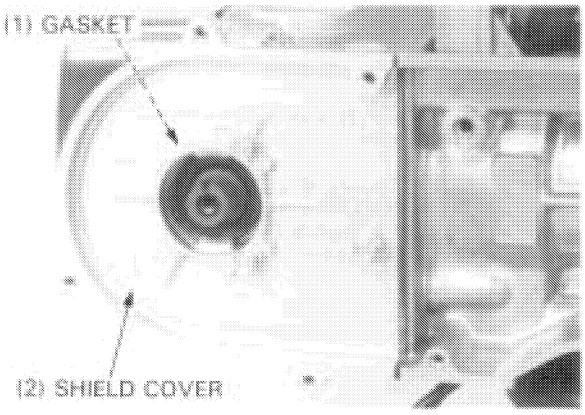
Universal holder	**07725–0030000**

CAUTION

- *Do not turn the camshaft when removing the driven pully bolt, or you may bend the valves.*

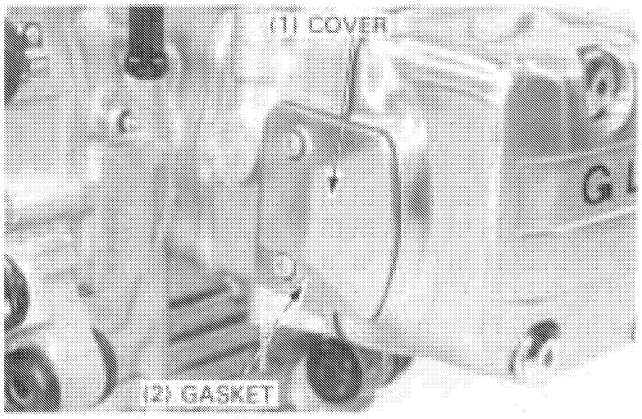


Remove the shield cover and the gasket.

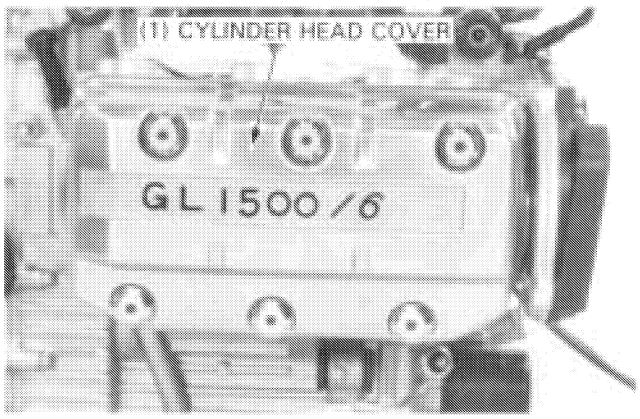


CAMSHAFT/ROCKER ARM REMOVAL

Remove the engine guard (page 6-3).
Remove the rear cylinder head cover and the gasket.



Remove the cylinder head cover.

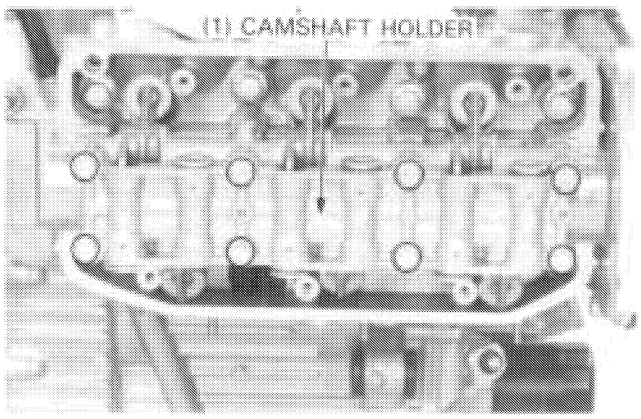


Remove the timing belt and driven pully (page 7-3).
Remove eight camshaft holder bolts.

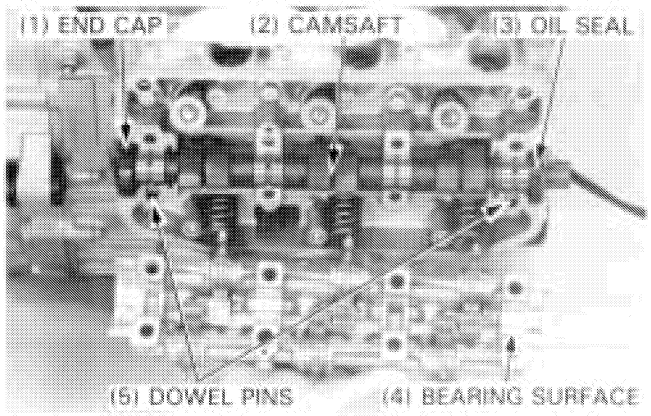
NOTE

- To prevent cocking the camshaft holder assembly, gradually unscrew the camshaft holder bolts in a crisscross pattern, 2 or 3 steps.

Remove the camshaft holder assembly. Mark the camshaft holder as "left" or "right".



Remove the camshaft, oil seal and end seal.



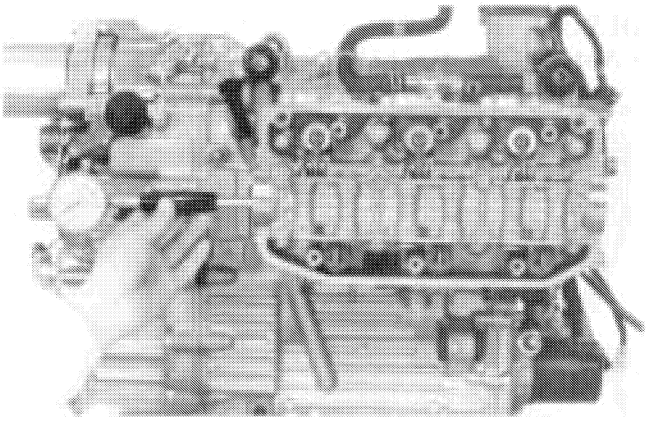
CAUTION

- *Do not let the camshaft fall out of the cylinder head.*

Remove the dowel pins.

Inspect the camshaft holder bearing surfaces for scoring, scratching or damage. Check that the oil passages are clear.

CAMSHAFT INSPECTION

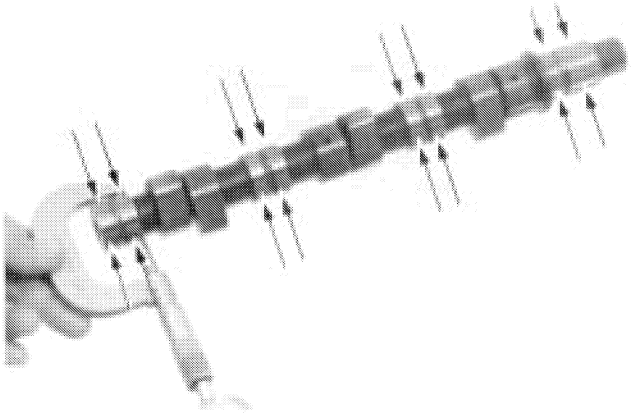


Bolt the camshaft holder in place and torque the bolts.

TORQUE: 20 N·m (2.0 kg-m, 14 ft-lb)

Measure and record the I.D. of each bearing. If the bearing is worn past the service limit, install a new cylinder head and camshaft holder set.

SERVICE LIMIT: 27.05 mm (1.065 in)



Measure and record the O.D. of each camshaft bearing journal. Install a new camshaft if worn past the service limit.

SERVICE LIMIT: 26.91 mm (1.059 in)

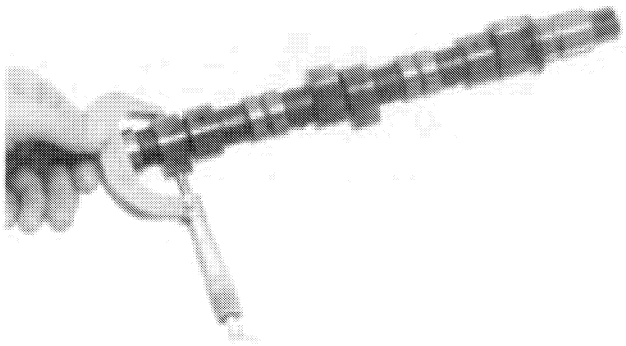
Determine the bearing clearance by subtracing the bearing I.D. from the journal O.D.

SERVICE LIMIT: 0.14 mm (0.006 in)

NOTE

- Clearance may also be checked by using Plastigauge.

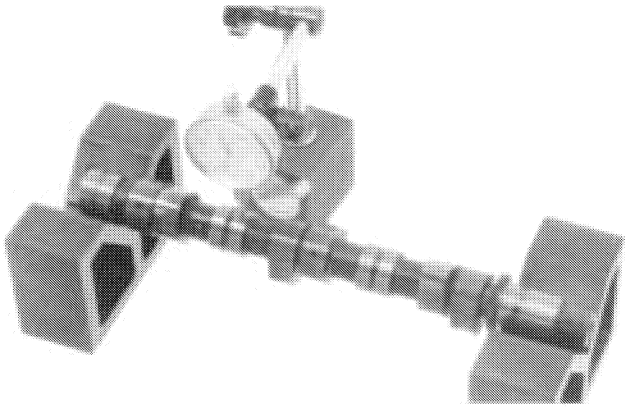
Check each cam lobe's height with a micrometer.
Replace the cam if the height is less than the service limit.



SERVICE LIMIT: 35.9 mm (1.41 in)

Rest each camshaft on Vee blocks. Place a dial indicator on the center bearing journal. Rotate the camshaft two revolutions and read the runout. Divide the total indicator reading in half to get the actual runout.

SERVICE LIMIT: 0.10 mm (0.004 in)



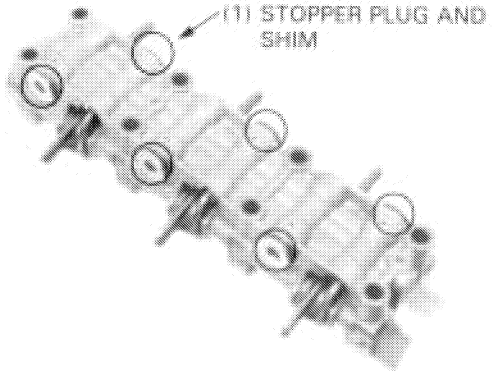
CAMSHAFT HOLDER DISASSEMBLY

NOTE

- Mark the camshaft holder parts during disassembly so they can be installed in their original positions during assembly.

Remove the stopper plugs and shims from the camshaft holder.

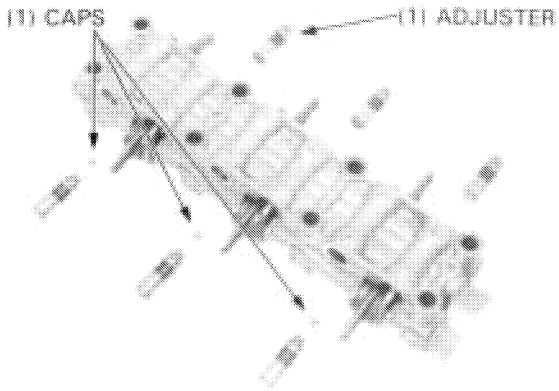
If the parts are to be reused, mark the shims with a felt tip pen so that they can be replaced in their original locations.



NOTE

- Failure to install the shims in their original locations can cause tappet noise or sticking valves.
- Mark the hydraulic valve adjusters as they are removed, so they can be installed in their original locations.

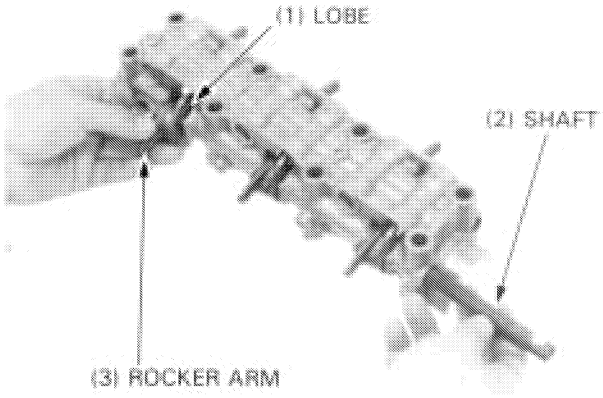
Remove the six hydraulic valve adjusters from the camshaft holder.



NOTE

- Caps are used only on the hydraulic vavle adjusters controlling the intake valve rocker arm lobes.

Remove the following:
— rocker arm shafts
— rocker arms
— rocker arm lobes

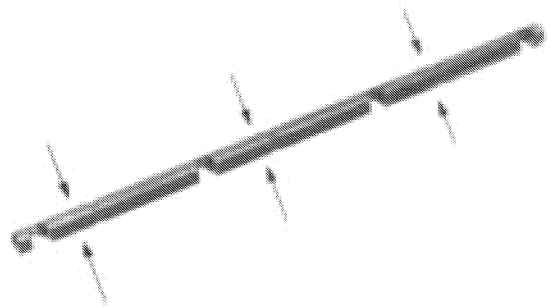


ROCKER ARM SHAFT INSPECTION

Inspect each rocker arm shaft for wear or damage to the sliding surfaces.

Measure the O.D.

SERVICE LIMIT: 11.95 mm (0.470 in)



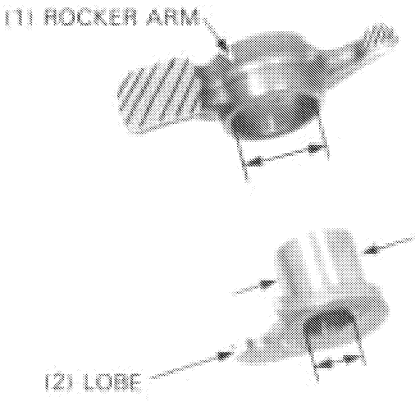
ROCKER ARM/LOBE INSPECTION

Inspect each rocker arm for wear or damage to the slipper and stem contact faces. Measure the I.D. of each rocker arm.

SERVICE LIMIT: 21.05 mm (0.829 in)

Inspect each rocker arm lobe for wear or damage to the sliding and adjuster contact faces. Measure the I.D. and O.D. of each rocker arm lobe.

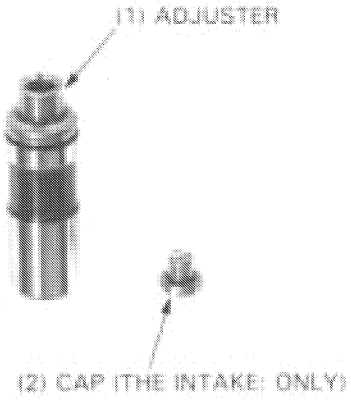
SERVICE LIMITS:
I.D.: 12.07 mm (0.475 in)
O.D.: 20.93 mm (0.824 in)



HYDRAULIC VALVE ADJUSTER INSPECTION

Inspect the hydraulic valve adjuster for wear, damage or a clogged oil hole.

Inspect the adjuster cap of the intake side for wear or damage.



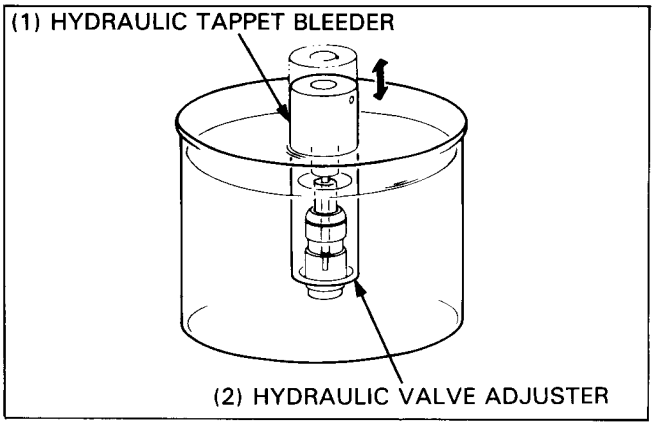
Measure the compression stroke of each adjuster as follows:

Attach the Hydraulic Tappet Bleeder to the adjuster, center the bleeder pin, and while holding it upright, compress and extend the bleeder slowly in a jar filled with kerosene.

TOOL:

Hydraulic tappet bleeder	**07973—MJ00000 or 07973—ME90000**

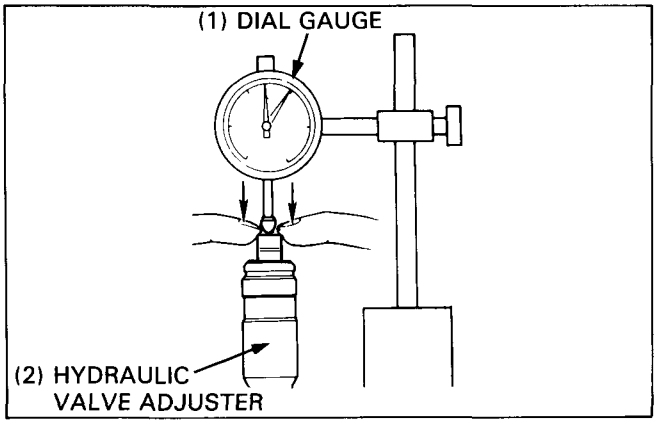
Continue operating the bleeder until there are no air bubbles.



Remove the adjuster and try to compress it quickly by hand. Measure the compression stroke with a dial gauge.

COMPRESSION STROKE SERVICE LIMIT:
0.30 mm (0.012 in)

If the stroke is more than the service limit, repeat the bleeding procedure.

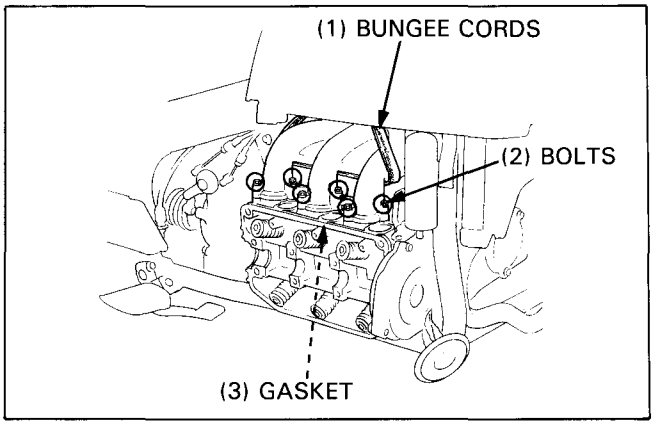


CYLINDER HEAD REMOVAL

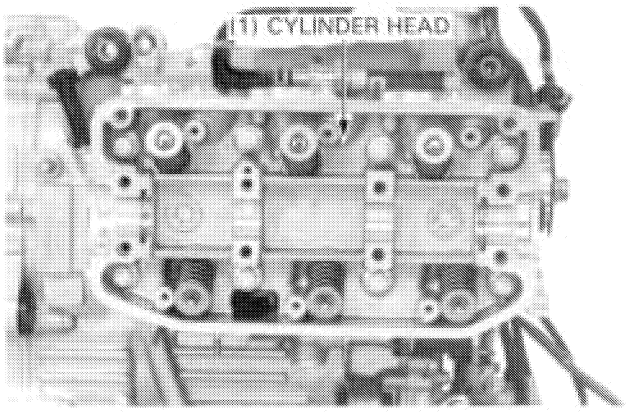
Drain the coolant (page 5-7).

Remove the following:
- timing belt and driven pully (page 7-3).
- cylinder head cover, camshaft holder and camshaft (page 7-5).
- exhaust pipe (page 12-17).
- spark plug wires.

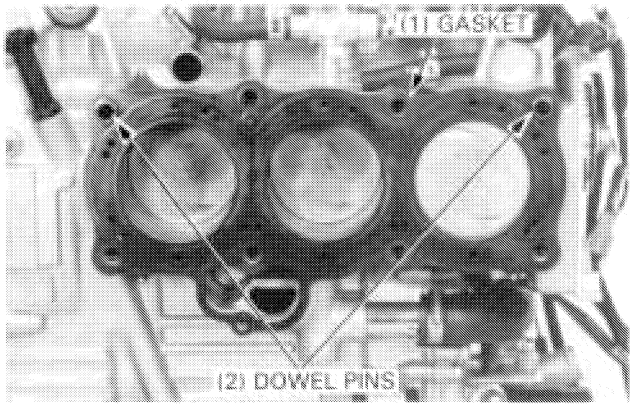
Support the intake manifold with bungee cords as shown and remove the intake manifold mounting bolts and gasket.



Remove the following:
- secondary air supply pipes (page 4-54).
- cylinder head bolts.
- cylinder head.



Remove the following:
- gasket
- dowel pins



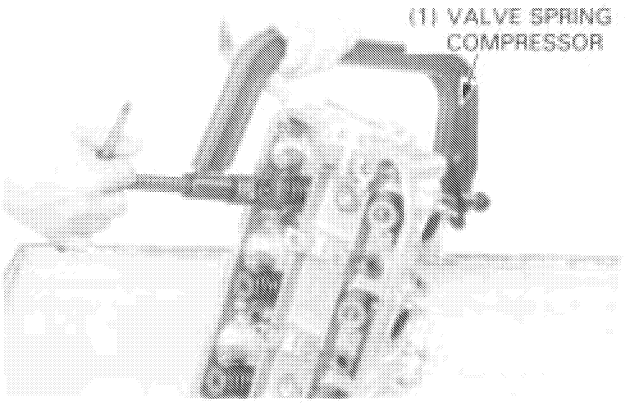
Remove the oil control orifice from the cylinder head.
Clean the oil passage.

CYLINDER HEAD DISASSEMBLY

Compress the valve spring and remove valve cotters.
Remove the retainers, springs, and valves. Keep each valve and its related parts in sets.

TOOL:
Valve spring compressor **07757–0010000**

Clean any gasket material from the cylinder head.



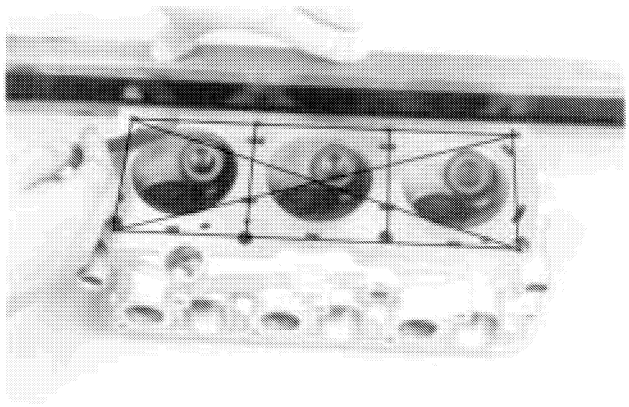
CYLINDER HEAD INSPECTION

Clean carbon deposits from the combustion chamber and exhaust ports.

Check the spark plugs holes and valve areas for cracks.

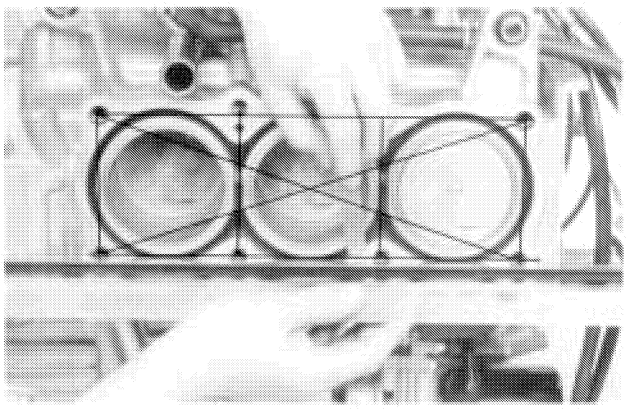
Check the cylinder head for warpage with a straight edge and feeler gauges.

SERVICE LIMIT: 0.10 mm (0.004 in)



Check the cylinders for warpage across the head mating surface.

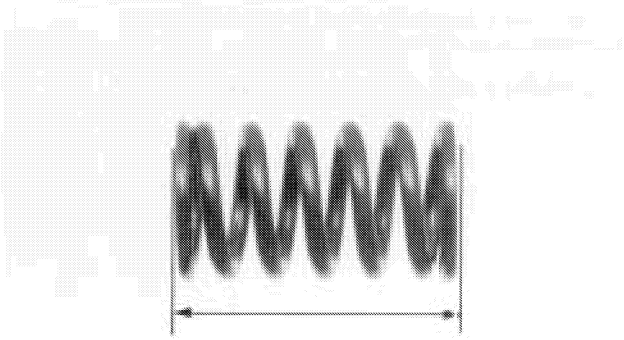
SERVICE LIMIT: 0.10 mm (0.004 in)



VALVE SPRING INSPECTION

Measure the valve spring free length.

SERVICE LIMIT: 43.3 mm (1.70 in)



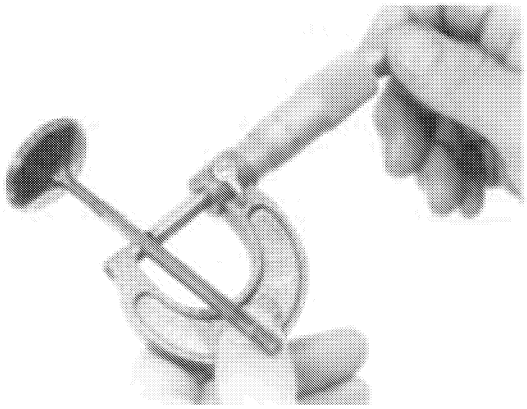
VALVE AND GUIDE INSPECTION

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

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

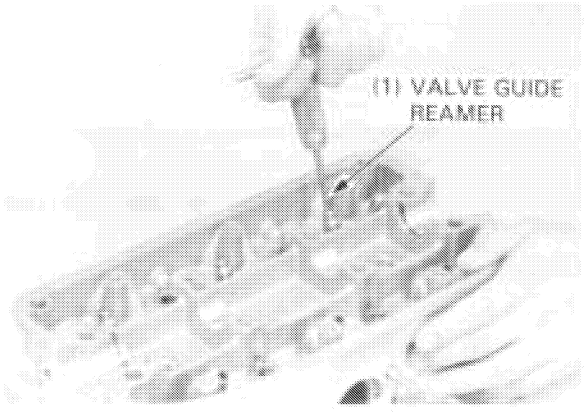
Measure and record the O.D. of each valve stem.

SERVICE LIMITS:
IN: 5.45 mm (0.215 in)
EX: 5.44 mm (0.214 in)



Run the proper reamer through the guides from the rocker arm side of the cylinder head to remove carbon deposits.

TOOL:
Valve guide reamer, 5.5 mm 07984—2000001

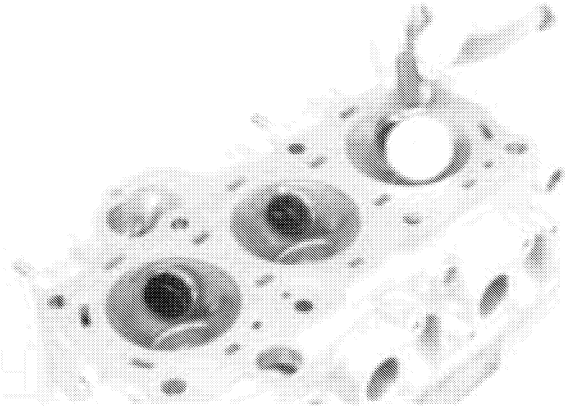


Measure and record the I.D. of each valve guide.

SERVICE LIMIT: 5.55 mm (0.219 in)

Subtract the valve stem O.D. from the valve guide I.D. to determine the clearance.

SERVICE LIMITS:
IN: 0.08 mm (0.003 in)
EX: 0.10 mm (0.004 in)



If the clearance is over the service limit, install new guides and remeasure.

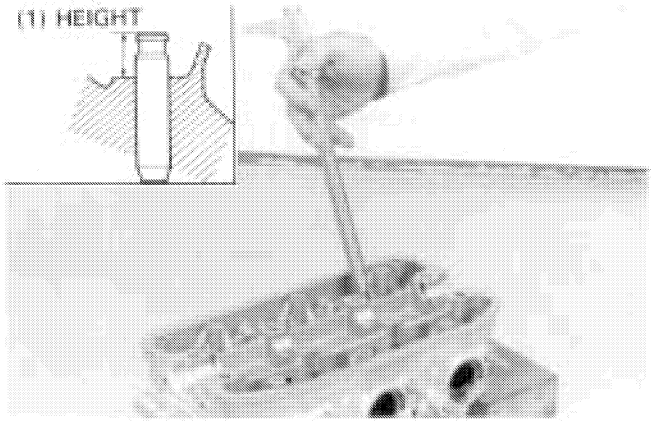
If clearance is still over the service limit, replace the valves.

VALVE GUIDE REPLACEMENT

NOTE

- Reface the valve seats whenever the valve guides are replaced.

Measure the valve guide height.



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

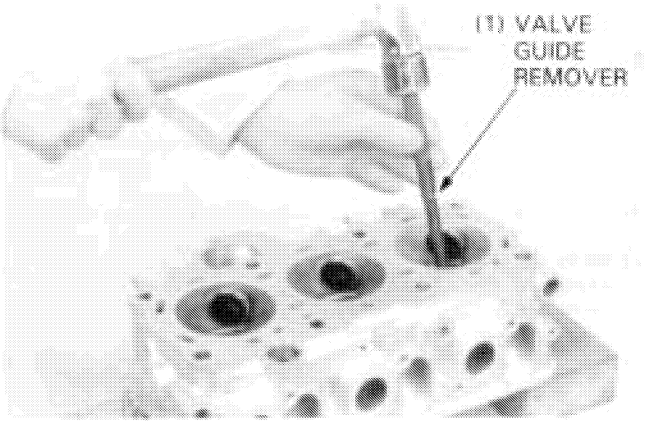
Heat the cylinder head to 100—150°C (212—300°F).

CAUTION

- *Do not use a torch to heat the cylinder head; it may cause warping.*
- *To avoid burns, wear heavy gloves when handling the heated cylinder head.*

Drive out the old guides from the combustion chamber side of the cylinder head.

TOOL:
Valve guide remover, 5.5 mm 07742—0010100



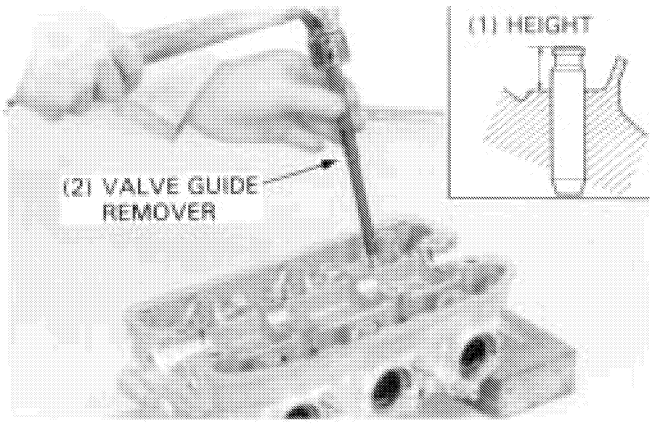
Drive in new guides from the rocker arm side of the cylinder head while measuring the valve guide height.

STANDARD VALVE GUIDE HEIGHT: 18.3—15.5 mm (0.72—0.73 in)

NOTE

- The cylinder head should still be hot for installation of the new guides.

TOOL:
Valve guide remover, 5.5 mm 07742—0010100



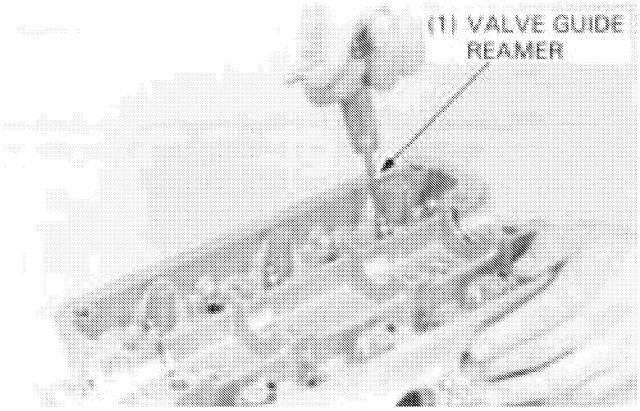
Ream the new guides to finished size with a reamer from the rocker arm side of the cylinder head.

TOOL:
Valve guide reamer, 5.5 mm 07984—2000001

NOTE

- Use cutting oil on the reamer during this procedure. While inserting or removing the reamer, turn it in the cutting direction.

Clean all cutting residue out of the valve guides.

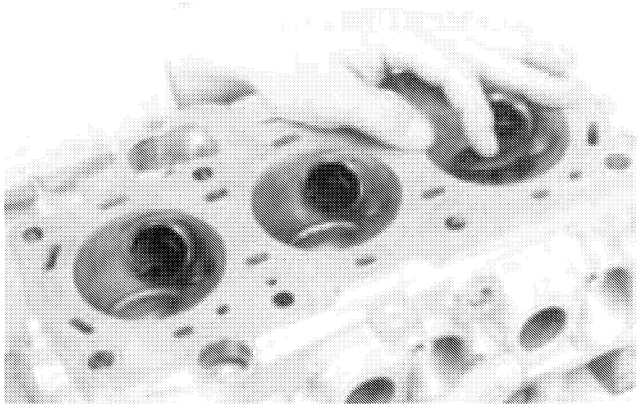


VALVE SEAT INSPECTION/REFACING

NOTE

- Check hydraulic valve adjuster shim selection whenever the valve seats are refaced (page 7-22).

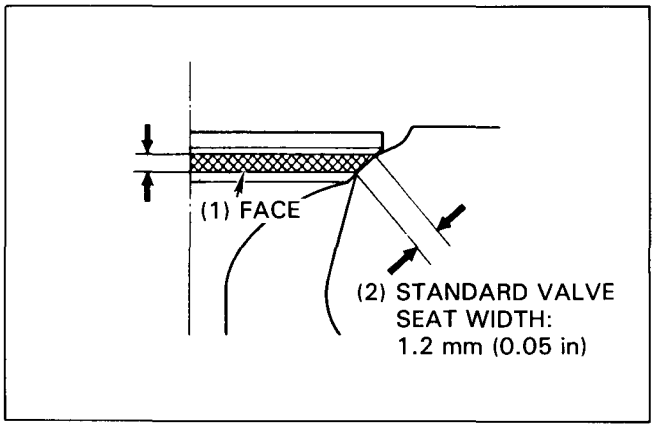
Apply a light coating of Prussian Blue to the valve face, then install the valve and lap it against its seat.



Remove the valve and inspect the face. If the seat is too wide, too rough, or has low spots, the seat must be refaced.

CAUTION

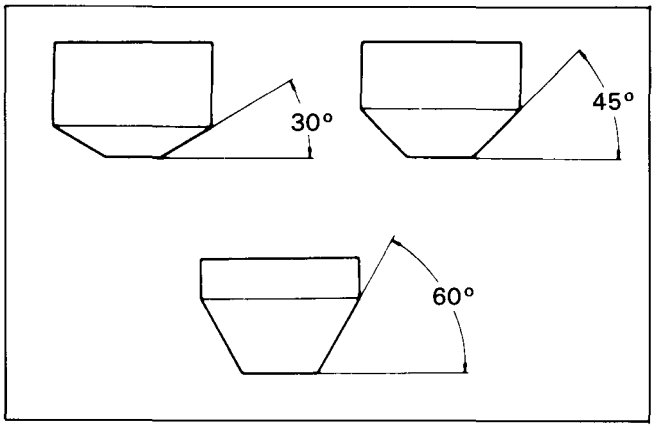
- *The valves cannot be ground. If the valve face is rough, worn unevenly, or contacts the seat improperly the valve must be replaced.*



TOOLS:

Valve seat cutter

– seat cutter, 33 mm (45° IN/EX)	**07780–0010800**
– flat cutter, 30 mm (32° EX)	**07780–0012200**
– flat cutter, 35 mm (32° IN)	**07780–0012300**
– interior cutter, 30 mm (60° EX)	**07780–0014000**
– interior cutter, 37.5 mm (60° IN)	**07780–0014100**
– cutter holder, 5.5 mm	**07781–0010101**

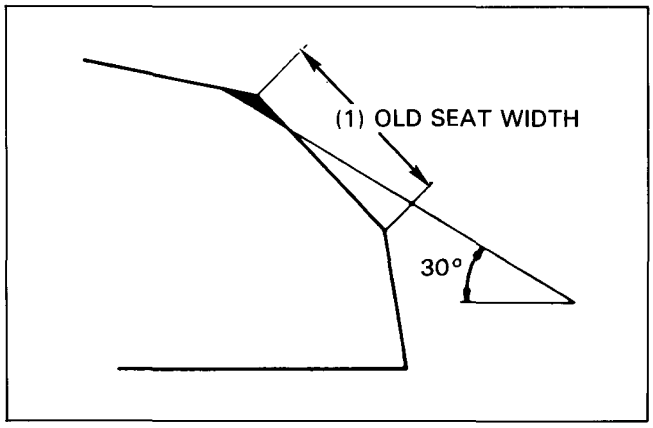


Follow the refacer manufacturer's instructions. Use a 45 degree cutter to remove any roughness or irregularities from the seat.

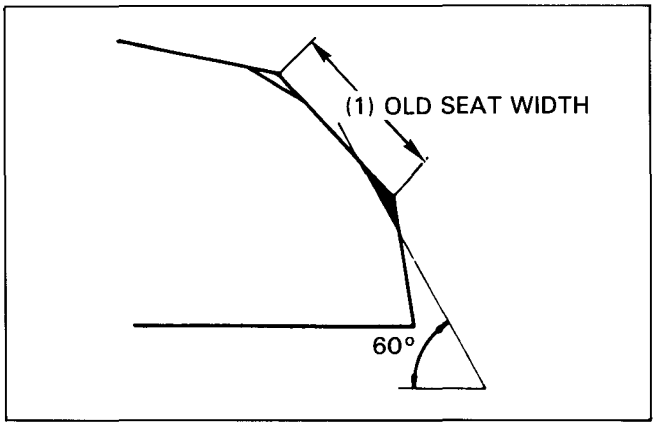
NOTE

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

Use a 30 degree cutter to remove 1/4 of the existing valve seat material.

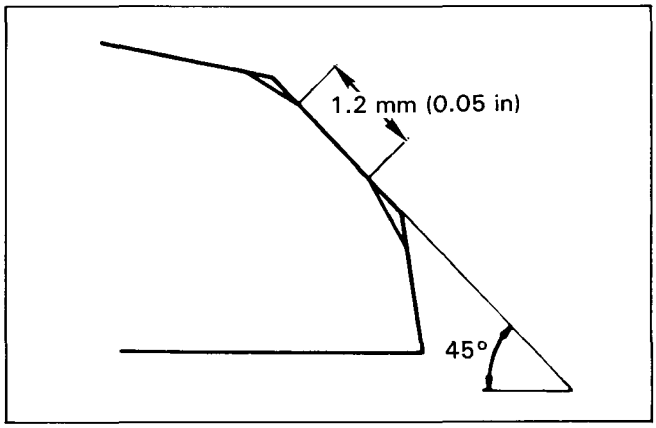


Use a 60 degree cutter to remove the bottom 1/4 of the old seat. Remove the cutter and inspect the area you have just removed.



Install a 45 degree finish cutter and cut the seat to the proper width.

VAVLE SEAT WIDTH: 1.2 mm (0.05 in)

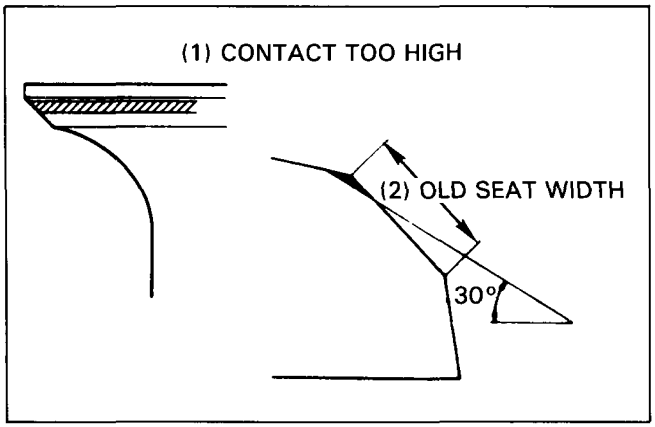


Apply a light coating of Prussian Blue to the valve face, then install the valve and lap it against its seat. Remove the valve and inspect the face.

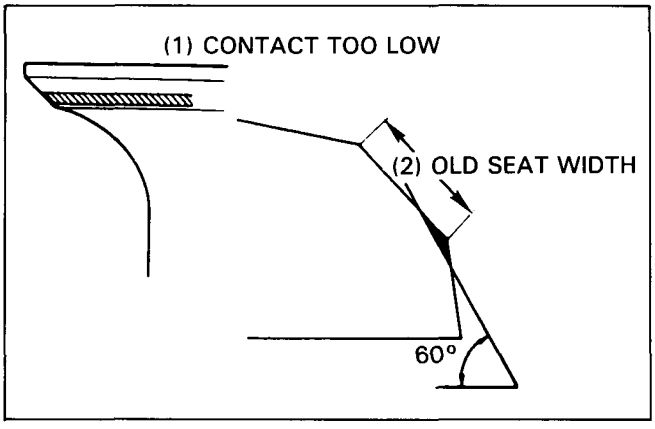
NOTE

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

If the contact area is too high on the valve, the seat must be lowered using a 30 degree flat cutter.

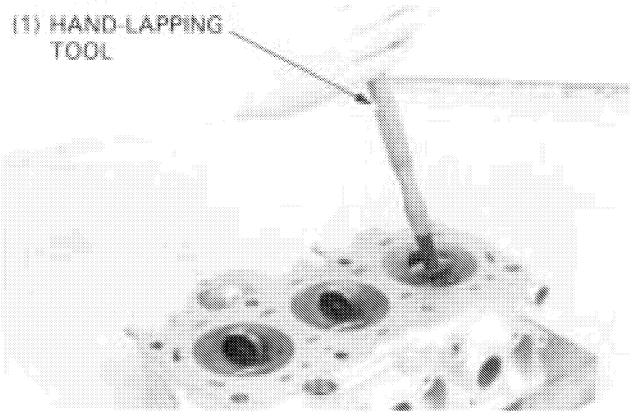


If the contact area is too low on the valve, the seat must be raised using a 60 degree inner cutter.



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

Apply a light coating of valve lapping compound to the valve face. Lap the valve and seat, using a rubber hose or other hand-lapping tool.



CAUTION

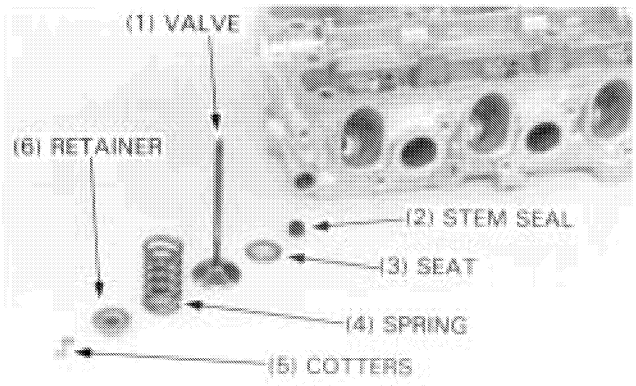
- *Do not allow lapping compound to enter the valve guide. After lapping, wash out the compound completely and coat the valve face and seat with engine oil.*

CYLINDER HEAD ASSEMBLY

Install a new stem seal on each valve guide.

Lubricate each valve stem with molybdenum disulfide oil.

Install the following:
- spring seats
- valves
- springs
- retainers

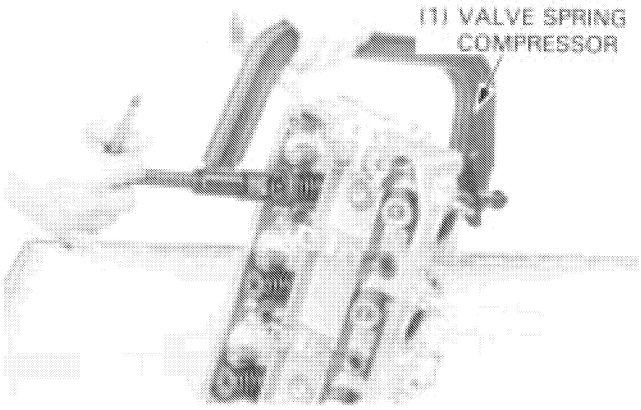


Compress the valve spring and install valve cotters.

CAUTION

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

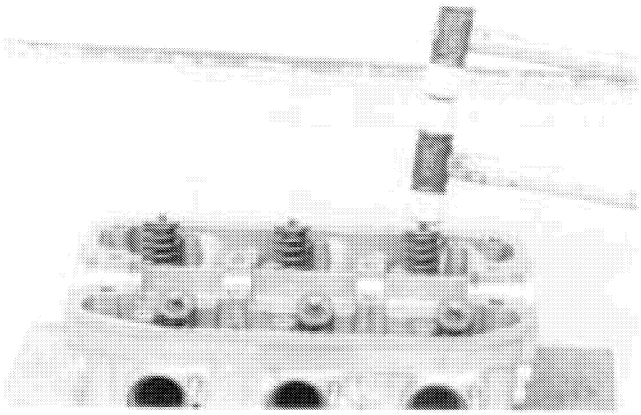
TOOL:
Valve spring compressor **07757–0010000**



Tap the top of each valve with a plastic hammer to seat the keepers.

CAUTION

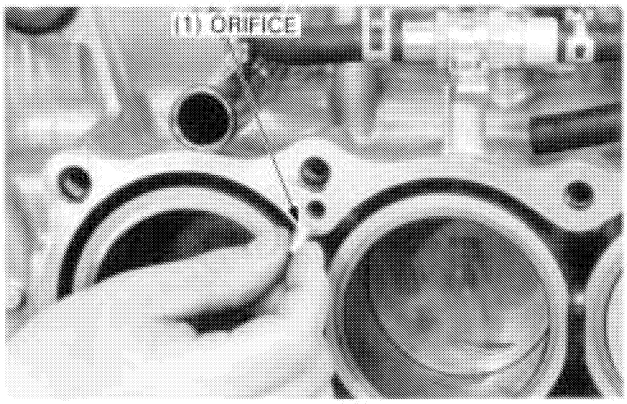
- *Support the cylinder head above the work bench surface to prevent the valves from bending.*



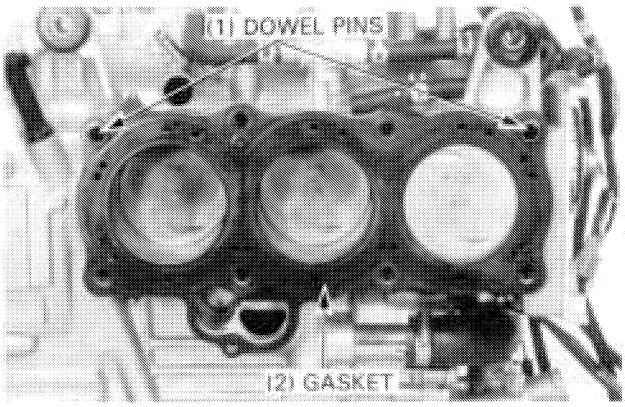
CYLINDER HEAD INSTALLATION

Clean any gasket material from the engine block, and check that all oil and water passages are clear.

Install the oil control orifice.



Install dowel pins and head gasket.

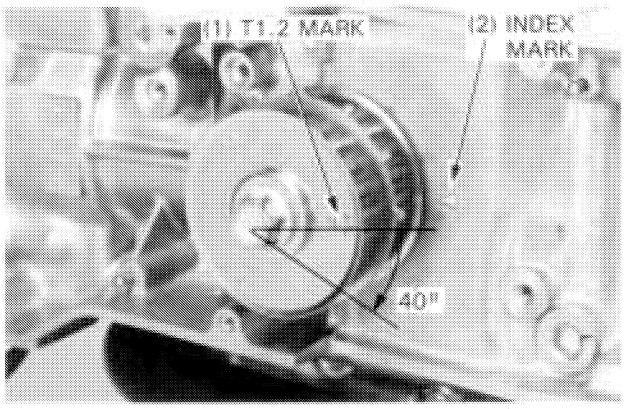


Check the T1.2 drive pully mark lines up with the index mark on the crankcase at the No. 1 and No. 2 pistons TDC.

Turn the crankshaft 40 degree clockwise to lower the No. 1 and No. 2 pistons 10—15 mm (0.4—0.6 in) from the cylinder top surface.

NOTE

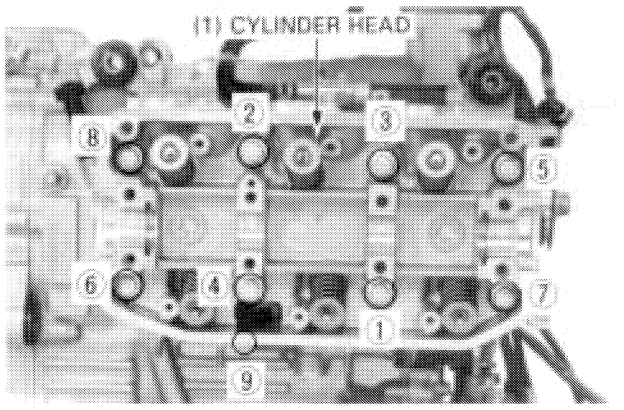
- This will reduce the possibility of bending during assembling the cylinder head.



Install the cylinder head and the head bolts, making sure the coolant pipe and O-ring are installed correctly (page 5-13).

NOTE

- Coat the 9 mm bolt threads and flange surfaces with molybdenum dislfide oil.
- 9 mm bolts have the washers.

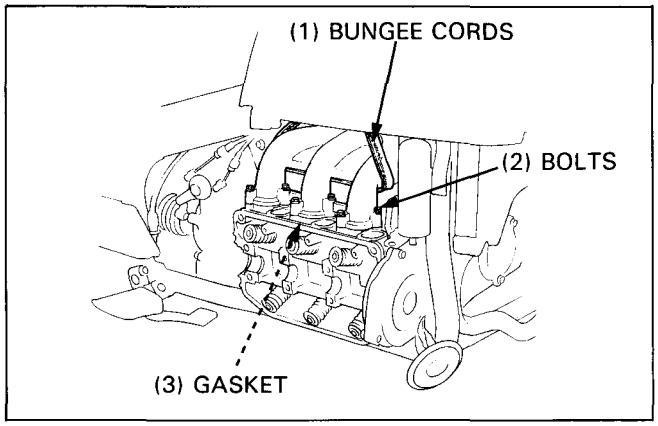


First torque eight 9 mm bolts in 2—3 steps in a crisscross pattern, then torque the single 6 mm bolt.

TORQUE: 9 mm bolts 45 N·m (4.5 kg-m, 33 ft-lb)

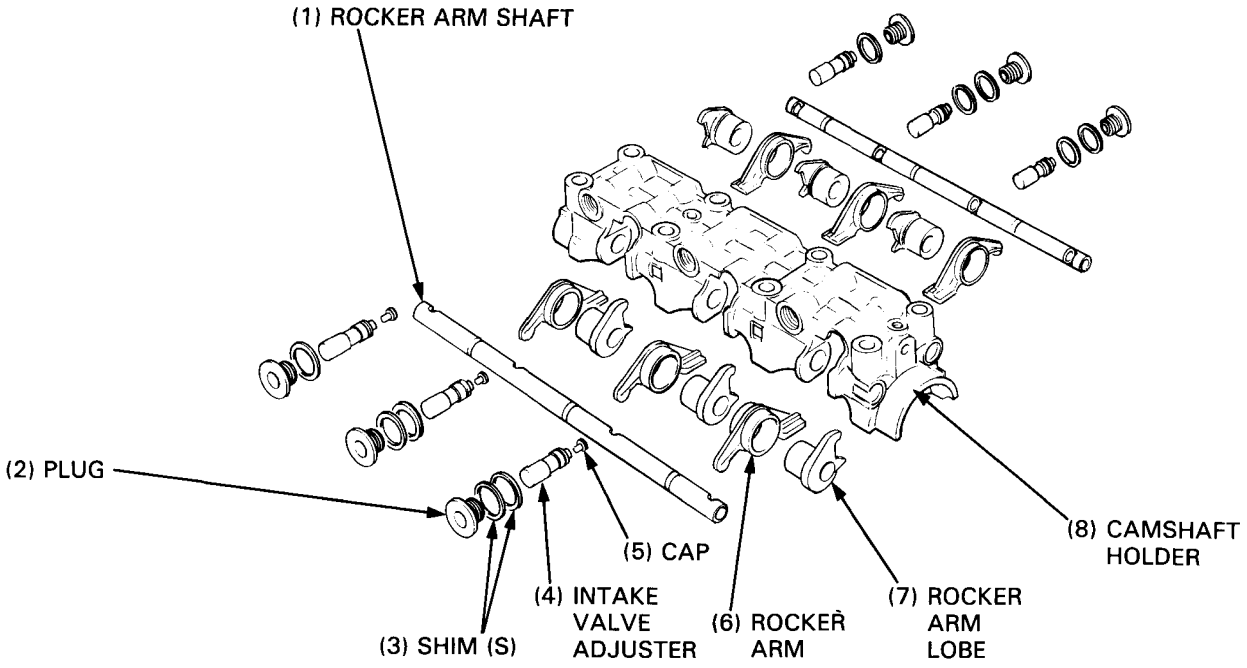
Install the secondary air supply pipes (page 4-54).

Install and tighten the intake manifold mounting bolts with gasket securely.
Release the bungee cords from the manifold.

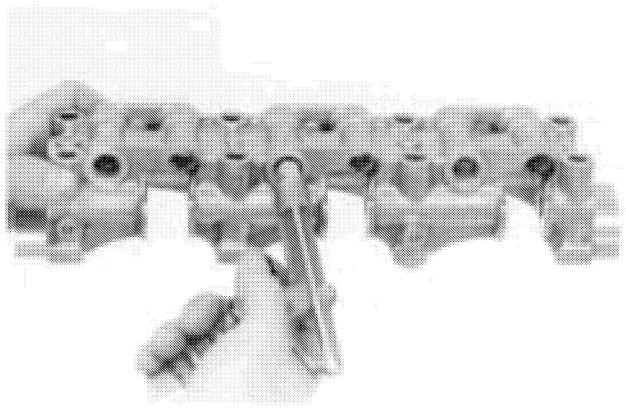


CAMSHAFT HOLDER ASSEMBLY/ INSTALLATION

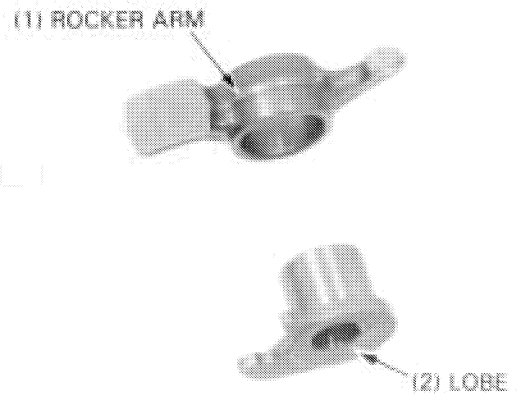
Assemble the rocker arm shafts, rocker arms and rocker arm lobes in their correct locations by referring to the identification marks made during disassembly.



Clean the camshaft holder thoroughly, and blow through all holes and passages with compressed air.



Lubricate all sliding surfaces with molybdenum disulfide oil.



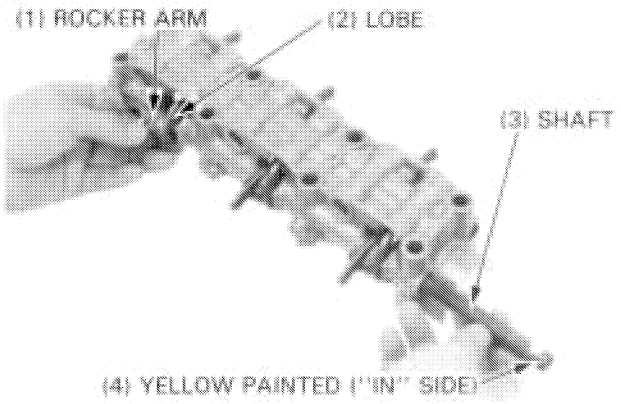
Install the following:
– rocker arms
– rocker arm lobes
– rocker arm shafts

NOTE

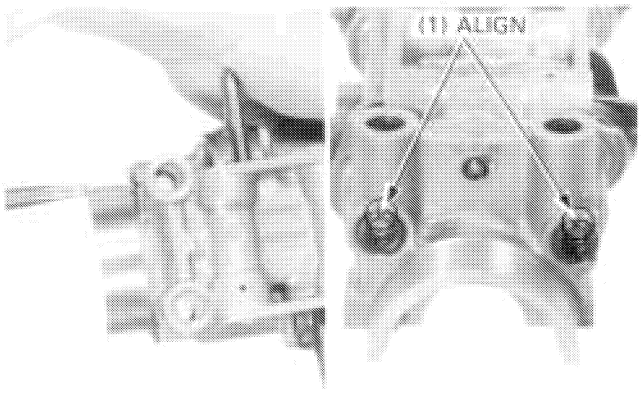
- The shaft of the intake side has a yellow painted mark.

CAUTION

- *Do not drop the rocker arm shafts or attempt to drive them into position. Rotate the shafts while sliding them into position.*



Align the rocker arm shaft cutouts with the bolt holes in the camshaft holder and also align the cutouts of the rocker arm shafts and camshaft holder.



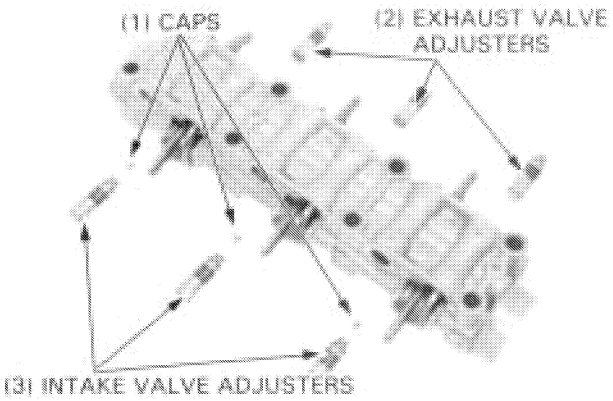
Install each hydraulic valve adjuster in sequence with its rocker arm lobe, in the same bore it came from.

NOTE

- Only the intake hydraulic valve adjusters have caps. The caps go against the rocker arm lobes.
- Shim adjustment is necessary if the following parts are replaced:
  – Cylinder head and camshaft holder.
  – Camshaft.
  – Valves or refaced valve seats.
  – Rocker arm or shaft.

For shim selection, go to page 7-22.
Tighten the stopper plugs.

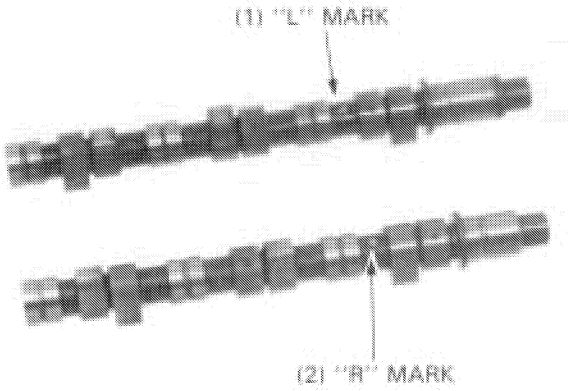
TORQUE: 30 N·m (3.0 kg-m, 22 ft-lb)



Lubricate the camshaft journals and cam lobes with molybdenum disulfide oil.

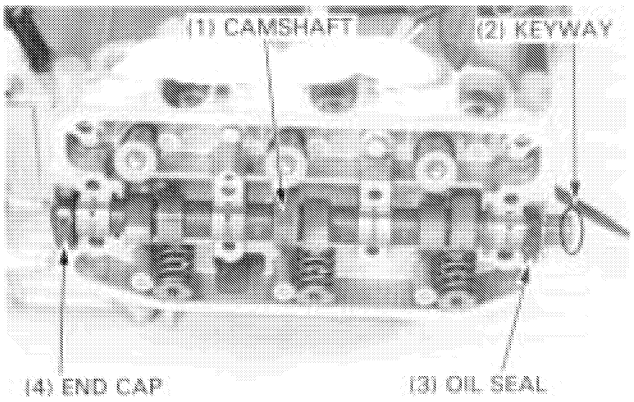
NOTE

- The "R" marked camshaft is installed onto the right side head; "L" marked, onto the left.

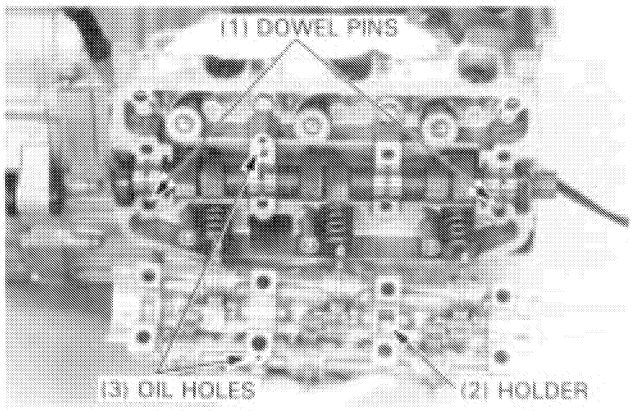


Install the oil seal and cap on the ends of the camshaft.
Coat the outer edges of the oil seal and end cap with sealant.

Lay the camshaft in the cylinder head, aligning the front keyway with the cylinder-head/head-cover mating surface, facing the intake ports. (each side)



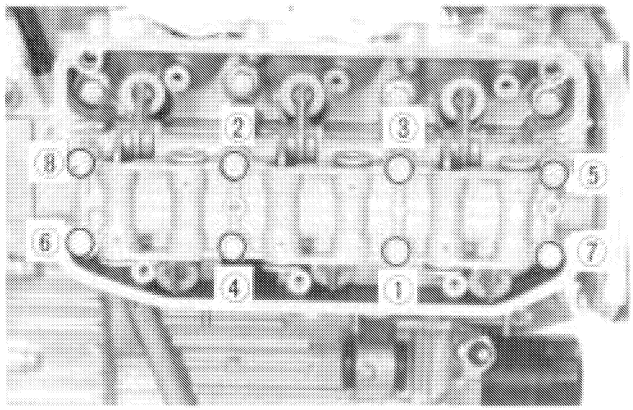
Install the two dowel pins onto the cylinder head.
Install the camshaft holder in the cylinder head, aligning the oil holes on the holder and cylinder head.



Install and tighten eight bolts in the sequence as shown.

TORQUE: 20 N·m (2.0 kg-m, 14 ft-lb)

Install the timing belt (next page).

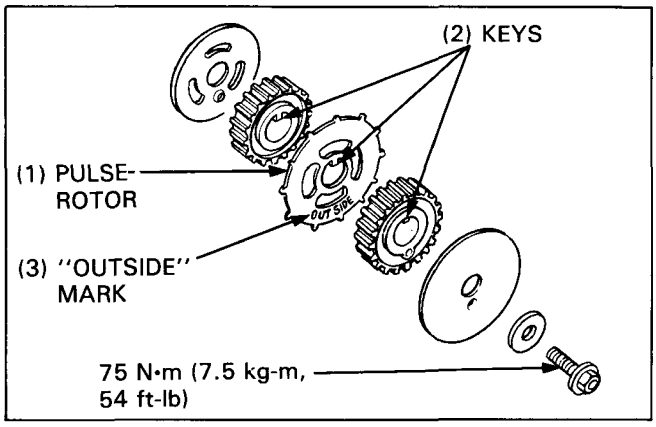


TIMING BELT INSTALLATION

Check that both timing belt drive pulleys are tight.

NOTE

- If the bolt is properly torqued and one or both of the pulleys is loose, disassemble and inspect the pulley keys for wear.
- The timing belt guide plates should be installed with the cupped edges facing away from the belt.
- Pulse rotor should be installed with its "OUTSIDE" mark facing out (for detail, see page 18-11).



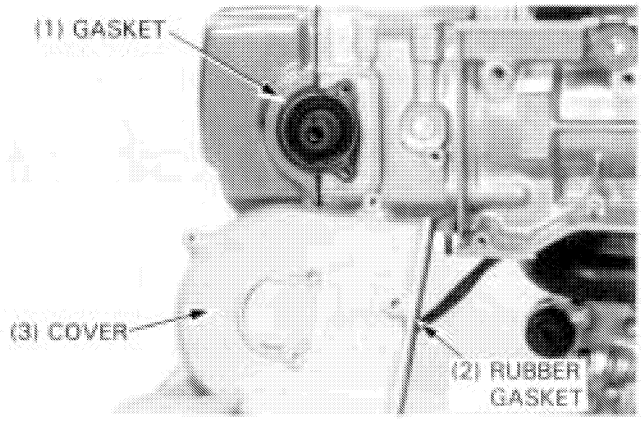
Apply locking agent to the shield cover bolt threads.

Place new shield cover gaskets on the cylinder head.

Install each shield cover with the rubber gasket glued in the correct position.

NOTE

- The shield covers are identified by marks:
  "MN5-R": right side shield cover
  "MN5-L": left side shield cover



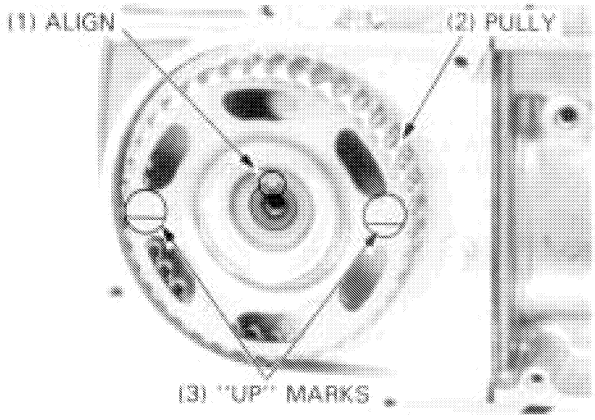
Install the driven pulley on the camshaft with the camshaft keyway aligned with the key in the driven pulley.

NOTE

- "UP" marks on the pulleys should be facing outward.

CAUTION

- *Do not turn the camshaft while timing belts are removed; you may damage the valves and piston domes.*



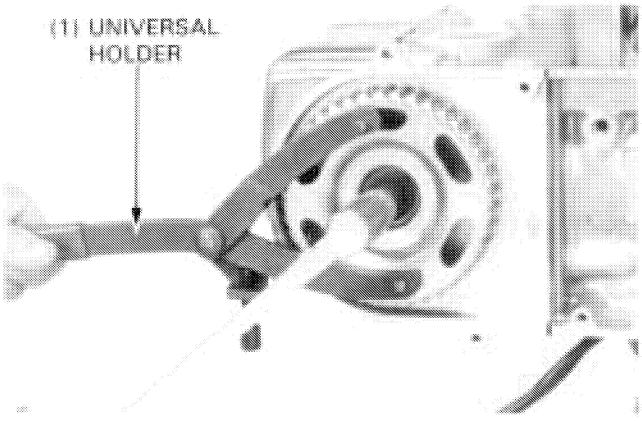
Hold the pulley and tighten the bolt with washer.

TORQUE: 27 N·m (2.7 kg-m, 20 ft-lb)

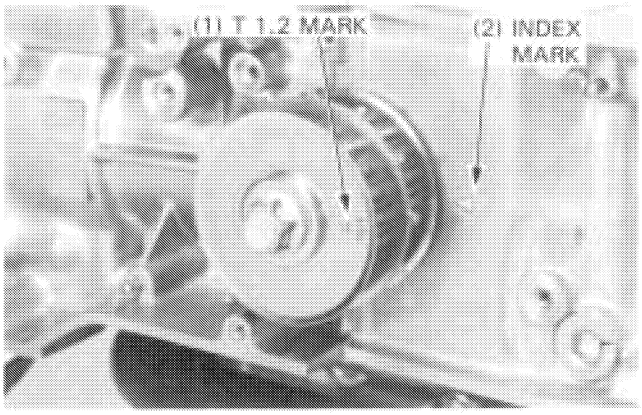
TOOL:
Universal holder **07725–0030000**

NOTE

- Install the washer with its chamfered side facing the bolt.



Turn the crankshaft counterclockwise until the T1.2 drive pully mark lines up with the index mark on the crankcase.



Apply locking agent to the tensioner bolt threads.

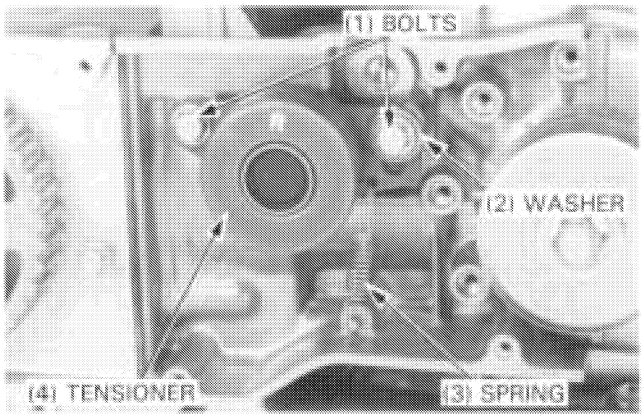
Install the timing belt tensioners on the crankcase, and tighten the bolts just enough to allow smooth movement of the tensioners.

CAUTION

- *Do not lubricate the tensioners. Oil will damage the timing belts.*

NOTE

- Install the tensioner springs with open ends facing outward.
- Install the washer with the drive pully side bolt (each side).

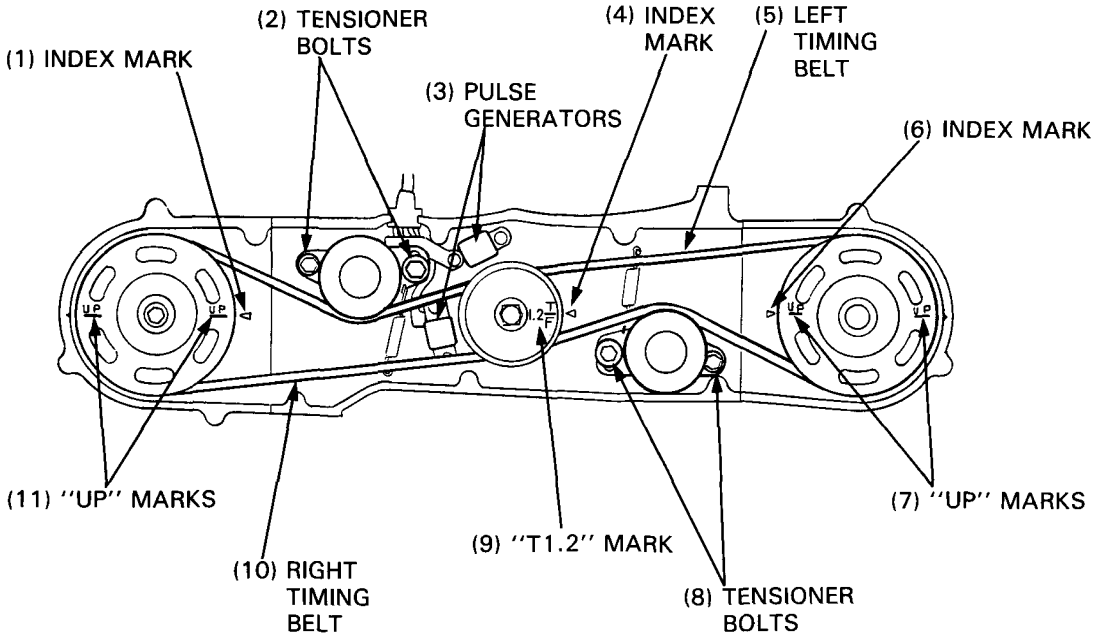


Check the "UP" marks on the driven pullys align with the shield cover index marks. The pully "UP" marks should face up.

Loosen the left tensioner bolts and install the left timing belt.

Apply clockwise pressure on the left driven pully so the belt will be slack at the tensioner.
Install the pulse generators (page 18-10).

Install the right timing belt using the same procedures.

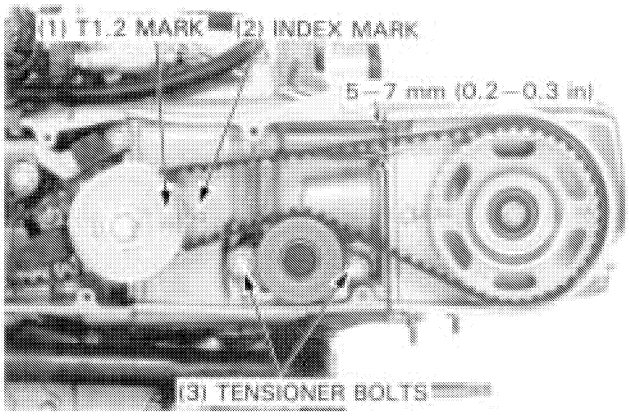


To check the timing mark alignment, turn the crankshaft 90 degrees clockwise and then 90 degrees counterclockwise. Make sure the T1.2 mark is aligned with index mark.

Tighten the tensioner driven pully side bolt first, then tighten the drive pully side bolt.

TORQUE: 26 N·m (2.6 kg-m, 19 ft-lb)

Push the belt upper run midway between the pulleys with 2 kg (4.4 lb) force and make sure that belt slack is 5—7 mm (0.2—0.3 in).

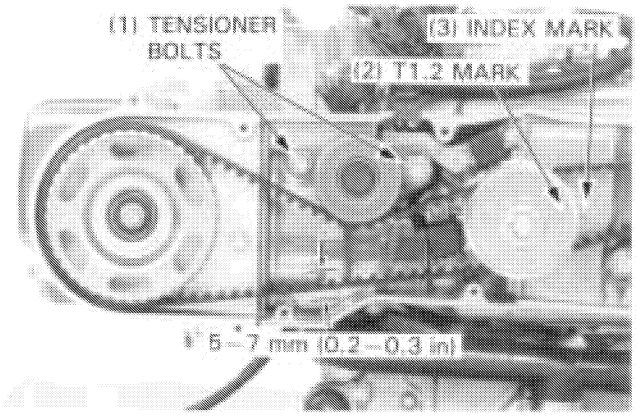


NOTE

- Inspect and adjust timing belt tension while the engine is cold.

In the same way as above, for the left belt, check the timing mark alignment and tighten the tensioner bolts as same procedure and same torque.

Push the belt lower run midway between the pullys with 2 kg (4.4 lb) force and make sure that belt slack is 5—7 mm (0.2—0.3 in).



CAUTION

- *Do not lubricate the belt tensioners since oil will damage the timing belts. To protect the sealed tensioner bearings, do not use solvents or other cleaning agents inside the front timing cover.*

HYDRAULIC VALVE ADJUSTER SHIM SELECTION

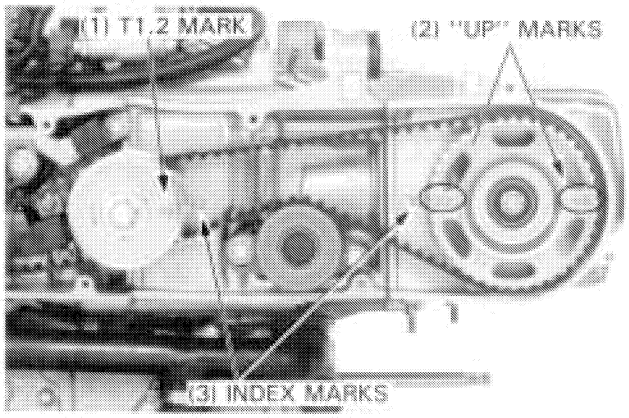
Shim the hydraulic valve adjusters when any of the following parts are replaced:
- cylinder head/camshaft holder
- camshaft
- valve/valve seat (refaced)
- rocker arm/rocker arm shaft

CAUTION

- *Intake and exhaust hydraulic valve adjusters are different and must not be interchanged.*

If none of the above parts are new, install the original shims in their correct positions. If one or more of the above parts are replaced, proceed as follows:

Check the T1.2 drive pully mark lines up with the index mark on the crankcase. The "UP" marks on the driven pullys should be facing up (each side).



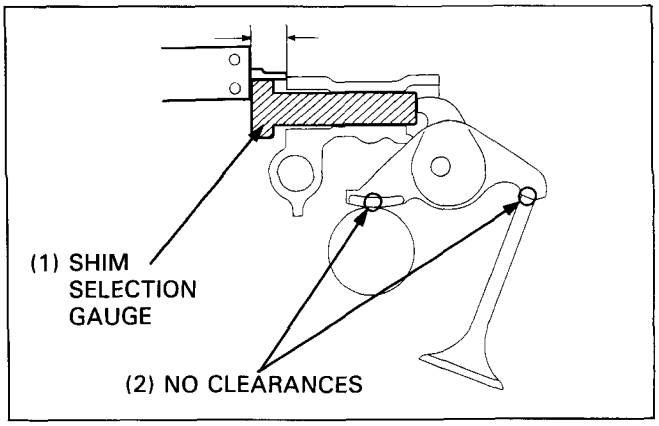
Measure the distance between the top end of the Shim Selection Gauge and shim surface of the cam holder by inserting the gauge into the valve adjuster mount hole.

TOOL:
Shim selection gauge **07974—MG90000**

NOTE

- Check that there is no clearance between the rocker arm and cam lobe, and rocker arm and valve stem.

Determine the number of shims to be used for the No. 1 cylinder valves.



Determine the number of shims to be used for the other cylinder valves in firing order, using the same procedure of the No. 1 cylinder.

Firing order (cylinder number)	1	4	5	2	3	6
Drive pully mark	T1.2	T3.4	T5.6	T1.2	T3.4	T5.6

NOTE

- Do turn the crankshaft clockwise.

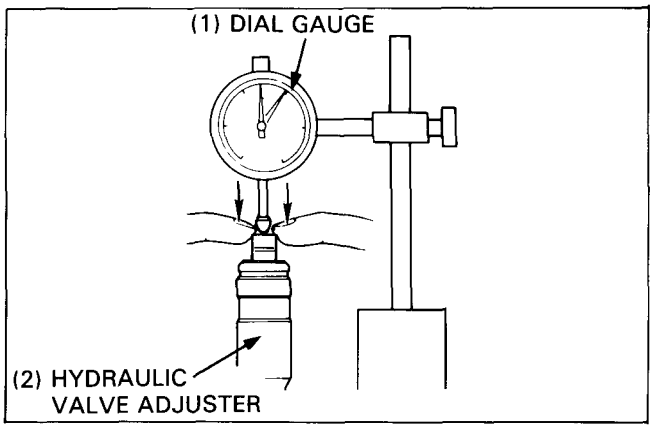
(1) Intake mm (in)	(2) Exhaust mm (in)	(3) Number of shim
8.2—9.2 (0.32—0.36)	10.2—11.2 (0.40—0.44)	0
9.2—10.2 (0.36—0.40)	11.2—12.2 (0.44—0.48)	1
10.2—11.2 (0.40—0.44)	12.2—13.2 (0.48—0.52)	2

Fill the hydraulic valve adjusters with oil, and check for the absence of air by compressing with your fingers.

CAUTION

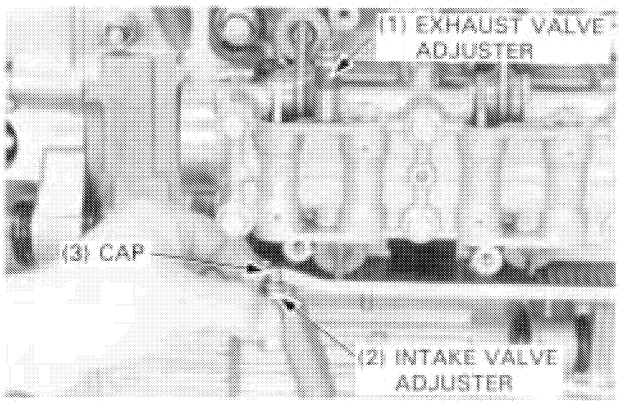
- *To prevent entry of air, do not tilt the adjusters once they are filled with oil or kerosene.*

Bleed air from the adjuster if it compresses by more than 0.30 mm (0.012 in); (page 7-8).



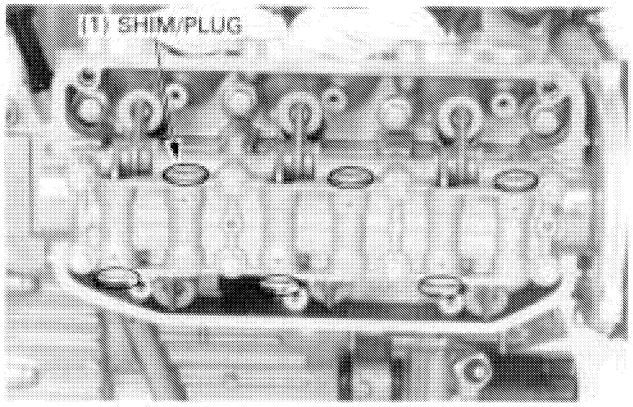
Slide the exhaust valve adjusters into the camshaft holder, with the oil holes facing up.

Install the cap on each intake valve adjuster and slide it into position in the camshaft holder, with the cap facing up.



Install the shims and stopper plugs.

TORQUE: 30 N·m (3.0 kg-m, 22 ft-lb)

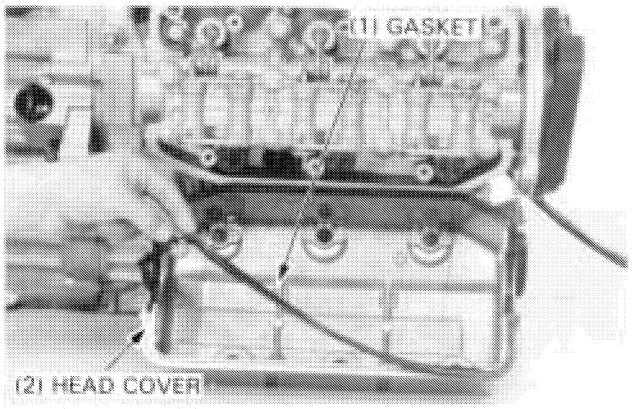


Apply adhesive (Three Bond #1521 or equivalent) to the cylinder head cover gasket groove if removed the gasket.

Attach the gasket to the head cover groove correctly.

NOTE

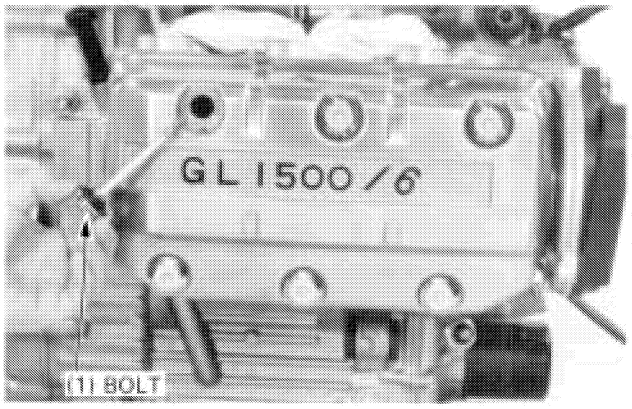
- Clean the groove before applying adhesive.
- Do not apply adhesive to the camshaft holder contacting surfaces.



Coat the rubber areas of the cover bolts with oil, and torque the bolts.

TORQUE: 12 N·m (1.2 kg-m, 9 ft-lb)

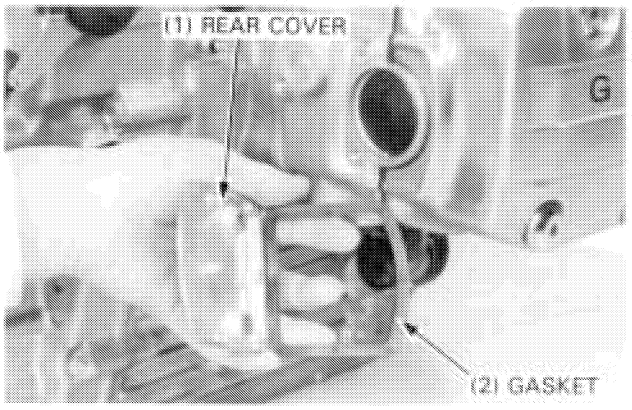
Install the rubber plugs in the bolt head holes.



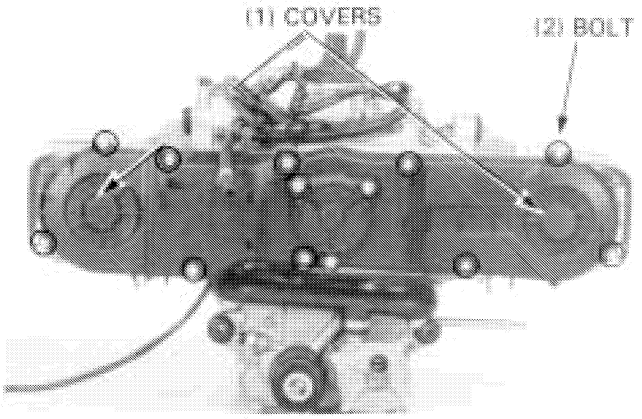
Install the rear cylinder head cover with the gasket.

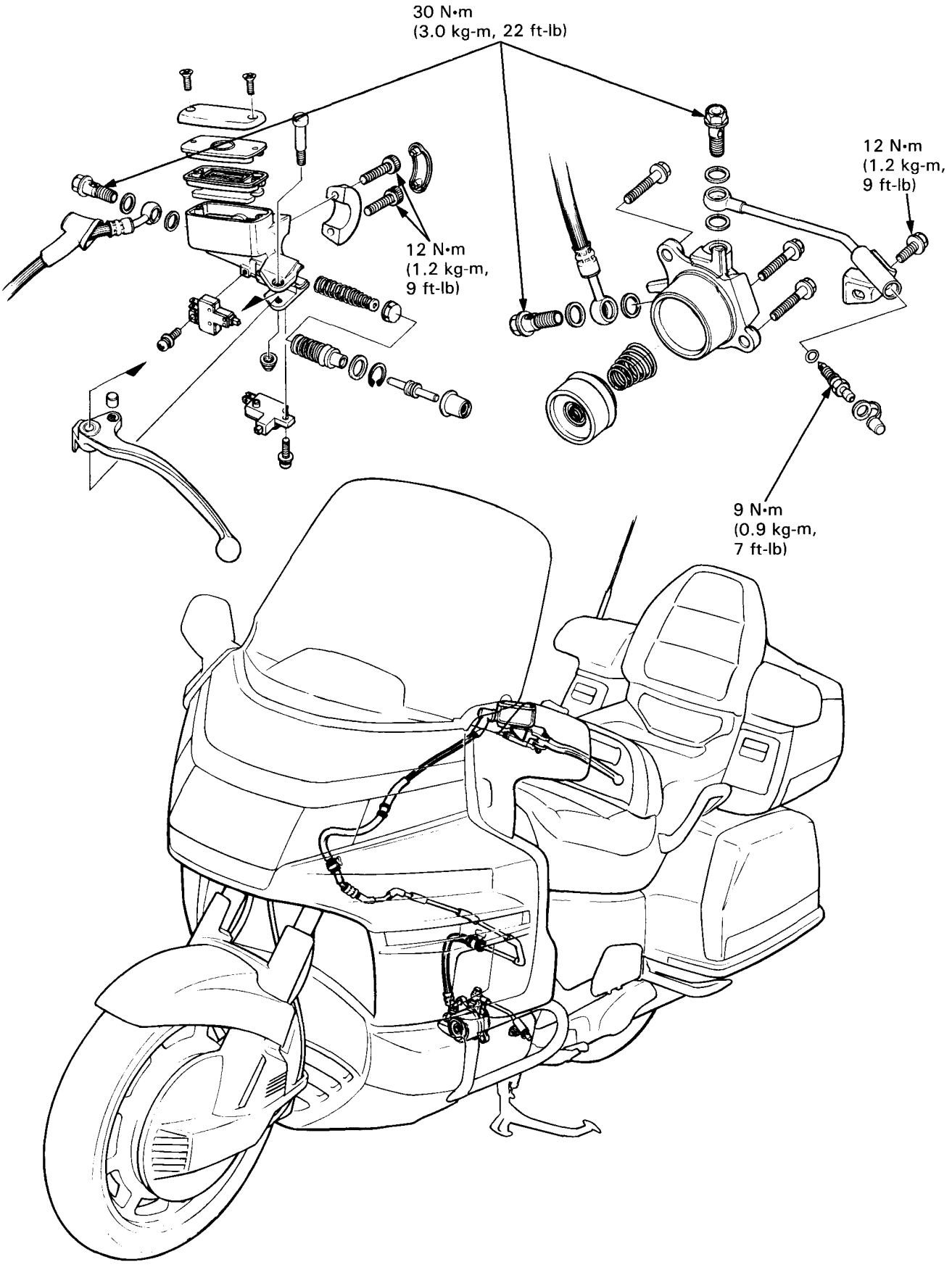
NOTE

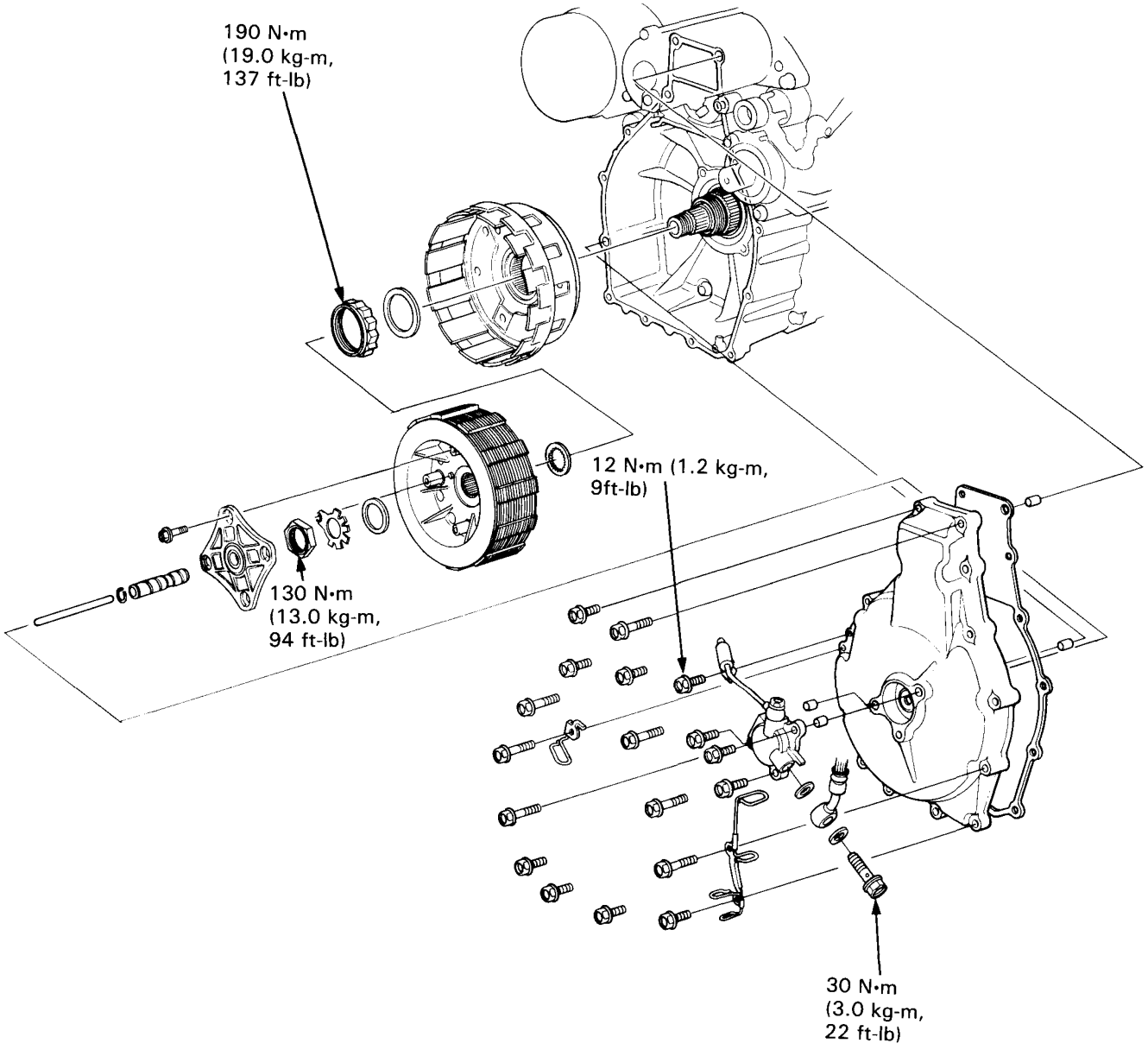
- Align the cover holes with the gasket projections.



Install the timing belt covers with cover gaskets.
Install the under cover and fairing front cover (page 12-8).




30 N•m
(3.0 kg-m, 22 ft-lb)
12 N•m
(1.2 kg-m,
9 ft-lb)
12 N•m
(1.2 kg-m,
9 ft-lb)
9 N•m
(0.9 kg-m,
7 ft-lb)


190 N•m
(19.0 kg-m,
137 ft-lb)
12 N•m (1.2 kg-m,
9ft-lb)
130 N•m
(13.0 kg-m,
94 ft-lb)
30 N•m
(3.0 kg-m,
22 ft-lb)

SERVICE INFORMATON

GENERAL

- This section covers removal and installation of the clutch hydraulic system and the clutch.
- DOT4 brake fluid is used for the hydraulic clutch and is referred to as clutch fluid in the section. Do not use other types of fluid as they are not compatible.
- Brake fluid will damage painted, plastic and rubber parts. Whenever handling brake fluid, protect the painted, plastic and rubber parts by covering them with a rag. If fluid does get on these parts, wipe it off with a clean cloth.
- Clutch service can be done with the engine in the frame.
- To keep slave cylinder piston from being forced out of the cylinder, squeeze the clutch lever and tie it to the handlebar grip.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Clutch master cylinder	Cylinder I.D.		15.870–15.913 (0.6248–0.6265)	15.93 (0.627)
	Piston O.D.		15.827–15.854 (0.6231–0.6242)	15.82 (0.623)
Clutch	Spring free height		5.38 (0.212)	5.1 (0.20)
	Disc thickness	A	3.80–3.88 (0.150–0.153)	3.5 (0.14)
		B	3.72–3.88 (0.146–0.153)	3.5 (0.14)
	Plate warpage		—	0.30 (0.012)
Clutch fluid			DOT 4	—

TORQUE VALUES

Clutch hose/pipe oil bolt	30 N·m (3.0 kg-m, 22 ft-lb)
Clutch master cylinder holder bolt	12 N·m (1.2 kg-m, 9 ft-lb)
Clutch slave cylinder bleed valve	9 N·m (0.9 kg-m, 7 ft-lb)
Clutch center lock nut	130 N·m (13.0 kg-m, 94 ft-lb)
Clutch outer lock nut	190 N·m (19.0 kg-m, 137 ft-lb)-Apply locking agent/Stake (2 plcs)
Clutch bleed pipe bolt	12 N·m (1.2 kg-m, 9 ft-lb)-Apply locking agent

TOOLS

Special

Snap ring pliers	07914–3230001
Clutch center holder	07JMB–MN50300
Oil seal driver attachment	07965–MA10200
Clutch outer holder	07JMB–MN50100
Lock nut wrench, 46 mm	07JMA–MN50100

Common

Driver	07749–0010000
Attachment, 32 x 35 mm	07746–0010100
Extension bar	07716–0020500

TROUBLESHOOTING

Clutch lever too hard
- Sticking piston(s)
- Clogged hydraulic system

Clutch slips
- Hydraulic system sticking
- Discs worn
- Spring weak
- Sticking lifter system
- Clogged hydraulic system

Clutch will not disengage
- Air bubbles in hydraulic system
- Low fluid level
- Hydraulic system leaking
- Hydraulic system sticking
- Plates warped

Hard to shift into gear
- Clutch disengaged
- Gearshift linkage or transmission faulty (Section 10)

Motorcycle creeps with clutch disengaged
- Air bubbles in hydraulic system
- Low fluid level
- Hydraulic system leaking
- Hydraulic system sticking
- Plates warped
- Engine oil level too high (too much engine oil)
- Engine oil viscosity too thick.

Excessive lever pressure
- Hydraulic system sticking
- Lifter mechanism damaged

Clutch operation feels rough
- Outer drum slots rough
- Sticking piston(s)

CLUTCH FLUID REPLACEMENT/AIR BLEEDING

CAUTION

- *Do not allow foreign material to enter the system when the diaphragm is removed.*
- *Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.*

CLUTCH FLUID REPLACEMENT

Remove the reservoir cover, set plate, diaphragm and float with the fluid reservoir parallel to the ground.

Draw the clutch fluid (brake fluid) from the reservoir completely using a commercial syringe.
Fill the reservoir with fresh DOT 4 brake fluid to the upper level mark.

Connect a commercial brake bleeder, such as the Mityvac No. 6860, to the bleed valve.
Open the bleed valve and pump the brake bleeder until new brake fluid appear coming out of the bleed valve and air bubbles do not appear in a plastic hose.

NOTE

- Add fluid when the fluid level in reservoir is low.
- Use only DOT 4 brake fluid from a sealed container.
- If air is entering the bleeder from around the bleed valve, seal the valve with Teflon tape.
- If you don't have a brake bleeder, replace the fluid following the instruction for air bleeding on next page.

CAUTION

- *Do not mix different types of fluid. They are not compatible.*

Tighten the bleed valve.

TORQUE: 9 N-m (0.9 kg-m, 7 ft-lb)

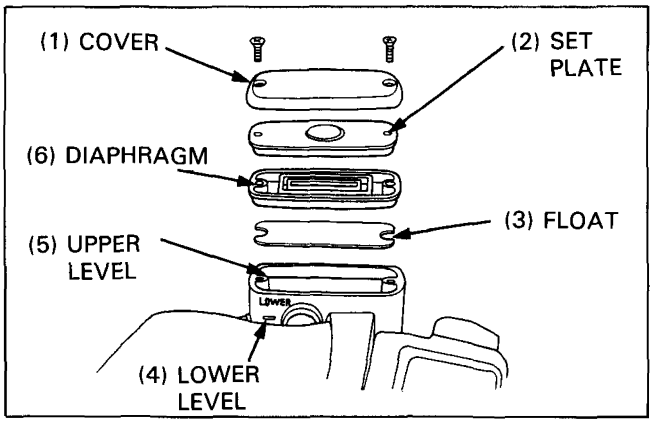
Fill the reservoir with fresh DOT 4 brake fluid to the upper level mark.

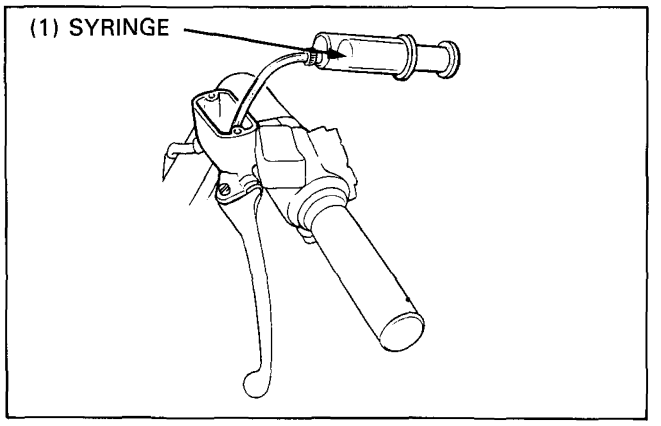
Then, bleed the system as below.

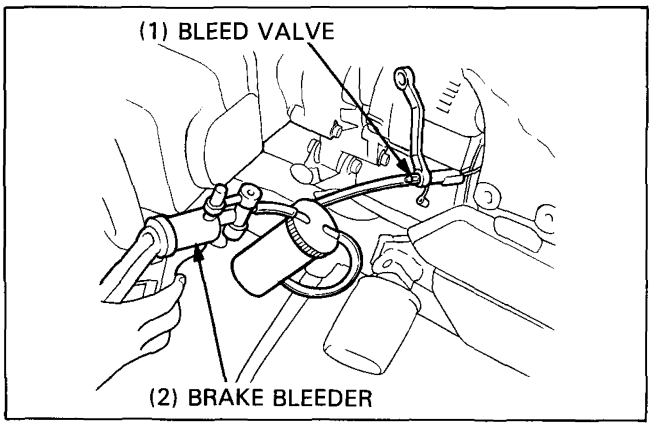
AIR BLEEDING

If brake bleeder is available, open the bleed valve and pump the bleeder until air bubbles do not appear in a prastic hose while adding fresh DOT 4 fluid to reservoir upper level (same procedure as clutch fluid replacement above).

If bleeder is not available, perform the air bleeding on next page.







Connect the plastic hose to the bleed valve.

1. Pump up the system pressure with the clutch lever until there are not air bubbles in the fluid flowing out of the reservoir small holes. Squeeze the lever, open the bleed valve 1/4 turn and then close the bleed valve.

NOTE

- Do not release the clutch lever until the bleed valve has been closed.
- Add fresh DOT 4 fluid when the fluid level in reservoir is low: do not mix different types of fluid.

2. Release the clutch lever slowly and wait several seconds after it reaches the end of its travel.

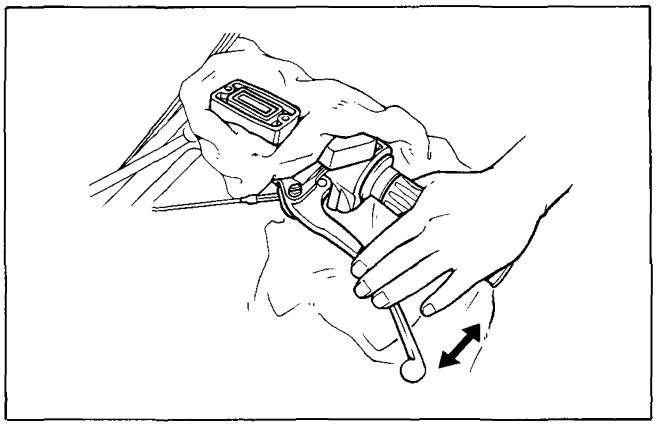
Repeat steps 1 and 2 until air bubbles cease to appear in the fluid coming out of the bleed valve.

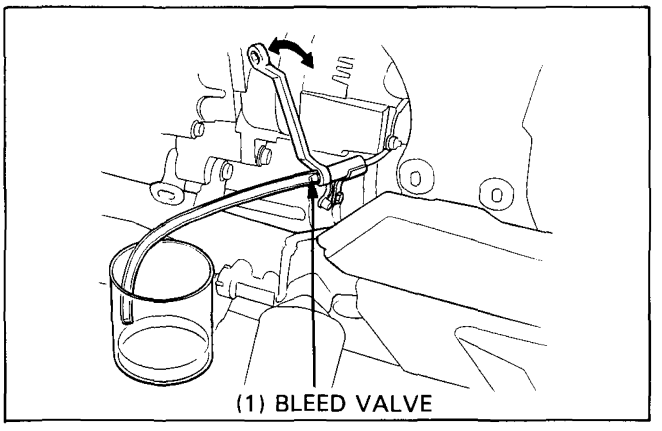
Tighten the bleed valve.

TORQUE: 9 N·m (0.9 kg-m, 7 ft-lb)

Fill the fluid reservoir to the upper level mark with fresh DOT 4 brake fluid from a sealed container.

Install the float, diaphragm, set plate and reservoir cover.





CLUTCH MASTER CYLINDER

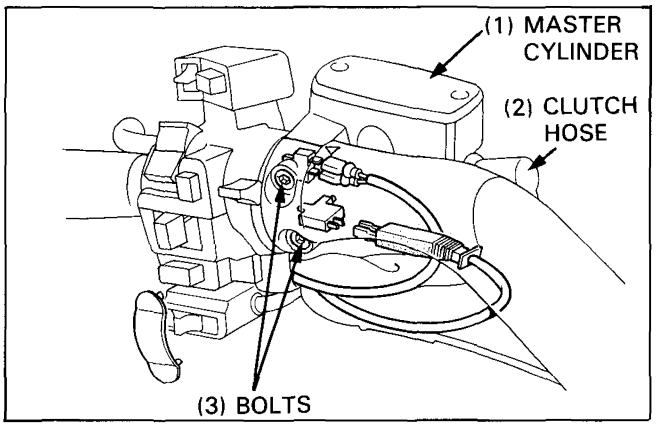
DISASSEMBLY

Draw the brake fluid from the reservoir completely using a commercial syringe (previous page).

Remove the following:
— clutch switch and cruise cancel switch wires.
— clutch hose.

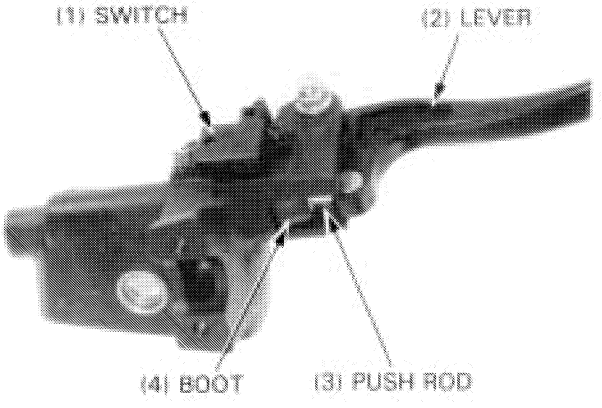
CAUTION

- *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 clutch hose to prevent contamination or air mixture.*



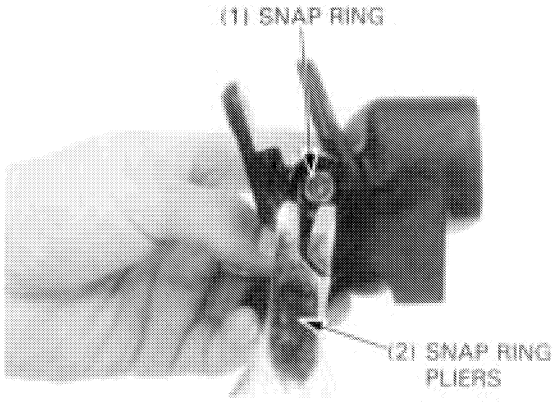
— master cylinder holder and master cylinder.

— clutch lever.
— switch.
— push rod.
— boot.

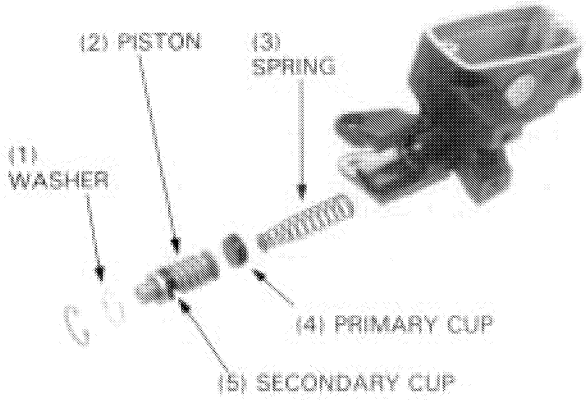


– snap ring

TOOL:
Snap ring pliers **07914–3230001**



– washer
– master piston
– primary cup
– spring

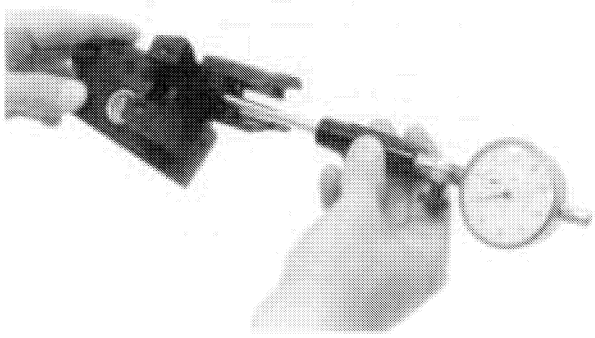


Clean the master cylinder, reservoir and master piston in clean DOT 4 fluid.

Check the primary and secondary cups for damage or deterioration.

INSPECTION

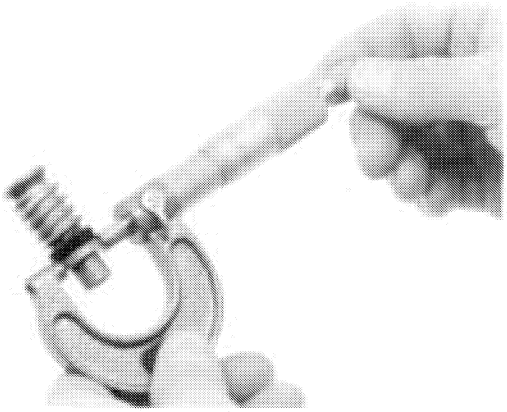
Check the master cylinder and piston for scoring or other damage.



Measure the master cylinder I.D.

SERVICE LIMIT: 15.93 mm (0.627 in)

Measure the master piston outside diameter.



SERVICE LIMIT: 15.82 mm (0.623 in)

NOTE

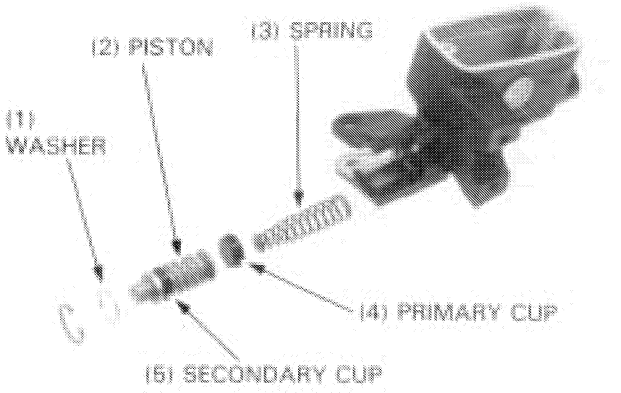
- The master piston, piston cups and spring must be replaced as a set

ASSEMBLY

CAUTION

- *Handle the master piston, spring, primary cup and secondary cup as a set.*

Coat the master piston, primary and secondary cups with clean DOT 4 brake fluid.



Install the following:
– spring
– primary cup
– master piston

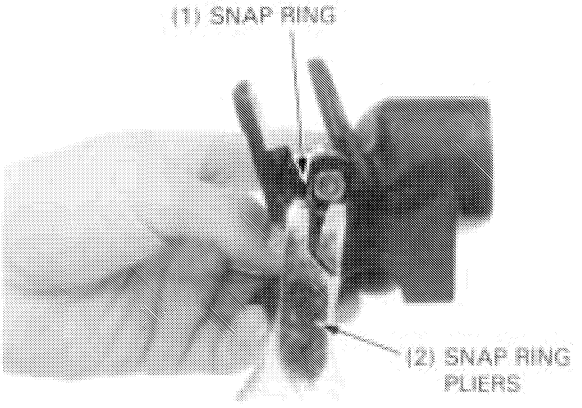
NOTE

- Install the spring with its small coil end toward the cup.

CAUTION

- *Do not allow the lips of the cups to turn inside and be certain the snap ring is firmly seated in the groove.*

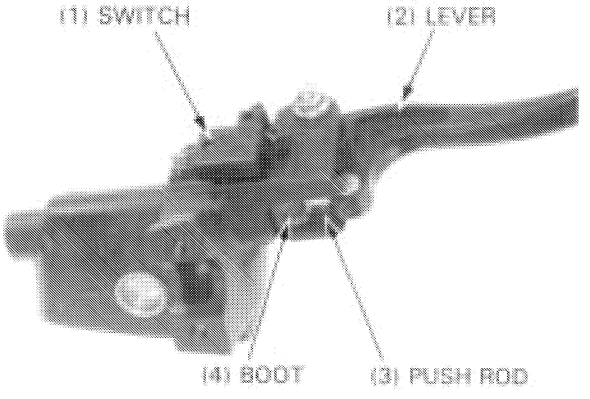
– washer
– snap ring



TOOL:

Snap ring pliers	**07916–3230001**

– boot
– push rod
– switch
– clutch lever



INSTALLATION

Place the clutch master cylinder on the handlebar and install the holder.

Align the edge of the master cylinder holder with the index mark on the left handlebar cover, and tighten the upper bolt first, then tighten the lower bolt.

TORQUE: 12 N·m (1.2 kg-m, 9 ft-lb)

Install the clutch hose on the master cylinder with the oil bolt and new two sealing washers.

NOTE

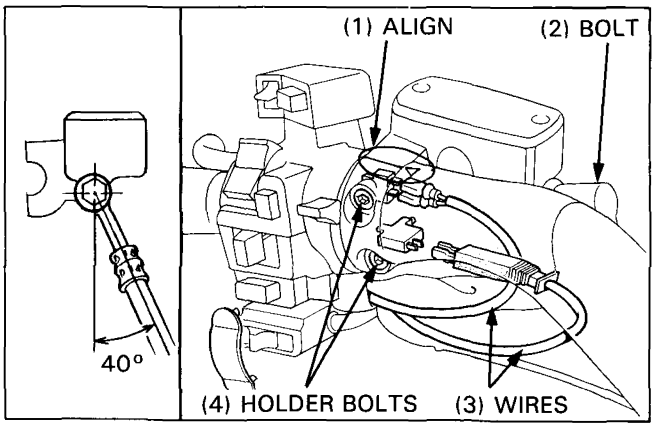
- Set the hose as shown.

Tighten the oil bolt.

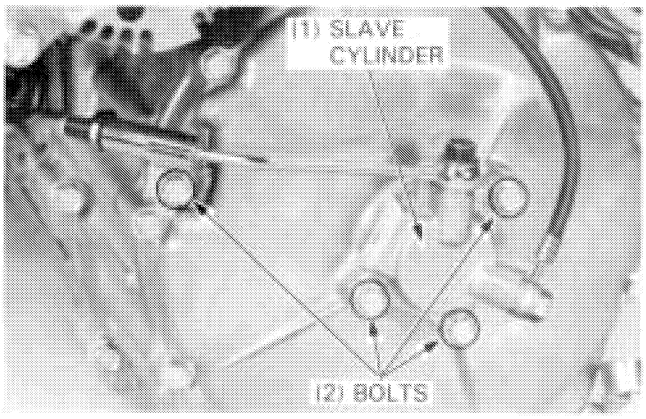
TORQUE: 30 N·m (3.0 Kg-m, 22 ft-lb)

Connect the switch wires to the switch.

Fill and bleed the clutch hydraulic system (page 8-4).



CLUTCH SLAVE CYLINDER



DISASSEMBLY

NOTE

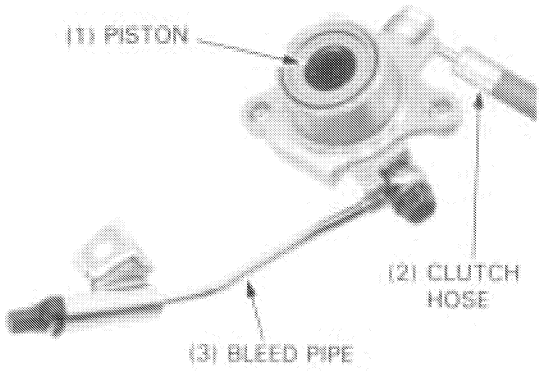
- Clutch slave cylinder can be removed with the engine in the frame.

Remove the following:
— front side covers (page 12-6).
— bleed pipe mounting bolt and slave cylinder bolts.
— slave cylinder.

Check the piston sliding area for fluid leak.
To get the slave piston out of the slave cylinder, squeeze the clutch lever several times.

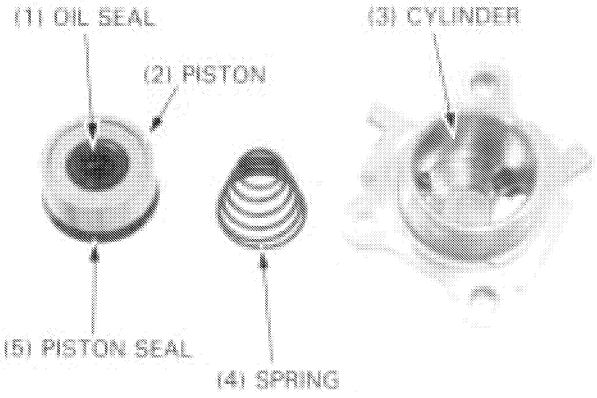
CAUTION

- *Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.*



Remove the clutch hose and bleed pipe if necessary.

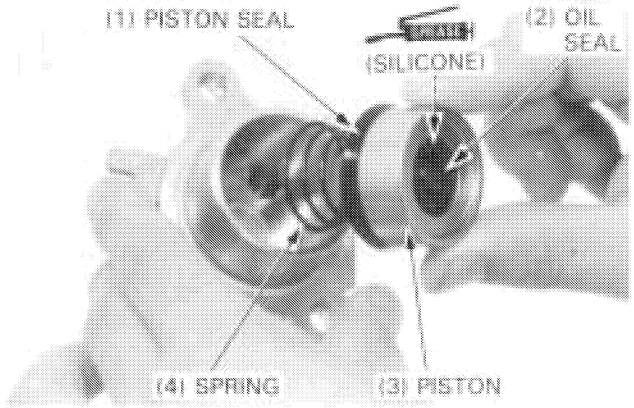
Check the following for score, wear or damage.
— piston
— seals
— spring
— cylinder



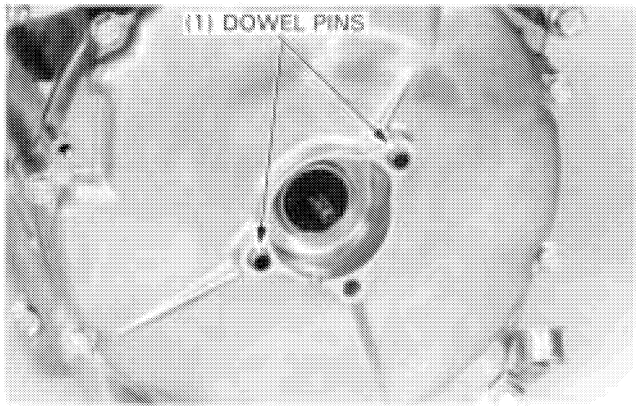
Apply small amount of silicone grease (0.2 grammes) to the lifter rod attaching area of the piston.
Apply clean DOT 4 fluid to the piston and a new piston seal.
Apply grease to a new oil seal lips.

Install the following to the piston:
— seals
— spring

Install the piston into the slave cylinder.



Install the dowel pins to the clutch cover.

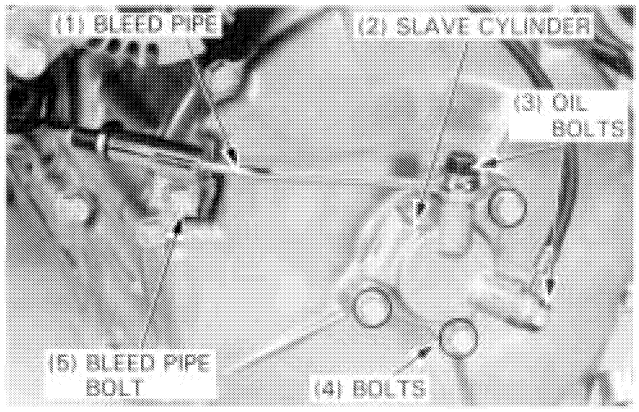


Install the slave cylinder and tighten the bolts securely.
Install the clutch hose and bleed pipe with new sealing washers to the slave cylinder if removed them.
Tighten the oil bolts to the specified torque.

TORQUE: 30 N·m (3.0 kg-m, 22 ft-lb)

Apply locking agent to the bleed pipe mounting bolt threads.
Tighten the bleed pipe mounting bolt.

TORQUE: 12 N·m (1.2 kg-m, 9 ft-lb)



Install the following:
— front side covers (page 12-6)

Fill and bleed the clutch hydraulic system (page 8-4).

CLUTCH

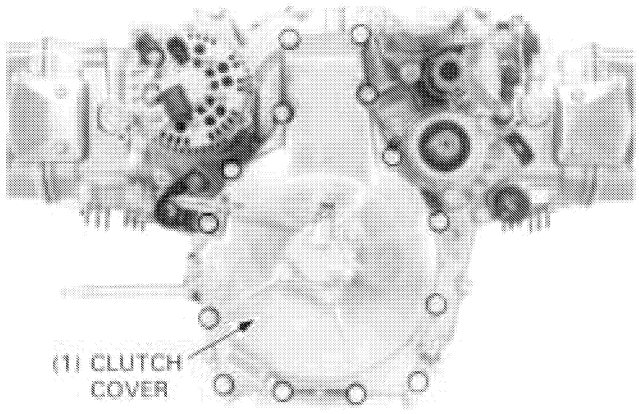
DISASSEMBLY/INSPECTION

NOTE

- Clutch can be removed with the engine in the frame.

Drain the engine oil (page 2-4).

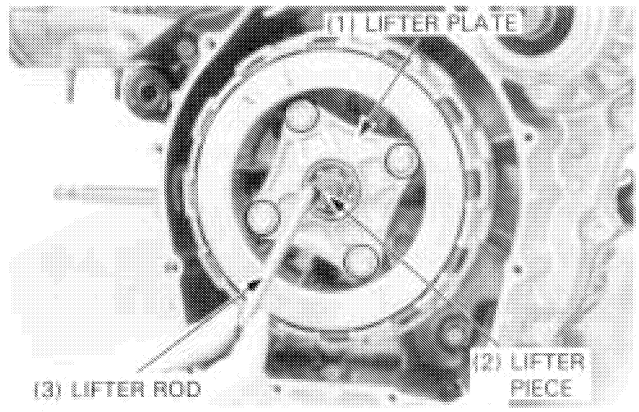
Remove the following:
— front side covers (page 12-6)
— left exhaust pipe protector and heat protector (page 12-16)
— clutch slave cylinder (page 8-8)



NOTE

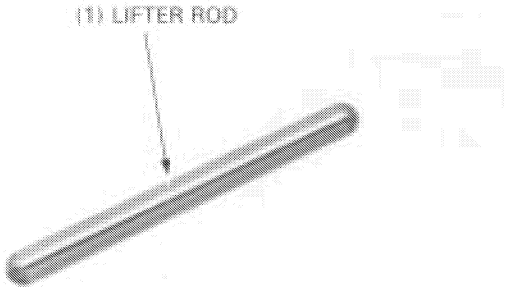
- Do not disconnect the clutch hose.
- To keep slave cylinder piston from being forced out of the cylinder, squeeze the clutch lever and tie it to the handlebar.

— clutch cover.
— dowel pins and gasket.

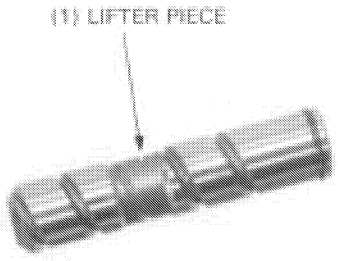


— clutch lifter rod and clutch lifter piece.
— clutch lifter plate.

Inspect the lifter rod for wear, damage or bending.



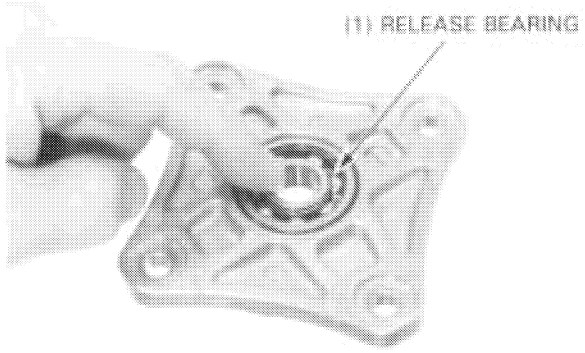
Check the lifter piece for wear or damage.



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

Remove and discard the bearing if the races do not turn smoothly, quietly, or if loosely in the lifter plate.

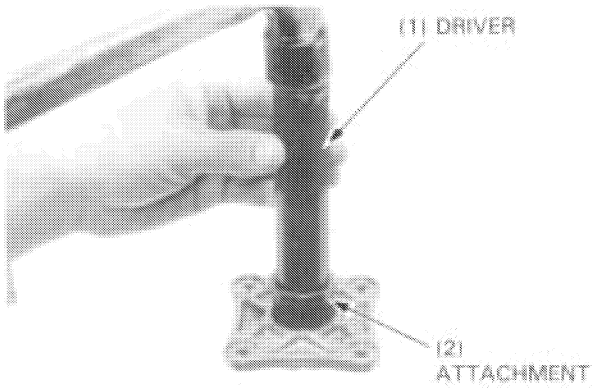
Drive the bearing out of the lifter plate.



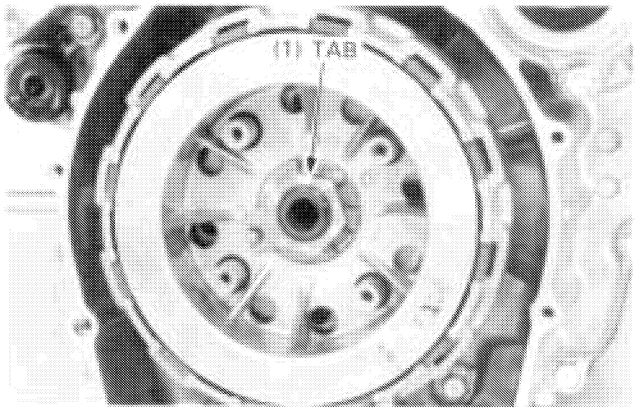
Install the bearing its marked side facing down.

TOOLS:

Driver	**07749–0010000**
Attachment, 32 x 35 mm	**07746–0010100**



Straighten the lock washer tab.

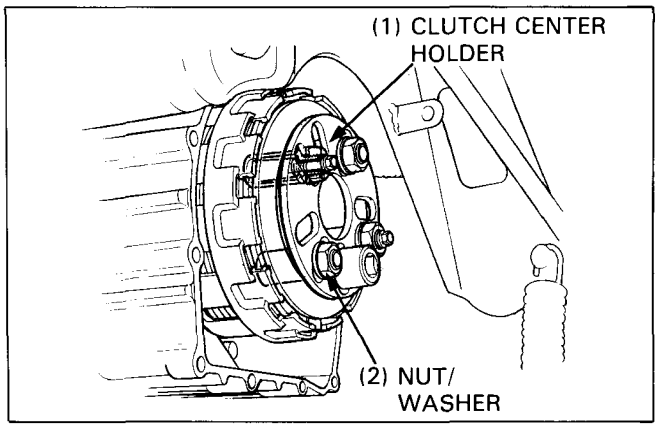


Set the clutch center holder to the pressure plate bosses and loosely install washers and nuts.

TOOL:

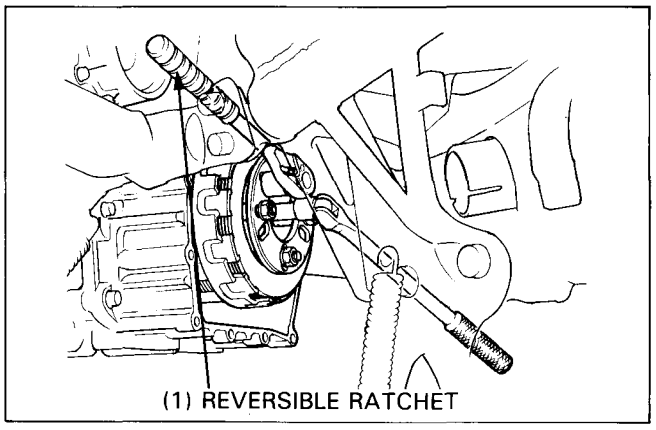
Clutch center holder	**07JMB—MN50300**

Temporarily remove the tool and tighten nuts; then reinstall the clutch center holder onto bosses.



Hold the clutch center holder with a commercial reversible ratchet as shown and remove the lock nut.

Remove the following:
- lock washer.
- washer.
- clutch center, pressure plate, discs and plates as an assembly from the clutch outer.



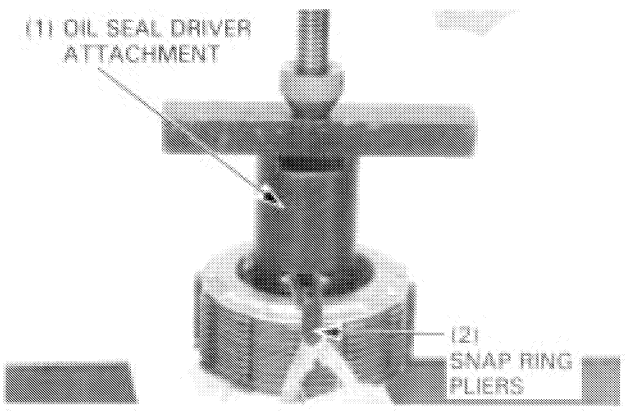
Compress the diaphragm spring in a bench press just enough to remove the stopper ring; remove the stopper ring and disassemble them.

CAUTION

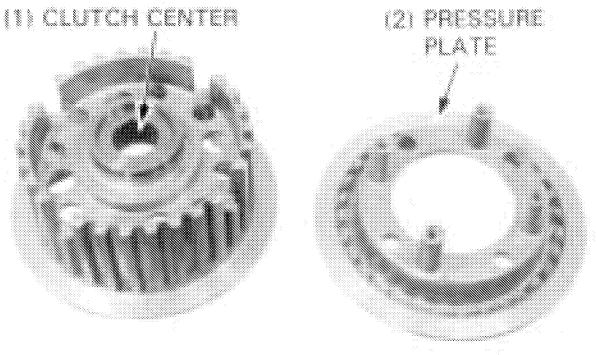
- *To prevent a loss of tension, do not compress the diaphragm spring more than necessary to remove the stopper ring.*

TOOLS:

Oil seal driver attachment	**07965—MA10200**
Snap ring pliers	**07914—3230001**

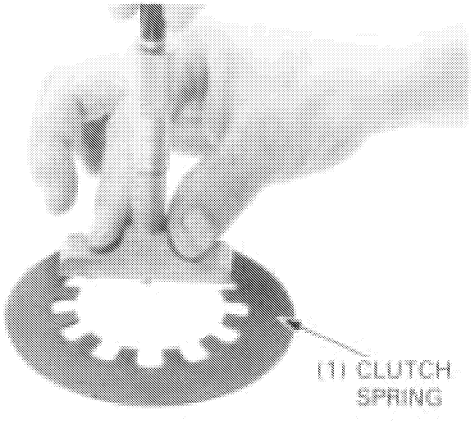


Check the clutch center and pressure plate for nicks, cuts and indentations made by the plates.



Measure the height of the clutch spring.

SERVICE LIMIT: 5.1 mm (0.20 in)

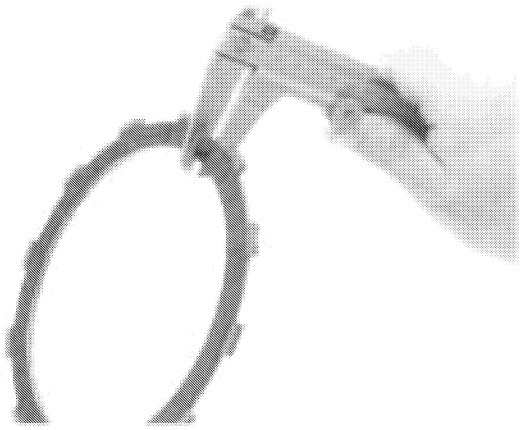


Replace the clutch discs if they show signs of scoring or discoloration.
Measure each clutch disc thickness.

SERVICE LIMIT: 3.5 mm (0.14 in)

NOTE

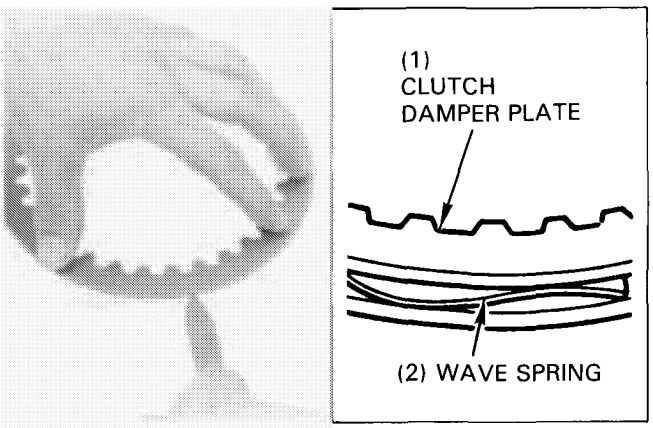
- Replace the discs and plates as a set.



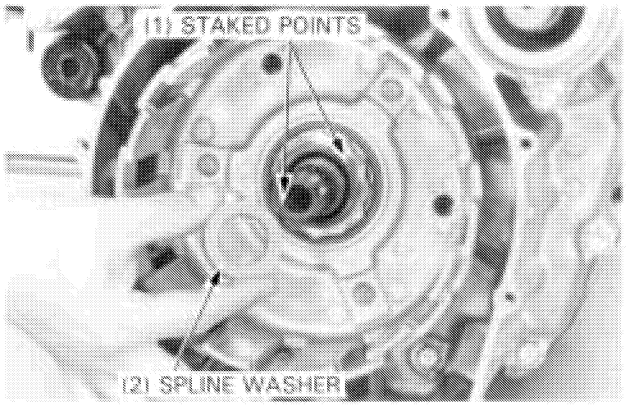
Check for plate warpage on a surface plate using a feeler gauge.

SERVICE LIMIT: 0.30 mm (0.012 in)

Check the clutch damper plate wave spring for damage.



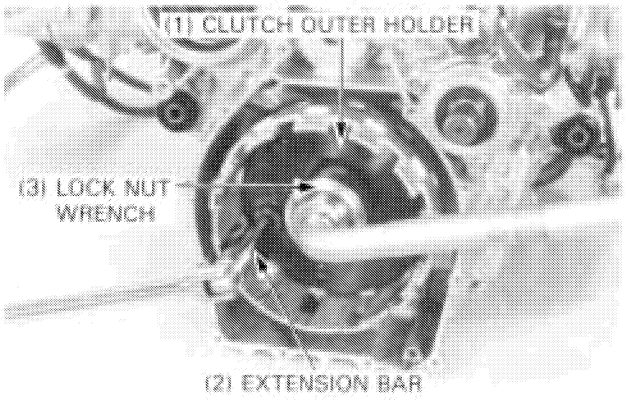
Remove the spline washer from the mainshaft.
Unstake the clutch outer lock nut.



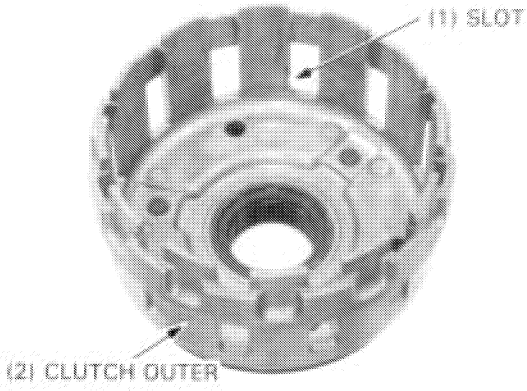
Hold the clutch outer with the special tool.
Remove the clutch outer lock nut and discard it.
Remove the lock washer and clutch outer.

TOOL:

Clutch outer holder	**07JMB—MN50100**
Extension bar	**07716—0020000**
Lock nut wrench, 46 mm	**07JMA—MN50100**



Check the slots in the clutch outer for nicks, cuts and indentations made by the friction discs. If the surfaces are not smooth *or there is evidence of other damage, replace the clutch outer.*



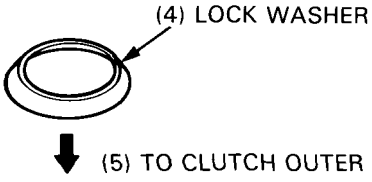
ASSEMBLY

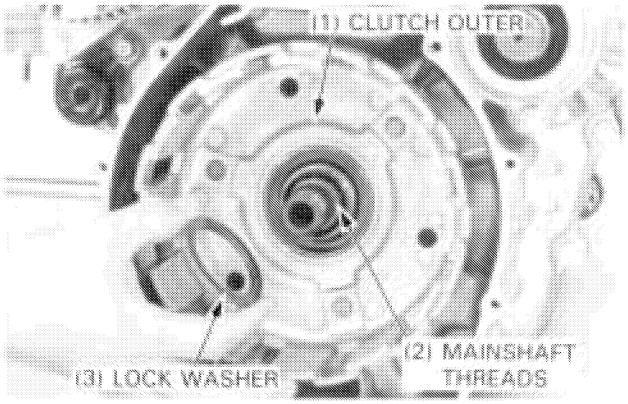
Clean the mainshaft and absorb the oil from the outer lock nut threads thoroughly.

Install the clutch outer and lock washer.

NOTE

- Install the lock washer as shown.



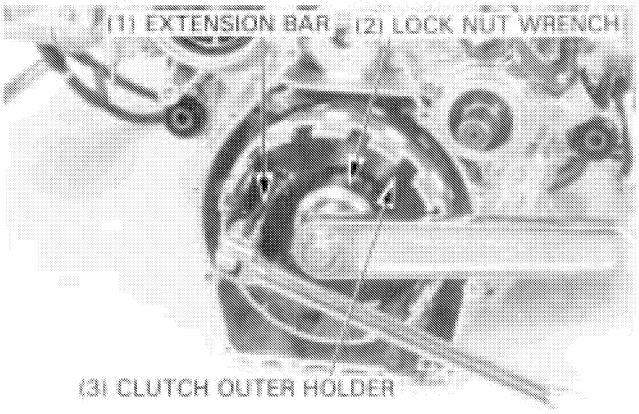


Apply a locking agent to the threads of a new lock nut.
Tighten the lock nut to the specified torque with the special tools.

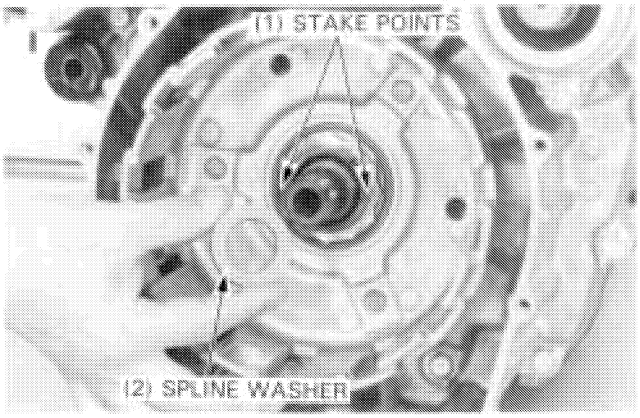
TORQUE: 190 N·m (19.0 kg-m, 137 ft-lb)

TOOLS:

Clutch outer holder	**07JMB—MN50100**
Extension bar	**07716—0020000**
Lock nut wrench, 46 mm	**07JMA—MN50100**



Stake the lock nut for two places.
Install the spline washer.

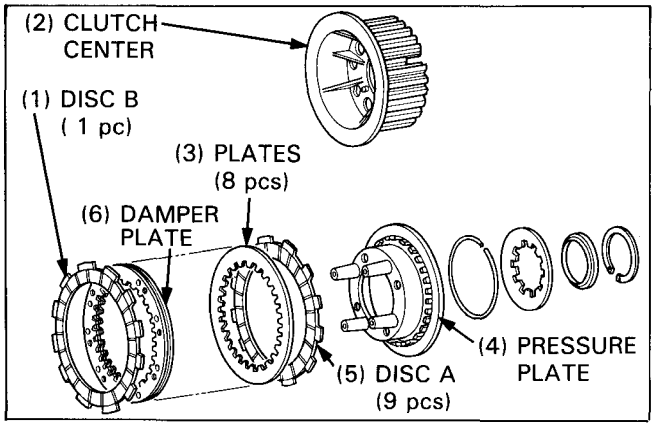


Coat the discs and plates with clean engine oil.

Install the clutch center, discs, plates, and pressure plate as shown.

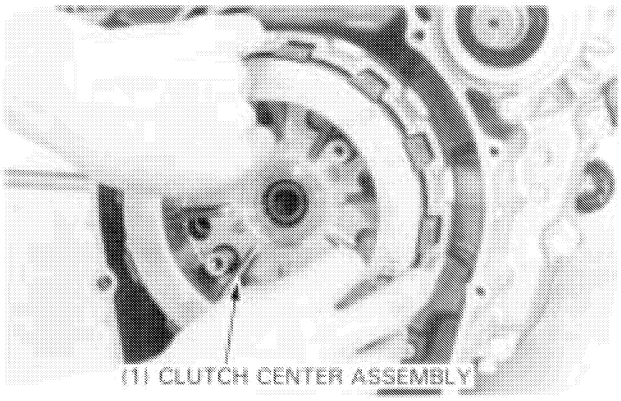
NOTE

- Each A Disc (9 pcs) has indentations on its circumference. The B Disc (1 pc) doesn't have any indentations.



Slide the clutch center assembly into the clutch outer to align the discs and plates.

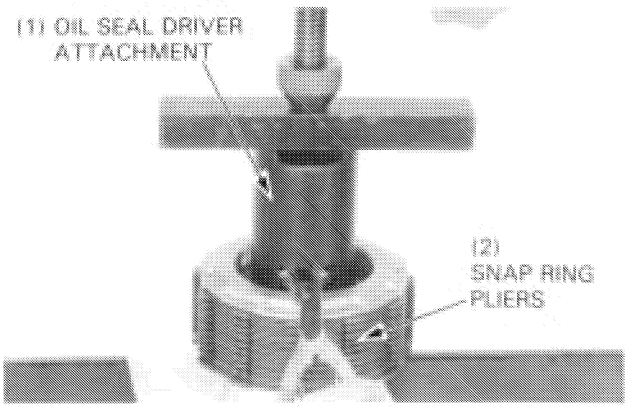
Remove the clutch center assembly from the clutch outer without disturbing the alignment.



Place the clutch spring on the clutch center and compress the spring in a press just enough to install the stopper ring.

CAUTION

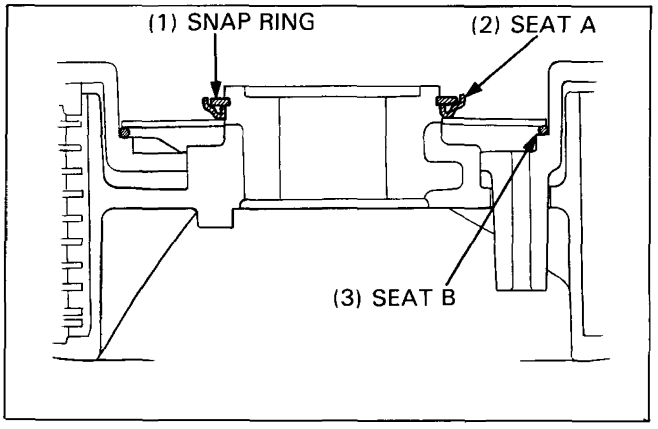
- *To prevent a loss of tension, do not compress the diaphragm spring more than necessary to install the stopper ring.*



Seat the snap ring in the ring groove in the clutch center boss with the sharp side facing up.

TOOLS:

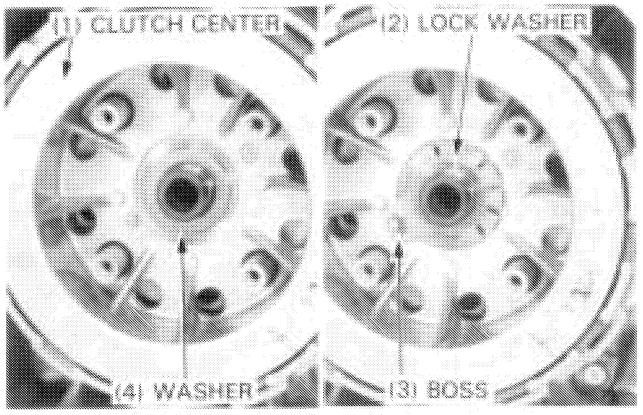
Oil seal driver attachment	**07965—MA10200**
Snap ring pliers	**07914—3230001**



Install the following:
- clutch center assembly on the clutch outer
- washer
- lock washer

NOTE

- Install a new lock washer, aligning the stopper tab with the clutch center boss.



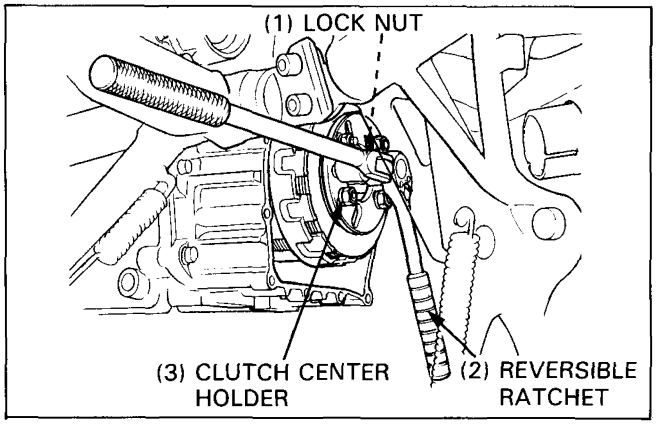
Install the clutch center lock nut.

Install the clutch center holder onto the clutch pressure plate.

TOOLS:

Clutch center holder	**07JMB—MN50300**

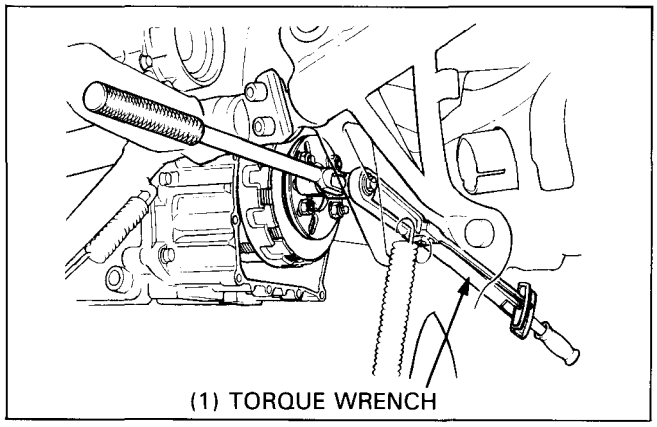
Position the tools as shown and tighten the lock nut to the initial torque (approximately 100 N-m) with a commercial reversible ratchet.



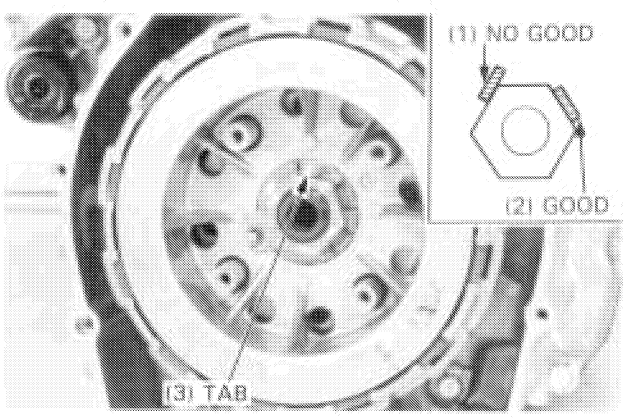
Remove the reversible ratchet and install a torque wrench.

Tighten the clutch center lock nut to the specified torque.

TORQUE: 130 N-m (13.0 kg-m, 94 ft-lb)

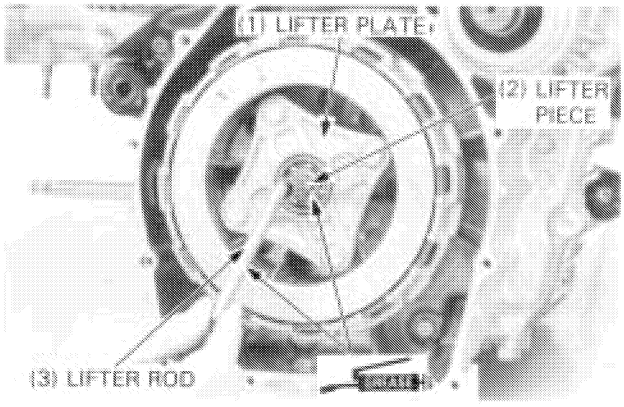


Bend one lock tab of the lock washer up to the lock nut as shown.

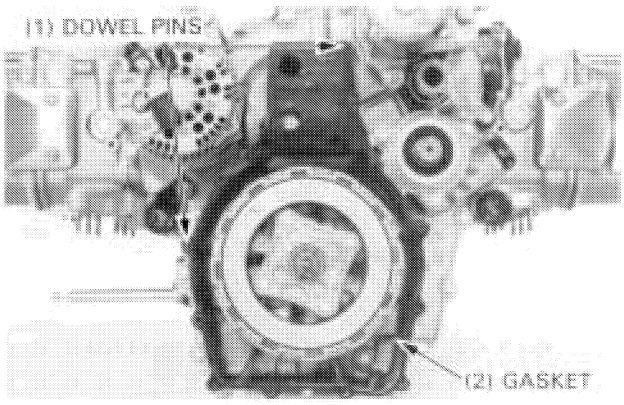


Install the lifter plate and tighten the bolts.
Apply grease to the clutch lifter piece and lifter rod.

Install the lifter piece and lifter rod.



Install two dowel pins and a new gasket.



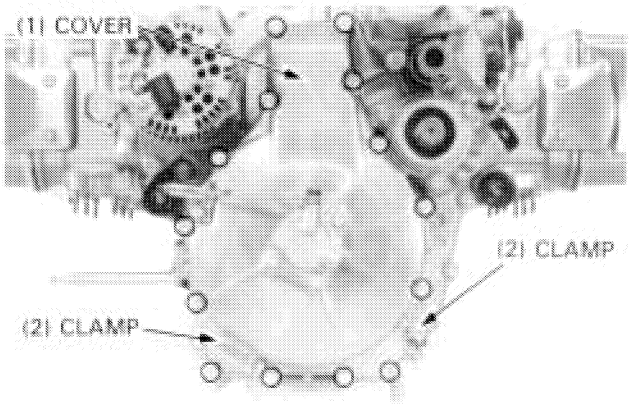
Install the following:
— clutch cover
— clutch slave cylinder (page 8-8).

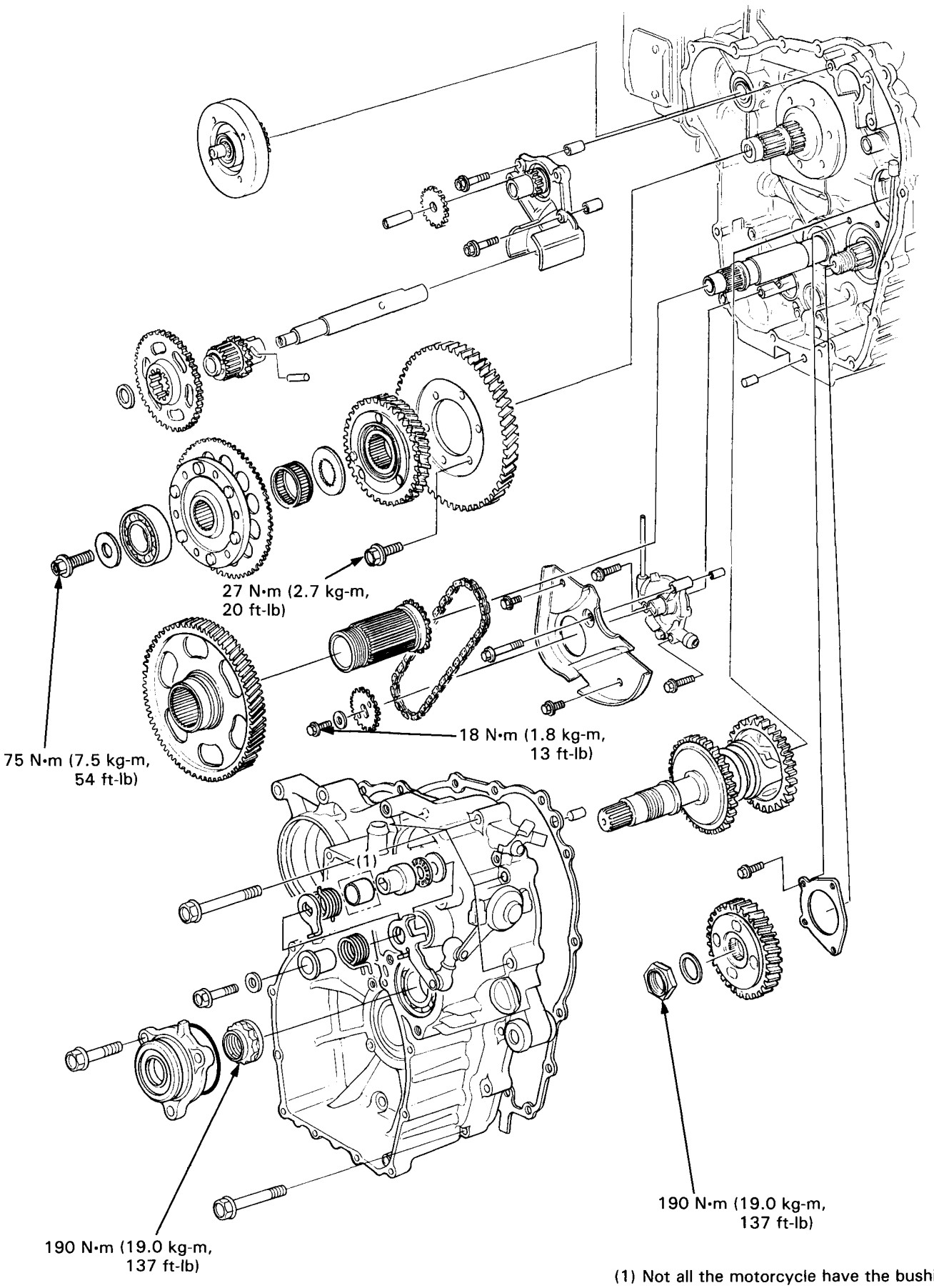
NOTE

- Release the clutch lever from the handlebar grip and push the slave cylinder piston in all the way.

— left exhaust pipe protector and heat protector (page 12-16)
— front side covers (page 12-16)

Fill the crankcase with the recommended engine oil (page 2-4).





(1) Not all the motorcycle have the bushing.

SERVICE INFORMATION

GENERAL

- For starter clutch removal/installation, see section 19.
- With the engine removed off the frame, maintenance services and repairs of the rear case cover, alternator gears, primary gears and output shaft described in this section must be performed.

SPECIFICATION

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Output shaft	damper spring free length		60.82 (2.394)	57.0 (2.24)
	Shaft O.D.		22.008–22.021 (0.8665–0.8670)	21.99 (0.866)
	Collar	I.D.	22.026–22.041 (0.8672–0.8678)	22.05 (0.868)
		O.D.	25.959–25.980 (1.0220–1.0228)	25.95 (1.022)
	driven gear I.D.		26.000–26.016 (1.0236–1.0242)	26.03 (1.025)

TORQUE VALUES

Alternator drive gear bolt	27 N·m (2.7 kg-m, 20 ft-lb) —Apply molybdenum disufide oil
Oil pump driven sprocket bolt	18 N·m (1.8 kg-m, 13 ft-lb) —Apply a locking agent
Final drive gear lock nut	190 N·m (19.0 kg-m, 137 ft-lb) —Apply a locking agent/left-hand threads/Stake (2 plcs)
Output shaft lock nut	190 N·m (19.0 kg-m, 137 ft-lb) —Stake (2 plcs)

TOOLS

Special

Mainshaft holder	07JMB–MN50200
Lock nut wrench, 30 x 64 mm	07916–MB00001
Attachment, 28 x 30 mm	07946–1870100
Bearing remover	07936–3710300
Remover handle	07936–3710100
Remover sliding weight	07741–0010201
Clutch outer holder	07JMB–MN50100

Common

Driver	07749–0010000
Attachment, 42 x 47 mm	07746–0010300
Attachment, 62 x 68 mm	07746–0010500
Pilot, 30 mm	07746–0040700
Pilot, 12 mm	07746–0040200
Attachment, 32 x 35 mm	07746–0010100
Pilot, 17 mm	07746–0040400
Inner driver B	07746–0020100
Attachment, 17 mm I.D.	07746–0020300
Pilot, 28 mm	07746–0041100
Pilot, 22 mm	07746–0041000
Extension bar	07716–0020000

TROUBLESHOOTING

Abnormal engine noise (gear noise)

- Worn or damaged alternator driver gear or driven gear.

Excessive output shaft noise

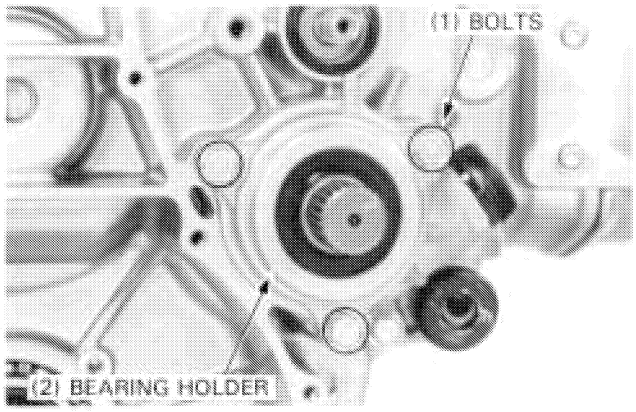
- Final drive and driven gears worn or damaged
- Output shaft bearing worn or damaged
- Excessive backlash between final drive and riven gears

REAR CASE COVER REMOVAL

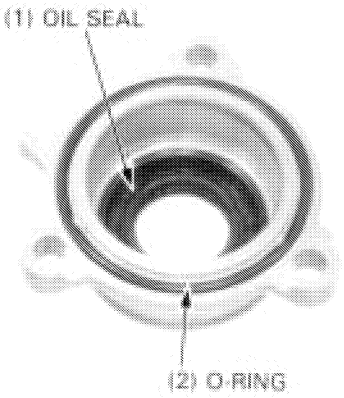
BEARING HOLDER (OUTPUT SHAFT)

Remove the following:
– engine (section 6).
– reverse shift arm (page 19-30).
– clutch (section 8).
– starter motor (page 19-13).
– alternator (page 17-8).

Remove the bolts and bearing holder.



Check the O-ring and oil seal for damage, fatigue or deterioration.
Replace them if necessary.

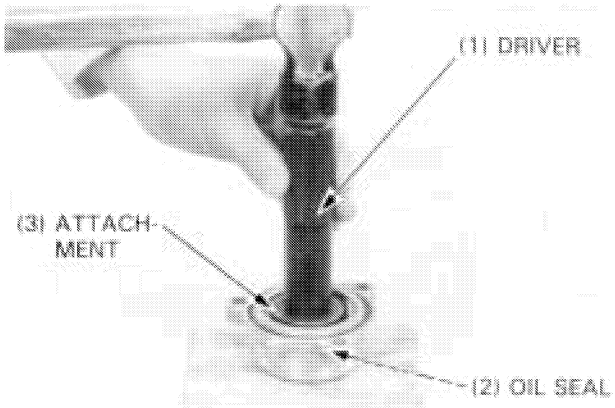


Driver the oil seal out of the holder and drive a new oil seal into the holder.

TOOLS:

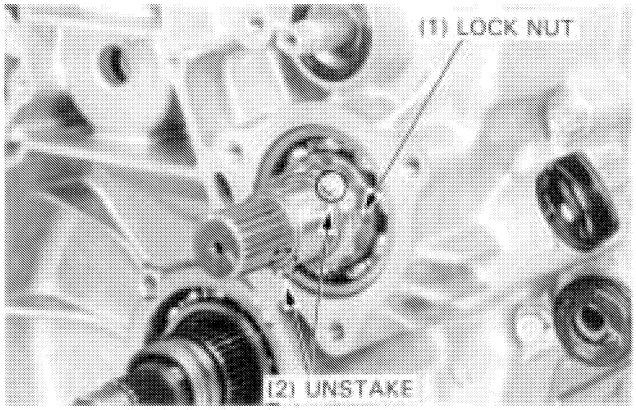
Driver	**07749–0010000**
Attachment, 42 x 47 mm	**07746–0010300**

Pack the oil seal lip with grease.



REAR CASE COVER

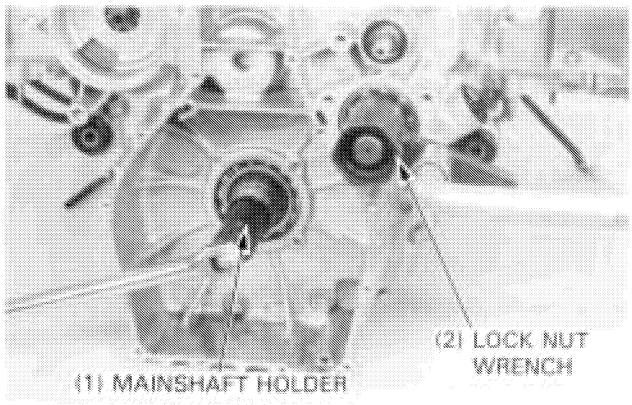
Unstake the output shaft lock nut with a drill or grinder (2plcs). Be careful that metal particles do not enter the bearing, and that the threads on shaft are not damaged.



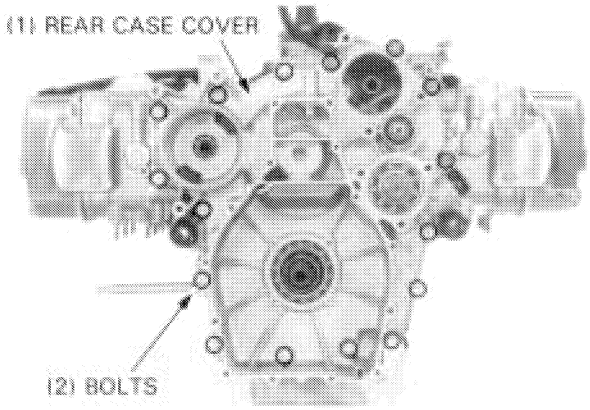
Shift the transmission in any gear except neutral and install special tools as shown.
Remove the lock nut.
Discard the lock nut.

TOOLS:

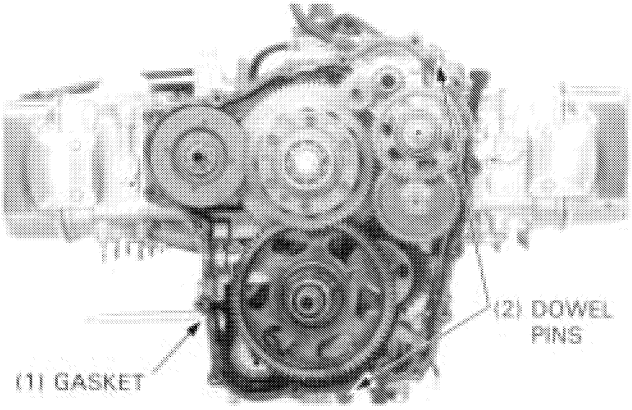
Mainshaft holder	**07JMB—MN50200**
Lock nut wrench, 30 x 64 mm	**07916—MB00001**



Remove the rear case cover mounting bolts and rear case cover.



Remove the dowel pins and gasket.



COVER BEARING

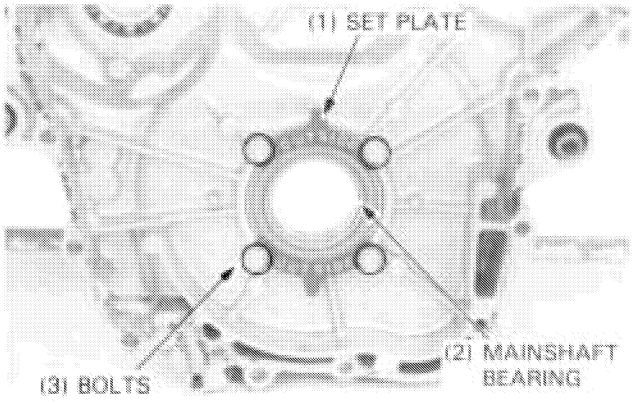
Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the outer race of each bearing fits tightly in the rear case cover. For replacement as below.

Remove the bearing set plates and mainshaft bearing.
Install a new bearing with the seal side facing inside.

TOOLS:

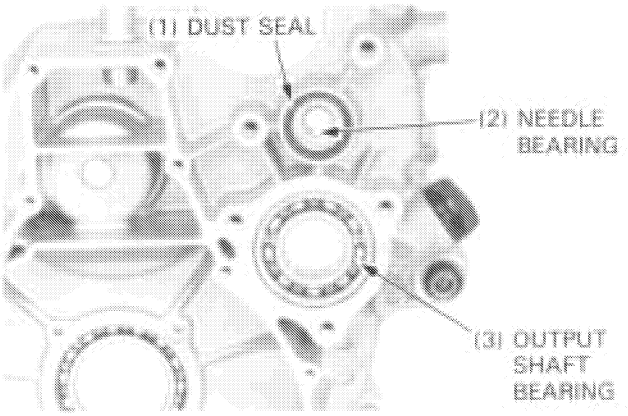
Driver	**07749—0010000**
Bearing driver attachment	**07GAD—SD40101**

Apply a locking agent to the bolt threads.
Install the bearing set plate with "OUTSIDE" mark facing out and tighten the bolts.



Drive the output shaft bearing and reverse shifter shaft needle bearing out of the case cover.

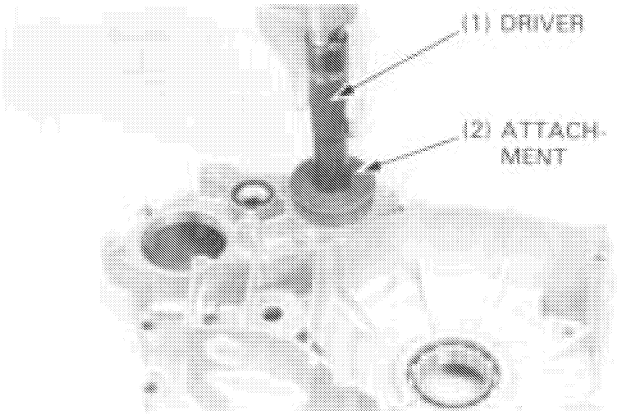
Check the dust seal for damage or fatigue.
Replace it if necessary.



Drive a new output shaft bearing into the cover.

TOOLS:

Driver	**07749–0010000**
Attachment, 62 x 68 mm	**07746–0010500**
Pilot, 30 mm	**07746–0040700**



Press a new needle bearing into the cover.

TOOLS:

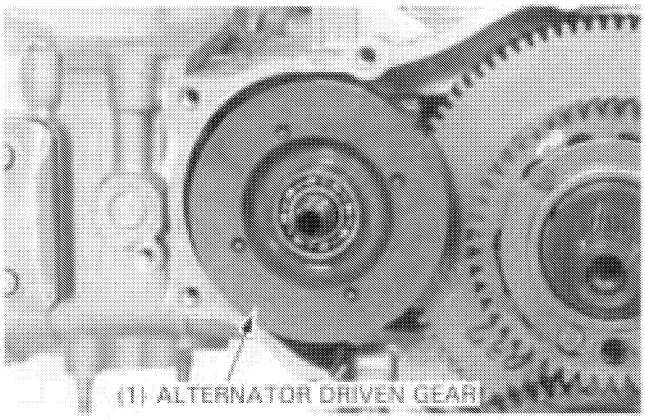
Driver	**07749–0010000**
Attachment, 28 x 30 mm	**07946–1870100**
Pilot, 12 mm	**07746–0040200**

ALTERNATOR DRIVE/DRIVEN GEARS

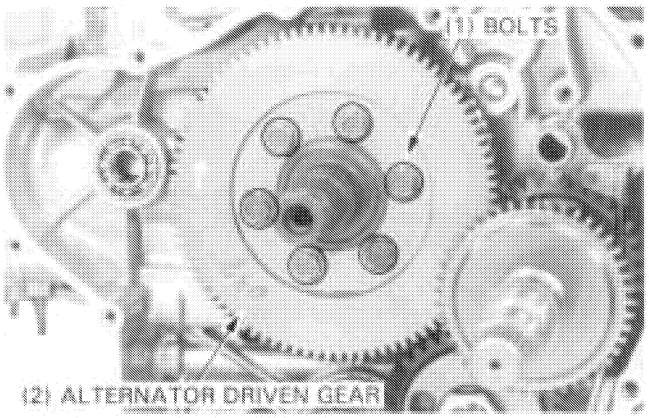
REMOVAL

Remove the starter clutch (section 19).

Remove the alternator driven gear.



Remove the primary drive and driven gears (page 9-10).
Remove six bolts and alternator drive gear from the crankshaft.



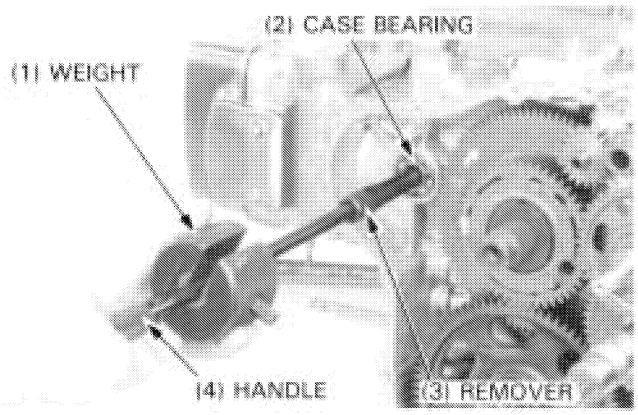
CASE BEARING REPLACEMENT

Turn the inner race of the bearing with your finger. The bearing should turn smoothly and quietly. Also check that the outer race of the bearing fits tightly in the case.
For replacement, as below.

Drive the bearing out of the case.

TOOLS:

Bearing remover	**07936—3710300**
Remover handle	**07936—3710100**
Remover sliding weight	**07741—0010201**



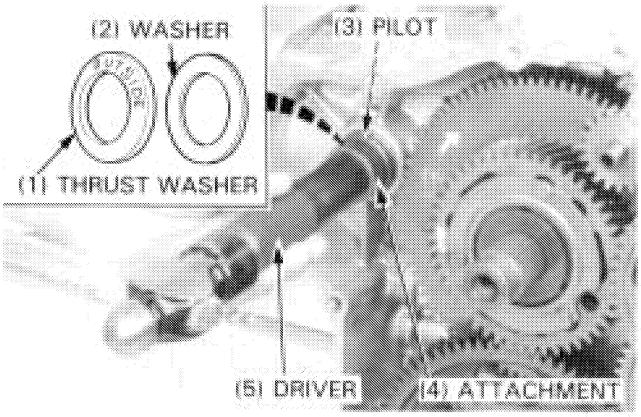
Install the washer and thrust washer with OUTSIDE mark facing out. Drive a new bearing into the case.

NOTE

- With its sealed side facing inside.

TOOLS:

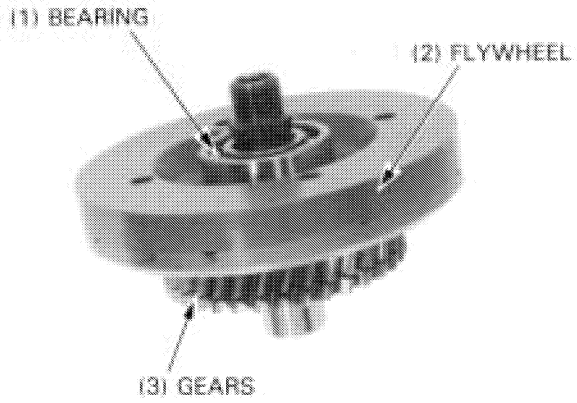
Driver	**07749—0010000**
Attachment, 32 x 35 mm	**07746—0010100**
Pilot, 17 mm	**07746—0040400**



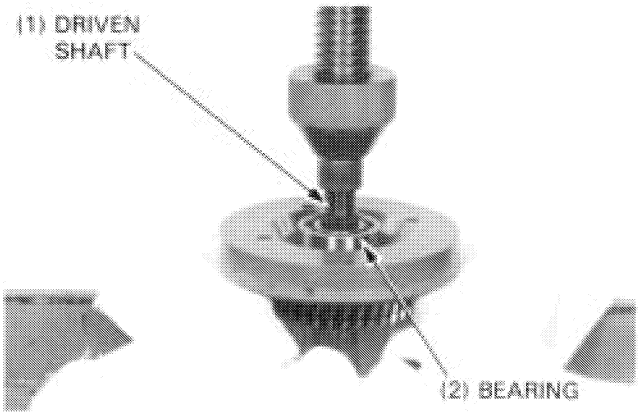
ALTERNATOR DRIVEN GEAR DISASSEMBLY/ INSPECTION

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

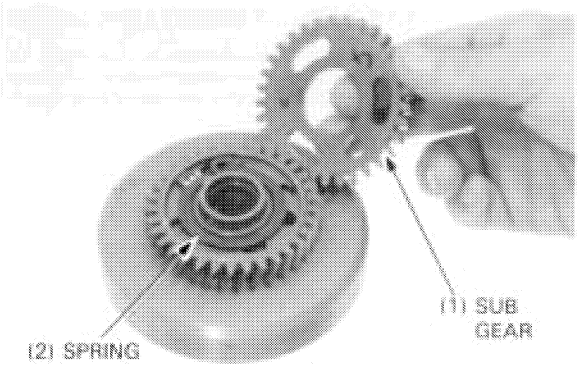
Inspect the gears or flywheel for damage or wear.



Remove the driven shaft by pressing the shaft. Discard the bearing.



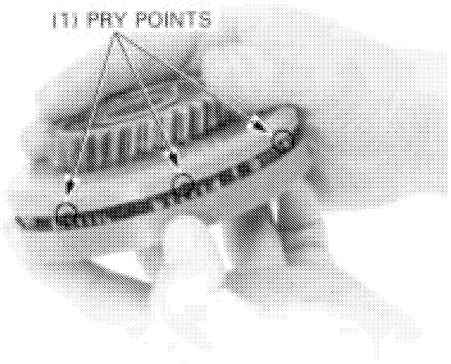
Remove the alternator driven sub gear and gear spring.



Separate the flywheels while prying open evenly.

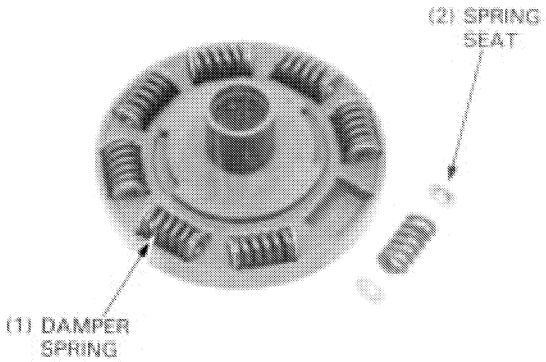
NOTE

- There are eight pry-point positions. Do not damage the flywheels when prying.

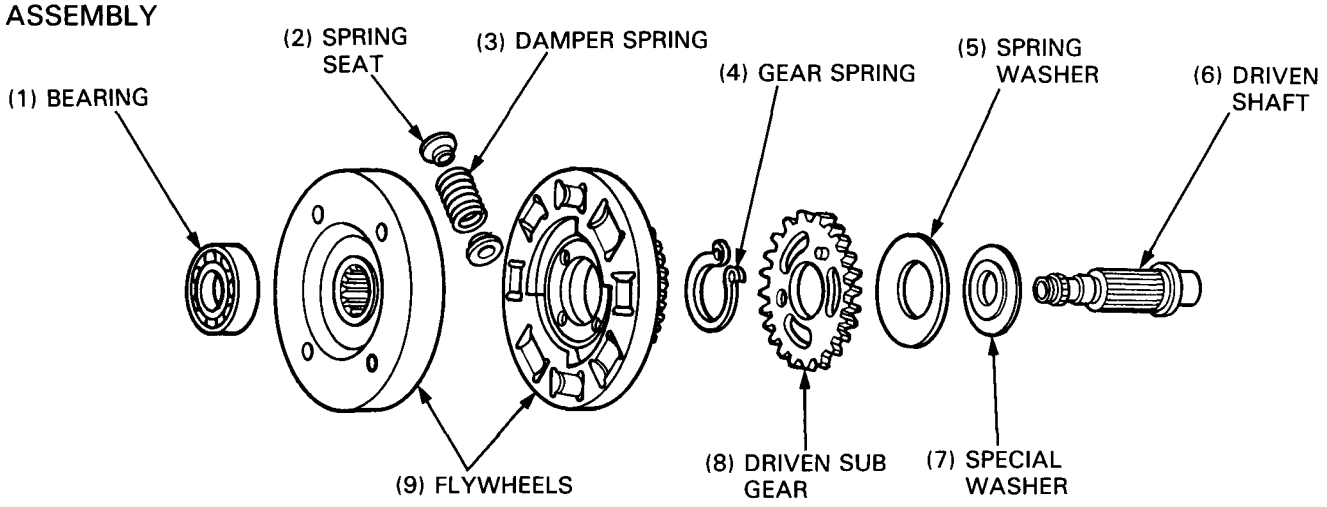


Remove the damper springs and spring seats from the flywheel.

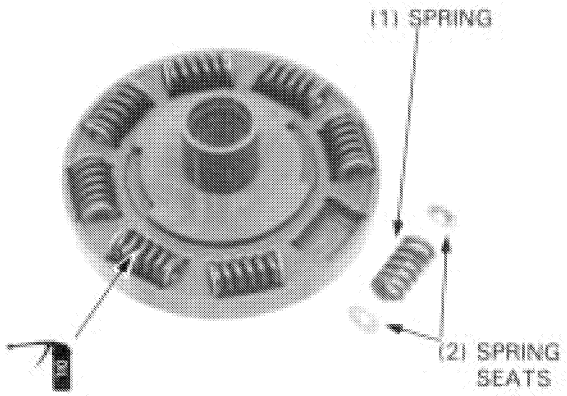
Check the springs and seats for damage or fatigue.



ASSEMBLY



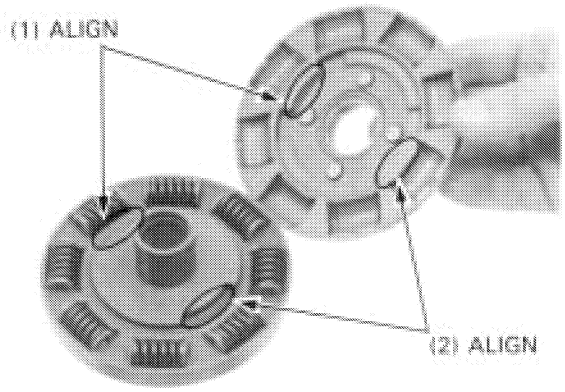
Apply oil to damper springs.
Install the spring and spring seats into the flywheel as shown.



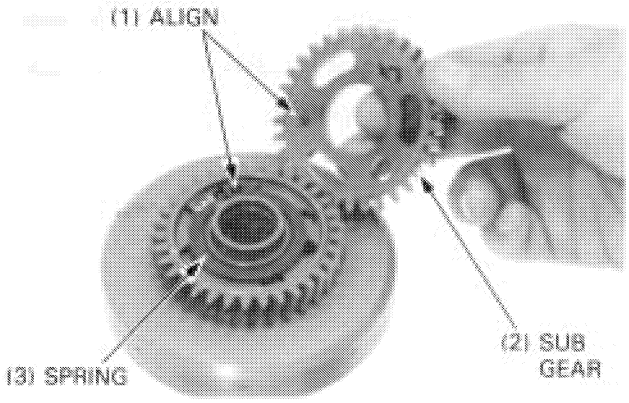
Assemble flywheels closely together, aligning the bosses with the grooves.

CAUTION

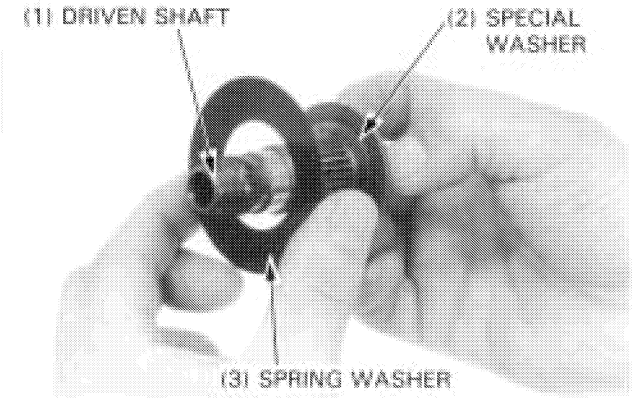
- *Do not damage the spring seats.*



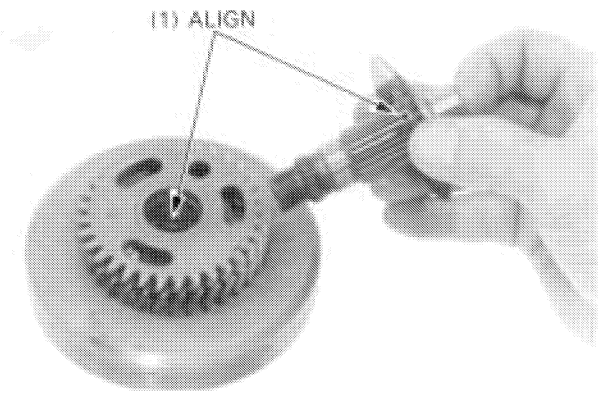
Install the driven gear spring onto the driven gear as shown.
Install the sub gear, aligning the gear boss with the spring hole.



Install the special washer onto the driven shaft as shown.
Install the spring washer onto the special washer, with its dished side facing the driven gears.



Install the alternator dirven shaft into the flywheel, aligning the holes of the flywheel and shaft.



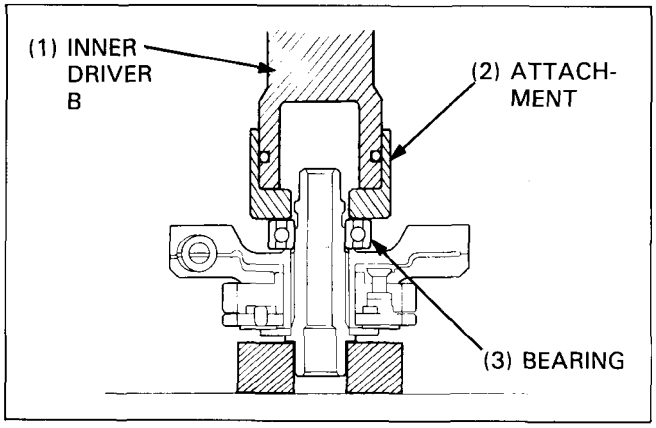
Press a new bearing into the shaft.

TOOLS:

Inner driver B	**07746–0020100**
Attachment, 17 mm I.D.	**07746–0020300**

NOTE

- Support the driven shaft as shown with blocks.



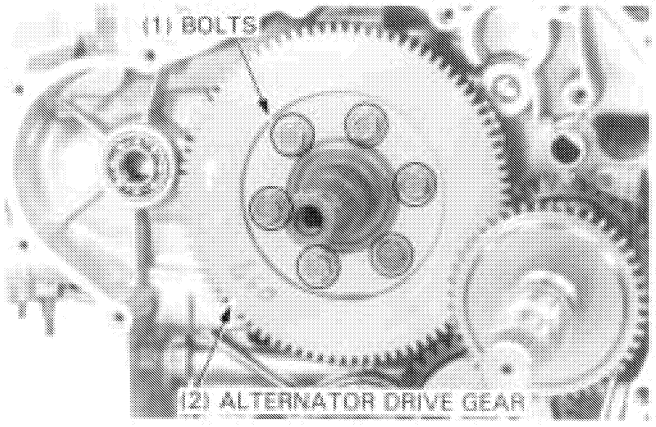
INSTALLATION

Apply molybdenum disulfide oil to the flange and threads of the alternator drive gear bolts.
Install the alternator drive gear onto the crankshaft and tighten bolts to the specified torque.

TORQUE: 27 N·m (2.7 kg-m, 20 ft-lb)

NOTE

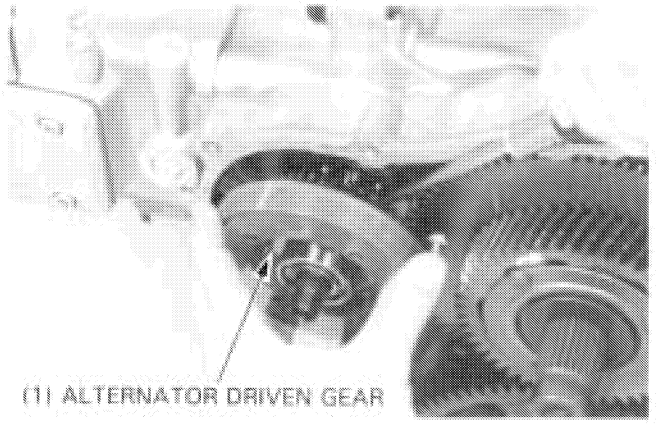
- Install the drive gear with its dished side facing inside.



Install the primary drive and driven gears (page 9-11).

Aligning the serrated teeth of the alternator driven gear with the drive gear teeth, install the alternator driven gear.

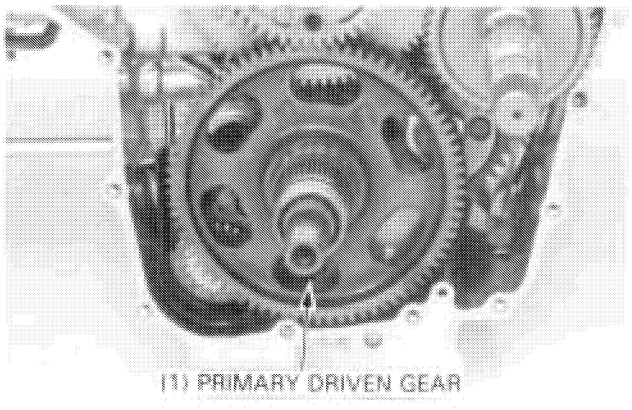
Install the starter clutch (section 19).



PRIMARY DRIVE/DRIVEN GEARS

REMOVAL

Remove the primary driven gear.

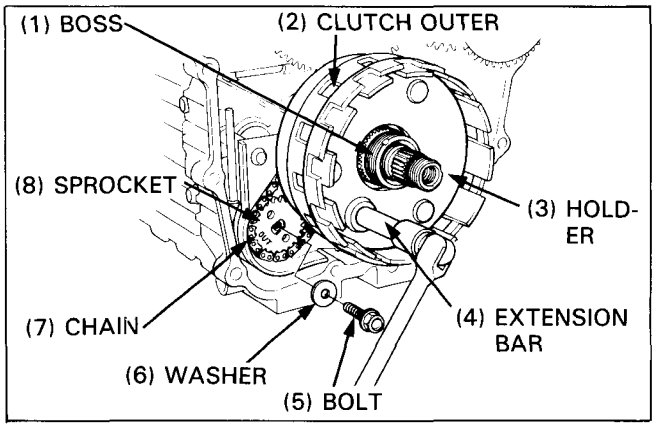


Temporarily install the clutch outer and clutch outer holder so that the oil pump sprocket can not be rotated.

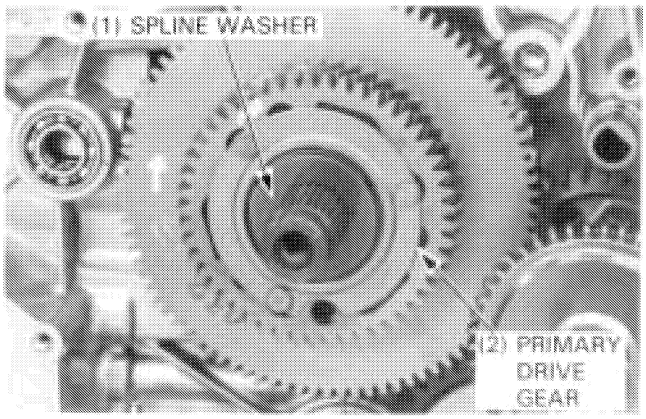
TOOL:

Clutch outer holder	**07JMB–MN50100**
Extension bar	**07716–0020000**

Remove the oil pump driven sprocket bolt and washer, holding the clutch outer.
Remove the special tools
Remove the driven sprocket, drive chain and primary driven gear boss as an assembly from the mainshaft.

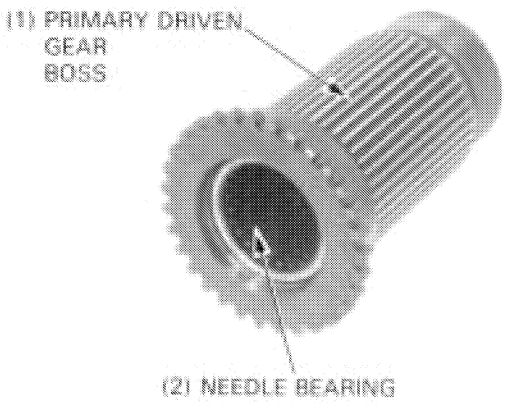


Remove the spline washer and primary drive gear.



BOSS BEARING REPLACEMENT

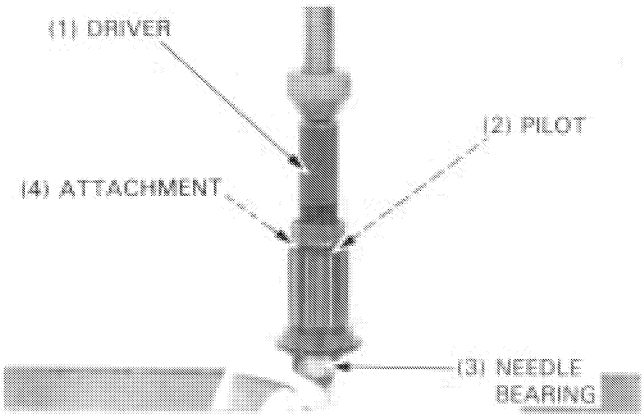
Check the primary driven gear boss for damage.
Inspect the boss needle bearing for excessive play or abnormal noise.
Replace if necessary, as shown on the next page.



Press the needle bearing out of the boss.

TOOLS:

Driver	**07749—0010000**
Attachment, 32 x 35 mm	**07746—0010100**
Pilot, 28 mm	**07746—0041100**



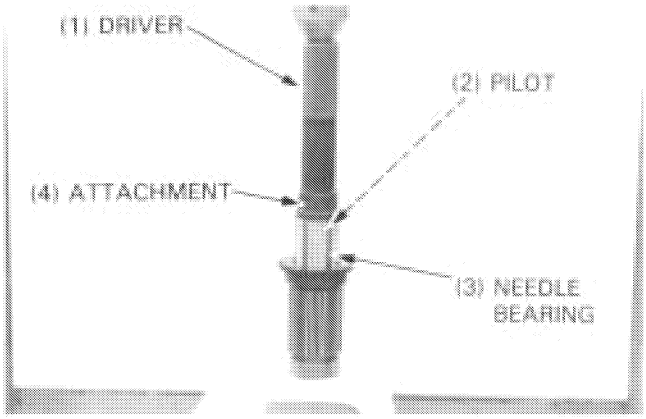
Press a new needle bearing into the boss.

NOTE

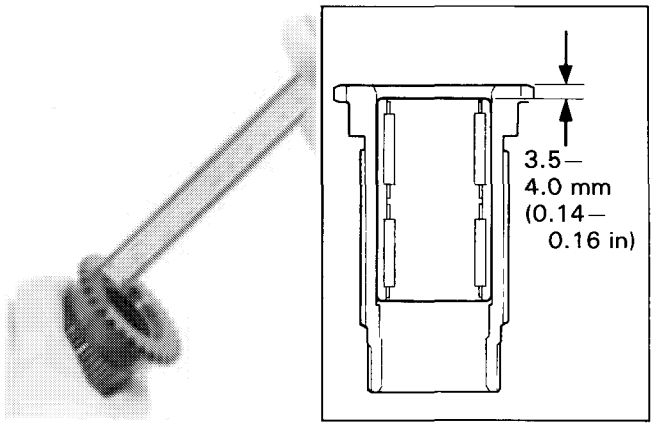
- Use the installed height shown below.

TOOLS:

Driver	**07749—0010000**
Attachment, 32 x 35 mm	**07746—0010100**
Pilot, 28 mm	**07746—0041100**

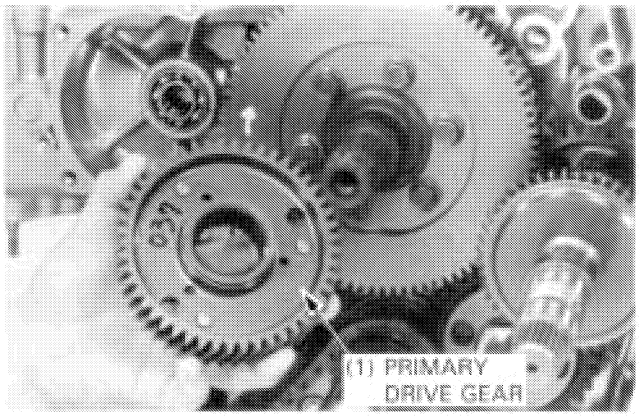


INSTALLED HEIGHT: 3.5—4.0 mm (0.14—0.16 in)

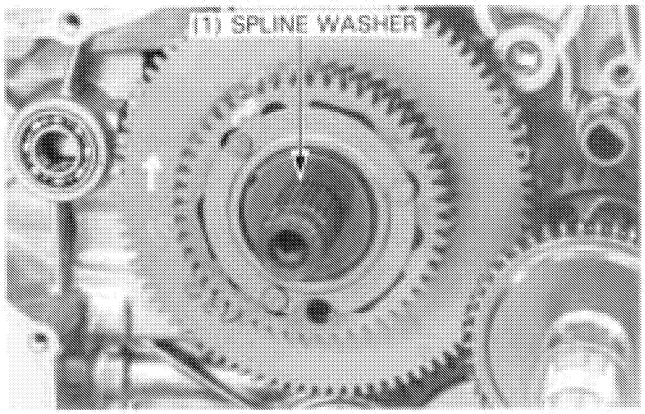


INSTALLATION

Install the primary drive gear onto the crankshaft.



Install the spline washer onto the crankshaft.



Install the oil pump sprocket, drive chain and primary driven gear boss as an assembly.

NOTE

- With the sprocket "OUT" mark facing out.

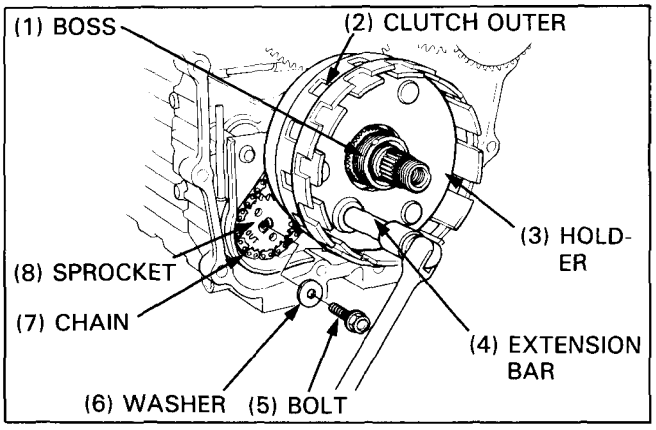
Temporarily install the clutch outer and clutch outer holder so that the oil pump sprocket can not be rotated.

TOOL:

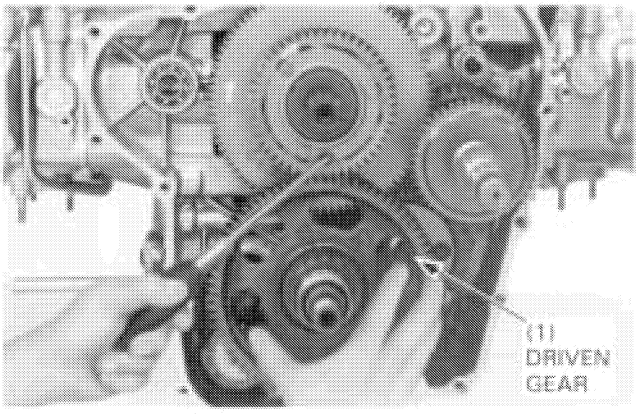
Clutch outer holder	**07JMB—MN50100**
Extension bar	**07716—0020000**

Apply a locking agent to the sprocket bolt threads. Install and tighten the washer and bolt, holding the clutch outer.

TORQUE: 18 N·m (1.8 kg-m, 13 ft-lb)



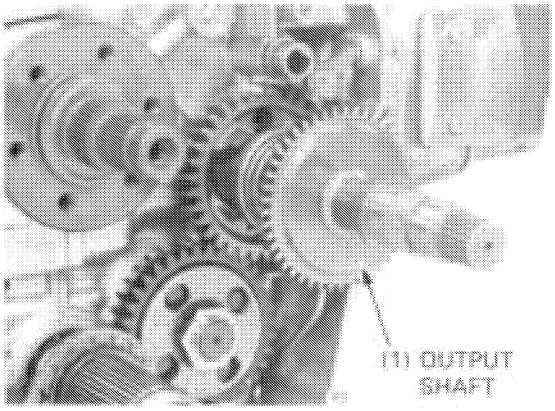
Align the serrated teeth of the drive gear with the driven gear teeth as shown and install the primary driven gear onto the driven gear boss.



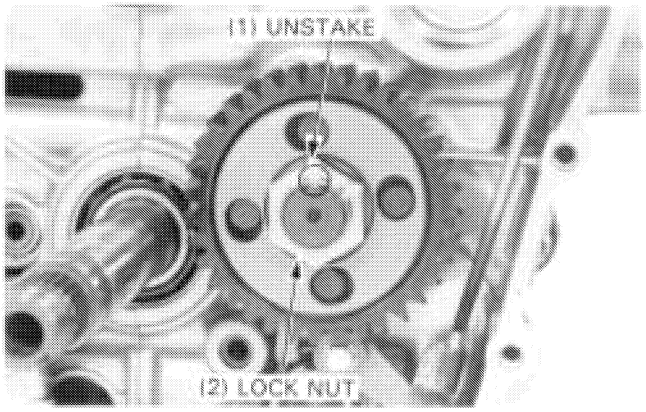
OUTPUT SHAFT

REMOVAL

Remove the primary drive and driven gear (page 9-10).
Remove the output shaft as an assembly from the engine.



Unstake the final drive gear lock nut with a drill or grinder. (2plcs).
Be careful that the threads on the countershaft are not damaged.



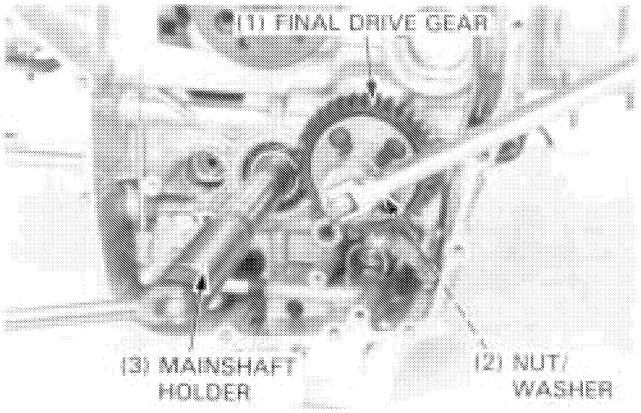
Shift the transmission in any gear except neutral.
Remove the lock nut by turning it clockwise.

NOTE

- The lock nut has left-hand threads.

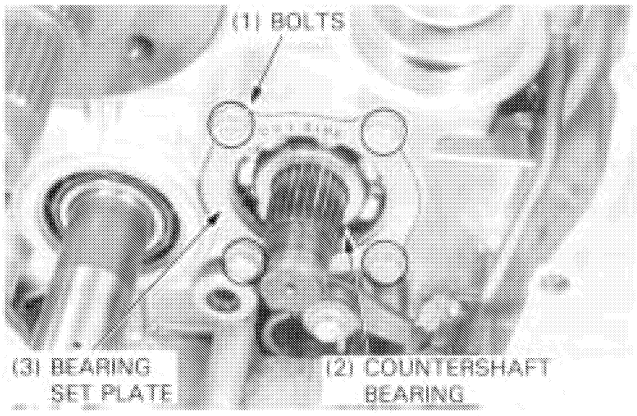
TOOL:
Mainshaft holder **07JMB—MN50200**

Remove the spring washer and final drive gear from the countershaft.

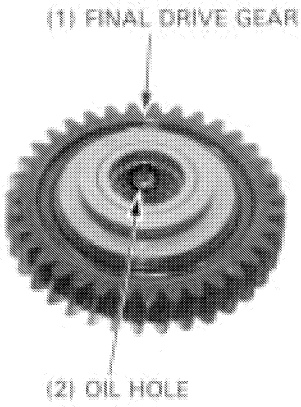


Remove the bolts and bearing set plate.

If necessary, countershaft bearing should be removed from the crankcase and be replaced.

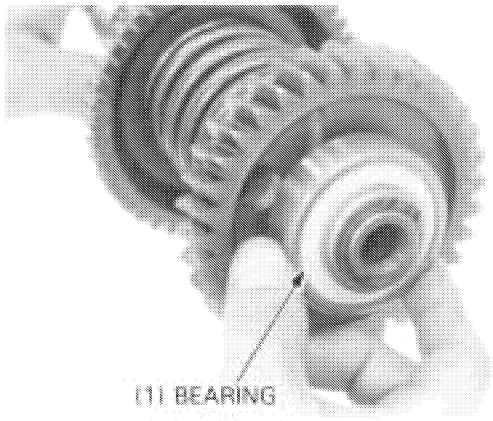


Check the final drive gear for damage. Inspect its oil hole for clogged.

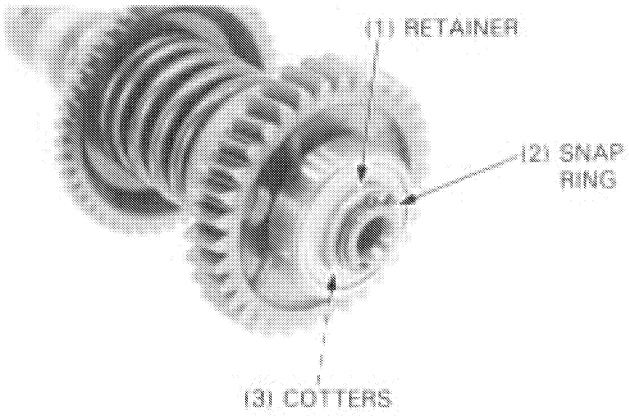


OUTPUT SHAFT DISASSEMBLY/INSPECTION

Turn the outer race of the bearing with your finger.
The bearing should turn smoothly and quietly. Also check that the inner race of the bearing fits tightly on the output shaft.



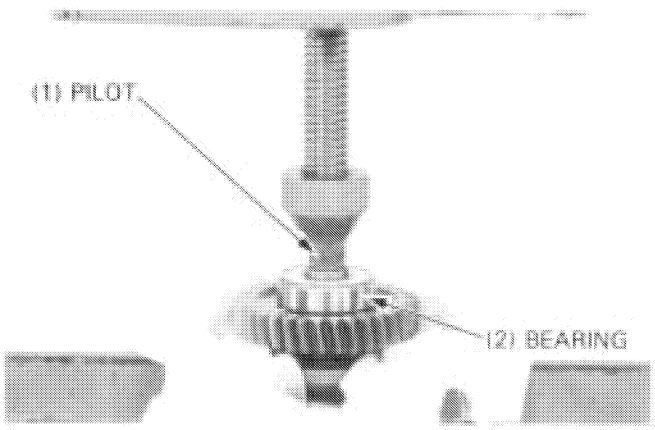
Remove the snap ring, retainer and cotters.



Press the output shaft out of the bearing.
Discard the bearing.

TOOL:
Pilot, 22 mm **07746–0041000**

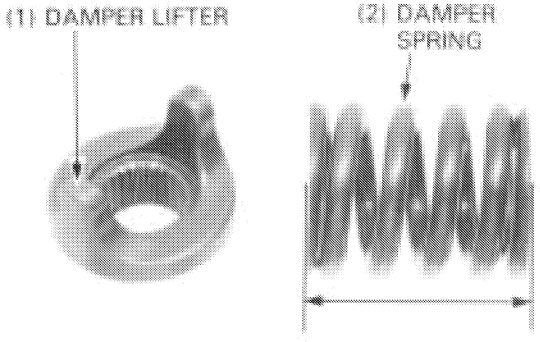
Disassemble the output shaft.



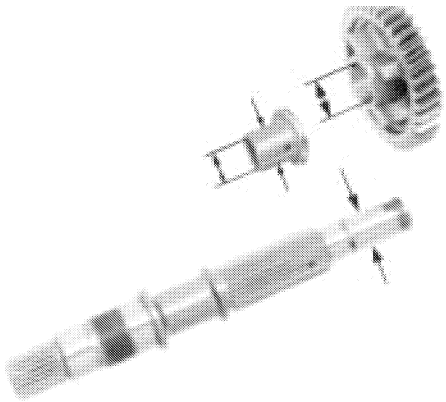
Check the damper lifter for wear or damage.

Measure the damper spring free length.

SERVICE LIMIT: 57.0 mm (2.24 in)



Check the output shaft, collar and final driven gear for wear or damage.

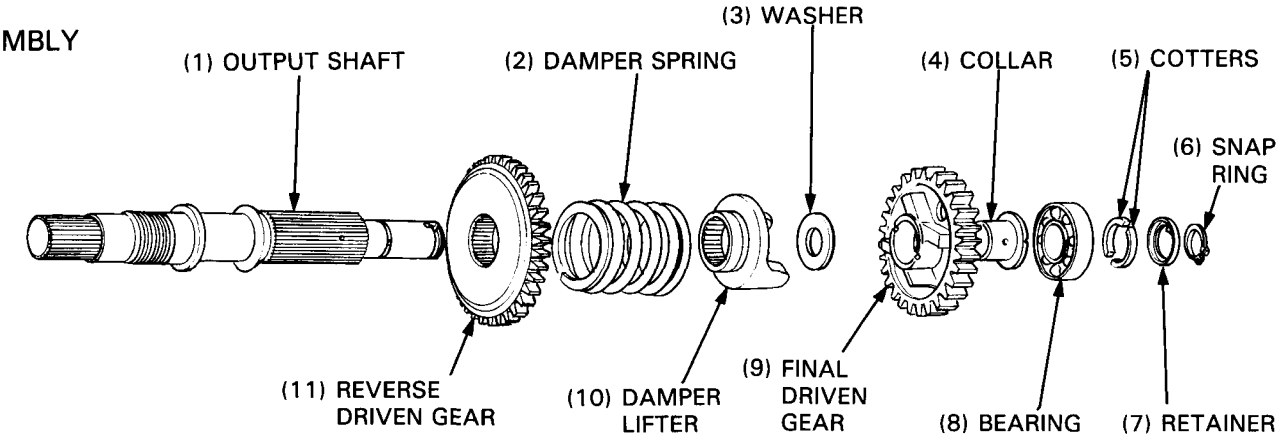


Measure the following:

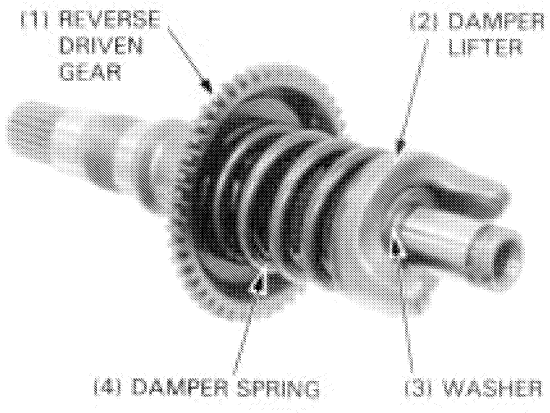
SERVICE LIMITS:

Output Shaft O.D.	**21.99 mm (0.866 in)**
Collar I.D.	**22.05 mm (0.868 in)**
O.D.	**25.95 mm (1.022 in)**
Driven Gear I.D.	**26.03 mm (1.025 in)**

ASSEMBLY



Install the reverse driven gear, damper spring, damper lifter and washer onto the output shaft.

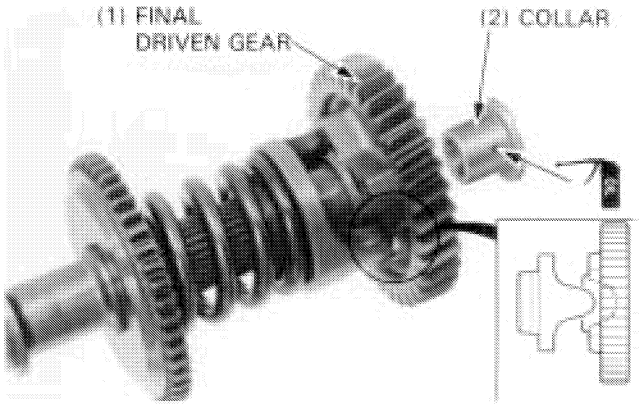


NOTE

- Install the driven gear with its dished side facing the spring.

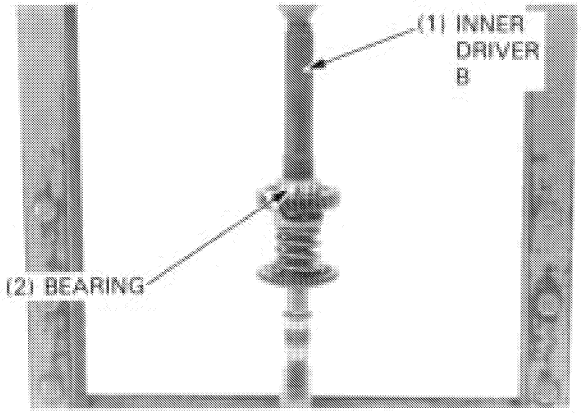
Apply oil to the collar.

Install the final driven gear and collar, keeping gear directions as shown.



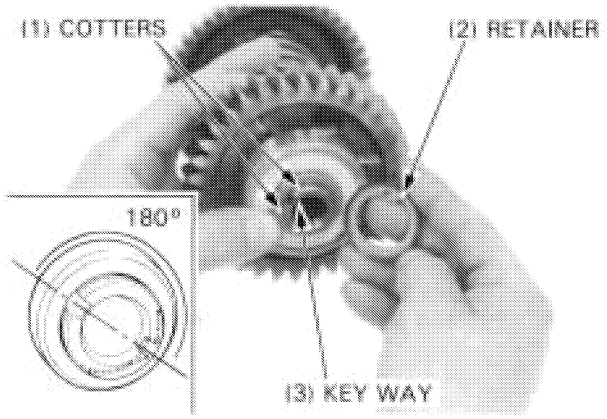
Press a new bearing with the sealed side facing up into the output shaft.

TOOL:
Inner driver B **07746–0020100**



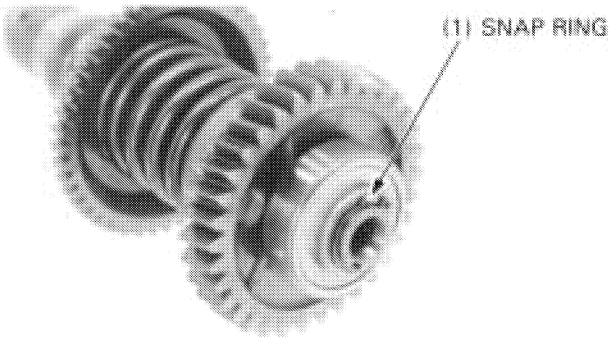
Install the cotters and retainer.

Rotate the retainer 180 degrees and set the retainer tab in the opposite position of the shaft key way.



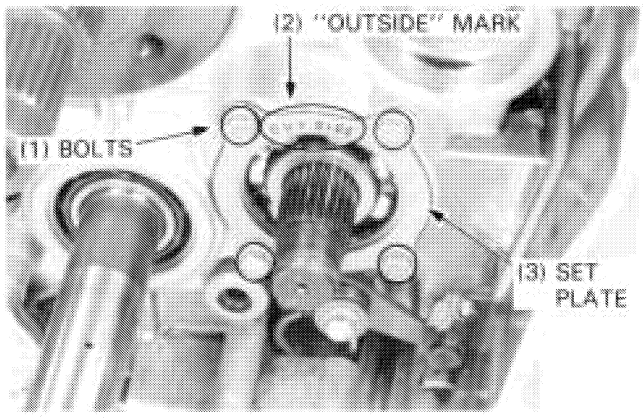
Install the snap ring with the chamfered surface facing the retainer.

Check the bearing for smooth rotation.



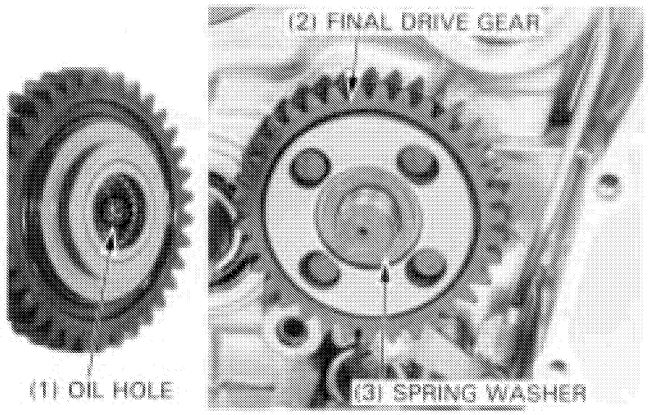
Apply a locking agent to the bearing set plate bolt threads.

Install the bearing set plate with "OUTSIDE" mark facing out. Install and tighten the bolts.



Aligning the oil holes on the final drive gear and countershaft, install the drive gear onto the shaft.

Install the spring washer with its dished side facing the gear.



Shift the transmission in any gear except neutral.

Apply a locking agent to a new nut threads and install the countershaft.

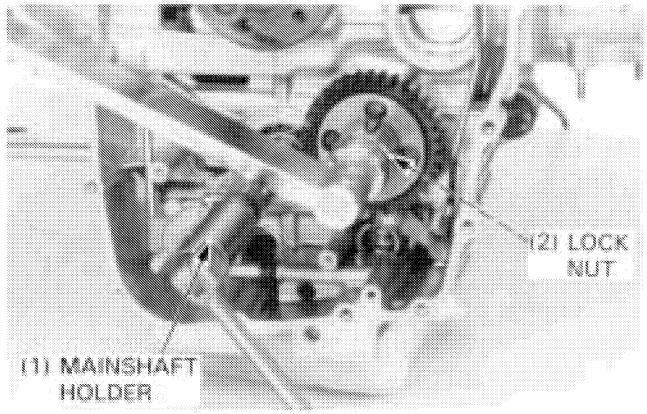
Tighten the nut to the specified torque, while turning the nut counterclockwise.

NOTE

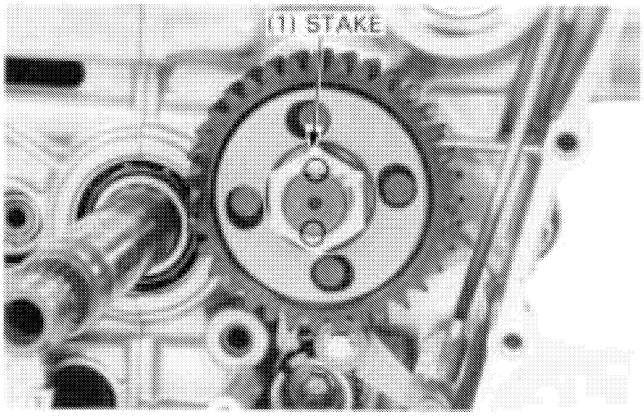
- The lock nut has left-hand threads.

TORQUE: 190 N·m (19.0 kg-m, 137 ft-lb)

TOOL:
Mainshaft holder **07JMB—MN50200**

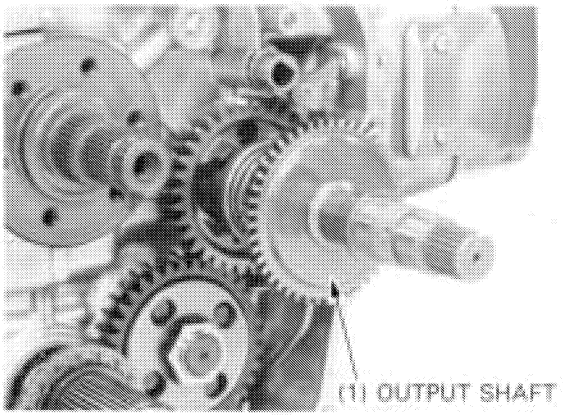


Stake the lock nut (2 plcs).



Install the output shaft as an assembly.

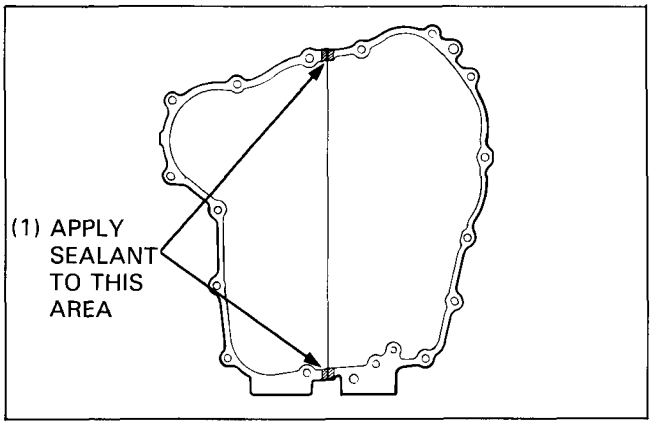
Install the primary drive and driven gear (page 9-11).



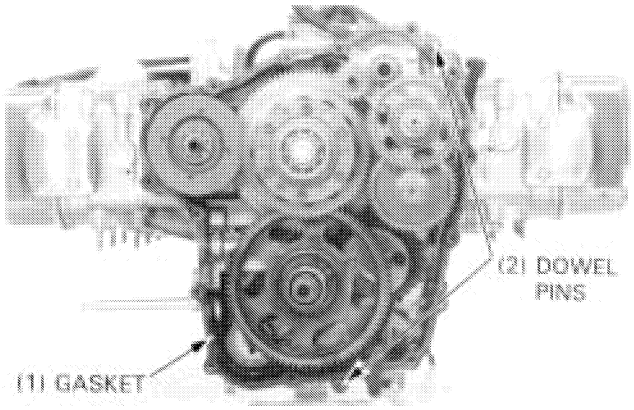
REAR CASE COVER INSTALLATION

REAR CASE COVER

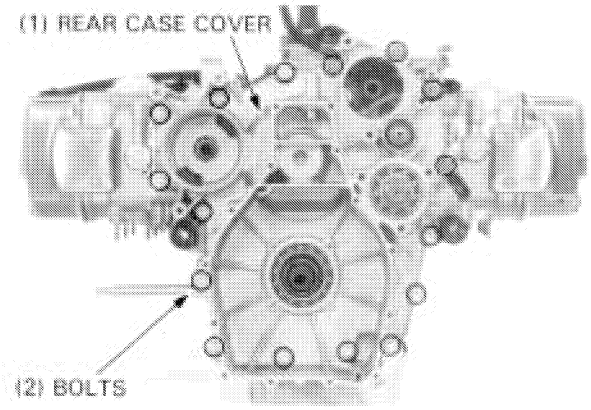
Apply sealant to the crankcase surface as shown.



Install a new gasket and dowel pins.



Install the rear engine cover and tighten the bolts in a crisscross pattern in 2—3 steps.

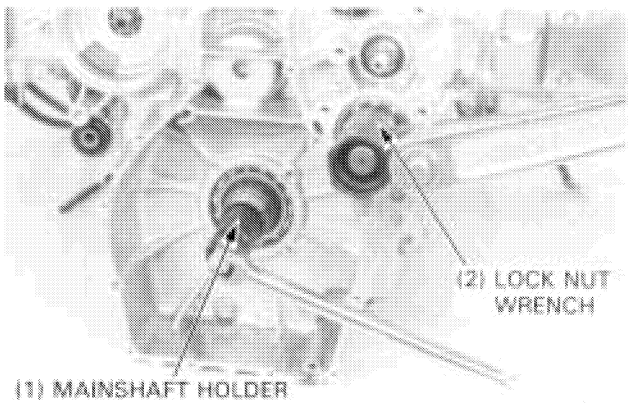


Shift the transmission in any gear except neutral.
Install and tighten a new output shaft lock nut.

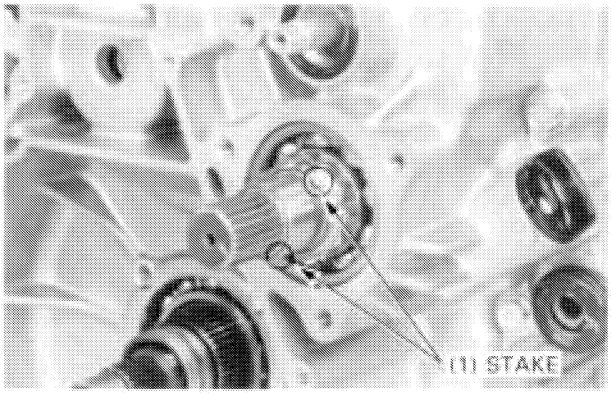
TORQUE: 190 N·m (19.0 kg-m, 137 ft-lb)

TOOLS:

Mainshaft holder	**07JMB—MN50200**
Lock nut wrench, 30 x 64 mm	**07916—MB00001**



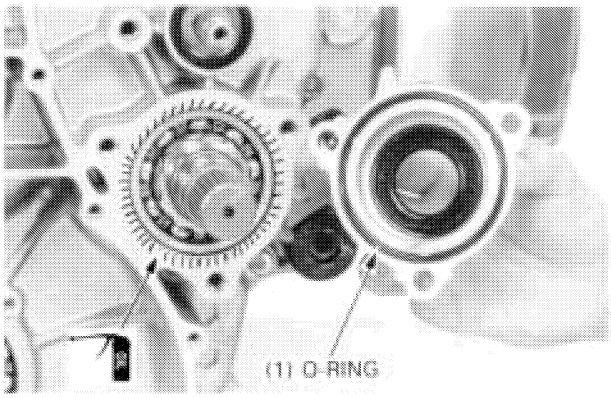
Stake the output shaft lock nut (2 plcs).



BEARING HOLDER (OUTPUT SHAFT)

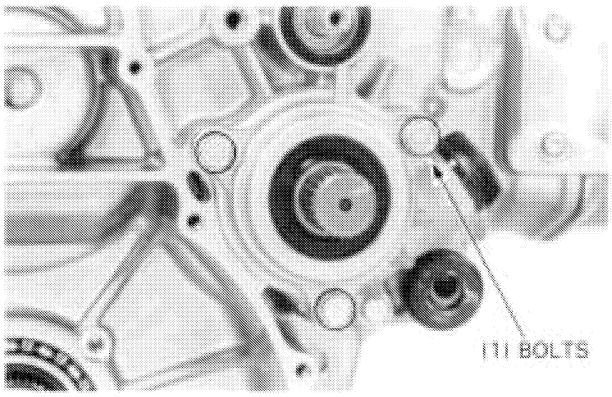
Apply oil to the rear case cover surface as shown.

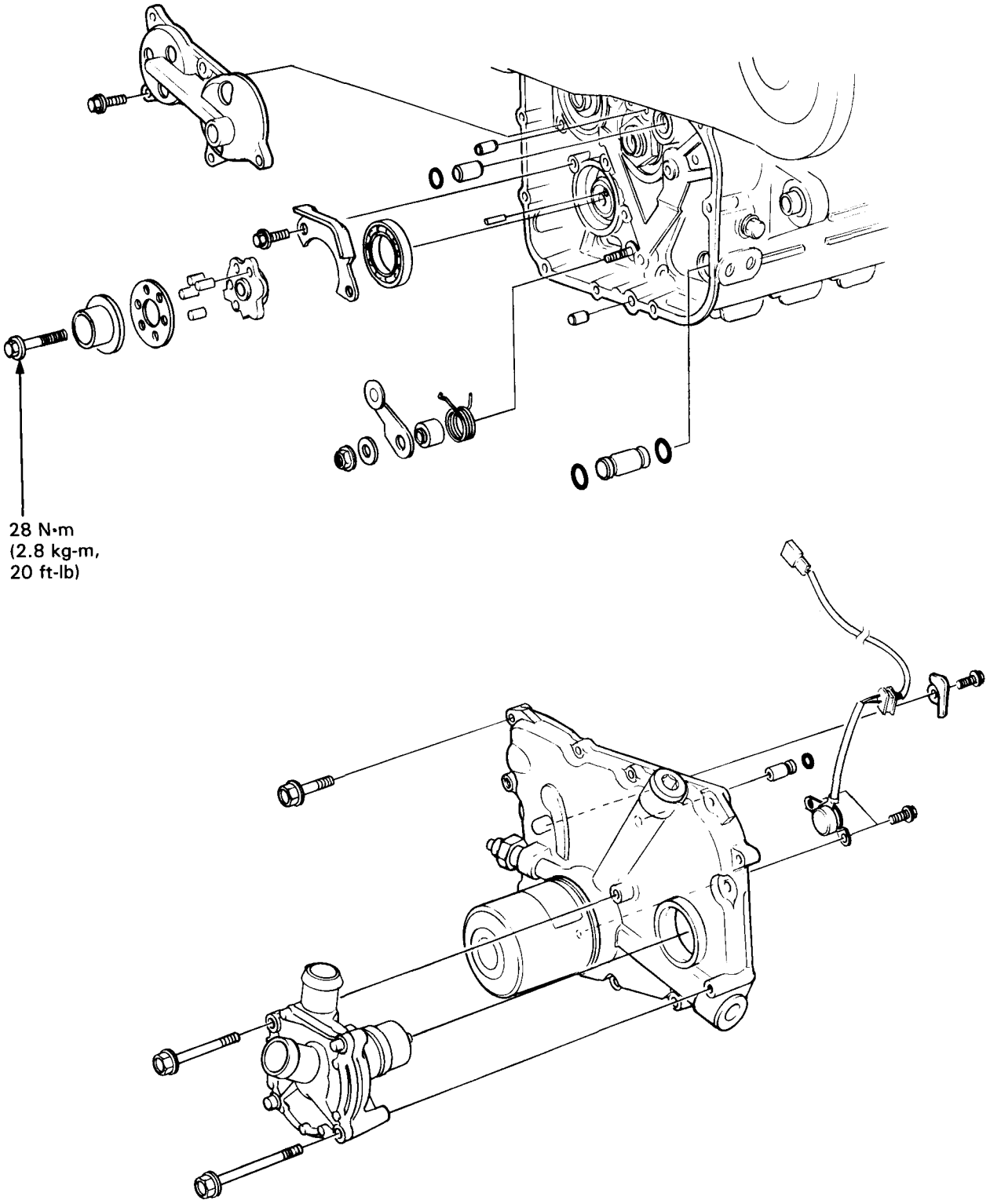
Install a O-ring into the bearing holder groove properly and install the holder over the output shaft.

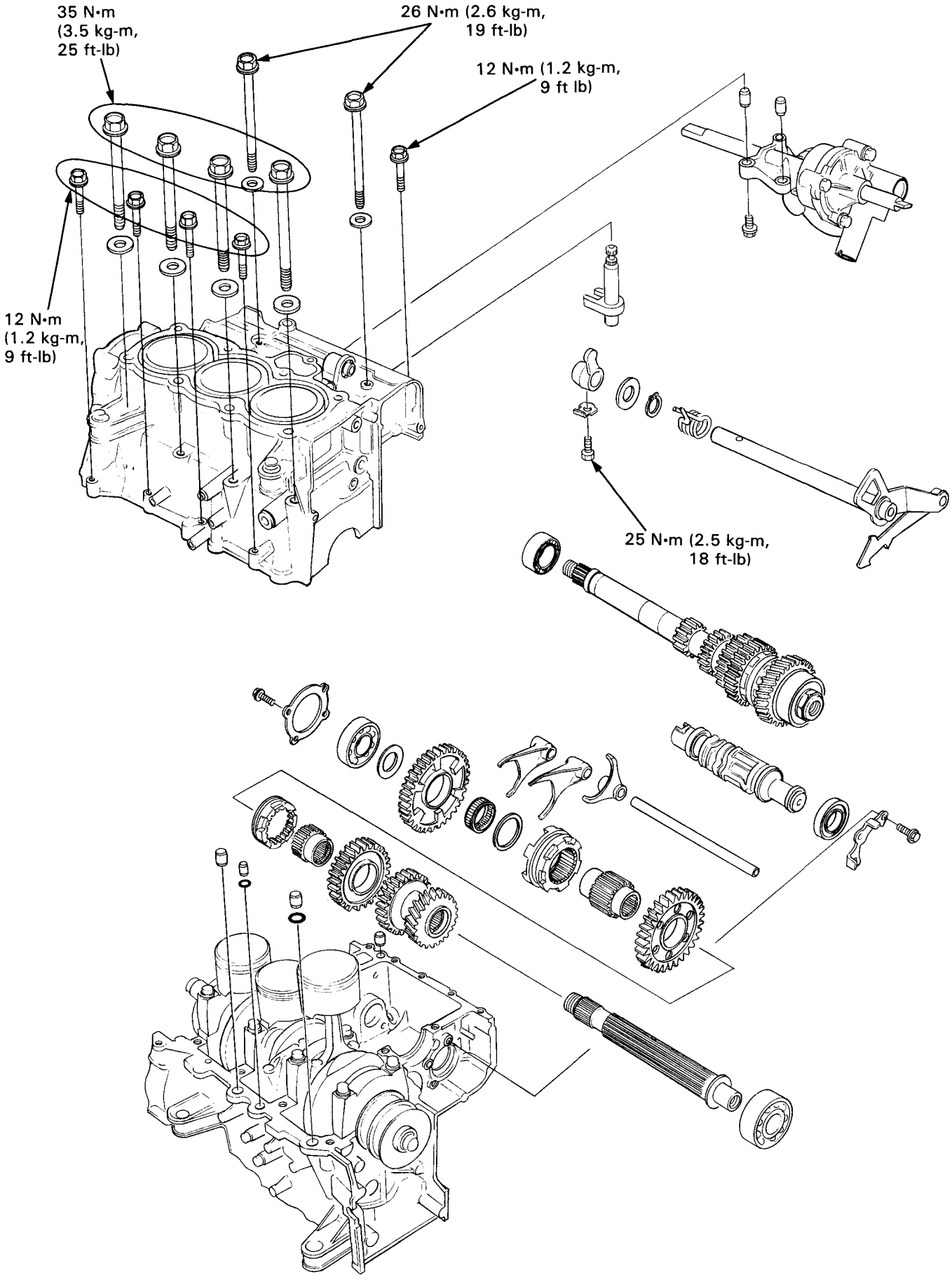


Install and tighten the bearing holder bolts securely.

Install the following:
- alternator (page 17-16).
- starter motor (page 19-21).
- clutch (section 8).
- reverse shift arm (page 19-36).
- engine (section 6).




28 N•m
(2.8 kg-m,
20 ft-lb)


35 N•m
(3.5 kg-m,
25 ft-lb)
26 N•m (2.6 kg-m,
19 ft-lb)
12 N•m (1.2 kg-m,
9 ft lb)
12 N•m
(1.2 kg-m,
9 ft-lb)
25 N•m (2.5 kg-m,
18 ft-lb)

SERVICE INFORMATION

GENERAL

- The gearshift linkage can be serviced with the engine in the frame except the shift spindle and shift arm.
- The crankcases must be separated to inspect the transmission gears.
- Avoid damaging the pistons against the transmission gears or crankcase when separating the crankcase halves because the pistons will fall as the cases are pulled off them.
- Prior to assembling the crankcase halves, apply a sealant to their mating surfaces. Wipe off excess sealant thoroughly.

SERVICE POINTS

SERVICE ITEM		REMOVED COMPONENTS
Gearshift linkage	Drum center, cam plate and stopper arm	Front engine cover (this section)
	Shift arm and spindle	Crankcase separation (below)
Crankcase separation		Engine (section 6) Secondary air supply system (section 4): SW only Water pipe (section 5) Timing belts (section 7) Left cylinder head (section 7) Clutch (section 8) Rear engine cover (section 9) Scavenge pump (section 2) Front engine cover and bearing holder (this section)
Transmission	Countershaft bearing (front)	Front engine cover and bearing holder (this section)
	Countershaft bearing (rear)	Engine (section 6) Rear engine cover and final drive gear (section 9)
	Mainshaft, shift drum and forks	Crankcase separation (above)
	Shift drum bearing (front)	Front engine cover and cam plate (this section)
	Countershaft	Crankcase separation (above) Final drive gear (section 9)

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Shift fork	ID	14.000–14.021 (0.5512–0.5520)	14.04 (0.553)
	Claw thickness	5.93–6.00 (0.233–0.236)	5.6 (0.22)
Shift fork shaft OD		13.966–13.984 (0.5498–0.5506)	13.90 (0.547)
Transmission gear ID	C2, C3, M4, M5	34.000–34.016 (1.3386–1.3392)	34.04 (1.340)
Gear bushing	C2, C3, M4/M5	33.940–33.965 (1.3362–1.3372)	33.92 (1.335)
Gear to bushing clearance		0.035–0.076 (0.0014–0.0030)	0.10 (0.004)

TORQUE VALUES

Crankcase bolt (10 mm)	35 N·m (3.5 kg-m, 25 ft-lb) –Apply oil
(8 mm)	26 N·m (2.6 kg-m, 19 ft-lb)
(6 mm)	12 N·m (1.2 kg-m, 9 ft-lb)
Shift arm lock bolt	25 N·m (2.5 kg-m, 18 ft-lb)
Mainshaft lock nut	190 N·m (19.0 kg-m, 137 ft-lb) –Stake (2 plcs)
Drum center bolt	28 N·m (2.8 kg-m, 20 ft-lb)
Shift drum lock cam bolt	12 N·m (1.2 kg-m, 9 ft-lb) –Apply locking agent

TOOLS

Special

Piston base set	07JMG–MN50101
– piston base A	07JMG–MN50121 (2 pcs. required)
– piston base B	07JMG–MN50111 (1 pc.)
Crankcase assembly guide	07JMG–MN50200
Piston ring compressor	07JMG–MN50300 (1 pc.)
Piston ring compressor	07955–3710000 (2 pcs.)
Mainshaft holder	07JMB–MN50200

TROUBLESHOOTING

Hard to shift into gear
- Improper clutch adjustment
  – Too much free play
- Shift forks bent
- Shift shaft bent
- Shift claw bent
- Shift spindle bolt loose
- Shift drum stopper bent
- Shift drum cam grooves damaged
- Damaged reverse drum lock system (Section 19)

Transmission jumps out of gear
- Gear dogs worn
- Shift shaft bent
- Shift drum stopper broken
- Shift forks bent

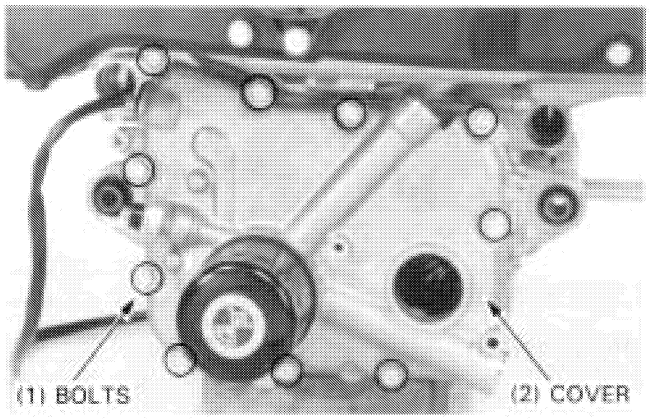
FRONT ENGINE COVER REMOVAL

NOTE

- The front engine cover can be serviced with the engine in the frame.

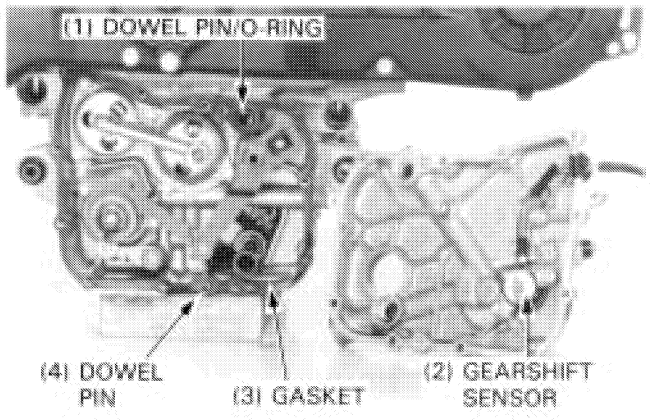
Drain the coolant (page 5-7).
Drain the engine oil (page 2-4).

Remove the following:
— fairing front cover and under cover (page 12-8).
— water pump (page 5-14).
— oil pressure switch wire.
— gearshift sensor 6P-BLK connector (page 18-12).
— bolts and front engine cover.

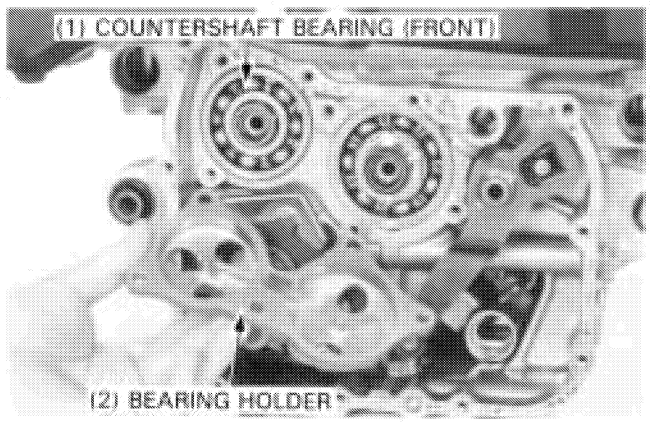


Remove the dowel pins, O-ring and gasket.
Remove the oil pipe from the oil pump.

For gearshift sensor removal, see page 18-12.



Remove the bearing holder and remove the countershaft bearing if necessary.



GEARSHIFT LINKAGE

REMOVAL

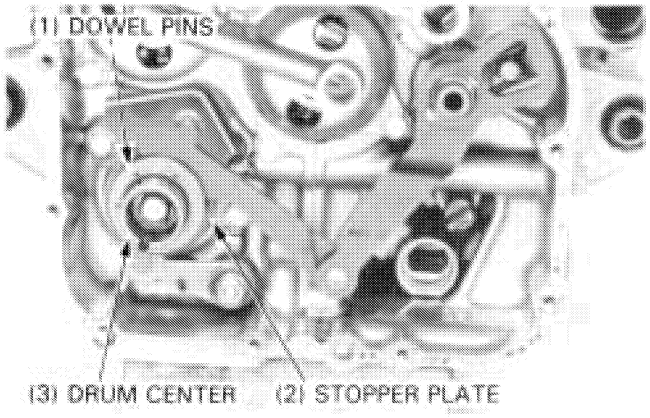
NOTE

- The gearshift linkage can be serviced with the engine in the frame except the shift arm and spindle.

Remove the following:
— front engine cover (above).
— drum center, stopper plate, dowel pins and cam plate.

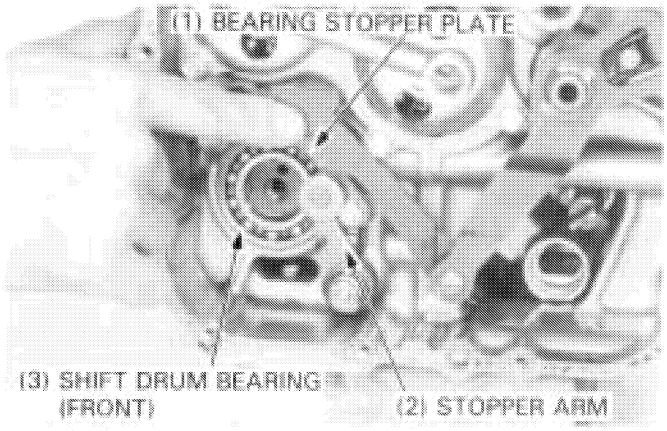
NOTE

- Do not drop dowel pins into the crankcase.



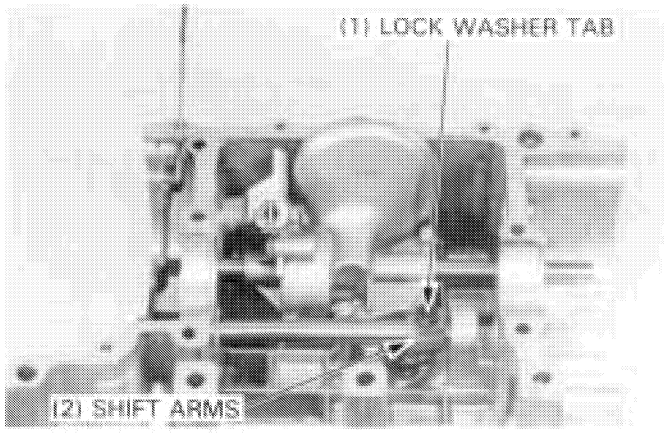
Remove the stopper arm.

If necessary, remove the bearing stopper plate and remove the shift drum bearing out of the crankcase.

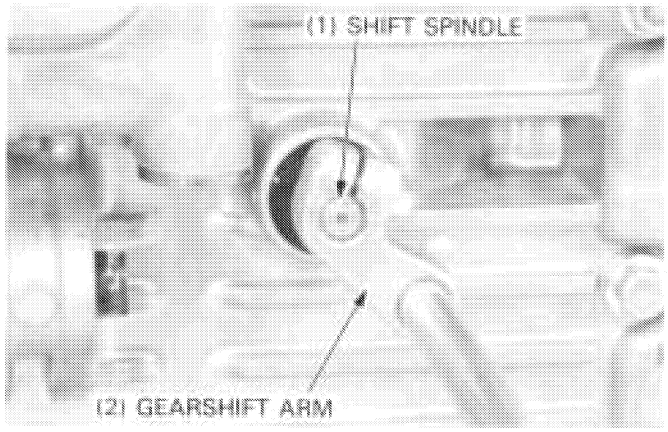


Separate the crankcases (page 10-8).

Straighten the lock washer tab, and remove the lock bolt, then remove the shift arms.



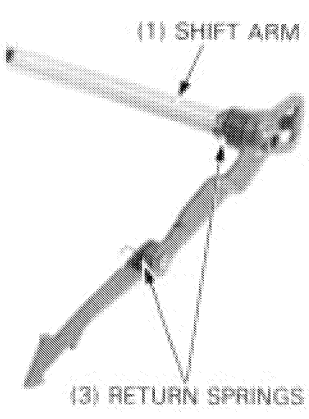
Remove the bolt and gearshift arm.
Remove the shift spindle out of the left crankcase.

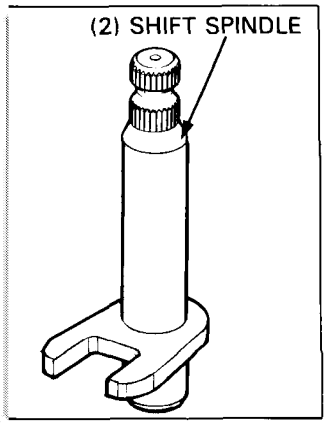


INSPECTION

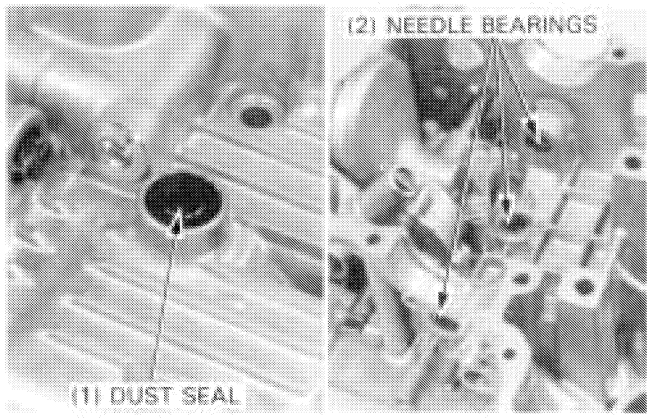
Inspect the shift spindle and shift arm for wear, damage or bending.

Inspect the shift arm and return springs for weakness or damage.



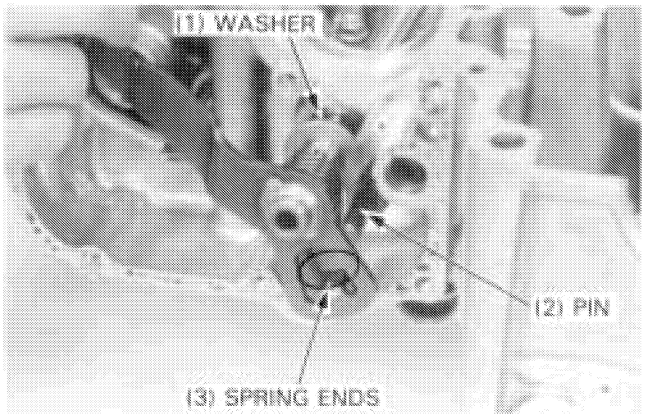


Check the shift spindle dust seal for damage, fatigue or deterioration.
Check the needle bearings for damage or excessive play.



INSTALLATION

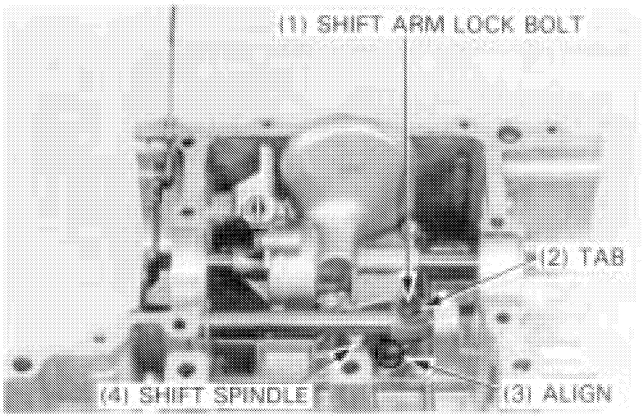
Install the washer onto the shift arm.
Install the shift arm, aligning the return spring ends with the pin.



Install the shift spindle onto the left crankcase and install the shift arm (smaller), aligning the arm with the spindle groove as shown.

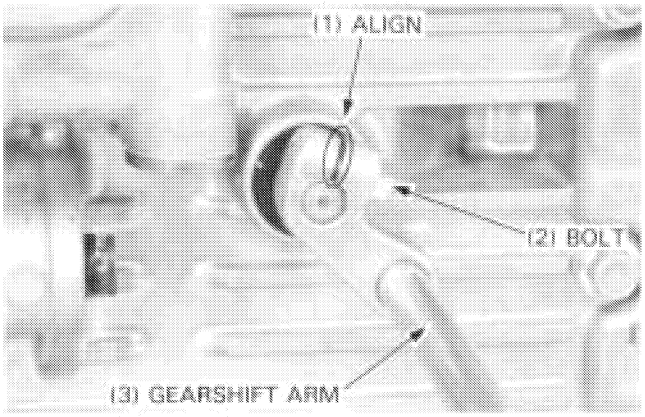
Install a new lock washer and the bolt on the shift arm.
Tighten the bolt and bend the lock tab of the lock washer up to the bolt.

TORQUE: 25 N·m (2.5 kg-m, 18 ft-lb)

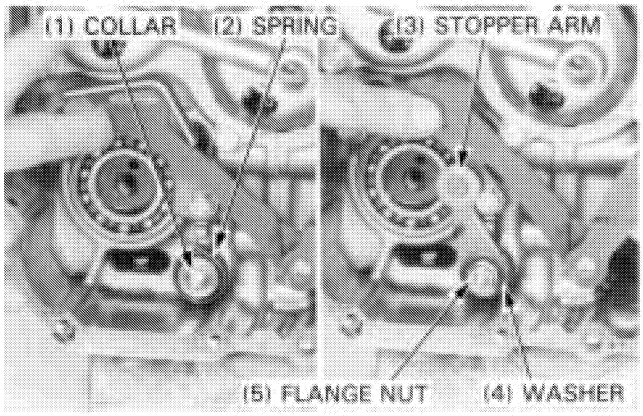


Install the gearshift arm onto the shift spindle, aligning the punch mark on the spindle with the slot of the arm.

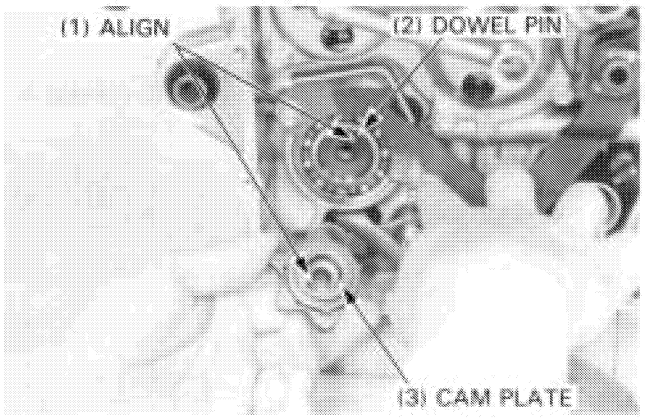
Tighten the bolt securely.



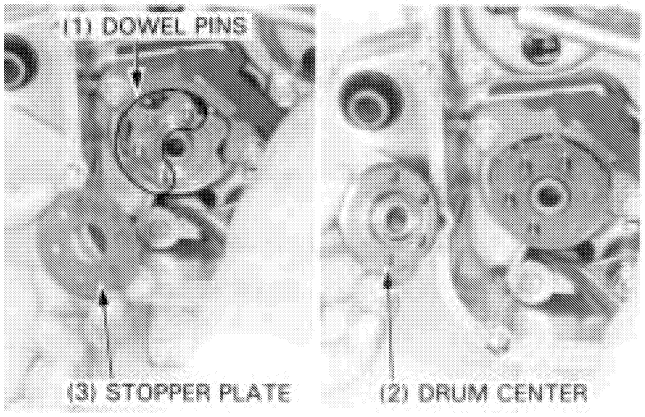
Install the collar and spring as shown.
Install the stopper arm, washer and flange nut.
Tighten the bolt securely.



Install the dowel pin in the shift drum.
Install the cam plate in the shift drum by holding the shift arm and stopper arm as shown, aligning the dowel pin with the slot in the cam plate.



Install the following:
– four dowel pins to the cam plate
– stopper plate
– drum center

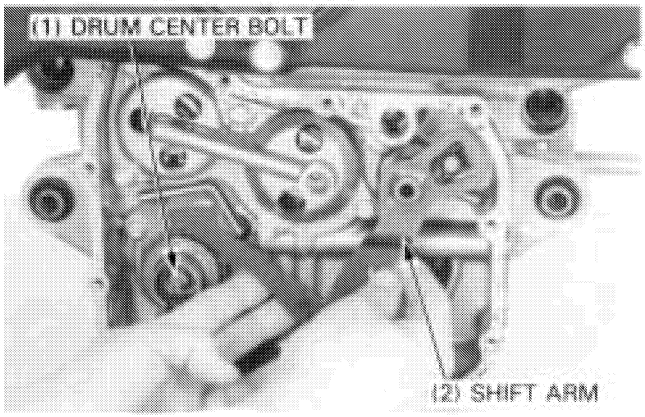


Tighten the drum center bolt to the specified torque.

TORQUE: 28 N·m (2.8 kg-m, 20 ft-lb)

Check that the stopper arm is engaged to the cam plate and shift arm is engaged to the dowel pins.

Check the operation of the gearshift linkage.



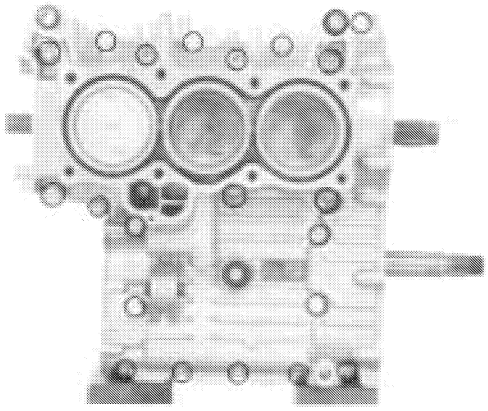
CRANKCASE SEPARATION

Remove the necessary components for separation before separating the crankcases (page 10-2).

Remove the 22 bolts.

NOTE

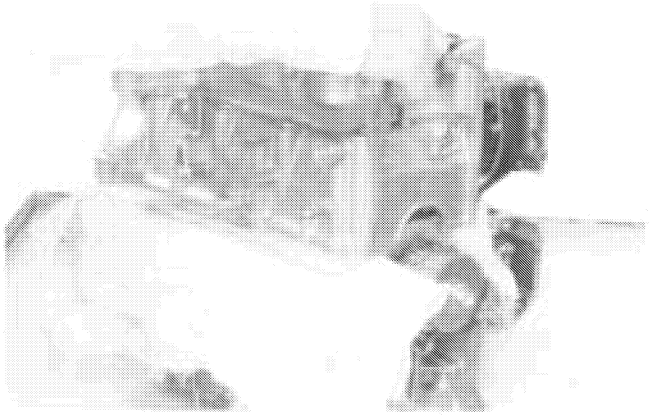
- Eight 10 mm bolts have sealing washers.



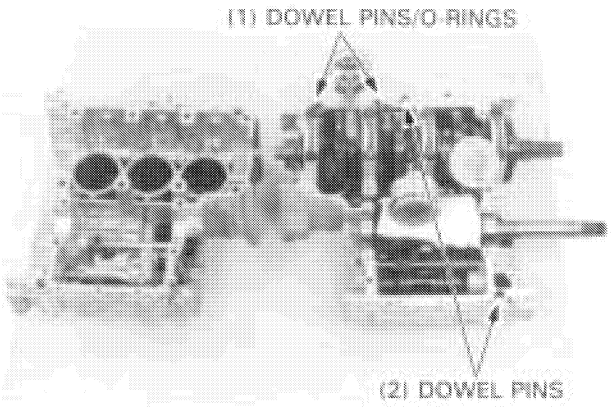
Place the engine with the right crankcase down.

Pull the shift arm away from the shift drum. Partially separate the case halves and install the case supports.
Place shop towels under the pistons to prevent them from falling onto the transmission when the left case is removed.

Lift off the left crankcase.



Remove the dowel pins and O-rings.
Clean any liquid sealant off the crankcase mating surface.



TRANSMISSION

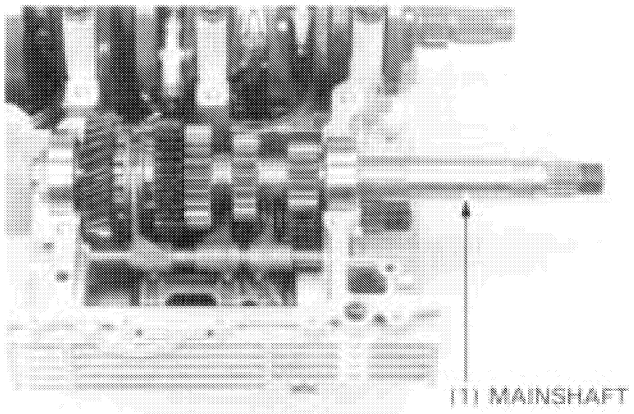
DISASSEMBLY

Separate the crankcases (above).

NOTE

- The mainshaft can be removed without removing the gearshift linkage.

Remove the mainshaft.

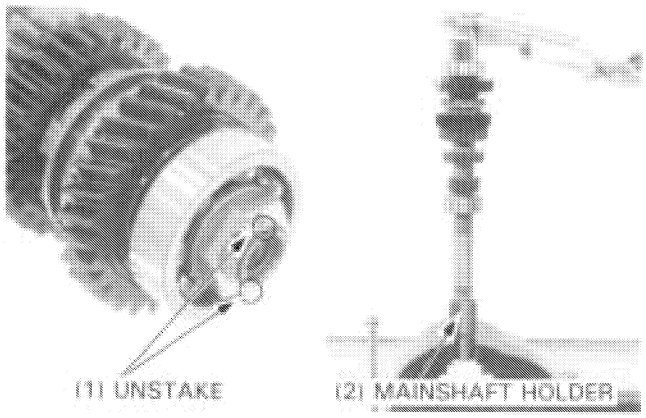


Unstake the mainshaft front bearing lock nut with a drill or grinder.

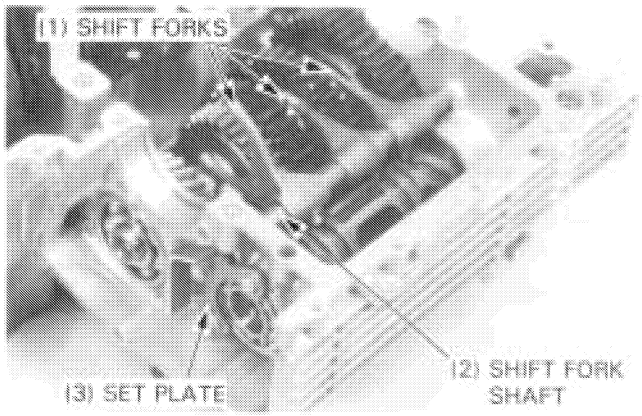
Hold the mainshaft with the shaft holder and remove the lock nut.

TOOL:
Mainshaft holder **07JMB–MN50200**

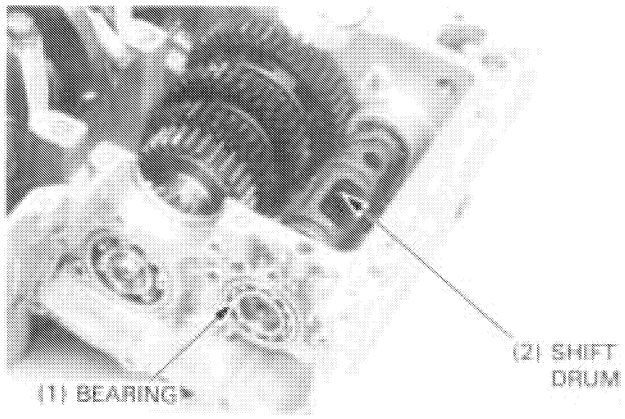
Disassemble them.



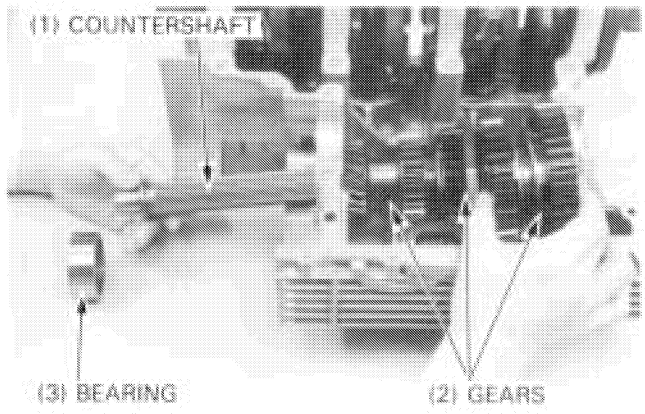
Remove the following:
– gearshift linkage (page 10-4).
– shift drum bearing set plate.
– shift fork shaft.
– shift forks.



Remove the shift drum front bearing and remove the shift drum.



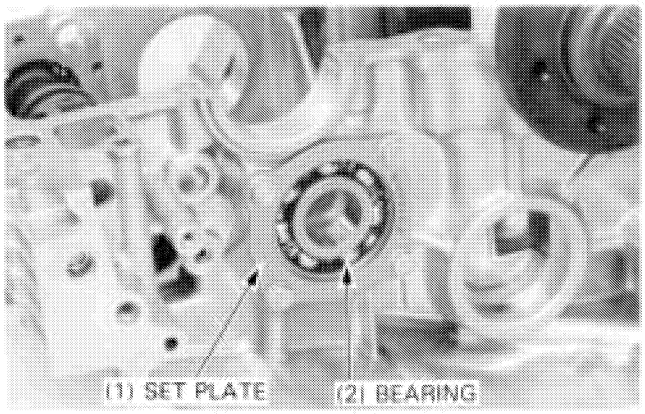
Remove the final drive gear (page 9-13).
Remove the countershaft front bearing and pull the countershaft out of gears.
Disassemble the countershaft gears.



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 loosely in the crankcase.

Remove the bearing set plate and countershaft rear bearing, if necessary.

Check the rotation of all bearings.



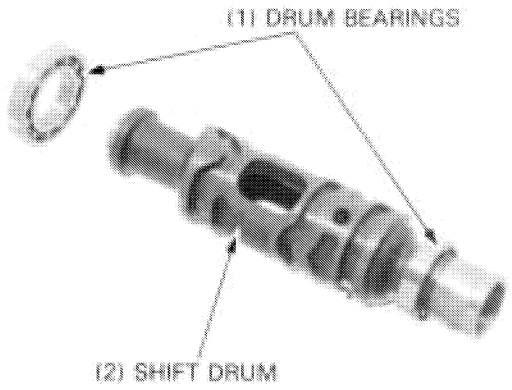
SHIFT DRUM INSPECTION

Inspect the shift drum bearings for smooth rotation.

Inspect the shift drum grooves. They should be smooth and free of chips and burrs.

NOTE

- Replace the bearings as a set.

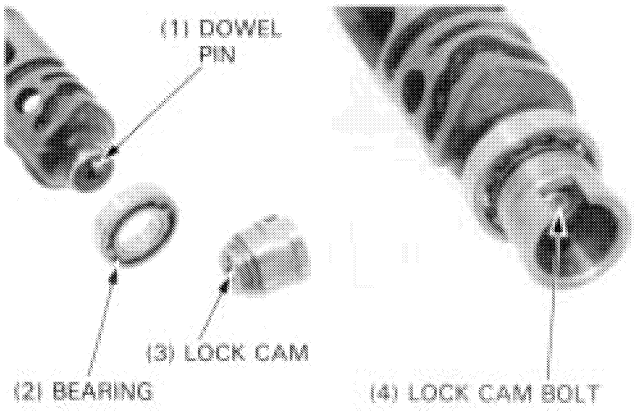


If necessary, remove the shift drum lock cam bolt and remove the lock cam, dowel pin and bearing.

Assemble them in the reverse order of disassembly.

Apply a locking agent to the shift drum lock cam bolt threads and tighten it to the specified torque.

TORQUE: 12 N·m (1.2 kg-m, 9 ft-lb)



SHIFT FORK/SHIFT FORK SHAFT INSPECTION

Inspect the shift fork guide pins for wear or damage.

Measure the shift fork claw thickness.

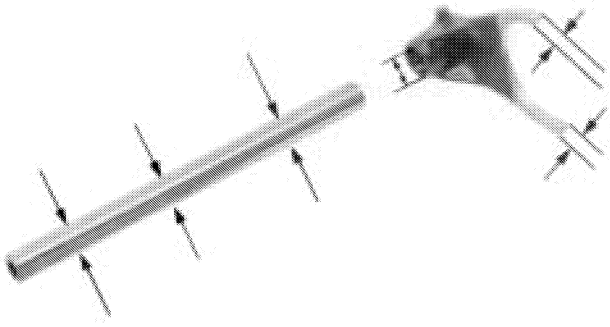
SERVICE LIMIT: 5.6 mm (0.22 in)

Measure the shift fork I.D.

SERVICE LIMIT: 14.04 mm (0.553 in)

Measure the shift fork shaft O.D. at shift fork surfaces.

SERVICE LIMIT: 13.90 mm (0.547 in)

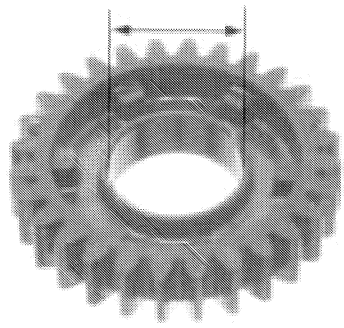


TRANSMISSION GEAR INSPECTION

Check gear dogs, dog holes, teeth, and bushings for excessive or abnormal wear, or insufficient lubrication.

Measure the I.D. of these gears.

SERVICE LIMITS:
M4/M5, C2, C3: 34.04 mm (1.340 in)

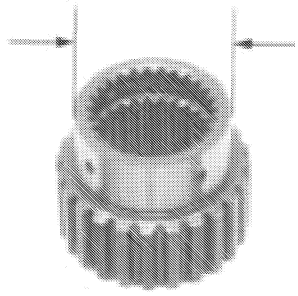


Measure the O.D. of these gear bushings.

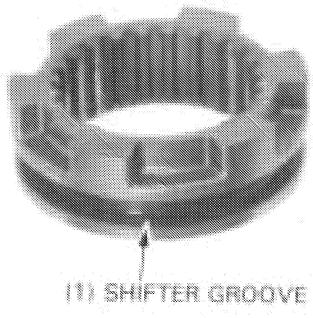
SERVICE LIMITS:
M4/M5, C2, C3: 33.92 mm (1.335 in)

Calculate the clearance between the gears and bushings.

SERVICE LIMIT: 0.10 mm (0.004 in)

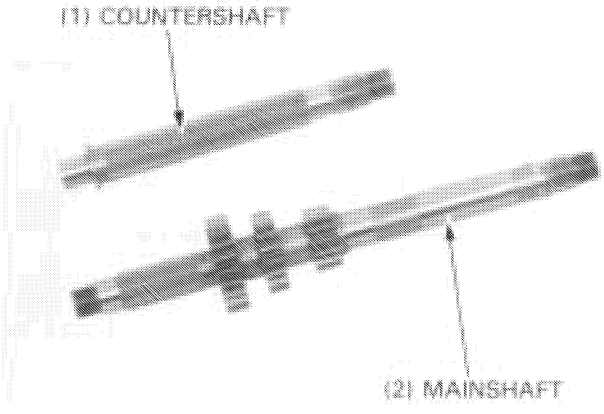


Check the shifter groove for excessive or abnormal wear.



SHAFT INSPECTION

Inspect the mainshaft and countershaft for excessive or abnormal wear.

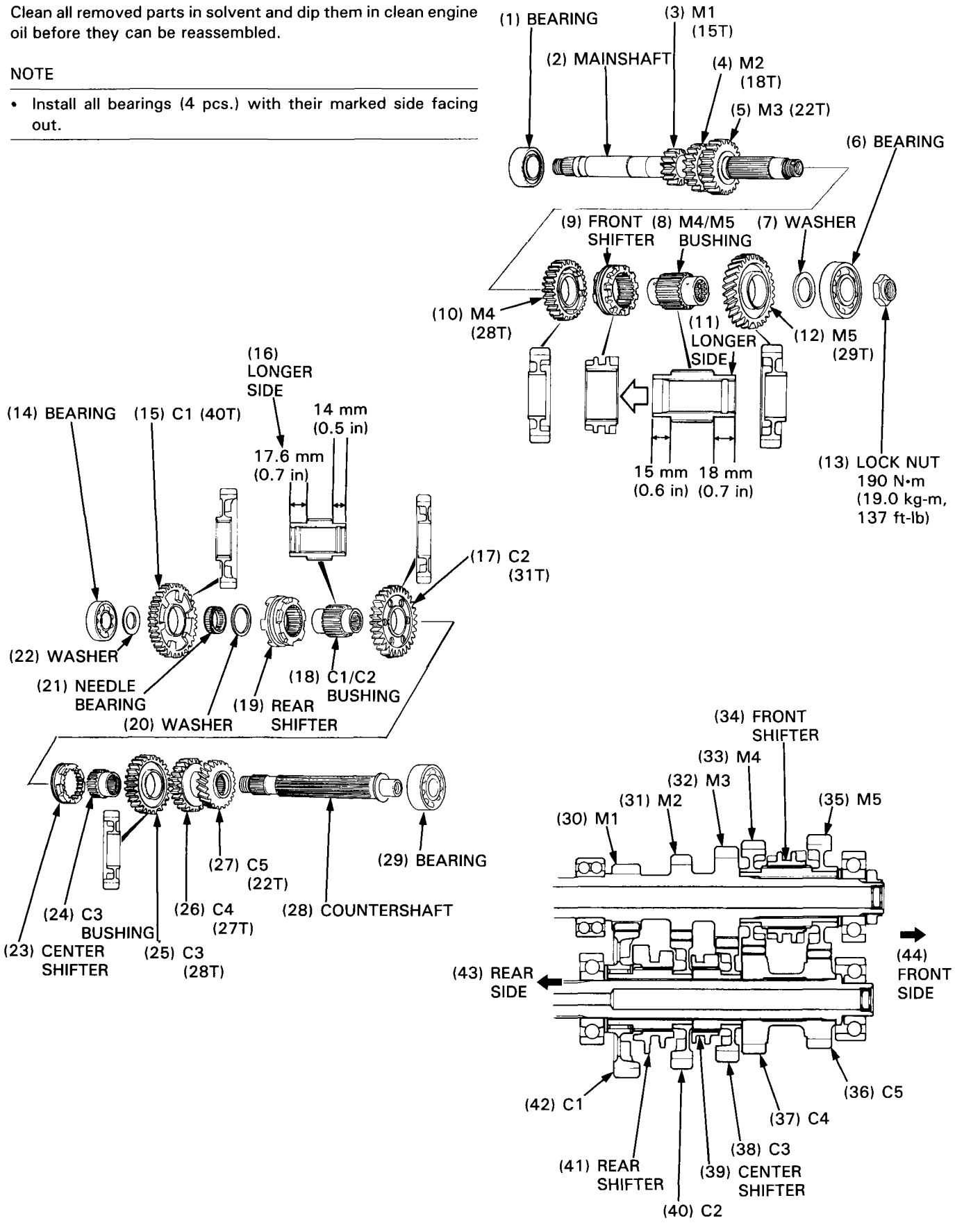


ASSEMBLY

Clean all removed parts in solvent and dip them in clean engine oil before they can be reassembled.

NOTE

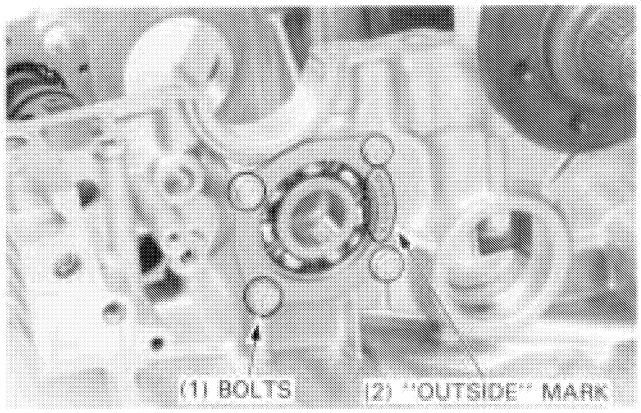
- Install all bearings (4 pcs.) with their marked side facing out.



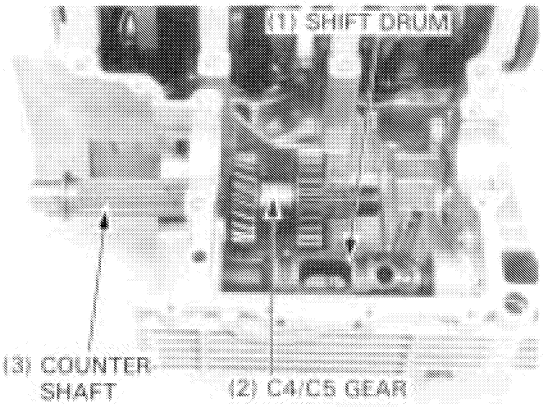
If removed, install the bearing with marked side facing out.

Install the bearing holder with the 'OUTSIDE' mark facing out.

Apply a locking agent to the bolt threads and tighten the bolts securely.

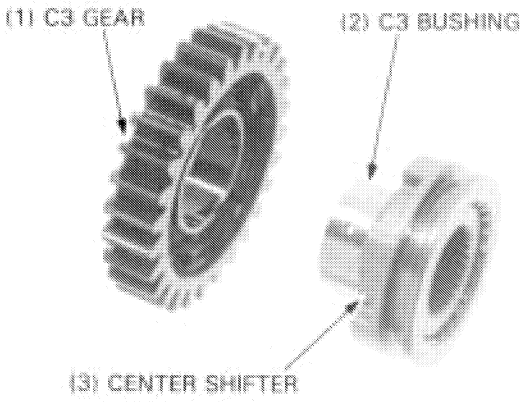


Install the shift drum.
Install the countershaft and C4/C5 gear as shown.

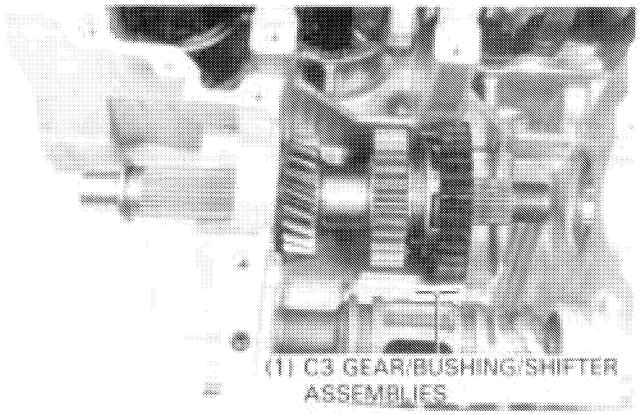


Assemble the C3 gear, C3 bushing and center shifter as shown.

Apply molybdenum disulfide oil to the shifter groove.



Install the C3 gear/bushing/shifter assemblies onto the countershaft.

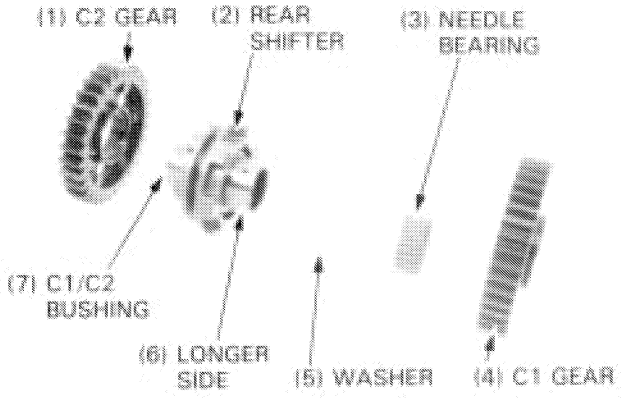


Assemble the C2 gear, C1/C2 bushing, rear shifter, washer, needle bearing and C1 gear as shown.

NOTE

- With the longer side of the bushing sliding surfaces facing toward C1 gear.

Apply molybdenum disulfide oil to the shifter groove.



Apply oil to the washer and temporarily install it to the inner race of the bearing as shown.

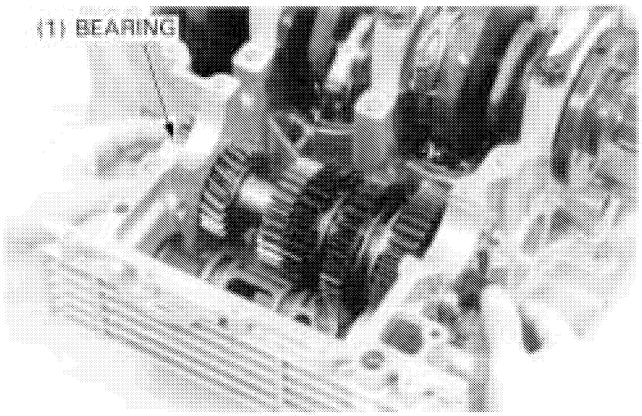
Install the assembled gears (above step) to the countershaft as shown.

NOTE

- *Do not drop the washer into the crankcase.*

Install the countershaft front bearing with the marked side facing out.

Temporarily install the final drive gear and nut to prevent the countershaft from sliding out of the case (page 9-17).

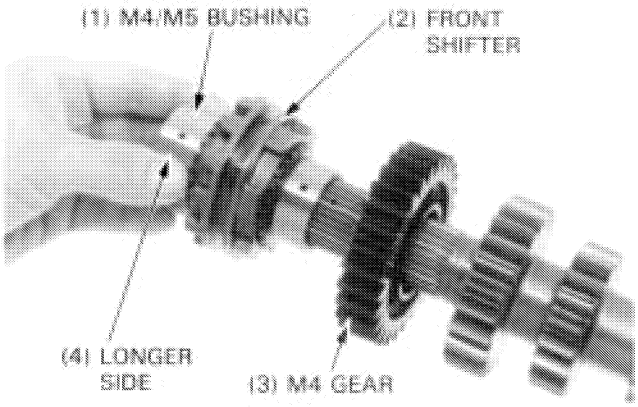


Install the M4 gear, M4/M5 bushing and front shifter onto the mainshaft.

NOTE

- With the longer side of the bushing sliding surfaces facing toward M5 gear.

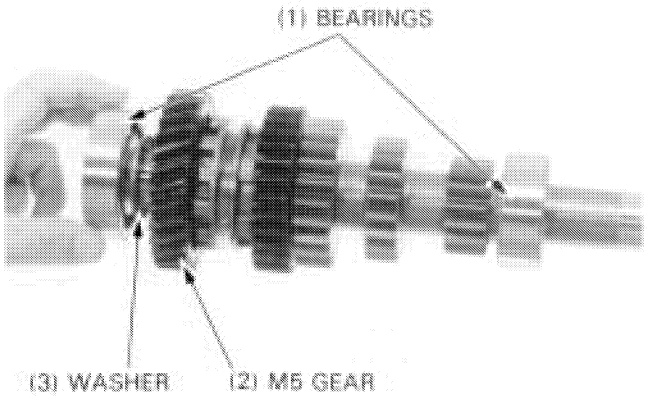
Apply molybdenum disulfide oil to the shifter groove.



Install the M5 gear, washer and bearings onto the mainshaft.

NOTE

- Install bearings with their marked side facing out.

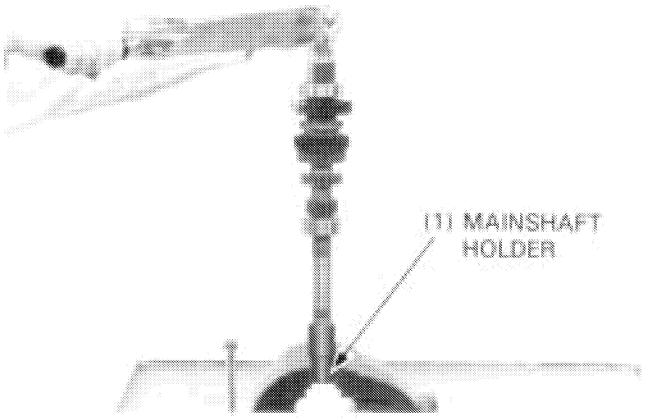


Install a new lock nut onto the mainshaft.

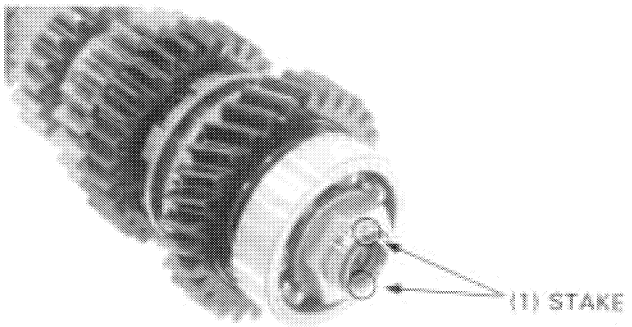
Hold the mainshaft with the shaft holder and tighten the lock nut.

TORQUE: 190 N·m (19.0 kg-m, 137 ft-lb)

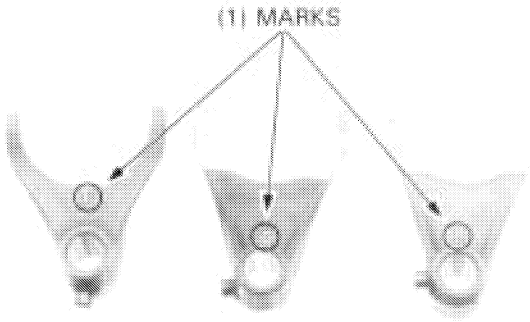
TOOL:
Mainshaft holder **07JMB—MN50200**



Stake the lock nut to the groove in the mainshaft ends (2 plcs).



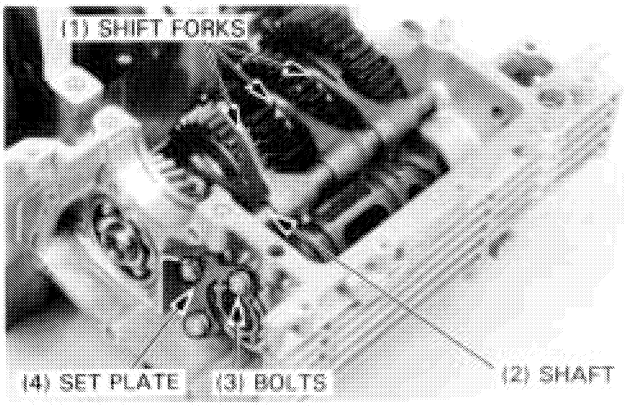
Shift forks have the following identification marks:
— F: front fork
— C: center fork
— R: rear fork



Install the shift forks onto their shifters and shift drum grooves with the marked side (F, C or R) facing toward the front.

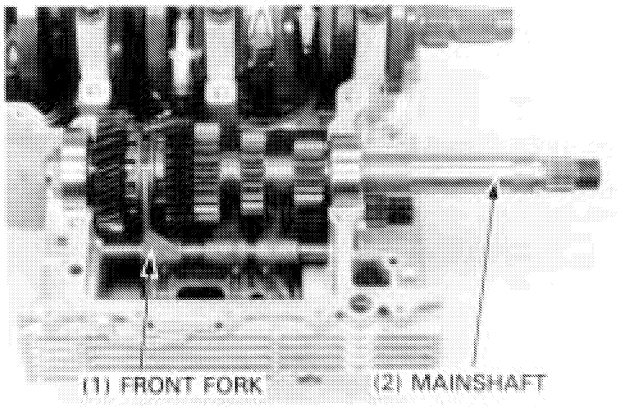
Apply oil to the shift fork shaft.
Slide the shaft through the crankcase and all shift forks.

Apply a locking agent to the set plate bolt threads.
Install the set plate and tighten the bolts securely.



Install the mainshaft, aligning the front fork with the front shifter groove.

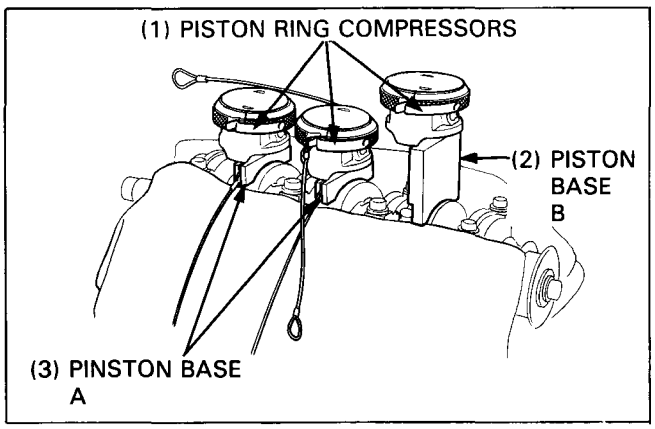
After assembling, check for smooth movement.



CRANKCASE ASSEMBLY

Coat the cylinders, pistons, and piston rings/grooves with oil. Make sure that the piston ring end gaps are staggered as shown on page 11-8.

Turn the crankshaft counterclockwise until the T1.2 drive pully mark is faced up to place the No. 2 piston on the T.D.C. position.
Set the special tools as shown.



TOOLS:

Piston ring compressor	**07955—3710000 (2 pcs.) and 07JMG—MN50300 (1 pc.)**
Piston base set	**07JMG—MN50101**
— piston base A	**07JMG—MN50121 (2 pcs. required)**
— piston base B	**07JMG—MN50111 (1 pc.)**

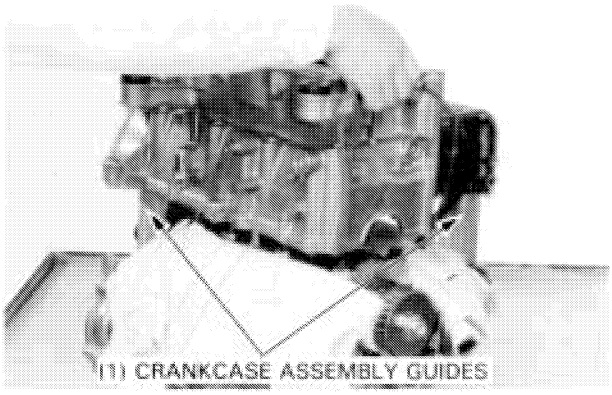
Fix the shift arm with a suitable wire.

Place the crankcase assembly guides on the crankcase as shown.

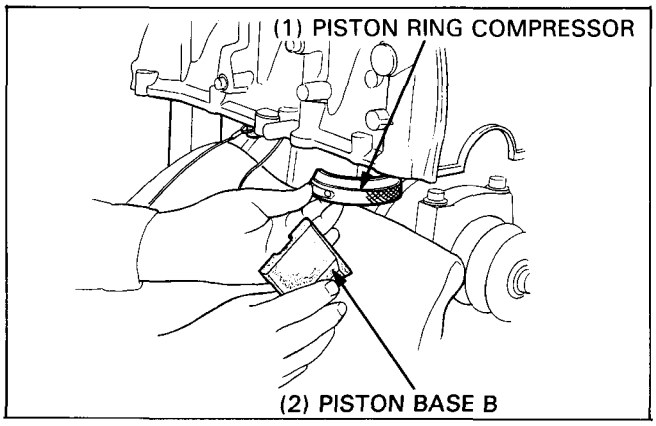
TOOL:

Crankcase assembly guide	**07JMG—MN50200**

Lower the case until it rests on the guides to install the No. 2 piston into its cylinder.



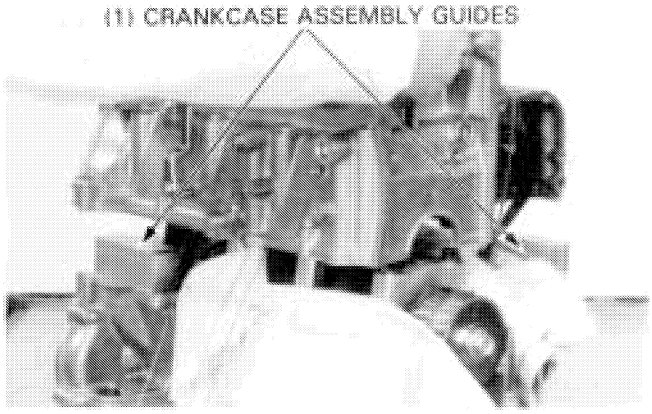
Remove the piston ring compressor and piston base B for No. 2 piston out of the crankcase.



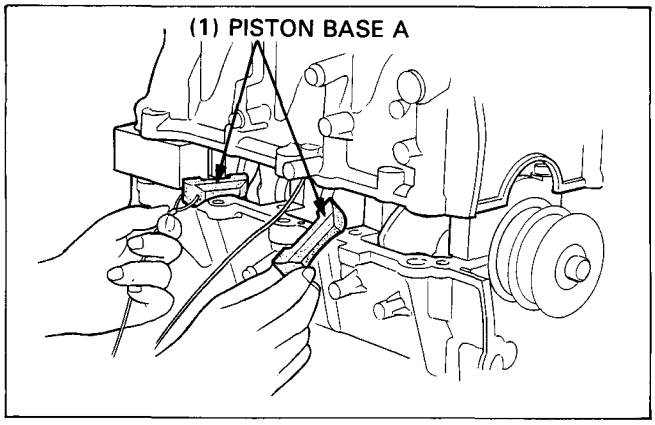
Hold the left crankcase and position the assembly guides as shown.

Lower the case until it rests on the guides to install the No. 2 and No. 4 pistons into their cylinders.

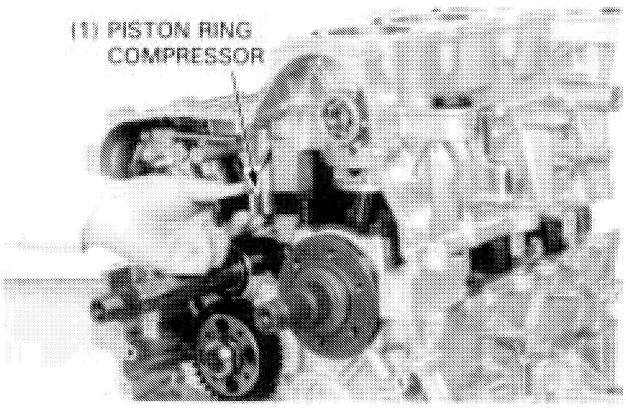
Remove the shop towels.



Remove the piston bases A for No. 4 and No. 6 pistons out of the case.

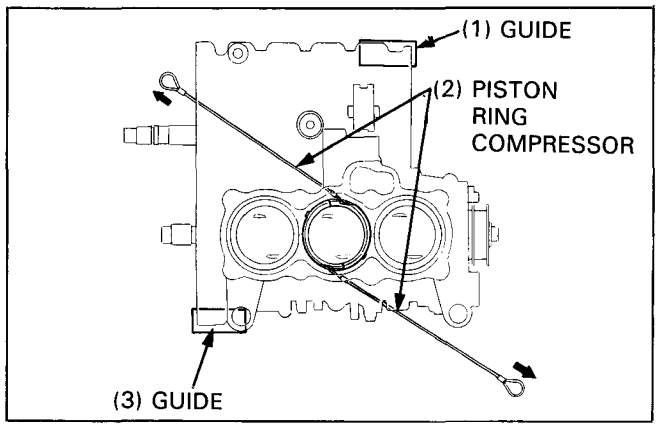


Remove the piston ring compressor for No. 6 piston out of the case as shown.

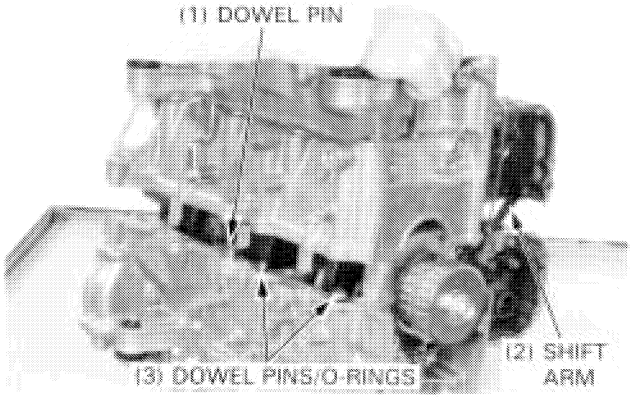


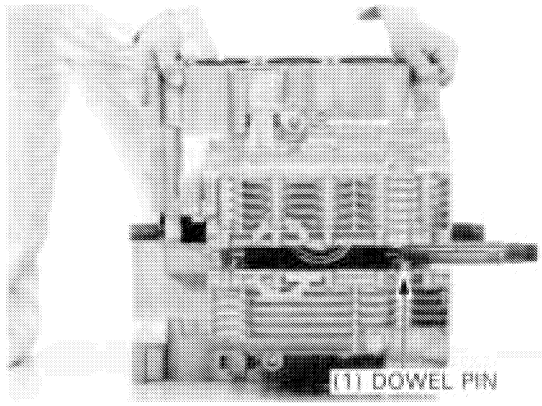
Remove the piston ring compressor for No. 4 piston out of the case by pulling each wire as shown.

Hold the case and remove the crankcase assembly guides.

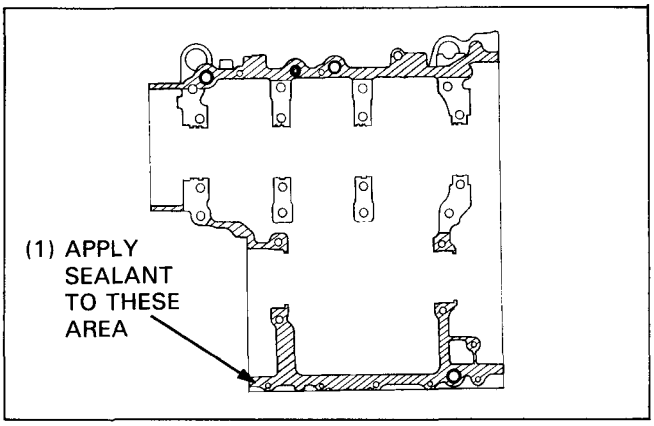


Install the dowel pins and O-ring.





Apply sealant to the crankcase mating surfaces as shown. Engage the shift arm with the shift drum and seat the case.

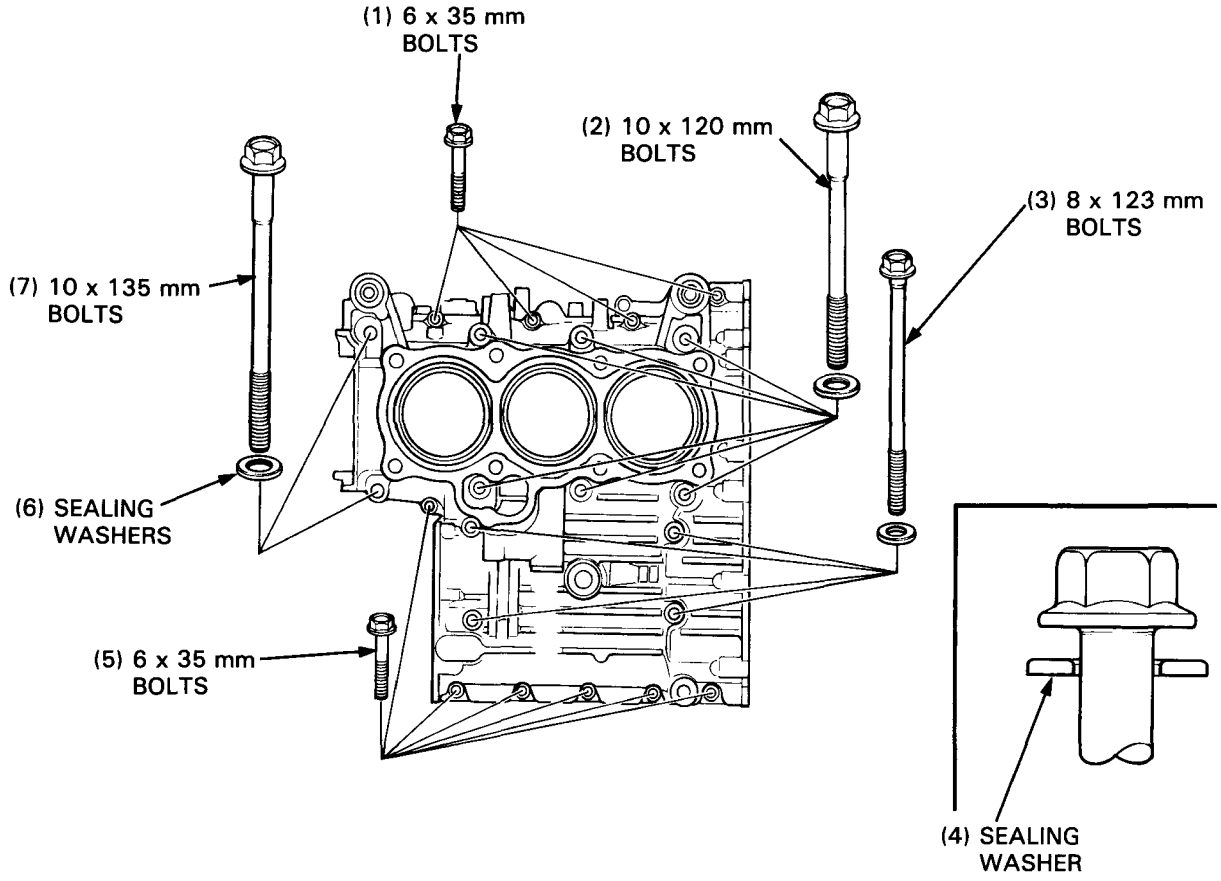


Coat all 10 mm bolts (under threads) with oil.

NOTE

- Tighten all case bolts in a crisscross pattern in 2–3 steps.
- Eight 10 mm bolts have sealing washers.
- Begin with larger-diameter bolts first.

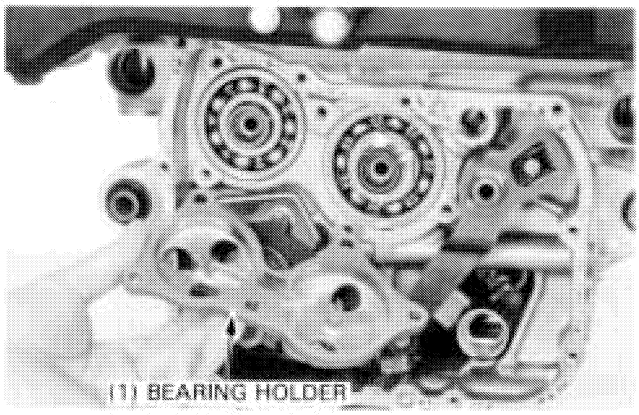
TORQUES:
10 mm Case bolts: 35 N·m (3.5 kg-m, 25 ft-lb)
8 mm Case bolts: 26 N·m (2.6 kg-m, 19 ft-lb)
6 mm Case bolts: 12 N·m (1.2 kg-m, 9 ft-lb)



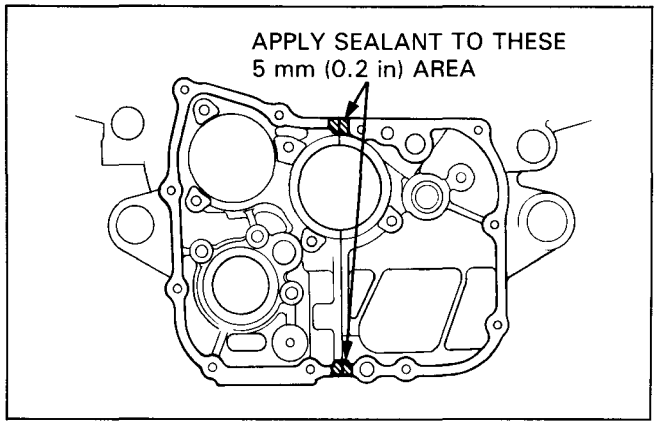
Install the removed parts (page 10-2).

FRONT ENGINE COVER INSTALLATION

If removed, install the bearing holder.

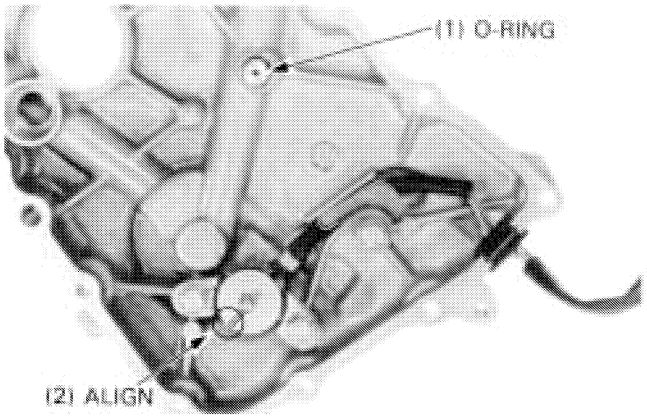


Apply sealant to the crankcase surfaces as shown.



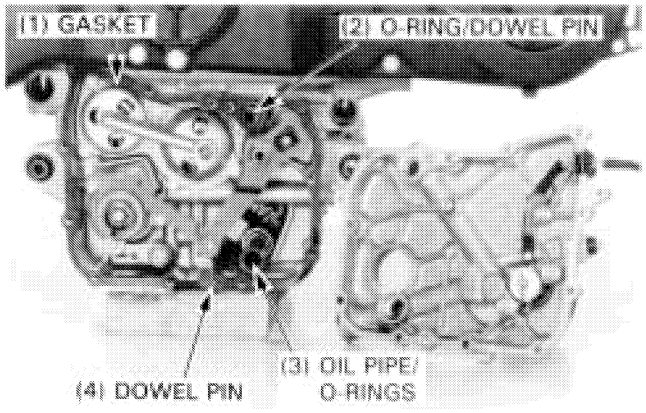
Align the gearshift sensor pin with the tab as shown.

Install the O-ring onto the oil orifice.



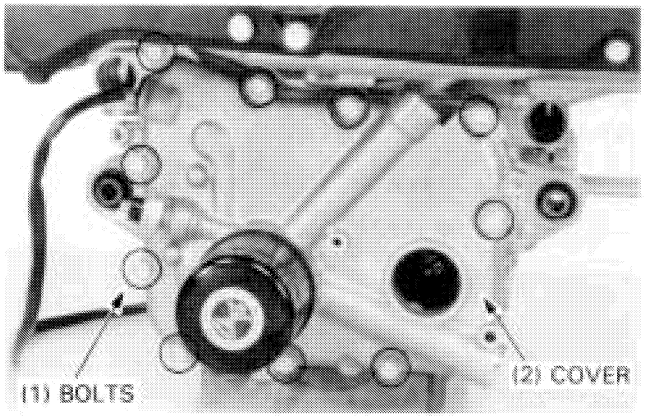
Install the following:
– a new gasket.
– dowel pins and O-ring.
– O-rings and oil pipe.

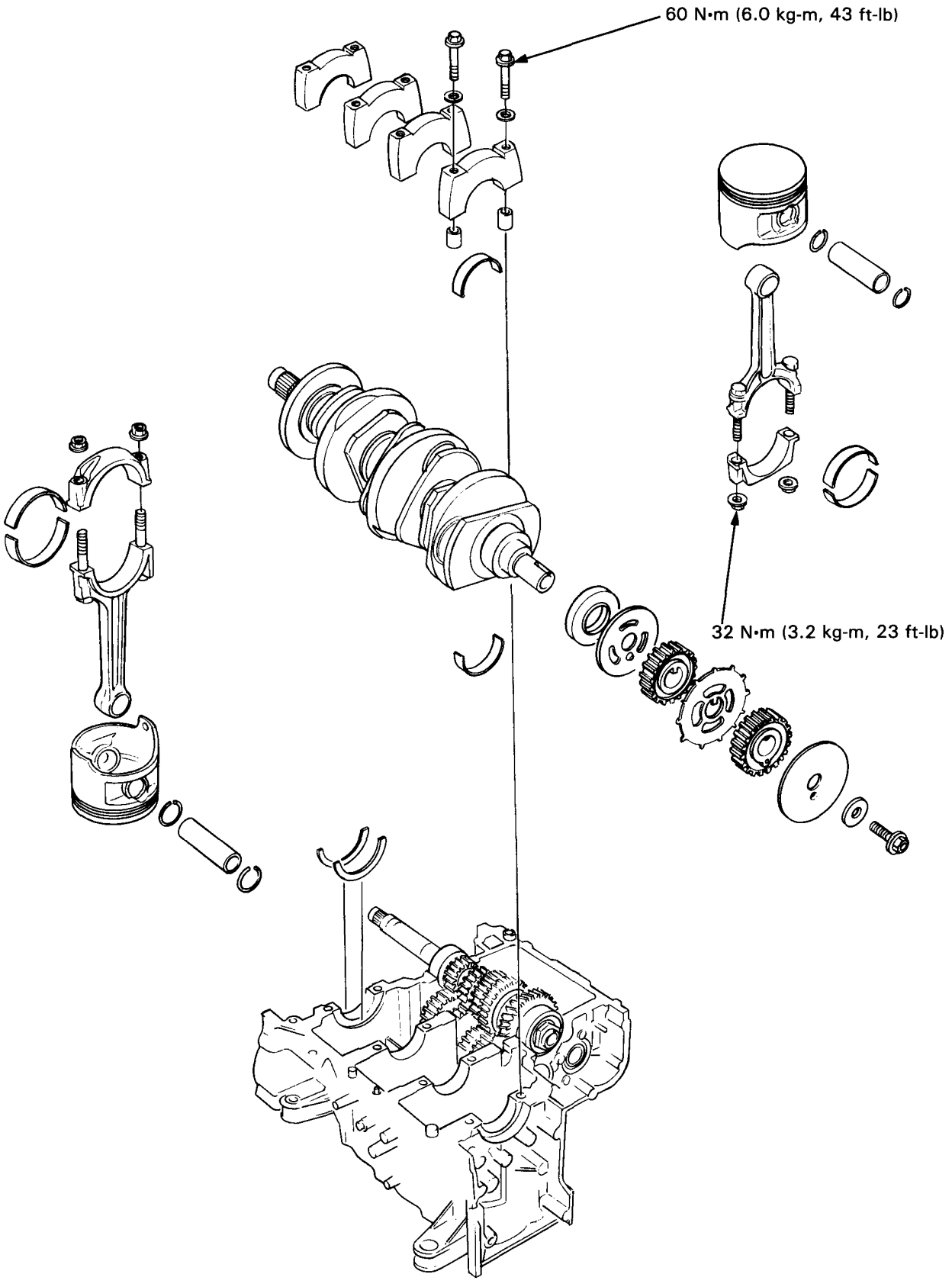
Shift the transmission into neutral.
Install the front engine cover, aligning the sensor pin with drum center and also aligning the oil passages.



Tighten the front engine cover bolts in a crisscross pattern in 2–3 steps.

Install the removed parts in the reverse order of removal.
Fill the engine with oil (page 2-4).
Fill the engine with coolant (page 5-7).




60 N•m (6.0 kg-m, 43 ft-lb)
32 N•m (3.2 kg-m, 23 ft-lb)

SERVICE INFORMATION

GENERAL

- See section 6 for engine removal and installation.
- To separate the crankcases, refer to section 10.
- If you will not be removing the right side pistons (cylinder No. 1, 3 and 5), it is not necessary to remove the right cylinder head. Certain steps are required to prevent valve damage when separating the crankcases without first removing the right cylinder head (section 10).
- Whenever the case is disassembled, remove all gasket material from oil passages and water jeackets.

SPECIFICATION

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder	Cylinder I.D.		71.005—71.025 (2.7955—2.7963)	71.1 (2.80)
	Out-of-round		—	0.15 (0.006)
	Taper		—	0.05 (0.002)
	Top warpage		—	0.05 (0.002)
Piston	Piston O.D.		70.960—70.990 (2.7937—2.7949)	70.85 (2.789)
	Piston pin bore		18.002—18.008 (0.7087—0.7090)	18.06 (0.711)
	Piston to cylinder clearance		0.015—0.065 (0.0006—0.0026)	0.10 (0.004)
Piston pin	Piston pin O.D. (at sliding surfaces)		17.994—18.000 (0.7084—0.7087)	18.99 (0.748)
	Pin-to-piston clearance		0.002—0.014 (0.0001—0.0006)	0.04 (0.002)
	Pin-to-rod clearance		0.009—0.033 (0.0004—0.0013)	0.04 (0.002)
Piston ring	Top and second (End gap)		0.15—0.30 (0.006—0.012)	0.5 (0.02)
	Oil ring side rail (End gap)		0.20—0.70 (0.008—0.028)	0.9 (0.04)
	Ring-to-ring land clearance	Top	0.025—0.055 (0.0010—0.0022)	0.10 (0.004)
		Second	0.015—0.045 (0.0006—0.0018)	
Crankshaft, connecting rod	Runout (at center journal)		—	0.03 (0.001)
	Rod side clearance		0.15—0.30 (0.006—0.012)	0.40 (0.016)
	Crankpin bearing oil clearance		0.027—0.045 (0.0011—0.0018)	0.06 (0.002)
	Main bearing oil clearance		0.028—0.046 (0.0011—0.0018)	0.06 (0.002)
	Main and crank pin journal	Taper	—	0.003 (0.0001)
		Out-of-round	—	0.005 (0.0002)
	Connecting rod small end I.D.		18.009—18.027 (0.7090—0.7097)	18.04 (0.710)

TORQUE VALUES

Crankshaft main bearing cap bolt	60 N·m (6.0 kg-m, 43 ft-lb) —Apply oil
Connecting rod cap nut	32 N·m (3.2 kg-m, 23 ft-lb) —Apply oil

TOOL

Common

Piston ring compressor	Equivalent commercially available.

TROUBLESHOOTING

Excessive Noise
- Crankshaft
  - — Worn main bearing
  - — Worn rod bearing
- Piston and Connecting Rod
  - — Worn piston or cylinder
  - — Worn piston pin or pin hole
  - — Worn rod small end

Low Compression or Uneven Compression
- Worn cylinder or piston ring

High Compression
- Excessive carbon build-ups on piston head or in combustion chambers

Excessive Smoke
- Worn cylinder, piston or piston rings
- Improperly installed piston rings
- Damaged piston or cylinder

Overheating
- Excessive carbon build-up on piston head
- Blocked or restricted flow of coolant
- Sticking thermostat

Knocking or Abnormal Noise
- Worn pistons and cylinders
- Excessive carbon build-up on piston head

PISTON/CONNECTING ROD REMOVAL

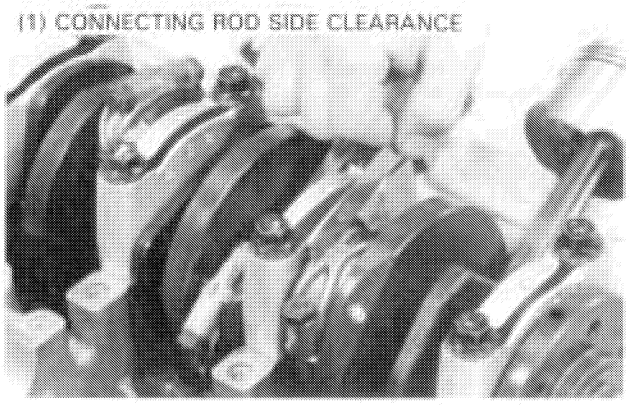
Separate the crankcase (page 10-8).

SIDE CLEARANCE INSPECTION

Measure the connecting rod side clearances.

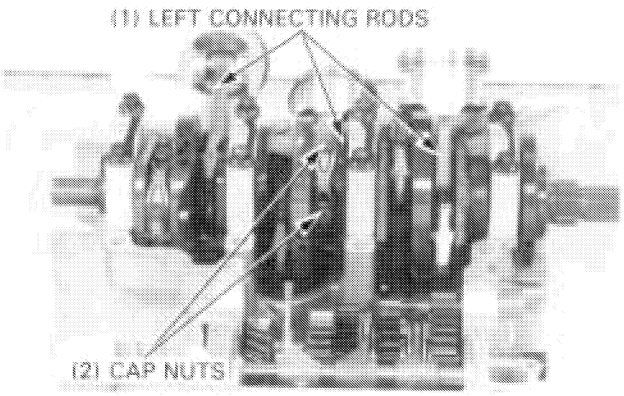
SERVICE LIMIT: 0.40 mm (0.016 in)

If clearance exceeds the service limit, replace the rod. Recheck and if still out of limit, replace the crankshaft. Inspect the crankshaft for rough spots or damage.



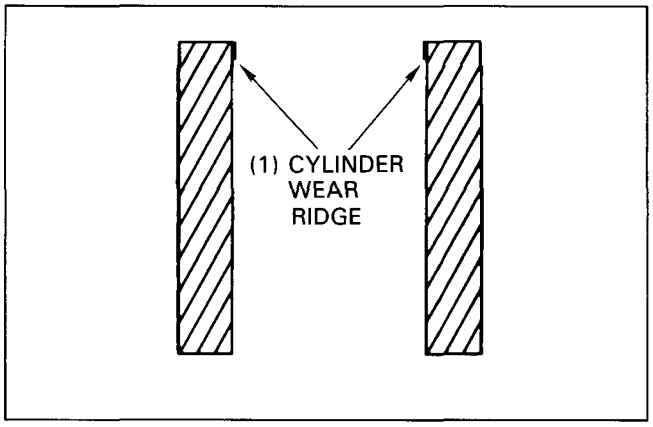
Remove the left connecting rods by removing the bearing caps. Mark them to indicate the correct cylinder (No. 2, 4 and 6) and position on the crankpins.

Remove the right connecting rod bearing caps.
Push the connecting rod and piston out through the top of the right cylinder bore. Mark them to indicate the correct cylinder (No. 1, 3 and 5) and position on the crankpins.



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 right side pistons to allow the pistons and rings to pass through the cylinder.*



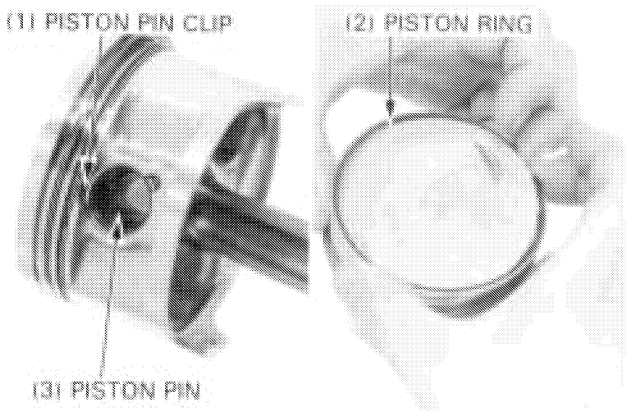
PISTON/RING/ROD INSPECTION

Remove the piston pin clip with needle nose pliers.
Remove the piston pin out of the piston.

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

CAUTION

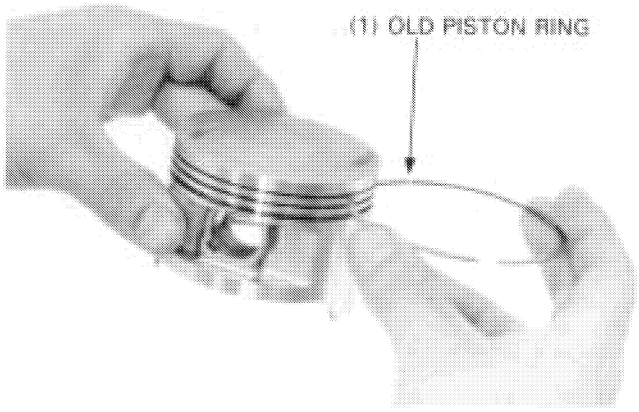
- *Do not damage the piston ring by spreading the ends too far.*



Clean the top of the piston. Inspect for evidence of pitting or deterioration. Use an old piston ring to remove carbon and oil deposits from the ring grooves.

CAUTION

- *Do not damage the piston ring grooves.*
- *Do not use a wire brush to clean ring grooves and lands; a wire brush can damage these areas.*



Measure the O.D. of the piston pin.

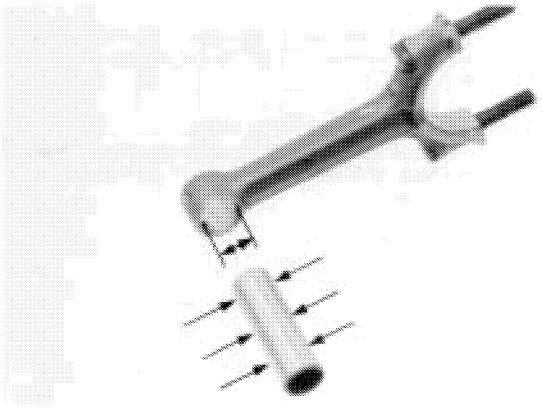
SERVICE LIMIT: 18.99 mm (0.748 in)

Measure the connecting rod small end I.D.

SERVICE LIMIT: 18.04 mm (0.710 in)

Calculate the connecting rod small end-to-piston pin clearance.

SERVICE LIMIT: 0.04 mm (0.002 in)

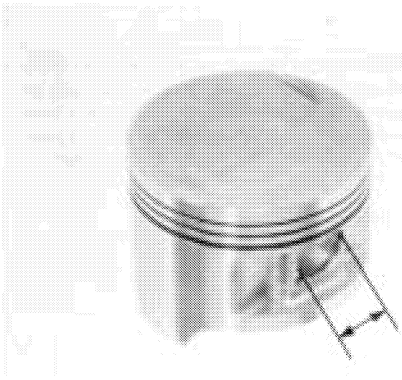


Measure the piston pin bore.

SERVICE LIMIT: 18.06 mm (0.711 in)

Calculate the piston pin-to-piston clearance. Replace the piston with a new one if the service limit is exceeded.

SERVICE LIMIT: 0.04 mm (0.002 in)

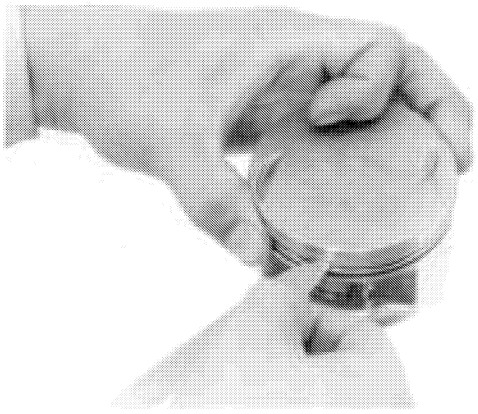


Inspect the ring lands for abnormal wear and piston thrust faces for scratches.

Inspect the pistons for cracks or other damage.

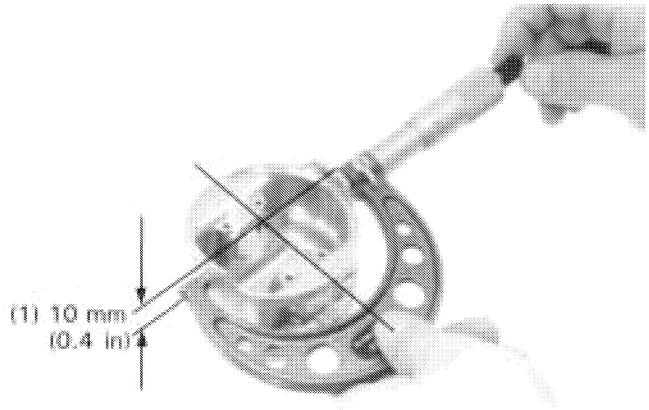
Inspect the piston ring-to-ring land clearances with the piston ring installed.

SERVICE LIMIT: 0.10 mm (0.004 in)



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

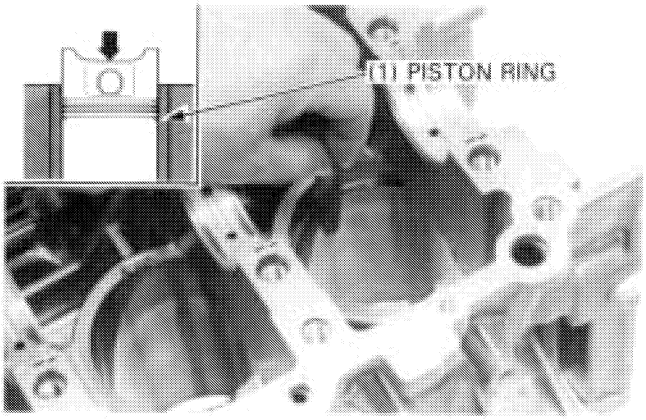
SERVICE LIMIT: 70.85 mm (2.789 in)



CYLINDER INSPECTION

Using a piston, push the ring into the cylinder squarely and measure the end gap at the point of the cylinder bottom.

SERVICE LIMITS:
Top/second: 0.5 mm (0.02 in)
Oil: 0.9 mm (0.04 in)

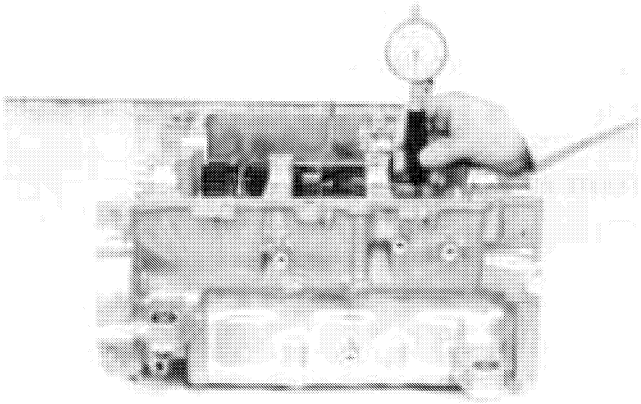


If the gap exceeds to the service limit, measure the cylinder I.D.
Replace the piston ring if the cylinder I.D. is within specification.

Inspect the cylinder walls for scratches and wear.

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

SERVICE LIMIT: 71.1 mm (2.80 in)



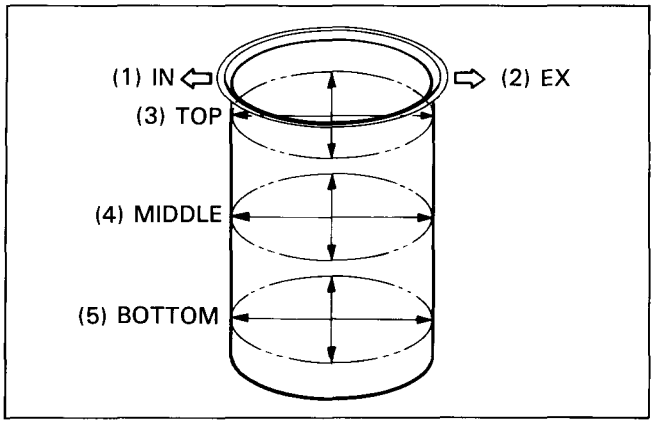
Measure each piston O.D. at three levels in X axis (see above). Calculate the piston-to-cylinder clearance. Take the maximum reading to determine the clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)

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

SERVICE LIMIT: 0.05 mm (0.002 in)

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



SERVICE LIMIT: 0.15 mm (0.006 in)

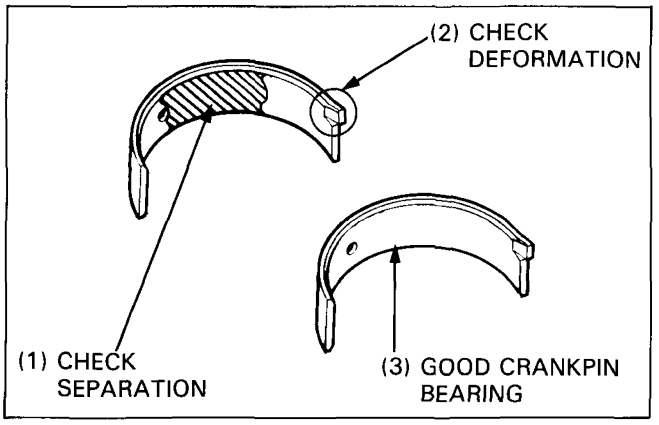
The cylinder must be rebored and oversize piston fitted if the service limits are exceeded.
The following oversize pistons are available:
0.25 mm (0.001 in), 0.50 mm (0.020 in), 0.75 mm (0.030 in), 1.00 mm (0.039 in)

The cylinder must be rebored so that the clearance to an oversize piston is 0.270—0.305 mm (0.0106—0.0120 in).

CRANKPIN BEARING

OIL CLEARANCE INSPECTION

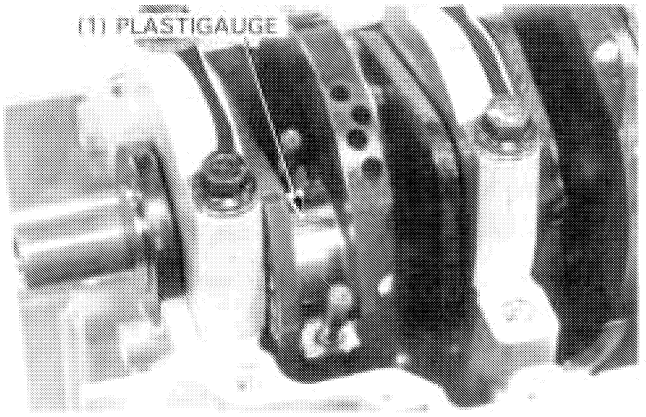
Inspect the bearings for scars, separation and damage on the bearing surfaces.
Inspect the bearing tab for deformation.



Put a piece of Plastigauge on each crankpin.

NOTE

- Do not place Plastigauge over any oil holes.
- Do not rotate the connecting rod or crankshaft during the inspection.



On the crankpin bearings, install the bearing caps and rods on the correct crankpins, and tighten them evenly.

TORQUE: 32 N·m (3.2 kg-m, 23 ft-lb)

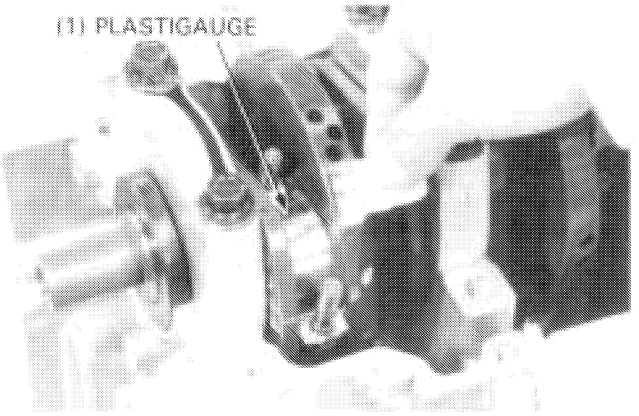
NOTE

- Apply oil to the nut flange and threads.

Remove the caps and measure the compressed Plastigauge on each crankpin.

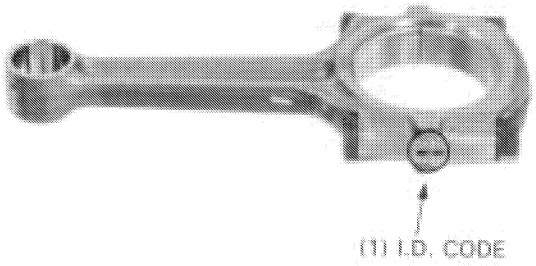
If the bearing clearance is beyond the service limit, select the correct replacement bearings.

SERVICE LIMIT: 0.06 *mm* (0.002 *in*)



BEARING SELECTION

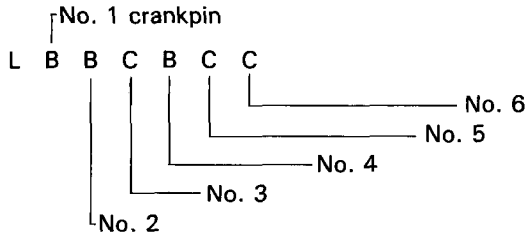
Record each connecting rod I.D. code number.
Codes may be (1, 2 or 3) or (I, II, or III)



Record the corresponding crankpin O.D. letter.
Codes may be A, B or C.

NOTE

- Example:



Cross reference the connecting rod and crankpin codes to determine the correct replacement bearing color.

(1) Rod bearing selection table

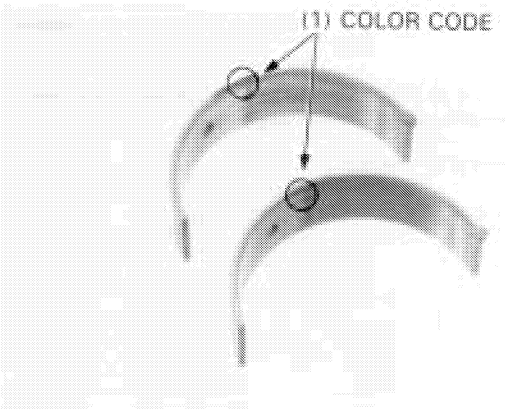
(2) Connecting rod I.D. codes	3 (III)	BROWN	BLACK	BLUE
	2 (II)	GREEN	BROWN	BLACK
	1 (I)	YELLOW	GREEN	BROWN
		A	B	C
		(3) Crankpin O.D. codes		

Bearing insert Thickness, mm (in)

Blue	**1.503—1.506**	**(0.05917—0.05929)**
Black	**1.500—1.503**	**(0.05906—0.05917)**
Brown	**1.497—1.500**	**(0.05894—0.05906)**
Green	**1.494—1.497**	**(0.05882—0.05894)**
Yellow	**1.491—1.494**	**(0.05870—0.05882)**

CAUTION

- *After selecting new bearings, recheck the clearance with Plastigauge. Incorrect clearance can cause major engine damage.*



BEARING INSTALLATION

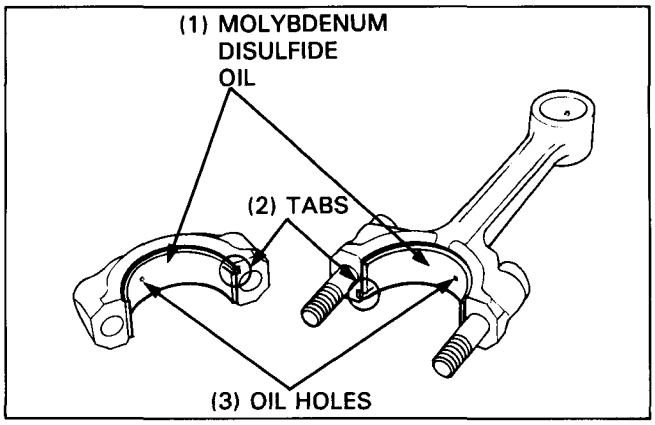
Clean oil off bearing outer surfaces, bearing caps and connecting rods.

Install the crankpin bearings onto the connecting rods and bearing caps, aligning each oil hole.

Apply molybdenum disulfide oil to the crankpin bearing surfaces.

CAUTION

- *Make sure the bearing tabs should be aligned with the grooves on the rods and caps.*

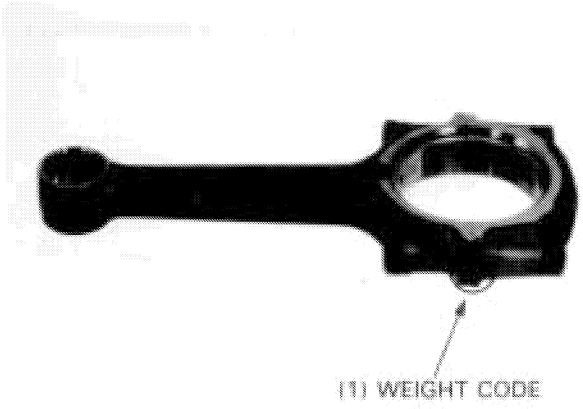


PISTON/CONNECTING ROD INSTALLATION

CONNECTING ROD SELECTION

When replacing a connecting rod, be sure to select a new rod according to the table shown below.

Old Rod Weight Code	New Rod Weight Code
A	A
B	B
C	C
D	D
E	E



If a connecting rod requires replacement, you should select a rod with the same weight as the original.

INSTALLATION

Before installing the pistons, apply a coat of oil to ring grooves, cylinder bores, and rod bearings.

Carefully install the piston rings on the piston.

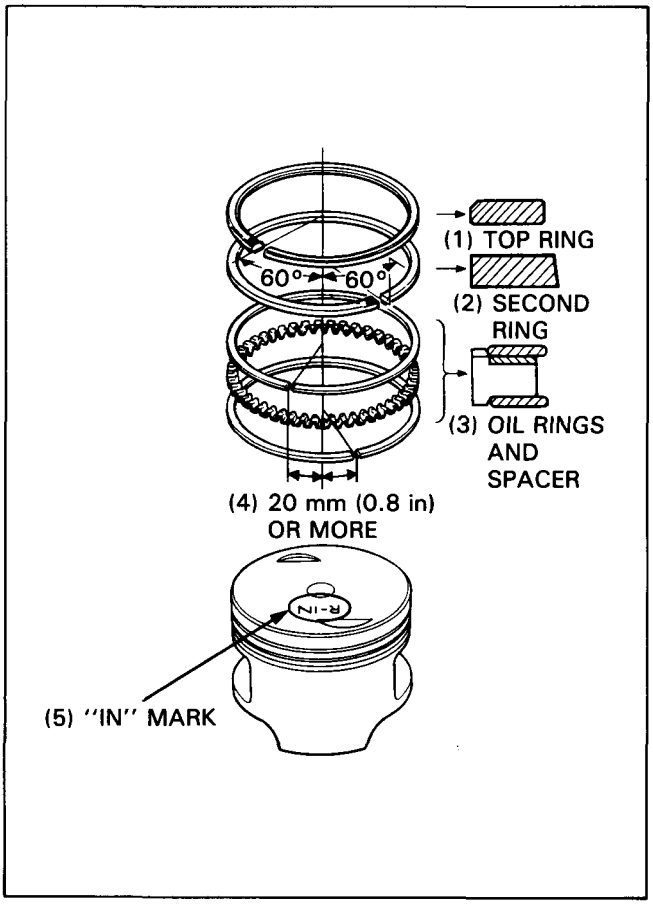
NOTE

- All rings should be installed with the markings toward the top of the piston. After installation they should be free to rotate in the piston ring grooves.
- Do not interchange the top and second ring.

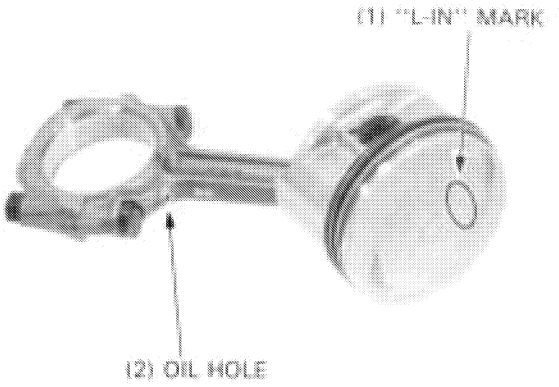
Stagger the top and second piston ring end gaps 60 degrees apart from "IN" mark as shown.
Stagger the oil ring and side rail end gaps as shown.

NOTE

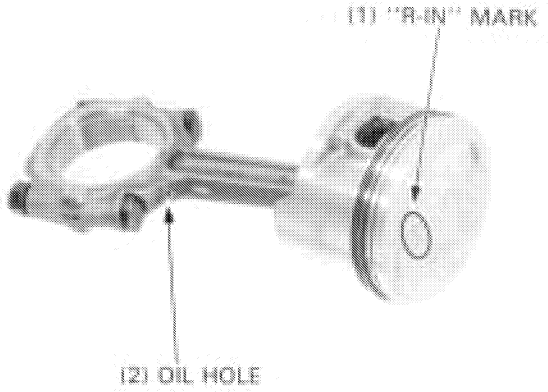
- For the installation of the oil rings and spacer, note that the right side piston is different from left side as shown.



Assemble the No. 2, No. 4 and No. 6 pistons and connecting rods so that the intake "L-IN" mark is opposite the oil hole in the rod.



Assemble the No. 1, No. 3 and No. 5 pistons and connecting rods so that the intake "R-IN" mark is facing the same direction as the oil hole in the rod.



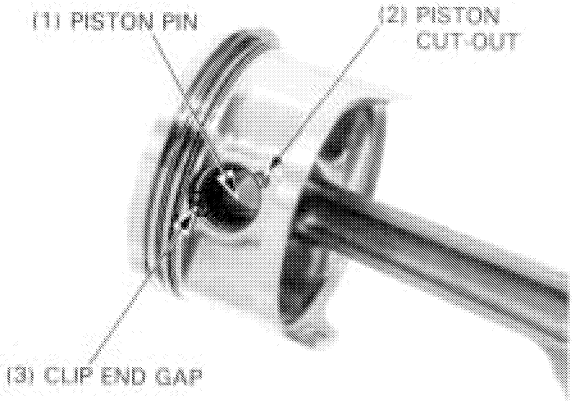
Apply molybdenum disulfide oil to the connecting rod small end.

Coat the piston pin with clean oil.

Install the piston pin into the piston and connecting rod small end with new pin clips.

NOTE

- Do not align the piston pin clip end gap with the piston cut-out.



Apply molybdenum disulfide oil to the crankpin bearings.

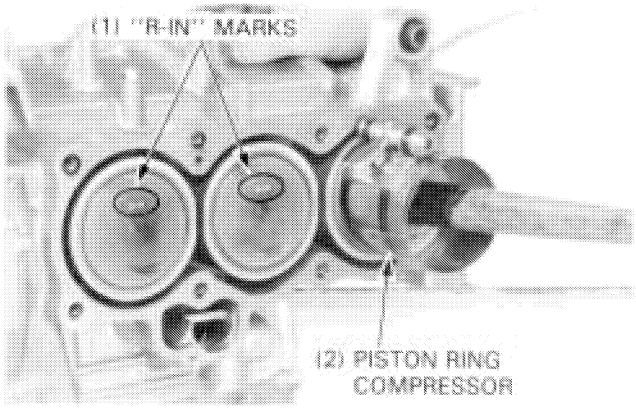
Install the right side rod assemblies in cylinders No. 1, 3 and 5 in their original positions.

NOTE

- To prevent crankshaft damage, slip short sections of rubber hose over the rod bolts before installation.
- Install the pistons so that the "R-IN" mark on the piston top is towards the top of the engine.

TOOL:

Piston Ring Compressor	**Equivalent commercially available.**



Apply molybdenum disulfide oil to the rod cap bearings.

Install the No. 1, 3 and 5 rod caps on the correct crankpins.

CAUTION

- *The bearing caps must be installed in their correct locations, or the bearing oil clearance may not be correct. This could cause engine damage.*

Apply oil to the rod cap nut flange and threads.
Tighten the nuts in a crisscross pattern in 2—3 steps.

TORQUE: 32 N·m (3.2 kg-m, 23 ft-lb)

Install the left side rod assemblies in cylinders No. 2, 4 and 6 in their original positions with "L-IN" marks towards the top of the engine.
Apply molybdenum disulfide oil to the crankpin bearings.
Apply oil to the rod cap nut flange and threads.

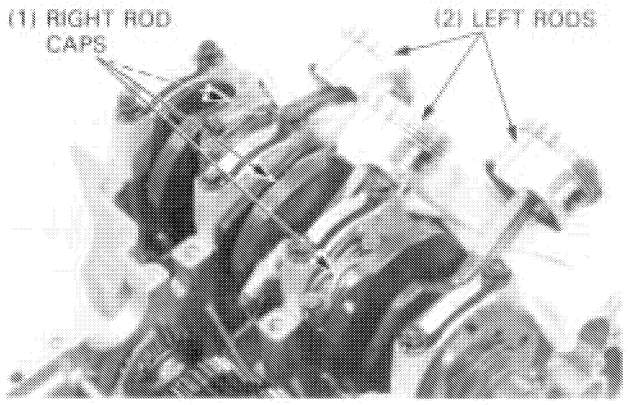
Install the No. 2, 4 and 6 rod caps on the correct crankpins.

Tighten the nuts in a crisscross pattern in 2—3 steps.

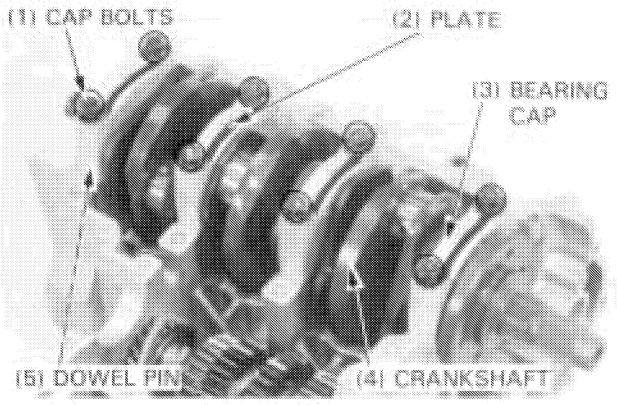
TORQUE: 32 N·m (3.2 kg-m, 23 ft-lb)

CRANKSHAFT REMOVAL

Separate the crankcases (page 10-8).
Remove the left side rod assemblies from the crankshaft (page 11-3).
Remove the right side rod bearing caps (page 11-3).



Remove the following:
— main bearing cap bolts.
— bearing cap plates.
— bearing caps.
— dowel pins.
— crankshaft.



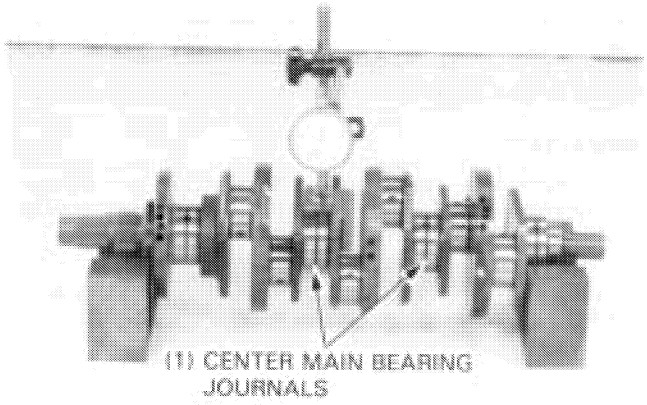
NOTE

- *Do not forcibly remove dowel pins from the bearing caps.*

CRANKSHAFT INSPECTION

Rest the crankshaft on Vee blocks. Set a dial indicator on the center main bearing journal. Rotate the crankshaft two revolutions and read the runout at two points. Divide the total indicator reading in half to get the actual runout.

SERVICE LIMIT: 0.03 mm (0.001 in)

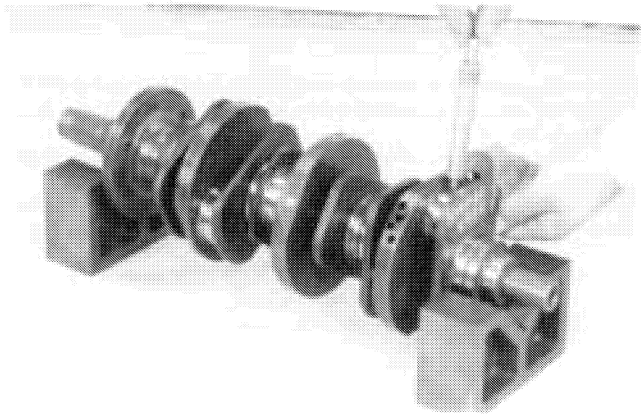


Measure the crankshaft main bearing journals and crankpins with a micrometer for out-of-round and taper.

SERVICE LIMIT:
Taper: 0.003 mm (0.0001 in)
Out-of-Round: 0.005 mm (0.0002 in)

NOTE

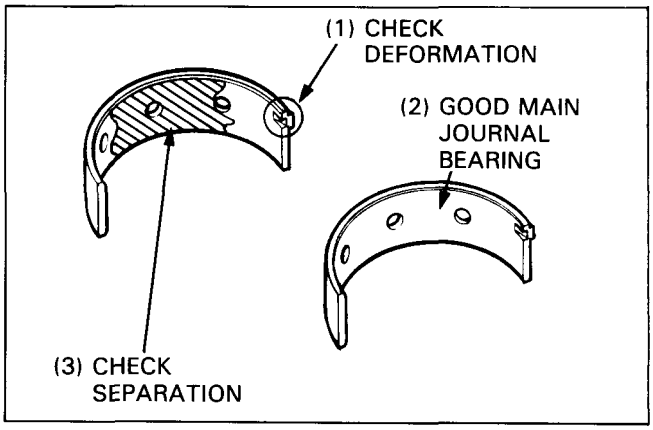
- The crankshaft cannot be repaired. Replace it if the journals or crankpins are burnt, cracked, or out of tolerance: or if the runout is beyond limits.



MAIN JOURNAL BEARING

OIL CLEARANCE INSPECTION

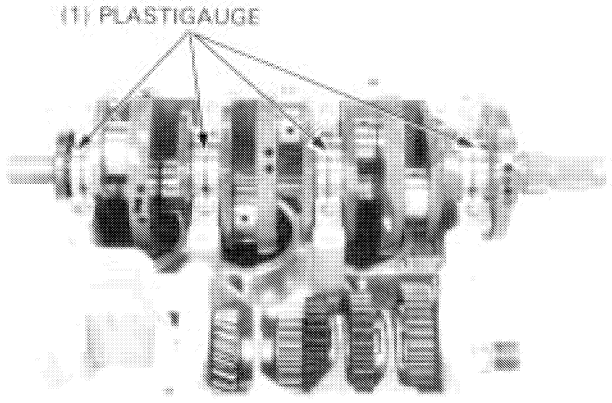
Inspect the bearings for scars, separation and damage on the bearing surfaces.
Inspect the bearing tab for deformation.



Put a piece of Plastigauge on each main journals.

NOTE

- Do not place Plastigauge over any oil holes.
- Do not rotate the crankshaft during the inspection.

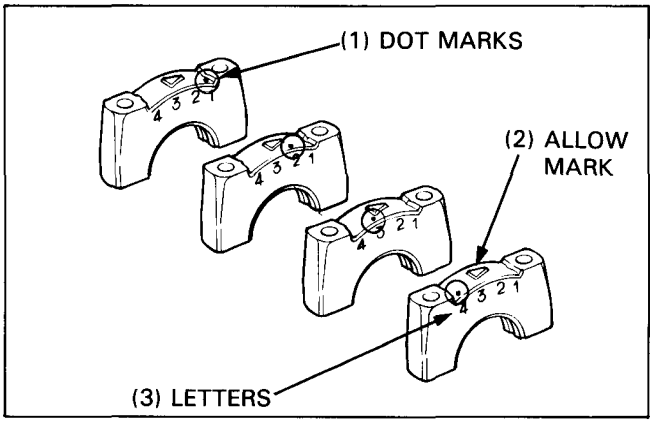


On the main journal bearings, install the main bearing caps and dowel pins on the correct journals.

NOTE

- The installation positions of the main bearing caps are identified with the dot marks aligned with the numerals 1, 2, 3 and 4: Viewed from the front side of the engine.

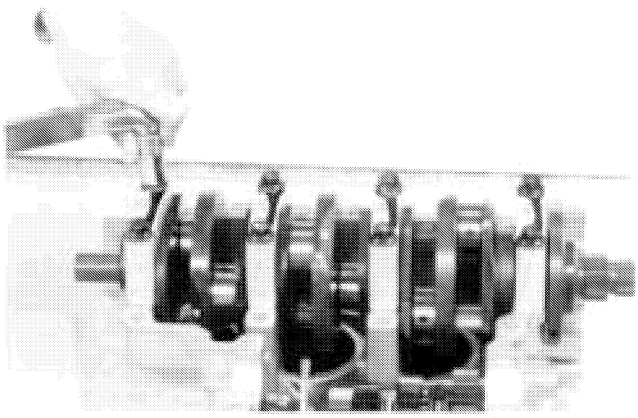
The allows on the caps should face toward the engine top.



Apply oil to the cap bolt threads and flange surfaces.

Tighten the cap bolts in a crisscross pattern in 2—3 steps.

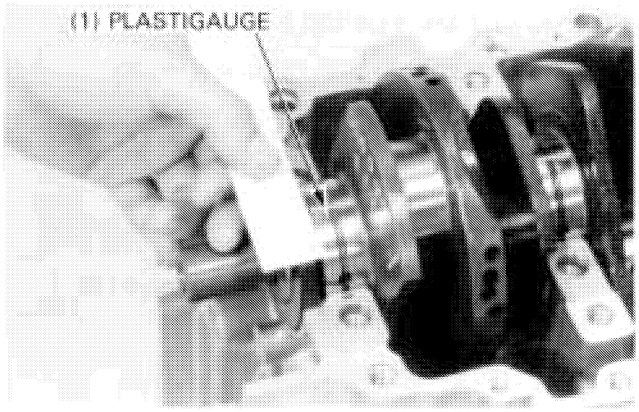
TORQUE: 60 N·m (6.0 kg-m, 43 ft-lb)



Remove the caps and measure the compressed Plastigauge on each main journals.

If the bearing clearance is beyond the service limit, select the correct replacement bearings.

SERVICE LIMIT: 0.06 mm (0.002 in)

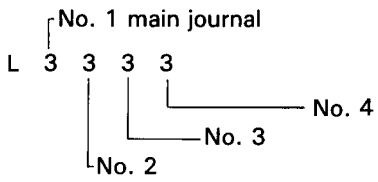


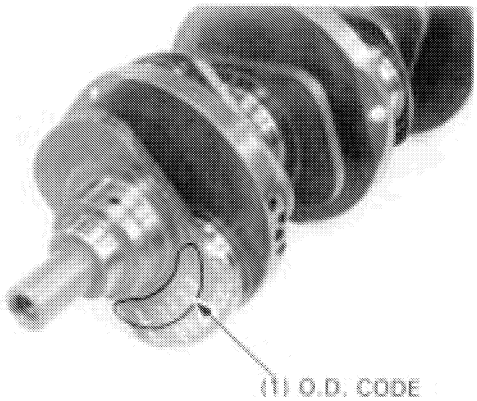
BEARING SELECTION

Record the crankshaft main journal O.D. code numbers. Codes may 1, 2, or 3.

NOTE

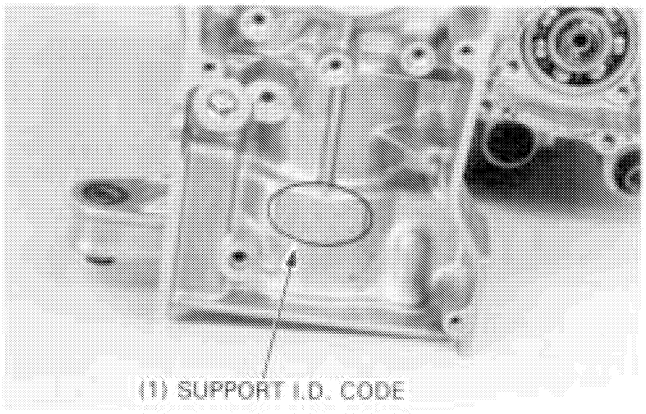
- Example:





Record the corresponding engine crankcase bearing support I.D. codes from the pad on the right side crankcase. Codes may be I, II, or III.

The letter 1, 2; 3 and 4 stand for crankshaft main journal from the front.



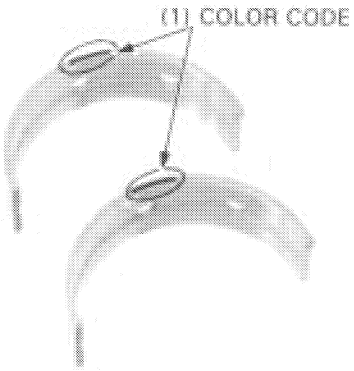
Cross reference the bearing support and main journal codes to determine the correct replacement bearing color.

(1) Main bearing selection table

(2) Crankcase Bearing Support I.D. Codes				
	III	BROWN	BLACK	BLUE
	II	GREEN	BROWN	BLACK
	I	YELLOW	GREEN	BROWN
		1	2	3
		(3) Crankshaft main journal O.D. Codes		

Bearing insert Thickness, mm (in)

Blue	**2.012—2.015**	**(0.07921—0.07933)**
Black	**2.009—2.012**	**(0.07909—0.07921)**
Brown	**2.006—2.009**	**(0.07898—0.07909)**
Green	**2.003—2.006**	**(0.07886—0.07898)**
Yellow	**2.000—2.003**	**(0.07874—0.07886)**



CAUTION

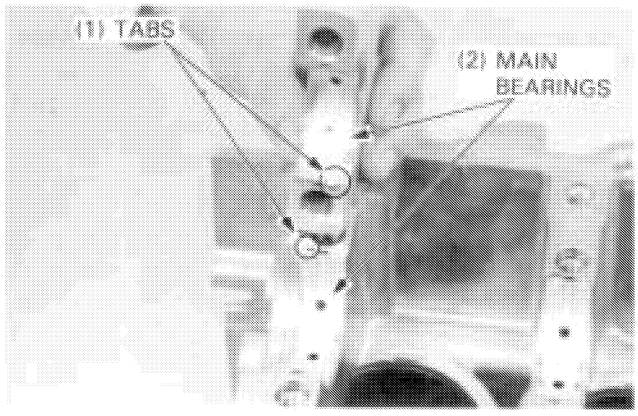
- *After selecting new bearings, recheck clearance with Plastigauge. Incorrect clearance can cause major engine damage.*

BEARING INSTALLATION

Clean oil off bearing outer surfaces, bearing caps and right case.

Install the main bearings onto the right crankcase and bearing caps.

Apply molybdenum disulfide oil to the main bearing surfaces.

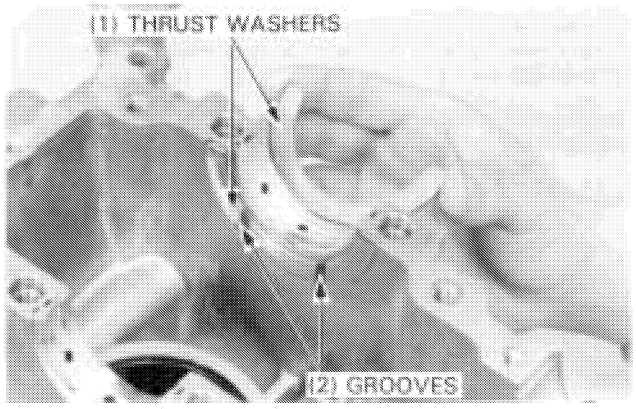


CAUTION

- *Make sure the bearing tabs should be aligned with the grooves on the case and caps.*

CRANKSHAFT INSTALLATION

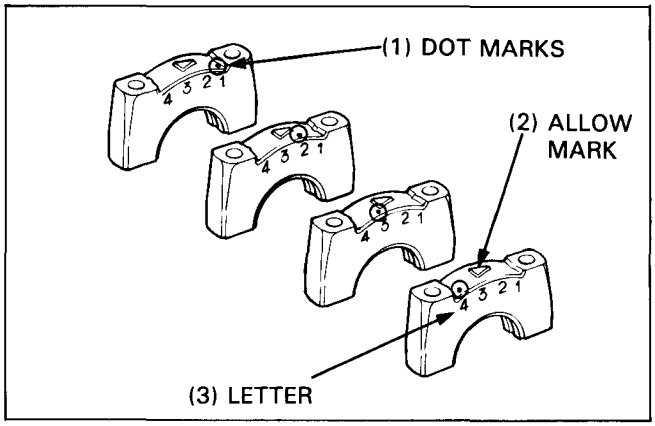
Inspect the thrust washers for scoring or discoloration. Replace, if necessary.
Install the thrust washers with groove sides facing out.



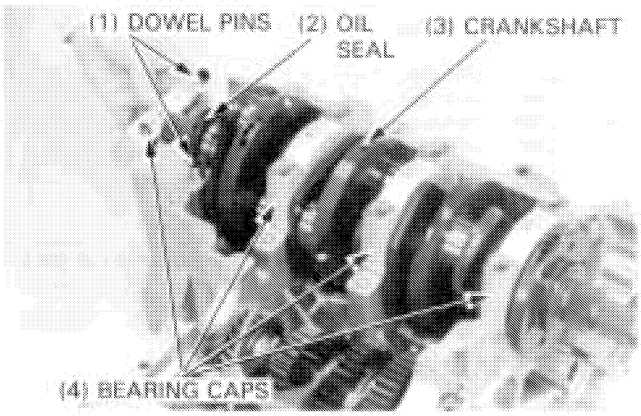
The installation position of the main bearing caps are identified with the dot mark that is aligned with the numeral of cap sides.

Numeral 1, 2, 3 and 4: Viewed from the front side of the engine.

Each cap should be installed with its arrow mark pointing toward the engine top.



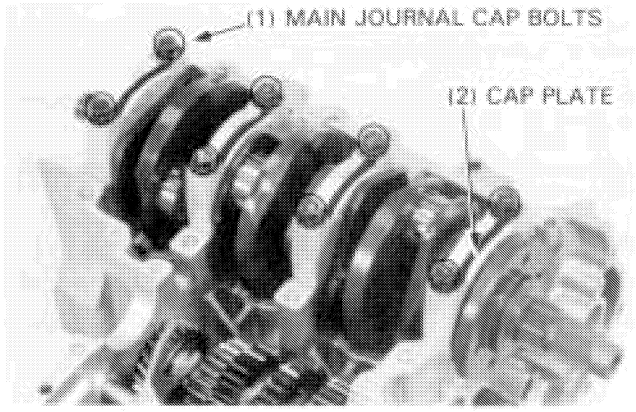
Install the crankshaft.
Install the oil seal with lip side facing inside.
Install the dowel pins and main bearing caps, noting cap installation procedure mentioned in the previous step.



Apply oil to the main journal cap bolt threads and flange surfaces.

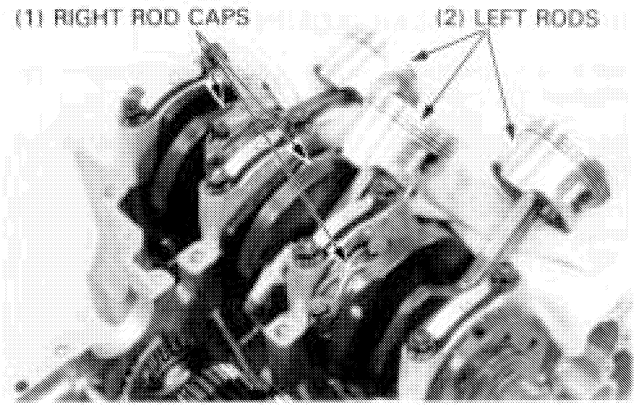
Install the bearing cap plates and cap bolts.
Tighten the bolts in a crisscross pattern in 2—3 steps.

TORQUE: 60 N·m (6.0 kg-m, 43 ft-lb)



Install the following:
— right side rod bearing caps (page 11-10).
— left side rod assemblies (page 11-10).

Assemble the crankcase (page 10-16).



SERVICE INFORMATION

GENERAL

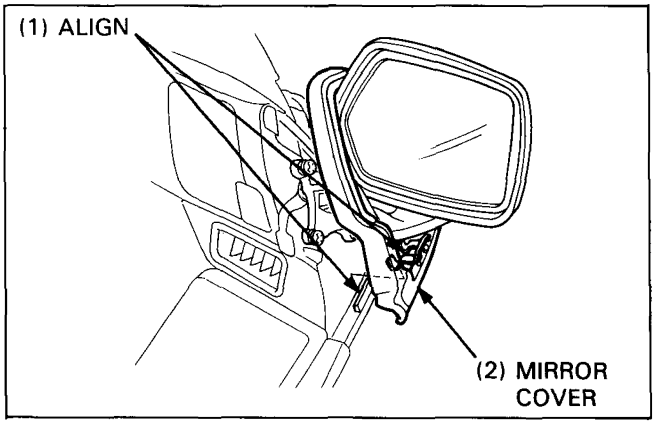
- This section instruct you in the component removal. Installation is in the reverse order of removal, unless noted otherwise. When removing a cover, be careful not to damage any tab or groove of a cover.

12

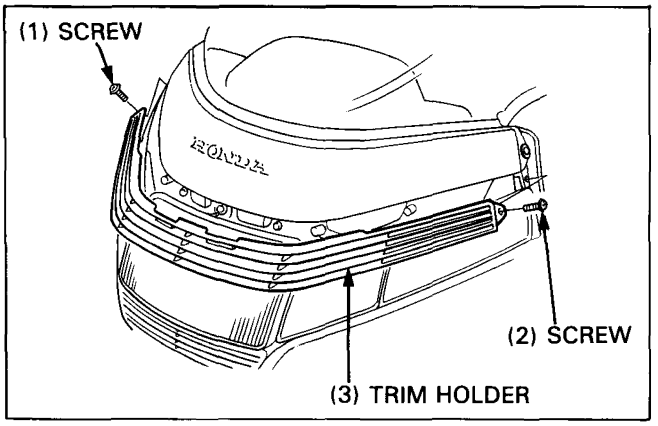
WINDSHIELD

REPLACEMENT

Release the spring clamp from the fairing groove and free the mirror covers.

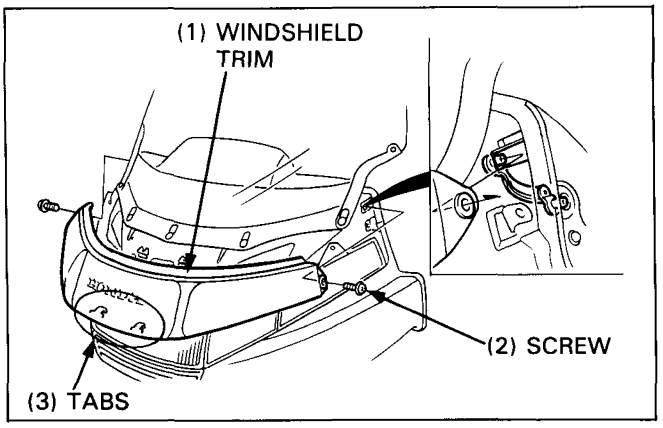


Remove two screws and trim holder.



Remove two screws and remove the windshield trim from the windshield height adjustment lever tension plate.

Free the trim tabs from the fairing grooves and remove the trim from the fairing.



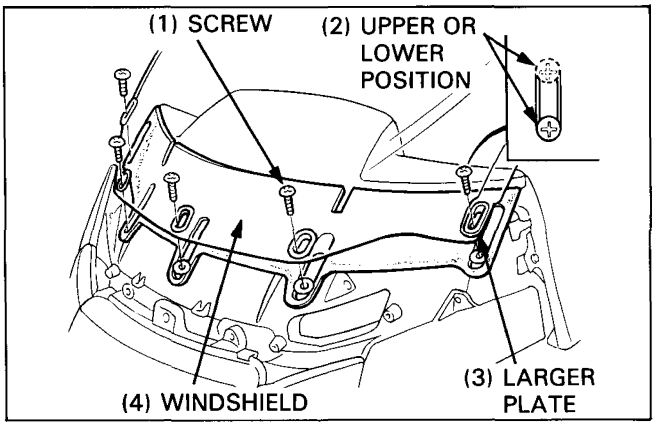
Remove the screws and windshield.

Install a new windshield. Install the setting plates onto the holes of the windshield and tighten the screws securely.

NOTE

- Position two larger setting plate on both ends.
- Make sure the windshield could be moved up and down to the desired position.

Position all screws in the same (upper or lower) position.
Install the remaining parts in the reverse order of removal.

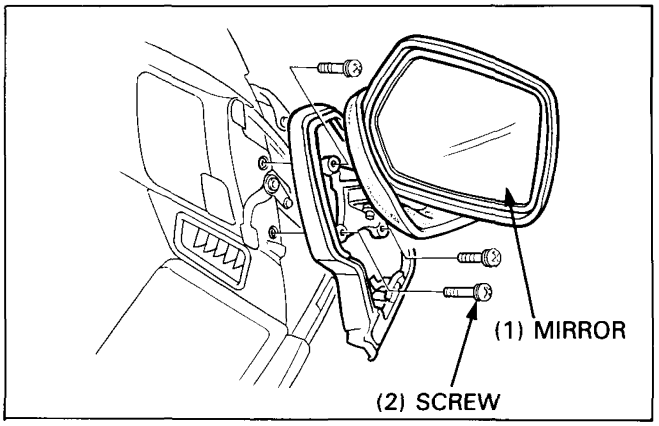


WINDSHIELD LEVER ADJUSTMENT

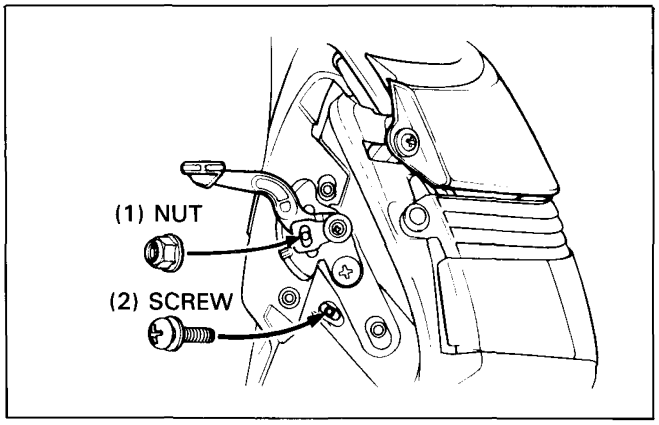
NOTE

- If the lever is removed, adjust the lever as follows:

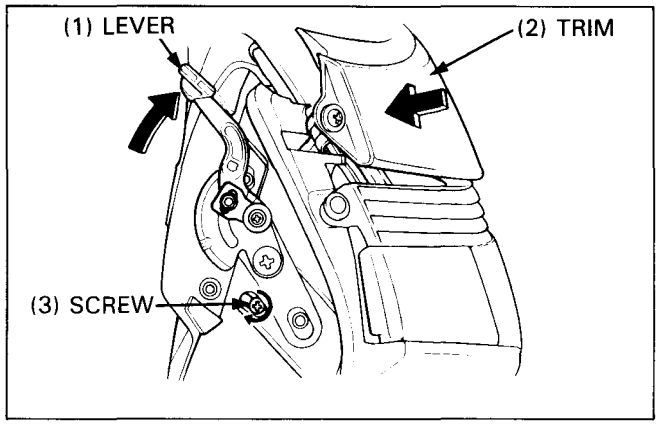
STEP 1:
Install the windshield (above).
Remove three screws and mirror (each side).



STEP 2:
Loose the nut and screw as shown (each side).
Position the nut stud and screw hole at the center of the sliding holes (each side).
Temporarily tighten the nut (each side).
Temporarily tighten the screw on the other side.
(Do not tighten the screw on the adjusted side.)



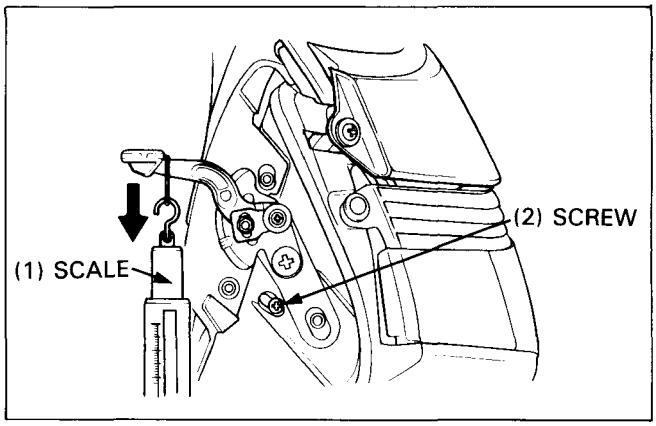
STEP 3:
Set the lever at the upper position.
Push the windshield trim and, at the same time, tighten the screw as shown.



STEP 4:
Set the other side lever at the lower position, and measure the windshield lever preload.
The scale should average 6.0—7.0 kg (13.23—15.43 lb) for the heaviest preload.

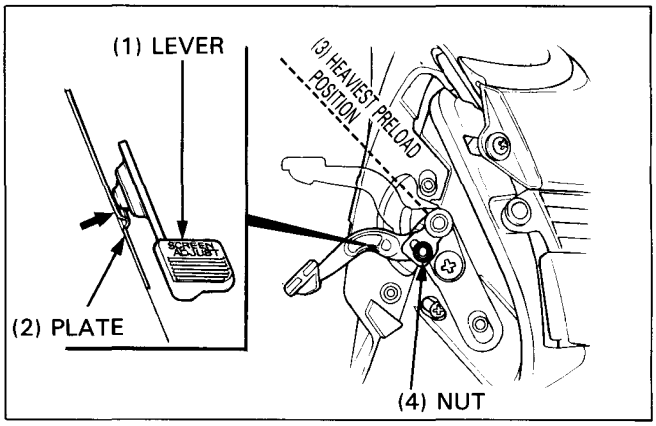
If the preload is not within above specification, loosen the screw and return to STEP 3.

For the other side windshield lever, perform the STEP 3 and 4.

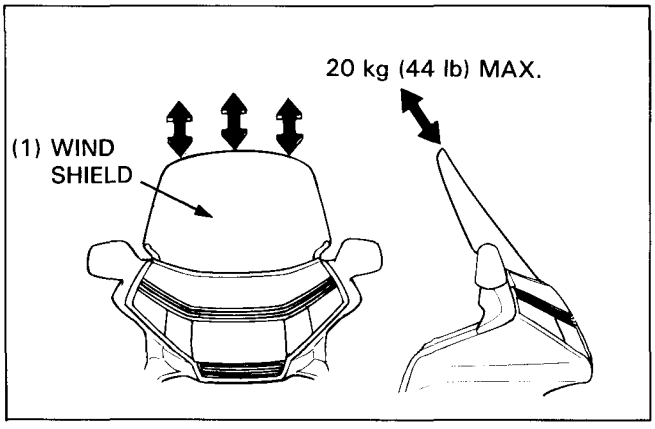


STEP 5:
Set the lever at the heaviest preload position.
Loosen the nut and align the tabs of the lever and plate as shown.
Tighten the nut securely.

For the other side windshield lever, perform the STEP 5.



STEP 6:
Make sure the lever should be operated smoothly.
Make sure the windshield does not move up and down, with each lever at the lower position, by applying a force which does not exceed 20 kg (44 lb).

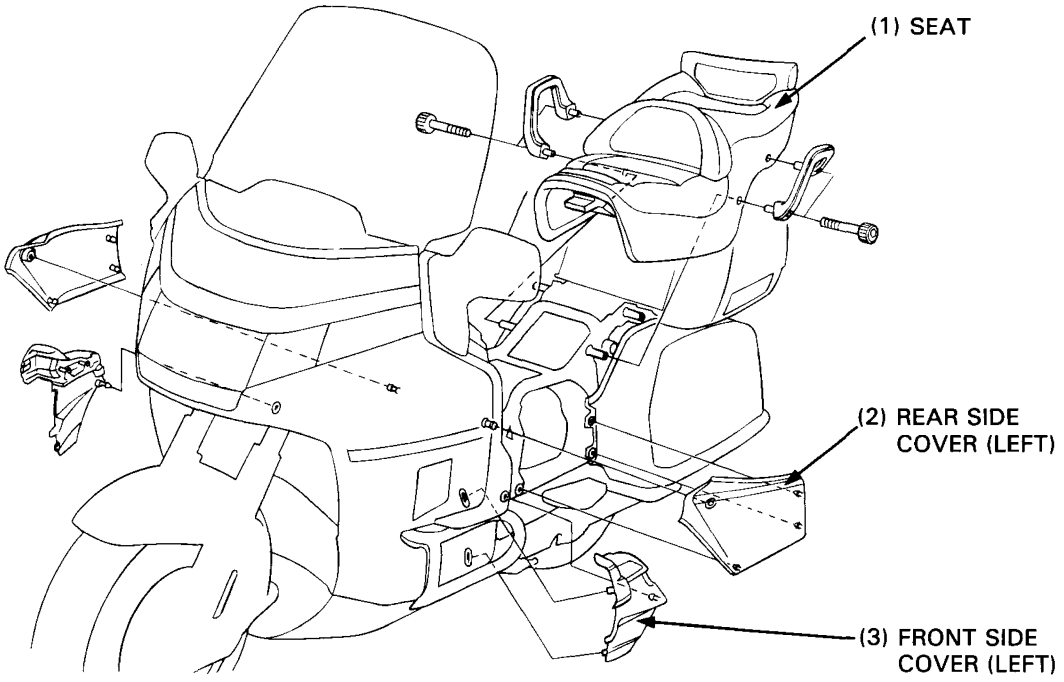


FAIRING

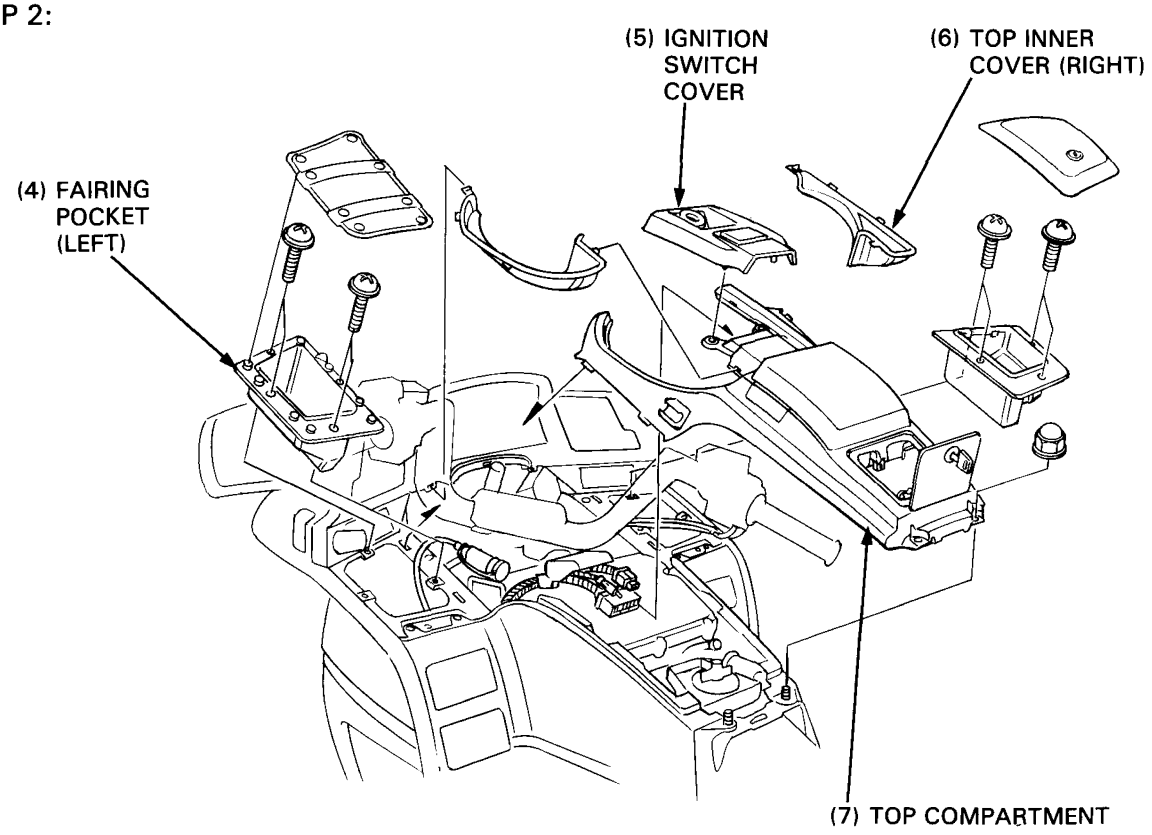
NOTE

- Remove the fairing following STEP 1 through STEP 4. For detailed instructions, see page 12-6 through page 12-10.

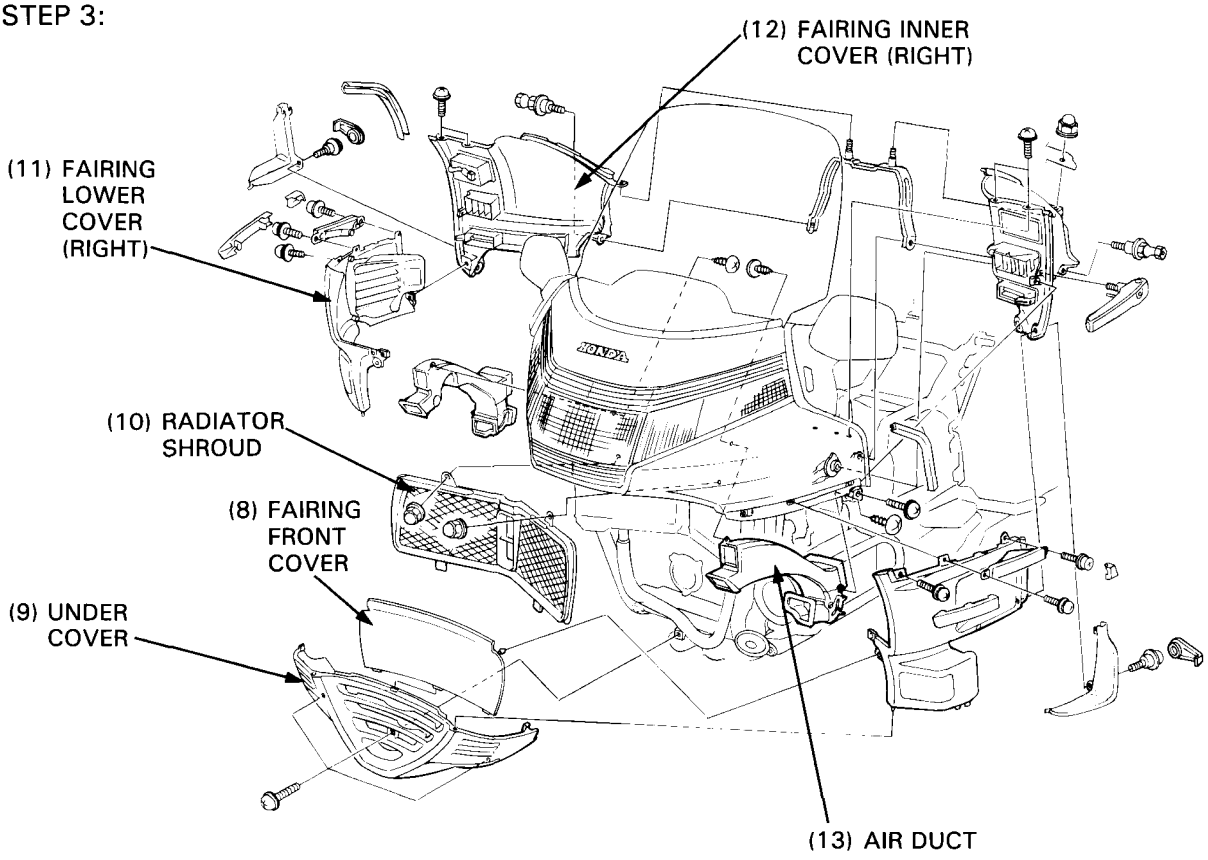
STEP 1:



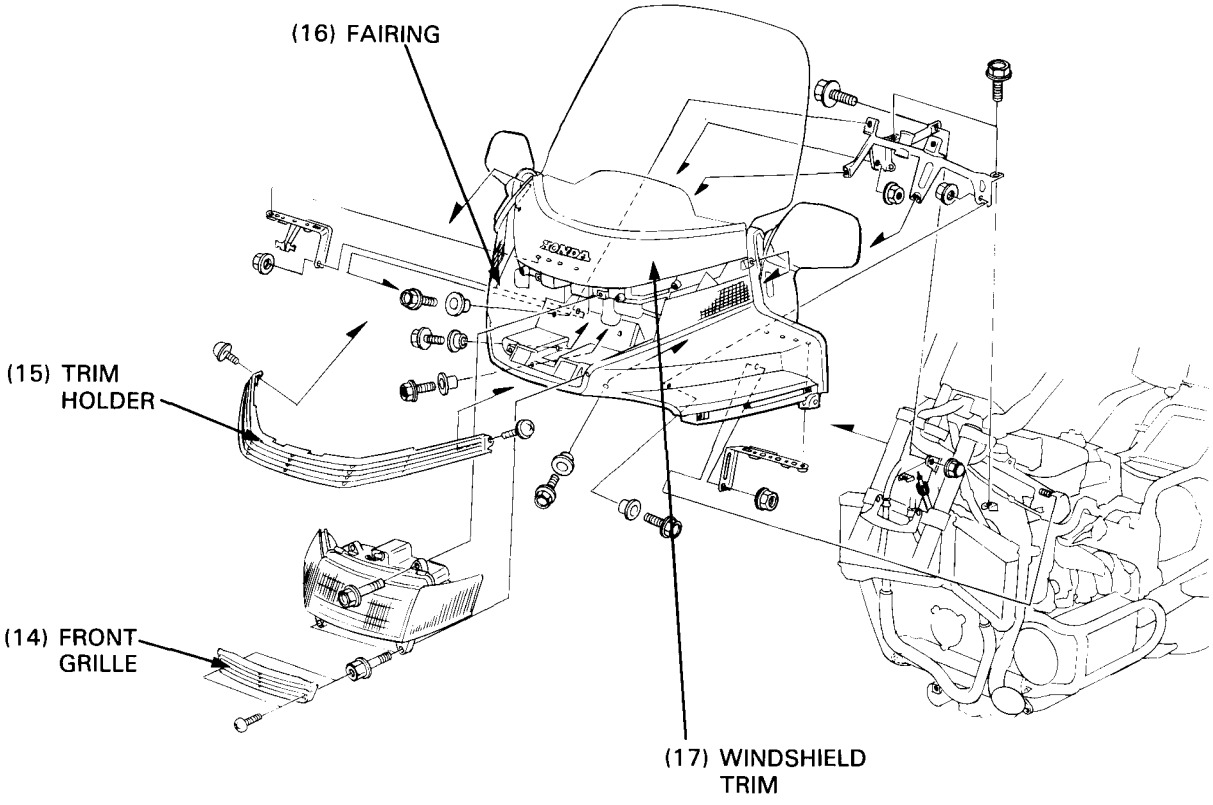
STEP 2:



STEP 3:

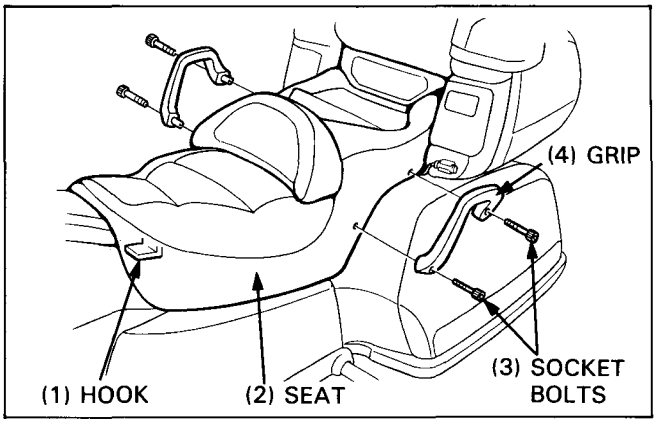

(12) FAIRING INNER COVER (RIGHT)
(11) FAIRING LOWER COVER (RIGHT)
(10) RADIATOR SHROUD
(8) FAIRING FRONT COVER
(9) UNDER COVER
(13) AIR DUCT

STEP 4:


(16) FAIRING
(15) TRIM HOLDER
(14) FRONT GRILLE
(17) WINDSHIELD TRIM

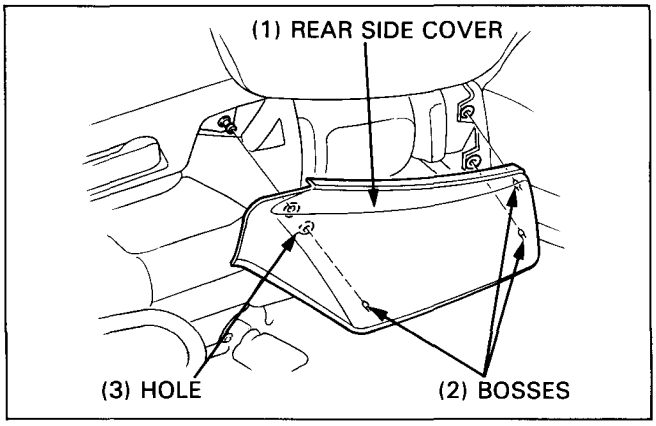
SEAT

Remove the four socket bolts and grips.
Release the hook under seat from the top compartment bracket and remove the seat.



REAR SIDE COVER

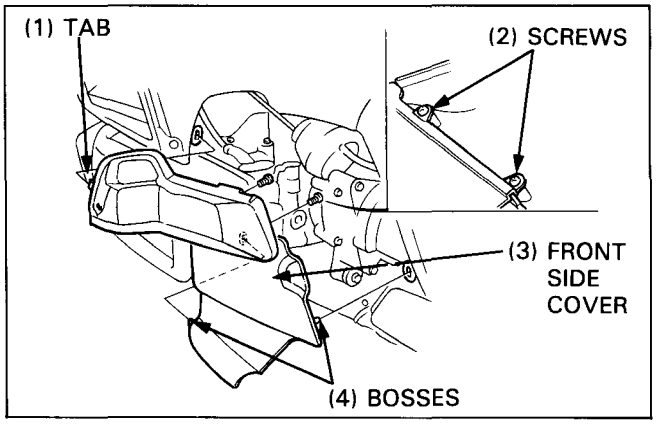
Release three bosses of the cover from frame rubber holes and free the rubber hole from the top compartment bracket bolt.
Remove the rear side cover.



FRONT SIDE COVER

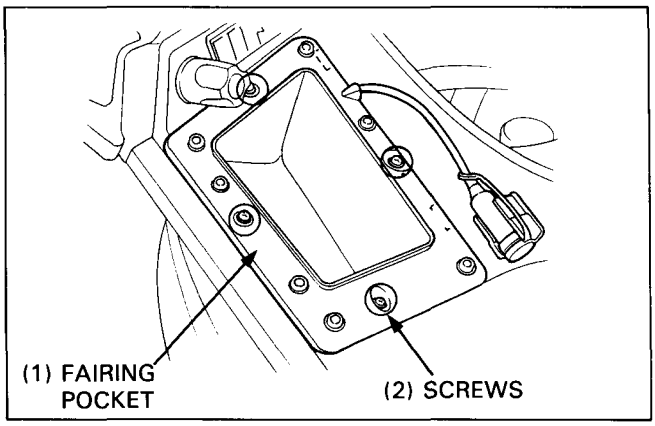
Release two bosses of the cover from frame rubber holes and release the cover front tab from the fairing inner cover groove.
Remove the front side cover.

Remove the screws and separate the cover.



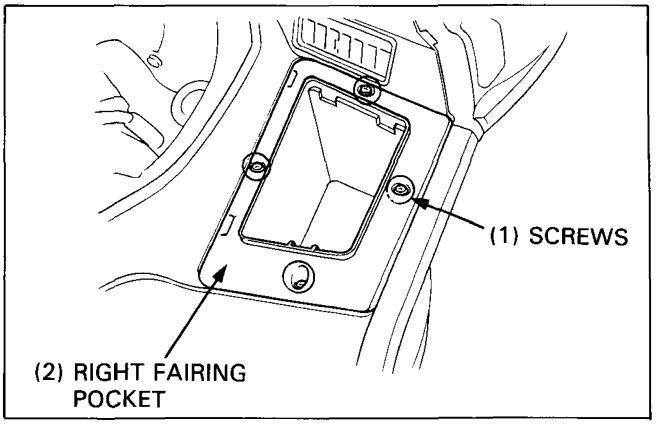
LEFT FAIRING POCKET

Remove four screws and left fairing pocket.



RIGHT FAIRING POCKET

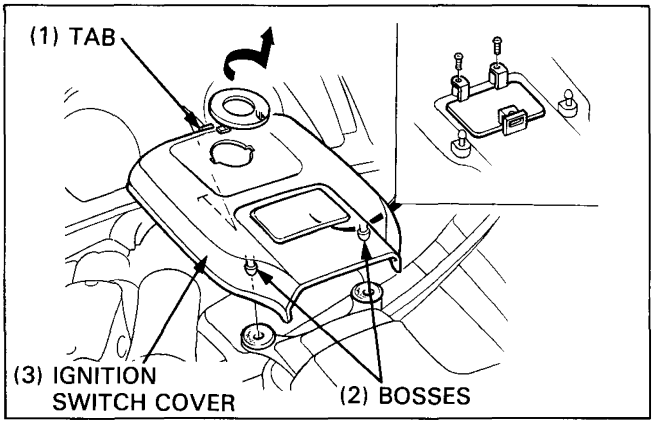
Remove the pocket cover with the ignition switch key, and remove the four screws and right fairing pocket.



IGNITION SWITCH COVER

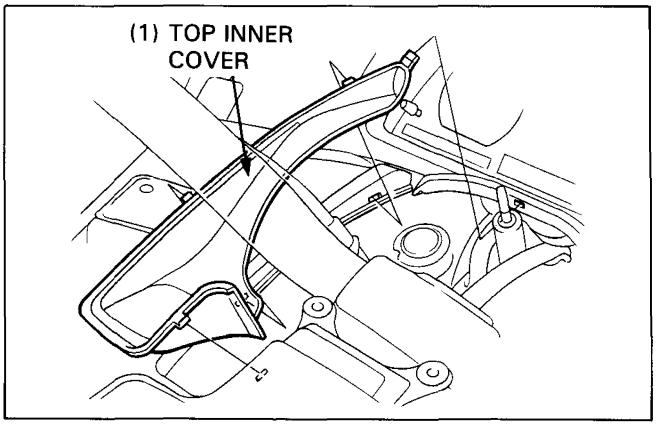
Release two bosses of the cover from the top compartment rubber holes and release the cover front tab from the instrument panel.

Remove the ignition switch cover.



TOP INNER COVER

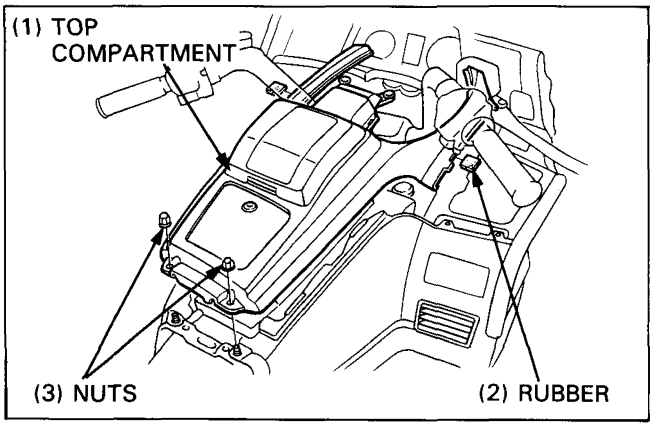
Remove the top inner cover by releasing tabs from the fairing.



TOP COMPARTMENT

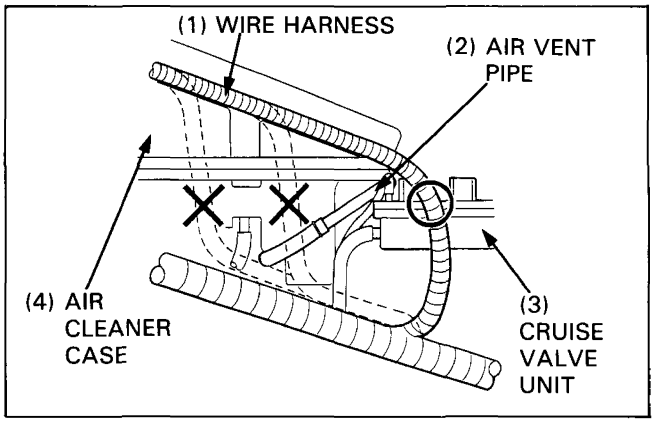
Remove the following.
- fairing pockets (above).
- ignition switch cover (above).
- top inner covers (above).
- seat (previous page).

Remove the cap nuts and top compartment.
Remove the compartment rubbers.



CAUTION

- *Route the radio/cassette deck wire harness properly as shown.*

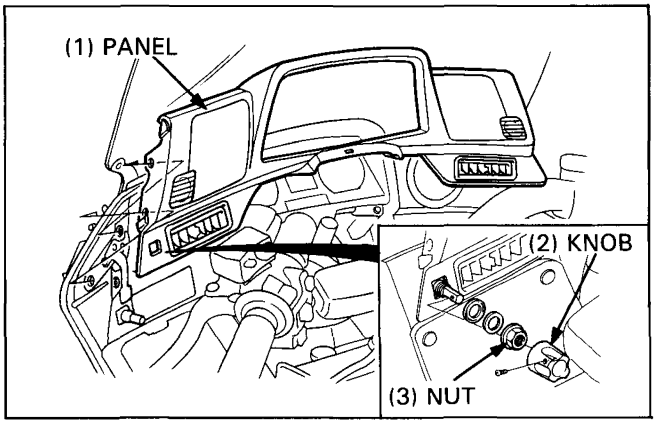


INSTRUMENT PANEL

Remove the following:
— top compartment (previous page).
— rear view mirror (page 12-2/windshield lever adjustment).
— headlight vertically adjusting knob, plastic nut and washers.

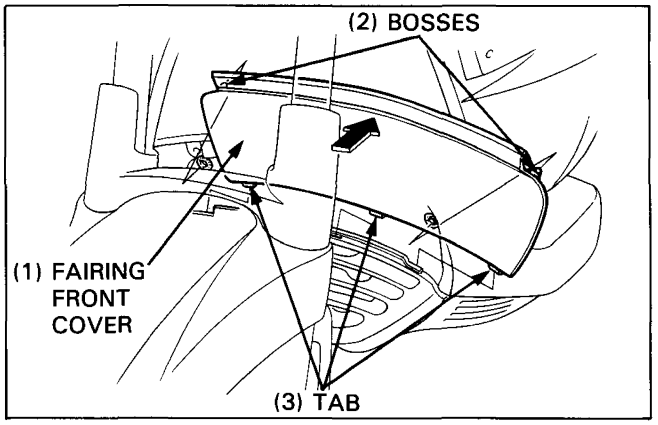
Except SW model:
Set the windshield lever at the upper position, and release the windshield trim from the windshield.

Remove the instrument panel from the fairing.



FAIRING FRONT COVER

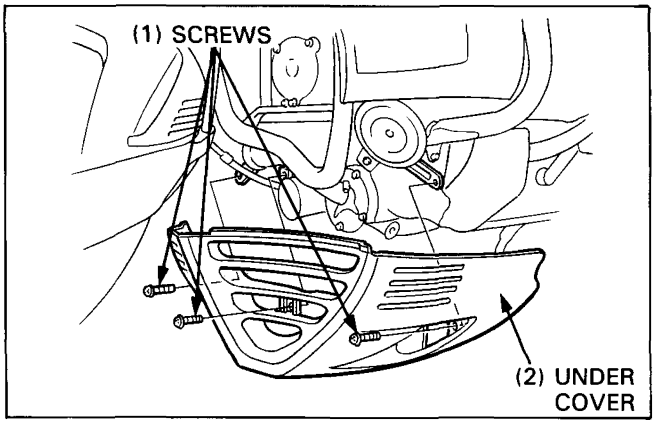
Release two bosses of the cover from the rubber holes of the fairing lower covers by pressing in on the middle area along the top of the fairing front cover. Release the cover lower tabs from the under cover grooves.
Remove the fairing front cover.



UNDER COVER

Remove the following:
— fairing front cover (above).

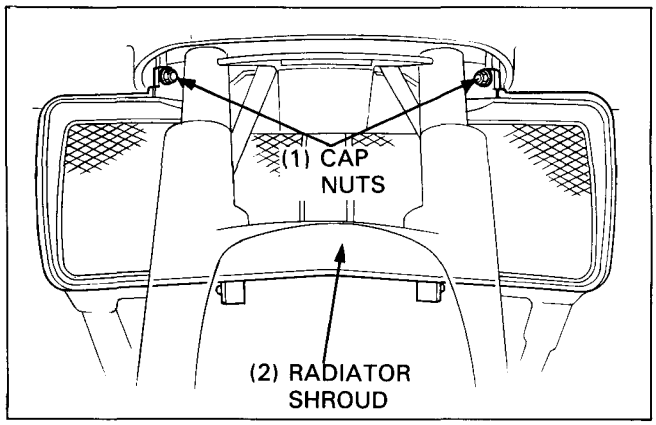
Remove three screws and under cover.



RADIATOR SHROUD

Remove the following:
— fairing front cover (previous page).

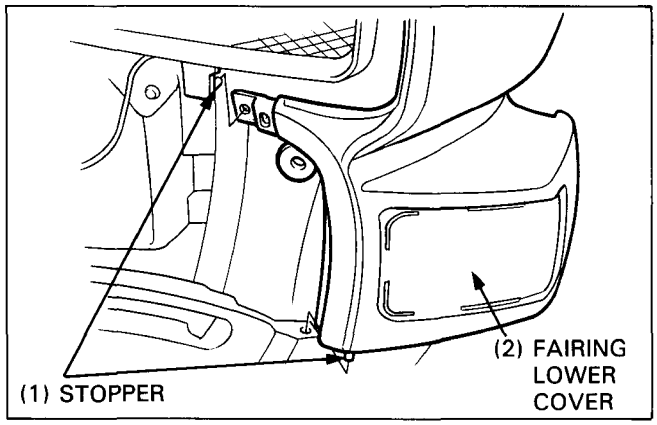
Remove two cap nuts.
Remove the radiator shroud.



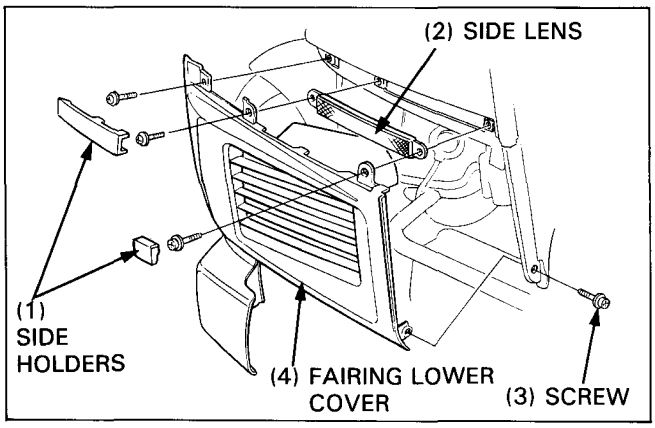
FAIRING LOWER COVER

Remove the following:
— fairing front cover (previous page).

Release the stoppers of the cover and radiator shroud from the under cover hole.



Remove the side holders.
Remove four screws, fairing lower cover and side lens.



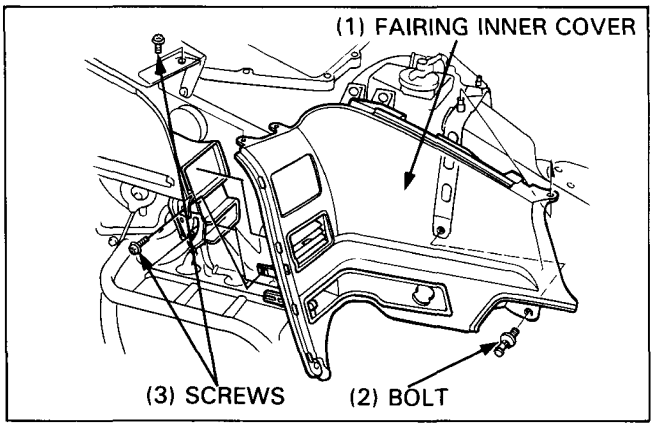
FAIRING INNER COVER

Remove the following:
— seat (page 12-6).
— fairing pocket (page 12-6, 7).
— ignition switch cover (page 12-7).
— top inner covers (page 12-7).
— top compartment (page 12-7).
— fairing front cover (previous page).
— fairing lower cover (above).

Remove three screws and bolt, and remove the fairing inner cover.

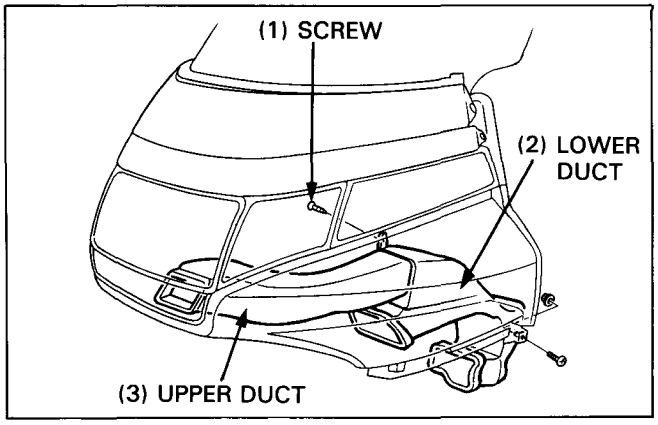
NOTE

- When removing the left fairing inner cover, first remove the reverse lever (page 19-30).



AIR DUCTS

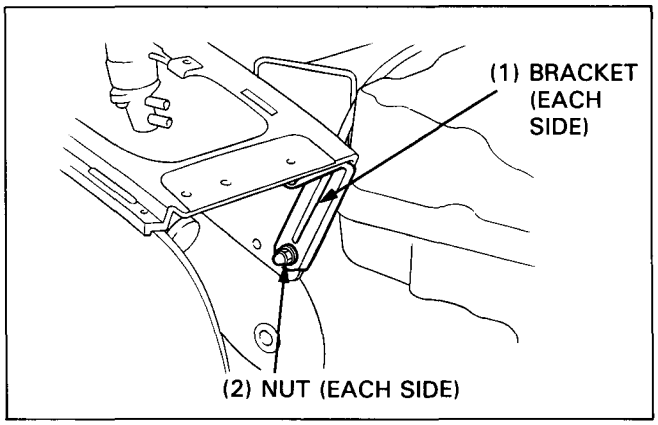
Remove the fairing inner cover (previous page).
Remove two screws and lower air duct from the fairing.
Remove the upper air duct from the fairing.



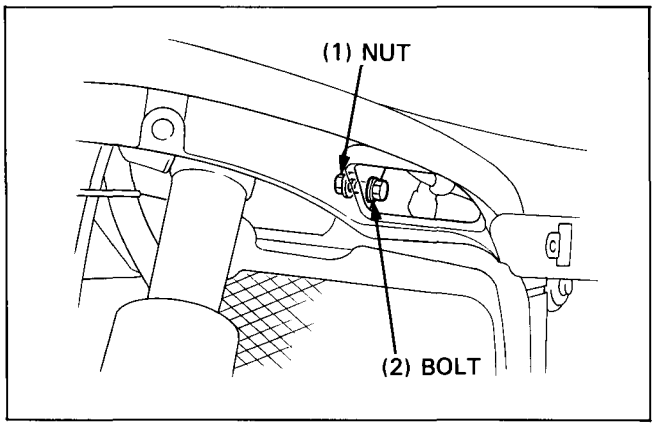
FAIRING

Remove the fairing inner covers (previous page) and air ducts (see above).
Remove the headlight (page 22-10).

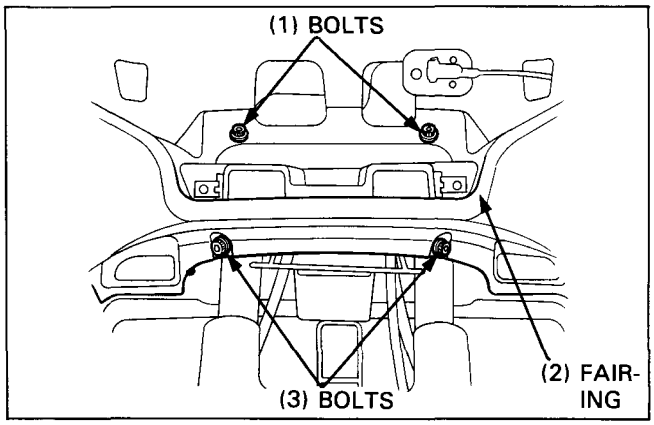
Remove the nut and solenoid valve bracket (each side).
Disconnect the instrument wire harness connectors.



Remove the fairing inner bolt and nut (each side).



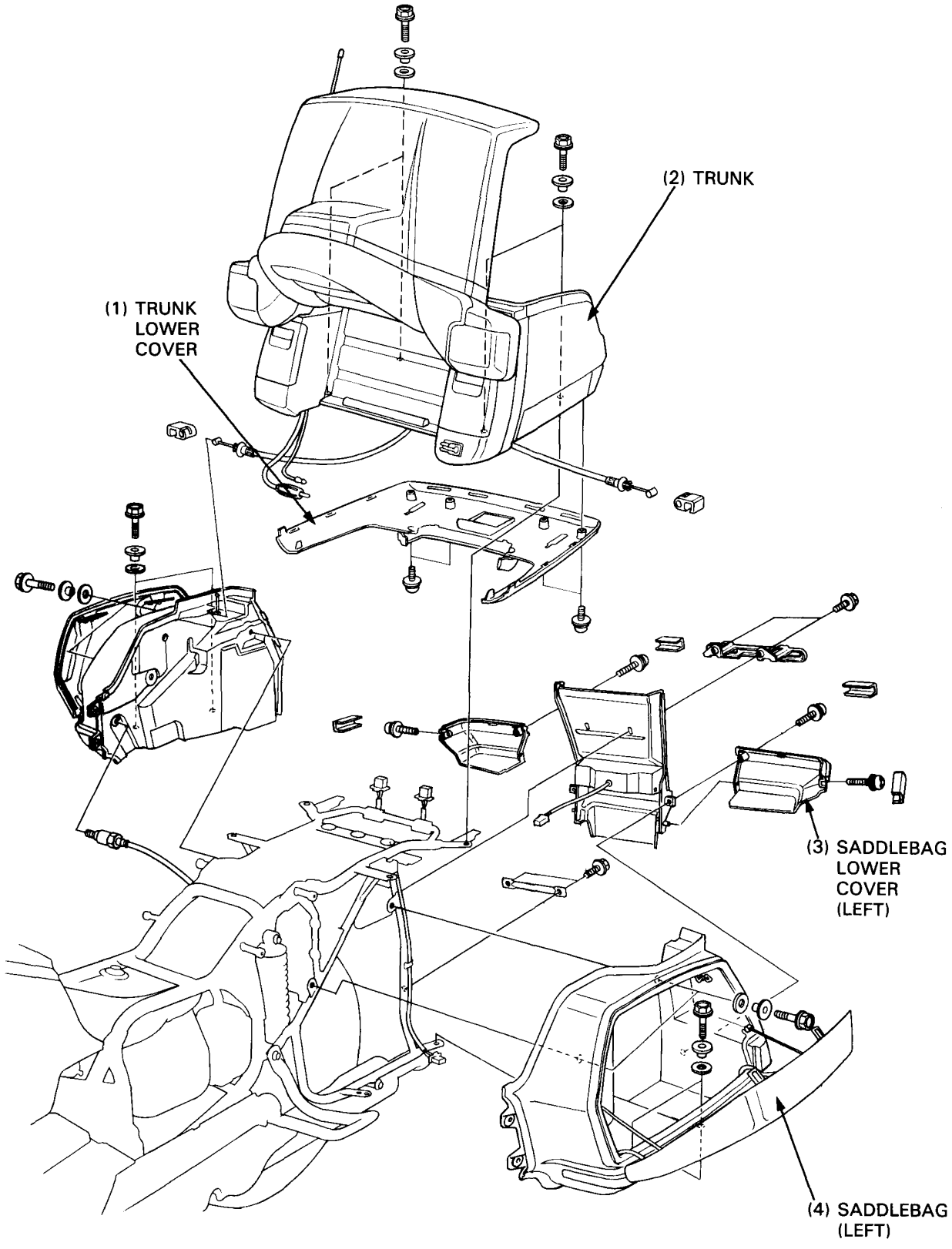
Remove four bolts and fairing from the frame.



TRUNK/SADDLEBAG

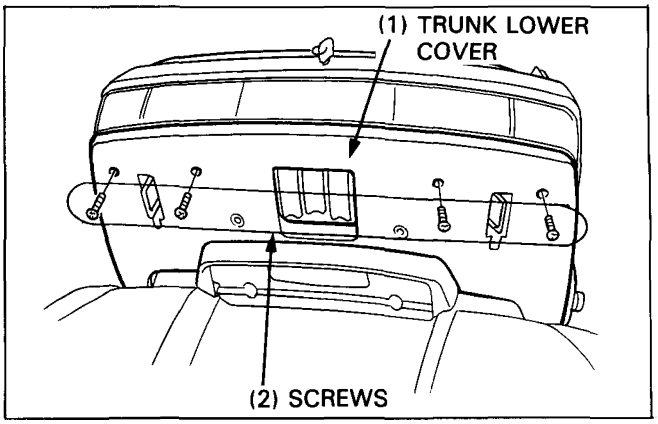
NOTE

- For detailed removal instructions, see page 12-12 through page 12-13.



TRUNK LOWER COVER

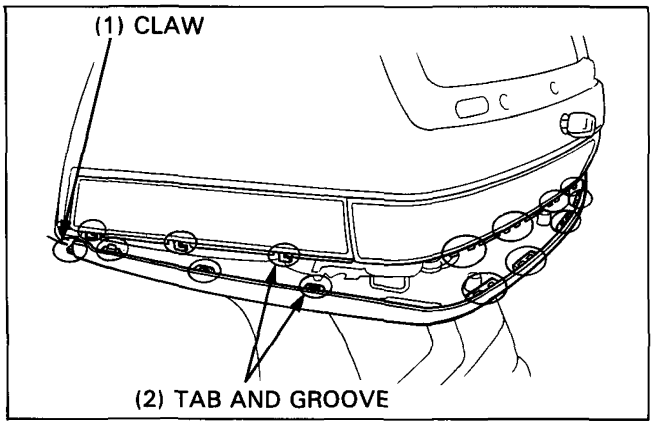
Remove four screws as shown.



Release the grooves of the cover from the trunk tabs.
Remove the trunk lower cover.

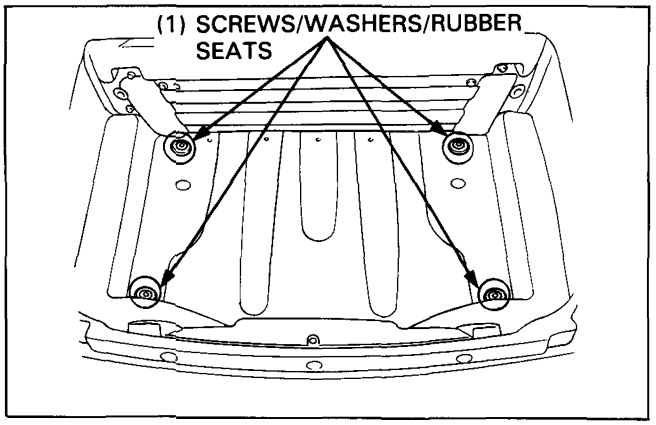
NOTE

- When installing the trunk lower cover, install the front claw of the cover into the trunk first, then align the trunk tabs with the lower cover grooves securely.



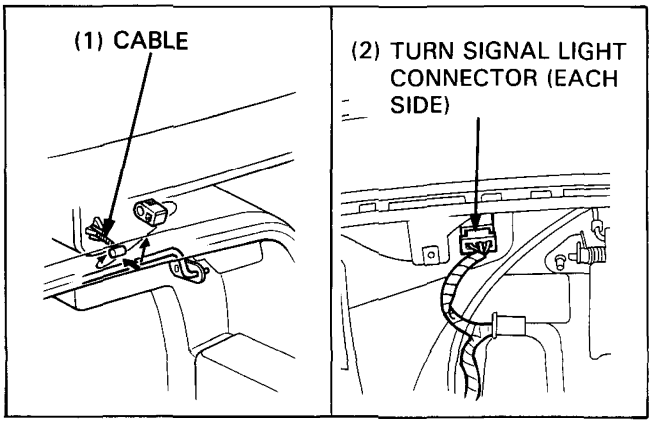
TRUNK

Remove the trunk lower cover (above).
Remove the screws, washers and rubber seats.



Disconnect the turn signal light wire connectors.

Open saddlebags and disconnect the opener cables from the cable stopper.
Remove the trunk.

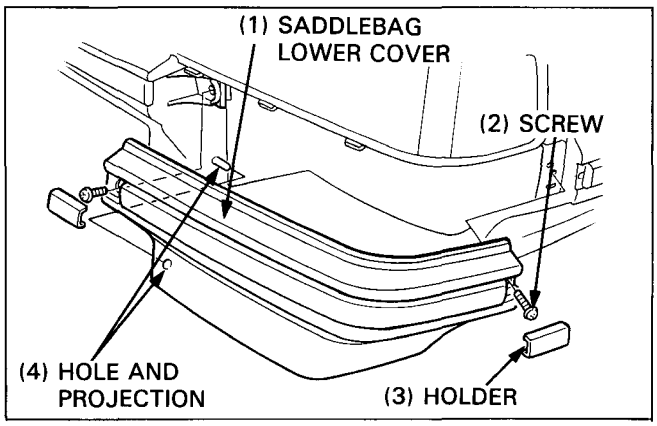


SADDLEBAG LOWER COVER

Remove the screw holders.
Remove two screws and saddlebag lower cover from the saddlebag.

NOTE

- When installing the saddlebag lower cover, aligning the hole with projection.



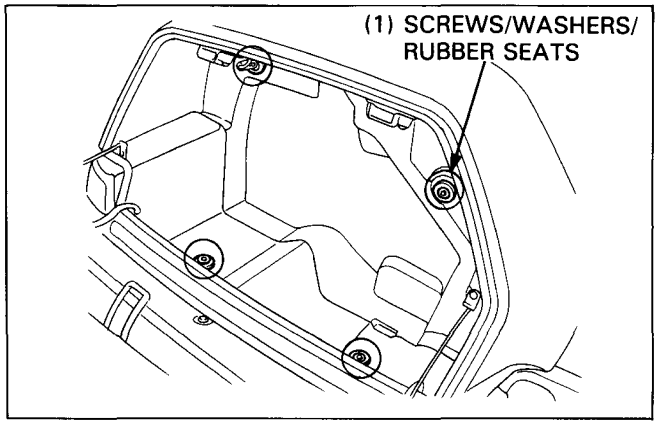
SADDLEBAG

Remove the following:
— trunk lower cover (previous page).
— saddlebag lower cover (above).

Disconnect the opener cables from the cable stopper (previous page).
Remove the screws, washers and rubber seats.
Remove the saddlebag.

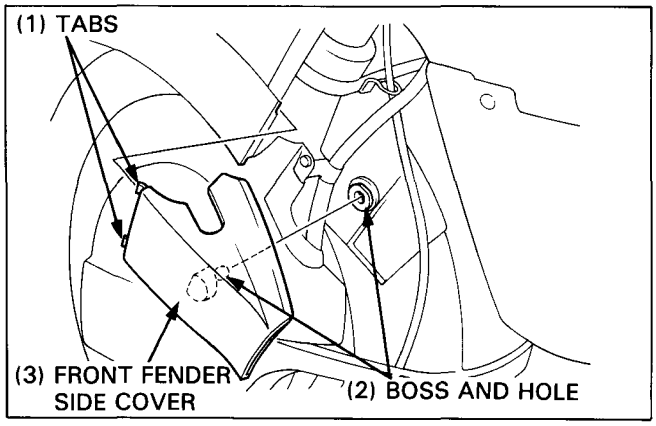
NOTE

- For right saddlebag removal, remove the outlet valve (On-board Air Compressor System).



FRONT FENDER

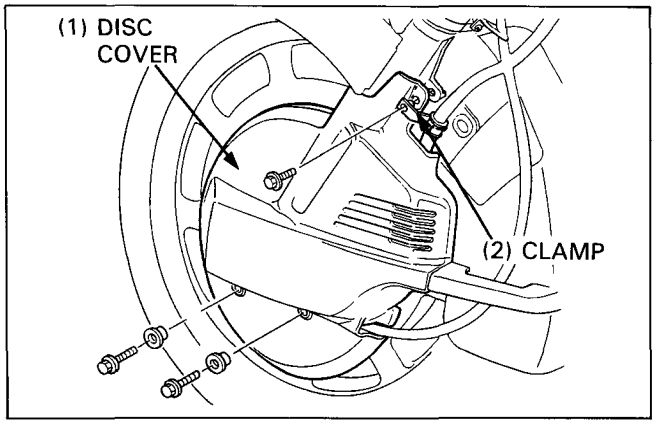
Release the boss from the fender rubber hole.
Release two tabs from the fender grooves and remove the front fender side cover (each side).



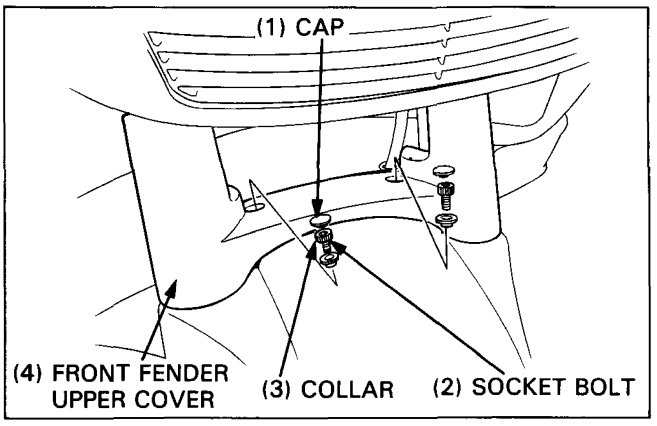
Remove three bolts and collars, and remove the disc cover (each side).

NOTE

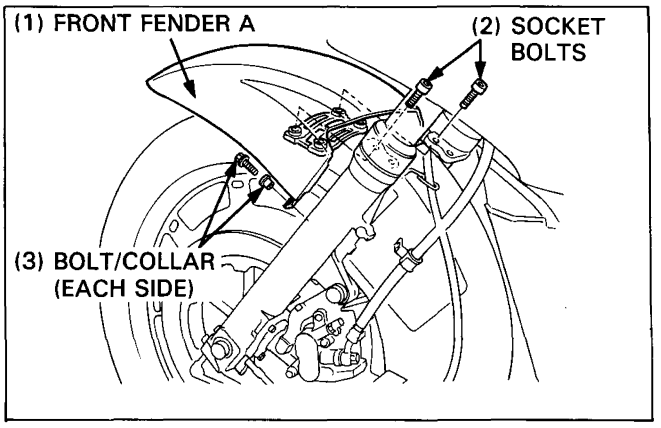
- The upper bolt does not have a collar. See the illustration.



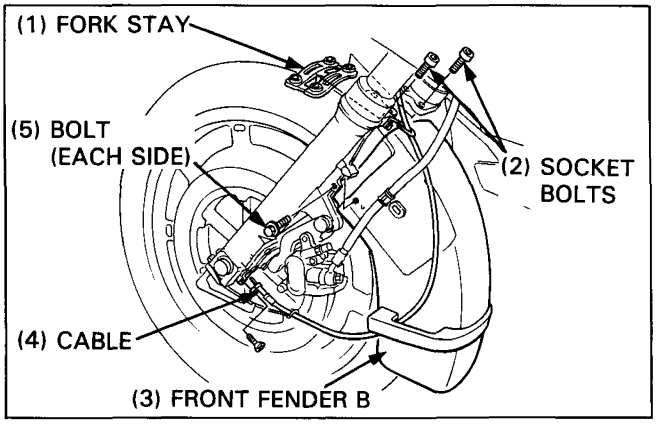
Remove the bolt caps.
Remove the socket bolts and collars.
Remove the front fender upper cover.



Remove two socket bolts, two flange bolts and collars.
Remove the front fender A.



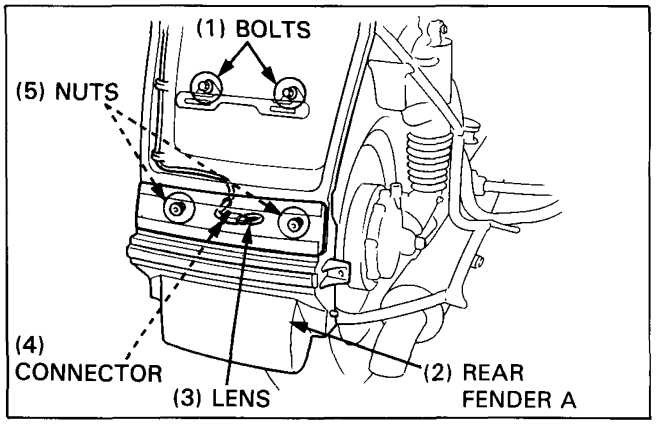
Disconnect the speedometer cable.
Remove two socket bolts and flange bolts.
Remove the front fender B and fork stay.



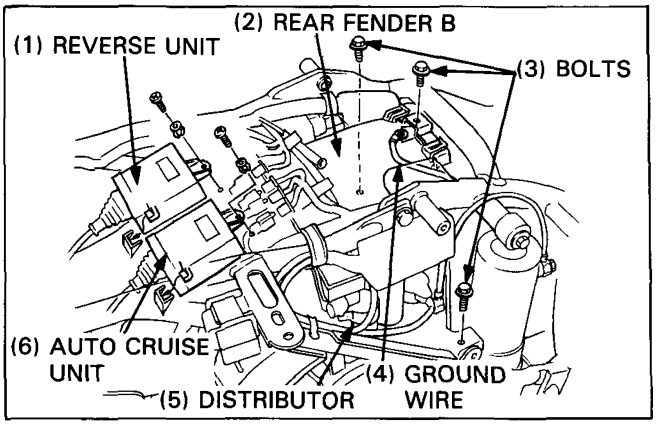
REAR FENDER

Remove the following:
– trunk (page 12-12).
– saddlebag (page 12-13).

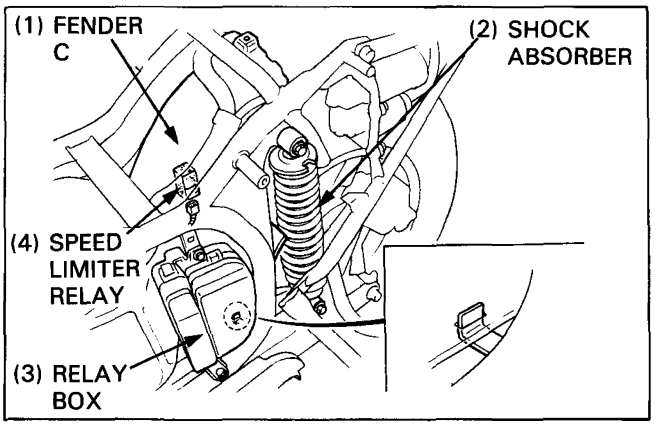
Remove the bolts and rear fender A.
Remove the cap nuts and brake/taillight lens.
Disconnect the brake and taillight connector.



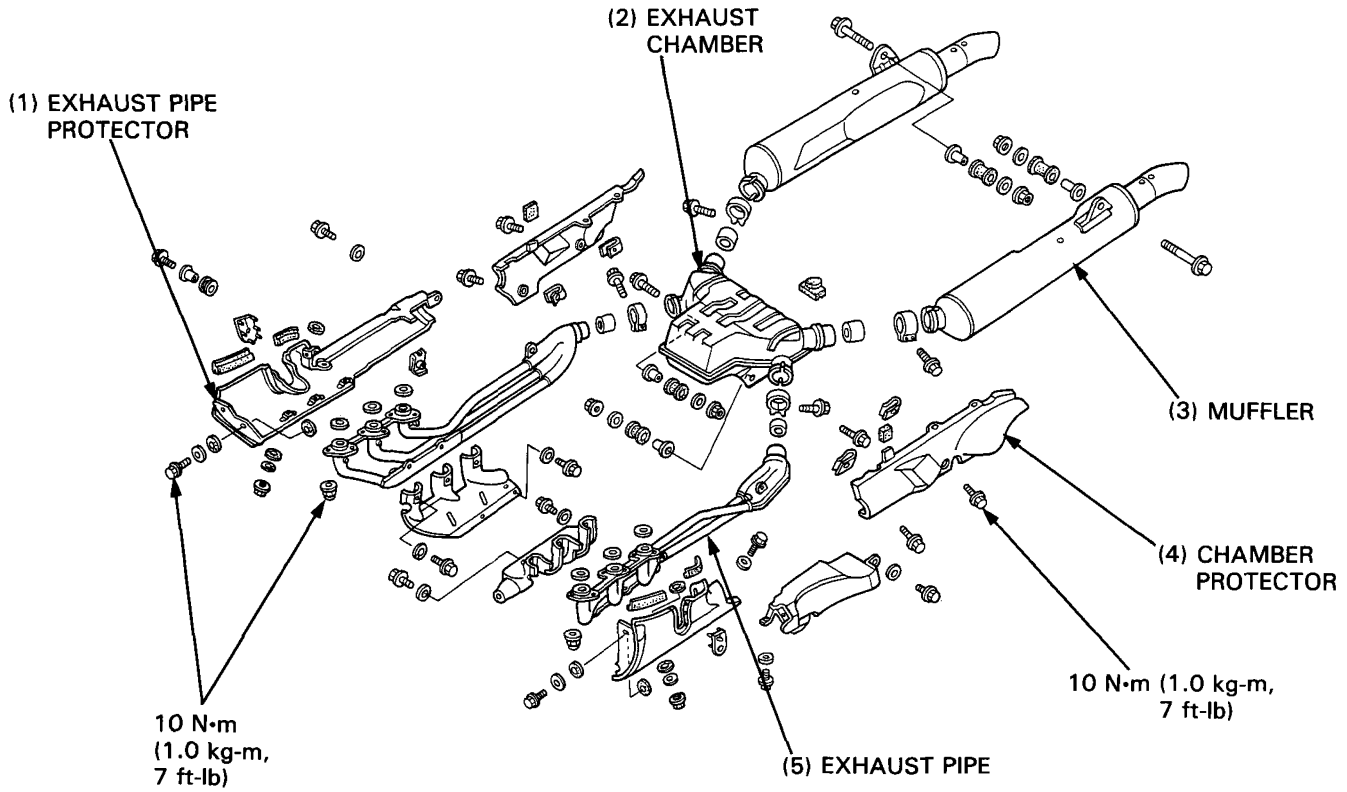
Remove the screws and remove the reverse control unit and auto cruise control unit from the rear fender B by releasing the unit tabs from the fender grooves.
Release the air distributor from the rear fender B without disconnecting the air hose (page 14-29).
Remove the upper bolt and disconnect the ground wire from the frame.
Remove two bolts and rear fender B backward.



Remove the following:
— left shock absorber (page 14-17).
— relay and fuse box by removing two bolts.
— speed limiter relay.
Release the frame tab from the rear fender C groove and remove the rear fender C backward.



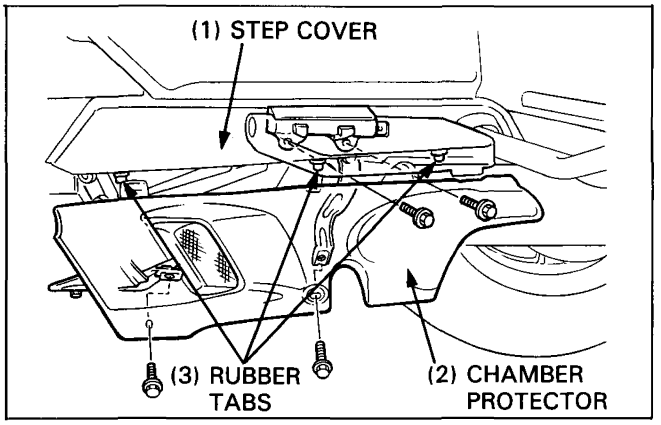
EXHAUST PIPE/MUFFLER



CHAMBER PROTECTOR

Remove two bolts and step cover, releasing its rubber tabs from the chamber protector holes.

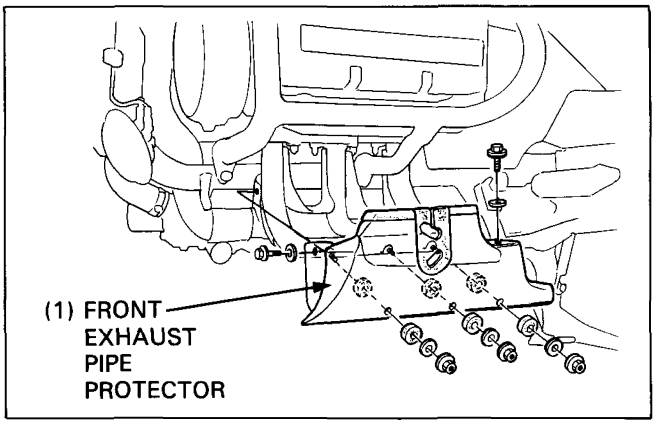
Remove two bolts and chamber protector.



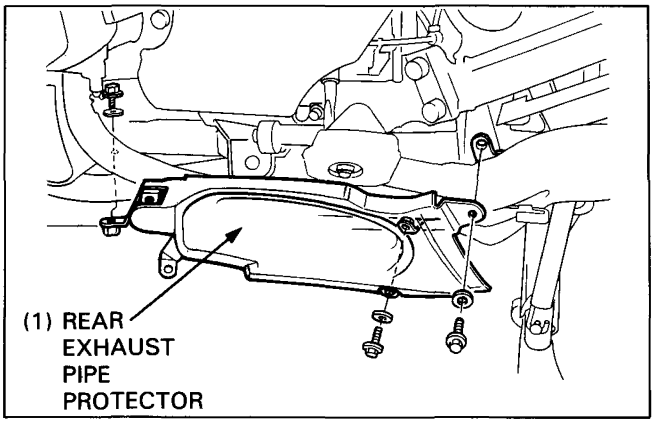
EXHAUST PIPE PROTECTORS

Remove the chamber protector (above).

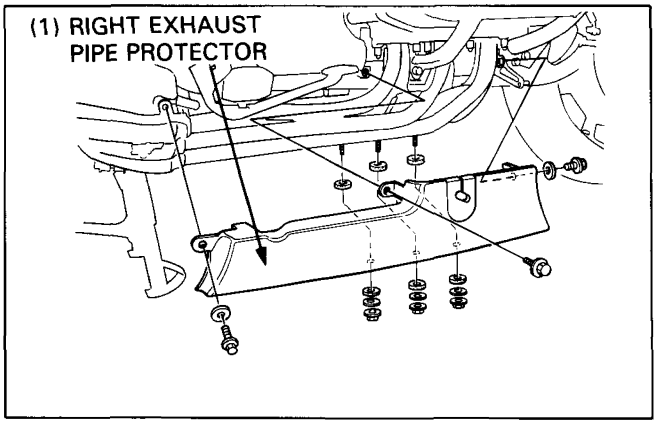
Left Side:
Remove two bolts and three nuts, and front exhaust pipe protector.



Remove three bolts and rear exhaust pipe protector.

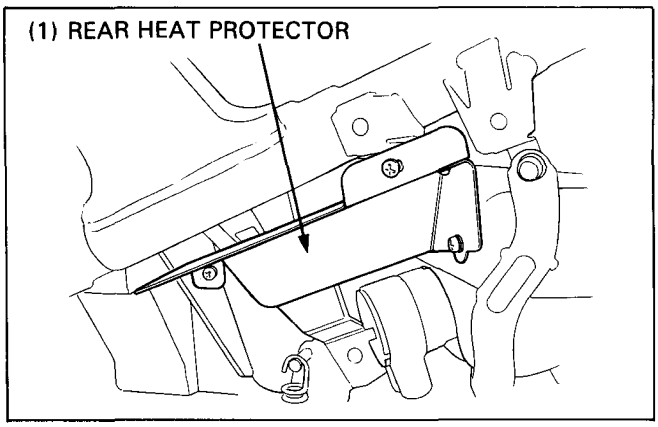


Right side:
Remove three bolts and three nuts, and right exhaust pipe protector.

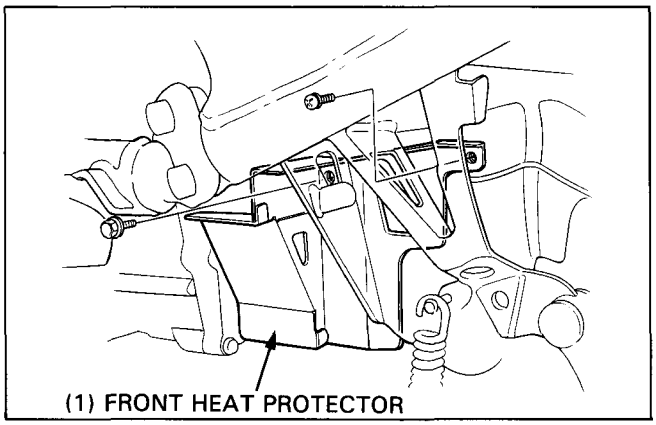


HEAT PROTECTORS

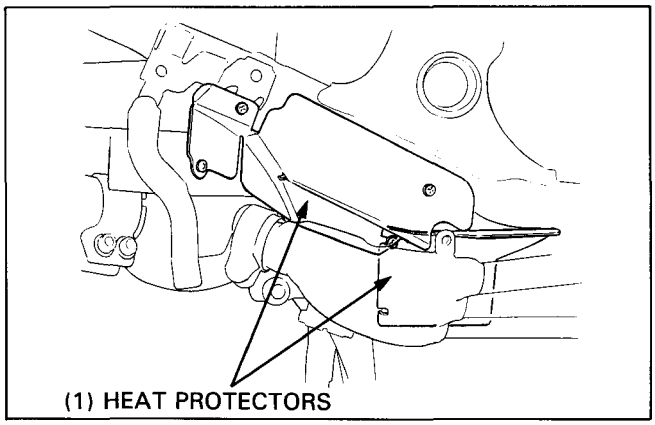
Left Side:
Remove the left exhaust pipe (below).
Remove three screws and rear heat protector.



Remove the bolt, screw and front heat protector.



Right Side:
Remove the chamber protector and exhaust pipe protector (previous page).
Remove four screws and front/rear heat protectors.

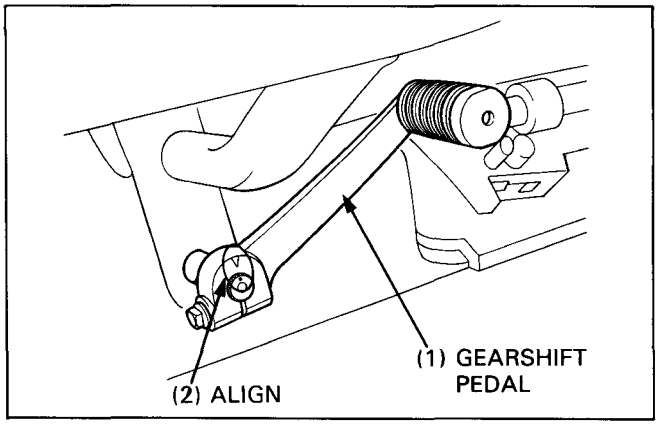


EXHAUST PIPE

Remove the following:
— exhaust pipe protector(s) (previous page).
— **Left side only:** gearshift pedal

NOTE

- When installing the gearshift pedal, align the ▽ mark with the punch mark of gearshift shaft.

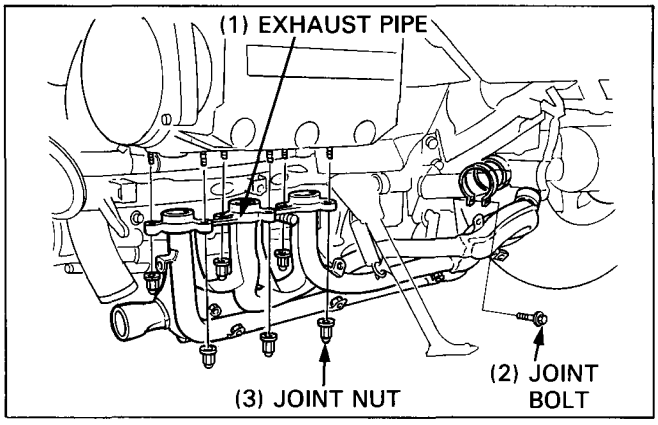


Remove the following:
– exhaust pipe protector(s) (page 12-16).

Loosen the exhaust pipe joint bolt.
Remove the exhaust pipe joint cap nuts.

Left Side:
Disconnect the hot air tube from the exhaust pipe hot air chamber.

Remove the exhaust pipe.

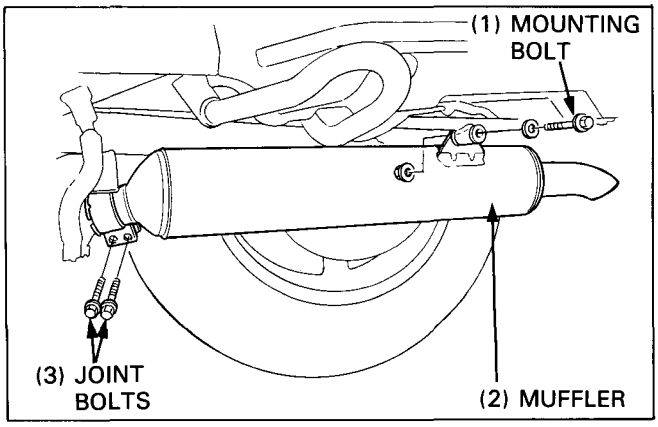


MUFFLER

Remove the following:
– chamber protector (page 12-16).

Loosen the muffler joint bolts.
Remove the muffler mounting bolt, washer and nut.

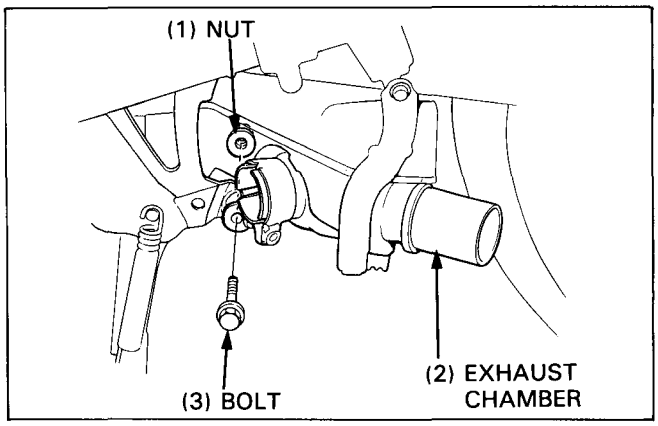
Remove the muffler.

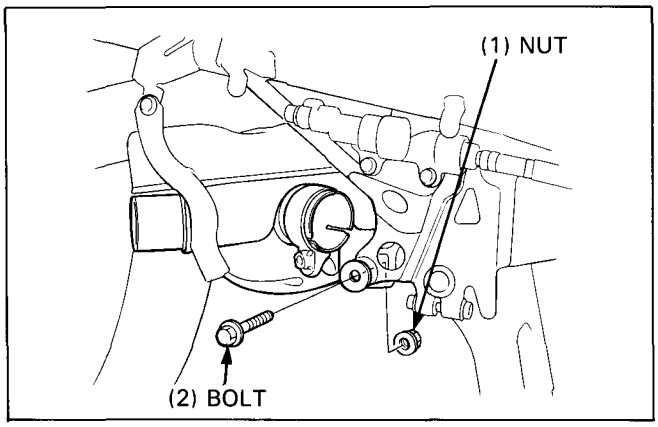


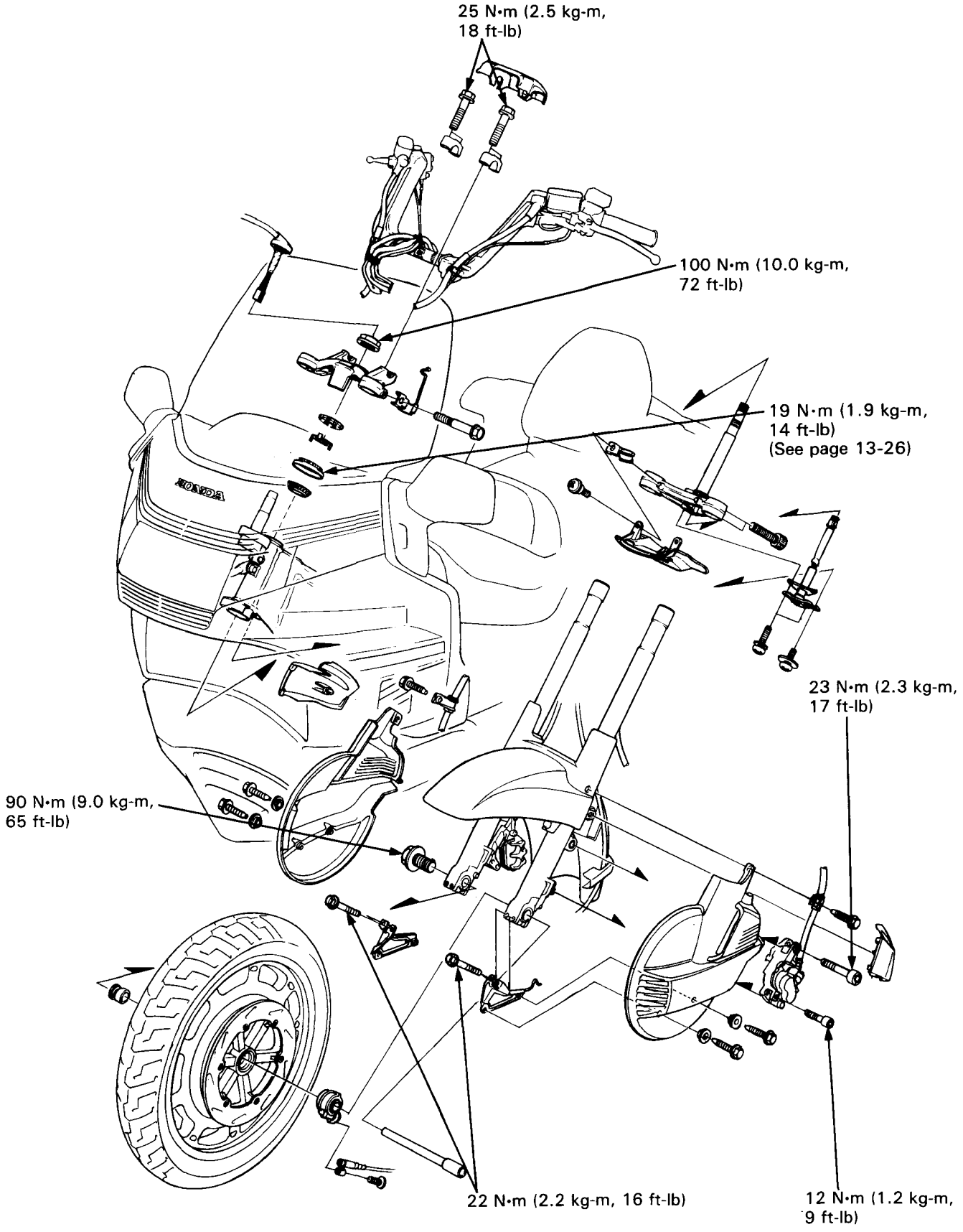
EXHAUST CHAMBER

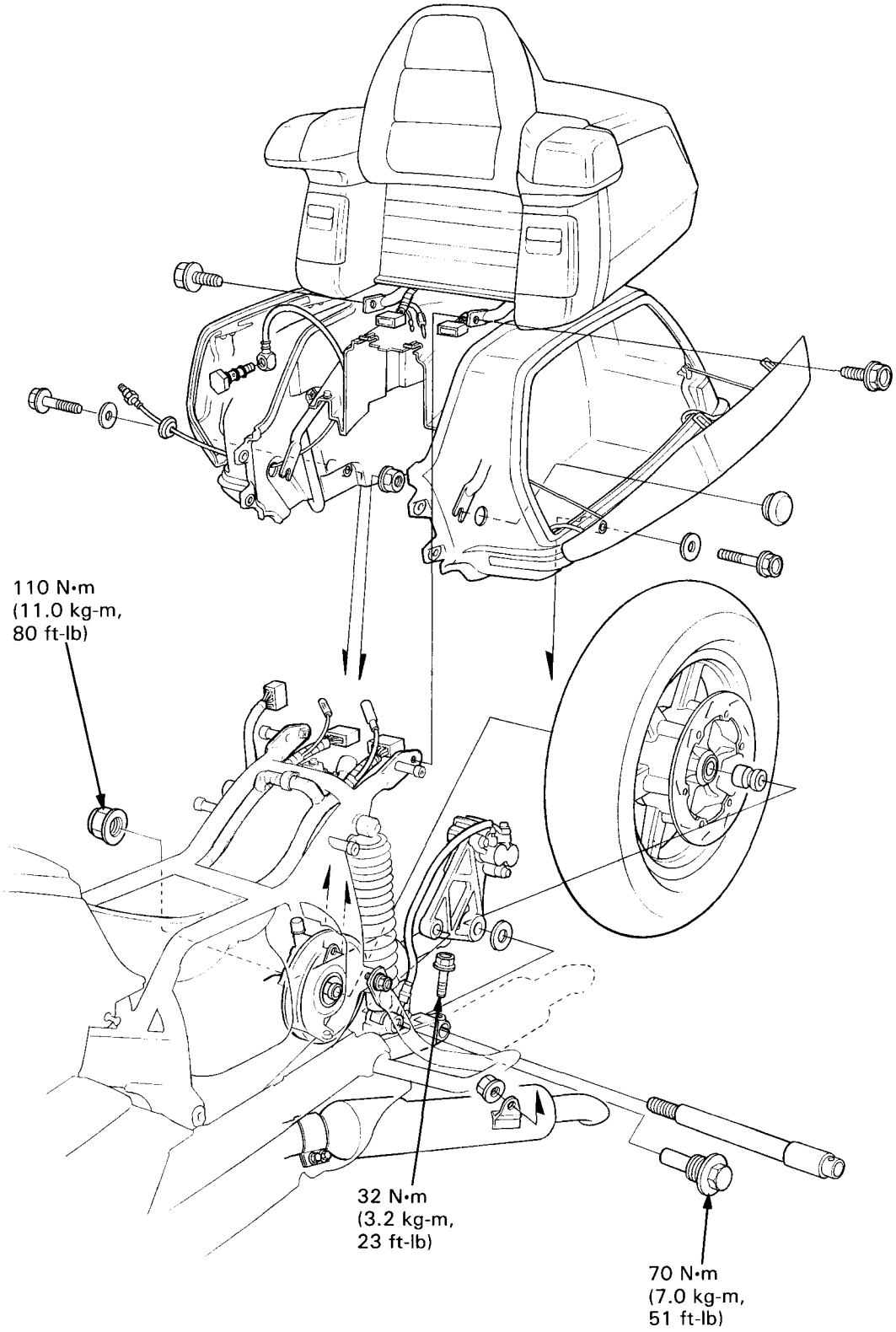
Remove the following:
– mufflers (above).
– one exhaust pipe (above).

Remove the exhaust chamber mounting bolts and nuts.
Remove the exhaust chamber.






25 N·m (2.5 kg-m, 18 ft-lb)
100 N·m (10.0 kg-m, 72 ft-lb)
19 N·m (1.9 kg-m, 14 ft-lb)
(See page 13-26)
23 N·m (2.3 kg-m, 17 ft-lb)
90 N·m (9.0 kg-m, 65 ft-lb)
22 N·m (2.2 kg-m, 16 ft-lb)
12 N·m (1.2 kg-m, 9 ft-lb)


110 N•m
(11.0 kg-m,
80 ft-lb)
32 N•m
(3.2 kg-m,
23 ft-lb)
70 N•m
(7.0 kg-m,
51 ft-lb)

SERVICE INFORMATION

GENERAL

⚠ WARNING

- ***Any attempt to mount passenger car tires on a motorcycle rim may cause the tire bead to separate from the rim with enough explosive force to cause serious injury or death.***

- There are two way how to remove the rear wheel; in works with a helper or without a helper. See to your desirable way.
- A jack or other support is required to support the motorcycle. And support it on the fixed points (page 13-4, 9), or the motorcycle may be damaged.
- Wheel bearings must not be re-used after they have been removed: Always use new bearings.
- Tubeless tire removal, repair and remounting procedures are covered in the Tubeless Tire Manual.
- If the motorcycle has been involved in an accident, inspect the frame very carefully at the steering head and at the engine mounts. These are the areas most likely to suffer damage.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Axle runout		—	0.2 (0.01)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Tire tread depth	Front	—	1.5 (0.06)
	Rear	—	2.0 (0.08)

RECOMMENDED TIRES AND PRESSURES:

Tire Size		Front	Rear
		130/70-18 63H	160/80-16 75H
Cold tire pressures kPa (kg/cm^2, psi)	Driver and passenger	225 (2.25, 33)	280 (2.80, 41)
	Driver only	225 (2.25, 33)	250 (2.50, 36)
Tire Brand Tubeless Only Dunlop		K177F	K177

TORQUE VALUES

Brake disc bolt	40 N·m (4.0 kg-m, 29 ft-lb)
Front axle pinch bolt	22 N·m (2.2 kg-m, 16 ft-lb)
Front axle bolt	90 N·m (9.0 kg-m, 65 ft-lb)
Shock absorber lower mounting bolt (left side)	70 N·m (7.0 kg-m, 51 ft-lb)
Rear axle pinch bolt	32 N·m (3.2 kg-m, 23 ft-lb)
Rear axle nut	110 N·m (11.0 kg-m, 80 ft-lb)
Handlebar upper holder bolt	25 N·m (2.5 kg-m, 18 ft-lb)—Apply grease
Front brake master cylinder holder	12 N·m (1.2 kg-m, 9 ft-lb)
Clutch master cylinder holder	12 N·m (1.2 kg-m, 9 ft-lb)
Steering stem adjustment nut	19 N·m (1.9 kg-m, 14 ft-lb)—see page 13-26.
Steering stem nut	100 N·m (10.0 kg-m, 72 ft-lb)
Caliper bracket bolt	23 N·m (2.3 kg-m, 17 ft-lb)
Anti-dive piston bolt	12 N·m (1.2 kg-m, 9 ft-lb)

TOOLS

Special	
Steering stem socket	07916—3710100
Steering stem driver	07946—MB00000
Ball race remover	07953—4250002
Bearing race remover	07946—3710500
Common	
Bearing remover shaft	07746—0050100
Bearing remover head, 20 mm	07746—0050600
Driver	07749—0010000
Attachment, 42 x 47 mm	07746—0010300
Pilot, 20 mm	07746—0040500
Lock nut wrench, 30 x 32 mm	07716—0020400
Attachment, 52 x 55 mm	07746—0010400

TROUBLESHOOTING

Hard steering
- Steering adjustment nut too tight
- Faulty steering stem bearings
- Damaged steering stem bearings
- Insufficient tire pressure

Steers to one side or does not track straight
- Bent forks
- Bent frame
- Forks installed incorrectly
- Axle installed incorrectly
- Bent swing arm
- Wheel installed incorrectly

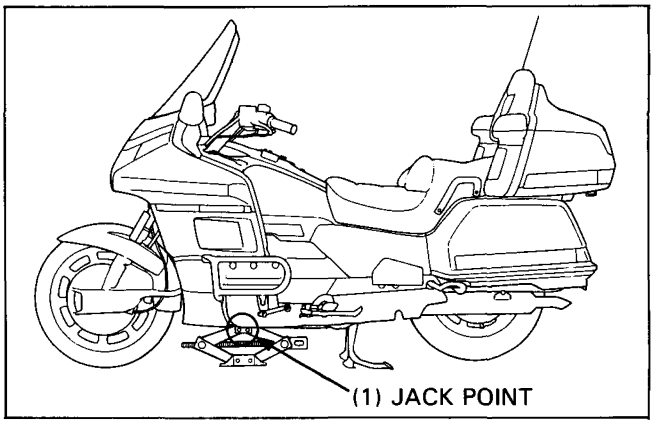
Front wheel wobbling or vibration
- Loose axle (front or rear)
- Loose wheel bearings
- Loose steering stem nut or bearings
- Loose lock nut of swing arm pivot bolt
- Unbalanced tire and wheel
- Bent wheel
- Excessive lateral wheel runout
- Bent forks
- Bent swing arm
- Bent or cracked frame
- Loose engine mounts

FRONT WHEEL

REMOVAL

Put the motorcycle on its center stand.

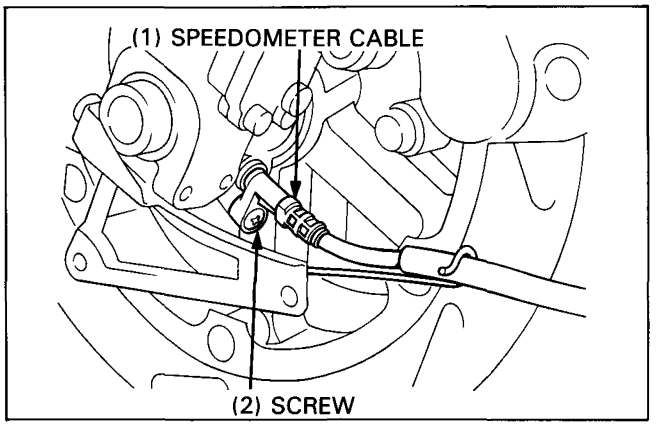
Raise the front wheel off the ground by placing a jack or other support on the fixed point under the engine as shown.



CAUTION

- *Do not use the oil filter as a jack point.*

Remove an either right or left disc cover (page 12-13).
Disconnect the speedometer cable from the speedometer gear box.



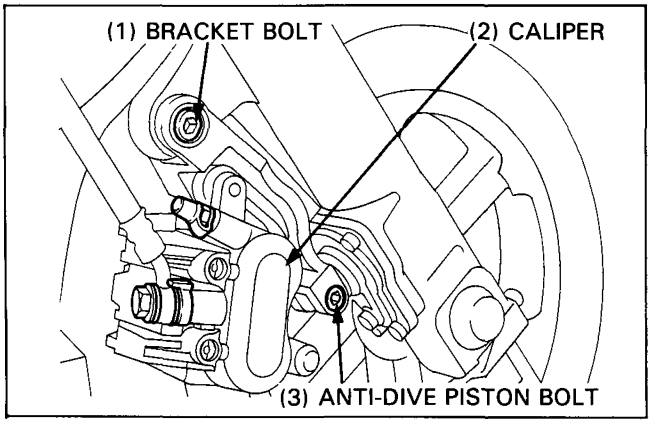
Remove the caliper bracket bolt and anti-dive piston bolt.
Remove a right or left caliper assembly.

CAUTION

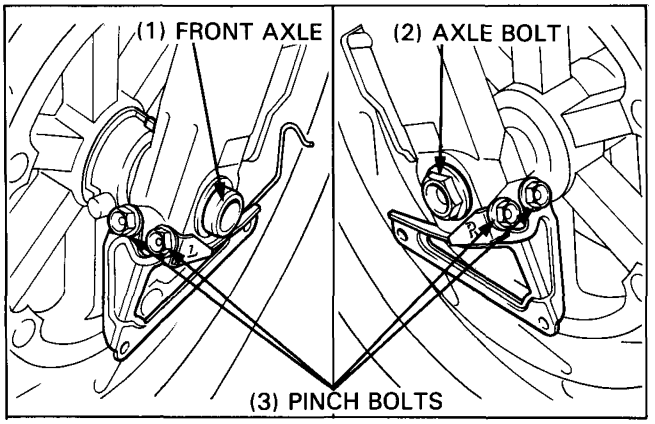
- *Suppot the removed caliper with a piece of wire so that it does not hang from the brake hose. Do not twist the brake hose.*

NOTE

- Do not depress the brake lever or pedal when the caliper is removed, or it will be difficult to refit the disc between the brake pads.



Remove the following:
- axle bolt.
- axle pinch bolts (Loosen).
- front axle.
- front wheel.

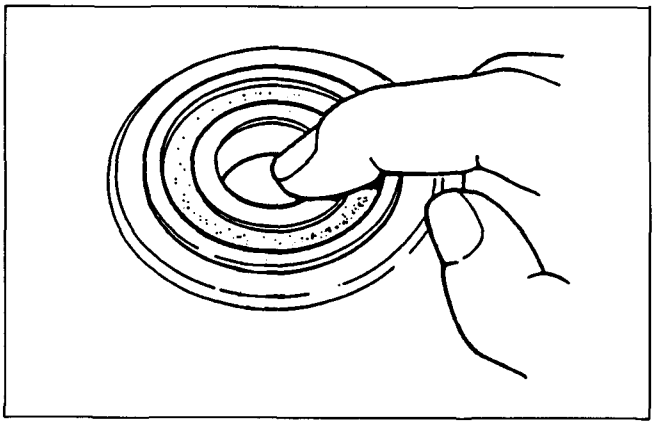


WHEEL BEARING INSPECTION

Turn the inner race of each bearing with your finger. The bearing should turn smoothly and quietly.
Also check that the bearing outer race fits tightly in the wheel hub.
Replace the bearings if necessary (page 13-6).

NOTE

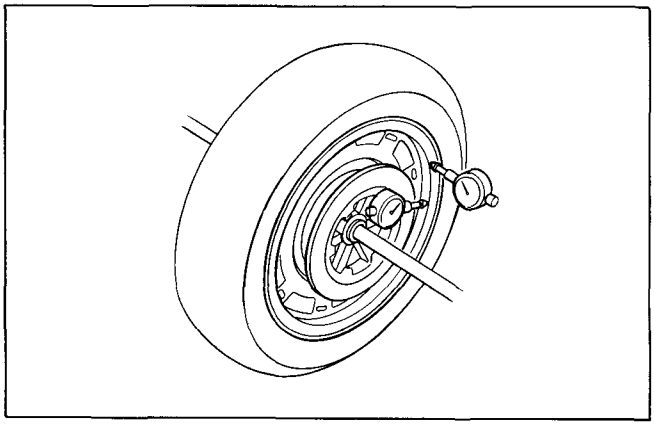
- Replace the wheel bearings as a set.



WHEEL RIM RUNOUT INSPECTION

Place the wheel in a truing stand. Spin the wheel slowly and measure the runout with a dial indicator gauge.
SERVICE LIMITS:
RADIAL RUNOUT: 2.0 mm (0.08 in)
AXIAL RUNOUT: 2.0 mm (0.08 in)

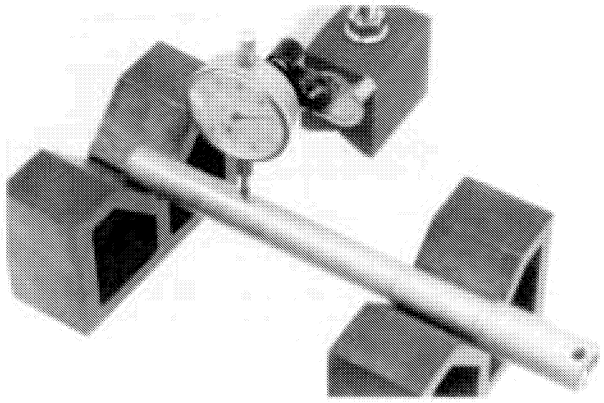
Replace the wheel if the runouts are exceeded the service limits.



AXLE INSPECTION

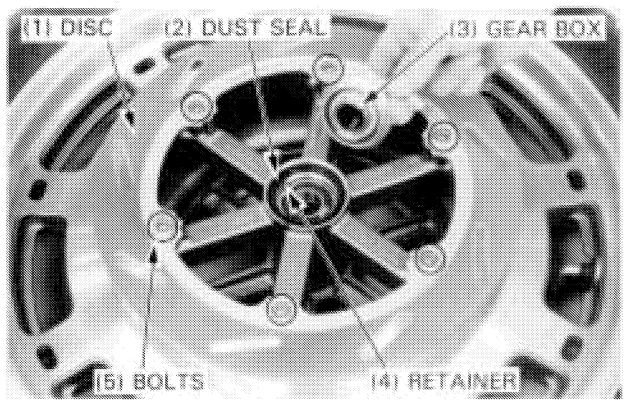
Set the axle in V blocks and measure the runout.
The actual runout is 1/2 of the total indicator reading.

SERVICE LIMIT: 0.2 mm (0.01 in)

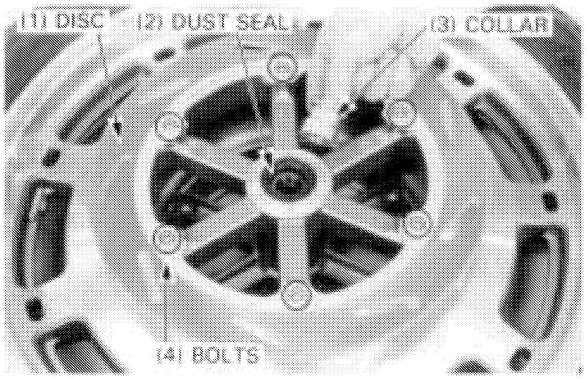


DISASSEMBLY

Remove the following from the left side of wheel.
- speedometer gear box.
- dust seal.
- retainer.
- brake disc.



Remove the following from the right side of wheel.
– axle collar.
– dust seal.
– brake disc.



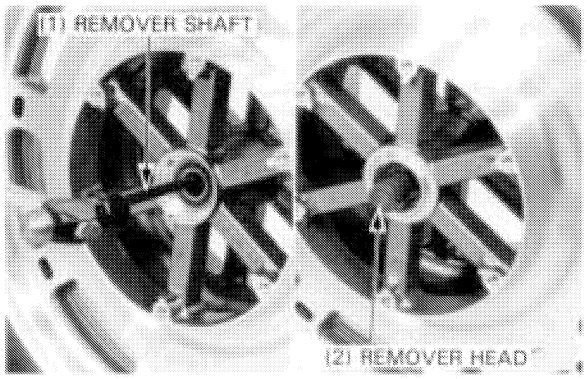
Remove the bearings and the distance collar from the hub.

TOOLS:

Bearing remover shaft	**07746–0050100**
Bearing remover head, 20 mm	**07746–0050600**

NOTE

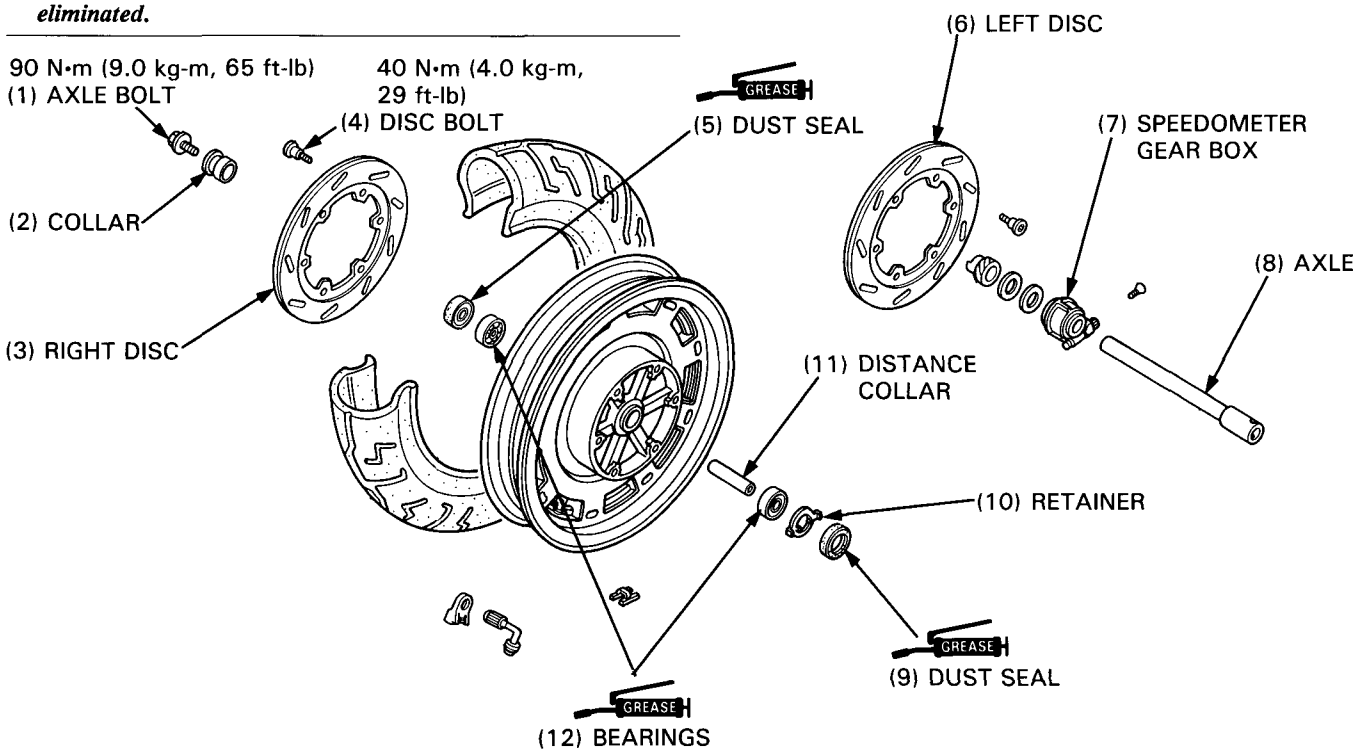
- Do not reuse the bearings once removed, replace them with new ones when installation.



ASSEMBLY

⚠WARNING

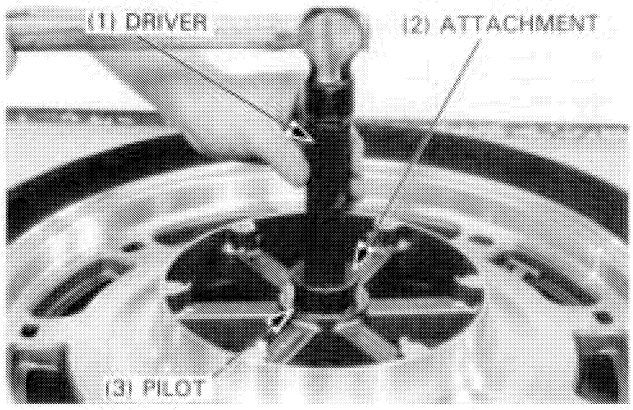
- ***Do not get grease on the brake disc or braking power will be eliminated.***



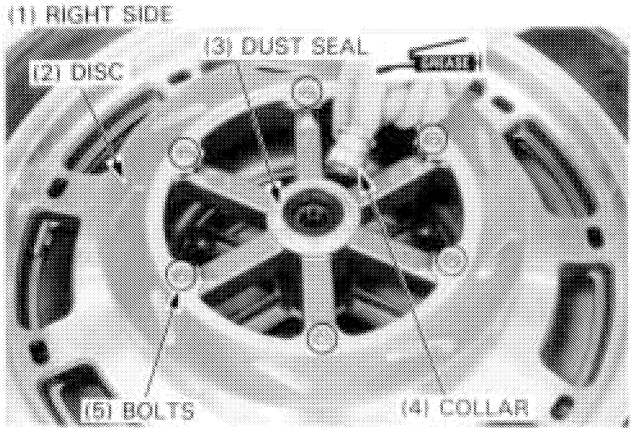
Pack the new bearing with grease.
Drive in the right bearing first with the sealed end facing out and put the distance collar in place.
Drive in the left bearing.

TOOLS:

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



Install the brake disc on the wheel and tighten the brake disc bolts (each side).
TORQUE: 40 N·m (4.0 kg-m, 29 ft-lb)

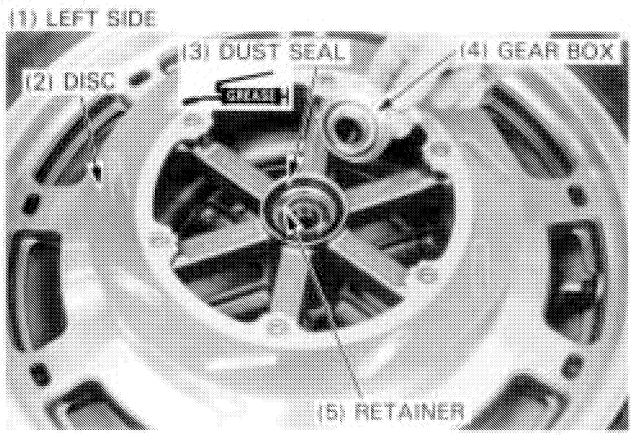


Install the dust seal into the hub.
Pack the dust seal lip cavity with grease.

CAUTION

- *Wipe off all the grease on the outside surface of the dust seal.*

Install the axle collar into the dust seal, noting its orientation as shown.



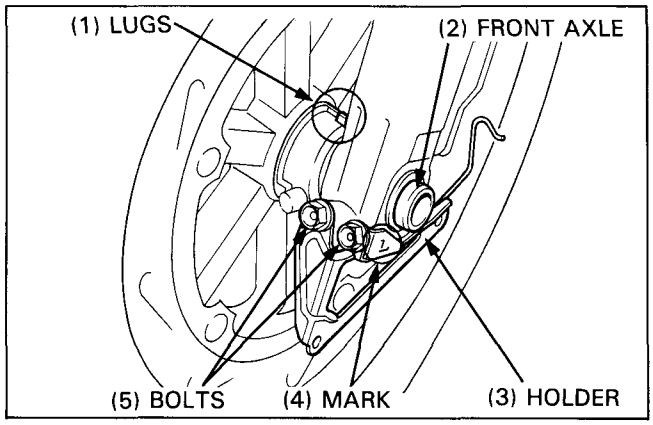
Fill the dust seal lip cavity with grease.
Install the speedometer gear retainer in the left wheel hub.
Coat the speedometer gear with grease.
Install the speedometer gear box onto the dust seal, aligning the tabs of the retainer with the gear box notches.

CAUTION

- *Wipe off all the grease on the outside surface of the dust seal.*

INSTALLATION

Position the front wheel between the fork legs and install the front axle from the left fork slider through the wheel to the right fork slider.
Position the speedometer gear box so that lug on the gear box is against rear of the stopper lug on left fork leg.



If the disc cover holders were removed, install them with the front axle pinch bolts.

NOTE

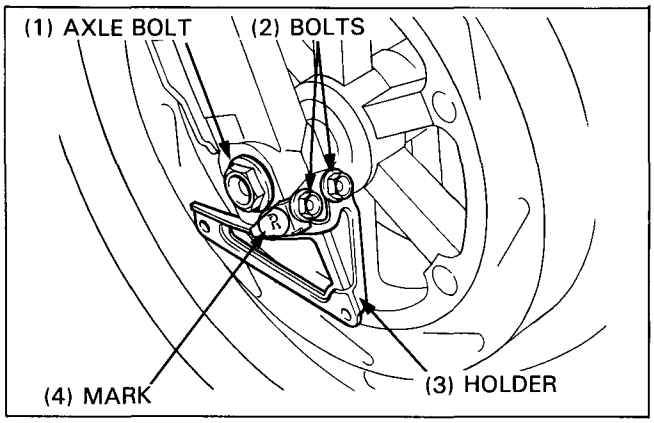
- The brake disc cover holders have the identification marks; "L" for the left side and "R" for the right side.

Install and tighten the front axle bolt.

TORQUE: 90 N·m (9.0 kg-m, 65 ft-lb)

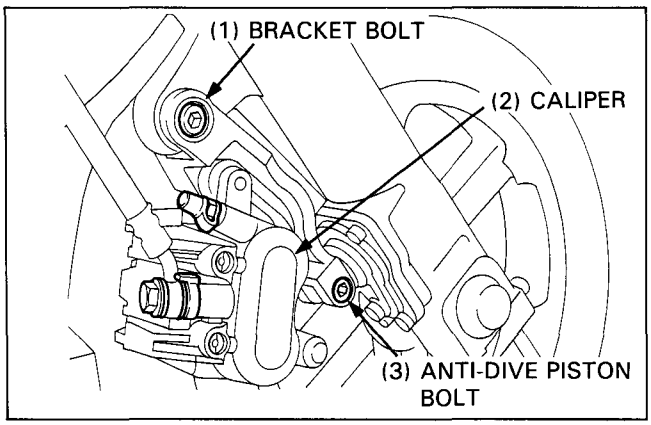
Install the disc cover holder with "R" mark if removed, and tighten the axle pinch bolts (each side).

TORQUE: 22 N·m (2.2 kg-m, 16 ft-lb)



Install a caliper and install the caliper bracket and anti-dive piston bolts.
Tighten the bolts.

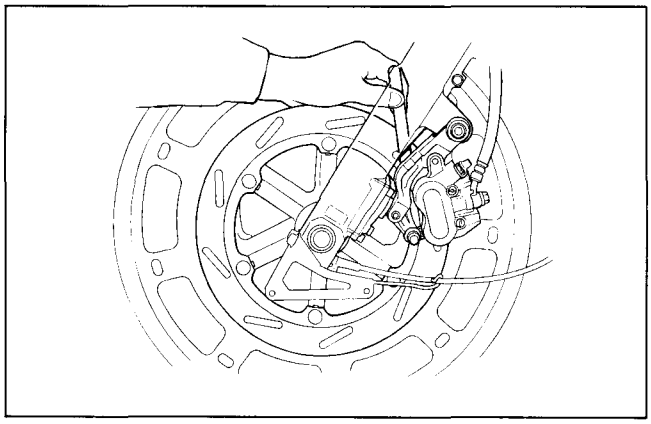
TORQUE:
Caliper bracket bolt: 23 N·m (2.3 kg-m, 17 ft-lb)
Anti-dive piston bolt: 12 N·m (1.2 kg-m, 9 ft-lb)



Measure the clearance between each surface of the left brake disc and the left brake caliper bracket with a 0.70 mm (0.028 in) feeler gauge.
If the feeler gauge cannot be inserted easily, loosen the front axle pinch bolts (left side) and move the left fork slider out until the gauge can be inserted.
Then retighten the left axle pinch bolts.

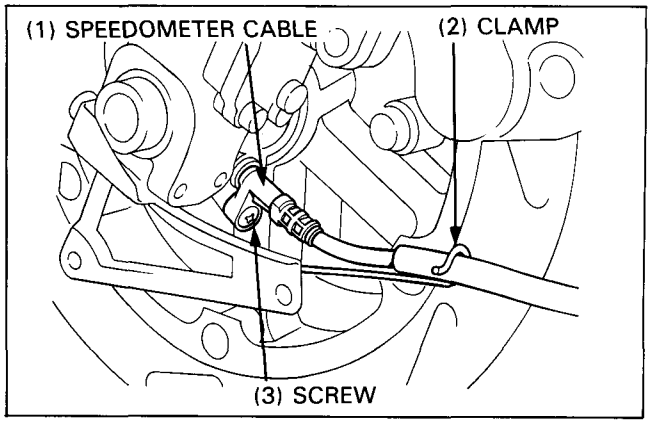
CAUTION

- *After installing the wheel, apply the brake several times and recheck the caliper clearances between each surface of the left brake disc and the left brake caliper. Failure to provide clearance will damage the brake disc and affect braking efficiency.*



Connect the speedometer cable to the speedometer gear box and secure it with the screw.
Clamp the speedometer cable as shown.

Install the disc cover (page 12-13).

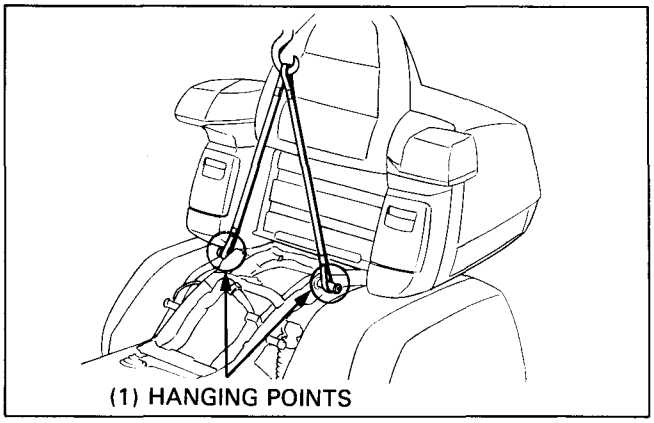


REAR WHEEL

REMOVAL

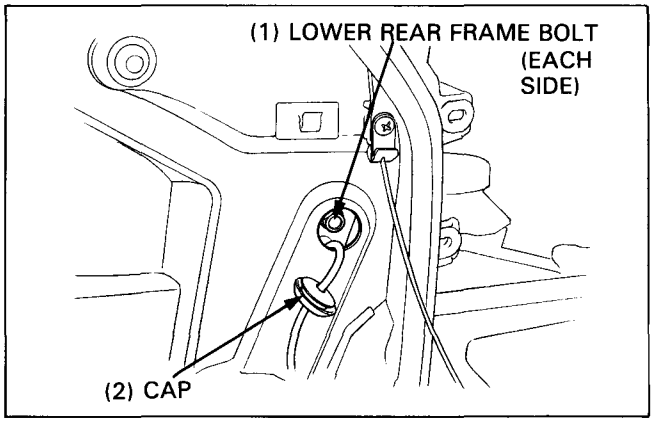
Put the motorcycle on its center stand.

If necessary, remove the seat (page 12-6) and raise the rear wheel off the ground by hanging the motorcycle on the fixed points with a suitable tool as shown.



*** Removal with a helper ***

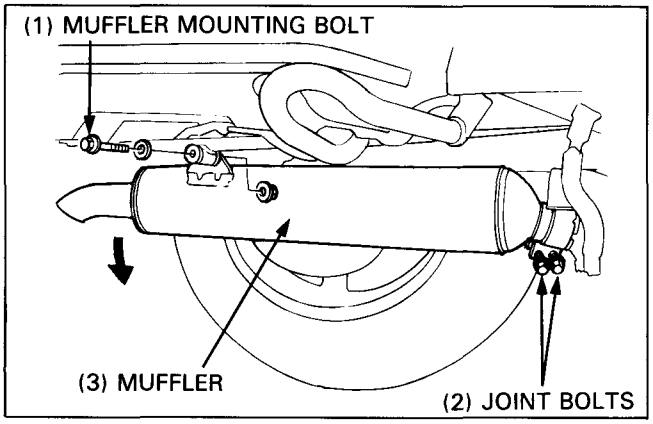
Remove the seat (page 12-6).
Open the left and right saddlebags. Inside both, remove the cap found at the front of the saddlebag to gain access to the lower rear frame bolt (each side).
Loosen the lower rear frame bolt (each side).



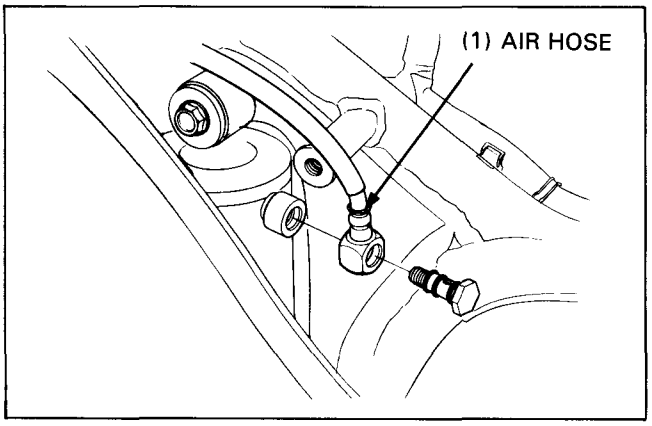
Loosen the muffler joint bolts (each side).
Remove the muffler mounting bolt, washer and nut (each side).
Lower the mufflers to remove the axle nut and shaft.

CAUTION

- *Do not damage the muffler gaskets.*

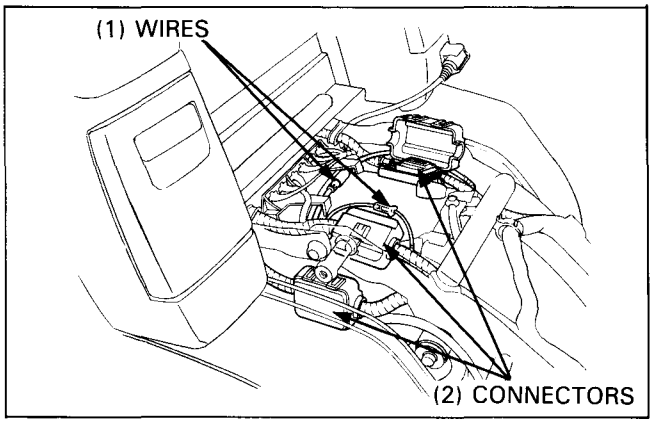


Disconnect the air hose from the right shock absorber.

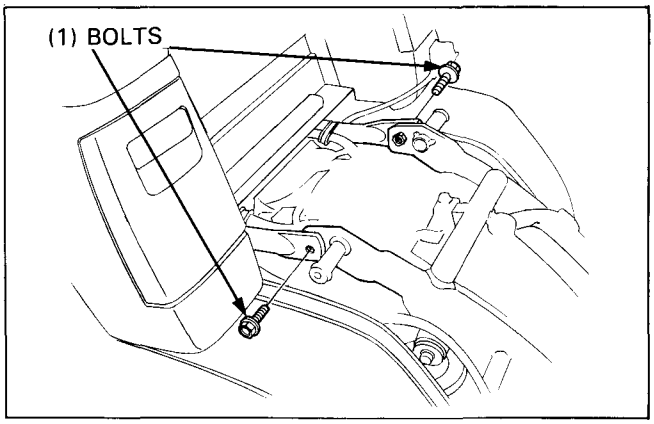


Disconnect the antenna wire.
Disconnect the ground wire near the antenna wire.

Open the three black plastic cases covering the three (red, black and white) connectors.
Disconnect the connectors.



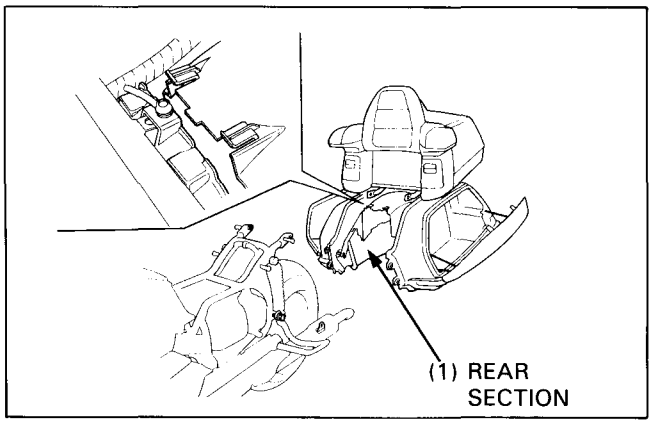
Remove the upper rear frame bolts.



Pull back on the rear section to slide the lower rear frame tubes away from the loosened bolts.

Lift the rear section off the motorcycle.

Go to "Removal with or without a helper" (next page).



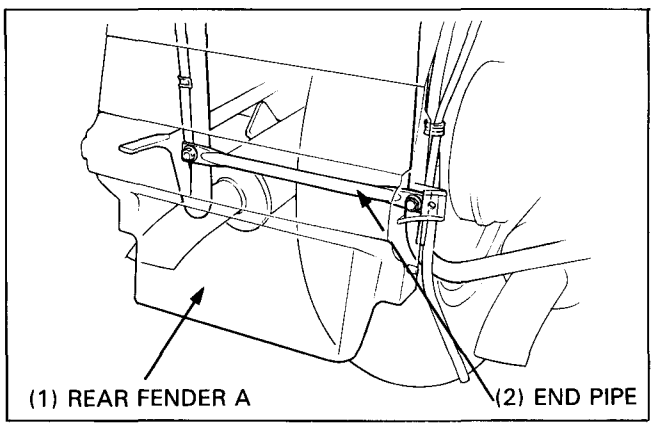
*** Removal without a helper ***

Remove the following:
– trunk lower cover (page 12-12).
– left and right saddlebags (page 12-13).
– rear fender A (page 12-14).
– rear frame end pipe.

Remove the muffler mounting bolt and loosen the joint bolts (each side) (page 12-18).
Lower the muffler (each side) so that the axle shaft could be removed.

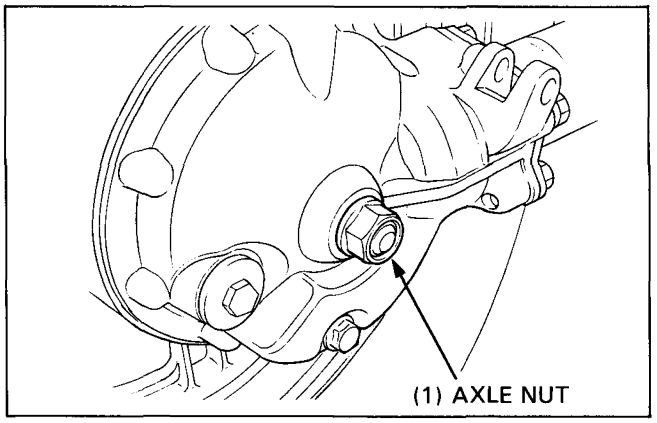
CAUTION

- *Do not damage the muffler gaskets.*

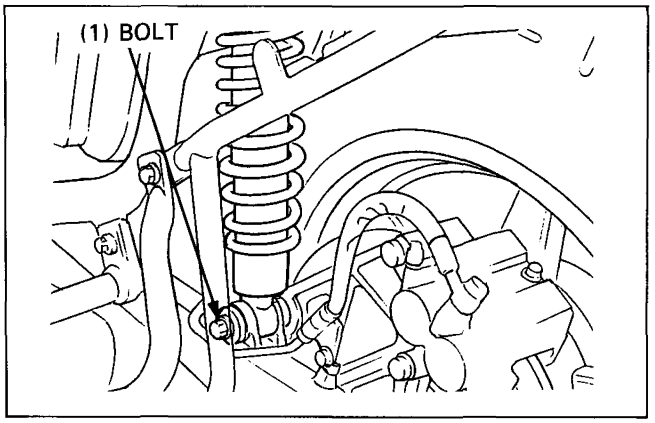


*** Removal with or without a helper ***

Remove the rear axle nut.



Remove the left shock absorber lower mount bolt.



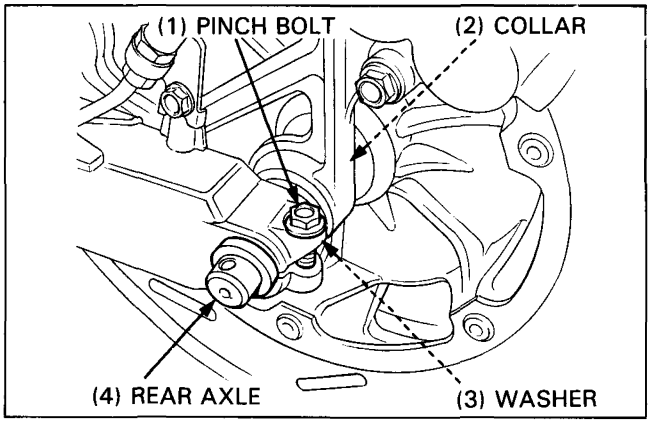
Remove the rear axle pinch bolt and pull the rear axle out of the wheel.
Remove the following:
— caliper assembly with bracket.
— washer.
— collar.

CAUTION

- *Support a caliper with a suitable string so that it does not hang from the brake hose. And do not twist the brake hose.*

NOTE

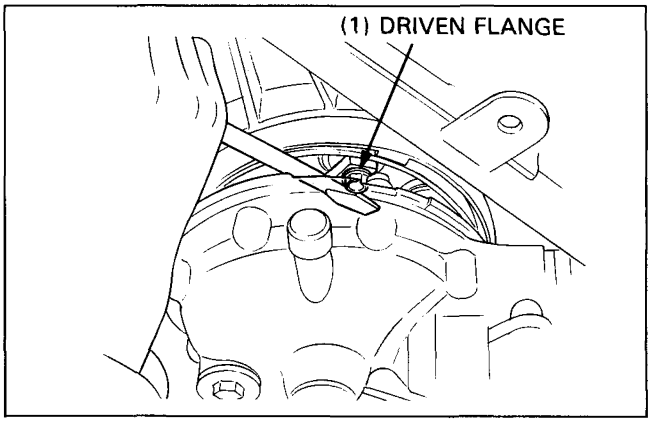
- Do not depress the brake pedal when the caliper is removed, or it will be difficult to refit the disc between the brake pads.



Remove the rear wheel from the final gear.

NOTE

- If the driven flange rest on the final gear side, push the driven flange in the rear wheel and then remove the wheel with the driven flange.

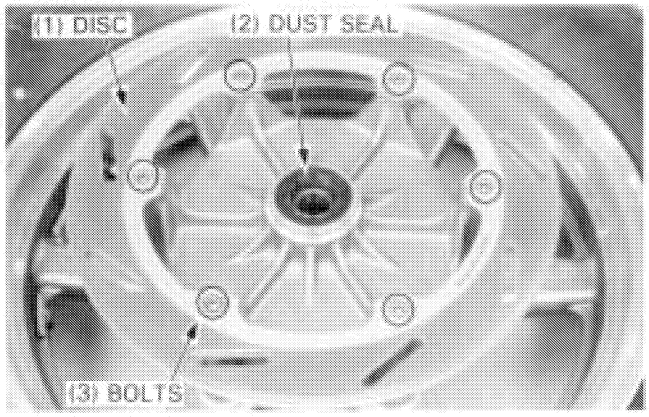


INSPECTION

Inspect the wheel as described in front wheel section.
- Axle inspection (page 13-5)
- Wheel bearing inspection (page 13-5)
- Wheel rim runout inspection (page 13-5)

DISASSEMBLY

Remove the brake disc and dust seal from the wheel hub.



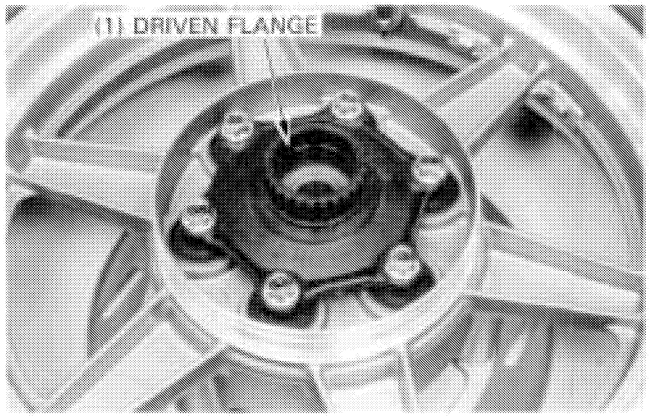
Remove the driven flange from the wheel hub.

CAUTION

- *Be careful not to damage the wheel hub.*

NOTE

- The pins and nuts cannot be removed.



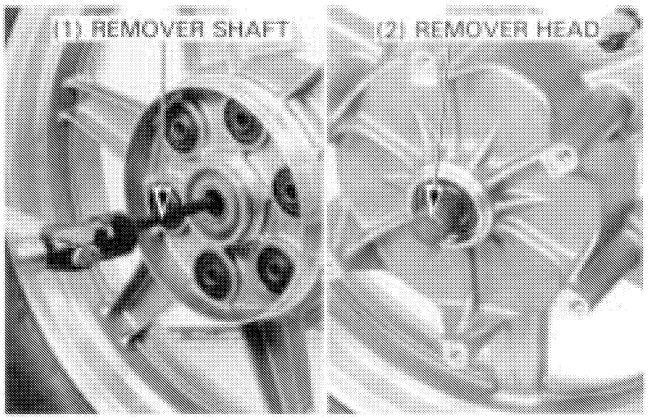
Remove the bearings and distance collar from the rear wheel hub.

TOOLS:

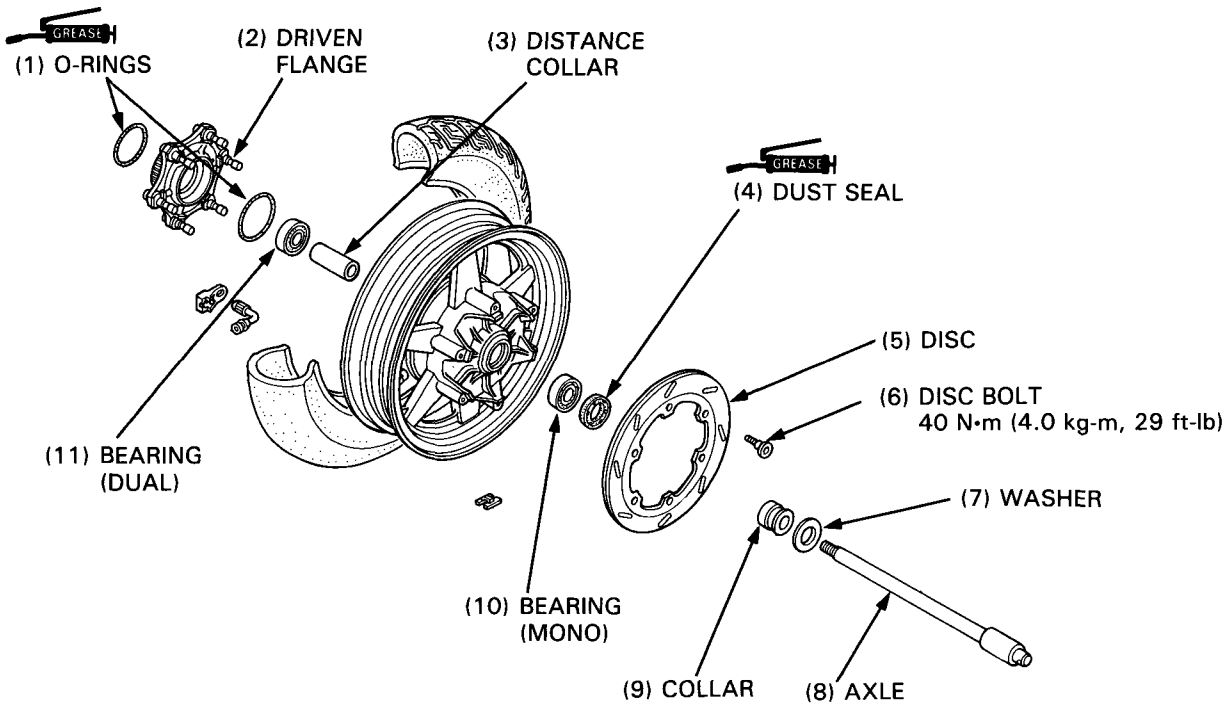
Bearing remover head, 20 mm	**07746–0050600**
Bearing remover shaft	**07746–0050100**

NOTE

- Do not reuse the bearings once removed, replace them with new ones when installation.



ASSEMBLY

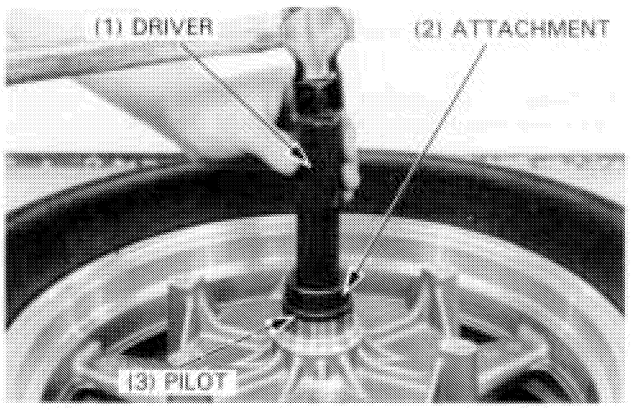


Pack new bearing cavities with grease and drive in the left bearing (mono) first.

TOOLS:

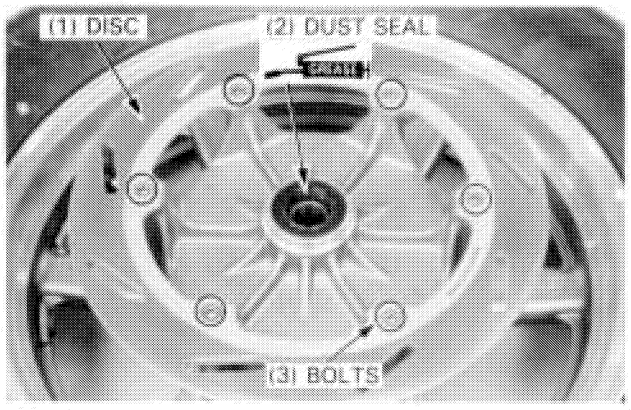
Driver	**07749—0010000**
Attachment, 42 x 47 mm	**07746—0010300**
Pilot, 20 mm	**07746—0040500**

Install the distance collar and then drive in the right bearing (dual).

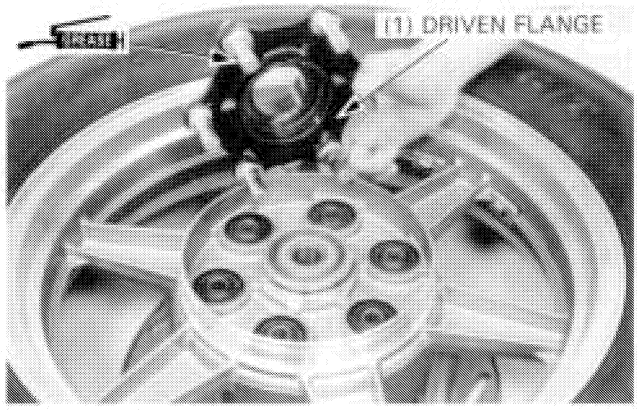


Pack the dust seal lip cavity with grease and install the dust seal in the wheel hub.
Install the brake disc and tighten the bolts.

TORQUE: 40 N·m (4.0 kg-m, 29 ft-lb)

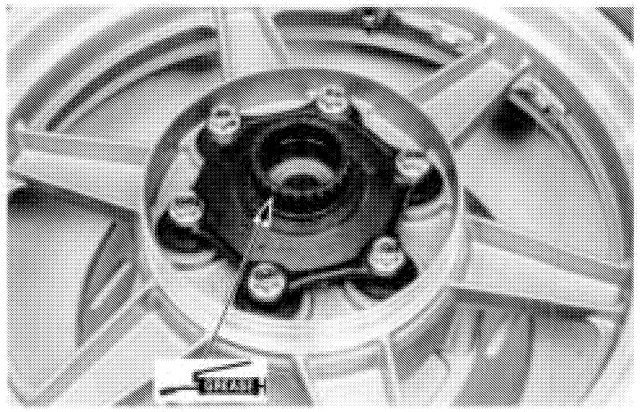


Lubricate the driven flange pin with grease.
Install the driven flange to the wheel hub.

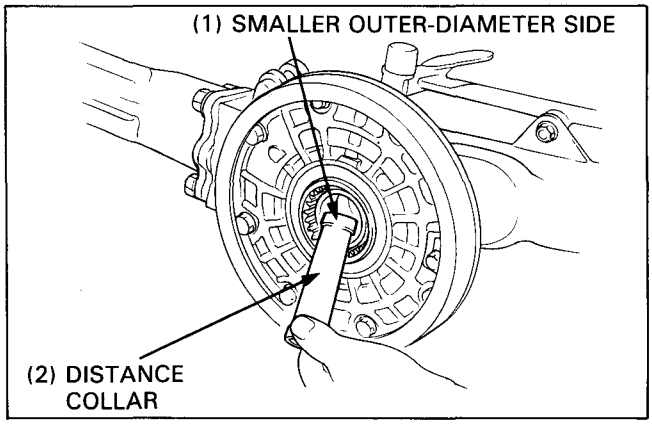


INSTALLATION

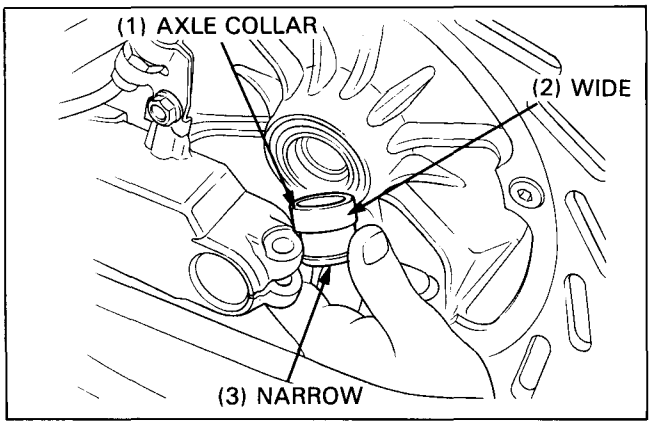
Apply grease to the driven flange splines.



Install the distance collar with its smaller outer-diameter side facing inside.



Install the rear wheel onto the final gear case, aligning their splines.
Install the rear axle collar in the dust seal, positioning it as shown.

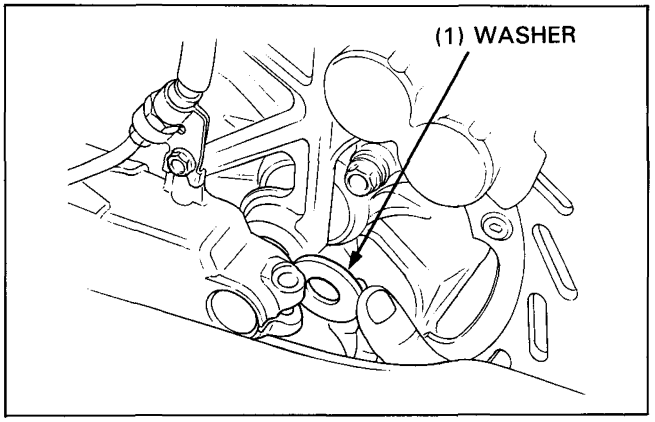


Position the caliper and bracket as an assembly over the disc.

NOTE

- Be careful not to damage the brake pads with the brake disc when installing the brake caliper.

Install the washer between the swing arm and the rear brake caliper bracket.

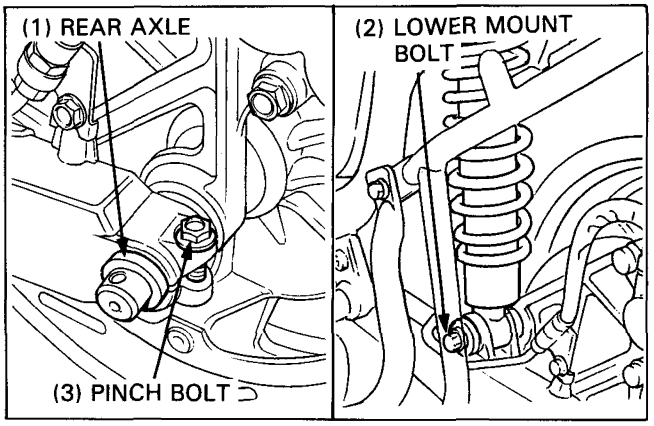


Insert the rear axle through the swing arm, washer, caliper bracket, collar and rear wheel.

Install the pinch bolt.

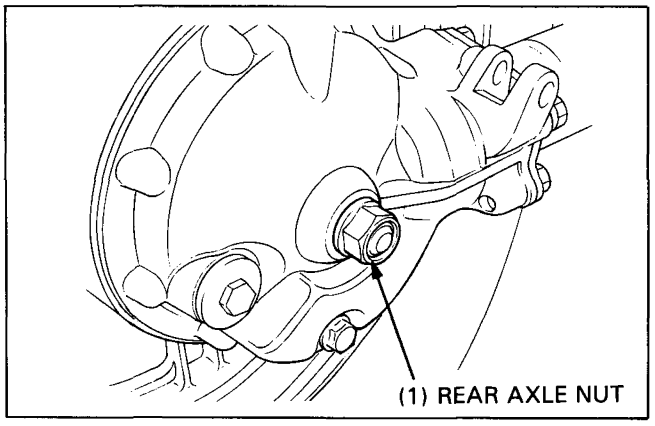
Install and tighten the left shock absorber lower mount bolt.

TORQUE: 70 N·m (7.0 kg-m, 51 ft-lb)



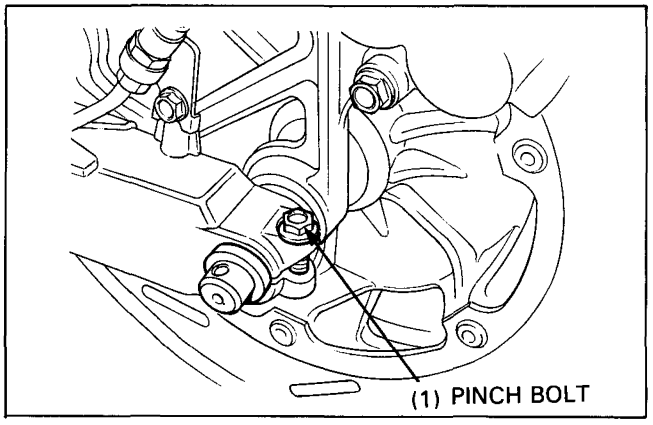
Install and tighten the rear axle nut.

TORQUE: 110 N·m (11.0 kg-m, 80 ft-lb)



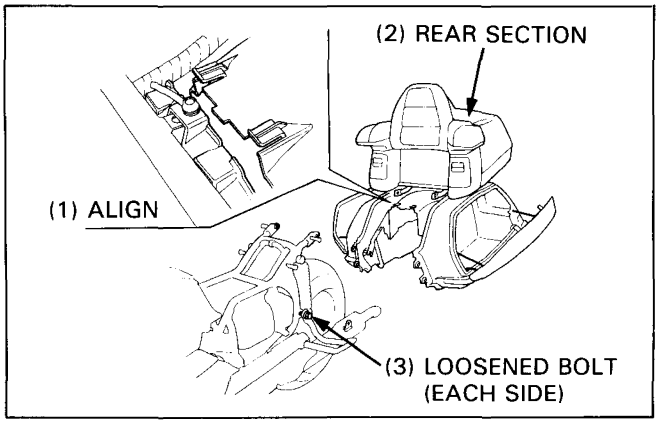
Tighten the rear axle pinch bolt.

TORQUE: 32 N·m (3.2 kg-m, 23 ft-lb)

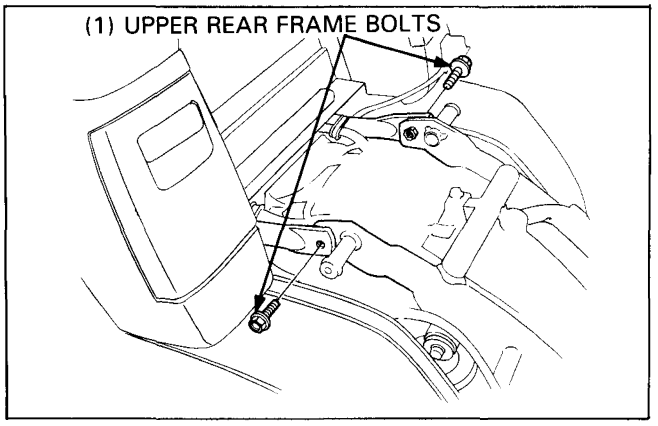


*** Installation with a helper ***

Install the rear section, sliding the lower rear frame tubes into the loosened bolts and aligning the fender upper tabs.



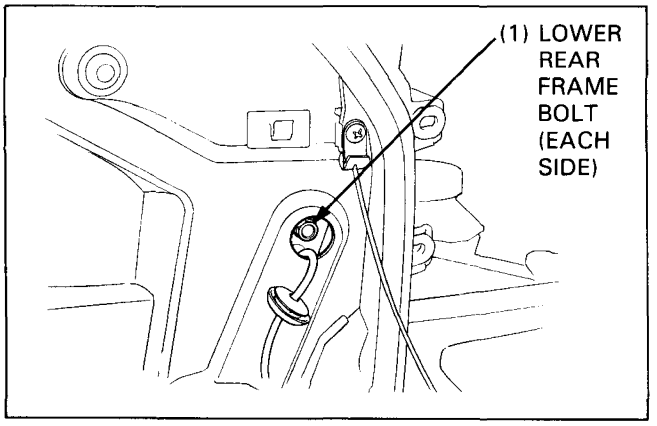
Install the upper rear frame bolts.



Push the rear frame forward and tighten the lower rear frame bolts (each side).

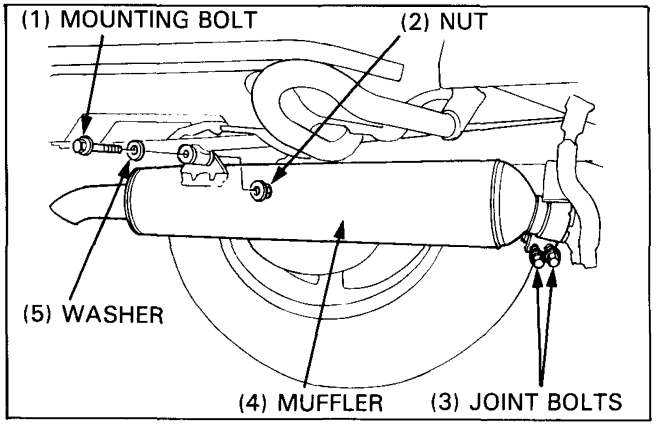
Install the cap securely (each side).

Tighten the upper rear frame bolts.



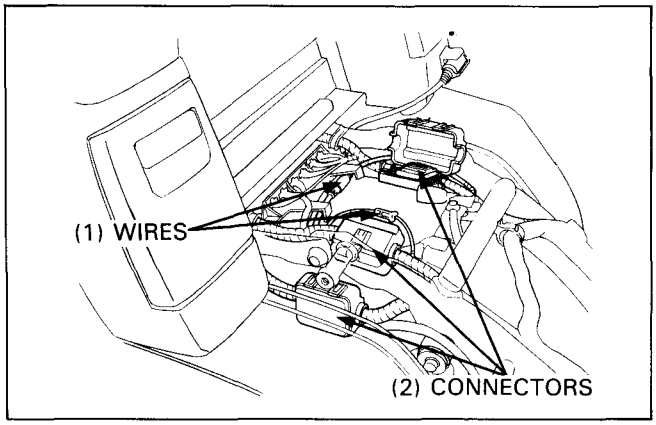
Install the muffler mounting bolt, special washer and nut (each side).
Tighten the nut securely (each side).

Tighten the muffler joint bolts securely (each side).



Connect the three connectors (red, black and white) securely and close the plastic cases.

Connect the antenna wire and ground wire.



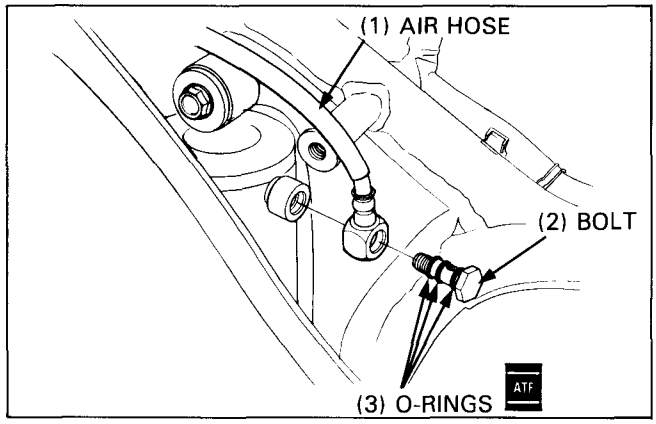
Apply a thin coat of ATF to new O-rings.
Connect the air hose to the shock absorber.

Tighten the air hose bolt to the specified torque.

TORQUE: 6 N·m (0.6 kg-m, 4 ft-lb)

NOTE

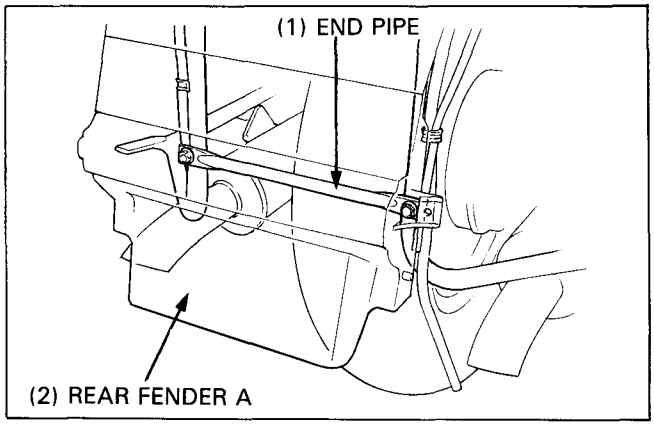
- Install the hose vertically as shown.



Install the seat (page 12-6).
Close the saddlebags.

*** Installation without a helper ***

Install the following:
— rear frame end pipe.
— rear fender A (page 12-14).
— left and right muffler (page 13-16).
— left and right saddlebags (page 12-13).
— trunk lower cover (page 12-12).



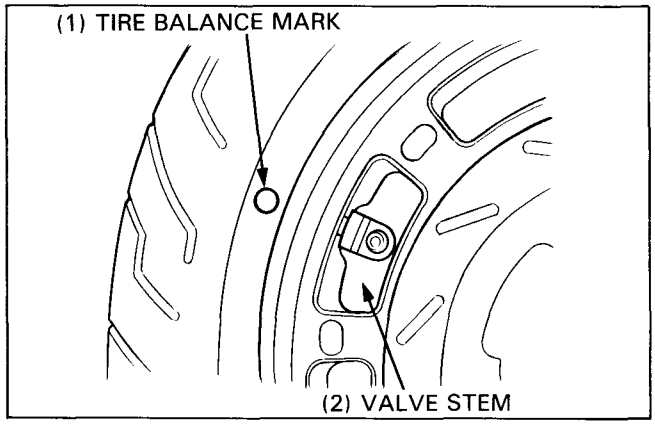
WHEEL BALANCING

CAUTION

- *Wheel balance directly affects the stability, handling and overall safery of the motorcycle.*
  Always check balance when the tire has been removed from the rim.

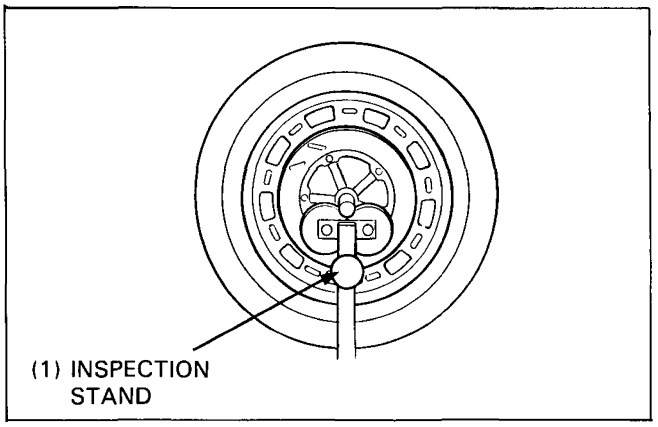
NOTE

- For optimum balance, the tire balance mark (a paint dot on the sidewall) must be located next to the valve stem. Remount the tire if necessary.

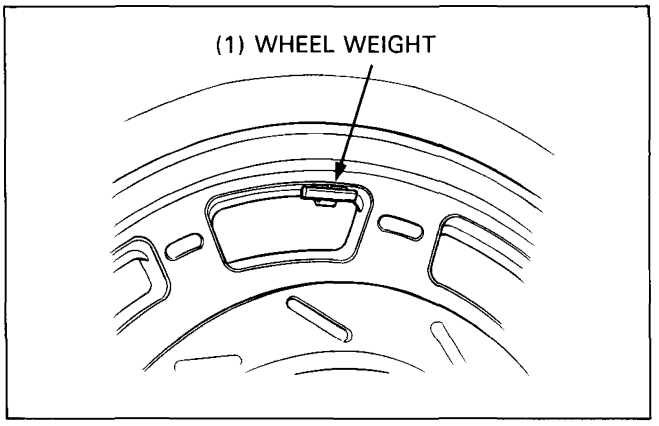


Mount the wheel, tire and brake disc assembly in an inspection stand. (If a stand is not available, mount the wheel on its axle and clamp the axle in a vise with a shop towel or soft jaws.)

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 the wheel is balanced, it will not stop consistently in the same position.



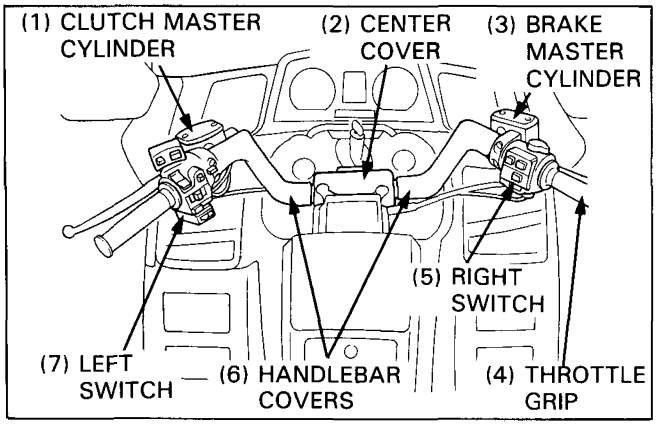
To balance the wheel, install wheel weights on the highest side of the rim, the side opposite the chalk marks. Add just enough weight so the wheel will no longer stop in the same position when it's spun.
Do not add more than below grams.
FRONT: 60 grams
REAR: 70 grams



HANDLEBAR

REMOVAL

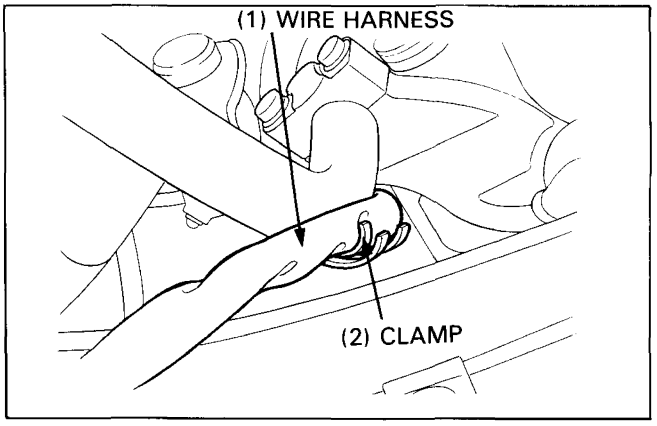
Remove the following:
- clutch master cylinder
- left switch housing
- front brake master cylinder
- right switch housing
- throttle grip
- handlebar cover set plates
- handlebar covers
- handlebar center cover



NOTE

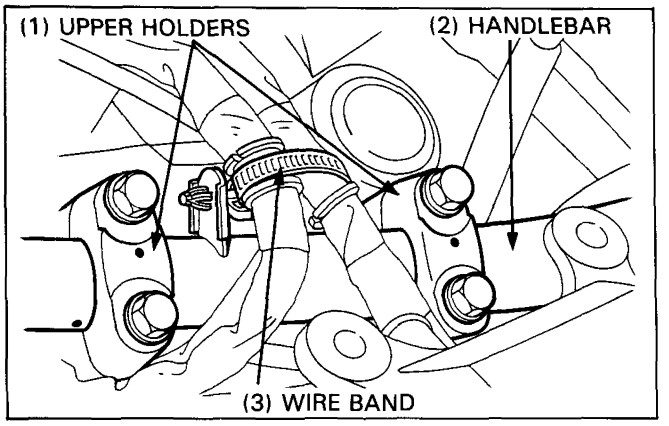
- Using wires, hang the clutch and front brake master cylinder at least as high as the position originally installed to prevent air from getting into the master cylinder.
- Do not twist the brake (clutch) hoses.

Release the right handlebar switch wire harness from the clamp.



Remove the wire band from the handlebar.

Remove the handle upper holders and handlebar.



INSTALLATION

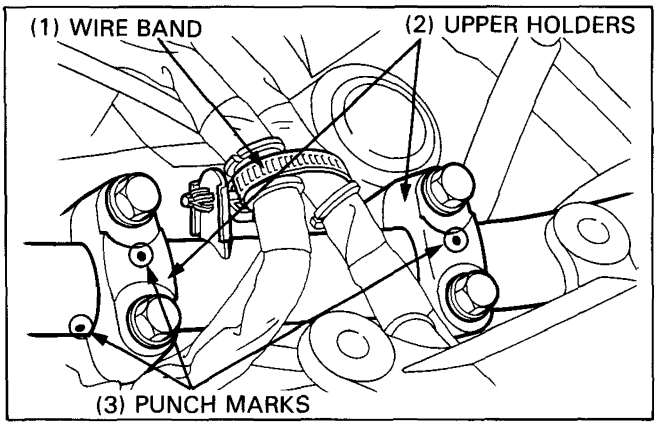
Apply grease to the bolt threads and flanges.
Install the handlebar onto the steering top bridge, Aligning the punch marks on the handlebar with the top bridge upper edge.
Install the handle upper holders with the punch marks facing forward, and tighten the holder bolts.

TORQUE 25 N·m (2.5 kg-m, 18 ft-lb)

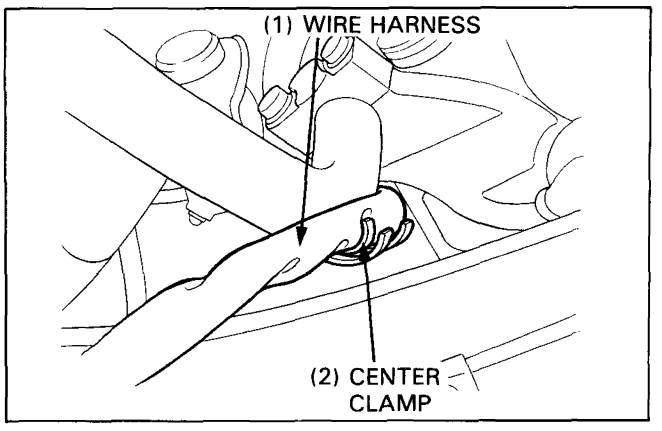
NOTE

- Tighten the holder bolts front side first then the rear side.

Install the wire band onto the handlebar.

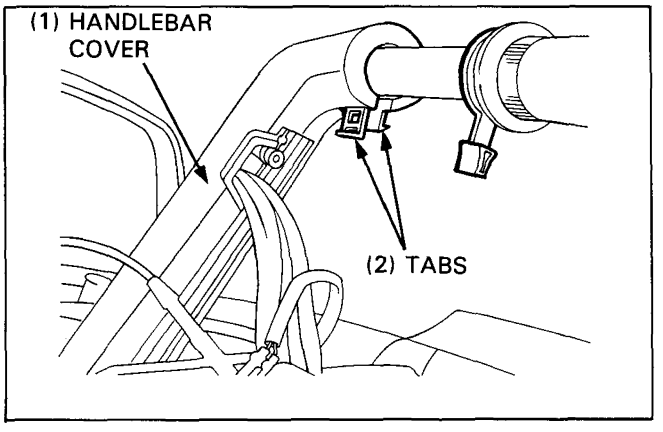


Clamp the right handlebar switch wire harness securely with the center clamp.



Install the handlebar cover (each side).

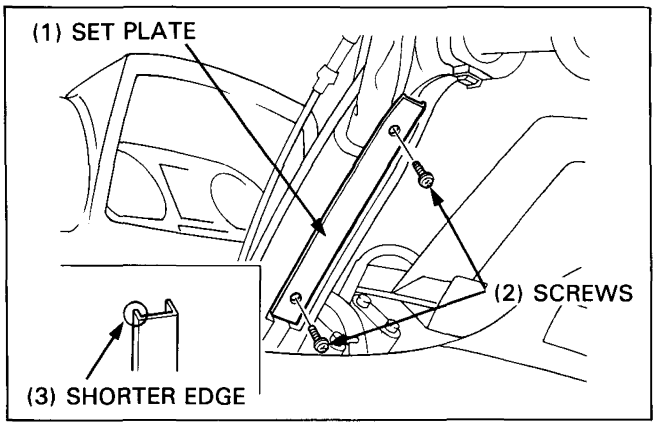
Secure the upper end of the handlebar covers by fastening the tab at the upper end.



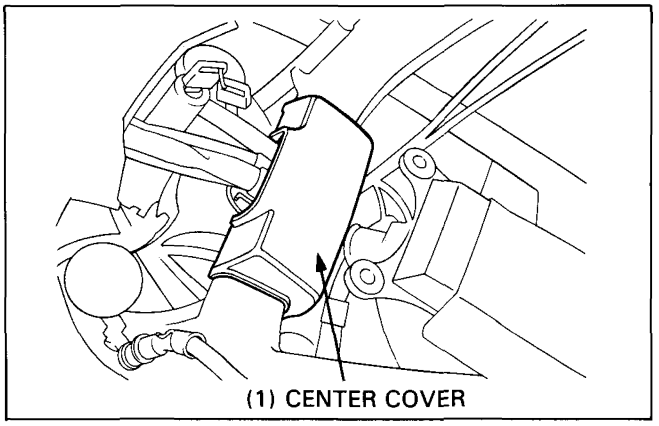
Install and secure the handlebar cover set plates with the screws.

NOTE

- Install the set plate with its shorter edge forward.



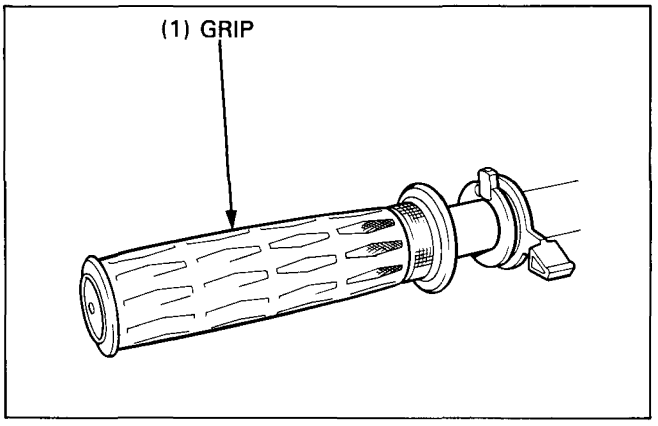
Install the handlebar center cover securely.



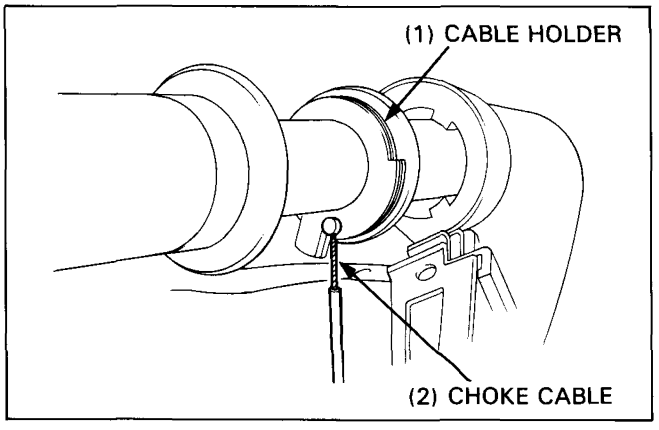
If the hand grips were removed, apply Honda Bond A to the inside surfaces of the grips and to the clean surfaces of the left handlebar and throttle grip. Wait 3-5 minutes and install the grips. Rotate the grips for even application of the adhesive.

NOTE

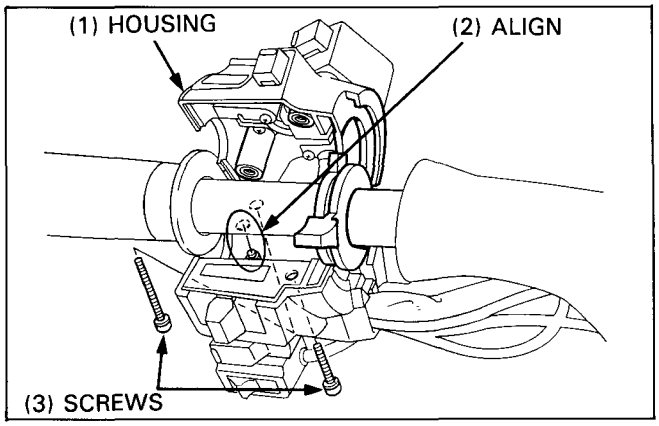
- Allow the adhesive to dry for an hour before using.



Install the choke cable onto the cable holder.



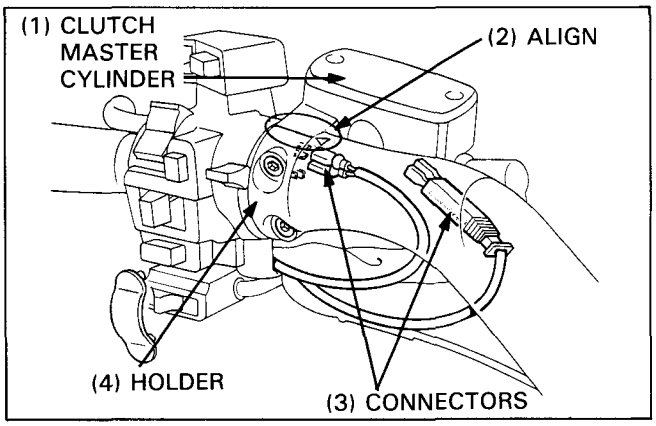
Install the left switch housing to the handlebar, aligning the boss of the housing with the hole in the handlebar.
Set the choke cable holder securely into the housing groove.
Secure the housing with the screws: tighten the forward screw first, then the rear screw.



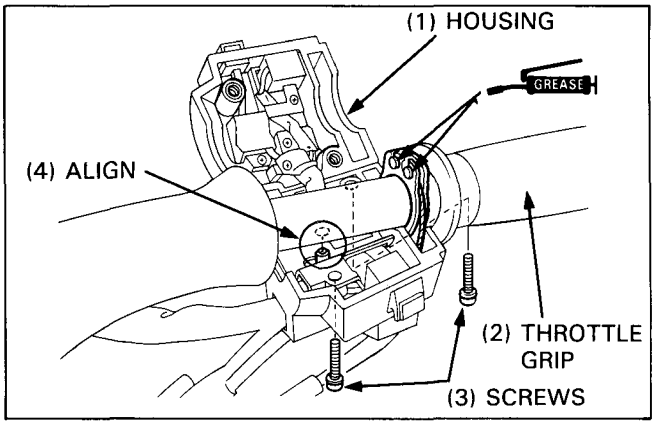
Install the clutch master cylinder and holder, aligning the end of the holder with the arrow mark on the handlebar cover.
Install and tighten the holder bolts.

TORQUE: 12 N·m (1.2 kg-m, 9 ft-lb)

Connect the switch connectors.



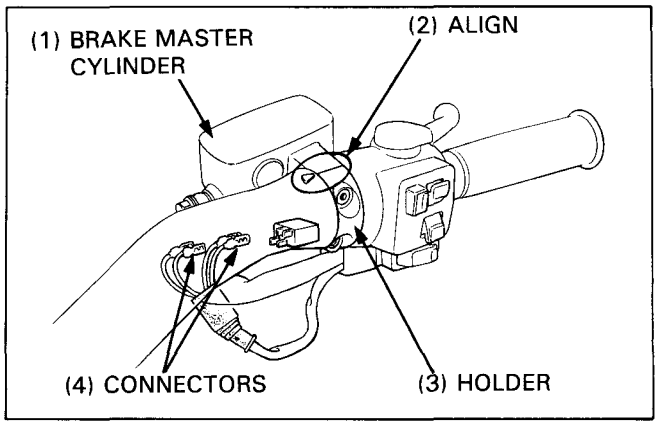
Coat the throttle grip sliding surface and throttle cable ends with grease.
Install the right switch housing to the handlebar, aligning the boss of the housing with the hole in the handlebar.
Set the throttle grip securely into the housing groove and connect the throttle cables to the grip.
Secure the housing with the screw; tighten the forward screw first, then the rear screw.



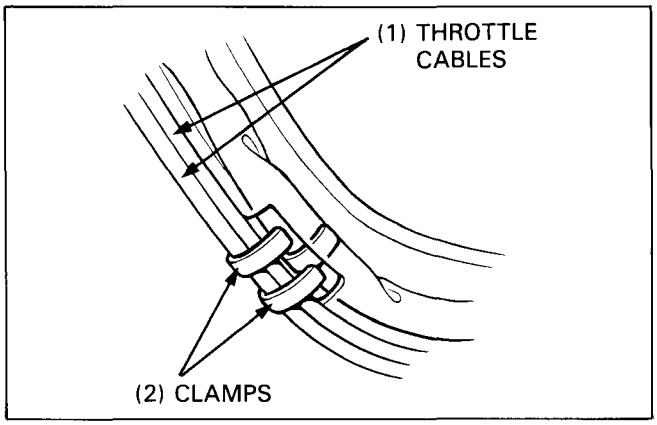
Install the brake master cylinder and holder, aligning the end of the holder with the arrow mark on the handlebar cover.
Install and tighten the holder bolts.

TORQUE: 12 N·m (1.2 kg-m, 9 ft-lb)

Connect the switch connectors.



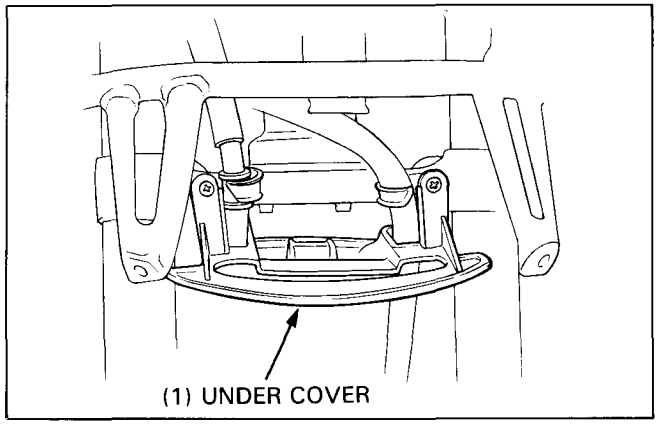
Clamp the throttle cables with right handlebar clamps securely.



STEERING STEM

REMOVAL

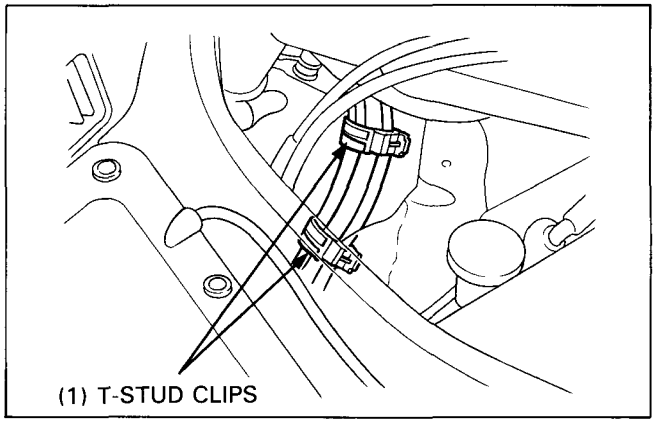
Remove the stem under cover from the steering stem.
(Not necessary to remove the fairing to remove the stem under cover)



Unfasten T-stud clips at the lower side of the ignition switch.

NOTE

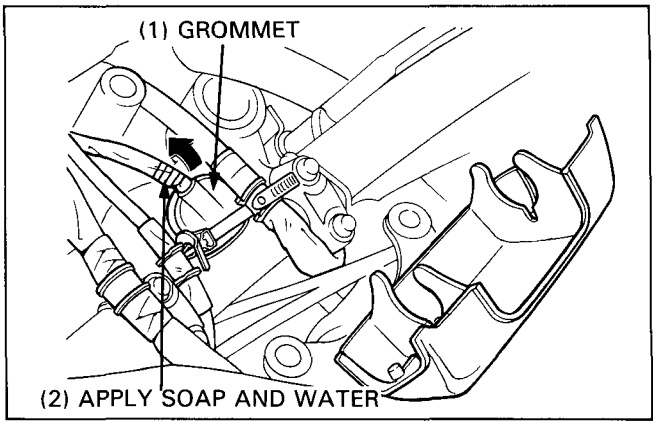
- Do not remove the T-stud clip from the frame. Re-use strictly prohibited.



Remove the steering stem grommet and slide it all the way to the wire harness side.

CAUTION

- *Apply a little amount of soapy water solution to the wire harness surface to allow the grommet to slide smoothly.*



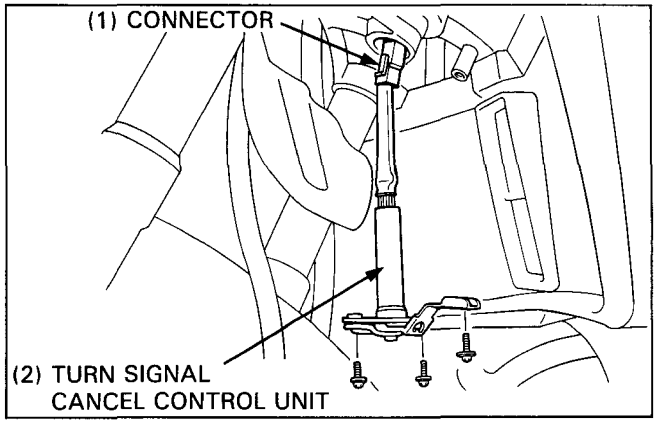
Remove the retaining screws and move the turn signal cancel control unit enough to disconnect the unit connector.

NOTE

- If necessary, slide the steering stem grommet up farther.

Disconnect the turn signal cancel control unit connector.

Remove the turn signal cancel control unit wire out of the steering stem.



Remove the following.
- handlebar (page 13-18)
- front wheel (page 13-4)
- front fender (page 12-13)

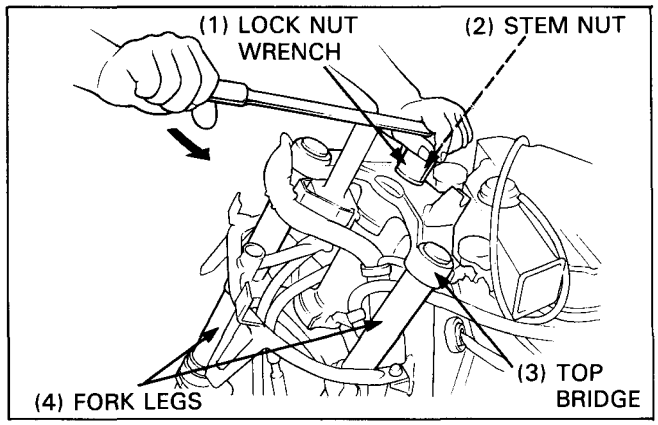
NOTE

- The steering stem can be removed without removing the fairing.

Remove the steering stem nut.

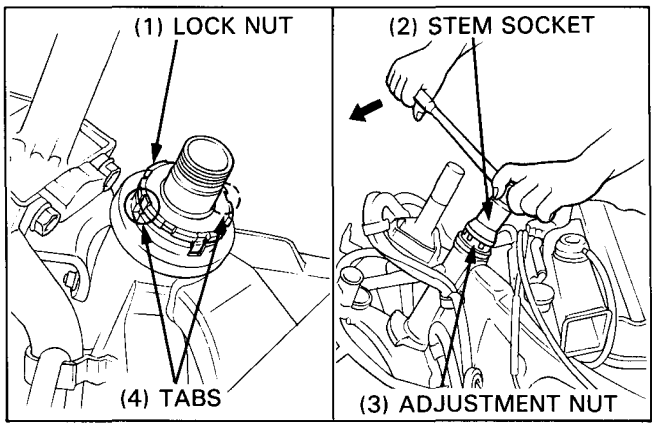
TOOL:
Lock nut wrench, 30 x 32 mm 07716–0020400

Remove the fork legs (page 14-10) and top bridge.



Straighten the lock washer tabs, and remove the lock nut and lock washer.
Hold the steering stem to keep it from falling while you remove the steering adjustment nut and the steering stem.

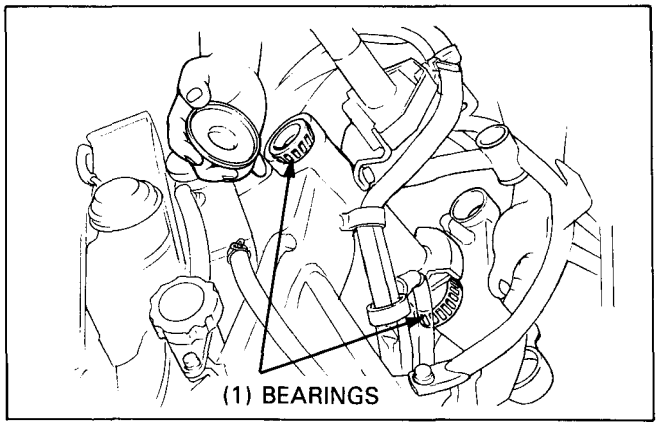
TOOL:
Steering stem socket 07916–3710100



Check the top and bottom bearings and races for wear or damage and replace if necessary.

CAUTION

- *Steering head bearings and races are supplied in matched sets to ensure a precision fit. Remove and install complete sets. Do not mix replacement bearings or races with original parts.*
- *If there has been collision damage, inspect the steering head for cracks, deformation, and misalignment before you install new races.*

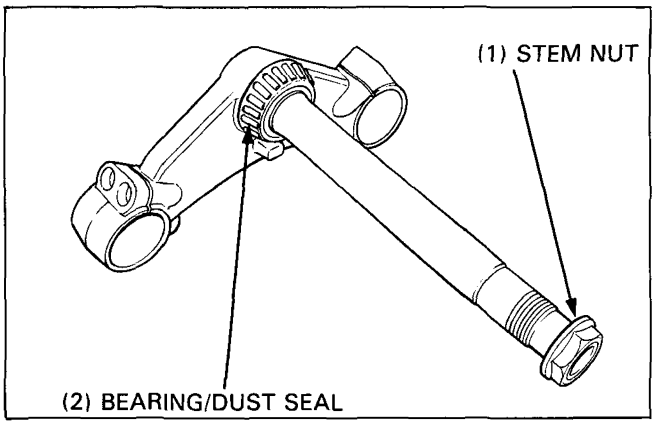


BOTTOM BEARING REPLACEMENT

Remove the bottom bearing with a hammer and a drift.

NOTE

- Install the adjustment nut on the top end of the steering stem to prevent damage to the threads.
- The bearing and dust seal with be damaged during removal. Install new parts.



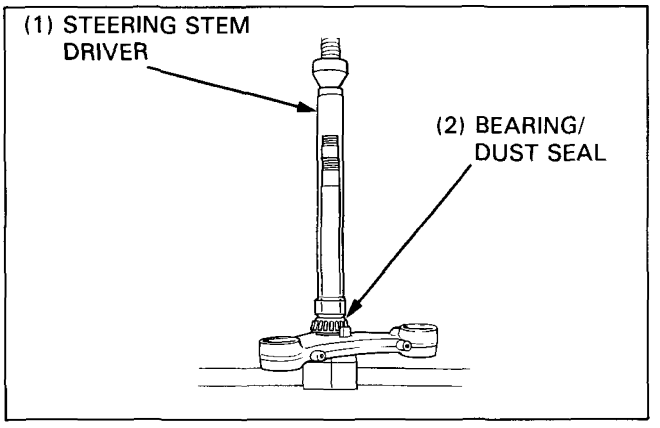
Install a new dust seal and drive a new bearing into place.

TOOL:

Steering stem driver	**07946–MB00000**

NOTE

- Replace the dust seal and bearing whenever they are removed from the steering stem.

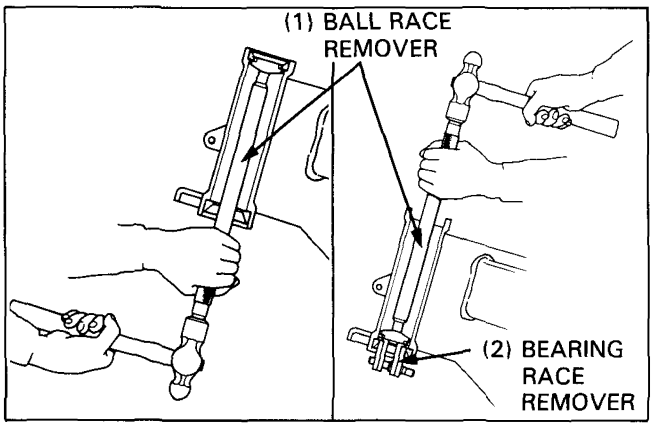


BEARING RACE REPLACEMENT

Inspect the top and bottom races and replace if worn or damaged.
Drive out the top race and then the bottom race.

TOOLS:

Top race:	**Ball race remover**	**07953–4250002**
Bottom race:	**Ball race remover**	**07953–4250002**
	Bearing race remover	**07946–3710500**



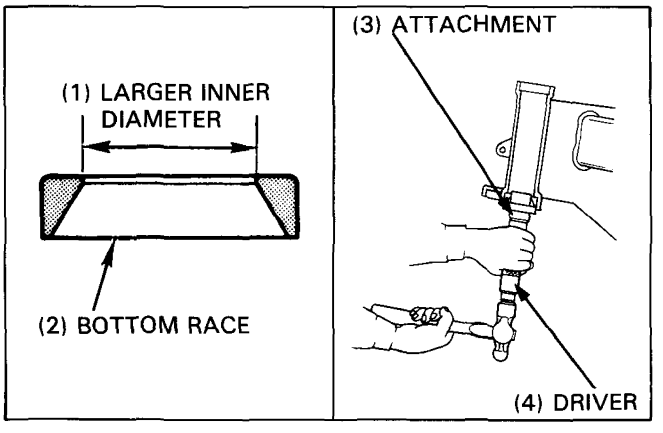
Install a new bottom race.

TOOLS:

Driver	**07749–0010000**
Attachment, 52 x 55 mm	**07746–0010400**

NOTE

- The bottom race has a larger I.D. than the top race. Be sure to install the races in their proper places.
- Drive the races in squarely until they seat fully.



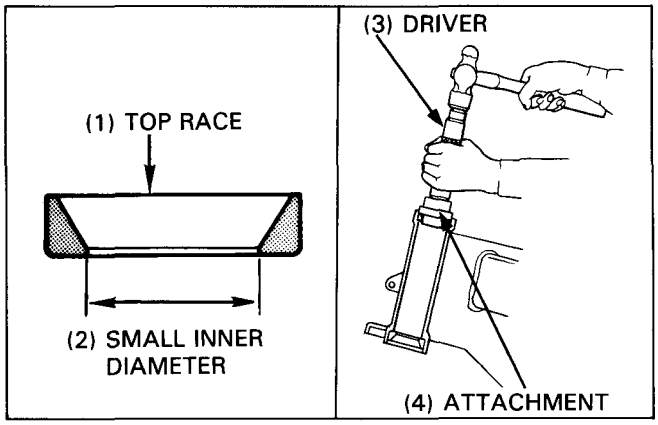
Install a new top race.

TOOLS:

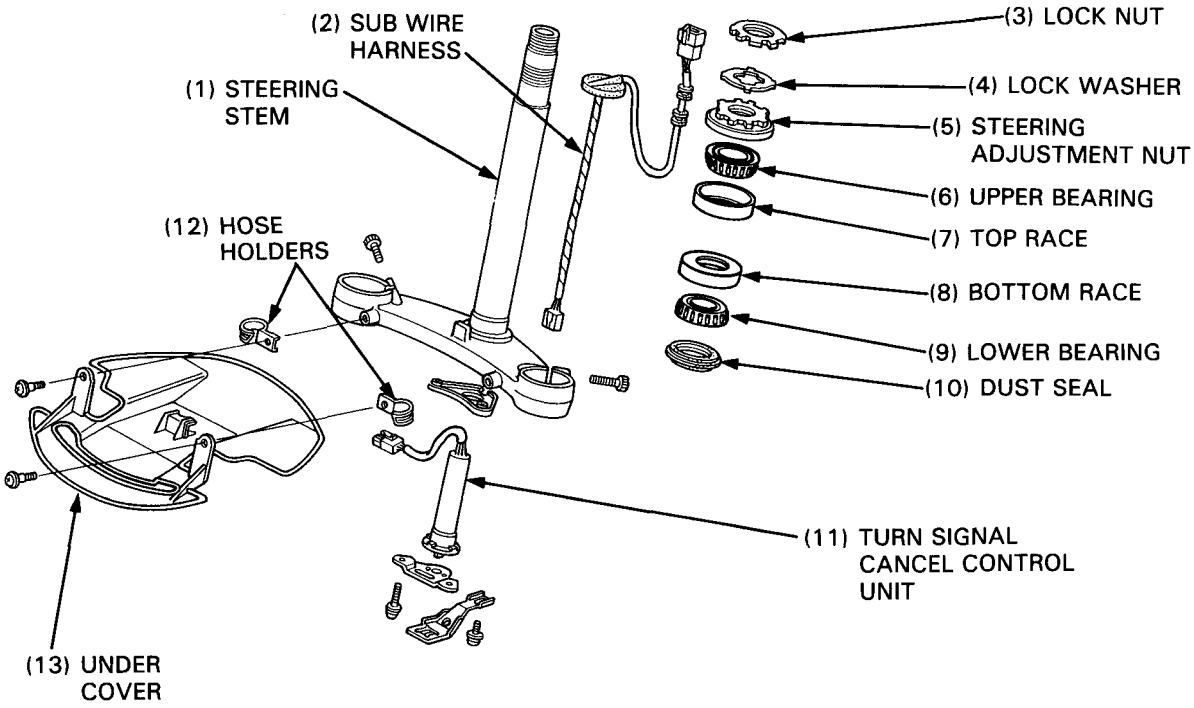
Driver	**07749–0010000**
Attachment, 42 x 47 mm	**07746–0010300**

NOTE

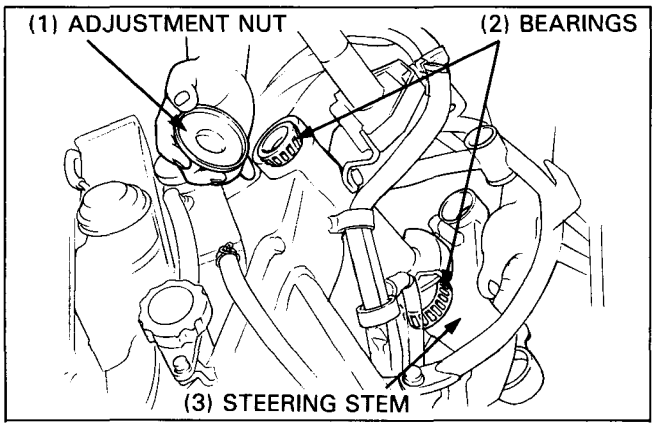
- Drive the races in squarely until they are fully seated.



INSTALLATION



Pack the bearing cavities with grease.
Install the steering stem through the steering head with the steering stem top bearing.
Install the steering adjustment nut.

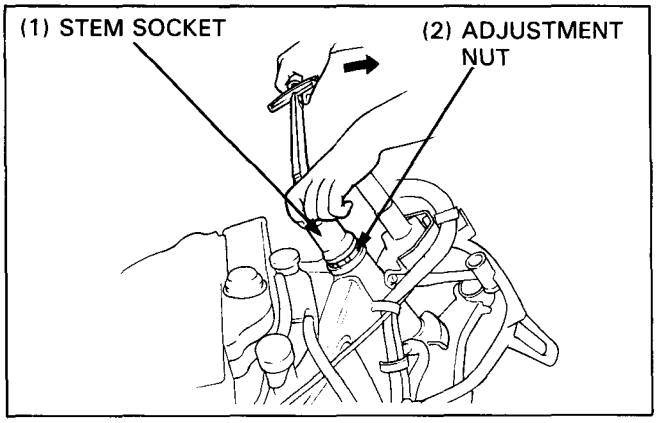


Tighten the steering stem adjustment nut as follows:
1. Tighten the adjustment nut to 40 N·m (4.0 kg-m, 29 ft-lb)
2. Turn the steering stem lock-to-lock five times to seat the bearings.
3. Loosen the adjustment nut until it can be loosened with hand, then retighten to the specified torque.

TOOL:
Steering stem socket 07916—3710100

TORQUE: 19 N·m (1.9 kg-m, 14 ft-lb)

4. Repeat the step 2 and retighten the adjustment nut to the specified torque (19 N·m). Repeat this operation twice.



⚠ WARNING

- ***If the adjustment nut is too loose, handlebar oscillation may be experienced. If too tight, cornering instability and excessive noise during braking will be experienced.***

Install a new lock washer, aligning the tabs with the nut grooves.

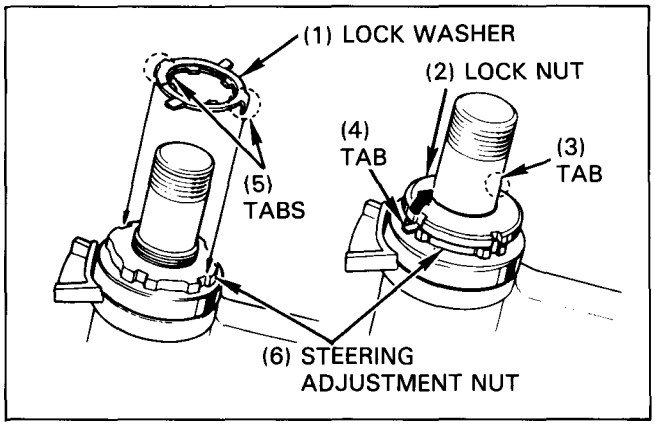
NOTE

- Always use a new lock washer.

Hold the adjustment nut, and hand tighten the lock nut only to align its grooves with the lock washer tabs.

NOTE

- If the lock nut grooves cannot be easily aligned with the lock washer tabs, remove the nut, turn it over and reinstall it.

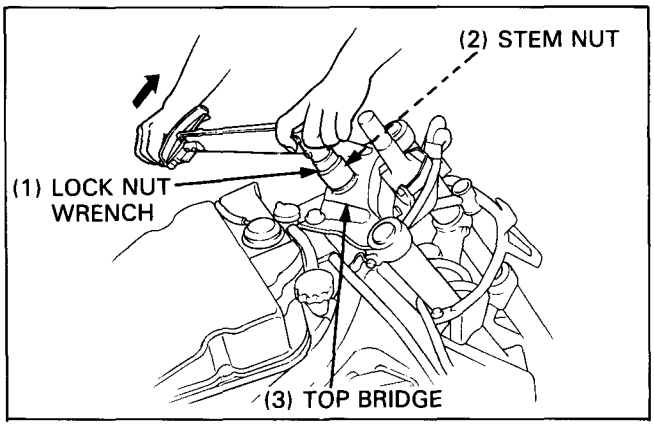


Bend the other two lock washer tabs up into the lock nut grooves.
Temporarily hold the front fork legs by tightening the lower fork pinch bolts.
Install the steering top bridge and tighten the steering stem nut.

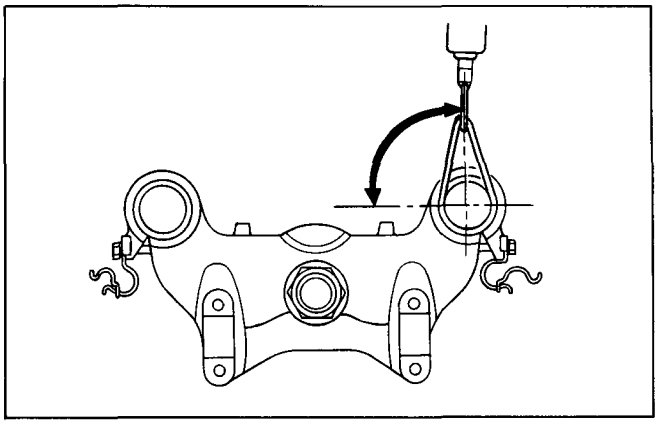
TOOL:
Lock nut wrench, 30 x 32 mm 07716—0020400

TORQUE: 100 N·m (10.0 kg-m, 72 ft-lb)

Loosen the lower fork pinch bolts and correctly install the fork legs (page 14-17).



Install the following:
– front fender (page 12-13)
– front wheel (page 13-7)
Place a stand under the engine and raise the front wheel off the ground.
Position the steering stem to the straight ahead position.
Hook a spring scale to the fork tube and measure the steering head bearing preload.



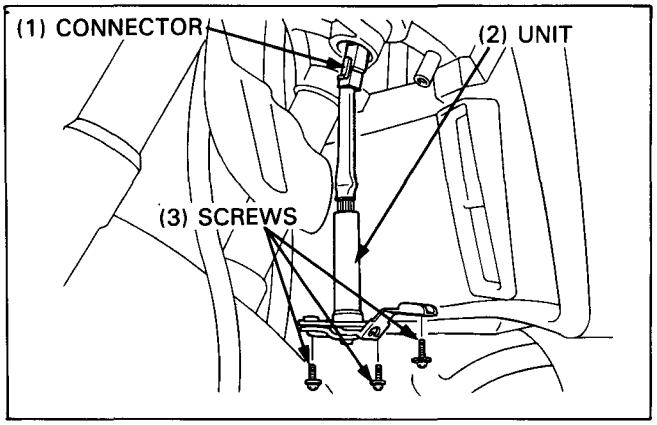
NOTE

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

The preload should be within 1.8–2.2 kg (4.00–4.85 lb) for right and left turns.
If the readings do not fall within the limits, lower the front wheel on the ground and adjust the steering stem adjustment nut (previous page).

Put the turn signal cancel control unit wire harness through the steering stem.
Connect the connector to the unit.

Install the unit into the steering stem and secure it with the screws.

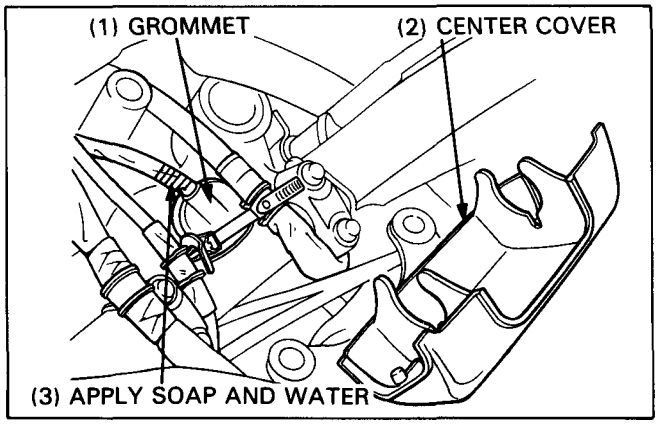


Slide the steering stem grommet and install it onto the steering stem nut.

NOTE

- Apply a little amount of soapy water solution to the wire harness surface to allow the grommet to slide smoothly.

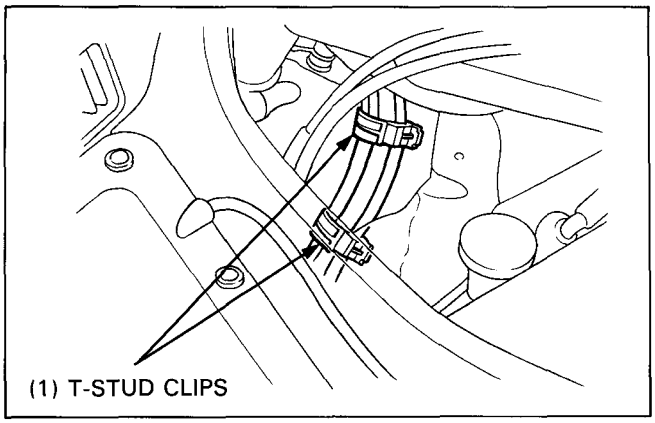
Install the handlebar (page 13-19).
Install the handlebar center cover securely.



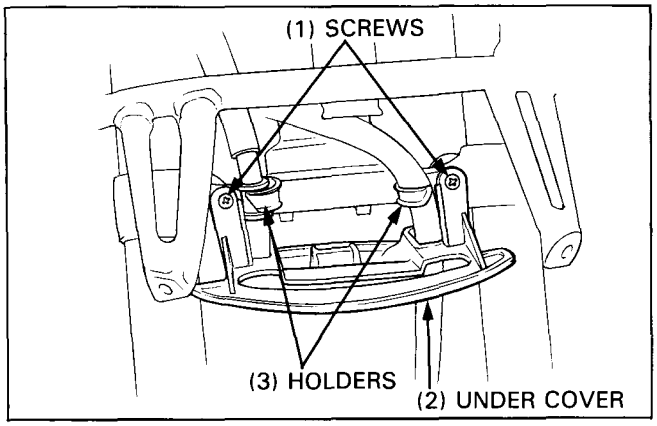
Fasten T-stud clips at lower side of the ignition switch.

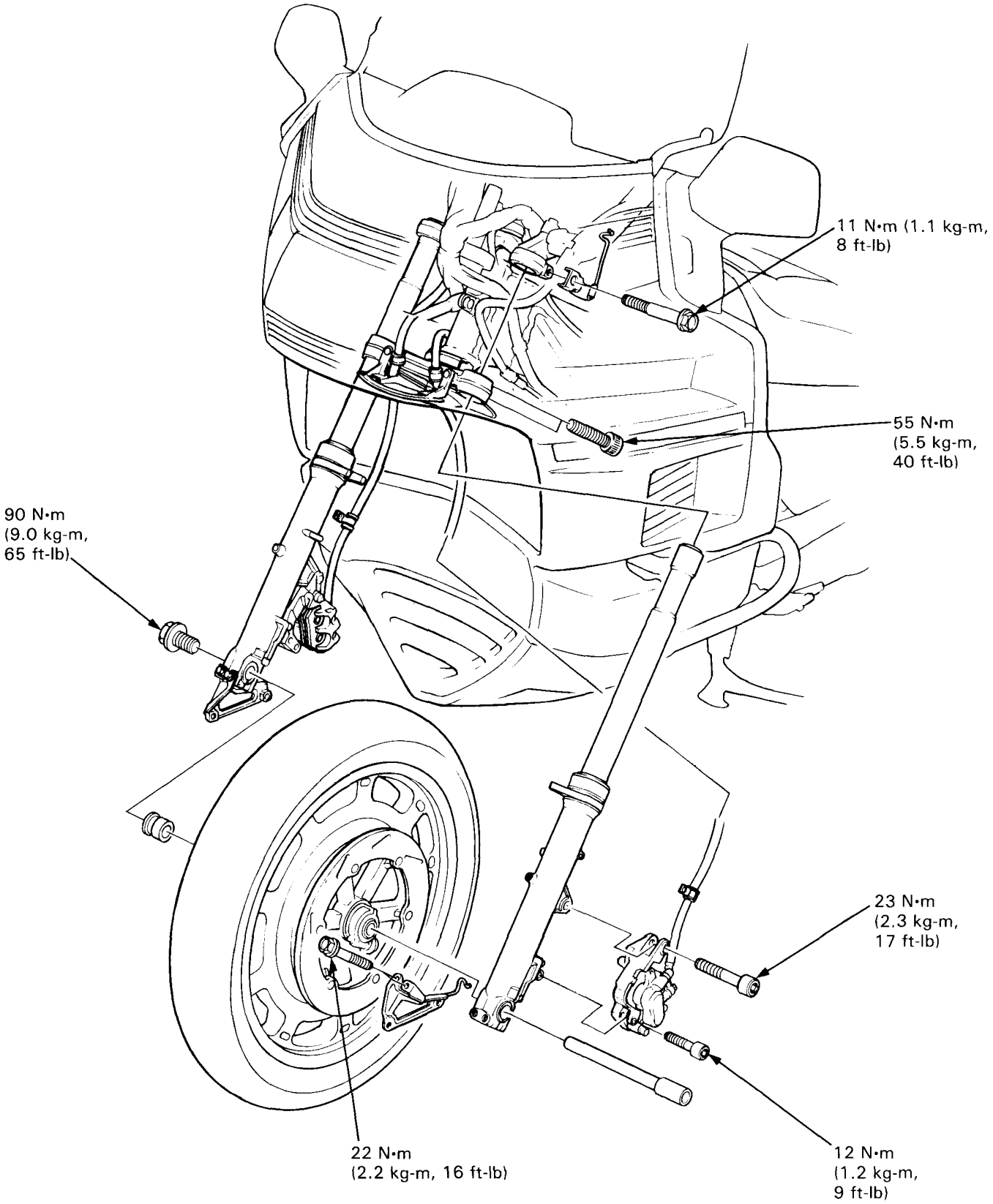
NOTE

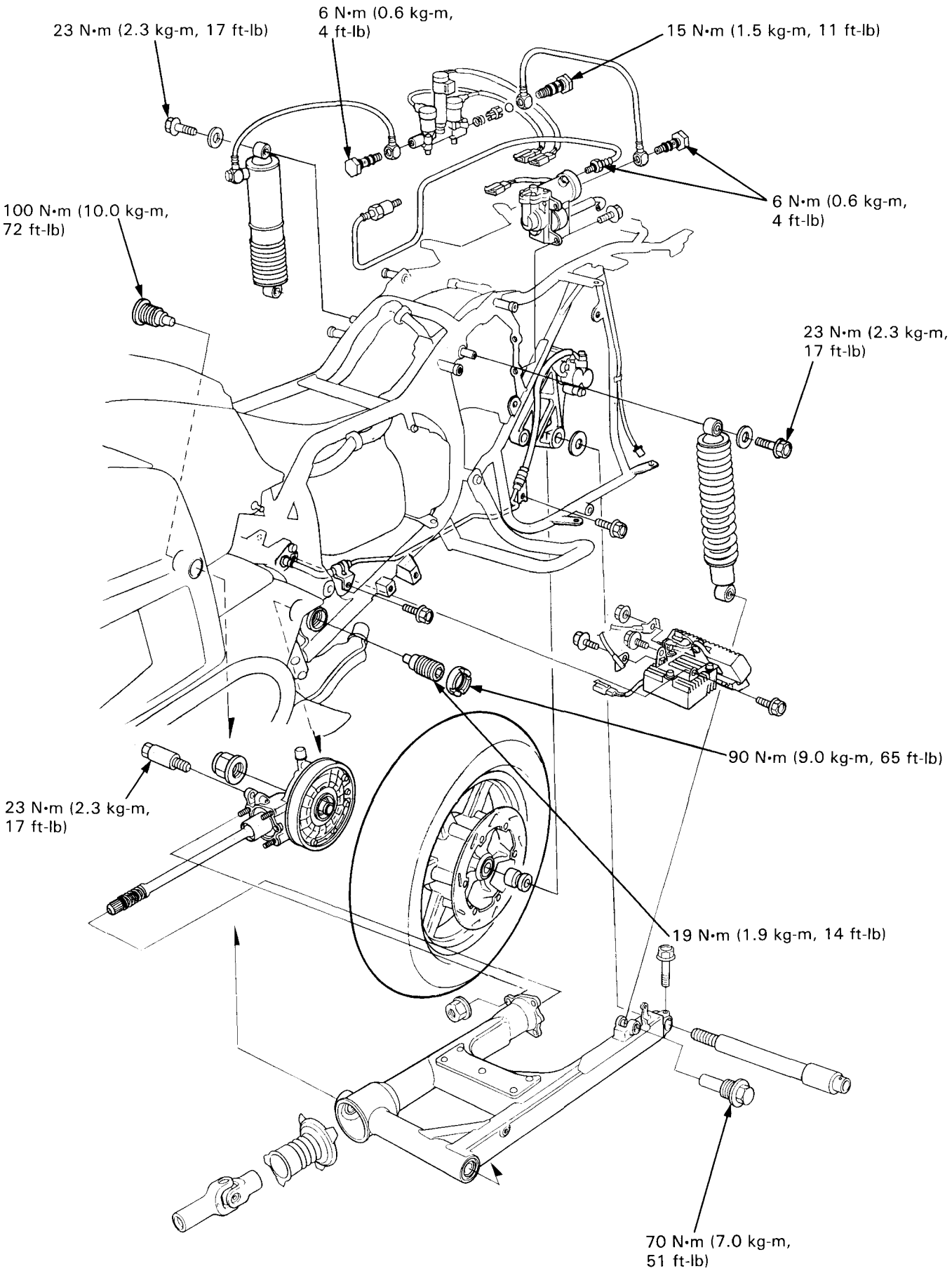
- Do not remove the T-stud clip from the frame. Re-use strictly prohibited.



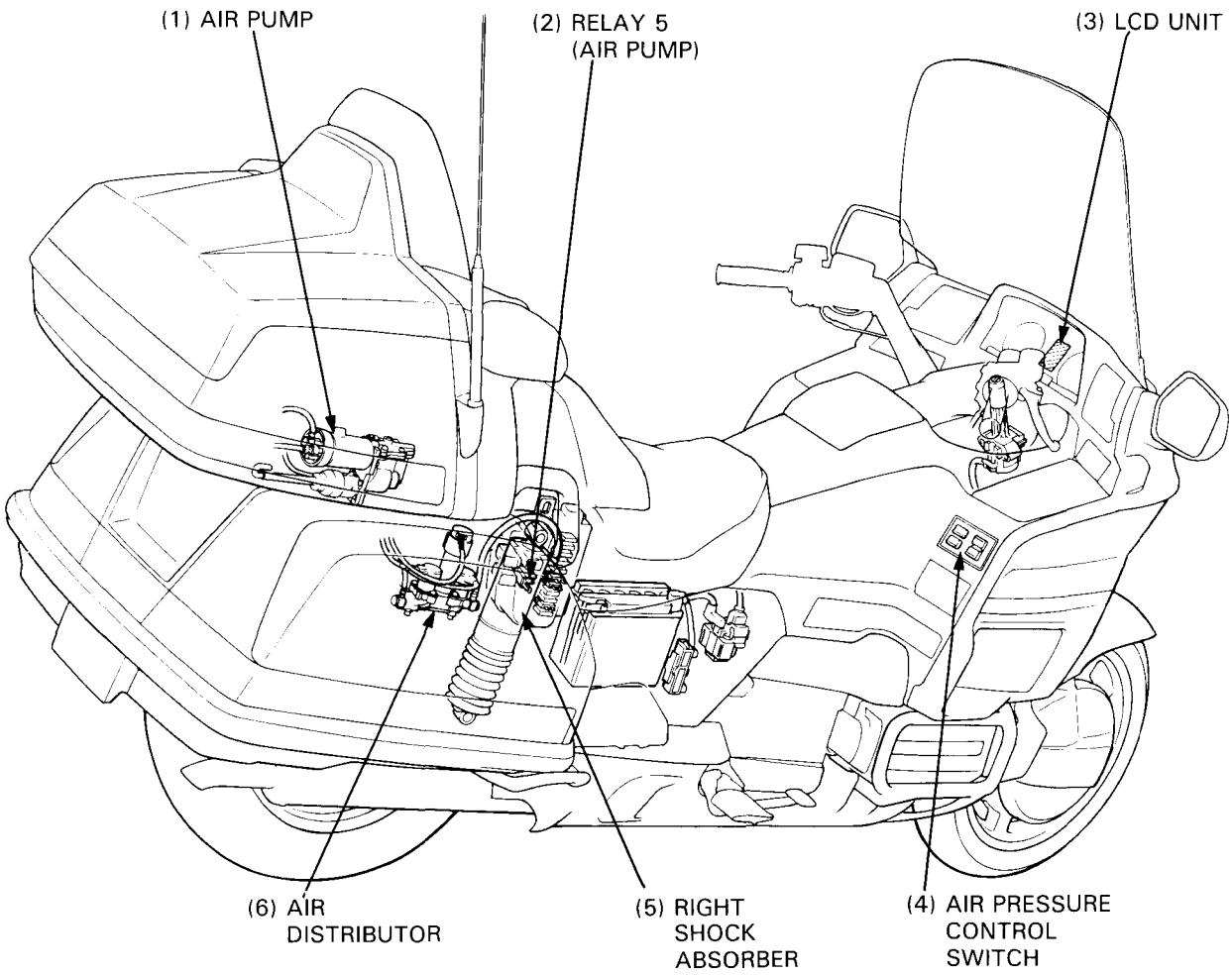
Install the stem under cover, inserting its tab between the turn signal cancel control unit plates, and secure with screws with brake hose holders.



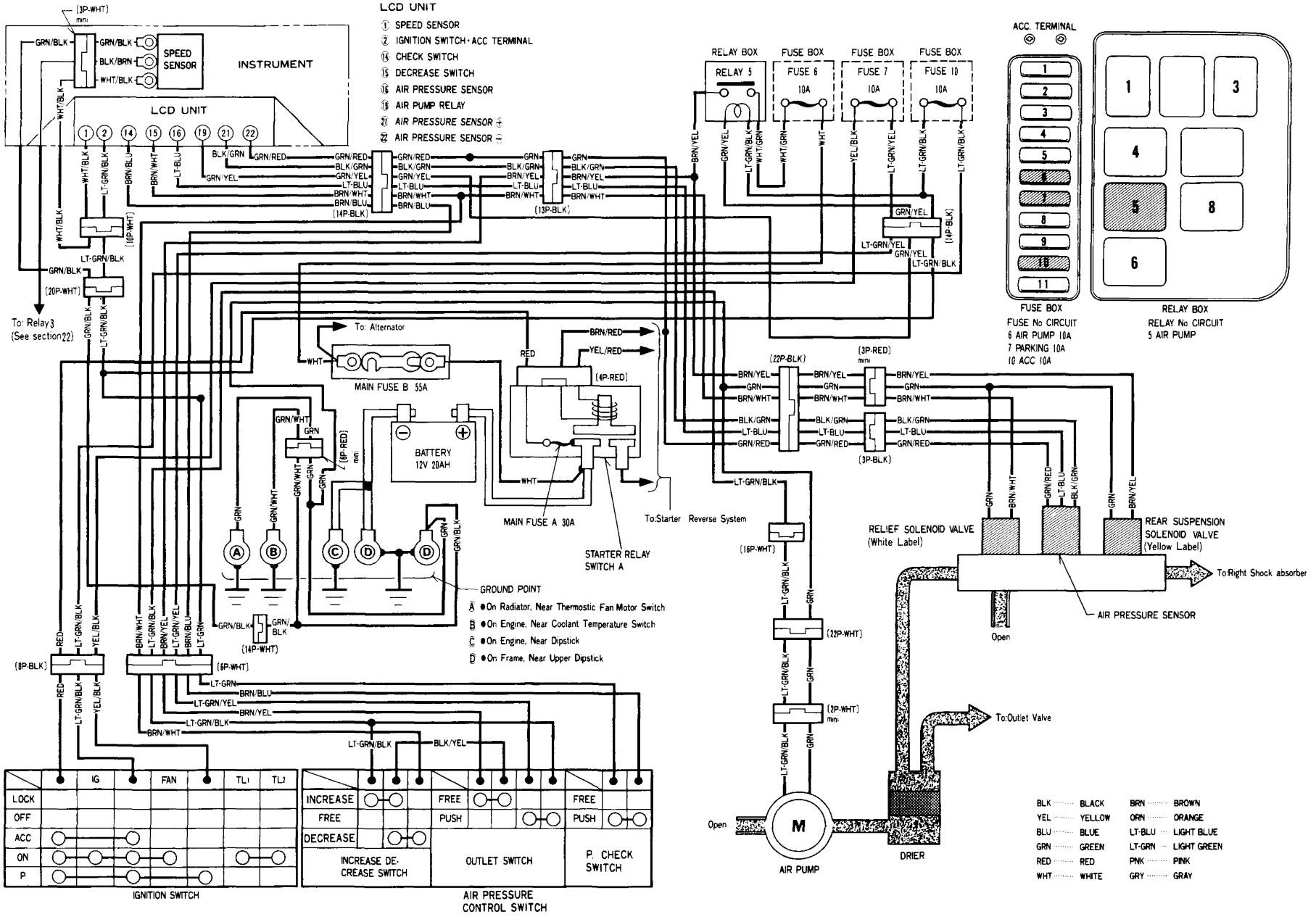

11 N•m (1.1 kg-m, 8 ft-lb)
55 N•m (5.5 kg-m, 40 ft-lb)
90 N•m (9.0 kg-m, 65 ft-lb)
23 N•m (2.3 kg-m, 17 ft-lb)
22 N•m (2.2 kg-m, 16 ft-lb)
12 N•m (1.2 kg-m, 9 ft-lb)


23 N•m (2.3 kg-m, 17 ft-lb)
6 N•m (0.6 kg-m, 4 ft-lb)
15 N•m (1.5 kg-m, 11 ft-lb)
6 N•m (0.6 kg-m, 4 ft-lb)
100 N•m (10.0 kg-m, 72 ft-lb)
23 N•m (2.3 kg-m, 17 ft-lb)
90 N•m (9.0 kg-m, 65 ft-lb)
23 N•m (2.3 kg-m, 17 ft-lb)
19 N•m (1.9 kg-m, 14 ft-lb)
70 N•m (7.0 kg-m, 51 ft-lb)

SYSTEM LOCATION



CIRCUIT DIAGRAM



SERVICE INFORMATION

GENERAL

- Apply clean ATF to the O-rings when install the air hoses.
- Always replace a bent forks; straightening them will weaken the material.
- When inspect the ON-BOARD AIR COMPRESSOR SYSTEM, check the system components and lines step-by-step according to the troubleshooting.

CAUTION

- *Always use the center stand when adjusting air pressures. Do not use the side stand when adjusting the air pressure, as you will get false perssure readings.*

SPECIFICATIONS

Right shock absorber air pressure;

Rear Air Pressure	Conditions	
	Rider	Riding Conditions
0 kPa (0 kg/cm², 0 psi) ↕ 400 kPa (4.0 kg/cm² 57 psi)	One ↕ With passenger	Ordinary or city road riding ↕ Rough road riding

ITEM		STANDARD	SERVICE LIMIT
Fork spring free length	Spring A	192.9 mm (7.59 in)	189.0 mm (7.44 in)
	Spring B	386.3 mm (15.21 in)	378.6 mm (14.91 in)
Fork tube runout		—	0.2 mm (0.01 in)
Fork oil capacity	Left	325 cm³ (10.9 US oz, 11.4 Imp oz)	—
	Right	320 cm³ (10.8 US oz, 11.2 Imp oz)	—
Fork oil level (from the top of tube)		239 mm (9.4 in)	—
Fork oil		ATF	—
Left shock absorber spring free length		280.7 mm (11.05 in)	274.5 mm (10.81 in)
Right shock absorber oil capacity		140 cm³ (4.7 US oz, 4.9 Imp oz)	—
Right shock absorber oil		ATF	—

TORQUE VALUES

Anti-dive case socket bolt		8 N·m (0.8 kg-m, 6 ft-lb) —Apply locking agent.
Fork bottom socket bolt		20 N·m (2.0 kg-m, 14 ft-lb) —Apply locking agent.
Fork bolt		23 N·m (2.3 kg-m, 17 ft-lb)
Fork leg upper pinch bolt		11 N·m (1.1 kg-m, 8 ft-lb)
Fork leg lower pinch bolt		55 N·m (5.5 kg-m, 40 ft-lb)
Left shock absorber mount bolt	(Upper)	23 N·m (2.3 kg-m, 17 ft-lb)
	(Lower)	70 N·m (7.0 kg-m, 51 ft-lb)
Right shock absorber mount bolt	(Upper)	23 N·m (2.3 kg-m, 17 ft-lb)
	(Lower)	23 N·m (2.3 kg-m, 17 ft-lb)
Swing arm right pivot bolt		100 N·m (10.0 kg-m, 72 ft-lb)
Swing arm left pivot bolt		19 N·m (1.9 kg-m, 14 ft-lb)
Swing arm left pivot lock nut		90 N·m (9.0 kg-m, 65 ft-lb) —Torque wrench scale reading
Air hose bolt		6 N·m (0.6 kg-m, 4 ft-lb)
Air hose special bolt (with seat)		15 N·m (1.5 kg-m, 11 ft-lb)
Air pressure sensor		6 N·m (0.6 kg-m, 4 ft-lb)
Air distributor solenoid valve mounting screw		3 N·m (0.3 kg-m, 2 ft-lb)
Outlet air hose joint		6 N·m (0.6 kg-m, 4 ft-lb)

TOOLS

Special

Fork seal driver	07947—KA50100
Fork seal driver attachment	07947—KF00100
Shock absorber compressor	07GME—0010000 or 07959—3290001
Shock absorber compressor attachment	07959—MB10000
Oil seal driver	07965—KE80100
Oil seal driver attachment	07965—MA60100
Lock nut wrench	07908—4690001
Pivot bearing outer race remover	07936—4150000

Common

Seal remover pump	Equivalent commercially available
Socket bit	07703—0020500
Driver	07749—0010000
Attachment, 37 x 40 mm	07746—0010200
Pressure pump	Equivalent commercially available
Vacuum pump	

TROUBLESHOOTING

Wobble or Vibration
- Distorted rim
- Loose wheel bearing
- Faulty tire
- Loose axle
- Loose swing arm pivot bolt

Soft Suspension
- Weak spring
- Insufficient air pressure (rear/right)
- Weak rear damper
- Insufficient fluid weight (low viscosity)

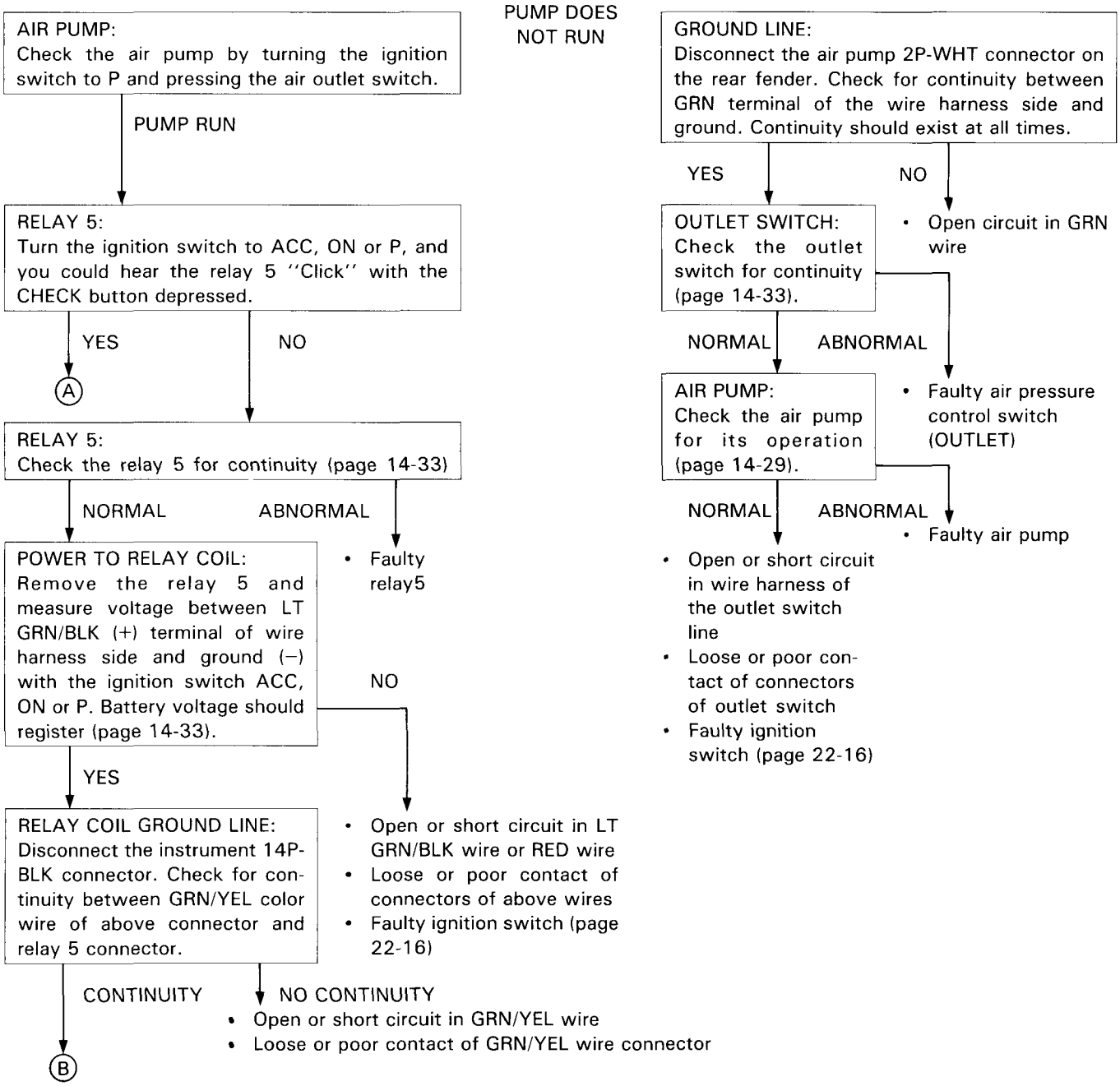
Hard Suspension
- Shock absorber improperly adjusted (right)
- Incorrect fluid weight (high viscosity)
- Too much air pressure (rear/right)
- Clogged fork hydraulic passage
- Bent fork tubes
- Slider binding
- Clogged anti-dive orifice

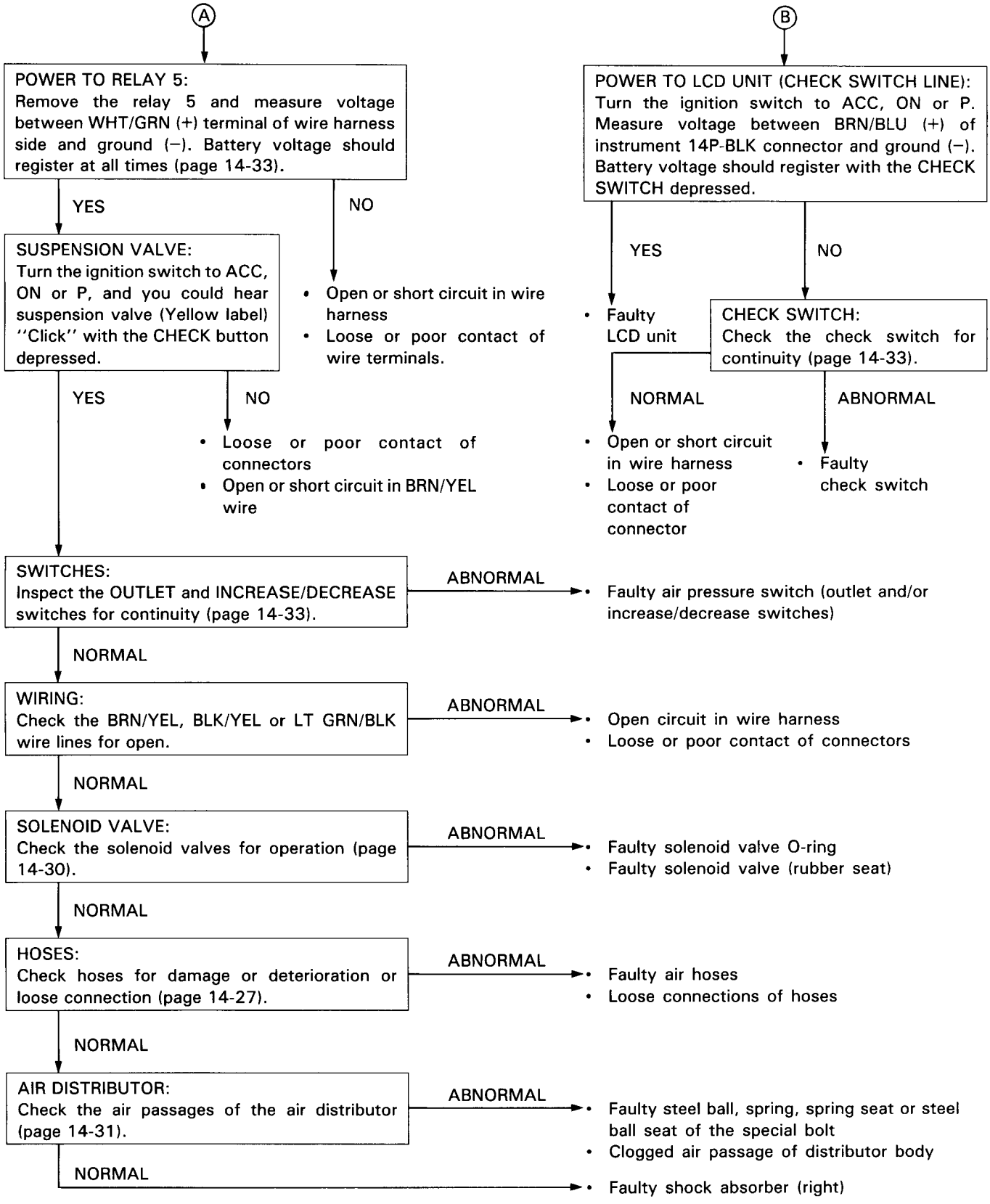
Suspension Noise
- Shock case binding
- Loose fasteners
- Insufficient fluid weight (low viscosity)

NOTE

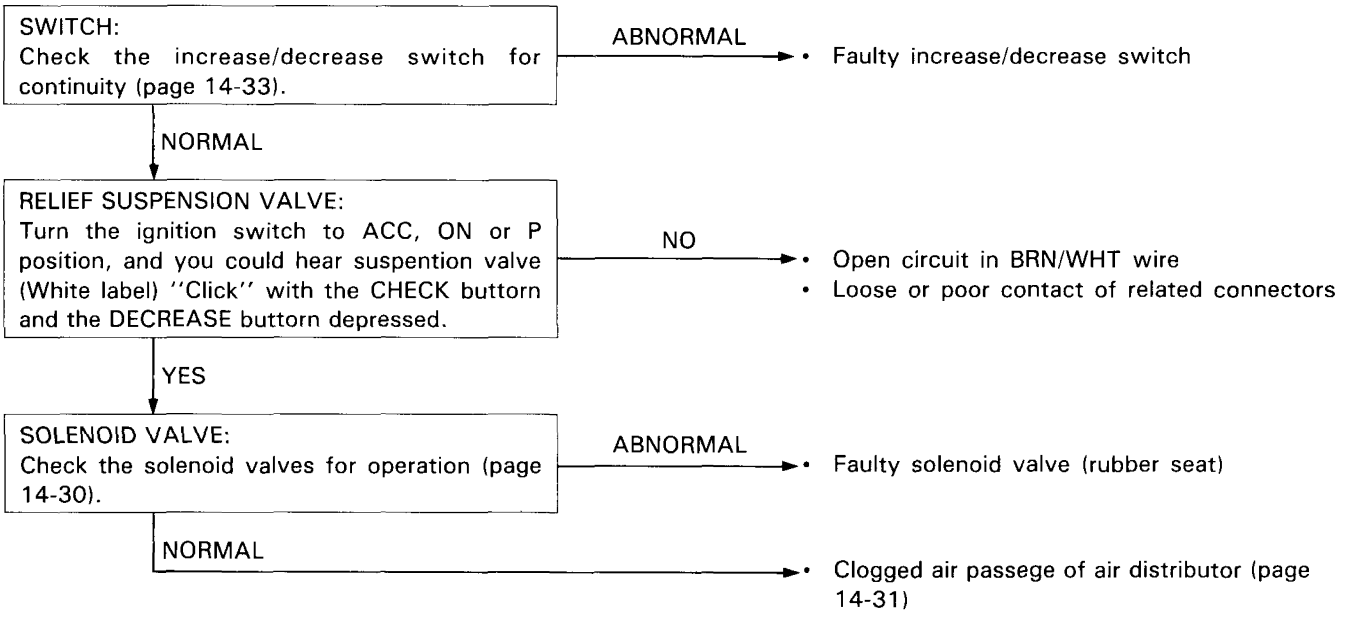
- Before the troubleshooting of the on-board air compressor system, check the following fuses.
  fuse 6 (10 A), 7 (10 A) or 10 (10 A)-inside the fuse box.
  main fuse A (30 A)-inside the starter relay switch A.
  main fuse B (55 A)-on the battery case.

Air compressor system will not increase.

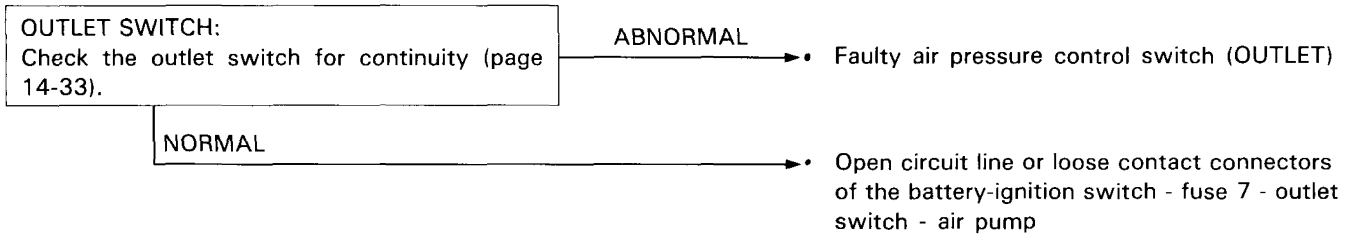



Ⓐ
POWER TO RELAY 5:
Remove the relay 5 and measure voltage between WHT/GRN (+) terminal of wire harness side and ground (−). Battery voltage should register at all times (page 14-33).
YES
NO
• Open or short circuit in wire harness
• Loose or poor contact of wire terminals.
SUSPENSION VALVE:
Turn the ignition switch to ACC, ON or P, and you could hear suspension valve (Yellow label) "Click" with the CHECK button depressed.
YES
NO
• Loose or poor contact of connectors
• Open or short circuit in BRN/YEL wire
SWITCHES:
Inspect the OUTLET and INCREASE/DECREASE switches for continuity (page 14-33).
ABNORMAL
• Faulty air pressure switch (outlet and/or increase/decrease switches)
NORMAL
WIRING:
Check the BRN/YEL, BLK/YEL or LT GRN/BLK wire lines for open.
ABNORMAL
• Open circuit in wire harness
• Loose or poor contact of connectors
NORMAL
SOLENOID VALVE:
Check the solenoid valves for operation (page 14-30).
ABNORMAL
• Faulty solenoid valve O-ring
• Faulty solenoid valve (rubber seat)
NORMAL
HOSES:
Check hoses for damage or deterioration or loose connection (page 14-27).
ABNORMAL
• Faulty air hoses
• Loose connections of hoses
NORMAL
AIR DISTRIBUTOR:
Check the air passages of the air distributor (page 14-31).
ABNORMAL
• Faulty steel ball, spring, spring seat or steel ball seat of the special bolt
• Clogged air passage of distributor body
NORMAL
• Faulty shock absorber (right)
Ⓑ
POWER TO LCD UNIT (CHECK SWITCH LINE):
Turn the ignition switch to ACC, ON or P. Measure voltage between BRN/BLU (+) of instrument 14P-BLK connector and ground (−). Battery voltage should register with the CHECK SWITCH depressed.
YES
NO
• Faulty LCD unit
CHECK SWITCH:
Check the check switch for continuity (page 14-33).
NORMAL
ABNORMAL
• Open or short circuit in wire harness
• Loose or poor contact of connector
• Faulty check switch

Compressor system will not decrease pressure, but the increase pressure operates.



The auxiliary air pressure does not work, but the air compressor system works.



Air compressor system works well, but LCD unit display does not work well.

WIRING:
Disconnect the instrument 14P-BLK connector and measure resistance between the BLK/GRN and GRN/RED wire terminals of wire harness side. 0.7—1.3 K ohms should register at 20°C (68°F).

ABNORMAL →
- Loose or poor contact of connectors
- Open or short circuit in wire harness

NORMAL ↓

WIRING:
Check for continuity between same color wires (LT BLU) terminals of instrument 14P-BLK and pressure sensor 3P-BLK connectors.

NO CONTINUITY →
- Open circuit in LT BLU wire
- Loose or poor contact of LT BLU wire line connectors

CONTINUITY ↓

PRESSURE SENSOR:
Inspect air pressure sensor (page 14-31).

ABNORMAL →
- Faulty air pressure sensor

NORMAL ↓

POWER TO LCD UNIT:
Turn the ignition switch to ACC, ON or P. Disconnect the instrument 10P-WHT connector. Measure voltage between LT GRN/BLK (+) and ground (−).
Battery voltage should register.

NO →
- Open or short circuit in LT GRN/BLK wire
- Loose or poor contact of LT GRN/BLK wire line connectors

YES ↓

CHECK SWITCH:
Turn the ignition switch to ACC, ON or P. Disconnect the instrument 14P-BLK connector. Measure voltage between BRN/BLU (+) and ground (−). With the P. CHECK SWITCH pushed, battery voltage should register.

NO →
- Open or short circuit in BRN/BLU or LT GRN wire
- Loose or poor contact of BRN/BLU or LT GRN wire line connectors

YES ↓

POWER TO PRESSURE SENSOR:
Connect above 10P-WHT connector.
Measure voltage between BLK/GRN (+) wire of the instrument side and ground (−).
About 5 voltage should register with the ignition switch to ACC, ON or P.

CAUTION:

Be careful not to short the BLK/GRN terminal to ground.

NO →
- Faulty LCD unit (BLK/GRN wire line)

YES →
- Loose or poor contact of instrument 14P-BLK connector
- Faulty LCD unit (GRN/RED wire line)

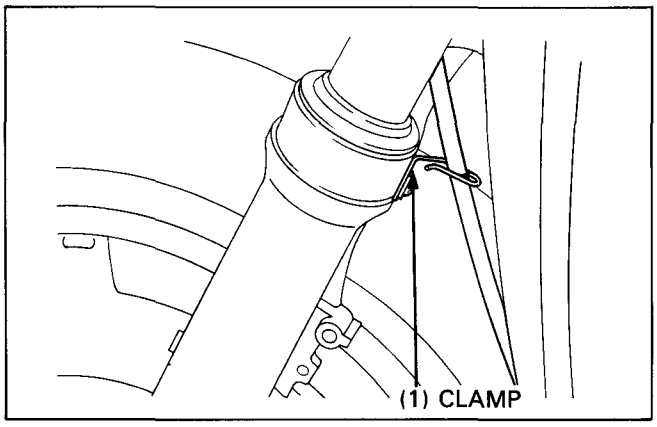
FORK LEG

REMOVAL

Remove the following:
- speedometer cable clamp.
- front fender (page 12-13).
- brake caliper (page 16-17).
- front wheel (page 13-4).

CAUTION

- *Support the caliper assembly so that it does not hang on the brake hose or pipe. Do not twist the brake hose. Do not bend the brake pipe.*



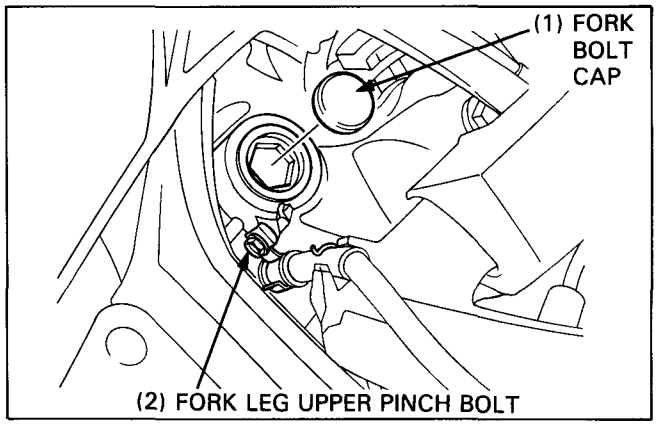
Remove the fork bolt cap.

Loosen the fork bolt; but still not remove it.

⚠ WARNING

- ***The fork bolt is under high spring pressure. Use care when loosening the bolt.***

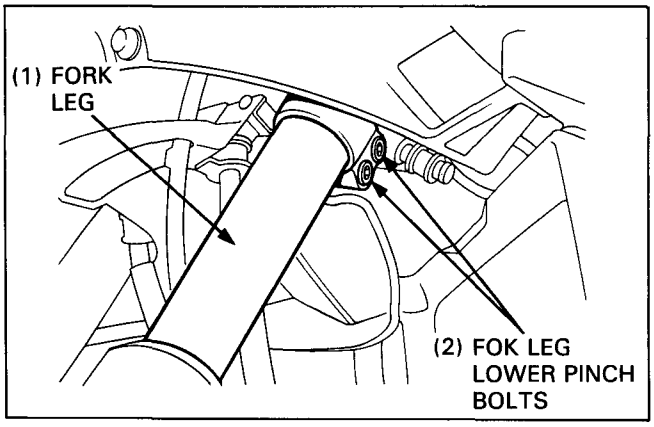
Loosen the fork leg upper pinch bolt.



Loosen the fork leg lower pinch bolts and remove the fork leg downward.

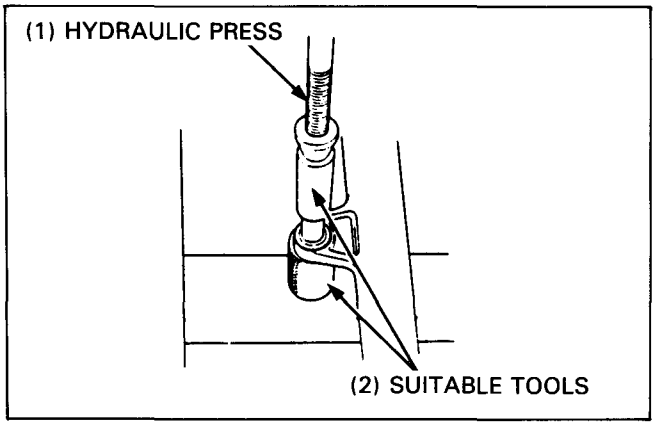
NOTE

- Be careful not to drop the fork legs when loosening the bolts.



FORK SLIDER NEEDLE BEARING REPLACEMENT

Remove the pivot collar.
Check the needle bearing for wear or damage.
Replace it if necessary.
Remove the needle bearing using a hydraulic press with suitable tools as shown.
Install a new needle bearing in the reverse order of removal.

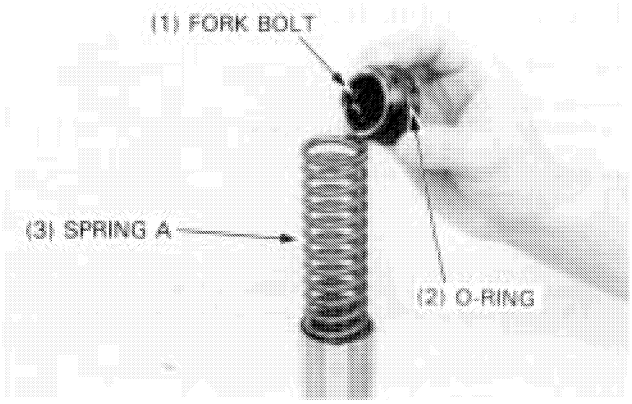


DISASSEMBLY

Remove the fork bolt.
Check the fork bolt O-ring for wear or damage.
Replace it if necessary.

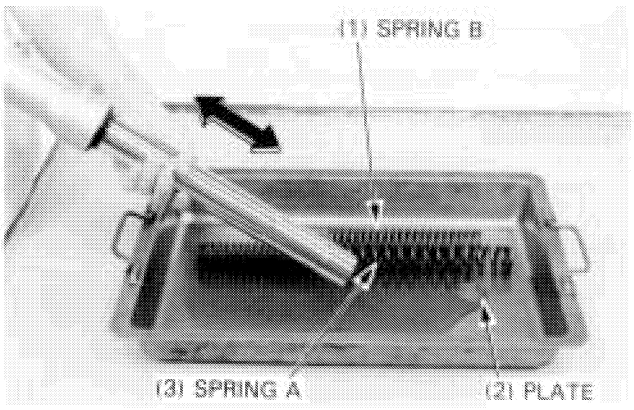
⚠ WARNING

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



Remove the spring A, spring joint plate and spring B.

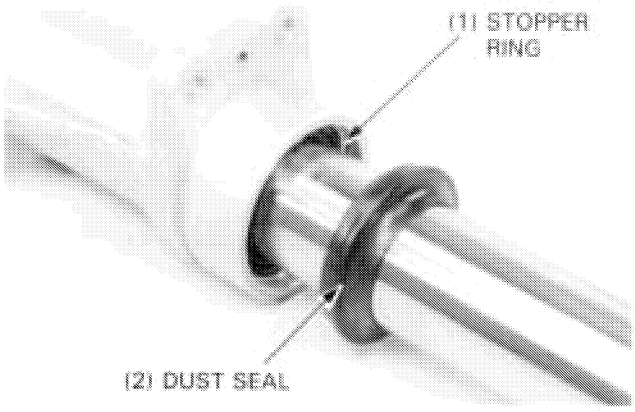
Pour out any remaining fork fluid by pumping the fork up and down several times.



Remove the dust seal and stopper ring.

NOTE

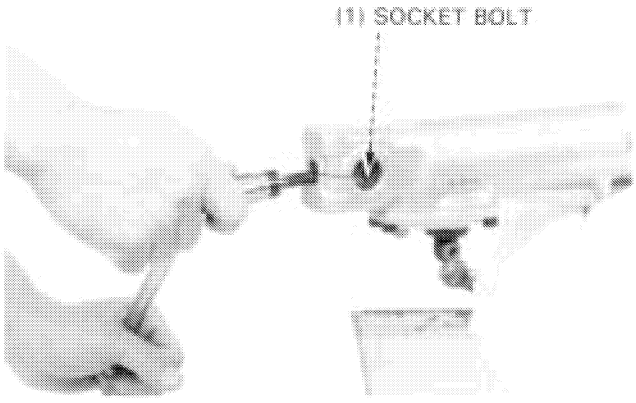
- When removing the stopper ring, do not damage the fork tube.



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

NOTE

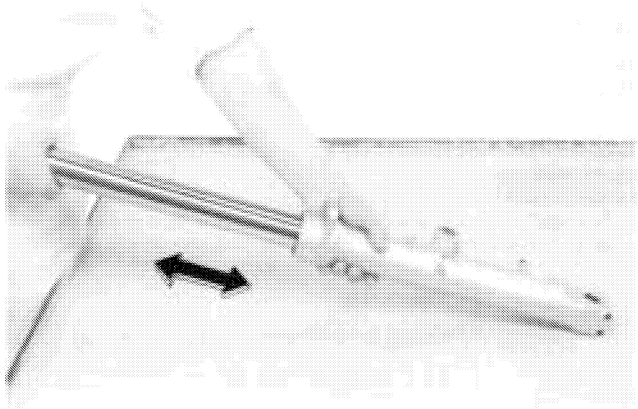
- Temporarily install the spring and fork bolt if difficulty is encountered in removing the socket bolt.



Remove the fork tube from the slider by slamming it out several times.

NOTE

- The fork tube bushing must force the slider bushing out.

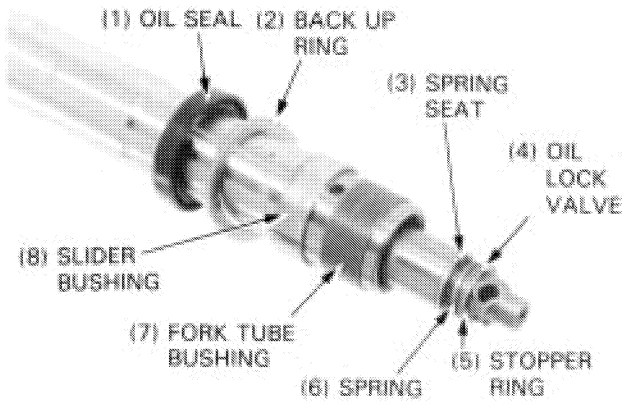


Remove the oil seal, back-up ring and slider bushing from the fork tube.

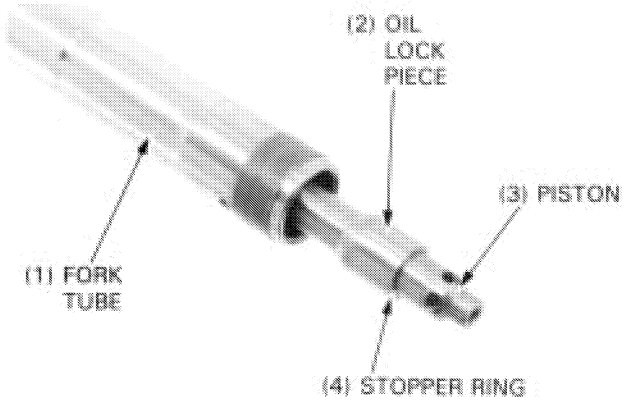
NOTE

- Do not remove the fork tube bushing unless it is necessary to replace.

Remove the stopper ring, oil lock valve, oil lock spring and spring seat from the fork piston.



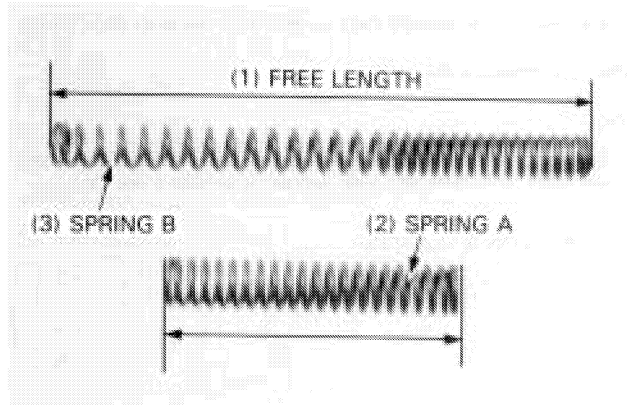
Remove the stopper ring and oil lock piece from the fork piston.
Remove the piston from the fork tube.



INSPECTION

Check the fork spring free lengths and replace the springs if shorter than the service limit.

SERVICE LIMITS:
Spring A: 189.0 mm (7.44 in)
Spring B: 378.6 mm (14.91 in)

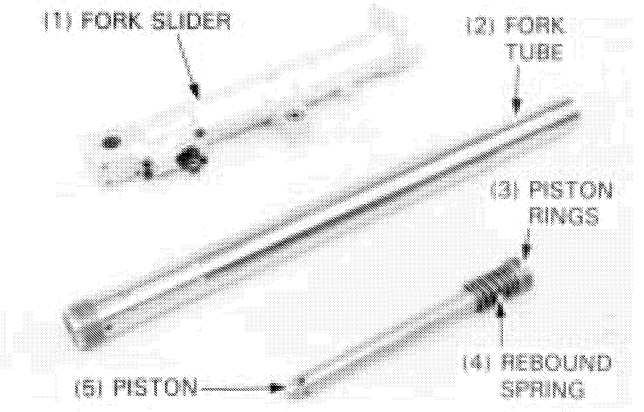


Check the fork tubes, fork sliders and pistons for score marks, scratches, or abnormal wear.

Check the fork piston rings for wear or damage.

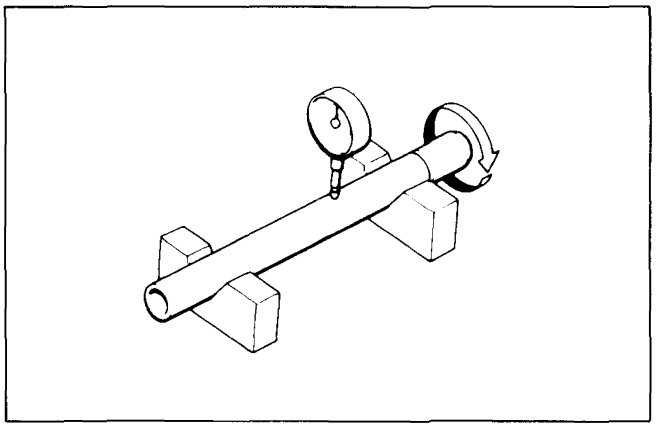
Check the rebound spring for damage.

Replace any worn or damaged parts.



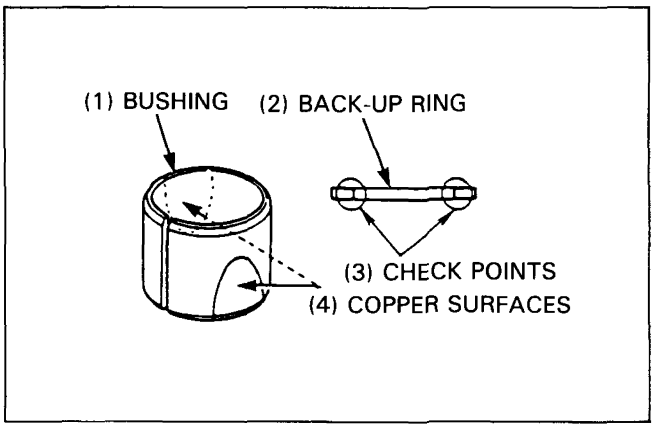
Set the fork tube in V blocks and read the runout.

SERVICE LIMIT: 0.2 mm (0.01 in)



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

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



ANTI-DIVE CASE

NOTE

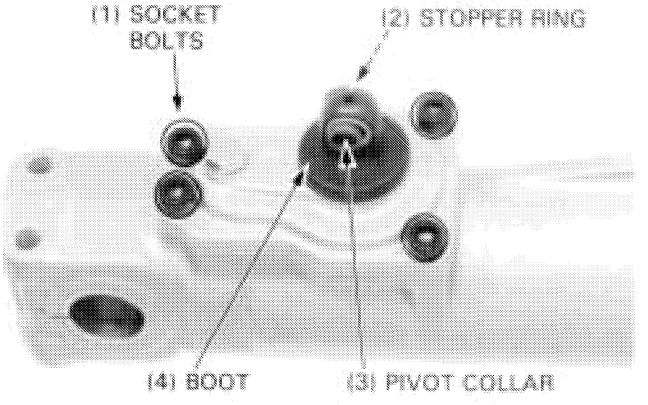
- Drain the oil before servicing the anti-dive system.

Remove the four socket bolts and the anti-dive case.

Remove the stopper ring, pivot collar and boot.

⚠ WARNING

- *Anti-dive case is under spring pressure. Use care when removing the case to keep it from becoming projectiles.*

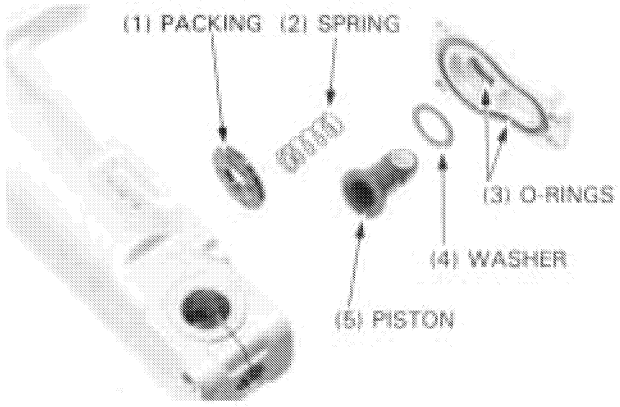


Check the packing, spring, piston, washer and O-rings for damage, wear or deterioration.
Replace them if necessary.

Assemble them in the reverse order of removal.

NOTE

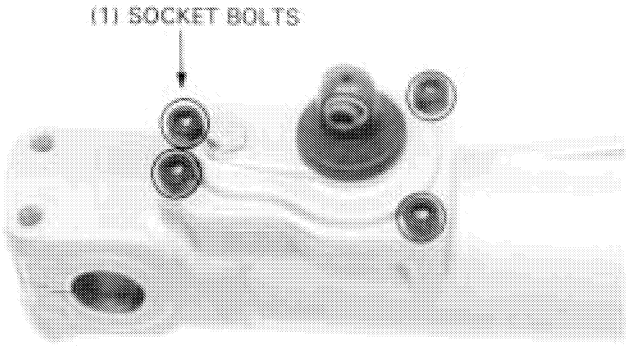
- Install the packing with its uneven side facing to the fork slider.
- Apply ATF to the O-rings and piston.



Apply a locking agent to the socket bolt threads.
Install them and tighten to the specified torque.

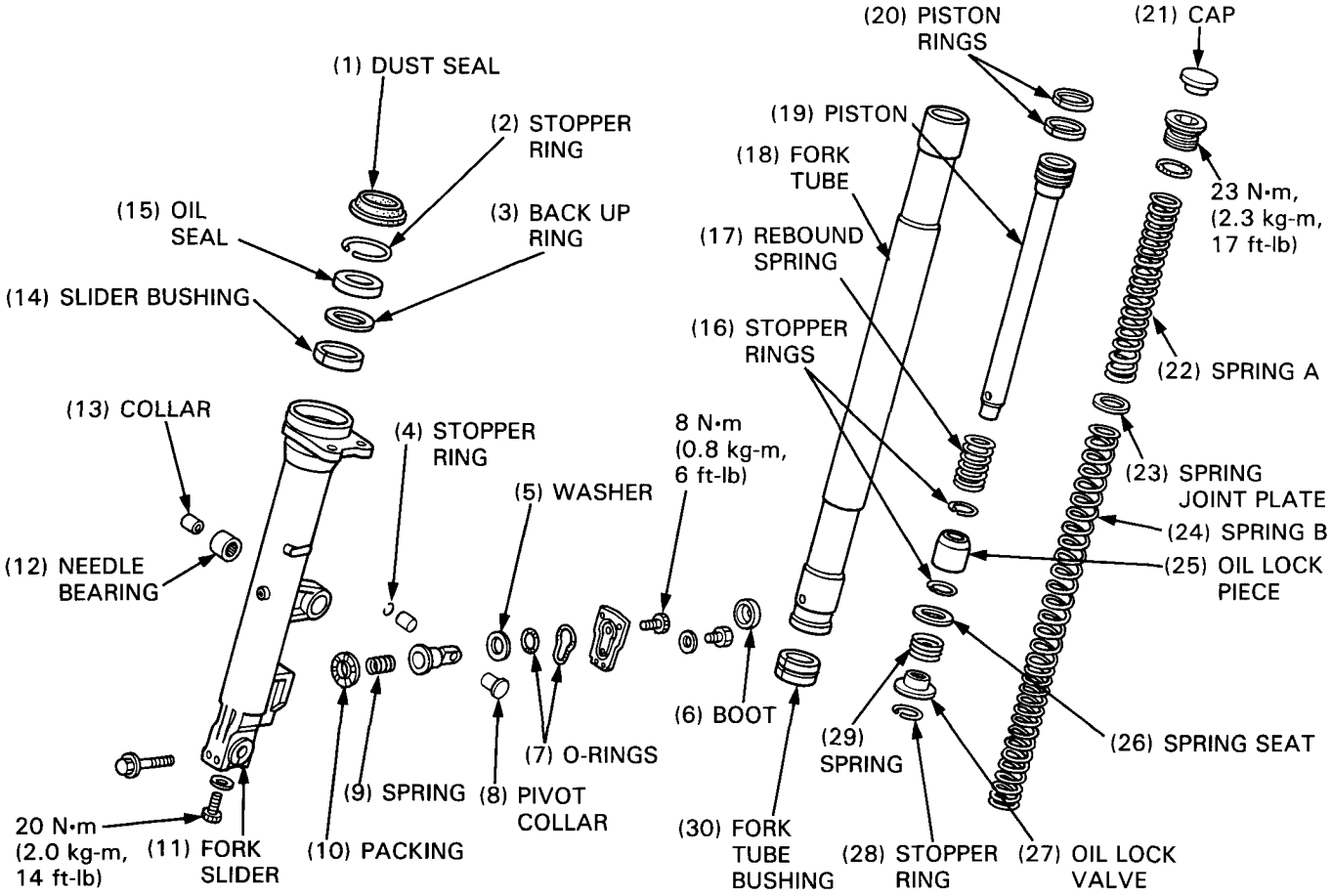
TORQUE: 8 N·m (0.8 kg-m, 6 ft-lb)

Check the operation of the piston.



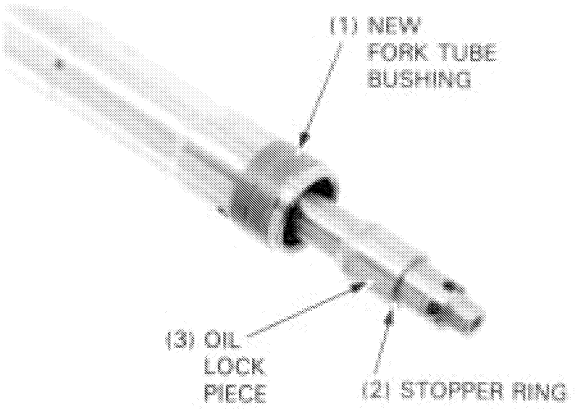
ASSEMBLY

Clean all disassembled parts.



Install new bushing on the fork tube if necessary. Place the piston with rebound spring into the fork tube.

Install the oil lock piece and stopper ring onto the fork piston.

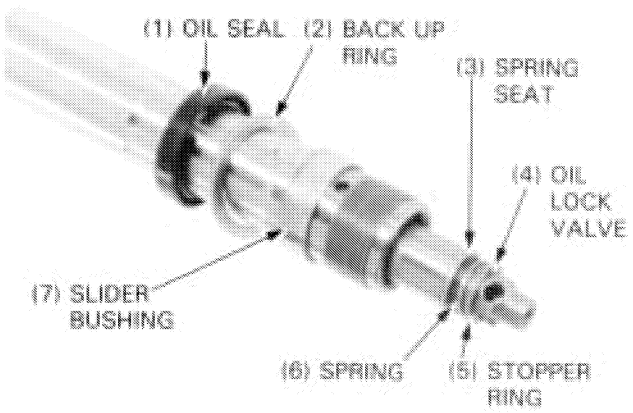


Install the spring seat, spring and oil lock valve on the piston, and secure them with the stopper ring.

Install the slider bushing, backc up ring and oil seal onto the fork tube.

NOTE

- Install the back up ring with its chamfered surface side facing down.
- Check the groove and top edge of the fork tube for burrs or scratches. Wrap the fork tube groove or top edge with vinyl tape to prevent damage to the oil seal lip during installation. Coat a new oil seal with ATF and install it with the seal mark facing up.



Place the fork slider in a vise with soft jaws.

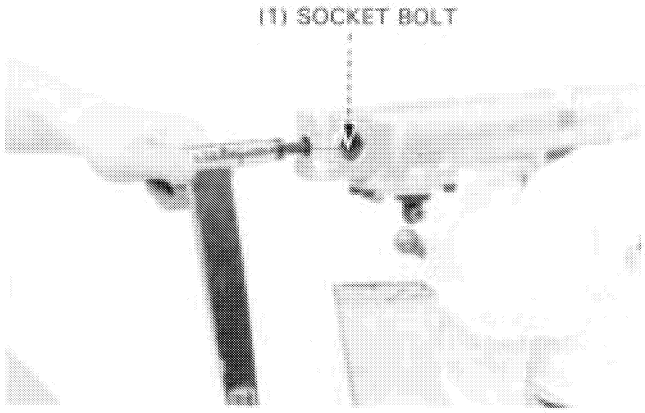
CAUTION

- *Do not distort the slider in the vise.*

Temporarily install the fork spring and fork bolt. This will hold the piston when you tighten the bottom socket bolt.

Apply a locking agent to the socket bolt and thread it into the piston. Then, tighten the socket bolt.

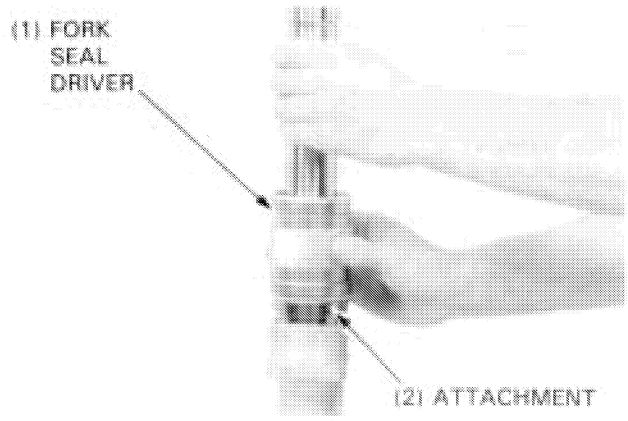
TORQUE: 20 N·m (2.0 kg-m, 14 ft-lb)



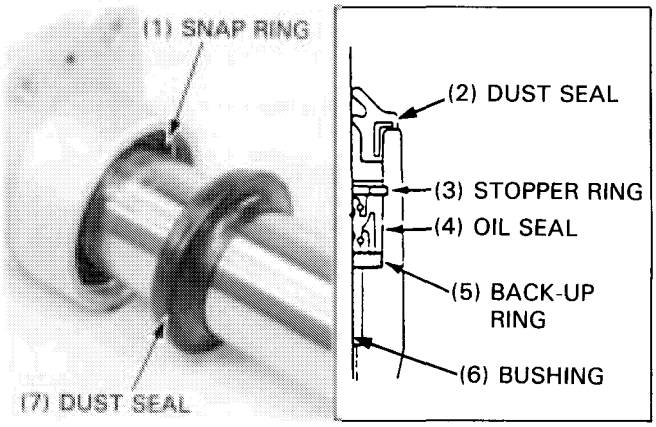
Drive the slider bushing, back-up ring and oil seal with the seal driver.

TOOLS:

Fork seal driver	**07947–KA50100**
Fork seal driver attachment	**07947–KF00100**



Install the stopper ring and dust seal.



If you installed the fork spring earlier, remove the fork bolt and spring.

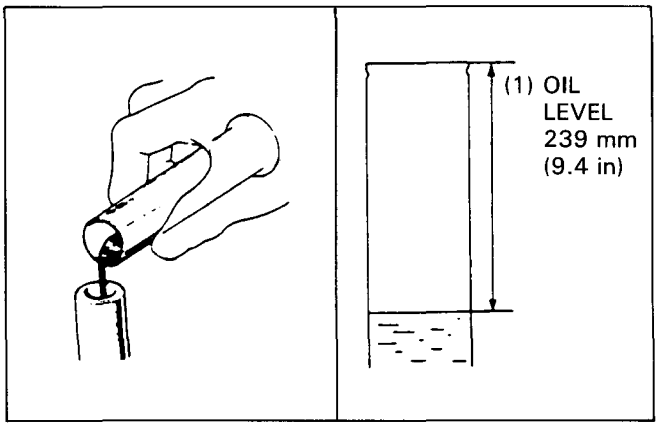
Fill the fork with ATF.

CAPACITY:
RIGHT FORK 320 cc (10.8 US oz, 11.2 Imp oz)
LEFT FORK 325 cc (10.9 US oz, 11.4 Imp oz)

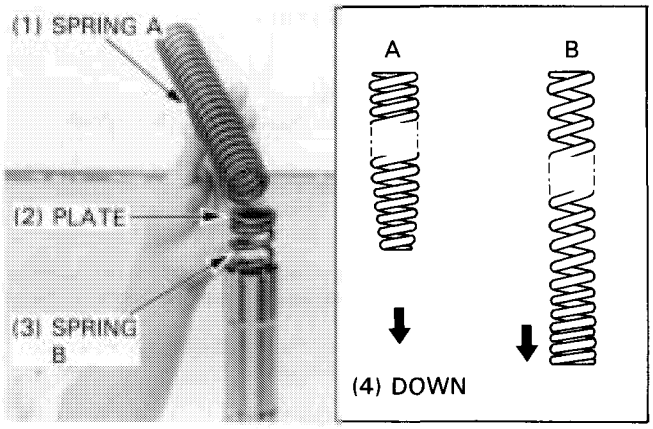
Pump the fork several times.

Compress the fork and measure the oil level from the top of the tube after the level stabilizes.

SPECIFIELD LEVEL: 239 mm (9.4 in)



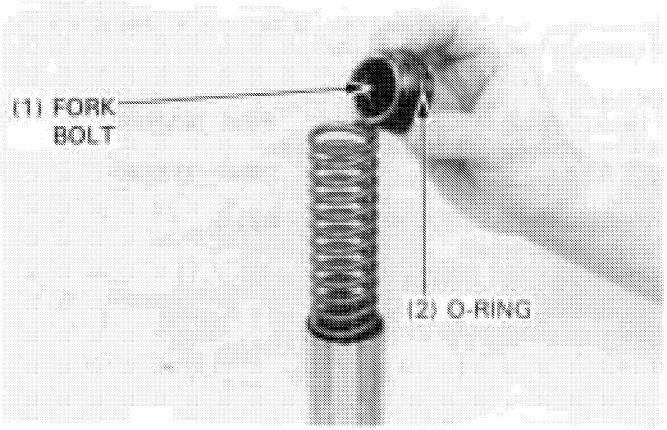
Wipe oil off the springs thoroughly using a clean cloth.
Install the spring B (longer) with tightly wound coil end facing down.
Install the spring joint plate and spring A (shorter) with its tapered end facing down.



Coat the O-ring with ATF.
Install the fork bolt with an O-ring and tighten it lightly.

CAUTION

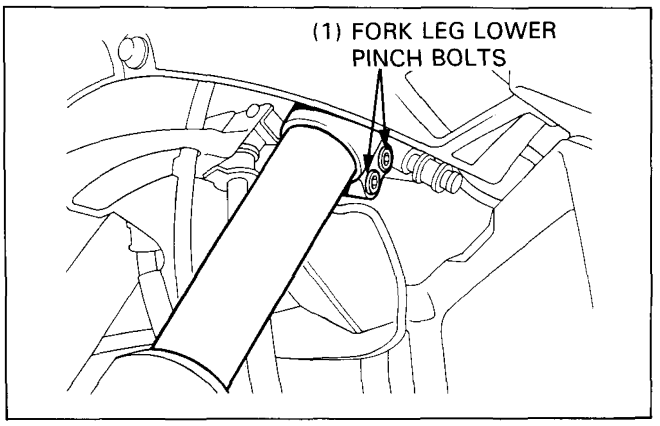
- *Be careful not to cross-thread the fork bolt.*



INSTALLATION

Place the fork leg into the steering stem.
Aligning the upper surfaces of the fork tube and fork top bridge, tighten the fork leg lower pinch bolts to the specified torque.

TORQUE: 55 N·m (5.5 kg-m, 40 ft-lb)



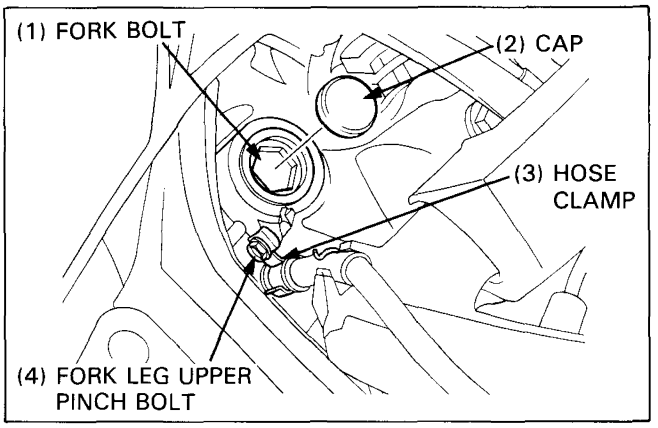
Tighten the fork leg upper pinch bolt with the hose clamp to the specified torque.

TORQUE: 11 N·m (1.1 kg-m, 8 ft-lb)

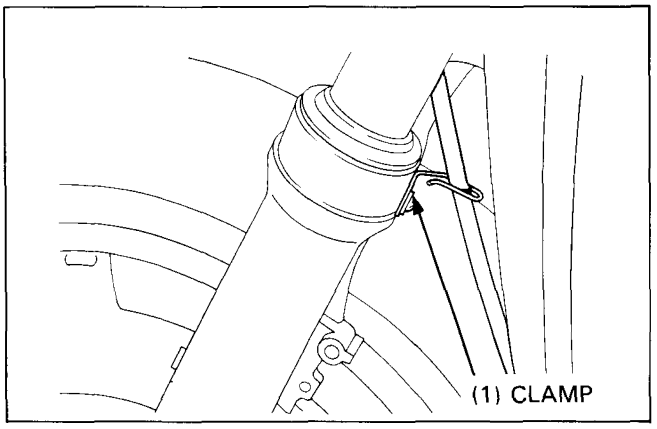
Tighten the fork bolt to the specified torque.

TORQUE: 23 N·m (2.3 kg-m, 17 ft-lb)

Install the fork bolt cap.



Install the following:
– speedometer clamp.
– front wheel (page 13-7).
– brake caliper (page 16-8).
– front fender (page 12-13).

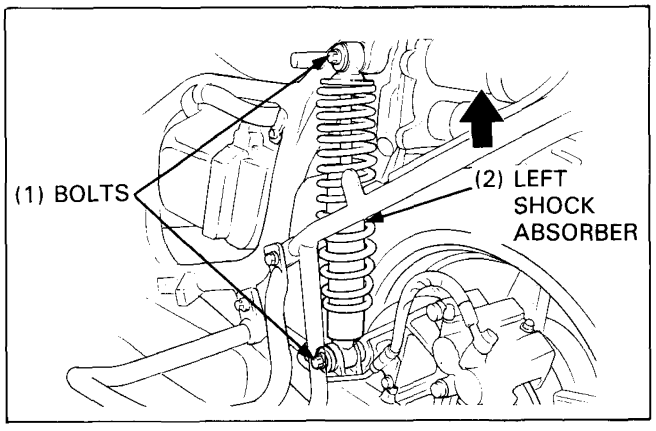


SHOCK ABSORBERS

REMOVAL (LEFT)

Remove the left saddlebag and trunk (page 12-13).

Place the motorcycle on the center stand.
Remove the shock absorber lower mount bolt and upper mount bolt.
Remove the left shock absorber upward from the frame.

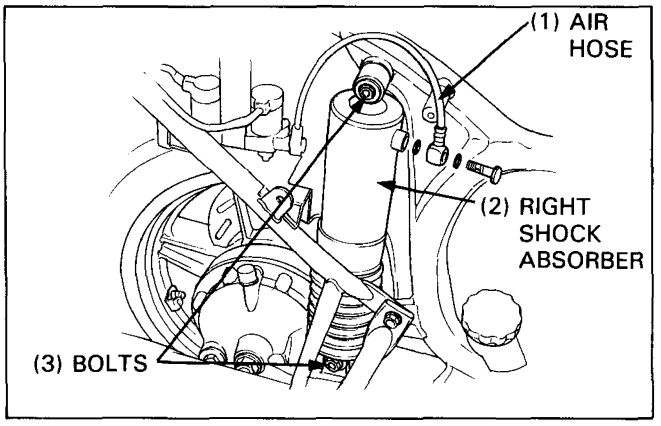


REMOVAL (RIGHT)

Remove the right saddlebag (page 12-13).

Place the motorcycle on the center stand.
Turn the ignition switch to ON, P or ACC. Push the P. CHECK and DECREASE buttons of the air pressure control switch to drain the air pressure until the air pressure display register 0 kPa (0 kg/cm², 0 psi).
Turn the ignition switch OFF.

Disconnect the air hose from the right shock absorber.
Remove the shock absorber lower mount bolt and upper mount bolt.
Remove the right shock absorber upward from the frame.

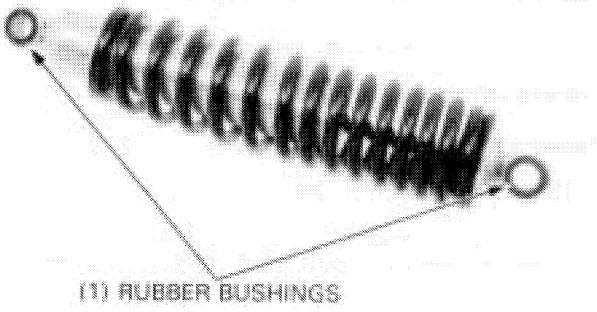


NOTE

- Do not lay the shock absorber over on its side, or the fluid will run out.

RUBBER BUSHIG INSPECTION

Check the rubber bushings of left and right shock absorber mounts for wear, damage or deterioration.



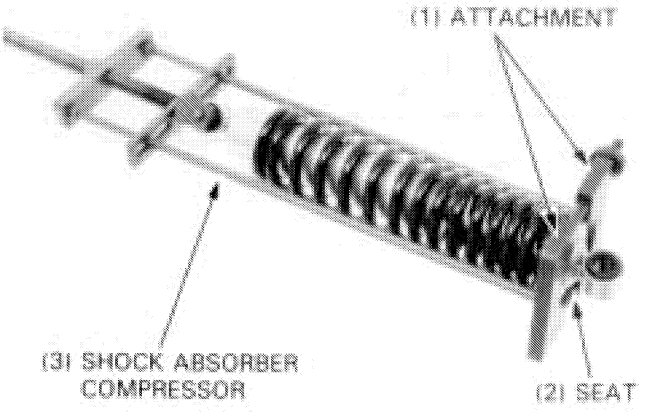
DISASSEMBLY/ASSEMBLY (LEFT)

Set the shock absorber in the shock absorber compressor.

TOOLS:

Shock absorber compressor	**07GME–0010000 or 07959–3290001**
Attachment	**07959–MB10000**

Compress the spring until the spring stopper seat can be removed, and remove the stopper seat.
Disassemble them.

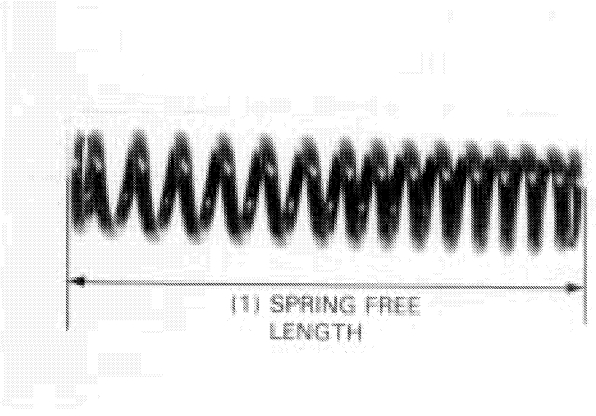


NOTE

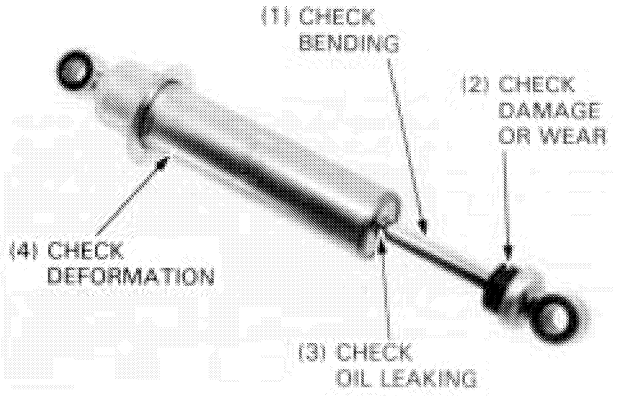
- Compress the spring while tightening the attachments to keep the shock absorber secure in the compressor.

Measure the spring free length.

SERVICE LIMIT: 274.5 mm (10.81 in)



Check the damper for deformation, oil leaking, bending of the rod or smooth operation.
Check the damper rubber for wear or damage.

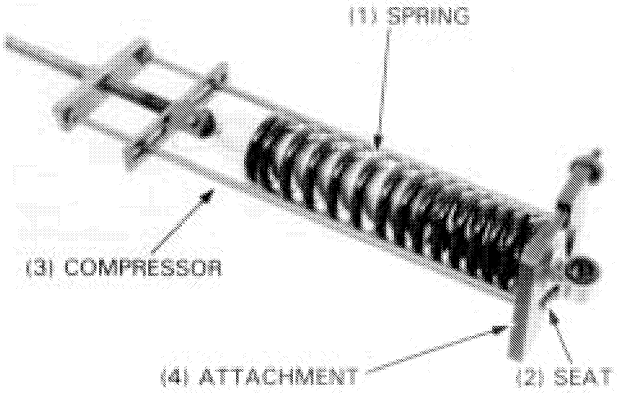


Install the spring with its tightly wound coil end toward the upper mount and set them in the shock absorber compressor.

TOOLS:

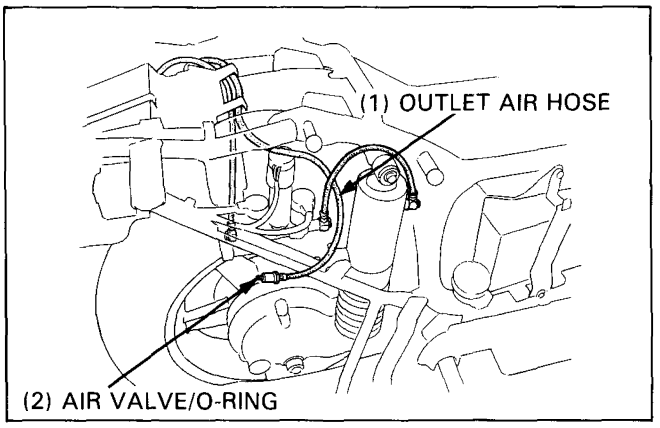
Shock absorber compressor	**07GME–0010000 or 07959–3290001**
Attachment	**07959–MB10000**

Compress the spring until the spring stopper seat can be installed, and install the stopper seat.
Remove the compressor.

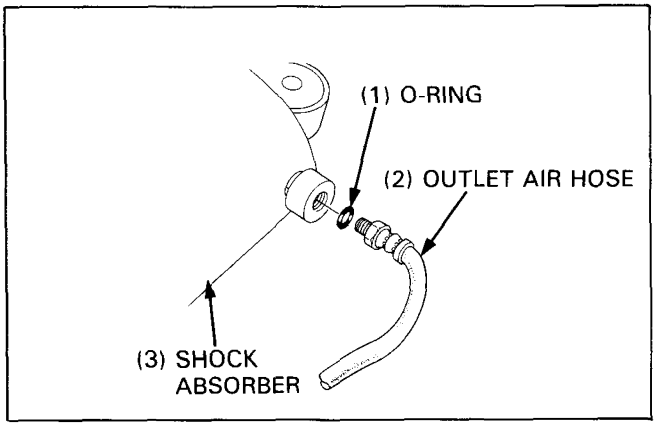


OIL SEAL REPLACEMENT (RIGHT)

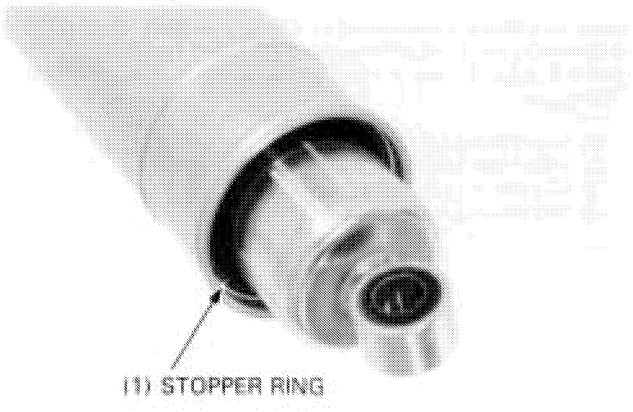
Remove the outlet air hose from the air pump.
Remove the air valve from the outlet air hose.



Install the outlet air hose with O-ring in the shock absorber.



Remove the boot and stopper ring from the shock absorber.

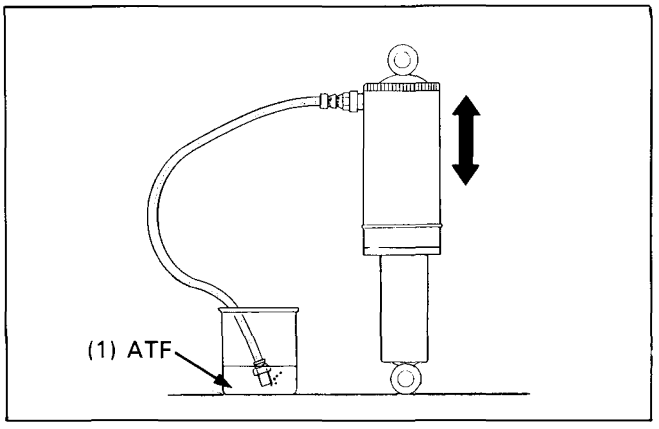


Place approximately 500 cm³ (16.9 US oz, 17.6 Imp oz) of ATF in a clean container.

Place the outlet air hose in ATF and pump the shock absorber several times until the shock absorber is filled up with ATF.

CAUTION

- *Do not over-pump the shock absorber. This shock absorber's stroke is 95 mm (3.7 in).*



Remove the outlet hose and install the air valve and O-ring in the shock absorber.

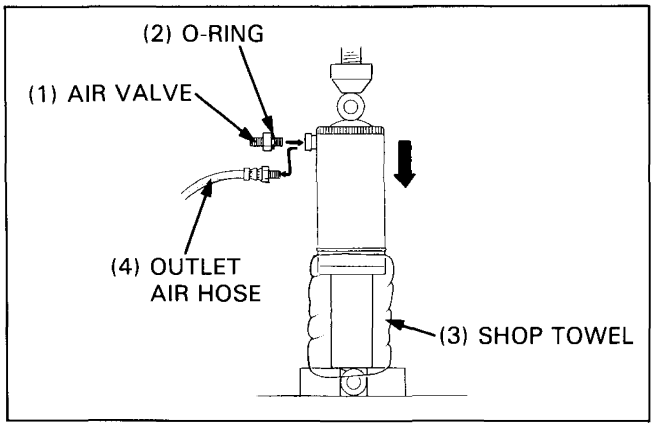
TORQUE: 6 N·m (0.6 kg-m, 4 ft-lb)

Wrap a shop towel around the shock absorber.

Press the oil seal out by compressing the shock absorber.

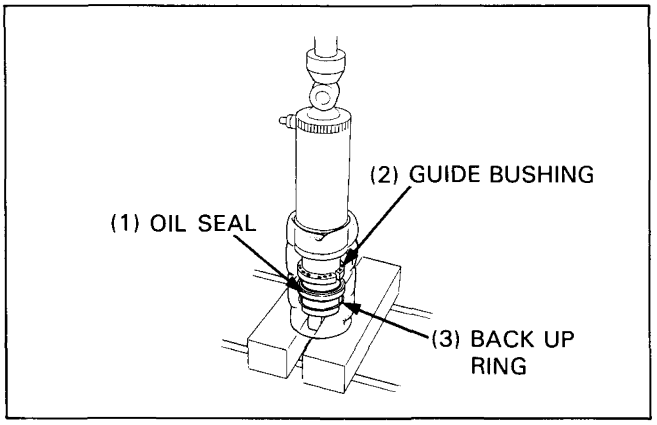
NOTE

- The ATF oil may splash.



Leave the shock absorber standing vertically for another 10 minutes to let any remaining ATF drain out.

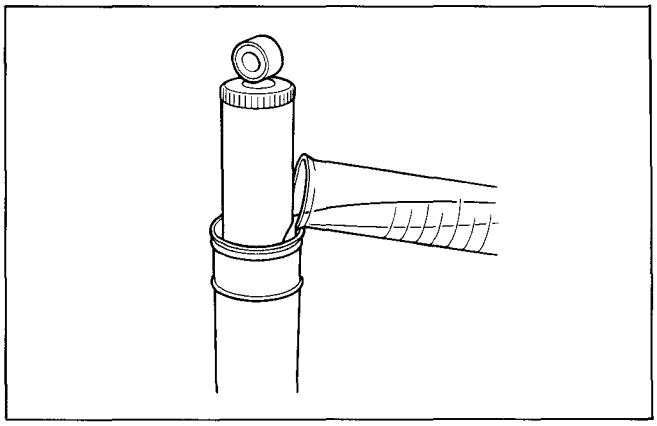
Keeping the shock upright, remove it from the hydraulic press then remove the shop towel, back up ring, the oil seal, and the guide bushing.



In one smooth motion, turn the shock absorber upside down and clamp it in the vise.

Fill the shock body with the specified amount of ATF.

STANDARD: 140 cm³ (4.7 US oz, 4.9 Imp oz)



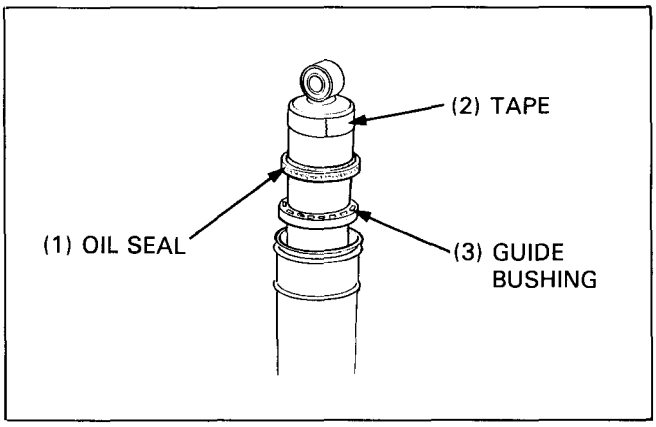
Install the guide bushing in the damper case.

Wrap a piece of vinyl tape around the groove at the end of the shock absorber, to protect the new oil seal.

Dip a new oil seal in ATF and install it onto the damper with its lip side toward the damper case.

CAUTION

- *Be careful not to damage the oil seal lip during installation.*



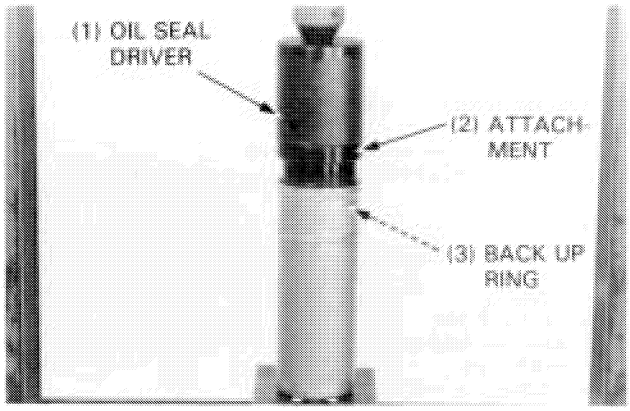
Remove the tape from the shock, and remove the shock from the vise.

Install the back up ring.

Press the oil seal into the damper case.

TOOLS:

Oil seal driver	**07965—KE80100**
Oil seal driver attachment	**07965—MA60100**



Install the stopper ring.

CAUTION

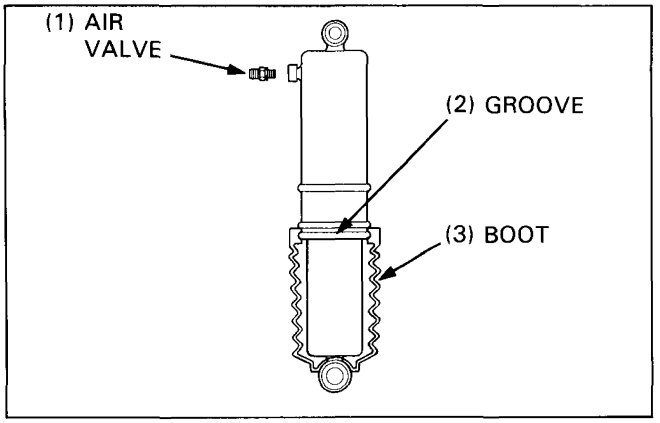
- *Be sure the stopper ring is seated all the way around the stopper ring groove.*

Install the boot onto the damper case and remove the air valve from the shock absorber.

NOTE

- Be sure the boot is installed properly onto the damper case groove.

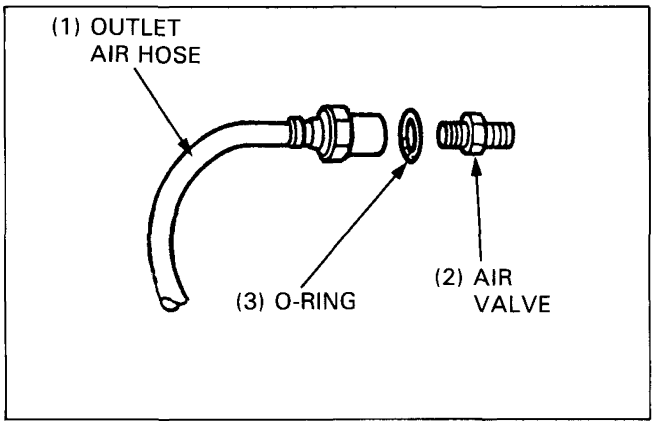
Do not lay the shock absorber over on its side, or the fluid will run out.



Install the air valve with O-ring to the outlet air hose.

TORQUE: 6 N·m (0.6 kg-m, 4 ft-lb)

Install the outlet air hose onto the air pump (page 14-29).

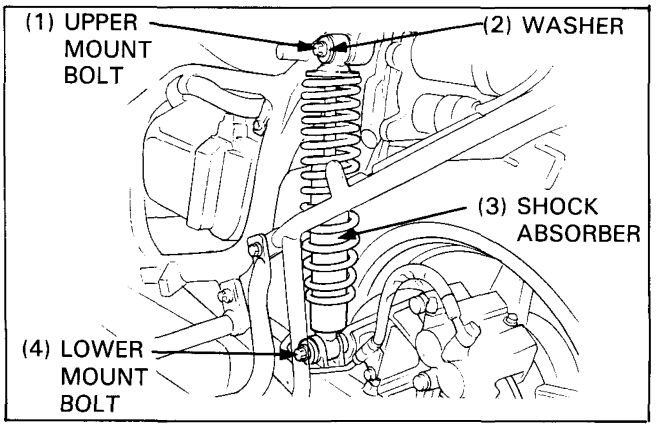


INSTALLATION (LEFT)

Install the shock absorber onto the frame.
Tighten the upper and lower mount bolts to the specified torque.

TORQUE:
Upper mount bolt: 23 N·m (2.3 kg-m, 17 ft-lb)
Lower mount bolt: 70 N·m (7.0 kg-m, 51 ft-lb)

Install the left saddlebag and trunk (page 12-13).



INSTALLATION (RIGHT)

Install the shock absorber onto the frame.
Tighten the upper and lower mount bolts to the specified torque.

TORQUE:
Upper mount bolt: 23 N·m (2.3 kg-m, 17 ft-lb)
Lower mount bolt: 23 N·m (2.3 kg-m, 17 ft-lb)

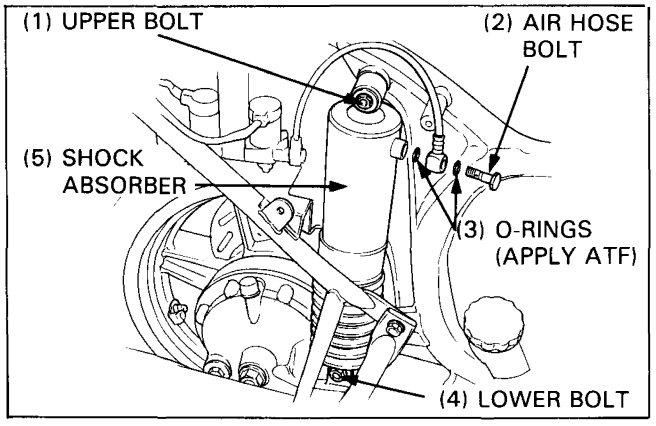
Apply ATF to new O-rings and connect the air hose to the shock aborber.
Tighten the air hose bolt to the specified torque.

TORQUE: 6 N·m (0.6 kg-m, 4 ft-lb)

NOTE

- Install the hose vertically as shown.

Install the right saddlebag (page 12-13).



SWING ARM

REMOVAL

Place the motorcycle on the center stand on a level ground.

Remove the following:
- rear wheel (page 13-9).
- shock absorbers (page 14-17).

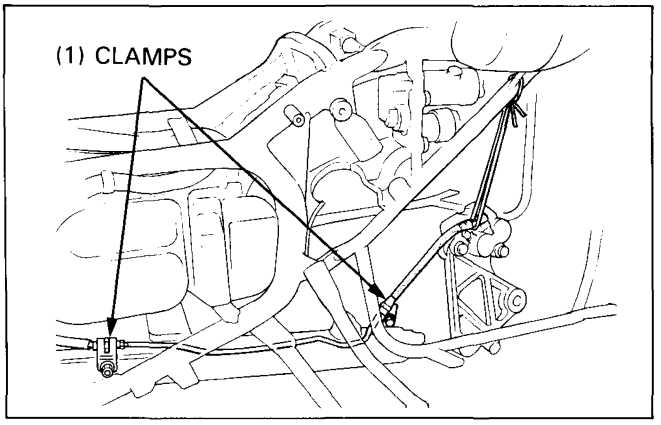
NOTE

- Keep the right shock upright with the air hose connected.

- final gear case (page 15-3).
- battery and battery box (page 17-5).
- brake hose and brake pipe clamps.
- exhaust chamber and heat protector (page 12-15).

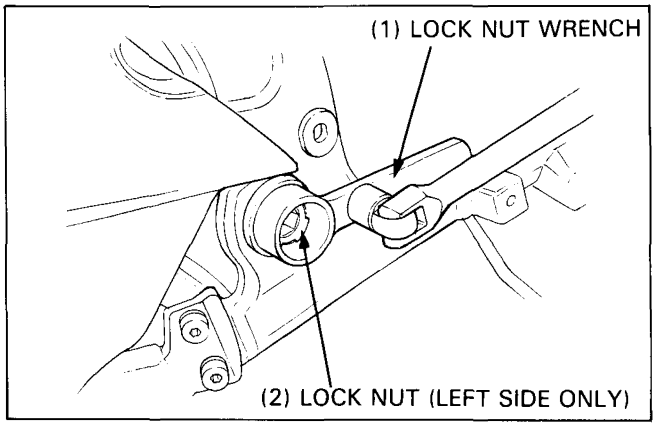
CAUTION

- *Do not let the caliper hang by the brake hose. Hang it with a suitable string.*



Remove the lock nut on the left side.

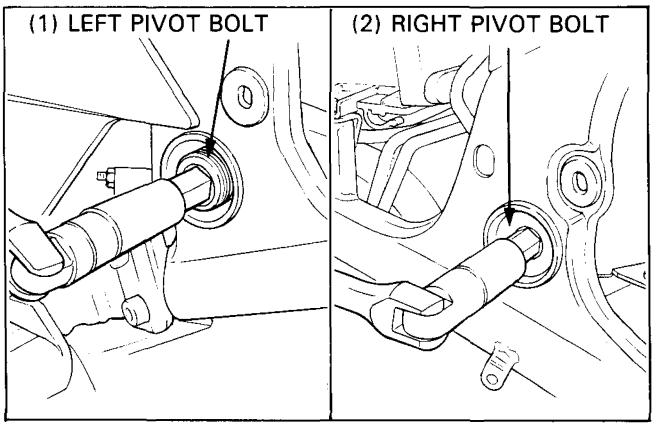
TOOL:
Lock nut wrench **07908–4690001**



Remove the right and left pivot bolts.

TOOL:
Socket bit **07703–0020500**

Remove the swing arm from the frame.
Check the swing arm for deformation or damage.



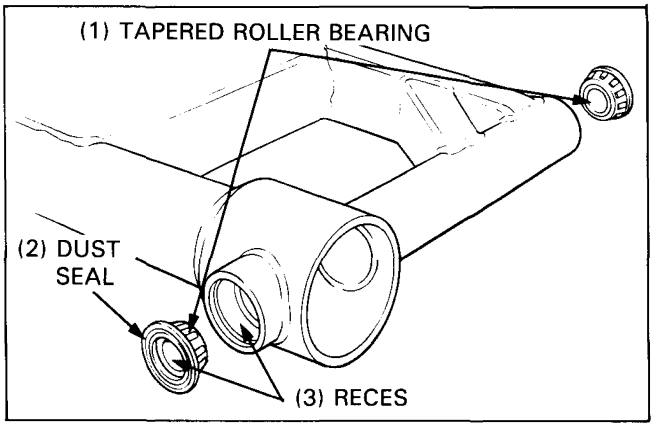
PIVOT BEARING REPLACEMENT

Remove the tapered roller bearing from the pivots.
Inspect the tapered roller bearings and races for damage or wear.
Check the bearing dust seals for damage or wear.

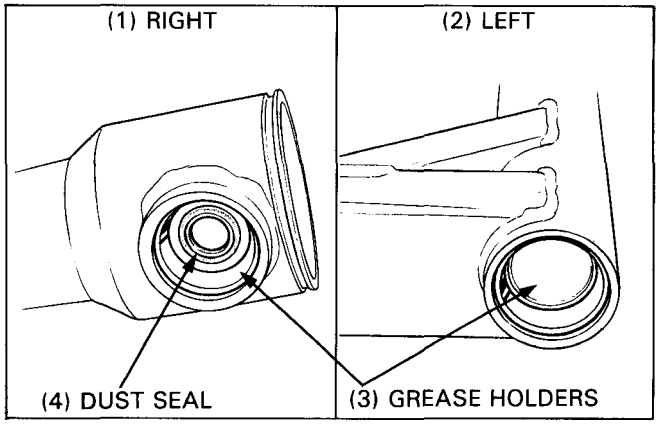
NOTE

- Always replace pivot bearings, races and grease holders in pairs.

Replace them if necessary.

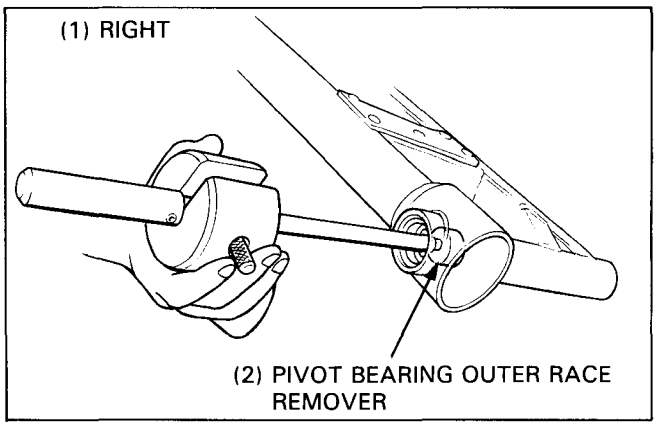


Check the grease holders for damage or deformation.
Check the grease holder dust seal (right side only) for damage or fatique.

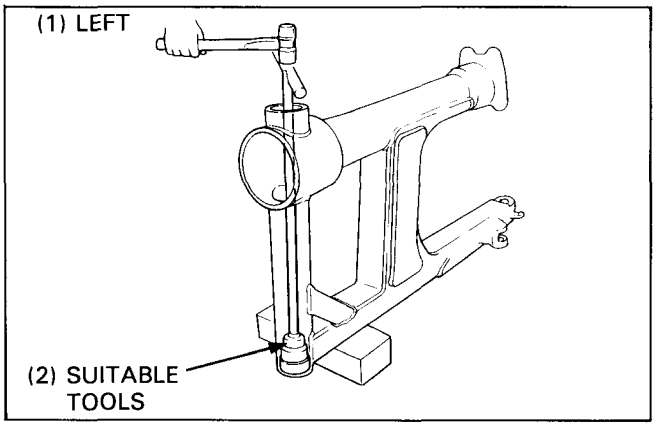


Remove the right outer race with the grease holder.

TOOL:
Pivot bearing outer race remover 07936–4150000



Remove the left outer race with the grease holder with a suitable tools as shown.



Install the grease holders.

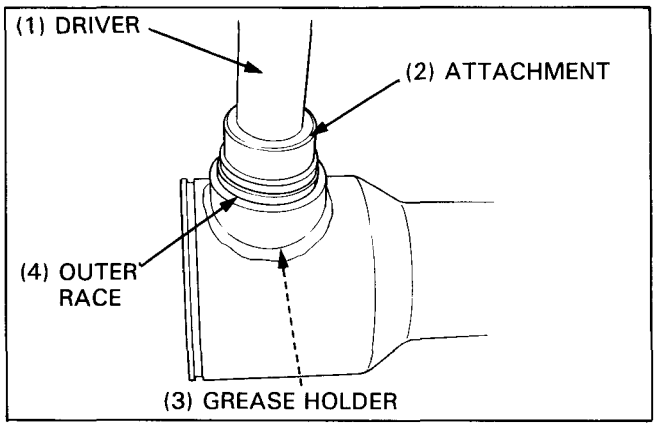
NOTE

- Install the grease holder with dust seal into the right side.

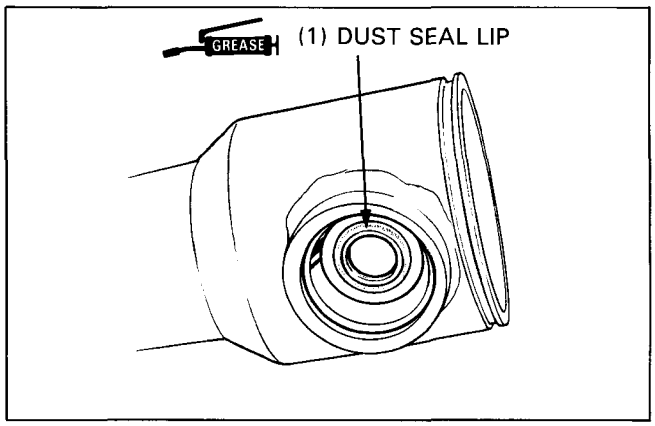
Drive the new bearing races squarely into the swing arm.

TOOLS:

Driver	**07749–0010000**
Attachment, 37 x 40 mm	**07746–0010200**

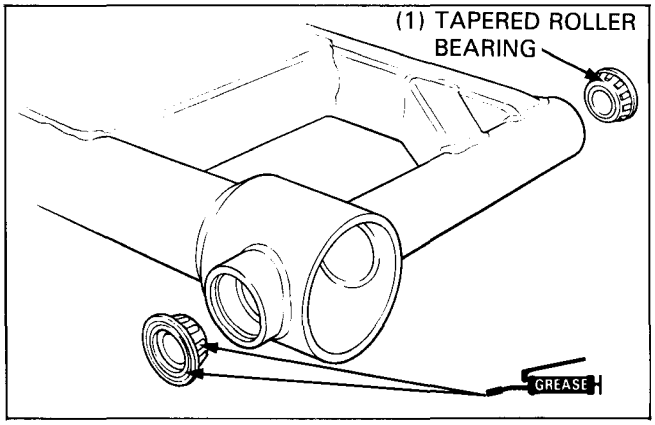


Apply grease to the right grease holder dust seal lip.

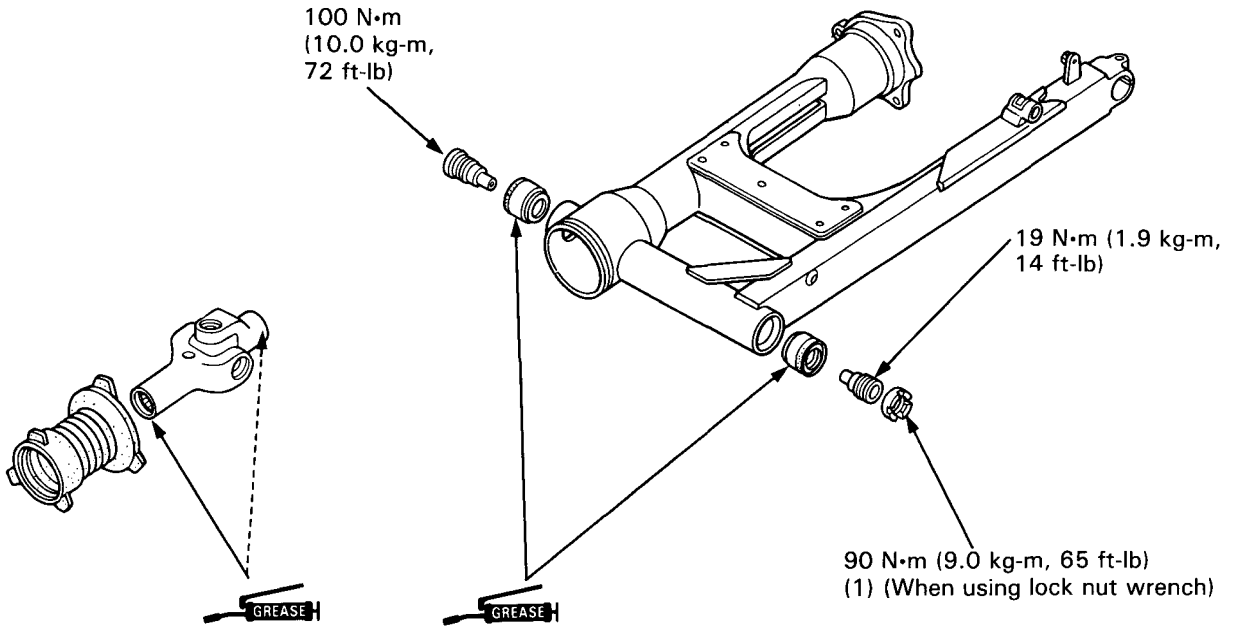


Pack the tapered roller bearings with grease and apply grease to the bearing dust seal lips.

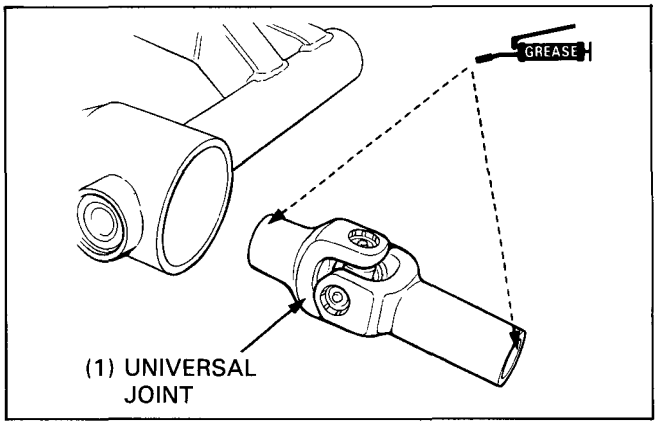
Install the bearings into the swing arm pivots.



INSTALLATION



Lubricate the universal joint splines with grease.
Place the universal joint in the swing arm, with the long splines to the front.

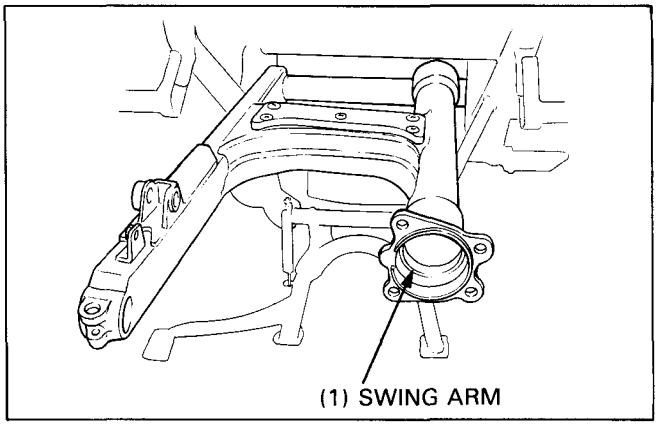


Position the swing arm in the frame.

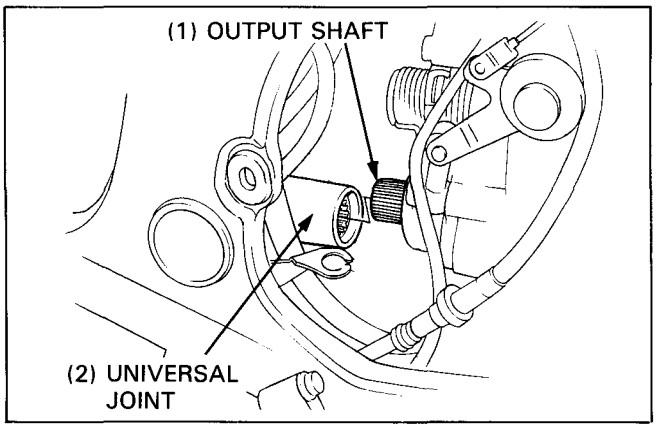
Grease the tips of the pivot bolts and loosely install them.

NOTE

- Make sure that the ends of the pivot bolts are inside the bearing inner races.



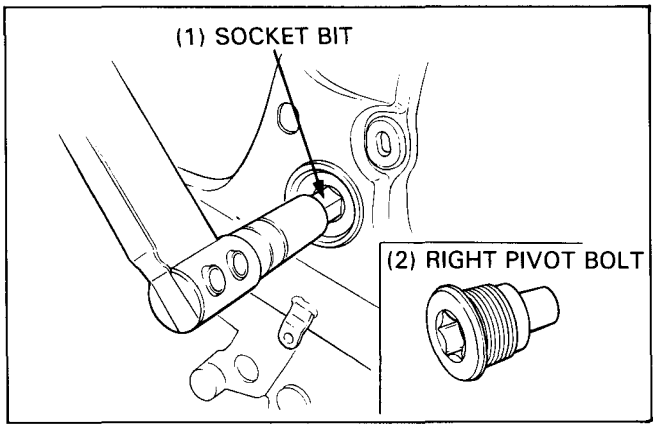
Slide the universal joint onto the output shaft.



Tighten the right pivot bolt.

TORQUE: 100 N·m (10.0 kg-m, 72 ft-lb)

TOOL:
Socket bit **07703–0020500**

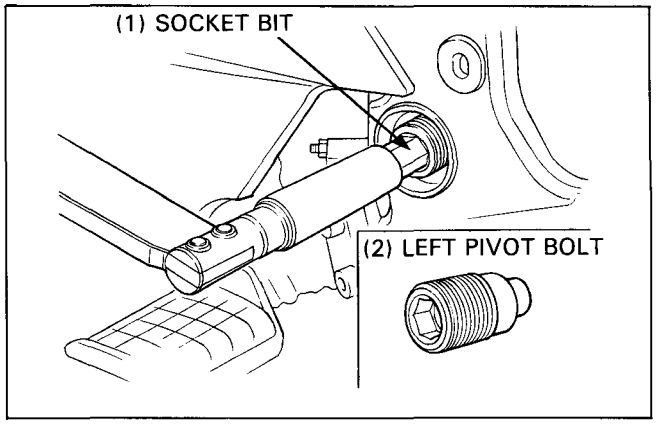


Tighten the left pivot bolt.

TORQUE: 19 N·m (1.9 kg-m, 14 ft-lb)

Move the swing arm up and down several times to seat the bearings, then retorque the pivot bolt.

TOOL:
Socket bit **07703–0020500**



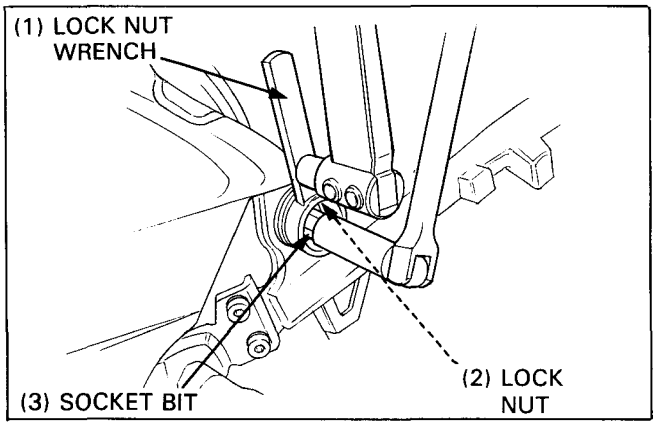
Install the pivot lock nut on the pivot bolt.

Hold the pivot bolt and tighten the pivot lock nut to a torque wrench reading of 90 N·m (9.0 kg-m, 65 ft-lb).

TOOLS:
Lock Nut Wrench **07908–4690001**
Socket bit **07903–0020500**

NOTE

- Because the lock nut wrench increases the torque wrench's leverage, the torque actually applied to the lock nut is the specified torque value: 100 N·m (10.0 kg-m, 72 ft-lb).



Install the removed parts in the reverse order of removal.

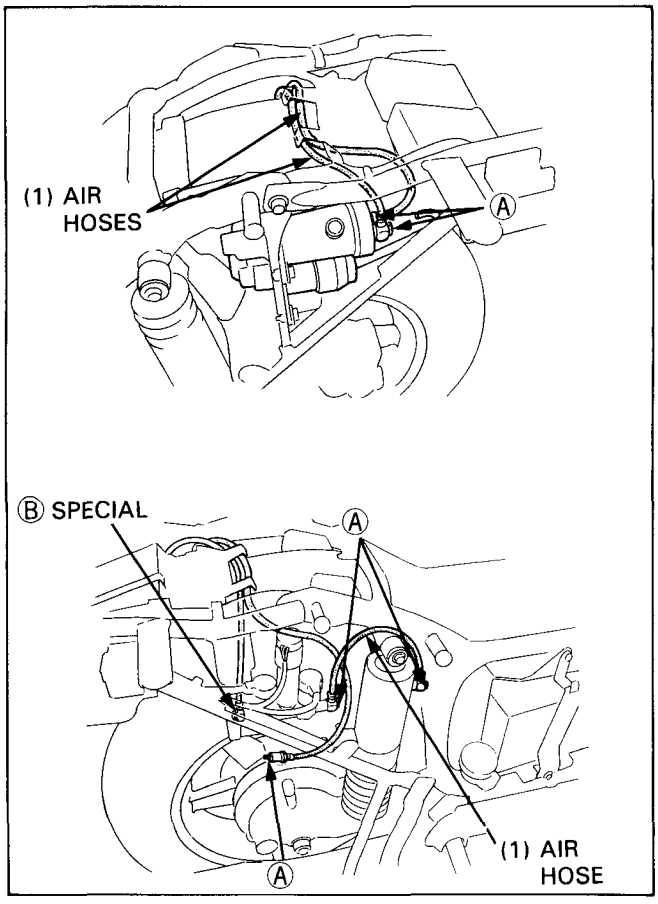
ON-BOARD AIR COMPRESSOR SYSTEM

AIR HOSES INSPECTION

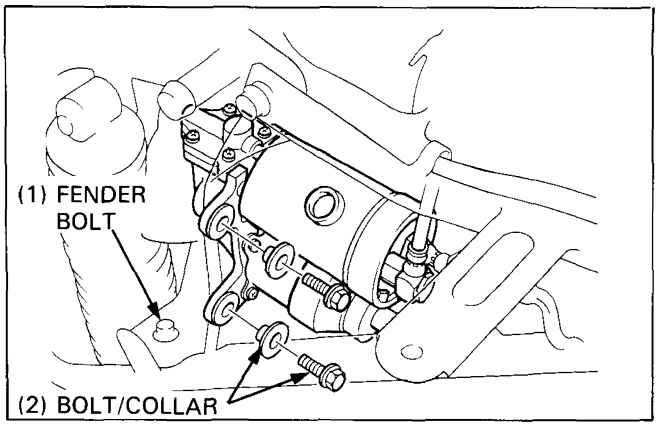
Check the air hoses for loose connection, damage or deterioration.

If the air hose connection are loose, tighten the bolt "A" or "B" as shown to the specified torque.

TORQUE:
"A" 6 N·m (0.6 kg-m, 4 ft-lb)
"B" (Special) 15 N·m (1.5 kg-m, 11 ft-lb)

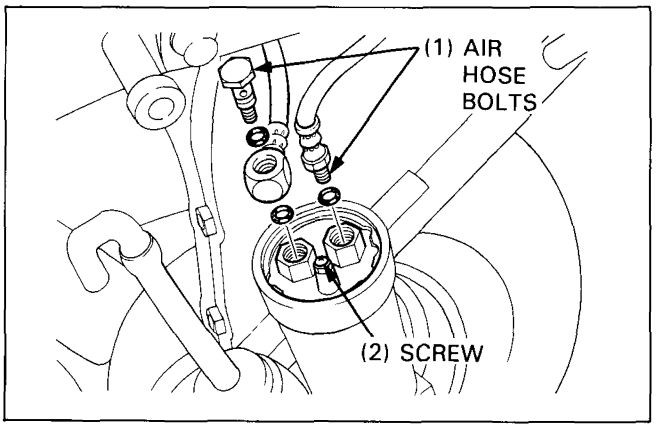


AIR PUMP



• **Removal**

Remove the trunk and left saddlebag (page 12-13).
Remove the rear fender (rear) mounting bolt.
Disconnect the 2P-WHT connector of the connector holder on the rear fender.
Remove the air pump mounting bolts and collars, and air pump from the frame.



Disconnect the air hose bolts and remove the air pump from the air hoses.

NOTE

- Do not remove the screw.

• **Drier Disassembly/Assembly**

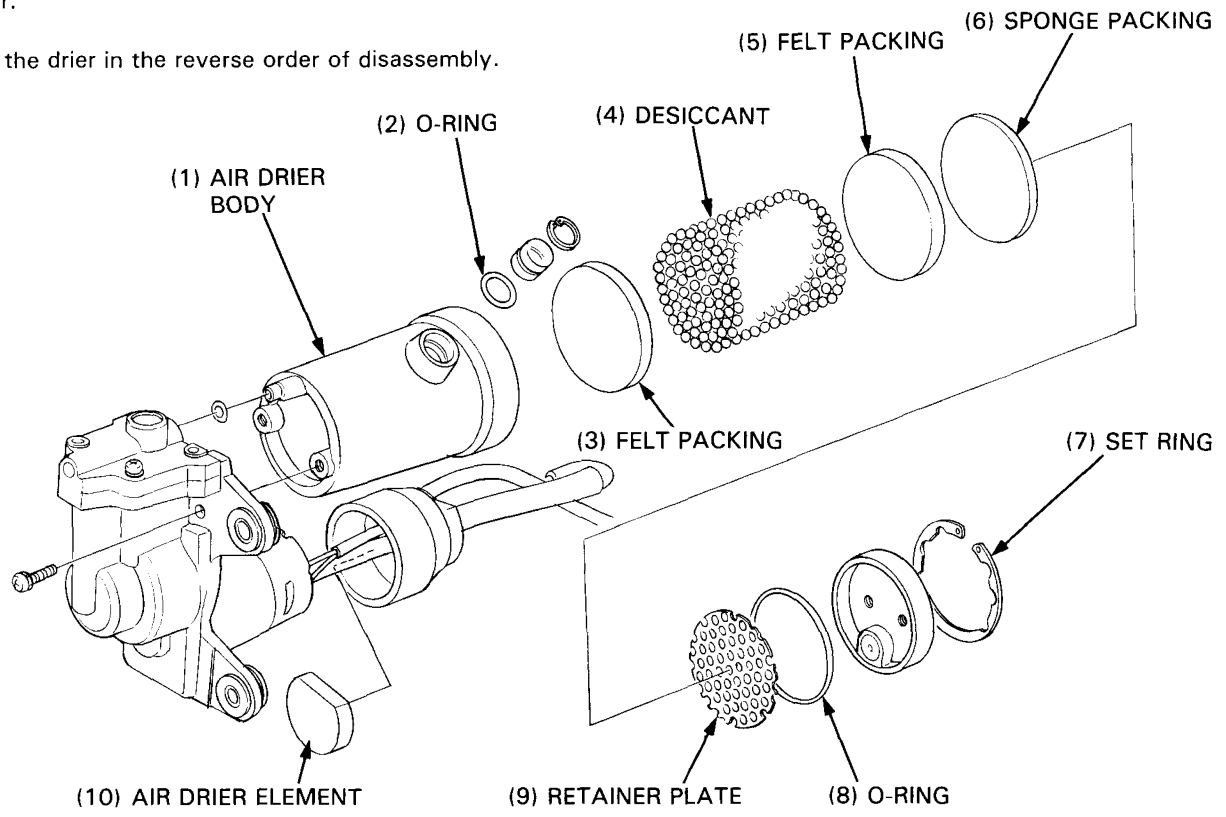
Check the color of the desiccant. It should be blue. If not, replace the desiccant.

Remove the set ring, then disassemble the drier as shown, if necessary.

Check the packings for dirt or moisture and replace, if necessary.

Clean the inside of the body and the cover openings with compressed air.

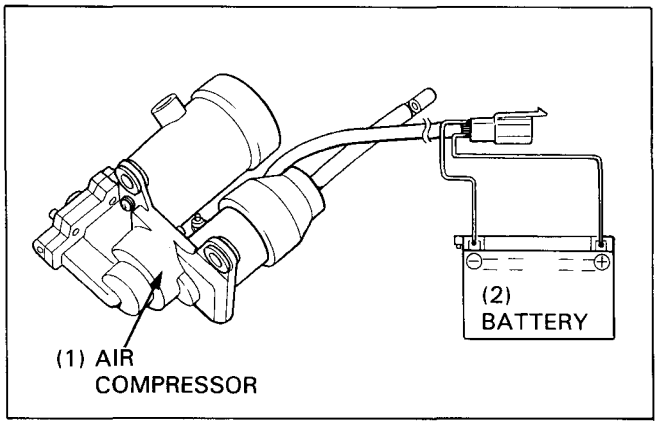
Assemble the drier in the reverse order of disassembly.



• **Air Pump Inspection**
Use a 12 V battery to energize the pump motor and check its operation.

NOTE

• Do not disassemble the air compressor.

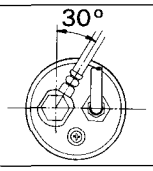


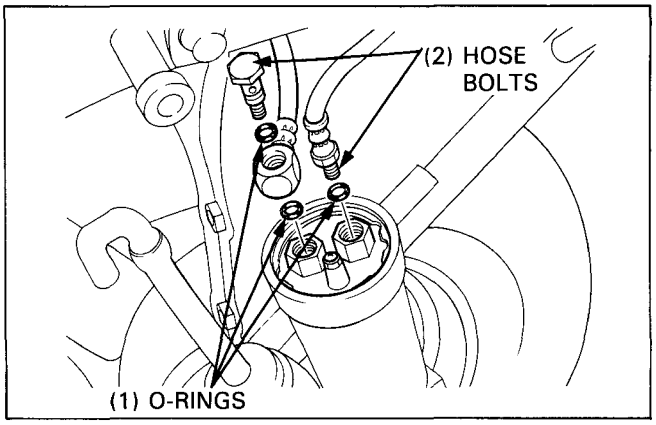
• **Installation**
Connect the air hose bolts with new O-rings and tighten the bolts to the specified torque.

TORQUE: 6 N·m (0.6 kg-m, 4 ft-lb)

NOTE

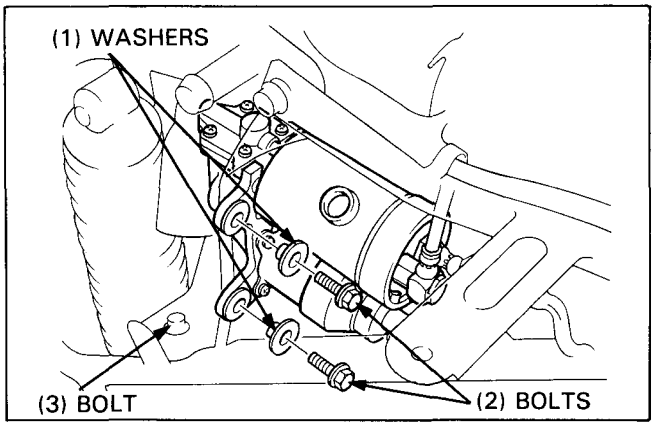
• Install each hose as shown.





Install the air pump onto the frame.

Install the following:
— rear fender (rear) mounting bolt.
— 2P-WHT connector.
— saddlebag and trunk (page 12-13).

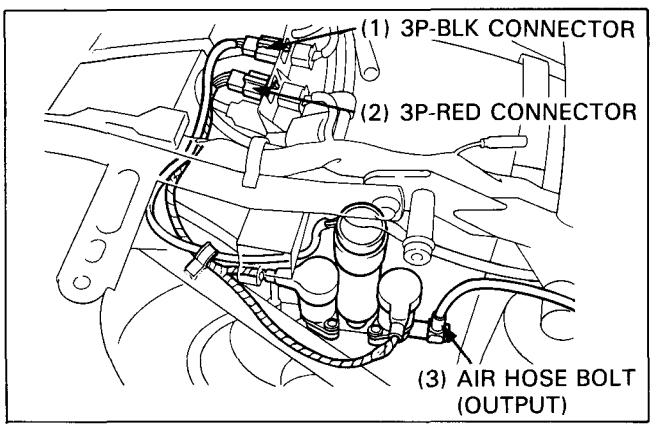


AIR DISTRIBUTOR

• **Removal**
Remove the trunk and right saddlebag (page 12-13).
Disconnect the 3P-BLK and 3P-RED connectors of the connector holder on the rear fender.

Remove the air hose bolt (Output side) and disconnect the air hose from the distributor body.

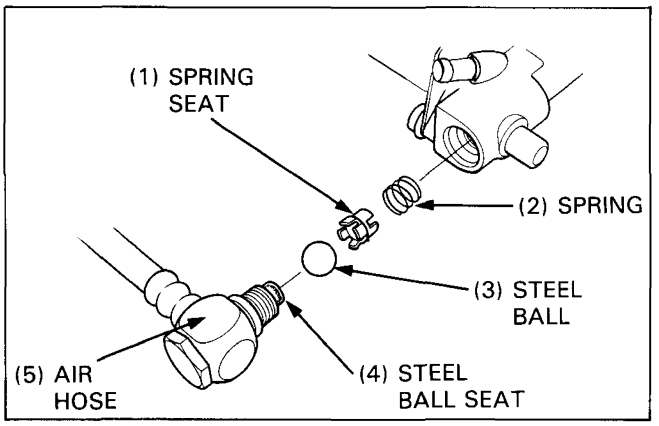
Remove the air distributor from the rear fender.



Remove the air hose bolt (Input side) and disconnect the air hose from the distributor body.

NOTE

- The hose joint contains a steel ball, spring seat and spring. Be careful not to drop these. Inspect the O-ring and steel ball seat for damage or deterioration.
  Inspect the spring seat and spring for damage.



- **Solenoid Valve Inspection**

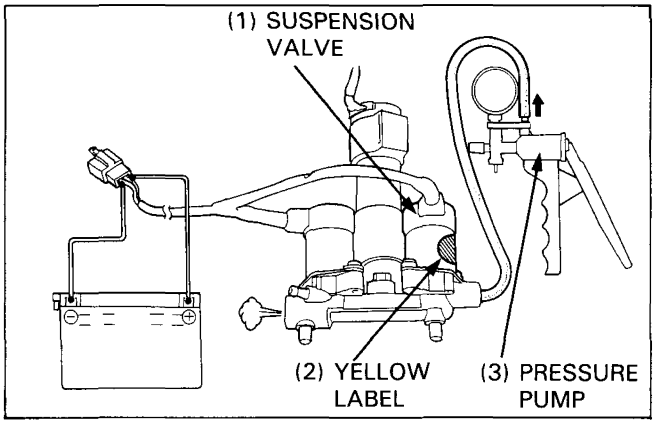
Connect a pressure pump to the suspension valve (Yellow Label) out-put port and apply pressure.

If pressure does not remain steady, replace the O-ring or suspension valve with a new one.

While maintaining pressure, apply battery voltage between the BRN/YEL and GRN terminals of the 3P-RED connector.

If pressure is not relieved through the air distributor, install a new solenoid valve.

If pressure remains steady even when the solenoid valve is activated, clean the air passage in the air distributor (page 14-31).



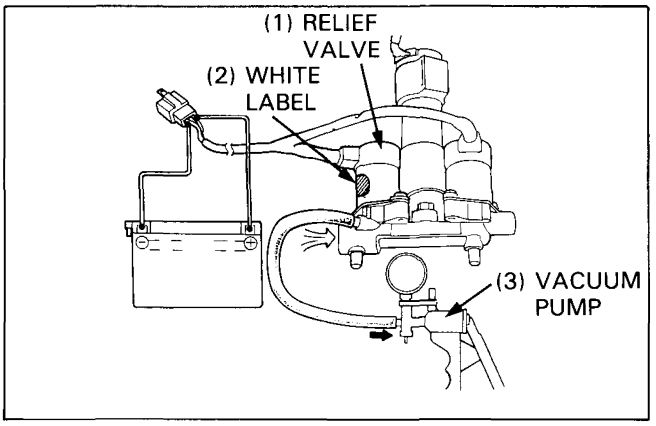
Connect a vacuum pump to the relief valve (White Label) relief port and apply vacuum.

If vacuum does not remain steady, replace the O-ring or relief valve with a new one.

While maintaining vacuum, apply battery voltage between the BRN/WHT and GRN terminals of the 3P-RED connector.

If vacuum is not relieved through the air distributor install a new relief valve.

If vacuum remains steady even when the solenoid valve is activated, clean the air distributor relief port (page 14-31).



• **Air Pressure Sensor Inspection**

Remove the air pressure sensor from the air distributor body.

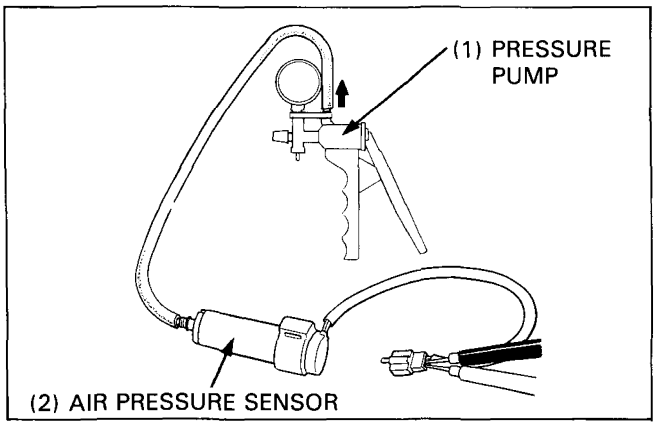
Measure the resistance between the sensor connector BLK/GRN and GRN/RED terminals.

STANDARD: 0.7—1.3 K ohms (20°C/68°F)

Measure the resistances between the BLK/GRN and LT BLU terminals, and LT BLU and GRN/RED terminals of the sensor by applying gradually increasing pressure from 0 to 4 kg/cm² (0—57 psi).

The resistances between the BLK/GRN and LT BLU terminals should decrease proportionally as the pressure increases.

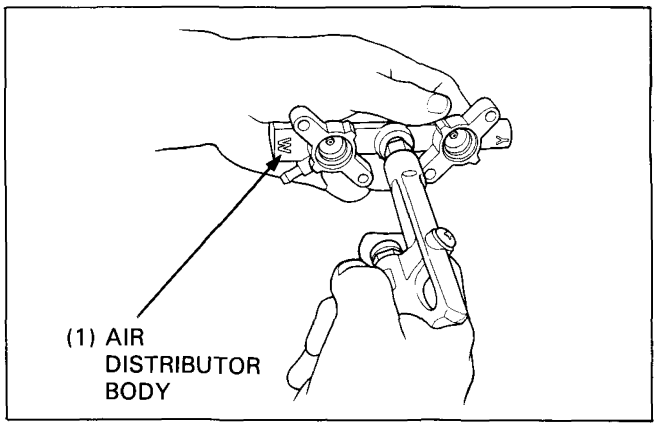
The resistances between the LT BLU and GRN/RED terminals should increase proportionally as the pressure increases.



• **Air Distributor Passage Cleaning**

Remove the solenoid valves and air pressure sensor from the air distributor body.

Use compressed air to clean all the air passages of the air distributor body.

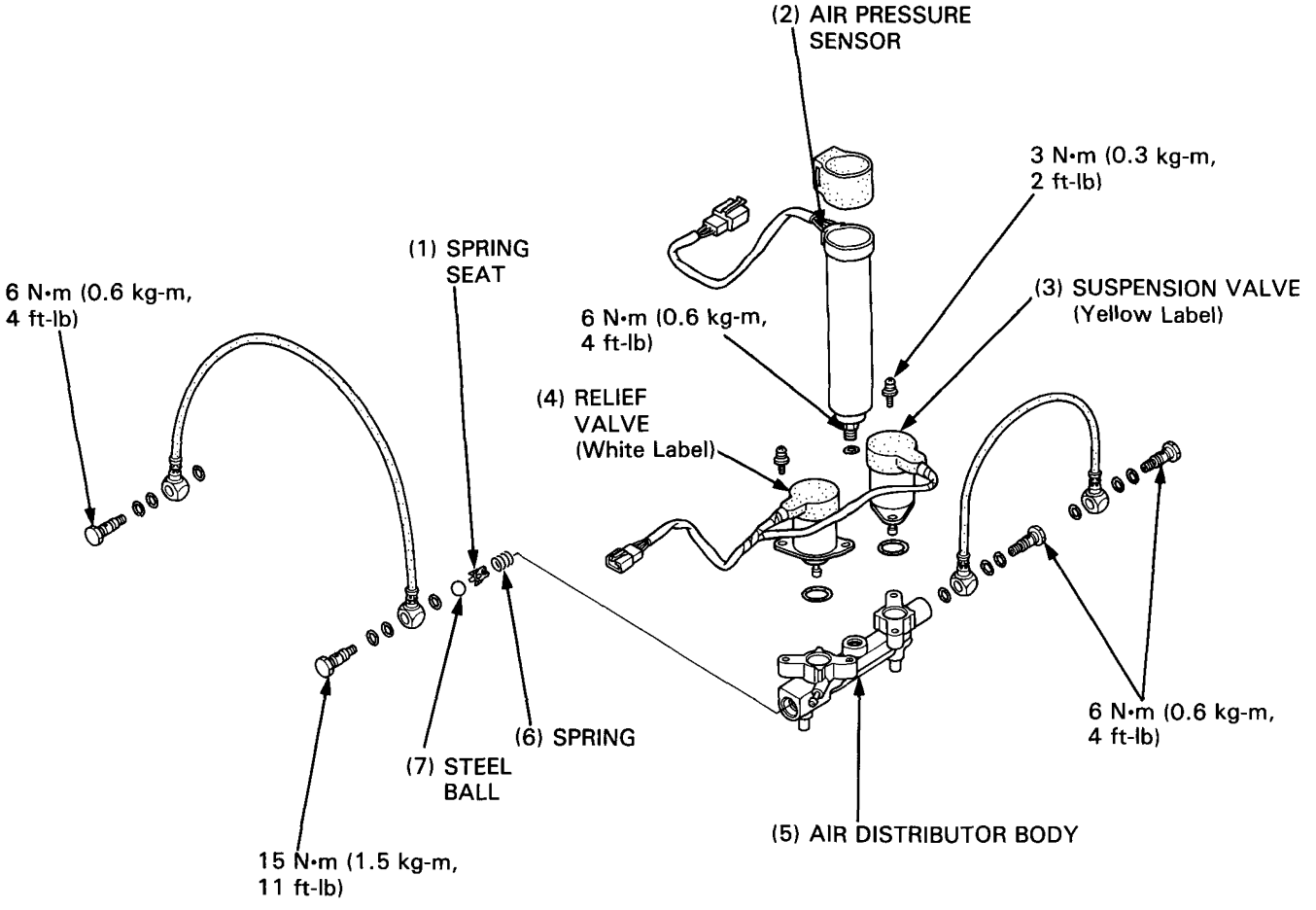


- **Assembly/Installation**

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

NOTE

- Clean all parts before assembly.
- Apply a thin coat of ATF to all O-rings.
- Make sure the rubber solenoid valve seats are in place during assembly. Check each valve for proper seating.
- Torque the parts as indicated.

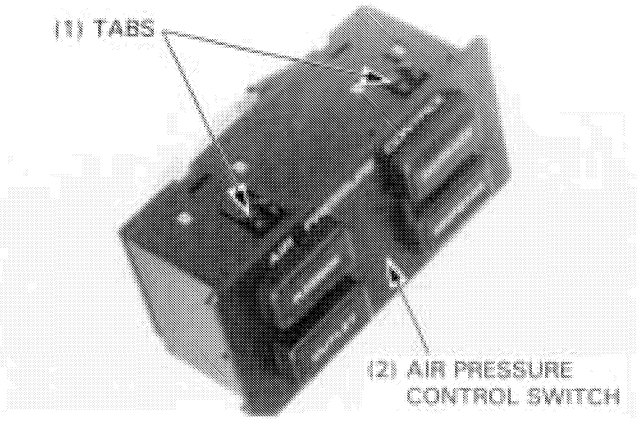


AIR PRESSURE CONTROL SWITCH

- **Inspection**

Remove the right fairing pocket (page 12-7).
Disconnect the 6P-WHT connector of the air pressure control switch and remove the air control switch from the right fairing inner fender by releasing the locking tabs of the switch box.

Check for continuity between the terminals indicated on next page.



Continuity should exist between the color coded wires in the charts as shown.

INCREASE/DECREASE SWITCH

Switch Position \ Color	LT GRN/BLK	BLK/YEL	BRN/WHT
INCREASE	O———	———O	
FREE			
DECREASE		O———	———O

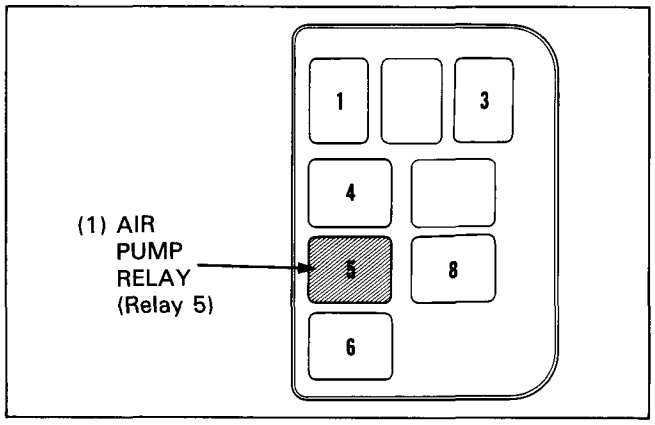
OUTLET SWITCH

Switch Position \ Color	BRN/YEL	BLK/YEL	LT GRN/ YEL	LT GRN/ BLK
FREE	O———	———O		
PUSH			O———	———O

P. CHECK SWITCH

Switch Position \ Color	LT GRN	BRN/BLU
FREE		
PUSH	O———	———O

AIR PUMP RELAY (Relay 5 in the relay box)



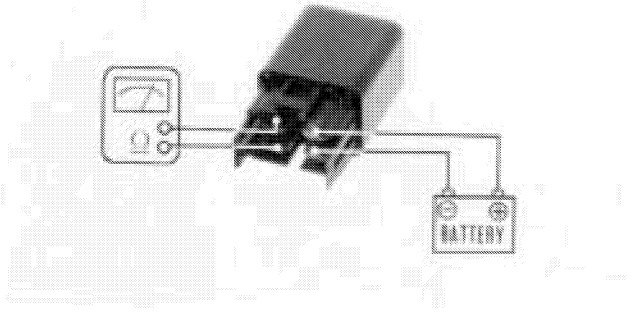
- **Operation Inspection**

Open the relay box cover under the left rear side cover.

Turn the ignition switch to ACC, ON or P. position.
When the P. CHECK button is depressed, the relay primary coil is normal if it clicks.

- **Continuity Inspection**

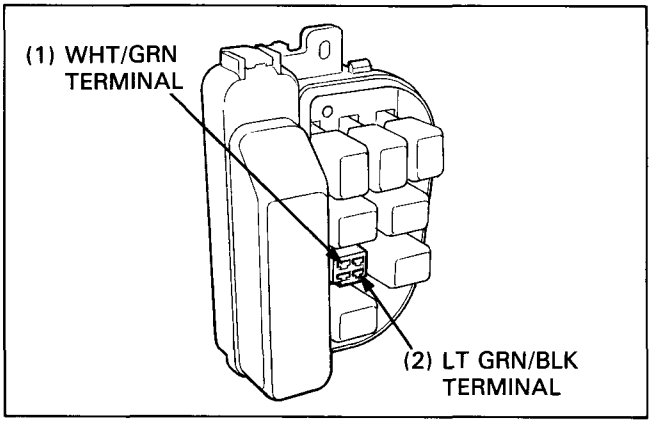
Remove the relay.
Connect an ohmmeter and 12 V battery to the relay as shown.
The relay is normal if there is continuity.

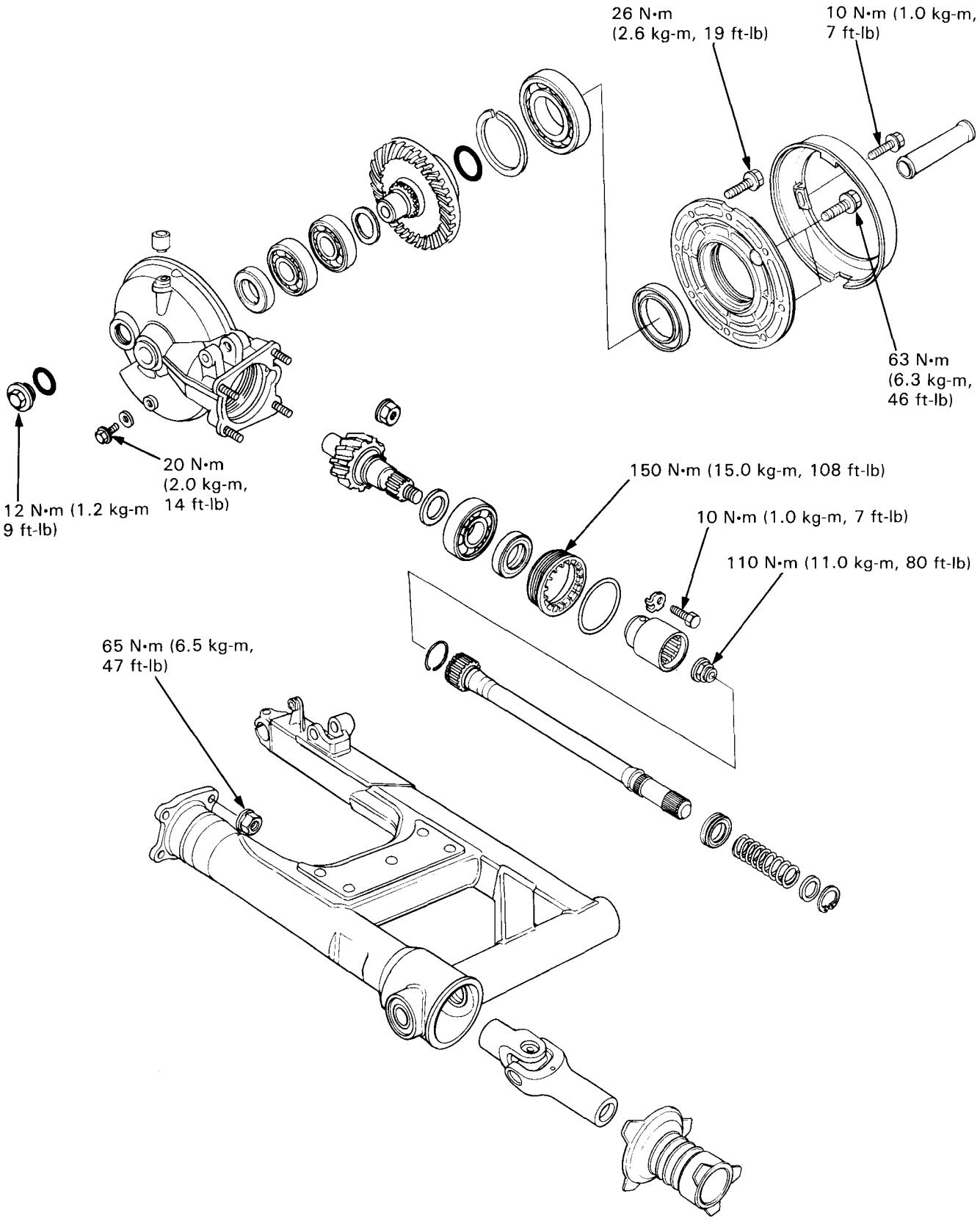


- **Wiring Inspection**

Measure voltage between LT GRN/BLK (+) terminal of the wire harness side and ground (−) with the ignition switch ACC, ON or P.
Battery voltage should register.

Measure voltage between WHT/GRN (+) terminal of the wire harness side and ground (−).
Battery voltage should register at all times.




26 N•m
(2.6 kg-m, 19 ft-lb)
10 N•m (1.0 kg-m,
7 ft-lb)
63 N•m
(6.3 kg-m,
46 ft-lb)
20 N•m
(2.0 kg-m,
14 ft-lb)
12 N•m (1.2 kg-m
9 ft-lb)
150 N•m (15.0 kg-m, 108 ft-lb)
10 N•m (1.0 kg-m, 7 ft-lb)
110 N•m (11.0 kg-m, 80 ft-lb)
65 N•m (6.5 kg-m,
47 ft-lb)

SERVICE INFORMATION

GENERAL

- Refer to section 2 for final drive gear oil check/replacement.
- Replace all oil seals and O-rings whenever the final drive gear is disassembled.
- Check tooth contact pattern and gear backlash when the bearing, gear set and/or gear case has been replaced.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Final gear oil	Capacity	170 cm³ (5.7 US oz, 6.0 Imp oz) at assembly	—
	Recommended oil	Hypoid gear oil, SAE #80	—
Gear backlash		0.05—0.15 (0.002—0.006)	0.3 (0.01)
	Difference at 3 points	—	0.10 (0.004)
Ring gear-to-stop pin clearance		*0.30—0.60 (0.012—0.024)*	—

TORQUE VALUES

Pinion bearing retainer	150 N·m (15.0 kg-m, 108 ft-lb)
Pinion joint nut	110 N·m (11.0 kg-m, 80 ft-lb) ┐ Apply a locking agent
Gear case cover bolt (10 mm)	63 N·m (6.3 kg-m, 46 ft-lb) ┘
(8 mm)	26 N·m (2.6 kg-m, 19 ft-lb)
Final drive gear case mounting nut	65 N·m (6.5 kg-m, 47 ft-lb)
Final drive gear case filler cap	12 N·m (1.2 kg-m, 9 ft-lb)
Final drive gear case drain bolt	20 N·m (2.0 kg-m, 14 ft-lb)
Dust guard plate bolt	10 N·m (1.0 kg-m, 7 ft-lb)
Retainer lock washer bolt	10 N·m (1.0 kg-m, 7 ft-lb)

TOOLS

Special

Oil seal driver attachment	07965—MB00100
Attachment (ring gear bearing)	07947—6340100
Inner base	07965—3710300
Pinion joint holder attachment	07924—9690101 (Must be modified 4 holes. Increase to 10.5 mm)
	or 07924—9690102
Pinion joint holder	07924—ME40000
Retainer wrench	07910—MA10100
Shaft puller	07931—ME40000
Oil seal remover	07948—4630100
Driver shaft	07946—MJ00100
Bearing race insert attachment	07931—4630300

Common

Attachment, 62 x 68 mm	07746—0010500
Driver	07749—0010000
Universal bearing puller	07631—0010000
Inner driver C	07746—0030100
Attachment, 25 mm I.D.	07746—0030200
Attachment, 52 x 55 mm	07746—0010400

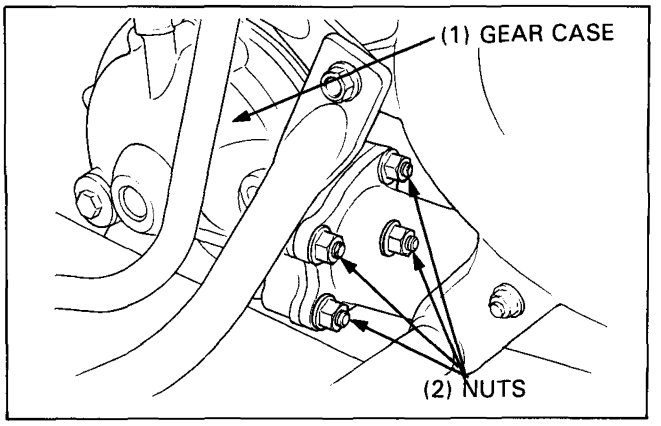
TROUBLESHOOTING

Excessive noise
- Worn or scored ring gear shaft and driven flange
- Scored driven flange and wheel hub
- Worn or scroed drive pinion and splines
- Worn pinion and ring gears
- Excessive backlash between pinion and ring gear
- Oil level too low

Oil leak
- Clogged breather
- Oil level too high
- Seals damaged
- Loosen cover bolt

Rear wheel will not rotate freely
- Damaged pinion and ring gear bearing
- Sticked pinion and ring gear
- Bent drive shaft

GEAR CASE REMOVAL



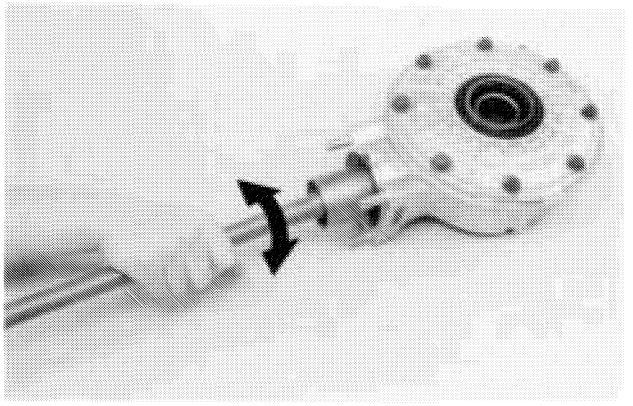
Place the motorcycle on its center stand.

Remove the rear wheel (page 13-9).

Drain the final gear case oil if disassembling the gear case (page 2-12).

Remove the four gear case mounting nuts.

Remove the final gear case from the swing arm.



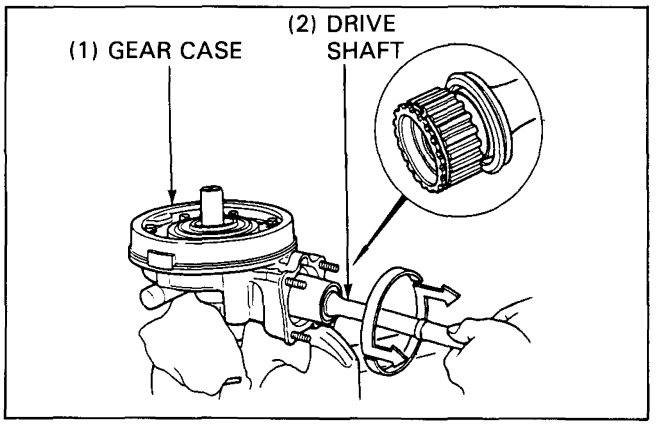
Turn the drive shaft.
The drive pinion and ring gear should turn smoothly and quietly.

Check or replace the following if the drive pinion and ring gear do not turn smoothly and quietly.
— case
— each bearing
— drive pinion
— ring gear

See page 15-4 for gear case disassembly.

DRIVE SHAFT

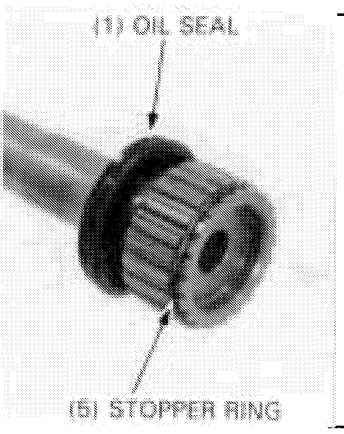
REMOVAL

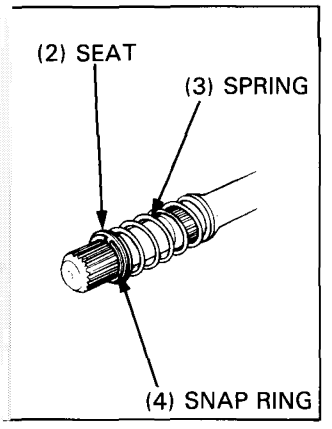


Insert the axle and distance collar through the gear case and secure the case in a vise with soft jaws or shop rags by clamping the axle. Place the shock mount between the jaws for stability.

Separate the drive shaft from the gear case by gently revolving the shaft in a circular motion while tugging slightly.

DISASSEMBLY





Remove the following:
— snap ring
— spring seat
— spring
— stopper ring
— oil seal

Discard the oil seal and stopper ring.

Inspect the drive shaft splines for wear or damage.

ASSEMBLY

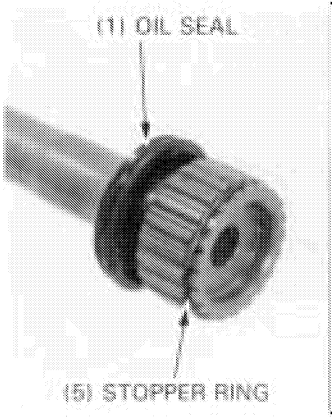
Install the following:
– a new oil seal
– a new stopper ring

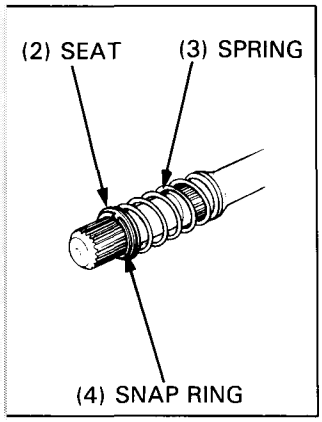
NOTE

• The stopper ring removed during disassembly does not have to be reinstalled. It is used for production line purpose.

– spring
– spring seat
– snap ring

See page 15-15 for gear case installation.





UNIVERSAL JOINT

REMOVAL/INSTALLATION

Remove the swing arm (page 14-23).

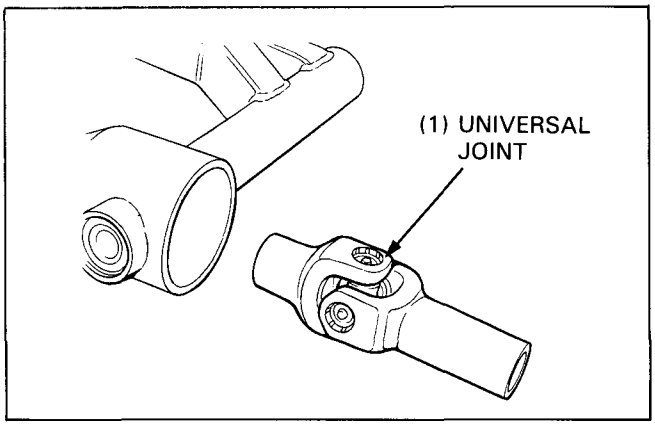
Remove the universal joint from the swing arm.

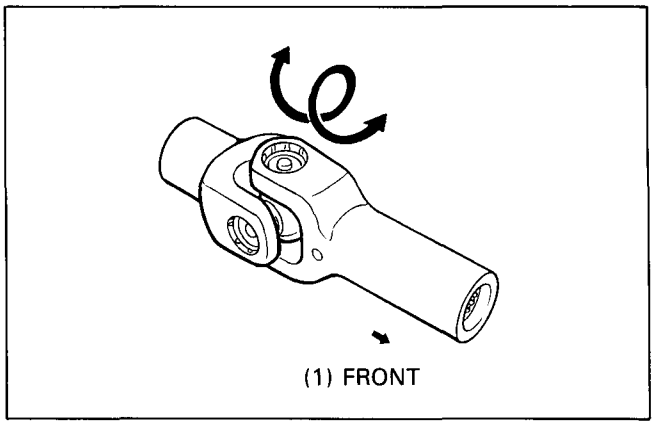
Inspect the universal joint. There should be no play in the bearings. Rotate the shaft and joint in opposite directions. If there is any evidence of side play, the universal joint must be replaced.

Apply grease to the splines.

NOTE

• Install the joint into the swing arm, with the long splines side to the front.





GEAR CASE DISASSEBLY

BACKLASH INSPECTION

Remove the oil filler cap.

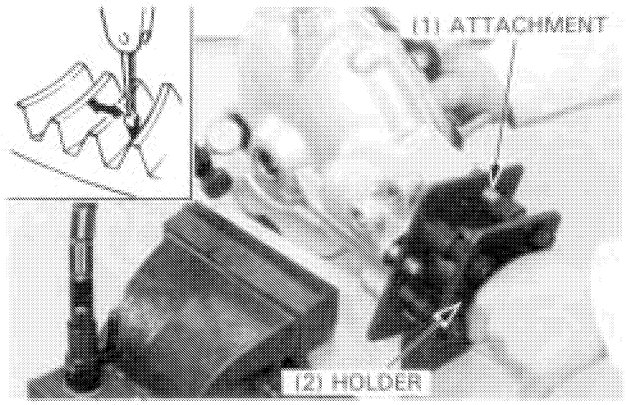
Place the pinion joint holder attachment onto the gear case. Align the holes in the attachment with the four studs in the case.
Install the pinion joint holder onto the attachment.

Position the gear case in a soft jaws to prevent to damage the case.

TOOLS:

Pinion joint holder attachment	**07924–9690101 (Must be modified 4 holes. Increase to 10.5 mm) or 07924–9690102**
Pinion joint holder	**07924–ME40000**

Set a horizontal type dial indicator on the ring gear, through the oil filler hole.



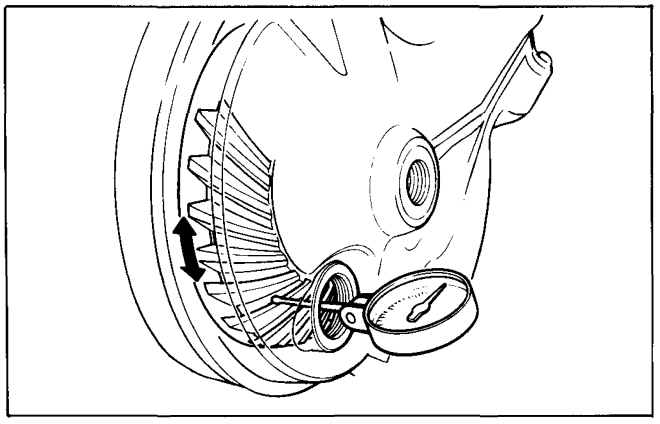
Hold the pinion joint holder by hand securely.
Rotate the ring gear by hand until gear slack is taken up. Turn the ring gear back and forth to read backlash.

STANDARD: 0.05—0.15 mm (0.002—0.006 in)
SERVICE LIMIT: 0.3 mm (0.01 in)

Remove the dial indicator. Turn the ring gear 120 degree and measure backlash. Repeat this procedure once more.

Compare the difference of the three measurements.

DIFFERENCE OF MEASUREMENT
SERVICE LIMIT: 0.10 mm (0.004 in)

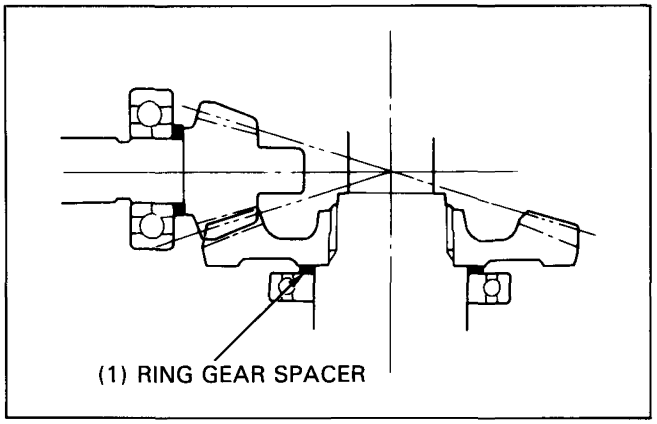


If the difference in measurements exceeds the limit, it indicates that either the bearing is not installed squarely, or the case is deformed.
Inspect the each bearing and case (as below).

If backlash is too small, install a thinner ring gear spacer.
If too large, install a thicker spacer.

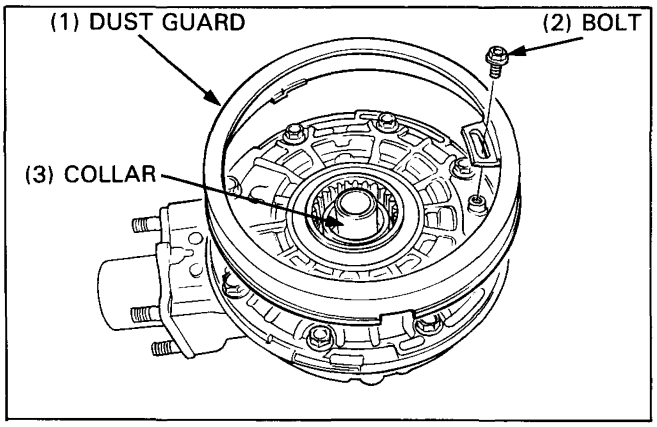
Backlash is changed by about 0.06—0.07 mm (0.002—0.003 in) when thickness of the spacer is changed by 0.10 mm (0.004 in).

RING GEAR SPACER:
- **A: 1.82 mm (0.072 in)**
- **B: 1.88 mm (0.074 in)**
- **C: 1.94 mm (0.076 in)**
- **D: 2.00 mm (0.079 in) Standard**
- **E: 2.06 mm (0.081 in)**
- **F: 2.12 mm (0.083 in)**
- **G: 2.18 mm (0.086 in)**
- **H: 2.24 mm (0.088 in)**
- **I: 2.30 mm (0.091 in)**



RING GEAR REMOVAL

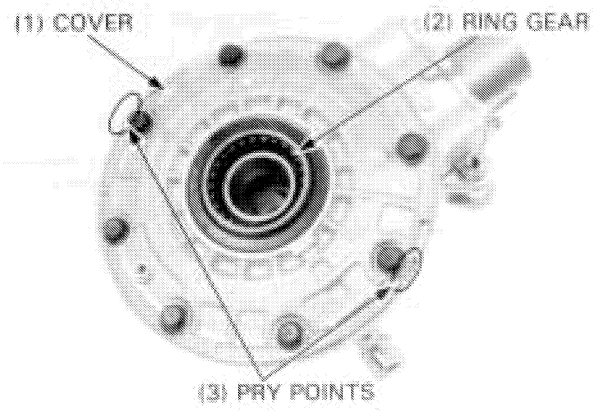
Remove the following:
— dust guard
— distance collar



— case cover bolt

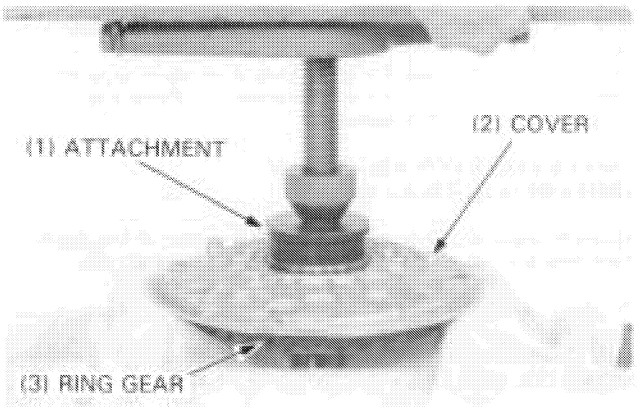
Carefully pry the cover off the case using a screwdriver on the pry points as shown.

Remove the case cover, ring gear spacer, ring gear and wave washer.

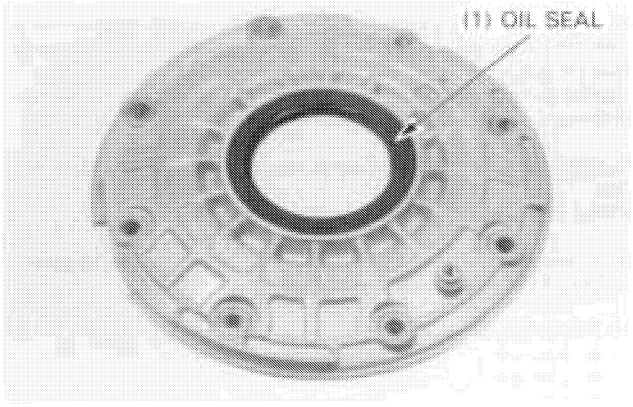


If the ring gear stays in the cover, do the following:
Place the cover in a press with the ring gear down.
Make sure the cover is securely supported.
Press the ring gear out of the cover.

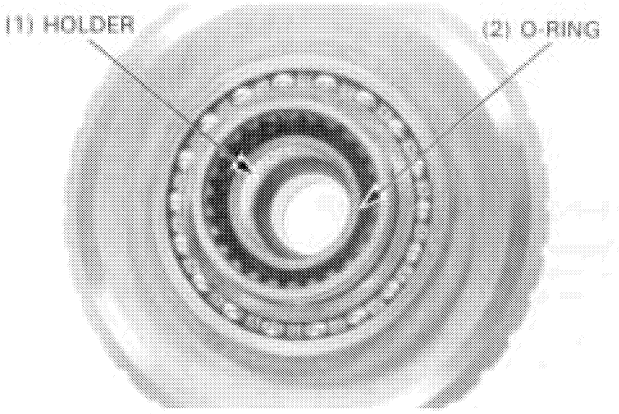
TOOL:
Attachment, 62 x 68 mm **07746–0010500**



Remove the oil seal from the case cover.



Replace the O-ring and O-ring holder with a new one if necessary.

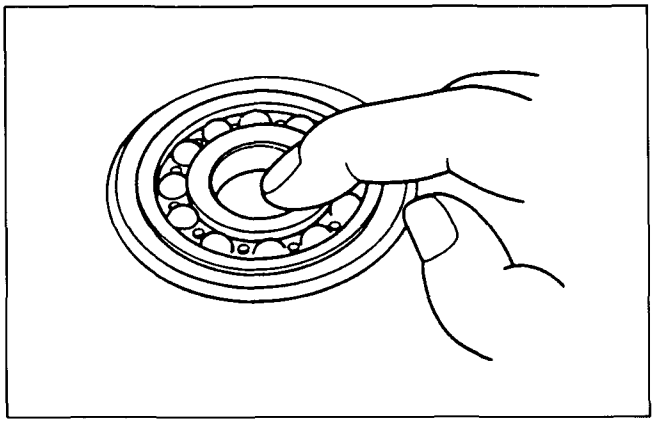


BEARING INSPECTION

Turn the inner or outer race of the ring gear bearings with your finger.
The bearings should turn smoothly and quietly. Also check that the outer or innner races fit tightly in the case or gear.

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

For ring gear bearing replacement, go to page 15-11.
For drive pinion removal and disassembly, go to page 15-9.



GEAR TOOTH CONTACT PATTERN CHECK

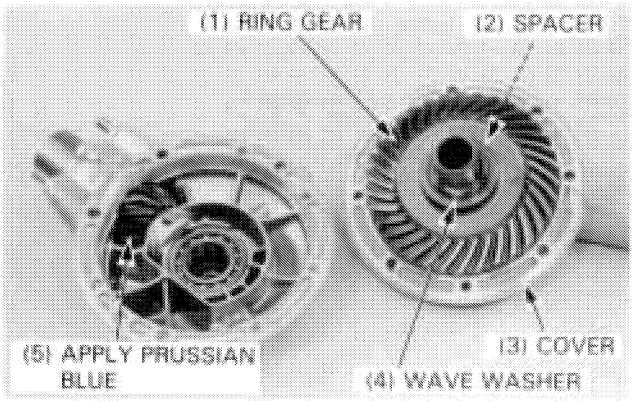
Clean all sealing material off the mating surfaces of the gear case and cover.

NOTE

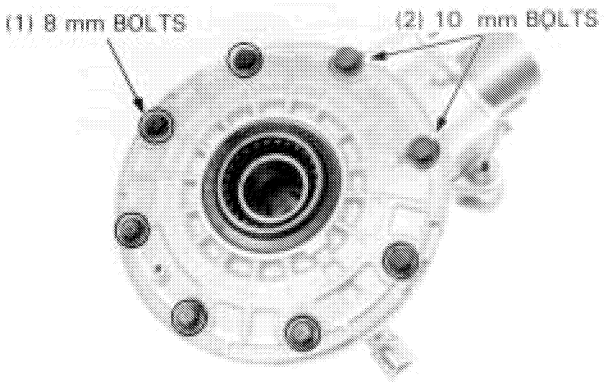
- Keep dust and dirt out of the gear case.
- Be careful not to damage the mating surfaces.

Apply a thin coat of Prussian Blue to the pinion gear teeth for a gear tooth contact pattern check.

Install the ring gear with the ring gear spacer (previous page) into the cover (page 15-12).
Install the ring gear and cover assemblies with the wave washer into the case.



Tighten the cover bolts in 2 or 3 steps until the cover evenly touches the gear case. Then, while rotating the drive pinion, tighten the bolts to the specified torque in 2-3 steps in a crisscross pattern.



TORQUES:
10 mm bolt: 63 N·m (6.3 kg-m, 46 ft-lb)
8 mm bolt: 26 N·m (2.6 kg-m, 19 ft-lb)

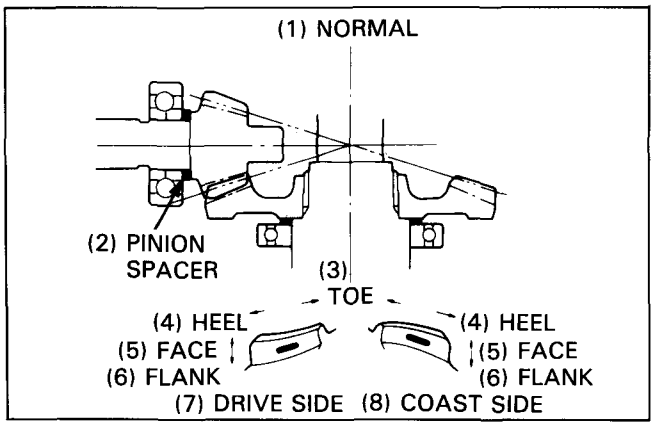
CAUTION

- *It is important to turn the pinion while tightening the bolts. If the ring gear spacer is too thick, the gears will lock after only light tightening.*

Remove the oil filler cap from the final drive case.

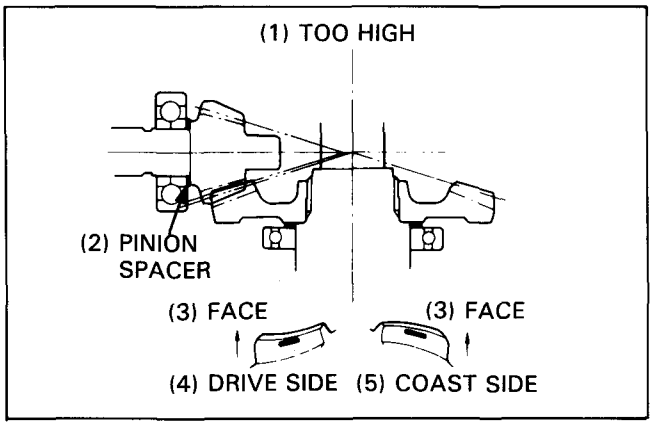
Rotate the ring gear several times in both directions. Check the gear tooth contact pattern through the oil filler hole. The pattern is indicated by the Prussian Blue applied to the pinion before assembly.

Contact is normal if the Prussian Blue is transfered to the approximate center of each tooth and slightly to the flank side.



If the patterns are not correct, remove and replace the pinion spacer. Replace the pinion spacer with a thicker one if the contacts are too high, toward the face.

Replace the pinion spacer with a thinner one if the contacts are too low, to the flank side.
The patterns will shift about 1.5—2.0 mm (0.06—0.08 in) when the thickness of the spacer is changed by 0.10 mm (0.004 in).



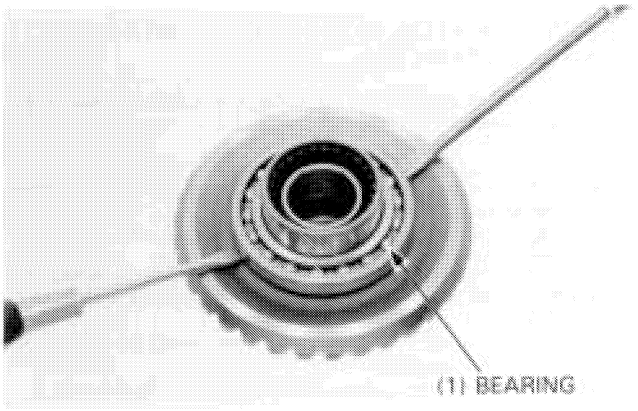
PINION SPACERS:
A: 1.32 mm (0.052 in)
B: 1.38 mm (0.054 in)
C: 1.44 mm (0.057 in)
D: 1.50 mm (0.059 in) Standard
E: 1.56 mm (0.061 in)
F: 1.62 mm (0.064 in)
G: 1.68 mm (0.066 in)

RING GEAR SPACER REPLACEMENT

Pry the bearing out from the ring gear.

CAUTION

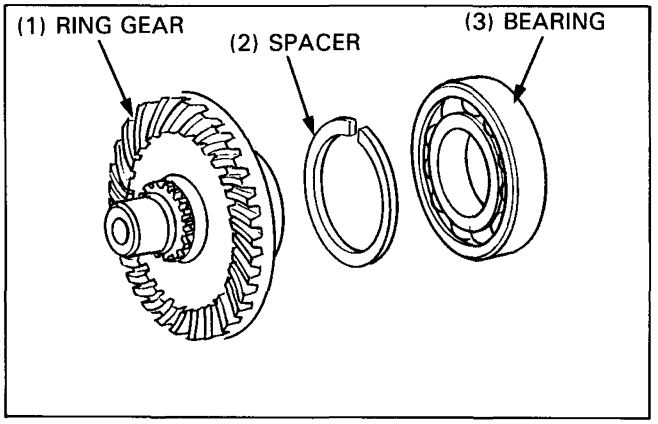
Do not damage the ring gear.



If the ring gear assembly was loose against the cover:
Install the suitable spacer (page 15-5) on the ring gear.

NOTE

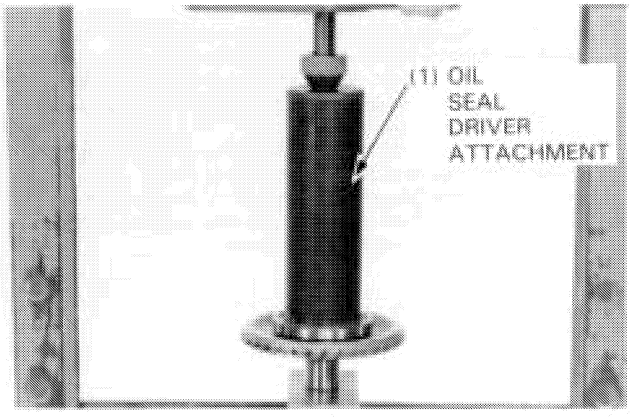
- If the gear set, pinion bearing, ring gear bearing and/or gear case is replaced, install a 2.00 mm (0.079 in) thick spacer (standard).



Place a new ring gear bearing over the ring gear shaft.

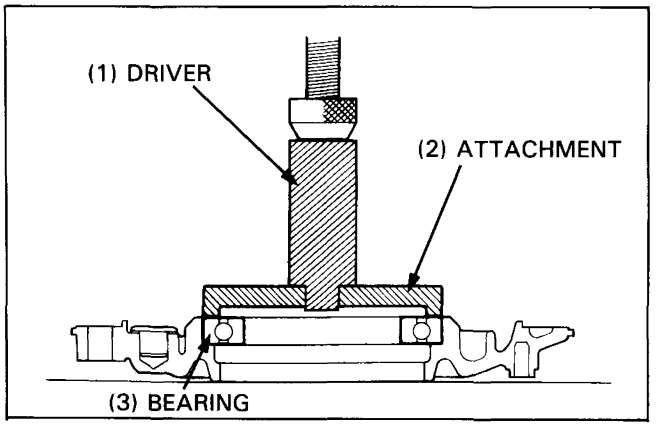
Use a hydraulic press to seat the ring gear bearing on the shaft.

TOOL:
Oil seal driver attachment **07965—MB00100**



If the ring gear stayed in the cover:
Press the ring gear bearig into the case.

TOOLS:
Driver **07749—0010000**
Attachment (ring gear bearing) **07947—6340100**



Install the suitable spacer (page 15-5) on the ring gear.

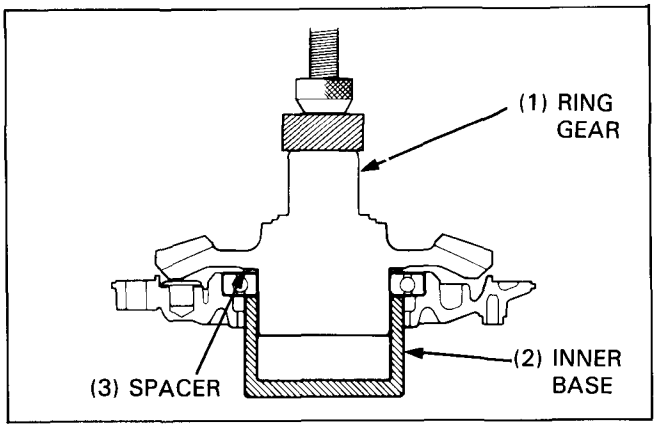
NOTE

- If the gear set, pinion bearing, ring gear bearing and/or gear case is replaced, install a 2.00 mm (0.079 in) thick spacer (standard).

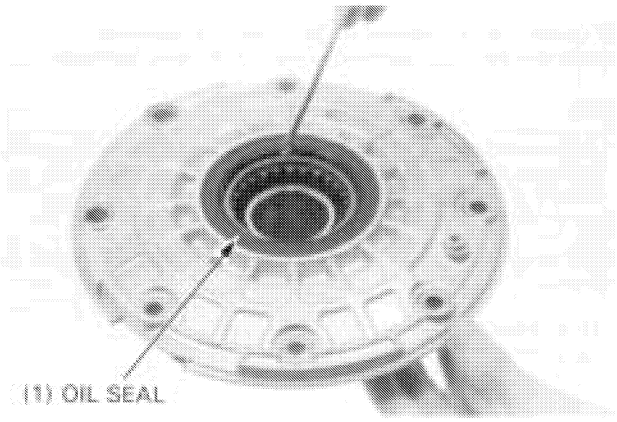
Support the bearing inner race with the inner base, and press the ring gear into the bearing with a suitable tool.

TOOL:

Inner base	**07965—3710300**



Apply gear oil to the case cover oil seal lip.
Install the ring gear into the case cover. Seat the oil seal lip to the ring gear shaft gently if the oil seal lip turns inside out.

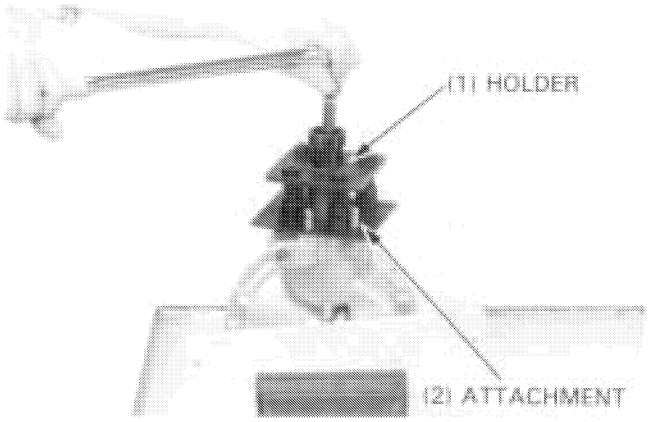


PINION SPACER REPLACEMENT

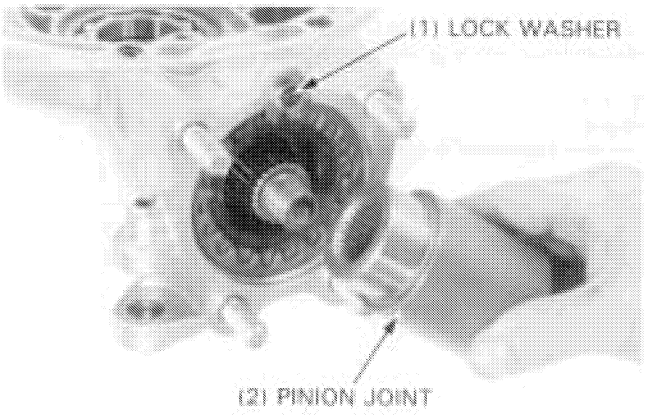
Remove the pinion joint nut.

TOOLS:

Pinion joint holder attachment	**07924—9690101 (Must be modified 4 holes. Increase to 10.5 mm) or 07924—9690102**
Pinion joint holder	**07924—ME40000**

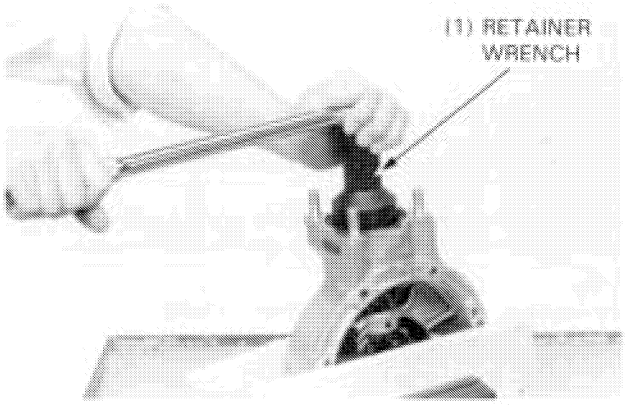


Remove the following:
— pinion joint
— retainer lock washer



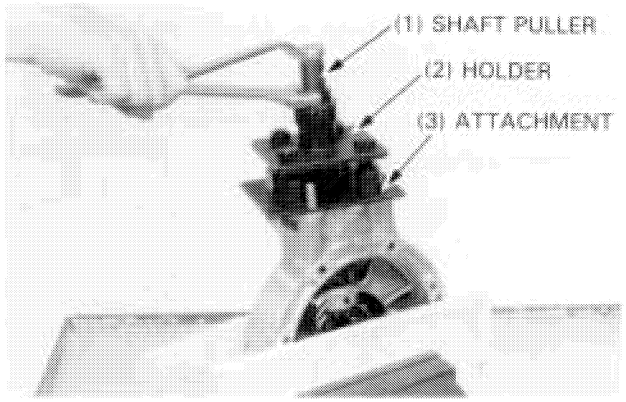
Remove the following:
– retainer

TOOL:
Retainer wrench **07910–MA10100**



– pinion assembly

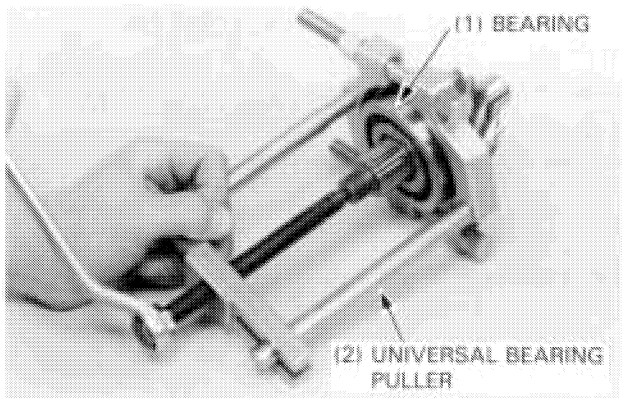
TOOLS:
Pinion joint holder attachment **07924–9690101 (modified) or 07924–9690102**
Pinion joint holder **07924–ME40000**
Shaft puller **07931–ME40000**



Pull the bearing outer and inner races off the shaft with the universal bearing puller.
Pull the other inner race off with the same tool.

TOOL:
Universal bearing puller **07631–0010000**

Remove the pinion spacer.

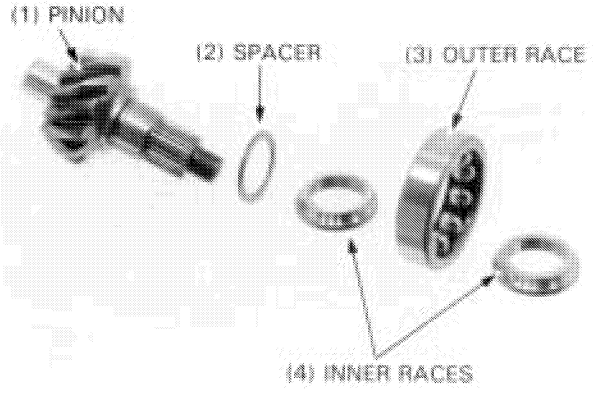


To reassemble, first install the pinion spacer.

NOTE

- When the gear set, pinion bearing and/or gear case have been replaced, use a 1.50 mm (0.059 in) thick spacer (standard).

Apply #80 gear oil to the inner races and the bearing.



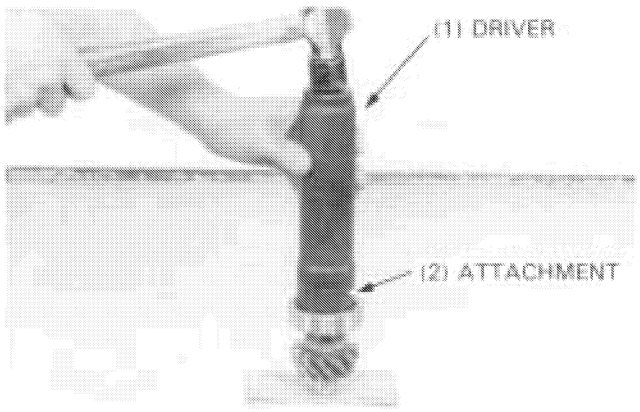
Press the bearing and both inner races onto the pinion gear shaft.

TOOLS:

Inner driver C	**07746–0030100**
Attachment, 25 mm I.D.	**07746–0030200**

NOTE

- Position the marked side of the outer race to the outside.



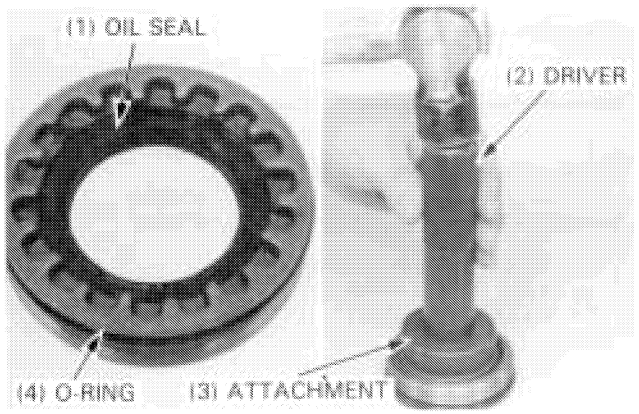
Remove the O-ring and oil seal from the pinion retainer.

Coat a new O-ring with oil and install it on the retainer.

Apply grease to a new oil seal lip and drive it into the retainer with lip side facing inside.

TOOLS:

Driver	**07749–0010000**
Attachment, 52 x 55 mm	**07746–0010400**



CASE BEARING REPLACEMENT

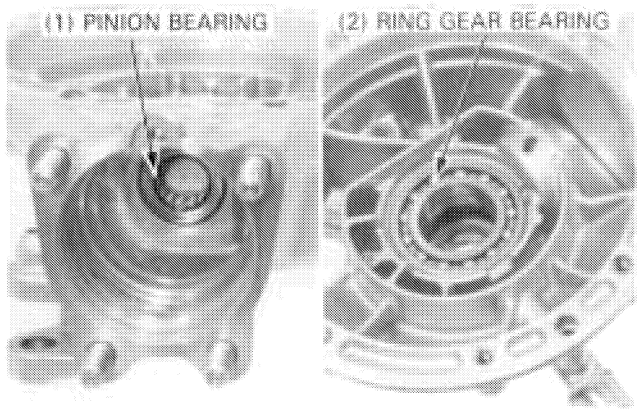
NOTE

- The drive pinion bearing cannot be removed. Replace the final drive case if the bearing is damaged.

Heat the gear case to approximately 80°C (175°F).

⚠WARNING

- ***Always wear gloves when handling hot parts.***



Set the oil seal remover on the ring gear bearing.

TOOL:

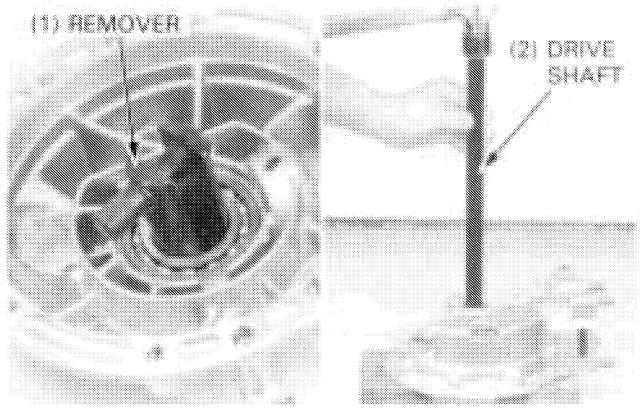
Oil seal remover	**07948–4630100**

Turn the gear case up side down.
Drive the ring gear bearing out of the gear case.

TOOL:

Driver shaft	**07946–MJ00100**

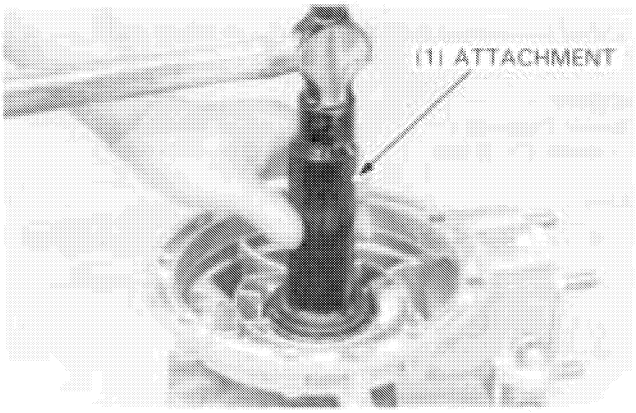
Remove the oil seal using same tools.



Drive a new oil seal into the case.

TOOL:
Bearing race insert attachment 07931—4630300

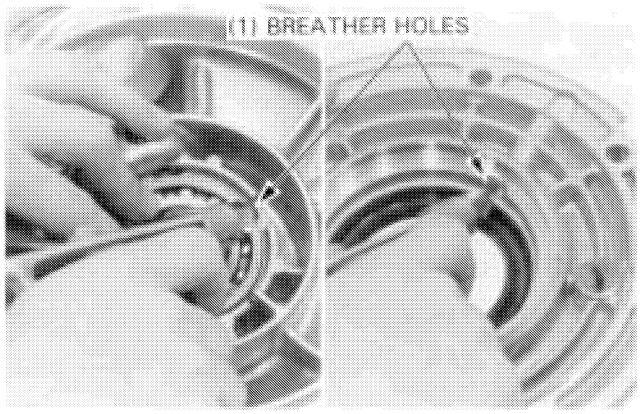
Apply grease to the oil seal lips.
Drive a new bearing into the case using the same tool.



Blow compressed air through the breather holes in the case and the cover.

CAUTION

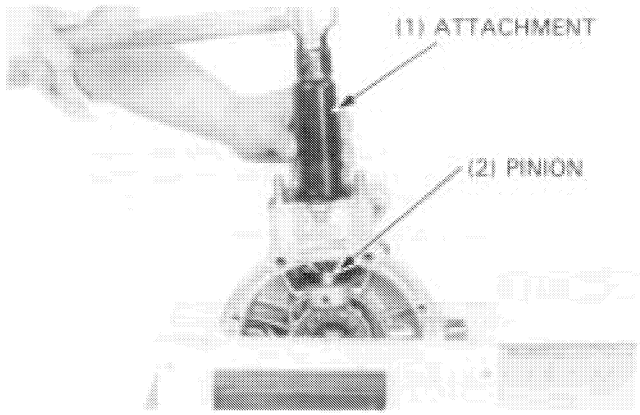
- *Hold the bearing to prevent it from rotating when using compressed air.*



GEAR CASE ASSEMBLY

Place the drive pinion assembly into its housing and drive it into the final gear case until the pinion retainer threads can engage the case threads.

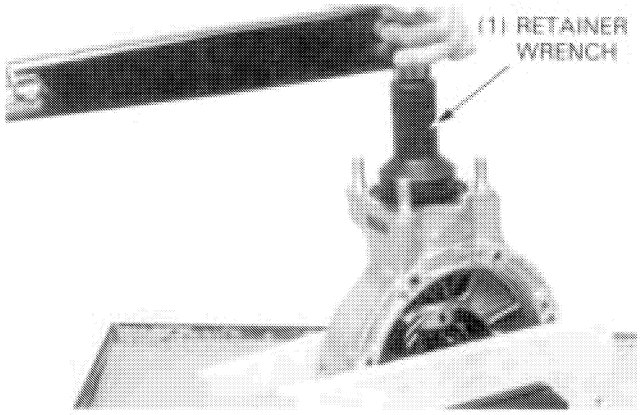
TOOL:
Bearing race insert attachment 07931—4630300



Screw in the pinion retainer to press the pinion bearing into place, then tighten it.

TORQUE: 150 N·m (15.0 kg-m, 108 ft-lb)

TOOL:
Retainer wrench 07910—MA10100

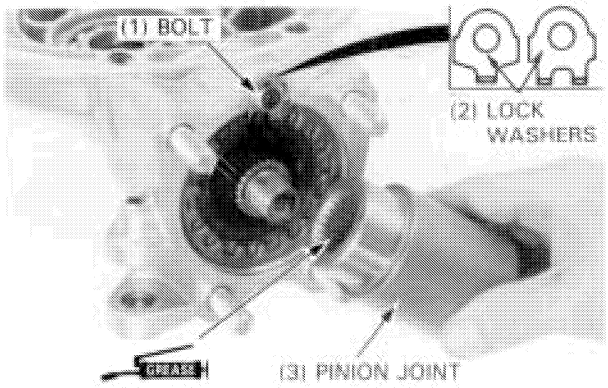


Install a pinion retainer lock tab and tighten the bolt.

TORQUE: 10 N·m (1.0 kg-m, 7 ft-lb)

NOTE

- There are two types of lock washer as shown.



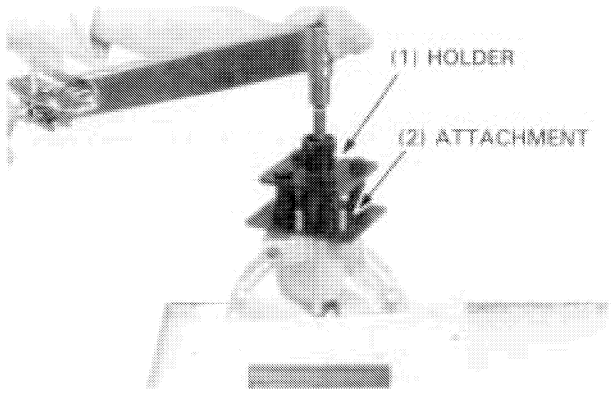
Apply grease to the pinion joint spline.

Install the pinion joint to the pinion.

Apply a locking agent to the pinion joint nut threads.
Set the attachment and holder onto the gear case.

TOOLS:

Pinion joint holder attachment	**07924—9690101 (modified) or 07924—9690102**
Pinion joint holder	**07924—ME40000**



Tighten the nut to the specified torque.

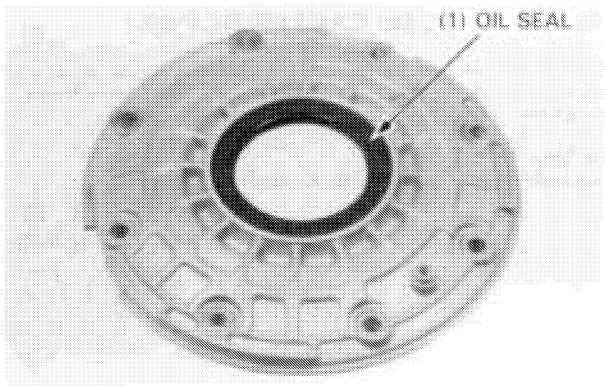
TORQUE: 110 N·m (11.0 kg-m, 80 ft-lb)

Remove the tools.

If the ring gear assembly was loose against the cover, install the oil seal into the cover.

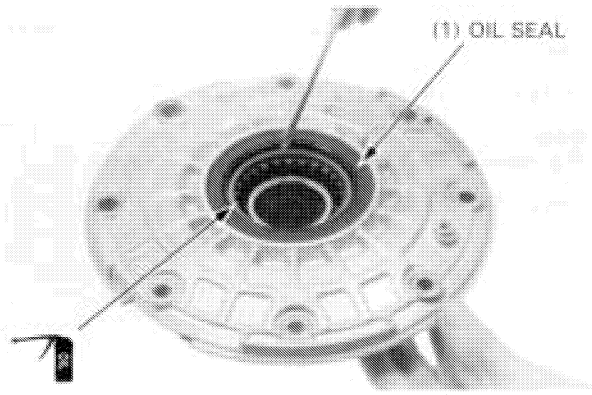
NOTE

- The seal surface should be aligned with the cover surface.



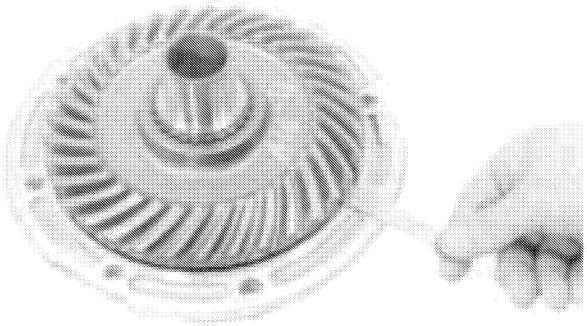
If the ring gear assembly was loose against the cover:
Apply gear oil to the case cover oil seal lip.
Install the ring gear into the case cover.
Seat the oil seal lip to the ring gear shaft gently if the oil seal lip turns inside out.

If the ring gear stayed in the cover:
Install the ring gear and oil seal (page 15-8/ring gear spacer replacement).



Measure the clearance between the ring gear and the ring gear stop pin with a feeler gauge.

CLEARANCE: 0.30—0.60 mm (0.012—0.024 in)



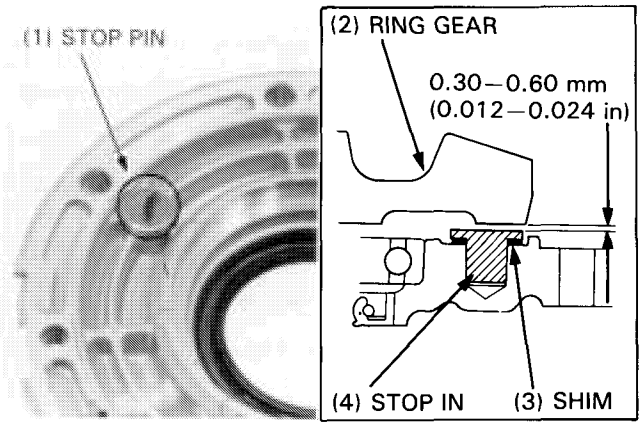
Remove the ring gear, if the clearance exceeds the standard. Heat the cover to approximately 80°C (176°F) and remove the stop pin by tapping the cover.

⚠ WARNING

- ***Always wear gloves when handling the cover after it has been heated to prevent burning your hands.***

Install a stop pin shim to obtain the correct clearance.

SHIM THICKNESS:
A: 0.10 mm (0.004 in)
B: 0.15 mm (0.006 in)



Install the shim and drive the stop pin into the cover.

NOTE

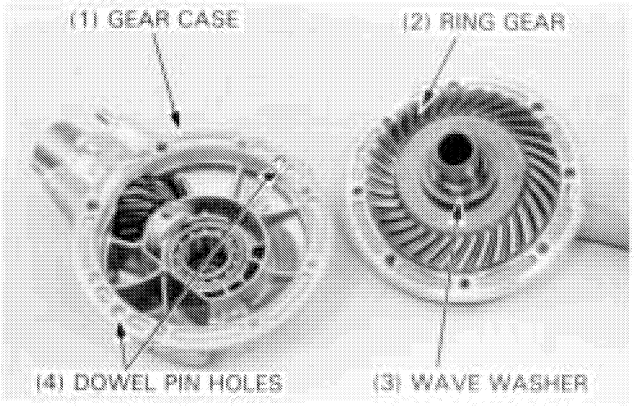
- When the bearing, gear set and/or case has been replaced, check the tooth contact pattern (page 15-7) and gear backlash (page 15-4).

Install a wave washer on the ring gear.

Apply liquid sealant to the mating surface of the cover and install the cover on the final gear case.

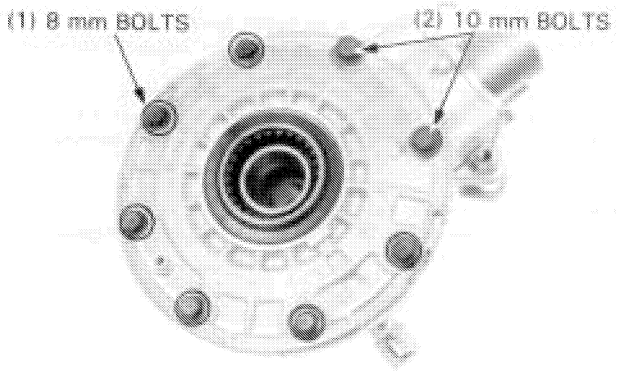
NOTE

- Do not apply lequid sealant to the dowel pin holes.



Apply a locking agent to the threads of the 10 mm bolts. Tighten the cover bolts in 2-3 steps until the cover evenly touches the final drive case. Then, while rotating the pinion, tighten the bolts to the specified torque in 2-3 steps in a crisscross pattern.

TORQUES:
10 mm bolt: 63 N·m (6.3 kg-m, 46 ft-lb)
8 mm bolt: 26 N·m (2.6 kg-m, 19 ft-lb)



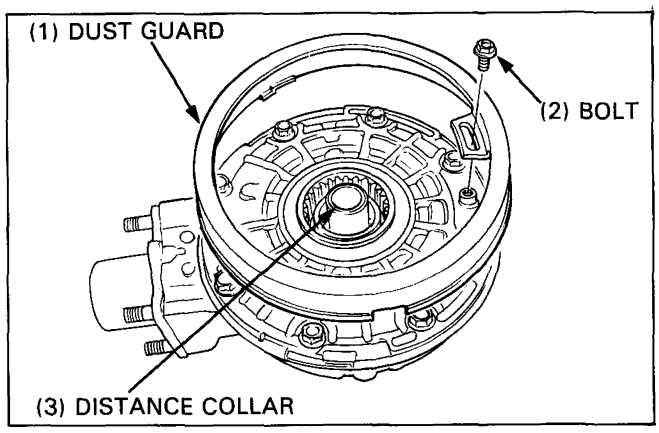
CAUTION

- *It is important to turn the pinion while tightening the bolts. If the ring gear spacer is too thick, the gears will lock after only a light tightening.*
- *Be careful not to damage the case oil seal lips.*

Install the dust guard plate and tighten the bolt.

TORQUE: 10 N·m (1.0 kg-m, 7 ft-lb)

Install the distance collar with its smaller outer diameter side facing inside.

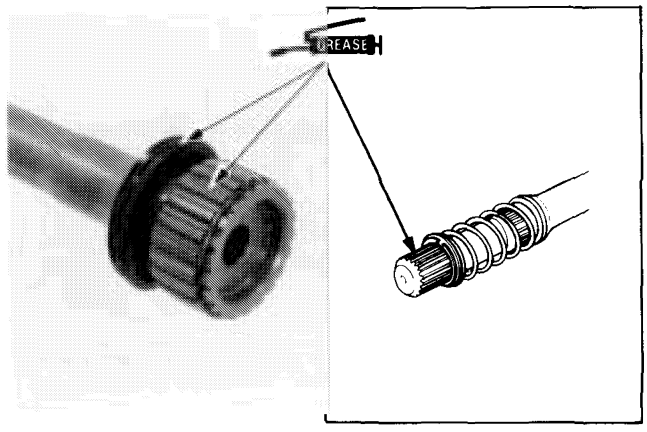


GEAR CASE INSTALLATION

Apply grease to the drive shaft spline.

NOTE

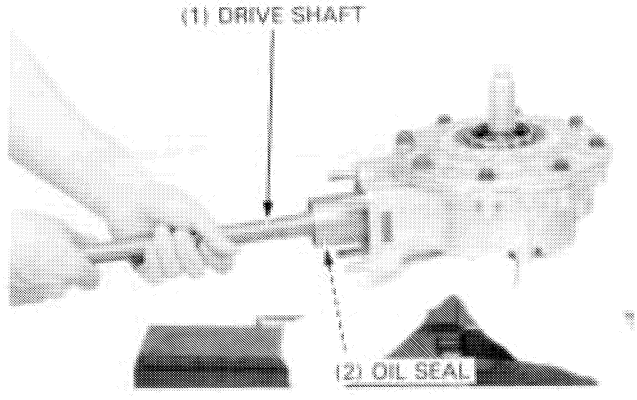
- Do not install a stopper ring on the drive shaft, even if one was present during disassembly. it is not necessary.



Insert the drive shaft into the pinion joint spline grooves.

NOTE

- Be careful not to damage the drive shaft oil seal.



Loosely attach the gear case on the swing arm.

NOTE

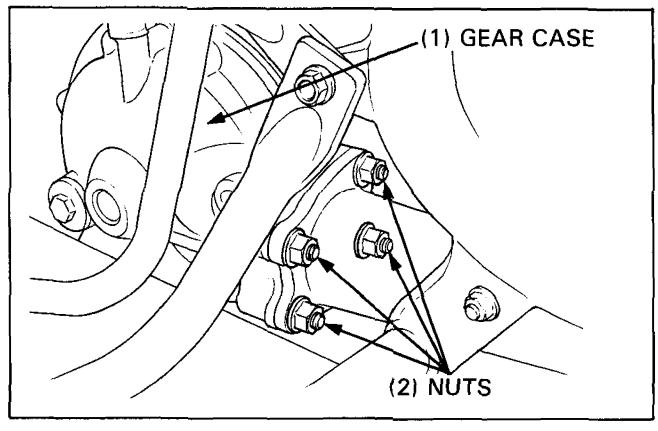
- To ease axle installation, do not tighten the gear case mounting nuts until after the axle is installed.

Make sure the distance collar is in the final gear case.

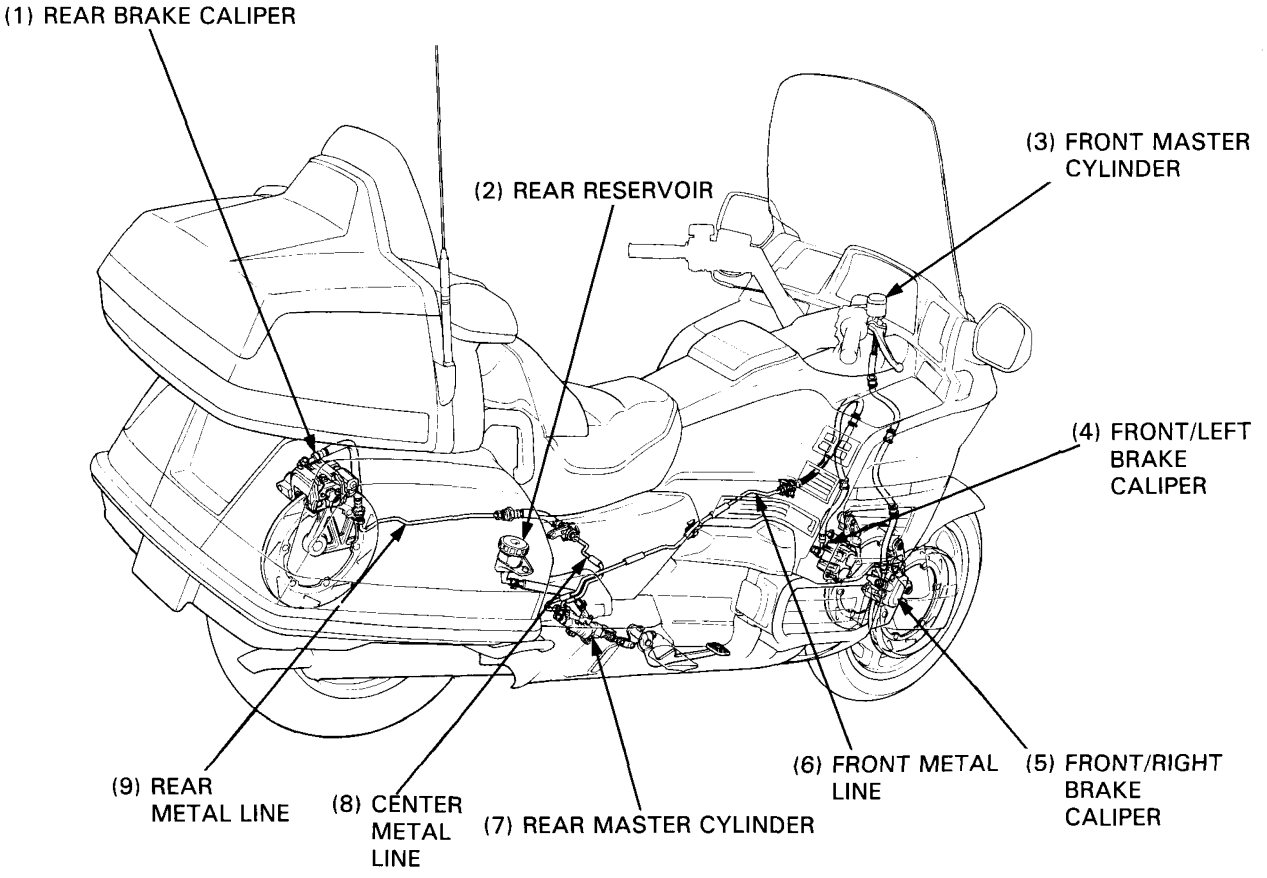
Install the rear wheel and torque the bolts and nut (page 13-14). Then, tighten the final gear case mounting nuts.

TORQUE: 65 N·m (6.5 kg-m, 47 ft-lb)

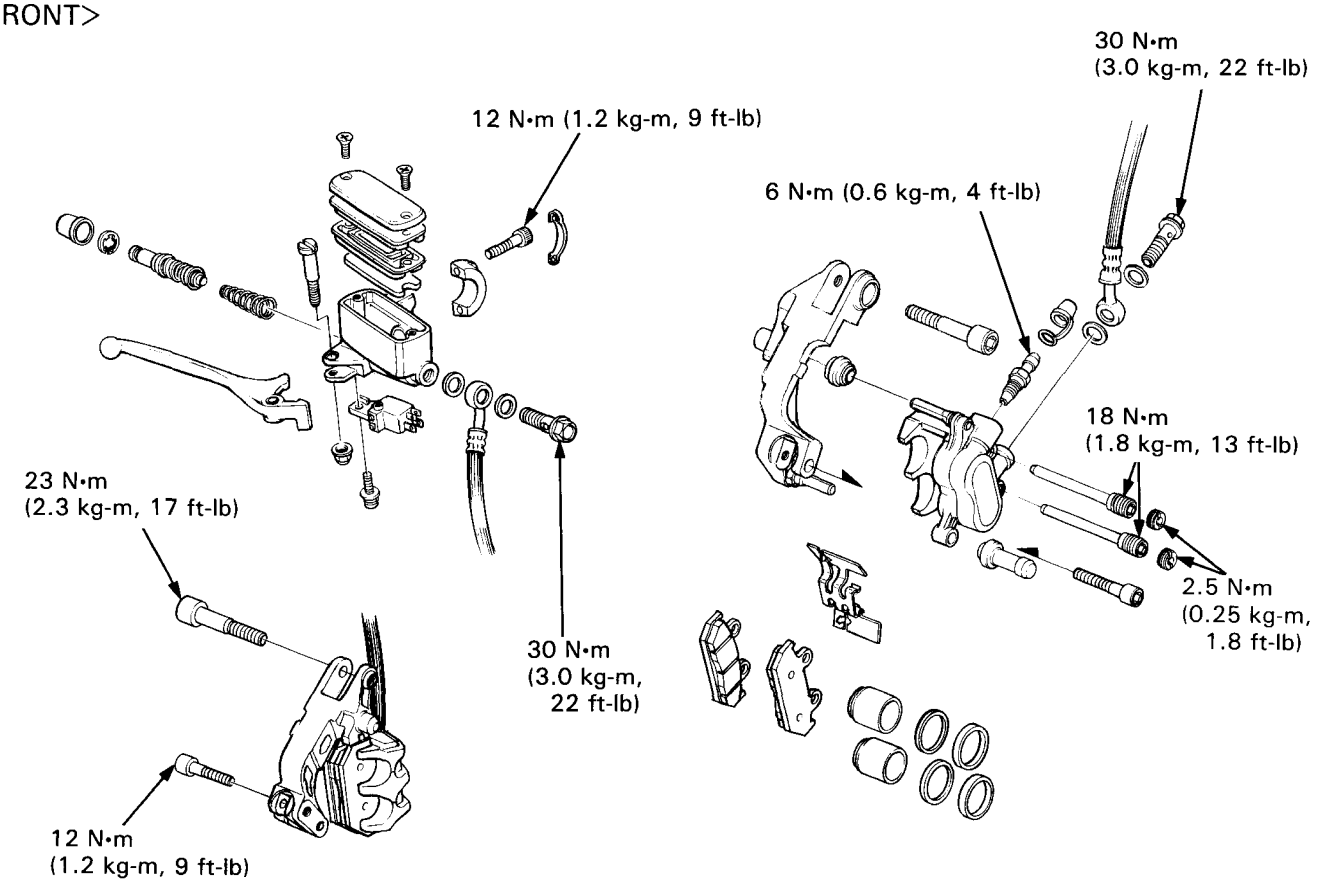
Fill the gear case with the recommended oil (page 2-12).



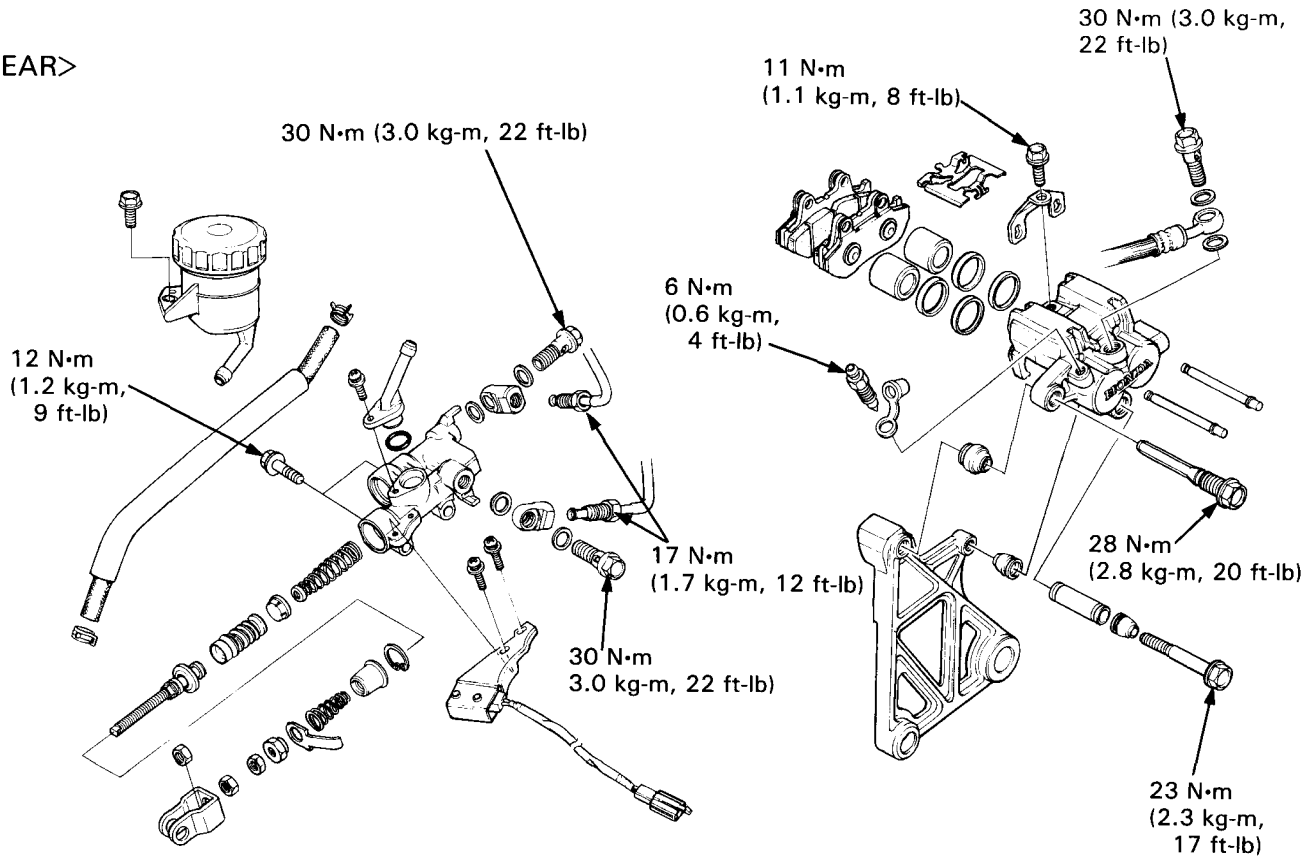
SYSTEM LOCATION



<FRONT>


30 N•m
(3.0 kg-m, 22 ft-lb)
12 N•m (1.2 kg-m, 9 ft-lb)
6 N•m (0.6 kg-m, 4 ft-lb)
18 N•m
(1.8 kg-m, 13 ft-lb)
23 N•m
(2.3 kg-m, 17 ft-lb)
2.5 N•m
(0.25 kg-m,
1.8 ft-lb)
30 N•m
(3.0 kg-m,
22 ft-lb)
12 N•m
(1.2 kg-m, 9 ft-lb)

<REAR>


30 N•m (3.0 kg-m,
22 ft-lb)
11 N•m
(1.1 kg-m, 8 ft-lb)
30 N•m (3.0 kg-m, 22 ft-lb)
6 N•m
(0.6 kg-m,
4 ft-lb)
12 N•m
(1.2 kg-m,
9 ft-lb)
17 N•m
(1.7 kg-m, 12 ft-lb)
28 N•m
(2.8 kg-m, 20 ft-lb)
30 N•m
3.0 kg-m, 22 ft-lb)
23 N•m
(2.3 kg-m,
17 ft-lb)

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.*

⚠WARNING

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

- This motorcycle has a unified brake system which provides simultaneous braking action of the left front and rear disc brakes when the brake pedal is operated. The hand brake lever operates the right front disc brake, which is independent of the unified system.
- Spilled brake fluid will severely damage instrument lenses, the windshield and painted surfaces. It is also harmful to some rubber parts. Be very careful whenever you remove the reservoir cap: make sure the front reservoir is horizontal first.
- Never allow contaminants (dirt, water, etc.) to get into an open reservoir.
- The front brake can be removed without disconnecting the hydraulic system. Once the hydraulic system has been opened, or if the brakes feel 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.

SPECIFICATION

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Brake fluid (front/rear)			DOT 4	—
Front 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)
Front brake caliper	Left	Cylinder I.D.	25.400–25.450 (1.0000–1.0020)	25.460 (1.0024)
		Piston O.D.	25.335–25.368 (0.9974–0.9987)	25.310 (0.9965)
	Right	Cylinder I.D.	30.230–30.280 (1.1902–1.1921)	30.290 (1.1925)
		Piston O.D.	30.165–30.198 (1.1876–1.1889)	30.140 (1.1866)
Front brake disc		Thickness	5.8–6.2 (0.23–0.24)	5.0 (0.20)
		Runout	—	0.3 (0.01)
Front brake pad thickness			5.5 (0.22)	1.0 (0.04)

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Rear brake master cylinder	Cylinder I.D.	15.870–15.913 (0.6248–0.6265)	15.925 (0.6270)
	Piston O.D.	15.827–15.854 (0.6231–0.6242)	15.815 (0.6226)
brake rod clevis installed length		100 (3.9)	—
Rear brake caliper	Cylinder I.D.	32.030–32.080 (1.2610–1.2630)	32.090 (1.2634)
	Piston O.D.	31.948–31.998 (1.2578–1.2598)	31.940 (1.2575)
Rear brake disc	Thickness	7.3–7.7 (0.29–0.30)	6.0 (0.24)
	Runout	—	0.3 (0.01)
Rear brake pad thickness		6.5 (0.26)	1.0 (0.04)

TORQUE VALUES

Front master cylinder holder bolt	12 N·m (1.2 kg-m, 9 ft-lb)
Caliper bleed valve	6 N·m (0.6 kg-m, 4 ft-lb)
Front caliper bracket bolt	23 N·m (2.3 kg-m, 17 ft-lb)
Anti-dive piston bolt	12 N·m (1.2 kg-m, 9 ft-lb)
Front pad pin plug	2.5 N·m (0.25 kg-m, 1.8 ft-lb)
Front pad pin	18 N·m (1.8 kg-m, 13 ft-lb)
Brake hose bolt	30 N·m (3.0 kg-m, 22 ft-lb)
Rear master cylinder mounting bolt	12 N·m (1.2 kg-m, 9 ft-lb)
Rear caliper retainer bolt	11 N·m (1.1 kg-m, 8 ft-lb)
Rear caliper bolt	23 N·m (2.3 kg-m, 17 ft-lb)
Rear caliper pin bolt	28 N·m (2.8 kg-m, 20 ft-lb)
Metal brake line nut	17 N·m (1.7 kg-m, 12 ft-lb)
Brake pedal bolt	25 N·m (2.5 kg-m, 18 ft-lb)

TOOL

Special

Snap ring pliers	07914–3230001

TROUBLESHOOTING

Brake lever/pedal soft or spongy
- Air bubbles in hydraulic system
- Low fluid level
- Hydraulic system leaking

Brake lever/pedal too hard
- Sticking piston(s)
- Clogged hydraulic system
- Pads glazed or worn excessively

Brake drag
- Hydraulic system sticking
- Sticking piston(s)
- Clogged hydraulic system
- Incorrect rear brake pedal adjustment
- Caliper side slide pin sticking
- Caliper installed incorrectly
- Disc or wheel misaligned

Brakes grab
- Pads contaminated
- Disc or wheel misaligned

Brake chatter or squeal
- Pads contaminated
- Excessive disc runout
- Caliper installed incorrectly
- Disc or wheel misaligned

Rear wheel locks up before front
- Pressure control valve of the rear master cylinder faulty

BRAKE FLUID REPLACEMENT/AIR BLEEDING

CAUTION

- *Do not allow foreign material to enter the system when the diaphragm is removed.*
- *Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.*

BRAKE FLUID REPLACEMENT

● Brake lever system (front/right)

Remove the reservoir cover, set plate, diaphragm and float with the fluid reservoir parallel to the ground.
Draw the brake fluid from the reservoir completely using a commercial syringe.
Fill the reservoir with fresh DOT 4 brake fluid to the upper level mark.

Connect a commercial brake bleeder, such as the Mityvac No. 6860, to the bleed valve.
Open the bleed valve and pump the brake bleeder until new brake fluid appear coming out of the bleed valve and air bubbles do not appear in a plastic hose.

NOTE

- Add fluid when the fluid level in reservoir is low.
- Use only DOT 4 brake fluid from a sealed container.
- If air is entering the bleeder from around the bleed valve, seal the valve with Teflon tape.
- If you don't have a brake bleeder, replace the fluid following the instructions for air bleeding on next page.

CAUTION

- *Do not mix different types of fluid. They are not compatible.*

Tighten the bleed valve.

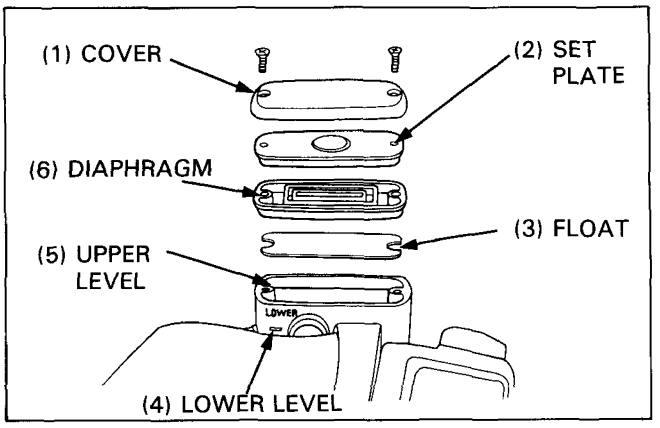
TORQUE: 6 N·m (0.6 kg-m, 4 ft-lb)

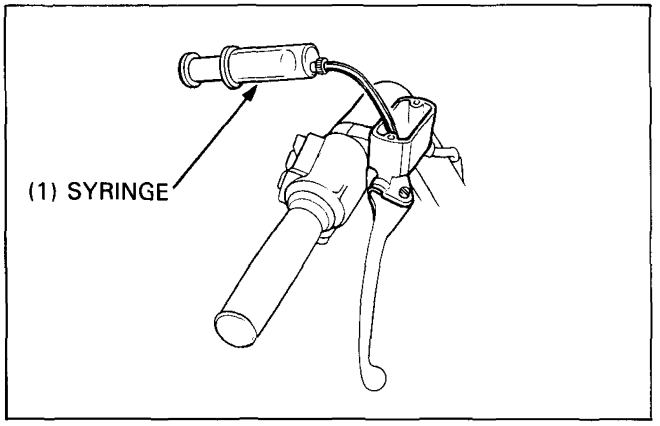
Fill the reservoir with fresh DOT 4 brake fluid to the upper level mark.
Then, bleed the system (next page).

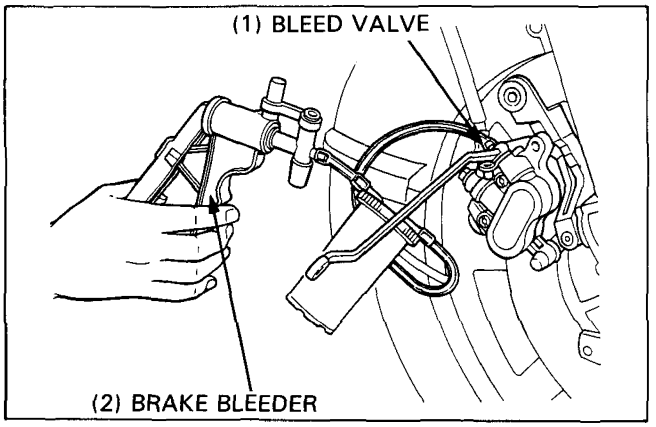
● Brake pedal system (front/left and rear)

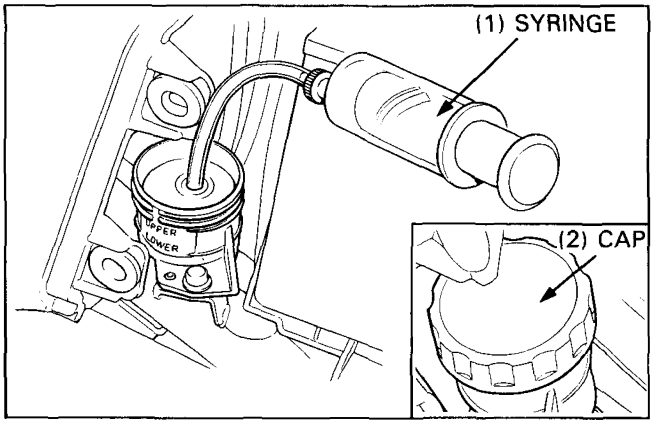
Place the motorcycle on its center stand.
Remove the right rear side cover (page 12-6).
Remove the reservoir cap, set plate and diaphragm.

Draw the brake fluid from the reservoir completely using a commercial syringe.
Fill the reservoir with fresh DOT 4 brake fluid to the upper level mark.





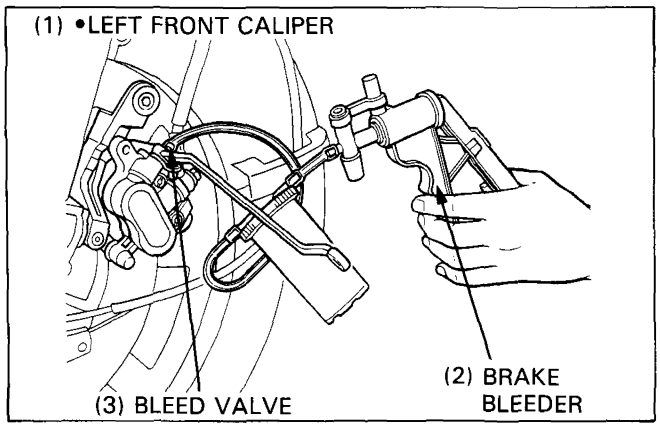




NOTE

- When replacing fluid from the brake pedal system, replace fluid from the left front caliper line first, then the rear caliper.
- See NOTE and CAUTION on previous page.

Remove the left disc cover and saddlebag (page 12-13).
Connect a commercial brake bleeder, such as the Mityvac No. 6860, to the bleed valve.
Open the bleed valve and pump the brake bleeder until new brake fluid appears coming out of the bleed valve and air bubbles do not appear in a plastic hose.

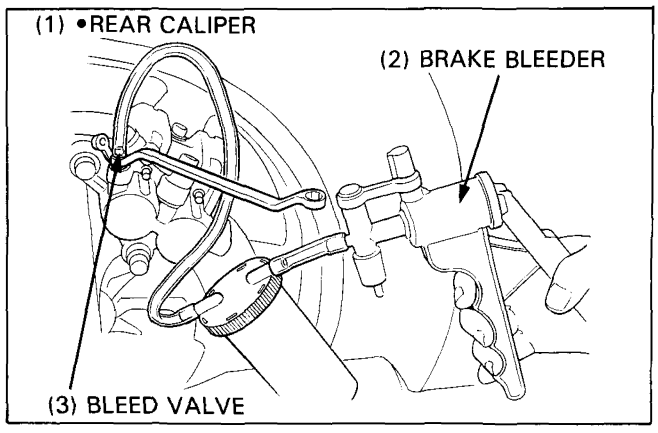


Tighten the bleed valve.

TORQUE: 6 N·m (0.6 kg-m, 4 ft-lb)

Fill the reservoir with fresh DOT 4 brake fluid to the upper level mark.

Then, bleed the system (below).



AIR BLEEDING

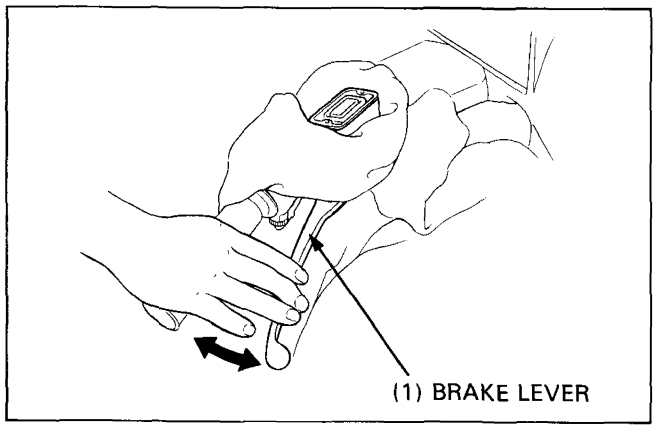
● Brake lever system
Perform the air bleeding as following.

Connect the plastic hose to the bleed valve.

1. Pump up the system pressure with the brake lever until there are not air bubbles in the fluid flowing out of the reservoir small holes. Squeeze the lever, open the bleed valve 1/2 turn and then close the bleed valve.

NOTE

- Do not release the brake lever until the bleed valve has been closed.
- Add fresh DOT 4 fluid when the fluid level in reservoir is low; do not mix different types of fluid.
- If air is entering the bleeder from around the bleed valve, seal the valve with Teflon tape.



2. Release the brake lever slowly and wait several seconds after it reaches the end of its travel.

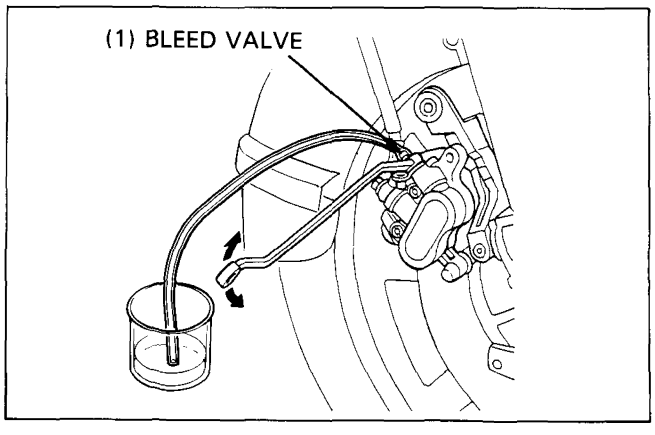
Repeat steps 1 and 2 until air bubbles cease to appear in the fluid coming out of the bleed valve.

Tighten the bleed valve.

TORQUE: 6 N·m (0.6 kg-m, 4 ft-lb)

Fill the fluid reservoir to the upper level mark with fresh DOT 4 brake fluid from a sealed container.

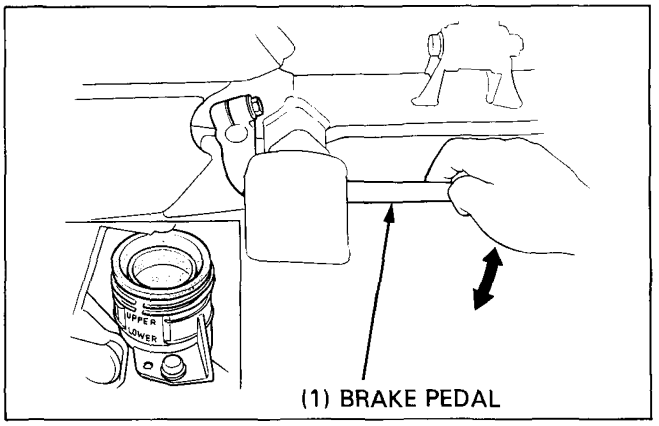
Install the diaphragm, set plate and reservoir cover.



● **Brake pedal system**

NOTE

- When bleeding the brake pedal system, bleed the left front caliper first, then the rear caliper.
- Bleed the brake pedal system using the same procedure used for the brake lever system air bleeding on the previous page.



BRAKE PAD REPLACEMENT

⚠ WARNING

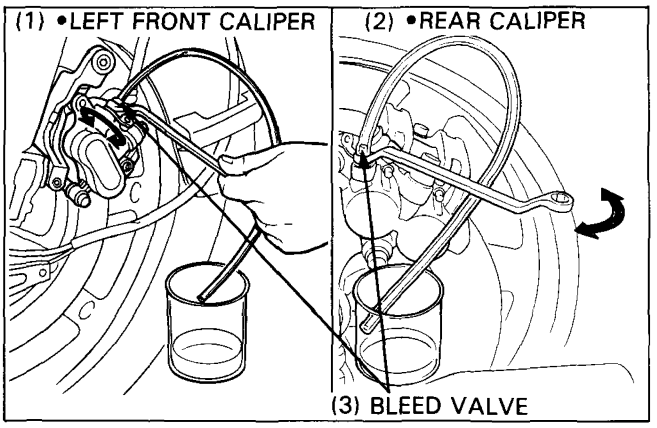
- ***Inhaled asbestos fibers have been fount to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies.***

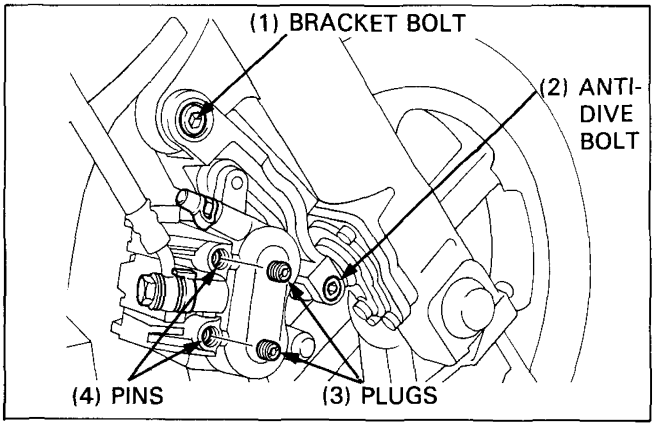
NOTE

- Always replace the brake pads in pairs to assure even disc pressure.
- Do not disturb the brake hose.

FRONT

Remove the disc cover (page 12-13).
Remove the pad pin plugs and loosen the pad pins.
Remove the caliper bracket bolt and anti-dive piston bolt, then remove the caliper.

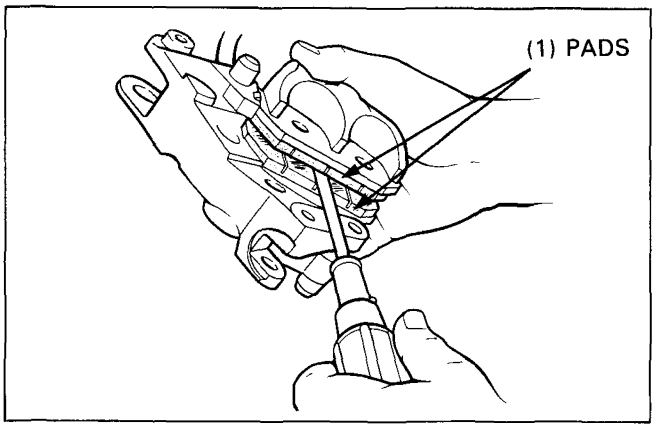




Push the piston all the way in to provide clearance for new brake pads.

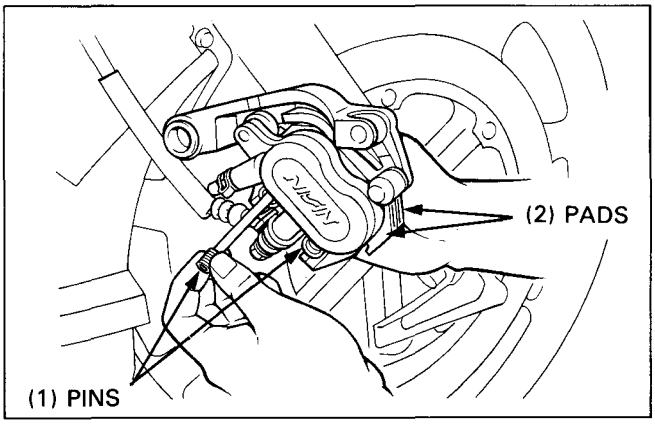
NOTE

- Check the brake fluid level in the reservoir. This operation causes the level to rise.



Pull the pad pins out of the caliper.

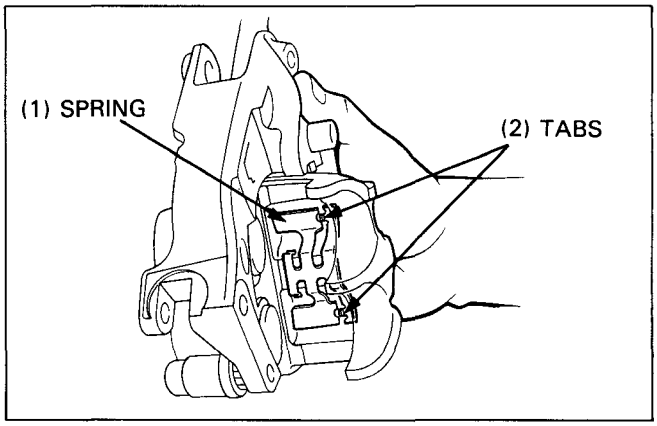
Remove the brake pads.



Position the pad spring in the caliper as shown.

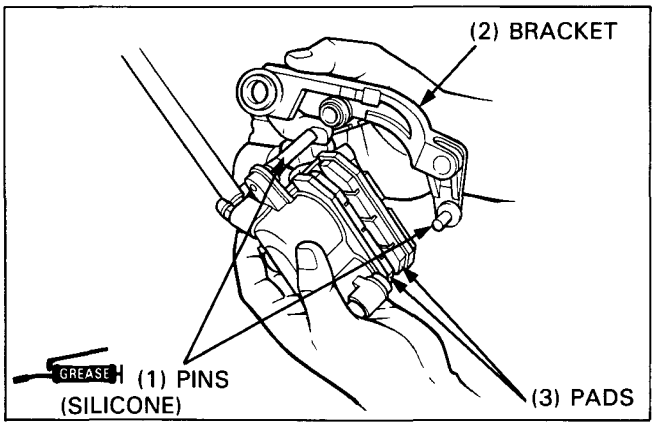
NOTE

- Make sure that tabs of the pad spring face the wheel side.

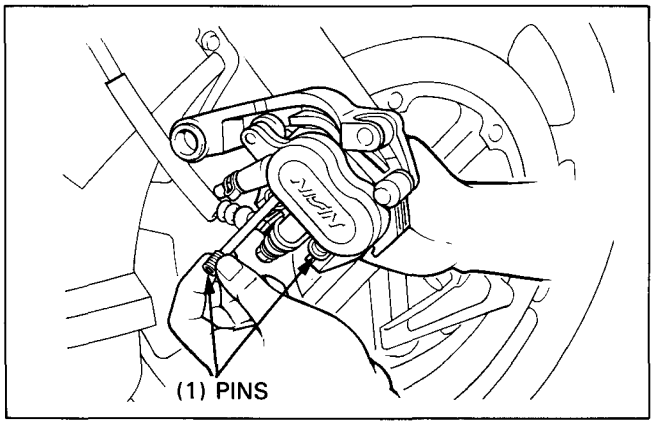


Install the new pads in the caliper.

If you removed the caliper bracket, install it, applying silicone grease with caliper slide pins.



Install one pad pin, then push the pads to compress the pad spring while you install the other pin.



Install the brake caliper, making sure not to damage the pads.
Apply grease to the needle bearing of the anti-dive piston bolt, and install it.
Tighten the caliper bracket bolt and anti-dive piston bolt.

TORQUES:
Caliper bracket bolt: 23 N·m (2.3 kg-m, 17 ft-lb)
Anti-dive piston bolt: 12 N·m (1.2 kg-m, 9 ft-lb)

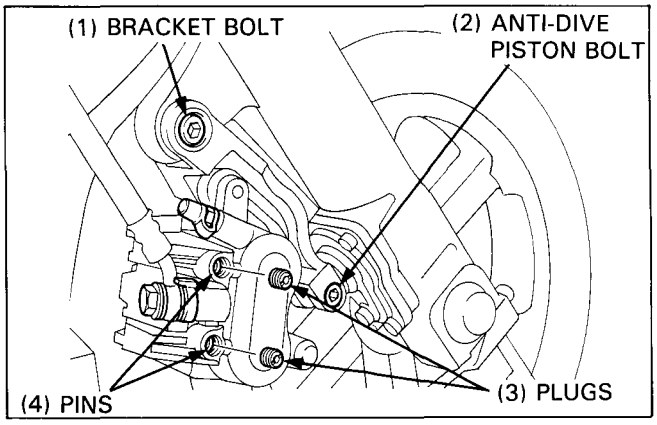
Install the pad pins and pad pin plugs.

TORQUES:
Pad pin: 18 N·m (1.8 kg-m, 13 ft-lb)
Pad pin plug: 2.5 N·m (0.25 kg-m, 1.8 ft-lb)

NOTE

- Operate brake lever to seat the caliper pistons against the pads.

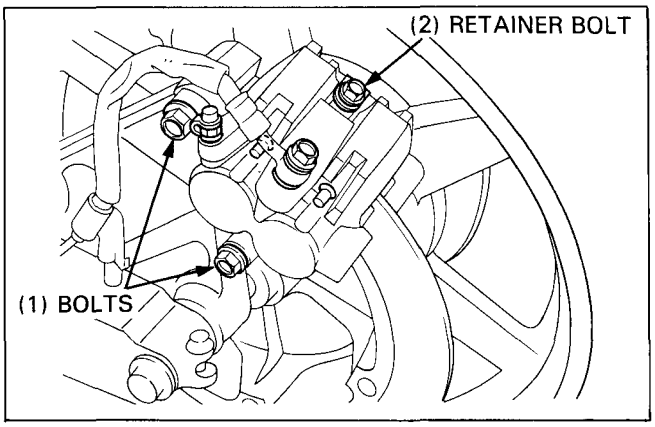
Install the disc covers (page 12-13).



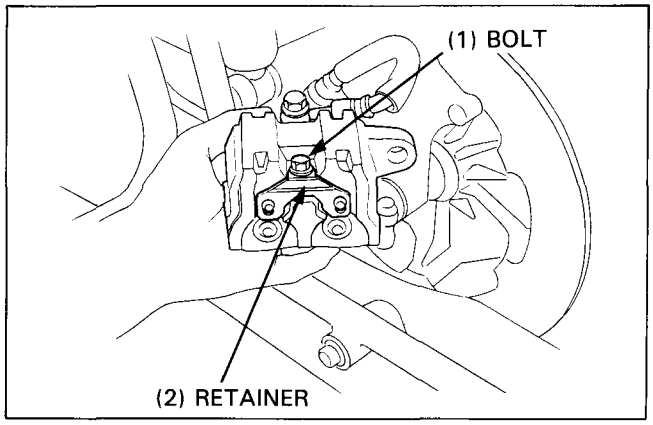
REAR

Remove the left saddlebag (page 12-13).

Loosen the pad pin retainer bolt.
Remove the caliper bolt and pin bolt.



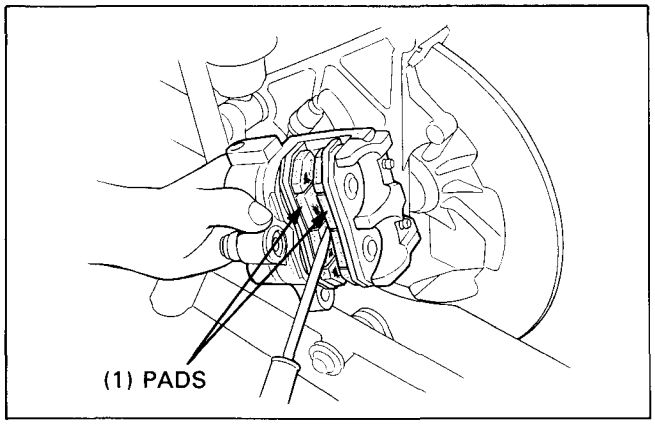
Remove the pad pin retainer bolt and retainer.



Push the piston all the way in to provide clearance for new brake pads.

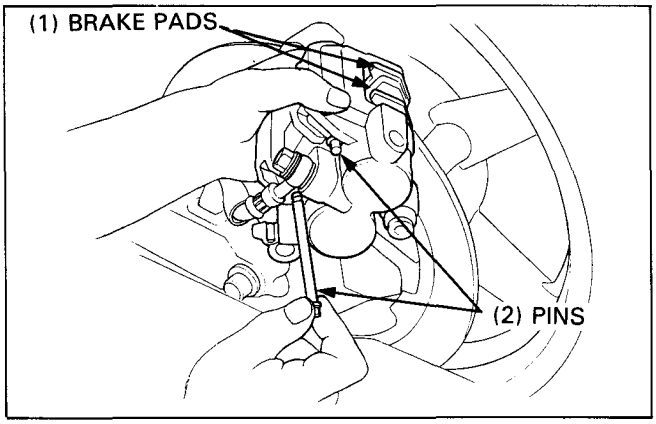
NOTE

- Check the brake fluid level in the reservoir. This operation causes the level to rise.



Pull the pad pins out of the caliper.

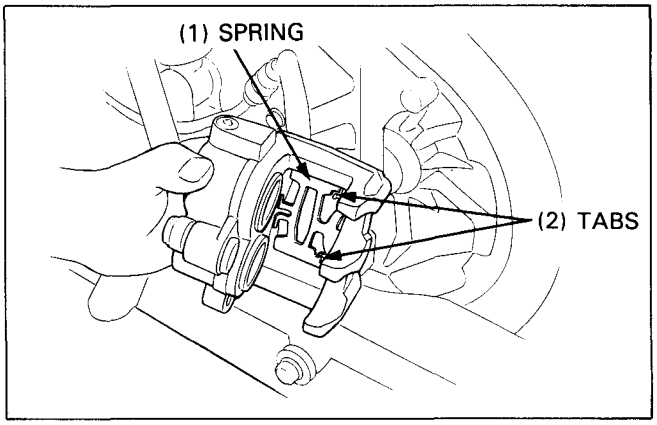
Remove the brake pads.



Position the pad spring in the caliper as shown.

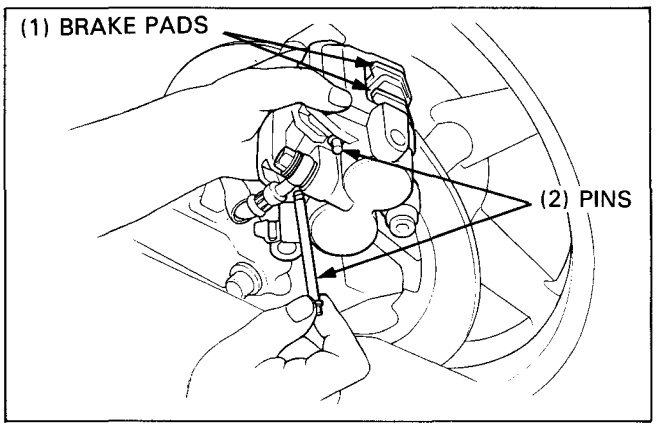
NOTE

- Make sure that tabs of the pad spring face the wheel side.



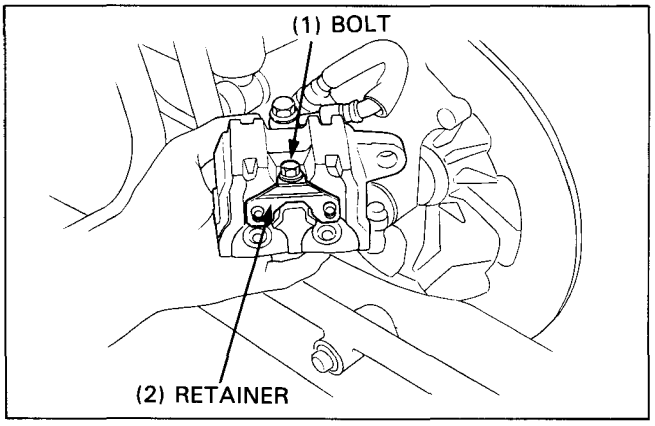
Install the new pads in the caliper.

Install one pad pin, then push the pads to compress the pad spring while you install the other pin.

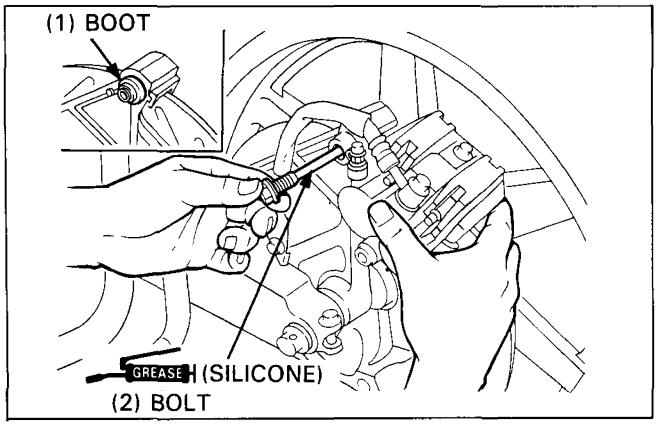


Place the pad pin retainer over the pad pins. Push the retainer down to secure the pins.

Install the pad pin retainer bolt, but do not tighten yet.



Align the caliper pin bolt hole with caliper bracket boot. Apply silicone grease to the caliper pin bolt, and insert the caliper pin bolt into the hole.

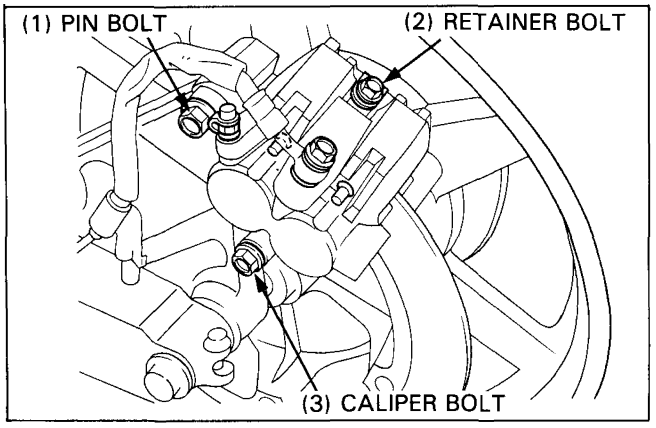


Tighten the caliper bolt, pin bolt and retainer bolt.

TORQUES:
Caliper bolt: 23 N·m (2.3 kg-m, 17 ft-lb)
Pin bolt: 28 N·m (2.8 kg-m, 20 ft-lb)
Retainer bolt: 11 N·m (1.1 kg-m, 8 ft-lb)

NOTE

- Operate brake pedal to seat the caliper pistons against the pads.

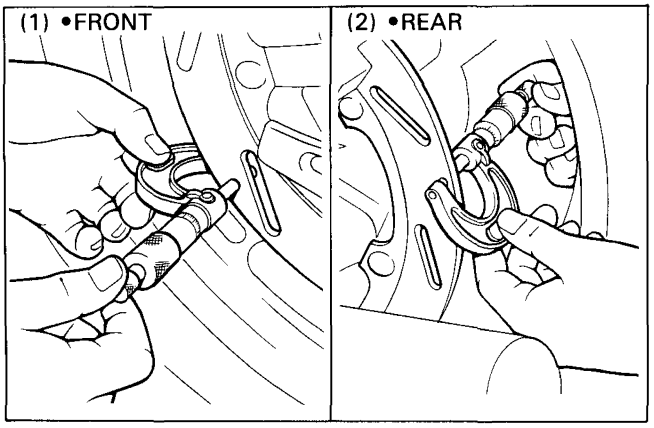


Install the right saddlebag (page 12-13).

BRAKE DISC INSPECTION

Measure the thickness of each brake disc.

SERVICE LIMITS:
Front: 5.0 mm (0.20 in)
Rear: 6.0 mm (0.24 in)

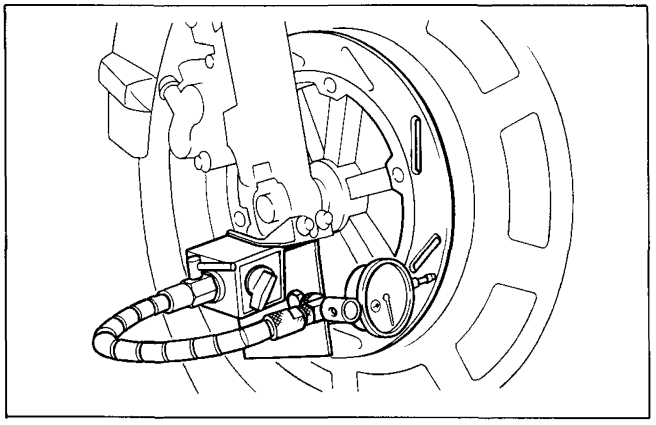


Measure the brake disc for warpage as shown.

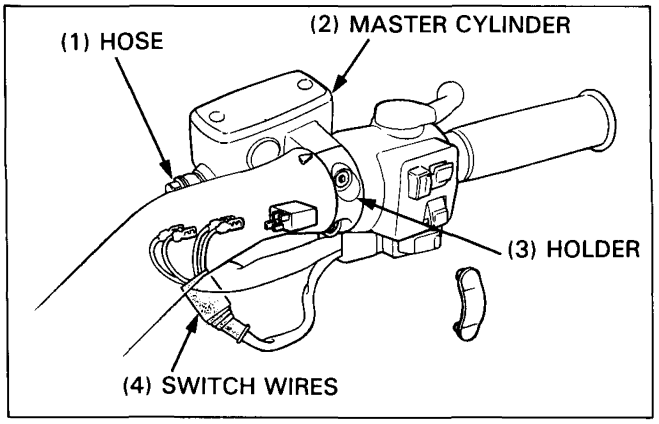
SERVICE LIMITS (Front/Rear): 0.3 mm (0.01 in)

NOTE

- When inspecting the front brake disc, set a suitable plate onto the disc cover holder and install a flexible dial gauge.



FRONT MASTER CYLINDER



REMOVAL

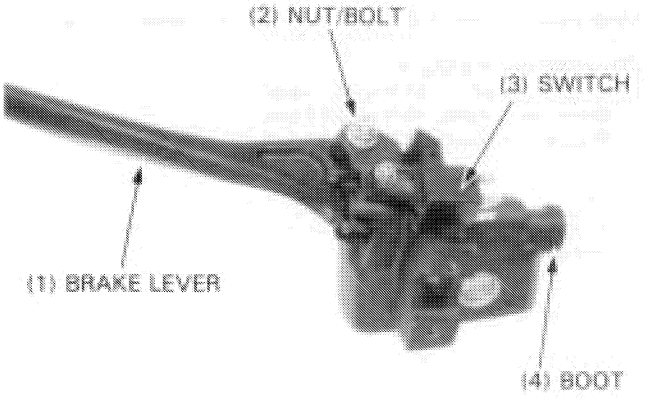
CAUTION

- *Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.*
- *When removing the brake hose, cover the end of the hose to prevent contamination. Secure the hose to prevent fluid from leaking out.*

Draw all the brake fluid from the reservoir completely using a commercial syringe (page 16-4).

Remove the following:
– brake light light switch and cruise cancel switch wires.
– brake hose.
– master cylinder holder and master cylinder.

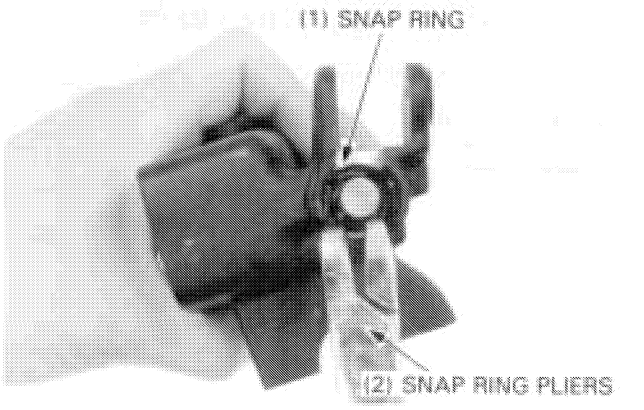
– brake lever.
– switch.
– piston boot.



DISASSEMBLY

Remove the snap ring from the master cylinder body.

TOOL:
Snap ring pliers **07914–3230001**

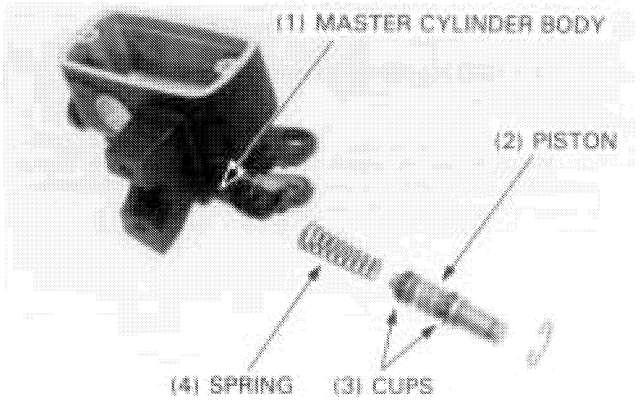


Remove the master cylinder piston, piston cups and spring.

Clean the inside of the master cylinder and master piston with clean DOT 4 brake fluid.

NOTE

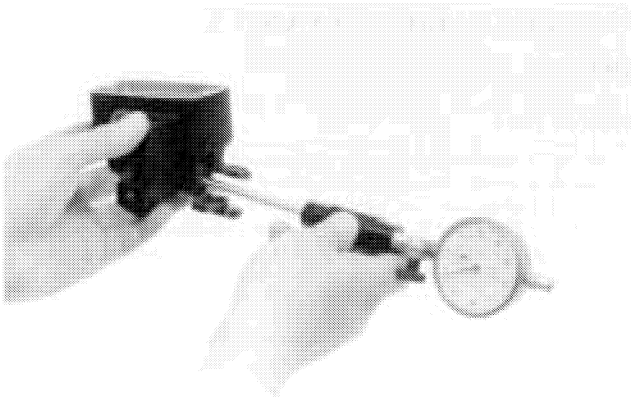
- Clean the disassembled parts with brake fluid and make sure air can pass the master cylinder port by using compressed air.



INSPECTION

Check the master cylinder for scores, scratches or nicks.
Measure the master cylinder I.D.

SERVICE LIMIT: 12.755 mm (0.5022 in)

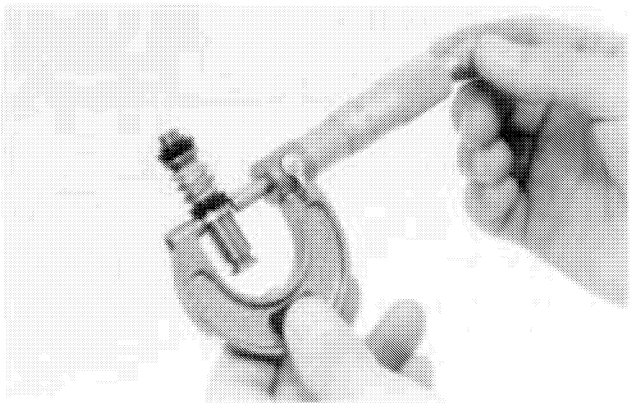


Check the piston for scores, scratches, nicks or other damage.

Measure the master cylinder piston O.D.

SERVICE LIMIT: 12.645 mm (0.4978 in)

Check the rubber piston cups for damage or deterioration. Install new parts if worn or damaged.



ASSEMBLY

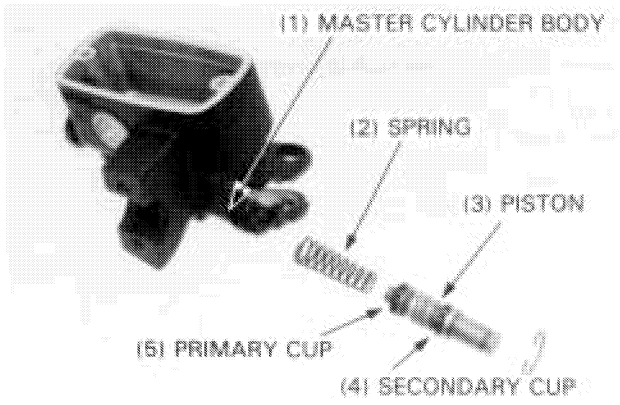
NOTE

- The master cylinder piston, cups and spring must be installed as a set.

Coat the all parts with clean DOT 4 brake fluid before assembly.
Install the following:
— spring and piston.

NOTE

- Install the spring with its small coil end toward the cup.

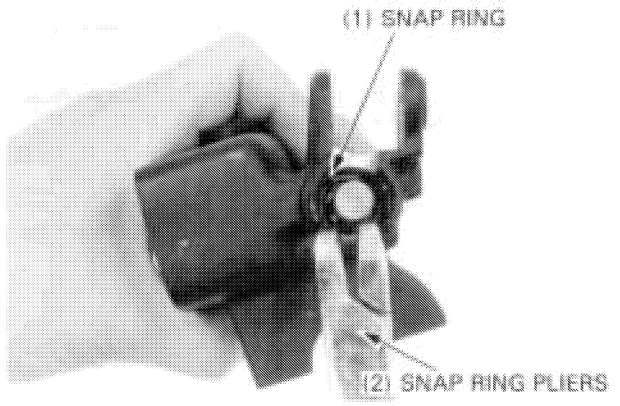


CAUTION

- *When installing the cups, do not allow the lips to turn inside out.*

Install the snap ring to the master cylinder body.

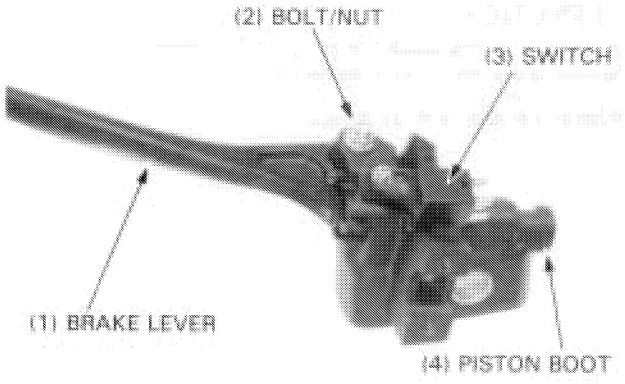
TOOL:
Snap ring pliers **07914—3230001**



CAUTION

- *Be certain the snap ring is firmly seated in the groove.*

Install the piston boot.
Apply grease to the brake lever pivot.
Install the switch.
Install the brake lever by its pivot bolt and nut.



INSTALLATION

Place the brake master cylinder on the handlebar and install the holder.

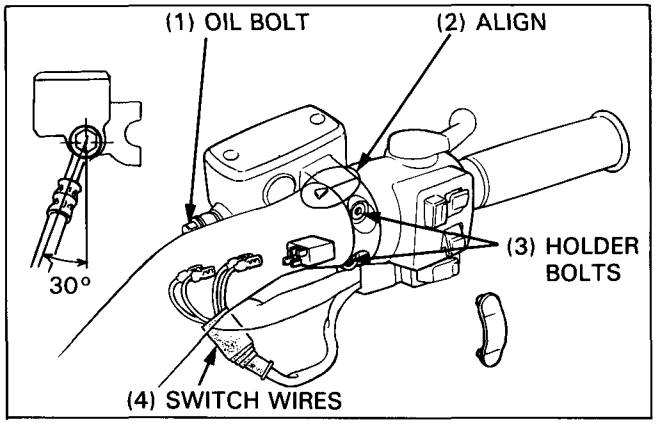
Align the edge of the master cylinder holder with the index mark on the right handlebar cover, and tighten the upper bolt first, then tighten the lower bolt.

TORQUE: 12 N·m (1.2 kg-m, 9 ft-lb)

Install the brake hose on the master cylinder with the oil bolt and two new sealing washers.

NOTE

- Position the hose as shown.



Tighten the oil bolt.

TORQUE: 30 N·m (3.0 kg-m, 22 ft-lb)

Connect the switch wires to the switch.

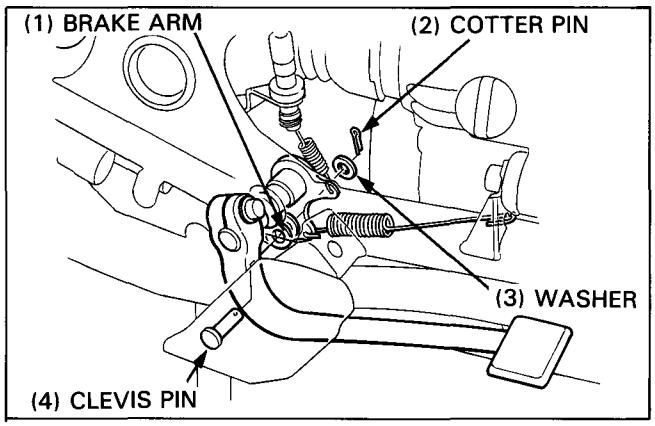
Fill and bleed the brake lever hydraulic system (page 16-5).

REAR MASTER CYLINDER

REMOVAL

Remove the following:
— left exhaust pipe, mufflers and exhaust chamber (page 12-15).
— right heat protectors (page 12-17).
— battery and battery holder (page 17-5).

Remove the cotter pin, washer and clevis pin, then disconnect the brake rod clevis from the brake arm.



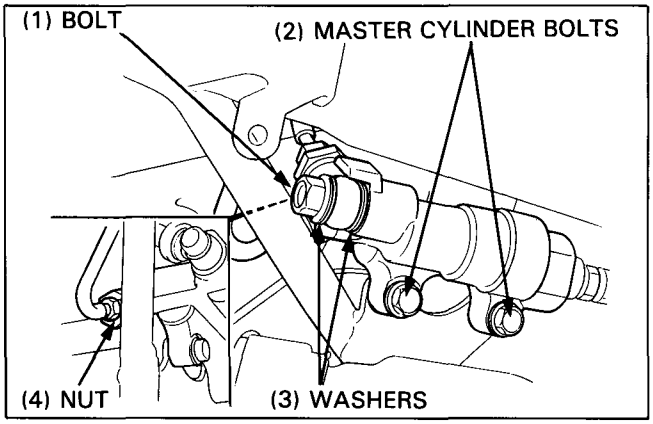
Disconnect the 2P-RED connector of the connector holder behind the ignition control unit.

Place a drip pan under the brake line.
Disconnect the metal brake line for the rear caliper by removing bolt and sealing washers.
Disconnect the metal brake line for the front caliper by loosening the nut.

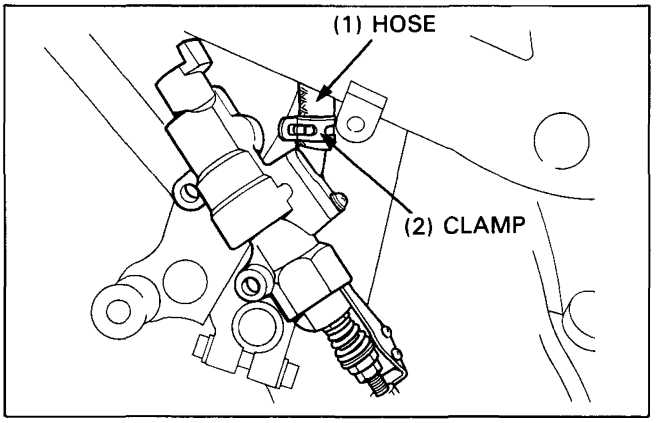
CAUTION

- *Avoid spilling brake fluid on painted surface.*

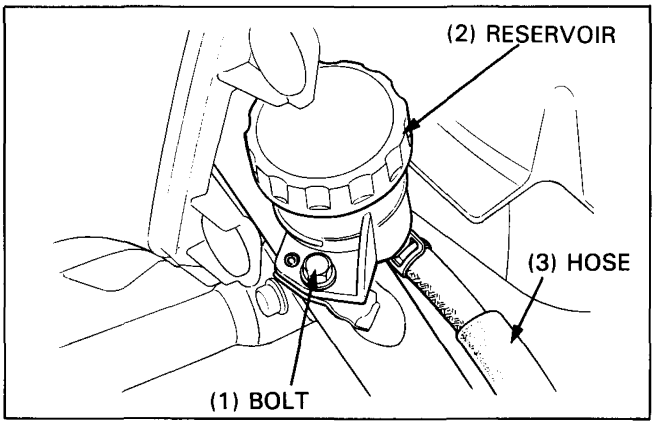
Remove the master cylinder by removing two bolts.



Disconnect the reservoir hose from the rear master cylinder by removing the clamp.



Remove the reservoir bolt and reservoir with the hose upward.

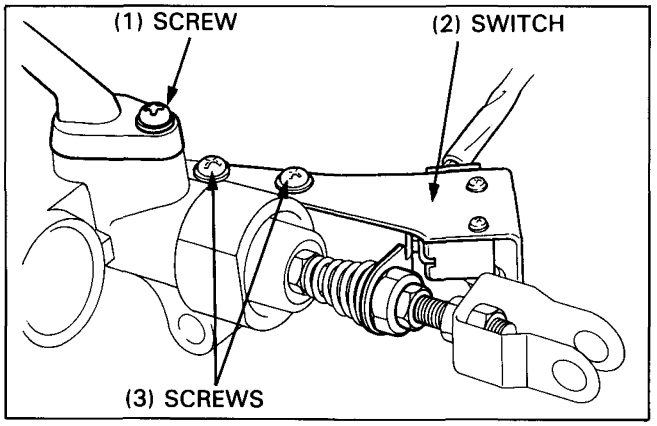


DISASSEMBLY

CAUTION

- *A pressure control valve is incorporated in the rear brake master cylinder. When filling the master cylinder, use extreme care to keep foreign matter out, or the performance of the control valve will be affected.*
- *The pressure control valve cannot be disassembled. Do not attempt to disassemble it.*

Remove the rear brake cruise cancel switch from the rear master cylinder by removing two screws.
Remove the reservoir hose joint by removing screw.



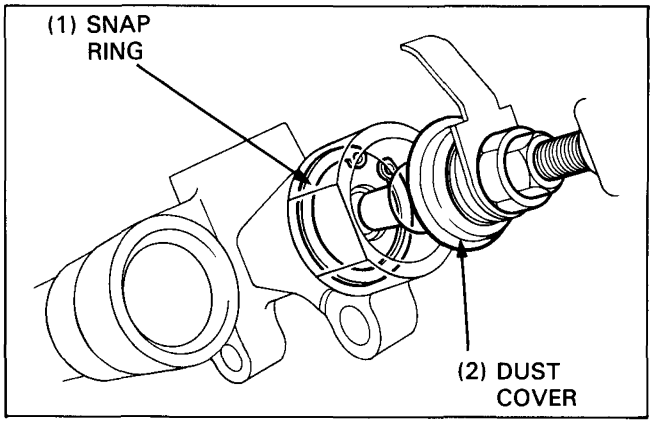
Move the dust cover from the master cylinder and remove the snap ring and pull the rod out of the master cylinder.

TOOL:
Snap ring pliers **07914—3230001**

⚠WARNING

- ***The push rod may pop out when removing the snap ring.***

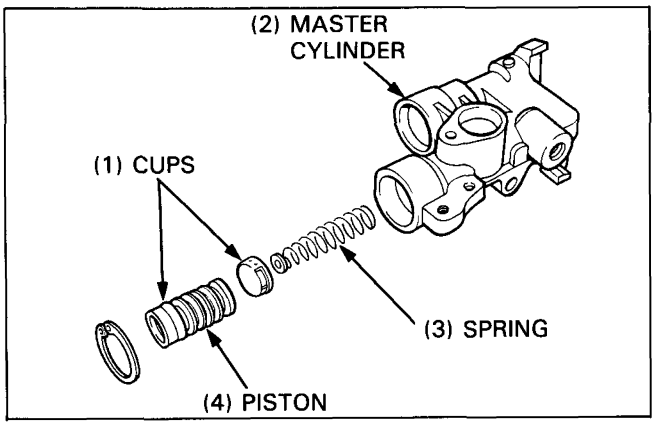
Check to be sure the push rod is not bent or damaged.



Remove the piston, piston cups and spring from the master cylinder.
Clean the inside of the master cylinder and piston with clean DOT 4 brake fluid.

NOTE

- Clean the disassembled parts with brake fluid and make sure air passes through the master cylinder port by using compressed air.

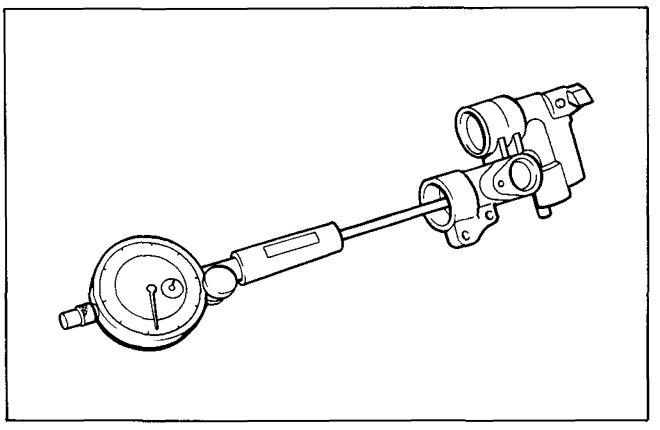


INSPECTION

Check the master cylinder for scores, scratches or nicks.

Measure the master cylinder I.D.

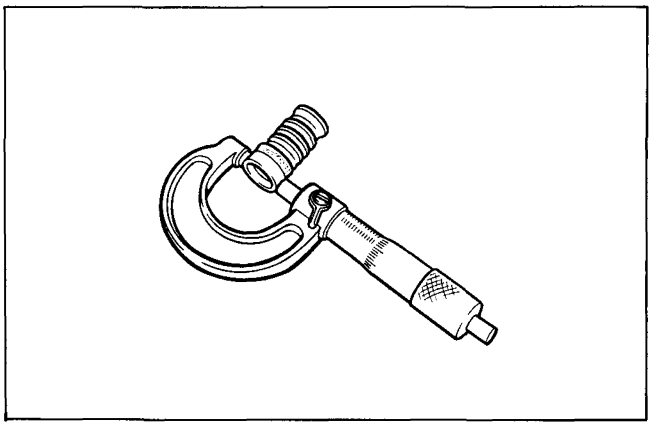
SERVICE LIMIT: 15.925 mm (0.6270 in)



Check the primary and secondary cups for damage or deterioration. If worn or damaged, install new parts.

Measure the master piston O.D. as shown.

SERVICE LIMIT: 15.815 mm (0.6226 in)



ASSEMBLY

Coat the all parts with clean DOT 4 brake fluid before assembly.

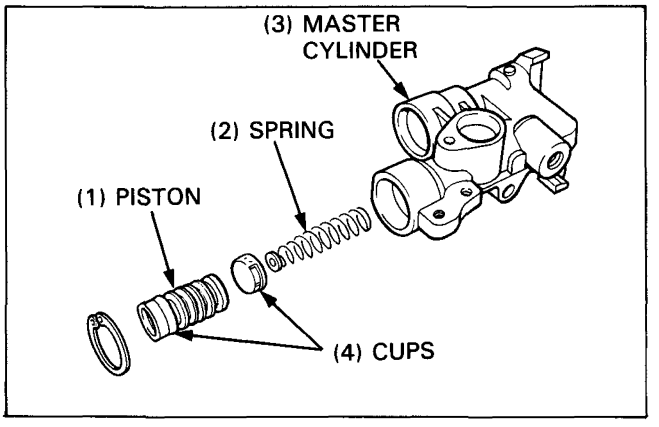
CAUTION

- *When installing the cups, do not allow the lips to turn inside out.*

Install the spring, primary cup and piston together, with its small coil end towards the piston.

NOTE

- The master cylinder piston, cups and spring must be installed as a set.



Apply grease to push rod.

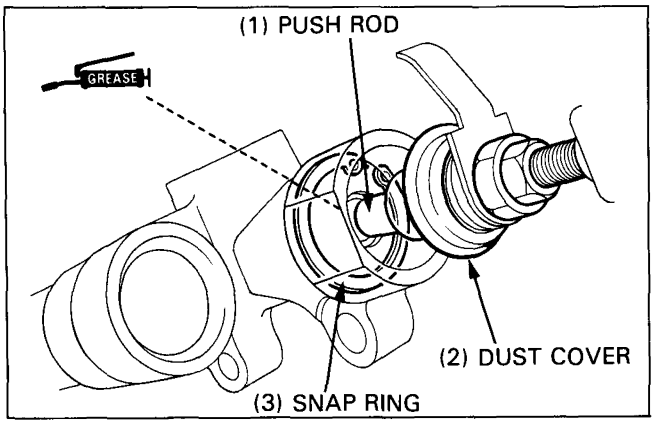
Install the push rod in to the master cylinder.
Install the snap ring.

TOOL:
Snap ring pliers **07914–3230001**

CAUTION

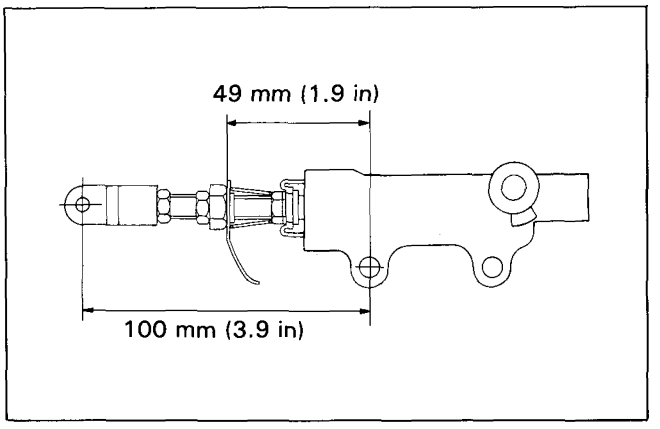
- *Be certain the snap ring is seated firmly in the groove.*

Install the dust cover.



Adjust the installed length of the cruise cancel switch plate and brake rod clevis as shown.

STANDARD INSTALLED LENGTH:
Brake rod clevis: 100 mm (3.9 in)
Cancel switch plate: 49 mm (1.9 in)

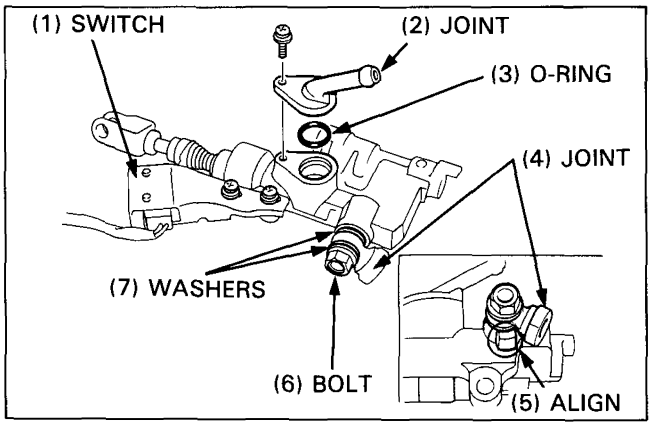


Check the O-ring for fatigue.
Install the O-ring and reservoir joint with screw.

Install the rear brake cruise cancel switch to the rear master cylinder with two screws.

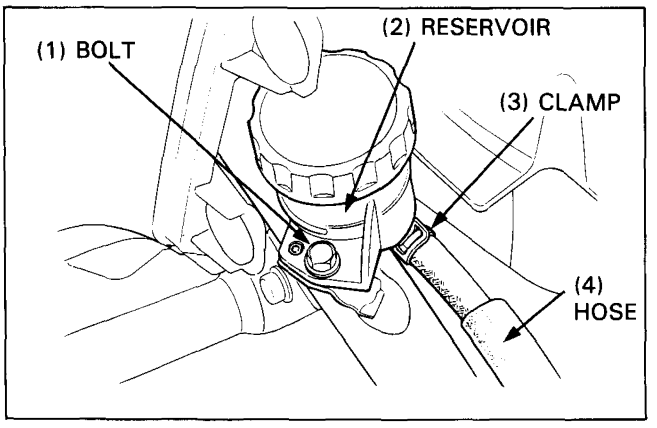
If the joint of the metal brake line for the front caliper was removed, install the joint with its bolt and new washers, aligning the joint with the tab of the master cylinder.
Tighten the bolt to specified torque.

TORQUE: 30 N·m (3.0 kg-m, 22 ft-lb)

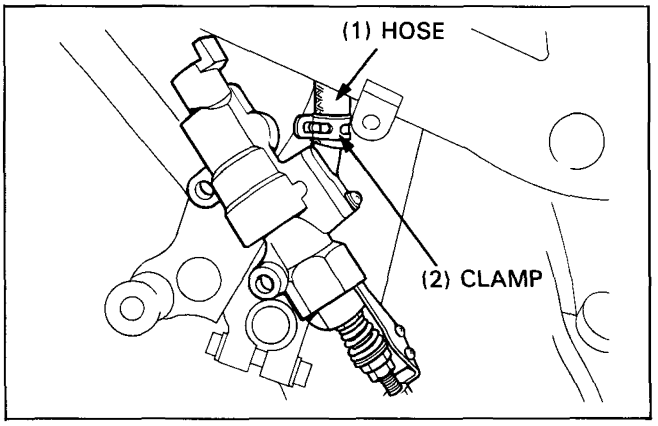


INSTALLATION

Connect the reservoir hose with clamp, and install the reservoir with bolt.



Connect the reservoir hose to master cylinder joint with clamp.



Connect the metal brake line for the front caliper at the rear master cylinder with nut.
Tighten the nut to specified torque.

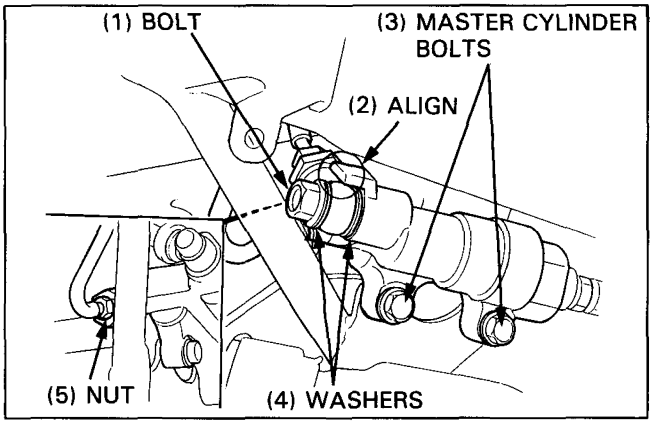
TORQUE: 17 N·m (1.7 kg-m, 12 ft-lb)

Connect the metal brake line for the rear caliper at the control valve with new sealing washers and bolt.
Tighten the bolt to specified torque.

TORQUE: 30 N·m (3.0 kg-m, 22 ft-lb)

NOTE

- Align the joint with the control valve tab.



Install the master cylinder with two bolts.

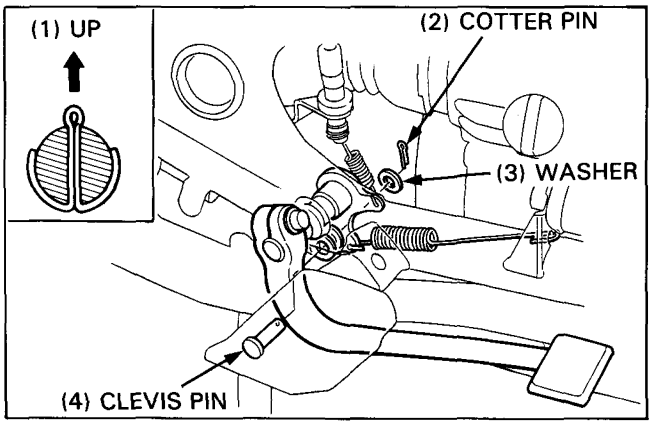
TORQUE: 12 N·m (1.2 kg-m, 9 ft-lb)

Connect the brake rod clevis to the brake arm with clevis pin.
Install the washer and new cotter pin.
Bend the cotter pin as shown.

Connect the 2P-RED connector of the connector holder behind the ignitioin control unit.

Install the following:
— battery and battery holder (page 17-6).
— heat protector (page 12-17).
— exhaust chamber (page 12-18).

Fill and bleed the brake pedal hydraulic system (page 16-6).



FRONT BRAKE CALIPER

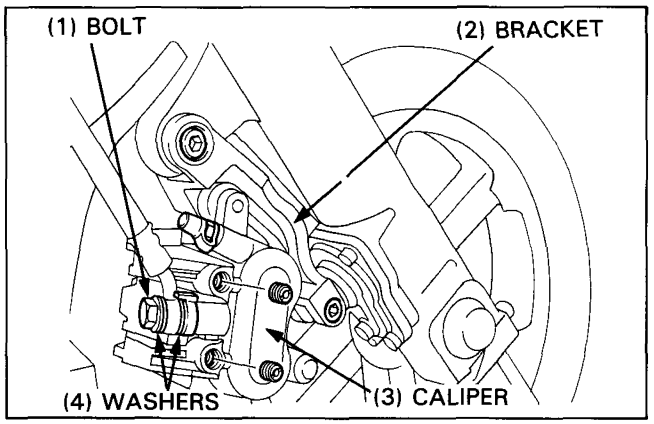
REMOVAL

Place a clean container under the caliper and disconnect the brake hose from the caliper.

CAUTION

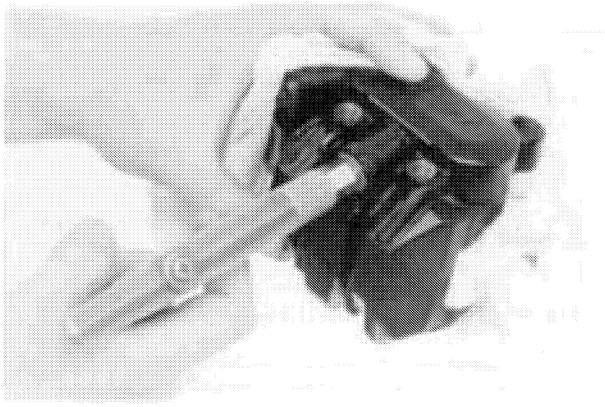
- *Avoid spilling brake fluid on painted surfaces.*

Remove the caliper, brake pads, caliper braket and pad spring (page 16-6).



DISASSEMBLY

Position the caliper with the pistons down and apply short bursts of air pressure to the fluid inlet.

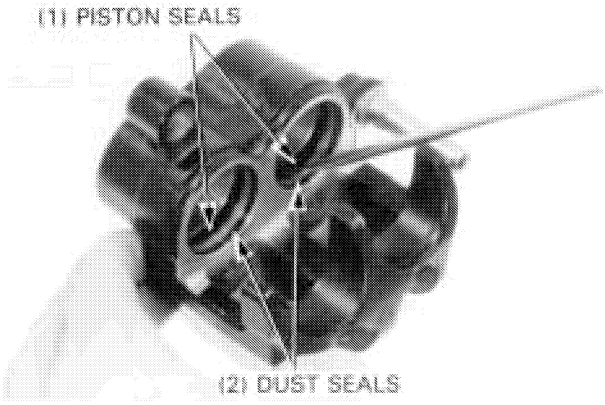


⚠ WARNING

- ***Do not use high pressure air or bring the nozzle too close to the inlet.***
- ***Place a shop towel over the pistons to prevent them from flying out.***

Examine the pistons and cylinders for scoring, scratches or other damage and replace if necessary.

Push the piston and dust seals in, lift them out and discard them.



CAUTION

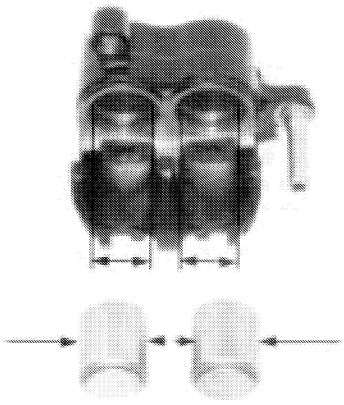
- *Be careful not to damage the piston sliding surfaces when removing the seals.*

Clean the caliper cylinders, seal grooves and caliper pistons with clean DOT 4 brake fluid.

INSPECTION

Measure the piston diameter with a micrometer.

SERVICE LIMITS:
Left: 25.310 mm (0.9965 in)
Right: 30.140 mm (1.1866 in)



Measure the caliper cylinder bore.

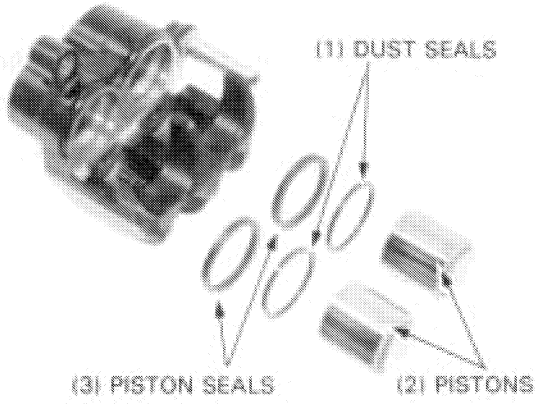
SERVICE LIMITS:
Left: 25.460 mm (1.0024 in)
Right: 30.290 mm (1.1925 in)

ASSEMBLY

NOTE

- If the piston boots are hardened or deteriorated, install new ones.
- Install new piston and dust seals every time they are removed. Coat the seals with DOT 4 brake fluid before assembly.

Install new seals.
Install the pistons with the insulated ends toward the pads.



Install the boots.
Apply silicone grease to the caliper pin and caliper bracket pin.

Install the caliper bracket, pad spring, pads and pad pins (page 16-7).

CAUTION

- *Be careful not to damage the pads.*

INSTALLATION

Install the caliper bracket on the fork leg.

Tighten the caliper bracket bolt and anti-dive piston bolt.

TORQUE:
Caliper bracket bolt: 23 N·m (2.3 kg-m, 17 ft-lb)
Anti-dive piston bolt: 12 N·m (1.2 kg-m, 9 ft-lb)

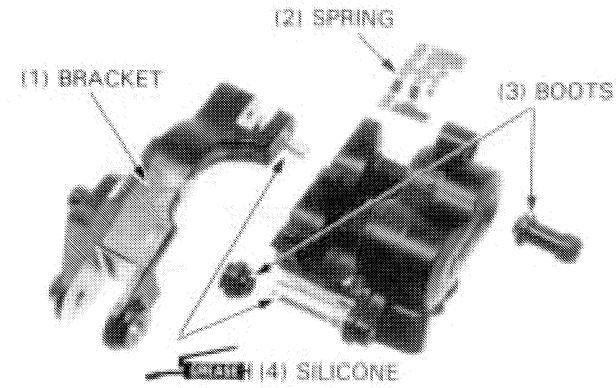
Connect the brake hose to the caliper with new sealing washers and the hose bolt, aligning the joint with the caliper tab.
Tighten the hose bolt.

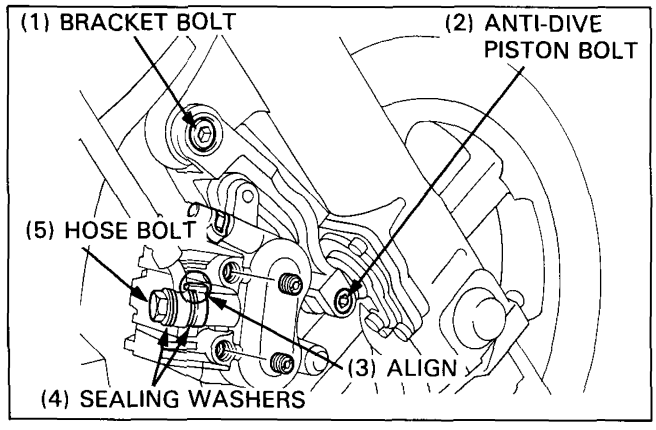
TORQUE: 30 N·m (3.0 kg-m, 22 ft-lb)

NOTE

- Align the hose joint with the caliper boss.

Fill and bleed the hydraulic system (page 16-4).





REAR BRAKE CALIPER

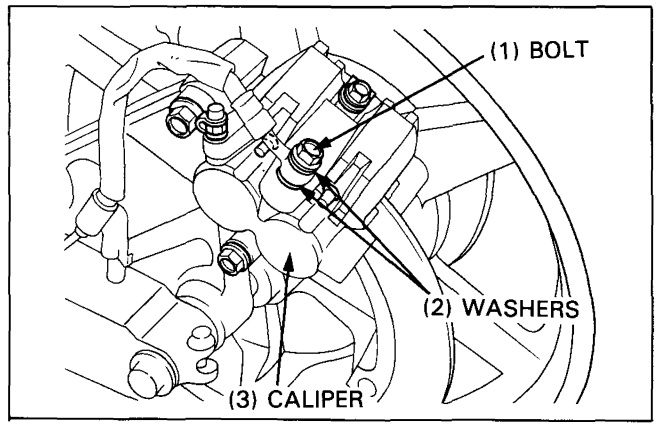
REMOVAL

Place a clean container under the caliper and disconnect the brake hose from the caliper.

CAUTION

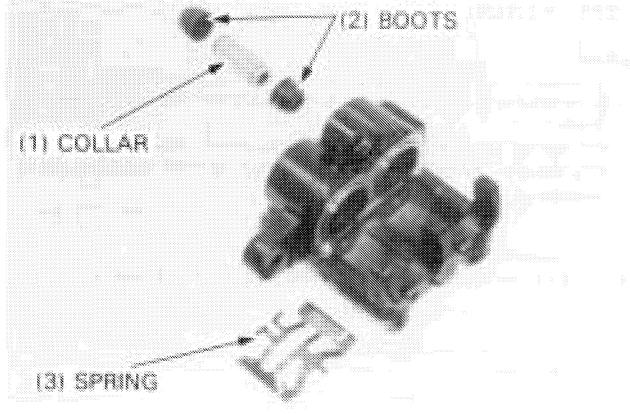
- *Avoid spilling brake fluid on painted surfaces.*

Remove caliper and pads (page 16-8).

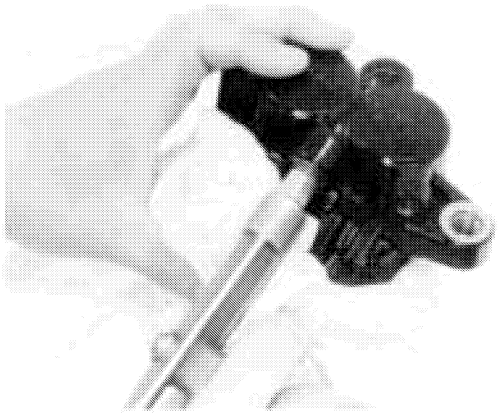


DISASSEMBLY

Remove the pad spring, boots and pivot collar from the rear brake caliper.
If the boots are hardened or deteriorated, replace them.



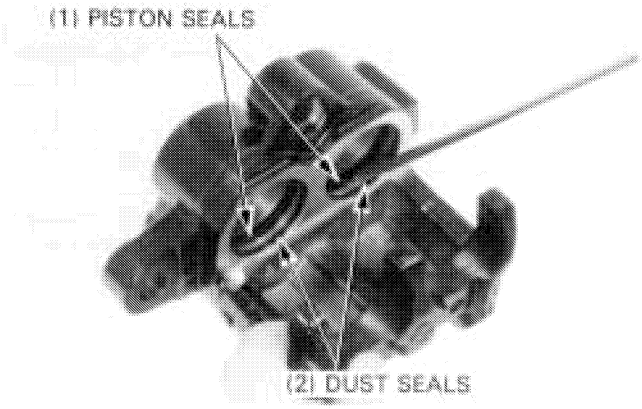
Position the caliper with the pistons down and apply short bursts of air pressure to the fluid inlet.



⚠WARNING

- ***Do not use high pressure air or bring the nozzle too close to the inlet.***
- ***Place a shop towel over the pistons to prevent them from flying out.***

Push the dust and piston seals in, lift them out and discard them.

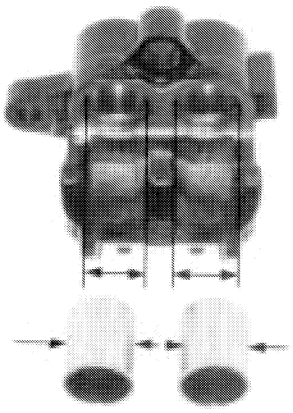


CAUTION

- *Be careful not to damage the piston sliding surfaces when removing the seals.*

Clean the caliper cylinders, seal grooves and caliper pistons with clean DOT 4 brake fluid.

INSPECTION



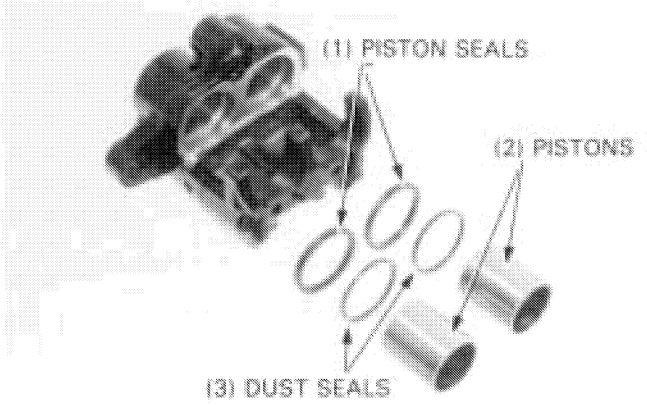
Check the caliper cylinder for scratches, scoring or other damage.
Measure the caliper cylinder bore.

SERVICE LIMIT: 32.090 mm (1.2634 in)

Check the pistons for scoring, scratches or other damage.
Measure the piston O.D..

SERVICE LIMIT: 31.940 mm (1.2575 in)

ASSEMBLY



NOTE

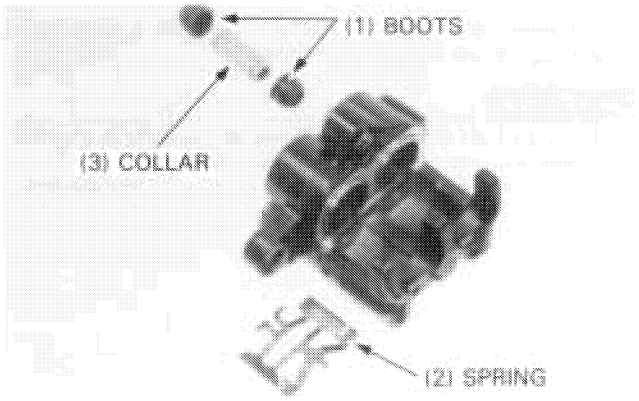
- If the piston boots are hardened or deteriorated, install new ones.
- Install new piston and dust seals every time they are removed. Coat the seals with DOT 4 brake fluid before assembly.

Install new seals.
Install the pistons with the opened ends toward the pads.

Apply silicone grease to the pivot collar and the insides of the boots and install them into the caliper.

CAUTION

- *Make sure that boots are seated in the caliper grooves.*



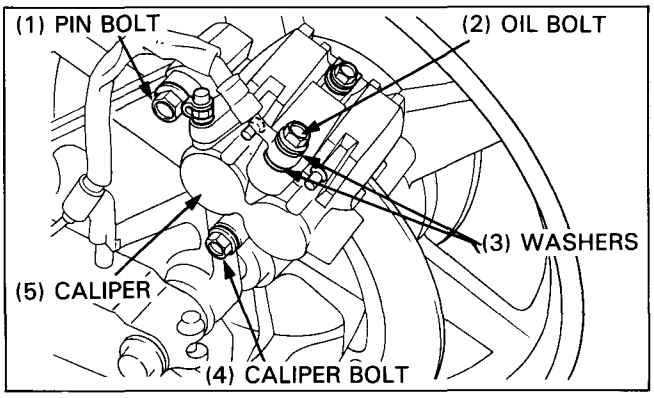
Install the pad spring, pads and pad pin (page 16-9).

CAUTION

- *Be careful not to damage brake pads.*

INSTALLATION

Install the caliper on the caliper bracket.
Apply silicone grease to the caliper pin bolt.
Install and tighten the caliper pin bolt and caliper bolt.
TORQUES:
Caliper bolt: 23 N·m (2.3 kg-m, 17 ft-lb)
Pin bolt: 28 N·m (2.8 kg-m, 20 ft-lb)



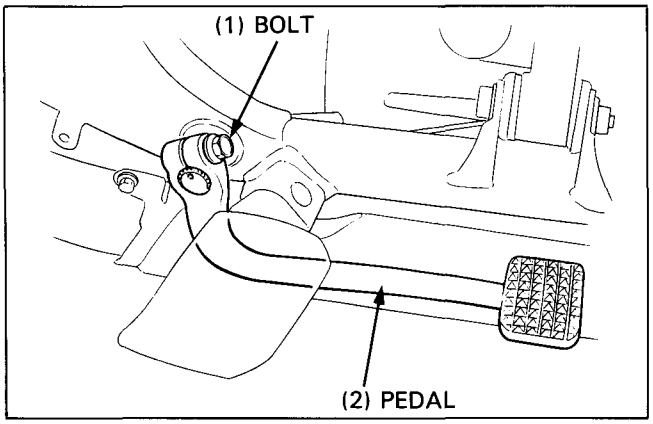
Install the pad pin retainer and tighten the bolt.
TORQUE: 11 N·m (1.1 kg-m, 8 ft-lb)

Install the brake hose with the bolt and new sealing washers.
Tighten the hose bolt.
TORQUE: 30 N·m (3.0 kg-m, 22 ft-lb)

NOTE

- Align the hose joint with the caliper boss.

Fill and bleed the brake pedal system (page 16-4).



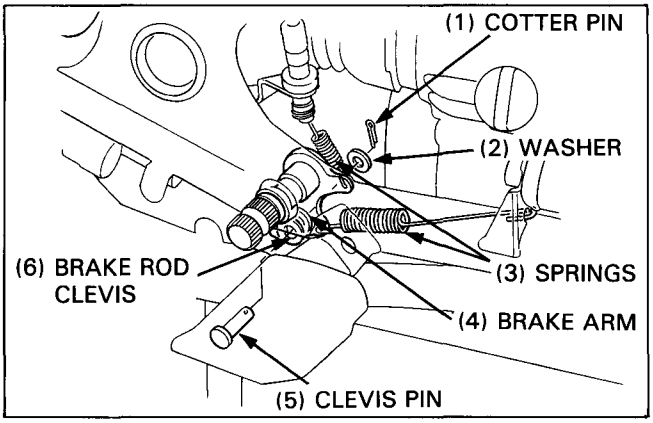
BRAKE PEDAL

REMOVAL

Remove the right exhaust pipe protector (page 12-16).
Remove the brake pedal bolt and brake pedal.

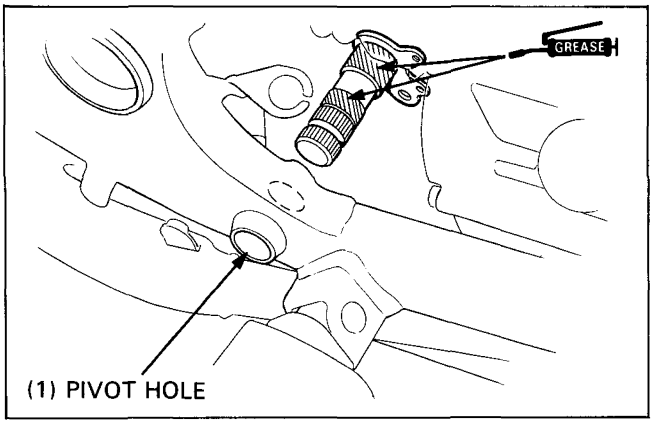
Remove the cotter pin, washer and clevis pin.
Disconnect the brake rod clevis from the brake arm.
Remove the rear brake light switch spring and brake pedal return spring.

Remove the brake arm.



INSTALLATION

Apply grease to the brake pedal shaft and install it to the pivot hole.

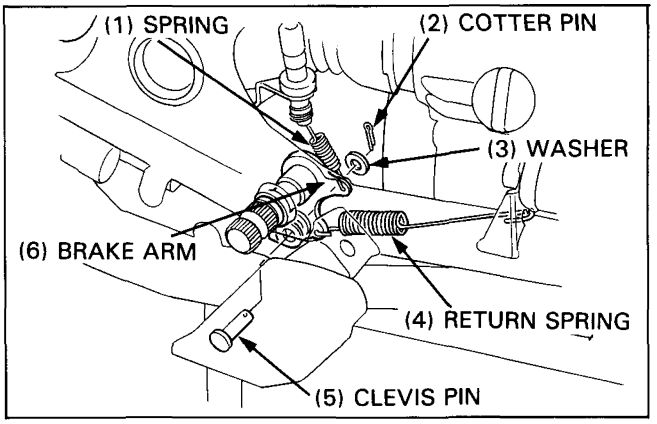


Install the brake pedal return spring and rear brake light switch spring to the brake arm.
Connect the brake rod clevis to the brake arm with the clevis pin.
Install the washer and new cotter pin to the clevis pin.

NOTE

- Bend the cotter pin as shown.

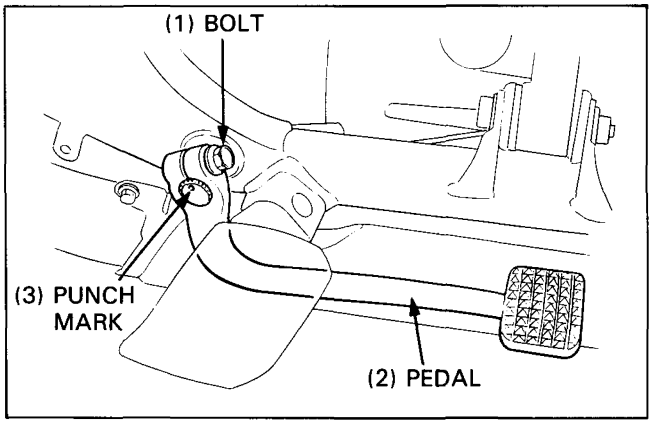
(7) UP



Install the brake pedal, aligning the punch mark as shown.
Tighten the brake pedal bolt.

TORQUE: 25 N·m (2,5 kg-m, 18 ft-lb)

Check the brake pedal height (page 3-14).



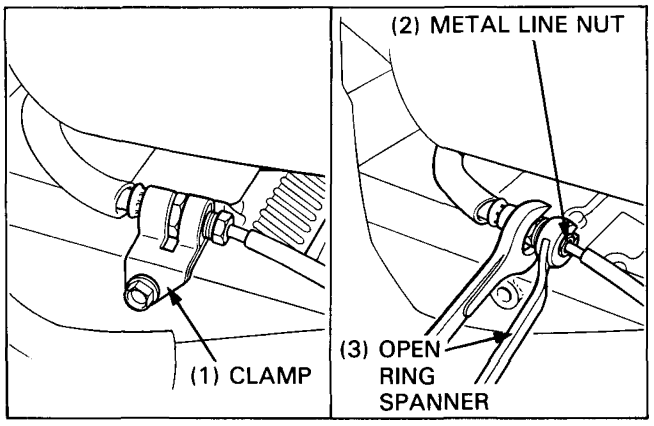
METAL BRAKE LINE

REMOVAL

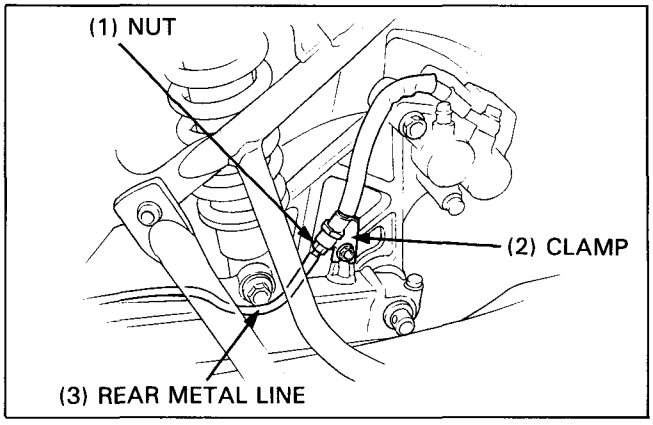
Drain the brake fluid from hydraulic system (page 16-4).

Remove the following:
— battery and battery holder (page 17-5).
— left rear side cover (page 12-6).
— left saddlebag (page 12-13).

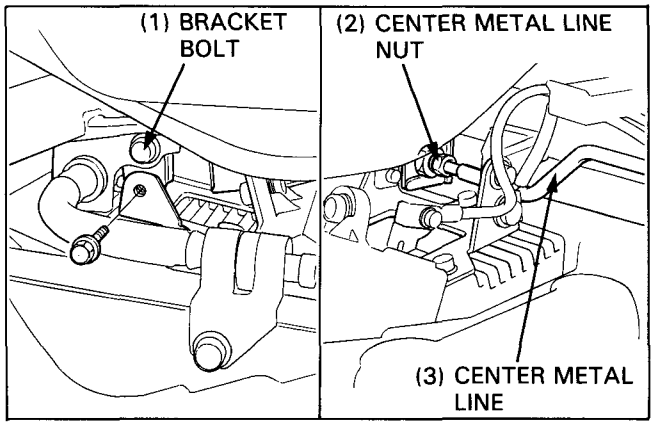
Remove the metal line clamp from the swing arm and disconnect the metal line by loosening the nut using a commercial open ring spanner as shown.



Remove the metal pipe clamp from the swing arm and disconnect the metal line by loosening the nut.
Remove the rear metal line.

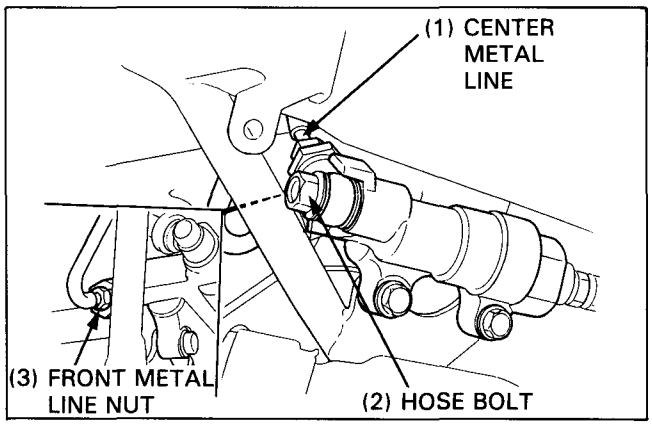


Remove the power control unit (page 19-40).
Remove the metal line bracket bolt and braket from the frame.
Loosen the center metal line nut using a open ring spanner.

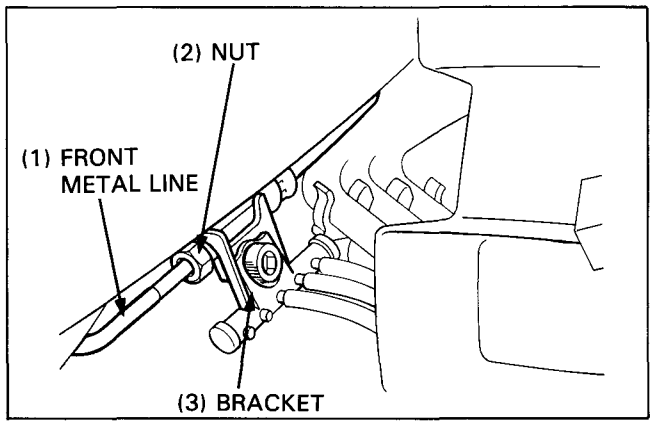


Remove the hose bolt from the rear master cylinder and remove the center metal line sidewards to the right.

Loosen the front metal line nut using a open ring spanner from the rear master cylinder.



Remove the right fairing inner cover (page 12-9).
Remove the front metal line bracket and loosen the front metal line nut using a open ring spanner.
Remove the front metal line upwards.



INSTALLATION

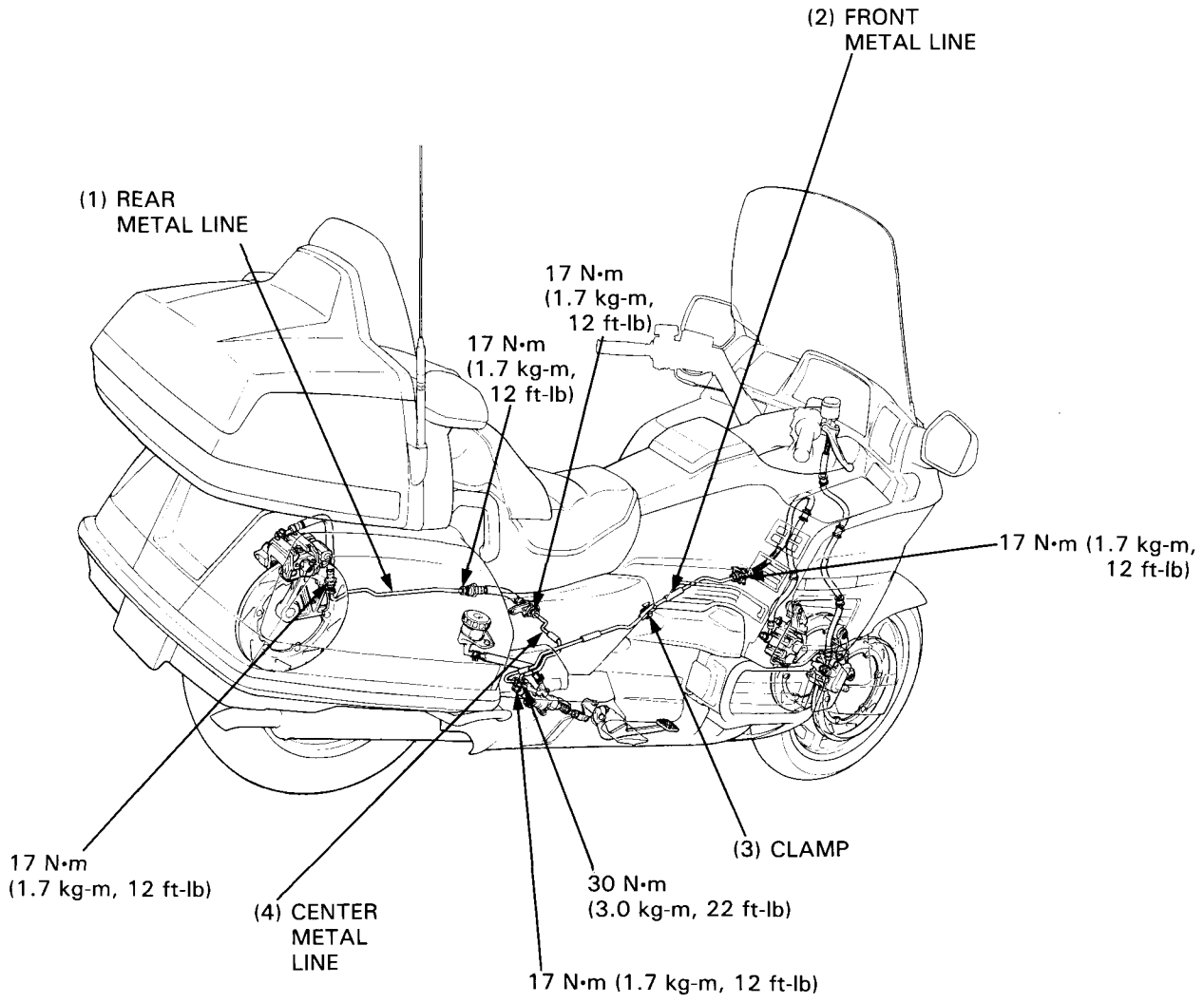
Install the metal lines in the reverse order of removal.

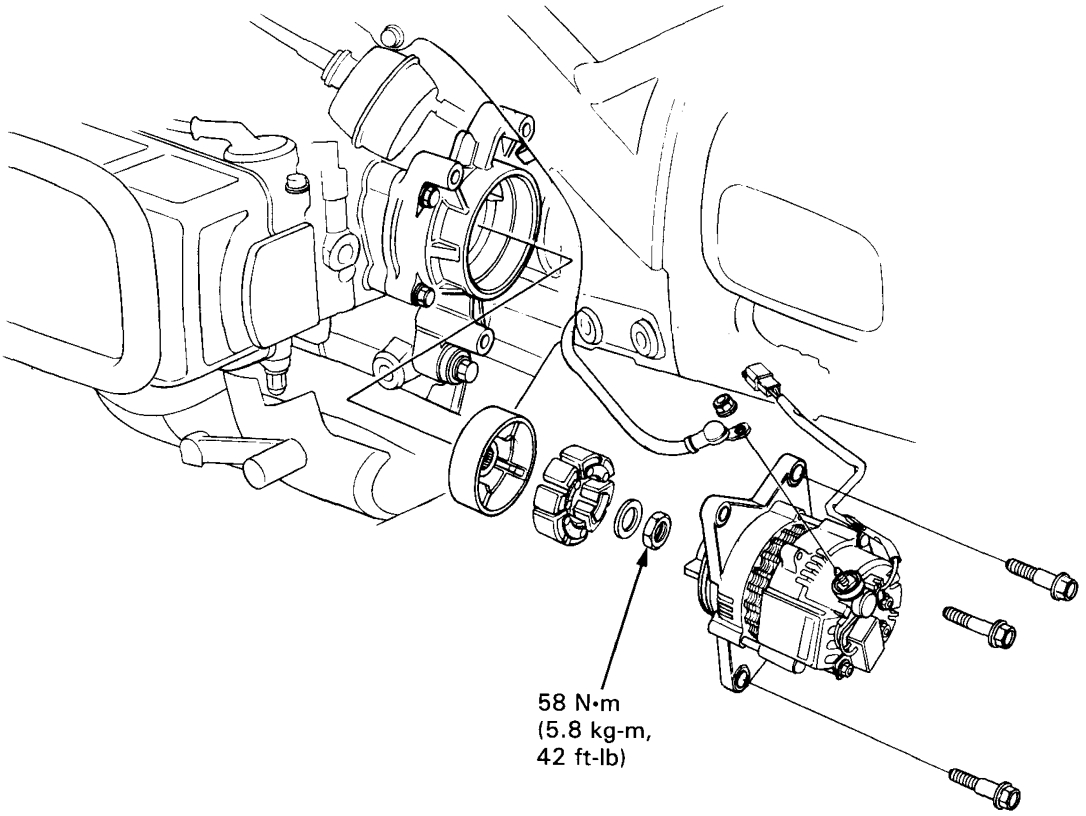
TORQUE:
Metal brake line nut 17 N·m (1.7 kg-m, 12 ft-lb)
Brake hose bolt 30 N·m (3.0 kg-m, 22 ft-lb)

NOTE

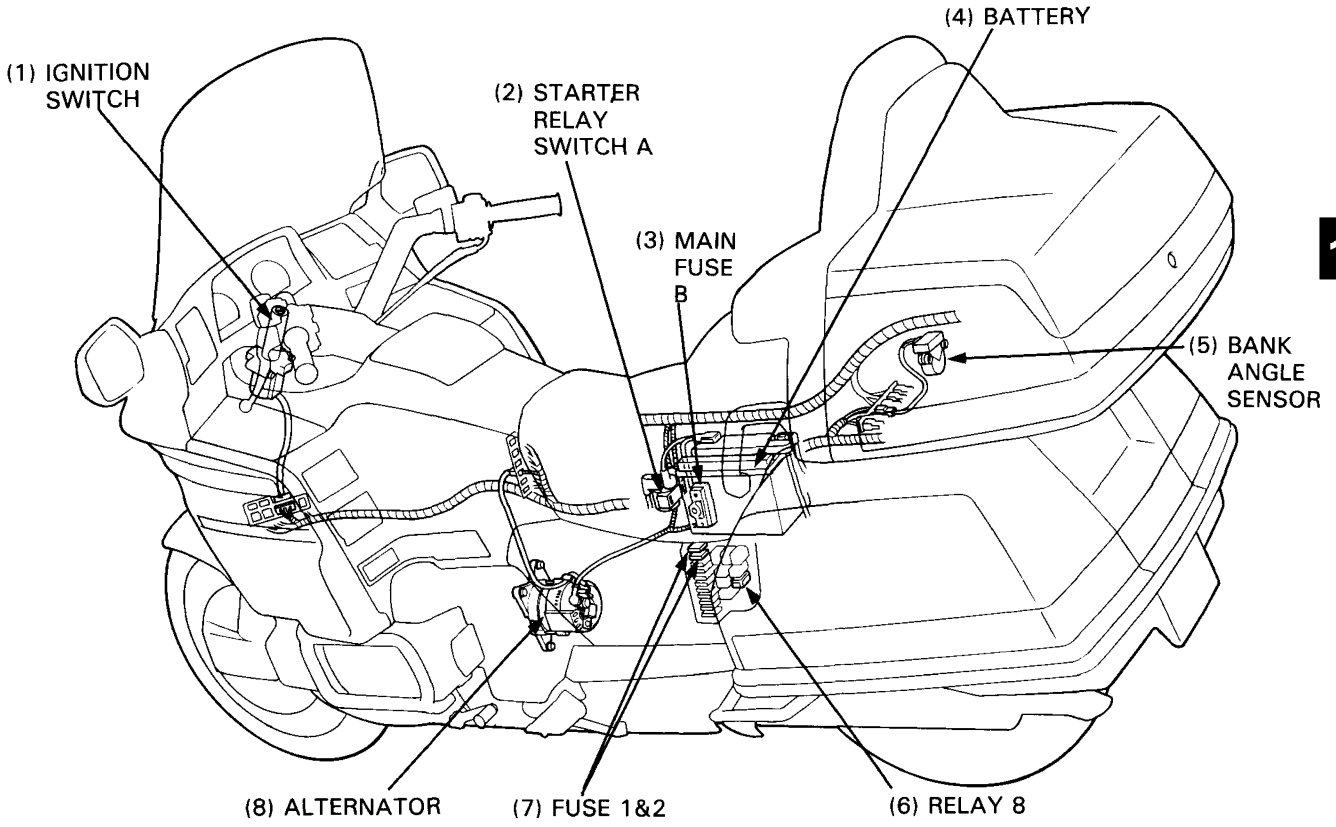
- Be care not to twist the metal lines when tightening metal line nuts.
- Secure the front metal line with the clamp as shown.
- Make sure the brake lines do not contact any moving parts.
- Check for leaks after installation.

Fill and bleed the hydraulic system (page 16-4).

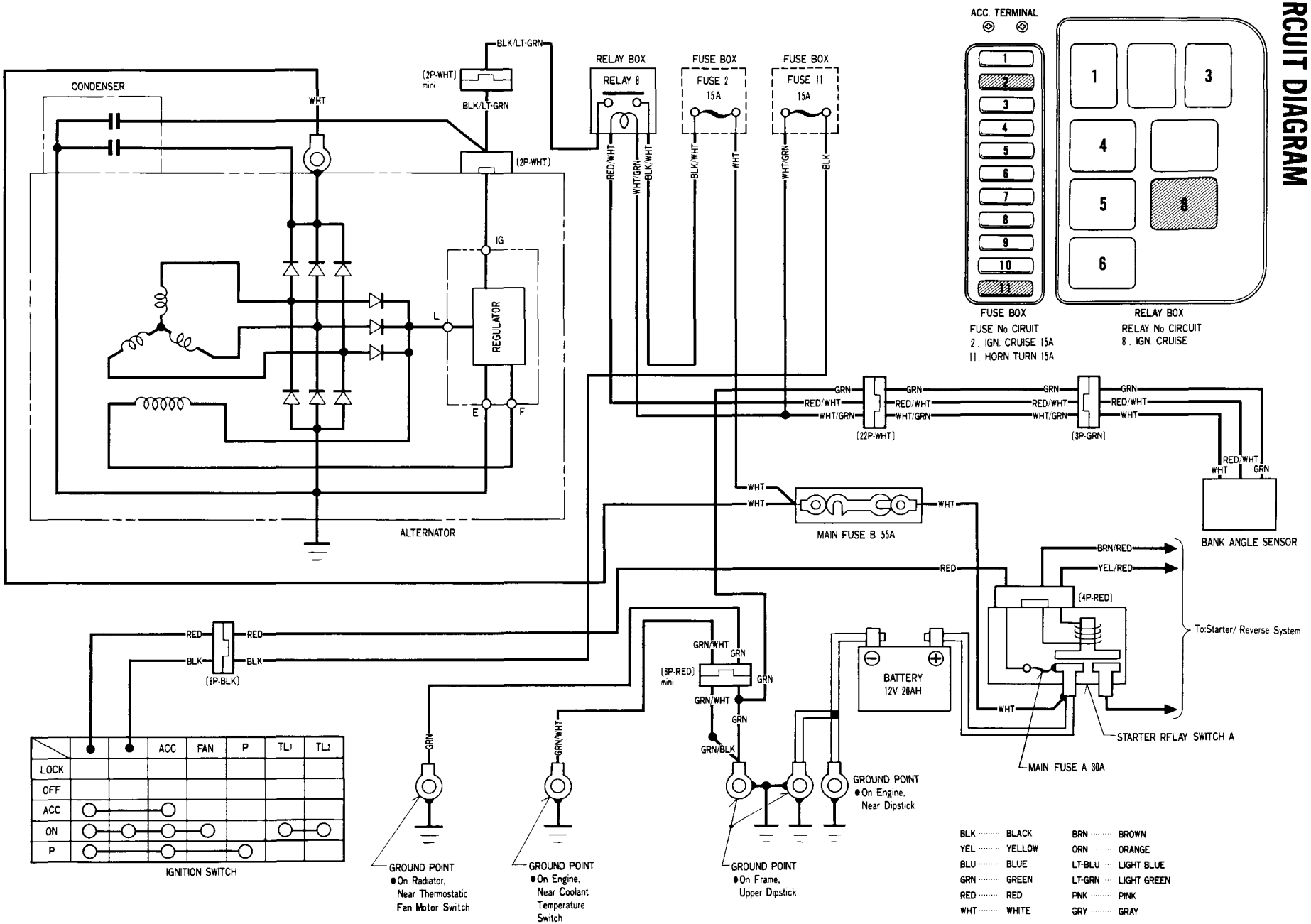




SYSTEM LOCATION



CIRCUIT DIAGRAM



SERVICE INFORMATION

GENERAL

⚠ WARNING

- ***Do not smoke and keep flames away from a charging battery. The gas produced by a battery will explode if a flame or spark is brought near.***
- ***The battery electrolyte contains sulfuric acid. Protect your eyes, skin, and clothing. In case of contact, flush thoroughly with water, and call a doctor if electrolyte gets in your eyes.***
- ***When disconnecting WHT wire terminal from the alternator, first disconnect the battery negative cable from the battery.***

CAUTION

- *For battery charging, do not exceed the charging current and time specified on the battery (and shown below). Use of excessive current or charging time may damage the battery.*

- The battery fluid level should be checked regularly. Fill with distilled water when necessary.
- Slow charge the battery whenever possible, quick charging should be an emergency procedure only.
- Remove the battery from the motorcycle for charging.
- When inspect the charging system, check the system components and lines step-by-step according to the troubleshooting on the next page.
- This regulator/rectifier is located in the alternator.
- For the alternator driven gear service, refer to section 9.

SPECIFICATION

Battery	Capacity		12 V−20 AH	
	Specific gravity	Fully charged	1.270−1.290 (20°C/68°F)	
		Need charging	Below 1.230 (20°C/68°F)	
	Charging current		2.0 amperes max.	
Alternator	Capacity		0.55 kW/5,000 min^{-1} (rpm)	
	Stator coil resistance		0.1−0.3 Ohms (20°C/68°F)	
	Rotor coil resistance		2.9−4.0 Ohms (20°C/68°F)	
	Rotor coil slip ring O.D.		Standard	27.0 mm (1.06 in)
			Service limit	26.0 mm (1.02 in)
	Charging start		800−1,000 min^{-1} (rpm)	
Regulator/rectifier (into alternator)	Type		Transistorized non-adjustable regulator/rectifier	
	Regulated voltage (at 20°C/68°F)	900 min^{-1} (rpm)	0−2 A	13.5−15.5 V
		1,850 min^{-1} (rpm)	1.5 A min.	13.5−15.5 V

TORQUE VALUES

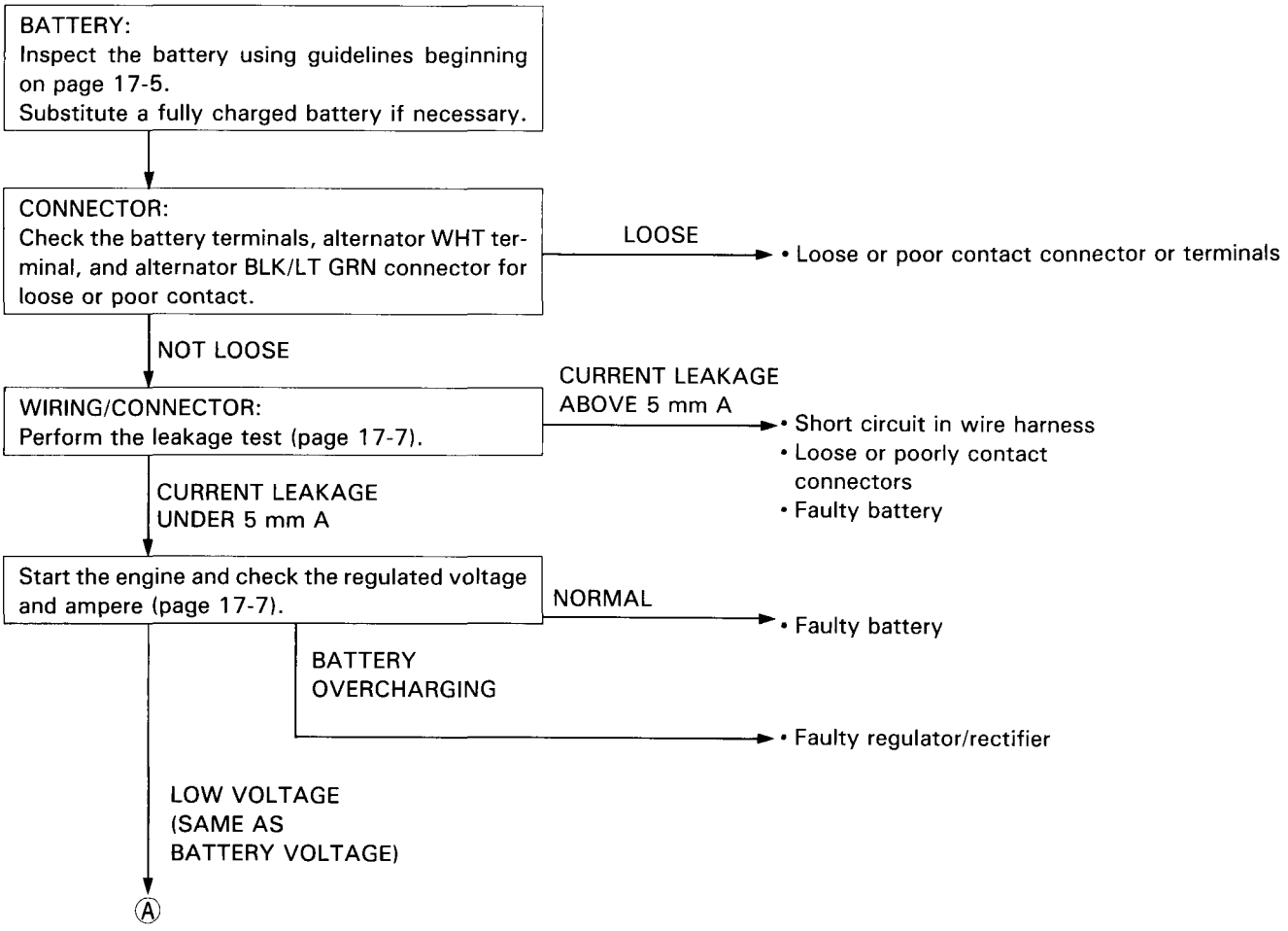
Couple B mounting nut	58 N·m (5.8 kg-m, 42 ft-lb)
Couple A mounting nut	58 N·m (5.8 kg-m, 42 ft-lb) —Apply locking agent.

TOOLS

Common	
Universal holder	07725—0030000
Bearing puller	Equivalent commercially available
Driver	07749—0010000
Pilot, 20 mm	07746—0040500
Inner driver B	07746—0020100
Inner driver C	07746—0030100
Attachment, 30 mm I.D.	07746—0030300
Soldering iron	Equivalent commercially available
Digital multimeter	07411—0020000
Circuit tester (SANWA)	07308—0020001
or	
Circuit tester (KOWA)	TH-5H

TROUBLESHOOTING

Battery discharging/overcharging.

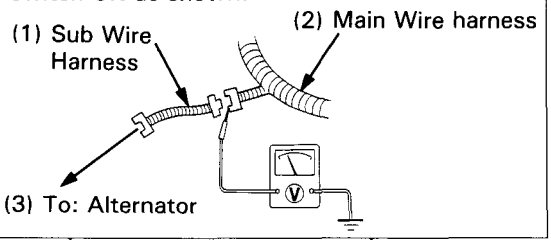


Ⓐ

WIRING:
Disconnect the alternator BLK/LT GRN wire 2P connector, and measure voltage between the BLK/LT GRN wire (+) (wire harness side) and ground (−).
Battery voltage should register with the ignition switch ON. (page 17-8)

NO →

WIRING/CONNECTOR:
Remove the sub wire harness (BLK/LT GRN) and measure the voltage between the BLK/LT GRN wire (+) (wire harness side) and ground (−).
Battery voltage should register with the ignition switch ON as shown.



YES
- Open circuit in BLK/LT GRN sub wire harness
- Loose or poorly contact 2P connector

NO
- Open circuit in BLK/LT GRN main wire harness

YES ↓

ALTERNATOR:
Remove the alternator and rotate the rotor shaft with your finger. The rotor should rotate smoothly (page 17-9).

NO →

Disassemble the alternator (page 17-9) and inspect the following. Replace if necessary.
—rotor bearing (page17-11)
—stator coil (page 17-12)
—rotor coil (page 17-10)

Then, Check ↓

YES ↓

Disassemble the alternator and inspect the following:
—condenser (page 17-10)
—brush length (page 17-11)
—stator coil (page 17-12)
—rotor coil (page 17-10)

ABNORMAL →
- Short circuit in the condenser
- Worn brush
- Faulty stator coil
- Faulty rotor coil

NORMAL →
- Faulty regulator/rectifier

BATTERY

⚠WARNING

- ***The battery electrolyte contains sulfuric acid. Protect your eyes, skin, and clothing. If electrolyte gets in your eyes; flush them thoroughly with water and get prompt medical attention.***

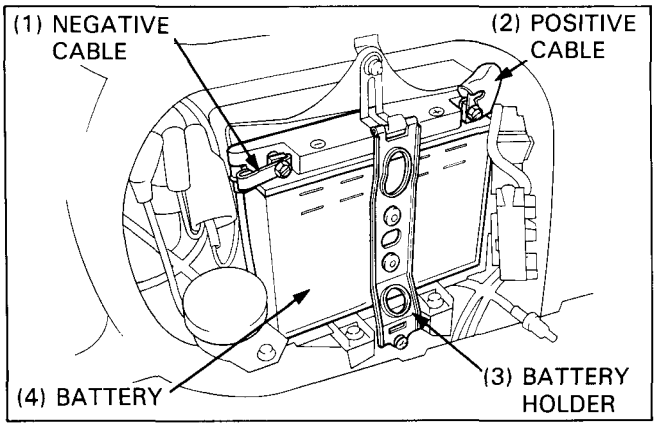
REMOVAL

Remove the left rear side cover (page 12-6).
Disconnect the negative cable first, then the positive cable. On installation, reconnect the negative cable last.

Remove the screw and battery holder.
Remove the battery from the case.

Check for a cracked or broken case or plates. Replace the battery if damaged, or if sulfation forms or sediments accumulate on the bottom.

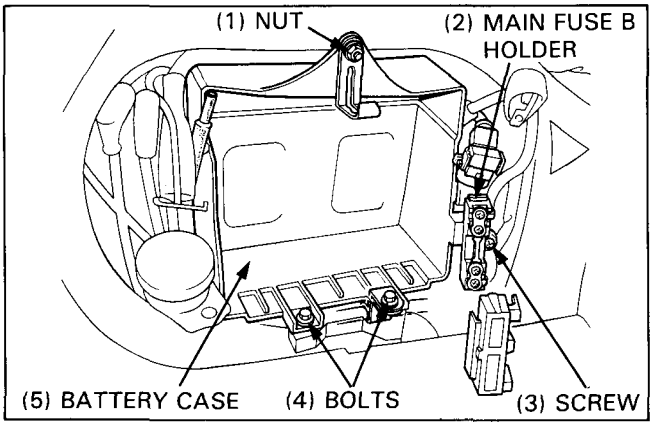
Check electrolyte level in the cells. If low, add distilled water to bring the level to the upper mark.



Open the main fuse B cover and remove the main fuse B holder by removing the screw.
Remove the nut and bolts, and battery case.

NOTE

- In order to obtain accurate test readings when checking the charging system, the battery must be fully charged and in good condition. Perform the following inspections and tests before attempting to troubleshoot charging system problems.

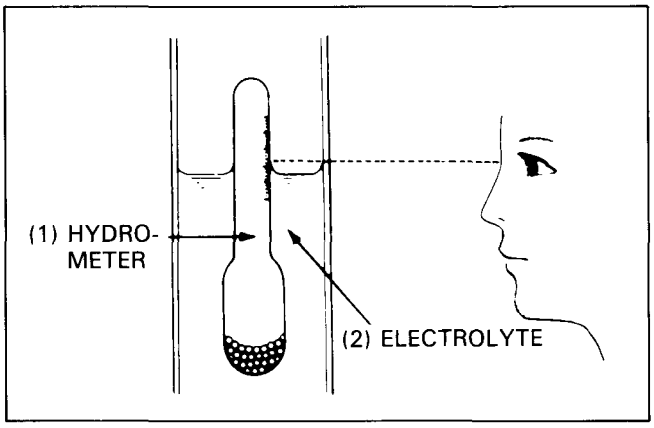


TESTING SPECIFIC GRAVITY

Test each cell with a hydrometer.

SPECIFIC GRAVITY: 1.270–1.290 (20°C/68°F)

1.270–1.290	Fully charged
Below 1.260	Undercharged

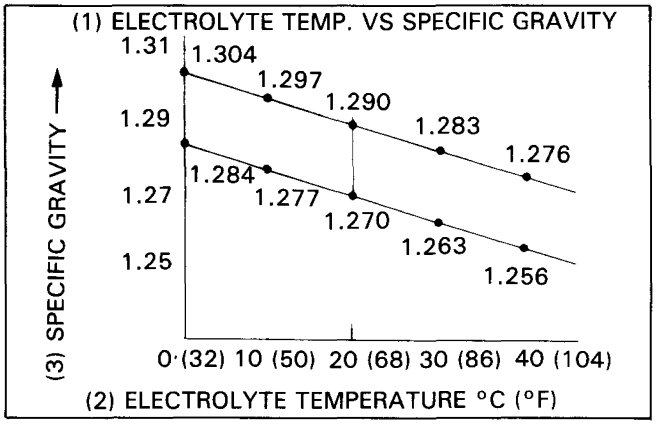


NOTE

- The battery must be recharged if the specific gravity is below 1.230.
- The specific gravity varies with the temperature as shown in the accompanying table.

⚠WARNING

- ***The battery contains sulfuric acid. Avoid contact with skin, eyes, or clothing.***
- ***Antidote: Flush with water and get prompt medical attention.***

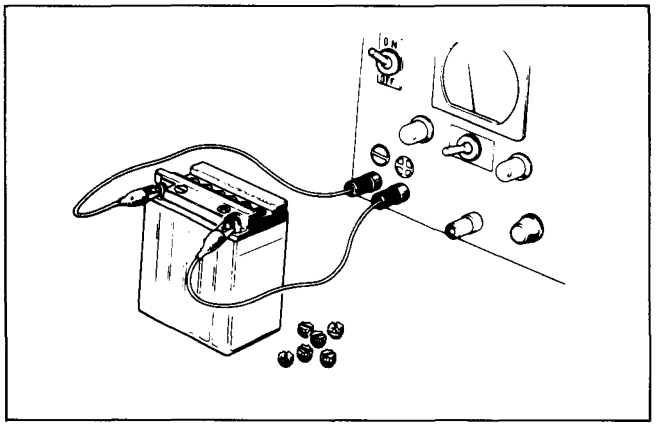


BATTERY CHARGING

Remove the battery cell caps. Fill the battery cells with distilled water to the upper level line, if necessary.
Connect the charger positive (+) cable to the battery positive (+) terminal.
Connect the charger negative (−) cable to the battery negative (−) terminal.

Charging current: 2.0 amperes max.

Charge the battery until specific gravity is 1.270−1.290 at 20°C (68°F).



⚠WARNING

- ***Before charging battery, remove the cap from each cell.***
- ***Keep flames and sparks away from a charging battery.***
- ***Turn power ON/OFF at the charger, not at the battery terminals to prevent sparks.***
- ***Discontinue charging if the electrolyte temperature exceeds 45°C (113°F).***
- ***Ventilate when charging in an enclosed area.***

CAUTION

- *Quick charging should only be done in an emergency; slow charging is preferred.*

INSTALLATION

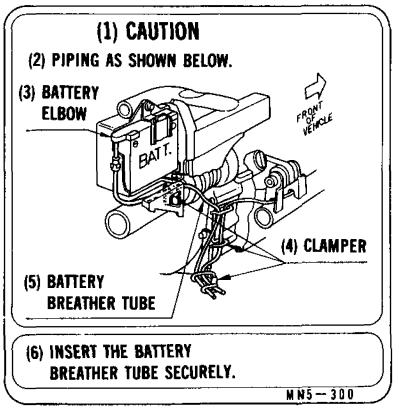
Install the battery in the reverse order of the removal.

Connect the positive cable first, then the negative cable.

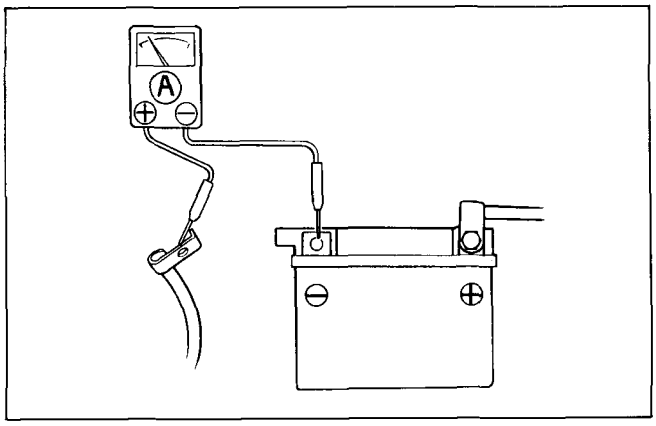
After installing the battery, coat the terminals with clean grease.

CAUTION

- *Make sure the positive cable is not forced against any metal parts, otherwise a short may occur.*
- *Route the breather tube as shown on the battery caution label.*
- *Make sure the breather tube does not bend, after the battery has been installed into the case.*



CHARGING SYSTEM OUTPUT



LEAKAGE TEST

Inspect for battery current leakage before testing charging output.

Turn the ignition switch OFF. Remove the ground cable from the battery. Connect the ammeter between the ground cable and battery (−) terminal.

CAUTION

- *Measure the current leakage while changing the tester renge from the higher to lower.*
- *While measuring, do not turn the ignition switch ON.*

SPECIFIED CURRENT LEAKAGE: 5 mm A max.

CHARGING SYSTEM OPERATION

NOTE

- This is a test of charging system operation. It does not measure maximum charging output.
- The battery should be fully charged (electrolyte specific gravity above 1.270). Use of a battery with a low charge will result in different readings.

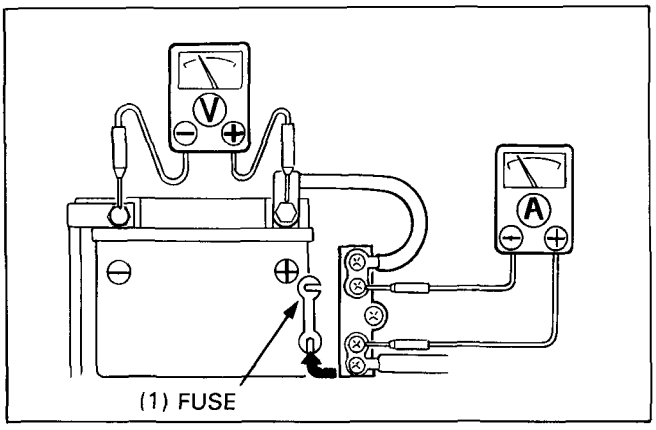
Start the engine and warm it up to operating temperature, then turn the ignition switch OFF.

Remove the main fuse B, connect an ammeter to the positive (−) and negative (−) terminals of the fuse holder as shown.

CAUTION

- *Do not hook up an ammeter directly between the battery positive (+) terminal and negative (−) cable of the battery, or the ammeter may burn out.*

Connect a voltmeter between the positive and negative battery terminals as shown.



Start the engine and observe the meter readings:

- Check the charging outputs at the speeds shown in the chart.

Charging Start rpm: 800−1,000 min^{-1} (rpm)

NOTE

- *Measure the current after the fan motor has come to a complete stop.*

(1) RECGULATED CHARGING OUTPUT:

(2) ENGINE RPM	(3) AMPERAGE	(4) VOLTAGE
900 min^{-1} (rpm)	0−2 A	13.5−15.5 V
1,850 min^{-1} (rpm)	1.5 A min.	13.5−15.5 V

WIRE HARNESS INSPECTION

Disconnect the WHT wire terminal and BLK/LT GRN wire connect from the alternator.

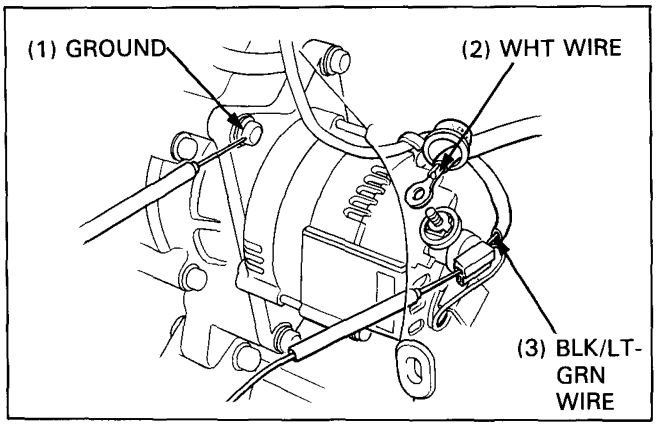
⚠ WARNING

- ***Disconnect the battery negative cable from the battery to prevent sparking when disconnecting the WHT wire terminal.***

Connect the battery negative cable onto the battery.
Measure the voltage between each wire (wire harness side) and ground as follow:

ITEM	TERMINALS	SPECIFICATION
Battery charging line	WHT (+) and ground (−)	Battery voltage should register.
Battery voltage input line	BLK/LT GLN (+) and ground (−)	Battery voltage should register with the ignition switch ON.

Disconnect the battery negative cable to avoid sparking which would otherwise occur when connecting each wire to the alternator.

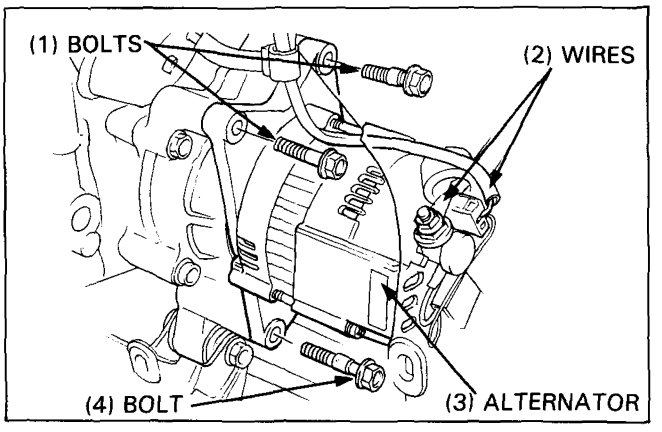


ALTERNATOR AND REGULATOR/ RECTIFIER

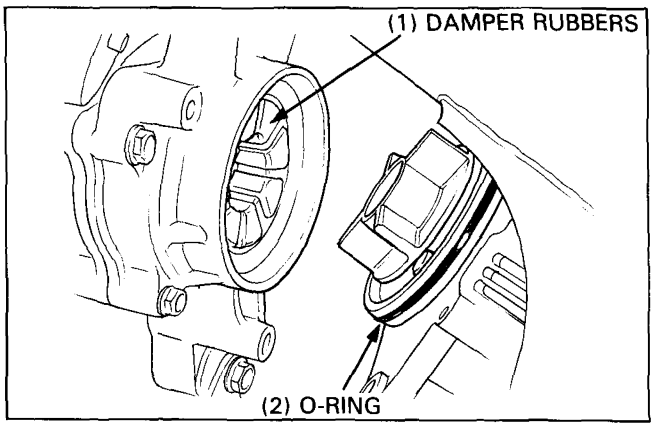
REMOVAL

Disconnect the battery negative cable.
Disconnect the alternator WHT wire terminal and BLK/LT GRN wire connector from the alternator.

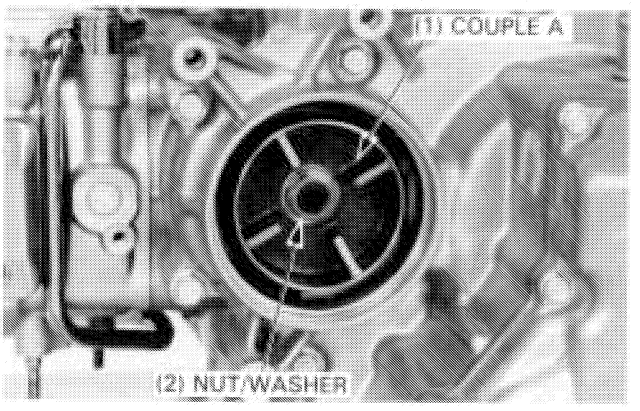
Remove the alternator mounting bolts and alternator and regulator/rectifier assembly.



Remove the O-ring and alternator damper rubbers.



Shift the transmission in any gear except neutral. Hold the rear wheel by hand.
Remove the nut, washer and alternator couple A.



DISASSEMBLY

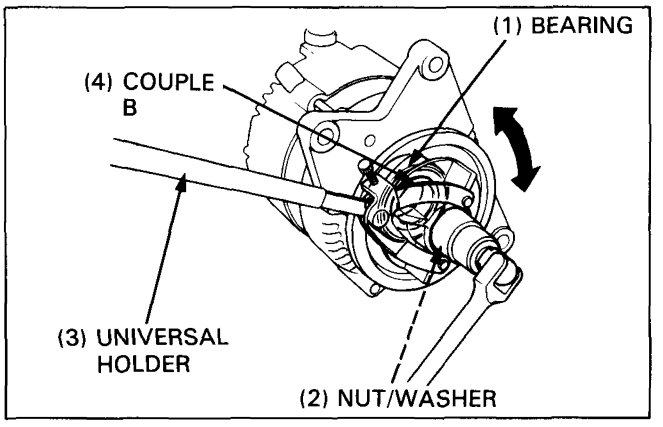
Check the rotor rotation by rotating the rotor shaft by your finger. The rotor should rotate smoothly.

Hold the couple B with a tool as shown and remove the nut, washer and couple B.

NOTE

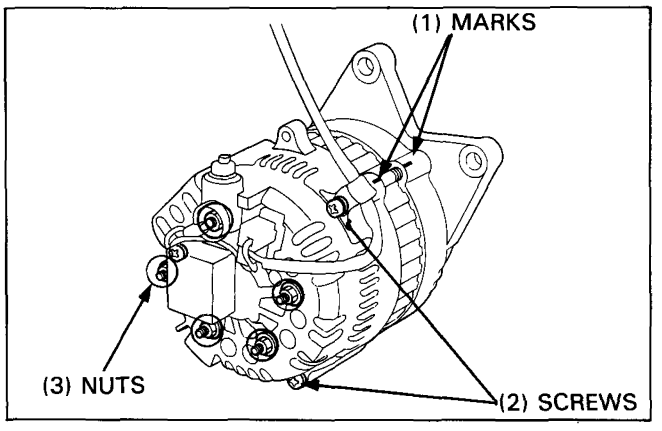
- It is not necessary to remove the couple without serving the rotor front bearing and oil seal.

TOOL:
Universal holder **07725—0030000**



Mark the front and rear cover to indicate their original position, before removing them.

Remove the three screws and wire clamp.
Remove the five nuts, terminal housing and condenser.



Separate the front cover/rotor from the rear cover/stator by prying them apart with a screwdriver.

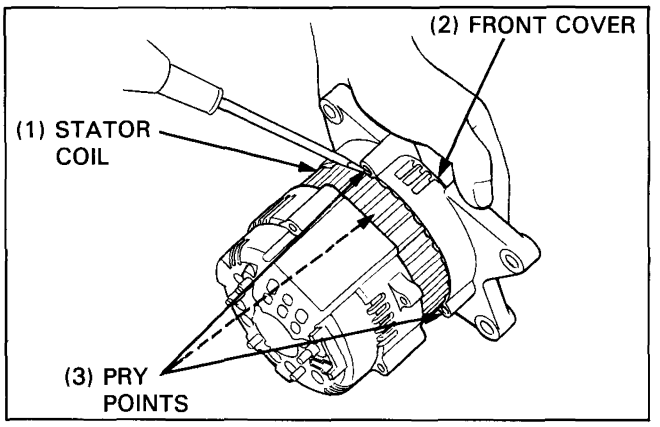
CAUTION

- *There are three pry-point positions which have screw threads on the front cover.*
- *Do not damage the stator coil when prying.*

Separate the stator coil from the rear cover.

CAUTION

- *Do not damage the stator coil. Protect the stator coil with a shop towel.*



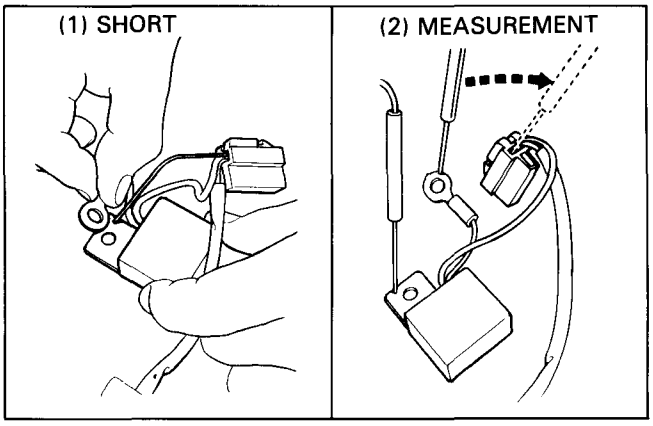
CONDENSER INSPECTION

Short each terminal of the condenser as shown.
Then, check for continuity between each terminal.
The tester needle should swing momentally, then return to ∞.

NOTE

- Use a analog ohmmeter on this test.

If continuity does exsist or the tester needle will not swing, replace the condenser.

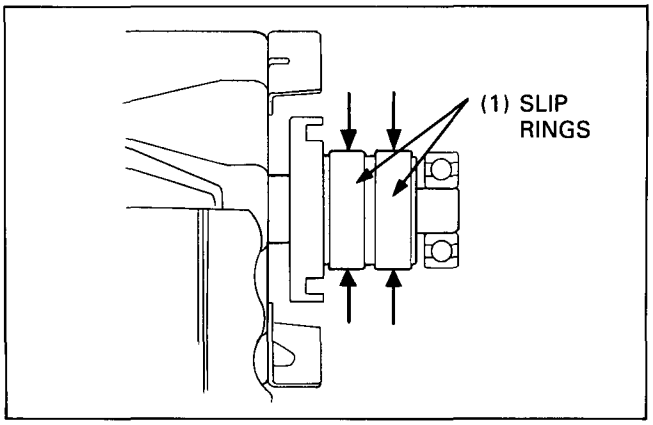


ROTOR COIL INSPECTION

Inspect the slip rings for discoloration.

Measure the O.D. of the slip rings.

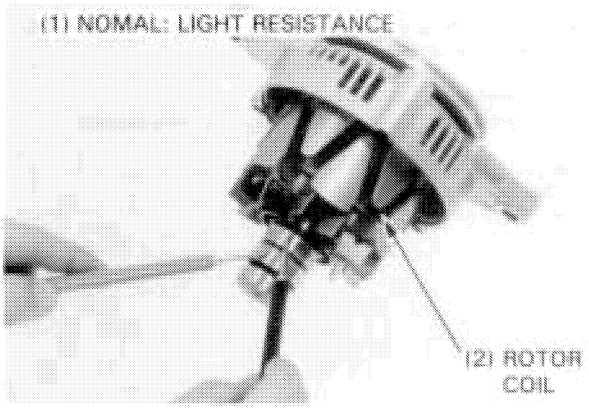
SERVICE LIMIT: 26.0 mm (1.02 in)



Check for resistance between slip rings.

There should be light resistance.

STANDARD: 2.9—4.0 Ohms (20°C/67°F)



Check for continuity between the slip ring and rotor shaft.

There should be no continuity.

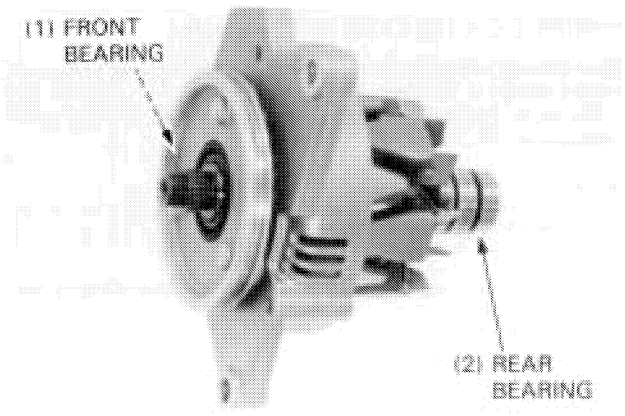
ROTOR BEARING INSPECTION

Turn the rotor shaft bearings with your finger.
The bearings should turn smoothly and quietly. Also check that the inner races of bearings fit tightly on the rotor shaft.

Remove and discard the bearings if the races do not turn smoothly, quietly or if loosely on the shaft (page 17-13).

NOTE

- Replace a front bearing, front cover, and rotor as an assembly.

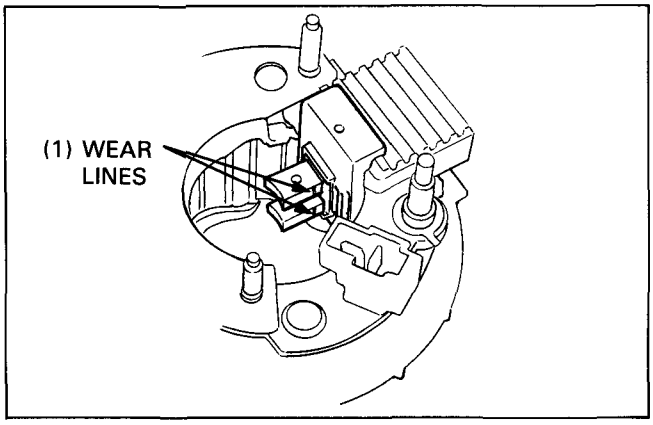


BRUSH LENGTH INSPECTION

Replace the brushes if they are worn down to or near to their wear lines.

CAUTION

- *Always replace the brushes in pairs.*

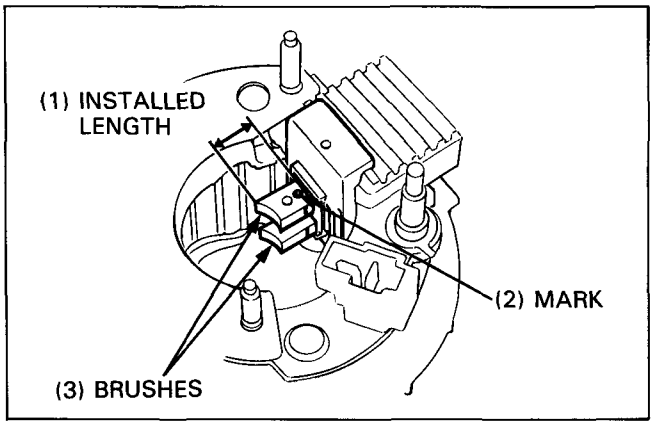


If replacement is necessary, melt the solder securing the brushes and pull them out of the brush holder.

Install new brushes in the brush holder with their marked side facing to the rear cover.

Set the brushes at the shown installed length.

INSTALLED LENGTH: 18.0 mm (0.71 in)

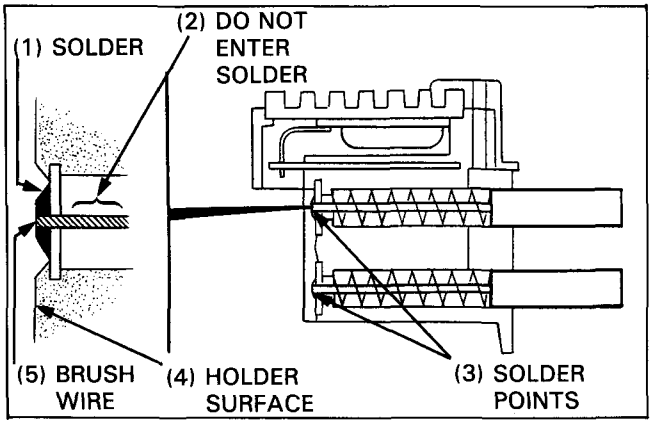


Heat the soldering iron (Capacity: about 32 W). Use low-temperature solder to solder the new brushes.

CAUTION

- *Take care that solder does not enter brush holder, or the brush will not operate properly.*
- *Do not supply excess solder; align the solder end with the brush holder surface as shown.*
- *Work quickly to avoid heat-damage to the regulator/rectifier.*

Cut off the surplus brush wires.

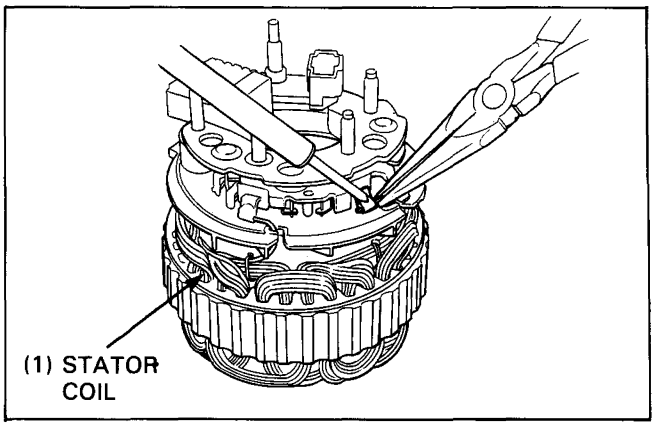


STATOR COIL INSPECTION

Melt the solder and separate the stator coil from the regulator/rectifier.

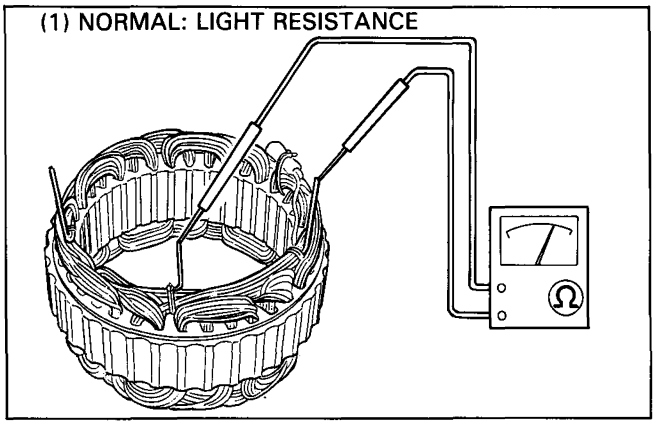
CAUTION

- *Work quickly to avoid heat-damage to the regulator/rectifier.*
- *Hold the stator coil lead wire with radio pliers to dissipate heat.*



Check for resistance between stator coil wires.
There should be light resistance.

STANDARD: 0.1—0.3 Ohms (20°C/67°F)

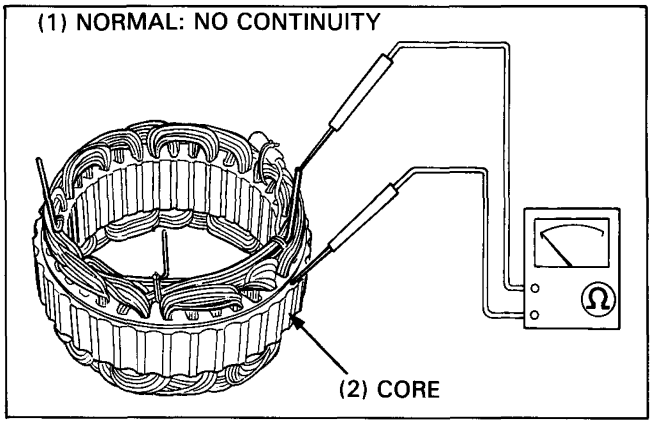


Check for continuity between the wire and stator core.
There should be no continuity.

NOTE

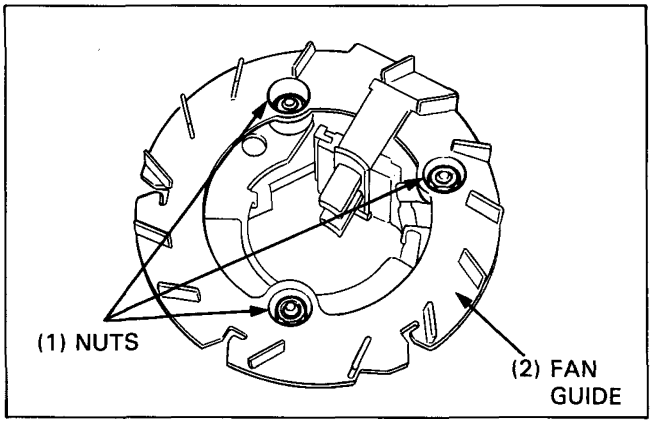
- The green color part of the core is insulated. Put the tester probe on the silver color part of it.

For stator coil assembly, see page 17-14.



If you need to remove the fan guide, separate it from the regulator/rectifier by removing three attaching nuts.

Install the fan guide in the reverse order of removal.

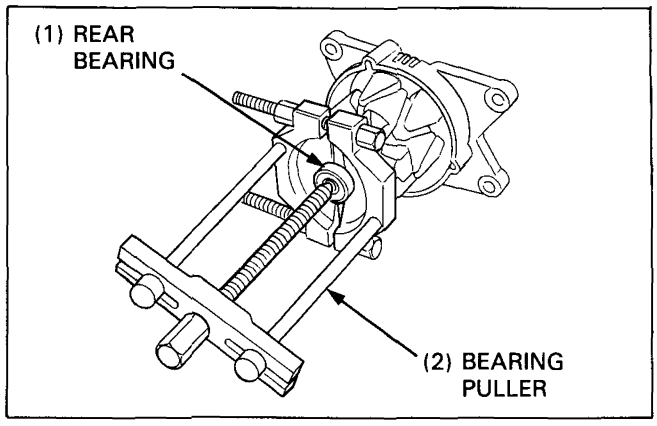


ROTOR BEARING REPLACEMENT

Remove the rear rotor bearing using a bearing puller.

TOOL:

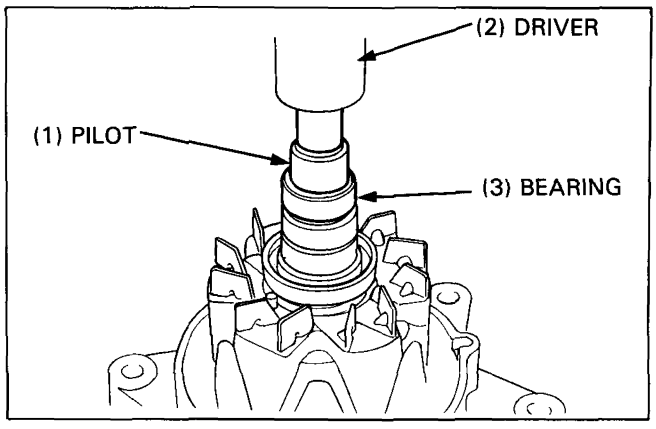
Bearing puller	**Equivalent commercially available**



Drive in a new bearing onto the rotor shaft.

TOOLS:

Driver	**07749–0010000**
Pilot, 20 mm	**07746–0040500**

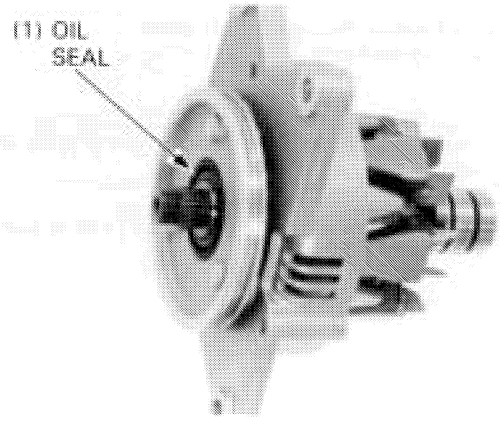


OIL SEAL REPLACEMENT

Remove the oil seal from the front cover.

CAUTION

- *Do not damage the cover or rotor shaft.*



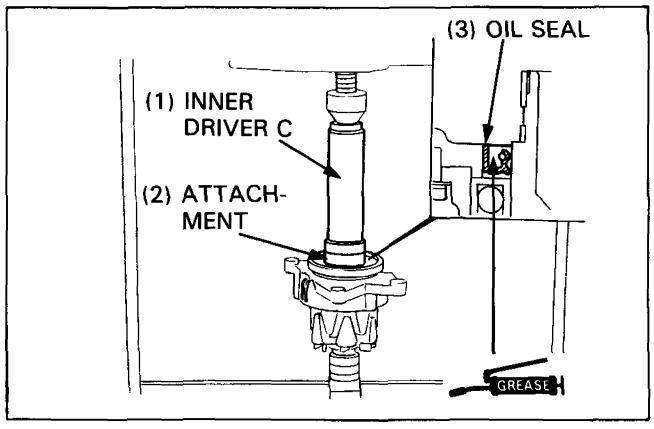
Apply grease to the oil seal lip and press a new oil seal into the front cover A with the lip side facing out.

TOOLS:

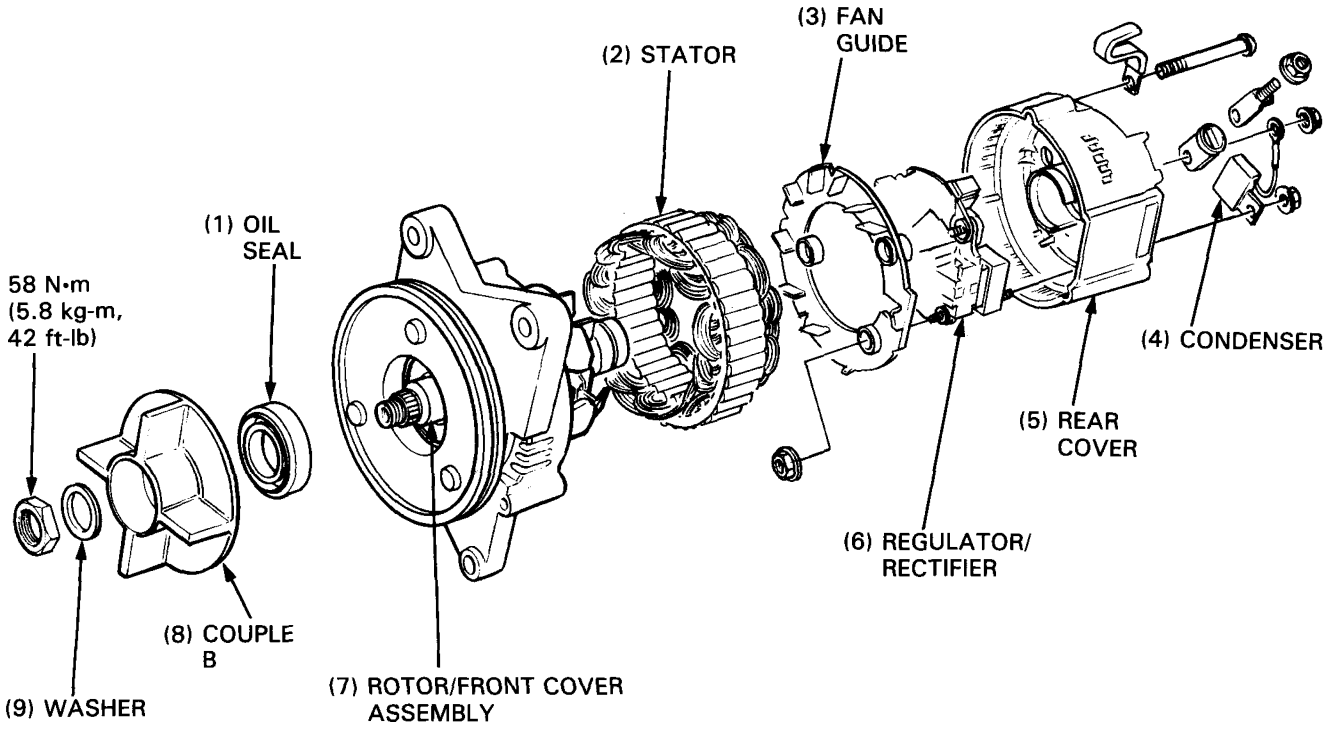
Inner driver C	**07746–0030100**
Attachment, 30 mm I.D.	**07746–0030300**

NOTE

- Make the oil seal surface flush with the front cover A.



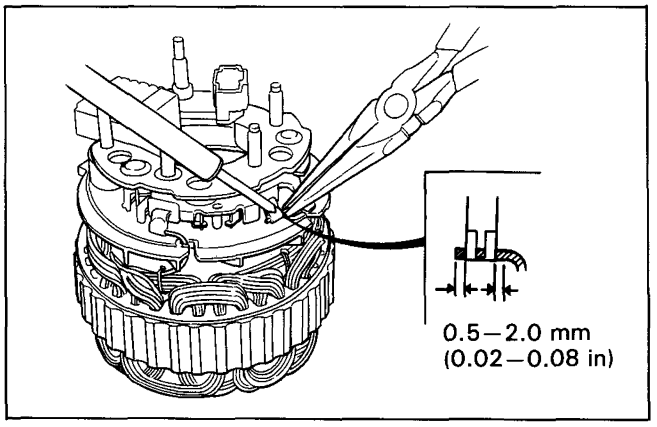
ASSEMBLY



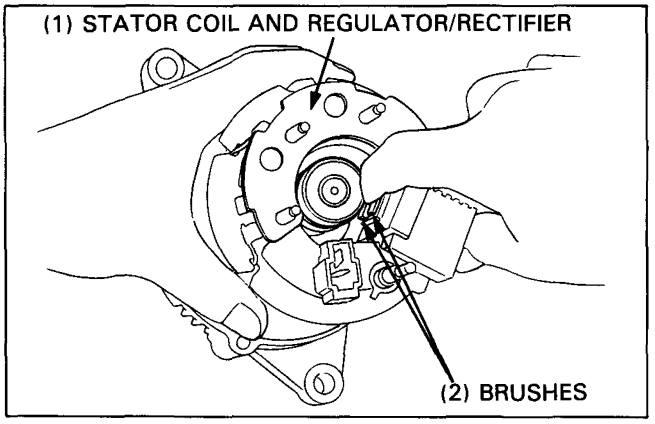
Heat a high-amperage soldering iron (Capacity: about 110 W). Join the stator and regulator/rectifier by soldering the stator coil wires on the diode terminals, using a high-temperature, high-lead content solder.

CAUTION

- *Work quickly to avoid heat-damage to the regulator/rectifier.*
- *Position the wires onto the terminals as shown.*



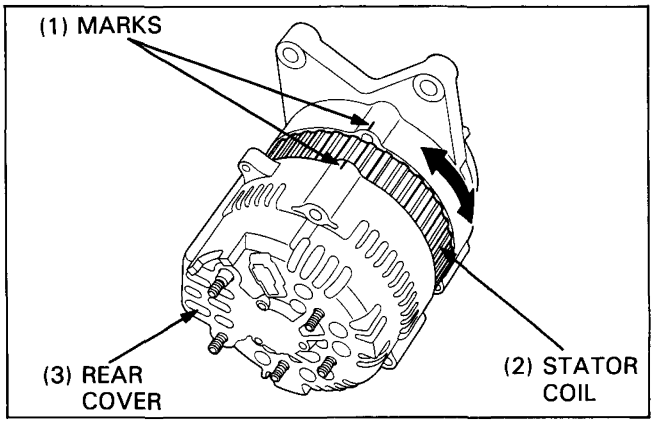
Install the stator coil and regulator/rectifier assembly in the front cover, while pressing the brushes into the holder.



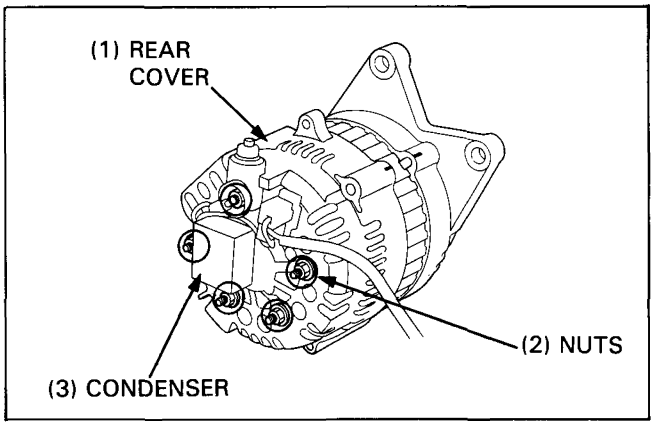
Install the rear cover on the regulator/rectifier and align the marks on the front and rear covers while moving the stator coil.

CAUTION

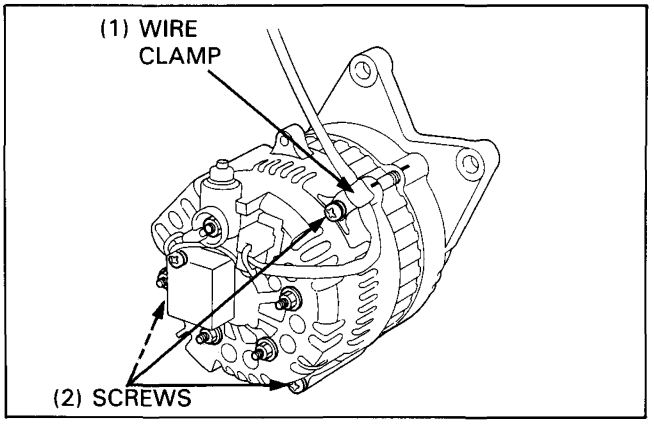
- *Do not move the rear cover when aligning the marks. Move the stator coil, or damage the stator coil wire.*



Install the condenser and tighten the rear cover nuts.



Install and tighten three screws securely with the wire clamp.

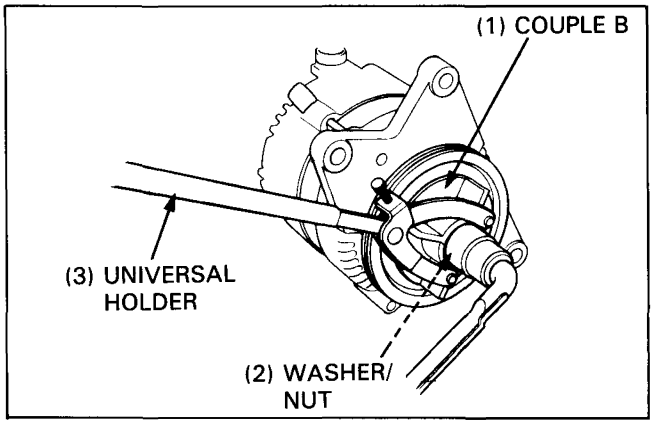


Install the couple B, washer and nut.
Fix the couple B with a tool as shown and tighten the nut to the specified torque.

TORQUE: 58 N·m (5.8 kg-m, 42 ft-lb)

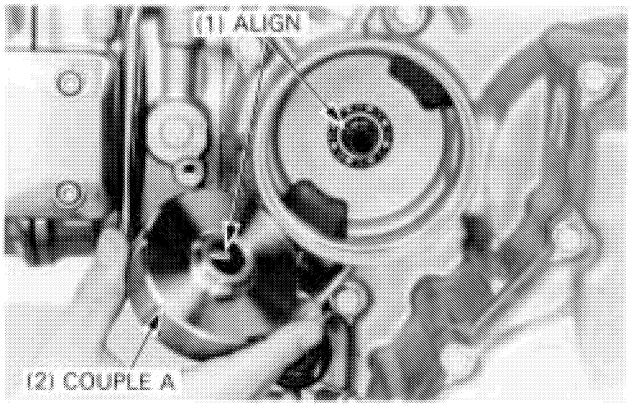
TOOL:

Universal holder	**07725—0030000**



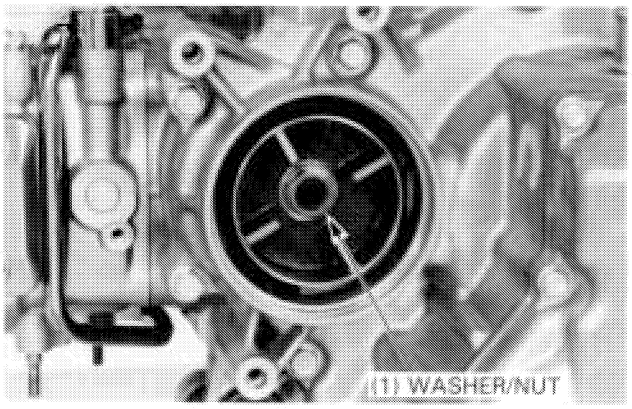
INSTALLATION

Install the couple A, aligning the splines on the couple and alternator driven gear.

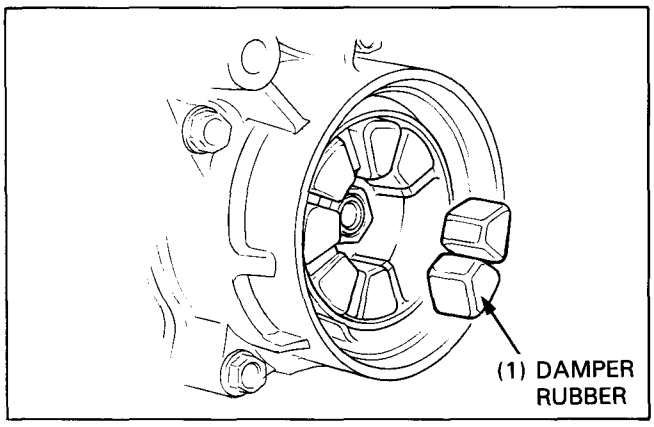


Shift the transmission in any gear except neutral and hold the rear wheel by hand.
Apply a locking agent to the nut threads.
Install the wather and nut, and tighten the nut to the specified torque.

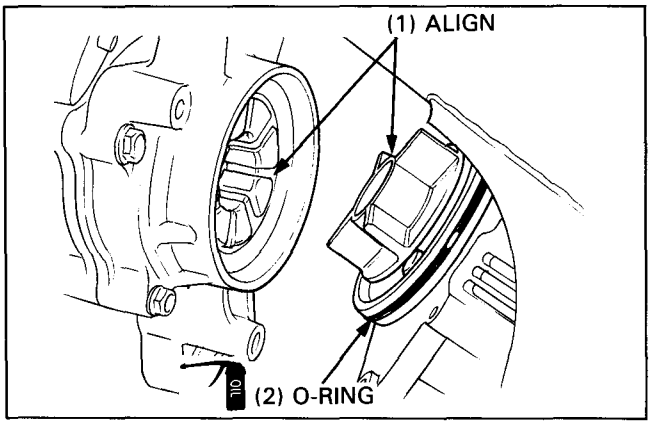
TORQUE: 58 N·m (5.8 kg-m, 42 ft-lb)



Install four damper rubbers in the coupler A.



Apply oil to the O-ring and install it on the front cover.
Install the alternator onto the engine, aligning the couple B with the damper rubber grooves.



Connect the alternator BLK/LT GRN wire connector and WHT wire terminal onto the alternator.

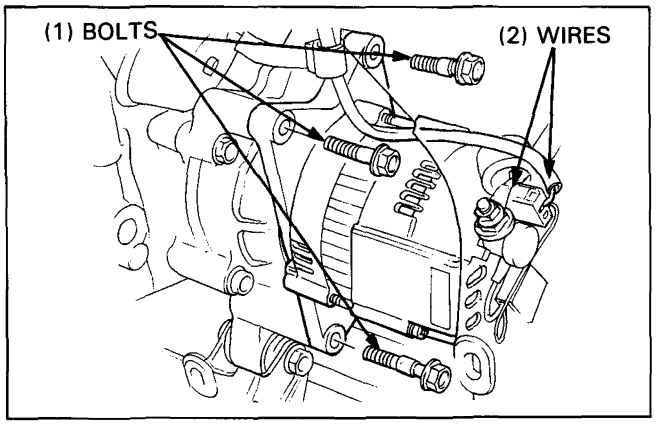
Install and tighten the alternator mounting bolts.

NOTE

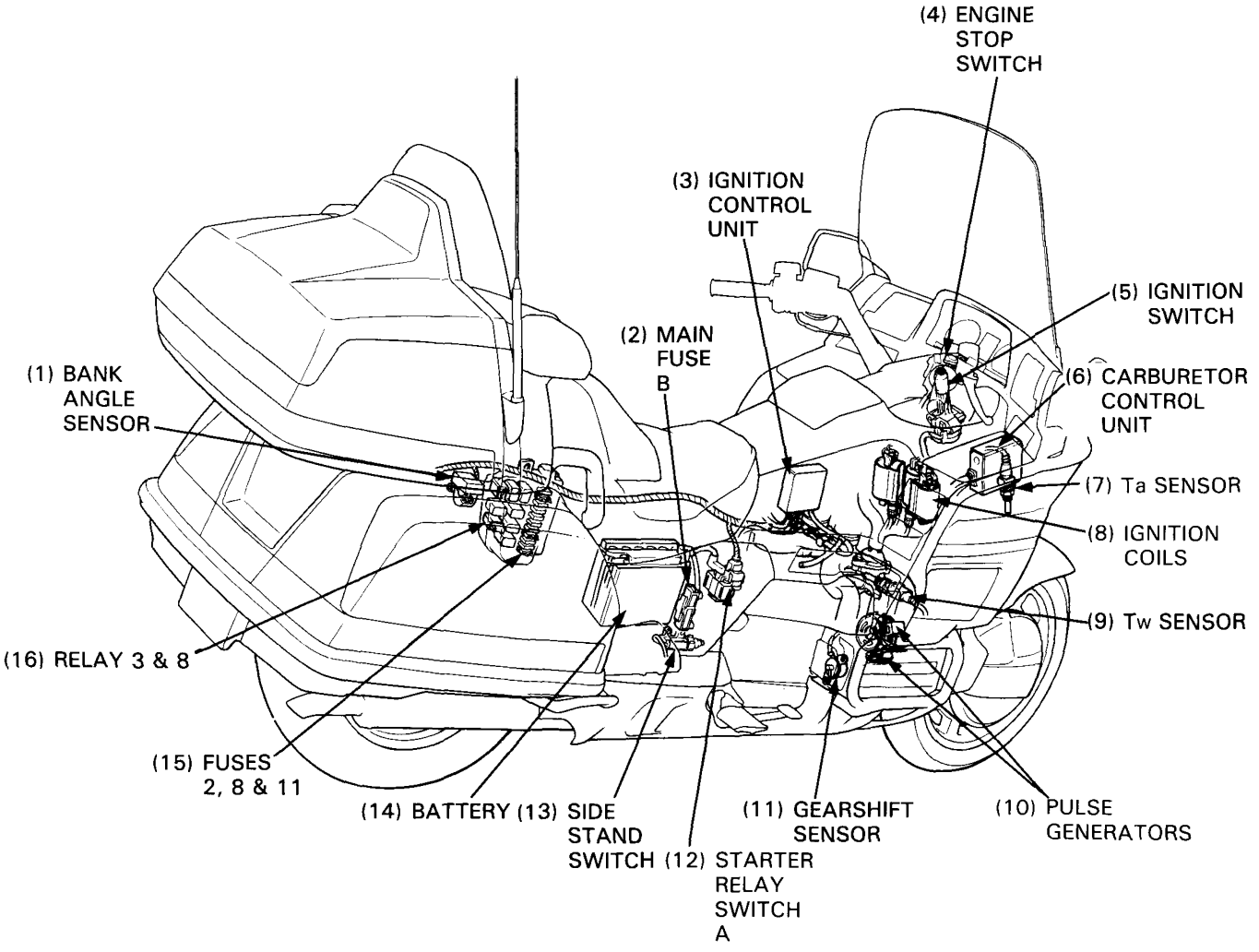
- The bolt orientation are as shown.

Connect the batery negative cable onto the battery.

Install as following:
—left front side cover (page 12-6).
—right rear side cover (page 12-6).

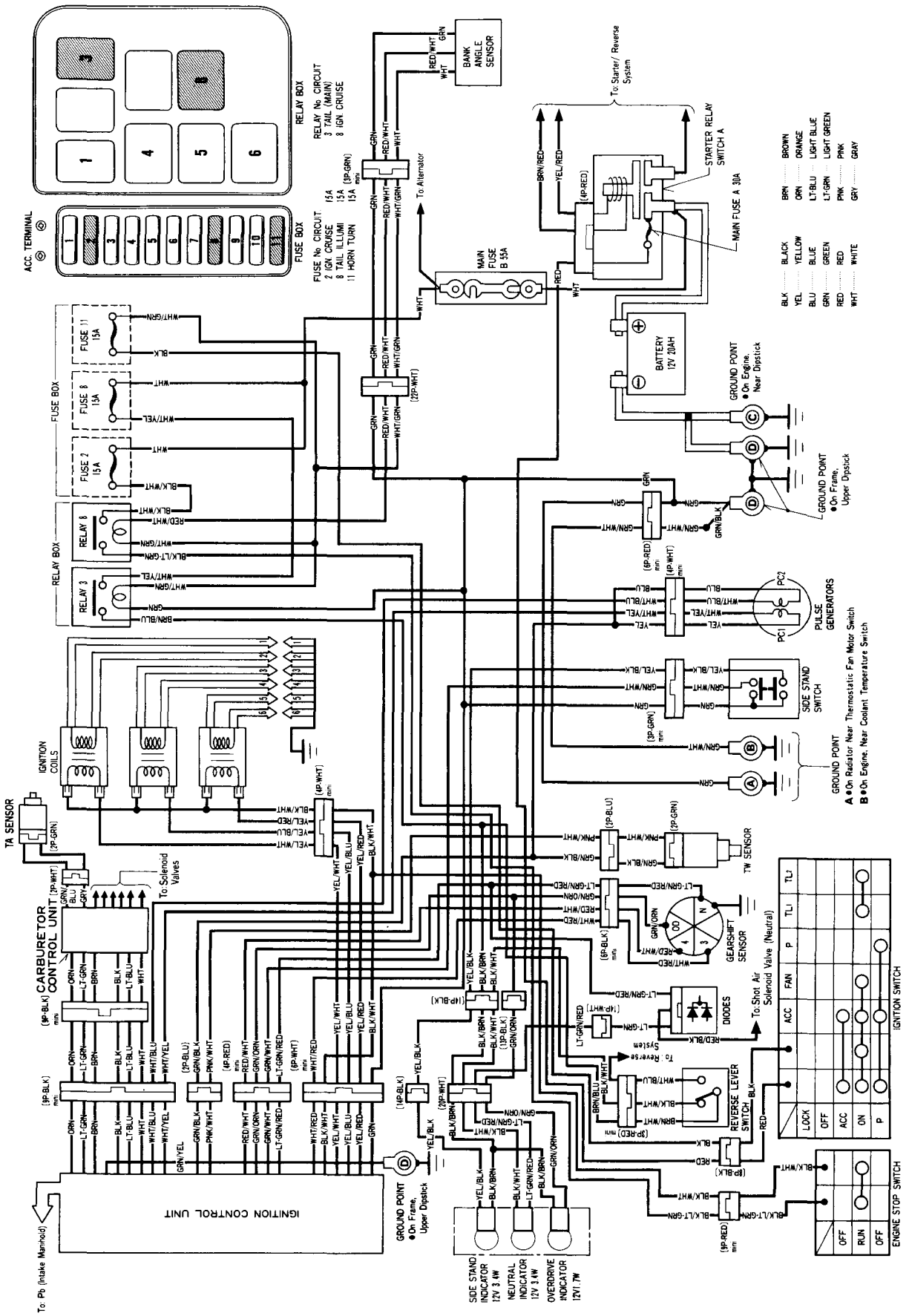


SYSTEM LOCATION



18

CIRCUIT DIAGRAM



SERVICE INFORMATION

GENERAL

- All electrical components can be inspected without removing them from the motorcycle.
- Current is sent through the ignition coil primary circuit by the ignition control unit. When the pulse generator rotor tooth just passes the coil pickup, the primary circuit is broken, causing the primary coil flux field to collapse. Secondary coil voltage rapidly rises, firing the spark plugs.
- The ignition control unit electronically varies ignition timing according to engine speed when the transmission is in 1st through 2nd gears. When the transmission is shifted into 3rd, 4th or OD gears, a gearshift sensor signals the ignition control unit to electronically vary ignition timing according to carburetor vacuum.
- When inspect the ignition system, check the system components and lines step-by-step according to the troubleshooting on next page.
- For spark plug gap inspection and adjustment procedure, see page 3-8.
- For Ta senser inspection, see page 4-50.

SPECIFICATIONS

Recommended spark plugs:

	For cold climate (Blow 5°C, 41°F)	Standard	For extended high speed riding
NGK	DPR6EA-9	DPR7EA-9	DPR8EA-9
ND	X20EPR-U9	X22EPR-U9	X24EPR-U9

Spark plug gap:		0.8—0.9 mm (0.031—0.035 in)
Ignition timing	Fmark:	0° BTDC at 900 ± 50 min^{-1} (rpm)
	Vacuum advance	
	Start vacuum:	10—110 mmHg (0.4—4.3 inHg) — at atmospheric pressure, 760 mmHg (29.9 inHg) and at idle
	Cease vacuum:	280—380 mmHg (11.0—15.0 inHg)
Firing order:		1-4-5-2-3-6-1
Ignition coil resistances		
	Primary coil:	2.6—3.2 Ohms
	Secondary coil:	21—29 K ohms (with spark plug wires) — at 20°C/68°F
		13—17 K ohms (without spark plug wires) — at 20°C/68°F
Pulse generator coil resistance:		400—500 Ohms
Tw sensor resistance:		2.0—3.0 K ohms at 20°C/68°F
		200—400 Ohms at 80°C/176°F

TORQUE VALUES

Timing belt drive pulley bolt	75 N·m (7.5 kg-m, 54 ft-lb)
Tw sensor	28 N·m (2.8 kg-m, 20 ft-lb)

TOOLS

Digital multimeter	07411—0020000
Circuit tester (SANWA)	07308—0020001
or	
Circuit tester (KOWA)	TH-5H
Inspection adaptor (P1)	07508—0013600
Tester harness	07508—0014600

TROUBLESHOOTING

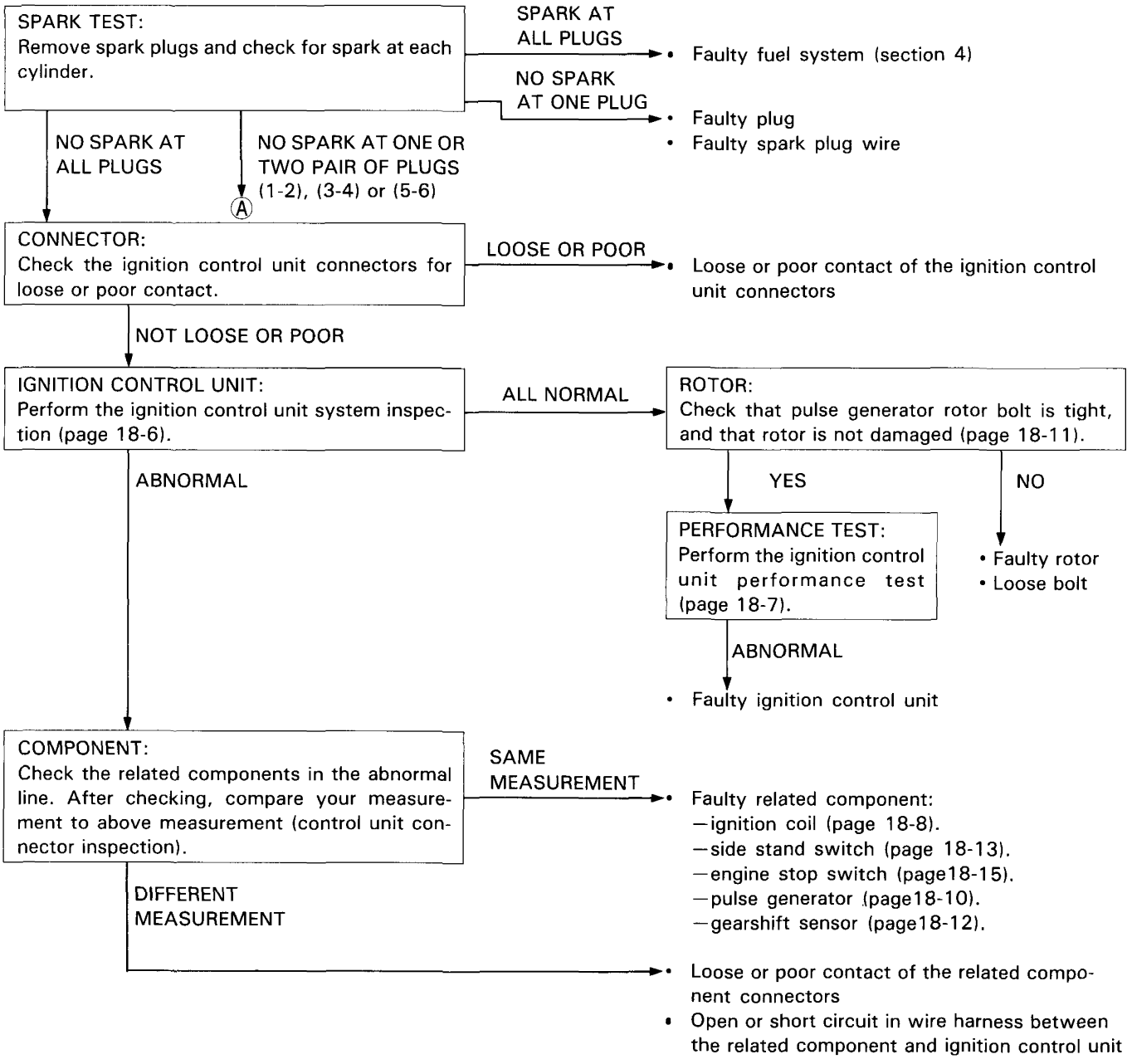
⚠WARNING

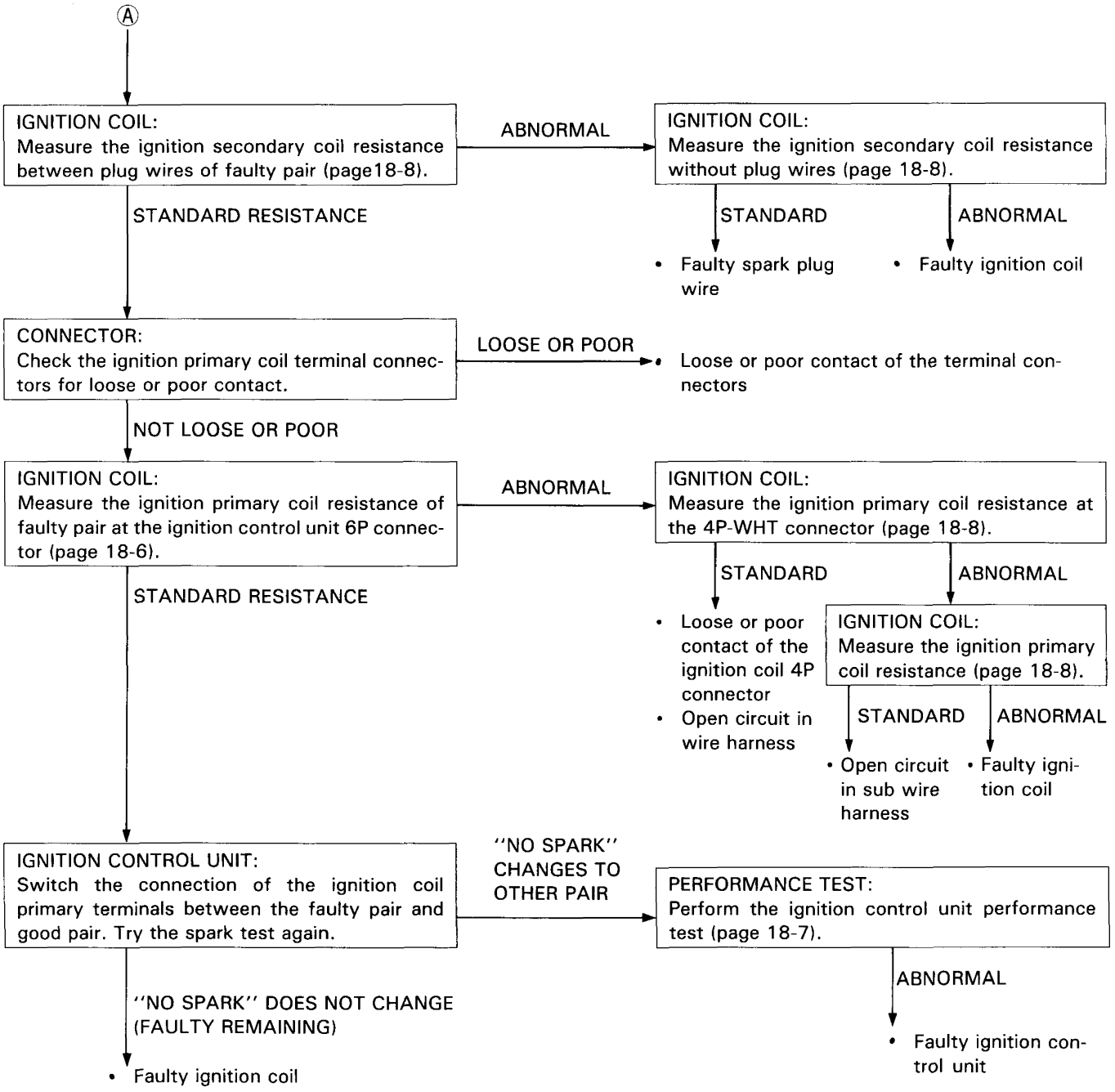
- *When performing a spark test, keep open flames or sparks away from the work area.*

NOTE

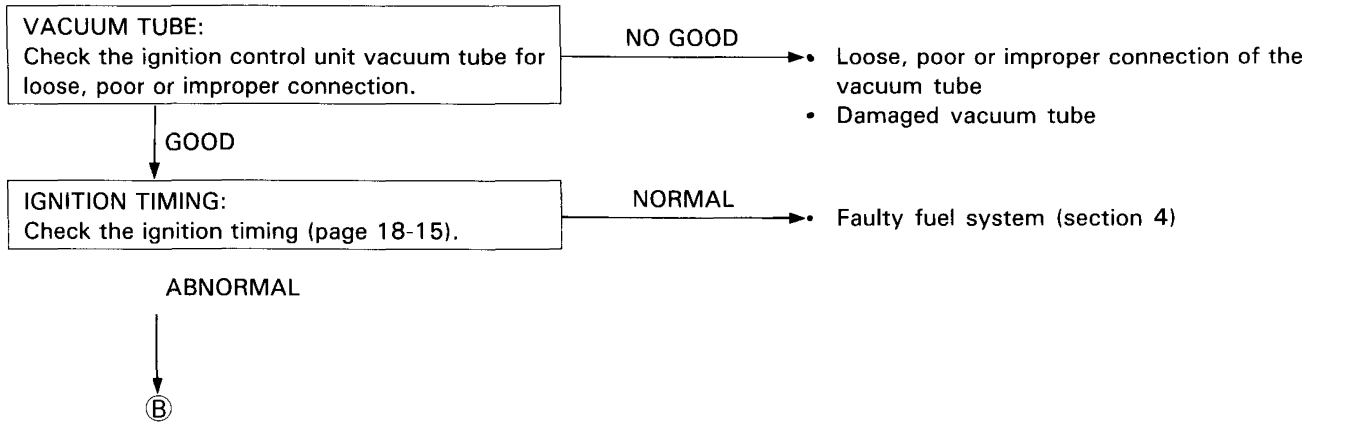
- Before beginning, be sure that the battery is fully charged.
- Each pair of spark plugs (1-2, 3-4, 5-6) has its own ignition circuit.

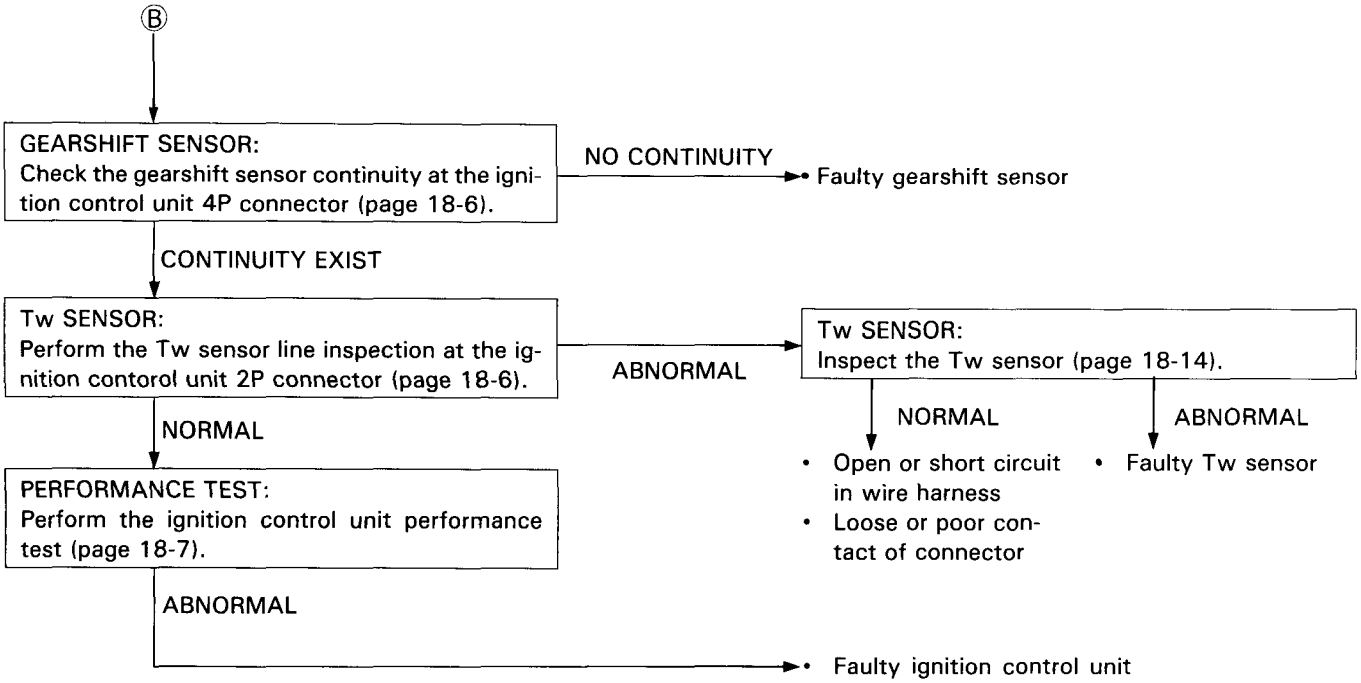
Engine does not start or is hard to start.





Engine starts, but runs rough at low engine speed (below 2,000 min^{-1} (rpm)).

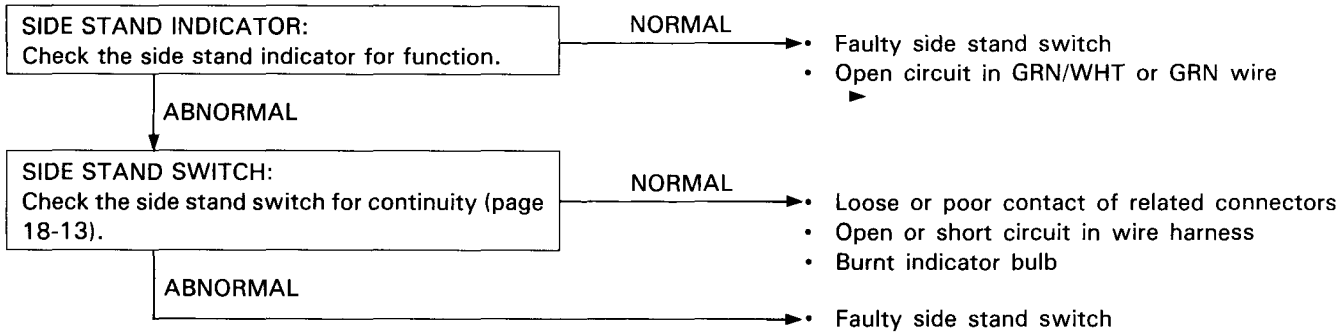




Poor performance (driveability) and poor fuel economy

- Faulty ignition timing (page 18-16)
- Fuel system malfunction (section 4)

Engine start, but side stand switch does not function at all



IGNITION CONTROL UNIT

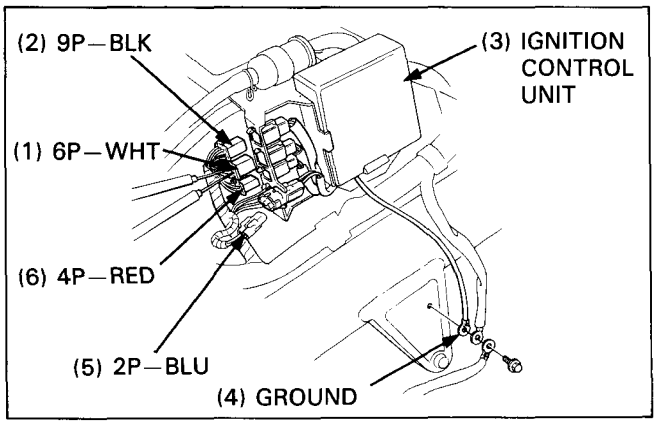
SYSTEM INSPECTION

Remove the right fairing inner cover (page 12-9).
Check that the ignition control unit is grounded on the frame properly.
Disconnect the ignition control unit connectors and check them for loose contact or corroded terminals.

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

NOTE

- When check for continuity of the side stand switch and gearshift sensor, connect the tester (+) probe to the ground.
- For Ta sensor inspection, see page 4-50.



ITEM	TERMINALS	SPECIFICATION
Ignition coil (primary, 5-6) (primary, 3-4) (primary, 1-2)	YEL/RED (6P-WHT) and BLK/WHT (6P-WHT) YEL/BLU (6P-WHT) and BLK/WHT (6P-WHT) YEL/WHT (6P-WHT) and BLK/WHT (6P-WHT)	2.6—3.2 Ohms (20°C/68°F)
Ground line	GRN (6P-WHT) and body ground	CONTINUITY
Battery voltage input	BLK/WHT (+) (6P-WHT) and ground (−) with the ignition switch ON and engine stop switch RUN	Battery voltage should register
Pulse generator coil (PC1) (PC 2)	GRN/BLK (2P-BLU) and WHT/YEL (9P-BLK) GRN/BLK (2P-BLU) and WHT/BLU (9P-BLK)	400—500 Ohms (20°C/68°F)
Side stand switch	GRN/WHT (4P-RED) (−) and ground (+)	CONTINUITY with the side stand housed NO CONTINUITY with the side stand applied
Gearshift sensor (Neutral) (Third gear) (Fourth gear) (Over Drive)	LT GRN/RED (4P-RED) (−) and ground (+) WHT/RED (6P-WHT) (−) and ground (+) RED/WHT (4P-RED) (−) and ground (+) GRN/ORN (4P-RED) (−) and ground (+)	CONTINUITY
Tw sensor	PNK/WHT (2P-BLU) and GRN/BLK (2P-BLU)	2.0—3.0 K ohms (20°C/68°F) 200—400 Ohms (80°C/176°F)

PERFORMANCE TEST

Remove the ignition control unit.

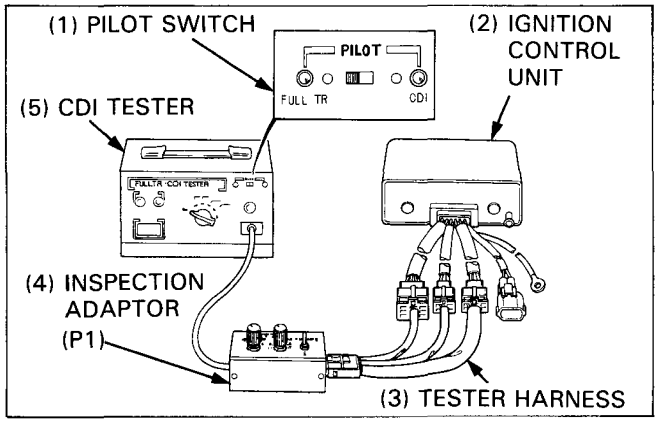
NOTE

- Follow the tester manufacturer's instructions.

Connect the inspection adaptor (P1) 07508—0013600 to the unit connector, and connect the tester.

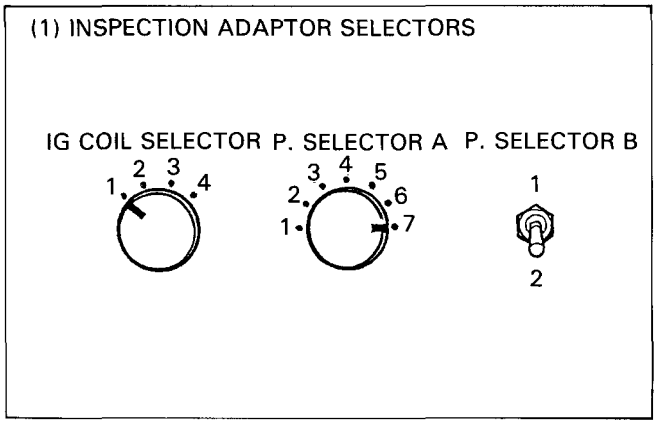
TOOL:

Inspection adaptor (P1)	**07508—0013600**
Tester harness	**07508—0014600**



Turn the selectors of the inspection adaptor as follows:

IG COIL SELECTOR: 1, 2, and 3
P.SELECTOR A: 4
P.SELECTOR B: 2



NOTE

- The fire must jump around all specified ranges (1, 2 and 3) of the IG COIL SELECTOR.

Turn the pilot switch on the FULL TR CDI TESTER to the "FULL TR" side.

Inspect the unit following table.

	Good condition	No good condition
OFF	No Fire	——
P	↑	——
EXT	↑	Fire
ON1	Fire	No Fire
ON2	↑	↑

IGNITION COIL

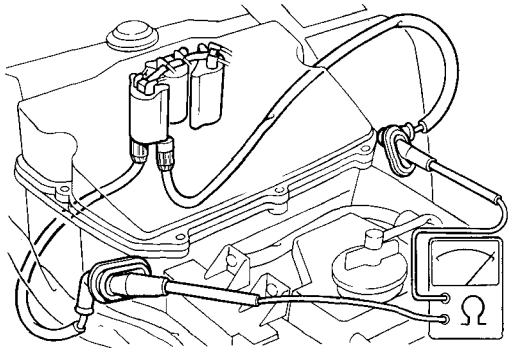
INSPECTION

Remove the fairing lower covers (page 12-9).
Disconnect the spark plug caps from the spark plugs and measure the secondary resistance with the spark plug caps at each ignition pair (1-2, 3-4 and 5-6).

STANDARD: 21—29 K ohms (20°C/68°F)

If the secondary resistance is not within specification, remove the ignition coils (see below) and check resistance again without the spark plug wires.
(see below).

(1) SECONDARY COIL RESISTANCE



Remove the right fairing inner cover (page 12-9).
Disconnect the 4P-WHT connector from the wire harness.

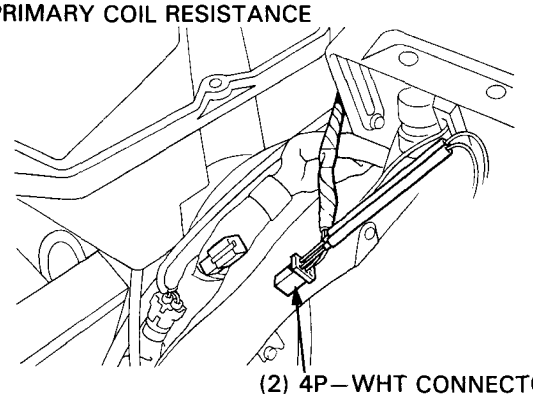
Measure the primary coil resistance between the below terminals.

- 1-2 coil: YEL/WHT and BLK/WHT
- 3-4 coil: YEL/BLU and BLK/WHT
- 5-6 coil: YEL/RED and BLK/WHT

STANDARD: 2.6—3.2 Ohms (20°C/68°F)

If the primary resistance is not within specification, remove the ignition coils (see below) and check resistance between the primary terminals (see below).

(1) PRIMARY COIL RESISTANCE

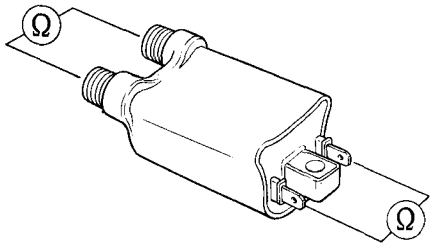


(2) 4P—WHT CONNECTOR

Remove the ignition coil, disconnect the spark plug wires and measure the primary/ secondary coil resistances as shown.

STANDARDS:
Primary coil: 2.6—3.2 Ohms (20°C/68°F)
Secondary coil: 13—17 K ohms (20°C/68°F)

(1) SECONDARY COIL

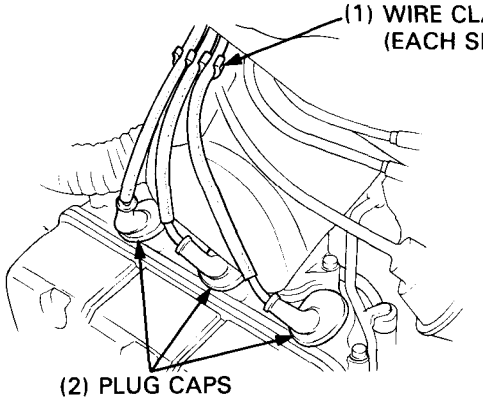


(2) PRIMARY COIL

REMOVAL

Remove the fairing lower covers (page 12-9).
Remove the spark plug caps from the spark plugs.
Release the spark plug wires from the wire clamps of the cooling fans.

(1) WIRE CLAMP (EACH SIDE)



(2) PLUG CAPS

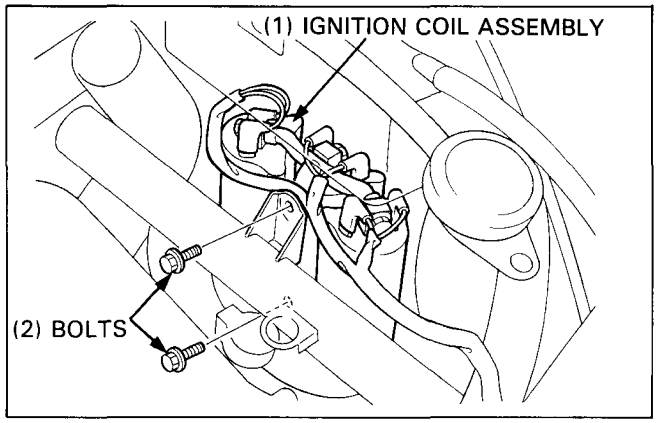
Remove the carburetor (page 4-17).

NOTE

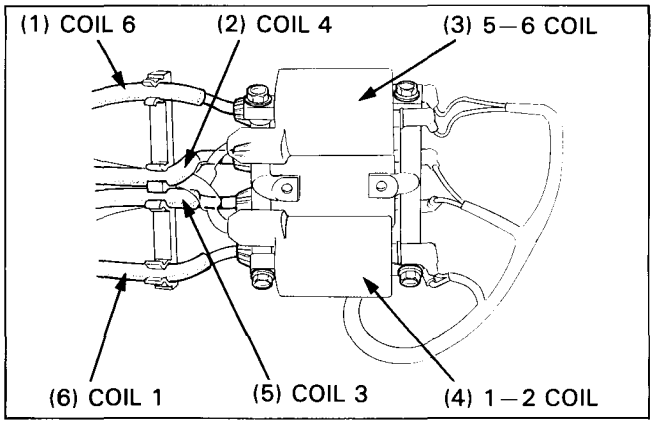
- Do not disconnect the cables and water hoses from the carburetor.

Remove the ignition coil stay mounting bolts, shift down the coils temporarily and then remove the radiator reserve tank (page 5-11).

Remove the ignition coil assembly.



Disconnect the ignition coil wires from the primary terminals and remove the spark plug wire clamp.
Remove the ignition coil mounting bolts and disassemble them.



INSTALLATION

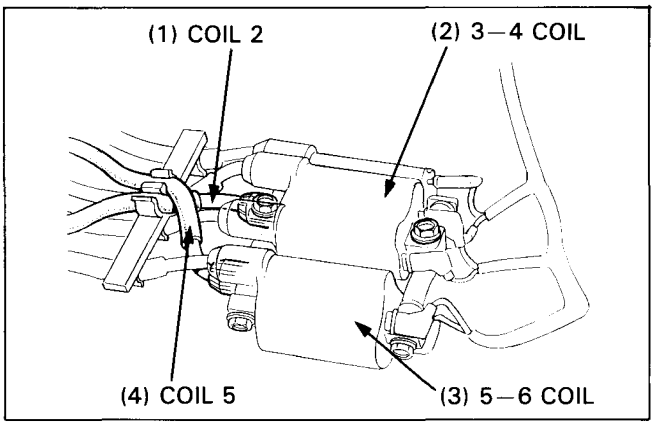
Install the ignition coils on the ignition coil stay as shown (step 2 and 3).

Route the spark plug wires properly onto the wire clamp as shown.

Connect the ignition coil wires on the primary terminals properly.

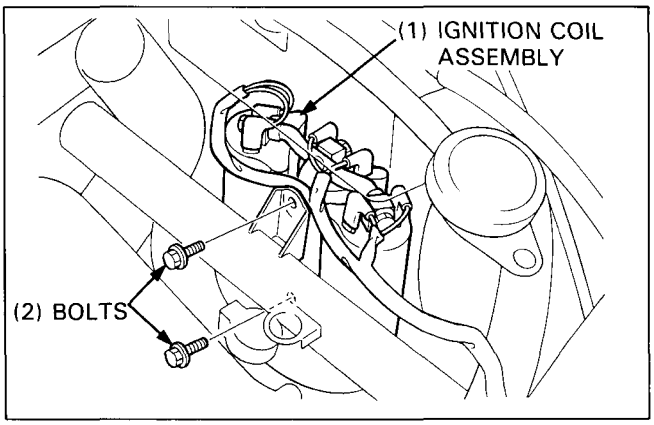
NOTE

	Black Teminal	Green Terminal
1-2 Coil	BLK/WHT wire	YEL/WHT wire
3-4 Coil	BLK/WHT wire	YEL/BLU wire
5-6 Coil	BLK/WHT wire	YEL/RED wire



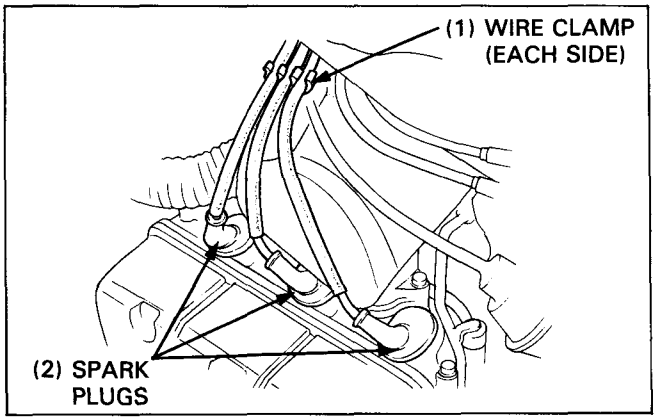
Install the ignition coil assembly onto the frame, but do not still install the mounting bolts.

Install the radiator reserve tank (page 5-11).
Install and tighten the ignition coil stay mounting bolts.
Install the carburetor (page 4-33).



Clamp the spark plug wires properly with the wire clamps of the cooling fans as shown.
Connect the spark plug caps to the spark plugs.

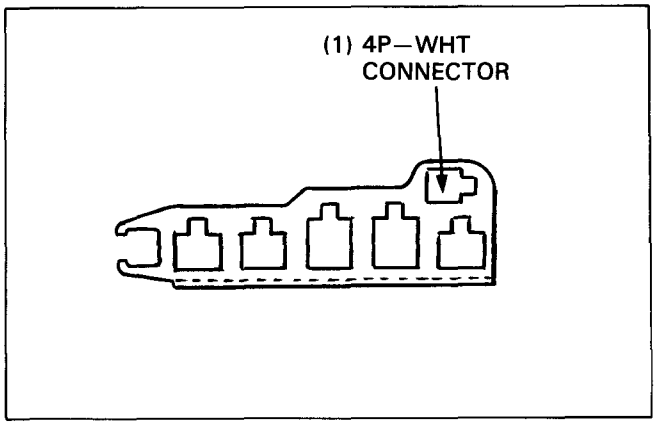
Install the fairing lower covers (page 12-9).



PULSE GENERATOR

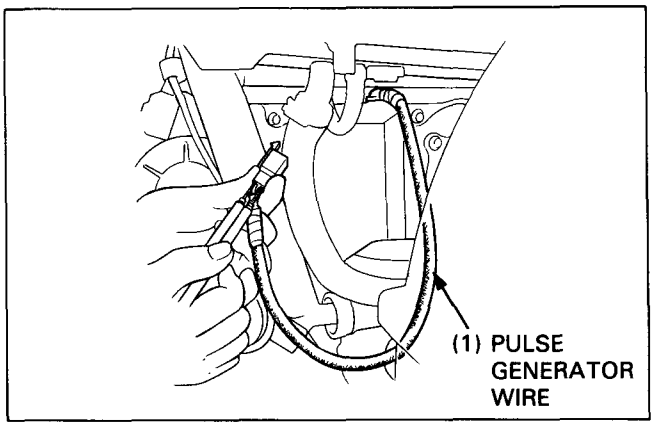
INSPECTION

Remove the right fairing lower cover (page 12-9).
Disconnect the 4P-WHT connector of the connector holder on the right cooling fan.



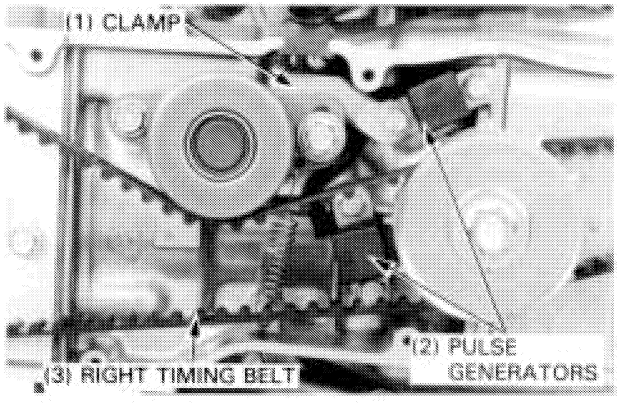
Measure resistance:
YEL and WHT/YEL wire terminals (pulse generator 1),
BLU and WHT/BLU wire terminals (palse generator 2).

STANDARDS: 400—500 Ohms (20°C/68°F)



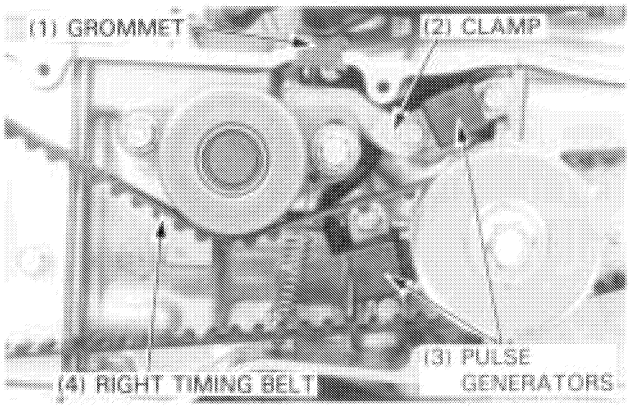
REMOVAL

Remove the following:
- fairing front cover (page 12-8).
- under cover (page 12-8)
- timing belt covers (page 7-3).
- right timing belt (page 7-3).
- pulse generator mounting bolts.
- wire clamp.
- pulse generators.



INSTALLATION

Set the pulse generator wire grommet into the crankcase *groove properly*.
Install the pulse generators with the wire clamp, and tighten the mounting bolts securely.
Connect the 4P-WHT connector.
Install the following:
— right timing belt (page 7-21).
— timing belt covers (page 7-25).
— under cover, fairing front cover and right fairing lower cover (page 12-5).



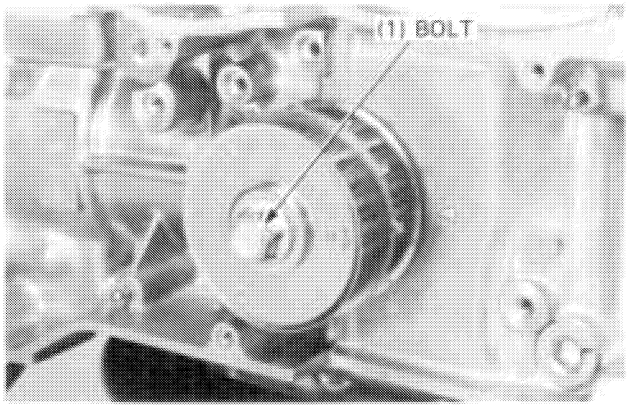
PULSE ROTOR REMOVAL/INSTALLATION

NOTE

- It is not necessary to remove the pulse generator and tensioner rollers.

Remove the timing belts (page 7-3).

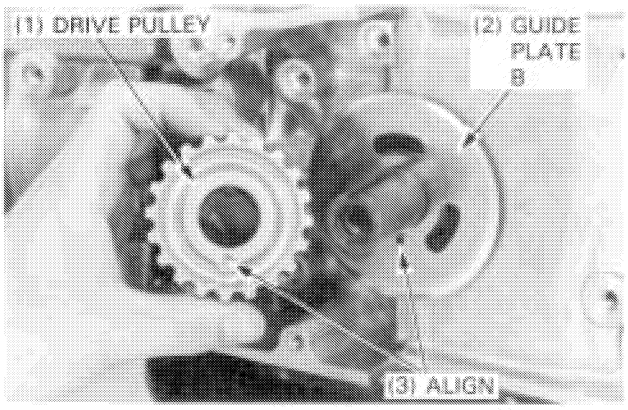
Remove the timing belt drive pulley bolt and disassemble them.



Install the guide plate B with its projection facing out.
Install one timing belt drive pulley, aligning the pulley hole with the guide projection.

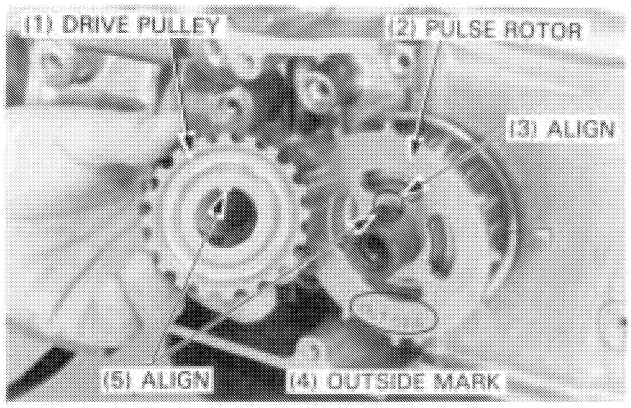
NOTE

- Align the pulley key with the crankshaft keyway.

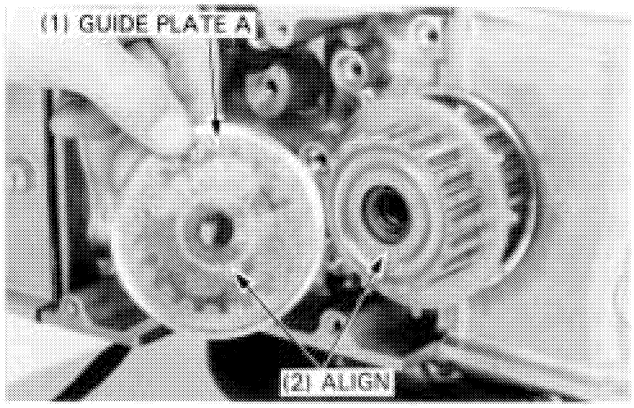


Install the pulse rotor with its "OUTSIDE" mark facing out, aligning the rotor key with the crankshaft keyway.

Install the timing belt drive pulley with its hole facing out, aligning the pulley key with the crankshaft keyway.

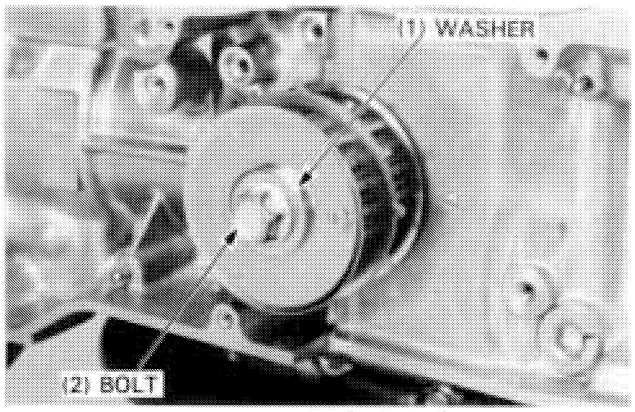


Install the guide plate A, aligning its projection with the pulley hole.



Install the washer and timing belt drive pulley bolt. Tighten the bolt to the specified torque.

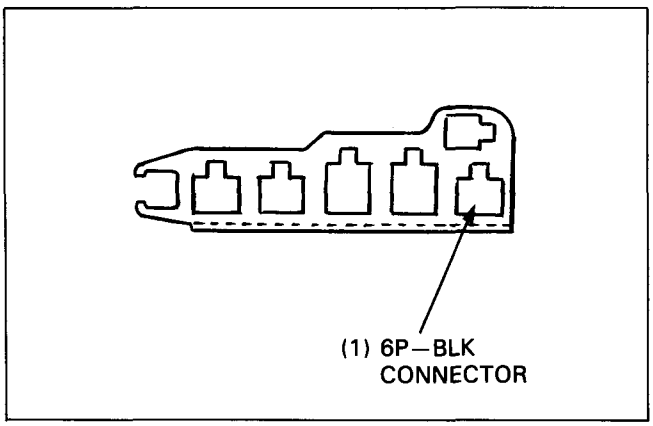
TORQUE: 75 N·m (7.5 kg-m, 54 ft-lb)



GEARSHIFT SENSOR

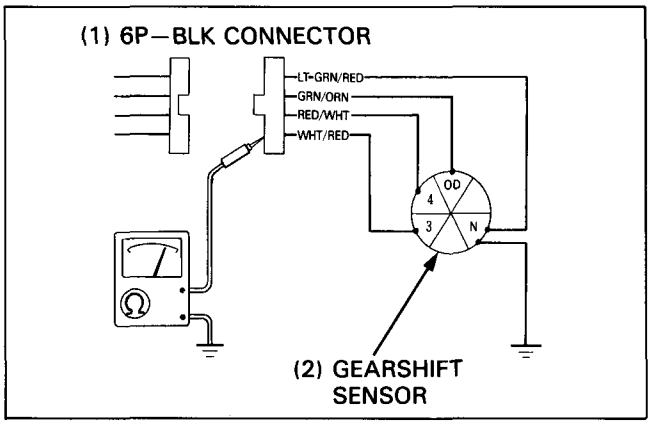
INSPECTION

Remove the right fairing lower cover (page 12-9).
Disconnect the 6P-BLK connector of the connector holder on the right cooling fan.



Check for continuity between each terminal as shown below and ground. There should be continuity at each gear position.

GEAR POSITION	TERMINALS	SPECIFICATION
Neutral gear Third gear Fourth gear OD gear	LT GRN/RED and ground WHT/RED and ground RED/WHT and ground GRN/ORN and ground	CONTINUITY



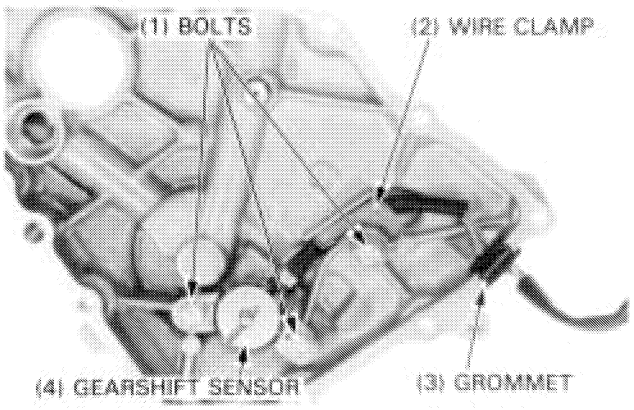
REMOVAL

Remove the front engine cover (page 10-4).
Remove the bolt and gearshift sensor.

INSTALLATION

Install the gearshift sensor with the wire grommet set into the cover groove.
Install and tighten the bolt with wire clamp.

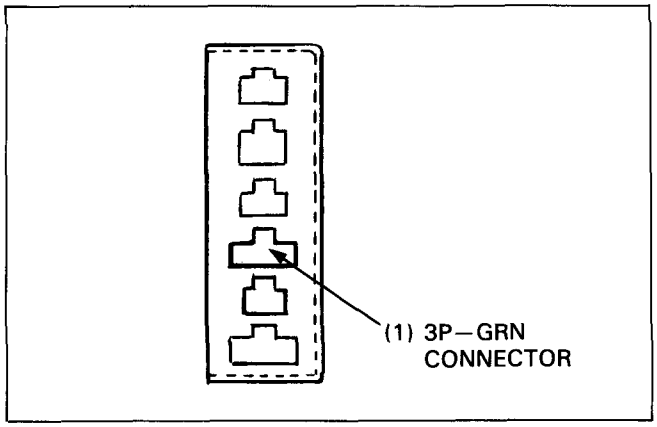
Install the front engine cover (page 10-19).



SIDE STAND SWITCH

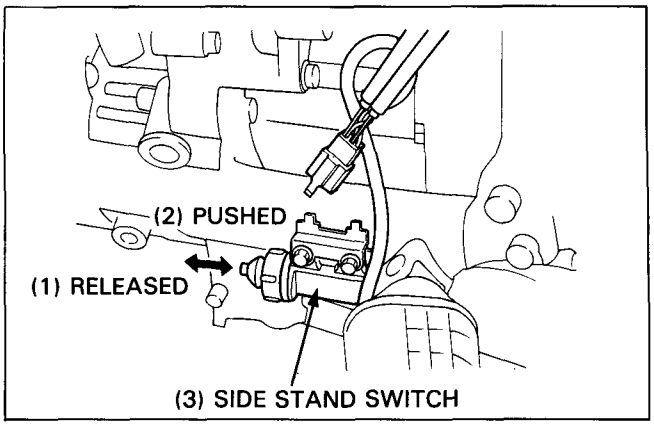
INSPECTION

Remove the left fairing inner cover (page 12-9).
Disconnect the 3P-GRN connector of the connector holder behind the cruise control valve unit.



Check for continuity between each terminal as shown below.

Item	Terminal	Specification
The switch is pushed. (side stand down)	GRN/WHT and GRN	NO CONTINUITY
	YEL/BLK and GRN	CONTINUITY
The switch is released. (side stand up)	GRN/WHT and GRN	CONTINUITY
	YEL/BLK and GRN	NO CONTINUITY

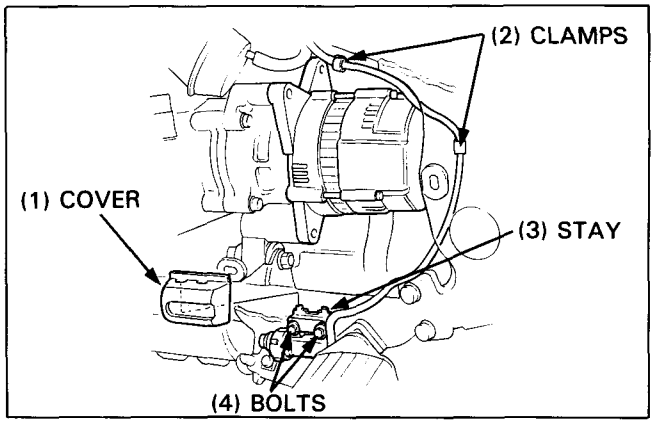


REMOVAL

Remove the side stand switch cover.
Remove the side stand switch mounting bolts and cover stay.
Release the wire clamps and remove the side stand switch from the frame.

INSTALLATION

Install the side stand switch in the reverse order of removal.



Tw SENSOR

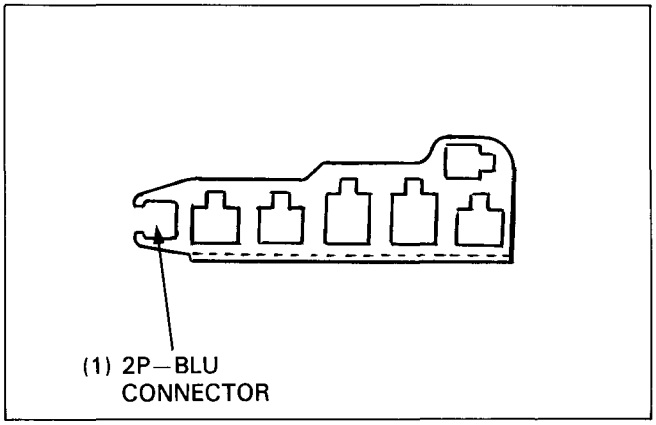
INSPECTION/REMOVAL

Remove the following:
- right fairing lower cover (page 12-9).
- right cooling fan (page 5-10).
- right radiator (page 5-8).

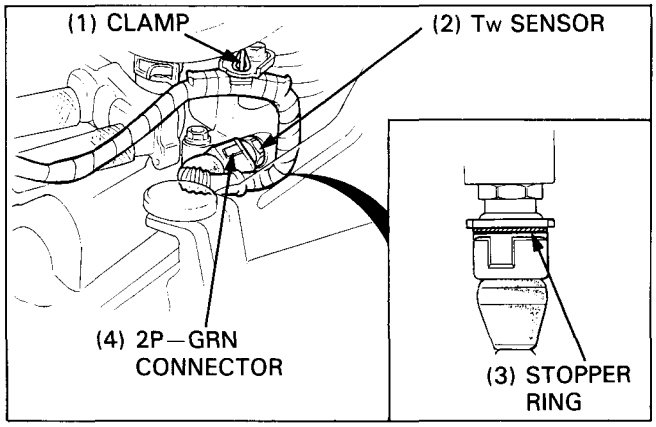
NOTE

- It is not necessary to disconnect the radiator hoses.

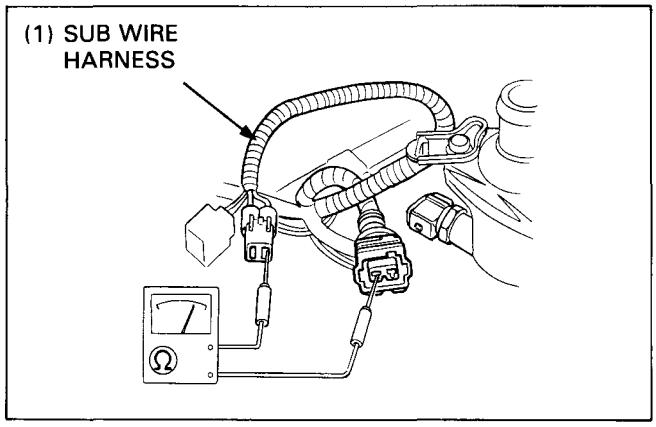
Disconnect the waterproof 2P-BLU connector of the connector holder on the right cooling fan.



Remove the sub wire harness clamp from the holder on the thermostat housing cover.
Disconnect the 2P-GRN connector from the Tw sensor by removing the stopper ring of the connector.



Check for continuity between connectors of the sub wire harness.
There should be continuity between same color wires.
There should be no continuity between different color wires.



Drain coolant (page 5-7).
Remove the Tw sensor from the thermostat housing.
Suspend the sensor in cold water. Heat the water slowly.
Measure resistance between the terminals.

STANDARDS:
2.0—3.0 K ohms at 20°C (68°F)
200—400 Ohms at 80°C (176°F)

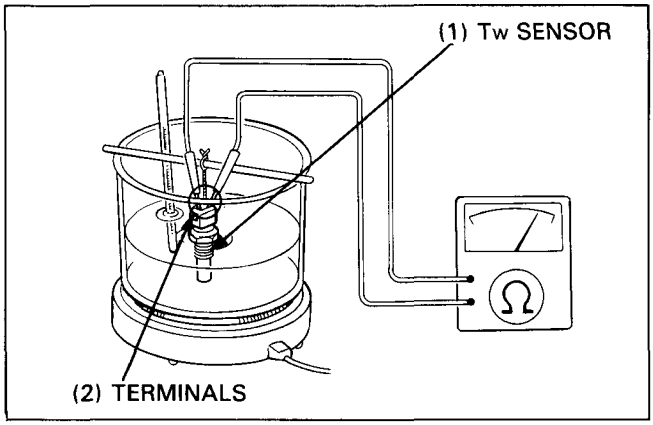
NOTE

- If the Tw sensor or thermometer touches the pan, false readings will result.
- Stir water well.

CAUTION

- *Do not attach water onto the sensor terminals.*

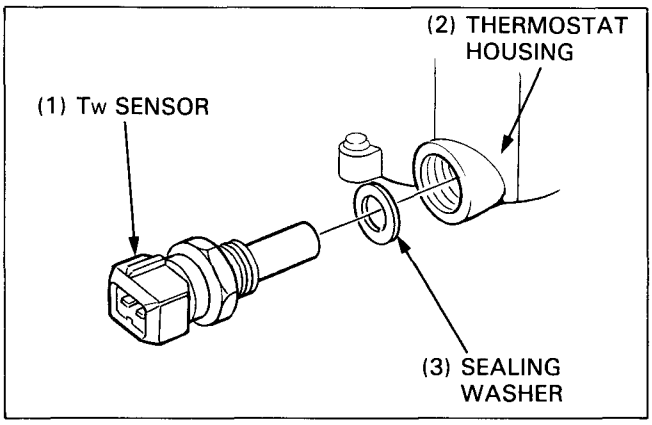
If resistance is outside the above ranges, replace the Tw senor.



INSTALLATION

Install the Tw sensor with a new sealing washer onto the thermostat housing.
Tighten the sensor to the specified torque.

TORQUE: 28 N·m (2.8 kg-m, 20 ft-lb)

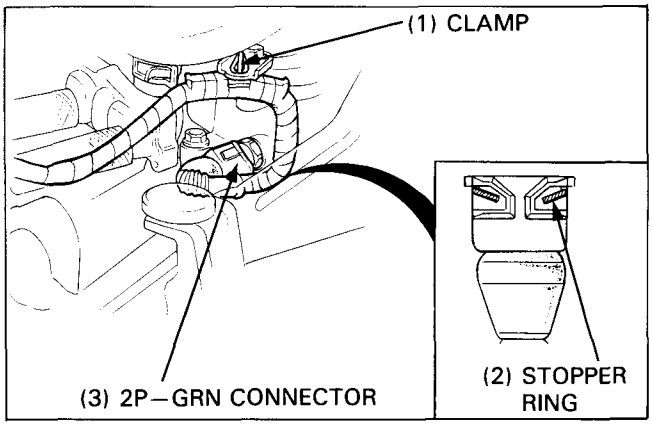


Set the stopper ring into the groove of the 2P-GRN connector as shown.

Connect the 2P-GRN connector to the Tw sensor properly.
Connect the sub wire harness clamp to the holder on the thermostat housing cover.
Connect the waterproof 2P-BLU connector of the connector holder on the right cooling fan.

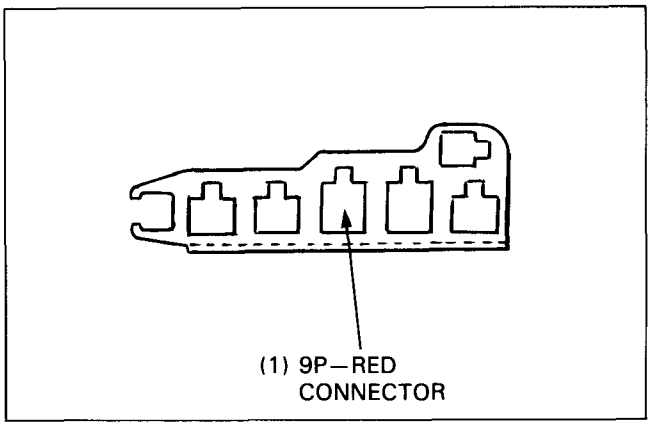
Install the following:
– right cooling fan (page 5-10).
– right radiator (page 5-9).
– right fairing lower cover (page 12-9).

Fill the cooling system with coolant (page 5-7).



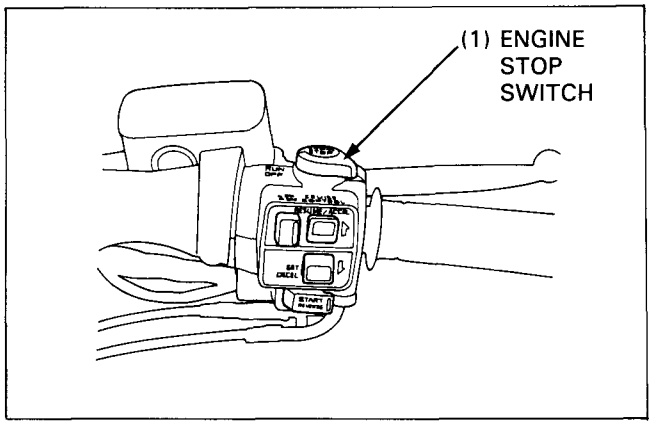
ENGINE STOP SWITCH

Remove the right fairing lower cover (page 12-9).
Disconnect the 9P-RED connector of the connector holder on the right cooling fan.



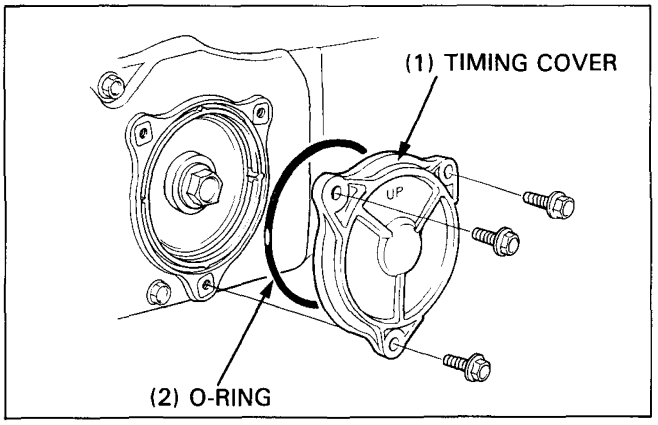
Test for continuity between the color coded wires.

Color	BLK/LT GRN	BLK/WHT
OFF		
RUN	○———	———○
OFF		



IGNITION TIMING

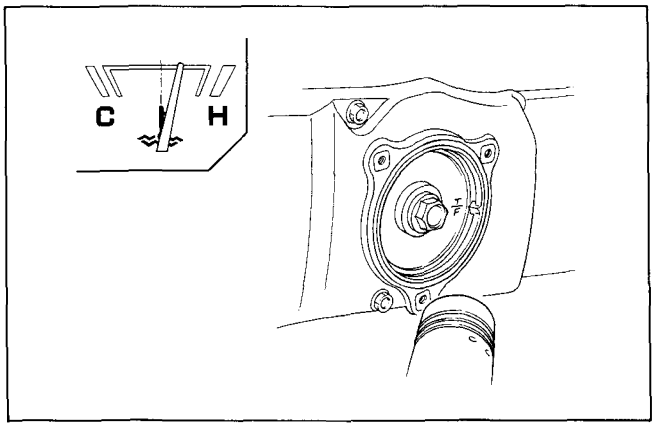
Remove the following:
— fairing lower covers (page 12-9).
— fairing front cover (page 12-8).
— timing cover and O-ring.



Start the engine and warm it up to operation temperature (above 50°C/122°F).

NOTE

- Make sure the temperature gauge resisters above the center position. This is the temperature that the cooling fan operate.



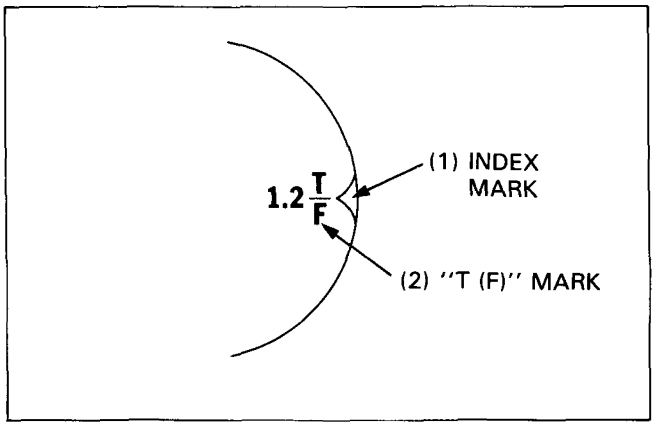
IGNITION TIMING INSPECTION

Stop the engine and connect a stroboscopic timing light to the No. 1 or No. 2 cylinder spark plug wire. Start the engine with the transmission in neutral and let it 900 ± 50 min^{-1} (rpm) by adjusting the throttle stop screw.

The timing is correct if the guide plate T(F) 1.2 mark aligns with the timing cover index mark.

Connect the timing light to the No. 3 or 4 cylinder spark plug wire and check the ignition timing for No. 3 or 4 cylinders as previously described by observing the T(F) 3.4 mark. And also check the No. 5 or 6 cylinder timing by the same way.

Stop the engine and check the vacuum advance.

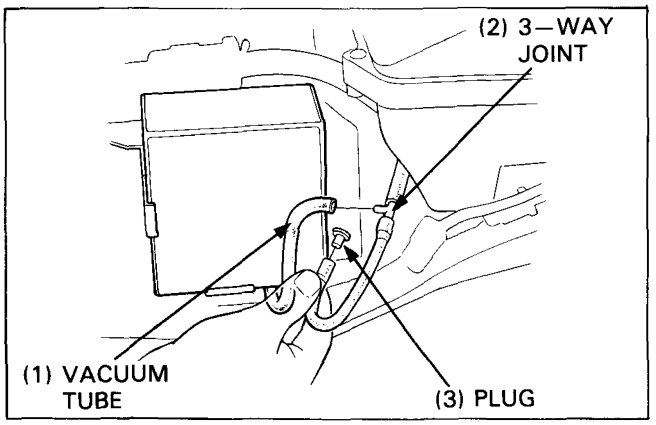


VACUUM ADVANCE INSPECTION

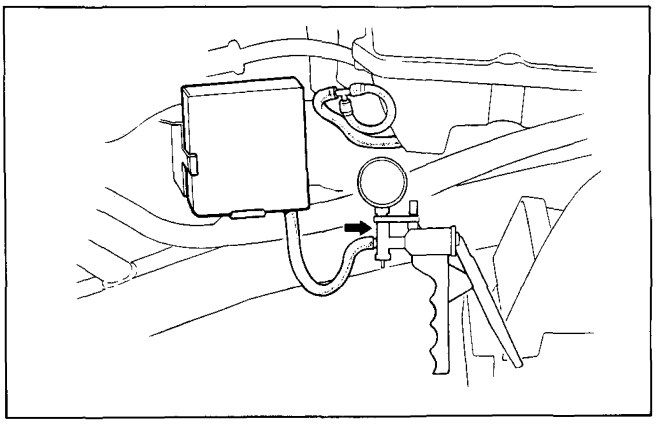
Remove the top compartment and right fairing inner cover (page 12-7).
Disconnect the vacuum tube that goes from the ignition control unit to the 3-way joint. Remove the plug from the dead end tube, and connect the tube to the 3-way joint as shown.

NOTE

- Do not lose the plug.



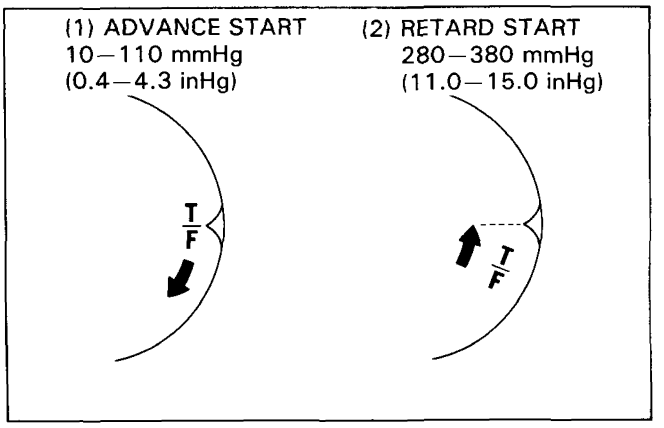
Connect a vacuum pump to the ignition control unit vacuum tube.



Start the engine and warm it up to operation temperature (above 50°C/122°F).

Let the engine idle with the transmission in the 3rd, 4th or OD. Apply vacuum to the control unit and check the T(F) mark movement with a timing light.

The advance should start at:
10—110 mmHg (0.4—4.3 inHg)
The advance stop and the retard should start at:
280—380 mmHg (11.0—15.0 inHg)
at atmospheric pressure, 760 mmHg (29.9 inHg)



NOTE

- Keep the engine speed on idle by adjusting the throttle stop screw while testing the vacuum advance.

Stop the engine and check the gearshift sensor timing shift.

GEARSHIFT SENSOR TIMING SHIFT INSPECTION

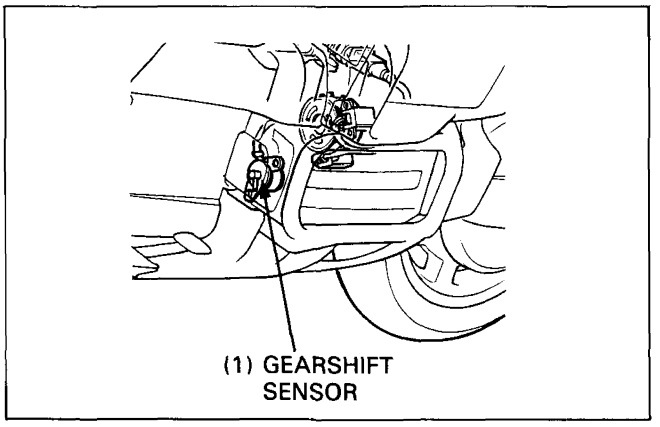
NOTE

- Connect a vacuum tube to the ignition control unit.

Start the engine and warm it up to operation temperature (above 50°C/122°F).
Let the engine run at 1,200 ± 100 min^{-1} (rpm) by adjusting the throttle stop screw with the transmission in neutral.

Shift the transmission to 3rd, 4th or OD from 1st, neutral or 2nd. The engine speed should increase by approximately 500 min^{-1} (rpm).

Stop the engine and check the atmosphere temperature timing shift.



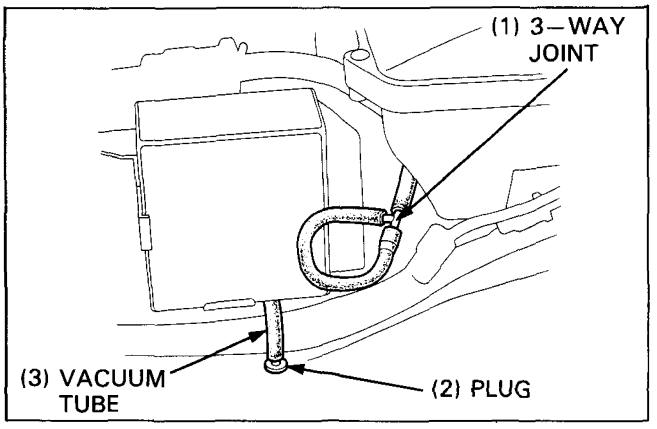
ATMOSPHERE TEMPERATURE TIMING SHIFT INSPECTION

NOTE

- You cannot run this test below 640 mmHg (25.2 inHg) of atmospheric pressure (above 1,500 mm/5,000 feet).

Start the engine and warm it up to operation temperature (above 50°C/122°F).

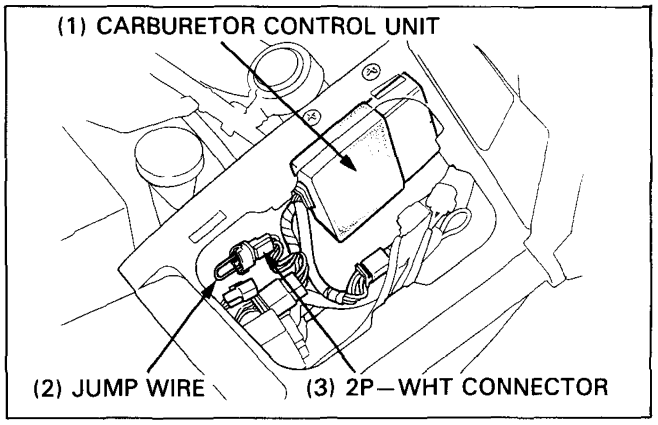
Stop the engine, and remove the top compartment and right *fairing inner cover (page 12-7)*.
Disconnect the vacuum tube that goes from the ignition control unit to the 3-way joint. Remove the plug from the dead end tube, and connect the tube to the 3-way joint and install the plug into the unit tube as shown.



Disconnect the waterproof 2P-WHT connector of the Ta sensor and short the terminals of the carburetor control unit side with a jump wire.

Start the engine and let it idle with the transmission in 3rd, 4th or OD.
Remove the jump wire, and the engine speed should increase by approximately 100 min^{-1} (rpm).

Stop the engine and check the coolant temperature timing shift inspection.



COOLANT TEMPERATURE TIMING SHIFT INSPECTION

Remove the Ta sensor (page 4-50) and remove the Tw sensor (page 18-14).

NOTE

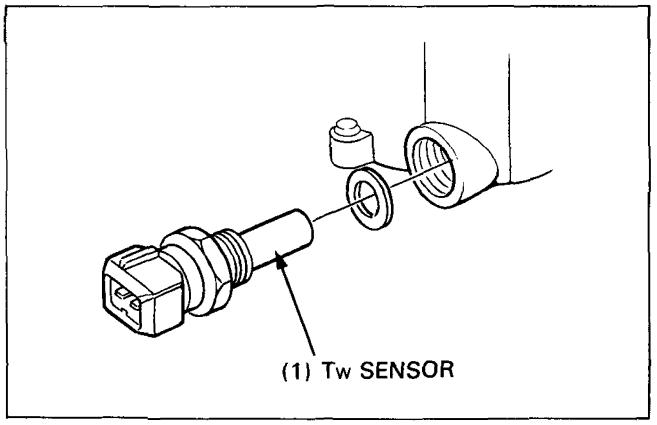
- To re-use the coolant, drain it into clean pan.

Disconnect the Ta sensor sub wire harness from the Ta sensor and temporarily connect the sub wire harness to the Tw sensor.

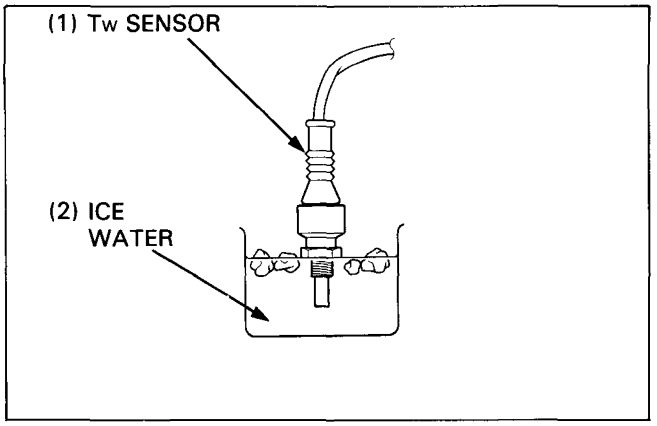
Install the removed Ta sensor into the thermostat housing (28 N·m) and fill the system with coolant.

CAUTION

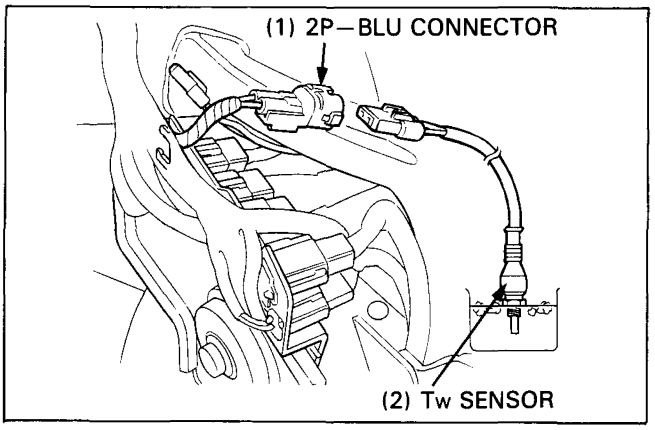
- *Do not damage the housing.*



Cool down the Tw sensor in the ice water for approximately 10 minutes.



Start the engine and warm it up to operating temperature (above 50°C/122°F).
Connect the cooled-down Tw sensor to the waterproof 2P-BLU connector of the connector holder on the right cooling fan.
The engine speed should increase by approximately 200 min^{-1} (rpm).



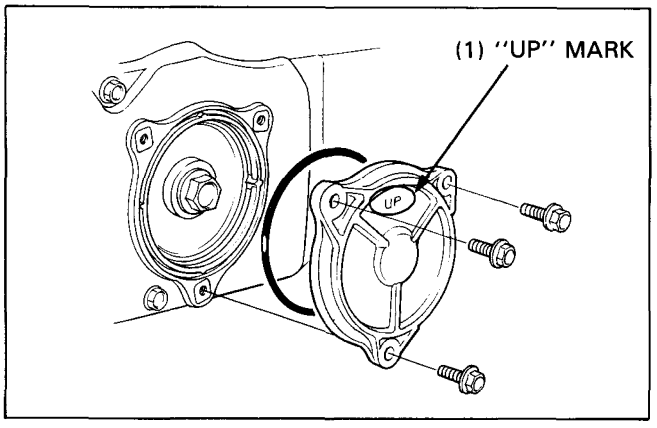
NOTE

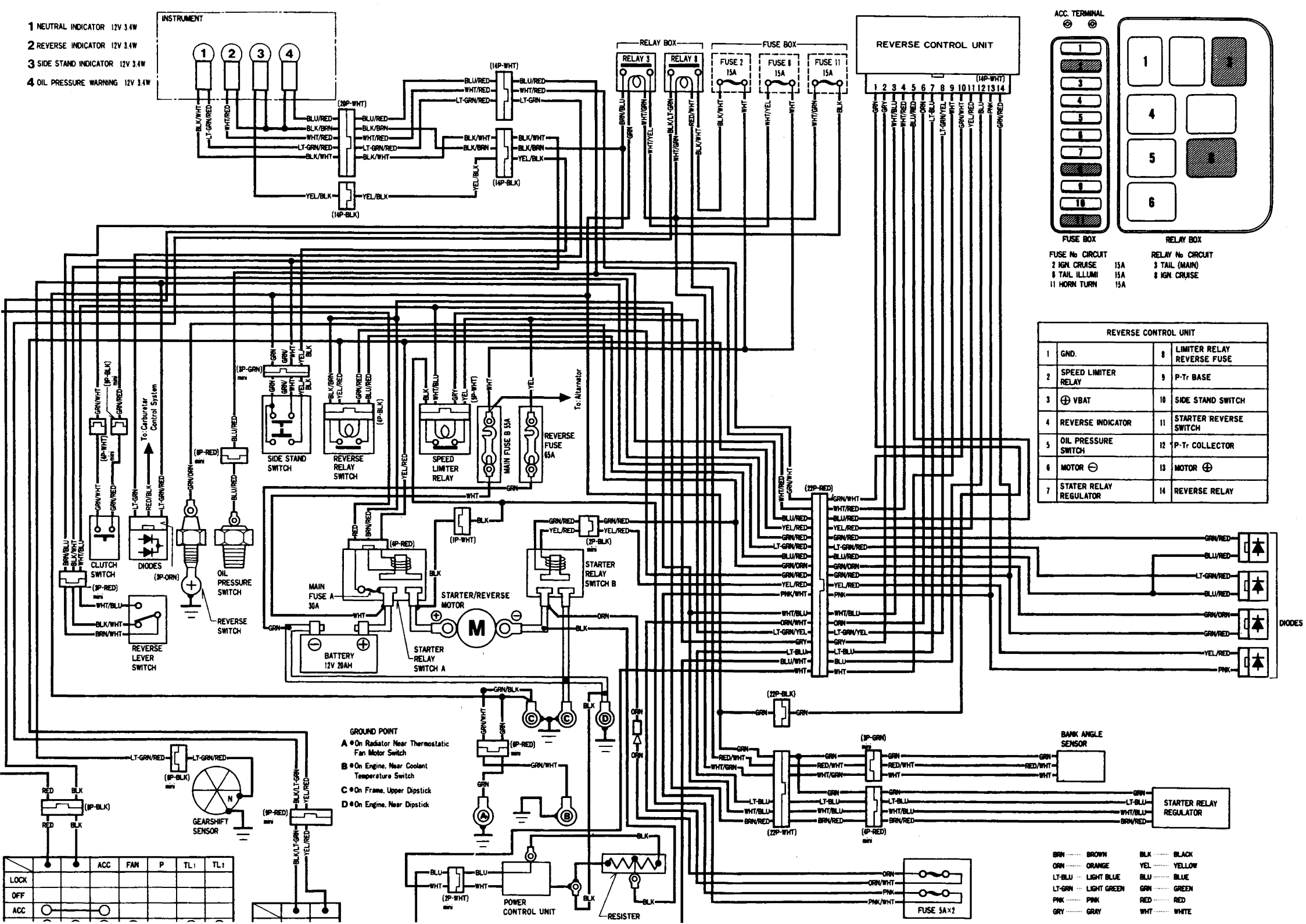
- If ignition timing is not correct, check all individual ignition system components except the ignition control unit. If the individual components are good, replace th ignition control unit.

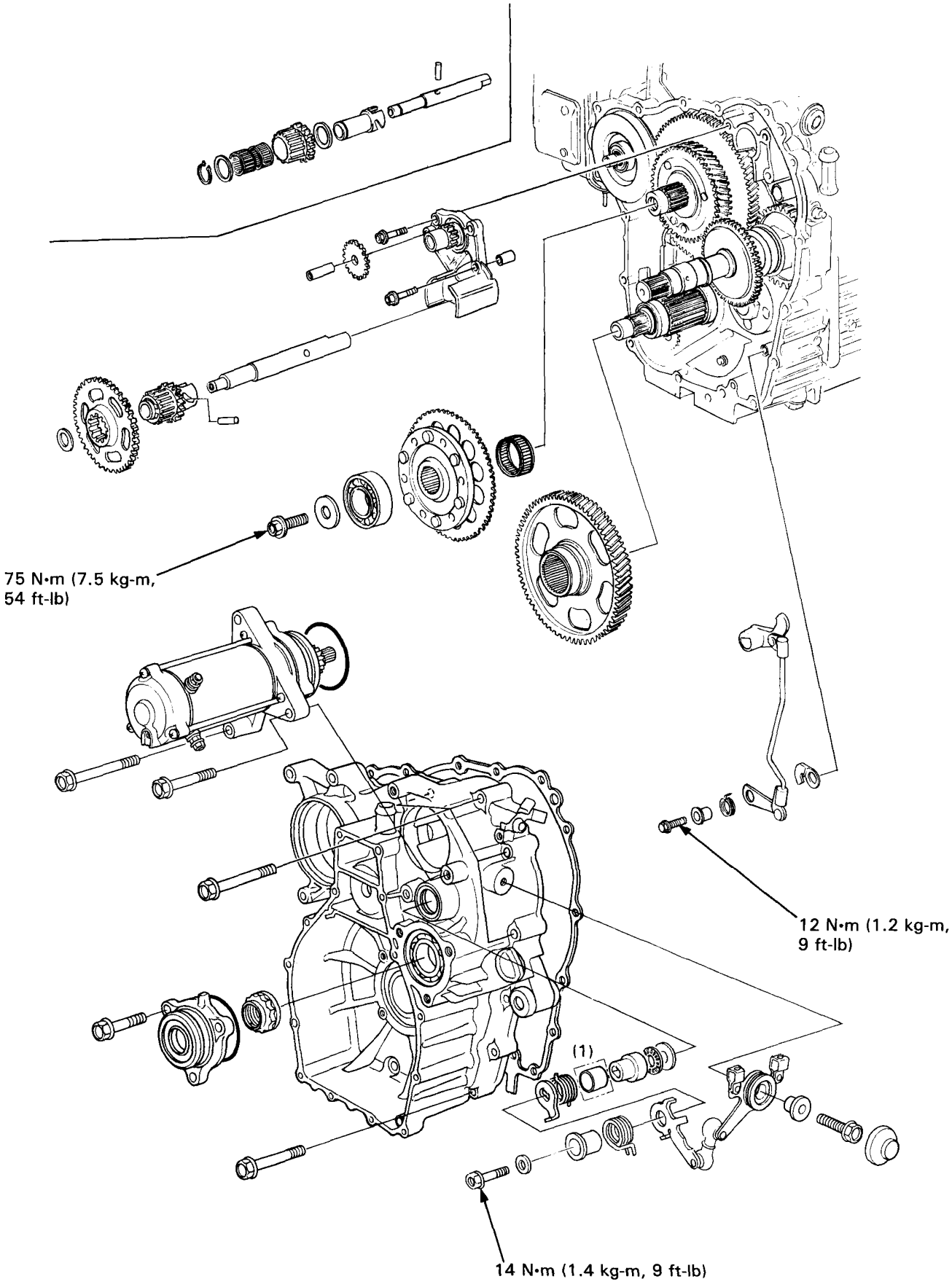
After inspecting the ignition timing, install the removed parts in the reverse order of removal.

NOTE

- Install the timing cover with its "UP" mark facing up.

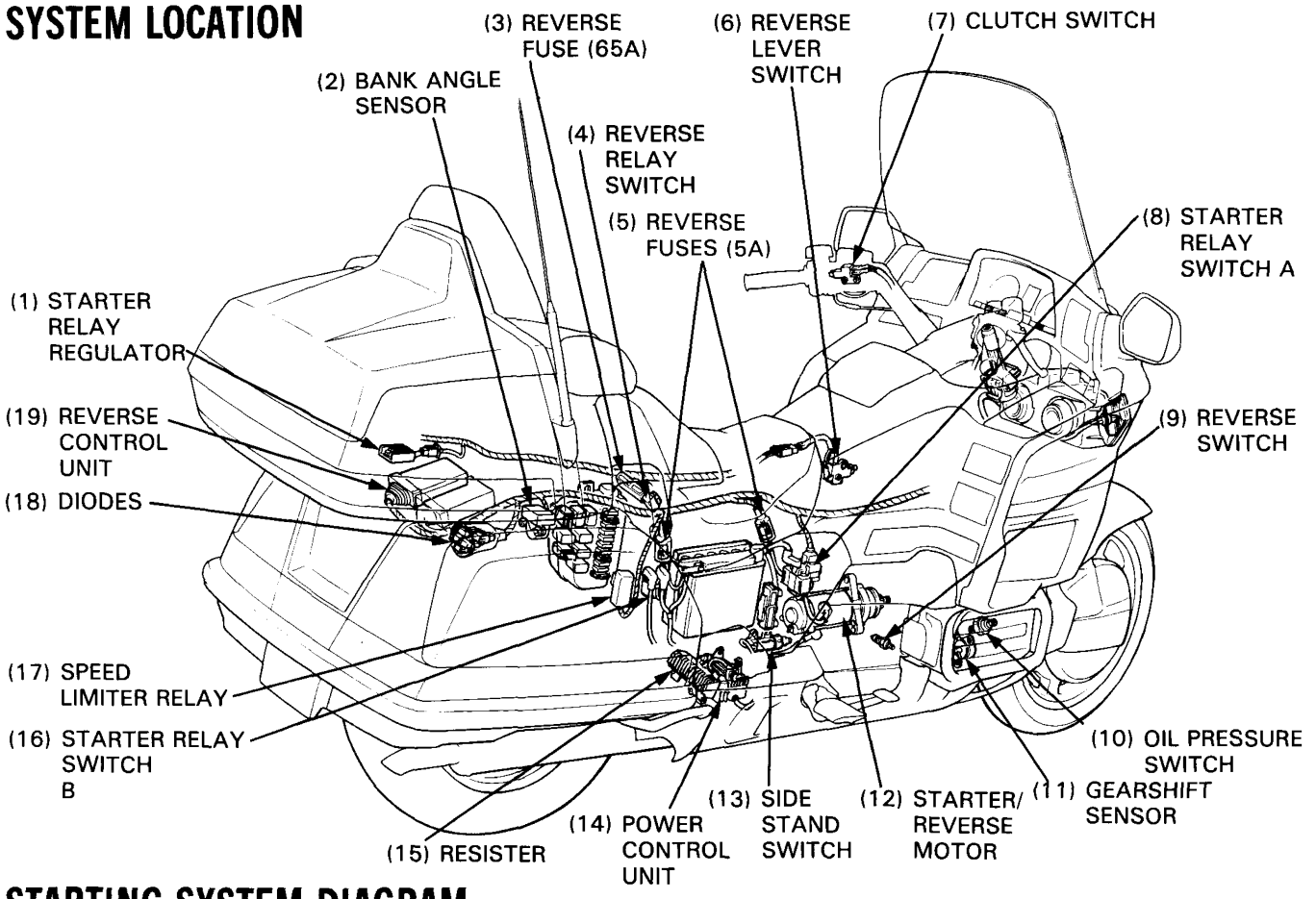



1 NEUTRAL INDICATOR 12V 3.4W
2 REVERSE INDICATOR 12V 3.4W
3 SIDE STAND INDICATOR 12V 3.4W
4 OIL PRESSURE WARNING 12V 3.4W
INSTRUMENT
RELAY BOX
RELAY 3
RELAY 8
FUSE BOX
FUSE 2 15A
FUSE 8 15A
FUSE 11 15A
REVERSE CONTROL UNIT
ACC. TERMINAL
FUSE BOX
RELAY BOX
FUSE No CIRCUIT
2 IGN. CRUISE 15A
8 TAIL ILLUMI 15A
11 HORN TURN 15A
RELAY No CIRCUIT
3 TAIL (MAIN)
8 IGN. CRUISE
REVERSE CONTROL UNIT
1 GND.
2 SPEED LIMITER RELAY
3 ⊕ VBAT
4 REVERSE INDICATOR
5 OIL PRESSURE SWITCH
6 MOTOR ⊖
7 STATER RELAY REGULATOR
8 LIMITER RELAY REVERSE FUSE
9 P-Tr BASE
10 SIDE STAND SWITCH
11 STARTER REVERSE SWITCH
12 P-Tr COLLECTOR
13 MOTOR ⊕
14 REVERSE RELAY
SIDE STAND SWITCH
REVERSE RELAY SWITCH
SPEED LIMITER RELAY
MAIN FUSE B 35A
REVERSE FUSE 65A
To: Alternator
To: Carburetor Control System
CLUTCH SWITCH
DIODES
OIL PRESSURE SWITCH
REVERSE SWITCH
REVERSE LEVER SWITCH
MAIN FUSE A 30A
STARTER/REVERSE MOTOR
STARTER RELAY SWITCH B
STARTER RELAY SWITCH A
BATTERY 12V 20AH
GEARSHIFT SENSOR
BANK ANGLE SENSOR
STARTER RELAY REGULATOR
POWER CONTROL UNIT
RESISTER
FUSE 5A×2
GROUND POINT
A ●On Radiator Near Thermostatic Fan Motor Switch
B ●On Engine, Near Coolant Temperature Switch
C ●On Frame, Upper Dipstick
D ●On Engine, Near Dipstick
LOCK
OFF
ACC
ACC FAN P TL1 TL2
BRN BROWN
ORN ORANGE
LT-BLU LIGHT BLUE
LT-GRN LIGHT GREEN
PNK PINK
GRY GRAY
BLK BLACK
YEL YELLOW
BLU BLUE
GRN GREEN
RED RED
WHT WHITE

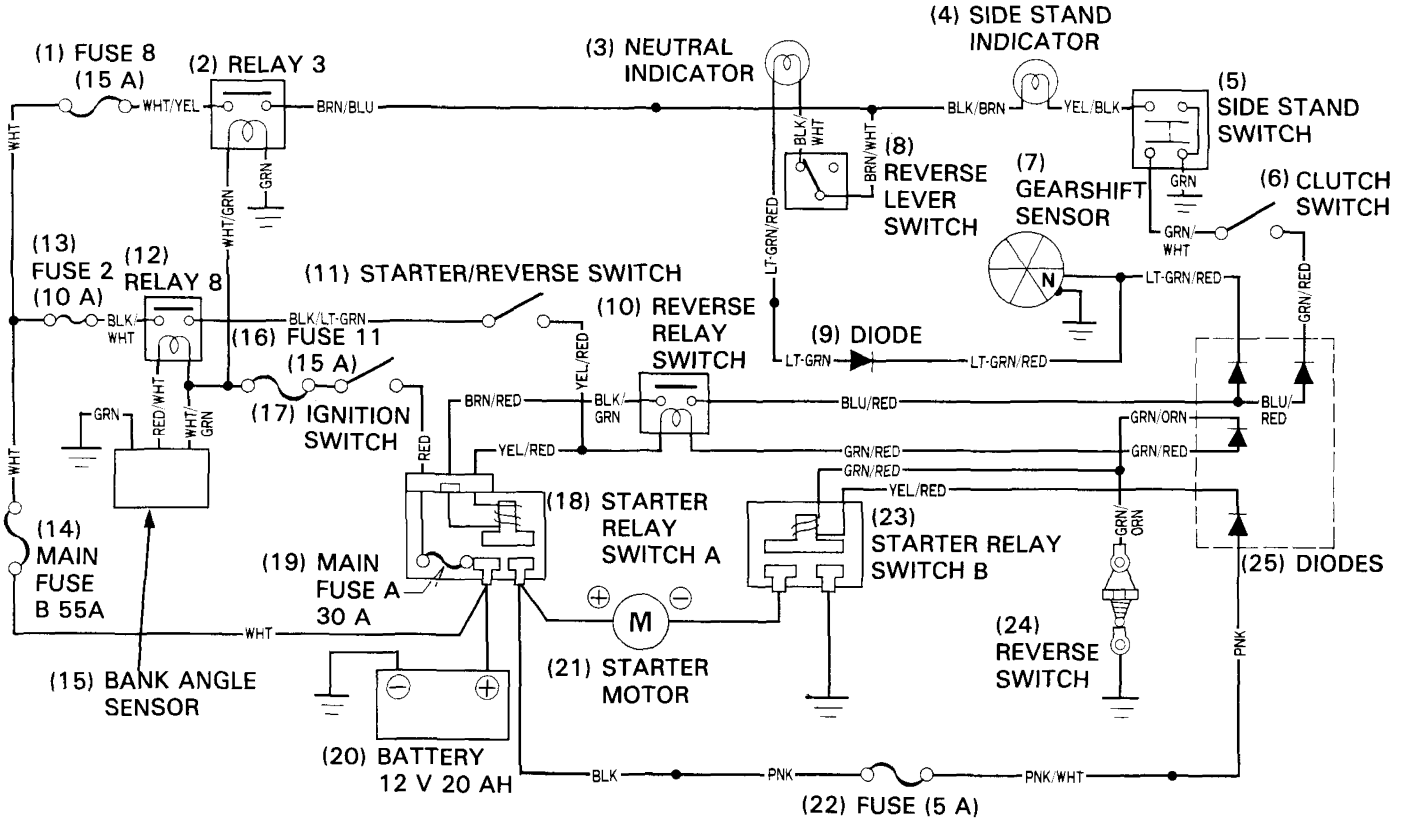


(1) Not all the motorcycle have the bushing.

SYSTEM LOCATION



STARTING SYSTEM DIAGRAM



SERVICE INFORMATION

- The starter/reverse motor can be serviced without removing the engine on the frame; to service the starter clutch and reverse shift system, the engine must be removed from the frame: See section 6.
- When the speed limiter is activated during reverse running, followed by the electrical motor brake, the reverse running stops and the reverse indicator goes out. To use reverse again, it is necessary to return the reverse lever to the OFF position and then return it to the ON position.
- When inspect the starter/reverse system, check the system components and lines step-by-step according to the troubleshooting.

SPECIFICATIONS

Motor brush length	Standard: 12.5 mm (0.49 in) Service limit: 6.0 mm (0.24 in)
Starter relay regulator	Regulated current: 0.7—1.0 A
Resister (20°C/68°F)	Between the relay and unit terminals: 0.06—0.09 Ohms Between the relay terminal and ground: 0.1—0.2 Ohms

TORQUE VALUES

Starter one-way clutch socket bolt	16 N·m (1.6 kg-m, 12 ft-lb)—Apply a locking agent.
Starter clutch mounting bolt	75 N·m (7.5 kg-m, 54 ft-lb)
Reverse switch	12 N·m (1.2 kg-m, 9 ft-lb)
Shift drum lock arm bolt	12 N·m (1.2 kg-m, 9 ft-lb)—Apply a locking agent.
Oil pump driven sprocket bolt	18 N·m (1.8 kg-m, 13 ft-lb)
Reverse shifter shaft bolt	14 N·m (1.4 kg-m, 10 ft-lb)—Apply a locking agent.

TOOLS

Special	
Pin driver, 4 mm	07944—SA00000
Clutch outer holder	07JMB—MN50100
Common	
Attachment, 35 mm I.D.	07746—0030400
Pilot, 22 mm	07746—0041000
Universal holder	07725—0030000
Torx bit	07703—0010200
Flywheel holder	07725—0040000
Pilot, 20 mm	07746—0040500
Attachment, 37 x 40 mm	07746—0010200
Attachment, 20 mm I.D.	07746—0020400
Extension bar	07716—0020000
Driver	07749—0010000
Attachment, 24 x 26 mm	07746—0010700
Digital multimeter	07411—0020000
Circuit tester (SANWA)	07308—0020001
or	
Circuit tester (KOWA)	TH-5H

TROUBLESHOOTING

• FOR STARTING

The starter/reverse motor for starting does not turn.

NOTE

- Inspect the following before troubleshooting the starter system.
- Be sure the battery is fully charged and in good condition.
- Be sure the reverse lever is in OFF position and the reverse cable is properly adjusted (page 3-17).
- Be sure the reverse switch arm is not damaged (page 19-32).
- Be sure the following fuses are good: main fuse A (30 A)-inside the starter relay switch A
  main fuse B (55 A)-on the battery case
  fuse 2 (15 A)-inside the fuse box
  fuse 11 (15 A)-inside the fuse box
  fuse 5 A-the right side of the battery
- Be sure the bank angle sensor is installed properly (page 19-24).

BATTERY CONNECTIONS:
Check battery terminal connections for corrosion and looseness and check the cables for open or short.
→ NO GOOD → • Loose or corrosive contact of terminals
• Open or short circuit in battery cables

↓ GOOD

STARTER RELAY A CONNECTIONS:
Check starter relay A terminal connections for corrosion and looseness and check the relay 4P-RED connector for loose or poor contact.
→ NO GOOD → • Loose or corrosive contact of terminals
• Loose or poor contact of the relay A connector

↓ GOOD

STARTER MOTOR CONNECTIONS:
Check starter motor terminal connections for corrosion and looseness and check the cables for open.
→ NO GOOD → • Loose or corrosive contact of terminals
• Open circuit in motor cables

↓ GOOD

GROUND CABLE CONNECTIONS:
Check the ground cable connections near the dipstick for corrosion and looseness and check the cables for open or short.
→ NO GOOD → • Loose or corrosive contact or cables
• Open or short circuit in ground cables

↓ GOOD

MOTOR:
Apply battery voltage to the motor directly and check its operation.
→ DO NOT TURN → • Faulty starter/reverse motor (page 19-14)

↓ TURN

RELAY 8:
Connect all connection properly.
When the ignition switch is turned to ON, you should hear the relay 8 "Click" (page 19-26).
→ NO →

WIRING/IGNITION SWITCH:
Disconnect the 3P-GRN connector of the connector holder on the rear fender, and measure voltage between the WHT/GRN (+) and GRN (−) wires and between the RED/WHT (+) and GRN (−). Battery voltage should register with the ignition switch ON.

YES → Ⓑ

NO →
- Loose or poor contact of 22P-WHT connector or 8P-BLK connector above the left cooling fan
- Open or short circuit in main or sub wire harness
- Faulty ignition switch (page 22-16)
- Faulty relay 8 (page 19-26)

YES → Ⓐ

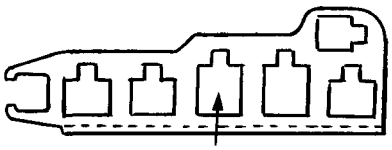
Ⓐ

RELAY 8:
Check the relay 8 for continuity (page 19-27)

CONTINUITY

NO CONTINUITY
• Faulty relay 8

WIRING/CONNECTORS:
Disconnect the 9P-RED connector of connector holder on the right cooling fan, and measure voltage between the BLK/LT GRN (+) wire and ground (−). Battery voltage should register with the ignition switch ON.



(1) 9P-RED CONNECTOR

NO
• Loose or poor contact of connectors
• Open or short circuit in main wire harness

YES

STARTER/REVERSE SWITCH:
Using the above checking connector, check the starter/reverse switch for continuity (page 19-28).

NO GOOD
• Faulty starter/reverse switch

GOOD

STARTER RELAY SWITCH A:
With the ignition switch ON and starter/reverse switch pushed, you should hear the starter relay switch A "Click" (page 19-25).

NO

YES

STARTER RELAY SWITCH A:
Check the starter relay switch A for continuity (page 19-26)

CONTINUITY

NO CONTINUITY
• Faulty starter relay switch A

Ⓒ

YES

WIRING/CONNECTORS/DIODE:
Remove the reverse relay switch and measure voltage between BLK/BRN (+) and BLU/RED (−) wires of the wire harness side. Battery voltage should register with the ignition switch ON, the starter/reverse switch pushed and the gear in neutral.

YES
• Faulty reverse relay switch

NO
• Faulty starter relay switch A
• Faulty gearshift sensor (page 18-12)
• Loose or poor contact of 22P-RED and 6P-BLK connectors
• Faulty diode (BLU/RED & LT GRN/RED) (page 19-27)
• Open or short circuit in main or sub wire harness

REVERSE RELAY SWITCH:
With the ignition switch ON and starter/reverse switch pushed, you should hear the reverse relay switch "Click" (page 19-26).

NO

WIRING/CONNECTORS/DIODE:
Remove the reverse relay switch and measure voltage between YEL/RED (+) and GRN/RED (−) wires of the wire harness side.
Battery voltage should register with the ignition switch ON and starter/reverse switch pushed.

YES

REVERSE RELAY SWITCH:
Check the reverse relay switch for continuity (page 19-26).

CONTINUITY
• Loose or poor contact of the relay connector

NO CONTINUITY
• Faulty reverse relay switch

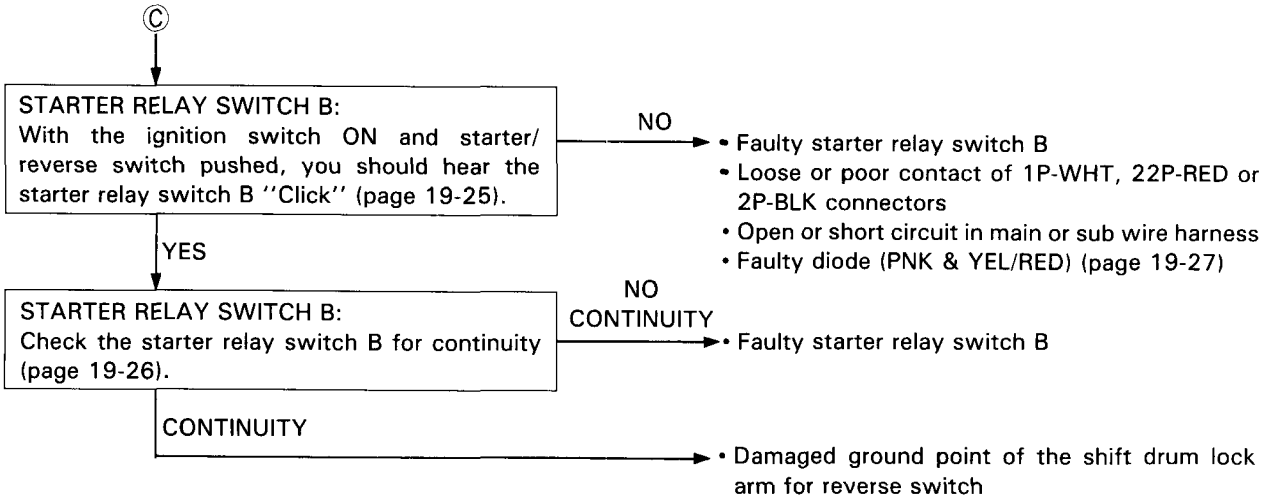
NO
• Faulty diode (GRN/RED & GRN/ORN) (page 19-27)
• Loose or poor contact of 22P-RED connector
• Open or short circuit in main or sub wire harness
• Faulty reverse switch (page 19-27)

Ⓑ

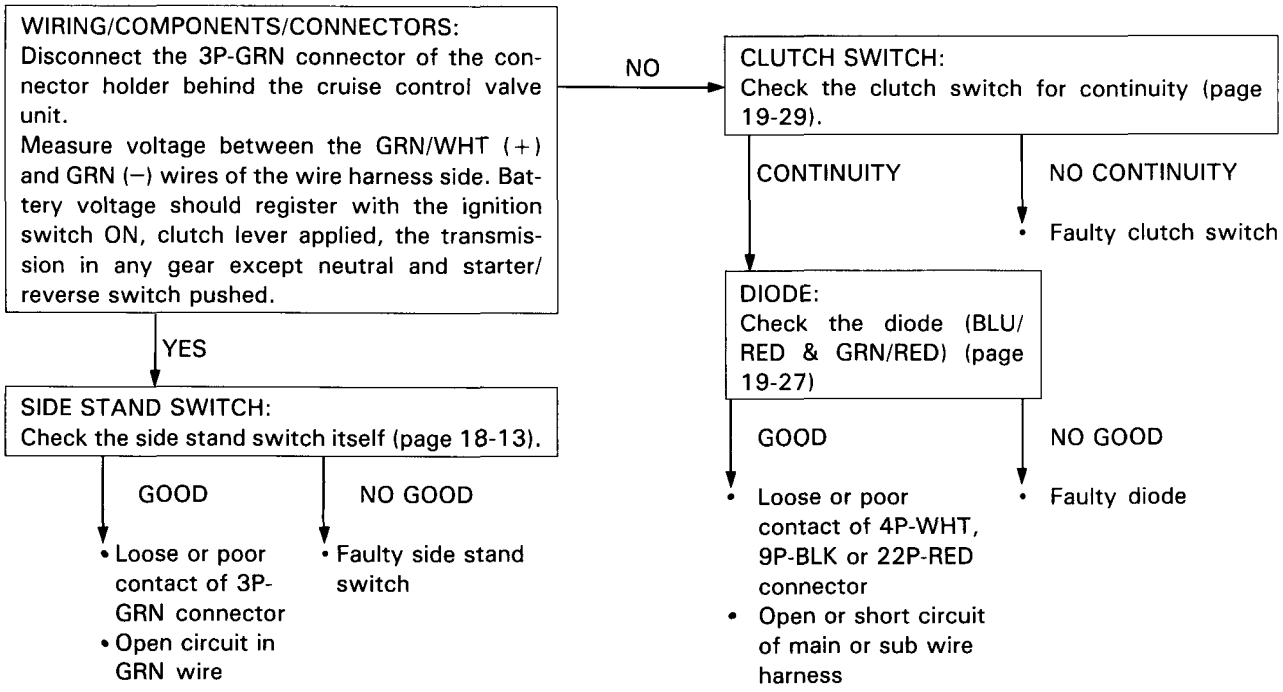
BANK ANGLE SENSOR:
Inspect the bank angle sensor (page 19-24)

GOOD
• Loose or poor contact of the 3P-GRN connector

NO GOOD
• Faulty bank angle sensor



The starter/reverse motor for starting turns in neutral position, but does not turn in gear with the side stand up and the clutch lever applied.



Starter/reverse motor turns engine slowly
- Low battery
- Excessive resistance in circuit
- Faulty starter motor (page 19-13)

Starter/reverse motor turns, but engine does not turn
- Faulty starter clutch (page 19-22)
- Faulty starter drive/or driven gear
- Faulty starter idle gear

Starter/reverse motor and engine turn, but engine does not start
- Faulty ignition system
- Engine problems, see engine related sections

• FOR REVERSE

The starter/reverse motor for reverse does not turn.

NOTE

When the speed limiter is activated during reverse running and then the electrical motor brake is worked, and when the motor is overloaded more than 3 seconds, the reverse system is turned to OFF and the reverse indicators goes out.
To use reverse again, it is necessary to return the reverse lever to the OFF position and then return it to the ON position.

Inspect the following before troubleshooting the reverse system.
- Be sure the transmission gears is in neutral position.
- Be sure the reverse lever is in the ON position and reverse cable is properly adjusted.
- Be sure the side stand is up.
- Be sure the following fuses are not burnt: fuse 8 (15 A)-inside the fuse box
  fuse 5 A-the right side of the battery
  fuse 5 A-the left side of the battery
  reverse fuse 65 A-under the seat

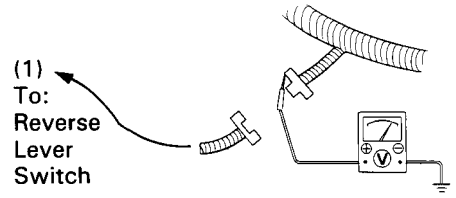
RELAY 3:
When the ignition switch is turned to ON, you should hear the relay 3 "Click" (page 19-26).
→ NO → • Open or short circuit in wire harness
• Loose or poor contact of the relay 3

↓ YES

RELAYS:
Check the relay 3 for continuity (page 19-27).
→ NO CONTINUITY → • Faulty relay 3

↓ CONTINUITY

WIRING:
Disconnect the 3P-RED connector from the connector holder behind the cruise control valve unit. Measure voltage between the BRN/WHT (+) and ground (−) wires of the wire harness side. Battery voltage should register with the ignition switch ON.



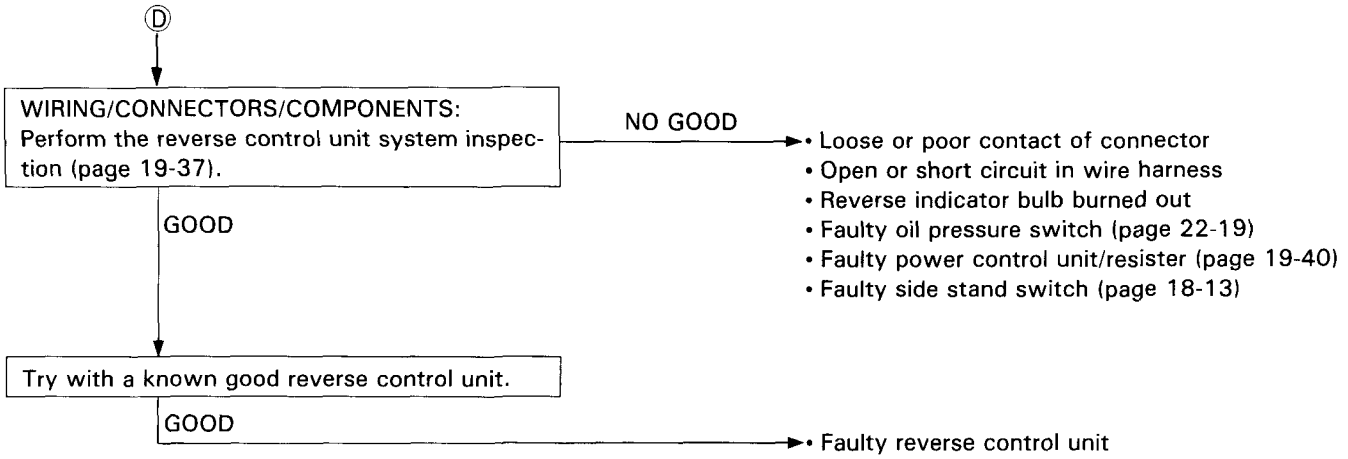
→ NO → • Open or short circuit in wire harness

↓ YES

REVERSE LEVER SWITCH:
Check the reverse lever switch for continuity (page 19-42).
→ NO CONTINUITY → • Faulty reverse lever switch

↓ CONTINUITY

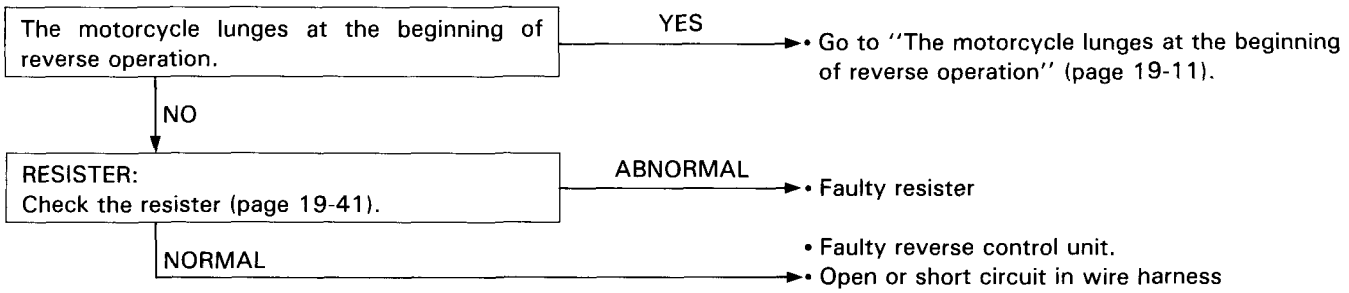
Ⓓ



The reverse system works well, but reverse indicator does not come on.

- Burnt reverse fuse (65 A)
- Burnt reverse indicator
- Faulty reverse control unit
- Open of short circuit in wire harness

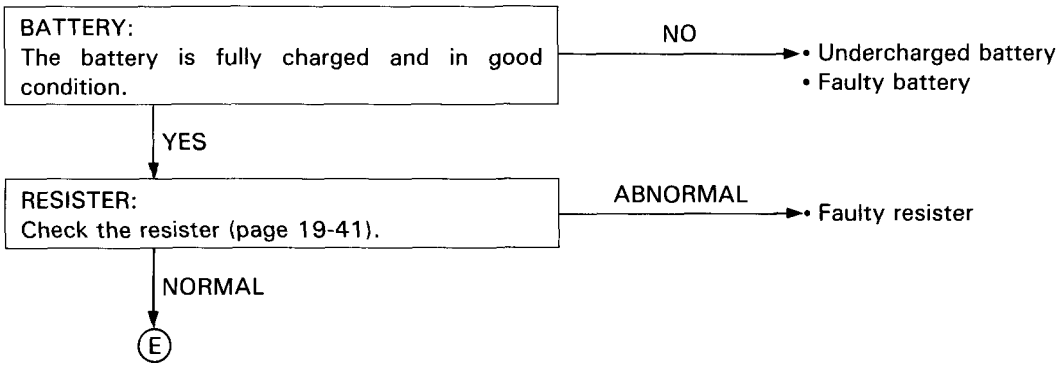
The reverse speed is fast (1.8 km/h minimum on a flat road)



The reverse speed is slow (1.0 km/h maximum on a flat road)

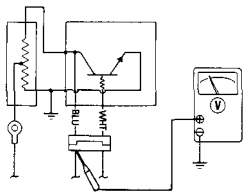
- Undercharged or faulty battery
- Faulty resister
- Faulty starter/reverse motor

Lack of the uphill power



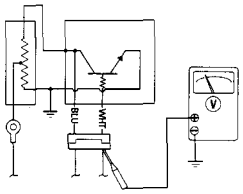
Ⓔ

MOTOR OUTPUT:
Place the motorcycle on its center stand. Work the reverse system with the brake pedal applied. The voltage is 3 V maximum between BLU wire terminal (+) and ground with the 2P-WHT connector connected.



NO

At the same conditions of previous step, voltage is 7 V minimum between power control unit WHT wire terminal (+) and ground (−) with the 2P-WHT connector connected.



YES
- Faulty reverse control unit

NO
- Faulty power control unit

YES
- Faulty starter/reverse motor

The reverse system works well, but the motor does not stop even if the motor is overloaded more than 3 seconds.

MOTOR VOLTAGE:
Place the motor cycle on its center stand. Work the reverse system with the brake pedal applied. The voltage is 2 V maximum. between the motor (+) and (−) terminals.

NO

RESISTER:
Check the resister (page 19-41).

NOTRMAL
- Faulty motor

ABNORMAL
- Faulty resister

YES
- Faulty reverse control unit

The speed limiter system is not activated at 2.5 km/h minimum in reverse.

SPEED LIMITER RELAY:
Check the speed limiter relay (page 19-41).

ABNORMAL
- Faulty speed limiter relay

NORMAL

RESISTER:
Check the resister (page 19-41).

ABNORMAL
- Faulty resister

NORMAL

SPEED LIMITER REAY LINE:
Check the speed limiter relay line (page 19-39)

NORMAL
- Faulty starter/reverse motor

ABNORMAL
- Burnt reverse fuse(s)-5 A
- Open or short circuit in wire harness
- Loose or poor contact of connectors
- Faulty reverse control unit

Reverse operation is rough, stalls, or runs poorly.

CONNECTION:
Check the ORN wire connectors (behind the starter relay switch B) for poor or loose contact.

LOOSE OR POOR
- Loose or poor contact of ORN wire connectors

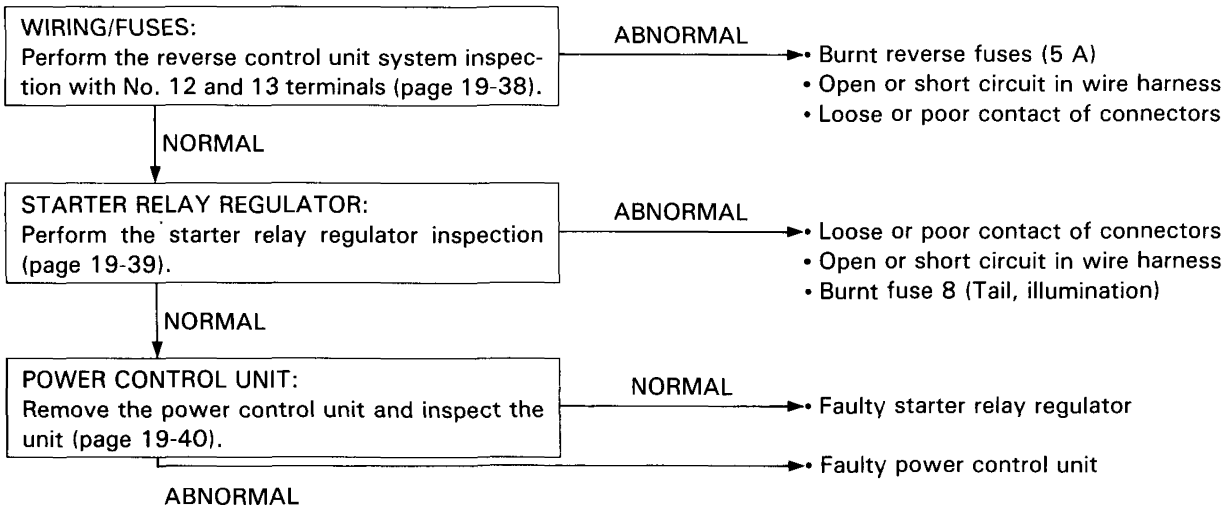
- Faulty reverse control unit

NOT LOOSE OR POOR

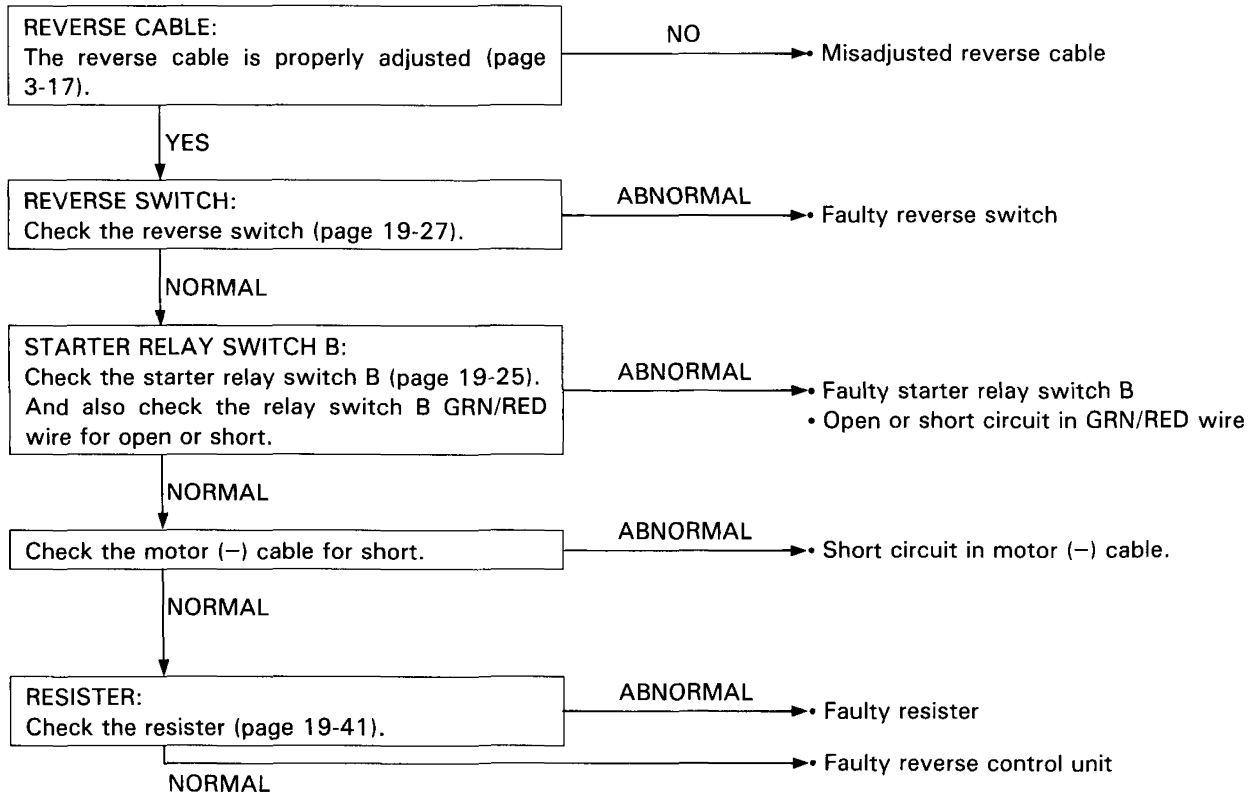
Continues operating in reverse even if the starter/reverse switch is free.

- Faulty starter/reverse switch
- Faulty starter relay switch A
- Short circuit in YEL/RED wire

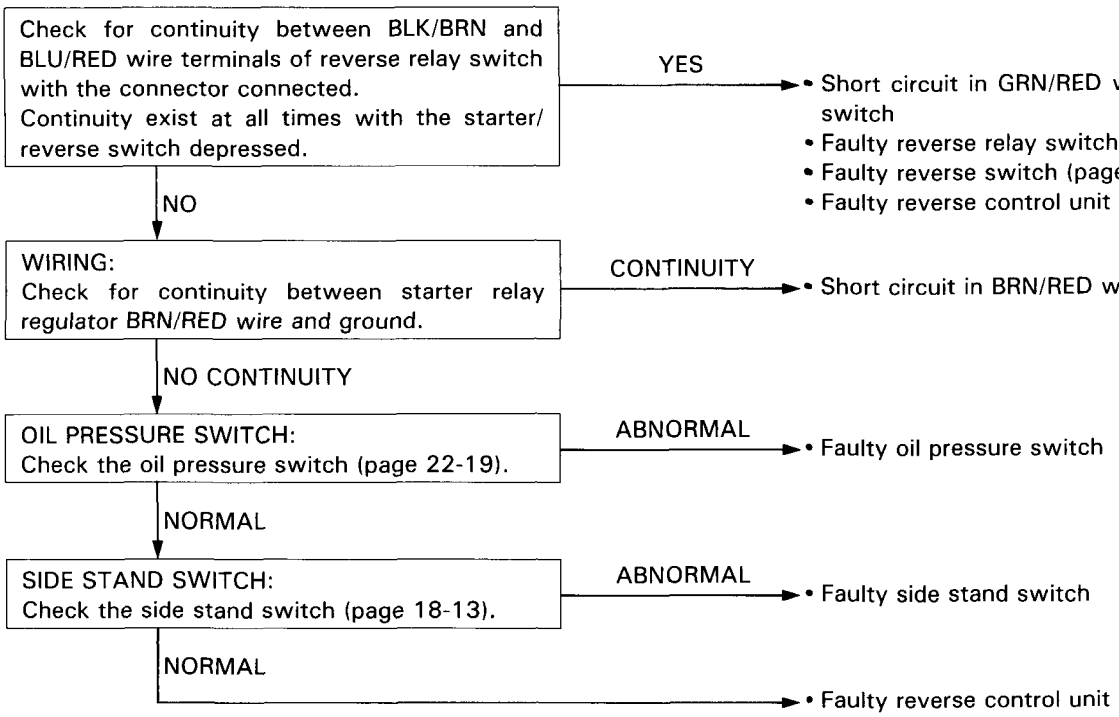
Stops immediately when reverse operation is initiated.



The motorcycle lunges at the beginning of reverse operation.



The reverse system operates before being properly selected.



During reverse operation, starter/reverse motor run idle.
- Mis-adjusted reverse cable (page 3-17)
- Faulty reverse shift system (page 19-30)

Transmission is hard to shift with reverse lever in OFF position
- Mis-adjusted reverse cable (page 3-17)
- Damage shift drum lock system (page 19-32)

During the normal run, the rear wheel is locked suddenly
- Damaged reverse shift system (page 19-30)

After shifting into reverse, transmission is easy to shift
- Mis-adjusted reverse cable (page 3-17)
- Damaged shift drum lock system (page 19-32)

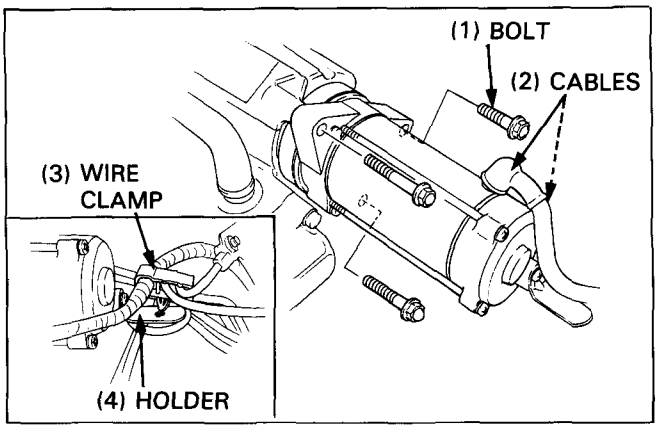
Hard to shift to reverse
- Damaged reverse shift system (page 19-30)
- Faulty reverse cable

STARTER/REVERSE MOTOR

REMOVAL

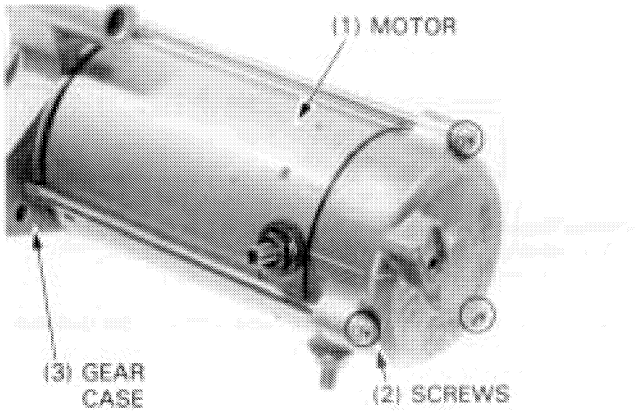
Remove the following.
—right front side cover (page 12-6).
—battery and battery case (page 17-5).

Remove the wire clamp from the clamp holder and remove the clamp holder.
Disconnect the (+) and (−) cables from the motor.
Remove the motor mounting bolts and motor from the engine.

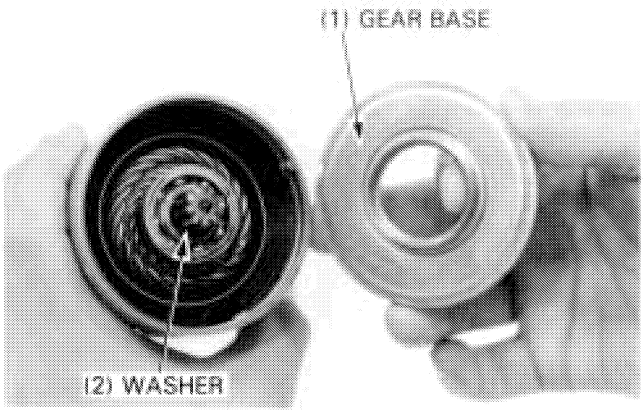


DISASSEMBLY

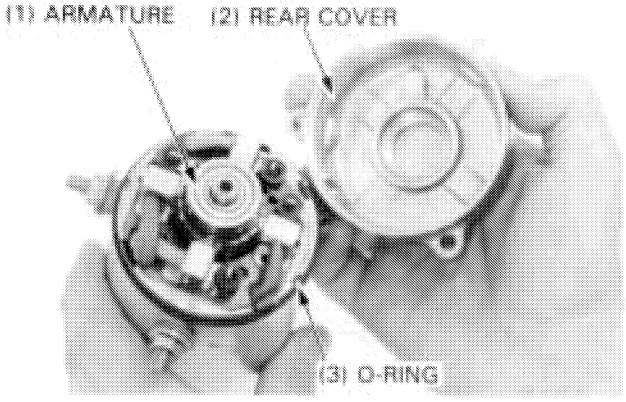
Remove the motor attaching screws and separate the motor reduction gear case from the starter/reverse motor.



Remove the starter reduction gears base and washer.

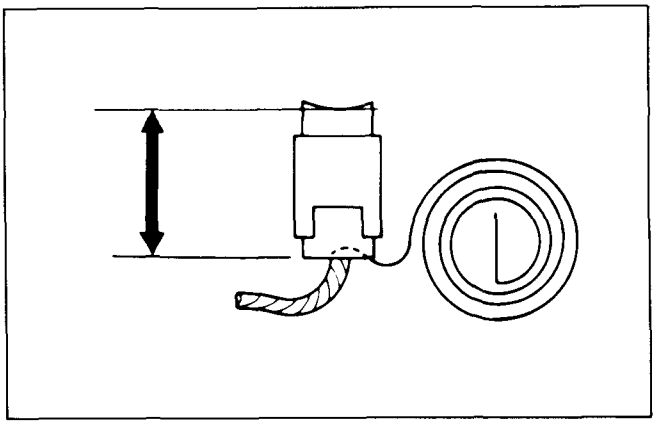


Remove the rear cover and O-ring.
Remove the armature.



Inspect the brushes and measure brush length.

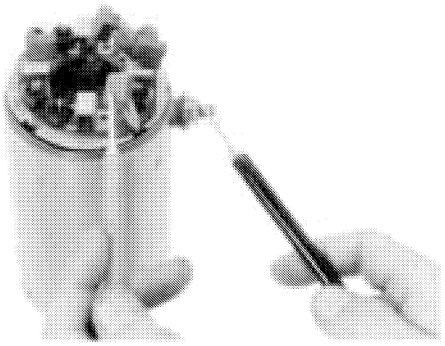
Service Limits:
Brush Length: 6.0 mm (0.24 in)



Check for continuity from the (+) cable terminal to the brush (red color insulated wires).

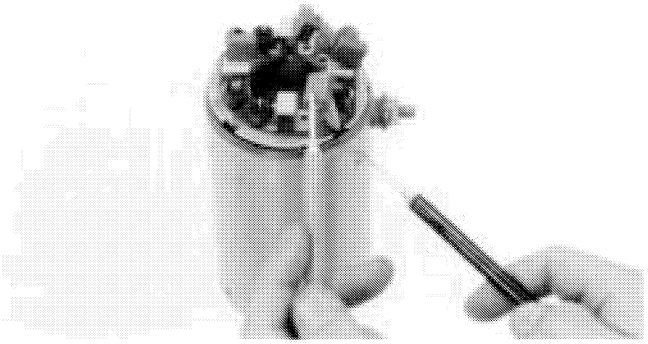
Check for continuity from the (−) cable terminal to the brush (yellow color insulated wires).

NORMAL: Continuity exist.



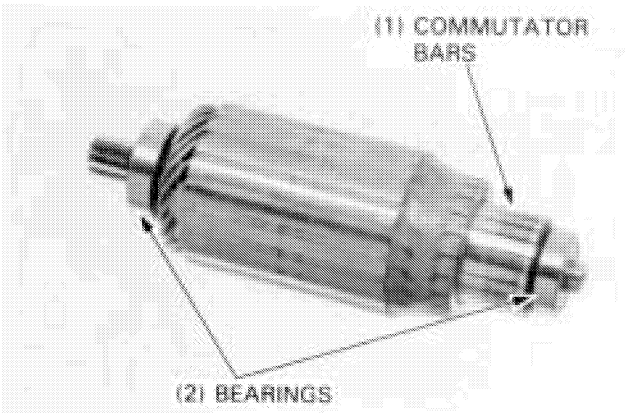
Check for continuity from each brush to the motor case.

NORMAL: No continuity exist.

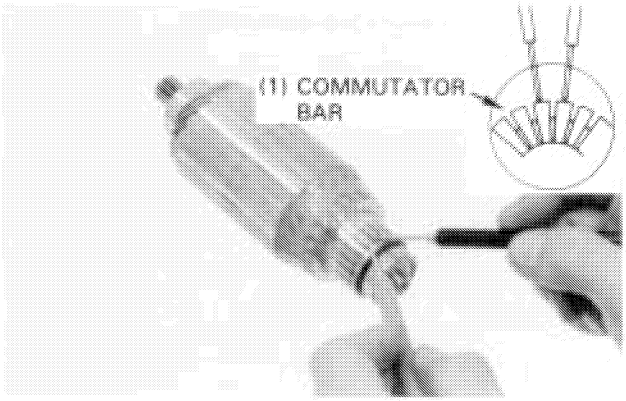


Inspect the commutator bars for discoloration. Bars discolored in pairs indicate grounded armature coils.

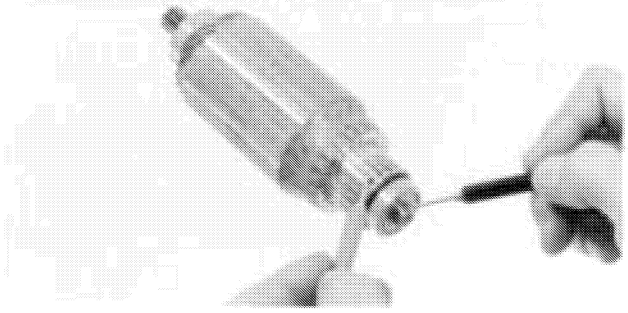
Turn the outer race of the bearings with your finger.
The bearings should turn smoothly and quietly. Also check that the inner race of the bearings fit tightly in the shaft.



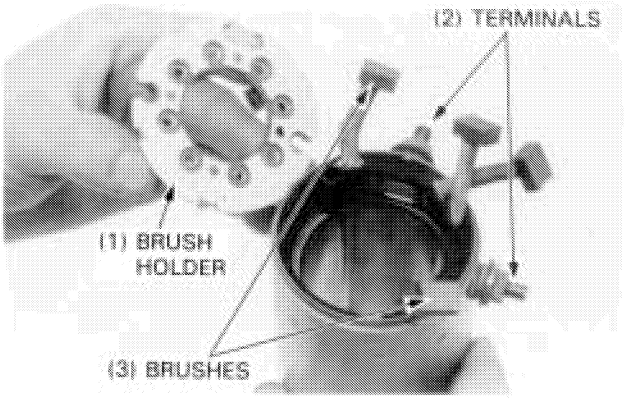
Check for continuity between pairs of commutator bars.
There should be continuity.



Check for continuity between commutator bars and armature shaft.
There should be no continuity.

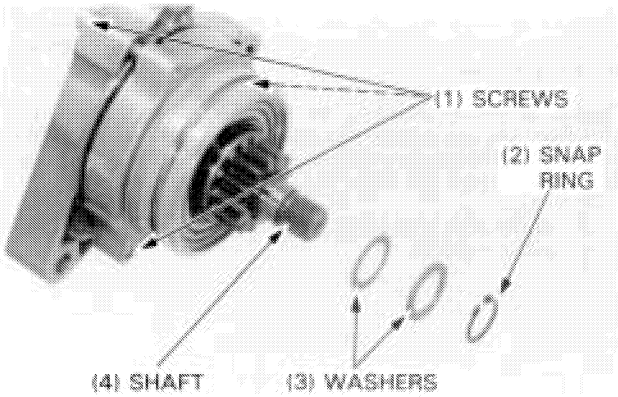


Remove the brush holder.
Remove the terminals from the motor case and remove the brushes.



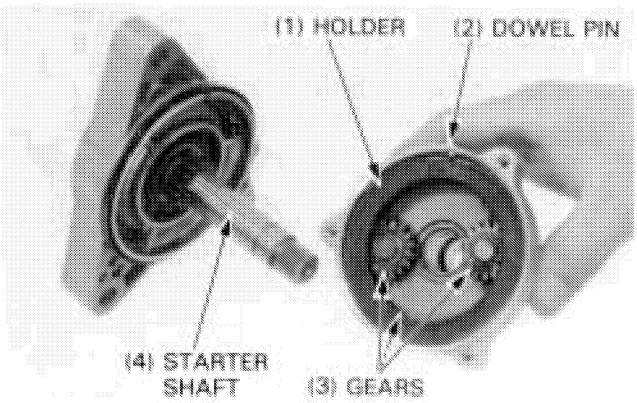
REDUCTION GEAR CASE DISASSEMBLY/ INSPECTION

Remove the snap ring and washers from the starter shaft.
Separate the reverse reduction gear case from the starter shaft case by removing three screws.

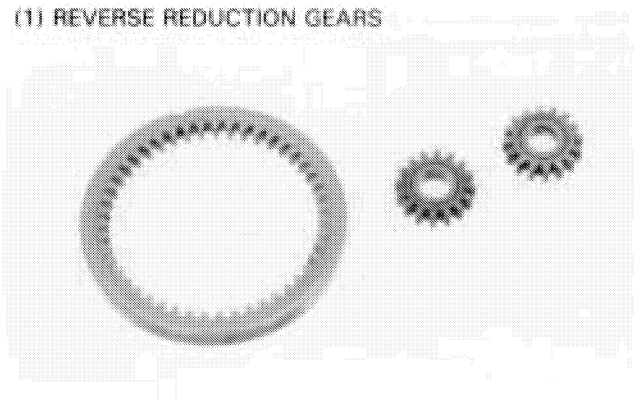


Remove the gear holder, dowel pin, reverse reduction gears from the reverse reduction gear case.

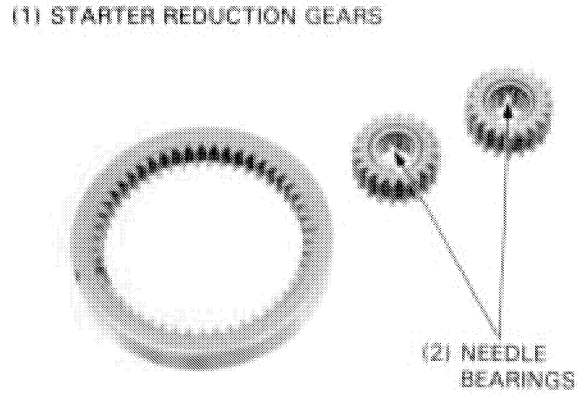
Remove the starter shaft from the starter shaft case.



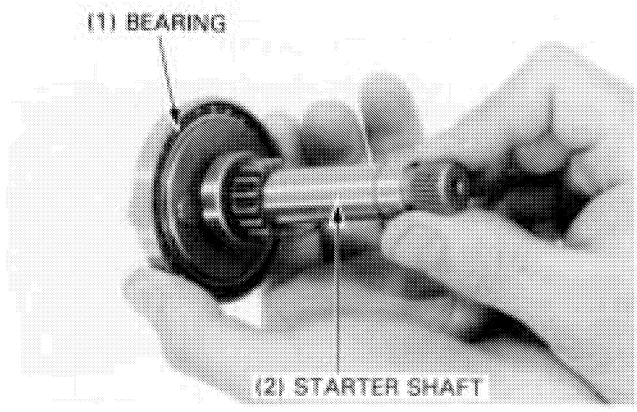
Check the reverse reduction gears for excessive or abnormal wear.



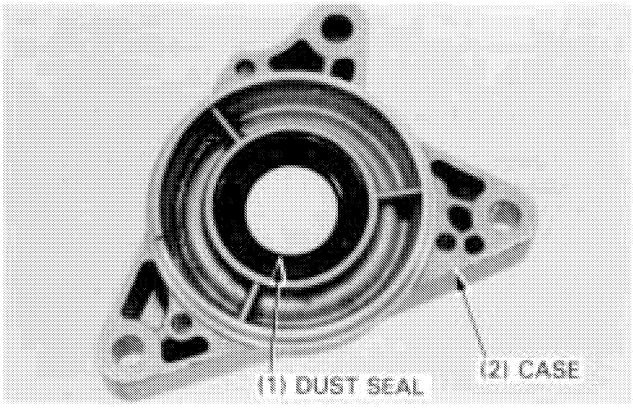
Check the starter reduction gears for excessive or abnormal wear.
Check the planetary gear needle bearings for damage or excessive wear.



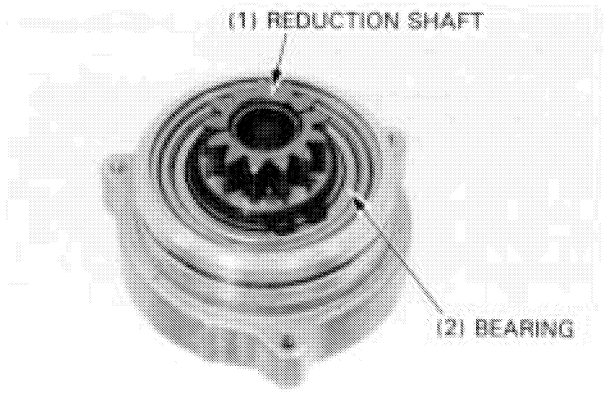
With the starter shaft installed into the bearing, turn the shaft with your finger as shown.
The bearing should turn smoothly and quietly.
Replace the bearing if necessary.



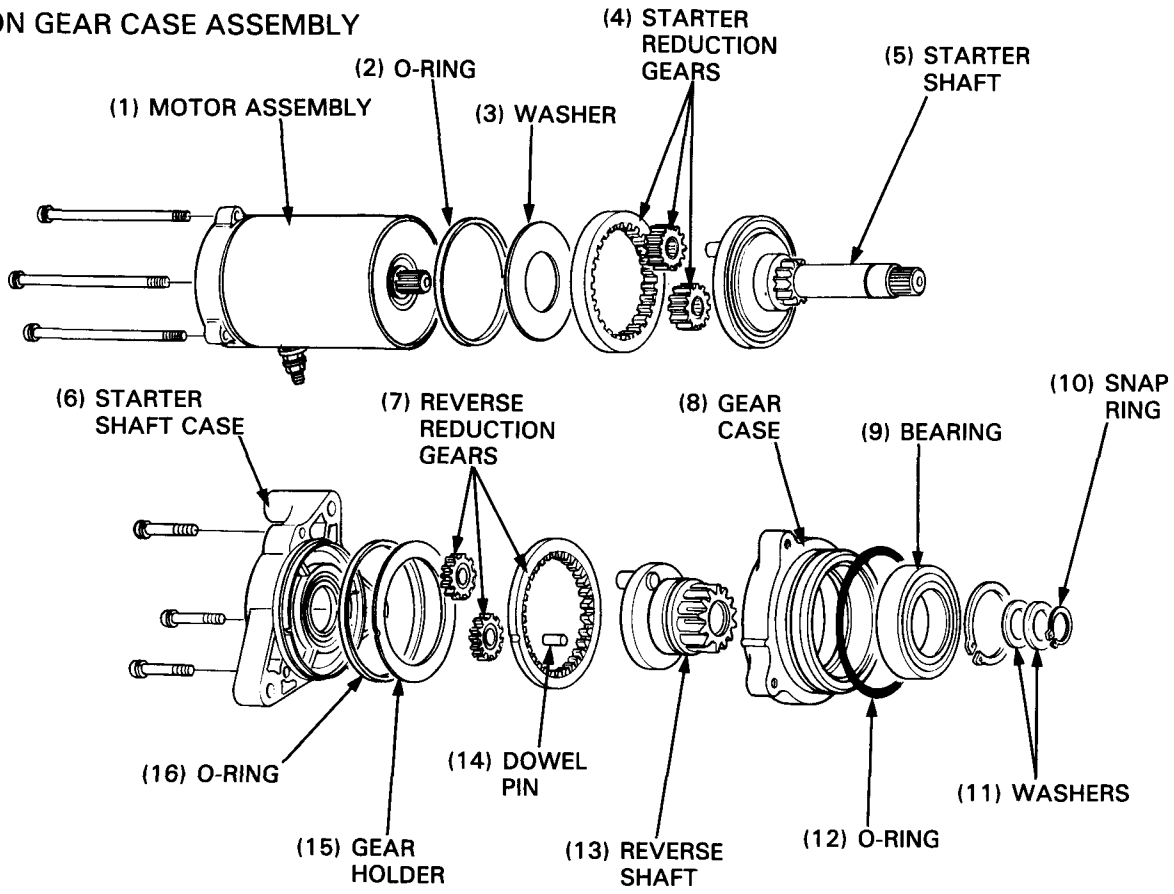
Inspect the dust seal of the starter shaft case for fatigue or damage.



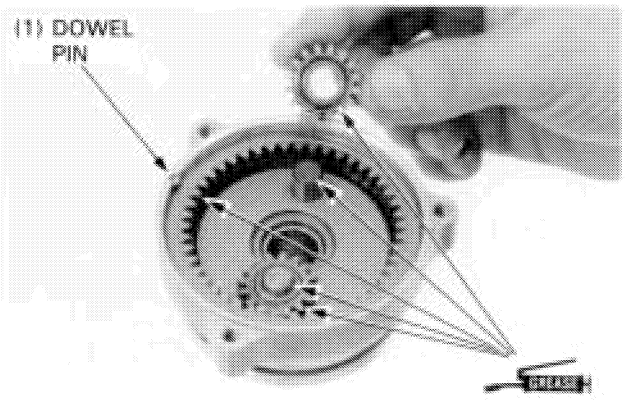
Turn the reduction shaft with your finger. The bearing should turn smoothly and quietly. If necessary, replace the bearing as assembly.



REDUCTION GEAR CASE ASSEMBLY

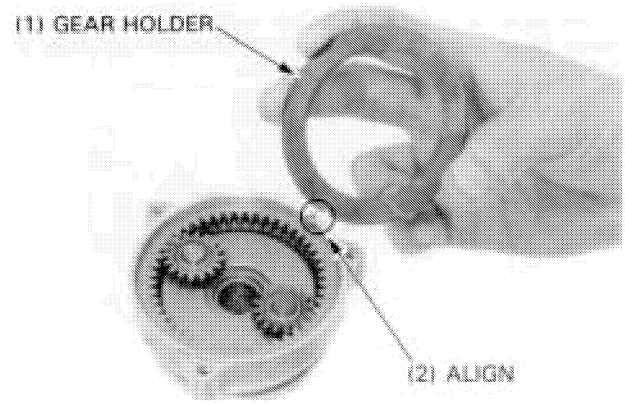


Apply grease to the gear teeth and reverse shaft bosses.
Install the dowel pin onto the reverse reduction gear case.
Install the sun gear, aligning the gear groove with the dowel pin.
Install the planetary gears onto the shaft.

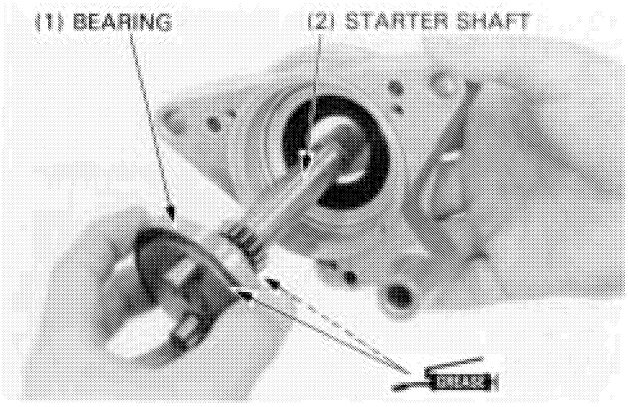


Install the gear holder, aligning the holder groove with the dowel pin.

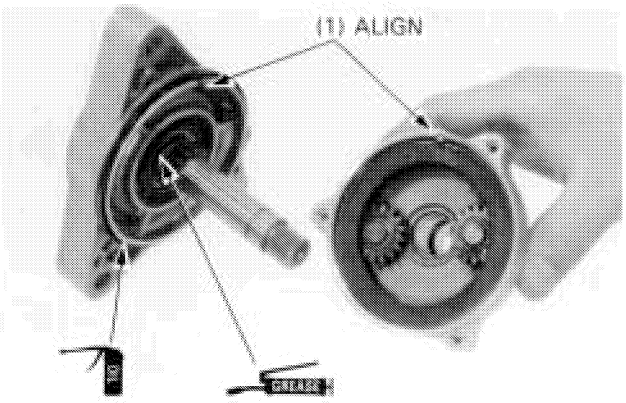
Check the gears for rotation. They should rotate freely.



Pack the bearing cavities with grease.
Install the bearing onto the starter shaft and install them into the starter shaft case.



Apply oil to the O-ring and install it onto the starter shaft case.
Apply grease to the dust seal of the shaft case.
Install the reverse reduction gear case assembly onto the starter shaft case, aligning the dowel pin of the gear case with the groove of the shaft case.



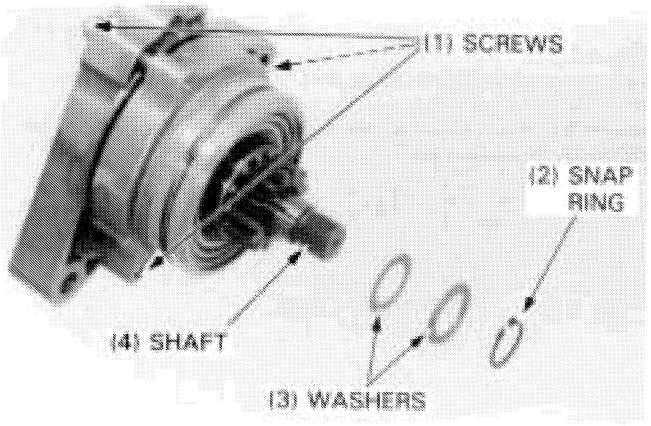
Install and tighten the three screws securely.

Install the washers and snap ring onto the starter shaft.

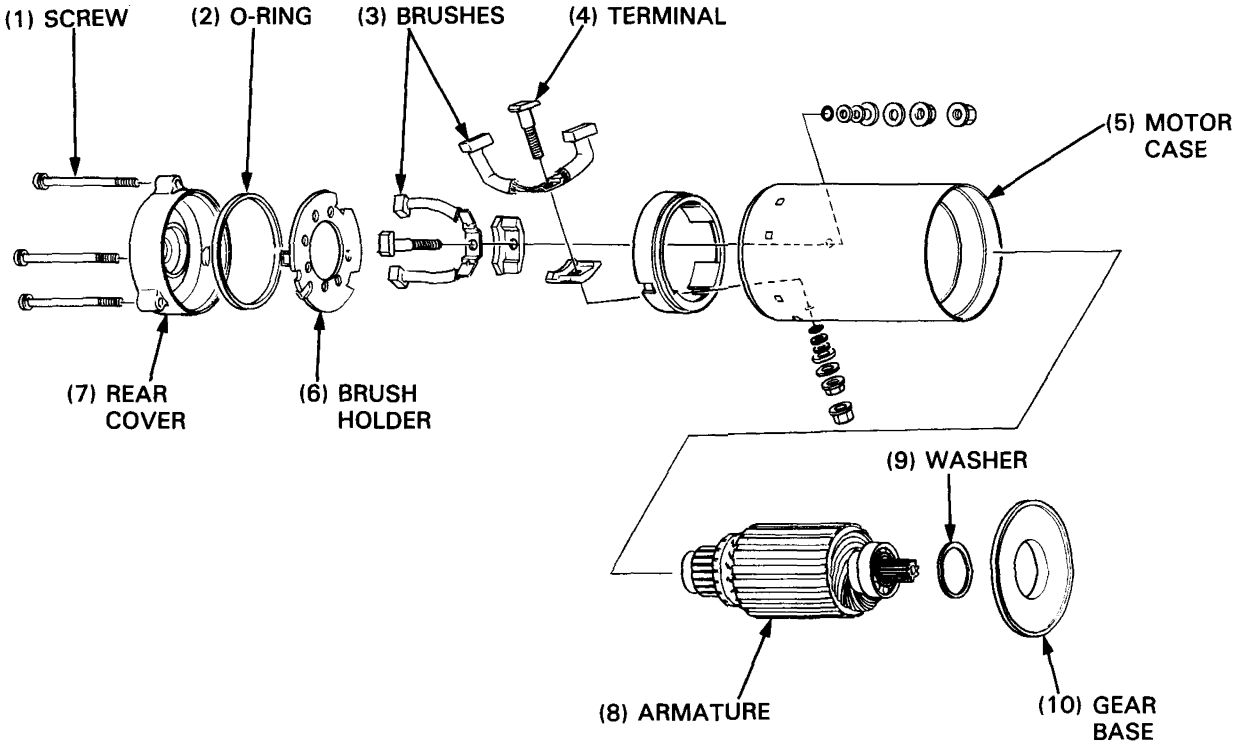
NOTE

- The thinner washer, inside: the thicker one, outside.

Check the reduction gear case for rotation.



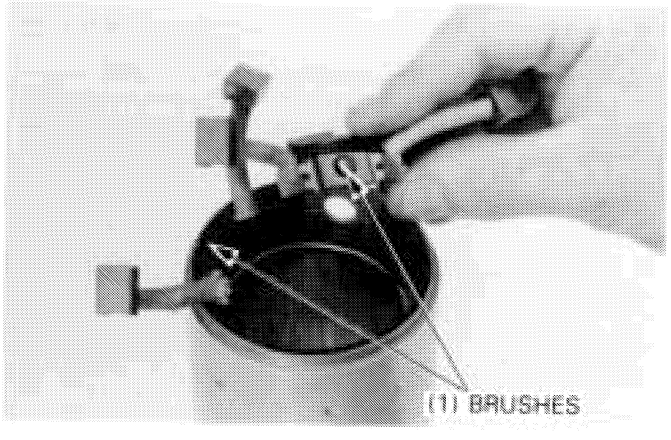
MOTOR ASSEMBLY



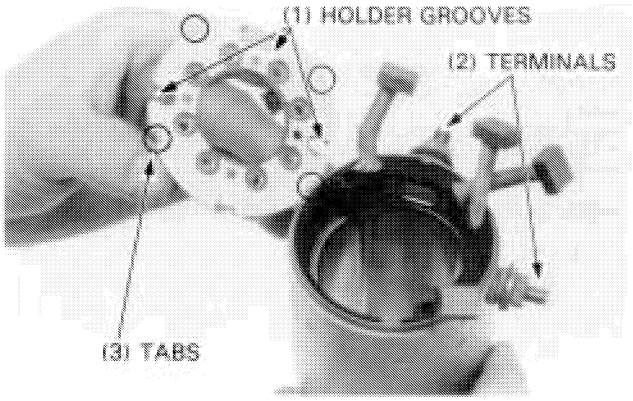
Install the brushes into the motor case.

NOTE

- The brushes of the red color wires to the (+) terminal side, brushes of the yellow color wires to the (−) terminal side.



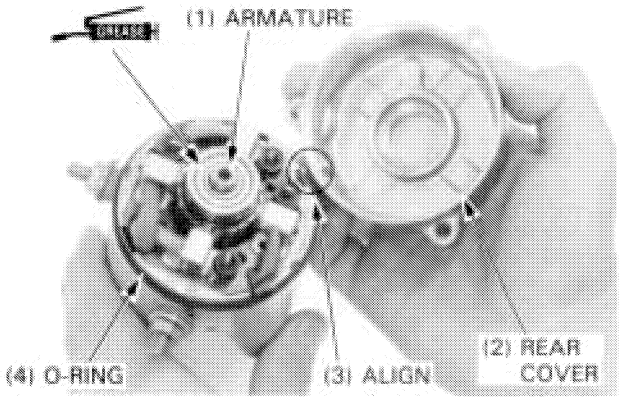
Install the motor terminals onto case.
Install the brush holder, aligning the holder grooves with the brush wires and also aligning the holder tabs with the case grooves.



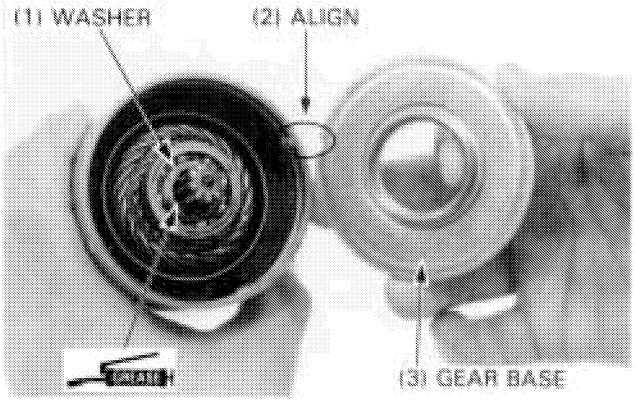
Pack the bearing cavities with grease.
Install the armature into the motor case.
Install the O-ring and rear cover.

NOTE

- Align the cover groove with the holder tab.

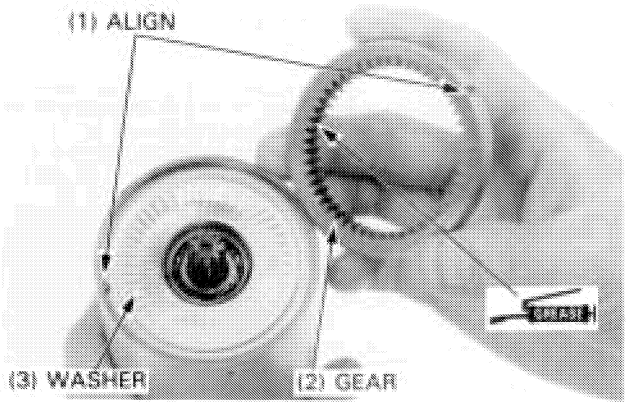


Pack the bearing cavities with grease.
Install the washer.
Install the starter reduction gears base, aligning the base groove with the case tab.



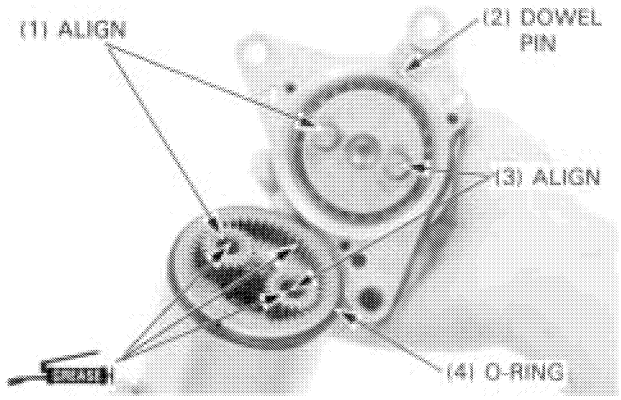
Install the washer.
Apply grease to the gear teeth.

Install the sun gear, aligning its groove with the case tab.



Apply grease to the planetary gears teeth and needle bearings.
Place the planetary gears in a straight line as shown.
Install the O-ring onto the motor case.

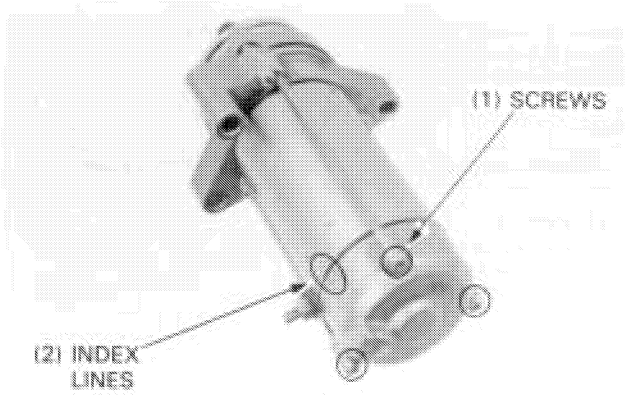
Install the dowel pin onto the gear case.
Install the gear case onto the motor, aligning the starter shaft bosses with the planetary gears and also aligning the dowel pin with the sun gear groove.



Install the motor attaching screws securely.

NOTE

- Make sure the index lines of case and cover are aligned.

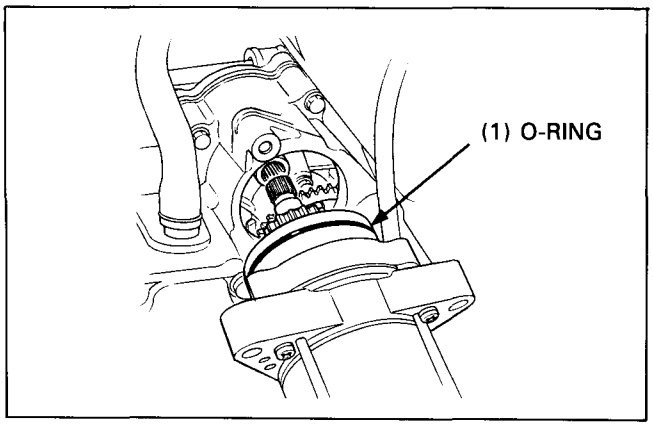


INSTALLATION

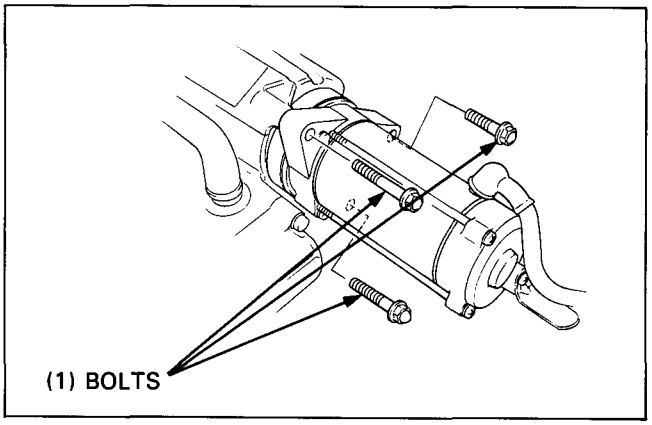
Apply oil to the O-ring and install the starter/reverse motor onto the engine.

NOTE

- Installation is easier if the rear wheel is rotated with the reverse lever in the ON position.

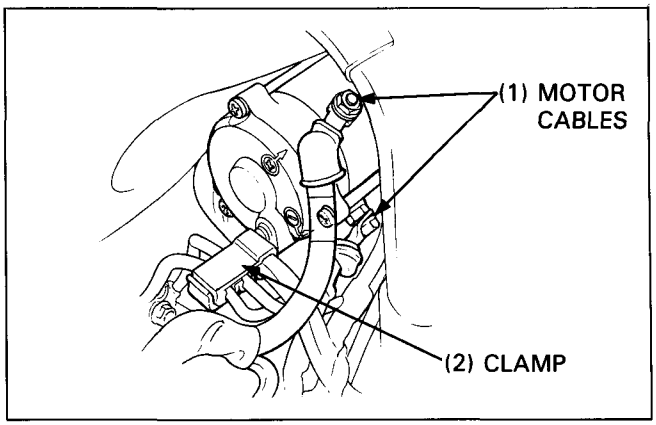


Install and tighten the motor mounting bolts securely.



Connect the (+) and (−) cables to each terminal.
Install the wire clamp onto the starter/reverse motor and clamp the wire cables properly.

Install the following:
—battery case and battery (page 17-6).
—right front side cover (page 12-6).



STARTER CLUTCH

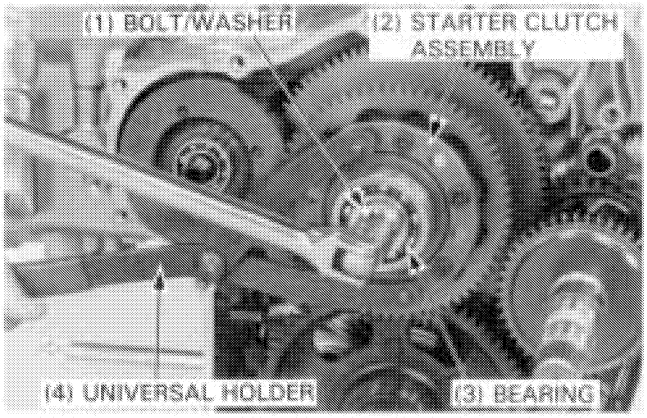
REMOVAL

Remove the rear engine cover (page 9-3).

Hold the starter clutch with the universal holder and remove the starter clutch bolt.

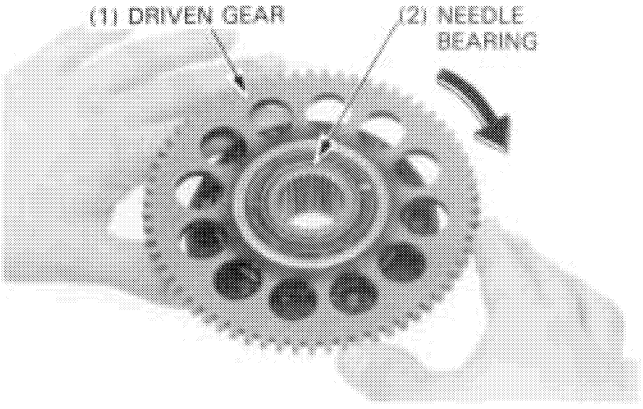
TOOL:
Universal holder **07725—003000**

Remove the washer and bearing.
Remove the starter clutch assembly.



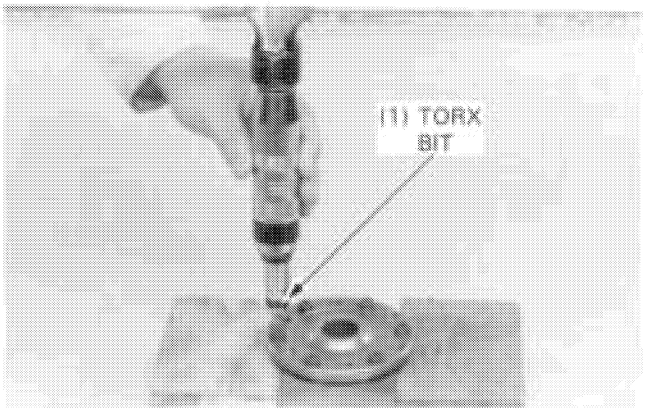
INSPECTION/DISASSEMBLY

Make sure that the starter driven gear only rotates clockwise.
Remove the starter driven gear and needle bearing from the starter clutch.



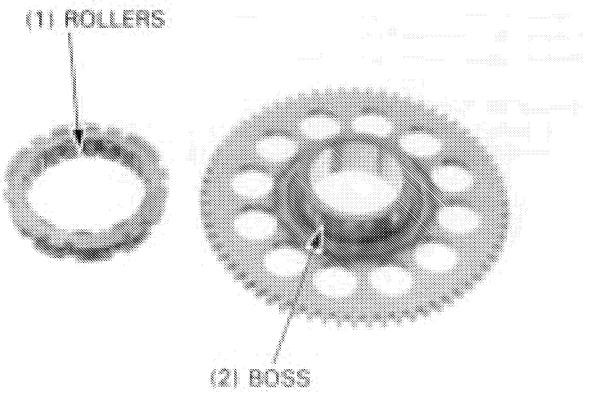
Remove the bolts using the special tool.

TOOL:
Torx bit **07703—0010200**



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

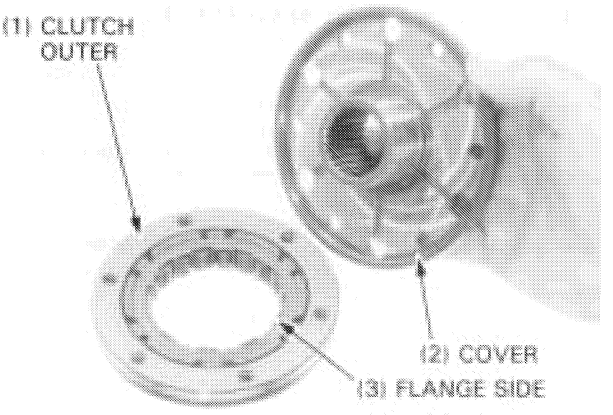
Check the one-way clutch rollers for wear or damage.



ASSEMBLY

Install the one-way clutch onto the starter clutch outer with its flange side facing up as shown.

Install the starter clutch cover.



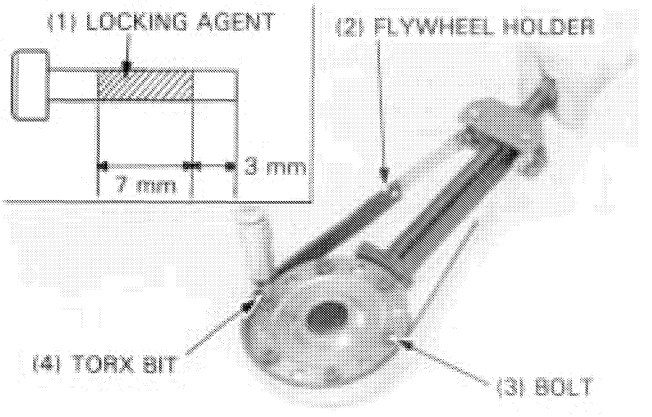
Apply a locking agent to the starter one-way clutch socket bolt threads as shown.

Install and tighten the bolts with the tools.

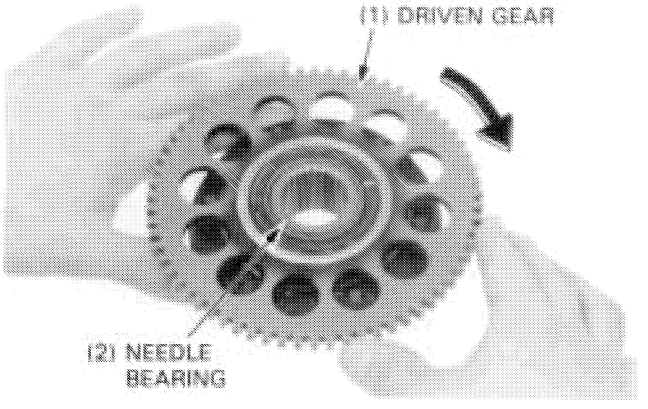
TORQUE: 16 N·m (1.6 kg-m, 12 ft-lb)

TOOLS:

Torx bit	**07703—0010200**
Flywheel holder	**07725—0040000**

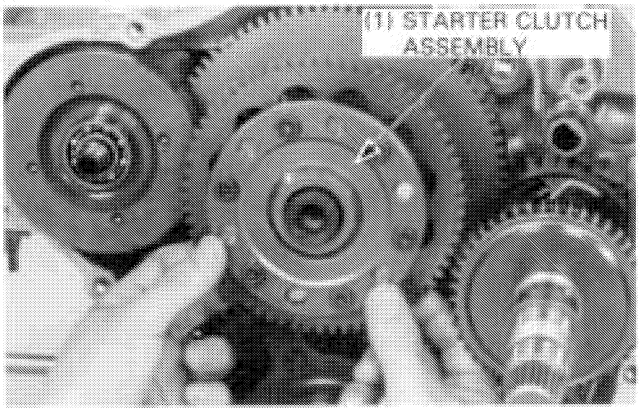


Install the needle bearing into the starter clutch.
Install the starter driven gear into the starter clutch, rotating it clockwise.

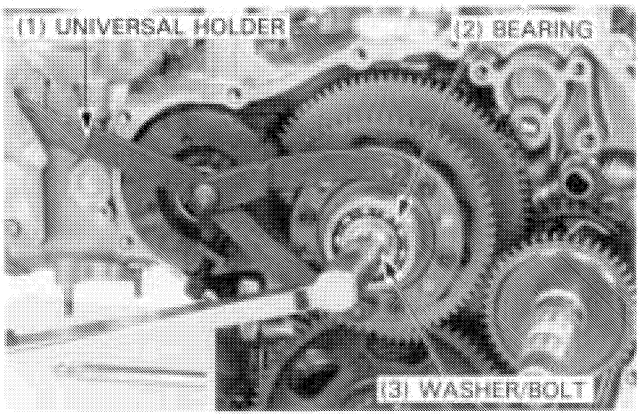


INSTALLATION

Install the starter clutch assembly onto the crankshaft.



Install the bearing, washer and starter clutch bolt.



NOTE

- Install the washer with its chamfered surface facing out.

Hold the starter clutch with the universal holder, and tighten the bolt to the specified torque.

TORQUE: 75 N·m (7.5 kg-m, 54 ft-lb)

TOOL:

Universal holder	**07725–0030000**

Install the rear engine cover (page 9-18).

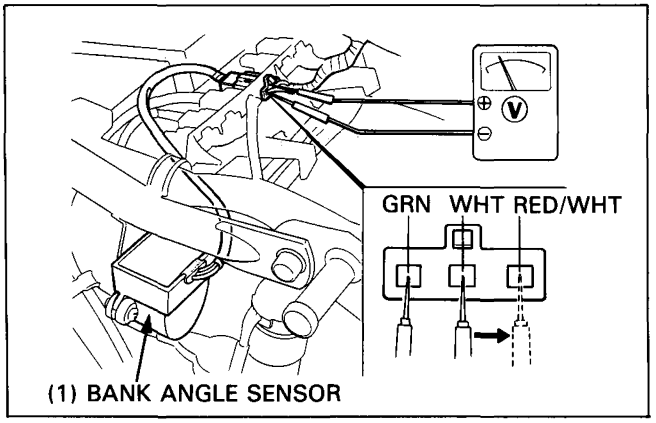
BANK ANGLE SENSOR

INSPECTION

Remove the seat, trunk and right saddlebag (page 12-12).
Turn the ignition switch ON and measure votage between the following terminals of the bank angle sensor with the 3P-GRN connector connected.

Terminals	Standard voltage
RED/WHT (+) and GRN (–)	0–1 V
WHT (+) and GRN (–)	10–14 V

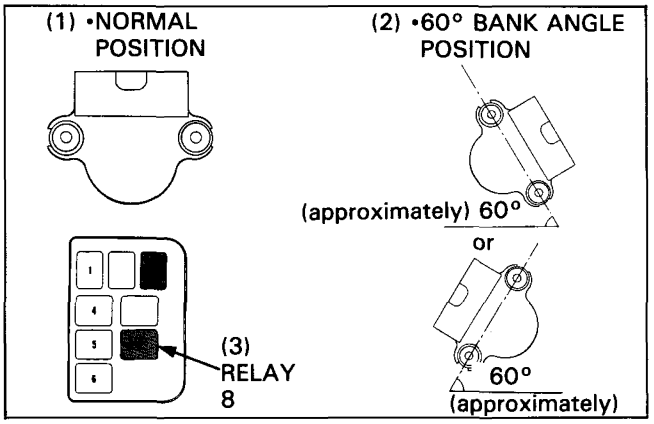
Remove the air pressure sensor assembly from the rear fender stay.
Remove the screws and bank angle sensor.



Turn the ignition switch OFF.
Place the bank angle sensor horizontal with the connector connected as first shown, and turn the ignition switch ON.
The bank angle sensor is normal if the relay 8 (IGN. CRUISE) clicks and the power supply line is closed.
Incline the bank angle sensor approximately 60 degrees to the left or right with the ignition switch remaining ON.
The bank angle sensor is normal if the relay 8 clicks and the power supply line is open.

NOTE

- If you repeat this test, first turn the ignition switch OFF; then the switch to ON and try test again.

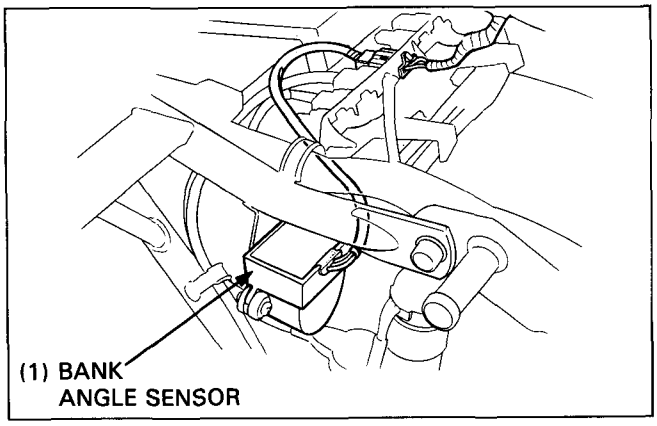


INSTALLATION

Install the bank angle sensor in the reverse order of removal.

NOTE

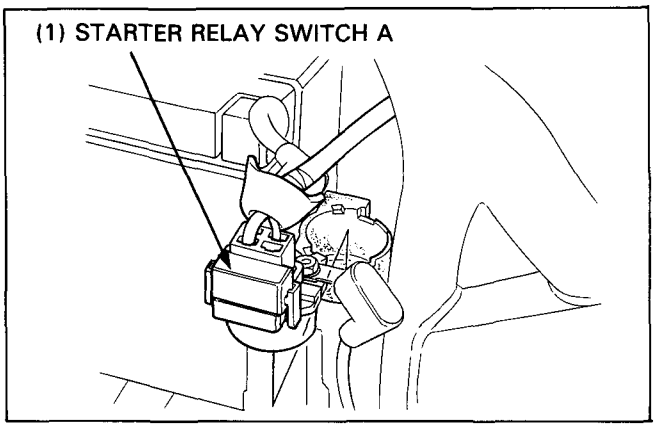
- Do not install it upside down, or the starter/reverse motor will not turn over.



STARTER RELAY SWITCH A

OPERATION INSPECTION

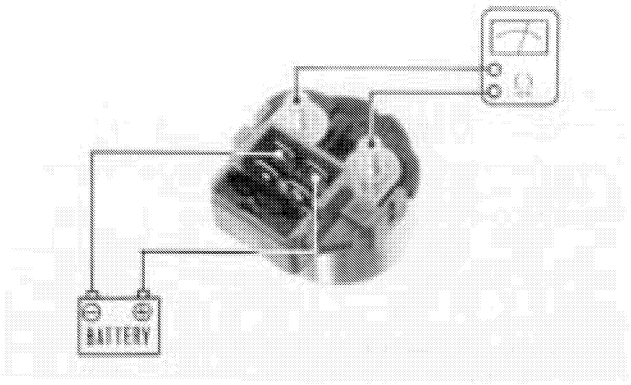
Remove the right rear side cover (page 12-6).
Depress the starter/reverse switch button with the ignition switch ON.
The relay primary coil is normal if it clicks.



CONTINUITY INSPECTION

Disconnect the battery negative cable from the battery.
Disconnect the relay connectors and remove the starter relay switch A.

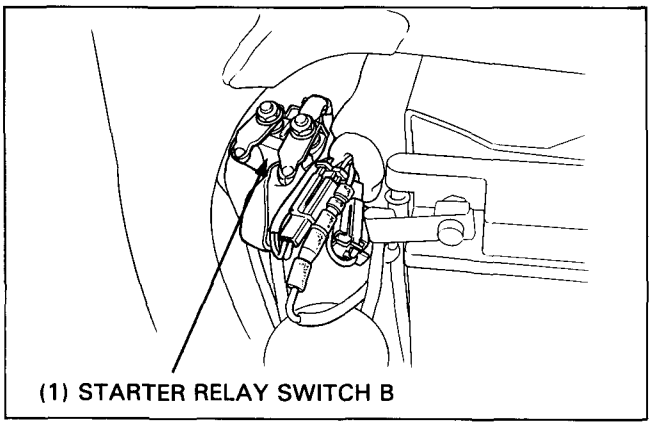
Connect an ohmmeter and 12 V battery to the starter relay switch A as shown. The switch is normal if there is continuity.



STARTER RELAY SWITCH B

ORERATION INSPECTION

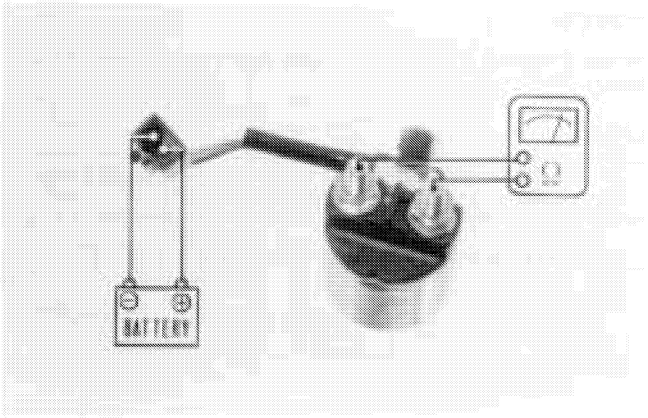
Remove the right rear side cover (page 12-6).
Depress the starter/reverse switch button with the ignition switch ON.
The relay primary coil is normal if it clicks.



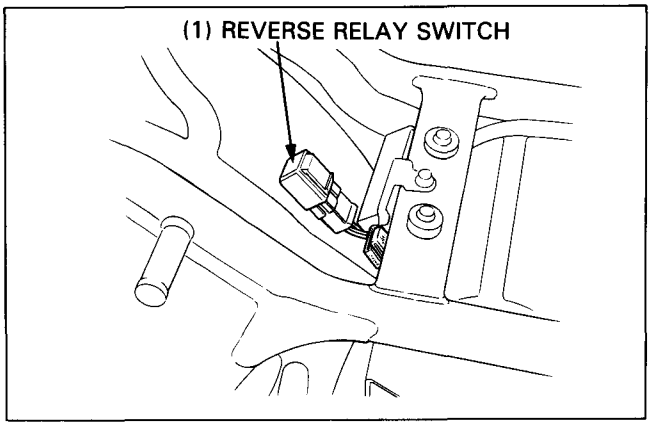
CONTINUITY INSPECTION

Disconnect the 2P-BLK connector and relay terminals, and remove the starter relay switch B.

Connect an ohmmeter and 12 V battery to the starter relay switch B as shown. The switch is normal if there is continuity.



REVERSE RELAY SWITCH

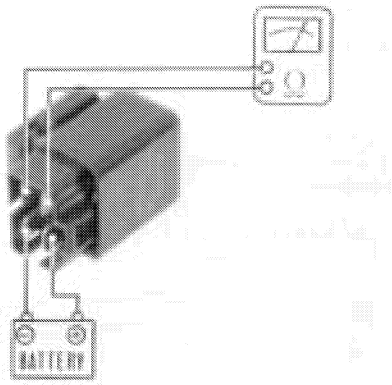


OPERATION INSPECTION

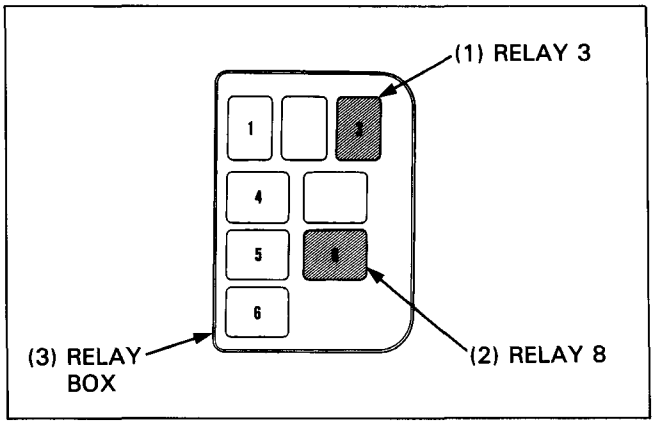
Remove the seat (page 12-6).
Depress the starter/reverse switch button with the ignition switch ON.
The relay primary coil is normal if it clicks.

CONTINUITY INSPECTION

Remove the reverse relay switch.
Connect an ohmmeter and 12 V battery to the reverse relay switch as shown. The switch is normal if there is continuity.



RELAYES IN THE RELAY BOX



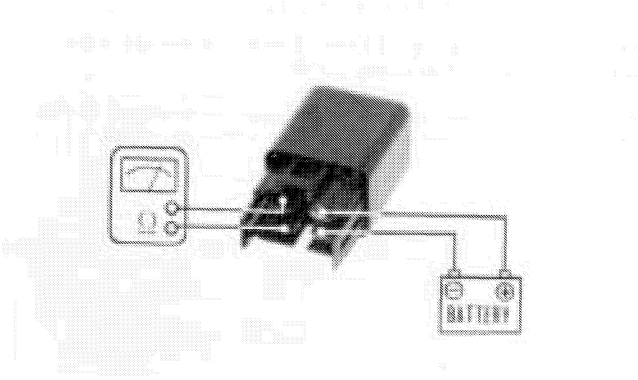
OPERATION INSPECTION

Remove the left rear side cover (page 12-6).
Open the relay box cover.

Relay 3 & 8:
When turning the ignition switch ON, the relay primary coil is normal if it clicks.

CONTINUITY INSPECTION

Remove the relay.
Connect an ohmmeter and 12 V battery to the relay as shown.
The relay is normal if there is continuity.



DIODE

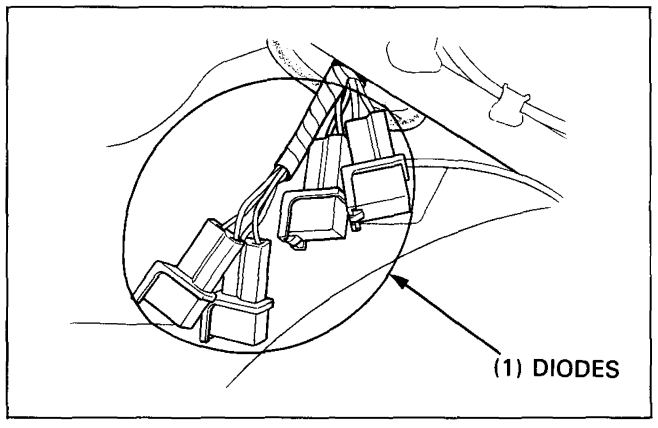
INSPECTION

Remove the right saddlebag (page 12-13).
Remove the diode from wire harness. There are four diodes.
Remove each diode and test it as indicated.

NOTE

- Example: Diode (GRN/RED & BLU/RED)

  GRN/RED and BLU/RED wires should be connected to the diode.

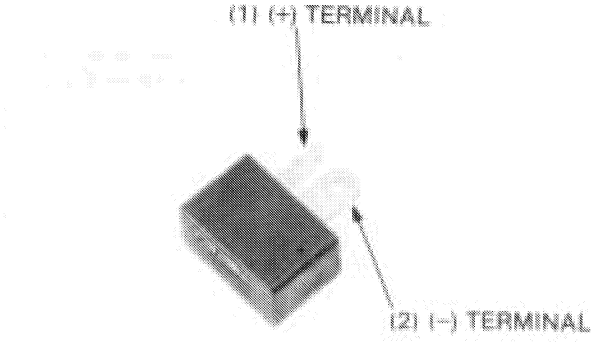


NOTE

- The test chart is for a positive ground ohmmeter. The test results will be reversed if a negative ground ohmmeter is used.

Normal Direction: Continuity
+ probe: (+) terminal
− probe: (−) terminal

Reverse Direction: No Continuity
+ probe: (+) terminal
− probe: (−) terminal



REVERSE SWITCH

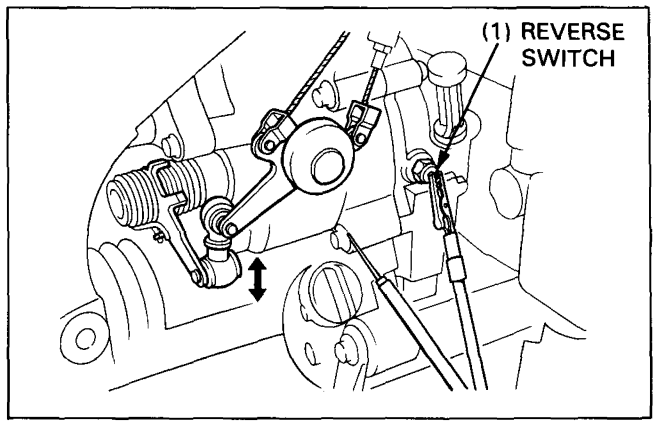
INSPECTION/REMOVAL

Remove the right front side cover (page 12-6).
Disconnect the GRN/ORN wire terminal from the reverse switch.

Check for continuity between the switch terminal and ground as shown.

There should be continuity with the reverse lever in the OFF position and no continuity with the lever in the ON position.

Perform the next check, if necessary.

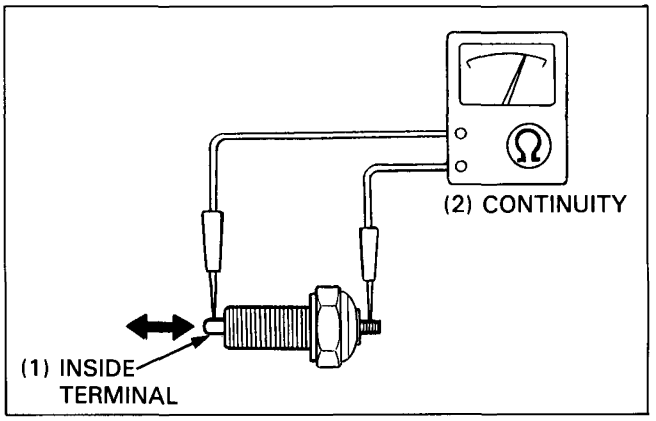


Remove the reverse switch and washer.

Inspect the inside terminal for operation. The inside terminal should move in and out smoothly.

Check for continuity between each terminal. There should be continuity.

Check the reverse shift system, if necessary (page 19-29).

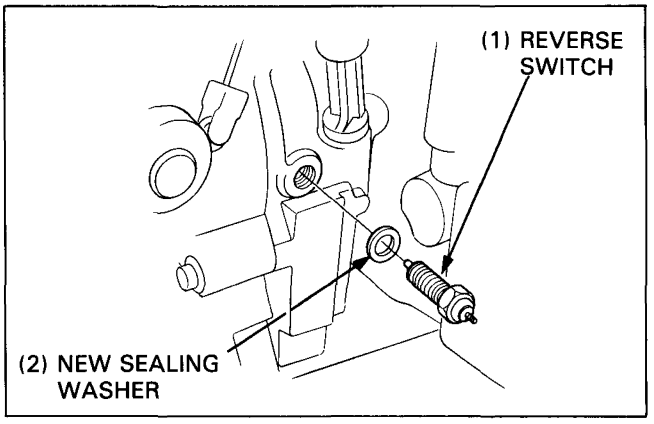


INSTALLATION

Install the reverse switch with a new sealing washer.
Tighten the switch to the specified torque.

TORQUE: 12 N·m (1.2 kg-m, 9 ft-lb)

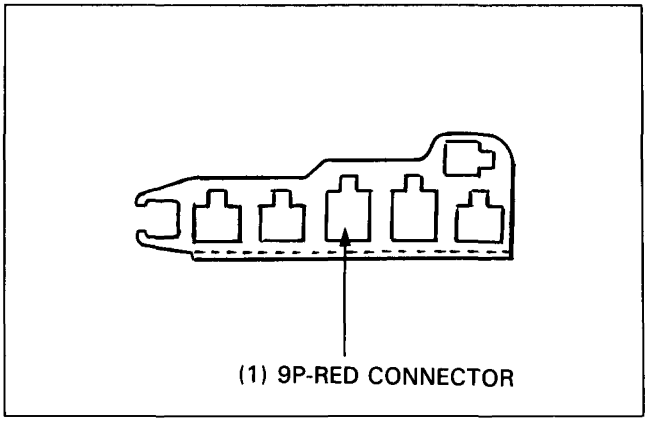
Install the removed parts in the reverse order of removal.



STARTER/REVERSE SWITCH

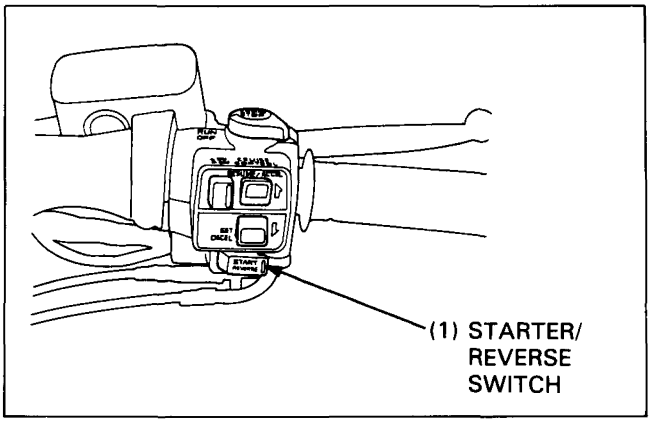
INSPECTION

Remove the right fairing lower cover (page 12-9).
Disconnect the 9P-RED connector of the connector holder on the right cooling fan.

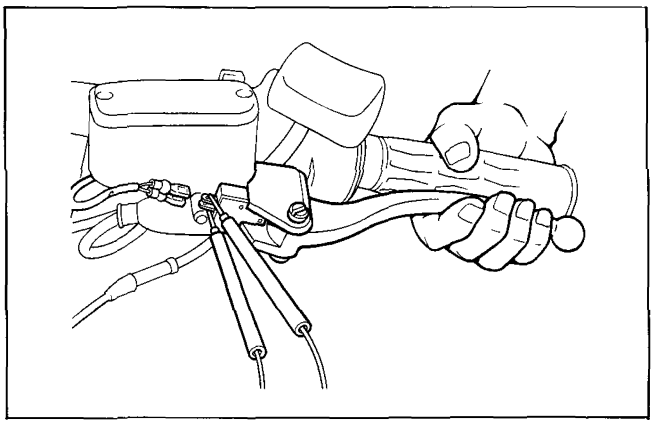


Continuity checks for the starter/reverse switch are as following.
Continuity should exist between the color coded wires in each chart below.

Color	BLK/ LT GRN	YEL/RED	BRN/WHT	BLU/WHT
FREE			O———	———O
PUSH	O———	———O		



CLUTCH SWITCH



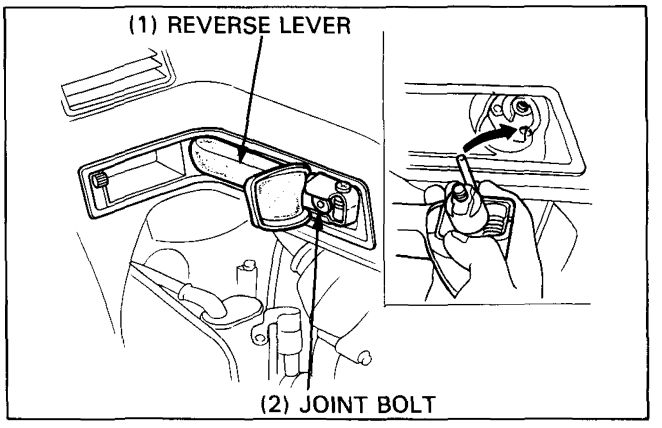
INSPECTION

Disconnect the clutch switch wire connectors.

Check for continuity between the switch terminals.

There should be continuity with the clutch lever applied and should be no continuity with the lever released.

REVERSE SYSTEM



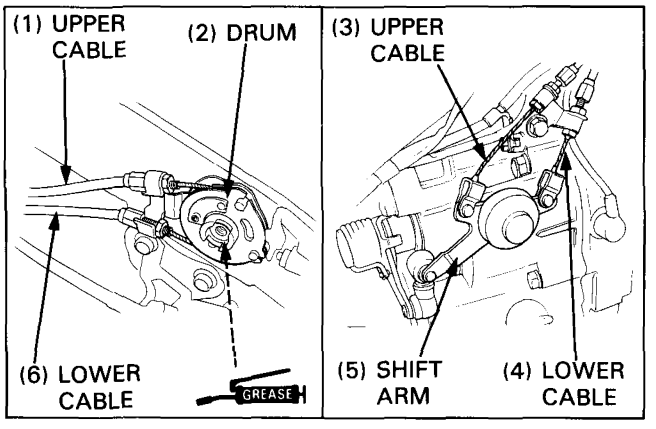
CABLE REPLACEMENT

Remove the reverse joint bolt and reverse lever from the reverse drum.

Remove the fairing inner covers (page 12-9).

Disconnect the reverse cables from the reverse drum.
Remove the reverse drum.

Disconnect the reverse cables from the reverse shift arm.
Remove the cables.



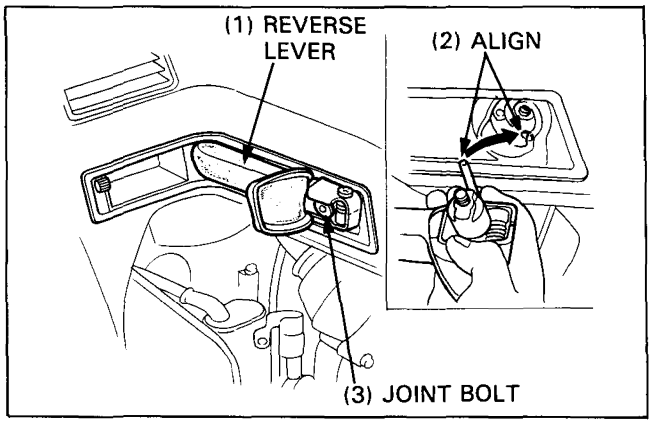
Install new cables to the reverse drum first, then connect them to the shift arm.

NOTE

- Apply grease to the reverse drum pivot.
- Connect the upper cable of the reverse drum to the upper side of the shift arm.

Adjust the reverse cables (page 3-17).

Install the fairing inner covers (page 12-9).
Install the reverse lever, aligning the lever pin with the drum hole, and tighten the joint bolt securely.



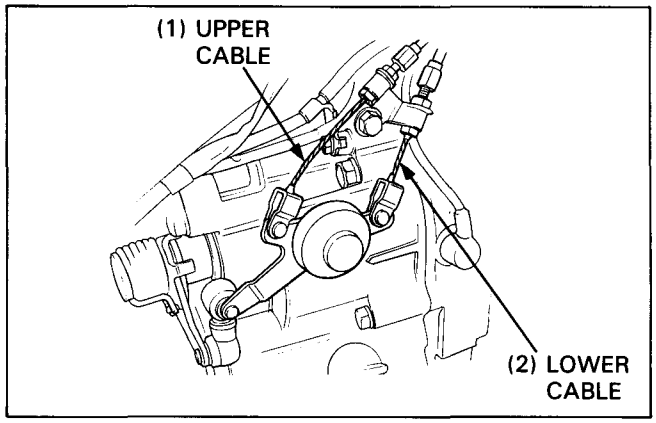
Check the reverse operation and re-adjust the cables if necessary.

REVERSE SHIFT SYSTEM REMOVAL

Disconnect the reverse cables from the shift arm.

NOTE

- Mark the cables to indicate their original position, before disconnecting them.

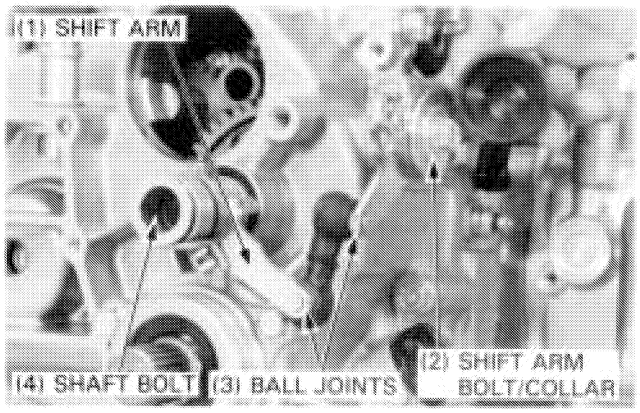


Remove the shift arm bolt and collar.
Remove the reverse shifter shaft bolt and remove the collars, springs, bushing and shift arm.

NOTE

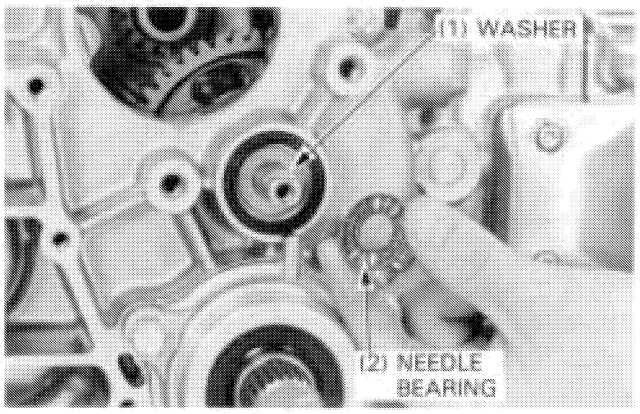
- Not all the motorcycle have the bushing.

Check the shift arm ball joints for operation.
The joints should rotate smoothly.

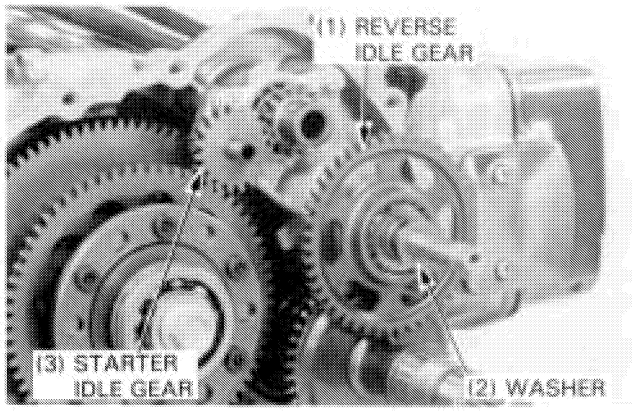


Remove the needle bearing and washer.

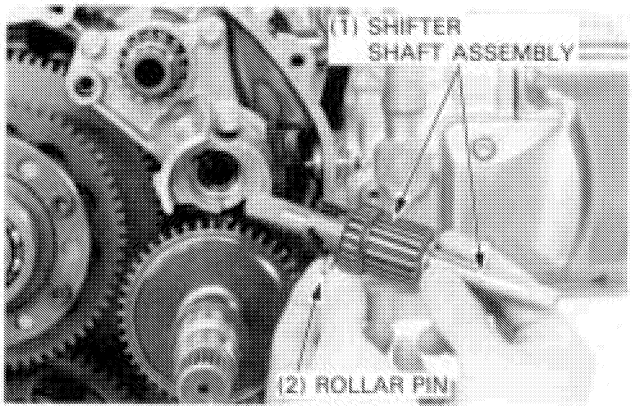
Remove the rear engine cover (page 9-3).



Remove the washer and reverse idle gear.
Remove the starter idle gear and shaft.

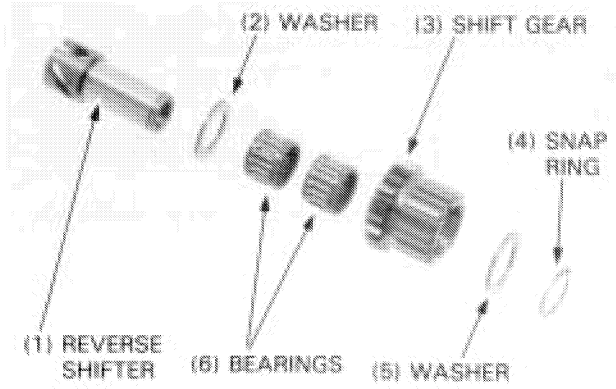


Remove the reverse shifter shaft assembly.
Remove the rollar pin from the shaft.

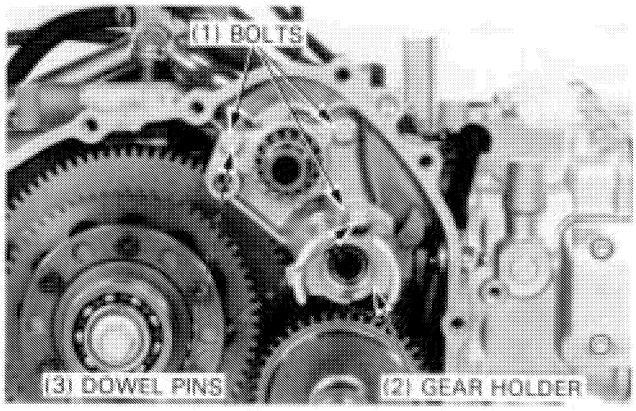


Remove the snap ring and disassemble them.

Check the needle bearings for damage or excessive wear.
Check the reverse shift gear teeth for excessive or abnormal wear.
Check the reverse shifter holes and groove for damage or wear.

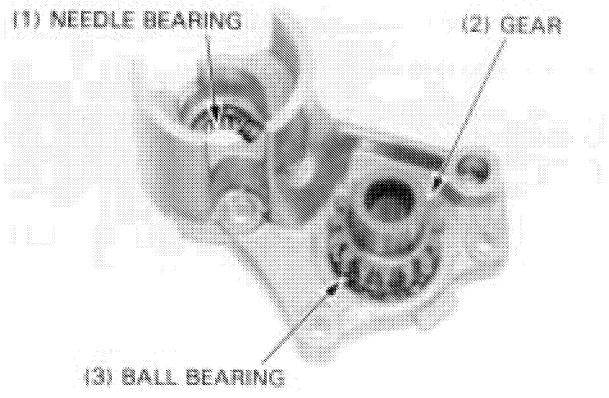


Remove the bolts and starter drive gear holder.
Remove the dowel pins.



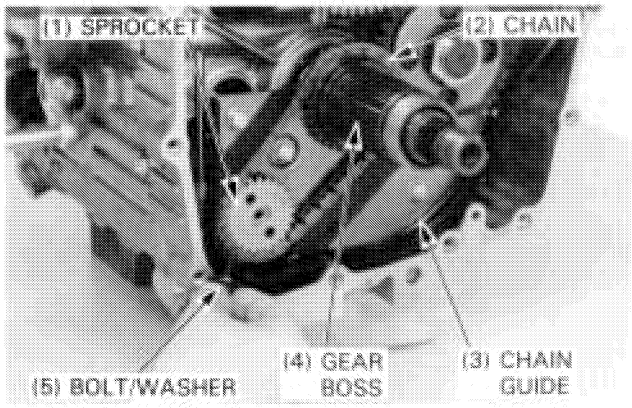
Turn the starter drive gear with your finger.
The bearing should turn smoothly and quietly.
Also check the outer race of the bearing fits tightly in the holder.
Replace the bearing if necessary (page 19-32).

Check the needle bearing for damage or abnormal noise and replace it if necessary (page 19-33).
Also check the gear teeth for damage or wear.

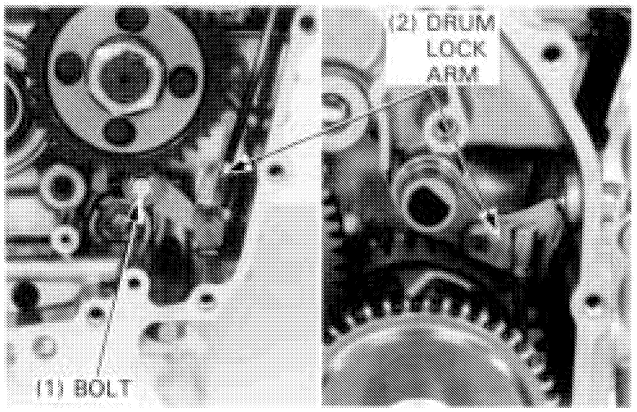


SHIFT DRUM LOCK SYSTEM REMOVAL

Remove the following:
—starter clutch (page 19-22).
—primary driven gear (page 9-10).
—oil pump sprocket bolt and washer (page 9-10).
—oil pump sprocket, drive chain and primary driven gear boss as an assembly (page 9-10).
—drive chain guide.



Remove the bolt and shift drum lock arm assembly.

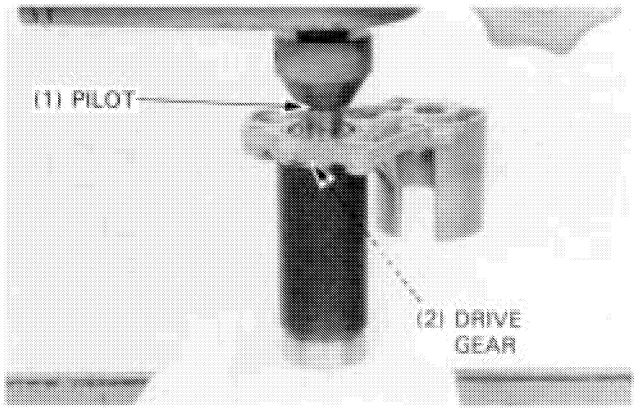


BEARING REPLACEMENT

● **Ball bearing**
Hold the gear holder with a suitable tool and press the starter drive gear out of the bearing.

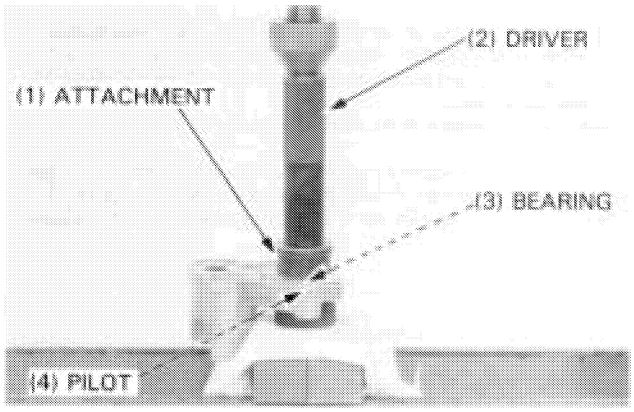
TOOL:
Pilot, 20 mm **07746—0040500**

Drive the ball bearing out of the holder.



Hold the gear holder with a suitable tool and press the bearing into the holder.

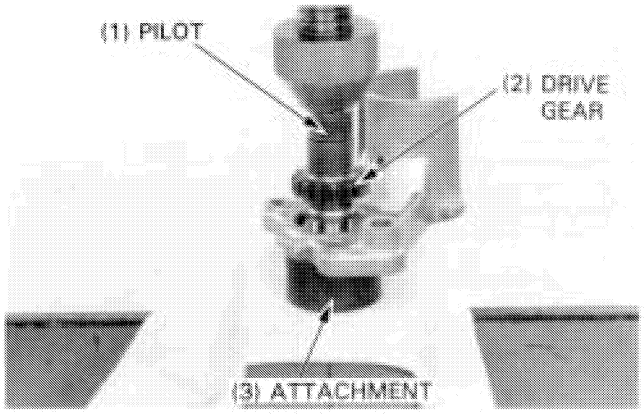
TOOLS:
Driver **07749—0010000**
Attachment, 37 x 40 mm **07746—0010200**
Pilot, 20 mm **07746—0040500**



Hold the bearing inner race with the inner driver, and press the starter drive gear into the bearing.

TOOLS:

Attachment, 20 mm, I.D.	**07746—0020400**
Pilot, 20 mm	**07746—0040500**



- **Needle bearing**

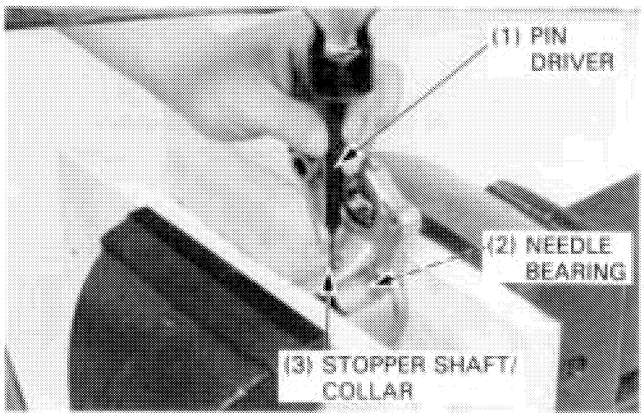
Remove the starter drive gear (page 19-32).

Hold the gear holder in a vise with a block as shown and drive the reverse stopper shaft and collar out of the holder.

TOOL:

Pin driver, 4 mm	**07944—SA00000**

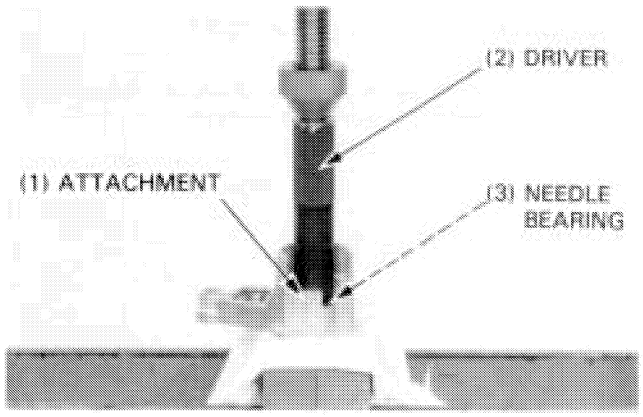
Remove the needle bearing out of the holder.



Press a new needle bearing into the holder.

TOOLS:

Driver	**07749—0010000**
Attachment, 24 x 26 mm	**07746—0010700**

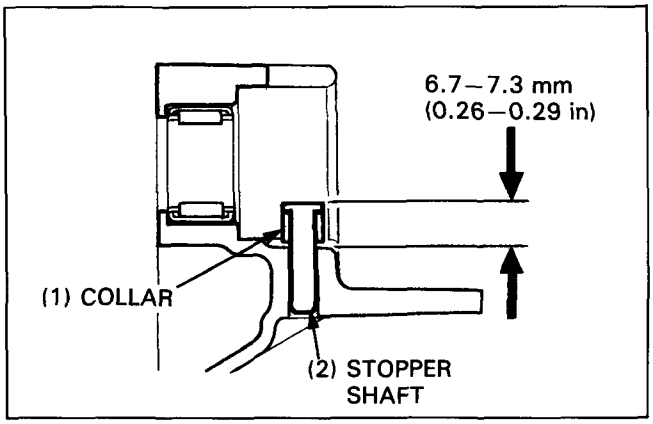


Drive the reverse stopper shaft with its collar into the holder.

NOTE

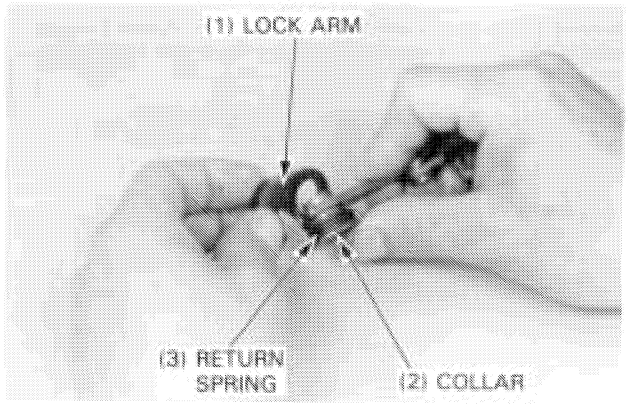
- Keep the installed height as shown.

Install the starter drive gear (see above).



SHIFT DRUM LOCK SYSTEM INSTALLATION

Install the arm, collar and return spring onto the shift drum lock arm.

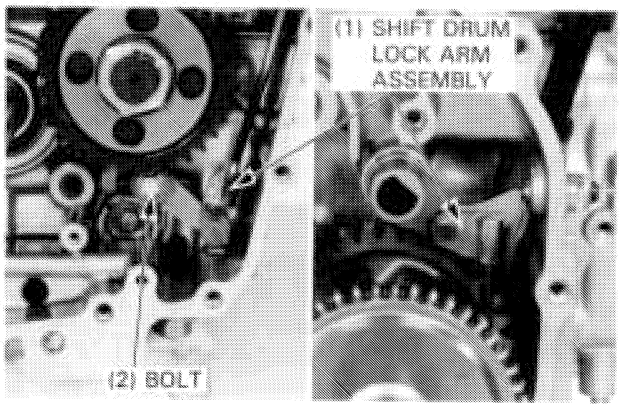


Apply a locking agent to the threads of the shift drum lock arm bolt.

Install the shift drum lock arm assembly and tighten the bolt to the specified torque.

TORQUE: 12 N·m (1.2 kg-m, 9 ft-lb)

With the transmission in neutral, check the arm assembly for operation.



Install the following:
—drive chain guide.
—oil pump sprocket, drive chain and primary driven gear boss as an assembly.

NOTE

- With the sprocket "OUT" mark facing out.

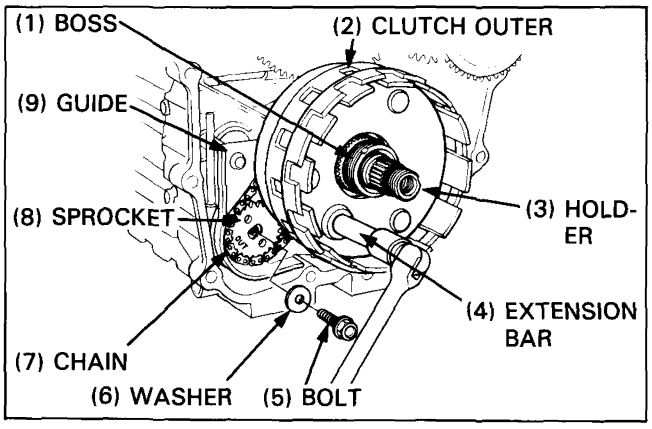
Temporarily install the clutch outer and clutch outer holder so that the oil pump sprocket can not be rotated.

TOOL:

Clutch outer holder	**07JMB—MN50100**
Extension bar	**07716—0020000**

Apply a locking agent to the sprocket bolt threads.
Install and tighten the washer and bolt, holding the clutch outer.

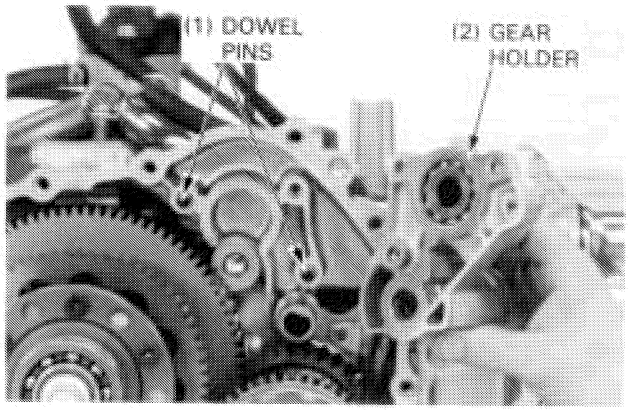
TORQUE: 18 N·m (1.8 kg-m, 13 ft-lb)



—primary driven gear (page 9-12).
—starter clutch (page 19-24).

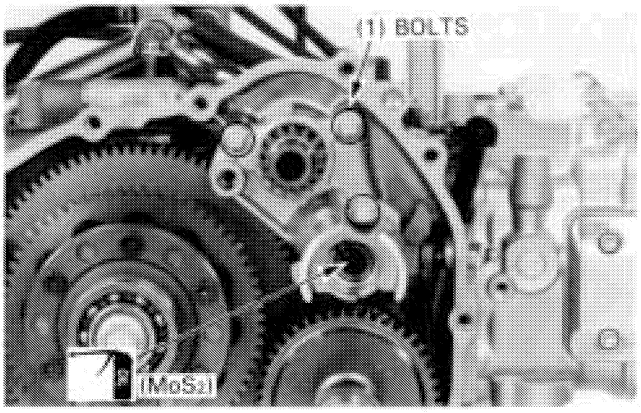
REVERSE SHIFT SYSTEM INSTALLATION

Install the dowel pins.
Install the starter drive gear holder.



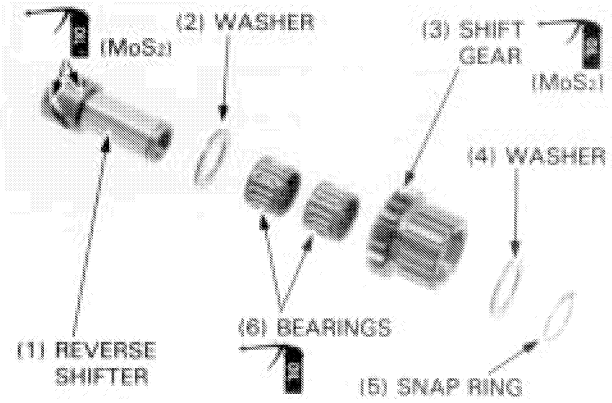
Install and tighten the starter drive gear holder bolts securely.

Apply molybdenum disulfide oil to the stopper shaft.



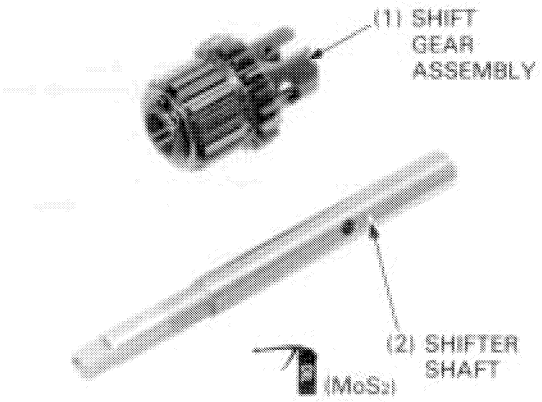
Apply oil to the needle bearings.
Apply molybdenum disulfide oil to the shift gear teeth and reverse shifter holes/and groove.

Install the washer, needle bearings, reverse shift gear and washer onto the reverse shifter.
Install the snap ring with its chamfered surface facing inside.



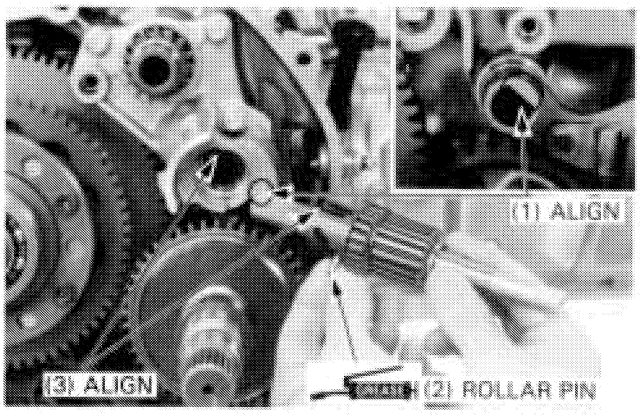
Check the shift gear for rotation.
Apply molybdenum disulfide oil to the shifter shaft.

Install the shift gear assembly onto the shifter shaft.

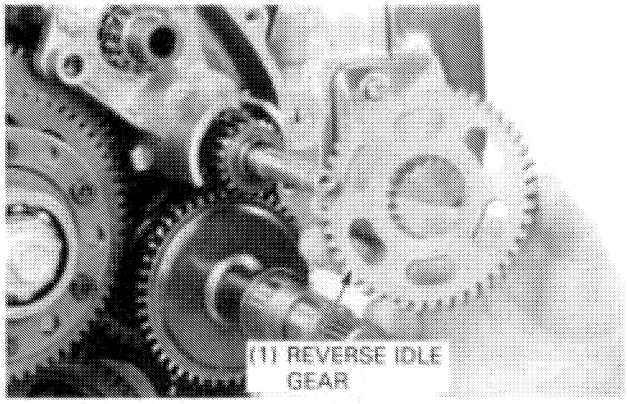


Apply grease to the rollar pin.
Install the rollar pin into the shifter holes and shaft hole as shown.

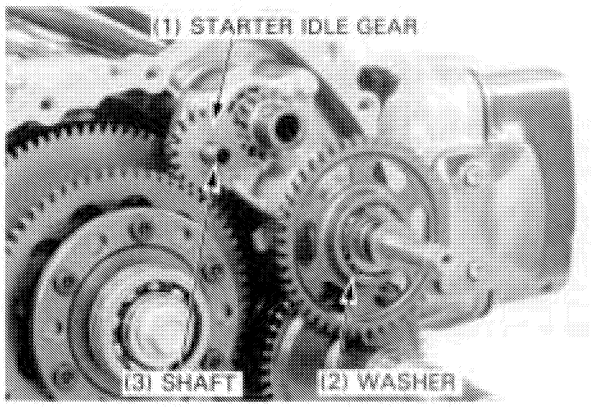
Install the reverse shifter shaft assembly, simultaneously aligning the shifter groove with the stopper shaft while aligning with the cut-outs of the shaft and shift drum lock arm boss.



Install the reverse idle gear with its flat surface facing inside.

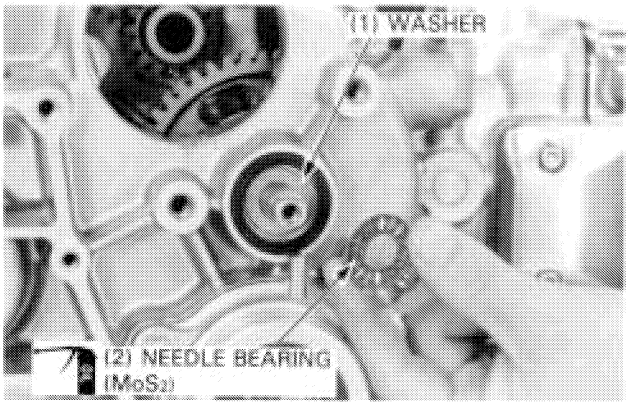


Install the washer.
Install the starter idle gear and shaft.



Install the rear engine cover (page 9-18).

Install the washer.
Apply molybdenum disulfide oil to the needle bearing.
Install the needle bearing to the shifter shaft.



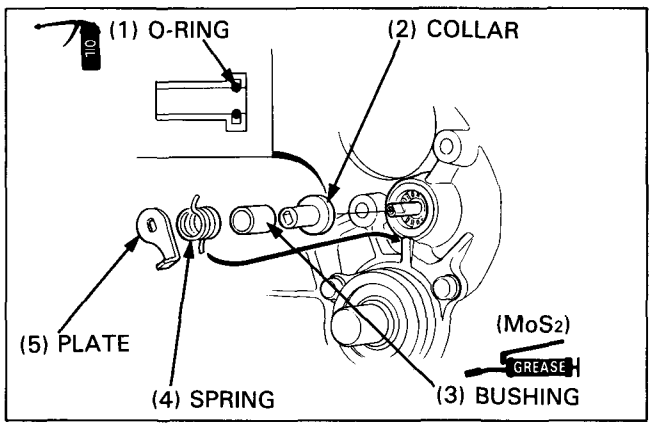
Apply oil to the O-ring and install it to the collar securely as shown.

Apply molybdenum disulfide grease (approximately 1.0 g/ 0.04 oz) to the inner and outer surfaces of the bushing.
Install the collar and bushing.

NOTE

- Not all the motorcycle have the bushing.

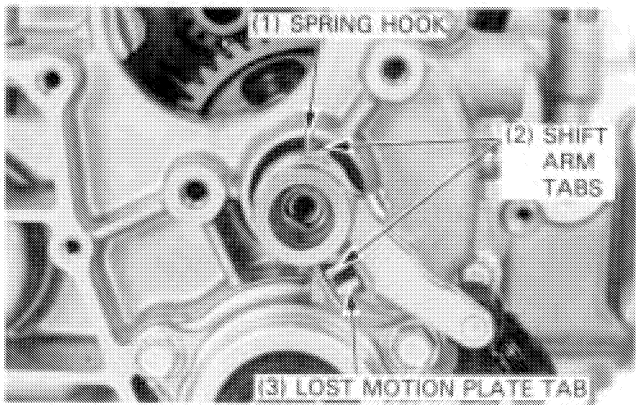
Install the spring, hooking it onto the tab of the output shaft bearing holder as shown.
Install the lost motion plate.



Install the shift arm, lost motion spring and spring collar to the shifter shaft as shown.

NOTE

- Make sure the locations of the spring hooks, shift arm tabs and lost motion plate tab are as shown.



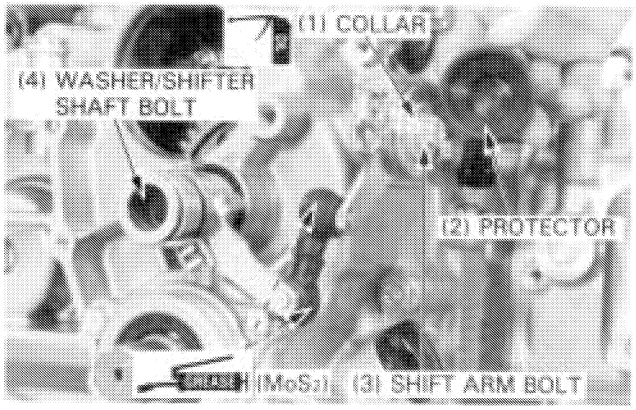
Apply a locking agent to the threads of the reverse shifter shaft bolt and shift arm bolt.

Install the washer and reverse shifter shaft bolt.
Tighten the bolt to the specified torque.

TORQUE: 14 N·m (1.4 kg-m, 10 ft-lb)

Apply oil to the reverse shift collar.
Install the shift collar and shift arm bolt.

Install the rubber protector.
Apply molybdenum disulfide grease (approxmately 0.5 g/ 0.02 oz) to the shift arm joints (2 plcs).
Check the shift arm for operation.

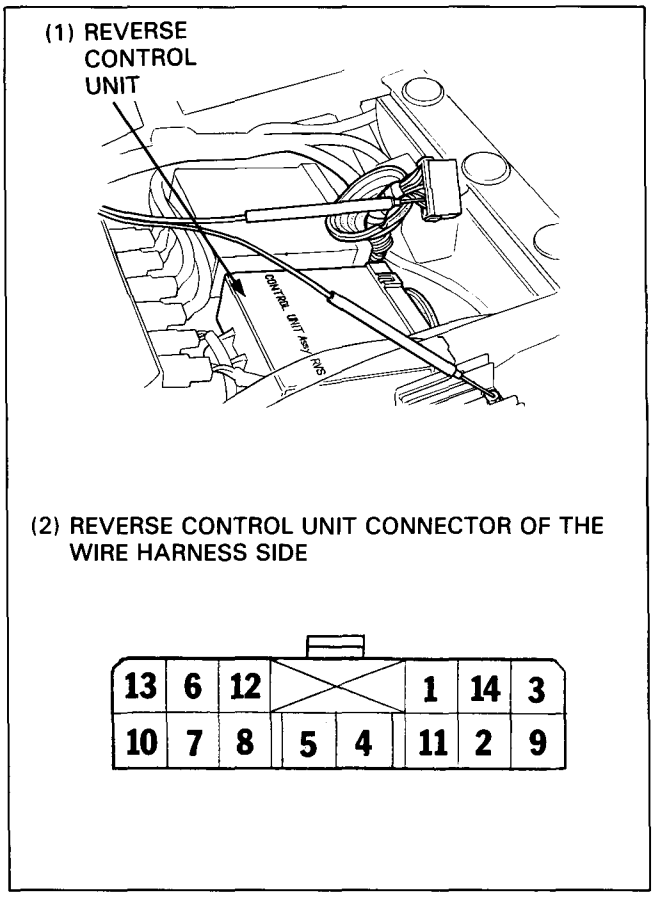


REVERSE CONTROL UNIT

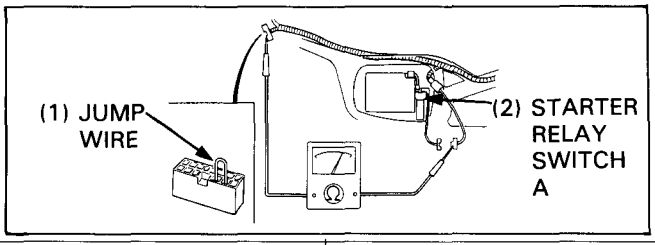
SYSTEM INSPECTION

Remove the seat and trunk (page 12-6, 12).
Disconnect the 14P-WHT connector of the reverse control unit and check it for loose contact or corroded terminals.

Measure the following (next page) between connector terminals of the wire harness side.



TERMINAL NUMBER/ITEM		TERMINALS	CONDITION(S)	SPECIFICATION
1	Ground line	GRN and ground	At all times	Continuity should exist.
2	Speed limiter relay line	GRY (+) and ground (−)	Ignition switch ON Reverse lever switch ON	Battery voltage should register.
3	Reverse lever line	WHT/BLU (+) and ground (−)	Ignition switch ON Reverse lever switch ON	Battery voltage should register.
4	Reverse indicator line	WHT/RED	Short it to ground.	Reverse indicator should come on.
5	Oil pressure line	BLU/RED (+) and ground (−)	Ignition switch ON	0 V should register.
			Disconnect the oil pressure switch terminal and turn the ignition switch ON	Battery voltage should register.
6	Motor (−) line	ORN and ground	At all times	Continuity should exist.
7	Starter relay regulator line	LT BLU and LT BLU of the unit and regulator	Disconnect the starter regulator 4P-RED connector (page 19-39) and check for continuity between the same color wire terminals.	Continuity should exist.
8	Reverse fuse line	LT GRN/YEL and ground	At all times	Continuity should exist.
	Speed limiter relay line	LT GRN/YEL and BLK (IP-WHT) of the wire harness sides	Connect the GRN/RED wire to GRN wire with a jump wire. Disconnect the 1P-WHT wire connector near the starter relay switch A. With the reverse lever ON, turn the ignition switch ON.	Continuity should exist.
9	Power control unit line	WHT and ground	At all times	0.1—1.0 kOhms (20°C/68°F)
10	Side stand switch line	GRN/WHT and ground	Side stand up	Continuity should exist.
			Side stand down	No continuity exist.
11	Starter/reverse switch line	YEL/RED (+) and ground (−)	Ignition switch ON Starter/reverse switch pushed	Battery voltage should register.
12	Power control unit/resister line	BLU and ground	At all times	0.2—0.3 Ohms (20°C/68°F)
13	Motor (+) line	PNK and Motor (+) cable	At all times	Continuity should exist.
14	Reverse relay switch line	GRN/RED (+) and ground (−)	Ignition switch ON Starter/reverse switch pushed	0—1.0 voltage should register.
			Ignition switch ON Starter/reverse switch pushed Reverse switch terminal (on engine) disconnected	Battery voltage should register.



SPEED LIMITER RELAY LINE INSPECTION

Start the engine.
Remove the reverse fuse (65 A).
Disconnect the motor cables from the starter/reverse motor (page 19-13).

Connect the voltmeter between the reverse fuse terminals (tester ⊕ cable to the fuse YEL terminal).
Connect the battery charger positive (+) cable to the motor (+) cable.
Connect the charger negative (−) cable to the motor negative (−) cable.

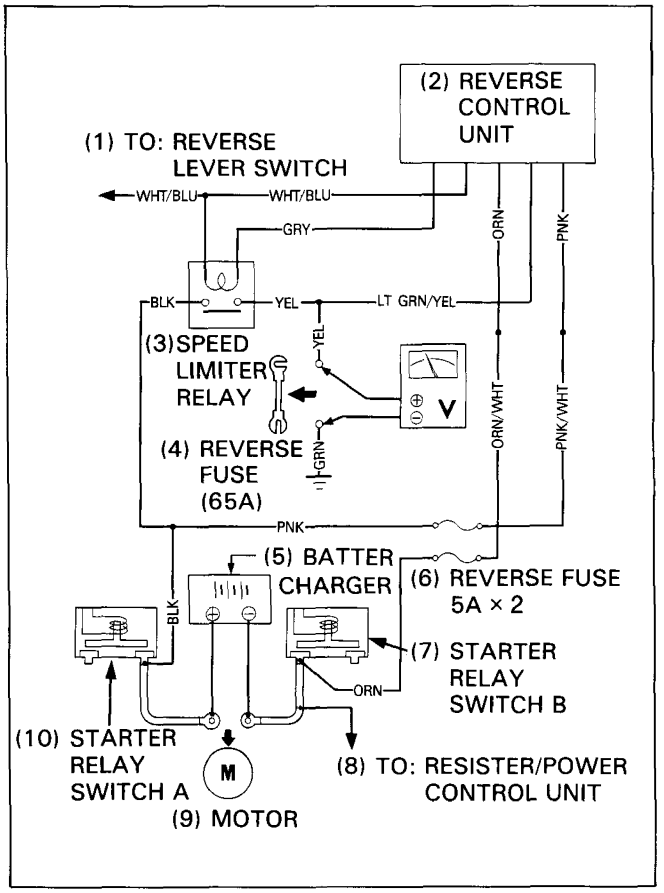
With the reverse conditions ready (gear in neutral, side stand up, engine run, and reverse lever switch ON), be the charger switch ON and apply 13−20 V between the motor cables.
The 13−20 Voltage should appear between reverse fuse terminals.

⚠WARNING

- ***Turn power ON/OFF at the charger, not at the battery terminals to prevent sparks.***

CAUTION

- *While applying the power to the line from a charger, do not depress the starter/reverse switch.*

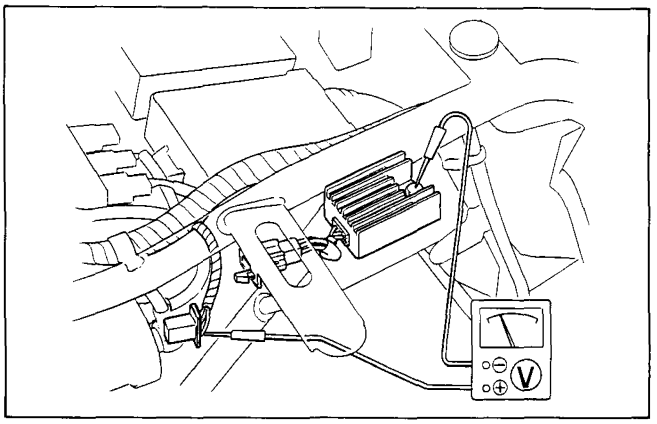


STARTER RELAY REGULATOR

WIRING INSPECTION

Remove the seat and trunk (page 12-6, 12).
Disconnect the 4P-RED connector of the starter relay regulator and check it for loose contact or corroded terminals.

Measure the following between connector terminals of the wire harness side. If there is OK, perform the next inspection.



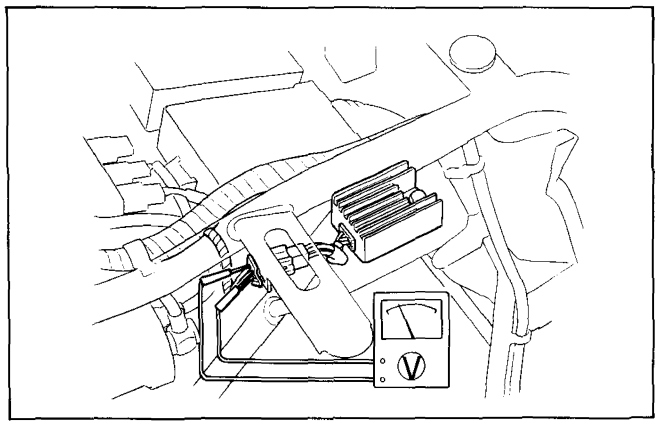
ITEM	TERMINALS	CONDITION(S)	SPECIFICATION
Battery voltage line	WHT/BLU (+) and ground (−)	Ignition switch ON Reverse lever switch ON	Battery voltage should register.
Starter relay switch A primary coil line	BRN/RED of the regulator and starter relay switch A	Disconnect the 4P-RED connector of the starter relay switch A (page 19-25) and check for continuity between the BRN/RED wire terminals.	Continuity should exist at all times.
Reverse control unit line	LT BLU of the regulator and reverse control unit	Disconnect the 14P-WHT connector of the reverse control unit (page 19-37) and check for continuity between the LT BLU wire terminals.	Continuity should exist at all times.
Ground line	GRN and ground	At all times	Continuity should exist.

REGULATED VOLTAGE INSPECTION

Turn the ignition switch ON and engine stop switch to the RUN position. Start the engine, raise the side stand and put the reverse lever in the ON position.

With the 4P-RED connector connected, set the tester probes to LT BLU (+) and GRN (−) wire terminals.

Starter/reverse switch is pushed, and voltage should be 0−1.0 V.



Turn the ignition switch ON and engine stop switch to the RUN position. Start the engine, raise the side stand and put the reverse lever in the ON position.

With the 4P-RED connector connected, set the tester probes to BRN/RED (+) and GRN (−) wire terminals.

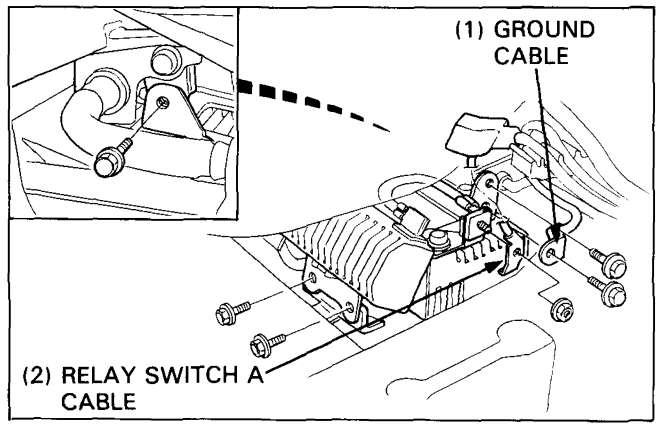
Starter/reverse switch is pushed, and voltage should be 0 V approximately for the first 0.3 seconds; then a minimum of 4.0 Voltage should register.

POWER CONTROL UNIT/RESISTER

REMOVAL

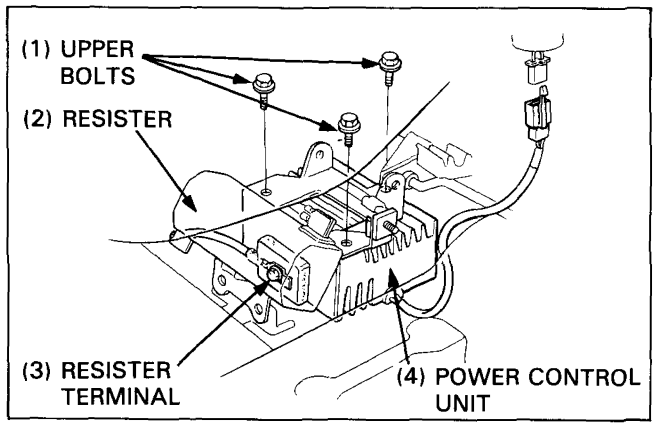
Remove the battery case (page 17-5).
Disconnect the ground cable (BLK) and starter relay switch B cable (BLK) from the resister holder terminals.
Remove the power control unit mounting bolts.

Disconnect the 2P-WHT connector of the power control unit near the starter relay switch A.



Remove the resister holder bolts and separate the resister holder from the power control unit.

Remove the power control unit/resister as an assembly from the frame and disconnect the resister terminal from the power control unit.
Remove the resister from the holder.

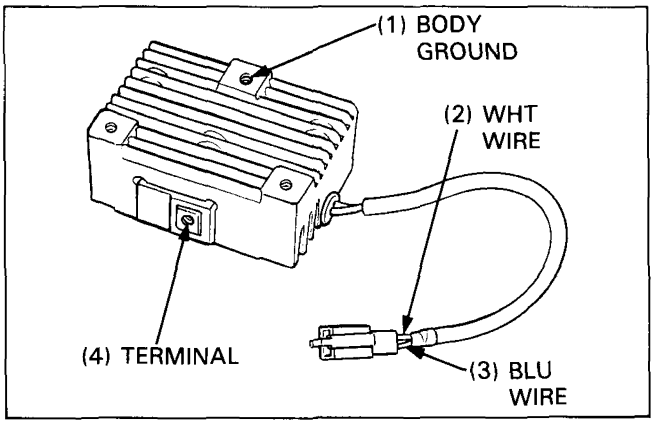


POWER CONTROL UNIT INSPECTION

Measure the resistances between the terminals as shown in the table below.

NOTE

- Use a SANWA circuit tester (07308—0020000), KOWA circuit tester (TH-5H) or KOWA digital multimeter (07411—0020000).
  Tester range: KOWA x 100 Ω, SANWA x kΩ
- The power contral unit has a semi-conductor, that if using a different tester, the test results will be out of specification.



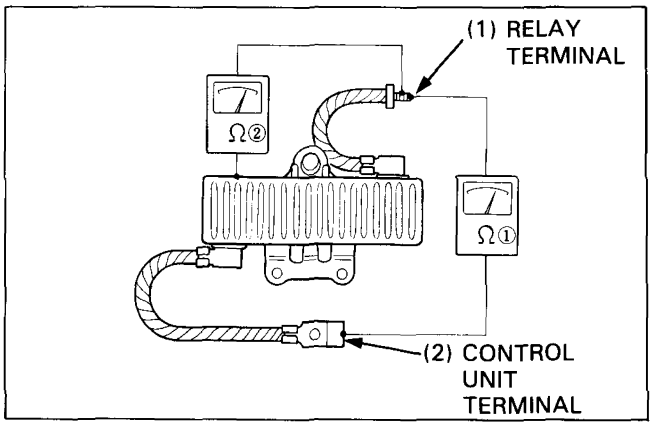
Unit: kOhms

Probe ⊕ / Probe ⊖	BLU	WHT	GROUND	TERMINAL
BLU		∞	∞	0
WHT	3 min.		0.1—1.0	3 min.
GROUND	3 min.	0.1—1.0		3 min.
TERMINAL	0	∞	∞	

RESISTER INSPECTION

Measure the resistances between the terminals as shown.

STANDARDS (20°C/68°F):
① Relay terminal-unit terminal 0.06—0.09 Ohms
② Relay terminal-body ground 0.1—0.2 Ohms



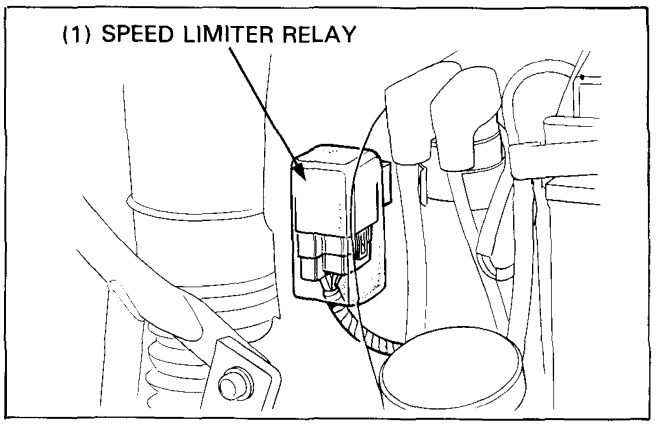
INSTALLATION

Install the power control unit and resister as an assembly in the reverse order of removal.

SPEED LIMITER RELAY

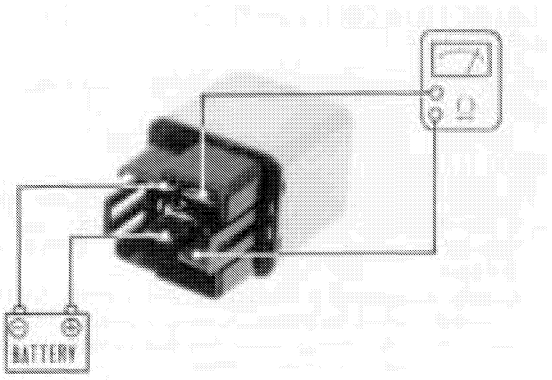
OPERATION INSPECTION

Remove the right rear side cover.
Disconnect the 14P-WHT connector of the reverse control unit (page 19-37) and connect the GRY wire to GRN wire with a jump wire (wire harness side).
Turn the ignition switch ON and position the reverse lever in the ON position.
The relay is normal if it clicks.



CONTINUITY INSPECTION

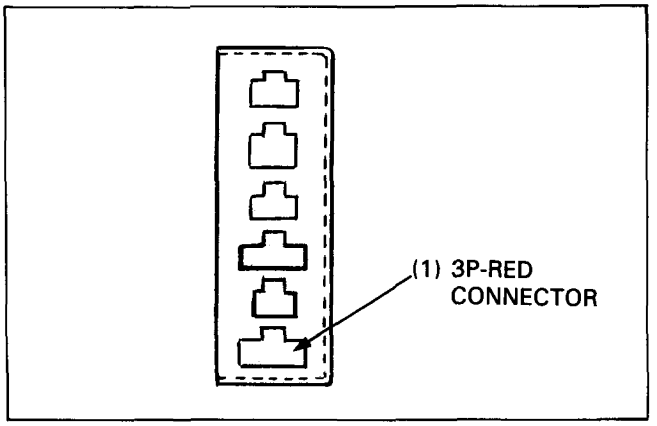
Remove the speed limiter relay with a protector rubber from the rear fender.
Disconnect the 5P-WHT connector and remove the speed limiter relay.
Connect an ohmmeter and 12 V battery to the speed limiter relay as shown. The relay is normal if there is continuity.



REVERSE LEVER SWITCH

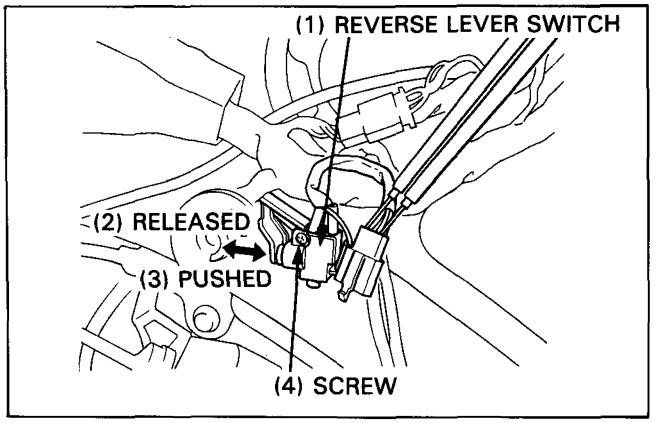
INSPECTION

Remove the left fairing inner cover (page 12-9).
Disconnect the 3P-RED connector of the connector holder behind the cruise control valve unit.



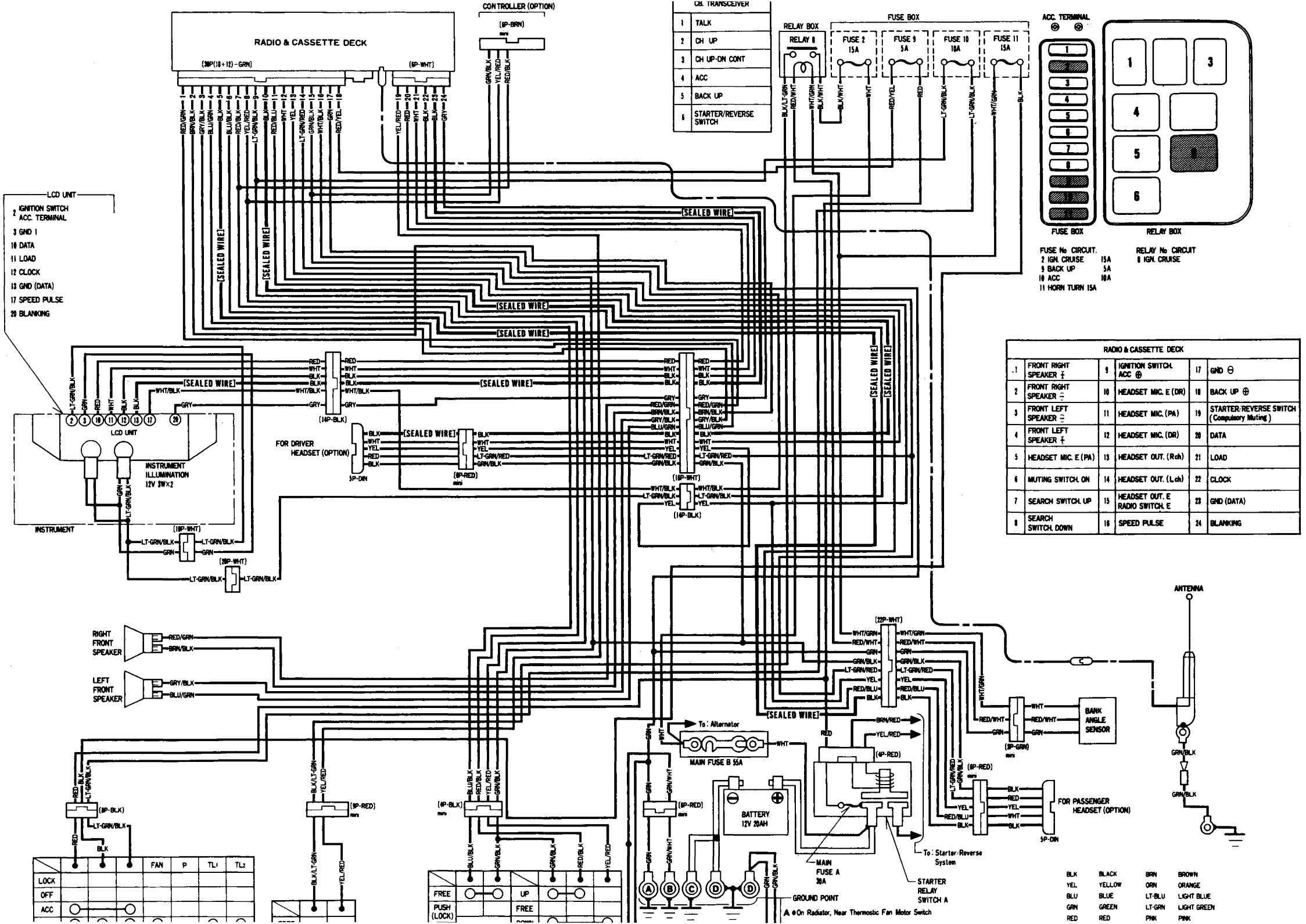
Check for continuity between each terminals as below.

Item	Terminal	Specification
The switch is pushed.	BLK/WHT and BRN/WHT	No continuity
	WHT/BLU and BRN/WHT	Continuity
The switch is released.	BLK/WHT and BRN/WHT	Continuity
	WHT/BLU and BRN/WHT	No continuity

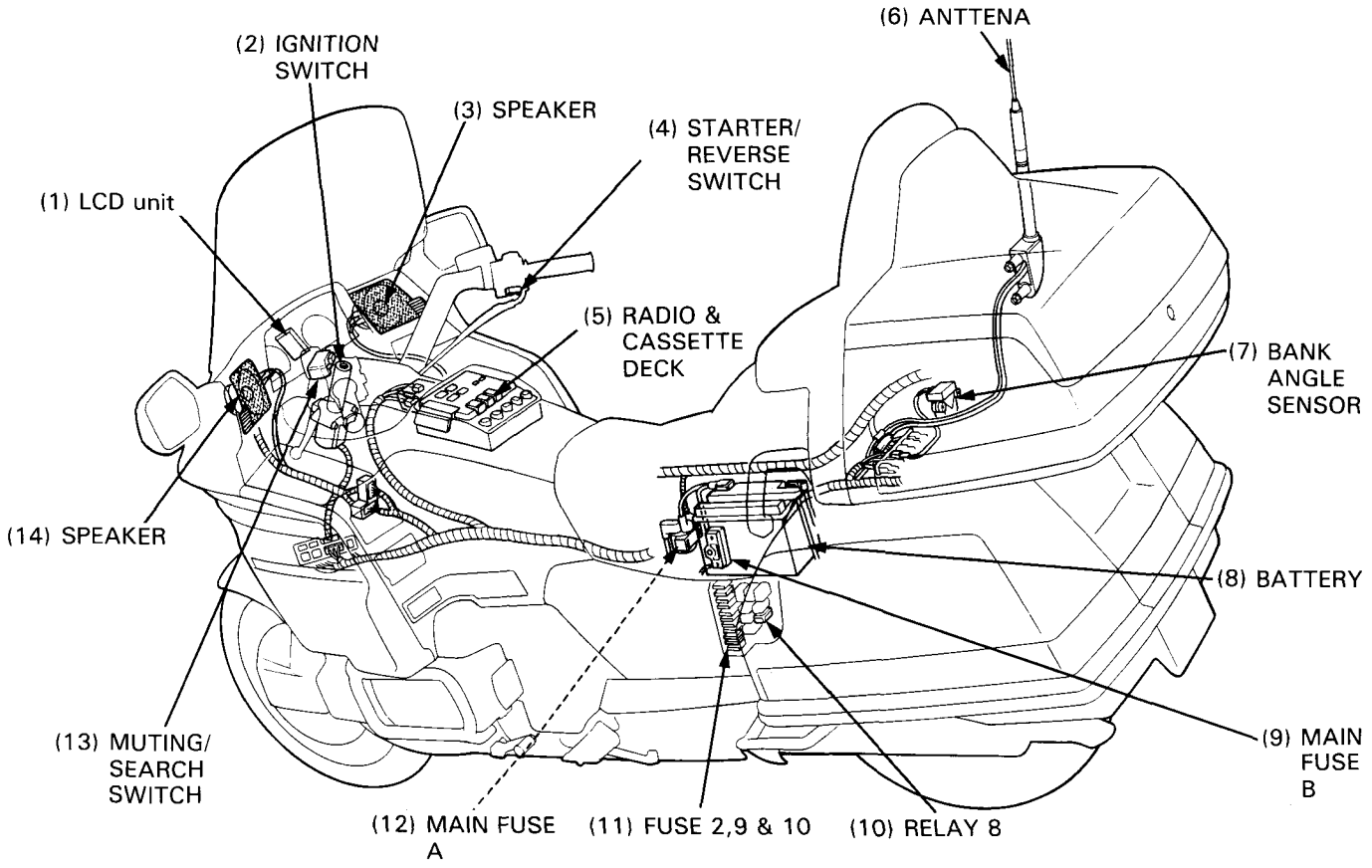


REPLACEMENT

Remove the screw and remove the switch from the frame.
Install it in the reverse order of removal.


RADIO & CASSETTE DECK
(39P(18+12)-GRN)
(6P-WHT)
CONTROLLER (OPTION)
(6P-BRN)
CB TRANSCEIVER
1 TALK
2 CH UP
3 CH UP-DN CONT
4 ACC
5 BACK UP
6 STARTER/REVERSE SWITCH
RELAY BOX
RELAY 8
FUSE BOX
FUSE 2 15A
FUSE 9 5A
FUSE 10 10A
FUSE 11 15A
ACC TERMINAL
FUSE BOX
RELAY BOX
FUSE No CIRCUIT
2 IGN. CRUISE 15A
9 BACK UP 5A
10 ACC 10A
11 HORN TURN 15A
RELAY No CIRCUIT
8 IGN. CRUISE
LCD UNIT
2 IGNITION SWITCH ACC. TERMINAL
3 GND 1
10 DATA
11 LOAD
12 CLOCK
13 GND (DATA)
17 SPEED PULSE
20 BLANKING
[SEALED WIRE]
(14P-BLK)
(18P-WHT)
(8P-RED)
5P-DIN
FOR DRIVER HEADSET (OPTION)
INSTRUMENT ILLUMINATION 12V 3W×2
INSTRUMENT
(20P-WHT)
RADIO & CASSETTE DECK
1 FRONT RIGHT SPEAKER +
2 FRONT RIGHT SPEAKER −
3 FRONT LEFT SPEAKER −
4 FRONT LEFT SPEAKER +
5 HEADSET MIC. E (PA)
6 MUTING SWITCH. ON
7 SEARCH SWITCH. UP
8 SEARCH SWITCH. DOWN
9 IGNITION SWITCH. ACC ⊕
10 HEADSET MIC. E (DR)
11 HEADSET MIC. (PA)
12 HEADSET MIC. (DR)
13 HEADSET OUT. (Rch)
14 HEADSET OUT. (Lch)
15 HEADSET OUT. E RADIO SWITCH. E
16 SPEED PULSE
17 GND ⊖
18 BACK UP ⊕
19 STARTER/REVERSE SWITCH (Compulsory Muting)
20 DATA
21 LOAD
22 CLOCK
23 GND (DATA)
24 BLANKING
RIGHT FRONT SPEAKER
LEFT FRONT SPEAKER
(22P-WHT)
ANTENNA
BANK ANGLE SENSOR
(3P-GRN)
To: Alternator
MAIN FUSE B 55A
(4P-RED)
BATTERY 12V 28AH
MAIN FUSE A 30A
STARTER RELAY SWITCH A
To: Starter/Reverse System
FOR PASSENGER HEADSET (OPTION)
5P-DIN
GROUND POINT
A ⊕On Radiator, Near Thermostic Fan Motor Switch
(8P-BLK)
(5P-RED)
(4P-BLK)
LOCK
OFF
ACC
FAN
P
TL1
TL2
FREE
PUSH (LOCK)
UP
FREE
DOWN
BLK BLACK
YEL YELLOW
BLU BLUE
GRN GREEN
RED RED
BRN BROWN
ORN ORANGE
LT-BLU LIGHT BLUE
LT-GRN LIGHT GREEN
PNK PINK

SYSTEM LOCATION



20

SERVICE INFORMATION

GENERAL

- When inspect the audio system, check the sytem components and lines step-by-step according to the troubleshooting as below.
- Tape Player Maintenance:
  The head in the cassette tape player can pick up dirt or tape deposits each time a cassette is played.
  The result is low or "muddy" sound from one or both channels, as if the treble tone control were turned all the way down.
  To prevent this, you should periodically clean the head with a commercially available cleaning cassette.
  As preventive maintenance, clean the head about every 30 hours of use. If you wait until the head becomes very dirty (noticeably poor sound), it may not be possible to remove all deposits with a simple cleaning cassette.

CAUTION

- *Failure to store cassettes in their cases, or touching the magnetic tape with your fingers will increase the amount of dirt that gets on the tape head. Using low-quality "off-brand" tape will increase the amount of tape deposits that get on the head. Such practices may eventually lead to damage of the head and playing mechanism.*

- If you remove the battery, all memorized channels of the radio are erased. Upon reconnecting the battery, the following channels will be set automatically.

Channels	AM (kHz)	FM (MHz)
1	522	87.5
2	603	90.1
3	999	98.1
4	1404	106.1
5	1620	108.0
6	522	87.5

- The "ambience" circuit blends and boosts certain frequencies from both channels, for a "live performance" effect. To use the circuit, push the AMB button until "AMB" appears in the display.

NOTE

- AMB is usable for stereo programs from both tape and FM. The ambience circuit, however, should not be used for the following:
  1. mono recorded tape
  2. AM rodio signals
  3. weak FM stereo signals
  4. FM stereo signals interfered with by mountains or buildings.
- In the areas of the FM stereo signals interfered with by mountains or buildings, the ambience circuit should be OFF to receive FM signals.

TROUBLESHOOTING

NOTE

- Inspect the following before troubleshooting the audio system.
- Be sure the following fuses are good: fuse 2 (15 A), fuse 9 (5 A), fuse 10 (10 A) — inside the fuse box

Speakers (option: or headsets) do not have no sound.

NOTE

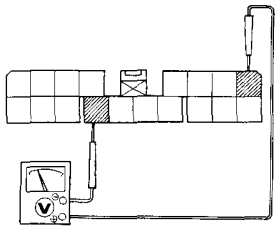
- If you want to use the speakers, push the Headset/Speaker Mode Button. The display will indicate nothing. To hear sound through the headset, push this button again; and the display will indicate "🎧" (headset).

CONNECTOR:
Remove the top compartment (page 12-7) and disconnect the 18P-WHT connector of the radio & cassette deck. Check the connector for loose or poor contact.

LOOSE OR POOR →
- Loose or poor contact of the radio & cassette deck connector

NOT LOOSE OR POOR ↓

WIRING:
Measure voltage between the LT GRN/BLK (+) and GRN (−) wire terminals of the 18P-WHT connector (wire harness side). Battery voltage should register with the ignition switch ACC, ON or P.



NO →
- Open or short circuit in wire harness
- Faulty ignition switch
- Loose or poor contact of connector

YES ↓

WIRING:
Measure voltage between the RED/YEL (+) and GRN (−) wire terminals of above connector. Battery voltage should register at all times.

NO →
- Open or short circuit in wire harness
- Loose or poor contact of connector

YES ↓

WIRING:
Perform the main harness check of the No. 1 (& No. 2 – headset; option) (page 20-10). (Perform the headset junction wire check (page 20-11).)

NO CONTINUITY →
- Loose or poor contact of the speaker terminals
- Open or short circuit in wire harness
- Loose or poor contact of the connectors
- Faulty headset junction wire)

CONTINUITY ↓

SPEAKER:
Check the speakers (page 20-7).

NO GOOD →
- Faulty speaker
- Option: faulty headset

GOOD →
- Faulty radio & cassette deck

Radio & cassette deck work, but do not seach or mute with the muting/search switch.

NOTE

- If you play the radio, push the radio/cassette switch and should be in the RADIO mode. And the display indicates "AM" or "FM".

CONNECTOR:
Remove the left fairing lower cover (page 12-9) and disconnect the 4P-BLK connector from the connector holder on the left cooling fan.
Check the connector for loose or poor contact.

LOOSE OR POOR → • Loose or poor contact of the connector

NOT LOOSE OR POOR

SWITCH:
Check the muting/search switch for continuity (page 20-7).

NO CONTINUITY → • Faulty muting/search switch

CONTINUITY

WIRING:
Perform the main harness check of the No. 3 (page 20-10).

NO CONTINUITY → • Open or short circuit in wire harness

CONTINUITY → • Faulty radio & cassette deck

Weak (or noisy) reception

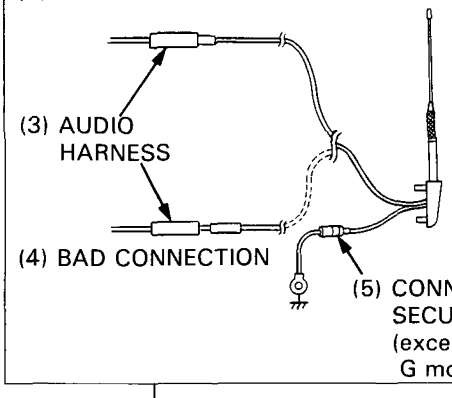
NOTE

- Use of the ambience (AMB) circuit may cause weak FM stereo signals.
- As FM stereo reception becomes weaker, special circuits in the radio gradually blend the sound toward mono to maintain some sound quality, even though the ST indicator remains ON.

ANTENNA CONNECTION:
Remove the seat (page 12-6) and check the antenna connector and antenna ground wire for loose or poor contact.

LOOSE OR POOR → • Loose or poor contact of the antenna nec- connector or ground wire

(1) GOOD CONNECTION (2) ANTENNA



NOT LOOSE OR POOR

Ⓐ

Ⓐ

ANTENNA:
Check the antenna base or feeder for continuity (page 20-8).
→ NO GOOD → • Faulty antenna base

GOOD ↓

WIRING:
Perform the main harness check of the No. 8 (page 20-10).
→ NO CONTINUITY → • Loose or poor contact of the connector
• Open or short circuit in wire harness

CONTINUITY ↓

CONDENSER:
Check the condenser of the regurator/rectifier (page 17-10) at alternator.
→ NO GOOD → • Open circuit in the condenser

GOOD → • Faulty radio & cassette deck

Radio cuts out and loses memory while riding.

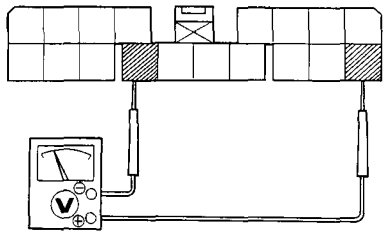
NOTE

- If you remove the battery, all memorized channels of the radio are erased. Upon reconnecting the battery, the certain channels will be set automatically (see SERVICE INFORMATION).

CONNECTOR:
Disconnect the 18P-WHT connector of the radio & cassette deck. Check the connector for loose or poor contact.
→ LOOSE OR POOR → • Loose or poor contact of the radio & cassette deck connector

NOT LOOSE OR POOR ↓

WIRING:
Measure the voltage between the RED/YEL (+) and GRN (−) wire terminals of the 18P-WHT connector (wire harness side). Battery voltage always have to register, even if the ignition switch is in OFF or LOCK position.



→ NO → • Open or short circuit in wire harness

YES → • Faulty radio & cassette deck

Display of the radio & cassette deck do not appear on the L.C.D. unit

• see page 22-9.

AVC (Auto Volume Control) do not work at all

SPEEDOMETER CABLE:
Speedometer should operate properly.
→ NO → • The speedometer cable disconnected
↓ YES

CONNECTOR:
Disconnect the 18P-WHT connector of the radio & cassette deck. Check the connector for loose or poor contact.
→ LOOSE OR POOR → • Loose or poor contact of the radio & cassette deck connector
↓ NOT LOOSE OR POOR

WIRING:
Perform the main harness check of the No. 6 (page 20-10).
→ NO CONTINUITY → • Open or short circuit in wire harness
• Loose or poor contact of the connectors
↓ CONTINUITY → • Faulty speed sensor (page 22-13)
• Faulty radio & cassette deck

Uneven tape speed

TAPE:
Exchange the tape and check the tape running.
→ SATISFACTORY → • Faulty tape
↓ STILL NOT SATISFACTORY

CASSETTE DECK:
The indide of the cassette deck is dirty.
→ YES → • Dusty cassette deck
↓ NO → • Faulty radio & cassette deck

Unsatisfactory cassette deck sound

NOTE

• Use of the ambience (AMB) circuit may cause poorly recorded tapes to sound worse.

Try with another good cassette tape.
→ GOOD SOUND → • Faulty tape
↓ STILL BAD SOUND

CASSETTE DECK HEAD:
Check the cassette deck head for dirt.
→ DUSTY → • Dusty cassette deck head (see SERVICE INFORMTION/Tape player maintenance)
↓ NOT DUSTY

SPEAKER:
Exchange the speaker for the other good one and listen to sound again.
→ SATISFACTORY → • Faulty speaker
↓ STILL NOT SATISFACTORY → • Faulty radio & cassette deck

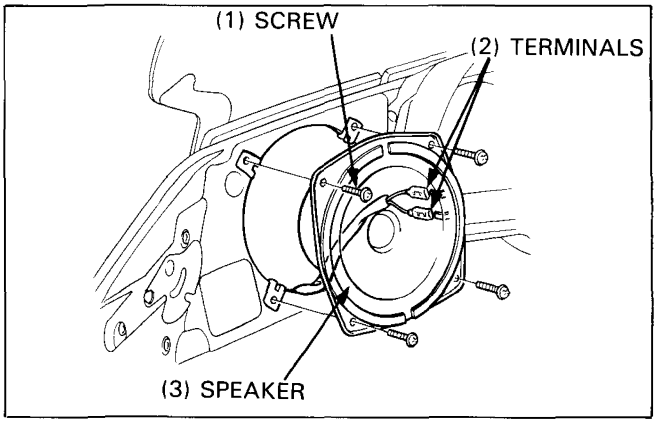
Radio works, but cassette deck do not work at all.

• Faulty radio & cassette deck

SPEAKER

REMOVAL

Remove the instrument panel (page 12-8).
Remove the four screws and speaker.
Disconnect the speaker terminals and remove the speaker.



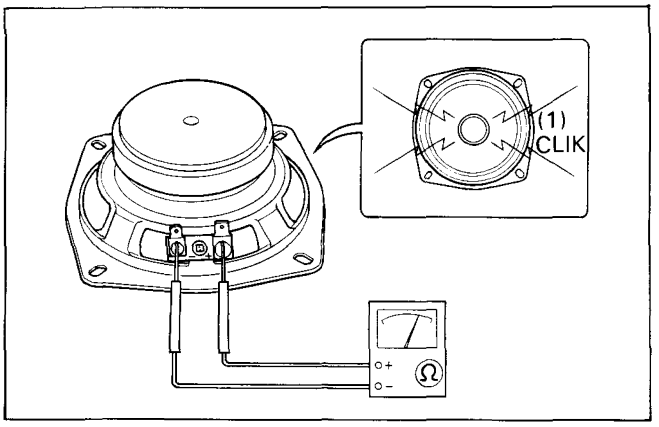
INSPECTION

Connect an ohmmeter to the speaker terminals as shown.

NOTE

- Select the smallest range on the ohmmeter.

The speaker is normal if it click, the moment the ohmmeter probes are connected to the speaker terminals.



INSTALLATION

Install the speaker in the reverse order of removal.

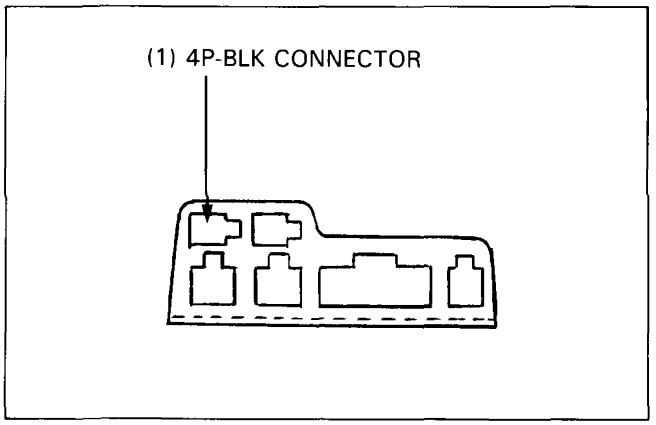
NOTE

- Connect RED/GRN wire (R ch) and BLU/GRN wire (L ch) to the speaker (+) terminals.
- Speaker terminals location is shown above.

MUTING/SEARCH SWITCH

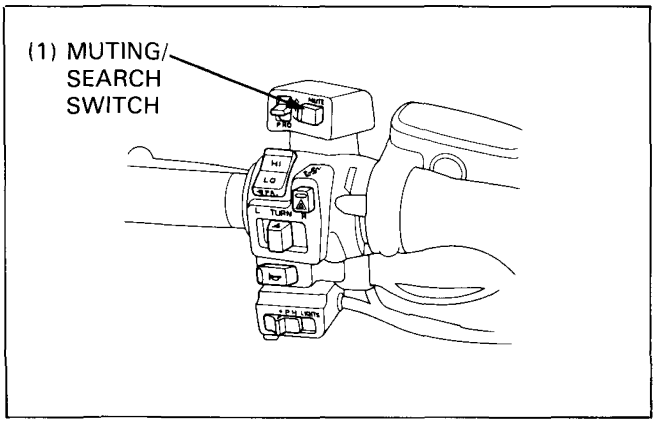
INSPECTION

Remove the left fairing lower cover (page 12-9).
Disconnect the 4P-BLK connector of the connector holder on the left cooling fan.



Continuity checks for the muting/search switch are as following.
Continuity should exist between the color coded wires in each chart below.

Color	BLU/ BLK	GRN/BLK		PNK/ BLK	YEL/ RED
FREE	O—O	UP	O—O		
PUSH (LOCK)		FREE			
MUTING		DOWN	O—		—O
		SEARCH			

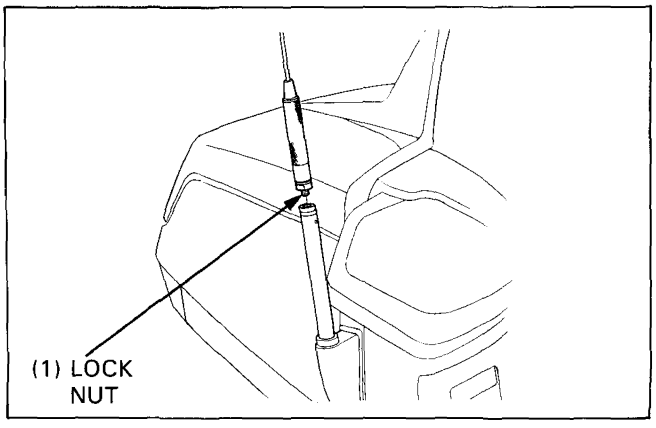


ANTENNA

ANTENNA REMOVAL

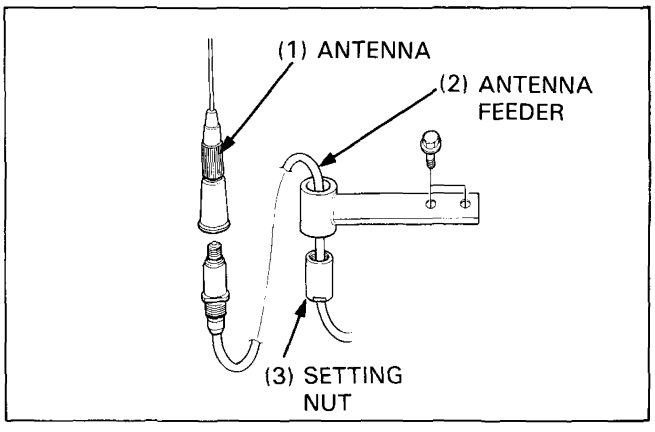
except G model:
Loosen the lock nut and remove the antenna from the antenna base.

Check the antenna for damage.



G model only:
Loosen the antenna setting nut and remove it.
Loosen the antenna feeder and remove it from the antenna.

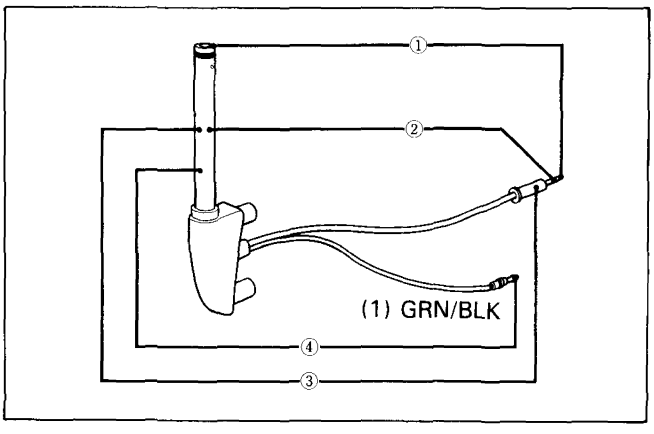
Check the antenna for damage.



INSPECTION

except G model:
Remove the seat (page 12-6).
Disconnect the antenna connector and antenna ground wire (GRN/BLK).
Check the antenna base for continuity, as shown.
Replace it if necessary.

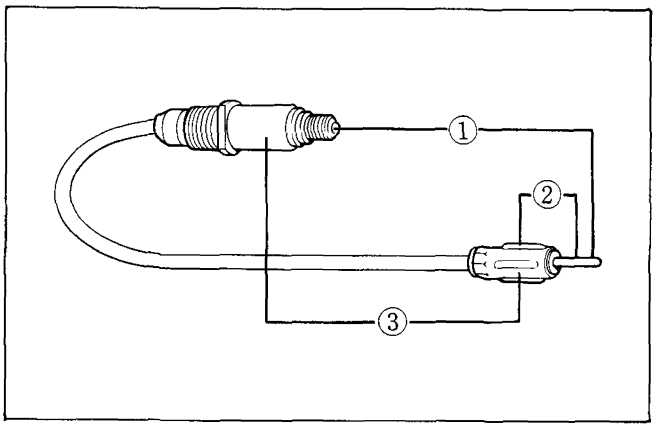
NORMAL:
1: Continuity
2: No continuity
3: Continuity
4: Continuity



G model only:
Remove the seat (page 12-6).
Disconnect the antenna connector.
Check the antenna feeder, as shown.
Replace it if necessary.

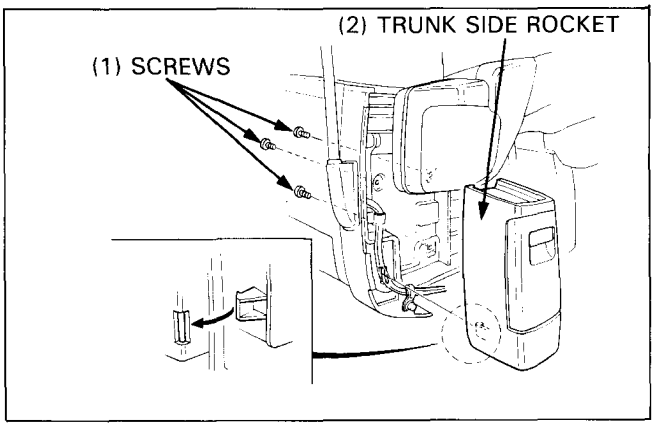
NORMAL:
1: Continuity
2: No continuity
3: Continuity

Install the antenna in the reverse order of removal.



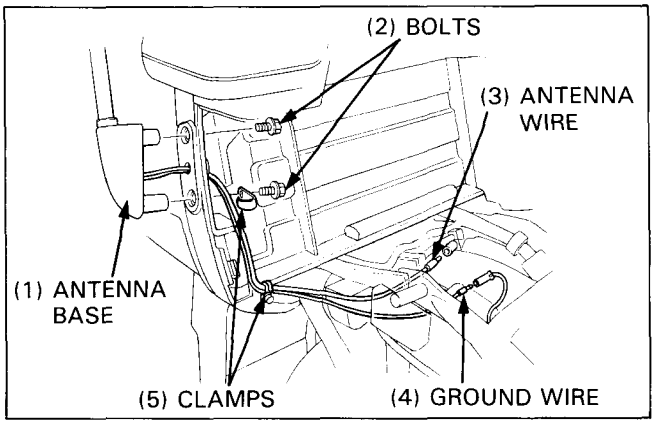
ANTENNA BASE REPLACEMENT (except G model)

Remove the right trunk side pocket by removing three attaching screws.



Release the antenna wires from the clamp and remove the bolts, clamp and antenna base from the trunk.

Install the antenna base and antenna in the reverse order of removal.



RADIO & CASSETTE DECK

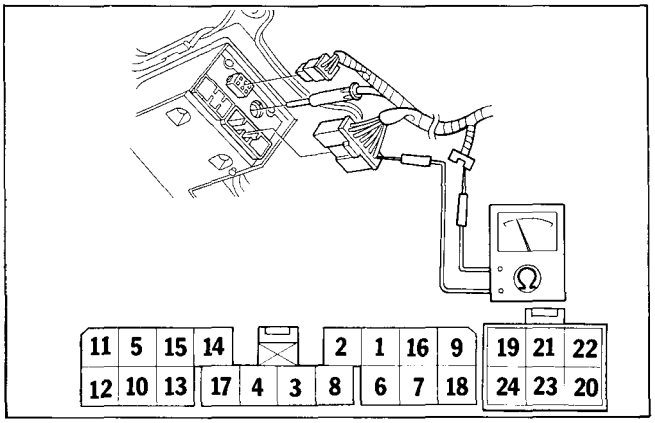
MAIN WIRE HARNESS CHECK

Remove the top compartment (page 12-7) and disconnect the 18P-WHT connector, 6P-WHT connector and antenna connector.
Check the connectors for loose or poor contact, or corroded terminals.

Measure the following continuity between radio & cossette deck connector terminal and related component connector teminal (see next page chart).

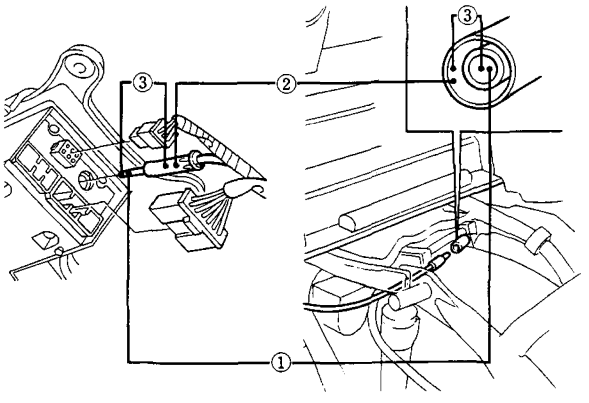
CAUTION

- *Do not damage connectors when measuring continuities.*



RADIO & CASSETTE DECK					
1	FRONT RIGHT SPEAKER ⊕	9	IGNTION SWITCH, ACC ⊕	17	GND ⊖
2	FRONT RIGHT SPEAKER ⊖	10	HEADSET MIC. E (DR)	18	BACK UP ⊕
3	FRONT LEFT SPEAKER ⊖	11	HEADSET MIC. (PA)	19	STARTER REVERSE SWITCH (Compulsory Muting)
4	FRONT LEFT SPEAKER ⊕	12	HEADSET MIC. (DR)	20	DATA
5	HEADSET MIC. E (PA)	13	HEADSET OUT (R ch)	21	LOAD
6	MUTING SWITCH ON	14	HEADSET OUT (L ch)	22	CLOCK
7	SEARCH SWITCH UP	15	HEADSET OUT. E RADIO SWITCH. E	23	GND (DATA)
8	SEARCH SWITCH DOWN	16	SPEED PULSE	24	BLANKING

System Number	System	Terminal	Color	Other Terminal Color	Other terminal/Location
1	Speaker circuit	1	RED/GRN	←	Speaker (+) terminal/Front right speaker
		2	BRN/BLK	←	Speaker (−) terminal/Front right speaker
		3	GRY/BLK	←	Speaker (−) terminal/Front left speaker
		4	BLU/GRN	←	Speaker (+) terminal/Front left speaker
2	Headset circuit	5	BLK (sealed)	BLK	6P-RED mini/On the rear fender
		10	BLK (sealed)	←	6P-RED mini/Inside the fairing (left pocket)
		11	RED/BLU	←	6P-RED mini/On the rear fender
		12	WHT	←	6P-RED mini/Inside the fairing (left pocket)
		13	YEL	←	6P-RED mini/Inside the fairing (left pocket)
				←	6P-RED mini/On the rear fender
		14	LT GRN/RED	←	6P-RED mini/Inside the fairing (left pocket)
				←	6P-RED mini/On the rear fender
		15	GRN/BLK	←	6P-RED mini/Inside the fairing (left pocket)
				←	6P-RED mini/On the rear fender
3	Muting/search switch circuit	6	BLU/BLK	←	4P-BLK mini/On the left cooling fan
		7	RED/BLK	←	
		8	YEL/RED	←	
		15	GRN/BLK	←	
4	Power circuit	9	LT GRN/BLK	←	10P-WHT/Under the instrument
				←	8P-BLK/On the left cooling fan
		18	RED/YEL	←	14P-BLK/Under the instrument
		17	GRN	←	Body ground
5	Display (LCD unit) circuit	20	RED	←	14P-BLK/Under the instrument
		21	WHT	←	
		22	BLK	←	
		23	BLK (sealed)	←	
		24	GRY	←	
6	AVC circuit	16	WHT/BLK	←	14P-BLK/Under the instrument
7	Starter/reverse switch circuit	19	YEL/RED	←	9P-RED mini/On the right cooling fan
8	Antenna circuit	Check the wire for continuity as shown. NORMAL: 1: Continuity 2: Continuity 3: No continuity			

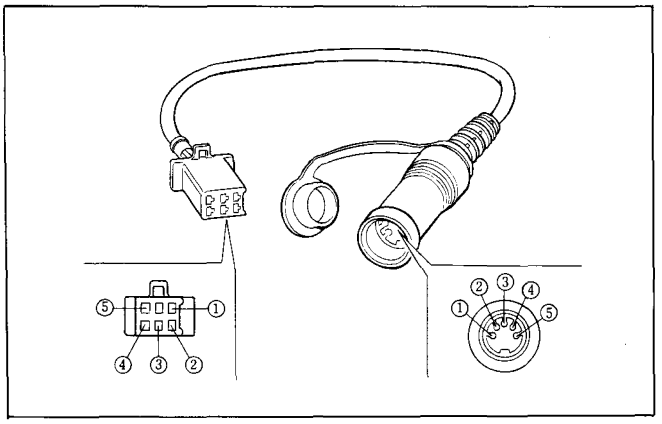


HEADSET JUNCTION WIRE CHECK

Remove the headset junctin wires.

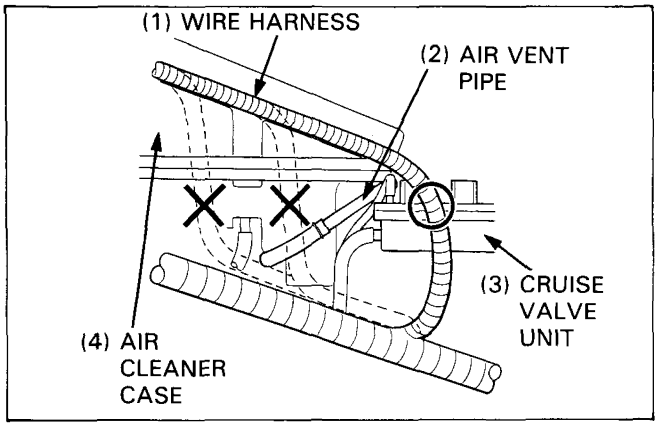
Check continuity between the same number of the junction wire connectors as shown.
Continuity should exist.

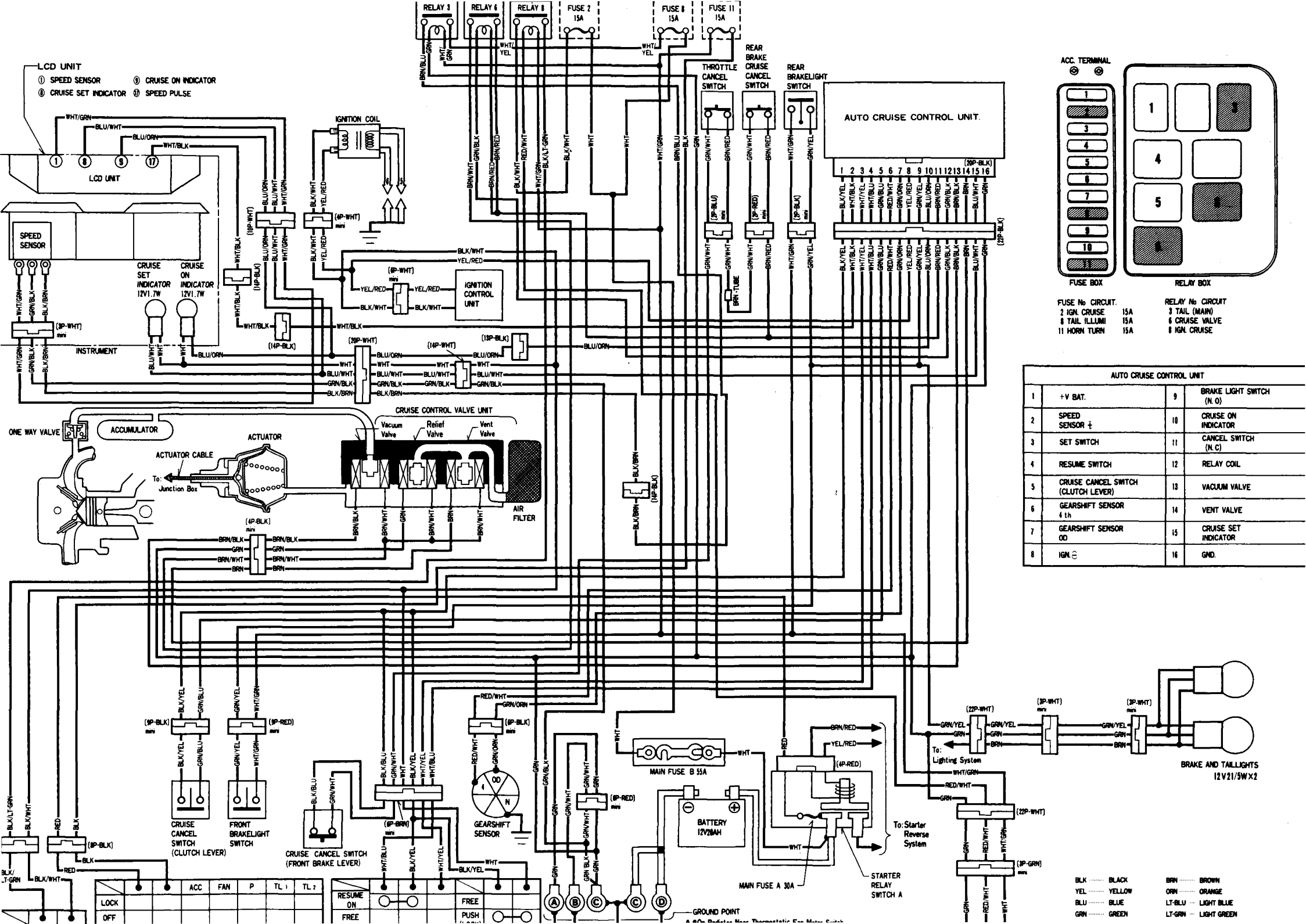
	Headset junction wire (driver or passenger)
1	microphone signal INPUT
2	microphone signal ground
3	headset OUTPUT ground
4	headset OUTPUT (R channel)
5	headset OUTPUT (L channel)



CAUTION

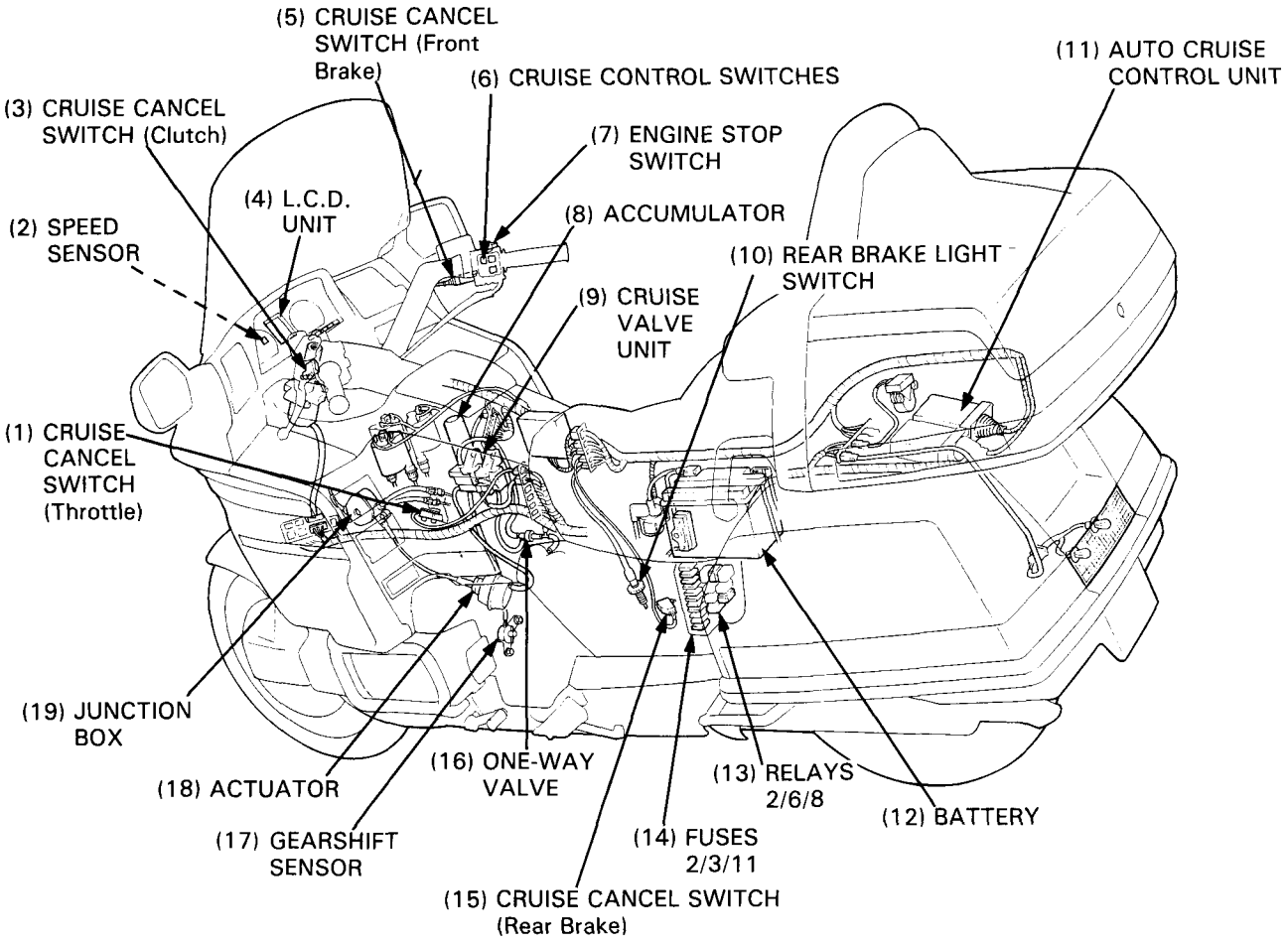
- *At installation, route the radio/cassette deck wire harness properly as shown.*





AUTO CRUISE CONTROL UNIT			
1	+V BAT.	9	BRAKE LIGHT SWITCH (N.O)
2	SPEED SENSOR	10	CRUISE ON INDICATOR
3	SET SWITCH	11	CANCEL SWITCH (N.C)
4	RESUME SWITCH	12	RELAY COIL
5	CRUISE CANCEL SWITCH (CLUTCH LEVER)	13	VACUUM VALVE
6	GEARSHIFT SENSOR 4 th	14	VENT VALVE
7	GEARSHIFT SENSOR OD	15	CRUISE SET INDICATOR
8	IGN.	16	GND.

SYSTEM LOCATION



SERVICE INFORMATION

GENERAL

- The Cruise Control System have below system operation. Before troubleshooting on next page, perform the system check with a road test.

1. Make sure the battery is fully charged and its terminals and cables are clean and tight.
2. Turn the ignition switch to ON. The "CRUISE SET" and "CRUISE ON" indicator lights should go on for a few seconds and then go out.
3. Turn the "CRUISE ON" switch to ON. The "CRUISE ON" indicator light should go on and stay on.
4. Start the motorcycle and accelerate to a speed above 48 km/h (30 mph). With the transmission in 4th gear or OD gear, press the SET/DECEL switch and release the throttle grip. The motorcycle should maintain the set speed.
5. Tap the SET/DECEL switch once. The motorcycle speed should decrease by 1.6 km/h (1 mph).
6. Tap the RESUME/ACCEL switch once. The motorcycle speed should increase by 1.6 km/h (1 mph).
7. Press and momentarily hold the SET/DECEL switch, then release it. The speed should decrease as long as you hold the switch; releasing the switch , set and maintain the speed at which you release it.
8. Press and momentrarily hold the RESUME/ACCEL switch, then release it. The speed should increase as long as you hold the switch; releasing the switch, set and maintain the speed at which you release it.
9. The cruise control should cancel whenever you close the throttle or use the clutch, front brake, or rear brake. With the speed set, check each cancel switch (close the throttle, disengage the clutch, apply the rear brake) and after each check, press the RESUME/ACCEL switch. The cruise control should cancel with each check and the speed should resume when you press the RESUME/ACCEL switch if you are still going above 48 km/h (30 mph). If the motorcycle has decelerted below about 48 km/h (30 mph), you can return to the set speed by using the throttle conventionally until you are above 48 km/h (30 mph) and then pushing the SET/RESUME switch.
10. Rotate the throttle grip to increase your speed, then release it. The motorcycle should speed up and slow down and resume the set speed.
11. Any speed above 128 km/h (80 mph)) will be memorized as 128 km/h (80 mph).
12. With the cruise control on, your speed will still vary slightly, particulary going up or down hills.
13. You can cancel the cruise control system by turning off the cruise control switch, ignition switch or engine stop switch, by both the resume and set switch operated simultaneously or by the bank angle sensor operated. Because this removes power to the control unit and erases the set speed from memory.

- When inspect the cruise control system, check the system components and lines step-by-step according to the troubleshooting on next page.

TROUBLESHOOTING

Cruise control does not function at all.

NOTE

Cruise control will be cancelled when:
- Either brake (front or rear) is applied.
- Clutch lever is operated.
- Throttle is returned.

Cruise speed memory will be cancelled when:
- Ignition switch, engine stop switch or auto cruise switch is operated to OFF. The bank angle sensor is operated. Both the resume and set switch are operated simultaneously.

Cruise control will not function under the following conditions.
- At speeds other than 48—128 km/h (30—80 mph)
- Transmission set in other than 4th or OD.

Inspect the following before troubleshooting the cruise control system.
- Be sure the terminal connections of the cruise cancel switches (page 21-11) are good.
- Be sure the cruise cancel switches of the rear brake and throttle are properly adjusted (page 21-12).

CRUISE INDICATOR:
Turn the ignition switch ON and engine stop switch to RUN, and check that the cruise indicator lights come on for a few seconds, then go off.

→ Abnormal → BULB:
Check the bulbs for burn.

NOT BURN → DISPLAY OPERATION:
Check the L.C.D. unit display operation.

BURN → • Faulty bulb

NORMAL → WIRING/SWITCH:
With the ignition switch ON and engine stop switch on RUN, turn the auto cruise switch to ON. The "CRUISE ON" indicator light should go on and stay on.

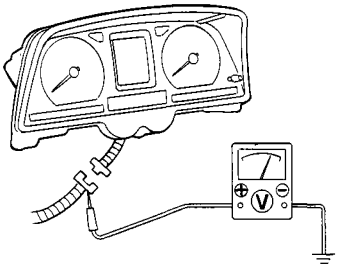
NORMAL → Ⓐ

ABNORMAL → WIRING:
Measure voltage between the control unit No. 1 terminal and ground (page 21-9).

NORMAL → Ⓑ

ABNORMAL →
- Open or short circuit in wire harness
- Loose or poor contact of connectors
- Faulty auto cruise switches (page 21-13)

NORMAL → WIRING/CONNECTOR:
Disconnect the 10P-WHT connector under the instrument, and measure the voltage between the WHT (+) and ground (−), between the BLU/ORN (+) and ground (−) and between the BLU/WHT (+) and ground (−). With the ignition switch ON and engine stop switch on RUN, battery voltage should register.



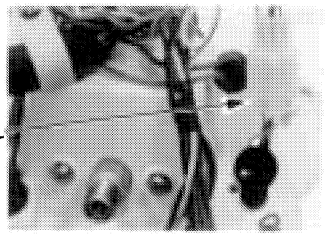
YES →
- Loose or poor contact of the 10P-WHT connector
- Faulty L.C.D. unit

NO →
- Open or short circuit in wire harness
- Loose or poor contact of connectors

ABNORMAL →
- Go to L.C.D. DOES NOT DISPLAY troubleshootings (page 22-7, 8, 9)

Ⓐ

POWER TO SPEED SENSOR:
Disconnect the 3P-WHT mini connector of the speed sensor under the instrument. Measure voltage between the BLK/BRN (+) and GRN/BLK (−) wire terminals with the ignition switch ON.



BATTERY VOLTAGE SHOULD RESISTER

VOLTAGE SHOULD NOT RESISTER

- Open or short circuit in wire harness
- Loose or poor contact of the connectors

WIRING:
Measure voltage between the control unit No. 2 terminal and ground (page 21-9).

ABNORMAL → SPEED SENSOR:
Check the speed sensor (page 22-13).

NORMAL

Ⓒ

WIRING/COMPONENTS:
Perform the auto cruise control unit system inspection. If not normal, check the related components in that part of the abnormal lines (page 21-9).

NORMAL

CRUISE CONTROL VALVE:
Check the cruise control valve (page 21-14).

ABNORMAL → • Faulty cruise control valve

NORMAL

HOSES:
Check vacuum hoses for disconnection, clogging or damage (page 21-17).

ABNORMAL → • Faulty vacuum circuit

NORMAL

Ⓓ

Ⓑ

WIRING:
Measure voltage between the control unit No. 10 terminal and ground (page 21-9).

NORMAL

Ⓒ

ABNORMAL

- Open or short circuit in wire harness
- Loose or poor contact of the connectors

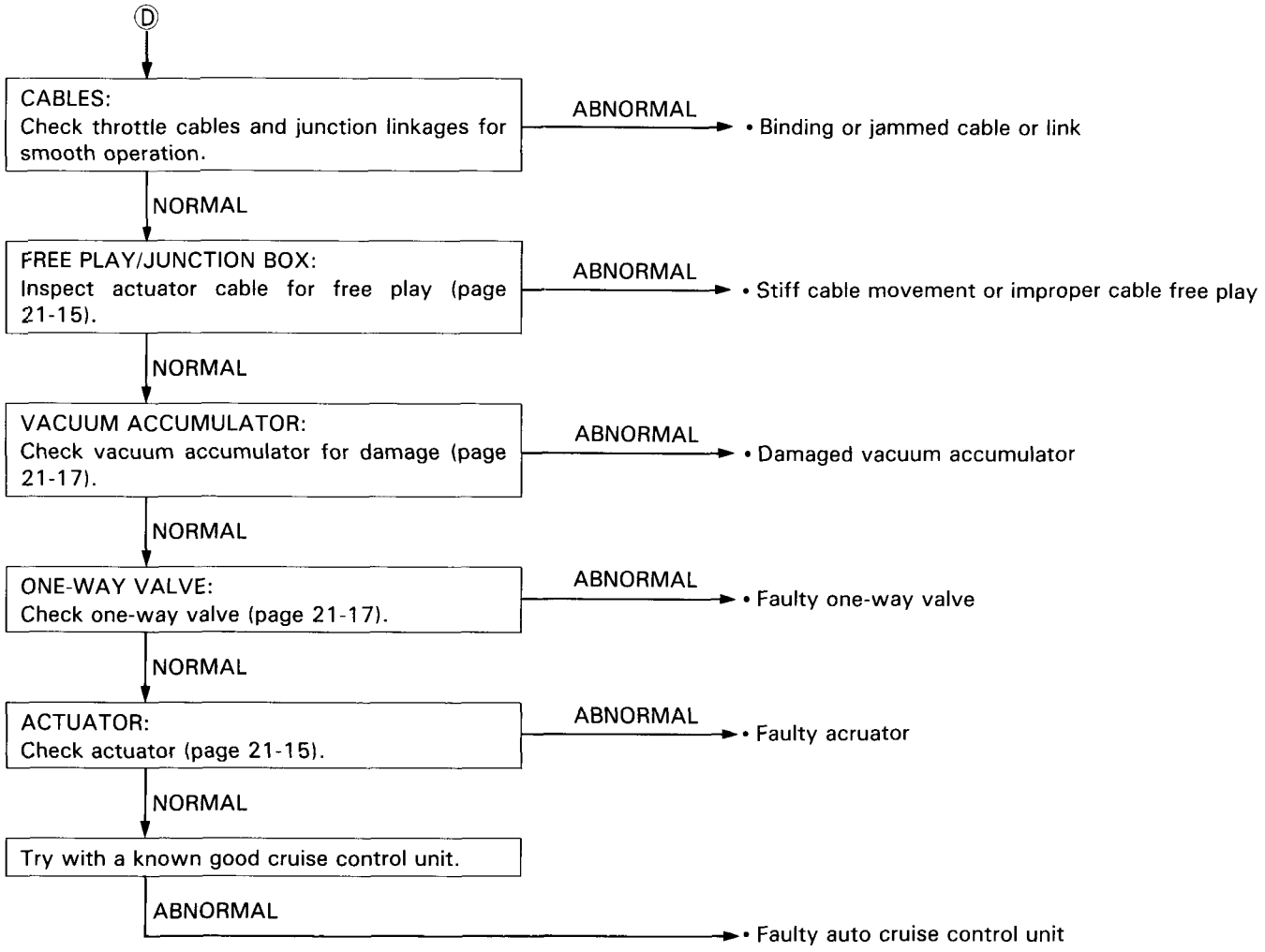
SPEED SENSOR:
Check the speed sensor (page 22-13).

NORMAL

- Open or short circuit in wire harness
- Loose or poor contact of connectors

ABNORMAL

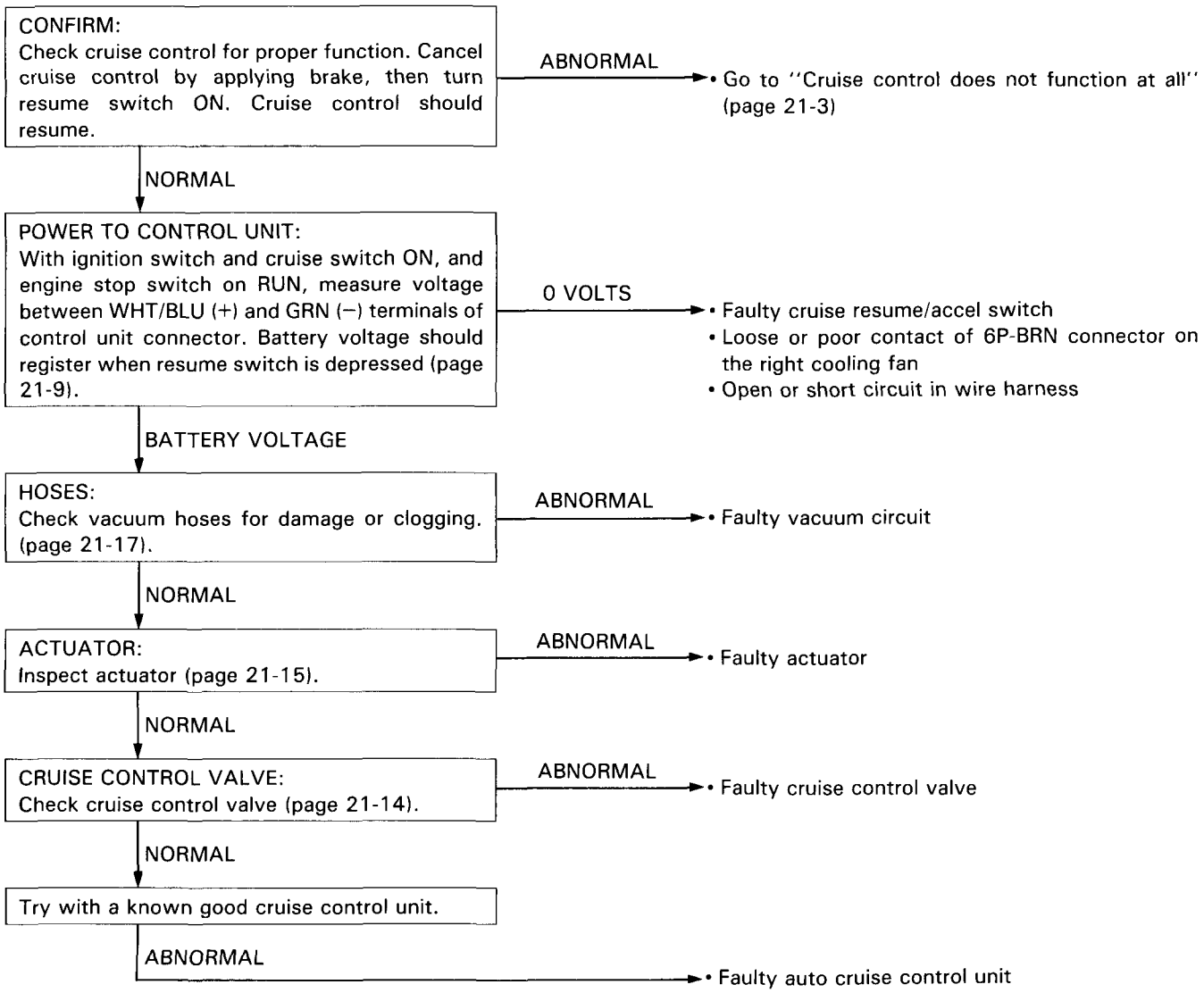
- Faulty speed sensor


Ⓓ
CABLES:
Check throttle cables and junction linkages for smooth operation.
ABNORMAL
• Binding or jammed cable or link
NORMAL
FREE PLAY/JUNCTION BOX:
Inspect actuator cable for free play (page 21-15).
ABNORMAL
• Stiff cable movement or improper cable free play
NORMAL
VACUUM ACCUMULATOR:
Check vacuum accumulator for damage (page 21-17).
ABNORMAL
• Damaged vacuum accumulator
NORMAL
ONE-WAY VALVE:
Check one-way valve (page 21-17).
ABNORMAL
• Faulty one-way valve
NORMAL
ACTUATOR:
Check actuator (page 21-15).
ABNORMAL
• Faulty acruator
NORMAL
Try with a known good cruise control unit.
ABNORMAL
• Faulty auto cruise control unit

Cruise control will not resume

NOTE

- Cruise control will not resume below 48 km/h (30 mph).
- Holding resume/accel switch ON causes the motorcycle to accelerate to nearly full throttle. However, cruise control will only operate to 128 km/h (80 mph).
- Cruise control will not resume when either the auto cruise switch, engine stop switch or ignition switch is turned OFF, or when both the resume and set switch are operated simultaneously, or when the bank angle sensor is operated (memory is erased).



Cruise speed fluctuates excessively (more than 8 km/h (5 mph)) immediately after setting

NOTE

- Before troubleshooting, check the carburetor synchronization. Adjust synchronization, if necessary. (page 3-9).

HOSES:
Check vacuum hoses for disconnection, clogging or damage.
→ ABNORMAL → • Faulty vacuum circuit
↓ NORMAL

CABLES:
Check throttle cables and junction linkages for smooth operation.
→ ABNORMAL → • Binding or jammed cable or link
↓ NORMAL

FREE PLAY:
Inspect actuator cable for free play (page 21-15).
→ ABNORMAL → • Stiff cable movement or improper cable free play
↓ NORMAL

ACTUATOR:
Check actuator (page 21-15).
→ ABNORMAL → • Faulty actuator
↓ NORMAL

CONTROL VALVE:
Check cruise control valve unit (page 21-14).
→ ABNORMAL → • Faulty cruise control valve unit
↓ NORMAL

ONE-WAY VALVE:
Check one-way valve (page 21-17).
→ ABNORMAL → • Faulty one-way valve
↓ NORMAL

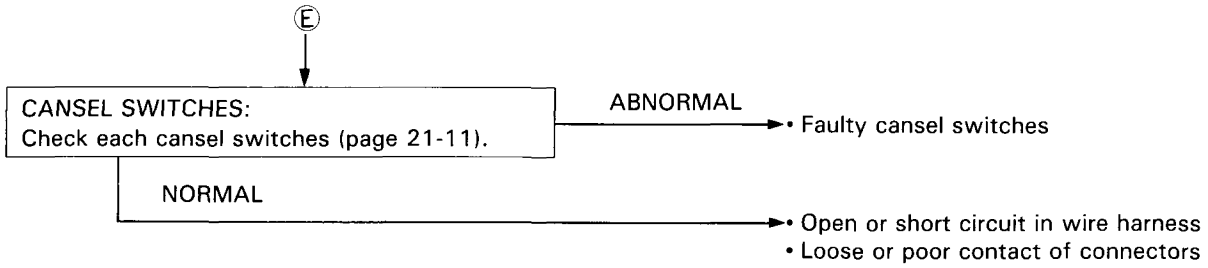
Try with a known good cruise control unit.
→ ABNORMAL → • Faulty cruise control unit

Cruise control is cancelled accidently.

SENSOR SIGNAL:
With ignition switch ON, measure voltage between WHT/BLK (+) and GRN (−) terminals of the auto cruise control unit connector. Voltage should change from about 10 V to less than 0 V alternately when rotating front wheel slowly (page 21-9).
→ ABNORMAL →
SPEED SENSOR:
Check the speed sensor (page 22-13).
↓ ABNORMAL → • Faulty speed sensor
↓ NORMAL → • Open or short circuit in wire harness
• Loose or poor contact of connectors
↓ NORMAL

CANCEL SWITCHES:
Check the cruise cansel switches of the rear brake and throttle grip for adjustment. (page 21-12).
→ ABNORMAL → • Improper switch adjustment
↓ NORMAL

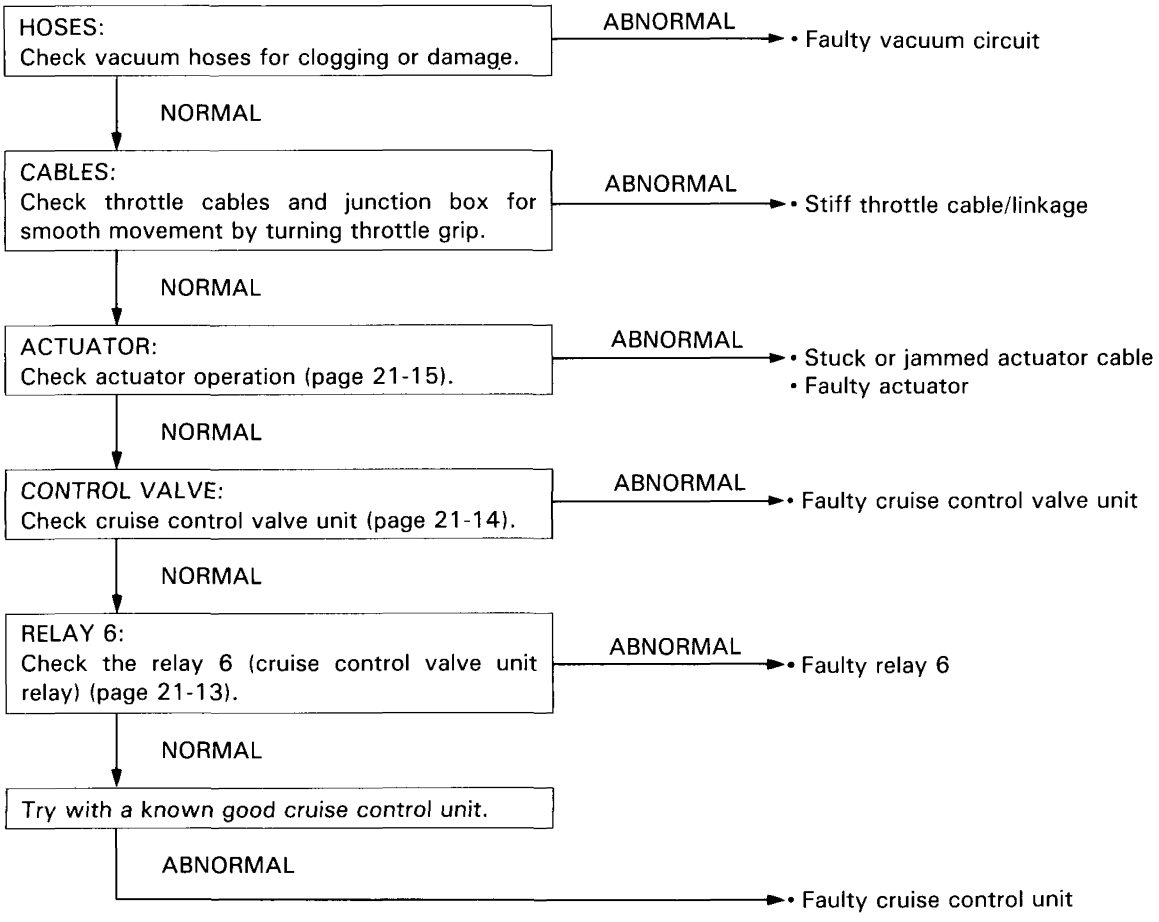
RELAY 6:
Check the relay 6 (cruise control valve unit relay) (page 21-13) and poor contact at relay terminals.
→ ABNORMAL → • Faulty relay 6
• Poor contact of relay terminals
↓ NORMAL
Ⓔ



Cruise control cannot be cancelled.

NOTE

- The cruise control should cancel when brake is applied, clutch lever is operated, throttle grip is returned, or transmission is shifted. Before going into details, check the cancel switches, brakelight switches or gearshift sensor for proper operation.



AUTO CRUISE CONTROL UNIT

SYSTEM INSPECTION

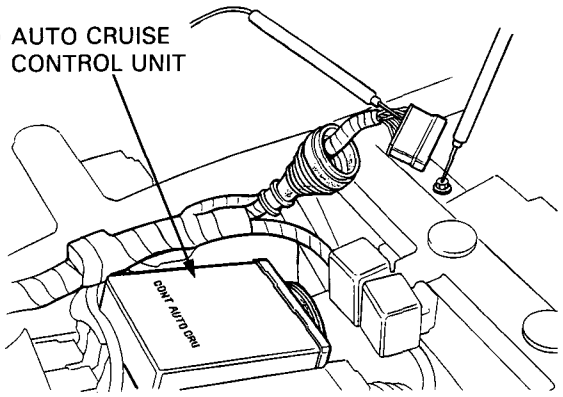
Remove the trunk (page 12-12).
Disconnect the auto cruise control unit connector and check it for loose contact or corroded terminals.

Turn the ignition switch ON and check for voltage at the following wires (+) in 20P-BLK connector.

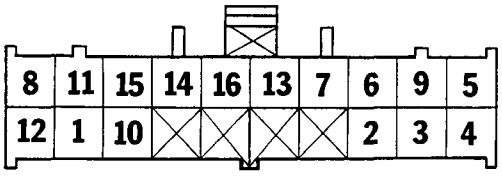
NOTE

- Inspect according to the following conditions:
  Condition 1: Engine stop switch in RUN
  2: Auto cruise switch pushed (LOCK)
  3: Set/decel switch depressed
  4: Resume/accel switch depressed
  5: Clutch disengaged
  6: Front brakelight or rear brakelight switch in ON
  7: Cruise cancel switches (front brake, rear brake and throttle) in OFF
  8: Front wheel rotated slowly

If each terminal/line check is not normal, first check the wire harness for open or short and check the connectors for loose or poor contact.
Then, inspect the following related component(s).



(2) • WIRE HARNESS SIDE CONNECTOR



TERMINAL/LINE		COLOR	VOLTAGE	CONDITION(S)	RELATED COMPONENT(S)
1	Battery voltage (+)	BLK/YEL	Battery	1, 2	Auto cruise switch (page 21-13)
2	Speed sensor (+)	WHT/BLK	0—10 volts Pulse	8	Speed sensor (page 22-13)
3	Set/decel switch	WHT/YEL	Battery	1, 2, 3	Set/decel switch (page 21-13) Auto cruise switch (page 21-13)
4	Resume/accel switch	WHT/BLU	Battery	1, 2, 4	Resume/accel switch (page 21-13) Auto cruise switch (page 21-13)
5	Cruise cancel switch (clutch)	GRN/BLU	Battery	1, 2, 5	Cruise cancel switch (clutch) (page 21-11) Auto cruise switch (page 21-13)
8	Ignition coil (−)	YEL/RED	Battery	1	Ignition coil (page 18-8)
9	Brakelight	GRN/YEL	Battery	6	Front brakelight switch (page 22-18) Rear brakelight switch (page 22-18)
10	CRUISE ON indicator	BLU/ORN	Battery	1	CRUISE ON indicator (page 22-12)
11	Cruise cancel switch (front brake, rear brake and throttle)	BRN/RED	Battery	1, 2, 7	Cruise cancel switch (front brake, rear brake and throttle) (page 21-11) Auto cruise switch (page 21-13)
12	Relay 6 coil	GRN/BLK	Battery	1, 2, 7	Cruise cancel switch (front brake, rear brake and throttle) (page 21-11) Auto cruise switch (page 21-13) Relay 6 (page 21-13)
15	CRUISE SET indicator	BLU/WHT	Battery	1	CRUISE SET indicator (page 22-12)

(Cont'd)

(Cont'd)-next, inspect terminals No. 13 & 14

13: Vacuum valve
14: Vent valve
With the cruise cancel switch (front brake, rear brake and throttle) in OFF, engine stop switch in RUN and ignition switch ON, short the GRN/BLK terminal to GRN terminal with a jumper wire.

Depress the auto cruise switch, and the cruise control valve (relief) is normal if it clicks.

NOTE

- At the same time, the relay 6 should also click.

Maintain all of the above conditions, and ground the terminal 13 (BRN/BLK wire) with a jumper wire. The cruise control valve (vacuum) is normal if it clicks.

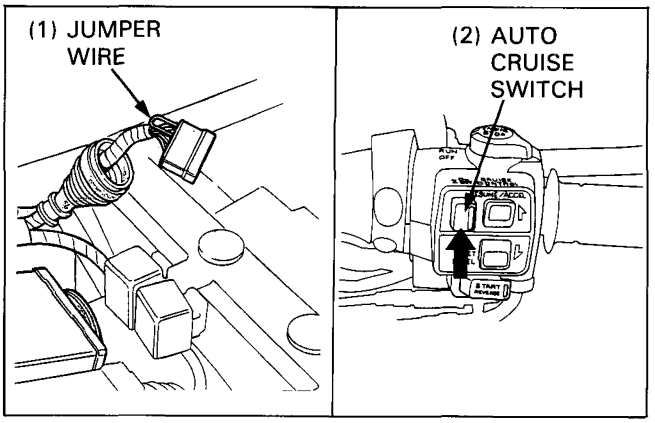
Then ground the terminal 14 (BRN wire) with a jumper wire. The cruise control valve (vent) is normal if it clicks.

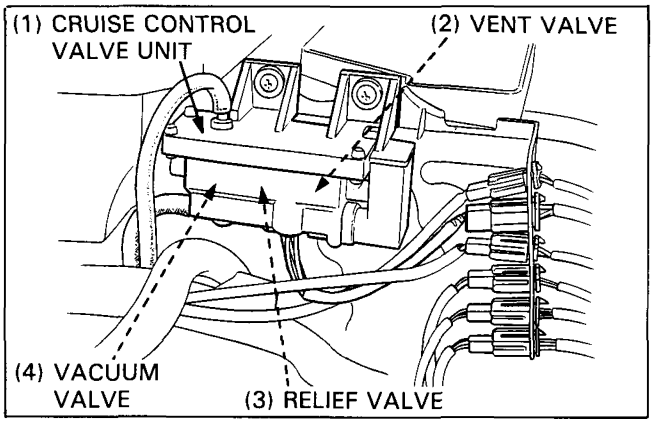
Next, maintaining all of the above conditions, measure voltage between the terminal 13 (BRN/BLK wire) (+) and ground, and between the terminal 14 (BRN wire)(+) and ground.
Battery voltage should register.

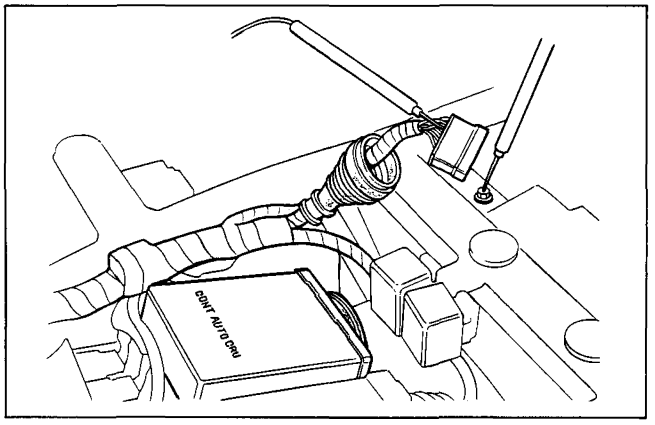
If there are not OK, inspect the following:
- Wire harness for open or short circuit.
- Connectors for loose or poor contact.
- Cruise cancel switch (front brake, rear brake and throttle) (page 21-11).
- Relay 6 (page 21-14).
- Cruise control valve unit (page 21-14).

Next, inspect the terminals 6, 7 and 16.
6: Gearshift sensor 4 th
7: Gearshift sensor OD
16: Ground

Turn the ignition switch to OFF.
Check for continuity between the following wires in 20P-BLK connector and ground.







TERMINAL/LINE		COLOR	CONTINUITY	CONDITION(S)	PROBABLE CAUSE
6	Gearshift sensor 4th	RED/WHT	Exist	Transmission in 4th	• Open or short circuit in wire harness • Loose or poor contact of connector • Gearshift sensor (page 18-12)
7	Gearshift sensor OD	GRN/ORN	Exist	Transmission in OD	
16	Ground	GRN	Exist	At all times	• Open or short circuit in wire harness • Loose or poor contact of ground terminal.

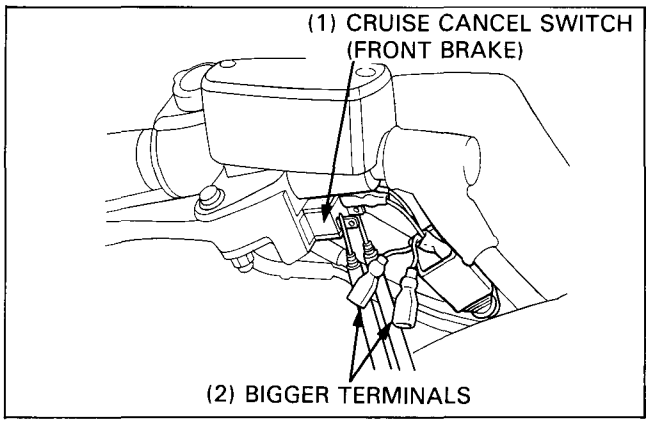
CRUISE CANCEL SWITCHES

FRONT BRAKE

Disconnect the bigger terminals behind the right handlebar.

Check for continuity between the BLK/BLU and GRN/WHT wire terminals.

Brake lever released: Continuity
Brake lever pulled in: No continuity

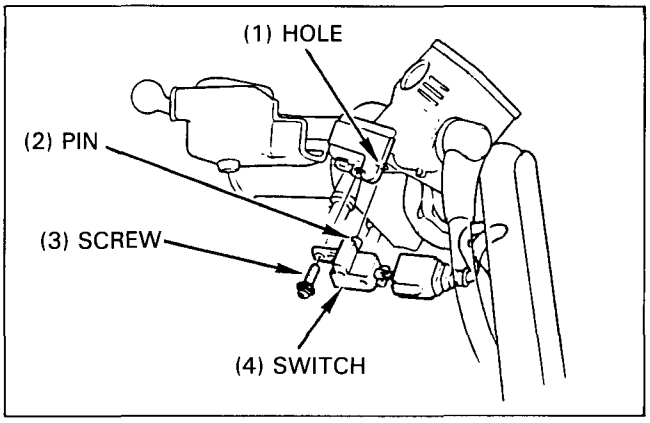


If continuity is abnormal, install a new switch.

Remove the screw and disconnect the wires from the switch.

NOTE

- When installing the switch, align the switch pin with the master cylinder hole. Connect the wires to the correct size terminals.

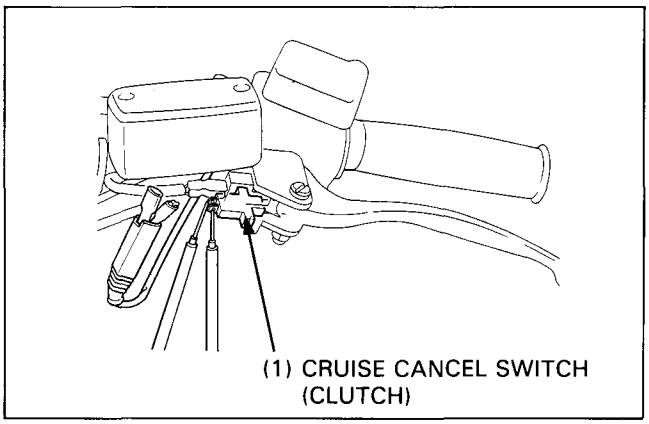


CLUTCH

Disconnect the BLK/YEL and GRN/BLU wires from the terminals on the cruise cancel switch.

Check for continuity between the switch terminals.

Clutch lever released: No continuity
Clutch lever pulled in: Continuity



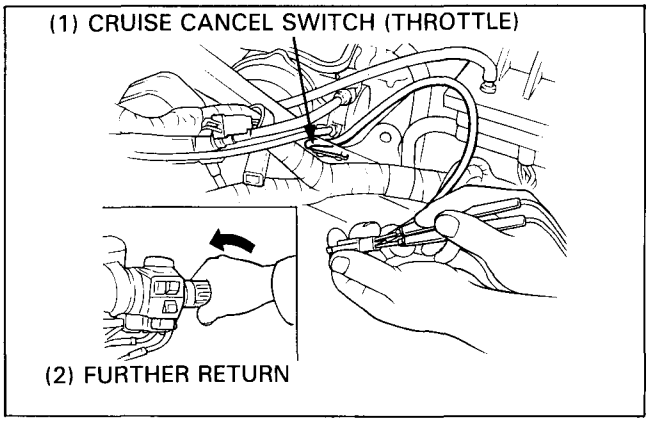
THROTTLE

Remove the left fairing inner cover (page 12-9).
Disconnect the 2P-BLU connector of the connector holder behind the cruise control valve unit.

Check for continuity between the GRN/WHT and BRN/RED wire terminals.

Throttle closed: Continuity
Further return: No continuity

If continuity or no continuity fails to shift, perform the next inspection.



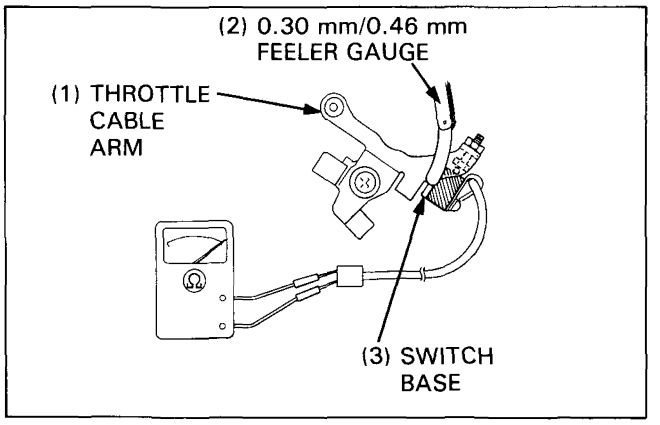
With the water tubes connected, remove the carburetor (page 4-17).
Connect an ohmmeter to the switch wire connector.

Insert the 0.30 mm (0.012 in) feeler gauge between the throttle cable arm and switch base.
Continuity should exist.

Insert the 0.46 mm (0.018 in) feeler gauge between the throttle cable arm and switch base.
No continuity should exist.

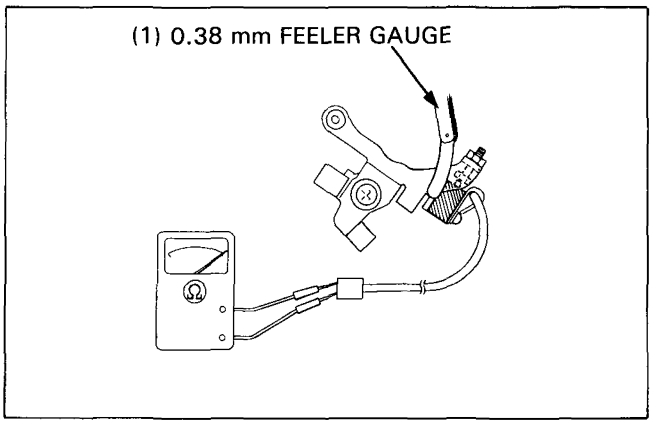
NOTE

- Adjust the switch as shown if continuity or no continuity fail to shift.



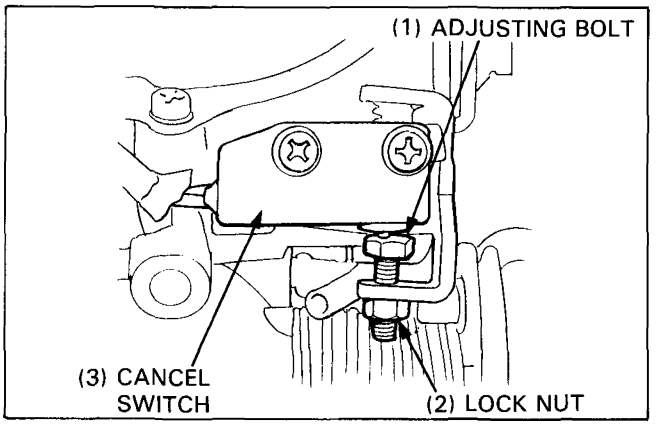
To adjust, Insert the 0.38 mm (0.015 in) feeler gauge between the throttle cable arm and switch base.

Connect an ohmmeter to the switch wire connector.



Loosen the adjusting bolt lock nut.
Turn the adjusting bolt until "No continuity" shifts to "Continuity".

Tighten the lock nut so that the adjusting bolt may not be turned.



REAR BRAKE

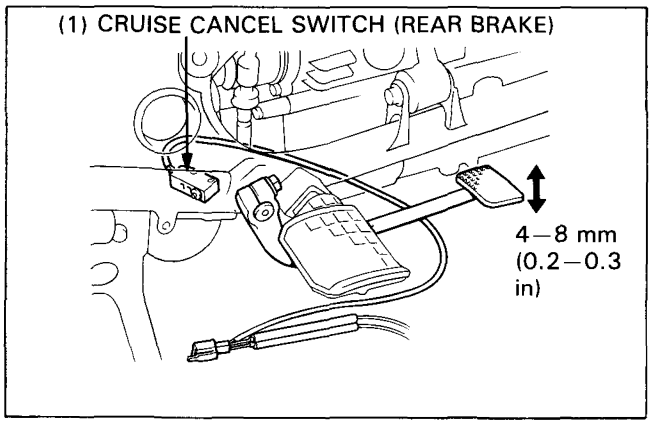
Remove the right fairing inner cover (page 12-9).
Disconnect the 2P-RED connector of the connector holder behind the ignition control unit.

Check for continuity between the GRN/WHT and BRN/RED wire terminals.

Brake pedal released: Continuity
Brake pedal depressed: No continuity

NOTE

- No continuity should appear when the brake pedal is depressed 4—8 mm (0.2—0.3 in).



To adjust, remove the right exhaust pipe (page 12-15).

Loosen the lock nut on the master cylinder push rod.

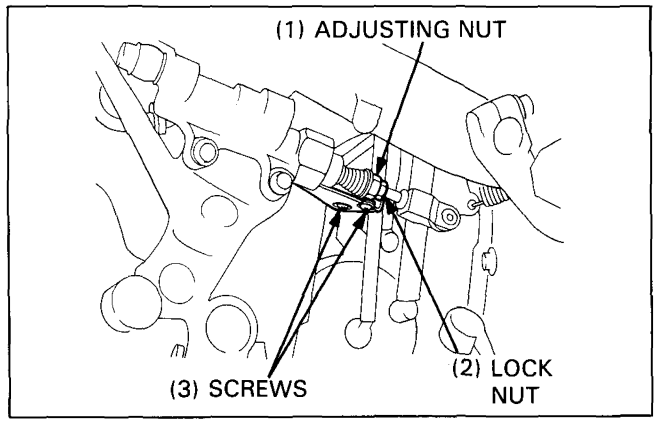
Connect an ohmmeter to the switch wire connector.

Depressed the brake pedal approximately 4—8 mm (0.2—0.3 in) and then turn the adjusting nut until "Continuity" shifts to "No continuity".

Tighten the lock nut.

NOTE

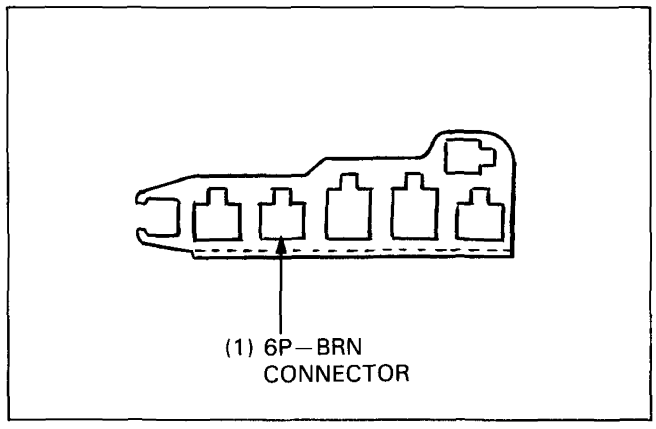
- Replace the switch by removing screws if continuity or no continuity fails to shift.



CRUISE CONTROL SWITCHES

INSPECTION

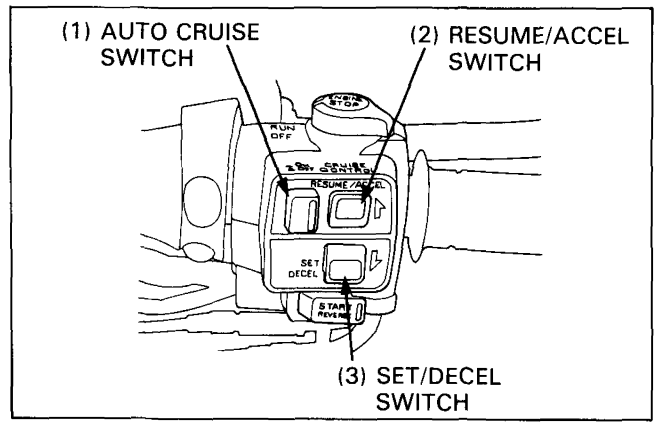
Remove the right fairing lower cover (page 12-9).
Disconnect the 6P-BRN connector of the connector holder on the right cooling fan.



Continuity checks for the cruise control switches (auto cruise switch, set/decel switch and resume/accel switch) are as following.
Continuity should exist between the color coded wires in each chart below.

Color	WHT/ BLU	BLK/ YEL	WHT/ YEL
RESUME ON	O	O	
FREE			
SET ON		O	O
RESUME ACCEL / SET DECEL SWITCH			

Color	BLK/ YEL	WHT
FREE		
PUSH (LOCK)	O	O
AUTO CRUISE SWITCH		

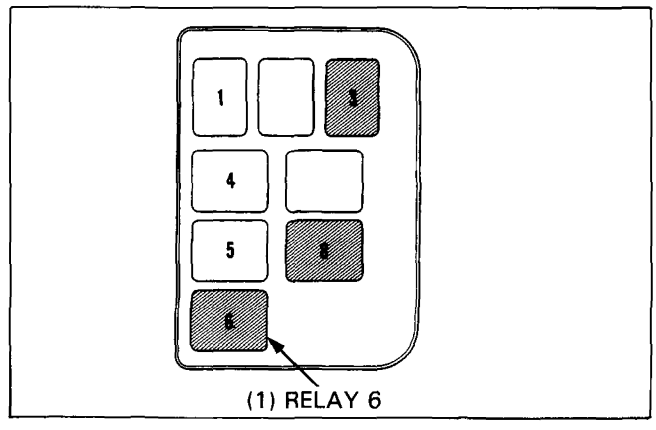


RELAYES IN THE RELAY BOX

OPERATION INSPECTION

Remove the left rear side cover (page 12-6).
Open the relay box cover.

Relay 6:
When turning the ignition switch ON, the relay primary coil is normal if it clicks.



CRUISE CONTROL VALVE UNIT

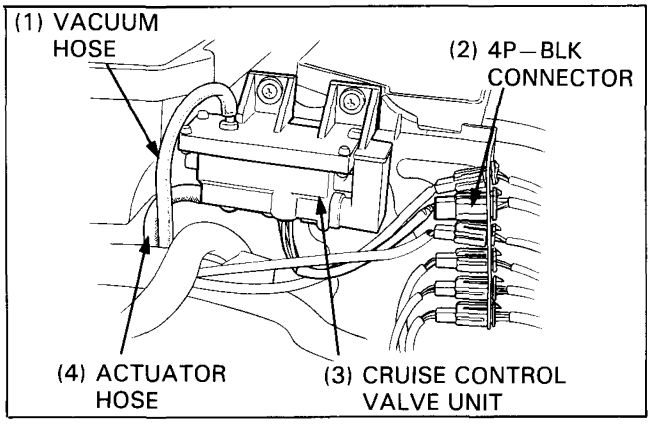
INSPECTION

Remove the left fairing inner cover (page 12-9).
Disconnect the 4P-BLK connector of the connector holder under the cruise control valve unit.

Pry off the valve unit and actuator vacuum hoses with a small screwdriver.

CAUTION

- *The plastic connectors are fragile. Pull the hoses straight off, side stress may break the connectors.*

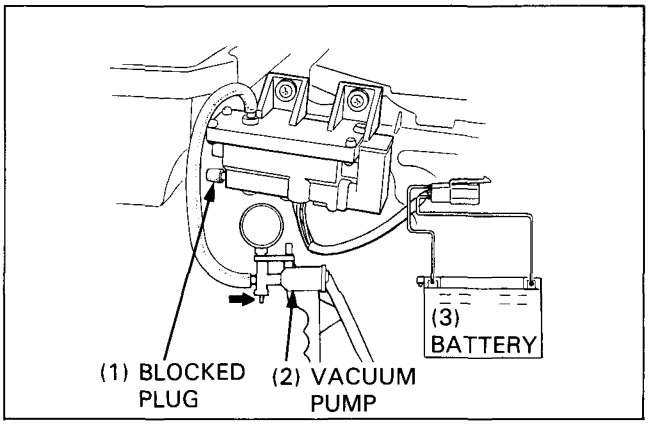


Connect a vacuum pump to the valve unti hose connector and apply vacuum. If the vacuum does not remain steady. Replace a new valve unit.

Connect a blocked plug to the actuator vacuum hose.
While maintaining vacuum, apply battery voltage across the connector terminals shown in the table.

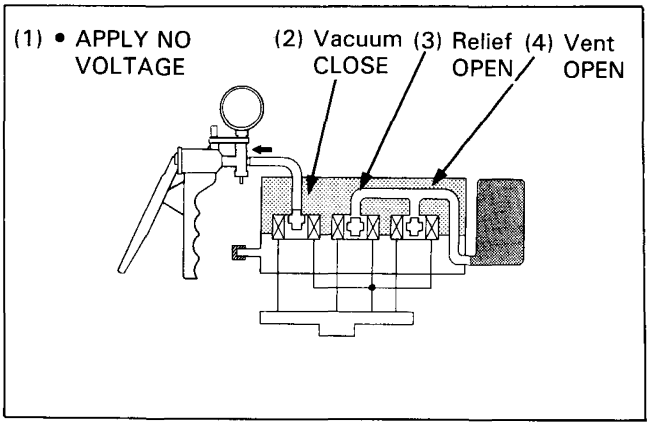
CAUTION

- *Avoid touching the positive (+) battery test wire to the negative (–) test wire. If a test involves two or more negative wires, first connect all negative wires to the negative battery wire, then connect the positive wire to the positive battery wire.*



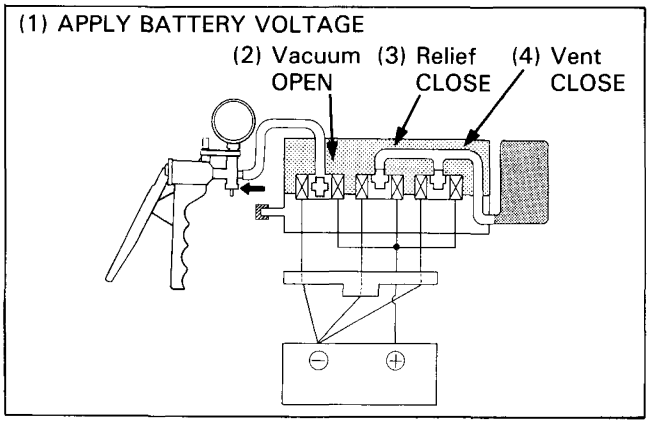
Inspection table

Terminals that voltage is applied		Vacuum
(–) battery wire	(+) battery wire	
Voltage is not applied		HOLD
BRN/BLK	BRN/WHT	RELIEVE
GRN		HOLD
BRN		HOLD
BRN/BLK, GRN		RELIEVE
BRN/BLK, BRN		RELIEVE
BRN, GRN		HOLD
BRN/BLK, BRN, GRN		DECREASE



NOTE

HOLD: Vacuum should remain steady when battery voltage is applied to the terminals.
RELIEVE: Vacuum should be relieved when battery voltage is applied.
DECREASE: About 100–150 mmHg (3.9–5.9 inHg) of vacuum should be lost each time battery voltage is applied.



If unable to obtain specified results, replace the valve unit as an assembly by removing screws.

CRUISE ACTUATOR

INSPECTION

Remove the top compartment (page 12-7).

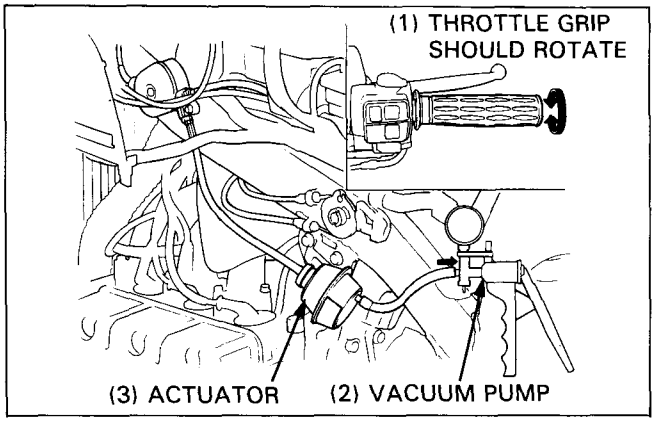
Disconnect the vacuum hose from the valve control unit, and connect a vacuum pump to the actuator. Apply vacuum.

CAUTION

- *The plastic connector is fragile. Pull the hose straight off; side stress may break the connector.*

If vacuum does not remain steady, install a new actuator.

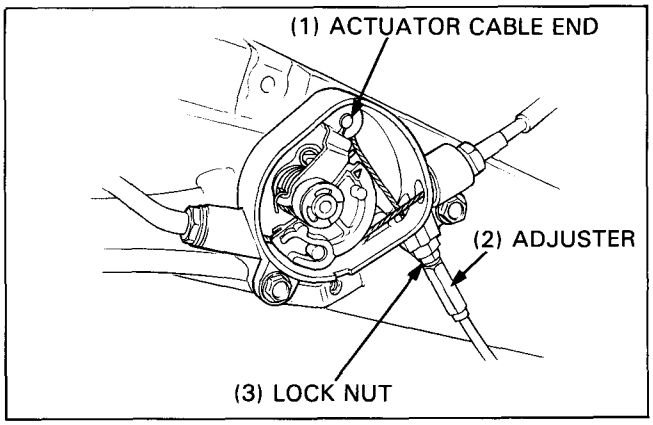
If the throttle grip does not rotate with vacuum applied, check the following:
- Throttle Operation (page 3-6)
- Junction box (operation of drum and lever) (page 21-16)
- Actuator cable
- Throttle cables (page 3-6)
- Actuator vacuum hose



REMOVAL/INSTALLATION

Remove the left fairing inner cover (page 12-9).
Open the junction box cover, loosen the lock nut and disconnect the cable adjuster from the box.

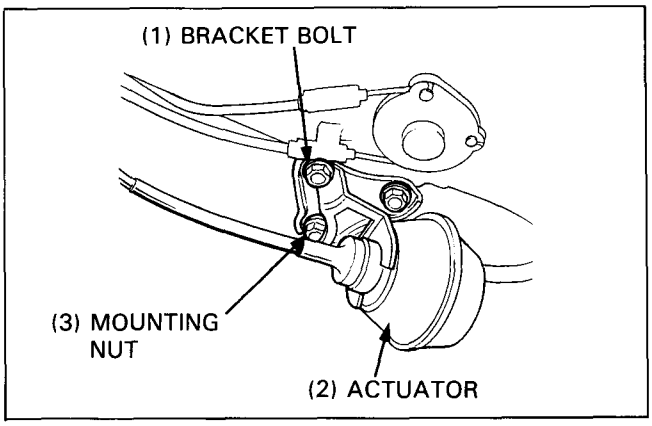
Disconnect the end of the actuator cable from the control arm.



Remove the engine bracket bolt and engine mounting nut.
Remove the actuator.

Install the actuator in the reverse order of removal.

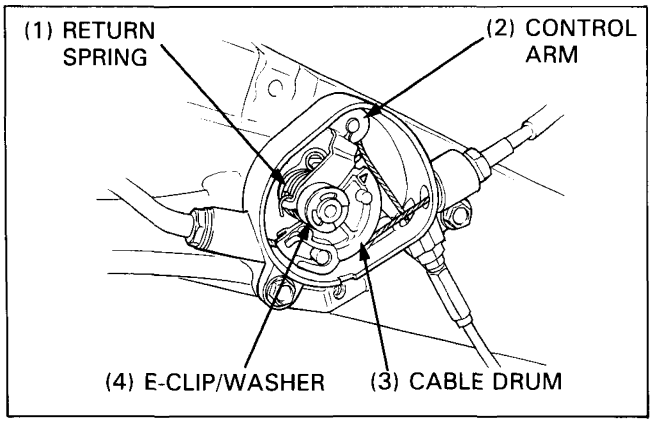
TORQUES:
Engine bracket bolt: 25 N·m (2.5 kg-m, 18 ft-lb)
Engine mounting nut: 40 N·m (4.0 kg-m, 29 ft-lb)



JUNCTION BOX

REMOVAL

Remove the following:
- E-clip and washer.
- cable drum and washer.
- control arm and return spring.
- actuator cable.
- handlebar and carburetor throttle cables.
- junction box.



INSTALLATION/CABLE ADJUSTMENT

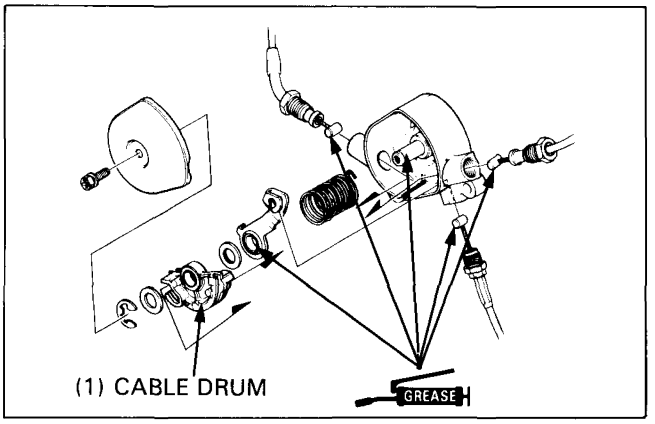
Install the removed parts in the reverse order of removal.

CAUTION

- *Keep contaminants away from junction box sliding surfaces. Clean parts with solvent before assembly.*

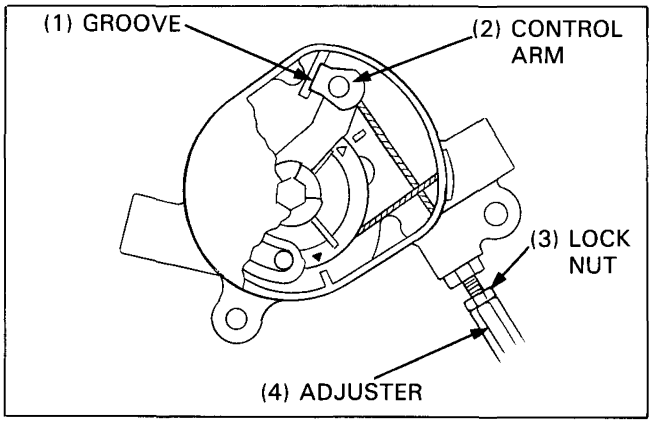
NOTE

- Coat the sliding faces of the control arm, shaft, throttle cable ends and actuator cable end with grease.
- Install the cable drum with the stopper facing the inside.



Loosen the actuator cable lock nut and turn the cable adjuster until the front end of the control arm is in the groove in the case as shown.

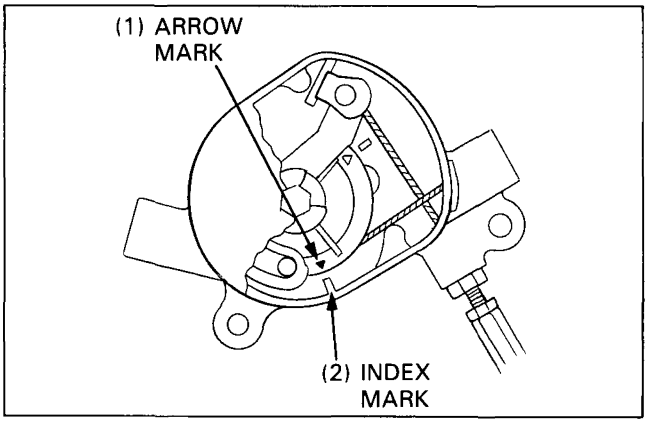
Tighten the adjuster lock nut.



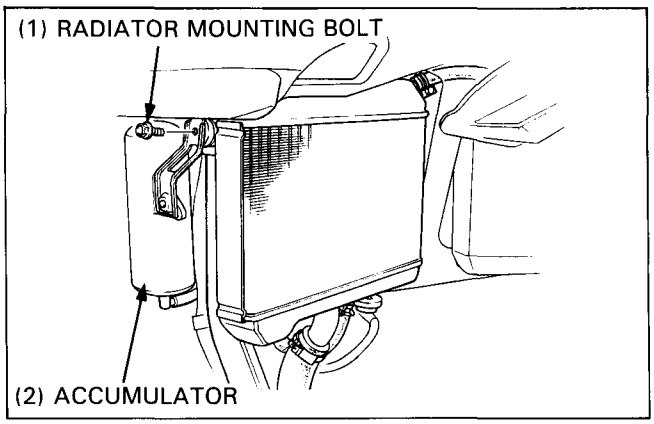
Adjust the throttle cable (page 3-6).

Check alignment of the box index marks and drum arrow mark.

Install the junction box cover.



VACUUM ACCUMULATOR



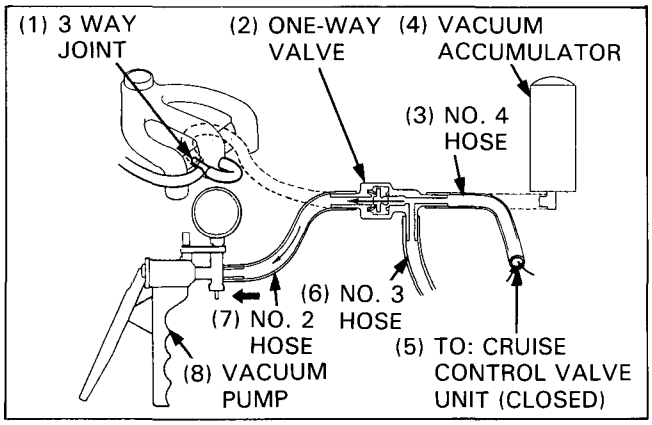
INSPECTION

Remove the right fairing lower cover (page 12-9).

Inspect the vacuum accumulator for damage.

Remove the radiator mounting bolt and remove the accumulator with the stay, and replace it if necessary.

ONE-WAY VALVE

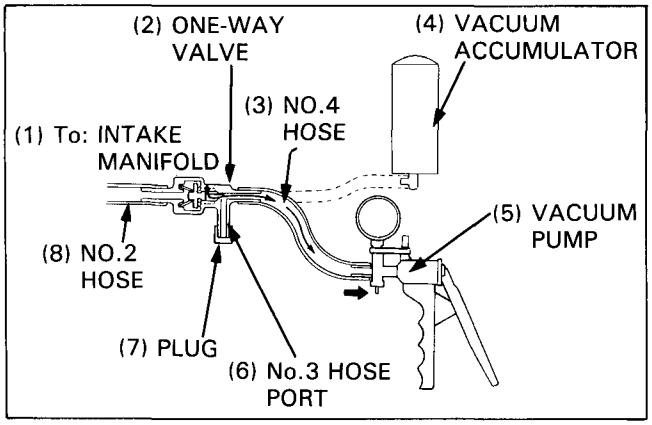


INSPECTION

Remove the right fairing lower cover (page 12-9).

Disconnect the vacuum hose (No. 2) from the 3 way joint behind the intake manifold of the No. 3 cylinder and disconnect the No. 4 hose from the vacuum accumulator.
Connect a vacuum pump as shown and apply vacuum.

Vacuum should not remain steady; the vacuum gauge would be down slowly because of valve orifice.



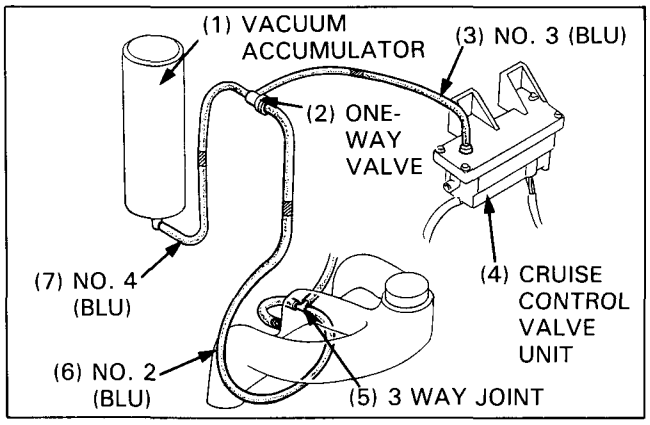
Connect a vacuum pump to the No. 4 hose. Disconnect the No. 3 hose from the valve and plug the No. 3 port.

Apply the specified vacuum and vacuum should be maintained.

SPECIFIED VACUUM: 40 mmHg (1.6 inHg)

If unable to obtain the above results, check vacuum hoses (below).
Replace the one-way valve if necessary.

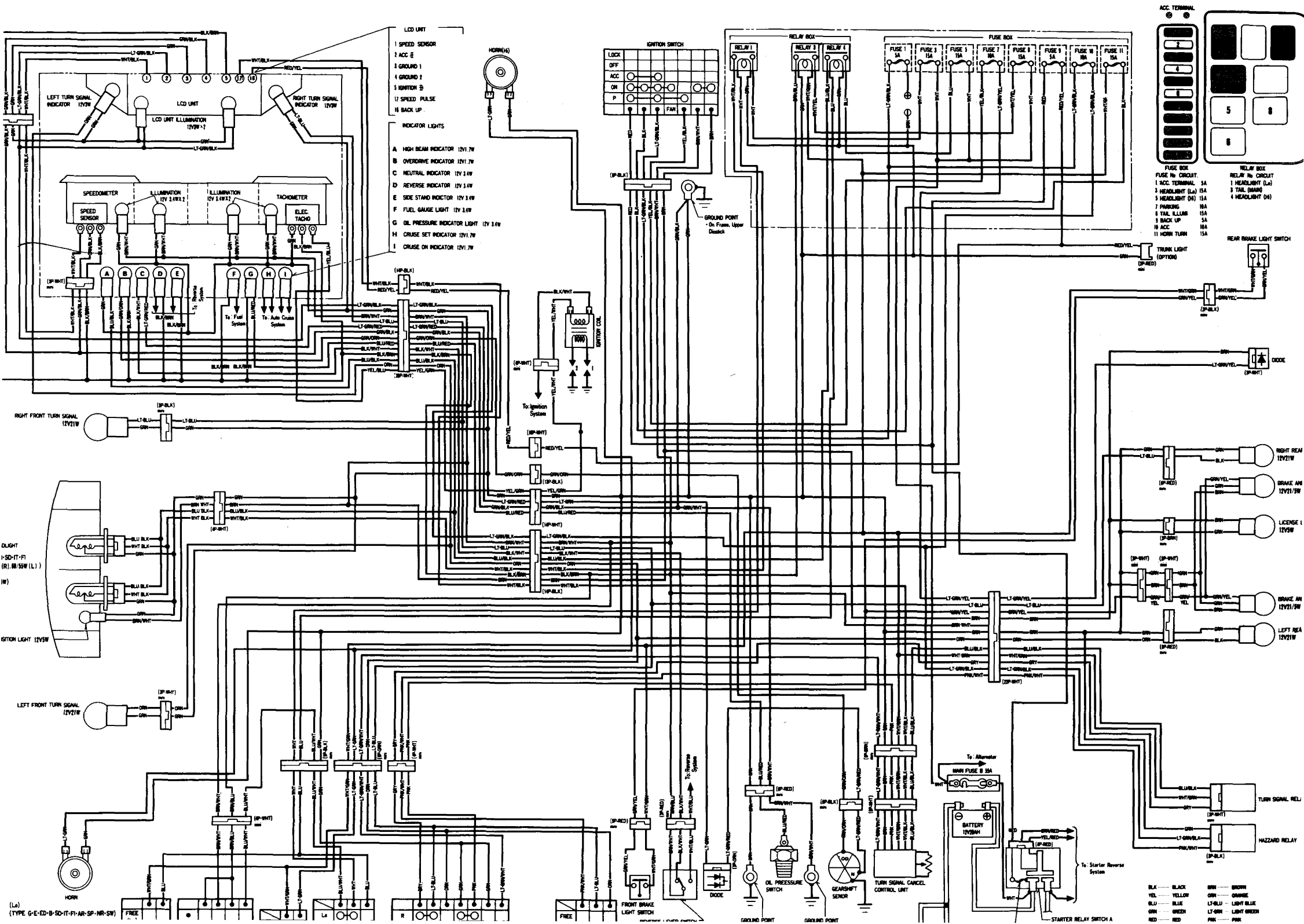
VACUUM HOSES



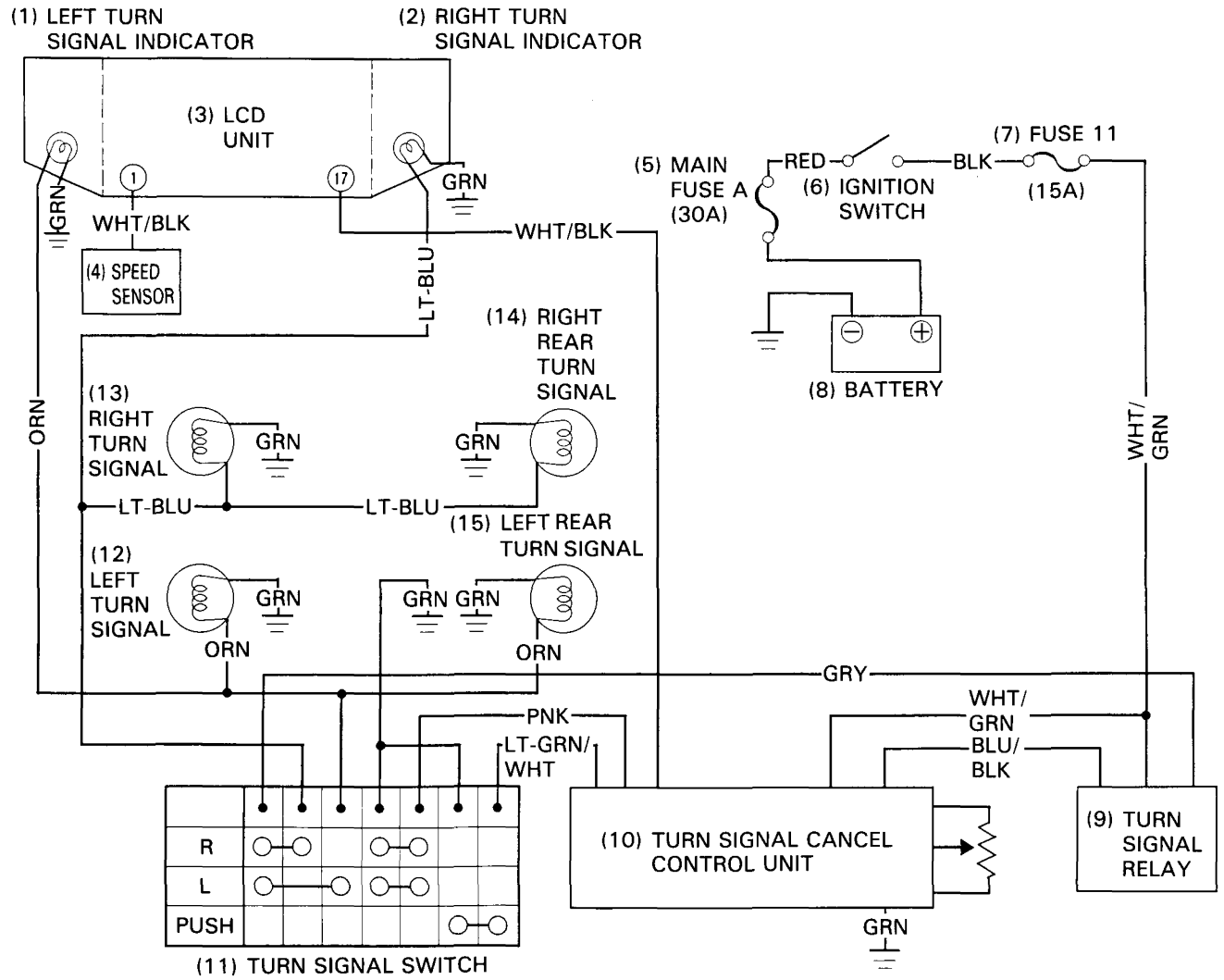
INSPECTION

Inspect the No. 2, 3 and 4 vacuum hoses (blue taping) for damage, deterioration, clogging or loose connection.

Also, check the 3 way joint for damage or clogging.


LCD UNIT
1 SPEED SENSOR
2 ACC
3 GROUND 1
4 GROUND 2
5 IGNITION
17 SPEED PULSE
18 BACK UP
INDICATOR LIGHTS
A HIGH BEAM INDICATOR 12V1.7W
B OVERDRIVE INDICATOR 12V1.7W
C NEUTRAL INDICATOR 12V 3.4W
D REVERSE INDICATOR 12V 3.4W
E SIDE STAND INDICTOR 12V 3.4W
F FUEL GAUGE LIGHT 12V 3.4W
G OIL PRESSURE INDICATOR LIGHT 12V 3.4W
H CRUISE SET INDICATOR 12V1.7W
I CRUISE ON INDICATOR 12V1.7W
LEFT TURN SIGNAL INDICATOR 12V2W
RIGHT TURN SIGNAL INDICATOR 12V2W
LCD UNIT ILLUMINATION 12V1W×2
SPEEDOMETER
SPEED SENSOR
ILLUMINATION 12V 3.4W×2
ILLUMINATION 12V 3.4W×2
TACHOMETER
ELEC. TACHO
To : Reverse System
To : Fuel System
To : Auto Cruise System
HORN(HI)
IGNITION SWITCH
LOCK
OFF
ACC
ON
P
FAN
GROUND POINT
On Frame, Upper Diodeck
RELAY BOX
RELAY 1
RELAY 3
RELAY 4
FUSE BOX
FUSE 1 5A
FUSE 2 15A
FUSE 3 15A
FUSE 5 15A
FUSE 7 10A
FUSE 8 15A
FUSE 9 5A
FUSE 10 10A
FUSE 11 15A
ACC. TERMINAL
FUSE BOX
FUSE No. CIRCUIT
1 ACC. TERMINAL 5A
3 HEADLIGHT (Lo) 15A
5 HEADLIGHT (Hi) 15A
7 PARKING 10A
8 TAIL ILLUMI 15A
9 BACK UP 5A
10 ACC 10A
11 HORN TURN 15A
RELAY BOX
RELAY No. CIRCUIT
1 HEADLIGHT (Lo)
3 TAIL (MAIN)
4 HEADLIGHT (Hi)
REAR BRAKE LIGHT SWITCH
TRUNK LIGHT (OPTION)
IGNITION COIL
To : Ignition System
DIODE
RIGHT FRONT TURN SIGNAL 12V21W
LEFT FRONT TURN SIGNAL 12V21W
RIGHT REAR 12V21W
BRAKE AND 12V21/5W
LICENSE L 12V5W
BRAKE AND 12V21/5W
LEFT REAR 12V21W
TURN SIGNAL RELAY
HAZZARD RELAY
To : Alternator
MAIN FUSE 30A
BATTERY 12V38AH
To : Starter Reverse System
STARTER RELAY SWITCH A
HORN
(Lo)
(TYPE G·E·ED·B·SD·IT·FI·AR·SP·NR·SW)
FREE
FRONT BRAKE LIGHT SWITCH
DIODE
To : Reverse System
OIL PRESSURE SWITCH
GEARSHIFT SENOR
TURN SIGNAL CANCEL CONTROL UNIT
GROUND POINT
GROUND POINT
BLK ..... BLACK
YEL ..... YELLOW
BLU ..... BLUE
GRN ..... GREEN
RED ..... RED
BRN ..... BROWN
ORN ..... ORANGE
LT-BLU ..... LIGHT BLUE
LT-GRN ..... LIGHT GREEN
PNK ..... PINK

SELF CANCELLING TURN SIGNAL SYSTEM DIAGRAM



22

SERVICE INFORMATION

GENERAL

- All plastic plugs have locking tabs that must be released before disconnecting, and must be aligned when reconnecting.
- To isolate an electrical failure, check the continuity of the electrical path through the part. A continuity check can usually be made without removing the part from the motorcycle. Simply disconnect the wires and connect a continuity tester or volt-ohmmeter to the terminals or connections.
- A continuity tester is useful when checking to find out whether or not there is an electrical connection between the two points. An ohmmeter is needed to measure the resistance of a circuit, as when there is a specific coil resistance involved, or when checking for high resistance by corroded connections.
- For the following switches, see the indicated section.
  - Ta sensor (section 4)
  - Coolant temperature sensor (section 5)
  - Thermostatic fan motor switch (section 5)
  - Air pressure switch (section 14)
  - Side stand switch (section 18)
  - Tw sensor (section 18)
  - Engine stop switch (section 18)
  - Gearshift sensor (section 18)
  - Reverse switch (section 19)
  - Starter/reverse switch (section 19)
  - Clutch switch (section 19)
  - Reverse lever switch (section 19)
  - Muting/search switch (section 20)
  - Cruise cancel switches (section 21)
  - Cruise control switches (section 21)

SPECIFICATIONS

Headlight	12 V 60 W (R), 60/55 W (L), SW model only: 12 V 60/55 W
Position light	12 V 5 W
Turn signal light	12 V 21 W x 4
Indicator light	12 V 3.4 W x 5/12 V 1.7 W
Turn signal indicator	12 V 3 W x 2
Instrument illumination	12 V 3.4 W x 4
LCD unit illumination	12 V 3 W x 2
License light	12 V 5 W
Brake and taillight	12 V 21/5 W × 2
Oil pressure switch continuity pressure	10—20 kPa (0.1—0.2 kg/cm^2, 1—3 psi)

TROUBLESHOOTING

NOTE

Inspect the following before troubleshooting this section.
- Be sure the battery is fully charged.
- Be sure the fuse 1 (5 A), 3 (15 A), 5 (15 A), 7 (10 A), 8 (15 A), 9 (5 A), 10 (10 A) and 11 (15 A) are not burnt.

Lights come on but are dim.
- Faulty bulb
- Loose or poor contact of related connectors
- Open or short circuit in related wire harness
- Faulty lighting switch (page 22-18)

No lights come on with the ignition switch ON and the lighting switch P or H.
- Faulty relay 3 in the relay box (TAIL. MAIN)
- Open or short circuit in wire harness from relay 3 to battery

Headlight does not come on with the ignition switch ON and the lgihting switch on H position.
- Faulty bulb
- Faulty relay 1 (HEADLIGHT Lo) and/or relay 4 (HEADLIGHT Hi)
- Faulty lighting switch (page 22-18)
- Faulty dimmer switch (page 22-18)
- Loose or poor contact of related connectors
- Open or short circuit in related wire harness

Parking lights (Lisence light, taillights and position light) do not come on with the ignition switch in P position.
- Faulty ignition switch (page 22-16)
- Faulty parking diode (LT-GRN/YEL & BRN) (page 22-19)
- Loose or poor contact of related connectors
- Open or short circuit in related wire harness

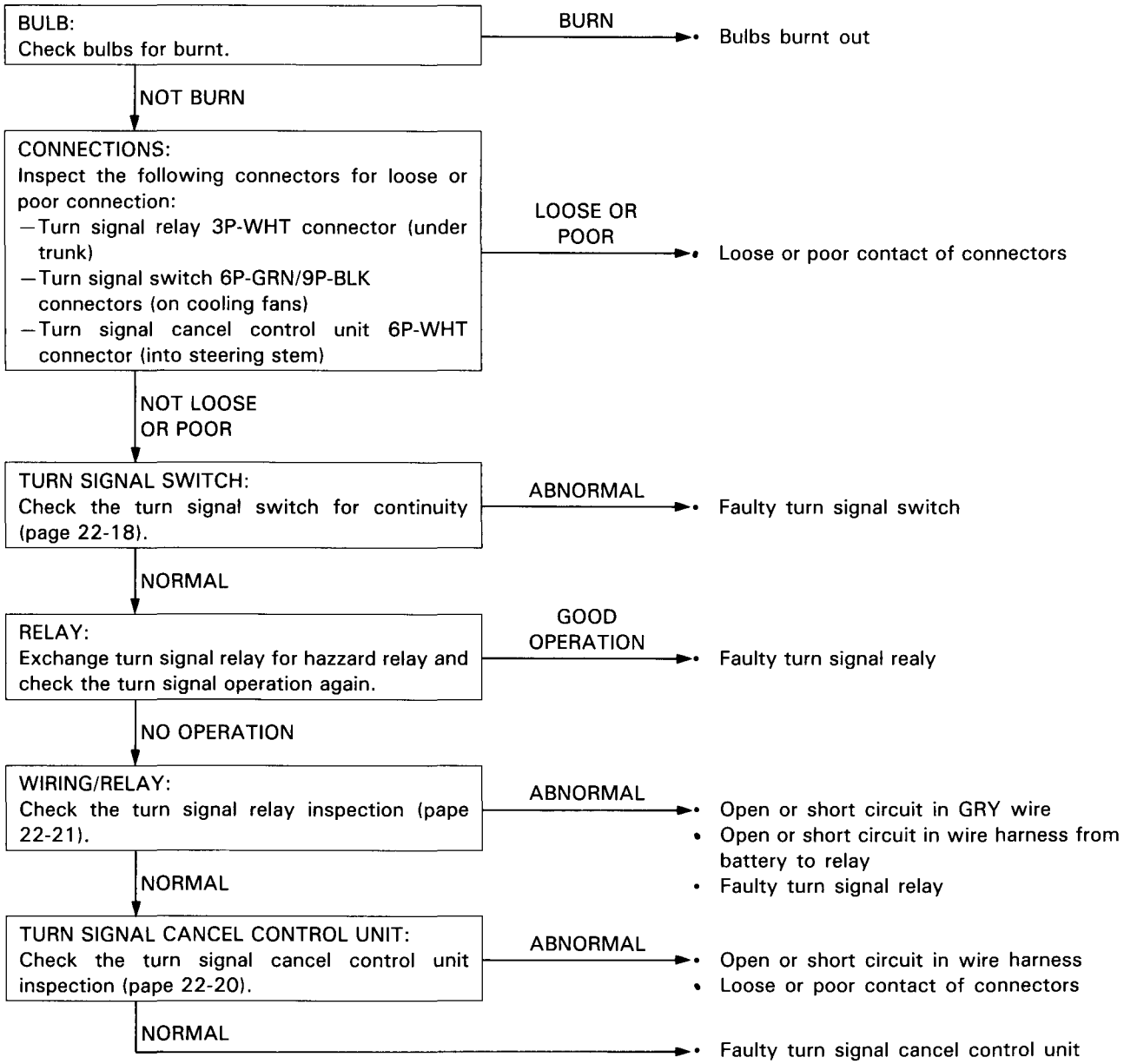
Brake lights do not come on with ignition switch ON and brake light switch applied.
- Faulty front and/or rear brake light switches
- Faulty bulbs
- Loose or poor contact of related connectors
- Open or short circuit in related wire harness

Neutral indicator will not come on.
- Faulty bulb
- Faulty gearshift sensor (page 18-12)
- Faulty 3 way diode (Neutral) (page 22-20)
- Loose or poor contact of related connectors
- Open or short circuit in related wire harness
- Faulty reverse lever switch (page 19-43)
- Faulty relay 3 (TAIL: MAIN)

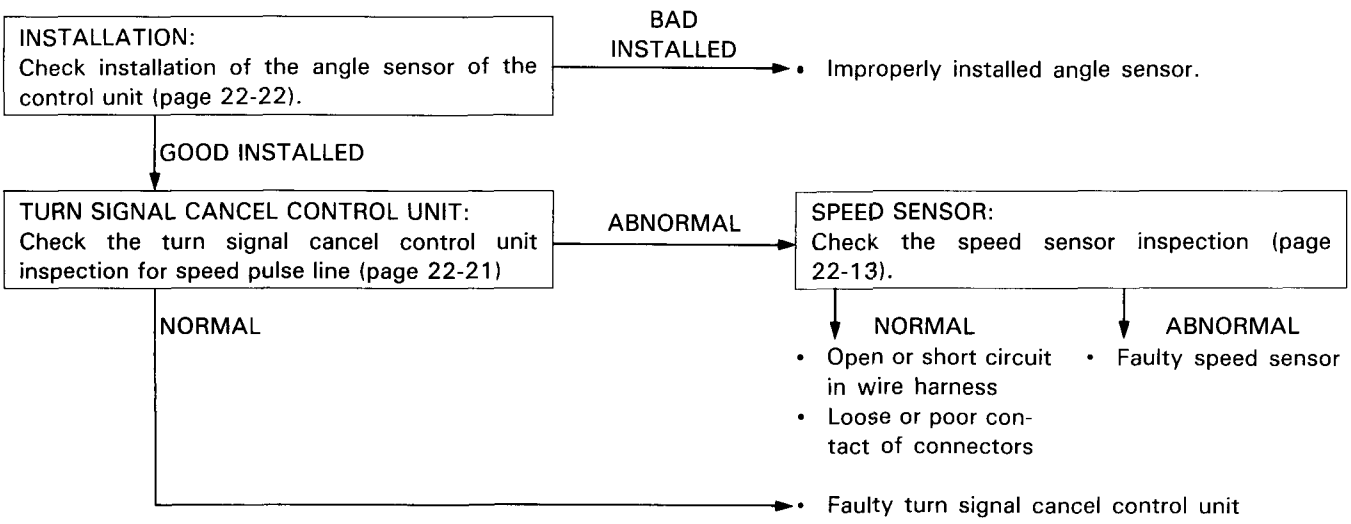
Turn signals do not operate.

NOTE

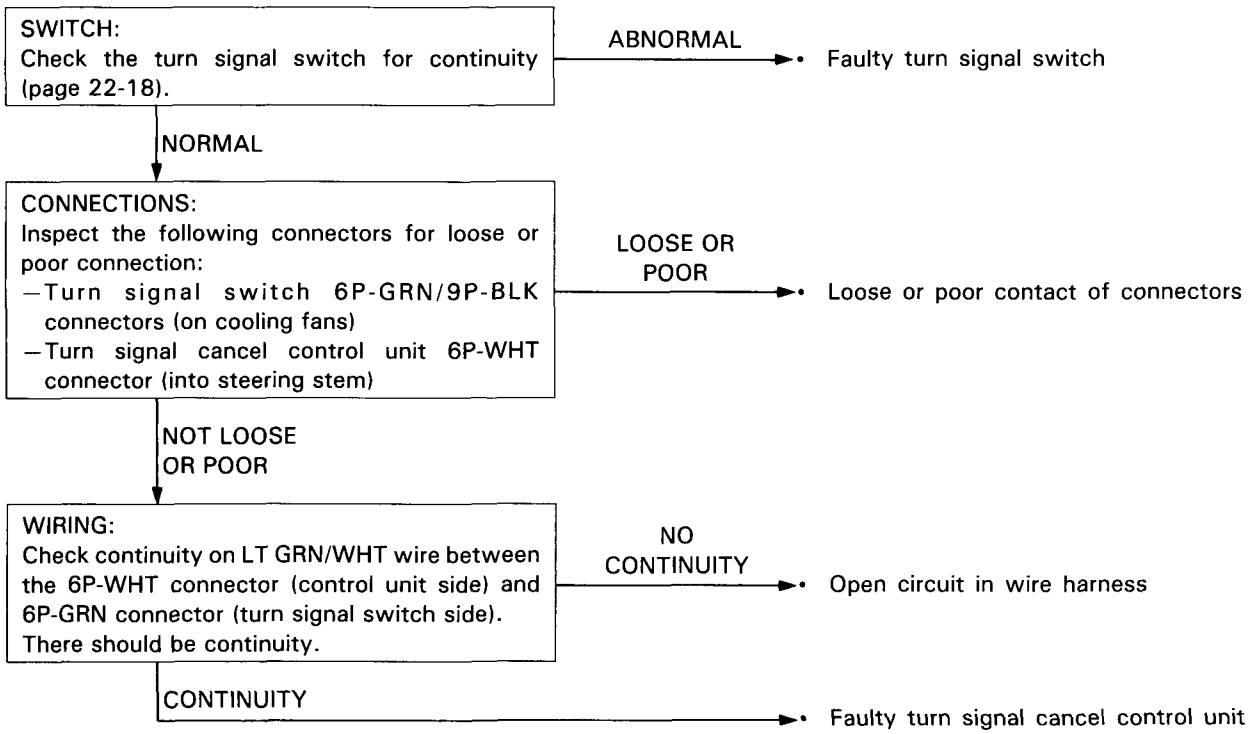
- If one bulb is burnt out, turn signals should blink faster than normal.



Turn signals are not cancelled automatically.



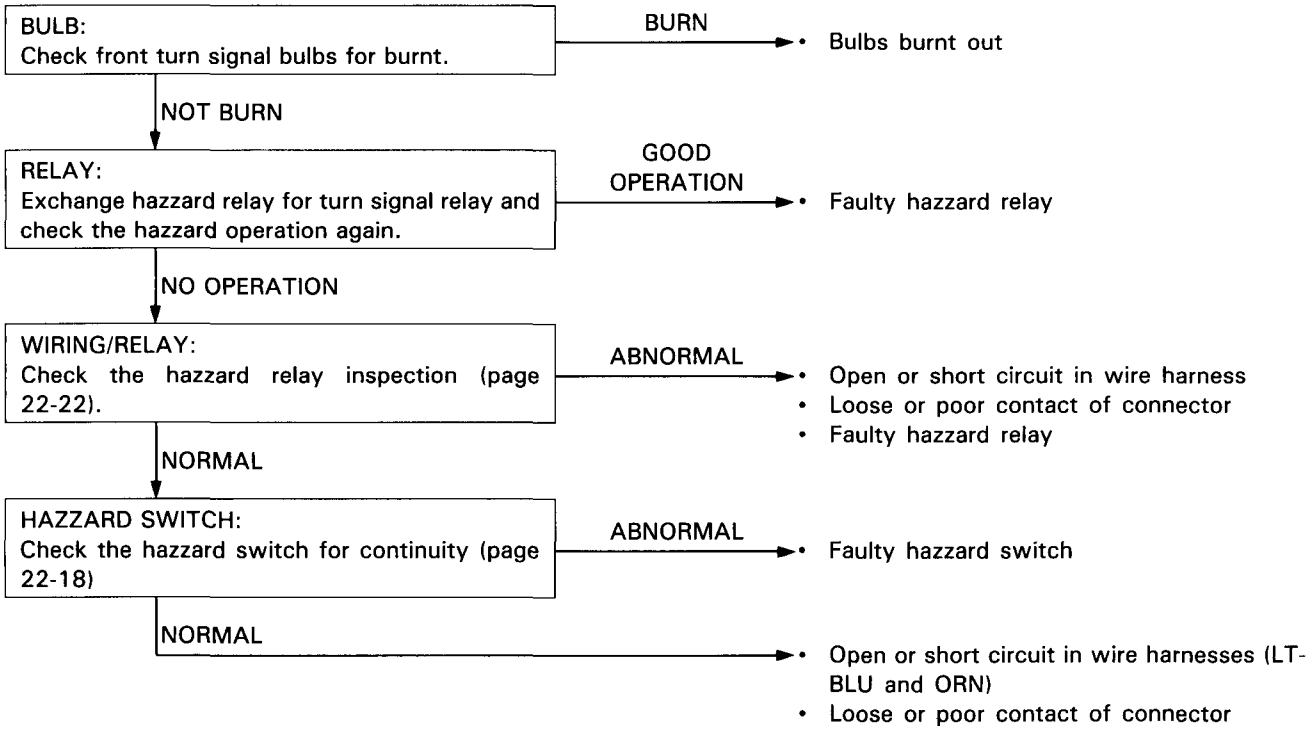
Turn signals do not cancel manually.



On parking, when the front wheel is turned slowly from left to right, turn signals is cancelled.

- Faulty turn signal cancel control unit

Hazzard system does not operate well



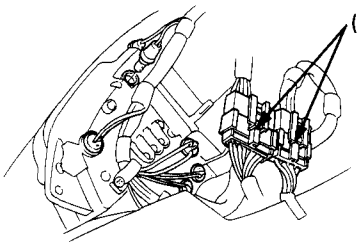
Liquid crystal display (L.C.D.) does not appear upon turning the ignition switch to ACC, ON or P.

Turn the ignition switch to ACC, ON or P. Turn the radio/cassette deck power switch/volume control knob to ON. Audio display should appear.

DO NOT APPEAR → • Go to DISPLAY OF THE RADIO & CASSETTE DECK DO NOT APPEAR ON THE LCD UNIT (page 22-9)

APPEAR (but clock and air pressure display still not come on)

POWER TO CONNECTOR:
Remove the instruments (page 22-12) and disconnect the 20P-WHT and 14P-BLK connectors. Turn the ignition switch ON. Measure voltage between the LT-GRN/BLK (+) and ground (−), between the BLK/BRN (+) and ground (−) and between the RED/YEL (+) and ground (−) of the wire harness side. Battery voltage should register

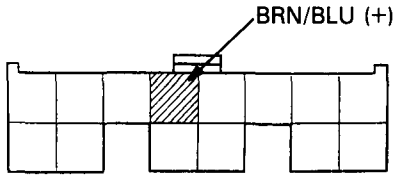


YES → • Faulty L.C.D. unit
• Loosely connectors
• Open circuit in instrument sub wire harness (between the 20P-WHT and 10P-WHT)

NO → • Loose or poor contact of the power INPUT line connectors
• Open or short circuit in power INPUT line

Clock displays, but air pressure display will not come on when the check switch is depressed with the motorcycle stopped.

POWER TO CONNECTOR:
Remove the instruments (page 22-12) and disconnect the 14P-BLK connector. Turn the ignition switch ON. Measure voltage between BRN/BLU (+) terminal and ground (−) of the wire harness side.
With the P.CHECK button depressed, battery voltage should register.



YES → • Faulty L.C.D. unit
• Loosely 14P-BLK connector

NO

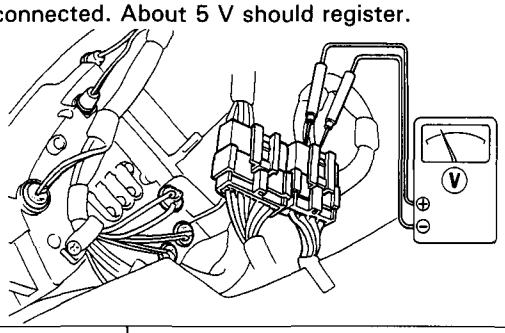
SWITCH:
Check the check switch for continuity (page 14-33).

ABNORMAL → • Faulty check switch

NORMAL → • Open or short circuit in BRN/BLU and/or LT-GRN wires
• Loose and poor contact of related connectors

Air pressure value is indicated abnormally: Air pressure display does not change, but the on-board air compressor system is operating properly.

AIR PRESSURE SENSOR:
Remove the instruments (page 22-12) and turn the ignition switch ON. Measure voltage between BLK/GRN (+) and GRN/RED (−) terminals with the 14P-BLK connector connected. About 5 V should register.



NO →

WIRING:
Remove the trunk (page 12-12). Disconnect the 14P-BLK (instruments) and 3P-BLK (rear fender) connectors. Check the continuity, end to end, of each wire. There should be continuity between same color.

YES ↓

NO ↓

- Open or short circuit in wire harness
- Loose or poor contact of connectors

AIR PRESSURE SENSOR:
Check the air pressure sensor (page 14-31).

NORMAL ↓

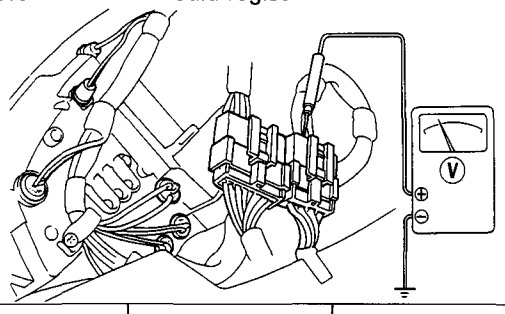
- Faulty L.C.D. unit

ABNOMAL ↓

- Faulty air pressure sensor

YES ↓

WIRING:
Turn the ignition switch ON. Measure voltage between LT BLU (+) terminal and ground (−) with the 14P-BLK connector connected. About 0.5 V—2.0 V should register.



YES ↓

- Faulty L.C.D. unit

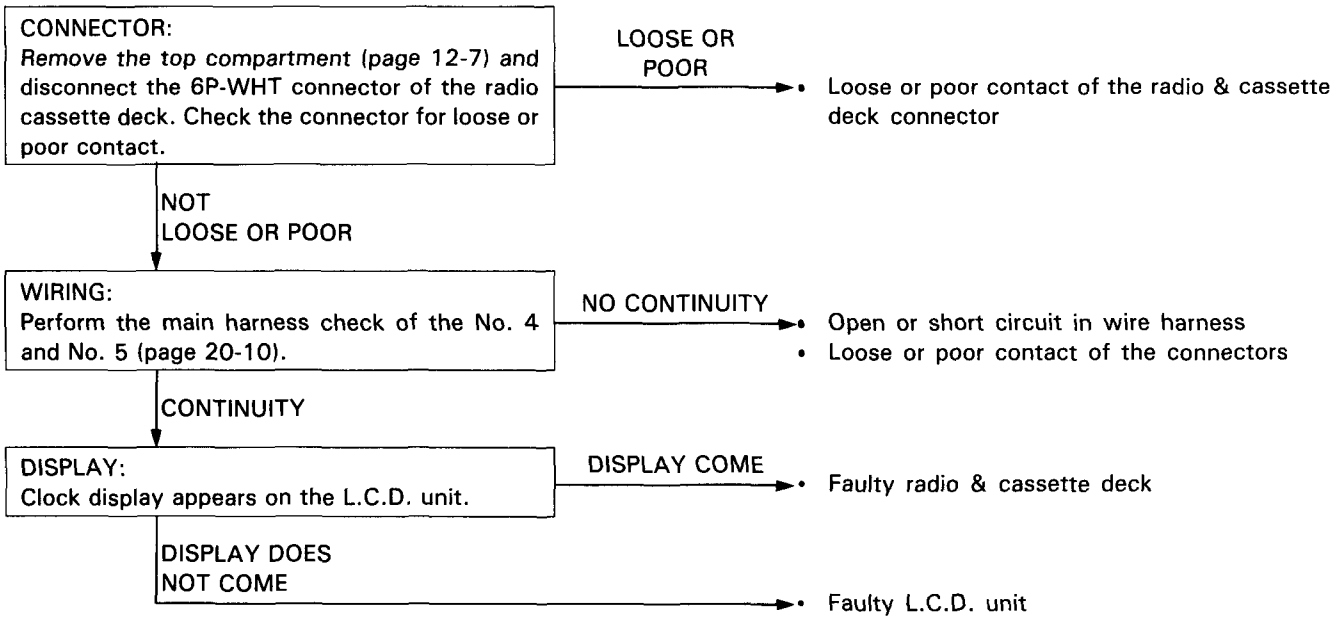
NO ↓

- Open or short circuit in wire harness
- Loose or poor contact of connectors

Display of the radio & cassette deck do not appear on the LCD unit.

NOTE

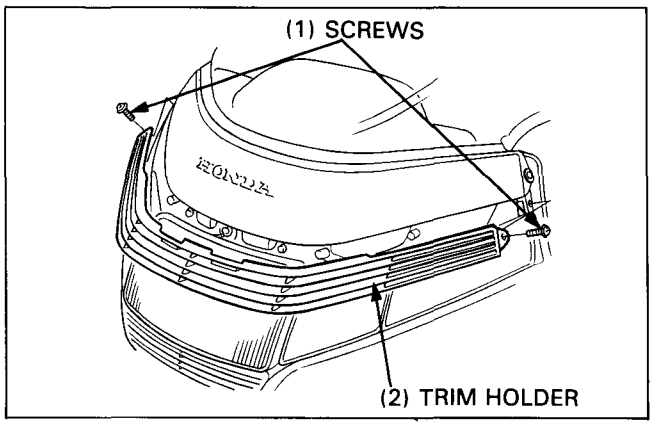
- Turn the radio/cassette deck power switch/volume control knob to ON, and audio display should appear. If you play the radio, push the radio/cassette switch and put the display in the RADIO mode. And the display indicates "AM" or "FM".



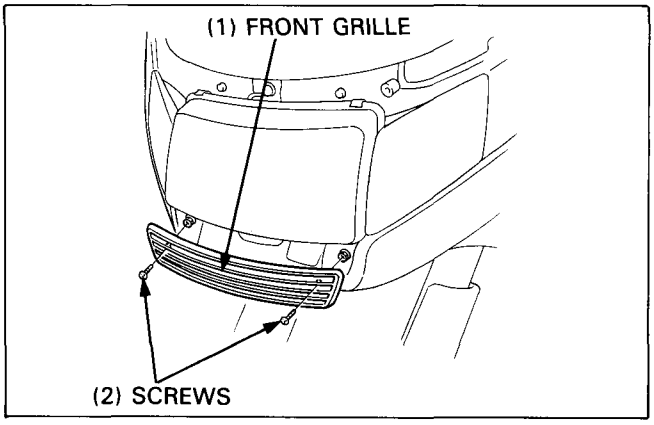
HEADLIGHT/POSITION LIGHT

REMOVAL

Remove the trim holder by removing two attaching screws.



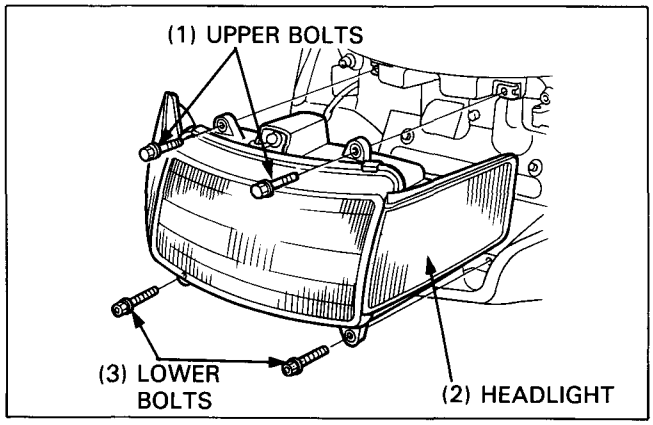
Remove the front grille by removing two attaching screws.



Remove the headlight by removing four mounting bolts.

NOTE

- Lower mounting bolts have screw threads in their bolt heads.



BULB REPLACEMENT

Remove the headlight connector and rubber bulb cover.
Remove the headlight bulb.

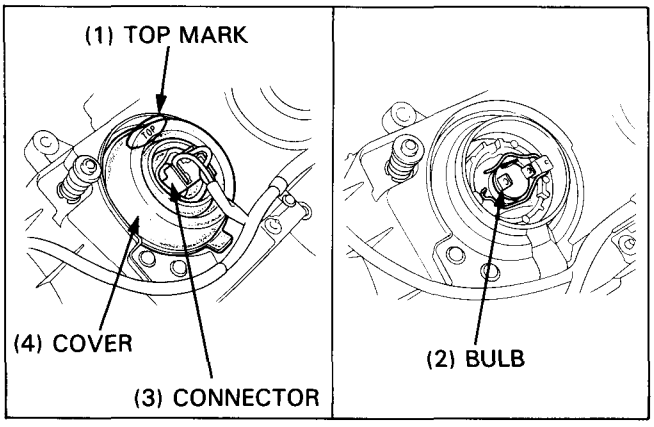
Install a new headlight bulb.

CAUTION

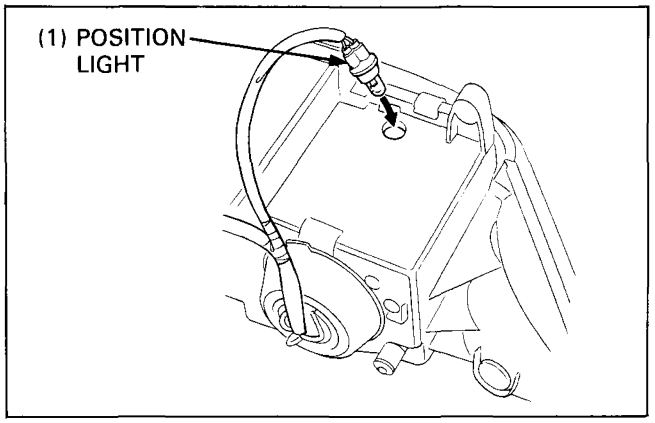
- *If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent early failure.*

NOTE

- Install the rubber bulb cover with its "TOP" mark facing up.



Pull the position light out of the headlight case and replace it with a new one.



INSTALLATION

Install the headlight in the reverse order of removal.

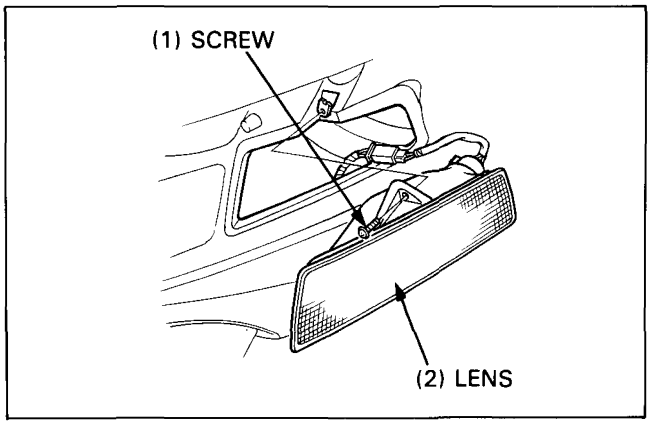
NOTE

- Be sure to install the headlight mounting bolts properly. The lower bolts have screw threads in their heads.

TURN SIGNAL LIGHT

FRONT TURN SIGNALS

Remove the front turn signal light lens by removing the screw.



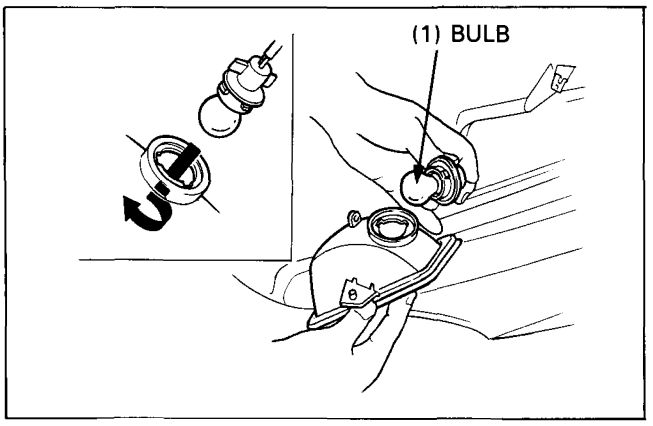
Remove the bulb by turning it counterclockwise.

Install a new bulb onto the bulb socket and install it by turning it clockwise.

Install the lens.

CAUTION

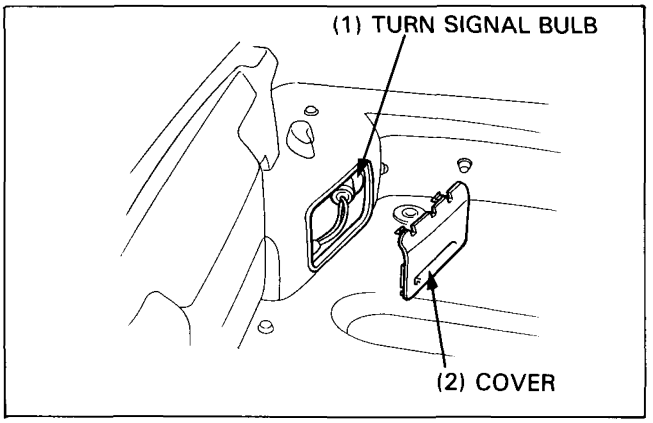
- *Do not overtighten the lens mounting screws, or the lens will crack.*



REAR TURN SIGNALS

Open the trunk lid.
Remove the bulb cover.

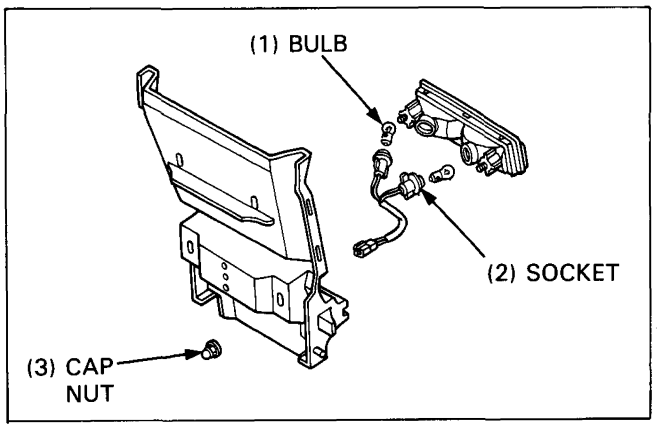
Remove the bulb by turning it counterclockwise.
Replace it with a new one and install it in the reverse order of removal.



BRAKE AND TAILLIGHT

BULB REPLACEMENT

Remove cap nuts and brake/taillight lens.
Remove the bulb by turning the bulb socket counterclockwise.
Replace it with a new one and install it in the reverse order of removal.



LICENSE LIGHT

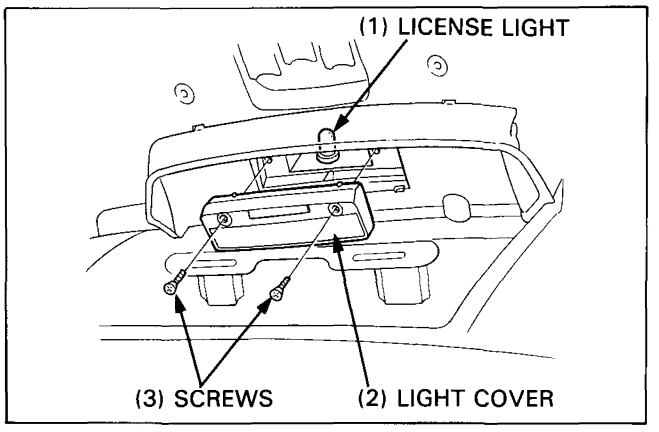
BULB REPLACEMENT

Remove the license light cover by removing two screws.
Pull the bulb out of the bulb case.

Replace it with a new one and install it in the reverse order of removal.

CAUTION

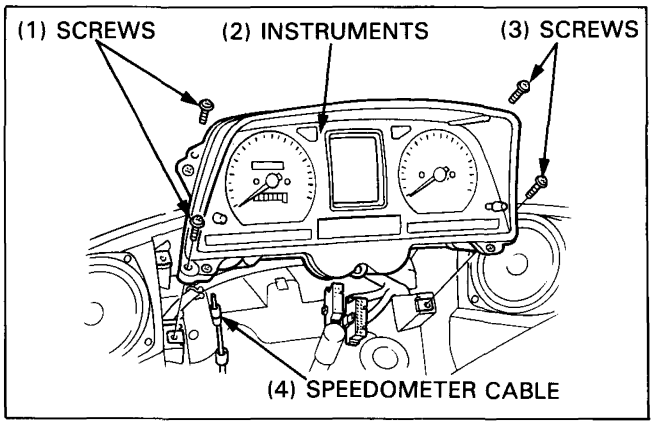
- *Do not overtighten the light cover mounting screws, or the cover will crack.*



INSTRUMENTS

REMOVAL/BULB REPLACEMENT

Remove the instrument panel (page 12-8).
Remove the instruments mounting screws and disconnect the speedometer cable.

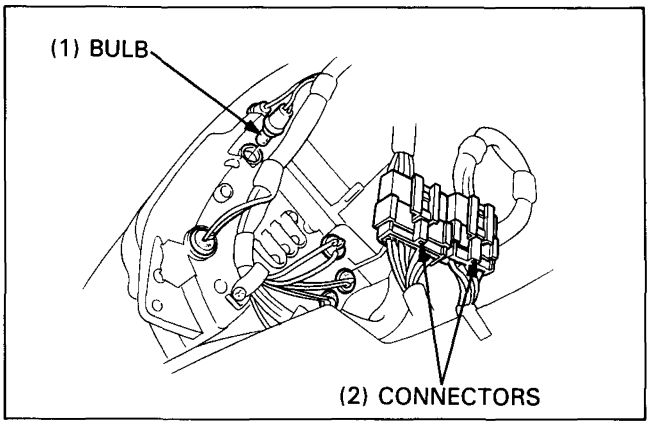


Pull the bulb out of the instrument case and replace it with a new one.

NOTE

- Refer to see next page for L.C.D. unit illumination replacement.

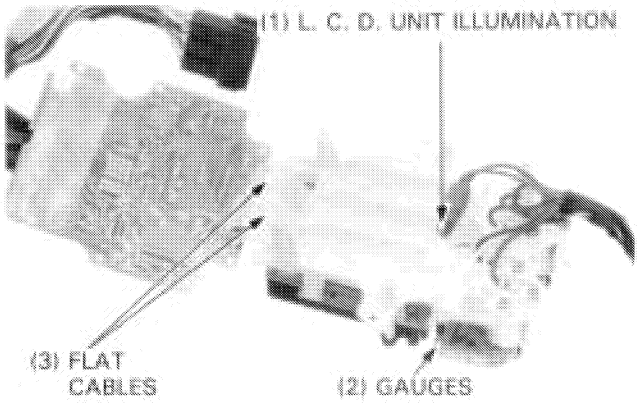
When disassembling the instruments, disconnect the 14P-BLK and 20P-WHT connectors and remove the instruments from the frame.



Only for L.C.D. unit illumination replacement, you should remove the L.C.D. unit as shown; for L.C.D. unit replacement, see page 22-15.

CAUTION

- *Do not turn a gauges upside down for a long time, or leak out the damper oil.*
- *Do not damage the L.C.D. unit flat cables.*



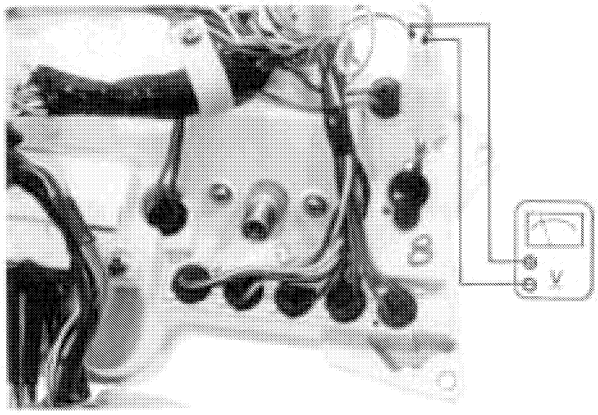
SPEED SENSOR INSPECTION

Check the speedometer cable connection for loose.
Remove the instruments with 14P-BLK and 20P-WHT connectors connected (page 22-12).

Connect a voltmeter across the BLK/BRN (+) and GRN/BLK (−) terminals of the sensor 3P-WHT connector.

Turn the ignition switch ON and battery voltage should register.

If there is not O.K., the speed sensor do not catch power from the battery. Trace and repair the related wiring, connectors and/or components (relay 3 and fuse 8/11)

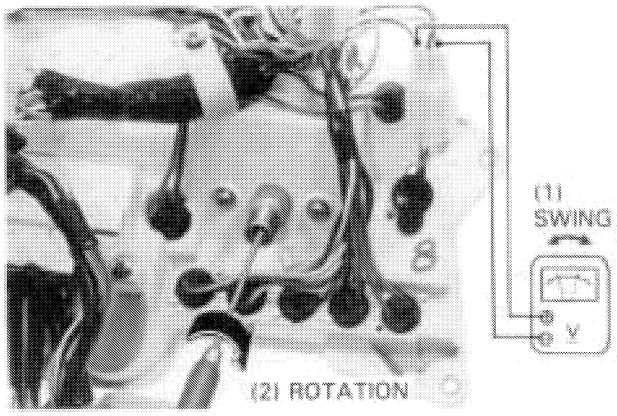


Connect a voltmeter across the BLK/BRN (+) and WHT/BLK (−) terminals of the sensor 3P-WHT connector.

Turn the ignition switch ON.

The sensor is normal if the voltmeter needle swings from 2 to about 10 V slowly eight times when the speedometer drive shaft is turned slowly one full turn.

If all checks are O.K., replace the speed sensor.



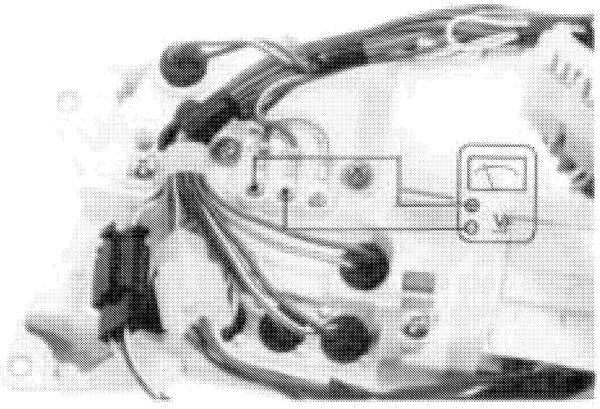
ELECTRIC TACHOMETER INSPECTION

Remove the instruments with 20P-WHT connectors connected (page 22-12).

Connect a voltmeter across the BLK/BRN (+) and GRN (−) terminals of the tachometer terminals.

Turn the ignition switch ON and battery voltage should register.

If there is not O.K., the electric tachometer do not catch power from the battery. Trace and repair the related wiring, connectors and/or components (relay 3 and fuse 8/11).

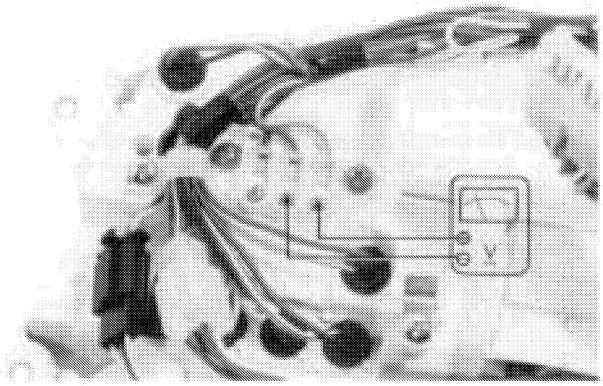


Connect a voltmeter across the YEL/BLU (+) and GRN (−) terminals of the tachometer terminals.

Turn the ignition switch ON with the engine stop switch on RUN and battery voltage should register.

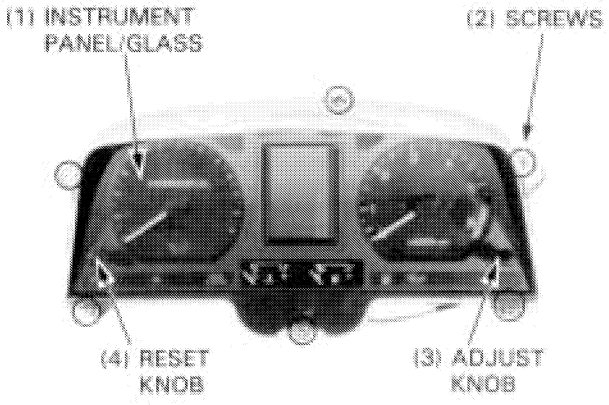
If there is not O.K., check the wiring for loose connectors from ignition coil (No. 2) to tachometer terminal. Trace and repair them.

If all checks are O.K., replace the electric tachometer.

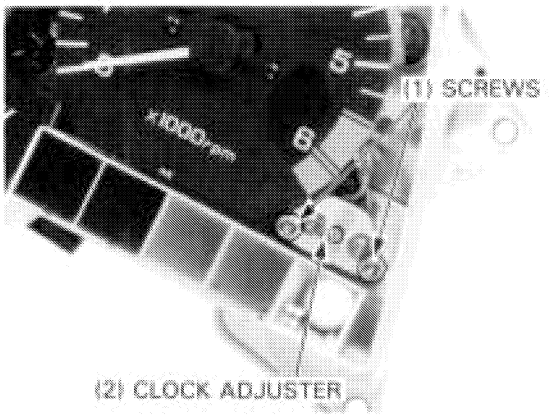


DISASSEMBLY

Remove the reset knob and clock adjust knob.
Remove the instrument panel and glass by removing six screws.

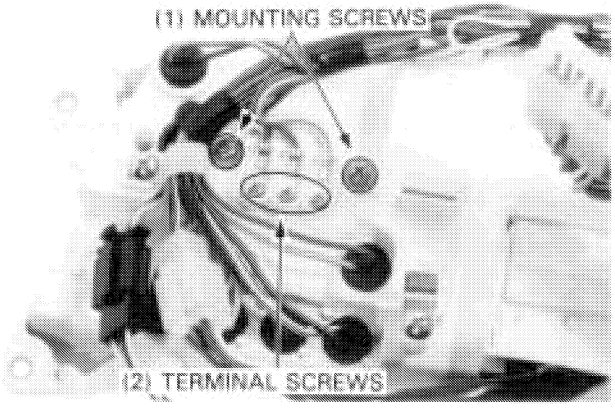


If you are replacing the clock adjuster, remove two screws and disconnect the 3P-BLK connector behind the instrument case.

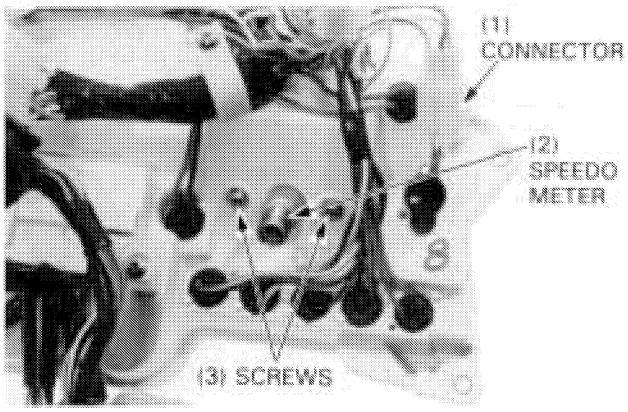


Remove three electric tachometer terminal screws and two tachometer mounting screws.

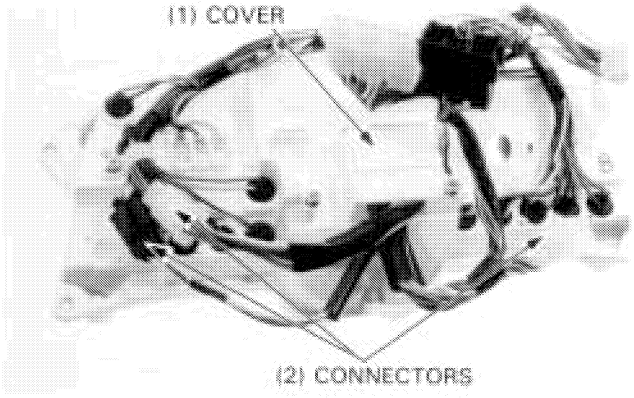
Remove the tachometer from the case.



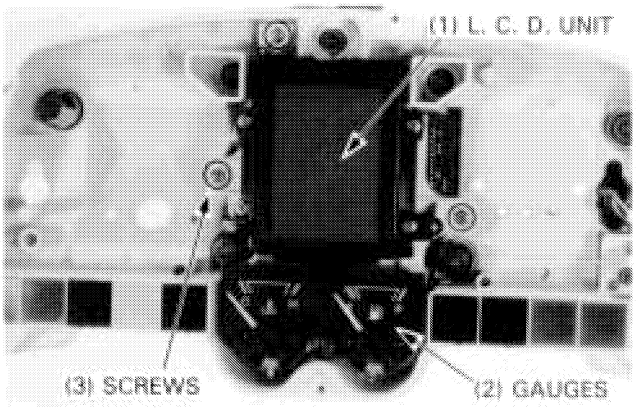
Disconnect the 3P-WHT connector of the speed sensor.
Remove two screws and speedometer from the case.



Disconnect the 10P-WHT, 6P-WHT and 3P-BLK connectors.
Remove the instrument backing cover.



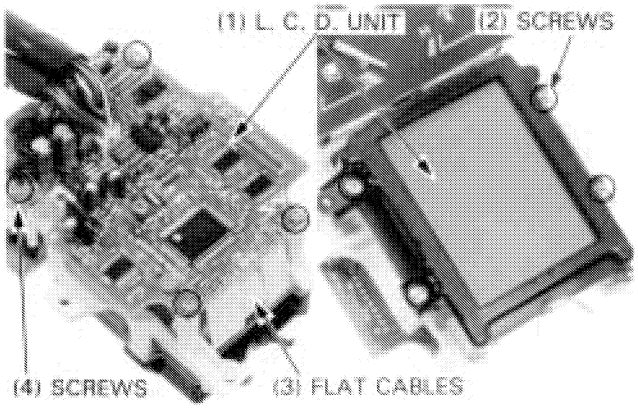
Remove four screws and L.C.D. unit and gauges as an assembly.



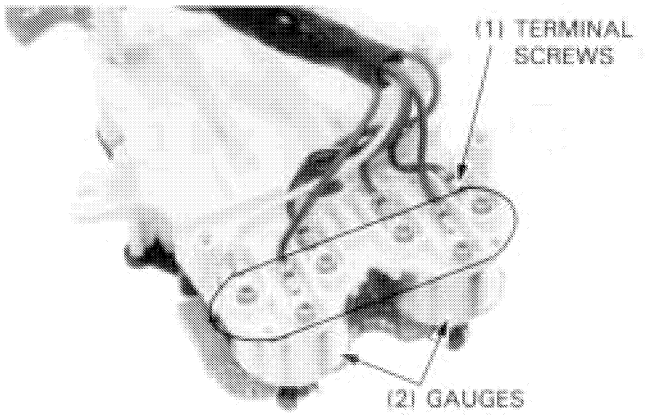
If you want to remove the L.C.D. unit, remove eight screws and L.C.D. unit from the base.

CAUTION

- *Do not damage the L.C.D. unit flat cables.*



If you want to remove the gauges, remove the rear side of L.C.D. unit (previous page).
Remove the gauge terminal screws and gauge panel screws.
Remove the gauges.



CAUTION

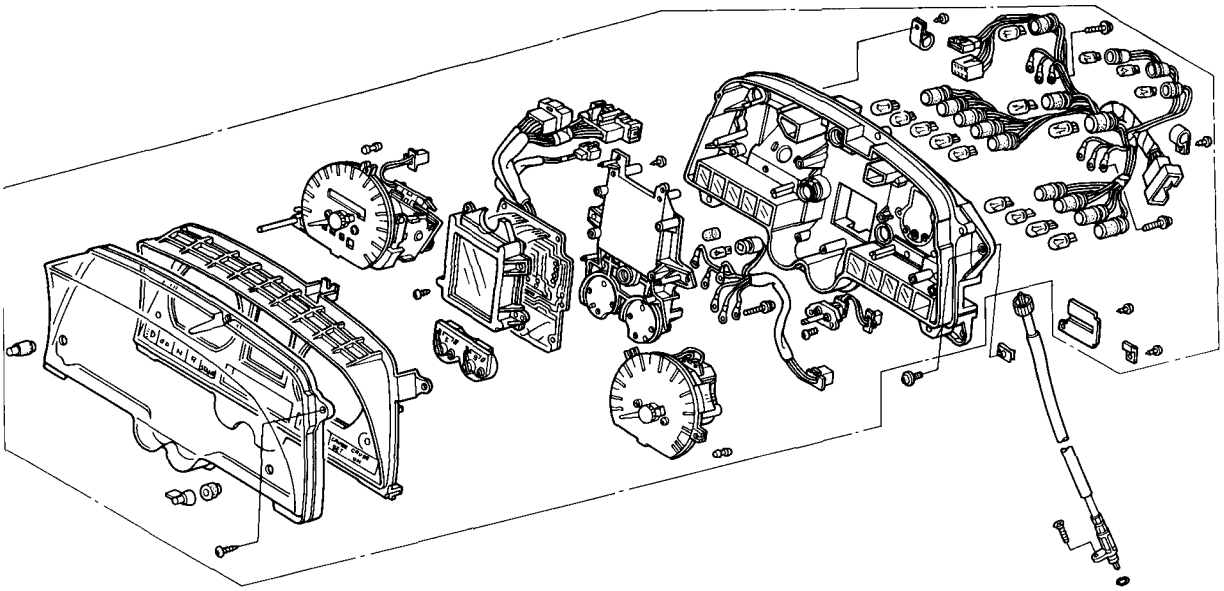
- *Do not turn a gauges upside down for a long time, or leak out the damper oil.*
- *Do not damage the L.C.D. unit flat cables.*

ASSEMBLY/INSTALLATION

Assembly and installation are in the reverse order of disassembly and removal.

NOTE

- Connect terminals to proper position according to color codes on the L.C.D. unit and instrument case.



IGNITION SWITCH

INSPECTION

Remove the left fairing lower cover (page 12-9).
Disconnect the 8P-BLK connector of the connector holder on the left cooling fan.

Check continuity of the terminals on the ignition switch in each position.

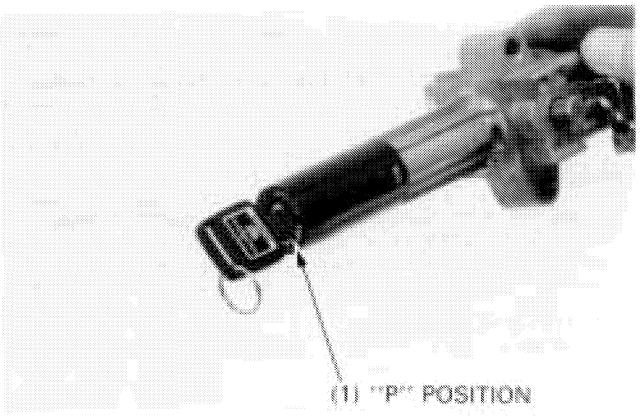
NOTE

- The continuity check may be made without removing the switch.

Color	RED	BLK	LT GRN/ BLK	BLU/ ORN	YEL/ BLK	BRN/ WHT	BRN
LOCK							
OFF							
ACC	O		O				
ON	O	O	O	O		O	O
P	O		O		O		

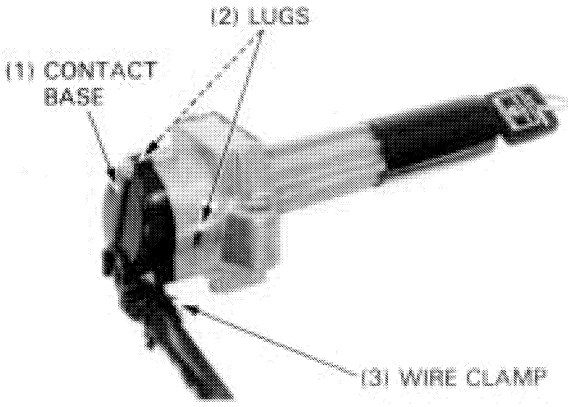
DISASSEMBLY

Remove the ignition switch.
Insert the key and turn it to "P" (park).



Release the wire from the wire clamp.

Push the lugs from the slots and remove the contact base.



ASSEMBLY

Assemble in the reverse order of removal.

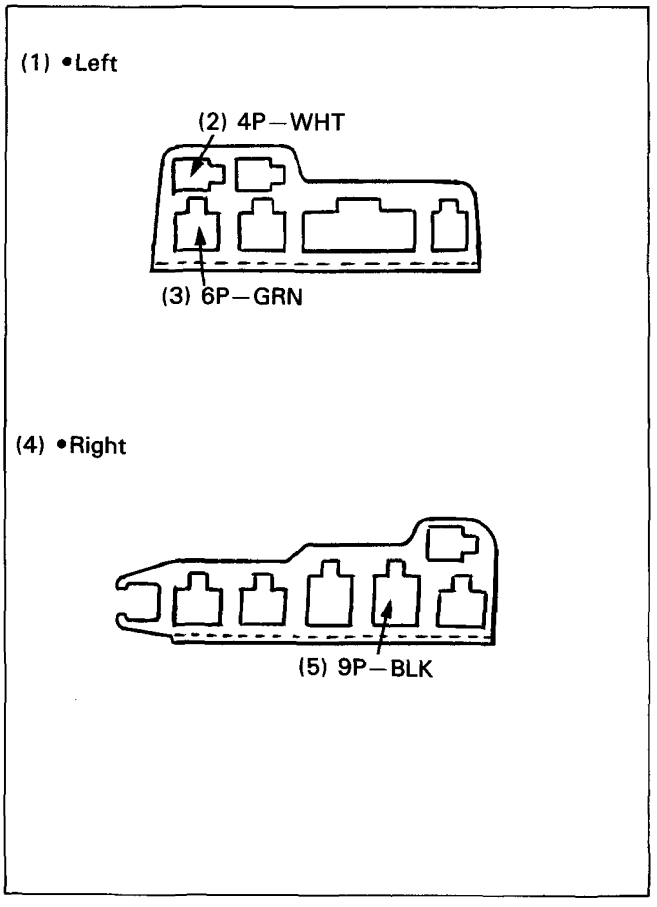
LEFT HANDLEBAR SWITCHES

INSPECTION

The handlebar cluster switches (dimmer, hazzard, turn signal, horn, lights and passing) must be replaced as assemblies.

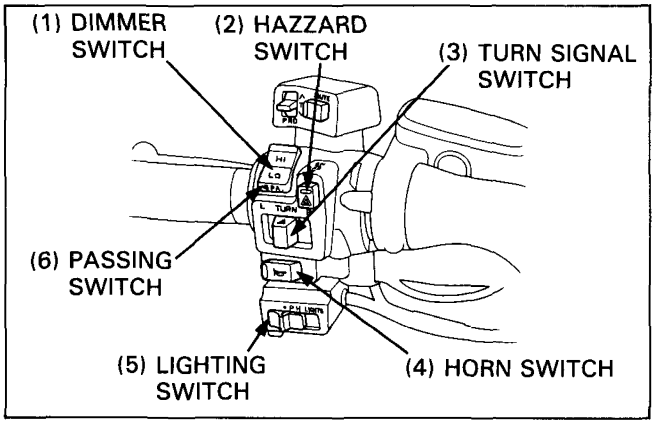
Remove the left and right fairing lower covers (page 12-9).

Disconnect the 9P-BLK, 6P-GRN and 4P-WHT connectors of connector holders on cooling fans.



Continuity tests for the components of the handlebar cluster switches follow:

Continuity should exist between the color coded wires in the charts below.



Color	BLU/ WHT	WHT	BLU
Lo	○—○		
(N)	○—○	○	
Hi	○		○

(1) DIMMER SWITCH

Color	PNK/ WHT	LT BLU	ORN
FREE			
PUSH (LOCK)	○	○	○

(2) HAZZARD SWITCH

Color	GRY	LT BLU	ORN	GRN	PNK	GRN	LT GRN/ WHT
R	○	○		○	○		
L	○		○	○	○		
PUSH						○	○

(3) TURN SIGNAL SWITCH

Color	WHT/ GRN	LT GRN
FREE		
PUSH	○	○

(4) HORN SWITCH

Color	BRN/ BLU	BRN/ WHT	BRN/ BLU	BLU/ WHT
•				
P	○	○		
H	○	○	○	○

(5) LIGHTING SWITCH

Color	WHT/ GRN	BLU
FREE (Lo)		
PUSH (PA)	○	○

(6) PASSING SWITCH

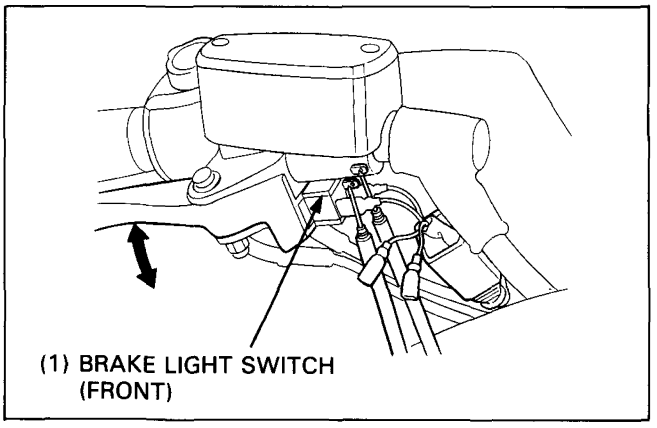
BRAKE LIGHT SWITCHES

FRONT

Disconnect the front brakelight switch wire connectors (smaller terminals).

Check for continuity between the WHT/GRN and GRN/YEL wire terminals.

Brake lever released: No continuity
Brake lever pulled in: Continuity

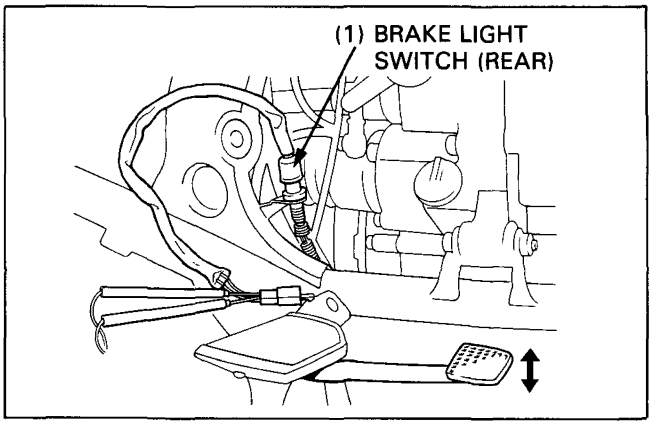


REAR

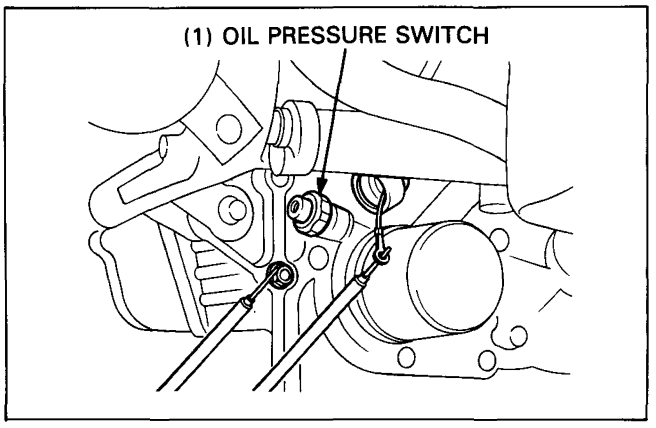
Remove the right fairing inner cover (page 12-9).
Disconnect the 2P-BLK connector of the connector holder behind the ignition control unit.

Check for continuity between connector terminals.

Brake pedal released: No continuity
Brake pedal applied: Continuity



OIL PRESSURE SWITCH



INSPECTION

- If the oil pressure indicator light does not come on, inspect the "POWER TO PRESSURE SWITCH" line first as follow.

Remove the under cover (page 12-8).
Pry off the rubber cover and disconnect the wires from the oil pressure switch.

Turn the ignition switch ON. Measure voltage between the BLU/RED (+) terminal and ground (−). Battery voltage should register.

If voltage should not register, inspect as follow.
— indicator bulb for burnt.
— open or short circuit in wire harness.
— loose or poor contact of related connector.

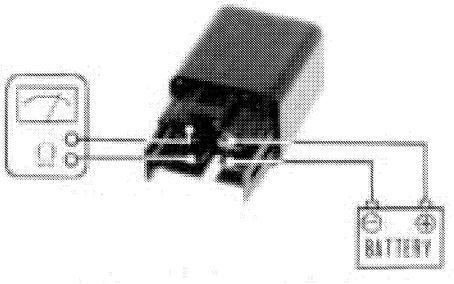
If voltage register, replace the oil pressure switch with a new one (page 2-5).

- If the oil pressure indicator light stay to come on with the engine started, check oil pressure (page 2-5).
  If the oil pressure check is O.K., replace the oil pressure switch (page 2-5).

RELAYES IN THE RELAY BOX

CONTINUITY INSPECTION

Remove the relay.
Connect an ohmmeter and 12 V battery to the relay (1, 3 and 4) as shown. The relay is normal if there is continuity.

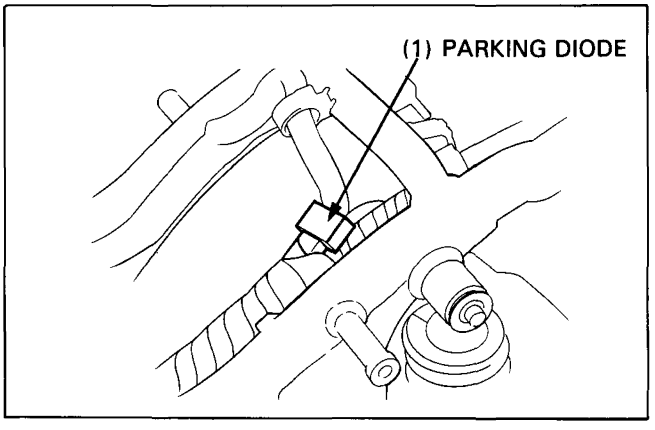


DIODE

DIODE (Parking) INSPECTION

Remove the right saddlebag (page 12-13).

Remove the parking diode (LT GRN/YEL & BRN) from the main wire harness.

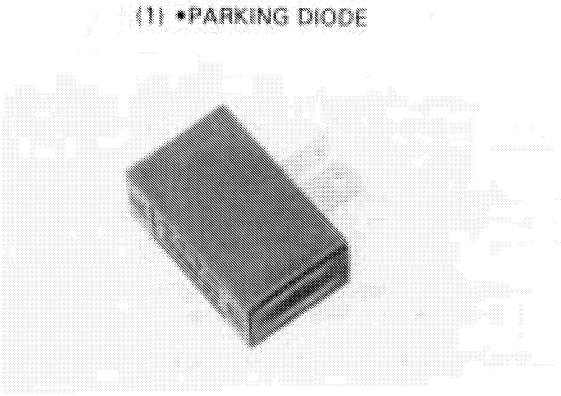


NOTE

- The test chart is for a positive ground ohmmeter. The test results will be reversed if a negative ground ohmmeter is used.

Normal Direction: Continuity
+ probe: (+) terminal
– probe: (–) terminal

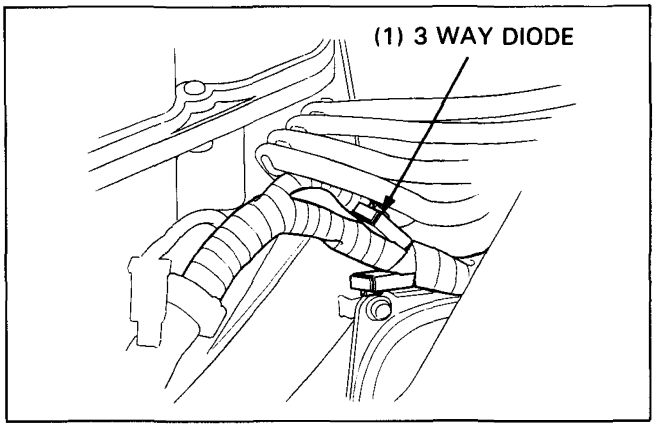
Reverse Direction: No Continuity
+ probe: (–) terminal
– probe: (+) terminal



DIODE (Neutral) INSPECTION

Remove the right fairing inner cover (page 12-9).
Remove the 3 way diode (Neutral) from the 3P-ORN connector.

If this diode is open, neutral indicator will not come on and the shot air solenoid valve (Neutral) will not operate.

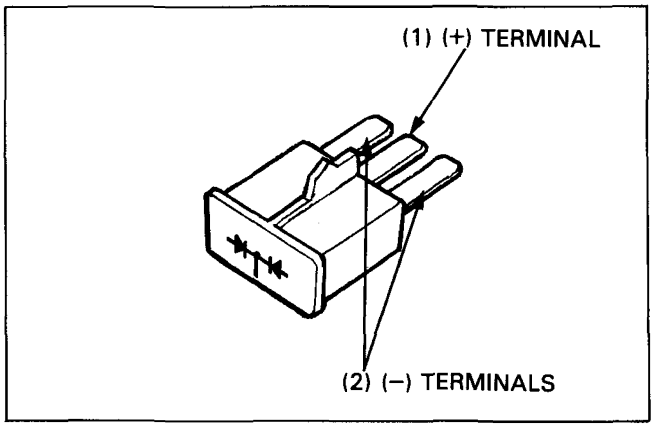


NOTE

- The test chart is for a positive ground ohmmeter. The test results will be reversed if a negative ground ohmmeter is used.

Normal Direction: Continuity
+ probe: center terminal (+)
– probe: left or right terminal (–)

Reverse Direction: No Continuity
+ probe: left or right terminal (–)
– probe: center terminal (+)



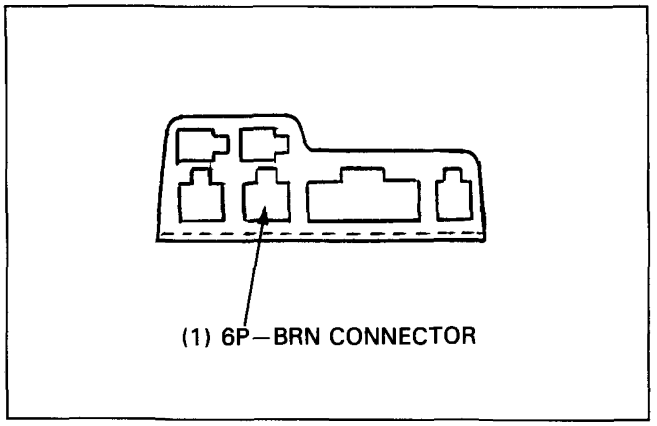
SELF CANCELLING TURN SIGNAL SYSTEM

NOTE

- Be sure the battery is fully charged.
- When inspect this system, check the system components and lines step-by-step according to the troubleshooting on page 22-4 through page 22-6.
- Check that the sub fuse (8 and 11) are not blown.

TURN SIGNAL CANCEL CONTROL UNIT INSPECTION

Remove the left fairing lower cover (page 12-9).
Disconnect the 6P-BRN connector from the connector holder on the left cooling fan.



Measure the following between each terminal of the main wire harness side and ground.

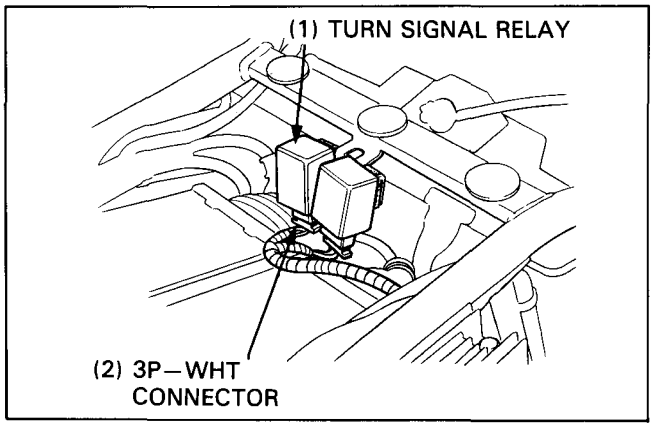
LINE	TERMINAL	CONDITION(S)		SPECIFICATION
Battery voltage (+) input	WHT/GRN	Ignition switch ON		Battery voltage should register
Turn signal ON	PNK	Turn signal switch R or L		Continuity should exist
		Turn signal switch PUSHED		No continuity
Turn signal OFF	LT GRN/WHT	Turn signal switch R or L		No continuity
		Turn signal switch PUSHED		Continuity should exist
Speed pulse from the speed sensor	WHT/BLK (+)	Front wheel rotated slowly and Ignition switch ON		0—10 volts pulse
Cancel output	BLU/BLK (+)	Ignition switch ON & 6P-BRN connector connected	Turn signal operated in R or L	0 volt should register
			Turn signal switch PUSHED	Battery voltage should register
Ground	GRN	At all times		Continuity should exist

TURN SIGNAL RELAY INSPECTION

Remove the trunk (page 12-12).
Disconnect the 3P-WHT connector from the turn signal relay.

Disconnect the 4P-WHT connector from the connector holder on the left cooling fan.
Check for continuity between same color (GRY) of the 3P-WHT and 4P-WHT connectors.

Continuity should exist at all times.



Measure voltage as follow.

Between WHT/GRN (+) and ground (−):
Battery voltage should exist with the ignition switch ON.

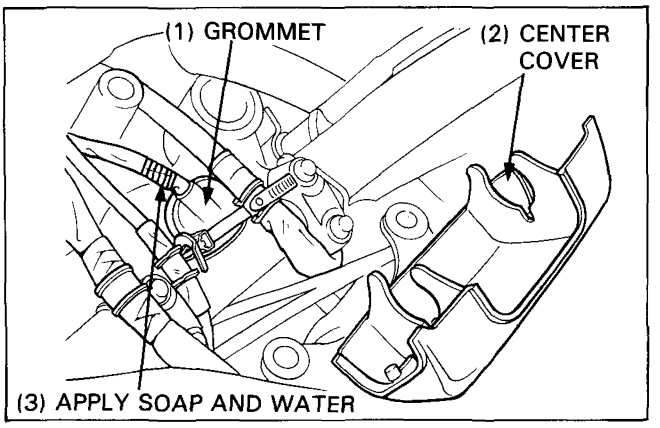
Between BLU/BLK (+) and ground (−):
Battery voltage should exist with the ignition switch ON and also with the relay 3P-WHT connector connected to the relay.

TURN SIGNAL CANCEL CONTROL UNIT REMOVAL/INSTALLATION

Remove the handlebar center cover.
Slide the steering stem grommet to the wire harness side.

CAUTION

- *Apply a little amount of soapy water solution to the turn signal cancel unit wire surface to slide the grommet smoothly.*

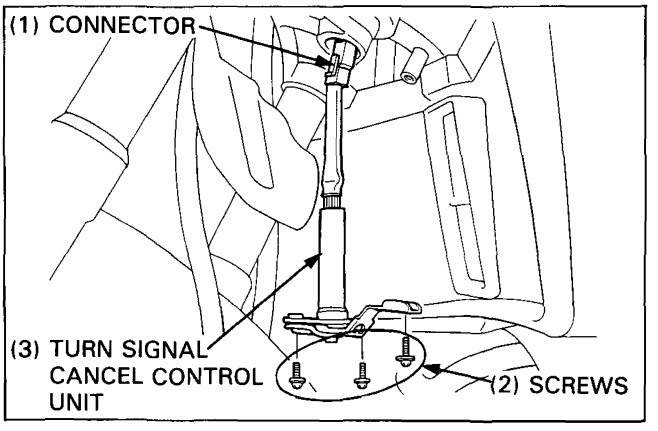


Remove the retaining screws and draw the turn signal cancel control unit enough to disconnect the unit connector.

NOTE

- If necessary, slide further the steering stem grommet up farther.

Disconnect the turn signal cancel control unit connector and remove it.

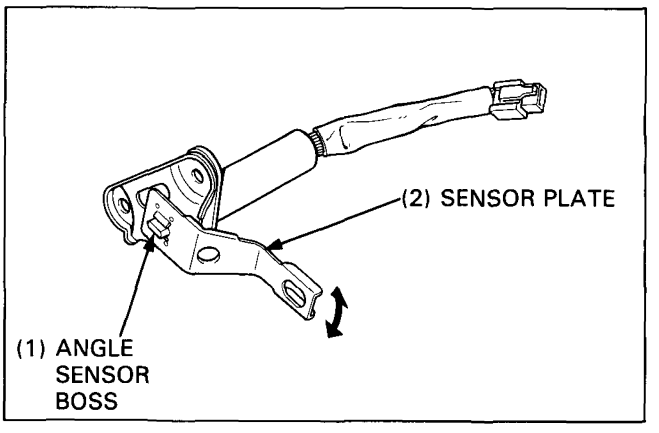


Make sure the angle sensor of the control unit is smoothly rotated.
Check angle sensor plate for damage and check that plate is installed tightly against the sensor boss.

Install it in the reverse order of removal.

NOTE

- Make sure the retaining screws are tighten securely.

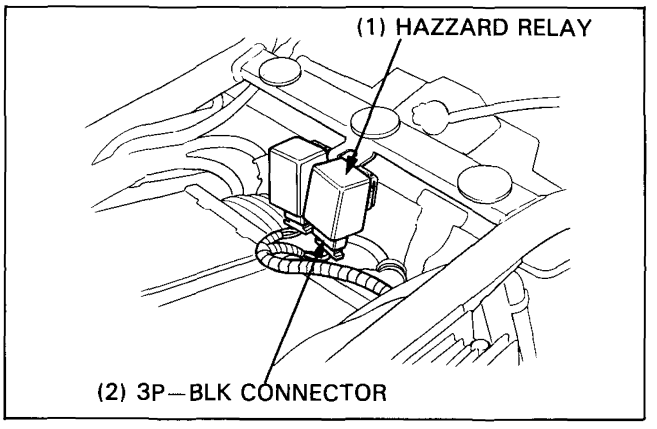


HAZZARD RELAY

INSPECTION

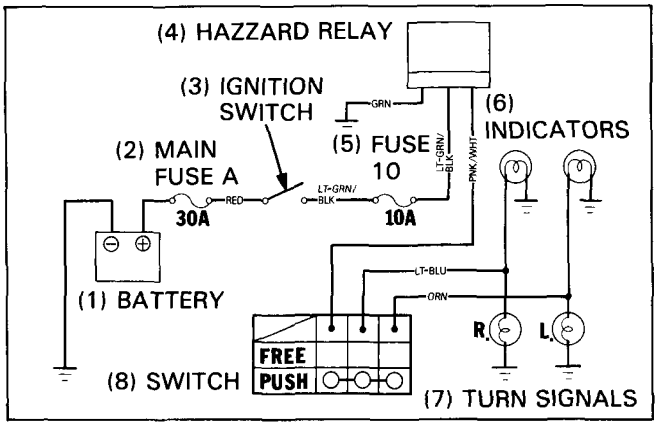
Remove the trunk and left fairing lower cover (page 12-9).
Disconnect the 3P-BLK connector from the hazzard relay.
Disconnect the 4P-WHT connector of the connector holder on the left cooling fan.
Check for continuity between same color (PNK/WHT) of the 3P-BLK and 4P-WHT connectors.

Continuity should exist at all times.



Measure voltage as follow.
Between LT GRN/BLK (+) and ground (−):
Battery voltage should exist with the ignition switch ON.

Between PNK/WHT (+) and ground (−):
About 5 volts should exist with the ignition switch ON and also with the relay 3P-BLK connector connected to the relay.

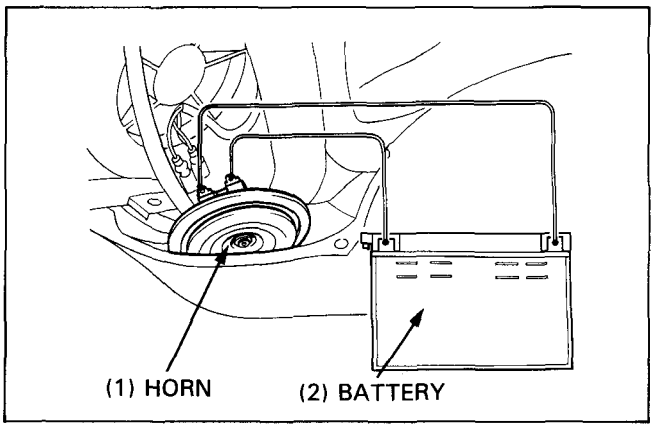


HORN

INSPECTION

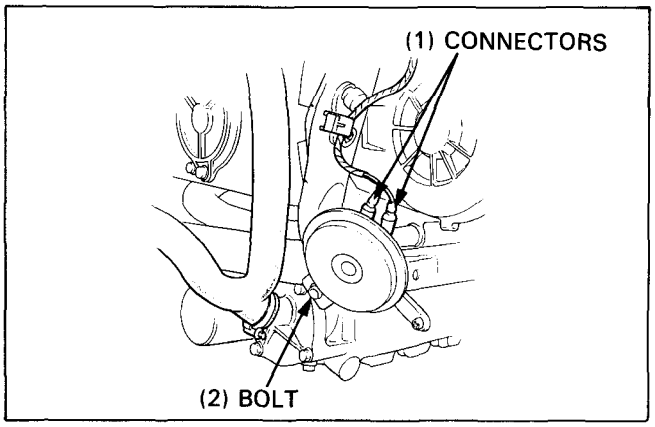
Remove the fairing front cover.
Disconnect the horn wire connectors and connect a fully charged 12 V battery to the horn terminals.

The horn is normal if it sounds when the battery is connected across the terminals.



REPLACEMENT

Remove the under cover (page 12-8).
Disconnect the horn wire connectors.
Remove the horn stay mounting bolt and horn.

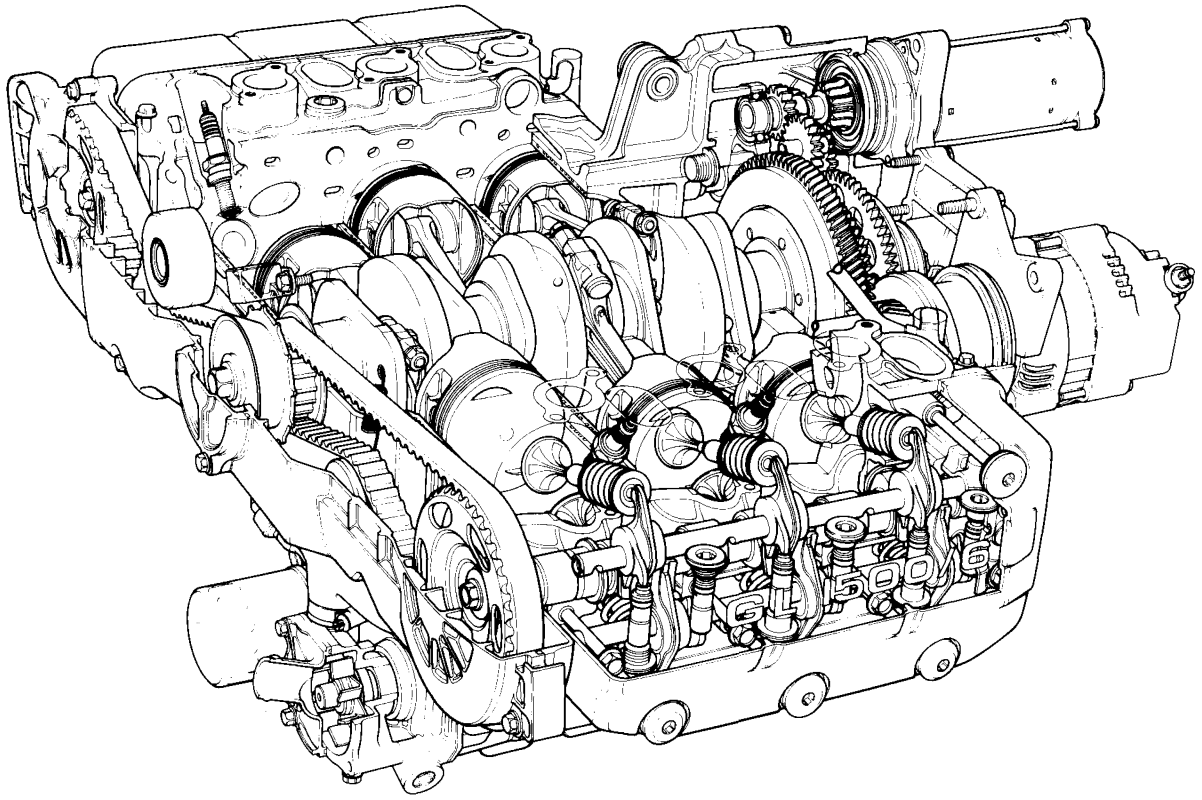


HORIZONTALLY-OPPOSED SIX ENGINE

The crankshaft of this horizontally-opposed six engine is supported by four main journals and rotates counterclockwise when viewed from the front.
As a standard design of horizontally-opposed engines, No.1 and No.2 crankpins are positioned 180 degrees apart. With this design, both pistons travel in and out at the same time. The inertia moment of the No.1 and the No.2 pistons/con-rods cancel out each other (primary imbalance and secondary imbalance are both cancelled) and its operation is nearly vibraiton-free. For this reason, counterweights on the crank are small.
In the GL1500's engine, the three cylinder pairs, #1/#2, #3/#4 and #5/#6, are positioned 120 degrees apart. Consequently the six crankpins are positioned 60 degrees apart.
This crankpin distribution provides even combustion intervals.
In two crank rotations:
720° ÷ 6 = 120°
Therefore this engine fires every 120 degrees of crankshaft rotation.

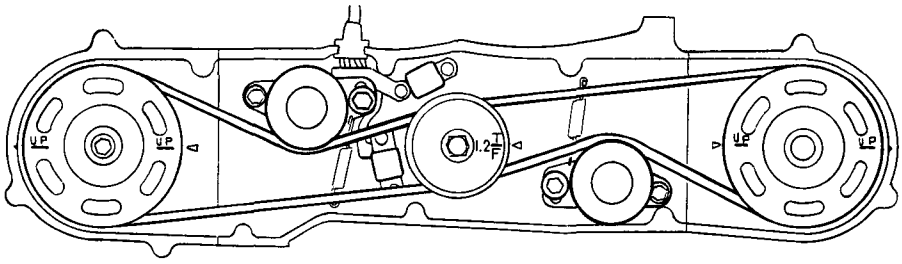
The firing order is: 1-4-5-2-3-6.

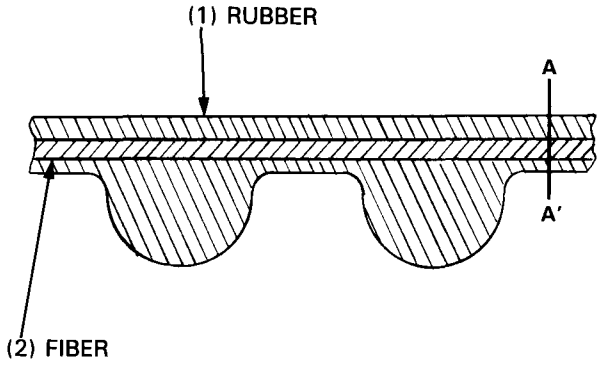
Vibration-free, smooth and low center of gravity.
This engine satisfies these requirements for the grand tourer.

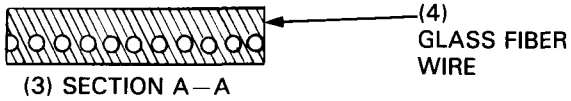


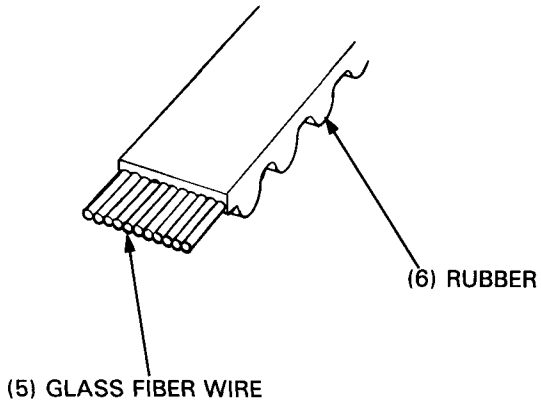
ROUNDED-TOOTH TIMING BELT

Rounded-tooth belts, which have been adopted on automobile engines, are employed to drive each bank's camshaft.
A rounded-tooth belt offers superior strength and durability. Because it receives drive force with a rounded face, there is no shoulder to concentrate stress.
Regular replacement is not necessary.





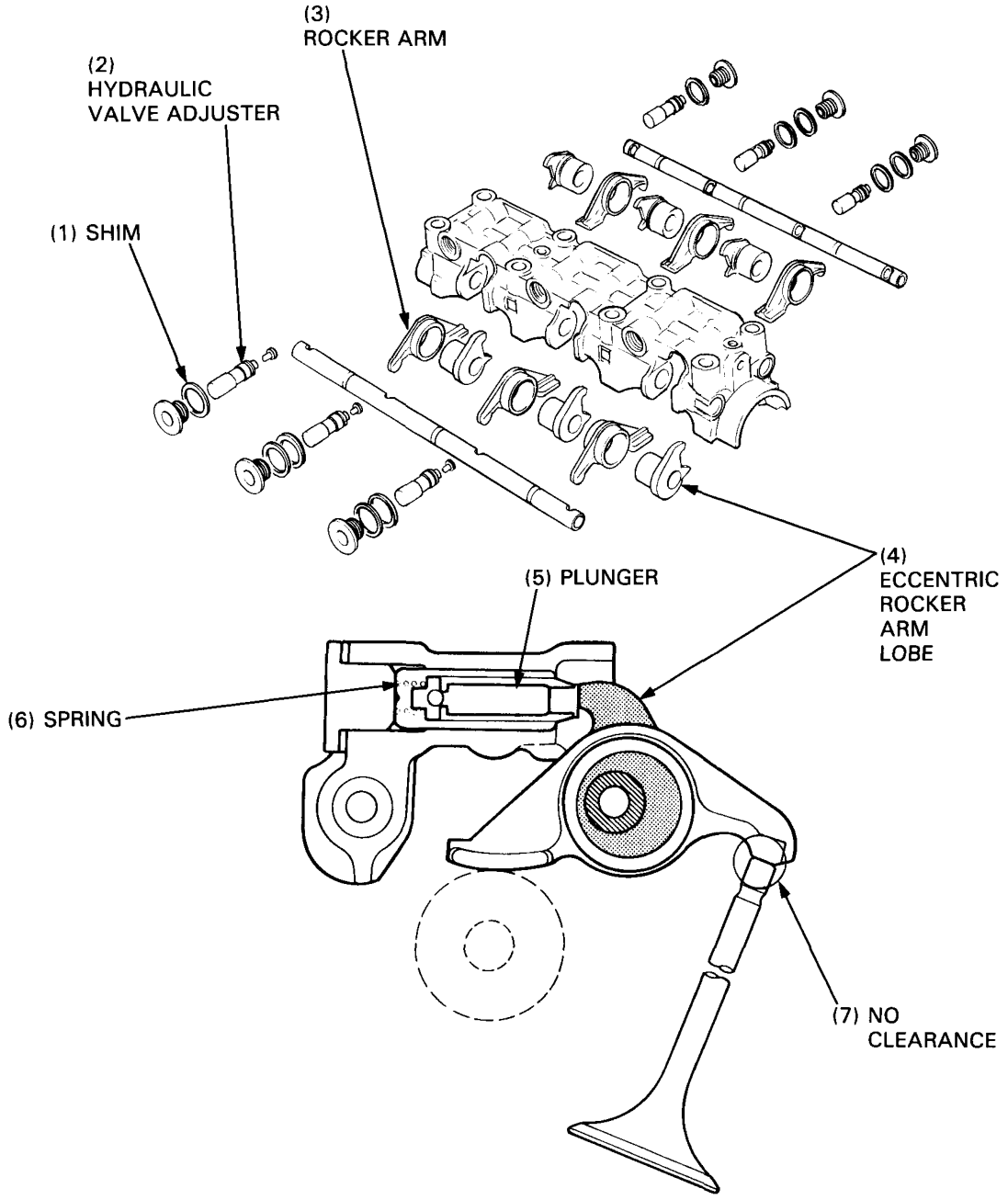




ECCENTRIC ROCKER ARM LOBE

Valve clearance adjustment is not necessary because hydraulic valve adjusters are used. A new adjustment mechanism uses eccentric rocker arm lobe to position the rocker arms.

With the rocker arm at rest, the plunger in the hydraulic valve adjuster is held against an arm on the eccentric rocker arm lobe by spring tension. This turns the lobe which is pivoting off-center on the shaft and positions the rocker arm to eliminate valve clearance.

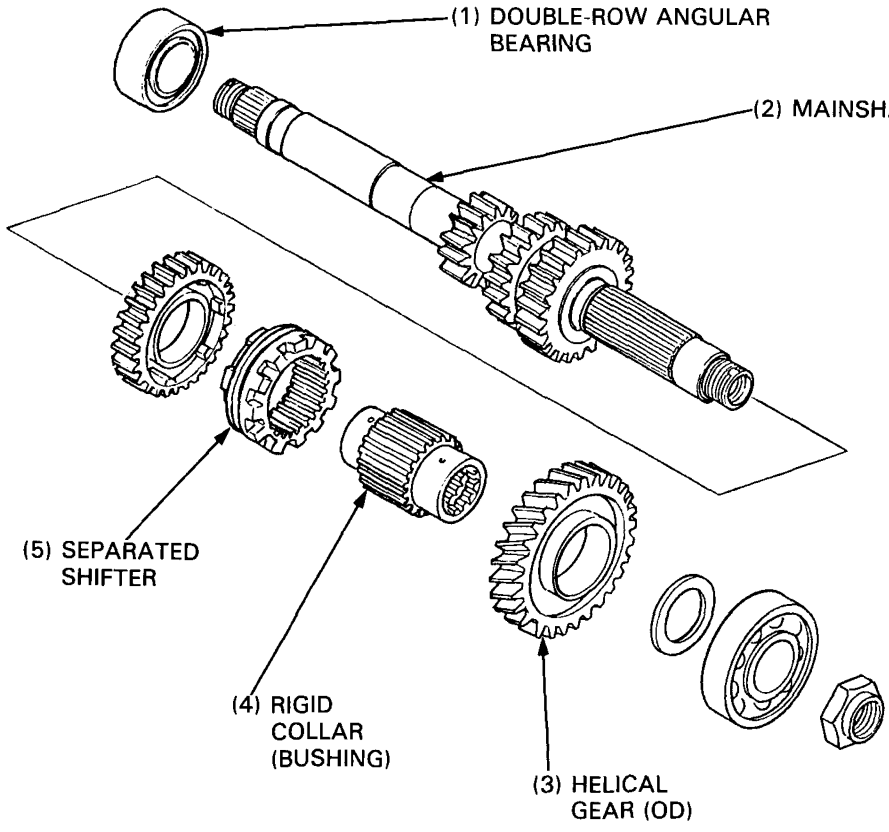


HELICAL GEAR TRANSMISSION/FINAL GEAR

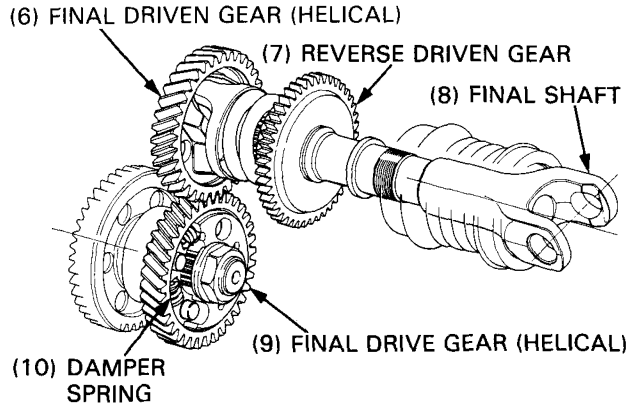
Low noise and smoothness are important requirements of this engine. For this reason, helical gear design is used for the transmission overdrive gears, final gears and alternator drive/driven gears.

To cope with the thrust load generated by overdrive gear, a double-row angular bearing is used on the rear of the mainshaft.

Previous method of snap rings and washers for thrust fixation of gears is replaced by a rigid collar (bushing) and seperated shifters. This improves preciseness in dimension and reduces rattling of gears, contributing to low-noise feature.

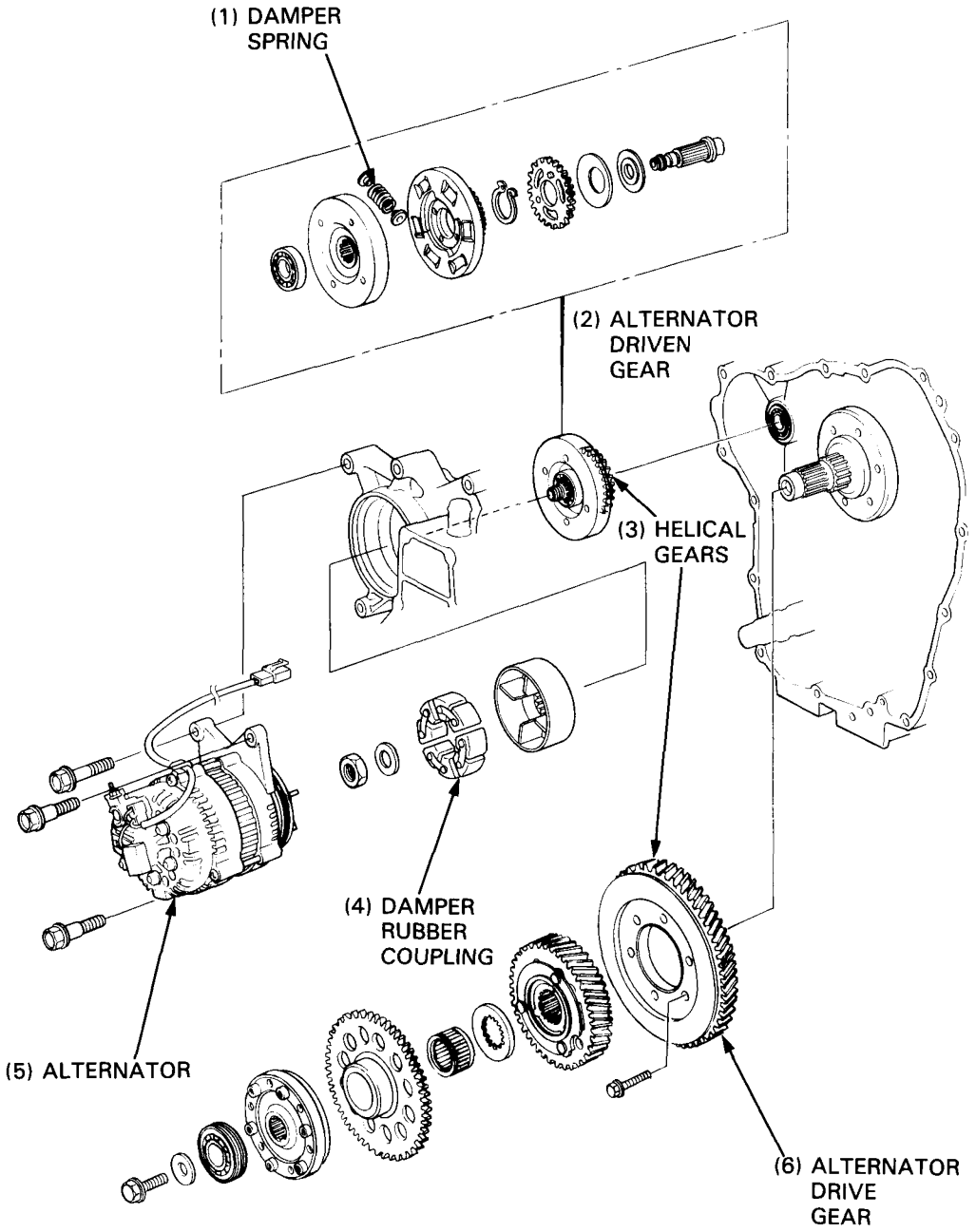


The final gear has helical gear tooth design for noise reduction. The drive gear includes a damper mechanism.



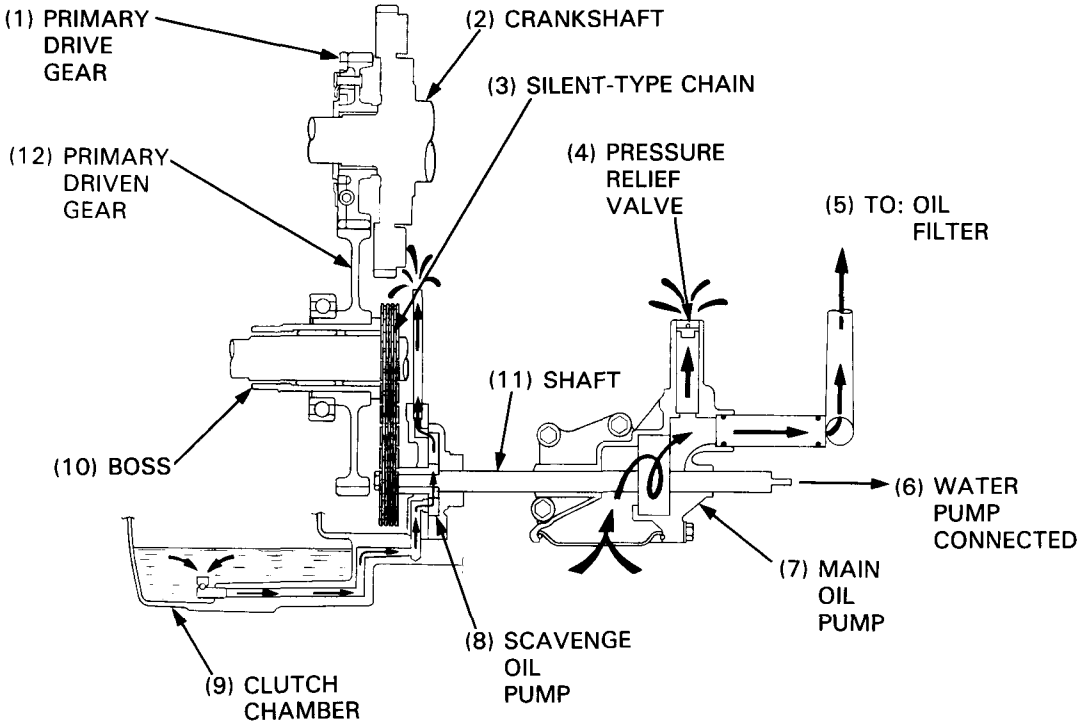
ALTERNATOR DRIVE MECHANISM

The alternator drive gear is attached to the crankshaft rear end with six bolts, to drive the altenator 2.7 times faster than crankshaft speed.
The driven gear is a split-type design to eliminate gear backlash.
To protect the driven gear, a damper mechanism is provided to absorb momentary accel/decel forces.
To reduce mechanical noise, a rubber coupling is used between the driven gear and the alternator.
And also, for low noise and smoothness of the engine, herical gear design is used for the alternator drive/driven gears.



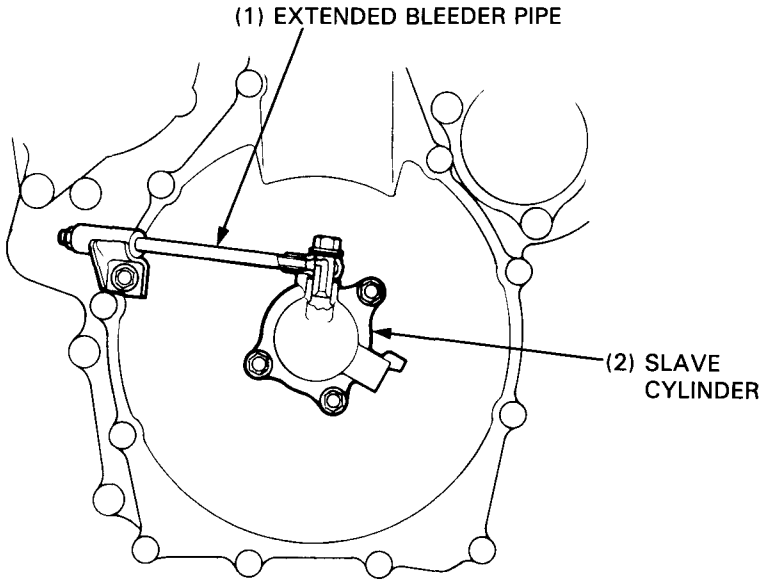
OIL PUMP/WATER PUMP DRIVE SILENT-TYPE CHAIN

A main oil pump for lubrication and a scavenge oil pump for sucking out oil from the clutch chamber are separately provided. These two oil pumps and water pump are driven by a shaft, which is driven with a silent-type chain, designed for low noise. The oil pressure is regulated to 500 kPa (5.0 kg/cm², 71 psi) by a pressure relief valve which is installed on the main oil pump.



SLAVE CYLINDER WITH EXTENDED BLEEDER PIPE

A hydraulic-operated, wet, multi-plate type clutch is adopted. The slave cylinder has an extended bleeder pipe for easy access when bleeding the system.

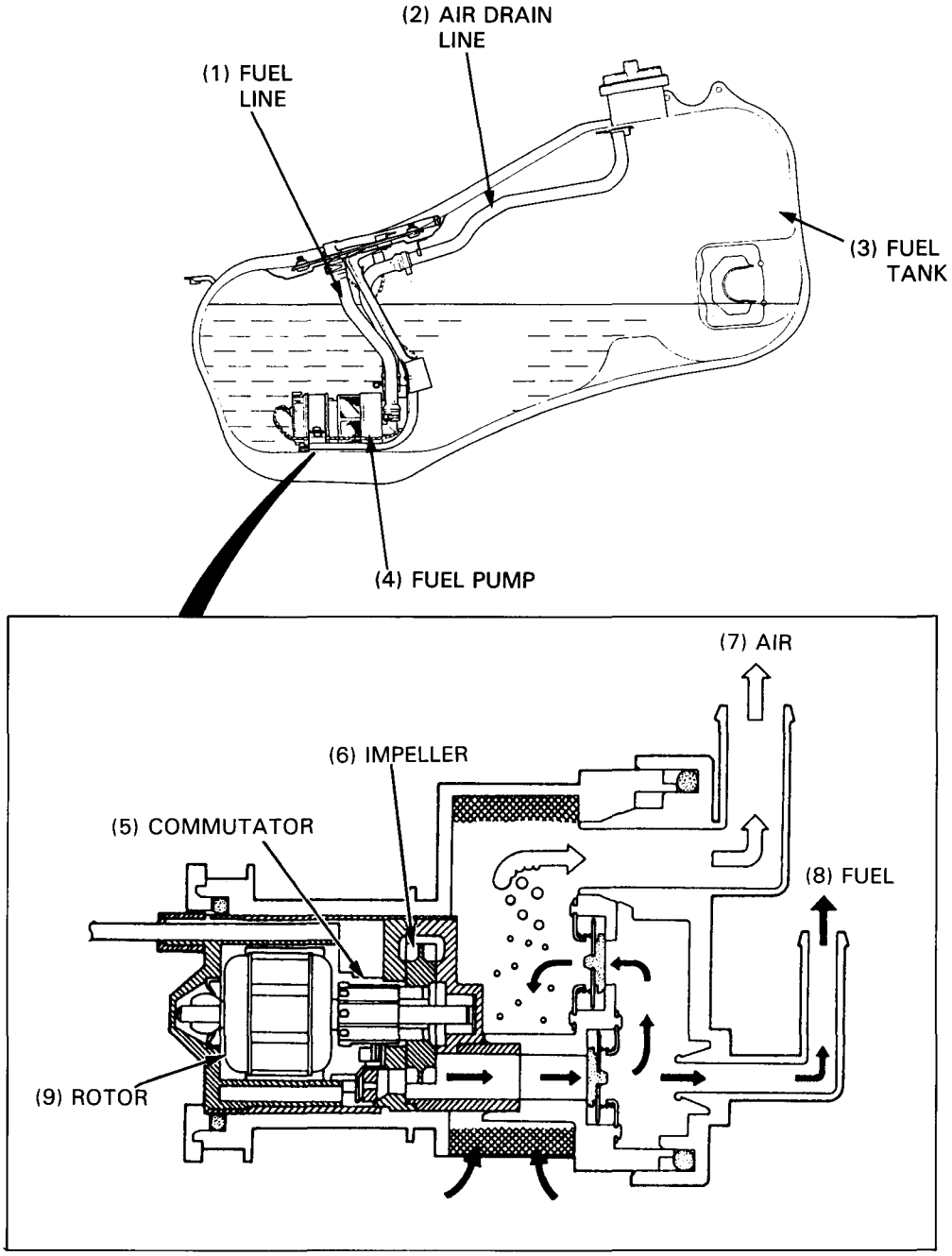


FUEL AND AIR SYSTEM

IN-TANK FUEL PUMP

An in-tank fuel pump has been used for GL1500 to save space and to ensure fuel supply under extremely hot conditions. Absense of fuel pipes in the intake side of the fuel pump eliminates possibilities of vapor locking in the fuel line. The pump is a centrifugal type having a maximum delivery rate of 48 liters per hour.

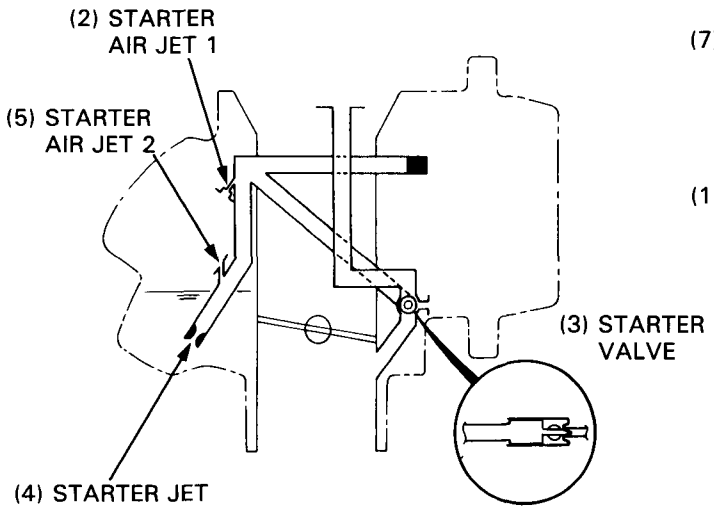
Then for weight down, the thiner and stronger plate is used for the fuel tank.



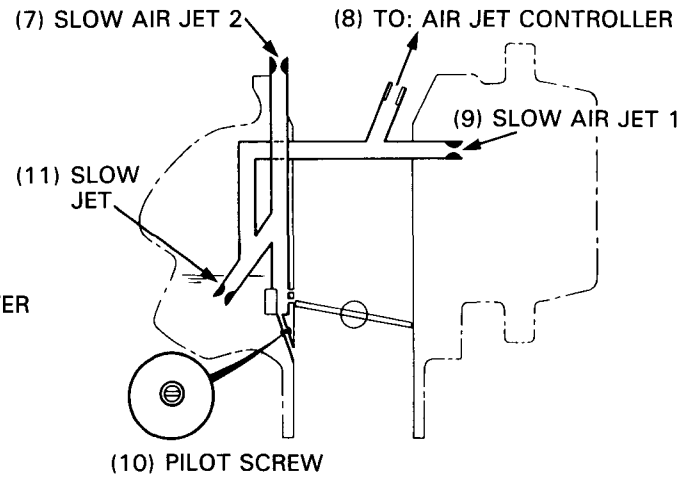
SYSTEMS IN CARBURETOR

Each speed changes each fuel and air lines as below. Air supply lines of the low speed and primary main system is newly designed for GL1500.

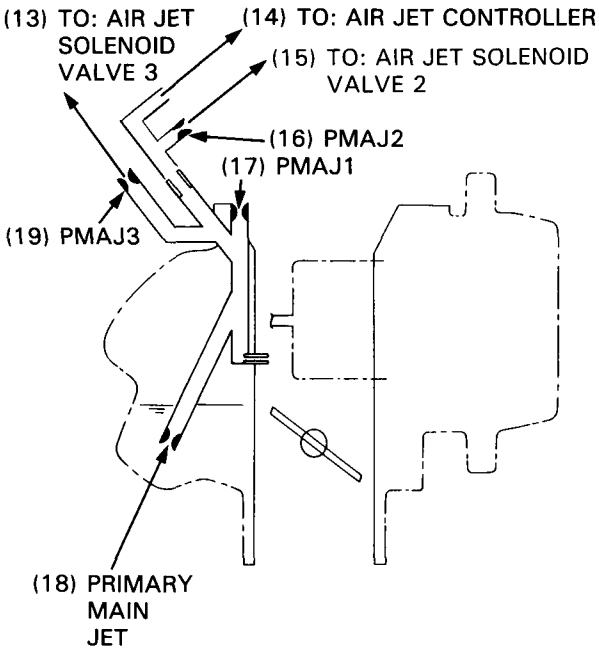
(1) • STARTING SYSTEM



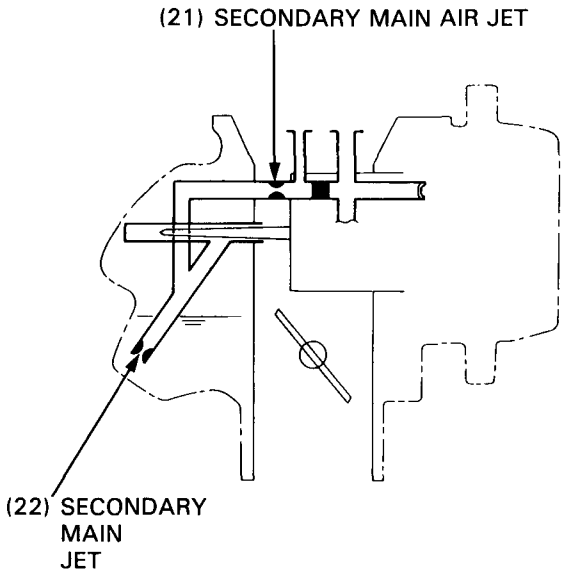
(6) • LOW SPEED SYSTEM



(12) • PRIMARY MAIN SYSTEM



(20) • SECONDARY MAIN SYSTEM



PRIMARY MAIN AIR JET CONTROL SYSTEM

To improve acceleration and driveability while reducing fuel consumption by ensuring most optimum air/fuel mixing rate under various riding conditions, a computerized air jet control system has been adopted on the GL1500.

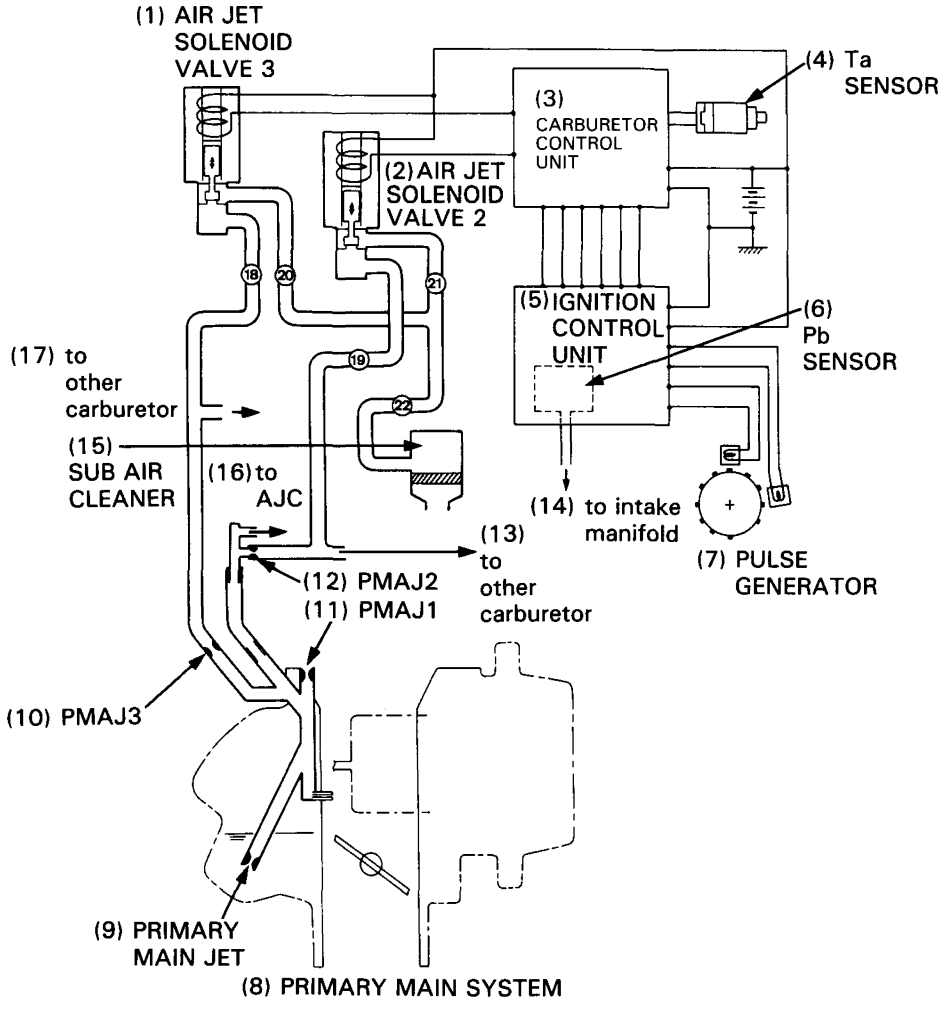
Fuel supply from the primary main system is actively controlled using three factors;
(1) Intake manifold pressure (vacuum)
(2) Engine rpm
(3) Intake air temperature

The intake manifold pressure is detected by a Pb sensor in the ignition control unit.
The engine rpm is detected by a pulse generator.
The intake air temperature is detected by a Ta sensor.

In the primary main system, three air jets are provided.
Primary main air jet 1 is a fixed jet and is always open to atmosphere.
The air passages to primary main air jet 2 and primary main air jet 3 are opened and closed by air jet solenoid valves (2 and 3) operated by the carburetor control unit.
Programmed into the carburetor control unit is a solenoid operating algorythm based on the above mentioned factors.

When both of the two solenoid valves are closed, the mixture is richest. With both solenoid valves opened, the mixture is the leanest.

When the throttle is opened wide (this causes manifold pressure to rise) at low engine rpm, the richest mixture is provided. The higher the intake air temperature, the leaner the mixture is controlled.

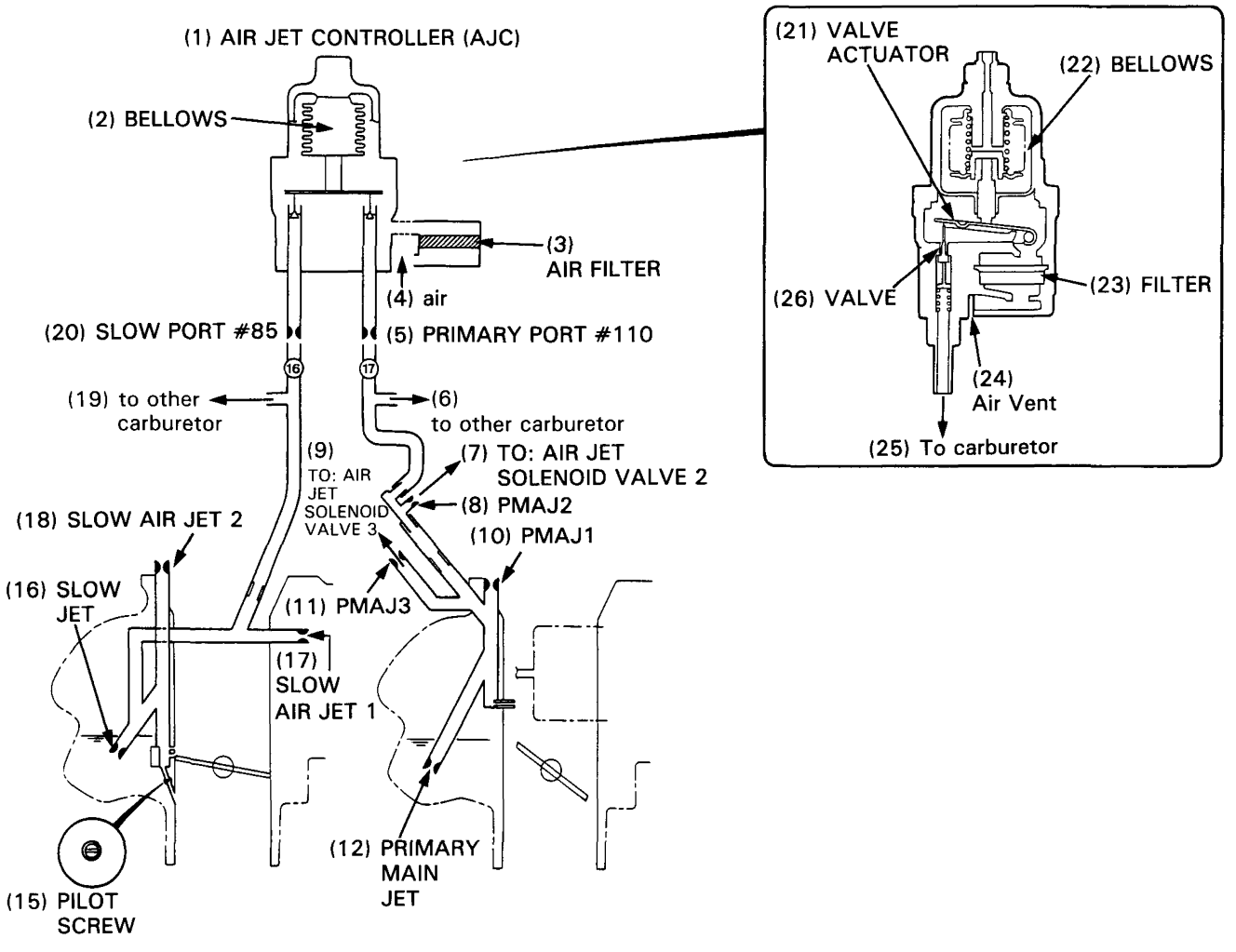


HIGH ALTITUDE COMPENSATION SYSTEM

At high altitudes, low atmospheric pressure results in an excessively rich mixture. Since the temperature is usually low at high altitudes, the temperature compensated accelerator pump (see page 23-11) supplies more fuel when cold and the primary air jet control system also enriches the mixture.
With all these enriching factors, a compensation system is required to ensure driveability and fuel economy at high altitudes.

An air jet controller is incorporated in the low speed and the primary main systems. Under normal atmospheric pressure conditions, the bellows in the AJC contracts and holds the valves closed. At high altitude where atmospheric pressure is low, the bellows expands, opening the valves to permit additional air to flow into the low speed and primary main systems.

With the increased air, the fuel supply from the low speed and primary main system is reduced, maintaining the optimum air/fuel mixing rate.



TEMPERATURE COMPENSATING ACCELERATOR PUMP

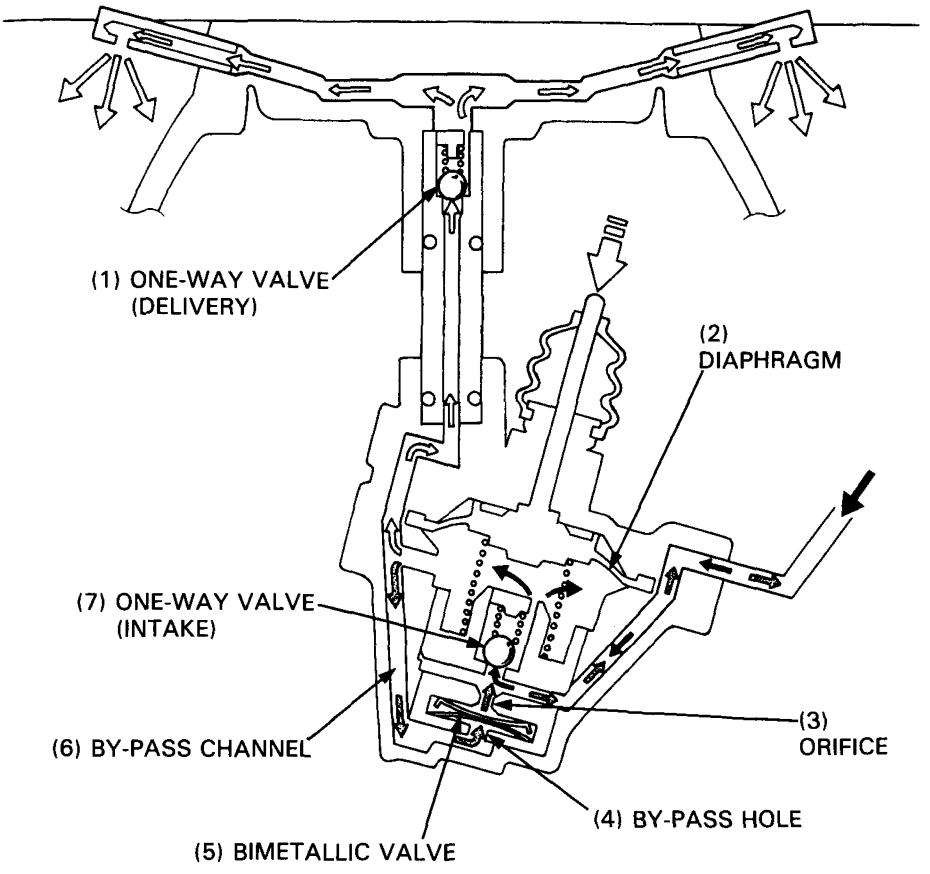
1 When cold (Below 10°C/50°F)

The bimetallic valve flattens, covering the by-pass port.
When the diaphragm moves up, fuel is drawn through the intake side one-way valve. As the throttle is opened for acceleration, the diaphragm is pushed down, feeding fuel to the engine. A full stroke of the diaphragm feeds approximately 0.9 cm^3.

2 When warm (Above 10°C/50°F)

The bimetal flexes and uncovers the by-pass hole. When the diaphragm is pushed down, with fuel flowing to the engine, fuel also flows through the by-pass channel, by-pass hole, orifice and is fed back to the intake side, reducing the amount of fuel distributed to the engine. With the by-pass opened, a full stroke of the diaphragm delivers approximately 0.45 cm^3 (about half the amount as when cold.)

This system assures good throttle response while maintaining fuel economy.



INTAKE MANIFOLD SHOT AIR (DECEL COMPENSATION) SYSTEM

Due to the large 1500 cm^3 engine displacement and the fact that the valve timing has a small intake/exhaust overlapping, the compression braking effect during deceleration is strong.

The shot air system ahs been incorporated to moderate compression braking and improve riging comfort.

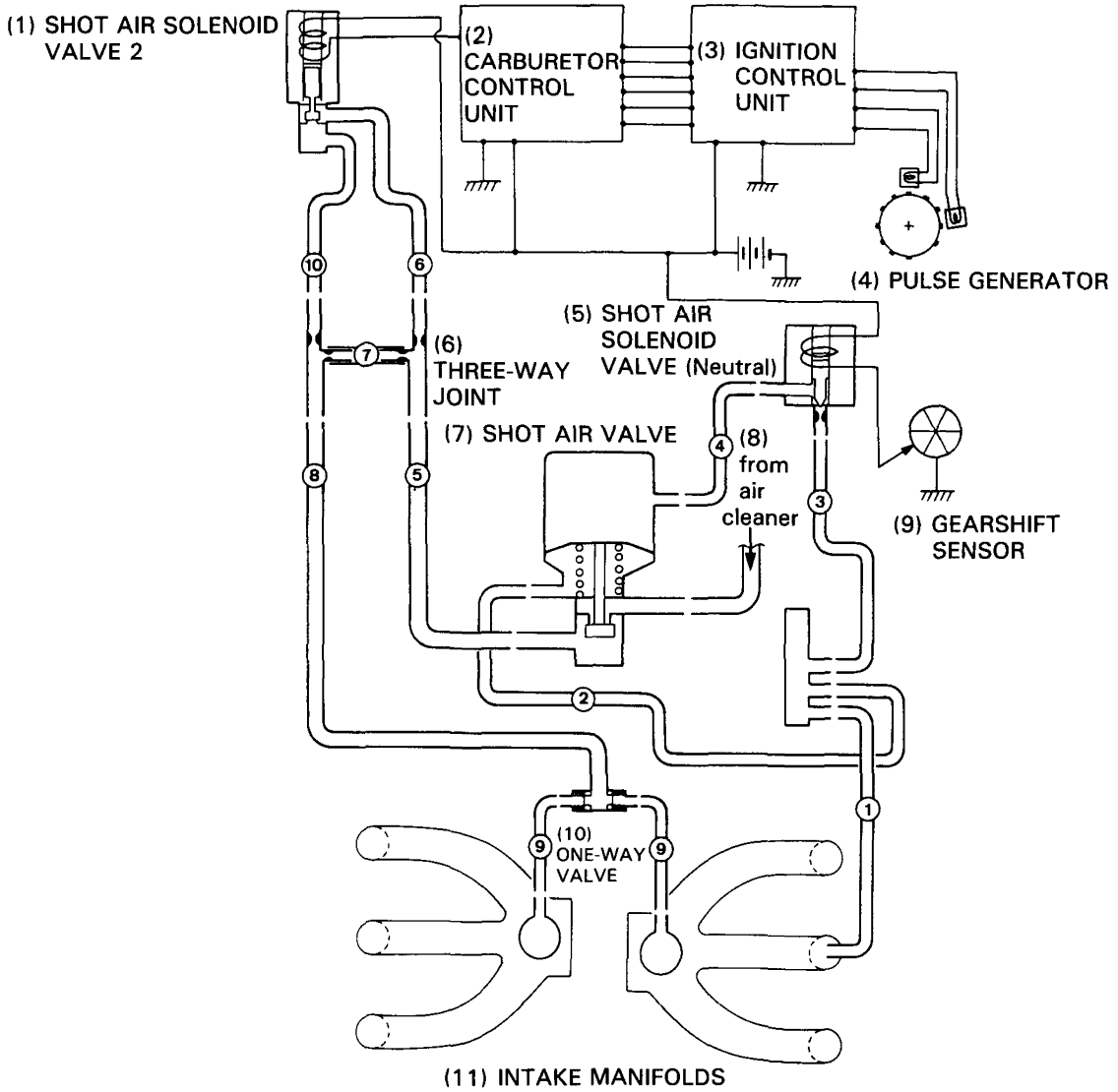
The shot air system supplies air to the intake manifolds during deceleration to prevent sudden induction of strong manifold vacuum.

As illustrated, the intake manifold vacuum acts on the lower diaphragm chamber of the shot air valve through No.1 and No.2 tubes. When vacuum rises during deceleration, the diaphragm is pulled down to allow air from the air cleaner to enter the intake manifolds.

To ensure a natural deceleration feeling when the engine is revved up and down with the transmittion in neutral, the solenoid valve (Neutral) opens the vacuum route to the upper chamber of the shot air valve when neutral is detected by the gearshift sensor. Under these conditions, the shot air valve remains closed.

Engine rotation per minute is detected by the pulse generator and signals are transmitted to the carburetor control unit via the ignition control unit. The solenoid valve 2 opens when engine speed is above 2,000 min^{-1} (rpm) to increase air supply. In addition to air through No. 7 tube, air flows through No. 6 tube, solenoid valve, and No. 10 tube.

The one-way valve is provided in the three-way joint near the intake manifolds. The one-way valve prevents manifold pressure interference.



HOT AIR INTAKE SYSTEM

To improve driveability and fuel economy and to prevent carburetor icing under cold conditions, a hot air intake system has been adopted.

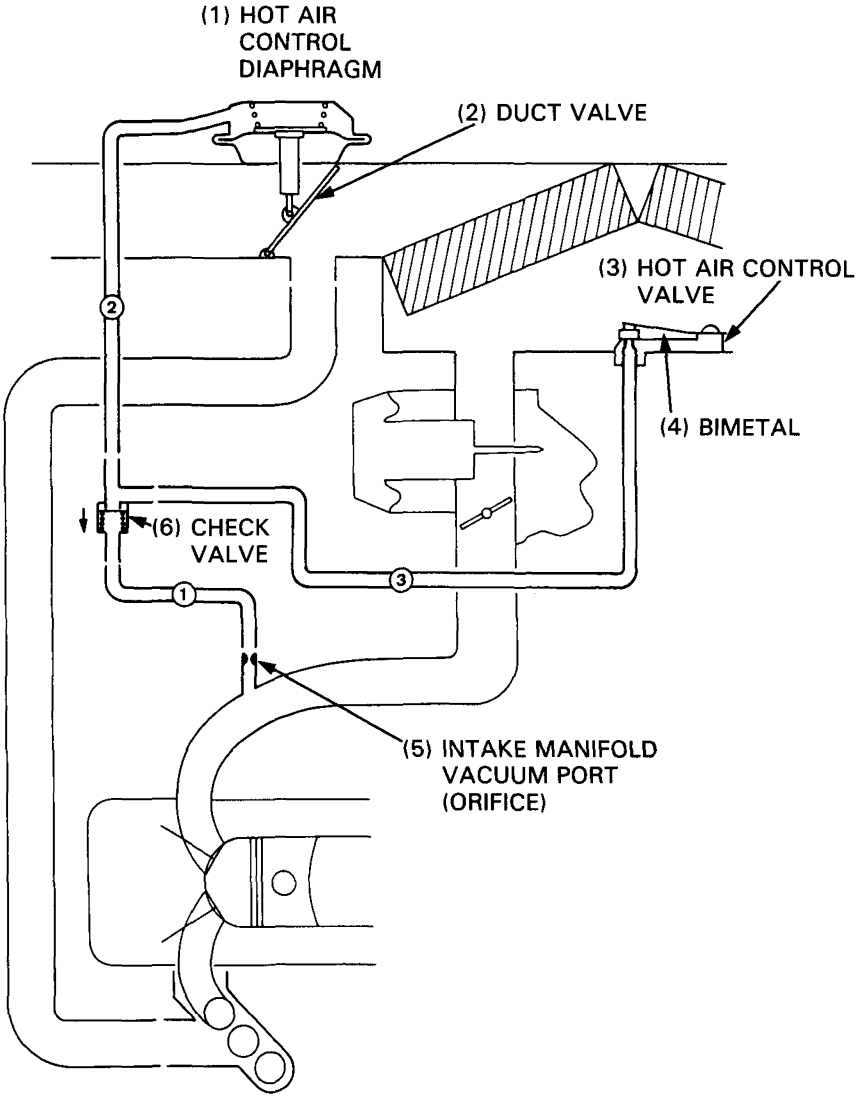
The heated air near the exhaust pipes is drawn into the air cleaner through the duct valve operated by the hot air control diaphragm.
To control intake air temperature, the hot air control diaphragm is operated by intake manifold vacuum. The vacuum to the diaphragm is regulated by the hot air control valve which is controlled by the bimetal according to temperature.

When cold, the air bleed valve is closed, allowing intake manifold vacuum to pull the diaphragm upwards, opening the duct valve to supply hot air.

As temperature rises, the bimetal flexes, permitting bleed air to flow into the system, reducing vacuum acting on the diaphragm, thus controlling the intake air temperature at the optimum level.

To prevent sudden application of strong vacuum to the control system, an orifice is provided in the connecting pipe of the intake manifold.

The check valve (one-way valve) in the system prevents fluctuation of the hot air control disphragm by shutting off positive pressure pulses from the intake manifold.



HEATED THREE-DIVIDED INTAKE MANIFOLD & CARBURETOR

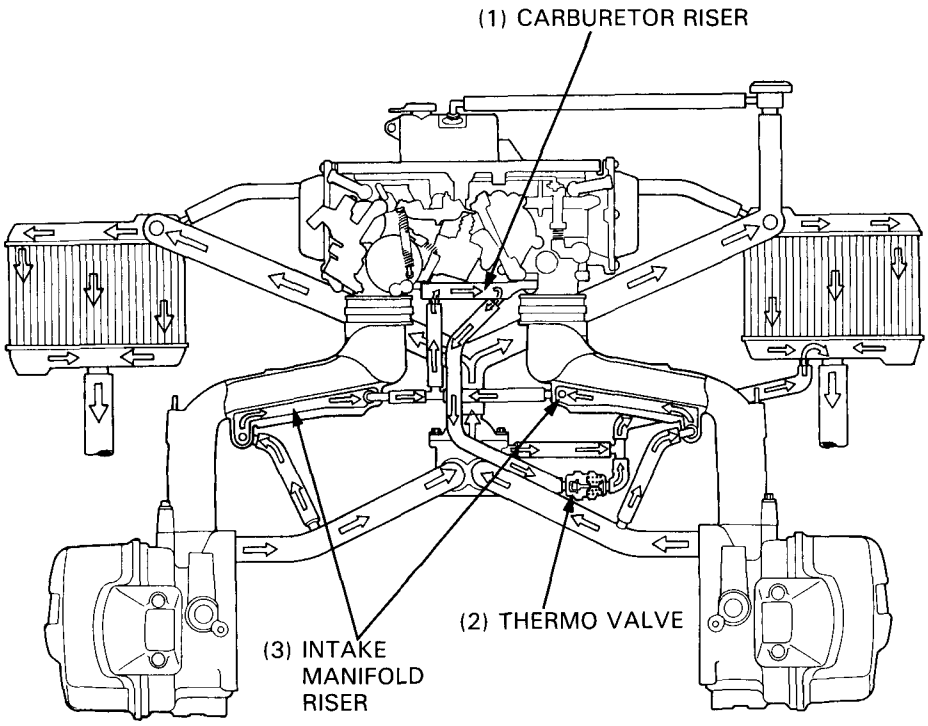
To give the fuel/air mixture equally to each cylinder, a three-divided intake manifold and down-draft dual carburetors have been adopted. To improve the driveability and carburetor icing under low temperature, heated intake manifold and carburetor is adopted.

The engine coolant is branched after the cylinder heads and distributed to the intake manifolds.
The coolant is further distributed from the intake manifolds to the carburetor base. After passing through the carburetor base, coolant returns to the radiator via the thermo valve.

By heating the intake manifolds, fuel atomization is improved, resulting in more efficient combustion. This contributes to improved driveability and fuel economy.

By keeping the carburetors warm, icing under cold conditions is prevented.

The thermo valve closes and shuts off the coolant passage when temperature rises to 78—82°C (172—180°F) to prevent overheating. The thermo valve is a wax pellet type and operates on the same principle as the thermostat.



SECONDARY AIR SUPPLY SYSTEM (SW MODEL ONLY)

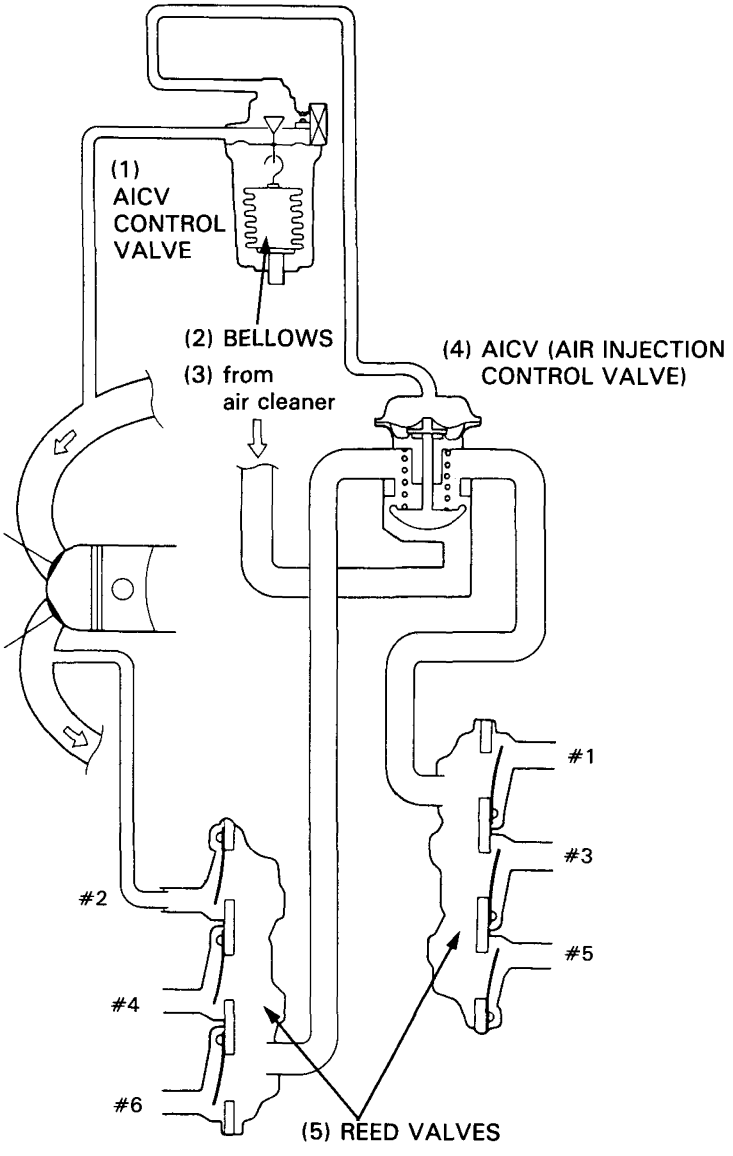
With the throttle open, vacuum in the intake manifold is low, keeping the AICV (Air Injection Control Valve) open to allow air to flow in each exhaust port via each reed valve when vacuum occurs in the exhaust port.

Air introduced in the exhaust permits CO and HC in exhaust gases to burn, thus reducing emission of the pollutants.

When the throttle is closed and vacuum in the intake manifold increases, the diaphragm in the AICV control valve is pulled up, opening the vacuum passage to the AICV.
As vacuum is applied to the AICV diaphragm, the AICV closes and shuts off the air passage to the read valves to prevent after burning in the muffler. This air supply to the exhaust is termed "AIR INJECTION".

Incorporated in the control valve is a high altitude compensation system using a bellows. The bellows is attached to the bottom of the diaphragm and serves as a spring to counteract vacuum force on the diaphragm.

At high altitudes where atmospheric pressure is low, the bellows expands, exerting a smaller spring force than at low altitudes. This causes the control valve to open early and consequently, the AICV to close early.



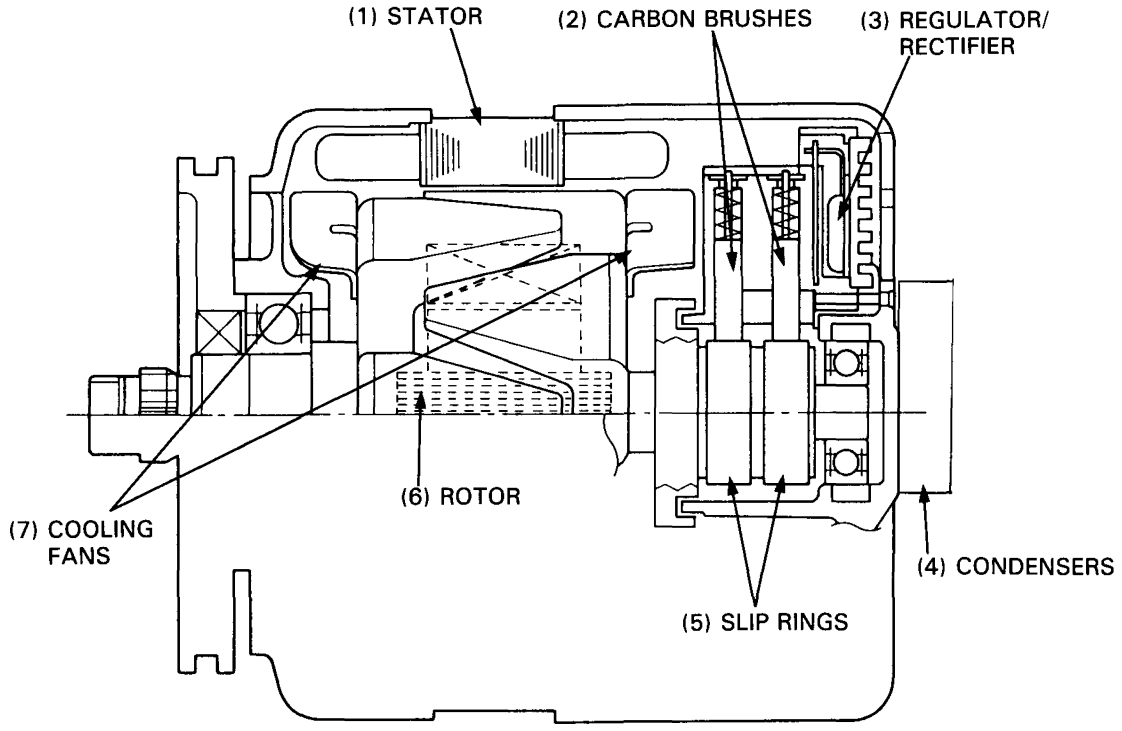
ALTERNATOR/CHARGING SYSTEM

CONSTRUCTION

The alternator used in the GL1500 is an integrated type similar in construction to those used in automobiles.
A regulator/rectifier is located inside of the alternator housing. Two carbon brushes and slip rings feed electric current to the rotor. Three-phase AC current is induced in the stator, rectified by diodes, and regulated at 14.5 V. The alternator output is rated 39 amperes at 5000 min^{-1} (rpm). Since the alternator is driven 2.7 times faster than the crankshaft, the 39 amperes are available when the engine is revved above 1850 min^{-1} (rpm).

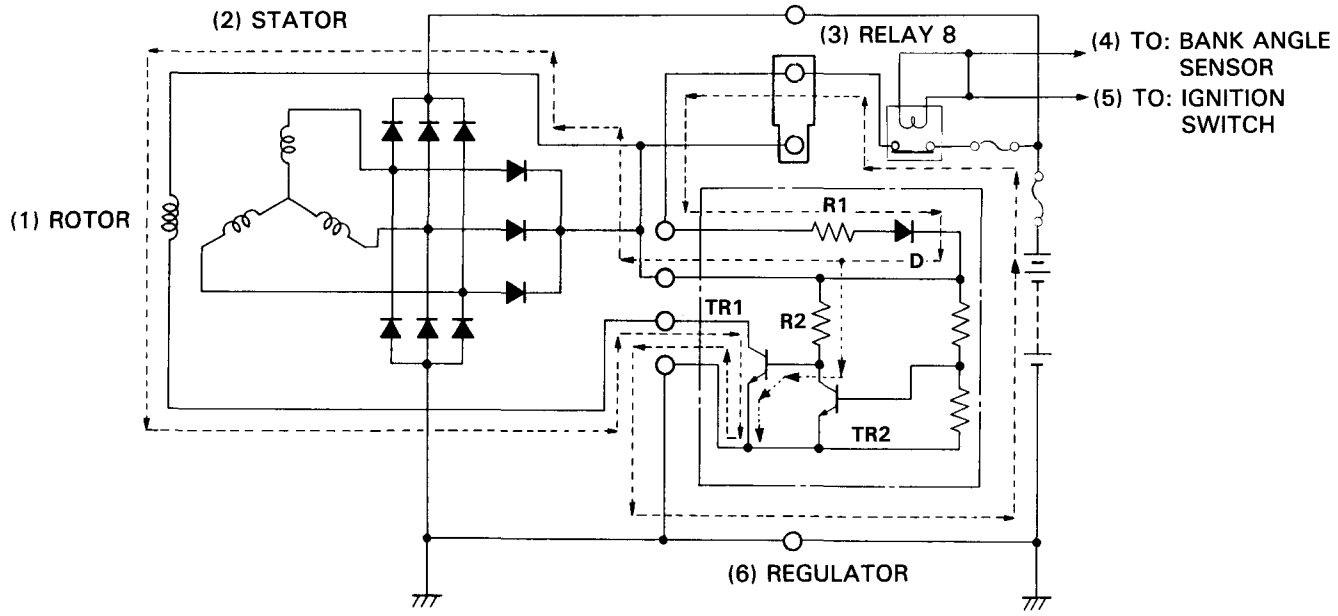
A package of two condensers is attached to the rear cover for noise surpression.

Alternator is cooled down compulsorily by two cooling fans.



CHARGING AND VOLTAGE REGULATION

1 When the ignition switch is turned on, relay 8 (IGN.CRUISE) is turned on and current from the battery flows through R1, D, R2, TR1 (base) and turns on transistor TR1. When TR1 is turned on, current flows through the rotor and TR1, exciting the rotor coils.

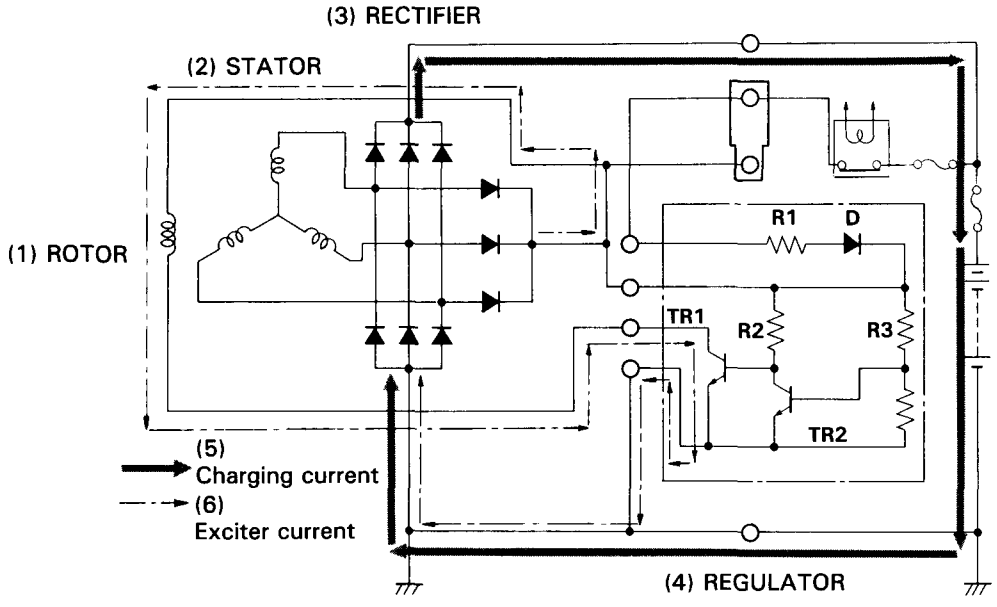


2 When the engine is operating with battery voltage below 14.5 V

As the rotor turns, AC current is induced in the stator coils and rectified by the diodes. In this condition, rectified DC curret from the stator (exciter current) supplies power to the rotor coil. At the same time, rectified DC current supplies power to various electrical components while charging the battery.

3 When voltage is above 14.5 V

As voltage exceeds the regulating level (14.5 V), transistor TR2 turns on and transistor TR1 turns off, cutting current to the rotor coil.
By turning the exciter current on and off, the system voltage is maintained at 14.5 volts.



COMPUTERIZED IGNITION SYSTEM

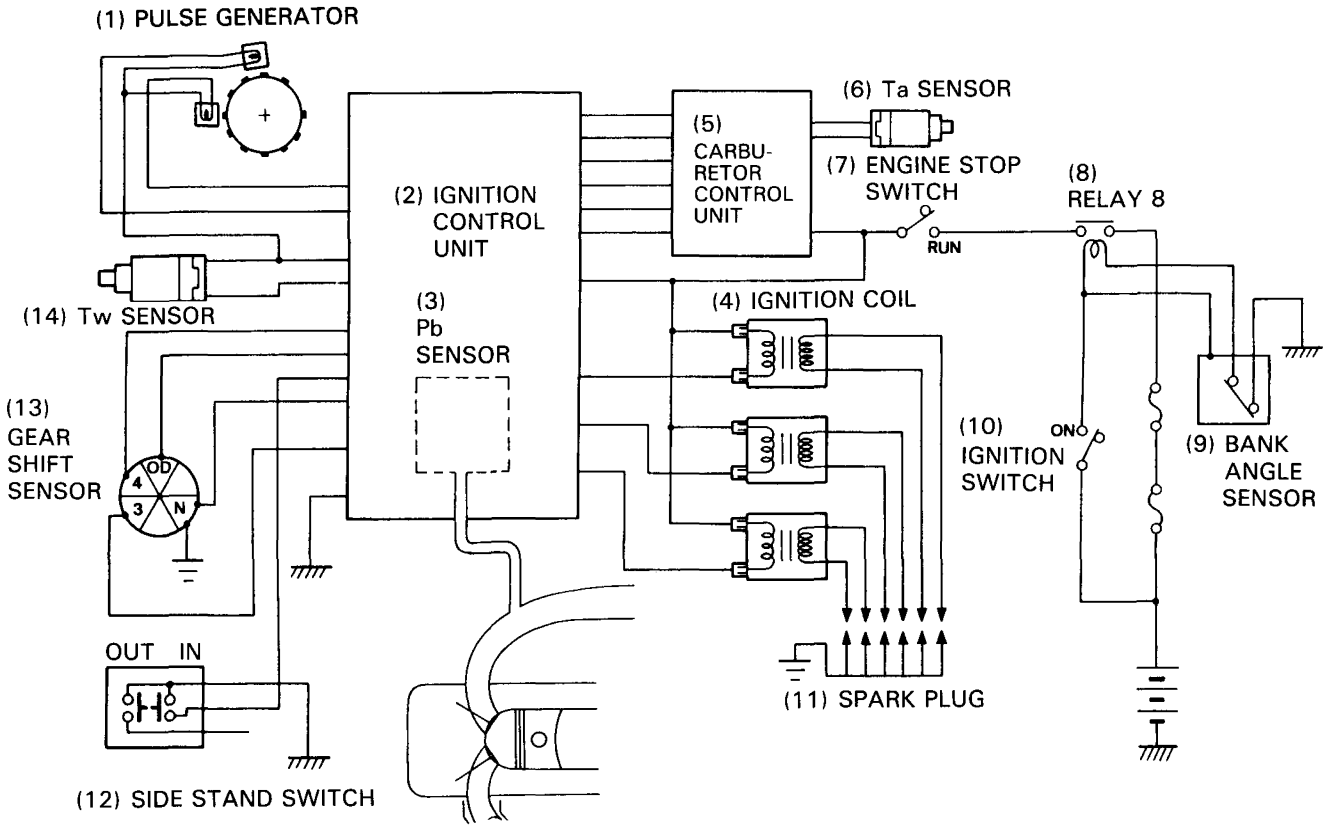
The ignition system is basically a fully transistorized digital type. Ignition timing is programmed and stored in the computer memory in the ignition control unit.

Basic ignition timing depends on two major factors; engine speed and intake manifold vacuum. The engine speed is detected by the pulse generator. The intake manifold vacuum is detected by the Pb sensor.

Compensation is made in the basic ignition timing using signals such as the engine coolant temperature, intake air temperature and gear position.

Each factor influences compensation ignition timing as shown below.

IGNITION TIMING / CONDITIONS		Advanced	Retarded	Remarks
Coolant temperature	High		O	
	Low	O		
Air temperature	High		O	Pb > 120 mm Hg (4.7 in Hg)
	Low	O		
Gear position	1.2.N		O	Ne > 2,000 min^{-1} (rpm)
	3.4.OD	O		



SIDE STAND INHIBITOR SYSTEM

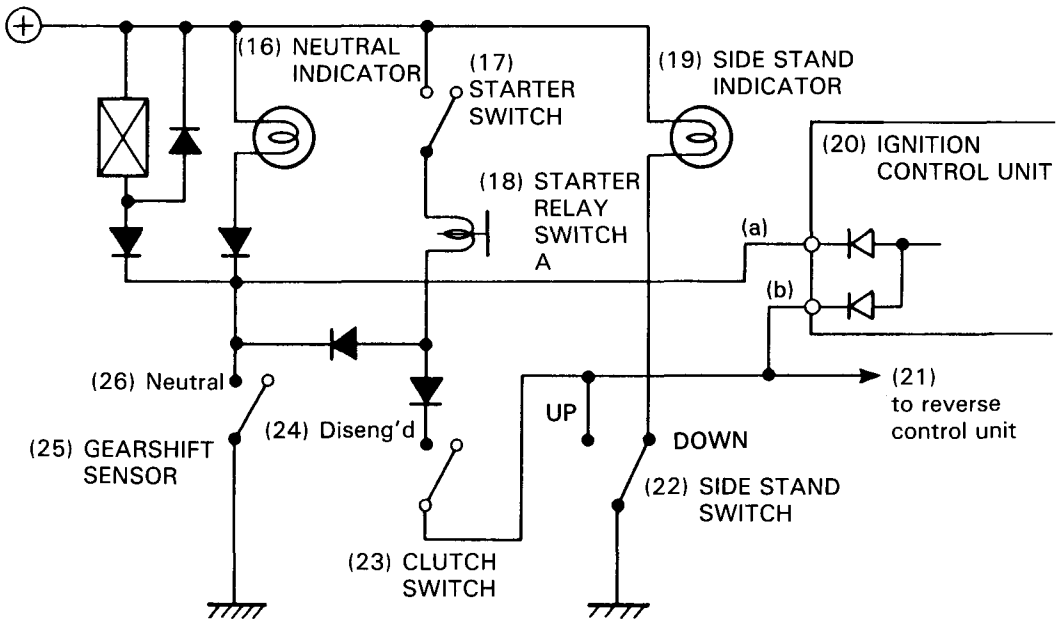
When the transmission is shifted into a gear from neutral with the side stand down, the ignition stops and the engine will stop.

When in neutral, line (a) is connected to ground via the gearshift sensor (Neutral).
When the side stand is retracted, line (b) passes to ground via the side sstand switch.

The ignition control unit monitors lines (a) and (b), and provides spark only when one or both of these lines is through to ground via the gearshift sensor (Neutral) or the side stand switch.

The relationship between switches and functions is shown below.

(1) SWITCH	(3) Neutral	O	O	O	×	O	×	×	×	O: (9) Neutral	×: (10) Others
	(4) Clutch	O	O	×	O	×	O	×	×	O: (11) Diseng'd	×: (12) Engaged
	(5) Side stand	O	×	O	O	×	×	O	×	O: (13) Retracted	×: (14) Extended
(2) SYSTEM	(6) Starter	O	O	O	O	O	×	×	×		
	(7) Ignition	O	O	O	O	O	×	O	×		
	(8) Reverse	O	×	O	▲	×	×	▲	×	▲: (15) Mechanically inhibited	



REVERSE SYSTEM

REVERSE CONTROL SYSTEM

Reverse drive system is added for the GL1500 to ease parking maneuvers. It is electrically driven by the starter motor. The speed of reverse is controlled to 1.0—1.5 kph (0.6—0.9 mph), which is slower than the average walking speed. The operation is easy, yet there is little chance to accidentally engage reverse because a particular sequence of conditions and procedures is necessary; and following conditions are monitored by each switches.

1) The engine must be RUNNING ..... Oil pressure switch
Engine operation is monitored by oil pressure switch.
Contact of the oil pressure switch is closed while the engine is stopped, opens while it is running.

2) The transmission must be in NEUTRAL ..... Gearshift sensor
The contact is closed while the transmission is in neutral, opened while it is in any other positions.

3) The side stand must be UP ..... Side stand switch
The side stand switch monitors the side stand position. This switch has two circuits; one is for the reverse system. The switch is closed when the side stand is up.

4) The reverse lever must be pulled up to the "12 O'CLOCK" POSITION. ..... Reverse lever switch/Reverse switch
The reverse lever switch monitors the lever position. It directs battery power to the neutral indicator circuit or the reverse circuit according to the lever position. The neutral indicator light on the instrument panel therefore goes off and the reverse indicator lamp goes on as the lever is pulled up to the reverse position.
As the reverse lever is operated, the reverse shift arm, which is installed on rear engine cover, is moved simultaneously via cables and a linkage. If the transmission is not in neutral, engagement of the reverse shift lever is mechanically blocked by a reverse shift inhibitor in the engine. A reverse switch, which is also on rear engine cover, monitors the position of the reverse shift arm and detects reverse gear engagement. The position of this switch determines whether the engine starter circuit or reverse system circuit can be operated. (See following).

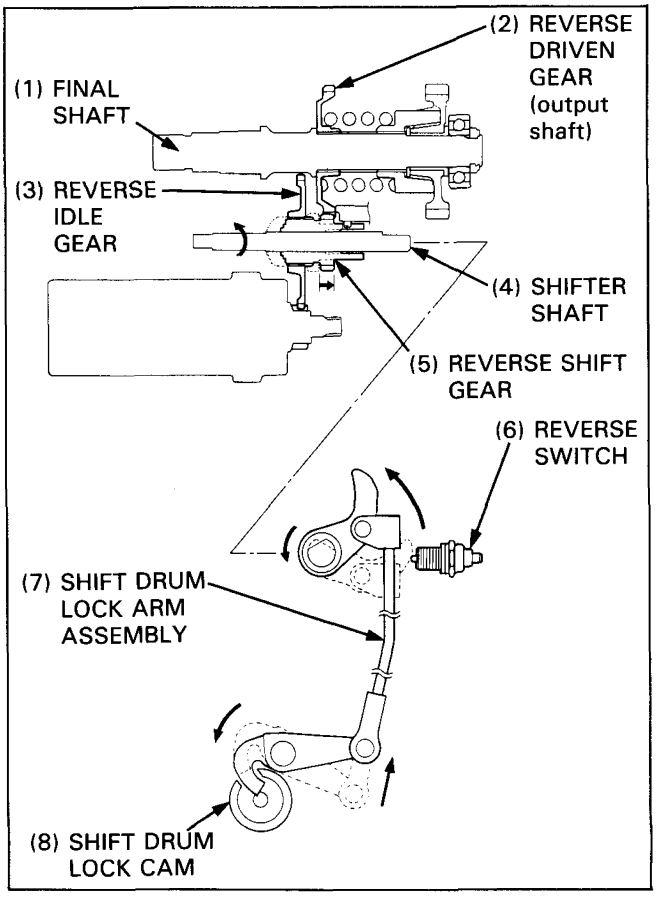
As the reverse lever on the motorcycle's lefthand is pulled up, reverse shift linkage moves and turns the shifter shaft. This slides the reverse shift gear to mesh with the reverse driven gear on the output shaft.
Simultaneously, the drum lock arm is pulled up to lock the shift drum. This inhibits gearshift operation. Movement of the drum lock arm simultaneously switches the reverse switch.

When these are completed, the reverse indicator light on the instrument panel comes on.

5) Press the starter/reverse button.
The motorcycle will move in reverse.

To stop moving, release the starter/reverse button. To disengage reverse, put the reverse lever back to its original ("9 o'clock") position, the reverse indicator goes off.

Next, see the reverse system operation.



REVERSE SYSTEM OPERATION

I. WHEN STARTING THE ENGINE

As the ST/RVS button is pressed, battery voltage energized the reverse relay switch and returns to ground through the reverse switch via diode.

As the reverse relay switch is energized, circuit of the starter relay switch A's primary coil completes via Reverse relay switch — Diode — Gearshift sensor, and turns on the starter relay switch A. This transmits the battery voltage to the starter motor. Then, circuit of starter relay switch B's primary coil completes the connection of Battery — Diode — Starter relay switch B's primary coil — Reverse switch — Ground. This turns on the starter relay switch B and current passed through the starter motor returns to ground through this starter relay switch B.

II. PRE-CONDITIONS FOR REVERSE

Pre-conditions for reverse operation are monitored electrically in the following processes.

The neutral position allows the starter relay switch A's switch circuit to complete, while shifting into reverse is mechanically allowed in the gearshift linkage.

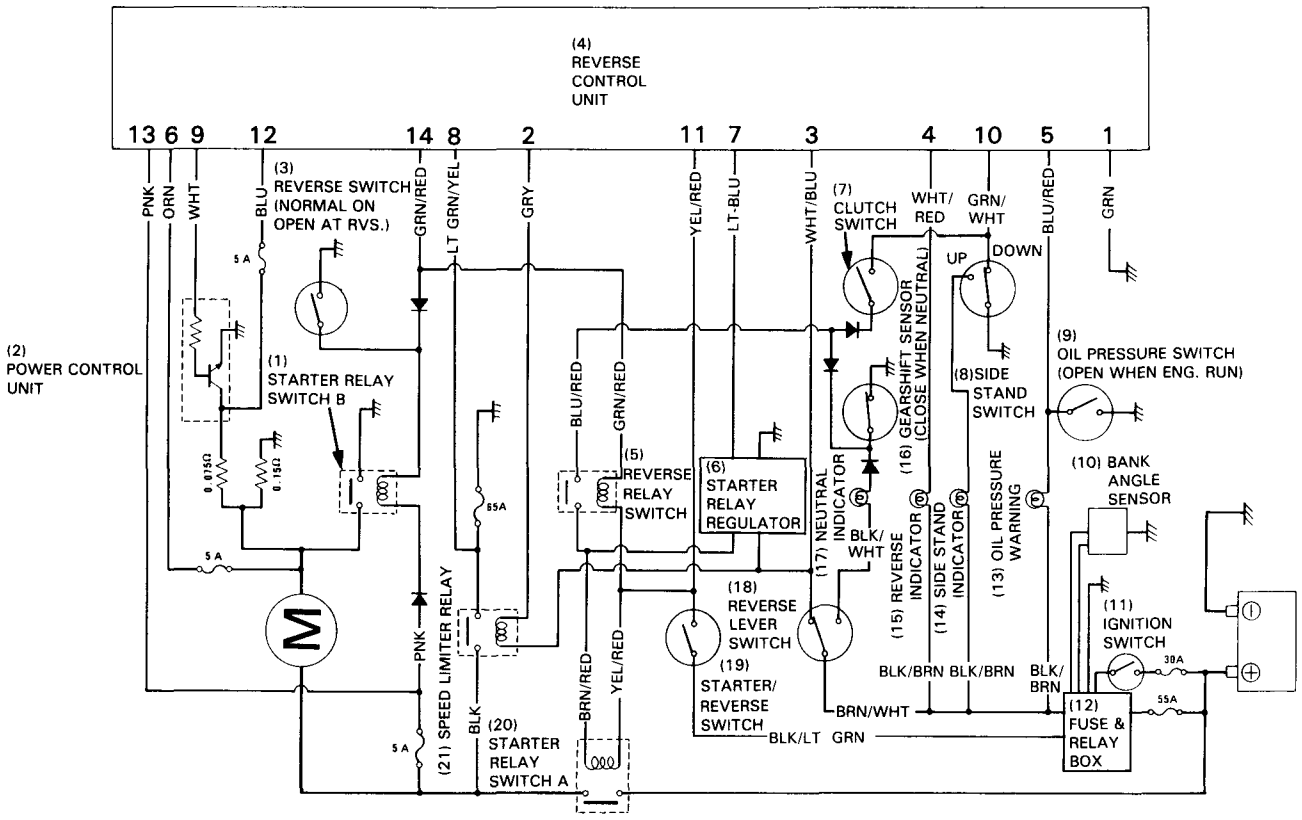
As the side stand is retracted, terminal #10 on the reverse control unit is connected to ground via the side stand switch.

The control unit is signaled if the engine is running or not by whether there is voltage supplied to the terminal #5. When the engine is stopped, the terminal voltage is nearly zero volt since the oil pressure switch is closed. While the engine is running, battery voltage is supplied to the terminal since the oil pressure switch is opened.

As the reverse lever is shifted to reverse position:

1. The reverse lever switch switches the contact to transmit battery power to the reverse control unit (terminal #3).
2. The gearbox is shifted to reverse position via cables and links, while shift-lock mechanism functions to inhibit shifting the transmission out of neutral.
3. The reverse switch on the right crankcase switches to open.

These operations complete the electric and mechanical conditions for reverse operation.
The reverse indicator light on the instrument panel comes on as the condition completes.



III. REVERSE OPERATION

When the pre-conditions are completed, the starter motor will move the motorcycle in reverse as the ST/RVS button is pressed.

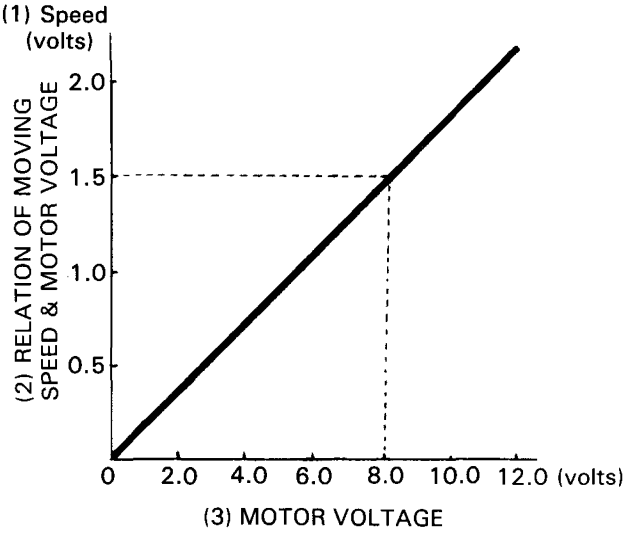
1. Battery voltage is available to terminal #11 on the control unit. This starts the following controls.
2. Operations in terminal #7 and #14 turn on the starter relay regulator and the reverse relay switch. Consequently, the starter relay switch A turns on. ⇨ MOTOR STARTS.
   0.3 seconds later, the reverse relay switch is turned off while the starter relay regulator stays on to keep the starter relay switch A on with minimum necessary current (0.70—1.00 A).

   In order to provide smooth and easy-to-control reverse maneuvering, the following supplementary control functions are included in this system.

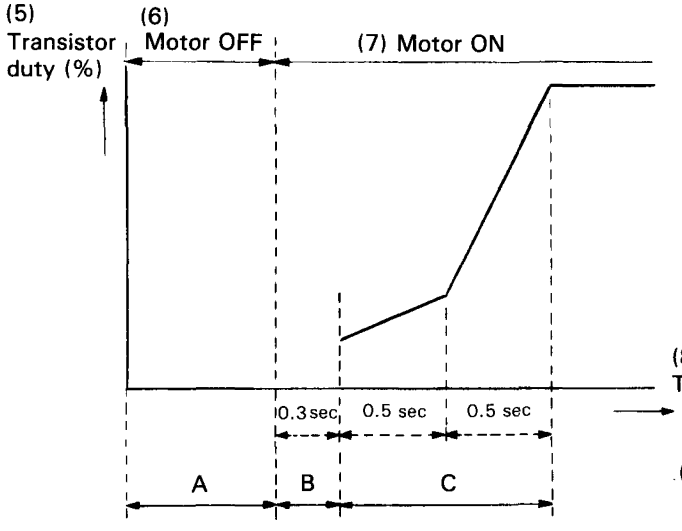
• Power-transistor controlled acceleration —smooth starting

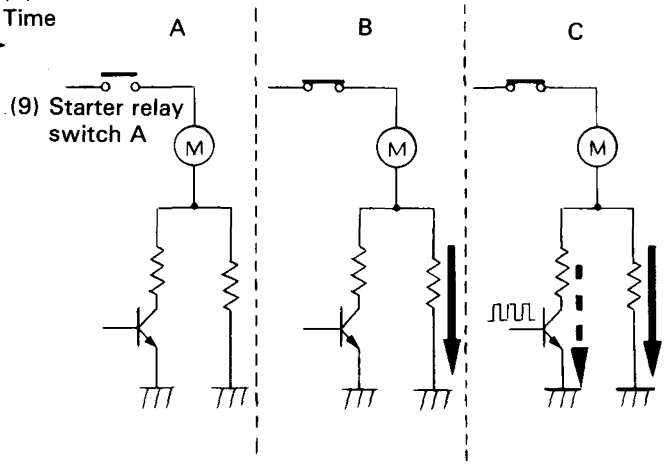
To reduce shock when starting to move in reverse, current to the starter motor is increased to operating level in two-steps. Terminal #6 and #13 monitor the starter motor voltage, which is proportional to motor rotation per minute. Based on this voltage, the control unit controls amount of current to the starter motor by controlling the power transistor through terminal #9.

With the starter one-way clutch, during reverse operation, rotating speed of the crankshaft-side is faster than speed of the motor side.



(4) POWER TRANSISTOR DUTY CONTROL



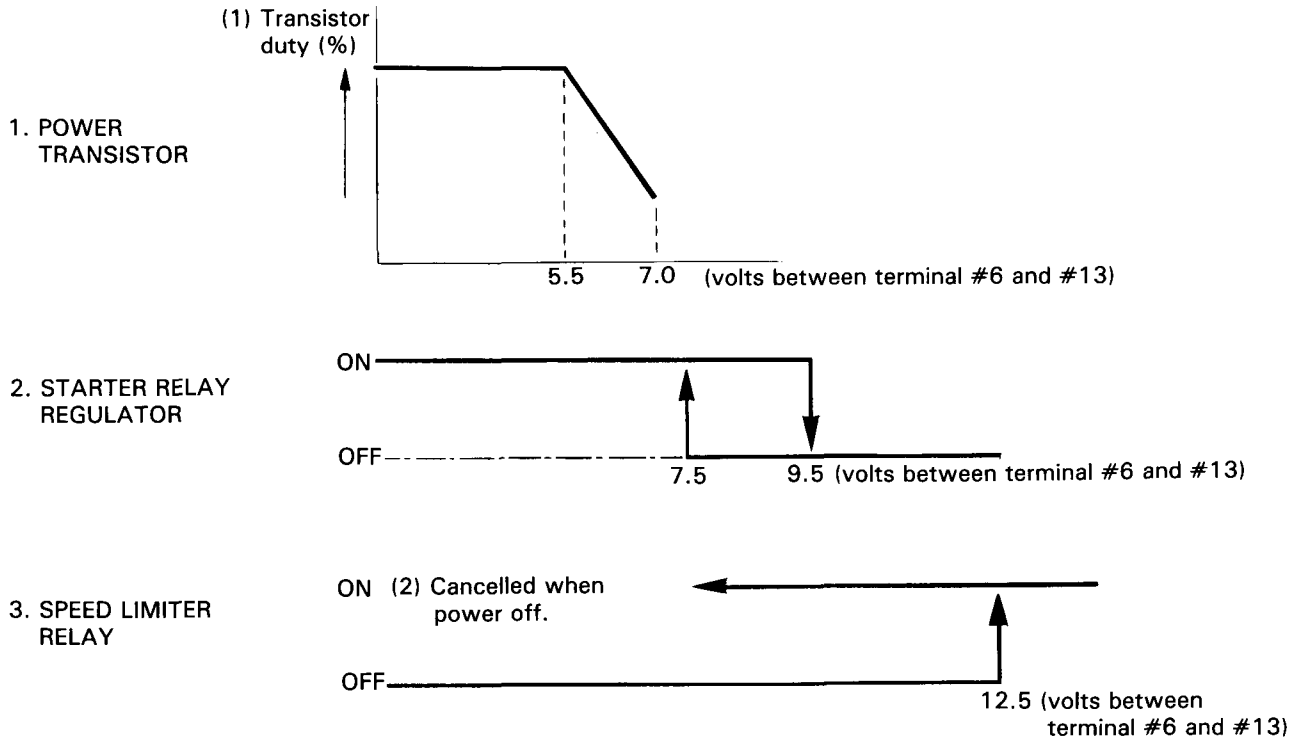


• Vehicle speed limiter above specified range

A speed-control function is provided to maintain rolling speed within a controlled speed range even when backing down an inclined surface.

Methods of the control are;

1. Power-transistor duty control
2. Turning off the STARTER RELAY REGULATOR. ⇨ Battery power to the starter motor is interrupted.
3. Electric braking ⇨ The speed limiter relay is turned on.



• System damage preventation

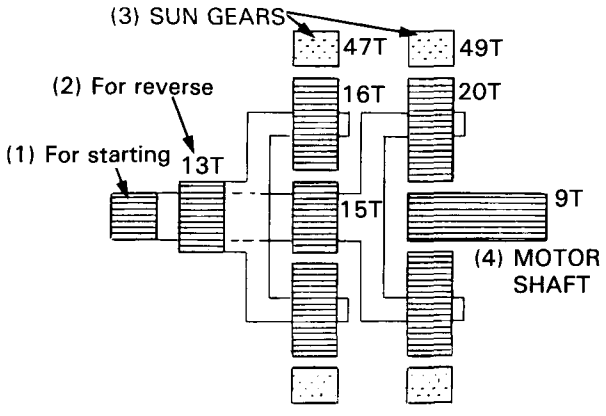
SYSTEM POWER OFF: The system power is turned off when any of these conditions occur.

1. Motor stop: When the motor rotation is blocked, the motor voltage drops lower than 2.0 volts. If this continued for more than three seconds, the control unit turns off the system.
2. If voltage between the motor's negative terminal (unit terminal #6) and the power-transistor's collector (unit terminal #12) is higher than a predetermined level while the transistor is off, the control unit judge that the transistor is shorted, and turns off the system.
3. If the motorcycle falled over, the bank angle sensor automatically shuts off system's power.

Once the system is interrupted, further reverse operation is prevented until the reverse lever is disengaged and then re-engaged. (In the process, it might also be a good idea to ride away and find a better parking place...)

STARTER MOTOR

The starter motor has two planetary gear reductions. The first reduction is for engine starting and the second is for reverse movement.



AUTO CRUISE CONTROL SYSTEM

The auto cruise control system is used in the GL1500. Refer to the owners' manual for its operation. Description of function:

1 Auto cruise can be used between 49 km/h (30 mph) and 128 km/h (80 mph), with the transmission in 4th or O.D.
2 Activated by intake manifold vacuum, the diaphragm actuator controls the throttle according to the speed command from the rider.
3 Three control valves are provided to regulate the vacuum to the actuator.

—1 Vacuum valve: This valve opens the vacuum passage from the intake manifold to the actuator to open the throttle.

—2 Vent valve: This valve opens a passage through to atmosphere from the actuator to close the throttle.

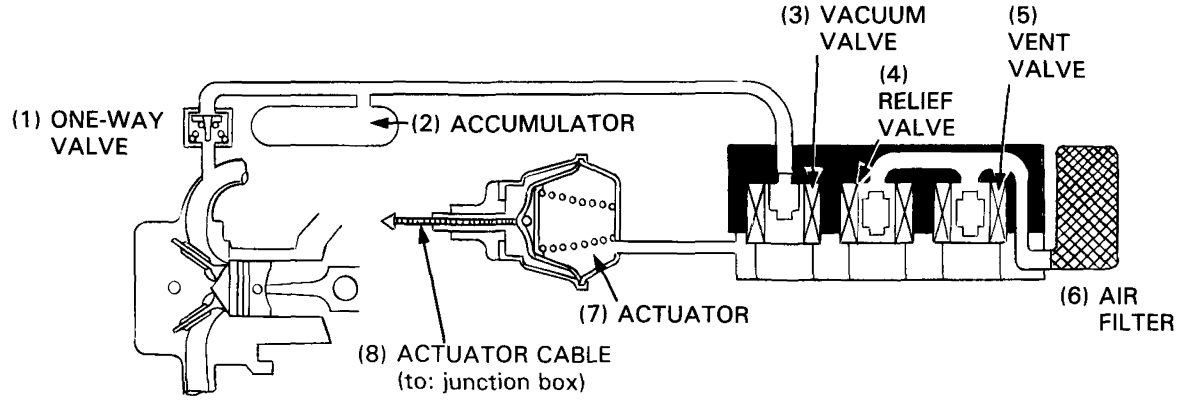
—3 Relief valve: This valve is redandant, having the same function as the vent valve. When the vent valve fails to operate due to a system failure, the relief valve opens to close the throttle.

4 The cruise control unit is a computer which turns the control valve solenoids on and off depending upon the deviation between the commanded speed memory and the actual speed identified by signals from the speed sensor.

5 When either one or more of the following switches is activated, auto cruising is immediately cancelled.

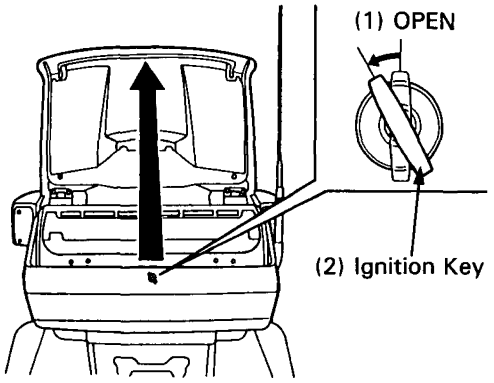
* Clutch cancel switch
* Throttle cancel switch
* Front brake light switch
* Rear brake light switch
* Front brake cancel switch
* Rear brake cancel switch
* Both SET and RESUME switches
* Bank angle sensor

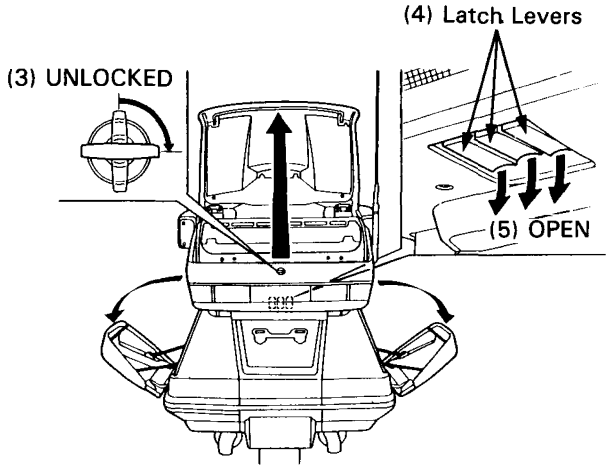
6 The accumulator stores vacuum for smooth and prompt actuator operation.



CENTRARIZED TRUNK/SADDLEBAG LOCKING SYSTEM

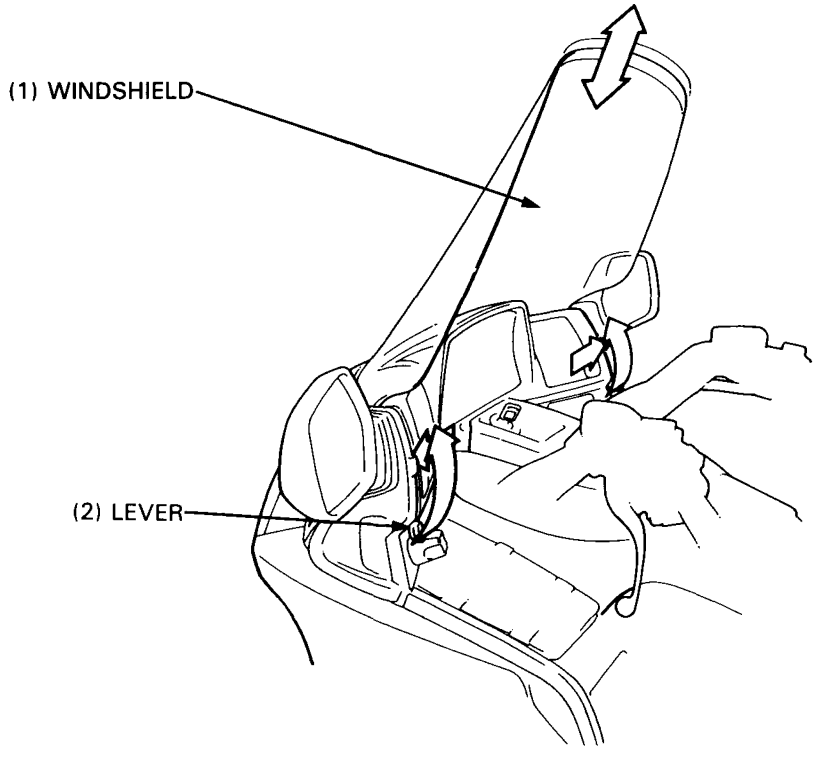
To improve operation of the trunk and saddlebags, centrarized trunk/saddlebag locking system has been adopted on GL1500. Refer to the owners' manual for their operation.





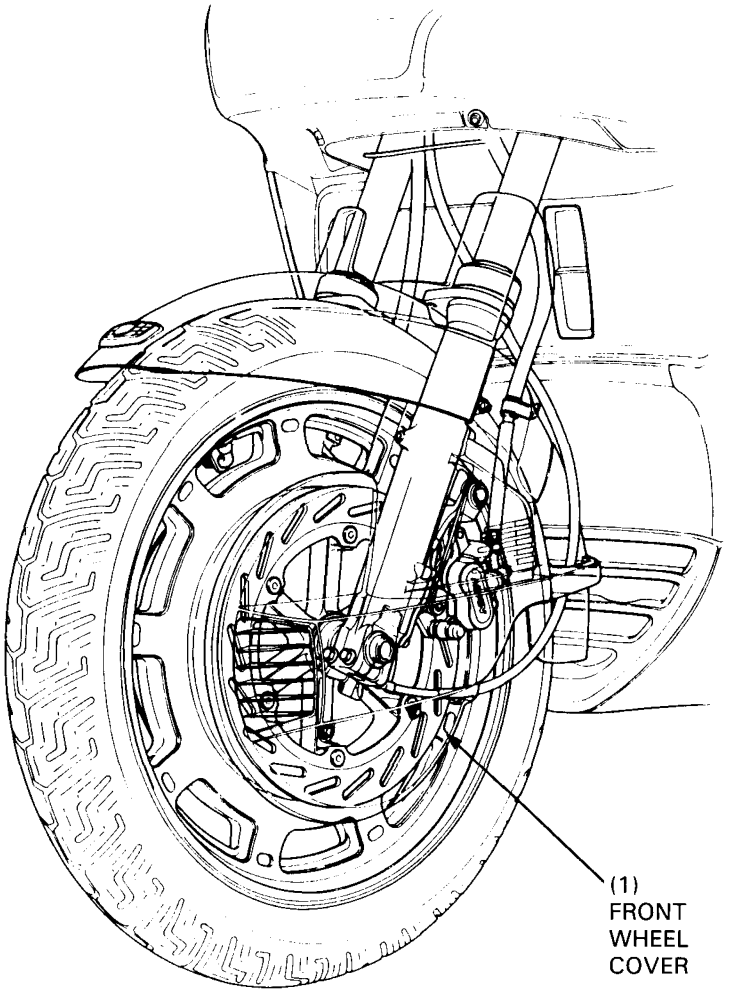
WINDSHIELD HEIGHT EASY ADJUSTMENT

To be easy to adjust the windshield height, the way that the windshield is fixed by cussion rubbers, easily released only with the adjusting levers pulled up, has been adopted on GL1500. Refer to the owners' manual for their operation.



FRONT WHEEL COVER

To prevent any materials from entering into the wheel, the front wheel covers has been adopted on GL1500. Using the superior resin for shockproof and heatproof, the brake discs, calipers and forks has been covered.



ENGINE DOES NOT START OR IS HARD TO START

		POSSIBLE CAUSE
1. Check fuel flow to carburetor	NOT REACHING CARBURETOR →	• Fuel tank empty • Clogged fuel line or fuel filter • Sticking float valve • Faulty fuel pump • Faulty fuel pump relay • Clogged fuel tank cap vent hole • Faulty fuel auto cock • Faulty vacuum tube of fuel auto cock
REACHING CARBURETOR ↓		
2. Perform spark test	WEAK OR NO SPARK →	• See *ignition system* (section 18)
GOOD SPARK ↓		
3. Test cylinder comperssion	LOW COMPRESSION →	• Low battery charge • Improper valve clearance (Faulty hydraulic valve) • Vavle stuck open • Worn cylinder and piston rings • Damaged cylinder head gasket • Seized valve • Improper vavle timing • Worn or damaged valve seat • Warped or cracked cylinder head
COMPRESSION NORMAL ↓		
4. Start by following normal procedure	ENGINE STARTS BUT STOPS →	• Improper choke operation • Carburetor incorrectly adjusted • Intake pipe leaking • Improper ignition timing (section 18) • Fuel contaminated
ENGINE DOES NOT FIRE ↓		
5. Remove and inspect spark plug	WET PLUG →	• Carburetor flooded • Incorrect choke cable free play • Cylinder flooded • Air cleaner dirty • Faulty carburetor (Rich mixture) • Excessive used accelerator pump

ENGINE LACKS POWER

		POSSIBLE CAUSE
1. Raise wheels off ground and spin by hand WHEEL SPINS FREELY	WHEELS DO NOT SPIN FREELY →	• Brake dragging • Worn or damaged wheel bearings • Wheel bearing needs lubrication • Rear axle nut excessively tight • Final gear bearing damaged
2. Check tire pressure PRESSURE NORMAL	PRESSURE LOW →	• Punctured tire • Faulty tire valve
3. Check clutch slipping CLUTCH ENGAGED PROPERLY	CLUTCH SLIPS →	• Faulty clutch hydraulic system • Clutch spring weak • Worn clutch disc/plate • Warped clutch disc/plate
4. Accelerate lightly ENGINE SPEED INCREASES	ENGINE SPEED DOES NOT INCREASE →	• Incorrect choke cable free play • Clogged air cleaner • Restricted fuel flow • Clogged muffler • Clogged fuel tank vent hole • Faulty carburetor • Faulty fuel pump or relay • Faulty fuel auto cock • Faulty hoes of fuel and air system • Faulty air vent control valve (SW model only)
5. Check ignition timing CORRECT	INCORRECT →	• Improper ignition timing (section 18)
6. Check hydraulic valve NOISE NOT HEARD	NOISE HEARD →	• Clogged hydraulic valve oil holes • Faulty hydraulic valve • Mis-selected hydraulic valve shim • Entry of air into hydraulic valve • Worn valve seat or camshaft • Oil level too low
7. Test cylinder compression NORMAL	TOO LOW →	• Valve stuck open • Worn cylinder and piston rings • Leaking head gasket • Improper valve timing • Faulty hydraulic valve
8. Check carburetor for clogging NOT CLOGGED	CLOGGED →	• Carburetor not serviced frequently enough
9. Remove spark plug NOT FOULED OR DISCOLORED	FOULED OR DISCOLORED →	• Plugs not serviced frequently enough • Spark plug with incorrect heat range
10. Check oil level and condition CORRECT	INCORRECT →	• Oil level too high • Oil level too low • Contaminated oil

(Cont'd)

Engine lacks Power (Cont'd)

		POSSIBLE CAUSE
11. Remove cylinder head cover and inspect lubrication	VALVE TRAIN NOT LUBRICATED PROPERLY →	• Clogged oil passage • Clogged oil control orifice • Clogged oil filter or screen
VALVE TRAIN LUBRICATED PROPERLY ↓		
12. Check for engine overheating	OVERHEATING →	• Collant level too low • Fan motor not working (fan motor switch faulty) • Thermostat stuck closed • Excessive carbon build-up in combustion chamber • Use of poor quality fuel • Improper ignition timing (section 18) • Lean fuel mixture
NOT OVERHEATING ↓		
13. 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 advanced (section 18) • Lean fuel mixture
ENGINE DOES NOT KNOCK		

POOR PERFORMANCE AT LOW AND IDLE SPEEDS

		POSSIBLE CAUSE
1. Check ignition timing and hydraulic valve noise	INCORRECT →	• Clogged hydraulic valve oil holes • Faulty hydraulic valve • Improper ignition timing (secetion 18)
CORRECT ↓		
2. Check carburetor pilot screw adjustment	INCORRECT →	• See pilot screw adjustment (section 4)
CORRECT ↓		
3. Check for leaking intake pipe and vacuum tubes	LEAKING →	• Loose carburetor insulator • Damaged or deteriorated vacuum tubes
NO LEAK ↓		
4. Perform spark test	WEAK OR INTERMITTENT SPARK →	• See ignition system (section 18)
GOOD SPARK →		• Faulty carburetor air system (section 4)

POOR PERFORMANCE AT HIGH SPEED

		POSSIBLE CAUSE
1. Check ignition timing and hydraulic valve noise	INCORRECT →	• Clogged hydraulic valve oil holes • Faulty hydraulic valve • Improper ignition timing (section 18)
CORRECT ↓		
2. Disconnect fuel line at carburetor	FUEL FLOW RESTRICTED →	• Fuel tank empty • Clogged fuel line or fuel filter • Clogged fuel tank cap vent hole • Sticking float valve • Faulty fuel pump • Faulty fuel pump relay
FUEL FLOWS FREELY ↓		
3. Remove carburetors and check for clogged jets	CLOGGED →	• Carburetor not serviced frequently enough
NO CLOGGED JETS ↓		
4. Check valve timing	INCORRECT →	• Camshaft pulley not installed properly
CORRECT ↓		
5. Check valve spring tension	WEAK →	• Faulty spring
NOT WEAKENED →		• Faulty carburetor air system (section 4)

POOR HANDLING → Check tire and suspension pressures

	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 balanced or misaligned wheels • Swing arm pivot bearing excessively worn • Bent frame
3. If the motorcycle pulls to one side →	• Bent frame • Front and rear wheels not aligned • Bent front fork • Bent swing arm

HYDRAULIC VALVE ADJUSTER SYSTEM

NOISY TAPPET

		POSSIBLE CAUSE
1. Check for low oil level. Ride for five minutes with the engine speed over 3.000 min^{-1} (rpm) Check oil level and condition.	INCORRECT →	• Contaminated oil • Use of poor quality oil
CORRECT ↓		
(Cont'd)		

Hydraulic valve adjuster system (Cont'd)

		POSSIBLE CAUSE
2. Check oil pressure	INCORRECT →	• Clogged oil filter screen • Clogged oil filter • Oil level too low • Faulty oil pump • Relief valve stuck open • Internal oil leakage • Worn crankshaft bearing • Clogged oil control orifice • Clogged oil passage • Clogged oil pipe
CORRECT ↓		
3. Remove cylinder head cover and check lubrication	NOT LUBRICATED PROPERLY →	• Clogged camshaft holder oil passage • Clogged oil control orifice
CORRECT ↓		
4. Remove hydraulic tappet and check it	INCORRECT →	• Plunger sticking • Faulty hydraulic valve • Air in hydraulic valve • Worn or sticking hydraulic valve • Improper hydraulic valve installation
CORRECT ↓		
5. Disassemble camshaft holder and check parts	INCORRECT →	• Worn or damaged rocker arm or shaft • Worn valve stem • Broken or weak valve spring • Use of improper shim • Improper installation • Worn camshaft

LOW CYLINDER COMPRESSION

		POSSIBLE CAUSE
1. Check oil level and condition	INCORRECT →	• Contaminated oil • Use of poor quality oil
CORRECT ↓		
2. Check oil pressure	INCORRECT →	• Use of poor quality oil
NORMAL ↓		
3. Remove hydraulic valve and check it	INCORRECT →	• Sticking hydraulic valve • Faulty hydraulic valve • Improper hydraulic valve installation
CORRECT ↓		
4. Disassemble camshaft holder and check parts	INCORRECT →	• Worn or damaged rocker arm or shaft • Use of improper shim • Improper installation
CORRECT ↓		
5. Check valve and valve seat	INCORRECT →	• Worn vale seat or valve face
CORRECT →		• Engine overreving

Paper Book
Part No. 67MN530Z

25. GL1500 (K) ADDENDUM

HOW TO USE THIS MANUAL

This addendum contains information for GL1500 (K). Refer to GL1500 SHOP MANUAL (No. 67MN530) for service procedures and data not included in this addendum.

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

CODE	AREA (TYPE)	CODE	AREA (TYPE)
E	U.K.	SD	Sweden
G	Germany	IT	Italy
F	France	FI	Finland
ED	Europe	AR	Austria
SW	Switzerland	SP	Spain
B	Belgium	NR	Norway

Wire Color Abbreviations

The following abbreviations are used to identify wire colors in the circuit schematics:

BLK	black	LT GRN	light green
BLU	blue	ORN	orange
BRN	brown	PNK	pink
GRN	green	RED	red
GRY	gray	WHT	white
LT BLU	light blue	YEL	yellow

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CONTENT

IMPORTANT SAFETY NOTICE

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

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

NOTE: Gives helpful information.

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

SPECIFICATIONS

Dimensions	Overall length		2,630 mm (103.5 in) G model: 2,635 mm (103.7 in)
	Overall width		955 mm (37.6 in)
	Overall height		1,525 mm (60.0 in) G, FI model: 1,335 mm (52.6 in)
	Wheelbase		1,700 mm (66.9 in)
	Seat height		770 mm (30.3 in)
	Ground clearance		140 mm (5.5 in) SP model: 135 mm (5.3 in)
	Dry weight		362 kg (798 lbs) G model: 357 kg (787 lbs)
	Curb weight		390 kg (860 lbs) G model: 385 kg (849 lbs)
Frame	Frame type		Double cradle
	Front suspension	Travel	Telescopic, 140 mm (5.5 in)
	Rear suspension	Travel	Swing arm, 105 mm (4.1 in)
		Air pressure	0—400 kPa (0—4.0 kg/cm², 0—57 psi)
	Front tire	Size	130/70—18 63H
		Air pressure	225 kPa (2.25 kg/cm², 33 psi)
	Rear tire	Size	160/80—16 75H
		Air pressure	250 kPa (2.50 kg/cm², 36 psi): Driver only
			280 kPa (2.80 kg/cm², 41 psi): Driver and Passenger
	Front brake		Double disc brake
	Rear brake		Disc brake
	Fuel capacity		24.0 lit. (6.4 US gal, 5.3 Imp gal)
	Caster angle		30°
	Trail length		115 mm (4.5 in)
	Front fork oil capacity	Left	325 cm³ (10.9 US oz, 11.4 Imp oz)
		Right	320 cm³ (10.8 US oz, 11.2 Imp oz)
Engine	Engine type		Water cooled, 4 stroke O.H.C.
	Cylinder arrangement		Flat six
	Bore and stroke		71 x 64 mm (2.8 x 2.5 in)
	Displacement		1,520 cm³ (92.7 cu-in)
	Compression ratio		9.8:1 SW model: 8.6:1
	Valve train		Belt driven over head camshaft
	Oil capacity	At disassembly	4.3 lit. (4.5 US qt, 3.8 Imp qt)
		After draining	3.5 lit. (3.7 US qt, 3.1 Imp qt)
	Lubrication system		Forced and wet sump
	Cooling system capacity		4.1 lit. (4.3 US qt, 3.6 Imp qt)
	Cylinder compression		1,500 kPa (15.0 kg/cm², 213 psi)
	Engine weight		126 kg (278 lbs)
	Camshaft: Intake valve	Opens	5° ATDC (At 1 mm lift)
		Closes	30° ABDC (At 1 mm lift)
	Camshaft: Exhaust valve	Opens	35° BBDC (At 1 mm lift)
		Closes	5° BTDC (At 1 mm lift)
	Valve clearance	Intake/Exhaust	Hydraulic valve adjuster system
	Idle speed		800±80 min⁻¹ (rpm)
		SW model	900±50 min⁻¹ (rpm)

Carburetion	Carburetor type		CV down-draft dual carburetors
	Throttle bore		36 mm (1.4 in)
	Carburetor identification No.		VD G6A SW model: VD GSA
	Pilot screw opening		1-1/2 turns out SW model: 1-7/8 turns out
	Float level		7.5 mm (0.30 in)
	Main jet		pri: #70 2nd: #155
	Slow jet		#50
	Throttle grip free play		5—8 mm (3/16—5/16 in)
	Fuel pump flow capacity		640 cm^3 (22.5 Imp oz)/minute
	Carburetor vacuum difference		Within 40 mm (1.6 in) Hg of each other
Drive Train	Clutch type		Wet, multi-plate
	Transmission		5-speed, constant mesh
	Primary reduction ratio		1.592 (78/49)
	Secondary reduction ratio		0.971 (34/35)
	Gear ratio	1st 2nd 3rd 4th OD	2.667 (40/15) 1.722 (31/18) 1.273 (28/22) 0.964 (27/28) 0.759 (22/29)
	Final reduction ratio		2.833 (34/12)
	Gearshift pattern		Left foot operated return system 1—N—2—3—4—OD
	Final gear oil capacity (After disassembly)		170 cm^3 (5.7 US oz, 6.0 Imp oz)
Electrical	Ignition		Battery, Ignition (Full transistor)
	Ignition timing "F" mark		0° BTDC
	Starting system		Starting motor
	Alternator		AC generator, 0.55 kW/5,000 min^{-1} (rpm)
	Battery capacity		12 V—20 AH
	Spark plug: Standard	NGK	DPR7EA-9
		ND	X22EPR-U9
	Spark plug: For cold climate (Below 5°C, 41°F)	NGK	DPR6EA-9
		ND	X20EPR-U9
	Spark plug: For extended high speed riding	NGK	DPR8EA-9
		ND	X24EPR-U9
	Spark plug gap		0.8—0.9 mm (0.031—0.035 in)
	Firing order		1—4—5—2—3—6—1
	Fuses		5 A x 3, 10 A x 4, 15 A x 5 (fuse box) 30 A, 55 A (main fuses) 5 A x 3, 65 A (reverse fuses)
Lights	Headlight		12 V 60 W (R), 60/55 W (L) SW model: 12 V 60/55 W E model: 60/55 W x 2
	Position light		12 V 5W
	Turn signal light		12 V 21 W x 4
	Indicator light		12 V 3.4 W x 5 / 12 V 1.7 W x 4
	Turn signal indicator		12 V 3 W x 2
	Instrument illumination		12 V 3.4 W x 4
	LCD unit illumination		12 V 3 W x 2
	License light		12 V 5 W
	Brake and taillight		12 V 21/5 W x 2

SERVICE DATA

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
Engine weight (including carburetors)				126 kg (278 lbs)	—
Engine oil capacity	at engine assembly			4.3 lit (4.5 US qt, 3.8 Imp qt)	—
	at oil change			3.5 lit (3.7 US qt, 3.1 Imp qt)	—
	at oil filter and oil change			3.7 lit (3.9 US qt, 3.3 Imp qt)	—
Radiator coolant capacity	After disassembly			4.1 lit (4.3 US qt, 3.6 Imp qt)	—
	After draining (including reserve tank)			3.8 lit (4.0 US qt, 3.3 Imp qt)	—
	Reserve tank			0.55 lit (0.6 US qt, 0.5 Imp qt)	—
OIL PUMP	Main oil pump	Tip clearance		0.15 (0.006) max.	0.35 (0.014)
		Pump body clearance		0.15–0.23 (0.006–0.009)	0.43 (0.017)
		Pump side clearance		0.02–0.07 (0.001–0.003)	0.12 (0.005)
	Scavenge pump	Tip clearance		0.15 (0.006) max.	0.35 (0.014)
		Pump body clearance		0.15–0.22 (0.006–0.009)	0.42 (0.017)
		Pump side clearance		0.02–0.07 (0.001–0.003)	0.12 (0.005)
	Pressure relief valve	Relief pressure		470–570 kPa (4.7–5.7 kg/cm^2, 67–81 psi)	—
		Relief valve spring free length		90.8 (3.57)	84.0 (3.31)
	Oil pressure (at oil pressure switch)	Cold (At 35°C/95°F)	Idle speed	130 kPa (1.3 kg/cm^2, 18 psi)	—
			5,000 min^{-1} (rpm)	500 kPa (5.0 kg/cm^2, 71 psi)	—
		Hot (At 80°C/176°F)	Idle speed	80 kPa (0.8 kg/cm^2, 11 psi)	—
			5,000 min^{-1} (rpm)	500 kPa (5.0 kg/cm^2, 71 psi)	—
COOLING	Radiator cap relief pressure			75–105 kPa (0.75–1.05 kg/cm^2, 11–15 psi)	—
	Thermostat	Begins to open temperature		80°–84°C (176°–183°F)	—
		Fully opened temperature		93°–97°C (199°–206°F)	—
		Valve lift (heated to 95°C/5 minutes)		8.0 (0.315) min.	—
	Thermo valve		Starts to close	78°–82°C (172°–180°F)	—
	Thermostatic fan motor switch		Starts to close	98°–102°C (208°–216°F)	—
	Coolant temperature sensor resistance		60°C (140°F)	104 ohms	—
			85°C (185°F)	44 ohms	—
			110°C (230°F)	20 ohms	—
			120°C (248°F)	16 ohms	—
CYLINDER HEAD	Cylinder head warpage			—	0.10 (0.004)
	Valve stem O.D.		IN	5.475–5.490 (0.2156–0.2161)	5.45 (0.215)
			EX	5.455–5.470 (0.2148–0.2154)	5.44 (0.214)
	Valve guide I.D.		IN, EX	5.500–5.512 (0.2165–0.2170)	5.55 (0.219)
	Valve stem to guide clearance		IN	0.010–0.037 (0.0004–0.0015)	0.08 (0.003)
			EX	0.030–0.057 (0.0012–0.0022)	0.10 (0.004)
	Valve seat width			1.2 (0.05)	—
	Valve spring free length			44.6 (1.76)	43.3 (1.70)
	Valve spring preload/length			15.6–18.2/37.5 kg/mm (34.39–40.12/1.48 lbs/in)	—
	Rocker arm I.D.			21.000–21.021 (0.8268–0.8276)	21.05 (0.829)
	Rocker arm shaft O.D.			11.966–11.984 (0.4711–0.4718)	11.95 (0.470)
	Rocker arm lobe		I.D.	11.996–12.031 (0.4723–0.4734)	12.07 (0.475)
			O.D.	20.945–20.980 (0.8246–0.8260)	20.93 (0.824)
	Hydraulic valve adjuster compression stroke with kerosene			0–0.30 (0–0.012)	0.30 (0.012) max.

Unit: mm (in)

ITEM				STANDARD	SERVICE LIMIT
CYLINDER HEAD	Camshaft	Cam lobe height		36.110–36.190 (1.4217–1.4248)	35.9 (1.41)
		Runout (at center journal)		—	0.10 (0.004)
		Journal O.D.	Both middles	26.934–26.955 (1.0604–1.0612)	26.91 (1.059)
			Both ends	26.949–26.970 (1.0610–1.0618)	26.91 (1.059)
		Holder journal I.D.		27.000–27.021 (1.0630–1.0638)	27.05 (1.065)
		Journal oil clearance	Both middles	0.045–0.087 (0.0018–0.0034)	0.14 (0.006)
			Both ends	0.030–0.072 (0.0012–0.0028)	0.14 (0.006)
CLUTCH	Clutch master cylinder	Cylinder I.D.		15.870–15.913 (0.6248–0.6265)	15.93 (0.627)
		Piston O.D.		15.827–15.854 (0.6231–0.6242)	15.82 (0.623)
	Clutch	Plate warpage		—	0.30 (0.012)
		Disc thickness	Disc A	3.80–3.88 (0.150–0.153)	3.5 (0.14)
			Disc B	3.72–3.88 (0.146–0.153)	3.5 (0.14)
		Clutch spring free height		5.38 (0.212)	5.1 (0.20)
OUTPUT SHAFT	Damper spring free length			60.82 (2.394)	57.0 (2.24)
	Shaft O.D.			22.008–22.021 (0.8665–0.8670)	21.99 (0.866)
	Collar		I.D.	22.026–22.041 (0.8672–0.8678)	22.05 (0.868)
			O.D.	25.959–25.980 (1.0220–1.0228)	25.95 (1.022)
	Driven gear I.D.			26.000–26.016 (1.0236–1.0242)	26.03 (1.025)
GEAR-SHIFT	Shift fork shaft O.D.			13.966–13.984 (0.5498–0.5506)	13.90 (0.547)
	Shift fork		I.D.	14.000–14.021 (0.5512–0.5520)	14.04 (0.553)
			Claw thickness	5.93–6.00 (0.233–0.236)	5.6 (0.22)
TRANS-MISSION	Gear I.D.		C2, C3, M4, M5	34.000–34.016 (1.3386–1.3392)	34.04 (1.340)
	Gear bushing O.D.		C2, C3, M4/M5	33.940–33.965 (1.3362–1.3372)	33.92 (1.335)
	Gear-to-bushing clearance			0.035–0.076 (0.0014–0.0030)	0.10 (0.004)
CYLINDER, PISTON	Cylinder compression pressure			1300–1700 kPa (13.0–17.0 kg/cm², 185–242 psi)	1000 kPa (10.0 kg/cm², 142 psi)
	Cylinder	I.D.		71.010–71.025 (2.7957–2.7963)	71.1 (2.80)
		Out-of-round		—	0.15 (0.006)
		Taper		—	0.05 (0.002)
		Top warpage		—	0.05 (0.002)
	Piston	O.D. (at skirt)		70.960–70.990 (2.7937–2.7949)	70.85 (2.789)
		Piston pin bore		18.010–18.016 (0.7091–0.7093)	18.03 (0.710)
		Piston-to-cylinder clearance		0.020–0.065 (0.0008–0.0026)	0.10 (0.004)
	Piston ring	End gap	Top and second	0.15–0.30 (0.006–0.012)	0.5 (0.02)
			Oil ring side rail	0.20–0.70 (0.008–0.028)	0.9 (0.04)
		Ring-to-ring land clearance	Top	0.025–0.055 (0.0010–0.0022)	0.10 (0.004)
			Second	0.015–0.045 (0.0006–0.0018)	0.10 (0.004)
	Piston pin	O.D. (at sliding surfaces)		17.994–18.000 (0.7084–0.7087)	18.99 (0.748)
		Pin-to-piston clearance		0.010–0.022 (0.0004–0.0009)	0.05 (0.002)
		Pin-to-rod interference		0.015–0.039 (0.0006–0.0015)	—

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
CRANKSHAFT	Main journal bearing oil clearance			0.020–0.038 (0.0008–0.0015)	0.06 (0.002)
	Crankpin bearing oil clearance			0.027–0.045 (0.0011–0.0018)	0.06 (0.002)
	Crankshaft runout (at center journal)			—	0.03 (0.001)
	Connecting rod side clearance			0.15–0.30 (0.006–0.012)	0.40 (0.016)
	Connecting rod small end I.D.			18.009–18.027 (0.7090–0.7097)	18.04 (0.710)
	Crankpin and main journal		Taper	—	0.003 (0.0001)
			Out-of-round	—	0.005 (0.0002)
WHEELS	Wheel axle runout			—	0.2 (0.01)
	Wheel rim runout		Axial	—	2.0 (0.08)
			Radial	—	2.0 (0.08)
	Tire tread depth		Front	—	1.5 (0.06)
			Rear	—	2.0 (0.08)
SUSPENSION	Rear suspension air pressure			0–400 kPa (0–4.0 kg/cm^2, 0–57 psi)	—
	Front fork spring free length		Spring A	192.9 (7.59)	189.0 (7.44)
			Spring B	386.3 (15.21)	378.6 (14.91)
	Front fork oil capacity		Left	325 cm^3 (10.9 US oz, 11.4 Imp oz)	—
			Right	320 cm^3 (10.8 US oz, 11.2 Imp oz)	—
	Front fork oil level (from the top of tube)			239 (9.4)	—
	Front fork oil			ATF	—
	Fork tube runout			—	0.2 (0.01)
	Left shock absorber spring free length (Rear)			280.7 (11.05)	274.5 (10.81)
	Right shock absorber oil capacity			140 cm^3 (4.7 US oz, 4.9 Imp oz)	—
	Right shock absorber oil			ATF	—
FINAL DRIVE	Final gear oil	Recommended oil		Hypoid gear oil, SAE #80	—
		Capacity	At assembly	170 cm^3 (5.7 US oz, 6.0 Imp oz)	—
			After draining	140 cm^3 (4.7 US oz, 4.9 Imp oz)	—
	Final gear backlash			0.05–0.15 (0.002–0.006)	0.3 (0.01)
		Difference at 3 points		—	0.10 (0.004)
	Ring gear-to-stop pin clearance			0.30–0.60 (0.012–0.024)	—
BRAKES	Front brake master cylinder	Cylinder I.D.		12.700–12.743 (0.5000–0.5017)	12.755 (0.5022)
		Piston O.D.		12.684–12.657 (0.4980–0.4983)	12.645 (0.4978)
	Front brake caliper	Left	Cylinder I.D.	25.400–25.450 (1.0000–1.0020)	25.460 (1.0024)
			Piston O.D.	25.335–25.368 (0.9974–0.9987)	25.310 (0.9965)
		Right	Cylinder I.D.	30.230–30.280 (1.1902–1.1921)	30.290 (1.1925)
			Piston O.D.	30.165–30.198 (1.1876–1.1889)	30.140 (1.1866)
	Front brake disc	Thickness		5.8–6.2 (0.23–0.24)	5.0 (0.20)
		Runout		—	0.3 (0.01)
	Front brake pad thickness			5.5 (0.22)	1.0 (0.04)
	Rear brake master cylinder	Cylinder I.D.		15.870–15.913 (0.6248–0.6265)	15.925 (0.6270)
		Piston O.D.		15.827–15.854 (0.6231–0.6242)	15.815 (0.6226)
		Brake rod clevis installed length		100 (3.9)	—
	Rear brake caliper	Cylinder I.D.		32.030–32.080 (1.2610–1.2630)	32.090 (1.2634)
		Piston O.D.		31.948–31.998 (1.2578–1.2598)	31.940 (1.2575)
	Rear brake disc	Thickness		7.3–7.7 (0.29–0.30)	6.0 (0.24)
		Runout		—	0.3 (0.01)
	Rear brake pad thickness			6.5 (0.26)	1.0 (0.04)
	Brake fluid (front/rear)			DOT 4	—

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
CHARGING	Battery capacity			12 V–20 AH	—
	Battery specific gravity (At 20°C, 68°F)	Full charged		1.270–1.290	—
		Need charging		Below 1.260	—
	Battery charging current			2.0 Amperes max.	—
	Alternator	Capacity		0.55 kW/5,000 min^{-1} (rpm)	—
		Stator coil resistance		0.1–0.3 ohms (20°C, 68°F)	—
		Rotor coil resistance		2.9–4.0 ohms (20°C, 68°F)	—
		Rotor coil slip ring O.D.		27.0 (1.06)	26.0 (1.02)
		Charging start		800–1,000 min^{-1} (rpm)	—
	Regulator/ Rectifier (into alternator)	Type		Transistorized non-adjustable reg./recti.	—
		Regulated voltage (at 20°C/68°F)	900 min^{-1} (rpm)	0–2 A, 13.5–15.5 V	—
			1,850 min^{-1} (rpm)	1.5 A min., 13.5–15.5 V	—
IGNITION	Firing order			1–4–5–2–3–6–1	—
	Ignition timing		F mark	0° BTDC at 900 ± 50 min^{-1} (rpm)	—
		Vacuum advance	Advance start	60–160 mmHg (2.4–6.3 inHg)	—
			Advance cease	310–360 mmHg (12.2–14.2 inHg)	—
	Ignition coil resistance (at 20°C/68°F)	Primary coil		2.6–3.2 ohms	—
		Secondary coil	With spark plug wire	20.2–26.8 Kohms	—
			Without spark plug wire	11.7–14.3 Kohms	—
	Pulse generator coil resistance (At 20°C, 68°F)			400–500 ohms	—
	Tw sensor/Ta sensor resistance		20°C (68°F)	2.0–3.0 Kohms	—
			80°C (176°F)	200–400 ohms	—
STARTER/ REVERSE	Starter motor brush length			12.5 (0.49)	6.0 (0.24)
	Reverse System	Starter relay regulator/regulated current		0.7–1.0 A	—
		Resister	Between relay and unit terminals	0.06–0.09 ohms	—
			Between relay terminal and ground	0.1–0.2 ohms	—
ELECTRICAL	Oil pressure switch continuity pressure			10–20 kPa (0.1–0.2 kg/cm^2, 1–3 psi)	—
	Fuel level sensor resistance (at 20°C/68°F)		Empty	90–100 ohms	—
			Reserve	66–81 ohms	—
			Full	4–10 ohms	—

TORQUE VALUES

ENGINE

Item	Qty	Thread dia (mm)	Torque N•m	Torque kg-m	Torque ft-lb	Remarks
Spark plug	6	12	16	1.6	12	
Carburetor insulator band screw	4	5	5	0.5	3.6	
Intake manifold vacuum tube joint	3	5	4	0.4	3	
Coolant temperature sensor	1	PT 1/8	12	1.2	9	NOTE 1
Thermostatic fan motor switch	1	16	18	1.8	13	
Tw sensor	1	12	28	2.8	20	
Reverse switch	1	10	12	1.2	9	
Reverse shifter shaft bolt	1	6	14	1.4	10	NOTE 2
LUBRICATION:						
Oil pressure switch	1	PT 1/8	12	1.2	9	NOTE 1
Engine oil drain bolt	1	14	38	3.8	27	
Engine oil filter cartrige	1	20	10	1.0	7	
Engine oil filter boss	1	20	18	1.8	13	NOTE 2
CYLINDER HEAD:						
Cylinder head bolt (9 mm bolt)	16	9	45	4.5	33	NOTE 3
Timing belt driven pulley bolt	2	8	27	2.7	20	
Camshaft holder bolt	16	8	20	2.0	14	
Hydraulic valve adjuster stopper plug	12	14	30	3.0	22	
Cylinder head cover bolt	12	6	12	1.2	9	
Timing belt tensioner bolt	4	8	26	2.6	19	NOTE 2
Cylinder head sealing bolt	6	18	45	4.5	33	NOTE 2
CLUTCH:						
Clutch hose/pipe oil bolt	3	10	30	3.0	22	
Clutch slave cylinder bleed valve	1	8	9	0.9	7	
Clutch bleed pipe bolt	1	6	12	1.2	9	NOTE 2
Clutch center lock nut	1	22	130	13.0	94	
Clutch outer lock nut	1	40	190	19.0	137	NOTE 2/5
ALTERNATOR:						
Front cover attaching screw	3	4	2	0.2	1.4	NOTE 2
Couple A mounting nut	1	14	58	5.8	42	NOTE 2
Couple B mounting nut	1	14	58	5.8	42	
REAR ENGINE CASE:						
Starter one-way clutch socket bolt	6	6	16	1.6	12	NOTE 2
Starter clutch mounting bolt	1	12	75	7.5	54	
Shift drum lock arm bolt (reverse system)	1	6	12	1.2	9	
Alternator drive gear bolt	6	8	27	2.7	20	NOTE 3
Final drive gear lock nut	1	22	190	19.0	137	NOTE 2/4/5
Output shaft lock nut	1	30	190	19.0	137	NOTE 5
Oil pump driven sprocket bolt	1	6	18	1.8	13	NOTE 2
GEARSHIFT:						
Shift arm lock bolt	1	8	25	2.5	18	
Shift drum center bolt	1	8	28	2.8	20	
Shift drum lock cam bolt	1	6	12	1.2	9	NOTE 2
Shift arm return spring pin	1	8	25	2.5	18	
CRANKCASE/CRANKSHAFT/TRANSMISSION:						
Crankcase bolt (10 mm)	8	10	35	3.5	25	NOTE 6
(8 mm)	4	8	26	2.6	19	
(6 mm)	10	6	12	1.2	9	
Crankcase sealing bolt (20 mm)	4	20	45	4.5	33	NOTE 2
(18 mm)	2	18	45	4.5	33	NOTE 2
Mainshaft lock nut	1	22	190	19.0	137	NOTE 5
Crankshaft main bearing cap bolt	8	10	60	6.0	43	NOTE 6
Connecting rod cap nut	8	8	32	3.2	23	NOTE 6
Timing belt drive pulley bolt	1	12	75	7.5	54	

NOTES:
1. Apply sealant to the threads.
2. Apply a locking agent to the threads.
3. Apply molybdenum disulfide oil to the threads and flange surfaces.
4. Left-hand threads.
5. Stake (2 plcs)
6. Apply oil to the threads and flange surfaces.
7. Torque wrench scale reading using a special tool.
8. Apply grease to the threads and flange surfaces.

FRAME

Item	Qty	Thread dia (mm)	Torque N•m	Torque kg-m	Torque ft-lb	Remarks
Engine mount nut	7	10	40	4.0	29	
Engine bracket bolt	4	8	25	2.5	18	
Subframe bolt (10 mm socket bolt)	4	10	40	4.0	29	
(10 mm flange bolt)	1	10	40	4.0	29	
(8 mm flange bolt)	1	8	25	2.5	18	
Exhaust pipe joint nut	12	6	10	1.0	7	
Side stand pivot	1	10	22	2.2	16	
Center stand pivot	1	8	18	1.8	13	
Chamber protector bolt	6	6	10	1.0	7	
Brake disc bolt	18	8	40	4.0	29	
HANDLEBAR:						
Handlebar upper holder bolt	4	8	25	2.5	18	NOTE 8
Front master cylinder holder bolt	2	6	12	1.2	9	
Clutch master cylinder holder bolt	2	6	12	1.2	9	
FRONT:						
Axle pinch bolt	4	8	22	2.2	16	
Axle bolt	1	14	90	9.0	65	
Steering stem nut	1	24	100	10.0	72	
Steering stem adjustment nut	1	26	19	1.9	14	See page 13-26
Anti-dive case socket bolt	8	6	8	0.8	6	NOTE 2
Fork bottom socket bolt	2	8	20	2.0	14	NOTE 2
Fork bolt	2	37	23	2.3	17	
Fork leg upper pinch bolt	2	7	11	1.1	8	
Fork leg lower pinch bolt	4	10	55	5.5	40	
REAR:						
Axle pinch bolt	1	8	32	3.2	23	
Axle nut	1	18	110	11.0	80	
Left shock absorber mount bolt (Upper)	1	8	23	2.3	17	
(Lower)	1	18	70	7.0	51	
Right shock absorber mount bolt (Upper)	1	8	23	2.3	17	
(Lower)	1	8	23	2.3	17	
Air hose bolt	3	10	6	0.6	4	
Air hose special bolt (with seat)	1	10	15	1.5	11	
Outlet air hose joint	2	8	6	0.6	4	
Air pressure sensor	1	8	6	0.6	4	
Air distributor solenoid valve mounting screw	4	5	3	0.3	2	
Swing arm right pivot bolt	1	30	100	10.0	72	
Swing arm left pivot bolt	1	30	19	1.9	14	
Swing arm left pivot lock nut	1	30	90	9.0	65	NOTE 7
FINAL DRIVE:						
Pinion bearing retainer	1	70	150	15.0	108	
Pinion joint nut	1	16	110	11.0	80	NOTE 2
Gear case cover bolt (10 mm)	2	10	63	6.3	46	NOTE 2
(8 mm)	6	8	26	2.6	19	
Final drive gear case mounting nut	4	10	65	6.5	47	
Final drive gear case filler cap	1	30	12	1.2	9	
Final drive gear case drain bolt	1	14	20	2.0	14	
Dust guard plate bolt	1	6	10	1.0	7	
Retainer lock washer bolt	1	6	10	1.0	7	
HYDRAULIC BRAKE:						
Caliper bleed valve	3	7	6	0.6	4	
Front caliper bracket bolt	2	8	23	2.3	17	
Anti-dive piston bolt	2	6	12	1.2	9	
Front pad pin plug	4	10	2.5	0.25	1.8	
Front pad pin	4	10	18	1.8	13	
Brake hose bolt	6	10	30	3.0	22	
Rear master cylinder mounting bolt	2	6	12	1.2	9	
Rear caliper retainer bolt	1	6	11	1.1	8	
Rear caliper bolt	1	8	23	2.3	17	
Rear caliper pin bolt	1	12	28	2.8	20	
Metal brake line nut	4	10	17	1.7	12	
Brake pedal bolt	1	8	25	2.5	18	

Torque specifications listed above are for important fastners. Other should be tightened to standard torque values listed below.

STANDARD TORQUE VALUES

Item	Torque Values N•m (kg-m, ft-lb)	Item	Torque Values N•m (kg-m, ft-lb)
5 mm bolt and nut	5 (0.5, 4)	5 mm screw and 6 mm flange	4 (0.4, 3)
6 mm bolt and nut	10 (1.0, 7)	6 mm screw and 6 mm flange bolt with 8 mm head	9 (0.9, 7)
8 mm bolt and nut	22 (2.2, 16)	6 mm flange bolt and nut	12 (1.2, 9)
10 mm bolt and nut	35 (3.5, 25)	8 mm flange bolt and nut	27 (2.7, 20)
12 mm bolt and nut	55 (5.5, 40)	10 mm flange bolt and nut	40 (4.0, 29)

TOOLS

SPECIAL

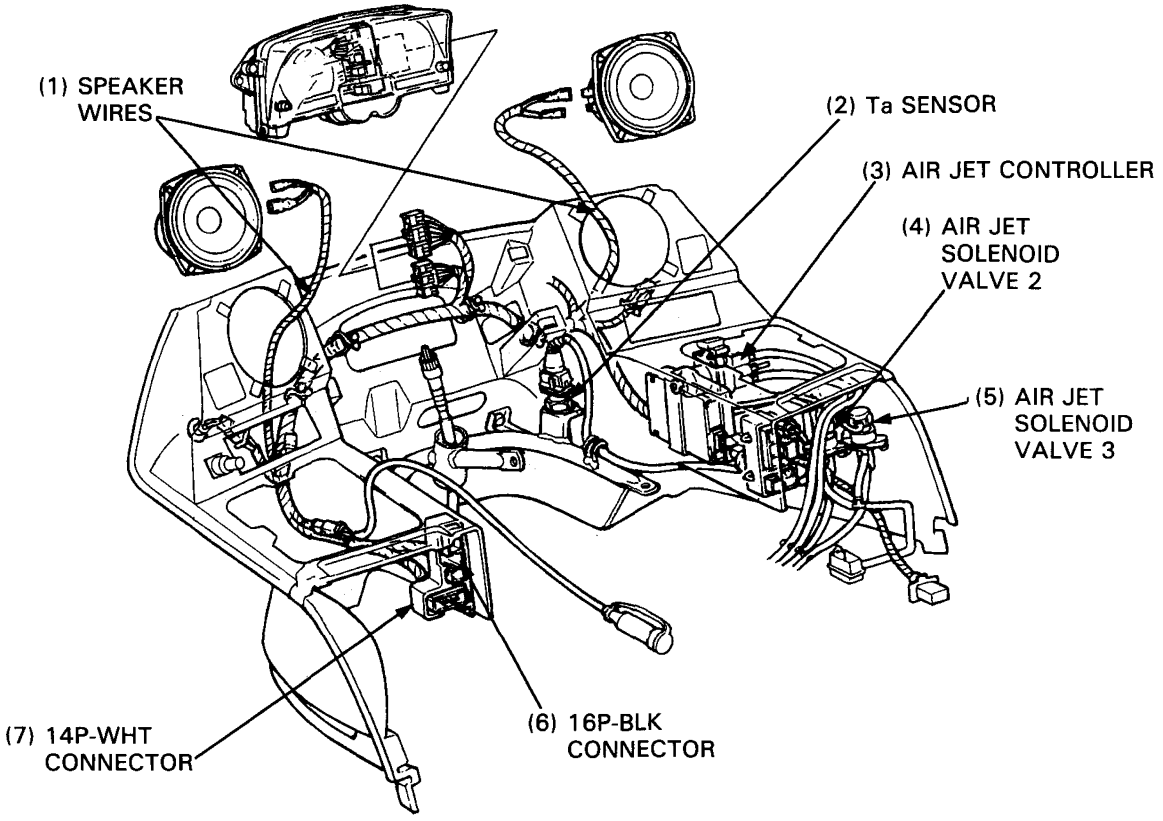
DESCRIPTION	TOOL NUMBER	REF. SECTION(S)
Oil filter wrench	07HAA—PJ70100	2
Pilot screw wrench	07KMA—MS60100 (SW model only)	25
Hydraulic tappet breeder	07973—MJ00000 or 07973—ME90000	7
Valve guide reamer, 5.5 mm	07984—2000001	7
Shim selection gauge	07974—MG90000	7
Snap ring pliers	07914—3230001	8, 16
Clutch center holder	07JMB—MN50300	8
Oil seal driver attachment	07965—MA10200	8
Clutch outer holder	07JMB—MN50100	2, 8, 9, 19
Lock nut wrench, 46 mm	07JMA—MN50100	8
Mainshaft holder	07JMB—MN50200	9, 10
Lock nut wrench, 30 x 64 mm	07916—MB00001	9
Bearing remover	07936—3710300	9
Remover handle	07936—3710100	9
Remover sliding weight	07741—0010201	9
Attachment, 28 x 30 mm	07946—1870100	9
Bearing driver attachment	07GAD—SD40101	9
*Piston ring compressor	07955—3710000 (2 pcs)	10
*Piston ring compressor	07JMG—MN50300 (1 pc.)	
*Piston base set	07JMG—MN50101	10
—piston base A	07JMG—MN50121 (2 pcs. required)	10
—piston base B	07JMG—MN50111 (1 pc.)	10
*Piston pin driver collar	07KMF—MT20200	25
*Piston base head	07JGF—001010A	25
Piston base	07973—6570500 } Included in Pistion Pin	25
Piston pin driver pilot	07973—6570400 } Dis/Assembly Tool set	25
Piston pin driver	07973—6570201 } (07973—6570002)	25
Crankcase assembly guide	07JMG—MN50200	10
Steering stem socket	07916—3710100	13
Steering stem driver	07946—MB00000	13
Ball race remover	07953—4250002	13
Bearing race remover	07946—3710500	13
Fork seal driver	07947—KA50100	14
Fork seal driver attachment	07947—KF00100	14
Shock absorber compressor	07GME—0010000 or 07959—3290001	14
Shock absorber compressor attachment	07959—MB10000	14
Oil seal driver	07965—KE80100	14
Oil seal driver attachment	07965—MA60100	14
Lock nut wrench	07908—4690001	14
Pivot bearing outer race remover	07936—4150000	14
Pinion joint holder attachment	07924—9690100 (Modified) or 07924—9690102	15
Pinion joint holder	07924—ME40000	15
Retainer wrench	07910—MA10100	15
Bearing race insert attachment	07931—4630300	15
Driver shaft	07946—MJ00100	15
Oil seal remover (final drive)	07948—4630100	15
Oil seal driver attachment (final drive)	07965—MB00100	15
Shaft puller	07931—ME40000	15
Attachment (ring gear bearing)	07947—6340100	15
Inner base	07965—3710300	15
Inspection adaptor (P1)	07508—0013600	18
Tester Harness	07508—0014600	18
Pin driver, 4 mm	07944—SA00000	19

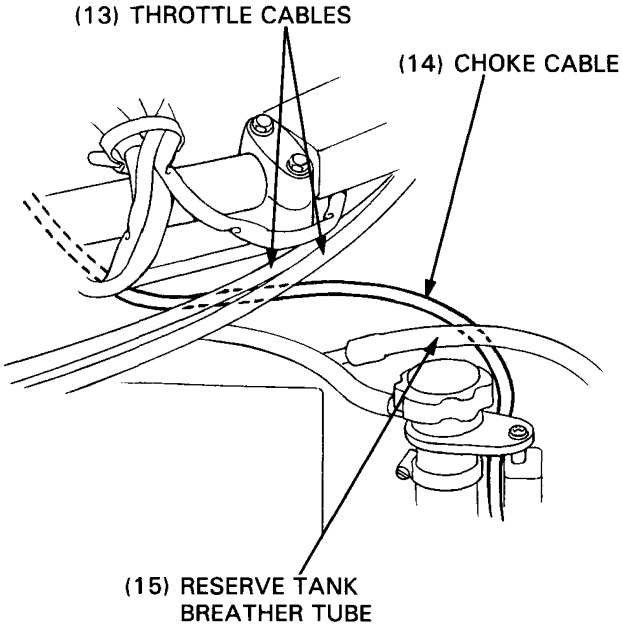
: The tools marked "" are new for this model.

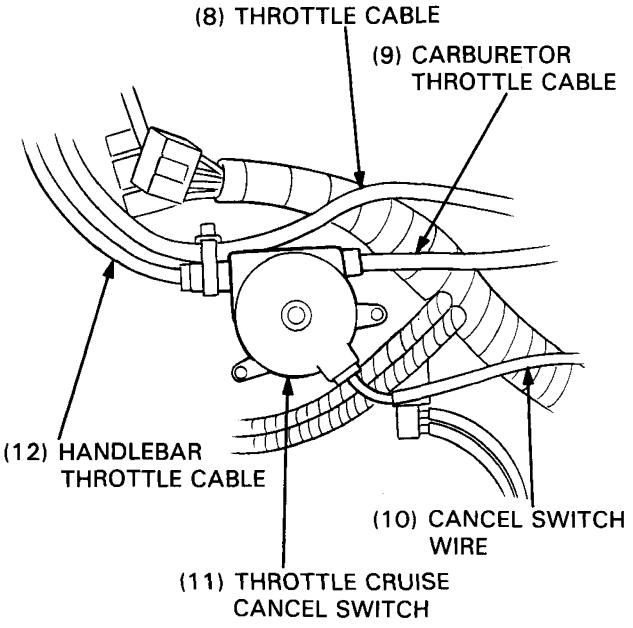
COMMON

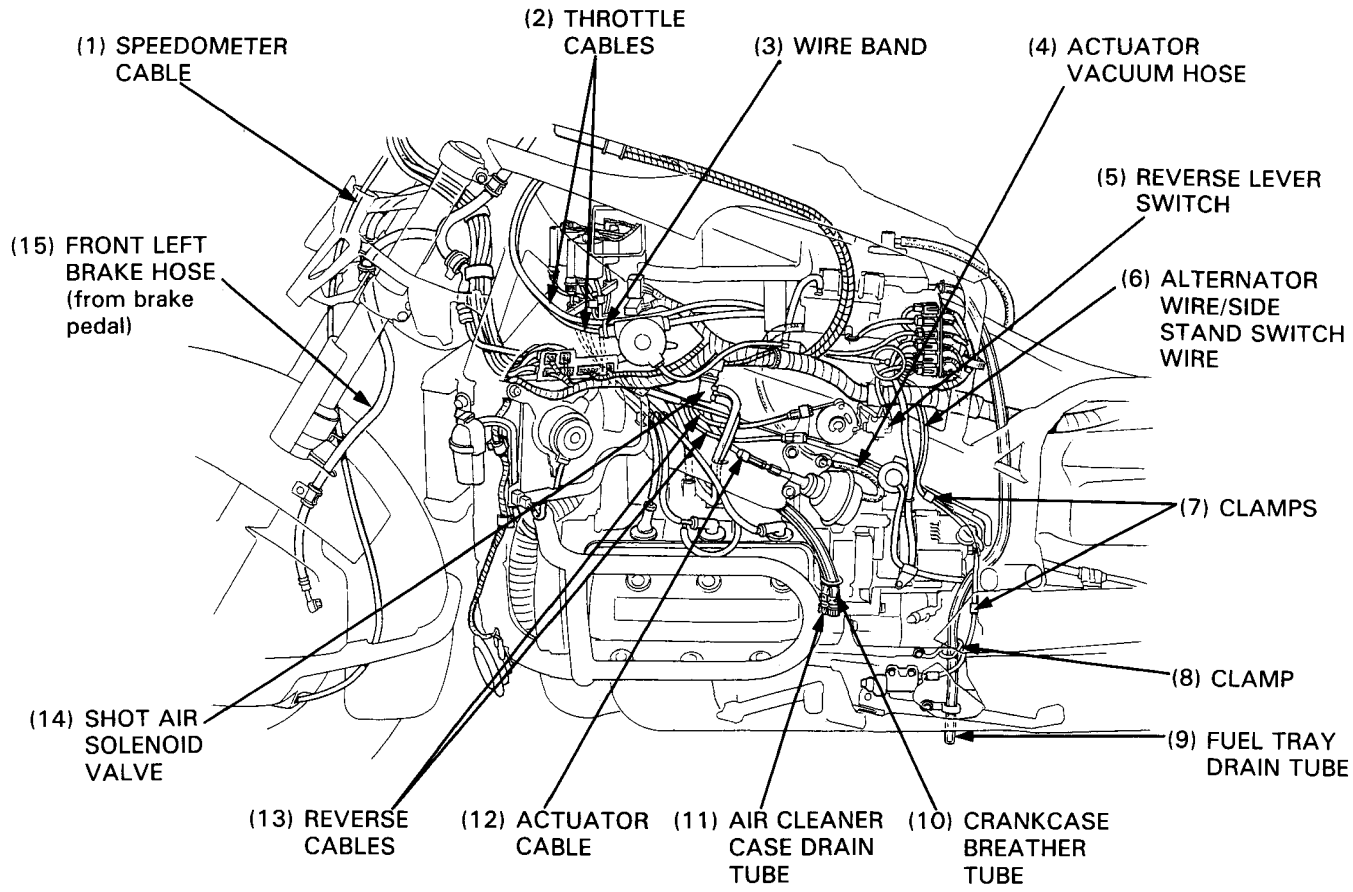
DESCRIPTION	TOOL NUMBER	REF. SECTION(S)
Oil pressure gauge	07506—3000000	2
Oil pressure gauge attachment	07510—4220100	2
Vacuum gauge	07404—0020000 or 07404—0030000	3
Vacuum gauge attachment (except SW model)	07510—3000100	3
Float level gauge	07401—0010000	4
Vacuum pump	equivalent commercially available	4, 14, 18
Pressure pump		4, 14
Valve spring compressor	07757—0010000	7
Valve guide remover, 5.5 mm	07742—0010100	7
Universal holder	07725—0030000	7, 17, 19
Valve seat cutter		7
—seat cutter, 33 mm (45° IN/EX)	07780—0010800	
—flat cutter, 30 mm (32° EX)	07780—0012200	
—flat cutter, 35 mm (32° IN)	07780—0012300	
—interior cutter, 30 mm (60° EX)	07780—0014000	
—interior cutter, 37.5 mm (60° IN)	07780—0014100	
—cutter holder, 5.5 mm	07781—0010101	
Extention bar	07716—0020500	2, 8, 9, 19
Driver	07749—0010000	8, 9, 13, 14, 15, 17, 19
Attachment, 32 x 35 mm	07746—0010100	8, 9
Pilot, 28 mm	07746—0041100	9
Inner driver B	07746—0020100	9
Attachment, 17 mm I.D.	07746—0020300	9
Attachment, 42 x 47 mm	07746—0010300	9, 13
Pilot, 22 mm	07746—0041000	9
Attachment, 62 x 68 mm	07746—0010500	9, 15
Pilot, 30 mm	07746—0040700	9
Pilot, 17 mm	07746—0040400	9
Pilot, 12 mm	07746—0040200	9
Piston ring compressor	Equivalent commercially available	11
Bearing remover shaft	07746—0050100	13
Bearing remover head, 20 mm	07746—0050600	13
Pilot, 20 mm	07746—0040500	13, 17, 19
Lock nut wrench, 30 x 32 mm	07716—0020400	13
Attachment, 52 x 55 mm	07746—0010400	13, 15
Seal remover pump	Equivalent commercially available	14
Socket bit	07703—0020500	14
Attachment, 37 x 40 mm	07746—0010200	14, 19
Universal bearing puller	07631—0010000	15
Inner driver C	07746—0030100	15
Attachment, 25 mm I.D.	07746—0030200	15
Inner driver C	07746—0030100	17
Attachment, 30 mm I.D.	07746—0030300	17
Bearing puller	Equivalent commercially available	17
Soldering iron	Equivalent commercially available	17
Digital multimeter	07411—0020000	4, 5, 14, 17, 18, 19, 20, 21, 22
Circuit tester (SANWA)	07308—0020001	
or circuit tester (KOWA)	TH-5H	
Battery charger	equivalent commercially available	17
Battery tester		17
Torx bit	07703—0010200	19
Flywheel holder	07725—0040000	19
Attachment, 20 mm I.D.	07746—0020400	19
Attachment, 24 x 26 mm	07746—0010700	19

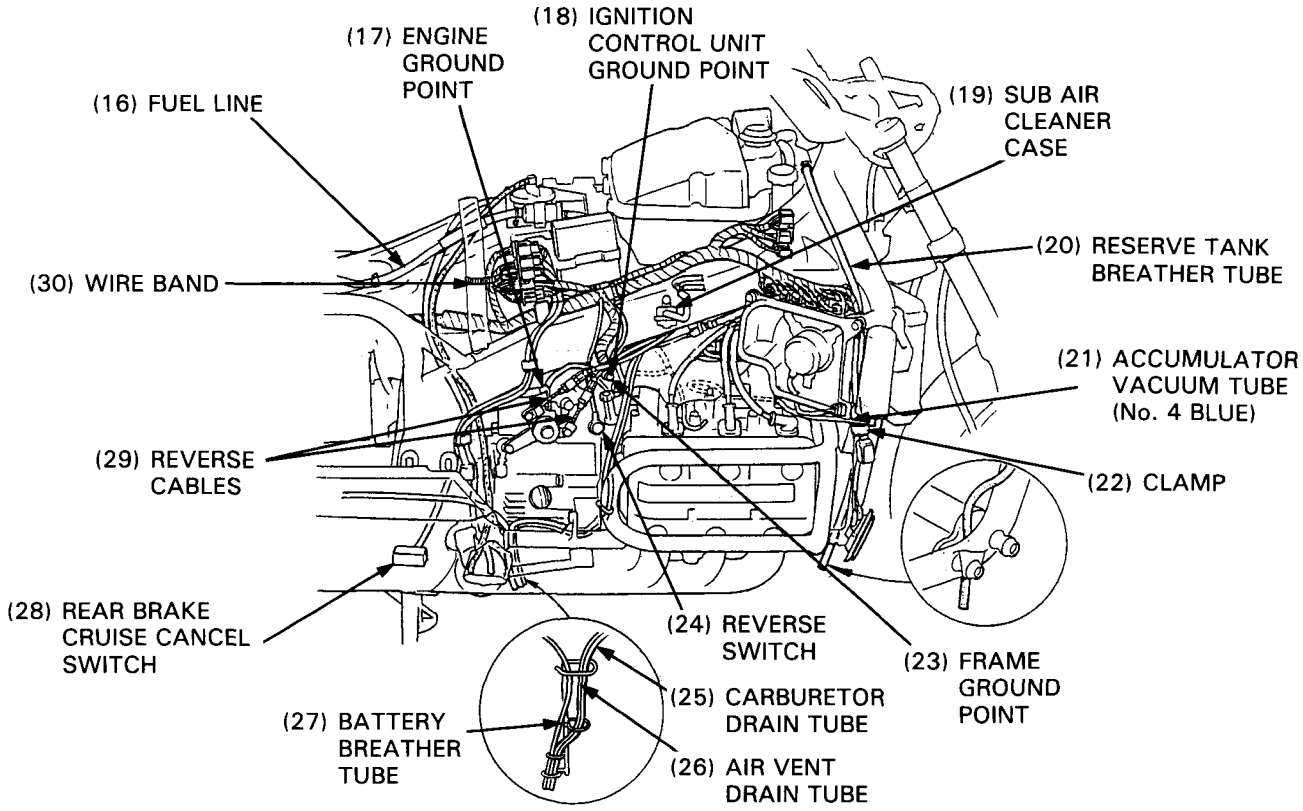
CABLE & HARNESS ROUTING








(1) SPEEDOMETER CABLE
(2) THROTTLE CABLES
(3) WIRE BAND
(4) ACTUATOR VACUUM HOSE
(5) REVERSE LEVER SWITCH
(6) ALTERNATOR WIRE/SIDE STAND SWITCH WIRE
(7) CLAMPS
(8) CLAMP
(9) FUEL TRAY DRAIN TUBE
(10) CRANKCASE BREATHER TUBE
(11) AIR CLEANER CASE DRAIN TUBE
(12) ACTUATOR CABLE
(13) REVERSE CABLES
(14) SHOT AIR SOLENOID VALVE
(15) FRONT LEFT BRAKE HOSE (from brake pedal)

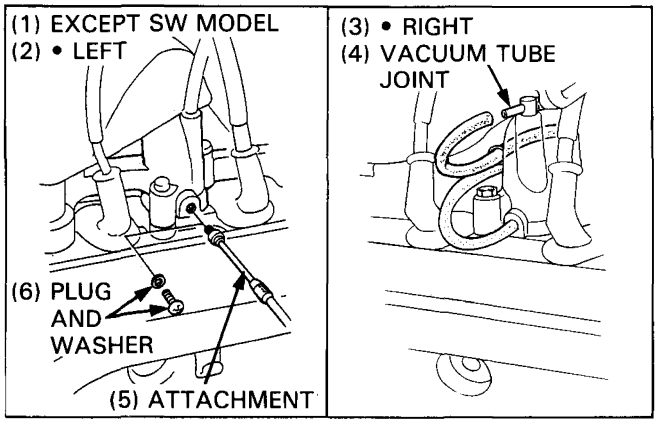

(16) FUEL LINE
(17) ENGINE GROUND POINT
(18) IGNITION CONTROL UNIT GROUND POINT
(19) SUB AIR CLEANER CASE
(20) RESERVE TANK BREATHER TUBE
(21) ACCUMULATOR VACUUM TUBE (No. 4 BLUE)
(22) CLAMP
(23) FRAME GROUND POINT
(24) REVERSE SWITCH
(25) CARBURETOR DRAIN TUBE
(26) AIR VENT DRAIN TUBE
(27) BATTERY BREATHER TUBE
(28) REAR BRAKE CRUISE CANCEL SWITCH
(29) REVERSE CABLES
(30) WIRE BAND

CARBURETOR SYNCHRONIZATION

NOTE

- Synchronize the carburetors with the engine at normal operating temperature, the transmission in neutral and the motorcycle supported on its center stand.

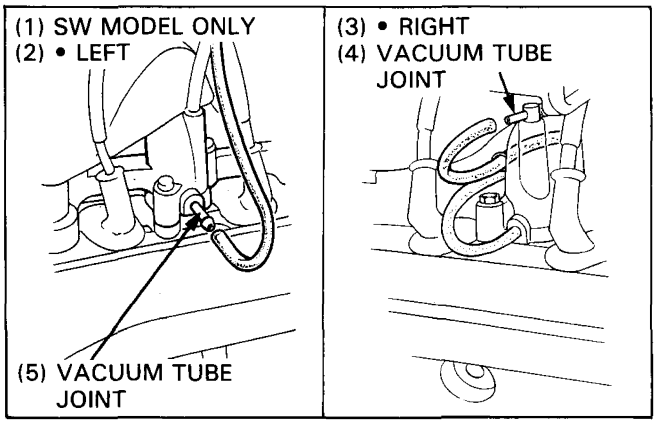
Remove the following:
— fairing lower covers (page 12-9).
— right fairing inner cover (page 12-9).
— No. 2 (BLU) vacuum tube from the right intake manifold vacuum tube joint.



except SW model:
— plug and washer from the left intake manifold
Install the vacuum gauge attachment onto the left intake manifold.

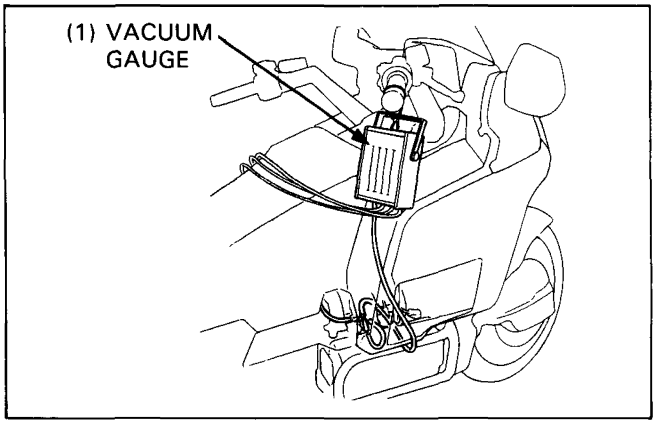
TOOL:
Vacuum gauge attachment **07510—3000100**

SW model only:
Disconnect the No. 6 (GRN) vacuum tube from the left intake manifold vacuum tube joint.



Connect the vacuum gauge tubes onto the left attachment (or tube joint) and right vacuum tube joint.

TOOL:
Vacuum gauge **07404—0020000 or 07404—0030000**

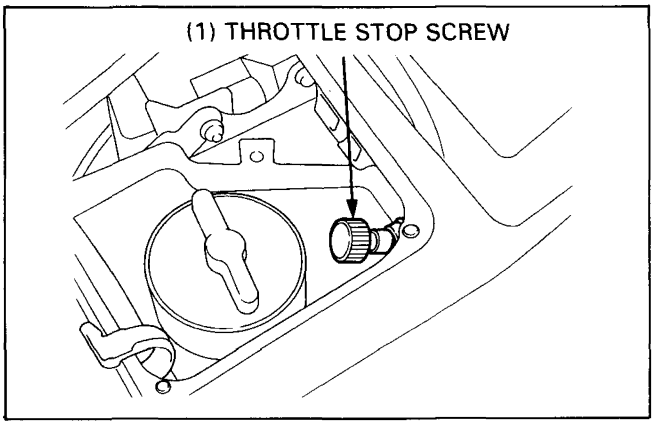


Start the engine and adjust the idle speed with the throttle stop screw.

IDLE SPEED: 800 ± 80 min^{-1} (rpm)

SW model only: 900 ± 50 min^{-1} (rpm)

Check that the difference in vacuum readings is 40 mm (1.6 in) Hg or less.



If adjustment is necessary, remove the access grommet in the right cooling fan shroud and insert a screwdriver into the shroud. Turn the adjusting screw until the vacuum gauge readings are within specification.

NOTE

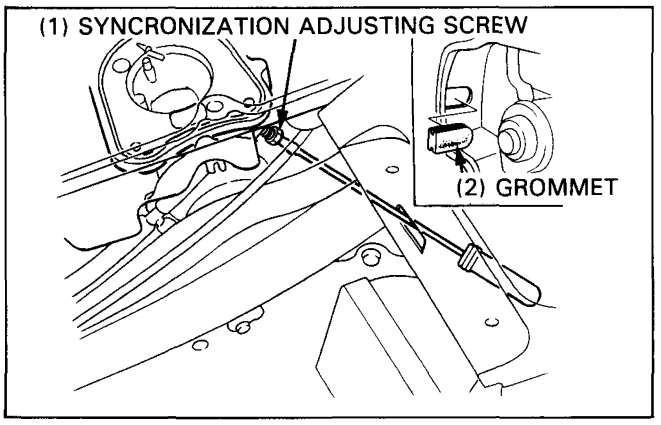
- The left (base) carburetor cannot be adjusted.

Start the engine and rev it up several times.

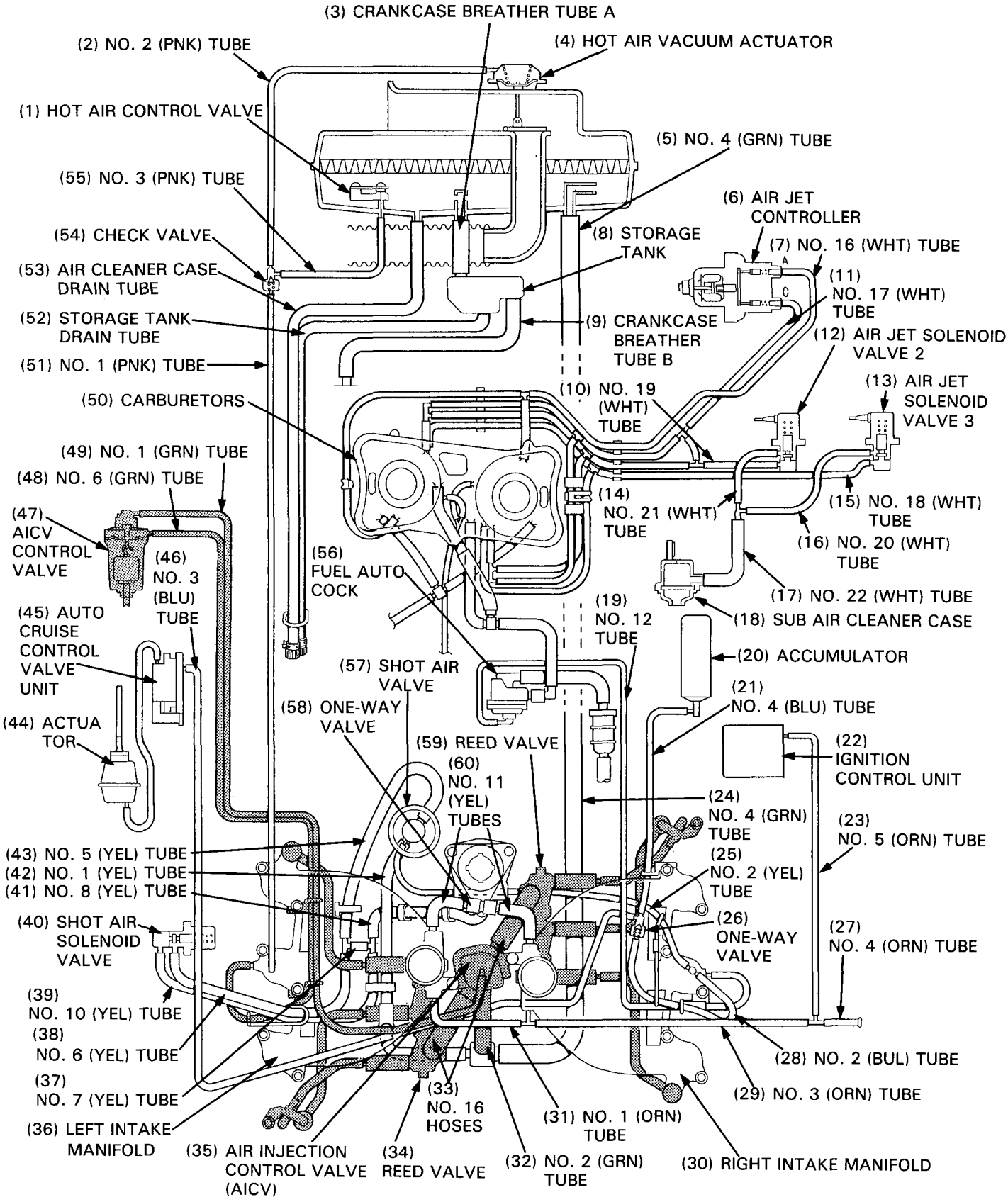
Recheck the synchronization and idle speed.

CAUTION

- *Take care to avoid injury working in proximity to the fan motor.*



HOSES AND TUBES ROUTING/CONNECTION (▒ : SW MODEL ONLY)

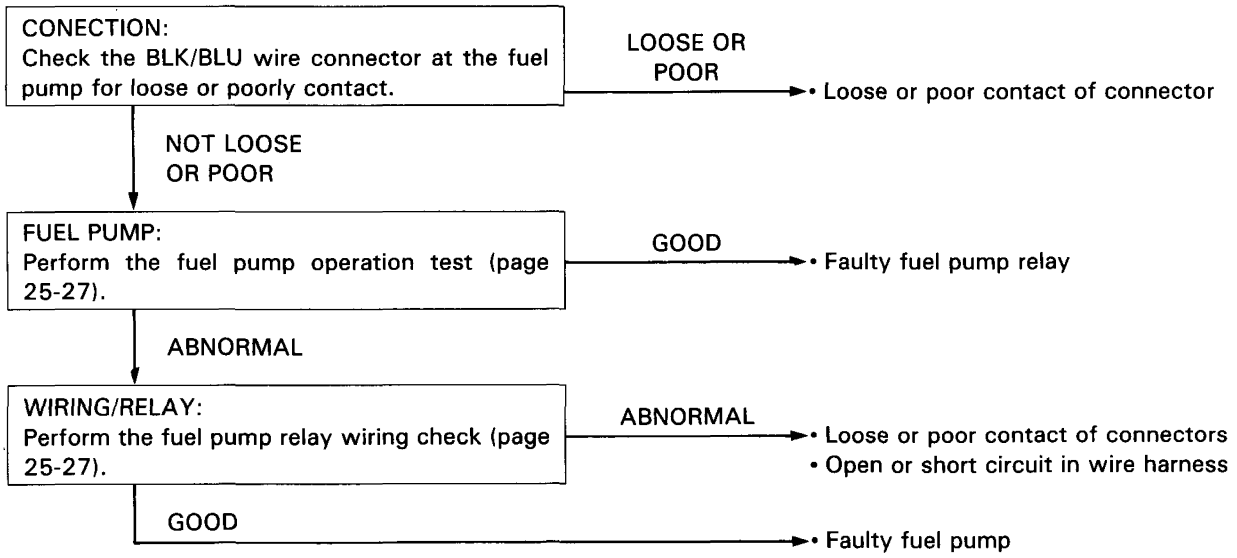


FUEL SYSTEM TROUBLESHOOTING

The fuel pump will not be operated well.

NOTE

- Be sure that the main fuse B, fuses 2 and 12 are good. Replace any suspect fuses.

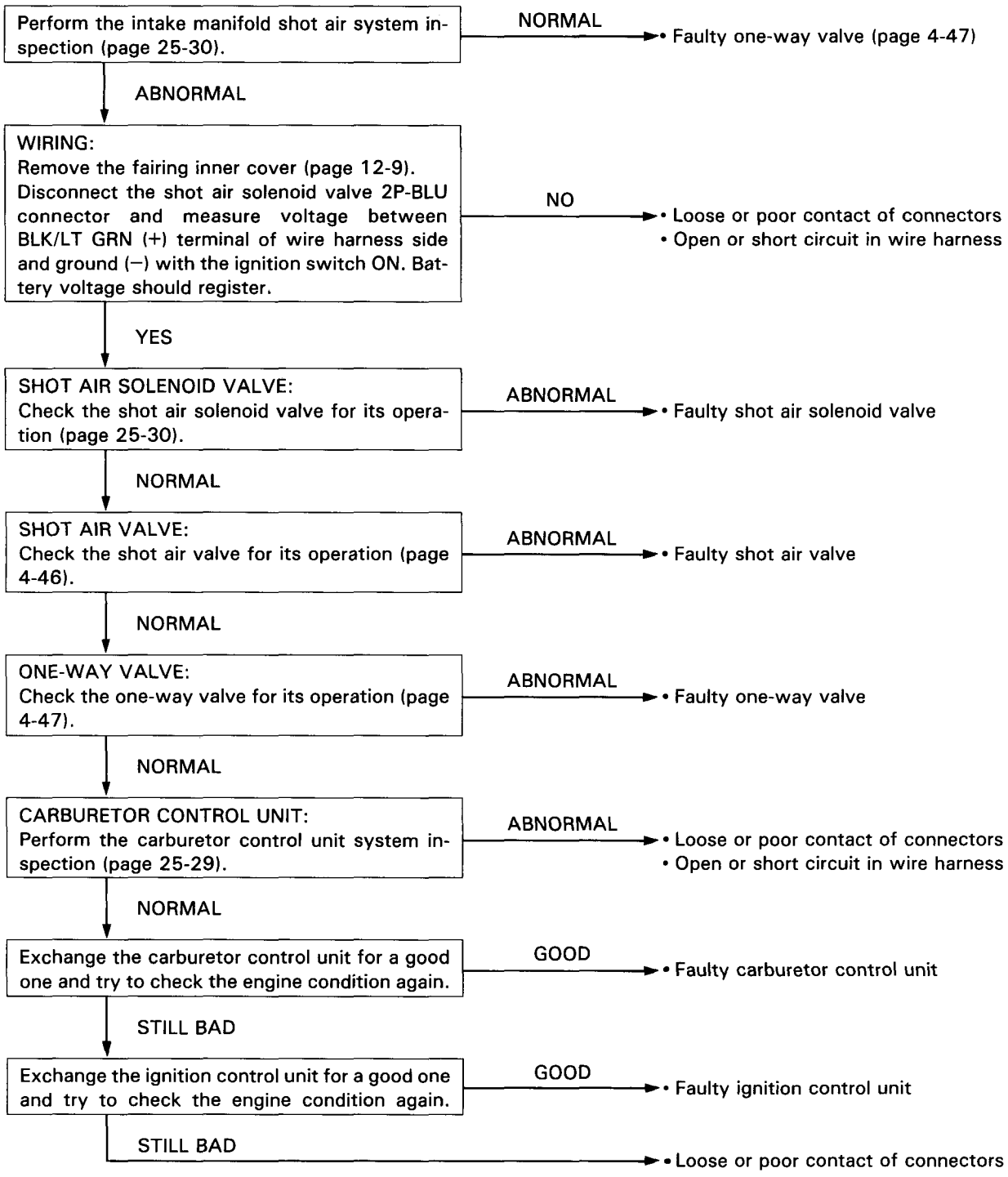


● **Intake Manifold Shot Air System**

NOTE

- Check the following tubes for disconnection or deterioration before troubleshooting.
  —No.4 (GRN), No.1 (YEL), No.2 (YEL), No.5 (YEL), No.6 (YEL), No.7 (YEL), No.8 (YEL), No.10 (YEL) and No.11 (YEL).

The engine speed will not drop smoothly and mildly.

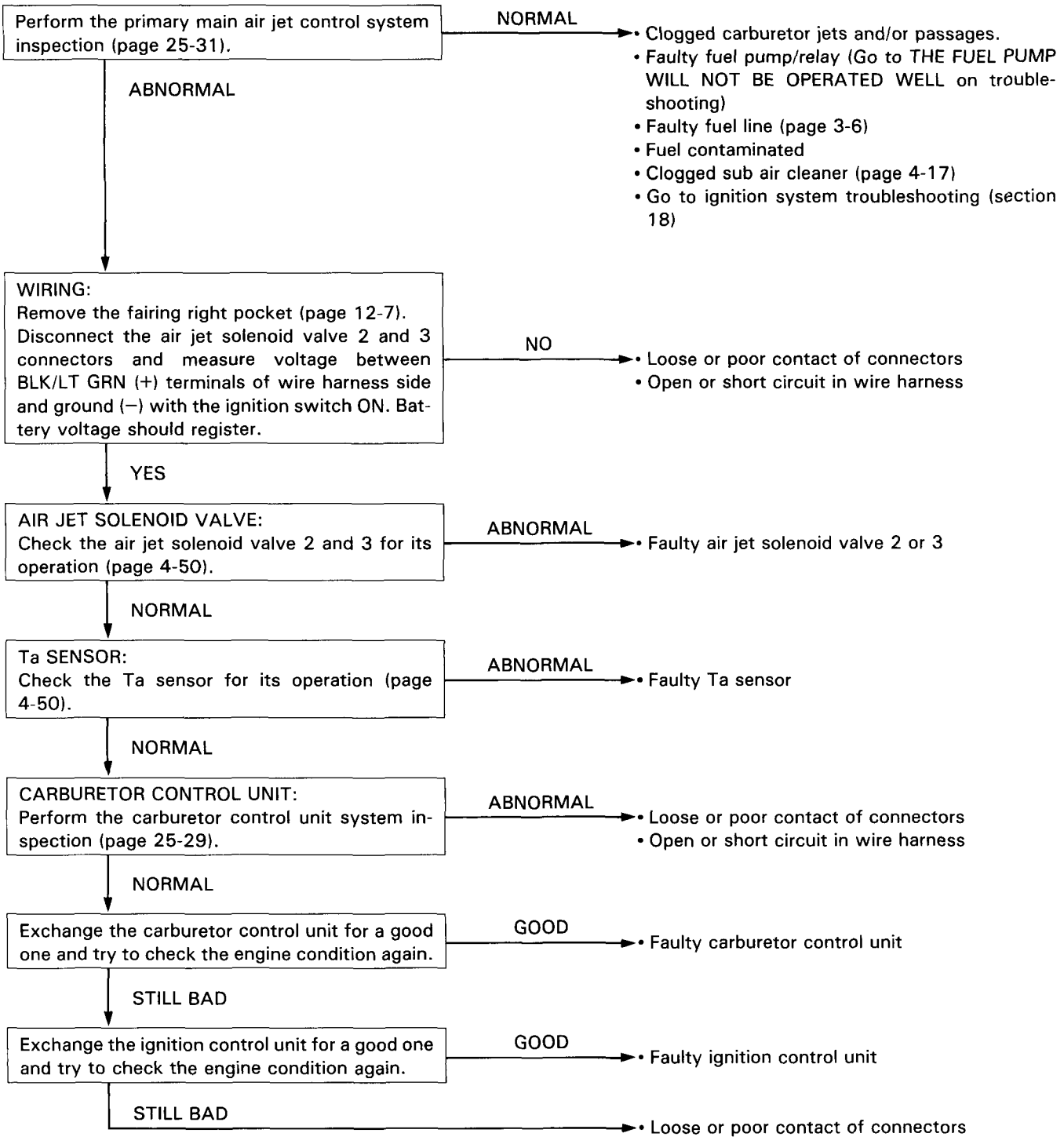


• **Primary Main Air Jet Control System**

NOTE

- Check the following tubes for disconnection or deterioration before troubleshooting.
  —No.18 (WHT), No.19 (WHT), No.20 (WHT), No.21 (WHT), No.22 (WHT), No.1 (ORN), No.3 (ORN), No.4 (ORN) and No.5 (ORN).

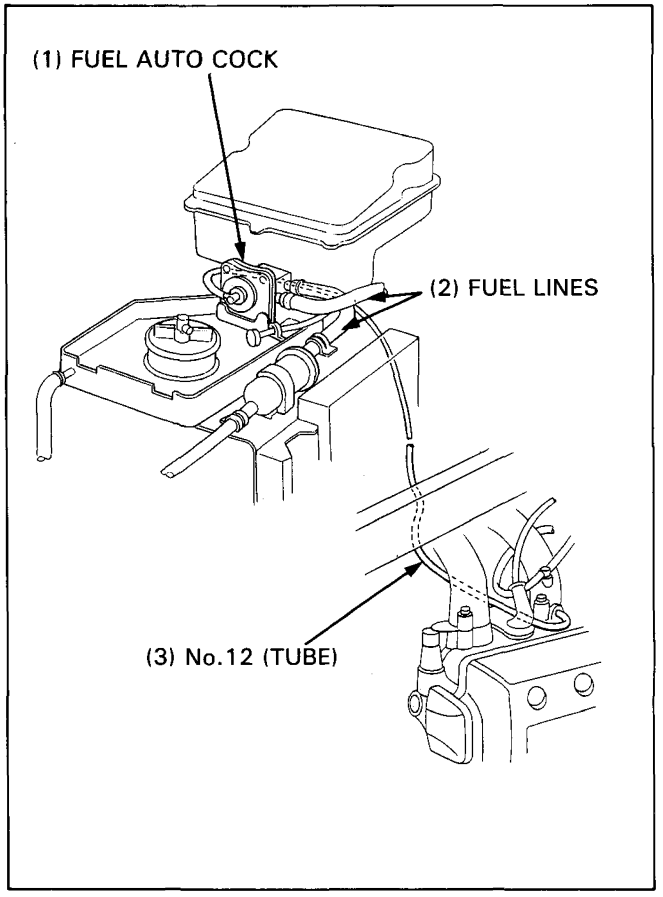
Poor performance (driveability) and poor fuel economy.



FUEL AUTO COCK

INSPECTION

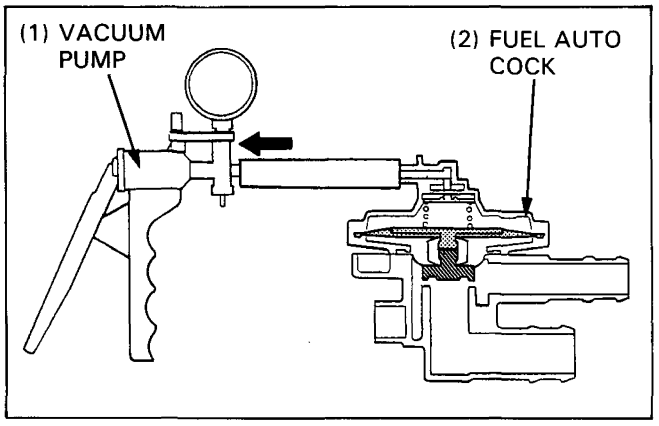
Check No.12 tube for clogging, bend or looseness.
Check the fuel lines for improper connections.



Connect a vacuum pump as shown.
Apply the specified vacuum to the fuel auto cock.

SPECIFIED VACUUM: 200 mmHg (7.9 inHg)

Vacuum should be maintained.
If the vacuum is not held, replace the auto cock.

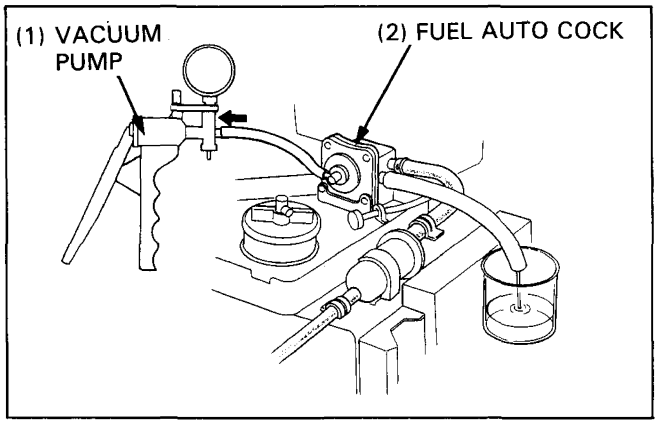


Disconnect the fuel outlet line from the fuel auto cock. Connect a suitable tube to the auto cock outlet port and hold a graduated beaker under the tube.

Short the BLK/WHT and BLK/BLU wire connector terminals of fuel pump relay (page 25-27/fuel pump operation test).

Turn the ignition switch ON and the engine stop switch RUN.
The gasoline should not flow out.

Then, keeping on above conditions, apply vacuum to the auto clock.
Vacuum should be maintained and the gasoline should flow out smoothly.
Replace the auto cock if necessary.



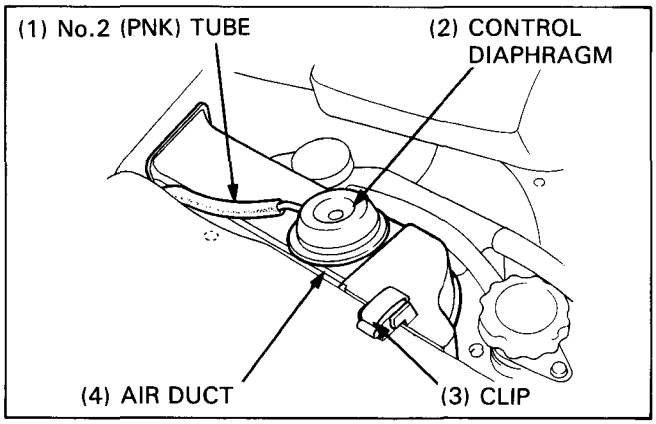
AIR CLEANER CASE

REMOVAL

Remove the top compartment (page 12-7).
Disconnect the No.2 (PNK) tube from the hot air control diaphragm.
Remove the clip and air duct.

NOTE

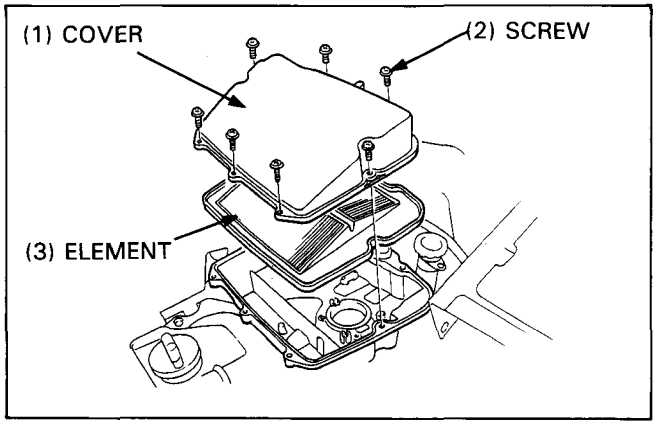
- For control valve removal, see page 4-51.



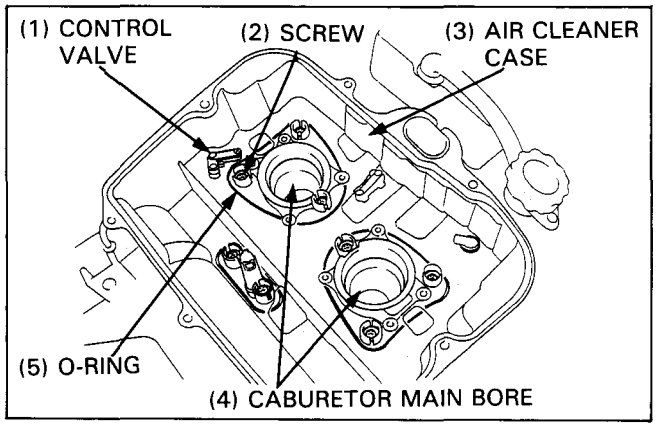
Remove seven screws and air cleaner case cover.
Remove the air cleaner element.

NOTE

- Do not drop anything into the carburetors.

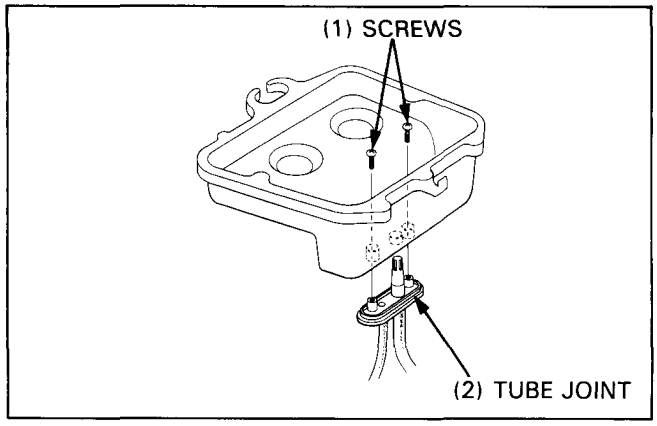


Remove the six screws and the air cleaner case from the carburetor.



Remove the two screw and the air cleaner tube joint from the case.
Disconnect the No.3 (PNK) and No.4 (GRN) tubes from air cleaner case and remove the case.

Remove the O-rings from the carburetor.

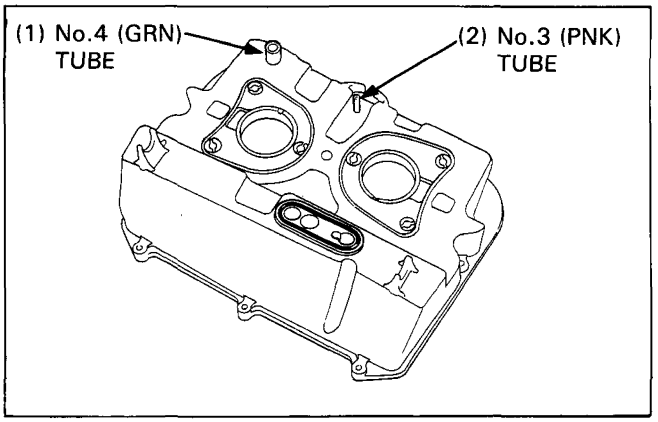


INSTALLATION

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

NOTE

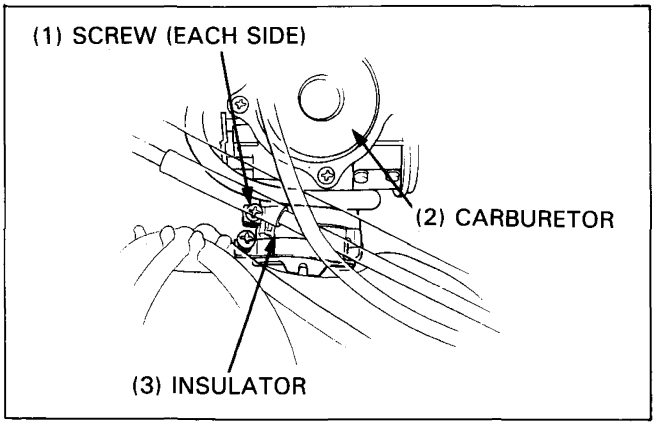
- Connect the related hoses to the air cleaner case as shown.



CARBURETOR REMOVAL

Drain coolant (page 5-7).
Remove the following:
— fairing inner covers (page 12-9).
— air cleaner case (page 25-20).

Loosen the carburetor insulator band screws (upper side, near carburetor) and remove the carburetor from insulators.

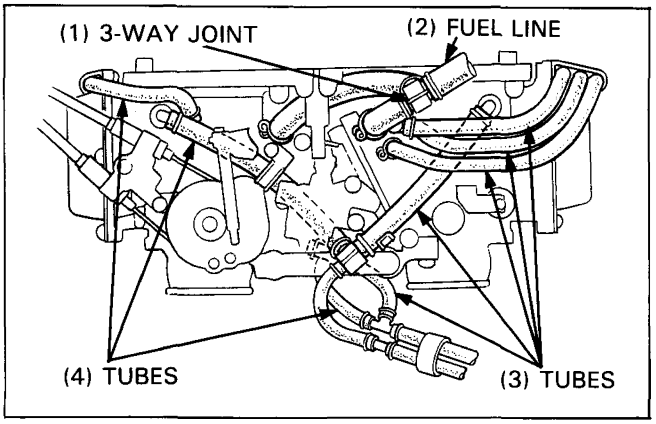


Disconnect the fuel line from the 3 way joint.

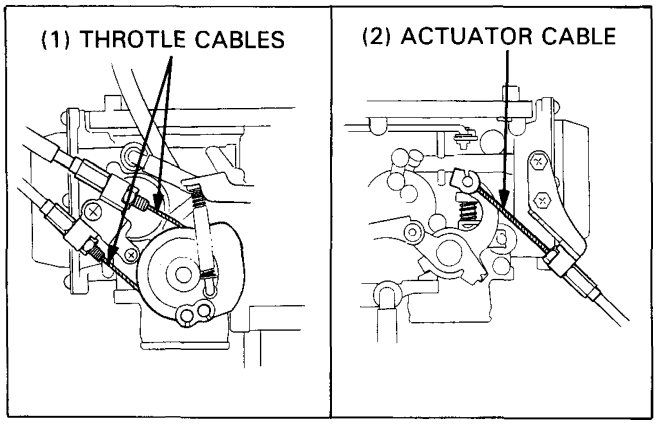
⚠ WARNING

- ***Keep gasoline away from flames or sparks. Wipe up spilled gasoline at once.***

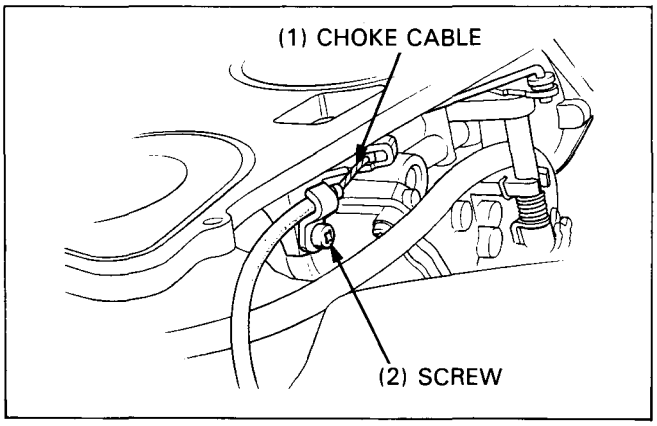
Disconnect all air and fuel vapor tubes from carburetors.



Disconnect the throttle and actuator cables from the throttle drum by loosening the cable lock nuts.



Loosen the choke cable holder screw and disconnect the choke cable.

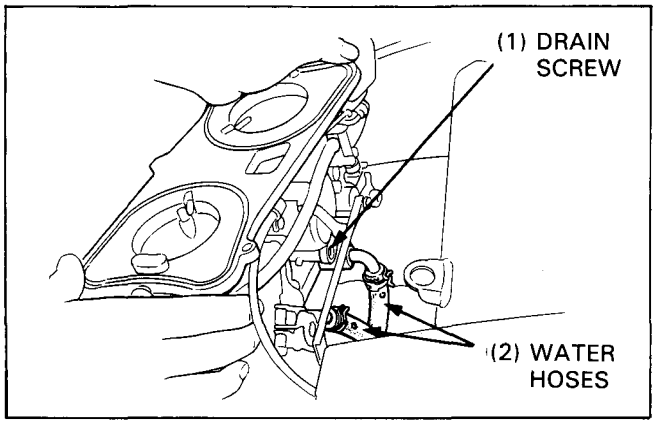


Disconnect water hoses from the carburetor heat riser.
Remove carburetor assembly.

NOTE

- Place a suitable container under the carburetor to catch residual coolant from the carburetor heat riser.
- Cover intake manifold bores with a shop towel to prevent dropping anything into the engine.

After removal, drain fuel out of the float chambers into a suitable container by loosening drain screws.
For intake manifold service, see page 25-25.



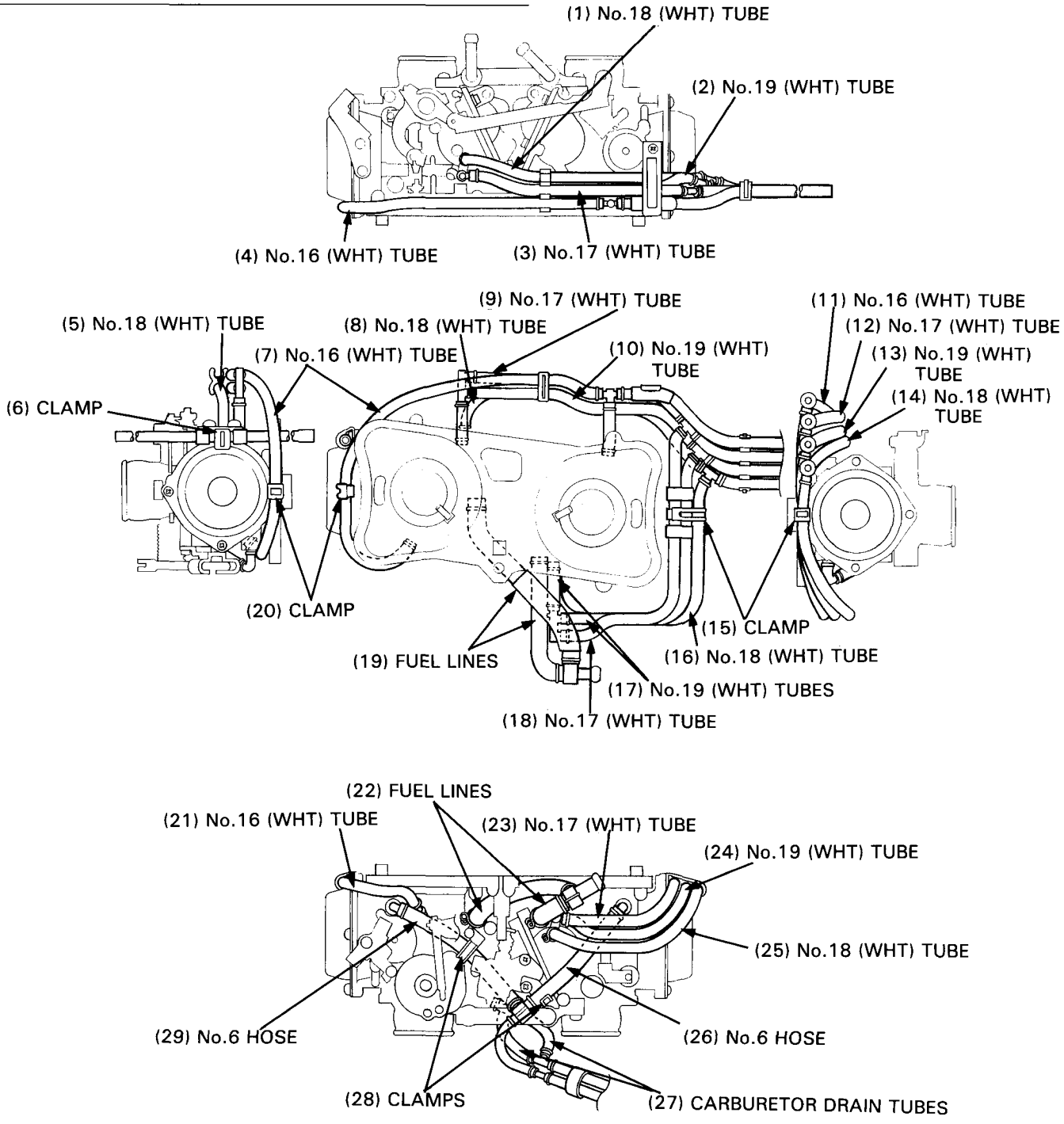
⚠ WARNING

- ***Keep gasoline away from flames or sparks. Wipe up spilled gasoline at once.***

CARBURETOR TUBES/HOSES

NOTE

- Be careful not to bend, twist or kink the tubes when installing.
- Install new tubes if the current tubes are deteriorated or damaged.
- Slide the end of each tube fully onto its fitting, and secure with a tube clamp.
- After installing the carburetors on the engine, check that the tubes do not contact sharp edges or corners.

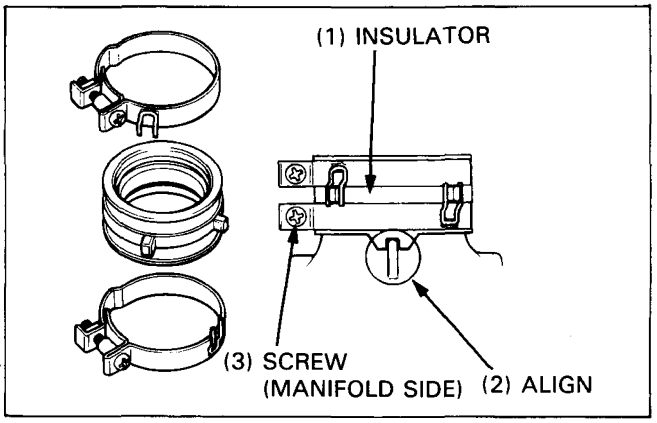


CARBURETOR INSTALLATION

If the carburetor insulator was removed, install the insulator onto the intake manifold, aligning the insulator groove with the manifold rib.

Secure the screw of the manifold side.

TORQUE: 5 N·m (0.5 kg-m, 3.6 ft-lb)

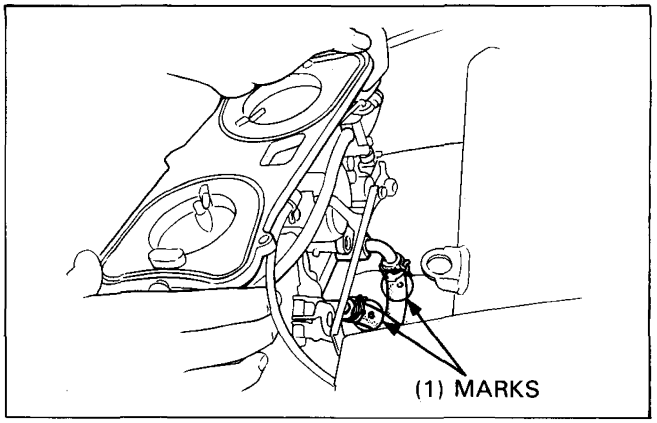


Connect the water hoses to the carburetor heat riser.

NOTE

- Connect the "C" marked hose to the left pipe; "D" marked hose to the right pipe.

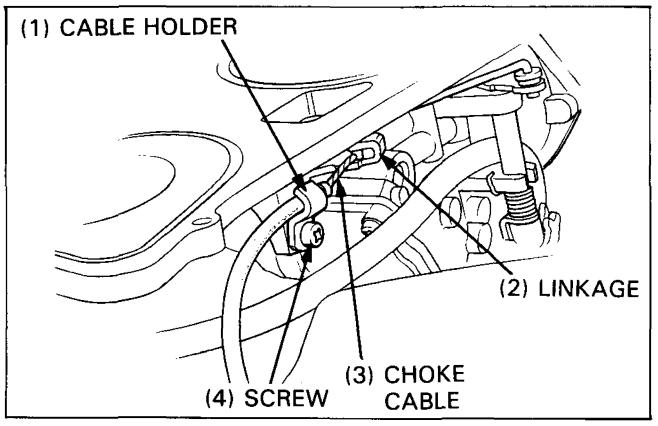
Secure the hoses with clamps.



Connect the choke cable to the choke linkage. Align the end of the cable outer housing with the edge of the cable holder.

Tighten the cable holder screw securely.

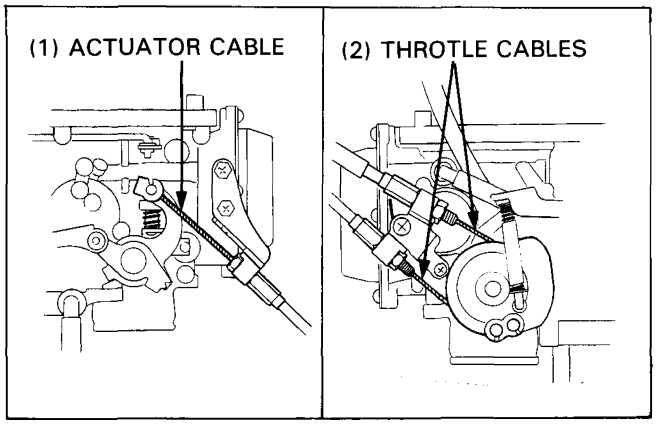
Make sure that the choke linkage end does not contact the cable outer housing when the choke lever is fully open.



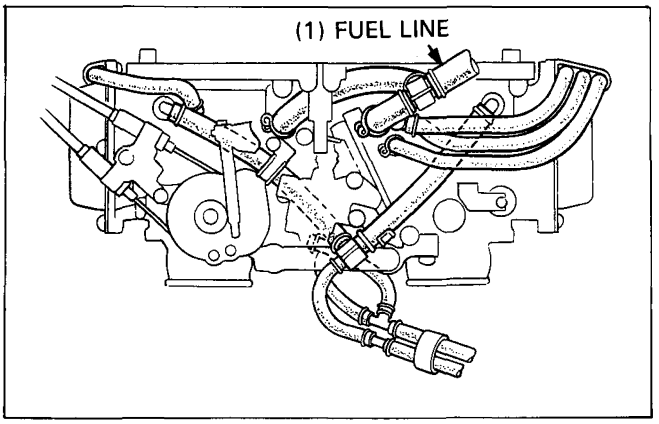
Connect the actuator and throttle cables to the throttle drum and tighten the lock nuts.

NOTE

- Front cable: from the actuator.
- Rear upper cable: from the throttle grip.
- Rear lower cable: from the switch box.



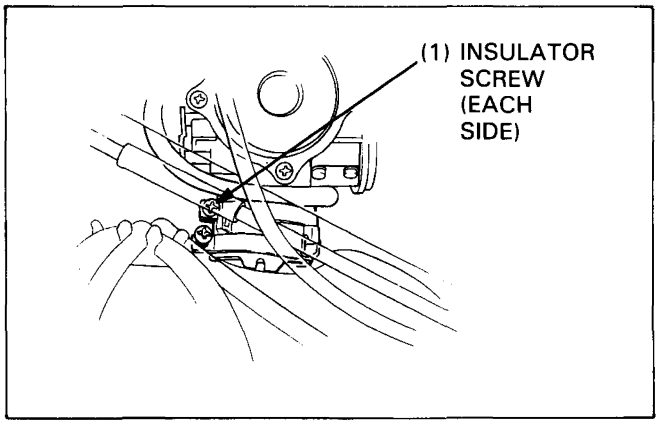
Connect the fuel line to the 3 way joint.



Install the carburetor onto the insulators and secure the screws to the specified torque.

TORQUE: 5 N·m (0.5 kg-m, 3.6 ft-lb)

Connect all hoses and tubes, refering to the hoses and tubes routing/connection (page 25-15).

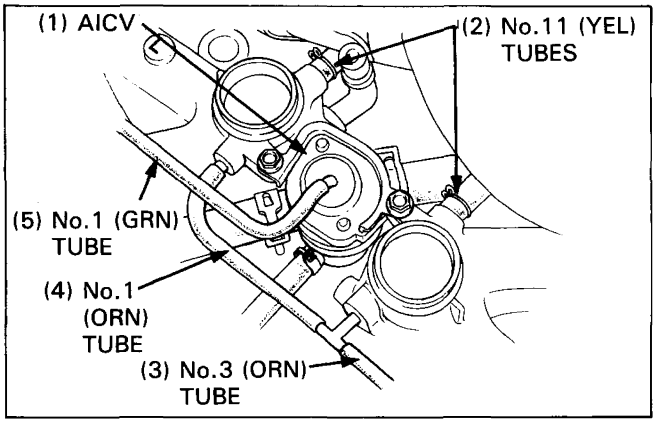


INTAKE MANIFOLD

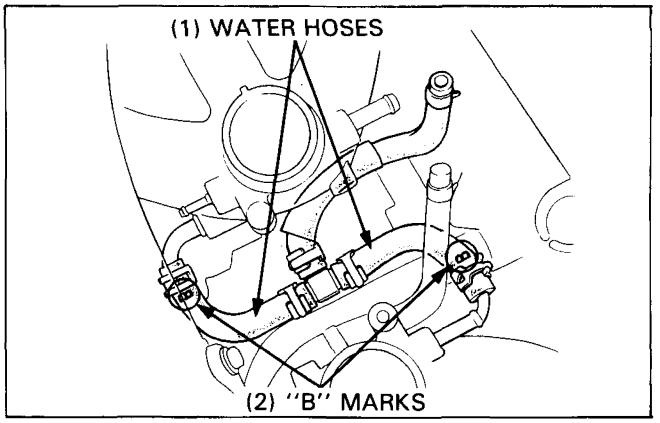
REMOVAL

Remove the following:
—air cleaner case (page 25-20).
—carburetors (page 25-21).
—heat guard.
—insulators.
SW model only:
—air injection control valve (AICV) (page 4-53).

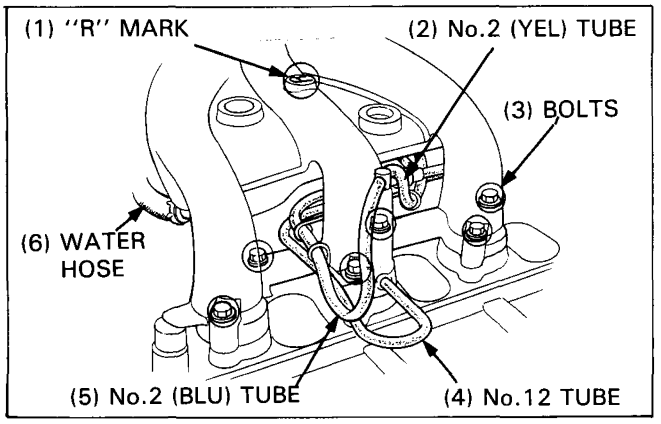
Disconnect vacuum tubes (No.11: YEL, No.1: GRN, No.1: ORN, No.3: ORN) from intake manifolds.



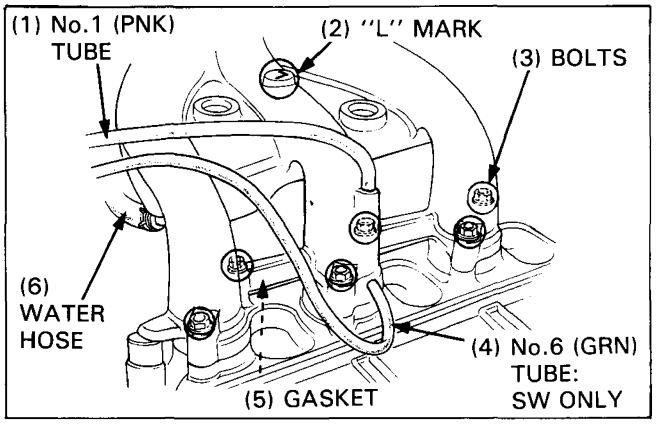
Disconnect water hoses (B marked hoses) from intake manifold riser pipes.



Disconnect the vacuum tubes (No.2 (BLU), No.2 (YEL) and No.12) and water hose from the right intake manifold.
Remove the six bolts, the right intake manifold and gasket.



Disconnect vacuum tubes (No.1: PNK, No.6: GRN: SW model only) and water hose from the left intake manifold.
Remove six bolts, left intake manifold and gasket.

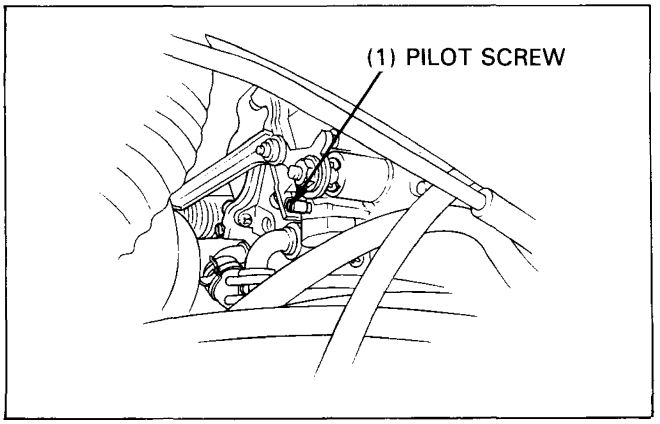


PILOT SCREW ADJUSTMENT

Idle Drop Procedure

NOTE

- The pilot screws are factory pre-set and no adjustment is necessary unless the pilot screws are replaced.
- Use a tachometer with graduations of 50 min^{-1} (rpm) or smaller that will accurately indicate a 50 min^{-1} (rpm) change.
- Turn on an electric fan to cool the coolant.



Remove the cooling fan (page 5-10).

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

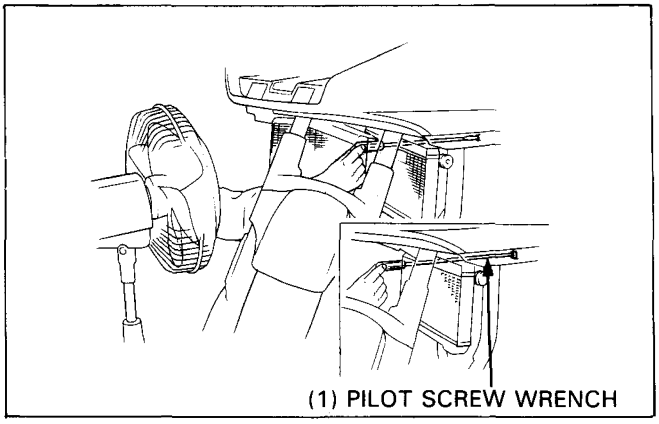
Initial Opening: 1-1/2 turns out
(SW model: 1-7/8 turns out)

CAUTION

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

TOOL:

Pilot screw wrench	**07KMA—MS60100** **(SW model only)**

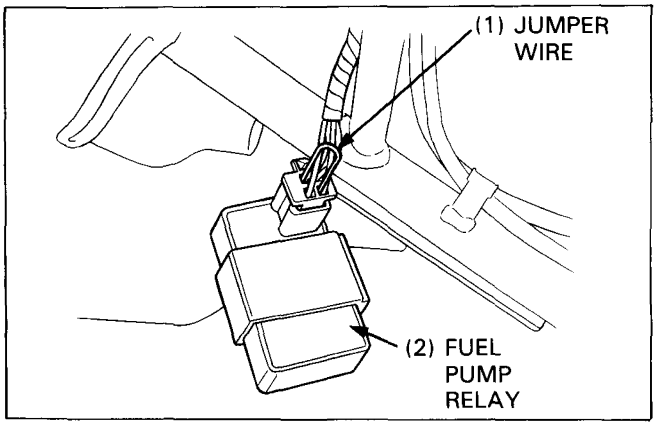


2. Warm up the engine to operating temperature. Stop and go driving for 10 minutes is sufficient.
3. Attach a tachometer according to the manufactuer's instructions.
4. Adjust the idle speed with the throttle stop screw.
5. Turn each pilot screw 1/2 turn out from the initial setting.
6. If the engine speed increases by 50 min^{-1} (rpm) or more, turn each pilot screw out a continual 1/2 turn until engine speed drops by 50 min^{-1} (rpm) or less.
7. Adjust the idle speed with the throttle stop screw.
8. Turn the left carburetor pilot screw in until the engine speed drops 50 min^{-1} (rpm).
9. Turn the left carburetor pilot screw 1 turn out from the position obtained in step 8.
10. Adjust the idle speed with the throttle stop screw.
11. Perform steps 8,9 and 10 for the right carburetor pilot screw.

FUEL PUMP/RELAY

FUEL PUMP OPERATION TEST

Remove the right saddlebag and top compartment (page 12-13, 7).
Turn the ignition switch OFF. Remove the fuel pump relay from the relay stay and short the BLK/WHT and BLK/BLU wire connector terminals with a jumper wire.

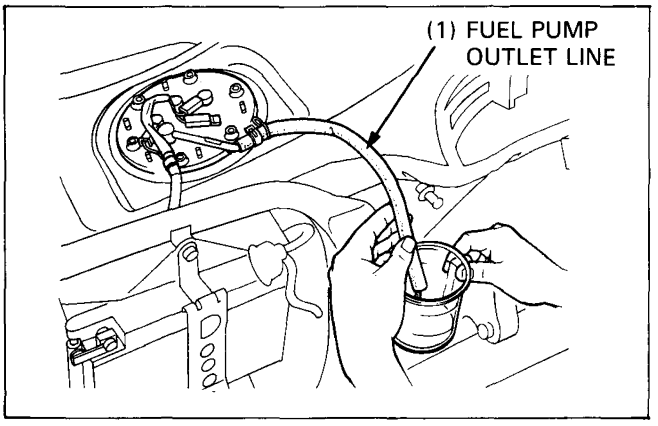


Disconnect the fuel pump outlet line at the fuel filter and hold a graduated beaker under the tube.

Turn the ignition switch ON, engine stop switch RUN and let fuel flow into the beaker for 5 seconds, then turn the ignition switch OFF.

Multiply the amount in the beaker by 12 to determine the fuel pump flow capacity per minute.

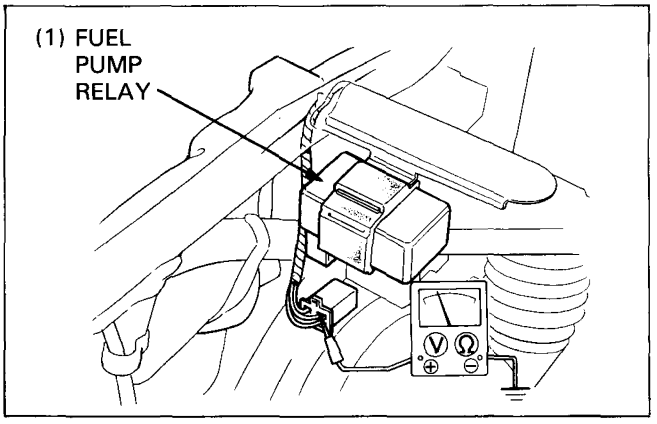
Fuel Pump Minimum Flow: 640 cm^3 (22.5 Imp oz)/minute



FUEL PUMP RELAY WIRING CHECK

Disconnect the fuel pump relay 4P-WHT connector and check it for loose contact or corroded terminals.

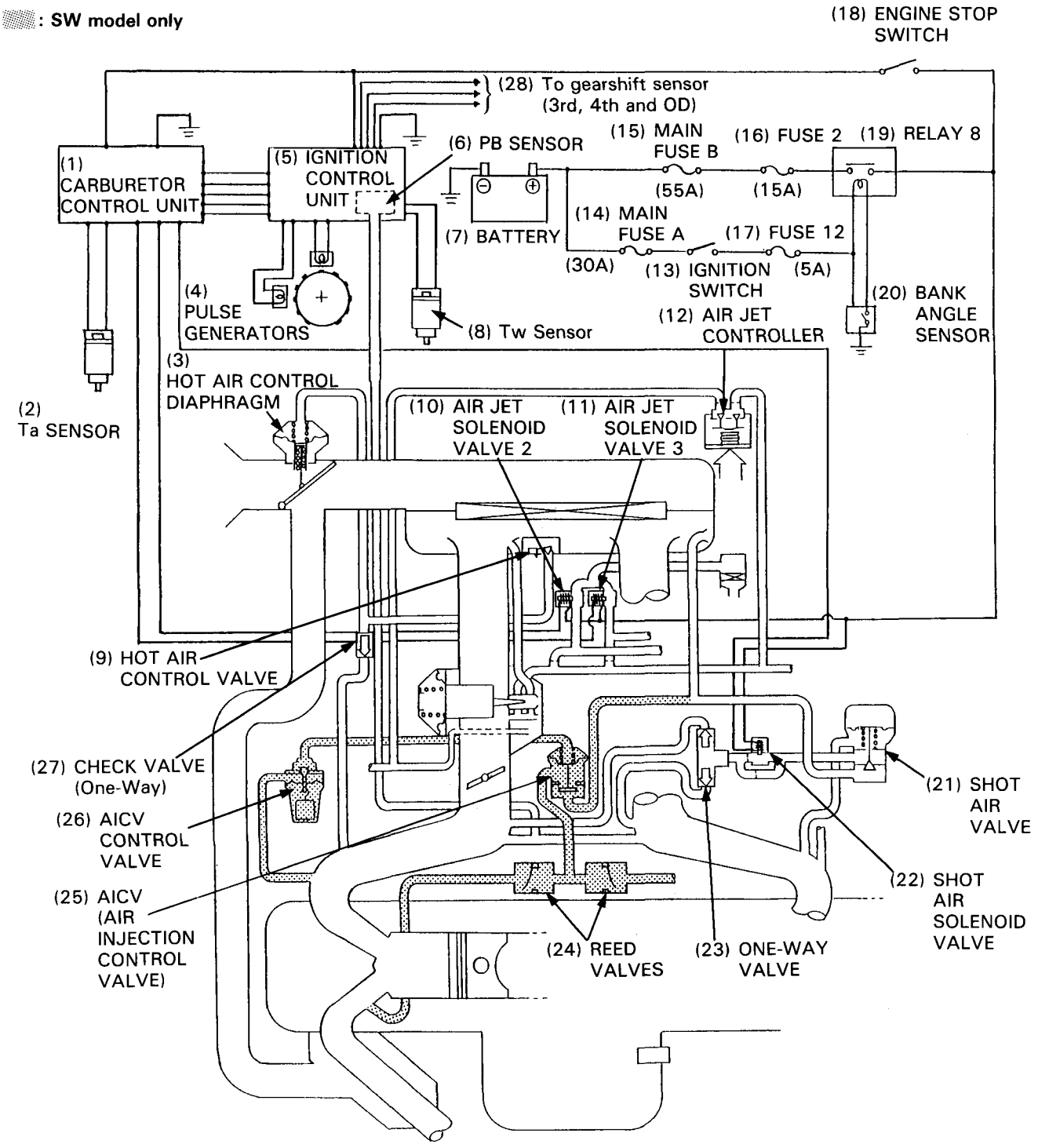
Measure the following between connector terminal of the wire harness side and body ground.



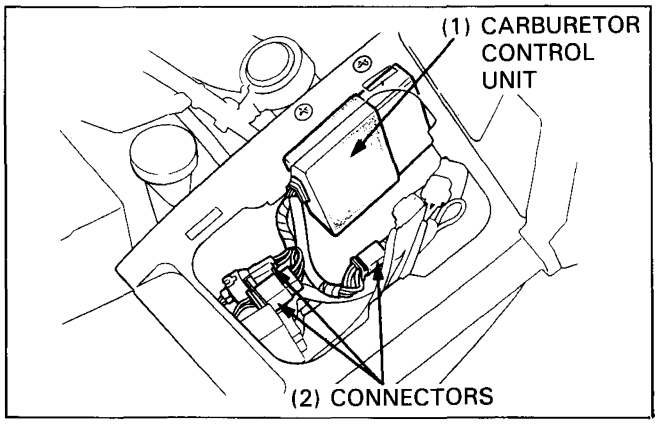
LINE	COLOR	CONDITION(S)	SPECIFICATION
Battery voltage input	BLK/WHT (+)	Engine stop switch: RUN Ignition switch: ON	Battery voltage should register.
Fuel pump	BLK/BLU	at all times	About 4-5 k ohms
Ignition control unit	YEL/BLU (+)	Engine stop switch: RUN Ignition switch: ON	Battery voltage should register.
Ground	GRN	at all times	CONTINUITY should be exsist

AIR SYSTEM CIRCUIT DIAGRAM

▒▒: **SW model only**



CARBURETOR CONTROL UNIT



SYSTEM INSPECTION

Remove the fairing right pocket (page 12-7).
Remove te right fairing inner cover (page 12-9).

Disconnect all carburetor control unit connectors and ignition control unit 9P-BLK and 2P-WHT connectors.
Check them for loose contact or corroded terminals.

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

NOTE

- Inspect according to the following conditions:
  Condition 1: Engine stop switch on RUN
  2: Ignition switch in ON
  3: At all times

LINE	TERMINALS	CONDITION(s)	SPECIFICATION
Battery voltage input	BLK/WHT (+) and ground (−)	1,2	Battery voltage should register
Shot air solenoid valve	RED/BLU (+) and ground (−)	2	
Air jet solenoid valve 2	RED/WHT (+) and ground (−)	2	
Air jet solenoid valve 3	RED (+) and ground (−)	2	
Ground	GRN and ground	3	CONTINUITY should exist
Ignition control unit	Between same colors of carburetor control unit connectors and ignition control unit connectors (wire harness side)	3	CONTINUITY should exist
Ta sensor	GRY and GRN/BLK	3	2.0—3.0 kohms (20°C/68°F)

INTAKE MANIFOLD SHOT AIR SYSTEM

SYSTEM INSPECTION

Remove the left and right fairing inner covers (page 12-9).

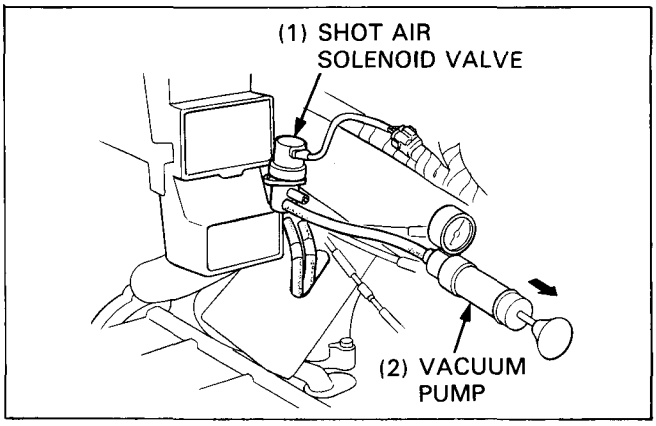
Disconnect the No.6 (YEL) and No.10 (YEL) tubes from the shot air solenoid valve.
Connect a vacuum pump as shown and apply the specified vacuum to the valve.

SPECIFIED VACUUM: 200 mm Hg (7.9 in Hg)

Start the engine.

Engine speed: Below 2,000 min^{-1} (rpm)
Air should hold steady.

Engine speed: Over (2,000 min^{-1} (rpm)
Air should flow out.



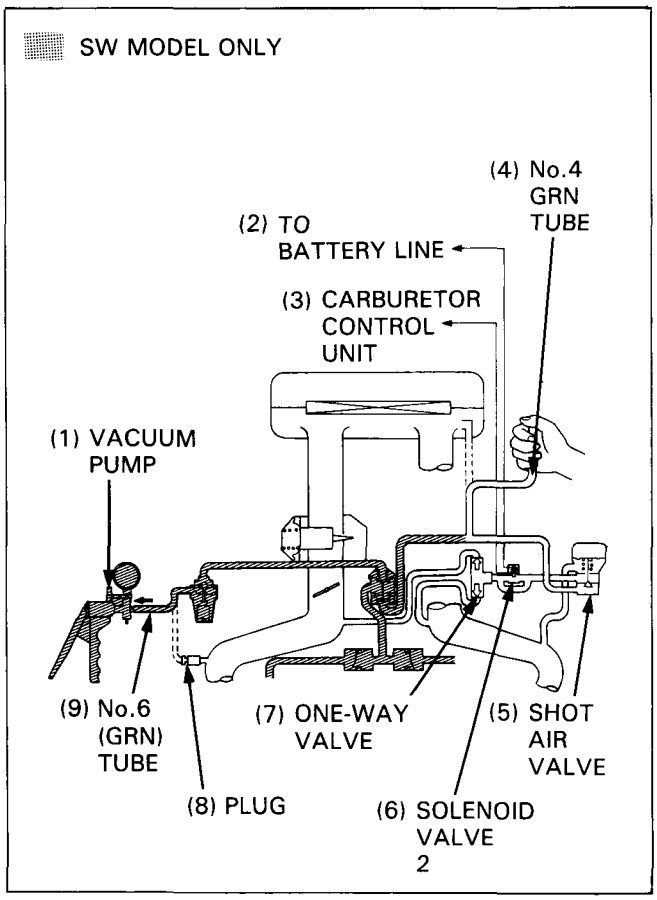
Remove the air cleaner case (page 25-20).

SW model only
Disconnect the No.6 (GRN) tube from the left intake manifold; install a plug to keep air from entering.
Connect a vacuum pump to the No.6 (GRN) tube and apply the specified vacuum. Hold vacuum.

SPECIFIED VACUUM: 600 mm Hg (23.6 in Hg)

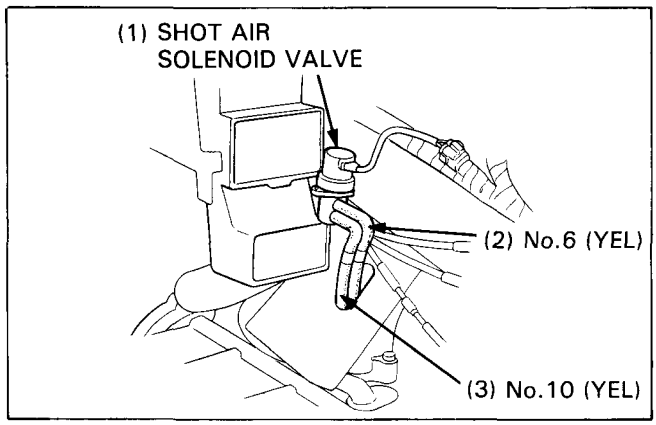
Start the engine in neutral and make sure that air should not be drawn in through No.4 (GRN) tube.

With the engine started and raise the engine speed above 2,000 min^{-1} (rpm); then close the throttle quickly, air should be sucked in through the No.4 (GRN) tube.



SHOT AIR SOLENOID VALVE CHECK

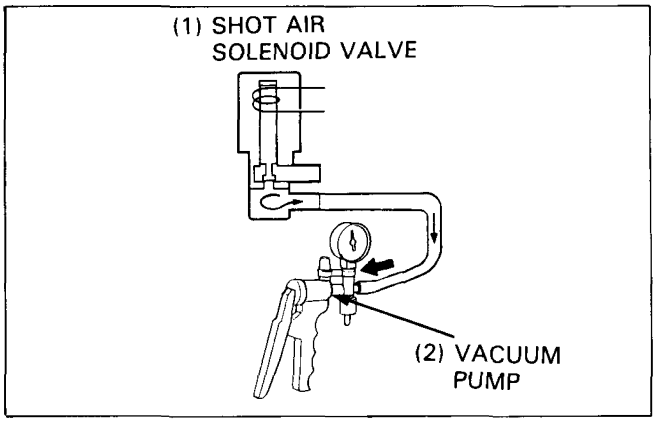
Remove the left fairing inner cover.
Disconnect air tubes and 2P-BLU connector.
Remove the shot air solenoid valve.



Remove the solenoid valve. Connect a vacuum pump as shown. Apply the specified vacuum to the valve.
Vacuum should be maintained.

SPECIFIED VACUUM: 400 mm Hg (15.7 in Hg)

Replace the valve if vacuum do not remain steady.



Connect a vacuum pump to valve as shown. Apply the specified vacuum to the valve.

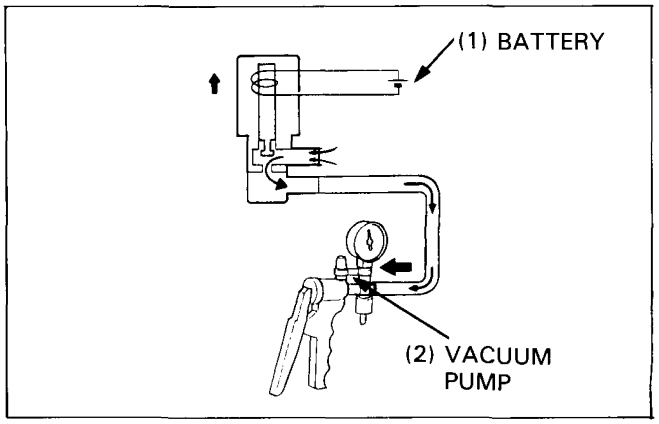
SPECIFIED VACUUM: 200 mm Hg (7.9 in Hg)

Connect a 12 V battery to the valve wires. Vacuum should be released. Replace the valve if vacuum remain steady.

Install the valve in the reverse order of removal.

NOTE

- Route the tubes properly (page 25-15) and check the tube connections for loose or poor.



PRIMARY MAIN AIR JET CONTROL SYSTEM

SYSTEM INSPECTION

Remove the right fairing inner cover (page 12-9).

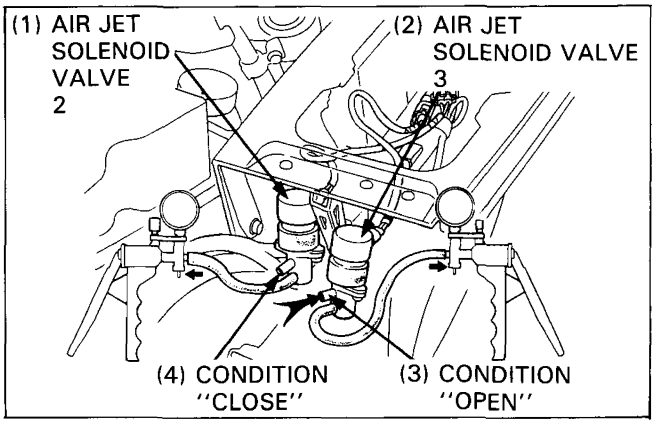
Shift the transmission into neutral.
Start the engine and warm it up to normal operating temperature.
Stop the engine.

Disconnect the No.18 (WHT), No.19 (WHT), No.20 (WHT) and No.21 (WHT) tubes from the air jet solenoid valve 2 and 3.

NOTE

- "Open" and "Close" in the chart on next page mean that:
  "Open"
  Connect a vacuum pump as shown and apply the specified vacuum. Vacuum should not be maintained.
  "Close"
  Apply the specified vacuum. Vacuum should be maintained.

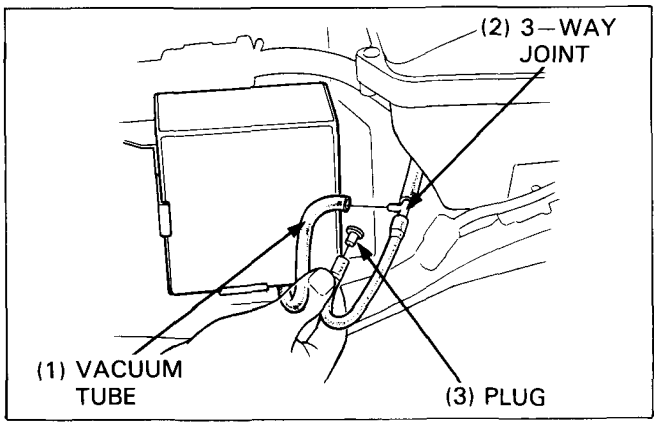
SPECIFIED VACUUM: 200 mm Hg (7.9 in Hg)



NOTE

- This test must be performed with the engine coolant temperature above 60°C (140°F) and the surrounding temperature above 20°C (68°F).

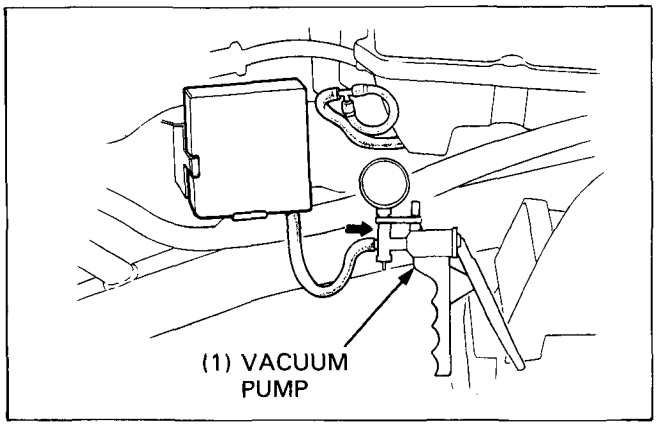
Disconnect the vacuum tube that goes from the ignition control unit to the 3-way joint. Remove the plug from the dead end tube, and connect the tube to the 3-way joint as shown.



NOTE

- Do not lose the plug.

Connect a vacuum pump to the ignition control unit vacuum tube.



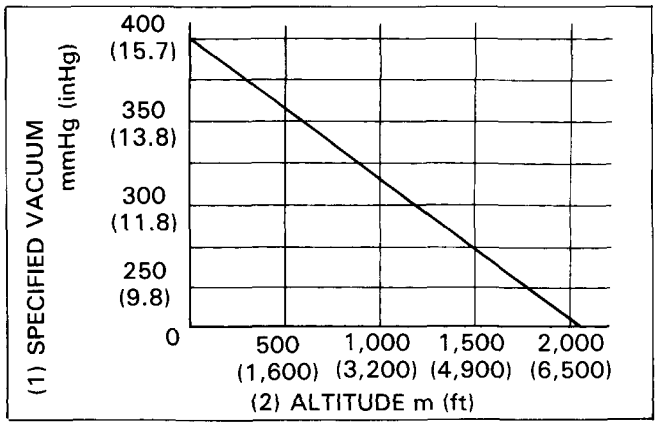
Start the engine and allow it to run at specified rpm shown in the table below. The following results should be obtained as the specified vacuum is applied.

ENGINE RPM	VALVE NUMBER	SPECIFIED VACUUM APPLIED	
		0 mmHg*1 (0 inHg)	400 mmHg*2 (15.7 inHg)
Idle speed 800 min⁻¹ (rpm)	2	Valve is "Close"*3	Open
	3	Close	Open
3,500 min⁻¹ (rpm)	2	Close*3	Open
	3	Open	Open

*1: Open to atmosphere

*2: The specified vacuum applied (400 mmHg/15.7 inHg) in the table is for standard sea level atmospheric pressure of 760 mmHg (29.9 inHg). Change the specified vacuum applied in accordance with the altitude where the test is to be done as shown in the figure.

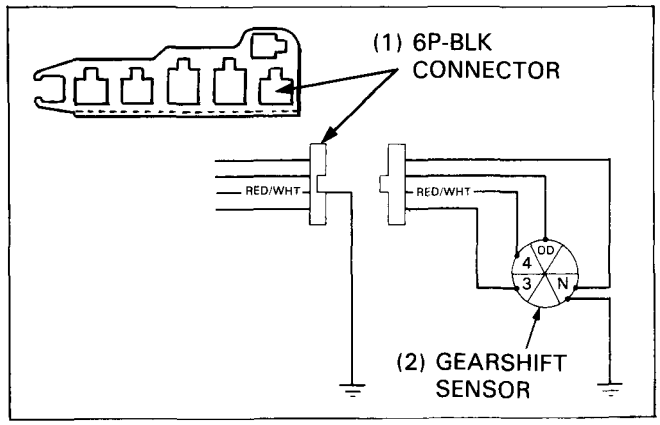
*3: The test results may be different from the table in the area where the altitude is higher than 1,500 m (4,900 ft) because of the atmospheric pressure.



Disconnect the gearshift sensor 6P-BLK connector of the connector holder on the right cooling fan. Ground the RED/WHT wire of the wire harness side connector.

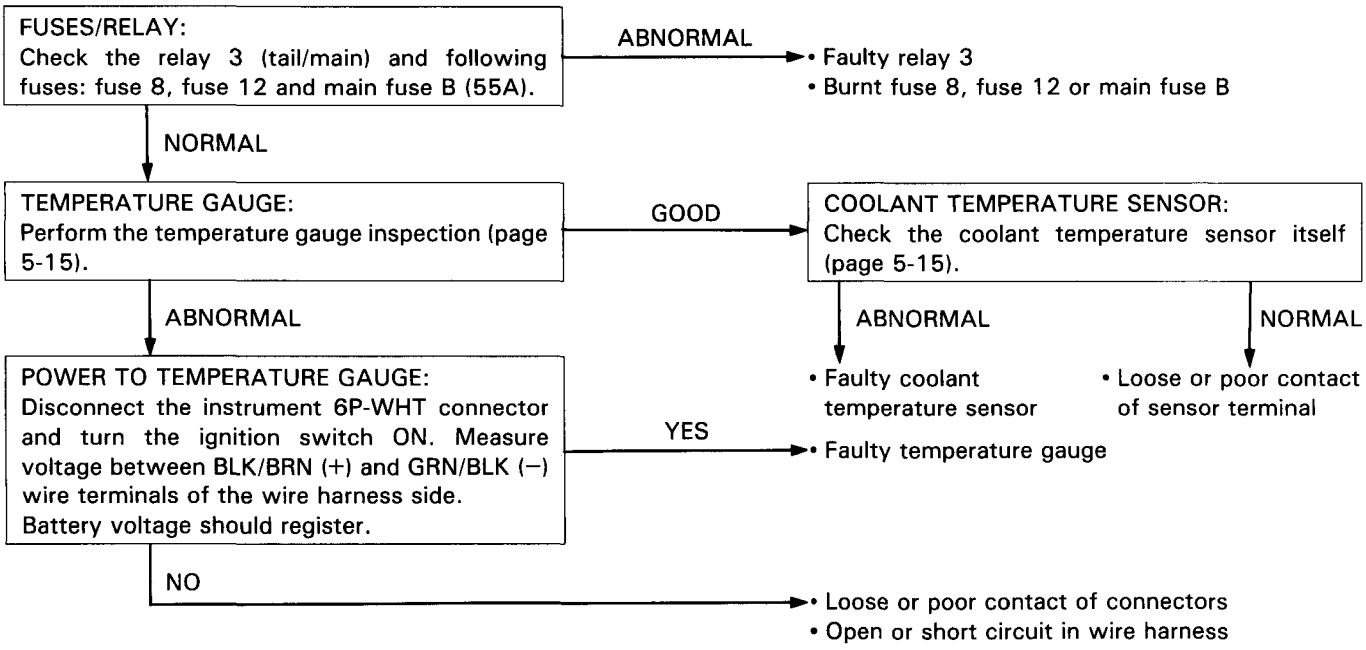
Start the engine and allow it to run at specified rpm shown in the table below. The following results should be obtained as the specified vacuum is applied.

ENGINE RPM	VALVE NUMBER	SPECIFIED VACUUM APPLIED	
		0 mmHg*1 (0 inHg)	400 mmHg*2 (15.7 inHg)
Idle speed 800 min⁻¹ (rpm)	2	Valve is "Close"*3	Open
	3	Close	Open
3,500 min⁻¹ (rpm)	2	Close*3	Open
	3	Open	Open



COOLING SYSTEM TROUBLESHOOTING

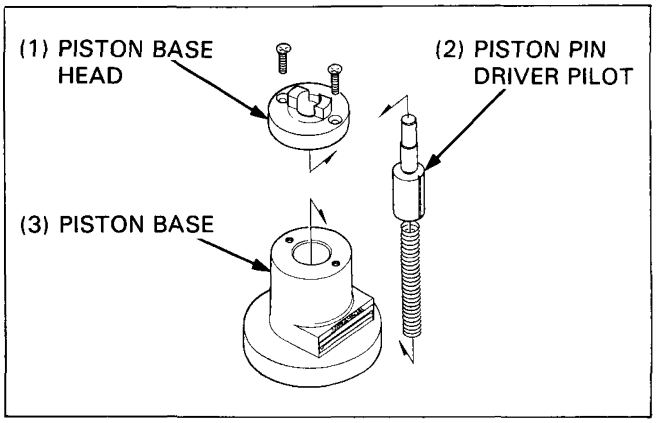
The temperature gauge is not operated properly.



PISTON PIN

REMOVAL

Install the piston pin driver pilot and piston base head on the piston base as shown.



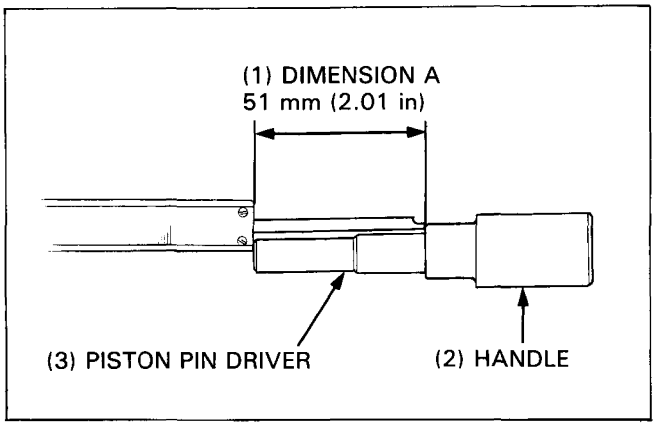
TOOLS:

Piston base head	**07JGF–001010A**
Piston base	**07973–6570500**
Piston pin driver pilot	**07973–6570400**

Turn the handle of the piston pin driver so that dimension A is 51 mm (2.01 in).

TOOL:

Piston pin driver	**07973–6570201**



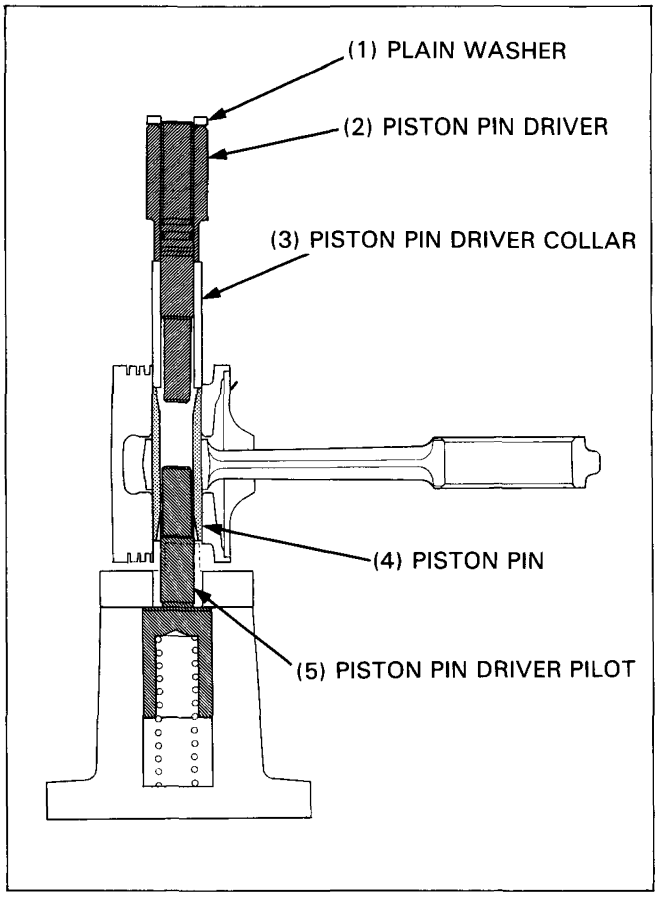
NOTE

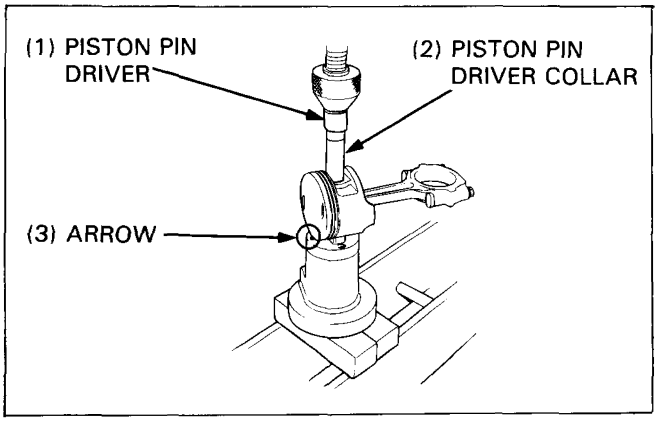
- After adjusting the piston pin driver length, the driver shaft will protrude past the driver head (handle). Place a suitable 12 mm plain washer over the driver head to prevent the shaft threads from directly pressing when setting the piston pin driver in the hydraulic press.

Place the piston on the piston base with the piston head toward the arrow on the base and press the piston pin out of the connecting rod with the hydraulic press.

TOOL:

Piston pin driver collar	**07KMF–MT20200**



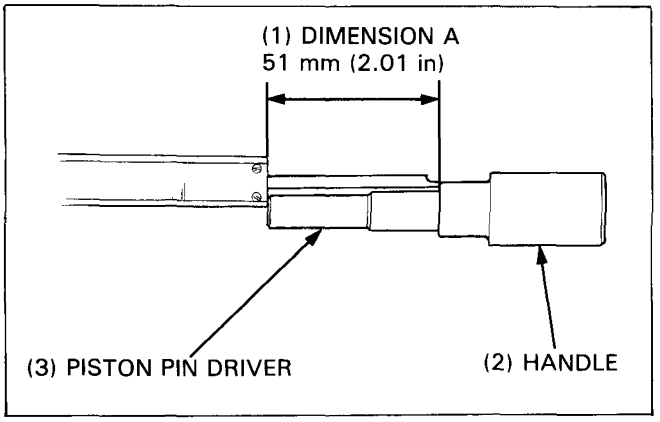


INSTALLATION

Turn the handle of the piston pin driver so that dimension A is 51 mm (2.01 in).

TOOL:

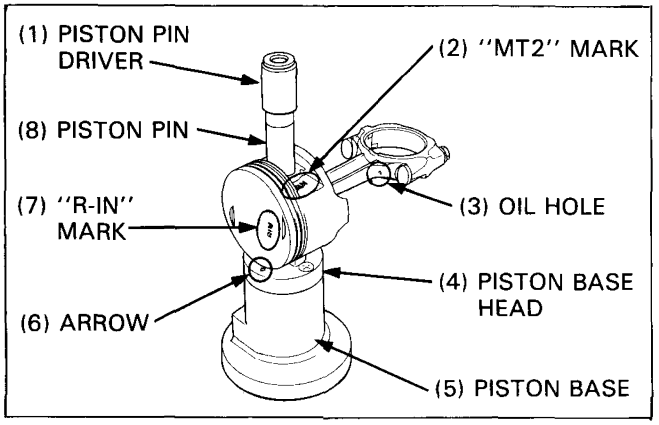
Piston pin driver	**07973–6570201**



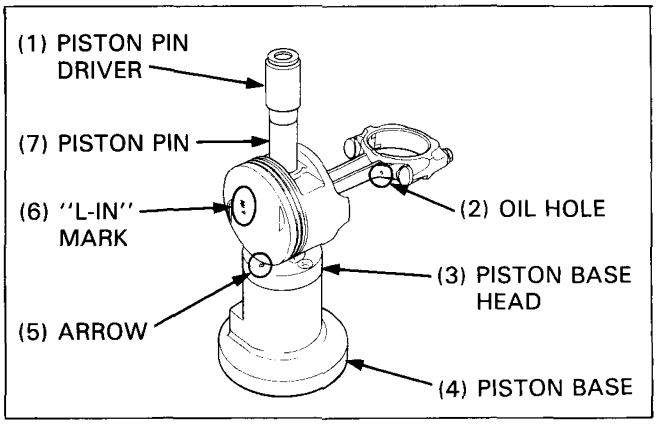
Install the piston pin driver collar onto the driver pilot.

Install the piston and connecting rod onto the piston base as follows:

No. 1, No. 3 and No. 5 pistons:
- "MT2" mark on the piston is facing up.
- piston head is toward the arrow on the base.
- "R-IN" mark is facing the same direction as the oil hole in the rod.



No. 2, No. 4 and No. 6 pistons:
- "MT2" mark on the piston is facing down.
- piston head is toward the arrow on the base.
- "L-IN" mark is opposite the oil hole in the rod.



Coat the piston pin with clean engine oil and insert it into the piston. Place the piston pin driver onto the piston pin.

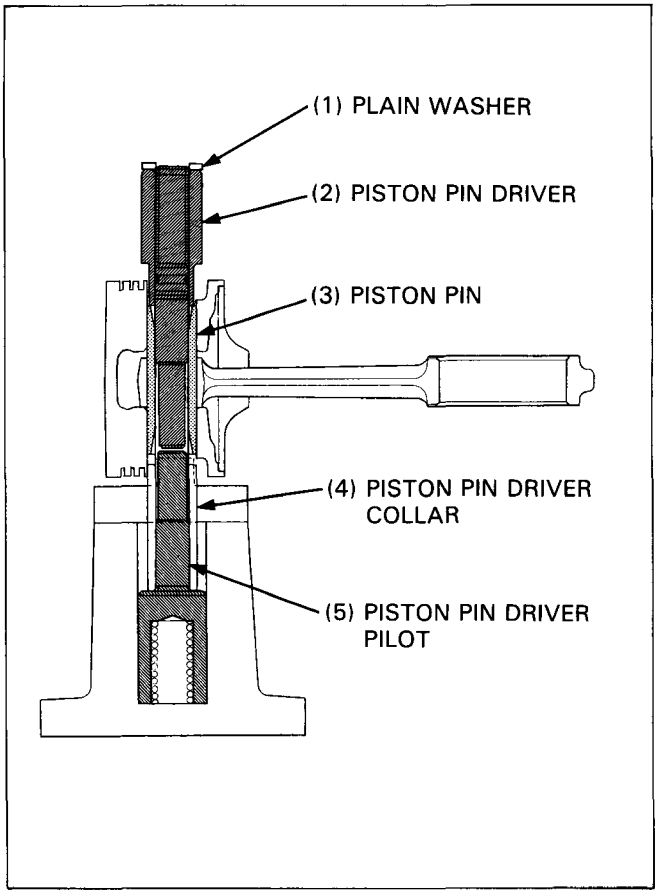
TOOLS:

Piston base	**07973–6570500**
Piston base head	**07JGF–001010A**
Piston pin driver pilot	**07973–6570400**
Piston pin driver collar	**07KMF–MT20200**

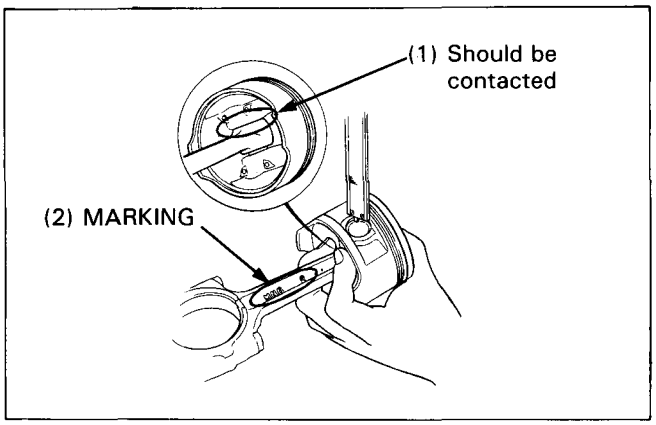
NOTE

- After adjusting the piston pin driver length, the driver shaft will protrude past the driver head (handle). Place a suitable 12 mm plain washer over the driver head to prevent the shaft threads from directly pressing when setting the piston pin driver in the hydraulic press.

Press the piston pin into the connecting rod using a hydraulic press until the driver pilot bottoms against the base (hydraulic pressure rises slightly.)

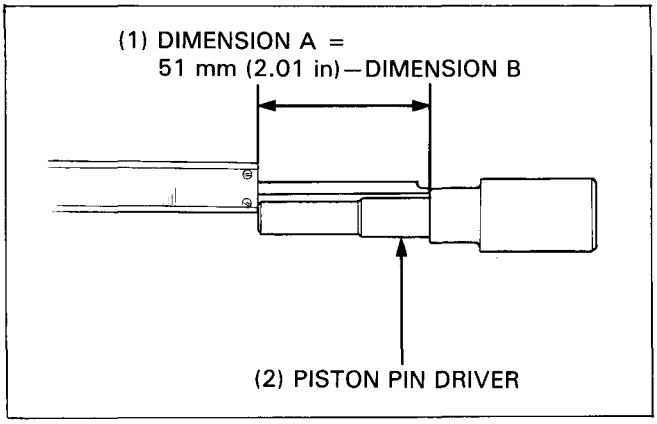


Remove the piston assembly from the tools.
Measure the dimension B between the piston pin and piston end with the connecting rod small end of the marking side contacted with the piston.



Determine the dimension A by subtracting the dimension B from 51 mm (2.01 in).
Adjust the dimension A of the piston pin driver.

Press in the piston pin again in the same manner until the driver pilot is bottoms.

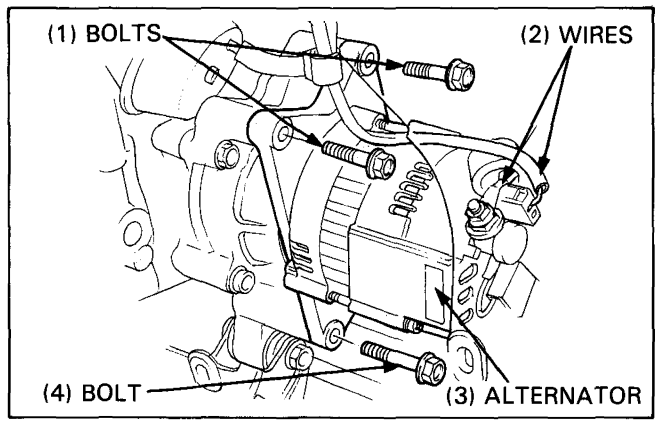


ALTERNATOR

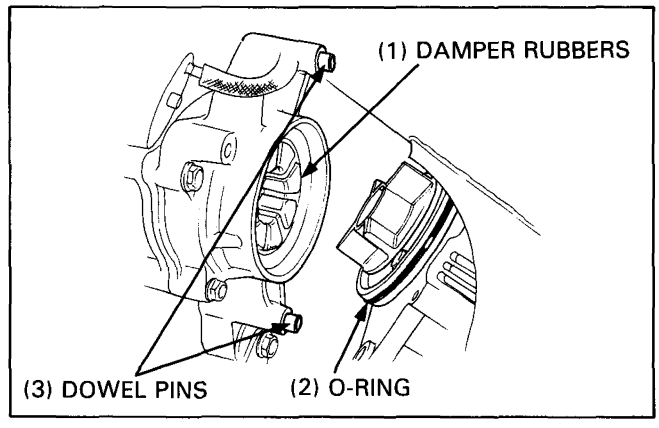
REMOVAL

Disconnect the battery negative cable.
Disconnect the alternator WHT wire terminal and BLK/LT GRN wire connector from the alternator.

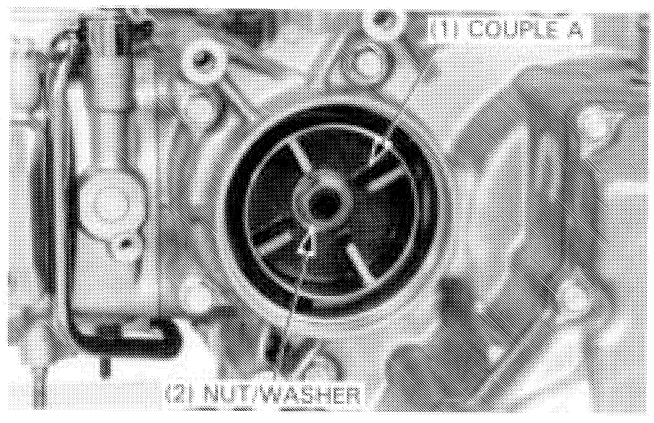
Remove the alternator mounting bolts and alternator and regulator/rectifier assembly.



Remove the dowel pins from the rear case cover.
Remove the O-ring and alternator damper rubbers.

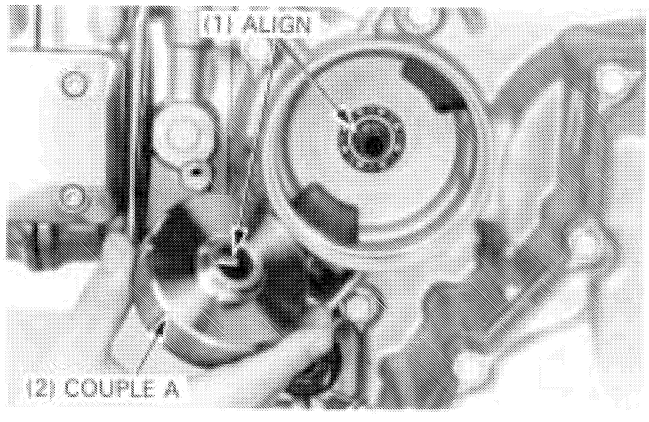


Shift the transmission in any gear except neutral. Hold the rear wheel by hand.
Remove the nut, washer and alternator couple A.



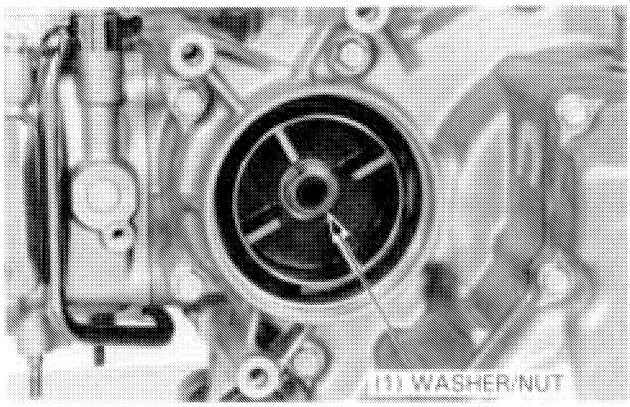
INSTALLATION

Install the couple A, aligning the splines on the couple and alternator driven gear.

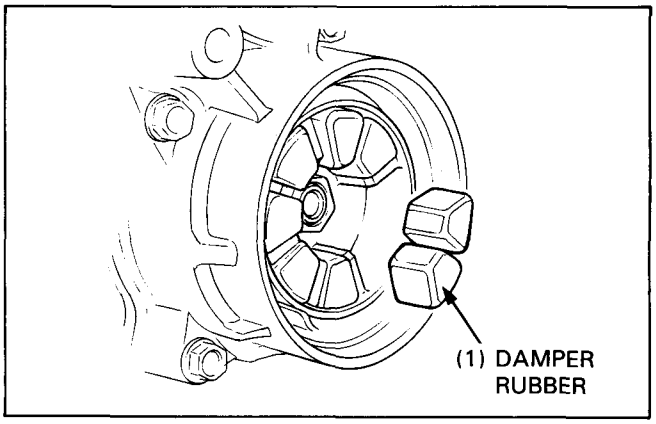


Shift the transmission in any gear except neutral and hold the rear wheel by hand.
Apply a locking agent to the nut threads.
Install the wather and nut, and tighten the nut to the specified torque.

TORQUE: 58 N·m (5.8 kg-m, 42 ft-lb)

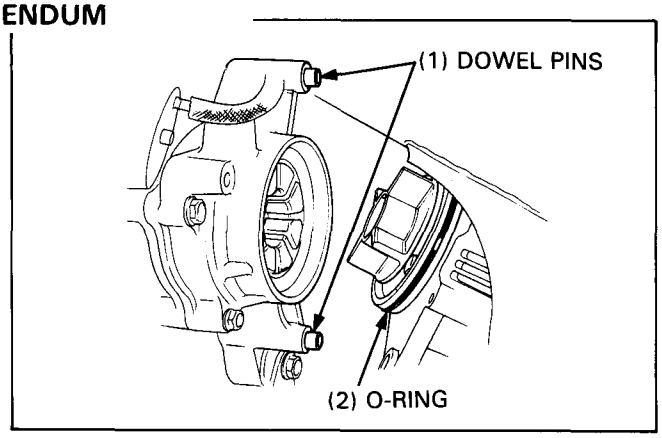


Install four damper rubbers in the coupler A.



GL1500 (K) ADDENDUM

Apply oil to the O-ring and install it on the front cover.
Install the dowel pins onto the rear case cover.
Install the alternator onto the engine, aligning the tabs of couple B with the damper rubber grooves.

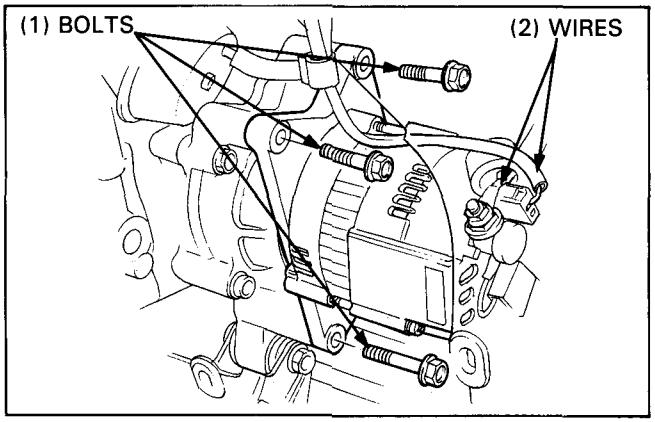


Connect the alternator BLK/LT GRN wire connector and WHT wire terminal onto the alternator.

Install and tighten the alternator mounting bolts.

Connect the battery negative cable onto the battery.

Install as following:
—left front side cover (page 12-6).
—right rear side cover (page 12-6).

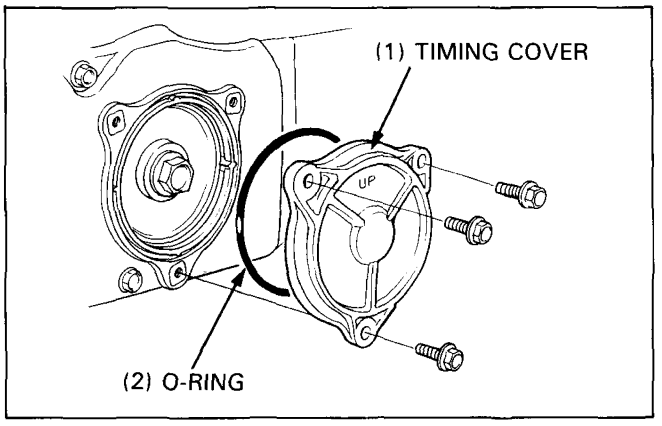


IGNITION TIMING

NOTE

- The ignition control unit electronically varies ignition timing according to engine speed and intake manifold vacuum. The gearshift sensor and Tw sensor signal the ignition control unit to compensate the ignition timing according to the gear position and coolant temperature.

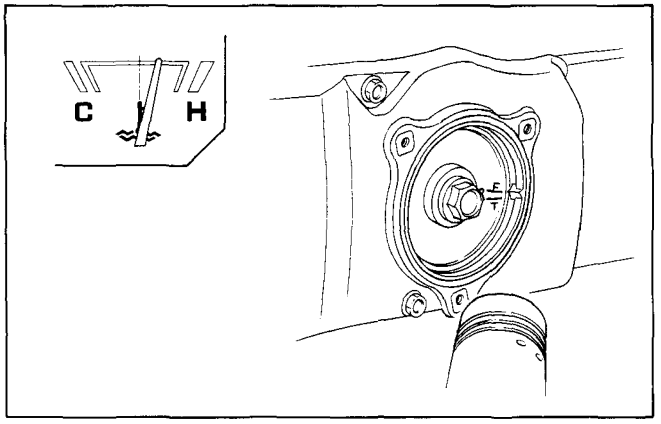
Remove the following:
- fairing lower covers (page 12-9).
- fairing front cover (page 12-8).
- timing cover and O-ring.



Start the engine and warm it up to operation temperature (above 50°C/122°F).

NOTE

- Make sure the temperature gauge resisters above the center position. This is the temperature that the cooling fans operate.



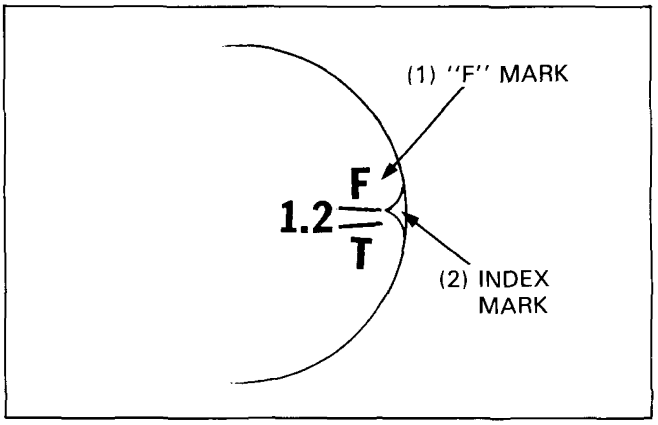
IGNITION TIMING INSPECTION

Stop the engine and connect a stroboscopic timing light to the No. 1 or No. 2 cylinder spark plug wire. Start the engine with the transmission in neutral and let it 900 ± 50 min^{-1} (rpm) by adjusting the throttle stop screw.

The timing is correct if the guide plate "F" 1.2 mark aligns with the timing cover index mark.

Connect the timing light to the No. 3 or 4 cylinder spark plug wire and check the ignition timing for No. 3 or 4 cylinders as previously described by observing the "F" 3.4 mark. And also check the No. 5 or 6 cylinder timing by the same way.

Stop the engine and check the vacuum advance.

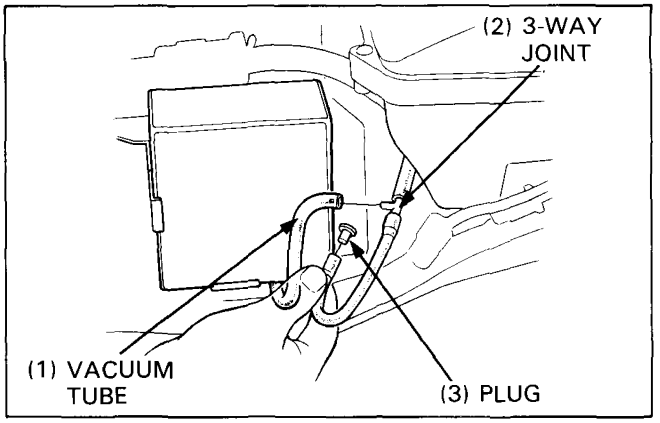


VACUUM ADVANCE INSPECTION

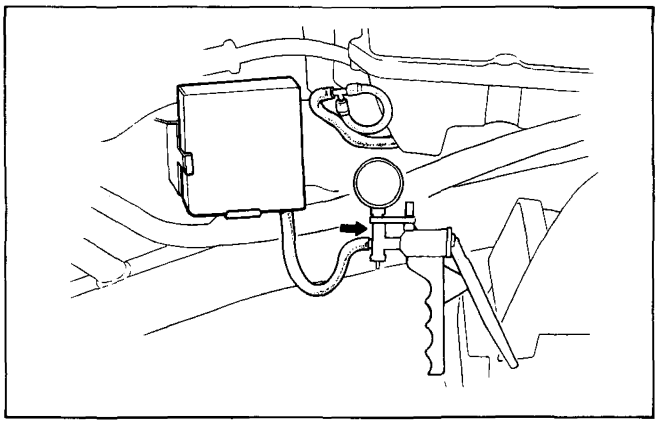
Remove the top compartment and right fairing inner cover (page 12-7).
Disconnect the vacuum tube that goes from the ignition control unit to the 3-way joint. Remove the plug from the dead end tube, and connect the tube to the 3-way joint as shown.

NOTE

- Do not lose the plug.



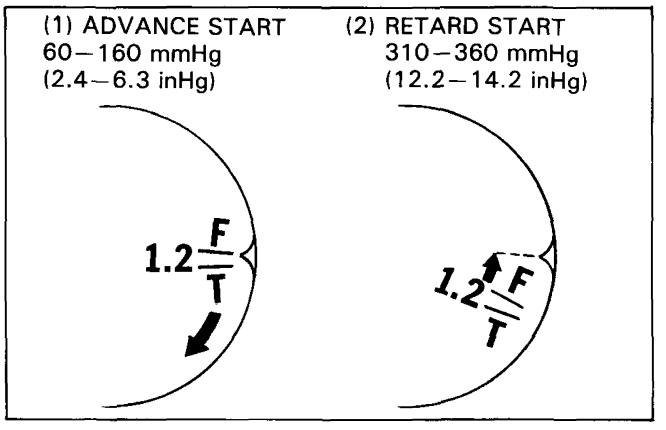
Connect a vacuum pump to the ignition control unit vacuum tube.



Start the engine and warm it up to operation temperature (above 50°C/122°F).

Let the engine idle with the transmission in the 3rd, 4th or OD. Apply vacuum to the control unit and check the "F" mark movement with a timing light.

The advance should start at:
60—160 mmHg (2.4—6.3 inHg)
The advance stop and the retard should start at:
310—360 mmHg (12.2—14.2 inHg)
at atmospheric pressure, 760 mmHg (29.9 inHg)



NOTE

- Keep the engine speed on idle by adjusting the throttle stop screw while testing the vacuum advance.

Stop the engine and check the gearshift sensor timing shift.

GEARSHIFT SENSOR TIMING SHIFT INSPECTION

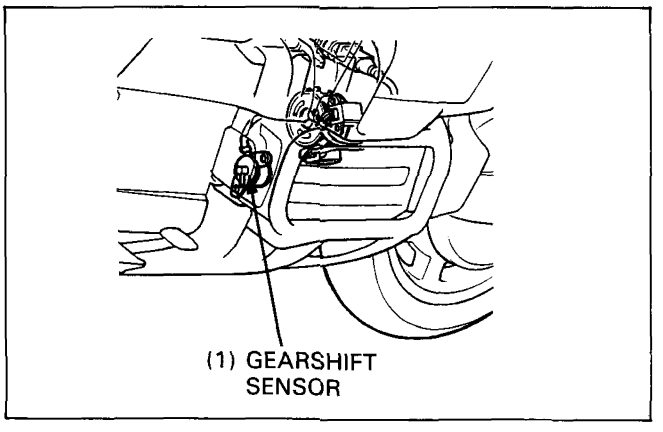
NOTE

- Connect a vacuum tube to the ignition control unit.

Start the engine and warm it up to operation temperature (above 50°C/122°F).
Let the engine run at 1,200 ± 100 min^{-1} (rpm) by adjusting the throttle stop screw with the transmission in neutral.

Shift the transmission to 3rd, 4th or OD from 1st, neutral or 2nd. The engine speed should increase by approximately 500 min^{-1} (rpm).

Stop the engine and check the atmosphere temperature timing shift.



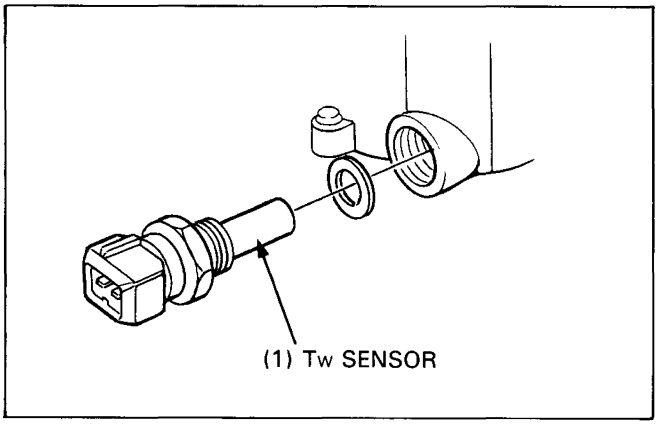
COOLANT TEMPERATURE TIMING SHIFT INSPECTION

Remove the Ta sensor (page 4-50) and remove the Tw sensor (page 18-14).

NOTE

- To re-use the coolant, drain it into clean pan.

Disconnect the Ta sensor sub wire harness from the Ta sensor and temporarily connect the sub wire harness to the Tw sensor.

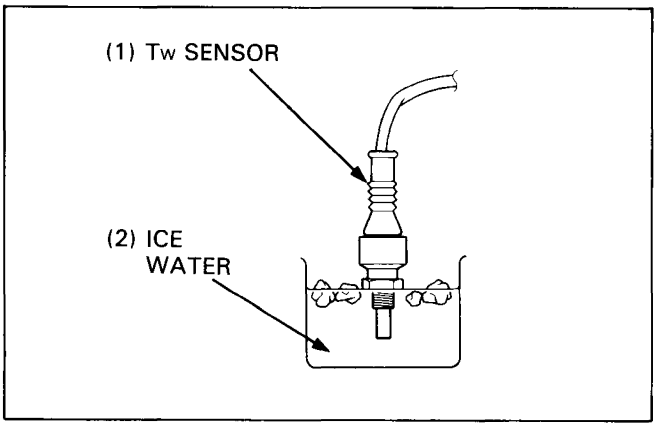


Install the removed Ta sensor into the thermostat housing (28 N•m) and fill the system with coolant.

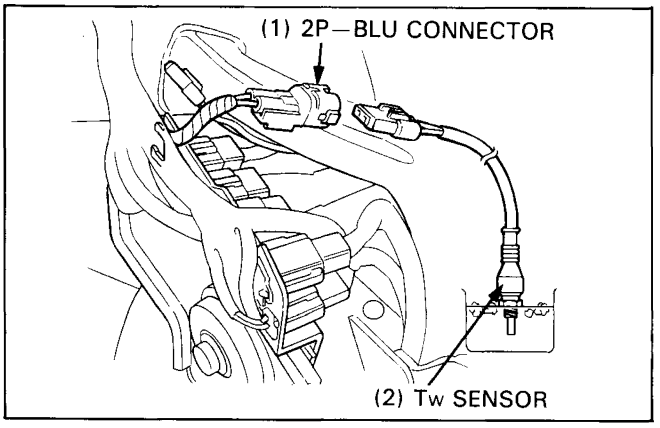
CAUTION

- *Do not damage the housing.*

Cool down the Tw sensor in the ice water for approximately 10 minutes.



Start the engine and warm it up to operating temperature (above 50°C/122°F).
Connect the cooled-down Tw sensor to the waterproof 2P-BLU connector of the connector holder on the right cooling fan.
The engine speed should increase by approximately 200 min^{-1} (rpm).



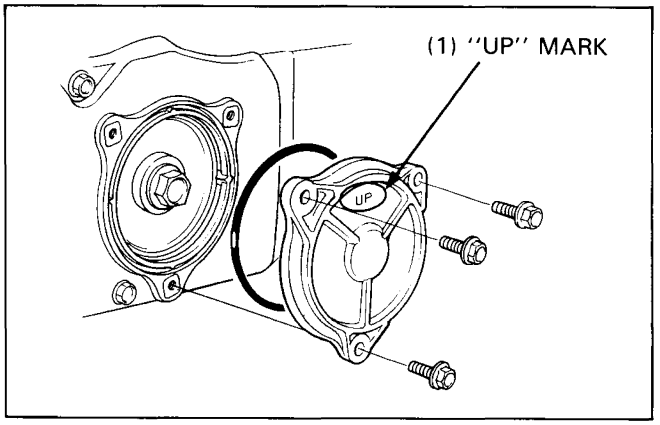
NOTE

- If ignition timing is not correct, check all individual ignition system components except the ignition control unit. If the individual components are good, replace the ignition control unit.

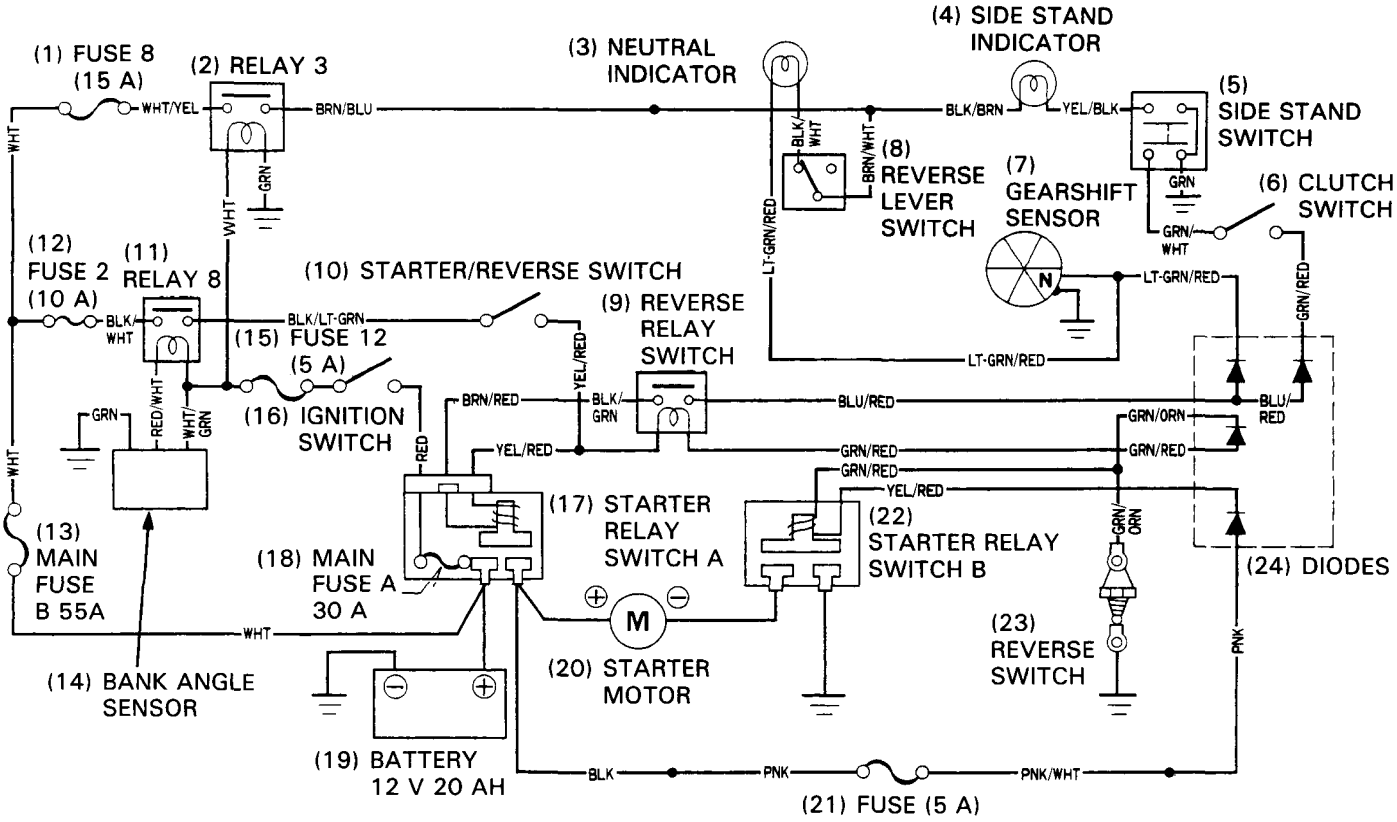
After inspecting the ignition timing, install the removed parts in the reverse order of removal.

NOTE

- Install the timing cover with its "UP" mark facing up.



STARTING SYSTEM DIAGRAM



STARTER/REVERSE SYSTEM TROUBLESHOOTING

• FOR STARTING

The starter/reverse motor for starting does not turn.

NOTE

- Inspect the following before troubleshooting the starter system.
- Be sure the battery is fully charged and in good condition.
- Be sure the reverse lever is in OFF position and the reverse cable is properly adjusted (page 3-17).
- Be sure the reverse switch arm is not damaged (page 19-32).
- Be sure the following fuses are good: main fuse A (30 A)-inside the starter relay switch A
  main fuse B (55 A)-on the battery case
  fuse 2 (15 A)-inside the fuse box
  fuse 12 (5 A)-inside the relay box
  fuse 5 A-the right side of the battery
- Be sure the bank angle sensor is installed properly (page 19-24).

BATTERY CONNECTIONS:
Check battery terminal connections for corrosion and looseness and check the cables for open or short.
→ NO GOOD
- Loose or corrosive contact of terminals
- Open or short circuit in battery cables

↓ GOOD

STARTER RELAY A CONNECTIONS:
Check starter relay A terminal connections for corrosion and looseness and check the relay 4P-RED connector for loose or poor contact.
→ NO GOOD
- Loose or corrosive contact of terminals
- Loose or poor contact of the relay A connector

↓ GOOD

STARTER MOTOR CONNECTIONS:
Check starter motor terminal connections for corrosion and looseness and check the cables for open.
→ NO GOOD
- Loose or corrosive contact of terminals
- Open circuit in motor cables

↓ GOOD

GROUND CABLE CONNECTIONS:
Check the ground cable connections near the dipstick for corrosion and looseness and check the cables for open or short.
→ NO GOOD
- Loose or corrosive contact or cables
- Open or short circuit in ground cables

↓ GOOD

MOTOR:
Apply battery voltage to the motor directly and check its operation.
→ DO NOT TURN
- Faulty starter/reverse motor (page 19-14)

↓ TURN

RELAY 8:
Connect all connection properly.
When the ignition switch is turned to ON, you should hear the relay 8 "Click" (page 19-26).
→ NO

WIRING/IGNITION SWITCH:
Disconnect the 3P-GRN connector of the connector holder on the rear fender, and measure voltage between the WHT (+) and GRN (−) wires and between the RED/WHT (+) and GRN (−). Battery voltage should register with the ignition switch ON.

YES ↓ Ⓐ

YES ↓ Ⓑ

NO ↓
- Loose or poor contact of 22P-BLK or 22P-RED connector, or 8P-BLK connector above the left cooling fan
- Open or short circuit in main or sub wire harness
- Faulty ignition switch (page 22-16)
- Faulty relay 8 (page 19-26)

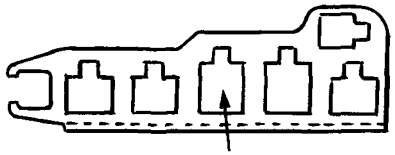
Ⓐ

RELAY 8:
Check the relay 8 for continuity (page 19-27)

CONTINUITY

NO CONTINUITY
• Faulty relay 8

WIRING/CONNECTORS:
Disconnect the 9P-RED connector of connector holder on the right cooling fan, and measure voltage between the BLK/LT GRN (+) wire and ground (−). Battery voltage should register with the ignition switch ON.



(1) 9P-RED CONNECTOR

NO
• Loose or poor contact of connectors
• Open or short circuit in main wire harness

YES

STARTER/REVERSE SWITCH:
Using the above checking connector, check the starter/reverse switch for continuity (page 19-28).

NO GOOD
• Faulty starter/reverse switch

GOOD

STARTER RELAY SWITCH A:
With the ignition switch ON and starter/reverse switch pushed, you should hear the starter relay switch A "Click" (page 19-25).

NO

REVERSE RELAY SWITCH:
With the ignition switch ON and starter/reverse switch pushed, you should hear the reverse relay switch "Click" (page 19-26).

YES

STARTER RELAY SWITCH A:
Check the starter relay switch A for continuity (page 19-26)

CONTINUITY

Ⓒ

NO CONTINUITY
• Faulty starter relay switch A

WIRING/CONNECTORS/DIODE:
Remove the reverse relay switch and measure voltage between BLK/BRN (+) and BLU/RED (−) wires of the wire harness side. Battery voltage should register with the ignition switch ON, the starter/reverse switch pushed and the gear in neutral.

YES
• Faulty reverse relay switch

NO
• Faulty starter relay switch A
• Faulty gearshift sensor (page 18-12)
• Loose or poor contact of 22P-RED and 6P-BLK connectors
• Faulty diode (BLU/RED & LT GRN/RED) (page 19-27)
• Open or short circuit in main or sub wire harness

NO

WIRING/CONNECTORS/DIODE:
Remove the reverse relay switch and measure voltage between YEL/RED (+) and GRN/RED (−) wires of the wire harness side.
Battery voltage should register with the ignition switch ON and starter/reverse switch pushed.

YES

REVERSE RELAY SWITCH:
Check the reverse relay switch for continuity (page 19-26).

CONTINUITY
• Loose or poor contact of the relay connector

NO CONTINUITY
• Faulty reverse relay switch

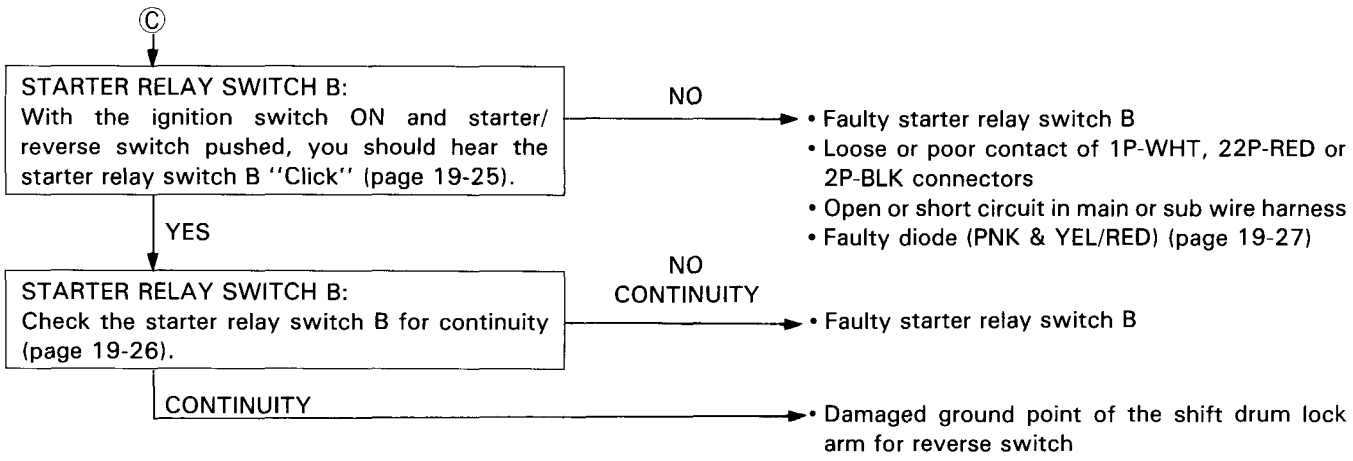
NO
• Faulty diode (GRN/RED & GRN/ORN) (page 19-27)
• Loose or poor contact of 22P-RED connector
• Open or short circuit in main or sub wire harness
• Faulty reverse switch (page 19-27)

Ⓑ

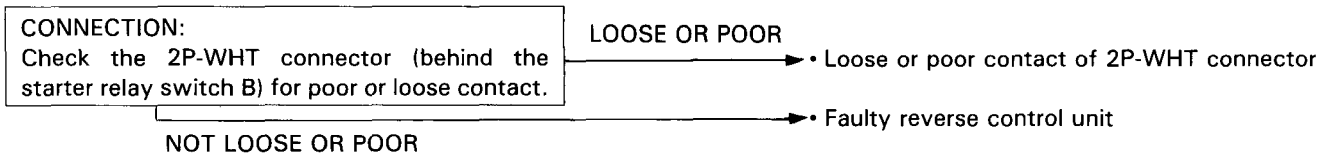
BANK ANGLE SENSOR:
Inspect the bank angle sensor (page 19-24)

GOOD
• Loose or poor contact of the 3P-GRN connector

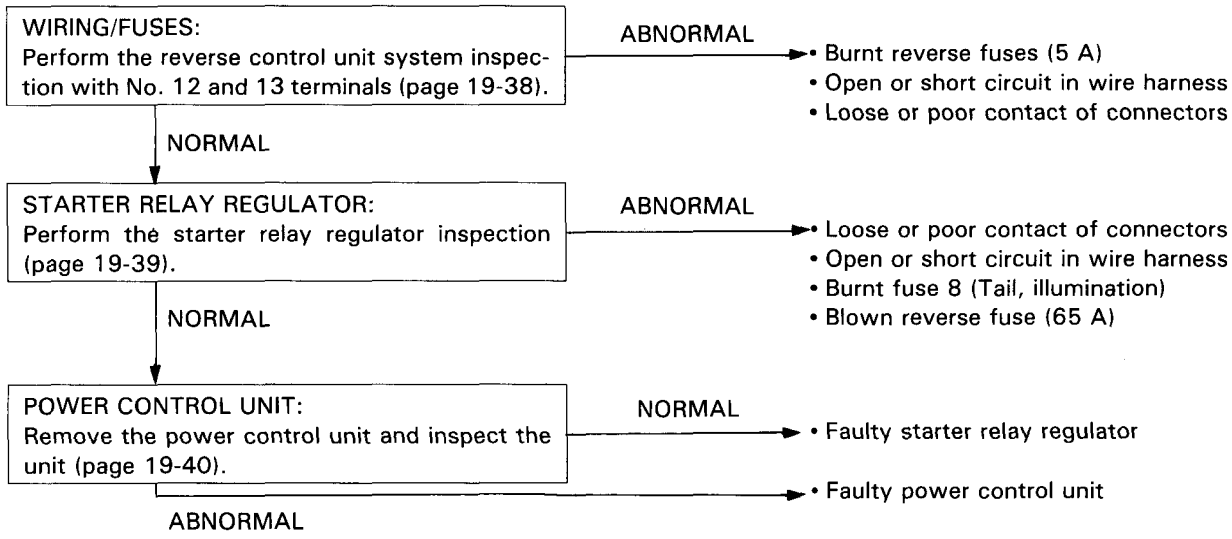
NO GOOD
• Faulty bank angle sensor



Reverse operation is rough, stalls, or runs poorly.



Stops immediately when reverse operation is initiated.



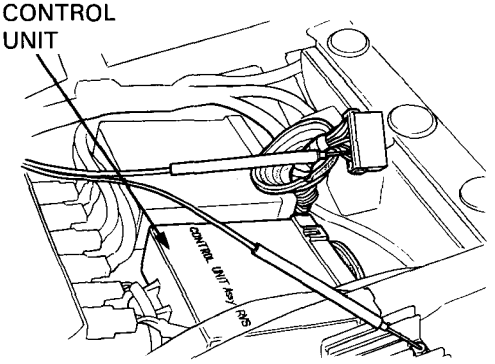
REVERSE CONTROL UNIT

SYSTEM INSPECTION

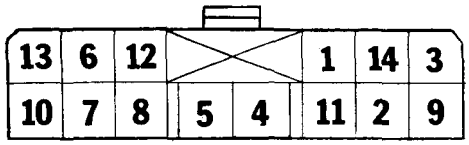
Remove the seat and trunk (page 12-6, 12).
Disconnect the 14P-WHT connector of the reverse control unit and check it for loose contact or corroded terminals.

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

(1) REVERSE CONTROL UNIT



(2) REVERSE CONTROL UNIT CONNECTOR OF THE WIRE HARNESS SIDE



TERMINAL NUMBER/ITEM		TERMINALS	CONDITION(S)	SPECIFICATION
1	Ground line	GRN and ground	At all times	Continuity should exist.
2	Speed limiter relay line	GRY (+) and ground (−)	Ignition switch ON Reverse lever switch ON	Battery voltage should register.
3	Reverse lever line	WHT/BLU (+) and ground (−)	Ignition switch ON Reverse lever switch ON	Battery voltage should register.
4	Reverse indicator line	WHT/RED	Short it to ground.	Reverse indicator should come on.
5	Oil pressure line	BLU/RED (+) and ground (−)	Ignition switch ON	0 V should register.
			Disconnect the oil pressure switch terminal and turn the ignition switch ON	Battery voltage should register.
6	Motor (−) line	ORN and motor (−) cable	At all times	Continuity should exist.
7	Starter relay regulator line	LT BLU and LT BLU of the unit and regulator	Disconnect the starter regulator 4P-RED connector (page 19-39) and check for continuity between the same color wire terminals.	Continuity should exist.
8	Neutral switch line	LT-GRN/RED and ground	Transmission in neutral	Continuity should exist.

TERMINAL NUMBER/ITEM		TERMINALS	CONDITION(S)	SPECIFICATION
9	Power control unit line	WHT and ground	At all times	0.1—1.0 kOhms (20°C/68°F)
10	Side stand switch line	GRN/WHT and ground	Side stand up	Continuity should exist.
			Side stand down	No continuity exist.
11	Starter/reverse switch line	YEL/RED (+) and ground (−)	Ignition switch ON Starter/reverse switch pushed	Battery voltage should register.
12	Power control unit/resister line	BLU and ground	At all times	0.2—0.3 Ohms (20°C/68°F)
13	Motor (+) line	PNK and Motor (+) cable	At all times	Continuity should exist.
14	Reverse relay switch line	GRN/RED (+) and ground (−)	Ignition switch ON Starter/reverse switch pushed	0—1.0 voltage should register.
			Ignition switch ON Starter/reverse switch pushed Reverse switch terminal (on engine) disconnected	Battery voltage should register.

SPEED LIMITER RELAY LINE INSPECTION

Start the engine.
Remove the reverse fuse (65 A).
Disconnect the motor cables from the starter/reverse motor (page 19-13).

Connect the voltmeter between the reverse fuse terminals (tester ⊕ cable to the fuse YEL terminal).
Connect the battery charger positive (+) cable to the motor (+) cable.
Connect the charger negative (−) cable to the motor negative (−) cable.

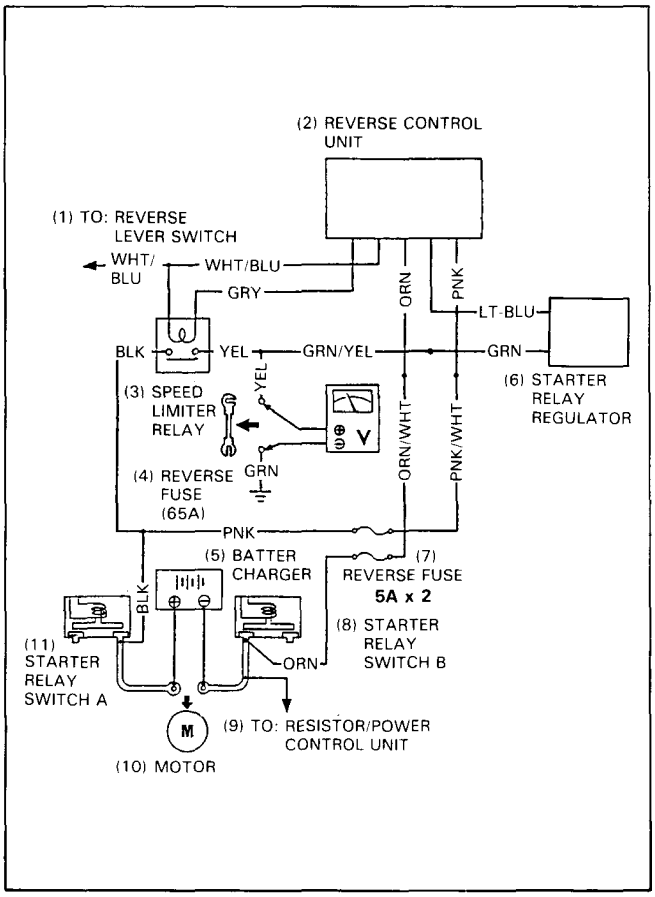
With the reverse conditions ready (gear in neutral, side stand up, engine run, and reverse lever switch ON), be the charger switch ON and apply 13—20 V between the motor cables.
The 13—20 Voltage should appear between reverse fuse terminals.

⚠ WARNING

- ***Turn power ON/OFF at the charger, not at the battery terminals to prevent sparks.***

CAUTION

- *While applying the power to the line from a charger, do not depress the starter/reverse switch.*

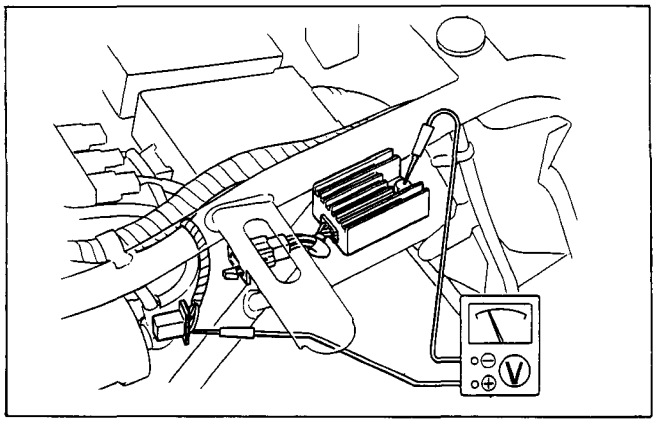


STARTER RELAY REGULATOR

WIRING INSPECTION

Remove the seat and trunk (page 12-6, 12).
Disconnect the 4P-RED connector of the starter relay regulator and check it for loose contact or corroded terminals.

Measure the following between connector terminals of the wire harness side. If there is OK, perform the next inspection (page 19-40).



ITEM	TERMINALS	CONDITION(S)	SPECIFICATION
Battery voltage line	WHT/BLU (+) and ground (−)	Ignition switch ON Reverse lever switch ON	Battery voltage should register.
Starter relay switch A primary coil line	BRN/RED of the regulator and starter relay switch A	Disconnect the 4P-RED connector of the starter relay switch A (page 19-25) and check for continuity between the BRN/RED wire terminals.	Continuity should exist at all times.
Reverse control unit line	LT BLU of the regulator and reverse control unit	Disconnect the 14P-WHT connector of the reverse control unit (page 19-37) and check for continuity between the LT BLU wire terminals.	Continuity should exist at all times.
Reverse fuse line	GRN and ground	At all time	Continuity should exist.
Speed limiter relay line	GRN/YEL and BLK (1P-WHT) on the wire harness side	Disconnect the 14P-WHT connector of the reverse control unit (see page 25-46) and connect the GRY wire and GRN wire with a jumper wire. With the reverse lever ON, turn the ignition switch ON.	Continuity should exist.

CRUISE CONTROL SYSTEM TROUBLESHOOTING

Cruise control does not function at all.

NOTE

Cruise control will be cancelled when:
- Either brake (front or rear) is applied.
- Clutch lever is operated.
- Throttle is returned.

Cruise speed memory will be cancelled when:
- Ignition switch, engine stop switch or auto cruise switch is operated to OFF. The bank angle sensor is operated. Both the resume and set switch are operated simultaneously.

Cruise control will not function under the following conditions.
- At speeds other than 48—128 km/h (30—80 mph)
- Transmission set in other than 4th or OD.

Inspect the following before troubleshooting the cruise control system.
- Be sure the terminal connections of the cruise cancel switches (page 21-11) are good.
- Be sure the cruise cancel switches of the rear brake and throttle are properly adjusted (page 21-12).

CRUISE INDICATOR:
Turn the ignition switch ON and engine stop switch to RUN, and check that the cruise indicator lights come on for a few seconds, then go off.

ABNORMAL → BULB:
Check the bulbs for burn.

NOT BURN → DISPLAY OPERATION:
Check the L.C.D. unit display operation.

BURN → • Faulty bulb

NORMAL → WIRING/SWITCH:
With the ignition switch ON and engine stop switch on RUN, turn the auto cruise switch to ON. The "CRUISE ON" indicator light should go on and stay on.

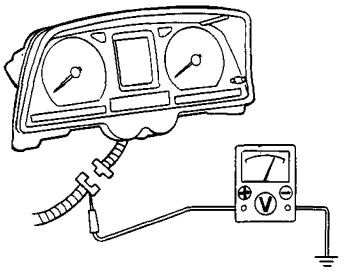
NORMAL → Ⓐ

ABNORMAL → WIRING:
Measure voltage between the control unit No. 1 terminal and ground (page 21-9).

NORMAL → Ⓑ

ABNORMAL →
- Open or short circuit in wire harness
- Loose or poor contact of connectors
- Faulty auto cruise switches (page 21-13)

NORMAL → WIRING/CONNECTOR:
Disconnect the 10P-WHT connector under the instrument, and measure the voltage between the BLU/ORN (+) and ground (−) and between the BLU/WHT (+) and ground (−). With the ignition switch ON and engine stop switch on RUN, battery voltage should register.



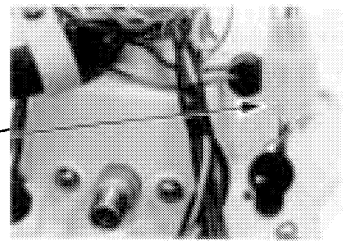
YES →
- Loose or poor contact of the 10P-WHT connector
- Faulty L.C.D. unit

NO →
- Open or short circuit in wire harness
- Loose or poor contact of connectors

ABNORMAL → • Go to L.C.D. DOES NOT DISPLAY troubleshootings (page 22-7, 8, 9)

Ⓐ

POWER TO SPEED SENSOR:
Disconnect the 3P-WHT mini connector of the speed sensor under the instrument. Measure voltage between the LT-GRN/BLK (+) and GRN/BLK (–) wire terminals with the ignition switch ACC, ON or P.



BATTERY VOLTAGE SHOULD REGISTER

VOLTAGE SHOULD NOT REGISTER

- Open or short circuit in wire harness
- Loose or poor contact of the connectors

WIRING:
Measure voltage between the control unit No. 2 terminal and ground (page 21-9).

ABNORMAL

SPEED SENSOR:
Check the speed sensor (page 22-13).

NORMAL

ABNORMAL

- Open or short circuit in wire harness
- Loose or poor contact of connectors

- Faulty speed sensor

NORMAL

Ⓒ

WIRING/COMPONENTS:
Perform the auto cruise control unit system inspection. If not normal, check the related components in that part of the abnormal lines (page 21-9).

NORMAL

CRUISE CONTROL VALVE:
Check the cruise control valve (page 21-14).

ABNORMAL

- Faulty cruise control valve

NORMAL

HOSES:
Check vacuum hoses for disconnection, clogging or damage (page 21-17).

ABNORMAL

- Faulty vacuum circuit

NORMAL

Ⓓ

Ⓑ

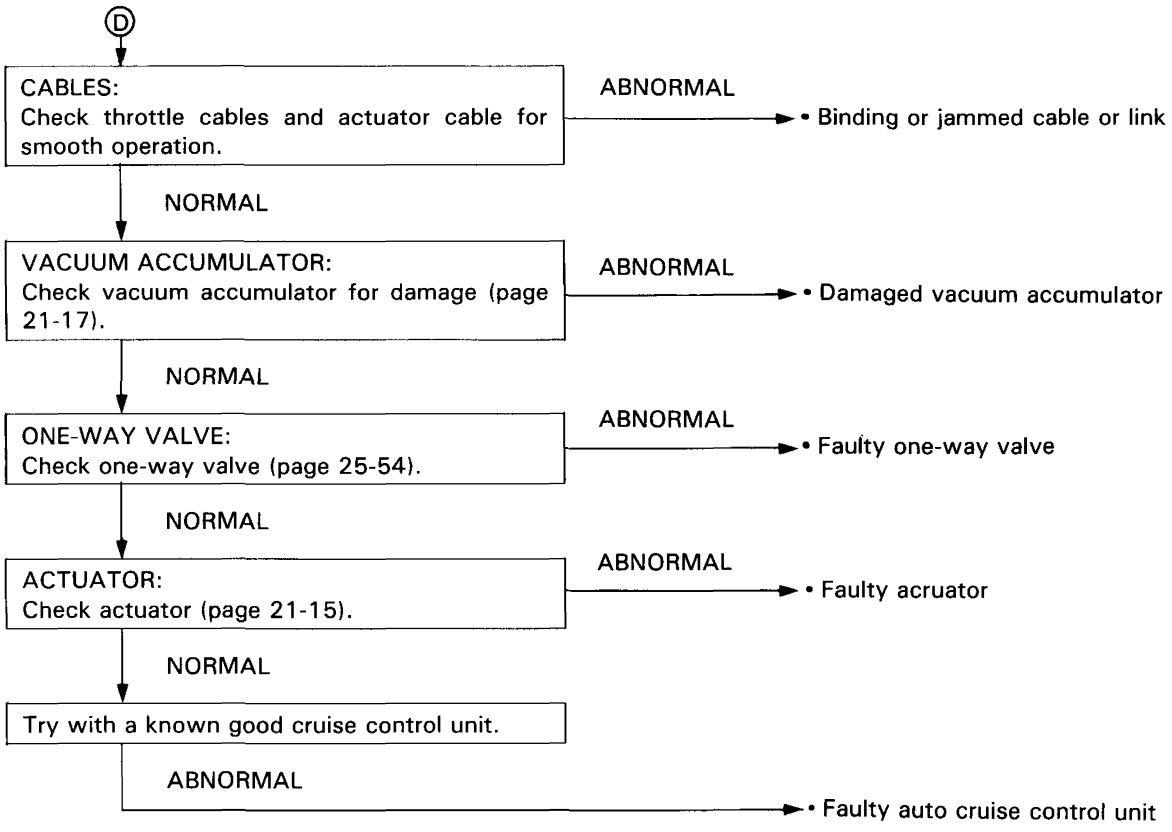
WIRING:
Measure voltage between the control unit No. 10 terminal and ground (page 21-9).

NORMAL

ABNORMAL

- Open or short circuit in wire harness
- Loose or poor contact of the connectors

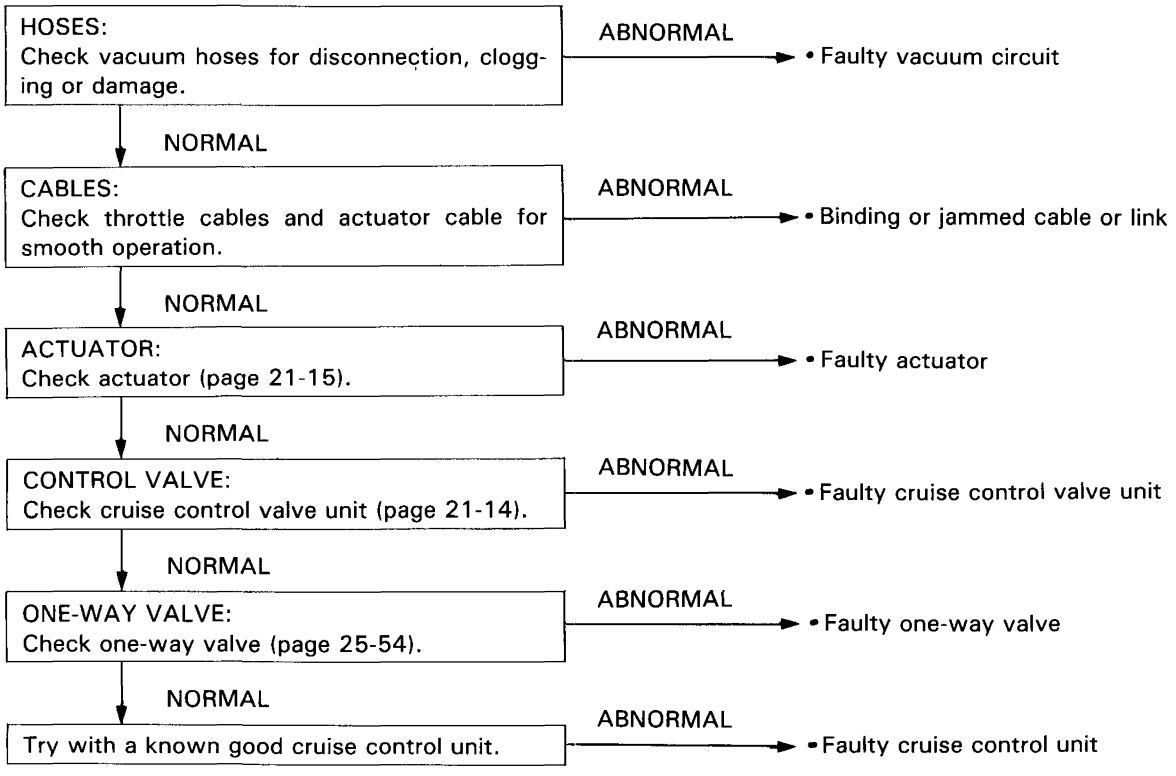
Ⓒ



Cruise speed fluctuates excessively (more than 8 km/h (5 mph)) immediately after setting

NOTE

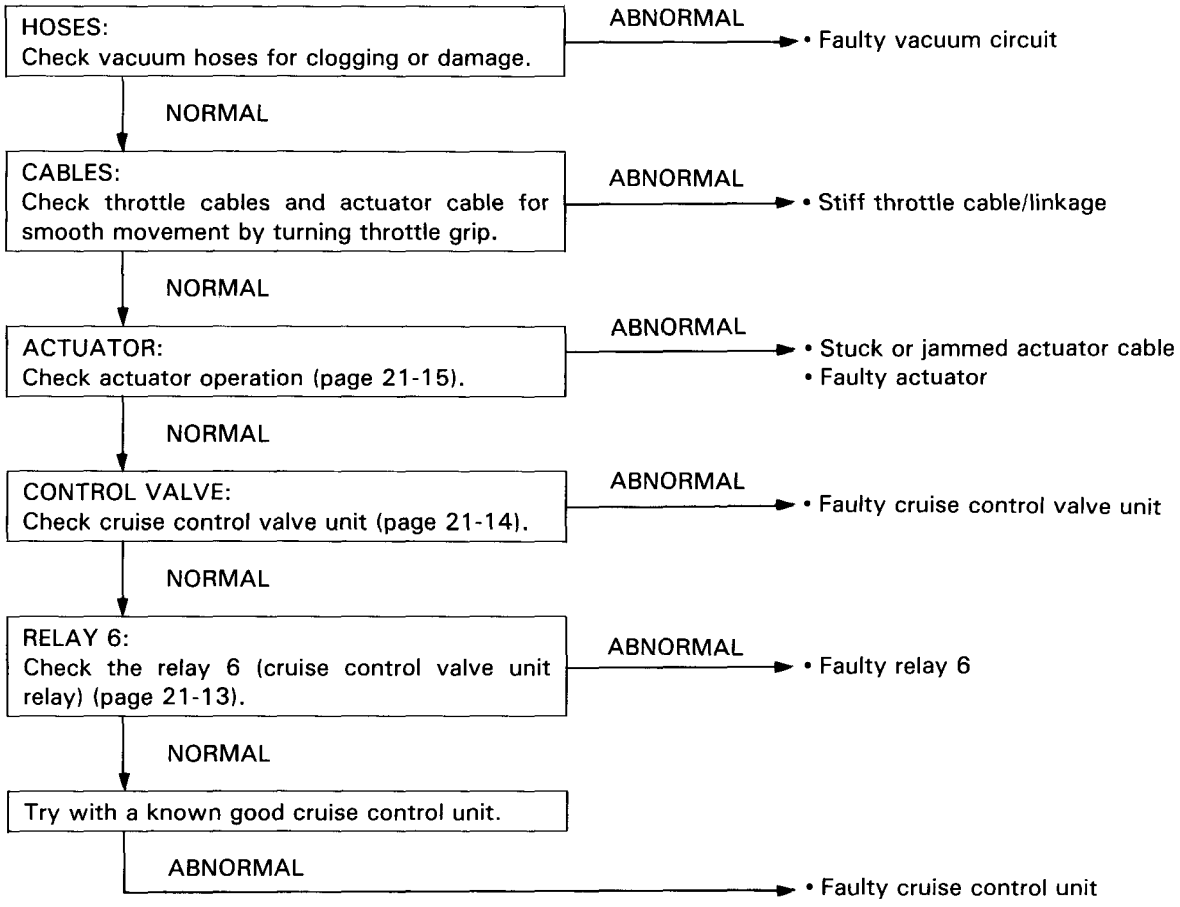
• Before troubleshooting, check the carburetor synchronization. Adjust synchronization, if necessary. (page 25-13).



Cruise control cannot be cancelled.

NOTE

- The cruise control should cancel when brake is applied, clutch lever is operated, throttle grip is returned, or transmission is shifted. Before going into details, check the cancel switches, brakelight switches or gearshift sensor for proper operation.



THROTTLE CRUISE CANCEL SWITCH

INSPECTION

Check for continuity between the GRN/WHT and BRN/RED wire terminals. There should be continuity with the throttle grip in any position.

Turn the throttle grip to open the throttle, hold the throttle drum and return the throttle grip.
There should be no continuity.

REPLACEMENT

If either of the two tests fails, replace the grip cancel switch as follows:

Disconnect the throttle return cables from the throttle grip and the carburetor throttle drum.

Remove the bolt and the cancel switch cover.
Remove the two mounting bolts and the grip cancel switch.

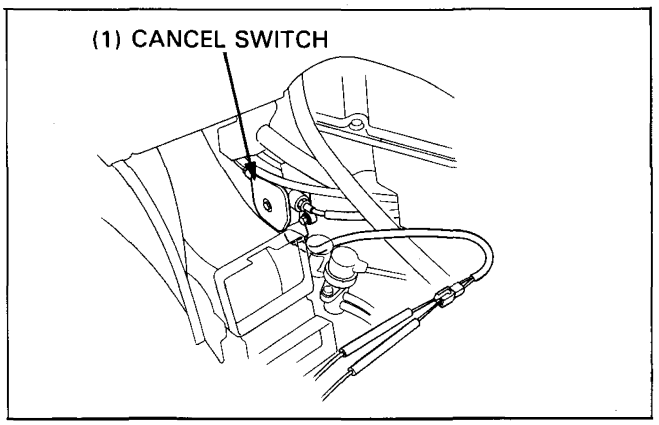
Install a new grip cancel switch in the reverse order of removal.

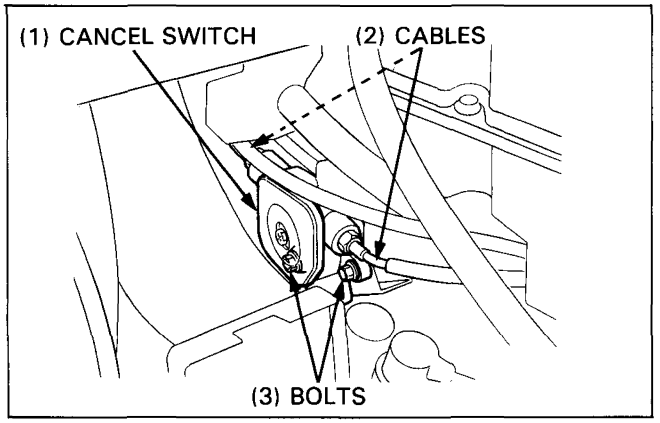
NOTE

- Apply grease to the cable ends and switch drum before connecting them.

CAUTION

- *Do not remove the cancel switch drum from the switch shaft.*





CRUISE ACTUATOR

REMOVAL/INSTALLATION

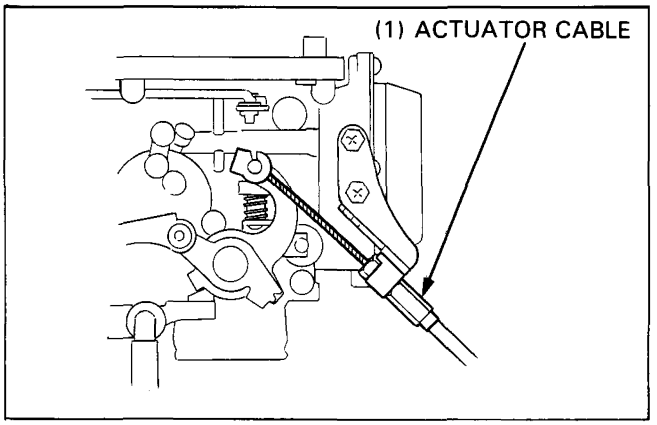
Remove the left fairing inner cover (page 12-9).

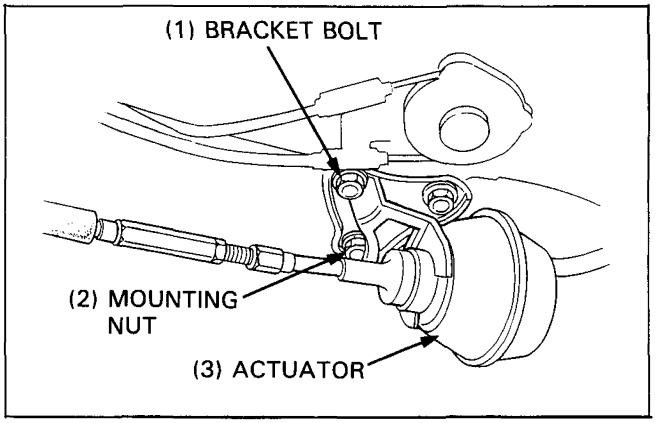
Disconnect the actuator cable from the throttle drum by loosening the lock nut.

Remove the engine bracket bolt and engine mounting nut.
Remove the actuator.

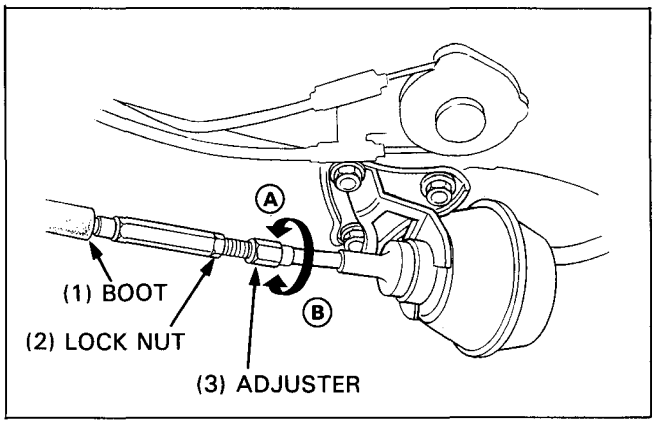
Install the actuator in the reverse order of removal.

TORQUES:
Engine bracket bolt: 25 N·m (2.5 kg-m, 18 ft-lb)
Engine mounting nut: 40 N·m (4.0 kg-m, 29 ft-lb)





After installing the cruise actuator, remove the inspection window cap and check that the aligning mark on the actuator cable arm with the index groove by putting the light from a flashlight on the inspection window.



CAUTION

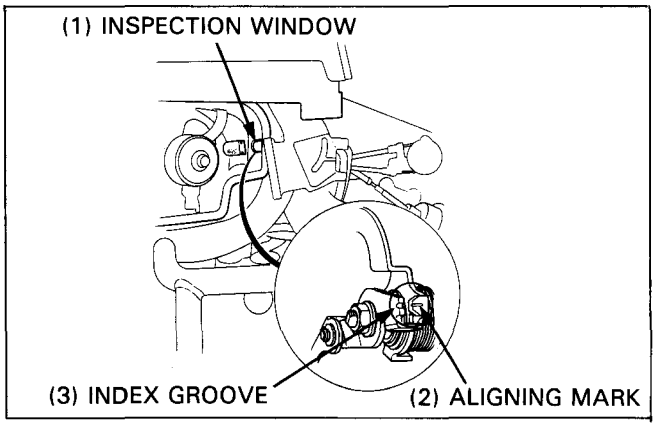
- *Do not move the acturator cable out of its routing when checking and adjusting the cable.*
  If the cable is moved out of its routing, the actuator arm may be pulled with the inner cable and aligning mark may shift.

If the aligning mark does not align with the index groove adjust as follows:

Slide the boot off the adjuster, loosen the lock nut and turn the adjuster as required.

To move the aligning mark upward, turn the adjuster in the direction A .
To move the aligning mark downward, turn the adjuster in the direction B .

After adjustment, slide the boot back on the adjuster properly.



ONE-WAY VALVE

INSPECTION

Remove the right fairing lower cover (page 12-9).

Disconnect the vacuum hose (No. 2) from the vacuum fitting of the intake manifold of the No. 3 cylinder and disconnect the No. 4 hose from the vacuum accumulator.
Connect a vacuum pump as shown and apply vacuum.

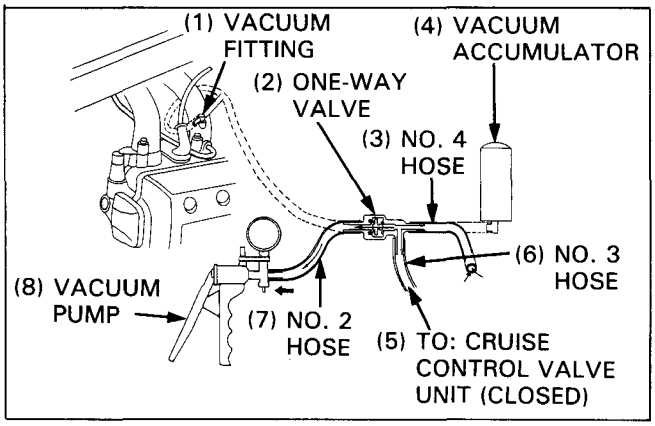
Vacuum should not remain steady; the vacuum gauge would be down slowly because of valve orifice.

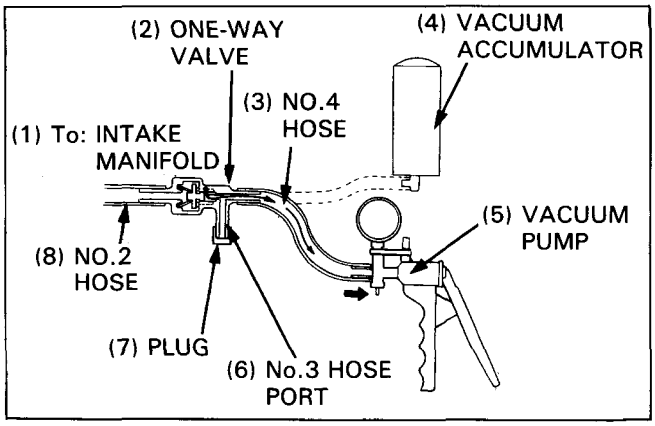
Connect a vacuum pump to the No. 4 hose. Disconnect the No. 3 hose from the valve and plug the No. 3 port.

Apply the specified vacuum and vacuum should be maintained.

SPECIFIED VACUUM: 40 mmHg (1.6 inHg)

If unable to obtain the above results, check vacuum hoses. Replace the one-way valve if necessary.





INSTRUMENTS

SPEED SENSOR INSPECTION

Check the speedometer cable connection for loose.
Remove the instruments with 14P-BLK and 20P-WHT connectors connected (page 22-12).

Connect a voltmeter across the LT-GRN/BLK (+) and GRN/BLK (−) terminals of the sensor 3P-WHT connector.

Turn the ignition switch ACC, ON or P. Battery voltage should register.

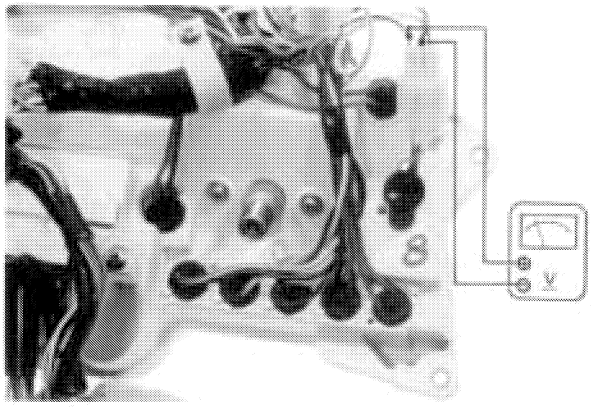
The absence of power indicates the speed sensor is not receiving power from the battery. Trace and repair the related wiring, connectors and/or fuse 10.

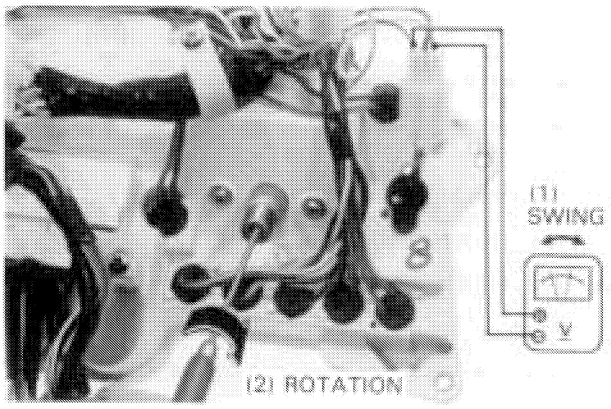
Connect a voltmeter across the LT-GRN/BLK (+) and WHT/BLU (−) terminals of the sensor 3P-WHT connector.

Turn the ignition switch ON.

The sensor is normal if the voltmeter needle swings from 2 to about 10 V slowly eight times when the speedometer drive shaft is turned slowly one full turn.

If all checks are O.K., replace the speed sensor.





ELECTRIC TACHOMETER INSPECTION

Remove the instruments with 20P-WHT connectors connected (page 22-12).

Connect a voltmeter across the BLK/BRN (+) and GRN (−) terminals of the tachometer terminals.

Turn the ignition switch ON and battery voltage should register.

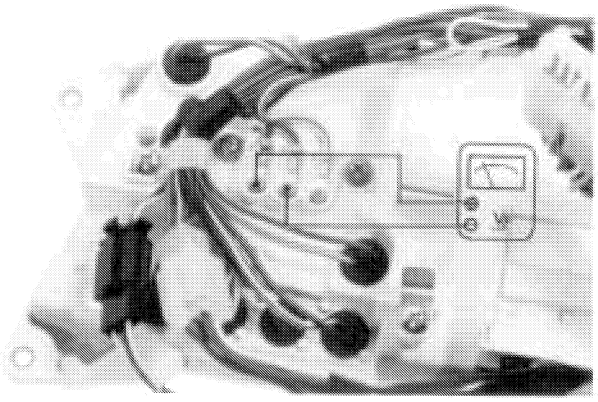
The absence of voltage indicates the tachometer is not receiving power from the battery. Trace and repair the related wiring, connectors and/or components (relay 3 and fuse 8/12).

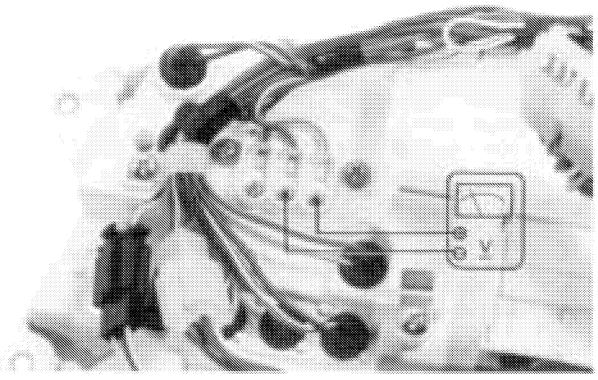
Connect a voltmeter across the YEL/BLU (+) and GRN (−) terminals of the tachometer terminals.

Turn the ignition switch ON with the engine stop switch on RUN and battery voltage should register.

If there is not O.K., check the wiring for loose connectors from ignition coil (No. 2) to tachometer terminal. Trace and repair them.

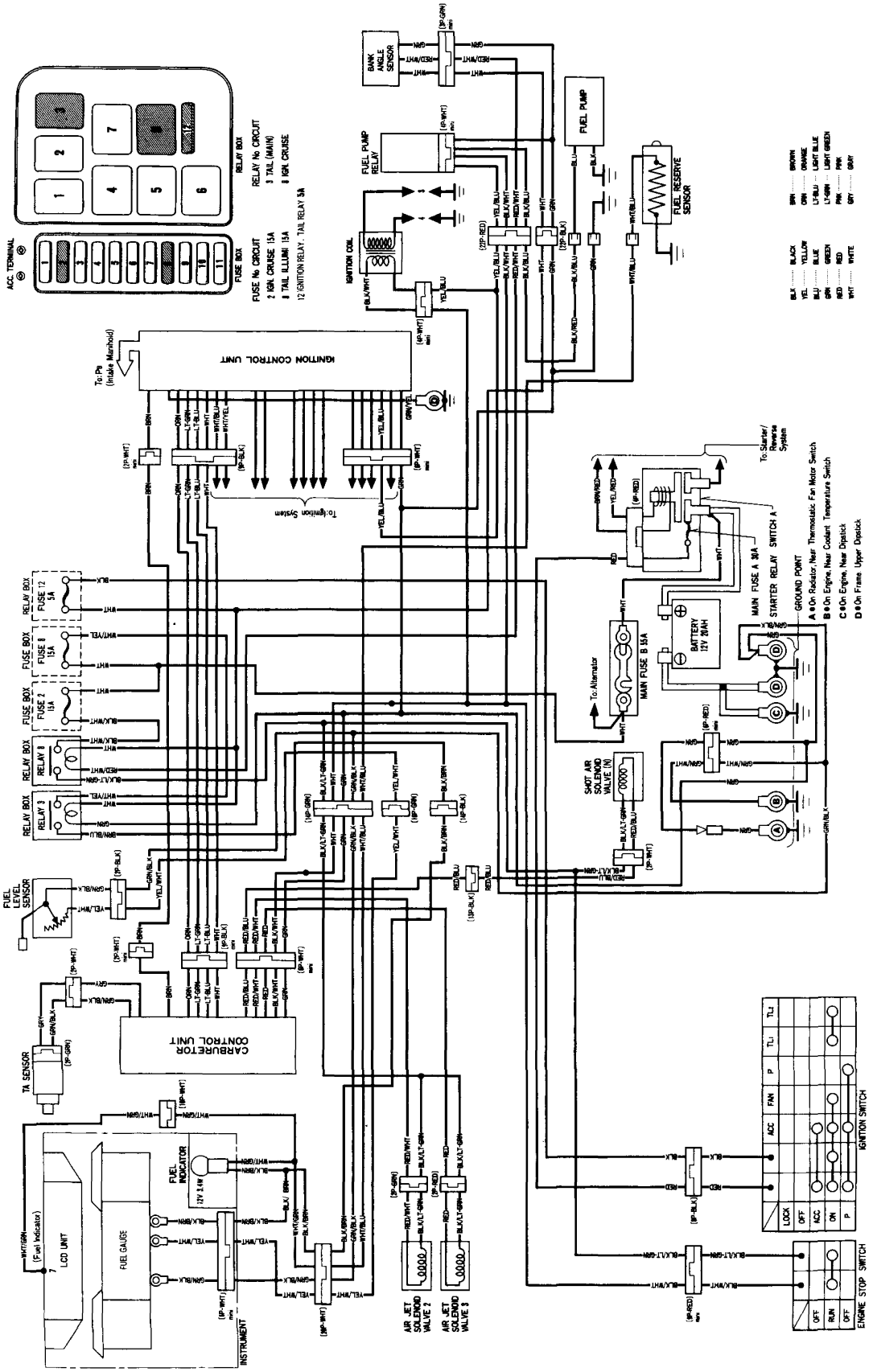
If all checks are O.K., replace the electric tachometer.

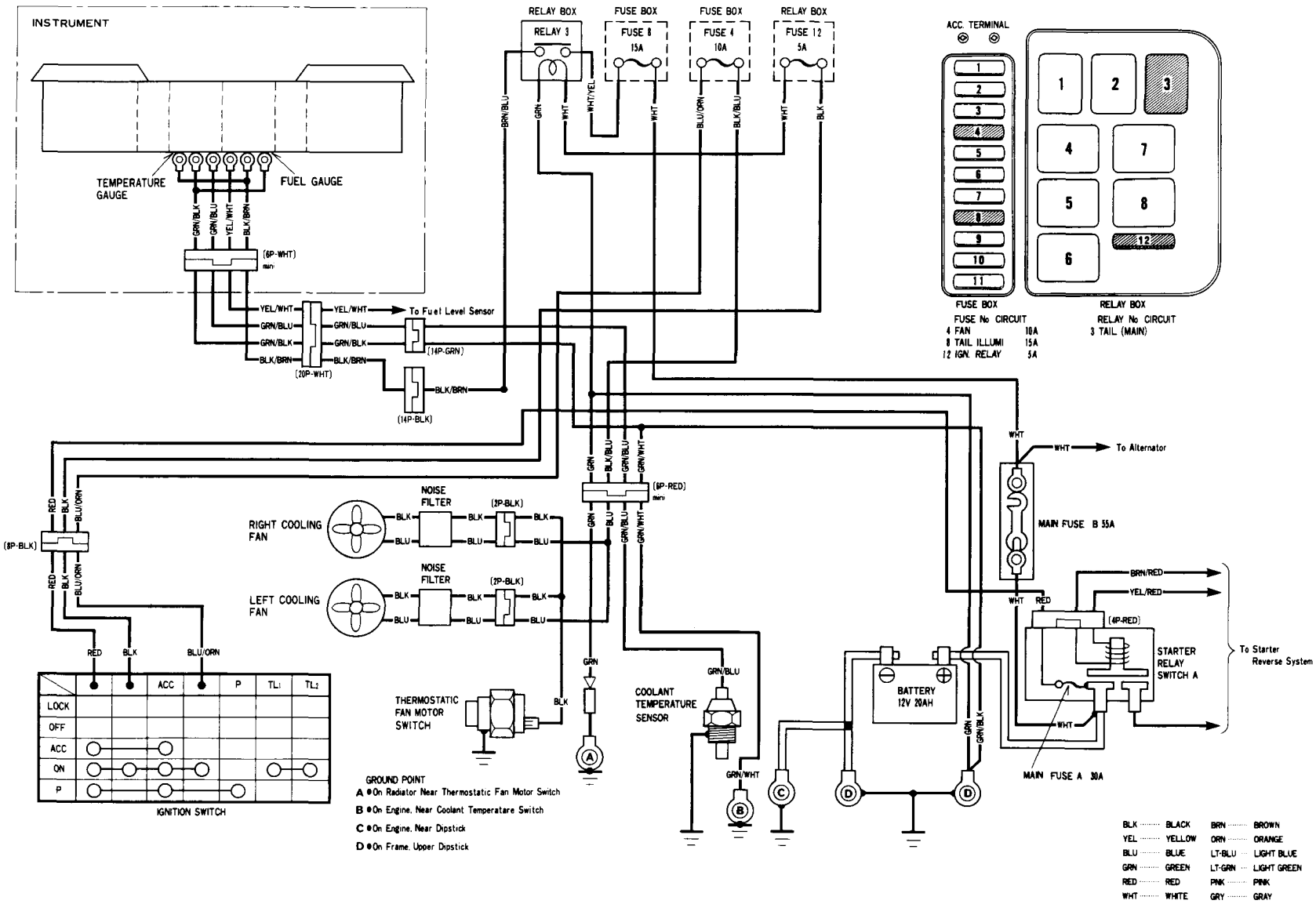


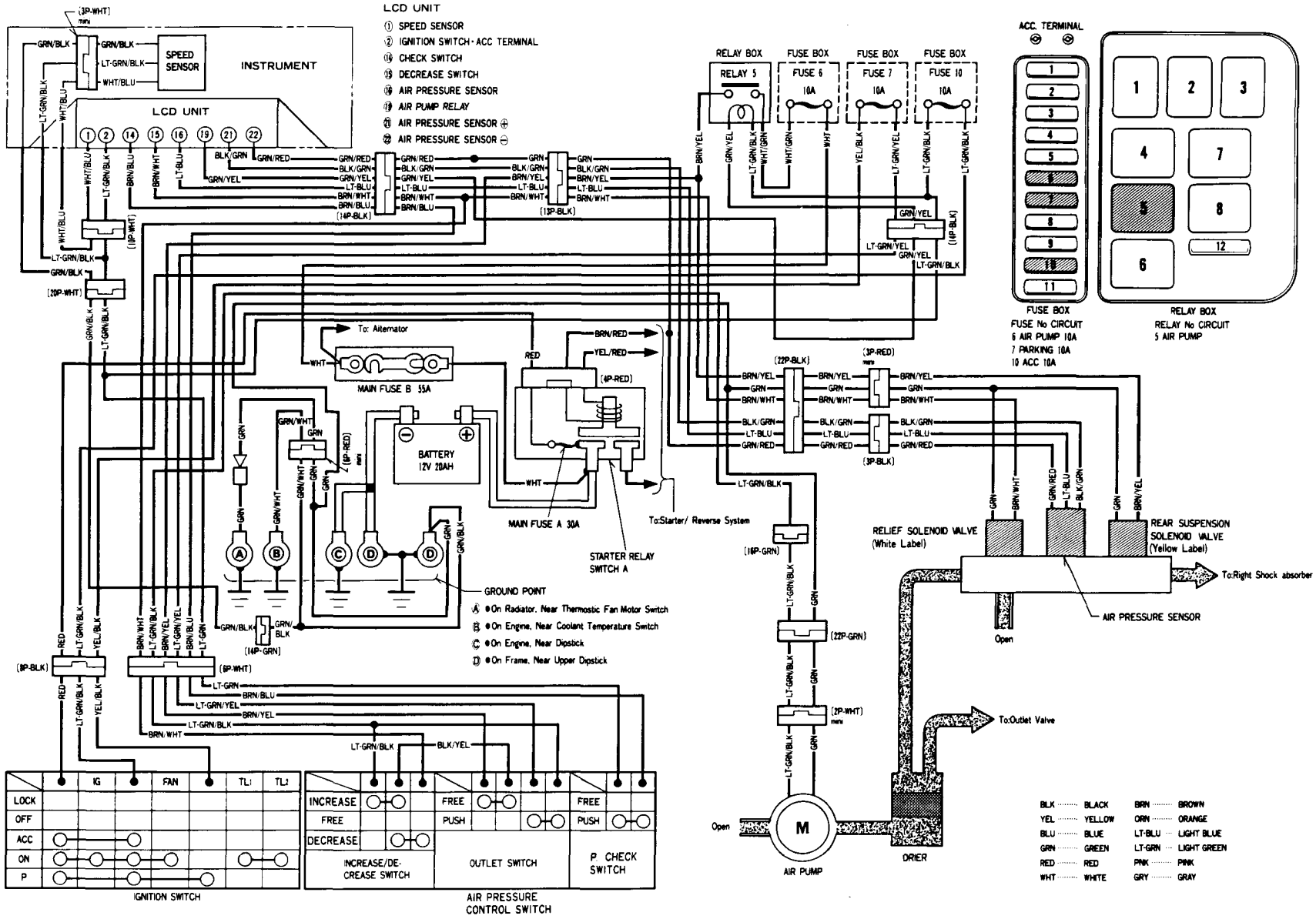


CIRCUIT DIAGRAM

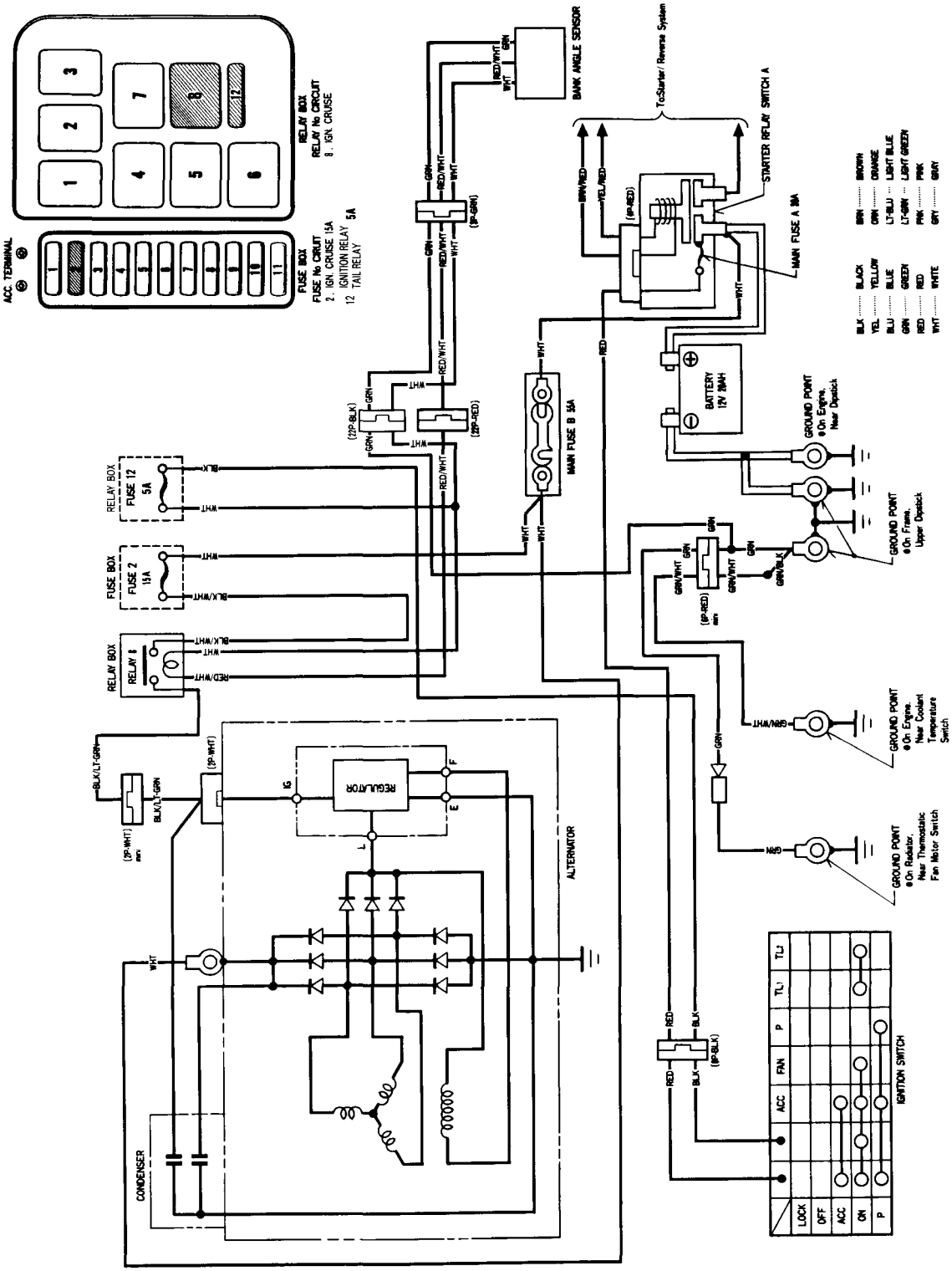
FUEL SYSTEM

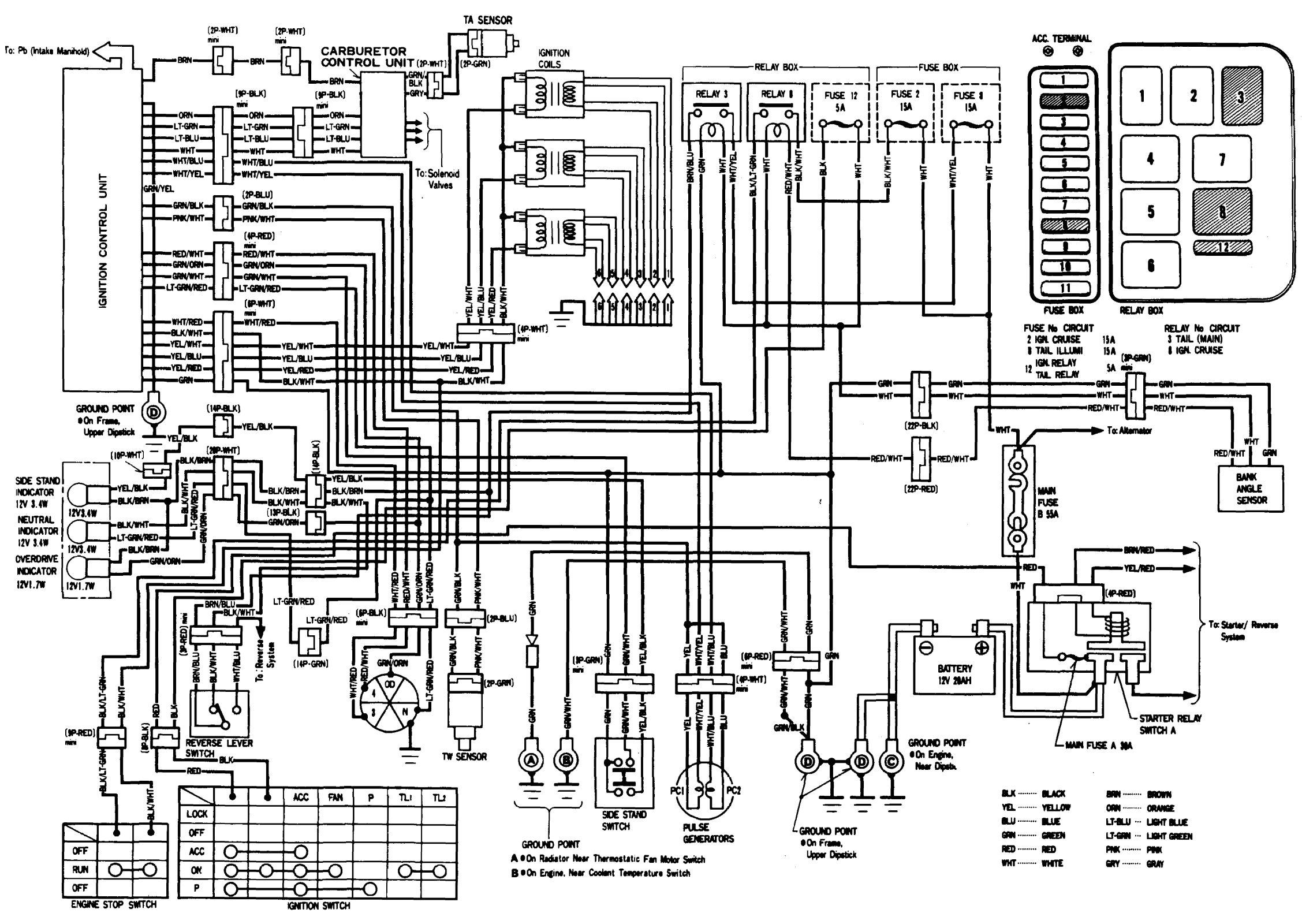


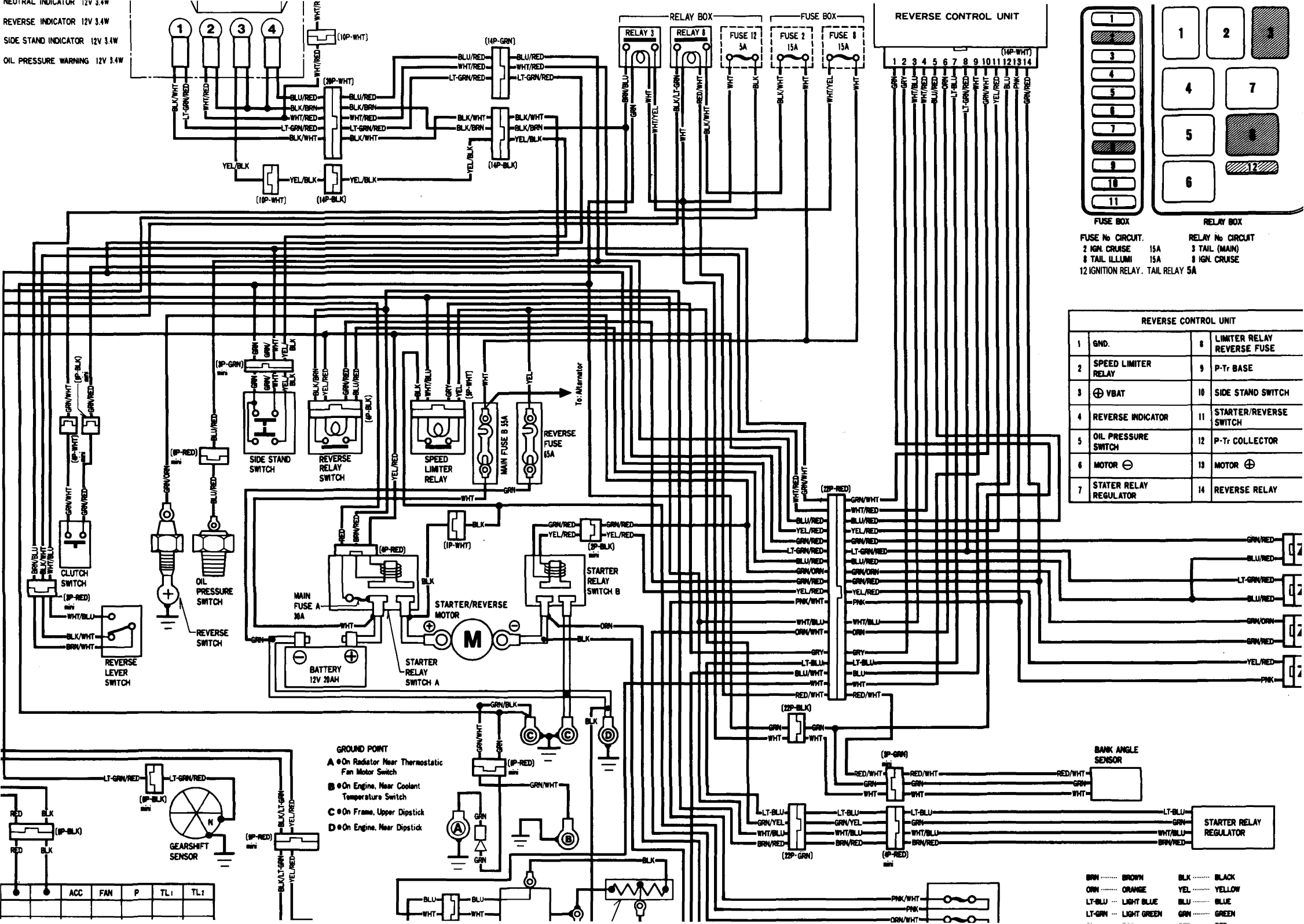

INSTRUMENT
TEMPERATURE GAUGE
FUEL GAUGE
GRN/BLK
GRN/BLU
YEL/WHT
BLK/BRN
(6P-WHT)
YEL/WHT
GRN/BLU
GRN/BLK
BLK/BRN
(20P-WHT)
To Fuel Level Sensor
(14P-GRN)
BLK/BRN
(14P-BLK)
RELAY BOX
RELAY 3
FUSE BOX
FUSE 8
15A
FUSE BOX
FUSE 4
10A
RELAY BOX
FUSE 12
5A
BRN/BLU
GRN
WHT
WHT/YEL
WHT
BLU/ORN
BLK/BLU
WHT
BLK
ACC. TERMINAL
FUSE BOX
RELAY BOX
FUSE No CIRCUIT
4 FAN 10A
8 TAIL ILLUMI 15A
12 IGN. RELAY 5A
RELAY No CIRCUIT
3 TAIL (MAIN)
WHT
To Alternator
MAIN FUSE B 55A
(6P-RED)
GRN
BLK/BLU
GRN/BLU
GRN/WHT
(8P-BLK)
RED
BLK
BLU/ORN
NOISE FILTER
(2P-BLK)
RIGHT COOLING FAN
LEFT COOLING FAN
BRN/RED
YEL/RED
(4P-RED)
STARTER RELAY SWITCH A
To Starter Reverse System
WHT
RED
LOCK
OFF
ACC
ON
P
IGNITION SWITCH
THERMOSTATIC FAN MOTOR SWITCH
COOLANT TEMPERATURE SENSOR
BATTERY 12V 20AH
MAIN FUSE A 30A
GROUND POINT
A ●On Radiator Near Thermostatic Fan Motor Switch
B ●On Engine, Near Coolant Temperatare Switch
C ●On Engine, Near Dipstick
D ●On Frame, Upper Dipstick
BLK ..... BLACK
BRN ..... BROWN
YEL ..... YELLOW
ORN ..... ORANGE
BLU ..... BLUE
LT-BLU ... LIGHT BLUE
GRN ..... GREEN
LT-GRN ... LIGHT GREEN
RED ..... RED
PNK ..... PINK
WHT ..... WHITE
GRY ..... GRAY

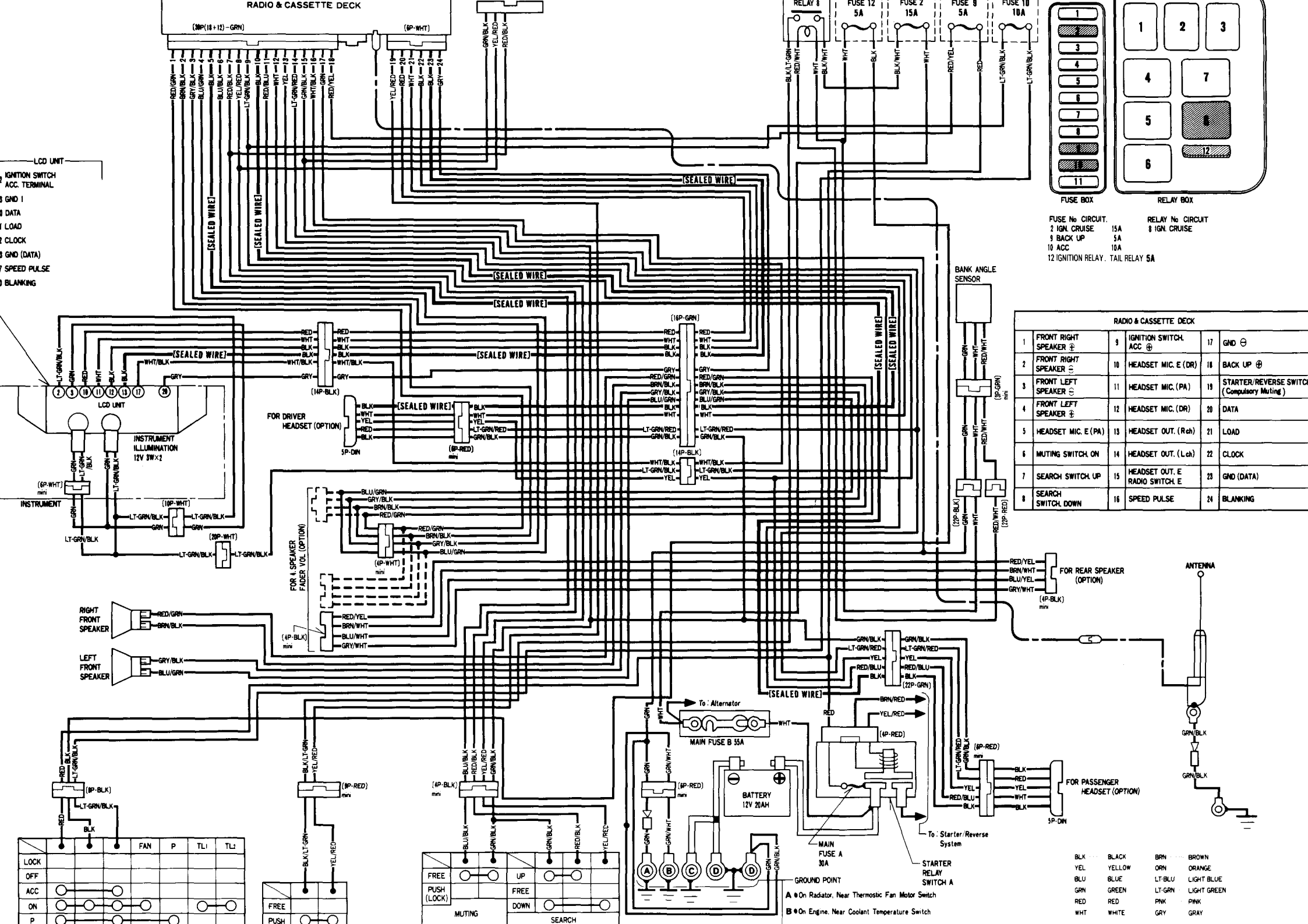

LCD UNIT
① SPEED SENSOR
② IGNITION SWITCH - ACC TERMINAL
⑯ CHECK SWITCH
⑲ DECREASE SWITCH
⑯ AIR PRESSURE SENSOR
⑰ AIR PUMP RELAY
㉑ AIR PRESSURE SENSOR ⊕
㉒ AIR PRESSURE SENSOR ⊖
INSTRUMENT
SPEED SENSOR
LCD UNIT
RELAY BOX
RELAY 5
FUSE BOX
FUSE 6 10A
FUSE 7 10A
FUSE 10 10A
ACC. TERMINAL
FUSE BOX
FUSE No CIRCUIT
6 AIR PUMP 10A
7 PARKING 10A
10 ACC 10A
RELAY BOX
RELAY No CIRCUIT
5 AIR PUMP
To: Alternator
MAIN FUSE B 55A
BATTERY 12V 20AH
MAIN FUSE A 30A
STARTER RELAY SWITCH A
To:Starter/ Reverse System
GROUND POINT
Ⓐ On Radiator, Near Thermostic Fan Motor Switch
Ⓑ On Engine, Near Coolant Temperature Switch
Ⓒ On Engine, Near Dipstick
Ⓓ On Frame, Near Upper Dipstick
RELIEF SOLENOID VALVE (White Label)
REAR SUSPENSION SOLENOID VALVE (Yellow Label)
To:Right Shock absorber
AIR PRESSURE SENSOR
Open
To:Outlet Valve
Open
M
AIR PUMP
ORIER
IGNITION SWITCH
LOCK
OFF
ACC
ON
P
IG
FAN
TL1
TL2
AIR PRESSURE CONTROL SWITCH
INCREASE
FREE
DECREASE
INCREASE/DE-CREASE SWITCH
FREE
PUSH
OUTLET SWITCH
FREE
PUSH
P CHECK SWITCH
BLK BLACK
YEL YELLOW
BLU BLUE
GRN GREEN
RED RED
WHT WHITE
BRN BROWN
ORN ORANGE
LT-BLU LIGHT BLUE
LT-GRN LIGHT GREEN
PNK PINK
GRY GRAY

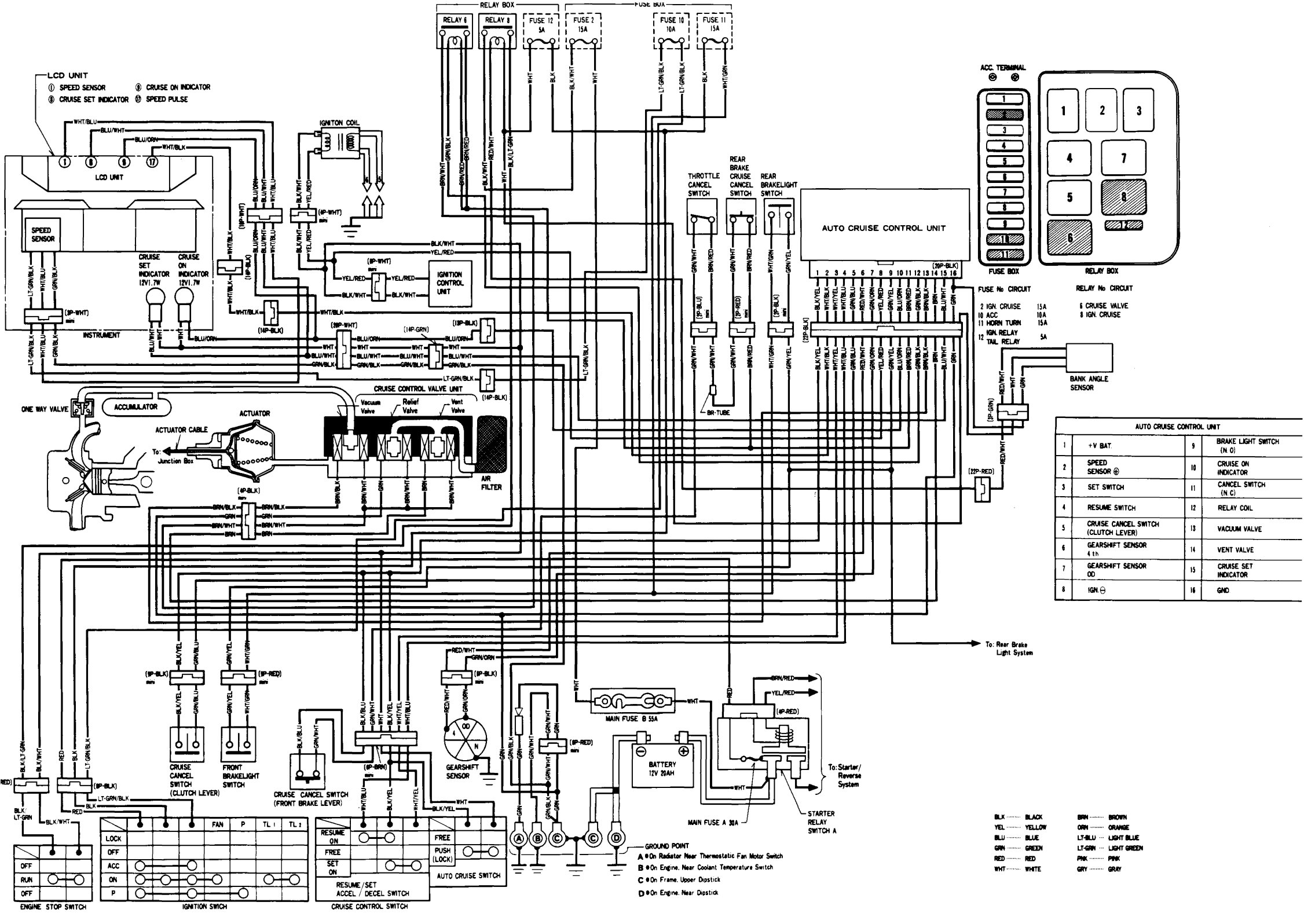
CHARGING SYSTEM/ALTERNATOR




To: Pb (Intake Manifold)
IGNITION CONTROL UNIT
CARBURETOR CONTROL UNIT
TA SENSOR
IGNITION COILS
To: Solenoid Valves
RELAY BOX
RELAY 3
RELAY 8
FUSE 12 5A
FUSE BOX
FUSE 2 15A
FUSE 8 15A
ACC. TERMINAL
FUSE BOX
RELAY BOX
FUSE No CIRCUIT
2 IGN. CRUISE 15A
8 TAIL ILLUMI 15A
12 IGN. RELAY TAIL RELAY 5A
RELAY No CIRCUIT
3 TAIL (MAIN)
8 IGN. CRUISE
GROUND POINT
On Frame, Upper Dipstick
SIDE STAND INDICATOR 12V 3.4W
NEUTRAL INDICATOR 12V 3.4W
OVERDRIVE INDICATOR 12V1.7W
12V3.4W
12V3.4W
12V1.7W
To: Alternator
BANK ANGLE SENSOR
MAIN FUSE B 55A
MAIN FUSE A 90A
STARTER RELAY SWITCH A
To: Starter/ Reverse System
BATTERY 12V 28AH
REVERSE LEVER SWITCH
To: Reverse System
TW SENSOR
SIDE STAND SWITCH
PULSE GENERATORS
PC1
PC2
GROUND POINT
On Engine, Near Dipstk.
GROUND POINT
On Frame, Upper Dipstick
A On Radiator Near Thermostatic Fan Motor Switch
B On Engine, Near Coolant Temperature Switch
ENGINE STOP SWITCH
OFF
RUN
OFF
IGNITION SWITCH
LOCK
OFF
ACC
ON
P
ACC
FAN
P
TL1
TL2
BLK ..... BLACK
YEL ..... YELLOW
BLU ..... BLUE
GRN ..... GREEN
RED ..... RED
WHT ..... WHITE
BRN ..... BROWN
ORN ..... ORANGE
LT-BLU ... LIGHT BLUE
LT-GRN ... LIGHT GREEN
PNK ..... PINK
GRY ..... GRAY

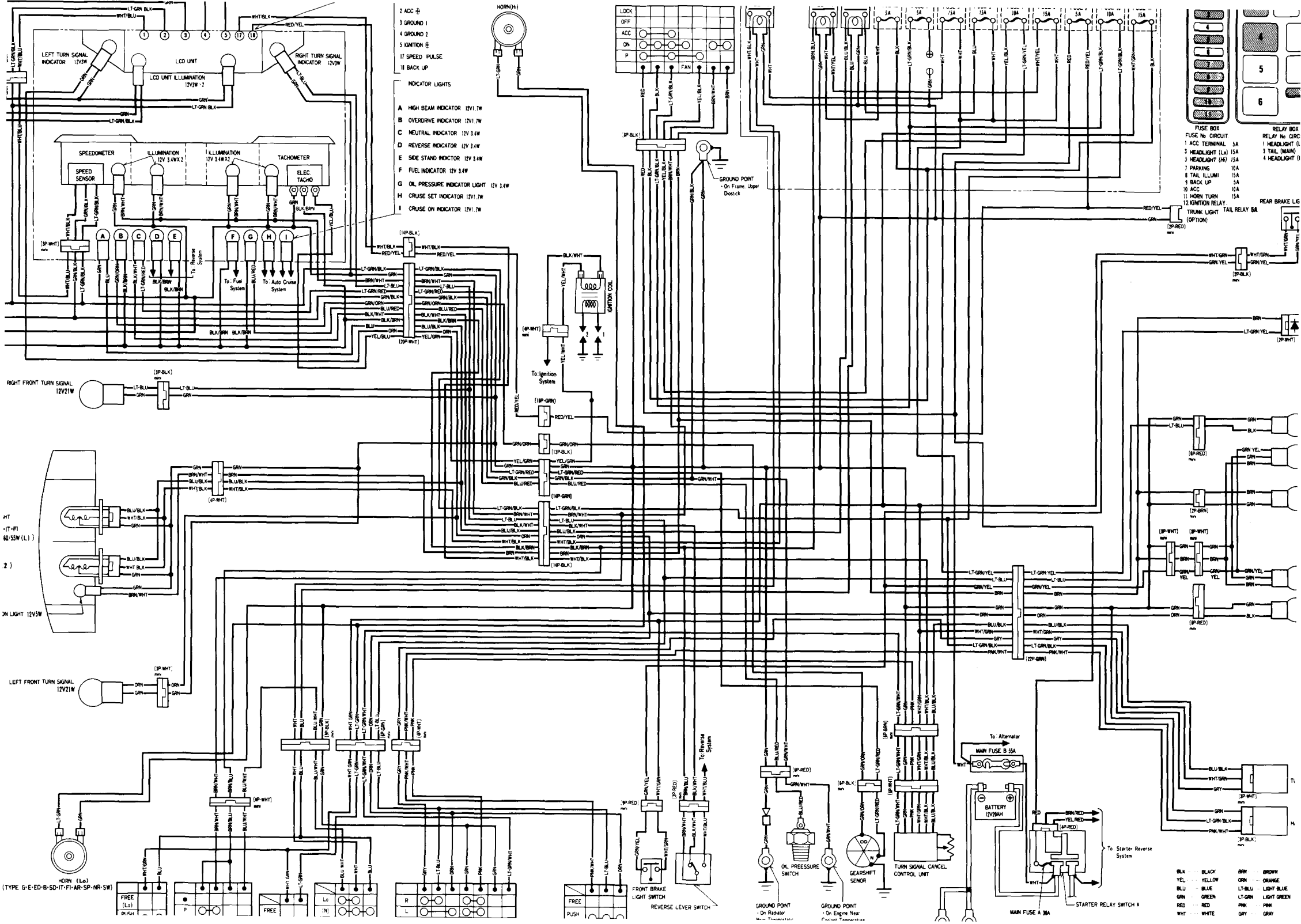

NEUTRAL INDICATOR 12V 3.4W
REVERSE INDICATOR 12V 3.4W
SIDE STAND INDICATOR 12V 3.4W
OIL PRESSURE WARNING 12V 3.4W
RELAY BOX
FUSE BOX
RELAY 3
RELAY 8
FUSE 12 5A
FUSE 2 15A
FUSE 8 15A
REVERSE CONTROL UNIT
FUSE BOX
RELAY BOX
FUSE No CIRCUIT. RELAY No CIRCUIT
2 IGN. CRUISE 15A 3 TAIL (MAIN)
8 TAIL ILLUMI 15A 8 IGN. CRUISE
12 IGNITION RELAY. TAIL RELAY 5A
REVERSE CONTROL UNIT
1 GND. 8 LIMITER RELAY REVERSE FUSE
2 SPEED LIMITER RELAY 9 P-Tr BASE
3 ⊕ VBAT 10 SIDE STAND SWITCH
4 REVERSE INDICATOR 11 STARTER/REVERSE SWITCH
5 OIL PRESSURE SWITCH 12 P-Tr COLLECTOR
6 MOTOR ⊖ 13 MOTOR ⊕
7 STATER RELAY REGULATOR 14 REVERSE RELAY
SIDE STAND SWITCH
REVERSE RELAY SWITCH
SPEED LIMITER RELAY
MAIN FUSE B 35A
REVERSE FUSE 65A
To Alternator
CLUTCH SWITCH
OIL PRESSURE SWITCH
REVERSE SWITCH
REVERSE LEVER SWITCH
MAIN FUSE A 30A
STARTER/REVERSE MOTOR
STARTER RELAY SWITCH B
STARTER RELAY SWITCH A
BATTERY 12V 20AH
BANK ANGLE SENSOR
STARTER RELAY REGULATOR
GEARSHIFT SENSOR
GROUND POINT
A On Radiator Near Thermostatic Fan Motor Switch
B On Engine, Near Coolant Temperature Switch
C On Frame, Upper Dipstick
D On Engine, Near Dipstick
ACC FAN P TL1 TL2
BRN BROWN BLK BLACK
ORN ORANGE YEL YELLOW
LT-BLU LIGHT BLUE BLU BLUE
LT-GRN LIGHT GREEN GRN GREEN


RADIO & CASSETTE DECK
(30P(18+12)-GRN)
(6P-WHT)
LCD UNIT
IGNITION SWITCH ACC. TERMINAL
GND (
DATA
LOAD
CLOCK
GND (DATA)
SPEED PULSE
BLANKING
[SEALED WIRE]
(14P-BLK)
(16P-GRN)
(8P-RED)
5P-DIN
FOR DRIVER HEADSET (OPTION)
INSTRUMENT ILLUMINATION 12V 3W×2
INSTRUMENT
(6P-WHT) mini
(10P-WHT)
(20P-WHT)
FOR 4 SPEAKER FADER VOL (OPTION)
(4P-WHT) mini
(4P-BLK) mini
RIGHT FRONT SPEAKER
LEFT FRONT SPEAKER
BANK ANGLE SENSOR
(3P-GRN) mini
(22P-BLK)
(22P-RED)
RELAY 8
FUSE 12 5A
FUSE 2 15A
FUSE 9 5A
FUSE 10 10A
FUSE BOX
RELAY BOX
FUSE No. CIRCUIT. 2 IGN. CRUISE 15A 9 BACK UP 5A 10 ACC 10A 12 IGNITION RELAY. TAIL RELAY 5A
RELAY No. CIRCUIT 8 IGN. CRUISE
RADIO & CASSETTE DECK
1 FRONT RIGHT SPEAKER ⊕
2 FRONT RIGHT SPEAKER ⊖
3 FRONT LEFT SPEAKER ⊖
4 FRONT LEFT SPEAKER ⊕
5 HEADSET MIC. E (PA)
6 MUTING SWITCH. ON
7 SEARCH SWITCH. UP
8 SEARCH SWITCH. DOWN
9 IGNITION SWITCH. ACC ⊕
10 HEADSET MIC. E (DR)
11 HEADSET MIC. (PA)
12 HEADSET MIC. (DR)
13 HEADSET OUT. (Rch)
14 HEADSET OUT. (Lch)
15 HEADSET OUT. E RADIO SWITCH. E
16 SPEED PULSE
17 GND ⊖
18 BACK UP ⊕
19 STARTER/REVERSE SWITCH (Compulsory Muting)
20 DATA
21 LOAD
22 CLOCK
23 GND (DATA)
24 BLANKING
To: Alternator
MAIN FUSE B 55A
BATTERY 12V 20AH
MAIN FUSE A 30A
STARTER RELAY SWITCH A
To: Starter/Reverse System
GROUND POINT
A ●On Radiator, Near Thermostic Fan Motor Switch
B ●On Engine, Near Coolant Temperature Switch
FOR REAR SPEAKER (OPTION)
FOR PASSENGER HEADSET (OPTION)
ANTENNA
(8P-BLK)
(8P-RED)
(4P-RED)
(22P-GRN)
LOCK
OFF
ACC
ON
P
FAN
P
TL1
TL2
FREE
PUSH (LOCK)
MUTING
UP
FREE
DOWN
SEARCH
BLK BLACK
YEL YELLOW
BLU BLUE
GRN GREEN
RED RED
WHT WHITE
BRN BROWN
ORN ORANGE
LT-BLU LIGHT BLUE
LT-GRN LIGHT GREEN
PNK PINK
GRY GRAY



AUTO CRUISE CONTROL UNIT			
1	+V BAT.	9	BRAKE LIGHT SWITCH (N.O)
2	SPEED SENSOR ⊕	10	CRUISE ON INDICATOR
3	SET SWITCH	11	CANCEL SWITCH (N.C)
4	RESUME SWITCH	12	RELAY COIL
5	CRUISE CANCEL SWITCH (CLUTCH LEVER)	13	VACUUM VALVE
6	GEARSHIFT SENSOR 4 th	14	VENT VALVE
7	GEARSHIFT SENSOR OD	15	CRUISE SET INDICATOR
8	IGN.⊖	16	GND

BLK	BLACK	BRN	BROWN
YEL	YELLOW	ORN	ORANGE
BLU	BLUE	LT-BLU	LIGHT BLUE
GRN	GREEN	LT-GRN	LIGHT GREEN
RED	RED	PNK	PINK
WHT	WHITE	GRY	GRAY


2 ACC
3 GROUND 1
4 GROUND 2
5 IGNITION
17 SPEED PULSE
18 BACK UP
INDICATOR LIGHTS
A HIGH BEAM INDICATOR 12V1.7W
B OVERDRIVE INDICATOR 12V1.7W
C NEUTRAL INDICATOR 12V 3.4W
D REVERSE INDICATOR 12V 3.4W
E SIDE STAND INDICTOR 12V 3.4W
F FUEL INDICATOR 12V 3.4W
G OIL PRESSURE INDICATOR LIGHT 12V 3.4W
H CRUSE SET INDICATOR 12V1.7W
I CRUSE ON INDICATOR 12V1.7W
HORN(Hi)
LOCK
OFF
ACC
ON
P
FAN
LEFT TURN SIGNAL INDICATOR 12V3W
LCD UNIT
LCD UNIT ILLUMINATION 12V3W×2
RIGHT TURN SIGNAL INDICATOR 12V3W
SPEEDOMETER
SPEED SENSOR
ILLUMINATION 12V 3.4W×2
ILLUMINATION 12V 3.4W×2
TACHOMETER
ELEC. TACHO
To: Reverse System
To: Fuel System
To: Auto Cruse System
To: Ignition System
IGNITION COIL
GROUND POINT
• On Frame, Upper Diostck
FUSE BOX
FUSE No. CIRCUIT
1 ACC TERMINAL 5A
3 HEADLIGHT (Lo) 15A
3 HEADLIGHT (Hi) 15A
7 PARKING 10A
8 TAIL ILLUMI 15A
9 BACK UP 5A
10 ACC 10A
11 HORN TURN 15A
12 IGNITION RELAY
TRUNK LIGHT (OPTION)
TAIL RELAY 5A
REAR BRAKE LIG
RELAY BOX
RELAY No. CIRC
1 HEADLIGHT (L
3 TAIL (MAIN)
4 HEADLIGHT (
RIGHT FRONT TURN SIGNAL 12V21W
LEFT FRONT TURN SIGNAL 12V21W
HORN (Lo)
(TYPE G·E·ED·B·SD·IT·FI·AR·SP·NR·SW)
FREE (Lo)
PUSH
FREE
FREE
PUSH
FRONT BRAKE LIGHT SWITCH
REVERSE LEVER SWITCH
To: Reverse System
OIL PREESSURE SWITCH
GEARSHIFT SENOR
TURN SIGNAL CANCEL CONTROL UNIT
To: Alternator
MAIN FUSE B 35A
BATTERY 12V20AH
To: Starter Reverse System
STARTER RELAY SWITCH A
MAIN FUSE A 30A
GROUND POINT
• On Radiator
GROUND POINT
• On Engine Near
BLK BLACK
YEL YELLOW
BLU BLUE
GRN GREEN
RED RED
WHT WHITE
BRN BROWN
ORN ORANGE
LT-BLU LIGHT BLUE
LT-GRN LIGHT GREEN
PNK PINK
GRY GRAY

Paper Book Part No. 67MN500Y

HOW TO USE THIS MANUAL

This addendum contains information for GL1500 (L). Refer to GL1500 SHOP MANUAL (No. 67MN500 and No. 67MN500Z) for service procedures and data not included in this addendum.

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

CODE	AREA (TYPE)	CODE	AREA (TYPE)
E	U.K.	SD	Sweden
G	Germany	IT	Italy
F	France	FI	Finland
ED	Europe	AR	Austria
SW	Switzerland	U	Australia
B	Belgium	NR	Norway
CM	Canada		

Wire Color Abbreviations

The following abbreviations are used to identify wire colors in the circuit schematics:

BLK	black	LT GRN	light green
BLU	blue	ORN	orange
BRN	brown	PNK	pink
GRN	green	RED	red
GRY	gray	WHT	white
LT BLU	light blue	YEL	yellow

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SERVICE PUBLICATIONS OFFICE

CONTENT

IMPORTANT SAFETY NOTICE

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

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

NOTE: Gives helpful information.

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

SPECIFICATIONS

Dimensions	Overall length		2,630 mm (103.5 in) G model: 2,635 mm (103.7 in)
	Overall width		955 mm (37.6 in)
	Overall height		1,525 mm (60.0 in) G, FI model: 1,335 mm (52.6 in)
	Wheelbase		1,700 mm (66.9 in)
	Seat height		770 mm (30.3 in)
	Ground clearance		140 mm (5.5 in) SP model: 135 mm (5.3 in)
	Dry weight		366 kg (807 lbs) G model: 361 kg (796 lbs)
	Curb weight		394 kg (869 lbs) G model: 389 kg (858 lbs)
Frame	Frame type		Double cradle
	Front suspension	Travel	Telescopic, 140 mm (5.5 in)
	Rear suspension	Travel	Swing arm, 105 mm (4.1 in)
		Air pressure	0–400 kPa (0–4.0 kg/cm², 0–57 psi)
	Front tire	Size	130/70–18 63H
		Air pressure	225 kPa (2.25 kg/cm², 33 psi)
	Rear tire	Size	160/80–16 75H
		Air pressure	250 kPa (2.50 kg/cm², 36 psi): Driver only
			280 kPa (2.80 kg/cm², 41 psi): Driver and Passenger
	Front brake		Double disc brake
	Rear brake		Disc brake
	Fuel capacity		24.0 lit. (6.4 US gal, 5.3 Imp gal)
	Caster angle		30°
	Trail length		115 mm (4.5 in)
	Front fork oil capacity	Left	325 cm³ (10.9 US oz, 11.4 Imp oz)
		Right	320 cm³ (10.8 US oz, 11.2 Imp oz)
Engine	Engine type		Water cooled, 4 stroke O.H.C.
	Cylinder arrangement		Flat six
	Bore and stroke		71 x 64 mm (2.8 x 2.5 in)
	Displacement		1,520 cm³ (92.7 cu-in)
	Compression ratio		9.8:1 SW model: 8.6:1
	Valve train		Belt driven over head camshaft
	Oil capacity	At disassembly	4.3 lit. (4.5 US qt, 3.8 Imp qt)
		After draining	3.5 lit. (3.7 US qt, 3.1 Imp qt)
	Lubrication system		Forced and wet sump
	Cooling system capacity		4.1 lit. (4.3 US qt, 3.6 Imp qt)
	Cylinder compression		1,500 kPa (15.0 kg/cm², 213 psi)
	Engine weight		126 kg (278 lbs)
	Camshaft: Intake valve	Opens	5° ATDC (At 1 mm lift)
		Closes	30° ABDC (At 1 mm lift)
	Camshaft: Exhaust valve	Opens	40° BBDC (At 1 mm lift)
		Closes	5° BTDC (At 1 mm lift)
	Valve clearance	Intake/Exhaust	Hydraulic valve adjuster system
	Idle speed		800±80 min⁻¹ (rpm)
		SW model	900±50 min⁻¹ (rpm)

Carburetion	Carburetor type			CV down-draft dual carburetors
	Throttle bore			36 mm (1.4 in)
	Carburetor identification No.			VDG9A SW model: VDGWB
	Pilot screw opening			2 turns out SW model: 1-1/4 turns out
	Float level			7.5 mm (0.30 in)
	Main jet			pri: #95 (SW model #90) 2nd: #158
	Slow jet			#60
	Throttle grip free play			5–8 mm (3/16–5/16 in)
	Fuel pump flow capacity			640 cm^3 (22.5 Imp oz)/minute
	Carburetor vacuum difference			Within 40 mm (1.6 in) Hg of each other
Drive Train	Clutch type			Wet, multi-plate
	Transmission			5-speed, constant mesh
	Primary reduction ratio			1.592 (78/49)
	Secondary reduction ratio			0.971 (34/35)
	Gear ratio	1st 2nd 3rd 4th OD		2.667 (40/15) 1.722 (31/18) 1.273 (28/22) 0.964 (27/28) 0.759 (22/29)
	Final reduction ratio			2.833 (34/12)
	Gearshift pattern			Left foot operated return system 1–N–2–3–4–OD
	Final gear oil capacity (After disassembly)			170 cm^3 (5.7 US oz, 6.0 Imp oz)
Electrical	Ignition			Battery, Ignition (Full transistor)
	Ignition timing "F" mark			3.5° BTDC
	Starting system			Starting motor
	Alternator			AC generator, 0.55 kW/5,000 min^{-1} (rpm)
	Battery capacity			12 V–20 AH
	Spark plug	Standard	NGK	DPR7EA-9
			ND	X22EPR-U9
		For cold climate (Below 5°C, 41°F)	NGK	DPR6EA-9
			ND	X20EPR-U9
		For extended high speed riding	NGK	DPR8EA-9
			ND	X24EPR-U9
	Spark plug gap			0.8–0.9 mm (0.031–0.035 in)
	Firing order			1–4–5–2–3–6–1
	Fuses			5 A x 3, 10 A x 4, 15 A x 5 (fuse box) 30 A, 55 A (main fuses) 5 A x 3, 65 A (reverse fuses)
Lights	Headlight			12 V 60 W (R), 60/55 W (L) SW model: 12 V 60/55 W E model: 60/55 W x 2
	Position light			12 V 5W
	Turn signal light			12 V 21 W x 4
	Indicator light			12 V 3.4 W x 5 / 12 V 1.7 W x 4
	Turn signal indicator			12 V 3 W x 2
	Instrument illumination			12 V 3.4 W x 4
	LCD unit illumination			12 V 3 W x 2
	License light			12 V 5 W
	Brake and taillight			12 V 21/5 W x 2

SERVICE DATA

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
Engine weight (including carburetors)				126 kg (278 lbs)	—
Engine oil capacity		at engine assembly		4.3 lit (4.5 US qt, 3.8 Imp qt)	—
		at oil change		3.5 lit (3.7 US qt, 3.1 Imp qt)	—
		at oil filter and oil change		3.7 lit (3.9 US qt, 3.3 Imp qt)	—
Radiator coolant capacity		After disassembly		4.1 lit (4.3 US qt, 3.6 Imp qt)	—
		After draining (including reserve tank)		3.8 lit (4.0 US qt, 3.3 Imp qt)	—
		Reserve tank		0.55 lit (0.6 US qt, 0.5 Imp qt)	—
OIL PUMP	Main oil pump	Tip clearance		0.15 (0.006) max.	0.35 (0.014)
		Pump body clearance		0.15–0.23 (0.006–0.009)	0.43 (0.017)
		Pump side clearance		0.02–0.07 (0.001–0.003)	0.12 (0.005)
	Scavenge pump	Tip clearance		0.15 (0.006) max.	0.35 (0.014)
		Pump body clearance		0.15–0.22 (0.006–0.009)	0.42 (0.017)
		Pump side clearance		0.02–0.07 (0.001–0.003)	0.12 (0.005)
	Pressure relief valve	Relief pressure		470–570 kPa (4.7–5.7 kg/cm², 67–81 psi)	—
		Relief valve spring free length		90.8 (3.57)	84.0 (3.31)
	Oil pressure (at oil pressure switch)	Cold (At 35°C/95°F)	Idle speed	130 kPa (1.3 kg/cm², 18 psi)	—
			5,000 min⁻¹ (rpm)	500 kPa (5.0 kg/cm², 71 psi)	—
		Hot (At 80°C/176°F)	Idle speed	80 kPa (0.8 kg/cm², 11 psi)	—
			5,000 min⁻¹ (rpm)	500 kPa (5.0 kg/cm², 71 psi)	—
COOLING	Radiator cap relief pressure			75–105 kPa (0.75–1.05 kg/cm², 11–15 psi)	—
	Thermostat	Begins to open temperature		80°–84°C (176°–183°F)	—
		Fully opened temperature		93°–97°C (199°–206°F)	—
		Valve lift (heated to 95°C/5 minutes)		8.0 (0.315) min.	—
	Thermo valve		Starts to close	78°–82°C (172°–180°F)	—
	Thermostatic fan motor switch		Starts to close	98°–102°C (208°–216°F)	—
	Coolant temperature sensor resistance		60°C (140°F)	104 ohms	—
			85°C (185°F)	44 ohms	—
			110°C (230°F)	20 ohms	—
			120°C (248°F)	16 ohms	—
CYLINDER HEAD	Cylinder head warpage			—	0.10 (0.004)
	Valve stem O.D.		IN	5.475–5.490 (0.2156–0.2161)	5.45 (0.215)
			EX	5.455–5.470 (0.2148–0.2154)	5.44 (0.214)
	Valve guide I.D.		IN, EX	5.500–5.512 (0.2165–0.2170)	5.55 (0.219)
	Valve stem to guide clearance		IN	0.010–0.037 (0.0004–0.0015)	0.08 (0.003)
			EX	0.030–0.057 (0.0012–0.0022)	0.10 (0.004)
	Valve seat width			1.2 (0.05)	—
	Valve spring free length			44.6 (1.76)	43.3 (1.70)
	Valve spring preload/length			15.6–18.2/37.5 kg/mm (34.39–40.12/1.48 lbs/in)	—
	Rocker arm I.D.			21.000–21.021 (0.8268–0.8276)	21.05 (0.829)
	Rocker arm shaft O.D.			11.966–11.984 (0.4711–0.4718)	11.95 (0.470)
	Rocker arm lobe		I.D.	11.996–12.031 (0.4723–0.4734)	12.07 (0.475)
			O.D.	20.945–20.980 (0.8246–0.8260)	20.93 (0.824)
	Hydraulic valve adjuster compression stroke with kerosene			0–0.30 (0–0.012)	0.30 (0.012) max.

Unit: mm (in)

ITEM				STANDARD	SERVICE LIMIT
CYLINDER HEAD	Camshaft	Cam lobe height		36.110–36.190 (1.4217–1.4248)	35.9 (1.41)
		Runout (at center journal)		—	0.10 (0.004)
		Journal O.D.	Both middles	26.934–26.955 (1.0604–1.0612)	26.91 (1.059)
			Both ends	26.949–26.970 (1.0610–1.0618)	26.91 (1.059)
		Holder journal I.D.		27.000–27.021 (1.0630–1.0638)	27.05 (1.065)
		Journal oil clearance	Both middles	0.045–0.087 (0.0018–0.0034)	0.14 (0.006)
			Both ends	0.030–0.072 (0.0012–0.0028)	0.14 (0.006)
CLUTCH	Clutch master cylinder	Cylinder I.D.		15.870–15.913 (0.6248–0.6265)	15.93 (0.627)
		Piston O.D.		15.827–15.854 (0.6231–0.6242)	15.82 (0.623)
	Clutch	Plate warpage		—	0.30 (0.012)
		Disc thickness		3.72–3.88 (0.146–0.153)	3.5 (0.14)
		Clutch spring free height		5.38 (0.212)	5.1 (0.20)
OUTPUT SHAFT	Damper spring free length			60.82 (2.394)	57.0 (2.24)
	Shaft O.D.			22.008–22.021 (0.8665–0.8670)	21.99 (0.866)
	Collar		I.D.	22.026–22.041 (0.8672–0.8678)	22.05 (0.868)
			O.D.	25.959–25.980 (1.0220–1.0228)	25.95 (1.022)
	Driven gear I.D.			26.000–26.016 (1.0236–1.0242)	26.03 (1.025)
GEAR-SHIFT	Shift fork shaft O.D.			13.966–13.984 (0.5498–0.5506)	13.90 (0.547)
	Shift fork		I.D.	14.000–14.021 (0.5512–0.5520)	14.04 (0.553)
			Claw thickness	5.93–6.00 (0.233–0.236)	5.6 (0.22)
TRANS-MISSION	Gear I.D.		C2, C3, M4, M5	34.000–34.016 (1.3386–1.3392)	34.04 (1.340)
	Gear bushing O.D.		C2, C3, M4/M5	33.940–33.965 (1.3362–1.3372)	33.92 (1.335)
	Gear-to-bushing clearance			0.035–0.076 (0.0014–0.0030)	0.10 (0.004)
CYLINDER, PISTON	Cylinder compression pressure			1300–1700 kPa (13.0–17.0 kg/cm², 185–242 psi)	1000 kPa (10.0 kg/cm², 142 psi)
	Cylinder	I.D.		71.010–71.025 (2.7957–2.7963)	71.1 (2.80)
		Out-of-round		—	0.15 (0.006)
		Taper		—	0.05 (0.002)
		Top warpage		—	0.05 (0.002)
	Piston	O.D. (at skirt)		70.960–70.990 (2.7937–2.7949)	70.85 (2.789)
		Piston pin bore		18.010–18.016 (0.7091–0.7093)	18.03 (0.710)
		Piston-to-cylinder clearance		0.020–0.065 (0.0008–0.0026)	0.10 (0.004)
	Piston ring	End gap	Top and second	0.15–0.30 (0.006–0.012)	0.5 (0.02)
			Oil ring side rail	0.20–0.70 (0.008–0.028)	0.9 (0.04)
		Ring-to-ring land clearance	Top	0.025–0.055 (0.0010–0.0022)	0.10 (0.004)
			Second	0.015–0.045 (0.0006–0.0018)	0.10 (0.004)
	Piston pin	O.D. (at sliding surfaces)		17.994–18.000 (0.7084–0.7087)	18.99 (0.748)
		Pin-to-piston clearance		0.010–0.022 (0.0004–0.0009)	0.05 (0.002)
		Pin-to-rod interference		0.015–0.039 (0.0006–0.0015)	—

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
CRANKSHAFT	Main journal bearing oil clearance			0.020–0.038 (0.0008–0.0015)	0.06 (0.002)
	Crankpin bearing oil clearance			0.027–0.045 (0.0011–0.0018)	0.06 (0.002)
	Crankshaft runout (at center journal)			—	0.03 (0.001)
	Connecting rod side clearance			0.15–0.30 (0.006–0.012)	0.40 (0.016)
	Connecting rod small end I.D.			18.009–18.027 (0.7090–0.7097)	18.04 (0.710)
	Crankpin and main journal		Taper	—	0.003 (0.0001)
			Out-of-round	—	0.005 (0.0002)
WHEELS	Wheel axle runout			—	0.2 (0.01)
	Wheel rim runout		Axial	—	2.0 (0.08)
			Radial	—	2.0 (0.08)
	Tire tread depth		Front	—	1.5 (0.06)
			Rear	—	2.0 (0.08)
SUSPENSION	Rear suspension air pressure			0–400 kPa (0–4.0 kg/cm^2, 0–57 psi)	—
	Front fork spring free length		Spring A	192.9 (7.59)	189.0 (7.44)
			Spring B	386.3 (15.21)	378.6 (14.91)
	Front fork oil capacity		Left	325 cm^3 (10.9 US oz, 11.4 Imp oz)	—
			Right	320 cm^3 (10.8 US oz, 11.2 Imp oz)	—
	Front fork oil level (from the top of tube)			239 (9.4)	—
	Front fork oil			ATF	—
	Fork tube runout			—	0.2 (0.01)
	Left shock absorber spring free length (Rear)			280.7 (11.05)	274.5 (10.81)
	Right shock absorber oil capacity			140 cm^3 (4.7 US oz, 4.9 Imp oz)	—
	Right shock absorber oil			ATF	—
FINAL DRIVE	Final gear oil	Recommended oil		Hypoid gear oil, SAE #80	—
		Capacity	At assembly	170 cm^3 (5.7 US oz, 6.0 Imp oz)	—
			After draining	140 cm^3 (4.7 US oz, 4.9 Imp oz)	—
	Final gear backlash			0.05–0.15 (0.002–0.006)	0.3 (0.01)
		Difference at 3 points		—	0.10 (0.004)
	Ring gear-to-stop pin clearance			0.30–0.60 (0.012–0.024)	—
BRAKES	Front brake master cylinder	Cylinder I.D.		12.700–12.743 (0.5000–0.5017)	12.755 (0.5022)
		Piston O.D.		12.684–12.657 (0.4980–0.4983)	12.645 (0.4978)
	Front brake caliper	Left	Cylinder I.D.	25.400–25.450 (1.0000–1.0020)	25.460 (1.0024)
			Piston O.D.	25.335–25.368 (0.9974–0.9987)	25.310 (0.9965)
		Right	Cylinder I.D.	30.230–30.280 (1.1902–1.1921)	30.290 (1.1925)
			Piston O.D.	30.165–30.198 (1.1876–1.1889)	30.140 (1.1866)
	Front brake disc	Thickness		5.8–6.2 (0.23–0.24)	5.0 (0.20)
		Runout		—	0.3 (0.01)
	Front brake pad thickness			5.5 (0.22)	1.0 (0.04)
	Rear brake master cylinder	Cylinder I.D.		15.870–15.913 (0.6248–0.6265)	15.925 (0.6270)
		Piston O.D.		15.827–15.854 (0.6231–0.6242)	15.815 (0.6226)
		Brake rod clevis installed length		100 (3.9)	—
	Rear brake caliper	Cylinder I.D.		32.030–32.080 (1.2610–1.2630)	32.090 (1.2634)
		Piston O.D.		31.948–31.998 (1.2578–1.2598)	31.940 (1.2575)
	Rear brake disc	Thickness		7.3–7.7 (0.29–0.30)	6.0 (0.24)
		Runout		—	0.3 (0.01)
	Rear brake pad thickness			6.5 (0.26)	1.0 (0.04)
	Brake fluid (front/rear)			DOT 4	—

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
CHARGING	Battery capacity			12 V–20 AH	—
	Battery specific gravity (At 20°C, 68°F)	Full charged		1.270–1.290	—
		Need charging		Below 1.260	—
	Battery charging current			2.0 Amperes max.	—
	Alternator	Capacity		0.55 kW/5,000 min^{-1} (rpm)	—
		Stator coil resistance		0.1–0.3 ohms (20°C, 68°F)	—
		Rotor coil resistance		2.9–4.0 ohms (20°C, 68°F)	—
		Rotor coil slip ring O.D.		27.0 (1.06)	26.0 (1.02)
		Charging start		800–1,000 min^{-1} (rpm)	—
	Regulator/ Rectifier (into alternator)	Type		Transistorized non-adjustable reg./recti.	—
		Regulated voltage (at 20°C/68°F)	900 min^{-1} (rpm)	0–2 A, 13.5–15.5 V	—
			1,850 min^{-1} (rpm)	1.5 A min., 13.5–15.5 V	—
IGNITION	Firing order			1–4–5–2–3–6–1	—
	Ignition timing		F mark	3.5° BTDC at 800 ± 80 min^{-1} (rpm) (SW model 900 ± 50 min^{-1} (rpm))	—
		Vacuum advance	Advance start	60–160 mmHg (2.4–6.3 inHg)	—
			Advance cease	310–360 mmHg (12.2–14.2 inHg)	—
	Ignition coil resistance (at 20°C/68°F)	Primary coil		2.6–3.2 ohms	—
		Secondary coil	With spark plug wire	20.2–26.8 Kohms	—
			Without spark plug wire	11.7–14.3 Kohms	—
	Pulse generator coil resistance (At 20°C, 68°F)			400–500 ohms	—
	Tw sensor/Ta sensor resistance		20°C (68°F)	2.0–3.0 Kohms	—
			80°C (176°F)	200–400 ohms	—
STARTER/ REVERSE	Starter motor brush length			12.5 (0.49)	6.0 (0.24)
	Reverse System	Starter relay regulator/regulated current		0.7–1.0 A	—
		Resister	Between relay and unit terminals	0.06–0.09 ohms	—
			Between relay terminal and ground	0.1–0.2 ohms	—
ELECTRICAL	Oil pressure switch continuity pressure			10–20 kPa (0.1–0.2 kg/cm^2, 1–3 psi)	—
	Fuel level sensor resistance (at 20°C/68°F)		Empty	90–100 ohms	—
			Reserve	66–81 ohms	—
			Full	4–10 ohms	—

TORQUE VALUES

ENGINE

Item	Qty	Thread dia (mm)	Torque N•m	Torque kg-m	Torque ft-lb	Remarks
Spark plug	6	12	16	1.6	12	
Carburetor insulator band screw	4	5	5	0.5	3.6	
Intake manifold vacuum tube joint	4	5	2.8	0.28	2	
Coolant temperature sensor	1	PT 1/8	12	1.2	9	NOTE 1
Water hose clamp screw	2	4	2.0	0.2	1.4	
Thermostatic fan motor switch	1	16	18	1.8	13	
Tw sensor	1	12	28	2.8	20	
Reverse switch	1	10	12	1.2	9	
Reverse shifter shaft bolt	1	6	14	1.4	10	NOTE 2
LUBRICATION:						
Oil pressure switch	1	PT 1/8	12	1.2	9	NOTE 1
Engine oil drain bolt	1	14	38	3.8	27	
Engine oil filter cartrige	1	20	10	1.0	7	
Engine oil filter boss	1	20	18	1.8	13	NOTE 2
CYLINDER HEAD:						
Cylinder head bolt (9 mm bolt)	16	9	45	4.5	33	NOTE 3
Timing belt driven pulley bolt	2	8	27	2.7	20	
Camshaft holder bolt	16	8	20	2.0	14	
Hydraulic valve adjuster stopper plug	12	14	30	3.0	22	
Cylinder head cover bolt	12	6	12	1.2	9	
Timing belt tensioner bolt	4	8	26	2.6	19	NOTE 2
Cylinder head sealing bolt	6	18	45	4.5	33	NOTE 2
CLUTCH:						
Clutch hose/pipe oil bolt	3	10	30	3.0	22	
Clutch slave cylinder bleed valve	1	8	9	0.9	7	
Clutch bleed pipe bolt	1	6	12	1.2	9	NOTE 2
Clutch lifter plate bolt	4	6	10	1.0	7	
Clutch center lock nut	1	22	130	13.0	94	
Clutch outer lock nut	1	40	190	19.0	137	NOTE 2/5
ALTERNATOR:						
Front cover attaching screw	3	4	2	0.2	1.4	NOTE 2
Couple A mounting nut	1	14	58	5.8	42	NOTE 2
Couple B mounting nut	1	14	58	5.8	42	
REAR ENGINE CASE:						
Starter one-way clutch socket bolt	6	6	16	1.6	12	NOTE 2
Starter clutch mounting bolt	1	12	75	7.5	54	
Shift drum lock arm bolt (reverse system)	1	6	12	1.2	9	
Alternator drive gear bolt	6	8	27	2.7	20	NOTE 3
Final drive gear lock nut	1	22	190	19.0	137	NOTE 2/4/5
Output shaft lock nut	1	30	190	19.0	137	NOTE 5
Oil pump driven sprocket bolt	1	6	18	1.8	13	NOTE 2
GEARSHIFT:						
Shift arm lock bolt	1	8	25	2.5	18	
Shift drum center bolt	1	8	28	2.8	20	
Shift drum lock cam bolt	1	6	12	1.2	9	NOTE 2
Shift arm return spring pin	1	8	25	2.5	18	
CRANKCASE/CRANKSHAFT/TRANSMISSION:						
Crankcase bolt (10 mm)	8	10	35	3.5	25	NOTE 6
(8 mm)	4	8	26	2.6	19	
(6 mm)	10	6	12	1.2	9	
Crankcase sealing bolt (20 mm)	4	20	45	4.5	33	NOTE 2
(18 mm)	2	18	45	4.5	33	NOTE 2
Mainshaft lock nut	1	22	190	19.0	137	NOTE 4/5
Crankshaft main bearing cap bolt	8	10	60	6.0	43	NOTE 6
Connecting rod cap nut	8	8	32	3.2	23	NOTE 6
Timing belt drive pulley bolt	1	12	75	7.5	54	

NOTES:
1. Apply sealant to the threads.
2. Apply a locking agent to the threads.
3. Apply molybdenum disulfide oil to the threads and flange surfaces.
4. Left-hand threads.
5. Stake (2 plcs)
6. Apply oil to the threads and flange surfaces.
7. Torque wrench scale reading using a special tool.
8. Apply grease to the threads and flange surfaces.

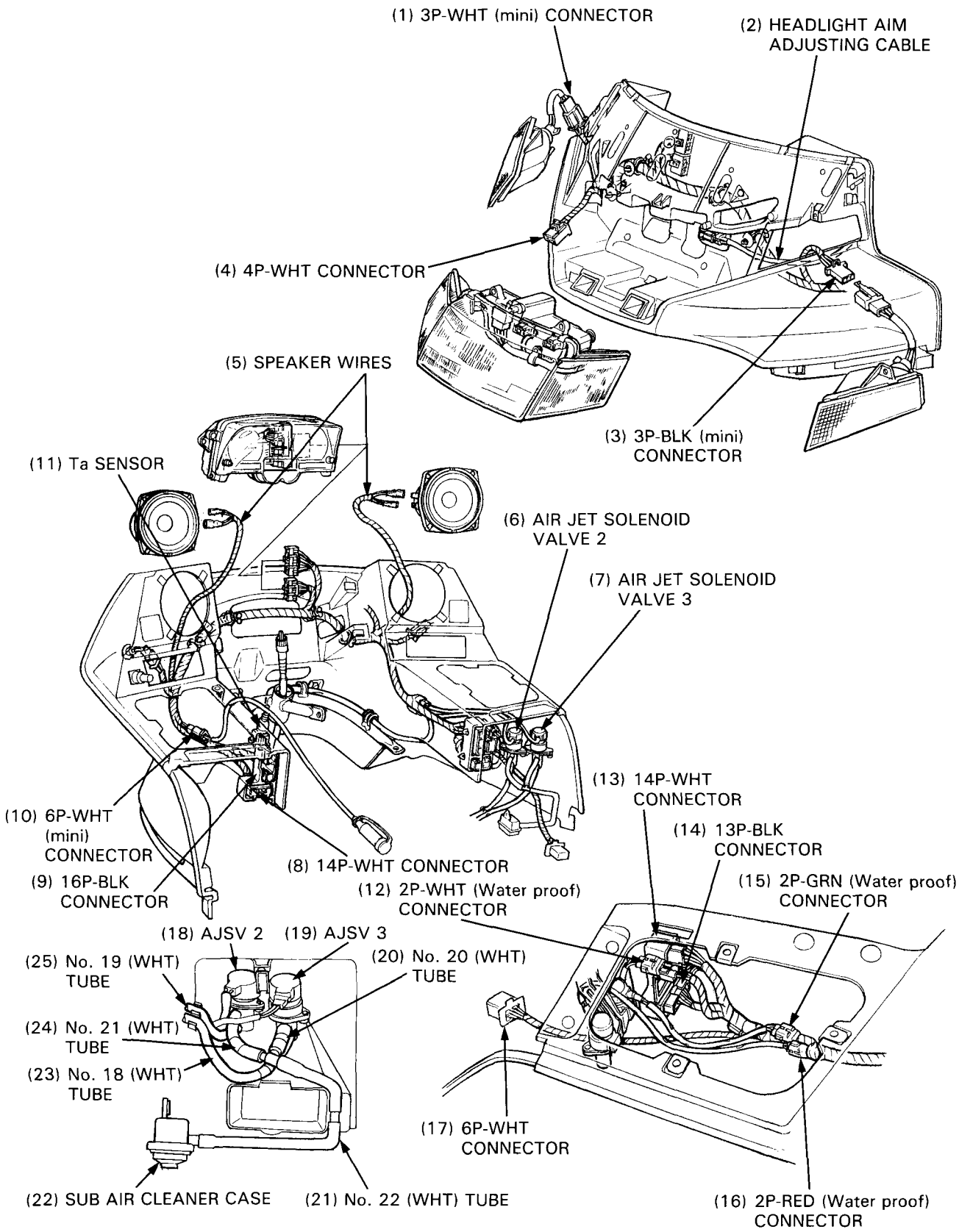
FRAME

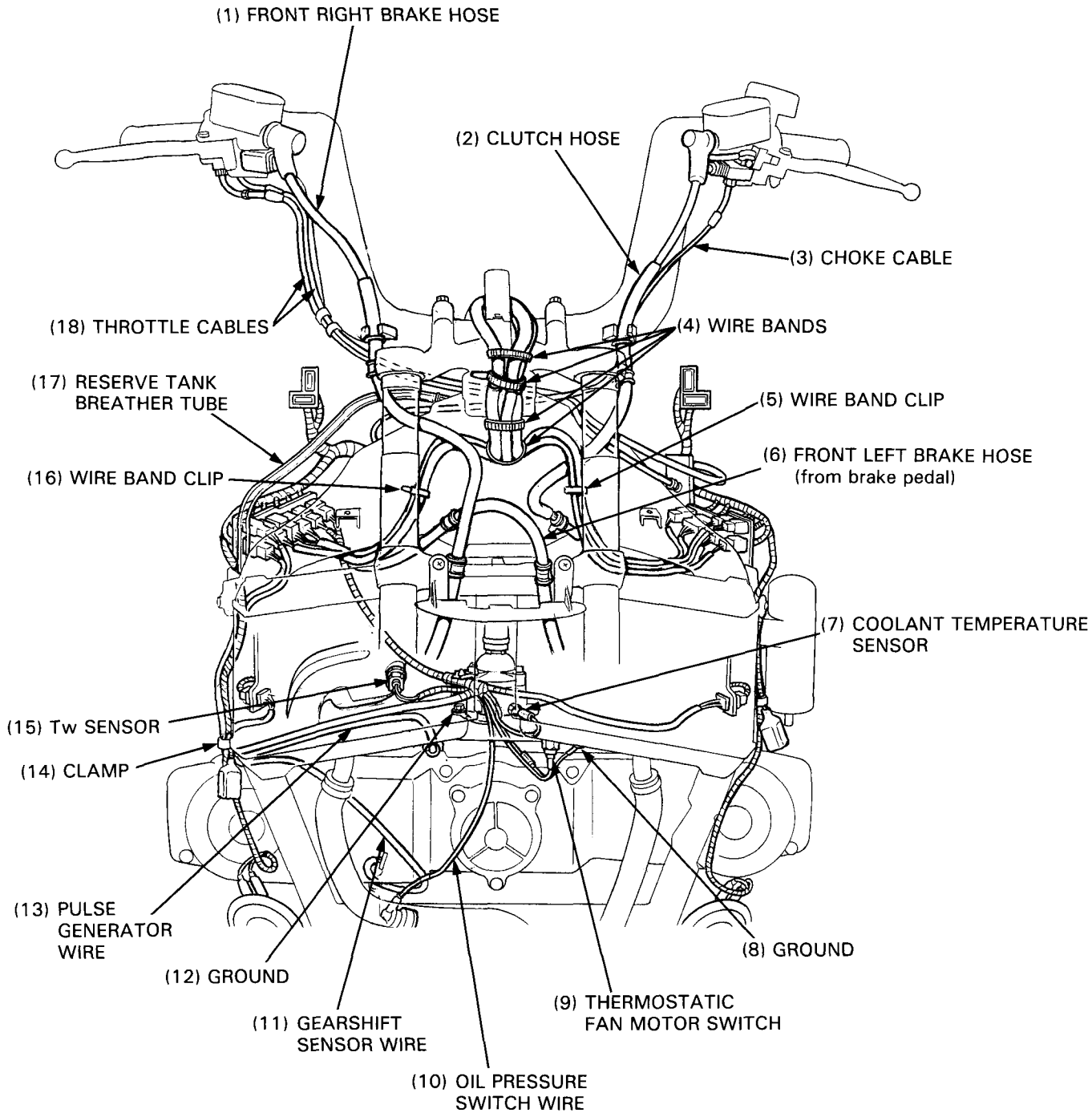
Item	Qty	Thread dia (mm)	Torque N•m	Torque kg-m	Torque ft-lb	Remarks
Engine mount nut	7	10	40	4.0	29	
Engine bracket bolt	4	8	25	2.5	18	
Subframe bolt (10 mm socket bolt)	4	10	40	4.0	29	
(10 mm flange bolt)	1	10	40	4.0	29	
(8 mm flange bolt)	1	8	25	2.5	18	
Exhaust pipe joint nut	12	6	10	1.0	7	
Side stand pivot	1	10	22	2.2	16	
Center stand pivot	1	8	18	1.8	13	
Chamber protector bolt	6	6	10	1.0	7	
Brake disc bolt	18	8	40	4.0	29	
HANDLEBAR:						
Handlebar upper holder bolt	4	8	25	2.5	18	NOTE 8
Front master cylinder holder bolt	2	6	12	1.2	9	
Clutch master cylinder holder bolt	2	6	12	1.2	9	
FRONT:						
Axle pinch bolt	4	8	22	2.2	16	
Axle bolt	1	14	90	9.0	65	
Steering stem nut	1	24	100	10.0	72	
Steering stem adjustment nut	1	26	19	1.9	14	See page 13-26
Anti-dive case socket bolt	8	6	8	0.8	6	NOTE 2
Fork bottom socket bolt	2	8	20	2.0	14	NOTE 2
Fork bolt	2	37	23	2.3	17	
Fork leg upper pinch bolt	2	7	11	1.1	8	
Fork leg lower pinch bolt	4	10	55	5.5	40	
REAR:						
Axle pinch bolt	1	8	32	3.2	23	
Axle nut	1	18	110	11.0	80	
Damper holder bolt	5	6	20	2.0	14	
Left shock absorber mount bolt (Upper)	1	8	23	2.3	17	
(Lower)	1	18	70	7.0	51	
Right shock absorber mount bolt (Upper)	1	8	23	2.3	17	
(Lower)	1	8	23	2.3	17	
Air hose bolt	3	10	6	0.6	4	
Air hose special bolt (with seat)	1	10	15	1.5	11	
Outlet air hose joint	2	8	6	0.6	4	
Air pressure sensor	1	8	6	0.6	4	
Air distributor solenoid valve mounting screw	4	5	3	0.3	2	
Swing arm right pivot bolt	1	30	100	10.0	72	
Swing arm left pivot bolt	1	30	19	1.9	14	
Swing arm left pivot lock nut	1	30	100	10.0	72	NOTE 7
FINAL DRIVE:						
Pinion bearing retainer	1	70	150	15.0	108	
Pinion joint nut	1	16	110	11.0	80	NOTE 2
Gear case cover bolt (10 mm)	2	10	63	6.3	46	NOTE 2
(8 mm)	6	8	26	2.6	19	
Final drive gear case mounting nut	4	10	65	6.5	47	
Final drive gear case filler cap	1	30	12	1.2	9	
Final drive gear case drain bolt	1	14	20	2.0	14	
Dust guard plate bolt	1	6	10	1.0	7	
Retainer lock washer bolt	1	6	10	1.0	7	
HYDRAULIC BRAKE:						
Caliper bleed valve	3	7	6	0.6	4	
Front caliper bracket bolt	2	8	23	2.3	17	
Anti-dive piston bolt	2	6	12	1.2	9	
Front pad pin plug	4	10	2.5	0.25	1.8	
Front pad pin	4	10	18	1.8	13	
Brake hose bolt	6	10	30	3.0	22	
Rear master cylinder mounting bolt	2	6	12	1.2	9	
Rear caliper retainer bolt	1	6	11	1.1	8	
Rear caliper bolt	1	8	23	2.3	17	
Rear caliper pin bolt	1	12	28	2.8	20	
Metal brake line nut	4	10	17	1.7	12	
Brake pedal bolt	1	8	25	2.5	18	

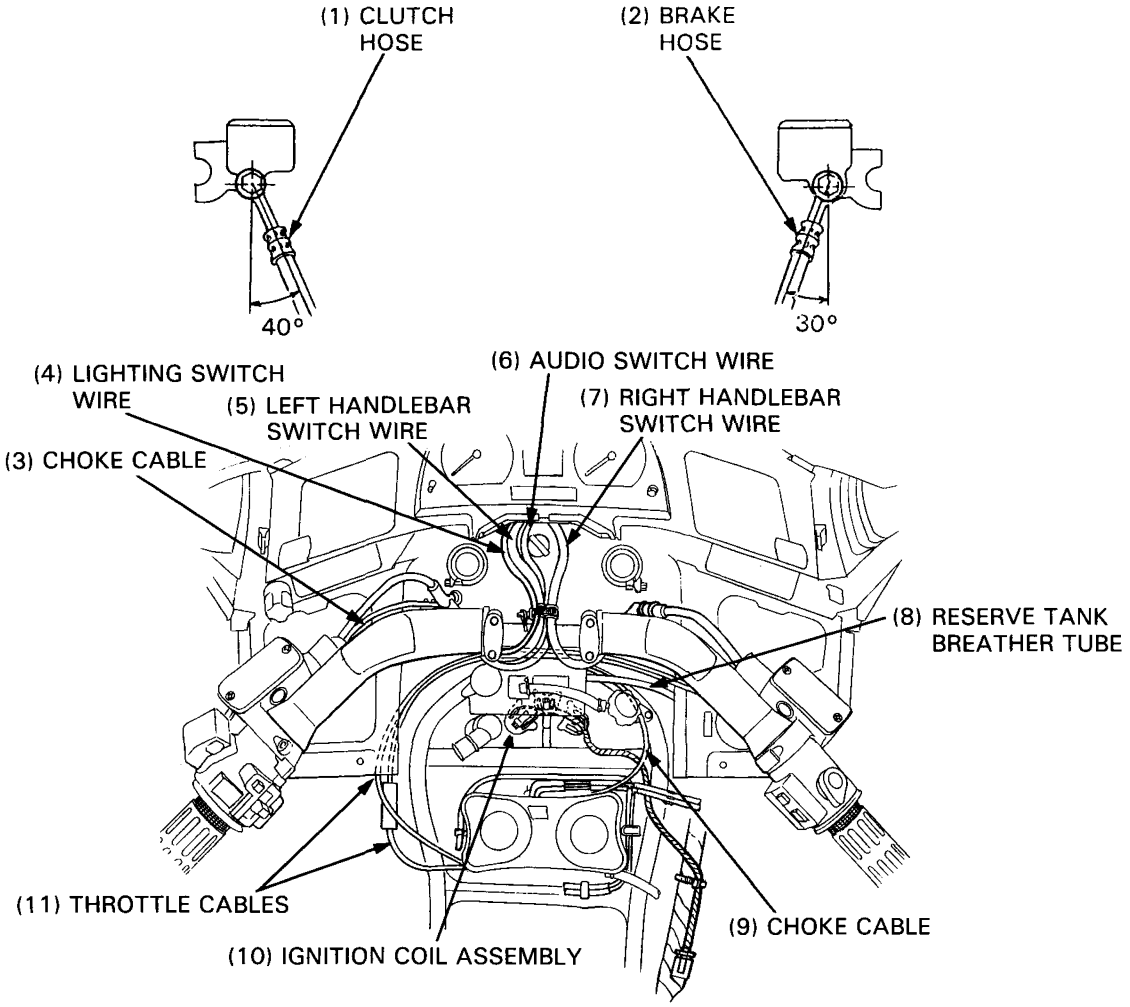
Torque specifications listed above are for important fastners. Other should be tightened to standard torque values listed below.

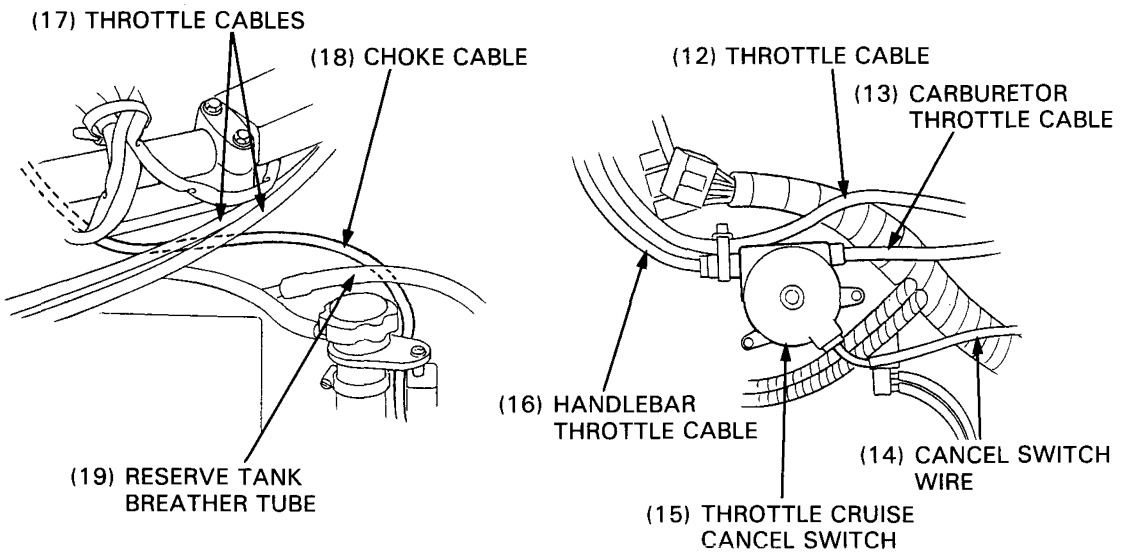
STANDARD TORQUE VALUES

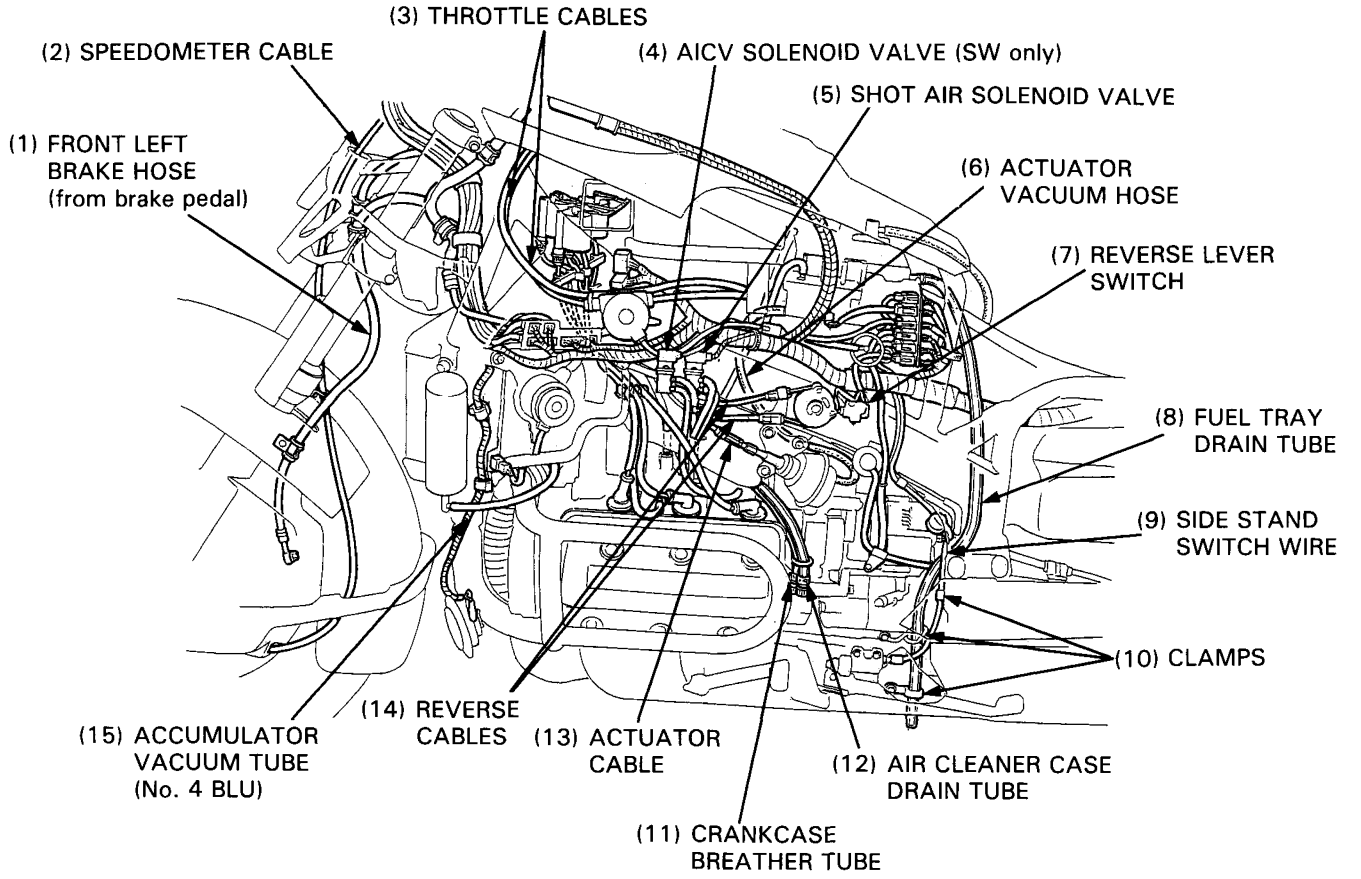
Item	Torque Values N•m (kg-m, ft-lb)	Item	Torque Values N•m (kg-m, ft-lb)
5 mm bolt and nut	5 (0.5, 4)	5 mm screw and 6 mm flange	4 (0.4, 3)
6 mm bolt and nut	10 (1.0, 7)	6 mm screw and 6 mm flange bolt with 8 mm head	9 (0.9, 7)
8 mm bolt and nut	22 (2.2, 16)	6 mm flange bolt and nut	12 (1.2, 9)
10 mm bolt and nut	35 (3.5, 25)	8 mm flange bolt and nut	27 (2.7, 20)
12 mm bolt and nut	55 (5.5, 40)	10 mm flange bolt and nut	40 (4.0, 29)

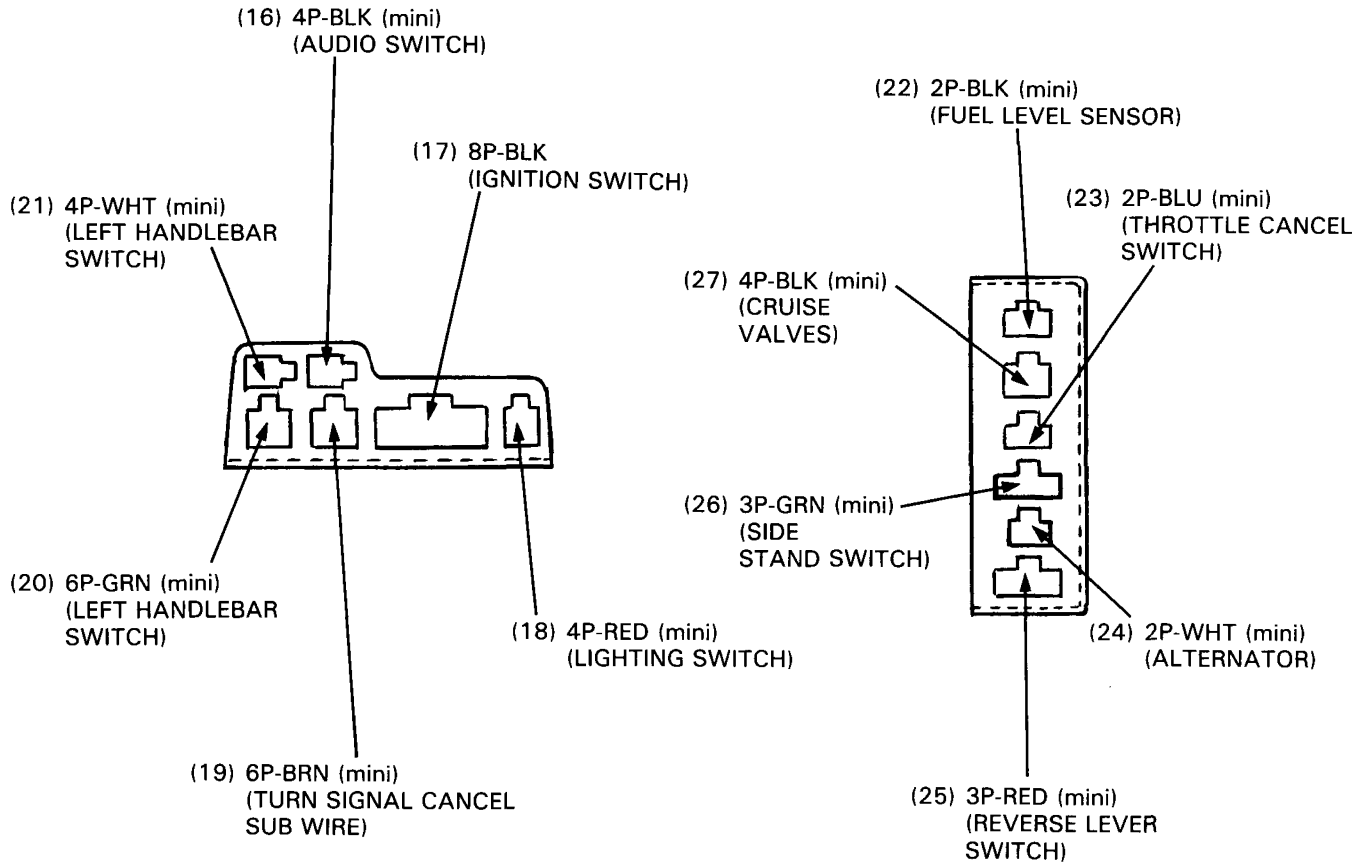

(1) 3P-WHT (mini) CONNECTOR
(2) HEADLIGHT AIM ADJUSTING CABLE
(4) 4P-WHT CONNECTOR
(5) SPEAKER WIRES
(3) 3P-BLK (mini) CONNECTOR
(11) Ta SENSOR
(6) AIR JET SOLENOID VALVE 2
(7) AIR JET SOLENOID VALVE 3
(10) 6P-WHT (mini) CONNECTOR
(9) 16P-BLK CONNECTOR
(8) 14P-WHT CONNECTOR
(12) 2P-WHT (Water proof) CONNECTOR
(13) 14P-WHT CONNECTOR
(14) 13P-BLK CONNECTOR
(15) 2P-GRN (Water proof) CONNECTOR
(18) AJSV 2
(19) AJSV 3
(25) No. 19 (WHT) TUBE
(20) No. 20 (WHT) TUBE
(24) No. 21 (WHT) TUBE
(23) No. 18 (WHT) TUBE
(17) 6P-WHT CONNECTOR
(22) SUB AIR CLEANER CASE
(21) No. 22 (WHT) TUBE
(16) 2P-RED (Water proof) CONNECTOR

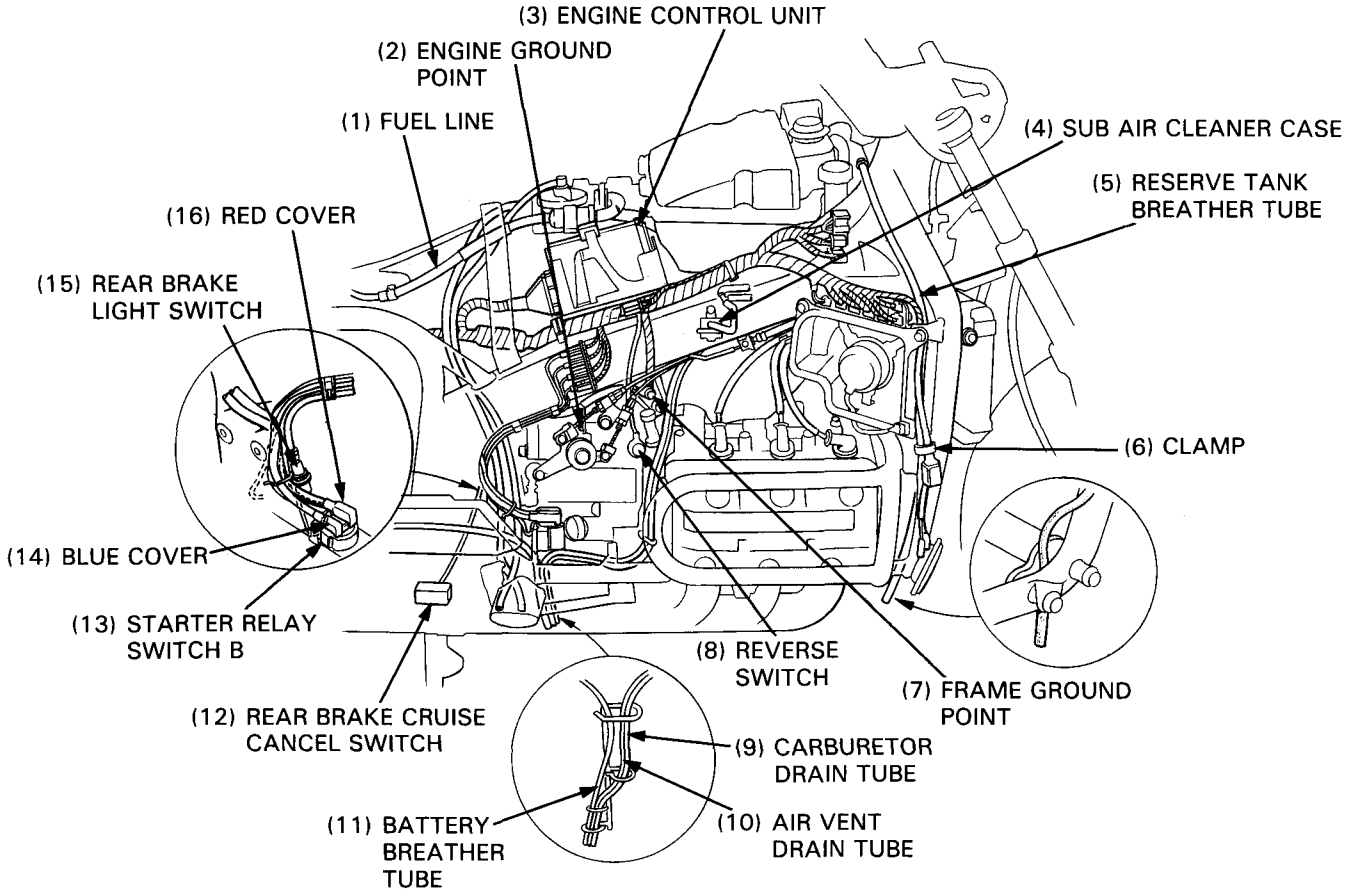

(1) FRONT RIGHT BRAKE HOSE
(2) CLUTCH HOSE
(3) CHOKE CABLE
(18) THROTTLE CABLES
(4) WIRE BANDS
(17) RESERVE TANK BREATHER TUBE
(5) WIRE BAND CLIP
(16) WIRE BAND CLIP
(6) FRONT LEFT BRAKE HOSE (from brake pedal)
(7) COOLANT TEMPERATURE SENSOR
(15) Tw SENSOR
(14) CLAMP
(13) PULSE GENERATOR WIRE
(12) GROUND
(11) GEARSHIFT SENSOR WIRE
(10) OIL PRESSURE SWITCH WIRE
(9) THERMOSTATIC FAN MOTOR SWITCH
(8) GROUND

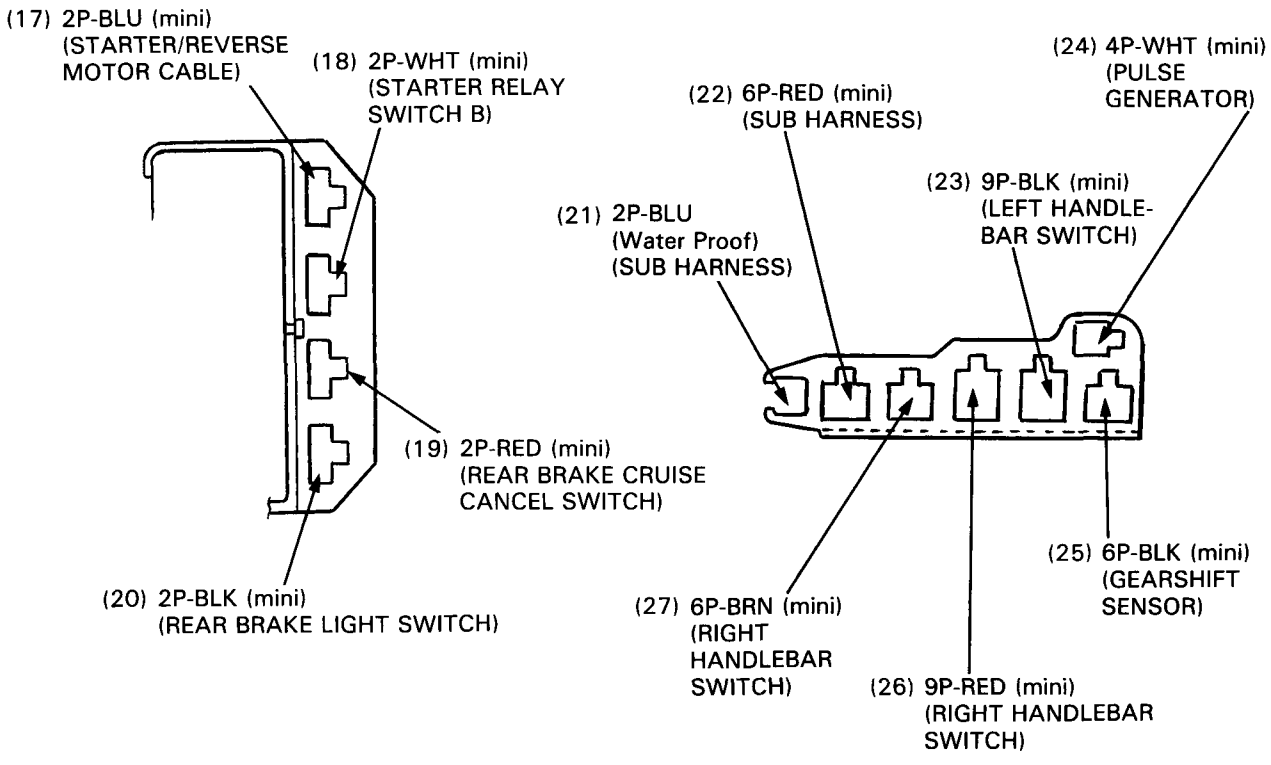

(1) CLUTCH HOSE
(2) BRAKE HOSE
40°
30°
(4) LIGHTING SWITCH WIRE
(5) LEFT HANDLEBAR SWITCH WIRE
(6) AUDIO SWITCH WIRE
(7) RIGHT HANDLEBAR SWITCH WIRE
(3) CHOKE CABLE
(8) RESERVE TANK BREATHER TUBE
(11) THROTTLE CABLES
(10) IGNITION COIL ASSEMBLY
(9) CHOKE CABLE

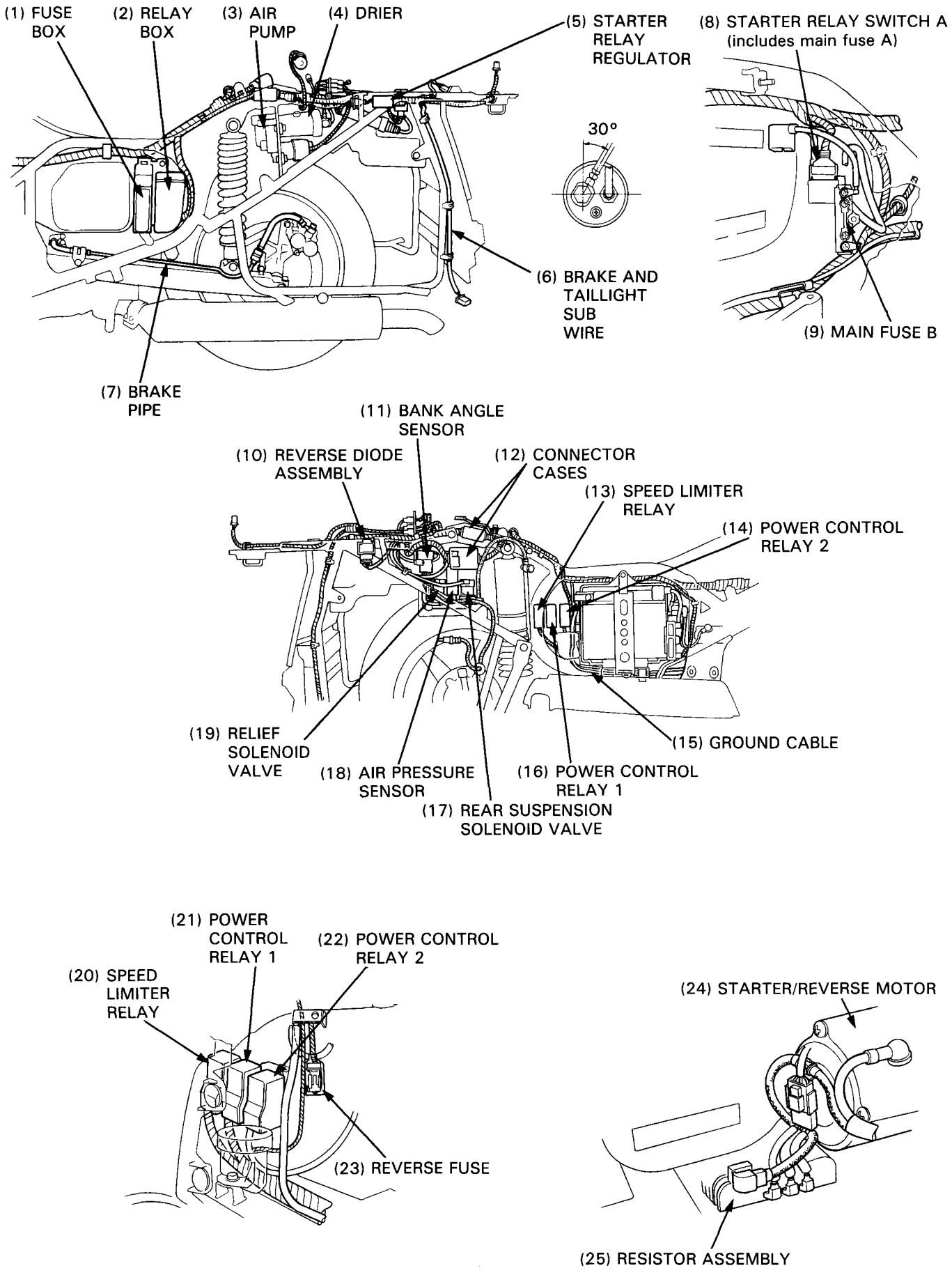

(17) THROTTLE CABLES
(18) CHOKE CABLE
(19) RESERVE TANK BREATHER TUBE
(12) THROTTLE CABLE
(13) CARBURETOR THROTTLE CABLE
(16) HANDLEBAR THROTTLE CABLE
(14) CANCEL SWITCH WIRE
(15) THROTTLE CRUISE CANCEL SWITCH

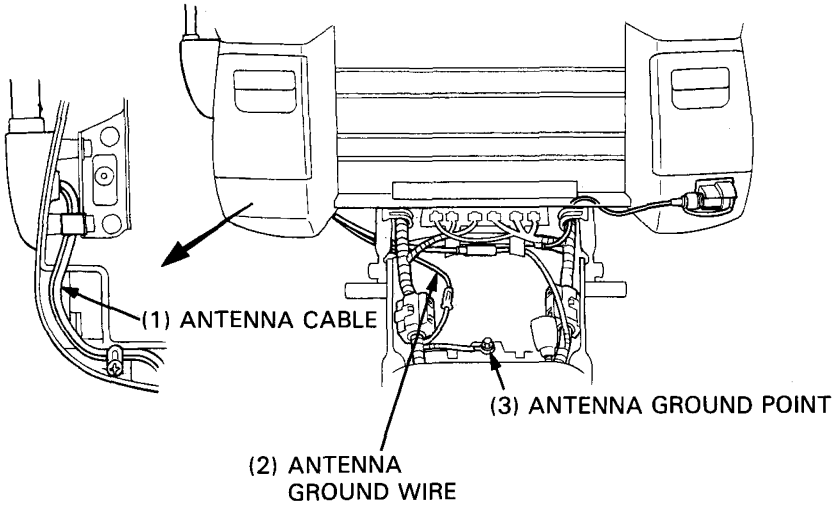

(3) THROTTLE CABLES
(2) SPEEDOMETER CABLE
(4) AICV SOLENOID VALVE (SW only)
(5) SHOT AIR SOLENOID VALVE
(1) FRONT LEFT BRAKE HOSE (from brake pedal)
(6) ACTUATOR VACUUM HOSE
(7) REVERSE LEVER SWITCH
(8) FUEL TRAY DRAIN TUBE
(9) SIDE STAND SWITCH WIRE
(10) CLAMPS
(15) ACCUMULATOR VACUUM TUBE (No. 4 BLU)
(14) REVERSE CABLES
(13) ACTUATOR CABLE
(12) AIR CLEANER CASE DRAIN TUBE
(11) CRANKCASE BREATHER TUBE

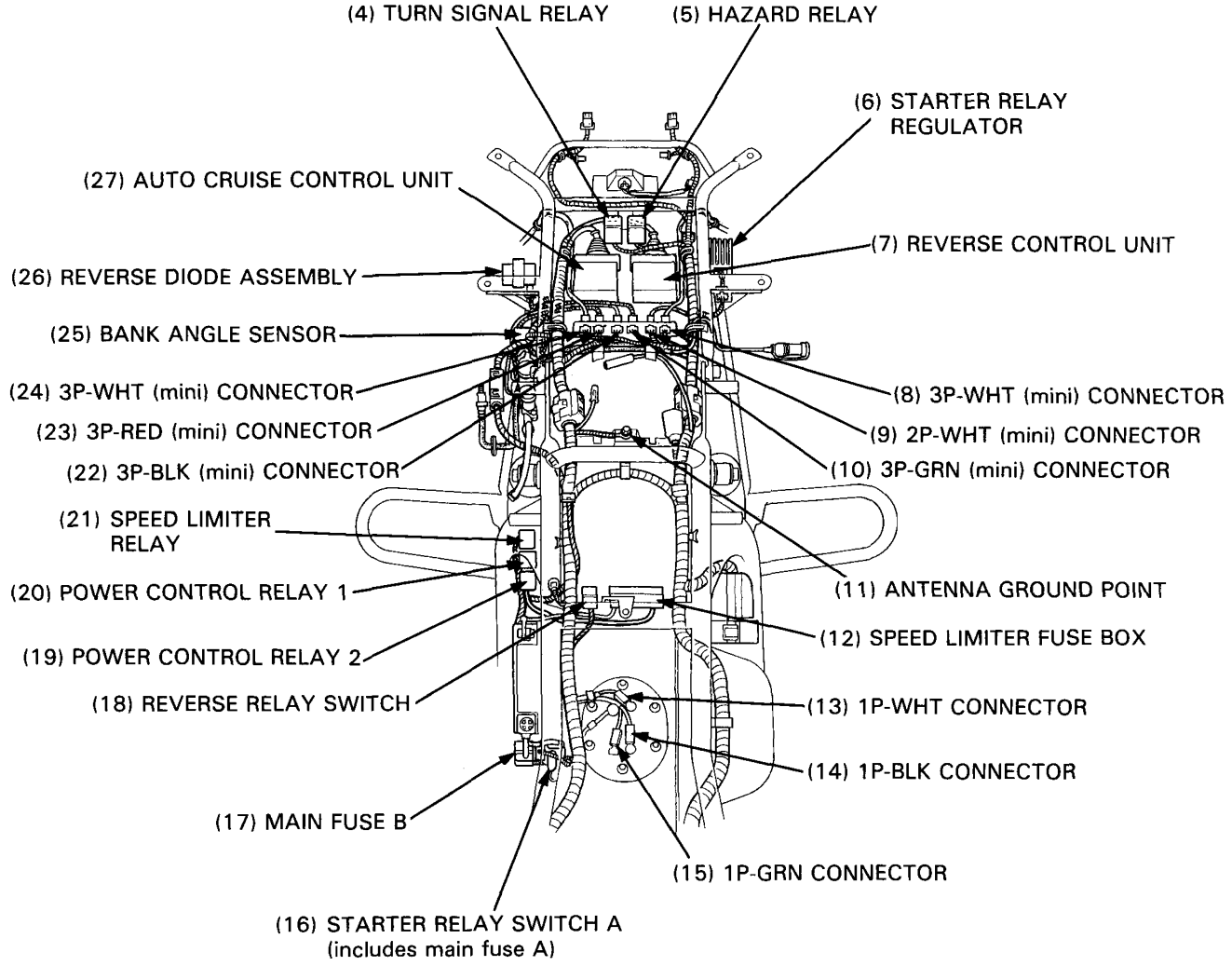

(16) 4P-BLK (mini) (AUDIO SWITCH)
(17) 8P-BLK (IGNITION SWITCH)
(21) 4P-WHT (mini) (LEFT HANDLEBAR SWITCH)
(22) 2P-BLK (mini) (FUEL LEVEL SENSOR)
(23) 2P-BLU (mini) (THROTTLE CANCEL SWITCH)
(27) 4P-BLK (mini) (CRUISE VALVES)
(26) 3P-GRN (mini) (SIDE STAND SWITCH)
(20) 6P-GRN (mini) (LEFT HANDLEBAR SWITCH)
(18) 4P-RED (mini) (LIGHTING SWITCH)
(24) 2P-WHT (mini) (ALTERNATOR)
(19) 6P-BRN (mini) (TURN SIGNAL CANCEL SUB WIRE)
(25) 3P-RED (mini) (REVERSE LEVER SWITCH)


(3) ENGINE CONTROL UNIT
(2) ENGINE GROUND POINT
(1) FUEL LINE
(4) SUB AIR CLEANER CASE
(5) RESERVE TANK BREATHER TUBE
(16) RED COVER
(15) REAR BRAKE LIGHT SWITCH
(6) CLAMP
(14) BLUE COVER
(13) STARTER RELAY SWITCH B
(8) REVERSE SWITCH
(7) FRAME GROUND POINT
(12) REAR BRAKE CRUISE CANCEL SWITCH
(9) CARBURETOR DRAIN TUBE
(11) BATTERY BREATHER TUBE
(10) AIR VENT DRAIN TUBE


(17) 2P-BLU (mini) (STARTER/REVERSE MOTOR CABLE)
(18) 2P-WHT (mini) (STARTER RELAY SWITCH B)
(19) 2P-RED (mini) (REAR BRAKE CRUISE CANCEL SWITCH)
(20) 2P-BLK (mini) (REAR BRAKE LIGHT SWITCH)
(22) 6P-RED (mini) (SUB HARNESS)
(24) 4P-WHT (mini) (PULSE GENERATOR)
(23) 9P-BLK (mini) (LEFT HANDLE-BAR SWITCH)
(21) 2P-BLU (Water Proof) (SUB HARNESS)
(25) 6P-BLK (mini) (GEARSHIFT SENSOR)
(27) 6P-BRN (mini) (RIGHT HANDLEBAR SWITCH)
(26) 9P-RED (mini) (RIGHT HANDLEBAR SWITCH)


(1) FUSE BOX
(2) RELAY BOX
(3) AIR PUMP
(4) DRIER
(5) STARTER RELAY REGULATOR
30°
(6) BRAKE AND TAILLIGHT SUB WIRE
(7) BRAKE PIPE
(8) STARTER RELAY SWITCH A (includes main fuse A)
(9) MAIN FUSE B
(10) REVERSE DIODE ASSEMBLY
(11) BANK ANGLE SENSOR
(12) CONNECTOR CASES
(13) SPEED LIMITER RELAY
(14) POWER CONTROL RELAY 2
(15) GROUND CABLE
(16) POWER CONTROL RELAY 1
(17) REAR SUSPENSION SOLENOID VALVE
(18) AIR PRESSURE SENSOR
(19) RELIEF SOLENOID VALVE
(20) SPEED LIMITER RELAY
(21) POWER CONTROL RELAY 1
(22) POWER CONTROL RELAY 2
(23) REVERSE FUSE
(24) STARTER/REVERSE MOTOR
(25) RESISTOR ASSEMBLY


(1) ANTENNA CABLE
(2) ANTENNA GROUND WIRE
(3) ANTENNA GROUND POINT


(4) TURN SIGNAL RELAY
(5) HAZARD RELAY
(6) STARTER RELAY REGULATOR
(7) REVERSE CONTROL UNIT
(8) 3P-WHT (mini) CONNECTOR
(9) 2P-WHT (mini) CONNECTOR
(10) 3P-GRN (mini) CONNECTOR
(11) ANTENNA GROUND POINT
(12) SPEED LIMITER FUSE BOX
(13) 1P-WHT CONNECTOR
(14) 1P-BLK CONNECTOR
(15) 1P-GRN CONNECTOR
(16) STARTER RELAY SWITCH A (includes main fuse A)
(17) MAIN FUSE B
(18) REVERSE RELAY SWITCH
(19) POWER CONTROL RELAY 2
(20) POWER CONTROL RELAY 1
(21) SPEED LIMITER RELAY
(22) 3P-BLK (mini) CONNECTOR
(23) 3P-RED (mini) CONNECTOR
(24) 3P-WHT (mini) CONNECTOR
(25) BANK ANGLE SENSOR
(26) REVERSE DIODE ASSEMBLY
(27) AUTO CRUISE CONTROL UNIT

EMISSION CONTROL SYSTEM

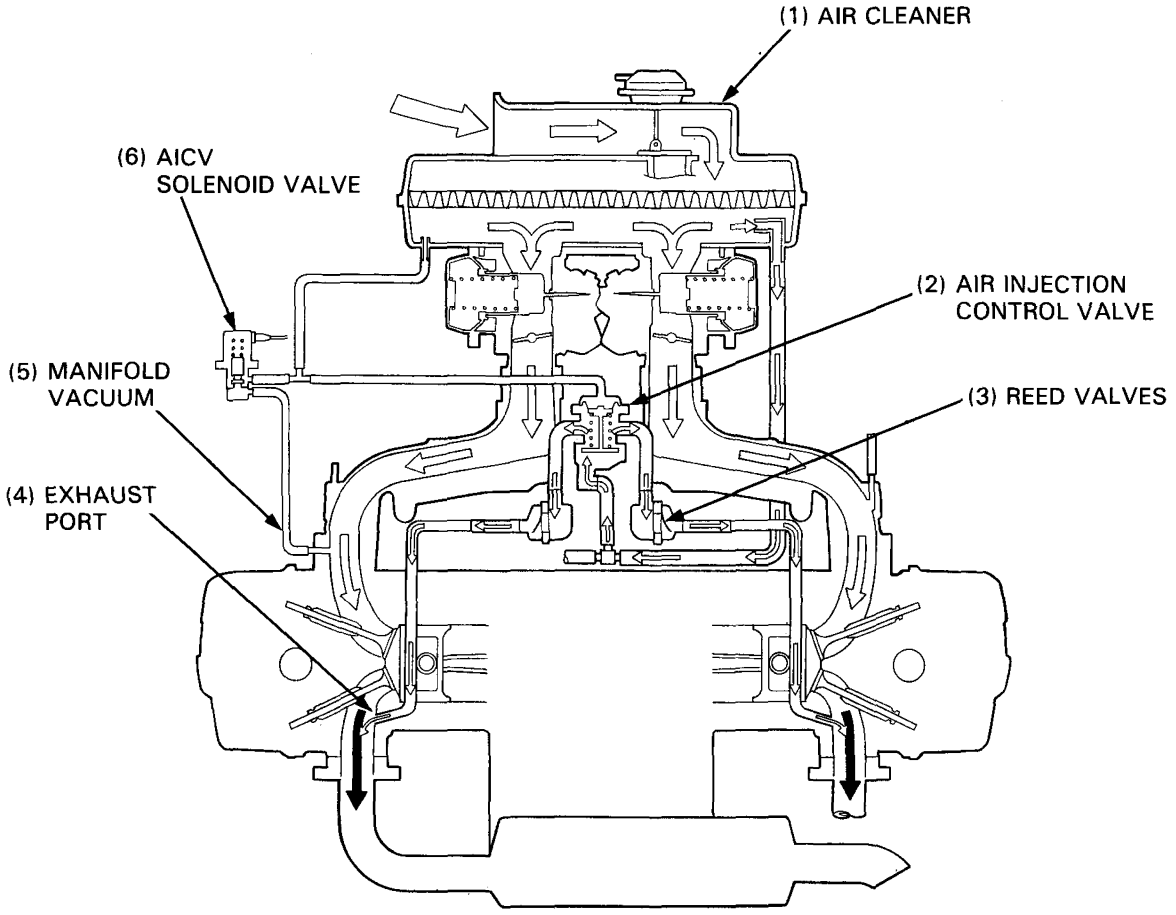
SW MODEL ONLY:

EXHAUST EMISSION CONTROL SYSTEM (SECONDARY AIR SUPPLY SYSTEM)

The exhaust emission control system consists of a secondary air supply system which introduces filtered air into the exhaust gases in the exhaust port. Fresh air is drawn into the exhaust port 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.

The reed valve prevents reverse air flow through the system. The engine control unit reacts to high intake manifold vacuum and signals the AICV solenoid valve. The manifold vacuum is applied to the air injection control valve (AICV) and the AICV will cut off the supply of fresh air during engine deceleration, thereby preventing afterburn in the exhaust system.

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

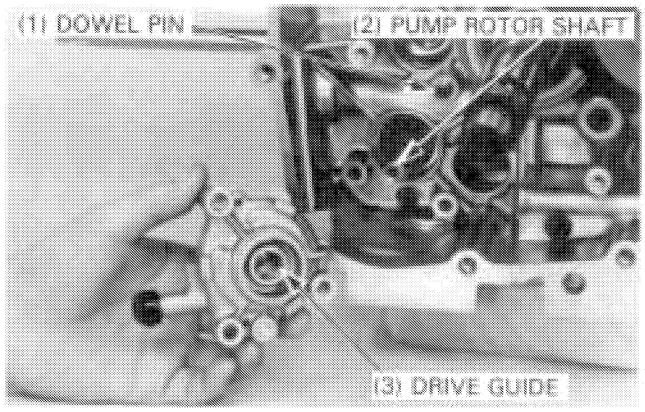


SCAVENGE PUMP

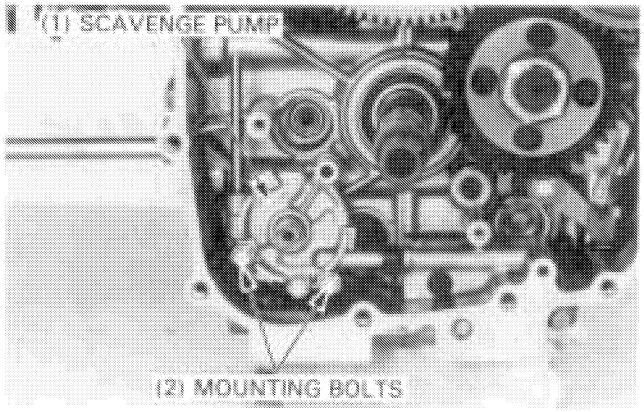
INSTALLATION

Install the dowel pin.

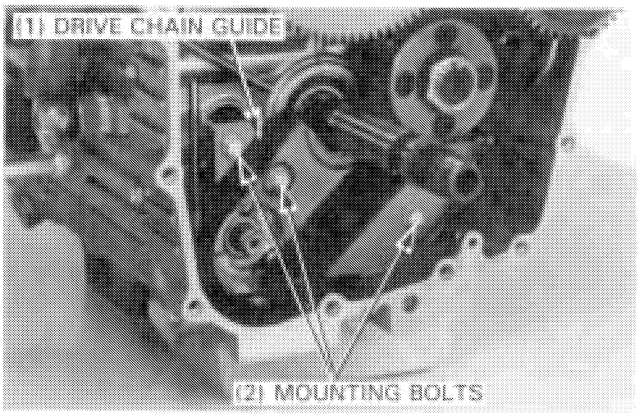
Install the pump on the left crankcase with aligning the flat on the pump rotor shaft with the flat on the drive guide.



Install and tighten the two mounting bolts.



Install the drive chain guide and tighten the three mounting bolts.



Install the oil pump sprocket, drive chain and primary driven gear boss as an assembly.

NOTE

- The sprocket "OUT" mark should face out.

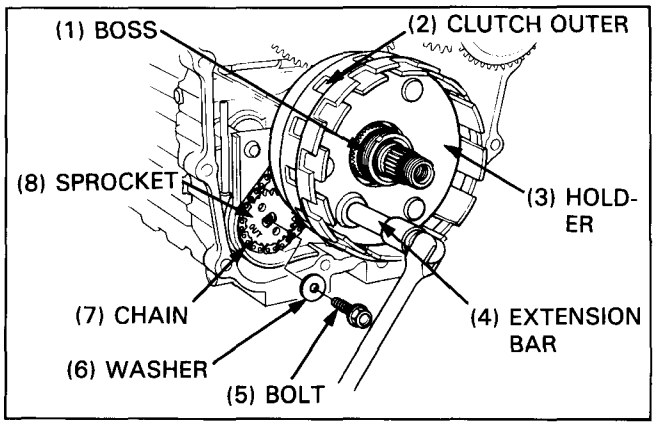
Temporarily install the clutch outer and clutch outer holder so that the oil pump sprocket can not be rotated.

TOOLS:

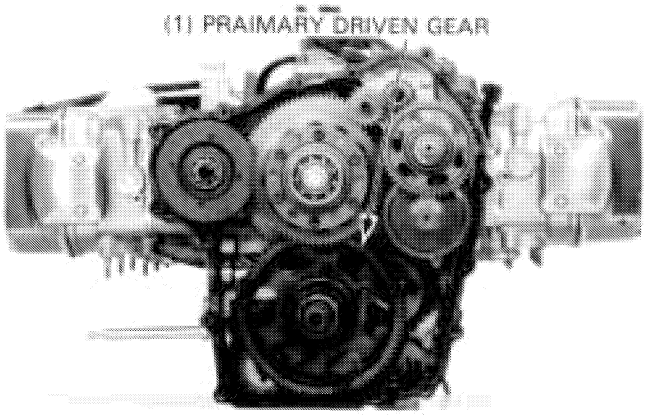
Clutch outer holder	**07JMB—MN50100**
Extension bar	**07716—0020000**

Apply a locking agent to the sprocket bolt threads.
Install and tighten the washer and bolt, holding the clutch outer.

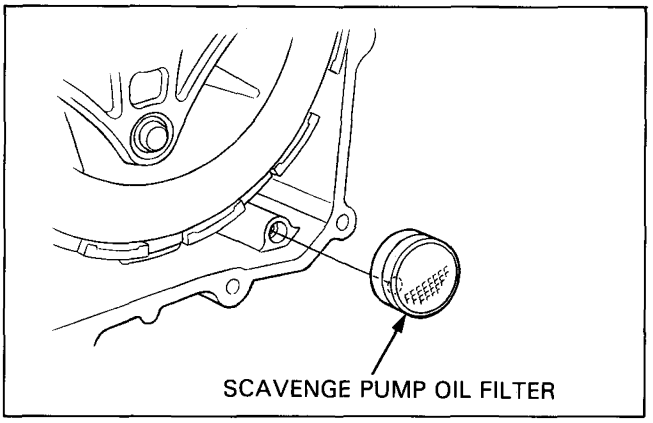
TORQUE: 18 N·m (1.8 kg-m, 13 ft-lb)



Install the primary driven gear (section 9).
Install the starter clutch (section 19).
Assemble the rear engine cover (section 9).



Install the scavenge pump oil filter to the rear engine cover.
Install the clutch (section 8).
Install the engine (section 6).



MAINTENANCE SCHEDULE

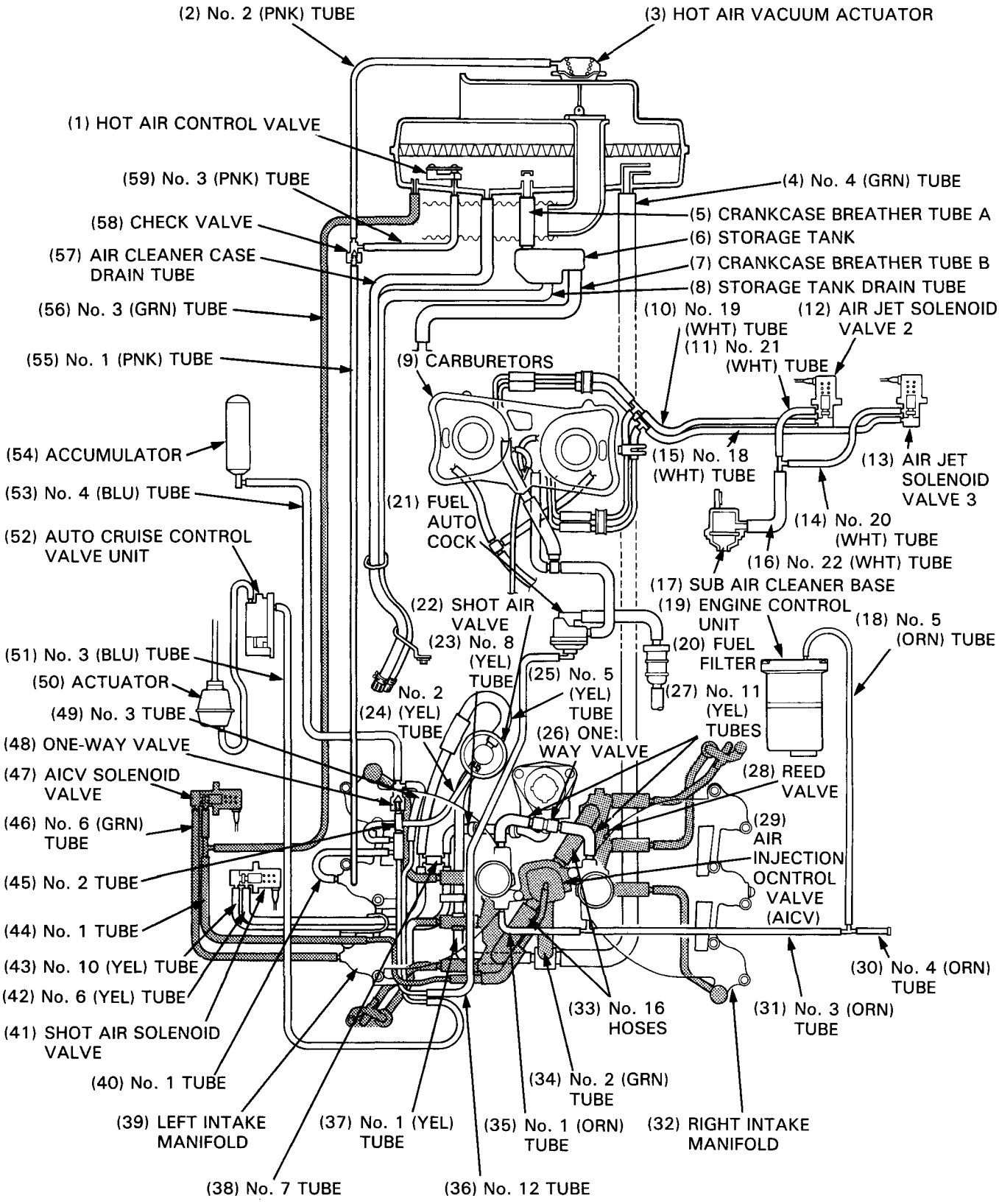
Perform the PRE-RIDE INSPECTION in the Owner's Manual at each scheduled maintenance period.
I: Inspect and Clean, Adjust, Lubricate, or Replace if necessary.
C: Clean. R: Replace
The following items require some mechanical knowledge. Certain items (particularly those marked * and **) may require more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

	ITEM / FREQUENCY	WHICHEVER COMES FIRST / NOTE	ODOMETER READING (NOTE 1)							Refer to page
			x 1000 km	1	6	12	18	24	30	36	
			x 1000 mi	0.6	4	8	12	16	20	24	
			MONTHS		6	12	18	24	30	36	
*	FUEL LINE					I		I		I	3-6
*	THROTTLE OPERATION					I		I		I	3-6
*	CARBURETOR CHOKE					I		I		I	3-7
	AIR CLEANER	(NOTE 2)					R			R	3-7
	CRANKCASE BREATHER	(NOTE 3)			C	C	C	C	C	C	3-8
	SPARK PLUG					R		R		R	3-8
	ENGINE OIL			R		R		R		R	2-4
	ENGINE OIL FILTER			R		R		R		R	2-4
*	CARBURETOR SYNCHRONIZATION					I		I		I	3-9
•	CARBURETOR IDLE SPEED			I	I	I	I	I	I	I	3-10
	RADIATOR COOLANT	(NOTE 4)				I		I		R	3-11
•	COOLING SYSTEM					I		I		I	3-11
•	SECONDARY AIR SUPPLY SYSTEM	(NOTE 5)				I		I		I	3-12
	FINAL DRIVE OIL					I		I		R	2-12
	BATTERY				I	I	I	I	I	I	3-13
	BRAKE FLUID	(NOTE 4)			I	I	R	I	I	R	3-13
	BRAKE PAD WEAR				I	I	I	I	I	I	3-14
	BRAKE SYSTEM			I		I		I		I	3-14
*	BRAKE LIGHT SWITCH					I		I		I	3-15
•	HEADLIGHT AIM					I		I		I	3-15
	CLUTCH SYSTEM					I		I		I	3-16
	CLUTCH FLUID	(NOTE 4)			I	I	R	I	I	R	3-16
•	REVERSE OPERATION					I		I		I	3-17
	SIDE STAND					I		I		I	3-17
•	SUSPENSION					I		I		I	3-18
•	CRUISE VALVE ELEMENT									R	3-19
•	AIR PUMP ELEMENT							C			3-19
•	AIR DRIER					I		I		I	3-20
*	NUTS, BOLTS, FASTENERS			I		I		I		I	3-21
**	WHEELS/TIRES					I		I		I	3-21
**	STEERING HEAD BEARINGS			I		I		I		I	3-22

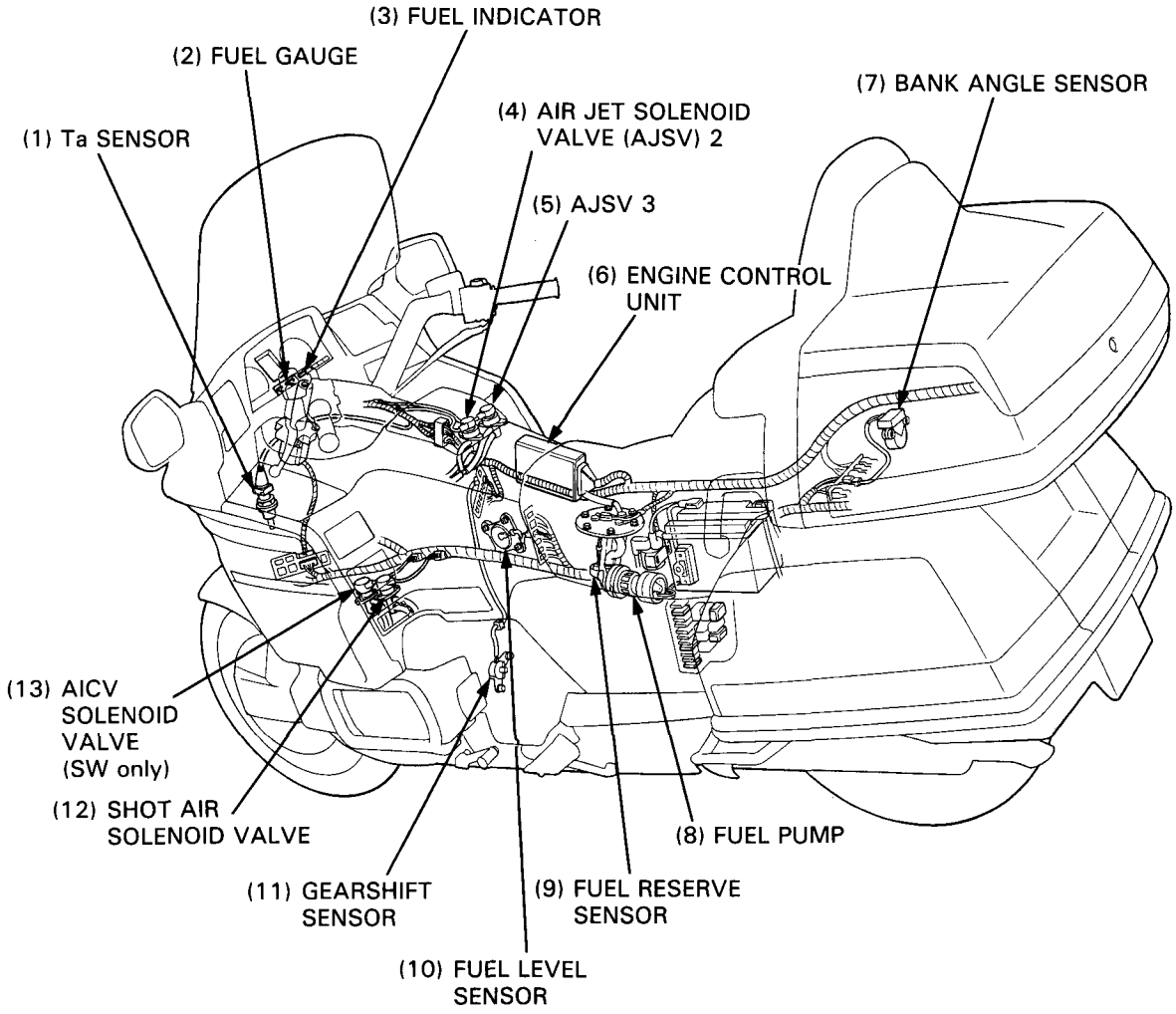
* SHOULD BE SERVICED BY AN AUTHORIZED HONDA DEALER, UNLESS THE OWNER HAS PROPER TOOLS AND SERVICE DATA AND IS MECHANICALLY QUALIFIED.
** IN THE INTEREST OF SAFETY, WE RECOMMEND THESE ITEMS BE SERVICED ONLY BY AN AUTHORIZED HONDA DEALER.

NOTES: 1. At higher odometer 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 reguires mechanical skill.
5. Switzerland type only.

HOSES AND TUBES ROUTING/CONNECTION (▒▒: SW MODEL ONLY)



FUEL SYSTEM LOCATION



FUEL SYSTEM TROUBLESHOOTING

Engine cranks but won't start
- No fuel in tank
- No fuel to carburetor
  - clogged fuel tube or filter
  - faulty fuel pump (next page)
  - faulty fuel auto cock (page 26-26)
  - faulty vacuum tube of fuel auto cock (page 26-26)
  - faulty vacuum tubes of cruise control system or shot air system (page 26-20)
  - clogged fuel tank cap breather hole
- Engine flooded with fuel
- No spark at plug (ignition system faulty-section 18)
- Air cleaner clogged
- Intake air leak
- Improper choke operation
- Improper throttle operation
- Incorrect choke cable free play
- Fuel tank vent blocked

After burning during deceleration
- Ignition system faulty (section 18)
- Lean mixture
- Faulty secondary air supply system (SW only)
- Faulty hoses of the emission control system (SW only)

Misfiring during acceleration
- Ignition malfunction (section 18)
- Lean mixture

Backfiring
- Ignition malfunction (section 18)
- Carburetor malfunction
- Lean mixture

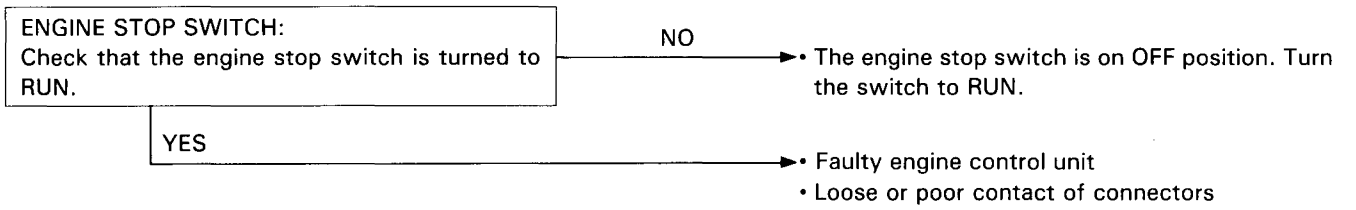
Lean mixture: Insufficient fuel to cylinders
- Clogged fuel jets
- Piston stuck closed
- Faulty float valve
- Float level too low
- Fuel tank cap vent blocked
- Fuel strainer screen (fuel pump) or fuel filter clogged
- Restricted fuel line
- Intake air leak
- Restricted or faulty fuel pump
- Faulty primary main air jet control system (page 26-40)

Rich mixture: Excessive fuel to cylinders
- Clogged air jets
- Faulty float valve
- Float level too high
- Starter valve stuck open or damaged
- Dirty air cleaner
- Needle and seat faulty or worn
- Faulty primary main air jet control system (page 26-40)

Engine idles roughly, stalls, or runs poorly
- Air cleaner clogged
- Ignition malfunction (section 18)
- Carburetors not synchronized
- Fuel contaminated
- Intake air leak.
- Idle speed incorrect
- Rich mixture
- Lean mixture
- Low cylinder compression
- Incorrect pilot screw adjustment
- Starter valve stuck open
- Faulty hoses of the emission control system (SW only)

Poor performance (driveability) and poor fuel economy
- Fuel system clogged
- Air cleaner clogged
- Ignition malfunction (section 18)
- Faulty primary main air jet control system (page 26-48)
- In low temperature,
  - Faulty hot air system (page 4-51)
- Faulty hoses of the emission control system (SW only)

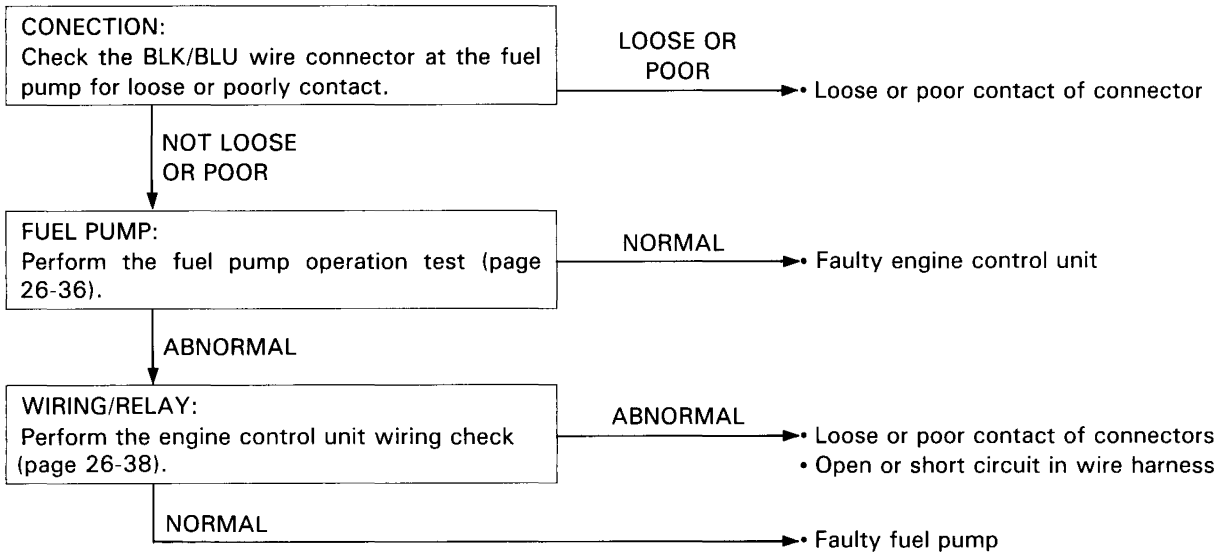
The fuel pump does not operate for a few seconds, when turning the ignition switch ON.



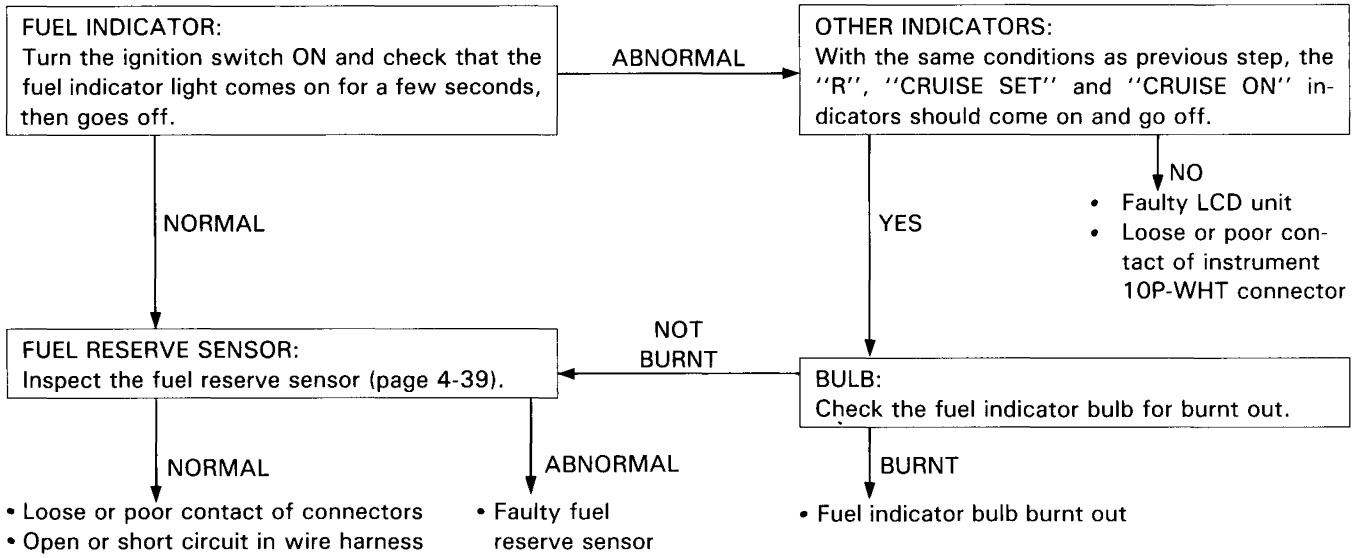
The fuel pump will not be operated well.

NOTE

- Be sure that the main fuse B, fuse 2 and 12 are good. Replace any suspect fuses.



Fuel indicator light will not come on within 3 minutes after the ignition switch has been turned ON with less than 4.0 liters (0.8 Imp gal) of fuel in the tank.

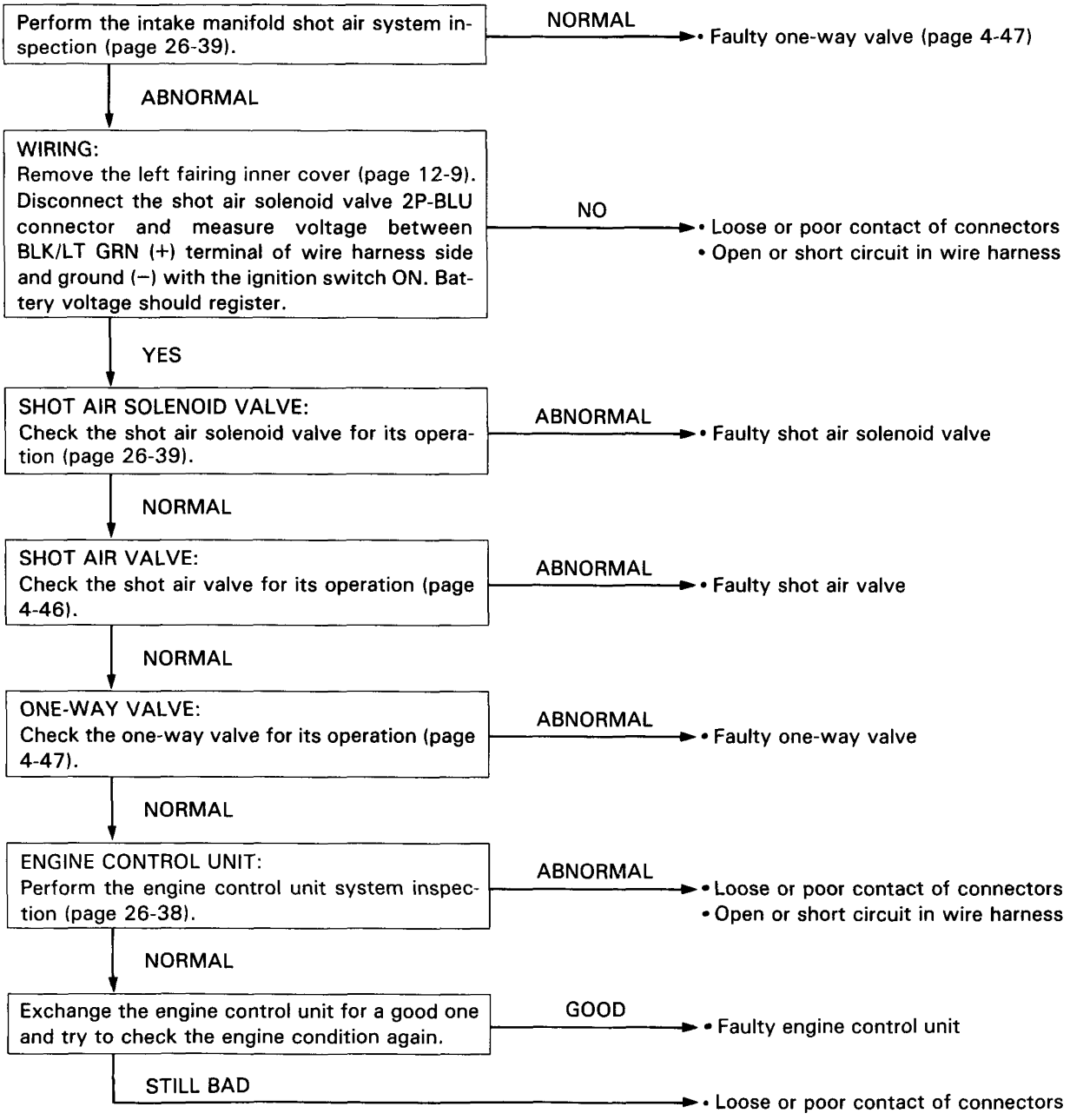


● **Intake Manifold Shot Air System**

NOTE

- Check the following tubes for disconnection or deterioration before troubleshooting.
  —No. 4 (GRN), No. 1 (YEL), No. 2 (YEL), No. 5 (YEL), No. 6 (YEL), No. 7, No. 8 (YEL), No. 10 (YEL) and No. 11 (YEL).

The engine speed will not drop smoothly and mildly.

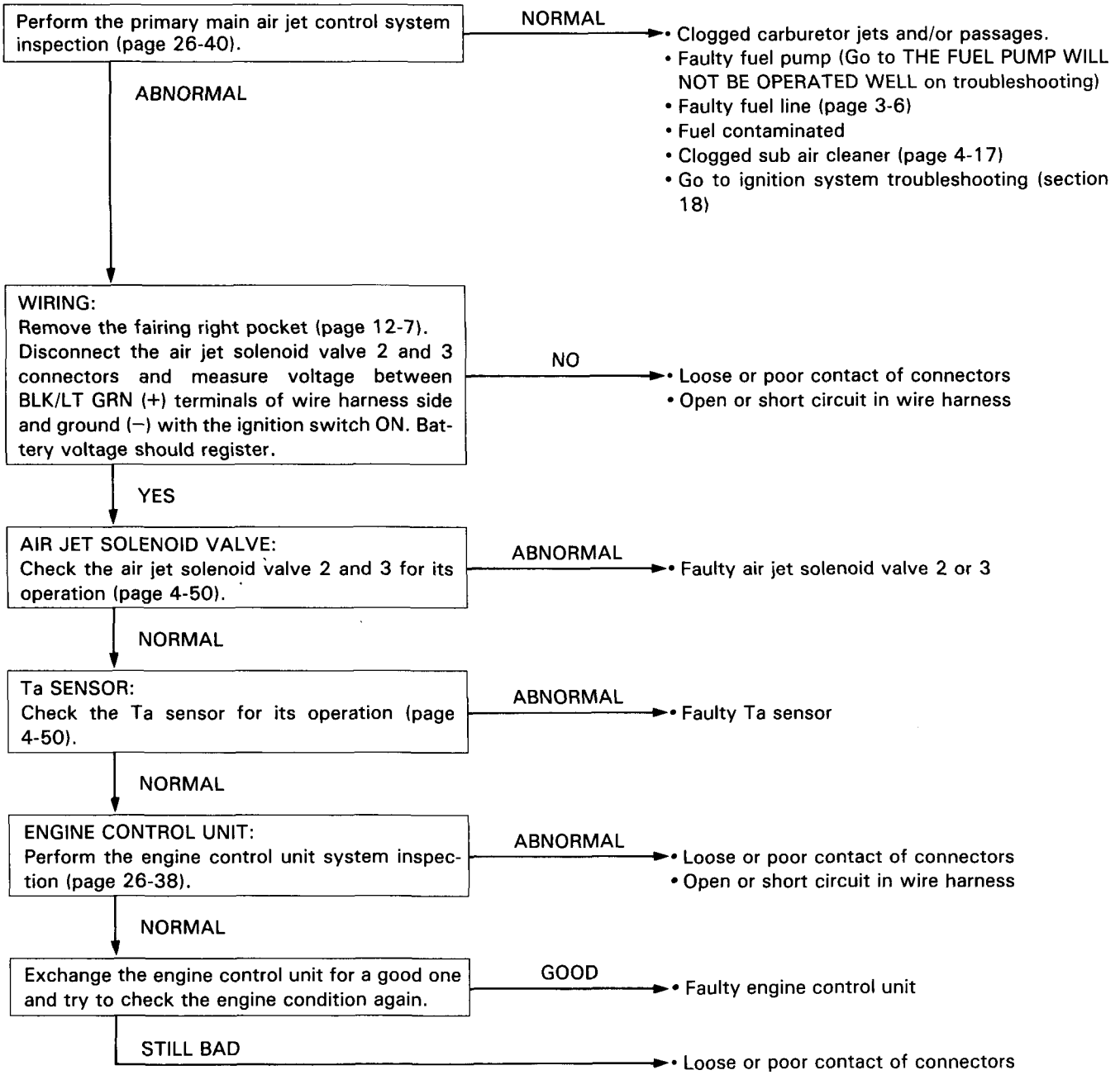


• Primary Main Air Jet Control System

NOTE

- Check the following tubes for disconnection or deterioration before troubleshooting.
  —No.18 (WHT), No.19 (WHT), No.20 (WHT), No.21 (WHT), No.22 (WHT), No.1 (ORN), No.3 (ORN), No.4 (ORN) and No.5 (ORN).

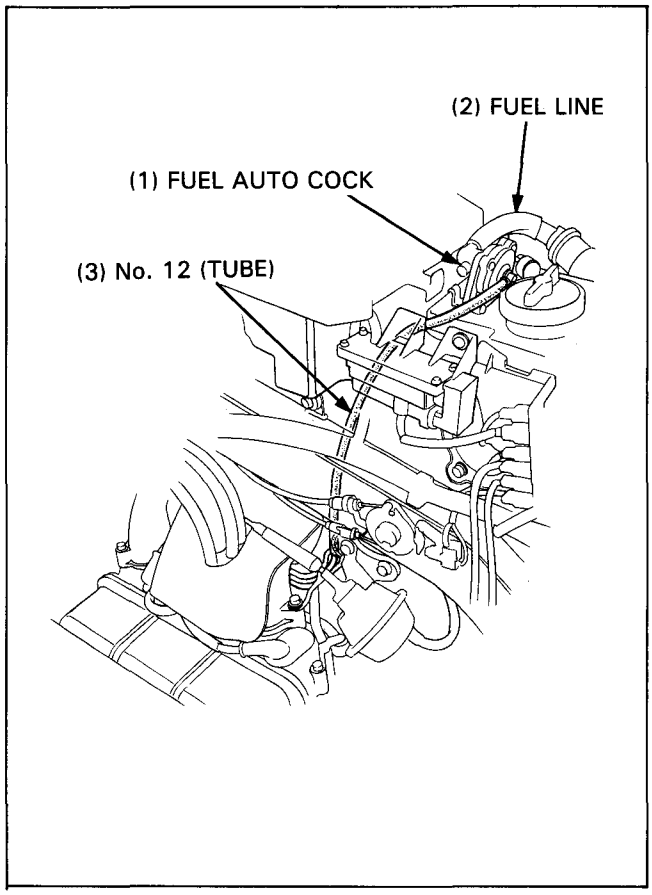
Poor performance (driveability) and poor fuel economy.



FUEL AUTO COCK

INSPECTION

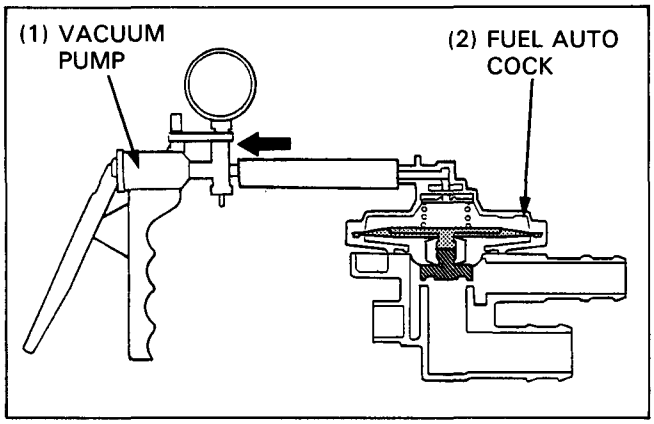
Check No.12 tube for clogging, bend or looseness.
Check the fuel lines for improper connections.



Connect a vacuum pump as shown.
Apply the specified vacuum to the fuel auto cock.

SPECIFIED VACUUM: 200 mmHg (7.9 inHg)

Vacuum should be maintained.
If the vacuum is not held, replace the auto cock.

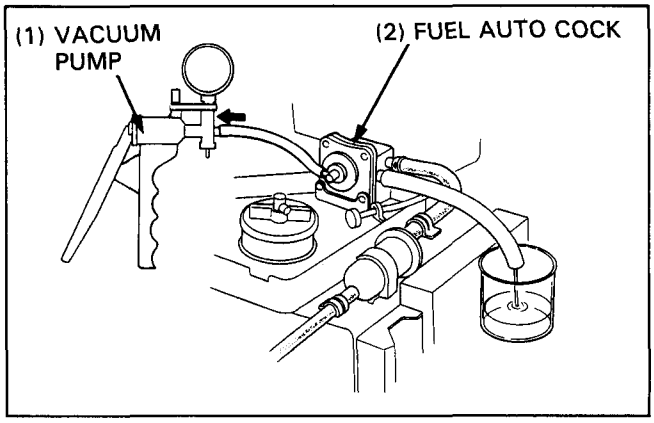


Disconnect the fuel outlet line from the fuel auto cock. Connect a suitable tube to the auto cock outlet port and hold a graduated beaker under the tube.

Short the BLK/WHT and BLK/BLU wire connector terminals of engine control unit (page 26-36/fuel pump operation test).

Turn the ignition switch ON and the engine stop switch RUN.
The gasoline should not flow out.

Then, keeping on above conditions, apply vacuum to the auto cock.
Vacuum should be maintained and the gasoline should flow out smoothly.
Replace the auto cock if necessary.



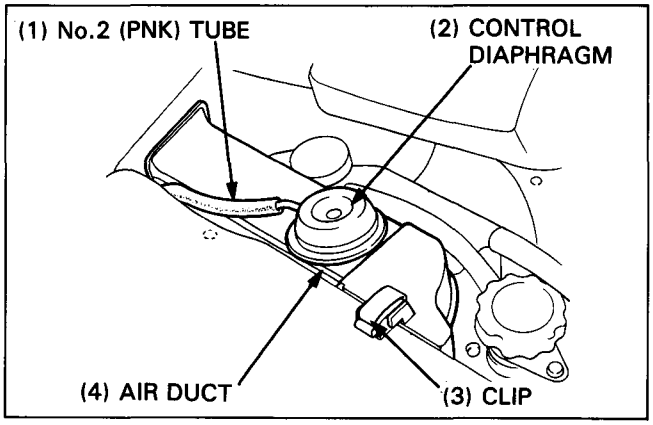
AIR CLEANER CASE

REMOVAL

Remove the top compartment (page 12-7).
Disconnect the No.2 (PNK) tube from the hot air control diaphragm.
Remove the clip and air duct.

NOTE

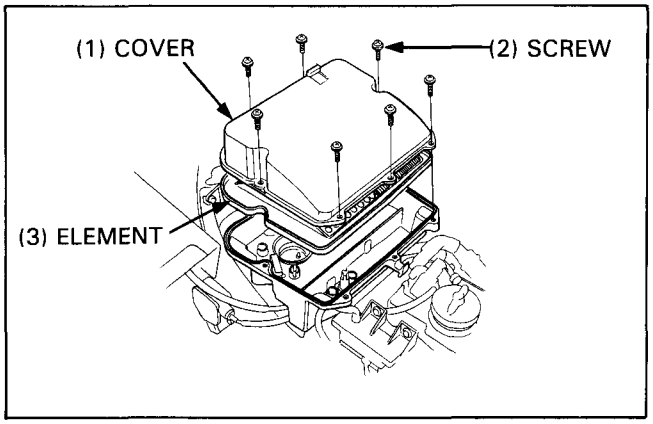
- For control valve removal, see page 4-51.



Remove seven screws and air cleaner case cover.
Remove the air cleaner element.

NOTE

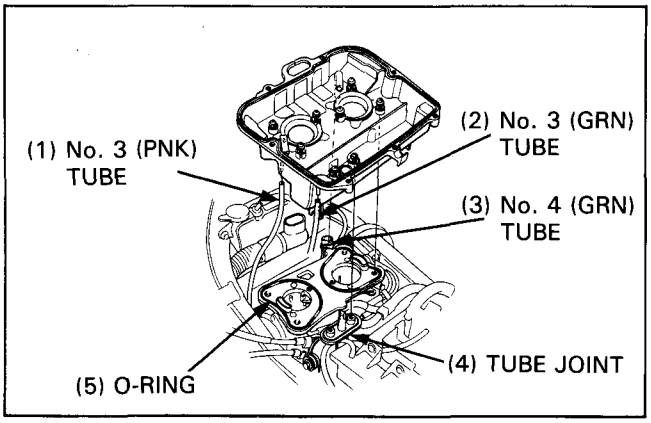
- Do not drop anything into the carburetors.



Remove six screws and air cleaner case.
Remove the O-rings from carburetor.
Disconnect the No. 3 (GRN; SW model only), No. 4 (GRN) and No. 3 (PNK) tubes from the air cleaner case.
Remove the O-rings from the carburetor.

NOTE

- Cover carburetor main bores with a shop towel to prevent dropping anything into the carburetors.
- For hot air control valve removal, see page 4-51.

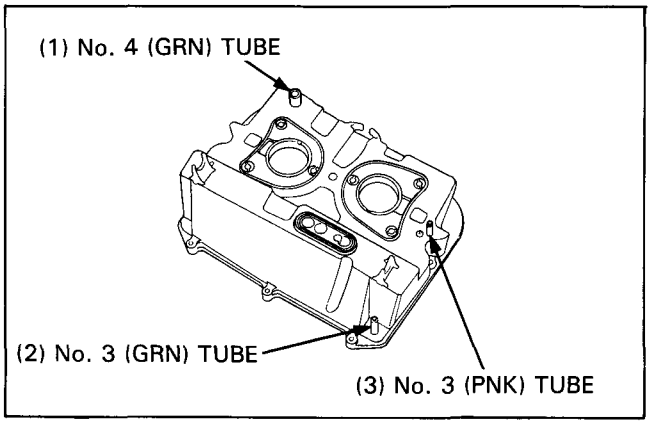


INSTALLATION

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

NOTE

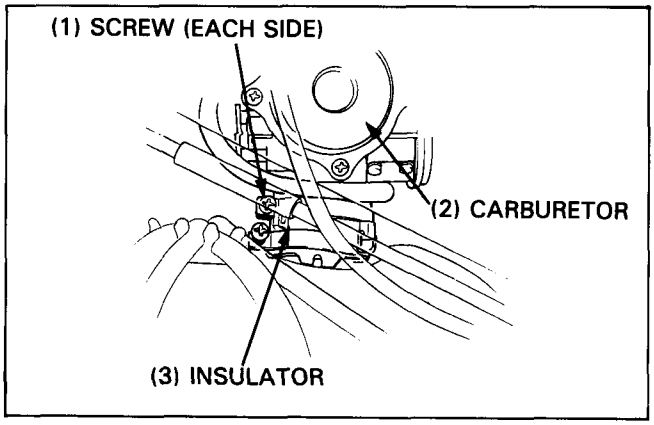
- Connect the related hoses to the air cleaner case as shown.



CARBURETOR REMOVAL

Drain coolant (page 5-7).
Remove the following:
— fairing inner covers (page 12-9).
— air cleaner case (page 26-27).

Loosen the carburetor insulator band screws (upper side, near carburetor) and remove the carburetor from insulators.

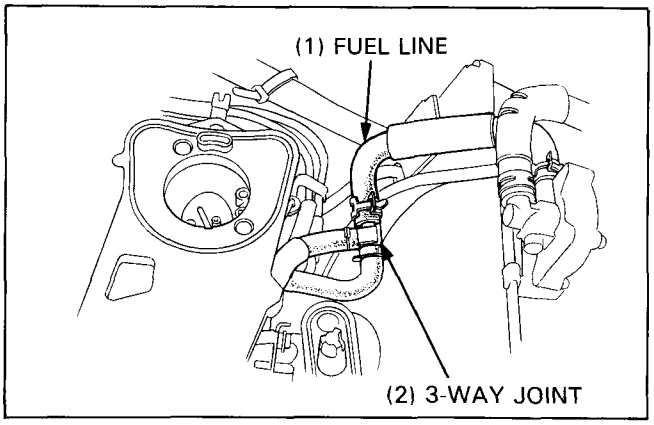


Disconnect the fuel line from the 3 way joint.

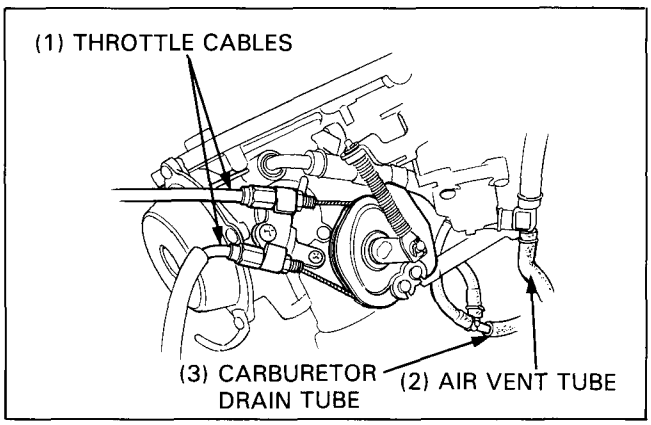
⚠ WARNING

- ***Keep gasoline away from flames or sparks. Wipe up spilled gasoline at once.***

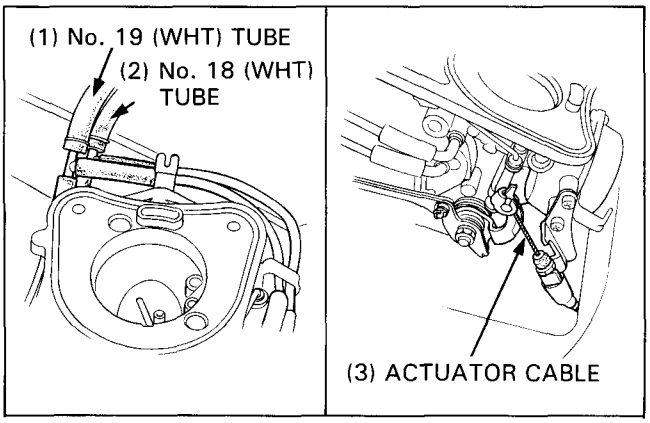
Disconnect all air and fuel vapor tubes from carburetors.



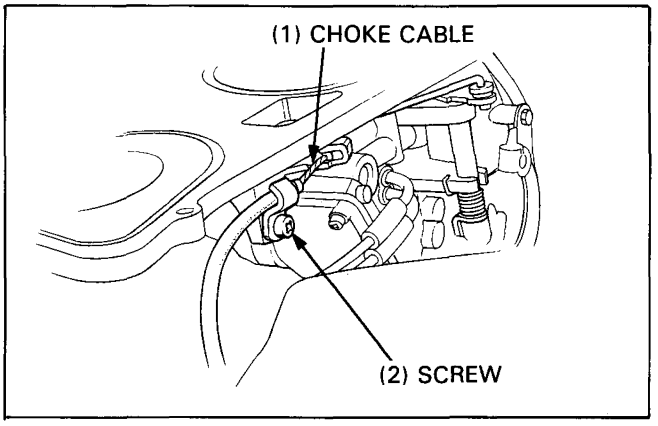
Disconnect the throttle cables from the throttle drum.
Disconnect the air vent tube and carburetor drain tube at each 3-way joint.



Disconnect the No. 18 (WHT) and No. 19 (WHT) tube at the 3-way joint.
Disconnect the auto cruise actuator cable from the throttle drum.



Loosen the choke cable holder screw and disconnect the choke cable.

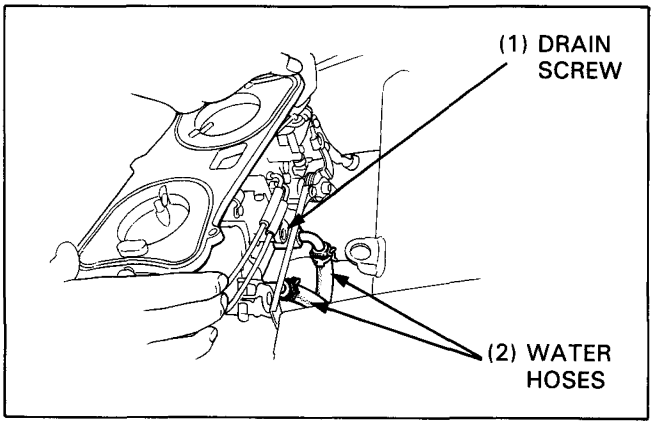


Disconnect water hoses from the carburetor heat riser.
Remove carburetor assembly.

NOTE

- Place a suitable container under the carburetor to catch residual coolant from the carburetor heat riser.
- Cover intake manifold bores with a shop towel to prevent dropping anything into the engine.

After removal, drain fuel out of the float chambers into a suitable container by loosening drain screws.
For intake manifold service see page 26-33.



⚠ WARNING

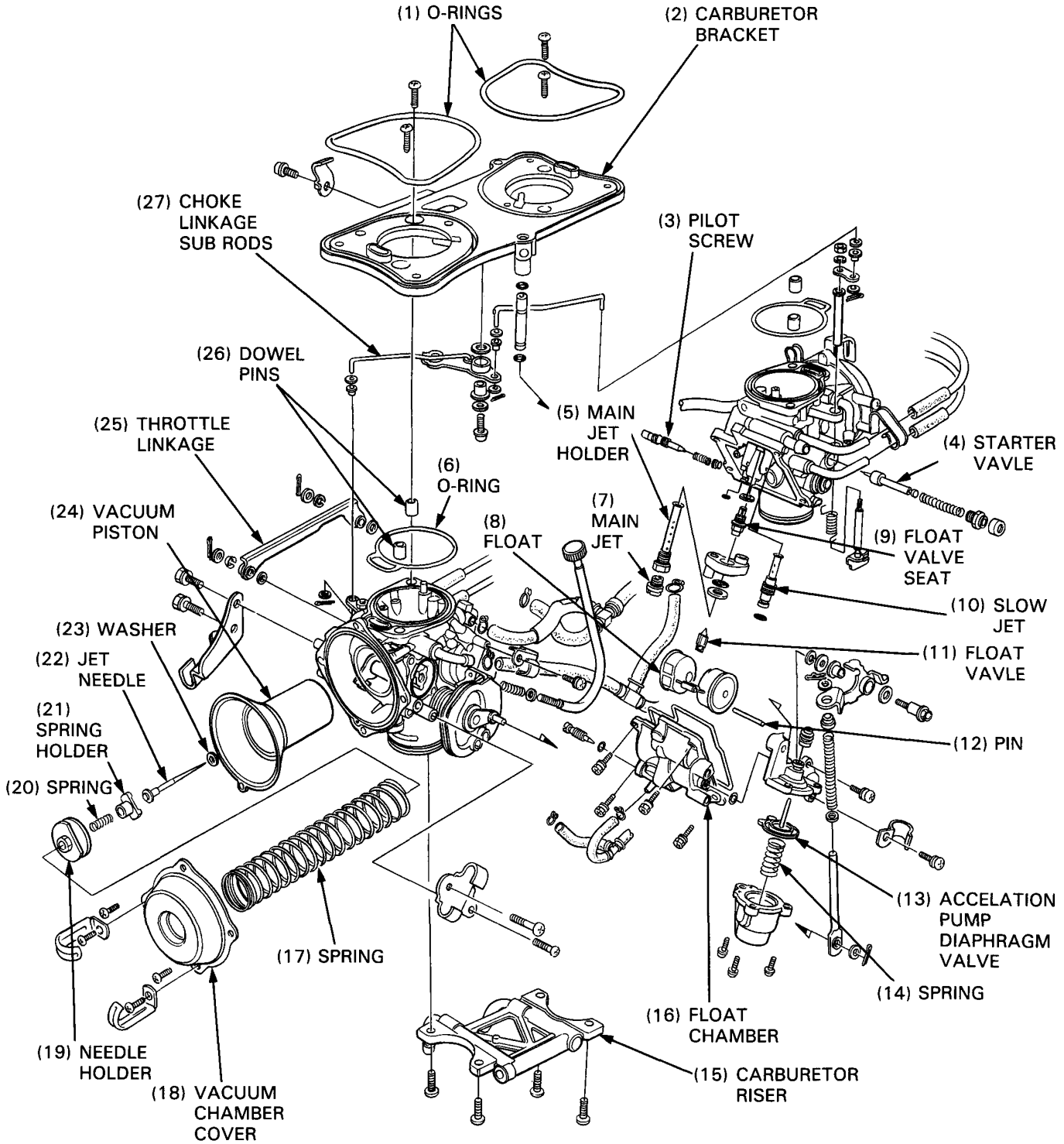
- ***Keep gasoline away from flames or sparks. Wipe up spilled gasoline at once.***

CARBURETOR ASSEMBLY

Reassembly is essentially the reverse of disassembly.

NOTE

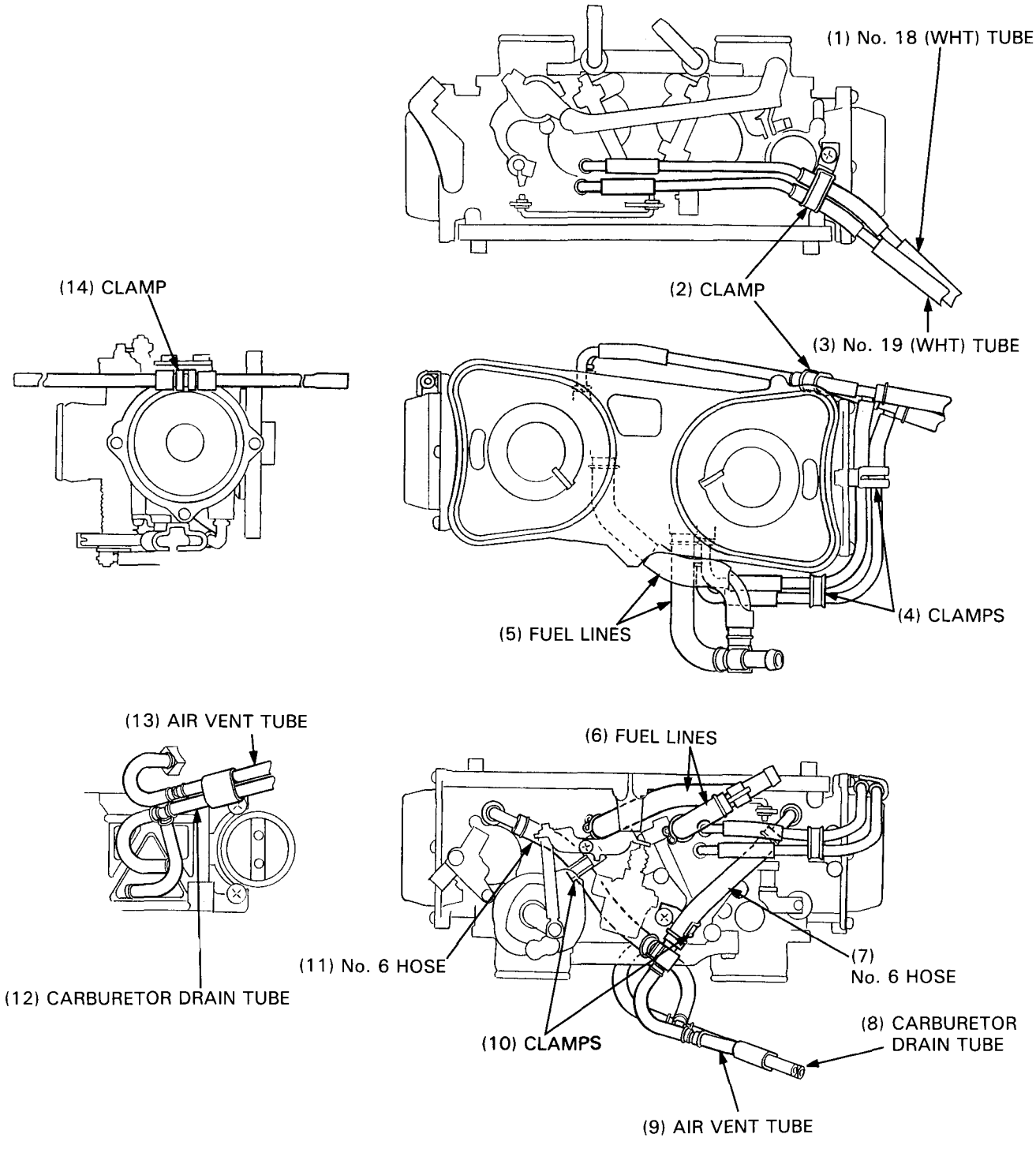
- Do not overtighten the main jet holder and float valve seat.



CARBURETOR TUBES/HOSES

NOTE

- Be careful not to bend, twist or kink the tubes when installing.
- Install new tubes if the current tubes are deteriorated or damaged.
- Slide the end of each tube fully onto its fitting, and secure with a tube clamp.
- After installing the carburetors on the engine, check that the tubes do not contact sharp edges or corners.

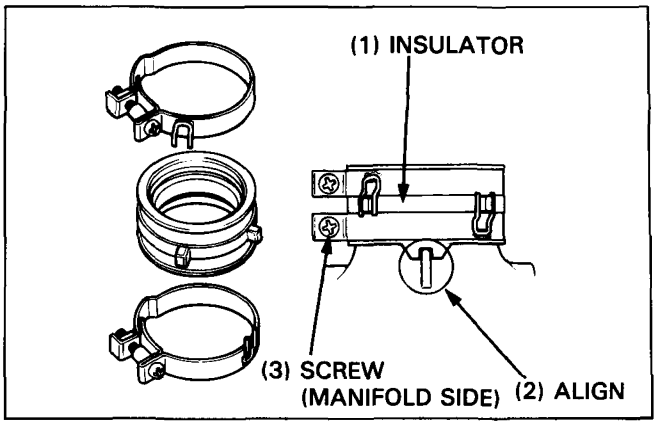


CARBURETOR INSTALLATION

If the carburetor insulator was removed, install the insulator onto the intake manifold, aligning the insulator groove with the manifold rib.

Secure the screw of the manifold side.

TORQUE: 5 N·m (0.5 kg-m, 3.6 ft-lb)

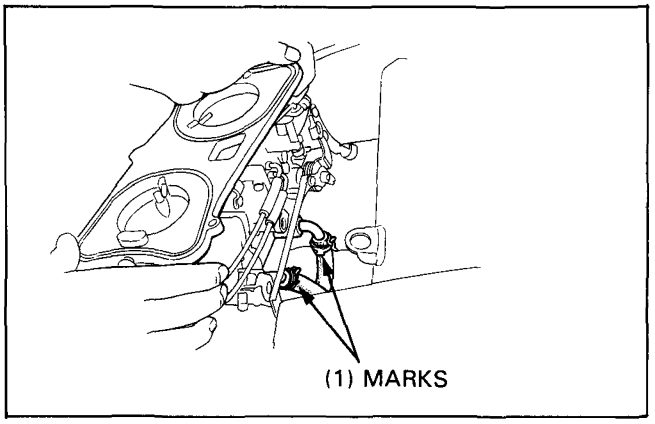


Connect the water hoses to the carburetor heat riser.

NOTE

- Connect the "J" (yellow) marked hose to the left pipe; "D" marked hose to the right pipe.

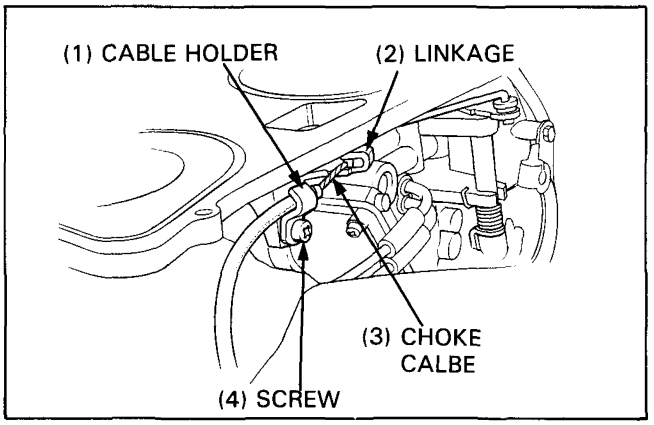
Secure the hoses with clamps.



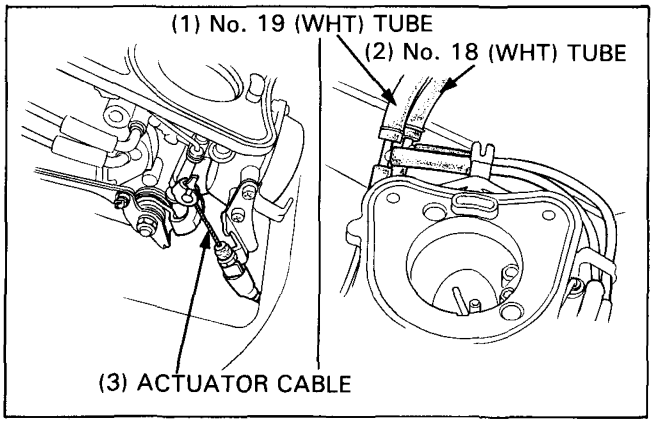
Connect the choke cable to the choke linkage. Align the end of the cable outer housing with the edge of the cable holder.

Tighten the cable holder screw securely.

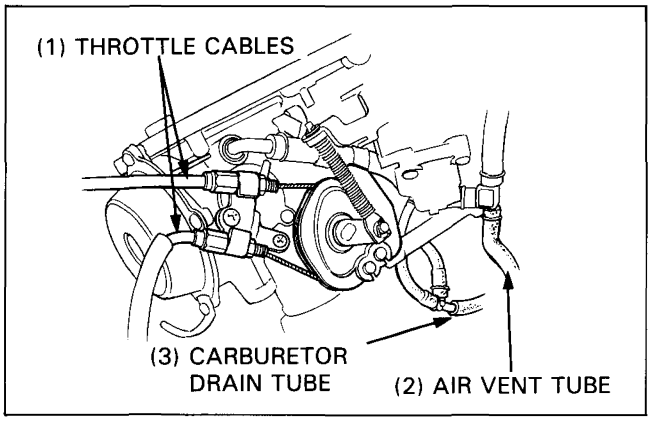
Make sure that the choke linkage end does not contact the cable outer housing when the choke lever is fully open.



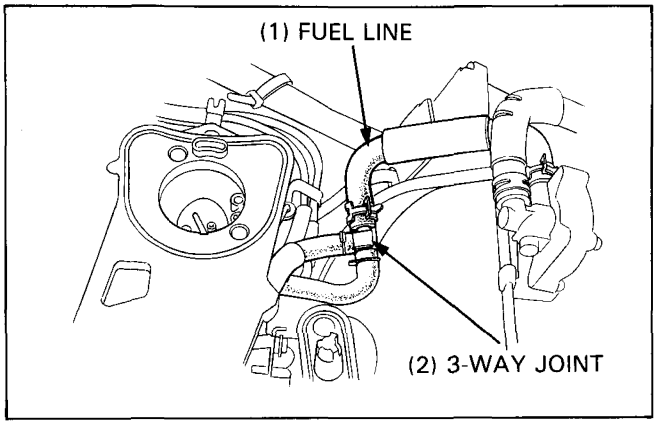
Connect the actuator cable.
Connect the No. 18 (WHT) and No. 19 (WHT) tubes.



Connect the carburetor drain tube and air vent tube to each 3-way joint.
Connect the throttle cables to the throttle drum.



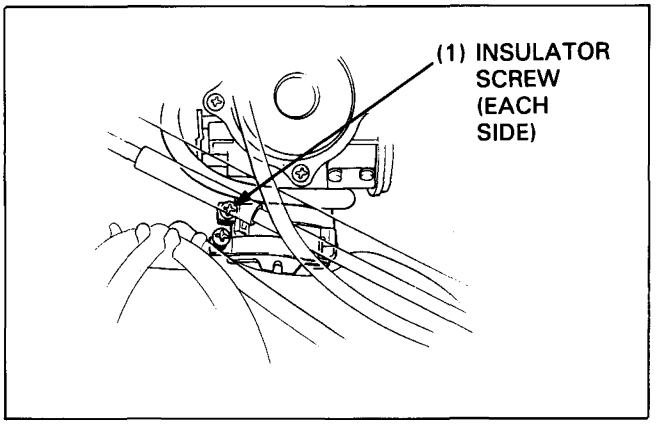
Connect the fuel line to the 3 way joint.



Install the carburetor onto the insulators and secure the screws to the specified torque.

TORQUE: 5 N·m (0.5 kg-m, 3.6 ft-lb)

Connect all hoses and tubes, refering to the hoses and tubes routing/connection (page 26-20).

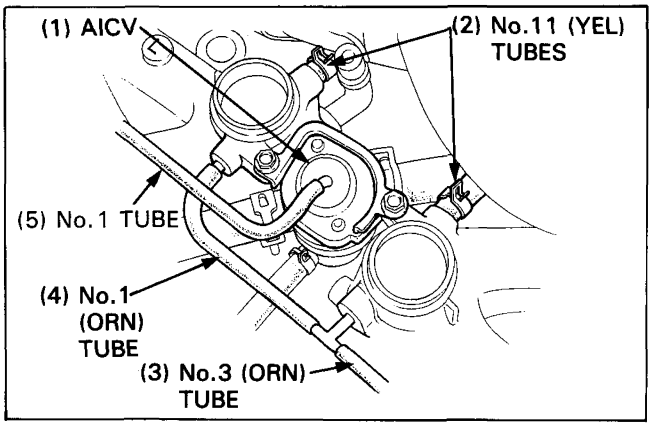


INTAKE MANIFOLD

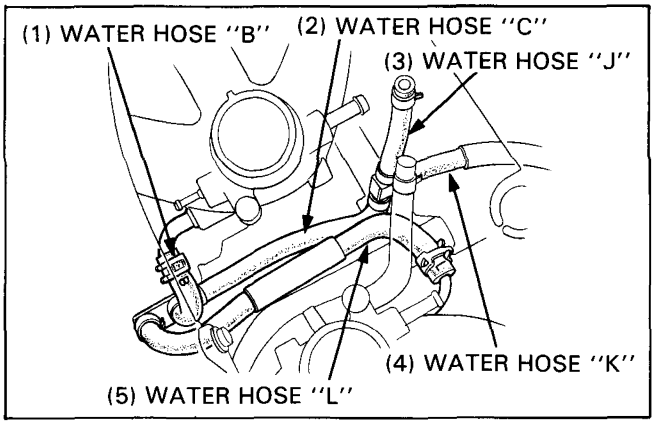
REMOVAL

Remove the following:
—air cleaner case (page 26-27).
—carburetors (page 26-28).
—heat guard.
—insulators.
SW model only:
—air injection control valve (AICV) (page 26-43).

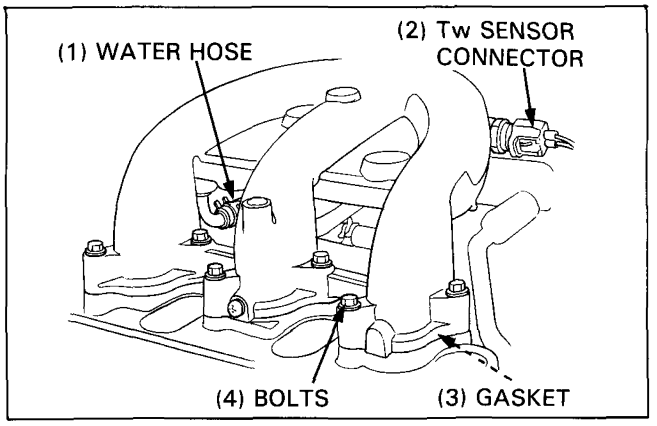
Disconnect vacuum tubes (No. 11: YEL, No. 1, No. 1: ORN, No. 3: ORN) from intake manifolds.



Disconnect water hoses (B marked hoses) from intake manifold riser pipes.



Disconnect the Tw sensor connector and water hose from the right intake manifold.
Remove six bolts, right intake manifold and gasket.



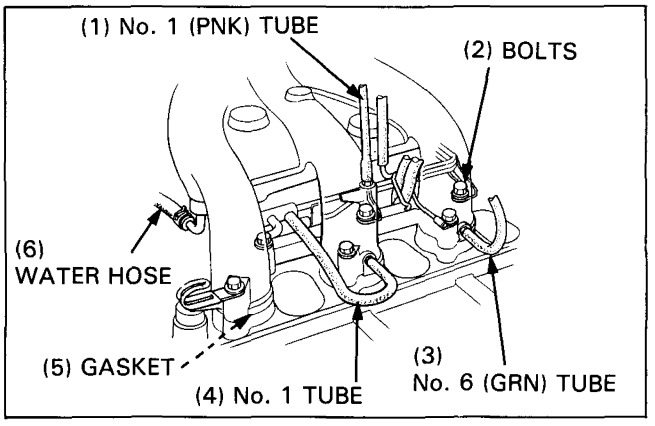
Disconnect vacuum tubes (No. 1, No. 1: PNK, No. 6: GRN: SW model only) and water hose from the left intake manifold.
Remove six bolts, left intake manifold and gasket.

INSTALLATION

Install the intake manifolds in the reverse order of removal.

NOTE

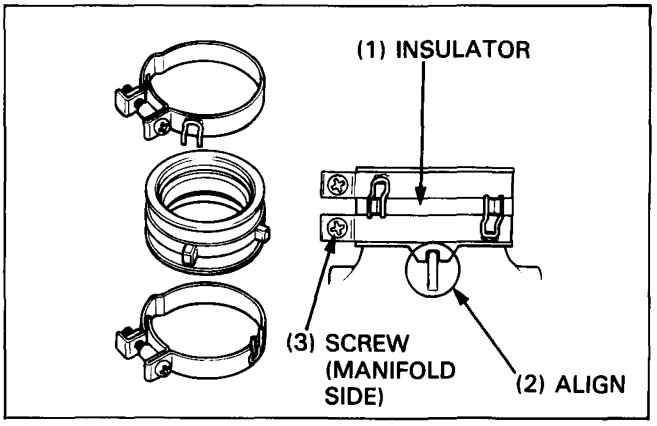
- **"L" marked manifold to the left side; and "R" marked to the right.**
- **For all vacuum tubes connection and routing, refering to the hose and tubes routing/connection (page 26-20).**



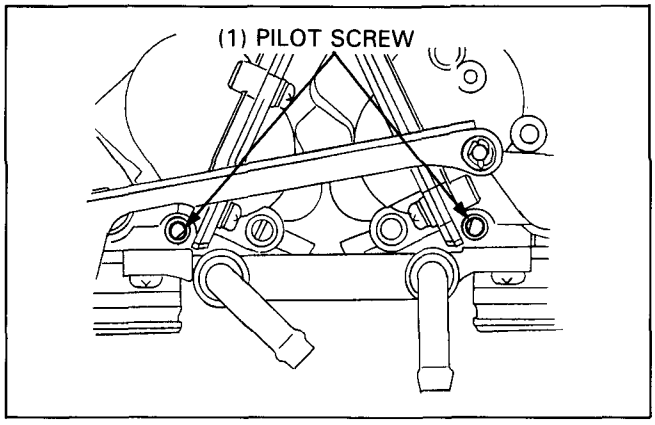
Install the carburetor insulator onto the intake manifolds, aligning the insulator groove with the manifold ribs.

Secure the screws of the manifold side.

TORQUE: 5 N·m (0.5 kg-m, 3.6 ft-lb)



PILOT SCREW ADJUSTMENT



Idle Drop Procedure

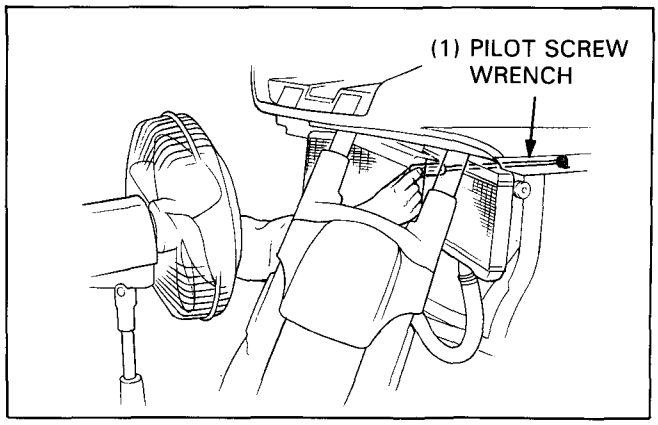
NOTE

- The pilot screws are factory pre-set and no adjustment is necessary unless the pilot screws are replaced.
- Use a tachometer with graduations of 50 min^{-1} (rpm) or smaller that will accurately indicate a 50 min^{-1} (rpm) change.
- Turn on an electric fan to cool the coolant.

Remove the coding fan (page 5-10).

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

   Initial Opening: 2 turns out
   (SW model: 1-1/4 turns out)
   TOOL:
   Pilot screw wrench **07KMA—MS60100**
   (SW model only)



CAUTION

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

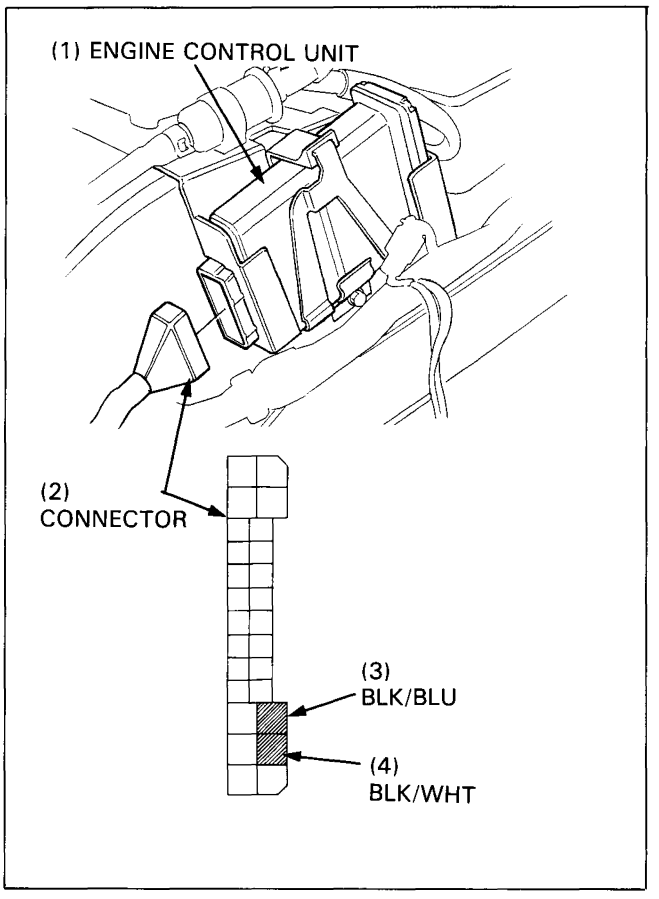
2. Warm up the engine to operating temperature. Stop and go driving for 10 minutes is sufficient.
3. Attach a tachometer according to the manufacturer's instructions.
4. Adjust the idle speed with the throttle stop screw.
5. Turn each pilot screw 1/2 turn out from the initial setting.
6. If the engine speed increases by 50 min^{-1} (rpm) or more, turn each pilot screw out a continual 1/2 turn until engine speed drops by 50 min^{-1} (rpm) or less.
7. Adjust the idle speed with the throttle stop screw.
8. Turn the left carburetor pilot screw in until the engine speed drops 50 min^{-1} (rpm).
9. Turn the left carburetor pilot screw 1 turn out from the position obtained in step 8.
10. Adjust the idle speed with the throttle stop screw.
11. Perform steps 8,9 and 10 for the right carburetor pilot screw.

FUEL PUMP

FUEL PUMP OPERATION TEST

Remove the right fairing inner cover (page 12-9).

Turn the ignition switch OFF.
Disconnect the engine control unit connector.
Short the BLK/WHT and BLK/BLU wire connector terminal with a jumper wire (wire harness side).

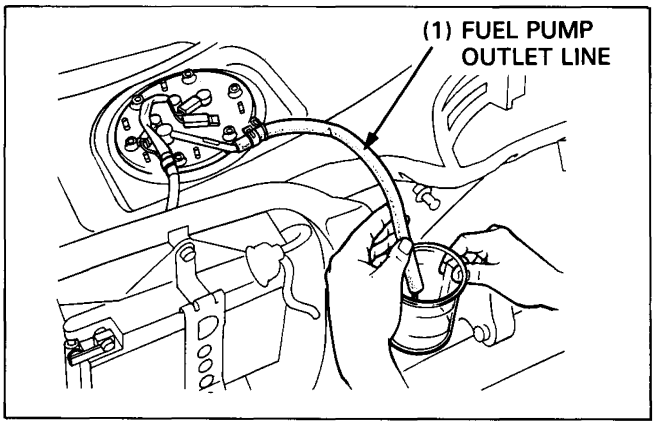


Disconnect the fuel pump outlet line at the fuel filter and hold a graduated beaker under the tube.

Turn the ignition switch ON, engine stop switch RUN and let fuel flow into the beaker for 5 seconds, then turn the ignition switch OFF.

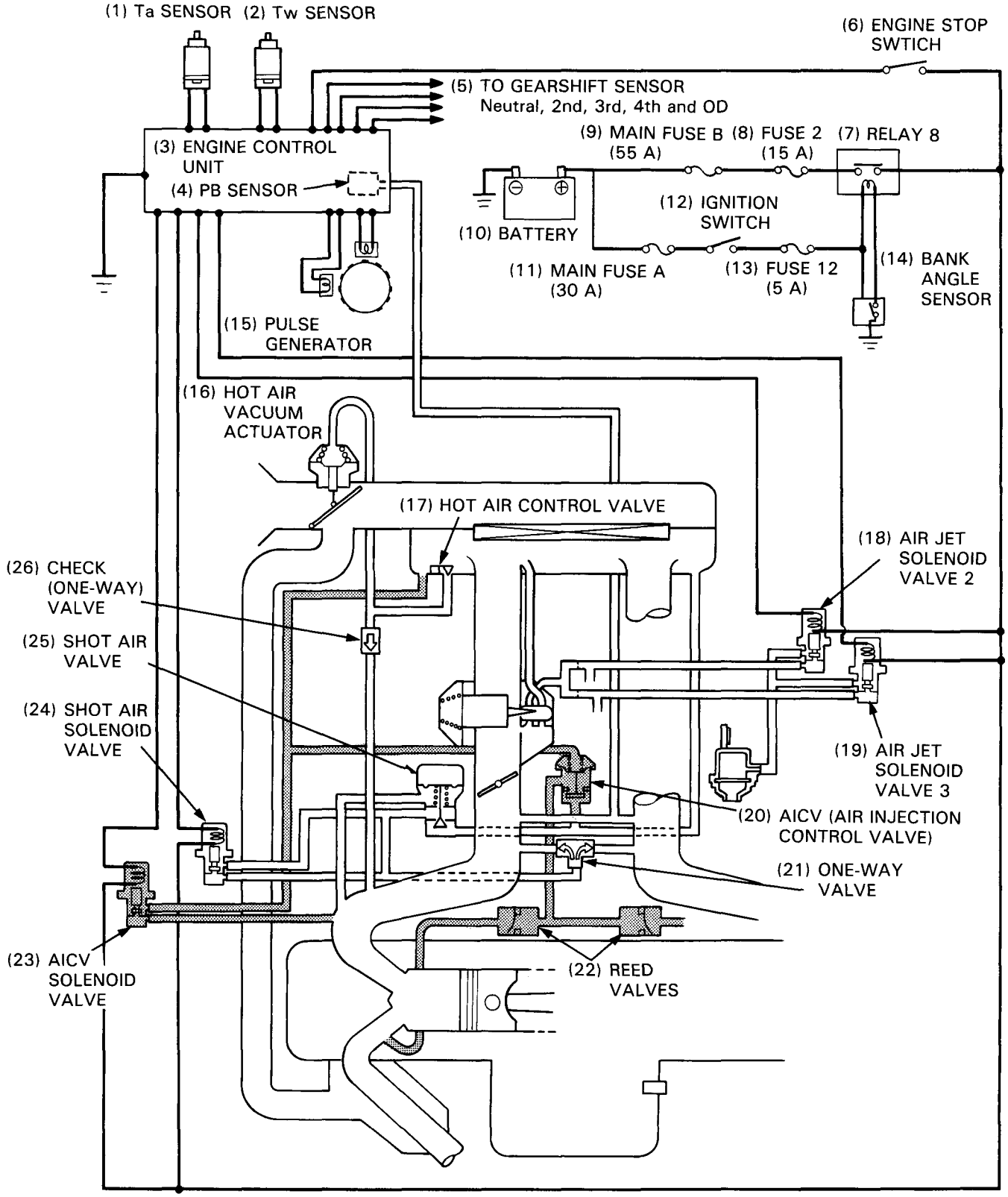
Multiply the amount in the beaker by 12 to determine the fuel pump flow capacity per minute.

Fuel Pump Minimum Flow: 640 cm³ (22.5 Imp oz)/minute



AIR SYSTEM CIRCUIT DIAGRAM

: SW model only



ENGINE CONTROL UNIT

SYSTEM INSPECTION

Remove the right fairing inner cover (see page 13-11).

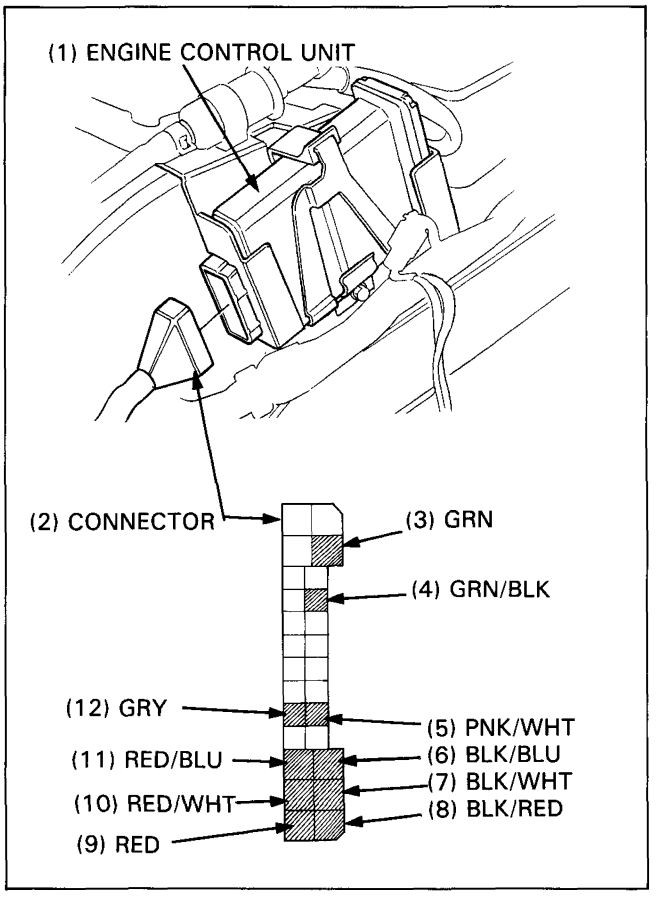
Disconnect the control unit connector.

Check it for loose contact or corroded terminals.

Measure the following between the connector terminals on the wire harness side:

NOTE

- Inspect according to the following conditions:
  Condition 1: Engine stop switch on RUN
  2: Ignition switch in ON
  3: At all times



LINE	TERMINALS	CONDITION(s)	SPECIFICATION
Battery voltage/input	BLK/WHT (+) and ground (−)	1, 2	Battery voltage should register
Decel Compensation solenoid SA	RED/BLU (+) and ground (−)	2	
Air jet solenoid valve 2	RED/WHT (+) and ground (−)	2	
Air jet solenoid valve 3	RED (+) and ground (−)	2	
AICV solenoid valve	BLK/RED (+) and ground (−)	2	
Ta sensor	GRY and GRN/BLK	3	2.0−3.0 kohms (20°C/68°F)
Tw sensor	PNK/WHT and GRN/BLK	3	2.0−3.0 kohms (20°C/68°F)
Fuel pump	BLK/BLU and ground	3	Approx. 6 ohms
Ground	GRN and ground	3	CONTINUITY should exist

INTAKE MANIFOLD SHOT AIR SYSTEM

SYSTEM INSPECTION

Remove the left and right fairing inner covers (page 12-9).

Disconnect the No.6 (YEL) and No.10 (YEL) tubes from the shot air solenoid valve and plug the tube ends.
Connect a vacuum pump as shown and apply the specified vacuum to the valve.

SPECIFIED VACUUM: 200 mm Hg (7.9 in Hg)

Start the engine.

Engine speed: Below 2,000 min^{-1} (rpm)
Air should hold steady.

Engine speed: Over (2,000 min^{-1} (rpm)
Air should flow out.

Remove the air cleaner case (page 26-27).

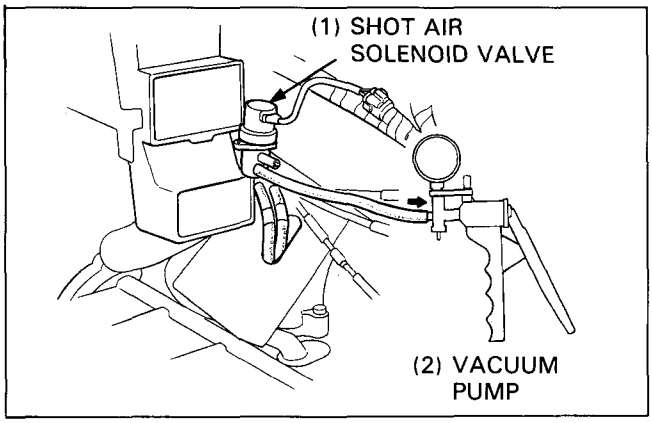
SW model only
Clamp the No. 6 (GRN) tube at the AICV solenoid valve.

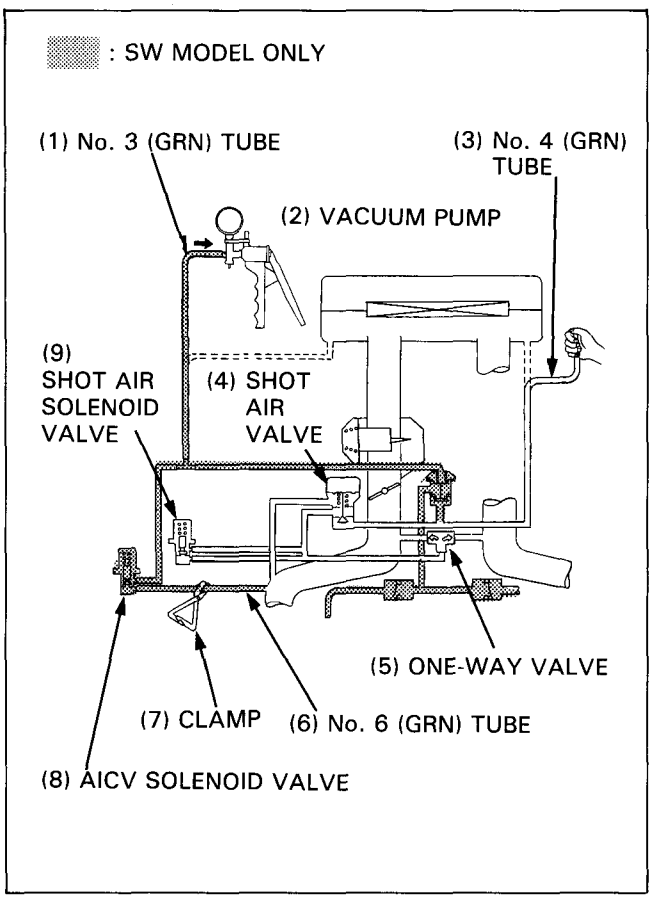
Connect a vacuum pump to the No. 3 (GRN) tube and apply the specified vacuum.

Specified Vacuum: 200 mmHg (7.9 inHg)

Start the engine in neutral and make sure that air should not be drawn in through No.4 (GRN) tube.

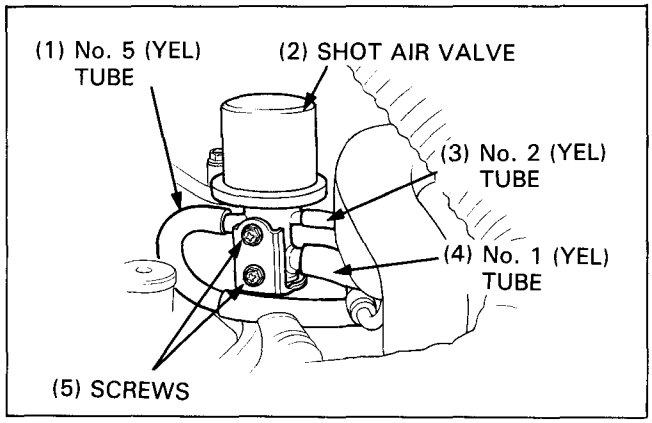
With the engine started and raise the engine speed above 2,000 min^{-1} (rpm); then close the throttle quickly, air should be sucked in through the No.4 (GRN) tube.





SHOT AIR VALVE CHECK

Remove the left cooling fan (page 5-10).
Remove the screws and disconnect air tubes from the shot air valve.
Remove the shot air valve.

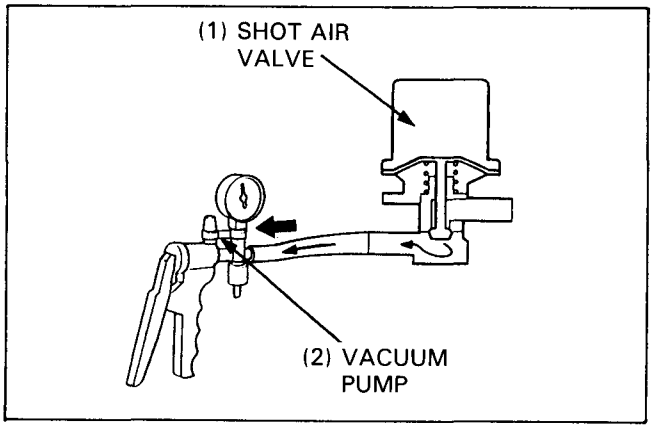


Connect a vacuum pump as shown.

Apply the specified vacuum to the valve. 500 mm Hg (19.7 in Hg) vacuum should be maintained.

When continuing to apply vacuum, vacuum could not be applied more than approximately 560 mm Hg (22.0 in Hg).

Replace the valve if necessary.



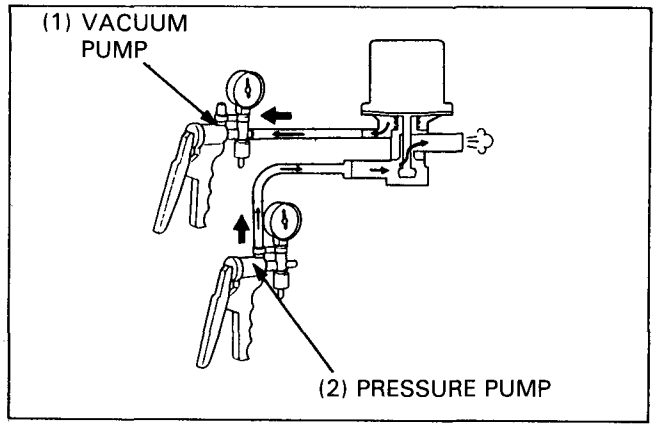
Connect a vacuum pump and pressure pump as shown.

Apply light pressure (approximately 5 psi).
Apply the specified vacuum. The valve should open and the pressure would be released.

SPECIFIED VACUUM: 110—150 mm Hg (4.3—6.3 in Hg)

NOTE

- Vacuum should not be maintained.
- Route the tubes properly (page 26-20) and check the tube connections for loose or poor.
- Coat soap water onto valve pipes before connecting tubes.



PRIMARY MAIN AIR JET CONTROL SYSTEM

SYSTEM INSPECTION

Remove the right fairing inner cover (page 12-9).

Shift the transmission into neutral.
Start the engine and warm it up to normal operating temperature.
Stop the engine.

NOTE

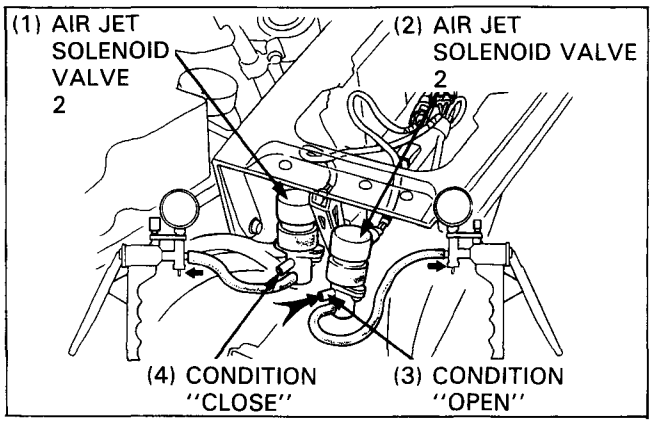
- This test must be performed with the engine coolant temperature above 60°C (140°F) and the surrounding temperature above 20°C (68°F).

Disconnect the No. 18 (WHT), No. 19 (WHT), No. 20 (WHT) and No. 21 (WHT) tubes from the air jet solenoid valves 2 and 3.
Connect vacuum pumps to the air jet solenoid valves as shown.

NOTE

- "Open" and "Closed" in the table on the next page mean that:
  "Open":
  Vacuum should not maintained when it is applied to the solenoid valve.
  "Closed":
  Vacuum should be maintained when it is applied to the solenoid valve.

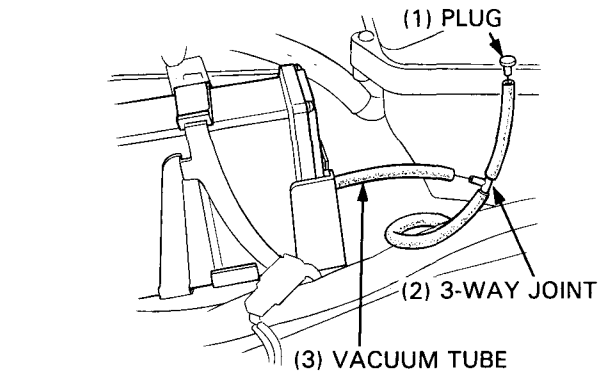
  Specified vacuum: 200 mmHg (7.9 inHg)



Disconnect the vacuum tube that goes from the ignition control unit to the 3-way joint. Remove the plug from the dead end tube, and connect the tube to the 3-way joint as shown.

NOTE

- Do not lose the plug.

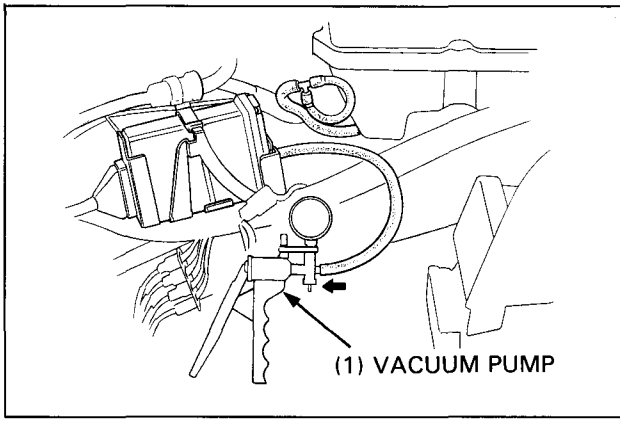


Connect a vacuum pump to the ignition control unit vacuum tube.

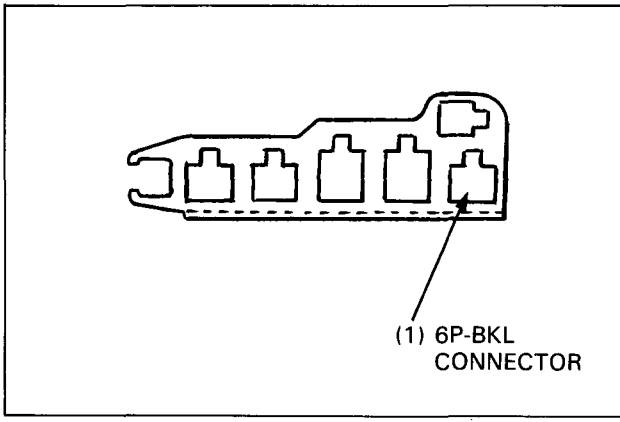
Start the engine and allow it to run at specified rpm shown in the table below. The following results should be obtained as the specified vacuum is applied.

ENGINE RPM	VALVE NUMBER	SPECIFIED VACUUM APPLIED	
		0 mmHg (0 inHg)	200 mmHg (7.9 inHg)
Idle speed 800 min^{-1} (rpm)	2	Valve is "Closed"	Closed
	3	Closed	Closed
2,000 min^{-1} (rpm)	2	Open*	Closed
	3	Closed	Closed

* 0 mmHg (0 inHg) in the table is for standard sea level atmospheric pressure of 760 mmHg (29.9 inHg). Therefore, the test result may be different in the area where the altitude is higher than 300 m (1,000 feet) because of the atmospheric pressure.



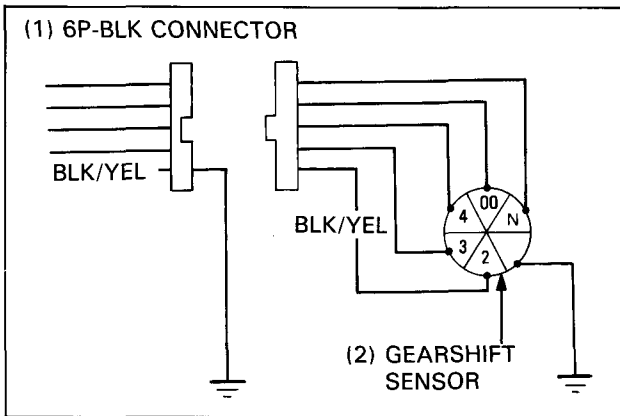
Disconnect the gearshift sensor 6P-BLK connector of the connector holder on the right cooling fan. Ground the BLK/YEL wire of the wire harness side connector.



Start the engine and allow it to run at specified rpm shown in the table bewlo. The following results should be obtained as the specified vacuum is applied.

ENGINE RPM	VALVE NUMBER	SPECIFIED VACUUM APPLIED	
		0 mmHg (0 inHg)	200 mmHg (7.9 inHg)
Idle speed 800 min^{-1} (rpm)	2	Valve is "Closed"	Closed
	3	Closed	Closed
2,000 min^{-1} (rpm)	2	Open*	Closed
	3	Closed	Closed

* 0 mmHg (0 inHg) in the table is for standard sea level atmospheric pressure of 760 mmHg (29.9 inHg). Therefore, the test result may be different in the area where the altitude is higher than 300 m (1,000 feet) because of the atmospheric pressure.



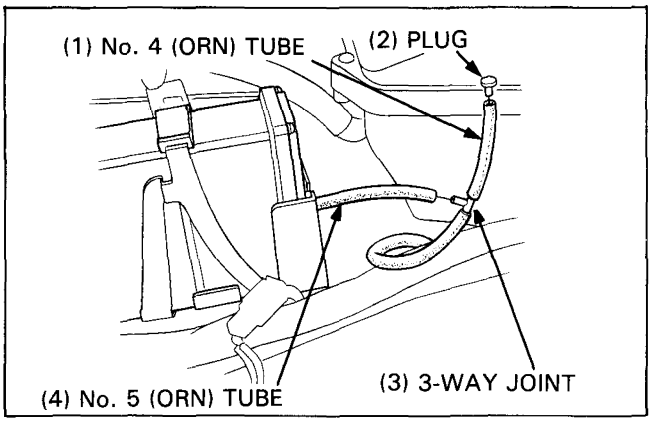
SECONDARY AIR SUPPLY SYSTEM (SW MODEL ONLY)

SYSTEM INSPECTION

Remove both fairing inner covers (see page 13-11).

Disconnect the No. 5 (ORN) tube at the 3-way joint.
Remove the plug from the No. 4 (ORN) tube and connect the tube to the 3-way joint as shown.

Connect a vacuum pump to the engine control unit No. 5 (ORN) tube.



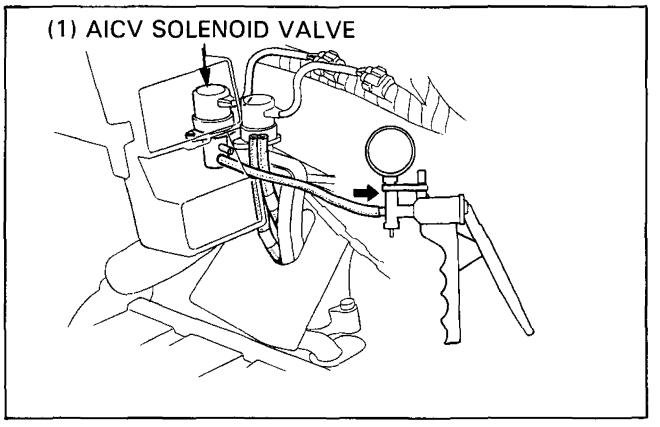
Disconnect the No. 1 and No. 6 (GRN) tubes from the AICV solenoid valve and plug the tube ends.

Connect a vacuum pump as shown and apply the specified vacuum to the valve.

Specified Vacuum: 200 mmHg (7.9 inHg)

Start the engine and allow it to idle.

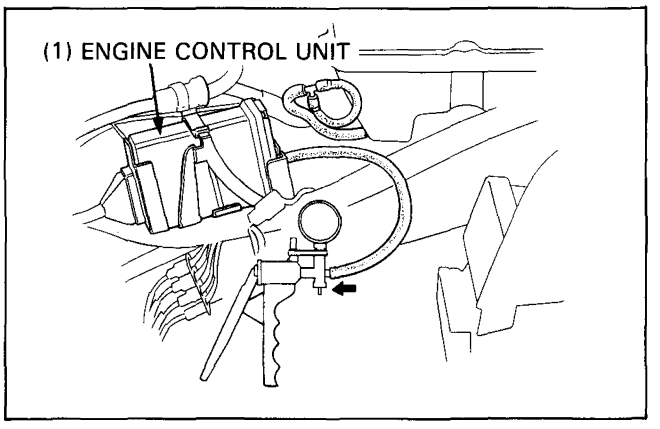
Vacuum should hold.



Apply the specified vacuum to the engine control unit.

Specified vacuum: 550 mmHg (21.7 inHg)

Vacuum applied to the AICV solenoid valve should released.

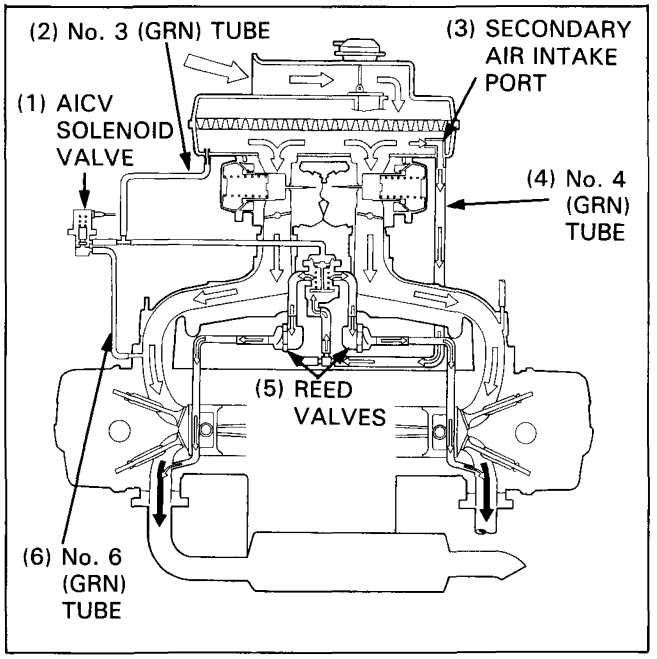


Stop the engine and remove the air cleaner element (page 26-27).

Check that the secondary air intake port is clean and free of carbon deposits.

Check the reed valves in the secondary air passage if the ports are carbon fouled (page 4-54).

Disconnect the air cleaner-to-air injection control valve No.4 (GRN) tube from the air cleaner case.



Clamp the No. 6 (GRN) tube at the AICV solenoid valve.
Connect a vacuum pump to the No. 3 (GRN) tube.

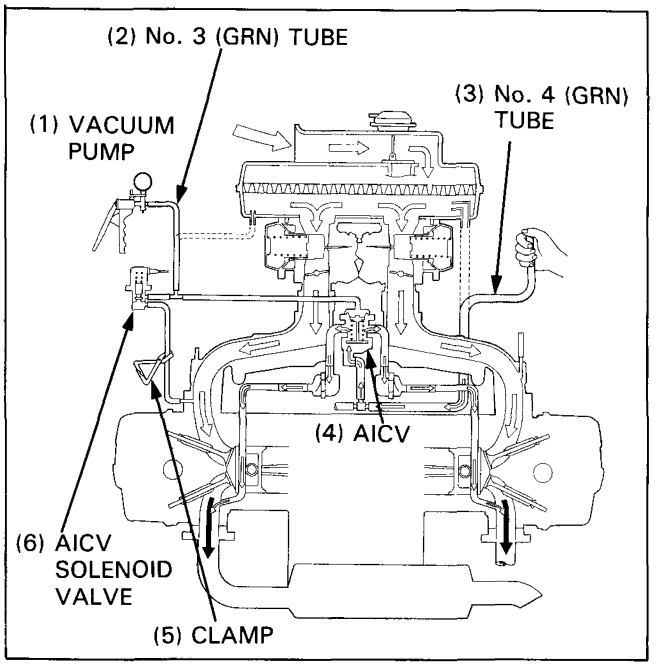
Start the engine and open the throttle slightly to be certain that air is sucked in through the No.4 (GRN) tube.

If air is not drawn in, check the No.2 (GRN) and No.4 (GRN) tubes for clogging.

With the engine running, gradually apply vacuum to the No. 3 (GRN) tube.
Specified vacuum: 200 mmHg (7.9 inHg)

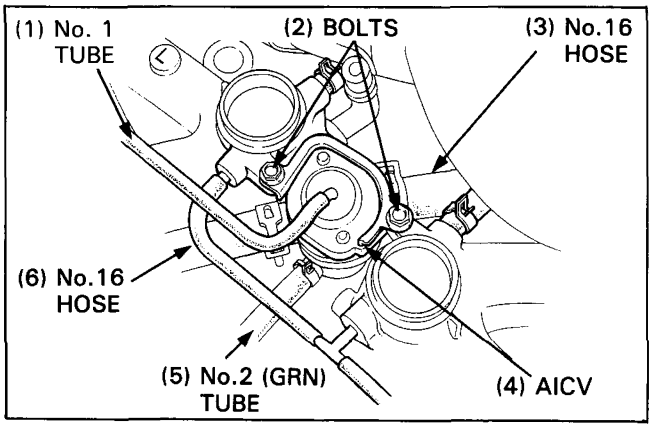
Check that the air intake port stops drawing air, and that the vacuum does not bleed.

If air is still drawn in, or if the specified vacuum is not maintained, check the No. 1 and No. 3 (GRN) tubes for clogging; check the AICV (next page) if necessary.
Check the reed valve joint hoses and air supply pipes (page 26-20).



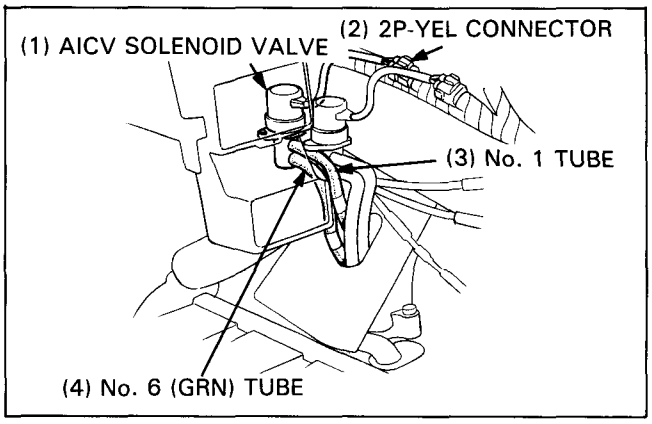
AICV REMOVAL

Remove the carburetor (page 26-28).
Disconnect the No. 1, No. 2 (GRN) tubes and No. 16 hoses from the AICV.
Remove the bolts and AICV.



AICV SOLENOID VALVE INSPECTION

Remove the left fairing inner cover (see page 13-11).
Disconnect the No. 1 tube and No. 6 (GRN) tube from the AICV solenoid valve.
Disconnect the 2P-YEL connector and remove the AICV solenoid valve.



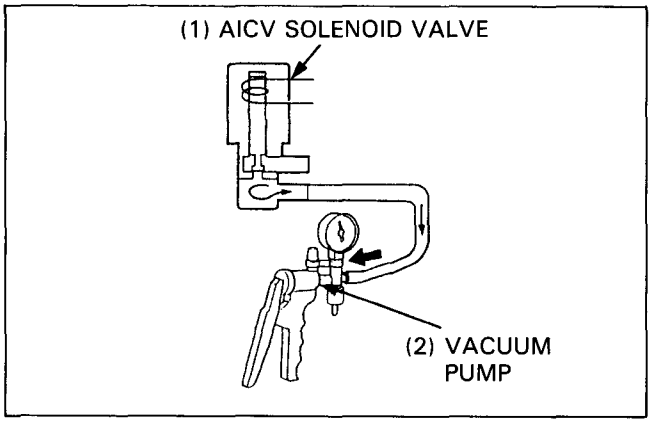
Connect a vacuum pump as shown.

Apply the specified vacuum to the valve.

Specified vacuum: 400 mmHg (15.7 inHg)

Vacuum should hold.

Replace the valve if vacuum does not hold.



Connect a vacuum pump to the valve as shown. Apply the specified vacuum to the valve.

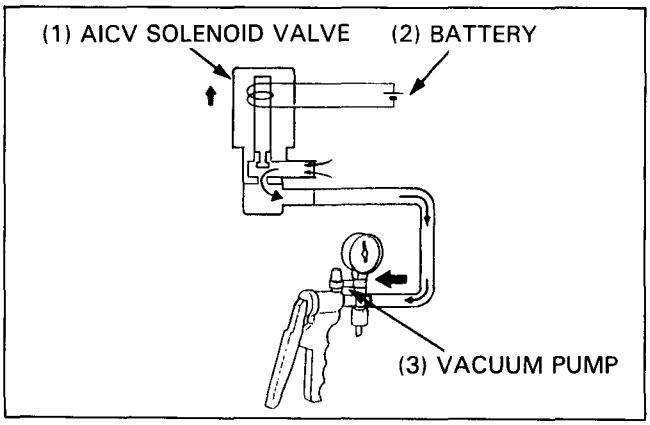
Specified vacuum: 200 mmHg (7.9 inHg)

Connect a 12 V battery to the valve wires. Vacuum should be released. Replace the valve if vacuum remains steady.

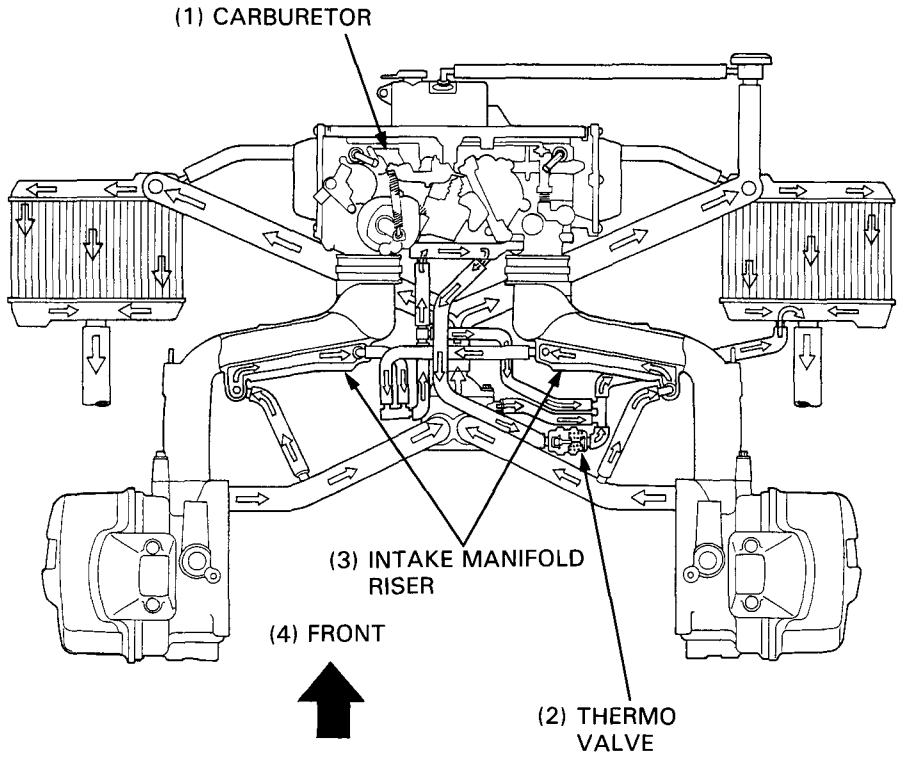
Install the valve in the reverse order of removal.

NOTE

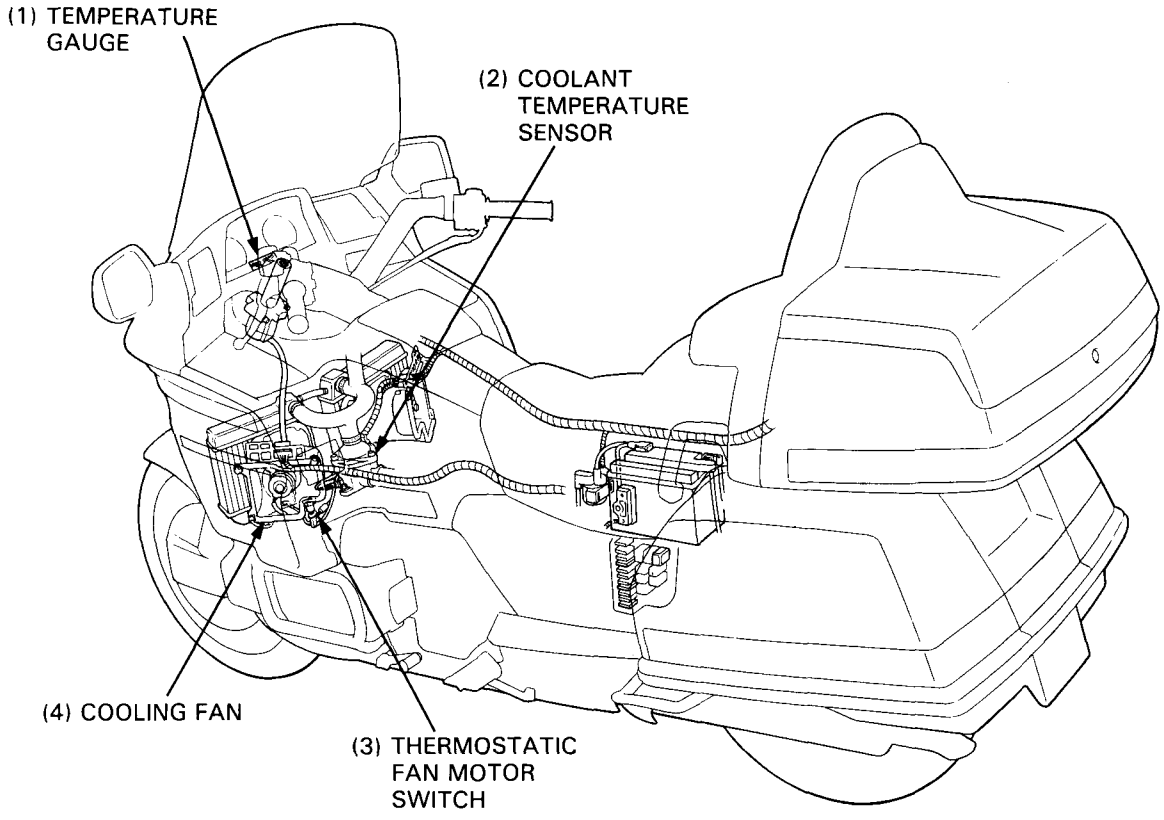
- Route the tubes properly (page 26-20) and check the tube for loose or poor connections.



COOLANT COURSE



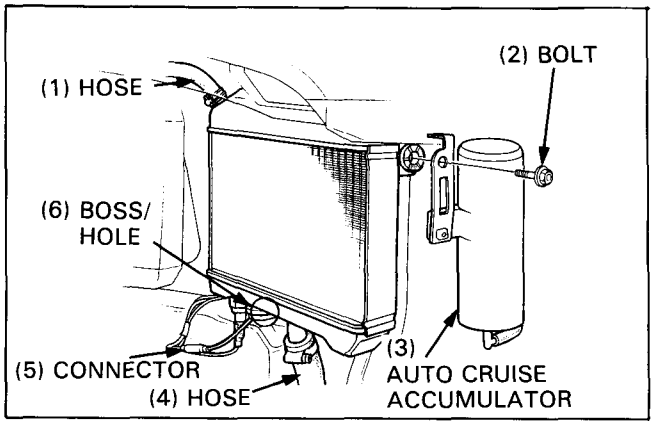
COOLING SYSTEM LOCATION



RADIATOR

REMOVAL

Remove the following:
— radiator shroud (page 12-9).
— fairing front cover (page 12-8).
— fairing lower covers (page 12-9).
Drain the coolant (page 5-7).
Disconnect the thermostatic fan motor switch connector.



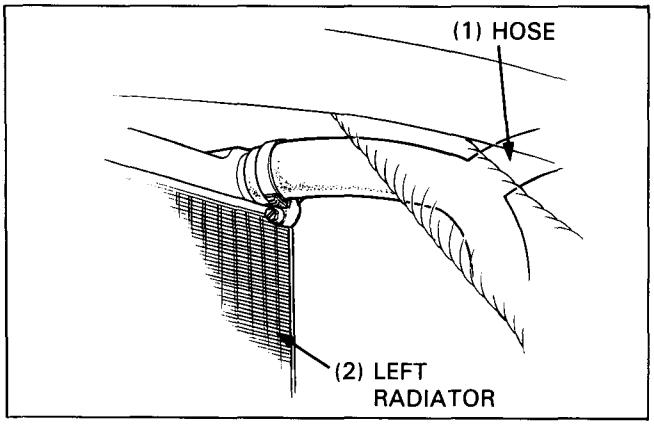
Remove the bolt and auto cruise accumulator.

Release the radiator boss from the frame rubber hole.

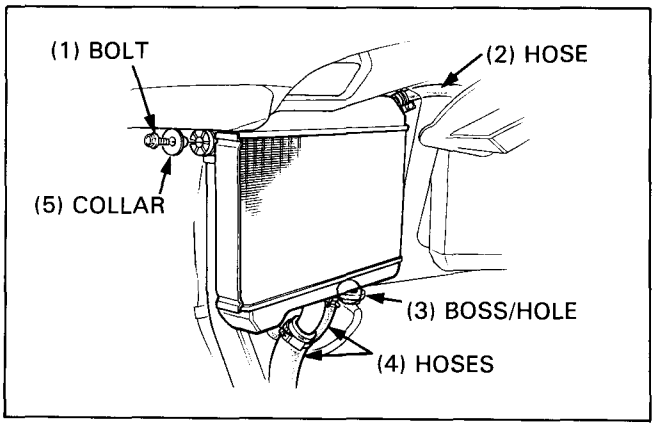
Disconnect the radiator water hoses (3 connections) and remove the left radiator from the frame.

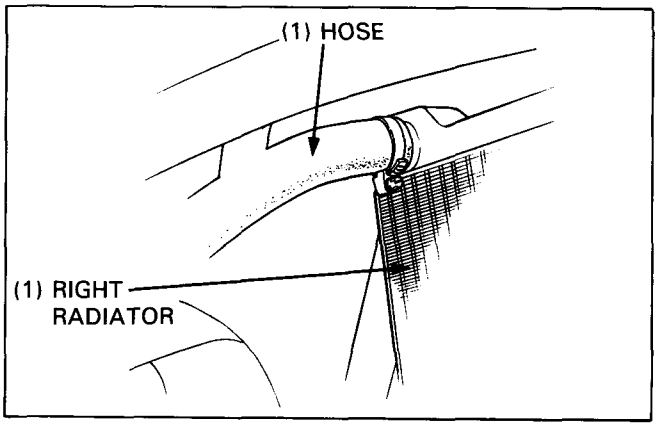
CAUTION

- *Be careful not to damage radiator fins.*



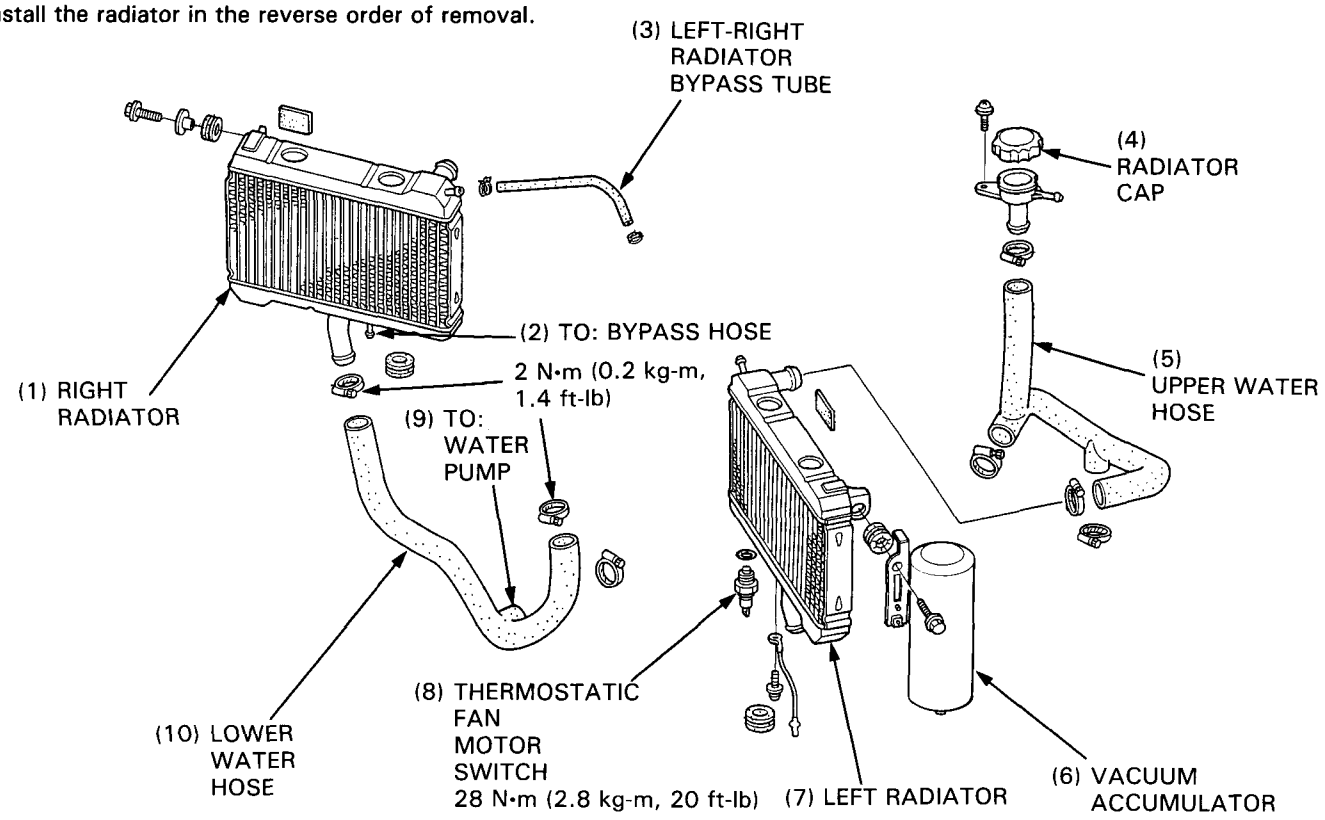
Remove the radiator mounting bolt and collar. Release the radiator boss from the frame rubber hole.
Disconnect the radiator water hoses (4 connections) and remove the right radiator from the frame.





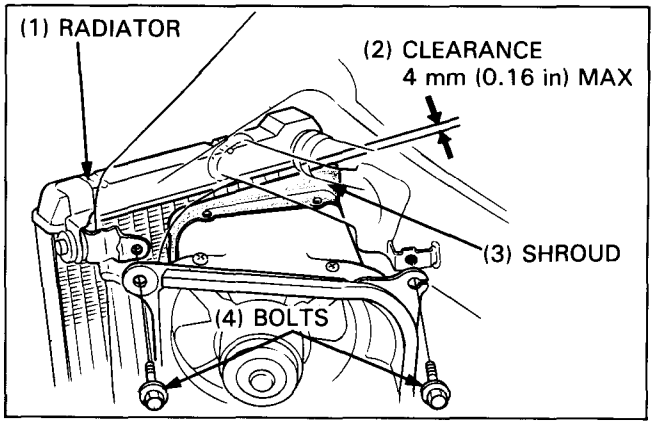
INSTALLATION

Install the radiator in the reverse order of removal.



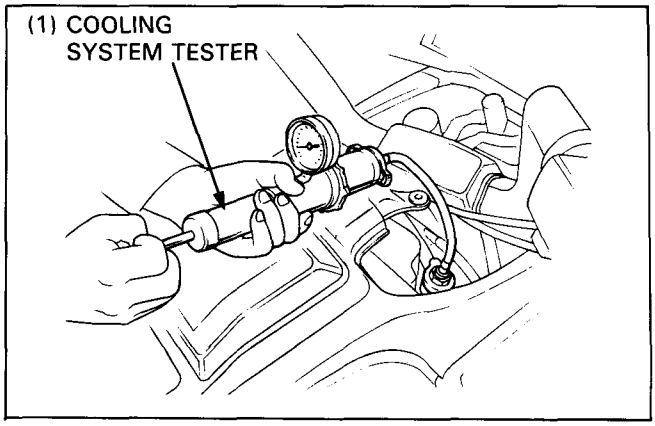
CAUTION

- *Make sure the clearance between the radiator and cooling fan shroud is 4 mm (0.16 in) max. all the way around. An improper clearance will cause the system to lose cooling power. To get the specified clearance, loosen the cooling fan shroud bolts and reset the cooling fan properly.*



Check the radiator for leakage by system pressure test (page 5-6) after installation.

Fill the system with coolant and bleed air from the radiator (page 5-7).



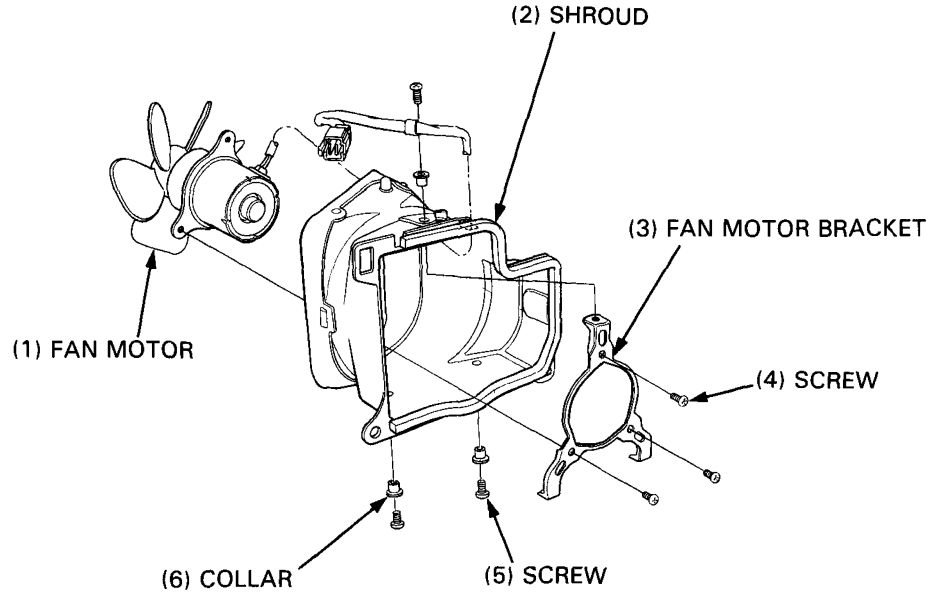
COOLING FAN

DISASSEMBLY

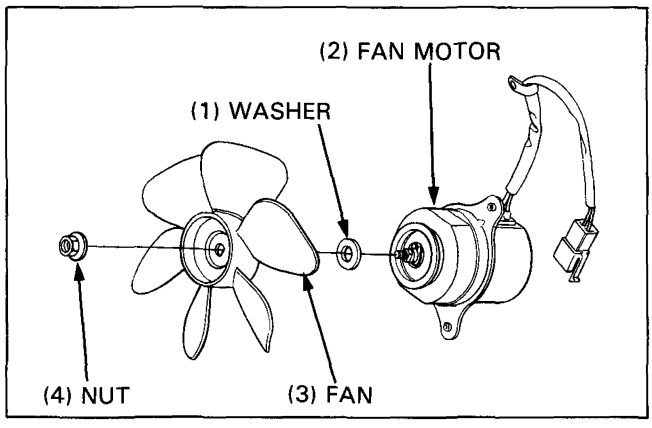
Remove the cooling fan (page 5-10).

Remove three screws and the fan motor from the shroud.

Remove three screws collars and fan motor bracket from the shroud.



Remove the nut, fan and washer from the fan motor.



ASSEMBLY/INSTALLATION

Install the cooling fan in the reverse order of removal.

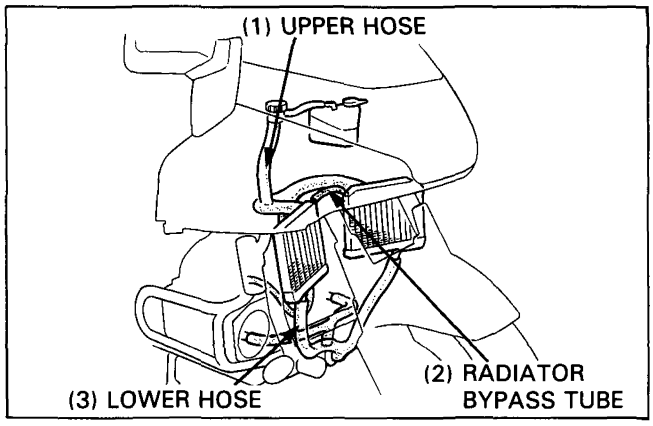
CAUTION

- *Make sure the clearance between the radiator and cooling fan shroud is within 4 mm (0.16 in) (previous page).*
- *Do not exchange the left motor for the right. Each motor rotates in a reverse direction.*

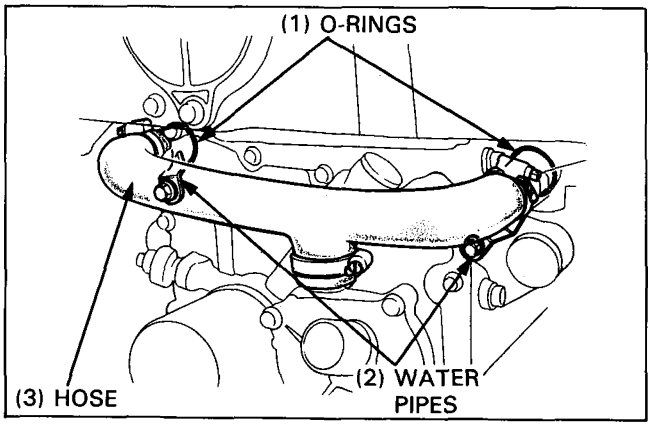
THERMOSTAT, THERMO VALVE AND WATER LINES

WATER LINE REMOVAL

Remove the radiators (page 26-46).
Remove the upper water hose, lower water hose and left-right radiators bypass tubes.



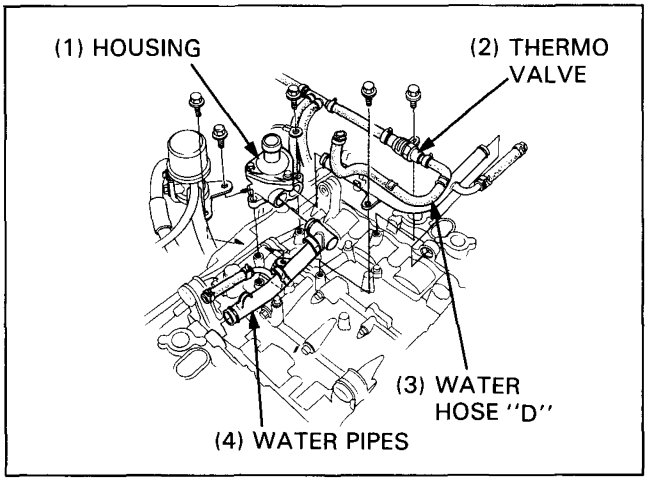
Remove the water pump hose and water pipes.
Inspect the O-rings for damage or deterioration.



Remove the carburetor and intake manifolds (page 4-34).
Remove three bolts, decel compensation valve and thermostat housing from the engine.
Remove two bolts and water pipes/bypass hose.

Inspect the O-rings of pipes for damage or deterioration.
Inspect the bypass hoses for damage or deterioration.

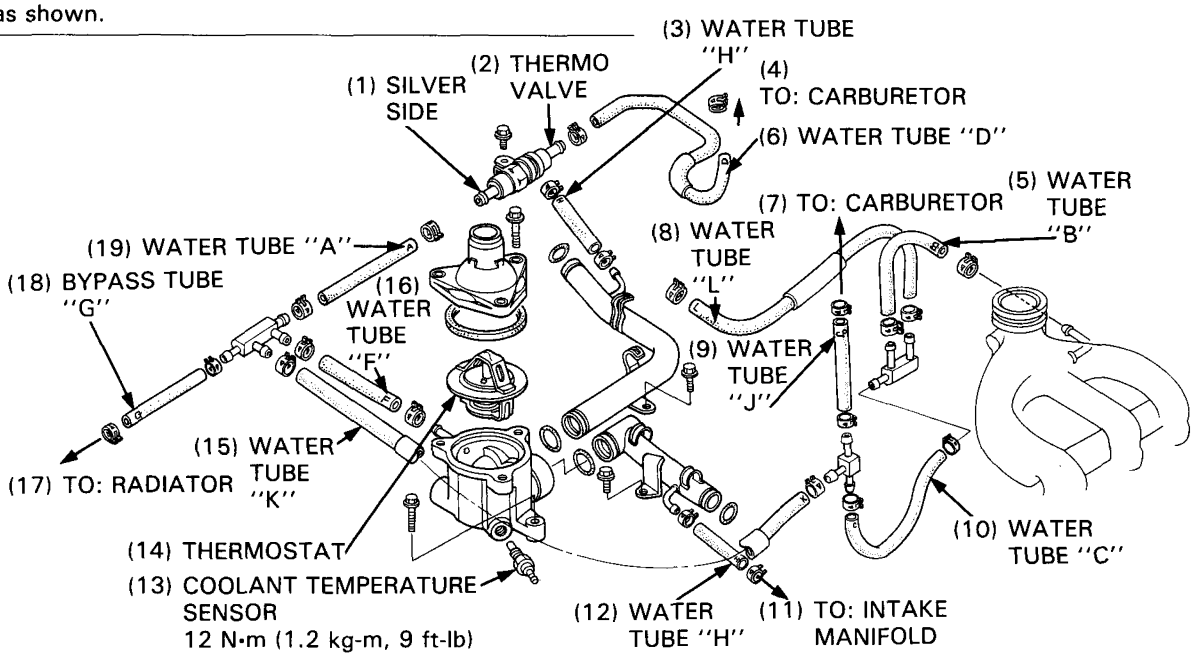
Remove the thermo valve from the bypass hose and inspect as follow (page 5-13).



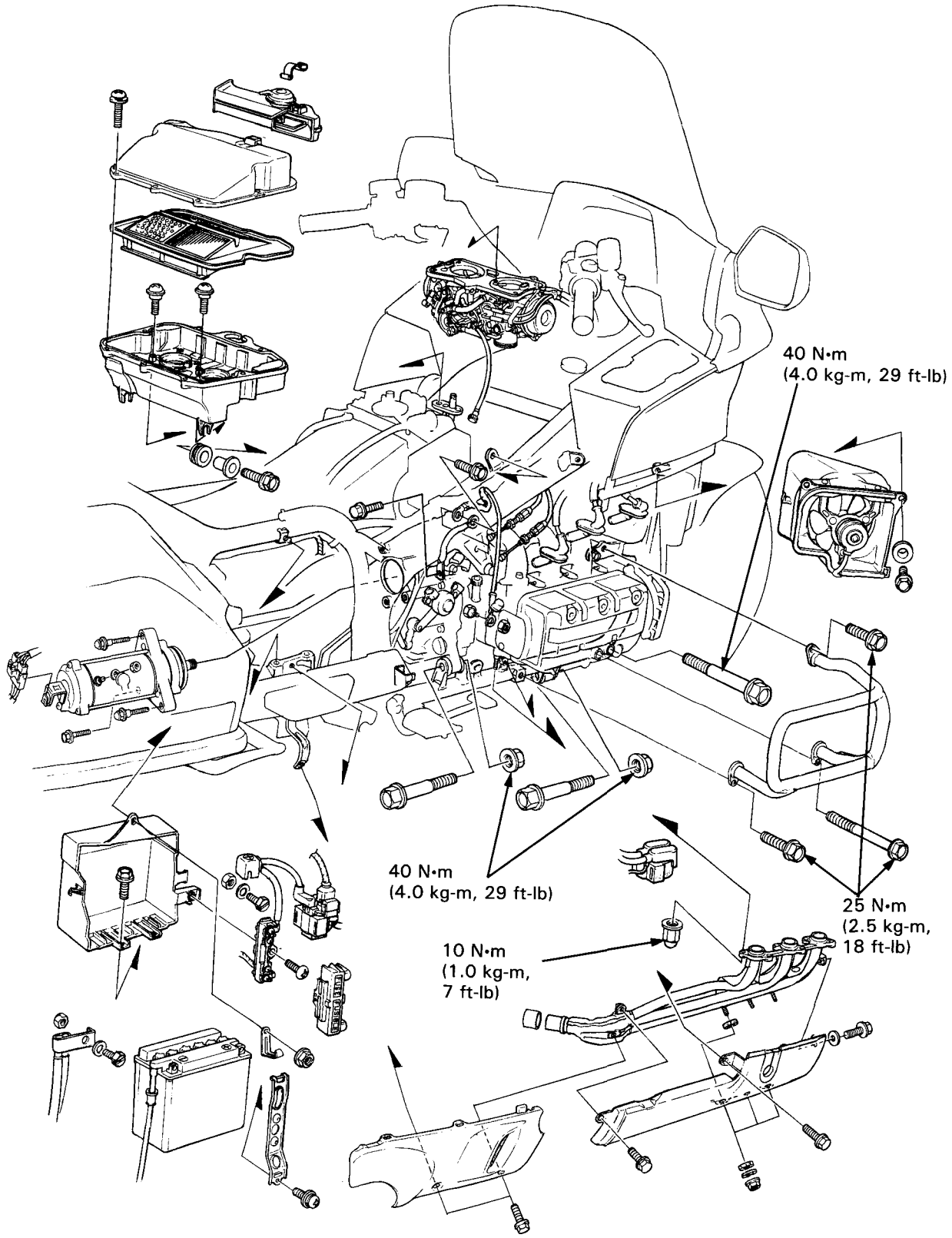
Installation
To install, reverse the removal procedure.

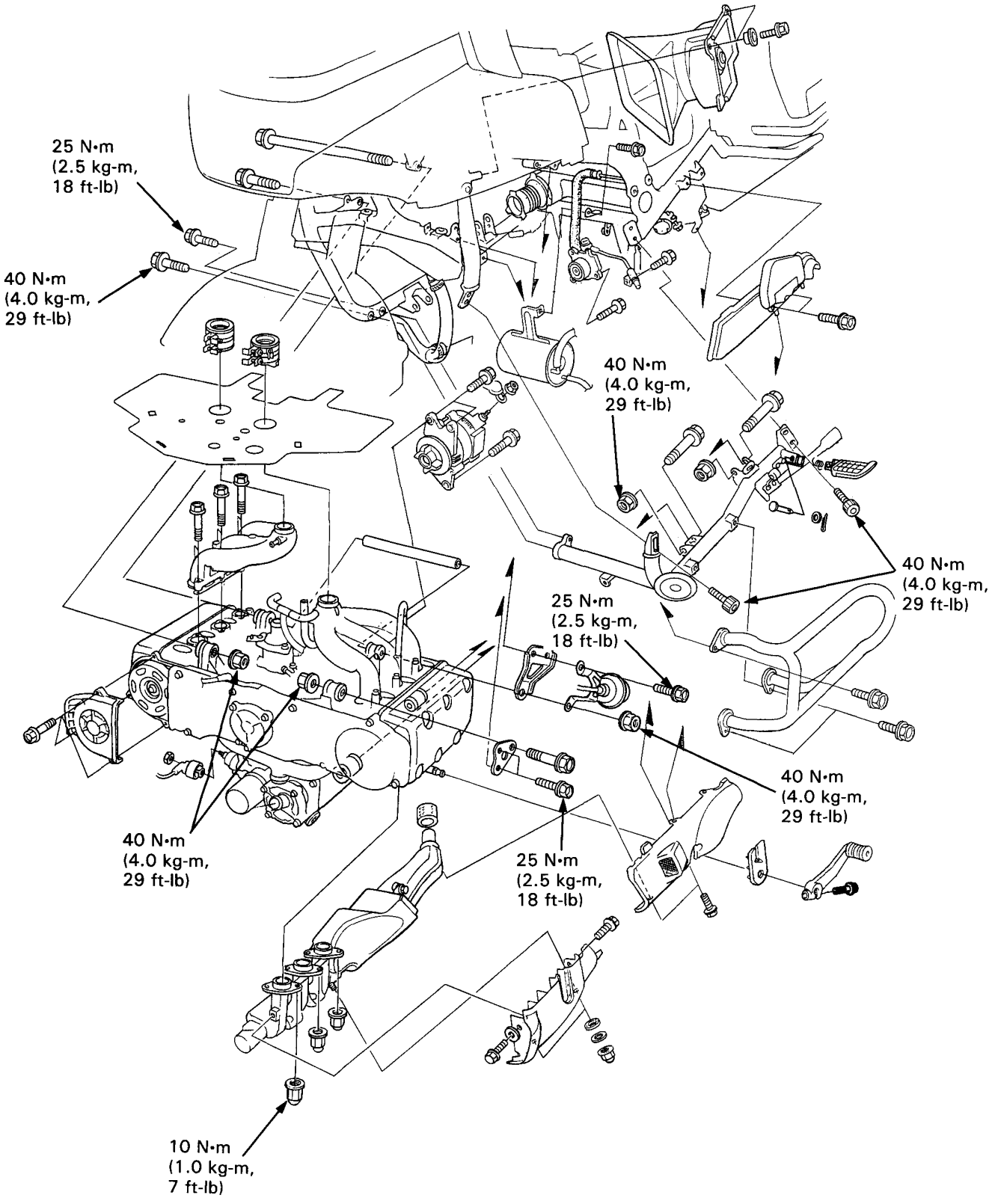
NOTE

- Apply a sealant such as Honda Silicone Liquid Gasket to the temperature sensor threads before installation.
- Install the thermo valve with its silver color side facing the thermostat housing.
- Install the water tubes properly according to their alphabet as shown.



ENGINE REMOVAL/INSTALLATION




25 N•m
(2.5 kg-m,
18 ft-lb)
40 N•m
(4.0 kg-m,
29 ft-lb)
40 N•m
(4.0 kg-m,
29 ft-lb)
40 N•m
(4.0 kg-m,
29 ft-lb)
25 N•m
(2.5 kg-m,
18 ft-lb)
40 N•m
(4.0 kg-m,
29 ft-lb)
40 N•m
(4.0 kg-m,
29 ft-lb)
25 N•m
(2.5 kg-m,
18 ft-lb)
10 N•m
(1.0 kg-m,
7 ft-lb)

CLUTCH

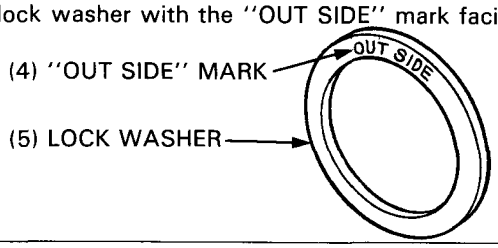
ASSEMBLY

Clean the mainshaft and absorb the oil from the outer lock nut threads thoroughly.

Install the clutch outer and lock washer.

NOTE

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



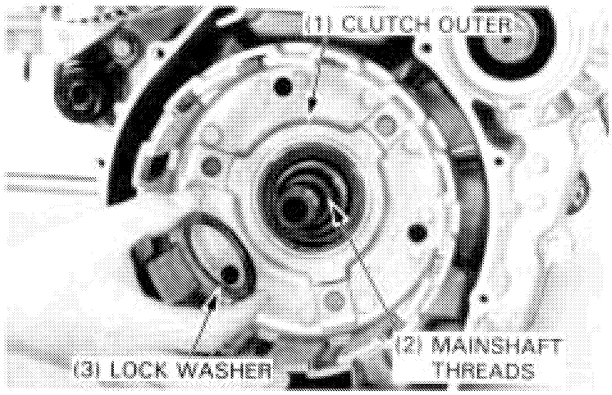
Apply a locking agent to the threads of a new lock nut.
Tighten the lock nut to the specified torque with the special tools.

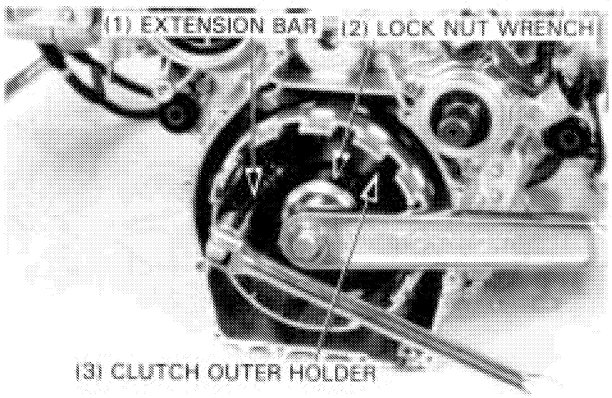
TORQUE: 190 N·m (19.0 kg-m, 137 ft-lb)

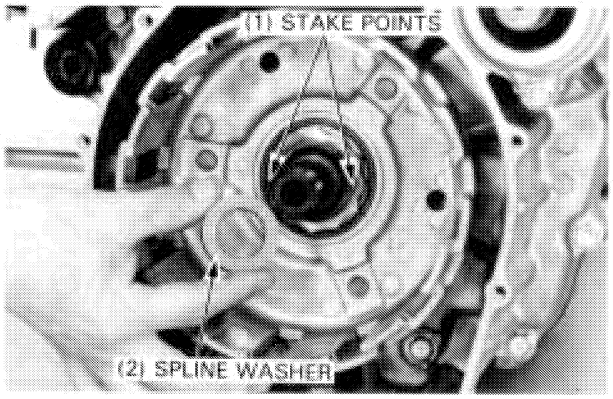
TOOLS:

Clutch outer holder	**07JMB—MN50100**
Extension bar	**07716—0020000**
Lock nut wrench, 46 mm	**07JMA—MN50100**

Stake the lock nut for two places.
Install the spline washer.

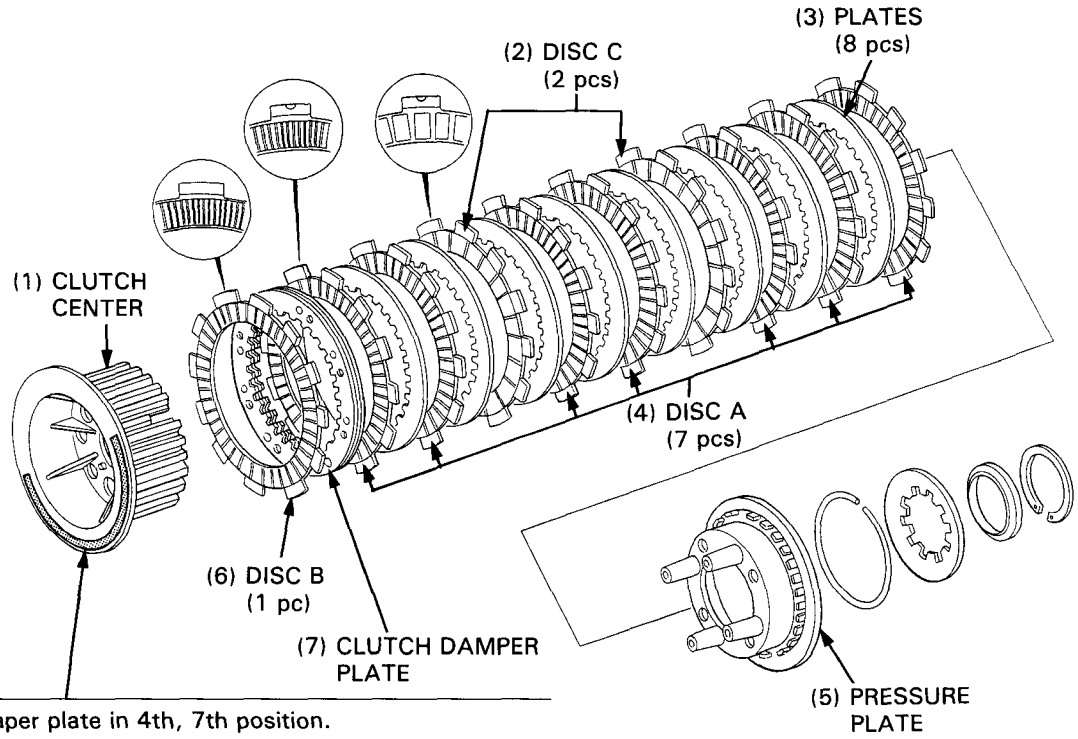






Coat the discs and plates with clean engine oil.

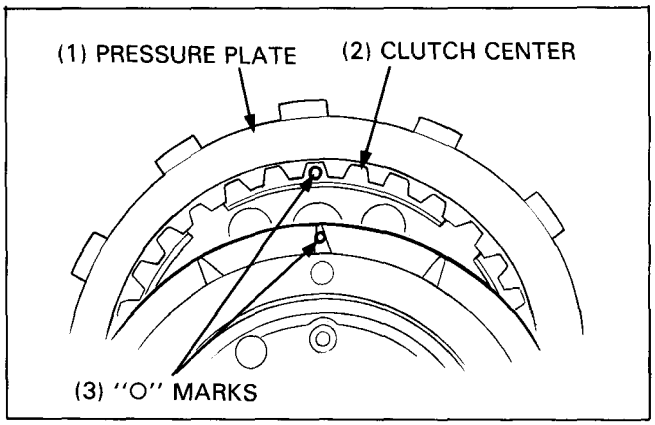
Install the clutch center, discs, plates, and pressure plate as shown.



NOTE

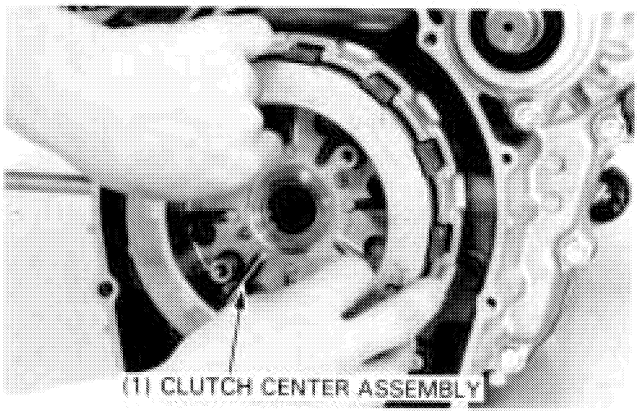
- Install paper plate in 4th, 7th position.

Install the pressure plate, aligning the "O" marks on the pressure plate and clutch center.



Slide the clutch center assembly into the clutch outer to align the discs and plates.

Remove the clutch center assembly from the clutch outer without disturbing the alignment.



Place the clutch spring on the clutch center and compress the spring in a press just enough to install the stopper ring.

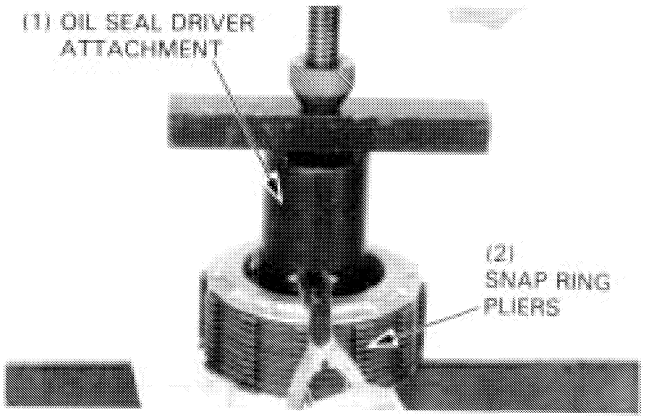
CAUTION

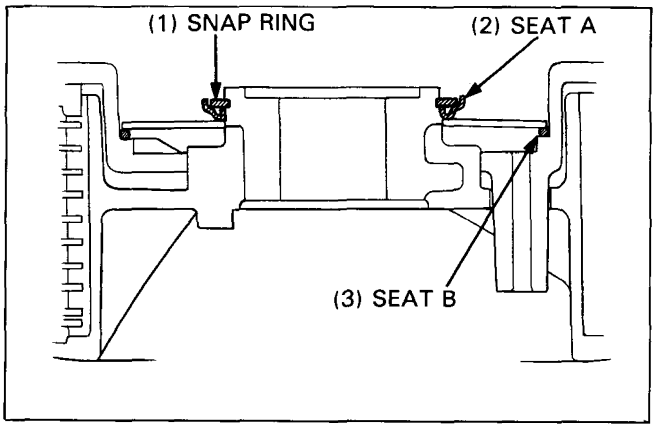
- *To prevent a loss of tension, do not compress the diaphragm spring more than necessary to install the stopper ring.*

Seat the snap ring in the ring groove in the clutch center boss with the sharp side facing up.

TOOLS:

Oil seal driver attachment	**07965—MA10200**
Snap ring pliers	**07914—3230001**

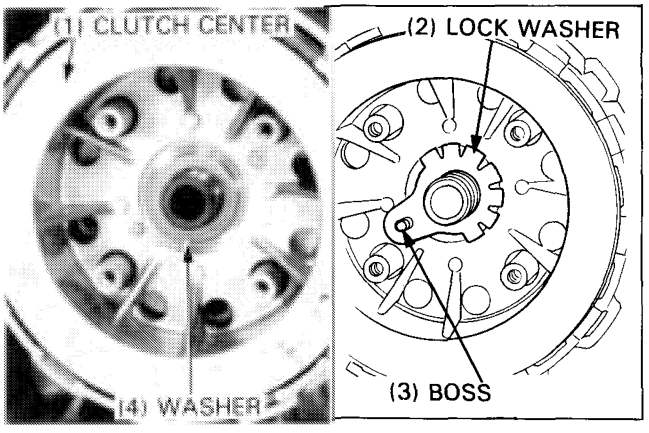




Install the following:
- clutch center assembly on the clutch outer
- washer
- lock washer

NOTE

- Install a new lock washer, aligning the stopper tab with the clutch center boss.



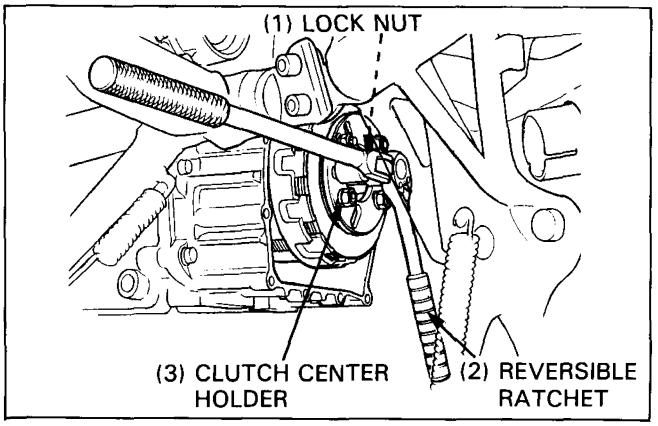
Install the clutch center lock nut.

Install the clutch center holder onto the clutch pressure plate.

TOOLS:

Clutch center holder	**07JMB—MN50300**

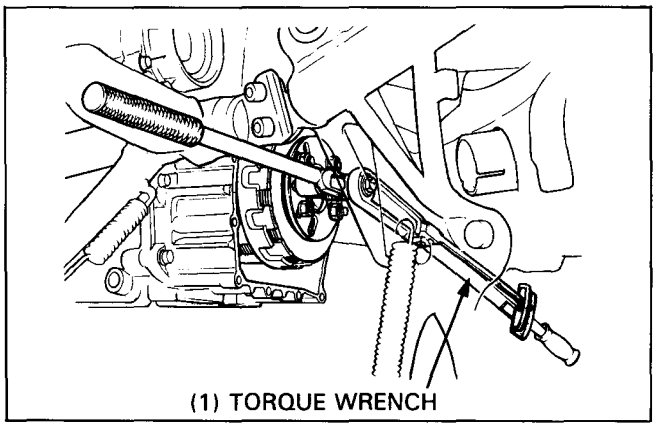
Position the tools as shown and tighten the lock nut to the initial torque (approximately 100 N-m) with a commercial reversible ratchet.



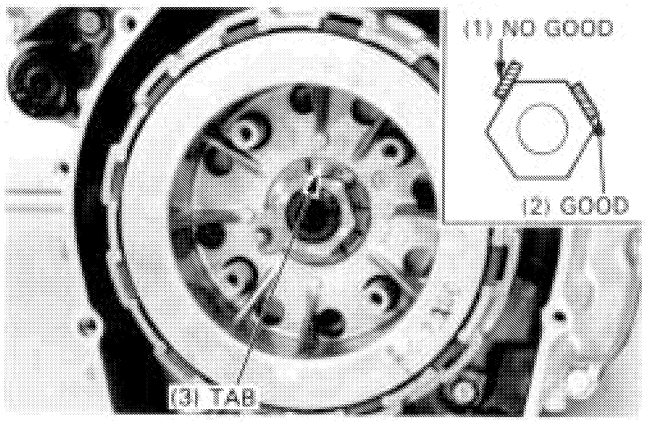
Remove the reversible ratchet and install a torque wrench.

Tighten the clutch center lock nut to the specified torque.

TORQUE: 130 N-m (13.0 kg-m, 94 ft-lb)

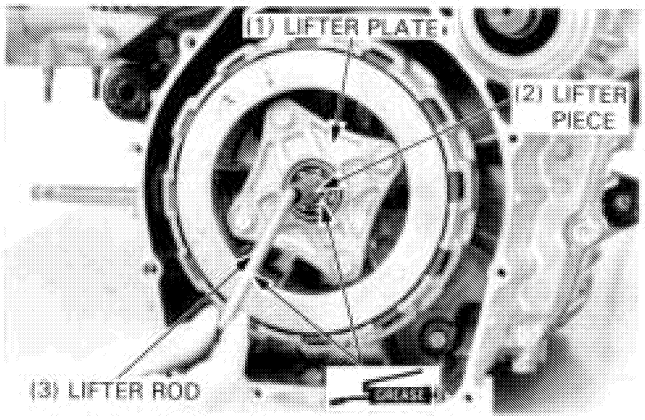


Bend one lock tab of the lock washer up to the lock nut as shown.

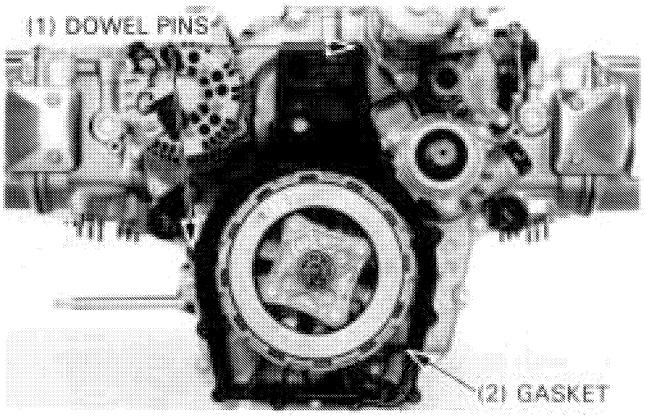


Install the lifter plate and tighten the bolts.
Apply grease to the clutch lifter piece and lifter rod.

Install the lifter piece and lifter rod.



Install two dowel pins and a new gasket.



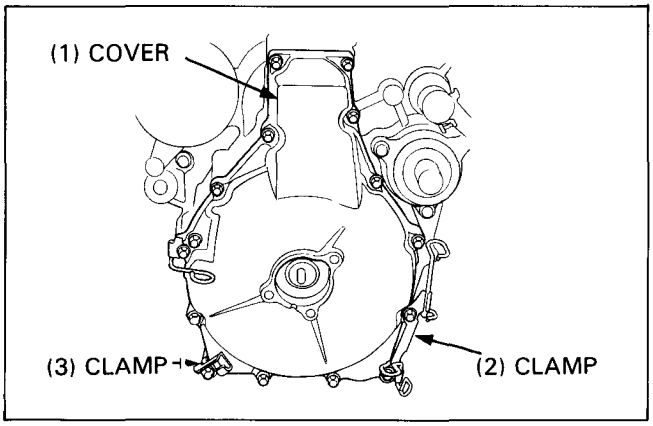
Install the following:
— clutch cover
— clutch slave cylinder (page 8-8).

NOTE

- Release the clutch lever from the handlebar grip and push the slave cylinder piston in all the way.

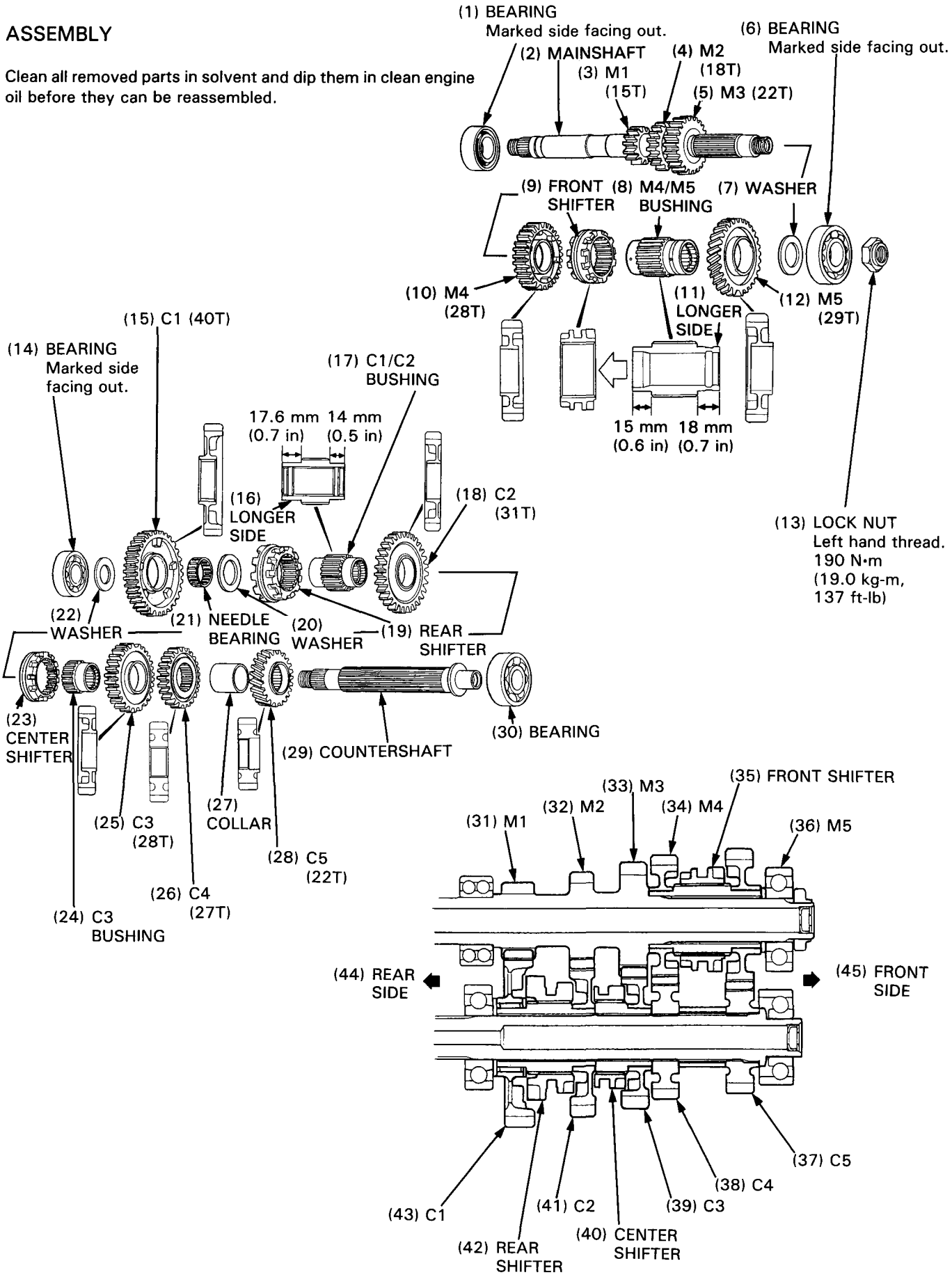
— left exhaust pipe protector and heat protector (page 12-16)
— front side covers (page 12-16)

Fill the crankcase with the recommended engine oil (page 2-4).



ASSEMBLY

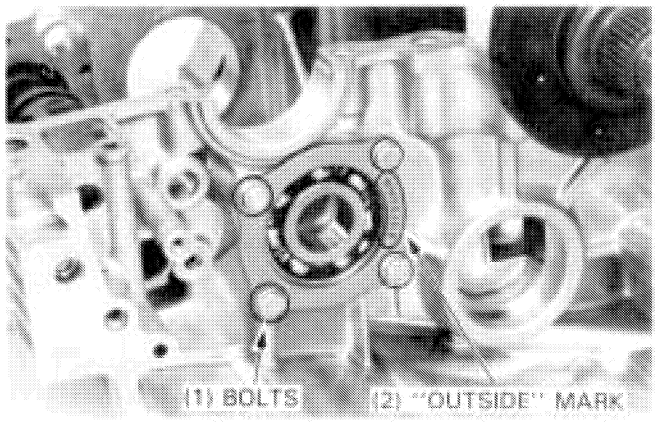
Clean all removed parts in solvent and dip them in clean engine oil before they can be reassembled.



If removed, install the bearing with marked side facing out.

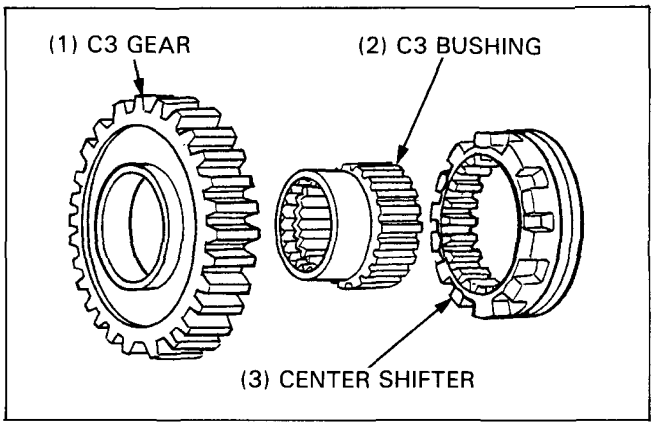
Install the bearing holder with the 'OUTSIDE' mark facing out.

Apply a locking agent to the bolt threads and tighten the bolts securely.



Assemble the C3 gear, C3 bushing and center shifter as shown.

Apply molybdenum disulfide oil to the shifter groove.

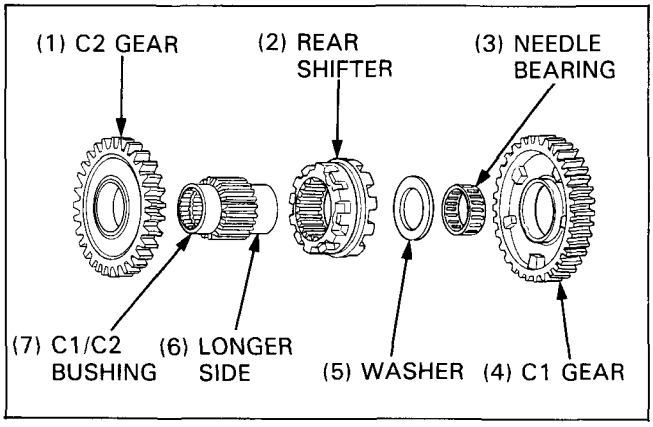


Assemble the C2 gear, C1/C2 bushing, rear shifter, washer, needle bearing and C1 gear as shown.

NOTE

- With the longer side of the bushing sliding surfaces facing toward C1 gear.

Apply molybdenum disulfide oil to the shifter groove.



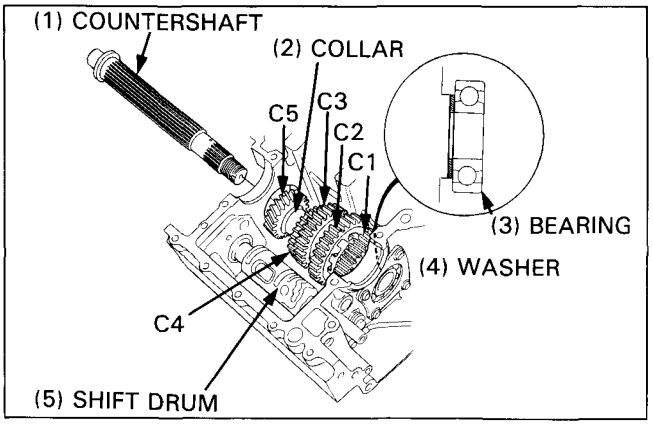
Install the shift drum.

Apply oil to the washer and temporarily install it to the inner race of the bearing as shown.

Install the C5 gear, collar and assembled gears (above steps) to the countershaft as shown.

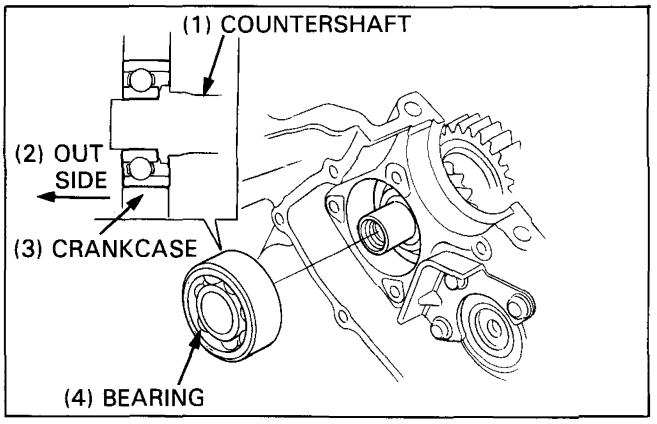
NOTE

- Do not drop the washer into the crankcase.



Install the countershaft front bearing as shown.

Temporarily install the final drive gear and nut to prevent the countershaft from sliding out of the case (page 9-17).

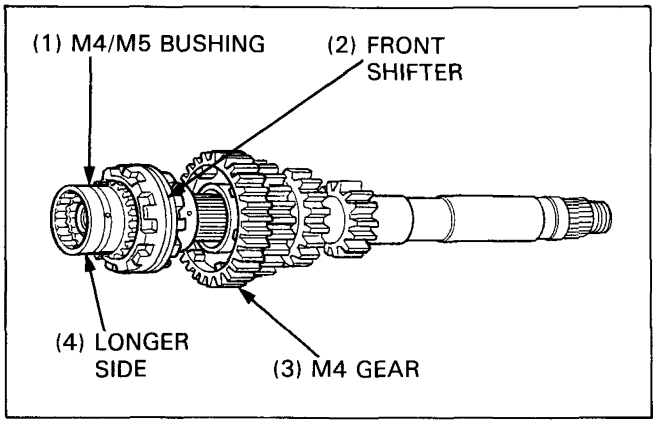


Install the M4 gear, M4/M5 bushing and front shifter onto the mainshaft.

NOTE

- With the longer side of the bushing sliding surfaces facing toward M5 gear.

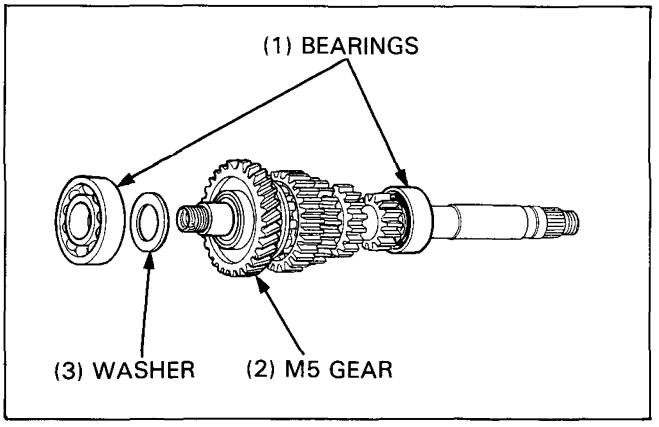
Apply molybdenum disulfide oil to the shifter groove.



Install the M5 gear, washer and bearings onto the mainshaft.

NOTE

- Install bearings with their marked side facing out.



Install a new lock nut onto the mainshaft.

Hold the mainshaft with the shaft holder and tighten the lock nut.

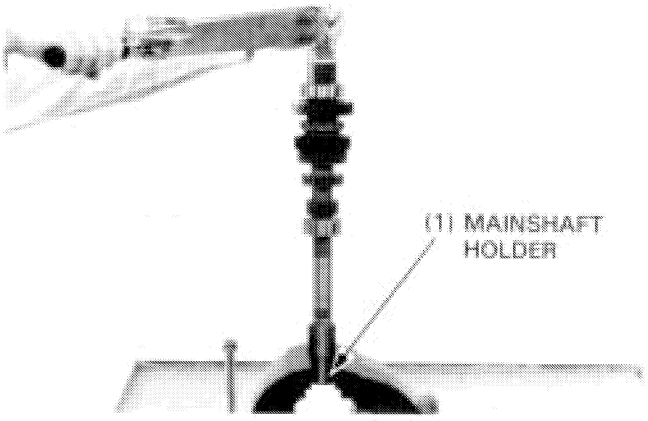
NOTE

- Mainshaft lock nut has left hand threads.

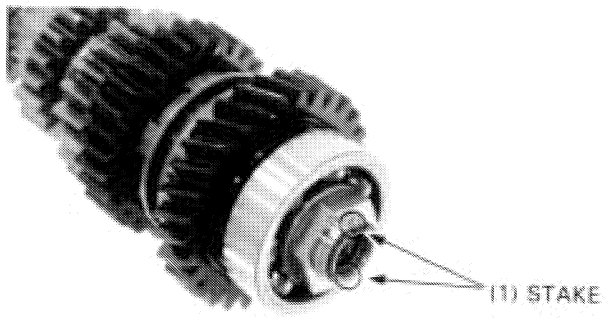
TORQUE: 190 N·m (19.0 kg-m, 137 ft-lb)

TOOL:

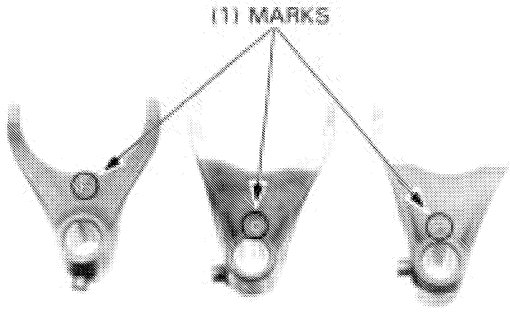
Mainshaft holder	**07JMB—MN50200**



Stake the lock nut to the groove in the mainshaft ends (2 plcs).



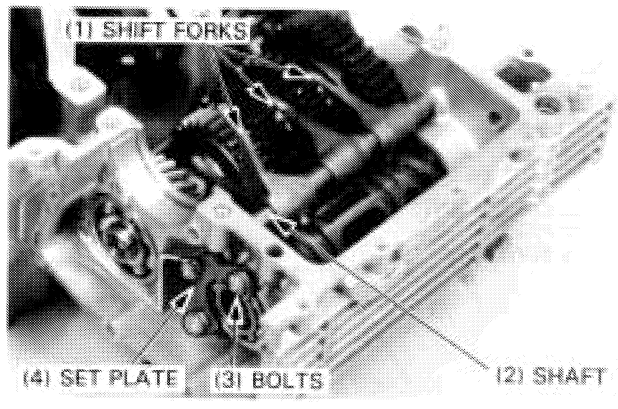
Shift forks have the following identification marks:
- F: front fork
- C: center fork
- R: rear fork



Install the shift forks onto their shifters and shift drum grooves with the marked side (F, C or R) facing toward the front.

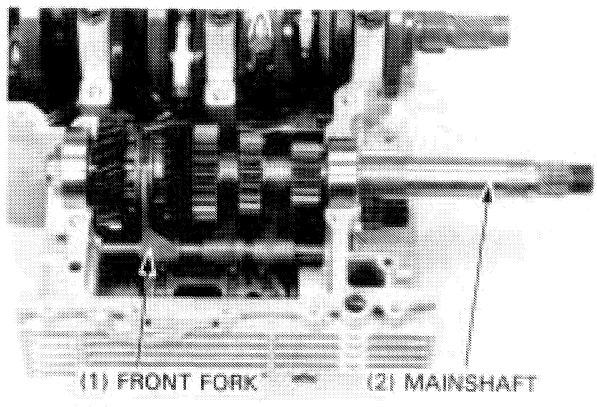
Apply oil to the shift fork shaft.
Slide the shaft through the crankcase and all shift forks.

Apply a locking agent to the set plate bolt threads.
Install the set plate and tighten the bolts securely.



Install the mainshaft, aligning the front fork with the front shifter groove.

After assembling, check for smooth movement.



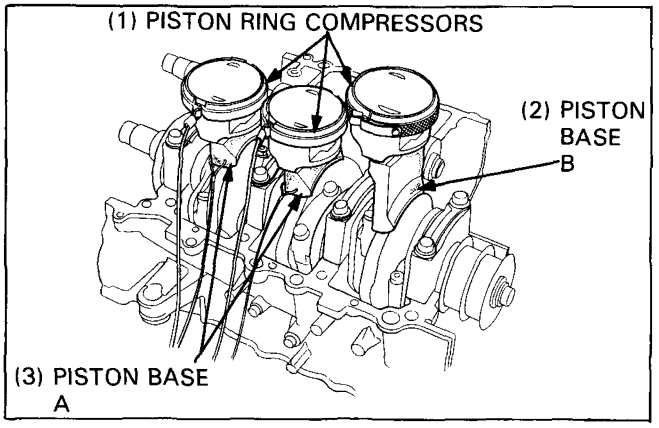
CRANKCASE ASSEMBLY

Coat the cylinders, pistons, and piston rings/grooves with oil. Make sure that the piston ring end gaps are staggered as shown on page 11-8.

Turn the crankshaft counterclockwise until the T1.2 drive pully mark is faced up to place the No. 2 piston on the T.D.C. position.
Set the special tools as shown.

TOOLS:

Piston ring compressor	**07955–3710000 (1 pc.) and 07JMG–MN50300 (2 pcs.)**
Piston base set	**07JMG–MN50101**
– piston base A	**07JMG–MN50121 (2 pcs. required)**
– piston base B	**07JMG–MN50111 (1 pc.)**

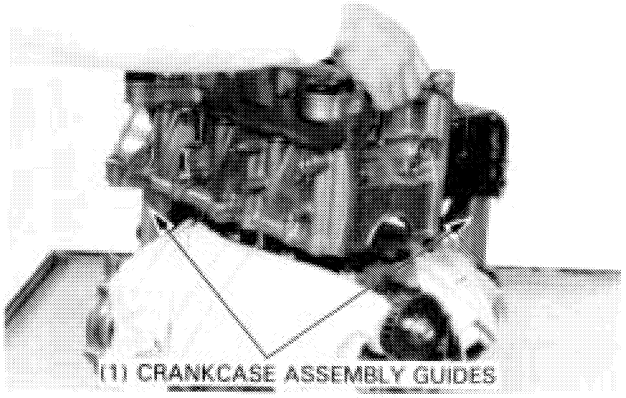


Fix the shift arm with a suitable wire.

Place the crankcase assembly guides on the crankcase as shown.

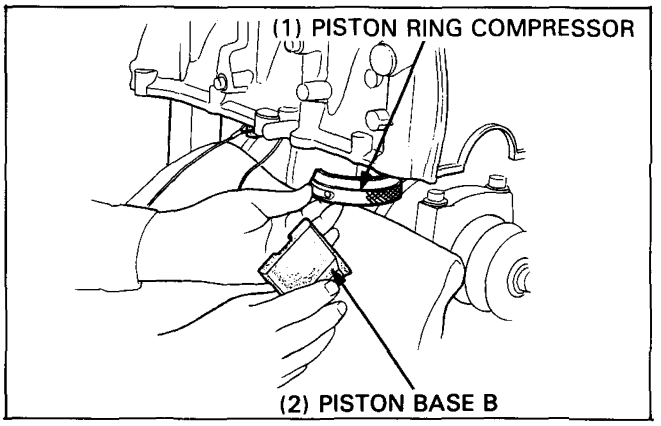
TOOL:

Crankcase assembly guide	**07JMG–MN50200**



Lower the case until it rests on the guides to install the No. 2 piston into its cylinder.

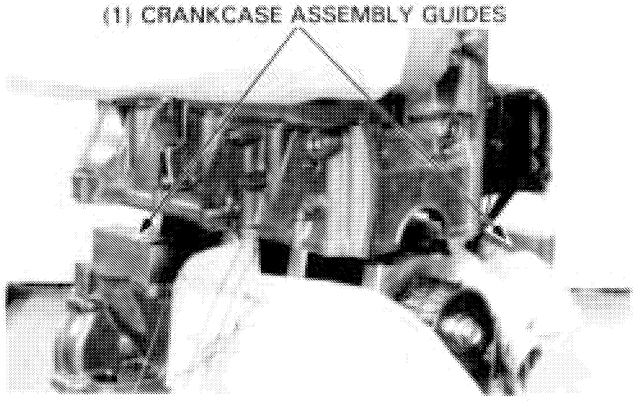
Remove the piston ring compressor and piston base B for No. 2 piston out of the crankcase.



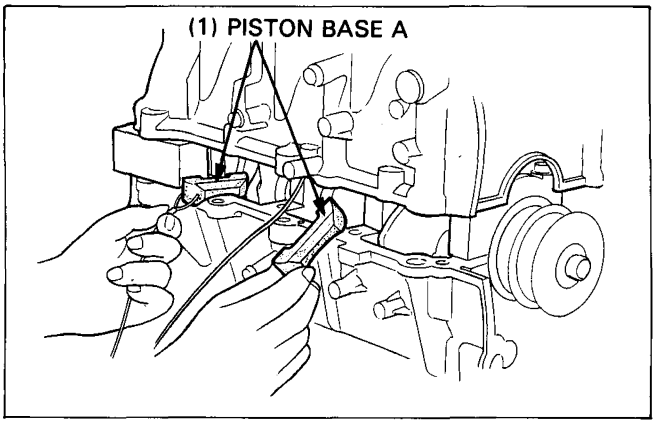
Hold the left crankcase and position the assembly guides as shown.

Lower the case until it rests on the guides to install the No. 2 and No. 4 pistons into their cylinders.

Remove the shop towels.

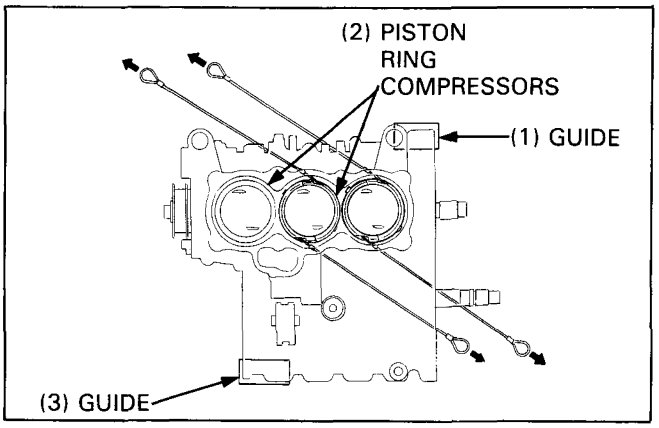


Remove the piston bases A for No. 4 and No. 6 pistons out of the case.

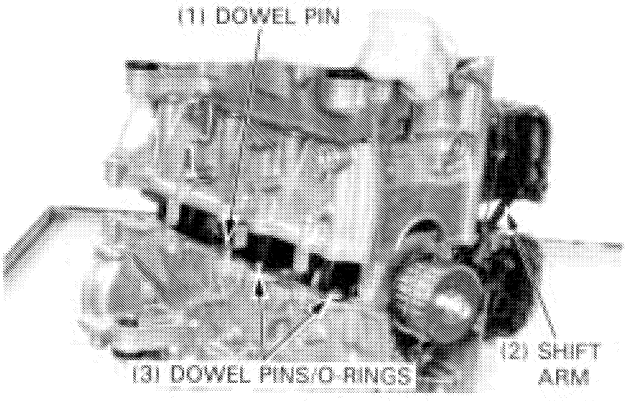


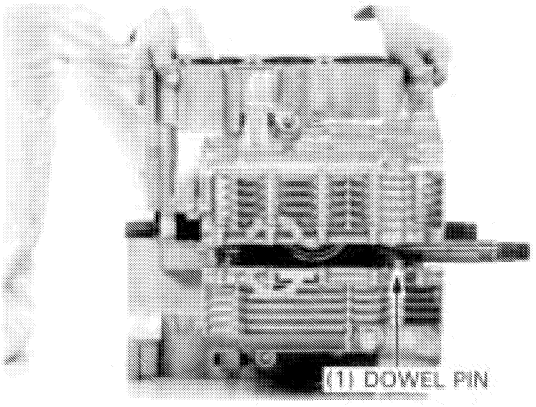
Remove the piston ring compressors for No. 4 and No. 6 pistons out of the case by pulling each wire as shown.

Hold the case and remove the crankcase assembly guides.

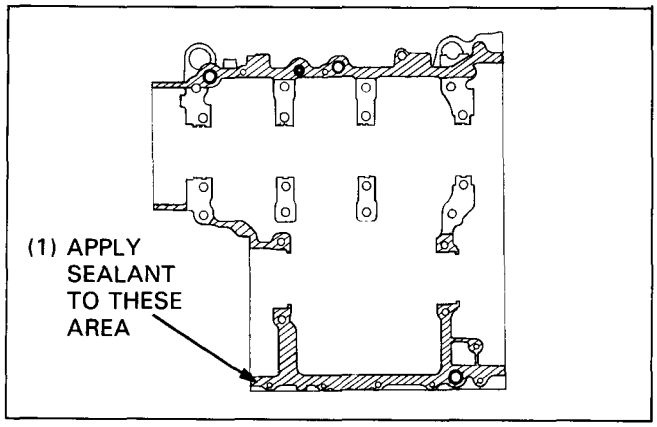


Install the dowel pins and O-ring.





Apply sealant to the crankcase mating surfaces as shown.
Engage the shift arm with the shift drum and seat the case.

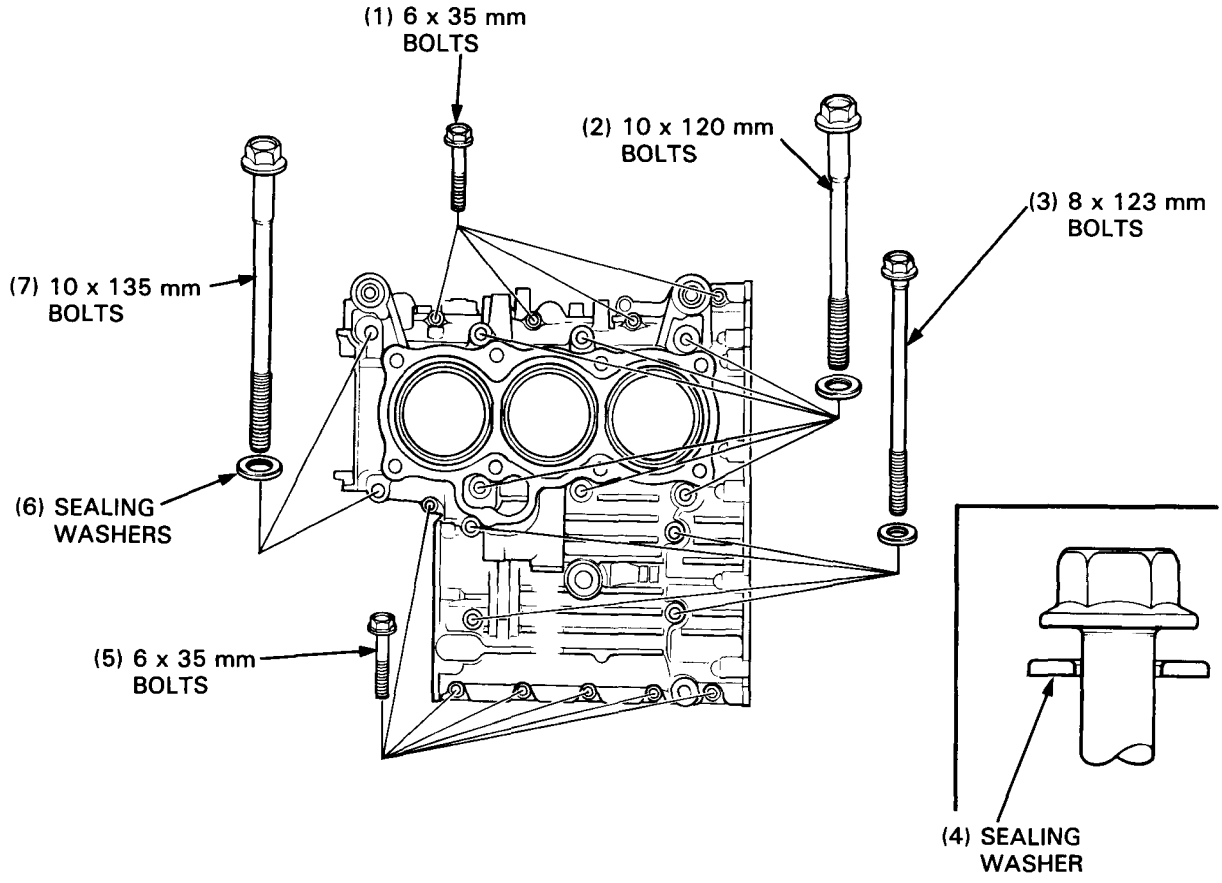


Coat all 10 mm bolts (under threads) with oil.

NOTE

- Tighten all case bolts in a crisscross pattern in 2–3 steps.
- Eight 10 mm bolts have sealing washers.
- Begin with larger-diameter bolts first.

TORQUES:
10 mm Case bolts: 35 N·m (3.5 kg-m, 25 ft-lb)
8 mm Case bolts: 26 N·m (2.6 kg-m, 19 ft-lb)
6 mm Case bolts: 12 N·m (1.2 kg-m, 9 ft-lb)



Install the removed parts (page 10-2).

WINDSHIELD

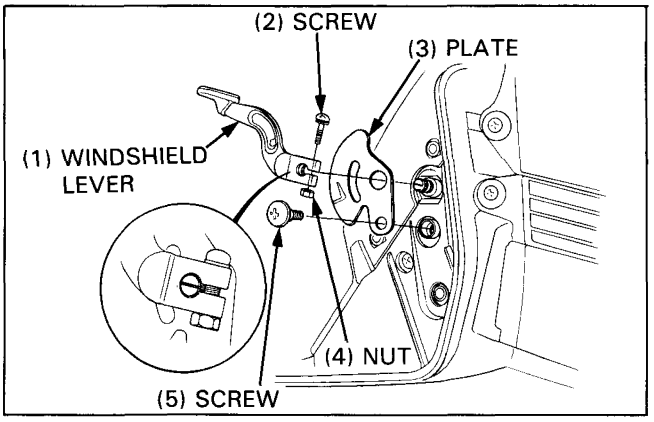
LEVER REPLACEMENT

Remove the nut, screw and windshield lever.
Remove the screw and plate.

Install the windshield lever in the reverse order of removal.

NOTE

- Install the windshield lever as shown.

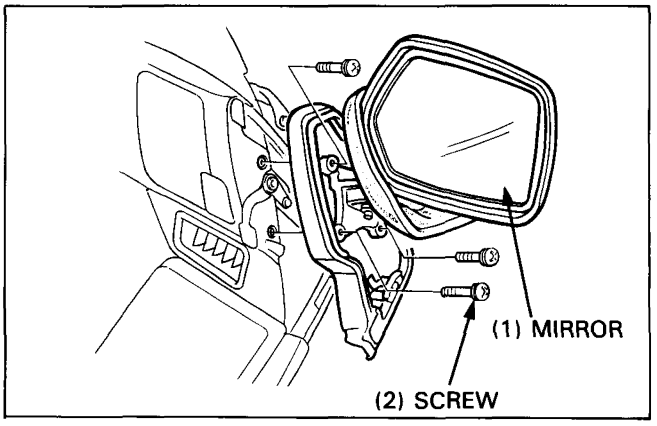


LEVER ADJUSTMENT

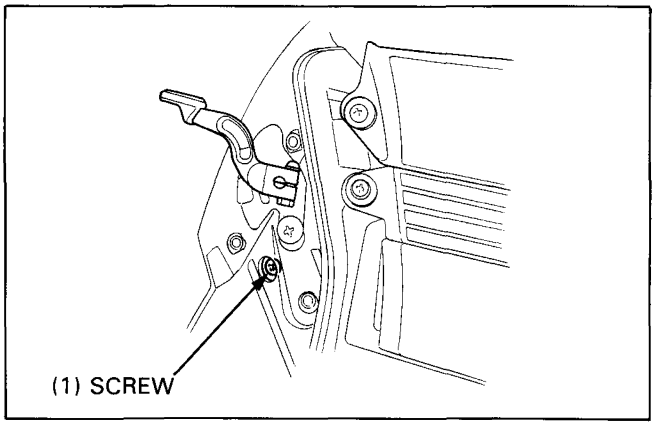
NOTE

- If the lever is removed, adjust the lever as follows:

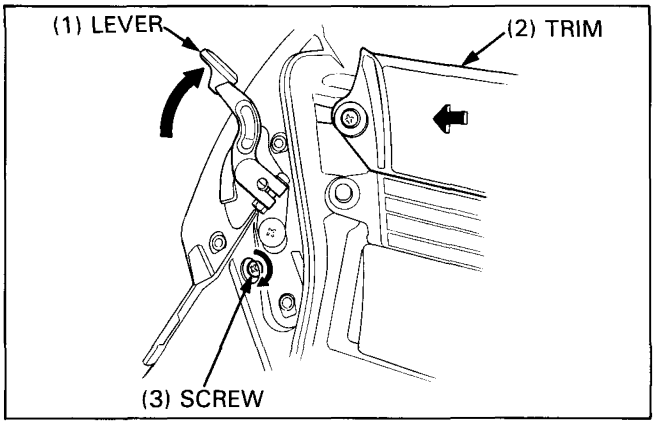
STEP 1:
Install the windshield (page 12-1).
Remove three screws and mirror (each side).



STEP 2:
Loose the screw as shown (each side).
Temporarily tighten the screw on the other side.
(Do not tighten the screw on the adjusted side.)



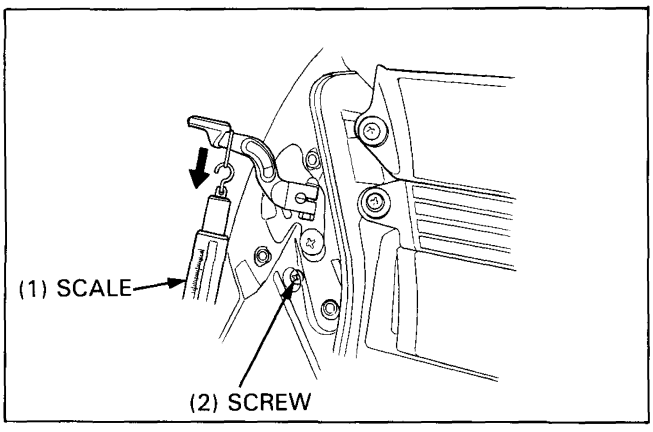
STEP 3:
Set the lever at the upper position.
Push the windshield trim and, at the same time, tighten the screw as shown.



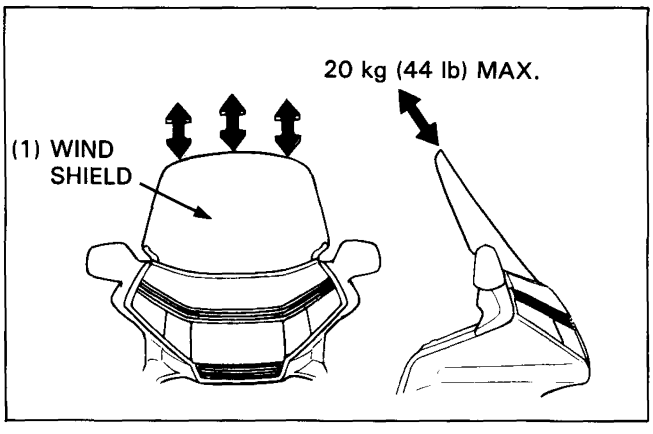
STEP 4:
Set the other side lever at the lower position, and measure the windshield lever preload.
The scale should average 5.0—8.0 kg (11.0—17.6 lb) for the heaviest preload.

If the preload is not within above specification, loosen the screw and return to STEP 3.

For the other side windshield lever, perform the STEP 3 and 4.



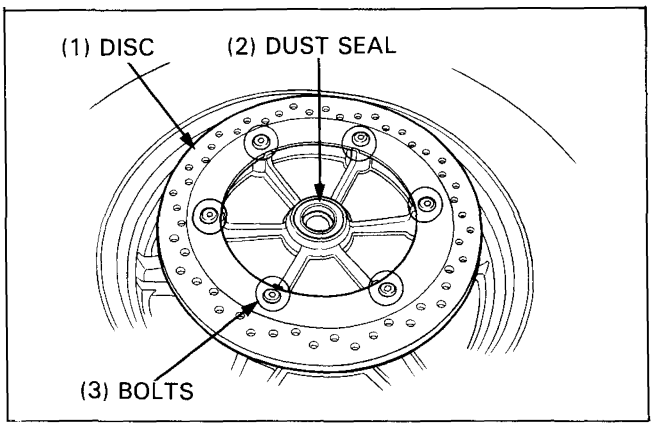
STEP 5:
Make sure the lever should be operated smoothly.
Make sure the windshield does not move up and down, with each lever at the lower position, by applying a force which does not exceed 20 kg (44 lb).



REAR WHEEL

DISASSEMBLY

Remove the rear wheel (page 13-9).
Remove the brake disc and dust seal from the wheel hub.



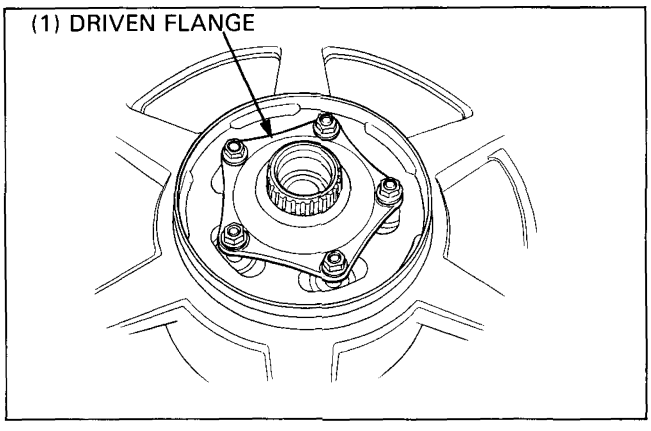
Remove the driven flange from the wheel hub.

CAUTION

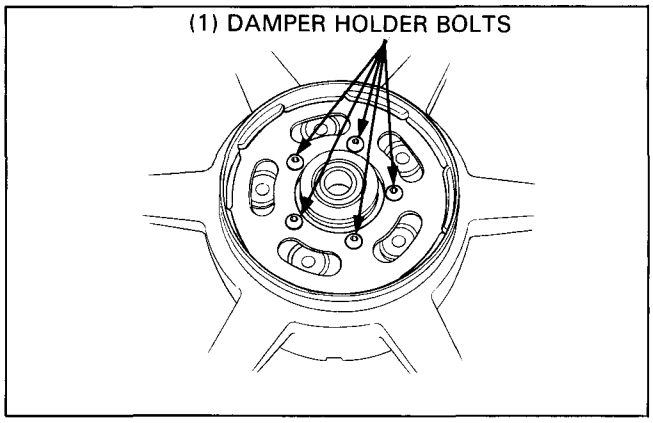
- *Be careful not to damage the wheel hub.*

NOTE

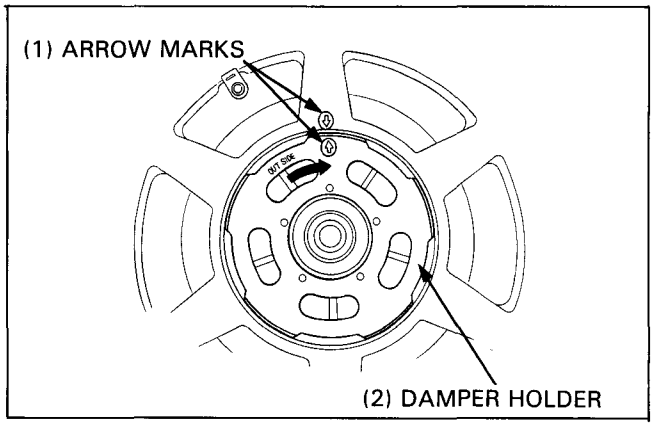
- The pins and nuts cannot be removed.



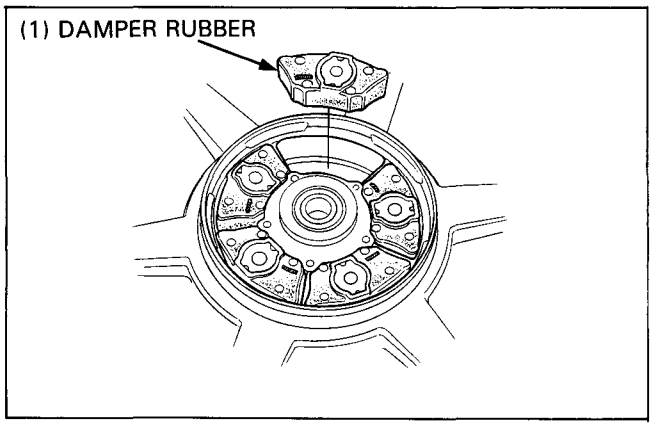
Remove the damper holder bolts.



Turn the damper holder clockwise and align the arrow marks on the damper holder and wheel hub.



Remove the damper rubbers.
Replace the damper rubbers if they are damaged or deteriorated.



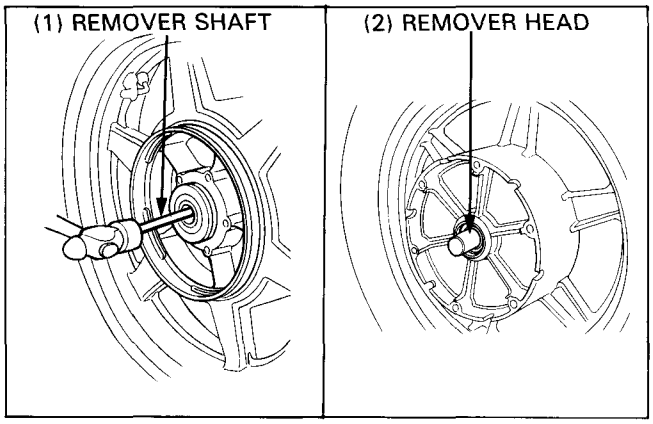
Remove the bearings and distance collar from the rear wheel hub.

TOOLS:

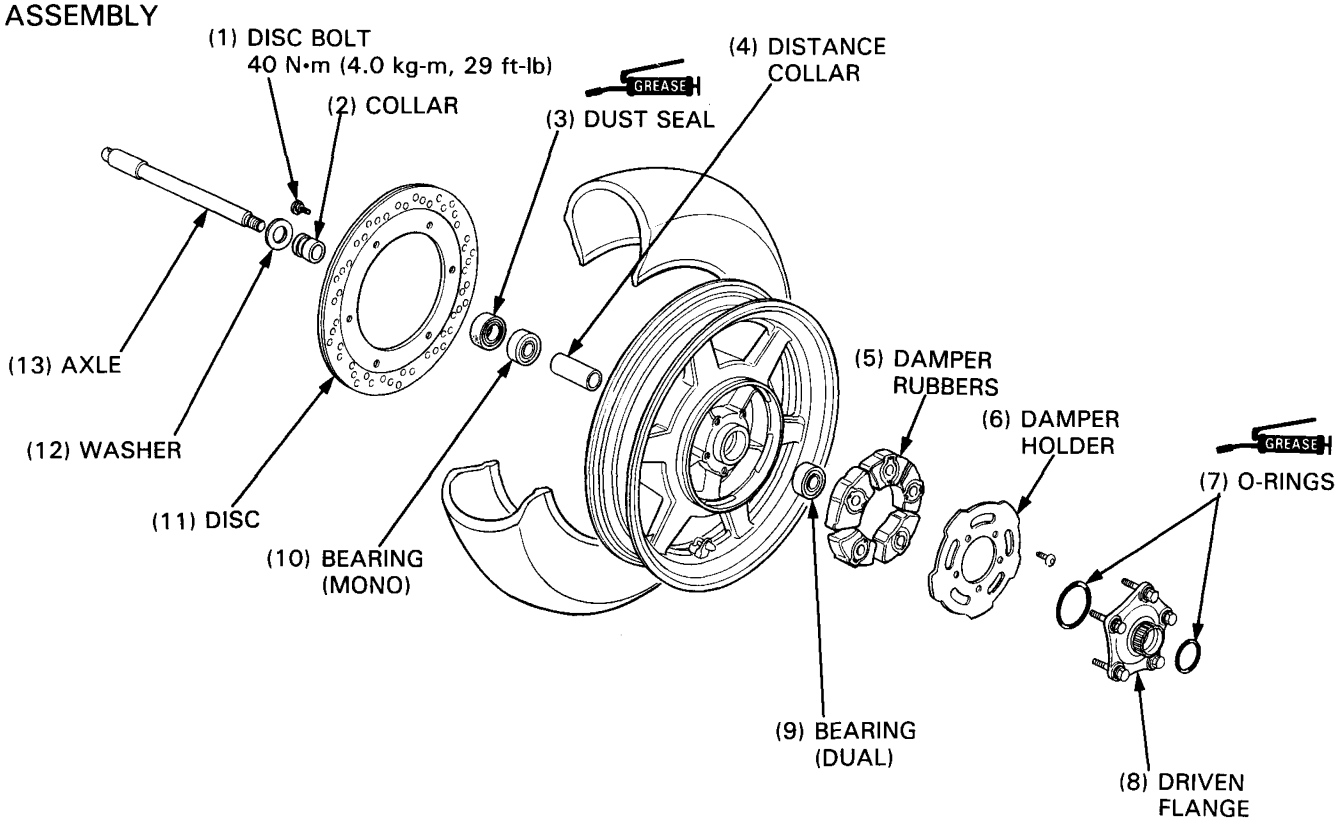
Bearing remover head, 20 mm	**07746–0050600**
Bearing remover shaft	**07746–0050100**

NOTE

- Do not reuse the bearings once removed, replace them with new ones when installation.



ASSEMBLY

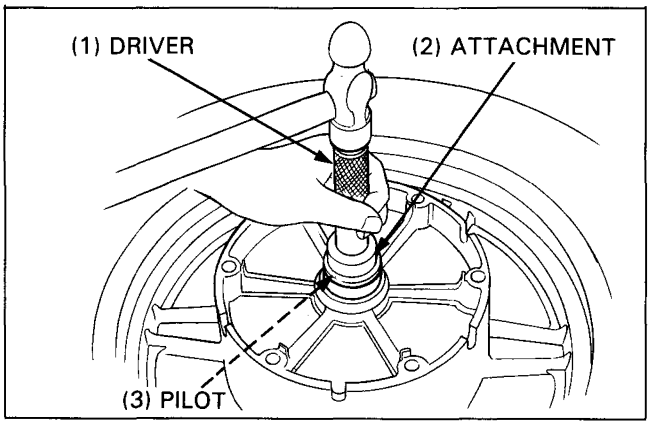


Pack new bearing cavities with grease and drive in the left bearing (mono) first.

TOOLS:

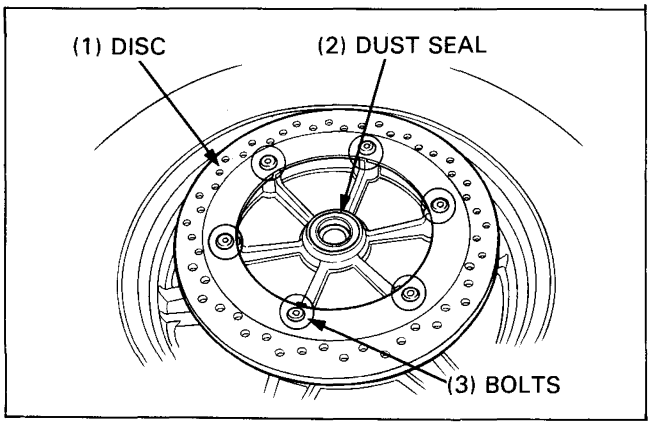
Driver	**07749–0010000**
Attachment, 42 x 47 mm	**07746–0010300**
Pilot, 20 mm	**07746–0040500**

Install the distance collar and then drive in the right bearing (dual).



Pack the dust seal lip cavity with grease and install the dust seal in the wheel hub.
Install the brake disc and tighten the bolts.

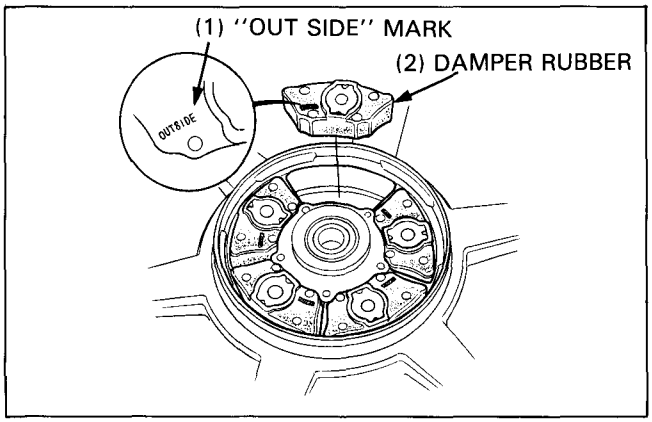
TORQUE: 40 N•m (4.0 kg-m, 29 ft-lb)



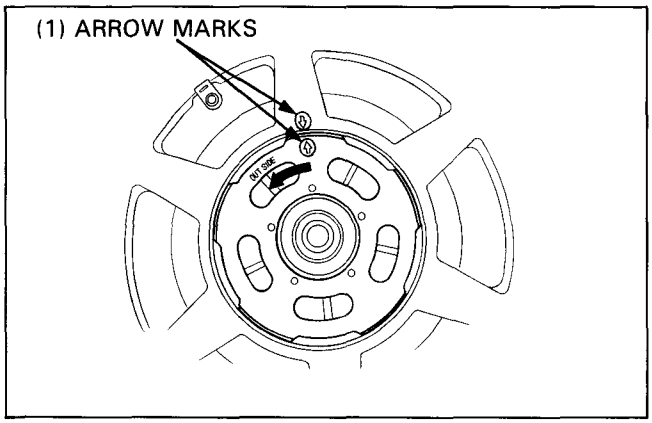
Install the damper rubbers into the wheel hub.

NOTE

- Install the damper rubbers with the "OUT SIDE" mark facing out.

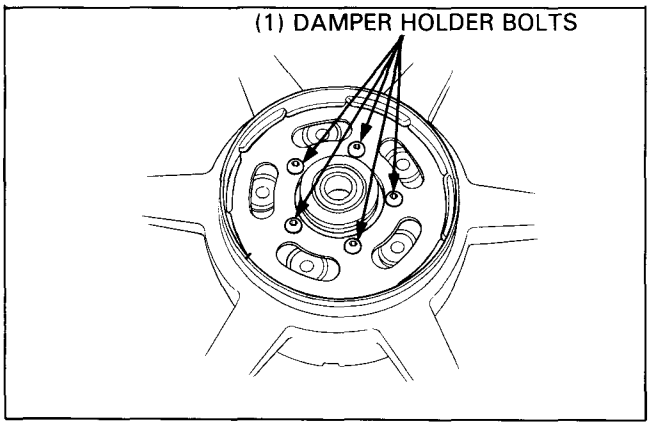


Install the damper holder into the wheel hub.
Align the arrow marks on the damper holder and wheel hub, then turn the damper holder counterclockwise.

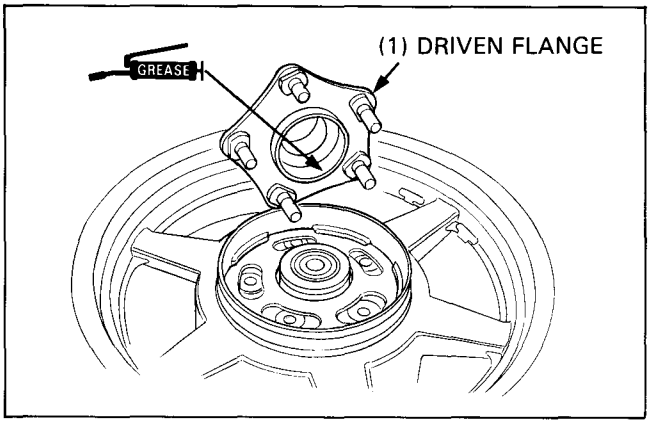


Install and tighten the damper holder bolts.

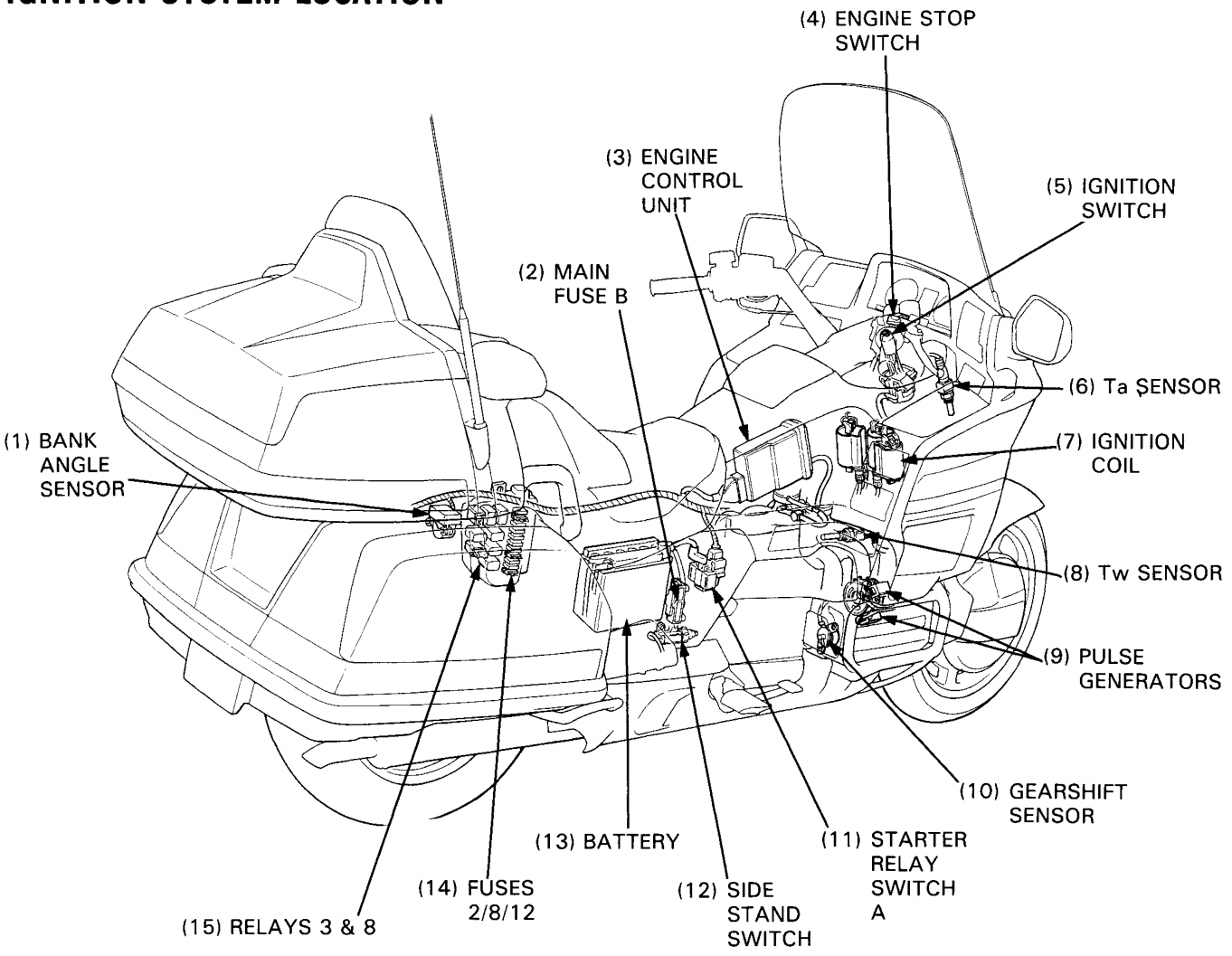
TORQUE: 20 N·m (2.0 kg-m, 14 ft-lb)



Lubricate the driven flange pin with grease.
Install the driven flange to the wheel hub.



IGNITION SYSTEM LOCATION



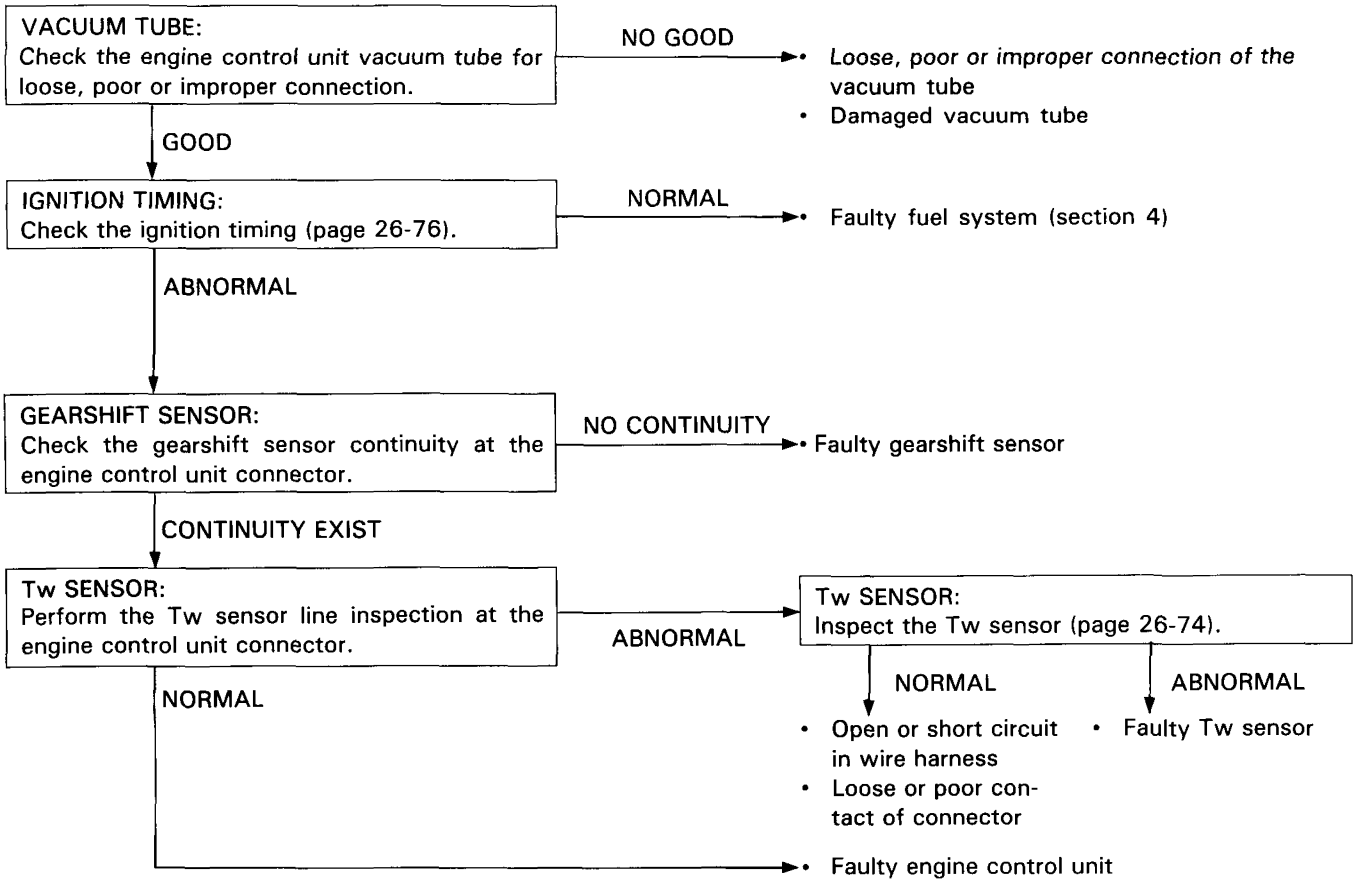
IGNITION SYSTEM TROUBLESHOOTING

- Inspect the followings 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).
- Temporarily exchange the ignition coil with the other good one and perform the spark test. If there is spark, the exchanged ignition coil is faulty.
- "Initial voltage" of the ignition primary coil is the voltage measured with the ignition switch ON and engine stop switch at RUN (when the engine is not cranking with the starter motor).

No spark at plugs

Abnormal condition		Probable cause (Check in numerical order)
Ignition coil primary voltage	No initial votage with the ignition switch ON and engine stop switch at RUN. (Other electrical components are normal.)	① Faulty engine stop switch. ② Open circuit in BLK/WHT wire between the engine stop switch and ignition coil. ③ Loose or poor connection of the ignition coil primary wire terminal, or open circuit in primary coil. (Check at the engine control unit connector.) ④ Faulty engine control unit, when the initial voltage is normal with the engine control unit connector disconnected.
	Initial voltage is normal, but it drops by 2—4 bolts while cranking the engine.	① Incorrect peak voltage adaptor connections. ② Battery is undercharged. (Voltage drops largely when the engine is started.) ③ No voltage at BLK/WHT wire of the engine control unit, or loose or poorly connected engine control unit connector. ④ Poor connection or open circuit in GRN wire of the engine control unit. ⑤ Loose or poor connections, or open circuit in YEL/WHT, YEL/BLU or YEL/RED between the ignition coil and engine control unit. ⑥ Short circuit in ignition primary coil. ⑦ Faulty side stand switch or neutral switch circuit. ⑧ Faulty pulse generator. (Measure peak voltage.) ⑨ Faulty engine control unit (when above No. ①—⑧ are normal.)
	Initial voltage is normal, but no peak voltage exists while cranking the engine.	① Incorrect peak voltage adaptor connections. ② Faulty peak voltage adaptor. ③ Faulty engine control unit (when above No. ① and ② are normal).
	Initial voltage is normal, but peak voltage is lower than the standard value.	① The multitester impedance is too low. ② Cranking speed is too slow. • Battery is undercharged. ③ The sample 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 coil. ⑤ Faulty engine control unit (when above No. ①—④ are normal, but no spark jumps at plug).
	Initial voltage and peak voltage are normal, but no spark jumps at plug.	① Faulty spark plug or leaking ignition coil secondary current ampere. ② Faulty ignition coil.
Pulse generator	Peak voltage is lower than the standard value.	① The multitester impedance is too low. ② Cranking speed is too slow. • Battery is undercharged. ③ The sample 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 pulse generator (when above No. ①—③ are normal).
	No peak voltage.	① Faulty peak voltage adaptor. ② Faulty pulse generator.

Engine starts, but runs rough at low engine speed (below 2,000 min^{-1} (rpm)).



IGNITION SYSTEM INSPECTON

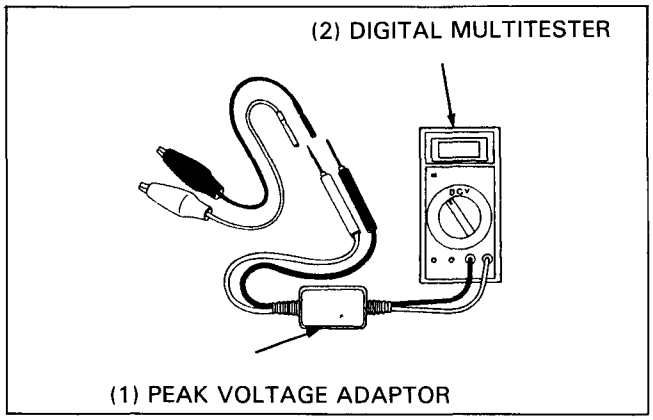
NOTE

- If no spark jumps at all plugs, check all connections for loose or poor contact before measuring each peak voltage.
- The reading differs depending on the multitester input impedance. Use only genuine digital multitester or commercially available multitester with the input impedance higher than 10 Mohm/DCV.

Connect the peak voltage adaptor to the digital multitester.

TOOLS:

Peak voltage adaptor	**07HGJ—0020100**
Kowa Digital multitester	**07411—0020000**



IGNITION COIL PRIMARY VOLTAGE INSPECTION

NOTE

- Check all system connections before this inspection. Poor connected connectors can cause incorrect readings.
- Make sure that all cylinder compressions are normal and check that the spark plugs are installed correctly in all cylinders.

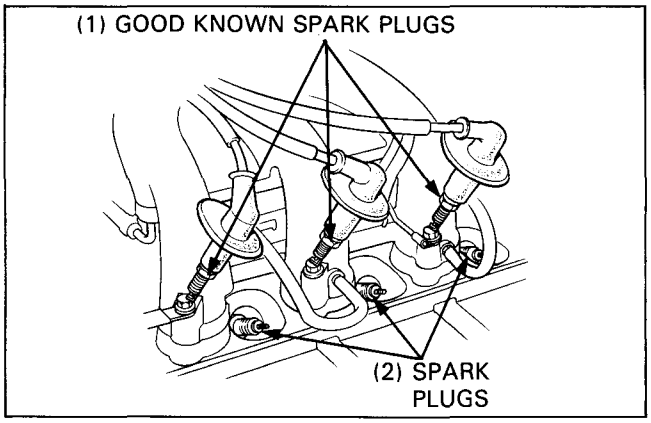
Place the motorcycle on its center stand and shift the transmission into neutral.

Remove the left and right fairing lower covers and right fairing inner cover (page 12-9).

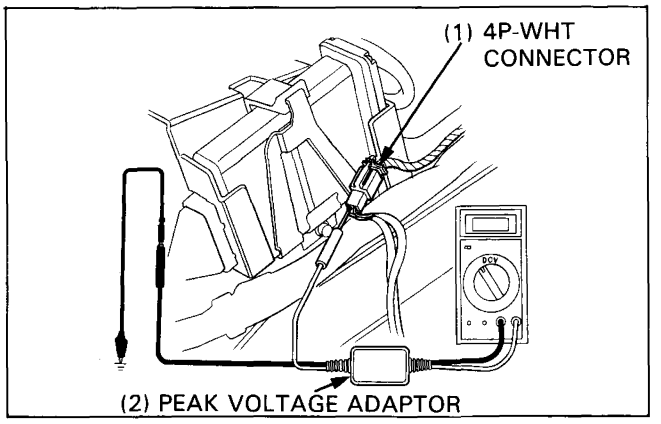
Disconnect all spark plug caps from the spark plugs.
Leave the spark plugs installed in the cylinder heads, install good known spark plugs into the spark plug caps and ground them to the engine.

NOTE

- The peak voltage must be measured under the normal cylinder compressions and with the ignition secondary circuits closed.



Connect the peak voltage adaptor probes between the primary ignition coil wire terminal at the 4P-WHT connector and ground with the connector connected.



CONNECTION
1—2 ignition coil: YEL/WHT (+) and ground (—)
3—4 ignition coil: YEL/BLU (+) and ground (—)
5—6 ignition coil: YEL/RED (+) and ground (—)

Turn the ignition switch ON and engine stop switch to RUN position, and measure the initial voltage.
The battery voltage should be registered.

Measure the ignition coil primary peak voltage while cranking the engine with the starter motor.

CONNECTION
1—2 ignition coil: YEL/WHT (+) and ground (—)
3—4 ignition coil: YEL/BLU (+) and ground (—)
5—6 ignition coil: YEL/RED (+) and ground (—)

PEAK VOLTAGE: 210 V minimum

⚠WARNING

- ***To avoid possible electrical shock during voltage measurements, do not touch the tester probe metal parts.***

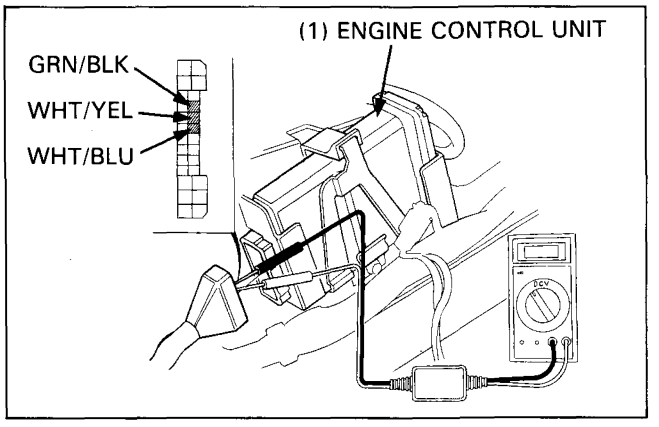
NOTE

- As long as the measured voltage exceed the specified value, the system is normal.

PULSE GENERATOR PEAK VOLTAGE INSPECTION

NOTE

- The peak voltage must be measured with all spark plugs installed in the cylinder heads and under normal cylinder compression.



Remove the right fairing inner cover (page 12-9).

Disconnect the engine control unit connector from the unit.
Connect the peak voltage adaptor probes to the pulse generator wire terminals of the wire harness side connector.

CONNECTION
Pulse generator 1: WHT/YEL (+) and GRN/BLK (—)
Pulse generator 2: WHT/BLU (+) and GRN/BLK (—)

Measure the pulse generator peak voltage while cranking the engine with the starter motor.

PEAK VOLTAGE: 1.9 V minimum

⚠WARNING

- ***To avoid possible electrical shock during voltage measurements, do not touch the tester probe metal parts.***

If the peak voltage is abnormal, disconnect the 4P-WHT connector of the connector holder on the right cooling fan.
Connect the adaptor probes to the pulse generator wire terminals.

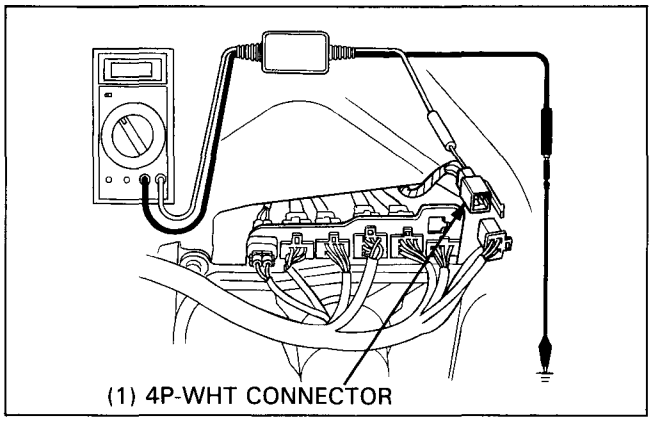
CONNECTION
Pulse generator 1: WHT/YEL (+) and YEL (–)
Pulse generator 2: WHT/BLU (+) and BLU (–)

Measure the pulse generator peak voltage while cranking the engine with the starter motor.

If the peak voltage measured at the unit is abnormal and the one measured at the 4P-WHT connector is normal, the wire harness has an open circuit or loose connections.

NOTE

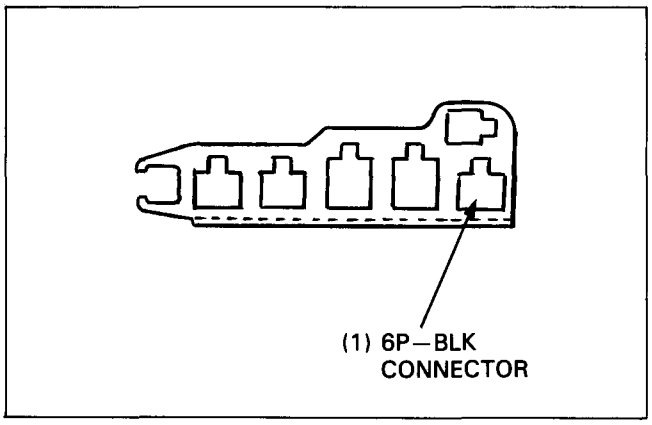
- As long as the measured voltages exceed the specified value, the system is normal.



GEARSHIFT SENSOR

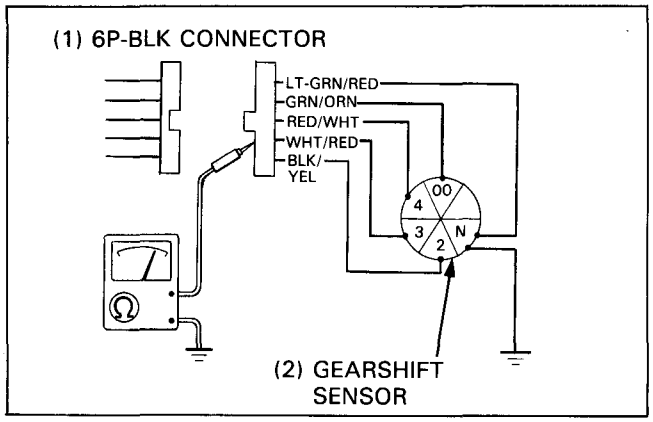
INSPECTION

Remove the right fairing lower cover (page 12-9).
Disconnect the 6P-BLK connector of the connector holder on the right cooling fan.



Check for continuity between each terminal as shown below and ground. There should be continuity at each gear position.

GEAR POSITION	TERMINALS	SPECIFICATION
Neutral gear Second gear Fourth gear OD gear	LT GRN/RED and ground BLK/YEL and ground RED/WHT and ground GRN/ORN and ground	CONTINUITY



Tw SENSOR

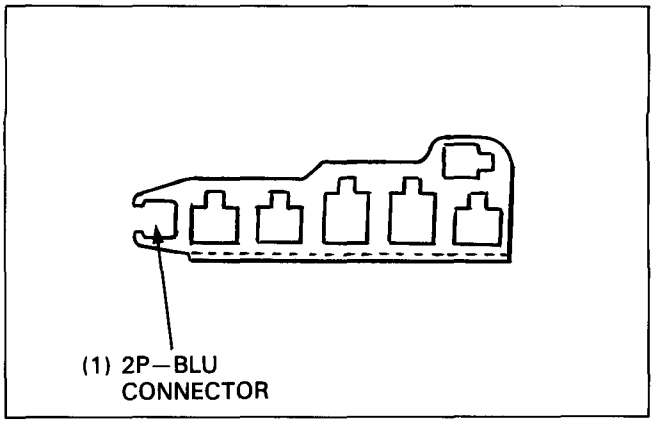
INSPECTION/REMOVAL

Remove the following:
- right fairing lower cover (page 12-9).
- right cooling fan (page 5-10).
- right radiator (page 26-46).

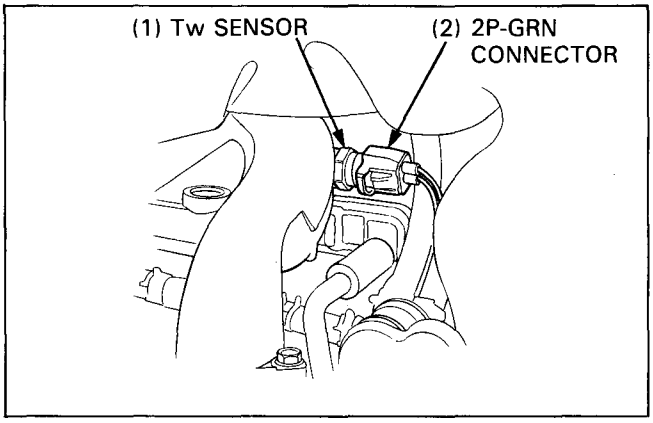
NOTE

- It is not necessary to disconnect the radiator hoses.

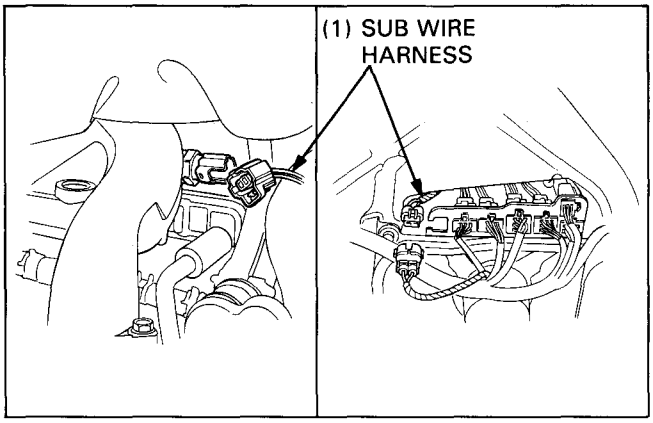
Disconnect the waterproof 2P-BLU connector of the connector holder on the right cooling fan.



Disconnect the 2P-GRN connector from the Tw sensor.



Check for continuity between connectors of the sub wire harness.
There should be continuity between same color wires.
There should be no continuity between different color wires.



Drain coolant (page 5-7).
Remove the Tw sensor from the right intake monifold.
Suspend the sensor in cold water. Heat the water slowly.
Measure resistance between the terminals.

STANDARDS:
2.0—3.0 K ohms at 20°C (68°F)
200—400 Ohms at 80°C (176°F)

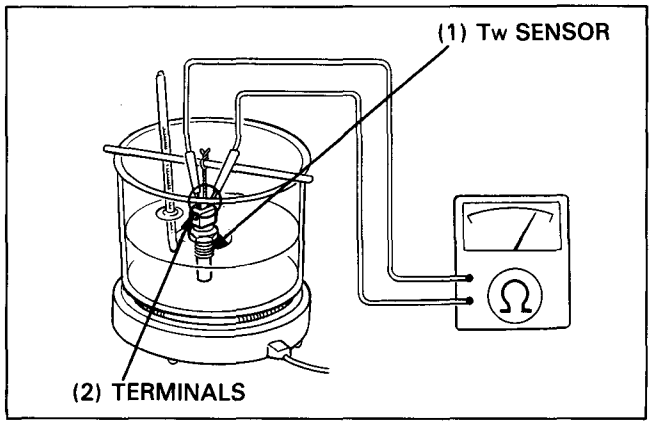
NOTE

- If the Tw sensor or thermometer touches the pan, false readings will result.
- Stir water well.

CAUTION

- *Do not attach water onto the sensor terminals.*

If resistance is outside the above ranges, replace the Tw senor.



INSTALLATION

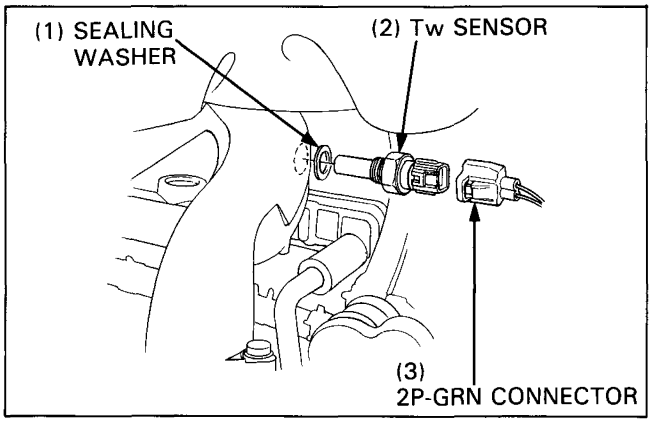
Install the Tw sensor with a new sealing washer onto the right intake manifold.
Tighten the sensor to the specified torque.

TORQUE: 28 N·m (2.8 kg-m, 20 ft-lb)

Connect the 2P-GRN connector to the Tw sensor properly.
Connect the waterproof 2P-BLU connector of the connector holder on the right cooling fan.

Install the following:
— right cooling fan (page 5-10).
— right radiator (page 26-46).
— right fairing lower cover (page 12-9).

Fill the cooling system with coolant (page 5-7).

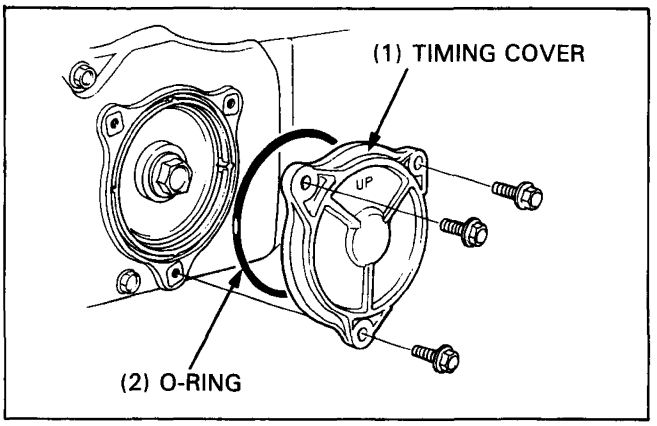


IGNITION TIMING

NOTE

- The ignition control unit electronically varies ignition timing according to engine speed and intake manifold vacuum. The gearshift sensor and Tw sensor signal the ignition control unit to compensate the ignition timing according to the gear position and coolant temperature.

Remove the following:
— fairing lower covers (page 12-9).
— fairing front cover (page 12-8).
— timing cover and O-ring.



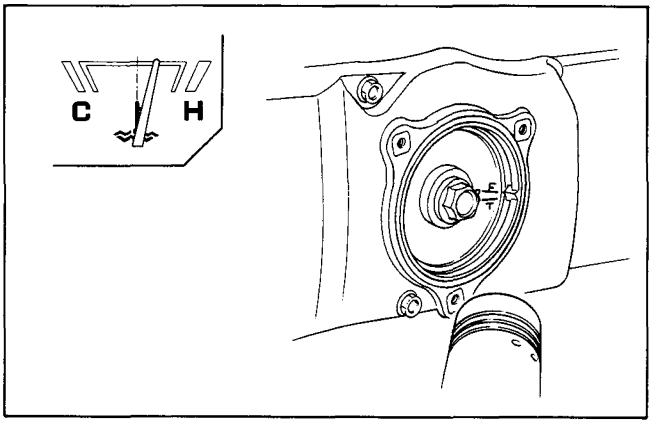
Start the engine and warm it up to operation temperature (above 50°C/122°F).

NOTE

- Make sure the temperature gauge resisters above the center position. This is the temperature that the cooling fans operate.

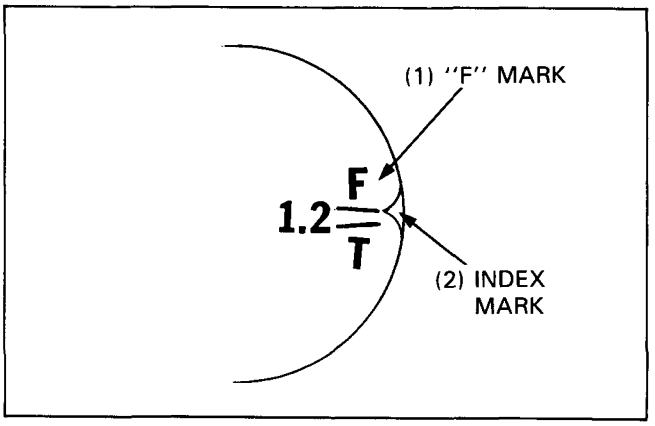
IGNITION TIMING INSPECTION

Stop the engine and connect a stroboscopic timing light to the No. 1 or No. 2 cylinder spark plug wire. Start the engine with the transmission in neutral and let it 800 ± 80 min^{-1} (rpm) (SW model: 900 ± 50 min^{-1} (rpm)) by adjusting the throttle stop screw.
The timing is correct if the guide plate "F" 1.2 mark aligns with the timing cover index mark.



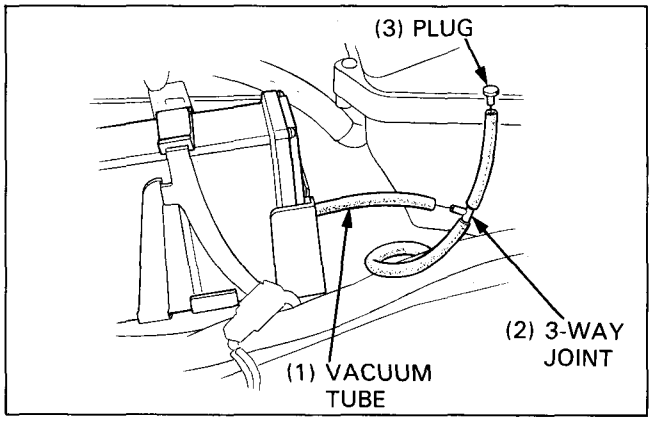
Connect the timing light to the No. 3 or 4 cylinder spark plug wire and check the ignition timing for No. 3 or 4 cylinders as previously described by observing the "F" 3.4 mark. And also check the No. 5 or 6 cylinder timing by the same way.

Stop the engine and check the vacuum advance.



VACUUM ADVANCE INSPECTION

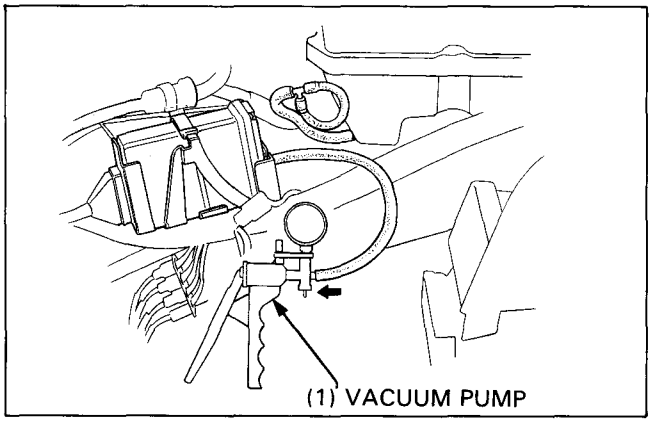
Remove the top compartment and right fairing inner cover (page 12-7).
Disconnect the vacuum tube that goes from the engine control unit to the 3-way joint. Remove the plug from the dead end tube, and connect the tube to the 3-way joint as shown.



NOTE

- Do not lose the plug.

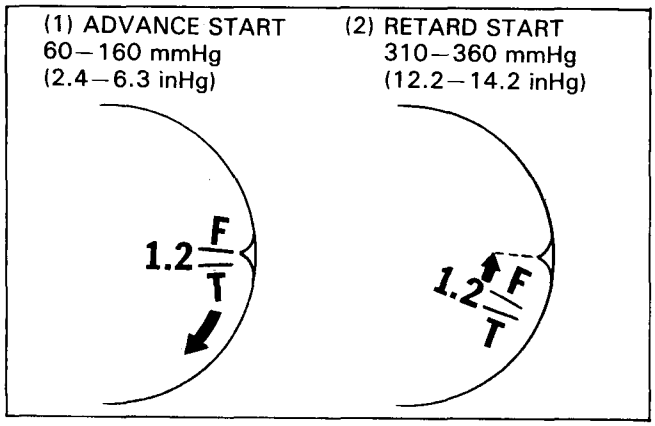
Connect a vacuum pump to the engine control unit vacuum tube.



Start the engine and warm it up to operation temperature (above 50°C/122°F).

Let the engine idle with the transmission in the 3rd, 4th or OD. Apply vacuum to the control unit and check the "F" mark movement with a timing light.

The advance should start at:
60–160 mmHg (2.4–6.3 inHg)
The advance stop and the retard should start at:
310–360 mmHg (12.2–14.2 inHg)
at atmospheric pressure, 760 mmHg (29.9 inHg)



NOTE

- Keep the engine speed on idle by adjusting the throttle stop screw while testing the vacuum advance.

Stop the engine and check the gearshift sensor timing shift.

GEARSHIFT SENSOR TIMING SHIFT INSPECTION

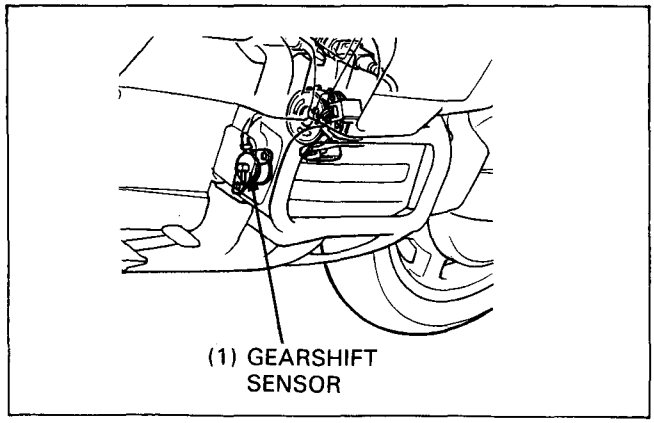
NOTE

- Connect a vacuum tube to the ignition control unit.

Start the engine and warm it up to operation temperature (above 50°C/122°F).
Let the engine run at 1,200 ± 100 min^{-1} (rpm) by adjusting the throttle stop screw with the transmission in neutral.

Shift the transmission to 3rd or neutral from 1st or 2nd. The engine speed should increase by approximately 500 min^{-1} (rpm).

Stop the engine and check the atmosphere temperature timing shift.



COOLANT TEMPERATURE TIMING SHIFT INSPECTION

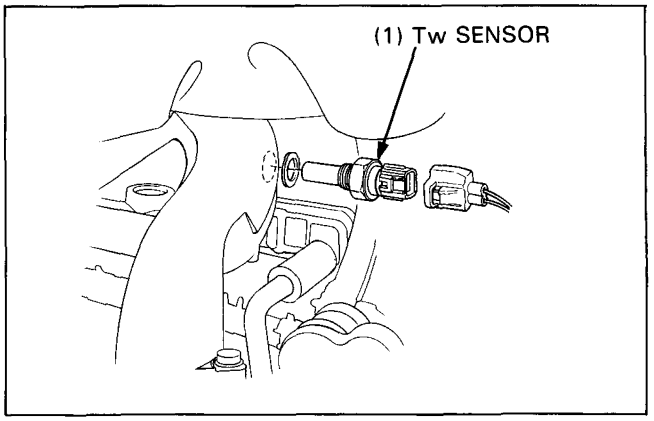
Remove the Ta sensor (page 4-50) and remove the Tw sensor.

NOTE

- To re-use the coolant, drain it into clean pan.

Disconnect the Ta sensor sub wire harness from the Ta sensor and temporarily connect the sub wire harness to the Tw sensor.

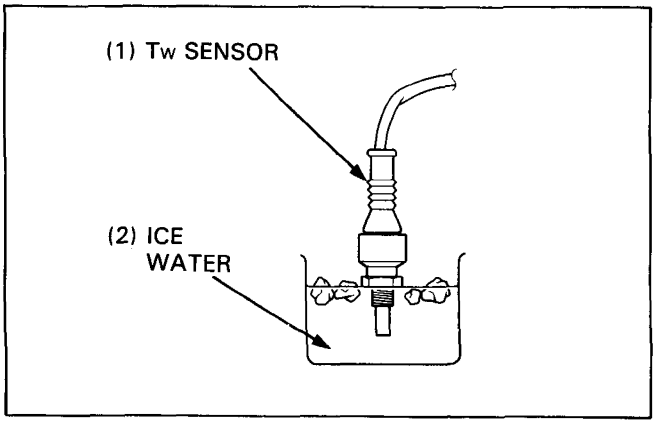
Install the removed Ta sensor into the right intake manifold (28 N·m) and fill the system with coolant.



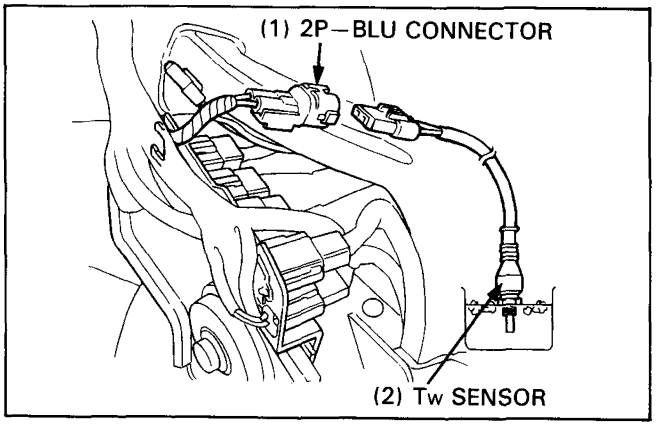
CAUTION

- *Do not damage the manifold.*

Cool down the Tw sensor in the ice water for approximately 10 minutes.



Start the engine and warm it up to operating temperature (above 50°C/122°F).
Connect the cooled-down Tw sensor to the waterproof 2P-BLU connector of the connector holder on the right cooling fan.
The engine speed should increase by approximately 200 min^{-1} (rpm).



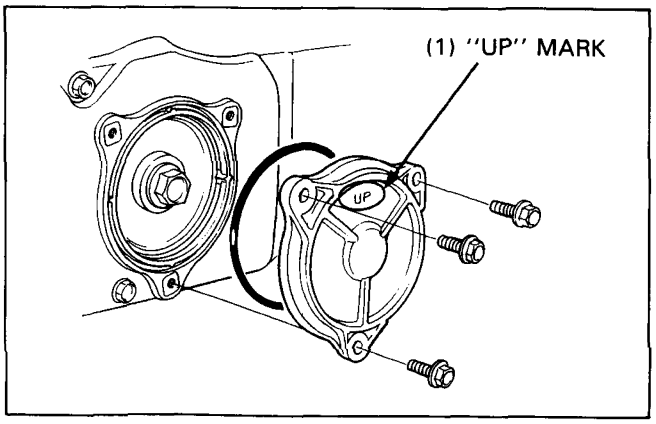
NOTE

- If ignition timing is not correct, check all individual ignition system components except the ignition control unit. If the individual components are good, replace the ignition control unit.

After inspecting the ignition timing, install the removed parts in the reverse order of removal.

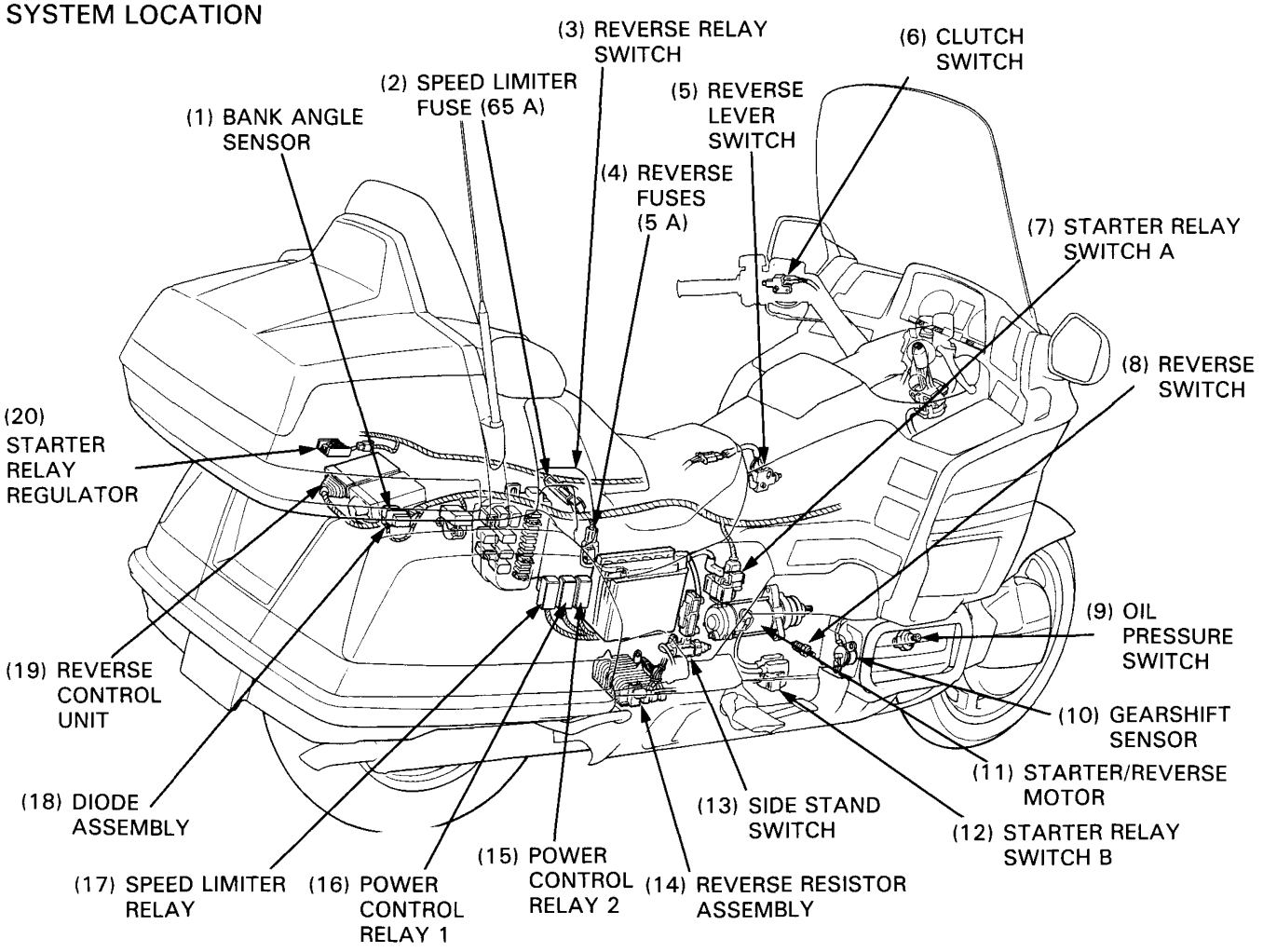
NOTE

- Install the timing cover with its "UP" mark facing up.

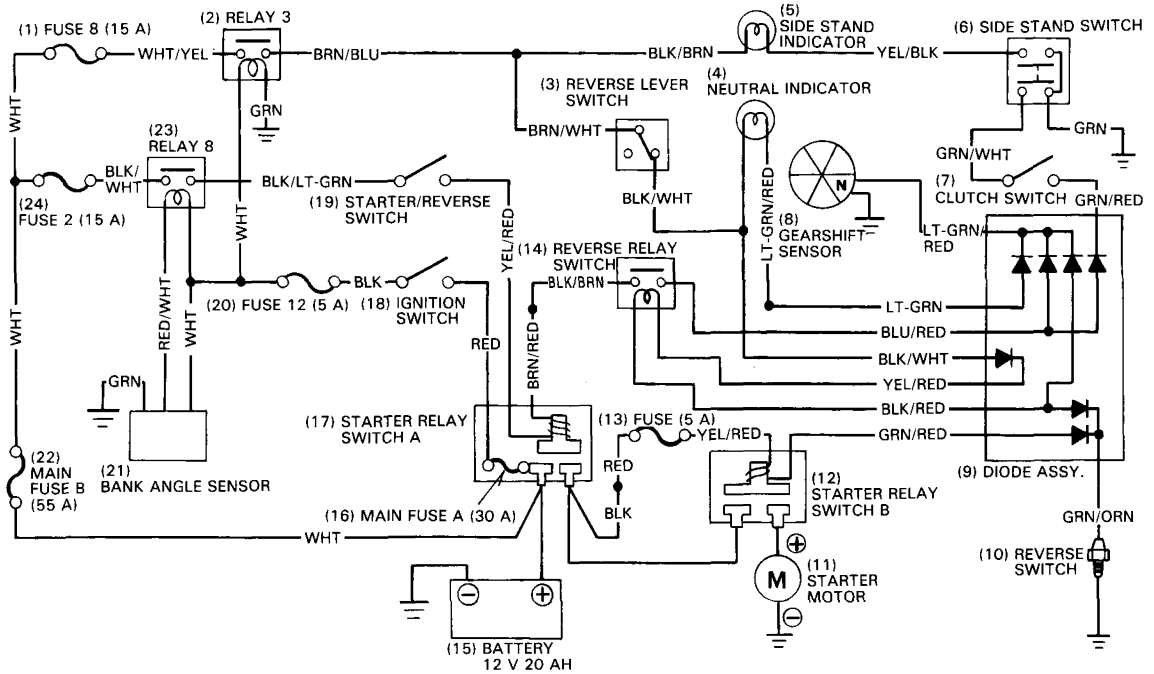


STARTER REVERSE SYSTEM LOCATION/DIAGRAM

SYSTEM LOCATION



SYSTEM DIAGRAM



STARTER/REVERSE SYSTEM TROUBLESHOOTING

• FOR STARTING

The starter/reverse motor for starting does not turn.

NOTE

Inspect the following before troubleshooting the starter system.

- Be sure the battery is fully charged and in good condition.
- Be sure the reverse lever is in OFF position and the reverse cable is properly adjusted (page 3-17).
- Be sure the reverse switch arm is not damaged (page 19-32).
- Be sure the following fuses are good: main fuse A (30 A)-inside the starter relay switch A
  main fuse B (55 A)-on the battery case
  fuse 2 (15 A)-inside the fuse box
  fuse 8 (15 A)-inside the fuse box
  fuse 12 (5 A)-inside the relay box
  fuse 5 A-the left side of the battery
- Be sure the bank angle sensor is installed properly (page 19-24).

BATTERY CONNECTIONS:
Check battery terminal connections for corrosion and looseness and check the cables for an open or short circuit.
→ NO GOOD → • Loose or corrosive contact of terminals
• Open or short circuit in battery cables

↓ GOOD

STARTER RELAY SWITCH A CONNECTIONS:
Check starter relay switch A terminal connections for corrosion and looseness and check the relay switch 4P-RED connector for loose or poor contact.
→ NO GOOD → • Loose or corrosive contact of terminals
• Loose or poor contact of the relay switch A connector

↓ GOOD

STARTER RELAY SWITCH B CONNECTIONS:
Check starter relay switch B terminal connections for corrosion and looseness. Check the relay 2P-BLK connector for loose or poor contact.
→ NO GOOD → • Loose or corrosive contact of terminals
• Loose or poor contact of the relay switch A connector

↓ GOOD

STARTER MOTOR CONNECTION:
Check starter motor terminal connection for corrosion and looseness and check the cables for an open circuit.
→ NO GOOD → • Loose or corrosive contact of terminal
• Open circuit in motor cable

↓ GOOD

GROUND CABLE CONNECTIONS:
Check the ground cable connections near the dipstick for corrosion and looseness and check the cables for open or short.
→ NO GOOD → • Loose or corrosive contact or cables
• Open or short circuit in ground cables

↓ GOOD

MOTOR:
Apply battery voltage to the motor directly and check its operation.
→ DO NOT TURN → • Faulty starter/reverse motor (page 19-14)

↓ TURN

RELAY 8:
Connect all connection properly.
When the ignition switch is turned to ON, you should hear the relay 8 "Click" (page 19-26).
→ NO →
WIRING/IGNITION SWITCH:
Disconnect the 3P-GRN connector of the connector holder on the rear fender, and measure voltage between the WHT (+) and GRN (−) wires and between the RED/WHT (+) and GRN (−). Battery voltage should register with the ignition switch ON.

↓ YES → Ⓐ

YES → Ⓑ

NO → Ⓒ

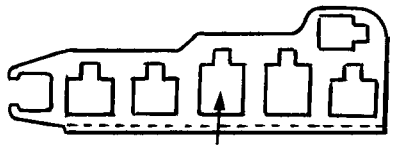
Ⓐ

RELAY 8:
Check the relay 8 for continuity (page 19-27)

CONTINUITY

NO CONTINUITY
• Faulty relay 8

WIRING/CONNECTORS:
Disconnect the 9P-RED connector of connector holder on the right cooling fan, and measure voltage between the BLK/LT GRN (+) wire and ground (−). Battery voltage should register with the ignition switch ON.



(1) 9P-RED CONNECTOR

NO
• Loose or poor contact of connectors
• Open or short circuit in main wire harness

YES

STARTER/REVERSE SWITCH:
Using the above connector, check the starter/reverse switch for continuity (page 19-28).

NO GOOD
• Faulty starter/reverse switch

GOOD

STARTER RELAY SWITCH A:
With the ignition switch ON, push starter/reverse switch. You should hear the starter relay switch A "Click" (page 19-25).

NO

YES

STARTER RELAY SWITCH A:
Check the starter relay switch A for continuity (page 19-26)

CONTINUITY

NO CONTINUITY
• Faulty starter relay switch A

Ⓒ

Ⓑ

BANK ANGLE SENSOR:
Inspect the bank angle sensor (page 26-89)

GOOD
• Loose or poor contact of the 3P-GRN connector

NO GOOD
• Faulty bank angle sensor

Ⓒ

• Loose or poor contact of 22P-BLK, 22P-RED connector or 8P-BLK connector above the left cooling fan
• Open or short circuit in main or sub wire harness
• Faulty ignition switch (page 22-16)
• Faulty relay 8 (page 19-26)

REVERSE RELAY SWITCH:
With the ignition switch ON, push starter/reverse switch. You should hear the reverse relay switch "Click" (page 19-26).

YES

WIRING/CONNECTORS/DIODE:
Remove the reverse relay switch and measure voltage between BLK/BRN (+) and BLU/RED (−) wires of the wire harness side. Battery voltage should register with the ignition switch ON, the starter/reverse switch pushed and the gear in neutral.

YES
• Faulty reverse relay switch

NO
• Faulty starter relay switch A
• Faulty gearshift sensor (page 18-12)
• Loose or poor contact of 22P-RED and 6P-BLK connectors
• Faulty reverse diode assembly (page 26-90)
• Open or short circuit in main or sub wire harness

NO

WIRING/CONNECTORS/DIODE:
Remove the reverse relay switch and measure voltage between YEL/RED (+) and BLK/RED (−) wires of the wire harness side.
Battery voltage should register with the ignition switch ON.

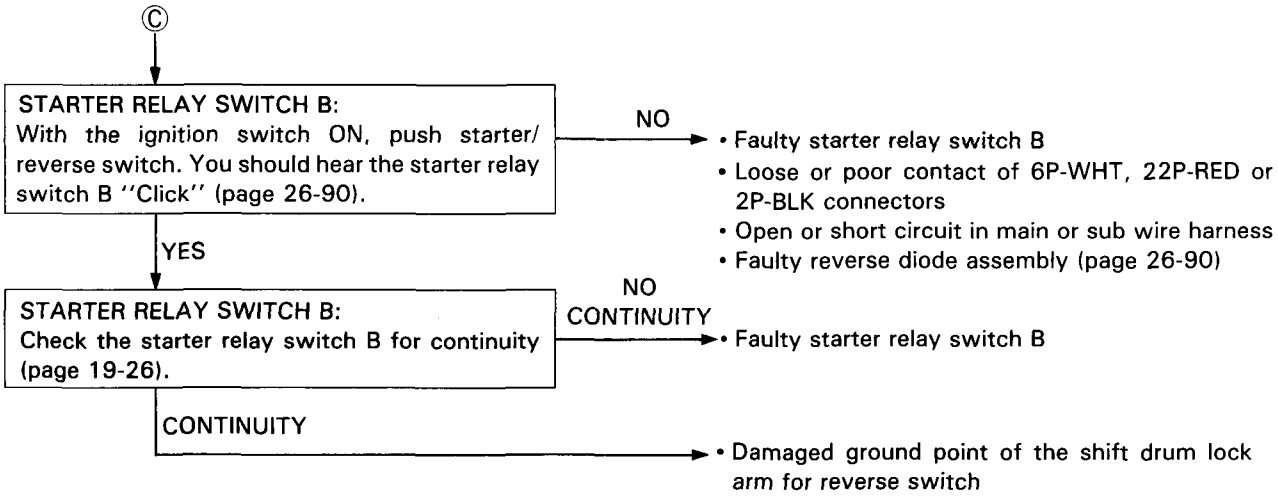
YES

REVERSE RELAY SWITCH:
Check the reverse relay switch for continuity (page 19-26).

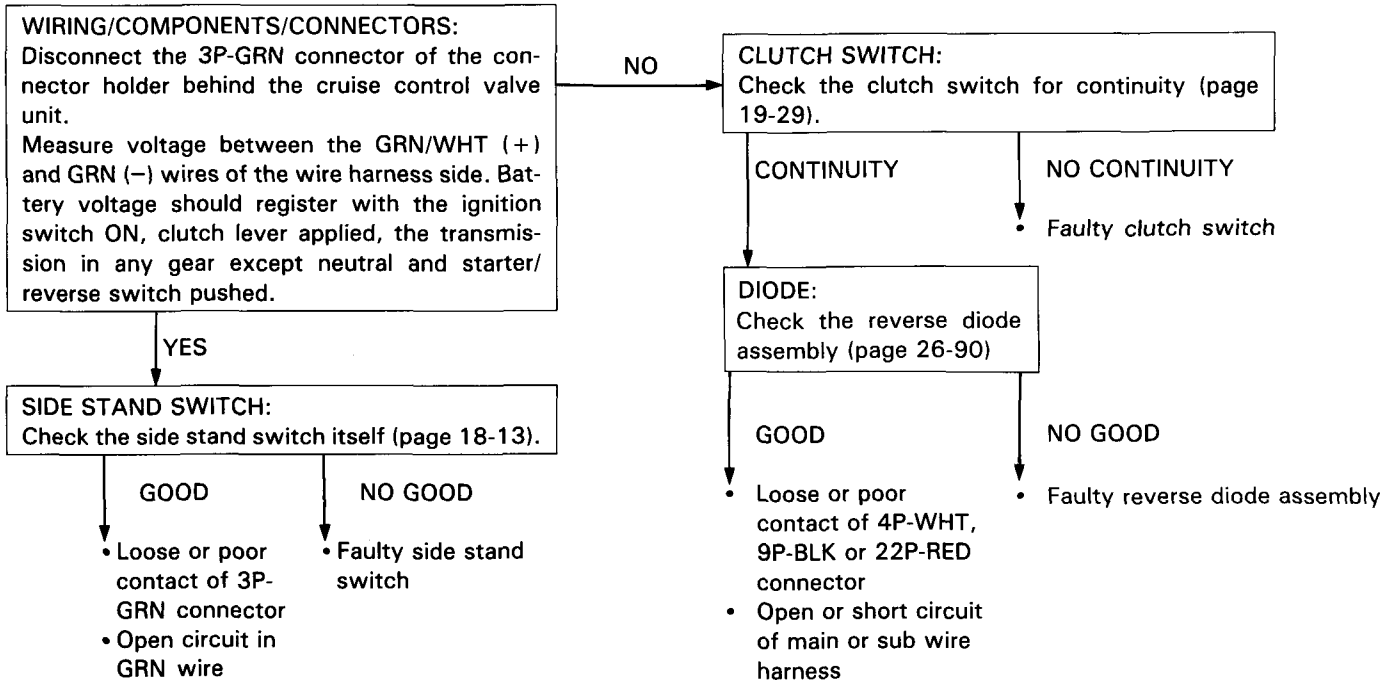
CONTINUITY
• Loose or poor contact of the relay connector

NO CONTINUITY
• Faulty reverse relay switch

NO
• Faulty reverse diode assembly (page 26-90)
• Loose or poor contact of 22P-RED connector
• Open or short circuit in main or sub wire harness
• Faulty reverse switch (page 19-27)
• Faulty relay 3



The starter/reverse motor for starting turns in neutral position, but does not turn in gear with the side stand up and the clutch lever applied.



Starter/reverse motor turns engine slowly
- Low battery
- Excessive resistance in circuit
- Faulty starter motor (page 19-13)

Starter/reverse motor turns, but engine does not turn
- Faulty starter clutch (page 19-22)
- Faulty starter drive/or driven gear
- Faulty starter idle gear

Starter/reverse motor and engine turn, but engine does not start
- Faulty ignition system
- Engine problems, see engine related sections

• FOR REVERSE

The starter/reverse motor for reverse does not turn.

NOTE

When the speed limiter is activated during reverse running and then the electrical motor brake is worked, and when the motor is overloaded more than 3 seconds, the reverse system is turned to OFF and the reverse indicators goes out.
To use reverse again, it is necessary to return the reverse lever to the OFF position and then return it to the ON position.

Inspect the following before troubleshooting the reverse system.
- Be sure the transmission gears is in neutral position.
- Be sure the reverse lever is in the ON position and reverse cable is properly adjusted.
- Be sure the side stand is up.
- Be sure the following fuses are not burnt: fuse 8 (15 A)-inside the fuse box
  fuse 5 A-the left side of the battery
  reverse fuse 65 A-under the seat

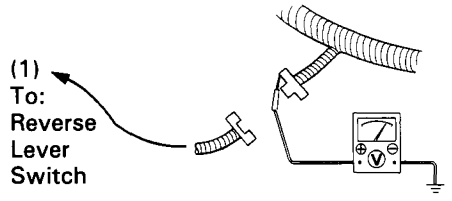
RELAY 3:
When the ignition switch is turned to ON, you should hear the relay 3 "Click" (page 19-26).
→ NO → • Open or short circuit in wire harness
• Loose or poor contact of the relay 3

↓ YES

RELAYS:
Check the relay 3 for continuity (page 19-27).
→ NO CONTINUITY → • Faulty relay 3

↓ CONTINUITY

WIRING:
Disconnect the 3P-RED connector from the connector holder behind the cruise control valve unit. Measure voltage between the BRN/WHT (+) and ground (−) wires of the wire harness side. Battery voltage should register with the ignition switch ON.



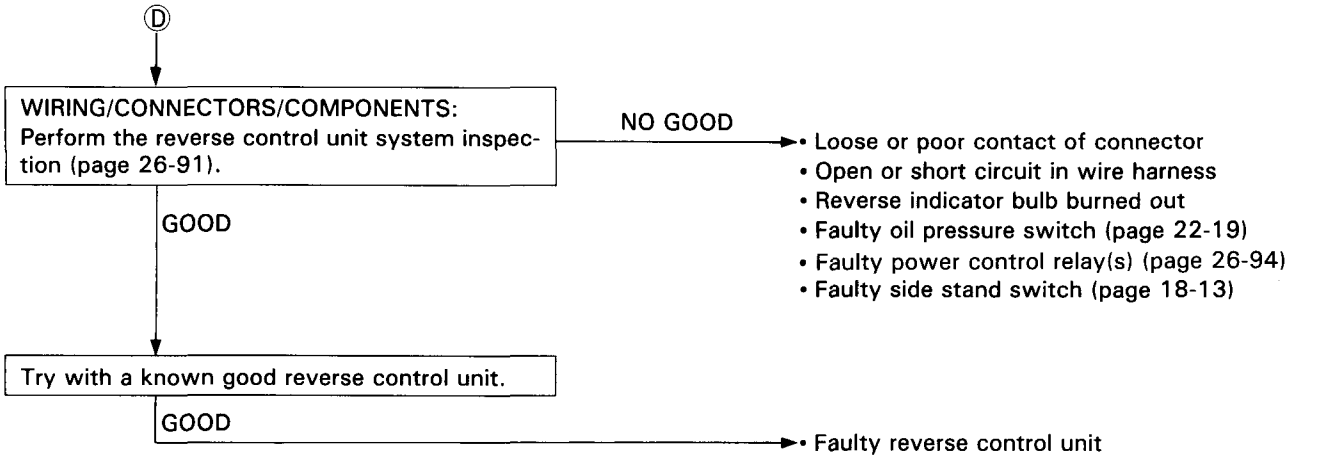
→ NO → • Open or short circuit in wire harness

↓ YES

REVERSE LEVER SWITCH:
Check the reverse lever switch for continuity (page 19-42).
→ NO CONTINUITY → • Faulty reverse lever switch

↓ CONTINUITY

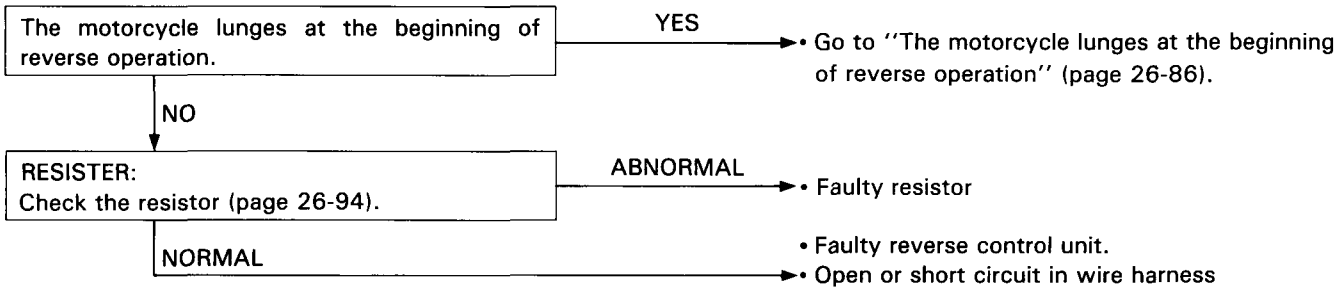
Ⓓ



The reverse system works well, but reverse indicator does not come on.

- Burnt reverse indicator
- Faulty reverse control unit
- Open or short circuit in wire harness

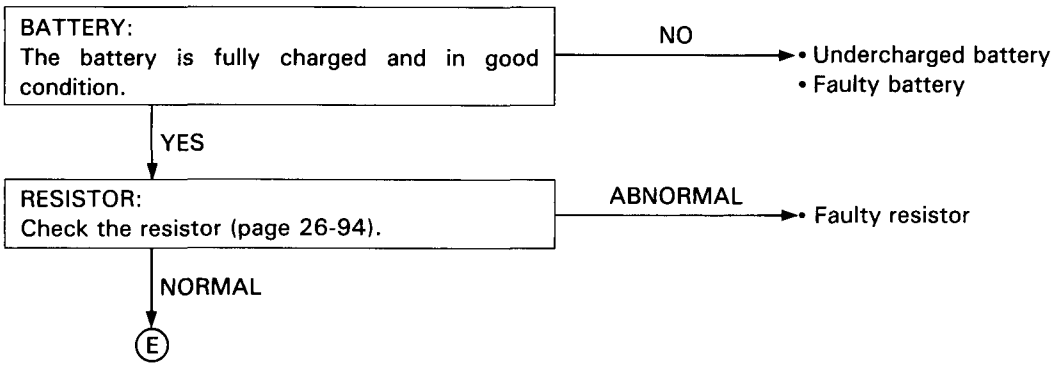
The reverse speed is fast (1.8 km/h minimum on a flat road)

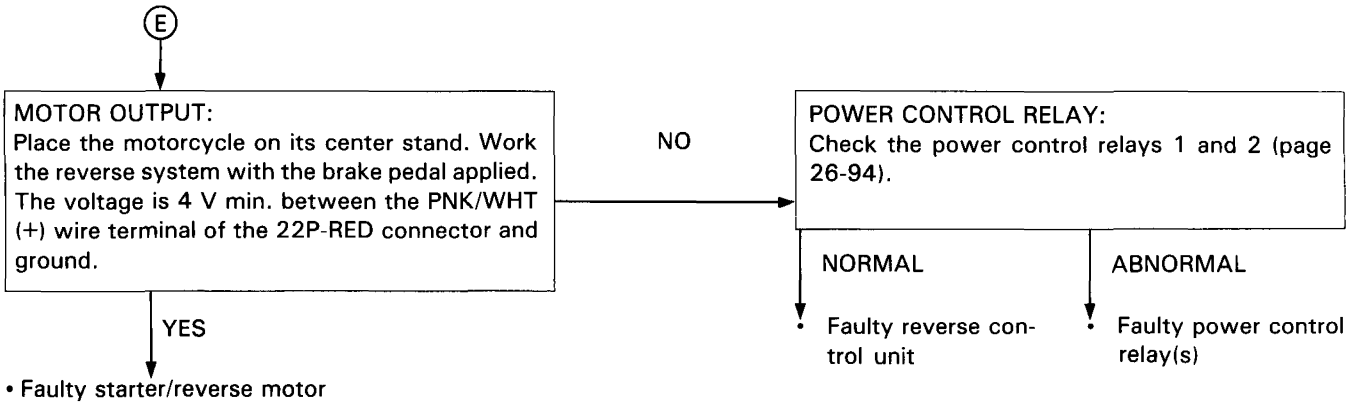


The reverse speed is slow (1.0 km/h maximum on a flat road)

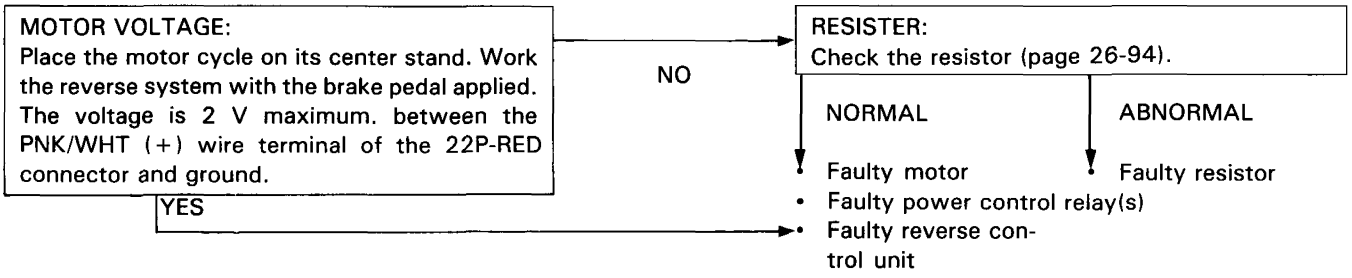
- Undercharged or faulty battery
- Faulty resister
- Faulty power control relay(s)
- Faulty starter/reverse motor

Lack of the uphill power

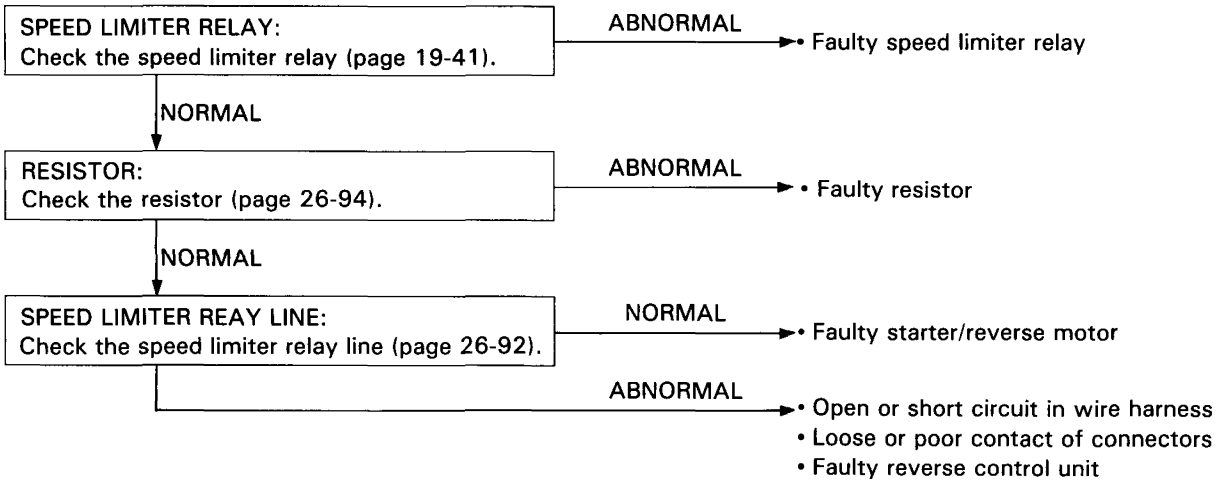




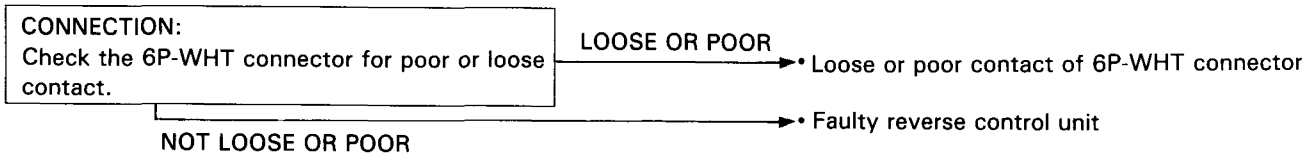
The reverse system works well, but the motor does not stop even if the motor is overloaded more than 3 seconds.



The speed limiter system is not activated at 2.5 km/h minimum in reverse.



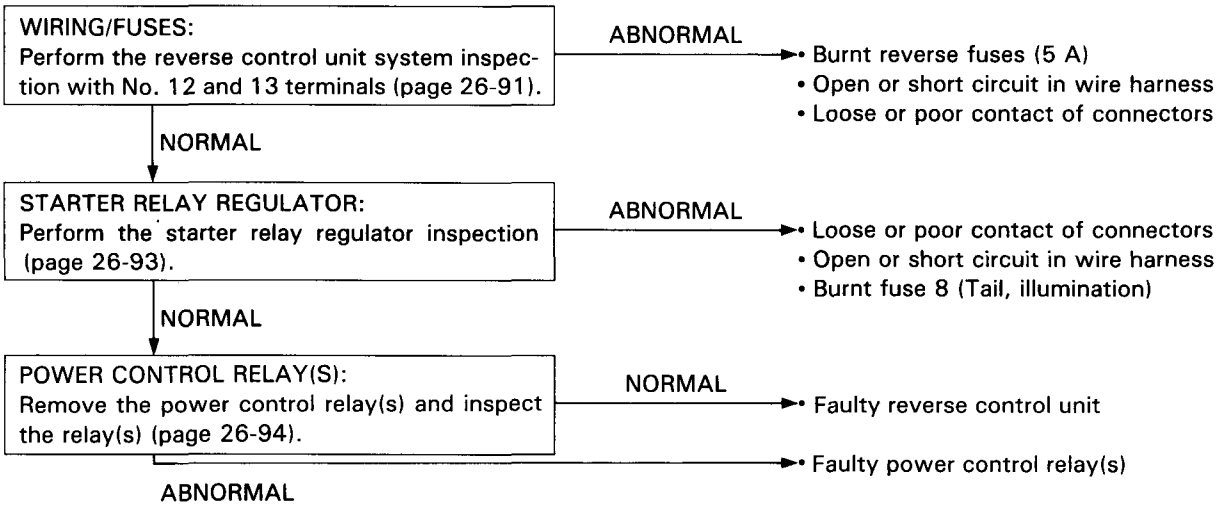
Reverse operation is rough, stalls, or runs poorly.



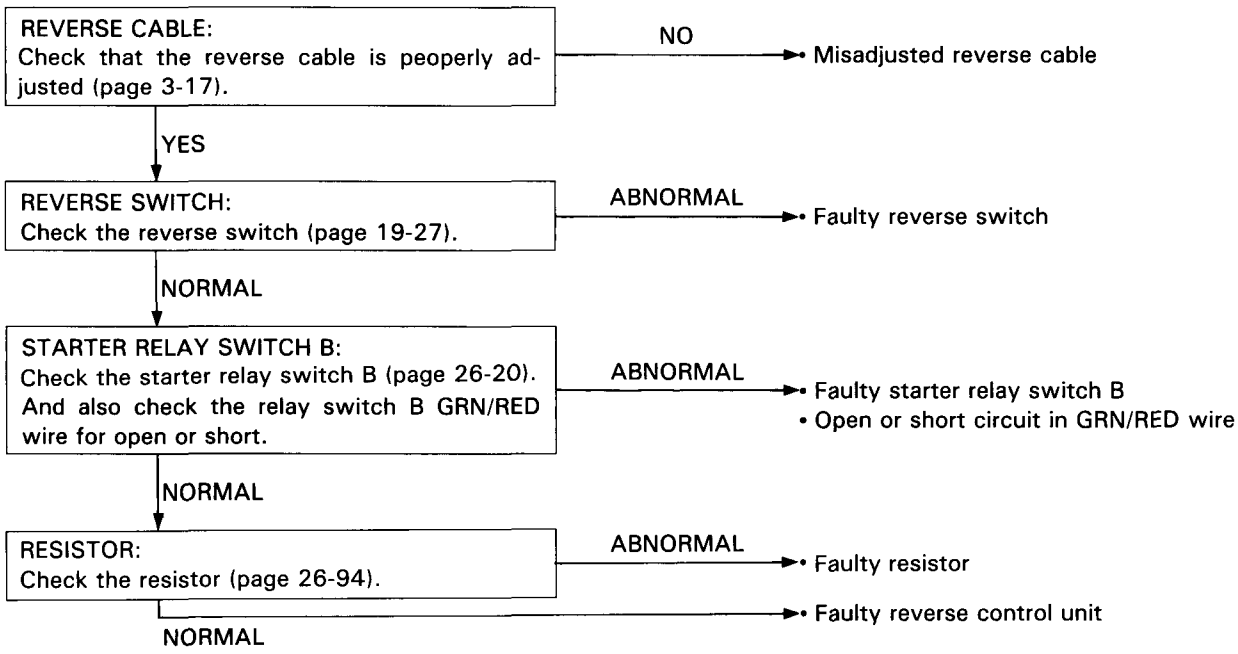
Continues operating in reverse even if the starter/reverse switch is free.

- Faulty starter/reverse switch
- Faulty starter relay switch A
- Short circuit in YEL/RED wire

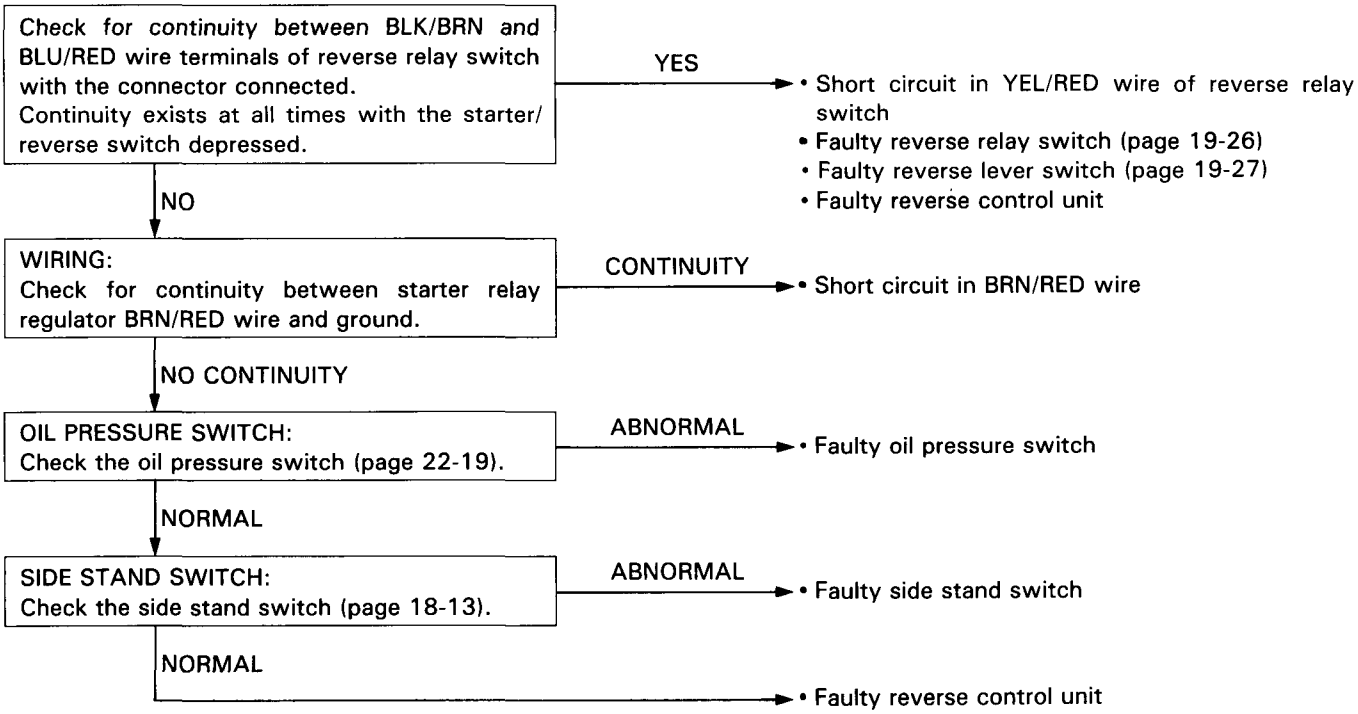
Stops immediately when reverse operation is initiated.



The motorcycle lunges at the beginning of reverse operation.



The reverse system operates before being properly selected.



During reverse operation, starter/reverse motor idles
- Mis-adjusted reverse cable (page 3-17)
- Faulty reverse shift system (page 19-30)

Transmission is hard to shift with reverse lever in OFF position
- Mis-adjusted reverse cable (page 3-17)
- Damage shift drum lock system (page 19-32)

During the normal run, the rear wheel is locked suddenly
- Damaged reverse shift system (page 19-30)

After shifting into reverse, transmission is easy to shift
- Mis-adjusted reverse cable (page 3-17)
- Damaged shift drum lock system (page 19-32)

Hard to shift to reverse
- Damaged reverse shift system (page 19-30)
- Faulty reverse cable

STARTER/REVERSE MOTOR

REMOVAL

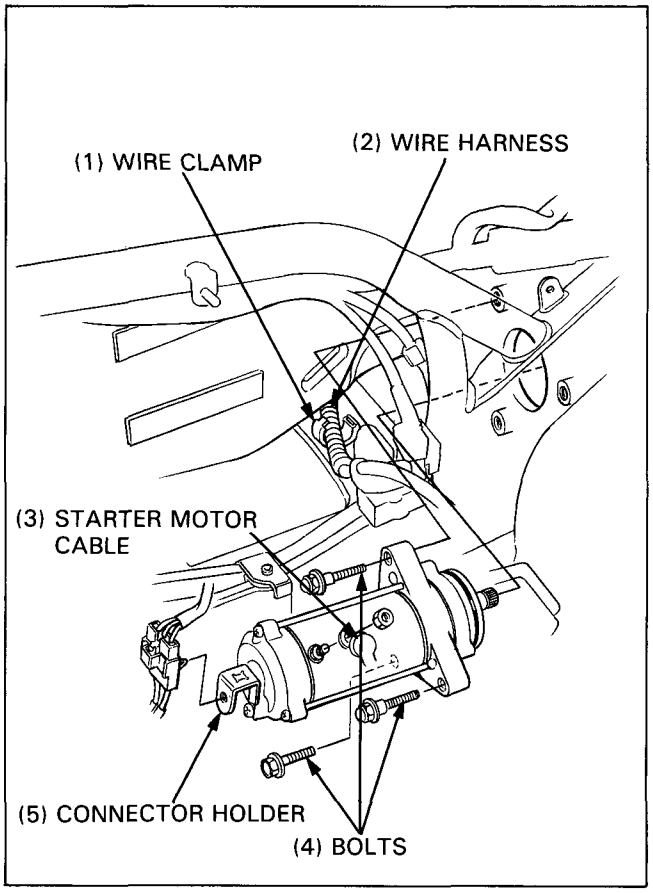
Remove the following.
—right front side cover (page 12-6).
—battery and battery case (page 17-5).

Remove the connector from the connector holder.

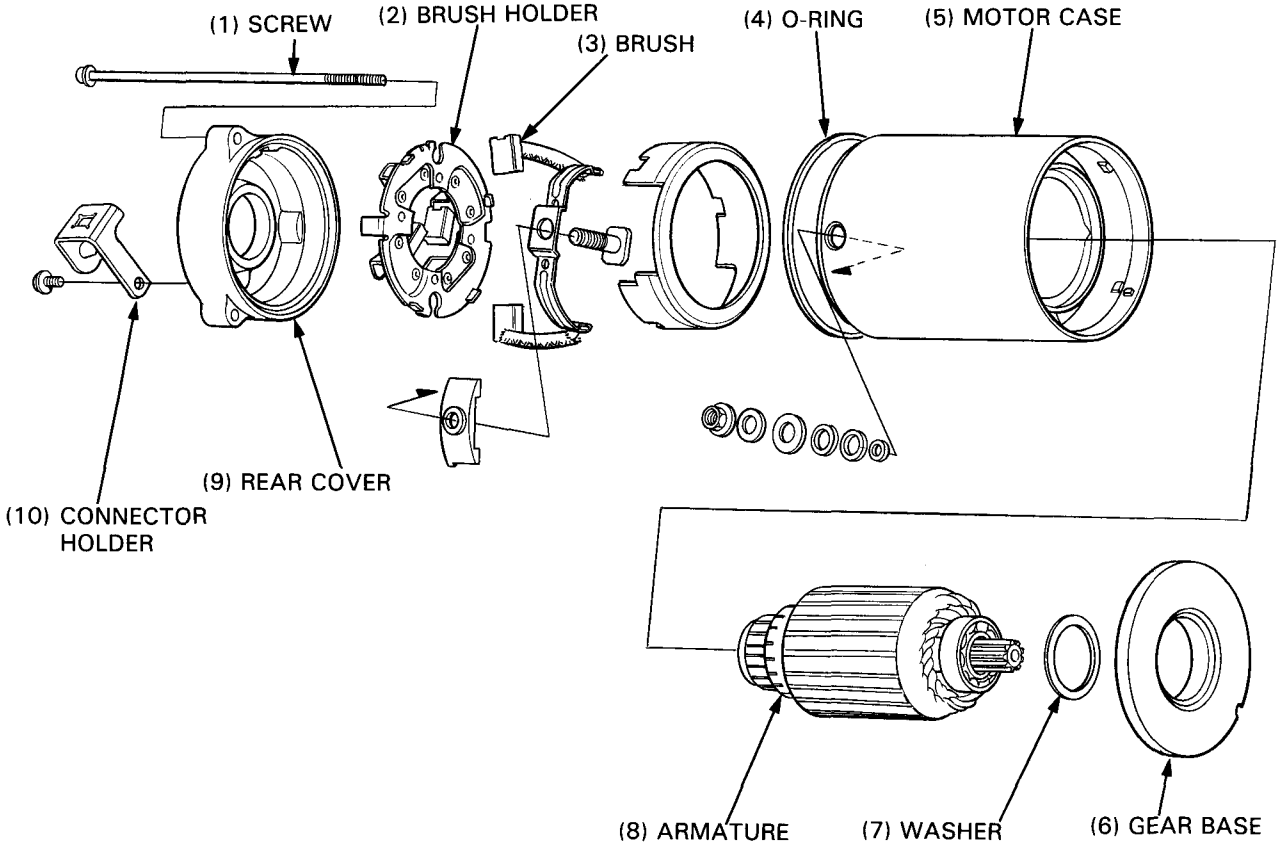
Remove the wire harness from the wire clamp.

Disconnect the starter motor cable from the motor.

Remove the motor mounting bolts and motor from the engine.



MOTOR ASSEMBLY



INSTALLATION

Apply oil to the O-ring and install the starter/reverse motor onto the engine.

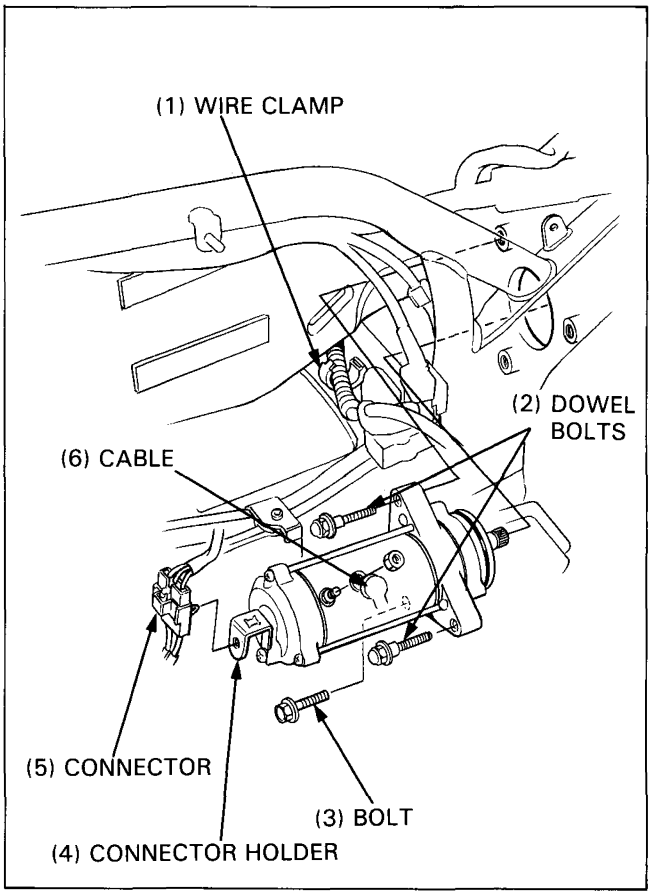
NOTE

- Installation is easier if the rear wheel is rotated with the reverse lever in the ON position.

Install and tighten the motor mounting bolts securely.

NOTE

- The two mounting bolts are the dowel bolt. Install them as shown.



Connect the starter motor cable to the terminal.

Install the wire harness onto the wire clamp.

Install the connector onto the connector holder.

Install the following:
- battery case and battery (see page 17-5).
- right front side cover (see page 12-6).

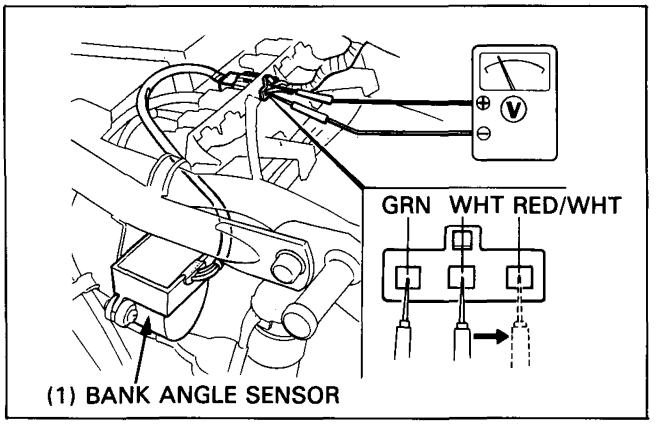
BANK ANGLE SENSOR

INSPECTION

Remove the seat, trunk and right saddlebag (page 12-12).
Turn the ignition switch ON and measure votage between the following terminals of the bank angle sensor with the 3P-GRN connector connected.

Terminals	Standard voltage
RED/WHT (+) and GRN (–)	0–1 V
WHT (+) and GRN (–)	10–14 V

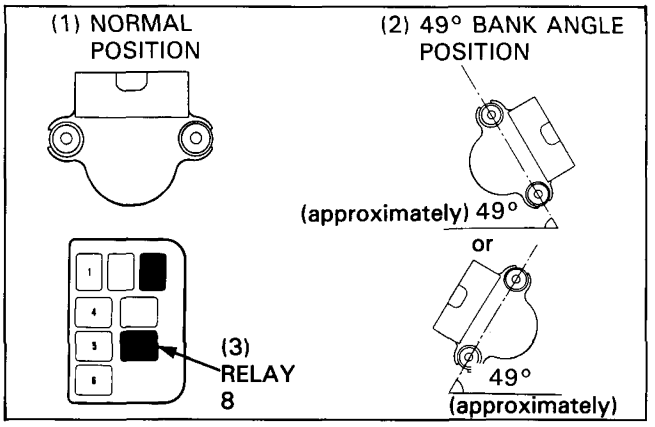
Remove the air pressure sensor assembly from the rear fender stay.
Remove the screws and bank angle sensor.



Turn the ignition switch OFF.
Place the bank angle sensor horizontal with the connector connected as first shown, and turn the ignition switch ON.
The bank angle sensor is normal if the relay 8 (IGN. CRUISE) clicks and the power supply line is closed.
Incline the bank angle sensor approximately 49 degrees to the left or right with the ignition switch remaining ON.
The bank angle sensor is normal if the relay 8 clicks and the power supply line is open.

NOTE

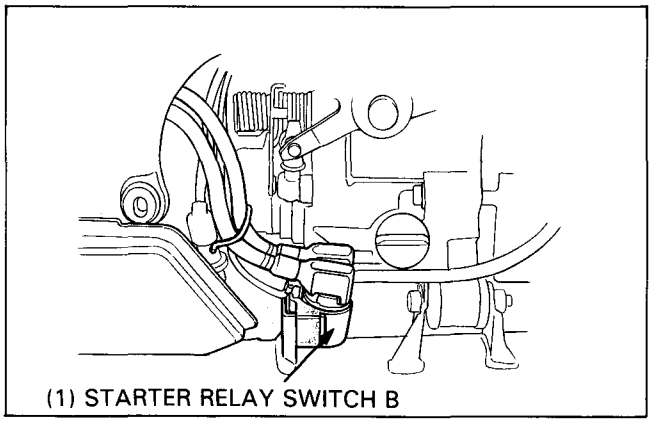
- If you repeat this test, first turn the ignition switch OFF; then the switch to ON and try test again.



STARTER RELAY SWITCH B

ORERATION INSPECTION

Remove the right front side cover (page 12-6).
Depress the starter/reverse switch button with the ignition switch ON.
The relay primary coil is normal if it clicks.



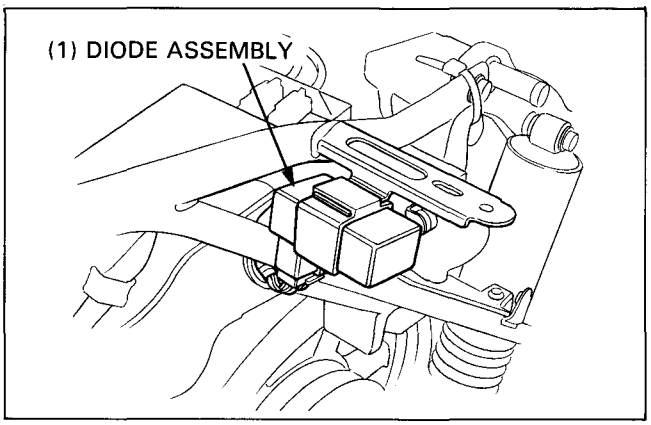
DIODE ASSEMBLY

CONTINUITY INSPECTION

Remove the right saddlebag (see page 13-16).
Remove the diode assembly from the stay.
Disconnect the connector from the diode assembly.

NOTE

- The eight diodes are integrated in the diode assembly. They are used in the following circuits:
  D1: Ground of starter relay switch B coil
  D2: Ground of reverse relay switch (clutch switch side)
  D3: Ground of reverse relay switch (neutral switch side)
  D4: Ground of reverse relay switch coil (reverse switch side)
  D5: Ground of reverse relay switch coil (neutral switch side)
  D6: Ground of neutral indicator
  D7: Power source of reverse relay switch coil
  D8: Power source of headlight



Perform the continuity check for each diode as follows:

Normal direction: Continuity

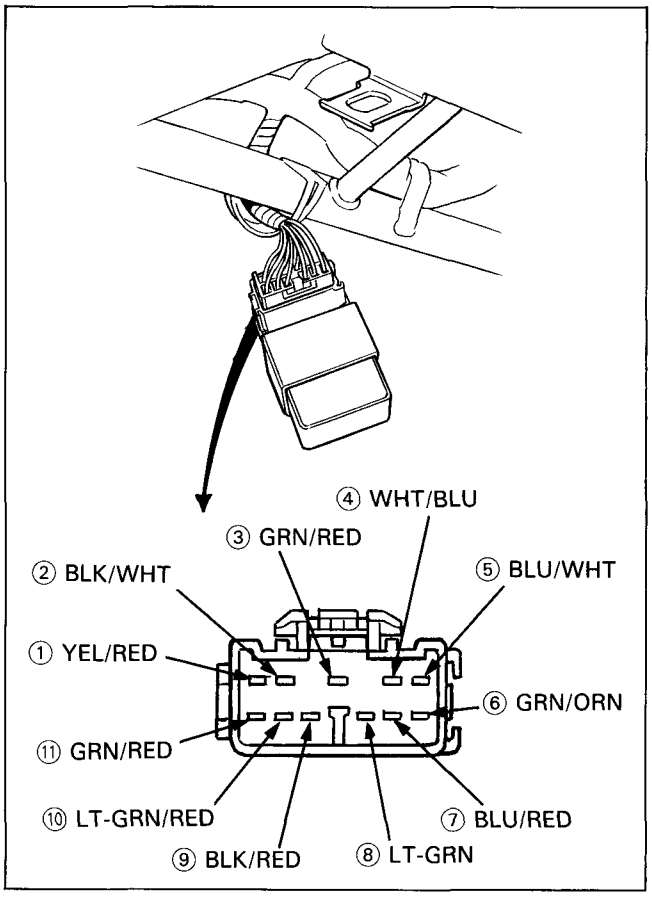
DIODE	D1	D2	D3	D4	D5	D6	D7	D8
⊕Probe	⑥	⑩	③	⑥	⑩	⑩	①	⑤
⊖Probe	⑪	⑦	⑦	⑨	⑨	⑧	②	④

Reverse direction: No continuity

DIODE	D1	D2	D3	D4	D5	D6	D7	D8
⊕Probe	⑪	⑦	⑦	⑨	⑨	⑧	②	④
⊖Probe	⑥	⑩	③	⑥	⑩	⑩	①	⑤

NOTE

- The following test chart is for a positive ground ohmmeter. The test results will be reversed if a negative ground ohmmeter is used.



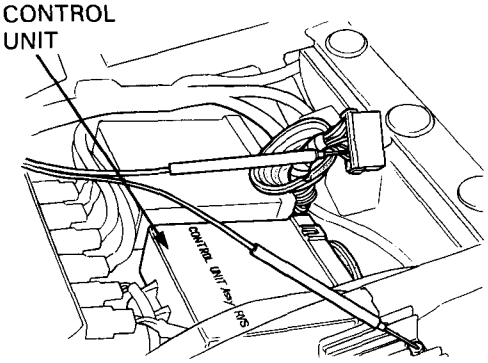
REVERSE CONTROL UNIT

SYSTEM INSPECTION

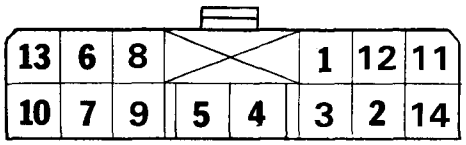
Remove the seat and trunk (page 12-6, 12).
Disconnect the 14P-WHT connector of the reverse control unit and check it for loose contact or corroded terminals.

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

(1) REVERSE CONTROL UNIT



(2) REVERSE CONTROL UNIT CONNECTOR OF THE WIRE HARNESS SIDE



TERMINAL NUMBER/ITEM		TERMINALS	CONDITION(S)	SPECIFICATION
1	Ground line	GRN and ground	At all times	Continuity should exist.
2	Speed limiter relay line	GRY (+) and ground (−)	Ignition switch ON Reverse lever switch ON	Battery voltage should register.
3	Reverse lever line	WHT/BLU (+) and ground (−)	Ignition switch ON Reverse lever switch ON	Battery voltage should register.
4	Reverse indicator line	WHT/RED	Short it to ground and turn the ignition switch ON.	Reverse indicator should come on.
5	Oil pressure line	BLU/RED (+) and ground (−)	Ignition switch ON	0 V should register.
			Disconnect the oil pressure switch terminal and turn the ignition switch ON	Battery voltage should register.
6	Power control relay 1 wire	ORN (+) and ground (−)	Ignition switch ON Reverse lever switch ON	Battery voltage should register.
7	Starter relay regulator line	LT BLU and LT BLU of the unit and regulator	Disconnect the starter relay regulator 4P-RED connector (page 19-39) and check for continuity between the same color wire terminals.	Continuity should exist.
8	Neutral switch line	LT-GRN/RED and ground	Transmission in neutral	Continuity should exist.

TERMINAL NUMBER/ITEM		TERMINALS	CONDITION(S)	SPECIFICATION
9	Power control relay 2 wire	WHT (+) and ground (−)	Ignition switch ON Reverse lever switch ON	Battery voltage should register
10	Side stand switch line	GRN/WHT and ground	Side stand up	Continuity should exist.
			Side stand down	No continuity exist.
11	Starter/reverse switch line	YEL/RED (+) and ground (−)	Ignition switch ON Starter/reverse switch pushed	Battery voltage should register.
12	Speed limiter fuse wire	YEL and ground	At all times	Continuity should exist.
13	Motor wire	PNK and motor cable	At all times	Continuity should exist.
14	Reverse relay switch line	YEL/RED (+) and ground (−)	Ignition switch ON Reverse lever switch OFF	Battery voltage should register.
			Ignition switch ON Reverse lever switch ON	0 V should register.

SPEED LIMITER RELAY LINE INSPECTION

Start the engine.

Remove the speed limiter fuse (65 A). Disconnect the motor cable from the starter/reverse motor (see page 18-3).

Connect the voltmeter between the speed limiter fuse terminals (tester (+) probe to the fuse YEL terminal).

Connect the battery charger positive (+) cable to the motor (+) cable.

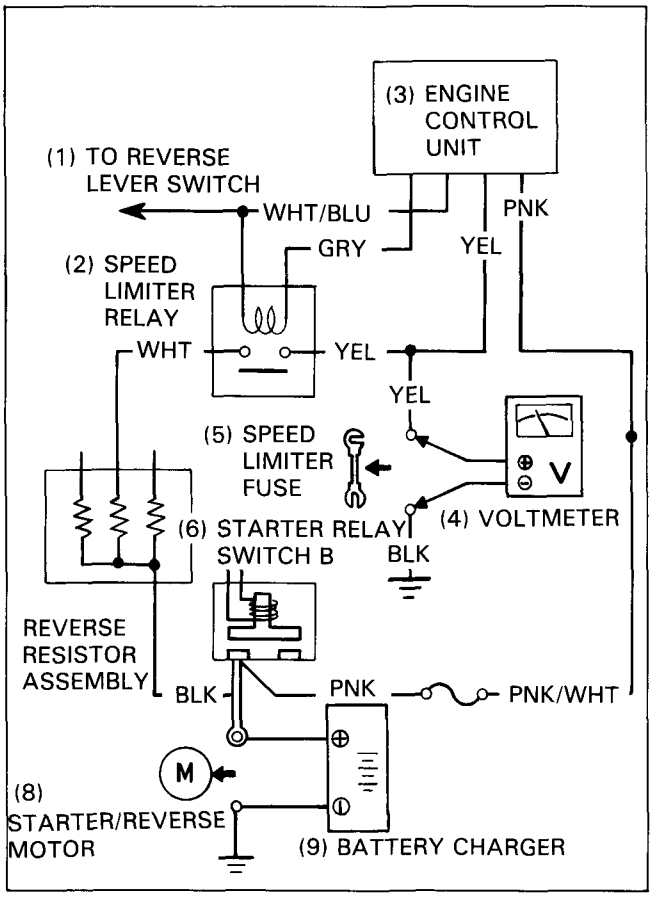
With the reverse conditions ready (gear in neutral, side stand up, engine running, and reverse lever switch ON), be sure the charger switch is ON and apply 13−20 V between the motor cable and engine ground. A reading of 13−20 V should appear between the speed limiter fuse terminals.

⚠ WARNING

- ***Turn power ON/OFF at the charger, not at the battery terminals to prevent sparks.***

CAUTION

- *While applying the power to the line from a charger, do not depress the starter/reverse switch.*

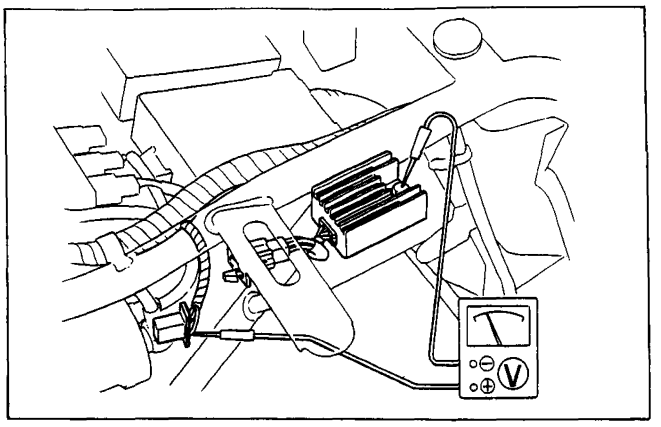


STARTER RELAY REGULATOR

WIRING INSPECTION

Remove the seat and trunk (page 12-6, 12).
Disconnect the 4P-RED connector of the starter relay regulator and check it for loose contact or corroded terminals.

Measure the following between connector terminals of the wire harness side. If there is OK, perform the next inspection (page 19-40).



ITEM	TERMINALS	CONDITION(S)	SPECIFICATION
Battery voltage line	WHT/BLU (+) and ground (−)	Ignition switch ON Reverse lever switch ON	Battery voltage should register.
Starter relay switch A primary coil line	BRN/RED of the regulator and starter relay switch A	Disconnect the 4P-RED connector of the starter relay switch A (page 19-25) and check for continuity between the BRN/RED wire terminals.	Continuity should exist at all times.
Reverse control unit line	LT BLU of the regulator and reverse control unit	Disconnect the 14P-WHT connector of the reverse control unit (page 26-91) and check for continuity between the LT BLU wire terminals.	Continuity should exist at all times.
Reverse fuse line	GRN and ground	At all time	Continuity should exist.

REVERSE RESISTOR ASSEMBLY

REMOVAL

Remove the battery case (see page 17-5).

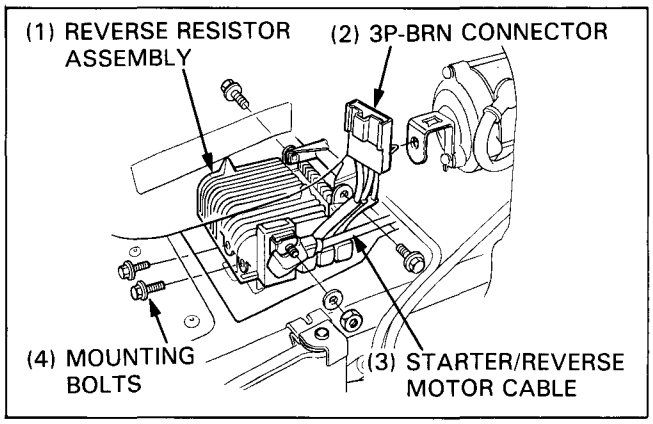
Disconnect the 3P-BRN connector.

Remove the starter/reverse motor cable from the resistor terminal.

Remove the exhaust chamber (see page 12-18).

Remove the heat protector.

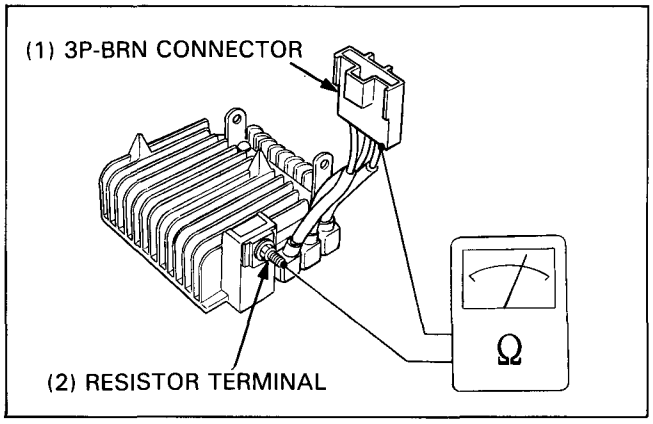
Remove the four mounting bolts and the reverse resistor assembly.



INSPECTION

Measure the resistances between the connector terminals and resister terminal.

Standards (20°C/68°F)
BLK wire terminal—resistor terminal: 0.12—0.17 ohm
WHT wire terminal—resistor terminal: 0.12—0.17 ohm
RED wire terminal—resistor terminal: 0.12—0.17 ohm



INSTALLATION

Install the reverse resistor assembly in the reverse order of removal.

POWER CONTROL RELAY

OPERATION INSPECTION

Remove the right rear side cover (see page 13-8) and trunk (see page 13-13).

Disconnect the 14P-WHT connector from the reverse control unit.

Relay 1
Connect the ORN wire to the GRN wire with a jump wire (wire harness side).

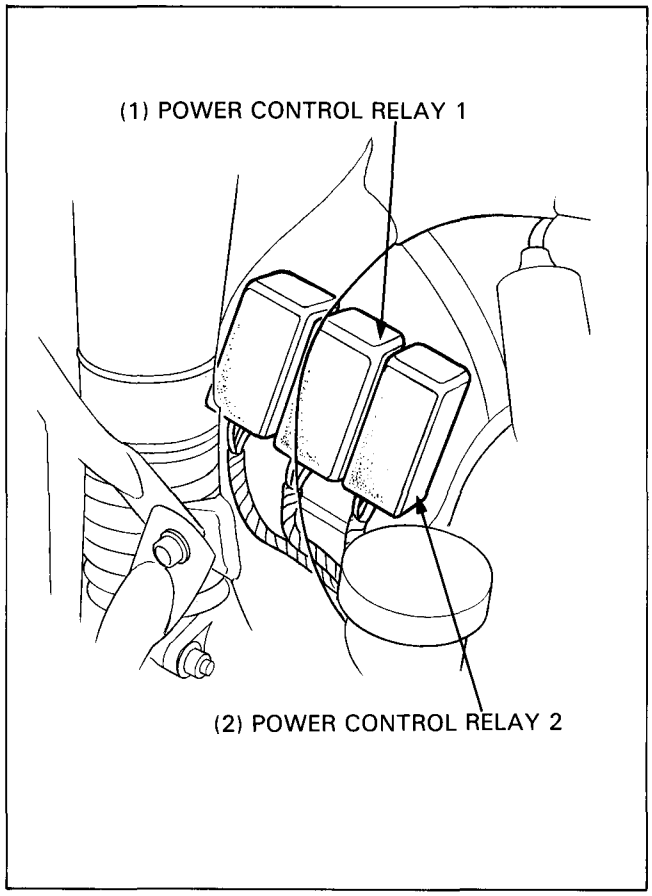
Turn the ignition switch ON and position the reverse lever in the ON position.

The relay is normal if it clicks.

Relay 2
Connect the WHT wire to the GRN wire with a jump wire (wire harness side).

Turn the ignition switch ON and position the reverse lever in the ON position.

The relay is normal if it clicks.

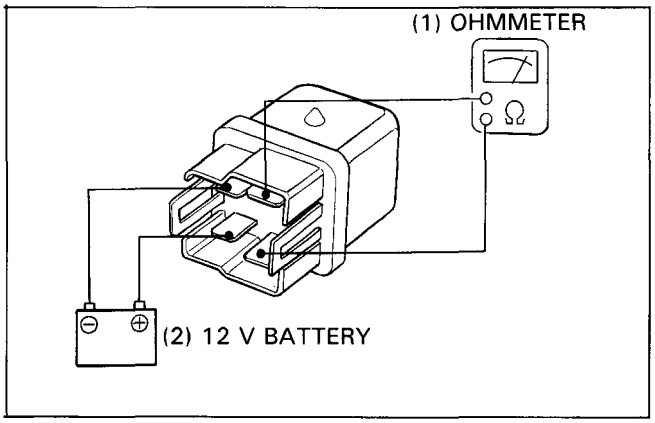


CONTINUITY INSPECTION

Remove the power control relay and its protector rubber from the rear fender.

Disconnect the 5P-WHT connector and remove the power control relay.

Connect an ohmmeter and 12 V battery to the power control relay as shown.
The relay is normal if there is continuity.



INSTRUMENTS

ELECTRIC TACHOMETER INSPECTION

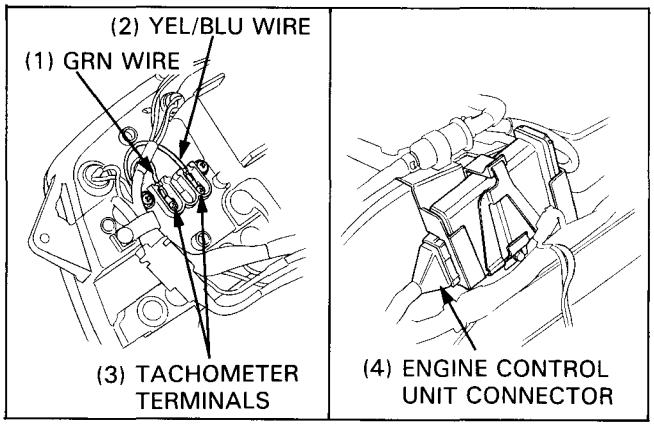
Remove the instrumens (page 22-12).

Apply battery voltage between the yellow/blue and green wire terminals of the instruments 20P-WHT connector.
Connect the battery positive (+) wire to the yellow/blue wire and the negative (−) wire to the green wire.

The tachometer pointer should move fully when the battery is connected, and return to 0 rpm when the battery is disconnected.

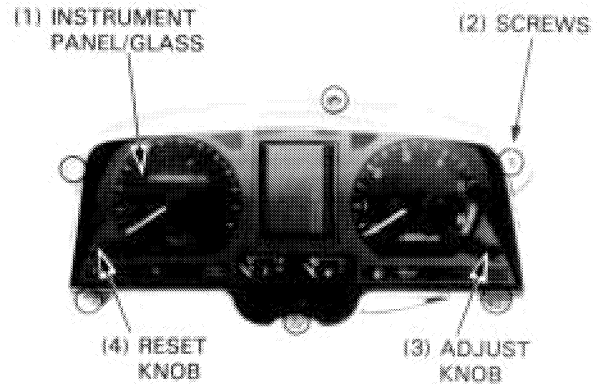
Connect the 20P-WHT connector.

Check the YEL/BLU wire for continuity between the tachometer terminal and the engine control unit connector.
There should be continuity.
Check the GRN wire for continuity between the tachmeter terminal and ground.
There should be continuity.

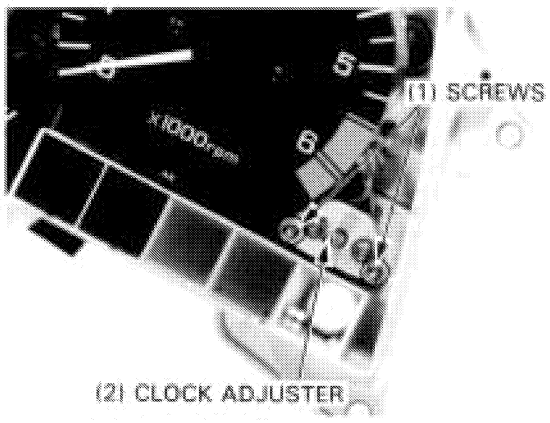


DISASSEMBLY

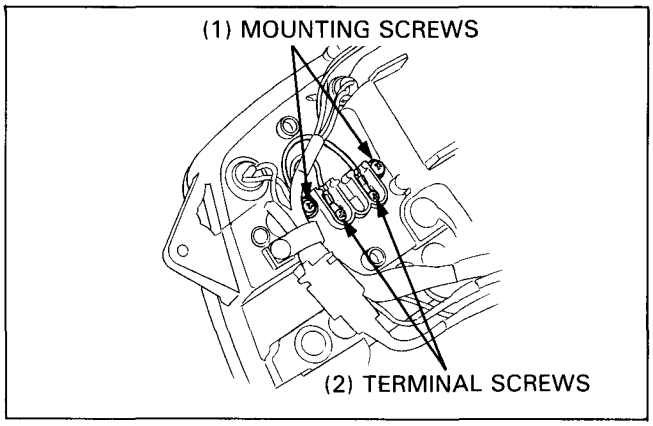
Remove the reset knob and clock adjust knob.
Remove the instrument panel and glass by removing six screws.



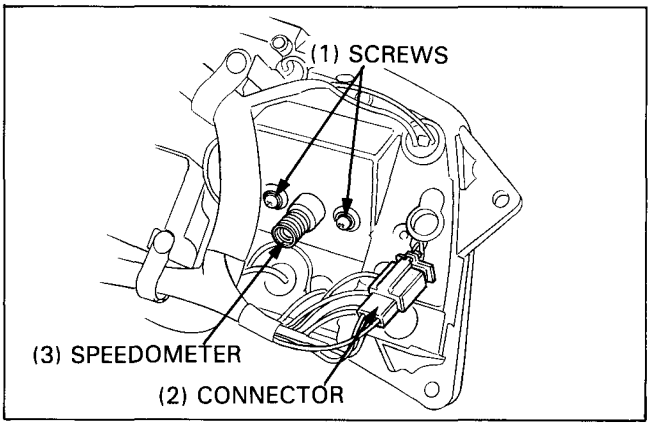
If you are replacing the clock adjuster, remove two screws and disconnect the 3P-BLK connector behind the instrument case.



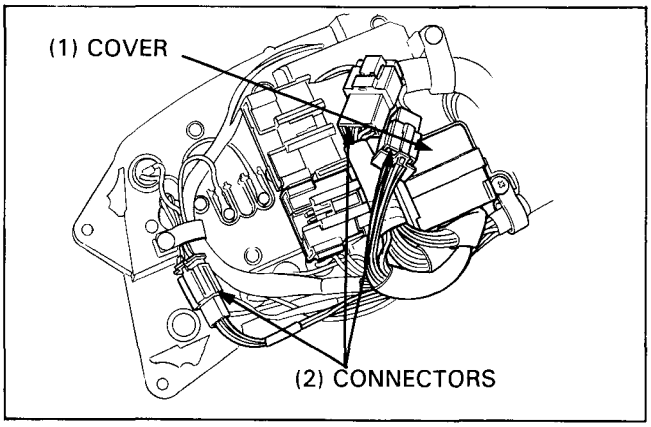
Remove two electric tachometer terminal screws and two tachometer mounting screws.



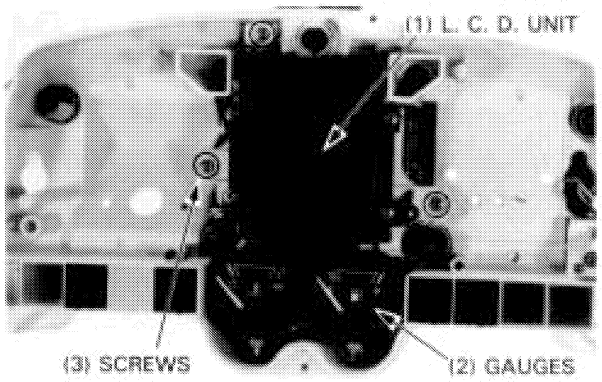
Disconnect the 3P-WHT connector of the speed sensor. Remove two screws and speedometer from the case.



Disconnect the 10P-WHT, 6P-WHT and 3P-BLK connectors. Remove the instrument backing cover.



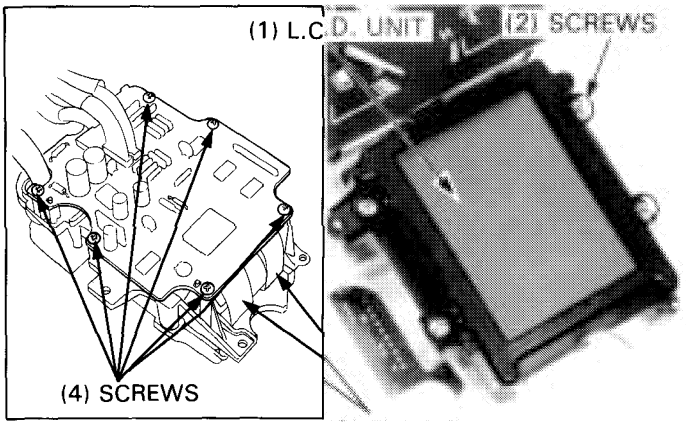
Remove four screws and L.C.D. unit and gauges as an assembly.



If you want to remove the L.C.D. unit, remove ten screws and L.C.D. unit from the base.

CAUTION

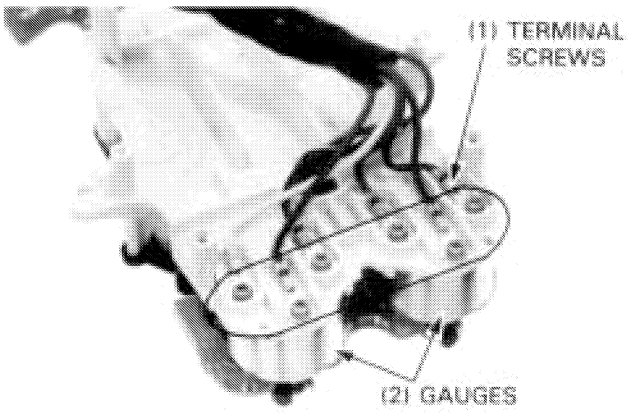
- *Do not damage the L.C.D. unit flat cables.*



If you want to remove the gauges, remove the rear side of L.C.D. unit (previous page).
Remove the gauge terminal screws and gauge panel screws.
Remove the gauges.

CAUTION

- *Do not turn a gauges upside down for a long time, or leak out the damper oil.*
- *Do not damage the L.C.D. unit flat cables.*

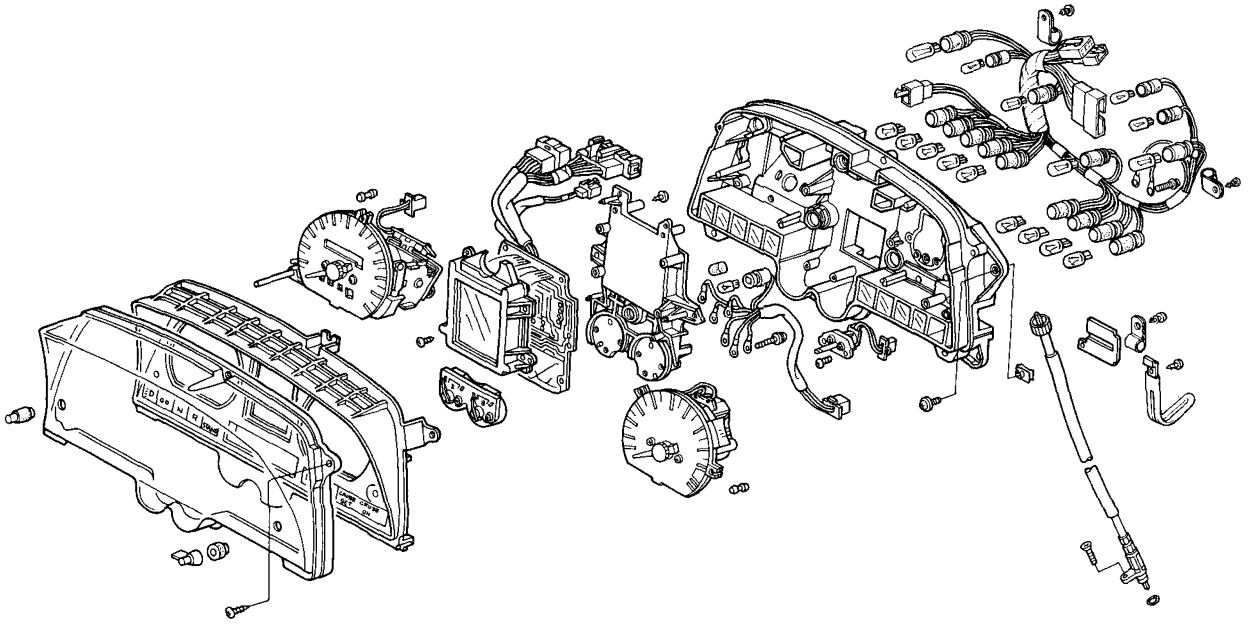


ASSEMBLY/INSTALLATION

Assembly and installation are in the reverse order of disassembly and removal.

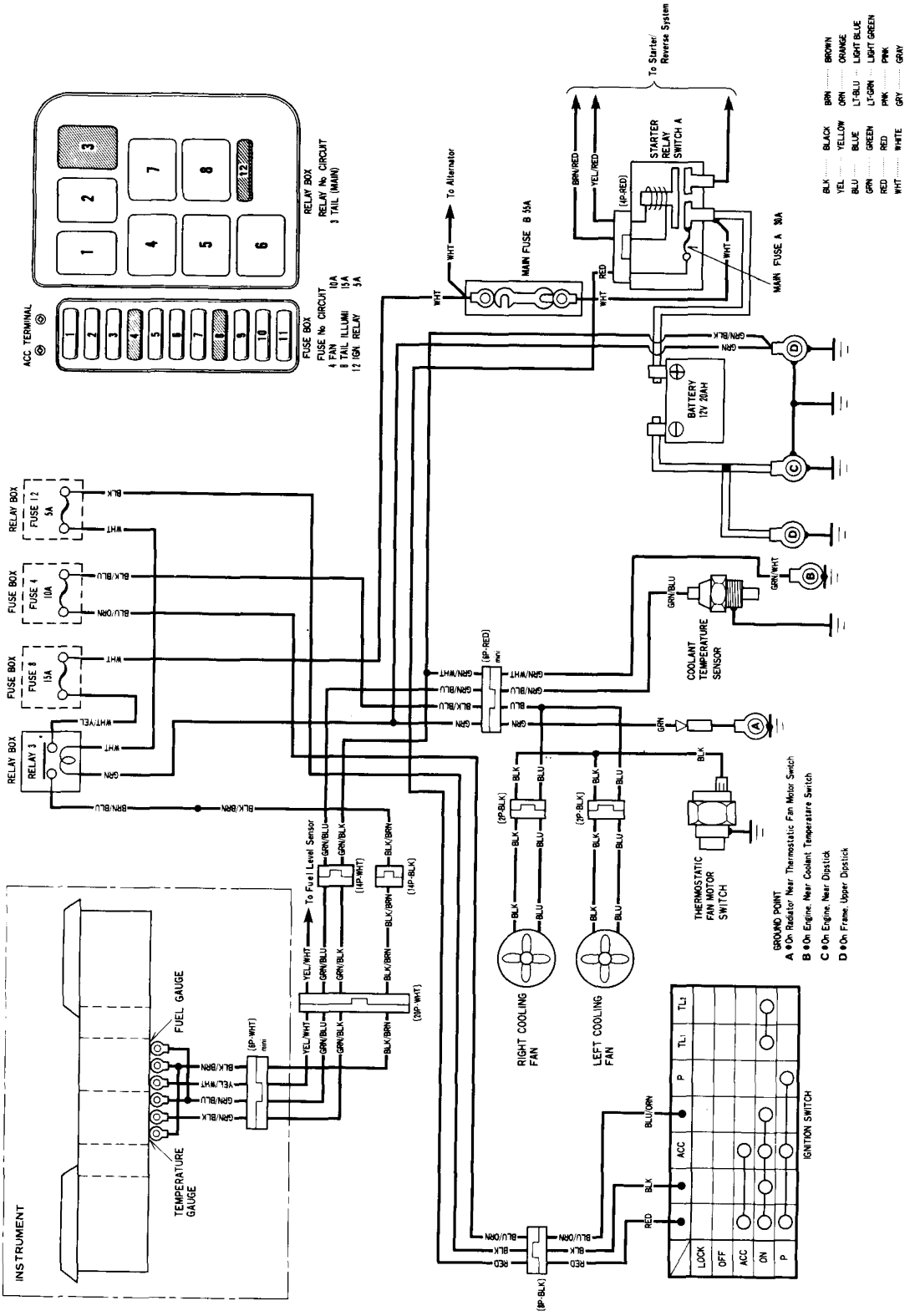
NOTE

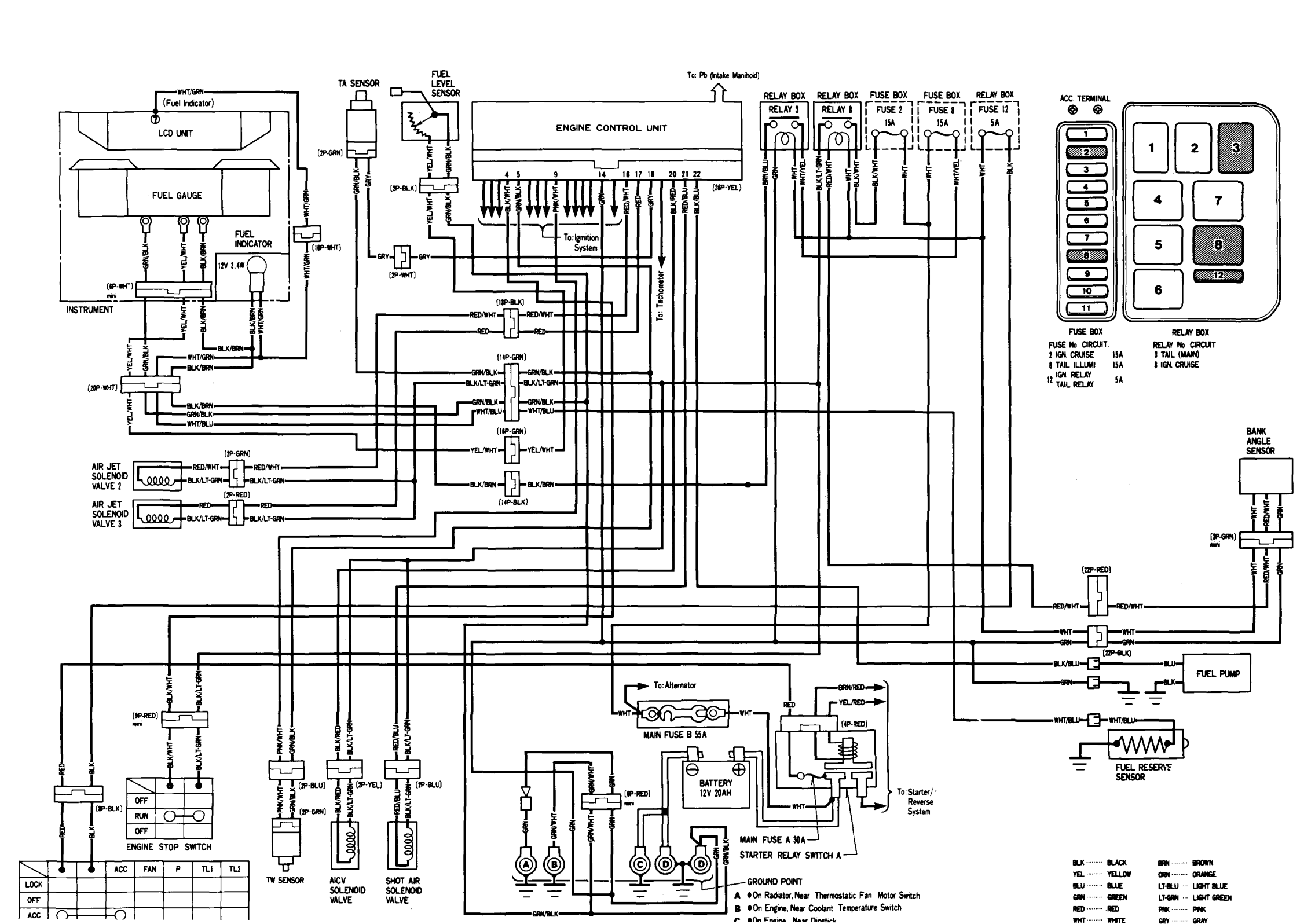
- Connect terminals to proper position according to color codes on the L.C.D. unit and instrument case.

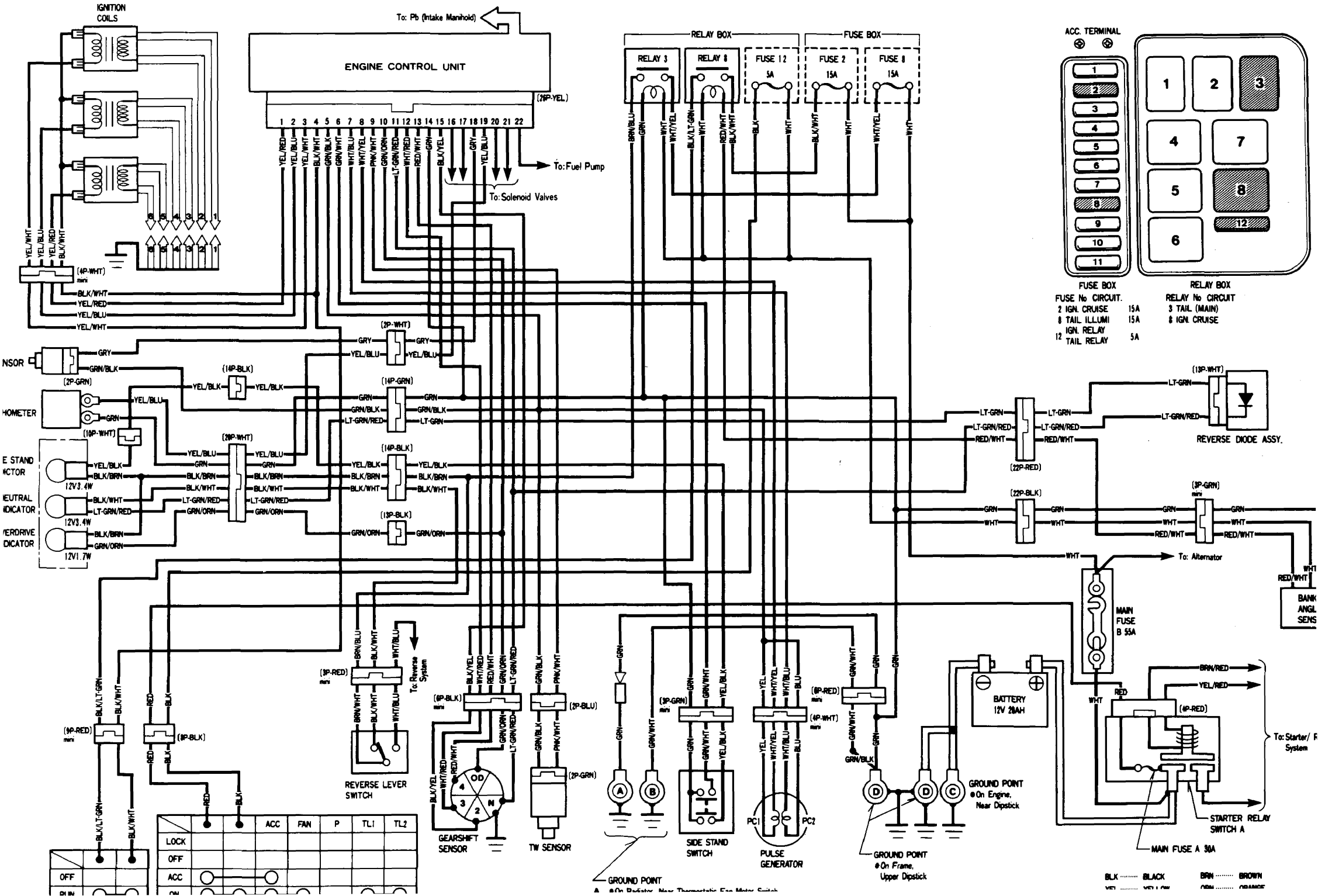


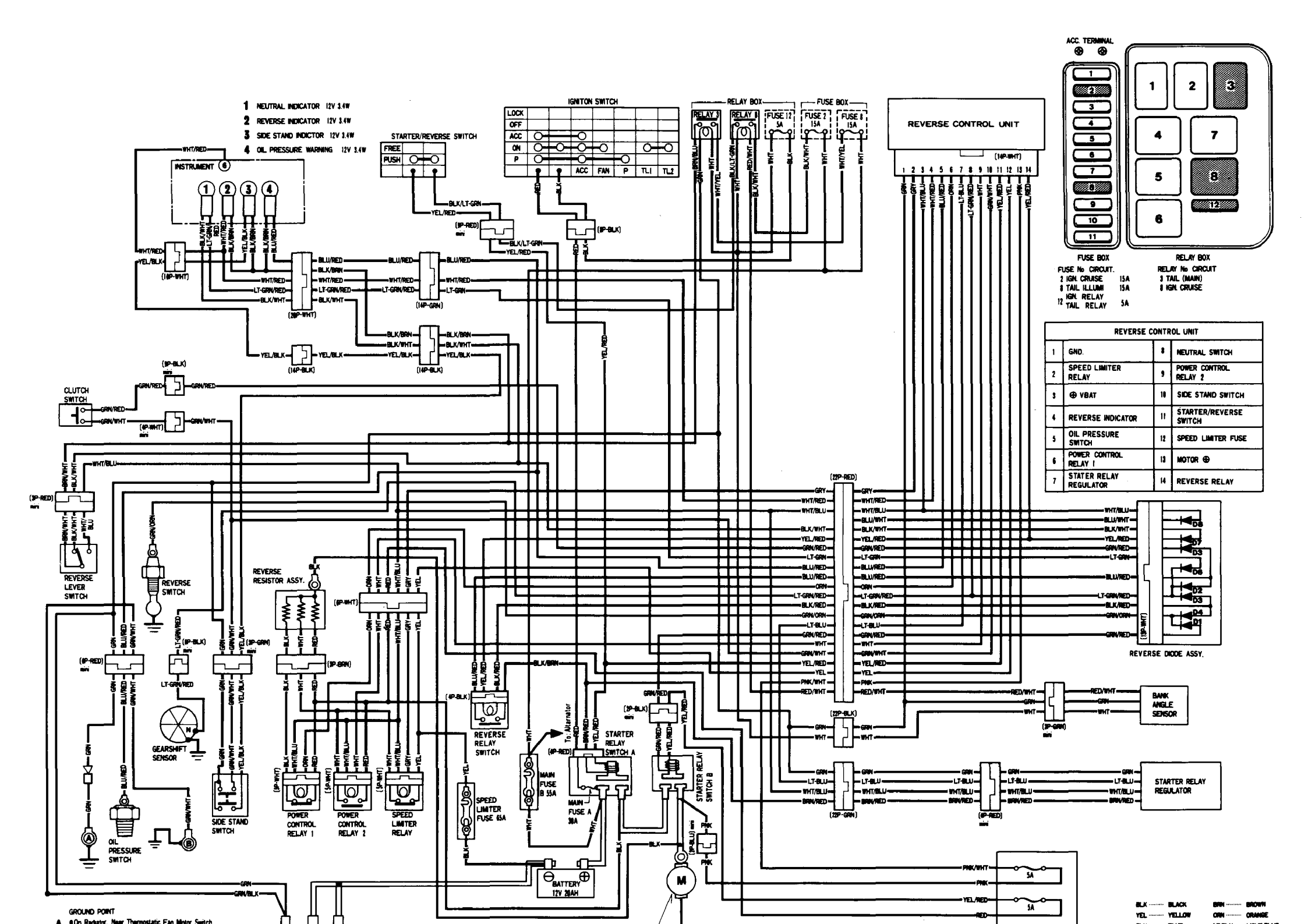
CIRCUIT DIAGRAM

COOLING SYSTEM




LCD UNIT
FUEL GAUGE
FUEL INDICATOR
12V 3.4W
INSTRUMENT
TA SENSOR
FUEL LEVEL SENSOR
ENGINE CONTROL UNIT
To: Pb (Intake Manifold)
To: Ignition System
To: Tachometer
RELAY BOX
RELAY 3
RELAY 8
FUSE BOX
FUSE 2
15A
FUSE 8
15A
RELAY BOX
FUSE 12
5A
ACC. TERMINAL
FUSE BOX
RELAY BOX
FUSE No CIRCUIT
2 IGN. CRUISE 15A
8 TAIL ILLUMI 15A
12 IGN. RELAY 5A
TAIL RELAY
RELAY No CIRCUIT
3 TAIL (MAIN)
8 IGN. CRUISE
BANK ANGLE SENSOR
AIR JET SOLENOID VALVE 2
AIR JET SOLENOID VALVE 3
FUEL PUMP
FUEL RESERVE SENSOR
To: Alternator
MAIN FUSE B 55A
BATTERY 12V 20AH
MAIN FUSE A 30A
STARTER RELAY SWITCH A
To: Starter/ Reverse System
ENGINE STOP SWITCH
OFF
RUN
OFF
LOCK
OFF
ACC
ACC
FAN
P
TL1
TL2
TW SENSOR
AICV SOLENOID VALVE
SHOT AIR SOLENOID VALVE
GROUND POINT
A On Radiator, Near Thermostatic Fan Motor Switch
B On Engine, Near Coolant Temperature Switch
C On Engine, Near Dipstick
BLK ..... BLACK
YEL ..... YELLOW
BLU ..... BLUE
GRN ..... GREEN
RED ..... RED
WHT ..... WHITE
BRN ..... BROWN
ORN ..... ORANGE
LT-BLU ... LIGHT BLUE
LT-GRN ... LIGHT GREEN
PNK ..... PINK
GRY ..... GRAY


IGNITION COILS
To: Pb (Intake Manifold)
ENGINE CONTROL UNIT
(26P-YEL)
To: Fuel Pump
To: Solenoid Valves
RELAY BOX
RELAY 3
RELAY 8
FUSE BOX
FUSE 12 5A
FUSE 2 15A
FUSE 8 15A
ACC. TERMINAL
FUSE BOX
FUSE No CIRCUIT.
2 IGN. CRUISE 15A
8 TAIL ILLUMI 15A
12 IGN. RELAY TAIL RELAY 5A
RELAY BOX
RELAY No CIRCUIT
3 TAIL (MAIN)
8 IGN. CRUISE
REVERSE DIODE ASSY.
To: Alternator
MAIN FUSE B 55A
BATTERY 12V 28AH
REVERSE LEVER SWITCH
GEARSHIFT SENSOR
TW SENSOR
SIDE STAND SWITCH
PULSE GENERATOR
GROUND POINT On Engine, Near Dipstick
GROUND POINT On Frame, Upper Dipstick
GROUND POINT
STARTER RELAY SWITCH A
MAIN FUSE A 30A
To: Starter/ R System
To: Reverse System
BLK ..... BLACK
BRN ..... BROWN



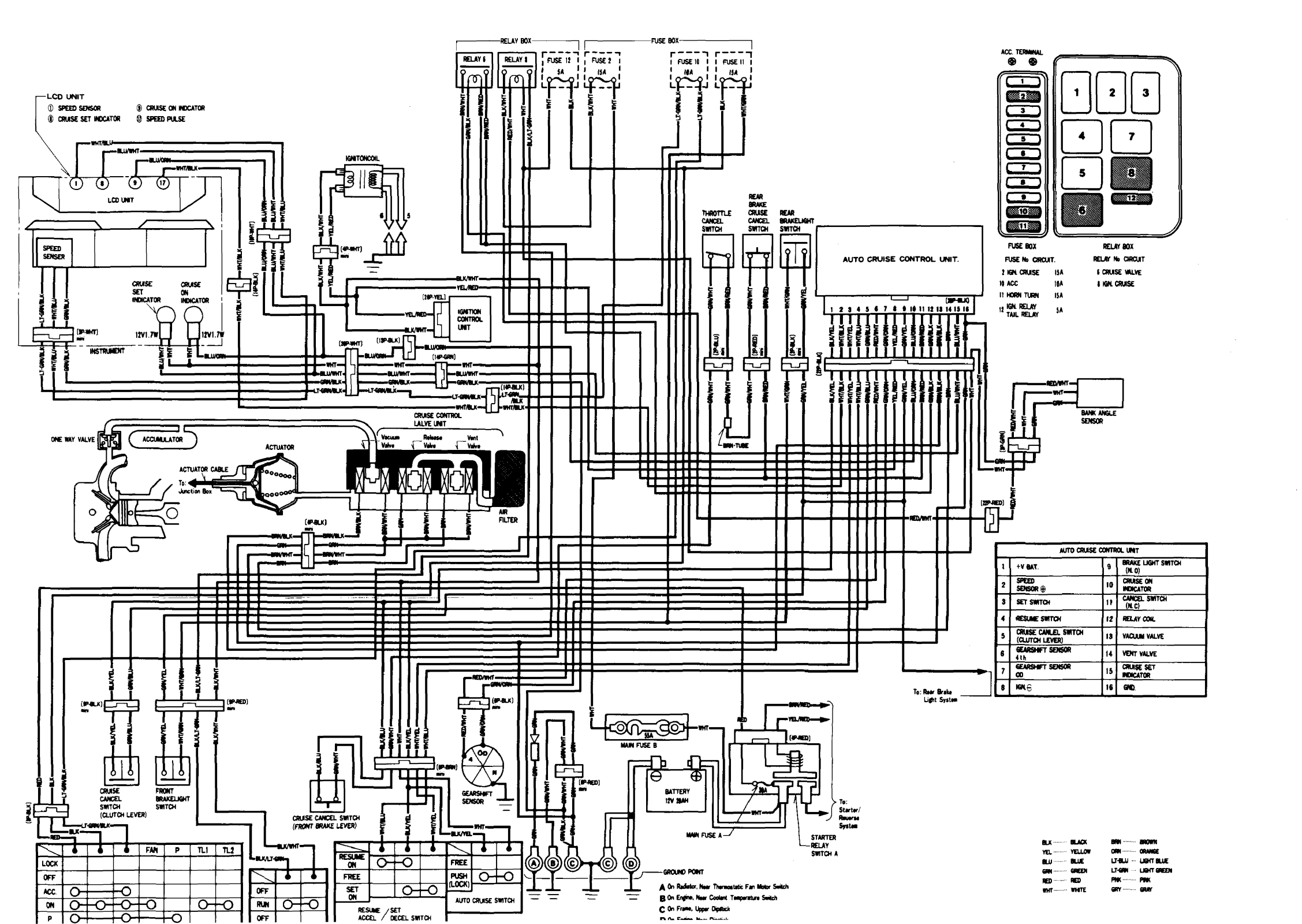
FUSE BOX

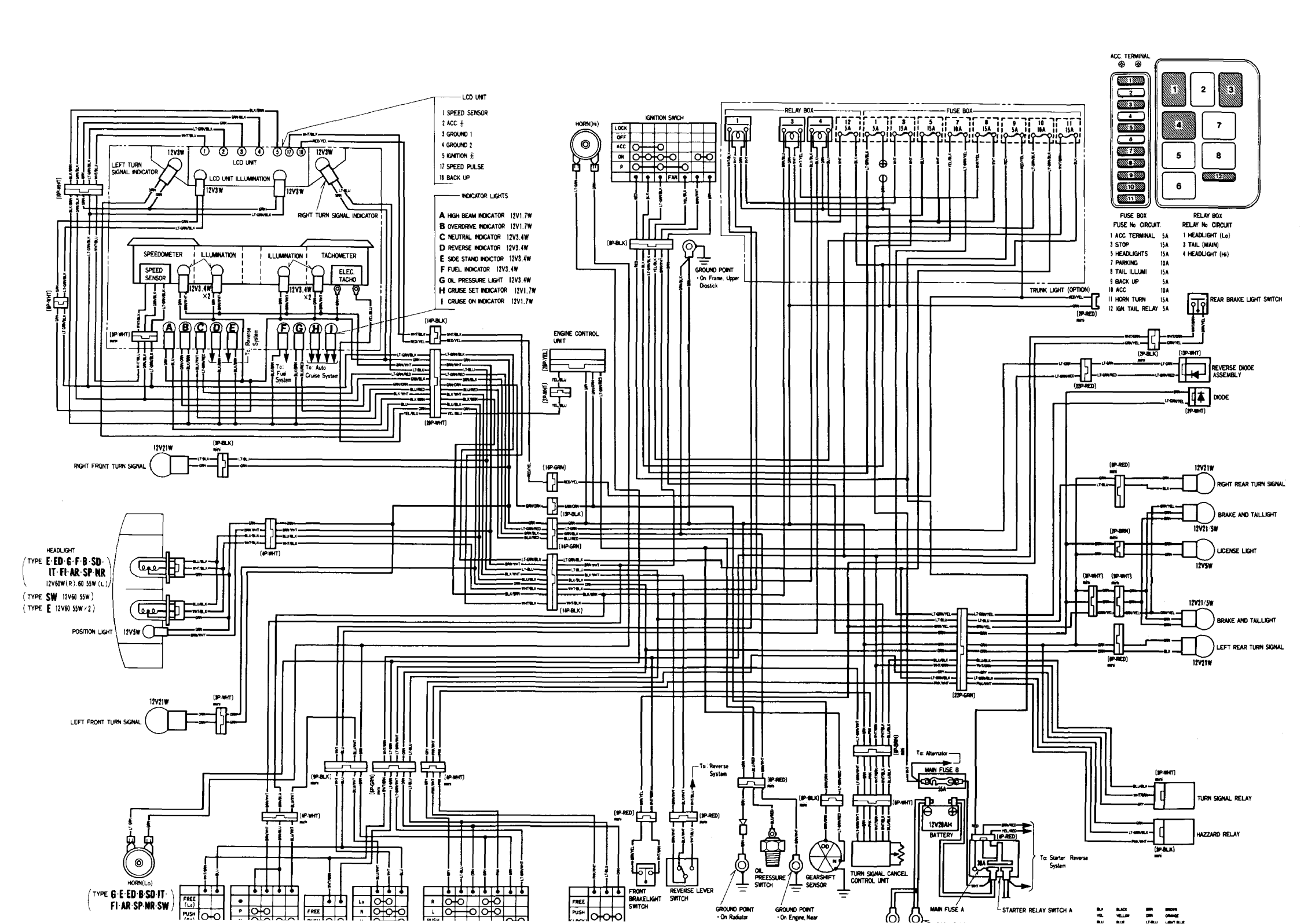
FUSE No	CIRCUIT	
2	IGN. CRUISE	15A
8	TAIL ILLUMI	15A
12	IGN. RELAY TAIL RELAY	5A

RELAY BOX

RELAY No	CIRCUIT
3	TAIL (MAIN)
8	IGN. CRUISE

REVERSE CONTROL UNIT			
1	GND.	8	NEUTRAL SWITCH
2	SPEED LIMITER RELAY	9	POWER CONTROL RELAY 2
3	⊕ VBAT	10	SIDE STAND SWITCH
4	REVERSE INDICATOR	11	STARTER/REVERSE SWITCH
5	OIL PRESSURE SWITCH	12	SPEED LIMITER FUSE
6	POWER CONTROL RELAY 1	13	MOTOR ⊕
7	STATER RELAY REGULATOR	14	REVERSE RELAY


LCD UNIT
① SPEED SENSOR
⑧ CRUISE SET INDICATOR
⑨ CRUISE ON INDICATOR
⑰ SPEED PULSE
RELAY BOX
FUSE BOX
RELAY 6
RELAY 8
FUSE 12 5A
FUSE 2 15A
FUSE 10 10A
FUSE 11 15A
IGNITION COIL
SPEED SENSER
CRUISE SET INDICATOR
CRUISE ON INDICATOR
12V1.7W
12V1.7W
INSTRUMENT
IGNITION CONTROL UNIT
THROTTLE CANCEL SWITCH
REAR BRAKE CRUISE CANCEL SWITCH
REAR BRAKELIGHT SWITCH
AUTO CRUISE CONTROL UNIT.
ACC. TERMINAL
FUSE BOX
RELAY BOX
FUSE No CIRCUIT.
2 IGN. CRUISE 15A
10 ACC 10A
11 HORN TURN 15A
12 IGN. RELAY TAIL RELAY 5A
RELAY No CIRCUIT
6 CRUISE VALVE
8 IGN. CRUISE
BANK ANGLE SENSOR
ONE WAY VALVE
ACCUMULATOR
ACTUATOR
ACTUATOR CABLE
To: Junction Box
CRUISE CONTROL VALVE UNIT
Vacuum Valve
Release Valve
Vent Valve
AIR FILTER
BRN-TUBE
To: Rear Brake Light System
AUTO CRUISE CONTROL UNIT
1 +V BAT.
2 SPEED SENSOR ⊕
3 SET SWITCH
4 RESUME SWITCH
5 CRUISE CAN/EL SWITCH (CLUTCH LEVER)
6 GEARSHIFT SENSOR 4th
7 GEARSHIFT SENSOR OD
8 IGN.⊖
9 BRAKE LIGHT SWITCH (N.O)
10 CRUISE ON INDICATOR
11 CANCEL SWITCH (N.C)
12 RELAY COIL
13 VACUUM VALVE
14 VENT VALVE
15 CRUISE SET INDICATOR
16 GND.
CRUISE CANCEL SWITCH (CLUTCH LEVER)
FRONT BRAKELIGHT SWITCH
CRUISE CANCEL SWITCH (FRONT BRAKE LEVER)
GEARSHIFT SENSOR
MAIN FUSE B
MAIN FUSE A
BATTERY 12V 28AH
STARTER RELAY SWITCH A
To: Starter/ Reverse System
LOCK
OFF
ACC.
ON
P
FAN
P
TL1
TL2
OFF
RUN
OFF
RESUME ON
FREE
SET ON
RESUME ACCEL / SET DECEL SWITCH
FREE
PUSH (LOCK)
AUTO CRUISE SWITCH
GROUND POINT
A On Radiator, Near Thermostatic Fan Motor Switch
B On Engine, Near Coolant Temperature Switch
C On Frame, Upper Dipstick
BLK BLACK
YEL YELLOW
BLU BLUE
GRN GREEN
RED RED
WHT WHITE
BRN BROWN
ORN ORANGE
LT-BLU LIGHT BLUE
LT-GRN LIGHT GREEN
PNK PINK
GRY GRAY


LCD UNIT
1 SPEED SENSOR
2 ACC
3 GROUND 1
4 GROUND 2
5 IGNITION
17 SPEED PULSE
18 BACK UP
INDICATOR LIGHTS
A HIGH BEAM INDICATOR 12V1.7W
B OVERDRIVE INDICATOR 12V1.7W
C NEUTRAL INDICATOR 12V3.4W
D REVERSE INDICATOR 12V3.4W
E SIDE STAND INDICTOR 12V3.4W
F FUEL INDICATOR 12V3.4W
G OIL PRESSURE LIGHT 12V3.4W
H CRUISE SET INDICATOR 12V1.7W
I CRUISE ON INDICATOR 12V1.7W
LEFT TURN SIGNAL INDICATOR
LCD UNIT ILLUMINATION
RIGHT TURN SIGNAL INDICATOR
SPEEDOMETER
ILLUMINATION
TACHOMETER
SPEED SENSOR
ELEC. TACHO
To: Reverse System
To: Fuel System
To: Auto Cruise System
RIGHT FRONT TURN SIGNAL
LEFT FRONT TURN SIGNAL
HEADLIGHT
(TYPE E·ED·G·F·B·SD·IT·FI·AR·SP·NR 12V60W(R)·60 55W(L))
(TYPE SW 12V60 55W)
(TYPE E 12V60 55W×2)
POSITION LIGHT
HORN(Lo)
(TYPE G·E·ED·B·SD·IT·FI·AR·SP·NR·SW)
HORN(Hi)
IGNITION SWICH
LOCK
OFF
ACC
ON
P
FAN
RELAY BOX
FUSE BOX
GROUND POINT · On Frame, Upper Diostock
ENGINE CONTROL UNIT
TRUNK LIGHT (OPTION)
REAR BRAKE LIGHT SWITCH
REVERSE DIODE ASSEMBLY
DIODE
RIGHT REAR TURN SIGNAL
BRAKE AND TAILLIGHT
LICENSE LIGHT
LEFT REAR TURN SIGNAL
FRONT BRAKELIGHT SWITCH
REVERSE LEVER SWITCH
OIL PREESSURE SWITCH
GEARSHIFT SENSOR
TURN SIGNAL CANCEL CONTROL UNIT
GROUND POINT · On Radiator
GROUND POINT · On Engine, Near
To: Alternator
MAIN FUSE B
BATTERY
MAIN FUSE A
STARTER RELAY SWITCH A
To: Starter Reverse System
TURN SIGNAL RELAY
HAZZARD RELAY
ACC TERMINAL
FUSE BOX
FUSE No CIRCUIT
1 ACC TERMINAL 5A
3 STOP 15A
5 HEADLIGHTS 15A
7 PARKING 10A
8 TAIL ILLUMI 15A
9 BACK UP 5A
10 ACC 10A
11 HORN TURN 15A
12 IGN. TAIL RELAY 5A
RELAY BOX
RELAY No CIRCUIT
1 HEADLIGHT (Lo)
3 TAIL (MAIN)
4 HEADLIGHT (Hi)
BLK BLACK
BRN BROWN
YEL YELLOW
ORN ORANGE
BLU BLUE
LT-BLU LIGHT BLUE

Paper Book Part No. 67MN500X

HOW TO USE THIS MANUAL

This addendum contains information for GL1500 (M). Refer to GL1500 SHOP MANUAL (No. 67MN500, No. 67MN500Z and 67MN500Y) for service procedures and data not included in this addendum.

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

CODE	AREA (TYPE)	CODE	AREA (TYPE)
E	U.K.	SD	Sweden
G	Germany	IT	Italy
F	France	FI	Finland
ED	Europe	AR	Austria
SW	Switzerland	U	Australia
B	Belgium	NR	Norway
SP	Spain		

Wire Color Abbreviations

The following abbreviations are used to identify wire colors in the circuit schematics:

BLK	black	LT GRN	light green
BLU	blue	ORN	orange
BRN	brown	PNK	pink
GRN	green	RED	red
GRY	gray	WHT	white
LT BLU	light blue	YEL	yellow

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SERVICE PUBLICATIONS OFFICE

CONTENT

IMPORTANT SAFETY NOTICE

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

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

NOTE: Gives helpful information.

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

SPECIFICATIONS

Dimensions	Overall length		2,630 mm (103.5 in) G model: 2,635 mm (103.7 in)
	Overall width		955 mm (37.6 in)
	Overall height		1,525 mm (60.0 in) G model: 1,335 mm (52.6) in
	Wheelbase		1,700 mm (66.9 in)
	Seat height		795 mm (31.3 in)
	Ground clearance		135 mm (5.3 in)
	Dry weight		366 kg (807 lbs) G model: 361 kg (796 lbs)
	Curb weight		394 kg (869 lbs) G model: 389 kg (858 lbs)
Frame	Frame type		Double cradle
	Front suspension	Travel	Telescopic, 140 mm (5.5 in)
	Rear suspension	Travel	Swing arm, 105 mm (4.1 in)
		Air pressure	0–400 kPa (0–4.0 kg/cm², 0–57 psi)
	Front tire	Size	130/70–18 63H
		Air pressure	225 kPa (2.25 kg/cm², 33 psi)
	Rear tire	Size	160/80–16 75H
		Air pressure	250 kPa (2.50 kg/cm², 36 psi): Driver only
			280 kPa (2.80 kg/cm², 41 psi): Driver and Passenger
	Front brake		Double disc brake
	Rear brake		Disc brake
	Fuel capacity		24.0 lit. (6.4 US gal, 5.3 Imp gal)
	Caster angle		30°
	Trail length		115 mm (4.5 in)
	Front fork oil capacity	Left	325 cm³ (10.9 US oz, 11.4 Imp oz)
		Right	320 cm³ (10.8 US oz, 11.2 Imp oz)
Engine	Engine type		Water cooled, 4 stroke O.H.C.
	Cylinder arrangement		Flat six
	Bore and stroke		71 x 64 mm (2.8 x 2.5 in)
	Displacement		1,520 cm³ (92.7 cu-in)
	Compression ratio		9.8:1 SW model: 8.6:1
	Valve train		Belt driven over head camshaft
	Oil capacity	At disassembly	4.3 lit. (4.5 US qt, 3.8 Imp qt)
		After draining	3.5 lit. (3.7 US qt, 3.1 Imp qt)
	Lubrication system		Forced and wet sump
	Cooling system capacity		4.1 lit. (4.3 US qt, 3.6 Imp qt)
	Cylinder compression		1,500 kPa (15.0 kg/cm², 213 psi)
	Engine weight		126 kg (278 lbs)
	Camshaft: Intake valve	Opens	5° ATDC (At 1 mm lift)
		Closes	30° ABDC (At 1 mm lift)
	Camshaft: Exhaust valve	Opens	40° BBDC (At 1 mm lift)
		Closes	5° BTDC (At 1 mm lift)
	Valve clearance	Intake/Exhaust	Hydraulic valve adjuster system
	Idle speed		800±80 min⁻¹ (rpm)
		SW model	900±50 min⁻¹ (rpm)

Carburetion	Carburetor type		CV down-draft dual carburetors
	Throttle bore		36 mm (1.4 in)
	Carburetor identification No.		VDG9A SW model: VDGWB
	Pilot screw opening		2 turns out SW model: 1-1/4 turns out
	Float level		7.5 mm (0.30 in)
	Main jet		pri: #95 (SW model #90) 2nd: #158
	Slow jet		#60
	Throttle grip free play		5–8 mm (3/16–5/16 in)
	Fuel pump flow capacity		640 cm^3 (22.5 Imp oz)/minute
	Carburetor vacuum difference		Within 40 mm (1.6 in) Hg of each other
Drive Train	Clutch type		Wet, multi-plate
	Transmission		5-speed, constant mesh
	Primary reduction ratio		1.592 (78/49)
	Secondary reduction ratio		0.971 (34/35)
	Gear ratio	1st 2nd 3rd 4th OD	2.667 (40/15) 1.722 (31/18) 1.273 (28/22) 0.964 (27/28) 0.759 (22/29)
	Final reduction ratio		2.833 (34/12)
	Gearshift pattern		Left foot operated return system 1–N–2–3–4–OD
	Final gear oil capacity (After disassembly)		170 cm^3 (5.7 US oz, 6.0 Imp oz)
Electrical	Ignition		Battery, Ignition (Full transistor)
	Ignition timing "F" mark		3.5° BTDC
	Starting system		Starting motor
	Alternator		AC generator, 0.55 kW/5,000 min^{-1} (rpm)
	Battery capacity		12 V–20 AH
	Spark plug: Standard	NGK	DPR7EA-9
		ND	X22EPR-U9
	Spark plug: For cold climate (Below 5°C, 41°F)	NGK	DPR6EA-9
		ND	X20EPR-U9
	Spark plug: For extended high speed riding	NGK	DPR8EA-9
		ND	X24EPR-U9
	Spark plug gap		0.8–0.9 mm (0.031–0.035 in)
	Firing order		1–4–5–2–3–6–1
	Fuses		5 A x 3, 10 A x 4, 15 A x 5 (fuse box) 30 A, 55 A (main fuses) 5 A x 3, 65 A (reverse fuses)
Lights	Headlight		12 V 60 W (R), 60/55 W (L) SW model: 12 V 60/55 W *E model:* 60/55 W x 2
	Position light		12 V 5W
	Turn signal light		12 V 21 W x 4
	Indicator light		12 V 3.4 W x 5 / 12 V 1.7 W x 4
	Turn signal indicator		12 V 3 W x 2
	Instrument illumination		12 V 3.4 W x 4
	LCD unit illumination		12 V 3 W x 2
	License light		12 V 5 W
	Brake and taillight		12 V 21/5 W x 2

SERVICE DATA

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
Engine weight (including carburetors)				126 kg (278 lbs)	—
Engine oil capacity	at engine assembly			4.3 lit (4.5 US qt, 3.8 Imp qt)	—
	at oil change			3.5 lit (3.7 US qt, 3.1 Imp qt)	—
	at oil filter and oil change			3.7 lit (3.9 US qt, 3.3 Imp qt)	—
Radiator coolant capacity	After disassembly			4.1 lit (4.3 US qt, 3.6 Imp qt)	—
	After draining (including reserve tank)			3.8 lit (4.0 US qt, 3.3 Imp qt)	—
	Reserve tank			0.55 lit (0.6 US qt, 0.5 Imp qt)	—
OIL PUMP	Main oil pump	Tip clearance		0.15 (0.006) max.	0.35 (0.014)
		Pump body clearance		0.15–0.23 (0.006–0.009)	0.43 (0.017)
		Pump side clearance		0.02–0.07 (0.001–0.003)	0.12 (0.005)
	Scavenge pump	Tip clearance		0.15 (0.006) max.	0.35 (0.014)
		Pump body clearance		0.15–0.22 (0.006–0.009)	0.42 (0.017)
		Pump side clearance		0.02–0.07 (0.001–0.003)	0.12 (0.005)
	Pressure relief valve	Relief pressure		470–570 kPa (4.7–5.7 kg/cm², 67–81 psi)	—
		Relief valve spring free length		90.8 (3.57)	84.0 (3.31)
	Oil pressure (at oil pressure switch)	Cold (At 35°C/95°F)	Idle speed	130 kPa (1.3 kg/cm², 18 psi)	—
			5,000 min⁻¹ (rpm)	500 kPa (5.0 kg/cm², 71 psi)	—
		Hot (At 80°C/176°F)	Idle speed	80 kPa (0.8 kg/cm², 11 psi)	—
			5,000 min⁻¹ (rpm)	500 kPa (5.0 kg/cm², 71 psi)	—
COOLING	Radiator cap relief pressure			75–105 kPa (0.75–1.05 kg/cm², 11–15 psi)	—
	Thermostat	Begins to open temperature		80°–84°C (176°–183°F)	—
		Fully opened temperature		93°–97°C (199°–206°F)	—
		Valve lift (heated to 95°C/5 minutes)		8.0 (0.315) min.	—
	Thermo valve		Starts to close	58°–62°C (136°–144°F)	—
	Thermostatic fan motor switch		Starts to close	98°–102°C (208°–216°F)	—
	Coolant temperature sensor resistance		60°C (140°F)	104 ohms	—
			85°C (185°F)	44 ohms	—
			110°C (230°F)	20 ohms	—
			120°C (248°F)	16 ohms	—
CYLINDER HEAD	Cylinder head warpage			—	0.10 (0.004)
	Valve stem O.D.		IN	5.475–5.490 (0.2156–0.2161)	5.45 (0.215)
			EX	5.455–5.470 (0.2148–0.2154)	5.44 (0.214)
	Valve guide I.D.		IN, EX	5.500–5.512 (0.2165–0.2170)	5.55 (0.219)
	Valve stem to guide clearance		IN	0.010–0.037 (0.0004–0.0015)	0.08 (0.003)
			EX	0.030–0.057 (0.0012–0.0022)	0.10 (0.004)
	Valve seat width			1.2 (0.05)	—
	Valve spring free length			44.6 (1.76)	43.3 (1.70)
	Valve spring preload/length			15.6–18.2/37.5 kg/mm (34.39–40.12/1.48 lbs/in)	—
	Rocker arm I.D.			21.000–21.021 (0.8268–0.8276)	21.05 (0.829)
	Rocker arm shaft O.D.			11.966–11.984 (0.4711–0.4718)	11.95 (0.470)
	Rocker arm lobe		I.D.	11.996–12.031 (0.4723–0.4734)	12.07 (0.475)
			O.D.	20.945–20.980 (0.8246–0.8260)	20.93 (0.824)
	Hydraulic valve adjuster compression stroke with kerosene			0–0.30 (0–0.012)	0.30 (0.012) max.

Unit: mm (in)

ITEM				STANDARD	SERVICE LIMIT
CYLINDER HEAD	Camshaft	Cam lobe height		36.110–36.190 (1.4217–1.4248)	35.9 (1.41)
		Runout (at center journal)		—	0.10 (0.004)
		Journal O.D.	Both middles	26.934–26.955 (1.0604–1.0612)	26.91 (1.059)
			Both ends	26.949–26.970 (1.0610–1.0618)	26.91 (1.059)
		Holder journal I.D.		27.000–27.021 (1.0630–1.0638)	27.05 (1.065)
		Journal oil clearance	Both middles	0.045–0.087 (0.0018–0.0034)	0.14 (0.006)
			Both ends	0.030–0.072 (0.0012–0.0028)	0.14 (0.006)
CLUTCH	Clutch master cylinder	Cylinder I.D.		15.870–15.913 (0.6248–0.6265)	15.93 (0.627)
		Piston O.D.		15.827–15.854 (0.6231–0.6242)	15.82 (0.623)
	Clutch	Plate warpage		—	0.30 (0.012)
		Disc thickness		3.72–3.88 (0.146–0.153)	3.5 (0.14)
		Clutch spring free height		5.38 (0.212)	5.1 (0.20)
OUTPUT SHAFT	Damper spring free length			60.82 (2.394)	57.0 (2.24)
	Shaft O.D.			22.008–22.021 (0.8665–0.8670)	21.99 (0.866)
	Collar		I.D.	22.026–22.041 (0.8672–0.8678)	22.05 (0.868)
			O.D.	25.959–25.980 (1.0220–1.0228)	25.95 (1.022)
	Driven gear I.D.			26.000–26.016 (1.0236–1.0242)	26.03 (1.025)
GEAR-SHIFT	Shift fork shaft O.D.			13.966–13.984 (0.5498–0.5506)	13.90 (0.547)
	Shift fork		I.D.	14.000–14.021 (0.5512–0.5520)	14.04 (0.553)
			Claw thickness	5.93–6.00 (0.233–0.236)	5.6 (0.22)
TRANS-MISSION	Gear I.D.		C2, C3, M4, M5	34.000–34.016 (1.3386–1.3392)	34.04 (1.340)
	Gear bushing O.D.		C2, C3, M4/M5	33.940–33.965 (1.3362–1.3372)	33.92 (1.335)
	Gear-to-bushing clearance			0.035–0.076 (0.0014–0.0030)	0.10 (0.004)
CYLINDER, PISTON	Cylinder compression pressure			1300–1700 kPa (13.0–17.0 kg/cm², 185–242 psi)	1000 kPa (10.0 kg/cm², 142 psi)
	Cylinder	I.D.		71.010–71.025 (2.7957–2.7963)	71.1 (2.80)
		Out-of-round		—	0.15 (0.006)
		Taper		—	0.05 (0.002)
		Top warpage		—	0.05 (0.002)
	Piston	O.D. (at skirt)		70.960–70.990 (2.7937–2.7949)	70.85 (2.789)
		Piston pin bore		18.010–18.016 (0.7091–0.7093)	18.03 (0.710)
		Piston-to-cylinder clearance		0.020–0.065 (0.0008–0.0026)	0.10 (0.004)
	Piston ring	End gap	Top and second	0.15–0.30 (0.006–0.012)	0.5 (0.02)
			Oil ring side rail	0.20–0.70 (0.008–0.028)	0.9 (0.04)
		Ring-to-ring land clearance	Top	0.025–0.055 (0.0010–0.0022)	0.10 (0.004)
			Second	0.015–0.045 (0.0006–0.0018)	0.10 (0.004)
	Piston pin	O.D. (at sliding surfaces)		17.994–18.000 (0.7084–0.7087)	18.99 (0.748)
		Pin-to-piston clearance		0.010–0.022 (0.0004–0.0009)	0.05 (0.002)
		Pin-to-rod interference		0.015–0.039 (0.0006–0.0015)	—

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
CRANKSHAFT	Main journal bearing oil clearance			0.020–0.038 (0.0008–0.0015)	0.06 (0.002)
	Crankpin bearing oil clearance			0.027–0.045 (0.0011–0.0018)	0.06 (0.002)
	Crankshaft runout (at center journal)			—	0.03 (0.001)
	Connecting rod side clearance			0.15–0.30 (0.006–0.012)	0.40 (0.016)
	Connecting rod small end I.D.			18.009–18.027 (0.7090–0.7097)	18.04 (0.710)
	Crankpin and main journal		Taper	—	0.003 (0.0001)
			Out-of-round	—	0.005 (0.0002)
WHEELS	Wheel axle runout			—	0.2 (0.01)
	Wheel rim runout		Axial	—	2.0 (0.08)
			Radial	—	2.0 (0.08)
	Tire tread depth		Front	—	1.5 (0.06)
			Rear	—	2.0 (0.08)
SUSPENSION	Rear suspension air pressure			0–400 kPa (0–4.0 kg/cm^2, 0–57 psi)	—
	Front fork spring free length		Spring A	192.9 (7.59)	189.0 (7.44)
			Spring B	386.3 (15.21)	378.6 (14.91)
	Front fork oil capacity		Left	325 cm^3 (10.9 US oz, 11.4 Imp oz)	—
			Right	320 cm^3 (10.8 US oz, 11.2 Imp oz)	—
	Front fork oil level (from the top of tube)			239 (9.4)	—
	Front fork oil			ATF	—
	Fork tube runout			—	0.2 (0.01)
	Left shock absorber spring free length (Rear)			280.7 (11.05)	274.5 (10.81)
	Right shock absorber oil capacity			140 cm^3 (4.7 US oz, 4.9 Imp oz)	—
	Right shock absorber oil			ATF	—
FINAL DRIVE	Final gear oil	Recommended oil		Hypoid gear oil, SAE #80	—
		Capacity	At assembly	170 cm^3 (5.7 US oz, 6.0 Imp oz)	—
			After draining	140 cm^3 (4.7 US oz, 4.9 Imp oz)	—
	Final gear backlash			0.05–0.15 (0.002–0.006)	0.3 (0.01)
		Difference at 3 points		—	0.10 (0.004)
	Ring gear-to-stop pin clearance			0.30–0.60 (0.012–0.024)	—
BRAKES	Front brake master cylinder	Cylinder I.D.		12.700–12.743 (0.5000–0.5017)	12.755 (0.5022)
		Piston O.D.		12.684–12.657 (0.4980–0.4983)	12.645 (0.4978)
	Front brake caliper	Left	Cylinder I.D.	25.400–25.450 (1.0000–1.0020)	25.460 (1.0024)
			Piston O.D.	25.335–25.368 (0.9974–0.9987)	25.310 (0.9965)
		Right	Cylinder I.D.	30.230–30.280 (1.1902–1.1921)	30.290 (1.1925)
			Piston O.D.	30.165–30.198 (1.1876–1.1889)	30.140 (1.1866)
	Front brake disc	Thickness		5.8–6.2 (0.23–0.24)	5.0 (0.20)
		Runout		—	0.3 (0.01)
	Front brake pad thickness			5.5 (0.22)	1.0 (0.04)
	Rear brake master cylinder	Cylinder I.D.		15.870–15.913 (0.6248–0.6265)	15.925 (0.6270)
		Piston O.D.		15.827–15.854 (0.6231–0.6242)	15.815 (0.6226)
		Brake rod clevis installed length		100 (3.9)	—
	Rear brake caliper	Cylinder I.D.		32.030–32.080 (1.2610–1.2630)	32.090 (1.2634)
		Piston O.D.		31.948–31.998 (1.2578–1.2598)	31.940 (1.2575)
	Rear brake disc	Thickness		7.3–7.7 (0.29–0.30)	6.0 (0.24)
		Runout		—	0.3 (0.01)
	Rear brake pad thickness			6.5 (0.26)	1.0 (0.04)
	Brake fluid (front/rear)			DOT 4	—

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
CHARGING	Battery capacity			12 V−20 AH	—
	Battery specific gravity (At 20°C, 68°F)	Full charged		1.270−1.290	—
		Need charging		Below 1.260	—
	Battery charging current			2.0 Amperes max.	—
	Alternator	Capacity		0.55 kW/5,000 min^{-1} (rpm)	—
		Stator coil resistance		0.1−0.3 ohms (20°C, 68°F)	—
		Rotor coil resistance		2.9−4.0 ohms (20°C, 68°F)	—
		Rotor coil slip ring O.D.		27.0 (1.06)	26.0 (1.02)
		Charging start		800−1,000 min^{-1} (rpm)	—
	Regulator/ Rectifier (into alternator)	Type		Transistorized non-adjustable reg./recti.	—
		Regulated voltage (at 20°C/68°F)	900 min^{-1} (rpm)	0−2 A, 13.5−15.5 V	—
			1,850 min^{-1} (rpm)	1.5 A min., 13.5−15.5 V	—
IGNITION	Firing order			1−4−5−2−3−6−1	—
	Ignition timing		F mark	3.5° BTDC at 800 ± 80 min^{-1} (rpm) (SW model 900 ± 50 min^{-1} (rpm))	—
		Vacuum advance	Advance start	60−160 mmHg (2.4−6.3 inHg)	—
			Advance cease	310−360 mmHg (12.2−14.2 inHg)	—
	Ignition coil resistance (at 20°C/68°F)	Primary coil		2.6−3.2 ohms	—
		Secondary coil	With spark plug wire	20.2−26.8 Kohms	—
			Without spark plug wire	11.7−14.3 Kohms	—
	Pulse generator coil resistance (At 20°C, 68°F)			400−500 ohms	—
	Tw sensor/Ta sensor resistance		20°C (68°F)	2.0−3.0 Kohms	—
			80°C (176°F)	200−400 ohms	—
STARTER/ REVERSE	Starter motor brush length			12.5 (0.49)	6.0 (0.24)
	Reverse System	Starter relay regulator/regulated current		0.7−1.0 A	—
		Resister	Between relay and unit terminals	0.06−0.09 ohms	—
			Between relay terminal and ground	0.1−0.2 ohms	—
ELECTRICAL	Oil pressure switch continuity pressure			10−20 kPa (0.1−0.2 kg/cm^2, 1−3 psi)	—
	Fuel level sensor resistance (at 20°C/68°F)		Empty	90−100 ohms	—
			Reserve	66−81 ohms	—
			Full	4−10 ohms	—

TORQUE VALUES

ENGINE

Item	Qty	Thread dia (mm)	Torque N•m	Torque kg-m	Torque ft-lb	Remarks
Spark plug	6	12	16	1.6	12	
Carburetor insulator band screw	4	5	5	0.5	3.6	
Intake manifold vacuum tube joint	4	5	2.8	0.28	2	
Coolant temperature sensor	1	PT 1/8	12	1.2	9	NOTE 1
Water hose clamp screw	2	4	2.0	0.2	1.4	
Thermostatic fan motor switch	1	16	18	1.8	13	
Tw sensor	1	12	28	2.8	20	
Reverse switch	1	10	12	1.2	9	
Reverse shifter shaft bolt	1	6	14	1.4	10	NOTE 2
LUBRICATION:						
Oil pressure switch	1	PT 1/8	12	1.2	9	NOTE 1
Engine oil drain bolt	1	14	38	3.8	27	
Engine oil filter cartrige	1	20	10	1.0	7	
Engine oil filter boss	1	20	18	1.8	13	NOTE 2
CYLINDER HEAD:						
Cylinder head bolt (9 mm bolt)	16	9	45	4.5	33	NOTE 3
Timing belt driven pulley bolt	2	8	27	2.7	20	
Camshaft holder bolt	16	8	20	2.0	14	
Hydraulic valve adjuster stopper plug	12	14	30	3.0	22	
Cylinder head cover bolt	12	6	12	1.2	9	
Timing belt tensioner bolt	4	8	26	2.6	19	NOTE 2
Cylinder head sealing bolt	6	18	45	4.5	33	NOTE 2
CLUTCH:						
Clutch hose/pipe oil bolt	3	10	30	3.0	22	
Clutch slave cylinder bleed valve	1	8	9	0.9	7	
Clutch bleed pipe bolt	1	6	12	1.2	9	NOTE 2
Clutch lifter plate bolt	4	6	10	1.0	7	
Clutch center lock nut	1	22	130	13.0	94	
Clutch outer lock nut	1	40	190	19.0	137	NOTE 2/5
ALTERNATOR:						
Front cover attaching screw	3	4	2	0.2	1.4	NOTE 2
Couple A mounting nut	1	14	58	5.8	42	NOTE 2
Couple B mounting nut	1	14	58	5.8	42	
REAR ENGINE CASE:						
Starter one-way clutch socket bolt	6	6	16	1.6	12	NOTE 2
Starter clutch mounting bolt	1	12	75	7.5	54	
Shift drum lock arm bolt (reverse system)	1	6	12	1.2	9	
Alternator drive gear bolt	6	8	27	2.7	20	NOTE 3
Final drive gear lock nut	1	22	190	19.0	137	NOTE 2/4/5
Output shaft lock nut	1	30	190	19.0	137	NOTE 5
Oil pump driven sprocket bolt	1	6	18	1.8	13	NOTE 2
GEARSHIFT:						
Shift arm lock bolt	1	8	25	2.5	18	
Shift drum center bolt	1	8	28	2.8	20	
Shift drum lock cam bolt	1	6	12	1.2	9	NOTE 2
Shift arm return spring pin	1	8	25	2.5	18	
CRANKCASE/CRANKSHAFT/TRANSMISSION:						
Crankcase bolt (10 mm)	8	10	35	3.5	25	NOTE 6
(8 mm)	4	8	26	2.6	19	
(6 mm)	10	6	12	1.2	9	
Crankcase sealing bolt (20 mm)	4	20	45	4.5	33	NOTE 2
(18 mm)	2	18	45	4.5	33	NOTE 2
Mainshaft lock nut	1	22	190	19.0	137	NOTE 4/5
Crankshaft main bearing cap bolt	8	10	60	6.0	43	NOTE 6
Connecting rod cap nut	8	8	32	3.2	23	NOTE 6
Timing belt drive pulley bolt	1	12	75	7.5	54	

NOTES:
1. Apply sealant to the threads.
2. Apply a locking agent to the threads.
3. Apply molybdenum disulfide oil to the threads and flange surfaces.
4. Left-hand threads.
5. Stake (2 plcs)
6. Apply oil to the threads and flange surfaces.
7. Torque wrench scale reading using a special tool.
8. Apply grease to the threads and flange surfaces.

FRAME

Item	Qty	Thread dia (mm)	Torque N•m	Torque kg-m	Torque ft-lb	Remarks
Engine mount nut	7	10	40	4.0	29	
Engine bracket bolt	4	8	25	2.5	18	
Subframe bolt (10 mm socket bolt)	4	10	40	4.0	29	
(10 mm flange bolt)	1	10	40	4.0	29	
(8 mm flange bolt)	1	8	25	2.5	18	
Exhaust pipe joint nut	12	6	10	1.0	7	
Side stand pivot	1	10	22	2.2	16	
Center stand pivot	1	8	18	1.8	13	
Chamber protector bolt	6	6	10	1.0	7	
Brake disc bolt	18	8	40	4.0	29	
HANDLEBAR:						
Handlebar upper holder bolt	4	8	25	2.5	18	NOTE 8
Front master cylinder holder bolt	2	6	12	1.2	9	
Clutch master cylinder holder bolt	2	6	12	1.2	9	
FRONT:						
Axle pinch bolt	4	8	22	2.2	16	
Axle bolt	1	14	90	9.0	65	
Steering stem nut	1	24	100	10.0	72	
Steering stem adjustment nut	1	26	19	1.9	14	See page 13-26
Anti-dive case socket bolt	8	6	8	0.8	6	NOTE 2
Fork bottom socket bolt	2	8	20	2.0	14	NOTE 2
Fork bolt	2	37	23	2.3	17	
Fork leg upper pinch bolt	2	7	11	1.1	8	
Fork leg lower pinch bolt	4	10	55	5.5	40	
REAR:						
Axle pinch bolt	1	8	32	3.2	23	
Axle nut	1	18	110	11.0	80	
Damper holder bolt	5	6	20	2.0	14	
Left shock absorber mount bolt (Upper)	1	8	23	2.3	17	
(Lower)	1	18	70	7.0	51	
Right shock absorber mount bolt (Upper)	1	8	23	2.3	17	
(Lower)	1	8	23	2.3	17	
Air hose bolt	3	10	6	0.6	4	
Air hose special bolt (with seat)	1	10	15	1.5	11	
Outlet air hose joint	2	8	6	0.6	4	
Air pressure sensor	1	8	10	1.0	7	
Air distributor solenoid valve mounting screw	4	5	3	0.3	2	
Swing arm right pivot bolt	1	30	100	10.0	72	
Swing arm left pivot bolt	1	30	19	1.9	14	
Swing arm left pivot lock nut	1	30	100	10.0	72	NOTE 7
FINAL DRIVE:						
Pinion bearing retainer	1	70	150	15.0	108	
Pinion joint nut	1	16	110	11.0	80	NOTE 2
Gear case cover bolt (10 mm)	2	10	63	6.3	46	NOTE 2
(8 mm)	6	8	26	2.6	19	
Final drive gear case mounting nut	4	10	65	6.5	47	
Final drive gear case filler cap	1	30	12	1.2	9	
Final drive gear case drain bolt	1	14	20	2.0	14	
Dust guard plate bolt	1	6	10	1.0	7	
Retainer lock washer bolt	1	6	10	1.0	7	
HYDRAULIC BRAKE:						
Caliper bleed valve	3	7	6	0.6	4	
Front caliper bracket bolt	2	8	23	2.3	17	
Anti-dive piston bolt	2	6	12	1.2	9	
Front pad pin plug	4	10	2.5	0.25	1.8	
Front pad pin	4	10	18	1.8	13	
Brake hose bolt	6	10	35	3.5	25	
Rear master cylinder mounting bolt	2	6	12	1.2	9	
Rear caliper retainer bolt	1	6	11	1.1	8	
Rear caliper bolt	1	8	23	2.3	17	
Rear caliper pin bolt	1	12	28	2.8	20	
Metal brake line nut	4	10	17	1.7	12	
Brake pedal bolt	1	8	25	2.5	18	

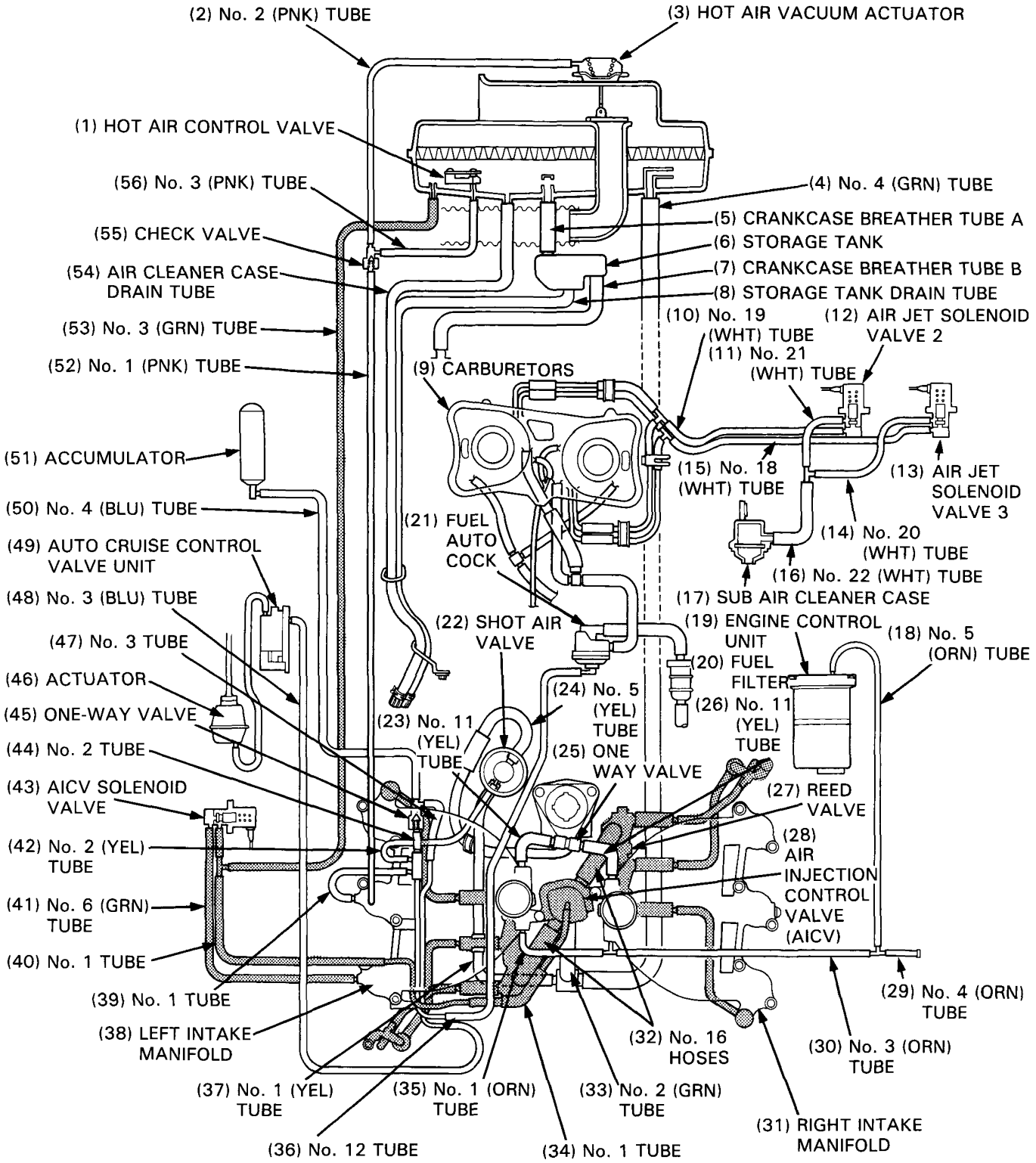
Item	Q'ty	Thread dia (mm)	Torque N•m	Torque kg-m	Torque ft-lb	Remarks
OTHER						
Side stand pivot bolt	1	10	22	2.2	16	
Center stand pivot bolt	1	8	18	1.8	13	
Passenger footrest bracket bolt	4	8	27	2.7	20	
Footrest cover	2	6	10	1.0	7	
Fairing inner cover bolt	2	6	10	1.0	7	
Air cleaner tube joint screw	2	5	0.3	0.03	0.2	
Starter motor cable nut	2	—	0.5	0.05	0.4	
Antenna lock nut	1	8	10	1.0	7	

Torque specifications listed above are for important fastners. Other should be tightened to standard torque values listed below.

STANDARD TORQUE VALUES

Item	Torque Values N•m (kg-m, ft-lb)	Item	Torque Values N•m (kg-m, ft-lb)
5 mm bolt and nut	5 (0.5, 4)	5 mm screw and 6 mm flange	4 (0.4, 3)
6 mm bolt and nut	10 (1.0, 7)	6 mm screw and 6 mm flange bolt with 8 mm head	9 (0.9, 7)
8 mm bolt and nut	22 (2.2, 16)	6 mm flange bolt and nut	12 (1.2, 9)
10 mm bolt and nut	35 (3.5, 25)	8 mm flange bolt and nut	27 (2.7, 20)
12 mm bolt and nut	55 (5.5, 40)	10 mm flange bolt and nut	40 (4.0, 29)

HOSES AND TUBES ROUTING/CONNECTION (▒▒: SW MODEL ONLY)



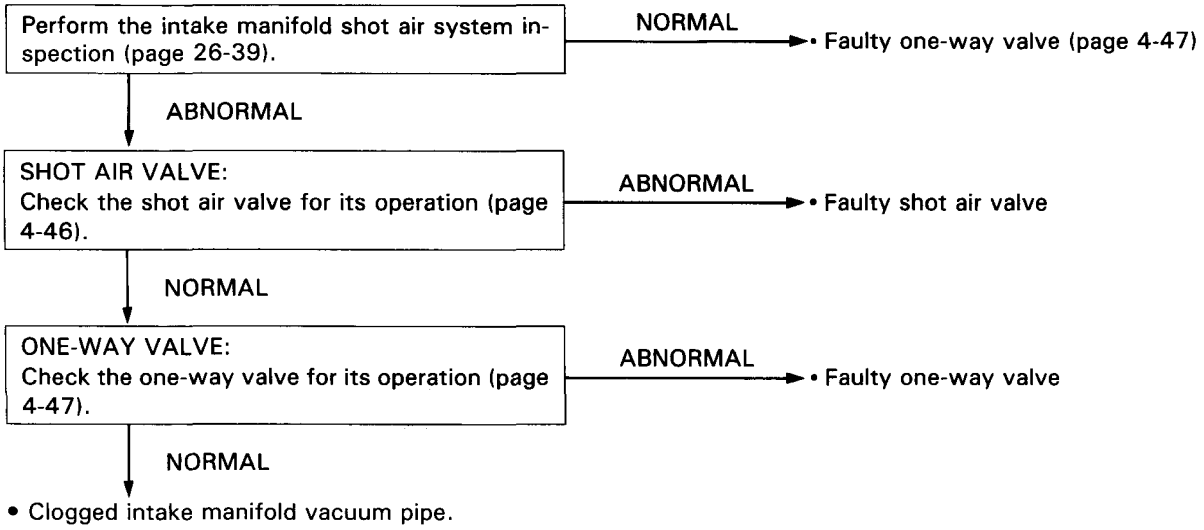
FUEL SYSTEM TROUBLESHOOTING

- **Intake Manifold Shot Air System**

NOTE

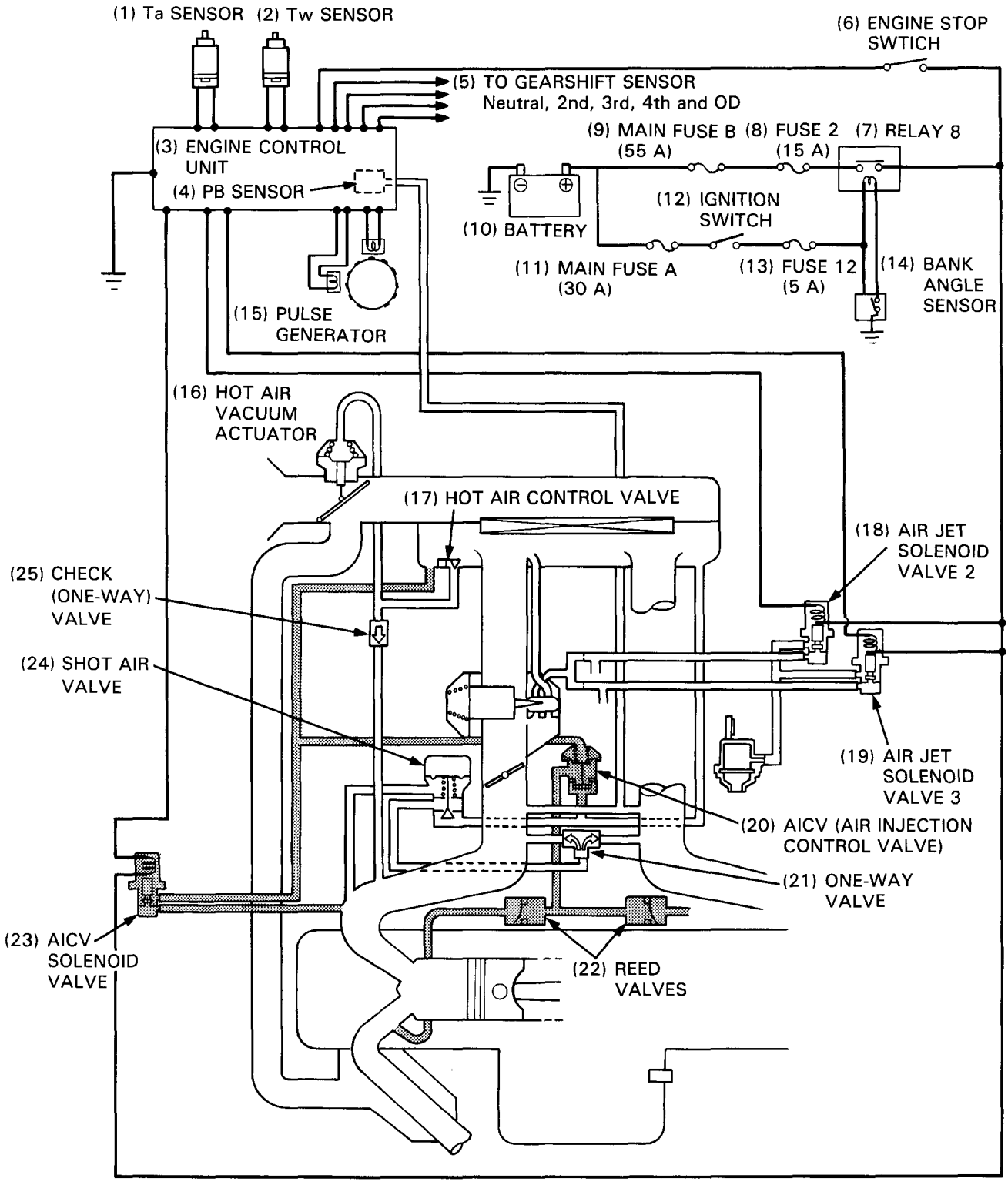
- Check the following tubes for disconnection or deterioration before troubleshooting.
  —No. 1, No. 4 (GRN), No. 1 (YEL), No. 2 (YEL), No. 5 (YEL) and No. 11 (YEL).

The engine speed will not drop smoothly and mildly.



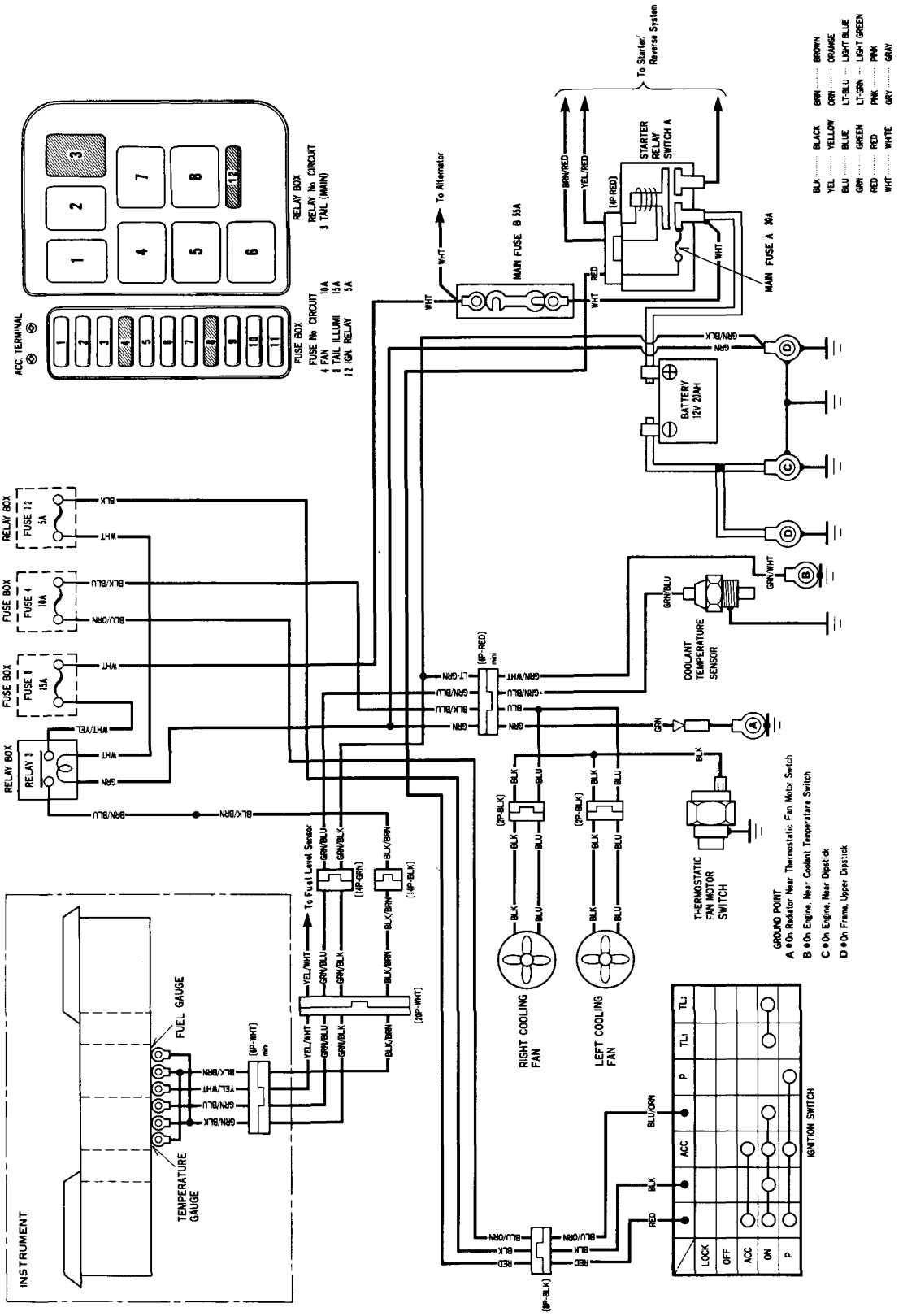
AIR SYSTEM CIRCUIT DIAGRAM

▒▒ : SW model only

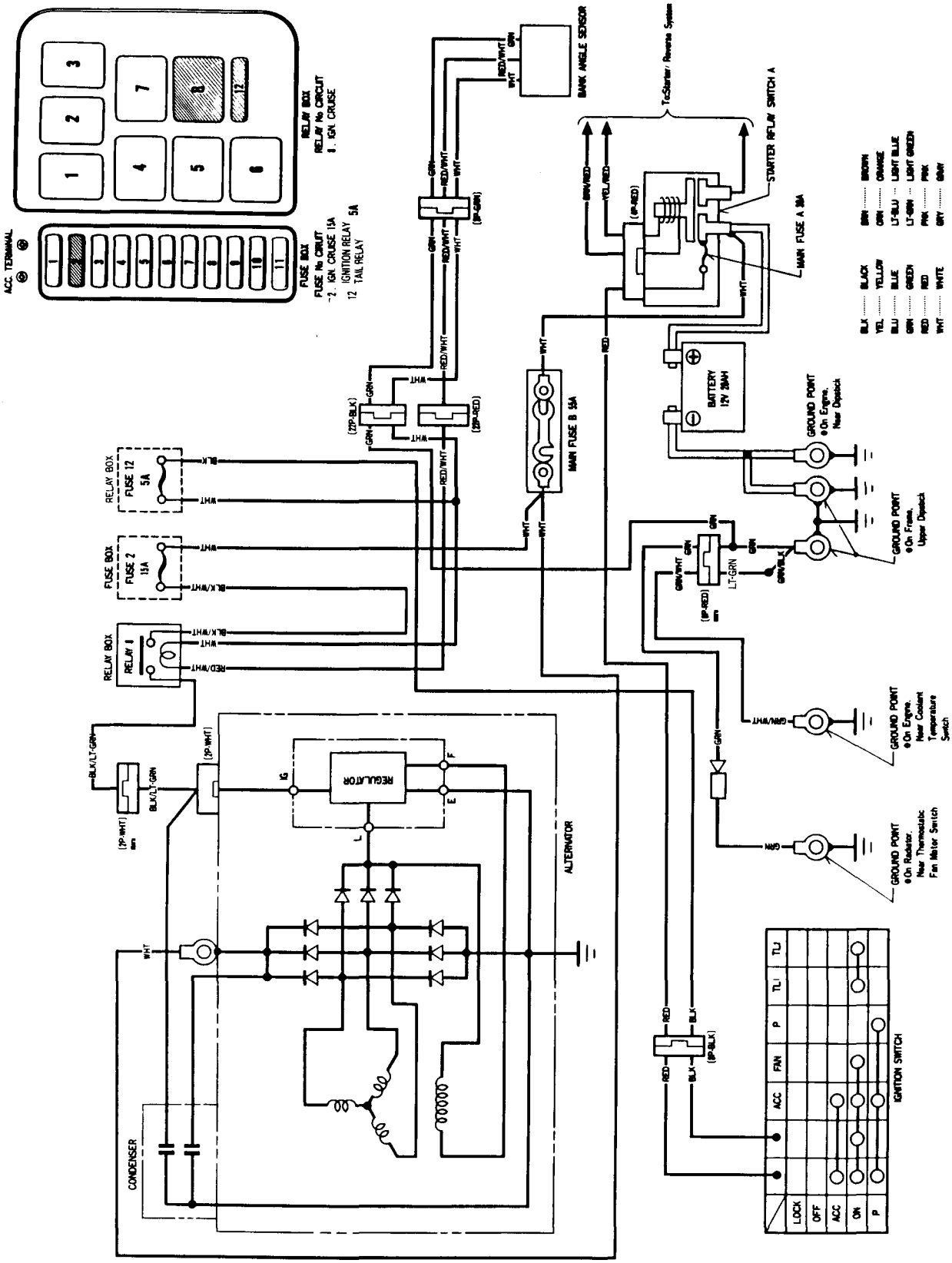


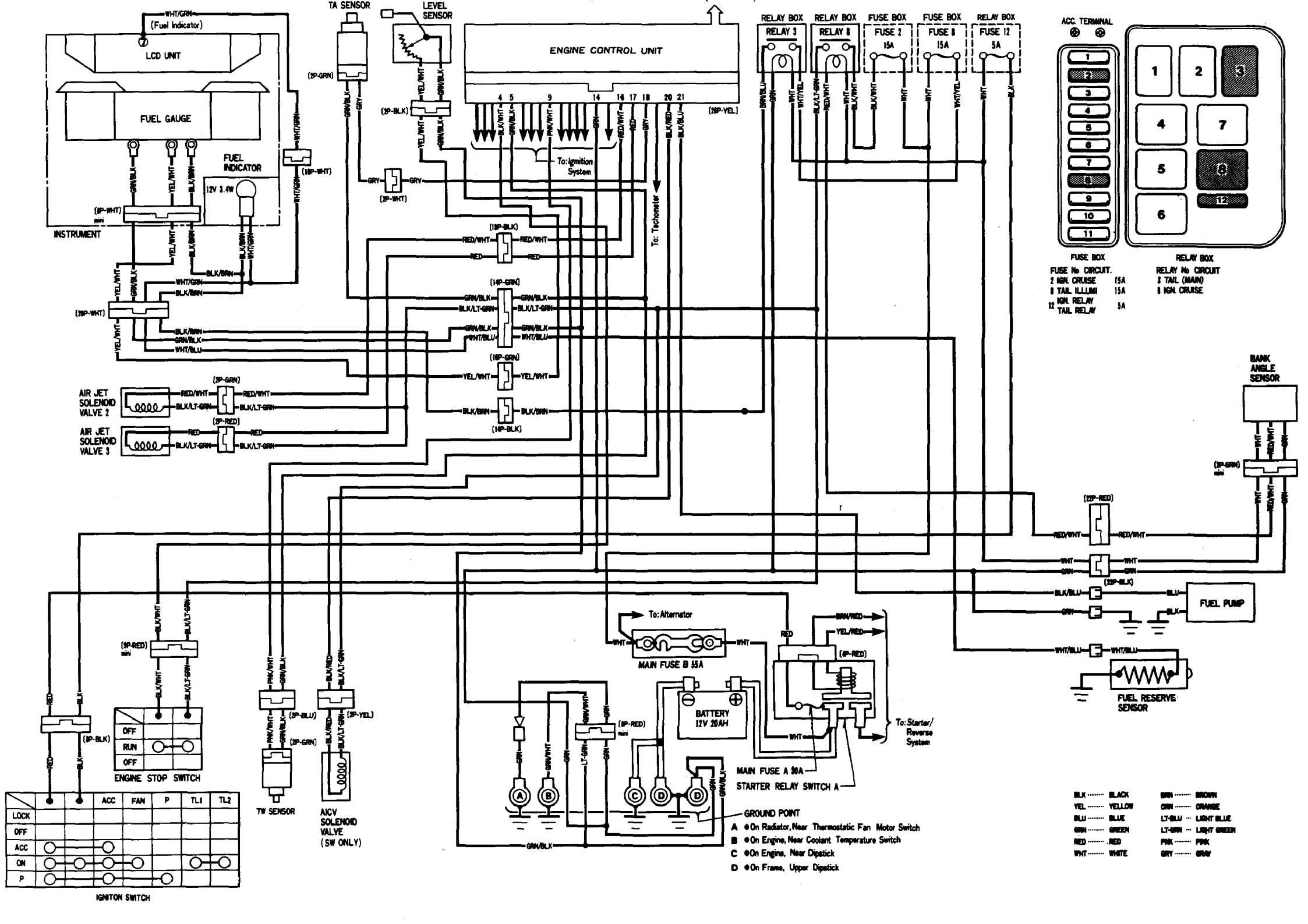
CIRCUIT DIAGRAM

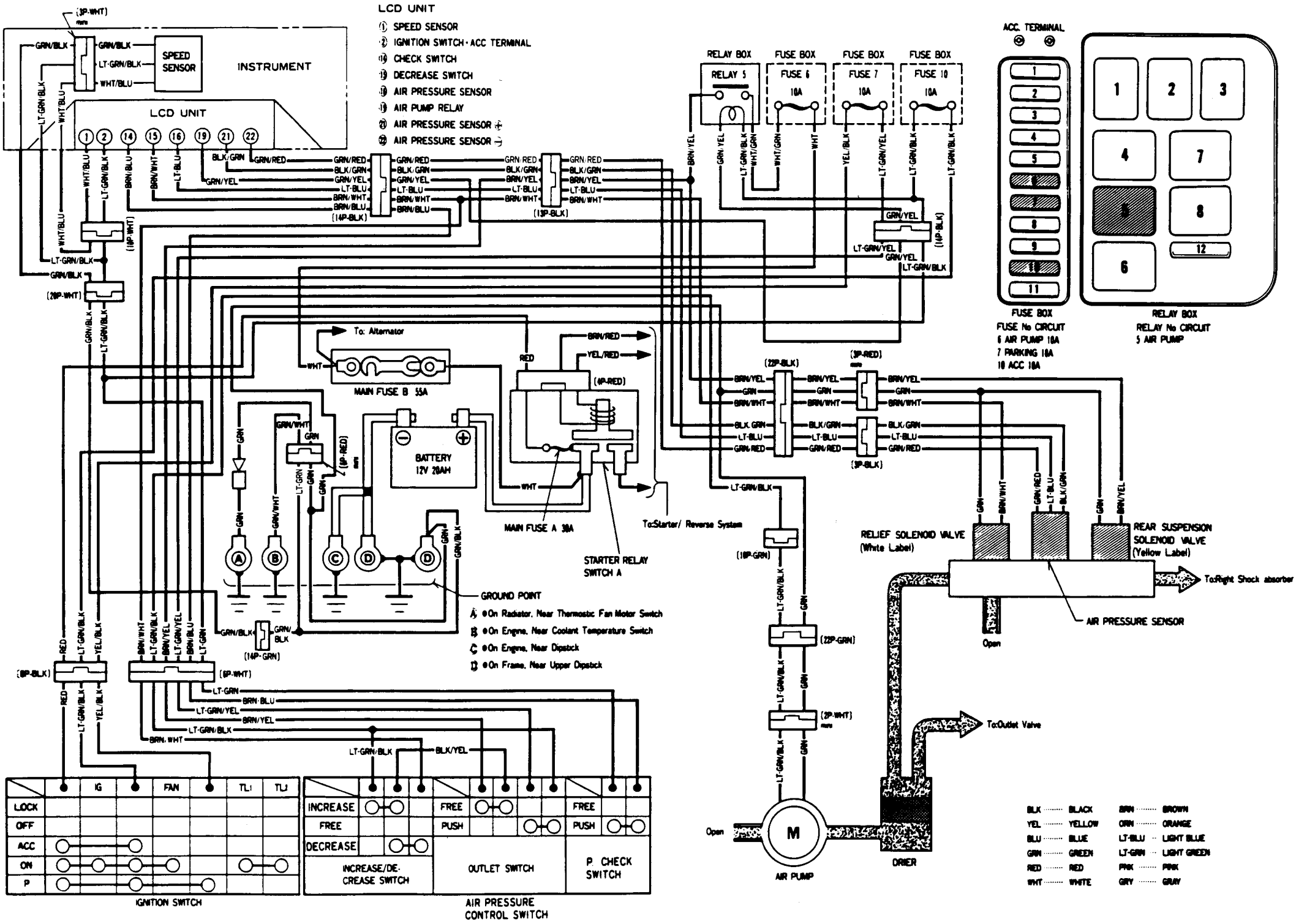
COOLING SYSTEM

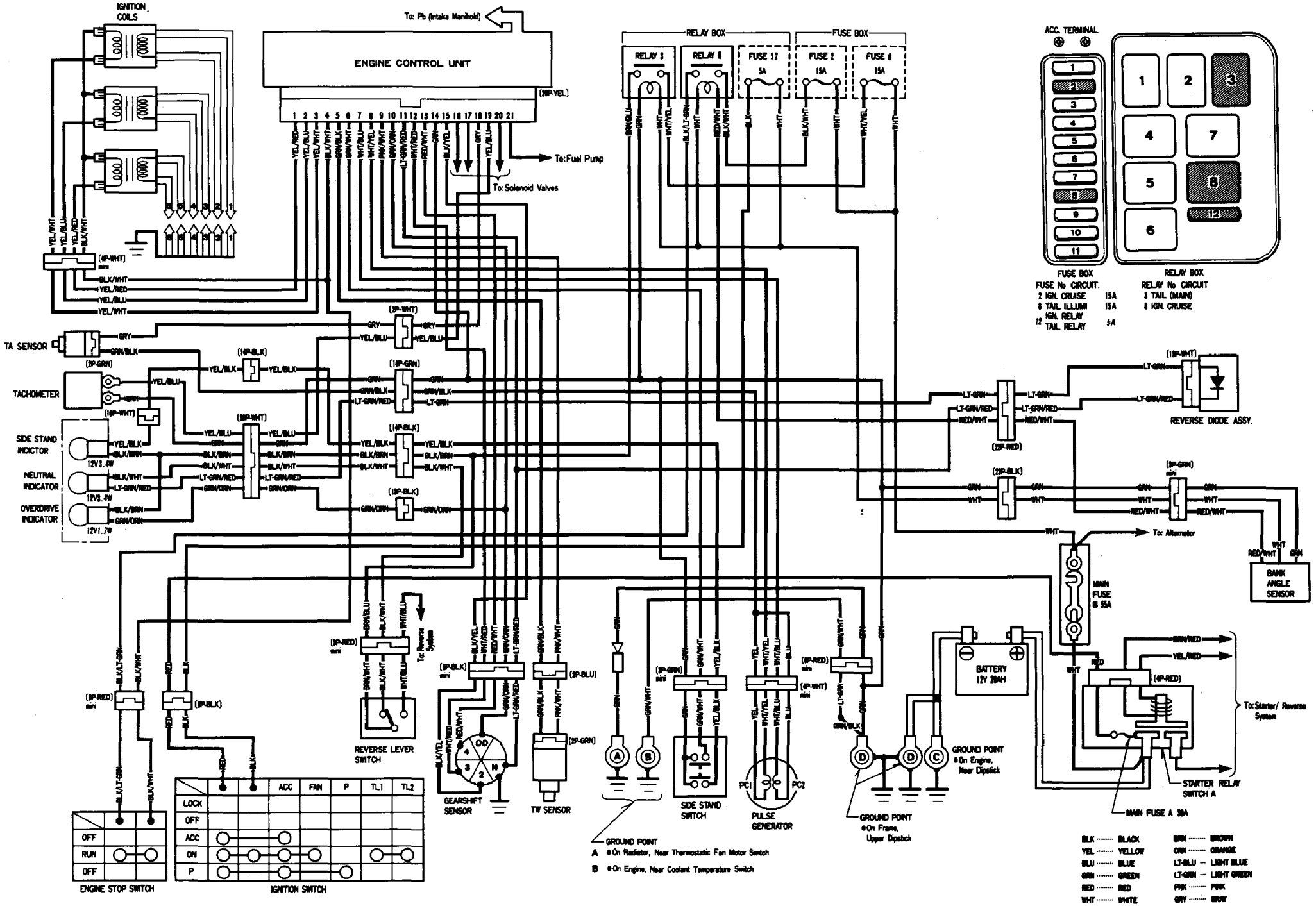


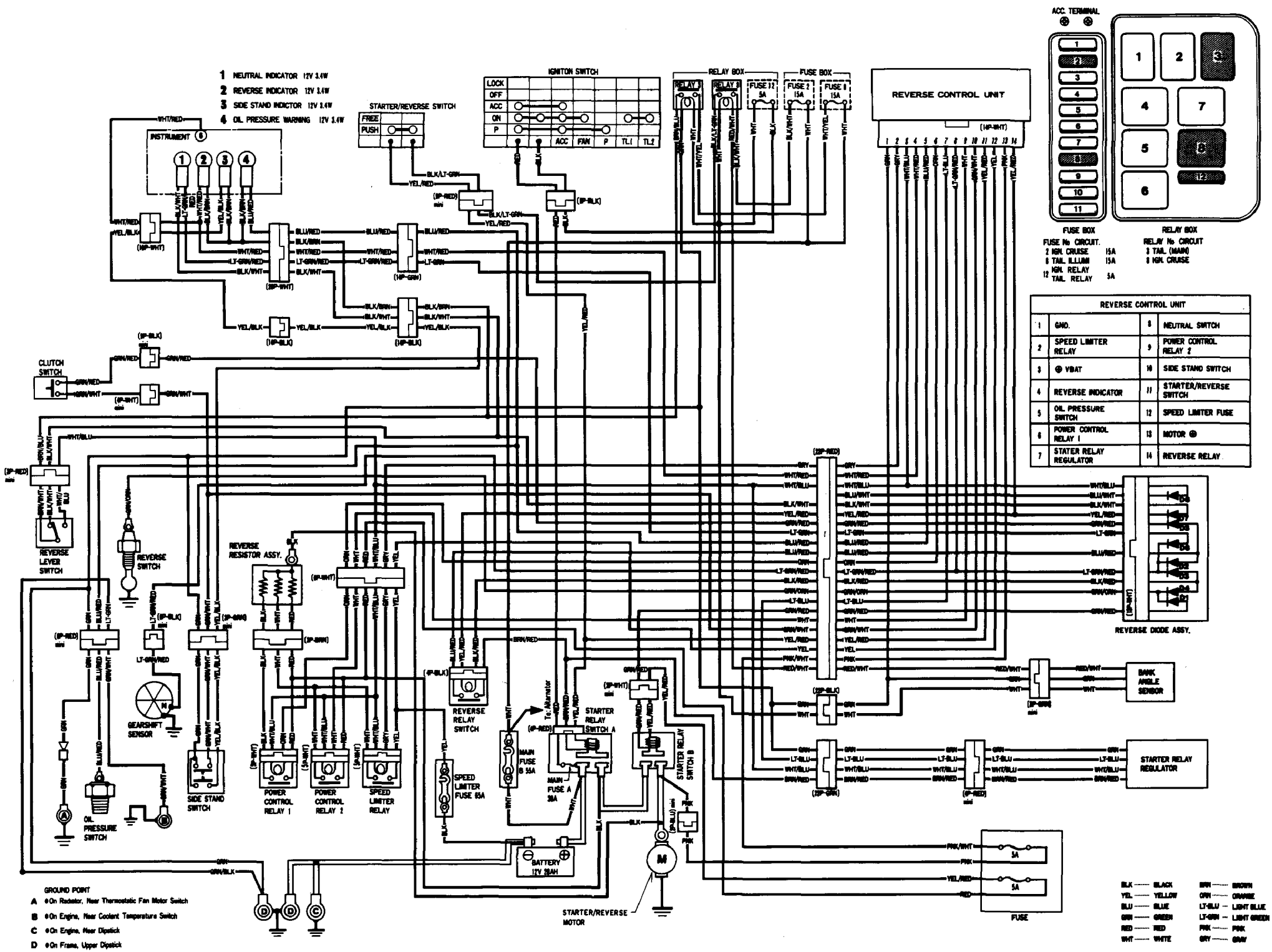
CHARGING SYSTEM/ALTERNATOR

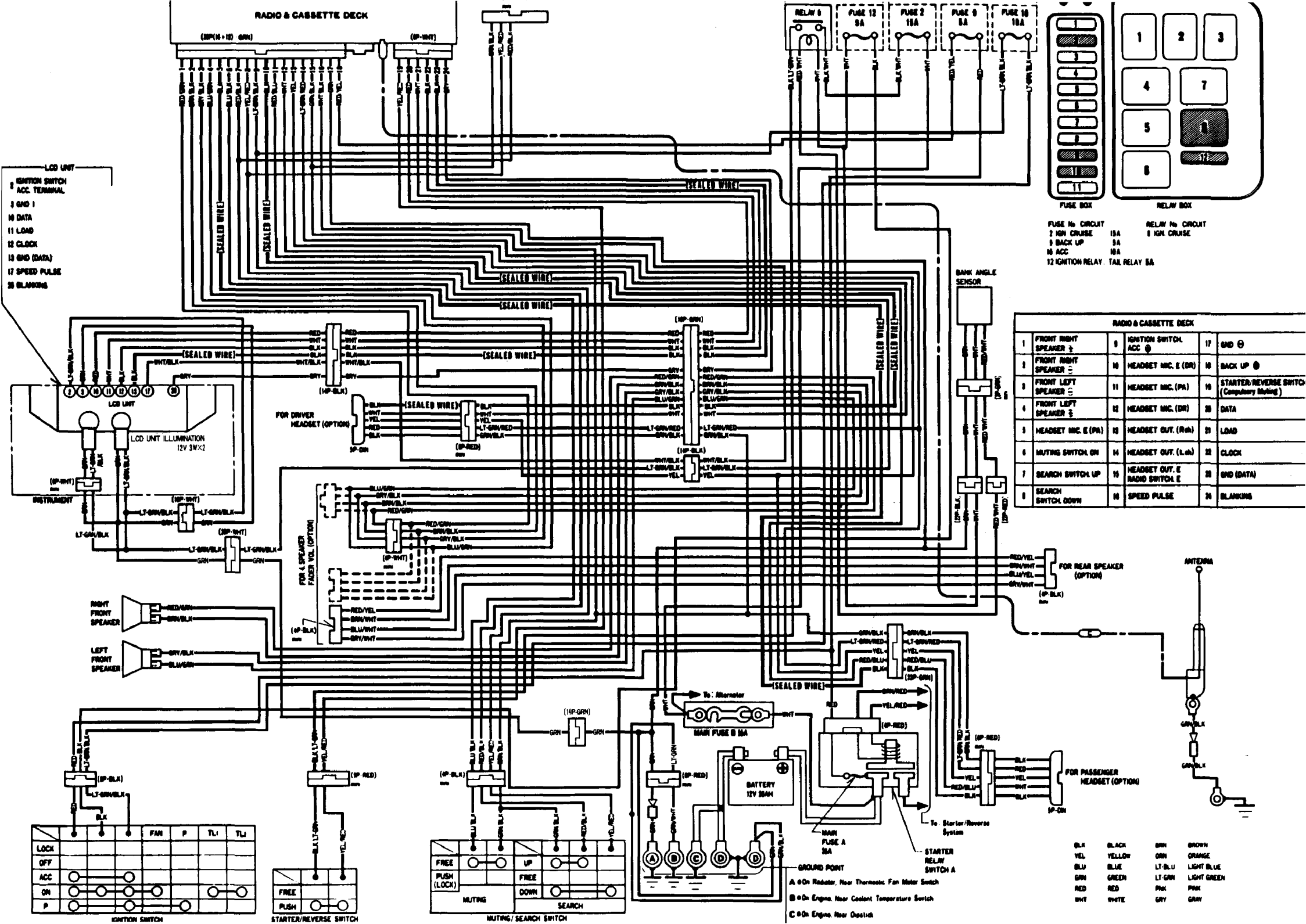


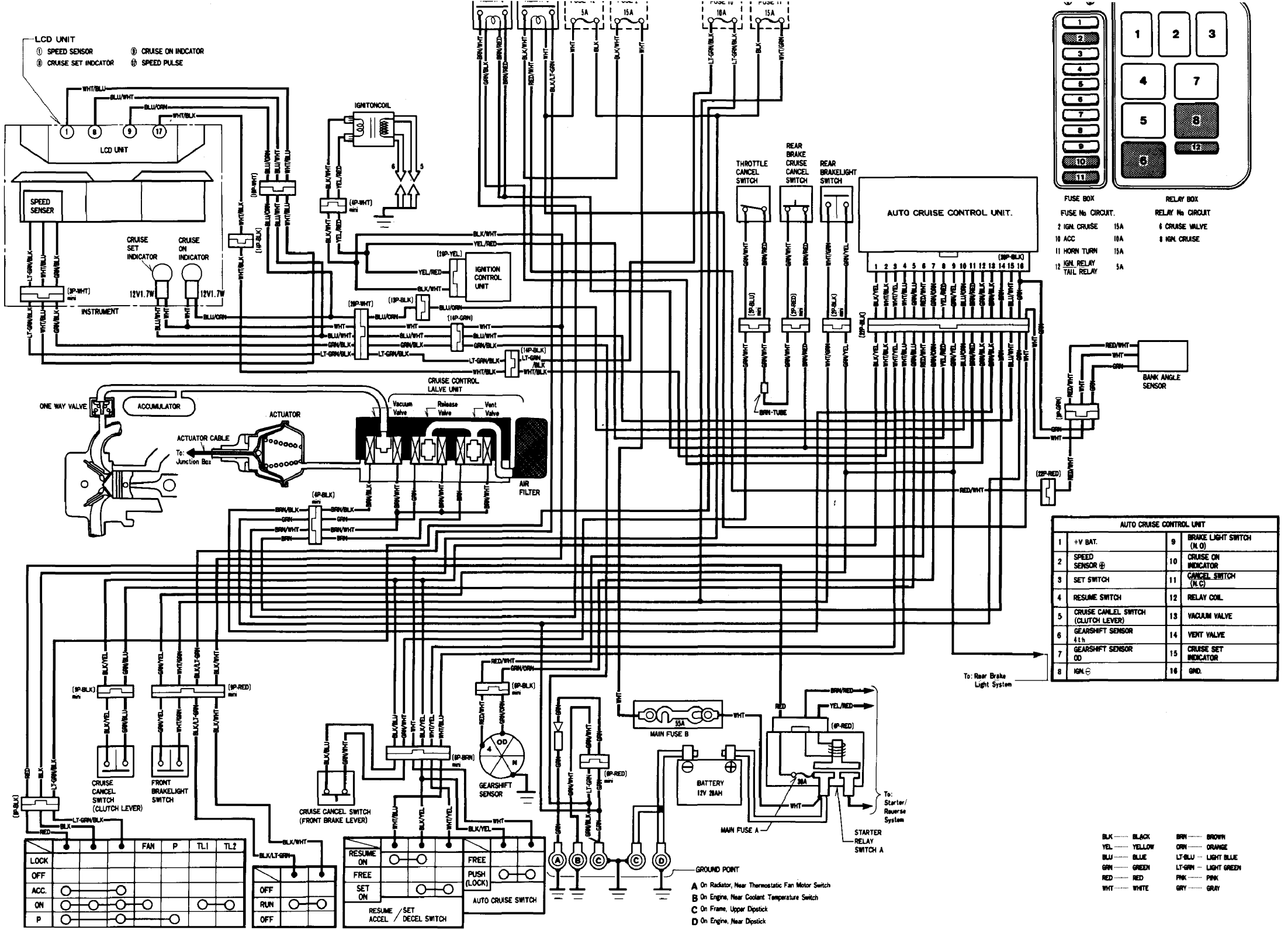

LCD UNIT
FUEL GAUGE
FUEL INDICATOR
12V 3.4W
INSTRUMENT
(Fuel Indicator)
WHT/GRN
TA SENSOR
LEVEL SENSOR
ENGINE CONTROL UNIT
To: Ignition System
To: Tachometer
RELAY BOX
RELAY 3
RELAY 8
FUSE BOX
FUSE 2
15A
FUSE 8
15A
RELAY BOX
FUSE 12
5A
ACC TERMINAL
FUSE BOX
FUSE No CIRCUIT.
2 IGN. CRUISE 15A
8 TAIL ILLUMI 15A
IGN. RELAY
12 TAIL RELAY 5A
RELAY BOX
RELAY No CIRCUIT
3 TAIL (MAIN)
8 IGN. CRUISE
AIR JET SOLENOID VALVE 2
AIR JET SOLENOID VALVE 3
BANK ANGLE SENSOR
FUEL PUMP
FUEL RESERVE SENSOR
To: Alternator
MAIN FUSE B 15A
BATTERY 12V 20AH
MAIN FUSE A 30A
STARTER RELAY SWITCH A
To: Starter/ Reverse System
ENGINE STOP SWITCH
OFF
RUN
OFF
IGNITON SWITCH
LOCK
OFF
ACC
ON
P
ACC
FAN
P
TL1
TL2
TW SENSOR
AICV SOLENOID VALVE (SW ONLY)
GROUND POINT
A ●On Radiator, Near Thermostatic Fan Motor Switch
B ●On Engine, Near Coolant Temperature Switch
C ●On Engine, Near Dipstick
D ●On Frame, Upper Dipstick
BLK ..... BLACK
YEL ..... YELLOW
BLU ..... BLUE
GRN ..... GREEN
RED ..... RED
WHT ..... WHITE
BRN ..... BROWN
ORN ..... ORANGE
LT-BLU ... LIGHT BLUE
LT-GRN ... LIGHT GREEN
PNK ..... PINK
GRY ..... GRAY


LCD UNIT
① SPEED SENSOR
② IGNITION SWITCH · ACC TERMINAL
⑭ CHECK SWITCH
⑰ DECREASE SWITCH
⑱ AIR PRESSURE SENSOR
⑲ AIR PUMP RELAY
⑳ AIR PRESSURE SENSOR
㉒ AIR PRESSURE SENSOR
INSTRUMENT
SPEED SENSOR
LCD UNIT
RELAY BOX
RELAY 5
FUSE BOX
FUSE 6 10A
FUSE 7 10A
FUSE 10 10A
ACC. TERMINAL
FUSE BOX
FUSE No CIRCUIT
6 AIR PUMP 10A
7 PARKING 10A
10 ACC 10A
RELAY BOX
RELAY No CIRCUIT
5 AIR PUMP
To: Alternator
MAIN FUSE B 55A
BATTERY 12V 20AH
MAIN FUSE A 30A
STARTER RELAY SWITCH A
To:Starter/ Reverse System
GROUND POINT
Ⓐ On Radiator, Near Thermostat Fan Motor Switch
Ⓑ On Engine, Near Coolant Temperature Switch
Ⓒ On Engine, Near Dipstick
Ⓓ On Frame, Near Upper Dipstick
RELIEF SOLENOID VALVE (White Label)
REAR SUSPENSION SOLENOID VALVE (Yellow Label)
To:Right Shock absorber
AIR PRESSURE SENSOR
Open
To:Outlet Valve
Open
M
AIR PUMP
DRIER
IGNITION SWITCH
LOCK
OFF
ACC
ON
P
IG
FAN
TL
TL
AIR PRESSURE CONTROL SWITCH
INCREASE
FREE
DECREASE
INCREASE/DE-CREASE SWITCH
FREE
PUSH
OUTLET SWITCH
FREE
PUSH
P. CHECK SWITCH
BLK ..... BLACK
YEL ..... YELLOW
BLU ..... BLUE
GRN ..... GREEN
RED ..... RED
WHT ..... WHITE
BRN ..... BROWN
ORN ..... ORANGE
LT-BLU .. LIGHT BLUE
LT-GRN .. LIGHT GREEN
PNK ..... PINK
GRY ..... GRAY


IGNITION COILS
ENGINE CONTROL UNIT
To: Pb (Intake Manifold)
To:Fuel Pump
To:Solenoid Valves
RELAY BOX
RELAY 3
RELAY 8
FUSE BOX
FUSE 12 5A
FUSE 2 15A
FUSE 8 15A
ACC. TERMINAL
FUSE BOX
FUSE No CIRCUIT.
2 IGN. CRUISE 15A
8 TAIL ILLUMI 15A
12 IGN. RELAY TAIL RELAY 5A
RELAY BOX
RELAY No CIRCUIT
3 TAIL (MAIN)
8 IGN. CRUISE
TA SENSOR
TACHOMETER
SIDE STAND INDICTOR
12V3.4W
NEUTRAL INDICATOR
12V3.4W
OVERDRIVE INDICATOR
12V1.7W
REVERSE DIODE ASSY.
To: Alternator
BANK ANGLE SENSOR
MAIN FUSE 8 55A
BATTERY 12V 28AH
GROUND POINT ●On Engine, Near Dipstick
STARTER RELAY SWITCH A
To: Starter/ Reverse System
MAIN FUSE A 30A
REVERSE LEVER SWITCH
GEARSHIFT SENSOR
TW SENSOR
SIDE STAND SWITCH
PULSE GENERATOR
GROUND POINT ●On Frame, Upper Dipstick
GROUND POINT
A ●On Radiator, Near Thermostatic Fan Motor Switch
B ●On Engine, Near Coolant Temperature Switch
ENGINE STOP SWITCH
IGNITION SWITCH
LOCK
OFF
ACC
ON
P
BLK ..... BLACK
YEL ..... YELLOW
BLU ..... BLUE
GRN ..... GREEN
RED ..... RED
WHT ..... WHITE
BRN ..... BROWN
ORN ..... ORANGE
LT-BLU ... LIGHT BLUE
LT-GRN ... LIGHT GREEN
PNK ..... PINK
GRY ..... GRAY

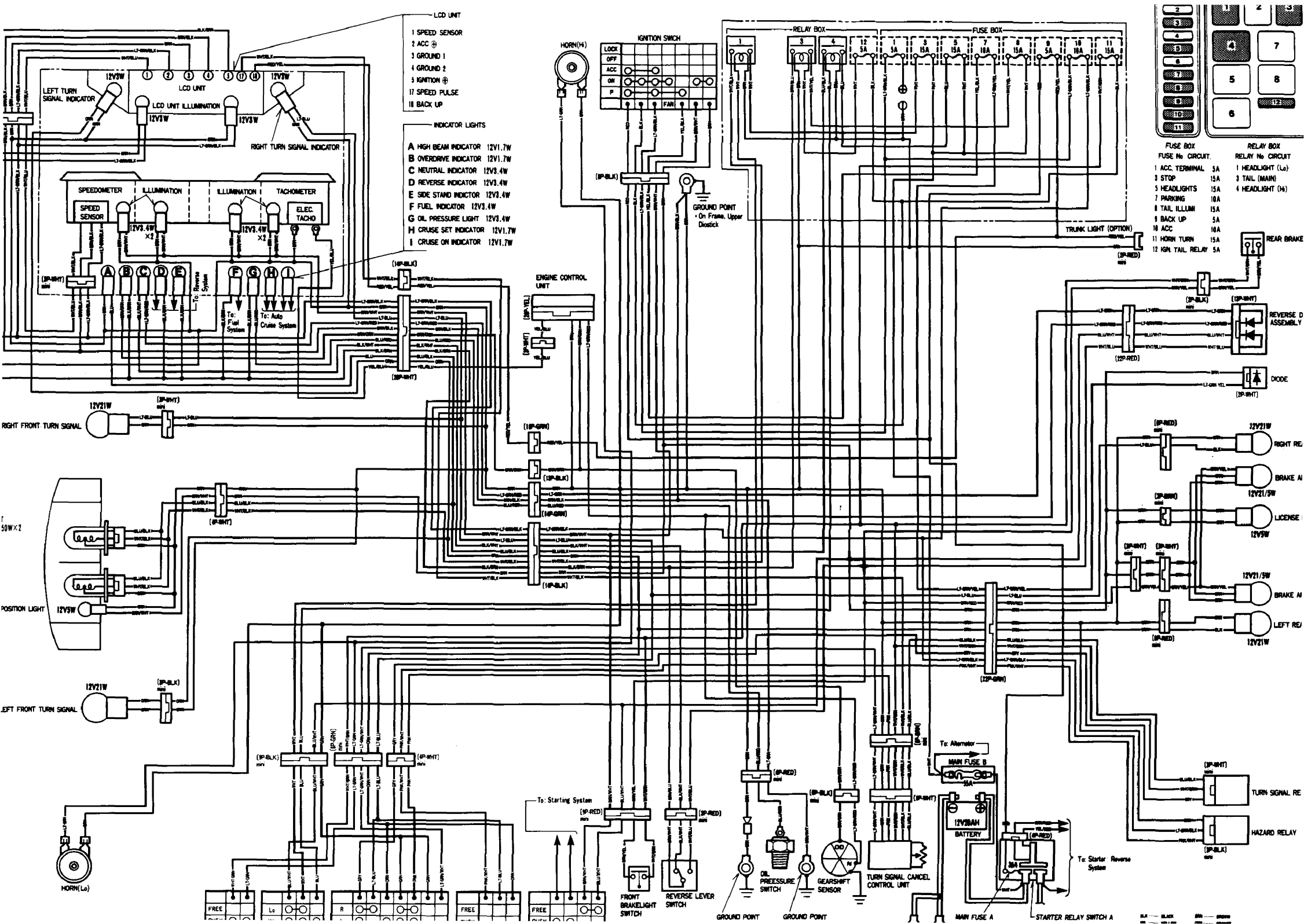

1 NEUTRAL INDICATOR 12V 3.4W
2 REVERSE INDICATOR 12V 3.4W
3 SIDE STAND INDICTOR 12V 3.4W
4 OIL PRESSURE WARNING 12V 3.4W
IGNITION SWITCH
LOCK
OFF
ACC
ON
P
ACC FAN P TL1 TL2
STARTER/REVERSE SWITCH
FREE
PUSH
RELAY BOX
FUSE BOX
FUSE 12 5A
FUSE 2 15A
FUSE 8 15A
REVERSE CONTROL UNIT
(14P-WHT)
ACC TERMINAL
INSTRUMENT
CLUTCH SWITCH
REVERSE LEVER SWITCH
REVERSE SWITCH
REVERSE RESISTOR ASSY.
REVERSE RELAY SWITCH
STARTER RELAY SWITCH A
STARTER RELAY SWITCH B
MAIN FUSE B 50A
MAIN FUSE A 30A
SPEED LIMITER FUSE 15A
POWER CONTROL RELAY 1
POWER CONTROL RELAY 2
SPEED LIMITER RELAY
SIDE STAND SWITCH
OIL PRESSURE SWITCH
GEARSHIFT SENSOR
BATTERY 12V 28AH
STARTER/REVERSE MOTOR
REVERSE DIODE ASSY.
BANK ANGLE SENSOR
STARTER RELAY REGULATOR
FUSE
5A
5A
FUSE BOX
FUSE No CIRCUIT.
2 IGN. CRUISE 15A
8 TAIL ILLUMI 15A
12 IGN. RELAY TAIL RELAY 5A
RELAY BOX
RELAY No CIRCUIT
3 TAIL (MAIN)
8 IGN. CRUISE
REVERSE CONTROL UNIT
1 GND.
2 SPEED LIMITER RELAY
3 ⊕ VBAT
4 REVERSE INDICATOR
5 OIL PRESSURE SWITCH
6 POWER CONTROL RELAY 1
7 STATER RELAY REGULATOR
8 NEUTRAL SWITCH
9 POWER CONTROL RELAY 2
10 SIDE STAND SWITCH
11 STARTER/REVERSE SWITCH
12 SPEED LIMITER FUSE
13 MOTOR ⊕
14 REVERSE RELAY
GROUND POINT
A ⊕On Radiator, Near Thermostatic Fan Motor Switch
B ⊕On Engine, Near Coolant Temperature Switch
C ⊕On Engine, Near Dipstick
D ⊕On Frame, Upper Dipstick
BLK ..... BLACK
BRN ..... BROWN
YEL ..... YELLOW
ORN ..... ORANGE
BLU ..... BLUE
LT-BLU .. LIGHT BLUE
GRN ..... GREEN
LT-GRN .. LIGHT GREEN
RED ..... RED
PNK ..... PINK
WHT ..... WHITE
GRY ..... GRAY


RADIO & CASSETTE DECK
LCD UNIT
1 IGNITION SWITCH ACC. TERMINAL
3 GND ⊖
10 DATA
11 LOAD
12 CLOCK
13 GND (DATA)
17 SPEED PULSE
20 BLANKING
LCD UNIT ILLUMINATION 12V 3WX2
INSTRUMENT
FOR DRIVER HEADSET (OPTION)
FOR L SPEAKER FADER VOL (OPTION)
RIGHT FRONT SPEAKER
LEFT FRONT SPEAKER
FOR REAR SPEAKER (OPTION)
FOR PASSENGER HEADSET (OPTION)
ANTENNA
BANK ANGLE SENSOR
[SEALED WIRE]
RELAY 6
FUSE 12 5A
FUSE 2 15A
FUSE 9 5A
FUSE 10 10A
FUSE BOX
RELAY BOX
FUSE No. CIRCUIT
2 IGN. CRUISE 15A
9 BACK UP 5A
10 ACC 10A
12 IGNITION RELAY, TAIL RELAY 5A
RELAY No. CIRCUIT
8 IGN. CRUISE
RADIO & CASSETTE DECK
1 FRONT RIGHT SPEAKER ⊕
2 FRONT RIGHT SPEAKER ⊖
3 FRONT LEFT SPEAKER ⊖
4 FRONT LEFT SPEAKER ⊕
5 HEADSET MIC. E (PA)
6 MUTING SWITCH ON
7 SEARCH SWITCH UP
8 SEARCH SWITCH DOWN
9 IGNITION SWITCH ACC
10 HEADSET MIC. E (DR)
11 HEADSET MIC. (PA)
12 HEADSET MIC. (DR)
13 HEADSET OUT. (Rch)
14 HEADSET OUT. (Lch)
15 HEADSET OUT. E RADIO SWITCH E
16 SPEED PULSE
17 GND ⊖
18 BACK UP ⊕
19 STARTER/REVERSE SWITCH (Compulsory Muting)
20 DATA
21 LOAD
22 CLOCK
23 GND (DATA)
24 BLANKING
IGNITION SWITCH
LOCK
OFF
ACC
ON
P
FAN
P
TLI
TLI
STARTER/REVERSE SWITCH
FREE
PUSH
MUTING/SEARCH SWITCH
FREE
PUSH (LOCK)
MUTING
UP
FREE
DOWN
SEARCH
To: Alternator
MAIN FUSE B 50A
MAIN FUSE A 30A
BATTERY 12V 38AH
STARTER RELAY SWITCH A
To Starter/Reverse System
GROUND POINT
A On Radiator, Near Thermostat, Fan Motor Switch
B On Engine, Near Coolant Temperature Switch
C On Engine, Near Dipstick
BLK BLACK
YEL YELLOW
BLU BLUE
GRN GREEN
RED RED
WHT WHITE
BRN BROWN
ORN ORANGE
LT-BLU LIGHT BLUE
LT-GRN LIGHT GREEN
PNK PINK
GRY GRAY



AUTO CRUISE CONTROL UNIT			
1	+V BAT.	9	BRAKE LIGHT SWITCH (N.O)
2	SPEED SENSOR ⊕	10	CRUISE ON INDICATOR
3	SET SWITCH	11	CANCEL SWITCH (N.C)
4	RESUME SWITCH	12	RELAY COIL
5	CRUISE CAMLEL SWITCH (CLUTCH LEVER)	13	VACUUM VALVE
6	GEARSHIFT SENSOR 4th	14	VENT VALVE
7	GEARSHIFT SENSOR OD	15	CRUISE SET INDICATOR
8	IGN.⊖	16	GND.

BLK	BLACK	BRN	BROWN
YEL	YELLOW	ORN	ORANGE
BLU	BLUE	LT-BLU	LIGHT BLUE
GRN	GREEN	LT-GRN	LIGHT GREEN
RED	RED	PNK	PINK
WHT	WHITE	GRY	GRAY


LCD UNIT
1 SPEED SENSOR
2 ACC ⊕
3 GROUND 1
4 GROUND 2
5 IGNITION ⊕
17 SPEED PULSE
18 BACK UP
INDICATOR LIGHTS
A HIGH BEAM INDICATOR 12V1.7W
B OVERDRIVE INDICATOR 12V1.7W
C NEUTRAL INDICATOR 12V3.4W
D REVERSE INDICATOR 12V3.4W
E SIDE STAND INDICTOR 12V3.4W
F FUEL INDICATOR 12V3.4W
G OIL PRESSURE LIGHT 12V3.4W
H CRUISE SET INDICATOR 12V1.7W
I CRUISE ON INDICATOR 12V1.7W
LEFT TURN SIGNAL INDICATOR
LCD UNIT ILLUMINATION
RIGHT TURN SIGNAL INDICATOR
SPEEDOMETER
ILLUMINATION
TACHOMETER
SPEED SENSOR
ELEC. TACHO
To: Reverse System
To: Fuel System
To: Auto Cruise System
ENGINE CONTROL UNIT
HORN(Hi)
IGNITION SWICH
LOCK
OFF
ACC
ON
P
FAN
RELAY BOX
FUSE BOX
GROUND POINT
On Frame, Upper Diostick
TRUNK LIGHT (OPTION)
FUSE BOX
FUSE No CIRCUIT
1 ACC. TERMINAL 5A
3 STOP 15A
5 HEADLIGHTS 15A
7 PARKING 10A
8 TAIL ILLUMI 15A
9 BACK UP 5A
10 ACC 10A
11 HORN TURN 15A
12 IGN. TAIL RELAY 5A
RELAY BOX
RELAY No CIRCUIT
1 HEADLIGHT (Lo)
3 TAIL (MAIN)
4 HEADLIGHT (Hi)
REAR BRAKE
REVERSE D ASSEMBLY
DIODE
RIGHT FRONT TURN SIGNAL
12V21W
50W×2
POSITION LIGHT
12V5W
LEFT FRONT TURN SIGNAL
BRAKE A
12V21/5W
LICENSE
LEFT RE
HORN(Lo)
To: Starting System
FRONT BRAKELIGHT SWITCH
REVERSE LEVER SWITCH
OIL PRESSSURE SWITCH
GEARSHIFT SENSOR
TURN SIGNAL CANCEL CONTROL UNIT
To: Alternator
MAIN FUSE B
35A
12V28AH BATTERY
TURN SIGNAL RE
HAZARD RELAY
To: Starter Reverse System
GROUND POINT
MAIN FUSE A
STARTER RELAY SWITCH A
FREE
Lo
R

Paper Book Part Number 67MN530V

29. GL1500/GL1500SE (N) ADDENDUM

HOW TO USE THIS MANUAL

This addendum contains information for GL1500 (N) and GL1500SE (N).
Refer to GL1500 SHOP MANUAL (No. 67MN530, No. 67MN530Z, No. 67MN530Y, No. 67MN530X and No. 67MN530W) for service procedures and data not included in this addendum.

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

GL1500 (N)

CODE	AREA (TYPE)	CODE	AREA (TYPE)
B	Belgium	SD	Sweden
SP	Spain	NR	Norway
F	France		

GL1500SE (N)

CODE	AREA (TYPE)	CODE	AREA (TYPE)
E	U.K.	B	Belgium
G	Germany	IT	Italy
F	France	FI	Finland
SW	Switzerland	AR	Austria

Wire Color Abbreviations
The following abbreviations are used to identify wire colors in the circuit schematics:

BLK	black	LT GRN	light green
BLU	blue	ORN	orange
BRN	brown	PNK	pink
GRN	green	RED	red
GRY	gray	WHT	white
LT BLU	light blue	YEL	yellow

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CONTENT

IMPORTANT SAFETY NOTICE

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

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

NOTE: Gives helpful information.

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

SPECIFICATIONS (GL1500)

Dimensions	Overall length		2,630 mm (103.5 in)
	Overall width		955 mm (37.6 in)
	Overall height		1,525 mm (60.0 in)
	Wheelbase		1,700 mm (66.9 in)
	Seat height		795 mm (31.3 in)
	Ground clearance		135 mm (5.3 in)
	Dry weight		366 kg (807 lbs)
	Curb weight		394 kg (869 lbs)
Frame	Frame type		Double cradle
	Front suspension	Travel	Telescopic, 140 mm (5.5 in)
	Rear suspension	Travel	Swing arm, 105 mm (4.1 in)
		Air pressure	0–400 kPa (0–4.0 kg/cm², 0–57 psi)
	Front tire	Size	130/70–18 63H
		Air pressure	225 kPa (2.25 kg/cm², 33 psi)
	Rear tire	Size	160/80–16 75H
		Air pressure	250 kPa (2.50 kg/cm², 36 psi): Driver only
			280 kPa (2.80 kg/cm², 41 psi): Driver and Passenger
	Front brake		Double disc brake
	Rear brake		Disc brake
	Fuel capacity		24.0 lit. (6.4 US gal, 5.3 Imp gal)
	Caster angle		30°
	Trail length		115 mm (4.5 in)
	Front fork oil capacity	Left	325 cm³ (10.9 US oz, 11.4 Imp oz)
		Right	320 cm³ (10.8 US oz, 11.2 Imp oz)
Engine	Engine type		Water cooled, 4 stroke O.H.C.
	Cylinder arrangement		Flat six
	Bore and stroke		71 x 64 mm (2.8 x 2.5 in)
	Displacement		1,520 cm³ (92.7 cu-in)
	Compression ratio		9.8:1
	Valve train		Belt driven over head camshaft
	Oil capacity	At disassembly	4.3 lit. (4.5 US qt, 3.8 Imp qt)
		After draining	3.5 lit. (3.7 US qt, 3.1 Imp qt)
	Lubrication system		Forced and wet sump
	Cooling system capacity		4.1 lit. (4.3 US qt, 3.6 Imp qt)
	Cylinder compression		1,500 kPa (15.0 kg/cm², 213 psi)
	Engine weight		126 kg (278 lbs)
	Camshaft: Intake valve	Opens	5° ATDC (At 1 mm lift)
		Closes	30° ABDC (At 1 mm lift)
	Camshaft: Exhaust valve	Opens	40° BBDC (At 1 mm lift)
		Closes	5° BTDC (At 1 mm lift)
	Valve clearance	Intake/Exhaust	Hydraulic valve adjuster system
	Idle speed		800±80 min⁻¹ (rpm)

Carburetion	Carburetor type		CV down-draft dual carburetors
	Throttle bore		36 mm (1.4 in)
	Carburetor identification No.		VDG9C
	Pilot screw opening		2-1/2 turns out
	Float level		7.5 mm (0.30 in)
	Main jet		pri: #80 2nd: #148
	Slow jet		#70
	Throttle grip free play		5–8 mm (3/16–5/16 in)
	Fuel pump flow capacity		640 cm³ (22.5 Imp oz)/minute
	Carburetor vacuum difference		Within 40 mm (1.6 in) Hg of each other
Drive Train	Clutch type		Wet, multi-plate
	Transmission		5-speed, constant mesh
	Primary reduction ratio		1.592 (78/49)
	Secondary reduction ratio		0.971 (34/35)
	Gear ratio	1st 2nd 3rd 4th OD	2.667 (40/15) 1.722 (31/18) 1.273 (28/22) 0.964 (27/28) 0.759 (22/29)
	Final reduction ratio		2.833 (34/12)
	Gearshift pattern		Left foot operated return system 1–N–2–3–4–OD
	Final gear oil capacity (After disassembly)		170 cm³ (5.7 US oz, 6.0 Imp oz)
Electrical	Ignition		Battery, Ignition (Full transistor)
	Ignition timing "F" mark		0° TDC
	Starting system		Starting motor
	Alternator		AC generator, 0.55 kW/5,000 min⁻¹ (rpm)
	Battery capacity		12 V–20 AH
	Spark plug: Standard	NGK	DPR7EA-9
		ND	X22EPR-U9
	Spark plug: For cold climate (Below 5°C, 41°F)	NGK	DPR6EA-9
		ND	X20EPR-U9
	Spark plug: For extended high speed riding	NGK	DPR8EA-9
		ND	X24EPR-U9
	Spark plug gap		0.8–0.9 mm (0.031–0.035 in)
	Firing order		1–4–5–2–3–6–1
	Fuses		5 A x 3, 10 A x 4, 15 A x 5 (fuse box) 30 A, 55 A (main fuses) 5 A x 2, 65 A (reverse fuses)
Lights	Headlight		12 V 60 W (R), 60/55 W (L)
	Position light		12 V 5W
	Turn signal light		12 V 21 W x 4
	Indicator light		12 V 3.4 W x 5 / 12 V 1.7 W x 4
	Turn signal indicator		12 V 3 W x 2
	Instrument illumination		12 V 3.4 W x 4
	LCD unit illumination		12 V 3 W x 2
	License light		12 V 5 W
	Brake and taillight		12 V 21/5 W x 2

SPECIFICATIONS (GL1500SE)

Dimensions	Overall length		2,630 mm (103.5 in) G model: 2,635 mm (103.7 in)
	Overall width		955 mm (37.6 in)
	Overall height		1,525 mm (60.0 in) G model: 1,335 mm (52.6 in)
	Wheelbase		1,700 mm (66.9 in)
	Seat height		795 mm (31.3 in)
	Ground clearance		135 mm (5.3 in)
	Dry weight		368 kg (811 lbs) G model: 363 kg (800 lbs)
	Curb weight		396 kg (873 lbs) G model: 391 kg (862 lbs)
Frame	Frame type		Double cradle
	Front suspension	Travel	Telescopic, 140 mm (5.5 in)
	Rear suspension	Travel	Swing arm, 105 mm (4.1 in)
		Air pressure	0—400 kPa (0—4.0 kg/cm², 0—57 psi)
	Front tire	Size	130/70—18 63H
		Air pressure	225 kPa (2.25 kg/cm², 33 psi)
	Rear tire	Size	160/80—16 75H
		Air pressure	250 kPa (2.50 kg/cm², 36 psi): Driver only
			280 kPa (2.80 kg/cm², 41 psi): Driver and Passenger
	Front brake		Double disc brake
	Rear brake		Disc brake
	Fuel capacity		24.0 lit. (6.4 US gal, 5.3 Imp gal)
	Caster angle		30°
	Trail length		115 mm (4.5 in)
	Front fork oil capacity	Left	325 cm³ (10.9 US oz, 11.4 Imp oz)
		Right	320 cm³ (10.8 US oz, 11.2 Imp oz)
Engine	Engine type		Water cooled, 4 stroke O.H.C.
	Cylinder arrangement		Flat six
	Bore and stroke		71 x 64 mm (2.8 x 2.5 in)
	Displacement		1,520 cm³ (92.7 cu-in)
	Compression ratio		9.8:1
	Valve train		Belt driven over head camshaft
	Oil capacity	At disassembly	4.3 lit. (4.5 US qt, 3.8 Imp qt)
		After draining	3.5 lit. (3.7 US qt, 3.1 Imp qt)
	Lubrication system		Forced and wet sump
	Cooling system capacity		4.1 lit. (4.3 US qt, 3.6 Imp qt)
	Cylinder compression		1,500 kPa (15.0 kg/cm², 213 psi)
	Engine weight		126 kg (278 lbs)
	Camshaft: Intake valve	Opens	5° ATDC (At 1 mm lift)
		Closes	30° ABDC (At 1 mm lift)
	Camshaft: Exhaust valve	Opens	40° BBDC (At 1 mm lift)
		Closes	5° BTDC (At 1 mm lift)
	Valve clearance	Intake/Exhaust	Hydraulic valve adjuster system
	Idle speed		800±80 min⁻¹ (rpm)
		SW model	800±50 min⁻¹ (rpm)

Carburetion	Carburetor type		CV down-draft dual carburetors
	Throttle bore		36 mm (1.4 in)
	Carburetor identification No.		VDG9C SW model: VDGWG AR model: VDGWE
	Pilot screw opening		2-1/2 turns out SW, AR models: 2-5/8 turns out
	Float level		7.5 mm (0.30 in)
	Main jet		pri: #80 2nd: # 148
	Slow jet		#70 SW, AR models: #65
	Throttle grip free play		5—8 mm (3/16—5/16 in)
	Fuel pump flow capacity		640 cm^3 (22.5 Imp oz)/minute
	Carburetor vacuum difference		Within 40 mm (1.6 in) Hg of each other
Drive Train	Clutch type		Wet, multi-plate
	Transmission		5-speed, constant mesh
	Primary reduction ratio		1.592 (78/49)
	Secondary reduction ratio		0.971 (34/35)
	Gear ratio	1st 2nd 3rd 4th OD	2.667 (40/15) 1.722 (31/18) 1.273 (28/22) 0.964 (27/28) 0.759 (22/29)
	Final reduction ratio		2.833 (34/12)
	Gearshift pattern		Left foot operated return system 1—N—2—3—4—OD
	Final gear oil capacity (After disassembly)		170 cm^3 (5.7 US oz, 6.0 Imp oz)
Electrical	Ignition		Battery, Ignition (Full transistor)
	Ignition timing "F" mark		0°TDC
	Starting system		Starting motor
	Alternator		AC generator, 0.55 kW/5,000 min^{-1} (rpm)
	Battery capacity		12 V—20 AH
	Spark plug: Standard	NGK	DPR7EA-9
		ND	X22EPR-U9
	Spark plug: For cold climate (Below 5°C, 41°F)	NGK	DPR6EA-9
		ND	X20EPR-U9
	Spark plug: For extended high speed riding	NGK	DPR8EA-9
		ND	X24EPR-U9
	Spark plug gap		0.8—0.9 mm (0.031—0.035 in)
	Firing order		1—4—5—2—3—6—1
	Fuses		5 A x 3, 10 A x 4, 15 A x 5 (fuse box) 30 A, 55 A (main fuses) 5 A x 2, 65 A (reverse fuses)
Lights	Headlight		12 V 60 W (R), 60/55 W (L) SW model: 12 V 60/55 W E model: 60/55 W x 2
	Position light		12 V 5W
	Turn signal light		12 V 21 W x 4
	Indicator light		12 V 3.4 W x 5 / 12 V 1.7 W x 4
	Turn signal indicator		12 V 3 W x 2
	Instrument illumination		12 V 3.4 W x 4
	LCD unit illumination		12 V 3 W x 2
	License light		12 V 5 W
	Brake and taillight		12 V 21/5 W x 2

SERVICE DATA

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
Engine weight (including carburetors)				126 kg (278 lbs)	—
Engine oil capacity		at engine assembly		4.3 lit (4.5 US qt, 3.8 Imp qt)	—
		at oil change		3.5 lit (3.7 US qt, 3.1 Imp qt)	—
		at oil filter and oil change		3.7 lit (3.9 US qt, 3.3 Imp qt)	—
Radiator coolant capacity		After disassembly		4.1 lit (4.3 US qt, 3.6 Imp qt)	—
		After draining (including reserve tank)		3.8 lit (4.0 US qt, 3.3 Imp qt)	—
		Reserve tank		0.55 lit (0.6 US qt, 0.5 Imp qt)	—
OIL PUMP	Main oil pump	Tip clearance		0.15 (0.006) max.	0.35 (0.014)
		Pump body clearance		0.15–0.23 (0.006–0.009)	0.43 (0.017)
		Pump side clearance		0.02–0.07 (0.001–0.003)	0.12 (0.005)
	Scavenge pump	Tip clearance		0.15 (0.006) max.	0.35 (0.014)
		Pump body clearance		0.15–0.22 (0.006–0.009)	0.42 (0.017)
		Pump side clearance		0.02–0.07 (0.001–0.003)	0.12 (0.005)
	Pressure relief valve	Relief pressure		470–570 kPa (4.7–5.7 kg/cm², 67–81 psi)	—
		Relief valve spring free length		90.8 (3.57)	84.0 (3.31)
	Oil pressure (at oil pressure switch)	Cold (At 35°C/95°F)	Idle speed	130 kPa (1.3 kg/cm², 18 psi)	—
			5,000 min⁻¹ (rpm)	500 kPa (5.0 kg/cm², 71 psi)	—
		Hot (At 80°C/176°F)	Idle speed	80 kPa (0.8 kg/cm², 11 psi)	—
			5,000 min⁻¹ (rpm)	500 kPa (5.0 kg/cm², 71 psi)	—
COOLING	Radiator cap relief pressure			75–105 kPa (0.75–1.05 kg/cm², 11–15 psi)	—
	Thermostat	Begins to open temperature		80°–84°C (176°–183°F)	—
		Fully opened temperature		93°–97°C (199°–206°F)	—
		Valve lift (heated to 95°C/5 minutes)		8.0 (0.315) min.	—
	Thermo valve		Starts to close	58°–62°C (136°–144°F)	—
	Thermostatic fan motor switch		Starts to close	98°–102°C (208°–216°F)	—
	Coolant temperature sensor resistance		60°C (140°F)	104 ohms	—
			85°C (185°F)	44 ohms	—
			110°C (230°F)	20 ohms	—
			120°C (248°F)	16 ohms	—
CYLINDER HEAD	Cylinder head warpage			—	0.10 (0.004)
	Valve stem O.D.		IN	5.475–5.490 (0.2156–0.2161)	5.45 (0.215)
			EX	5.455–5.470 (0.2148–0.2154)	5.44 (0.214)
	Valve guide I.D.		IN, EX	5.500–5.512 (0.2165–0.2170)	5.55 (0.219)
	Valve stem to guide clearance		IN	0.010–0.037 (0.0004–0.0015)	0.08 (0.003)
			EX	0.030–0.057 (0.0012–0.0022)	0.10 (0.004)
	Valve seat width			1.2 (0.05)	—
	Valve spring free length			44.6 (1.76)	43.3 (1.70)
	Valve spring preload/length			15.6–18.2/37.5 kg/mm (34.39–40.12/1.48 lbs/in)	—
	Rocker arm I.D.			21.000–21.021 (0.8268–0.8276)	21.05 (0.829)
	Rocker arm shaft O.D.			11.966–11.984 (0.4711–0.4718)	11.95 (0.470)
	Rocker arm lobe		I.D.	11.996–12.031 (0.4723–0.4734)	12.07 (0.475)
			O.D.	20.945–20.980 (0.8246–0.8260)	20.93 (0.824)
	Hydraulic valve adjuster compression stroke with kerosene			0–0.30 (0–0.012)	0.30 (0.012) max.

Unit: mm (in)

ITEM				STANDARD	SERVICE LIMIT
CYLINDER HEAD	Camshaft	Cam lobe height		36.110–36.190 (1.4217–1.4248)	35.9 (1.41)
		Runout (at center journal)		—	0.10 (0.004)
		Journal O.D.	Both middles	26.934–26.955 (1.0604–1.0612)	26.91 (1.059)
			Both ends	26.949–26.970 (1.0610–1.0618)	26.91 (1.059)
		Holder journal I.D.		27.000–27.021 (1.0630–1.0638)	27.05 (1.065)
		Journal oil clearance	Both middles	0.045–0.087 (0.0018–0.0034)	0.14 (0.006)
			Both ends	0.030–0.072 (0.0012–0.0028)	0.14 (0.006)
CLUTCH	Clutch master cylinder	Cylinder I.D.		15.870–15.913 (0.6248–0.6265)	15.93 (0.627)
		Piston O.D.		15.827–15.854 (0.6231–0.6242)	15.82 (0.623)
	Clutch	Plate warpage		—	0.30 (0.012)
		Disc thickness		3.72–3.88 (0.146–0.153)	3.5 (0.14)
		Clutch spring free height		5.38 (0.212)	5.1 (0.20)
OUTPUT SHAFT	Damper spring free length			60.82 (2.394)	57.0 (2.24)
	Shaft O.D.			22.008–22.021 (0.8665–0.8670)	21.99 (0.866)
	Collar		I.D.	22.026–22.041 (0.8672–0.8678)	22.05 (0.868)
			O.D.	25.959–25.980 (1.0220–1.0228)	25.95 (1.022)
	Driven gear I.D.			26.000–26.016 (1.0236–1.0242)	26.03 (1.025)
GEAR-SHIFT	Shift fork shaft O.D.			13.966–13.984 (0.5498–0.5506)	13.90 (0.547)
	Shift fork		I.D.	14.000–14.021 (0.5512–0.5520)	14.04 (0.553)
			Claw thickness	5.93–6.00 (0.233–0.236)	5.6 (0.22)
TRANS-MISSION	Gear I.D.		C2, C3, M4, M5	34.000–34.016 (1.3386–1.3392)	34.04 (1.340)
	Gear bushing O.D.		C2, C3, M4/M5	33.940–33.965 (1.3362–1.3372)	33.92 (1.335)
	Gear-to-bushing clearance			0.035–0.076 (0.0014–0.0030)	0.10 (0.004)
CYLINDER, PISTON	Cylinder compression pressure			1300–1700 kPa (13.0–17.0 kg/cm², 185–242 psi)	1000 kPa (10.0 kg/cm², 142 psi)
	Cylinder	I.D.		71.010–71.025 (2.7957–2.7963)	71.1 (2.80)
		Out-of-round		—	0.15 (0.006)
		Taper		—	0.05 (0.002)
		Top warpage		—	0.05 (0.002)
	Piston	O.D. (at skirt)		70.960–70.990 (2.7937–2.7949)	70.85 (2.789)
		Piston pin bore		18.010–18.016 (0.7091–0.7093)	18.03 (0.710)
		Piston-to-cylinder clearance		0.020–0.065 (0.0008–0.0026)	0.10 (0.004)
	Piston ring	End gap	Top and second	0.15–0.30 (0.006–0.012)	0.5 (0.02)
			Oil ring side rail	0.20–0.70 (0.008–0.028)	0.9 (0.04)
		Ring-to-ring land clearance	Top	0.025–0.055 (0.0010–0.0022)	0.10 (0.004)
			Second	0.015–0.045 (0.0006–0.0018)	0.10 (0.004)
	Piston pin	O.D. (at sliding surfaces)		17.994–18.000 (0.7084–0.7087)	18.99 (0.748)
		Pin-to-piston clearance		0.010–0.022 (0.0004–0.0009)	0.05 (0.002)
		Pin-to-rod interference		0.015–0.039 (0.0006–0.0015)	—

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
CRANKSHAFT	Main journal bearing oil clearance			0.020–0.038 (0.0008–0.0015)	0.06 (0.002)
	Crankpin bearing oil clearance			0.027–0.045 (0.0011–0.0018)	0.06 (0.002)
	Crankshaft runout (at center journal)			—	0.03 (0.001)
	Connecting rod side clearance			0.15–0.30 (0.006–0.012)	0.40 (0.016)
	Connecting rod small end I.D.			18.009–18.027 (0.7090–0.7097)	18.04 (0.710)
	Crankpin and main journal		Taper	—	0.003 (0.0001)
			Out-of-round	—	0.005 (0.0002)
WHEELS	Wheel axle runout			—	0.2 (0.01)
	Wheel rim runout		Axial	—	2.0 (0.08)
			Radial	—	2.0 (0.08)
	Tire tread depth		Front	—	1.5 (0.06)
			Rear	—	2.0 (0.08)
SUSPENSION	Rear suspension air pressure			0–400 kPa (0–4.0 kg/cm^2, 0–57 psi)	—
	Front fork spring free length		Spring A	192.9 (7.59)	189.0 (7.44)
			Spring B	386.3 (15.21)	378.6 (14.91)
	Front fork oil capacity		Left	325 cm^3 (10.9 US oz, 11.4 Imp oz)	—
			Right	320 cm^3 (10.8 US oz, 11.2 Imp oz)	—
	Front fork oil level (from the top of tube)			239 (9.4)	—
	Front fork oil			ATF	—
	Fork tube runout			—	0.2 (0.01)
	Left shock absorber spring free length (Rear)			280.7 (11.05)	274.5 (10.81)
	Right shock absorber oil capacity			140 cm^3 (4.7 US oz, 4.9 Imp oz)	—
	Right shock absorber oil			ATF	—
FINAL DRIVE	Final gear oil	Recommended oil		Hypoid gear oil, SAE #80	—
		Capacity	At assembly	170 cm^3 (5.7 US oz, 6.0 Imp oz)	—
			After draining	140 cm^3 (4.7 US oz, 4.9 Imp oz)	—
	Final gear backlash			0.05–0.15 (0.002–0.006)	0.3 (0.01)
		Difference at 3 points		—	0.10 (0.004)
	Ring gear-to-stop pin clearance			0.30–0.60 (0.012–0.024)	—
BRAKES	Front brake master cylinder	Cylinder I.D.		12.700–12.743 (0.5000–0.5017)	12.755 (0.5022)
		Piston O.D.		12.684–12.657 (0.4980–0.4983)	12.645 (0.4978)
	Front brake caliper	Left	Cylinder I.D.	25.400–25.450 (1.0000–1.0020)	25.460 (1.0024)
			Piston O.D.	25.335–25.368 (0.9974–0.9987)	25.310 (0.9965)
		Right	Cylinder I.D.	30.230–30.280 (1.1902–1.1921)	30.290 (1.1925)
			Piston O.D.	30.165–30.198 (1.1876–1.1889)	30.140 (1.1866)
	Front brake disc	Thickness		5.8–6.2 (0.23–0.24)	5.0 (0.20)
		Runout		—	0.3 (0.01)
	Front brake pad thickness			5.5 (0.22)	1.0 (0.04)
	Rear brake master cylinder	Cylinder I.D.		15.870–15.913 (0.6248–0.6265)	15.925 (0.6270)
		Piston O.D.		15.827–15.854 (0.6231–0.6242)	15.815 (0.6226)
		Brake rod clevis installed length		100 (3.9)	—
	Rear brake caliper	Cylinder I.D.		32.030–32.080 (1.2610–1.2630)	32.090 (1.2634)
		Piston O.D.		31.948–31.998 (1.2578–1.2598)	31.940 (1.2575)
	Rear brake disc	Thickness		7.3–7.7 (0.29–0.30)	6.0 (0.24)
		Runout		—	0.3 (0.01)
	Rear brake pad thickness			6.5 (0.26)	1.0 (0.04)
	Brake fluid (front/rear)			DOT 4	—

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
CHARGING	Battery capacity			12 V–20 AH	—
	Battery specific gravity (At 20°C, 68°F)	Full charged		1.270–1.290	—
		Need charging		Below 1.260	—
	Battery charging current			2.0 Amperes max.	—
	Alternator	Capacity		0.55 kW/5,000 min^{-1} (rpm)	—
		Stator coil resistance		0.1–0.3 ohms (20°C, 68°F)	—
		Rotor coil resistance		2.9–4.0 ohms (20°C, 68°F)	—
		Rotor coil slip ring O.D.		27.0 (1.06)	26.0 (1.02)
		Charging start		800–1,000 min^{-1} (rpm)	—
	Regulator/ Rectifier (into alternator)	Type		Transistorized non-adjustable reg./recti.	—
		Regulated voltage (at 20°C/68°F)	900 min^{-1} (rpm)	0–2 A, 13.5–15.5 V	—
			1,850 min^{-1} (rpm)	1.5 A min., 13.5–15.5 V	—
IGNITION	Firing order			1–4–5–2–3–6–1	—
	Ignition timing		F mark	0° TDC at 800 ± 80 min^{-1} (rpm) (SW model 800 ± 50 min^{-1} (rpm)	—
		Vacuum advance	Advance start	60–160 mmHg (2.4–6.3 inHg)	—
			Advance cease	310–360 mmHg (12.2–14.2 inHg)	—
	Ignition coil resistance (at 20°C/68°F)	Primary coil		2.6–3.2 ohms	—
		Secondary coil	With spark plug wire	20.2–26.8 Kohms	—
			Without spark plug wire	11.7–14.3 Kohms	—
	Pulse generator coil resistance (At 20°C, 68°F)			400–500 ohms	—
	Tw sensor/Ta sensor resistance		20°C (68°F)	2.0–3.0 Kohms	—
			80°C (176°F)	200–400 ohms	—
STARTER/ REVERSE	Starter motor brush length			12.5 (0.49)	6.0 (0.24)
	Reverse System	Starter relay regulator/regulated current		0.7–1.0 A	—
		Resister	Between relay and unit terminals	0.06–0.09 ohms	—
			Between relay terminal and ground	0.1–0.2 ohms	—
ELECTRICAL	Oil pressure switch continuity pressure			10–20 kPa (0.1–0.2 kg/cm^2, 1–3 psi)	—
	Fuel level sensor resistance (at 20°C/68°F)		Empty	90–100 ohms	—
			Reserve	66–81 ohms	—
			Full	4–10 ohms	—

TORQUE VALUES

ENGINE

Item	Qty	Thread dia (mm)	Torque N•m	Torque kg-m	Torque ft-lb	Remarks
Spark plug	6	12	16	1.6	12	
Carburetor insulator band screw	4	5	5	0.5	3.6	
Intake manifold vacuum tube joint	4	5	2.8	0.28	2	
Coolant temperature sensor	1	PT 1/8	12	1.2	9	NOTE 1
Water hose clamp screw	2	4	2.0	0.2	1.4	
Thermostatic fan motor switch	1	16	18	1.8	13	
Tw sensor	1	12	28	2.8	20	
Reverse switch	1	10	12	1.2	9	
Reverse shifter shaft bolt	1	6	14	1.4	10	NOTE 2
LUBRICATION:						
Oil pressure switch	1	PT 1/8	12	1.2	9	NOTE 1
Engine oil drain bolt	1	14	38	3.8	27	
Engine oil filter cartrige	1	20	10	1.0	7	
Engine oil filter boss	1	20	18	1.8	13	NOTE 2
CYLINDER HEAD:						
Cylinder head bolt (9 mm bolt)	16	9	45	4.5	33	NOTE 3
Timing belt driven pulley bolt	2	8	27	2.7	20	
Camshaft holder bolt	16	8	20	2.0	14	
Hydraulic valve adjuster stopper plug	12	14	30	3.0	22	
Cylinder head cover bolt	12	6	12	1.2	9	
Timing belt tensioner bolt	4	8	26	2.6	19	NOTE 2
Cylinder head sealing bolt	6	18	45	4.5	33	NOTE 2
CLUTCH:						
Clutch hose/pipe oil bolt	3	10	30	3.0	22	
Clutch slave cylinder bleed valve	1	8	9	0.9	7	
Clutch bleed pipe bolt	1	6	12	1.2	9	NOTE 2
Clutch lifter plate bolt	4	6	10	1.0	7	
Clutch center lock nut	1	22	130	13.0	94	
Clutch outer lock nut	1	40	190	19.0	137	NOTE 2/5
ALTERNATOR:						
Front cover attaching screw	3	4	2	0.2	1.4	NOTE 2
Couple A mounting nut	1	14	58	5.8	42	NOTE 2
Couple B mounting nut	1	14	58	5.8	42	
REAR ENGINE CASE:						
Starter one-way clutch socket bolt	6	6	16	1.6	12	NOTE 2
Starter clutch mounting bolt	1	12	75	7.5	54	
Shift drum lock arm bolt (reverse system)	1	6	12	1.2	9	
Alternator drive gear bolt	6	8	27	2.7	20	NOTE 3
Final drive gear lock nut	1	22	190	19.0	137	NOTE 2/4/5
Output shaft lock nut	1	30	190	19.0	137	NOTE 5
Oil pump driven sprocket bolt	1	6	18	1.8	13	NOTE 2
GEARSHIFT:						
Shift arm lock bolt	1	8	25	2.5	18	
Shift drum center bolt	1	8	28	2.8	20	
Shift drum lock cam bolt	1	6	12	1.2	9	NOTE 2
Shift arm return spring pin	1	8	25	2.5	18	
CRANKCASE/CRANKSHAFT/TRANSMISSION:						
Crankcase bolt (10 mm)	8	10	35	3.5	25	NOTE 6
(8 mm)	4	8	26	2.6	19	
(6 mm)	10	6	12	1.2	9	
Crankcase sealing bolt (20 mm)	4	20	45	4.5	33	NOTE 2
(18 mm)	2	18	45	4.5	33	NOTE 2
Mainshaft lock nut	1	22	190	19.0	137	NOTE 4/5
Crankshaft main bearing cap bolt	8	10	60	6.0	43	NOTE 6
Connecting rod cap nut	8	8	32	3.2	23	NOTE 6
Timing belt drive pulley bolt	1	12	75	7.5	54	

NOTES:
1. Apply sealant to the threads.
2. Apply a locking agent to the threads.
3. Apply molybdenum disulfide oil to the threads and flange surfaces.
4. Left-hand threads.
5. Stake (2 plcs)
6. Apply oil to the threads and flange surfaces.
7. Torque wrench scale reading using a special tool.
8. Apply grease to the threads and flange surfaces.

FRAME

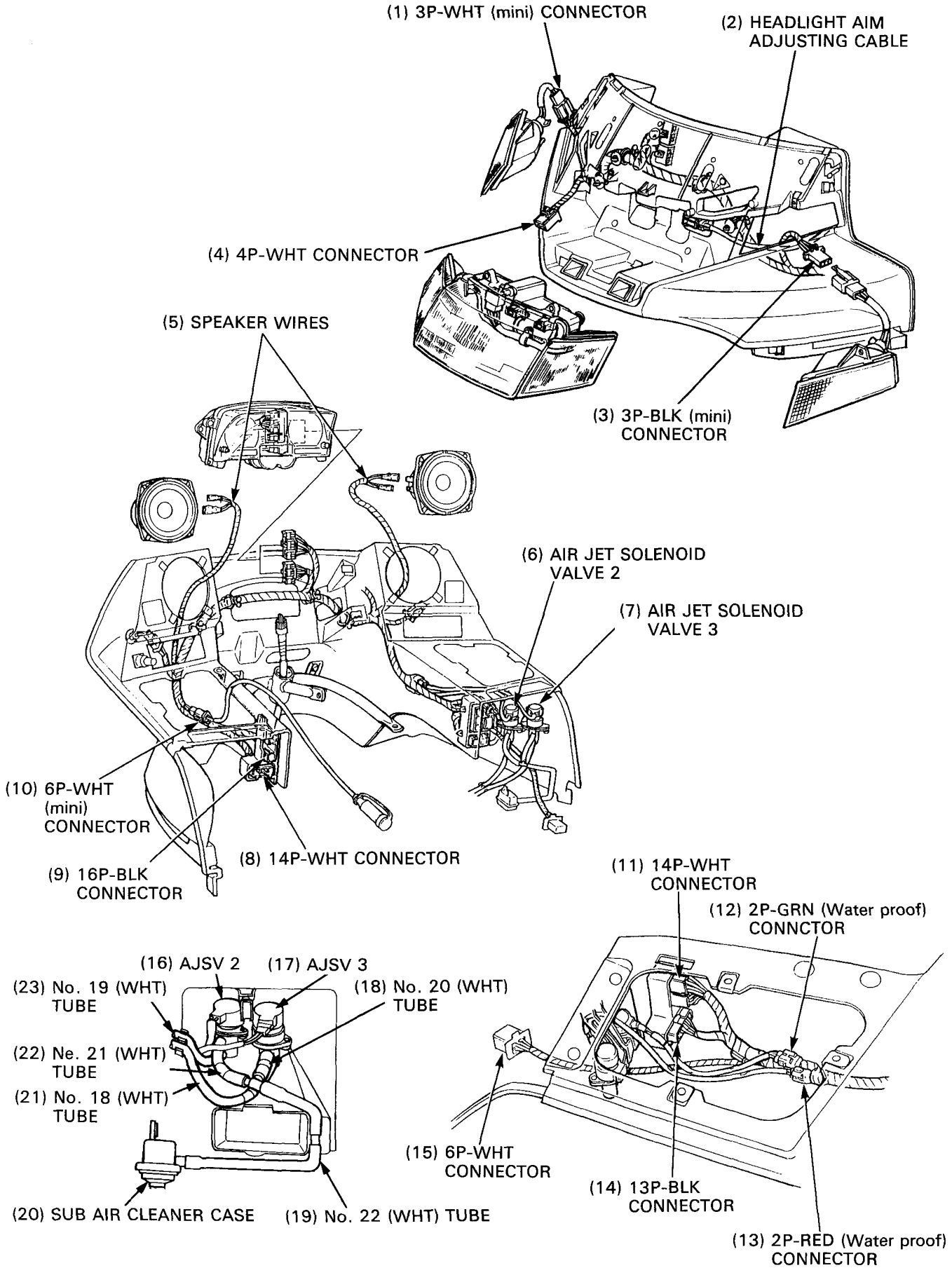
Item	Qty	Thread dia (mm)	Torque N•m	Torque kg-m	Torque ft-lb	Remarks
Engine mount nut	7	10	40	4.0	29	
Engine bracket bolt	4	8	25	2.5	18	
Subframe bolt (10 mm socket bolt)	4	10	40	4.0	29	
(10 mm flange bolt)	1	10	40	4.0	29	
(8 mm flange bolt)	1	8	25	2.5	18	
Exhaust pipe joint nut	12	6	10	1.0	7	
Side stand pivot	1	10	22	2.2	16	
Center stand pivot	1	8	18	1.8	13	
Chamber protector bolt	6	6	10	1.0	7	
Brake disc bolt	18	8	40	4.0	29	
HANDLEBAR:						
Handlebar upper holder bolt	4	8	25	2.5	18	NOTE 8
Front master cylinder holder bolt	2	6	12	1.2	9	
Clutch master cylinder holder bolt	2	6	12	1.2	9	
FRONT:						
Axle pinch bolt	4	8	22	2.2	16	
Axle bolt	1	14	90	9.0	65	
Steering stem nut	1	24	100	10.0	72	
Steering stem adjustment nut	1	26	19	1.9	14	See page 13-26
Anti-dive case socket bolt	8	6	8	0.8	6	NOTE 2
Fork bottom socket bolt	2	8	20	2.0	14	NOTE 2
Fork bolt	2	37	23	2.3	17	
Fork leg upper pinch bolt	2	7	11	1.1	8	
Fork leg lower pinch bolt	4	10	55	5.5	40	
REAR:						
Axle pinch bolt	1	8	32	3.2	23	
Axle nut	1	18	110	11.0	80	
Damper holder bolt	5	6	20	2.0	14	
Left shock absorber mount bolt (Upper)	1	8	23	2.3	17	
(Lower)	1	18	70	7.0	51	
Right shock absorber mount bolt (Upper)	1	8	23	2.3	17	
(Lower)	1	8	23	2.3	17	
Air hose bolt	3	10	6	0.6	4	
Air hose special bolt (with seat)	1	10	15	1.5	11	
Outlet air hose joint	2	8	6	0.6	4	
Air pressure sensor	1	8	10	1.0	7	
Air distributor solenoid valve mounting screw	4	5	3	0.3	2	
Swing arm right pivot bolt	1	30	100	10.0	72	
Swing arm left pivot bolt	1	30	19	1.9	14	
Swing arm left pivot lock nut	1	30	100	10.0	72	NOTE 7
FINAL DRIVE:						
Pinion bearing retainer	1	70	150	15.0	108	
Pinion joint nut	1	16	110	11.0	80	NOTE 2
Gear case cover bolt (10 mm)	2	10	63	6.3	46	NOTE 2
(8 mm)	6	8	26	2.6	19	
Final drive gear case mounting nut	4	10	65	6.5	47	
Final drive gear case filler cap	1	30	12	1.2	9	
Final drive gear case drain bolt	1	14	20	2.0	14	
Dust guard plate bolt	1	6	10	1.0	7	
Retainer lock washer bolt	1	6	10	1.0	7	
HYDRAULIC BRAKE:						
Caliper bleed valve	3	7	6	0.6	4	
Front caliper bracket bolt	2	8	23	2.3	17	
Anti-dive piston bolt	2	6	12	1.2	9	
Front pad pin plug	4	10	2.5	0.25	1.8	
Front pad pin	4	10	18	1.8	13	
Brake hose bolt	6	10	35	3.5	25	
Rear master cylinder mounting bolt	2	6	12	1.2	9	
Rear caliper retainer bolt	1	6	11	1.1	8	
Rear caliper bolt	1	8	23	2.3	17	
Rear caliper pin bolt	1	12	28	2.8	20	
Metal brake line nut	4	10	17	1.7	12	
Brake pedal bolt	1	8	25	2.5	18	

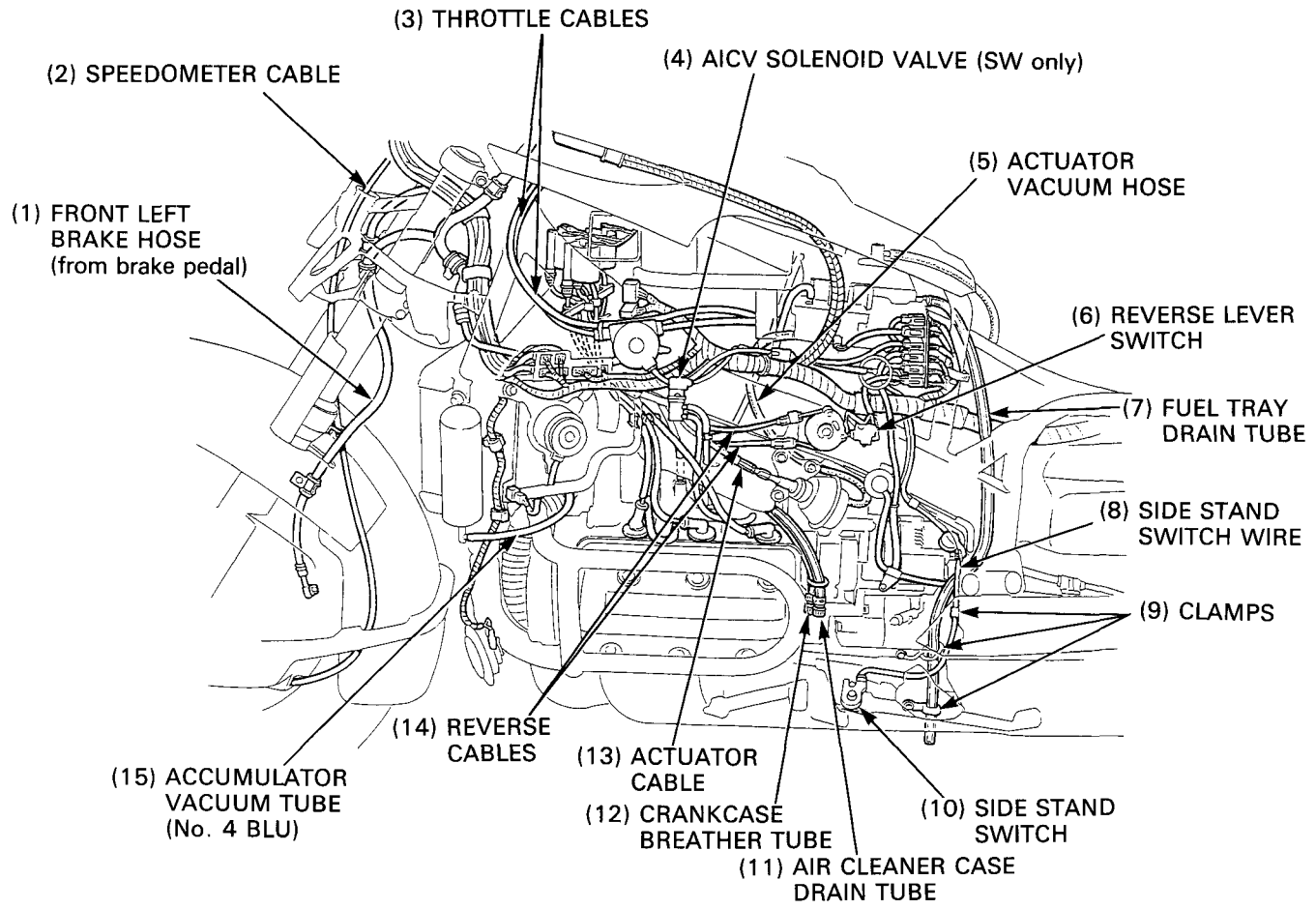
Item	Q'ty	Thread dia (mm)	Torque N·m	Torque kg-m	Torque ft-lb	Remarks
OTHER						
Side stand pivot bolt	1	10	22	2.2	16	
Center stand pivot bolt	1	8	18	1.8	13	
Passenger footrest bracket bolt	4	8	27	2.7	20	
Footrest cover	2	6	10	1.0	7	
Fairing inner cover bolt	2	6	10	1.0	7	
Air cleaner tube joint screw	2	5	0.3	0.03	0.2	
Starter motor cable nut	2	—	0.5	0.05	0.4	
Antenna lock nut	1	8	10	1.0	7	

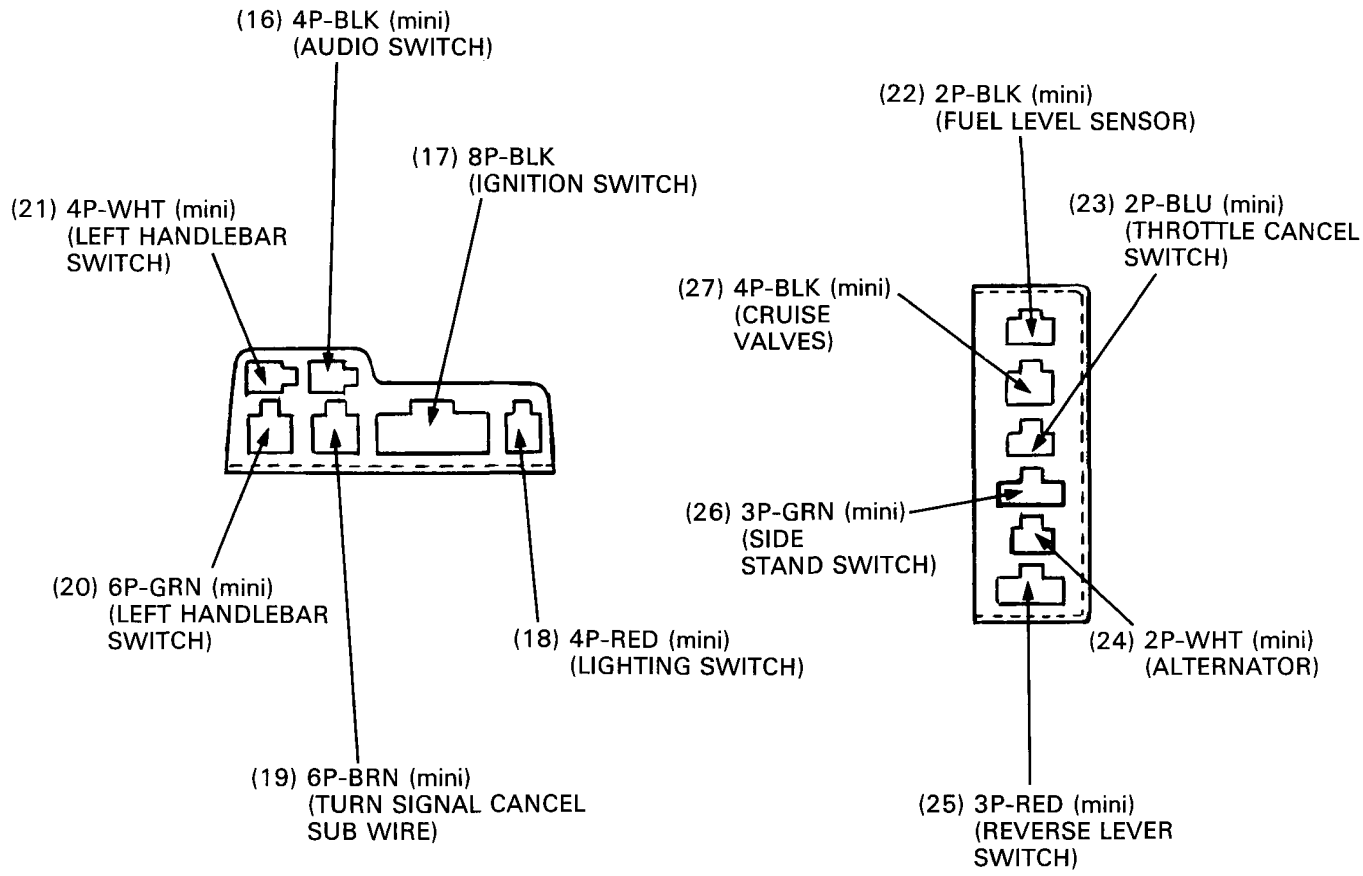
Torque specifications listed above are for important fastners. Other should be tightened to standard torque values listed below.

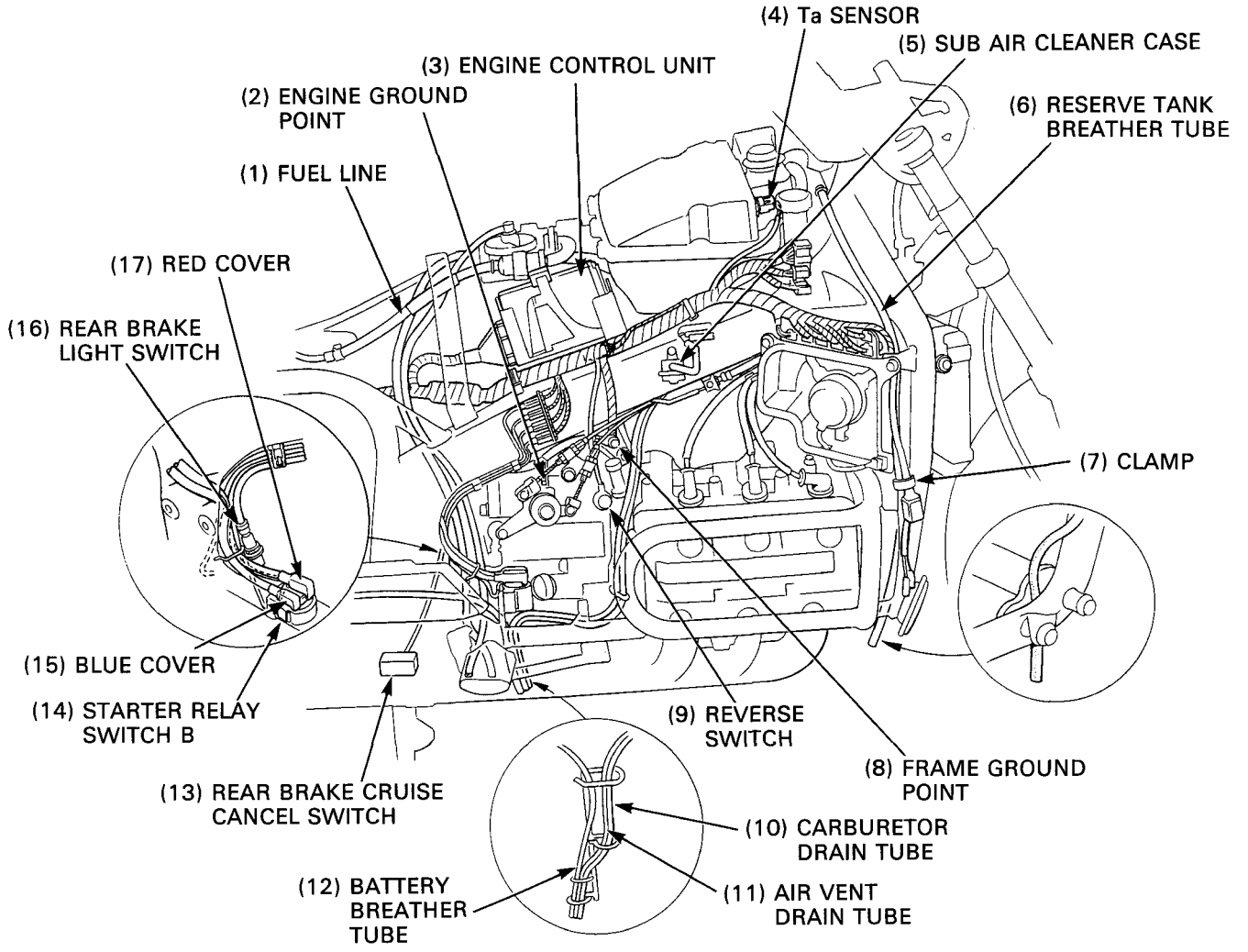
STANDARD TORQUE VALUES

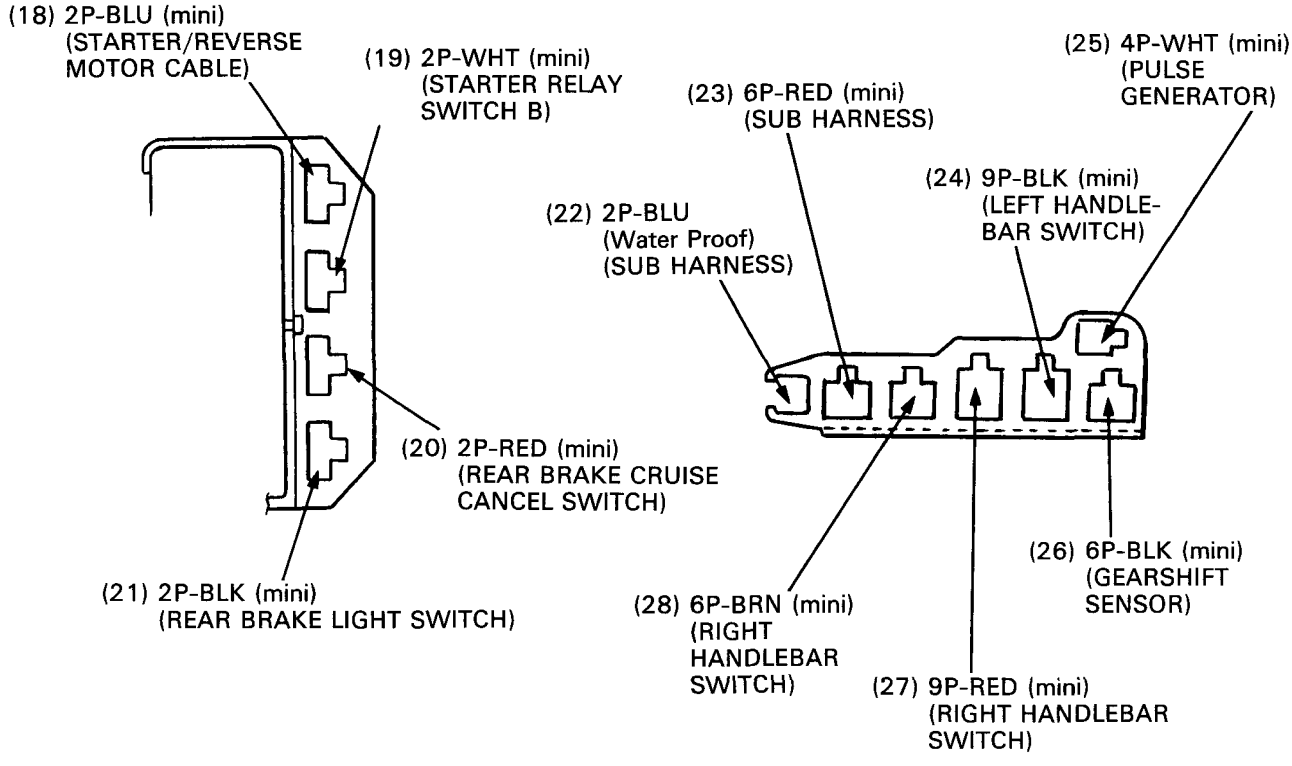
Item	Torque Values N·m (kg-m, ft-lb)	Item	Torque Values N·m (kg-m, ft-lb)
5 mm bolt and nut	5 (0.5, 4)	5 mm screw and 6 mm flange	4 (0.4, 3)
6 mm bolt and nut	10 (1.0, 7)	6 mm screw and 6 mm flange bolt with 8 mm head	9 (0.9, 7)
8 mm bolt and nut	22 (2.2, 16)	6 mm flange bolt and nut	12 (1.2, 9)
10 mm bolt and nut	35 (3.5, 25)	8 mm flange bolt and nut	27 (2.7, 20)
12 mm bolt and nut	55 (5.5, 40)	10 mm flange bolt and nut	40 (4.0, 29)


(1) 3P-WHT (mini) CONNECTOR
(2) HEADLIGHT AIM ADJUSTING CABLE
(4) 4P-WHT CONNECTOR
(5) SPEAKER WIRES
(3) 3P-BLK (mini) CONNECTOR
(6) AIR JET SOLENOID VALVE 2
(7) AIR JET SOLENOID VALVE 3
(10) 6P-WHT (mini) CONNECTOR
(9) 16P-BLK CONNECTOR
(8) 14P-WHT CONNECTOR
(11) 14P-WHT CONNECTOR
(12) 2P-GRN (Water proof) CONNCTOR
(16) AJSV 2
(17) AJSV 3
(23) No. 19 (WHT) TUBE
(18) No. 20 (WHT) TUBE
(22) Ne. 21 (WHT) TUBE
(21) No. 18 (WHT) TUBE
(15) 6P-WHT CONNECTOR
(14) 13P-BLK CONNECTOR
(20) SUB AIR CLEANER CASE
(19) No. 22 (WHT) TUBE
(13) 2P-RED (Water proof) CONNECTOR

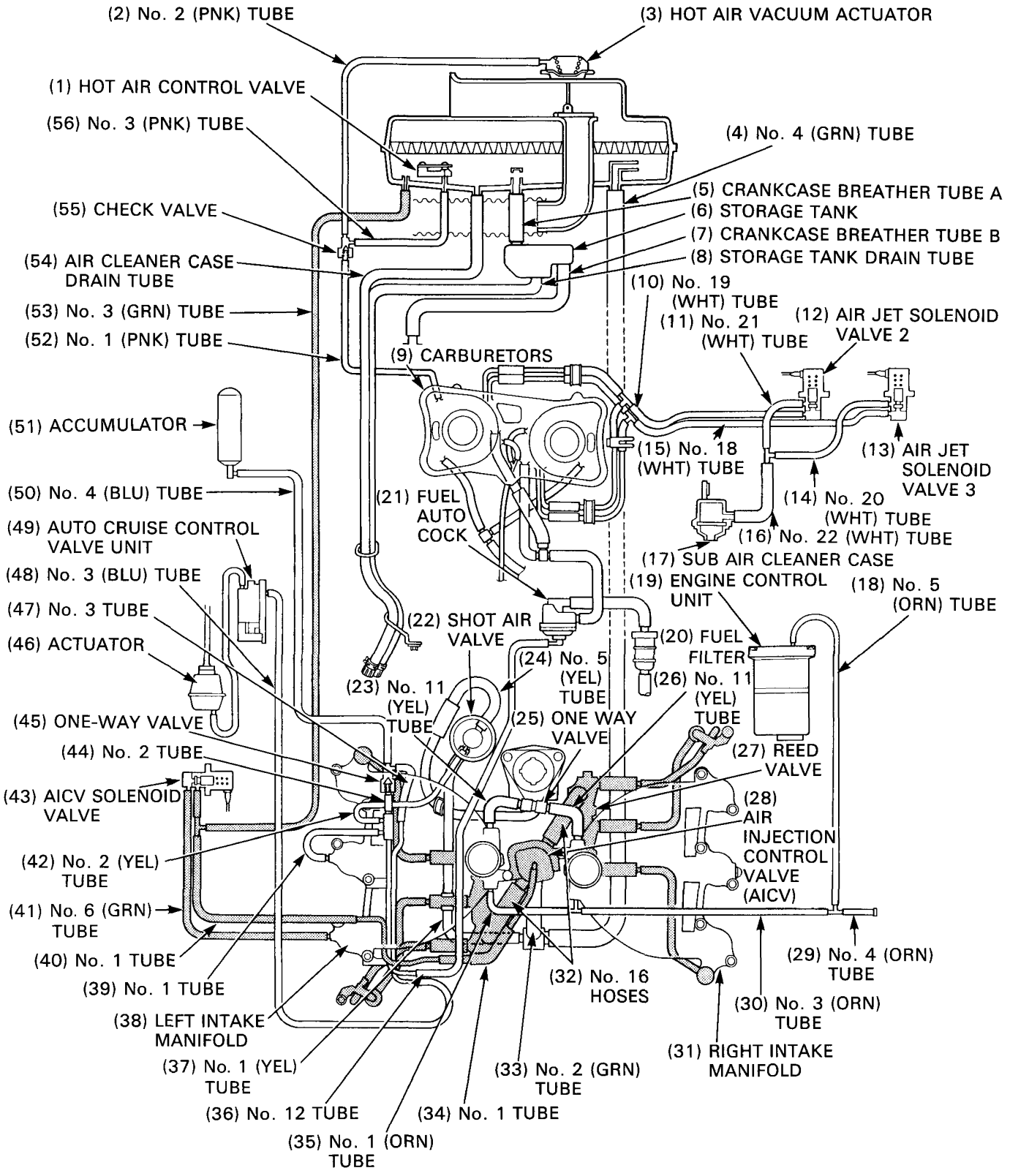

(3) THROTTLE CABLES
(2) SPEEDOMETER CABLE
(4) AICV SOLENOID VALVE (SW only)
(5) ACTUATOR VACUUM HOSE
(1) FRONT LEFT BRAKE HOSE (from brake pedal)
(6) REVERSE LEVER SWITCH
(7) FUEL TRAY DRAIN TUBE
(8) SIDE STAND SWITCH WIRE
(9) CLAMPS
(14) REVERSE CABLES
(13) ACTUATOR CABLE
(15) ACCUMULATOR VACUUM TUBE (No. 4 BLU)
(12) CRANKCASE BREATHER TUBE
(10) SIDE STAND SWITCH
(11) AIR CLEANER CASE DRAIN TUBE


(16) 4P-BLK (mini) (AUDIO SWITCH)
(17) 8P-BLK (IGNITION SWITCH)
(21) 4P-WHT (mini) (LEFT HANDLEBAR SWITCH)
(22) 2P-BLK (mini) (FUEL LEVEL SENSOR)
(23) 2P-BLU (mini) (THROTTLE CANCEL SWITCH)
(27) 4P-BLK (mini) (CRUISE VALVES)
(26) 3P-GRN (mini) (SIDE STAND SWITCH)
(20) 6P-GRN (mini) (LEFT HANDLEBAR SWITCH)
(18) 4P-RED (mini) (LIGHTING SWITCH)
(24) 2P-WHT (mini) (ALTERNATOR)
(19) 6P-BRN (mini) (TURN SIGNAL CANCEL SUB WIRE)
(25) 3P-RED (mini) (REVERSE LEVER SWITCH)


(4) Ta SENSOR
(5) SUB AIR CLEANER CASE
(3) ENGINE CONTROL UNIT
(2) ENGINE GROUND POINT
(6) RESERVE TANK BREATHER TUBE
(1) FUEL LINE
(17) RED COVER
(16) REAR BRAKE LIGHT SWITCH
(7) CLAMP
(15) BLUE COVER
(14) STARTER RELAY SWITCH B
(9) REVERSE SWITCH
(8) FRAME GROUND POINT
(13) REAR BRAKE CRUISE CANCEL SWITCH
(10) CARBURETOR DRAIN TUBE
(12) BATTERY BREATHER TUBE
(11) AIR VENT DRAIN TUBE


(18) 2P-BLU (mini) (STARTER/REVERSE MOTOR CABLE)
(19) 2P-WHT (mini) (STARTER RELAY SWITCH B)
(25) 4P-WHT (mini) (PULSE GENERATOR)
(23) 6P-RED (mini) (SUB HARNESS)
(24) 9P-BLK (mini) (LEFT HANDLE-BAR SWITCH)
(22) 2P-BLU (Water Proof) (SUB HARNESS)
(20) 2P-RED (mini) (REAR BRAKE CRUISE CANCEL SWITCH)
(26) 6P-BLK (mini) (GEARSHIFT SENSOR)
(21) 2P-BLK (mini) (REAR BRAKE LIGHT SWITCH)
(28) 6P-BRN (mini) (RIGHT HANDLEBAR SWITCH)
(27) 9P-RED (mini) (RIGHT HANDLEBAR SWITCH)

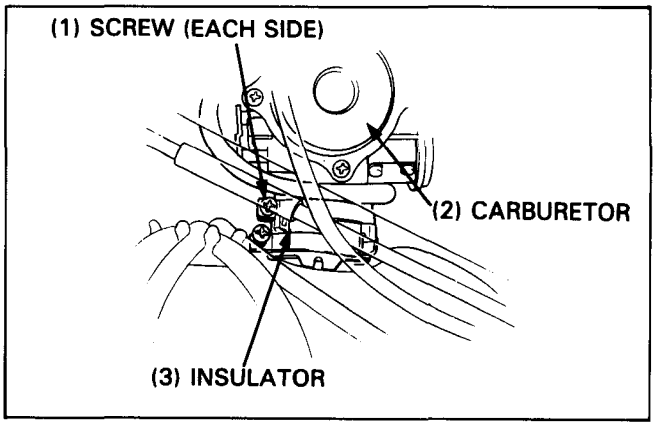
HOSES AND TUBES ROUTING/CONNECTION (▒▒: SW MODEL ONLY)



CARBURETOR REMOVAL

Drain coolant (page 5-7).
Remove the following:
– fairing inner covers (page 12-9).
– air cleaner case (page 26-27).

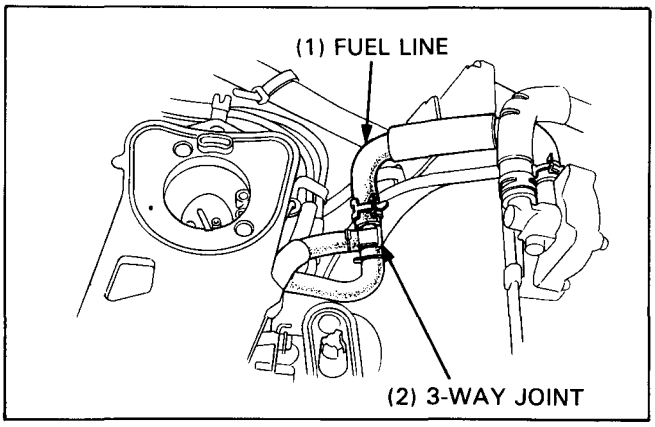
Loosen the carburetor insulator band screws (upper side, near carburetor) and remove the carburetor from insulators.



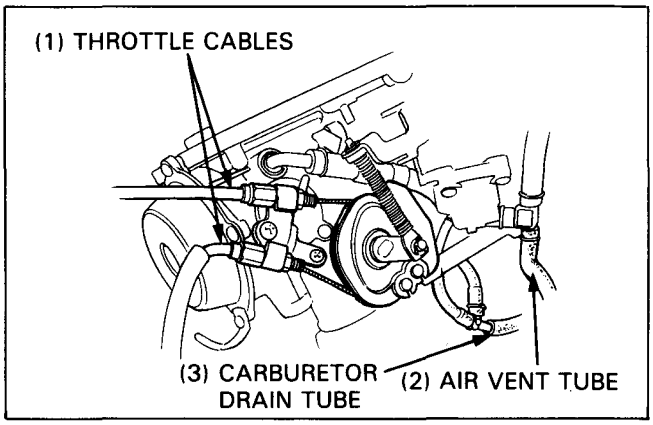
Disconnect the fuel line from the 3-way joint.

⚠ WARNING

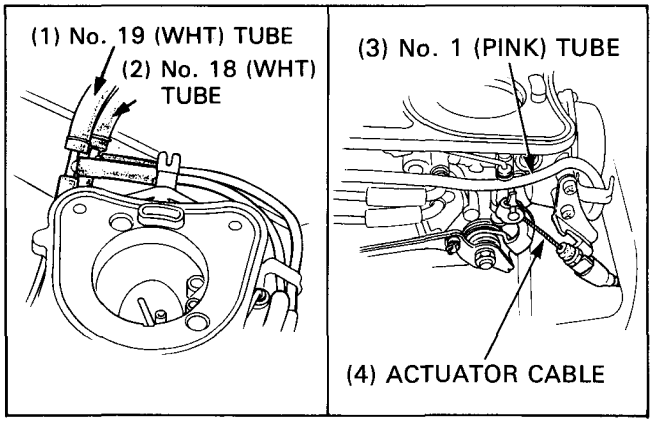
- ***Keep gasoline away from flames or sparks. Wipe up spilled gasoline at once.***



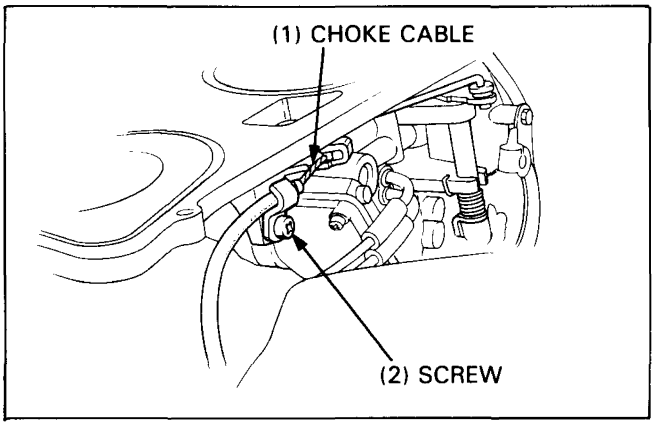
Disconnect the throttle cables from the throttle drum.
Disconnect the air vent tube and carburetor drain tube at each 3-way joint.



Disconnect the No. 18 (WHT) and No. 19 (WHT) tube at the 3-way joint.
Remove the No. 1 (PINK) tube from the clamp and disconnect it from the carburetor.
Disconnect the auto cruise actuator cable from the throttle drum.



Loosen the choke cable holder screw and disconnect the choke cable.

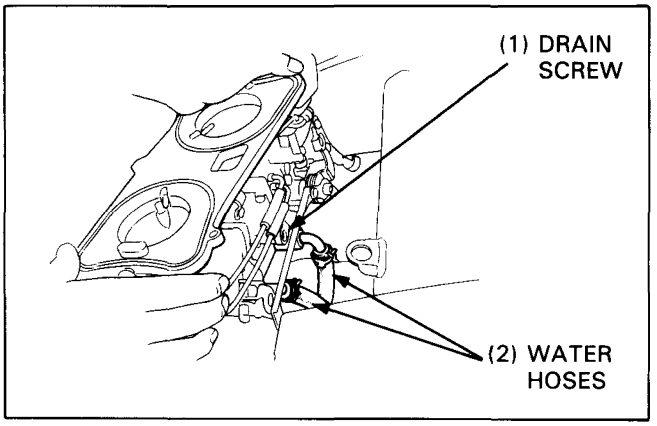


Disconnect water hoses from the carburetor heat riser.
Remove carburetor assembly.

NOTE

- Place a suitable container under the carburetor to catch residual coolant from the carburetor heat riser.
- Cover intake manifold bores with a shop towel to prevent dropping anything into the engine.

After removal, drain fuel out of the float chambers into a suitable container by loosening drain screws.
For intake manifold service, see page 29-20.



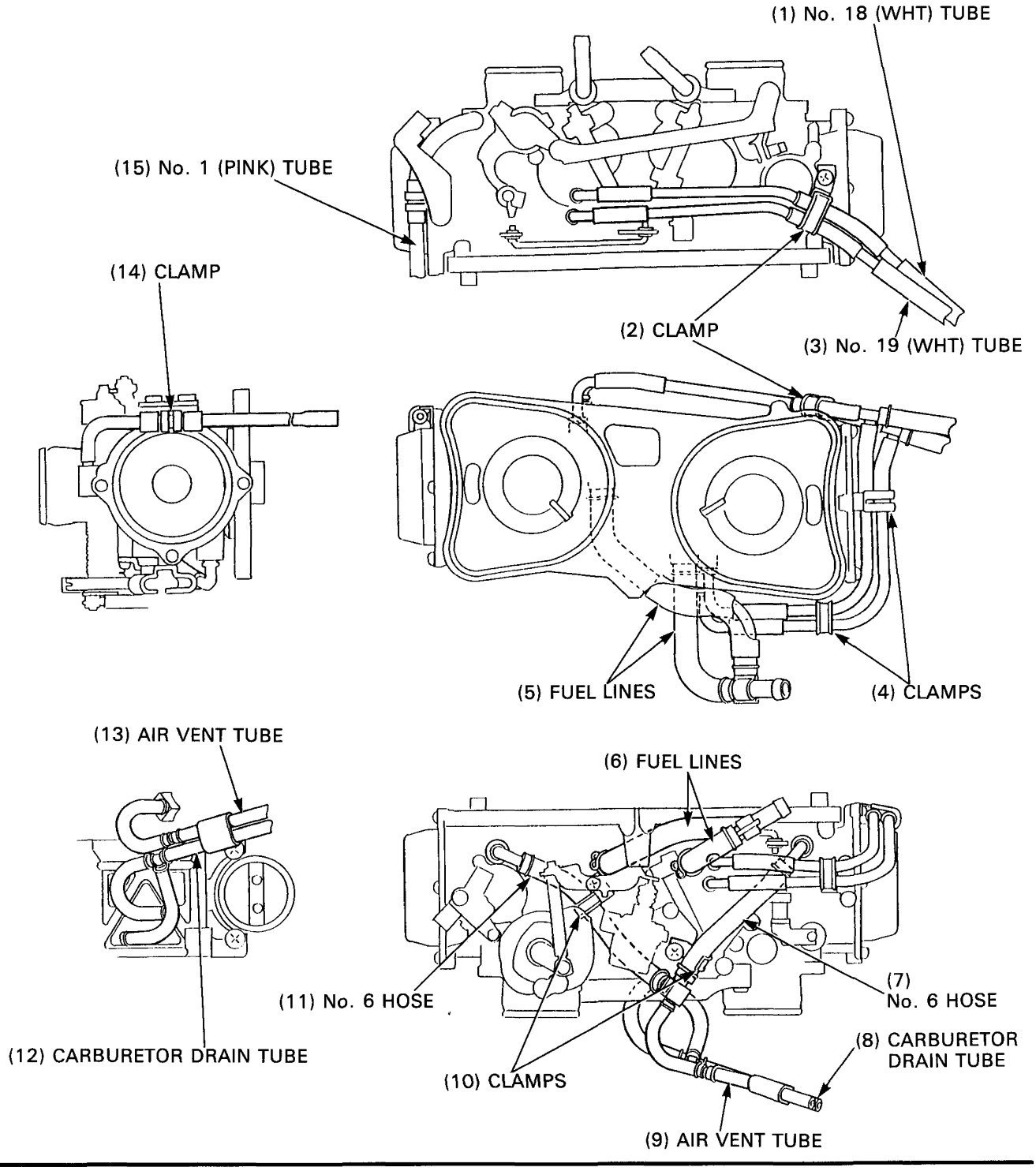
⚠ WARNING

- ***Keep gasoline away from flames or sparks. Wipe up spilled gasoline at once.***

CARBURETOR TUBES/HOSES

NOTE

- Be careful not to bend, twist or kink the tubes when installing.
- Install new tubes if the current tubes are deteriorated or damaged.
- Slide the end of each tube fully onto its fitting, and secure with a tube clamp.
- After installing the carburetors on the engine, check that the tubes do not contact sharp edges or corners.

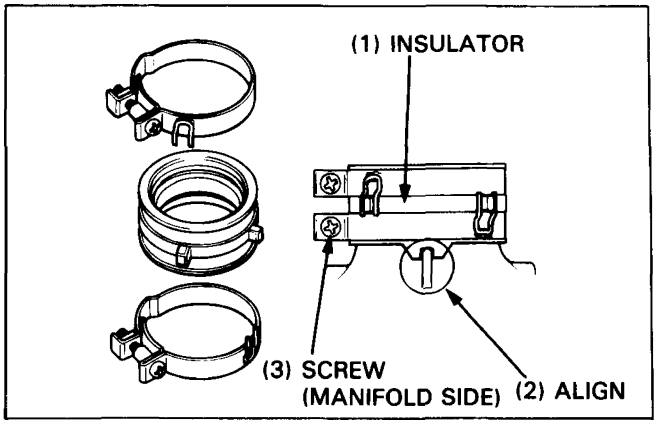


CARBURETOR INSTALLATION

If the carburetor insulator was removed, install the insulator onto the intake manifold, aligning the insulator groove with the manifold rib.

Secure the screw of the manifold side.

TORQUE: 5 N·m (0.5 kg-m, 3.6 ft-lb)

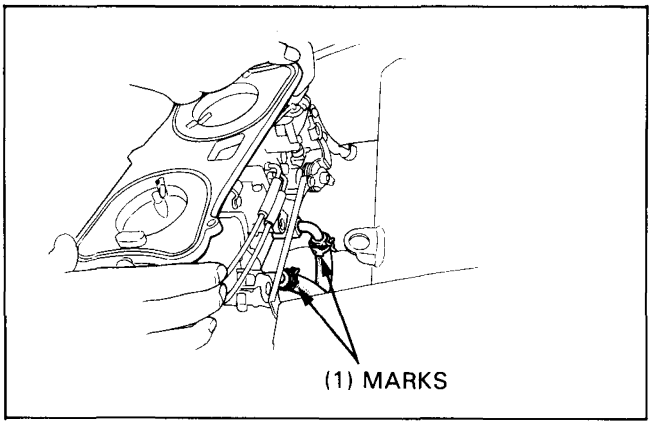


Connect the water hoses to the carburetor heat riser.

NOTE

- Connect the "J" marked hose (with yellow tape) to the left pipe (with yellow paint); the "D"marked hose to the right pipe.

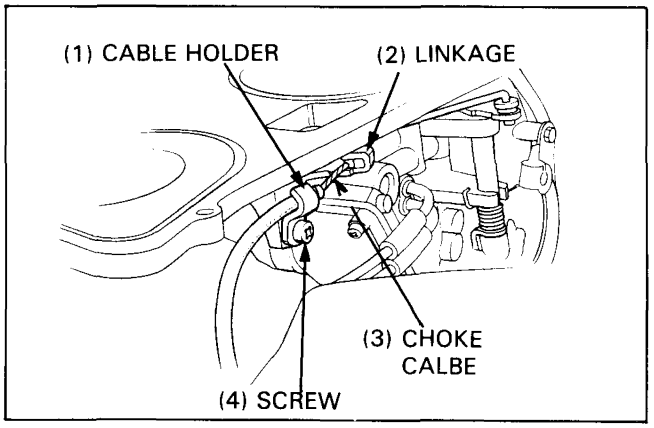
Secure the hoses with clamps.



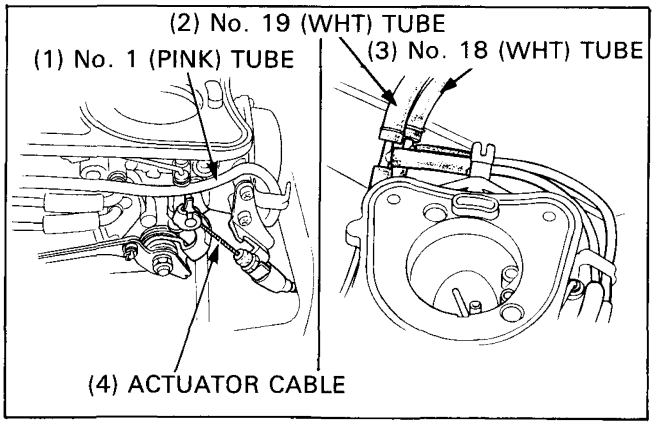
Connect the choke cable to the choke linkage. Align the end of the cable outer housing with the edge of the cable holder.

Tighten the cable holder screw securely.

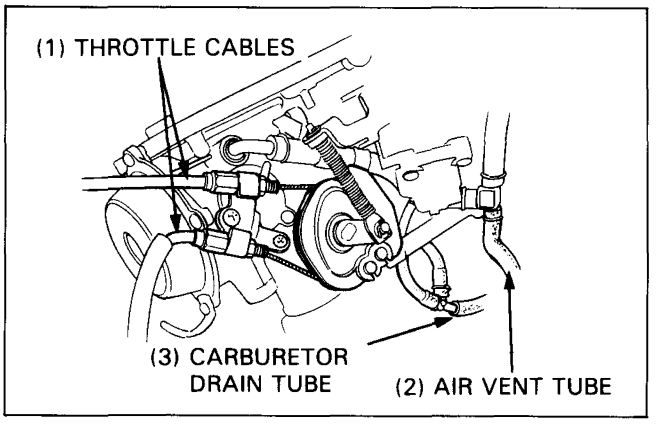
Make sure that the choke linkage end does not contact the cable outer housing when the choke lever is fully open.



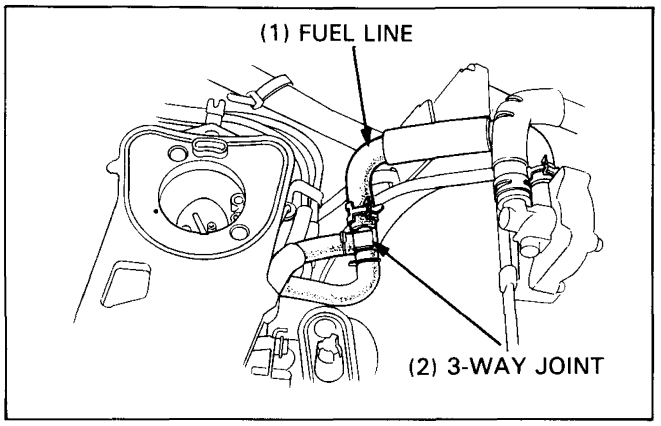
Connect the actuator cable.
Connect the No. 1 (PINK) tube to the carburetor and clamp it properly.
Connect the No. 18 (WHT) and No. 19 (WHT) tubes.



Connect the carburetor drain tube and air vent tube to each 3-way joint.
Connect the throttle cables to the throttle drum.

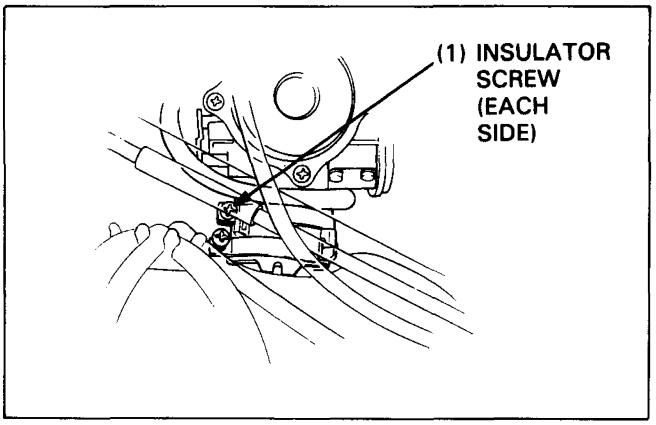


Connect the fuel line to the 3 way joint.



Install the carburetor onto the insulators and secure the screws to the specified torque.

TORQUE: 5 N·m (0.5 kg-m, 3.6 ft-lb)



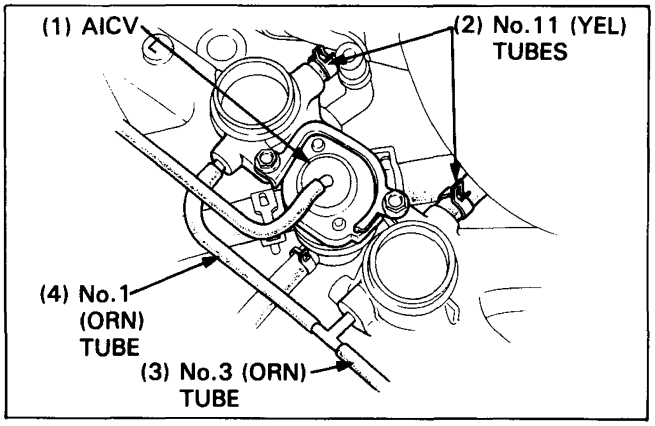
INTAKE MANIFOLD

REMOVAL

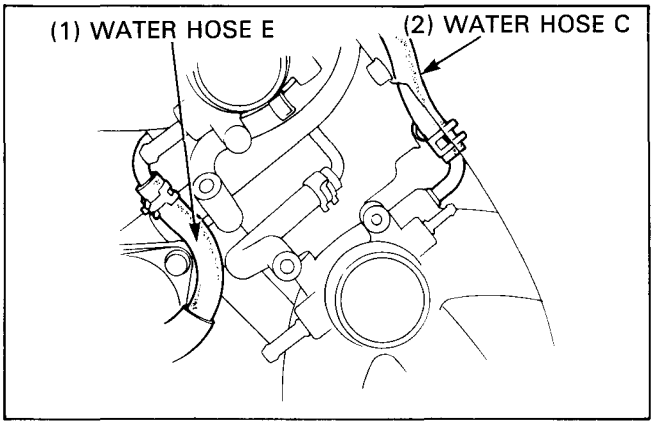
Remove the following:
- air cleaner case (page 26-27).
- carburetors (page 29-16).
- heat guard.
- insulators.

SW and AR models only:
- air injection control valve (AICV) (page 26-43).

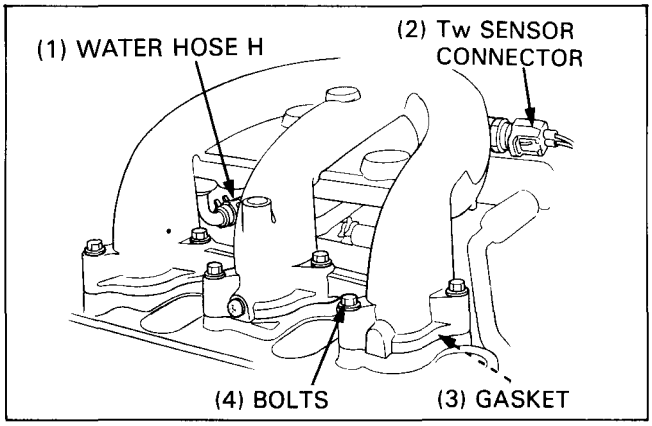
Disconnect the No. 11 (YEL), No. 1 (ORN) and No. 3 (ORN) tubes from the intake manifold.



Disconect water hoses C and E from intake manifold riser pipes.



Disconnect the Tw sensor connector and water hose H from the right intake manifold.
Remove six bolts, right intake manifold and gasket.



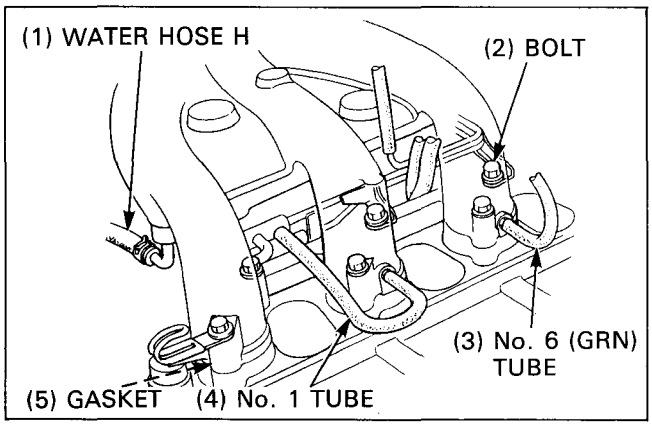
Disconnct the No. 1 tube and water hose H from the left intake manifold.
SW and AR models only: Disconnect the No. 6 (GRN) tube from the intake manifold:
Remove six bolts, left intake manifold and gasket.

INSTALLATION

Install the intake manifolds in the reverse order of removal.

NOTE

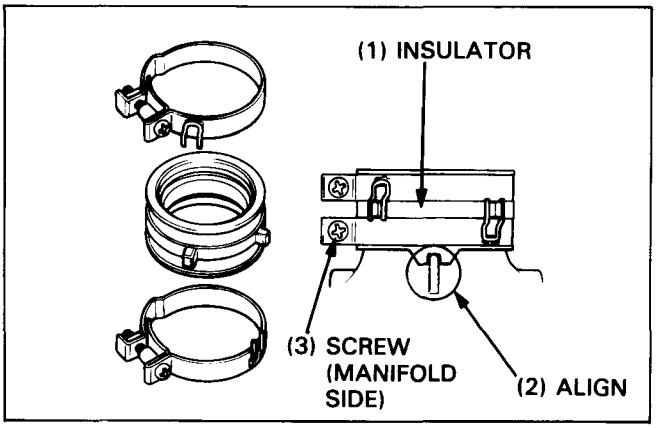
- "L" marked manifold to the left side; and "R" marked to the right.
- For all vacuum tubes connection and routing, refering to the hose and tubes routing/connection (page 29-15).



Install the carburetor insulator onto the intake manifolds, aligning the insulator groove with the manifold ribs.

Secure the screws of the manifold side.

TORQUE: 5 N·m (0.5 kg-m, 3.6 ft-lb)



Ta SENSOR CHECK

Remove the air cleaner case cover (page 26-27).

Remove the nut and the Ta sensor from the air cleaner case cover.

Suspend the sensor in cold water. Heat the water slowly. Measure resistance between the terminals.

STANDARDS:
2.0—3.0 K ohms at 20°C (68°F)
200—400 ohms at 80°C (176°F)

NOTE

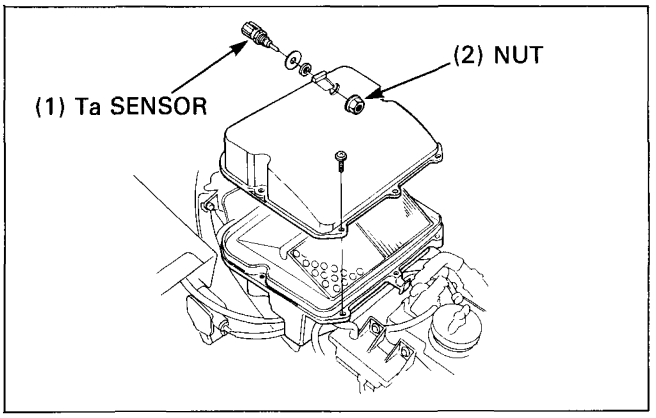
- If the sensor or thermometer touches the pan, false readings will result.
- Stir water well.

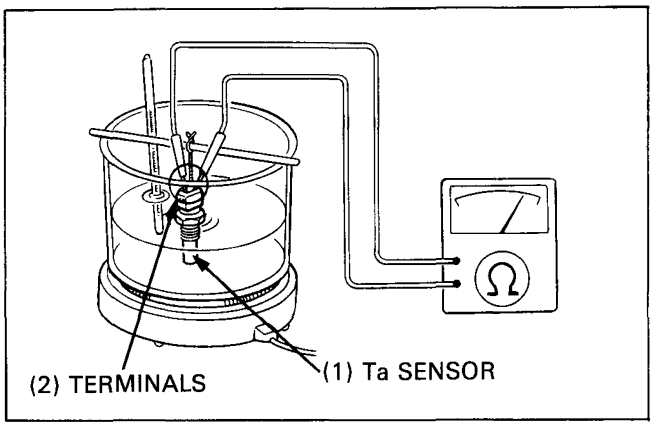
CAUTION

- *Do not attach water onto the sensor terminals.*

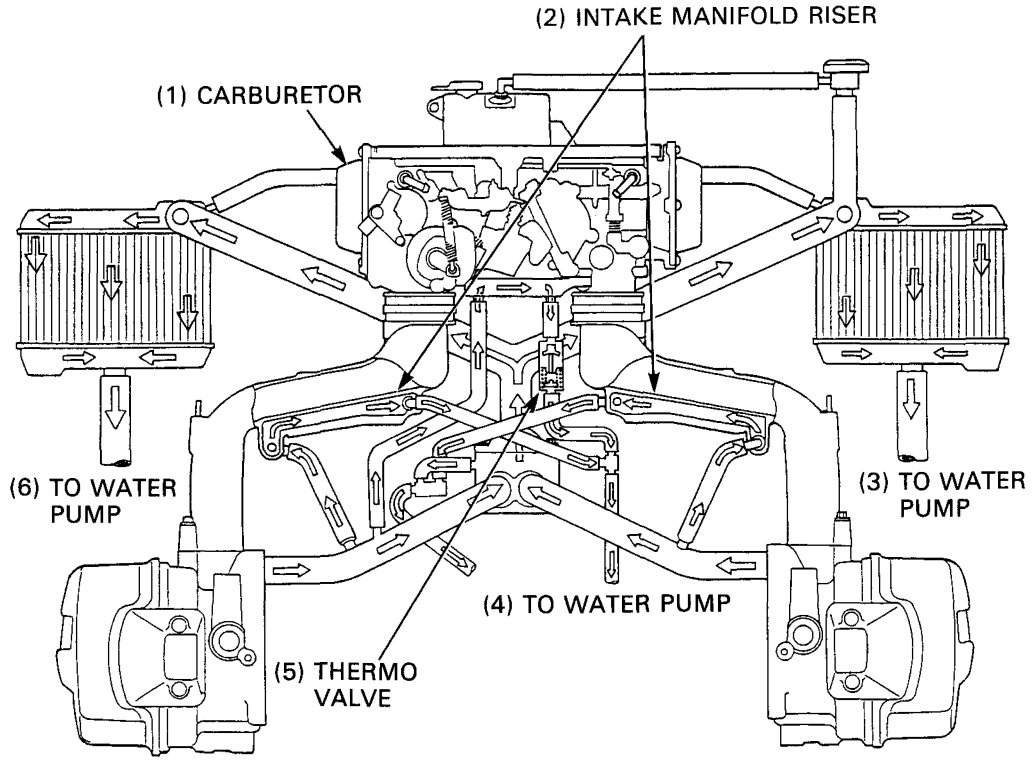
If resistance is outside the above ranges, replace the Ta sensor.

Set the connector stopper ring into the groove of the 2P-GRN connector and connect the connector to the Ta sensor properly. Install the Ta sensor in the reverse order of removal.





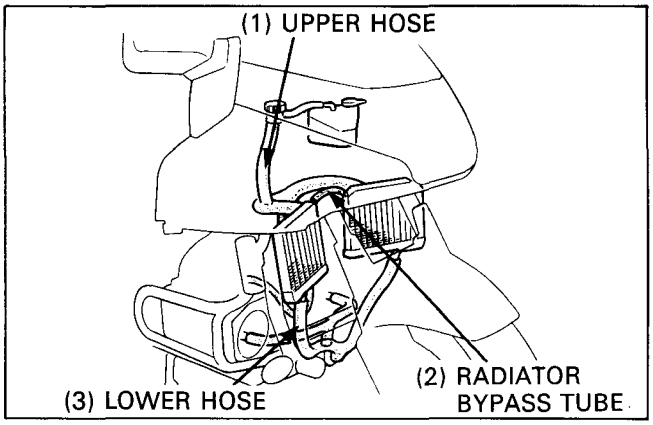
COOLANT COURSE



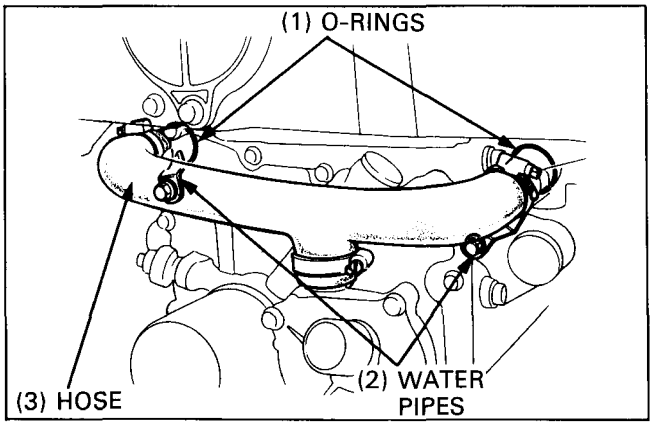
THERMOSTAT, THERMO VALVE AND WATER LINES

WATER LINE REMOVAL

Remove the radiators (page 26-46).
Remove the upper water hose, lower water hose and left-right radiators bypass tubes.



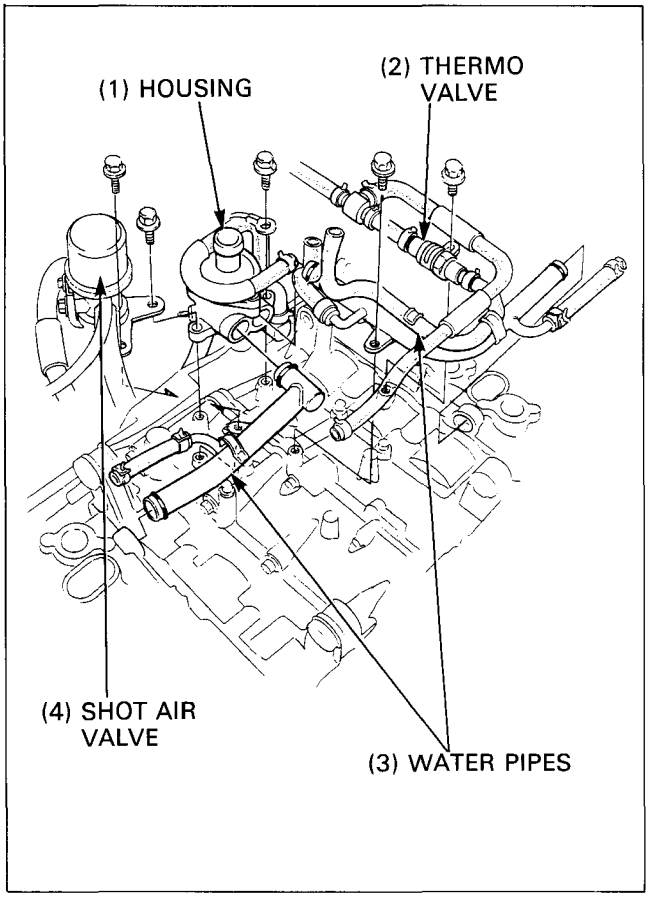
Remove the water pump hose and water pipes.
Inspect the O-rings for damage or deterioration.



Remove the carburetor and intake manifolds (page 29-20).

Remove the five bolts, shot air valve, water pipes, thermo valve and the thermostat housing from the engine.

Inspect the pipe O-ring and water hoses for damage or deterioration.
Inspect the thermo valve.

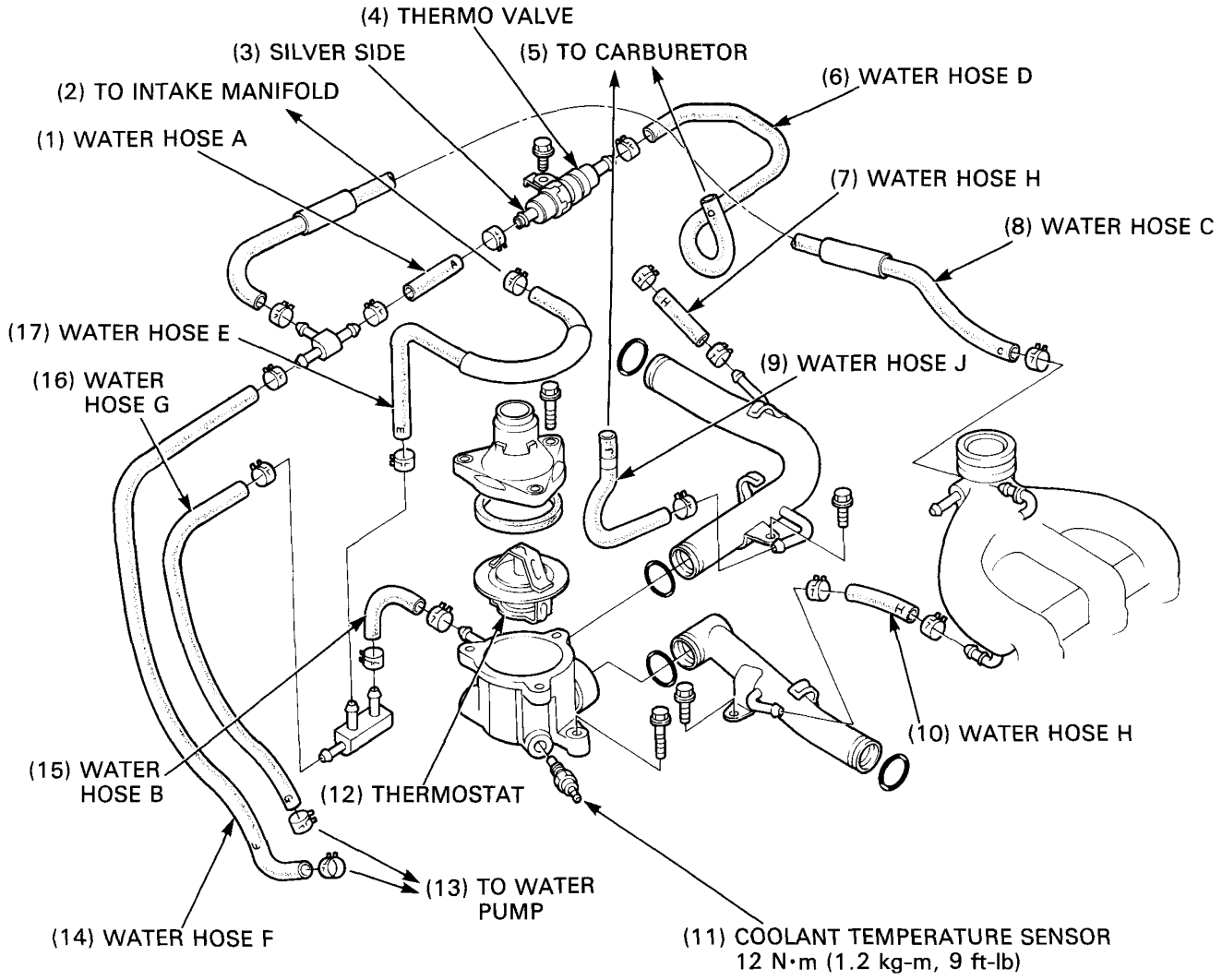


INSTALLATION

To install, reverse the removal procedure.

NOTE

- Apply a sealant such as Honda Silicone Liquid Gasket to the temperature sensor threads before installation.
- Install the thermo valve so that its silver side is connected to water hose A.
- Install the water tubes properly according to their alphabet as shown.



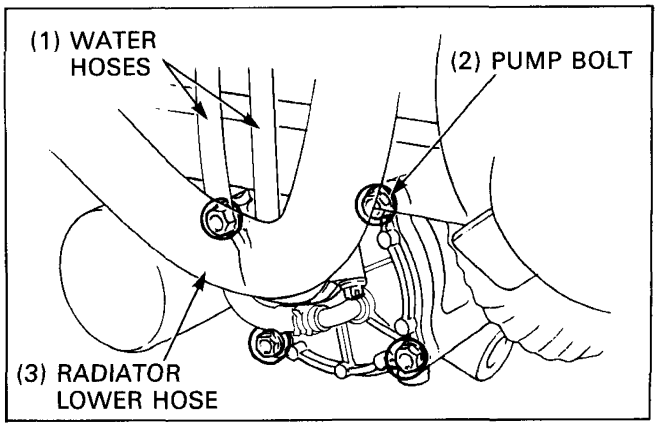
WATER PUMP

REMOVAL

Remove the subframe (page 6-4).

Drain the engine oil (page 2-4).
Drain the coolant (page 5-7).
Disconnect the radiator lower hose and water hoses F and G from the water pump cover.

Remove the four bolts and water pump cover from the body.



Disconnect the water pump hose from the water pump body.

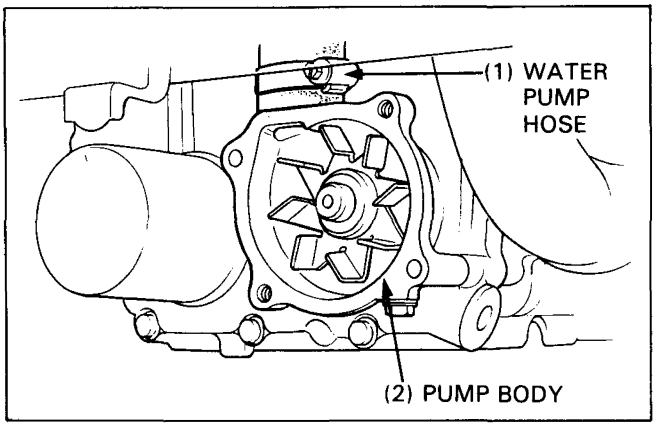
Remove the pump body from the engine.

INSPECTION

Check the water pump rotor for damage.

NOTE

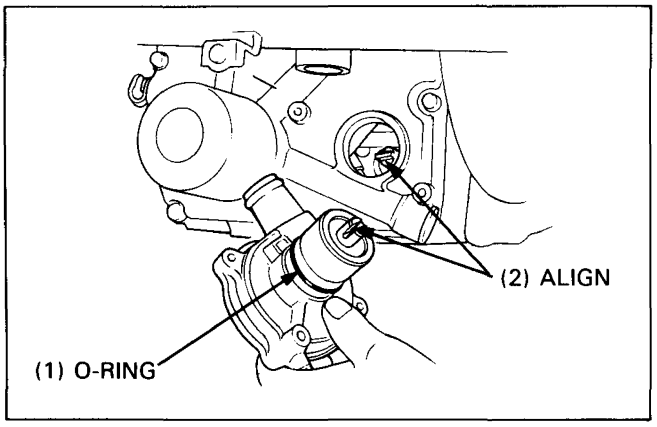
- Do not disassemble the pump rotor.



INSTALLATION

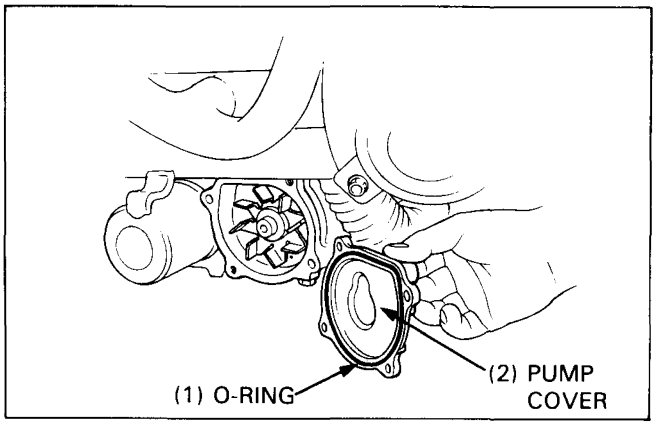
Install a new O-ring to the pump body.

Install pump body onto the engine, aligning the water pump rotor shaft slot with the oil pump shaft.



Install a new O-ring onto the pump cover.

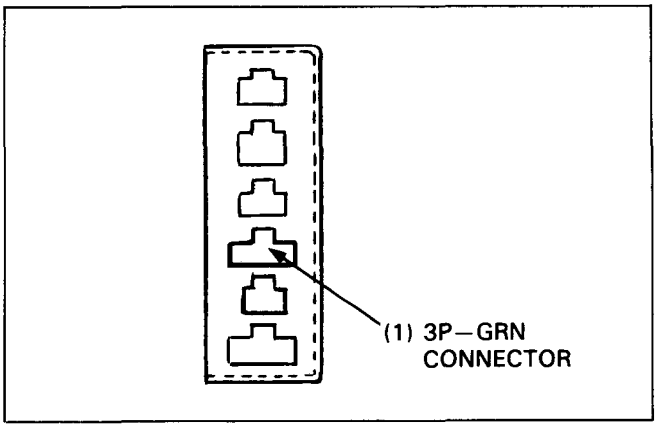
Connect the water pump hose and install the water pump cover to the pump body.
Connect the radiator lower hose and water hoses F and G to the water pump cover.



SIDE STAND SWITCH

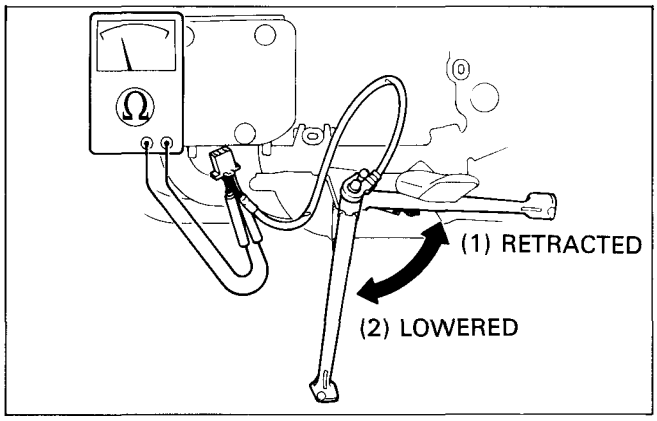
INSPECTION

Remove the left fairing inner cover (page 12-9).
Disconnect the 3P-GRN connector of the connector holder behind the cruise control valve unit.



Check for continuity between each terminal as shown below.

Item	Terminal	Specification
Side stand lowered	GRN/WHT and GRN	NO CONTINUITY
	YEL/BLK and GRN	CONTINUITY
Side stand retracted	GRN/WHT and GRN	CONTINUITY
	YEL/BLK and GRN	NO CONTINUITY



REMOVAL

Remove the left front side cover (page 12-6).

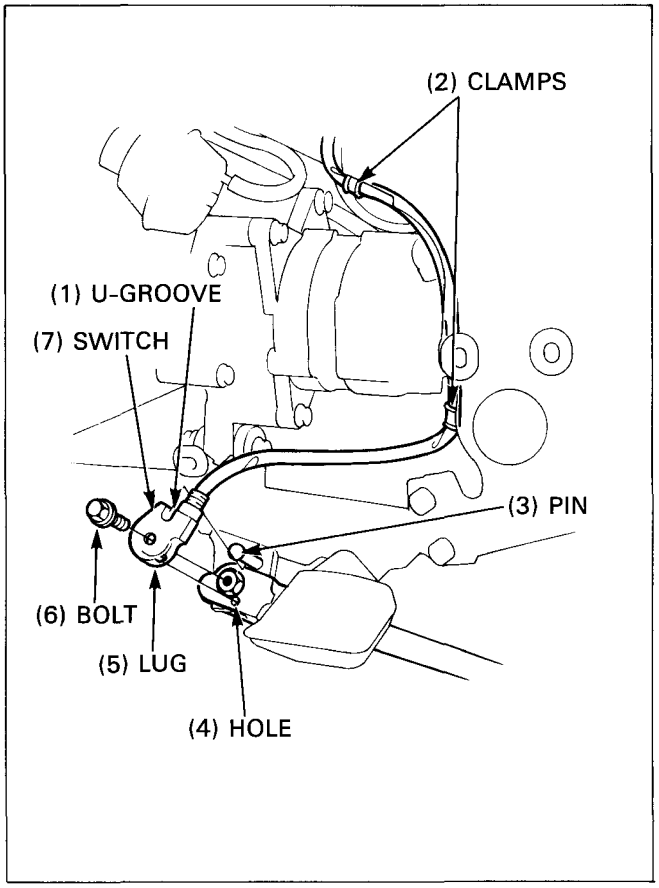
Remove the side stand switch mounting bolt.

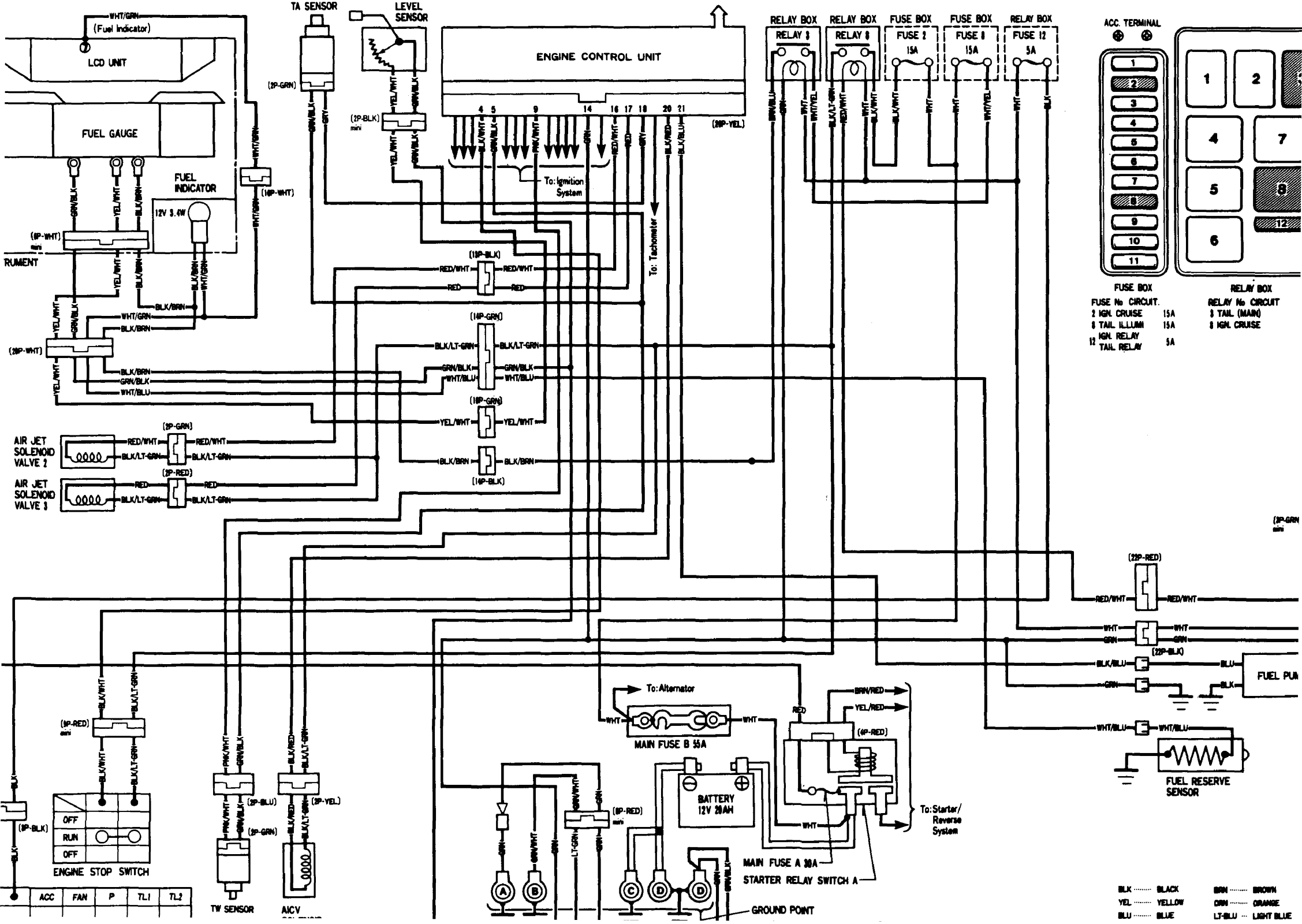
Release the wire clamps and remove the side stand switch from the side stand.

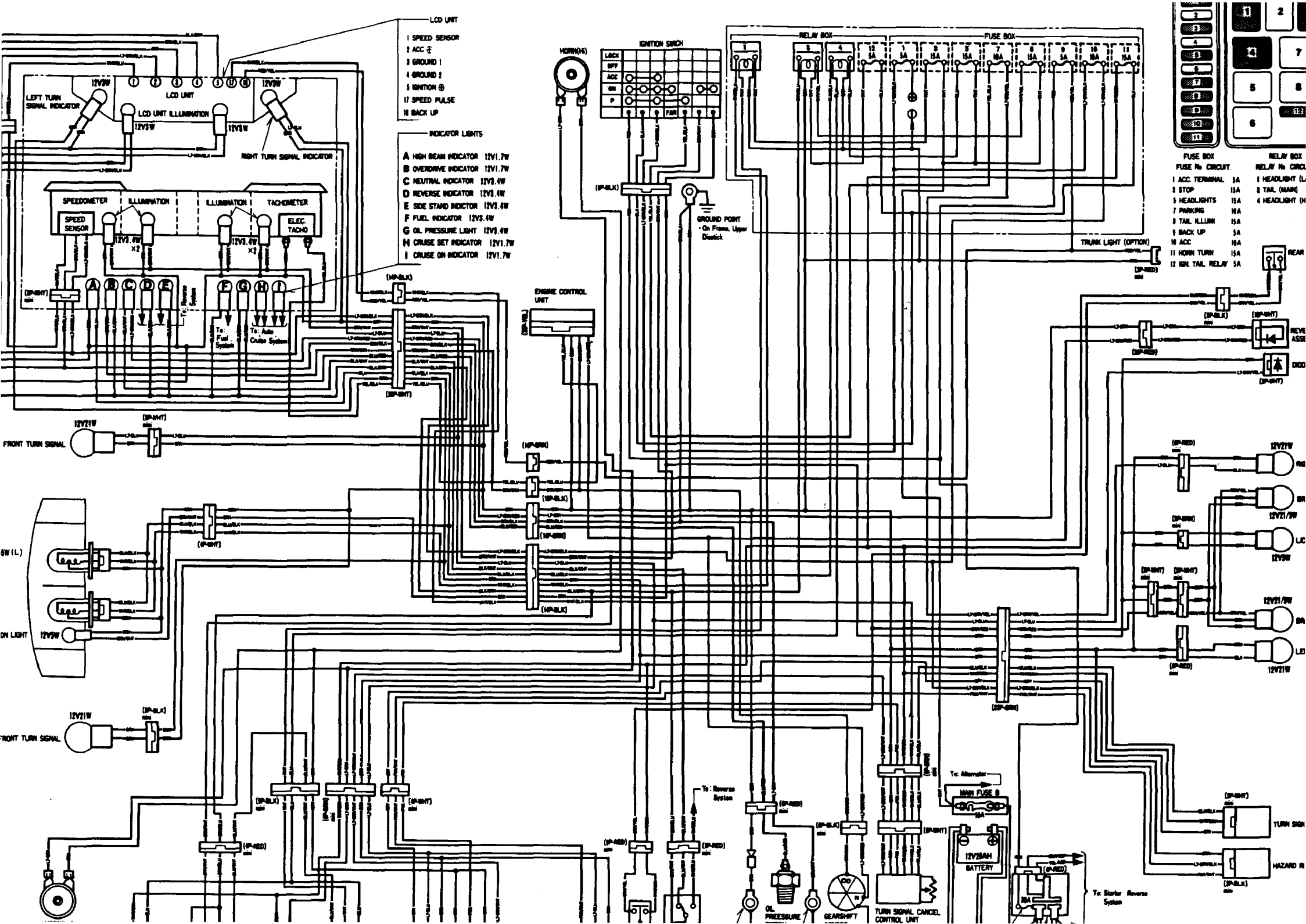
INSTALLATION

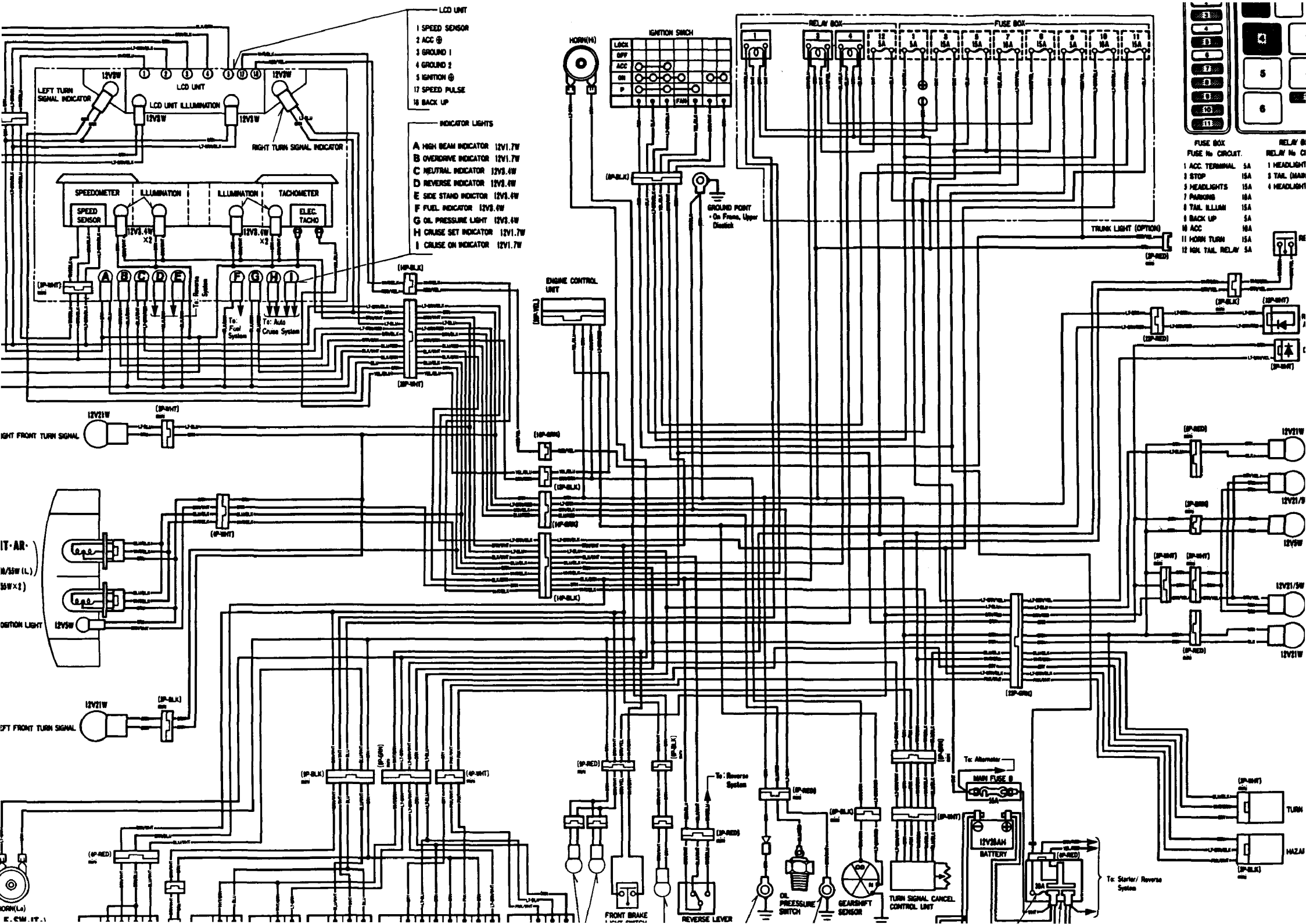
Install the side stand switch, aligning its U-goove with the pin. Align the lug of the switch rotor with the hole in the side stand bar pivot and install the mounting bolt.

Install the removed parts in the reverse order of removal.




WHT/GRN
(Fuel Indicator)
LCD UNIT
FUEL GAUGE
FUEL INDICATOR
12V 3.4W
(8P-WHT)
mini
RUMENT
(16P-WHT)
(20P-WHT)
TA SENSOR
LEVEL SENSOR
(2P-GRN)
(2P-BLK)
mini
ENGINE CONTROL UNIT
4 5 9 14 16 17 18 20 21
(20P-YEL)
To: Ignition System
To: Tachometer
RELAY BOX
RELAY 3
RELAY BOX
RELAY 8
FUSE BOX
FUSE 2
15A
FUSE BOX
FUSE 8
15A
RELAY BOX
FUSE 12
5A
ACC. TERMINAL
FUSE BOX
FUSE No CIRCUIT.
2 IGN. CRUISE 15A
8 TAIL ILLUM 15A
12 IGN. RELAY
TAIL RELAY 5A
RELAY BOX
RELAY No CIRCUIT
3 TAIL (MAIN)
8 IGN. CRUISE
(18P-BLK)
(14P-GRN)
(10P-GRN)
(14P-BLK)
AIR JET SOLENOID VALVE 2
AIR JET SOLENOID VALVE 3
(2P-GRN)
(2P-RED)
(22P-RED)
(22P-BLK)
FUEL PUM
FUEL RESERVE SENSOR
To: Alternator
MAIN FUSE B 55A
(4P-RED)
BATTERY 12V 28AH
To: Starter/ Reverse System
MAIN FUSE A 30A
STARTER RELAY SWITCH A
GROUND POINT
(8P-RED)
mini
(8P-BLK)
OFF
RUN
OFF
ENGINE STOP SWITCH
ACC FAN P TL1 TL2
(3P-BLU)
(2P-GRN)
(3P-YEL)
TW SENSOR
AICV
BLK ..... BLACK
YEL ..... YELLOW
BLU ..... BLUE
BRN ..... BROWN
ORN ..... ORANGE
LT-BLU ... LIGHT BLUE


LCD UNIT
1 SPEED SENSOR
2 ACC
3 GROUND 1
4 GROUND 2
5 IGNITION
17 SPEED PULSE
18 BACK UP
INDICATOR LIGHTS
A HIGH BEAM INDICATOR 12V1.7W
B OVERDRIVE INDICATOR 12V1.7W
C NEUTRAL INDICATOR 12V3.4W
D REVERSE INDICATOR 12V3.4W
E SIDE STAND INDICTOR 12V3.4W
F FUEL INDICATOR 12V3.4W
G OIL PRESSURE LIGHT 12V1.4W
H CRUISE SET INDICATOR 12V1.7W
I CRUISE ON INDICATOR 12V1.7W
LEFT TURN SIGNAL INDICATOR
LCD UNIT ILLUMINATION
RIGHT TURN SIGNAL INDICATOR
SPEEDOMETER
ILLUMINATION
TACHOMETER
SPEED SENSOR
ELEC. TACHO
To: Reverse System
To: Fuel System
To: Auto Cruise System
HORN(HI)
IGNITION SWICH
LOCK
OFF
ACC
ON
P
FAN
GROUND POINT
On Frame, Upper Diestick
RELAY BOX
FUSE BOX
FUSE No CIRCUIT
1 ACC. TERMINAL 5A
3 STOP 15A
5 HEADLIGHTS 15A
7 PARKING 10A
8 TAIL ILLUM 15A
9 BACK UP 5A
10 ACC 10A
11 HORN TURN 15A
12 IGN. TAIL RELAY 5A
RELAY No CIRCUIT
1 HEADLIGHT (L
2 TAIL (MAIN)
4 HEADLIGHT (H
TRUNK LIGHT (OPTION)
ENGINE CONTROL UNIT
FRONT TURN SIGNAL
REAR
12V21W
12V5W
12V21/5W
To: Alternator
MAIN FUSE B
80A
12V28AH BATTERY
30A
To: Starter Reverse System
OIL PRESSURE
GEARSHIFT
TURN SIGNAL CANCEL CONTROL UNIT
TURN SIGN
HAZARD R


LCD UNIT
1 SPEED SENSOR
2 ACC ⊕
3 GROUND 1
4 GROUND 2
5 IGNITION ⊕
17 SPEED PULSE
18 BACK UP
INDICATOR LIGHTS
A HIGH BEAM INDICATOR 12V1.7W
B OVERDRIVE INDICATOR 12V1.7W
C NEUTRAL INDICATOR 12V3.4W
D REVERSE INDICATOR 12V3.4W
E SIDE STAND INDICTOR 12V3.4W
F FUEL INDICATOR 12V3.4W
G OIL PRESSURE LIGHT 12V3.4W
H CRUISE SET INDICATOR 12V1.7W
I CRUISE ON INDICATOR 12V1.7W
LEFT TURN SIGNAL INDICATOR
LCD UNIT ILLUMINATION
RIGHT TURN SIGNAL INDICATOR
SPEEDOMETER
ILLUMINATION
TACHOMETER
SPEED SENSOR
ELEC. TACHO
To: Reverse System
To: Fuel System
To: Auto Cruise System
HORN(H)
IGNITION SWITCH
LOCK
OFF
ACC
ON
P
FAN
RELAY BOX
FUSE BOX
GROUND POINT
On Frame, Upper Diestick
TRUNK LIGHT (OPTION)
FUSE BOX
FUSE No. CIRCUIT
1 ACC TERMINAL 5A
3 STOP 15A
5 HEADLIGHTS 15A
7 PARKING 10A
8 TAIL ILLUM 15A
9 BACK UP 5A
10 ACC 10A
11 HORN TURN 15A
12 IGN. TAIL RELAY 5A
ENGINE CONTROL UNIT
FRONT BRAKE
REVERSE LEVER
OIL PRESSURE SWITCH
GEARSHIFT SENSOR
TURN SIGNAL CANCEL CONTROL UNIT
MAIN FUSE 8
12V28AH BATTERY
To: Alternator
To: Starter/ Reverse System
TURN
HAZAI

Paper Book Part No. 67MN500U 30. GL1500A/GL1500SE (P) ADDENDUM

HOW TO USE THIS MANUAL

This addendum contains information for GL1500A (P) and GL1500SE (P).
Refer to GL1500 SHOP MANUAL (No. 67MN500, No. 67MN500Z, No. 67MN500Y, No. 67MN500X, No. 67MN500W and No. 67MN500V) for service procedures and data not included in this addendum.

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

GL1500 (P)

CODE	AREA (TYPE)	CODE	AREA (TYPE)
AR	Austria	SD	Sweden
SP	Spain	FI	Finland
F	France	U	Australia
ED	European direct sales		

GL1500SE (P)

CODE	AREA (TYPE)	CODE	AREA (TYPE)
E	U.K.	FI	Finland
G	Germany	AR	Austria
F	France	SW	Switzerland
ED	European direct sales	SP	Spain

Wire Color Abbreviations
The following abbreviations are used to identify wire colors in the circuit schematics:

BLK	black	LT GRN	light green
BLU	blue	ORN	orange
BRN	brown	PNK	pink
GRN	green	RED	red
GRY	gray	WHT	white
LT BLU	light blue	YEL	yellow

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CONTENT

IMPORTANT SAFETY NOTICE

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

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

NOTE: Gives helpful information.

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

SPECIFICATIONS (GL1500A)

Dimensions	Overall length		2,630 mm (103.5 in)
	Overall width		955 mm (37.6 in)
	Overall height		1,525 mm (60.0 in)
	Wheelbase		1,700 mm (66.9 in)
	Seat height		795 mm (31.3 in)
	Ground clearance		135 mm (5.3 in)
	Dry weight		366 kg (807 lbs)
	Curb weight		394 kg (869 lbs)
Frame	Frame type		Double cradle
	Front suspension	Travel	Telescopic, 140 mm (5.5 in)
	Rear suspension	Travel	Swing arm, 105 mm (4,1 in)
		Air pressure	0—400 kPa (0—4.0 kg/cm², 0—57 psi)
	Front tire	Size	130/70—18 63H
		Air pressure	225 kPa (2.25 kg/cm², 33 psi)
	Rear tire	Size	160/80 —16 75H
		Air pressure	250 kPa (2.50 kg/cm², 36 psi): Driver only
			280 kPa (2.80 kg/cm², 41 psi): Driver and Passenger
	Front brake		Double disc brake
	Rear brake		Disc brake
	Fuel capacity		24.0 lit. (6.4 US gal, 5.3 Imp gal)
	Caster angle		30°
	Trail length		115 mm (4.5 in)
	Front fork oil capacity	Left	325 cm³ (10.9 US oz, 11.4 Imp oz)
		Right	320 cm³ (10.8 US oz, 11.2 Imp oz)
Engine	Engine type		Water cooled, 4 stroke O.H.C.
	Cylinder arrangement		Flat six
	Bore and stroke		71 x 64 mm (2.8 x 2.5 in)
	Displacement		1,520 cm³ (92.7 cu-in)
	Compression ratio		9.8:1
	Valve train		Belt driven over head camshaft
	Oil capacity	At disassembly	4.3 lit. (4.5 US qt, 3.8 Imp qt)
		After draining	3.5 lit. (3.7 US qt, 3.1 Imp qt)
	Lubrication system		Forced and wet sump
	Cooling system capacity		4.1 lit. (4.3 US qt, 3.6 Imp qt)
	Cylinder compression		1,500 kPa (15.0 kg/cm², 213 psi)
	Engine weight		126 kg (278 lbs)
	Camshaft: Intake valve	Opens	5° ATDC (At 1 mm lift)
		Closes	30° ABDC (At 1 mm lift)
	Camshaft: Exhaust valve	Opens	40° BBDC (At 1 mm lift)
		Closes	5° BTDC (At 1 mm lift)
	Valve clearance	Intake/Exhaust	Hydraulic valve adjuster system
	Idle speed		800 ± 80 min^{-1} (rpm)

Carburetion	Carburetor type		CV down-draft dual carburetors
	Throttle bore		36 mm (1.4 in)
	Carburetor identification No.		VDG9C AR: VDGWE
	Pilot screw opening		2-1/2 turns out AR: 2-5/8 turns out
	Float level		7.5 mm (0.30 in)
	Main jet		pri: #80 2nd: #148
	Slow jet		#70 AR: #65
	Throttle grip free play		5–8 mm (3/16–5/16 in)
	Fuel pump flow capacity		640 cm^3 (22.5 Imp oz)/minute
	Carburetor vacuum difference		Within 40 mm (1.6 in) Hg of each other
Drive Train	Clutch type		wet, multi-plate
	Transmission		5-speed, constant mesh
	Primary reduction ratio		1.592 (78/49)
	Secondary reduction ratio		0.971 (34/35)
	Gear ratio	1st 2nd 3rd 4th OD	2.666 (40/15) 1.722 (31/18) 1.272 (28/22) 0.964 (27/28) 0.758 (22/29)
	Final reduction ratio		2.833 (34/12)
	Gearshift pattern		Left foot operated return system 1–N–2–3–4–OD
	Final gear oil capacity (After disassembly)		170 cm^3 (5.7 US oz, 6.0 Imp oz)
Electrical	Ignition		Battery ignition (Full transistor)
	Ignition timing "F" mark		0°TDC
	Starting system		Starting motor
	Alternator		AC generator, 0.55 kW/5,000 min^{-1} (rpm)
	Battery capacity		12 V–20 AH
	Spark plug: Standard	NGK	DPR7EA-9
		Nippondenso	X22EPR-U9
	Spark plug: For cold climate (Below 5°C, 41°F)	NGK	DPR6EA-9
		Nippondenso	X20EPR-U9
	Spark plug: For extended high speed riding	NGK	DPR8EA-9
		Nippondenso	X24EPR-U9
	Spark plug gap		0.8–0.9 mm (0.031–0.035 in)
	Firing order		1–4–5–2–3–6–1
	Fuses		5 A x 4, 10 A x 4, 15 A x 5 (fuse box) 30 A, 55 A (main fuses) 5 A x 2, 65 A (reverse fuses)
Lights	Headlight		12 V 60 W (R), 60/55 W (L) U: 12 V 45/45W x 2
	Position light		12 V 5 W
	Turn signal light		12 V 21 W x 4
	Indicator light		12 V 3.4 W x 5/12 V 1.7 W x 4
	Turn signal indicator		12 V 3 W x 2
	Instrument illumination		12 V 3.4 W x 4
	LCD unit illumination		12 V 3 W x 2
	License light		12 V 5 W
	Brake and taillight		12 V 21/5 W x 2

SPECIFICATIONS (GL1500SE)

Dimensions	Overall length		2,630 mm (103.5 in) G: 2,635 mm (103.7 in)
	Overall witdth		955 mm (37.6 in)
	Overall height		1,525 mm (60.0 in) G: 1,335 mm (52.6 in)
	Wheelbase		1,700 mm (66.9 in)
	Seat height		795 mm (31.3 in)
	Ground clearance		135 mm (5.3 in)
	Dry weight		368 kg (811 lbs) G: 363 kg (800 lbs)
	Curb weight		396 kg (873 lbs) G: 391 kg (862 lbs)
Frame	Frame type		Double cradle
	Front suspension	Travel	Telescopic, 140 mm (5.5 in)
	Rear suspension	Travel	Swing arm, 105 mm (4.1 in)
		Air pressure	0—400 kPa (0—4.0 kg/cm², 0—57 psi)
	Front tire	Size	130/70—18 63H
		Air pressure	225 kPa (2.25 kg/cm², 33 psi)
	Rear tire	Size	160/80—16 75H
		Air pressure	250 kPa (2.50 kg/cm², 36 psi): Driver only
			280 kPa (2.80 kg/cm², 41 psi): Driver and Passenger
	Front brake		Double disc brake
	Rear brake		Disc brake
	Fuel capacity		24.0 lit. (6.4 US gal, 5.3 Imp gal)
	Caster angle		30°
	Trail length		115 mm (4.5 in)
	Front fork oil capacity	Left	325 cm³ (10.9 US oz, 11.4 Imp oz)
		Right	320 cm³ (10.8 US oz, 11.2 Imp oz)
Engine	Engine type		Water cooled, 4 stroke O.H.C.
	Cylinder arrangement		Flat six
	Bore and stroke		71 x 64 mm (2.8 x 2.5 in)
	Displacement		1,520 cm³ (92.7 cu-in)
	Compression ratio		9.8 : 1
	Valve train		Belt driven over head camshaft
	Oil capacity	At disassembly	4.3 lit. (4.5 US qt, 3.8 Imp qt)
		After draining	3.5 lit. (3.7 US qt, 3.1 Imp qt)
	Lubrication system		Forced and wet sump
	Cooling system capacity		4.1 lit. (4.3 US qt, 3.6 Imp qt)
	Cylinder compression		1,500 kPa (15.0 kg/cm², 213 psi)
	Engine weight		126 kg (278 lbs)
	Camshaft: Intake valve	Opens	5° ATDC (At 1 mm lift)
		Closes	30° ABDC (At 1 mm lift)
	Camshaft: Exhaust valve	Opens	40° BBDC (At 1 mm lift)
		Closes	5° BTDC (At 1 mm lift)
	Valve clearance	Intake/Exhaust	Hydraulic valve adjuster system
	Idle speed		800 ± 80 min⁻¹ (rpm)
		SW	800 ± 50 min⁻¹ (rpm)

Carburetion	Carburetor type			CV down-draft dual carburetors
	Throttle bore			36 mm (1.4 in)
	Carburetor identification No.			VDG9C SW: VDGWG AR: VDGWE
	Pilot screw opening			2-1/2 turns out SW, AR: 2-5/8 turns out
	Float level			7.5 mm (0.30 in)
	Main jet			pri: #80 2nd: #148
	Slow jet			#70 SW, AR: #65
	Throttle grip free play			5—8 mm (3/16—5/16 in)
	Fuel pump flow capacity			640 cm³ (22.5 Imp oz)/minute
	Carburetor vacuum difference			Within 40 mm (1.6 in) Hg of each other
Drive Train	Clutch type			Wet, multi-plate
	Transmission			5-speed, constant mesh
	Primary reduction ratio			1.592 (78/49)
	Secondary reduction ratio			0.971 (34/35)
	Gear ratio	1st 2nd 3rd 4th OD		2.666 (40/15) 1.722 (31/18) 1.272 (28/22) 0.964 (27/28) 0.758 (22/29)
	Final reduction ratio			2.833 (34/12)
	Gearshift pattern			Left foot operated return system 1—N—2—3—4—OD
	Final gear oil capacity (After disassembly)			170 cm³ (5.7 US oz, 6.0 Imp oz)
Electrical	Ignition			Battery ignition (Full transistor)
	Ignition timing "F" mark			0°TDC
	Starting system			Starting motor
	Alternator			AC generator, 0.55 kW/5,000 min⁻¹ (rpm)
	Battery capacity			12 V—20 AH
	Spark plug	Standard	NGK	DPR7EA-9
			Nippondenso	X22EPR-U9
		For cold climate (Below 5°C, 41°F)	NGK	DPR6EA-9
			Nippondenso	X20EPR-U9
		For extended high speed riding	NGK	DPR8EA-9
			Nippondenso	X24EPR-U9
	Spark plug gap			0.8—0.9 mm (0.031—0.035 in)
	Firing order			1—4—5—2—3—6—1
	Fuses			5 A x 4 (G: 5 A x 3), 10 A x 4, 15 A x 5 (fuse box) 30 A, 55 A (main fuses) 5 A x 2, 65 A (reverse fuses)
Lights	Headlight			12 V 60 W (R), 60/55 W (L) E: 60/55 W x 2
	Position light			12 V 5 W
	Turn signal light			12 V 21 W x 4
	Indicator light			12 V 3.4 W x 5/12 V 1.7 W x 4
	Turn signal indicator			12 V 3 W x 2
	Instrument illumination			12 V 3.4 W x 4
	LCD unit illumination			12 V 3 W x 2
	License light			12 V 5 W
	Brake and taillight			12 V 21/5 W x 2

SERVICE DATA

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
Engine weight (including carburetors)				126 kg (278 lbs)	—
Engine oil capacity		at engine assembly		4.3 lit (4.5 US qt, 3.8 Imp qt)	—
		at oil change		3.5 lit (3.7 US qt, 3.1 Imp qt)	—
		at oil filter and oil change		3.7 lit (3.9 US qt, 3.3 Imp qt)	—
Radiator coolant capacity		After disassembly		4.1 lit (4.3 US qt, 3.6 Imp qt)	—
		After draining (including reserve tank)		3.8 lit (4.0 US qt, 3.3 Imp qt)	—
		Reserve tank		0.55 lit (0.6 US qt, 0.5 Imp qt)	—
OIL PUMP	Main oil pump	Tip clearance		0.15 (0.006) max.	0.35 (0.014)
		Pump body clearance		0.15—0.23 (0.006—0.009)	0.43 (0.017)
		Pump side clearance		0.02—0.07 (0.001—0.003)	0.12 (0.005)
	Scavenge pump	Tip clearance		0.15 (0.006) max.	0.35 (0.014)
		Pump body clearance		0.15—0.22 (0.006—0.009)	0.42 (0.017)
		Pump side clearance		0.02—0.07 (0.001—0.003)	0.12 (0.005)
	Pressure relief valve	Relief pressure		470—570 kPa (4.7—5.7 kg/cm^2, 67—81 psi)	—
		Relief valve spring free length		90.8 (3.57)	84.0 (3.31)
	Oil pressure (at oil pressure switch)	Cold (At 35°C/95°F)	Idle speed	130 kPa (1.3 kg/cm^2, 18 psi)	—
			5,000 min^{-1} (rpm)	500 kPa (5.0 kg/cm^2, 71psi)	—
		Hot (At 80°C/176°F)	Idle speed	80 kPa (0.8 kg/cm^2, 11 psi)	
			5,000 min^{-1} (rpm)	500 kPa (5.0 kg/cm^2, 71 psi)	—
COOLING	Radiator cap relief pressure			75—105 kPa (0.75—1.05 kg/cm^2, 11—15 psi)	—
	Thermostat	Begins to open temperature		80°—84°C (176°—183°F)	—
		Fully opened temperature		93°—97°C (199°—206°F)	—
		Valve lift (heated to 95°C/5 minutes)		8.0 (0.315) min.	—
	Thermo valve		Starts to close	58°—62°C (136°—144°F)	—
	Thermostatic fan motor switch		Starts to close	98°—102°C (208°—216°F)	—
	Coolant temperature sensor resistance		60°C (140°F)	104 ohms	—
			85°C (185°F)	44 ohms	—
			110°C (230°F)	20 ohms	—
			120°C (248°F)	16 ohms	—
CYLINDER HEAD	Cylinder head warpage			—	0.10 (0.004)
	Valve stem O.D.		IN	5.475—5.490 (0.2156—0.2161)	5.45 (0.215)
			EX	5.455—5.470 (0.2148—0.2154)	5.44 (0.214)
	Valve guide I.D.		IN, EX	5.500—5.512 (0.2165—0.2170)	5.55 (0.219)
	Valve stem to guide clearance		IN	0.010—0.037 (0.0004—0.0015)	0.08 (0.003)
			EX	0.030—0.057 (0.0012—0.0022)	0.10 (0.004)
	Valve seat width			1.2 (0.05)	—
	Valve spring free length			44.6 (1.76)	43.3 (1.70)
	Valve spring preload/length			15.6—18.2/37.5 kg/mm (34.39—40.12/1.48 lbs/in)	—
	Rocker arm I.D.			25.000—25.021 (0.9843—0.9851)	25.05 (0.986)
	Rocker arm shaft O.D.			11.966—11.984 (0.4711—0.4718)	11.95 (0.470)
	Rocker arm lobe		I.D.	11.996—12.031 (0.4723—0.4734)	12.07 (0.475)
			O.D.	20.945—20.980 (0.8246—0.8260)	20.93 (0.824)
	Hydraulic valve adjuster compression stroke with kerosene			0—0.30 (0—0.012)	0.30 (0.012) max.

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
CYLINDER HEAD	Camshaft	Cam lobe height		36.110–36.190 (1.4217–1.4248)	35.9 (1.41)
		Runout (at center journal)		—	0.10 (0.004)
		Journal O.D.	Both middles	26.934–26.955 (1.0604–1.0612)	26.91 (1.059)
			Both ends	26.949–26.970 (1.0610–1.0618)	26.91 (1.059)
		Holder journal I.D.		27.000–27.021 (1.0630–1.0638)	27.05 (1.065)
		Journal oil clearance	Both middles	0.045–0.087 (0.0018–0.0034)	0.14 (0.006)
			Both ends	0.030–0.072 (0.0012–0.0028)	0.14 (0.006)
CLUTCH	Clutch master cylinder	Cylinder I.D.		15.870–15.913 (0.6248–0.6265)	15.93 (0.627)
		Piston O.D.		15.827–15.854 (0.6231–0.6242)	15.82 (0.623)
	Clutch	Plate warpage		—	0.30 (0.012)
		Disc thickness		3.72–3.88 (0.146–0.153)	3.5 (0.14)
		Clutch spring free height		5.38 (0.212)	5.1 (0.20)
OUTPUT SHAFT	Damper spring free length			60.82 (2.394)	57.0 (2.24)
	Shaft O.D.			22.008–22.021 (0.8665–0.8670)	21.99 (0.866)
	Collar		I.D.	22.026–22.041 (0.8672–0.8678)	22.05 (0.868)
			O.D.	25.959–25.980 (1.0220–1.0228)	25.95 (1.022)
	Driven gear I.D.			26.000–26.016 (1.0236–1.0242)	26.03 (1.025)
GEAR-SHIFT	Shift fork shaft O.D.			13.966–13.984 (0.5498–0.5506)	13.90 (0.547)
	Shift fork		I.D.	14.000–14.021 (0.5512–0.5520)	14.04 (0.553)
			Claw thickness	5.93–6.00 (0.233–0.236)	5.6 (0.22)
TRANS-MISSION	Gear I.D.		C2, C3, M4, M5	34.000–34.016 (1.3386–1.3392)	34.04 (1.340)
	Gear bushing O.D.		C2, C3, M4/M5	33.940–33.965 (1.3362–1.3372)	33.92 (1.335)
	Gear-to-bushing clearance			0.035–0.076 (0.0014–0.0030)	0.10 (0.004)
CYLINDER, PISTON	Cylinder compression pressure			1300–1700 kPa (13.0–17.0 kg/cm², 185–242 psi)	1000 kPa (10.0 kg/cm², 142 psi)
	Cylinder	I.D.		71.010–71.025 (2.7957–2.7963)	71.1 (2.80)
		Out-of-round		—	0.15 (0.006)
		Taper		—	0.05 (0.002)
		Top warpage		—	0.05 (0.002)
	Piston	O.D. (at skirt)		70.960–70.990 (2.7937–2.7949)	70.85 (2.789)
		Piston pin bore		18.010–18.016 (0.7091–0.7093)	18.03 (0.710)
		Piston-to-cylinder clearance		0.020–0.065 (0.0008–0.0026)	0.10 (0.004)
	Piston ring	End gap	Top and second	0.15–0.30 (0.006–0.012)	0.5 (0.02)
			Oil ring side rail	0.20–0.70 (0.008–0.028)	0.9 (0.04)
		Ring-to-ring land clearance	Top	0.025–0.055 (0.0010–0.0022)	0.10 (0.004)
			Second	0.015–0.045 (0.0006–0.0018)	0.10 (0.004)
	Piston pin	O.D. (at sliding surfaces)		17.994–18.000 (0.7084–0.7087)	18.99 (0.748)
		Pin-to-piston clearance		0.010–0.022 (0.0004–0.0009)	0.05 (0.002)
		Pin-to-rod interference		0.015–0.039 (0.0006–0.0015)	—

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
CRANKSHAFT	*Main journal bearing oil clearance*			0.020–0.038 (0.0008–0.0015)	0.06 (0.002)
	Crankpin bearing oil clearance			0.027–0.045 (0.0011–0.0018)	0.06 (0.002)
	Crankshaft runout (at center journal)			—	0.03 (0.001)
	Connecting rod side clearance			0.15–0.30 (0.006–0.012)	0.40 (0.016)
	Crankpin and main journal		Taper	—	0.003 (0.0001)
			Out-of-round	—	0.005 (0.0002)
WHEELS	Wheel axle runout			—	0.2 (0.01)
	Wheel rim runout		Axial	—	2.0 (0.08)
			Radial	—	2.0 (0.08)
	Tire tread depth		Front	—	1.5 (0.06)
			Rear	—	2.0 (0.08)
SUSPENSION	Rear suspension air pressure			0–400 kPa (0–4.0 kg/cm^2, 0–57 psi)	—
	Front fork spring free length		Spring A	192.9 (7.59)	189.0 (7.44)
			Spring B	386.3 (15.21)	378.6 (14.91)
	Front fork oil capacity		Left	325 cm^3 (10.9 US oz, 11.4 Imp oz)	—
			Right	320 cm^3 (10.8 US oz, 11.2 Imp oz)	—
	Front fork oil level (from the top of tube)			239 (9.4)	—
	Front fork oil			ATF	—
	Fork tube runout			—	0.2 (0.01)
	Left shock absorber spring free length (Rear)			280.7 (11.05)	274.5 (10.81)
	Right shock absorber oil capacity			140 cm^3 (4.7 US oz, 4.9 Imp oz)	—
	Right shock absorber oil			ATF	—
FINAL DRIVE	Final gear oil	Recommended oil		Hypoid gear oil, SAE #80	—
		Capacity	At assembly	170 cm^3 (5.7 US oz, 6.0 Imp oz)	—
			After draining	140 cm^3 (4.7 US oz, 4.9 Imp oz)	—
	Final gear backlash			0.05–0.15 (0.002–0.006)	0.3 (0.01)
		Difference at 3 points		—	0.10 (0.004)
	Ring gear-to-stop pin clearance			0.30–0.60 (0.012–0.024)	—
BRAKES	Front brake master cylinder	Cylinder I.D.		12.700–12.743 (0.5000–0.5017)	12.755 (0.5022)
		Piston O.D.		12.684–12.657 (0.4980–0.4983)	12.645 (0.4978)
	Front brake caliper	Left	Cylinder I.D.	25.400–25.450 (1.0000–1.0020)	25.460 (1.0024)
			Piston O.D.	25.335–25.368 (0.9974–0.9987)	25.310 (0.9965)
		Right	Cylinder I.D.	30.230–30.280 (1.1902–1.1921)	30.290 (1.1925)
			Piston O.D.	30.165–30.198 (1.1876–1.1889)	30.140 (1.1866)
	Front brake disc	Thickness		5.8–6.2 (0.23–0.24)	5.0 (0.20)
		Runout		—	0.3 (0.01)
	Front brake pad thickness			5.5 (0.22)	1.0 (0.04)
	Rear brake master cylinder	Cylinder I.D.		15.870–15.913 (0.6248–0.6265)	15.925 (0.6270)
		Piston O.D.		15.827–15.854 (0.6231–0.6242)	15.815 (0.6226)
		Brake rod clevis installed length		100 (3.9)	—
	Rear brake caliper	Cylinder I.D.		32.030–32.080 (1.2610–1.2630)	32.090 (1.2634)
		Piston O.D.		31.948–31.998 (1.2578–1.2598)	31.940 (1.2575)
	Rear brake disc	Thickness		7.3–7.7 (0.29–0.30)	6.0 (0.24)
		Runout		—	0.3 (0.01)
	Rear brake pad thickness			6.5 (0.26)	1.0 (0.04)
	Brake fluid (front/rear)			DOT 4	—

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
CHARGING	Battery capacity			12 V−20 AH	—
	Battery specific gravity (At 20°C, 68°F)	Full charged		1.270−1.290	—
		Need charging		Below 1.260	—
	Battery charging current			2.0 Amperes max.	—
	Alternator	Capacity		0.55 kW/5,000 min^{-1} (rpm)	—
		Stator coil resistance		0.1−0.3 ohms (20°C, 68°F)	—
		Rotor coil resistance		2.9−4.0 ohms (20°C, 68°F)	—
		Rotor coil slip ring O.D.		27.0 (1.06)	26.0 (1.02)
		Charging start		800−1,000 min^{-1} (rpm)	—
	Regulator/ Rectifier (into alternator)	Type		Transistorized non-adjustable reg./recti.	—
		Regulated voltage (at 20°C/68°F)	900 min^{-1} (rpm)	0−2 A, 13.5−15.5 V	—
			1,850 min^{-1} (rpm)	1.5 A min., 13.5−15.5 V	—
IGNITION	Firing order			1−4−5−2−3−6−1	—
	Ignition timing		F mark	0°TDC at 800 ± 80 min^{-1} (rpm) (SW model 800 ± 50 min^{-1} (rpm))	—
		Vacuum advance	Advance start	60−160 mmHg (2.4−6.3 inHg)	—
			Advance cease	310−360 mmHg (12.2−14.2 inHg)	—
	Ignition coil resistance (at 20°C/68°F)	Primary coil		2.6−3.2 ohms	—
		Secondary coil	With spark plug wire	20.2−26.8 Kohms	—
			Without spark plug wire	11.7−14.3 Kohms	—
	Pulse generator coil resistance (At 20°C, 68°F)			400−500 ohms	—
	Tw sensor/Ta sensor resistance		20°C (68°F)	2.0−3.0 Kohms	—
			80°C (176°F)	200−400 ohms	—
STARTER/ REVERSE	Starter motor brush length			12.5 (0.49)	6.0 (0.24)
	Reverse System	Starter relay regulator/regulated current		0.7−1.0 A	—
		Resister	Between connector and resistor terminals	0.12−0.17 ohms	—
ELECTRICAL	Oil pressure switch continuity pressure			10−20 kPa (0.1−0.2 kg/cm^2, 1−3 psi)	—
	Fuel level sensor resistance (at 20°C, 68°F)		Empty	90−100 ohms	—
			Reserve	66−81 ohms	—
			Full	4−10 ohms	—

TORQUE VALUES

ENGINE

Item	Qty	Thread dia (mm)	Torque N•m	Torque kg-m	Torque ft-lb	Remarks
Spark plug	6	12	15	1.5	11	
Carburetor insulator band screw	4	5	5	0.5	3.6	
Intake manifold vacuum tube joint	4	5	2.8	0.28	2	
Coolant temperature sensor	1	PT 1/8	12	1.2	9	NOTE 1
Water hose clamp screw	2	4	2.0	0.2	1.4	
Thermostatic fan motor switch	1	16	18	1.8	13	
Tw sensor	1	12	28	2.8	20	
Reverse switch	1	10	12	1.2	9	
Reverse shifter shaft bolt	1	6	14	1.4	10	NOTE 2
LUBRICATION:						
Oil pressure switch	1	PT 1/8	12	1.2	9	NOTE 1
Engine oil drain bolt	1	14	35	3.5	25	
Enigne oil filter cartrige	1	20	10	1.0	7	
Engine oil filter boss	1	20	17	1.7	12	NOTE 2
CYLINDER HEAD:						
Cylinder head bolt (9 mm bolt)	16	9	45	4.5	33	NOTE 3
Timing belt driven pulley bolt	2	8	27	2.7	20	
Camshaft holder bolt	16	8	20	2.0	14	
Hydraulic valve adjuster stopper plug	12	14	30	3.0	22	
Cylinder head cover bolt	12	6	12	1.2	9	
Timing belt tensioner bolt	4	8	26	2.6	19	NOTE 2
Cylinder head sealing bolt	6	18	45	4.5	33	NOTE 2
CLUTCH:						
Clutch hose/pipe oil bolt	3	10	35	3.5	25	
Clutch slave cylinder bleed valve	1	8	9	0.9	7	
Clutch bleed pipe bolt	1	6	12	1.2	9	NOTE 2
Clutch center lock nut	1	22	130	13.0	94	
Clutch outer lock nut	1	40	190	19.0	137	NOTE 2/5
ALTERNATOR:						
Front cover attaching screw	3	4	2	0.2	1.4	NOTE 2
Couple A mounting nut	1	14	58	5.8	42	NOTE 2
Couple B mounting nut	1	14	58	5.8	42	
REAR ENGINE CASE:						
Starter one-way clutch socket bolt	6	6	16	1.6	12	NOTE 2
Starter clutch mounting bolt	1	12	75	7.5	54	
Alternator drive gear bolt	6	8	27	2.7	20	NOTE 6
Final drive gear lock nut	1	22	190	19.0	137	NOTE 2/4/5
Output shaft lock nut	1	30	190	19.0	137	NOTE 5
Oil pump driven sprocket bolt	1	6	18	1.8	13	NOTE 2
GEARSHIFT:						
Shift arm lock bolt	1	8	25	2.5	18	
Shift drum center bolt	1	8	28	2.8	20	
Shift drum lock arm bolt	1	6	12	1.2	9	NOTE 2
Shift arm return spring pin	1	8	25	2.5	18	
CRANKCASE/CRANKSHAFT/TRANSMISSION:						
Crankcase bolt (10 mm)	8	10	35	3.5	25	NOTE 6
(8 mm)	4	8	26	2.6	19	
(6 mm)	10	6	12	1.2	9	
Crankcase sealing bolt (20 mm)	4	20	45	4.5	33	NOTE 2
(18 mm)	2	18	45	4.5	33	NOTE 2
Mainshaft lock nut	1	22	190	19.0	137	NOTE 4/5
Crankshaft main bearing cap bolt	8	10	70	7.0	51	NOTE 6
Connecting rod cap nut	8	8	32	3.2	23	NOTE 6
Timing belt driven pulley bolt	1	12	75	7.5	54	

NOTES:
1. Apply sealant to the threads.
2. Apply a locking agent to the threads.
3. Apply molybdenum disulfide oil to the threads and flange surfaces.
4. Left-hand threads.
5. Stake (2 places)
6. Apply oil to the threads and flange surfaces.
7. Torque wrench scale reading using a special tool.
8. Apply grease to the threads and flange surfaces.

FRAME

Item	Qty	Thread dia (mm)	Torque N•m	Torque kg-m	Torque ft-lb	Remarks
ENGINE MOUNT:						
Engine mount nut	7	10	40	4.0	29	
Engine bracket bolt	4	8	25	2.5	18	
Subframe bolt (10 mm socket bolt)	4	10	40	4.0	29	
(10 mm flange bolt)	1	10	40	4.0	29	
(8 mm flange bolt)	1	8	25	2.5	18	
HANDLEBAR:						
Handlebar upper holder bolt	4	8	25	2.5	18	NOTE 8
Front master cylinder holder bolt	2	6	12	1.2	9	
Clutch master cylinder holder bolt	2	6	12	1.2	9	
FRONT:						
Axle pinch bolt	4	8	22	2.2	16	
Axle bolt	1	14	90	9.0	65	
Steering stem nut	1	24	100	10.0	72	
Steering stem adjustment nut	1	26	19	1.9	14	See page 13-26
Anti-dive case socket bolt	8	6	8	0.8	6	NOTE 2
Fork bottom socket bolt	2	8	20	2.0	14	NOTE 2
Fork bolt	2	37	23	2.3	17	
Fork leg upper pinch bolt	2	8	22	2.2	16	
Fork leg lower pinch bolt	4	10	55	5.5	40	
REAR:						
Axle pinch bolt	1	8	32	3.2	23	
Axle nut	1	18	110	11.0	80	
Damper holder bolt	5	6	20	2.0	14	
Left shock absorber mount bolt (Upper)	1	8	23	2.3	17	
(Lower)	1	18	70	7.0	51	
Right shock absorber mount bolt (Upper)	1	8	23	2.3	17	
(Lower)	1	8	23	2.3	17	
Air hose bolt	3	10	6	0.6	4	
Air hose special bolt (with seat)	1	10	15	1.5	11	
Outlet air hose joint	2	8	6	0.6	4	
Air pressure sensor	1	8	10	1.0	7	
Air distributor solenoid valve mounting screw	4	5	3	0.3	2	
Swing arm right pivot bolt	1	30	100	10.0	72	
Swing arm left pivot bolt	1	30	19	1.9	14	
Swing arm left pivot lock nut	1	30	100	10.0	72	NOTE 7
FINAL DRIVE:						
Pinion bearing retainer	1	70	150	15.0	108	
Pinion joint nut	1	16	110	11.0	80	NOTE 2
Gear case cover bolt (10 mm)	2	10	63	6.3	46	NOTE 2
(8 mm)	6	8	26	2.6	19	
Final drive gear case mounting nut	4	10	65	6.5	47	
Final drive gear case drain bolt	1	14	20	2.0	14	
Dust guard plate bolt	1	6	10	1.0	7	
Retainer lock washer bolt	1	6	10	1.0	7	
HYDRAULIC BRAKE:						
Caliper bleed valve	3	7	6	0.6	4	
Front caliper bracket bolt	2	8	23	2.3	17	
Anti-dive piston bolt	2	6	12	1.2	9	
Front pad pin plug	4	10	2.5	0.25	1.8	
Front pad pin	4	10	18	1.8	13	
Brake hose bolt	6	10	35	3.5	25	
Rear caliper retainer bolt	1	6	11	1.1	8	
Rear caliper bolt	1	8	23	2.3	17	
Rear caliper pin bolt	1	12	28	2.8	20	
Metal brake line nut	4	10	17	1.7	12	
Brake disc bolt	18	8	40	4.0	29	

Item	Qty	Thread dia (mm)	Torque N•m	Torque kg-m	Torque ft-lb	Remarks
OTHER						
Side stand pivot bolt	1	10	10	1.0	7	
Side stand lock nut	1	10	29	2.9	21	
Side stand switch mounting bolt	1	6	10	1.0	7	
Center stand pivot bolt	1	8	18	1.8	13	
Exhaust pipe joint nut	12	6	10	1.0	7	
Tail spoiler mounting bolt	4	6	6	0.6	4.3	GL1500SE only
Passenger footrest bracket bolt	4	8	26	2.6	19	
Fairing inner cover bolt	2	6	10	1.0	7	
Air cleaner tube joint screw	2	5	3	0.3	2.2	
Starter motor cable nut	1	—	5	0.5	3.6	
Antenna lock nut	1	8	10	1.0	7	

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

STANDARD TORQUE VALUES

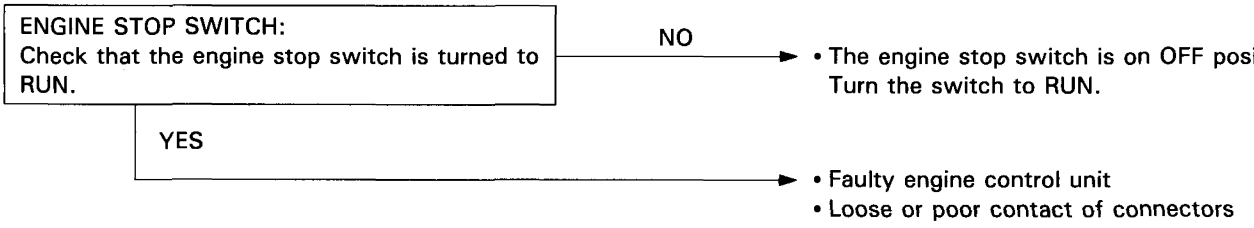
Item	Torque Values N•m (kg-m, ft-lb)	Item	Torque Values N•m (kg-m, ft-lb)
5 mm bolt and nut	5 (0.5, 4)	5 mm screw	4 (0.4, 3)
6 mm bolt and nut	10 (1.0, 7)	6 mm screw and 6 mm flange bolt with 8 mm head	9 (0.9, 7)
8 mm bolt and nut	22 (2.2, 16)	6 mm flange bolt and nut	12 (1.2, 9)
10 mm bolt and nut	35 (3.5, 25)	8 mm flange bolt and nut	27 (2.7, 20)
12 mm bolt and nut	55 (5.5, 40)	10 mm flange bolt and nut	40 (4.0, 29)

FUEL SYSTEM TROUBLESHOOTING

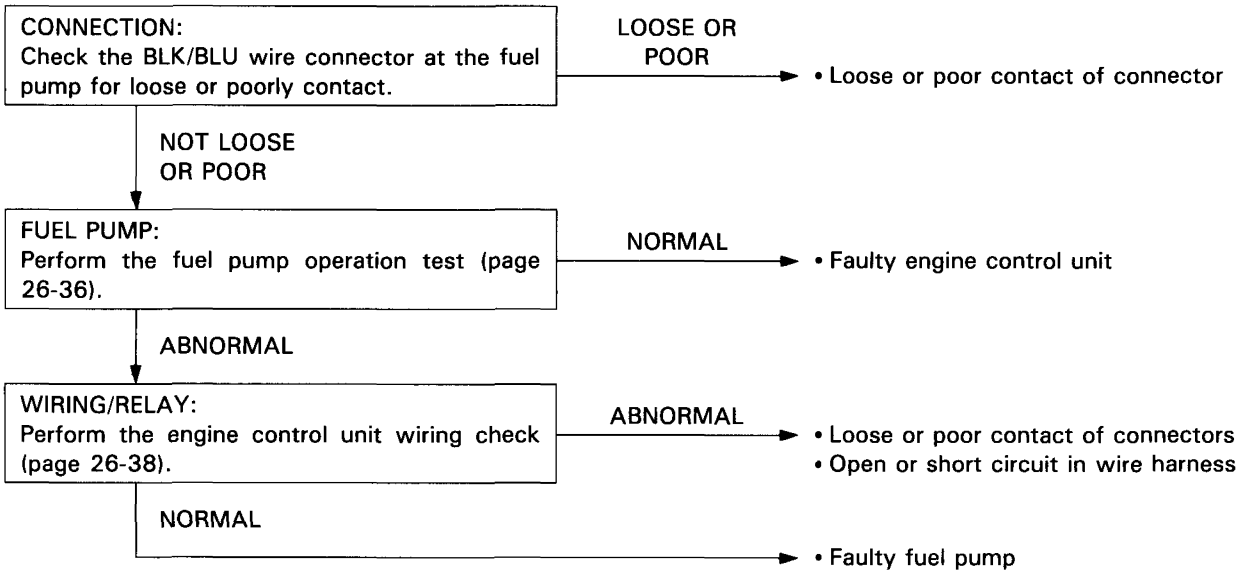
The fuel pump does not operate for a few seconds, when turning the ignition switch ON.

NOTE

- Be sure that the main fuse B and fuse 11 (G type: fuse 3) are good. Replace any suspect fuses.



The fuel pump will not be operated well.



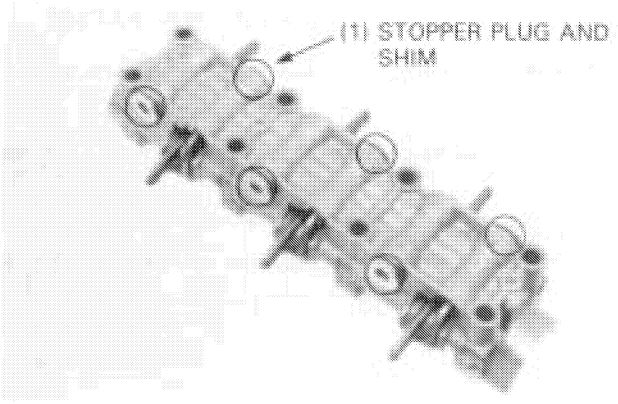
CAMSHAFT HOLDER DISASSEMBLY

NOTE

- Mark the camshaft holder parts during disassembly so they can be installed in their original positions during assembly.

Remove the stopper plugs and shims from the camshaft holder.

If the parts are to be reused, mark the shims with a felt tip pen so that they can be replaced in their original locations.



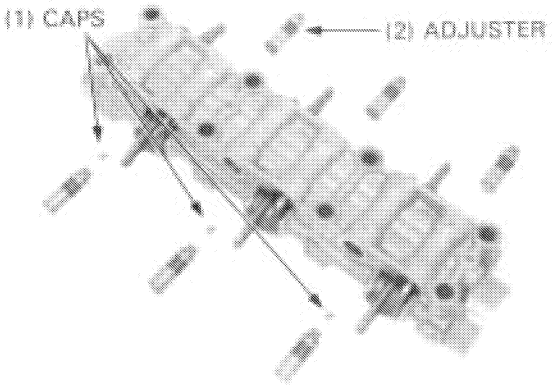
NOTE

- Failure to install the shims in their original locations can cause tappet noise or sticking valves.
- Mark the hydraulic valve adjusters as they are removed, so they can be installed in their original locations.

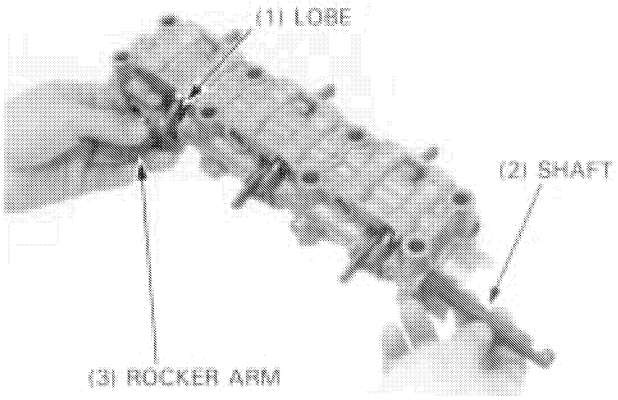
Remove the six hydraulic valve adjusters from the camshaft holder.

NOTE

- Caps are used only on the hydraulic valve adjusters controlling the intake valve rocker arm lobes.



Remove the following:
— rocker arm shafts
— rocker arms
— rocker arm lobes
— needle bearings

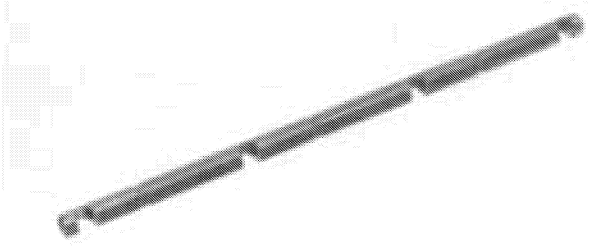


ROCKER ARM SHAFT INSPECTION

Inspect each rocker arm shaft for wear or damage to the sliding surfaces.

Measure the O.D.

SERVICE LIMIT: 11.95 mm (0.470 in)



ROCKER ARM/LOBE INSPECTION

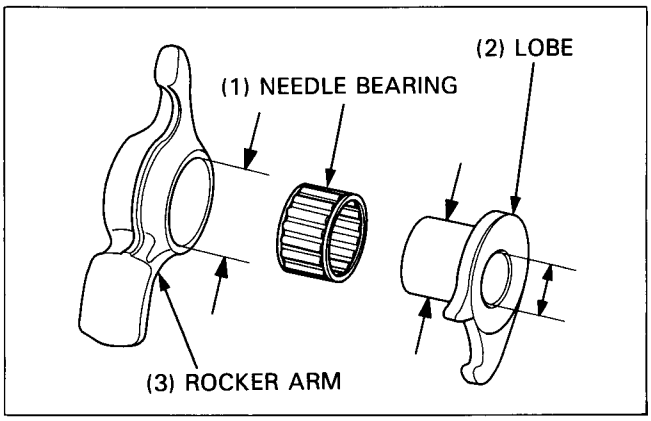
Inspect each needle bearing for wear or damage.

Inspect each rocker arm for wear or damage to the slipper and stem contact faces. Measure the I.D. of each rocker arm.

SERVICE LIMIT: 25.05 mm (0.986 in)

Inspect each rocker arm lobe for wear or damage to the sliding and adjuster contact faces. Measure the I.D. and O.D. of each rocker arm lobe.

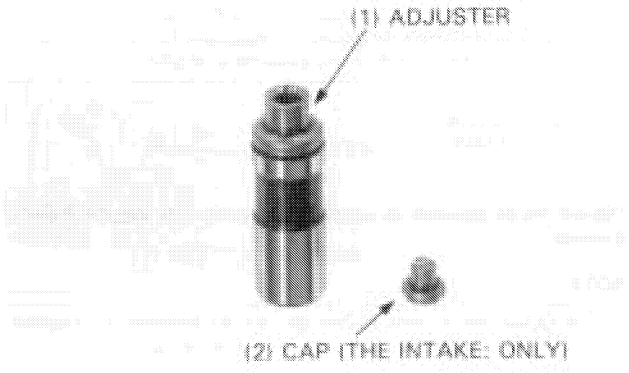
SERVICE LIMITS:
I.D.: 12.07 mm (0.475 in)
O.D.: 20.93 mm (0.824 in)



HYDRAULIC VALVE ADJUSTER INSPECTION

Inspect the hydraulic valve adjuster for wear, damage or a clogged oil hole.

Inspect the adjuster cap of the intake side for wear or damage.



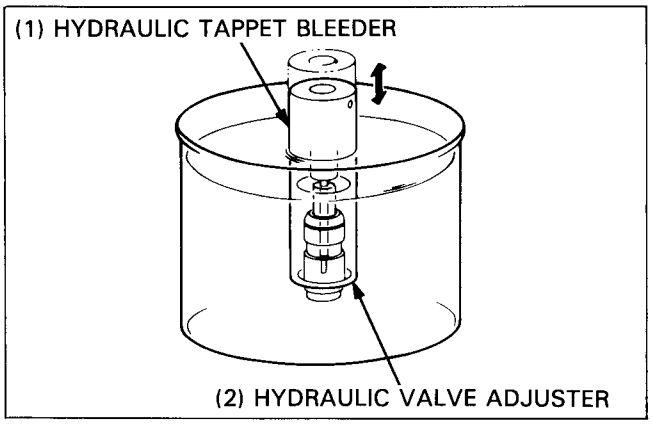
Measure the compression stroke of each adjuster as follows:

Attach the Hydraulic Tappet Bleeder to the adjuster, center the bleeder pin, and while holding it upright, compress and extend the bleeder slowly in a jar filled with kerosene.

TOOL:

Hydraulic tappet bleeder	**07973—MJ00000**
	or
	07973—ME90000

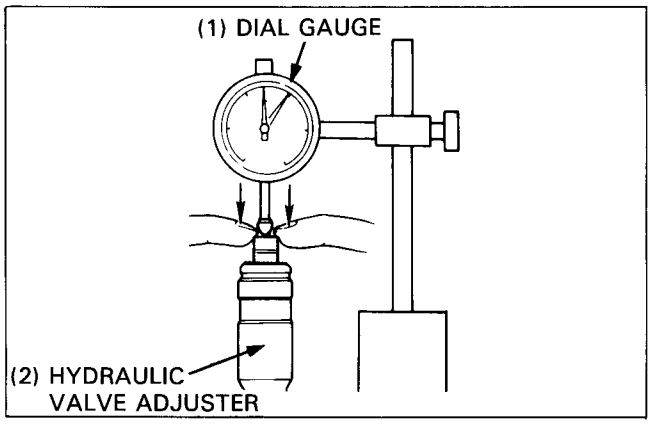
Continue operating the bleeder until there are no air bubbles.



Remove the adjuster and try to compress it quickly by hand. Measure the compression stroke with a dial gauge.

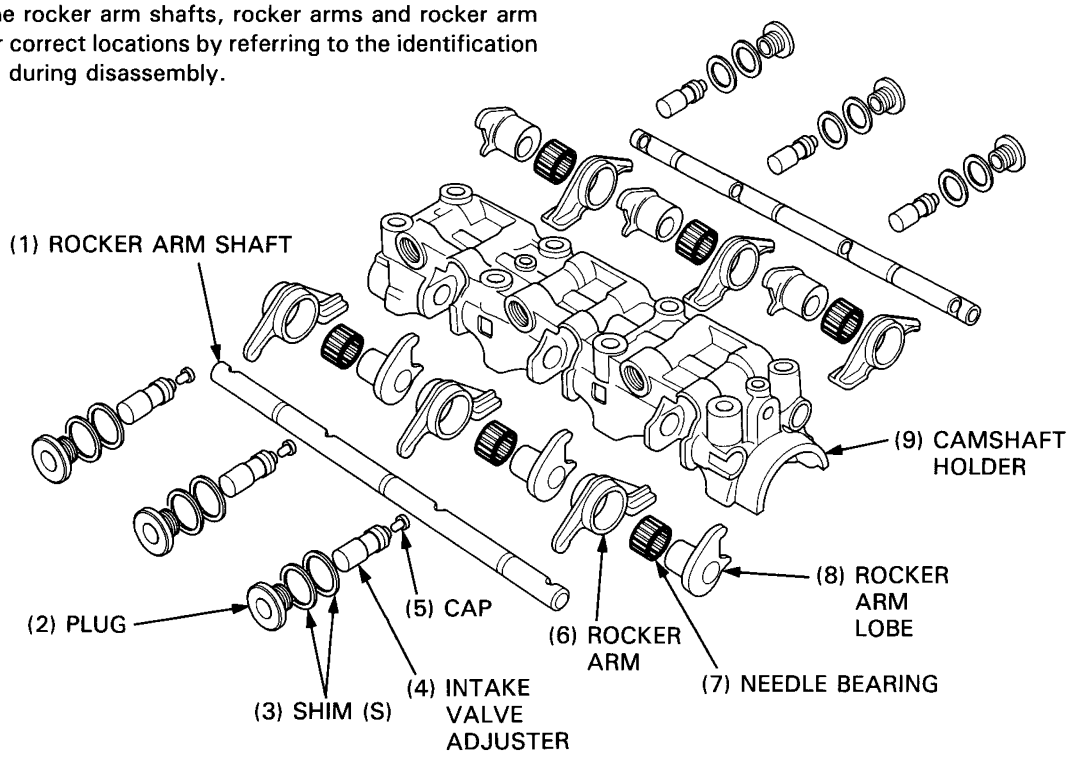
COMPRESSION STROKE SERVICE LIMIT:
0.30 mm (0.012 in)

If the stroke is more than the service limit, repeat the bleeding procedure.

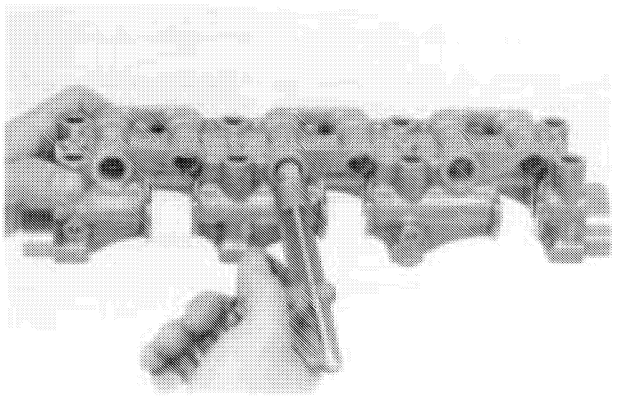


CAMSHAFT HOLDER ASSEMBLY

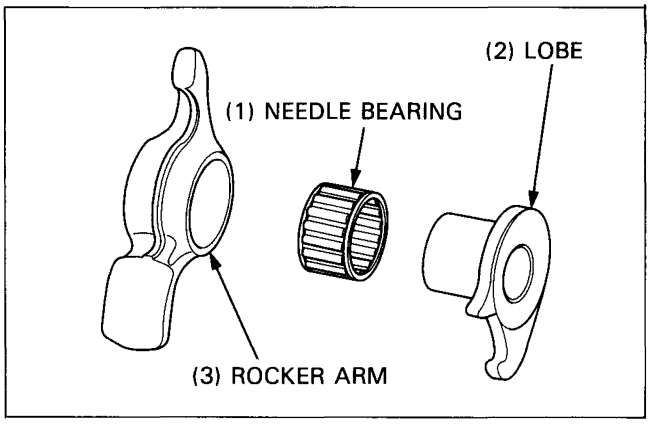
Assemble the rocker arm shafts, rocker arms and rocker arm lobes in their correct locations by referring to the identification marks made during disassembly.



Clean the camshaft holder thoroughly and blow through all holes and passages with compressed air.



Lubricate all sliding surfaces with molybdenum disulfide oil.



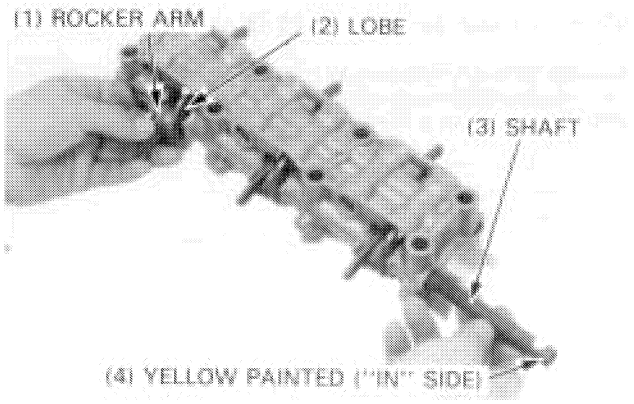
Install the following:
— needle bearings
— rocker arms
— rocker arm lobes
— rocker arm shafts

NOTE

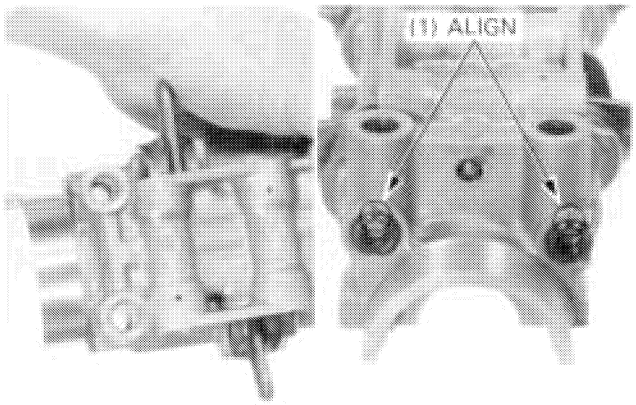
• The shaft of the intake side has a yellow painted mark.

CAUTION

• *Do not drop the rocker arm shafts or attempt to drive them into position. Rotate the shafts while sliding them into position.*



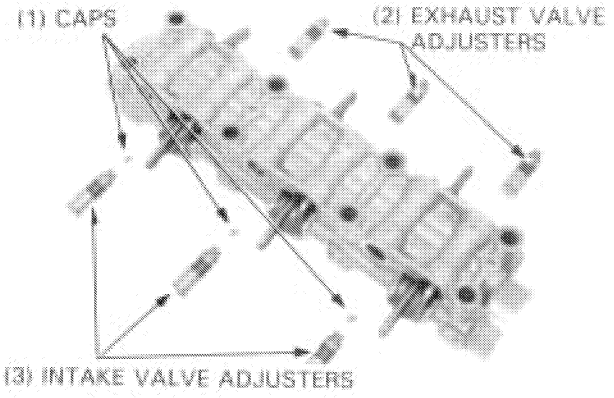
Align the rocker arm shaft cutouts with the bolt holes in the camshaft holder and also align the cutouts of the rocker arm shafts and camshaft holder.



Install each hydraulic valve adjuster in sequence with its rocker arm lobe in the same bore it came from.

NOTE

- Only the intake hydraulic valve adjusters have caps. The caps go against the rocker arm lobes.
- Shim adjustment is necessary if the following parts are replaced:
  — Cylinder head and camshaft holder.
  — Camshaft.
  — Valves or refaced valve seats
  — Rocker arm or shaft.

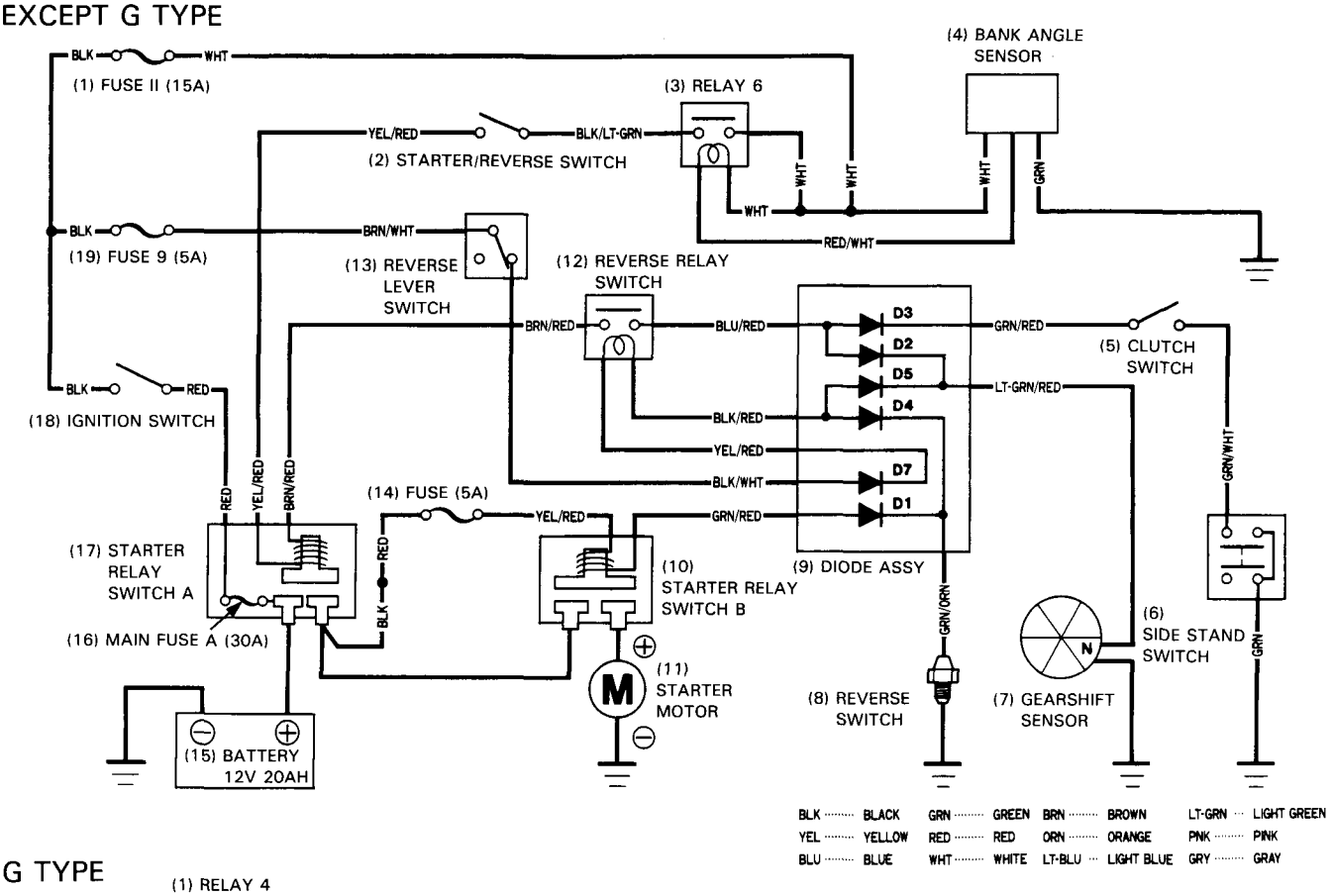


For shim selection, go to page 7-22.
Tighten the stopper plugs.

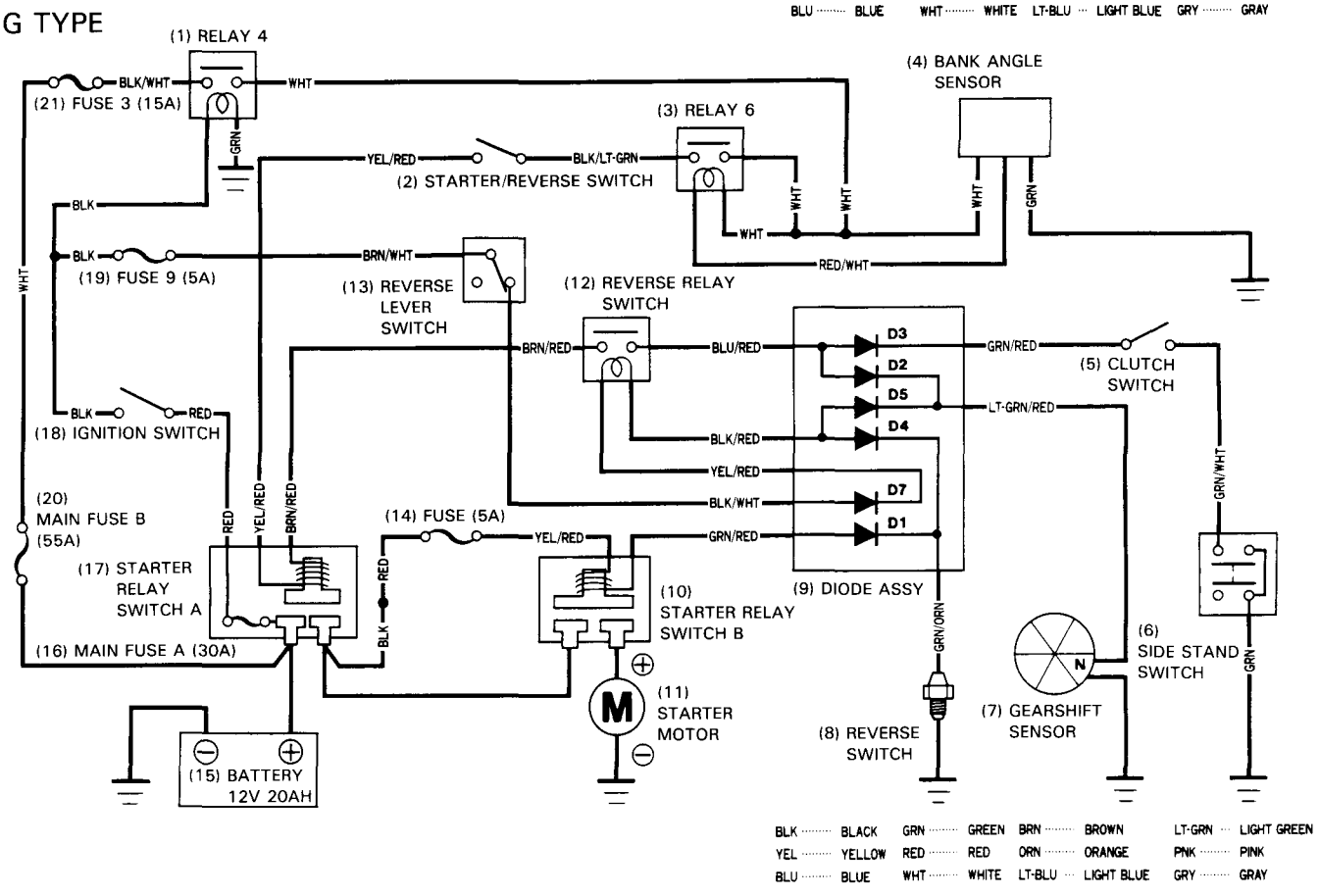
TORQUE: 30 N·m (3.0 kg-m, 22 ft-lb)

STARTING SYSTEM DIAGRAM

EXCEPT G TYPE



G TYPE



STARTER/REVERSE SYSTEM TROUBLESHOOTING

• FOR STARTING

The starter/reverse motor for starting does not turn.

NOTE

Inspect the following before troubleshooting the starter system.
- Be sure the battery is fully charged and in good condition.
- Be sure the reverse lever is in OFF position and the reverse cable is properly adjusted (page 3-17).
- Be sure the reverse switch arm is not damaged (page 19-32).
- Be sure the following fuses are good: main fuse A (30 A)-inside the starter relay switch A
  main fuse B (55 A)-on the battery case
  fuse 3 (15 A)-inside the fuse box (G type only)
  fuse 9 (5 A)-inside the fuse box
  fuse 11 (15 A)-inside the relay box (Except G type)
  fuse 5 A-the left side of the battery
- Be sure the bank angle sensor is installed properly (page 19-24).

BATTERY CONNECTIONS:
Check battery terminal connections for corrosion and looseness and check the cables for an open or short circuit.
→ NO GOOD → • Loose or corrosive contact of terminals
• Open or short circuit in battery cables
↓ GOOD

STARTER RELAY SWITCH A CONNECTIONS:
Check starter relay switch A terminal connections for corrosion and looseness and check the relay switch 4P-RED connector for loose or poor contact.
→ NO GOOD → • Loose or corrosive contact of terminals
• Loose or poor contact of the relay switch A connector
↓ GOOD

STARTER RELAY SWITCH B CONNECTIONS:
Check starter relay switch B terminal connections for corrosion and looseness. Check the relay switch 2P-WHT connector for loose or poor contact.
→ NO GOOD → • Loose or corrosive contact of terminals
• Loose or poor contact of the relay switch B connector
↓ GOOD

STARTER MOTOR CONNECTION:
Check starter motor terminal connection for corrosion and looseness and check the cables for an open circuit.
→ NO GOOD → • Loose or corrosive contact of terminal
• Open circuit in motor cable
↓ GOOD

GROUND CABLE CONNECTIONS:
Check the ground cable connections near the dipstick for corrosion and looseness and check the cables for open or short.
→ NO GOOD → • Loose or corrosive contact of cables
• Open or short circuit in ground cables
↓ GOOD

MOTOR:
Apply battery voltage to the motor directly and check its operation.
→ DO NOT TURN → • Faulty starter/reverse motor (page 19-14)
↓ TURN

RELAY 6:
Connect all connection properly.
When the ignition switch is turned to ON, you should hear the relay 6 "Click".
→ NO →
WIRING/IGNITION SWITCH:
Disconnect the 3P-GRN connector of the connector holder on the rear fender, and measure voltage between the WHT (+) and GRN (−) wires and between the RED/WHT (+) and GRN (−). Battery voltage should register with the ignition switch ON.
↓ YES
Ⓐ

Ⓑ YES Ⓒ NO

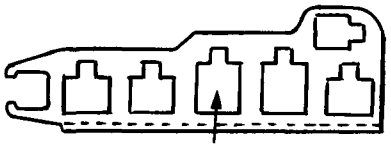
Ⓐ

RELAY 6:
Check the relay 6 for continuity (page 19-27)

CONTINUITY

NO CONTINUITY
• Faulty relay 6

WIRING/CONNECTORS:
Disconnect the 9P-RED connector of connector holder on the right cooling fan, and measure voltage between the BLK/LT GRN (+) wire and ground (−). Battery voltage should register with the ignition switch ON.



(1) 9P-RED CONNECTOR

NO
• Loose or poor contact of connectors
• Open or short circuit in main wire harness

YES

STARTER/REVERSE SWITCH:
Using the above connector, check the starter/reverse switch for continuity (page 19-28).

NO GOOD
• Faulty starter/reverse switch

GOOD

STARTER RELAY SWITCH A:
With the ignition switch ON, push starter/reverse switch. You should hear the starter relay switch A "Click" (page 19-25).

NO

YES

STARTER RELAY SWITCH A:
Check the starter relay switch A for continuity (page 19-26).

CONTINUITY

NO CONTINUITY
• Faulty starter relay switch A

Ⓒ

Ⓑ

BANK ANGLE SENSOR:
Inspect the bank angle sensor (page 30-26).

GOOD
• Loose or poor contact of the 3P-GRN connector

NO GOOD
• Faulty bank angle sensor

Ⓒ
• Loose or poor contact of 22P-BLK, 22P-RED connector or 8P-BLK connector above the left cooling fan
• Open or short circuit in main or sub wire harness
• Faulty ignition switch (page 22-16)
• Faulty relay 6.

REVERSE RELAY SWITCH:
Turn the ignition switch ON. You should hear the reverse relay switch "Click".

YES

NO

WIRING/CONNECTORS/DIODE:
Disconnect the reverse relay switch connector and measure voltage between BRN/RED (+) and BLU/RED (−) wires of the wire harness side. Battery voltage should register with the ignition switch ON, the starter/reverse switch pushed and the gear in neutral.

YES
• Faulty reverse relay switch

NO
• Faulty starter relay switch A
• Faulty gearshift sensor (page 18-12)
• Loose or poor contact of 22P-RED and 6P-BLK connectors
• Faulty reverse diode assembly (page 26-90)
• Open or short circuit in main or sub wire harness

WIRING/CONNECTORS/DIODE:
Disconnect the reverse relay switch connector and measure voltage between YEL/RED (+) and BLK/RED (−) wires of the wire harness side. Battery voltage should register with the ignition switch ON.

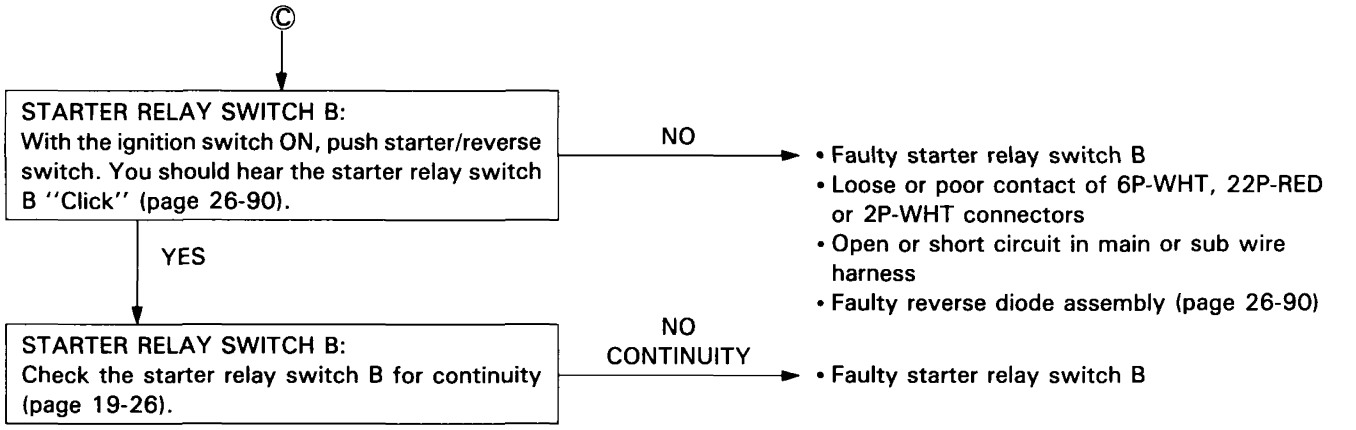
YES

REVERSE RELAY SWITCH:
Check the reverse relay switch for continuity (page 19-26).

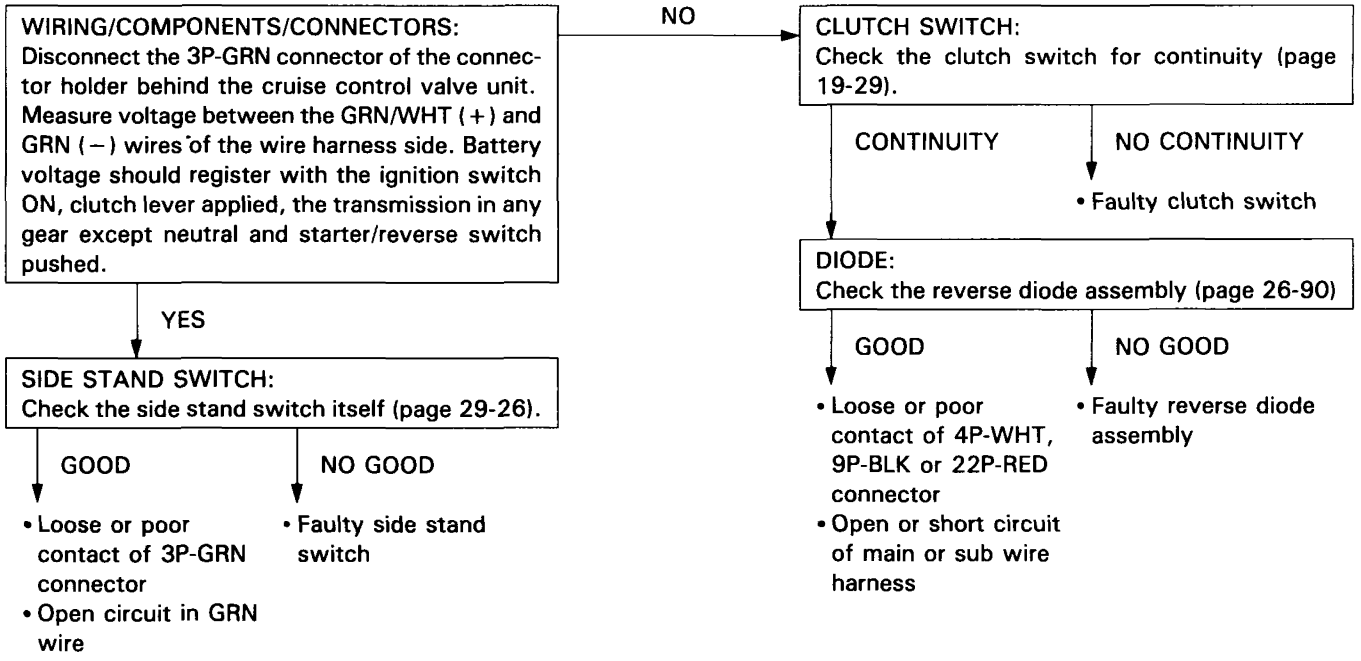
CONTINUITY
• Loose or poor contact of the relay connector

NO CONTINUITY
• Faulty reverse relay switch

NO
• Faulty reverse diode assembly (page 26-90)
• Loose or poor contact of 22P-RED connector
• Open or short circuit in main or sub wire harness
• Faulty reverse switch (page 19-27)
• Faulty reverse lever switch



The starter/reverse motor for starting turns in neutral position, but does not turn in gear with the side stand up and the clutch lever applied.



Starter/reverse motor turns engine slowly
- Low battery
- Excessive resistance in circuit
- Faulty starter motor (page 19-13)

Starter/reverse motor turns, but engine does not turn
- Faulty starter clutch (page 19-22)
- Faulty starter drive or driven gear
- Faulty starter idle gear

Starter/reverse motor and engine turn, but engine does not start
- Faulty ignition system
- Engine problems, see engine related sections

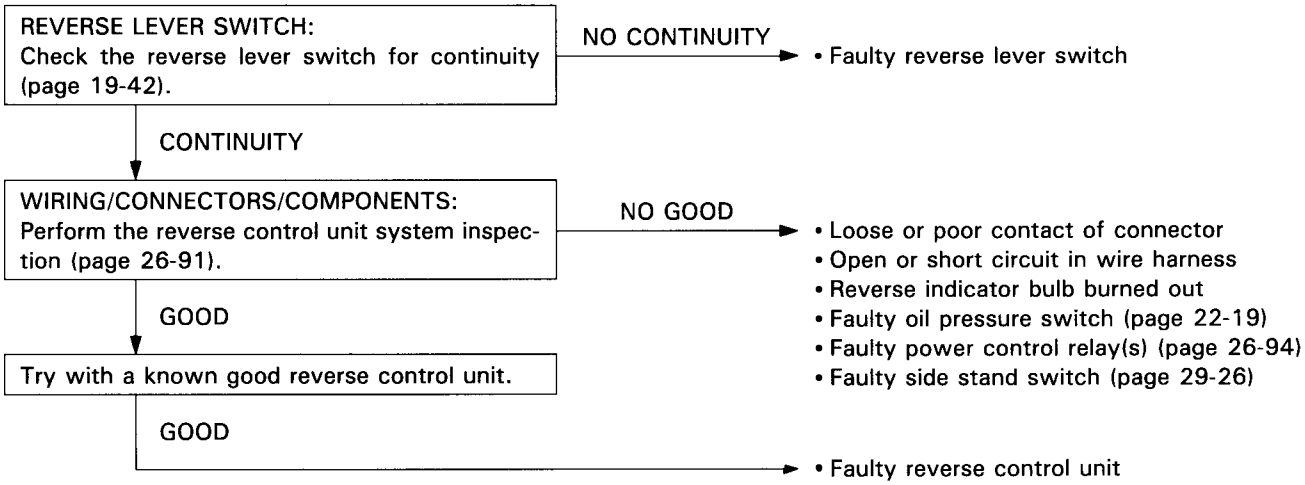
• FOR REVERSE

The starter/reverse motor for reverse does not turn.

NOTE

When the speed limiter is activated during reverse running and then the electrical motor brake is worked, and when the motor is overloaded more than 3 seconds, the reverse system is turned OFF and the reverse indicators goes out.
To use reverse again, it is necessary to return the reverse lever to the OFF position and then return it to the ON position.

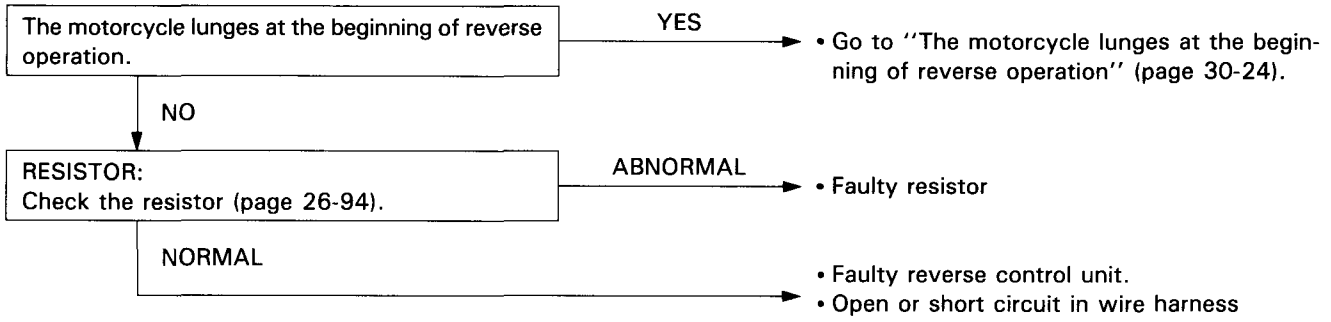
Inspect the following before troubleshooting the reverse system.
- Be sure the transmission gears is in neutral position.
- Be sure the reverse lever is in the ON position and reverse cable is properly adjusted.
- Be sure the side stand is up.
- Be sure the following fuses are not burnt: fuse 5 A-the left side of the battery
  reverse fuse 65 A-under the seat



The reverse system works well, but reverse indicator does not come on.

- Burnt reverse indicator
- Faulty reverse control unit
- Open or short circuit in wire harness

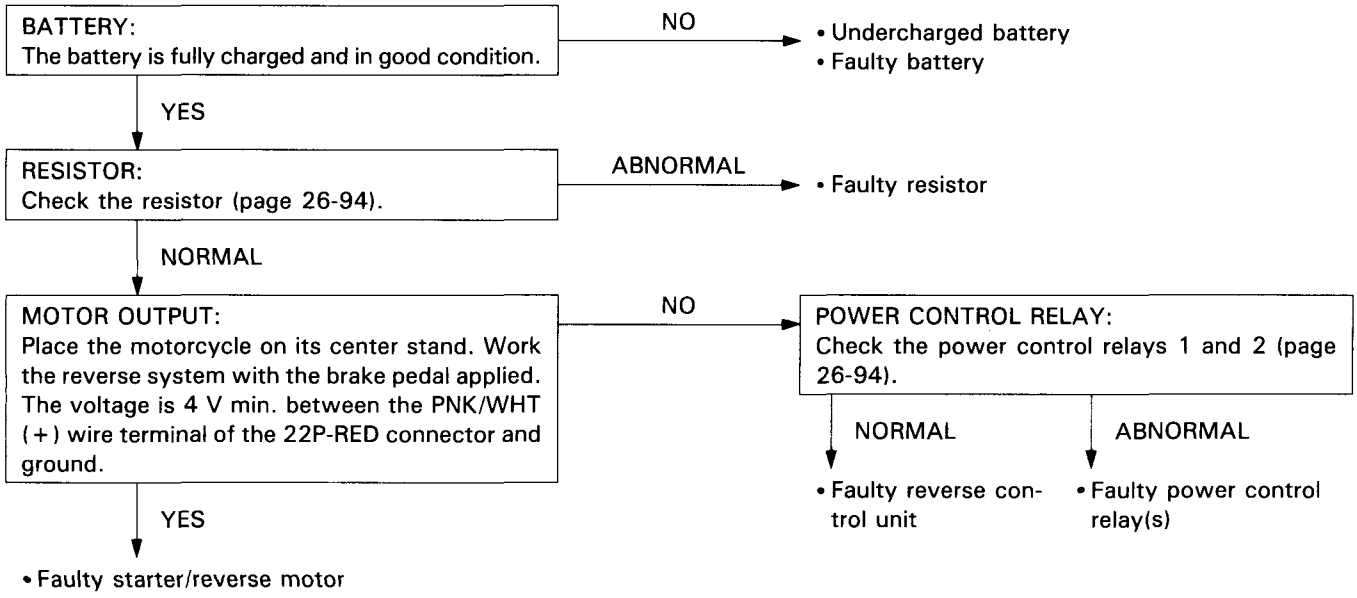
The reverse speed is fast (1.8 km/h minimum on a flat road)



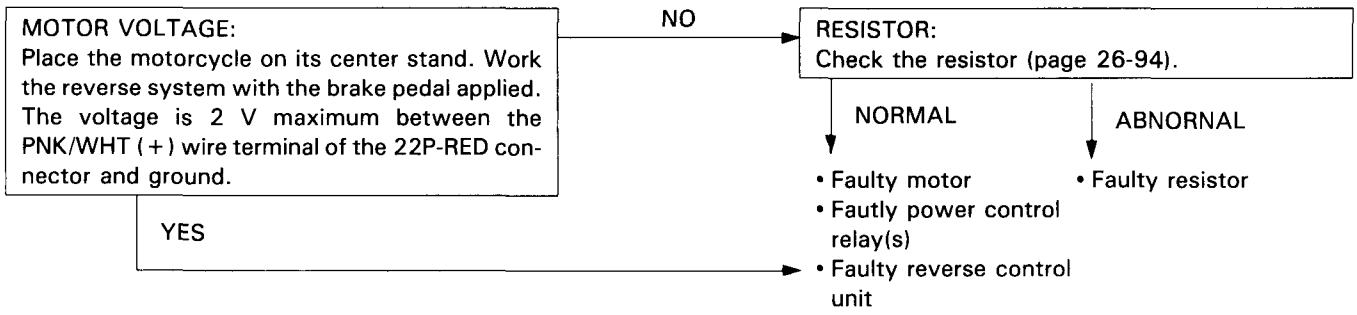
The reverse speed is slow (1.0 km/h maximum on a flat road)

- Undercharged or faulty battery
- Faulty resistor
- Faulty power control relay(s)
- Fautly starter/reverse motor

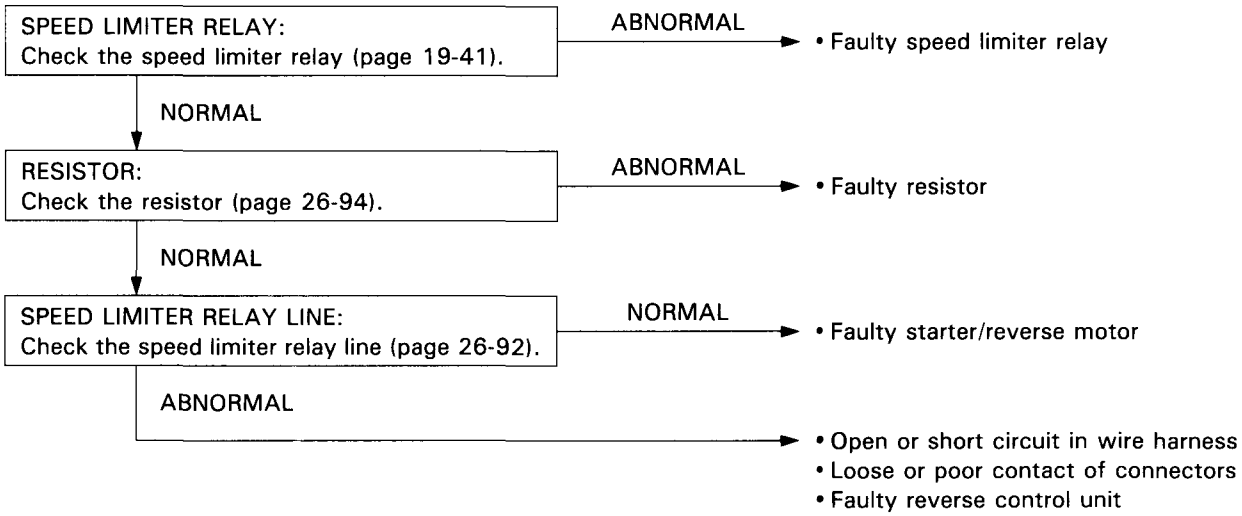
Lack of the uphill power



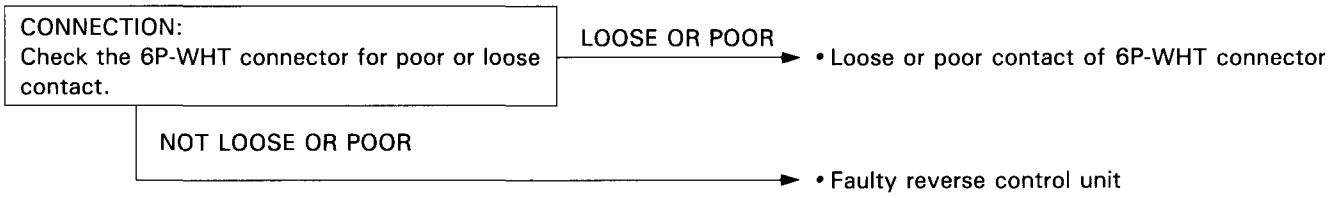
The reverse system works well, but the motor does not stop even if the motor is overloaded more than 3 seconds.



The speed limiter system is not activated at 2.5 km/h minimum in reverse.

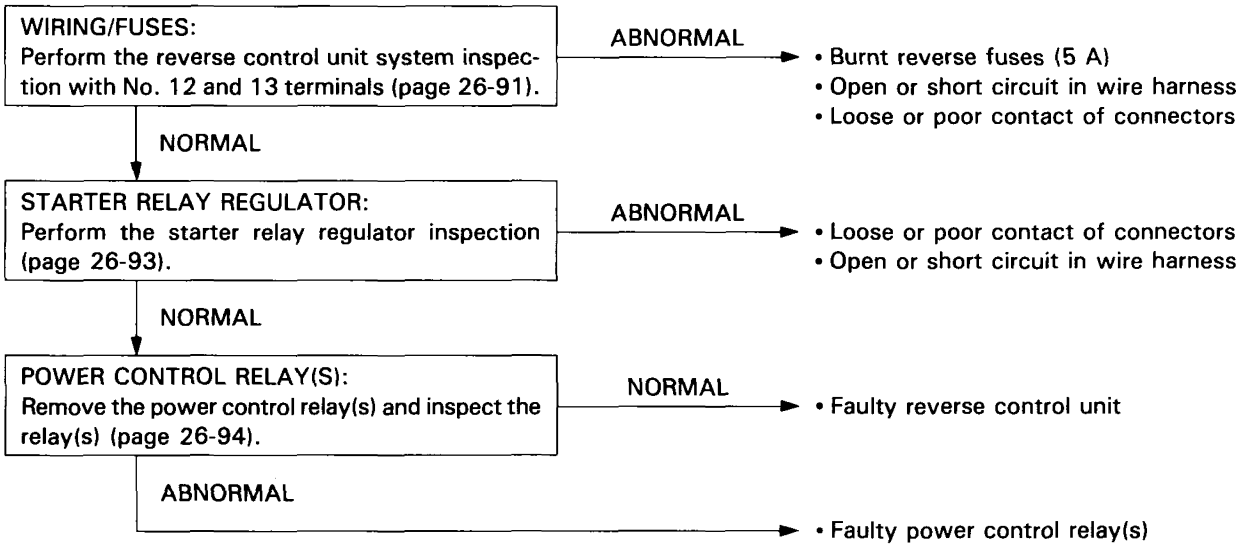


Reverse operation is rough, stalls, or runs poorly.

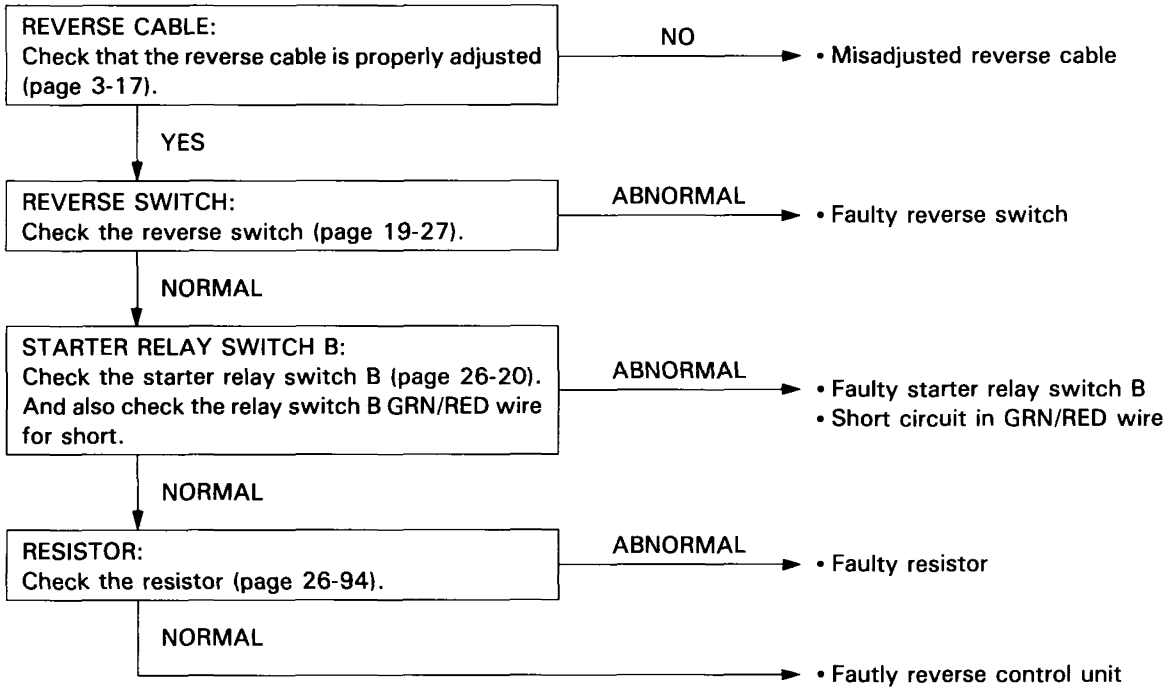


Continues operating in reverse even if the starter/reverse switch is free.
- Faulty starter/reverse switch
- Faulty starter relay switch A

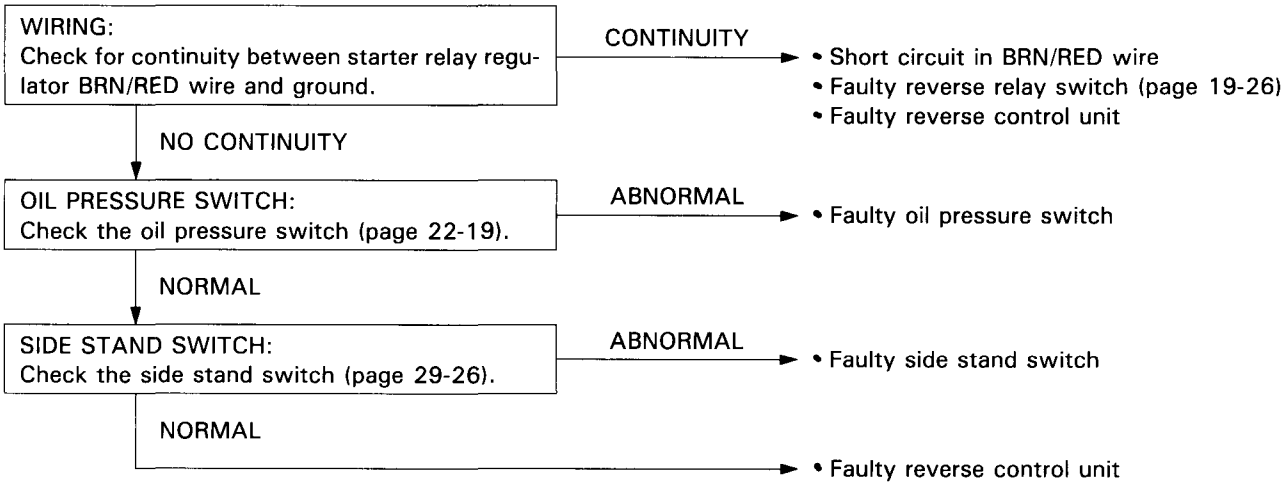
Stops immediately when reverse operation is initiated.



The motorcycle lunges at the beginnng of reverse operation.



The reverse system operates before being properly selected.



During reverse operation, starter/reverse motor idles
- Mis-adjusted reverse cable (page 3-17)
- Faulty reverse shift system (page 19-30)

Transmission is hard to shift with reverse lever in OFF position
- Mis-adjusted reverse cable (page 3-17)
- Damage shift drum lock system (page 19-32)

During the normal run, the rear wheel is locked suddenly
- Damaged reverse shift system (page 19-30)

After shifting into reverse, transmission is easy to shift
- Mis-adjusted reverse cable (page 3-17)
- Damaged shift drum lock system (page 19-32)

Hard to shift to reverse
- Damaged reverse shift system (page 19-30)
- Faulty reverse cable

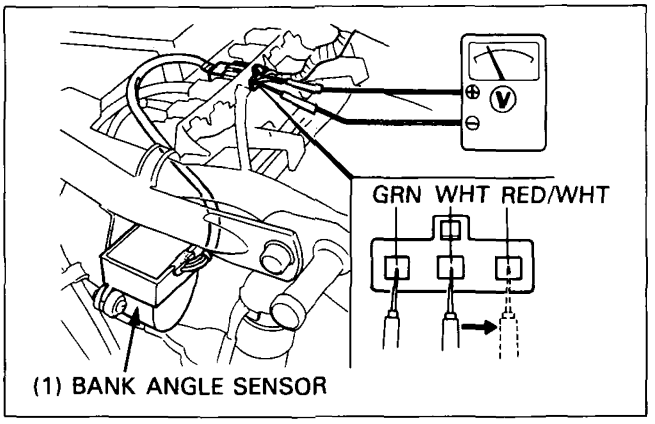
BANK ANGLE SENSOR

INSPECTION

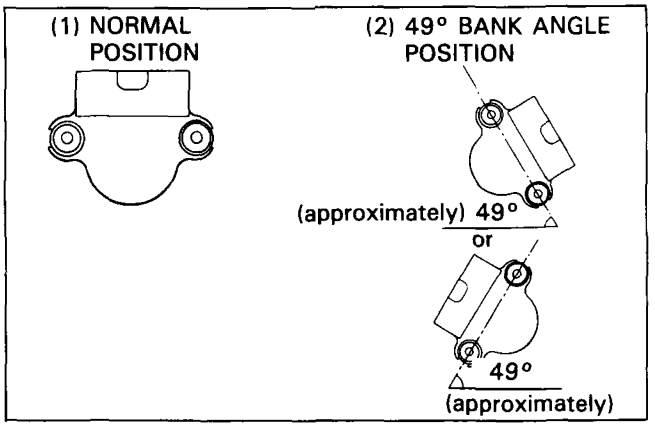
Remove the seat, trunk and right saddlebag (page 12-12).
Turn the ignition switch ON and measure voltage between the following terminals of the bank angle sensor with the 3P-GRN connector connected.

Terminals	Standard voltage
RED/WHT (+) and GRN (−)	0−1 V
WHT (+) and GRN (−)	10−14 V

Remove the air pressure sensor assembly from the rear fender stay.
Remove the screws and bank angle sensor.



Turn the ignition switch OFF.
Place the bank angle sensor horizontal with the connector connected as first shown, and turn the ignition switch ON.
The bank angle sensor is normal if the relay 6 (IGN. CRUISE) clicks and the power supply line is closed.
Incline the bank angle sensor approximately 49 degrees to the left or right with the ignition switch remaining ON.
The bank angle sensor is normal if the relay 6 clicks and the power supply line is open.



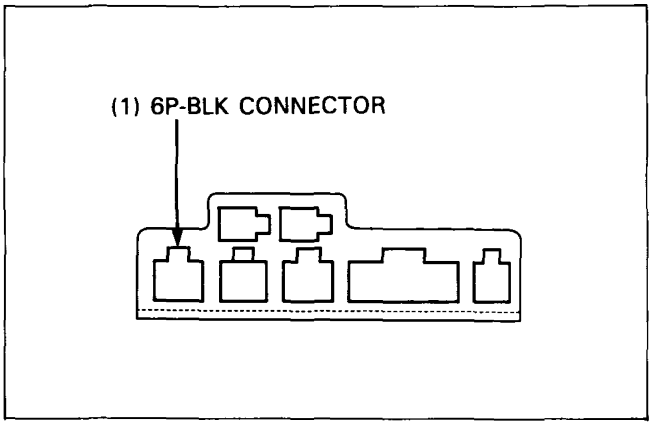
NOTE

- If you repeat this test, first turn the ignition switch OFF; then the switch to ON and try test again.

FADER CONTROL (GL1500SE except G type)

INSPECTION

Disconnect the 6P-BLK connector from the connector holder on the left cooling fan.

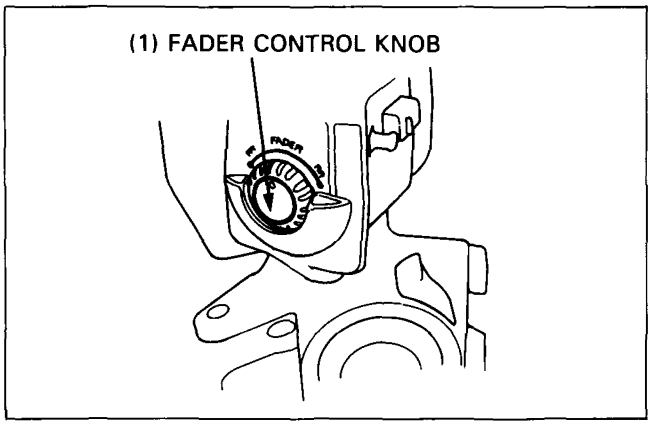


Turn the fader control knob counterclockwise fully and measure the resistances between the terminals.

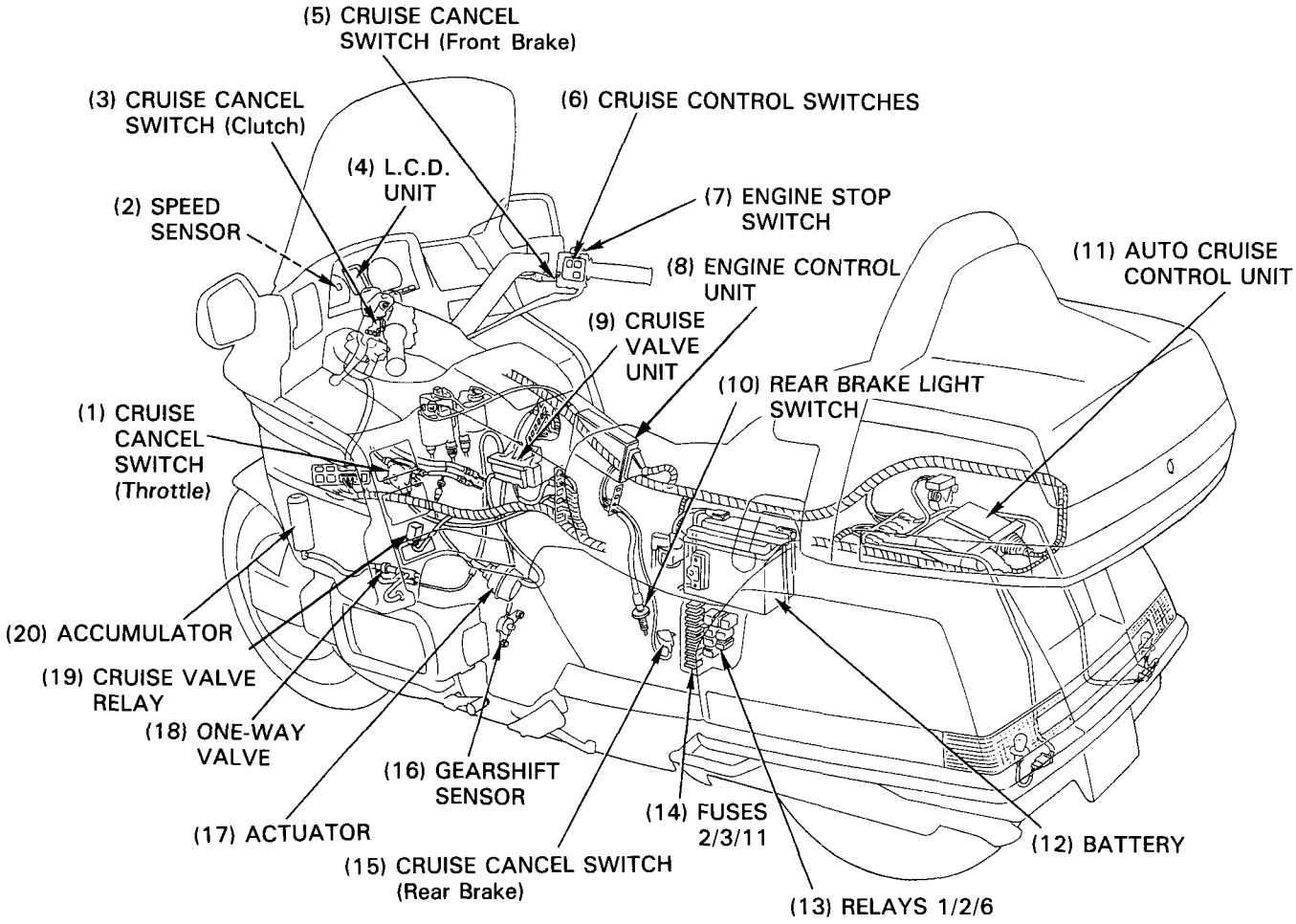
Standard Resistance: RED/YEL and BRN/WHT: 0 Ω
BRN/WHT and BRN/BLK: 56−104 Ω
BLU/YEL and GRY/WHT: 0 Ω
GRY/WHT and GRY/BLK: 56−104 Ω

Turn the fader control knob clockwise fully and measure the resistances between the terminals.

Standard Resistance: RED/YEL and BRN/WHT: 56−104 Ω
BRN/WHT and BRN/BLK: 0 Ω
BLU/YEL and GRY/WHT: 56−104 Ω
GRY/WHT and GRY/BLK: 0 Ω



CRUISE CONTROL SYSTEM LOCATION



CRUISE CONTROL SYSTEM TROUBLESHOOTING

Cruise control does not function at all.

NOTE

Cruise control will be cancelled when:
- Either brake (front or rear) is applied.
- Clutch lever is operated.
- Throttle is returned.

Cruise speed memory will be cancelled when:
- Ignition switch, engine stop switch or auto cruise switch is operated to OFF. The bank angle sensor is operated. Both the resume and set switch are operated simultaneously.

Cruise control will not function under the following conditions.
- At speeds other than 48—128 km/h (30—80 mph)
- Transmission is in a gear other than 4th or OD.

Inspect the following before troubleshooting the cruise control system.
- Be sure the terminal connections of the cruise cancel switches (pages 21-11 and 25-53) are good.
- Be sure the rear brake cruise cancel switch is properly adjusted (page 21-12).

CRUISE INDICATOR:
Turn the ignition switch ON and engine stop switch to RUN, and check that the cruise indicator lights come on for a few seconds, then go off.

ABNORMAL → BULB:
Check the bulbs for burn.

NOT BURN → DISPLAY OPERATION:
Check the L.C.D. unit display operation.

BURN
- Faulty bulb

NORMAL → WIRING/SWITCH:
With the ignition switch ON and engine stop switch on RUN, turn the auto cruise switch to ON. The "CRUISE ON" indicator light should go on and stay on.

NORMAL
Ⓐ

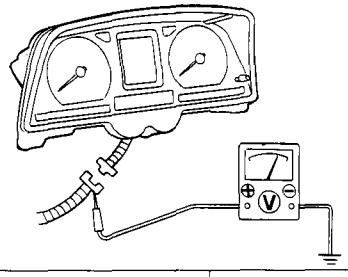
ABNORMAL
- Go to L.C.D. DOES NOT DISPLAY troubleshootings (page 22-7, 8, 9)

NORMAL → WIRING:
Measure voltage between the control unit No. 1 terminal and ground (page 30-35).

NORMAL
Ⓑ

ABNORMAL
- Open or short circuit in wire harness
- Loose or poor contact of connectors
- Faulty auto cruise switches (page 21-13).

WIRING/CONNECTOR:
Disconnect the 10P-WHT connector under the instrument, and measure the voltage between the BLU/ORN (+) and ground (−) and between the BLU/WHT (+) and ground (−). With the ignition switch ON and engine stop switch on RUN, battery voltage should register.



YES
- Loose or poor contact of the 10P-WHT connector
- Faulty L.C.D. unit

NO
- Open or short circuit in wire harness
- Loose or poor contact of connectors

Ⓐ

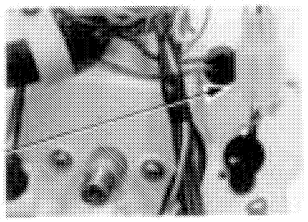
WIRING:
Measure the voltage between the control unit No. 2 terminal and ground (page 30-35).

ABNORMAL

NORMAL

POWER TO SPEED SENSOR:
Disconnect the 3P-WHT mini connector of the speed sensor under the instrument. Measure voltage between the LT-GRN/BLK (+) and GRN/BLK (−) wire terminals with the ignition switch ACC, ON or P.

3P-WHT CONNECTOR



BATTERY VOLTAGE SHOULD REGISTER

VOLTAGE DOES NOT REGISTER

- Open or short circuit in wire harness
- Loose or poor contact of the connectors

WIRING:
Measure voltage between the control unit No. 8 terminal and ground (page 30-35).

ABNORMAL

SPEED SENSOR:
Check the speed sensor (page 25-55).

NORMAL

ABNORMAL

- Open or short circuit in wire harness
- Loose or poor contact of connectors

- Faulty speed sensor

NORMAL

Ⓒ

WIRING/COMPONENTS:
Perform the auto cruise control unit system inspection. If not normal, check the related components in that part of the abnormal lines (page 30-35).

NORMAL

CRUISE CONTROL VALVE:
Check the cruise control valve (page 21-14).

ABNORMAL

- Faulty cruise control valve

NORMAL

Ⓓ

Ⓑ

WIRING:
Measure voltage between the control unit No. 10 terminal and ground (page 30-35).

NORMAL

ABNORMAL

- Open or short circuit in wire harness
- Loose or poor contact of the connectors

Ⓒ

WIRING/ENGINE CONTROL UNIT:
Disconnect the 26P-YEL connector from the engine control unit and measure the voltage between the cruise control unit No. 2 terminal and ground (page 30-35).

ABNORMAL

NORMAL

- Faulty engine control unit

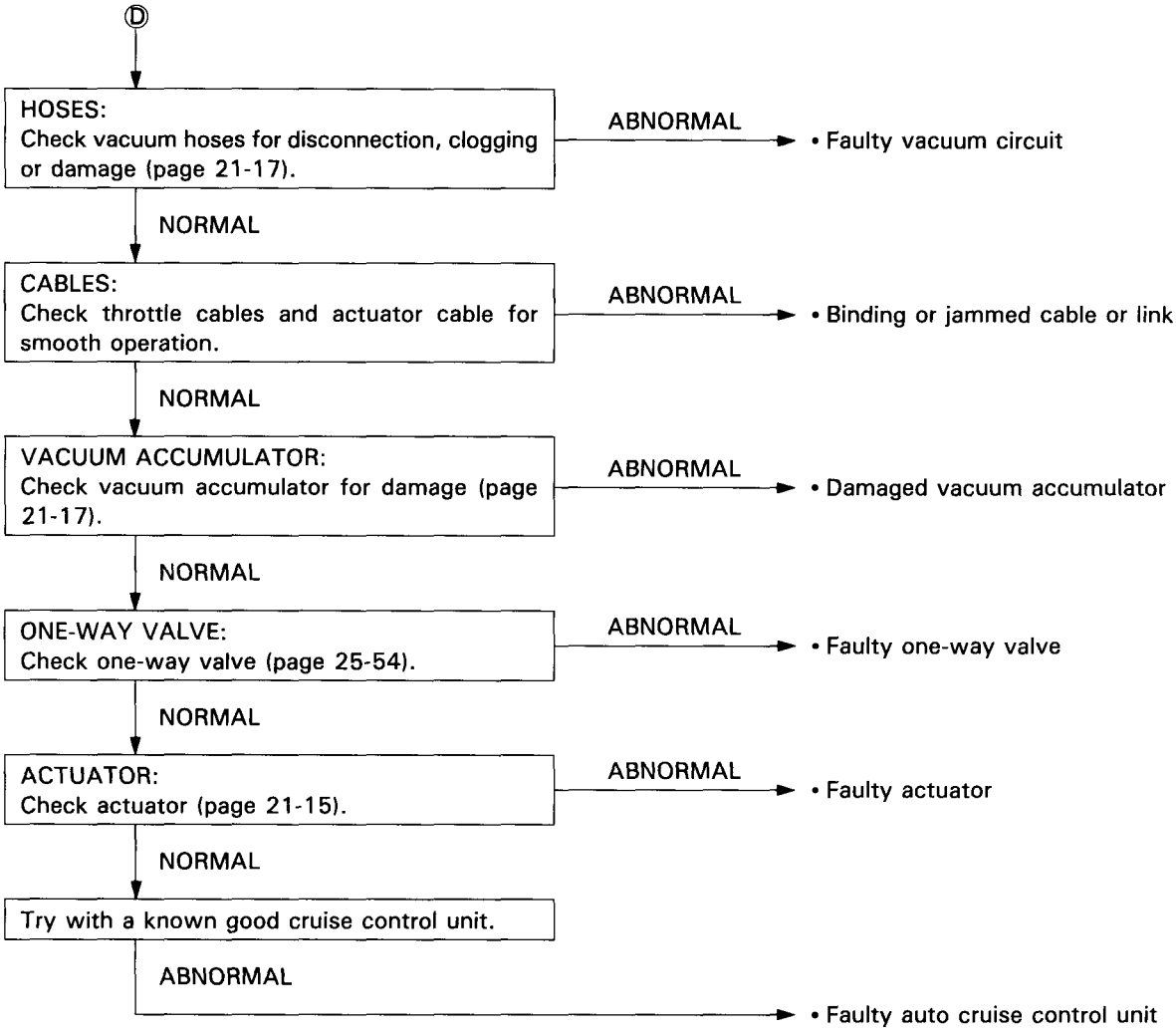
WIRING/CRUISE CONTROL UNIT:
Disconnect the 20P-BLK connector from the cruise control unit and check for continuity between the connector No. 2 (WHT/BLK) terminal and ground.

NO CONTINUITY

CONTINUITY

- Faulty auto cruise control unit

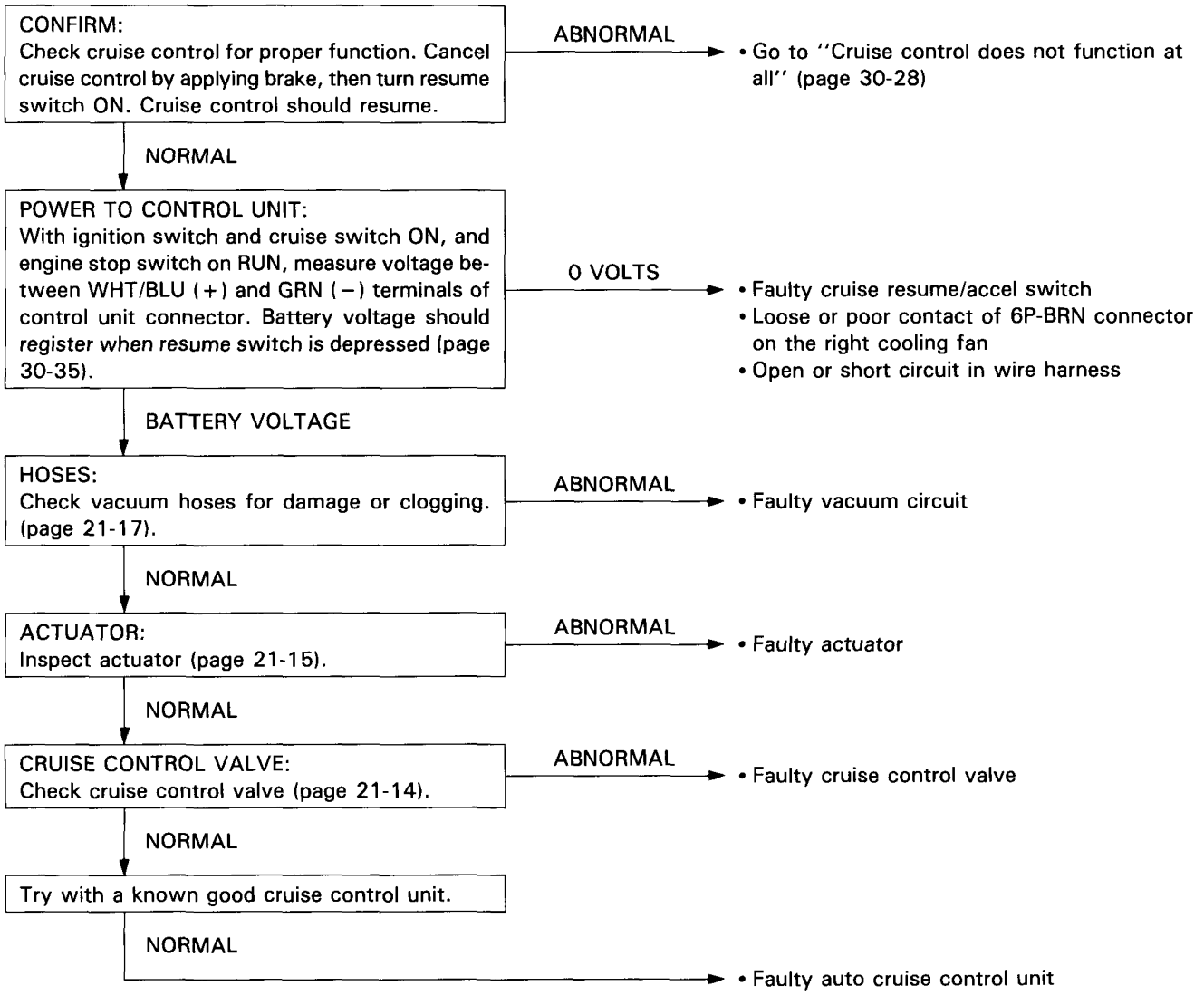
- Short circuit in wire harness


Ⓓ
HOSES:
Check vacuum hoses for disconnection, clogging or damage (page 21-17).
ABNORMAL
• Faulty vacuum circuit
NORMAL
CABLES:
Check throttle cables and actuator cable for smooth operation.
ABNORMAL
• Binding or jammed cable or link
NORMAL
VACUUM ACCUMULATOR:
Check vacuum accumulator for damage (page 21-17).
ABNORMAL
• Damaged vacuum accumulator
NORMAL
ONE-WAY VALVE:
Check one-way valve (page 25-54).
ABNORMAL
• Faulty one-way valve
NORMAL
ACTUATOR:
Check actuator (page 21-15).
ABNORMAL
• Faulty actuator
NORMAL
Try with a known good cruise control unit.
ABNORMAL
• Faulty auto cruise control unit

Cruise control will not resume

NOTE

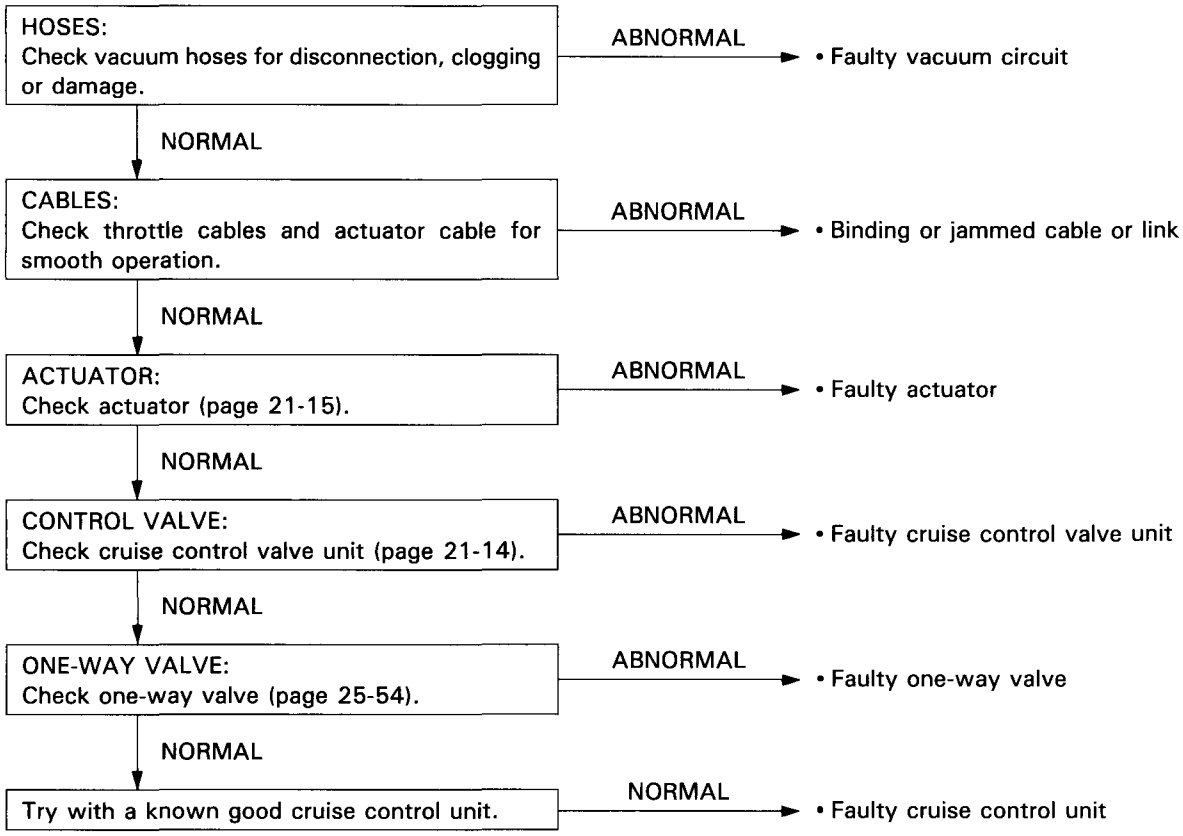
- Cruise control will not resume below 48 km/h (30 mph).
- Holding resume/accel switch ON causes the motorcycle to accelerate to nearly full throttle. However, cruise control will only operate to 128 km/h (80 mph).
- Cruise control will not resume when either the auto cruise switch, engine stop switch or ignition switch is turned OFF, or when both the resume and set switch are operated simultaneously, or when the bank angle sensor is operated (memory is erased).



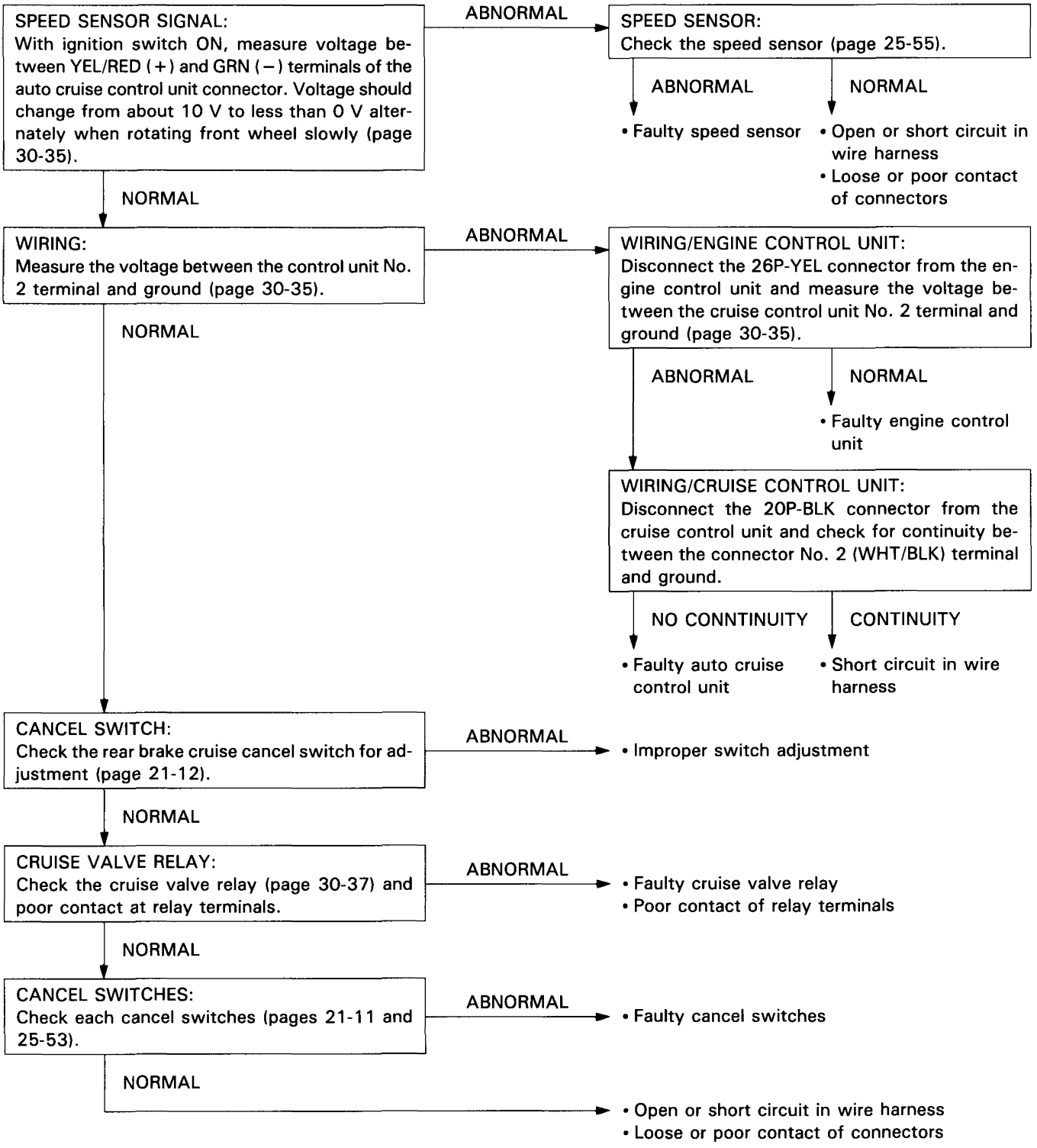
Cruise speed fluctuates excessively (more than 8 km/h (5 mph)) immediately after setting

NOTE

- Before troubleshooting, check the carburetor synchronization. Adjust synchronization, if necessary.



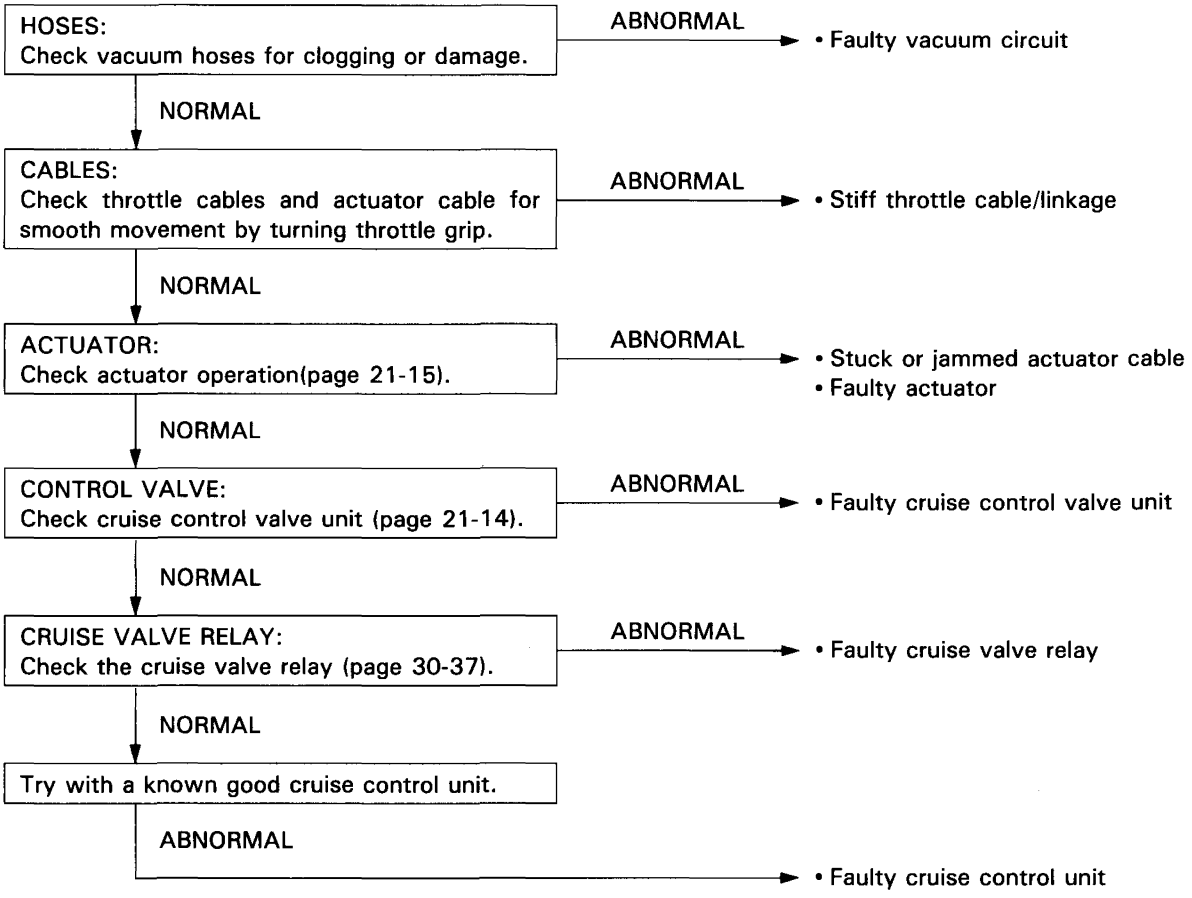
Cruise control is cancelled accidently.



Cruise control cannot be cancelled.

NOTE

- The cruise control should cancel when brake is applied, clutch lever is operated, throttle grip is returned, or transmission is shifted. Before going into details, check the cancel switches, brakelight switches or gearshift sensor for proper operation.



AUTO CRUISE CONTROL UNIT

SYSTEM INSPECTION

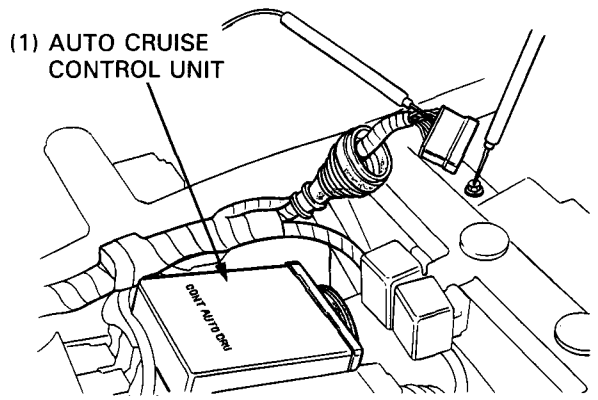
Remove the trunk (page 12-12).
Disconnect the auto cruise control unit connector and check it for loose contact or corroded terminals.

Turn the ignition switch ON and check for voltage at the following wires (+) in 20P-BLK connector.

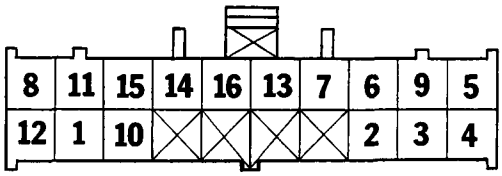
NOTE

- Inspect according to the following conditions:
  Condition 1: Engine stop switch in RUN
  2: Auto cruise switch pushed (LOCK)
  3: Set/decel switch depressed
  4: Resume/accel switch depressed
  5: Clutch disengaged
  6: Front brakelight or rear brakelight switch in ON
  7: Cruise cancel switches (front brake, rear brake and throttle) in OFF
  8: Front wheel rotated slowly
  9: Auto cruise control unit connector connected

If each terminal/line check is not normal, first check the wire harness for open or short and check the connectors for loose or poor contact.
Then, inspect the following related component(s).



(2) • WIRE HARNESS SIDE CONNECTOR



TERMINAL/LINE		COLOR	VOLTAGE	CONDITION(S)	RELATED COMPONENT(S)
1	Battery voltage (+)	BLK/YEL	Battery	1, 2	Auto cruise switch (page 21-13)
2	Engine speed pulse	WHT/BLK	Battery	1, 9	Engine control unit
3	Set/decel switch	WHT/YEL	Battery	1, 2, 3	Set/decel switch (page 21-13) Auto cruise switch (page 21-13)
4	Resume/accel switch	WHT/BLU	Battery	1, 2, 4	Resume/accel switch (page 21-13) Auto cruise switch (page 21-13)
5	Cruise cancel switch (clutch)	GRN/BLU	Battery	1, 2, 5	Cruise cancel switch (clutch) (page 21-11) Auto cruise switch (page 21-13)
8	Speed sensor (+)	YEL/RED	0—10 volts Pulse	8	Speed sensor (page 25-55)
9	Brakelight	GRN/YEL	Battery	6	Front brakelight switch (page 22-18) Rear brakelight switch (page 22-18)
10	CRUISE ON indicator	BLU/ORN	Battery	1	CRUISE ON indicator (page 22-12)
11	Cruise cancel switch (front brake, rear brake and throttle)	BRN/RED	Battery	1, 2, 7	Cruise cancel switch (front brake, rear brake and throttle) (pages 21-11 and 25-53) Auto cruise switch (page 21-13)
12	Relay coil	GRN/BLK	Battery	1, 2, 7	Cruise cancel switch (front brake rear brake and throttle) (pages 21-11 and 25-53) Auto cruise switch (page 21-13) Cruise valve relay (page 30-37)
15	CRUISE SET indicator	BLU/WHT	Battery	1	CRUISE SET indicator (page 22-12)

(Cont'd)

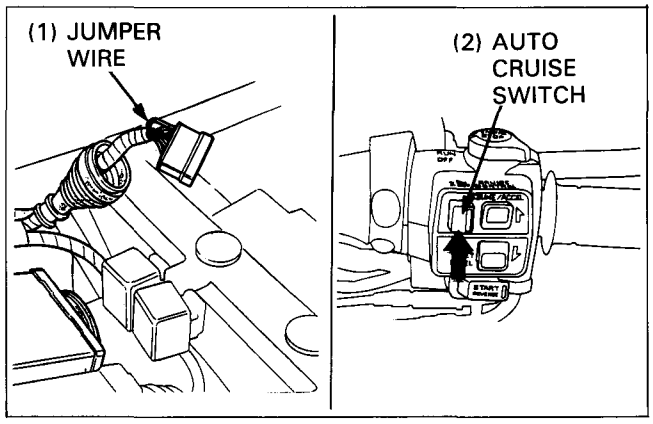
(Cont'd)-next, inspect terminals No. 13 & 14

13: Vacuum valve
14: Vent valve
With the cruise cancel switch (front brake, rear brake and throttle) in OFF, engine stop switch in RUN and ignition switch ON, short the GRN/BLK terminal to GRN terminal with a jumper wire.

Depress the auto cruise switch, and the cruise control valve (relief) is normal if it clicks.

NOTE

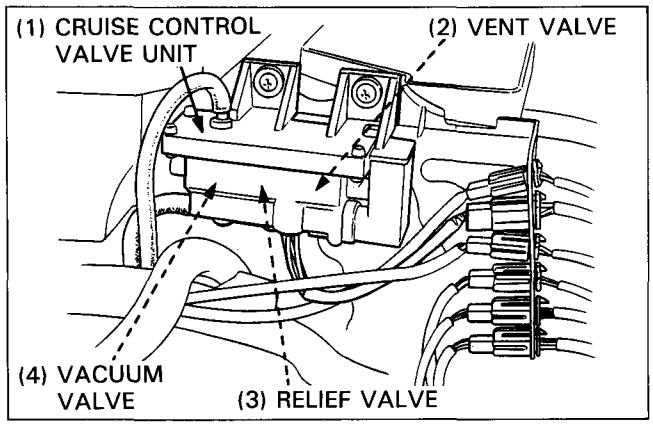
- At the same time, the cruise valve relay should also click.



Maintain all of the above conditions, and ground the terminal 13 (BRN/BLK wire) with a jumper wire. The cruise control valve (vacuum) is normal if it clicks.

Then ground the terminal 14 (BRN wire) with a jumper wire. The cruise control valve (vent) is normal if it clicks.

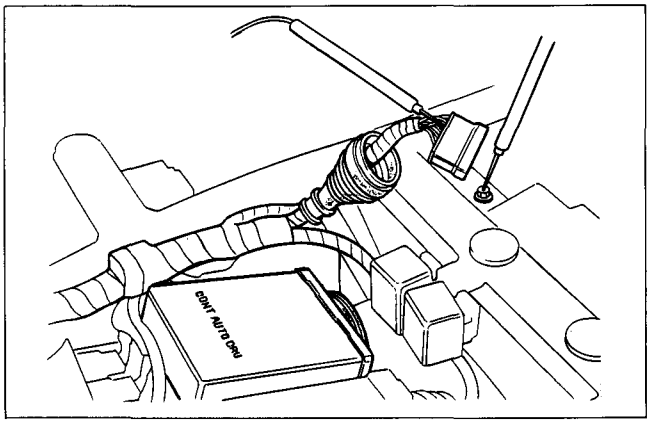
Next, maintaining all of the above conditions, measure valtage between the terminal 13 (BRN/BLK wire) (+) and ground, and between the terminal 14 (BRN wire) (+) and ground.
Battery voltage should register.



If there are not OK, inspect the following:
- Wire harness for open or short circuit.
- Connectors for loose or poor contact.
- Cruise cancel switch (front brake, rear brake and throttle) (pages 21-11 and 25-53).
- Cruise valve relay (page 30-37).
- Cruise control valve unit (page 21-14).

Next, inspect the terminals 6, 7 and 16.
6: Gearshift sensor 4 th
7: Gearshift sensor OD
16: Ground

Turn the ignition switch ro OFF.
Check for continuity between the following wires in 20P-BLK connector and ground.



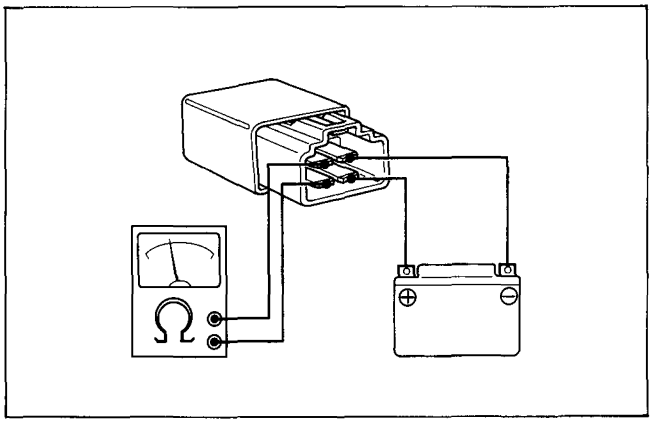
TERMINAL/LINE		COLOR	CONTINUITY	CONDITION(S)	PROBABLE CAUSE
6	Gearshift sensor 4th	RED/WHT	Exist	Transmission in 4th	• Open or short circuit in wire harness • Loose or poor contact of connector • Gearshift sensor (page 26-74)
7	Gearshift sensor OD	GRN/ORN	Exist	Transmission in OD	
16	Ground	GRN	Exist	At all times	• Open circuit in wire harness • Loose or poor contact of ground terminal.

CRUISE VALVE RELAY

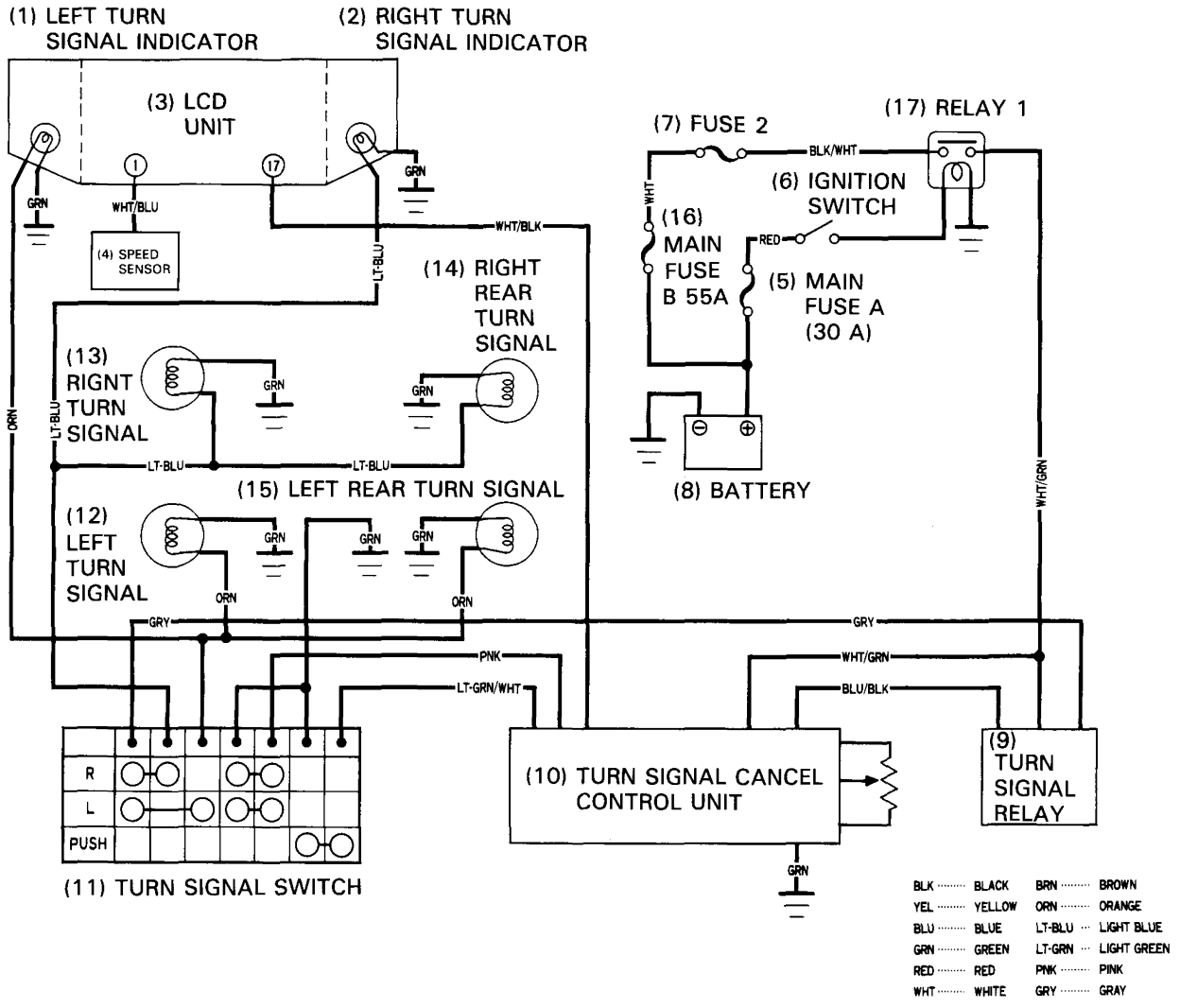
CONTINUITY INSPECTION

Remove the left fairing inner cover (page 12-9).

Remove the cruise valve relay.
Connect an ohmmeter and 12 V battery to the relay as shown.
There should be continuity.
Disconnect the battery. There should be no continuity.

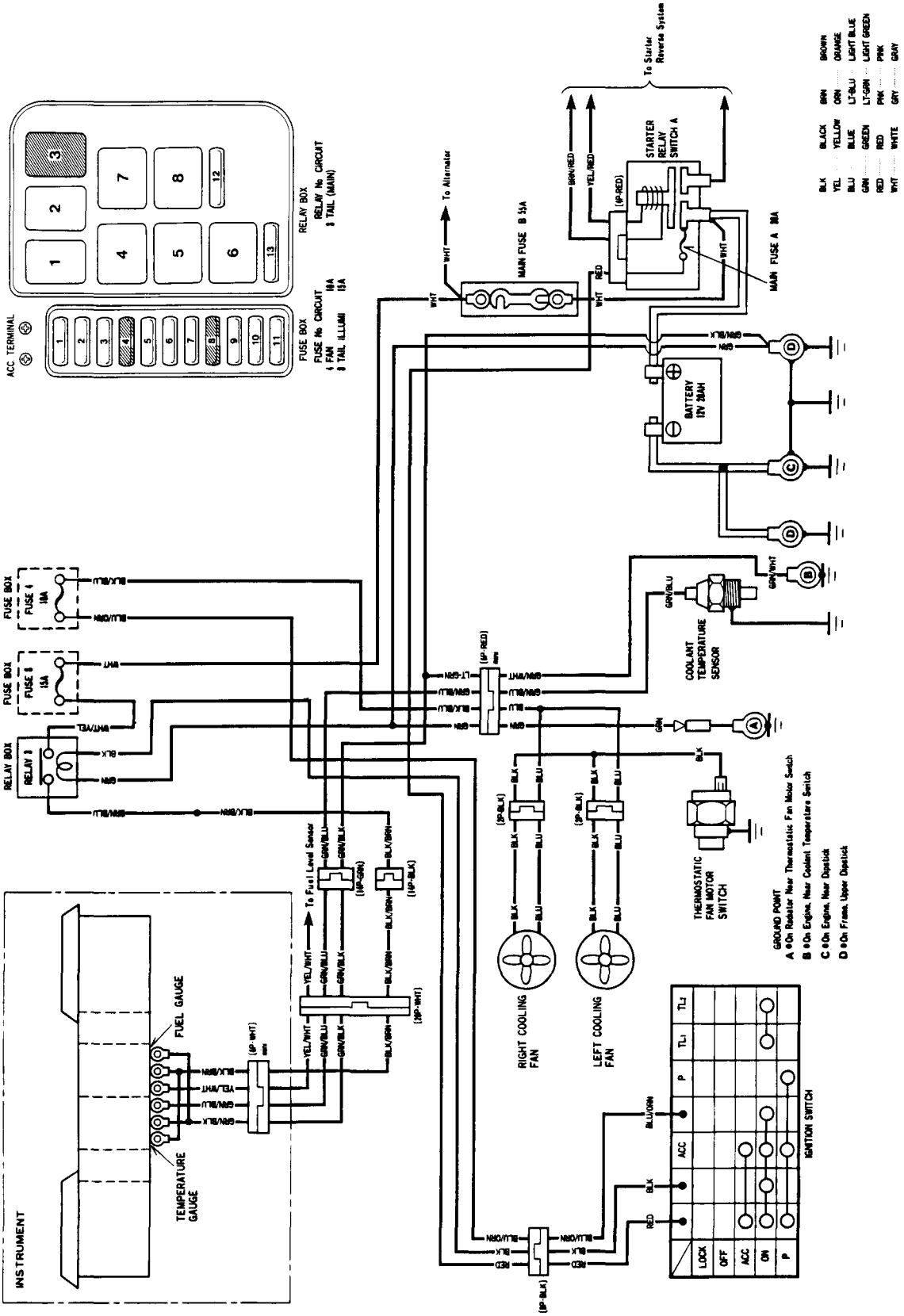


SELF CANCELLING TURN SIGNAL SYSTEM DIAGRAM

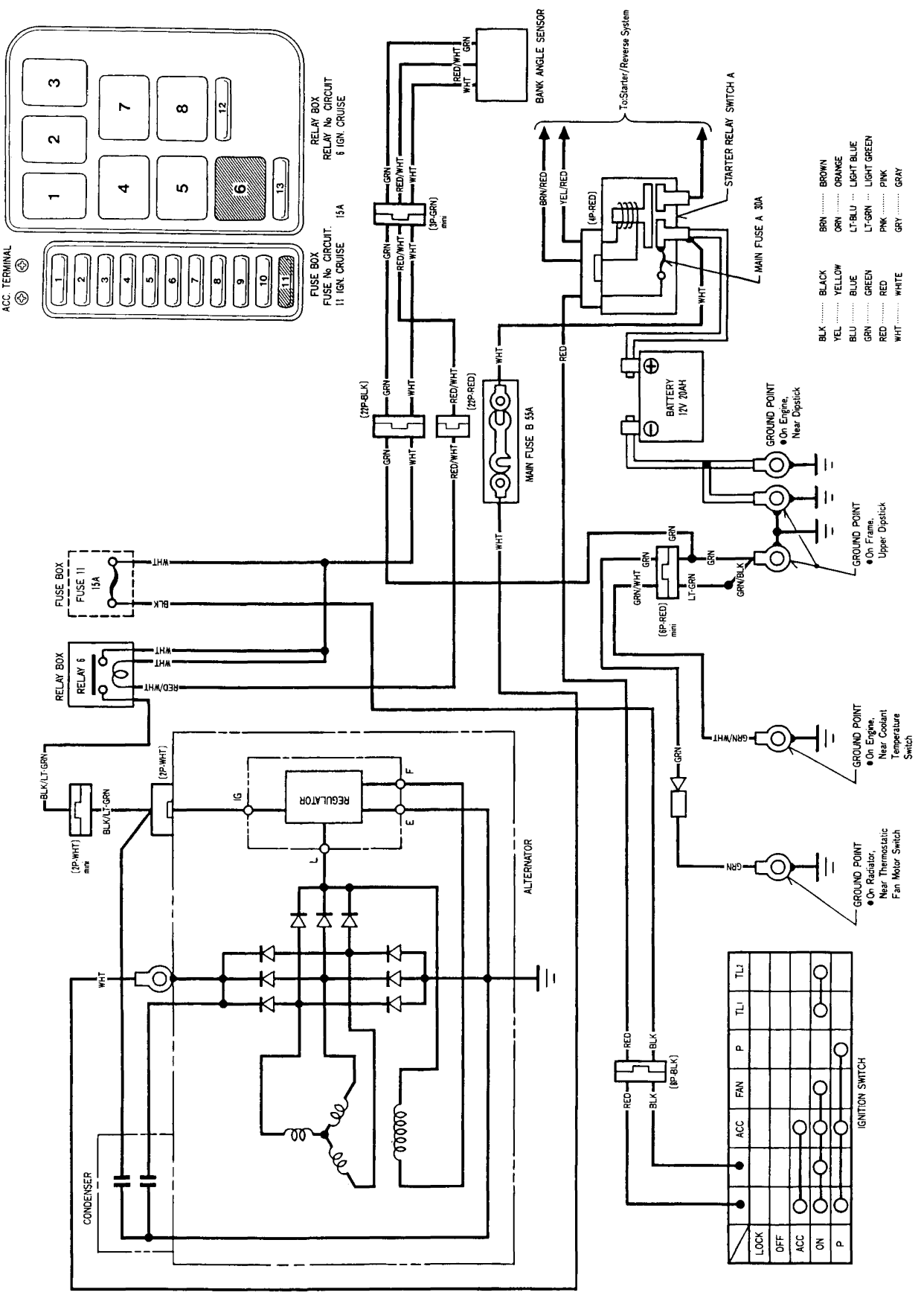


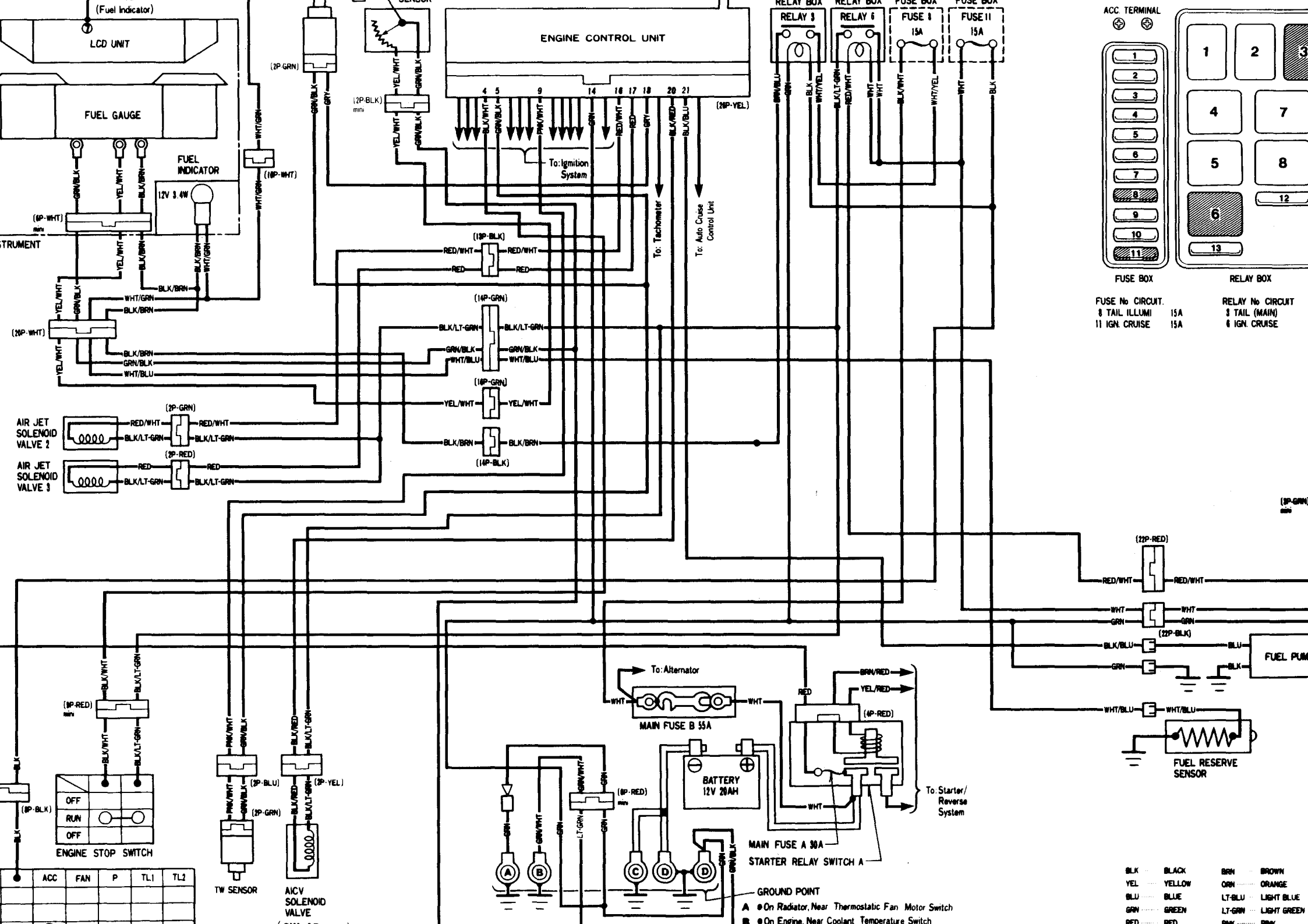
CIRCUIT DIAGRAM

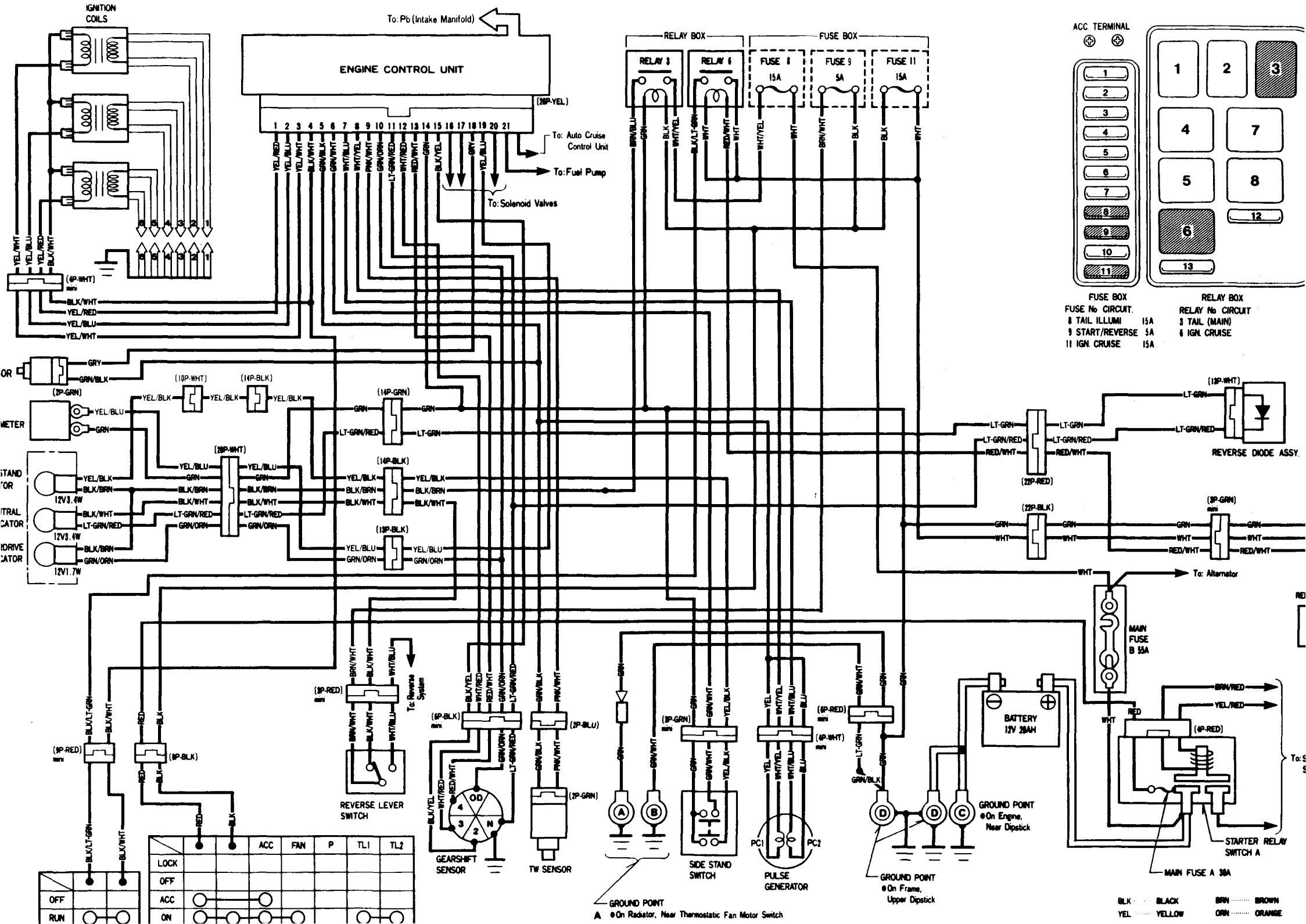
COOLING SYSTEM

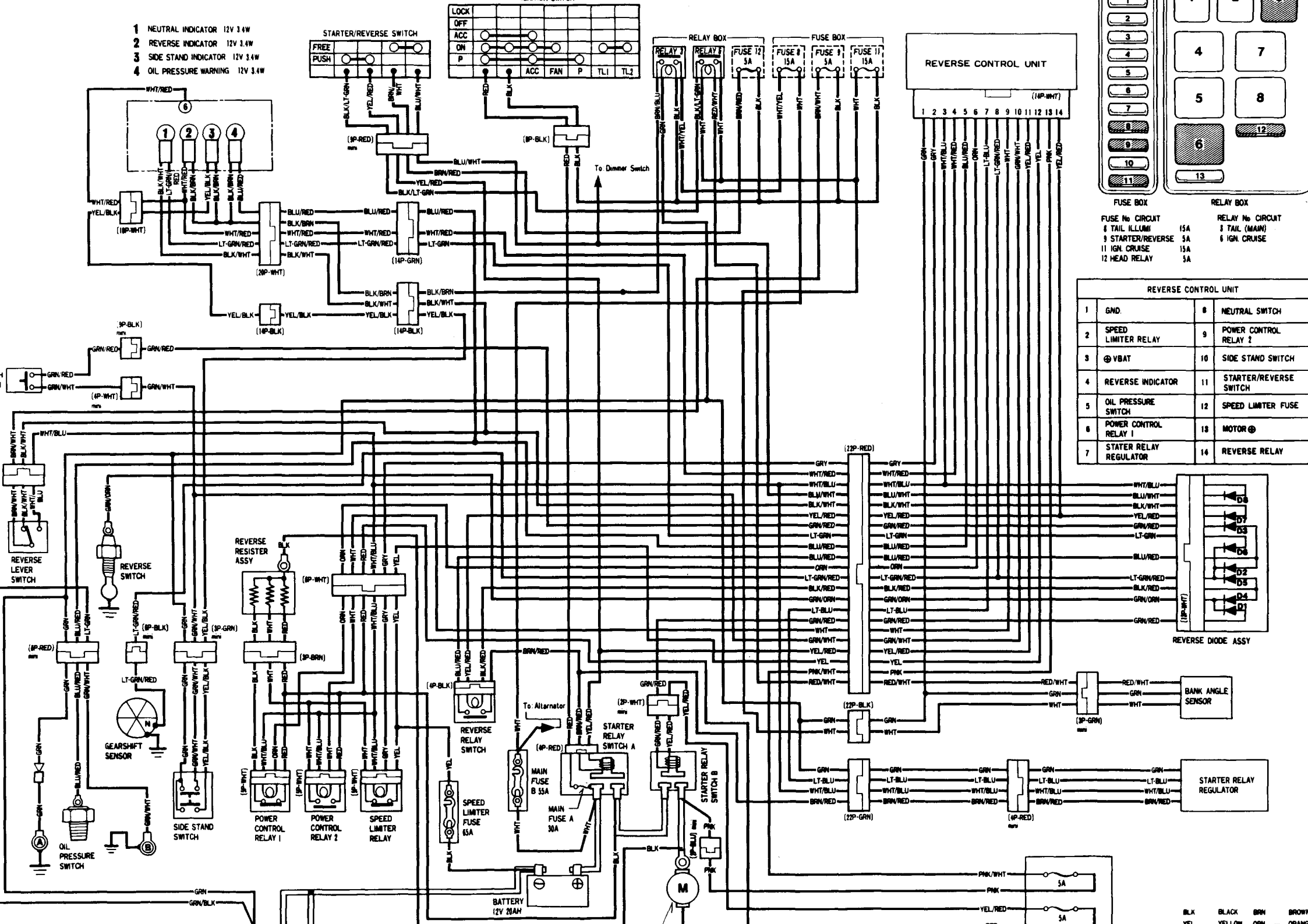


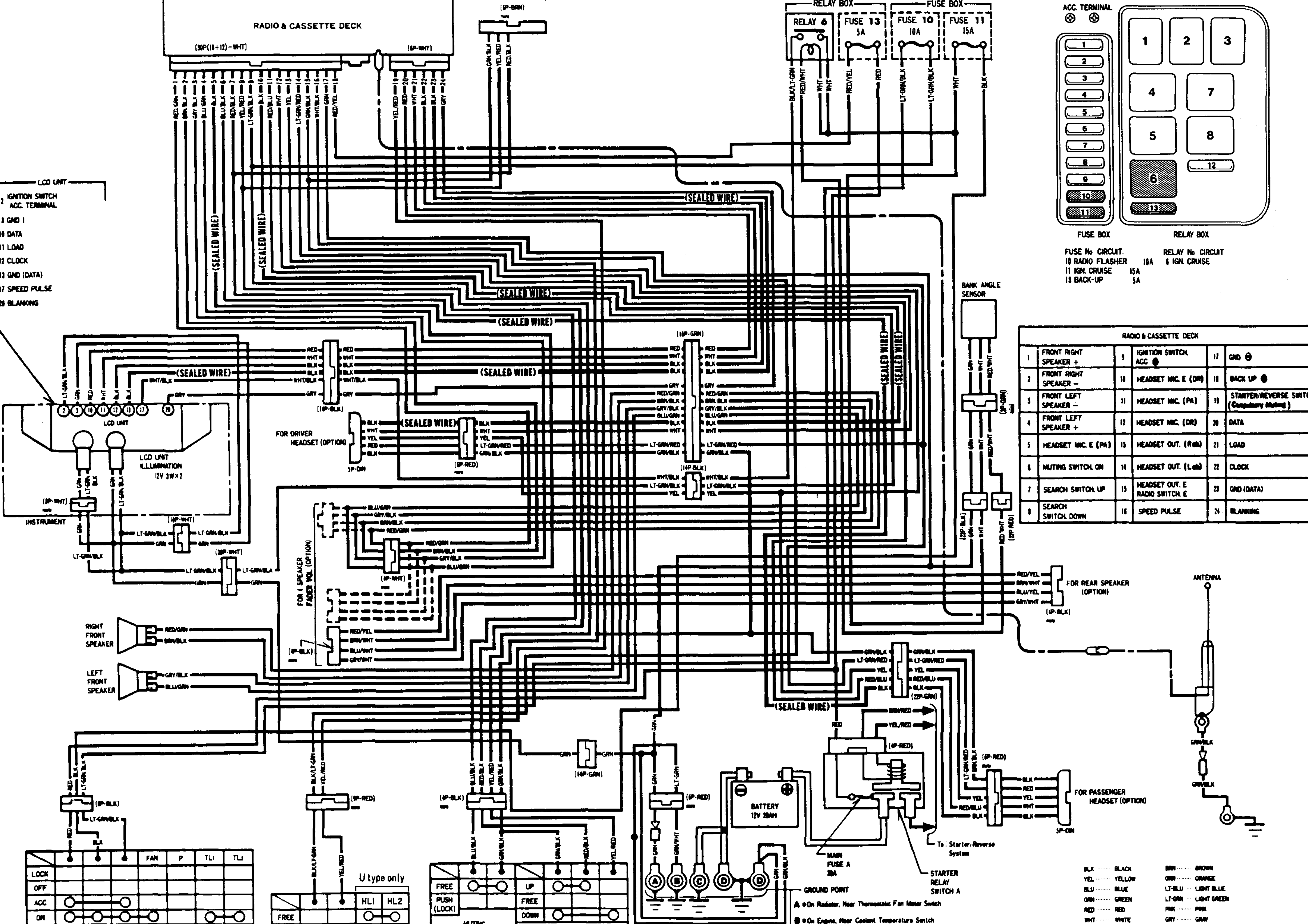
CHARGING SYSTEM/ALTERNATOR (Except G Type)




(Fuel Indicator)
LCD UNIT
FUEL GAUGE
FUEL INDICATOR
12V 3.4W
(6P-WHT)
STRUMENT
(20P-WHT)
(16P-WHT)
(2P-GRN)
SENSOR
(2P-BLK)
mini
ENGINE CONTROL UNIT
(26P-YEL)
To: Ignition System
To: Tachometer
To: Auto Cruse Control Unit
RELAY BOX
RELAY 3
RELAY 6
FUSE BOX
FUSE 8
15A
FUSE 11
15A
ACC. TERMINAL
FUSE BOX
RELAY BOX
FUSE No CIRCUIT.
8 TAIL ILLUMI 15A
11 IGN. CRUISE 15A
RELAY No CIRCUIT
3 TAIL (MAIN)
6 IGN. CRUISE
(13P-BLK)
(14P-GRN)
(16P-GRN)
(14P-BLK)
AIR JET SOLENOID VALVE 2
AIR JET SOLENOID VALVE 3
(2P-RED)
(22P-RED)
(22P-BLK)
FUEL PUM
FUEL RESERVE SENSOR
To: Alternator
MAIN FUSE B 55A
BATTERY 12V 20AH
(4P-RED)
To: Starter/ Reverse System
MAIN FUSE A 30A
STARTER RELAY SWITCH A
(8P-RED)
(8P-BLK)
OFF
RUN
OFF
ENGINE STOP SWITCH
ACC
FAN
P
TL1
TL2
TW SENSOR
AICV SOLENOID VALVE
(2P-BLU)
(2P-YEL)
GROUND POINT
A • On Radiator, Near Thermostatic Fan Motor Switch
B • On Engine, Near Coolant Temperature Switch
BLK BLACK
YEL YELLOW
BLU BLUE
GRN GREEN
RED RED
BRN BROWN
ORN ORANGE
LT-BLU LIGHT BLUE
LT-GRN LIGHT GREEN

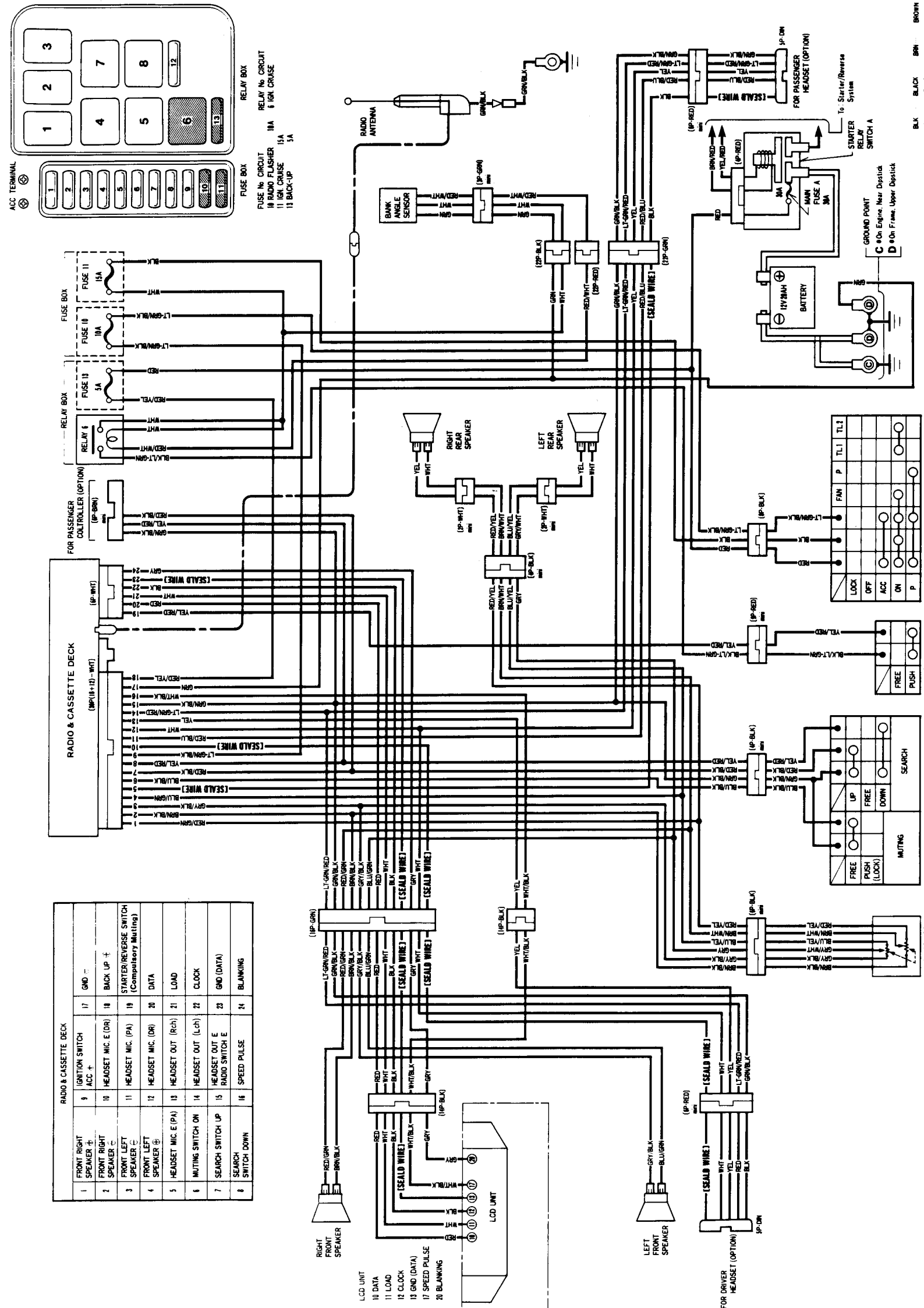

IGNITION COILS
ENGINE CONTROL UNIT
To: Pb (Intake Manifold)
(36P-YEL)
To: Auto Cruise Control Unit
To: Fuel Pump
To: Solenoid Valves
RELAY BOX
RELAY 3
RELAY 6
FUSE BOX
FUSE 8 15A
FUSE 9 5A
FUSE 11 15A
ACC TERMINAL
FUSE BOX
FUSE No CIRCUIT.
8 TAIL ILLUMI 15A
9 START/REVERSE 5A
11 IGN. CRUISE 15A
RELAY BOX
RELAY No CIRCUIT
3 TAIL (MAIN)
6 IGN. CRUISE
(4P-WHT)
(2P-GRN)
(10P-WHT)
(14P-BLK)
(14P-GRN)
(20P-WHT)
(19P-BLK)
12V3.4W
12V3.4W
12V1.7W
(13P-WHT)
REVERSE DIODE ASSY.
(22P-RED)
(22P-BLK)
(3P-GRN)
To: Alternator
MAIN FUSE B 55A
(9P-RED)
(8P-BLK)
(3P-RED)
To: Reverse System
REVERSE LEVER SWITCH
(6P-BLK)
(2P-BLU)
(2P-GRN)
GEARSHIFT SENSOR
TW SENSOR
(3P-GRN)
SIDE STAND SWITCH
(6P-WHT)
PULSE GENERATOR
PC1
PC2
(6P-RED)
BATTERY 12V 28AH
GROUND POINT ●On Engine, Near Dipstick
GROUND POINT ●On Frame, Upper Dipstick
(4P-RED)
STARTER RELAY SWITCH A
MAIN FUSE A 30A
GROUND POINT A ●On Radiator, Near Thermostatic Fan Motor Switch
OFF
RUN
LOCK
OFF
ACC
ON
ACC
FAN
P
TL1
TL2
BLK BLACK
YEL YELLOW
BRN BROWN
ORN ORANGE


1 NEUTRAL INDICATOR 12V 3.4W
2 REVERSE INDICATOR 12V 3.4W
3 SIDE STAND INDICATOR 12V 3.4W
4 OIL PRESSURE WARNING 12V 3.4W
STARTER/REVERSE SWITCH
FREE
PUSH
IGNITION SWITCH
LOCK
OFF
ACC
ON
P
ACC
FAN
P
TL1
TL2
RELAY BOX
FUSE BOX
REVERSE CONTROL UNIT
(14P-WHT)
FUSE No CIRCUIT
8 TAIL ILLUMI 15A
9 STARTER/REVERSE 5A
11 IGN. CRUISE 15A
12 HEAD RELAY 5A
RELAY No CIRCUIT
8 TAIL (MAIN)
6 IGN. CRUISE
REVERSE CONTROL UNIT
1 GND.
2 SPEED LIMITER RELAY
3 ⊕VBAT
4 REVERSE INDICATOR
5 OIL PRESSURE SWITCH
6 POWER CONTROL RELAY 1
7 STATER RELAY REGULATOR
8 NEUTRAL SWITCH
9 POWER CONTROL RELAY 2
10 SIDE STAND SWITCH
11 STARTER/REVERSE SWITCH
12 SPEED LIMITER FUSE
13 MOTOR⊕
14 REVERSE RELAY
To Dimmer Switch
To Alternator
REVERSE LEVER SWITCH
REVERSE SWITCH
REVERSE RESISTER ASSY
REVERSE DIODE ASSY
GEARSHIFT SENSOR
SIDE STAND SWITCH
OIL PRESSURE SWITCH
POWER CONTROL RELAY 1
POWER CONTROL RELAY 2
SPEED LIMITER RELAY
REVERSE RELAY SWITCH
STARTER RELAY SWITCH A
STARTER RELAY SWITCH B
MAIN FUSE B 55A
MAIN FUSE A 30A
SPEED LIMITER FUSE 65A
BANK ANGLE SENSOR
STARTER RELAY REGULATOR
BATTERY 12V 20AH
M

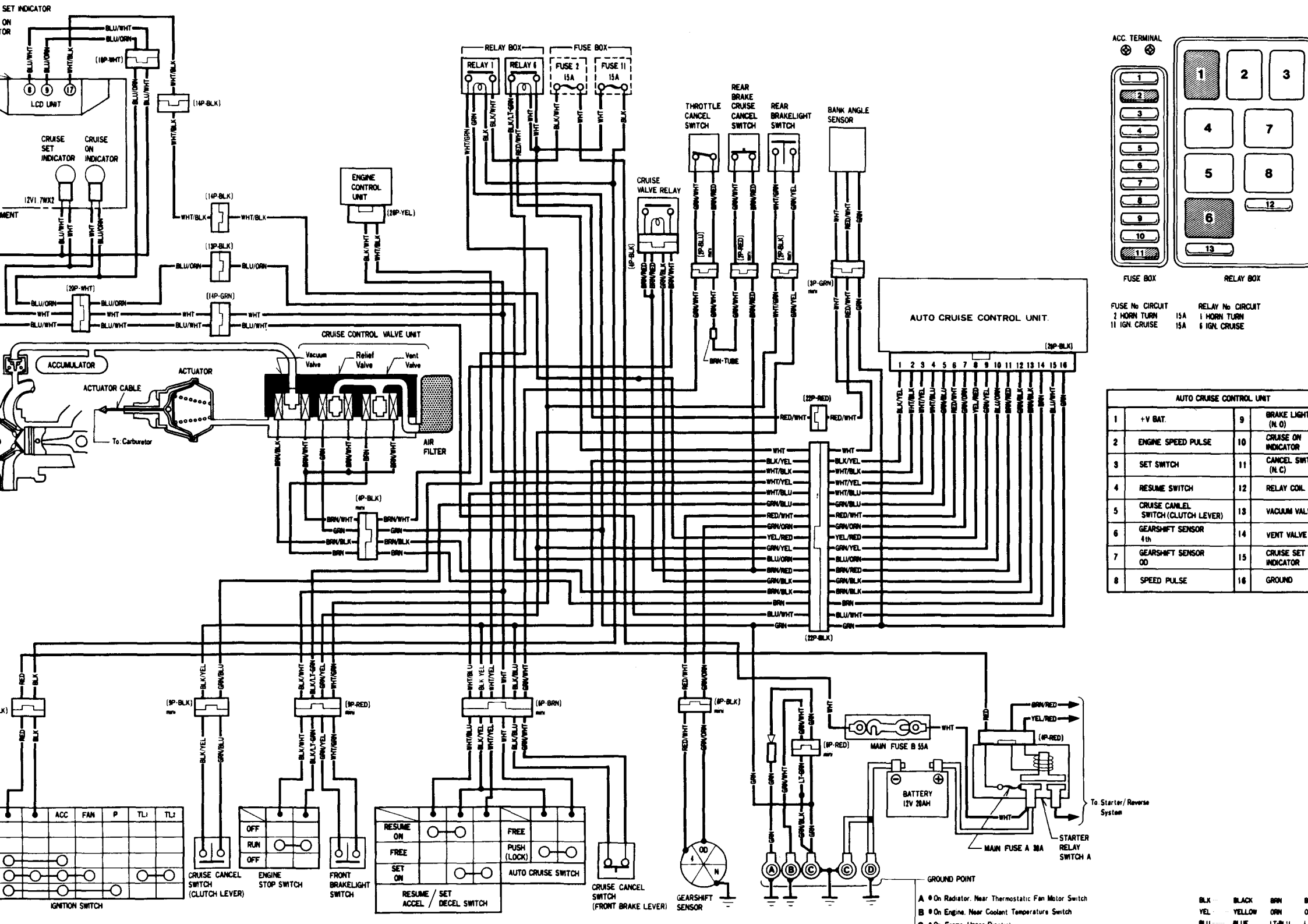


RADIO & CASSETTE DECK

1	FRONT RIGHT SPEAKER +	9	IGNITION SWITCH, ACC ●	17	GND ⊖
2	FRONT RIGHT SPEAKER −	10	HEADSET MIC. E (DR)	18	BACK UP ●
3	FRONT LEFT SPEAKER −	11	HEADSET MIC. (PA)	19	STARTER/REVERSE SWITC (Compulsory Muting)
4	FRONT LEFT SPEAKER +	12	HEADSET MIC. (DR)	20	DATA
5	HEADSET MIC. E (PA)	13	HEADSET OUT. (Rch)	21	LOAD
6	MUTING SWITCH ON	14	HEADSET OUT. (Lch)	22	CLOCK
7	SEARCH SWITCH UP	15	HEADSET OUT. E RADIO SWITCH E	23	GND (DATA)
8	SEARCH SWITCH DOWN	16	SPEED PULSE	24	BLANKING



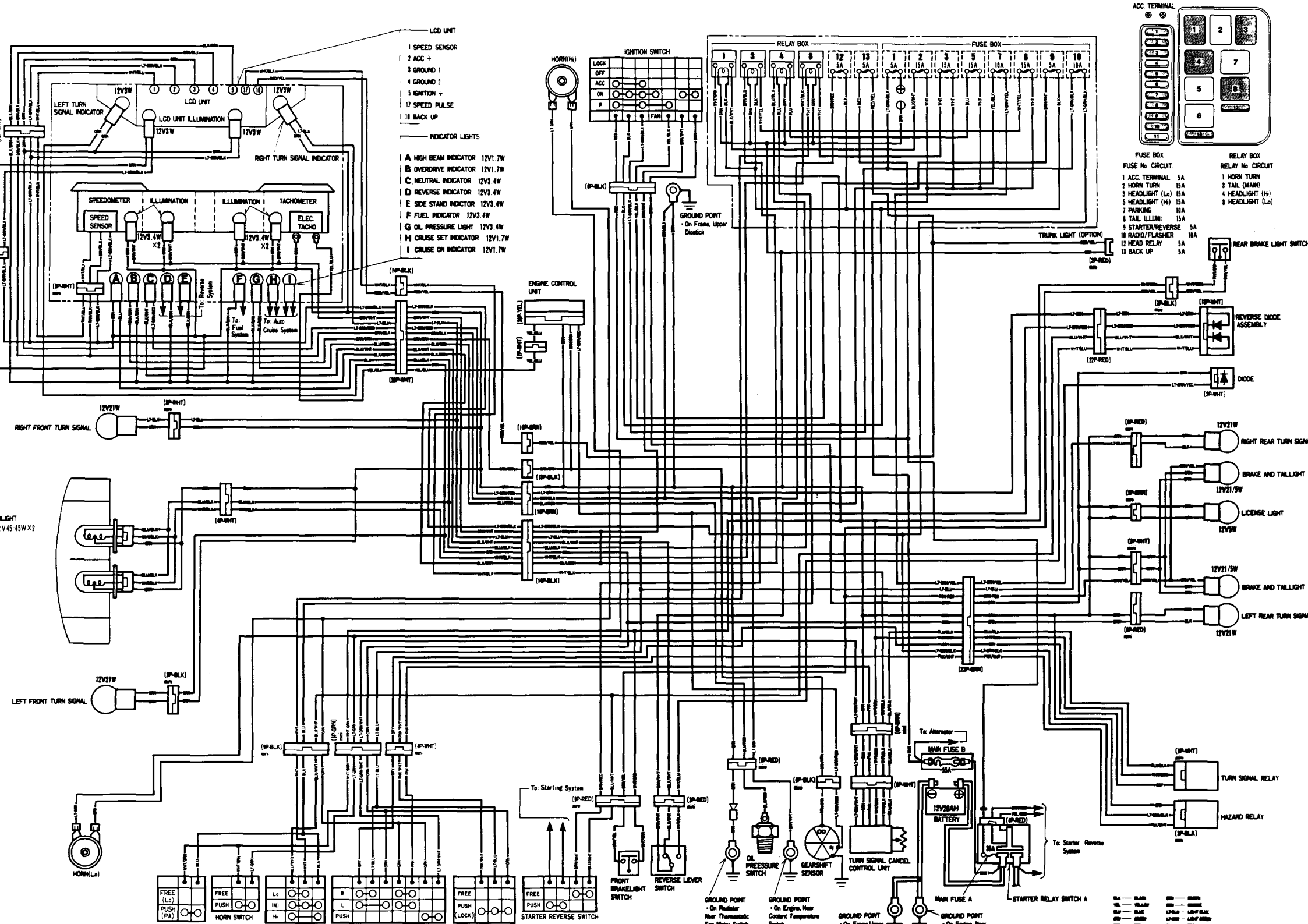
RADIO & CASSETTE DECK							
1	FRONT RIGHT SPEAKER +	9	IGNITION SWITCH ACC +	17	GND −		
2	FRONT RIGHT SPEAKER −	10	HEADSET MIC. E (DR)	18	BACK UP +		
3	FRONT LEFT SPEAKER −	11	HEADSET MIC. (PA)	19	STARTER/REVERSE SWITCH (Compulsory Muting)		
4	FRONT LEFT SPEAKER +	12	HEADSET MIC. (DR)	20	DATA		
5	HEADSET MIC. E (PA)	13	HEADSET OUT (Rch)	21	LOAD		
6	MUTING SWITCH ON	14	HEADSET OUT (Lch)	22	CLOCK		
7	SEARCH SWITCH UP	15	HEADSET OUT E RADIO SWITCH E	23	GND (DATA)		
8	SEARCH SWITCH DOWN	16	SPEED PULSE	24	BLANKING		

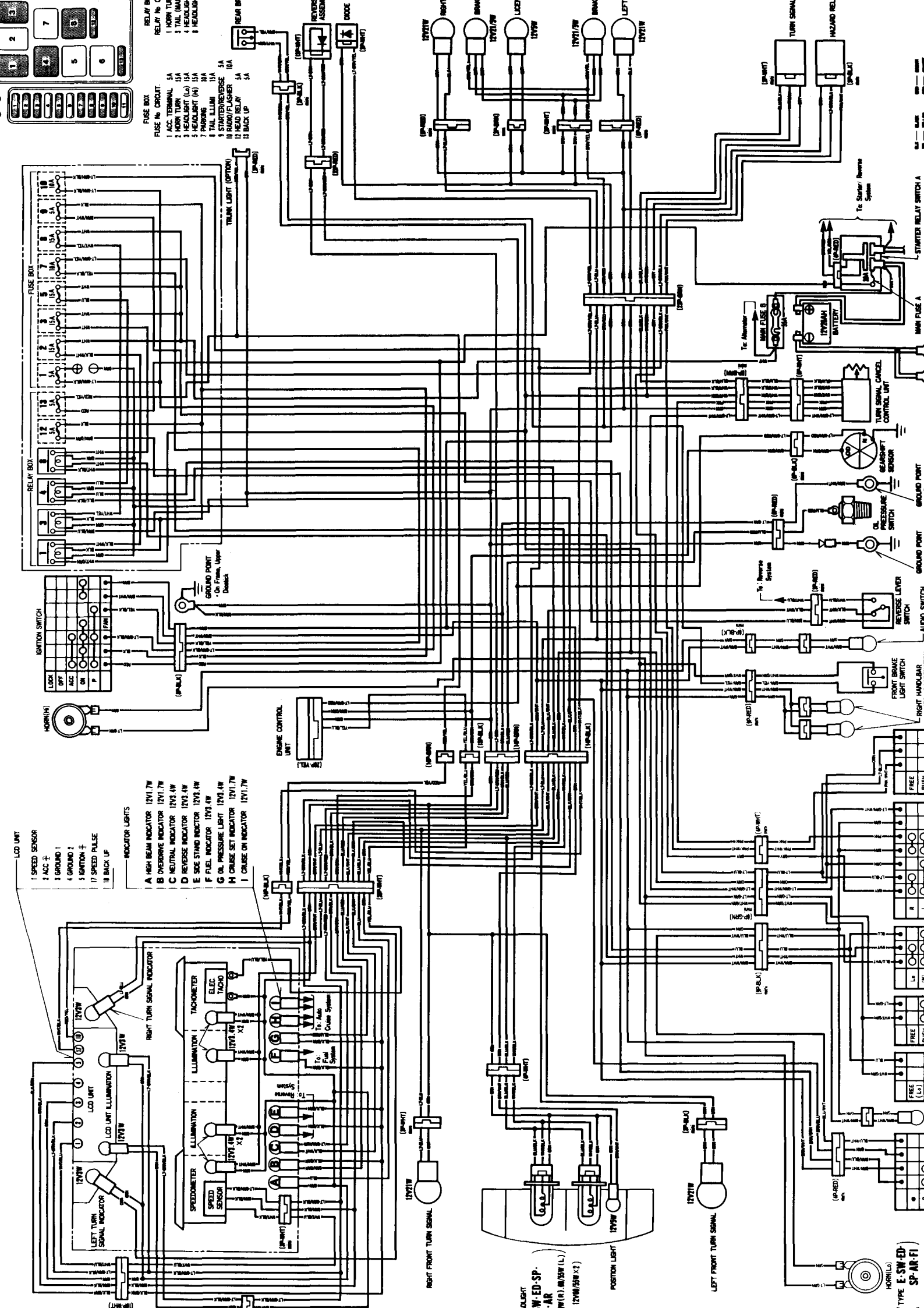


FUSE No	CIRCUIT	RELAY No	CIRCUIT
2	HORN TURN	1	HORN TURN
11	IGN. CRUISE	6	IGN. CRUISE

AUTO CRUISE CONTROL UNIT			
1	+V BAT.	9	BRAKE LIGHT (N.O)
2	ENGINE SPEED PULSE	10	CRUISE ON INDICATOR
3	SET SWITCH	11	CANCEL SWITCH (N.C)
4	RESUME SWITCH	12	RELAY COIL
5	CRUISE CANCEL SWITCH (CLUTCH LEVER)	13	VACUUM VALVE
6	GEARSHIFT SENSOR 4th	14	VENT VALVE
7	GEARSHIFT SENSOR OD	15	CRUISE SET INDICATOR
8	SPEED PULSE	16	GROUND

BLK	BLACK	BRN	B
YEL	YELLOW	ORN	O
BLU	BLUE	LT-BLU	L


LCD UNIT
1 SPEED SENSOR
2 ACC +
3 GROUND 1
4 GROUND 2
5 IGNITION +
17 SPEED PULSE
18 BACK UP
INDICATOR LIGHTS
A HIGH BEAM INDICATOR 12V1.7W
B OVERDRIVE INDICATOR 12V1.7W
C NEUTRAL INDICATOR 12V3.4W
D REVERSE INDICATOR 12V3.4W
E SIDE STAND INDICTOR 12V3.4W
F FUEL INDICATOR 12V3.4W
G OIL PRESSURE LIGHT 12V3.4W
H CRUISE SET INDICATOR 12V1.7W
I CRUISE ON INDICATOR 12V1.7W
LEFT TURN SIGNAL INDICATOR
LCD UNIT ILLUMINATION
RIGHT TURN SIGNAL INDICATOR
SPEEDOMETER
ILLUMINATION
TACHOMETER
SPEED SENSOR
ELEC. TACHO
To: Reverse System
To: Fuel System
To: Auto Cruise System
HORN(Hi)
IGNITION SWITCH
LOCK
OFF
ACC
ON
P
FAN
RELAY BOX
FUSE BOX
ACC TERMINAL
FUSE BOX
FUSE No. CIRCUIT
1 ACC. TERMINAL 5A
2 HORN TURN 15A
3 HEADLIGHT (Lo) 15A
5 HEADLIGHT (Hi) 15A
7 PARKING 10A
8 TAIL ILLUMI 15A
9 STARTER/REVERSE 5A
10 RADIO/FLASHER 10A
12 HEAD RELAY 5A
13 BACK UP 5A
RELAY BOX
RELAY No. CIRCUIT
1 HORN TURN
3 TAIL (MAIN)
4 HEADLIGHT (Hi)
8 HEADLIGHT (Lo)
GROUND POINT
• On Frame, Upper Dashtick
TRUNK LIGHT (OPTION)
REAR BRAKE LIGHT SWITCH
REVERSE DIODE ASSEMBLY
DIODE
ENGINE CONTROL UNIT
RIGHT FRONT TURN SIGNAL
LEFT FRONT TURN SIGNAL
RIGHT REAR TURN SIGNAL
BRAKE AND TAILLIGHT
LICENSE LIGHT
LEFT REAR TURN SIGNAL
HORN(Lo)
HORN SWITCH
STARTER REVERSE SWITCH
To: Starting System
FRONT BRAKELIGHT SWITCH
REVERSE LEVER SWITCH
OIL PRESSURE SWITCH
GEARSHIFT SENSOR
TURN SIGNAL CANCEL CONTROL UNIT
To: Alternator
MAIN FUSE B
MAIN FUSE A
12V28AH BATTERY
STARTER RELAY SWITCH A
To: Starter Reverse System
TURN SIGNAL RELAY
HAZARD RELAY
GROUND POINT
• On Radiator Near Thermostatic
GROUND POINT
• On Engine, Near Coolant Temperature
GROUND POINT
GROUND POINT


FUSE BOX
RELAY BOX
IGNITION SWITCH
LOCK
OFF
ACC
ON
P
PUSH
HORN(Hi)
HORN(Lo)
GROUND POINT
On Frame, Upper Deckick
TRUNK LIGHT (OPTION)
REAR BRAKE LIGHT SWITCH
REVERSE ASSEMBLY
DIODE
ENGINE CONTROL UNIT
To Starter/ Reverse System
STARTER RELAY SWITCH A
MAIN FUSE A
MAIN FUSE B
To Alternator
12V28AH BATTERY
TURN SIGNAL CANCEL CONTROL UNIT
GEARSHIFT SENSOR
OIL PRESSSURE SWITCH
GROUND POINT
To Reverse System
REVERSE LEVER SWITCH
FRONT BRAKE LIGHT SWITCH
RIGHT HANDLEBAR SWITCH
LEFT HANDLEBAR SWITCH
TURN SIGNAL RELAY
HAZARD RELAY
FREE
LCD UNIT
1 SPEED SENSOR
2 ACC +
3 GROUND 1
4 GROUND 2
5 IGNITION +
17 SPEED PULSE
18 BACK UP
INDICATOR LIGHTS
A HIGH BEAM INDICATOR 12V1.7W
B OVERDRIVE INDICATOR 12V1.7W
C NEUTRAL INDICATOR 12V3.4W
D REVERSE INDICATOR 12V3.4W
E SIDE STAND INDICATOR 12V3.4W
F FUEL INDICATOR 12V3.4W
G OIL PRESSURE LIGHT 12V3.4W
H CRUISE SET INDICATOR 12V1.7W
I CRUISE ON INDICATOR 12V1.7W
RIGHT TURN SIGNAL INDICATOR
LCD UNIT ILLUMINATION
LEFT TURN SIGNAL INDICATOR
TACHOMETER
ILLUMINATION
ELEC. TACHO
SPEEDOMETER
SPEED SENSOR
To Auto Cruise System
To Fuel System
RIGHT FRONT TURN SIGNAL
POSITION LIGHT
LEFT FRONT TURN SIGNAL
TYPE E·SW·ED SP·AR·FI

Paper Book Part Number 67MN530T

31. GL1500A/GL1500SE (R) ADDENDUM

HOW TO USE THIS MANUAL

This addendum contains information for GL1500A (R) and GL1500SE (R).
Refer to GL1500 SHOP MANUAL (No. 67MN530, No. 67MN530Z, No. 67MN530Y, No. 67MN530X, No. 67MN530W and No. 67MN530V, No. 67MN530U) for service procedures and data not included in this addendum.

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

GL1500 (R)

CODE	AREA (TYPE)	CODE	AREA (TYPE)
AR	Austria	SD	Sweden
SP	Spain	FI	Finland
F	France	U	Australia
ED	European direct sales		

GL1500SE (R)

CODE	AREA (TYPE)	CODE	AREA (TYPE)
E	U.K.	FI	Finland
G	Germany	AR	Austria
F	France	SW	Switzerland
ED	European direct sales	SP	Spain

Wire Color Abbreviations
The following abbreviations are used to identify wire colors in the circuit schematics:

BLK	black	LT GRN	light green
BLU	blue	ORN	orange
BRN	brown	PNK	pink
GRN	green	RED	red
GRY	gray	WHT	white
LT BLU	light blue	YEL	yellow

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CONTENT

IMPORTANT SAFETY NOTICE

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

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

NOTE: Gives helpful information.

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

SPECIFICATIONS (GL1500A)

Dimensions	Overall length		2,630 mm (103.5 in)
	Overall width		955 mm (37.6 in)
	Overall height		1,525 mm (60.0 in)
	Wheelbase		1,700 mm (66.9 in)
	Seat height		795 mm (31.3 in)
	Ground clearance		135 mm (5.3 in)
	Dry weight		366 kg (807 lbs)
	Curb weight		394 kg (869 lbs)
Frame	Frame type		Double cradle
	Front suspension	Travel	Telescopic, 140 mm (5.5 in)
	Rear suspension	Travel	Swing arm, 105 mm (4.1 in)
		Air pressure	0—400 kPa (0—4.0 kg/cm², 0—57 psi)
	Front tire	Size	130/70—18 63H
		Air pressure	225 kPa (2.25 kg/cm², 33 psi)
	Rear tire	Size	160/80 —16 75H
		Air pressure	250 kPa (2.50 kg/cm², 36 psi): Driver only
			280 kPa (2.80 kg/cm², 41 psi): Driver and Passenger
	Front brake		Double disc brake
	Rear brake		Disc brake
	Fuel capacity		24.0 lit. (6.4 US gal, 5.3 Imp gal)
	Caster angle		30°
	Trail length		115 mm (4.5 in)
	Front fork oil capacity	Left	325 cm³ (10.9 US oz, 11.4 Imp oz)
		Right	320 cm³ (10.8 US oz, 11.2 Imp oz)
Engine	Engine type		Water cooled, 4 stroke O.H.C.
	Cylinder arrangement		Flat six
	Bore and stroke		71 x 64 mm (2.8 x 2.5 in)
	Displacement		1,520 cm³ (92.7 cu-in)
	Compression ratio		9.8:1
	Valve train		Belt driven over head camshaft
	Oil capacity	At disassembly	4.3 lit. (4.5 US qt, 3.8 Imp qt)
		After draining	3.5 lit. (3.7 US qt, 3.1 Imp qt)
	Lubrication system		Forced and wet sump
	Cooling system capacity		4.1 lit. (4.3 US qt, 3.6 Imp qt)
	Cylinder compression		1,500 kPa (15.0 kg/cm², 213 psi)
	Engine weight		126 kg (278 lbs)
	Camshaft: Intake valve	Opens	5° ATDC (At 1 mm lift)
		Closes	30° ABDC (At 1 mm lift)
	Camshaft: Exhaust valve	Opens	40° BBDC (At 1 mm lift)
		Closes	5° BTDC (At 1 mm lift)
	Valve clearance	Intake/Exhaust	Hydraulic valve adjuster system
	Idle speed		800±80 min^{-1} (rpm)

Carburetion	Carburetor type		CV down-draft dual carburetors
	Throttle bore		36 mm (1.4 in)
	Carburetor identification No.		VDG9C AR: VDGWE
	Pilot screw opening		2-1/2 turns out AR: 2-5/8 turns out
	Float level		7.5 mm (0.30 in)
	Main jet		pri: #80 2nd: #148
	Slow jet		#70 AR: #65
	Throttle grip free play		5—8 mm (3/16—5/16 in)
	Fuel pump flow capacity		640 cm³ (22.5 Imp oz)/minute
	Carburetor vacuum difference		Within 40 mm (1.6 in) Hg of each other
Drive Train	Clutch type		Wet, multi-plate
	Transmission		5-speed, constant mesh
	Primary reduction ratio		1.592 (78/49)
	Secondary reduction ratio		0.971 (34/35)
	Gear ratio	1st 2nd 3rd 4th OD	2.666 (40/15) 1.722 (31/18) 1.272 (28/22) 0.964 (27/28) 0.758 (22/29)
	Final reduction ratio		2.833 (34/12)
	Gearshift pattern		Left foot operated return system 1—N—2—3—4—OD
	Final gear oil capacity (After disassembly)		170 cm³ (5.7 US oz, 6.0 Imp oz)
Electrical	Ignition		Battery ignition (Full transistor)
	Ignition timing "F" mark		0°TDC
	Starting system		Starting motor
	Alternator		AC generator, 0.55 kW/5,000 min⁻¹ (rpm)
	Battery capacity		12 V—20 AH
	Spark plug: Standard	NGK	DPR7EA-9
		Nippondenso	X22EPR-U9
	Spark plug: For cold climate (Below 5°C, 41°F)	NGK	DPR6EA-9
		Nippondenso	X20EPR-U9
	Spark plug: For extended high speed riding	NGK	DPR8EA-9
		Nippondenso	X24EPR-U9
	Spark plug gap		0.8—0.9 mm (0.031—0.035 in)
	Firing order		1—4—5—2—3—6—1
	Fuses		5 A x 4, 10 A x 4, 15 A x 5 (fuse box) 30 A, 55 A (main fuses) 5 A x 2, 65 A (reverse fuses)
Lights	Headlight		12 V 60 W (R), 60/55 W (L) U: 12 V 45/45 W x 2
	Position light		12 V 5 W
	Turn signal light		12 V 21 W x 4
	Indicator light		12 V 3.4 W x 5/12 V 1.7 W x 4
	Turn signal indicator		12 V 3 W x 2
	Instrument illumination		12 V 3.4 W x 4
	LCD unit illumination		12 V 3 W x 2
	License light		12 V 5 W
	Brake and taillight		12 V 21/5 W x 2

SPECIFICATIONS (GL1500SE)

Dimensions	Overall length		2,630 mm (103.5 in) G: 2,635 mm (103.7 in)
	Overall width		955 mm (37.6 in)
	Overall height		1,525 mm (60.0 in) G: 1,335 mm (52.6 in)
	Wheelbase		1,700 mm (66.9 in)
	Seat height		795 mm (31.3 in)
	Ground clearance		135 mm (5.3 in)
	Dry weight		368 kg (811 lbs) G: 363 kg (800 lbs)
	Curb weight		396 kg (873 lbs) G: 391 kg (862 lbs)
Frame	Frame type		Double cradle
	Front suspension	Travel	Telescopic, 140 mm (5.5 in)
	Rear suspension	Travel	Swing arm, 105 mm (4.1 in)
		Air pressure	0—400 kPa (0—4.0 kg/cm², 0—57 psi)
	Front tire	Size	130/70—18 63H
		Air pressure	225 kPa (2.25 kg/cm², 33 psi)
	Rear tire	Size	160/80—16 75H
		Air pressure	250 kPa (2.50 kg/cm², 36 psi): Driver only
			280 kPa (2.80 kg/cm², 41 psi): Driver and Passenger
	Front brake		Double disc brake
	Rear brake		Disc brake
	Fuel capacity		24.0 lit. (6.4 US gal, 5.3 Imp gal)
	Caster angle		30°
	Trail length		115 mm (4.5 in)
	Front fork oil capacity	Left	325 cm³ (10.9 US oz, 11.4 Imp oz)
		Right	320 cm³ (10.8 US oz, 11.2 Imp oz)
Engine	Engine type		Water cooled, 4 stroke O.H.C.
	Cylinder arrangement		Flat six
	Bore and stroke		71 x 64 mm (2.8 x 2.5 in)
	Displacement		1,520 cm³ (92.7 cu-in)
	Compression ratio		9.8 : 1
	Valve train		Belt driven over head camshaft
	Oil capacity	At disassembly	4.3 lit. (4.5 US qt, 3.8 Imp qt)
		After draining	3.5 lit. (3.7 US qt, 3.1 Imp qt)
	Lubrication system		Forced and wet sump
	Cooling system capacity		4.1 lit. (4.3 US qt, 3.6 Imp qt)
	Cylinder compression		1,500 kPa (15.0 kg/cm², 213 psi)
	Engine weight		126 kg (278 lbs)
	Camshaft: Intake valve	Opens	5° ATDC (At 1 mm lift)
		Closes	30° ABDC (At 1 mm lift)
	Camshaft: Exhaust valve	Opens	40° BBDC (At 1 mm lift)
		Closes	5° BTDC (At 1 mm lift)
	Valve clearance	Intake/Exhaust	Hydraulic valve adjuster system
	Idle speed		800 ± 80 min⁻¹ (rpm)
		SW	800 ± 50 min⁻¹ (rpm)

Carburetion	Carburetor type			CV down-draft dual carburetors
	Throttle bore			36 mm (1.4 in)
	Carburetor identification No.			VDG9C SW: VDGWG AR: VDGWE
	Pilot screw opening			2-1/2 turns out SW, AR: 2-5/8 turns out
	Float level			7.5 mm (0.30 in)
	Main jet			pri: #80 2nd: #148
	Slow jet			#70 SW, AR: #65
	Throttle grip free play			5–8 mm (3/16–5/16 in)
	Fuel pump flow capacity			640 cm³ (22.5 Imp oz)/minute
	Carburetor vacuum difference			Within 40 mm (1.6 in) Hg of each other
Drive Train	Clutch type			Wet, multi-plate
	Transmission			5-speed, constant mesh
	Primary reduction ratio			1.592 (78/49)
	Secondary reduction ratio			0.971 (34/35)
	Gear ratio	1st 2nd 3rd 4th OD		2.666 (40/15) 1.722 (31/18) 1.272 (28/22) 0.964 (27/28) 0.758 (22/29)
	Final reduction ratio			2.833 (34/12)
	Gearshift pattern			Left foot operated return system 1–N–2–3–4–OD
	Final gear oil capacity (After disassembly)			170 cm³ (5.7 US oz, 6.0 Imp oz)
Electrical	Ignition			Battery ignition (Full transistor)
	Ignition timing "F" mark			0°TDC
	Starting system			Starting motor
	Alternator			AC generator, 0.55 kW/5,000 min⁻¹ (rpm)
	Battery capacity			12 V–20 AH
	Spark plug	Standard	NGK	DPR7EA-9
			Nippondenso	X22EPR-U9
		For cold climate (Below 5°C, 41°F)	NGK	DPR6EA-9
			Nippondenso	X20EPR-U9
		For extended high speed riding	NGK	DPR8EA-9
			Nippondenso	X24EPR-U9
	Spark plug gap			0.8–0.9 mm (0.031–0.035 in)
	Firing order			1–4–5–2–3–6–1
	Fuses			5 A x 4 (G: 5 A x 3), 10 A x 4, 15 A x 5 (fuse box) 30 A, 55 A (main fuses) 5 A x 2, 65 A (reverse fuses)
Lights	Headlight			12 V 60 W (R), 60/55 W (L) E: 60/55 W x 2
	Position light			12 V 5 W
	Turn signal light			12 V 21 W x 4
	Indicator light			12 V 3.4 W x 5/12 V 1.7 W x 4
	Turn signal indicator			12 V 3 W x 2
	Instrument illumination			12 V 3.4 W x 4
	LCD unit illumination			12 V 3 W x 2
	License light			12 V 5 W
	Brake and taillight			12 V 21/5 W x 2

SERVICE DATA

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
Engine weight (including carburetors)				126 kg (278 lbs)	—
Engine oil capacity		at engine assembly		4.3 lit (4.5 US qt, 3.8 Imp qt)	—
		at oil change		3.5 lit (3.7 US qt, 3.1 Imp qt)	—
		at oil filter and oil change		3.7 lit (3.9 US qt, 3.3 Imp qt)	—
Radiator coolant capacity		After disassembly		4.1 lit (4.3 US qt, 3.6 Imp qt)	—
		After draining (including reserve tank)		3.8 lit (4.0 US qt, 3.3 Imp qt)	—
		Reserve tank		0.55 lit (0.6 US qt, 0.5 Imp qt)	—
OIL PUMP	Main oil pump	Tip clearance		0.15 (0.006) max.	0.35 (0.014)
		Pump body clearance		0.15—0.23 (0.006—0.009)	0.43 (0.017)
		Pump side clearance		0.02—0.07 (0.001—0.003)	0.12 (0.005)
	Scavenge pump	Tip clearance		0.15 (0.006) max.	0.35 (0.014)
		Pump body clearance		0.15—0.22 (0.006—0.009)	0.42 (0.017)
		Pump side clearance		0.02—0.07 (0.001—0.003)	0.12 (0.005)
	Pressure relief valve	Relief pressure		470—570 kPa (4.7—5.7 kg/cm^2, 67—81 psi)	—
		Relief valve spring free length		90.8 (3.57)	84.0 (3.31)
	Oil pressure (at oil pressure switch)	Cold (At 35°C/95°F)	Idle speed	130 kPa (1.3 kg/cm^2, 18 psi)	—
			5,000 min^{-1} (rpm)	500 kPa (5.0 kg/cm^2, 71 psi)	—
		Hot (At 80°C/176°F)	Idle speed	80 kPa (0.8 kg/cm^2, 11 psi)	—
			5,000 min^{-1} (rpm)	500 kPa (5.0 kg/cm^2, 71 psi)	—
COOLING	Radiator cap relief pressure			75—105 kPa (0.75—1.05 kg/cm^2, 11—15 psi)	—
	Thermostat	Begins to open temperature		80°—84°C (176°—183°F)	—
		Fully opened temperature		93°—97°C (199°—206°F)	—
		Valve lift (heated to 95°C/5 minutes)		8.0 (0.315) min.	—
	Thermo valve		Starts to close	78°—82°C (172°—180°F)	—
	Thermostatic fan motor switch		Starts to close	98°—102°C (208°—216°F)	—
	Coolant temperature sensor resistance		60°C (140°F)	104 ohms	—
			85°C (185°F)	44 ohms	—
			110°C (230°F)	20 ohms	—
			120°C (248°F)	16 ohms	—
CYLINDER HEAD	Cylinder head warpage			—	0.10 (0.004)
	Valve stem O.D.		IN	5.475—5.490 (0.2156—0.2161)	5.45 (0.215)
			EX	5.455—5.470 (0.2148—0.2154)	5.44 (0.214)
	Valve guide I.D.		IN, EX	5.500—5.512 (0.2165—0.2170)	5.55 (0.219)
	Valve stem to guide clearance		IN	0.010—0.037 (0.0004—0.0015)	0.08 (0.003)
			EX	0.030—0.057 (0.0012—0.0022)	0.10 (0.004)
	Valve seat width			1.2 (0.05)	—
	Valve spring free length			44.6 (1.76)	43.3 (1.70)
	Valve spring preload/length			15.6—18.2/37.5 kg/mm (34.39—40.12/1.48 lbs/in)	—
	Rocker arm I.D.			25.000—25.021 (0.9843—0.9851)	25.05 (0.986)
	Rocker arm shaft O.D.			11.966—11.984 (0.4711—0.4718)	11.95 (0.470)
	Rocker arm lobe		I.D.	11.996—12.031 (0.4723—0.4734)	12.07 (0.475)
			O.D.	20.945—20.980 (0.8246—0.8260)	20.93 (0.824)
	Hydraulic valve adjuster compression stroke with kerosene			0—0.30 (0—0.012)	0.30 (0.012) max.

Unit: mm (in)

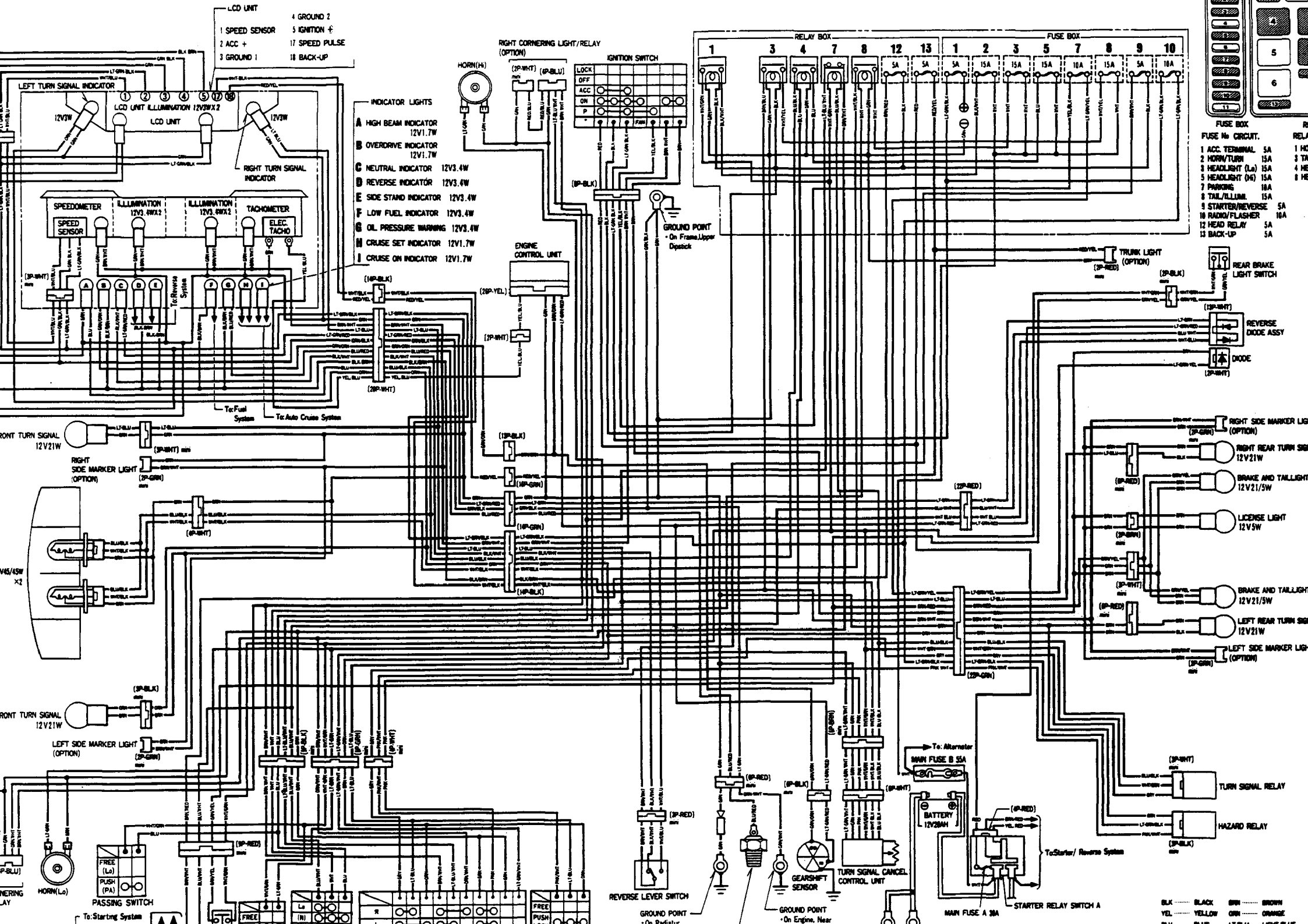
	ITEM			STANDARD	SERVICE LIMIT
CYLINDER HEAD	Camshaft	Cam lobe height		36.110–36.190 (1.4217–1.4248)	35.9 (1.41)
		Runout (at center journal)		—	0.10 (0.004)
		Journal O.D.	Both middles	26.934–26.955 (1.0604–1.0612)	26.91 (1.059)
			Both ends	26.949–26.970 (1.0610–1.0618)	26.91 (1.059)
		Holder journal I.D.		27.000–27.021 (1.0630–1.0638)	27.05 (1.065)
		Journal oil clearance	Both middles	0.045–0.087 (0.0018–0.0034)	0.14 (0.006)
			Both ends	0.030–0.072 (0.0012–0.0028)	0.14 (0.006)
CLUTCH	Clutch master cylinder	Cylinder I.D.		15.870–15.913 (0.6248–0.6265)	15.93 (0.627)
		Piston O.D.		15.827–15.854 (0.6231–0.6242)	15.82 (0.623)
	Clutch	Plate warpage		—	0.30 (0.012)
		Disc thickness		3.72–3.88 (0.146–0.153)	3.5 (0.14)
		Clutch spring free height		5.38 (0.212)	5.1 (0.20)
OUTPUT SHAFT	Damper spring free length			60.82 (2.394)	57.0 (2.24)
	Shaft O.D.			22.008–22.021 (0.8665–0.8670)	21.99 (0.866)
	Collar		I.D.	22.026–22.041 (0.8672–0.8678)	22.05 (0.868)
			O.D.	25.959–25.980 (1.0220–1.0228)	25.95 (1.022)
	Driven gear I.D.			26.000–26.016 (1.0236–1.0242)	26.03 (1.025)
GEAR-SHIFT	Shift fork shaft O.D.			13.966–13.984 (0.5498–0.5506)	13.90 (0.547)
	Shift fork		I.D.	14.000–14.021 (0.5512–0.5520)	14.04 (0.553)
			Claw thickness	5.93–6.00 (0.233–0.236)	5.6 (0.22)
TRANS-MISSION	Gear I.D.		C2, C3, M4, M5	34.000–34.016 (1.3386–1.3392)	34.04 (1.340)
	Gear bushing O.D.		C2, C3, M4/M5	33.940–33.965 (1.3362–1.3372)	33.92 (1.335)
	Gear-to-bushing clearance			0.035–0.076 (0.0014–0.0030)	0.10 (0.004)
CYLINDER, PISTON	Cylinder compression pressure			1300–1700 kPa (13.0–17.0 kg/cm², 185–242 psi)	1000 kPa (10.0 kg/cm², 142 psi)
	Cylinder	I.D.		71.010–71.025 (2.7957–2.7963)	71.1 (2.80)
		Out-of-round		—	0.15 (0.006)
		Taper		—	0.05 (0.002)
		Top warpage		—	0.05 (0.002)
	Piston	O.D. (at skirt)		70.960–70.990 (2.7937–2.7949)	70.85 (2.789)
		Piston pin bore		18.010–18.016 (0.7091–0.7093)	18.03 (0.710)
		Piston-to-cylinder clearance		0.020–0.065 (0.0008–0.0026)	0.10 (0.004)
	Piston ring	End gap	Top and second	0.15–0.30 (0.006–0.012)	0.5 (0.02)
			Oil ring side rail	0.20–0.70 (0.008–0.028)	0.9 (0.04)
		Ring-to-ring land clearance	Top	0.025–0.055 (0.0010–0.0022)	0.10 (0.004)
			Second	0.015–0.045 (0.0006–0.0018)	0.10 (0.004)
	Piston pin	O.D. (at sliding surfaces)		17.994–18.000 (0.7084–0.7087)	18.99 (0.748)
		Pin-to-piston clearance		0.010–0.022 (0.0004–0.0009)	0.05 (0.002)
		Pin-to-rod interference		0.015–0.039 (0.0006–0.0015)	—

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
CRANKSHAFT	Main journal bearing oil clearance			0.020–0.038 (0.0008–0.0015)	0.06 (0.002)
	Crankpin bearing oil clearance			0.027–0.045 (0.0011–0.0018)	0.06 (0.002)
	Crankshaft runout (at center journal)			—	0.03 (0.001)
	Connecting rod side clearance			0.15–0.30 (0.006–0.012)	0.40 (0.016)
	Crankpin and main journal		Taper	—	0.003 (0.0001)
			Out-of-round	—	0.005 (0.0002)
WHEELS	Wheel axle runout			—	0.2 (0.01)
	Wheel rim runout		Axial	—	2.0 (0.08)
			Radial	—	2.0 (0.08)
	Tire tread depth		Front	—	1.5 (0.06)
			Rear	—	2.0 (0.08)
SUSPENSION	Rear suspension air pressure			0–400 kPa (0–4.0 kg/cm^2, 0–57 psi)	—
	Front fork spring free length		Spring A	192.9 (7.59)	189.0 (7.44)
			Spring B	386.3 (15.21)	378.6 (14.91)
	Front fork oil capacity		Left	325 cm^3 (10.9 US oz, 11.4 Imp oz)	—
			Right	320 cm^3 (10.8 US oz, 11.2 Imp oz)	—
	Front fork oil level (from the top of tube)			239 (9.4)	—
	Front fork oil			ATF	—
	Fork tube runout			—	0.2 (0.01)
	Left shock absorber spring free length (Rear)			280.7 (11.05)	274.5 (10.81)
	Right shock absorber oil capacity			140 cm^3 (4.7 US oz, 4.9 Imp oz)	—
	Right shock absorber oil			ATF	—
FINAL DRIVE	Final gear oil	Recommended oil		Hypoid gear oil, SAE #80	—
		Capacity	At assembly	170 cm^3 (5.7 US oz, 6.0 Imp oz)	—
			After draining	140 cm^3 (4.7 US oz, 4.9 Imp oz)	—
	Final gear backlash			0.05–0.15 (0.002–0.006)	0.3 (0.01)
		Difference at 3 points		—	0.10 (0.004)
	Ring gear-to-stop pin clearance			0.30–0.60 (0.012–0.024)	—
BRAKES	Front brake master cylinder	Cylinder I.D.		12.700–12.743 (0.5000–0.5017)	12.755 (0.5022)
		Piston O.D.		12.684–12.657 (0.4980–0.4983)	12.645 (0.4978)
	Front brake caliper	Left	Cylinder I.D.	25.400–25.450 (1.0000–1.0020)	25.460 (1.0024)
			Piston O.D.	25.335–25.368 (0.9974–0.9987)	25.310 (0.9965)
		Right	Cylinder I.D.	30.230–30.280 (1.1902–1.1921)	30.290 (1.1925)
			Piston O.D.	30.165–30.198 (1.1876–1.1889)	30.140 (1.1866)
	Front brake disc	Thickness		5.8–6.2 (0.23–0.24)	5.0 (0.20)
		Runout		—	0.3 (0.01)
	Front brake pad thickness			5.5 (0.22)	1.0 (0.04)
	Rear brake master cylinder	Cylinder I.D.		15.870–15.913 (0.6248–0.6265)	15.925 (0.6270)
		Piston O.D.		15.827–15.854 (0.6231–0.6242)	15.815 (0.6226)
		Brake rod clevis installed length		100 (3.9)	—
	Rear brake caliper	Cylinder I.D.		32.030–32.080 (1.2610–1.2630)	32.090 (1.2634)
		Piston O.D.		31.948–31.998 (1.2578–1.2598)	31.940 (1.2575)
	Rear brake disc	Thickness		7.3–7.7 (0.29–0.30)	6.0 (0.24)
		Runout		—	0.3 (0.01)
	Rear brake pad thickness			6.5 (0.26)	1.0 (0.04)
	Brake fluid (front/rear)			DOT 4	—

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
CHARGING	Battery capacity			12 V–20 AH	—
	Battery specific gravity (At 20°C, 68°F)	Full charged		1.270–1.290	—
		Need charging		Below 1.260	—
	Battery charging current			2.0 Amperes max.	—
	Alternator	Capacity		0.55 kW/5,000 min^{-1} (rpm)	—
		Stator coil resistance		0.1–0.3 ohms (20°C, 68°F)	—
		Rotor coil resistance		2.9–4.0 ohms (20°C, 68°F)	—
		Rotor coil slip ring O.D.		27.0 (1.06)	26.0 (1.02)
		Charging start		800–1,000 min^{-1} (rpm)	—
	Regulator/ Rectifier (into alternator)	Type		Transistorized non-adjustable reg./recti.	—
		Regulated voltage (at 20°C/68°F)	900 min^{-1} (rpm)	0–2 A, 13.5–15.5 V	—
			1,850 min^{-1} (rpm)	1.5 A min., 13.5–15.5 V	—
IGNITION	Firing order			1–4–5–2–3–6–1	—
	Ignition timing		F mark	0°TDC at 800 ± 80 min^{-1} (rpm) *(SW model 800 ± 50 min^{-1} (rpm))*	—
		Vacuum advance	Advance start	60–160 mmHg (2.4–6.3 inHg)	—
			Advance cease	310–360 mmHg (12.2–14.2 inHg)	—
	Ignition coil resistance (at 20°C/68°F)	Primary coil		2.6–3.2 ohms	—
		Secondary coil	With spark plug wire	20.2–26.8 Kohms	—
			Without spark plug wire	11.7–14.3 Kohms	—
	Pulse generator coil resistance (At 20°C, 68°F)			400–500 ohms	—
	Tw sensor/Ta sensor resistance		20°C (68°F)	2.0–3.0 Kohms	—
			80°C (176°F)	200–400 ohms	—
STARTER/ REVERSE	Starter motor brush length			12.5 (0.49)	6.0 (0.24)
	Reverse System	Starter relay regulator/regulated current		0.7–1.0 A	—
		Resister	Between connector and resistor terminals	0.12–0.17 ohms	—
ELECTRICAL	Oil pressure switch continuity pressure			10–20 kPa (0.1–0.2 kg/cm^2, 1–3 psi)	—
	Fuel level sensor resistance (at 20°C, 68°F)		Empty	90–100 ohms	—
			Reserve	66–81 ohms	—
			Full	4–10 ohms	—


LCD UNIT
1 SPEED SENSOR
2 ACC +
3 GROUND 1
4 GROUND 2
5 IGNITION
17 SPEED PULSE
18 BACK-UP
LEFT TURN SIGNAL INDICATOR
LCD UNIT ILLUMINATION 12V3WX2
LCD UNIT
12V3W
RIGHT TURN SIGNAL INDICATOR
SPEEDOMETER
ILLUMINATION 12V3.4WX2
ILLUMINATION 12V3.4WX2
TACHOMETER
SPEED SENSOR
ELEC. TACHO
INDICATOR LIGHTS
A HIGH BEAM INDICATOR 12V1.7W
B OVERDRIVE INDICATOR 12V1.7W
C NEUTRAL INDICATOR 12V3.4W
D REVERSE INDICATOR 12V3.4W
E SIDE STAND INDICATOR 12V3.4W
F LOW FUEL INDICATOR 12V3.4W
G OIL PRESSURE WARNING 12V3.4W
H CRUISE SET INDICATOR 12V1.7W
I CRUISE ON INDICATOR 12V1.7W
To:Reverse System
To:Fuel System
To:Auto Cruise System
HORN(Hi)
RIGHT CORNERING LIGHT/RELAY (OPTION)
IGNITION SWITCH
LOCK
OFF
ACC
ON
P
Fan
GROUND POINT
• On Frame,Upper Dipstick
ENGINE CONTROL UNIT
RELAY BOX
FUSE BOX
FUSE No CIRCUIT.
1 ACC. TERMINAL 5A
2 HORN/TURN 15A
3 HEADLIGHT (Lo) 15A
5 HEADLIGHT (Hi) 15A
7 PARKING 10A
8 TAIL/ILLUMI. 15A
9 STARTER/REVERSE 5A
10 RADIO/FLASHER 10A
12 HEAD RELAY 5A
13 BACK-UP 5A
TRUNK LIGHT (OPTION)
REAR BRAKE LIGHT SWITCH
REVERSE DIODE ASSY
DIODE
RIGHT SIDE MARKER LIGHT (OPTION)
RIGHT REAR TURN SIGNAL 12V21W
BRAKE AND TAILLIGHT 12V21/5W
LICENSE LIGHT 12V5W
BRAKE AND TAILLIGHT 12V21/5W
LEFT REAR TURN SIGNAL 12V21W
LEFT SIDE MARKER LIGHT (OPTION)
FRONT TURN SIGNAL 12V21W
RIGHT SIDE MARKER LIGHT (OPTION)
FRONT TURN SIGNAL 12V21W
LEFT SIDE MARKER LIGHT (OPTION)
V45/45W X2
HORN(Lo)
PASSING SWITCH
FREE (Lo)
PUSH (PA)
To:Starting System
REVERSE LEVER SWITCH
GROUND POINT
• On Radiator
GROUND POINT
• On Engine, Near
GEARSHIFT SENSOR
TURN SIGNAL CANCEL CONTROL UNIT
To: Alternator
MAIN FUSE B 55A
BATTERY 12V28AH
MAIN FUSE A 30A
STARTER RELAY SWITCH A
To:Starter/ Reverse System
TURN SIGNAL RELAY
HAZARD RELAY
BLK ..... BLACK
BRN ..... BROWN
YEL ..... YELLOW
ORN ..... ORANGE

Paper Book Part No. 67MN530S

32. GL1500A/GL1500SE (S) ADDENDUM

HOW TO USE THIS MANUAL

This addendum contains information for GL1500A (S) and GL1500SE (S).
Refer to GL1500 SHOP MANUAL (No. 67MN530, No. 67MN530Z, No. 67MN530Y, No. 67MN530X, No. 67MN530W, No. 67MN530V, No. 67MN530U and No. 67MN530T) for service procedures and data not included in this addendum.

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

GL1500A (S)

CODE	AREA (TYPE)	CODE	AREA (TYPE)
AR	Austria	SD	Sweden
SP	Spain	FI	Finland
F	France	U	Australia
ED	European direct sales		

GL1500SE (S)

CODE	AREA (TYPE)	CODE	AREA (TYPE)
E	U.K.	FI	Finland
G	Germany	AR	Austria
F	France	SW	Switzerland
ED	European direct sales	SP	Spain

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CONTENT

IMPORTANT SAFETY NOTICE

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

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

NOTE: Gives helpful information.

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

SPECIFICATIONS (GL1500A)

Dimensions	Overall length		2,615 mm (103.0 in)
	Overall width		955 mm (37.6 in)
	Overall height		1,495 mm (58.9 in)
	Wheelbase		1,690 mm (66.5 in)
	Seat height		765 mm (30.1 in)
	Ground clearance		115 mm (4.5 in)
	Dry weight		370 kg (816 lbs)
	Curb weight		398 kg (877 lbs)
Frame	Frame type		Double cradle
	Front suspension	Travel	Telescopic, 140 mm (5.5 in)
	Rear suspension	Travel	Swing arm, 105 mm (4.1 in)
		Air pressure	0—400 kPa (0—4.0 kg/cm², 0—57 psi)
	Front tire	Size	130/70—18 63H
		Air pressure	225 kPa (2.25 kg/cm², 33 psi)
	Rear tire	Size	160/80 —16 75H
		Air pressure	250 kPa (2.50 kg/cm², 36 psi): Driver only
			280 kPa (2.80 kg/cm², 41 psi): Driver and Passenger
	Front brake		Double disc brake
	Rear brake		Disc brake
	Fuel capacity		24.0 lit. (6.4 US gal, 5.3 Imp gal)
	Caster angle		30°
	Trail length		111 mm (4.4 in)
	Front fork oil capacity	Left	327 cm³ (12.6 US oz, 13.1 Imp oz)
		Right	377 cm³ (12.7 US oz, 13.2 Imp oz)
Engine	Engine type		Water cooled, 4 stroke O.H.C.
	Cylinder arrangement		Flat six
	Bore and stroke		71 x 64 mm (2.8 x 2.5 in)
	Displacement		1,520 cm³ (92.7 cu-in)
	Compression ratio		9.8:1
	Valve train		Belt driven over head camshaft
	Oil capacity	At disassembly	4.3 lit. (4.5 US qt, 3.8 Imp qt)
		After draining	3.5 lit. (3.7 US qt, 3.1 Imp qt)
	Lubrication system		Forced and wet sump
	Cooling system capacity		4.1 lit. (4.3 US qt, 3.6 Imp qt)
	Cylinder compression		1,500 kPa (15.0 kg/cm², 213 psi)
	Engine weight		126 kg (278 lbs)
	Camshaft: Intake valve	Opens	5° ATDC (At 1 mm lift)
		Closes	30° ABDC (At 1 mm lift)
	Camshaft: Exhaust valve	Opens	40° BBDC (At 1 mm lift)
		Closes	5° BTDC (At 1 mm lift)
	Valve clearance	Intake/Exhaust	Hydraulic valve adjuster system
	Idle speed		800±80 min⁻¹ (rpm)

Carburetion	Carburetor type		CV down-draft dual carburetors
	Throttle bore		36 mm (1.4 in)
	Carburetor identification No.		VDG9C AR: VDGWE
	Pilot screw opening		2-1/2 turns out AR: 2-5/8 turns out
	Float level		7.5 mm (0.30 in)
	Main jet		pri: #80 2nd: #148
	Slow jet		#70 AR: #65
	Throttle grip free play		5–8 mm (3/16–5/16 in)
	Fuel pump flow capacity		640 cm³ (22.5 Imp oz)/minute
	Carburetor vacuum difference		Within 40 mm (1.6 in) Hg of each other
Drive Train	Clutch type		Wet, multi-plate
	Transmission		5-speed, constant mesh
	Primary reduction ratio		1.592 (78/49)
	Secondary reduction ratio		0.971 (34/35)
	Gear ratio	1st 2nd 3rd 4th OD	2.666 (40/15) 1.722 (31/18) 1.272 (28/22) 0.964 (27/28) 0.758 (22/29)
	Final reduction ratio		2.833 (34/12)
	Gearshift pattern		Left foot operated return system 1–N–2–3–4–OD
	Final gear oil capacity (After disassembly)		170 cm³ (5.7 US oz, 6.0 Imp oz)
Electrical	Ignition		Battery ignition (Full transistor)
	Ignition timing "F" mark		0°TDC
	Starting system		Starting motor
	Alternator		AC generator, 0.55 kW/5,000 min⁻¹ (rpm)
	Battery capacity		12 V–20 AH
	Spark plug: Standard	NGK	DPR7EA-9
		Nippondenso	X22EPR-U9
	Spark plug: For cold climate (Below 5°C, 41°F)	NGK	DPR6EA-9
		Nippondenso	X20EPR-U9
	Spark plug: For extended high speed riding	NGK	DPR8EA-9
		Nippondenso	X24EPR-U9
	Spark plug gap		0.8–0.9 mm (0.031–0.035 in)
	Firing order		1–4–5–2–3–6–1
	Fuses		5 A x 4, 10 A x 4, 15 A x 5 (fuse box) 30 A, 55 A (main fuses) 5 A x 2, 65 A (reverse fuses)
Lights	Headlight		12 V 60 W (R), 60/55 W (L) U: 12 V 45/45 W x 2
	Position light		12 V 5 W
	Turn signal light		12 V 21 W x 4
	Indicator light		12 V 3.4 W x 5/12 V 1.7 W x 4
	Turn signal indicator		12 V 3 W x 2
	Instrument illumination		12 V 3.4 W x 4
	LCD unit illumination		12 V 3 W x 2
	License light		12 V 5 W
	Brake and taillight		12 V 21/5 W x 2

SPECIFICATIONS (GL1500SE)

Dimensions	Overall length		2,615 mm (103.0 in) G: 2,620 mm (103.1 in)
	Overall width		955 mm (37.6 in)
	Overall height		1,495 mm (58.9 in) G: 1,315 mm (51.8 in)
	Wheelbase		1,690 mm (66.5 in)
	Seat height		765 mm (30.1 in)
	Ground clearance		115 mm (4.5 in)
	Dry weight		372 kg (820 lbs) G: 367 kg (809 lbs)
	Curb weight		400 kg (882 lbs) G: 395 kg (871 lbs)
Frame	Frame type		Double cradle
	Front suspension	Travel	Telescopic, 140 mm (5.5 in)
	Rear suspension	Travel	Swing arm, 105 mm (4.1 in)
		Air pressure	0—400 kPa (0—4.0 kg/cm², 0—57 psi)
	Front tire	Size	130/70—18 63H
		Air pressure	225 kPa (2.25 kg/cm², 33 psi)
	Rear tire	Size	160/80—16 75H
		Air pressure	250 kPa (2.50 kg/cm², 36 psi): Driver only
			280 kPa (2.80 kg/cm², 41 psi): Driver and Passenger
	Front brake		Double disc brake
	Rear brake		Disc brake
	Fuel capacity		24.0 lit. (6.4 US gal, 5.3 Imp gal)
	Caster angle		30°
	Trail length		111 mm (4.4 in)
	Front fork oil capacity	Left	327 cm³ (12.6 US oz, 13.1 Imp oz)
		Right	377 cm³ (12.7 US oz, 13.2 Imp oz)
Engine	Engine type		Water cooled, 4 stroke O.H.C.
	Cylinder arrangement		Flat six
	Bore and stroke		71 x 64 mm (2.8 x 2.5 in)
	Displacement		1,520 cm³ (92.7 cu-in)
	Compression ratio		9.8 : 1
	Valve train		Belt driven over head camshaft
	Oil capacity	At disassembly	4.3 lit. (4.5 US qt, 3.8 Imp qt)
		After draining	3.5 lit. (3.7 US qt, 3.1 Imp qt)
	Lubrication system		Forced and wet sump
	Cooling system capacity		4.1 lit. (4.3 US qt, 3.6 Imp qt)
	Cylinder compression		1,500 kPa (15.0 kg/cm², 213 psi)
	Engine weight		126 kg (278 lbs)
	Camshaft: Intake valve	Opens	5° ATDC (At 1 mm lift)
		Closes	30° ABDC (At 1 mm lift)
	Camshaft: Exhaust valve	Opens	40° BBDC (At 1 mm lift)
		Closes	5° BTDC (At 1 mm lift)
	Valve clearance	Intake/Exhaust	Hydraulic valve adjuster system
	Idle speed		800 ± 80 min⁻¹ (rpm)
		SW	800 ± 50 min⁻¹ (rpm)

Carburetion	Carburetor type		CV down-draft dual carburetors
	Throttle bore		36 mm (1.4 in)
	Carburetor identification No.		VDG9C SW: VDGWG AR: VDGWE
	Pilot screw opening		2-1/2 turns out SW, AR: 2-5/8 turns out
	Float level		7.5 mm (0.30 in)
	Main jet		pri: #80 2nd: #148
	Slow jet		#70 SW, AR: #65
	Throttle grip free play		5–8 mm (3/16–5/16 in)
	Fuel pump flow capacity		640 cm³ (22.5 Imp oz)/minute
	Carburetor vacuum difference		Within 40 mm (1.6 in) Hg of each other
Drive Train	Clutch type		Wet, multi-plate
	Transmission		5-speed, constant mesh
	Primary reduction ratio		1.592 (78/49)
	Secondary reduction ratio		0.971 (34/35)
	Gear ratio	1st 2nd 3rd 4th OD	2.666 (40/15) 1.722 (31/18) 1.272 (28/22) 0.964 (27/28) 0.758 (22/29)
	Final reduction ratio		2.833 (34/12)
	Gearshift pattern		Left foot operated return system 1–N–2–3–4–OD
	Final gear oil capacity (After disassembly)		170 cm³ (5.7 US oz, 6.0 Imp oz)
Electrical	Ignition		Battery ignition (Full transistor)
	Ignition timing "F" mark		0°TDC
	Starting system		Starting motor
	Alternator		AC generator, 0.55 kW/5,000 min⁻¹ (rpm)
	Battery capacity		12 V–20 AH
	Spark plug: Standard	NGK	DPR7EA-9
		Nippondenso	X22EPR-U9
	Spark plug: For cold climate (Below 5°C, 41°F)	NGK	DPR6EA-9
		Nippondenso	X20EPR-U9
	Spark plug: For extended high speed riding	NGK	DPR8EA-9
		Nippondenso	X24EPR-U9
	Spark plug gap		0.8–0.9 mm (0.031–0.035 in)
	Firing order		1–4–5–2–3–6–1
	Fuses		5 A x 4 (G: 5 A x 3), 10 A x 4, 15 A x 5 (fuse box) 30 A, 55 A (main fuses) 5 A x 2, 65 A (reverse fuses)
Lights	Headlight		12 V 60 W (R), 60/55 W (L) E: 60/55 W x 2
	Position light		12 V 5 W
	Turn signal light		12 V 21 W x 4
	Indicator light		12 V 3.4 W x 5/12 V 1.7 W x 4
	Turn signal indicator		12 V 3 W x 2
	Instrument illumination		12 V 3.4 W x 4
	LCD unit illumination		12 V 3 W x 2
	License light		12 V 5 W
	Brake and taillight		12 V 21/5 W x 2

SERVICE DATA

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
Engine weight (including carburetors)				126 kg (278 lbs)	—
Engine oil capacity	at engine assembly			4.3 lit (4.5 US qt, 3.8 Imp qt)	—
	at oil change			3.5 lit (3.7 US qt, 3.1 Imp qt)	—
	at oil filter and oil change			3.7 lit (3.9 US qt, 3.3 Imp qt)	—
Radiator coolant capacity	After disassembly			4.1 lit (4.3 US qt, 3.6 Imp qt)	—
	After draining (including reserve tank)			3.8 lit (4.0 US qt, 3.3 Imp qt)	—
	Reserve tank			0.55 lit (0.6 US qt, 0.5 Imp qt)	—
OIL PUMP	Main oil pump	Tip clearance		0.15 (0.006) max.	0.35 (0.014)
		Pump body clearance		0.15—0.23 (0.006—0.009)	0.43 (0.017)
		Pump side clearance		0.02—0.07 (0.001—0.003)	0.12 (0.005)
	Scavenge pump	Tip clearance		0.15 (0.006) max.	0.35 (0.014)
		Pump body clearance		0.15—0.22 (0.006—0.009)	0.42 (0.017)
		Pump side clearance		0.02—0.07 (0.001—0.003)	0.12 (0.005)
	Pressure relief valve	Relief pressure		470—570 kPa (4.7—5.7 kg/cm^2, 67—81 psi)	—
		Relief valve spring free length		90.8 (3.57)	84.0 (3.31)
	Oil pressure (at oil pressure switch)	Cold (At 35°C/95°F)	Idle speed	130 kPa (1.3 kg/cm^2, 18 psi)	—
			5,000 min^{-1} (rpm)	500 kPa (5.0 kg/cm^2, 71 psi)	—
		Hot (At 80°C/176°F)	Idle speed	80 kPa (0.8 kg/cm^2, 11 psi)	—
			5,000 min^{-1} (rpm)	500 kPa (5.0 kg/cm^2, 71 psi)	—
COOLING	Radiator cap relief pressure			75—105 kPa (0.75—1.05 kg/cm^2, 11—15 psi)	—
	Thermostat	Begins to open temperature		80°—84°C (176°—183°F)	—
		Fully opened temperature		93°—97°C (199°—206°F)	—
		Valve lift (heated to 95°C/5 minutes)		8.0 (0.315) min.	—
	Thermo valve		Starts to close	78°—82°C (172°—180°F)	—
	Thermostatic fan motor switch		Starts to close	98°—102°C (208°—216°F)	—
	Coolant temperature sensor resistance		60°C (140°F)	104 ohms	—
			85°C (185°F)	44 ohms	—
			110°C (230°F)	20 ohms	—
			120°C (248°F)	16 ohms	—
CYLINDER HEAD	Cylinder head warpage			—	0.10 (0.004)
	Valve stem O.D.		IN	5.475—5.490 (0.2156—0.2161)	5.45 (0.215)
			EX	5.455—5.470 (0.2148—0.2154)	5.44 (0.214)
	Valve guide I.D.		IN, EX	5.500—5.512 (0.2165—0.2170)	5.55 (0.219)
	Valve stem to guide clearance		IN	0.010—0.037 (0.0004—0.0015)	0.08 (0.003)
			EX	0.030—0.057 (0.0012—0.0022)	0.10 (0.004)
	Valve seat width			1.2 (0.05)	—
	Valve spring free length			44.6 (1.76)	43.3 (1.70)
	Valve spring preload/length			15.6—18.2/37.5 kg/mm (34.39—40.12/1.48 lbs/in)	—
	Rocker arm I.D.			25.000—25.021 (0.9843—0.9851)	25.05 (0.986)
	Rocker arm shaft O.D.			11.966—11.984 (0.4711—0.4718)	11.95 (0.470)
	Rocker arm lobe		I.D.	11.996—12.031 (0.4723—0.4734)	12.07 (0.475)
			O.D.	20.945—20.980 (0.8246—0.8260)	20.93 (0.824)
	Hydraulic valve adjuster compression stroke with kerosene			0—0.30 (0—0.012)	0.30 (0.012) max.

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
CYLINDER HEAD	Camshaft	Cam lobe height		36.110–36.190 (1.4217–1.4248)	35.9 (1.41)
		Runout (at center journal)		—	0.10 (0.004)
		Journal O.D.	Both middles	26.934–26.955 (1.0604–1.0612)	26.91 (1.059)
			Both ends	26.949–26.970 (1.0610–1.0618)	26.91 (1.059)
		Holder journal I.D.		27.000–27.021 (1.0630–1.0638)	27.05 (1.065)
		Journal oil clearance	Both middles	0.045–0.087 (0.0018–0.0034)	0.14 (0.006)
			Both ends	0.030–0.072 (0.0012–0.0028)	0.14 (0.006)
CLUTCH	Clutch master cylinder	Cylinder I.D.		15.870–15.913 (0.6248–0.6265)	15.93 (0.627)
		Piston O.D.		15.827–15.854 (0.6231–0.6242)	15.82 (0.623)
	Clutch	Plate warpage		—	0.30 (0.012)
		Disc thickness		3.72–3.88 (0.146–0.153)	3.5 (0.14)
		Clutch spring free height		5.38 (0.212)	5.1 (0.20)
OUTPUT SHAFT	Damper spring free length			60.82 (2.394)	57.0 (2.24)
	Shaft O.D.			22.008–22.021 (0.8665–0.8670)	21.99 (0.866)
	Collar		I.D.	22.026–22.041 (0.8672–0.8678)	22.05 (0.868)
			O.D.	25.959–25.980 (1.0220–1.0228)	25.95 (1.022)
	Driven gear I.D.			26.000–26.016 (1.0236–1.0242)	26.03 (1.025)
GEAR-SHIFT	Shift fork shaft O.D.			13.966–13.984 (0.5498–0.5506)	13.90 (0.547)
	Shift fork		I.D.	14.000–14.021 (0.5512–0.5520)	14.04 (0.553)
			Claw thickness	5.93–6.00 (0.233–0.236)	5.6 (0.22)
TRANS-MISSION	Gear I.D.		C2, C3, M4, M5	34.000–34.016 (1.3386–1.3392)	34.04 (1.340)
	Gear bushing O.D.		C2, C3, M4/M5	33.940–33.965 (1.3362–1.3372)	33.92 (1.335)
	Gear-to-bushing clearance			0.035–0.076 (0.0014–0.0030)	0.10 (0.004)
CYLINDER, PISTON	Cylinder compression pressure			1300–1700 kPa (13.0–17.0 kg/cm², 185–242 psi)	1000 kPa (10.0 kg/cm², 142 psi)
	Cylinder	I.D.		71.010–71.025 (2.7957–2.7963)	71.1 (2.80)
		Out-of-round		—	0.15 (0.006)
		Taper		—	0.05 (0.002)
		Top warpage		—	0.05 (0.002)
	Piston	O.D. (at skirt)		70.960–70.990 (2.7937–2.7949)	70.85 (2.789)
		Piston pin bore		18.010–18.016 (0.7091–0.7093)	18.03 (0.710)
		Piston-to-cylinder clearance		0.020–0.065 (0.0008–0.0026)	0.10 (0.004)
	Piston ring	End gap	Top and second	0.15–0.30 (0.006–0.012)	0.5 (0.02)
			Oil ring side rail	0.20–0.70 (0.008–0.028)	0.9 (0.04)
		Ring-to-ring land clearance	Top	0.025–0.055 (0.0010–0.0022)	0.10 (0.004)
			Second	0.015–0.045 (0.0006–0.0018)	0.10 (0.004)
	Piston pin	O.D. (at sliding surfaces)		17.994–18.000 (0.7084–0.7087)	18.99 (0.748)
		Pin-to-piston clearance		0.010–0.022 (0.0004–0.0009)	0.05 (0.002)
		Pin-to-rod interference		0.015–0.039 (0.0006–0.0015)	—

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
CRANKSHAFT	Main journal bearing oil clearance			0.020–0.038 (0.0008–0.0015)	0.06 (0.002)
	Crankpin bearing oil clearance			0.027–0.045 (0.0011–0.0018)	0.06 (0.002)
	Crankshaft runout (at center journal)			—	0.03 (0.001)
	Connecting rod side clearance			0.15–0.30 (0.006–0.012)	0.40 (0.016)
	Crankpin and main journal		Taper	—	0.003 (0.0001)
			Out-of-round	—	0.005 (0.0002)
WHEELS	Wheel axle runout			—	0.2 (0.01)
	Wheel rim runout		Axial	—	2.0 (0.08)
			Radial	—	2.0 (0.08)
	Tire tread depth		Front	—	1.5 (0.06)
			Rear	—	2.0 (0.08)
SUSPENSION	Rear suspension air pressure			0–400 kPa (0–4.0 kg/cm^2, 0–57 psi)	—
	Front fork spring free length			390.6 (15.38)	382.8 (15.07)
	Front fork oil capacity		Left	327 cm^3 (12.6 US oz, 13.1 Imp oz)	—
			Right	377 cm^3 (12.7 US oz, 13.2 Imp oz)	—
	Front fork oil level (from the top of tube)			194 (7.6)	—
	Front fork oil			ATF	—
	Fork tube runout			—	0.2 (0.01)
	Right shock absorber oil capacity			140 cm^3 (4.7 US oz, 4.9 Imp oz)	—
	Right shock absorber oil			ATF	—
FINAL DRIVE	Final gear oil	Recommended oil		Hypoid gear oil, SAE #80	—
		Capacity	At assembly	170 cm^3 (5.7 US oz, 6.0 Imp oz)	—
			After draining	140 cm^3 (4.7 US oz, 4.9 Imp oz)	—
	Final gear backlash			0.05–0.15 (0.002–0.006)	0.3 (0.01)
		Difference at 3 points		—	0.10 (0.004)
	Ring gear-to-stop pin clearance			0.30–0.60 (0.012–0.024)	—
BRAKES	Front brake master cylinder	Cylinder I.D.		12.700–12.743 (0.5000–0.5017)	12.755 (0.5022)
		Piston O.D.		12.684–12.657 (0.4980–0.4983)	12.645 (0.4978)
	Front brake caliper	Left	Cylinder I.D.	25.400–25.450 (1.0000–1.0020)	25.460 (1.0024)
			Piston O.D.	25.335–25.368 (0.9974–0.9987)	25.310 (0.9965)
		Right	Cylinder I.D.	30.230–30.280 (1.1902–1.1921)	30.290 (1.1925)
			Piston O.D.	30.165–30.198 (1.1876–1.1889)	30.140 (1.1866)
	Front brake disc	Thickness		5.8–6.2 (0.23–0.24)	5.0 (0.20)
		Runout		—	0.3 (0.01)
	Front brake pad thickness			5.5 (0.22)	1.0 (0.04)
	Rear brake master cylinder	Cylinder I.D.		15.870–15.913 (0.6248–0.6265)	15.925 (0.6270)
		Piston O.D.		15.827–15.854 (0.6231–0.6242)	15.815 (0.6226)
		Brake rod clevis installed length		100 (3.9)	—
	Rear brake caliper	Cylinder I.D.		32.030–32.080 (1.2610–1.2630)	32.090 (1.2634)
		Piston O.D.		31.948–31.998 (1.2578–1.2598)	31.940 (1.2575)
	Rear brake disc	Thickness		7.3–7.7 (0.29–0.30)	6.0 (0.24)
		Runout		—	0.3 (0.01)
	Rear brake pad thickness			6.5 (0.26)	1.0 (0.04)
	Brake fluid (front/rear)			DOT 4	—

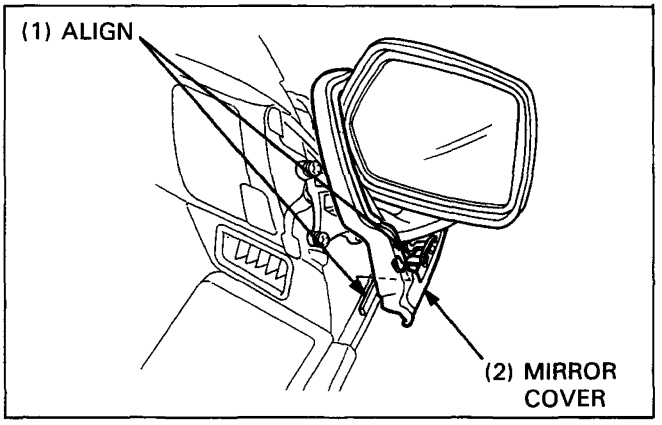
Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
CHARGING	Battery capacity			12 V–20 AH	—
	Battery specific gravity (At 20°C, 68°F)	Full charged		1.270–1.290	—
		Need charging		Below 1.260	—
	Battery charging current			2.0 Amperes max.	—
	Alternator	Capacity		0.55 kW/5,000 min^{-1} (rpm)	—
		Stator coil resistance		0.1–0.3 ohms (20°C, 68°F)	—
		Rotor coil resistance		2.9–4.0 ohms (20°C, 68°F)	—
		Rotor coil slip ring O.D.		27.0 (1.06)	26.0 (1.02)
		Charging start		800–1,000 min^{-1} (rpm)	—
	Regulator/ Rectifier (into alternator)	Type		Transistorized non-adjustable reg./recti.	—
		Regulated voltage (at 20°C/68°F)	900 min^{-1} (rpm)	0–2 A, 13.5–15.5 V	—
			1,850 min^{-1} (rpm)	1.5 A min., 13.5–15.5 V	—
IGNITION	Firing order			1–4–5–2–3–6–1	—
	Ignition timing		F mark	0°TDC at 800 ± 80 min^{-1} (rpm) (SW model 800 ± 50 min^{-1} (rpm))	—
		Vacuum advance	Advance start	60–160 mmHg (2.4–6.3 inHg)	—
			Advance cease	310–360 mmHg (12.2–14.2 inHg)	—
	Ignition coil resistance (at 20°C/68°F)	Primary coil		2.6–3.2 ohms	—
		Secondary coil	With spark plug wire	20.2–26.8 Kohms	—
			Without spark plug wire	11.7–14.3 Kohms	—
	Pulse generator coil resistance (At 20°C, 68°F)			400–500 ohms	—
	Tw sensor/Ta sensor resistance		20°C (68°F)	2.0–3.0 Kohms	—
			80°C (176°F)	200–400 ohms	—
STARTER/ REVERSE	Starter motor brush length			12.5 (0.49)	6.0 (0.24)
	Reverse System	Starter relay regulator/regulated current		0.7–1.0 A	—
		Resister	Between connector and resistor terminals	0.12–0.17 ohms	—
ELECTRICAL	Oil pressure switch continuity pressure			10–20 kPa (0.1–0.2 kg/cm^2, 1–3 psi)	—
	Fuel level sensor resistance (at 20°C, 68°F)		Empty	90–100 ohms	—
			Reserve	66–81 ohms	—
			Full	4–10 ohms	—

WINDSHIELD

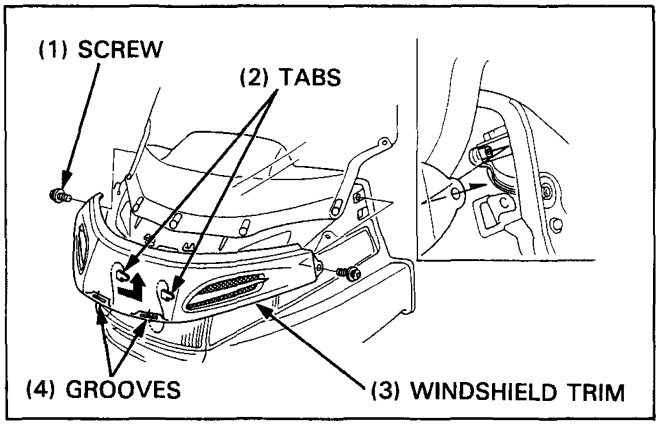
REPLACEMENT

Release the spring clamp from the fairing groove and free the mirror covers.



Remove two screws and remove the windshield trim from the windshield height adjustment lever tension plate.

Free the trim grooves from the fairing tabs and remove the trim from the fairing.



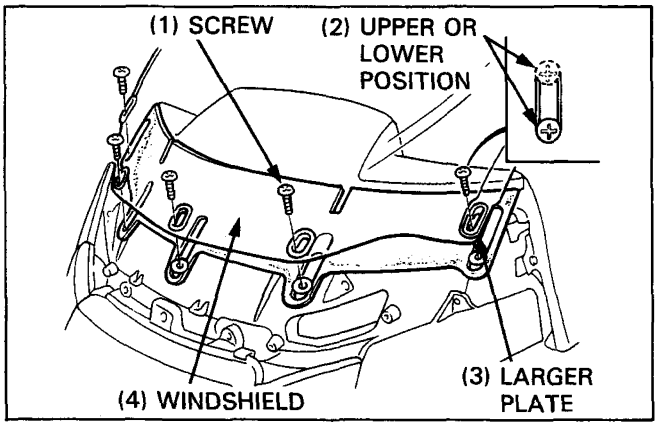
Remove the screws and windshield.

Install a new windshield. Install the setting plates onto the holes of the windshield and tighten the screws securely.

NOTE

- Position two larger setting plate on both ends.
- Make sure the windshield could be moved up and down to the desired position.

Position all screws in the same (upper or lower) position. Install the remaining parts in the reverse order of removal.



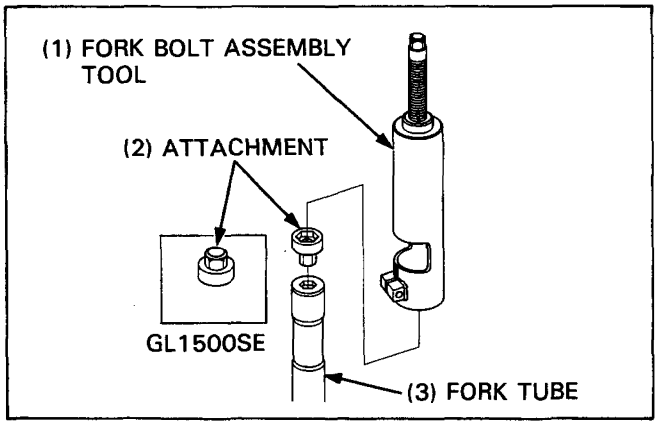
FORK LEG

DISASSEMBLY

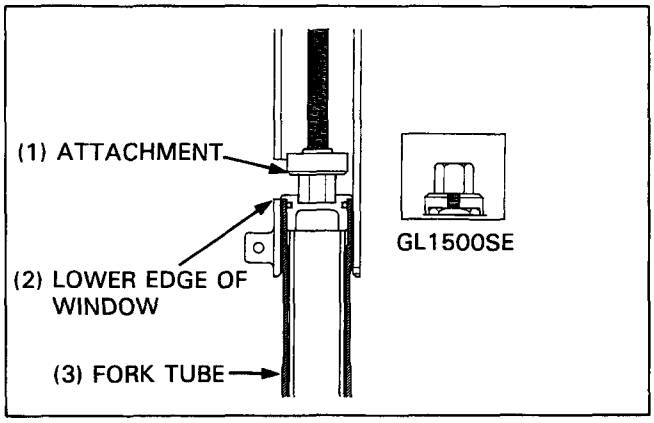
GL1500SE: Remove the air valve from the fork bolt.
GL1500SE: Install the attachment onto the fork bolt with the protrusion facing upward.
GL1500A: Install the attachment onto the fork bolt with the protrusion facing downward.

Install the fork bolt assembly tool on the fork tube.

TOOL:
Fork bolt assembly tool **07KMF—MT20300**



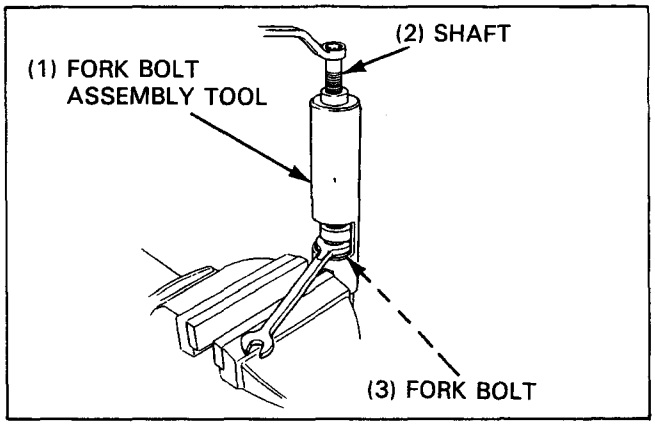
Align the lower edge of the window in the tool with the top of the fork tube as shown.



Clamp the mounting lug of the tool in the vise securely.
Turn the shaft of the tool in until it contacts with the attachment of the tool.
Loosen the fork bolt and the shaft of the tool alternately until the fork bolt thread is removed from the fork tube.

NOTE

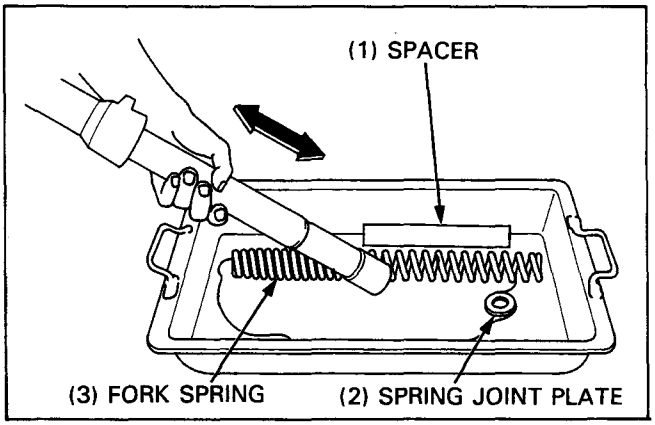
- Do not make a large gap between the shaft and attachment of the tool when loosening.



After the fork bolt thread is removed, loosen the shaft until the fork spring load is released from the fork bolt.
Remove the tool from the vise while holding the fork tube, then remove the tool and fork bolt from the fork tube.

Remove the spacer, spring joint plate and fork spring.

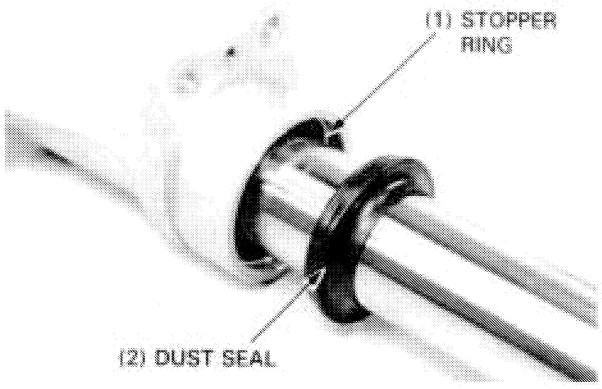
Drain any remaining fork fluid by pumping the fork tube back and forth several times.



Remove the dust seal and stopper ring.

NOTE

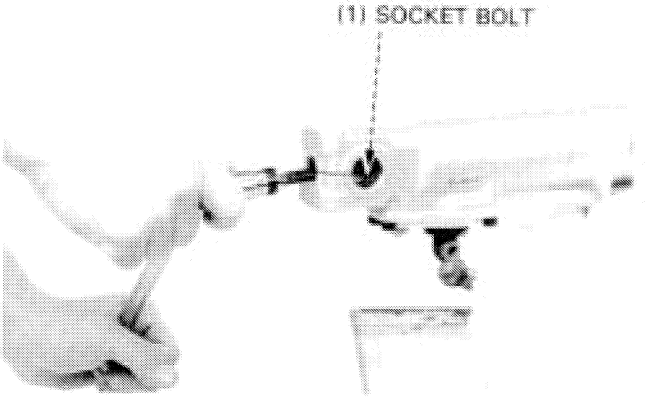
- When removing the stopper ring, do not damage the fork tube.



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

NOTE

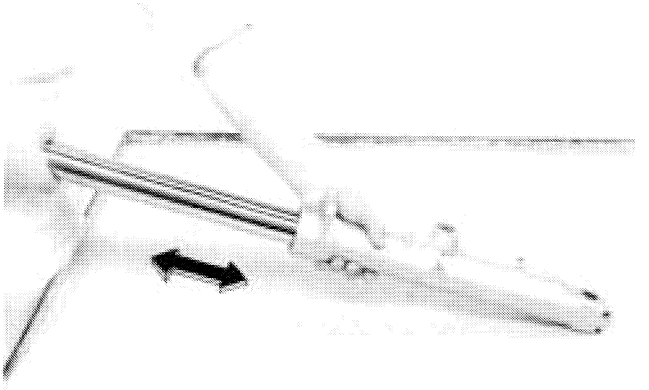
- Temporarily install the spring and fork bolt if difficulty is encountered in removing the socket bolt.



Remove the fork tube from the slider by slamming it out several times.

NOTE

- The fork tube bushing must force the slider bushing out.

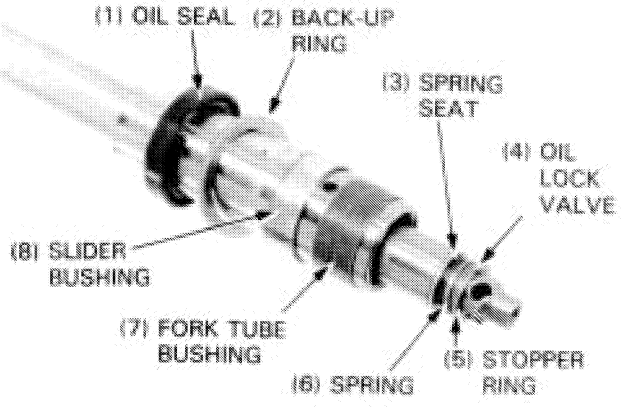


Remove the oil seal, back-up ring and slider bushing from the fork tube.

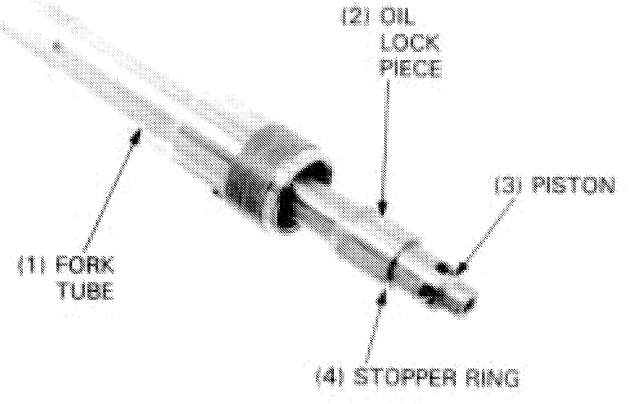
NOTE

- Do not remove the fork tube bushing unless it is necessary to replace.

Remove the stopper ring, oil lock valve, oil lock spring and spring seat from the fork piston.



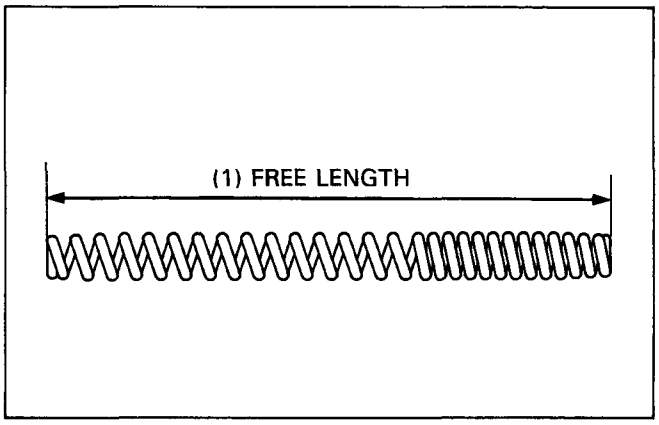
Remove the stopper ring and oil lock piece from the fork piston. Remove the piston from the fork tube.



INSPECTION

Check the fork spring free lengths and replace the springs if shorter than the service limit.

SERVICE LIMIT: 382.8 mm (15.07 in)

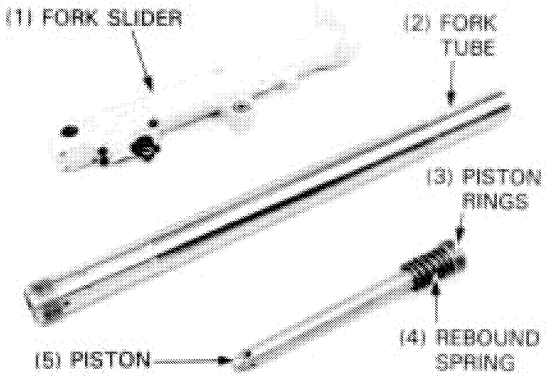


Check the fork tubes, fork sliders and pistons for score marks, scratches, or abnormal wear.

Check the fork piston rings for wear or damage.

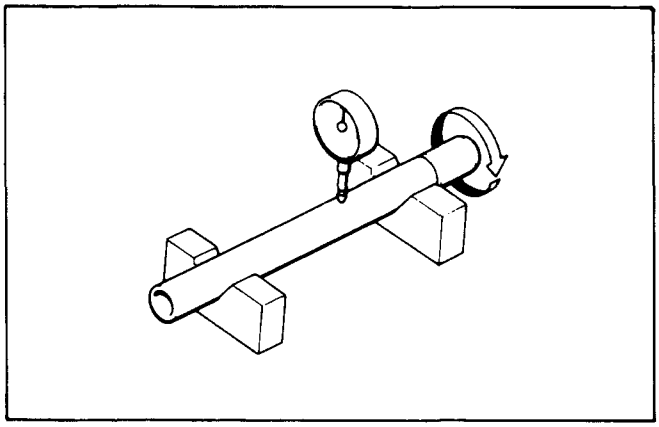
Check the rebound spring for damage.

Replace any worn or damaged parts.



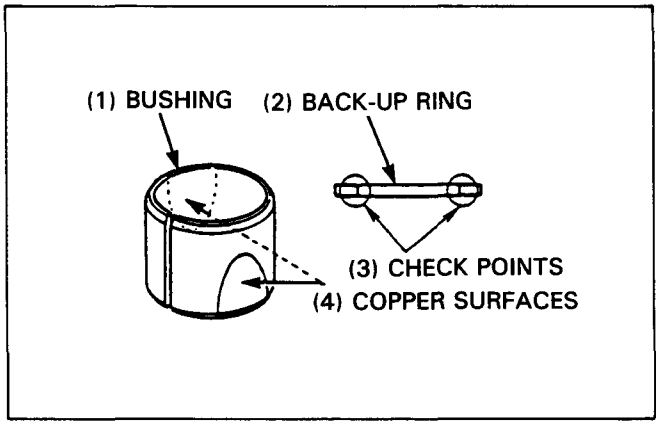
Set the fork tube in V blocks and read the runout.

SERVICE LIMIT: 0.2 mm (0.01 in)



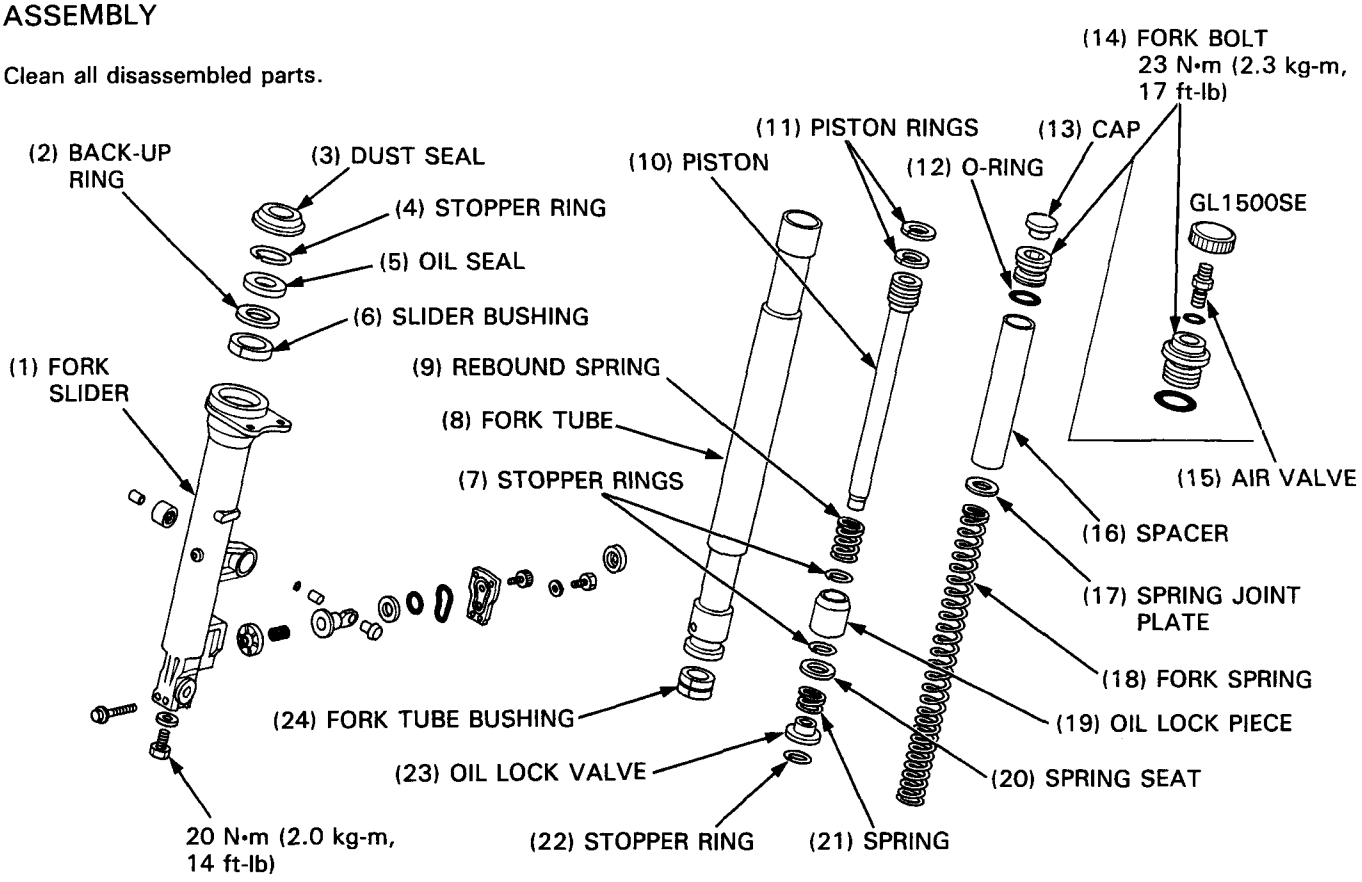
Visually inspect the slider and fork tube bushings.
Replace the bushings if there is excessive scoring or scratching, or if the teflon is worn so that the copper surface appears on more than 3/4 of the entire surface.

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



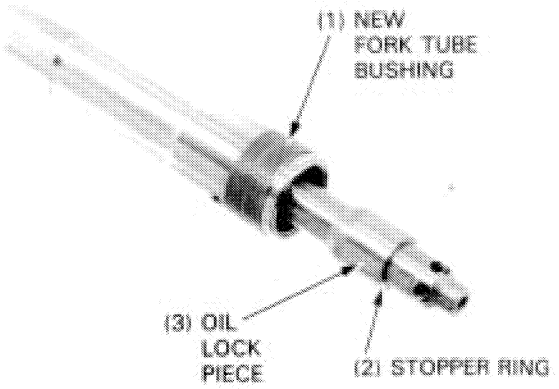
ASSEMBLY

Clean all disassembled parts.



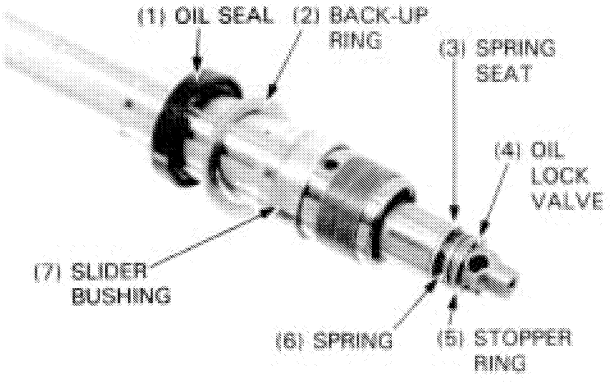
Install new bushing on the fork tube if necessary. Place the piston with rebound spring into the fork tube.

Install the oil lock piece and stopper ring onto the fork piston.



Install the spring seat, spring and oil lock valve on the piston, and secure them with the stopper ring.

Install the slider bushing, back-up ring and oil seal onto the fork tube.



NOTE

- Install the back-up ring with its chamfered surface side facing down.
- Check the groove and top edge of the fork tube for burrs or scratches. Wrap the fork tube groove or top edge with vinyl tape to prevent damage to the oil seal lip during installation. Coat a new oil seal with ATF and install it with the seal mark facing up.

Place the fork slider in a vise with soft jaws.

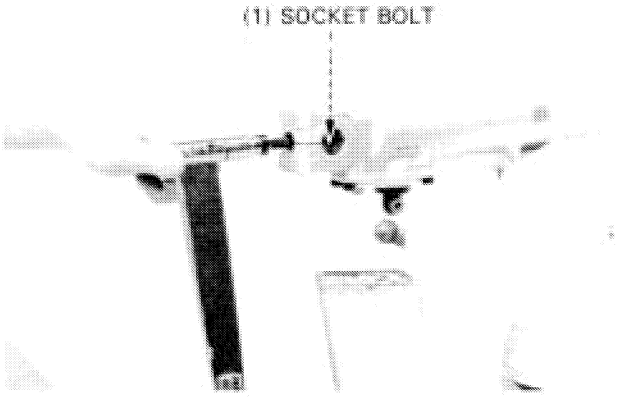
CAUTION

- *Do not distort the slider in the vise.*

Temporarily install the fork spring and fork bolt. This will hold the piston when you tighten the bottom socket bolt.

Apply a locking agent to the socket bolt and thread it into the piston. Then, tighten the socket bolt.

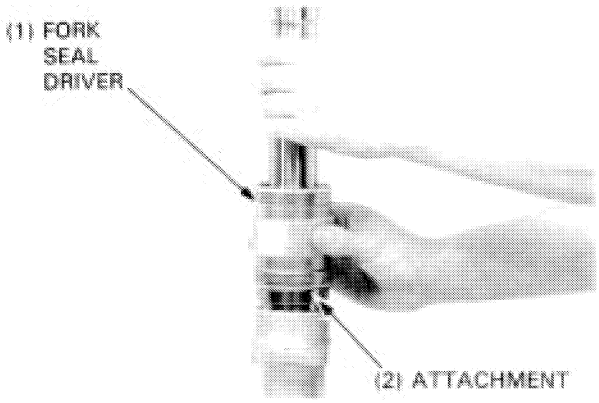
TORQUE: 20 N·m (2.0 kg-m, 14 ft-lb)



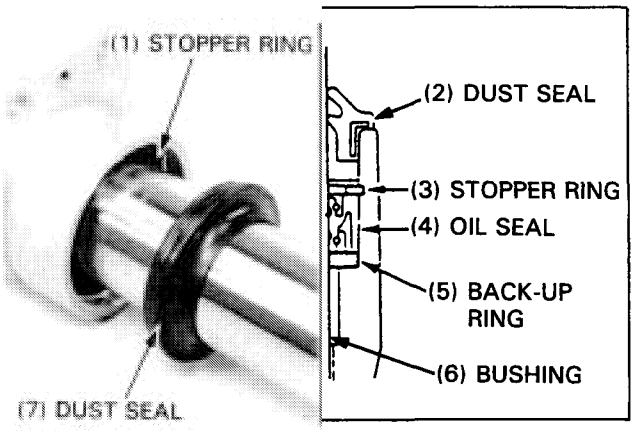
Driver the slider bushing, back-up ring and oil seal with the seal driver.

TOOLS:

Fork seal driver	**07947—KA50100**
Fork seal driver attachment	**07947—KF00100**



Install the stopper ring and dust seal.



If you installed the fork spring earlier, remove the fork bolt and spring.

Fill the fork with ATF.

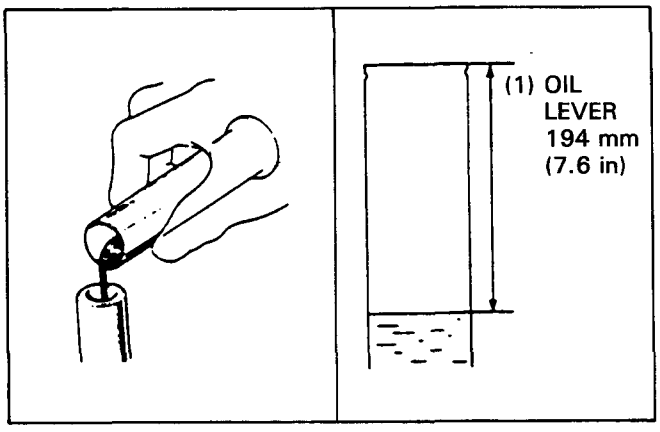
CAPACITY:

RIGHT FORK 377 cm³ (12.7 US oz, 13.2 Imp oz)
LEFT FORK 327 cm³ (12.6 US oz, 13.1 Imp oz)

Pump the fork several times.

Compress the fork and measure the oil level from the top of the tube after the level stabilizes.

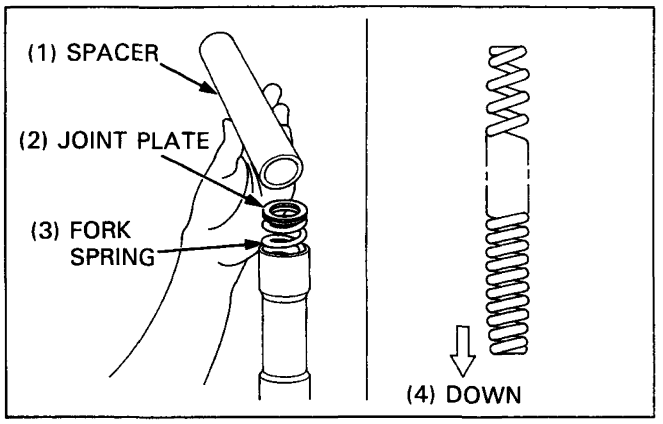
SPECIFIED LEVEL: 194 mm (7.6 in)



Wipe off the fork spring and spacer thoroughly using a clean, lint-free cloth.

Install the fork spring with its tightly wound coil end facing down.

Intall the spring joint plate and spacer.

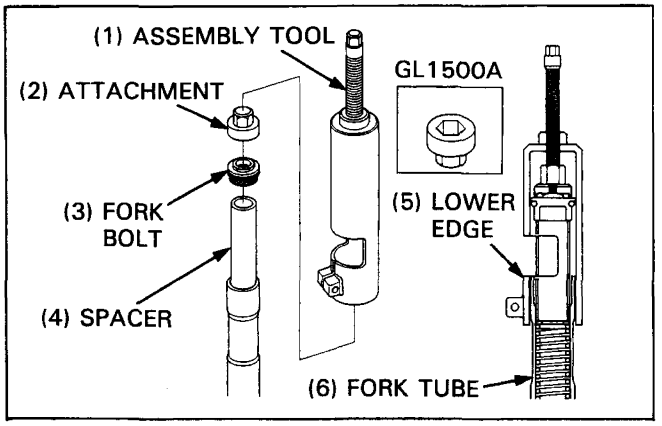


Coat a new O-ring with ATF and install it onto the fork bolt. Place the fork bolt onto the spacer.

GL1500SE: Install the attachment onto the fork bolt with the protrusion facing upward.
GL1500A: Install the attachment onto the fork bolt with the protrusion facing downward.

Install the fork bolt assembly tool on the fork tube and align the lower edge of the window in the tool with the top of the fork tube.

TOOL:
Fork bolt assembly tool **07KMF—MT20300**



Clamp the mounting lug of the tool in the vise securely.

Compress the fork spring until the fork bolt thread contacts with the fork tube thread by turning the shaft of the tool in.

Turn the shaft in another 1/3 turn after the threads contact.

CAUTION

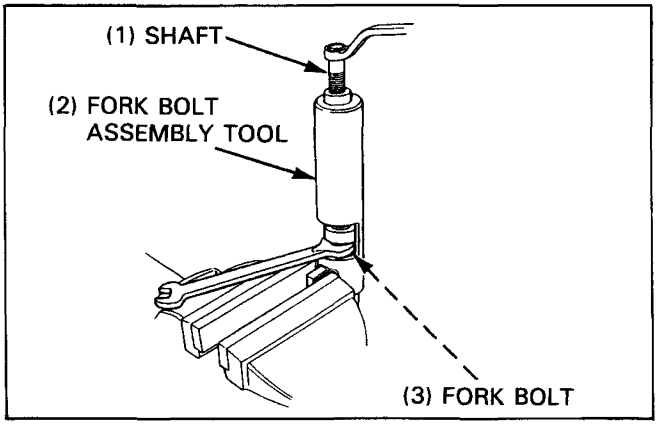
- *Over-turning the shaft will damage the fork bolt threads.*

Engage the fork bolt threads with the fork tube threads by turning the bolt clockwise.

Screw the bolt threads in more than 5 threads, then remove the tool from the fork tube.

Install the fork into the steering stem, and tighten the fork bolt to the specified torque (page 14-17).

GL1500SE: Install the air valve into the fork bolt.



Paper Book Part No. 67MN530R

33. GL1500A/GL1500SE (V) ADDENDUM

HOW TO USE THIS MANUAL

This addendum contains information for GL1500A (V) and GL1500SE (V).
Refer to GL1500 SHOP MANUAL (No. 67MN530, No. 67MN530 (Z~S)) for service procedures and data not included in this addendum.

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

GL1500A (V)

CODE	AREA (TYPE)	CODE	AREA (TYPE)
AR	Austria	SD	Sweden
SP	Spain	FI	Finland
F	France	U	Australia
ED	European direct sales		

GL1500SE (V)

CODE	AREA (TYPE)	CODE	AREA (TYPE)
E	U.K.	FI	Finland
G	Germany	AR	Austria
F	France	SW	Switzerland
ED	European direct sales	SP	Spain
U	Australia		

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CONTENT

IMPORTANT SAFETY NOTICE

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

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

NOTE: Gives helpful information.

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

SPECIFICATIONS (GL1500A)

Dimensions	Overall length		2,615 mm (103.0 in)
	Overall width		955 mm (37.6 in)
	Overall height		1,495 mm (58.9 in)
	Wheelbase		1,690 mm (66.5 in)
	Seat height		740 mm (29.1 in)
	Ground clearance		115 mm (4.5 in)
	Dry weight		370 kg (816 lbs)
	Curb weight		398 kg (877 lbs)
Frame	Frame type		Double cradle
	Front suspension	Travel	Telescopic, 140 mm (5.5 in)
	Rear suspension	Travel	Swing arm, 105 mm (4.1 in)
		Air pressure	0 – 400 kPa (0 – 4.0 kgf/cm², 0 – 57 psi)
	Front tire	Size	130/70 – 18 63H (DUNLOP), 130/70B18 63H (METZELER)
		Air pressure	225 kPa (2.25 kgf/cm², 33 psi)
	Rear tire	Size	160/80 – 16 75H (DUNLOP), 160/80B16 75H (METZELER)
		Air pressure	250 kPa (2.50 kgf/cm², 36 psi): Driver only
			280 kPa (2.80 kgf/cm², 41 psi): Driver and Passenger
	Front brake		Double disc brake
	Rear brake		Disc brake
	Fuel capacity		23.0 lit. (6.1 US gal, 5.1 Imp gal)
	Caster angle		30°
	Trail length		111 mm (4.4 in)
	Front fork oil capacity	Left	372 cm³ (12.6 US oz, 13.1 Imp oz)
		Right	377 cm³ (12.7 US oz, 13.2 Imp oz)
Engine	Engine type		Water cooled, 4 stroke O.H.C.
	Cylinder arrangement		Flat six
	Bore and stroke		71 x 64 mm (2.8 x 2.5 in)
	Displacement		1,520 cm³ (92.7 cu-in)
	Compression ratio		9.8 : 1
	Valve train		Belt driven over head camshaft
	Oil capacity	At disassembly	4.3 lit. (4.5 US qt, 3.8 Imp qt)
		After draining	3.5 lit. (3.7 US qt, 3.1 Imp qt)
	Lubrication system		Forced and wet sump
	Cooling system capacity		4.1 lit. (4.3 US qt, 3.6 Imp qt)
	Cylinder compression		1,471 kPa (15.0 kgf/cm², 213 psi)
	Engine weight		126 kg (278 lbs)
	Camshaft: Intake valve	Opens	5° ATDC (At 1 mm lift)
		Closes	30° ABDC (At 1 mm lift)
	Camshaft: Exhaust valve	Opens	40° BBDC (At 1 mm lift)
		Closes	5° BTDC (At 1 mm lift)
	Valve clearance	Intake/Exhaust	Hydraulic valve adjuster system
	Idle speed		800 ± 80 min⁻¹ (rpm)

Carburetion	Carburetor type		CV down-draft dual carburetors
	Throttle bore		36 mm (1.4 in)
	Carburetor identification No.		VDG9C AR: VDGWE
	Pilot screw opening		2-1/2 turns out AR: 2-5/8 turns out
	Float level		7.5 mm (0.30 in)
	Main jet		pri: #80 2nd: #148
	Slow jet		#70 AR: #65
	Throttle grip free play		5 – 8 mm (3/16 – 5/16 in)
	Fuel pump flow capacity		640 cm³ (22.5 Imp oz)/minute
	Carburetor vacuum difference		Within 40 mm (1.6 in) Hg of each other
Drive Train	Clutch type		Wet, multi-plate
	Transmission		5-speed, constant mesh
	Primary reduction ratio		1.591 (78/49)
	Secondary reduction ratio		0.971 (34/35)
	Gear ratio	1st 2nd 3rd 4th OD	2.666 (40/15) 1.722 (31/18) 1.291 (31/24) 0.964 (27/28) 0.758 (22/29)
	Final reduction ratio		2.833 (34/12)
	Gearshift pattern		Left foot operated return system 1 – N – 2 – 3 – 4 – OD
	Final gear oil capacity (After disassembly)		170 cm³ (5.7 US oz, 6.0 Imp oz)
Electrical	Ignition		Battery ignition (Full transistor)
	Ignition timing "F" mark		3.5° BTDC at idle
	Starting system		Starting motor
	Alternator		AC generator, 0.55 kW/5,000 min⁻¹ (rpm)
	Battery capacity		12 V – 20 AH
	Spark plug: Standard	NGK	DPR7EA-9
		Nippondenso	X22EPR-U9
	Spark plug: For cold climate (Below 5°C, 41°F)	NGK	DPR6EA-9
		Nippondenso	X20EPR-U9
	Spark plug: For extended high speed riding	NGK	DPR8EA-9
		Nippondenso	X24EPR-U9
	Spark plug gap		0.8 – 0.9 mm (0.031 – 0.035 in)
	Firing order		1 – 4 – 5 – 2 – 3 – 6 – 1
	Fuses		5 A x 4, 10 A x 4, 15 A x 5 (fuse box) 30 A, 55 A (main fuses) 5 A x 2, 65 A (reverse fuses)
Lights	Headlight		12 V 60 W (R), 60/55 W (L) U: 12 V 45/45 W x 2
	Position light		12 V 5 W (Except U)
	Turn signal light		12 V 21 W x 4
	Indicator light		12 V 3.4 W x 5/12 V 1.7 W x 4
	Turn signal indicator		12 V 3 W x 2
	Instrument illumination		12 V 3.4 W x 4
	LCD unit illumination		12 V 3 W x 2
	License light		12 V 5 W
	Brake and taillight		12 V 21/5 W x 2

SPECIFICATIONS (GL1500SE)

Dimensions	Overall length			2,615 mm (103.0 in)
	Overall width			955 mm (37.6 in)
	Overall height			1,495 mm (58.9 in) G: 1,315 mm (51.8 in)
	Wheelbase			1,690 mm (66.5 in)
	Seat height			740 mm (29.1 in)
	Ground clearance			115 mm (4.5 in)
	Dry weight			372 kg (820 lbs)
	Curb weight			400 kg (882 lbs)
Frame	Front type			Double cradle
	Frame suspension		Travel	Telescopic, 140 mm (5.5 in)
	Rear suspension		Travel	Swing arm, 105 mm (4.1 in)
			Air pressure	0 – 400 kPa (0 – 4.0 kgf/cm², 0 – 57 psi)
	Front tire		Size	130/70 – 18 63H (DUNLOP), 130/70B18 63H (METZELER)
			Air pressure	225 kPa (2.25 kgf/cm², 33 psi)
	Rear tire		Size	160/80 – 16 75H (DUNLOP), 160/80B16 75H (METZELER)
			Air pressure	250 kPa (2.50 kgf/cm², 36 psi): Driver only 280 kPa (2.80 kgf/cm², 41 psi): Driver and Passenger
	Front brake			Double disc brake
	Rear brake			Disc brake
	Fuel capacity			23.0 lit. (6.1 US gal, 5.1 Imp gal)
	Caster angle			30°
	Trail length			111 mm (4.4 in)
	Front fork oil capacity		Left	372 cm³ (12.6 US oz, 13.1 Imp oz)
			Right	377 cm³ (12.7 US oz, 13.2 Imp oz)
Engine	Engine type			Water cooled, 4 stroke O.H.C.
	Cylinder arrangement			Flat six
	Bore and stroke			71 x 64 mm (2.8 x 2.5 in)
	Displacement			1,520 cm³ (92.7 cu-in)
	Compression ratio			9.8 : 1
	Valve train			Belt driven over head camshaft
	Oil capacity		At disassembly	4.3 lit. (4.5 US qt, 3.8 Imp qt)
			After draining	3.5 lit. (3.7 US qt, 3.1 Imp qt)
	Lubrication system			Forced and wet sump
	Cooling system capacity			4.1 lit. (4.3 US qt, 3.6 Imp qt)
	Cylinder compression			1,471 kPa (15.0 kgf/cm², 213 psi)
	Engine weight			126 kg (278 lbs)
	Camshaft	Intake valve	Opens	5° ATDC (At 1 mm lift)
			Closes	30° ABDC (At 1 mm lift)
		Exhaust valve	Opens	40° BBDC (At 1 mm lift)
			Closes	5° BTDC (At 1 mm lift)
	Valve clearance		Intake/Exhaust	Hydraulic valve adjuster system
	Idle speed			800 ± 80 min⁻¹ (rpm)
			SW	800 ± 50 min⁻¹ (rpm)

Carburetion	Carburetor type		CV down-draft dual carburetors
	Throttle bore		36 mm (1.4 in)
	Carburetor identification No.		VDG9C SW: VDGWG AR: VDGWE
	Pilot screw opening		2-1/2 turns out SW, AR: 2-5/8 turns out
	Float level		7.5 mm (0.30 in)
	Main jet		pri: #80 2nd: #148
	Slow jet		#70 SW, AR: #65
	Throttle grip free play		5 – 8 mm (3/16 – 5/16 in)
	Fuel pump flow capacity		640 cm^3 (22.5 Imp oz)/minute
	Carburetor vacuum difference		Within 40 mm (1.6 in) Hg of each other
Drive Train	Clutch type		Wet, multi-plate
	Transmission		5-speed, constant mesh
	Primary reduction ratio		1.591 (78/49)
	Secondary reduction ratio		0.971 (34/35)
	Gear ratio	1st 2nd 3rd 4th OD	2.666 (40/15) 1.722 (31/18) 1.291 (31/24) 0.964 (27/28) 0.758 (22/29)
	Final reduction ratio		2.833 (34/12)
	Gearshift pattern		Left foot operated return system 1 – N – 2 – 3 – 4 – OD
	Final gear oil capacity (After disassembly)		170 cm^3 (5.7 US oz, 6.0 Imp oz)
Electrical	Ignition		Battery ignition (Full transistor)
	Ignition timing "F" mark		3.5° BTDC at idle
	Starting system		Starting motor
	Alternator		AC generator, 0.55 kW/5,000 min^{-1} (rpm)
	Battery capacity		12 V – 20 AH
	Spark plug: Standard	NGK	DPR7EA-9
		Nippondenso	X22EPR-U9
	Spark plug: For cold climate (Below 5°C, 41°F)	NGK	DPR6EA-9
		Nippondenso	X20EPR-U9
	Spark plug: For extended high speed riding	NGK	DPR8EA-9
		Nippondenso	X24EPR-U9
	Spark plug gap		0.8 – 0.9 mm (0.031 – 0.035 in)
	Firing order		1 – 4 – 5 – 2 – 3 – 6 – 1
	Fuses		5 A x 4 (G: 5 A x 3), 10 A x 4, 15 A x 5 (fuse box) 30 A, 55 A (main fuses) 5 A x 2, 65 A (reverse fuses)
Lights	Headlight		12 V 60 W (R), 60/55 W (L) E: 60/55 W x 2 U: 45/45 W x 2
	Position light		12 V 5 W (Except U)
	Turn signal light		12 V 21 W x 4
	Indicator light		12 V 3.4 W x 5/12 V 1.7 W x 4
	Turn signal indicator		12 V 3 W x 2
	Instrument illumination		12 V 3.4 W x 4
	LCD unit illumination		12 V 3 W x 2
	License light		12 V 5 W
	Brake and taillight		12 V 21/5 W x 2

SERVICE DATA

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
Engine weight (including carburetors)				126 kg (278 lbs)	———
Engine oil capacity	at engine assembly			4.3 lit (4.5 US qt, 3.8 Imp qt)	———
	at oil change			3.5 lit (3.7 US qt, 3.1 Imp qt)	———
	at oil filter and oil change			3.7 lit (3.9 US qt, 3.3 Imp qt)	———
Radiator coolant capacity	After disassembly			4.1 lit (4.3 US qt, 3.6 Imp qt)	———
	After draining (including reserve tank)			3.8 lit (4.0 US qt, 3.3 Imp qt)	———
	Reserve tank			0.55 lit (0.6 US qt, 0.5 Imp qt)	———
OIL PUMP	Main oil pump	Tip clearance		0.15 (0.006) max.	0.35 (0.014)
		Pump body clearance		0.15 – 0.23 (0.006 – 0.009)	0.43 (0.017)
		Pump side clearance		0.02 – 0.07 (0.001 – 0.003)	0.12 (0.005)
	Scavenge pump	Tip clearance		0.15 (0.006) max.	0.35 (0.014)
		Pump body clearance		0.15 – 0.22 (0.006 – 0.009)	0.42 (0.017)
		Pump side clearance		0.02 – 0.07 (0.001 – 0.003)	0.12 (0.005)
	Pressure relief valve	Relief pressure		461 – 559 kPa (4.7 – 5.7 kgf/cm², 67 – 81 psi)	———
		Relief valve spring free length		90.8 (3.57)	84.0 (3.31)
	Oil pressure (at oil pressure switch)	Cold (At 35°C/95°F)	Idle speed	127 kPa (1.3 kgf/cm², 18 psi)	———
			5,000 min⁻¹ (rpm)	490 kPa (5.0 kgf/cm², 71 psi)	———
		Hot (At 80°C/176°F)	Idle speed	78 kPa (0.8 kgf/cm², 11 psi)	———
			5,000 min⁻¹ (rpm)	490 kPa (5.0 kgf/cm², 71 psi)	———
COOLING	Radiator cap relief pressure			108 – 137 kPa (1.1 – 1.4 kgf/cm², 16 – 20 psi)	———
	Thermostat	Begins to open temperature		80° – 84°C (176° – 183°F)	———
		Fully opened temperature		93° – 97°C (199° – 206°F)	———
		Valve lift (heated to 95°C/5 minutes)		8.0 (0.315) min.	———
	Thermo valve		Starts to close	78° – 82°C (172° – 180°F)	———
	Thermostatic fan motor switch		Starts to close	98° – 102°C (208° – 216°F)	———
	Coolant temperature sensor resistance		60°C (140°F)	104 ohms	———
			85°C (185°F)	44 ohms	———
			110°C (230°F)	20 ohms	———
			120°C (248°F)	16 ohms	———
CYLINDER HEAD	Cylinder head warpage			———	0.10 (0.004)
	Valve stem O.D.		IN	5.475 – 5.490 (0.2156 – 0.2161)	5.45 (0.215)
			EX	5.455 – 5.470 (0.2148 – 0.2154)	5.44 (0.214)
	Valve guide I.D.		IN, EX	5.500 – 5.512 (0.2165 – 0.2170)	5.55 (0.219)
	Valve stem to guide clearance		IN	0.010 – 0.037 (0.0004 – 0.0015)	0.08 (0.003)
			EX	0.030 – 0.057 (0.0012 – 0.0022)	0.10 (0.004)
	Valve seat width			1.2 (0.05)	———
	Valve spring free length			44.6 (1.76)	43.3 (1.70)
	Valve spring preload/length			15.6 – 18.2/37.5 kg/mm (34.39 – 40.12/1.48 lbs/in)	———
	Rocker arm I.D.			25.000 – 25.021 (0.9843 – 0.9851)	25.05 (0.986)
	Rocker arm shaft O.D.			11.966 – 11.984 (0.4711 – 0.4718)	11.95 (0.470)
	Rocker arm lobe		I.D.	11.996 – 12.031 (0.4723 – 0.4734)	12.07 (0.475)
			O.D.	20.945 – 20.980 (0.8246 – 0.8260)	20.93 (0.824)
	Hydraulic valve adjuster compression stroke with kerosene			0 – 0.30 (0 – 0.012)	0.30 (0.012) max.

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
CYLINDER HEAD	Camshaft	Cam lobe height		36.110 – 36.190 (1.4217 – 1.4248)	35.9 (1.41)
		Runout (at center journal)		—	0.10 (0.004)
		Journal O.D.	Both middles	26.934 – 26.955 (1.0604 – 1.0612)	26.91 (1.059)
			Both ends	26.949 – 26.970 (1.0610 – 1.0618)	26.91 (1.059)
		Holder journal I.D.		27.000 – 27.021 (1.0630 – 1.0638)	27.05 (1.065)
		Journal oil clearance	Both middles	0.045 – 0.087 (0.0018 – 0.0034)	0.14 (0.006)
			Both ends	0.030 – 0.072 (0.0012 – 0.0028)	0.14 (0.006)
CLUTCH	Clutch master cylinder	Cylinder I.D.		15.870 – 15.913 (0.6248 – 0.6265)	15.93 (0.627)
		Piston O.D.		15.827 – 15.854 (0.6231 – 0.6242)	15.82 (0.623)
	Clutch	Plate warpage		—	0.30 (0.012)
		Disc thickness		3.72 – 3.88 (0.146 – 0.153)	3.5 (0.14)
		Clutch spring free height		5.38 (0.212)	5.1 (0.20)
OUTPUT-SHAFT	Damper spring free length			60.82 (2.394)	57.0 (2.24)
	Shaft O.D.			22.008 – 22.021 (0.8665 – 0.8670)	21.99 (0.866)
	Collar		I.D.	22.026 – 22.041 (0.8672 – 0.8678)	22.05 (0.868)
			O.D.	25.959 – 25.980 (1.0220 – 1.0228)	25.95 (1.022)
	Driven gear I.D.			26.000 – 26.016 (1.0236 – 1.0242)	26.03 (1.025)
GEAR-SHIFT	Shift fork shaft O.D.			13.966 – 13.984 (0.5498 – 0.5506)	13.90 (0.547)
	Shift fork		I.D.	14.000 – 14.021 (0.5512 – 0.5520)	14.04 (0.553)
			Claw thickness	5.93 – 6.00 (0.233 – 0.236)	5.6 (0.22)
TRANSMISSION	Gear I.D.		M4	31.000 – 31.025 (1.2205 – 1.2215)	31.04 (1.222)
			M5	30.000 – 30.021 (1.1811 – 1.1819)	30.04 (1.183)
			C2, C3	34.000 – 34.016 (1.3386 – 1.3392)	34.04 (1.340)
	Gear bushing O.D.		M4	30.950 – 30.975 (1.2185 – 1.2195)	30.93 (1.218)
			M5	29.955 – 29.980 (1.1793 – 1.1803)	29.93 (1.178)
			C2, C3	33.940 – 33.965 (1.3362 – 1.3372)	33.92 (1.335)
	Gear bushing I.D.		M4	28.000 – 28.021 (1.1024 – 1.1032)	28.04 (1.104)
			M5	23.000 – 23.021 (0.9055 – 0.9063)	23.03 (0.907)
	Mainshaft O.D.		M4	27.974 – 27.987 (1.1013 – 1.1018)	27.95 (1.100)
			M5	22.974 – 22.987 (0.9045 – 0.9050)	22.95 (0.904)
	Gear-to-bushing		M4	0.025 – 0.075 (0.0010 – 0.0030)	0.10 (0.004)
			M5	0.020 – 0.066 (0.0008 – 0.0026)	0.09 (0.004)
			C2, C3	0.035 – 0.076 (0.0014 – 0.0030)	0.10 (0.004)
	Bushing-to-shaft		M4, M5	0.013 – 0.047 (0.0005 – 0.0019)	0.08 (0.003)
CYLINDER, PISTON	Cylinder compression pressure			1300 – 1700 kPa (13.0 – 17.0 kgf/cm², 185 – 242 psi)	1000 kPa (10.0 kg/cm², 142 psi)
	Cylinder	I.D.		71.010 – 71.025 (2.7957 – 2.7963)	71.1 (2.80)
		Out-of-round		—	0.15 (0.006)
		Taper		—	0.05 (0.002)
		Top warpage		—	0.05 (0.002)
	Piston	O.D. (at skirt)		70.960 – 70.990 (2.7937 – 2.7949)	70.85 (2.789)
		Piston pin bore		18.010 – 18.016 (0.7091 – 0.7093)	18.03 (0.710)
		Piston-to-cylinder clearance		0.020 – 0.065 (0.0008 – 0.0026)	0.10 (0.004)

Unit: mm (in)

ITEM				STANDARD	SERVICE LIMIT
CYLINDER, PISTON	Piston ring	End gap	Top and second	0.15 – 0.30 (0.006 – 0.012)	0.5 (0.02)
			Oil ring side rail	0.20 – 0.70 (0.008 – 0.028)	0.9 (0.04)
		Ring-to-ring land clearance	Top	0.025 – 0.055 (0.0010 – 0.0022)	0.10 (0.004)
			Second	0.015 – 0.045 (0.0006 – 0.0018)	0.10 (0.004)
	Piston pin	O.D. (at sliding surfaces)		17.994 – 18.000 (0.7084 – 0.7087)	18.99 (0.748)
		Pin-to-piston clearance		0.010 – 0.022 (0.0004 – 0.0009)	0.05 (0.002)
		Pin-to-rod interference		0.015 – 0.039 (0.0006 – 0.0015)	—
CRANKSHAFT	Main journal bearing oil clearance			0.020 – 0.038 (0.0008 – 0.0015)	0.06 (0.002)
	Crankpin bearing oil clearance			0.027 – 0.045 (0.0011 – 0.0018)	0.06 (0.002)
	Crankshaft runout (at center journal)			—	0.03 (0.001)
	Connecting rod side clearance			0.15 – 0.30 (0.006 – 0.012)	0.40 (0.016)
	Crankpin and main journal		Taper	—	0.003 (0.0001)
			Out-of-round	—	0.005 (0.0002)
WHEELS	Wheel axle runout			—	0.2 (0.01)
	Wheel rim runout		Axial	—	2.0 (0.08)
			Radial	—	2.0 (0.08)
	Tire tread depth		Front	—	1.5 (0.06)
			Rear	—	2.0 (0.08)
SUSPENSION	Rear suspension air pressure			0 – 400 kPa (0 – 4.0 kgf/cm², 0 – 57 psi)	—
	Front fork spring free length			390.6 (15.38)	382.8 (15.07)
	Front fork oil capacity		Left	327 cm³ (12.6 US oz, 13.1 Imp oz)	—
			Right	377 cm³ (12.7 US oz, 13.2 Imp oz)	—
	Front fork oil level (from the top of tube)			194 (7.6)	—
	Front fork oil			ATF	—
	Fork tube runout			—	0.2 (0.01)
	Right shock absorber oil capacity			140 cm³ (4.7 US oz, 4.9 Imp oz)	—
	Right shock absorber oil			ATF	—
FINAL DRIVE	Final gear oil	Recommended oil		Hypoid gear oil, SAE #80	—
		Capacity	At assembly	170 cm³ (5.7 US oz, 6.0 Imp oz)	—
			After draining	140 cm³ (4.7 US oz, 4.9 Imp oz)	—
	Final gear backlash			0.05 – 0.15 (0.002 – 0.006)	0.3 (0.01)
		Difference at 3 points		—	0.10 (0.004)
	Ring gear-to-stop pin clearance			0.30 – 0.60 (0.012 – 0.024)	—
BRAKES	Front brake master cylinder	Cylinder I.D.		12.700 – 12.743 (0.5000 – 0.5017)	12.755 (0.5022)
		Piston O.D.		12.684 – 12.657 (0.4980 – 0.4983)	12.645 (0.4978)
	Front brake caliper	Left	Cylinder I.D.	25.400 – 25.450 (1.0000 – 1.0020)	25.460 (1.0024)
			Piston O.D.	25.335 – 25.368 (0.9974 – 0.9987)	25.310 (0.9965)
		Right	Cylinder I.D.	30.230 – 30.280 (1.1902 – 1.1921)	30.290 (1.1925)
			Piston O.D.	30.165 – 30.198 (1.1876 – 1.1889)	30.140 (1.1866)
	Front brake disc	Thickness		5.8 – 6.2 (0.23 – 0.24)	5.0 (0.20)
		Runout		—	0.3 (0.01)
	Front brake pad thickness			5.5 (0.22)	1.0 (0.04)

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
BRAKES	Rear brake master cylinder	Cylinder I.D.		15.870 – 15.913 (0.6248 – 0.6265)	15.925 (0.6270)
		Piston O.D.		15.827 – 15.854 (0.6231 – 0.6242)	15.815 (0.6226)
		Brake rod clevis installed length		100 (3.9)	———
	Rear brake caliper	Cylinder I.D.		32.030 – 32.080 (1.2610 – 1.2630)	32.090 (1.2634)
		Piston O.D.		31.948 – 31.998 (1.2578 – 1.2598)	31.940 (1.2575)
	Rear brake disc	Thickness		7.3 – 7.7 (0.29 – 0.30)	6.0 (0.24)
		Runout		———	0.3 (0.01)
	Rear brake pad thickness			6.5 (0.26)	1.0 (0.04)
	Brake fluid (front/rear)			DOT 4	———
CHARGING	Battery capacity			12 V – 20 AH	———
	Battery specific gravity (At 20°C, 68°F)	Full charged		1.270 – 1.290	———
		Need charging		Below 1.260	———
	Battery charging current			2.0 Amperes max.	———
	Alternator	Capacity		0.55 kW/5,000 min–1 (rpm)	———
		Stator coil resistance		0.1 – 0.3 ohms (20°C, 68°F)	———
		Rotor coil resistance		2.9 – 4.0 ohms (20°C, 68°F)	———
		Rotor coil slip ring O.D.		27.0 (1.06)	26.0 (1.02)
		Charging start		800 – 1,000 min^{-1} (rpm)	———
	Regulator/ Rectifier (into alternator)	Type		Transistorized non-adjustable reg./recti.	———
		Regulated voltage (at 20°C/68°F)	900 min^{-1} (rpm)	0 – 2 A, 13.5 – 15.5 V	———
			1,850 min^{-1} (rpm)	1.5 A min., 13.5 – 15.5 V	———
IGNITION	Firing order			1 – 4 – 5 – 2 – 3 – 6 – 1	———
	Ignition timing		F mark	3.5°BTDC at 800 ± 80 min^{-1} (rpm) (SW model 800 ± 50 min^{-1} (rpm))	———
		Vacuum advance	Advance start	60 – 160 mmHg (2.4 – 6.3 inHg)	———
			Advance cease	310 – 360 mmHg (12.2 – 14.2 inHg)	———
	Ignition coil resistance (at 20°C/68°F)	Primary coil		2.6 – 3.2 ohms	———
		Secondary coil	With spark plug wire	20.2 – 26.8 Kohms	———
			Without spark plug wire	11.7 – 14.3 Kohms	———
	Pulse generator coil resistance (At 20°C, 68°F)			400 – 500 ohms	———
	Tw sensor/Ta sensor resistance		20°C (68°F)	2.0 – 3.0 Kohms	———
			80°C (176°F)	200 – 400 ohms	———
STARTER/ REVERSE	Starter motor brush length			12.5 (0.49)	6.0 (0.24)
	Reverse System	Starter relay regulator/regulated current		0.7 – 1.0 A	———
		Resister	Between connector and resistor terminals	0.12 – 0.17 ohms	———
ELECTRICAL	Oil pressure switch continuity pressure			10 – 20 kPa (0.1 – 0.2 kgf/cm^2, 1 – 3 psi)	———
	Fuel level sensor resistance (at 20°C, 68°F)		Empty	90 – 100 ohms	———
			Reserve	66 – 81 ohms	———
			Full	4 – 10 ohms	———

TORQUE VALUES

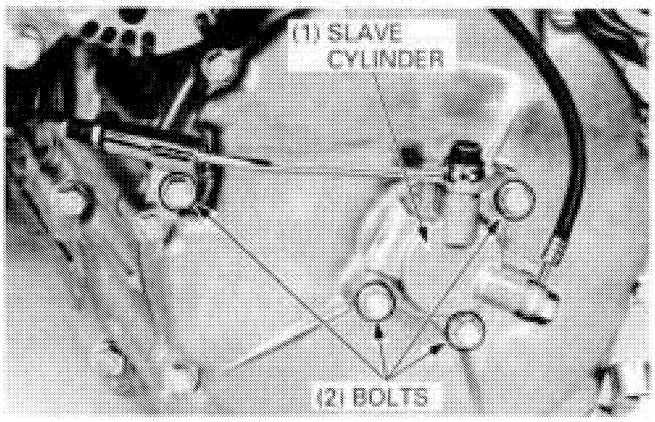
ENGINE

Item	Qty	Thread dia (mm)	Torque			Remarks
			N·m	kgf·m	lbf·ft	
Spark plug	6	12	15	1.5	11	
Carburetor insulator band screw	4	5	5	0.5	3.6	
Intake manifold vacuum tube joint	1	5	2.5	0.25	1.8	Except SW, AR
	2	5	2.5	0.25	1.8	SW, AR
Coolant temperature sensor	1	PT 1/8	12	1.2	9	NOTE 1
Water hose clamp screw	2	4	2.0	0.2	1.4	
Thermostatic fan motor switch	1	16	18	1.8	13	
Tw sensor	1	12	27	2.8	20	
Reverse switch	1	10	12	1.2	9	
Reverse shifter shaft bolt	1	6	14	1.4	10	NOTE 2
LUBRICATION:						
Oil pressure switch	1	PT 1/8	12	1.2	9	NOTE 1
Engine oil drain bolt	1	14	34	3.5	25	
Engine oil filter cartridge	1	20	10	1.0	7	
Engine oil filter boss	1	20	17	1.7	12	NOTE 2
CYLINDER HEAD:						
Cylinder head bolt (9 mm bolt)	16	9	44	4.5	33	NOTE 3
Timing belt driven pulley bolt	2	8	26	2.7	20	
Camshaft holder bolt	16	8	20	2.0	14	
Hydraulic valve adjuster stopper plug	12	14	29	3.0	22	
Cylinder head cover bolt	12	6	12	1.2	9	
Timing belt tensioner bolt	4	8	26	2.6	19	NOTE 2
Cylinder head sealing bolt	6	18	44	4.5	33	NOTE 2
CLUTCH:						
Clutch hose/pipe oil bolt	3	10	34	3.5	25	
Clutch slave cylinder bleed valve	1	8	9	0.9	7	
Clutch bleed pipe bolt	1	6	12	1.2	9	NOTE 2
Clutch center lock nut	1	22	127	13.0	94	
Clutch outer lock nut	1	40	186	19.0	137	NOTE 2/5
ALTERNATOR:						
Alternator mounting bolt	3	8	29	3.0	22	
Couple A mounting nut	1	14	57	5.8	42	NOTE 2
Couple B mounting nut	1	14	57	5.8	42	
REAR ENGINE CASE:						
Starter one-way clutch socket bolt	6	6	16	1.6	12	NOTE 2
Starter clutch mounting bolt	1	12	74	7.5	54	
Alternator drive gear bolt	6	8	26	2.7	20	NOTE 6
Final drive gear lock nut	1	22	186	19.0	137	NOTE 2/4/5
Output shaft lock nut	1	30	186	19.0	137	NOTE 5
Oil pump driven sprocket bolt	1	6	18	1.8	13	NOTE 2
Rear case cover bolt	14	8	29	3.0	22	
Output shaft bearing holder bolt	3	8	29	3.0	22	
GEARSHIFT:						
Shift arm lock bolt	1	8	25	2.5	18	
Shift drum center bolt	1	8	27	2.8	20	
Shift drum lock arm bolt	1	6	12	1.2	9	NOTE 2
Shift arm return spring pin	1	8	25	2.5	18	
STARTER/REVERSE:						
Starter/reverse motor mounting bolt	3	8	29	3.0	22	

Item	Qty	Thread dia (mm)	Torque			Remarks
			N·m	kgf·m	lbf·ft	
CRANKCASE/CRANKSHAFT/ TRANSMISSION:						
Crankcase bolt (10 mm)	8	10	34	3.5	25	NOTE 6
(8 mm)	4	8	25	2.6	19	
(6 mm)	10	6	12	1.2	9	
Crankcase sealing bolt (20 mm)	4	20	44	4.5	33	NOTE 2
(18 mm)	2	18	44	4.5	33	NOTE 2
Mainshaft lock nut	1	22	186	19.0	137	NOTE 4/5
Crankshaft main bearing cap bolt	8	10	59	6.0	43	NOTE 6
Connecting rod cap nut	8	8	31	3.2	23	NOTE 6
Timing belt driven pulley bolt	1	12	74	7.5	54	

NOTES:
1. Apply sealant to the threads.
2. Apply a locking agent to the threads.
3. Apply molybdenum disulfide oil to the threads and flange surfaces.
4. Left-hand threads.
5. Stake (2 places)
6. Apply oil to the threads and flange surfaces.
7. Torque wrench scale reading using a special tool.
8. Apply grease to the threads and flange surfaces.

CLUTCH SLAVE CYLINDER



NOTE

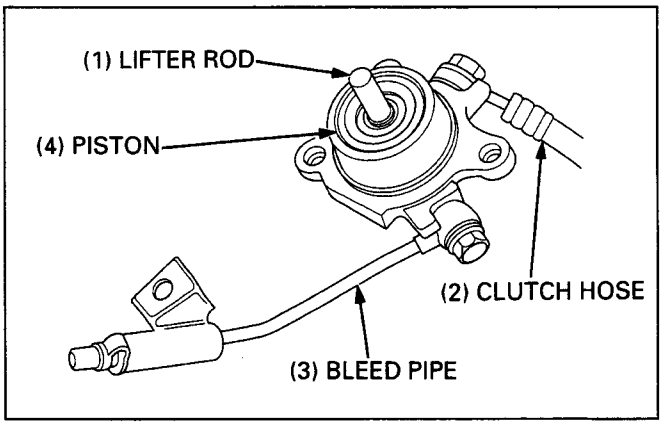
- There are two types of clutch lifter rod and lifter piece. Refer to the base shop manual when the clutch lifter rod and lifter piece are different from those in this addendum.

DISASSEMBLY

NOTE

- Clutch slave cylinder can be removed with the engine in the frame.

Remove the following:
— front side covers (page 12-6).
— bleed pipe mounting bolt and slave cylinder bolts.
— slave cylinder.
— lifter rod.



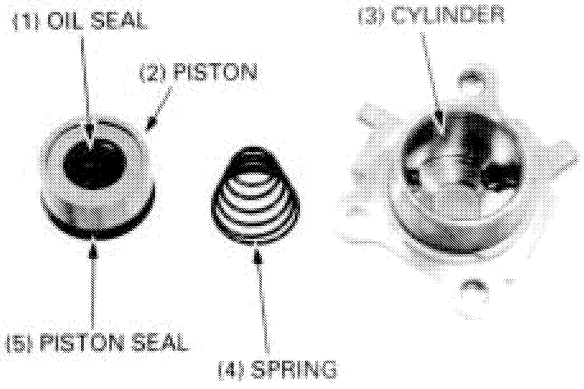
Check the piston sliding area for fluid leak.
To get the slave piston out of the slave cylinder, squeeze the clutch lever several times.

CAUTION

- *Avoid spilling brake fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.*

Remove the clutch hose and bleed pipe if necessary.

Check the following for score, wear or damage.
— piston
— seals
— spring
— cylinder

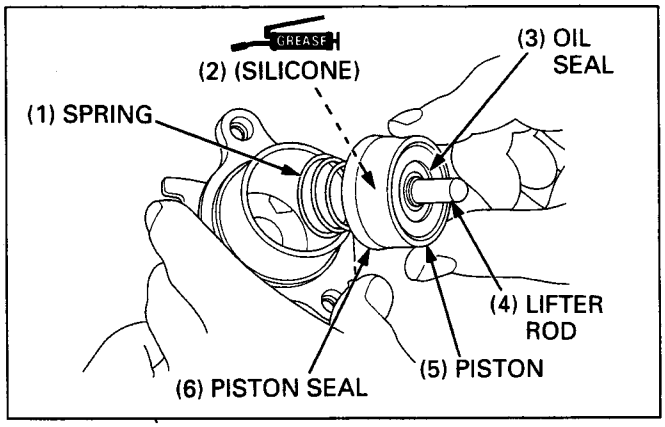


ASSEMBLY

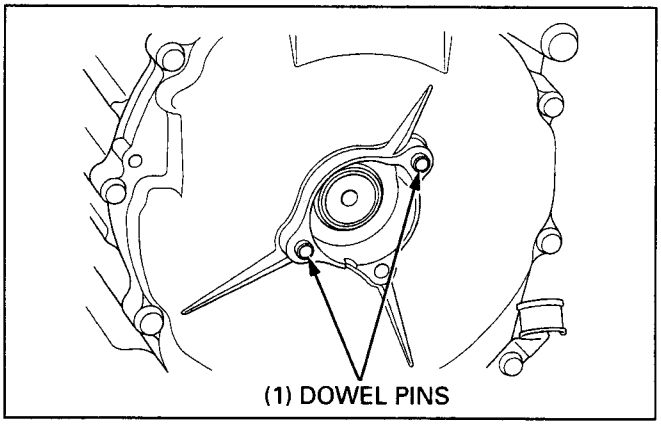
Apply small amount of silicone grease (0.2 grammes) to the lifter rod attaching area of the piston.
Apply clean DOT 4 fluid to the piston and a new piston seal.
Apply grease to a new oil seal lips.

Install the following to the piston:
— seals
— spring
— lifter rod

Install the piston into the slave cylinder.



Install the dowel pins to the clutch cover.

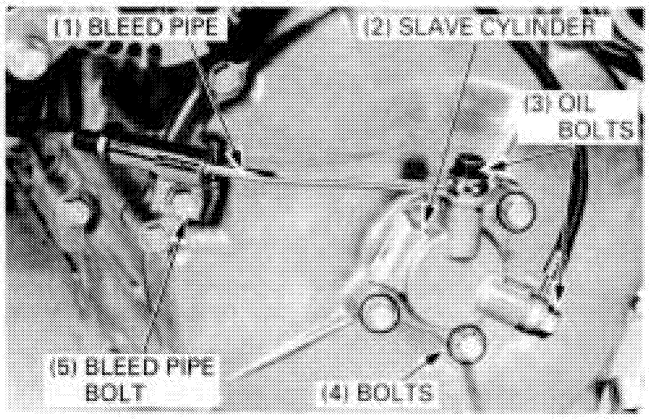


Install the slave cylinder and tighten the bolts securely.
Install the clutch hose and bleed pipe with new sealing washers to the slave cylinder if removed them.
Tighten the oil bolts to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Apply locking agent to the bleed pipe mounting bolt threads.
Tighten the bleed pipe mounting bolt.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Install the following:
— front side covers (page 12-6)

Fill and bleed the clutch hydraulic system (page 8-4).

CLUTCH

NOTE

- There are two types of clutch lifter rod and lifter piece. Refer to the base shop manual when the clutch lifter rod and lifter piece are different from those in this addendum.

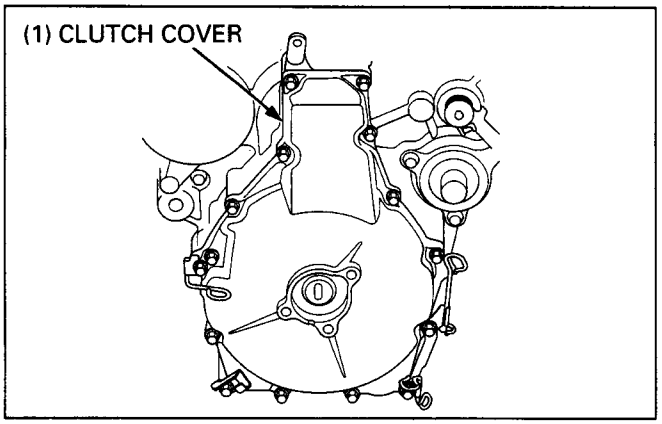
DISASSEMBLY/INSPECTION

NOTE

- Clutch can be removed with the engine in the frame.

Drain the engine oil (page 2-4).

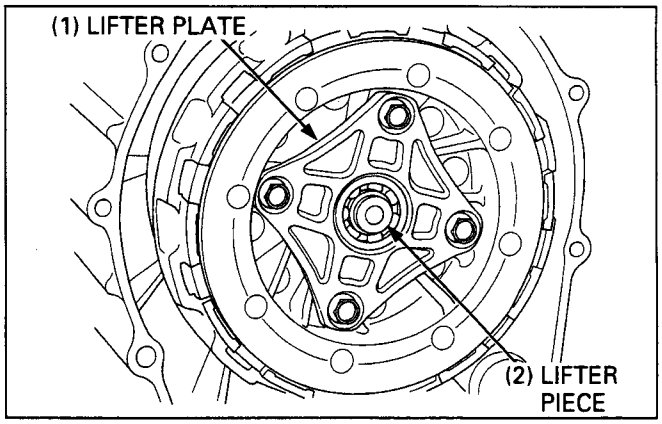
Remove the following:
— front side covers (page 12-6)
— left exhaust pipe protector and heat protector (page 12-16)
— clutch slave cylinder (page 33-11)



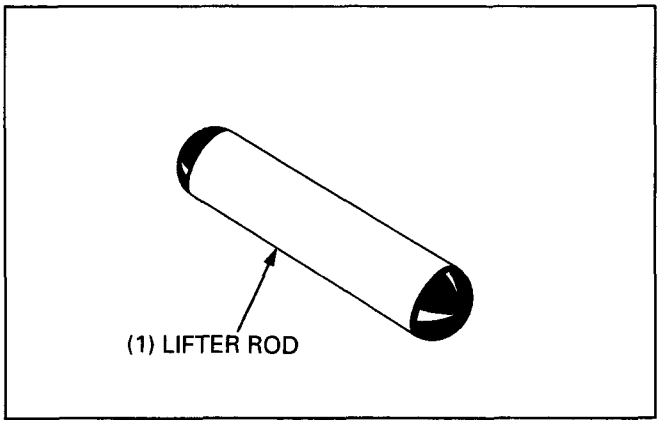
NOTE

- 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.

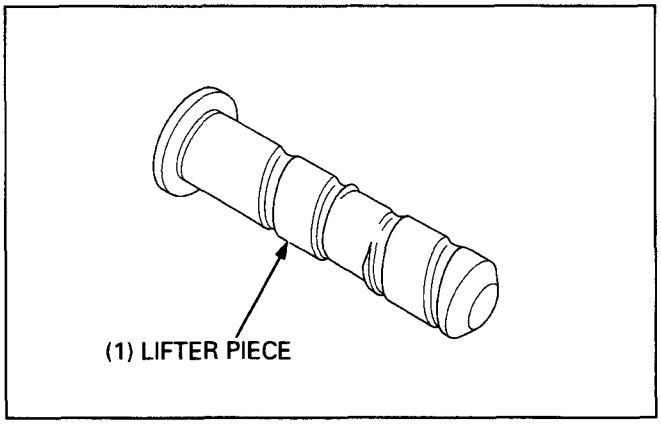
— clutch cover.
— dowel pins and gasket.
— clutch lifter piece.
— clutch lifter plate.



Inspect the lifter rod for wear or damage.



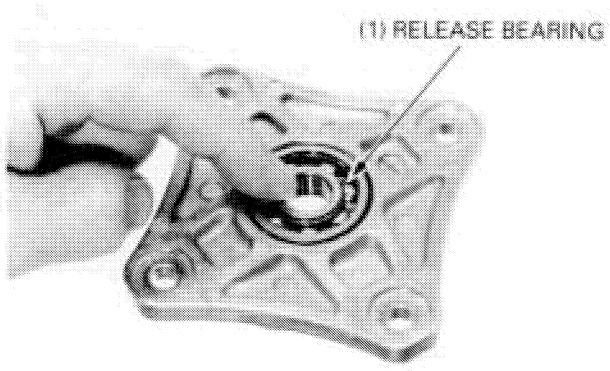
Check the lifter piece for wear or damage.



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

Remove and discard the bearing if the races do not turn smoothly, quietly, or if loosely in the lifter plate.

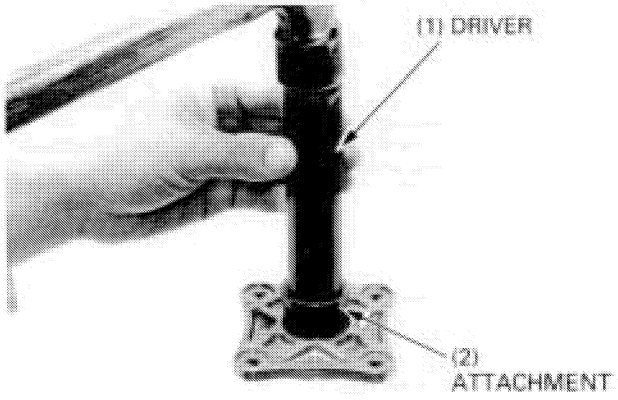
Drive the bearing out of the lifter plate.



Install the bearing its marked side facing down.

TOOLS:

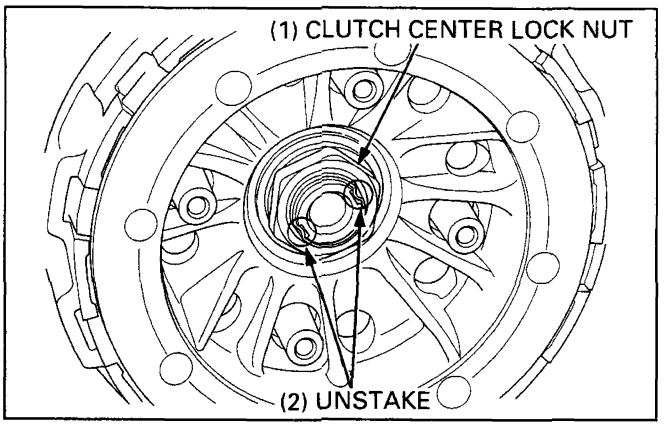
Driver	**07749 – 0010000**
Attachment, 32 x 35 mm	**07746 – 0010100**



Unstake the clutch center lock nut with a drill or grinder.

CAUTION

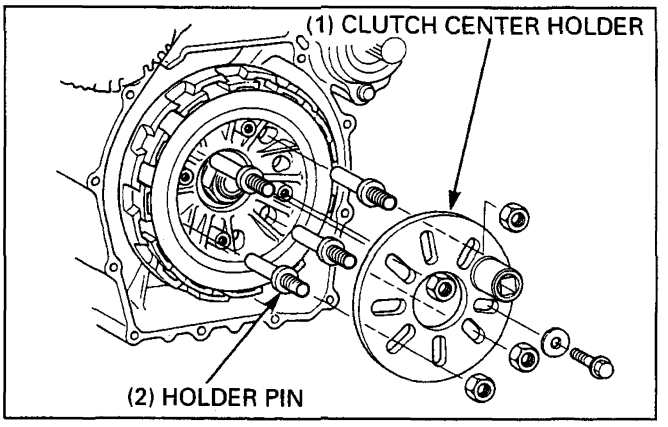
- *Be careful not to damage the mainshaft threads.*



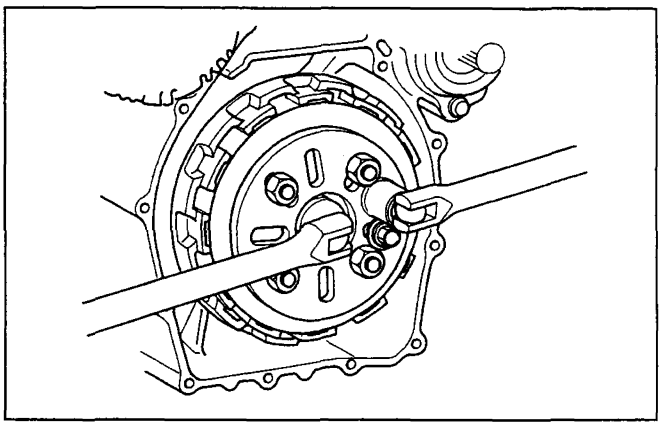
Set the clutch center holder pins in the four holes of the clutch center and pressure plate.
Install the clutch center holder onto the pins, set it with a suitable 6 mm washer and lifter plate (6 mm) bolt, and then tighten the nuts securely.

TOOLS:

Clutch center holder pin	**07VMB – MZ00100**
Clutch center holder	**07JMB – MN50300**



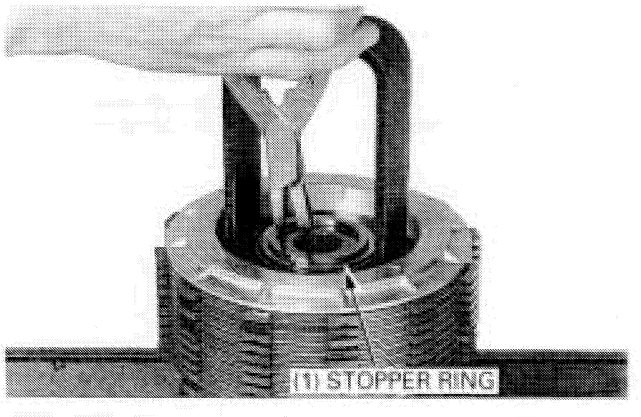
Hold the clutch center holder, loosen the clutch center lock nut and remove it.
Remove the washer.
Remove the clutch center assembly from the clutch outer.



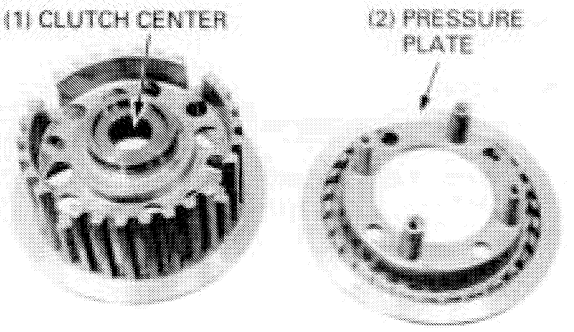
Compress the clutch spring with a suitable tool and a hydraulic press just enough to remove the stopper ring; remove the stopper ring and disassemble the clutch center assembly.

CAUTION

- *To prevent a loss of tension, do not compress the clutch spring more than necessary to remove the stopper ring.*

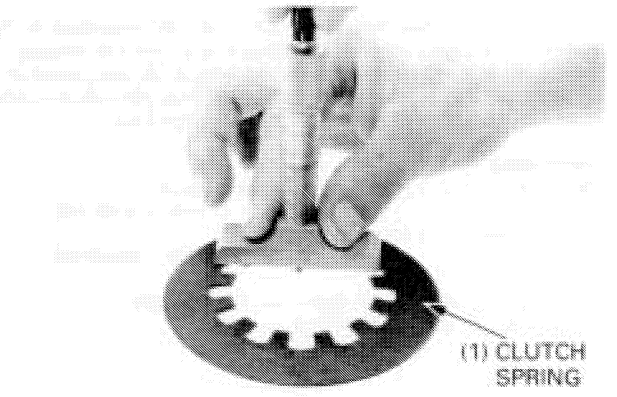


Check the clutch center and pressure plate for nicks, cuts and indentations made by the plates.



Measure the height of the clutch spring.

SERVICE LIMIT: 5.1 mm (0.20 in)

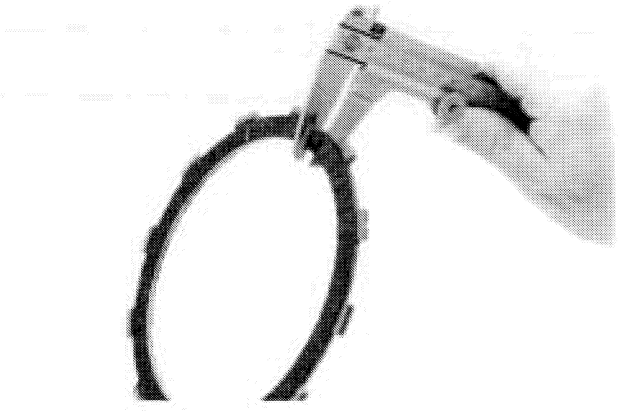


Replace the clutch discs if they show signs of scoring or discoloration.
Measure each clutch disc thickness.

SERVICE LIMIT: 3.5 mm (0.14 in)

NOTE

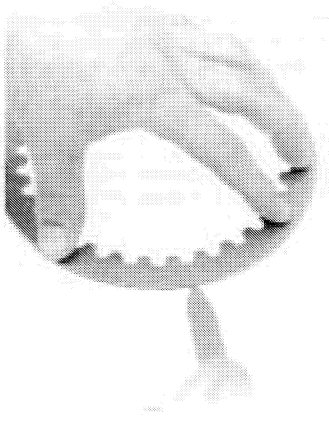
- Replace the discs and plates as a set.

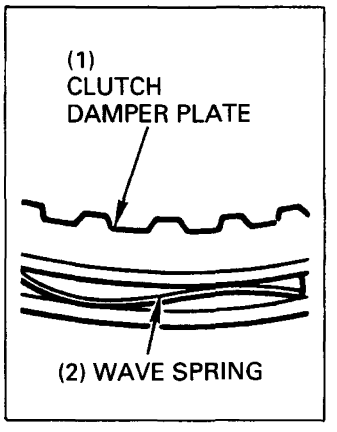


Check for plate warpage on a surface plate using a feeler gauge.

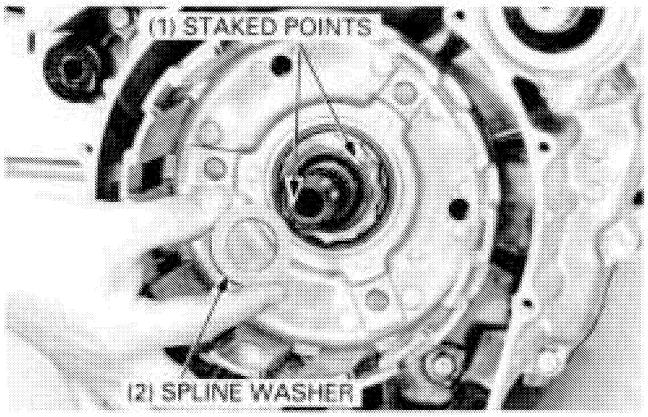
SERVICE LIMIT: 0.30 mm (0.012 in)

Check the clutch damper plate wave spring for damage.





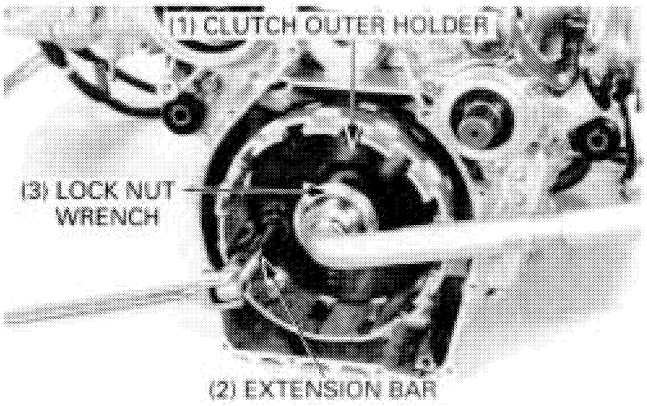
Remove the spline washer from the mainshaft.
Unstake the clutch outer lock nut.



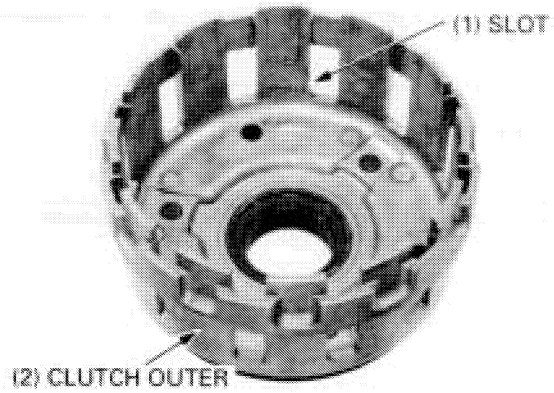
Hold the clutch outer with the special tool.
Remove the clutch outer lock nut and discard it.
Remove the lock washer and clutch outer.

TOOL:

Clutch outer holder	**07JMB – MN50100**
Extension bar	**07716 – 0020000**
Lock nut wrench, 46 mm	**07JMA – MN50100**



Check the slots in the clutch outer for nicks, cuts and indentations made by the friction discs. If the surfaces are not smooth or there is evidence of other damage, replace the clutch outer.



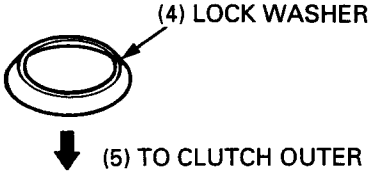
ASSEMBLY

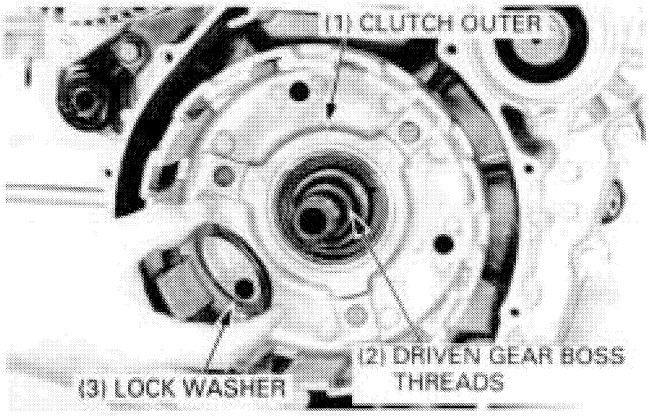
Clean the primary driven gear boss threads thoroughly.

Install the clutch outer and lock washer.

NOTE

- Install the lock washer as shown.



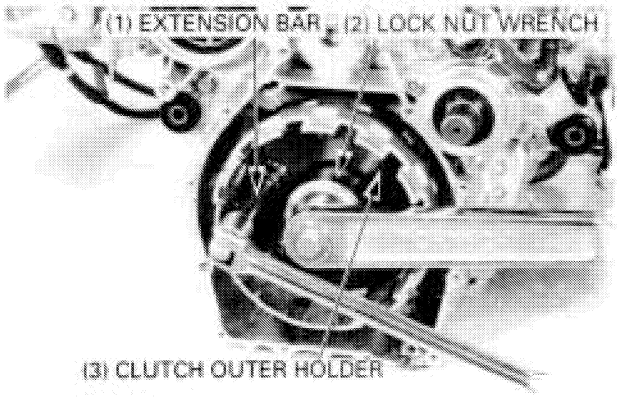


Apply a locking agent to the threads of a new lock nut.
Tighten the lock nut to the specified torque with the special tools.

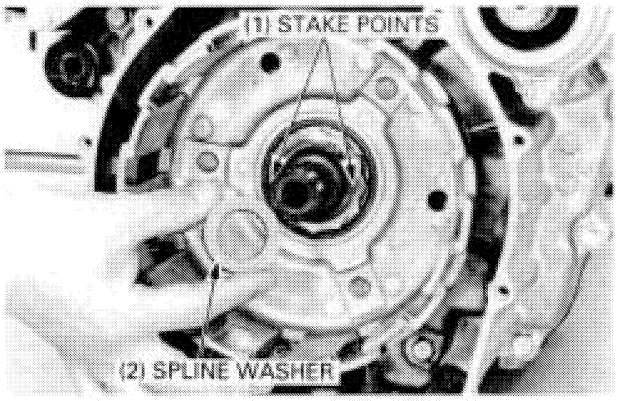
TORQUE: 186 N·m (19.0 kgf·m, 137 lbf·ft)

TOOLS:

Clutch outer holder	**07JMB – MN50100**
Extension bar	**07716 – 0020000**
Lock nut wrench, 46 mm	**07JMA – MN50100**



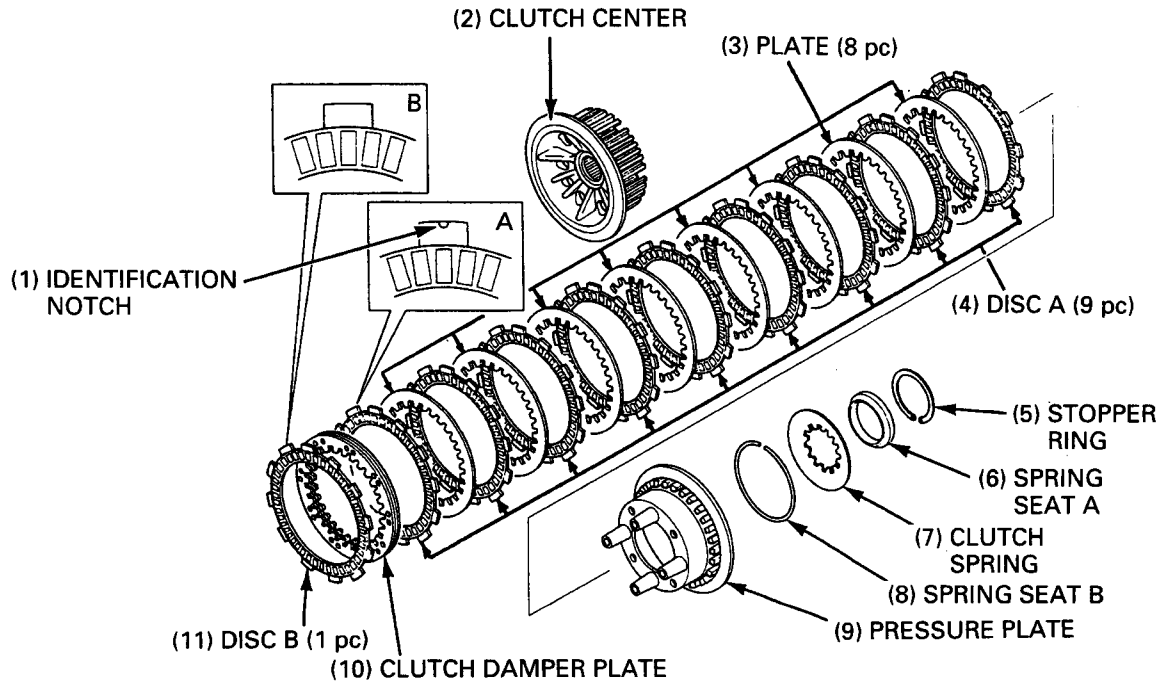
Stake the lock nut for two places.
Install the spline washer.



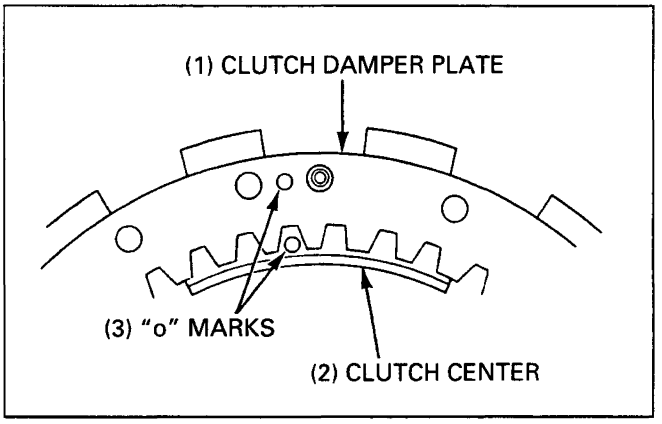
Coat the clutch discs and plates with clean engine oil.

NOTE

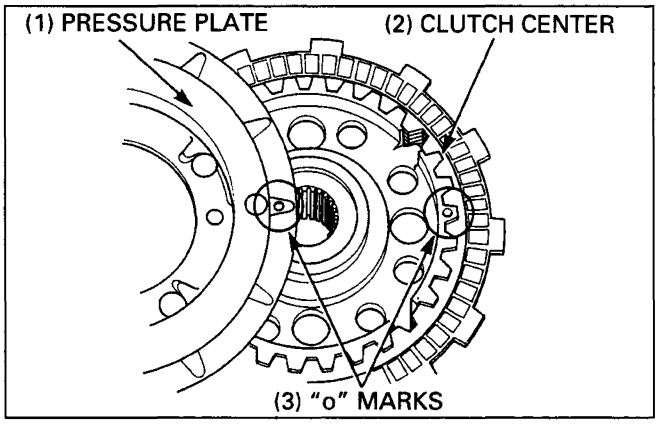
- Do not interchange clutch disc A and disc B. Disc A has the identification notch in its tab in three places, and disc B has no identification notch.



Install the clutch damper plate, aligning the "o" marks on the clutch damper plate and clutch center.

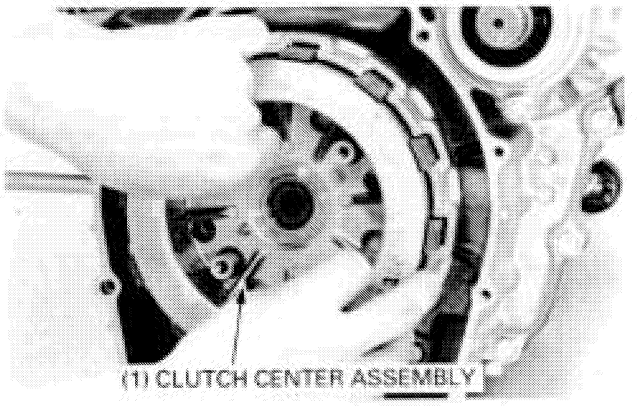


Install the pressure plate, aligning the "o" marks on the pressure plate and clutch center.



Slide the clutch center assembly into the clutch outer to align the discs and plates.

Remove the clutch center assembly from the clutch outer without disturbing the alignment.

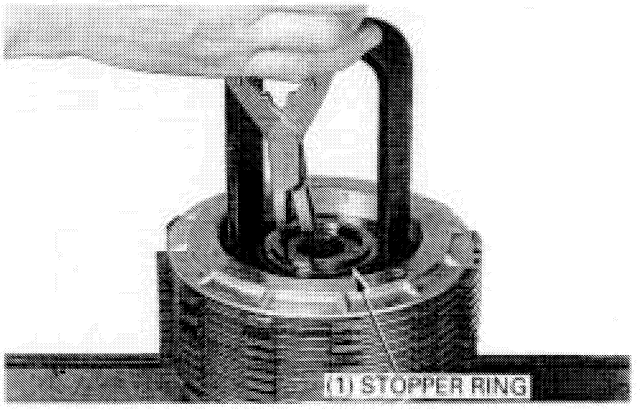


Install spring seat B, the clutch spring and spring seat A on the pressure plate.

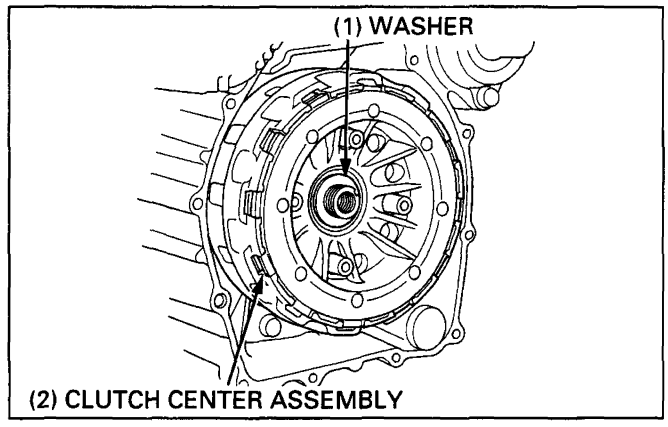
Compress the clutch spring with a suitable tool and a hydraulic press just enough to reinstall the stopper ring and install the stopper ring into the groove in the clutch center securely.

CAUTION

- *To prevent a loss of tension, do not compress the clutch spring more than necessary to install the stopper ring.*



Install the clutch center assembly into the clutch outer and onto the mainshaft.
Install the washer.



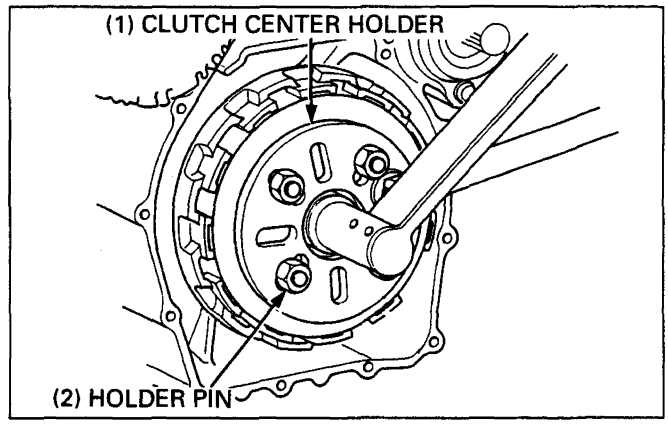
Install a new clutch center lock nut.
Set the clutch center holder pins in the four holes of the clutch center and pressure plate.
Install the holder plate onto the pins, set it with a suitable 6 mm washer and lifter plate (6 mm) bolt, and then tighten the nuts securely.

TOOLS:

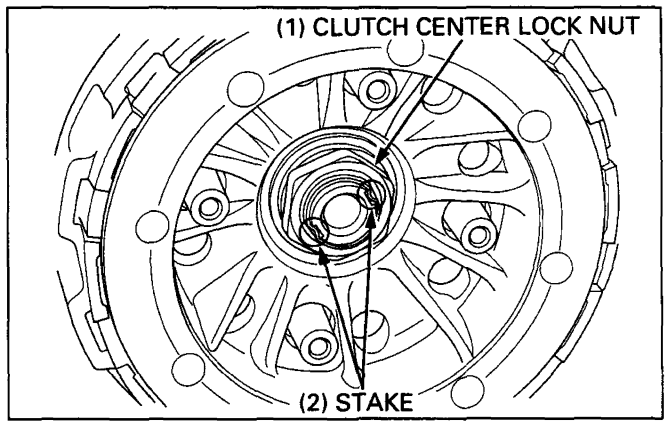
Clutch center holder pin	**07VMB – MZ00100**
Clutch center holder	**07JMB – MN50300**

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

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



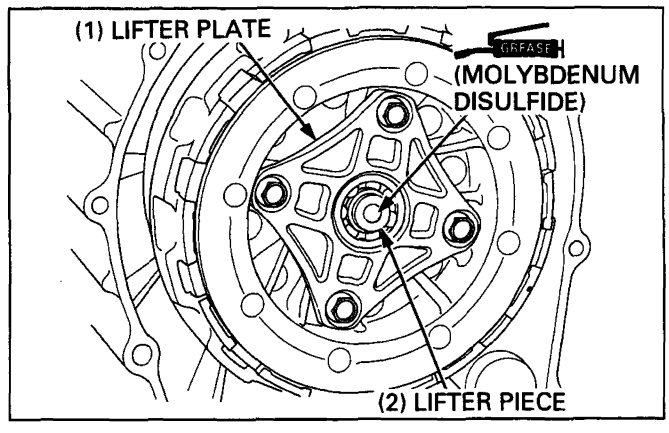
Stake the clutch center lock nut into the mainshaft in two places.



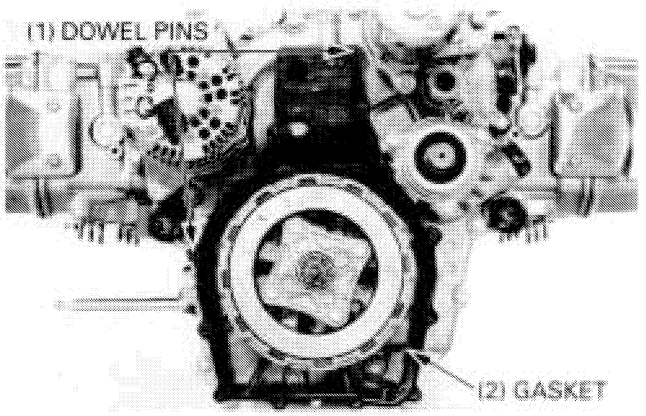
Install the clutch lifter plate and tighten the mounting bolts in a crisscross pattern in 2 or 3 steps.

Coat the clutch lifter piece with molybdenum disulfide grease and install it.

Check that the lifter piece turns smoothly. If not, loosen the lifter plate bolts, center the lifter plate and retighten the bolt in a crisscross pattern in 2 or 3 steps.



Install two dowel pins and a new gasket.



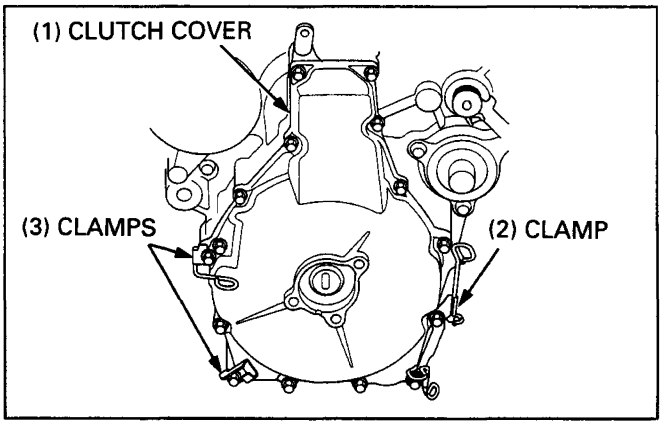
Install the following:
— clutch cover
— clutch slave cylinder (page 33-12).

NOTE

- Release the clutch lever from the handlebar grip and push the slave cylinder piston in all the way.

— left exhaust pipe protector and heat protector (page 12-16)
— front side covers (page 12-16)

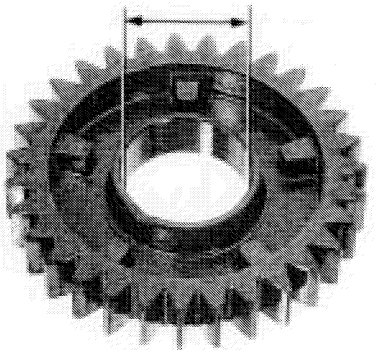
Fill the crankcase with the recommended engine oil (page 2-4).



TRANSMISSION

TRANSMISSION GEAR/SHAFT INSPECTION

Check the gear dogs, teeth, and bushing for excessive or abnormal wear, or insufficient lubrication.

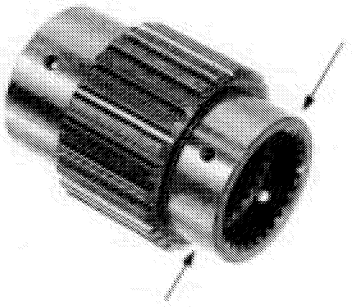


Measure the gear I.D.

SERVICE LIMITS: M4: 31.04 mm (1.222 in)
M5: 30.04 mm (1.183 in)
C2, C3: 34.04 mm (1.340 in)

Measure the gear bushing O.D.

SERVICE LIMITS: M4: 30.93 mm (1.218 in)
M5: 29.93 mm (1.178 in)
C2, C3: 33.92 mm (1.335 in)



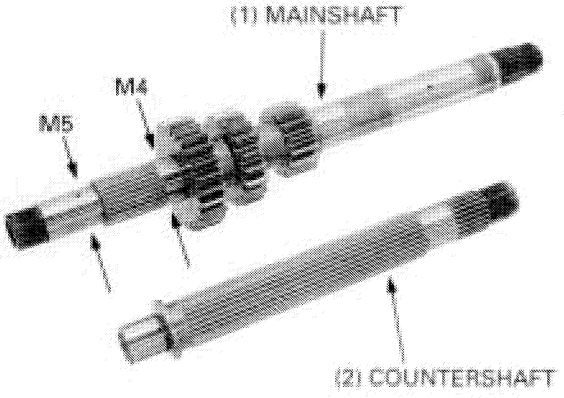
Calculate the gear-to bushing clearance.

SERVICE LIMITS: M4: 0.10 mm (0.004 in)
M5: 0.09 mm (0.004 in)
C2, C3: 0.10 mm (0.004 in)

Measure the gear bushing I.D.

SERVICE LIMITS: M4: 28.04 mm (1.104 in)
M5: 23.03 mm (0.907 in)

Check the mainshaft and countershaft for excessive or abnormal wear.



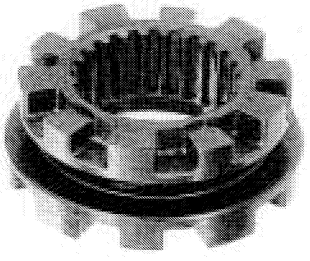
Measure the mainshaft O.D.

SERVICE LIMITS: At M4 gear: 27.95 mm (1.100 in)
At M5 gear: 22.95 mm (0.904 in)

Calculate the gear bushing-to-mainshaft clearance.

SERVICE LIMIT: 0.08 mm (0.003 in)

Check the gear shifter groove for excessive or abnormal wear.

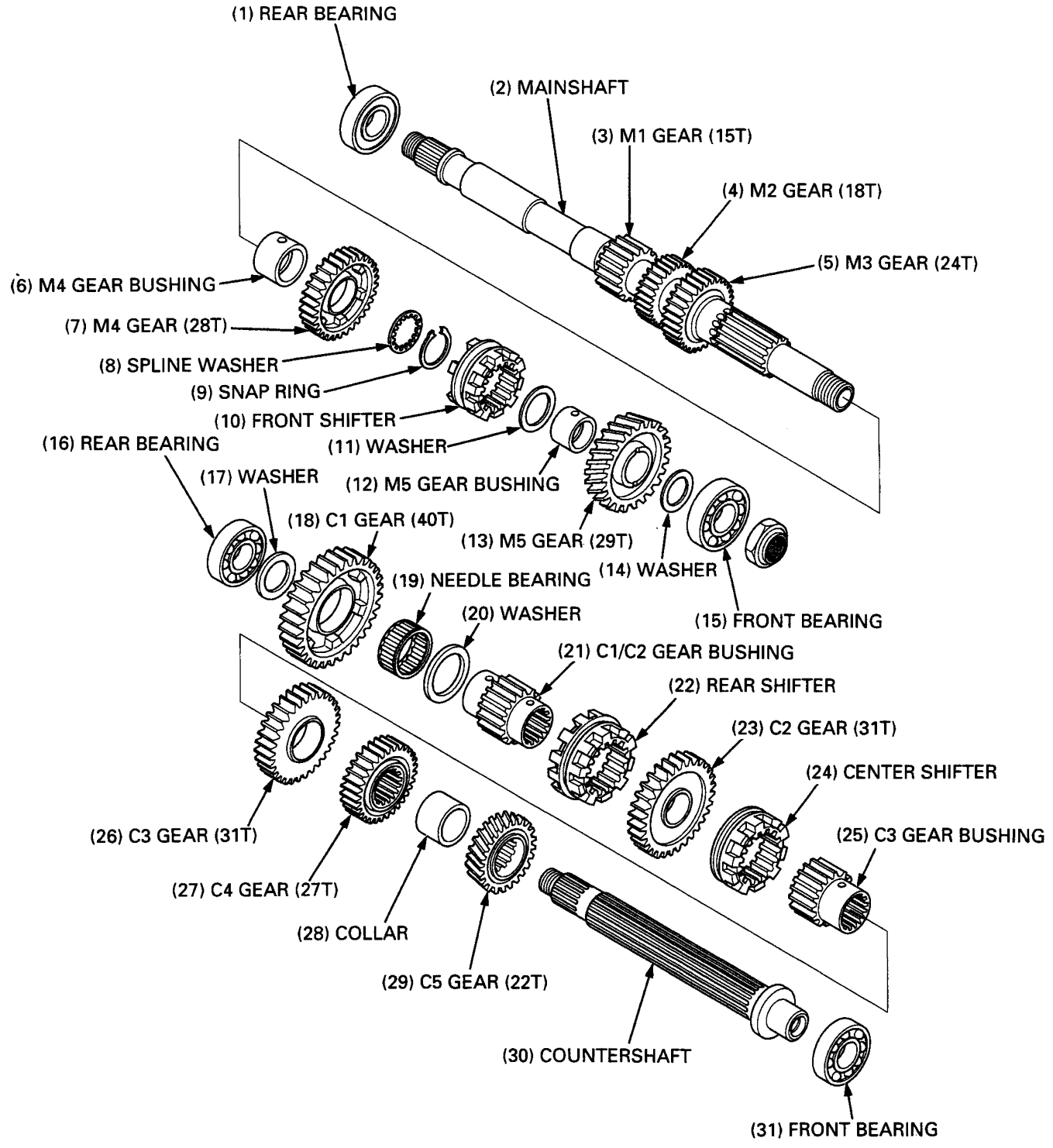


ASSEMBLY

Clean all disassembled parts in solvent and coat them with clean engine oil.

NOTE

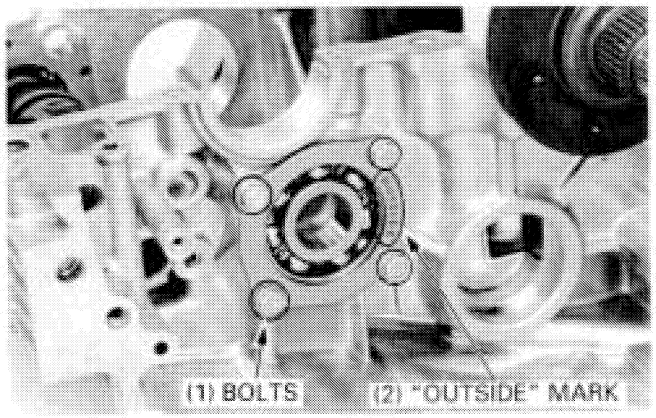
- Align the oil holes in the bushings with the oil holes in the shafts.



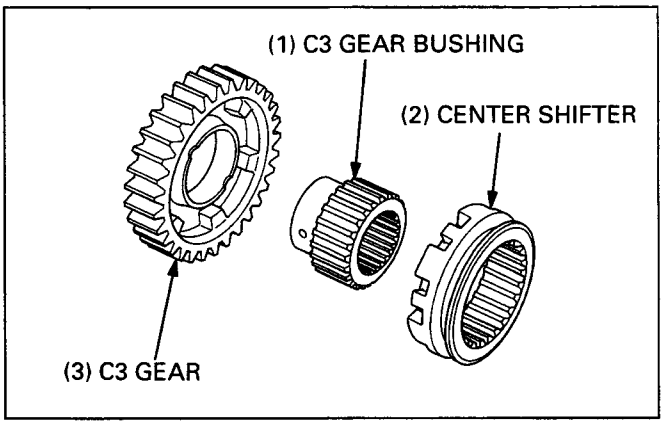
If removed, install the bearing with marked side facing out.

Install the bearing holder with the "OUTSIDE" mark facing out.

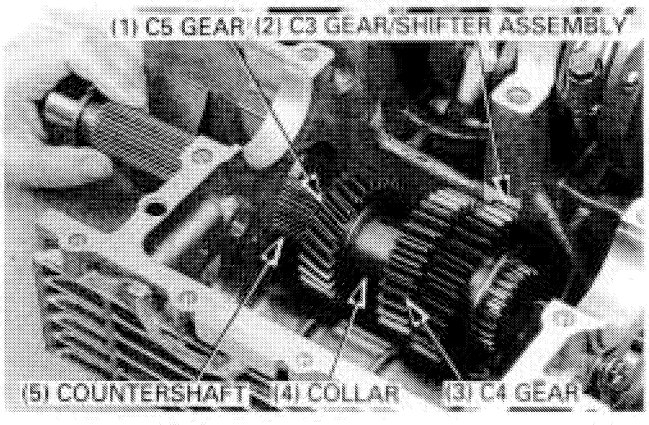
Apply a locking agent to the bolt threads and tighten the bolts securely.



Apply molybdenum disulfide oil to the center shifter groove.
Install the C3 gear and center shifter onto the C3 bushing.



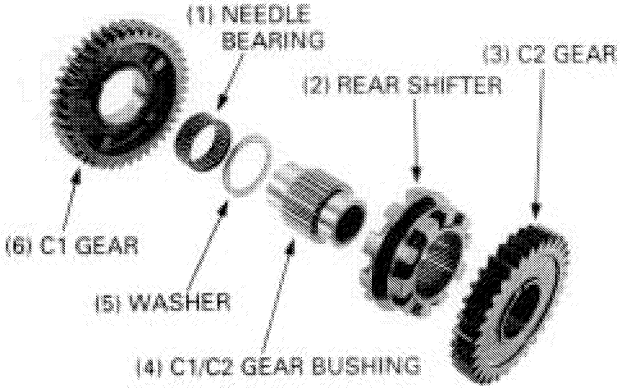
Install the C5 gear, collar, C4 gear and C3 gear/shifter assembly onto the countershaft.



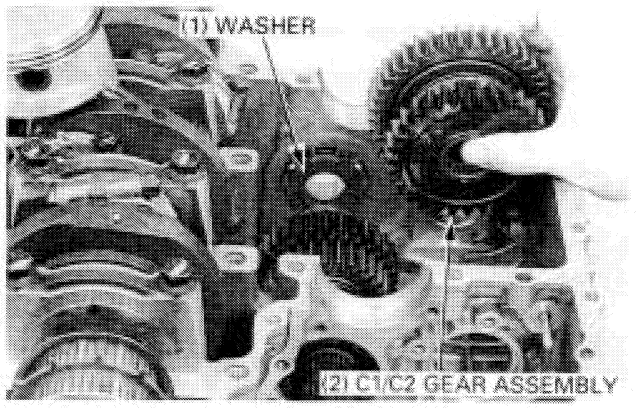
Apply molybdenum disulfide oil to the rear shifter groove.
Install the rear shifter, C2 gear, washer, needle bearing and C1 gear onto the C1/C2 bushing.

NOTE

- The longer side of the bushing sliding surfaces is toward the C1 gear.

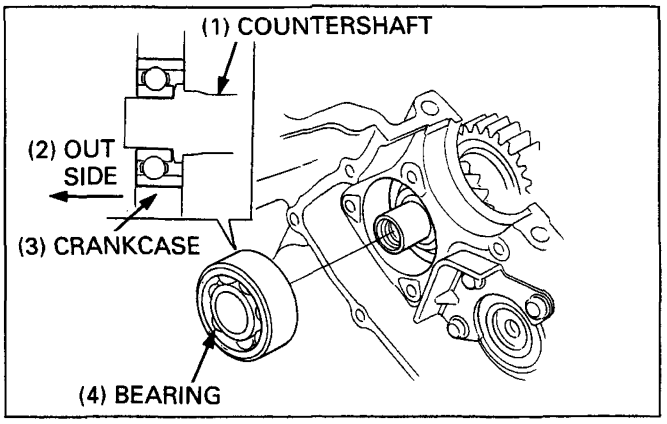


Install the C1/C2 gear assembly and washer onto the countershaft.
Install the countershaft into the rear bearing.

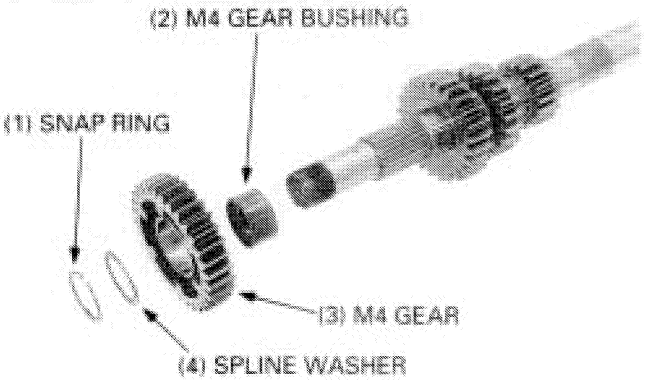


Install the countershaft front bearing as shown.

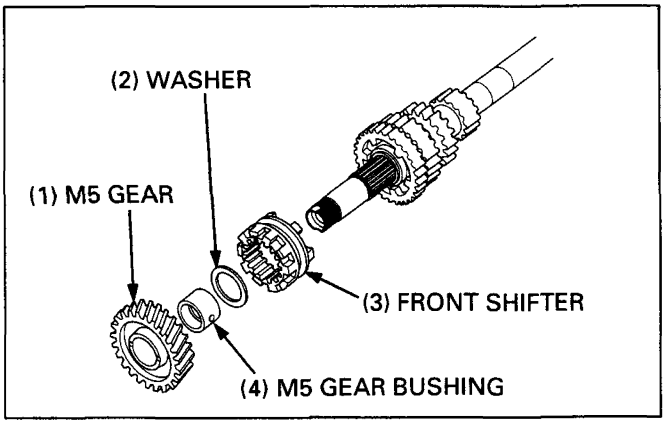
Temporarily install the final drive gear and nut to prevent the countershaft from sliding out of the case (page 9-17).



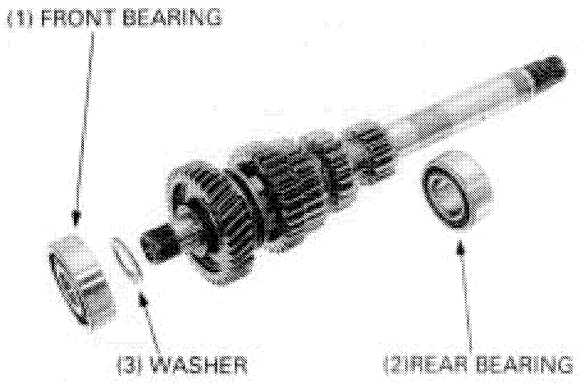
Install the M4 gear bushing and M4 gear onto the mainshaft.
Install the spline washer and snap ring with the chamfered side facing the M4 gear.



Apply molybdenum disulfide oil to the front shifter groove.
Install the front shifter, washer, M5 gear bushing and M5 gear onto the mainshaft.



Install the washer and bearings onto the mainshaft.



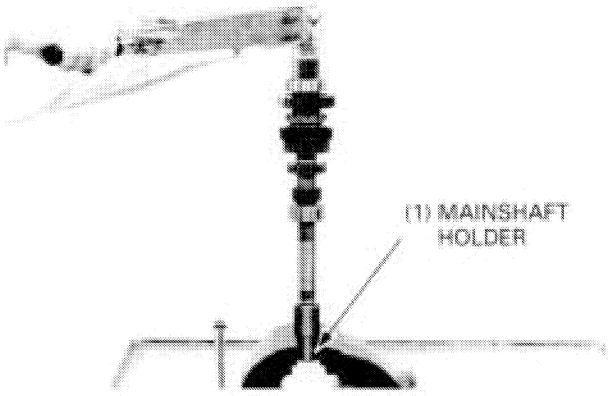
Hold the mainshaft with the mainshaft holder in a vise.
Install and tighten a new mainshaft lock nut.

NOTE

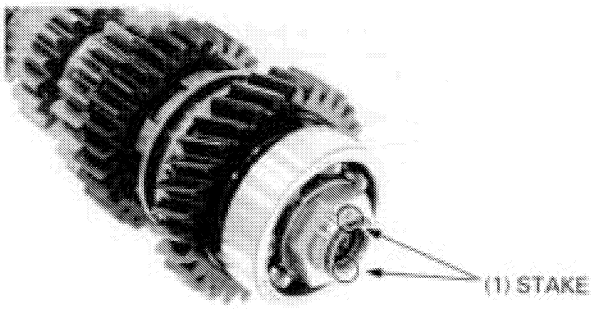
- The mainshaft lock nut has left-hand threads.

TOOL:
Mainshaft holder **07JMB – MN50200**

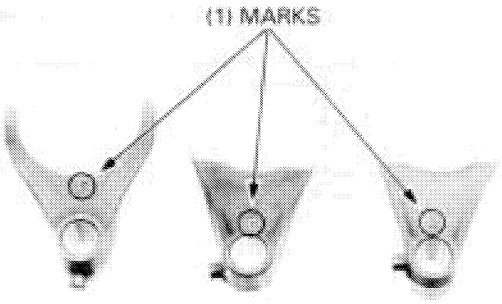
TORQUE: 186 N·m (19.0 kgf·m, 137 lbf·ft)



Stake the mainshaft lock nut in two places.



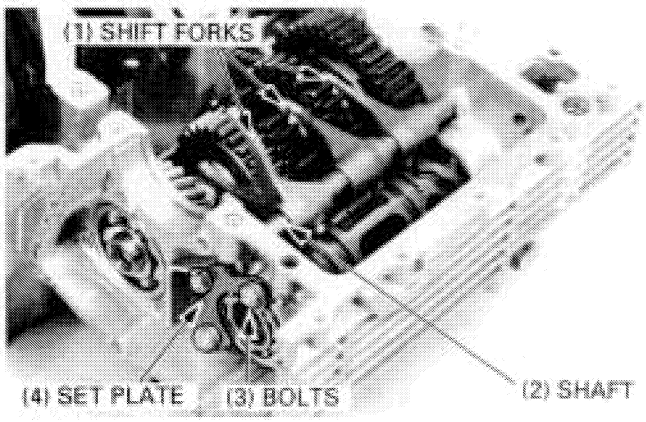
Shift forks have the following identification marks:
— F: front fork
— C: center fork
— R: rear fork



Install the shift forks onto their shifters and shift drum grooves with the marked side (F, C or R) facing toward the front.

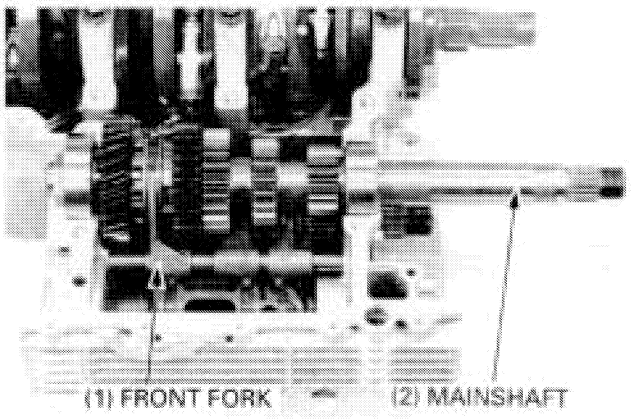
Apply oil to the shift fork shaft.
Slide the shaft through the crankcase and all shift forks.

Apply a locking agent to the set plate bolt threads.
Install the set plate and tighten the bolts securely.

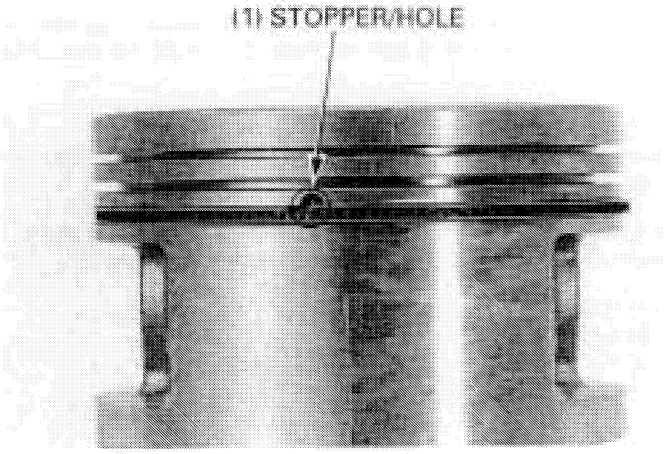


Install the mainshaft, aligning the front fork with the front shifter groove.

After assembling, check for smooth movement.



PISTON/CONNECTING ROD INSTALLATION



PISTON RING INSTALLATION

Carefully install the piston rings into the piston grooves with the markings facing up.

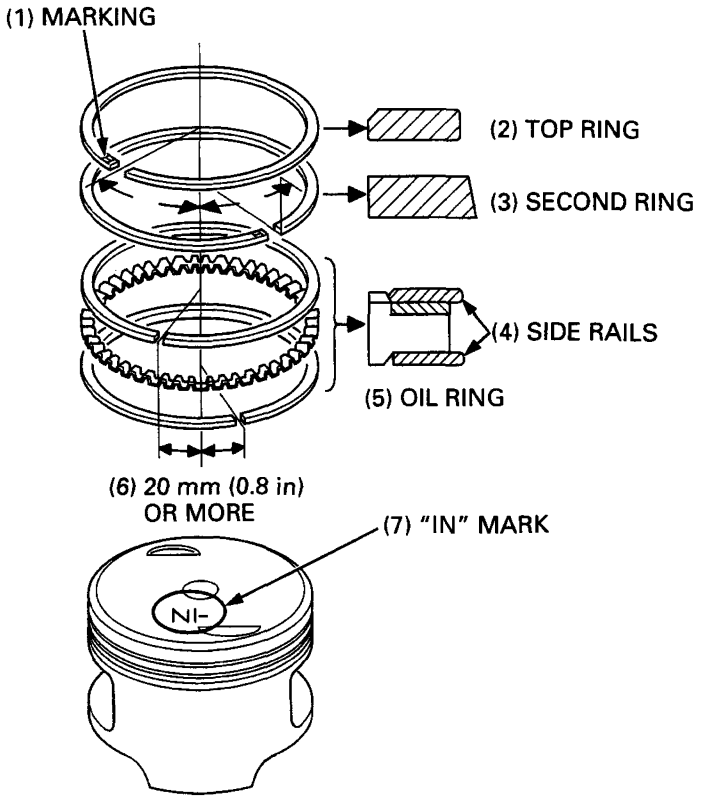
CAUTION

- *Be careful not to damage the piston and rings during installation.*

NOTE

- Do not interchange the top and second rings.
- To install the oil ring, install the spacer first, then install the side rails.
- On the upper side rail of the left cylinder (No. 2, No. 4 and No. 6) piston, align the end stopper with the stopper hole.

Stagger the top and second piston ring end gaps 60 degrees apart from "IN" mark as shown.
Stagger the side rail end gaps as shown.



Paper Book
Part No. 67MN530Q

34. GL1500A/GL1500SE (W) ADDENDUM

HOW TO USE THIS MANUAL

This addendum contains information for GL1500A (W) and GL1500SE (W).
Refer to GL1500 SHOP MANUAL (No. 67MN530, and No. 67MN530Z thru. 67MN530R) for service procedures and data not included in this addendum.

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

GL1500A (W)

CODE	AREA (TYPE)	CODE	AREA (TYPE)
AR	Austria	SD	Sweden
SP	Spain	FI	Finland
F	France	U	Australia
ED	European direct sales		

GL1500SE (W)

CODE	AREA (TYPE)	CODE	AREA (TYPE)
E	U.K.	FI	Finland
G	Germany	AR	Austria
F	France	SW	Switzerland
ED	European direct sales	SP	Spain
U	Australia		

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CONTENT

IMPORTANT SAFETY NOTICE

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

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

NOTE: Gives helpful information.

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

SPECIFICATIONS (GL1500A)

Dimensions	Overall length		2,615 mm (103.0 in)
	Overall width		955 mm (37.6 in)
	Overall height		1,495 mm (58.9 in)
	Wheelbase		1,690 mm (66.5 in)
	Seat height		740 mm (29.1 in)
	Ground clearance		115 mm (4.5 in)
	Dry weight		370 kg (816 lbs)
	Curb weight		398 kg (877 lbs)
Frame	Frame type		Double cradle
	Front suspension	Travel	Telescopic, 140 mm (5.5 in)
	Rear suspension	Travel	Swing arm, 105 mm (4.1 in)
		Air pressure	0 – 400 kPa (0 – 4.0 kgf/cm², 0 – 57 psi)
	Front tire	Size	130/70 – 18 63H (DUNLOP)
		Air pressure	225 kPa (2.25 kgf/cm², 33 psi)
	Rear tire	Size	160/80 – 16 75H (DUNLOP)
		Air pressure	250 kPa (2.50 kgf/cm², 36 psi): Driver only
			280 kPa (2.80 kgf/cm², 41 psi): Driver and Passenger
	Front brake		Double disc brake
	Rear brake		Disc brake
	Fuel capacity		23.0 lit. (6.1 US gal, 5.1 Imp gal)
	Caster angle		30°
	Trail length		111 mm (4.4 in)
	Front fork oil capacity	Left	372 cm³ (12.6 US oz, 13.1 Imp oz)
		Right	377 cm³ (12.7 US oz, 13.2 Imp oz)
Engine	Engine type		Water cooled, 4 stroke O.H.C.
	Cylinder arrangement		Flat six
	Bore and stroke		71 x 64 mm (2.8 x 2.5 in)
	Displacement		1,520 cm³ (92.7 cu-in)
	Compression ratio		9.8 : 1
	Valve train		Belt driven over head camshaft
	Oil capacity	At disassembly	4.3 lit. (4.5 US qt, 3.8 Imp qt)
		After draining	3.5 lit. (3.7 US qt, 3.1 Imp qt)
	Lubrication system		Forced and wet sump
	Cooling system capacity		4.1 lit. (4.3 US qt, 3.6 Imp qt)
	Cylinder compression		1,471 kPa (15.0 kgf/cm², 213 psi)
	Engine weight		126 kg (278 lbs)
	Camshaft: Intake valve	Opens	5° ATDC (At 1 mm lift)
		Closes	30° ABDC (At 1 mm lift)
	Camshaft: Exhaust valve	Opens	40° BBDC (At 1 mm lift)
		Closes	5° BTDC (At 1 mm lift)
	Valve clearance	Intake/Exhaust	Hydraulic valve adjuster system
	Idle speed		800 ± 80 min⁻¹ (rpm)

Carburetion	Carburetor type		CV down-draft dual carburetors
	Throttle bore		36 mm (1.4 in)
	Carburetor identification No.		VDG9C AR: VDGWE
	Pilot screw opening		2-1/2 turns out AR: 2-5/8 turns out
	Float level		7.5 mm (0.30 in)
	Main jet		pri: #80 2nd: #148
	Slow jet		#70 AR: #65
	Throttle grip free play		5 – 8 mm (3/16 – 5/16 in)
	Fuel pump flow capacity		640 cm^3 (22.5 Imp oz)/minute
	Carburetor vacuum difference		Within 40 mm (1.6 in) Hg of each other
Drive Train	Clutch type		Wet, multi-plate
	Transmission		5-speed, constant mesh
	Primary reduction ratio		1.591 (78/49)
	Secondary reduction ratio		0.971 (34/35)
	Gear ratio	1st 2nd 3rd 4th OD	2.666 (40/15) 1.722 (31/18) 1.291 (31/24) 0.964 (27/28) 0.758 (22/29)
	Final reduction ratio		2.833 (34/12)
	Gearshift pattern		Left foot operated return system 1 – N – 2 – 3 – 4 – OD
	Final gear oil capacity (After disassembly)		170 cm^3 (5.7 US oz, 6.0 Imp oz)
Electrical	Ignition		Battery ignition (Full transistor)
	Ignition timing "F" mark		3.5° BTDC at idle
	Starting system		Starting motor
	Alternator		AC generator, 0.55 kW/5,000 min^{-1} (rpm)
	Battery capacity		12 V – 20 AH
	Spark plug: Standard	NGK	DPR7EA-9
		Nippondenso	X22EPR-U9
	Spark plug: For cold climate (Below 5°C, 41°F)	NGK	DPR6EA-9
		Nippondenso	X20EPR-U9
	Spark plug: For extended high speed riding	NGK	DPR8EA-9
		Nippondenso	X24EPR-U9
	Spark plug gap		0.8 – 0.9 mm (0.031 – 0.035 in)
	Firing order		1 – 4 – 5 – 2 – 3 – 6 – 1
	Fuses		5 A x 4, 10 A x 4, 15 A x 5 (fuse box) 30 A, 55 A (main fuses) 5 A x 2, 65 A (reverse fuses)
Lights	Headlight		12 V 60 W (R), 60/55 W (L) U: 12 V 45/45 W x 2
	Position light		12 V 5 W (Except U)
	Turn signal light		12 V 21 W x 4
	Indicator light		12 V 3.4 W x 5/12 V 1.7 W x 4
	Turn signal indicator		12 V 3 W x 2
	Instrument illumination		12 V 3.4 W x 4
	LCD unit illumination		12 V 3 W x 2
	License light		12 V 5 W
	Brake and taillight		12 V 21/5 W x 2

SPECIFICATIONS (GL1500SE)

Dimensions	Overall length		2,615 mm (103.0 in)
	Overall width		955 mm (37.6 in)
	Overall height		1,495 mm (58.9 in) G: 1,315 mm (51.8 in)
	Wheelbase		1,690 mm (66.5 in)
	Seat height		740 mm (29.1 in)
	Ground clearance		115 mm (4.5 in)
	Dry weight		372 kg (820 lbs)
	Curb weight		400 kg (882 lbs)
Frame	Front type		Double cradle
	Frame suspension	Travel	Telescopic, 140 mm (5.5 in)
	Rear suspension	Travel	Swing arm, 105 mm (4.1 in)
		Air pressure	0 – 400 kPa (0 – 4.0 kgf/cm², 0 – 57 psi)
	Front tire	Size	130/70 – 18 63H (DUNLOP)
		Air pressure	225 kPa (2.25 kgf/cm², 33 psi)
	Rear tire	Size	160/80 – 16 75H (DUNLOP)
		Air pressure	250 kPa (2.50 kgf/cm², 36 psi): Driver only 280 kPa (2.80 kgf/cm², 41 psi): Driver and Passenger
	Front brake		Double disc brake
	Rear brake		Disc brake
	Fuel capacity		23.0 lit. (6.1 US gal, 5.1 Imp gal)
	Caster angle		30°
	Trail length		111 mm (4.4 in)
	Front fork oil capacity	Left	372 cm³ (12.6 US oz, 13.1 Imp oz)
		Right	377 cm³ (12.7 US oz, 13.2 Imp oz)
Engine	Engine type		Water cooled, 4 stroke O.H.C.
	Cylinder arrangement		Flat six
	Bore and stroke		71 x 64 mm (2.8 x 2.5 in)
	Displacement		1,520 cm³ (92.7 cu-in)
	Compression ratio		9.8 : 1
	Valve train		Belt driven over head camshaft
	Oil capacity	At disassembly	4.3 lit. (4.5 US qt, 3.8 Imp qt)
		After draining	3.5 lit. (3.7 US qt, 3.1 Imp qt)
	Lubrication system		Forced and wet sump
	Cooling system capacity		4.1 lit. (4.3 US qt, 3.6 Imp qt)
	Cylinder compression		1,471 kPa (15.0 kgf/cm², 213 psi)
	Engine weight		126 kg (278 lbs)
	Camshaft: Intake valve	Opens	5° ATDC (At 1 mm lift)
		Closes	30° ABDC (At 1 mm lift)
	Camshaft: Exhaust valve	Opens	40° BBDC (At 1 mm lift)
		Closes	5° BTDC (At 1 mm lift)
	Valve clearance	Intake/Exhaust	Hydraulic valve adjuster system
	Idle speed		800 ± 80 min⁻¹ (rpm)
		SW	800 ± 50 min⁻¹ (rpm)

Carburetion	Carburetor type		CV down-draft dual carburetors
	Throttle bore		36 mm (1.4 in)
	Carburetor identification No.		VDG9C SW: VDGWG AR: VDGWE
	Pilot screw opening		2-1/2 turns out SW, AR: 2-5/8 turns out
	Float level		7.5 mm (0.30 in)
	Main jet		pri: #80 2nd: #148
	Slow jet		#70 SW, AR: #65
	Throttle grip free play		5 – 8 mm (3/16 – 5/16 in)
	Fuel pump flow capacity		640 cm^3 (22.5 Imp oz)/minute
	Carburetor vacuum difference		Within 40 mm (1.6 in) Hg of each other
Drive Train	Clutch type		Wet, multi-plate
	Transmission		5-speed, constant mesh
	Primary reduction ratio		1.591 (78/49)
	Secondary reduction ratio		0.971 (34/35)
	Gear ratio	1st 2nd 3rd 4th OD	2.666 (40/15) 1.722 (31/18) 1.291 (31/24) 0.964 (27/28) 0.758 (22/29)
	Final reduction ratio		2.833 (34/12)
	Gearshift pattern		Left foot operated return system 1 – N – 2 – 3 – 4 – OD
	Final gear oil capacity (After disassembly)		170 cm^3 (5.7 US oz, 6.0 Imp oz)
Electrical	Ignition		Battery ignition (Full transistor)
	Ignition timing "F" mark		3.5° BTDC at idle
	Starting system		Starting motor
	Alternator		AC generator, 0.55 kW/5,000 min^{-1} (rpm)
	Battery capacity		12 V – 20 AH
	Spark plug: Standard	NGK	DPR7EA-9
		Nippondenso	X22EPR-U9
	Spark plug: For cold climate (Below 5°C, 41°F)	NGK	DPR6EA-9
		Nippondenso	X20EPR-U9
	Spark plug: For extended high speed riding	NGK	DPR8EA-9
		Nippondenso	X24EPR-U9
	Spark plug gap		0.8 – 0.9 mm (0.031 – 0.035 in)
	Firing order		1 – 4 – 5 – 2 – 3 – 6 – 1
	Fuses		5 A x 4 (G: 5 A x 3), 10 A x 4, 15 A x 5 (fuse box) 30 A, 55 A (main fuses) 5 A x 2, 65 A (reverse fuses)
Lights	Headlight		12 V 60 W (R), 60/55 W (L) E: 60/55 W x 2 U: 45/45 W x 2
	Position light		12 V 5 W (Except U)
	Turn signal light		12 V 21 W x 4
	Indicator light		12 V 3.4 W x 5/12 V 1.7 W x 4
	Turn signal indicator		12 V 3 W x 2
	Instrument illumination		12 V 3.4 W x 4
	LCD unit illumination		12 V 3 W x 2
	License light		12 V 5 W
	Brake and taillight		12 V 21/5 W x 2

SERVICE DATA

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
Engine weight (including carburetors)				126 kg (278 lbs)	———
Engine oil capacity	at engine assembly			4.3 lit (4.5 US qt, 3.8 Imp qt)	———
	at oil change			3.5 lit (3.7 US qt, 3.1 Imp qt)	———
	at oil filter and oil change			3.7 lit (3.9 US qt, 3.3 Imp qt)	———
Radiator coolant capacity	After disassembly			4.1 lit (4.3 US qt, 3.6 Imp qt)	———
	After draining (including reserve tank)			3.8 lit (4.0 US qt, 3.3 Imp qt)	———
	Reserve tank			0.55 lit (0.6 US qt, 0.5 Imp qt)	———
OIL PUMP	Main oil pump	Tip clearance		0.15 (0.006) max.	0.35 (0.014)
		Pump body clearance		0.15 – 0.23 (0.006 – 0.009)	0.43 (0.017)
		Pump side clearance		0.02 – 0.07 (0.001 – 0.003)	0.12 (0.005)
	Scavenge pump	Tip clearance		0.15 (0.006) max.	0.35 (0.014)
		Pump body clearance		0.15 – 0.22 (0.006 – 0.009)	0.42 (0.017)
		Pump side clearance		0.02 – 0.07 (0.001 – 0.003)	0.12 (0.005)
	Pressure relief valve	Relief pressure		461 – 559 kPa (4.7 – 5.7 kgf/cm², 67 – 81 psi)	———
		Relief valve spring free length		90.8 (3.57)	84.0 (3.31)
	Oil pressure (at oil pressure switch)	Cold (At 35°C/95°F)	Idle speed	127 kPa (1.3 kgf/cm², 18 psi)	———
			5,000 min⁻¹ (rpm)	490 kPa (5.0 kgf/cm², 71 psi)	———
		Hot (At 80°C/176°F)	Idle speed	78 kPa (0.8 kgf/cm², 11 psi)	———
			5,000 min⁻¹ (rpm)	490 kPa (5.0 kgf/cm², 71 psi)	———
COOLING	Radiator cap relief pressure			108 – 137 kPa (1.1 – 1.4 kgf/cm², 16 – 20 psi)	———
	Thermostat	Begins to open temperature		80° – 84°C (176° – 183°F)	———
		Fully opened temperature		93° – 97°C (199° – 206°F)	———
		Valve lift (heated to 95°C/5 minutes)		8.0 (0.315) min.	———
	Thermo valve		Starts to close	78° – 82°C (172° – 180°F)	———
	Thermostatic fan motor switch		Starts to close	98° – 102°C (208° – 216°F)	———
	Coolant temperature sensor resistance		60°C (140°F)	104 ohms	———
			85°C (185°F)	44 ohms	———
			110°C (230°F)	20 ohms	———
			120°C (248°F)	16 ohms	———
CYLINDER HEAD	Cylinder head warpage			———	0.10 (0.004)
	Valve stem O.D.		IN	5.475 – 5.490 (0.2156 – 0.2161)	5.45 (0.215)
			EX	5.455 – 5.470 (0.2148 – 0.2154)	5.44 (0.214)
	Valve guide I.D.		IN, EX	5.500 – 5.512 (0.2165 – 0.2170)	5.55 (0.219)
	Valve stem to guide clearance		IN	0.010 – 0.037 (0.0004 – 0.0015)	0.08 (0.003)
			EX	0.030 – 0.057 (0.0012 – 0.0022)	0.10 (0.004)
	Valve seat width			1.2 (0.05)	———
	Valve spring free length			44.6 (1.76)	43.3 (1.70)
	Valve spring preload/length			15.6 – 18.2/37.5 kg/mm (34.39 – 40.12/1.48 lbs/in)	———
	Rocker arm I.D.			25.000 – 25.021 (0.9843 – 0.9851)	25.05 (0.986)
	Rocker arm shaft O.D.			11.966 – 11.984 (0.4711 – 0.4718)	11.95 (0.470)
	Rocker arm lobe		I.D.	11.996 – 12.031 (0.4723 – 0.4734)	12.07 (0.475)
			O.D.	20.945 – 20.980 (0.8246 – 0.8260)	20.93 (0.824)
	Hydraulic valve adjuster compression stroke with kerosene			0 – 0.30 (0 – 0.012)	0.30 (0.012) max.

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
CYLINDER HEAD	Camshaft	Cam lobe height		36.110 – 36.190 (1.4217 – 1.4248)	35.9 (1.41)
		Runout (at center journal)		——	0.10 (0.004)
		Journal O.D.	Both middles	26.934 – 26.955 (1.0604 – 1.0612)	26.91 (1.059)
			Both ends	26.949 – 26.970 (1.0610 – 1.0618)	26.91 (1.059)
		Holder journal I.D.		27.000 – 27.021 (1.0630 – 1.0638)	27.05 (1.065)
		Journal oil clearance	Both middles	0.045 – 0.087 (0.0018 – 0.0034)	0.14 (0.006)
			Both ends	0.030 – 0.072 (0.0012 – 0.0028)	0.14 (0.006)
CLUTCH	Clutch master cylinder	Cylinder I.D.		15.870 – 15.913 (0.6248 – 0.6265)	15.93 (0.627)
		Piston O.D.		15.827 – 15.854 (0.6231 – 0.6242)	15.82 (0.623)
	Clutch	Plate warpage		——	0.30 (0.012)
		Disc thickness		3.72 – 3.88 (0.146 – 0.153)	3.5 (0.14)
		Clutch spring free height		5.38 (0.212)	5.1 (0.20)
OUTPUT-SHAFT	Damper spring free length			60.82 (2.394)	57.0 (2.24)
	Shaft O.D.			22.008 – 22.021 (0.8665 – 0.8670)	21.99 (0.866)
	Collar		I.D.	22.026 – 22.041 (0.8672 – 0.8678)	22.05 (0.868)
			O.D.	25.959 – 25.980 (1.0220 – 1.0228)	25.95 (1.022)
	Driven gear I.D.			26.000 – 26.016 (1.0236 – 1.0242)	26.03 (1.025)
GEAR-SHIFT	Shift fork shaft O.D.			13.966 – 13.984 (0.5498 – 0.5506)	13.90 (0.547)
	Shift fork		I.D.	14.000 – 14.021 (0.5512 – 0.5520)	14.04 (0.553)
			Claw thickness	5.93 – 6.00 (0.233 – 0.236)	5.6 (0.22)
TRANSMISSION	Gear I.D.		M4	31.000 – 31.025 (1.2205 – 1.2215)	31.04 (1.222)
			M5	30.000 – 30.021 (1.1811 – 1.1819)	30.04 (1.183)
			C2, C3	34.000 – 34.016 (1.3386 – 1.3392)	34.04 (1.340)
	Gear bushing O.D.		M4	30.950 – 30.975 (1.2185 – 1.2195)	30.93 (1.218)
			M5	29.955 – 29.980 (1.1793 – 1.1803)	29.93 (1.178)
			C2, C3	33.940 – 33.965 (1.3362 – 1.3372)	33.92 (1.335)
	Gear bushing I.D.		M4	28.000 – 28.021 (1.1024 – 1.1032)	28.04 (1.104)
			M5	23.000 – 23.021 (0.9055 – 0.9063)	23.03 (0.907)
	Mainshaft O.D.		M4	27.974 – 27.987 (1.1013 – 1.1018)	27.95 (1.100)
			M5	22.974 – 22.987 (0.9045 – 0.9050)	22.95 (0.904)
	Gear-to-bushing		M4	0.025 – 0.075 (0.0010 – 0.0030)	0.10 (0.004)
			M5	0.020 – 0.066 (0.0008 – 0.0026)	0.09 (0.004)
			C2, C3	0.035 – 0.076 (0.0014 – 0.0030)	0.10 (0.004)
	Bushing-to-shaft		M4, M5	0.013 – 0.047 (0.0005 – 0.0019)	0.08 (0.003)
CYLINDER, PISTON	Cylinder compression pressure			1300 – 1700 kPa (13.0 – 17.0 kgf/cm², 185 – 242 psi)	1000 kPa (10.0 kg/cm², 142 psi)
	Cylinder	I.D.		71.010 – 71.025 (2.7957 – 2.7963)	71.1 (2.80)
		Out-of-round		——	0.15 (0.006)
		Taper		——	0.05 (0.002)
		Top warpage		——	0.05 (0.002)
	Piston	O.D. (at skirt)		70.960 – 70.990 (2.7937 – 2.7949)	70.85 (2.789)
		Piston pin bore		18.010 – 18.016 (0.7091 – 0.7093)	18.03 (0.710)
		Piston-to-cylinder clearance		0.020 – 0.065 (0.0008 – 0.0026)	0.10 (0.004)

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
CYLINDER, PISTON	Piston ring	End gap	Top and second	0.15 – 0.30 (0.006 – 0.012)	0.5 (0.02)
			Oil ring side rail	0.20 – 0.70 (0.008 – 0.028)	0.9 (0.04)
		Ring-to-ring land clearance	Top	0.025 – 0.055 (0.0010 – 0.0022)	0.10 (0.004)
			Second	0.015 – 0.045 (0.0006 – 0.0018)	0.10 (0.004)
	Piston pin	O.D. (at sliding surfaces)		17.994 – 18.000 (0.7084 – 0.7087)	18.99 (0.748)
		Pin-to-piston clearance		0.010 – 0.022 (0.0004 – 0.0009)	0.05 (0.002)
		Pin-to-rod interference		0.015 – 0.039 (0.0006 – 0.0015)	———
CRANKSHAFT	Main journal bearing oil clearance			0.020 – 0.038 (0.0008 – 0.0015)	0.06 (0.002)
	Crankpin bearing oil clearance			0.027 – 0.045 (0.0011 – 0.0018)	0.06 (0.002)
	Crankshaft runout (at center journal)			———	0.03 (0.001)
	Connecting rod side clearance			0.15 – 0.30 (0.006 – 0.012)	0.40 (0.016)
	Crankpin and main journal		Taper	———	0.003 (0.0001)
			Out-of-round	———	0.005 (0.0002)
WHEELS	Wheel axle runout			———	0.2 (0.01)
	Wheel rim runout		Axial	———	2.0 (0.08)
			Radial	———	2.0 (0.08)
	Tire tread depth		Front	———	1.5 (0.06)
			Rear	———	2.0 (0.08)
SUSPENSION	Rear suspension air pressure			0 – 400 kPa (0 – 4.0 kgf/cm², 0 – 57 psi)	———
	Front fork spring free length			390.6 (15.38)	382.8 (15.07)
	Front fork oil capacity		Left	327 cm³ (12.6 US oz, 13.1 Imp oz)	———
			Right	377 cm³ (12.7 US oz, 13.2 Imp oz)	———
	Front fork oil level (from the top of tube)			194 (7.6)	———
	Front fork oil			ATF	———
	Fork tube runout			———	0.2 (0.01)
	Right shock absorber oil capacity			140 cm³ (4.7 US oz, 4.9 Imp oz)	———
	Right shock absorber oil			ATF	———
FINAL DRIVE	Final gear oil	Recommended oil		Hypoid gear oil, SAE #80	———
		Capacity	At assembly	170 cm³ (5.7 US oz, 6.0 Imp oz)	———
			After draining	140 cm³ (4.7 US oz, 4.9 Imp oz)	———
	Final gear backlash			0.05 – 0.15 (0.002 – 0.006)	0.3 (0.01)
		Difference at 3 points		———	0.10 (0.004)
	Ring gear-to-stop pin clearance			0.30 – 0.60 (0.012 – 0.024)	———
BRAKES	Front brake master cylinder	Cylinder I.D.		12.700 – 12.743 (0.5000 – 0.5017)	12.755 (0.5022)
		Piston O.D.		12.684 – 12.657 (0.4980 – 0.4983)	12.645 (0.4978)
	Front brake caliper	Left	Cylinder I.D.	25.400 – 25.450 (1.0000 – 1.0020)	25.460 (1.0024)
			Piston O.D.	25.335 – 25.368 (0.9974 – 0.9987)	25.310 (0.9965)
		Right	Cylinder I.D.	30.230 – 30.280 (1.1902 – 1.1921)	30.290 (1.1925)
			Piston O.D.	30.165 – 30.198 (1.1876 – 1.1889)	30.140 (1.1866)
	Front brake disc	Thickness		5.8 – 6.2 (0.23 – 0.24)	5.0 (0.20)
		Runout		———	0.3 (0.01)
	Front brake pad thickness			5.5 (0.22)	1.0 (0.04)

Unit: mm (in)

	ITEM			STANDARD	SERVICE LIMIT
BRAKES	Rear brake master cylinder	Cylinder I.D.		15.870 – 15.913 (0.6248 – 0.6265)	15.925 (0.6270)
		Piston O.D.		15.827 – 15.854 (0.6231 – 0.6242)	15.815 (0.6226)
		Brake rod clevis installed length		100 (3.9)	———
	Rear brake caliper	Cylinder I.D.		32.030 – 32.080 (1.2610 – 1.2630)	32.090 (1.2634)
		Piston O.D.		31.948 – 31.998 (1.2578 – 1.2598)	31.940 (1.2575)
	Rear brake disc	Thickness		7.3 – 7.7 (0.29 – 0.30)	6.0 (0.24)
		Runout		———	0.3 (0.01)
	Rear brake pad thickness			6.5 (0.26)	1.0 (0.04)
	Brake fluid (front/rear)			DOT 4	———
CHARGING	Battery capacity			12 V – 20 AH	———
	Battery specific gravity (At 20°C, 68°F)	Full charged		1.270 – 1.290	———
		Need charging		Below 1.260	———
	Battery charging current			2.0 Amperes max.	———
	Alternator	Capacity		0.55 kW/5,000 min–1 (rpm)	———
		Stator coil resistance		0.1 – 0.3 ohms (20°C, 68°F)	———
		Rotor coil resistance		2.9 – 4.0 ohms (20°C, 68°F)	———
		Rotor coil slip ring O.D.		27.0 (1.06)	26.0 (1.02)
		Charging start		800 – 1,000 min^{-1} (rpm)	———
	Regulator/ Rectifier (into alternator)	Type		Transistorized non-adjustable reg./recti.	———
		Regulated voltage (at 20°C/68°F)	900 min^{-1} (rpm)	0 – 2 A, 13.5 – 15.5 V	———
			1,850 min^{-1} (rpm)	1.5 A min., 13.5 – 15.5 V	———
IGNITION	Firing order			1 – 4 – 5 – 2 – 3 – 6 – 1	———
	Ignition timing		F mark	3.5°BTDC at 800 ± 80 min^{-1} (rpm) (SW model 800 ± 50 min^{-1} (rpm))	———
		Vacuum advance	Advance start	60 – 160 mmHg (2.4 – 6.3 inHg)	———
			Advance cease	310 – 360 mmHg (12.2 – 14.2 inHg)	———
	Ignition coil resistance (at 20°C/68°F)	Primary coil		2.6 – 3.2 ohms	———
		Secondary coil	With spark plug wire	20.2 – 26.8 Kohms	———
			Without spark plug wire	11.7 – 14.3 Kohms	———
	Pulse generator coil resistance (At 20°C, 68°F)			400 – 500 ohms	———
	Tw sensor/Ta sensor resistance		20°C (68°F)	2.0 – 3.0 Kohms	———
			80°C (176°F)	200 – 400 ohms	———
STARTER/ REVERSE	Starter motor brush length			12.5 (0.49)	6.0 (0.24)
	Reverse System	Starter relay regulator/regulated current		0.7 – 1.0 A	———
		Resister	Between connector and resistor terminals	0.12 – 0.17 ohms	———
ELECTRICAL	Oil pressure switch continuity pressure			10 – 20 kPa (0.1 – 0.2 kgf/cm^2, 1 – 3 psi)	———
	Fuel level sensor resistance (at 20°C, 68°F)		Empty	90 – 100 ohms	———
			Reserve	66 – 81 ohms	———
			Full	4 – 10 ohms	———

To print chapters, click on the printer icon and fill in the page range.

Note: Make sure to select √ Shrink to fit in the printer dialog box when printing wiring diagrams.